Wideband Hybrid IC Modules

DATA HANDBOOK

BOOK SC16 1994

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

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DEFINITIONS

Data sheet status	
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.
Limiting values	
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.	
Application information	
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.

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SELECTION GUIDE

CATV AMPLIFIER MODULES

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BGD102	40 to 450	18 to 19	0.5 to 2.5	power doubler	39
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BGD106	40 to 450	21.5 to 22.5	0 to 2	power doubler	41
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BGD504 (note 1)	40 to 550	19.5 to 20.5	0.2 to 2.2	power doubler	45
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BGD602 (note 2)	40 to 600	18 to 19	0.2 to 2.2	power doubler	58
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BGE884	40 to 860	16.5 to17.5	0.2 to 1.4	amplifier	83
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BGX881	40 to 860	12 to 13	0.2 to 1.4	amplifier	89
BGX885N	40 to 860	16.5 to 17.5	0.2 to 1.4	amplifier	92
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BGY61	5 to 200	12.5 to 13.5 (note 4)	−0.2 to +0.5	reverse amplifier	97
BGY65	5 to 200	18 to 19 (note 4)	−0.2 to +0.5	reverse amplifier	99
BGY67	5 to 200	21.5 to 22.5 (note 4)	−0.2 to +0.5	reverse amplifier	101
BGY67A	5 to 200	23.5 to 24.5 (note 4)	−0.2 to +0.5	reverse amplifier	103
BGY80	40 to 450	12 to 13	0.2 to 1.5	pre-amplifier	105
BGY81	40 to 450	12 to 13	0.2 to 1.5	final amplifier	105
BGY82	40 to 450	13.5 to 14.5	0.2 to 1.5	pre-amplifier	107
BGY83	40 to 450	13.5 to 14.5	0.2 to 1.5	amplifier	107
BGY84	40 to 450	16.5 to 17.5	0.5 to 1.5	pre-amplifier	110
BGY84A	40 to 450	18 to 18.8	0.3 to 1.5	pre-amplifier	113
BGY85	40 to 450	16.5 to 17.5	0.5 to 1.5	final amplifier	110
BGY85A	40 to 450	18 to 18.8	0.3 to 1.5	final amplifier	113
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CATV AMPLIFIER MODULES (continued)

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BGY86	40 to 450	21.5 to 22.5	0 to 1.5	pre-amplifier	119
BGY87	40 to 450	21.5 to 22.5	0 to 1.5	final amplifier	119
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BGY88	40 to 450	33.5 to 35.5	0.5 to 2.5	line extender	123
BGY89	40 to 450	37 to 39	0 to 2.5	line extender	125
BGY580	40 to 550	12 to 13	0.5 to 2	pre-amplifier	127
BGY581	40 to 550	12 to 13	0.5 to 2	final amplifier	127
BGY582	40 to 550	13.5 to 14.5	0.2 to 1.5	pre-amplifier	130
BGY583	40 to 550	13.5 to 14.5	0.2 to 1.5	amplifier	130
BGY584 (note 1)	40 to 550	16.5 to 17.5	0.5 to 2	pre-amplifier	133
BGY584A (note 1)	40 to 550	17.7 to 18.7	0.5 to 2	pre-amplifier	136
BGY585 (note 1)	40 to 550	16.5 to 17.5	0.5 to 2	final amplifier	133
BGY585A (note 1)	40 to 550	17.7 to 18.7	0.5 to 2	final amplifier	136
BGY586	40 to 550	21.5 to 22.5	0.2 to 1.5	pre-amplifier	141
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BGY681 (note 2)	40 to 600	12 to 13	0.7 to 2.2	amplifier	148
BGY683 (note 2)	40 to 600	13.5 to 14.5	0.2 to 1.7	amplifier	152
BGY685 (note 2)	40 to 600	16.5 to 17.5	0.5 to 2.2	amplifier	156
BGY685A/04 (note 2)	40 to 600	17.7 to 18.7	0.5 to 2.2	amplifier	160
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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	172
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BGY787	40 to 750	21 to 22	0 to 1.5	amplifier	178
BGY883	40 to 860	14.5 to 15.5	0 to 2	amplifier	183
BGY885A	40 to 860	18 to 19	0 to 2	amplifier	185
BGY885B	40 to 860	19.5 to 20.5	0 to 2	amplifier	191
BGY887B	40 to 860	28.5 to 29.5	0.5 to 2.5	amplifier	193
BGY887BO	40 to 860	–	–	optical receiver	198
BGY1085A	40 to 100	18 to 19	0 to 2	amplifier	200

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.

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/μV) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM2045	11.5	1	12	3.6	99	2.0	1.4	239
OM2050	18	2	18	5.2	100	1.5	1.9	251
OM2052	42	2	28	4.5	107	2.2	2.1	257
OM2060	56	3	23	5.4	107	1.4	1.6	263
OM2063	52	3	29	3.6	105	2.3	1.4	269
OM2064	51	3	28	4.4	107	1.3	1.5	276
OM2070	100	3	28	4.8	112	2.3	1.9	283

'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/μV) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM2046	82	1	10	10	114	1.5	1.4	245
OM2070B	100	3	30	4.8	112	2.7	1.9	289
OM2081/60	85	1	10	7.5	115	1.5	1.3	295
OM2082/60	145	2	20	7.5	114	1.5	1.6	301
OM2082/86	145	2	19	7.5	114	1.7	1.4	307
OM2083/60	175	3	29	6.5	114	1.2	1.3	313
OM2083/86	165	3	30	7	112	1.9	1.7	320

'Satellite band'; 12 V supply voltage (note 1)

TYPE	SUPPLY CURRENT (mA)	STAGES	GAIN (dB)	NOISE FIGURE (dB)	$V_{O(RMS)}$ TYP. VALUES (dB/μV) (note 1)	MAX. VSWR TYP. VALUES (note 2)		PAGE
						INPUT	OUTPUT	
OM926	28	2	16	6.5	103	1.8	1.7	219
OM926E	37.5	2	20	6.5	105	2.1	2.0	226
OM956/1	57.5	3	18.5	4.5	112 (note 3)	2.0	1.7	232

Notes

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

GENERAL

QUALITY

Total Quality Management

Philips Semiconductors are 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:

quality assurance

based on ISO 9000 standards, customer standards such as Ford Q1 and IBM MDQ, and the CECC system of conformity. Our factories are certified to ISO 9000 and CECC by external inspectorates

partnerships with customers

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

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 OEM (original equipment manufacturer) equipment, component reliability must be extremely high. Our research laboratories and development departments study the failure mechanisms of semiconductors. Their studies have resulted 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.

QUALITY TESTING

The TQM system of Philips Semiconductors ensures that quality is built-in during the design, development and manufacturing stages of semiconductors. In TQM, quality testing continuously verifies product conformance to the specifications and to product reliability.

Conformance test programmes

ACCEPTANCE TESTS (GROUP A TESTS)

Acceptance tests on finished products verify conformance to the final device specification. The test results are used for quality feedback and corrective actions.

PERIODIC INSPECTIONS (GROUP B TESTS)

These measure and monitor the conformance of final products to the required level of quality for processing in OEM assembly lines.

Table 1 Overview of group A tests (acceptance tests per lot)

EXAMINATION/TEST		CECC 50 000 REFERENCE	INSPECTION REQUIREMENTS	
SUBGROUP	DESCRIPTION		LEVEL	AQL (note 1)
A1	inoperative: visual/mechanical	4.2.1	II	0.1
A2a	inoperative: electrical	4.3.4	II	0.1
A2b	electrical: primary DC	4.3.4	II	0.1
A3	electrical: other DC	4.3.4	II	0.65
A4	electrical: AC	4.3.4	S4	1.0
A5	visual inspection	–	I	0.65

Note

1. Average quality level (AQL) refers to sample sizes and is not an indication of the quality of the product.

Table 2 Overview of group B tests (periodic inspections per lot)

EXAMINATION/TEST		CECC 50 000 REFERENCE	INSPECTION REQUIREMENTS	
SUBGROUP	DESCRIPTION		n (note 1)	c (note 2)
B1	dimensions (possibly checked with gauge)	4.2.2	20	0
B2a	characteristic inspection	4.3.3	20	0
B2b	complementary characteristics	4.3.3 and 4.3.4	20	0
B3	robustness of terminations, bending	4.4.9	20	0
B4	solderability, initial (0 h) and after ageing	4.4.7	20	0
B5	temperature cycling plus accelerated damp heat or sealing	4.4.4 plus 4.4.2 or 4.4.10	25	0
B8	electrical endurance (168 h)	4.5	30	0
B12	permanence of marking	4.4.12	15	0

Notes

1. n = sample size.
2. c = acceptance criterion.

QUARTERLY INSPECTIONS (GROUP C TESTS)

These measure and monitor the conformance of final products to the required level of reliability. Their purpose is to identify reliability performance trends and to collect data of failure rates and failure modes.

Table 3 Overview of group C tests (quarterly inspections for maintenance of qualification)

EXAMINATION/TEST		CECC 50 000 REFERENCE	INSPECTION REQUIREMENTS	
SUBGROUP	DESCRIPTION		n (note 1)	c (note 2)
C1	dimensions	4.2.2	20	0
C2a	characteristic inspection	4.3.3	20	0
C2b	complementary characteristics	4.3.3 and 4.3.4	20	0
C2c	verification of maximum ratings	4.3.4	15	0
C3	robustness of terminations other than B3	4.4.9	10	0
C4	soldering heat	4.4.8	20	0
C5	temperature cycling plus accelerated damp heat or sealing	4.4.4 plus 4.4.2 or 4.4.10	25	0
C6	mechanical treatment (shock and/or acceleration and/or vibration)	4.4.5, 4.4.11, 4.4.6	10	0
C7a	damp heat (cyclic) including check on solderability	4.4.2	20	0
C7b	reverse bias tropical at 85 °C, 85% RH for 1000 h	4.4.3	20	0
C8	endurance at maximum ratings, performed per test (1000 h)	4.5	30	0
C9	storage at high temperature (1000 h)	4.4.1	30	0

Notes

1. n = sample size.
2. c = acceptance criterion.

QUALIFICATION TESTS (GROUP D TESTS)

These are reliability tests to assess new or modified products or manufacturing processes.

Table 4 Overview of group D tests (qualification tests)

EXAMINATION/TEST		INSPECTION REQUIREMENTS	
SUBGROUP	**DESCRIPTION**	**n (note 1)**	**c (note 2)**
D8	endurance at maximum ratings, performed per test (> 1000 h)	30	1
D9	storage at high temperatures (> 1000 h)	30	1
D10	storage at low temperatures (> 1000 h)	30	1
D11	HAST test (unsaturated) 133 °C, 85% RH, 48 h with bias	25	1
D12	thermal shock, liquid to liquid	25	1
D13	passive flammability	25	1
D14	electrostatic discharge investigation	–	–

Notes

1. n = sample size.
2. c = acceptance criterion.

THE CECC SYSTEM

The objective of the CECC system is stated as:
'... to facilitate international trade by the publication of specifications and quality assessment procedures for electronic components and by the grant of an internationally recognized Mark and/or Certificate, of Conformity. The components produced under this system are thereby acceptable by all member countries without further testing.'

There are 15 member countries of CECC: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CECC specifications

Harmonization of specifications greatly reduces the variety of test methods and specifications of both manufacturers and users of electronic components. This harmonization takes place on:

- testing and sampling methods
- blank detail specifications, which give the standard presentation and requirements for the detail specifications of a family of components
- detail specifications of specific components.

CECC approvals

Before components can be supplied with CECC approval, the factories producing these components must have CECC manufacturer approval. For this type of approval the certification to ISO 9000 is used.

There are two types of product approval:

qualification approval	this is the approval for one component of a specific type. Approval is granted after a series of fixed tests have been successfully completed and the results have been approved by the National Supervising Inspectorate
capability approval	this is the approval for a group of components sharing a common technology. From this group a number of 'capability qualifying components' are chosen as relevant for the technological domain and represent the group in tests as in the qualification approval.

Components with CECC approval are registered in the qualified products list, CECC 00200. Products are delivered in a sealed package with the CECC mark of conformity. The sealed package may only be opened by an approved distributor.

Policy towards CECC approvals

A key element of our quality policy is the securing of CECC approval for all standard products and all production centres.

For us, CECC's comprehensive system of quality assurance and result-reporting is another aid in our quest for zero defects.

For our customers, the benefits of CECC approval are:

- a guarantee of the quality of our components
- evidence of our highly developed QA system
- knowledge that our products are ship-to-stock capable.

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 $R_{th\ j\text{-}mb}$ > 15 K/W and power types by $R_{th\ j\text{-}mb} \leq$ 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.(1) 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 (µm). 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_F, V_R, v_F, 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.

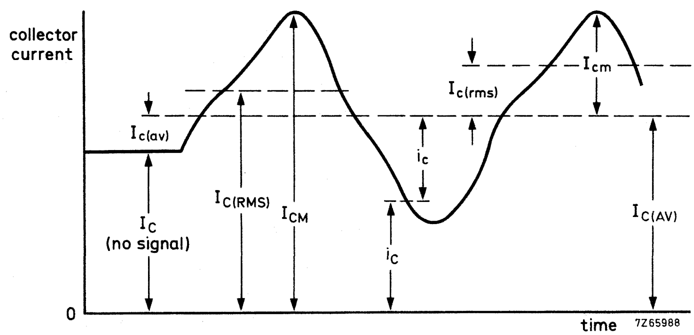


Fig.1 Collector current as a function of time.

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_f, 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_{fe}	small-signal value of the short-circuit forward current transfer ratio in common-emitter configuration
$Z_e = R_e + jX_e$	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_{fe}.

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_{fe} (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: $Z_i = R_i + jX_i$, $y_{fe} = g_{fe} + jb_{fe}$.

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 Ω (Z_o) 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.

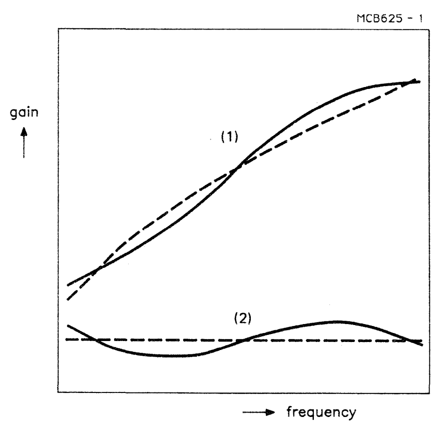
Flatness of frequency response (FL)

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.

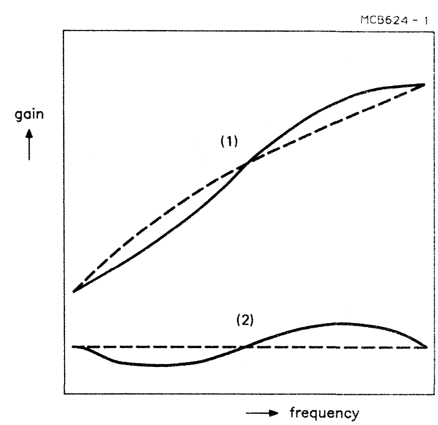
CALCULATION

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:



———	Measured gain
- - - - -	'Ideal gain' curve
(1)	Slope
(2)	After normalization for flatness

Fig.2 Gain curve before optimizing.



———	Measured gain
- - - - -	'Ideal gain' curve
(1)	Slope
(2)	After normalization for flatness

Fig.3 Gain curve after optimizing.

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

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:

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

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 ± 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:

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

where

$\delta G = G_{f_n} - G_{f_1}$

f_1 = start frequency

f_n = stop frequency

a = 3.1224×10^{-3}

b = 1.9932×10^{-6}

c = -8.934×10^{-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).

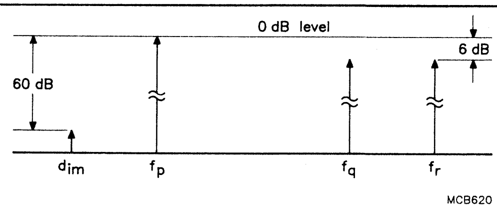


Fig.4 Intermodulation distortion.

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(1) 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.(2) 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) = $60 \times 525 \div 2 = 15.75$ 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.

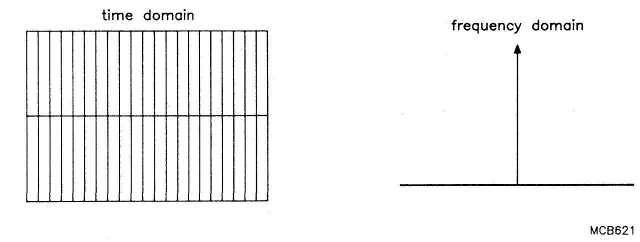


Fig.5 CW signal (sinewave), no other signals switched on.

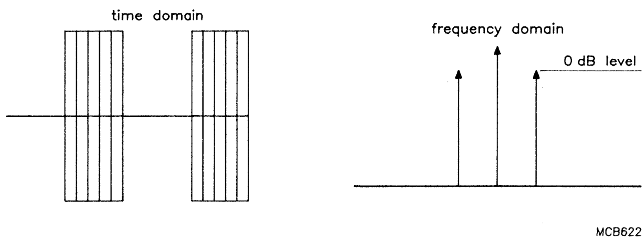


Fig.6 One signal switched on 100% modulated.

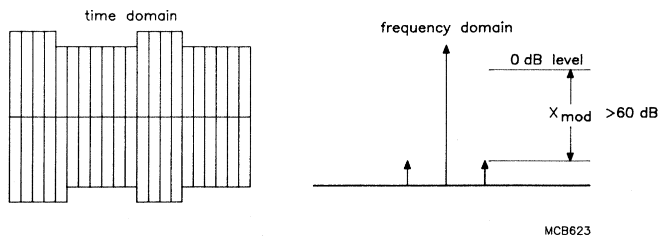


Fig.7 CW signal with X_{mod} distortion caused by other modulated signals.

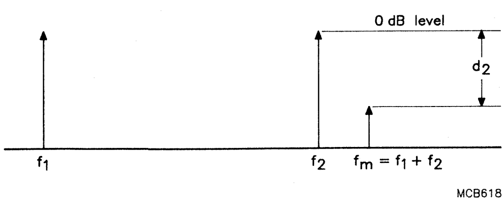


Fig.8 Second order distortion (d_2).

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

The X_{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_{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

$f_m = f_1 \pm f_2$ or
$f_m = 2 \times f_1$ or
$f_m = 2 \times f_2$.

MEASUREMENT

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

During the measurement, all channels in the band are levelled to the specified V_o. 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).

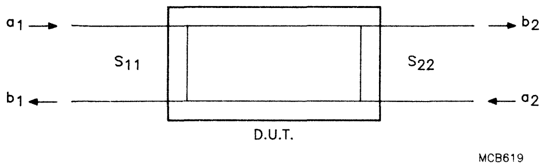


Fig.9 Two-port network with reflection coefficients S_{11} and S_{22}.

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

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

where

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

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

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

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

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_o (derived from formula (4)).

In (6), $a_1 = 0$ means input port terminated with Z_o (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_o 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.

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_{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

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

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

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

APPENDIX E - TEST CHANNELS

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

RANGE	NAMES	FREQUENCIES (MHz)	CHANNELS
40 - 300 MHz	2-4	55.25 - 67.25	3 channels
32 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	2-4	55.25 - 67.25	3 channels
52 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	T7-T13	7.00 - 43.00	7 channels
22 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	2-4	55.25 - 67.25	3 channels
60 channels	5-6	77.25 - 83.25	2 channels
	A-H22	121.25 - 445.25	55 channels
40 - 550 MHz	2-4	55.25 - 67.25	3 channels
77 channels	5-6	77.25 - 83.25	2 channels
	A-27	121.25 - 547.25	77 channels
40 - 600 MHz	2-4	55.25 - 67.25	3 channels
85 channels	5-6	77.25 - 83.25	2 channels
	A-35	121.25 - 595.25	80 channels
40 - 750 MHz	2-4	55.25 - 67.25	3 channels
110 channels	5-6	77.25 - 83.25	2 channels
	A-60	121.25 - 745.25	105 channels
40 - 860 MHz	2-4	55.25 - 67.25	3 channels
129 channels	5-6	77.25 - 83.25	2 channels
	A-79	121.25 - 859.25	124 channels
40 - 450 MHz	2-3	55.25 - 61.25	2 channels
36 channels	C-F	133.25 - 151.25	4 channels
German raster	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

DEVICE DATA

CATV amplifier modules

(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	$+V_B$
7	common
8	common
9	output

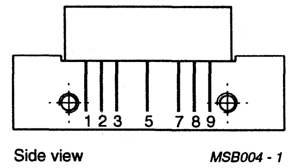


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz			
	BGD102		18	19	dB
	BGD104		19.5	20.5	dB
	power gain	f = 450 MHz			
	BGD102		19.2	21.2	dB
	BGD104		20.5	22.5	dB
I_{tot}	total current consumption (DC)	$V_B = 24$ V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	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 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz			
	BGD102		18	19	dB
	BGD104		19.5	20.5	dB
	power gain	f = 450 MHz			
	BGD102		19.2	21.2	dB
	BGD104		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	–	±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	60 channels flat; V_o = 46 dBmV; measured at 445.25 MHz			
	BGD102		–	–65	dB
	BGD104		–	–64	dB
X_{mod}	cross modulation	60 channels flat; V_o = 46 dBmV; measured at 55.25 MHz			
	BGD102		–	–67	dB
	BGD104		–	–66	dB
d_2	second order distortion	note 1	–	–73	dB
V_o	output voltage	d_{im} = –60 dB; note 2			
	BGD102		65	–	dBmV
	BGD104		64.5	–	dBmV
F	noise figure	f = 40 to 450 MHz	–	7	dB
I_{tot}	total current consumption (DC)	note 3	–	435	mA

Notes

1. 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.
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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

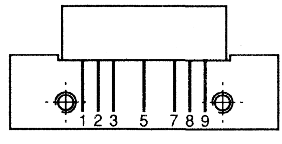


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	21.5	22.5	dB
		f = 450 MHz	22.1	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz; f = 450 MHz	21.5 22.1	22.5 –	dB dB
SL	slope cable equivalent	f = 40 to 450 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	± 0.3	dB

S_{11}	input return losses	f = 40 to 80 MHz;
		f = 80 to 160 MHz;
		f = 160 to 450 MHz
			–
			–
			–
				20
				19
				18
					dB
					dB
					dB

S_{22}	output return losses	f = 40 to 80 MHz;
		f = 80 to 160 MHz;
		f = 160 to 450 MHz
			–
			–
			–
				20
				19
				18
					dB
					dB
					dB

CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–63	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–63	dB
CSO	composite second order distortion	60 chs flat; V_o= 46 dBmV; measured at 446.5 MHz	–	–59	dB
d_2	second order distortion	V_o = 46 dBmV note 1	–	–68	dB
V_o	output voltage	d_{im} = –60 dB note 2	66.5	–	dBmV
F	noise figure	f = 450 MHz	–	6.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	435	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; $V_p = V_o$ = 66.5 dBmV;
   f_q = 447.25 MHz; $V_q = V_o$ –6 dB;
   f_r = 449.25 MHz; $V_r = V_o$ –6 dB;
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

Capability approved to CECC NECC-C-005

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

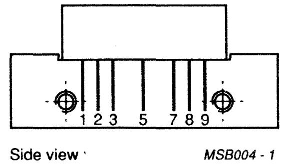


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	35	37	dB
		f = 450 MHz	36.5	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	625	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

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

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	–	± 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
CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–64	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–65	dB
CSO	composite second order distortion	60 chs 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 value; V_B = +24 V; note 3	–	625	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. 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 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	$+V_B$
7	common
8	common
9	output

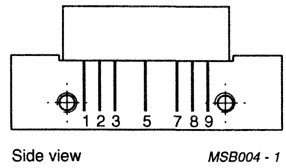


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz			
	BGD502		18	19	dB
	BGD504		19.5	20.5	dB
	power gain	f = 550 MHz			
	BGD502		18.8	20.8	dB
	BGD504		20.2	22.2	dB
I_{tot}	total current consumption (DC)	$V_B = 24$ V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz				
	BGD502		18	–	19	dB
	BGD504		19.5	–	20.5	dB
	power gain	f = 550 MHz				
	BGD502		18.8	–	20.8	dB
	BGD504		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	–	–	±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	77 channels flat;				
	BGD502	V_o = 44 dBmV;	–	–	–65	dB
	BGD504	measured at 547.25 MHz	–	–	–64	dB
X_{mod}	cross modulation	77 channels flat;				
	BGD502	V_o = 44 dBmV;	–	–	–68	dB
	BGD504	measured at 55.25 MHz	–	–	–67	dB
CSO	composite second order distortion	77 channels flat;				
	BGD502	V_o = 44 dBmV;	–	–	–62	dB
	BGD504	measured at 548.5 MHz	–	–	–60	dB
d_2	second order distortion	note 1				
	BGD502		–	–	–72	dB
	BGD504		–	–	–70	dB
V_o	output voltage	d_{im} = –60 dB; note 2				
	BGD502		64	–	–	dBmV
	BGD504		63.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	8	dB
I_{tot}	total current consumption (DC)	note 3	–	415	435	mA

Notes

1. 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.
2. 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.
3. The modules normally operate at V_B = 24 V, but are able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

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

PIN CONFIGURATION

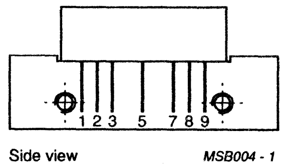


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	21.5	22.5	dB
		f = 550 MHz	22.1	–	dB
I_{tot}	total current consumption	DC value; $V_B = +24$ V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C
V_B	DC supply voltage	–	+28	V

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	21.5	22.5	dB
		f = 550 MHz	22.1	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0	2	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;	–	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 dBmV; measured at 547.25 MHz	–	–62	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–63	dB
CSO	composite second order distortion	77 chs flat; V_o= 44 dBmV; measured at 548.5 MHz	–	–55	dB
d_2	second order distortion	V_o = 44 dBmV; note 1	–	–66	dB
V_o	output voltage	d_{im} = –60 dB note 2	62.5	–	dBmV
F	noise figure	f = 550 MHz	–	7	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	435	mA

Notes

1. 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
2. Measured according to DIN45004B;
   f_p = 540.25 MHz; $V_o = V_p$;
   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
   V_o = 62.5 dBmV.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

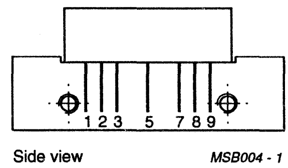


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	35	37	dB
		f = 550 MHz	36.5	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	625	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 550 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	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	–	±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

1. 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.
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.

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	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	–	±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

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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

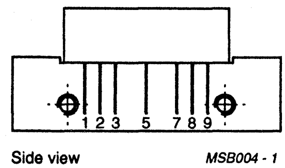


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	12	13	dB
		f = 600 MHz	12.7	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 600 MHz; T_{case} = 35 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	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	0.2	2.2	dB
FL	flatness of frequency response	f = 40 to 600 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 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
CTB	composite triple beat	85 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–62	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	85 chs 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	–	9.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	435	mA

Notes

1. 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
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 35 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	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	0.2	2	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;	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 dBmV; measured at 547.25 MHz	–	−65	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−68	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 548.5 MHz	–	−64	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	–	9	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	435	mA

Notes

1. 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
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 35 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	12	13	dB
		f = 450 MHz	12.5	–	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	–	± 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
CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	−67	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	−67	dB
CSO	composite second order distortion	60 chs 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 = 450 MHz	–	8	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	435	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. 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 — BGD602

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 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	$+V_B$
7	common
8	common
9	output

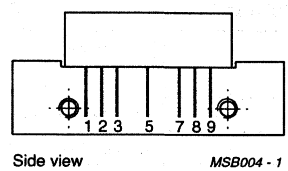


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	19	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 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 = 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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 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 = 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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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

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.

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 configuration 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

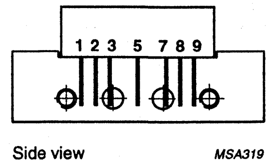


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.5	18.5	dB
		f = 600 MHz	18.5	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	440	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	mounting base operating temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.5	18.5	dB
		f = 600 MHz	18.5	–	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	–	± 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 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–68	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	–64	dB
d_2	second order distortion	note 1	–	–76	dB
V_o	output voltage	d_{im} = –60 dB; note 2	66	–	dBmV
F	noise figure	f = 600 MHz	–	7	dB
I_{tot}	total current consumption	DC value; V_B = 24 V note 3	–	440	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

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	–	± 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 dBmV; measured at 547.25 MHz	–	–69	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–62	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz	–	–66	dB
d_2	second order distortion	note 1	–	–78	dB
V_o	output voltage	d_{im} = –60 dB; note 2	67	–	dBmV
F	noise figure	f = 550 MHz	–	7	dB
I_{tot}	total current consumption	DC value; V_B = 24 V note 3	–	440	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.5	18.5	dB
		f = 450 MHz	18.1	–	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 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–68	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz	–	–66	dB
d_2	second order distortion	note 1	–	–80	dB
V_o	output voltage	d_{im} = –60 dB; note 2	67	–	dBmV
F	noise figure	f = 450 MHz	–	6.5	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	440	mA

Notes

1. f_p = 55.25 MHz; V_p = 44 dBmV;
   f_q = 391.25 MHz; V_q = 44 dBmV;
   measured at $f_p + f_q$ = 446.5 MHz.
2. 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 — 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	$+V_B$
7	common
8	common
9	output

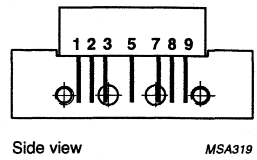


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	18.5	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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	18.5	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	2	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	±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

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

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

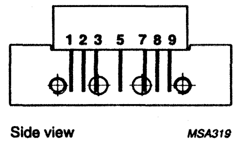


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	mounting base operating temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 750 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 750 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 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 chs flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–57	dB
X_{mod}	cross modulation	110 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	110 chs flat; V_o = 44 dBmV; measured at 746.5 MHz	–	–56	dB
d_2	second order distortion	note 1	–	–66	dB
V_o	output voltage	d_{im} = –60 dB; note 2	60.5	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 750 MHz	–	9	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	435	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 600 MHz; T_{case} = 35 °C; Z_S = Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 600 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 600 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 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 600 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 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	−64	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−64	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	−58	dB
d_2	second order distortion	note 1	–	−68	dB
V_o	output voltage	d_{im} = −60 dB; note 2	63	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 600 MHz	–	8	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	435	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 550 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0	2	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	–45	+45	deg
CTB	composite triple beat	77 chs flat; V_o = 44 dBmV; measured at 547.25 MHz	–	–66	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	77 chs 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	63.5	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 550 MHz	–	7.5	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	435	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 450 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0	2	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	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 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–67	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–64	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz	–	–63	dB
d_2	second order distortion	note 1	–	–73	dB
V_o	output voltage	d_{im} = –60 dB; note 2	66	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 450 MHz	–	7	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	435	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. 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 — 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	$+V_B$
9	output

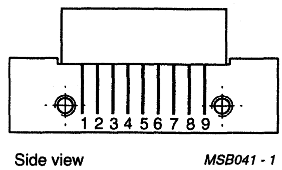


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	16.5	17.5	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	450	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_B	DC supply voltage	–	26	V
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 860 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	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	–	±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

1. Decrease per octave of 1.5 dB.
2. 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.
3. 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.
4. 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.
5. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

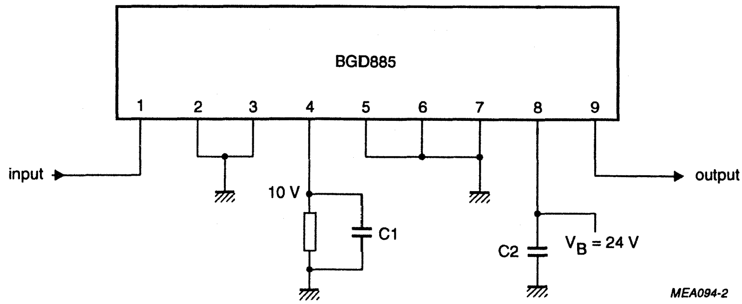


Fig.2 Test circuit.

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	$+V_B$
7	common
8	common
9	output

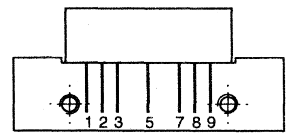


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	17.4	–	19.4	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	200	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

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	–	–	±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

1. $f_p = 55.25$ MHz; $V_o = 46$ dBmV;
   $f_q = 391.25$ MHz; $V_o = 46$ dBmV;
   measured at $f_p + f_q = 446.5$ MHz.
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 — 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

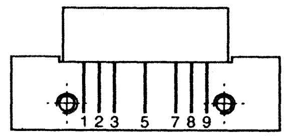


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	33	–	36	dB
I_{tot}	total current consumption	DC value; $V_B = +24$ 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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{case}	operating case temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	33	–	36	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	–	–	0.3	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	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
d_2	second order distortion	note 1	–	–	–70	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGE88		60	–	–	dBmV
	BGE88/01		59	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	6	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3				
	BGE88		–	290	330	mA
	BGE88/01		–	250	260	mA

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. 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

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	$+V_B$
9	output

PIN CONFIGURATION

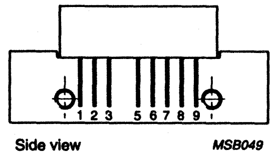


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	16.5	17.5	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	150	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	mounting base operating temperature	–20	+100	°C
V_B	DC supply voltage	–	26	V

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 860 MHz; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω.

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	1.4	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	± 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 to 860 MHz	15	–	dB
d_2	second order distortion	note 2	–	–60	dB
V_o	output voltage	d_{im} = –60 dB; notes 3 and 4	55	–	dBmV
F	noise figure	f = 350 MHz	–	7.5	dB
		f = 860 MHz	–	8	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 5	–	150	mA

Notes

1. Decreases by 1.5 dB per octave.
2. f_p = 349.25 MHz; V_p = 44 dBmV;
   f_q = 403.25 MHz; V_q= 44 dBmV;
   measured at $f_p + f_q$ = 752.5 MHz.
3. 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.
4. 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.
5. The module normally operates at V_B = 24 V but is able to withstand supply transients up to 30 V.

Capability approved to CECC NECC-C-005

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	$+V_B$
9	output (note 1)

Note

1. Pins 1 and 9 carry DC voltages.

PIN CONFIGURATION

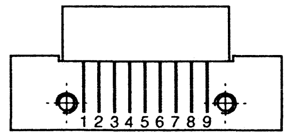


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	16.5	17.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C
V_B	DC supply voltage	–	+28	V

Capability approved to CECC NECC-C-005

CHARACTERISTICS

T_{mb} = 30 °C; Z_S = Z_L = 75 Ω

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	1.2	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	± 0.5	dB
S_{11}	input return losses	f = 40 to 450 MHz f = 450 to 860 MHz	– –	14 10	dB dB
S_{22}	output return losses	f = 40 to 450 MHz f = 450 to 860 MHz	– –	14 10	dB dB
d_2	second order distortion	note 1	–	–53	dB
V_o	output voltage	d_{im} = –60 dB note 2	–	59	dBmV
F	noise figure	f = 350 MHz; f = 860 MHz	– –	7.5 8	dB dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	240	mA

Notes

1. V_p = 59 dBmV at f_p = 349.25 MHz;
   V_p = 59 dBmV at f_p = 403.25 MHz;
   measured at $f_p + f_q$ = 752.25 MHz.
2. Measured according to DIN45004B;
   f_p = 851.25 MHz; $V_p = V_o$ = 59.0 dBmV;
   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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

Capability approved to CECC NECC-C-005

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	$+V_B$
6	common
8	common
9	output

PIN CONFIGURATION

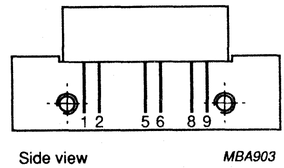


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 470 MHz;	22.5	25	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 1	–	280	mA

Note

1. The module normally operates at V_B = +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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C
V_B	DC supply voltage	–	+28	V

Capability approved to CECC NECC-C-005

CHARACTERISTICS

T_{case} = 30 °C; Z_S = Z_L = 75 Ω;

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

Notes

1. f_p = 483.25 MHz; V_p = V_o
   f_q = 490.25 MHz; V_q = V_o −6 dB
   f_r = 492.25 MHz; V_r = V_o −6 dB
   measured at $f_p + f_q - f_r$ = 481.25 MHz
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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; note1
2	common
3	common
4	12 V, 60 mA supply terminal
5	common
6	common
7	common
8	$+V_B$
9	output; note1

Note

1. Pins 1 and 9 carry DC voltages.

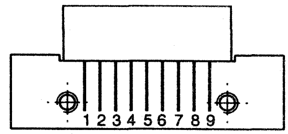


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	12	13	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_B	DC supply voltage	–	26	V
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

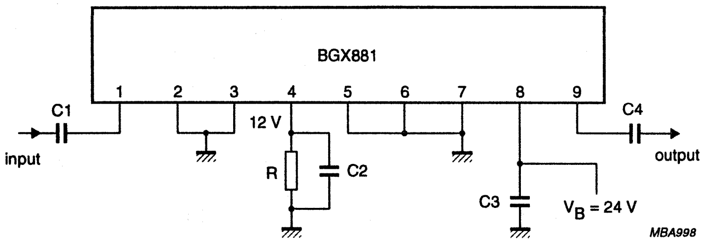
CHARACTERISTICS

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

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	–	±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

1. Decreases 1.5 dB per octave.
2. 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.
3. 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.
4. 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.
5. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.



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 Ω, 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	$+V_B$
9	output; note 1

Note

1. Pins 1 and 9 carry DC voltages.

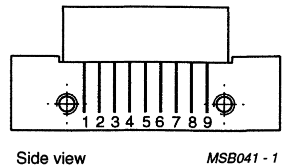


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	16.5	17.5	dB
		f = 750 MHz	17.3	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_B	DC supply voltage	–	26	V
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

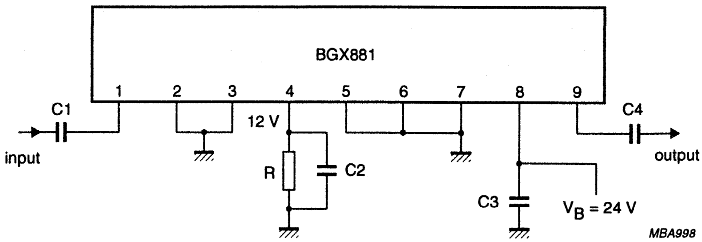
CHARACTERISTICS

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

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	–	±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

1. Decreases by 1.5 dB per octave.
2. 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.
3. 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.
4. 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.
5. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.



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 Ω; 1 W

Hybrid VHF push-pull amplifier module

BGY60

FEATURES

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

DESCRIPTION

Interstage hybrid amplifier module for CATV systems operating over a frequency range of 40 to 300 MHz at a voltage supply of +24 V (DC). The inputs and outputs of the stages have been terminated separately.

PINNING - SOT115D

PIN	DESCRIPTION
1	input pre-stage
2	common
3	common
4	output pre-stage
5	$+V_B$
6	input final stage
7	common
8	common
9	output final stage

PIN CONFIGURATION

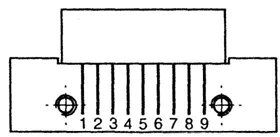


Fig.1 Simplified outline.

QUICK REFERENCE DATA

For total amplifier.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	32.5	–	34.5	dB
I_{tot}	total current consumption	DC value; $V_B = +24$ V	–	320	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage (total amplifier)	–	55	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+90	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

For total amplifier unless otherwise specified; Bandwidth 40 to 300 MHz; T_{amb} = 25 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	32.5	–	34.5	dB
SL	slope cable equivalent	f = 40 to 300 MHz	0.5	–	1.5	dB
FL	flatness of frequency response	f = 40 to 300 MHz	–	–	± 0.3	dB
S_{11}	input return losses	f = 40 to 300 MHz;				
		pre-stage;	20	–	–	dB
		final stage	18	–	–	dB
S_{22}	output return losses	f = 40 to 300 MHz;				
		pre-stage;	18	–	–	dB
		final stage	20	–	–	dB
d_2	second order distortion	note 1	–	–	−66	dB
V_o	output voltage	d_{im} = −60 dB note 2	64	–	–	dBmV
F	noise figure	f = 40 to 300 MHz	–	–	6	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	320	340	mA

Notes

1. f_p = 55.25 MHz; $V_p = V_o$ = 50 dBmV;
   f_q = 211.25 MHz; $V_q = V_o$ = 50 dBmV;
   measured at $f_p + f_q$ = 266.5 MHz
2. 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
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

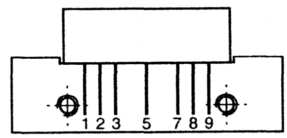


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 10 MHz;	12.5	–	13.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	215	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	67	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+90	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 5 to 200 MHz; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

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

Notes

1. f_p = 83.25 MHz; V_p = 50 dBmV;
   f_q = 109.25 MHz; V_q = 50 dBmV;
   measured at $f_p + f_q$ = 192.5 MHz
2. Measured according to DIN45004B;
   f_p = 35.25 MHz; $V_o = V_p$;
   f_q = 42.25 MHz; $V_q = V_o$ −6 dB;
   f_r = 44.25 MHz; $V_r = V_o$ −6 dB;
   measured at $f_p + f_q - f_r$ = 33.25 MHz
3. Measured according to DIN45004B;
   f_p = 187.25 MHz; $V_o = V_p$;
   f_q = 194.25 MHz; $V_q = V_o$ −6 dB;
   f_r = 196.25 MHz; $V_r = V_o$ −6 dB;
   measured at $f_p + f_q - f_r$ = 185.25 MHz
4. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

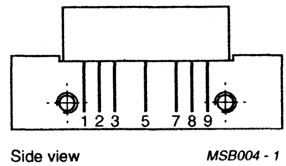


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 10 MHz;	18	–	19	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	215	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	65	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+90	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 5 to 200 MHz; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

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

Notes

1. f_p = 83.25 MHz; V_p = 50 dBmV;
   f_q = 109.25 MHz; V_q = 50 dBmV;
   measured at $f_p + f_q$ = 192.5 MHz
2. Measured according to DIN45004B;
   f_p = 35.25 MHz; $V_o = V_p$;
   f_q = 42.25 MHz; $V_q = V_o$ –6 dB;
   f_r = 44.25 MHz; $V_r = V_o$ –6 dB;
   measured at $f_p + f_q - f_r$ = 33.25 MHz
3. Measured according to DIN45004B;
   f_p = 187.25 MHz; $V_o = V_p$;
   f_q = 194.25 MHz; $V_q = V_o$ –6 dB;
   f_r = 196.25 MHz; $V_r = V_o$ –6 dB;
   measured at $f_p + f_q - f_r$ = 185.25 MHz
4. 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

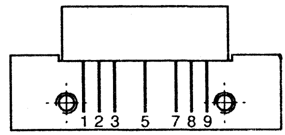


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 10 MHz;	21.5	–	22.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	215	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	65	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+90	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 5 to 200 MHz; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

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

Notes

1. f_p = 83.25 MHz; V_p = 50 dBmV;
   f_q = 109.25 MHz; V_q = 50 dBmV;
   measured at $f_p + f_q$ = 192.5 MHz
2. Measured according to DIN45004B;
   f_p = 35.25 MHz; $V_o = V_p$;
   f_q = 42.25 MHz; $V_q = V_o$ –6 dB;
   f_r = 44.25 MHz; $V_r = V_o$ –6 dB;
   measured at $f_p + f_q - f_r$ = 33.25 MHz
3. Measured according to DIN45004B;
   f_p = 187.25 MHz; $V_o = V_p$;
   f_q = 194.25 MHz; $V_q = V_o$ –6 dB;
   f_r = 196.25 MHz; $V_r = V_o$ –6 dB;
   measured at $f_p + f_q - f_r$ = 185.25 MHz
4. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

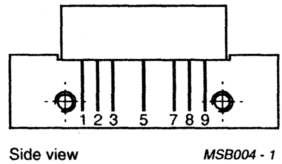


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 10 MHz;	23.5	–	24.5	dB
I_{tot}	total current consumption	DC value; $V_B = +24$ V	–	215	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	63	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+90	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 5 to 200 MHz; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

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

Notes

1. f_p = 83.25 MHz; V_p = 50 dBmV;
   f_q = 109.25 MHz; V_q = 50 dBmV;
   measured at $f_p + f_q$ = 192.5 MHz
2. Measured according to DIN45004B;
   f_p = 35.25 MHz; $V_o = V_p$;
   f_q = 42.25 MHz; $V_q = V_o$ −6 dB;
   f_r = 44.25 MHz; $V_r = V_o$ −6 dB;
   measured at $f_p + f_q - f_r$ = 33.25 MHz
3. Measured according to DIN45004B;
   f_p = 187.25 MHz; $V_o = V_p$;
   f_q = 194.25 MHz; $V_q = V_o$ −6 dB;
   f_r = 196.25 MHz; $V_r = V_o$ −6 dB;
   measured at $f_p + f_q - f_r$ = 185.25 MHz
4. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

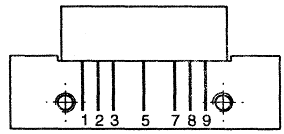


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	12	–	13	dB
		f = 450 MHz	12.5	–	14	dB
I_{tot}	total current consumption (DC)	V_B = 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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

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	–	–	±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				
	BGY80		–	–	–54	dB
	BGY81		–	–	–58	dB
X_{mod}	cross modulation	60 channels flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY80		–	–	–59	dB
	BGY81		–	–	–62	dB
CSO	composite second order distortion	60 channels flat; V_o = 46 dBmV; measured at 446.5 MHz				
	BGY80		–	–	–58	dB
	BGY81		–	–	–61	dB
d_2	second order distortion	note 1				
	BGY80		–	–	–72	dB
	BGY81		–	–	–74	dB
V_o	output voltage	d_{im} = –60 dB; note 2				
	BGY80		61.5	–	–	dBmV
	BGY81		64	–	–	dBmV
F	noise figure	f = 450 MHz				
	BGY80		–	–	7.5	dB
	BGY81		–	–	8	dB
I_{tot}	total current consumption (DC)	note 3				
	BGY80		–	180	200	mA
	BGY81		–	220	240	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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

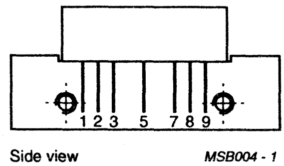


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption	DC value; V_B = +24 V				
	BGY82		–	180	200	mA
	BGY83		–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{case}	operating case temperature range	−20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω

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	–	–	± 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 dBmV; measured at 445.25 MHz				
	BGY82		–	–	–55	dB
	BGY83		–	–	–59	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY82		–	–	–56	dB
	BGY83		–	–	–59	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz				
	BGY82		–	–	–55	dB
	BGY83		–	–	–59	dB
d_2	second order distortion	note 1				
	BGY82		–	–	–72	dB
	BGY83		–	–	–74	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY82		61.5	–	–	dBmV
	BGY83		64	–	–	dBmV
F	noise figure	f = 450 MHz				
	BGY82		–	–	7	dB
	BGY83		–	–	8	dB

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

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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

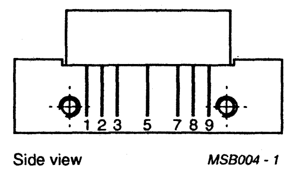


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	16.5	–	17.5	dB
		f = 450 MHz	17.3	–	18.8	dB
I_{tot}	total current consumption	DC value; V_B = +24 V				
	BGY84		–	180	200	mA
	BGY85		–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	65	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{mb} = 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	17.3	–	18.8	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	–	–	± 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 dBmV; measured at 445.25 MHz				
	BGY84		–	–	–55	dB
	BGY85		–	–	–58	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY84		–	–	–57	dB
	BGY85		–	–	–60	dB
d_2	second order distortion	note 1	–	–	–70	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY84		60	–	–	dBmV
	BGY85		62.5	–	–	dBmV
F	noise figure	f = 40 to 450 MHz				
	BGY84		–	–	6.5	dB
	BGY85		–	–	7	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3				
	BGY84		–	180	200	mA
	BGY85		–	220	240	mA

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.

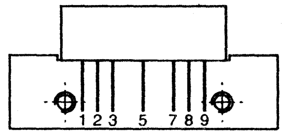
DESCRIPTION

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION



Side view MSB004 - 1

Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption	DC value; V_B = +24 V				
	BGY84A		–	180	200	mA
	BGY85A		–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	65	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	operating mounting base temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{mb} = 30 °C; Z_S = Z_L = 75 Ω

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	–	–	± 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 dBmV; measured at 445.25 MHz				
	BGY84A		–	–	–55	dB
	BGY85A		–	–	–59	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY84A		–	–	–58	dB
	BGY85A		–	–	–61	dB
d_2	second order distortion	note 1	–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY84A		60	–	–	dBmV
	BGY85A		62.5	–	–	dBmV
F	noise figure	f = 40 to 450 MHz				
	BGY84A		–	–	6.5	dB
	BGY85A		–	–	7	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3				
	BGY84A		–	180	200	mA
	BGY85A		–	220	240	mA

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

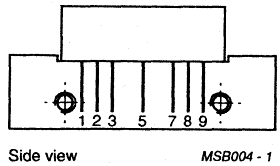


Fig.1 Simplified outline.

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_p	power gain	f = 50 MHz;	14.8	–	16.4	dB
		f = 450 MHz	20.2	–	21.2	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	215	230	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	65	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+100	°C
V_B	DC supply voltage	–	+28	V

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	14.8	–	16.4	dB
		f = 450 MHz	20.2	–	21.2	dB
ΔG	delta gain	f = 40 to 450 MHz	4.7	–	5.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz; note 1	–	–	± 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	36 chs flat; V_o = 46 dBmV; measured at 433.25 MHz	–	–	–65	dB
		60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–59	–	dB
X_{mod}	cross modulation	36 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–	–65	dB
		60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–61	–	dB
d_2	second order distortion	note 2	–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB				
		note 3	65	–	–	dBmV
		note 4	64	–	–	dBmV
		note 5	62.5	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	6.8	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 6	–	215	230	mA

Notes

1. 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;
   ΔG = measured difference in gain between 450 and 50 MHz;
   $a = 3.132 \times 10^{-3}$
   $b = 1.993 \times 10^{-6}$
   $c = -8.934 \times 10^{-9}$

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	$+V_B$
7	common
8	common
9	output

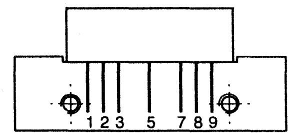


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption (DC)	V_B = 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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

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	–	–	±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	60 channels flat; V_o = 46 dBmV; measured at 445.25 MHz				
	BGY86		–	–	–54	dB
	BGY87		–	–	–58	dB
X_{mod}	cross modulation	60 channels flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY86		–	–	–51	dB
	BGY87		–	–	–55	dB
CSO	composite second order distortion	60 channels flat; V_o = 46 dBmV; measured at 446.5 MHz				
	BGY86		–	–	–53	dB
	BGY87		–	–	–57	dB
d_2	second order distortion	note 1				
	BGY86		–	–	–68	dB
	BGY87		–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB; note 2				
	BGY86		61.5	–	–	dBmV
	BGY87		64	–	–	dBmV
F	noise figure	f = 450 MHz				
	BGY86		–	–	6	dB
	BGY87		–	–	6.5	dB
I_{tot}	total current consumption (DC)	note 3				
	BGY86		–	180	200	mA
	BGY87		–	220	240	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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

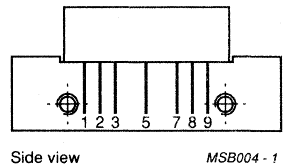


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	26.2	27.8	dB
I_{tot}	total current consumption	DC value; V_B = +24 V (note 1)	–	340	mA

Note

1. The module normally operates at V_B = +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_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

T_{case} = 35 °C; Z_S = Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	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_{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 dBmV; measured at 445.25 MHz	–	–58	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz	–	–60	dB
d_2	second order beat	V_o = 46 dBmV note 1	–	–70	dB
V_o	output voltage	d_{im} = –60 dB note 2	64	–	dBmV
F	noise figure	f = 450 MHz	–	6	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	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 DIN 45004B;
   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.

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

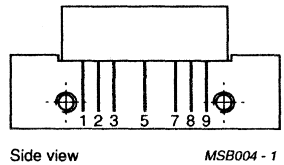


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 450 MHz	35	–	37	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	320	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 450 MHz	35	–	37	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	–	–	± 0.3	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
CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–	–58	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–	–59	dB
d_2	second order distortion	note 1	–	–	–70	dB
V_o	output voltage	d_{im} = –60 dB; note 2	62	–	–	dBmV
F	noise figure	f = 450 MHz	–	–	6	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	320	340	mA

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; $V_p = V_o$ = 62 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
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

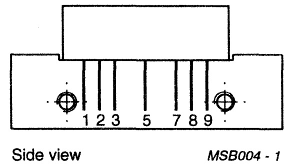


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	37	–	39	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	320	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

Capability approved to CECC NECC-C-005

CATV amplifier module BGY89

CHARACTERISTICS

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

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	–	–	±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

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; $V_p = V_o$ = 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.
3. 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

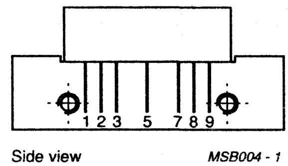


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	12	–	13	dB
		f = 550 MHz	12.5	–	14.5	dB
I_{tot}	total current consumption	DC value; V_B = +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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{case}	operating case temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	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_{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 dBmV; measured at 547.25 MHz				
	BGY580		–	–	–52	dB
	BGY581		–	–	–56	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz				
	BGY580		–	–	–59	dB
	BGY581		–	–	–62	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz				
	BGY580		–	–	–56	dB
	BGY581		–	–	–59	dB
d_2	second order distortion	note 1				
	BGY580		–	–	–70	dB
	BGY581		–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY580		59	–	–	dBmV
	BGY581		61.5	–	–	dBmV
F	noise figure	f = 550 MHz				
	BGY580		–	–	8.5	dB
	BGY581		–	–	9	dB

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

Notes

1. 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
2. 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.
3. The modules normally operate at V_B = +24 V, but are able to withstand supply transients up to 30 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

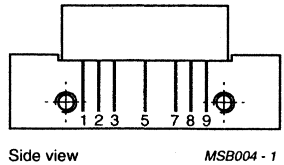


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption	DC value; V_B = +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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω

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	–	–	± 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
CTB	composite triple beat	77 chs flat; V_o = 44 dBmV; measured at 547.25 MHz				
	BGY582		–	–	–55	dB
	BGY583		–	–	–59	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz				
	BGY582		–	–	–58	dB
	BGY583		–	–	–61	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz				
	BGY582		–	–	–55	dB
	BGY583		–	–	–59	dB
d_2	second order distortion	note 1				
	BGY582		–	–	–70	dB
	BGY583		–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY582		59	–	–	dBmV
	BGY583		61.5	–	–	dBmV
F	noise figure	f = 550 MHz				
	BGY582		–	–	7.5	dB
	BGY583		–	–	8.5	dB

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

1. 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
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

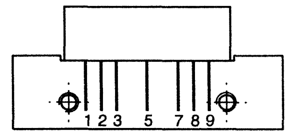


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption (DC)	V_B = 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_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 550 MHz; V_B = 24 V; T_{mb} = 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 = 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	–	–	±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				
	BGY584		–	–	–56	dB
	BGY585		–	–	–59	dB
X_{mod}	cross modulation	77 channels flat; V_o = 44 dBmV; measured at 55.25 MHz				
	BGY584		–	–	–59	dB
	BGY585		–	–	–62	dB
CSO	composite second order distortion	77 channels flat; V_o = 44 dBmV; measured at 548.5 MHz				
	BGY584		–	–	–56	dB
	BGY585		–	–	–59	dB
d_2	second order distortion	note 1				
	BGY584		–	–	–68	dB
	BGY585		–	–	–70	dB
V_o	output voltage	d_{im} = –60 dB; note 2				
	BGY584		58.5	–	–	dBmV
	BGY585		61	–	–	dBmV
F	noise figure	f = 550 MHz				
	BGY584		–	–	7	dB
	BGY585		–	–	8	dB
I_{tot}	total current consumption (DC)	note 3				
	BGY584		–	180	200	mA
	BGY585		–	220	240	mA

Notes

1. 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.
2. 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.
3. The modules normally operate at V_B = 24 V, but are able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; V_B = 24 V; T_{mb} = 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				
	BGY584		–	–	–58	dB
	BGY585		–	–	–61	dB
X_{mod}	cross modulation	60 channels flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY584		–	–	–57	dB
	BGY585		–	–	–60	dB
CSO	composite second order distortion	60 channels flat; V_o = 46 dBmV; measured at 446.5 MHz				
	BGY584		–	–	–58	dB
	BGY585		–	–	–61	dB
d_2	second order distortion	note 1				
	BGY584		–	–	–73	dB
	BGY585		–	–	–75	dB
V_o	output voltage	d_{im} = –60 dB; note 2				
	BGY584		61.5	–	–	dBmV
	BGY585		64	–	–	dBmV
F	noise figure	f = 450 MHz				
	BGY584		–	–	6	dB
	BGY585		–	–	7	dB
I_{tot}	total current consumption (DC)	note 3				
	BGY584		–	180	200	mA
	BGY585		–	220	240	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 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

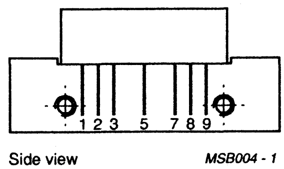


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption	DC value; V_B = +24 V				
	BGY584A		–	180	200	mA
	BGY585A		–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{case}	operating case temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω

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	–	–	± 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
CTB	composite triple beat	77 chs flat; V_o = 44 dBmV; measured at 547.25 MHz				
	BGY584A		–	–	–56	dB
	BGY585A		–	–	–59	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz				
	BGY584A		–	–	–59	dB
	BGY585A		–	–	–62	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz				
	BGY584A		–	–	–55	dB
	BGY585A		–	–	–59	dB
d_2	second order distortion	note 1				
	BGY584A		–	–	–70	dB
	BGY585A		–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB note 2				
	BGY584A		59	–	–	dBmV
	BGY585A		61.5	–	–	dBmV
F	noise figure	f = 550 MHz				
	BGY584A		–	–	7	dB
	BGY585A		–	–	8	dB

Capability approved to CECC NECC-C-005

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

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
   $f_q = 493.25$ MHz; $V_q = 44$ dBmV;
   measured at $f_p + f_q = 548.5$ MHz
2. 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.
3. The modules normally operate at $V_B = +24$ V, but are able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	17.7	–	18.7	dB
		f = 450 MHz	18.6	–	19.8	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
CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz				
	BGY584A		–	–	–57	dB
	BGY585A		–	–	–61	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz				
	BGY584A		–	–	–58	dB
	BGY585A		–	–	–61	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz				
	BGY584A		–	–	–58	dB
	BGY585A		–	–	–61	dB
d_2	second order distortion	note 1				
	BGY584A		–	–	–73	dB
	BGY585A		–	–	–75	dB
V_o	output voltage	d_{im} = −60 dB note 2				
	BGY584A		61.5	–	–	dBmV
	BGY585A		64	–	–	dBmV
F	noise figure	f = 450 MHz				
	BGY584A		–	–	6	dB
	BGY585A		–	–	7	dB

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

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; $V_q = V_p -6$ dB;
   $f_r = 449.25$ MHz; $V_r = V_p -6$ dB;
   measured at $f_p + f_q - f_r = 438.25$ MHz.
3. 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	$+V_B$
7	common
8	common
9	output

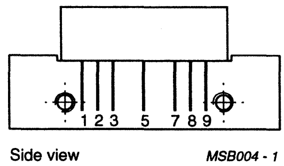


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21.5	–	22.5	dB
		f = 550 MHz	22	–	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V				
	BGY586		–	180	200	mA
	BGY587		–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

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	–	–	±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	77 channels flat; V_o = 44 dBmV; measured at 547.25 MHz				
	BGY586		–	–	−53	dB
	BGY587		–	–	−57	dB
X_{mod}	cross modulation	77 channels flat; V_o = 44 dBmV; measured at 55.25 MHz				
	BGY586		–	–	−55	dB
	BGY587		–	–	−58	dB
CSO	composite second order distortion	77 channels flat; V_o = 44 dBmV; measured at 548.5 MHz				
	BGY586		–	–	−50	dB
	BGY587		–	–	−54	dB
d_2	second order distortion	note 1				
	BGY586		–	–	−62	dB
	BGY587		–	–	−66	dB
V_o	output voltage	d_{im} = −60 dB; note 2				
	BGY586		58.5	–	–	dBmV
	BGY587		61	–	–	dBmV
F	noise figure	f = 550 MHz				
	BGY586		–	–	6.5	dB
	BGY587		–	–	7	dB
I_{tot}	total current consumption (DC)	note 3				
	BGY586		–	180	200	mA
	BGY587		–	220	240	mA

Notes

1. 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.
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

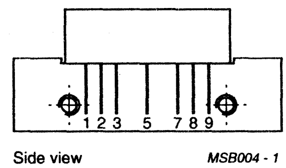


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	26.2	27.8	dB
		f = 550 MHz	27.5	–	dB
I_{tot}	total current consumption	DC value; $V_B = +24$ V	–	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	55	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C
V_B	DC supply voltage	–	+28	V

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 550 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω

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	–	± 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 dBmV; measured at 547.25 MHz	–	–57	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 chs 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 value; V_B = +24 V; note 3	–	340	mA

Notes

1. 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
2. Measured according to DIN45004B;
   f_p = 540.25 MHz; $V_p = V_o$ = 66.5 dBmV;
   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
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

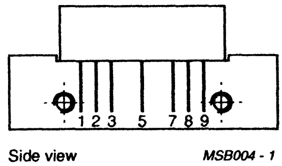


Fig.1 Simplified outline.

QUICK REFERENCE DATA

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
I_{tot}	total current consumption	DC value; V_B = +24 V	–	320	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	−40	+100	°C
T_{mb}	mounting base operating temperature range	−20	+100	°C

CHARACTERISTICS

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

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	–	–	± 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 dBmV; measured at 547.25 MHz	–	–	–57	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–	–59	dB
CSO	composite second order distortion	77 chs 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 value; V_B = +24 V; note 3	–	320	340	mA

Notes

1. 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
2. Measured according to DIN45004B;
   f_p = 540.25 MHz; $V_p = V_o$ = 66.5 dBmV;
   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
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	33.5	–	35.5	dB
		f = 450 MHz	35	–	37	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	–	–	± 0.3	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
CTB	composite triple beat	60 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–	−61	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–	−59	dB
CSO	composite second order distortion	60 chs flat; V_o= 46 dBmV; measured at 446.5 MHz	–	–	−59	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 = 450 MHz	–	–	6	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	320	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; $V_p = V_o$ = 66.5 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
3. The module normally operates at V_B = +24 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	$+V_B$
7	common
8	common
9	output

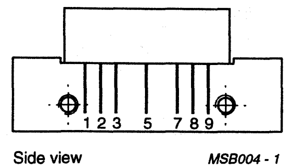


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	12	13	dB
		f = 600 MHz	12.7	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

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

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	–	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	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_{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	–	–	–56	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	–	–	–72	dB
V_o	output voltage	d_{im} = –60 dB; note 2	61.5	–	–	dBmV
F	noise figure	f = 550 MHz	–	–	9	dB
I_{tot}	total current consumption (DC)	note 3	–	220	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

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	–	–	±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

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

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	$+V_B$
7	common
8	common
9	output

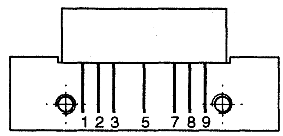


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	13.5	14.5	dB
		f = 600 MHz	14.5	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 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	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	–	–	±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

1. 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.
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.

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

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 — 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	$+V_B$
7	common
8	common
9	output

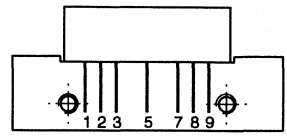


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	16.5	17.5	dB
		f = 600 MHz	17.8	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 MHz; V_B = 24 V; T_{mb} = 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 = 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	–	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; V_B = 24 V; T_{mb} = 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	–	220	240	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

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

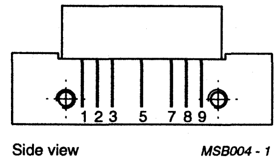


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.7	–	18.7	dB
		f = 600 MHz	19	–	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	220	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	−40	+100	°C
T_{mb}	mounting base operating temperature	−20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 MHz; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.7	18.7	dB
		f = 600 MHz	19	–	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	–	±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 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–55	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	–56	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 = 600 MHz	–	8.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

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	–	–	±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 dBmV; measured at 547.25 MHz	–	–	–59	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–	–62	dB
CSO	composite second order distortion	77 chs 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	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	220	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	17.7		18.7	dB
		f = 450 MHz	18.6	–	19.8	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 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	–	–61	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	60 chs 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 value; V_B = +24 V; note 3	–	220	240	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. 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.

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

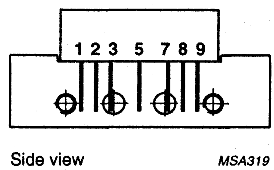


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	18.75	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	250	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	mounting base operating temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 MHz; 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 = 600 MHz	18.75	–	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	–	± 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
CTB	composite triple beat	85 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–62	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	85 chs 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	62	–	dBmV
F	noise figure	f = 600 MHz	–	8	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	250	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

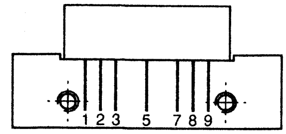


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	18	19	dB
		f = 600 MHz	18.5	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	250	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 600 MHz; 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 = 600 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.5	2.0	dB
FL	flatness of frequency response	f = 40 to 600 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 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
CTB	composite triple beat	85 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–56	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–55	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	–56	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 = 600 MHz	–	5.0	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	250	mA

Notes

1. 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
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 550 MHz; 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	0.5	2.0	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;	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 dBmV; measured at 547.25 MHz	–	–58	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz	–	–58	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	–	4.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	250	mA

Notes

1. 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
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; 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 = 450 MHz	18.3	–	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	–	± 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 dBmV; measured at 445.25 MHz	–	–58	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	60 chs 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	62.5	–	dBmV
F	noise figure	f = 450 MHz	–	4.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	250	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. 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 — 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

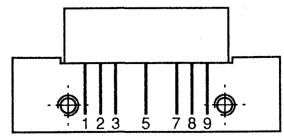


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	21	22	dB
		f = 600 MHz	22	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

CHARACTERISTICS

T_{case} = 30 °C; Z_S = Z_L = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz; f = 600 MHz	21 22	22 –	dB dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.8	2.2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	0.2	dB

S_{11}	input return losses	f = 40 to 80 MHz;
		f = 80 to 160 MHz;
		f = 160 to 600 MHz
			20
			19
			18
				–
				–
				–
					dB
					dB
					dB

S_{22}	output return losses	f = 40 to 80 MHz;
		f = 80 to 160 MHz;
		f = 160 to 550 MHz;
		f = 550 to 600 MHz
			20
			19
			18
			16
				–
				–
				–
				–
					dB
					dB
					dB
					dB

CTB	composite triple beat	85 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	−54	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−54	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.25 MHz	–	−52	dB
d_2	second order distortion	note 1	–	−66	dB
V_o	output voltage	d_{im} = −60 dB note 2	58	–	dBmV
F	noise figure	f = 600 MHz	–	6.5	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	240	mA

Notes

1. 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
2. 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.
3. The module normally operates at V_B = +24 V, but is able to withstand supply transients up to +30 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	$+V_B$
7	common
8	common
9	output

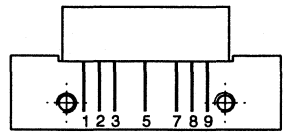


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	26.2	27.8	dB
		f = 600 MHz	27.8	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 600 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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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	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_{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	–	–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 = 450 MHz	–	6	dB
I_{tot}	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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

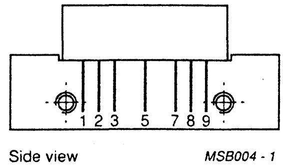


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	18	19	dB
		f = 750 MHz	18.5	–	dB
I_{tot}	total current consumption	DC value; V_B = +24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature range	–40	+100	°C
T_{mb}	mounting base operating temperature range	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

T_{case} = 30 °C; Z_S = Z_L = 75 Ω; Bandwidth 40 to 750 MHz;

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	2.0	dB
FL	flatness of frequency response	f = 40 to 750 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 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 chs flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–53	dB
X_{mod}	cross modulation	110 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	110 chs 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	–	8	dB
I_{tot}	total current consumption	DC value; V_B = +24 V; note 3	–	240	mA

Notes

1. 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
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

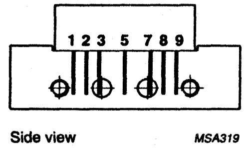


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz;	21	22	dB
		f = 750 MHz	21.5	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	100	°C
T_{mb}	mounting base operating temperature	–20	100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 750 MHz; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21	22	dB
		f = 750 MHz	21.5	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	±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 chs flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–51	dB
X_{mod}	cross modulation	110 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–51	dB
CSO	composite second order distortion	110 chs flat; V_o = 44 dBmV; measured at 746.5 MHz	–	–50	dB
d_2	second order distortion	note 1	–	–63	dB
V_o	output voltage	d_{im} = –60 dB; note 2	59	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 750 MHz	–	8	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 600 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21	22	dB
		f = 600 MHz	21.5	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	±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 chs flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–56	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–53	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	–53	dB
d_2	second order distortion	note 1	–	–66	dB
V_o	output voltage	d_{im} = –60 dB; note 2	59.5	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 600 MHz	–	7	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21	22	dB
		f = 550 MHz	21.5	–	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	–45	+45	deg
CTB	composite triple beat	77 chs flat; V_o = 44 dBmV; measured at 547.25 MHz	–	–59	dB
X_{mod}	cross modulation	77 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–55	dB
CSO	composite second order distortion	77 chs flat; V_o = 44 dBmV; measured at 548.5 MHz	–	–55	dB
d_2	second order distortion	note 1	–	–66	dB
V_o	output voltage	d_{im} = –60 dB; note 2	61.5	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 550 MHz	–	6.5	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	240	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = +24 V but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 MHz; T_{case} = 30 °C; Z_S = Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21	22	dB
		f = 450 MHz	21.5	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	±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 chs flat; V_o = 46 dBmV; measured at 445.25 MHz	–	−59	dB
X_{mod}	cross modulation	60 chs flat; V_o = 46 dBmV; measured at 55.25 MHz	–	−53	dB
CSO	composite second order distortion	60 chs flat; V_o = 46 dBmV; measured at 446.5 MHz	–	−60	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 = 50 MHz	–	5	dB
		f = 450 MHz	–	6	dB
I_{tot}	total current consumption	DC value; V_B = 24 V; note 3	–	240	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. 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 | BGY883

FEATURES

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

DESCRIPTION

The BGY883 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	$+V_B$
7	common
8	common
9	output

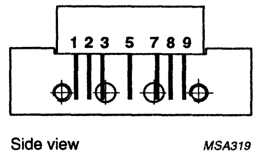


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	14.5	15.5	dB
		f = 860 MHz	15	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	235	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 860 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	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
CTB	composite triple beat	49 channels flat; V_o = 44 dBmV; measured at 859.25 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_{im} = –60 dB; note 2	60	–	dBmV
F	noise figure	f = 860 MHz	–	8.5	dB
I_{tot}	total current consumption (DC)	note 3	–	235	mA

Notes

1. 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.
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

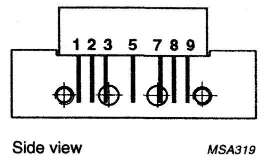


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 860 MHz	18.5	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	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 Ω.

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	–	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 600 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	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	–	±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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 550 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	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	–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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 450 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	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	–	±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

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 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	$+V_B$
7	common
8	common
9	output

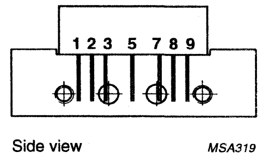


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 860 MHz	20	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	235	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Bandwidth 40 to 860 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	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	–	±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

1. 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.
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

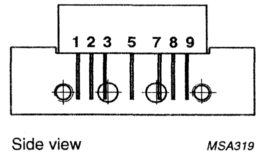


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	340	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	−40	+100	°C
T_{mb}	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 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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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	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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CHARACTERISTICS

Bandwidth 40 to 600 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 = 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	–	±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

1. 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.
2. 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.
3. 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	$+V_B$
7	common
8	common
9	output

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	860	MHz
S_{22}	output return losses	f = 40 to 860 MHz	12	–	dB
	optical input return losses		40	–	dB
d_2	second order distortion		–	–70	dBc
F	equivalent noise input		–	7	pA/√Hz
I_{tot}	total current consumption	DC value; V_B = 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

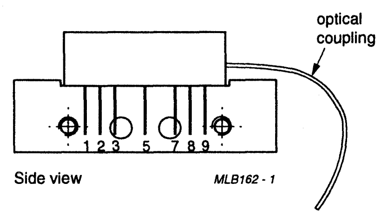


Fig.1 Simplified outline.

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_{stg}	storage temperature		–40	+85	°C
T_{mb}	mounting base operating temperature		–20	+85	°C
P_{IN}	optical input power	continuous	–	2	mW
ESD	ESD sensitivity	human body model; R = 1.5 kΩ; C = 100 pF	500	–	V

HANDLING

Fibreglass optical coupling: maximum tensile strength = 5 N; minimum bending radius = 35 mm.

CHARACTERISTICS

Bandwidth 40 to 860 MHz; T_{mb} = 30 °C; Z_S = Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
S	responsivity	λ = 1300 nm	1000	–	V/W
FL	flatness of frequency response		–	±0.5	dB
S_{22}	output return losses	f = 40 to 860 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 MHz	–	7	pA/√Hz
s_λ	spectral sensitivity	λ = 1310 ±20 nm	0.85	–	A/W
		λ = 1550 ±20 nm	0.9	–	A/W
λ	optical wavelength		1290	1600	nm
L	length of pigtail	fibre: SM type; 9/125 μm	1	–	m
I_{tot}	total current consumption (DC)	V_B = 24 V	–	250	mA

Notes

1. Two laser test, each laser with a 40% modulation index;
   f_p = 135 MHz; P_p = 0.5 mW;
   f_q = 189.25 MHz; P_q = 0.5 mW;
   measured at $f_p + f_q$ = 324.25 MHz.
2. Three laser test, each laser with a 40% modulation index;
   f_p = 326.25 MHz; P_p = 0.33 mW;
   f_q = 333.25 MHz; P_q = 0.33 mW;
   f_r = 335.25 MHz; P_q = 0.33 mW;
   measured at $f_p + f_q - f_r$ = 324.25 MHz.

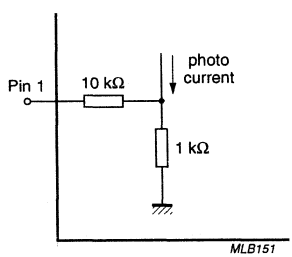


Fig.2 Monitor current pin.

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	$+V_B$
7	common
8	common
9	output

PIN CONFIGURATION

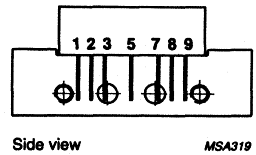


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 1000 MHz	18.5	–	dB
I_{tot}	total current consumption	DC value; V_B = 24 V	–	240	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_i	RF input voltage	–	60	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	mounting base operating temperature	–20	+100	°C

Capability approved to CECC NECC-C-005

CHARACTERISTICS

Bandwidth 40 to 1000 MHz; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω.

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	–	–	± 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 dBmV; measured at 595.25 MHz	–	–	−58	dB
		110 chs flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–	−53	dB
		150 chs flat; V_o = 40 dBmV; measured at 985.25 MHz	–	−53	–	dB
X_{mod}	cross modulation	85 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–	−58	dB
		110 chs flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–	−54	dB
		150 chs flat; V_o = 40 dBmV; measured at 55.25 MHz	–	−54	–	dB
CSO	composite second order distortion	85 chs flat; V_o = 44 dBmV; measured at 596.5 MHz	–	–	−60	dB
		110 chs flat; V_o = 44 dBmV; measured at 746.5 MHz	–	–	−56	dB
		150 chs flat; V_o = 40 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_{im} = −60 dB				
		note 4	61	–	–	dBmV
		note 5	60	–	–	dBmV
		note 6	–	59	–	dBmV

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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

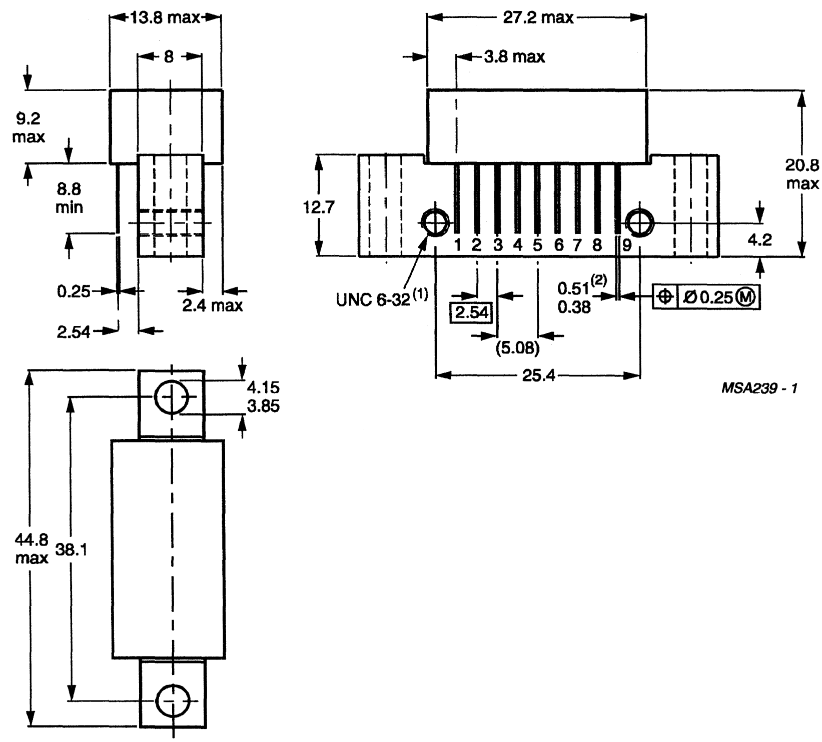
When mounting CATV hybrid components, the UNC screws must first be turned finger-tight. The screws should then be tightened to within the tolerance 0.5 Nm minimum and 0.7 Nm maximum.

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

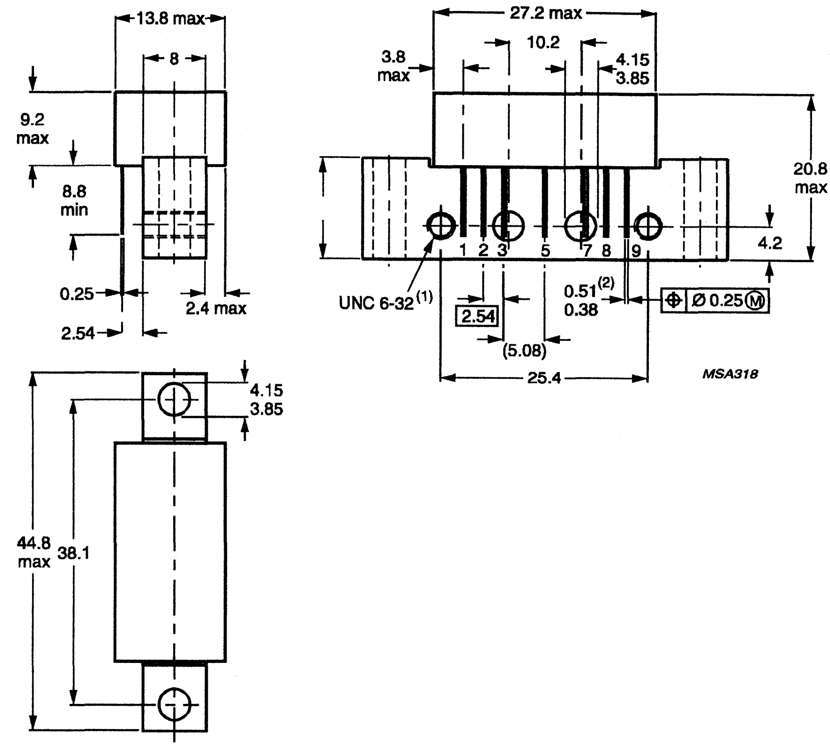


Dimensions in mm

(1) Screw 6-32 UNC-2A available on request (see Accessories).

(2) Leads gold plated

Fig.1 SOT115

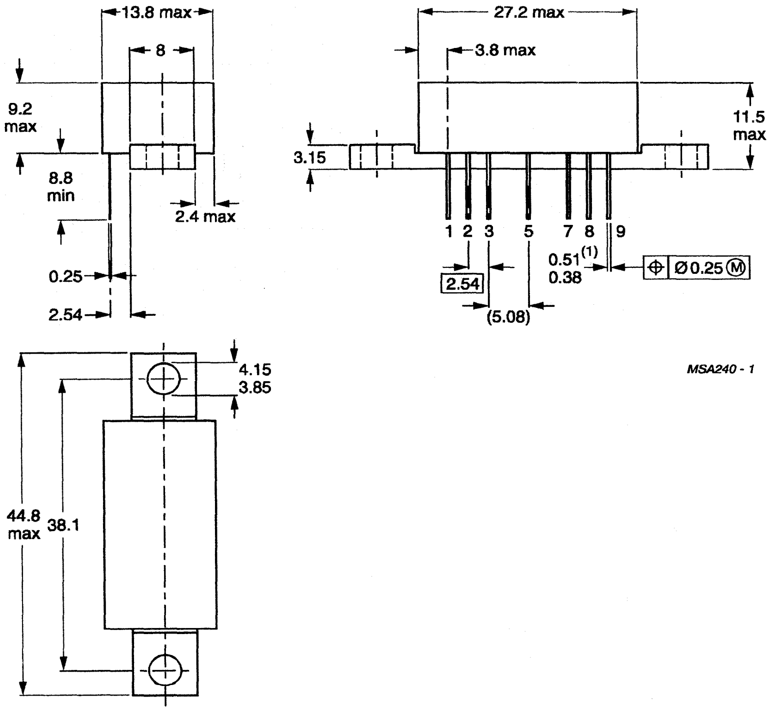


Dimensions in mm

(1) Screw 6-32 UNC-2A available on request (see Accessories).

(2) Leads gold plated

Fig.2 SOT115J2



Dimensions in mm

(1) Screw 6-32 UNC-2A available on request (see Accessories).

(2) Leads gold plated

Fig.3 SOT115L

ACCESSORIES

CATV test jig

SPECIFICATION FOR CATV TEST JIG

(range 40 - 860 MHz)

Impedance	:	75 Ω
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 Ω 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 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 °C.
RF connectors	:	N-type female (75 Ω)
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 BGX885 and BGD885
Ordering information	:	CATV test fixture 860 MHz, 12NC : 7322 142 89060.

CATV test jig

SPECIFICATION FOR CATV TEST JIG

(range 5 - 600 MHz)

Impedance	:	75 Ω
Return loss	:	< −40 dB (Measured with thru-line system and other port terminated with a very good 75 Ω load)
Cross talk	:	< −80 dB
Insertion loss	:	< 0.1 dB (Measured with thru-line system)

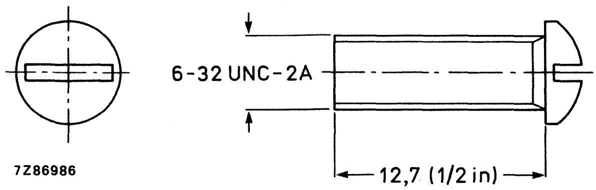
Note

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 Ω)
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.



7Z86986

DEVICE DATA

Hybrid wideband amplifiers

(in alphanumeric sequence)

PRODUCT CAPABILITY OVERVIEW

TECHNOLOGIES

CERAMICS	RESISTIVE TECHNOLOGY	CONDUCTIVE TECHNOLOGY	DIE BONDING AND WIRE BONDING
Al_2O_3 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.

FINISHINGS

Substrates
Plate
SIL lacquered
DIL lacquered
Hermetic
SMD
Plastic cover

TYPICAL TIME TO MARKET (custom made circuits)

Between two and seven months (depending on product style/complexity).

DESIGN LANGUAGES

IGDS (Intergraph, Microstation)
GDSII (CALMA), DXF (AutoCad), IGES, also HPGL, GERBER.

Hybrid Wideband Amplifiers for 12 V Antenna Systems and Industrial Applications

Type No. OM	Gain (dB) (1)	F (dB) (2)	$V_{O(rms)}$ (3)	$V_{O(rms)}$ (4)
2083/86	30-30	7.5	102	112
2083/87	30-30	7.5	105	115
2083/60	29-29	7.5	104	114
2063	29-29	3.6	85	105
2064	28-28	4.4	85	107
2070B	31-31	4.8	95	112
2070	28-29	4.8	95	112
2052	27-27	4.5	-	107
2060	23-23	5.4	87	107
2082/87	21-21	6	105	115
2082/61	21-21	6	105	115
2082/60	20-20	6	104	114
2082/86	19-19	6	103	114
2050	18-18	5.2	81	100
956/25	15-23	4.5	-	122
956/1	18.5-21	4.5	-	112
956/11	20-24	4.5	-	115
926/EMSD	15-20	4.5	-	115
926E	15-20	6.5	-	107
926	15-18	6.5	-	107
2081/60	10-10	7.5	105	115
2081/86	11-11	7.5	105	115
20-46	10-10	10.0	-	114
2045	12-12	3.6	76	99

Not existing yet

(1) Example: 20-20 = Flat gain
20-24 = Sloped gain

(2) F: noise figure in dB

(3) Output level for 60 dB two-tone intermodulation distortion rejection

(4) Output level for 60 dB three-tone intermodulation distortion rejection
(35 dB rejection for OM 9 xx - series)

New developments

3 stage Amplifier

2 stage Amplifier

1 stage Amplifier

Gain (dB): 10, 20, 30

Frequency range (MHz): 40, 600, 860, 950, 1750, 2050, 2500

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

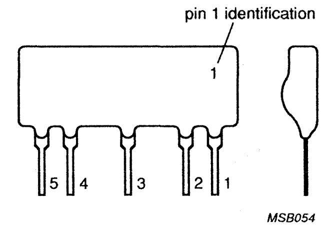


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		10	–	2000	MHz
G_{tr}	transducer gain	f = 1750 MHz; $G_{tr} = \|s_f\|^2$	–	18	–	dB
$V_{o(RMS)}$	output voltage	d_{im} = –60 dB (DIN 45004, paragraph 6.3: 3-tone)	101	–	–	dBμV
F	noise figure		–	6.5	–	dB
V_B	supply voltage	DC value	–	12	–	V
T_{amb}	ambient operating temperature range		–20	–	70	°C

MECHANICAL DATA

Encapsulation

The encapsulation comprises a 5-pin, in-line, resin-coated body, see Fig.8.

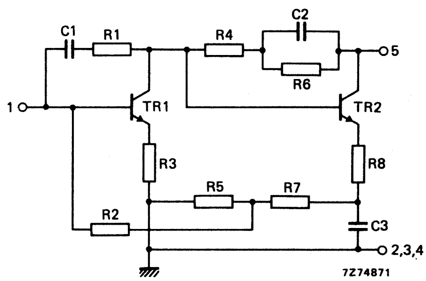


Fig.2 Circuit diagram.

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.

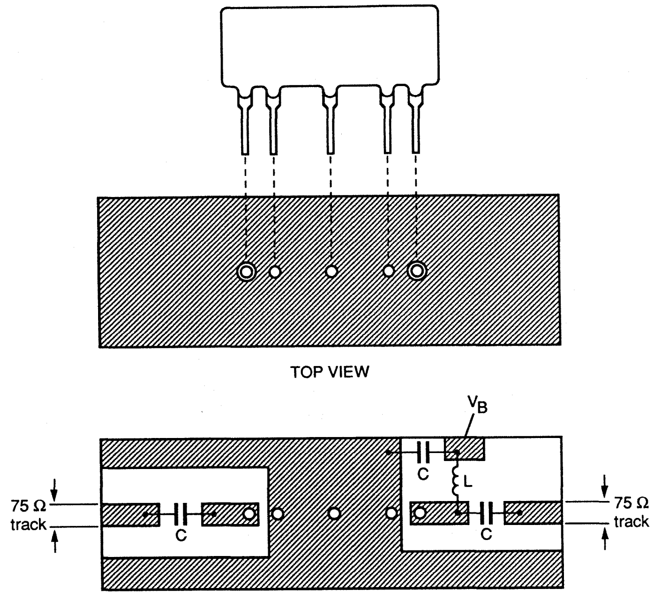
The total contact time of successive solder waves must not exceed 5 s.

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.



L > 5 µH; 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 pF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

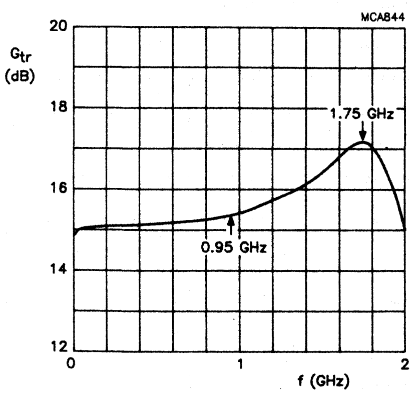
LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
T_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I5M}	peak incident powers on pins 1 and 5	–	100	mW

CHARACTERISTICS

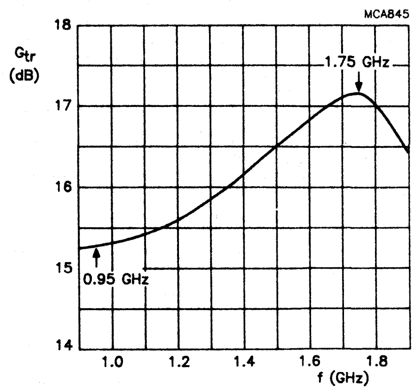
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	supply voltage	DC value	–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Performance						
I_B	supply current		–	28	–	mA
G_{tr}	transducer gain	$G_{tr} = \|s_f\|^2$;				
		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	–	dBμV
F	noise figure		–	6.5	–	dB
Operating conditions						
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	–	Ω
Z_L	load impedance		–	75	–	Ω



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

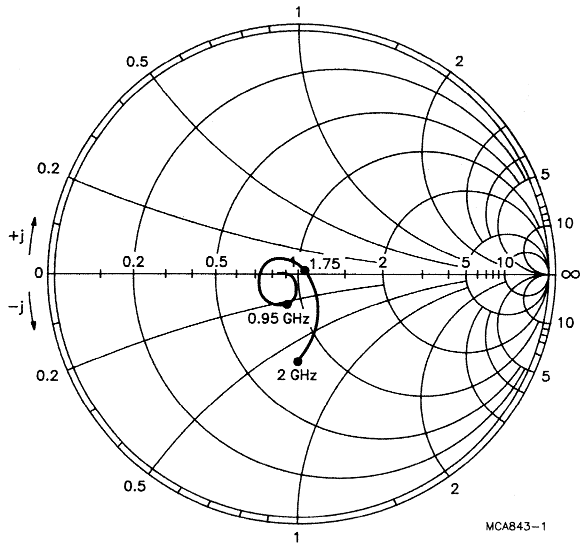


Fig.6 Input impedance derived from input reflection coefficient S_{ie}, co-ordinates in ohms x 75; typical values.

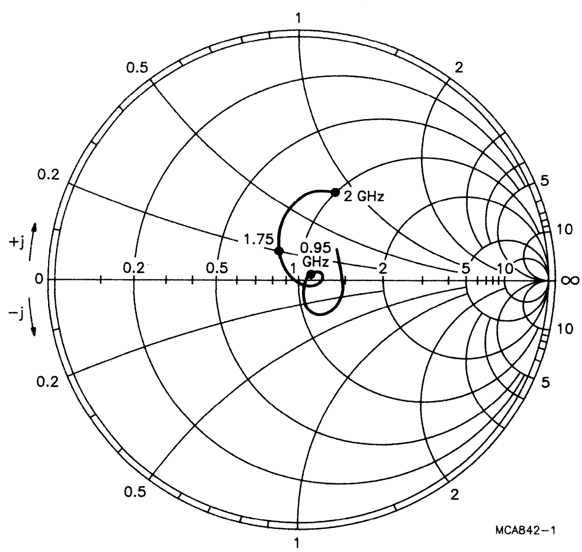
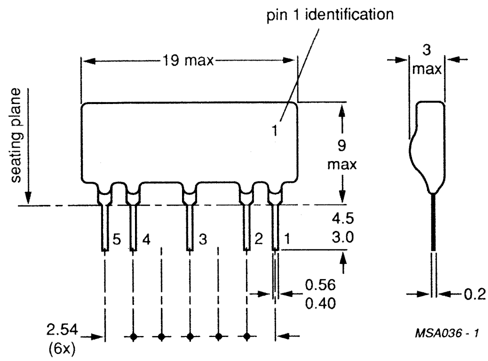


Fig.7 Output impedance derived from output reflection coefficient S_{oe}, co-ordinates in ohms x 75; typical values.

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 (+)

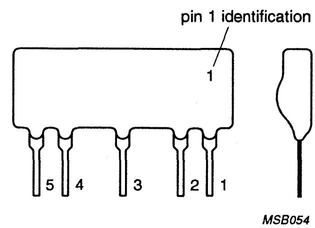


Fig.1 Simplified outline.

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	–	dBμV
		d_{im} = –35 dB; 2-tone	112	113	–	dBμV
F	noise figure		–	6.5	–	dB
V_B	DC supply voltage		–	12	–	V
T_{amb}	operating ambient temperature		–20	–	+70	°C

CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD

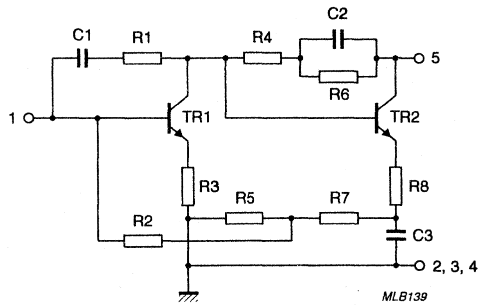
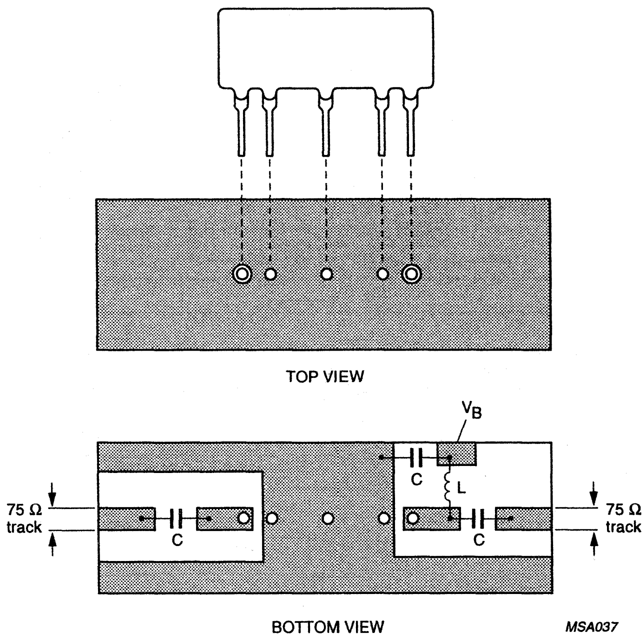


Fig.2 Simplified circuit diagram.



L > 5 µH; 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.

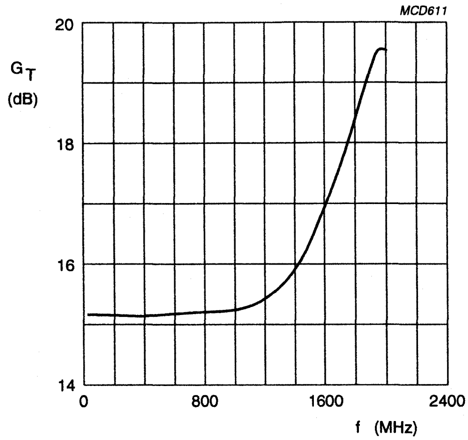
LIMITING VALUES

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
Measuring conditions						
T_{amb}	ambient operating temperature		−	25	−	°C
V_B	DC supply voltage		−	12	−	V
Z_S	source impedance		−	75	−	Ω
Z_L	load impedance		−	75	−	Ω
Performance						
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	−	dBμV
		d_{im} = −35 dB; 2-tone	112	113	−	dBμV
F	noise figure		−	6.5	−	dB
Operating conditions						
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	−	Ω
Z_L	load impedance		−	75	−	Ω



Gain over entire frequency range.
$Z_o = 75\ \Omega$.

Fig.4 Transducer gain as a function of frequency.

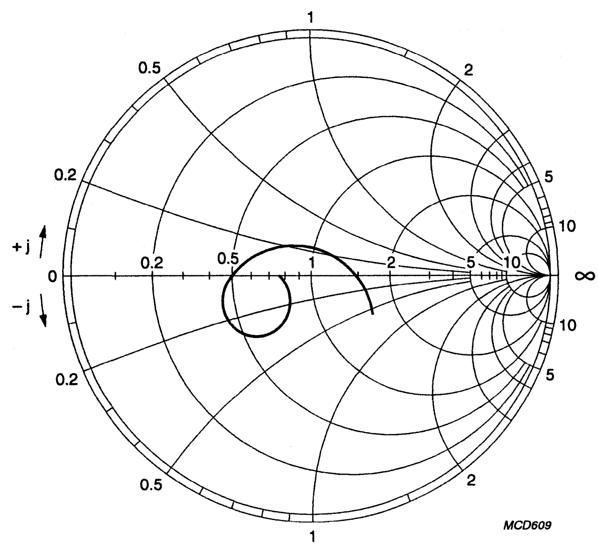


Fig.5 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

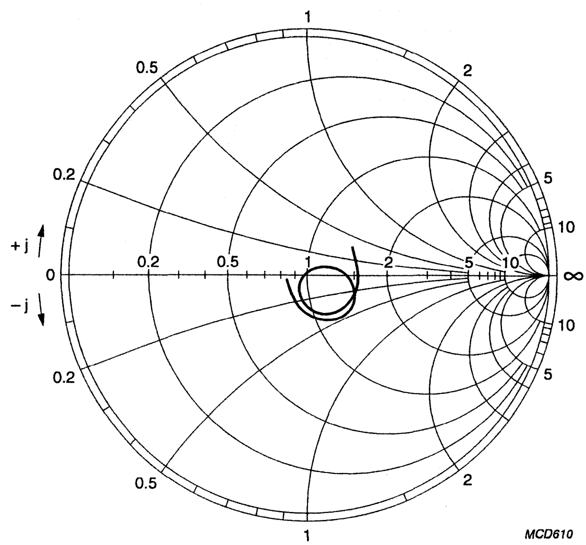


Fig.6 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

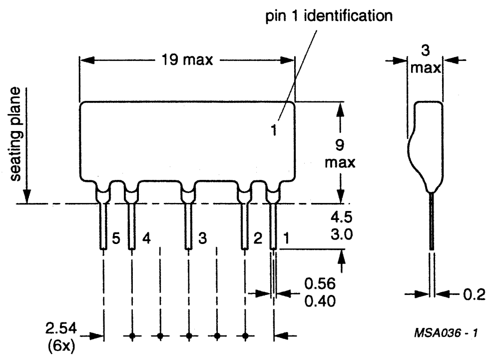
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



Dimensions in mm.

Fig.7 Resin coated encapsulation.

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 (+)

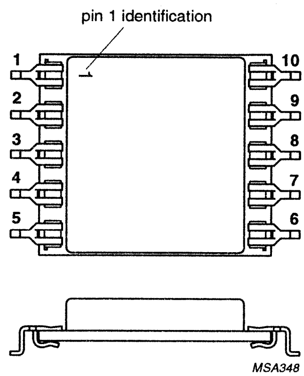
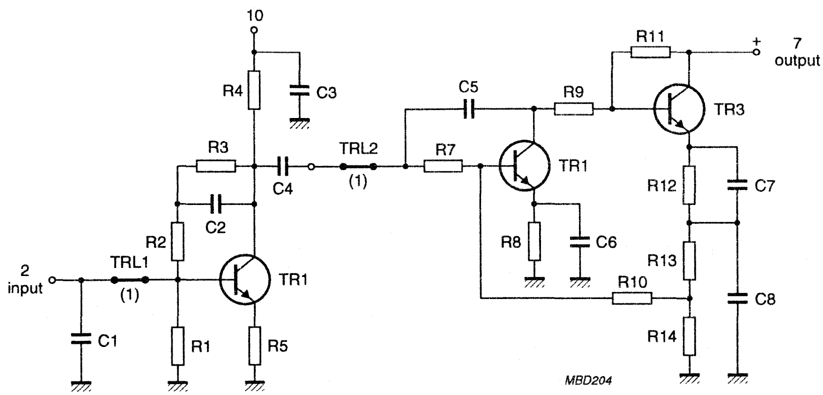


Fig.1 Simplified outline.

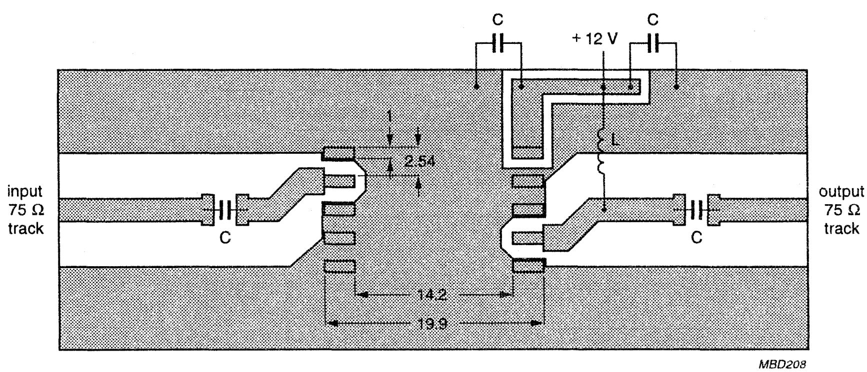
QUICK REFERENCE DATA

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	–	–	dBμV
F	noise figure		–	4.5	–	dB
V_B	DC supply voltage		–	12	–	V
T_{amb}	operating ambient temperature		–20	–	+70	°C



(1) Transmission line.

Fig.2 Simplified circuit diagram.



L > 5 μH; 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.

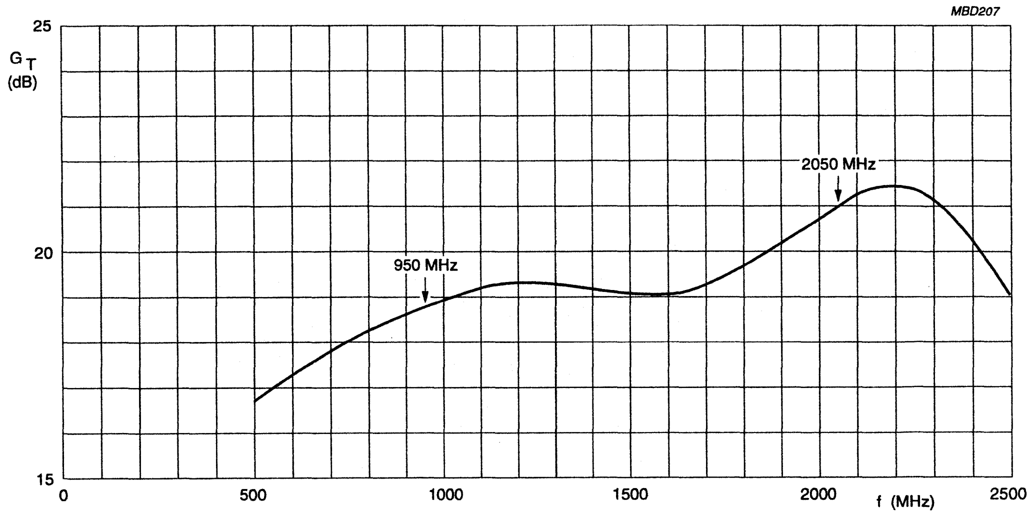
LIMITING VALUES

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
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Performance						
I_B	supply current		–	57.5	–	mA
G_T	transducer gain = $\lvert S_{21}\rvert^2$	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
$\lvert S_{12}\rvert^2$	feedback attenuation		–		–	dB
$V_{o(rms)}$	output voltage (RMS value)	d_{im} = –35 dB; third order, 2-tone	–	112.0	–	dBμV
F	noise figure		–	4.5	–	dB
Operating conditions						
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	–	Ω
Z_L	load impedance		–	75	–	Ω



Gain over entire frequency range.
Z_0 = 75 Ω.

Fig.4 Transducer gain as a function of frequency.

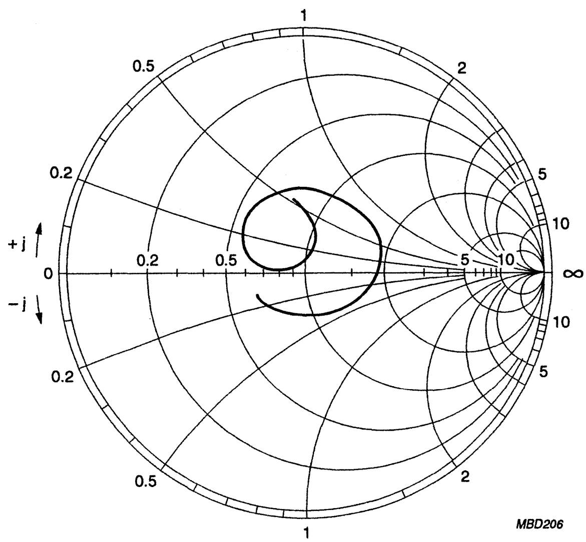


Fig.5 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

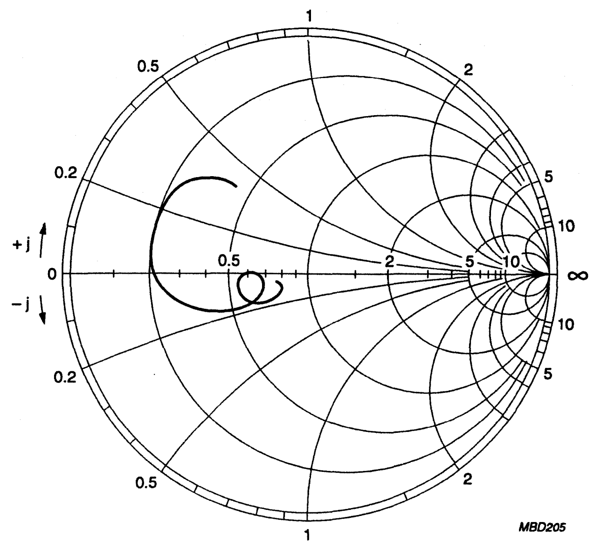


Fig.6 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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.

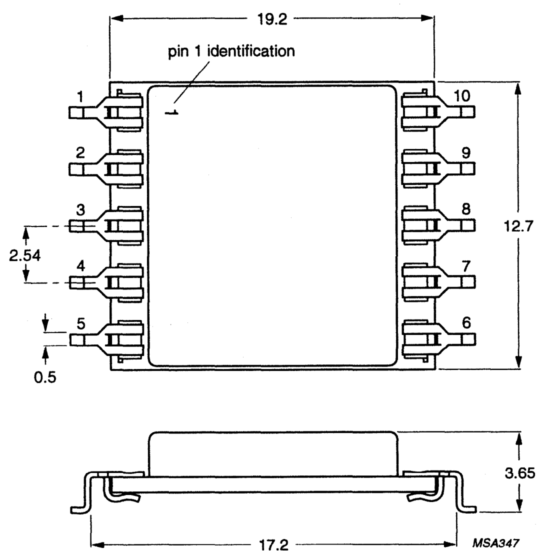
SOLDERING

Hand soldering

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

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 ± 10%
Frequency range	f		40 to 860	MHz
Source and load (characteristic) impedance	$R_s = R_\ell = Z_o$	=	75	Ω
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	dBμV
Noise figure	F	typ.	3,6	dB
Operating ambient temperature	T_{amb}		−20 to + 70	°C

ENCAPSULATION 5-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

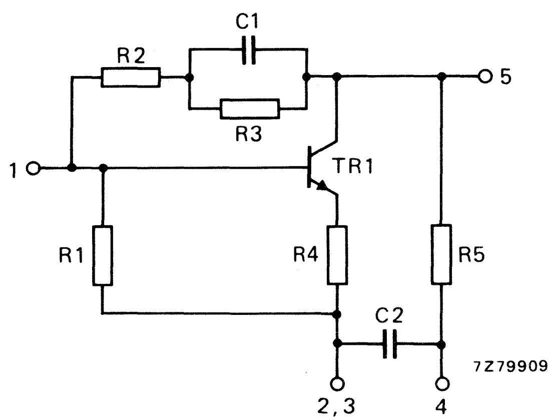


Fig. 1 Circuit diagram.

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	Ω
Characteristic impedance of h.f. connections	Z_o	=	75	Ω
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	$VSWR_{(i)}$	typ.	2,0	*
output	$VSWR_{(o)}$	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	dBμV
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, occuring in the frequency range.

OPERATING CONDITIONS

Ambient temperature range	T_{amb}		−20 to + 70 °C
D.C. supply voltage	V_B	=	12 V ±10%
Frequency range	f		40 to 860 MHz
Source impedance and load impedance	R_s, R_ℓ	=	75 Ω

MECHANICAL DATA

Dimensions in mm

The device is resin coated.

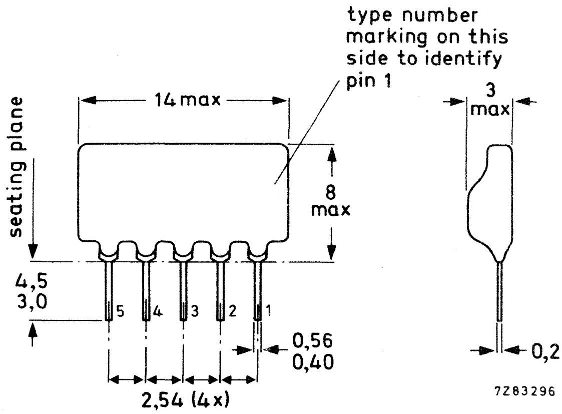


Fig. 2 Encapsulation.

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.

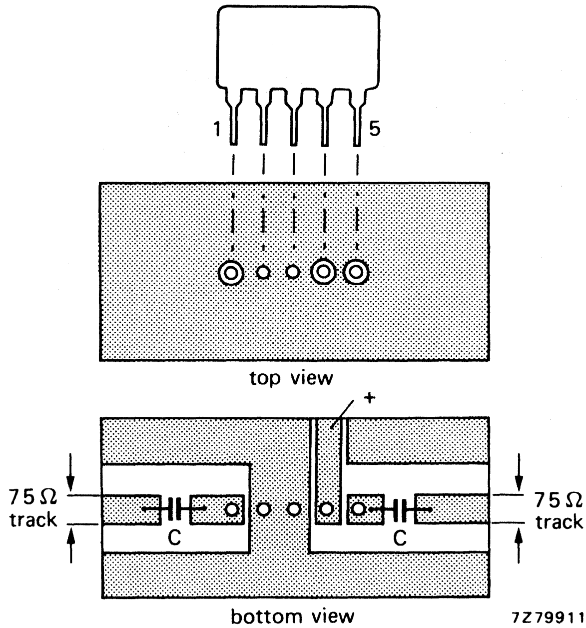


Fig. 3 Printed-circuit board holes and tracks.
C > 220 pF ceramic capacitor.

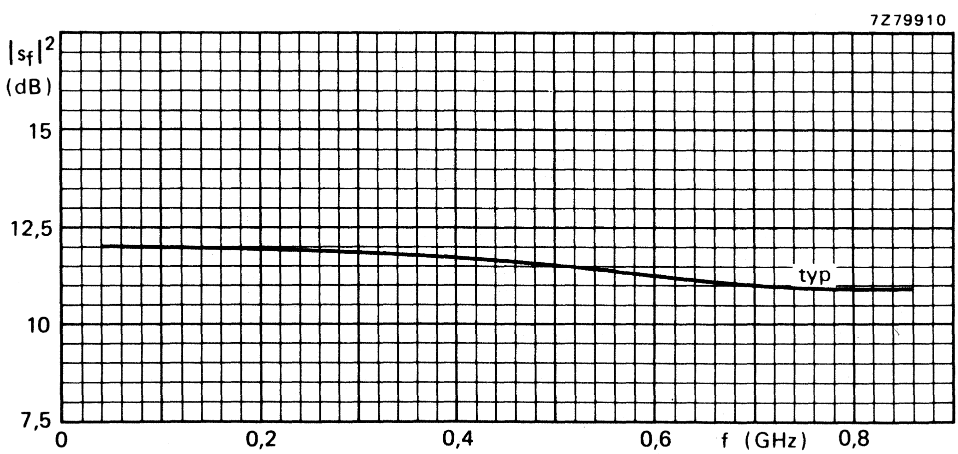


Fig. 4 Transducer gain as a function of frequency; $Z_o = 75\ \Omega$.

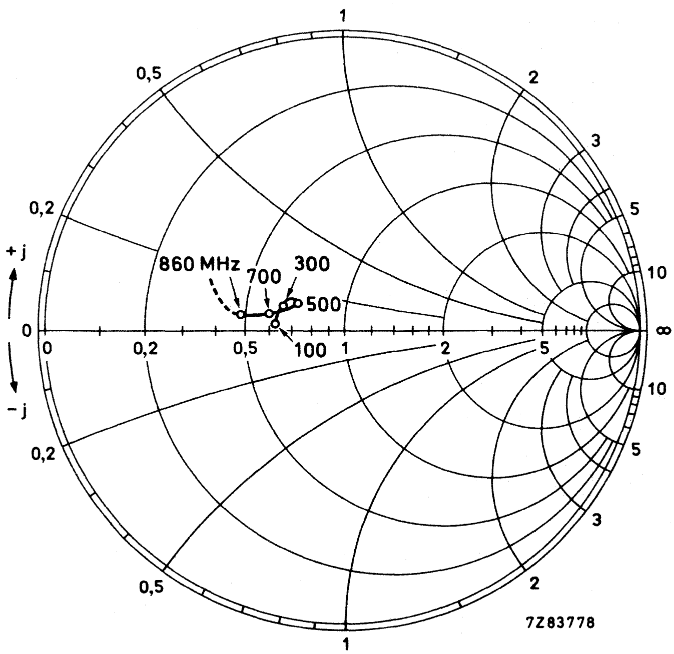


Fig. 5 Input impedance derived from input reflection coefficient s_i, co-ordinates in ohm x 75; typical values.

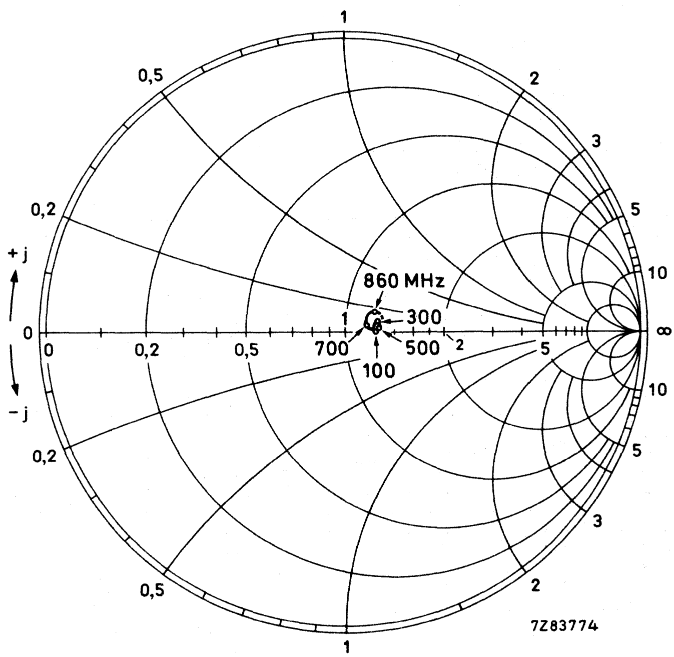


Fig. 6 Output impedance derived from output reflection coefficient s_o, co-ordinates in ohm x 75; typical values.

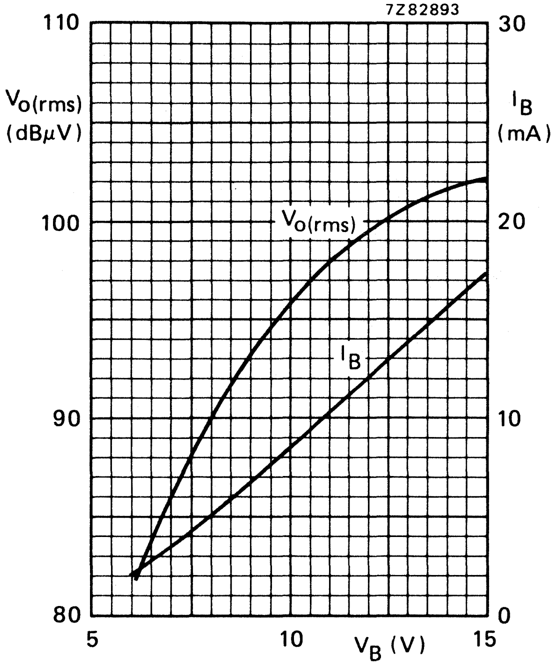


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

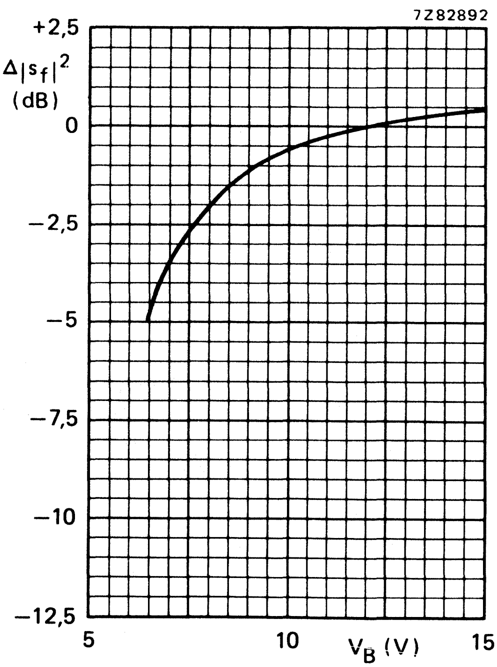


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V; f = 100 to 860 MHz; typical values.

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

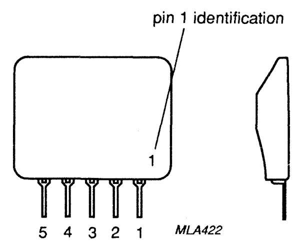


Fig.1 Simplified outline.

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	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
$G_{tr} = \lvert s_f \rvert^2$	transducer gain		–	10	–	dB
$\pm\Delta\lvert s_f \rvert^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)				
	VHF		–	116	–	dBμV
	UHF		–	114	–	dBμV
F	noise figure		–	10	–	dB
V_B	DC supply voltage		10.8	12	13.2	V
T_{amb}	ambient operating temperature range		–20	–	70	°C

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.

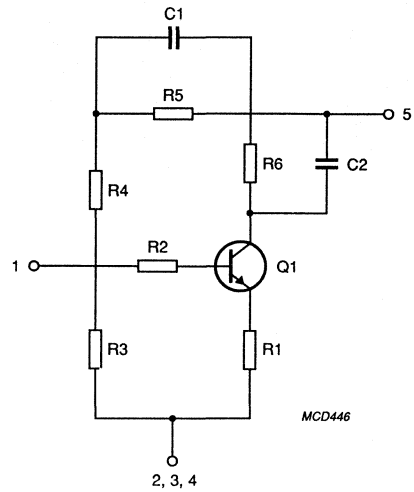
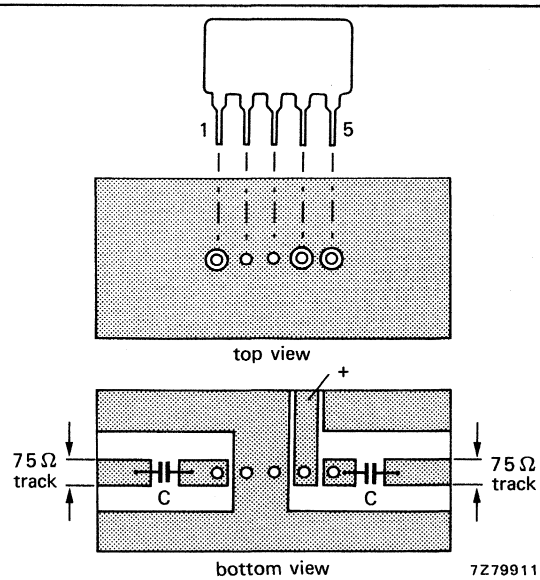


Fig.2 Circuit diagram.



L > 5 μH; 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 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_{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_{I1M}, P_{I8M}	peak incident powers on pins 1 and 8	–	100	mW

CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
R_S, R_L	source and load resistance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		–	82	–	mA
$G_{tr} = \lvert s_f\rvert^2$	transducer gain		9	10	11	dB
$\pm\Delta\lvert s_f\rvert^2$	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)	–	
$\lvert s_r\rvert^2$	back attenuation	f = 100 MHz	–	16	–	dB
		f = 860 MHz	–	15	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)				
	VHF		115	116	–	dBμV
	UHF		113	114	–	dBμV
F	noise figure		–	10	–	dB

Notes

Scattering parameters: $s_f = s_{21}$; $s_r = s_{12}$.

1. 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	13.2	V
f	frequency range	40	−	860	MHz
R_S, R_L	source and load resistance	−	75	−	Ω

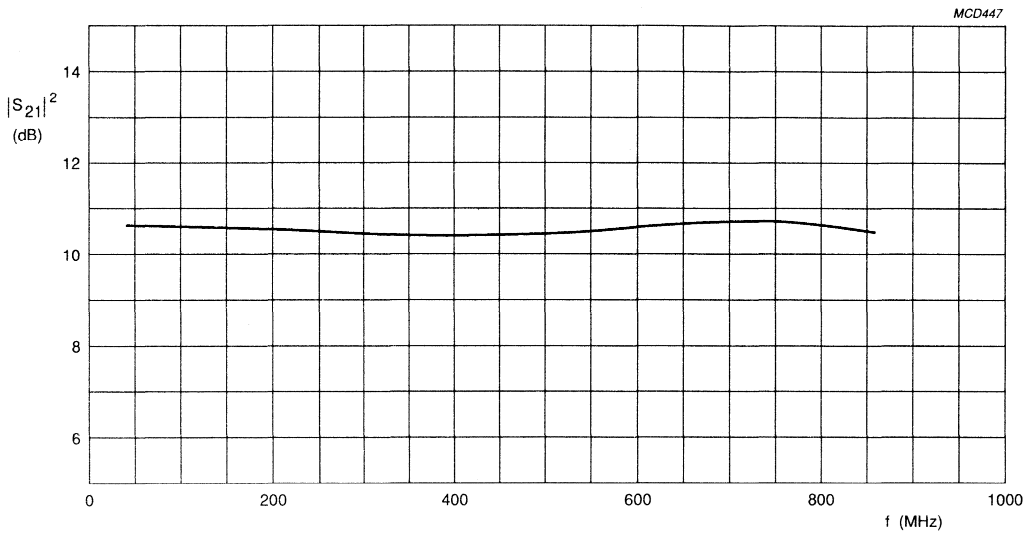
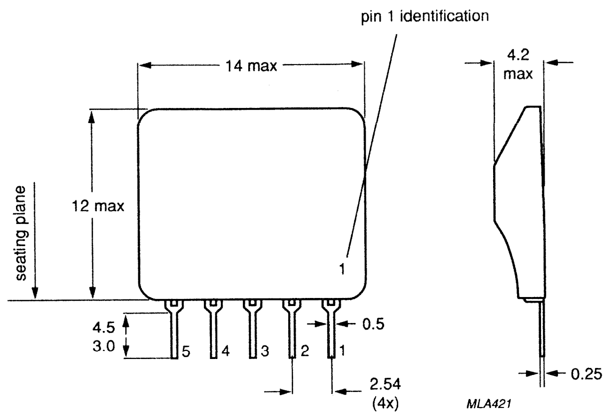


Fig.4 Transducer gain as a function of frequency; Z_O = 75 Ω.

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 ± 10%
Frequency range	f		40 to 860	MHz
Source and load (characteristic) impedance	$R_s = R_\ell = Z_o$	=	75	Ω
Transducer gain	$G_{tr} = \lvert s_f \rvert^2$	typ.	18	dB
Flatness of frequency response	$\pm \Delta \lvert s_f \rvert^2$	typ.	1	dB
Output voltage at −60 dB intermodulation distortion (DIN 45004, 3-tone)	$V_{o(rms)}$	typ.	100	dBμV
Noise figure	F	typ.	5,2	dB
Operating ambient temperature	T_{amb}		−20 to +70	°C

ENCAPSULATION 5-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

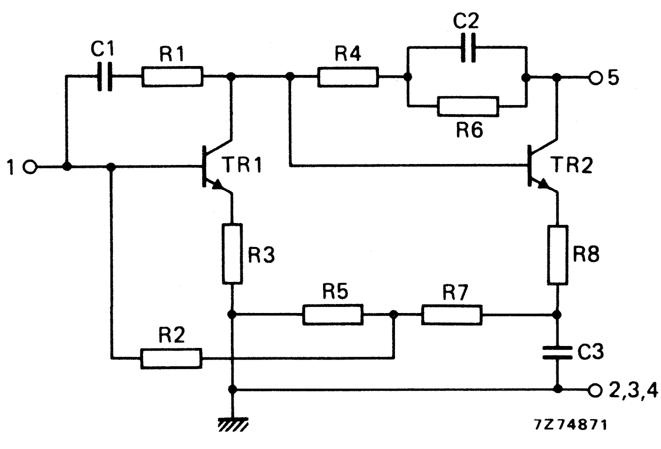


Fig. 1 Circuit diagram.

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	Ω
Characteristic impedance of h.f. connections	Z_o	= 75	Ω
Frequency range	f	= 40 to 860	MHz

Performance

Supply current	I_B	typ.	18	mA
Transducer gain	$G_{tr} = \lvert s_f \rvert^2$	typ.	18	dB
Flatness of frequency response	$\pm \Delta \lvert s_f \rvert^2$	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	$\lvert s_r \rvert^2$	typ.	29	dB
f = 860 MHz	$\lvert s_r \rvert^2$	typ.	25	dB
Output voltage at −60 dB intermodulation distortion (DIN 45004, par. 6.3: 3-tone)	$V_{o(rms)}$	typ.	100	dBμV
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 ± 10%
Frequency range	f	40 to 860	MHz
Source impedance and load impedance	R_s, R_ℓ	= 75	Ω

MECHANICAL DATA

Dimensions in mm

The device is resin coated.

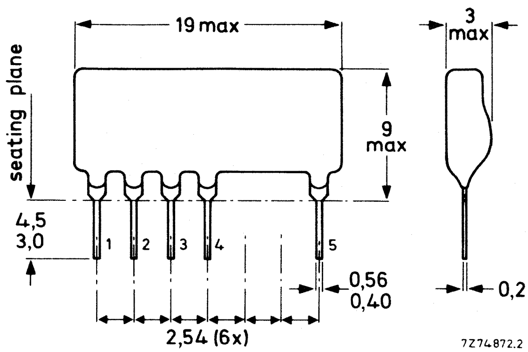


Fig. 2 Encapsulation.

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

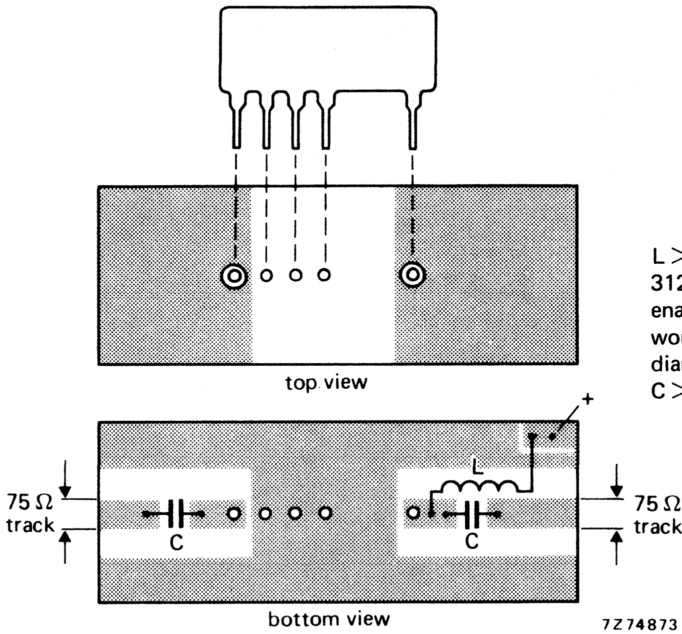
260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must 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.



L > 5 μH; 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 pF ceramic capacitor.

Fig. 3 Printed-circuit board holes and tracks.

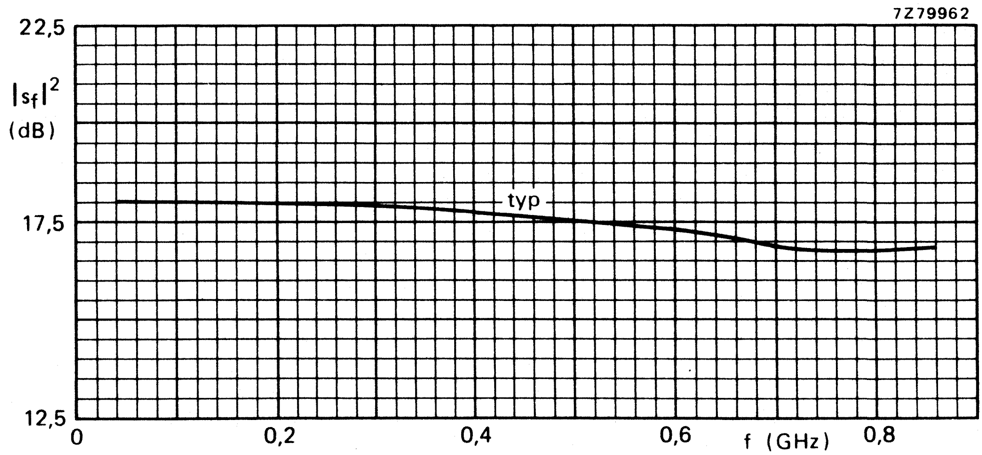


Fig. 4 Transducer gain as a function of frequency; Z_o = 75 Ω.

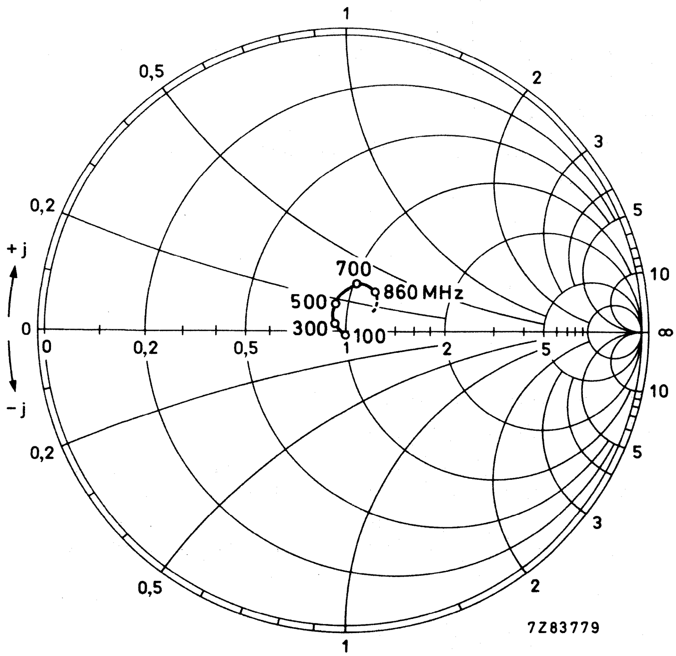


Fig. 5 Input impedance derived from input reflection coefficient s_i, co-ordinates in ohm x 75; typical values.

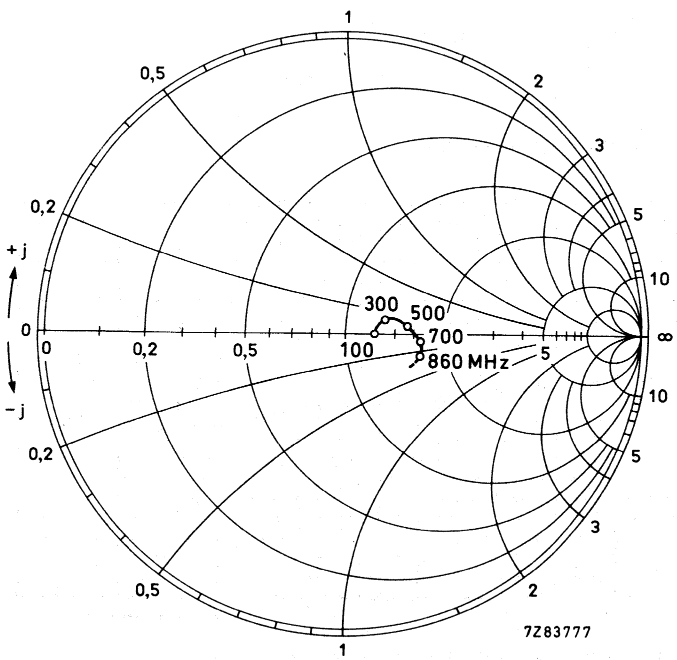


Fig. 6 Output impedance derived from output reflection coefficient s_o, co-ordinates in ohm x 75; typical values.

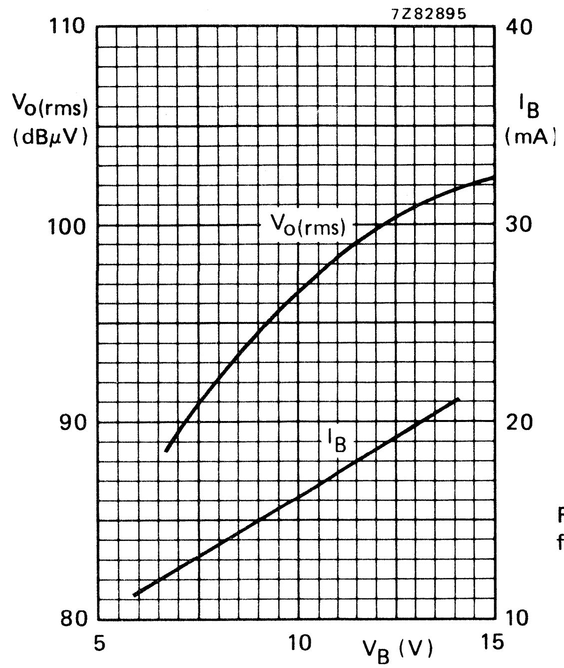


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

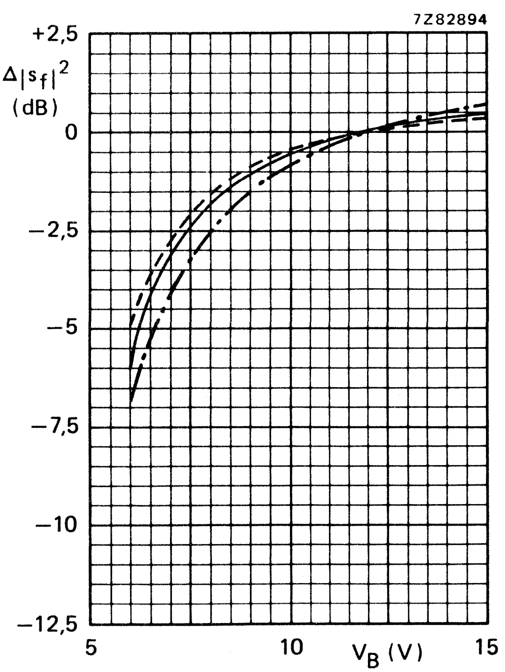


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V:
——— f = 500 MHz;
– – – – f = 100 MHz;
—.—.—. f = 860 MHz;
typical values.

Hybrid integrated circuit VHF/UHF wideband amplifier

OM2052

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

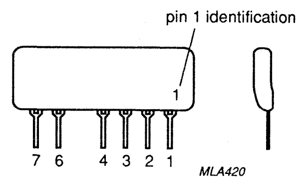


Fig.1 Simplified outline.

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	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
$G_{tr} = \|s_f\|^2$	transducer gain		–	28	–	dB
$\pm\Delta\|s_f\|^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)	–	107	–	dBμV
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	°C

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.

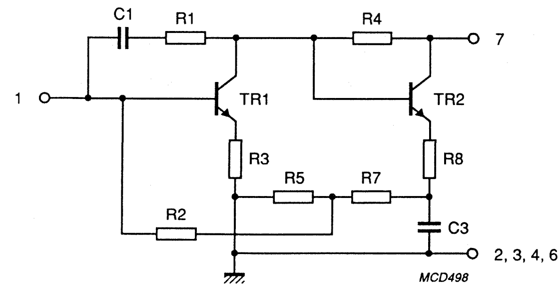
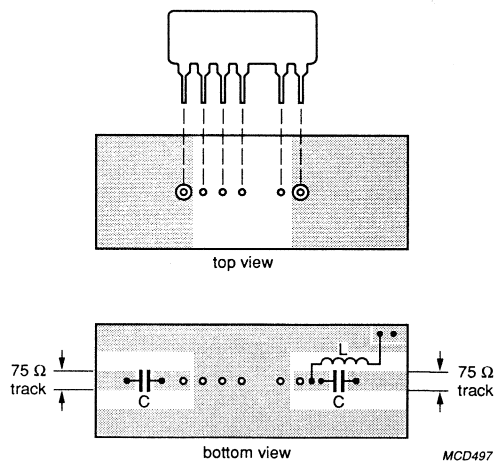


Fig.2 Circuit diagram.



L > 5 µH; 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 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_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I8M}	peak incident powers on pins 1 and 8	–	100	mW

CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
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	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		38	42	44	mA
$G_{tr} = \|s_f\|^2$	transducer gain		26	28	29	dB
$\pm\Delta\|s_f\|^2$	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)	–	
$\|s_r\|^2$	back attenuation	f = 100 MHz	–	36	–	dB
		f = 860 MHz	–	29	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	–	107	–	dBμV
F	noise figure		–	4.5	–	dB

Notes

Scattering parameters: $s_f = s_{21}$; $s_r = s_{12}$; $s_i = s_{11}$; $s_o = s_{22}$.

1. Highest value (for a sample) occurring in the frequency range.

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	–	Ω

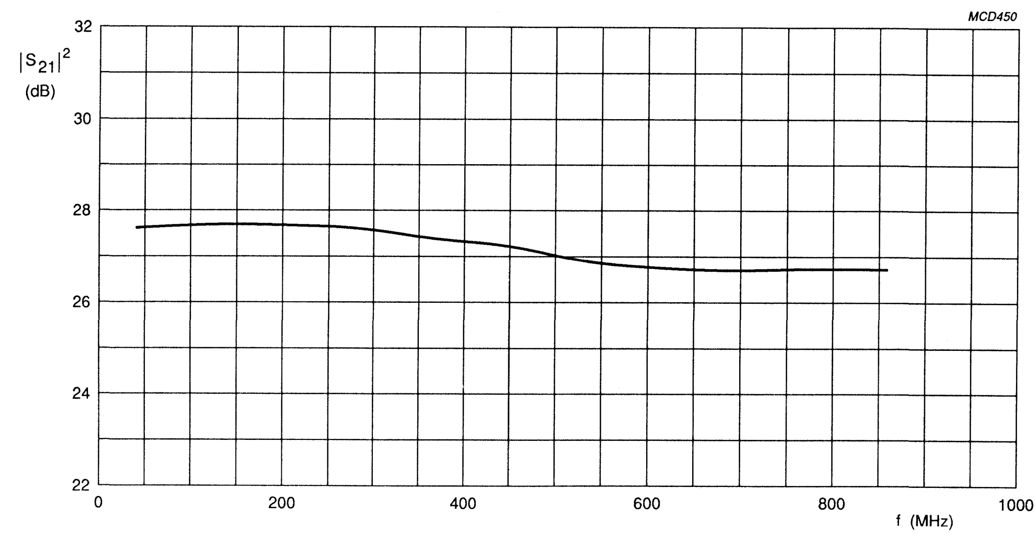


Fig.4 Transducer gain as a function of frequency; Z_O = 75 Ω.

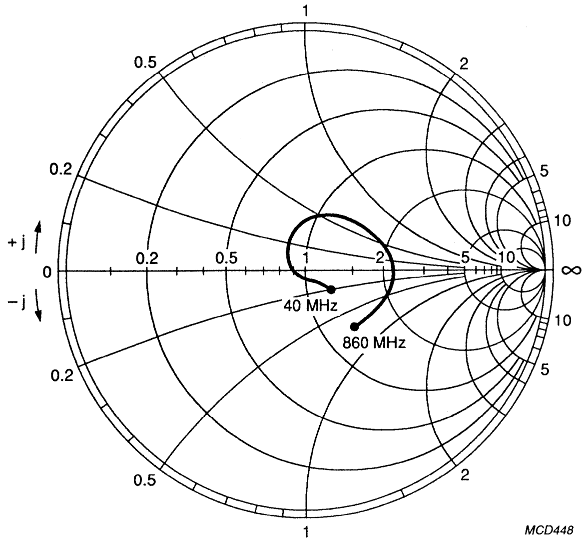


Fig.5 Input impedance derived from input reflection coefficient (s_i), co-ordinates in ohms x 75; typical values.

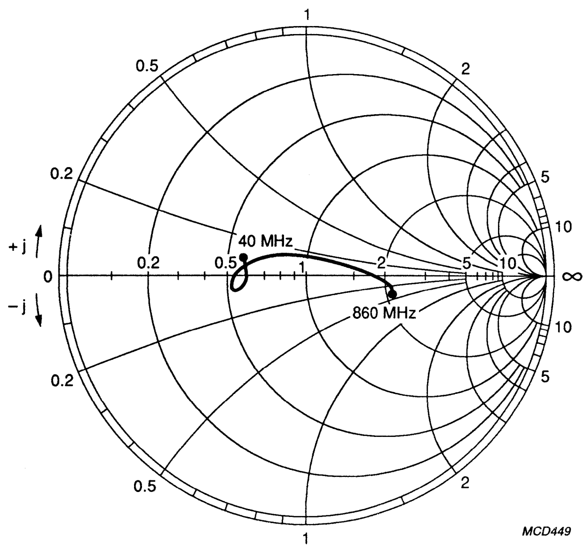
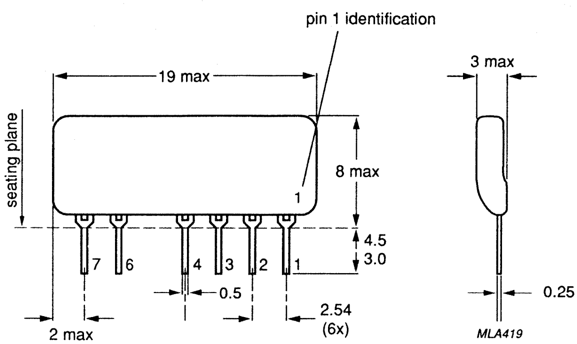


Fig.6 Output impedance derived from output reflection coefficient (s_o), co-ordinates in ohms x 75; typical values.

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	$R_s = R_\ell = Z_o$	=	75	Ω
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)	$V_{o(rms)}$	>	105	dBμV
Noise figure	F	typ.	5,4	dB
D.C. supply voltage	V_B	=	12	V ± 10%
Operating ambient temperature	T_{amb}		−20 to +70	°C

ENCAPSULATION 8-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig. 2)

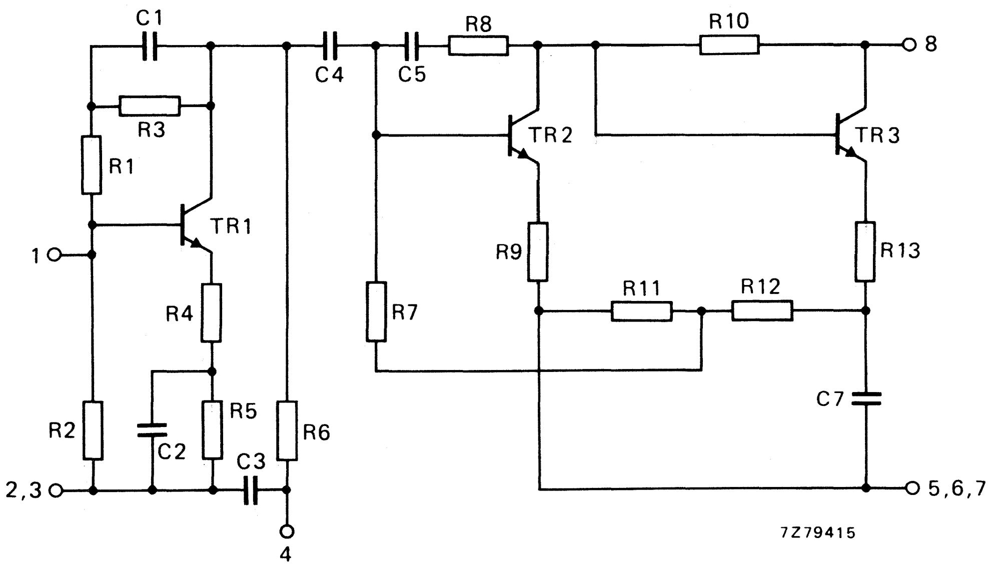


Fig. 1 Circuit diagram.

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_{I1M}, P_{I7M}	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.

OPERATING CONDITIONS

Ambient temperature range	T_{amb}	−20 to +70 °C
D.C. supply voltage	V_B	= 12 V ± 10%
Frequency range	f	40 to 860 MHz
Source impedance and load impedance	R_s, R_ℓ	= 75 Ω

MECHANICAL DATA

Dimensions in mm

The device is resin coated.

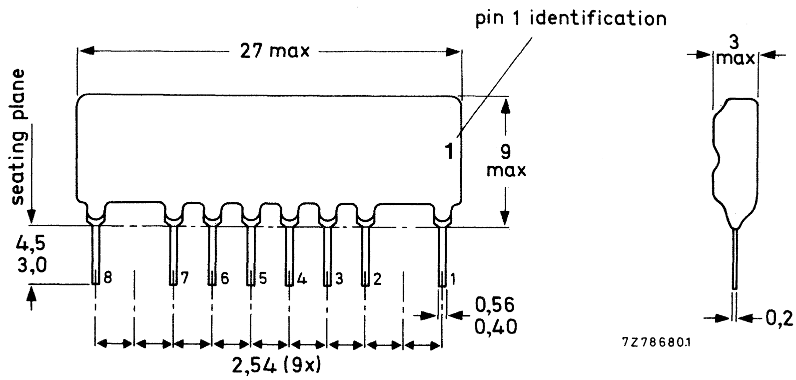


Fig. 2 Encapsulation.

Terminal connections

1	= input
2, 3, 5, 6, 7	= common
4	= supply (+)
8	= 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

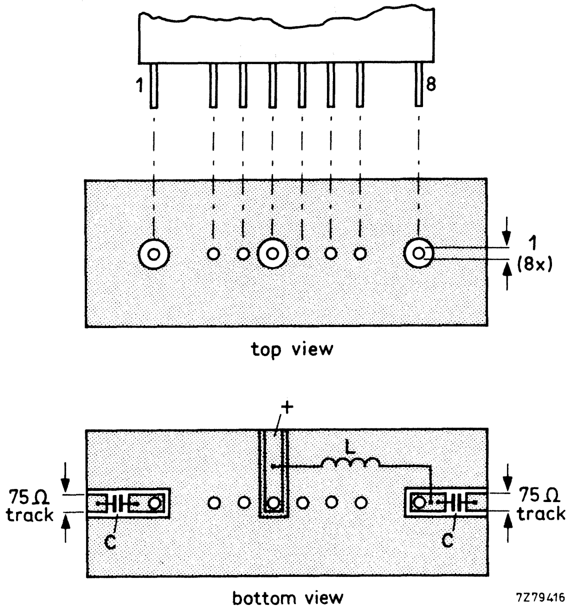
260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must 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 μH; 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 pF ceramic capacitor.

Fig. 3 Printed-circuit board holes and tracks.

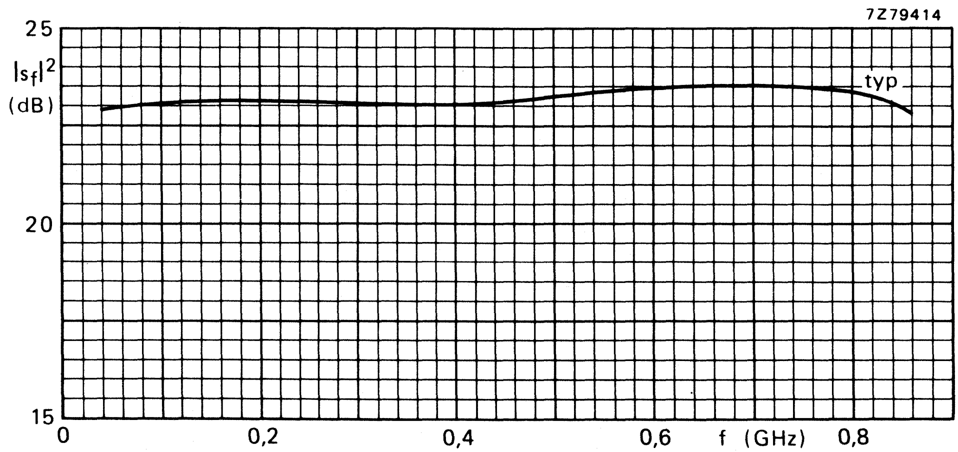


Fig. 4 Transducer gain as a function of frequency; Z_o = 75 Ω.

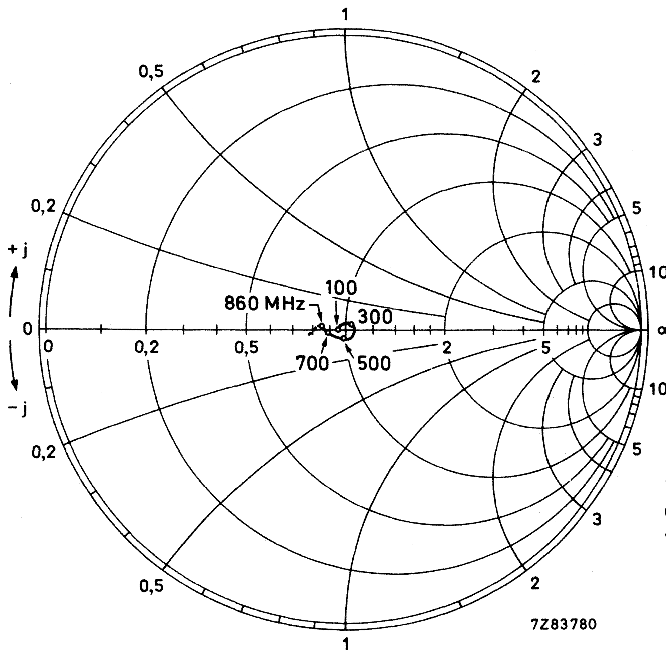


Fig. 5 Input impedance derived from input reflection coefficient s_i, co-ordinates in ohm x 75; typical values.

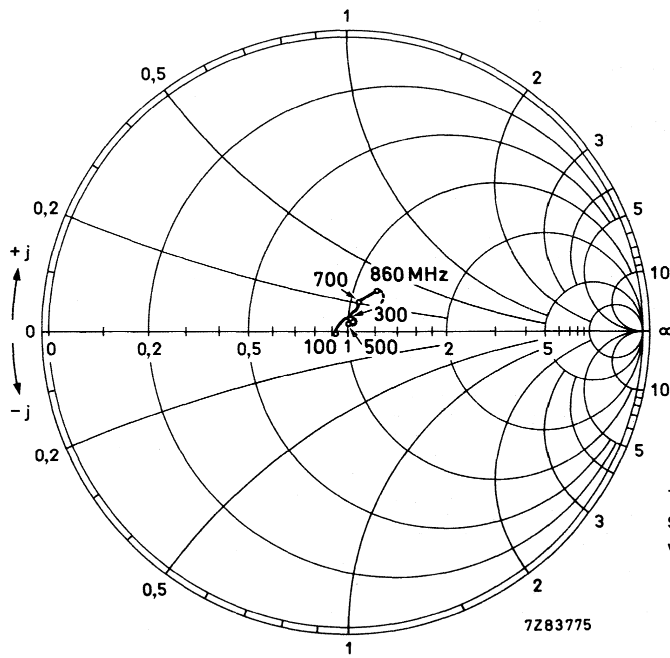


Fig. 6 Output impedance derived from output reflection coefficient s_o, co-ordinates in ohm x 75; typical values.

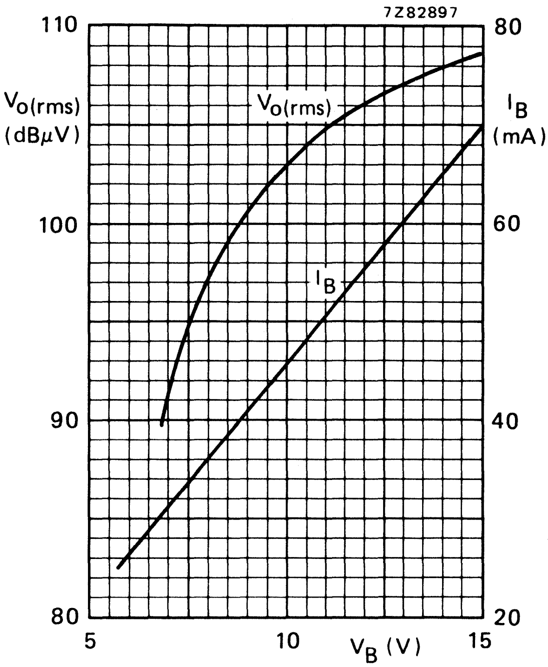


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

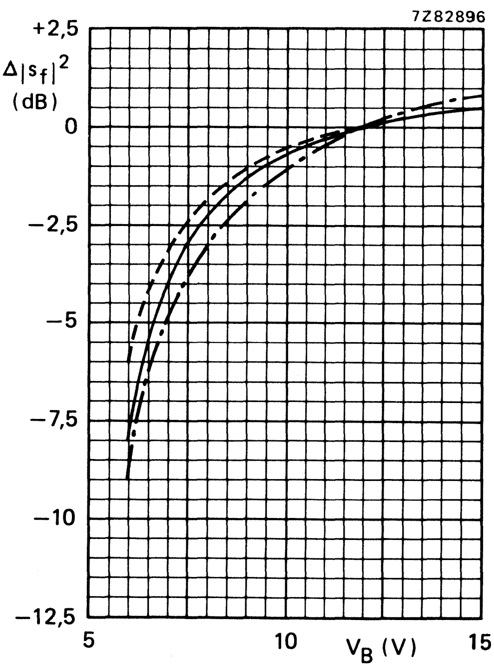


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V;
——— f = 500 MHz;
– – – – f = 100 MHz;
—.—.— f = 860 MHz;
typical values.

Hybrid integrated VHF/UHF wideband amplifier

OM2063

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

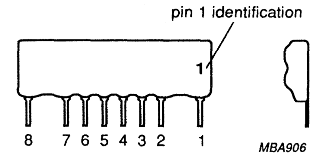


Fig.1 Simplified outline.

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	–	Ω
$G_{tr} = \lvert s_f \rvert^2$	transducer gain		–	29	–	dB
$\pm\Delta\lvert s_f \rvert^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)				
	VHF		–	103	–	dBμV
	UHF		–	105	–	dBμV
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	°C

MECHANICAL DATA

Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.8.

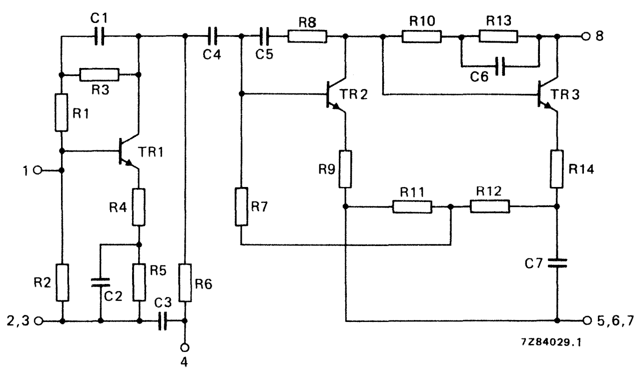


Fig.2 Circuit diagram.

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.

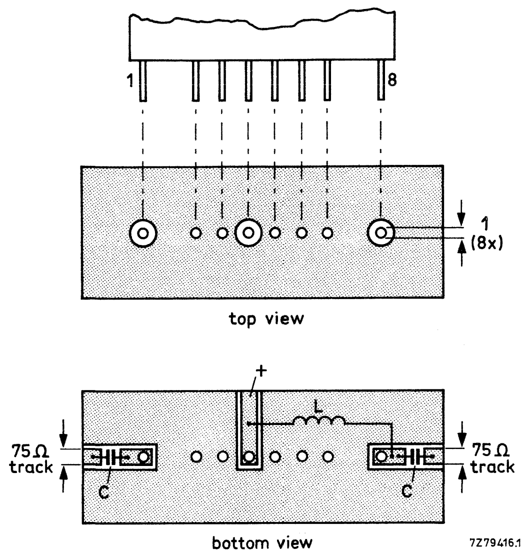
The total contact time of successive solder waves must not exceed 5 s.

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.



L > 5 μH; 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 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_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I8M}	peak incident powers on pins 1 and 8	–	100	mW

CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
R_S, R_L	source impedance and load impedance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		–	52	–	mA
$G_{tr} = \|s_f\|^2$	transducer gain		–	29	–	dB
$\pm\Delta\|s_f\|^2$	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)	–	
$\|s_r\|^2$	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	–	dBμV
	UHF		–	105	–	dBμV
F	noise figure		–	3.6	–	dB

Notes

Scattering parameters: $s_f = s_{21}$; $s_r = s_{12}$.

1. 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	–	Ω

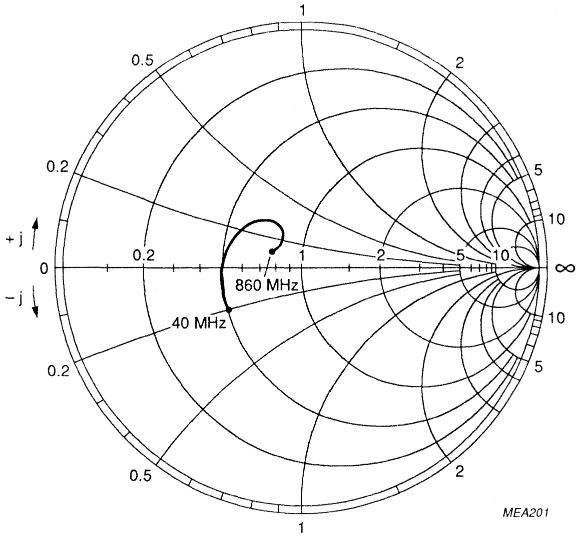


Fig.4 Input impedance derived from input reflection coefficient (s_i), co-ordinates in ohms x 75; typical values.

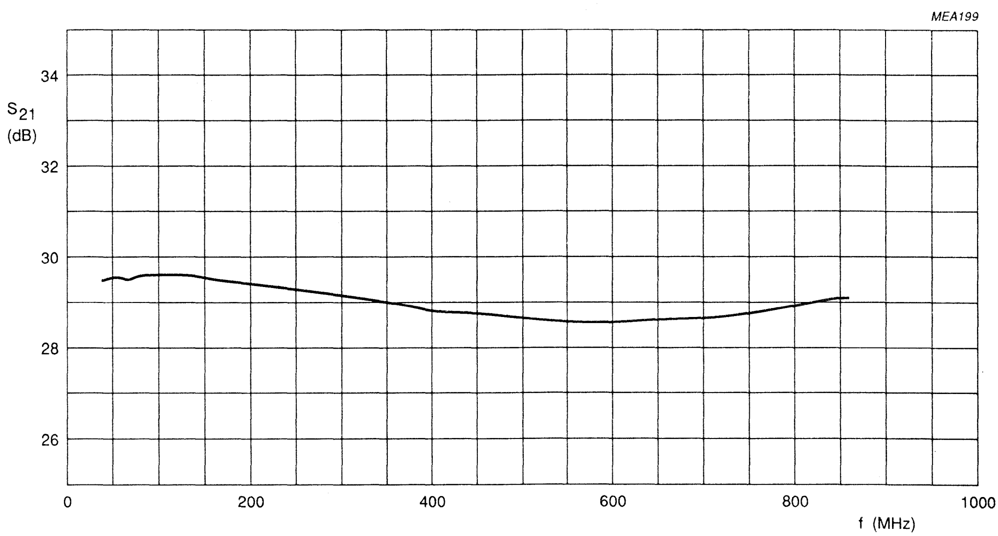


Fig.5 Transducer gain as a function of frequency; Z = 75 Ω.

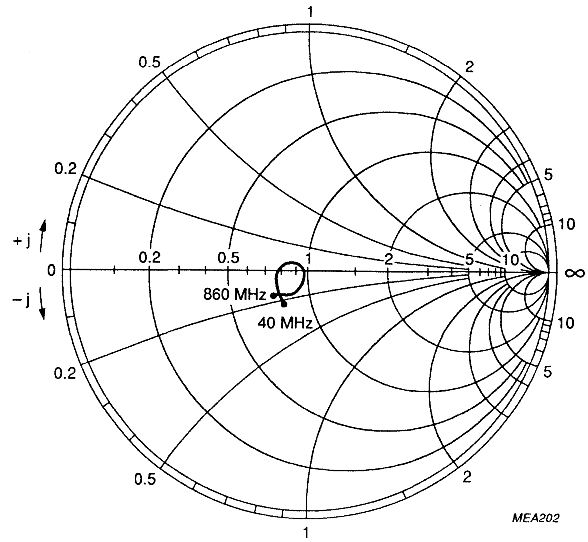


Fig.6 Output impedance derived from output reflection coefficient (s_o), co-ordinates in ohms x 75; typical values.

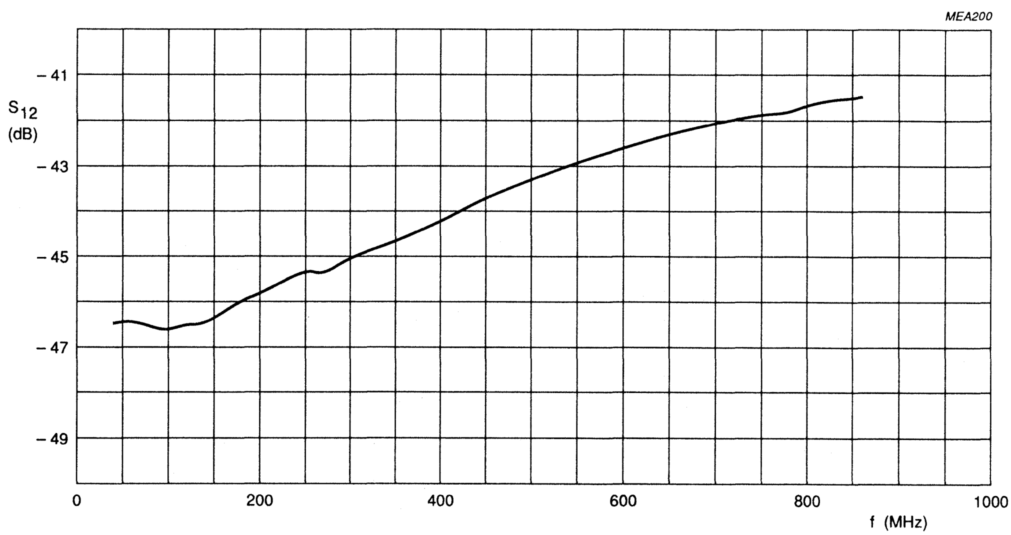
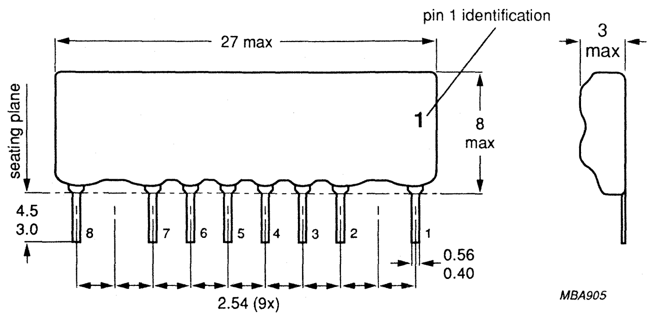


Fig.7 Back attenuation as a function of frequency; Z = 75 Ω.



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

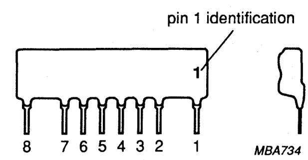


Fig.1 Simplified outline.

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	–	Ω
$G_{tr} = \|s_f\|^2$	transducer gain		–	28	–	dB
$\pm\Delta\|s_f\|^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)	105	107	–	dBμV
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	°C

MECHANICAL DATA

Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.7.

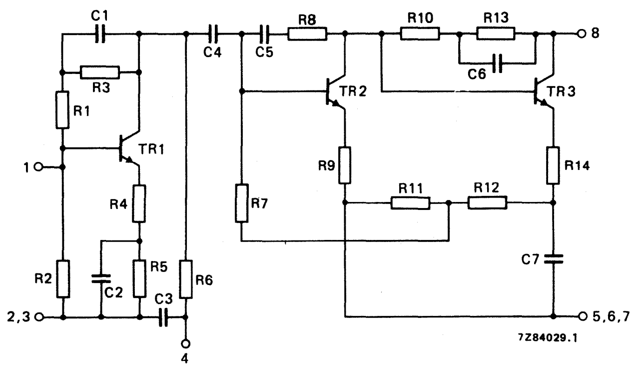


Fig.2 Circuit diagram.

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.

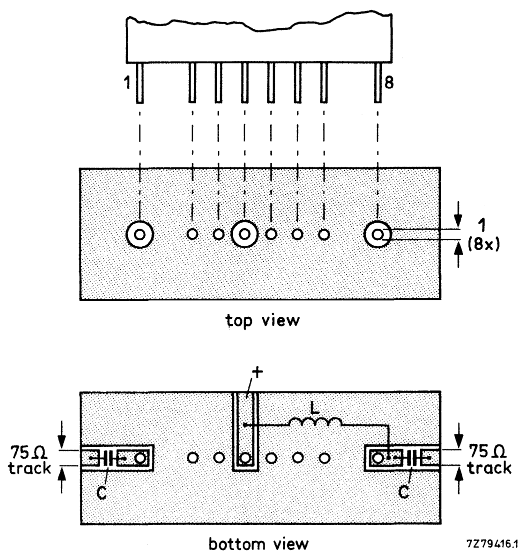
The total contact time of successive solder waves must not exceed 5 s.

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.



L > 5 μH; 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 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_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I8M}	peak incident powers on pins 1 and 8	–	100	mW

CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
R_S, R_L	source impedance and load impedance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		48	51	54	mA
$G_{tr} = \|s_f\|^2$	transducer gain		26	28	31	dB
$\pm\Delta\|s_f\|^2$	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	
$\|s_r\|^2$	back attenuation	f = 100 MHz f = 860 MHz	42 37	44 39	– –	dB dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	105	107	–	dBμV
F	noise figure		–	4.4	–	dB

Notes

Scattering parameters: $s_f = s_{21}$; $s_r = s_{12}$.

1. 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	–	Ω

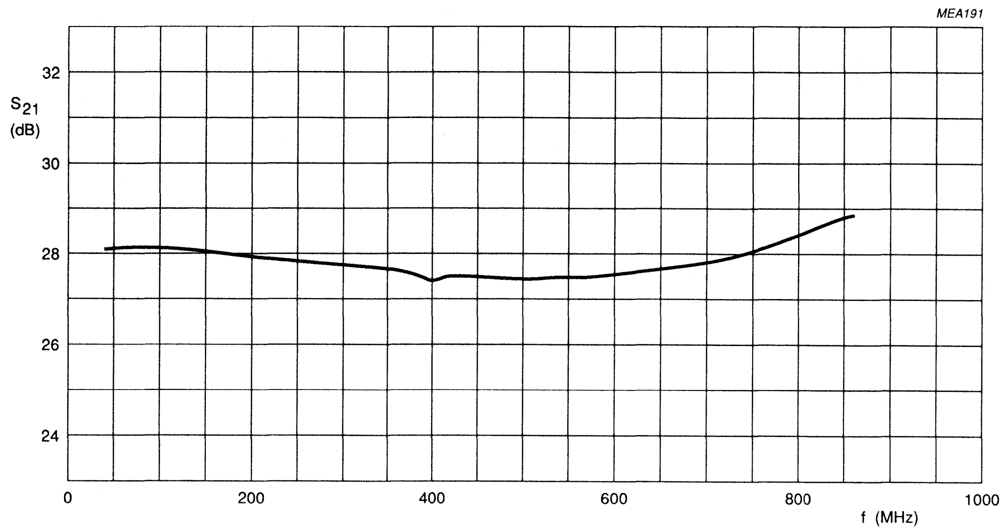


Fig.4 Transducer gain as a function of frequency; Z_o = 75 Ω.

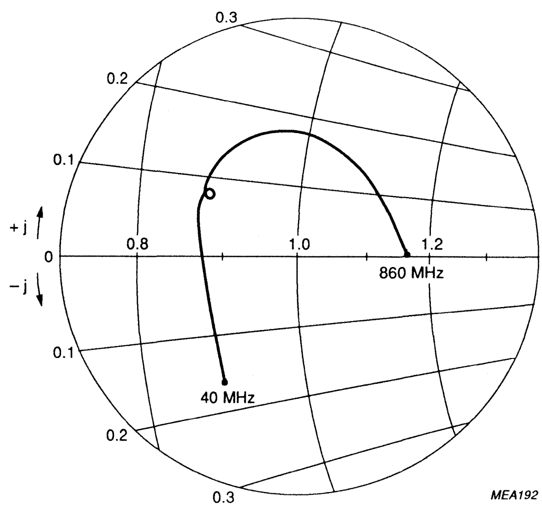


Fig.5 Input impedance derived from input reflection coefficient (s_{11}), co-ordinates in ohms x 75; typical values.

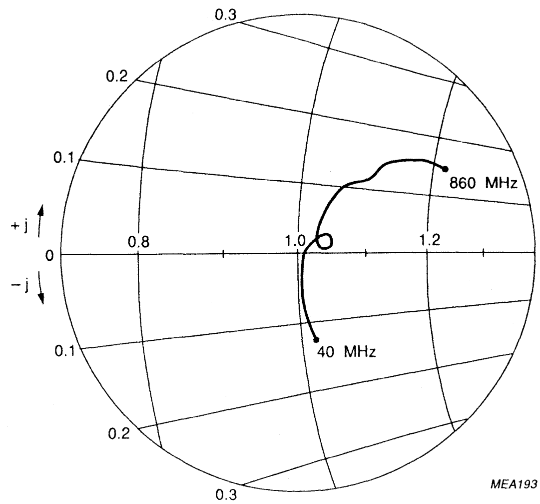
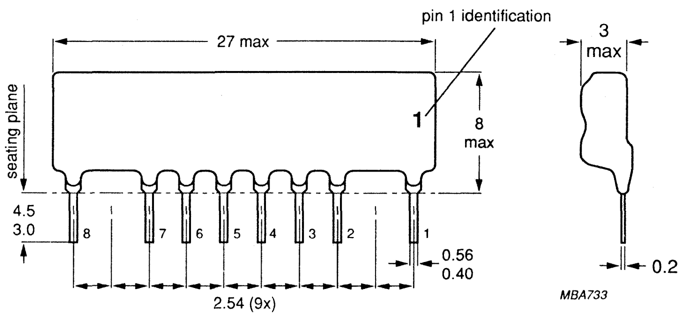


Fig.6 Output impedance derived from output reflection coefficient (s_{22}), co-ordinates in ohms x 75; typical values.



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	$R_s = R_\ell = Z_o$	=	75	Ω
Transducer gain	$G_{tr} = \|s_{f}\|^2$	typ.	28	dB
Flatness of frequency response	$\pm\Delta\|s_{f}\|^2$	typ.	1	dB
Output voltage at −60 dB intermodulation distortion (DIN 45004, 3-tone)				
VHF	$V_{o(rms)}$	typ.	113	dBμV
UHF	$V_{o(rms)}$	typ.	112	dBμV
Noise figure	F	typ.	4,8	dB
D.C. supply voltage	V_B	=	12	V ± 10%
Operating ambient temperature	T_{amb}		−20 to +70	°C

ENCAPSULATION 9-pin, in-line, resin-coated body, see MECHANICAL DATA (Fig.2)

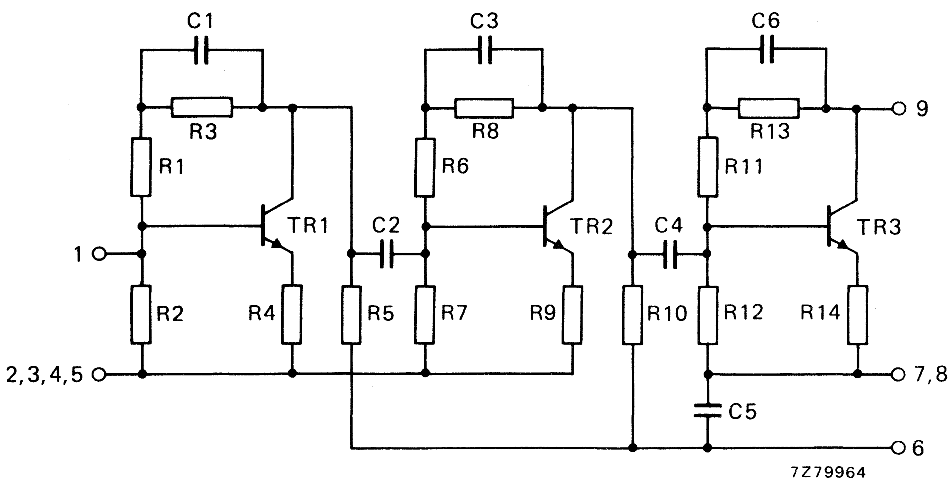


Fig. 1 Circuit diagram.

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	$VSWR_{(i)}$	typ.	2,3	*
output	$VSWR_{(o)}$	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
		typ.	113	dBμV
UHF	$V_{o(rms)}$	>	110	dBμV
		typ.	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	T_{amb}		−20 to +70	°C
D.C. supply voltage	V_B	=	12	V ± 10%
Frequency range	f		40 to 860	MHz
Source impedance and load impedance	R_s, R_ℓ	=	75	Ω

MECHANICAL DATA

Dimensions in mm

The device is resin coated.

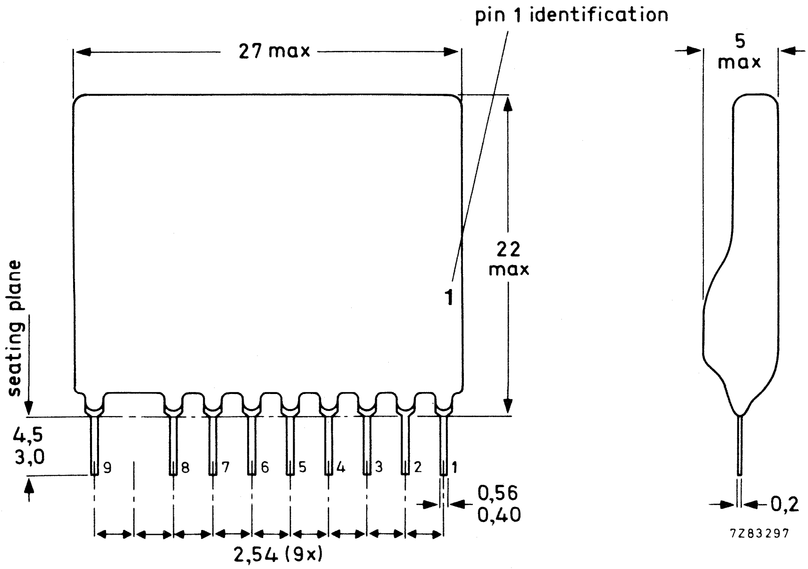


Fig. 2 Encapsulation.

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

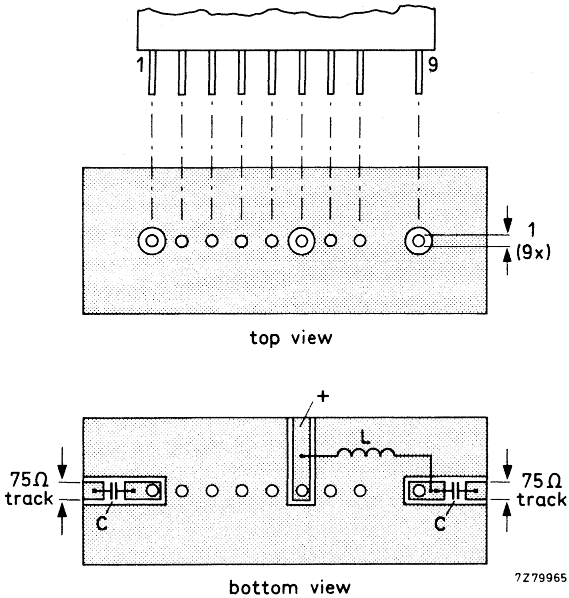
260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. The device may be mounted against the printed-circuit board, but the temperature of the device must 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 μH; 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 pF ceramic capacitor.

Fig. 3 Printed-circuit board holes and tracks.

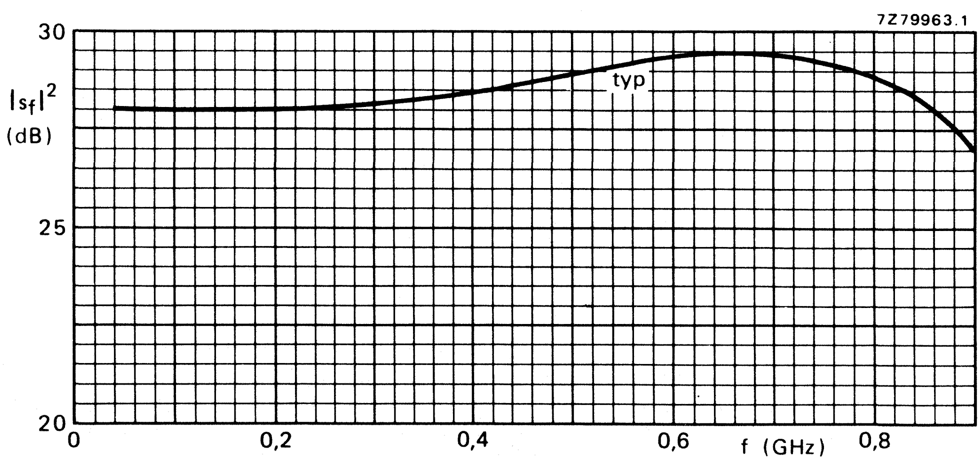


Fig. 4 Transducer gain as a function of frequency; Z_o = 75 Ω.

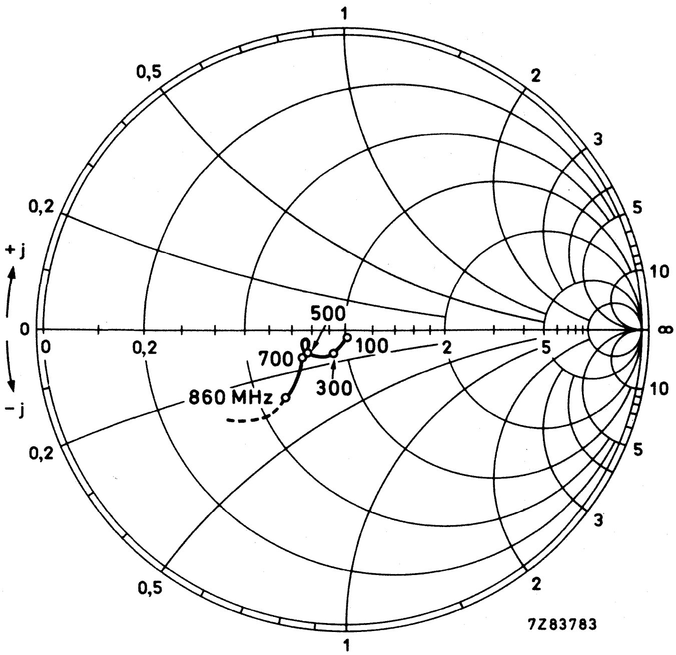


Fig. 5 Input impedance derived from input reflection coefficient s_i, co-ordinates in ohm x 75; typical values.

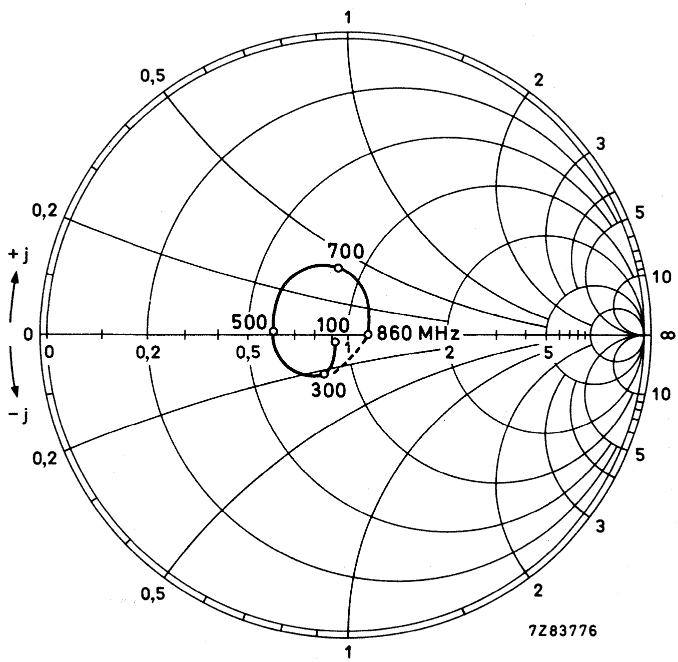


Fig. 6 Output impedance derived from output reflection coefficient s_o, co-ordinates in ohm x 75; typical values.

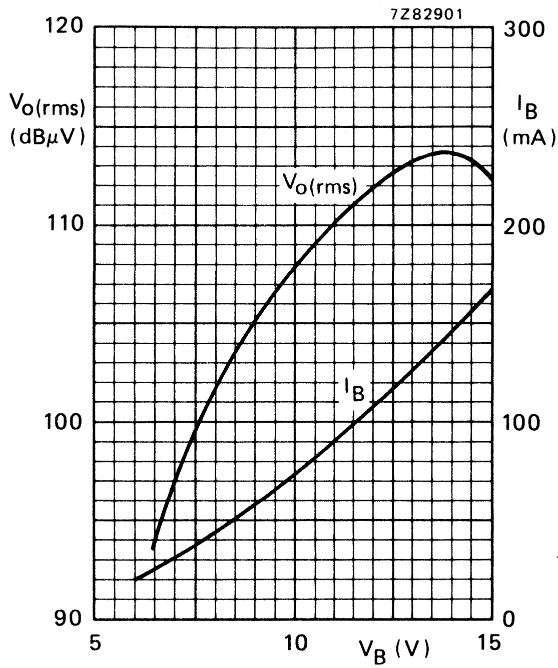


Fig. 7 Output voltage and supply current as a function of the supply voltage; typical values.

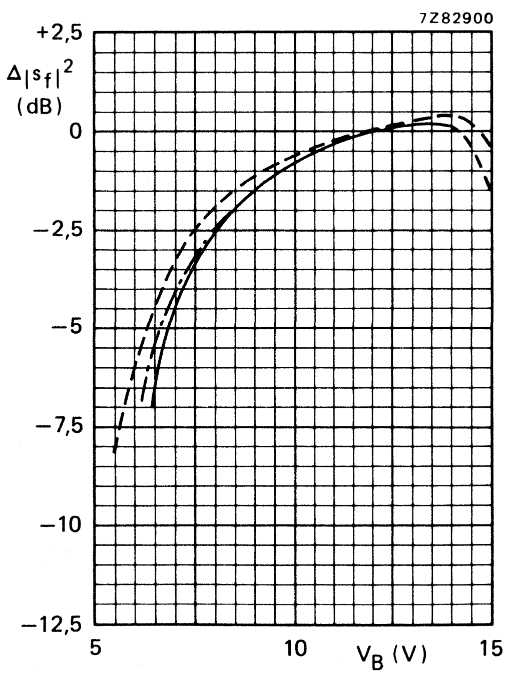


Fig. 8 Variation of transducer gain with supply voltage; reference 0 dB at 12 V;
——— f = 500 MHz;
– – – – f = 100 MHz;
—.—.—. f = 860 MHz;
typical values.

Hybrid integrated circuit VHF/UHF wideband amplifier

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

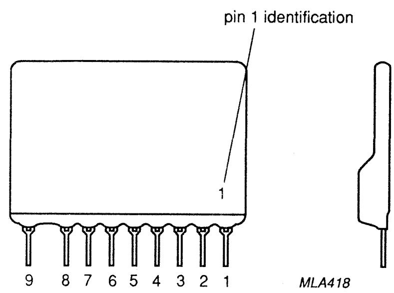


Fig.1 Simplified outline.

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	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
$G_{tr} = \lvert s_f \rvert^2$	transducer gain		–	30	–	dB
$\pm\Delta\lvert s_f \rvert^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)				
	VHF		–	113	–	dBμV
	UHF		–	112	–	dBμV
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	°C

MECHANICAL DATA

Encapsulation

The encapsulation comprises a 9-pin, in-line, resin-coated body, see Fig.6.

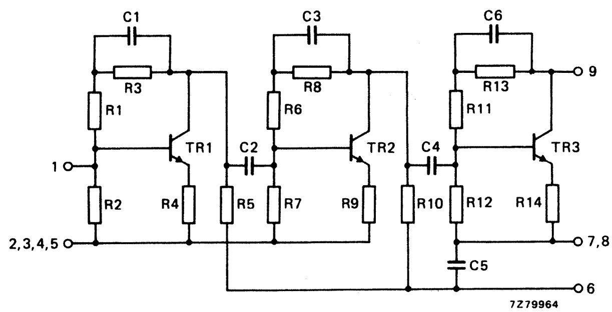


Fig.2 Circuit diagram.

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.

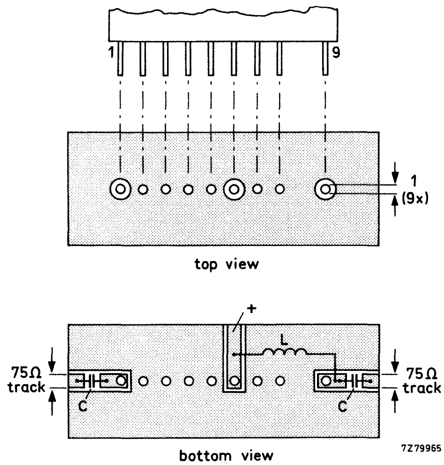
The total contact time of successive solder waves must not exceed 5 s.

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.



L > 5 µH; 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 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_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I8M}	peak incident powers on pins 1 and 8	–	100	mW

CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
R_S, R_L	source and load resistance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		–	100	–	mA
$G_{tr} = \|s_f\|^2$	transducer gain		28	30	33	dB
$\pm\Delta\|s_f\|^2$	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)	–	
$\|s_r\|^2$	back attenuation	f = 100 MHz f = 860 MHz	– –	45 35	– –	dB dB
$V_{o(RMS)}$	output voltage VHF UHF	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	 111 110	 113 112	 – –	 dBμV dBμV
F	noise figure		–	4.8	–	dB

Notes

Scattering parameters: $s_f = s_{21}$; $s_r = s_{12}$; $s_i = s_{11}$; $s_o = s_{22}$.

1. Highest value (for a sample) occurring in the frequency range.

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	−	Ω

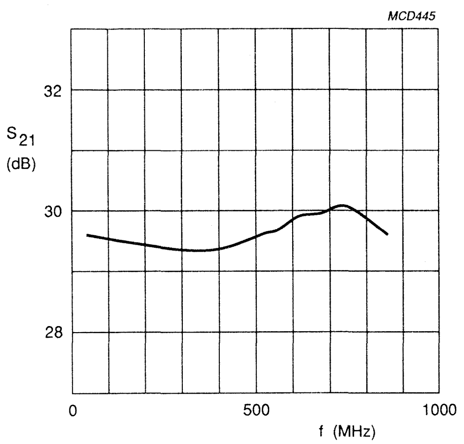
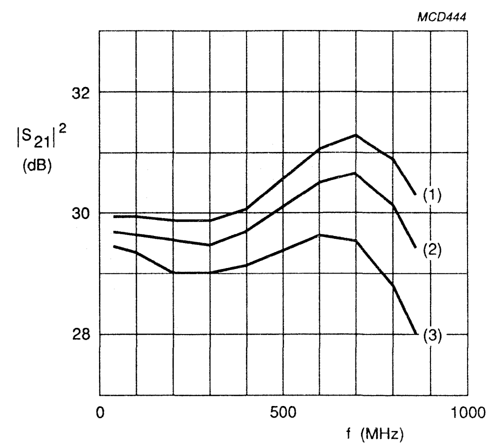


Fig.4 Transducer gain as a function of frequency; Z_O = 75 Ω.



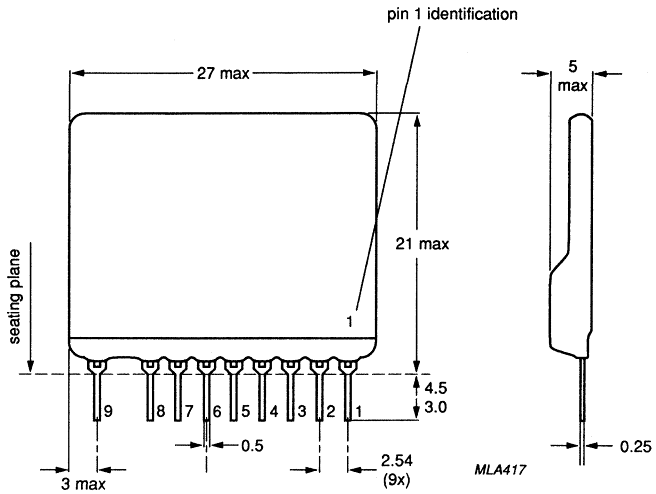
(1) Maximum gain.

(2) Average gain.

(3) Minimum gain.

Fig.5 Power gain.

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 (+)

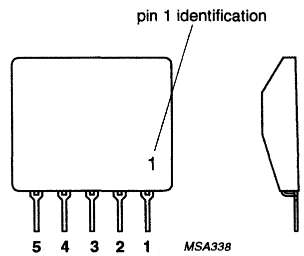


Fig.1 Simplified outline.

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	–	Ω
G_T	transducer gain = $\lvert S_{21}\rvert^2$		–	10	11	dB
ΔG_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	–	dBμV
		3rd order intermodulation (3-tone)	114	115	–	dBμV
F	noise figure		–	7.5	–	dB
V_B	DC supply voltage		10.8	12	13.2	V
T_{amb}	ambient operating temperature		–20	–	+70	°C

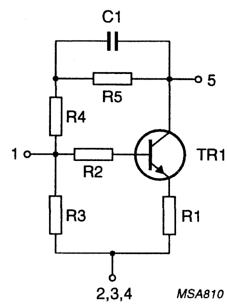
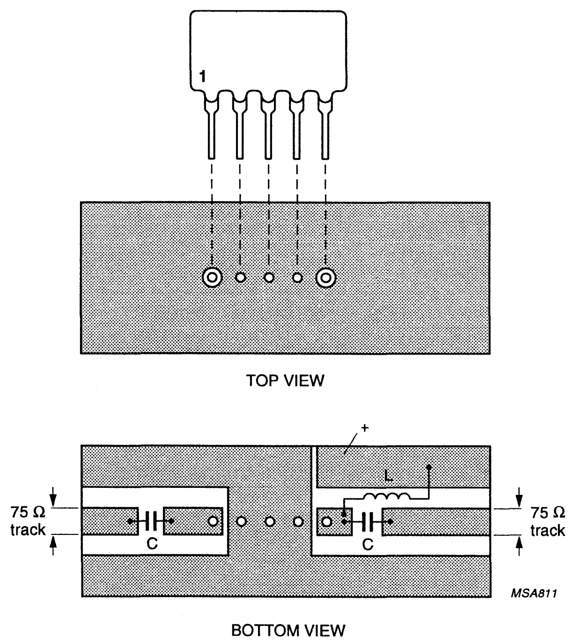


Fig.2 Circuit diagram.



L > 5 µH; 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 pF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

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

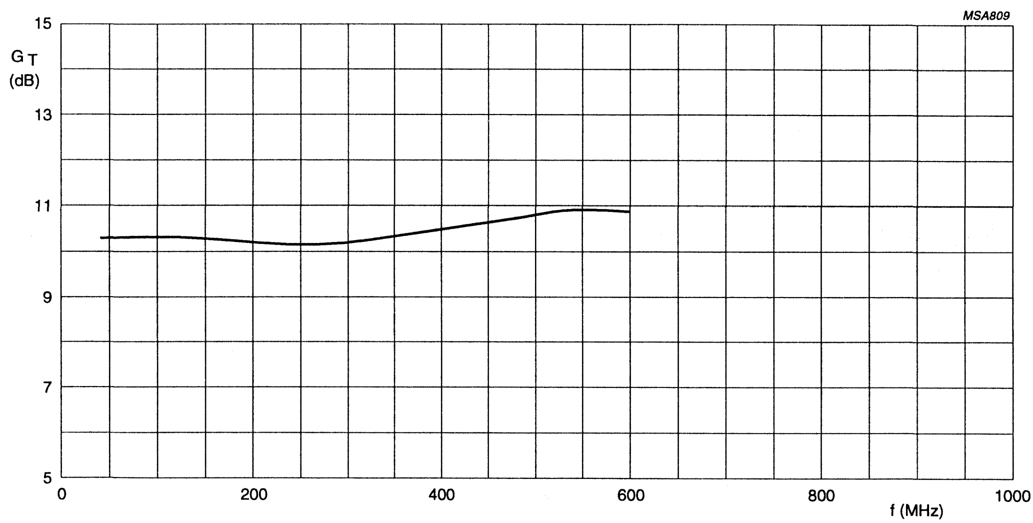
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		−	25	−	°C
V_B	DC supply voltage		−	12	−	V
Z_S	source impedance		−	75	−	Ω
Z_L	load impedance		−	75	−	Ω
Z_O	characteristic impedance of HF connections		−	75	−	Ω
f	frequency range		40	−	600	MHz
Performance						
I_B	supply current		−	85	−	mA
G_T	transducer gain = $\lvert S_{21}\rvert^2$		10	11	12	dB
ΔG_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	
$\lvert S_{12}\rvert^2$	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	−	dBµV
		3rd order intermodulation (3-tone)	114	115	−	dBµV
F	noise figure		−	7.5	−	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating conditions						
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	−	Ω
Z_L	load impedance		−	75	−	Ω

Note to the characteristics

1. Highest value (for sample) occurring in the frequency range.



Gain over entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.

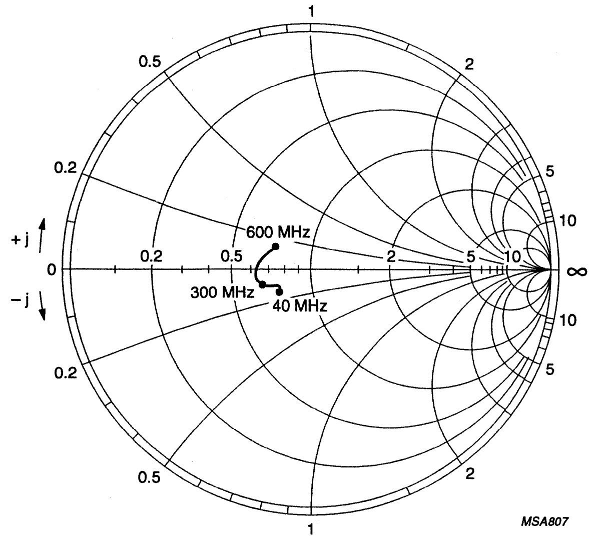


Fig.5 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

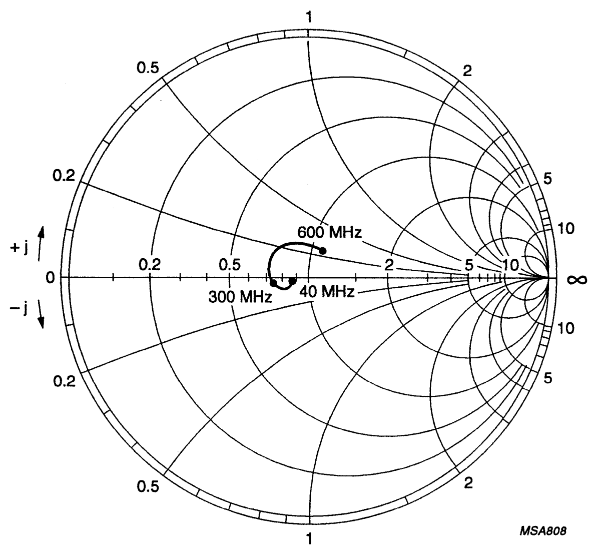


Fig.6 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

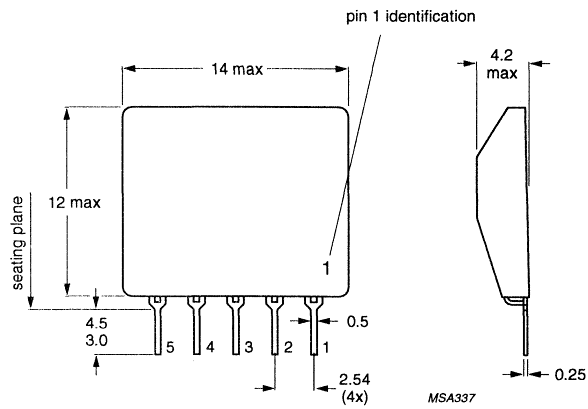
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



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 (+)

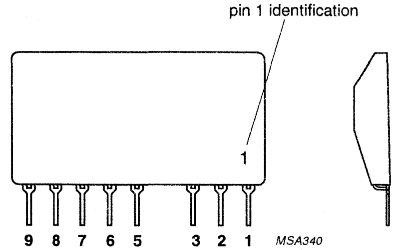


Fig.1 Simplified outline.

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	–	Ω
G_T	transducer gain = $\lvert S_{21}\rvert^2$		20	21	–	dB
ΔG_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	–	dBμV
		3rd order intermodulation (3-tone)	114	115	–	dBμV
F	noise figure		–	7.5	–	dB
V_B	DC supply voltage		10.8	12	13.2	V
T_{amb}	ambient operating temperature		–20	–	+70	°C

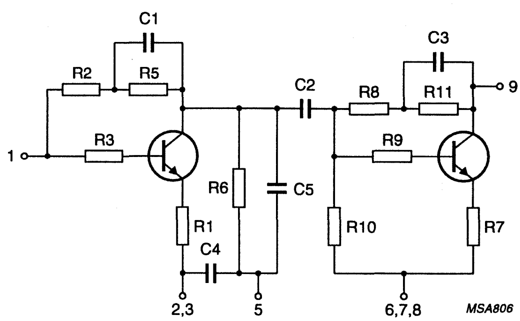
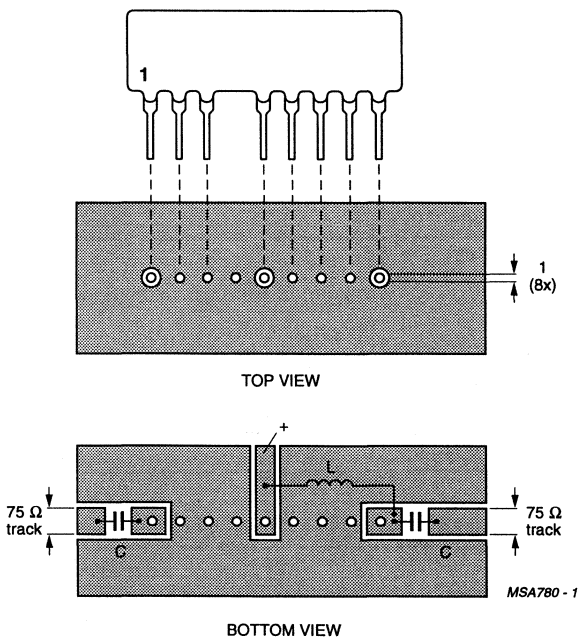


Fig.2 Circuit diagram.



L > 5 µH; 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.

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

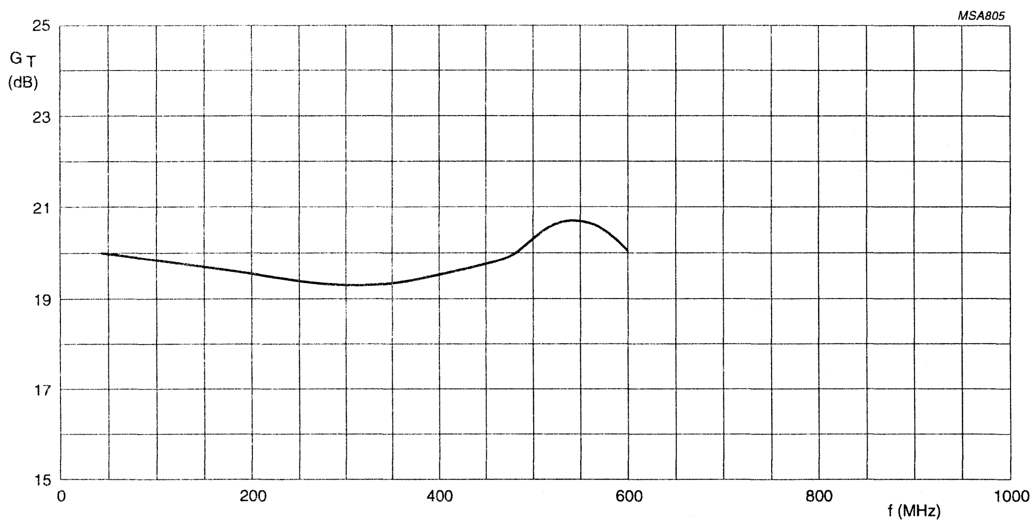
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	600	MHz
Performance						
I_B	supply current		–	145	150	mA
G_T	transducer gain = $\|S_{21}\|^2$		19	20	21	dB
ΔG_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)	–	1.6	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	–	dBμV
		3rd order intermodulation (3-tone)	114	115	–	dBμV
F	noise figure		–	7.5	–	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating conditions						
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	–	Ω
Z_L	load impedance		–	75	–	Ω

Note to the characteristics

1. Highest value (for sample) occurring in the frequency range.



Gain over entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.

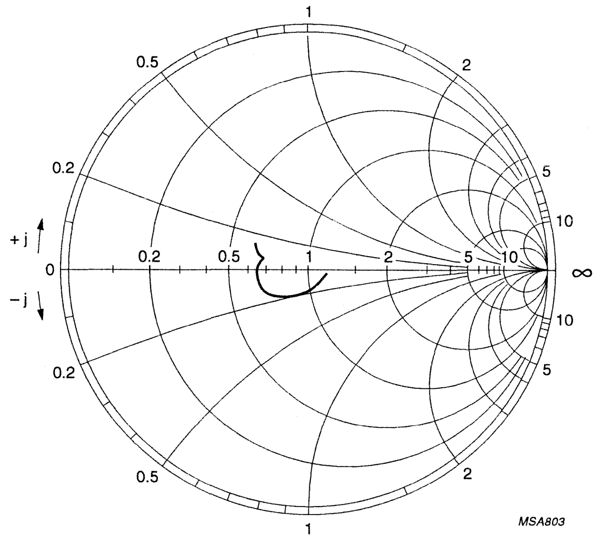


Fig.5 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

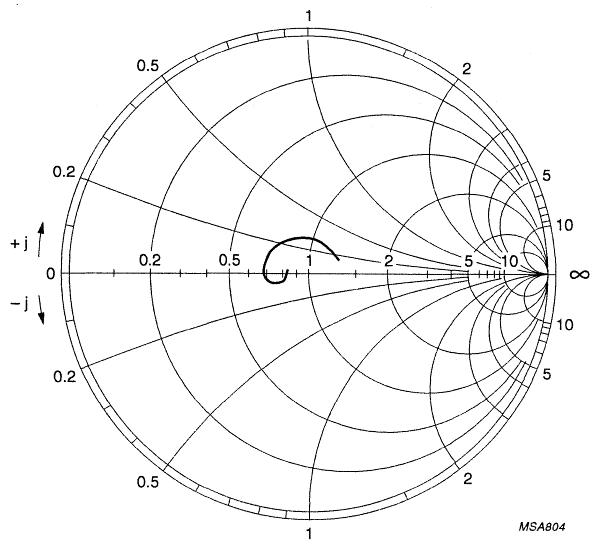


Fig.6 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

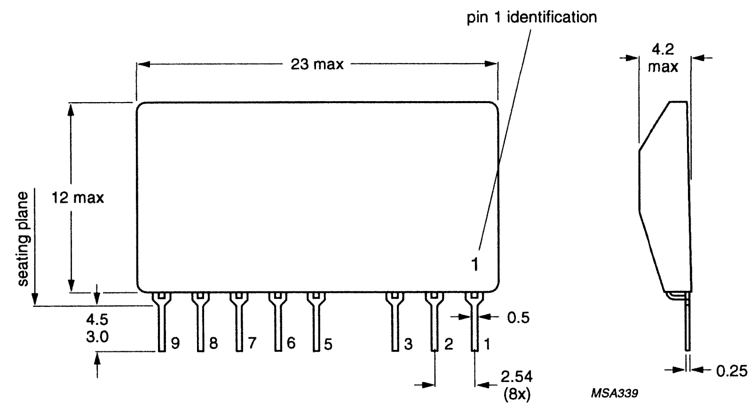
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



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 (+)

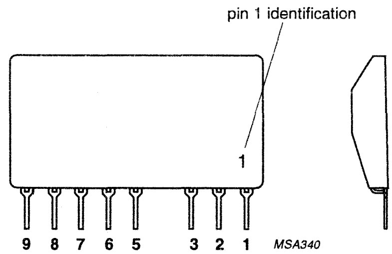


Fig.1 Simplified outline.

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	–	Ω
G_T	transducer gain = $\|S_{21}\|^2$		17	19	21	dB
ΔG_T	flatness of frequency response		–	2	–	dB
$V_{o(rms)}$	output voltage (RMS value)	d_{im} = −60 dB				
		2nd order intermodulation (2-tone)	103	104	–	dBμV
		3rd order intermodulation (3-tone)	110	111	–	dBμV
F	noise figure		–	7.5	–	dB
V_B	DC supply voltage		10.8	12	13.2	V
T_{amb}	ambient operating temperature		−20	–	+70	°C

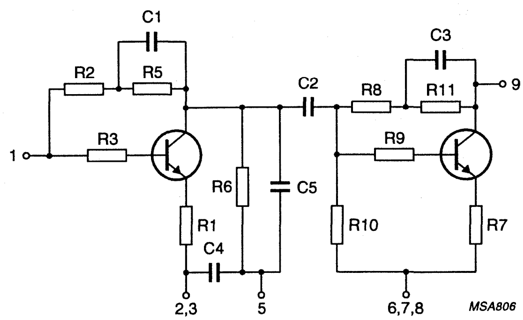
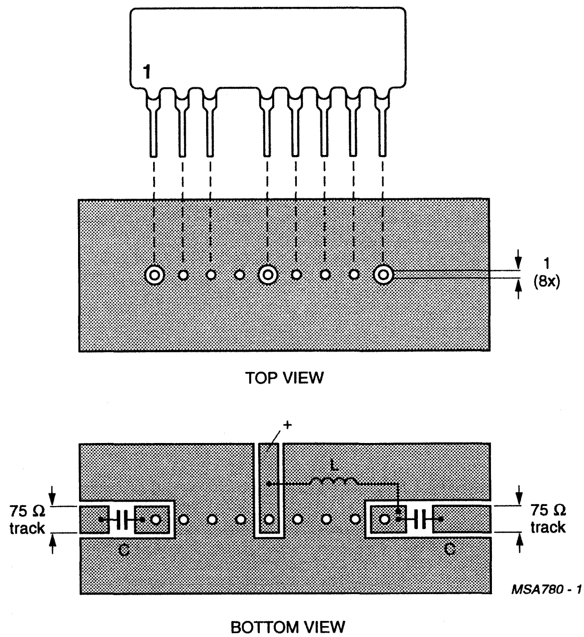


Fig.2 Circuit diagram.



L > 5 μH; 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.

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

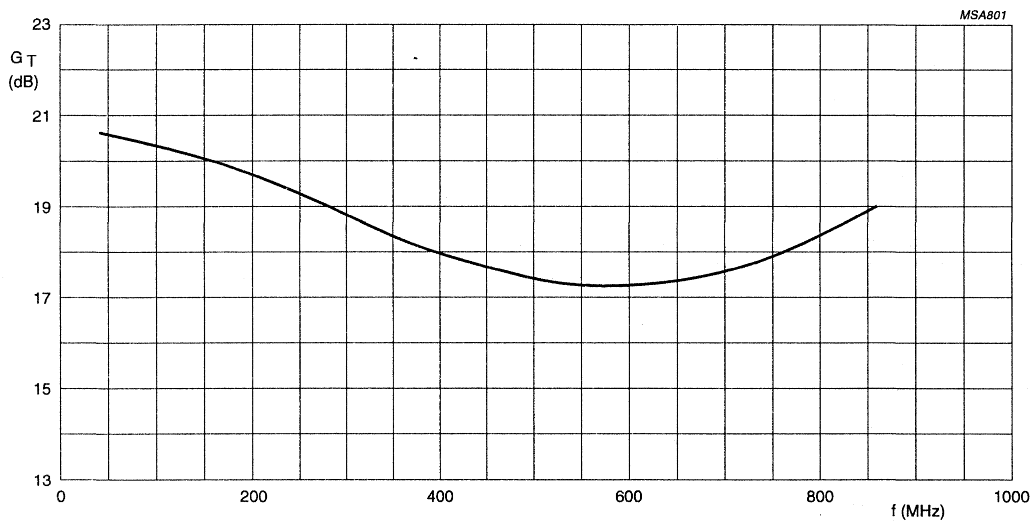
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		–	145	150	mA
G_T	transducer gain = $\lvert S_{21}\rvert^2$		17	19	21	dB
ΔG_T	flatness of frequency response		–	2	–	dB
$VSWR_{in}$	individual maximum VSWR	input; note (1)	–	1.7	1.9	
$VSWR_{out}$	individual maximum VSWR	output; note (1)	–	1.4	1.6	
$\lvert S_{12}\rvert^2$	back attenuation	f = 100 MHz	–	30	–	dB
		f = 860 MHz	–	30	–	dB
$V_{o(rms)}$	output voltage (RMS value)	d_{im} = –60 dB				
		2nd order intermodulation (2-tone)	103	104	–	dBμV
		3rd order intermodulation (3-tone)	110	111	–	dBμV
F	noise figure		–	7.5	–	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating conditions						
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	–	Ω
Z_L	load impedance		–	75	–	Ω

Note to the characteristics

1. Highest value (for sample) occurring in the frequency range.



Gain over entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.

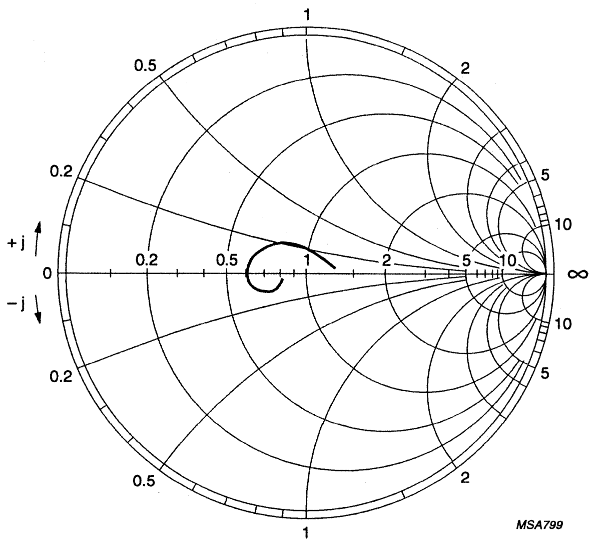


Fig.5 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

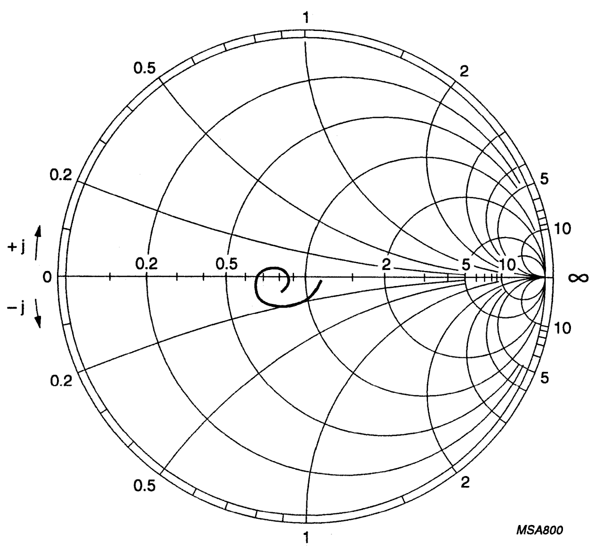


Fig.6 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

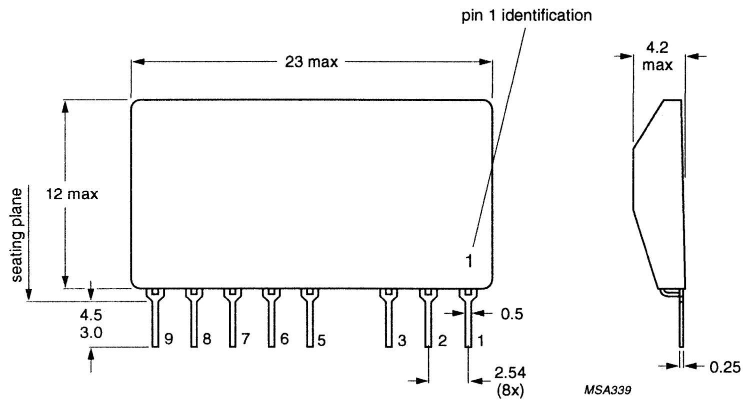
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



Dimensions in mm.

Fig.7 Resin coated encapsulation.

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 (+)

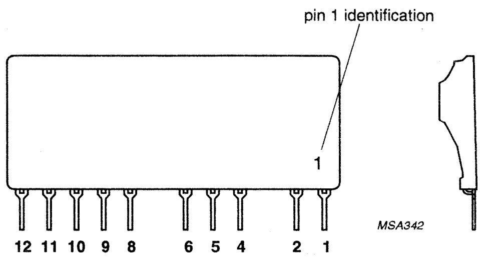


Fig.1 Simplified outline.

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	–	Ω
G_T	transducer gain = $\|S_{21}\|^2$		28	29	30	dB
ΔG_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	–	dBμV
		3rd order intermodulation (3-tone)	113	114	–	dBμV
F	noise figure		–	6.5	–	dB
V_B	DC supply voltage		10.8	12	13.2	V
T_{amb}	ambient operating temperature		–20	–	+70	°C

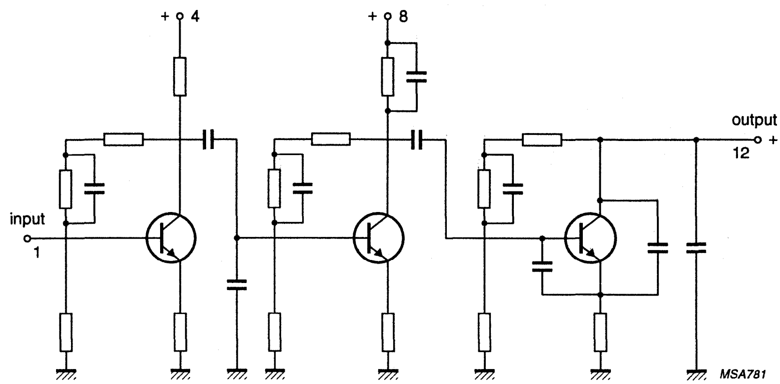
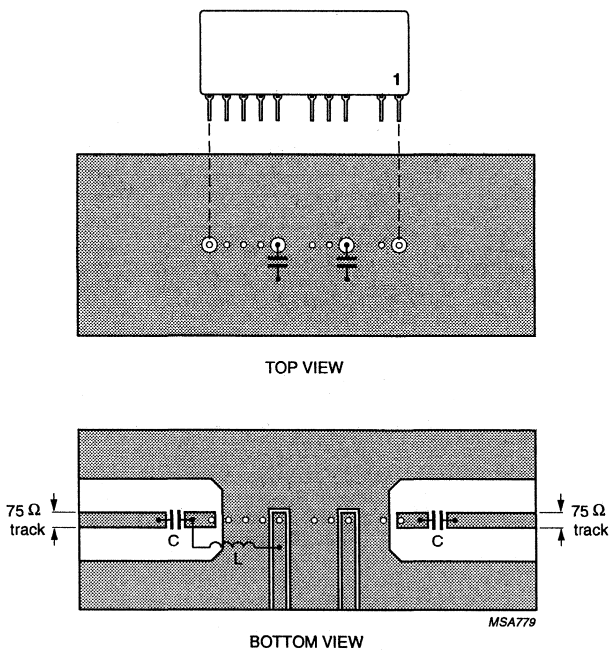


Fig.2 Circuit diagram.



L > 5 µH; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter o 1.6 mm.
C > 1 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

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

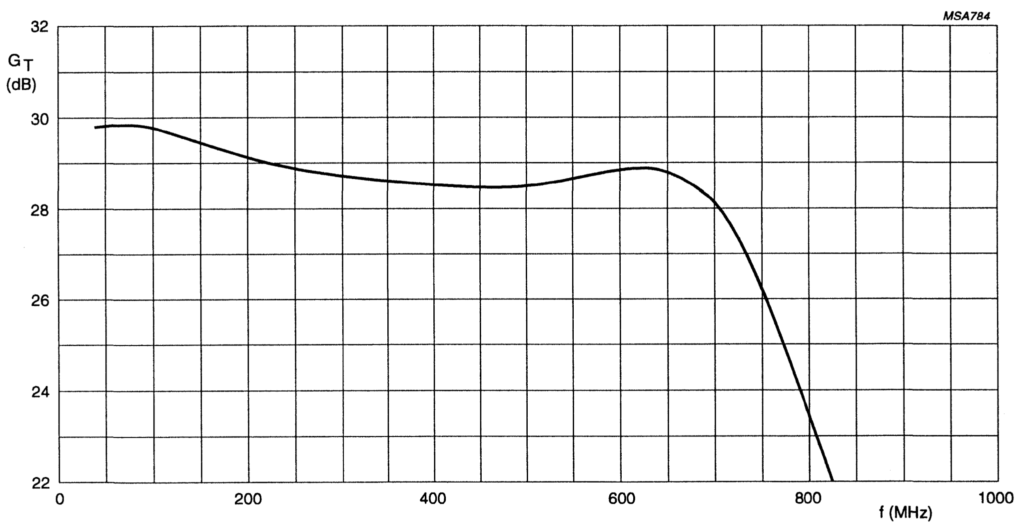
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Z_O	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	600	MHz
Performance						
I_B	supply current		–	175	–	mA
G_T	transducer gain = $\lvert S_{21}\rvert^2$		28	29	30	dB
ΔG_T	flatness of frequency response		–	1	–	dB
$VSWR_{in}$	individual maximum VSWR	input; note (1)	–	1.2	1.35	
$VSWR_{out}$	individual maximum VSWR	output; note (1)	–	1.3	1.35	
$\lvert S_{12}\rvert^2$	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	–	dBμV
		3rd order intermodulation (3-tone)	113	114	–	dBμV
F	noise figure		–	6.5	7.5	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating conditions						
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	−	Ω
Z_L	load impedance		−	75	−	Ω

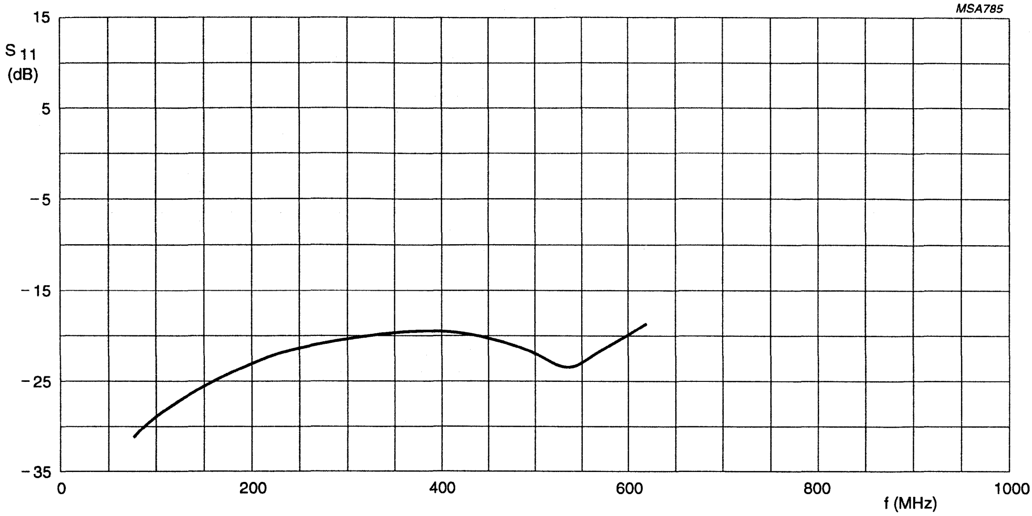
Note to the characteristics

1. Highest value (for sample) occurring in the frequency range.



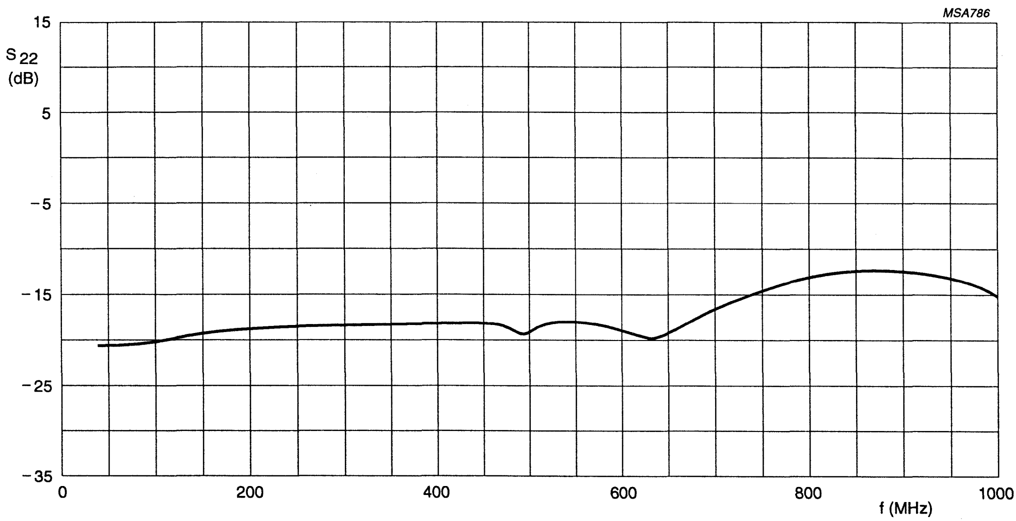
Gain over entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.



Z_o = 75 Ω.

Fig.5 Input reflection coefficient (S_{11}) as a function of frequency.



Z_o = 75 Ω.

Fig.6 Output reflection coefficient (S_{22}) as a function of frequency.

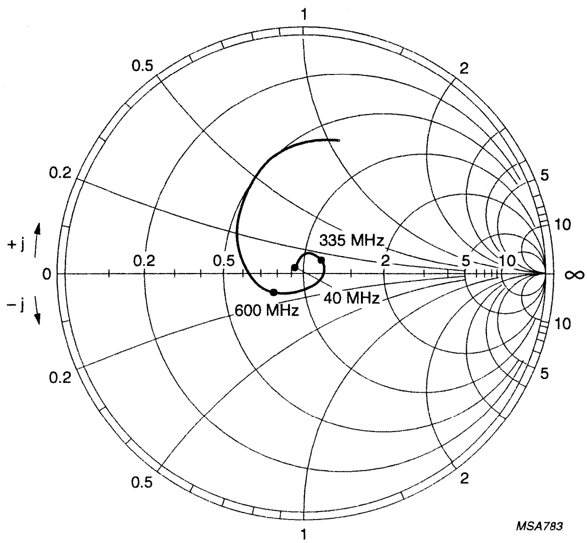


Fig.7 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

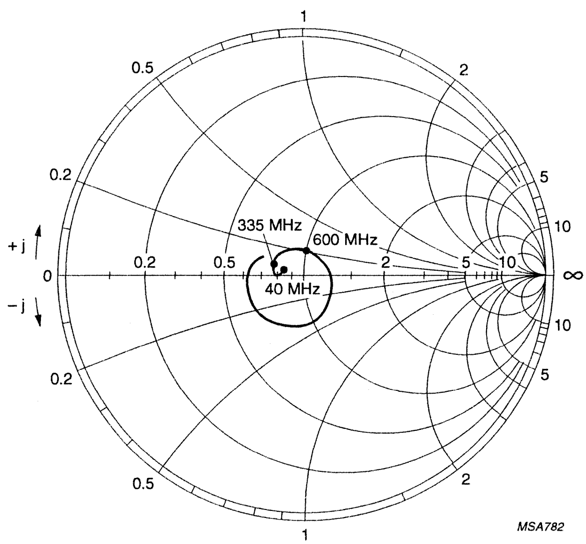


Fig.8 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

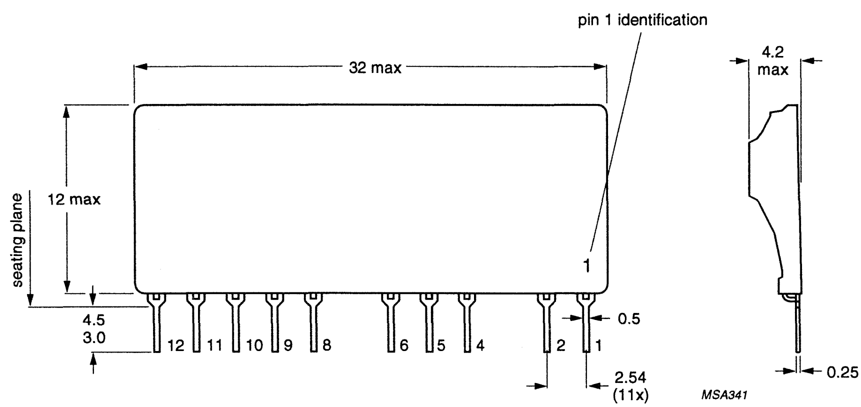
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



Dimensions in mm.

Fig.9 Resin coated encapsulation.

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 (+)

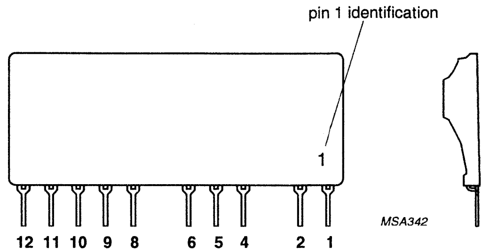


Fig.1 Simplified outline.

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	–	Ω
G_T	transducer gain = $\lvert S_{21}\rvert^2$		28.5	30	31.5	dB
ΔG_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[1]	103	–	dBμV
		3rd order intermodulation (3-tone)	112	113	–	dBμV
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	°C

Note

1. 100 dBμV over 750 MHz.

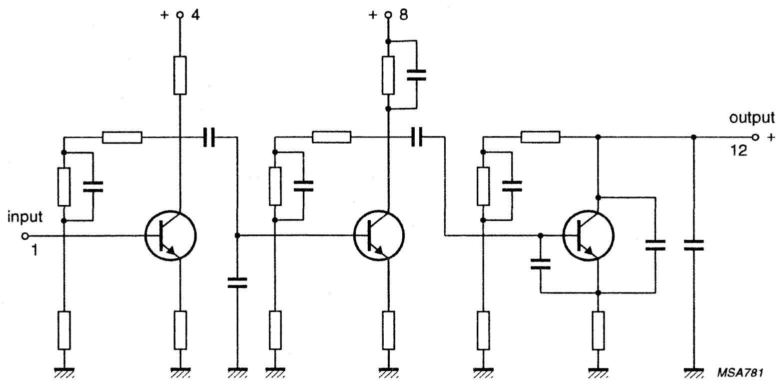
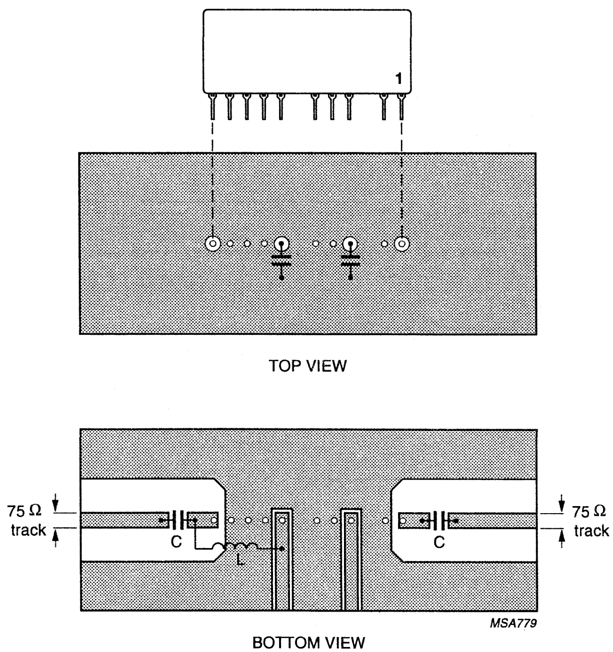


Fig.2 Circuit diagram.



L > 5 µH; 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 nF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

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

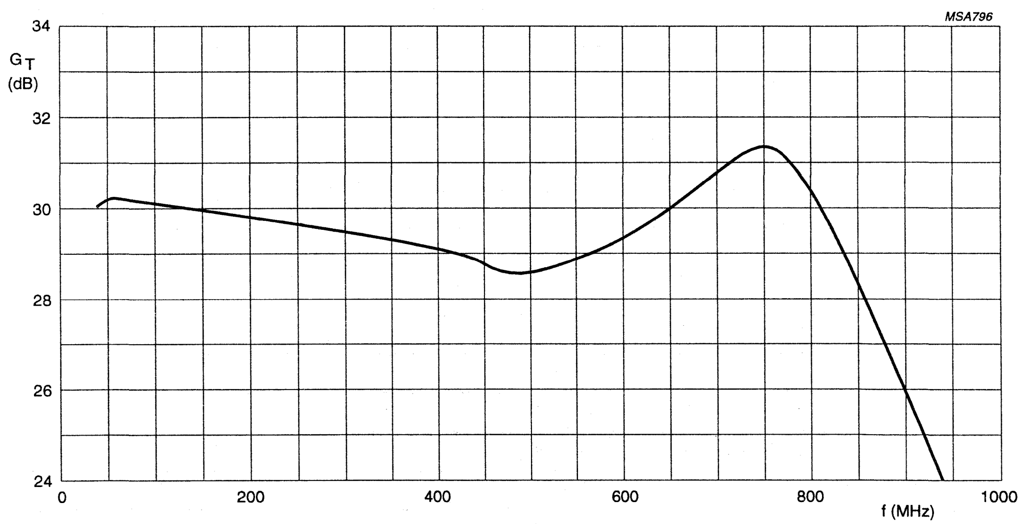
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		−	25	−	°C
V_B	DC supply voltage		−	12	−	V
Z_S	source impedance		−	75	−	Ω
Z_L	load impedance		−	75	−	Ω
Z_O	characteristic impedance of HF connections		−	75	−	Ω
f	frequency range		40	−	860	MHz
Performance						
I_B	supply current		−	165	−	mA
G_T	transducer gain = $\lvert S_{21}\rvert^2$		28	30	32	dB
ΔG_T	flatness of frequency response		−	1.5	−	dB
$VSWR_{in}$	individual maximum VSWR	input; note (1)	−	1.9	2.0	
$VSWR_{out}$	individual maximum VSWR	output; note (1)	−	1.7	1.8	
$\lvert S_{12}\rvert^2$	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(2)	103	−	dBμV
		3rd order intermodulation (3-tone)	112	113	−	dBμV
F	noise figure		−	7	7.5	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating conditions						
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	–	Ω
Z_L	load impedance		–	75	–	Ω

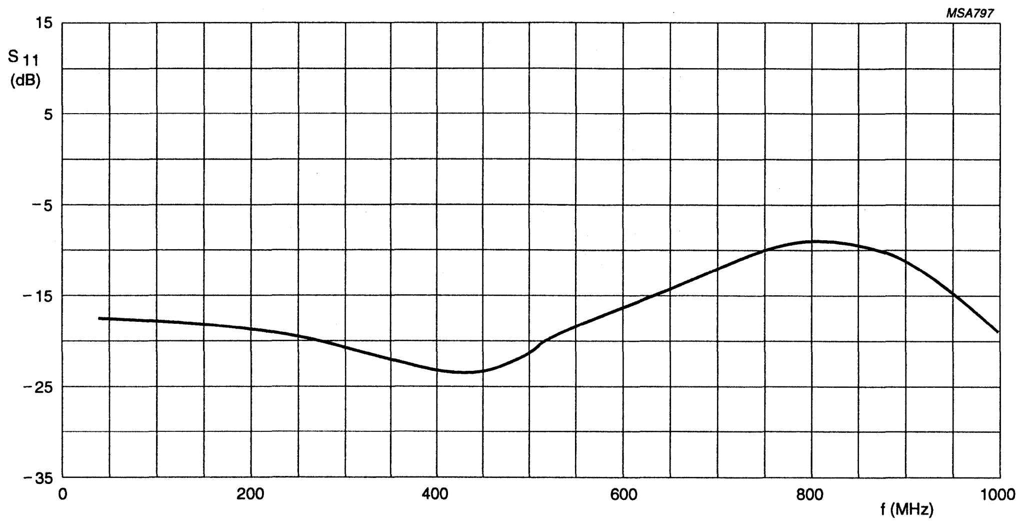
Notes to the characteristics

1. Highest value (for sample) occurring in the frequency range.
2. 100 dBμV over 750 MHz.



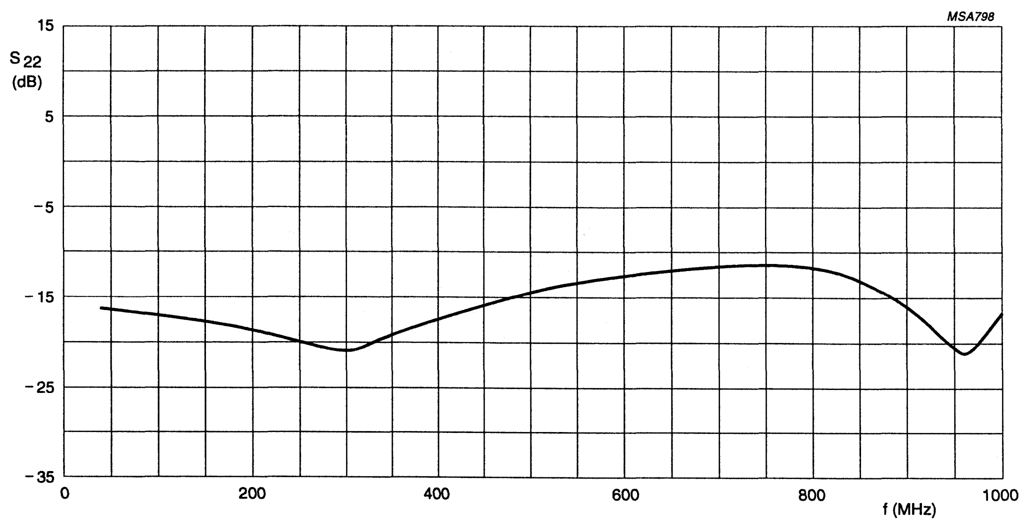
Gain over entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.



$Z_o = 75\ \Omega$.

Fig.5 Input reflection coefficient (S_{11}) as a function of frequency.



$Z_o = 75\ \Omega$.

Fig.6 Output reflection coefficient (S_{22}) as a function of frequency.

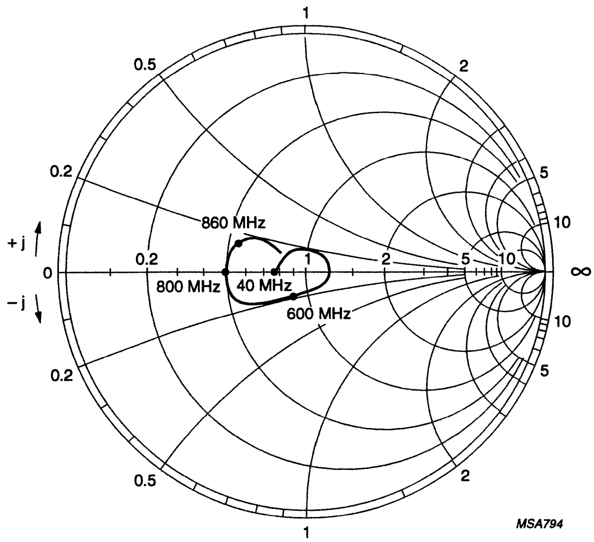


Fig.7 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms x 75; typical values.

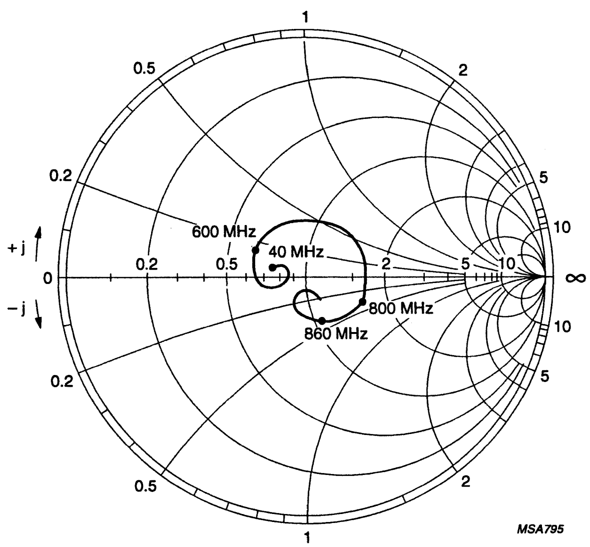


Fig.8 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms x 75; typical values.

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

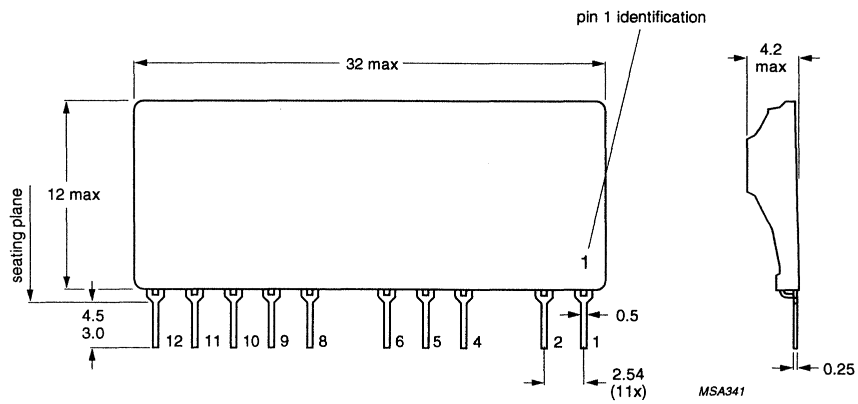
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



Dimensions in mm.

Fig.9 Resin coated encapsulation.

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Data handbook system

DATA HANDBOOK SYSTEM

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Data handbook system

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