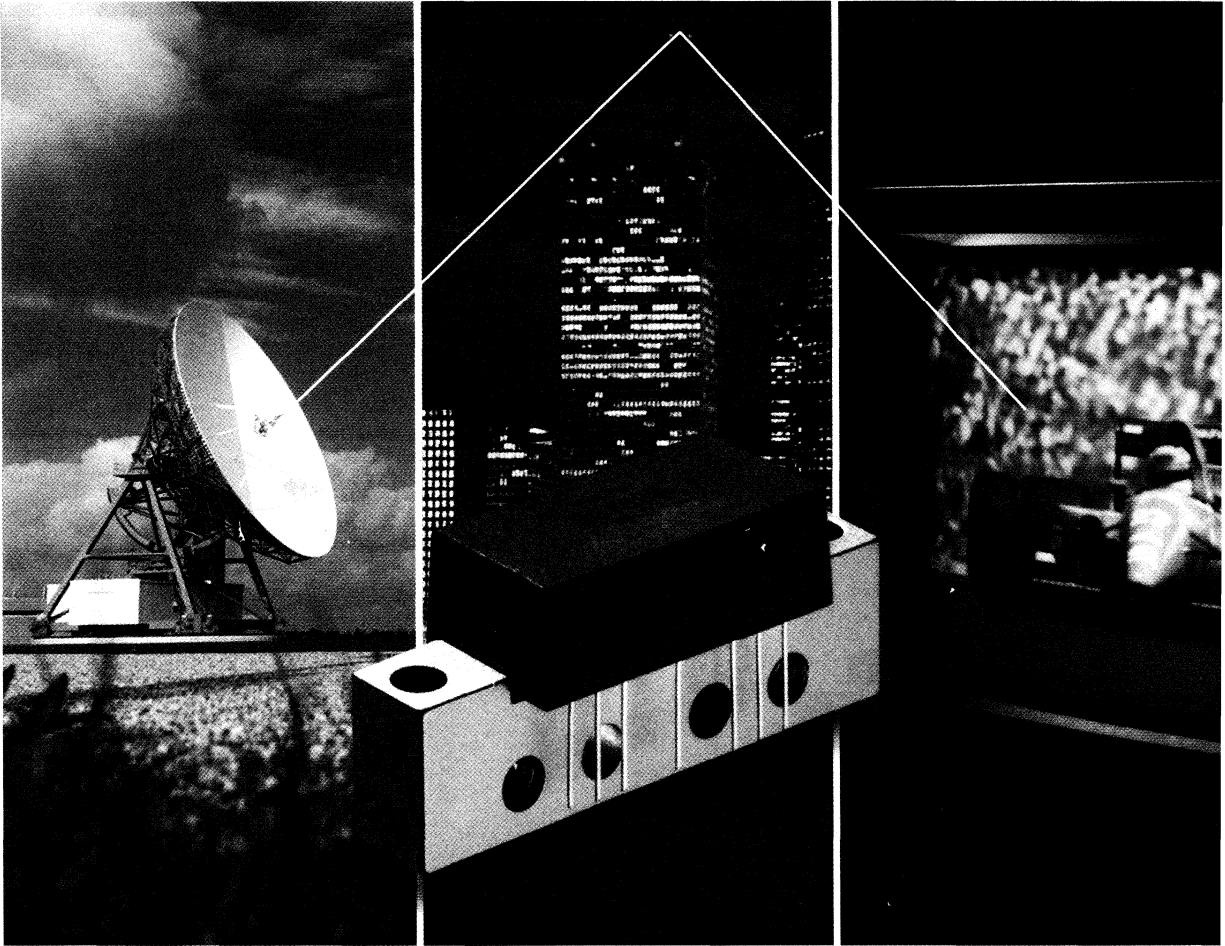


# Wideband Hybrid IC Modules



1995

DATA HANDBOOK SC16

Philips  
Semiconductors



# PHILIPS

## **QUALITY ASSURED**

Our quality system focuses on the continuing high quality of our components and the best possible service for our customers. We have a three-sided quality strategy: we apply a system of total quality control and assurance; we operate customer-oriented dynamic improvement programmes; and we promote a partnering relationship with our customers and suppliers.

## **PRODUCT SAFETY**

In striving for state-of-the-art perfection, we continuously improve components and processes with respect to environmental demands. Our components offer no hazard to the environment in normal use when operated or stored within the limits specified in the data sheet.

Some components unavoidably contain substances that, if exposed by accident or misuse, are potentially hazardous to health. Users of these components are informed of the danger by warning notices in the data sheets supporting the components. Where necessary the warning notices also indicate safety precautions to be taken and disposal instructions to be followed. Obviously users of these components, in general the set-making industry, assume responsibility towards the consumer with respect to safety matters and environmental demands.

All used or obsolete components should be disposed of according to the regulations applying at the disposal location. Depending on the location, electronic components are considered to be 'chemical', 'special' or sometimes 'industrial' waste. Disposal as domestic waste is usually not permitted.

# Wideband Hybrid IC Modules

## CONTENTS

	Page
ALPHANUMERIC INDEX	5
SELECTION GUIDE	7
GENERAL	13
CATV AMPLIFIER MODULES	
Device data (in alphanumeric sequence)	33
Package outlines	211
Accessories	217
HYBRID WIDEBAND AMPLIFIERS	
Device data (in alphanumeric sequence)	221
DATA HANDBOOK SYSTEM	339

## DEFINITIONS

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

## LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

## **ALPHANUMERIC INDEX**



## Wideband Hybrid IC Modules

## Alphanumeric Index

TYPE	PAGE
BGD102	34
BGD104	34
BGD106	36
BGD108	38
BGD502	40
BGD504	40
BGD506	44
BGD508	46
BGD601	49
BGD602	53
BGD602D	57
BGD702	61
BGD704	66
BGD885	71
BGE85A	74
BGE88	76
BGE88/01	76
BGE884	78
BGE885	80
BGE887	83
BGX881	85
BGX885N	88
BGY61	91
BGY65	93
BGY66B	95
BGY67	97
BGY67A	99
BGY80	101
BGY81	101
BGY82	103

TYPE	PAGE
BGY83	103
BGY84	106
BGY84A	109
BGY85	106
BGY85A	109
BGY85H/01	112
BGY86	115
BGY87	115
BGY87B	117
BGY88	119
BGY89	121
BGY580	123
BGY581	123
BGY582	126
BGY583	126
BGY584	129
BGY584A	132
BGY585	129
BGY585A	132
BGY586	137
BGY587	137
BGY587B	139
BGY588	141
BGY681	144
BGY683	148
BGY685	152
BGY685A/04	156
BGY685AD	160
BGY685AL	162
BGY687	166

TYPE	PAGE
BGY687B	168
BGY785A	172
BGY785AD	174
BGY787	179
BGY883	184
BGY885A	186
BGY885B	192
BGY887B	194
BGY887BO	199
BGY888	201
BGY1085A	206
OM926	225
OM926E	232
OM956/1	238
OM2045	245
OM2046	251
OM2050	257
OM2052	263
OM2060	269
OM2063	275
OM2064	282
OM2070	289
OM2070B	295
OM2081/60	301
OM2081/86	307
OM2082/60	313
OM2082/86	319
OM2083/60	325
OM2083/86	332





## **SELECTION GUIDE**

	Page
<b>CATV amplifier modules</b>	<b>8</b>
<b>General purpose hybrid amplifier modules</b>	<b>11</b>

## Wideband Hybrid IC Modules

## Selection guide

## CATV AMPLIFIER MODULES

TYPE NUMBER	FREQUENCY RANGE (MHz)	POWER GAIN at $f = 50$ MHz ( $G_p$ ) (dB)	SLOPE CABLE EQUIVALENT (SL) (dB)	APPLICATION	PAGE
BGD102	40 to 450	18 to 19	0.5 to 2.5	power doubler	34
BGD104	40 to 450	19.5 to 20.5	0.5 to 2.5	power doubler	34
BGD106	40 to 450	21.5 to 22.5	0 to 2	power doubler	36
BGD108	40 to 450	35 to 37	0.2 to 2.2	power doubler	38
BGD502 (note 1)	40 to 550	18 to 19	0.2 to 2.2	power doubler	40
BGD504 (note 1)	40 to 550	19.5 to 20.5	0.2 to 2.2	power doubler	40
BGD506	40 to 550	21.5 to 22.5	0 to 2	power doubler	44
BGD508 (note 1)	40 to 550	35 to 37	0.2 to 2.2	power doubler	46
BGD601 (note 2)	40 to 600	12 to 13	0.2 to 2.2	power doubler	49
BGD602 (note 2)	40 to 600	18 to 19	0.2 to 2.2	power doubler	53
BGD602D (note 2)	40 to 600	17.5 to 18.5	0.2 to 2.2	p.d., darlington	57
BGD702 (note 5)	40 to 750	18 to 19	0.2 to 2	power doubler	61
BGD704 (note 5)	40 to 750	19.5 to 20.5	0 to 2	power doubler	66
BGD885	40 to 860	16.5 to 17.5	0.2 to 1.6	power doubler	71
BGE85A	40 to 450	17.4 to 19.4	0.3 to 1.5	output amplifier	74
BGE88	40 to 450	33 to 36	0.5 to 2.5	amplifier	76
BGE88/01	40 to 450	33 to 36	0.5 to 2.5	amplifier	76
BGE884	40 to 860	16.5 to 17.5	0.2 to 1.4	amplifier	78
BGE885	40 to 860	16.5 to 17.5	0.2 to 1.2	amplifier	80
BGE887	470 to 860	22.5 to 25 (note 3)	-0.2 to +1	amplifier	83
BGX881	40 to 860	12 to 13	0.2 to 1.4	amplifier	85
BGX885N	40 to 860	16.5 to 17.5	0.2 to 1.4	amplifier	88
BGY61	5 to 200	12.5 to 13.5 (note 4)	-0.2 to +0.5	reverse amplifier	91
BGY65	5 to 200	18 to 19 (note 4)	-0.2 to +0.5	reverse amplifier	93
BGY66B	5 to 120	24.5 to 25.5	-0.2 to +0.5	reverse amplifier	95
BGY67	5 to 200	21.5 to 22.5 (note 4)	-0.2 to +0.5	reverse amplifier	97
BGY67A	5 to 200	23.5 to 24.5 (note 4)	-0.2 to +0.5	reverse amplifier	99
BGY80	40 to 450	12 to 13	0.2 to 1.5	pre-amplifier	101
BGY81	40 to 450	12 to 13	0.2 to 1.5	final amplifier	101
BGY82	40 to 450	13.5 to 14.5	0.2 to 1.5	pre-amplifier	103
BGY83	40 to 450	13.5 to 14.5	0.2 to 1.5	amplifier	103
BGY84	40 to 450	16.5 to 17.5	0.5 to 1.5	pre-amplifier	106
BGY84A	40 to 450	18 to 18.8	0.3 to 1.5	pre-amplifier	109
BGY85	40 to 450	16.5 to 17.5	0.5 to 1.5	final amplifier	106
BGY85A	40 to 450	18 to 18.8	0.3 to 1.5	final amplifier	109
BGY85H/01	40 to 450	14.8 to 16.4	-	trunk amplifier	112

## Wideband Hybrid IC Modules

## Selection guide

## CATV AMPLIFIER MODULES (continued)

TYPE NUMBER	FREQUENCY RANGE (MHz)	POWER GAIN at $f = 50$ MHz ( $G_p$ ) (dB)	SLOPE CABLE EQUIVALENT (SL) (dB)	APPLICATION	PAGE
BGY86	40 to 450	21.5 to 22.5	0 to 1.5	pre-amplifier	115
BGY87	40 to 450	21.5 to 22.5	0 to 1.5	final amplifier	115
BGY87B	40 to 450	26.2 to 27.8	0.5 to 2.5	amplifier	117
BGY88	40 to 450	33.5 to 35.5	0.5 to 2.5	line extender	119
BGY89	40 to 450	37 to 39	0 to 2.5	line extender	121
BGY580	40 to 550	12 to 13	0.5 to 2	pre-amplifier	123
BGY581	40 to 550	12 to 13	0.5 to 2	final amplifier	123
BGY582	40 to 550	13.5 to 14.5	0.2 to 1.5	pre-amplifier	126
BGY583	40 to 550	13.5 to 14.5	0.2 to 1.5	amplifier	126
BGY584 (note 1)	40 to 550	16.5 to 17.5	0.5 to 2	pre-amplifier	129
BGY584A (note 1)	40 to 550	17.7 to 18.7	0.5 to 2	pre-amplifier	132
BGY585 (note 1)	40 to 550	16.5 to 17.5	0.5 to 2	final amplifier	129
BGY585A (note 1)	40 to 550	17.7 to 18.7	0.5 to 2	final amplifier	132
BGY586	40 to 550	21.5 to 22.5	0.2 to 1.5	pre-amplifier	137
BGY587	40 to 550	21.5 to 22.5	0.2 to 1.5	final amplifier	137
BGY587B	40 to 550	26.2 to 27.8	0.5 to 2.5	amplifier	139
BGY588 (note 1)	40 to 550	33.5 to 35.5	0 to 2.5	line extender	141
BGY681 (note 2)	40 to 600	12 to 13	0.7 to 2.2	amplifier	144
BGY683 (note 2)	40 to 600	13.5 to 14.5	0.2 to 1.7	amplifier	148
BGY685 (note 2)	40 to 600	16.5 to 17.5	0.5 to 2.2	amplifier	152
BGY685A/04 (note 2)	40 to 600	17.7 to 18.7	0.5 to 2.2	amplifier	156
BGY685AD	40 to 600	18 to 19	0.2 to 2.2	darlington amp.	160
BGY685AL (note 2)	40 to 600	18 to 19	0.5 to 2	amplifier	162
BGY687	40 to 600	21 to 22	0.8 to 2.2	amplifier	166

## Wideband Hybrid IC Modules

## Selection guide

## CATV AMPLIFIER MODULES (continued)

TYPE NUMBER	FREQUENCY RANGE (MHz)	POWER GAIN at $f = 50$ MHz ( $G_p$ ) (dB)	SLOPE CABLE EQUIVALENT (SL) (dB)	APPLICATION	PAGE
BGY687B	40 to 600	26.2 to 27.8	0.8 to 2.8	amplifier	168
BGY785A	40 to 750	18 to 19	0 to 2	amplifier	172
BGY785AD	40 to 750	18 to 19	0 to 1.5	amplifier	174
BGY787	40 to 750	21 to 22	0 to 1.5	amplifier	179
BGY883	40 to 860	14.5 to 15.5	0 to 2	amplifier	184
BGY885A	40 to 860	18 to 19	0 to 2	amplifier	186
BGY885B	40 to 860	19.5 to 20.5	0 to 2	amplifier	192
BGY887B	40 to 860	28.5 to 29.5	0.5 to 2.5	amplifier	194
BGY887BO	40 to 860	—	—	optical receiver	199
BGY888	40 to 860	33.5 to 34.5	0.5 to 2.5	amplifier	201
BGY1085A	40 to 100	18 to 19	0 to 2	amplifier	206

## Notes

1. Specifications also supplied for 450 MHz bandwidth operation.
2. Specifications also supplied for 450 MHz and 550 MHz bandwidth operation.
3. Power gain measured at  $f = 470$  MHz.
4. Power gain measured at 10 MHz.
5. Specifications also supplied for 450 MHz, 550 MHz and 600 MHz bandwidth operation.

## Wideband Hybrid IC Modules

## Selection guide

## GENERAL PURPOSE HYBRID AMPLIFIER MODULES

'Low noise' CECC; 12 V supply voltage (note 1)

TYPE	SUPPLY CURRENT (mA)	STAGES	GAIN (dB)	NOISE FIGURE (dB)	$V_{O(RMS)}$ TYP. VALUES (dB/ $\mu$ V) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM2045	11.5	1	12	3.6	99	2.0	1.4	245
OM2050	18	2	18	5.2	100	1.5	1.9	257
OM2052	42	2	28	4.5	107	2.2	2.1	263
OM2060	56	3	23	5.4	107	1.4	1.6	269
OM2063	52	3	29	3.6	105	2.3	1.4	275
OM2064	51	3	28	4.4	107	1.3	1.5	282
OM2070	100	3	28	4.8	112	2.3	1.9	289

'High output' CECC; 12 V supply voltage (note 1)

TYPE	SUPPLY CURRENT (mA)	STAGES	GAIN (dB)	NOISE FIGURE (dB)	$V_{O(RMS)}$ TYP. VALUES (dB/ $\mu$ V) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM2046	82	1	10	10	114	1.5	1.4	251
OM2070B	100	3	30	4.8	112	2.7	1.9	295
OM2081/60	85	1	10	7.5	115	1.5	1.3	301
OM2081/86	65	1	10.5	7.5	115	1.5	1.3	307
OM2082/60	145	2	20	7.5	114	1.5	1.6	313
OM2082/86	145	2	19	7.5	114	1.7	1.4	319
OM2083/60	175	3	29	6.5	114	1.2	1.3	325
OM2083/86	165	3	30	7	112	1.9	1.7	332

## Wideband Hybrid IC Modules

## Selection guide

\*Satellite band; 12 V supply voltage (note 1)

TYPE	SUPPLY CURRENT (mA)	STAGES	GAIN (dB)	NOISE FIGURE (dB)	$V_{C(RMS)}$ TYP. VALUES (dB/ $\mu$ V) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM926	28	2	16	6.5	103	1.8	1.7	225
OM926E	37.5	2	20	6.5	105	2.1	2.0	232
OM956/1	57.5	3	18.5	4.5	112 (note 3)	2.0	1.7	238

**Notes**

- Information on 24 volt versions available on request.
- Measured at -60 dB intermodulation distortion to DIN 45004, para. 6.3: 3-tone.
- The typical maximum VSWR occurring in the frequency range 40 - 860 MHz, for a sample connected to a 75  $\Omega$  line.
- Measured at -60 dB intermodulation distortion to DIN 45004, para. 6.3: 3-tone.

## **GENERAL**

	<b>Page</b>
<b>Quality</b>	<b>14</b>
<b>Pro electron type numbering system</b>	<b>15</b>
<b>Rating systems</b>	<b>17</b>
<b>Letter symbols</b>	<b>18</b>
<b>CATV parameters</b>	<b>21</b>

**QUALITY****Total Quality Management**

Philips Semiconductors is a Quality Company, renowned for the high quality of our products and service. We keep alive this tradition by constantly aiming towards one ultimate standard, that of zero defects. This aim is guided by our Total Quality Management (TQM) system, the basis of which is described in the following paragraphs.

**QUALITY ASSURANCE**

Based on ISO 9000 standards, customer standards such as Ford TQE and IBM MDQ. Our factories are certified to ISO 9000 by external inspectorates.

**PARTNERSHIPS WITH CUSTOMERS**

PPM co-operations, design-in agreements, ship-to-stock, just-in-time and self-qualification programmes, and application support.

**PARTNERSHIPS WITH SUPPLIERS**

Ship-to-stock, statistical process control and ISO 9000 audits.

**QUALITY IMPROVEMENT PROGRAMME**

Continuous process and system improvement, design improvement, complete use of statistical process control, realization of our final objective of zero defects, and logistics improvement by ship-to-stock and just-in-time agreements.

**Advanced quality planning**

During the design and development of new products and processes, quality is built-in by advanced quality planning. Through failure-mode-and-effect analysis the critical parameters are detected and measures taken to ensure good performance on these parameters. The capability of process steps is also planned in this phase.

**Product conformance**

The assurance of product conformance is an integral part of our quality assurance (QA) practice. This is achieved by:

- Incoming material management through partnerships with suppliers.
- In-line quality assurance to monitor process reproducibility during manufacture and initiate any necessary corrective action. Critical process steps are 100% under statistical process control.
- Acceptance tests on finished products to verify conformance with the device specification. The test results are used for quality feedback and corrective actions. The inspection and test requirements are detailed in the general quality specifications.
- Periodic inspections to monitor and measure the conformance of products.

**Product reliability**

With the increasing complexity of Original Equipment Manufacturer (OEM) equipment, component reliability must be extremely high. Our research laboratories and development departments study the failure mechanisms of semiconductors. Their studies result in design rules and process optimization for the highest built-in product reliability. Highly accelerated tests are applied to the products reliability evaluation. Rejects from reliability tests and from customer complaints are submitted to failure analysis, to result in corrective action.

**Customer responses**

Our quality improvement depends on joint action with our customer. We need our customer's inputs and we invite constructive comments on all aspects of our performance. Please contact our local sales representative.

**Recognition**

The high quality of our products and services is demonstrated by many Quality Awards granted by major customers and international organizations.



**PRO ELECTRON TYPE NUMBERING SYSTEM****Basic type number**

This type designation code applies to discrete semiconductor devices (not integrated circuits), multiples of such devices, semiconductor chips and darlington transistors.

**FIRST LETTER**

The first letter gives information about the material for the active part of the device.

- A germanium or other material with a band gap of 0.6 to 1 eV
- B silicon or other material with a band gap of 1 to 1.3 eV
- C gallium arsenide (GaAs) or other material with a band gap of 1.3 eV or more
- R compound materials, e.g. cadmium sulphide.

**SECOND LETTER**

The second letter indicates the function for which the device is primarily designed. The same letter can be used for multi-chip devices with similar elements.

In the following list low power types are defined by  $R_{th\ j-mb} > 15\ K/W$  and power types by  $R_{th\ j-mb} \leq 15\ K/W$ .

- A diode; signal, low power
- B diode; variable capacitance
- C transistor; low power, audio frequency
- D transistor; power, audio frequency
- E diode; tunnel
- F transistor; low power, high frequency
- G multiple of dissimilar devices/miscellaneous devices; e.g. oscillators. Also with special third letter, see under 'Serial number'
- H diode; magnetic sensitive
- L transistor; power, high frequency
- N photocoupler
- P radiation detector; e.g. high sensitivity photo-transistor; with special third letter

- Q radiation generator; e.g. LED, laser; with special third letter
- R control and switching device; e.g. thyristor, low power; with special third letter
- S transistor; low power, switching
- T control and switching device; e.g. thyristor, power; with special third letter
- U transistor; power, switching
- W surface acoustic wave device
- X diode; multiplier, e.g. varactor, step recovery
- Y diode; rectifying, booster
- Z diode; voltage reference or regulator, transient suppressor diode; with special third letter.

**SERIAL NUMBER/SPECIAL THIRD LETTER**

The number comprises three figures running from 100 to 999 for devices primarily intended for consumer equipment, or one letter (Z, Y, X, etc.) and two figures running from 10 to 99 for devices primarily intended for industrial or professional equipment.<sup>(1)</sup> The letter has no fixed meaning, except in the following cases:

- A for triacs, after second letter 'R' or 'T'
- F for emitters and receivers in fibre-optic communication, after second letter 'G', 'P' or 'Q'. When the second letter is 'G', the first letter should be defined in accordance with the material of the main optical device.
- L for lasers in non-fibre-optic applications, after second letter 'G' or 'Q'. When the second letter is 'G', the first letter should be defined in accordance with the material of the main optical device.
- O for opto-triacs, after second letter 'R'
- T for 3-state bicolour LEDs, after second letter 'Q'
- W for transient voltage suppressor diodes, after second letter 'Z'.

(1) When the supply of these serial numbers is exhausted, the serial number may be expanded to three figures for industrial types and four figures for consumer types.

## EXAMPLES OF BASIC TYPE NUMBERS

- AA112: germanium, low-power signal diode (consumer type)  
 ACY32: germanium, low-power AF transistor (industrial type)  
 BD232: silicon, power AF transistor (consumer type)  
 CQY17: GaAs, light-emitting diode (industrial type)  
 RPY84: CdS, photo-conductive cell (industrial type).

**Version letter(s)**

One or two letters may be added to the basic type number to indicate minor electrical or mechanical variants of the basic type. The letters never have a fixed meaning, except that the letter 'R' indicates reverse polarity and the letter 'W' indicates a surface mounted device (SMD).

**Suffix**

Sub-classification can be used for devices supplied in a wide range of variants, called associated types. The following sub-coding suffixes are in use:

## VOLTAGE REFERENCE AND VOLTAGE REGULATOR DIODES

One letter and one number, preceded by a hyphen (-). The letter, if required, indicates the nominal tolerance of the Zener voltage.

- A 1% (in accordance with IEC 63, series E96)
- B 2% (in accordance with IEC 63, series E48)
- C 5% (in accordance with IEC 63, series E24)
- D 10% (in accordance with IEC 63, series E12)
- E 20% (in accordance with IEC 63, series E6).

In the case of a 3% tolerance, the letter 'F' is used.

The number denotes the typical operating (Zener) voltage, related to the nominal current rating for the entire range. The letter 'V' is used in place of the decimal point.

Example: BZY74-C6V3 or -C10.

## TRANSIENT VOLTAGE SUPPRESSOR DIODES

One number, preceded by a hyphen (-). The number indicates the maximum recommended continuous reversed (stand-off) voltage,  $V_R$ . The letter 'V' is used in place of the decimal point.

Example: BZW70-9V1 or -39.

The letter 'B' may be used immediately after the last number, to indicate a bidirectional suppressor diode.

Example: BZW10-15B.

## CONVENTIONAL AND CONTROLLED AVALANCHE RECTIFIER DIODES AND THYRISTORS

One number, preceded by a hyphen (-). The number indicates the rated maximum repetitive peak reverse voltage,  $V_{RRM}$ , or the rated repetitive peak off-state voltage,  $V_{DRM}$ , whichever is the lower. Reversed polarity with respect to the case is indicated by the letter 'R' immediately after the number.

Example: BYT-100 or -100R.

## RADIATION DETECTORS

One number, preceded by a hyphen (-). The number indicates the depletion layer in micrometres ( $\mu\text{m}$ ). The resolution is indicated by a version letter.

Example: BPX10-2A.

## ARRAY OF RADIATION DETECTORS AND GENERATORS

One number, preceded by a hyphen (-). The number indicates the number of basic devices assembled into the array.

Examples: BPW50-6, BPW50-9, BPW50-12.

## HIGH FREQUENCY POWER TRANSISTORS

One number, preceded by a hyphen (-). The number indicates the supply voltage.

Example: BLU80-24.

**RATING SYSTEMS**

The rating systems described are those recommended by the International Electrotechnical Commission (IEC) in its publication number 134.

**Definitions of terms used**

## ELECTRONIC DEVICE

An electronic tube or valve, transistor or other semiconductor device. This definition excludes inductors, capacitors, resistors and similar components.

**CHARACTERISTIC**

A characteristic is an inherent and measurable property of a device. Such a property may be electrical, mechanical, thermal, hydraulic, electro-magnetic or nuclear, and can be expressed as a value for stated or recognized conditions. A characteristic may also be a set of related values, usually shown in graphical form.

**BOGEY ELECTRONIC DEVICE**

An electronic device whose characteristics have the published nominal values for the type. A bogey electronic device for any particular application can be obtained by considering only those characteristics that are directly related to the application.

**RATING**

A value that establishes either a limiting capability or a limiting condition for an electronic device. It is determined for specified values of environment and operation, and may be stated in any suitable terms. Limiting conditions may be either maxima or minima.

**RATING SYSTEM**

The set of principles upon which ratings are established and which determine their interpretation. The rating system indicates the division of responsibility between the device manufacturer and the circuit designer, with the object of ensuring that the working conditions do not exceed the ratings.

**Absolute maximum rating system**

Absolute maximum ratings are limiting values of operating and environmental conditions applicable to any electronic device of a specified type, as defined by its published data, which should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking no responsibility for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration and of all other electronic devices in the equipment.

The equipment manufacturer should design so that, initially and throughout the life of the device, no absolute maximum value for the intended service is exceeded with any device, under the worst probable operating conditions with respect to supply voltage variation,

equipment component variation, equipment control adjustment, load variations, signal variation, environmental conditions, and variations in characteristics of the device under consideration and of all other electronic devices in the equipment.

**Design maximum rating system**

Design maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under the worst probable conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device, taking responsibility for the effects of changes in operating conditions due to variations in the characteristics of the electronic device under consideration.

The equipment manufacturer should design so that, initially and throughout the life of the device, no design maximum value for the intended service is exceeded with a bogey electronic device, under the worst probable operating conditions with respect to supply voltage variation, equipment component variation, variation in characteristics of all other devices in the equipment, equipment control adjustment, load variation, signal variation and environmental conditions.

**Design centre rating system**

Design centre ratings are limiting values of operating and environmental conditions applicable to a bogey electronic device of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the device manufacturer to provide acceptable serviceability of the device in average applications, taking responsibility for normal changes in operating conditions due to rated supply voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all electronic devices.

The equipment manufacturer should design so that, initially, no design centre value for the intended service is exceeded with a bogey electronic device in equipment operating at the stated normal supply voltage.

**LETTER SYMBOLS**

The letter symbols for transistors and signal diodes detailed in this section are based on IEC publication number 148.

**Letter symbols for currents, voltages and powers****BASIC LETTERS**

I, i	current
V, v	voltage
P, p	power.

Upper-case letter symbols are used to represent all values except instantaneous values that vary with time, these are represented by lower-case letters.

**SUBSCRIPTS**

A, a	anode terminal
(AV), (av)	average value
B, b	base terminal (for MOS devices: substrate)
C, c	collector terminal
D, d	drain terminal
E, e	emitter terminal
F, f	forward
G, g	gate terminal
K, k	cathode terminal
M, m	peak value
O, o	as third subscript: the terminal not mentioned is open-circuit
R, r	as first subscript: reverse. As second subscript: repetitive. As third subscript: with a specified resistance between the terminal not mentioned and the reference terminal
(RMS), (rms)	root-mean-square value
S, s	as first or second subscript: source terminal (FETs only). As second subscript: non-repetitive (not FETs). As third subscript: short circuit between the terminal not mentioned and the reference terminal
X, x	specified circuit
Z, z	replaces R to indicate the actual working voltage, current or power of voltage reference and voltage regulator diodes.

No additional subscript is used for DC values.

Upper-case subscripts are used for the indication of:

- continuous (DC) values (without signal), e.g.  $I_B$
- instantaneous total values, e.g.  $i_B$
- average total values, e.g.  $I_{B(AV)}$
- peak total values, e.g.  $I_{BM}$
- root-mean-square total values, e.g.  $I_{B(RMS)}$

Lower-case subscripts are used for the indication of values applying to the varying component alone:

- instantaneous values, e.g.  $i_b$
- root-mean-square values, e.g.  $I_{b(rms)}$
- peak values, e.g.  $I_{bm}$
- average values, e.g.  $I_{b(av)}$

If more than one subscript is used, the subscript for which both styles exist are either all upper-case or all lower-case.

**ADDITIONAL RULES FOR SUBSCRIPTS***Transistor currents*

If it is necessary to indicate the terminal carrying the current, this should be done by the first subscript (conventional current flow from the external circuit into the terminal is positive).

Examples:  $I_B$ ,  $i_B$ ,  $I_b$ ,  $i_{bm}$ .

*Diode currents*

To indicate a forward current (conventional current flow into the anode terminal), the subscript F or f should be used. For a reverse current (conventional current flow out of the anode terminal), the subscript R or r should be used.

Examples:  $I_F$ ,  $I_R$ ,  $i_F$ ,  $i_{f(rms)}$ .

*Transistor voltages*

If it is necessary to indicate the points between which a voltage is measured, this should be done by the first two subscripts. The first subscript indicates the terminal at which the voltage is measured and the second the reference terminal or the circuit node. Where there is no possibility of confusion, the second subscript may be omitted.

Examples:  $V_{BE}$ ,  $V_{BE'}$ ,  $V_{be}$ ,  $V_{bem}$ .

### Diode voltages

To indicate a forward voltage (anode positive with respect to cathode), the subscript F or f should be used. For a reverse voltage (anode negative with respect to cathode), the subscript R or r should be used.

Examples:  $V_{F1}$ ,  $V_{R1}$ ,  $V_{F1}$ ,  $V_{Rm}$ .

### Supply voltages or currents

Supply voltages or supply currents are indicated by repeating the appropriate terminal subscript.

Examples:  $V_{CC}$ ,  $I_{EE}$ .

If it is necessary to indicate a reference terminal, this should be done by a third subscript.

Example:  $V_{CCE}$ .

### Subscripts for devices with more than one terminal of the same kind

If a device has more than one terminal of the same kind, the subscript is formed by the appropriate letter for the terminal, followed by a number. In the case of multiple subscripts, hyphens may be necessary to avoid confusion.

Examples:

$I_{B2}$  continuous (DC) current flowing into the second base terminal

$V_{B2-E}$  continuous (DC) voltage between the terminals of second base and emitter.

### Subscripts for multiple devices

For multiple unit devices, the subscripts are modified by a number preceding the letter subscript. In the case of multiple subscripts, hyphens may necessary to avoid confusion.

Examples:

$I_{2C}$  continuous (DC) current flowing into the collector terminal of the second unit

$V_{1C-2C}$  continuous (DC) voltage between the collector terminals of the first and second units.

### Application of the rules

Figure 1 represents a transistor collector current as a function of time. It comprises a continuous (DC) current and a varying component.

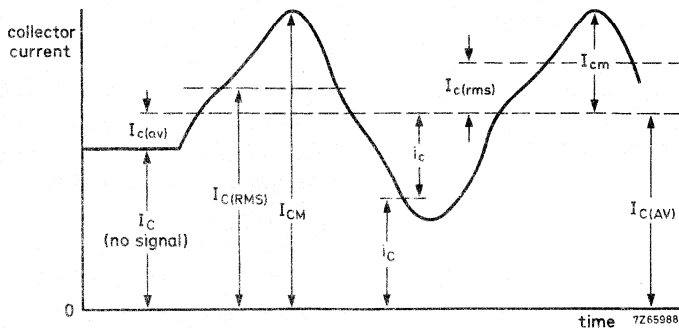


Fig.1 Collector current as a function of time.

**Letter symbols for electrical parameters**

## DEFINITION

For the purpose of this publication, the term 'electrical parameter' applies to four-pole matrix parameters, elements of electrical equivalent circuits, electrical impedances and admittances, inductances and capacitances.

## BASIC LETTERS

The following list comprises the most important basic letters used for electrical parameters of semiconductor devices.

B, b	susceptance (imaginary part of an admittance)
C	capacitance
G, g	conductance (real part of an admittance)
H, h	hybrid parameter
L	inductance
R, r	resistance (real part of an impedance)
X, x	reactance (imaginary part of an impedance)
Y, y	admittance
Z, z	impedance.

Upper-case letters are used for the representation of:

- electrical parameters of external circuits and of circuits in which the device forms only a part
- all inductances and capacitances.

Lower-case letters are used for the representation of electrical parameters inherent in the device, with the exception of inductances and capacitances.

## SUBSCRIPTS

*General subscripts*

The following list comprises the most important general subscripts used for electrical parameters of semiconductor devices.

F, f	forward (forward transfer)
I, i (or 1)	input
L, l	load
O, o (or 2)	output
R, r	reverse (reverse transfer)
S, s	source.

Examples:  $Z_s$ ,  $h_i$ ,  $h_F$ .

The upper-case variant of a subscript is used for the

designation of static (DC) values.

Examples:

$h_{FE}$	static value of forward current transfer ratio in common-emitter configuration (DC current gain)
$R_E$	DC value of the external emitter resistance.

The static value is the slope of the line from the origin to the operating point on the appropriate characteristic curve, i.e. the quotient of the appropriate electrical quantities at the operating point.

The lower-case variant of a subscript is used for the designation of small-signal values.

Examples:

$h_{ie}$	small-signal value of the short-circuit forward current transfer ratio in common-emitter configuration
$Z_o = R_o + jX_o$	small-signal value of the external impedance.

If more than one subscript is used, subscripts for which both styles exist are either all upper-case or all lower-case.

Example:  $h_{FE}$ ,  $Y_{RE}$ ,  $h_{ie}$ .

*Subscripts for four-pole matrix parameters*

The first letter subscript (or double numeric subscript) indicates input, output, forward transfer or reverse transfer.

Examples:  $h_i$  (or  $h_{11}$ ),  $h_o$  (or  $h_{22}$ ),  $h_f$  (or  $h_{21}$ ),  $h_r$  (or  $h_{12}$ ).

A further subscript is used for the identification of the circuit configuration. When no confusion is possible, this further subscript may be omitted.

Examples:  $h_{ie}$  (or  $h_{21e}$ ),  $h_{FE}$  (or  $h_{21E}$ ).

## DISTINCTION BETWEEN REAL AND IMAGINARY PARTS

If it is necessary to distinguish between real and imaginary parts of electrical parameters, no additional subscripts should be used. If basic symbols for the real and imaginary parts exist, these may be used.

Examples:  $Z_i = R_i + jX_i$ ,  $y_{ie} = g_{ie} + jb_{ie}$ .

If such symbols do not exist, or if they are not suitable, the following notation is used:

Examples:

Re ( $h_{ib}$ ) etc. for the real part of  $h_{ib}$

Im ( $h_{ib}$ ) etc. for the imaginary part of  $h_{ib}$ .

**CATV PARAMETERS**

**Gain ( $G_p$ )**

**DEFINITION**

The power gain, expressed in dB, is the ratio of output and input power of a module, operating in a 75  $\Omega$  ( $Z_0$ ) system.

**MEASUREMENT**

The power gain is measured at several frequencies throughout the band, although the gain performances are mostly given only at the start and stop frequencies. The gain is measured by applying a single tone signal to the module and measuring the output power. The input power is measured before connecting the module using a thru-line and feeding the system with exactly the same signals.

**EQUIPMENT**

Input and output power levels are measured with a power meter.

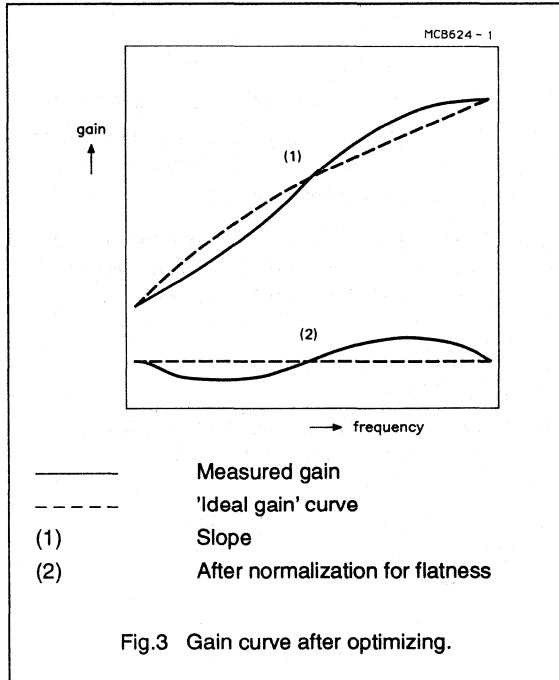
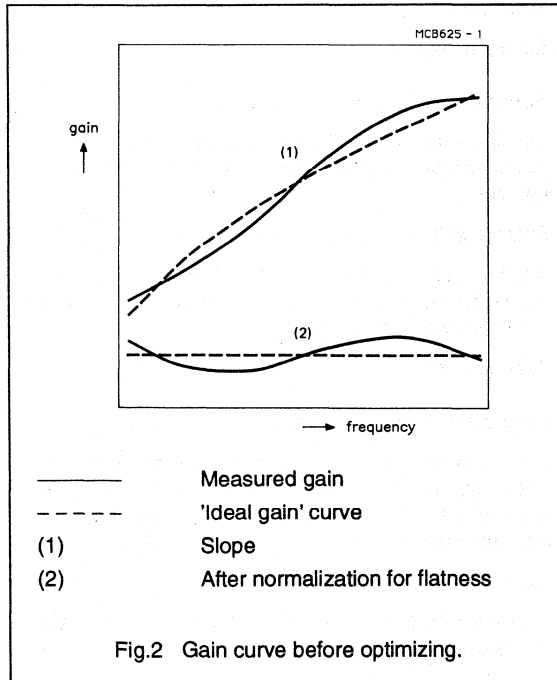
**Flatness of frequency response (FL)**

**DEFINITION**

The flatness of gain of a CATV amplifier module is defined as the maximum deviation from an absolute flat gain over a given frequency range, after the slope of the amplifier over this frequency range has been optimized and equalized by means of a certain cable length to give the best result for flatness (see Figs 2 and 3). This means that an 'ideal gain curve' for the module is calculated and the flatness is the maximum deviation of this 'ideal gain' curve.

**CALCULATION**

To determine the flatness, the measured gain values are compared with an 'ideal gain' curve derived from a mathematical model. The formula used is as follows:



$$\text{Gain} = G + C \sqrt{\frac{f_x}{f_1}}$$

where

$G$  = constant gain (frequency independent)

$C$  = cable constant

$f_x$  = desired frequency

$f_1$  = start frequency

The cable constant ( $C$ ) must be optimized during the flatness determination so that the gain curve best fits the measured gain figures. The start value for  $C$  is calculated using the formula:

$$C_{\text{start}} = \frac{G_n - G_1}{\sqrt{\frac{f_n}{f_1} - 1}}$$

where

$G_n$  = the measured gain at stop frequency

$G_1$  = the measured gain at start frequency

$f_n$  = stop frequency

The value of  $G$  is chosen so that the maximum positive deviation of the measured gain from the 'ideal gain' curve is the same as the maximum negative deviation. The value of  $C$  is adapted by  $\pm 0.001$  until the 'ideal gain' curve best fits the measured curve.

The flatness of the module gain is the maximum deviation in measured gain from the optimized gain formula.

### Slope (SL)

DEFINITION

The slope of a module is the difference between the 'ideal gain' at the start frequency and the 'ideal gain' at the stop frequency (see 'Flatness').

### Flatness (S-curve method)

DEFINITION

For some high-slope modules the flatness is calculated according to the 'S-curve' method. The ideal S-curve is defined as:

$$G_f = G_1 + \delta G \cdot a \cdot (f - f_1) + \delta G \cdot b \cdot (f - f_1)^2 + \delta G \cdot c \cdot (f - f_1)^3$$

where

$$\delta G = G_n - G_1$$

$f_1$  = start frequency

$f_n$  = stop frequency

$a$  =  $3.1224 \times 10^{-3}$

$b$  =  $1.9932 \times 10^{-6}$

$c$  =  $-8.934 \times 10^{-9}$

The flatness is the maximum deviation between the measured gain and the 'ideal gain' curve.

### Delta gain

DEFINITION

Delta gain is the difference in gain between two given frequencies (mostly the start and stop frequencies).

### Intermodulation distortion ( $d_{im}$ )

In accordance with DIN 45004B 6.3, 3-tone

DEFINITION

The intermodulation distortion product is the difference in dB between the peak of the RF signal in the measuring channel and the peak of the distortion signal caused by the influence of a signal in a neighbouring channel (see Fig.4).

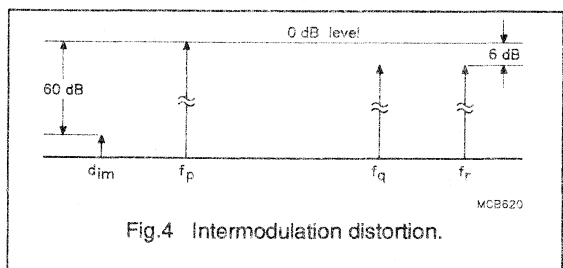


Fig.4 Intermodulation distortion.

To measure 3-tone  $d_{im}$ , three CW signals are applied to the module:

$f_p = f$  level = 0 dB

$f_q = f + 7$  MHz level = -6 dB

$f_r = f + 9$  MHz level = -6 dB

The distortion product is measured at  $f - 2$  MHz. This distortion product consists of the  $(f_p + f_q - f_r)$  beats and is expressed in dB referred to the 0 dB level (the  $f_p$  signal level).

This 0 dB level should be chosen so that the distortion product ( $d_{im}$ ) is -60 dB. For practical reasons the given output level ( $V_o$ ) for 3-tone distortion is defined as the



0 dB level and the modules are rejected if the distortion level is worse than -60 dB.

## EQUIPMENT

Spectrum analyzer with settings:

internal attenuator	40 dB
resolution bandwidth	3 kHz
video bandwidth	100 Hz
span	50 kHz.

The three signals are obtained from three different generators (see Appendix A).

### Composite third order distortion: composite triple beat (CTB) in CW carriers

In accordance with National Cable Television Association recommendations.

## DEFINITION

Composite third order modulation is the amplitude distortion of desired signals, caused by third order curvature of non-linear transfer characteristics in system equipment. It is the ratio, expressed in dB, of the peak level of the RF signal to the peak level of the cluster of distortion components centred around the carrier.

## MEASUREMENT

To measure the CTB, a signal at the measuring frequency is set to the specified  $V_o$  level. This output level is defined as the 0 dB level. During the measurement<sup>(1)</sup> all channels in the band are set to the specified  $V_o$  level, see Appendix E. Now, at the measuring frequency, the distortion product is measured with a spectrum analyzer or distortion analyzer.

The CTB distortion is measured high in the band because here the distortion products have most

amplitude (although the greatest number of beats ( $f_1 \pm f_2 \pm f_3$  and  $2 \times f_1 \pm f_2$ ) are found in the centre of the band).

## EQUIPMENT

Spectrum analyzer with settings:

resolution bandwidth	30 kHz
video bandwidth	100 kHz
span	500 kHz.

A bandpass filter is used to eliminate the distortion products caused by the spectrum analyzer itself. If desired, a distortion analyzer can be used instead of the spectrum analyzer.

The carrier signals are obtained from a multi-channel generator. The frequency deviation of each channel must be less than 5 kHz.

### Composite third order distortion: cross modulation ( $X_{mod}$ ) in modulated carriers

## DEFINITION

Cross modulation distortion is a form of distortion where modulation of interfering stations appears as a modulation of the desired station, caused by third order curvature of non-linear transfer characteristics in system equipment. It is the ratio, expressed in dB, of the peak level of the modulated RF signal to the peak level of the distortion components centred around the carrier (see Figs 5, 6 and 7).

## MEASUREMENT

To measure  $X_{mod}$ , the carrier of the desired channel is set to the specified  $V_o$  level. This channel is then 100% modulated with a 15.75 kHz square wave.<sup>(2)</sup> The peak level of this modulation signal (15.75 kHz on the carrier) is defined as the 0 dB level. The distortion product is now measured by setting each individual CW channel to the specified  $V_o$  level and switching them on in modulated

(1) In the USA, an equally spaced frequency raster is used with a space of 6 MHz between the channels. In the German frequency distribution the space between the channels is 7 MHz up to 300 MHz, and 8 MHz above 300 MHz. In general, the Philips measurements are made in accordance with the American frequency raster. For the German market, measurements can be made with a set-up which approximates as closely as possible to the German raster. A list of both rasters is given in Appendix D.

(2) The 15.75 kHz square wave modulation signal, used with  $X_{mod}$  measurements, found its origin in the American broadcasting method. Using the NTSC system, the 15.75 kHz is defined by the 60 Hz mains frequency and the number of 525 TV lines, i.e. (NTSC) =  $60 \times 525 + 2 = 15.75$  kHz.

The modulation frequency for PAL (one of the European methods) is 15.625 kHz. This is because in Europe the mains frequency is 50 Hz and the number of TV lines using PAL is 625.

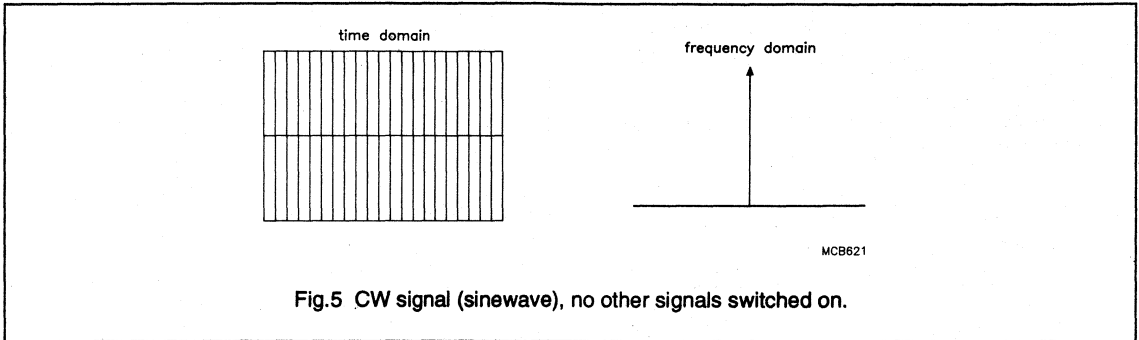


Fig.5 CW signal (sinewave), no other signals switched on.

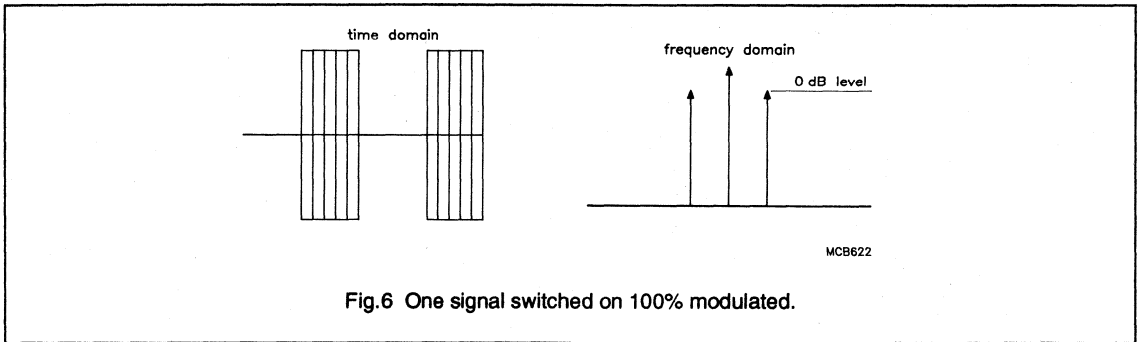


Fig.6 One signal switched on 100% modulated.

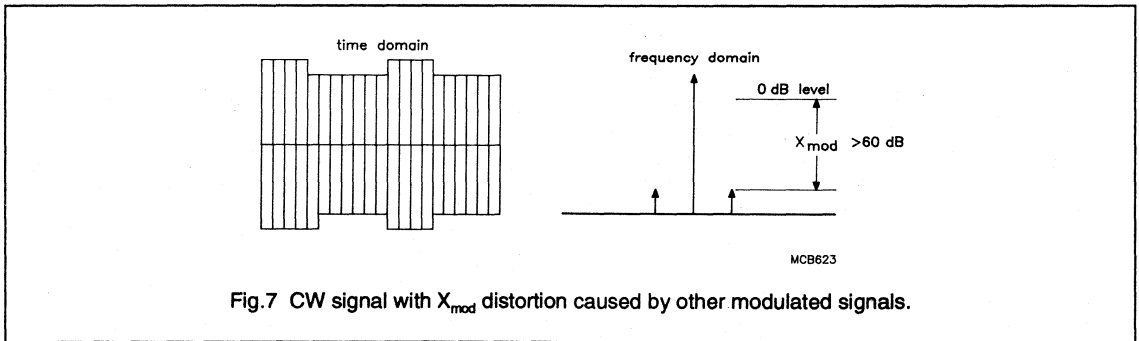


Fig.7 CW signal with  $X_{mod}$  distortion caused by other modulated signals.

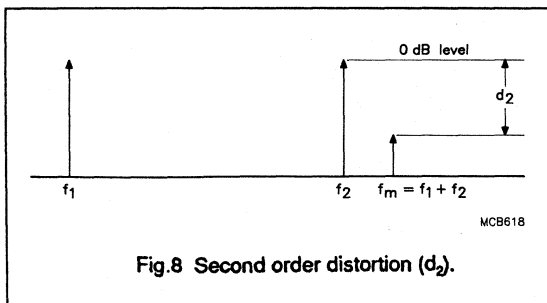


Fig.8 Second order distortion ( $d_2$ ).

mode, see Appendix E. Only the carrier in the channel where the  $X_{\text{mod}}$  distortion is to be measured, is not modulated. The  $X_{\text{mod}}$  distortion peak now appears as 15.75 kHz on the carrier.

The  $X_{\text{mod}}$  distortion is most easily measured at the low end of the frequency band.

#### EQUIPMENT

Bandpass filter:

tuned to the channel in which the distortion product is to be measured.

Spectrum analyzer with settings (for most types):

resolution bandwidth	300 kHz
video bandwidth	30 Hz
span	5 kHz.

A multi-channel generator is required for the test signals.

A distortion analyzer will be required if the  $X_{\text{mod}}$  is to be measured at a high frequency in the band. This is because phase noise will make spectrum analyzer measurements inaccurate.

#### Second order distortion ( $d_2$ )

In accordance with DIN 45004-A1

#### DEFINITION

The second order distortion product is the difference in dB between the peak level of an RF signal at the measuring frequency, and the peak level of the signal at the measuring frequency caused by two CW signals with their second order modulation product ( $f_1 \pm f_2$ ) at the measuring frequency (see Fig.8).

#### MEASUREMENT

Second order modulation is measured at the frequency in the band where the distortion product is found to be worst. In general this will be at the high end of the band.

In most cases the measuring procedure will be as follows:

Signals  $f_1$  and  $f_2$  are chosen so that  $f_1$  is the lowest channel in the band and  $f_2$  is the highest, this means that  $f_1 + f_2$  lays within the band.

The peak levels of  $f_1$  and  $f_2$  are equal and are defined as the 0 dB level. For frequency sets, see Appendix B.

#### EQUIPMENT

Spectrum analyzer with settings:

resolution bandwidth	3 kHz
video bandwidth	100 Hz
span	50 kHz.

A tunable bandpass filter is used to eliminate the distortion caused by the spectrum analyzer.

#### Composite second order (CSO) distortion

#### DEFINITION

Composite second order distortion is the ratio, expressed in dB, of the peak level, of the RF signal to the peak level of the cluster of distortion components centred around the desired signal. This distortion is caused by a compilation of components of second order intermodulation products of interfering signals with frequencies  $f_1$  and  $f_2$ , so that

$$\begin{aligned} f_m &= f_1 \pm f_2 \text{ or} \\ f_m &= 2 \times f_1 \text{ or} \\ f_m &= 2 \times f_2. \end{aligned}$$

#### MEASUREMENT

Measurement is made by setting a signal with the desired frequency to the specified level for  $V_0$ . This  $V_0$  level is defined as the 0 dB level.

During the measurement, all channels in the band are levelled to the specified  $V_0$ . Now at the measurement frequency, the distortion product is measured by use of a spectrum analyzer.

The CSO distortion is measured high in the band because it is here that this distortion product has most influence, see Appendix E.

#### EQUIPMENT

Spectrum analyzer with settings:

resolution bandwidth	30 kHz
video bandwidth	100 Hz
span	400 kHz.

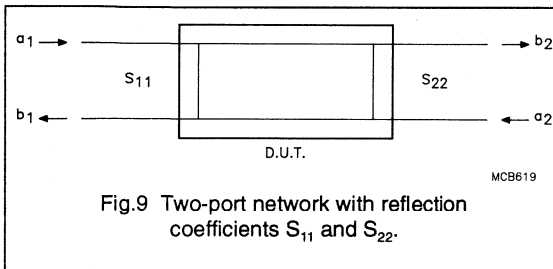
A bandpass filter is used at the input of the spectrum analyzer.

**S-parameters  $S_{11}$  and  $S_{22}$  (return losses)**

In accordance with IEC 747-7

**DEFINITION**

The return losses or reflection coefficients of a module can be defined as the  $S_{11}$  and the  $S_{22}$  of a two-port network (see Fig.9).



$$b_1 = S_{11} \cdot a_1 + S_{12} \cdot a_2 \quad (1)$$

$$b_2 = S_{21} \cdot a_1 + S_{22} \cdot a_2 \quad (2)$$

where

$$a_1 = \frac{1}{2 \cdot \sqrt{Z_0}} \cdot (V_1 + Z_0 \cdot i_1) = \text{signal into port 1} \quad (3)$$

$$a_2 = \frac{1}{2 \cdot \sqrt{Z_0}} \cdot (V_2 + Z_0 \cdot i_2) = \text{signal into port 2} \quad (4)$$

$$b_1 = \frac{1}{2 \cdot \sqrt{Z_0}} \cdot (V_1 - Z_0 \cdot i_1) = \text{signal out of port 1}$$

$$b_2 = \frac{1}{2 \cdot \sqrt{Z_0}} \cdot (V_2 - Z_0 \cdot i_2) = \text{signal out of port 2}$$

From (1) and (2) formulae for the return losses can be derived:

$$S_{11} = \frac{b_1}{a_1} \mid a_2 = 0 \quad (5)$$

$$S_{22} = \frac{b_2}{a_2} \mid a_1 = 0 \quad (6)$$

In (5),  $a_2 = 0$  means output port terminated with  $Z_0$  (derived from formula (4)).

In (6),  $a_1 = 0$  means input port terminated with  $Z_0$  (derived from formula (3)).

**MEASUREMENT**

The return losses are measured with a network analyzer after calibration, where the influence of the test jig is

eliminated. The necessary termination of the other port with  $Z_0$  is done automatically by the network analyzer.

The network analyzer must have a directivity of at least 40 dB to obtain an accuracy of 0.5 dB when measuring return loss figures of 20 dB. A full two-port correction method can be used to improve the accuracy.

**Noise figure (F)**

In accordance with IEC 747-7

**DEFINITION**

The noise figure is defined as the ratio of the total available noise power output from the module when connected to a noise source to that which is generated solely by the noise source.

**MEASUREMENT**

Noise figure is measured with a noise figure meter at the output of the module, while a noise source is connected to the input of the module. Measurements should be done in an electrically-shielded room to prevent pick-up of unwanted signals.

## Wideband Hybrid IC Modules

General

APPENDIX A - COMMON FREQUENCY SETS for  $d_{dim}$  MEASUREMENTS

$f_m$ (MHz)	$f_p$ (MHz)	$f_q$ (MHz)	$f_r$ (MHz)
33.25	35.25	42.25	44.25
163.25	165.25	172.25	174.25
185.25	187.25	194.25	196.25
285.25	287.25	294.25	296.25
335.25	337.25	344.25	346.25
339.25	341.25	348.25	350.25
385.25	387.25	394.25	396.25
438.25	440.25	447.25	449.25
481.25	483.25	490.25	492.25
538.25	540.25	547.25	549.25
849.25	851.25	858.25	860.25

APPENDIX B - COMMON FREQUENCY SETS for  $d_2$  MEASUREMENTS

$f_p$ (MHz)	$f_q$ (MHz)	$f_m$ (MHz)
83.25	109.25	192.50
66.00	144.00	210.00
55.25	211.25	266.50
55.25	343.35	398.50
55.25	391.25	446.50
55.25	493.25	548.50
300.00	450.00	750.00

**APPENDIX C - DISTORTION RESULTS USING THE CENELEC FREQUENCY RASTER**

The CENELEC Frequency Raster is increasingly being used in Europe. This raster has less channels and these are no longer equally spaced as with the USA Frequency Raster. This results generally in much better distortion readings.

The distortion figures of the CATV hybrids are measured using the standard USA Frequency Raster. A different number of channels is used, however, depending on the frequency range.

The following table based on calculations and correlation measurements using several different hybrid types provides a means of converting the standard measured distortion figures (USA Frequency Raster) into CENELEC Frequency Raster readings.

FREQUENCY RANGE (MHz)	CHANNELS		CTB (dB)	$X_{\text{mod}}$ (dB)	CSO (dB)
	USA	CENELEC			
40 - 600	85	29	-11.00	-8.00	-6.00
40 - 750	110	35	-12.00	-9.00	-9.00
40 - 860	49	42	+2.00	-1.00	+1.00

## Wideband Hybrid IC Modules

## General

## APPENDIX D - LIST of FREQUENCY RASTERS for USA and GERMANY

USA	
CHANNEL	FREQUENCY (MHz)
2	55.25
3	61.25
4	67.25
5	77.25
6	83.25
A2	109.25
A1	115.25
A	121.25
B	127.25
C	133.25
D	139.25
E3	145.25
F	151.25
G	157.25
H	163.25
I	169.25
7	175.25
8	181.25
9	187.25
10	193.25
11	199.25
12	205.25
13	211.25
J	217.25
K	223.25
L	229.25
M	235.25
N	241.25
O	247.25
P	253.25
Q	259.25
R	265.25
S	271.25
T	277.25

USA	
CHANNEL	FREQUENCY (MHz)
U	283.25
V	289.25
W	295.25
X	301.25
Y	307.25
Z	313.25
H1	319.25
H2	325.25
H3	331.25
H4	337.25
H5	343.25
H6	349.25
H7	355.25
H8	361.25
H9	367.25
H10	373.25
H11	379.25
H12	385.25
H13	391.25
H14	397.25
H15	403.25
H16	409.25
H17	415.25
H18	421.25
H19	427.25
H20	433.25
H21	439.25
H22	445.25
H23	451.25
H24	457.25
H25	463.25
14	469.25
15	475.25
16	481.25

## Wideband Hybrid IC Modules

General

## APPENDIX D (continued)

USA	
CHANNEL	FREQUENCY (MHz)
17	487.25
18	493.25
19	499.25
20	505.25
21	511.25
22	517.25
23	523.25
24	529.25
25	535.25
26	541.25
27	547.25
28	553.25
29	559.25
30	565.25
31	571.25
32	577.25
33	583.25
34	589.25
35	595.25
36	601.25
37	607.25
38	461.25
39	619.25
40	625.25
41	631.25
42	637.25
43	643.25
44	649.25
45	655.25
46	661.25
47	667.25
48	673.25
49	679.25
50	685.25
51	691.25

USA	
CHANNEL	FREQUENCY (MHz)
52	697.25
53	703.25
54	709.25
55	715.25
56	721.25
57	727.25
58	733.25
59	739.25
60	745.25
61	751.25
62	757.25
63	763.25
64	769.25
65	775.25
66	781.25
67	787.25
68	793.25
69	799.25
70	805.25
71	811.25
72	817.25
73	823.25
74	829.25
75	835.25
76	841.25
77	847.25
78	853.25
79	859.25
80	865.25
81	871.25
82	877.25
83	883.25
84	889.25
85	895.25



## Wideband Hybrid IC Modules

General

## APPENDIX D (continued)

GERMANY	
CHANNEL	FREQUENCY (MHz)
K2	48.25
K3	55.25
K4	62.25
-	69.25
-	76.25
S2	112.25
S3	119.25
S4	126.25
S5	133.25
S6	140.25
S7	147.25
S8	154.25
S10	168.25
K5	175.25
K6	182.25
K7	189.25
K8	196.25
K9	203.25
K10	210.25
K11	217.25
K12	224.25
S11	231.25
S12	238.25
S13	245.25
S14	252.25

GERMANY	
CHANNEL	FREQUENCY (MHz)
S15	259.25
S16	266.25
S17	273.25
S18	280.25
S19	287.25
S20	294.25
S21	303.25
S22	311.25
S23	319.25
S24	327.25
S25	335.25
S26	343.25
S27	351.25
S28	259.25
S29	367.25
S30	375.25
S31	383.25
S32	391.25
S33	399.25
S34	407.25
S35	415.25
S36	423.25
S37	431.25
S38	439.25
S39	445.25

## Wideband Hybrid IC Modules

## General

## APPENDIX E - TEST CHANNELS

Channels used during CTB,  $X_{mod}$  and CSO measurements

RANGE	NAMES	FREQUENCIES (MHz)	CHANNELS
40 - 300 MHz 32 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-2	109.25	1 channel
	A-F	121.25 - 151.25	6 channels
	H-S	163.25 - 271.25	19 channels
	W	295.25	1 channel
40 - 450 MHz 52 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-2	109.25	1 channel
	A-F	121.25 - 151.25	6 channels
	H-H14	163.25 - 397.25	40 channels
5 - 200 MHz 22 channels	T7-T13	7.00 - 43.00	7 channels
	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-7	121.25 - 175.25	10 channels
40 - 450 MHz 60 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-H22	121.25 - 445.25	55 channels
40 - 550 MHz 77 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-27	121.25 - 547.25	77 channels
40 - 600 MHz 85 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-35	121.25 - 595.25	80 channels
40 - 750 MHz 110 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-60	121.25 - 745.25	105 channels
40 - 860 MHz 129 channels	2-4	55.25 - 67.25	3 channels
	5-6	77.25 - 83.25	2 channels
	A-79	121.25 - 859.25	124 channels
40 - 450 MHz 36 channels German raster	2-3	55.25 - 61.25	2 channels
	C-F	133.25 - 151.25	4 channels
	H	163.25	1 channel
	7	175.25	1 channel
	9	187.25	1 channel
	12	205.25	1 channel
	J	217.25	1 channel
	L-M	229.25 - 235.25	2 channels

## **CATV AMPLIFIER MODULES**

**Device data (in alphanumeric sequence)**

## CATV power doubler amplifier modules

## BGD102; BGD104

## FEATURES

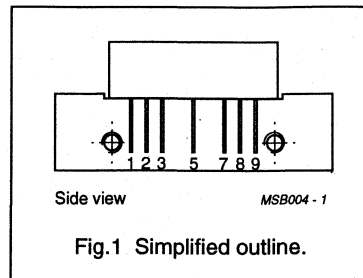
- Excellent linearity
- High output level
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Power doubler amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain BGD102 BGD104	f = 50 MHz	18	19	dB
			19.5	20.5	dB
	power gain BGD102 BGD104	f = 450 MHz	19.2	21.2	dB
			20.5	22.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV power doubler amplifier modules

## BGD102; BGD104

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain BGD102 BGD104	f = 50 MHz	18	19	dB
			19.5	20.5	dB
	power gain BGD102 BGD104	f = 450 MHz	19.2	21.2	dB
			20.5	22.5	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	–	20	dB
		f = 80 to 160 MHz	–	19	dB
		f = 160 to 450 MHz	–	18	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	–	20	dB
		f = 80 to 160 MHz	–	19	dB
		f = 160 to 450 MHz	–	18	dB
$S_{21}$	phase response	f = 50 MHz	+135	+225	deg-
CTB	composite triple beat BGD102 BGD104	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–65	dB
			–	–64	dB
$X_{mod}$	cross modulation BGD102 BGD104	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–67	dB
			–	–66	dB
$d_2$	second order distortion	note 1	–	–73	dB
$V_o$	output voltage BGD102 BGD104	$d_{im} = -60$ dB; note 2	65	–	dBmV
			64.5	–	dBmV
F	noise figure	f = 40 to 450 MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_o = 46$  dBmV;  
 $f_q = 343.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 398.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

# CATV power doubler amplifier module

## BGD106

### FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

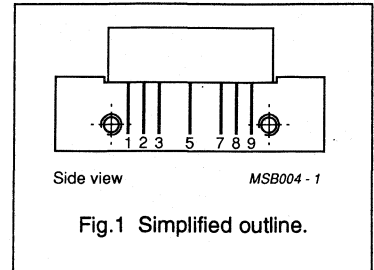
### DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC).

### PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

### PIN CONFIGURATION



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	21.5	22.5	dB
		f = 450 MHz	22.1	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	435	mA

### LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

# CATV power doubler amplifier module

BGD106

## CHARACTERISTICS

 Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\text{ }\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ; $f = 450\text{ MHz}$	21.5 22.1	22.5 –	dB dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ; $f = 80\text{ to }160\text{ MHz}$ ; $f = 160\text{ to }450\text{ MHz}$	– – –	20 19 18	dB dB dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ; $f = 80\text{ to }160\text{ MHz}$ ; $f = 160\text{ to }450\text{ MHz}$	– – –	20 19 18	dB dB dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–63	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–63	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–59	dB
$d_2$	second order distortion	$V_o = 46\text{ dBmV}$ note 1	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	66.5	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	435	mA

### Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o = 66.5\text{ dBmV}$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGD108

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

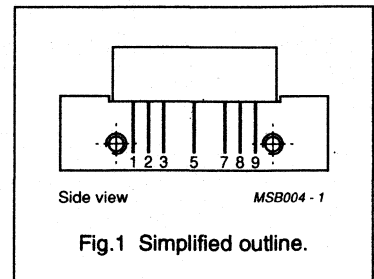
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz; f = 450 MHz	35 36.5	37 –	dB dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	625	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C



## CATV amplifier module

BGD108

## CHARACTERISTICS

 $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\text{ }\Omega$ ; Bandwidth 40 to 450 MHz;  $V_B = +24\text{ V}$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	35	37	dB
		$f = 450\text{ MHz}$	36.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.2	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–64	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–62	dB
$d_2$	second order distortion	note 1	–	–73	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	67	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	625	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV power doubler amplifier modules

## BGD502; BGD504

## FEATURES

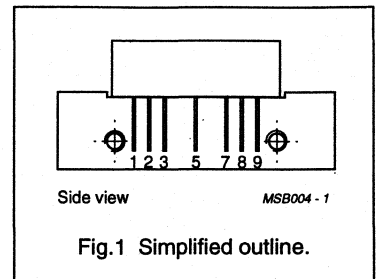
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain BGD502 BGD504	f = 50 MHz	18	19	dB
			19.5	20.5	dB
	power gain BGD502 BGD504	f = 550 MHz	18.8	20.8	dB
			20.2	22.2	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV power doubler amplifier modules

## BGD502; BGD504

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain BGD502 BGD504	f = 50 MHz	18	–	19	dB
			19.5	–	20.5	dB
	power gain BGD502 BGD504	f = 550 MHz	18.8	–	20.8	dB
			20.2	–	22.2	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	–	2.2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	+135	–	+225	deg
CTB	composite triple beat BGD502 BGD504	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–65	dB
			–	–	–64	dB
$X_{mod}$	cross modulation BGD502 BGD504	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–68	dB
			–	–	–67	dB
CSO	composite second order distortion BGD502 BGD504	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–62	dB
			–	–	–60	dB
$d_2$	second order distortion BGD502 BGD504	note 1	–	–	–72	dB
			–	–	–70	dB
$V_o$	output voltage BGD502 BGD504	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
			63.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	415	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  $f_q = 493.25$  MHz;  $V_q = 44$  dBmV; measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  $f_p = 540.25$  MHz;  $V_p = V_o$ ;  $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV power doubler amplifier modules

## BGD502; BGD504

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain BGD502 BGD504	f = 50 MHz	19	–	20	dB
			19.5	–	20.5	dB
	power gain BGD502 BGD504	f = 450 MHz	18.6	–	20.6	dB
			20	–	22	dB
SL	slope cable equivalent BGD502 BGD504	f = 40 to 450 MHz	0.2	–	1.8	dB
			0	–	1.65	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	+135	–	+225	deg
CTB	composite triple beat BGD502 BGD504	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–67	dB
			–	–	–66	dB
CSO	composite second order distortion BGD502 BGD504	60 channels flat; $V_o = 46$ dBmV; measured at 548.5 MHz	–	–	t.b.f.	dB
			–	–	t.b.f.	dB
$X_{mod}$	cross modulation BGD502 BGD504	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–67	dB
			–	–	–66	dB
$d_2$	second order distortion BGD502 BGD504	note 1	–	–	–75	dB
			–	–	–73	dB
$V_o$	output voltage BGD502 BGD504	$d_{im} = -60$ dB; note 2	67	–	–	dBmV
			66.5	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	415	435	mA

## CATV power doubler amplifier modules

BGD502; BGD504

**Notes**

1.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  $f_q = 391.25$  MHz;  $V_q = 46$  dBmV; measured at  $f_p + f_q = 446.5$  MHz.
2. Measured according to DIN45004B:  $f_p = 440.25$  MHz;  $V_p = V_o$ ;  $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 438.25$  MHz.
3. The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD506

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

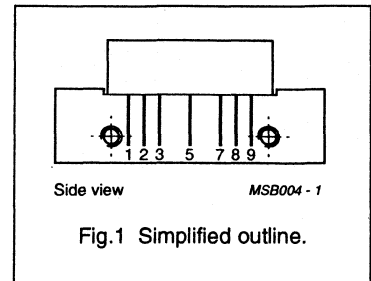
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	21.5	22.5	dB
		f = 550 MHz	22.1	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C
V <sub>B</sub>	DC supply voltage	–	+28	V

## CATV amplifier module

BGD506

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	21.5	22.5	dB
		$f = 550\text{ MHz}$	22.1	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	–	20	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	–	19	dB
		$f = 160\text{ to }550\text{ MHz}$	–	18	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	–	20	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	–	19	dB
		$f = 160\text{ to }550\text{ MHz}$	–	18	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–62	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–63	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–55	dB
$d_2$	second order distortion	$V_o = 44\text{ dBmV}$ ; note 1	–	–66	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	62.5	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_o = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 540.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$   
 $V_o = 62.5\text{ dBmV}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

# CATV amplifier module

BGD508

## FEATURES

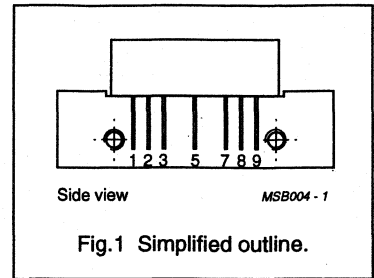
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	35	37	dB
		f = 550 MHz	36.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	625	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C



## CATV amplifier module

BGD508

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	35	37	dB
		$f = 550$ MHz	36.5	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0.2	2.2	dB
FL	flatness of frequency response	$f = 40$ to 550 MHz	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 550 MHz	18	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 550 MHz	18	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–62	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	63	–	dBmV
F	noise figure	$f = 550$ MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	625	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 393.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD508

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	35	37	dB
		$f = 450$ MHz	36.5	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.2	2.2	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 450 MHz	18	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 450 MHz	18	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–64	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV measured at 446.5 MHz	–	–62	dB
$d_2$	second order distortion	note 1	–	–73	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	67	–	dBmV
F	noise figure	$f = 450$ MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	625	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD601

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

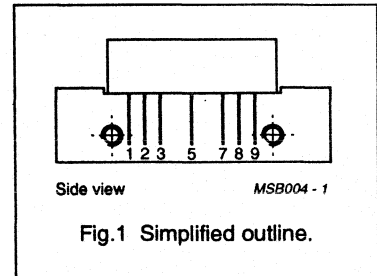
## DESCRIPTION

Hybrid high dynamic range amplifier module for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	12	13	dB
		f = 600 MHz	12.7	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier module

BGD601

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	12	13	dB
		$f = 600\text{ MHz}$	12.7	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.2	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–62	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	63	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	9.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGD601

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	12	13	dB
		$f = 550\text{ MHz}$	12.5	14.5	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.2	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–65	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–68	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–64	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	64	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	9	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGD601

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	12	13	dB
		$f = 450\text{ MHz}$	12.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.2	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–67	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–67	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–65	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	67	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

# CATV amplifier module

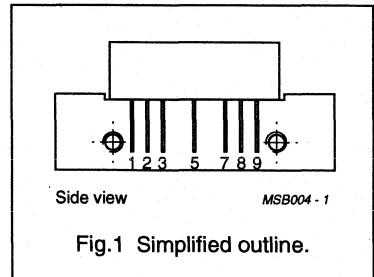
# BGD602

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## DESCRIPTION

Hybrid high dynamic range amplifier module designed for applications in CATV systems with a bandwidth of 40 to 600 MHz operating with a voltage supply of 24 V (DC).

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	19	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGD602

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	19	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.2	2.2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 600 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 600 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–62	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	63	–	dBmV
F	noise figure	f = 600 MHz	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGD602

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 550 MHz	18.8	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	2.2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–66	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–68	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–62	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	dBmV
F	noise figure	f = 550 MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD602

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 450 MHz	18.6	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	1.8	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	±0.3	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 450 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 450 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–67	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV measured at 446.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	67	–	dBmV
F	noise figure	f = 450 MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

# CATV amplifier module

BGD602D

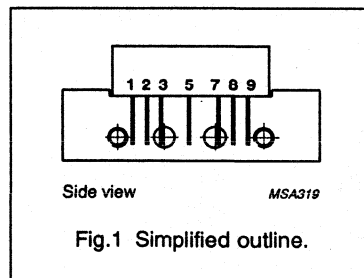
## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## DESCRIPTION

Hybrid high dynamic range cascode amplifier module with darlington configuration for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of +24 V (DC).

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	17.5	18.5	dB
		f = 600 MHz	18.5	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	-	440	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	-20	+100	°C

## CATV amplifier module

BGD602D

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	17.5	18.5	dB
		$f = 600\text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.2	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–68	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–64	dB
$d_2$	second order distortion	note 1	–	–76	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	66	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ note 3	–	440	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$ .
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGD602D

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\text{ }\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz;	17.5	18.5	dB
		f = 550 MHz	18.3	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	2.2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz;	20	–	dB
		f = 80 to 160 MHz;	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz;	20	–	dB
		f = 80 to 160 MHz;	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–69	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–62	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–66	dB
$d_2$	second order distortion	note 1	–	–78	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	67	–	dBmV
F	noise figure	f = 550 MHz	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ note 3	–	440	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$ .
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

## BGD602D

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	17.5	18.5	dB
		$f = 450\text{ MHz}$	18.1	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.2	1.8	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–68	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–66	dB
$d_2$	second order distortion	note 1	–	–80	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	67	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	440	mA

**Notes**

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGD702

## FEATURES

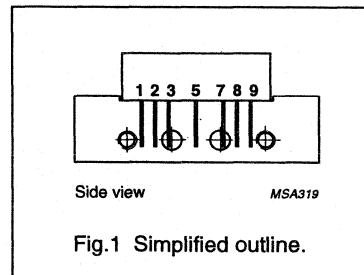
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module designed for CATV systems operating over a frequency range of 40 to 750 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	18.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

## BGD702

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 750$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0.2	2	dB
FL	flatness of frequency response	$f = 40$ to 750 MHz	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–58	dB
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–62	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 750$ MHz	–	9	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGD702

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 600$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	0.2	2	dB
FL	flatness of frequency response	$f = 40$ to 600 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 600 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 600 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–65	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 600$ MHz	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD702

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 550 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 550 MHz	16	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 550 MHz	16	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–67	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–67	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–62	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64.5	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 550 MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD702

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 450$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.2	2	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–68	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV measured at 446.5 MHz	–	–65	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	67	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 450$ MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	435	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

# CATV amplifier module

BGD704

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 750 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION

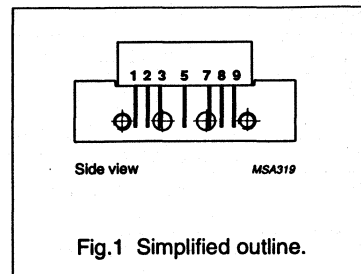


Fig.1 Simplified outline.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	-	435	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	-20	+100	°C

## CATV amplifier module

BGD704

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	19.5	20.5	dB
		$f = 750\text{ MHz}$	20	–	dB
SL	slope cable equivalent	$f = 40\text{ to }750\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }750\text{ MHz}$	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 745.25 MHz	–	–57	dB
$X_{\text{mod}}$	cross modulation	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 746.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–66	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	60.5	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 750\text{ MHz}$	–	9	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 691.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 746.5\text{ MHz}$ .
- $f_p = 740.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 747.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 749.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 738.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD704

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	19.5	20.5	dB
		$f = 600\text{ MHz}$	20	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }600\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }600\text{ MHz}$	17	–	dB
		$f = 320\text{ to }600\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–64	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–64	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_m = -60\text{ dB}$ ; note 2	63	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 600\text{ MHz}$	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$ .
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD704

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	19.5	20.5	dB
		$f = 550\text{ MHz}$	20	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–66	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	63.5	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 550\text{ MHz}$	–	7.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_b = 24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$ .
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_b = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD704

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	19.5	20.5	dB
		$f = 450\text{ MHz}$	20	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0	2	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–67	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–64	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–63	dB
$d_2$	second order distortion	note 1	–	–73	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	66	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 450\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	435	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGD885

## FEATURES

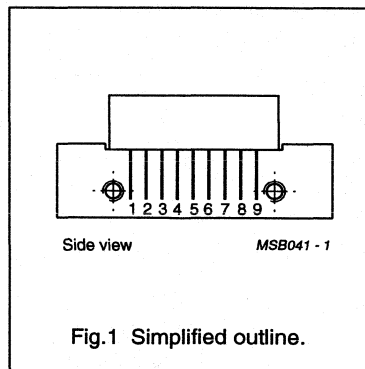
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module for CATV/MATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115D

PIN	DESCRIPTION
1	input
2	common
3	common
4	10 V, 200 mA supply terminal
5	common
6	common
7	common
8	+V <sub>B</sub>
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	17.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	450	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	DC supply voltage	–	26	V
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGD885

**CHARACTERISTICS**Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

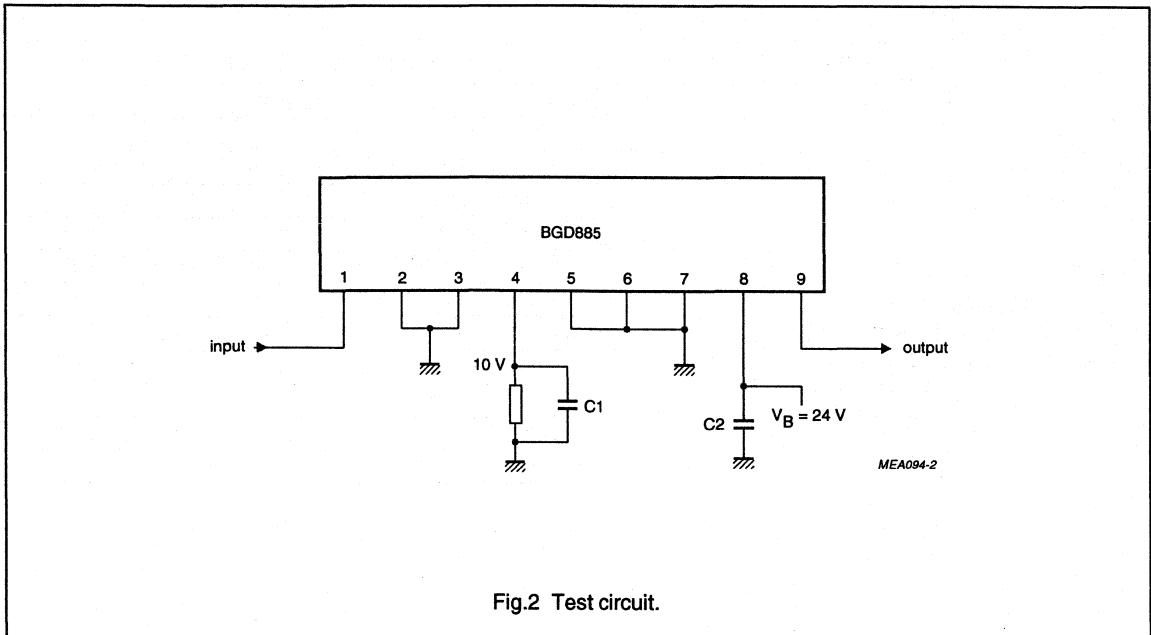
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	16.5	17.5	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.2	1.6	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 800$ to 860 MHz	10	–	dB
$S_{22}$	output return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 800$ to 860 MHz	10	–	dB
$d_2$	second order distortion	note 2	–	–53	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 3	64	–	dBmV
		$d_{im} = -60$ dB; note 4	63	–	dBmV
F	noise figure	$f = 860$ MHz	–	8	dB
$I_{tot}$	total current consumption (DC)	note 5	–	450	mA

**Notes**

- Decrease per octave of 1.5 dB.
- $V_p = 59$  dBmV at  $f_p = 349.25$  MHz;  
 $V_q = 59$  dBmV at  $f_q = 403.25$  MHz;  
measured at  $f_p + f_q = 752.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 341.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 348.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 350.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 339.25$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGD885



## List of components (see Fig.2)

COMPONENT	DESCRIPTION	VALUE
C1	ceramic multilayer capacitor	1 nF (max.)
C2	ceramic multilayer capacitor	1 nF
R	resistor	56 Ω, 2 W

## CATV amplifier module

BGE85A

## FEATURES

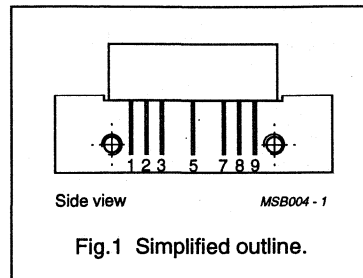
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of (DC). It is intended for use as an 18.5 dB output amplifier module.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	17.4	–	19.4	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	200	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

## BGE85A

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	17.4	–	19.4	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.3	–	1.5	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 450 MHz	15.5	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 450 MHz	15.5	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
$d_2$	second order distortion	$V_o = -46$ dB; note 1	–	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	60.5	–	–	dBmV
F	noise figure	$f = 40$ to 450 MHz	–	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	200	230	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_o = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_o = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGE88;BGE88/01

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TIPTAu metallized crystals.

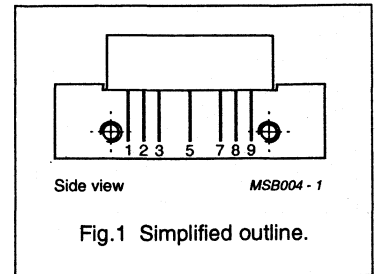
## DESCRIPTION

Low cost hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	33	–	36	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V				
	BGE88		–	290	330	mA
	BGE88/01		–	250	260	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>case</sub>	operating case temperature range	–20	+100	°C

## CATV amplifier module

BGE88;BGE88/01

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{case} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	33	–	36	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	2.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	0.3	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	–	dB
		$f = 320\text{ to }450\text{ MHz}$	15.5	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	–	dB
		$f = 320\text{ to }450\text{ MHz}$	15.5	–	–	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage BGE88 BGE88/01	$d_{im} = -60\text{ dB}$ note 2	60	–	–	dBmV
			59	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	6	dB
$I_{tot}$	total current consumption BGE88 BGE88/01	DC value; $V_B = +24\text{ V}$ ; note 3	–	290	330	mA
			–	250	260	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 343.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 398.5\text{ MHz}$
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The modules normally operate at  $V_B = +24\text{ V}$ , but are able to withstand supply transients up to 30 V.

# CATV amplifier module

BGE884

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

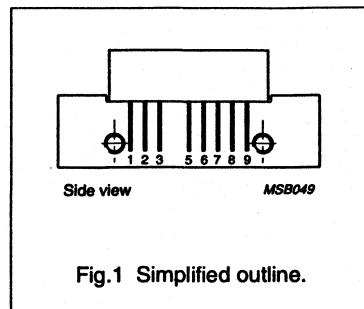
## DESCRIPTION

Hybrid amplifier module for CATV/MATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115G2

PIN	DESCRIPTION
1	input
2	common
3	common
5	common
6	common
7	common
8	+V <sub>B</sub>
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	17.5	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	-	150	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	-20	+100	°C
V <sub>B</sub>	DC supply voltage	-	26	V



## CATV amplifier module

BGE884

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\text{ }\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	16.5	17.5	dB
SL	slope cable equivalent	$f = 40\text{ to }860\text{ MHz}$	0.2	1.4	dB
FL	flatness of frequency response	$f = 40\text{ to }860\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ MHz}$ ; note 1 $f = 800\text{ to }860\text{ MHz}$	20 10	– –	dB dB
$S_{22}$	output return losses	$f = 40\text{ to }860\text{ MHz}$	15	–	dB
$d_2$	second order distortion	note 2	–	–60	dB
$V_o$	output voltage	$d_{in} = -60\text{ dB}$ ; notes 3 and 4	55	–	dBmV
F	noise figure	$f = 350\text{ MHz}$ $f = 860\text{ MHz}$	– –	7.5 8	dB dB
$I_{tot}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 5	–	150	mA

## Notes

- Decreases by 1.5 dB per octave.
- $f_p = 349.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 403.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 752.5\text{ MHz}$ .
- $f_p = 341.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 348.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 350.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 339.25\text{ MHz}$ .
- $f_p = 851.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 858.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 860.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 849.25\text{ MHz}$ .
- The module normally operates at  $V_B = 24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGE885

## FEATURES

- Excellent linearity
- Extremely low noise
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

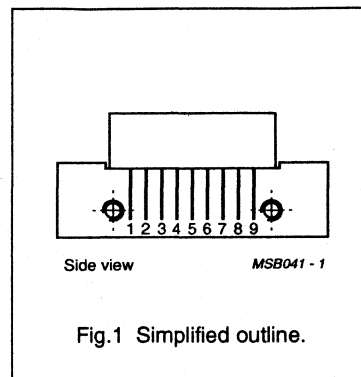
## DESCRIPTION

Hybrid amplifier module intended for use in CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115D

PIN	DESCRIPTION
1	input (note 1)
2	common
3	common
4	12 V - 60 mA supply terminal
5	common
6	common
7	common
8	+V <sub>B</sub>
9	output (note 1)

## PIN CONFIGURATION



## Note

1. Pins 1 and 9 carry DC voltages.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	16.5	17.5	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	240	mA

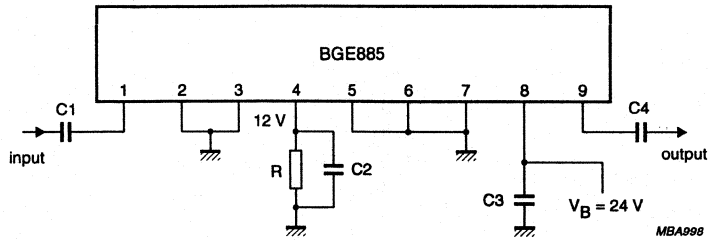
## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C
V <sub>B</sub>	DC supply voltage	–	+28	V

## CATV amplifier module

BGE885



Pins 1 and 9 carry DC voltages.

Fig.2 Test circuit.

List of components (see Fig.2)

COMPONENT	DESCRIPTION	VALUE
C1, C3, C4	ceramic multilayer capacitor	1 nF
C2	ceramic multilayer capacitor	1 nF (max.)
R	resistor	200 $\Omega$ , 1 W

## CATV amplifier module

BGE885

## CHARACTERISTICS

 $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	16.5	17.5	dB
SL	slope cable equivalent	$f = 40\text{ to }860\text{ MHz}$	0.2	1.2	dB
FL	flatness of frequency response	$f = 40\text{ to }860\text{ MHz}$	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40\text{ to }450\text{ MHz}$ $f = 450\text{ to }860\text{ MHz}$	–	14 10	dB dB
$S_{22}$	output return losses	$f = 40\text{ to }450\text{ MHz}$ $f = 450\text{ to }860\text{ MHz}$	–	14 10	dB dB
$d_2$	second order distortion	note 1	–	–53	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	–	59	dBmV
F	noise figure	$f = 350\text{ MHz}$ ; $f = 860\text{ MHz}$	–	7.5 8	dB dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	240	mA

## Notes

- $V_p = 59\text{ dBmV}$  at  $f_p = 349.25\text{ MHz}$ ;  
 $V_p = 59\text{ dBmV}$  at  $f_p = 403.25\text{ MHz}$ ;  
measured at  $f_p + f_q = 752.25\text{ MHz}$ .
- Measured according to DIN45004B;  
 $f_p = 851.25\text{ MHz}$ ;  $V_p = V_o = 59.0\text{ dBmV}$ ;  
 $f_q = 858.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 860.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 849.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGE887

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

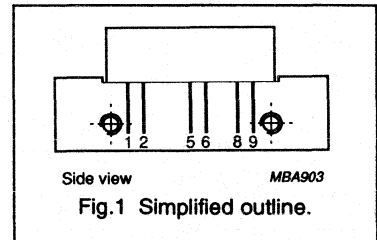
## DESCRIPTION

Hybrid amplifier module intended for use in the UHF part of VHF/UHF split-band CATV systems over a frequency range of 470 to 860 MHz with a voltage supply of +24 V (DC).

## PINNING - SOT115H

PIN	DESCRIPTION
1	input
2	common
5	+V <sub>B</sub>
6	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 470 MHz;	22.5	25	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V; note 1	–	280	mA

## Note

1. The module normally operates at V<sub>B</sub> = +24 V, but is able to withstand supply transients up to +30 V.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C
V <sub>B</sub>	DC supply voltage	–	+28	V

## CATV amplifier module

BGE887

## CHARACTERISTICS

 $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ ;

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 470\text{ MHz}$ ;	22.5	25	dB
SL	slope cable equivalent	$f = 470\text{ to }860\text{ MHz}$	-0.2	+1	dB
FL	flatness of frequency response	$f = 470\text{ to }860\text{ MHz}$	-	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 470\text{ to }860\text{ MHz}$ ;	12	-	dB
$S_{22}$	output return losses	$f = 470\text{ to }860\text{ MHz}$ ;	17	-	dB
$V_o$	output voltage	$d_{\text{in}} = -60\text{ dB}$ note 1	60.5	-	dBmV
		$d_{\text{in}} = -60\text{ dB}$ note 2	60.5	-	dBmV
F	noise figure	$f = 470\text{ MHz}$ ;	-	8	dB
		$f = 860\text{ MHz}$	-	8.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_{\text{B}} = +24\text{ V}$ ; note 3		280	mA

## Notes

- $f_p = 483.25\text{ MHz}$ ;  $V_p = V_o$   
 $f_q = 490.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$   
 $f_r = 492.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$   
 measured at  $f_p + f_q - f_r = 481.25\text{ MHz}$
- $f_p = 851.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 858.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 860.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
 measured at  $f_p + f_q - f_r = 849.25\text{ MHz}$ .
- The module normally operates at  $V_{\text{B}} = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGX881

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

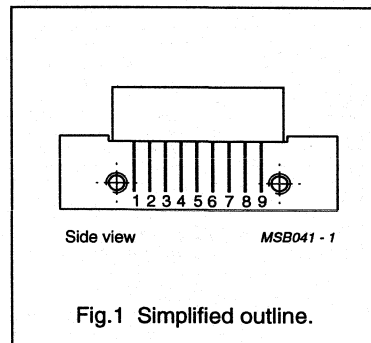
Hybrid amplifier module for CATV/MATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115D

PIN	DESCRIPTION
1	input; note 1
2	common
3	common
4	12 V, 60 mA supply terminal
5	common
6	common
7	common
8	+V <sub>B</sub>
9	output; note 1

## Note

1. Pins 1 and 9 carry DC voltages.



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	12	13	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	—	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	DC supply voltage	—	26	V
V <sub>i</sub>	RF input voltage	—	60	dBmV
T <sub>stg</sub>	storage temperature	-40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	-20	+100	°C

## CATV amplifier module

BGX881

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	12	13	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.2	1.4	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 800$ to 860 MHz	10	–	dB
$S_{22}$	output return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 640$ to 860 MHz	15	–	dB
$d_2$	second order distortion	note 2	–	–53	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 3	60.5	–	dBmV
		$d_{im} = -60$ dB; note 4	59.5	–	dBmV
F	noise figure	$f = 350$ MHz	–	8.5	dB
		$f = 860$ MHz	–	9	dB
$I_{tot}$	total current consumption (DC)	note 5	–	240	mA

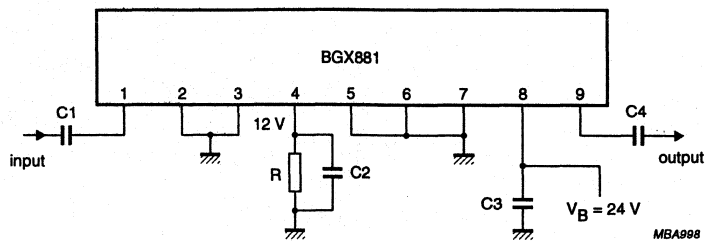
## Notes

- Decreases 1.5 dB per octave.
- $f_p = 349.25$  MHz;  $V_p = 59$  dBmV;  
 $f_q = 403.25$  MHz;  $V_q = 59$  dBmV;  
measured at  $f_p + f_q = 752.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 341.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 348.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 350.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 339.25$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGX881



Pins 1 and 9 carry DC voltages.

Fig.2 Test circuit.

List of components (see Fig.2)

COMPONENT	DESCRIPTION	VALUE
C1, C3, C4	ceramic multilayer capacitor	1 nF
C2	ceramic multilayer capacitor	1 nF (max.)
R	resistor	200 $\Omega$ , 1 W

## CATV amplifier module

## BGX885N

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

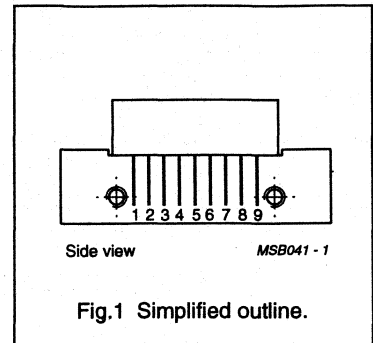
Hybrid amplifier module for CATV/MATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115D

PIN	DESCRIPTION
1	input; note 1
2	common
3	common
4	60 mA supply terminal
5	common
6	common
7	common
8	+V <sub>B</sub>
9	output; note 1

## Note

1. Pins 1 and 9 carry DC voltages.



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	17.5	dB
		f = 750 MHz	17.3	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	DC supply voltage	–	26	V
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGX885N

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

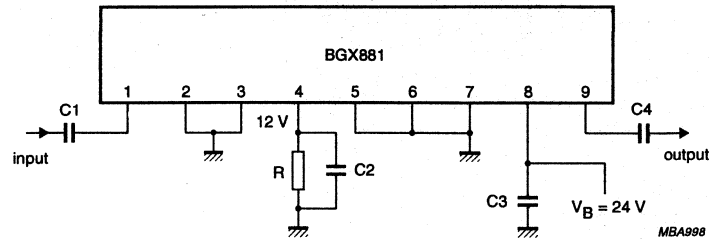
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	16.5	17.5	dB
		$f = 750$ MHz	17.3	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.2	1.4	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 800$ to 860 MHz	10	–	dB
$S_{22}$	output return losses	$f = 40$ MHz; note 1	20	–	dB
		$f = 640$ to 860 MHz	15	–	dB
$d_2$	second order distortion	note 2	–	–53	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 3	61	–	dBmV
		$d_{im} = -60$ dB; note 4	60	–	dBmV
F	noise figure	$f = 350$ MHz	–	7.5	dB
		$f = 860$ MHz	–	8	dB
$I_{tot}$	total current consumption (DC)	note 5	–	240	mA

## Notes

- Decreases by 1.5 dB per octave.
- $f_p = 349.25$  MHz;  $V_p = V_o = 59$  dBmV;  
 $f_q = 403.25$  MHz;  $V_q = V_o$ ;  
measured at  $f_p + f_q = 752.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 341.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 348.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 350.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 339.25$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGX885N



Pins 1 and 9 carry DC voltages.

Fig.2 Test circuit.

List of components (see Fig.2)

COMPONENT	DESCRIPTION	VALUE
C1, C3, C4	ceramic multilayer capacitor	1 nF
C2	ceramic multilayer capacitor	1 nF (max.)
R	resistor	200 $\Omega$ ; 1 W

## CATV amplifier module

BGY61

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

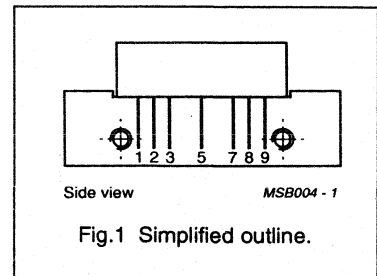
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 5 to 200 MHz at a voltage supply of +24 V (DC). The device is intended as a reverse amplifier for use in two way systems.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 10 MHz;	12.5	–	13.5	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	215	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	67	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+90	°C

## CATV amplifier module

BGY61

## CHARACTERISTICS

Bandwidth 5 to 200 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 10\text{ MHz}$ ;	12.5	–	13.5	dB
SL	slope cable equivalent	$f = 5\text{ to }200\text{ MHz}$	–0.2	–	+0.5	dB
FL	flatness of frequency response	$f = 5\text{ to }200\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
$S_{22}$	output return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
CTB	composite triple beat	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 175.25 MHz	–	–	–68	dB
$X_{mod}$	cross modulation	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–61	dB
$d_2$	second order distortion	$V_o = 50\text{ dBmV}$ ; note 1	–	–	–72	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	67	–	–	dBmV
		$d_{im} = -60\text{ dB}$ note 3	64	–	–	dBmV
F	noise figure	$f = 200\text{ MHz}$	–	–	7	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 4	–	215	230	mA

## Notes

- $f_p = 83.25\text{ MHz}$ ;  $V_p = 50\text{ dBmV}$ ;  
 $f_q = 109.25\text{ MHz}$ ;  $V_q = 50\text{ dBmV}$ ;  
measured at  $f_p + f_q = 192.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 35.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 42.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 44.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 33.25\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 187.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 194.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 196.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 185.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY65

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

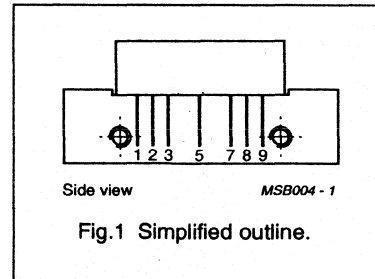
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 5 to 200 MHz at a voltage supply of +24 V (DC). The device is intended as a reverse amplifier for use in two way systems.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 10 MHz;	18	–	19	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	215	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+90	°C

## CATV amplifier module

BGY65

## CHARACTERISTICS

Bandwidth 5 to 200 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 10\text{ MHz}$ ;	18	–	19	dB
SL	slope cable equivalent	$f = 5\text{ to }200\text{ MHz}$	-0.2	–	+0.5	dB
FL	flatness of frequency response	$f = 5\text{ to }200\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
$S_{22}$	output return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
CTB	composite triple beat	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 175.25 MHz	–	–	-68	dB
$X_{mod}$	cross modulation	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 55.25 MHz	–	–	-61	dB
$d_2$	second order distortion	$V_o = 50\text{ dBmV}$ ; note 1	–	–	-72	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	67	–	–	dBmV
		$d_{im} = -60\text{ dB}$ note 3	64	–	–	dBmV
F	noise figure	$f = 200\text{ MHz}$	–	–	5.5	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 4	–	215	230	mA

## Notes

- $f_p = 83.25\text{ MHz}$ ;  $V_p = 50\text{ dBmV}$ ;  
 $f_q = 109.25\text{ MHz}$ ;  $V_q = 50\text{ dBmV}$ ;  
measured at  $f_p + f_q = 192.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 35.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 42.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 44.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 33.25\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 187.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 194.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 196.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 185.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .



## CATV amplifier module

BGY66B

## FEATURES

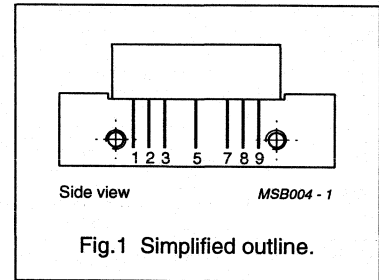
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## APPLICATIONS

- Intended as a reverse amplifier for use in two-way systems.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## DESCRIPTION

Hybrid high dynamic range amplifier module designed for applications in CATV systems with a bandwidth of 5 to 120 MHz operating with a voltage supply of 24 V (DC).

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 10 MHz	24.5	25.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	115	135	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY66B

**CHARACTERISTICS**Bandwidth 5 to 120 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 10$ MHz	24.5	25.5	dB
SL	slope cable equivalent		-0.2	+0.5	dB
FL	flatness of frequency response		-	$\pm 0.2$	dB
$S_{11}$	input return losses		20	-	dB
$S_{22}$	output return losses		20	-	dB
CTB	composite triple beat	14 channels flat; $V_o = 48$ dBmV; measured at 67.25 MHz	-	-66	dB
$X_{mod}$	cross modulation	14 channels flat; $V_o = 48$ dBmV; measured at 67.25 MHz	-	-54	dB
$d_2$	second order distortion	note 1	-	-70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	60	-	dBmV
F	noise figure	$f = 120$ MHz	-	5	dB
$I_{tot}$	total current consumption (DC)	note 3	115	135	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 48$  dBmV;  
 $f_q = 61.25$  MHz;  $V_q = 48$  dBmV;  
measured at  $f_p + f_q = 116.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 111.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 118.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 120.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 109.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY67

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

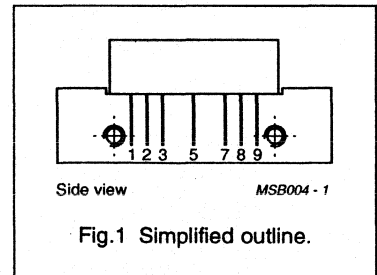
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 5 to 200 MHz at a voltage supply of +24 V (DC). The device is intended as a reverse amplifier for use in two way systems.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 10 MHz;	21.5	–	22.5	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	215	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+90	°C

## CATV amplifier module

BGY67

## CHARACTERISTICS

Bandwidth 5 to 200 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 10\text{ MHz}$ ;	21.5	–	22.5	dB
SL	slope cable equivalent	$f = 5\text{ to }200\text{ MHz}$	–0.2	–	+0.5	dB
FL	flatness of frequency response	$f = 5\text{ to }200\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
$S_{22}$	output return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
CTB	composite triple beat	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 175.25 MHz	–	–	–67	dB
$X_{mod}$	cross modulation	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–60	dB
$d_2$	second order distortion	$V_o = 50\text{ dBmV}$ ; note 1	–	–	–67	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	67	–	–	dBmV
		$d_{im} = -60\text{ dB}$ note 3	64	–	–	dBmV
F	noise figure	$f = 200\text{ MHz}$	–	–	5.5	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 4	–	215	230	mA

## Notes

- $f_p = 83.25\text{ MHz}$ ;  $V_p = 50\text{ dBmV}$ ;  
 $f_q = 109.25\text{ MHz}$ ;  $V_q = 50\text{ dBmV}$ ;  
measured at  $f_p + f_q = 192.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 35.25\text{ MHz}$ ;  $V_o = V_{pi}$ ;  
 $f_q = 42.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 44.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 33.25\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 187.25\text{ MHz}$ ;  $V_o = V_{pi}$ ;  
 $f_q = 194.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 196.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 185.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY67A

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

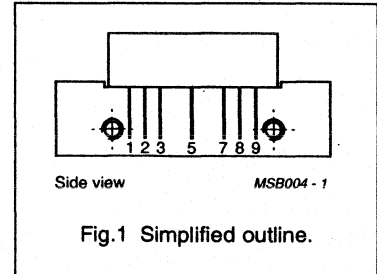
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 5 to 200 MHz at a voltage supply of +24 V (DC). The device is intended as a reverse amplifier for use in two way systems.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 10 MHz;	23.5	–	24.5	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	215	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	63	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+90	°C

## CATV amplifier module

BGY67A

## CHARACTERISTICS

Bandwidth 5 to 200 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 10\text{ MHz}$ ;	23.5	–	24.5	dB
SL	slope cable equivalent	$f = 5\text{ to }200\text{ MHz}$	–0.2	–	+0.5	dB
FL	flatness of frequency response	$f = 5\text{ to }200\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
$S_{22}$	output return losses	$f = 5\text{ to }200\text{ MHz}$ ;	20	–	–	dB
CTB	composite triple beat	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 175.25 MHz	–	–	–67	dB
$X_{mod}$	cross modulation	22 chs flat; $V_o = 50\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–59	dB
$d_2$	second order distortion	$V_o = 50\text{ dBmV}$ ; note 1	–	–	–67	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	67	–	–	dBmV
		$d_{im} = -60\text{ dB}$ note 3	64	–	–	dBmV
F	noise figure	$f = 200\text{ MHz}$	–	–	5.5	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 4	–	215	230	mA

## Notes

- $f_p = 83.25\text{ MHz}$ ;  $V_p = 50\text{ dBmV}$ ;  
 $f_q = 109.25\text{ MHz}$ ;  $V_q = 50\text{ dBmV}$ ;  
measured at  $f_p + f_q = 192.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 35.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 42.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 44.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 33.25\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 187.25\text{ MHz}$ ;  $V_o = V_p$ ;  
 $f_q = 194.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 196.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 185.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier modules

## BGY80; BGY81

## FEATURES

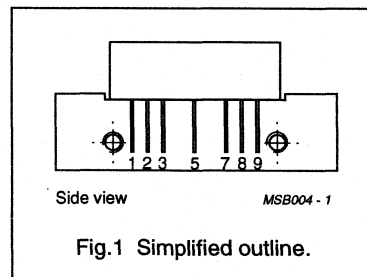
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of (DC). The BGY80 is intended for use as a 12.5 dB pre-amplifier and the BGY81 as a 12.5 dB final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	12	–	13	dB
		f = 450 MHz	12.5	–	14	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V				
	BGY80		–	180	200	mA
	BGY81	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier modules

## BGY80; BGY81

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	12	–	13	dB
		f = 450 MHz	12.5	–	14	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	–	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat BGY80 BGY81	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–54	dB
			–	–	–58	dB
$X_{mod}$	cross modulation BGY80 BGY81	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–59	dB
			–	–	–62	dB
CSO	composite second order distortion BGY80 BGY81	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–58	dB
			–	–	–61	dB
$d_2$	second order distortion BGY80 BGY81	note 1	–	–	–72	dB
			–	–	–74	dB
$V_o$	output voltage BGY80 BGY81	$d_{im} = -60$ dB; note 2	61.5	–	–	dBmV
			64	–	–	dBmV
F	noise figure BGY80 BGY81	f = 450 MHz	–	–	7.5	dB
			–	–	8	dB
$I_{tot}$	total current consumption (DC) BGY80 BGY81	note 3	–	180	200	mA
			–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  $f_q = 391.25$  MHz;  $V_q = 46$  dBmV; measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  $f_p = 440.25$  MHz;  $V_p = V_o$ ;  $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.



## CATV amplifier modules

## BGY82;BGY83

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

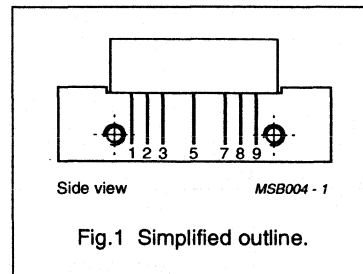
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	13.5	–	14.5	dB
		f = 450 MHz	14.5	–	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V				
			BGY82	–	180	200
	BGY83	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>case</sub>	operating case temperature range	–20	+100	°C

## CATV amplifier modules

## BGY82;BGY83

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	13.5	–	14.5	dB
		f = 450 MHz	14.5	–	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	–	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz				
			BGY82	–	–	–55
	BGY83	–	–	–59	dB	
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz				
			BGY82	–	–	–56
	BGY83	–	–	–59	dB	
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz				
			BGY82	–	–	–55
	BGY83	–	–	–59	dB	
$d_2$	second order distortion	note 1				
			BGY82	–	–	–72
	BGY83	–	–	–74	dB	
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2				
			BGY82	61.5	–	–
	BGY83	64	–	–	dBmV	
F	noise figure	f = 450 MHz				
			BGY82	–	–	7
	BGY83	–	–	8	dB	

## CATV amplifier modules

## BGY82;BGY83

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{tot}$	total current consumption	DC value; $V_B = +24$ V; note 3				
	BGY82		–	180	200	mA
	BGY83		–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
 measured at  $f_p + f_q = 446.5$  MHz
- Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
 measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY84;BGY85

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

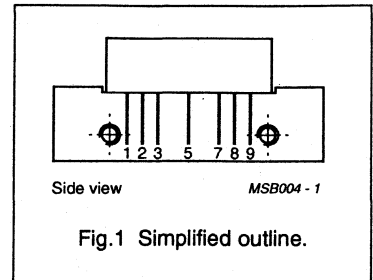
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC). BGY84 intended for use as an input amplifier module and BGY85 as an output amplifier module.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 450 MHz	17.3	–	18.8	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V				
			BGY84	–	180	200
	BGY85	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier modules

## BGY84;BGY85

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	16.5	–	17.5	dB
		$f = 450\text{ MHz}$	17.3	–	18.8	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–	–55	dB
					–58	dB
$X_{mod}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–57	dB
					–60	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2	60	–	–	dBmV
					62.5	–
F	noise figure	$f = 40\text{ to }450\text{ MHz}$	–	–	6.5	dB
					7	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	180	200	mA
				–	220	240

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**CATV amplifier modules****BGY84;BGY85**

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**Notes**

1.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 343.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 398.5$  MHz
2. Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
3. The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY84A;BGY85A

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

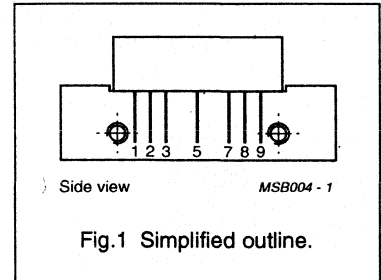
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC). The BGY84A is intended for use as an input amplifier module and BGY85A as an output amplifier module.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	–	18.8	dB
		f = 450 MHz	18.7	–	20.2	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V				
			BGY84A	–	180	200
	BGY85A	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature range	–20	+100	°C

## CATV amplifier modules

## BGY84A;BGY85A

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	–	18.8	dB
		f = 450 MHz	18.7	–	20.2	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.3	–	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz				
			BGY84A BGY85A	– –	– –	–55 –59
$X_{mod}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz				
			BGY84A BGY85A	– –	– –	–58 –61
$d_2$	second order distortion	note 1	–	–	–72	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2				
			BGY84A BGY85A	60 62.5	– –	– –
F	noise figure	f = 40 to 450 MHz				
			BGY84A BGY85A	– –	– –	6.5 7
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3				
			BGY84A BGY85A	– –	180 220	200 240



## CATV amplifier modules

## BGY84A;BGY85A

**Notes**

1.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 343.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 398.5$  MHz
2. Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
3. The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY85H/01

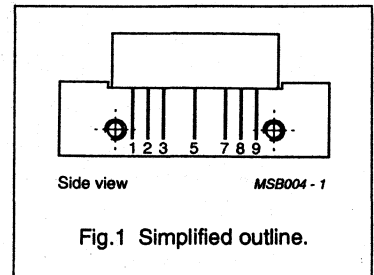
## FEATURES

- Excellent linearity
- High slope of 5.1 dB so that total cable slope can be equalised by the slope of the module
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## DESCRIPTION

High slope, pre-emphasis, hybrid amplifier module intended for use as a 20.7 dB trunk amplifier in CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC).

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	14.8	–	16.4	dB
		f = 450 MHz	20.2	–	21.2	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	215	230	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C
V <sub>B</sub>	DC supply voltage	–	+28	V

## CATV amplifier module

BGY85H/01

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	14.8	–	16.4	dB
		$f = 450\text{ MHz}$	20.2	–	21.2	dB
$\Delta G$	delta gain	$f = 40\text{ to }450\text{ MHz}$	4.7	–	5.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$ ; note 1	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	36 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 433.25 MHz	–	–	–65	dB
		60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–59	–	dB
$X_{\text{mod}}$	cross modulation	36 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–65	dB
		60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–61	–	dB
$d_2$	second order distortion	note 2	–	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 3	65	–	–	dBmV
		note 4	64	–	–	dBmV
		note 5	62.5	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	6.8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 6	–	215	230	mA

## Notes

- Flatness calculation is based on the following formula which describes the 'ideal' gain versus frequency curve,  $G_f = G_{50} + \Delta G [a(f - 50) + b(f - 50)^2 + c(f - 50)^3]$ , in which :  
 $G_{50}$  = measured gain at 50 MHz;  
 $\Delta G$  = measured difference in gain between 450 and 50 MHz;  
 $a = 3.132 \times 10^{-3}$   
 $b = 1.993 \times 10^{-6}$   
 $c = -8.934 \times 10^{-9}$

## CATV amplifier module

BGY85H/01

2.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 343.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 398.5$  MHz
3. Measured according to DIN45004B;  
 $f_p = 287.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 294.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 296.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 285.25$  MHz
4. Measured according to DIN45004B;  
 $f_p = 387.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 394.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 396.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 385.25$  MHz
5. Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz
6. The module normally operates at  $V_B = +24$  V, but is able to withstand supply transients up to +30 V.

## CATV amplifier modules

## BGY86; BGY87

## FEATURES

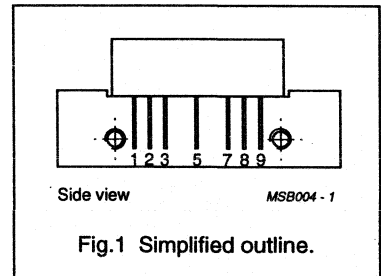
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of 24 V (DC). The BGY86 is intended for use as a pre-amplifier and BGY87 as a final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
G <sub>p</sub>	power gain	f = 50 MHz	21.5	–	22.5	dB	
		f = 450 MHz	21.7	–	23.5	dB	
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V					
			BGY86	–	180	200	mA
			BGY87	–	220	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier modules

## BGY86; BGY87

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	21.5	–	22.5	dB
		f = 450 MHz	21.7	–	23.5	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0	–	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	+135	–	+225	deg
CTB	composite triple beat BGY86 BGY87	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–54	dB
			–	–	–58	dB
$X_{mod}$	cross modulation BGY86 BGY87	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–51	dB
			–	–	–55	dB
CSO	composite second order distortion BGY86 BGY87	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–53	dB
			–	–	–57	dB
$d_2$	second order distortion BGY86 BGY87	note 1	–	–	–68	dB
			–	–	–72	dB
$V_o$	output voltage BGY86 BGY87	$d_{im} = -60$ dB; note 2	61.5	–	–	dBmV
			64	–	–	dBmV
F	noise figure BGY86 BGY87	f = 450 MHz	–	–	6	dB
			–	–	6.5	dB
$I_{tot}$	total current consumption (DC) BGY86 BGY87	note 3	–	180	200	mA
			–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  $f_q = 391.25$  MHz;  $V_q = 46$  dBmV; measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  $f_p = 440.25$  MHz;  $V_p = V_o$ ;  $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY87B

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimum reliability.

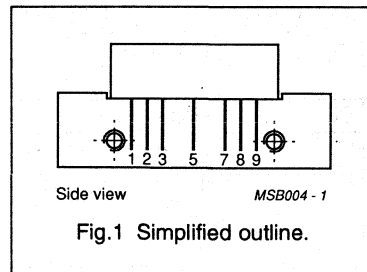
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	26.2	27.8	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V (note 1)	–	340	mA

## Note

1. The module normally operates at V<sub>B</sub> = +24 V, but is able to withstand supply transients up to +30 V.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier module

BGY87B

## CHARACTERISTICS

 $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	26.2	27.8	dB
		$f = 450\text{ MHz}$	27.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	2.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	–	20	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	–	19	dB
		$f = 160\text{ to }450\text{ MHz}$	–	18	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	–	20	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	–	19	dB
		$f = 160\text{ to }450\text{ MHz}$	–	18	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–58	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–60	dB
$d_2$	second order beat	$V_o = 46\text{ dBmV}$ note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	64	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	6	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$	–	340	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- Measured according to DIN 45004B;  
 $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .



## CATV amplifier module

BGY88

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

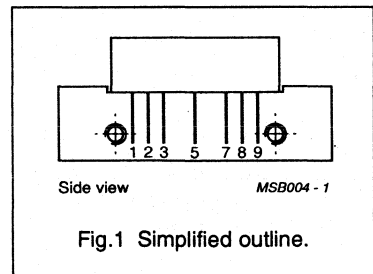
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of +24 V (DC) and intended for use as a line-extender.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 450 MHz	35	–	37	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	320	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier module

BGY88

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{mb} = 35\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	33.5	–	35.5	dB
		$f = 450\text{ MHz}$	35	–	37	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	2.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–	–58	dB
$X_{mod}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ ; note 2	62	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	6	dB
$I_{tot}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	320	340	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 343.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 398.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o = 62\text{ dBmV}$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY89

## FEATURES

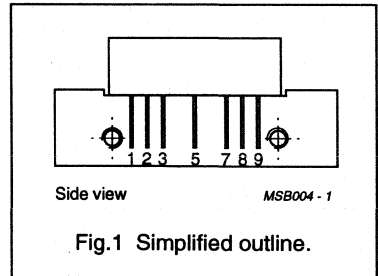
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 450 MHz at a voltage supply of 24 V (DC). The module is intended for use as a line-extender.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	37	–	39	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	320	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY89

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	37	–	39	dB
		$f = 450$ MHz	37	–	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0	–	2.5	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–58	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–58	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–58	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	63	–	–	dBmV
F	noise figure	$f = 450$ MHz	–	–	5.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	320	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 343.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 398.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o = 63$  dBmV;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY580;BGY581

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

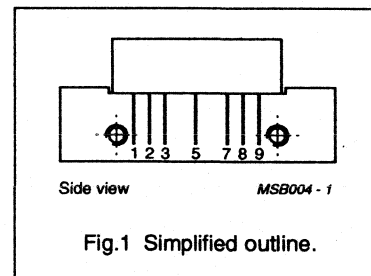
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC). The BGY580 is intended for use as a pre-amplifier and BGY581 as a final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
G <sub>p</sub>	power gain	f = 50 MHz	12	–	13	dB	
		f = 550 MHz	12.5	–	14.5	dB	
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V					
			BGY580	–	180	200	mA
			BGY581	–	220	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>case</sub>	operating case temperature range	–20	+100	°C

## CATV amplifier modules

## BGY580;BGY581

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{case} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	12	–	13	dB
		$f = 550\text{ MHz}$	12.5	–	14.5	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.5	–	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz				
			BGY580	–	–	–52
	BGY581	–	–	–56	dB	
$X_{mod}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz				
			BGY580	–	–	–59
	BGY581	–	–	–62	dB	
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz				
			BGY580	–	–	–56
	BGY581	–	–	–59	dB	
$d_2$	second order distortion	note 1				
			BGY580	–	–	–70
	BGY581	–	–	–72	dB	
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2				
			BGY580	59	–	–
	BGY581	61.5	–	–	dBmV	
F	noise figure	$f = 550\text{ MHz}$				
			BGY580	–	–	8.5
	BGY581	–	–	9	dB	

## CATV amplifier modules

## BGY580;BGY581

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24 \text{ V}$ ; note 3				
	BGY580		–	180	200	mA
	BGY581		–	220	240	mA

## Notes

- $f_p = 55.25 \text{ MHz}$ ;  $V_p = 44 \text{ dBmV}$ ;  
 $f_q = 493.25 \text{ MHz}$ ;  $V_q = 44 \text{ dBmV}$ ;  
 measured at  $f_p + f_q = 548.5 \text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 540.25 \text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25 \text{ MHz}$ ;  $V_q = V_p - 6 \text{ dB}$ ;  
 $f_r = 549.25 \text{ MHz}$ ;  $V_r = V_p - 6 \text{ dB}$ ;  
 measured at  $f_p + f_q - f_r = 538.25 \text{ MHz}$ .
- The modules normally operate at  $V_B = +24 \text{ V}$ , but are able to withstand supply transients up to  $30 \text{ V}$ .

## CATV amplifier modules

BGY582;BGY583

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

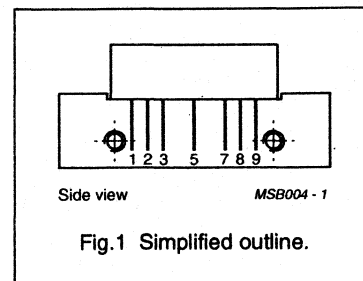
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
G <sub>p</sub>	power gain	f = 50 MHz	13.5	–	14.5	dB	
		f = 550 MHz	14.5	–	–	dB	
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V					
			BGY582	–	180	200	mA
			BGY583	–	220	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C



## CATV amplifier modules

## BGY582;BGY583

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	13.5	–	14.5	dB
		$f = 550\text{ MHz}$	14.5	–	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.2	–	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–	–55	dB
			–	–	–59	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–58	dB
			–	–	–61	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–	–55	dB
			–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
			–	–	–72	dB
$V_o$	output voltage	$d_{\text{m}} = -60\text{ dB}$ note 2	59	–	–	dBmV
			61.5	–	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	–	7.5	dB
			–	–	8.5	dB

## CATV amplifier modules

## BGY582;BGY583

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{tot}$	total current consumption	DC value; $V_B = +24$ V; note 3				
	BGY582		—	180	200	mA
	BGY583		—	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
 measured at  $f_p + f_q = 548.5$  MHz
- Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_p - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_p - 6$  dB;  
 measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY584; BGY585

## FEATURES

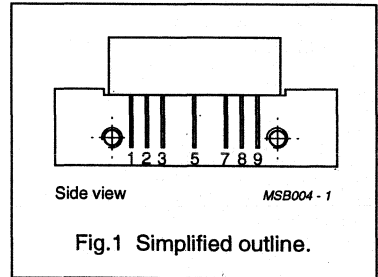
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of 24 V (DC). The BGY584 is intended for use as a pre-amplifier and BGY585 as a final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 550 MHz	17.6	–	19	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V				
	BGY584		–	180	200	mA
	BGY585	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier modules

## BGY584; BGY585

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 550 MHz	17.6	–	19	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.5	–	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat BGY584 BGY585	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–56	dB
			–	–	–59	dB
$X_{mod}$	cross modulation BGY584 BGY585	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–59	dB
			–	–	–62	dB
CSO	composite second order distortion BGY584 BGY585	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–56	dB
			–	–	–59	dB
$d_2$	second order distortion BGY584 BGY585	note 1	–	–	–68	dB
			–	–	–70	dB
$V_o$	output voltage BGY584 BGY585	$d_{im} = -60$ dB; note 2	58.5	–	–	dBmV
			61	–	–	dBmV
F	noise figure BGY584 BGY585	f = 550 MHz	–	–	7	dB
			–	–	8	dB
$I_{tot}$	total current consumption (DC) BGY584 BGY585	note 3	–	180	200	mA
			–	220	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  $f_q = 493.25$  MHz;  $V_q = 44$  dBmV; measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  $f_p = 540.25$  MHz;  $V_p = V_o$ ;  $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY584; BGY585

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	16.5	–	17.5	dB
		$f = 450$ MHz	17.4	–	18.8	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.5	–	1.8	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat BGY584 BGY585	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–58	dB
			–	–	–61	dB
$X_{mod}$	cross modulation BGY584 BGY585	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–57	dB
			–	–	–60	dB
CSO	composite second order distortion BGY584 BGY585	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–58	dB
			–	–	–61	dB
$d_2$	second order distortion BGY584 BGY585	note 1	–	–	–73	dB
			–	–	–75	dB
$V_o$	output voltage BGY584 BGY585	$d_{im} = -60$ dB; note 2	61.5	–	–	dBmV
			64	–	–	dBmV
F	noise figure BGY584 BGY585	$f = 450$ MHz	–	–	6	dB
			–	–	7	dB
$I_{tot}$	total current consumption (DC) BGY584 BGY585	note 3	–	180	200	mA
			–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  $f_q = 391.25$  MHz;  $V_q = 46$  dBmV; measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  $f_p = 440.25$  MHz;  $V_p = V_o$ ;  $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY584A;BGY585A

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Optimal reliability ensured by TiPtAu metallized crystals.

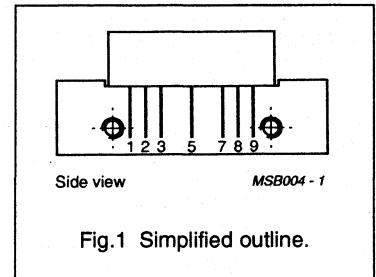
## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC). The BGY584A is intended for use as a pre-amplifier and BGY585A as a final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	17.7	–	18.7	dB
		f = 550 MHz	18.8	–	20	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V				
			BGY584A	–	180	200
	BGY585A	–	220	240	mA	

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>case</sub>	operating case temperature range	–20	+100	°C

## CATV amplifier modules

## BGY584A;BGY585A

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{case} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	17.7	–	18.7	dB
		$f = 550\text{ MHz}$	18.8	–	20	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.5	–	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz				
			BGY584A	–	–	–56
	BGY585A	–	–	–59	dB	
$X_{mod}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz				
			BGY584A	–	–	–59
	BGY585A	–	–	–62	dB	
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz				
			BGY584A	–	–	–55
	BGY585A	–	–	–59	dB	
$d_2$	second order distortion	note 1				
			BGY584A	–	–	–70
	BGY585A	–	–	–72	dB	
$V_o$	output voltage	$d_{im} = -60\text{ dB}$ note 2				
			BGY584A	59	–	–
	BGY585A	61.5	–	–	dBmV	
F	noise figure	$f = 550\text{ MHz}$				
			BGY584A	–	–	7
	BGY585A	–	–	8	dB	

## CATV amplifier modules

## BGY584A;BGY585A

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{tot}$	total current consumption	DC value; $V_B = +24$ V; note 3				
	BGY584A		–	180	200	mA
	BGY585A		–	220	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
 measured at  $f_p + f_q = 548.5$  MHz
- Measured according to DIN45004B;  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_p - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_p - 6$  dB;  
 measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.



## CATV amplifier modules

## BGY584A;BGY585A

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{case} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	17.7	–	18.7	dB
		$f = 450\text{ MHz}$	18.6	–	19.8	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	1.8	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
CTB	composite triple beat BGY584A BGY585A	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–	–57	dB
			–	–	–61	dB
$X_{mod}$	cross modulation BGY584A BGY585A	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–58	dB
			–	–	–61	dB
CSO	composite second order distortion BGY584A BGY585A	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–	–58	dB
			–	–	–61	dB
$d_2$	second order distortion BGY584A BGY585A	note 1	–	–	–73	dB
			–	–	–75	dB
$V_o$	output voltage BGY584A BGY585A	$d_{im} = -60\text{ dB}$ note 2	61.5	–	–	dBmV
			64	–	–	dBmV
F	noise figure BGY584A BGY585A	$f = 450\text{ MHz}$	–	–	6	dB
			–	–	7	dB

## CATV amplifier modules

## BGY584A;BGY585A

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{tot}$	total current consumption	DC value; $V_B = +24$ V; note 3				
	BGY584A		–	180	200	mA
	BGY585A		–	220	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz
- Measured according to DIN45004B;  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_p - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_p - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The modules normally operate at  $V_B = +24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier modules

## BGY586; BGY587

## FEATURES

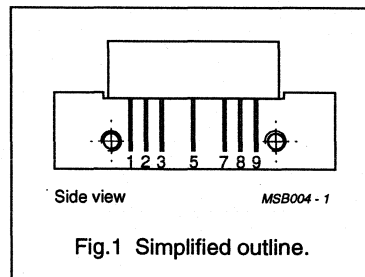
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

## DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of 24 V (DC). The BGY586 is intended for use as a pre-amplifier and BGY587 as a final amplifier.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	21.5	–	22.5	dB
		f = 550 MHz	22	–	–	dB
I <sub>tot</sub>	total current consumption (DC) BGY586 BGY587	V <sub>B</sub> = 24 V	–	180	200	mA
			–	220	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier modules

## BGY586; BGY587

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	21.5	–	22.5	dB
		f = 550 MHz	22	–	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	–	1.5	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	+135	–	+225	deg
CTB	composite triple beat BGY586 BGY587	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–53	dB
			–	–	–57	dB
$X_{mod}$	cross modulation BGY586 BGY587	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–55	dB
			–	–	–58	dB
CSO	composite second order distortion BGY586 BGY587	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–50	dB
			–	–	–54	dB
$d_2$	second order distortion BGY586 BGY587	note 1	–	–	–62	dB
			–	–	–66	dB
$V_o$	output voltage BGY586 BGY587	$d_{im} = -60$ dB; note 2	58.5	–	–	dBmV
			61	–	–	dBmV
F	noise figure BGY586 BGY587	f = 550 MHz	–	–	6.5	dB
			–	–	7	dB
$I_{tot}$	total current consumption (DC) BGY586 BGY587	note 3	–	180	200	mA
			–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  $f_q = 493.25$  MHz;  $V_q = 44$  dBmV; measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  $f_p = 540.25$  MHz;  $V_p = V_o$ ;  $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The modules normally operate at  $V_B = 24$  V, but are able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY587B

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

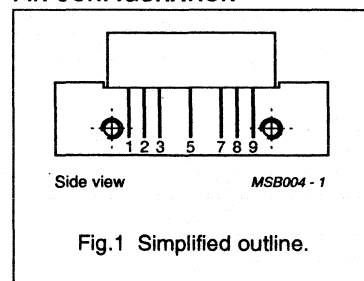
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	26.2	27.8	dB
		f = 550 MHz	27.5	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	-	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	55	dBmV
T <sub>stg</sub>	storage temperature range	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	-20	+100	°C
V <sub>B</sub>	DC supply voltage	-	+28	V

## CATV amplifier module

BGY587B

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\text{ }\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	26.2	27.8	dB
		$f = 550\text{ MHz}$	27.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.5	2.5	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–57	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–57	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	61	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	340	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o = 66.5\text{ dBmV}$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY588

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

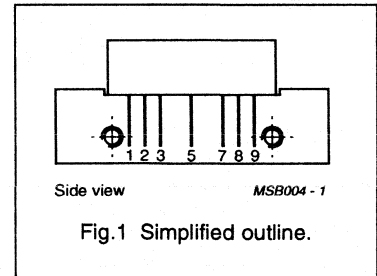
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of +24 V (DC) and intended for use as a line-extender.

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 550 MHz	35	–	37	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	320	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier module

BGY588

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 550 MHz	35	–	37	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0	–	2.5	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.4$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz;	20	–	–	dB
		f = 80 to 160 MHz;	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz;	20	–	–	dB
		f = 80 to 160 MHz;	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–	–57	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–59	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–	–57	dB
$d_2$	second order distortion	note 1	–	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	61	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	6.5	dB
$I_{\text{ct}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	320	340	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o = 66.5\text{ dBmV}$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to +30 V.



## CATV amplifier module

BGY588

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 35\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	33.5	–	35.5	dB
		$f = 450\text{ MHz}$	35	–	37	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	2.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–	–61	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–59	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	64	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	6	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	320	340	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$
- Measured according to DIN45004B;  
 $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o = 66.5\text{ dBmV}$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to +30 V.

## CATV amplifier module

BGY681

## FEATURES

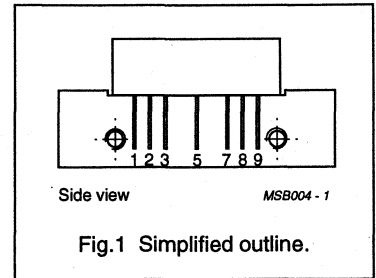
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range amplifier module designed for CATV systems operating over a frequency range of 40 to 600 MHz operating with a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	12	13	dB
		f = 600 MHz	12.7	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY681

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	12	–	13	dB
		f = 600 MHz	12.7	–	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.7	–	2.2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 600 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 600 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–	–52	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–58	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–	–57	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	59.5	–	–	dBmV
F	noise figure	f = 600 MHz	–	–	9.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY681

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	12	–	13	dB
		f = 550 MHz	12.5	–	14.5	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.5	–	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	±0.2	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 547.25 MHz	–	–	–56	dB
X <sub>mod</sub>	cross modulation	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 55.25 MHz	–	–	–62	dB
CSO	composite second order distortion	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 548.5 MHz	–	–	–59	dB
d <sub>2</sub>	second order distortion	note 1	–	–	–72	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	61.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	9	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	220	240	mA

**Notes**

- f<sub>p</sub> = 55.25 MHz; V<sub>p</sub> = 44 dBmV;  
f<sub>q</sub> = 493.25 MHz; V<sub>q</sub> = 44 dBmV;  
measured at f<sub>p</sub> + f<sub>q</sub> = 548.5 MHz.
- Measured according to DIN45004B:  
f<sub>p</sub> = 540.25 MHz; V<sub>p</sub> = V<sub>o</sub>;  
f<sub>q</sub> = 547.25 MHz; V<sub>q</sub> = V<sub>o</sub> –6 dB;  
f<sub>r</sub> = 549.25 MHz; V<sub>r</sub> = V<sub>o</sub> –6 dB;  
measured at f<sub>p</sub> + f<sub>q</sub> – f<sub>r</sub> = 538.25 MHz.
- The module normally operates at V<sub>B</sub> = 24 V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY681

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	12	–	13	dB
		$f = 450$ MHz	12.5	–	14	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.5	–	1.5	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	19	–	–	dB
		$f = 160$ to 450 MHz	18	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–58	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–62	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–74	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
F	noise figure	$f = 450$ MHz	–	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY683

## FEATURES

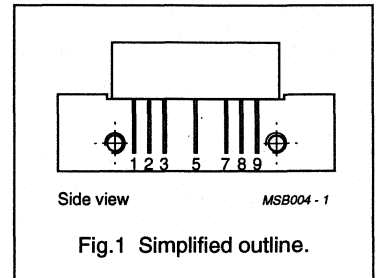
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range amplifier module for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	13.5	14.5	dB
		f = 600 MHz	14.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY683

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	13.5	14.5	dB
		f = 600 MHz	14.5	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.2	1.7	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 600 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 600 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–55	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–57	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	58	–	dBmV
F	noise figure	f = 600 MHz	–	9	dB
$I_{tot}$	total current consumption (DC)	note 3	–	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY683

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	13.5	–	14.5	dB
		f = 550 MHz	14.5	–	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	–	1.5	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–59	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	8.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	200	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGY683

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 450 MHz	17.4	–	18.8	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.5	–	1.8	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	±0.2	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–61	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–60	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–75	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	200	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

# CATV amplifier module

# BGY685

## FEATURES

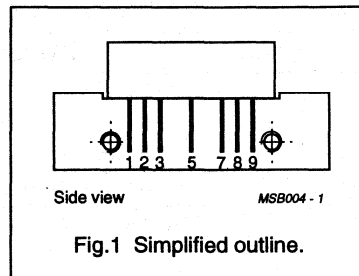
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range amplifier module designed for applications in CATV systems operating over a frequency range of 40 to 600 MHz operating with a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	16.5	17.5	dB
		f = 600 MHz	17.8	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY685

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	16.5	17.5	dB
		$f = 600$ MHz	17.8	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	0.5	2.2	dB
FL	flatness of frequency response	$f = 40$ to 600 MHz	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 600 MHz	18	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 600 MHz	18	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–55	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	60	–	dBmV
F	noise figure	$f = 600$ MHz	–	8.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY685

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 550 MHz	17.6	–	19	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.5	–	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–59	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–62	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	220	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY685

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 450 MHz	17.4	–	18.8	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.5	–	1.8	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 450 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–61	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–60	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–75	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	220	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY685A/04

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

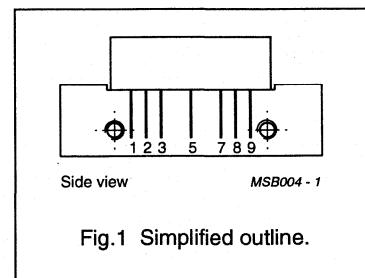
## DESCRIPTION

Special super-high dynamic range amplifier module designed for applications in CATV systems with a bandwidth of 40 to 600 MHz operating with a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	17.7	–	18.7	dB
		f = 600 MHz	19	–	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	–	220	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	–20	+100	°C

## CATV amplifier module

BGY685A/04

**CHARACTERISTICS**Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	17.7	18.7	dB
		$f = 600\text{ MHz}$	19	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.5	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–55	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	60	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	8.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	240	mA

**Notes**

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$ .
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = 24\text{ V}$ , but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY685A/04

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz;	17.7		18.7	dB
		f = 550 MHz	18.8	–	20	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.5	–	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	19	–	–	dB
		f = 160 to 550 MHz	18	–	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–	–59	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–62	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–	–59	dB
$d_2$	second order distortion	note 1	–	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	61.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	220	240	mA

**Notes**

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$ .
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_B = 24\text{ V}$ , but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGY685A/04

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	17.7		18.7	dB
		$f = 450\text{ MHz}$	18.6	–	19.8	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	1.8	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	–	+45	deg
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–	–61	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–75	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	64	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	220	240	mA

**Notes**

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = 24\text{ V}$ , but is able to withstand supply transients up to 30 V.

## Hybrid CATV amplifier module

BGY685AD

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

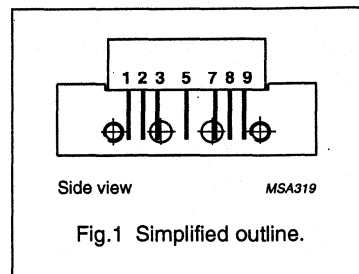
## DESCRIPTION

Hybrid high dynamic range cascode amplifier module with Darlington pre-stage crystals for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	18.75	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	-	250	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	-20	+100	°C

## Hybrid CATV amplifier module

BGY685AD

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	18	19	dB
		$f = 600\text{ MHz}$	18.75	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.2	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–62	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_m = -60\text{ dB}$ ; note 2	62	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	250	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$ .
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## Hybrid CATV amplifier module

BGY685AL

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

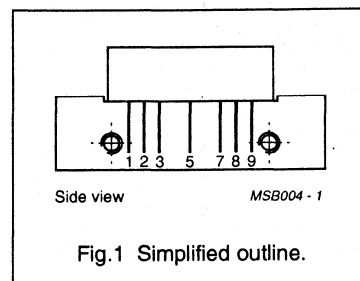
## DESCRIPTION

Hybrid high dynamic range amplifier module designed for applications in CATV systems operating over a frequency range of 40 MHz to 600 MHz operating with a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	18	19	dB
		f = 600 MHz	18.5	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	-	250	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature range	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	-20	+100	°C

## Hybrid CATV amplifier module

BGY685AL

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ; $f = 600\text{ MHz}$	18 18.5	19 –	dB dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.5	2.0	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ; $f = 80\text{ to }160\text{ MHz}$ ; $f = 160\text{ to }600\text{ MHz}$	20 19 18	– – –	dB dB dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ; $f = 80\text{ to }160\text{ MHz}$ ; $f = 160\text{ to }600\text{ MHz}$	20 19 18	– – –	dB dB dB
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–56	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–55	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	60	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	5.0	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	250	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## Hybrid CATV amplifier module

BGY685AL

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	18	19	dB
		$f = 550\text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.5	2.0	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–58	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	61.5	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	4.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	250	mA

**Notes**

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## Hybrid CATV amplifier module

BGY685AL

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	18	19	dB
		$f = 450\text{ MHz}$	18.3	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.3	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.2$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	19	–	dB
		$f = 160\text{ to }450\text{ MHz}$	18	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–58	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	62.5	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	4.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	250	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY687

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

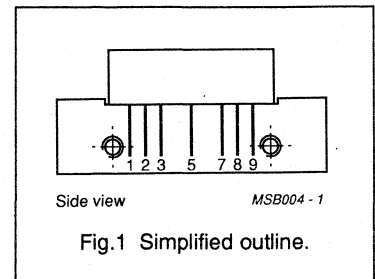
## DESCRIPTION

Hybrid high dynamic range amplifier module designed for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	21	22	dB
		f = 600 MHz	22	-	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	-	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	-	60	dBmV
T <sub>stg</sub>	storage temperature range	-40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	-20	+100	°C



## CATV amplifier module

BGY687

## CHARACTERISTICS

 $T_{\text{case}} = 30\text{ }^{\circ}\text{C}; Z_S = Z_L = 75\ \Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz};$	21	22	dB
		$f = 600\text{ MHz}$	22	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.8	2.2	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	0.2	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz};$	20	–	dB
		$f = 80\text{ to }160\text{ MHz};$	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz};$	20	–	dB
		$f = 80\text{ to }160\text{ MHz};$	19	–	dB
		$f = 160\text{ to }550\text{ MHz};$	18	–	dB
		$f = 550\text{ to }600\text{ MHz}$	16	–	dB
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV};$ measured at 595.25 MHz	–	–54	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV};$ measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV};$ measured at 596.25 MHz	–	–52	dB
$d_2$	second order distortion	note 1	–	–66	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ note 2	58	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V};$ note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}; V_p = 44\text{ dBmV};$   
 $f_q = 541.25\text{ MHz}; V_q = 44\text{ dBmV};$   
measured at  $f_p + f_q = 596.5\text{ MHz}$
- $f_p = 590.25\text{ MHz}; V_p = V_o;$   
 $f_q = 597.25\text{ MHz}; V_q = V_o - 6\text{ dB};$   
 $f_r = 599.25\text{ MHz}; V_r = V_o - 6\text{ dB};$   
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}.$
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY687B

## FEATURES

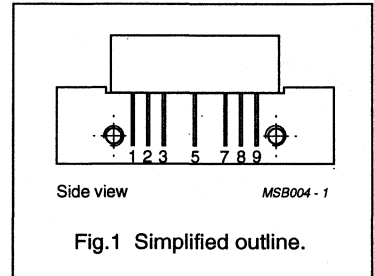
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range amplifier module designed for CATV systems operating over a frequency range of 40 to 600 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	26.2	27.8	dB
		f = 600 MHz	27.8	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY687B

**CHARACTERISTICS**Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	26.2	27.8	dB
		$f = 600$ MHz	27.8	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	0.8	2.8	dB
FL	flatness of frequency response	$f = 40$ to 600 MHz	–	$\pm 0.4$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 600 MHz	18	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	19	–	dB
		$f = 160$ to 600 MHz	18	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–53	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–54	dB
$d_2$	second order distortion	note 1	–	–66	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	60	–	dBmV
F	noise figure	$f = 600$ MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY687B

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	26.2	27.8	dB
		f = 550 MHz	27.5	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	$\pm 0.4$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 550 MHz	18	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–57	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–57	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	–	dBmV
F	noise figure	f = 550 MHz	–	6.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY687B

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	26.2	27.8	dB
		f = 450 MHz	27.5	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	±0.2	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 450 MHz	18	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 450 MHz	18	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 445.25 MHz	–	–58	dB
X <sub>mod</sub>	cross modulation	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 446.5 MHz	–	–60	dB
d <sub>2</sub>	second order distortion	note 1	–	–70	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	64	–	dBmV
F	noise figure	f = 450 MHz	–	6	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	340	mA

## Notes

1.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
2. Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
3. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY785A

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

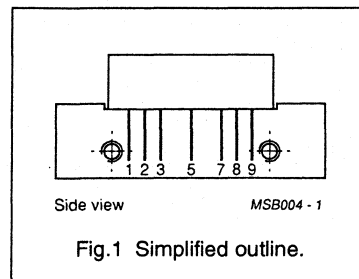
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 750 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	18	19	dB
		f = 750 MHz	18.5	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = +24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature range	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature range	–20	+100	°C

## CATV amplifier module

BGY785A

## CHARACTERISTICS

 $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ ; Bandwidth 40 to 750 MHz;

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$ ;	18	19	dB
		$f = 750\text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }750\text{ MHz}$	0	2.0	dB
FL	flatness of frequency response	$f = 40\text{ to }750\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$ ;	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$ ;	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$ ;	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$ ;	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
CTB	composite triple beat	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 745.25 MHz	–	–53	dB
$X_{\text{mod}}$	cross modulation	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 746.5 MHz	–	–53	dB
$d_2$	second order distortion	note 1	–	–65	dB
$V_o$	output voltage	$d_{\text{m}} = -60\text{ dB}$ note 2	59	–	dBmV
F	noise figure	$f = 750\text{ MHz}$	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = +24\text{ V}$ ; note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 691.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 746.5\text{ MHz}$
- $f_p = 740.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 747.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 749.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 738.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY785A

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 30 \text{ }^\circ\text{C}$ ;  $Z_S = Z_L = 75 \text{ } \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50 \text{ MHz}$	18	19	dB
		$f = 600 \text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40 \text{ to } 600 \text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40 \text{ to } 600 \text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40 \text{ to } 80 \text{ MHz}$	20	–	dB
		$f = 80 \text{ to } 160 \text{ MHz}$	18.5	–	dB
		$f = 160 \text{ to } 320 \text{ MHz}$	17	–	dB
		$f = 320 \text{ to } 600 \text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40 \text{ to } 80 \text{ MHz}$	20	–	dB
		$f = 80 \text{ to } 160 \text{ MHz}$	18.5	–	dB
		$f = 160 \text{ to } 320 \text{ MHz}$	17	–	dB
		$f = 320 \text{ to } 600 \text{ MHz}$	16	–	dB
CTB	composite triple beat	85 chs flat; $V_o = 44 \text{ dBmV}$ ; measured at 595.25 MHz	–	–57	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44 \text{ dBmV}$ ; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44 \text{ dBmV}$ ; measured at 596.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60 \text{ dB}$ ; note 2	61	–	dBmV
F	noise figure	$f = 50 \text{ MHz}$	–	5.5	dB
		$f = 600 \text{ MHz}$	–	7.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24 \text{ V}$ ; note 3	–	235	mA

## Notes

- $f_p = 55.25 \text{ MHz}$ ;  $V_p = 44 \text{ dBmV}$ ;  
 $f_q = 541.25 \text{ MHz}$ ;  $V_q = 44 \text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5 \text{ MHz}$ .
- $f_p = 590.25 \text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25 \text{ MHz}$ ;  $V_q = V_o - 6 \text{ dB}$ ;  
 $f_r = 599.25 \text{ MHz}$ ;  $V_r = V_o - 6 \text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25 \text{ MHz}$ .
- The module normally operates at  $V_B = +24 \text{ V}$ , but is able to withstand supply transients up to  $+30 \text{ V}$ .



## CATV amplifier module

BGY785A

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	18	19	dB
		$f = 550\text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–60	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	62	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 550\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	235	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$ .
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .

## CATV amplifier module

BGY785A

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_P$	power gain	$f = 50\text{ MHz}$	18	19	dB
		$f = 450\text{ MHz}$	18.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–61	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	60 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 446.5 MHz	–	–61	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	64	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 450\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	235	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$ , but is able to withstand supply transients up to  $+30\text{ V}$ .



# CATV amplifier module

# BGY785AD

## FEATURES

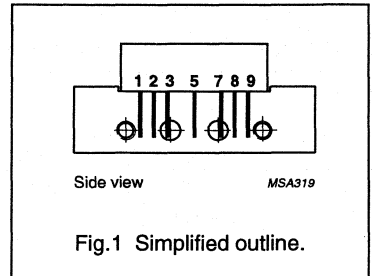
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range cascode amplifier module with darlington pre-stage crystals designed for CATV systems operating over a frequency range of 40 to 750 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	18.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	265	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

## BGY785AD

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 750$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0	1.5	dB
FL	flatness of frequency response	$f = 40$ to 750 MHz	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
$S_{21}$	phase response	$f = 50$ MHz	135	225	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–58	dB
$X_{\text{mod}}$	cross modulation	110 channels flat; $V_{\text{sig}} = 44$ dBmV; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.25 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	61	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 750$ MHz	–	7	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	265	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY785AD

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{21}$	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–64	dB
$X_{\text{mod}}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	64	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 600 MHz	–	6	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	265	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

## BGY785AD

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 550$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0	1.5	dB
FL	flatness of frequency response	$f = 40$ to 550 MHz	–	±0.3	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 550 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 550 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	135	225	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–66	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–62	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64.5	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 550$ MHz	–	5.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	265	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

## BGY785AD

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 450$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0	1.5	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	135	225	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–66	dB
$X_{\text{mod}}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–65	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	66	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 450$ MHz	–	5.5	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	265	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



# CATV amplifier module

**BGY787**

## FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

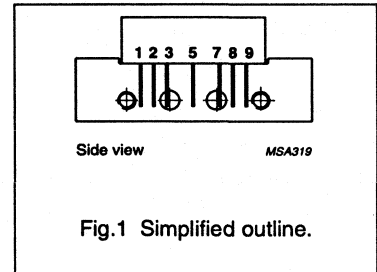
## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 750 MHz at a voltage supply of +24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz;	21	22	dB
		f = 750 MHz	21.5	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	100	°C
T <sub>mb</sub>	mounting base operating temperature	–20	100	°C

## CATV amplifier module

BGY787

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	21	22	dB
		$f = 750\text{ MHz}$	21.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }750\text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }750\text{ MHz}$	–	$\pm 0.5$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 745.25 MHz	–	–51	dB
$X_{\text{mod}}$	cross modulation	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–51	dB
CSO	composite second order distortion	110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 746.5 MHz	–	–50	dB
$d_2$	second order distortion	note 1	–	–63	dB
$V_o$	output voltage	$d_{\text{m}} = -60\text{ dB}$ ; note 2	59	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5	dB
		$f = 750\text{ MHz}$	–	8	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 691.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 746.5\text{ MHz}$ .
- $f_p = 740.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 747.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 749.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 738.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY787

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_{\text{S}} = Z_{\text{L}} = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	21	22	dB
		$f = 600\text{ MHz}$	21.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }600\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }600\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–56	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–53	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–53	dB
$d_2$	second order distortion	note 1	–	–66	dB
$V_o$	output voltage	$d_{\text{m}} = -60\text{ dB}$ ; note 2	59.5	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5	dB
		$f = 600\text{ MHz}$	–	7	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 541.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 596.5\text{ MHz}$ .
- $f_p = 590.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 597.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 599.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 588.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY787

## CHARACTERISTICS

Bandwidth 40 to 550 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_s = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	21	22	dB
		$f = 550\text{ MHz}$	21.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }550\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 547.25 MHz	–	–59	dB
$X_{\text{mod}}$	cross modulation	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–55	dB
CSO	composite second order distortion	77 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 548.5 MHz	–	–55	dB
$d_2$	second order distortion	note 1	–	–66	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	61.5	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5	dB
		$f = 550\text{ MHz}$	–	6.5	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_b = 24\text{ V}$ ; note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 44\text{ dBmV}$ ;  
 $f_q = 493.25\text{ MHz}$ ;  $V_q = 44\text{ dBmV}$ ;  
measured at  $f_p + f_q = 548.5\text{ MHz}$ .
- $f_p = 540.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 547.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 549.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 538.25\text{ MHz}$ .
- The module normally operates at  $V_b = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY787

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50\text{ MHz}$	21	22	dB
		$f = 450\text{ MHz}$	21.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
$S_{22}$	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }450\text{ MHz}$	16	–	dB
$S_{21}$	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 445.25 MHz	–	–59	dB
$X_{\text{mod}}$	cross modulation	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 55.25 MHz	–	–53	dB
CSO	composite second order distortion	60 chs flat; $V_o = 46\text{ dBmV}$ ; measured at 446.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{\text{im}} = -60\text{ dB}$ ; note 2	64	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5	dB
		$f = 450\text{ MHz}$	–	6	dB
$I_{\text{tot}}$	total current consumption	DC value; $V_B = 24\text{ V}$ ; note 3	–	240	mA

## Notes

- $f_p = 55.25\text{ MHz}$ ;  $V_p = 46\text{ dBmV}$ ;  
 $f_q = 391.25\text{ MHz}$ ;  $V_q = 46\text{ dBmV}$ ;  
measured at  $f_p + f_q = 446.5\text{ MHz}$ .
- $f_p = 440.25\text{ MHz}$ ;  $V_p = V_o$ ;  
 $f_q = 447.25\text{ MHz}$ ;  $V_q = V_o - 6\text{ dB}$ ;  
 $f_r = 449.25\text{ MHz}$ ;  $V_r = V_o - 6\text{ dB}$ ;  
measured at  $f_p + f_q - f_r = 438.25\text{ MHz}$ .
- The module normally operates at  $V_B = +24\text{ V}$  but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY883

## FEATURES

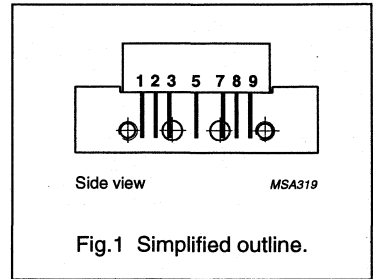
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module designed for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	14.5	15.5	dB
		f = 860 MHz	15	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	235	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	14.5	–	15.5	dB
		$f = 860$ MHz	15	–	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0	–	2	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	–	±0.3	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 640 MHz	15.5	–	–	dB
		$f = 640$ to 860 MHz	14	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 640 MHz	15.5	–	–	dB
		$f = 640$ to 860 MHz	14	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	49 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–	–61	dB
$X_{\text{mod}}$	cross modulation	49 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	49 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	58.5	60	–	dBmV
F	noise figure	$f = 50$ MHz	–	–	6	dB
		$f = 860$ MHz	–	–	8.5	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	–	235	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885A

## FEATURES

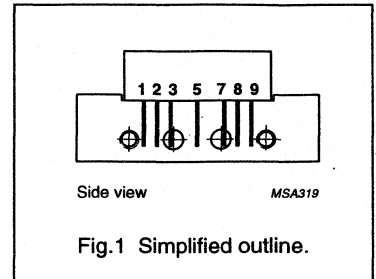
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 860 MHz	18.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C



**CHARACTERISTICS**Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	–	19	dB
		$f = 860$ MHz	18.5	–	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0	–	2	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 640 MHz	15.5	–	–	dB
		$f = 640$ to 860 MHz	14	–	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	–	dB
		$f = 80$ to 160 MHz	18.5	–	–	dB
		$f = 160$ to 320 MHz	17	–	–	dB
		$f = 320$ to 640 MHz	15.5	–	–	dB
		$f = 640$ to 860 MHz	14	–	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	49 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–	–61	dB
$X_{mod}$	cross modulation	49 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	49 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–	–61	dB
$d_2$	second order distortion	note 1	–	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	58	60	–	dBmV
F	noise figure	$f = 860$ MHz	–	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	–	240	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885A

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–53	dB
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–57	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–53	dB
$d_2$	second order distortion	note 1	–	–65	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	59	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 750 MHz	–	9	dB
$I_{tot}$	total current consumption (DC)	note 3	–	235	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885A

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–57	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–58	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 600 MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	235	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885A

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 550$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0	1.5	dB
FL	flatness of frequency response	$f = 40$ to 550 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 550 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 550 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–60	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	62	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 550$ MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	235	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 540.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 547.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 549.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 538.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885A

## CHARACTERISTICS

Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	18	19	dB
		$f = 450$ MHz	18.5	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0	1.5	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 450 MHz	16	–	dB
$S_{21}$	phase response	$f = 50$ MHz	–45	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–61	dB
$X_{mod}$	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–61	dB
$d_2$	second order distortion	note 1	–	–75	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	64	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 450$ MHz	–	6.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	235	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 440.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 447.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 449.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 438.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY885B

## FEATURES

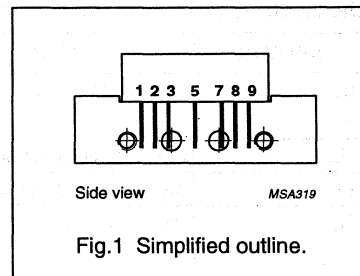
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

The BGY885B is a hybrid amplifier module designed for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	19.5	20.5	dB
		f = 860 MHz	20	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	235	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY885B

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	19.5	20.5	dB
		$f = 860$ MHz	20	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0	2	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	$\pm 0.3$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 860 MHz	14	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 860 MHz	14	–	dB
CTB	composite triple beat	49 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–60	dB
CSO	composite second order distortion	49 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	59	–	dBmV
F	noise figure	$f = 860$ MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	235	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY887B

## FEATURES

- Excellent linearity
- Extremely low noise
- High gain
- Excellent return loss properties.

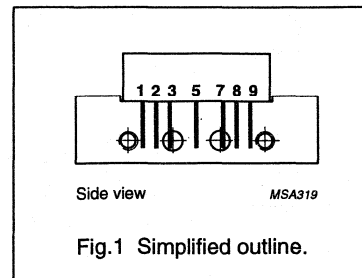
## DESCRIPTION

The BGY887B is a hybrid amplifier module designed for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

This high gain module consists of two cascaded stages, both in cascode configuration. It is intended for use as a single-module line extender.

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C



## CATV amplifier module

BGY887B

**CHARACTERISTICS**Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.5	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
CTB	composite triple beat	49 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–60	dB
$X_{mod}$	cross modulation	49 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	49 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	58.5	–	dBmV
F	noise figure	f = 860 MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

**Notes**

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY887B

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	$\pm 0.5$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
CTB	composite triple beat	129 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–46	dB
$X_{mod}$	cross modulation	129 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–52	dB
CSO	composite second order distortion	129 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–53	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	58.5	–	dBmV
F	noise figure	f = 860 MHz	–	7.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY887B

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	28.5	29.5	dB
		$f = 750$ MHz	29	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0.2	2.2	dB
FL	flatness of frequency response	$f = 40$ to 750 MHz	–	±0.45	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 750 MHz	14	–	dB
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–50	dB
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–70	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	59	–	dBmV
F	noise figure	$f = 750$ MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY887B

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	28.5	29.5	dB
		$f = 600$ MHz	29	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	–	2	dB
FL	flatness of frequency response	$f = 40$ to 600 MHz	–	$\pm 0.35$	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 600 MHz	16	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 600 MHz	16	–	dB
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–55	dB
$X_{mod}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–60	dB
$d_2$	second order distortion	note 1	–	–72	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	–	dBmV
F	noise figure	$f = 600$ MHz	–	6.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

# Optical receiver module

# BGY887BO

## FEATURES

- Excellent linearity
- Extremely low noise
- Excellent flatness
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability.

## DESCRIPTION

Hybrid high dynamic range optical receiver module for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of +24 V (DC). The module contains a monomode optical input suitable for wavelengths from 1290 to 1600 nm, a terminal to monitor the pin diode current and an electrical output with an impedance of 75 Ω.

## PINNING - SOT115M2

PIN	DESCRIPTION
1	monitor current
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

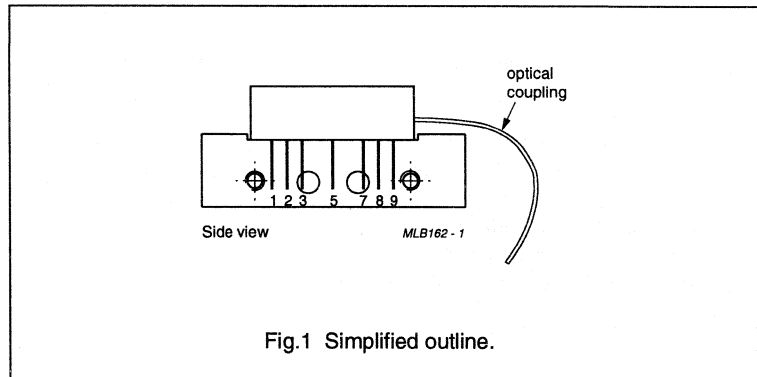
## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	860	MHz
S <sub>22</sub>	output return losses	f = 40 to 860 MHz	12	–	dB
	optical input return losses		40	–	dB
d <sub>2</sub>	second order distortion		–	–70	dBc
F	equivalent noise input		–	7	pA/√Hz
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	–	250	mA

## CAUTION

The device is supplied in an antistatic package. The gate-source input must be protected against static charge during transport and handling.

## PIN CONFIGURATION



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	860	MHz
T <sub>stg</sub>	storage temperature		–40	+85	°C
T <sub>mb</sub>	mounting base operating temperature		–20	+85	°C
P <sub>IN</sub>	optical input power	continuous	–	2	mW
ESD	ESD sensitivity	human body model; R = 1.5 kΩ; C = 100 pF	500	–	V

## Optical receiver module

BGY887BO

## HANDLING

Fibreglass optical coupling: maximum tensile strength = 5 N; minimum bending radius = 35 mm.

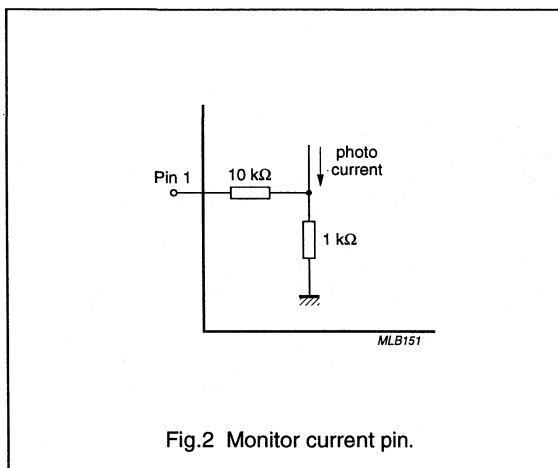
## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $T_{mb} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
S	responsivity	$\lambda = 1300\text{ nm}$	1000	–	V/W
FL	flatness of frequency response		–	$\pm 0.5$	dB
$S_{22}$	output return losses	$f = 40\text{ to }860\text{ MHz}$	11	–	dB
	optical input return losses		40	–	dB
$d_2$	second order distortion	note 1	–	–70	dBc
$d_3$	third order distortion	note 2	–	–80	dBc
F	equivalent noise input	$f_1 = 40\text{ MHz}$	–	7	$\mu\text{A}/\sqrt{\text{Hz}}$
$s_\lambda$	spectral sensitivity	$\lambda = 1310 \pm 20\text{ nm}$	0.85	–	A/W
		$\lambda = 1550 \pm 20\text{ nm}$	0.9	–	A/W
$\lambda$	optical wavelength		1290	1600	nm
L	length of pigtail	fibre: SM type; $9/125\ \mu\text{m}$	1	–	m
$I_{tot}$	total current consumption (DC)	$V_B = 24\text{ V}$	–	250	mA

## Notes

- Two laser test, each laser with a 40% modulation index;  
 $f_p = 135\text{ MHz}$ ;  $P_p = 0.5\text{ mW}$ ;  
 $f_q = 189.25\text{ MHz}$ ;  $P_q = 0.5\text{ mW}$ ;  
 measured at  $f_p + f_q = 324.25\text{ MHz}$ .
- Three laser test, each laser with a 40% modulation index;  
 $f_p = 326.25\text{ MHz}$ ;  $P_p = 0.33\text{ mW}$ ;  
 $f_q = 333.25\text{ MHz}$ ;  $P_q = 0.33\text{ mW}$ ;  
 $f_r = 335.25\text{ MHz}$ ;  $P_r = 0.33\text{ mW}$ ;  
 measured at  $f_p + f_q - f_r = 324.25\text{ MHz}$ .



## CATV amplifier module

BGY888

## FEATURES

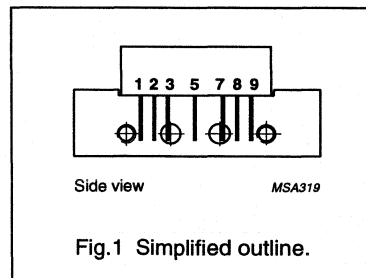
- Excellent linearity
- Extremely low noise
- High gain
- Excellent return loss properties.

## APPLICATIONS

- Intended for use as a single module line extender.

## PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



## DESCRIPTION

Hybrid high dynamic range amplifier module designed for CATV systems operating over a frequency range of 40 to 860 MHz at a voltage supply of 24 V (DC).

This high gain module consists of two cascaded stages, both in cascode configuration.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	33.5	34.5	dB
		f = 860 MHz	34	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	340	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	55	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

BGY888

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	33.5	34.5	dB
		f = 860 MHz	34	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.5	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	49 channels flat; V <sub>o</sub> = 44 dBmV; measured at 859.25 MHz	–	–60	dB
X <sub>mod</sub>	cross modulation	49 channels flat; V <sub>o</sub> = 44 dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	49 channels flat; V <sub>o</sub> = 44 dBmV; measured at 860.5 MHz	–	–55	dB
d <sub>2</sub>	second order distortion	note 1	–	–65	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	58	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 860 MHz	–	7.5	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	340	mA

## Notes

- f<sub>p</sub> = 55.25 MHz; V<sub>p</sub> = 44 dBmV;  
f<sub>q</sub> = 805.25 MHz; V<sub>q</sub> = 44 dBmV;  
measured at f<sub>p</sub> + f<sub>q</sub> = 860.5 MHz.
- Measured according to DIN45004B:  
f<sub>p</sub> = 851.25 MHz; V<sub>p</sub> = V<sub>o</sub>;  
f<sub>q</sub> = 858.25 MHz; V<sub>q</sub> = V<sub>o</sub> – 6 dB;  
f<sub>r</sub> = 860.25 MHz; V<sub>r</sub> = V<sub>o</sub> – 6 dB;  
measured at f<sub>p</sub> + f<sub>q</sub> – f<sub>r</sub> = 849.25 MHz.
- The module normally operates at V<sub>B</sub> = 24 V, but is able to withstand supply transients up to 30 V.



## CATV amplifier module

BGY888

## CHARACTERISTICS

Bandwidth 40 to 860 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	$f = 50$ MHz	33.5	34.5	dB
		$f = 860$ MHz	34	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	±0.5	dB
$S_{11}$	input return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 860 MHz	14	–	dB
$S_{22}$	output return losses	$f = 40$ to 80 MHz	20	–	dB
		$f = 80$ to 160 MHz	18.5	–	dB
		$f = 160$ to 320 MHz	17	–	dB
		$f = 320$ to 640 MHz	15.5	–	dB
		$f = 640$ to 860 MHz	14	–	dB
$S_{21}$	phase response	$f = 50$ MHz	135	225	deg
CTB	composite triple beat	129 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–46	dB
$X_{\text{mod}}$	cross modulation	129 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–50	dB
CSO	composite second order distortion	129 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–48	dB
$d_2$	second order distortion	note 1	–	–65	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	58	–	dBmV
F	noise figure	$f = 860$ MHz	–	7.5	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 805.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 860.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 851.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 858.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 860.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 849.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY888

## CHARACTERISTICS

Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$  Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	33.5	34.5	dB
		f = 750 MHz	34	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0.2	2.2	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	±0.45	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
$S_{21}$	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–50	dB
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–51	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–53	dB
$d_2$	second order distortion	note 1	–	–65	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	59	–	dBmV
F	noise figure	f = 750 MHz	–	7	dB
$I_{tot}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

## CATV amplifier module

BGY888

## CHARACTERISTICS

Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	33.5	34.5	dB
		f = 600 MHz	34	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	$\pm 0.35$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
$S_{21}$	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–55	dB
$X_{\text{mod}}$	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–56	dB
$d_2$	second order distortion	note 1	–	–68	dB
$V_o$	output voltage	$d_{\text{im}} = -60$ dB; note 2	61	–	dBmV
F	noise figure	f = 600 MHz	–	6.5	dB
$I_{\text{tot}}$	total current consumption (DC)	note 3	–	340	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- Measured according to DIN45004B:  
 $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

# CATV amplifier module

# BGY1085A

### FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

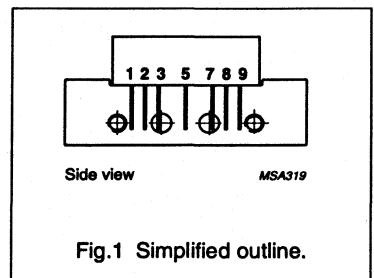
### DESCRIPTION

Hybrid amplifier module for CATV systems operating over a frequency range of 40 to 1000 MHz at a voltage supply of +24 V (DC).

### PINNING - SOT115J2

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output

### PIN CONFIGURATION



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	18	19	dB
		f = 1000 MHz	18.5	–	dB
I <sub>tot</sub>	total current consumption	DC value; V <sub>B</sub> = 24 V	–	240	mA

### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	–20	+100	°C

## CATV amplifier module

BGY1085A

## CHARACTERISTICS

Bandwidth 40 to 1000 MHz;  $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$ ;  $Z_S = Z_L = 75\ \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	18	–	19	dB
		f = 1000 MHz	18.5	–	–	dB
SL	slope cable equivalent	f = 40 to 1000 MHz	0	–	2	dB
FL	flatness of frequency response	f = 40 to 1000 MHz	–	–	$\pm 0.3$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	18.5	–	–	dB
		f = 160 to 320 MHz	17	–	–	dB
		f = 320 to 640 MHz	15.5	–	–	dB
		f = 640 to 1000 MHz	14	–	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	–	–	dB
		f = 80 to 160 MHz	18.5	–	–	dB
		f = 160 to 320 MHz	17	–	–	dB
		f = 320 to 640 MHz	15.5	–	–	dB
		f = 640 to 1000 MHz	14	–	–	dB
CTB	composite triple beat	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 595.25 MHz	–	–	–58	dB
		110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 745.25 MHz	–	–	–53	dB
		150 chs flat; $V_o = 40\text{ dBmV}$ ; measured at 985.25 MHz	–	–53	–	dB
$X_{\text{mod}}$	cross modulation	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–58	dB
		110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 55.25 MHz	–	–	–54	dB
		150 chs flat; $V_o = 40\text{ dBmV}$ ; measured at 55.25 MHz	–	–54	–	dB
CSO	composite second order distortion	85 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 596.5 MHz	–	–	–60	dB
		110 chs flat; $V_o = 44\text{ dBmV}$ ; measured at 746.5 MHz	–	–	–56	dB
		150 chs flat; $V_o = 40\text{ dBmV}$ ; measured at 986.5 MHz	–	–56	–	dB
$d_2$	second order distortion	note 1	–	–	–72	dB
		note 2	–	–	–65	dB
		note 3	–	–68	–	dB
$V_o$	output voltage	$d_{\text{m}} = -60\text{ dB}$	–	–	–	–
		note 4	61	–	–	dBmV
		note 5	60	–	–	dBmV
		note 6	–	59	–	dBmV

## CATV amplifier module

BGY1085A

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
F	noise figure	f = 50 MHz	–	–	6	dB
		f = 600 MHz	–	–	6.5	dB
		f = 750 MHz	–	–	7	dB
		f = 1000 MHz	–	7.5	–	dB
$I_{tot}$	total current consumption	DC value; $V_B = 24$ V; note 7	–	–	240	mA

## Notes

- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 541.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 596.5$  MHz.
- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 691.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 746.5$  MHz.
- $f_p = 55.25$  MHz;  $V_p = 40$  dBmV;  
 $f_q = 931.25$  MHz;  $V_q = 40$  dBmV;  
measured at  $f_p + f_q = 986.5$  MHz.
- $f_p = 590.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 597.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 599.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 588.25$  MHz.
- $f_p = 740.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 738.25$  MHz.
- $f_p = 980.25$  MHz;  $V_p = V_o$ ;  
 $f_q = 987.25$  MHz;  $V_q = V_o - 6$  dB;  
 $f_r = 989.25$  MHz;  $V_r = V_o - 6$  dB;  
measured at  $f_p + f_q - f_r = 978.25$  MHz.
- The module normally operates at  $V_B = +24$  V, but is able to withstand supply transients up to 30 V.

## **PACKAGE OUTLINES**

**CATV amplifier modules**

### **MOUNTING and SOLDERING RECOMMENDATIONS**

#### **Mounting**

The heatsink surface must be flat, free of burrs, oxidation and parallel to the mounting surface.

The heatsink, mounting base and ground leads should be properly RF grounded.

Heatsink compound should be applied sparingly and evenly on the mounting base. Suitable heatsink compounds are Dow Corning 340, Eccotherm TC-5 (E&C) and Wakefield 120.

When mounting CATV hybrid components, the UNC screws must first be turned finger-tight. The screws should then be tightened to within the tolerance 0.5 Nm minimum and 0.7 Nm maximum.

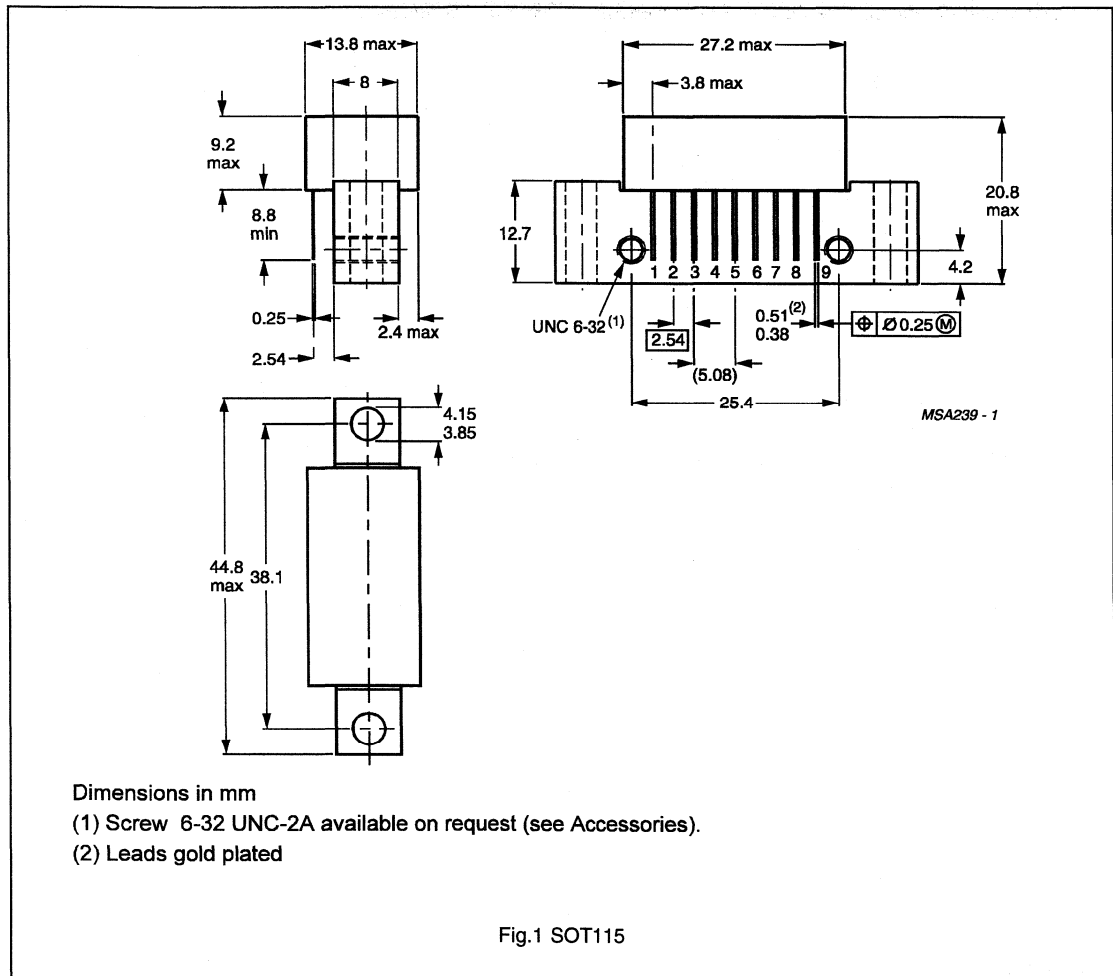
#### **Soldering**

Devices may be soldered directly into a circuit using a soldering iron with a maximum temperature of 260 °C for not more than 3 s when the soldered joints are a minimum of 3 mm from the module.

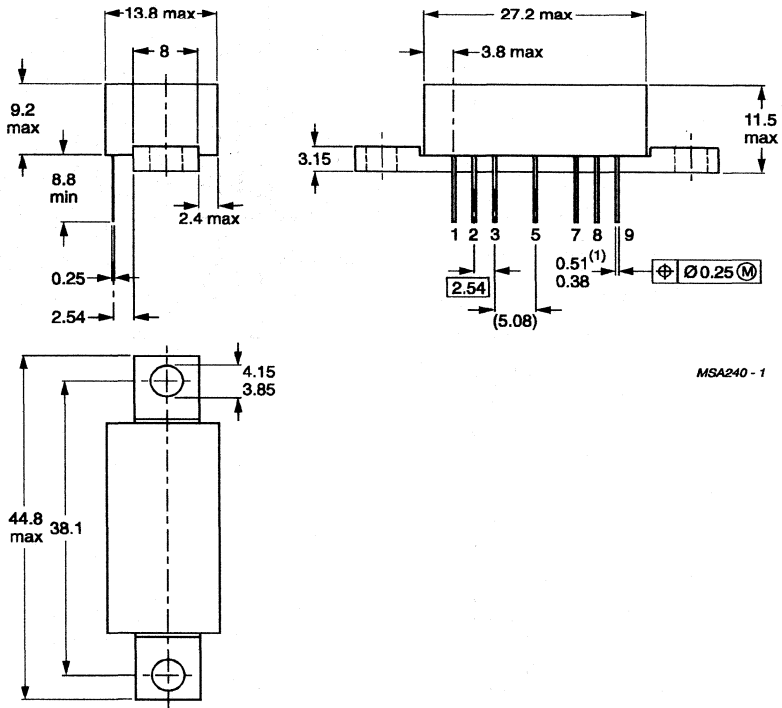


## SOT115 PACKAGE OUTLINES – SUMMARY

VARIANT	NUMBER OF PINS	USED PINS	FIGURE REFERENCE
C	7	1,2,3,5,7,8,9	Fig.1
D	9	ALL	Fig.1
E	7	1,2,5,6,8,9	Fig.1
G	8	1,2,3,5,6,7,8,9	Fig.1
H	6	1,2,5,6,8,9	Fig.1
J2	7	1,2,3,5,7,8,9	Fig.2
L	7	1,2,3,5,7,8,9	Fig.3







MSA240 - 1

Dimensions in mm

- (1) Screw 6-32 UNC-2A available on request (see Accessories).
- (2) Leads gold plated

Fig.3 SOT115L



## **ACCESSORIES**

**CATV amplifier modules**



**CATV test jig****Accessories****SPECIFICATION FOR CATV TEST JIG**

(range 40 - 860 MHz)

Impedance	: 75 $\Omega$
Return loss	: < -40 dB at 40 MHz. Decreases 1.5 dB/octave up to 860 MHz. < -32 dB at 860 MHz. (Measured with thru-line system and other port terminated with a very good 75 $\Omega$ load)
Cross talk	: < -80 dB
Insertion loss	: < 0.1 dB (Measured with thru-line system)

Devices : suitable only for BGX885 and  
BGD885

Ordering : CATV test fixture 860 MHz,  
information 12NC : 7322 142 89060.

**Note**

The above parameters are in the frequency range from  
40-860 MHz.

DC current	: max. 1 A.
Voltage	: max. 50 V. (The DC is automatically switched to the device, by means of a micro-switch, after closing the pressing system.)
Temperature range	: -25 to +75 $^{\circ}$ C.
RF connectors	: N-type female (75 $\Omega$ )
DC connectors	: Banana plug
Dimensions	: 110 x 60 x 55 mm (l x b x h, dimensions without pressing system, RF connectors and cooling connections). Distance between the centre contact of the RF connectors is 35.2 mm.
Cooling	: possibility for water cooling available on the fixture.

**SPECIFICATION FOR CATV TEST JIG**

(range 5 - 600 MHz)

Impedance	: 75 $\Omega$
Return loss	: < -40 dB (Measured with thru-line system and other port terminated with a very good 75 $\Omega$ load)
Cross talk	: < -80 dB
Insertion loss	: < 0.1 dB (Measured with thru-line system)

**Note**

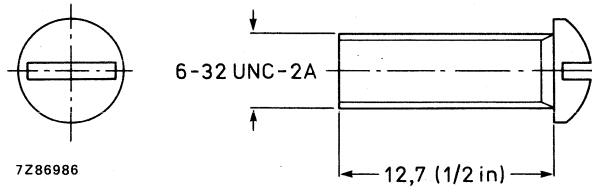
The above parameters are in the frequency range from 5 - 600 MHz.

DC current	: max. 1 A.
Voltage	: max. 50 V. (The DC is automatically switched to the device, by means of a micro-switch, after closing the pressing system.)
Temperature range	: -25 to +75 °C.
RF connectors	: N-type female (75 $\Omega$ )
DC connectors	: Banana plug
Dimensions	: 110 x 60 x 55 mm (l x b x h, dimensions without pressing system, RF connectors and cooling connections). Distance between the centre contact of the RF connectors is 35.2 mm.
Cooling	: possibility for water cooling available on the fixture.
Devices	: suitable only for devices with positive and negative power requirement, (by means of switch).
Ordering information	: CATV test fixture 600 MHz, 12NC : 7322 142 54250.



## ROUND HEAD SCREW 6-32 UNC-2A

Available, upon request, under type number 56396 or 12 NC code number 9390 298 10xx0.





## **HYBRID WIDEBAND AMPLIFIERS**

	Page
Product capability overview	222
Replaced types	224
Device data (in alphanumeric sequence)	

# PRODUCT CAPABILITY OVERVIEW

## TECHNOLOGIES

CERAMICS	RESISTIVE TECHNOLOGY	CONDUCTIVE TECHNOLOGY	DIE BONDING AND WIRE BONDING
Al <sub>2</sub> O <sub>3</sub> AlN	Nickel Chromium Tantalum Nitride	Gold Copper Track widths down to 25 microns	All technologies available for silicon and GaAs

## RF MODULES

### Products

### CATV MODULES

Substrates  
Wideband amplifiers (cable and satellite)  
Resistive circuits  
Video amplifiers  
Customized circuits  
Inductive proximity sensors.

## TYPICAL TIME TO MARKET (custom made circuits)

Between two and seven months (depending on product style/complexity).

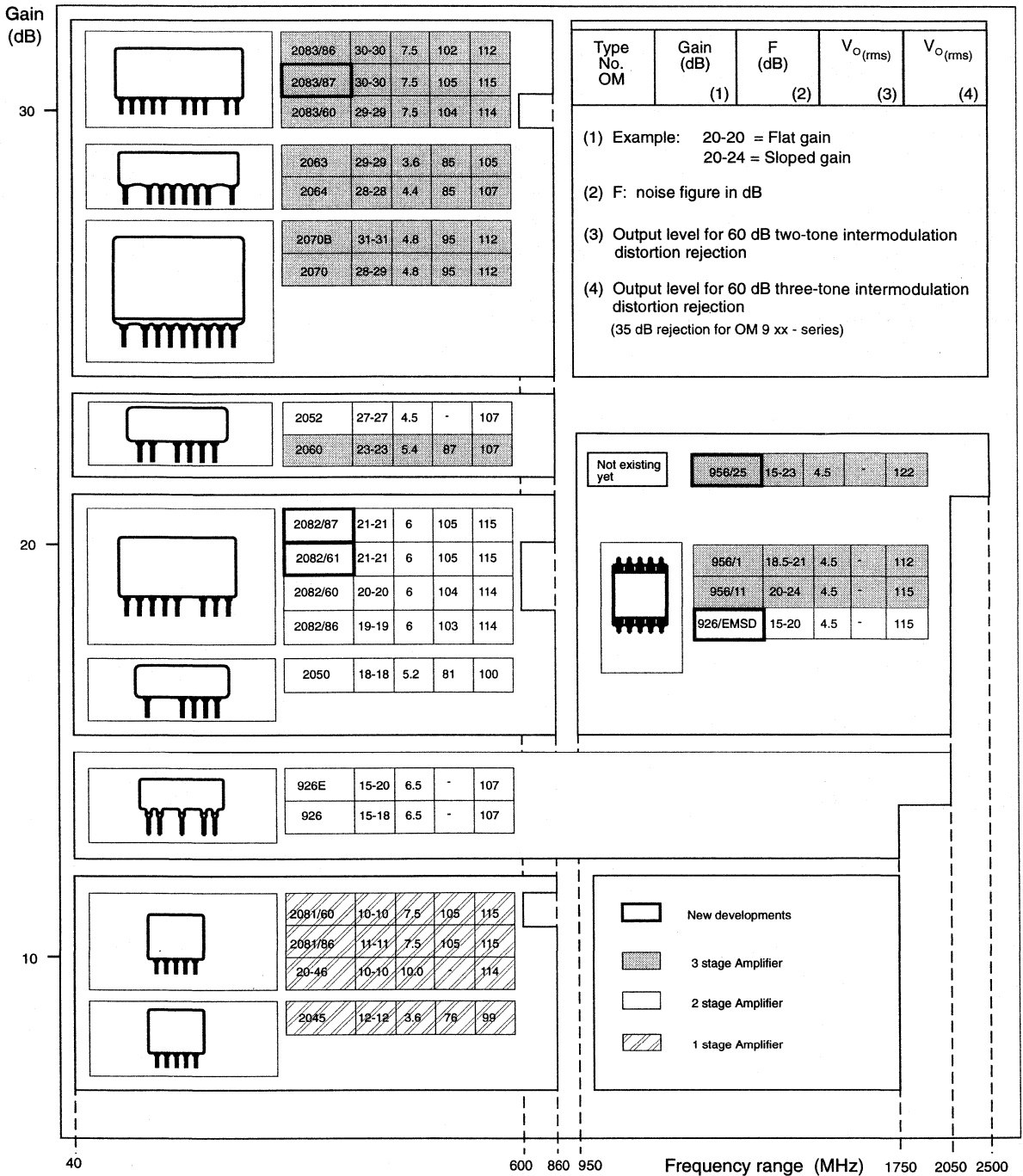
## FINISHINGS

Substrates  
Plate  
SIL lacquered  
DIL lacquered  
Hermetic  
SMD  
Plastic cover

## DESIGN LANGUAGES

IGDS (Intergraph, Microstation)  
GDSII (CALMA), DXF (AutoCad),  
IGES, also HPGL, GERBER.

# Hybrid Wideband Amplifiers for 12 V Antenna Systems and Industrial Applications



## REPLACED TYPES

WITHDRAWN TYPE	REPLACEMENT
OM345	OM2045
OM350	OM2050
OM361	OM2064
OM370	OM2070

## Hybrid wideband amplifier

OM926

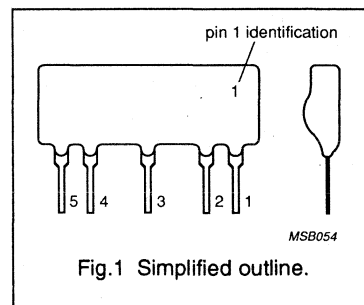
## DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use as an IF amplifier for satellite television and as a general purpose amplifier in the range 10 to 2000 MHz.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	common
5	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$f$	frequency range		10	—	2000	MHz
$G_{tr}$	transducer gain	$f = 1750$ MHz; $G_{tr} =  S_{21} ^2$	—	18	—	dB
$V_{o(RMS)}$	output voltage	$d_{in} = -60$ dB (DIN 45004, paragraph 6.3: 3-tone)	101	—	—	dB $\mu$ V
F	noise figure		—	6.5	—	dB
$V_B$	supply voltage	DC value	—	12	—	V
$T_{amb}$	ambient operating temperature range		-20	—	70	$^{\circ}$ C

## Hybrid wideband amplifier

OM926

**MECHANICAL DATA****Encapsulation**

The encapsulation comprises a 5-pin, in-line, resin-coated body, see Fig.8.

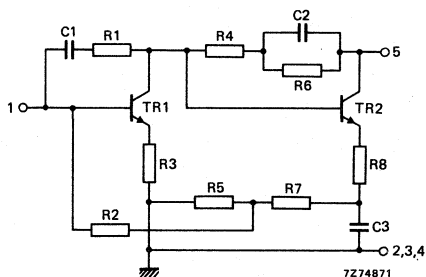


Fig.2 Circuit diagram.

**Soldering recommendations****HAND SOLDERING**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

**DIP OR WAVE SOLDERING**

The maximum permissible temperature for the solder is 250 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

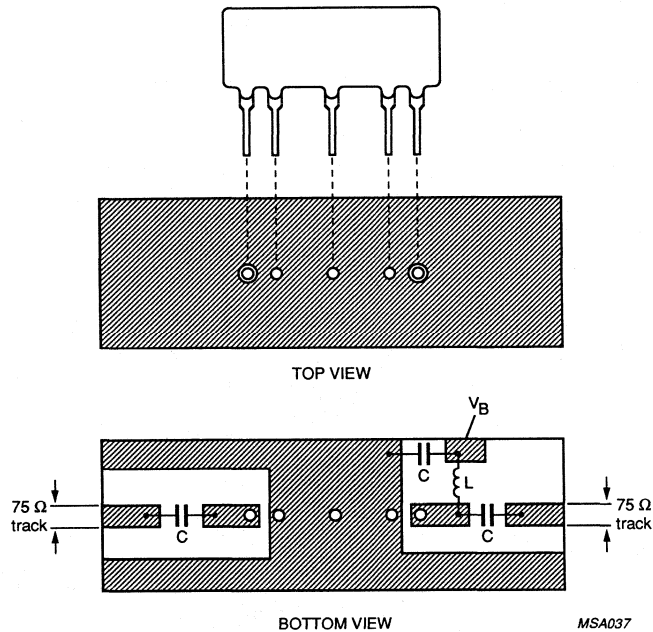
**Mounting recommendations**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.



## Hybrid wideband amplifier

OM926



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.

$C > 1000 \text{ pF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{\text{amb}}$	ambient operating temperature range	-20	70	°C
$T_{\text{stg}}$	storage temperature range	-40	125	°C
$V_{\text{B}}$	DC supply voltage	-	15	V
$P_{11M}, P_{15M}$	peak incident powers on pins 1 and 5	-	100	mW

## Hybrid wideband amplifier

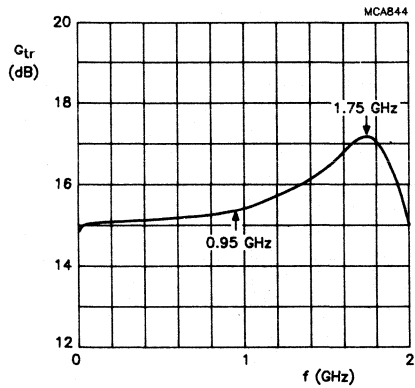
OM926

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		–	25	–	°C
$V_B$	supply voltage	DC value	–	12	–	V
$Z_S$	source impedance		–	75	–	$\Omega$
$Z_L$	load impedance		–	75	–	$\Omega$
<b>Performance</b>						
$I_B$	supply current		–	28	–	mA
$G_{tr}$	transducer gain	$G_{tr} =  s_i ^2$ ;	–	–	–	–
		f = 10 to 1000 MHz	–	15	–	dB
		f = 1750 MHz	–	18	–	dB
		f = 2000 MHz	–	16	–	dB
$S_{11}$	input return loss	f = 10 to 1000 MHz	–	14	–	dB
		f = 1000 to 1750 MHz	–	12	–	dB
$S_{22}$	output return loss	f = 10 to 1000 MHz	–	14	–	dB
		f = 1000 to 1750 MHz	–	12	–	dB
$ S_r ^2$	feedback attenuation		–	25	–	dB
$V_{o(RMS)}$	output voltage	$d_{im} = -60$ dB (DIN 45004, paragraph 6.3, 3-tone)	101	103	–	dB $\mu$ V
F	noise figure		–	6.5	–	dB
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature range		–20	–	70	°C
$V_B$	supply voltage	DC value	10.8	–	13.2	V
f	frequency range		10	–	2000	MHz
$Z_S$	source impedance		–	75	–	$\Omega$
$Z_L$	load impedance		–	75	–	$\Omega$

## Hybrid wideband amplifier

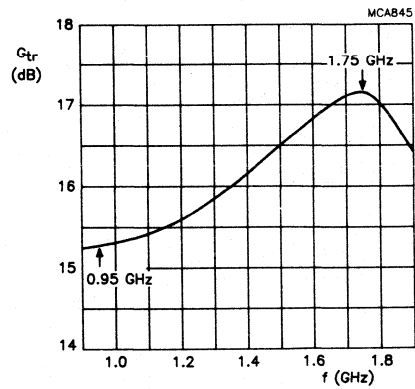
OM926



Gain over the entire frequency range.

$Z_o = 75 \Omega$ .

Fig.4 Transducer gain as a function of frequency.



Expanded view of the satellite first IF frequency range.

$Z_o = 75 \Omega$ .

Fig.5 Transducer gain as a function of frequency.

Hybrid wideband amplifier

OM926

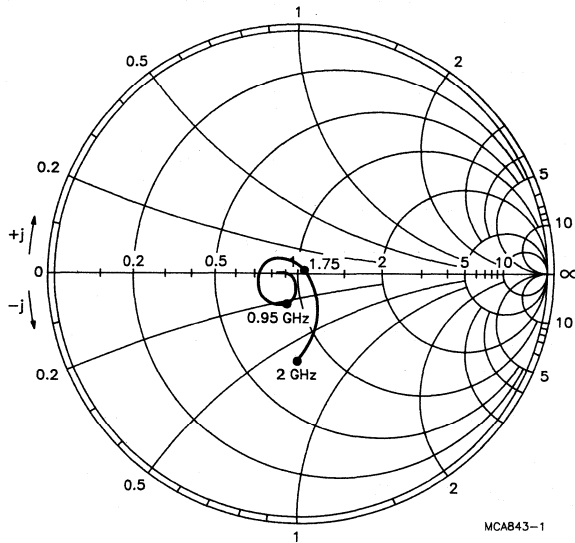


Fig.6 Input impedance derived from input reflection coefficient  $S_{ie}$ , co-ordinates in ohms x 75; typical values.

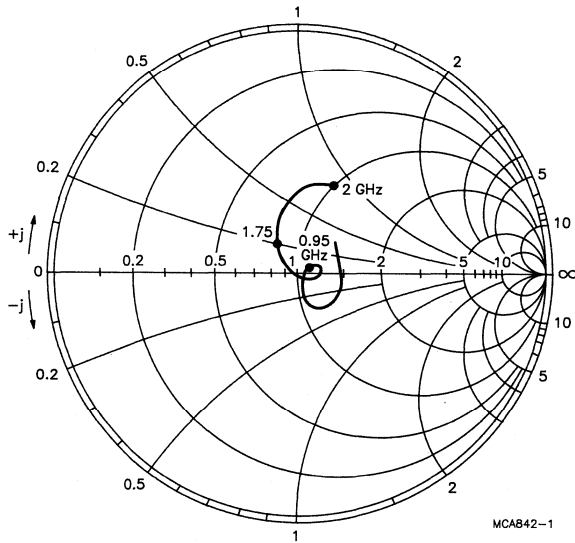
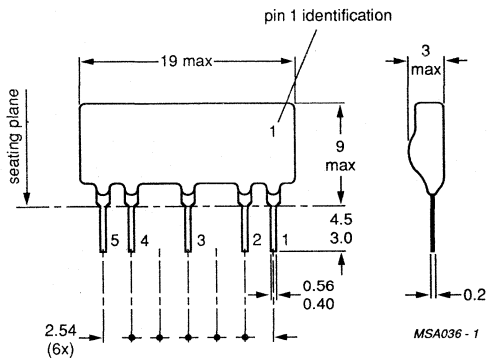


Fig.7 Output impedance derived from output reflection coefficient  $S_{oe}$ , co-ordinates in ohms x 75; typical values.

## Hybrid wideband amplifier

OM926

## PACKAGE OUTLINE



Dimensions in mm.

Fig.8 Encapsulation.

## Wideband amplifier module

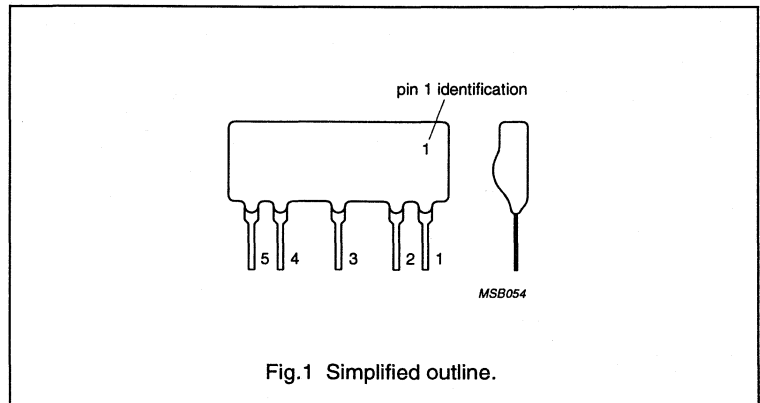
OM926E

## DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use as an IF amplifier for satellite television and as a general purpose amplifier in the range 10 to 2050 MHz.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	common
5	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		10	–	2050	MHz
$G_T$	transducer gain = $ S_{21} ^2$	$f = 2050$ MHz	–	20	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB; (DIN 45004, paragraph 6.3: 3-tone)	104	105	–	dB $\mu$ V
		$d_{im} = -35$ dB; 2-tone	112	113	–	dB $\mu$ V
F	noise figure		–	6.5	–	dB
$V_B$	DC supply voltage		–	12	–	V
$T_{amb}$	operating ambient temperature		-20	–	+70	°C

Wideband amplifier module

OM926E

CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD

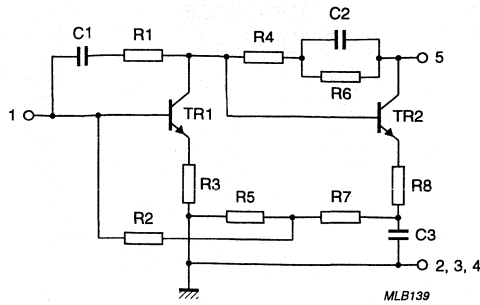


Fig.2 Simplified circuit diagram.

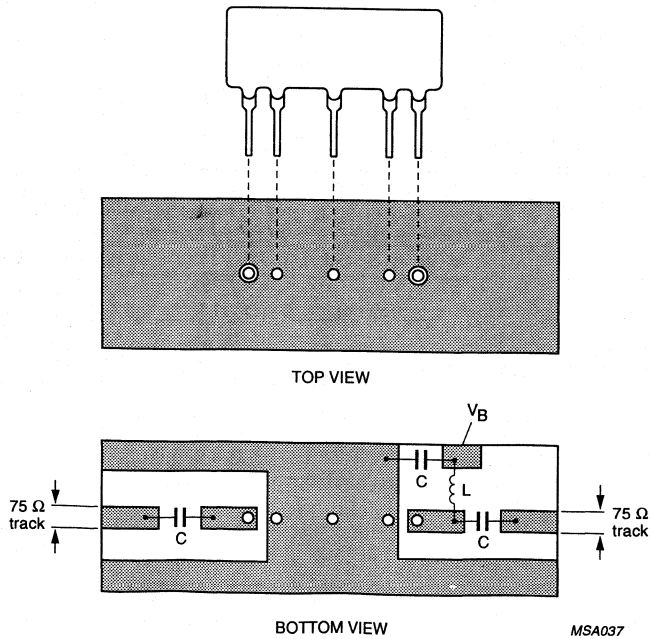


Fig.3 Printed-circuit board holes and tracks.

$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 $C > 1.0 \text{ nF}$  ceramic capacitor.

## Wideband amplifier module

OM926E

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	operating ambient temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	15	V
$P_{IM}$	peak incident powers on pins 1 and 5	-	100	mW

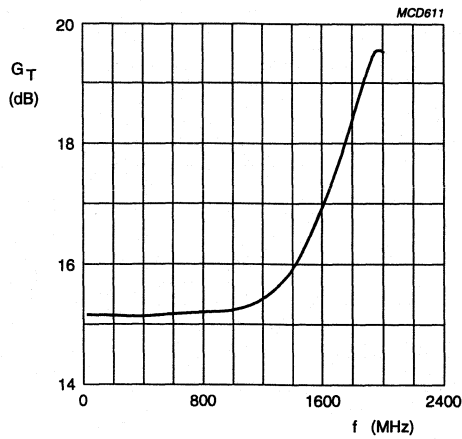
## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
<b>Performance</b>						
$I_B$	supply current		35	37.5	40	mA
$G_T$	transducer gain = $ S_{21} ^2$	f = 10 to 1000 MHz	14	15	16	dB
		f = 2050 MHz	19	20	22	dB
$S_{11}$	input return loss		7	8	-	dB
$S_{22}$	output return loss		7.5	10	-	dB
$ S_{12} ^2$	feedback attenuation		-	25	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB; (DIN 45004, paragraph 6.3: 3-tone)	104	105	-	dB $\mu$ V
		$d_{im} = -35$ dB; 2-tone	112	113	-	dB $\mu$ V
F	noise figure		-	6.5	-	dB
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	-	13.2	V
f	frequency range		10	-	2050	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$



Wideband amplifier module

OM926E



Gain over entire frequency range.  
 $Z_0 = 75 \Omega$ .

Fig.4 Transducer gain as a function of frequency.

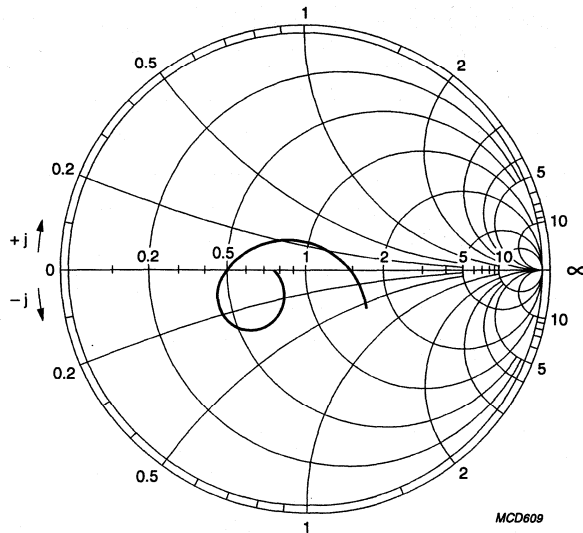


Fig.5 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

## Wideband amplifier module

OM926E

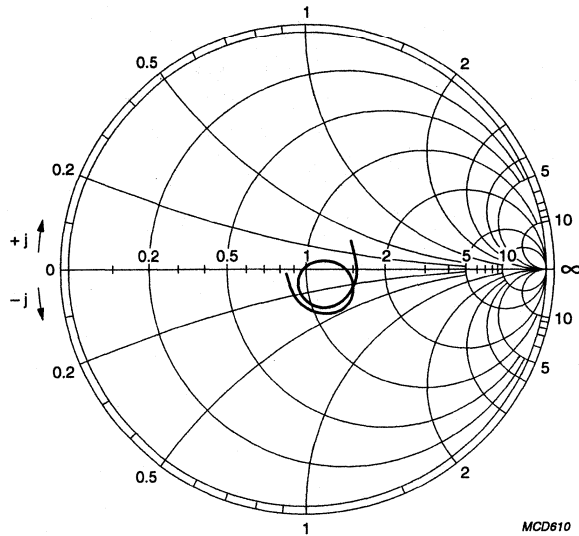


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.



## Hybrid wideband amplifier

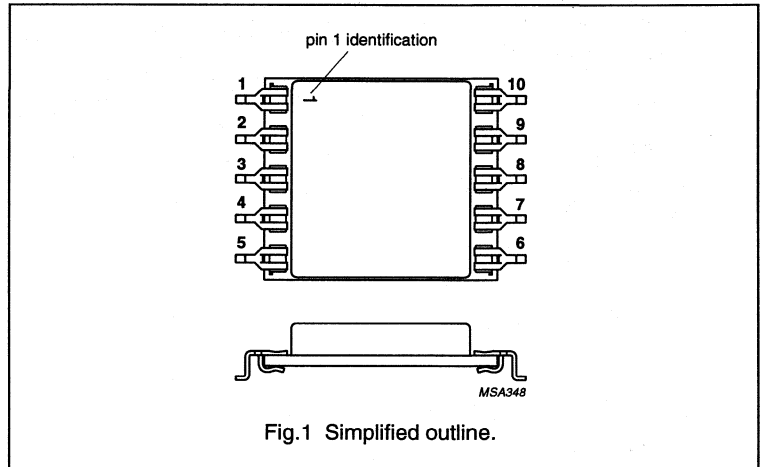
OM956/1

## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use as an IF amplifier for satellite television and as a general purpose amplifier in the range 950 to 2050 MHz.

## PINNING

PIN	DESCRIPTION
1	common
2	input
3	common
4	common
5	common
6	common
7	output/supply (+)
8	common
9	common
10	supply (+)

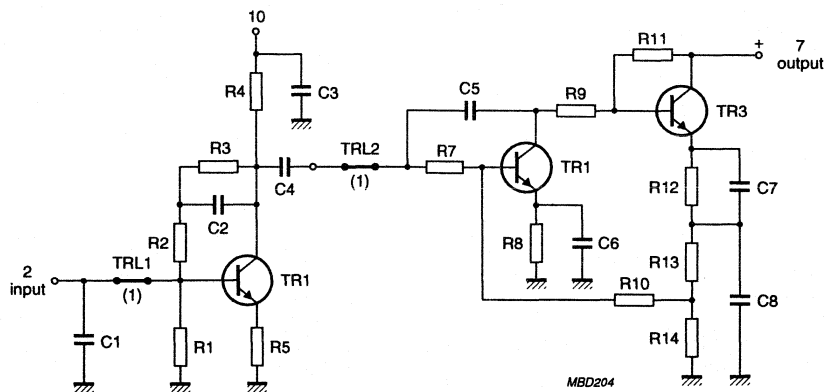


## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		950	—	2050	MHz
$G_T$	transducer gain = $ S_{21} ^2$	f = 950 MHz	—	18.5	—	dB
		f = 2050 MHz	—	21.0	—	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -35dB$ ; third order, 2-tone	112	—	—	$dB\mu V$
F	noise figure		—	4.5	—	dB
$V_B$	DC supply voltage		—	12	—	V
$T_{amb}$	operating ambient temperature		-20	—	+70	$^{\circ}C$

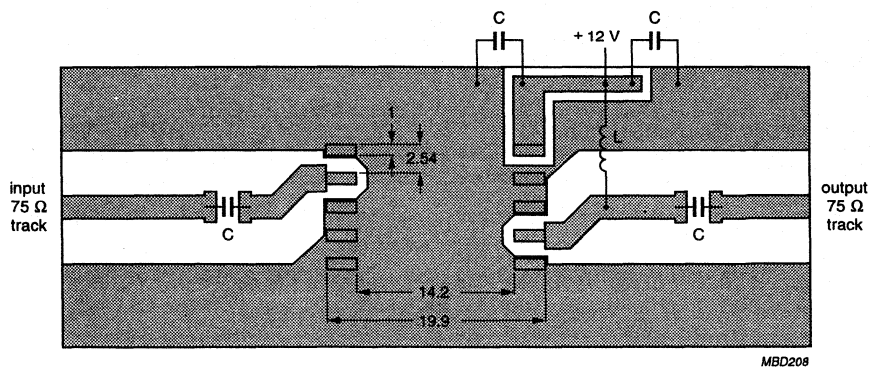
# Hybrid wideband amplifier

OM956/1



(1) Transmission line.

Fig.2 Simplified circuit diagram.



L > 5  $\mu$ H; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 C > 1.0 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## Hybrid wideband amplifier

OM956/1

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

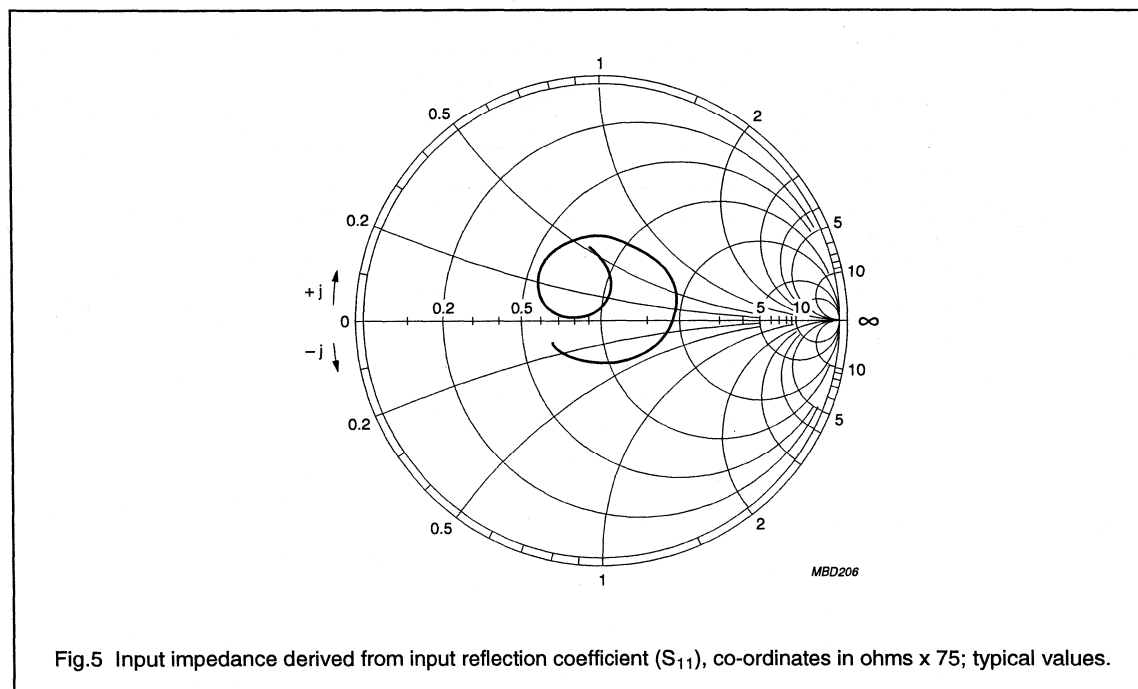
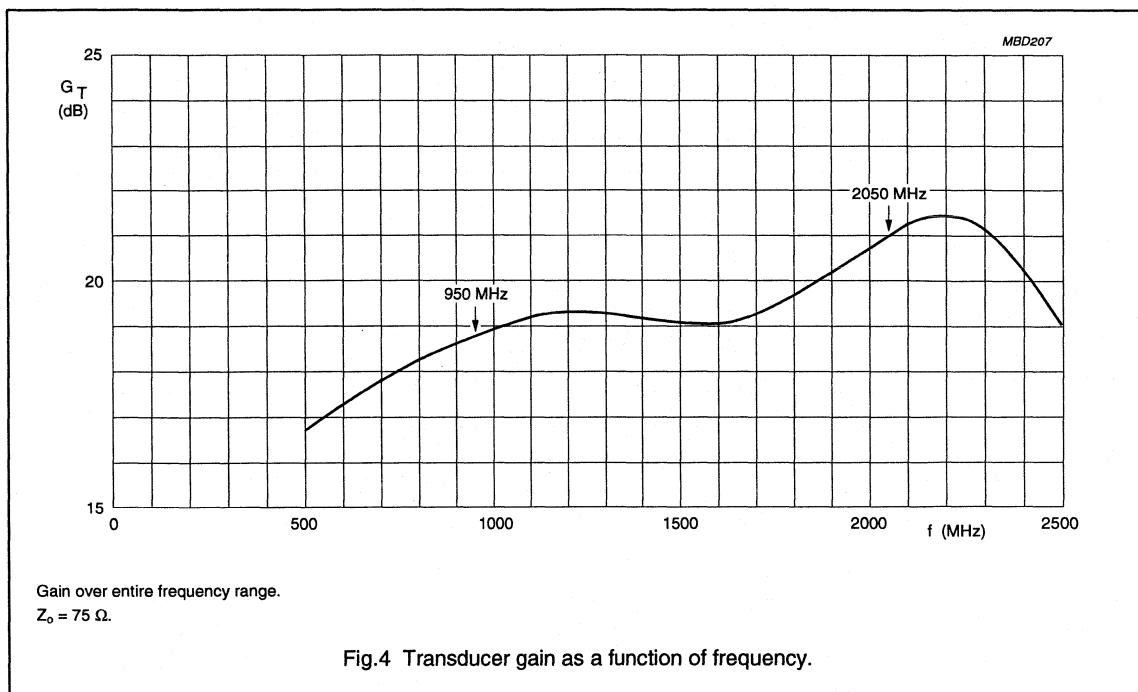
SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	operating ambient temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	15	V
$P_{IM}$	peak incident powers on pins 2 and 7	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
<b>Performance</b>						
$I_B$	supply current		-	57.5	-	mA
$G_T$	transducer gain = $ S_{21} ^2$	$f = 950$ MHz	-	18.5	-	dB
		$f = 2050$ MHz	-	21.0	-	dB
	slope		-	2.5	-	dB
$S_{11}$	input return loss	$f = 950$ to 2050 MHz	-	10.0	-	dB
$S_{22}$	output return loss	$f = 950$ to 2050 MHz	-	8.0	-	dB
$ S_{12} ^2$	feedback attenuation		-		-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -35$ dB; third order, 2-tone	-	112.0	-	dB $\mu$ V
F	noise figure		-	4.5	-	dB
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	-	13.2	V
f	frequency range		950	-	2050	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

Hybrid wideband amplifier

OM956/1



Hybrid wideband amplifier

OM956/1

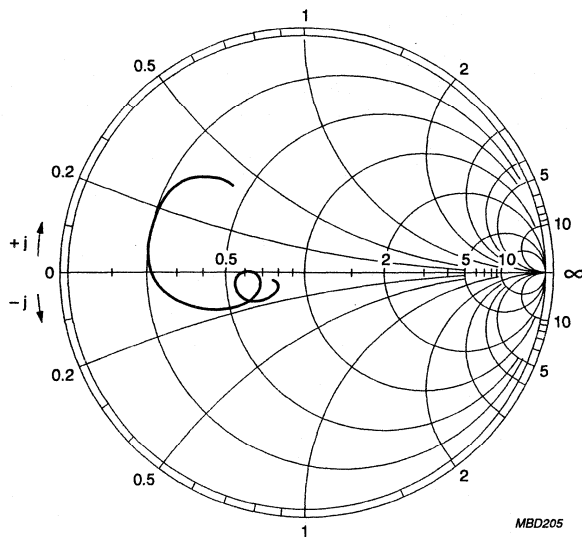


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.



## Hybrid wideband amplifier

OM956/1

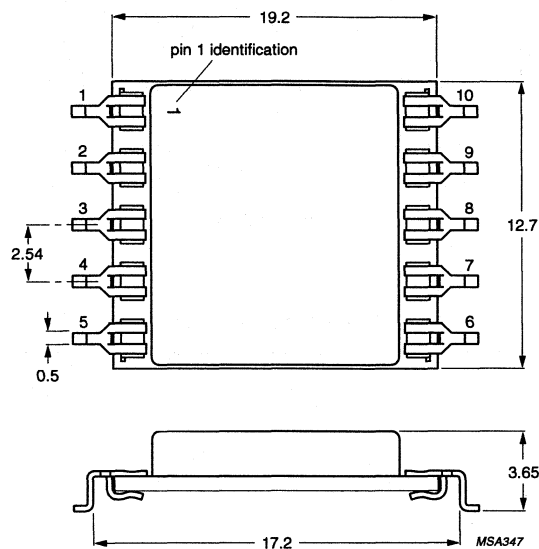
**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to  $75\ \Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of  $260\ ^\circ\text{C}$  up to the seating plane is 5 s.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**PACKAGE OUTLINE**

Dimensions in mm.

Fig.7 OM956/1 outline (top hat cover).



## HYBRID INTEGRATED CIRCUIT VHF/UHF WIDE-BAND AMPLIFIER

One-stage wide-band amplifier in hybrid integrated circuit technique on a thin-film substrate, intended for aerial amplifiers in car radios, caravans or RATV and MATV applications.

### QUICK REFERENCE DATA

D.C. supply voltage	$V_B$	=	12 V $\pm$ 10%
Frequency range	f		40 to 860 MHz
Source and load (characteristic) impedance	$R_s = R_l = Z_o$	=	75 $\Omega$
Transducer gain	$G_{tr} =  s_f ^2$	typ.	12 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1 dB
Output voltage			
at -60 dB intermodulation distortion (DIN 45004, 3-tone)	$V_o(rms)$	typ.	99 dB $\mu$ V
Noise figure	F	typ.	3,6 dB
Operating ambient temperature	$T_{amb}$		-20 to +70 $^{\circ}$ C

ENCAPSULATION 5-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

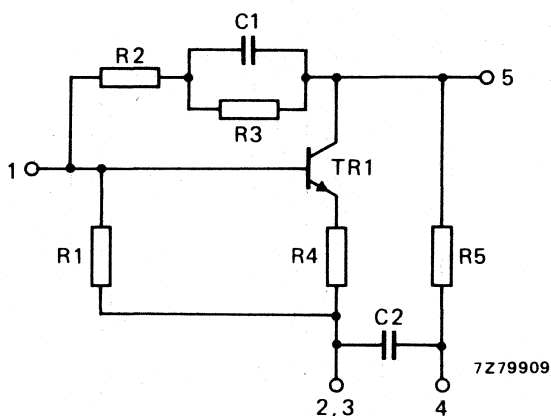


Fig. 1 Circuit diagram.

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Operating ambient temperature	$T_{amb}$	-20 to +70 °C
Storage temperature	$T_{stg}$	-40 to +125 °C
D.C. supply voltage	$V_B$	max. 15 V
Peak incident powers on pins 1 and 5	$P_{I1M}, P_{I5M}$	max. 100 mW

**CHARACTERISTICS**

**Measuring conditions**

Ambient temperature	$T_{amb}$	=	25 °C
D.C. supply voltage	$V_B$	=	12 V
Source impedance and load impedance	$R_s, R_l$	=	75 $\Omega$
Characteristic impedance of h.f. connections	$Z_0$	=	75 $\Omega$
Frequency range	f	=	40 to 860 MHz

**Performance**

Supply current	$I_B$	typ.	11,5 mA
Transducer gain	$G_{tr} =  s_f ^2$	typ.	12 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1 dB
Individual maximum v.s.w.r.			
input	VSWR <sub>(i)</sub>	typ.	2,0 *
output	VSWR <sub>(o)</sub>	typ.	1,4 *
Back attenuation			
f = 100 MHz	$ s_r ^2$	typ.	22 dB
f = 860 MHz	$ s_r ^2$	typ.	19 dB
Output voltage			
at -60 dB intermodulation distortion (DIN 45004, par. 6.3: 3-tone)	$V_{O(rms)}$	typ.	99 dB $\mu$ V
Noise figure	F	typ.	3,6 dB

s-parameters:	$s_f = s_{21}$	$s_i = s_{11}$
	$s_r = s_{12}$	$s_o = s_{22}$

\* Highest value, for a sample, occurring in the frequency range.

**OPERATING CONDITIONS**

Ambient temperature range

 $T_{amb} = -20 \text{ to } +70 \text{ } ^\circ\text{C}$ 

D.C. supply voltage

 $V_B = 12 \text{ V } \pm 10\%$ 

Frequency range

 $f = 40 \text{ to } 860 \text{ MHz}$ 

Source impedance and load impedance

 $R_s, R_l = 75 \text{ } \Omega$ **MECHANICAL DATA**

Dimensions in mm

The device is resin coated.

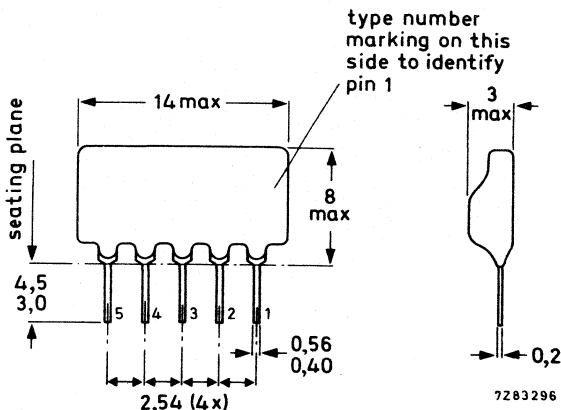


Fig. 2 Encapsulation.

**Terminal connections**

- 1 = input
- 2,3 = common
- 4 = supply (+)
- 5 = output

**Soldering recommendations***Hand soldering*

Maximum contact time for a soldering-iron temperature of 260 °C up to the seating plane is 5 s.

*Dip or wave soldering*

260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C. If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**Mounting recommendations**

The module should preferably be mounted on double-sided printed-circuit board, see the example shown below.

Input and output should be connected to 75 Ω tracks.

The connections to the 'common' pins should be as close to the seating plane as possible.

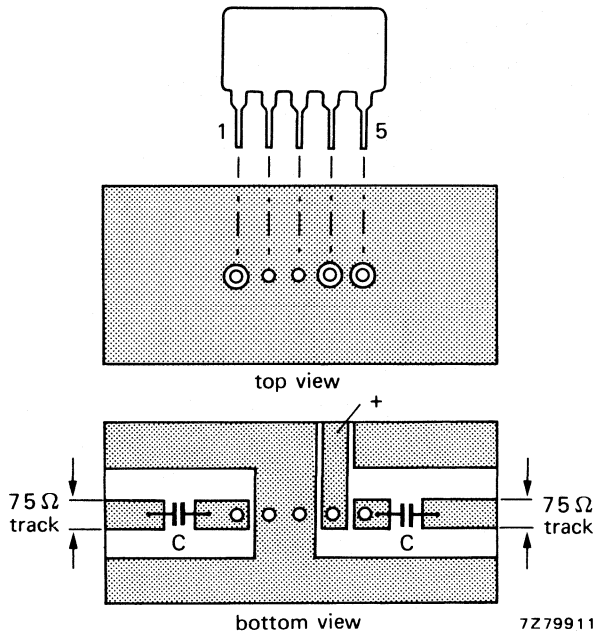


Fig. 3 Printed-circuit board holes and tracks.  
C > 220 pF ceramic capacitor.

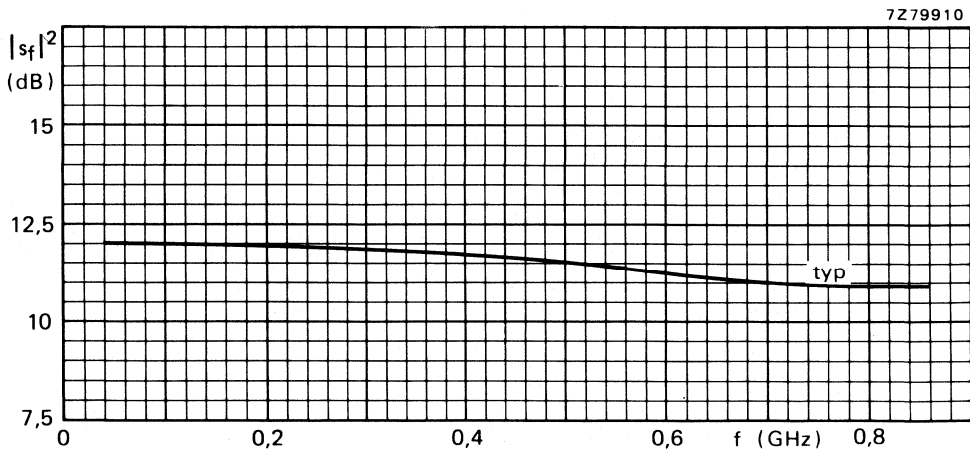


Fig. 4 Transducer gain as a function of frequency;  $Z_0 = 75 \Omega$ .

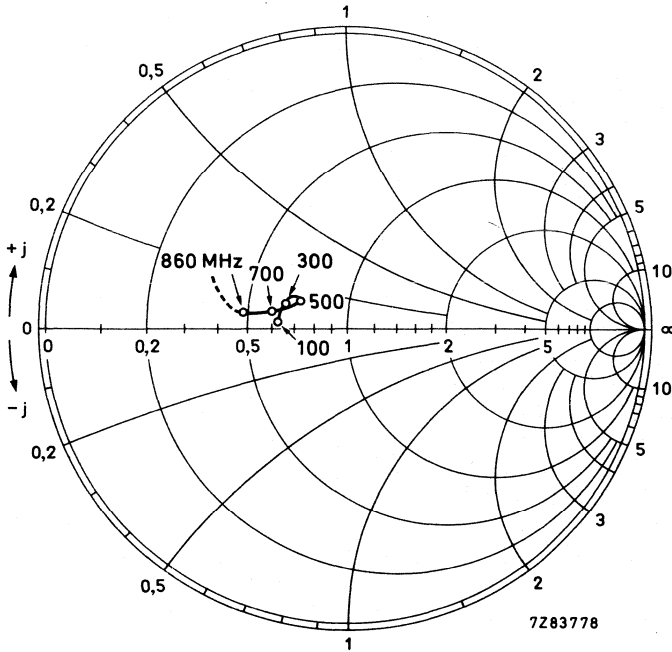


Fig. 5 Input impedance derived from input reflection coefficient  $s_i$ , co-ordinates in ohm x 75; typical values.

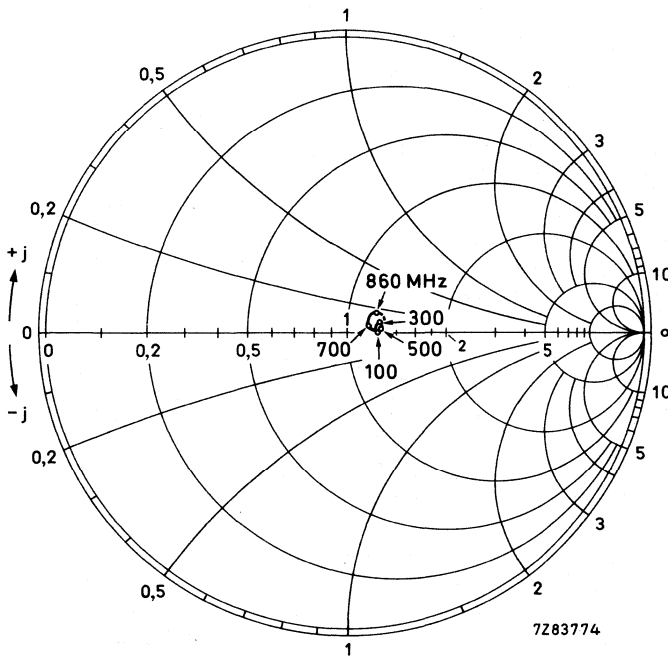


Fig. 6 Output impedance derived from output reflection coefficient  $s_o$ , co-ordinates in ohm x 75; typical values.

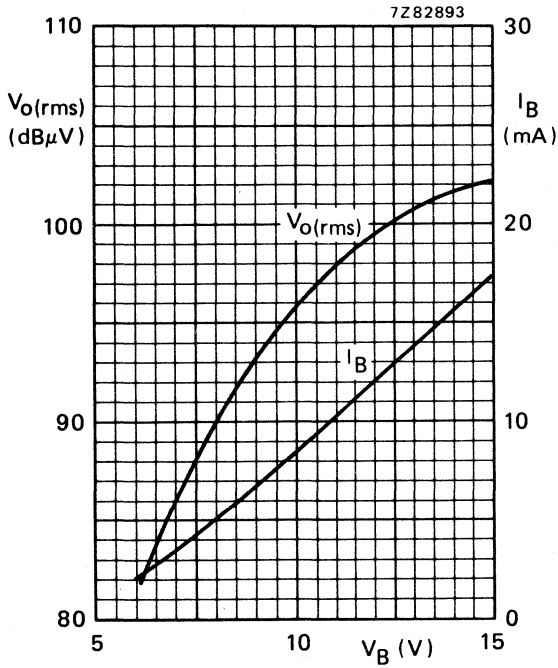


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

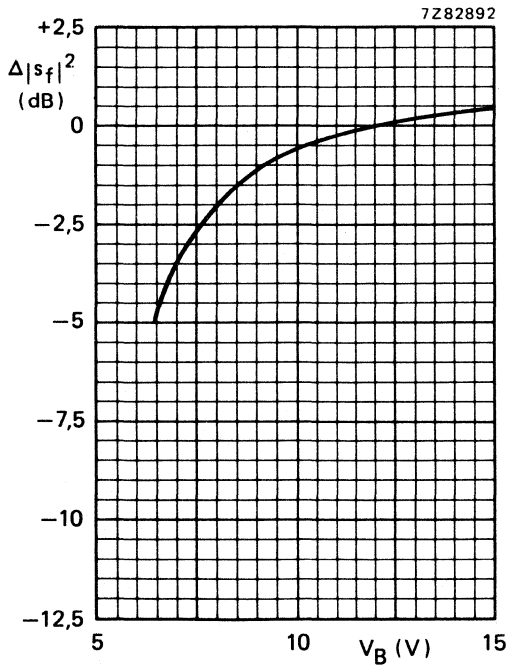


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V;  $f = 100$  to 860 MHz; typical values.



# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2046

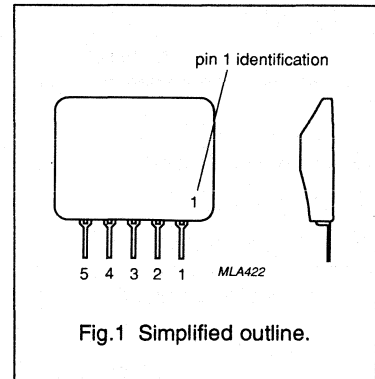
## DESCRIPTION

A one-stage wideband amplifier in hybrid integrated circuit technology on a thin-film substrate, intended for use in mast-head booster-amplifiers, as an amplifier in MATV and CATV systems, and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common (-)
3	common (-)
4	common (-)
5	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$R_S, R_L$	source and load resistance		–	75	–	$\Omega$
$Z_O$	characteristic impedance of HF connections		–	75	–	$\Omega$
$G_{tr} =  S_{r1} ^2$	transducer gain		–	10	–	dB
$\pm \Delta  S_{r1} ^2$	flatness of frequency response		–	1	–	dB
$V_{\alpha(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)				
	VHF		–	116	–	dB $\mu$ V
	UHF		–	114	–	dB $\mu$ V
F	noise figure		–	10	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature range		–20	–	70	$^{\circ}$ C

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2046

## MECHANICAL DATA

### Encapsulation

The encapsulation comprises a 5-pin, in-line, resin-coated body, see Fig.5.

### Soldering recommendations

#### HAND SOLDERING

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

#### DIP OR WAVE SOLDERING

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

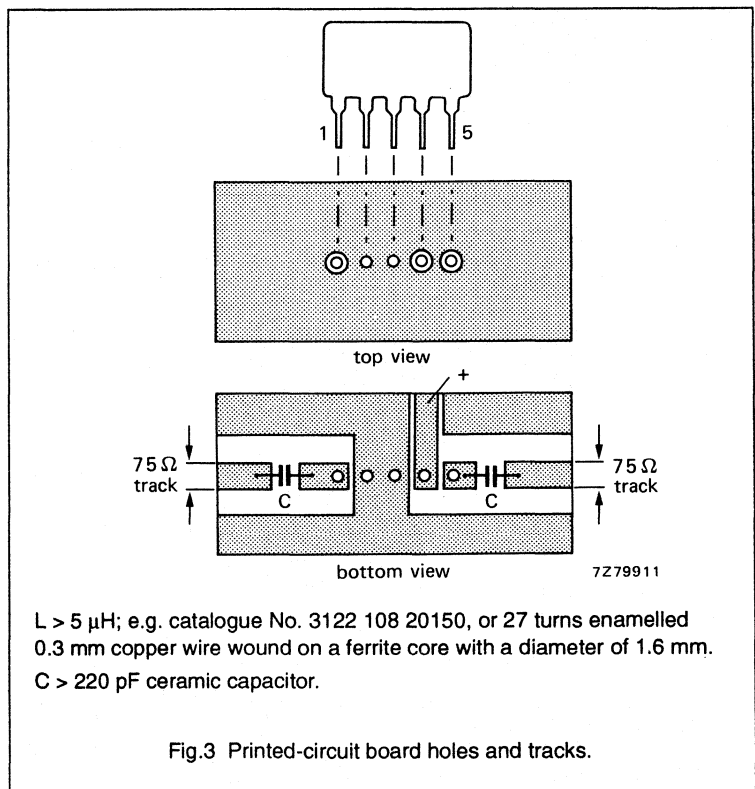
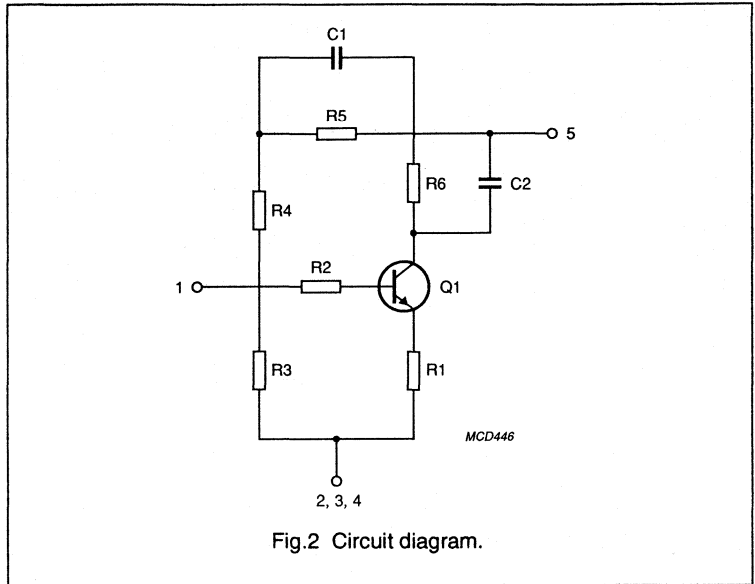
The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

### Mounting recommendations

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output pins should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.



# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2046

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	-20	70	°C
$T_{stg}$	storage temperature range	-40	125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{11M}, P_{18M}$	peak incident powers on pins 1 and 8	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$R_S, R_L$	source and load resistance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	860	MHz
<b>Performance</b>						
$I_B$	supply current		-	82	-	mA
$G_{tr} =  S_{21} ^2$	transducer gain		9	10	11	dB
$\pm\Delta S_{21} ^2$	flatness of frequency response		-	1	-	dB
$VSWR_{(i)}$	individual maximum VSWR	input	-	1.5 (note 1)	-	
$VSWR_{(o)}$	individual maximum VSWR	output	-	1.4 (note 1)	-	
$ S_{11} ^2$	back attenuation	f = 100 MHz f = 860 MHz	-	16 15	-	dB dB
$V_{\alpha(RMS)}$	output voltage	at -60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)				
	VHF		115	116	-	dB $\mu$ V
	UHF		113	114	-	dB $\mu$ V
F	noise figure		-	10	-	dB

## Notes

Scattering parameters:  $S_1 = S_{21}$ ;  $S_2 = S_{12}$ .

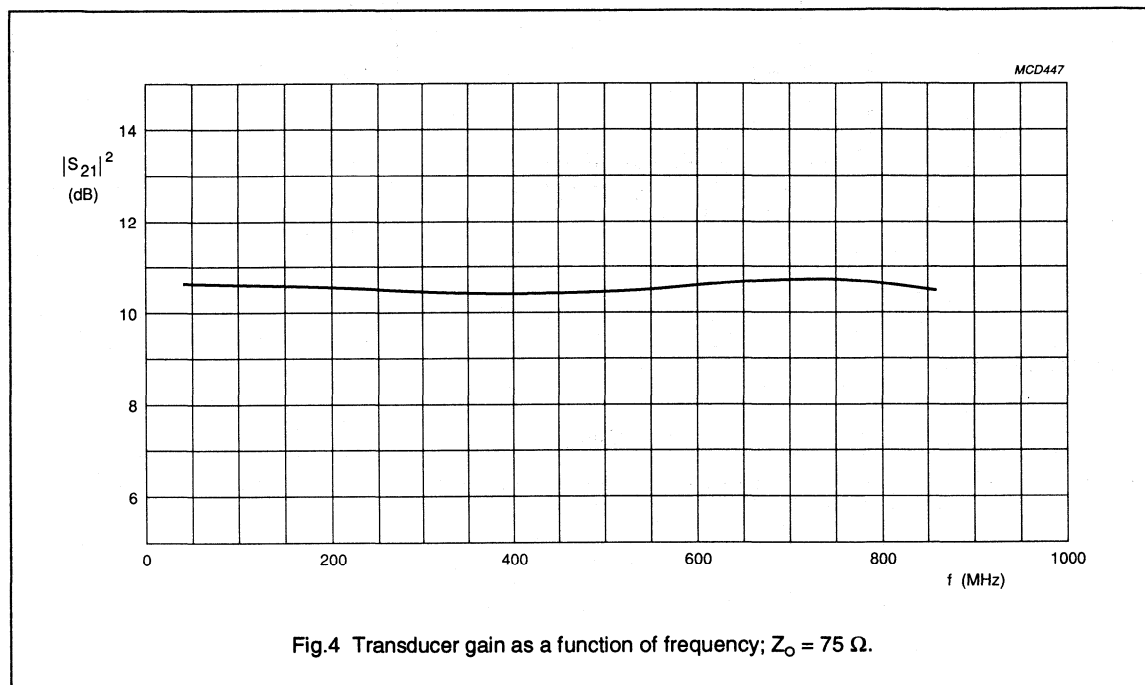
1. Highest value (for a sample) occurring in the frequency range.

# Hybrid integrated circuit VHF/UHF wideband amplifier

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## OPERATING CONDITIONS

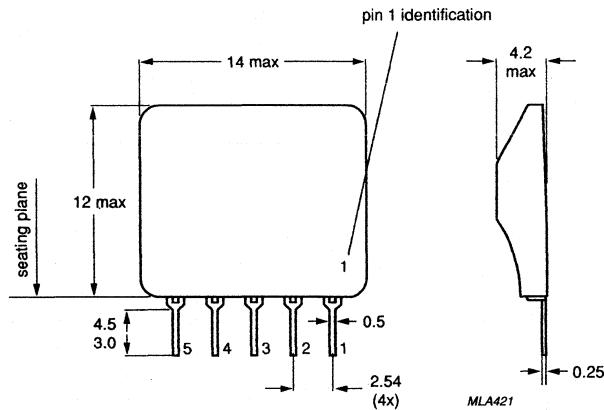
SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	-20	-	70	°C
$V_B$	DC supply voltage	10.8	12	13.2	V
$f$	frequency range	40	-	860	MHz
$R_S, R_L$	source and load resistance	-	75	-	$\Omega$



# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2046

## PACKAGE OUTLINE



Dimensions in mm.

Fig.5 Encapsulation.



## HYBRID INTEGRATED CIRCUIT VHF/UHF WIDE-BAND AMPLIFIER

Two-stage wide-band amplifier in hybrid integrated circuit technique on a thin-film substrate, intended for RATV and MATV applications.

## QUICK REFERENCE DATA

D.C. supply voltage	$V_B$	=	12 V $\pm$ 10%
Frequency range	f		40 to 860 MHz
Source and load (characteristic) impedance	$R_s = R_l = Z_o$	=	75 $\Omega$
Transducer gain	$G_{tr} =  s_f ^2$	typ.	18 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1 dB
Output voltage at -60 dB intermodulation distortion (DIN 45004, 3-tone)	$V_{O(rms)}$	typ.	100 dB $\mu$ V
Noise figure	F	typ.	5,2 dB
Operating ambient temperature	$T_{amb}$		-20 to +70 $^{\circ}$ C

ENCAPSULATION 5-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

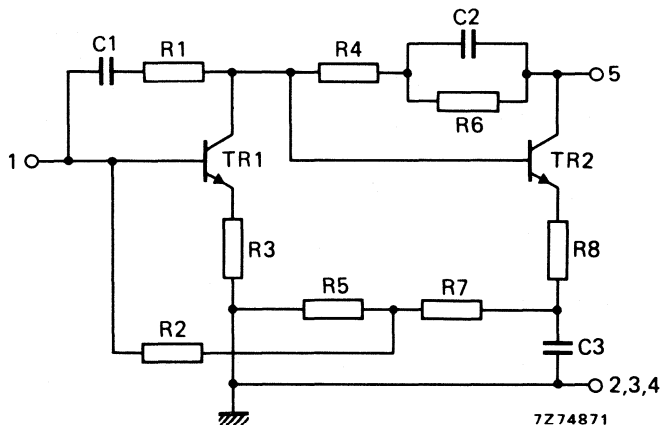


Fig. 1 Circuit diagram.

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Operating ambient temperature	$T_{amb}$	-20 to + 70 °C
Storage temperature	$T_{stg}$	-40 to + 125 °C
D.C. supply voltage	$V_B$	max. 15 V
Peak incident powers on pins 1 and 5	$P_{11M}, P_{15M}$	max. 100 mW

**CHARACTERISTICS**

**Measuring conditions**

Ambient temperature	$T_{amb}$	=	25 °C
D.C. supply voltage	$V_B$	=	12 V
Source impedance and load impedance	$R_s, R_l$	=	75 $\Omega$
Characteristic impedance of h.f. connections	$Z_0$	=	75 $\Omega$
Frequency range	f	=	40 to 860 MHz

**Performance**

Supply current	$I_B$	typ.	18 mA
Transducer gain	$G_{tr} =  s_f ^2$	typ.	18 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1 dB
Individual maximum v.s.w.r.			
input	$VSWR_{(i)}$	typ.	1,5 *
output	$VSWR_{(o)}$	typ.	1,9 *
Back attenuation			
f = 100 MHz	$ s_r ^2$	typ.	29 dB
f = 860 MHz	$ s_r ^2$	typ.	25 dB
Output voltage			
at -60 dB intermodulation distortion			
(DIN 45004, par. 6.3: 3-tone)	$V_{o(rms)}$	typ.	100 dB $\mu$ V
Noise figure	F	typ.	5,2 dB

s-parameters:	$s_f = s_{21}$	$s_i = s_{11}$
	$s_r = s_{12}$	$s_o = s_{22}$

\* Highest value, for a sample, occuring in the frequency range.



**OPERATING CONDITIONS**

Ambient temperature range

 $T_{amb}$  -20 to +70 °C

D.C. supply voltage

 $V_B$  = 12 V  $\pm$  10%

Frequency range

f 40 to 860 MHz

Source impedance and load impedance

 $R_S, R_L$  = 75  $\Omega$ **MECHANICAL DATA**

Dimensions in mm

The device is resin coated.

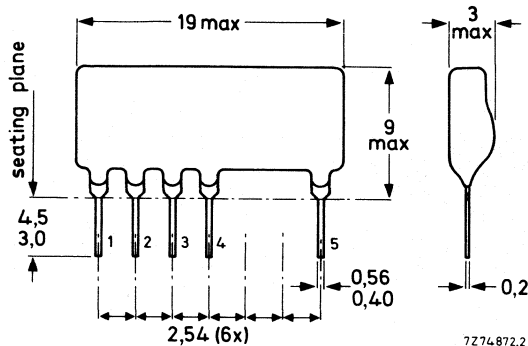


Fig. 2 Encapsulation.

**Terminal connections**

- 1 = input
- 2,3,4 = common
- 5 = output/supply(+)

**Soldering recommendations***Hand soldering*

Maximum contact time for a soldering-iron temperature of 260 °C up to the seating plane is 5 s.

*Dip or wave soldering*

260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C. If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**Mounting recommendations**

The module should preferably be mounted on double-sided printed-circuit board, see the example shown below.

Input and output should be connected to 75 Ω tracks.

The connections to the 'common' pins should be as close to the seating plane as possible.

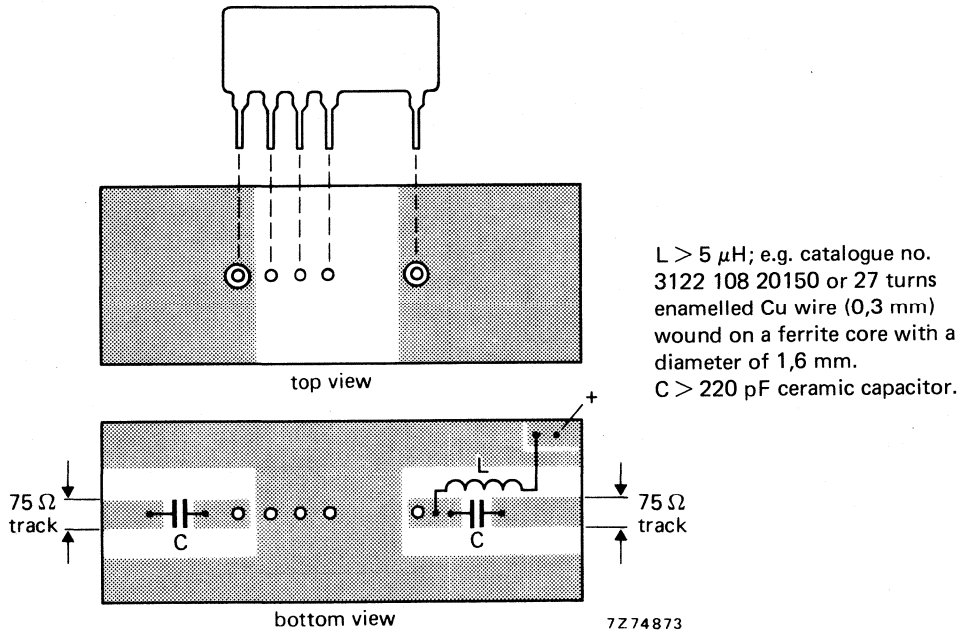


Fig. 3 Printed-circuit board holes and tracks.

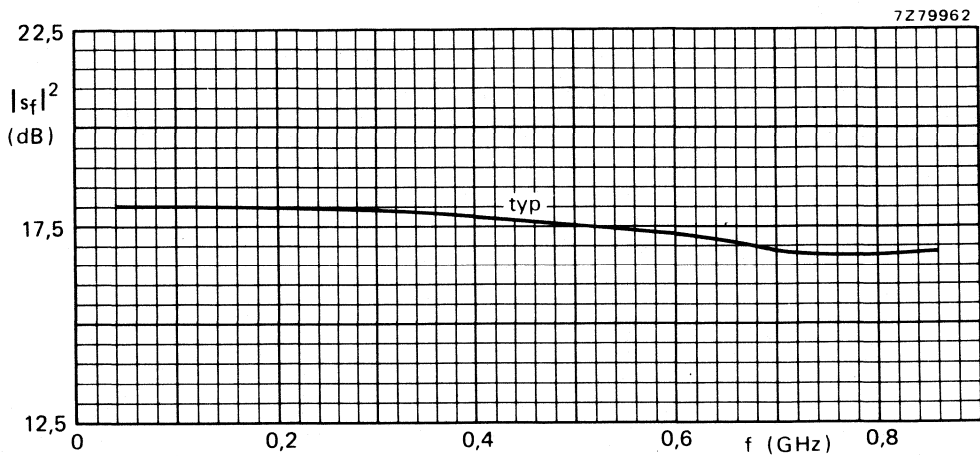


Fig. 4 Transducer gain as a function of frequency;  $Z_0 = 75 \Omega$ .

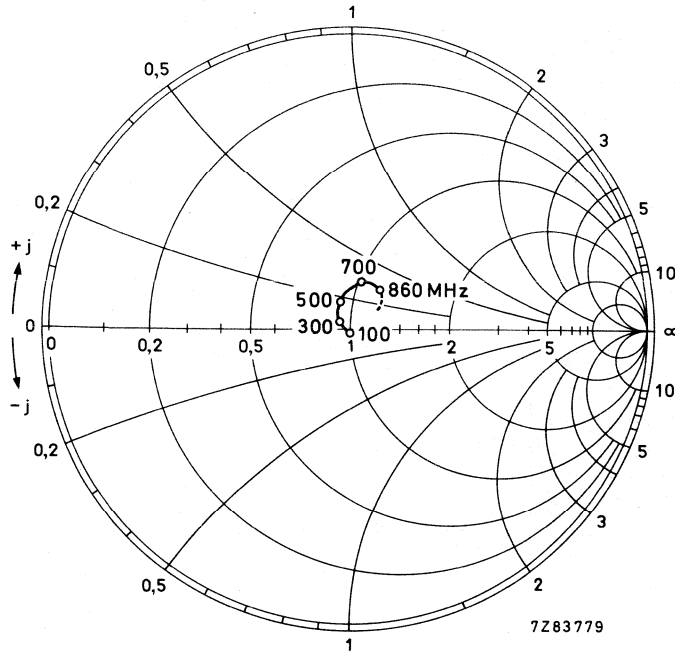


Fig. 5 Input impedance derived from input reflection coefficient  $s_i$ , co-ordinates in ohm x 75; typical values.

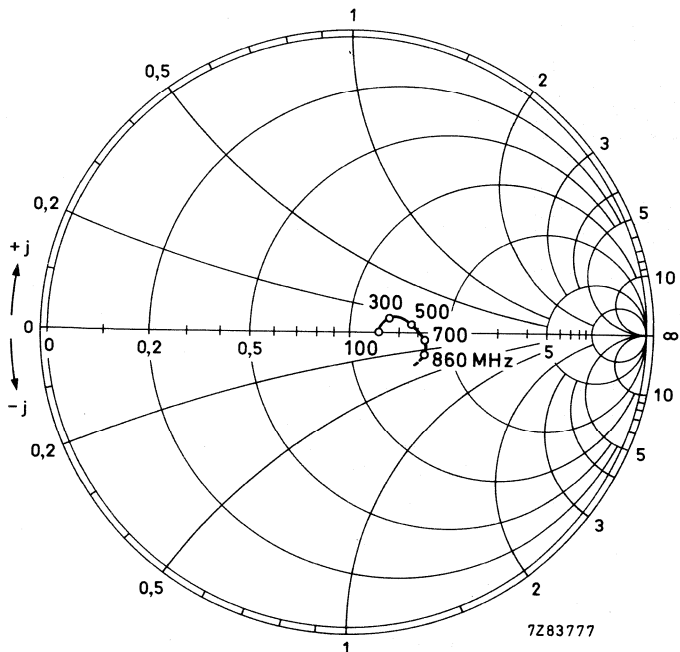


Fig. 6 Output impedance derived from output reflection coefficient  $s_o$ , co-ordinates in ohm x 75; typical values.

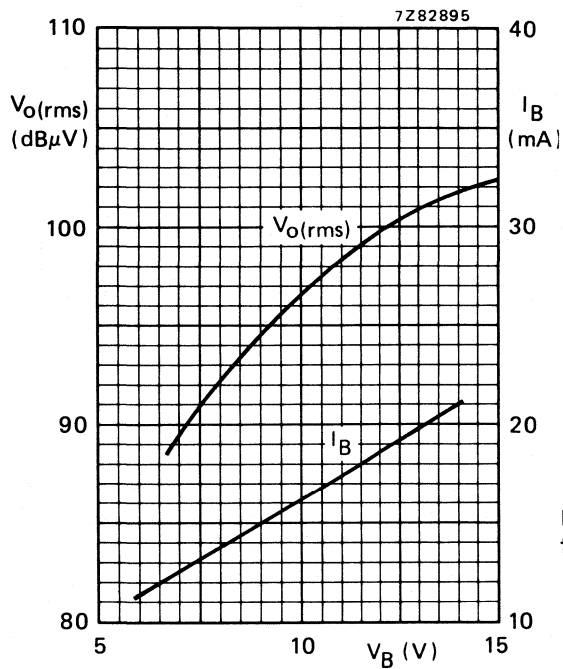


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

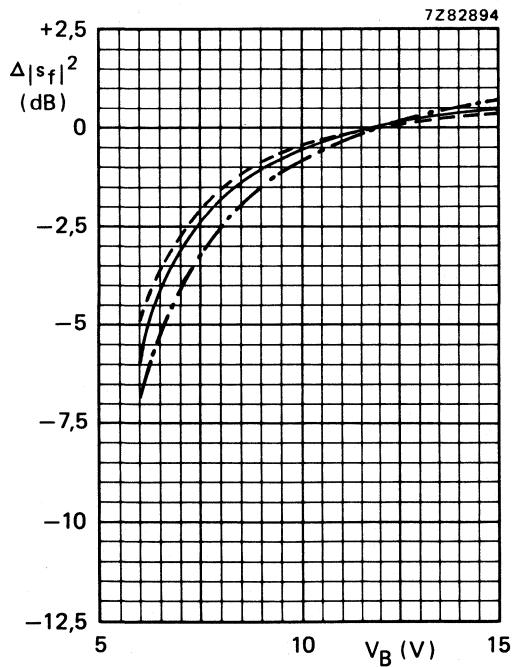


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V:  
 —  $f = 500$  MHz;  
 - - -  $f = 100$  MHz;  
 - · -  $f = 860$  MHz;  
 typical values.

# Hybrid integrated circuit VHF/UHF wideband amplifier

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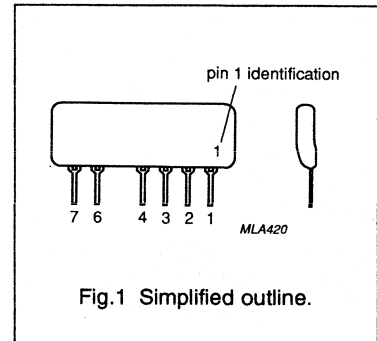
## DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit technology on a thin-film substrate, intended CATV and MATV applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common (-)
3	common (-)
4	common (-)
5	n.c.
6	common (-)
7	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$R_S, R_L$	source and load resistance		–	75	–	$\Omega$
$Z_O$	characteristic impedance of HF connections		–	75	–	$\Omega$
$G_{tr} =  S_{11} ^2$	transducer gain		–	28	–	dB
$\pm \Delta  S_{11} ^2$	flatness of frequency response		–	1	–	dB
$V_{O(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)	–	107	–	dB $\mu$ V
F	noise figure		–	4.5	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature range		–20	–	70	$^{\circ}$ C

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2052

## MECHANICAL DATA

### Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.7.

### Soldering recommendations

#### HAND SOLDERING

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

#### DIP OR WAVE SOLDERING

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

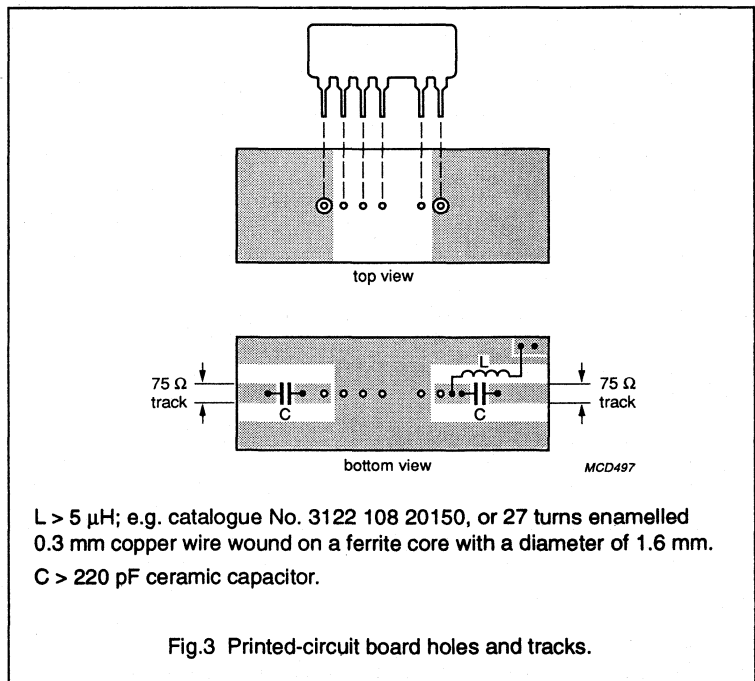
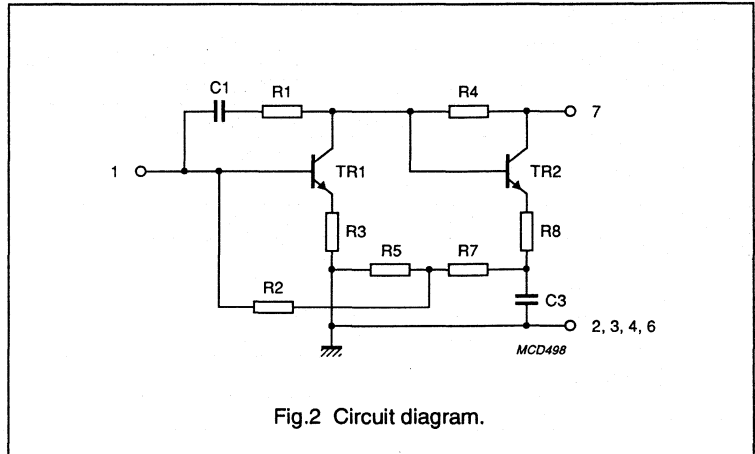
The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

### Mounting recommendations

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output pins should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.



# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2052

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	-20	70	°C
$T_{stg}$	storage temperature range	-40	125	°C
$V_B$	DC supply voltage	-	15	V
$P_{11M}, P_{18M}$	peak incident powers on pins 1 and 8	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient temperature		-	25	-	°C
$V_B$	DC supply voltage		11.9	12	12.1	V
$R_S, R_L$	source and load resistance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	860	MHz
<b>Performance</b>						
$I_B$	supply current		38	42	44	mA
$G_{tr} =  s_i ^2$	transducer gain		26	28	29	dB
$\pm\Delta s_i ^2$	flatness of frequency response		-	1	-	dB
$VSWR_{(i)}$	individual maximum VSWR	input	-	2.2 (note 1)	-	
$VSWR_{(o)}$	individual maximum VSWR	output	-	2.1 (note 1)	-	
$ s_i ^2$	back attenuation	f = 100 MHz f = 860 MHz	-	36 29	-	dB dB
$V_{\alpha(RMS)}$	output voltage	at -60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	-	107	-	$dB\mu V$
F	noise figure		-	4.5	-	dB

## Notes

Scattering parameters:  $s_i = s_{21}$ ;  $s_r = s_{12}$ ;  $s_i = s_{11}$ ;  $s_o = s_{22}$ .

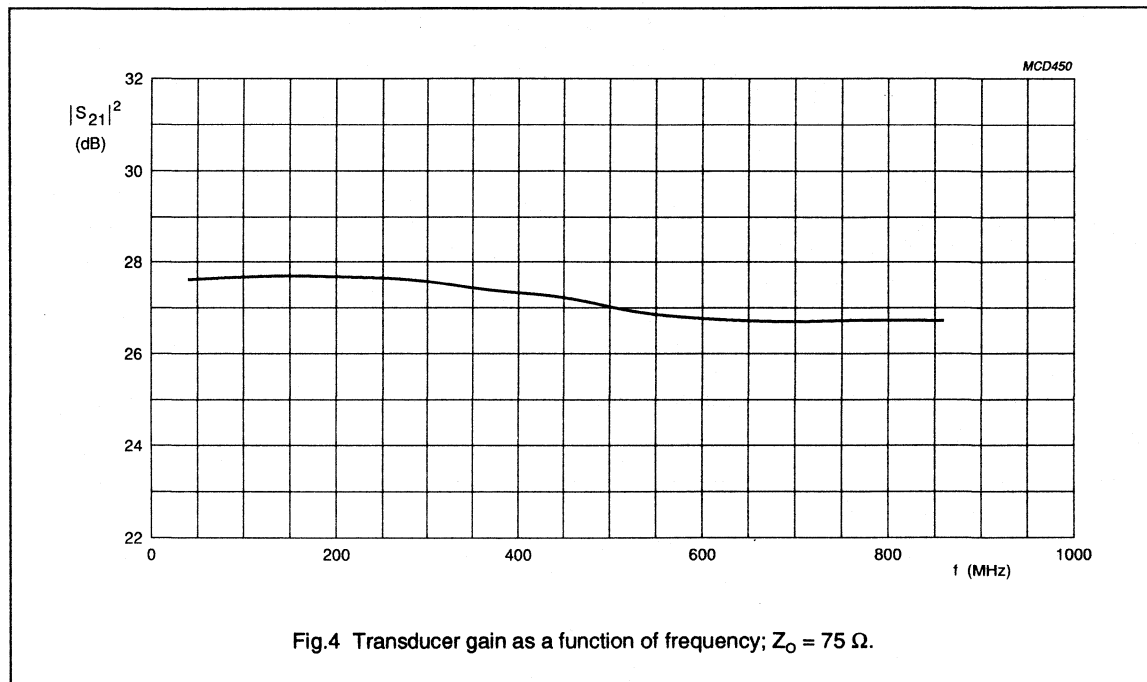
1. Highest value (for a sample) occurring in the frequency range.

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2052

## OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	-20	-	70	°C
$V_B$	DC supply voltage	10.8	12	13.2	V
f	frequency range	40	-	860	MHz
$R_S, R_L$	source and load resistance	-	75	-	$\Omega$





Hybrid integrated circuit VHF/UHF  
wideband amplifier

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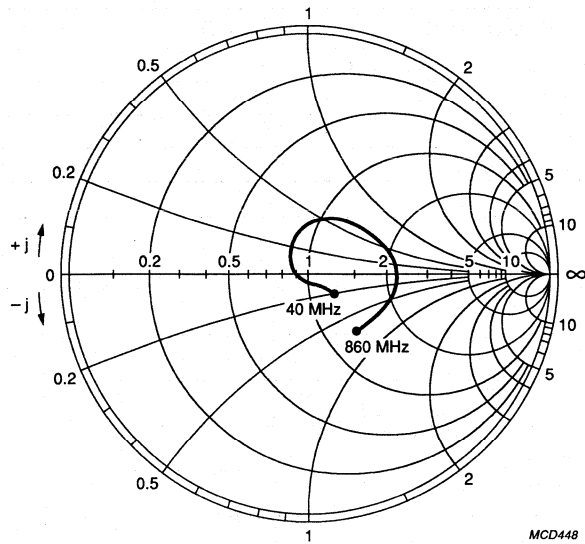


Fig.5 Input impedance derived from input reflection coefficient ( $s_i$ ), co-ordinates in ohms x 75; typical values.

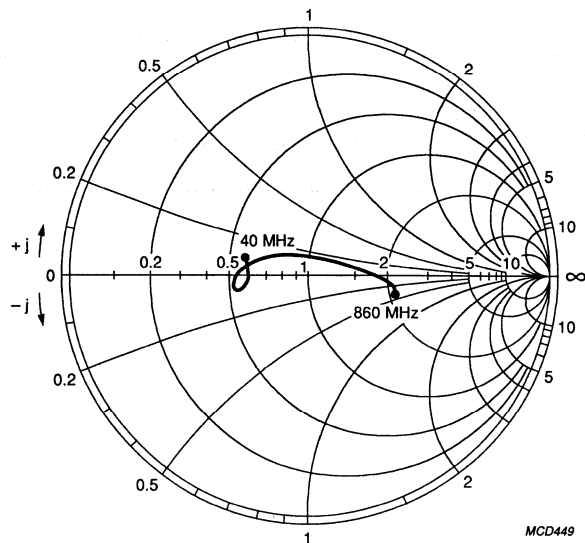
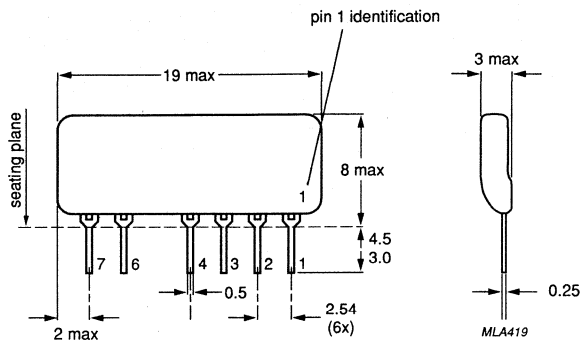


Fig.6 Output impedance derived from output reflection coefficient ( $s_o$ ), co-ordinates in ohms x 75; typical values.

Hybrid integrated circuit VHF/UHF  
wideband amplifier

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PACKAGE OUTLINE



Dimensions in mm.

Fig.7 Encapsulation.

## HYBRID INTEGRATED CIRCUIT VHF/UHF WIDE-BAND AMPLIFIER

Three-stage wide-band amplifier in hybrid integrated circuit technique on a thin-film substrate, intended for use in mast-head booster-amplifiers, as preamplifier in MATV systems, and as general-purpose amplifier for v.h.f. and u.h.f. applications.

### QUICK REFERENCE DATA

Frequency range	f	40 to 860 MHz
Source and load (characteristic) impedance	$R_s = R_l = Z_o =$	75 $\Omega$
Transducer gain	$G_{tr} =  s_f ^2$	typ. 23 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ. 1.0 dB
Output voltage at -60 dB intermodulation distortion (DIN 45004, 3-tone)	$V_o(\text{rms})$	> 105 dB $\mu$ V
Noise figure	F	typ. 5,4 dB
D.C. supply voltage	$V_B$	= 12 V $\pm$ 10%
Operating ambient temperature	$T_{amb}$	-20 to +70 $^{\circ}$ C

ENCAPSULATION 8-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

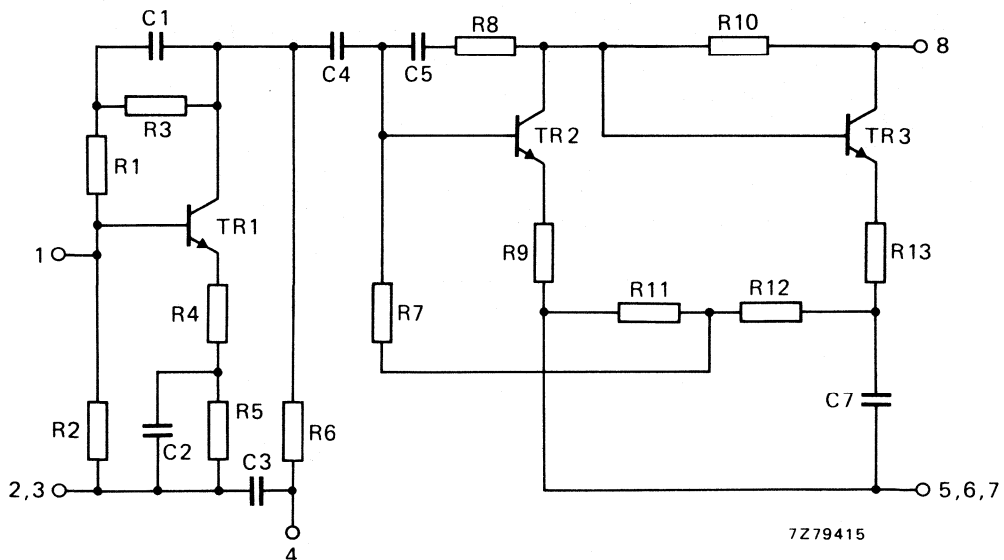


Fig. 1 Circuit diagram.

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Operating ambient temperature	$T_{amb}$	-20 to +70 °C
Storage temperature	$T_{stg}$	-40 to +125 °C
D.C. supply voltage	$V_B$	max. 15 V
Peak incident powers on pins 1 and 7	$P_{11M}, P_{17M}$	max. 100 mW

**CHARACTERISTICS**

**Measuring conditions**

Ambient temperature	$T_{amb}$	=	25 °C
D.C. supply voltage	$V_B$	=	12 V
Source impedance and load impedance	$R_s, R_l$	=	75 Ω
Characteristic impedance of h.f. connections	$Z_o$	=	75 Ω
Frequency range	f	=	40 to 860 MHz

**Performance**

Supply current	$I_B$	typ.	56 mA
Transducer gain	$G_{tr} =  s_f ^2$	typ.	23 dB 21 to 25 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1.0 dB
Individual maximum v.s.w.r.			
input	$VSWR_{(i)}$	typ.	1.4 *
output	$VSWR_{(o)}$	typ.	1.6 *
Back attenuation			
f = 100 MHz	$ s_r ^2$	typ.	42 dB
f = 860 MHz	$ s_r ^2$	typ.	33 dB
Output voltage			
at -60 dB intermodulation distortion (DIN 45004, par. 6.3: 3-tone)	$V_{o(rms)}$	>	105 dBμV typ. 107 dBμV
Noise figure	F	typ.	5,4 dB

s-parameters:	$s_f = s_{21}$	$s_i = s_{11}$
	$s_r = s_{12}$	$s_o = s_{22}$

\* Highest value, for a sample, occurring in the frequency range.

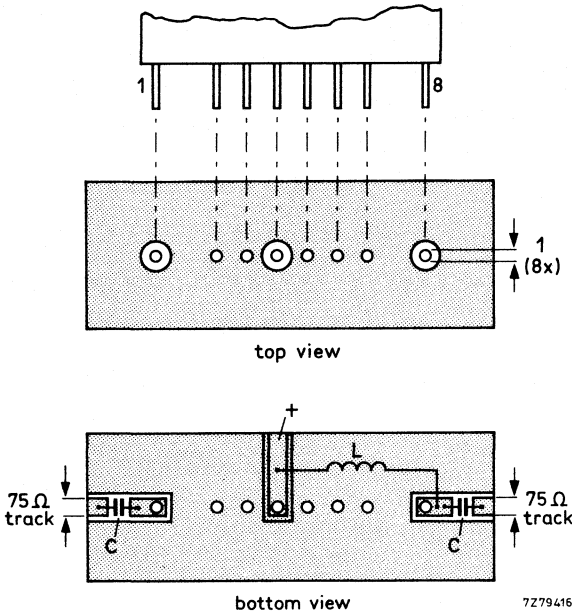


**Mounting recommendations**

The module should preferably be mounted on double-sided printed-circuit board, see the example shown below.

Input and output should be connected to 75 Ω tracks.

The connections to the 'common' pins should be as close to the seating plane as possible.



$L > 5 \mu\text{H}$ ; e.g. catalogue no. 3122 108 20150 or 27 turns enamelled Cu wire (0,3 mm) wound on a ferrite core with a diameter of 1,6 mm.  
 $C > 220 \text{ pF}$  ceramic capacitor.

Fig. 3 Printed-circuit board holes and tracks.

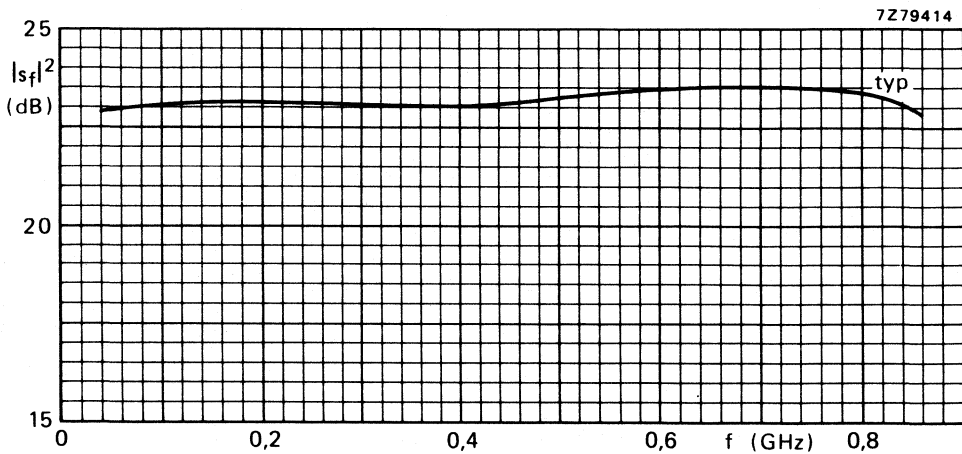


Fig. 4 Transducer gain as a function of frequency;  $Z_0 = 75 \Omega$ .

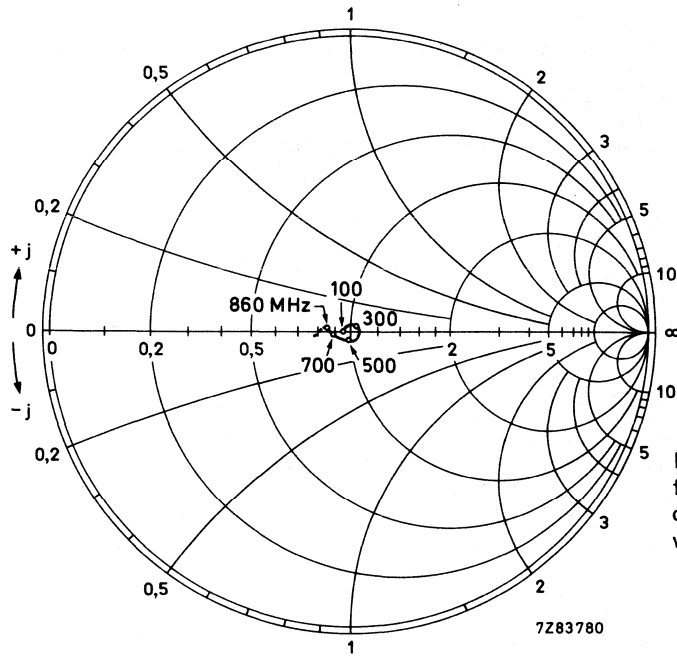


Fig. 5 Input impedance derived from input reflection coefficient  $s_i$ , co-ordinates in ohm x 75; typical values.

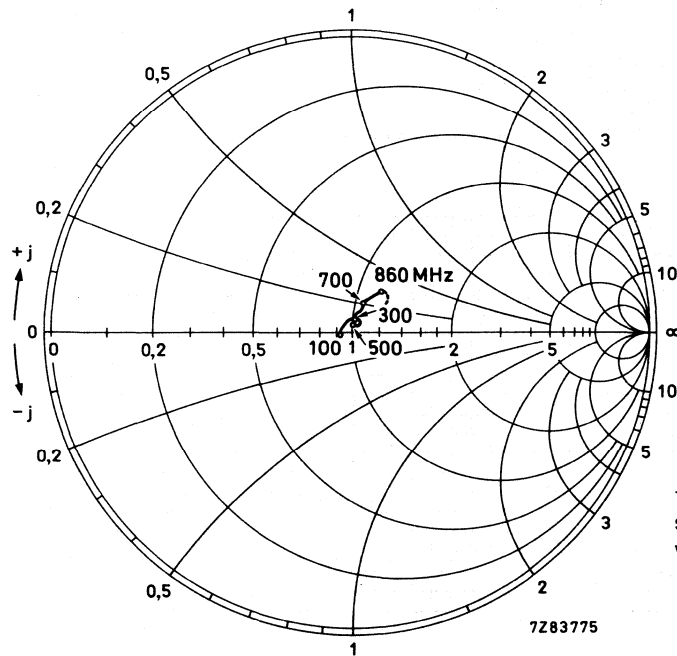


Fig. 6 Output impedance derived from output reflection coefficient  $s_o$ , co-ordinates in ohm x 75; typical values.

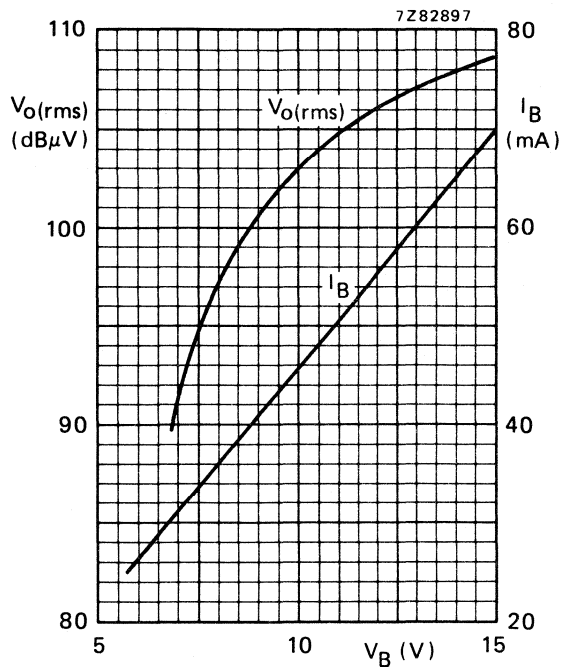


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

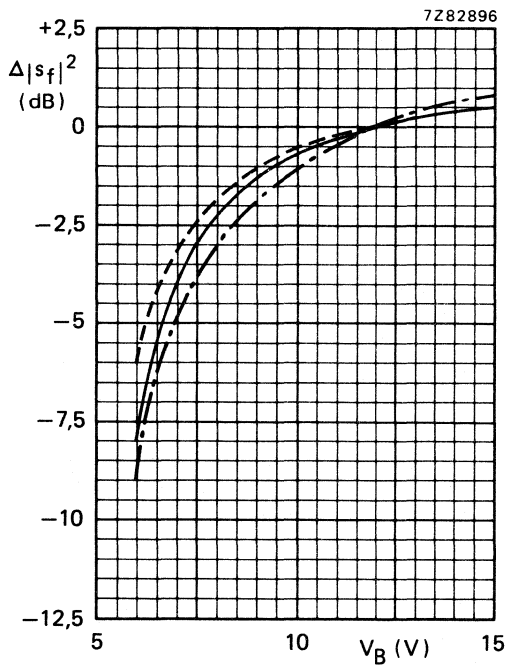


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V;  
 —  $f = 500$  MHz;  
 - - -  $f = 100$  MHz;  
 - · - ·  $f = 860$  MHz;  
 typical values.



# Hybrid integrated VHF/UHF wideband amplifier

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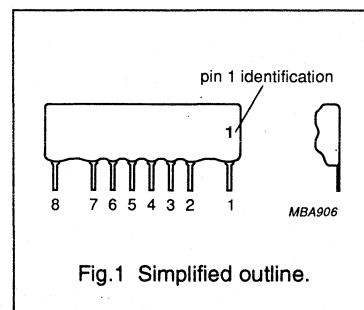
## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit technology on a thin-film substrate, intended for use in mast-head booster-amplifiers, as an amplifier in MATV systems, and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	supply (+)
5	common
6	common
7	common
8	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$R_s = R_L = Z_0$	source and load (characteristic) impedance		–	75	–	$\Omega$
$G_{tr} =  s_i ^2$	transducer gain		–	29	–	dB
$\pm \Delta  s_i ^2$	flatness of frequency response		–	1	–	dB
$V_{\alpha(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)				
	VHF		–	103	–	dB $\mu$ V
	UHF		–	105	–	dB $\mu$ V
F	noise figure		–	3.6	–	dB
$V_B$	DC supply voltage		10.8	12	13.4	V
$T_{amb}$	ambient operating temperature range		–20	–	70	$^{\circ}$ C

# Hybrid integrated VHF/UHF wideband amplifier

OM2063

## MECHANICAL DATA

### Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.8.

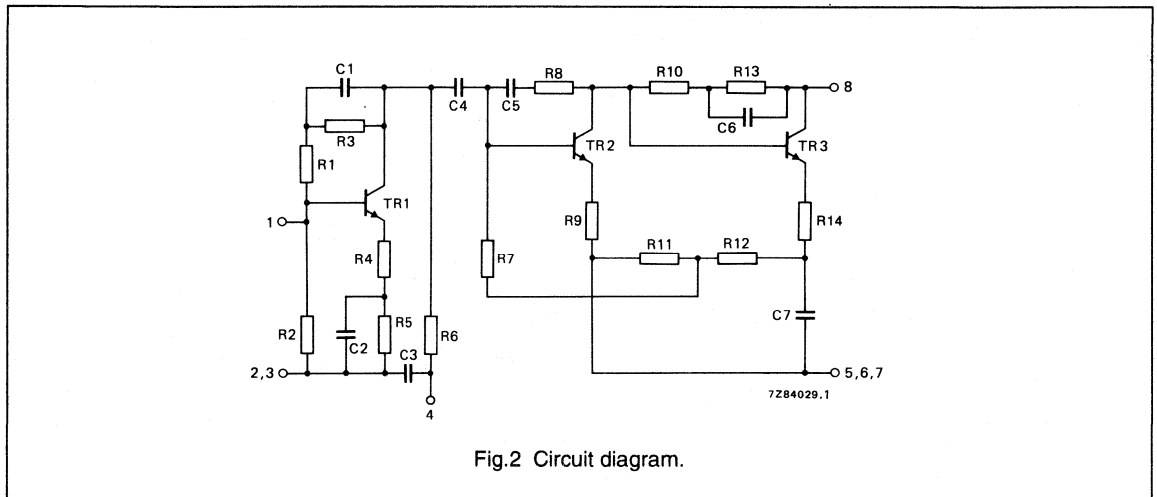


Fig.2 Circuit diagram.

### Soldering recommendations

#### HAND SOLDERING

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

#### DIP OR WAVE SOLDERING

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

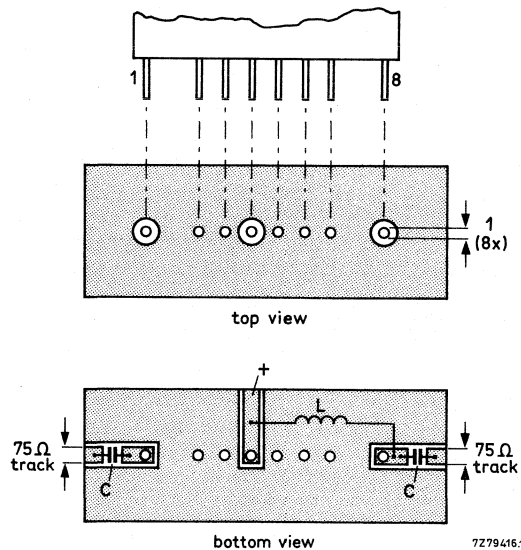
If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

### Mounting recommendations

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output pins should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.

# Hybrid integrated VHF/UHF wideband amplifier

OM2063



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core (material 4B1; catalogue No. 3122 104 91110) with a diameter of 1.6 mm.

$C > 220 \text{ pF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{\text{amb}}$	ambient operating temperature range	-20	70	°C
$T_{\text{stg}}$	storage temperature range	-40	125	°C
$V_{\text{B}}$	DC supply voltage	-	15	V
$P_{11\text{M}}, P_{18\text{M}}$	peak incident powers on pins 1 and 8	-	100	mW

# Hybrid integrated VHF/UHF wideband amplifier

OM2063

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient temperature		–	25	–	°C
$V_B$	DC supply voltage		–	12	–	V
$R_S, R_L$	source impedance and load impedance		–	75	–	$\Omega$
$Z_O$	characteristic impedance of HF connections		–	75	–	$\Omega$
f	frequency range		40	–	860	MHz
<b>Performance</b>						
$I_B$	supply current		–	52	–	mA
$G_{tr} =  s_i ^2$	transducer gain		–	29	–	dB
$\pm \Delta  s_i ^2$	flatness of frequency response		–	1	1.5	dB
$VSWR_{(i)}$	individual maximum VSWR	input	–	2.3 (note 1)	–	
$VSWR_{(o)}$	individual maximum VSWR	output	–	1.4 (note 1)	–	
$ s_i ^2$	back attenuation	f = 100 MHz	–	46	–	dB
		f = 860 MHz	–	41	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)				
	VHF		–	103	–	dB $\mu$ V
	UHF		–	105	–	dB $\mu$ V
F	noise figure		–	3.6	–	dB

### Notes

Scattering parameters:  $s_r = s_{21}$ ;  $S_r = s_{12}$ .

- Highest value (for a sample) occurring in the frequency range.

## OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	–20	–	70	°C
$V_B$	DC supply voltage	10.8	12	13.4	V
f	frequency range	40	–	860	MHz
$R_S, R_L$	source impedance and load impedance	–	75	–	$\Omega$

Hybrid integrated VHF/UHF  
wideband amplifier

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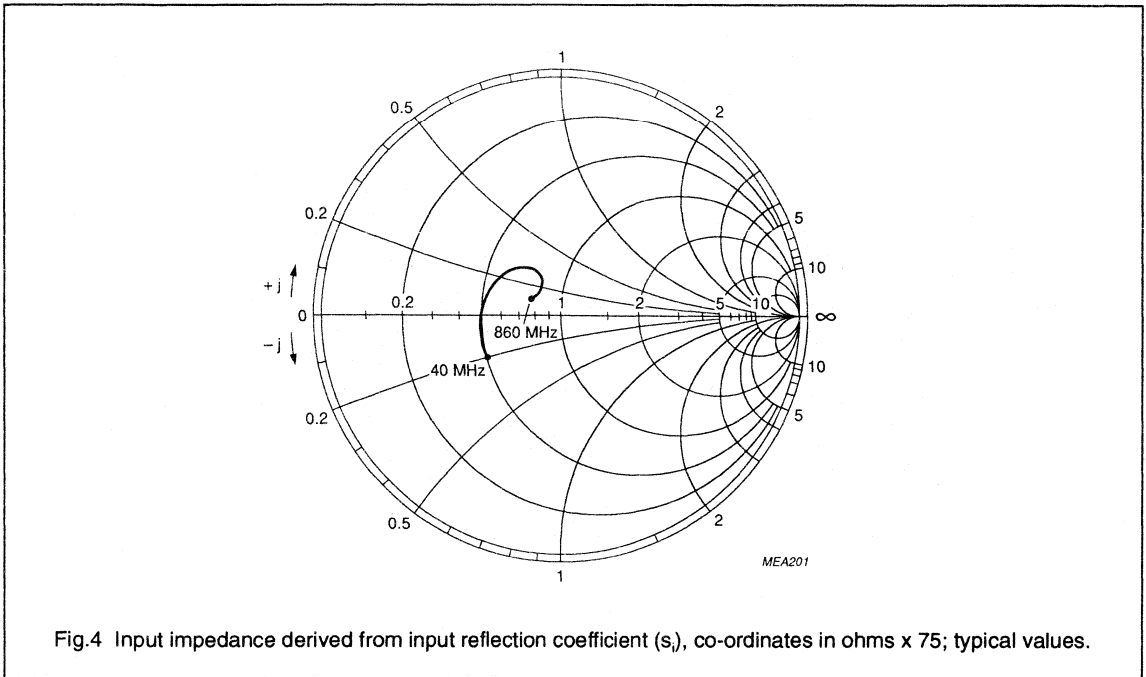


Fig.4 Input impedance derived from input reflection coefficient (s), co-ordinates in ohms x 75; typical values.

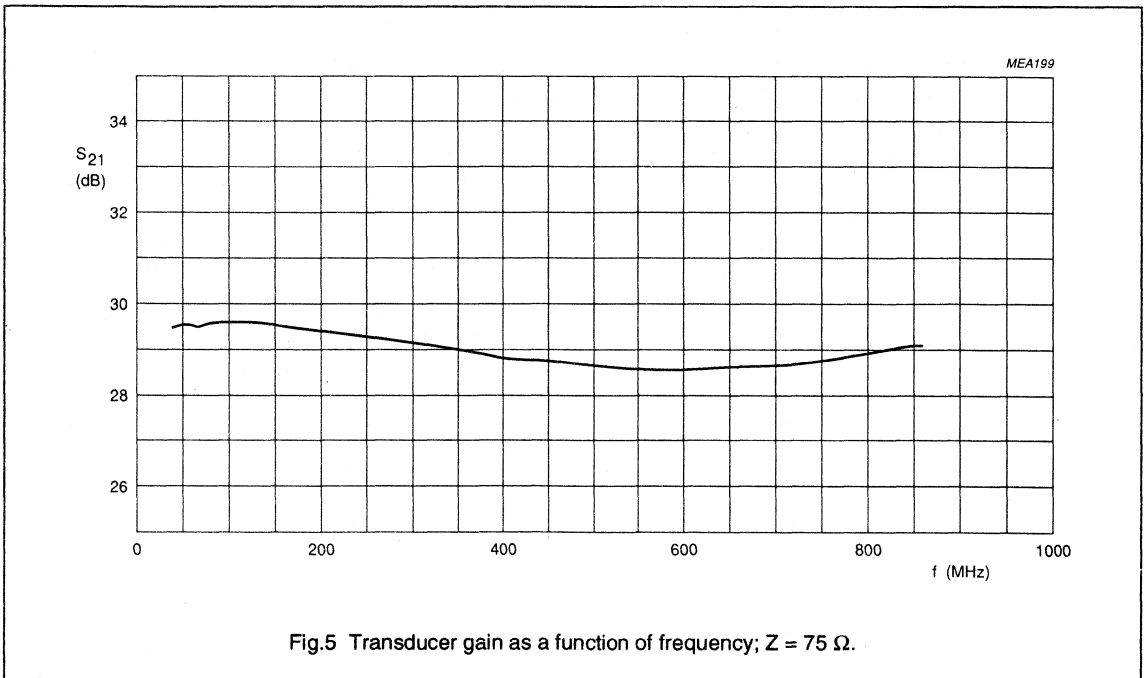


Fig.5 Transducer gain as a function of frequency;  $Z = 75 \Omega$ .

Hybrid integrated VHF/UHF  
wideband amplifier

OM2063

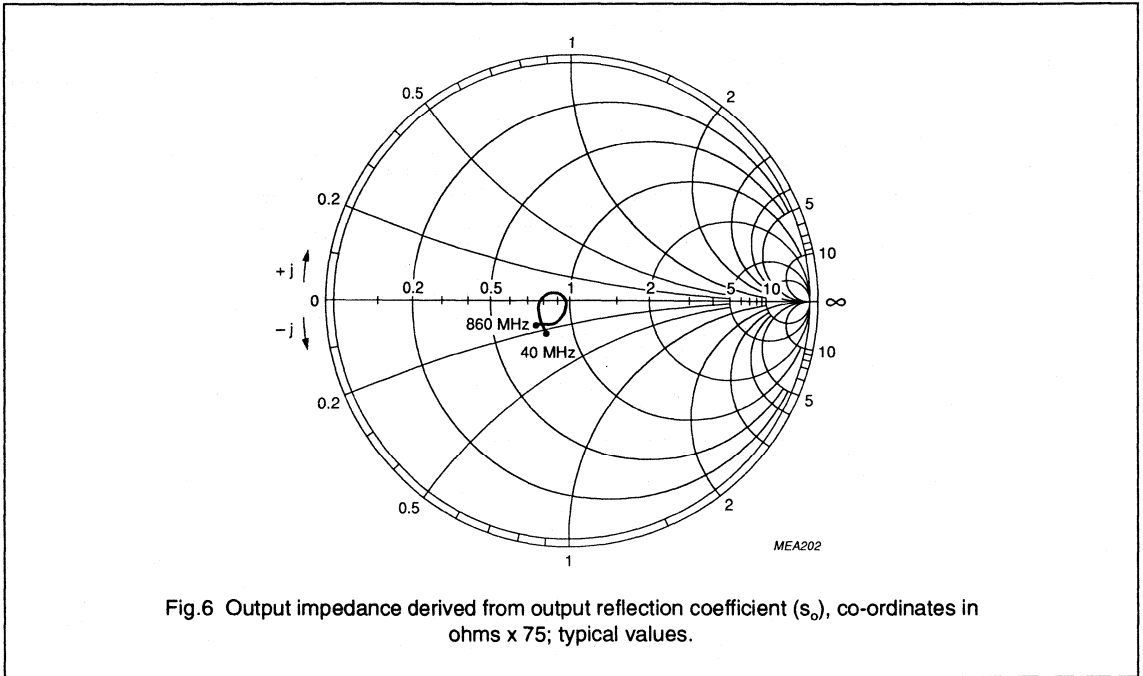


Fig.6 Output impedance derived from output reflection coefficient ( $s_o$ ), co-ordinates in ohms x 75; typical values.

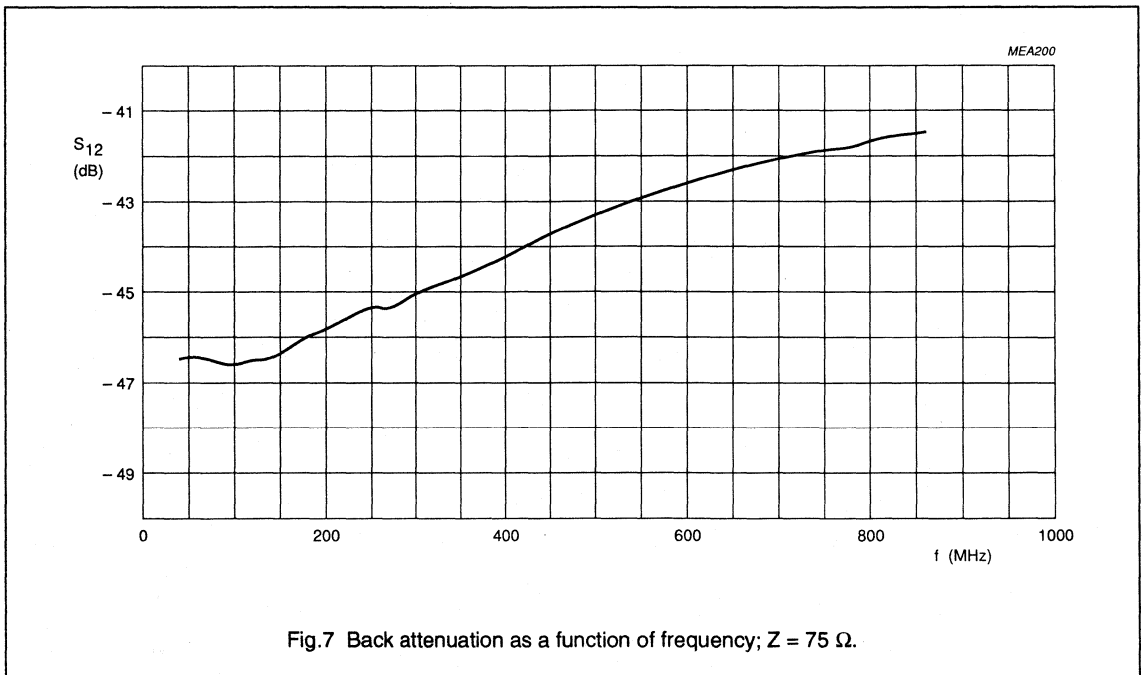
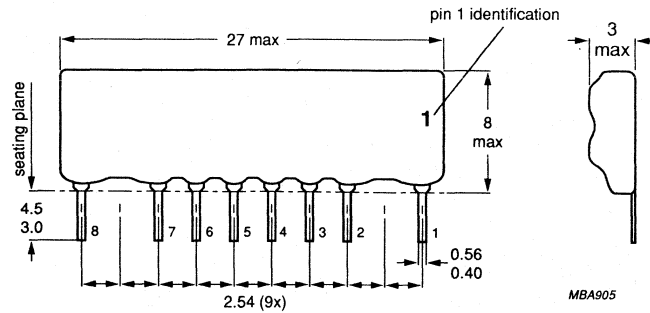


Fig.7 Back attenuation as a function of frequency;  $Z = 75 \Omega$ .

# Hybrid integrated VHF/UHF wideband amplifier

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Dimensions in mm.

Fig.8 Encapsulation.

# Hybrid integrated VHF/UHF wideband amplifier

OM2064

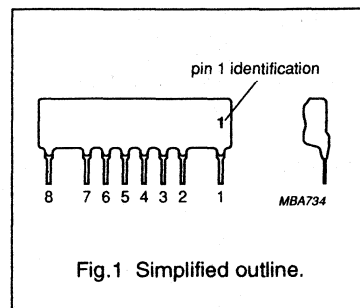
## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit technology on a thin-film substrate, intended for use in mast-head booster-amplifiers, as an amplifier in MATV systems, and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	supply (+)
5	common
6	common
7	common
8	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$R_S = R_L = Z_O$	source and load (characteristic) impedance		–	75	–	$\Omega$
$G_{tr} =  S_{21} ^2$	transducer gain		–	28	–	dB
$\pm \Delta  S_{21} ^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)	105	107	–	dB $\mu$ V
F	noise figure		–	4.4	–	dB
$V_B$	DC supply voltage		10.8	12	13.4	V
$T_{amb}$	ambient operating temperature range		–20	–	70	$^{\circ}$ C



# Hybrid integrated VHF/UHF wideband amplifier

OM2064

## MECHANICAL DATA

### Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.7.

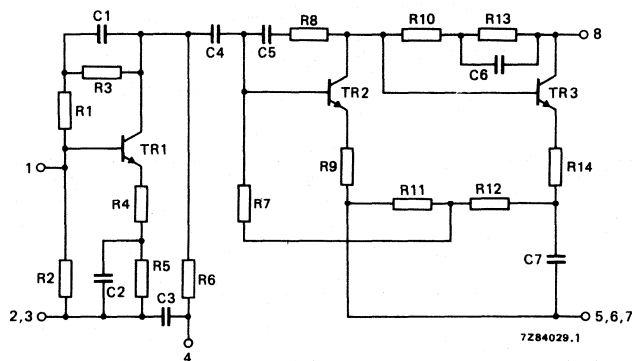


Fig.2 Circuit diagram.

### Soldering recommendations

#### HAND SOLDERING

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

#### DIP OR WAVE SOLDERING

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

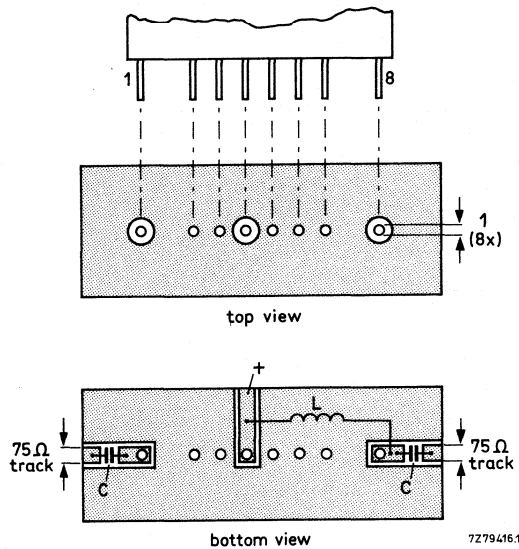
If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

### Mounting recommendations

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.

# Hybrid integrated VHF/UHF wideband amplifier

OM2064



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core (material 4B1; catalogue No. 3122 104 91110) with a diameter of 1.6 mm.

$C > 220 \text{ pF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{\text{amb}}$	ambient operating temperature range	-20	70	$^{\circ}\text{C}$
$T_{\text{stg}}$	storage temperature range	-40	125	$^{\circ}\text{C}$
$V_{\text{B}}$	DC supply voltage	-	15	V
$P_{\text{I1M}}, P_{\text{I8M}}$	peak incident powers on pins 1 and 8	-	100	mW

# Hybrid integrated VHF/UHF wideband amplifier

OM2064

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient temperature		–	25	–	°C
$V_B$	DC supply voltage		–	12	–	V
$R_S, R_L$	source impedance and load impedance		–	75	–	$\Omega$
$Z_O$	characteristic impedance of HF connections		–	75	–	$\Omega$
f	frequency range		40	–	860	MHz
<b>Performance</b>						
$I_B$	supply current		48	51	54	mA
$G_{tr} =  S_{21} ^2$	transducer gain		26	28	31	dB
$\pm\Delta S_{21} ^2$	flatness of frequency response		–	1	1.5	dB
$VSWR_{(i)}$	individual maximum VSWR	input	–	1.3 (note 1)	1.5	
$VSWR_{(o)}$	individual maximum VSWR	output	–	1.5 (note 1)	1.6	
$ S_{11} ^2$	back attenuation	f = 100 MHz	42	44	–	dB
		f = 860 MHz	37	39	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	105	107	–	dB $\mu$ V
F	noise figure		–	4.4	–	dB

### Notes

Scattering parameters:  $S_i = S_{21}$ ;  $S_r = S_{12}$ .

- Highest value (for a sample) occurring in the frequency range.

## OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$T_{amb}$	ambient temperature range	–20	–	70	°C
$V_B$	DC supply voltage	10.8	12	13.4	V
f	frequency range	40	–	860	MHz
$R_S, R_L$	source impedance and load impedance	–	75	–	$\Omega$

# Hybrid integrated VHF/UHF wideband amplifier

OM2064

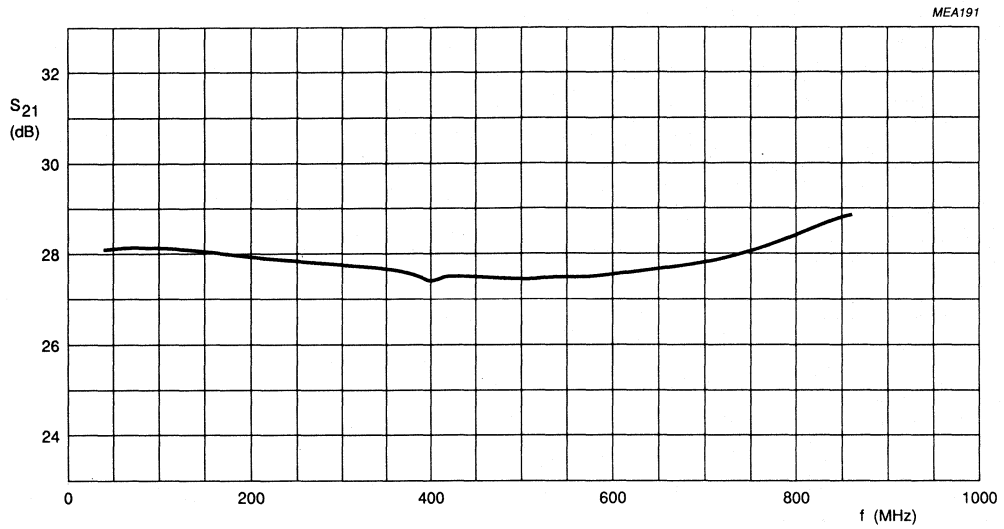


Fig.4 Transducer gain as a function of frequency; Z<sub>0</sub> = 75 Ω.

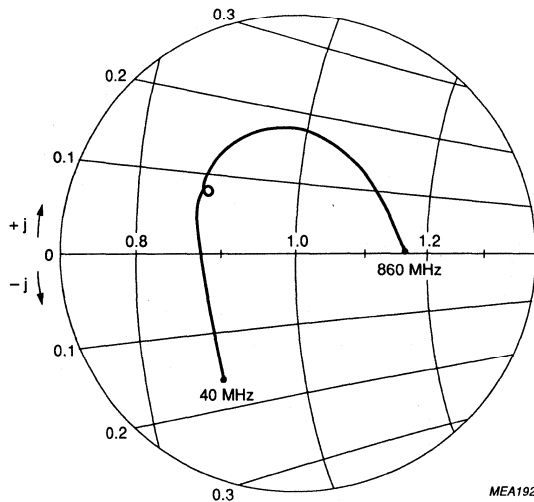


Fig.5 Input impedance derived from input reflection coefficient (s<sub>11</sub>), co-ordinates in ohms x 75; typical values.

Hybrid integrated VHF/UHF  
wideband amplifier

OM2064

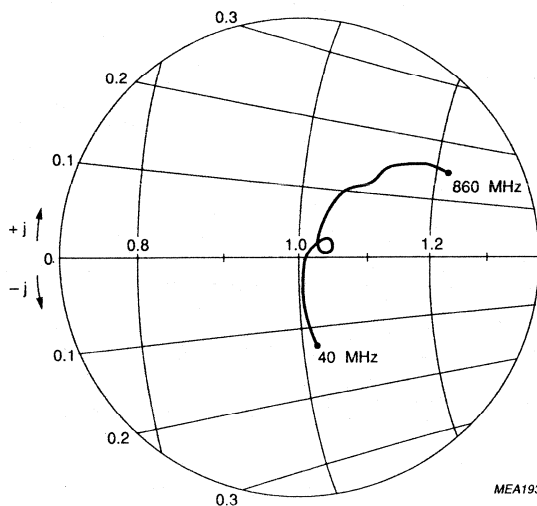
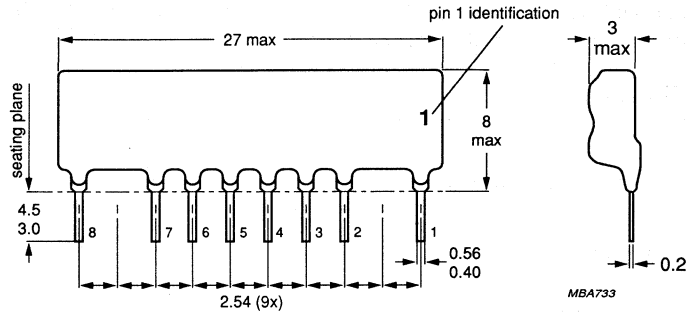


Fig.6 Output impedance derived from output reflection coefficient ( $s_{22}$ ), co-ordinates in ohms x 75; typical values.

Hybrid integrated VHF/UHF  
wideband amplifier

OM2064



Dimensions in mm.

Fig.7 Encapsulation.

## HYBRID INTEGRATED CIRCUIT VHF/UHF WIDE-BAND AMPLIFIER

Three-stage wide-band amplifier in hybrid integrated circuit technique on a thin-film substrate, intended for use in mast-head booster-amplifiers, as an amplifier in MATV and CATV systems, and as general-purpose amplifier for v.h.f. and u.h.f. applications.

### QUICK REFERENCE DATA

Frequency range	f		40 to 860 MHz
Source and load (characteristic) impedance	$R_s = R_l = Z_0 =$		75 $\Omega$
Transducer gain	$G_{tr} =  s_{f1} ^2$	typ.	28 dB
Flatness of frequency response	$\pm \Delta  s_{f1} ^2$	typ.	1 dB
Output voltage at -60 dB intermodulation distortion (DIN 45004, 3-tone)			
VHF	$V_{O(rms)}$	typ.	113 dB $\mu$ V
UHF	$V_{O(rms)}$	typ.	112 dB $\mu$ V
Noise figure	F	typ.	4,8 dB
D.C. supply voltage	$V_B$	=	12 V $\pm$ 10%
Operating ambient temperature	$T_{amb}$		-20 to +70 $^{\circ}$ C

ENCAPSULATION 9-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig.2)

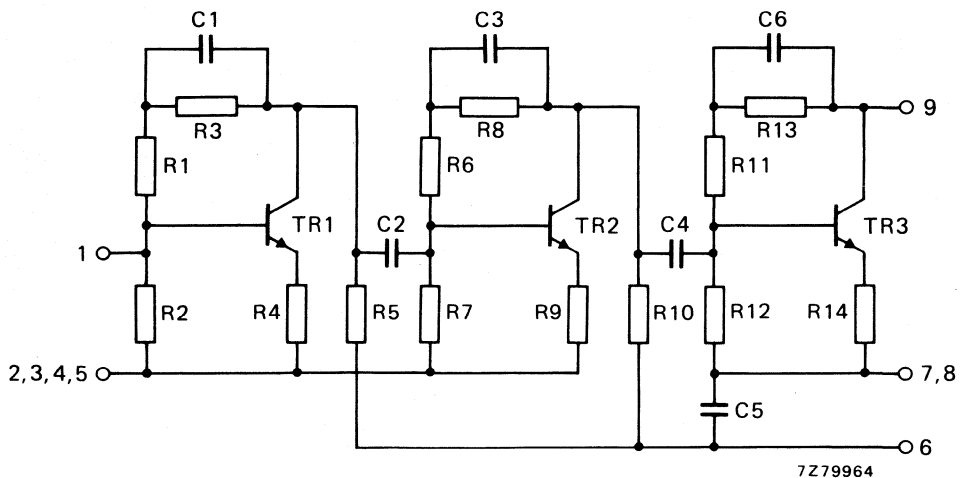


Fig. 1 Circuit diagram.

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Operating ambient temperature	$T_{amb}$		-20 to +70 °C
Storage temperature	$T_{stg}$		-40 to +125 °C
D.C. supply voltage	$V_B$	max.	15 V
Peak incident powers on pins 1 and 8	$P_{I1M}, P_{I8M}$	max.	100 mW

**CHARACTERISTICS**

**Measuring conditions**

Ambient temperature	$T_{amb}$	=	25 °C
D.C. supply voltage	$V_B$	=	12 V
Source impedance and load impedance	$R_s, R_l$	=	75 Ω
Characteristic impedance of h.f. connections	$Z_o$	=	75 Ω
Frequency range	f	=	40 to 860 MHz

**Performance**

Supply current	$I_B$	typ.	100 mA
Transducer gain	$G_{tr} =  s_f ^2$	typ.	28 dB 26 to 31 dB
Flatness of frequency response	$\pm \Delta  s_f ^2$	typ.	1 dB
Individual maximum v.s.w.r.			
input	VSWR <sub>(i)</sub>	typ.	2,3 *
output	VSWR <sub>(o)</sub>	typ.	1,9 *
Back attenuation			
f = 100 MHz	$ s_r ^2$	typ.	45 dB
f = 860 MHz	$ s_r ^2$	typ.	35 dB
Output voltage			
at -60 dB intermodulation distortion (DIN 45004, par. 6,3; 3-tone)			
VHF	$V_{o(rms)}$	>	111 dBμV 113 dBμV
UHF	$V_{o(rms)}$	>	110 dBμV 112 dBμV
Noise figure	F	typ.	4,8 dB

s-parameters:	$s_f = s_{21}$	$s_i = s_{11}$
	$s_r = s_{12}$	$s_o = s_{22}$

\* Highest value, for a sample, occurring in the frequency range.



**OPERATING CONDITIONS**

Ambient temperature range

D.C. supply voltage

Frequency range

Source impedance and load impedance

$T_{amb}$	=	-20 to +70 °C
$V_B$	=	12 V $\pm$ 10%
$f$	=	40 to 860 MHz
$R_s, R_l$	=	75 $\Omega$

**MECHANICAL DATA**

The device is resin coated.

Dimensions in mm

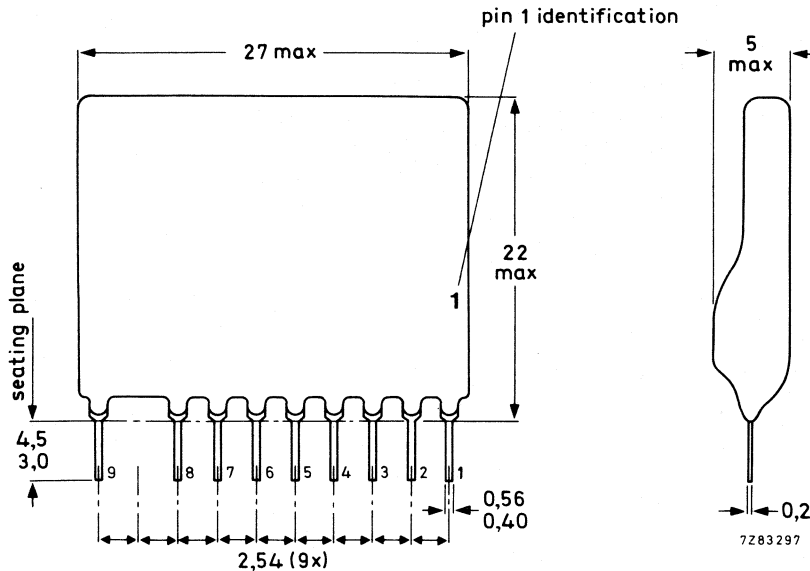


Fig. 2 Encapsulation.

**Terminal connections**

1	= input
2, 3, 4, 5 and 7, 8	= common
6	= supply (+)
9	= output/supply (+)

**Soldering recommendations***Hand soldering*

Maximum contact time for a soldering-iron temperature of 260 °C up to the seating plane is 5 s.

*Dip or wave soldering*

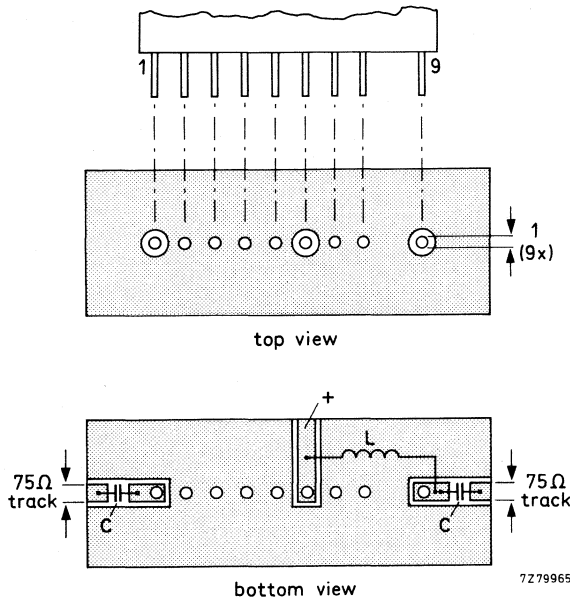
260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C. If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**Mounting recommendations**

The module should preferably be mounted on double-sided printed-circuit board, see the example shown below.

Input and output should be connected to 75 Ω tracks.

The connections to the 'common' pins should be as close to the seating plane as possible.



$L > 5 \mu\text{H}$ ; e.g. catalogue no. 3122 108 20150 or 27 turns enamelled Cu wire (0,3 mm) wound on a ferrite core (material 4B1; catalogue no. 3122 104 91110) with a diameter of 1,6 mm.  
 $C > 220 \text{ pF}$  ceramic capacitor.

Fig. 3 Printed-circuit board holes and tracks.

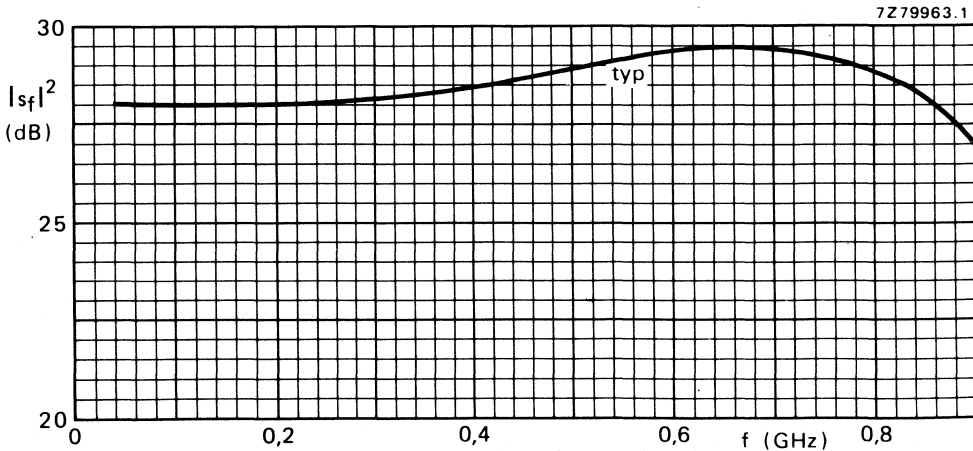


Fig. 4 Transducer gain as a function of frequency;  $Z_0 = 75 \Omega$ .

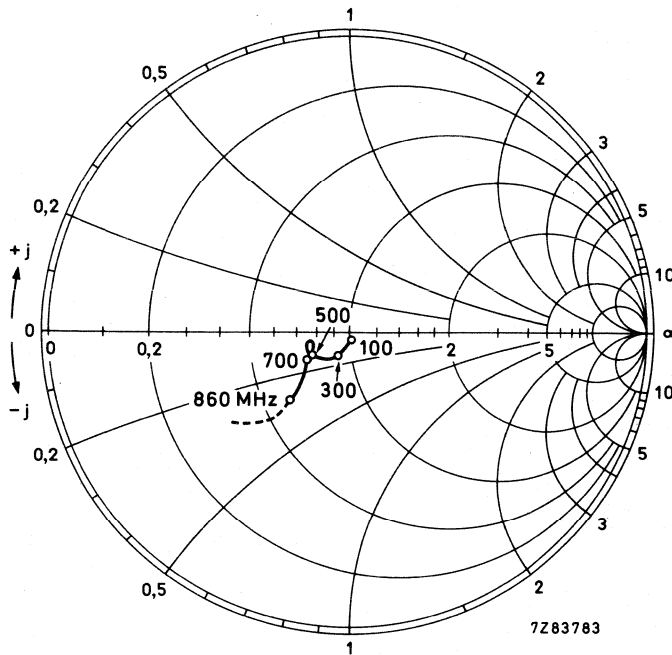


Fig. 5 Input impedance derived from input reflection coefficient  $s_i$ , co-ordinates in ohm  $\times 75$ ; typical values.

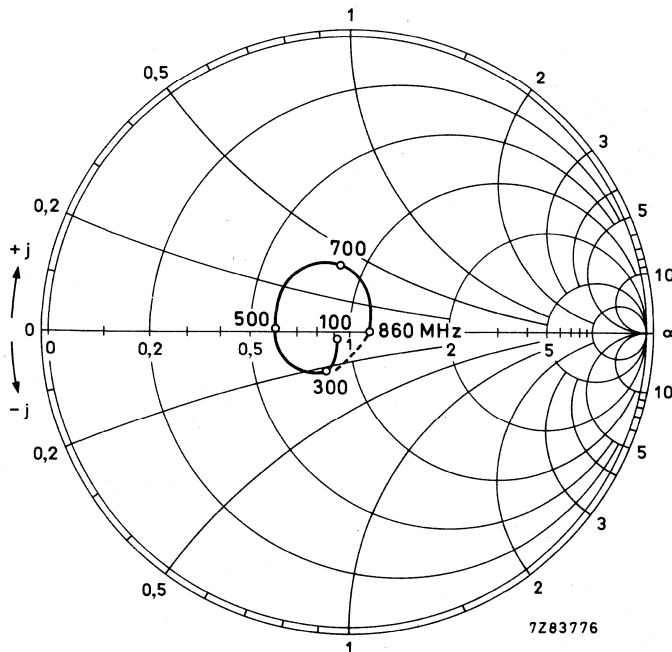


Fig. 6 Output impedance derived from output reflection coefficient  $s_o$ , co-ordinates in ohm  $\times 75$ ; typical values.

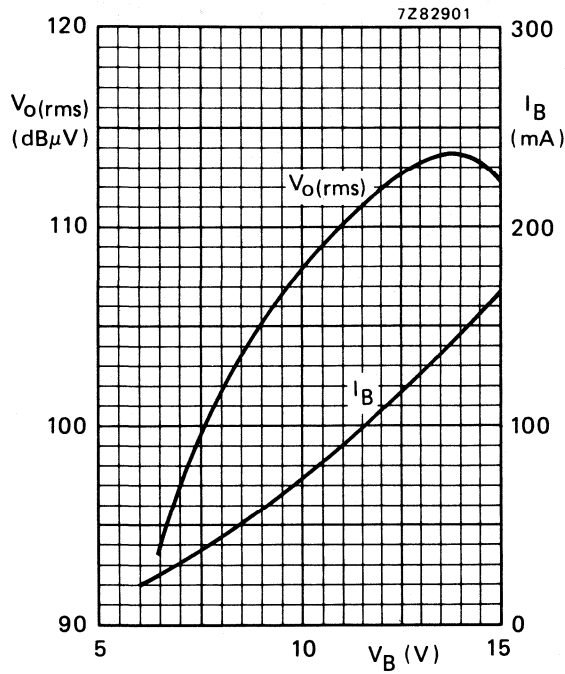


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

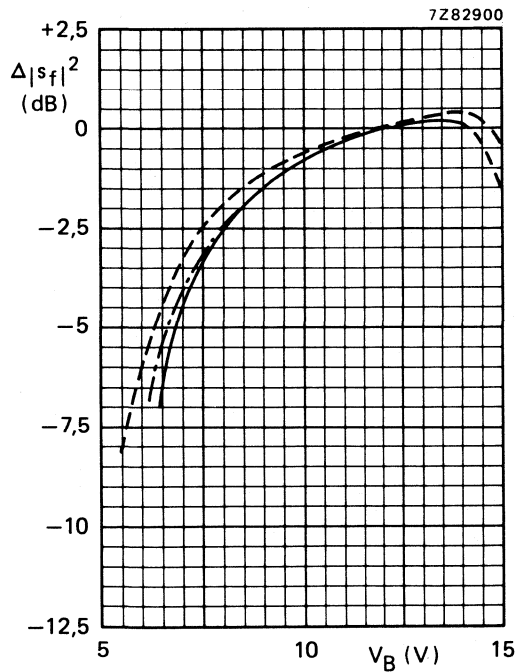


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V;  
 —  $f = 500$  MHz;  
 - - -  $f = 100$  MHz;  
 - · - ·  $f = 860$  MHz;  
 typical values.

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B

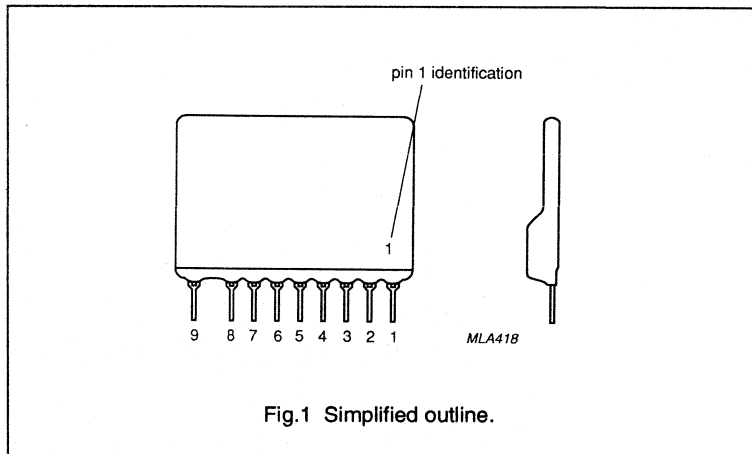
## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit technology on a thin-film substrate, intended for use in mast-head booster-amplifiers, as an amplifier in CATV and MATV systems, and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common (-)
3	common (-)
4	common (-)
5	common (-)
6	supply (+)
7	common (-)
8	common (-)
9	output/supply (+)

## PIN CONFIGURATION



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	-	860	MHz
$R_S, R_L$	source and load resistance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
$G_r =  S_{11} ^2$	transducer gain		-	30	-	dB
$\pm \Delta  S_{11} ^2$	flatness of frequency response		-	1	-	dB
$V_{\alpha(RMS)}$	output voltage VHF UHF	at -60 dB intermodulation distortion (DIN 45004, 3-tone)	-	113 112	-	$\text{dB}\mu\text{V}$ $\text{dB}\mu\text{V}$
F	noise figure		-	4.8	-	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature range		-20	-	70	$^{\circ}\text{C}$

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B

## MECHANICAL DATA

### Encapsulation

The encapsulation comprises a 9-pin, in-line, resin-coated body, see Fig.6.

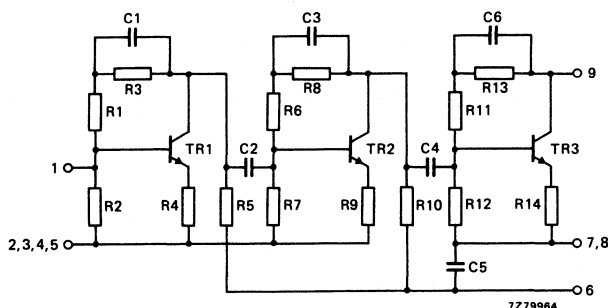


Fig.2 Circuit diagram.

### Soldering recommendations

#### HAND SOLDERING

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

#### DIP OR WAVE SOLDERING

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

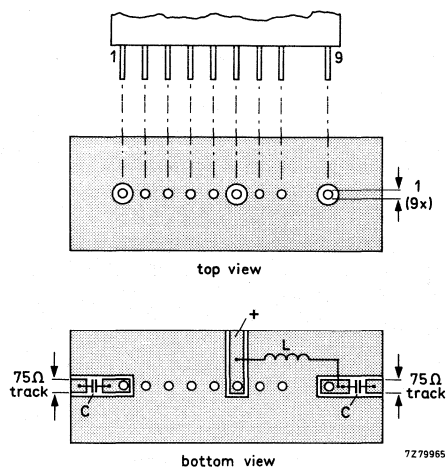
If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

### Mounting recommendations

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output pins should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.

$C > 220 \text{ pF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{\text{amb}}$	ambient operating temperature range	-20	70	°C
$T_{\text{stg}}$	storage temperature range	-40	125	°C
$V_{\text{B}}$	DC supply voltage	-	15	V
$P_{11\text{M}}, P_{18\text{M}}$	peak incident powers on pins 1 and 8	-	100	mW

# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient temperature		–	25	–	°C
$V_B$	DC supply voltage		–	12	–	V
$R_S, R_L$	source and load resistance		–	75	–	$\Omega$
$Z_o$	characteristic impedance of HF connections		–	75	–	$\Omega$
f	frequency range		40	–	860	MHz
<b>Performance</b>						
$I_B$	supply current		–	100	–	mA
$G_{tr} =  s_i ^2$	transducer gain		28	30	33	dB
$\pm\Delta s_i ^2$	flatness of frequency response		–	1	–	dB
$VSWR_{(i)}$	individual maximum VSWR	input	–	2.7 (note 1)	–	
$VSWR_{(o)}$	individual maximum VSWR	output	–	1.9 (note 1)	–	
$ s_i ^2$	back attenuation	f = 100 MHz	–	45	–	dB
		f = 860 MHz	–	35	–	dB
$V_{\alpha(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)				
	VHF		111	113	–	dB $\mu$ V
	UHF		110	112	–	dB $\mu$ V
F	noise figure		–	4.8	–	dB

### Notes

Scattering parameters:  $s_i = s_{21}$ ;  $s_r = s_{12}$ ;  $s_i = s_{11}$ ;  $s_o = s_{22}$ .

1. Highest value (for a sample) occurring in the frequency range.

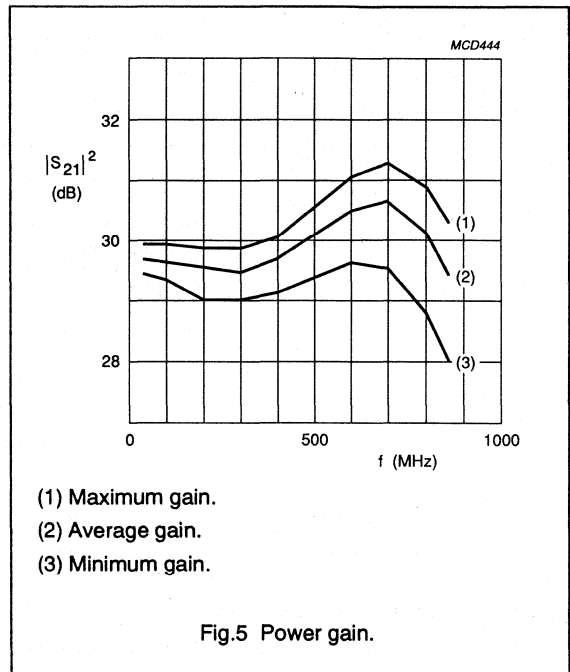
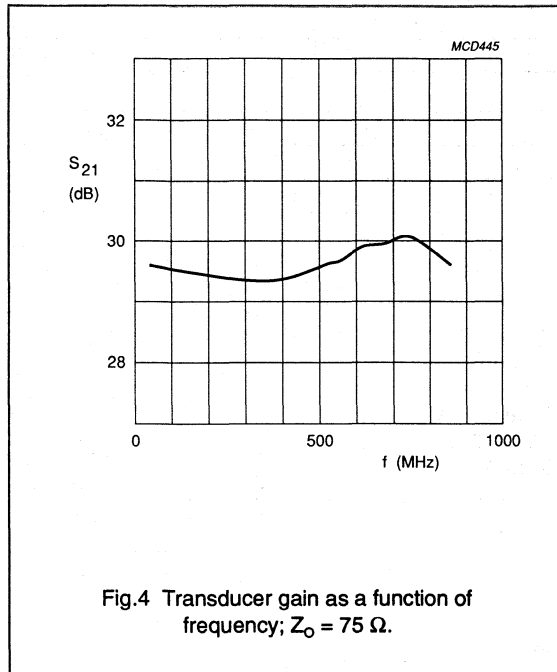


# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B

## OPERATING CONDITIONS

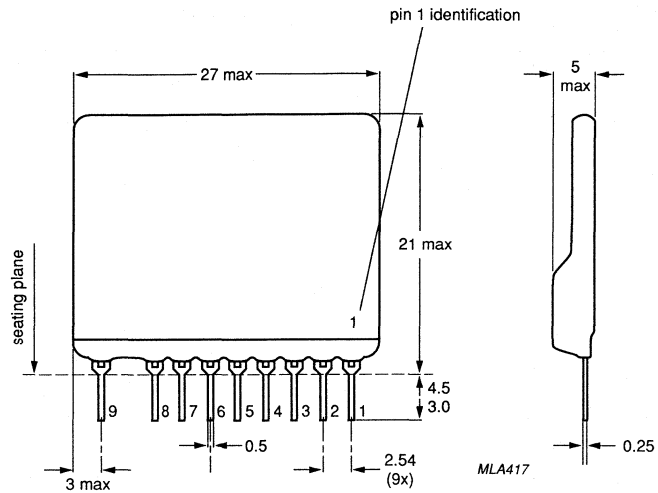
SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
$T_{amb}$	ambient operating temperature range	-20	-	70	°C
$V_B$	DC supply voltage	10.8	12	13.2	V
$f$	frequency range	40	-	860	MHz
$R_{S}, R_L$	source and load resistance	-	75	-	$\Omega$



# Hybrid integrated circuit VHF/UHF wideband amplifier

OM2070B

## PACKAGE OUTLINE



Dimensions in mm.

Fig.6 Encapsulation.

## Wideband amplifier module

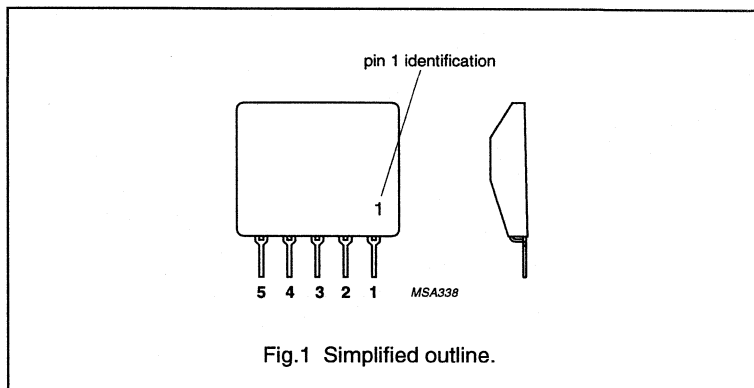
OM2081/60

## DESCRIPTION

A one-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	common
5	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	600	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		–	10	11	dB
$\Delta G_T$	flatness of frequency response		–	1	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB 2nd order intermodulation (2-tone) 3rd order intermodulation (3-tone)	104 114	105 115	– –	$\text{dB}\mu\text{V}$ $\text{dB}\mu\text{V}$
F	noise figure		–	7.5	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		-20	–	+70	$^{\circ}\text{C}$

## Wideband amplifier module

OM2081/60

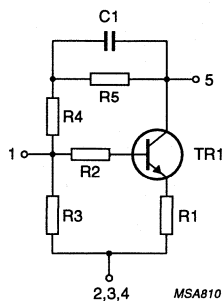
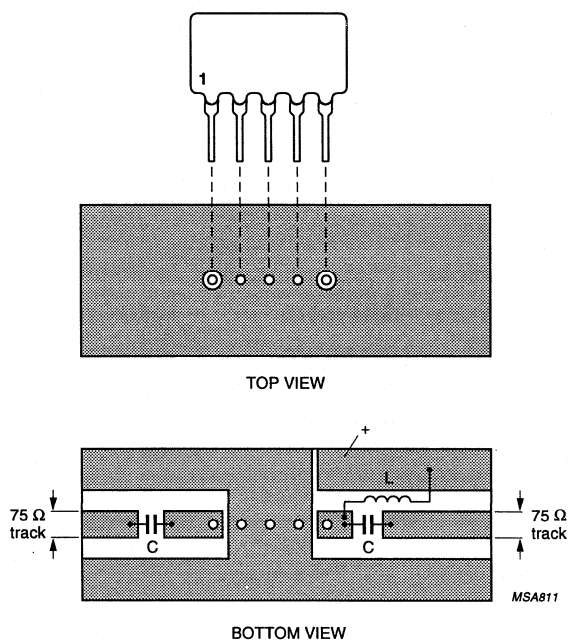


Fig.2 Circuit diagram.



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 $C > 220 \text{ pF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## Wideband amplifier module

OM2081/60

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 5	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	600	MHz
<b>Performance</b>						
$I_B$	supply current		-	85	-	mA
$G_T$	transducer gain = $ S_{21} ^2$		10	11	12	dB
$\Delta G_T$	flatness of frequency response		-	1	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note (1)	-	1.5	1.6	
$VSWR_{out}$	individual maximum VSWR	output; note (1)	-	1.3	1.4	
$ S_{12} ^2$	back attenuation	f = 100 MHz	15	16	-	dB
		f = 600MHz	13	14	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	104	105	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	114	115	-	dB $\mu$ V
F	noise figure		-	7.5	-	dB

## Wideband amplifier module

OM2081/60

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
$f$	frequency range		40	-	600	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

**Note to the characteristics**

- Highest value (for sample) occurring in the frequency range.

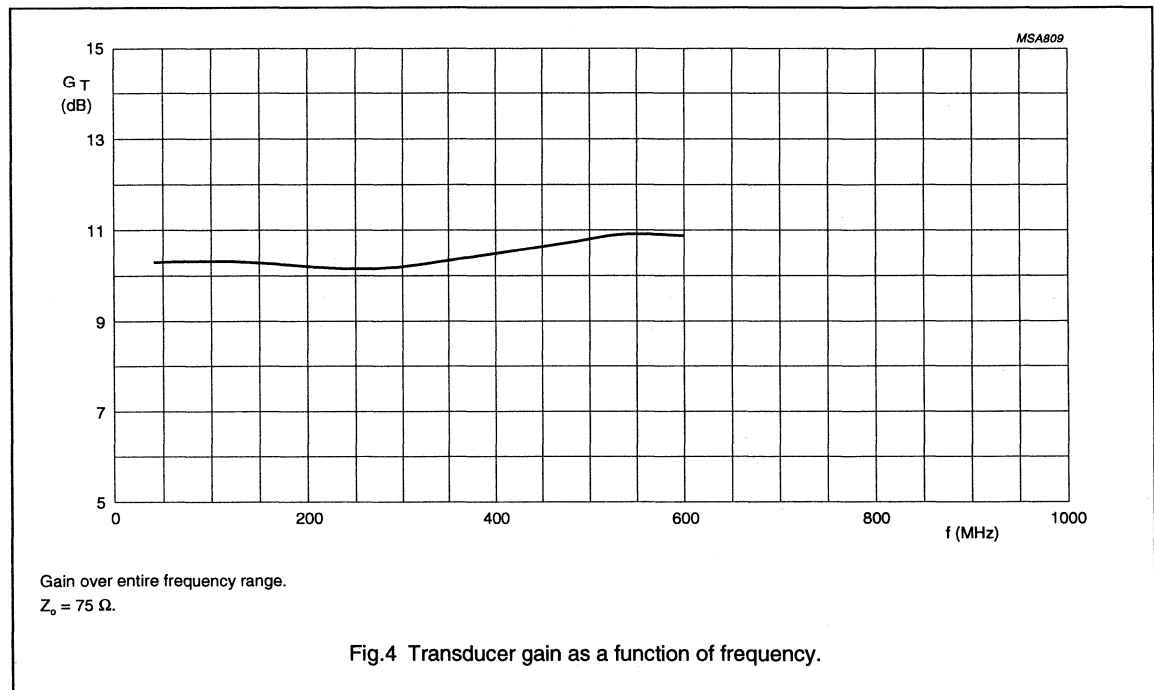


Fig.4 Transducer gain as a function of frequency.

Wideband amplifier module

OM2081/60

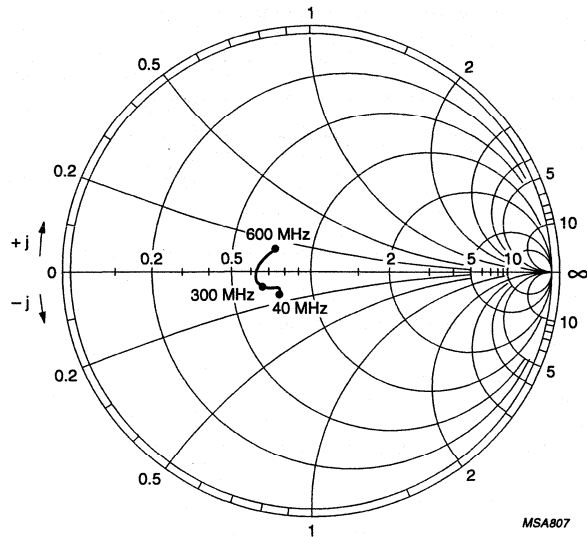


Fig.5 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

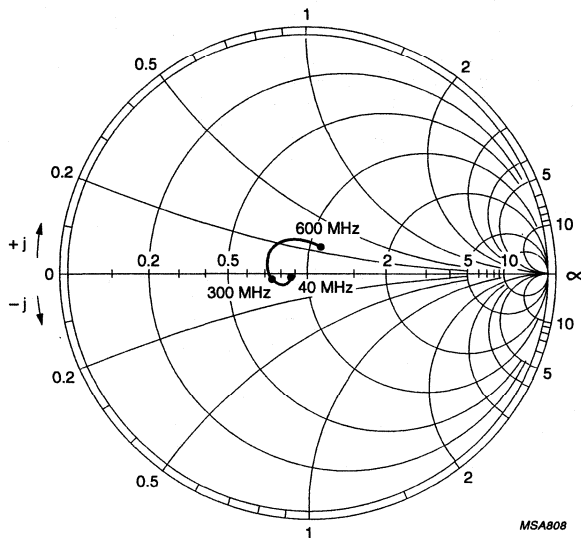


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.

## Wideband amplifier module

OM2081/60

**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75  $\Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

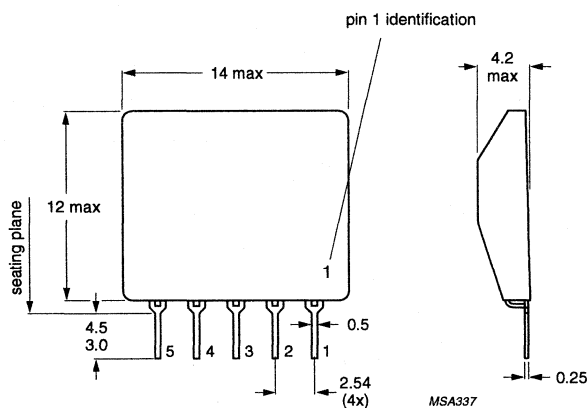
**Dip or wave soldering**

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**PACKAGE OUTLINE**

Dimensions in mm.

Fig.7 Resin coated encapsulation.



## Wideband amplifier module

OM2081/86

## DESCRIPTION

A one-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	common
5	output/supply (+)

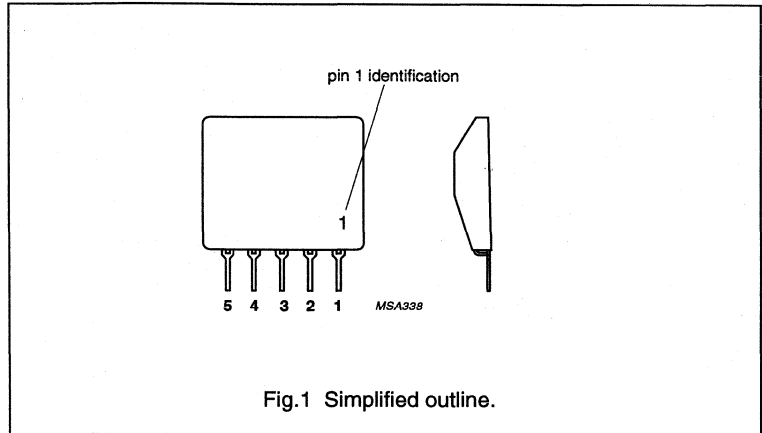


Fig.1 Simplified outline.

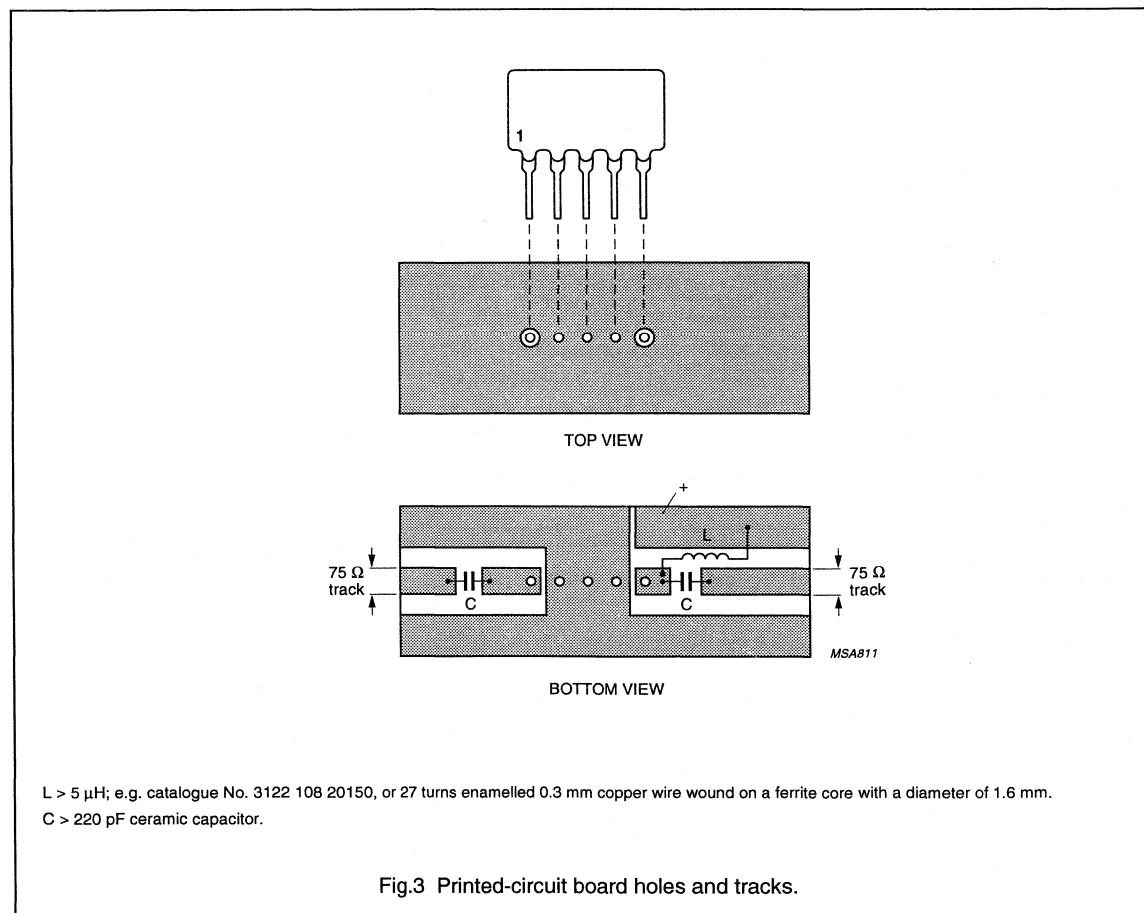
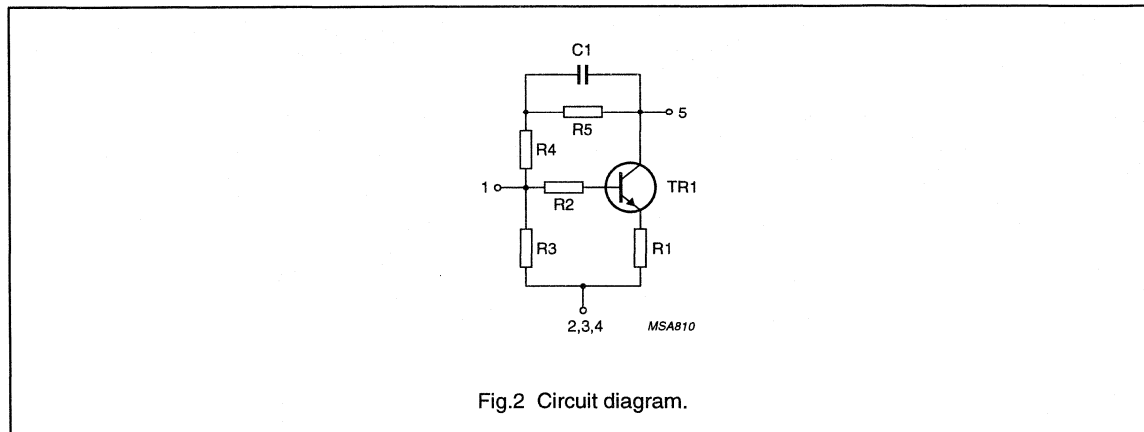
## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		10.0	10.5	12.0	dB
$\Delta G_T$	flatness of frequency response		–	1	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB 2nd order intermodulation (2-tone) 3rd order intermodulation (3-tone)	104 114	105 115	– –	dB $\mu$ V dB $\mu$ V
F	noise figure		–	7.5	8.0	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		–20	–	+70	$^{\circ}$ C

Wideband amplifier module

OM2081/86

CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD



## Wideband amplifier module

OM2081/86

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 5	-	100	mW

## CHARACTERISTICS

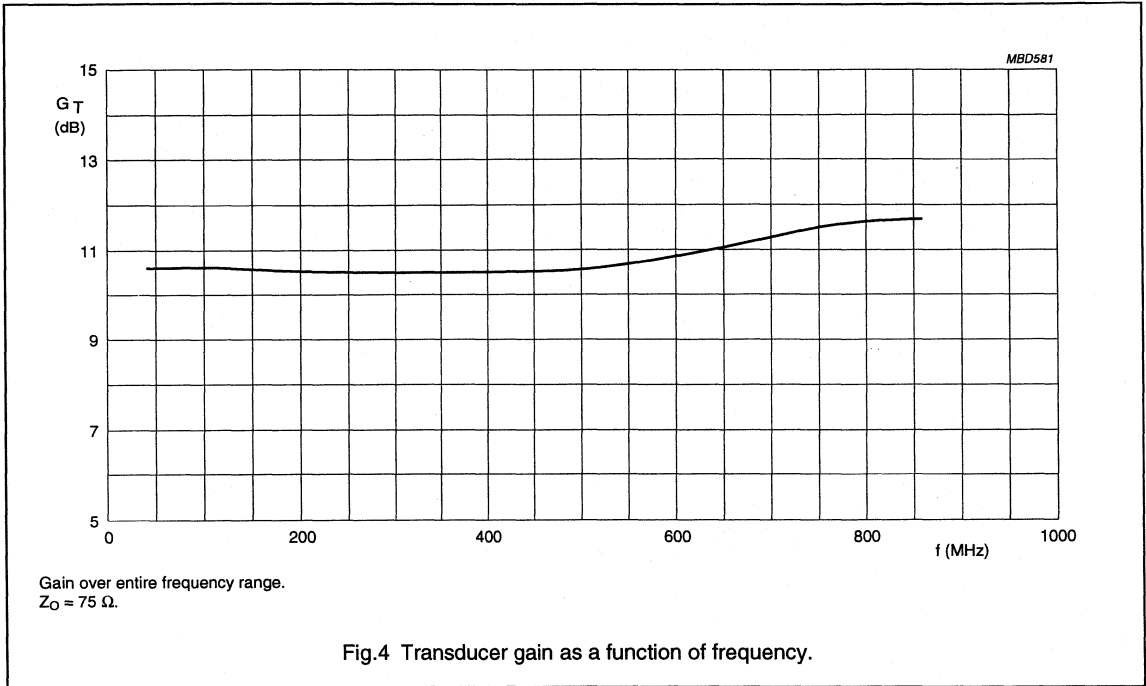
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	860	MHz
<b>Performance</b>						
$I_B$	supply current		60	65	70	mA
$G_T$	transducer gain = $ S_{21} ^2$		10	11	12	dB
$\Delta G_T$	flatness of frequency response		-	1	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note 1	-	1.5	1.6	
$VSWR_{out}$	individual maximum VSWR	output; note 1	-	1.3	1.4	
$ S_{12} ^2$	back attenuation	f = 100 MHz	15	16	-	dB
		f = 600MHz	13	14	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	104	105	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	114	115	-	dB $\mu$ V
F	noise figure		-	7.5	8.0	dB
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
f	frequency range		40	-	860	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

## Note

- Highest value (for sample) occurring in the frequency range.

Wideband amplifier module

OM2081/86



Wideband amplifier module

OM2081/86

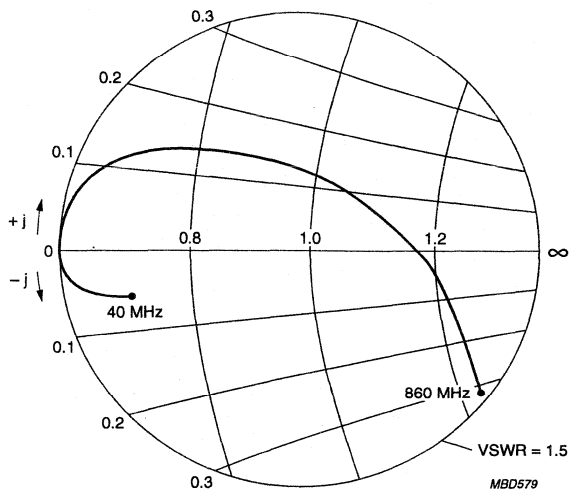


Fig.5 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

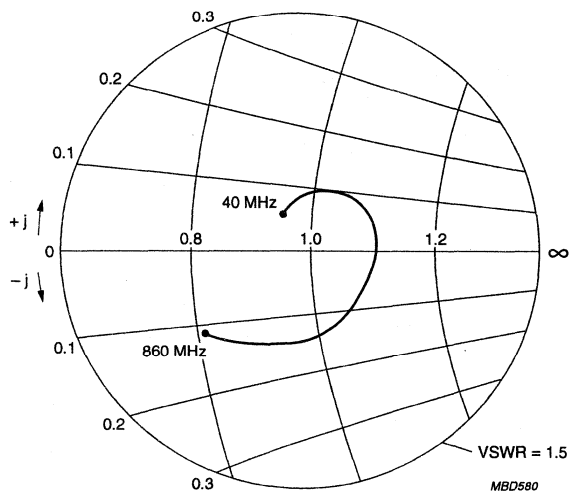


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.

## Wideband amplifier module

OM2081/86

**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75  $\Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

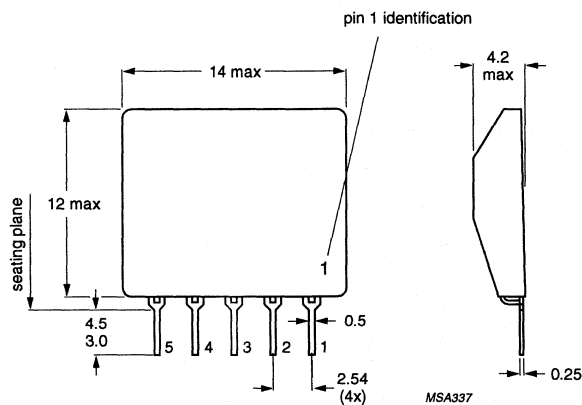
**Dip or wave soldering**

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**PACKAGE OUTLINE**

Dimensions in mm.

Fig.7 Resin coated encapsulation.

## Wideband amplifier module

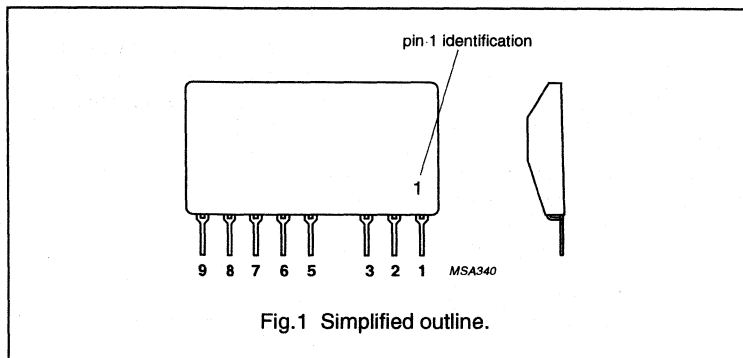
OM2082/60

## DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
5	supply (+)
6	common
7	common
8	common
9	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	600	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		20	21	–	dB
$\Delta G_T$	flatness of frequency response		–	1	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	104	105	–	dB $\mu$ V
		3rd order intermodulation (3-tone)	114	115	–	dB $\mu$ V
F	noise figure		–	7.5	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		–20	–	+70	$^{\circ}$ C

Wideband amplifier module

OM2082/60

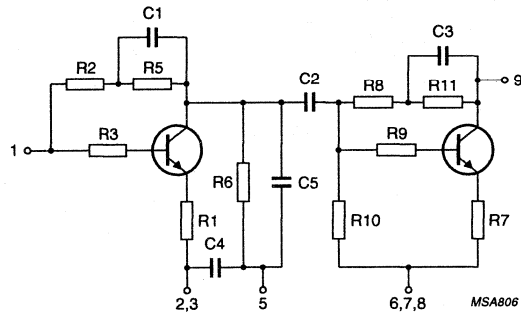
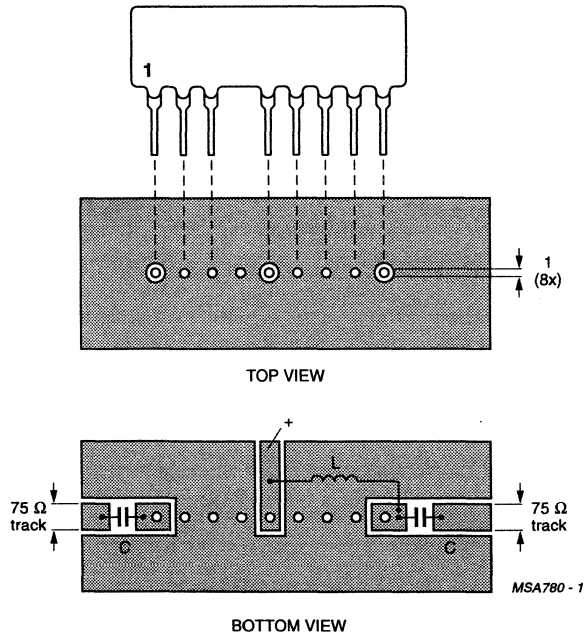


Fig.2 Circuit diagram.



L > 5  $\mu$ H; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 C > 1.5 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.



## Wideband amplifier module

OM2082/60

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 9	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_s$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_o$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	600	MHz
<b>Performance</b>						
$I_B$	supply current		-	145	150	mA
$G_T$	transducer gain = $ S_{21} ^2$		19	20	21	dB
$\Delta G_T$	flatness of frequency response		-	1	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note <sup>(1)</sup>	-	1.5	1.6	
$VSWR_{out}$	individual maximum VSWR	output; note <sup>(1)</sup>	-	1.6	1.7	
$ S_{12} ^2$	back attenuation	f = 100 MHz	-	16	-	dB
		f = 600MHz	-	14	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	104	105	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	114	115	-	dB $\mu$ V
F	noise figure		-	7.5	-	dB

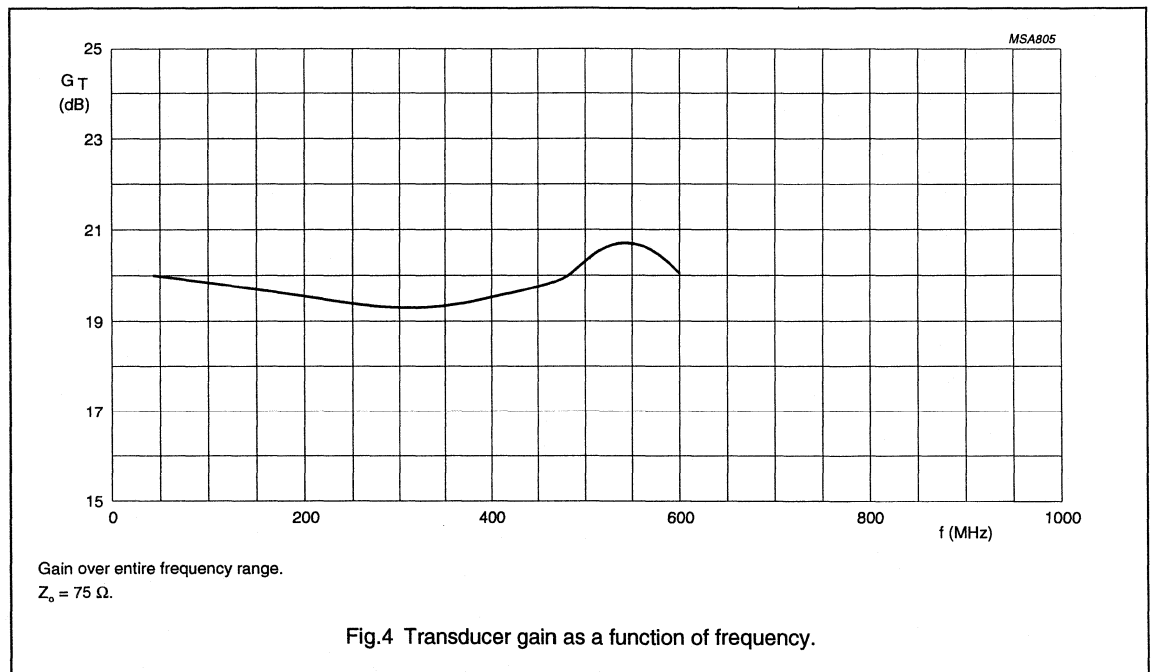
# Wideband amplifier module

OM2082/60

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
$f$	frequency range		40	-	600	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

**Note to the characteristics**

1. Highest value (for sample) occurring in the frequency range.



Wideband amplifier module

OM2082/60

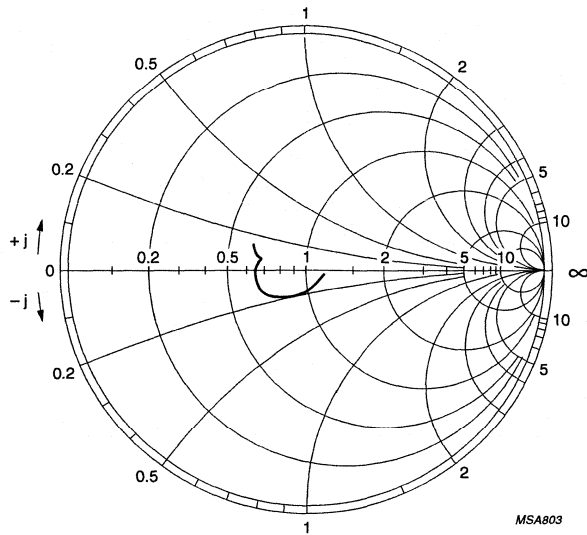


Fig.5 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

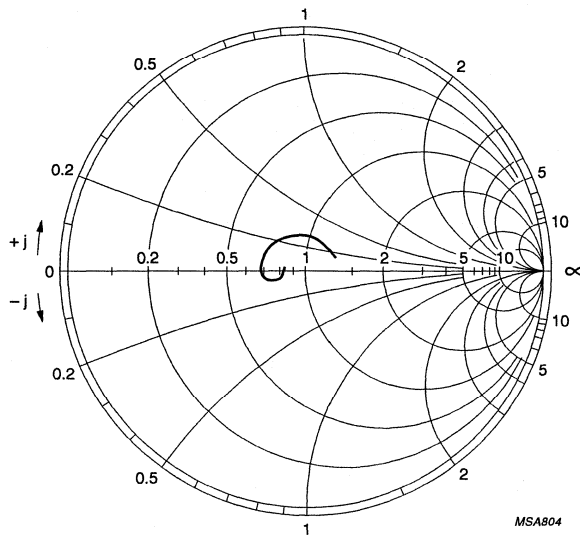


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.

## Wideband amplifier module

OM2082/60

**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75  $\Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

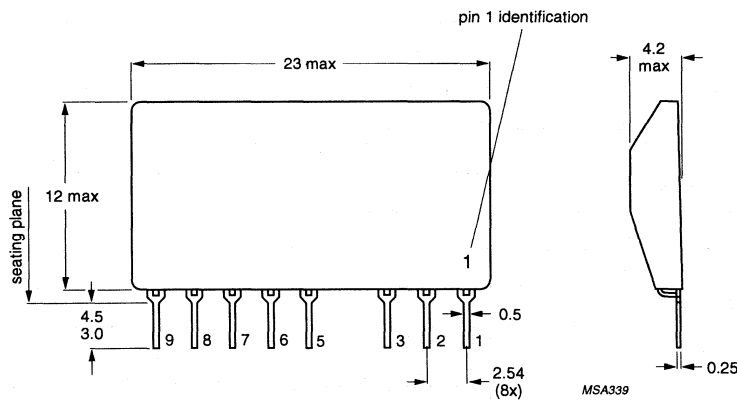
**Dip or wave soldering**

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**PACKAGE OUTLINE**

Dimensions in mm.

Fig.7 Resin coated encapsulation.

## Wideband amplifier module

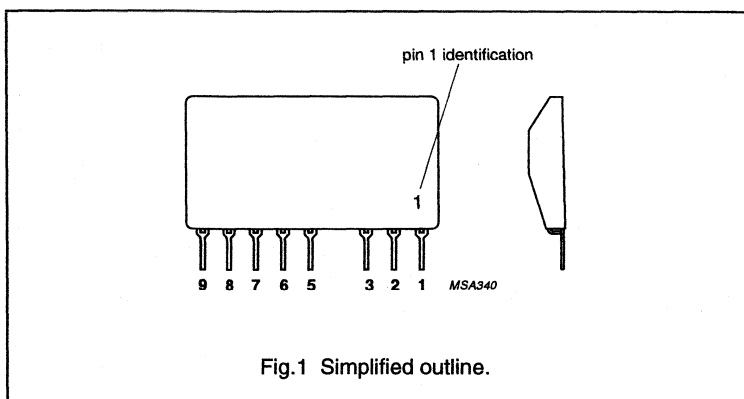
OM2082/86

## DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	supply (+)
5	common
6	common
7	common
8	common
9	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		17	19	21	dB
$\Delta G_T$	flatness of frequency response		–	2	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB 2nd order intermodulation (2-tone) 3rd order intermodulation (3-tone)	103 110	104 111	–	$dB\mu V$ $dB\mu V$
F	noise figure		–	7.5	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		-20	–	+70	$^{\circ}C$

Wideband amplifier module

OM2082/86

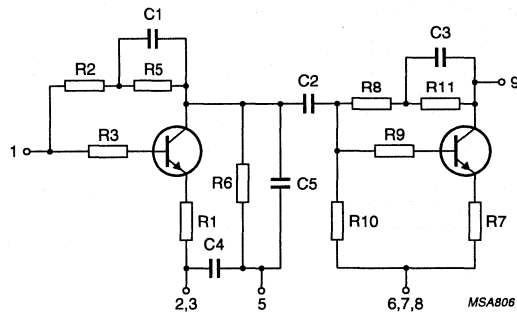
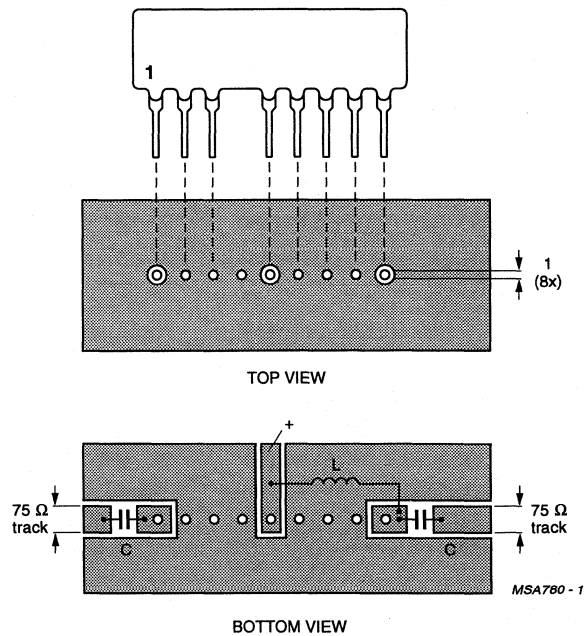


Fig.2 Circuit diagram.



L > 5  $\mu$ H; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 C > 1.5 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## Wideband amplifier module

OM2082/86

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 5	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	860	MHz
<b>Performance</b>						
$I_B$	supply current		-	145	150	mA
$G_T$	transducer gain = $ S_{21} ^2$		17	19	21	dB
$\Delta G_T$	flatness of frequency response		-	2	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note <sup>(1)</sup>	-	1.7	1.9	
$VSWR_{out}$	individual maximum VSWR	output; note <sup>(1)</sup>	-	1.4	1.6	
$ S_{12} ^2$	back attenuation	f = 100 MHz	-	30	-	dB
		f = 860 MHz	-	30	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{in} = -60$ dB				
		2nd order intermodulation (2-tone)	103	104	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	110	111	-	dB $\mu$ V
F	noise figure		-	7.5	-	dB

Wideband amplifier module

OM2082/86

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
$f$	frequency range		40	-	860	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

**Note to the characteristics**

1. Highest value (for sample) occurring in the frequency range.

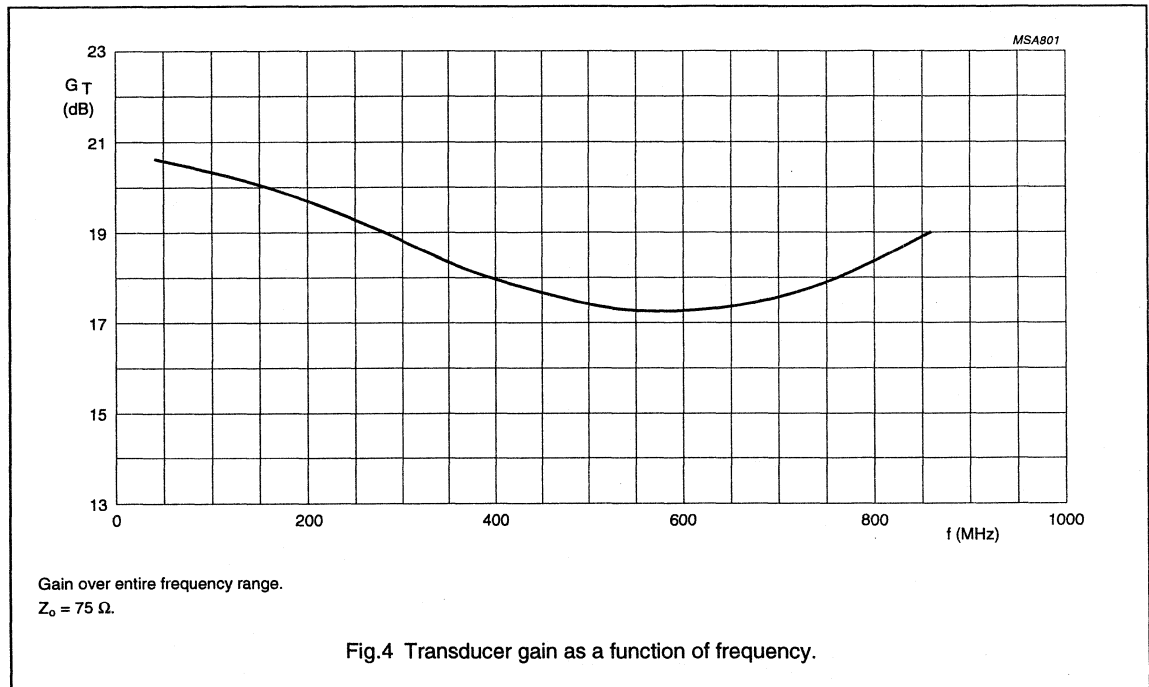


Fig.4 Transducer gain as a function of frequency.



## Wideband amplifier module

OM2082/86

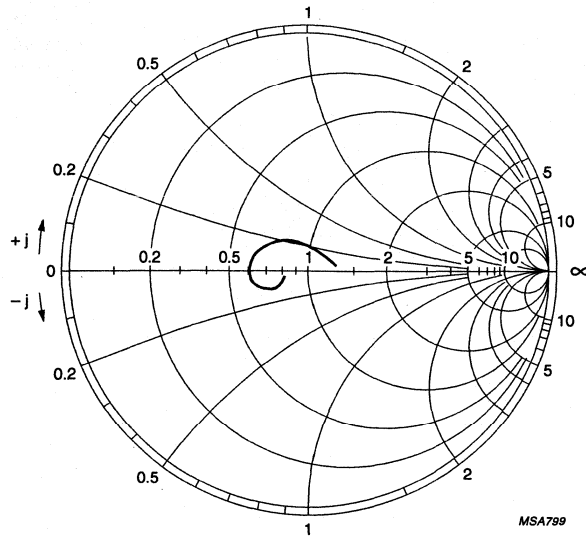


Fig.5 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

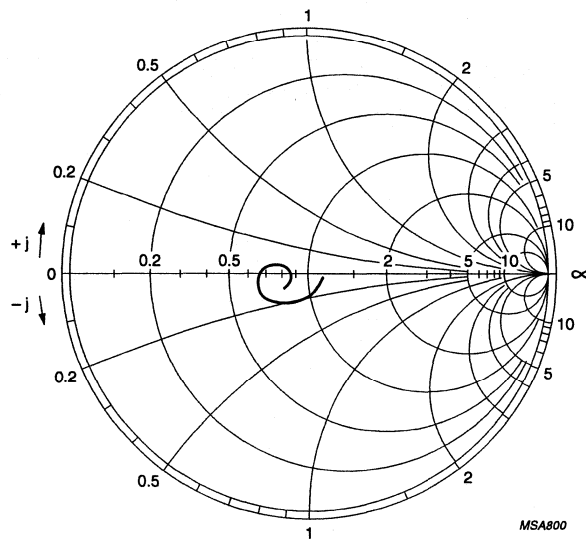


Fig.6 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.

# Wideband amplifier module

OM2082/86

## MOUNTING

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.

## SOLDERING

### Hand soldering

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

### Dip or wave soldering

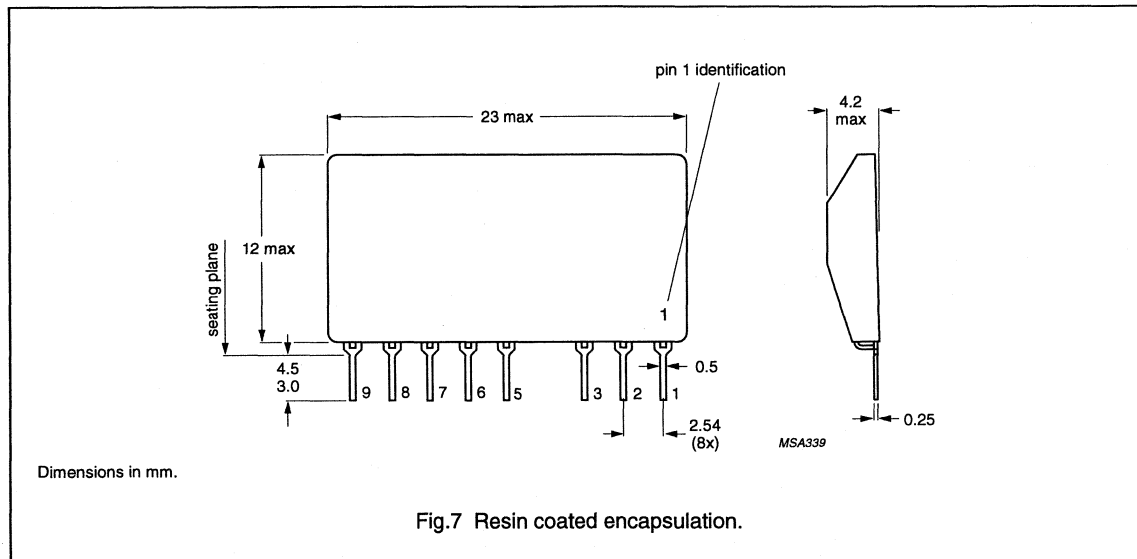
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

## PACKAGE OUTLINE



## Wideband amplifier module

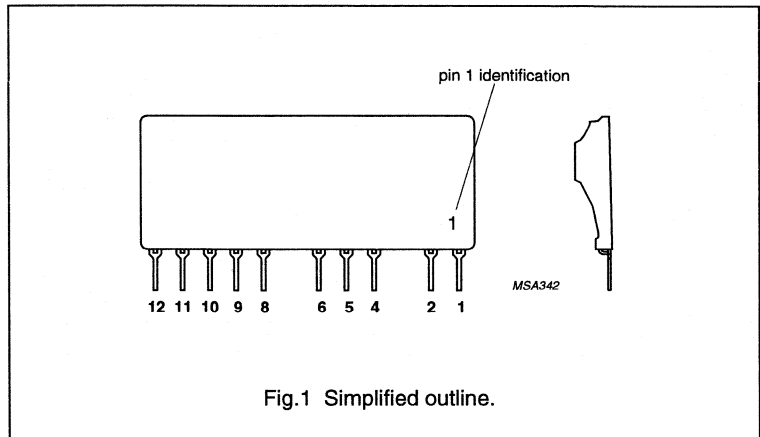
OM2083/60

## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
4	supply (+)
5	common
6	common
8	supply (+)
9	common
10	common
11	common
12	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	600	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		28	29	30	dB
$\Delta G_T$	flatness of frequency response		–	1	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	103	104	–	$\text{dB}\mu\text{V}$
		3rd order intermodulation (3-tone)	113	114	–	$\text{dB}\mu\text{V}$
F	noise figure		–	6.5	–	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		-20	–	+70	$^{\circ}\text{C}$

Wideband amplifier module

OM2083/60

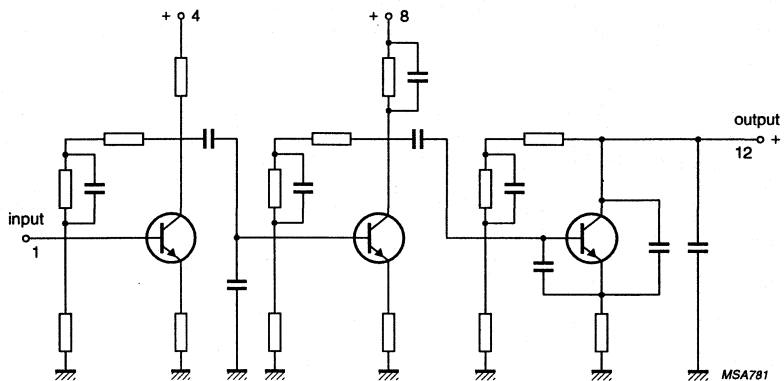
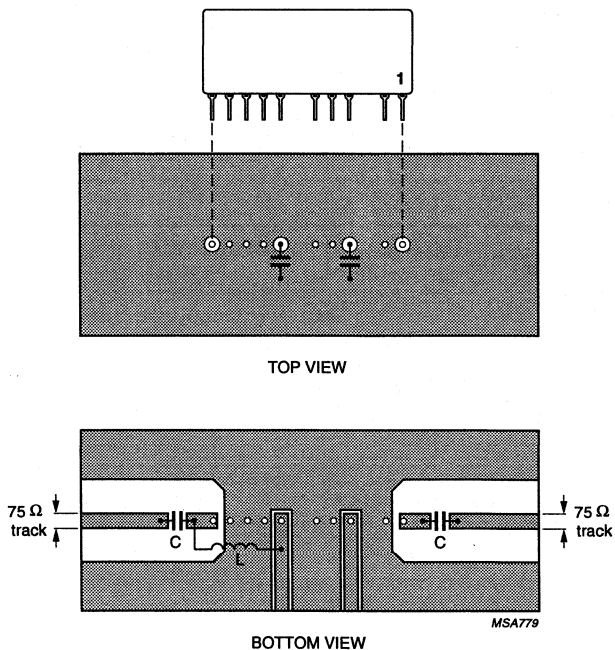


Fig.2 Circuit diagram.



BOTTOM VIEW

L > 5  $\mu$ H; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter  $\phi$  1.6 mm.  
 C > 1 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## Wideband amplifier module

OM2083/60

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 12	-	100	mW

## CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	600	MHz
<b>Performance</b>						
$I_B$	supply current		-	175	-	mA
$G_T$	transducer gain = $ S_{21} ^2$		28	29	30	dB
$\Delta G_T$	flatness of frequency response		-	1	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note <sup>(1)</sup>	-	1.2	1.35	
$VSWR_{out}$	individual maximum VSWR	output; note <sup>(1)</sup>	-	1.3	1.35	
$ S_{12} ^2$	back attenuation	f = 100 MHz	-	50	-	dB
		f = 600 MHz	-	40	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	103	104	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	113	114	-	dB $\mu$ V
F	noise figure		-	6.5	7.5	dB

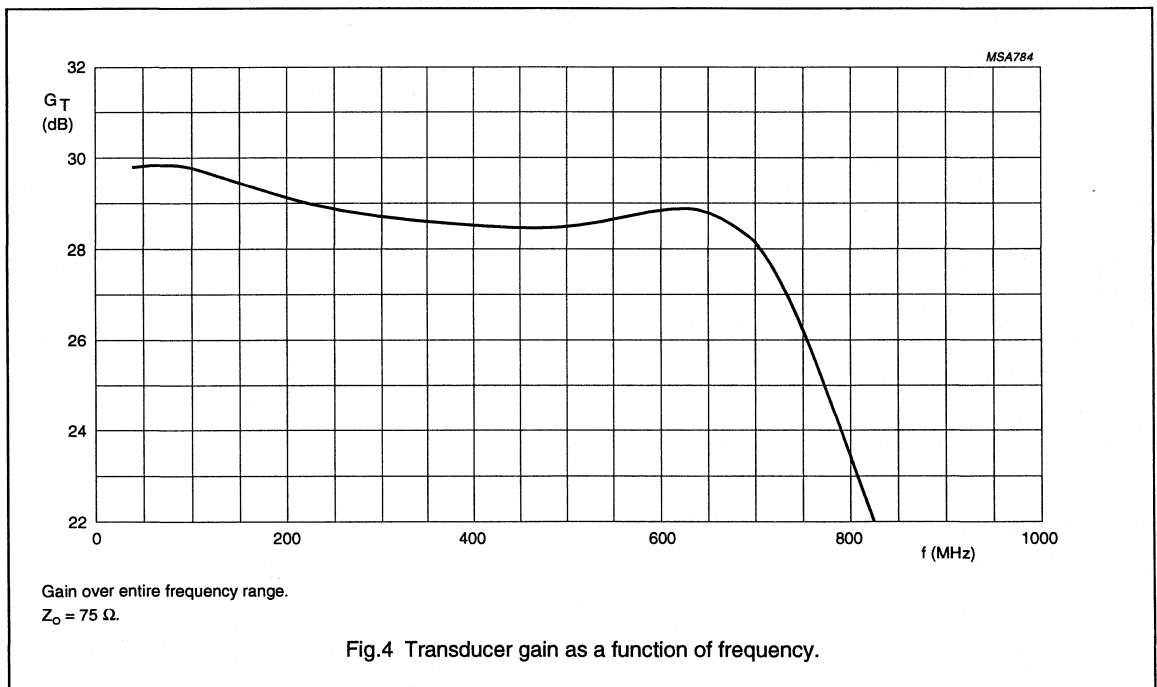
## Wideband amplifier module

OM2083/60

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
$f$	frequency range		40	-	600	MHz
$Z_s$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

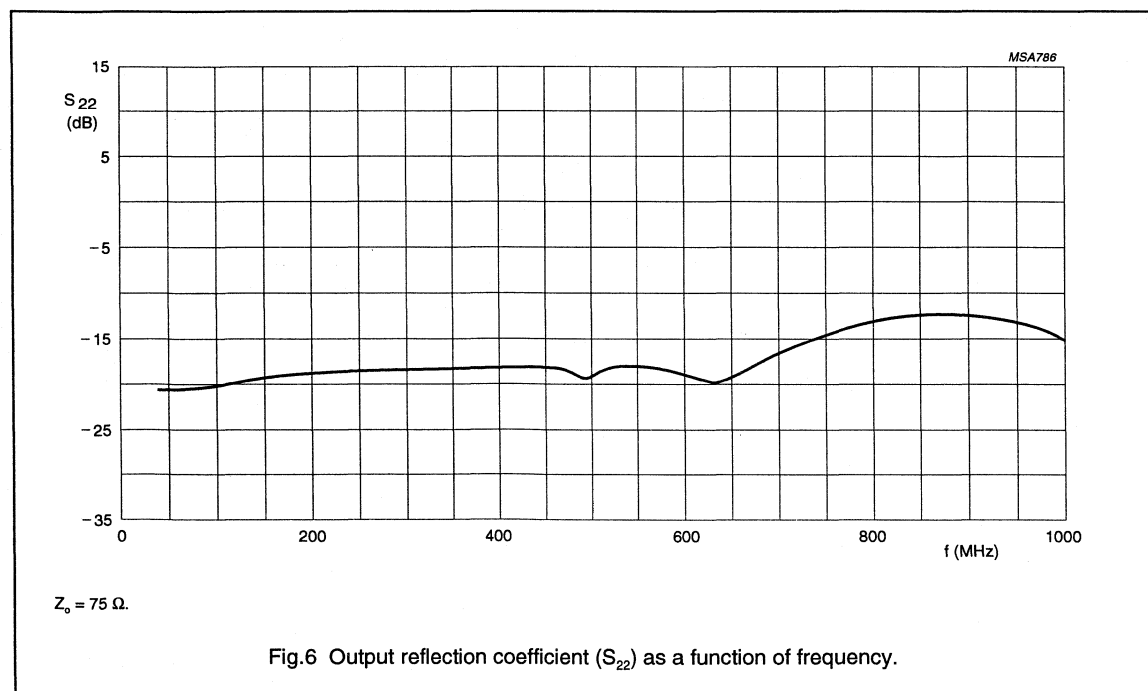
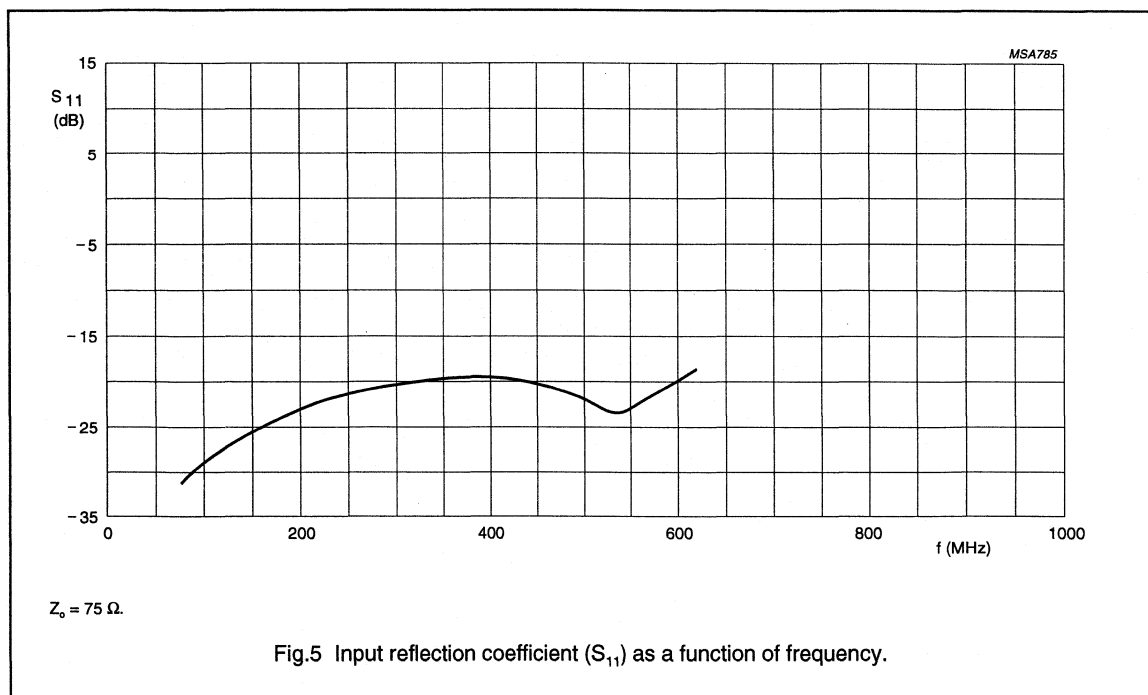
**Note to the characteristics**

1. Highest value (for sample) occurring in the frequency range.



## Wideband amplifier module

OM2083/60



Wideband amplifier module

OM2083/60

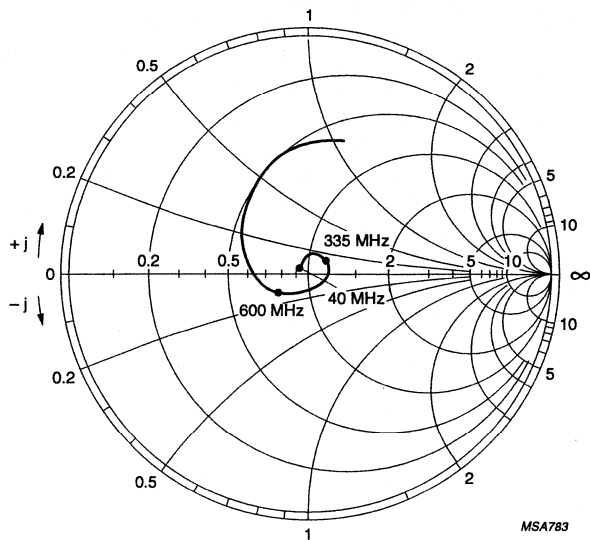


Fig.7 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

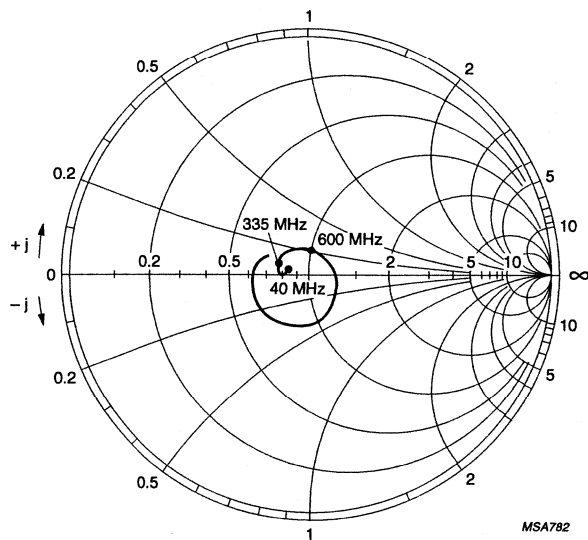


Fig.8 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.



## Wideband amplifier module

OM2083/60

**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75  $\Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of 260  $^{\circ}\text{C}$  up to the seating plane is 5 s.

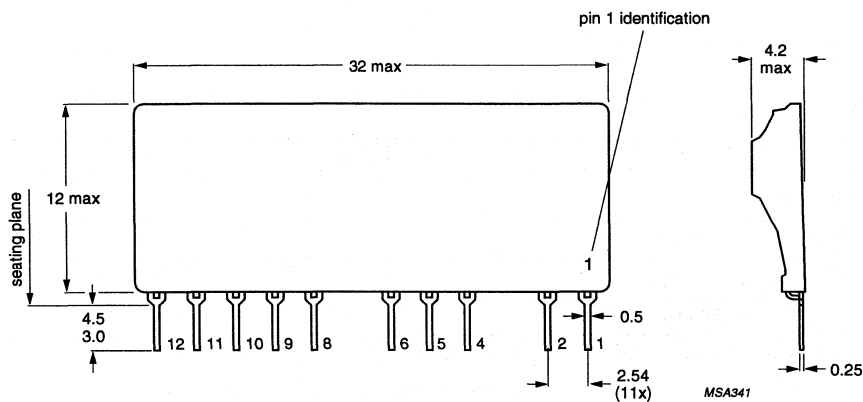
**Dip or wave soldering**

The maximum permissible temperature for the solder is 260  $^{\circ}\text{C}$ . It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125  $^{\circ}\text{C}$ .

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

**PACKAGE OUTLINE**

Dimensions in mm.

Fig.9 Resin coated encapsulation.

## Wideband amplifier module

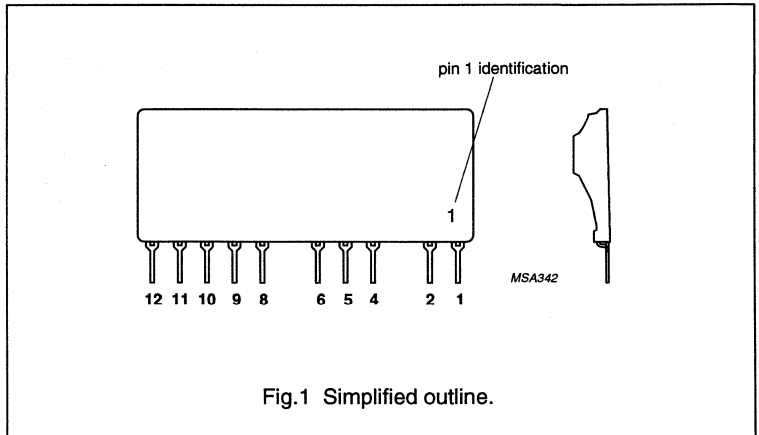
OM2083/86

## DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

## PINNING

PIN	DESCRIPTION
1	input
2	common
4	supply (+)
5	common
6	common
8	supply (+)
9	common
10	common
11	common
12	output/supply (+)



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$Z_S, Z_L$	source and load impedance		–	75	–	$\Omega$
$G_T$	transducer gain = $ S_{21} ^2$		28.5	30	31.5	dB
$\Delta G_T$	flatness of frequency response		–	1.5	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	102 <sup>(1)</sup>	103	–	dB $\mu$ V
		3rd order intermodulation (3-tone)	112	113	–	dB $\mu$ V
F	noise figure		–	7	7.5	dB
$V_B$	DC supply voltage		10.8	12	13.2	V
$T_{amb}$	ambient operating temperature		–20	–	+70	$^{\circ}$ C

## Note

- 100 dB $\mu$ V over 750 MHz.

## Wideband amplifier module

OM2083/86

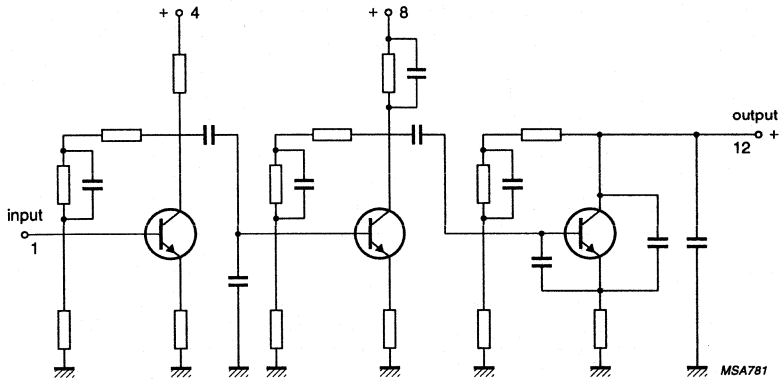
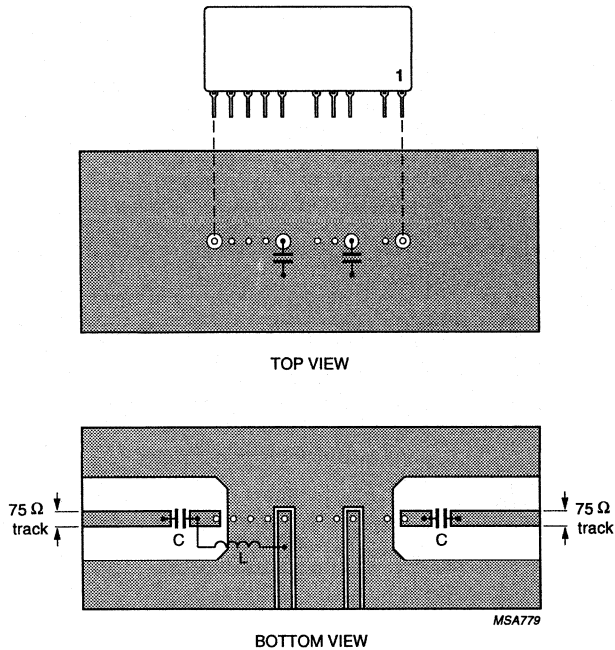


Fig.2 Circuit diagram.



$L > 5 \mu\text{H}$ ; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.  
 $C > 1 \text{ nF}$  ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

## Wideband amplifier module

OM2083/86

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$T_{amb}$	ambient operating temperature	-20	+70	°C
$T_{stg}$	storage temperature	-40	+125	°C
$V_B$	DC supply voltage	-	13.5	V
$P_{IM}$	peak incident powers on pins 1 and 12	-	100	mW

**CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Measuring conditions</b>						
$T_{amb}$	ambient operating temperature		-	25	-	°C
$V_B$	DC supply voltage		-	12	-	V
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$
$Z_O$	characteristic impedance of HF connections		-	75	-	$\Omega$
f	frequency range		40	-	860	MHz
<b>Performance</b>						
$I_B$	supply current		-	165	-	mA
$G_T$	transducer gain = $ S_{21} ^2$		28	30	32	dB
$\Delta G_T$	flatness of frequency response		-	1.5	-	dB
$VSWR_{in}$	individual maximum VSWR	input; note <sup>(1)</sup>	-	1.9	2.0	
$VSWR_{out}$	individual maximum VSWR	output; note <sup>(1)</sup>	-	1.7	1.8	
$ S_{12} ^2$	back attenuation	f = 100 MHz	-	45	-	dB
		f = 860 MHz	-	40	-	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60$ dB				
		2nd order intermodulation (2-tone)	102 <sup>(2)</sup>	103	-	dB $\mu$ V
		3rd order intermodulation (3-tone)	112	113	-	dB $\mu$ V
F	noise figure		-	7	7.5	dB

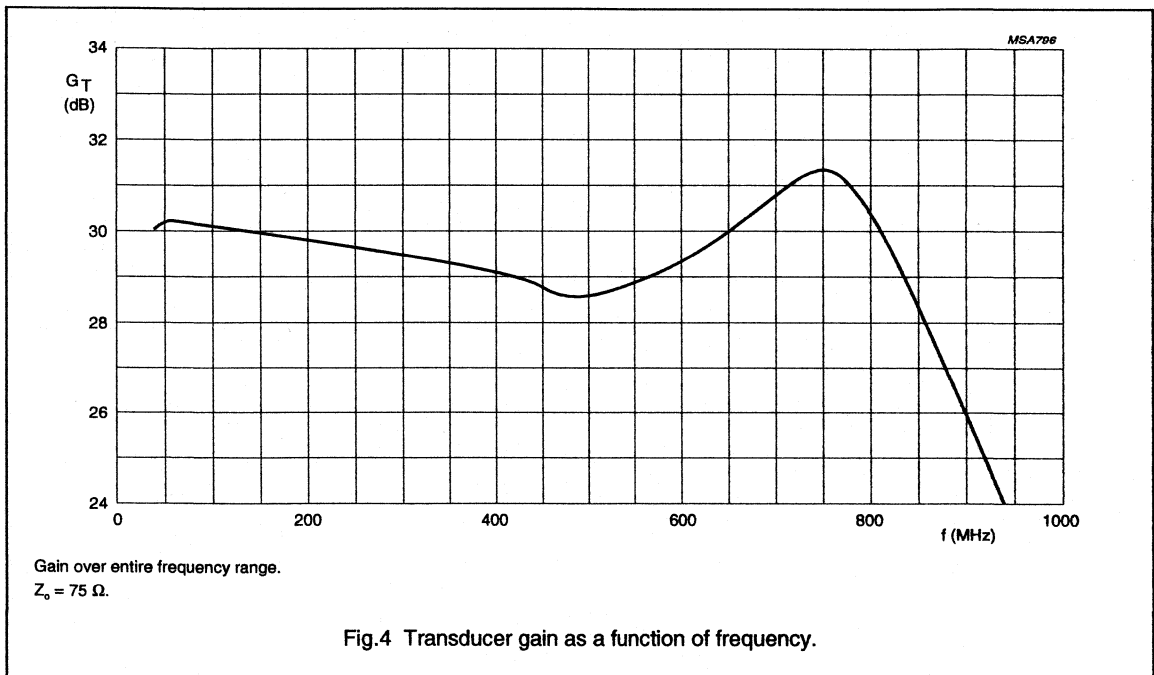
## Wideband amplifier module

OM2083/86

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Operating conditions</b>						
$T_{amb}$	ambient operating temperature		-20	-	+70	°C
$V_B$	DC supply voltage		10.8	12	13.2	V
$f$	frequency range		40	-	860	MHz
$Z_S$	source impedance		-	75	-	$\Omega$
$Z_L$	load impedance		-	75	-	$\Omega$

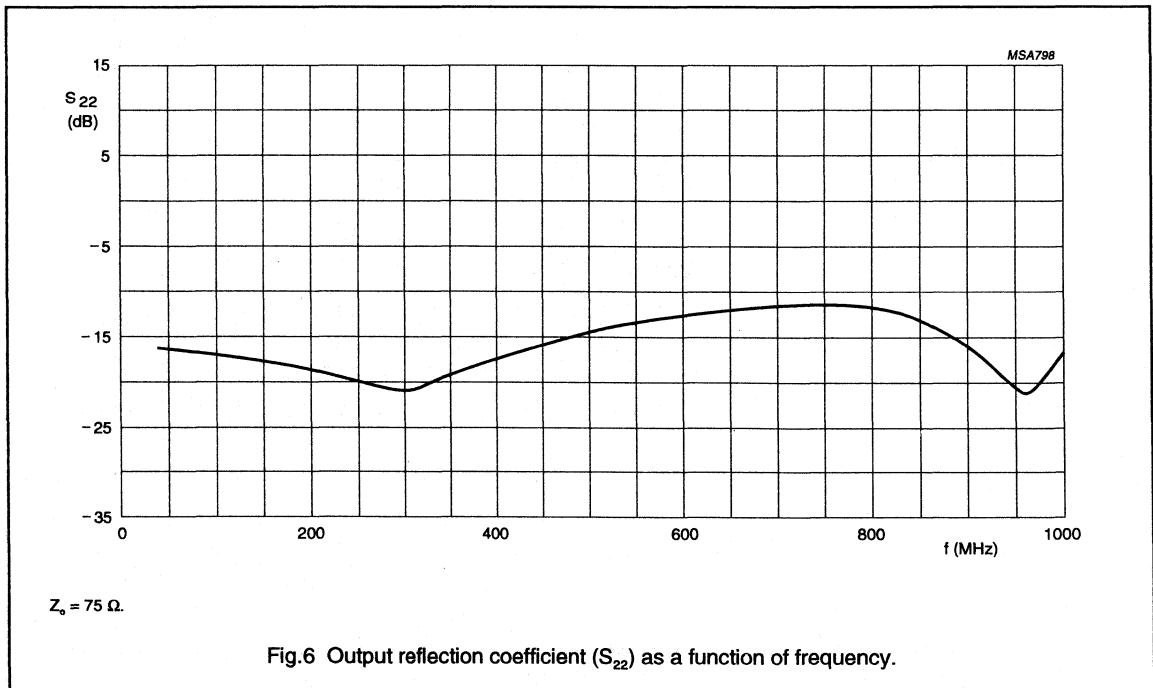
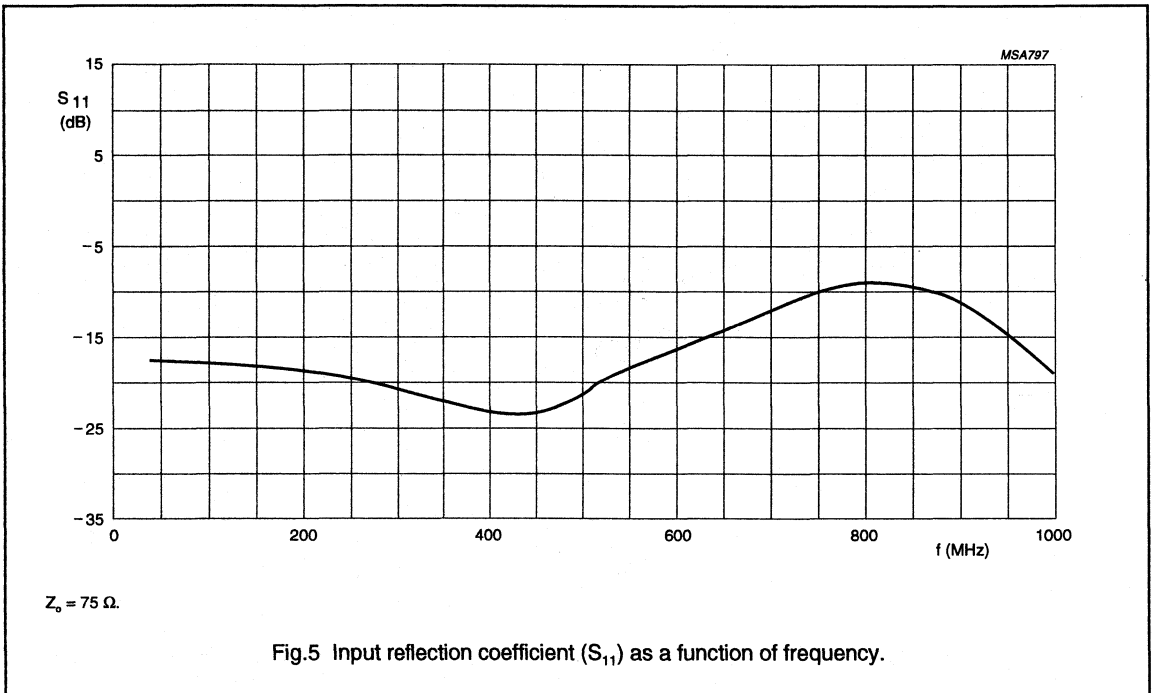
**Notes to the characteristics**

1. Highest value (for sample) occurring in the frequency range.
2. 100 dB $\mu$ V over 750 MHz.



Wideband amplifier module

OM2083/86



Wideband amplifier module

OM2083/86

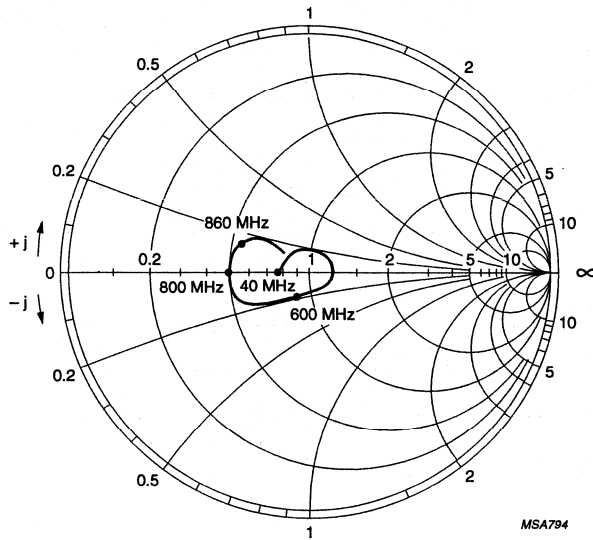


Fig.7 Input impedance derived from input reflection coefficient ( $S_{11}$ ), co-ordinates in ohms x 75; typical values.

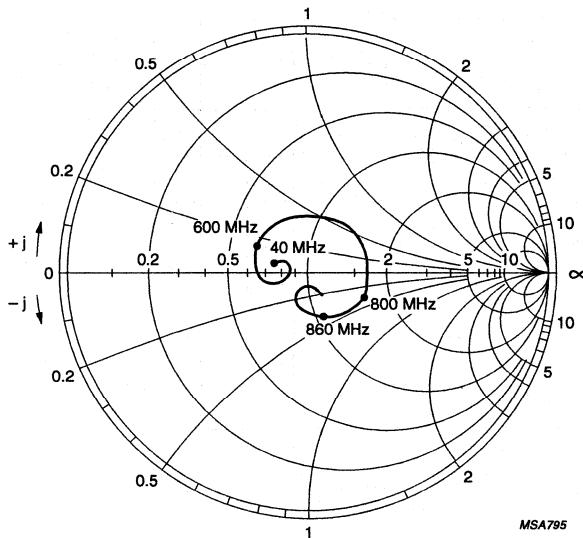


Fig.8 Output impedance derived from output reflection coefficient ( $S_{22}$ ), co-ordinates in ohms x 75; typical values.

## Wideband amplifier module

OM2083/86

**MOUNTING**

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75  $\Omega$  tracks. The connection to the common pins should be as close to the seating plane as possible.

**SOLDERING****Hand soldering**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

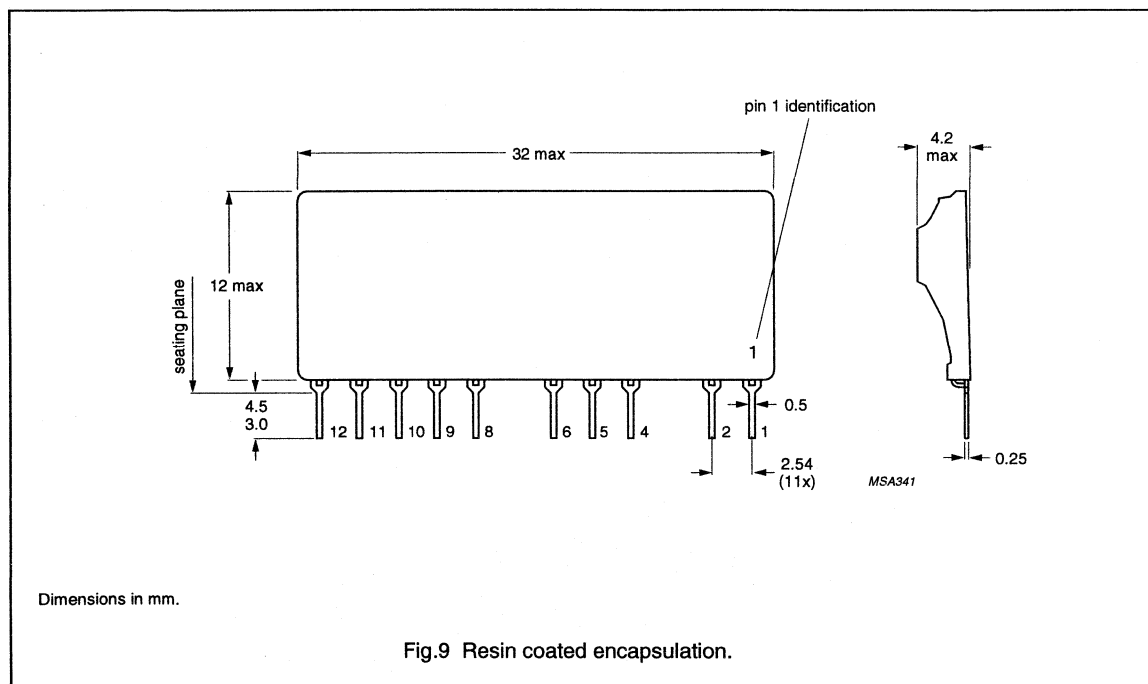
**Dip or wave soldering**

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

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**DATA HANDBOOK SYSTEM**

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