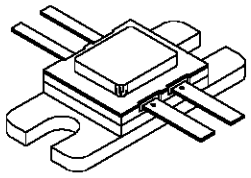
SGS-THOMSON MICROELECTRONICS

SD4010

RF & MICROWAVE TRANSISTORS UHF TV LINEAR APPLICATIONS

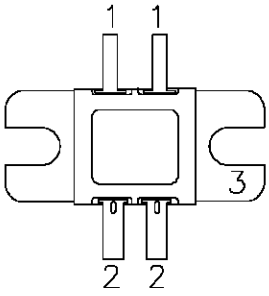
- 470-860 MHz
- 26.5 VOLTS
- GOLD METALLIZATION
- P_{OUT} = 20.0W MIN. WITH 9.5 dB GAIN
- INTERNAL INPUT MATCHING
- DIFFUSED EMITTER BALLAST RESISTORS



.400 x .425 4LFL (M119)
hermetically sealed

ORDER CODE	BRANDING
SD4010	SUTV200

PIN CONNECTION



1. Collector
2. Base
3. Emitter

DESCRIPTION

The SD4010 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors. The SD4010 is intended for use in linear applications up to 1GHz, including UHF television transmitters, transposers and cellular base stations.

ABSOLUTE MAXIMUM RATINGS (Tcase = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60.0	V
V_{CES}	Collector-Emitter Voltage	60.0	V
V_{EBO}	Emitter-Base Voltage	4.0	V
I_C	Device Current (Maximum)	11.0	A
P_{DISS}	Power Dissipation	88.8	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	– 65 to +150	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	1.9	°C/W

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{EBO}	I_E = 10mA	I_C = 0mA	3.0	4.0	—	V
BV_{CES}	I_C = 50mA	V_{BE} = 0V	60.0	85.0	—	V
BV_{CEO}	I_C = 50mA	I_B = 0mA	28.0	30.0	—	V
I_{CEO}	V_{CE} = 26.5V	I_E = 0mA	—	—	5	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	25	50	80	—

Tested Per Side

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 860MHz	V_{CE} = 26.5V	P_{IN} = 2.2W	20.0	28.0	—	W
G_P	f = 860MHz	V_{CE} = 26.5V	P_{OUT} = 20W	9.5	10.5	—	dB
IMD_3	P_{SYNC} = 20W	V_{CE} = 26.5V	(note 1)	—	–48	–46	dBc
IP_3	V_{CB} = 26.5V	P_{OUT} = 20W PEP	(note 2)	—	55	—	dBm
C_{OB}	f = 860MHz	V_{CB} = 26.5V	(note 3)	—	25	36	pF
Load* Mismatch	f = 860MHz	V_{CE} = 26.5V	P_{OUT} = 20W	3:1	10:1	—	VSWR

$I_{CQ} = I_C$ = 2.7A (1.35A per Side)

*VSWR tested for a minimum of 3:1 SWR at all phase angles.

Note 1: Three Tone IMD Testing (CCIR)

f_1 = 860.0MHz/ –8dB ref. to P_{SYNC} - Visual

f_2 = 863.5MHz/ –16dB ref. to P_{SYNC} - Color Subcarrier

f_3 = 864.5MHz/ –7dB ref. to P_{SYNC} - Aural

Note 2: IP_3 Calculated Based on Two-Tone IMD Testing:

f_1 = 900.0 MHz/ –6dB ref. to P_{OUT}

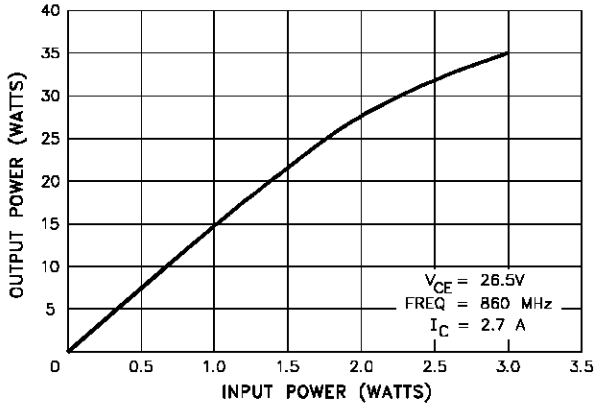
f_2 = 900.1 MHz/ –6dB ref. to P_{OUT}

IMD_3 (Typ) < –36dBc

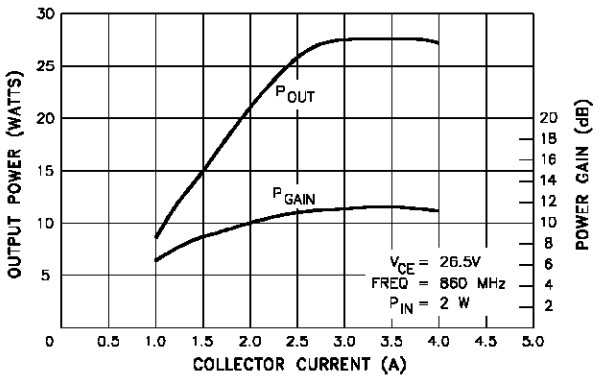
Note 3: Tested Per Side

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT

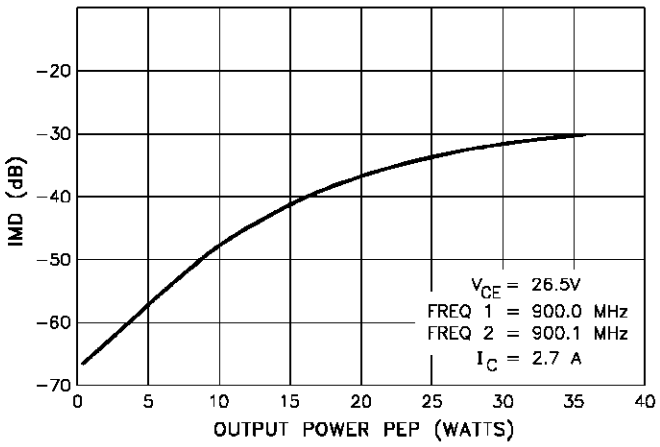


POWER OUTPUT & POWER GAIN vs TOTAL COLLECTOR CURRENT

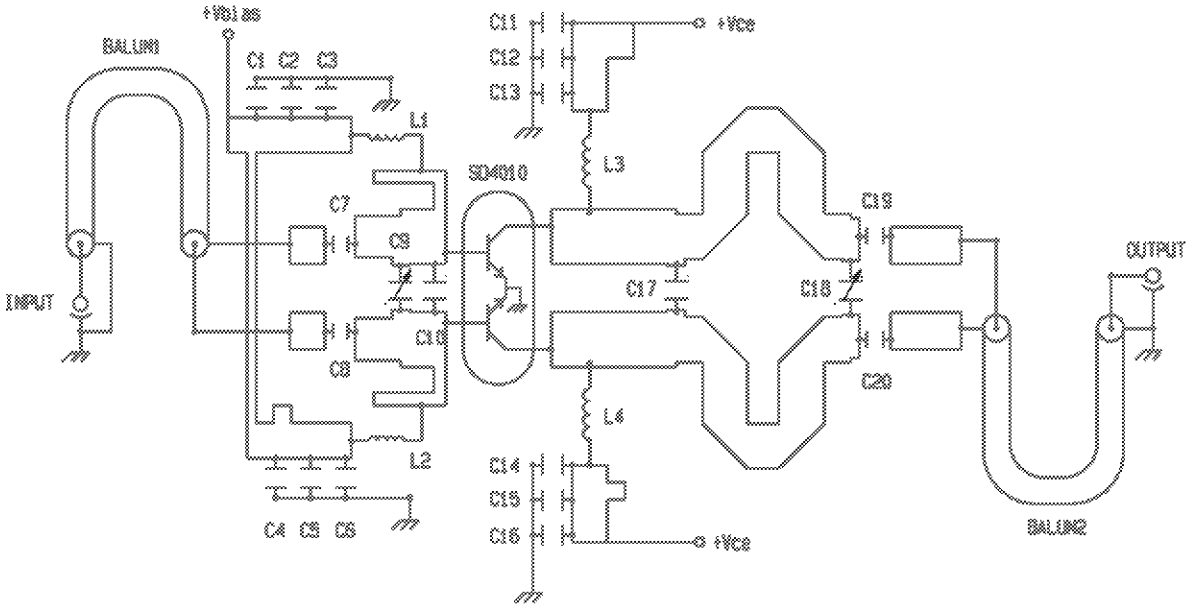


TYPICAL PERFORMANCE (cont'd)

INTERMODULATION DISTORTION vs POWER OUTPUT



TEST CIRCUIT SCHEMATIC



Balun 1, 2 : 50Ω Coaxial Cable, λ/4 @ 860 MHz

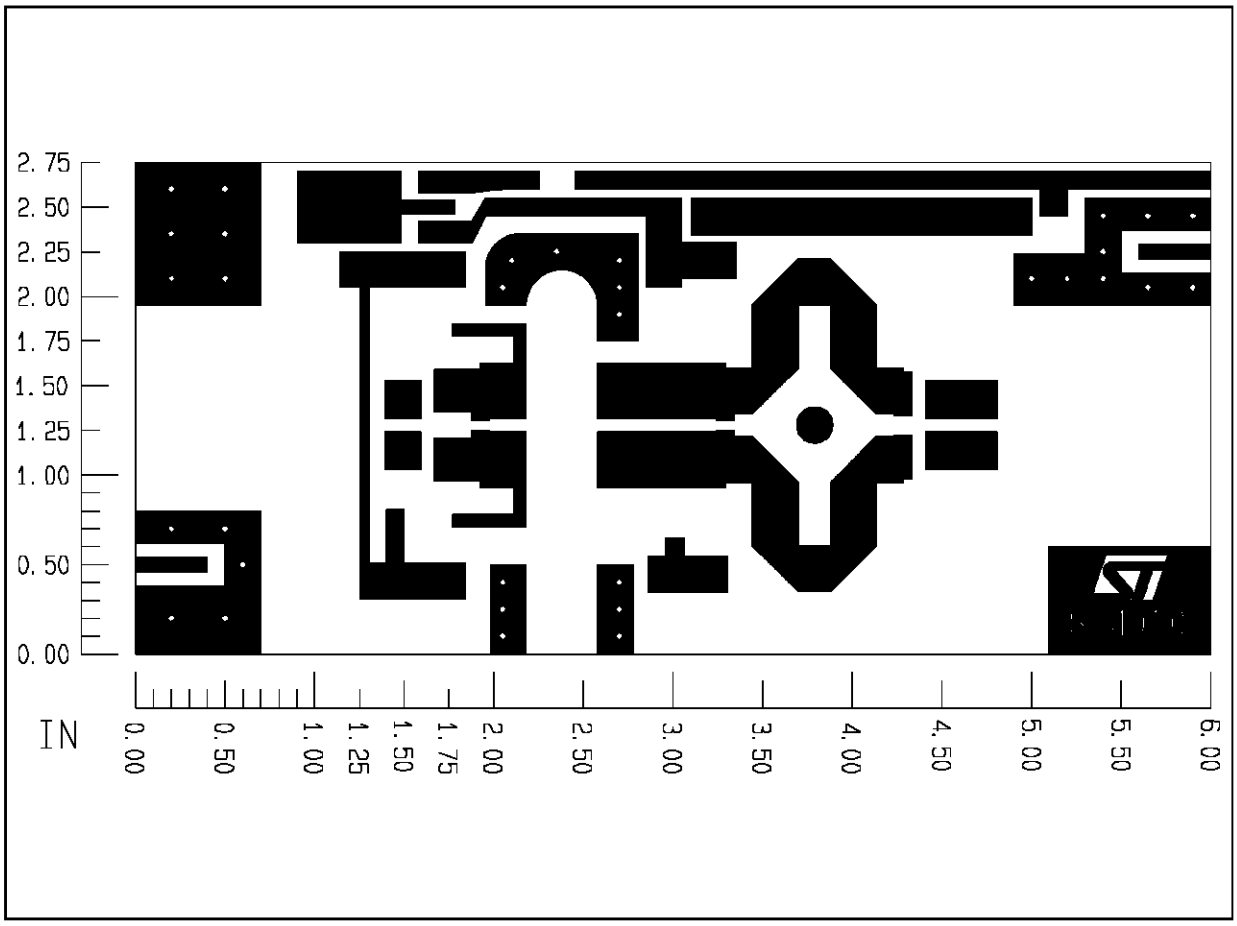
C1, C4,
C11, C16 : 100µF, 50V Electrolytic
C2, C5,
C12, C15 : 10µF, 35V Tantalum
C3, C6, C7 C8,
C19, C20 : 75 pF Ceramic Chip, ATC B
C9, C18 : 0.4 - 2.5 pF Variable, JOHANSON Giga-trim
C10 : 2pF Ceramic Chip, ATC B
C17 : 5pF Ceramic Chip, ATC B

L1, L2 : 7 Turns, 0.12" I.D., #22 AWG (1:1)
L3, L4 : 5 Turns, 0.12" I.D., #22 AWG (1:1)

See Photomaster for Microstrip Lines

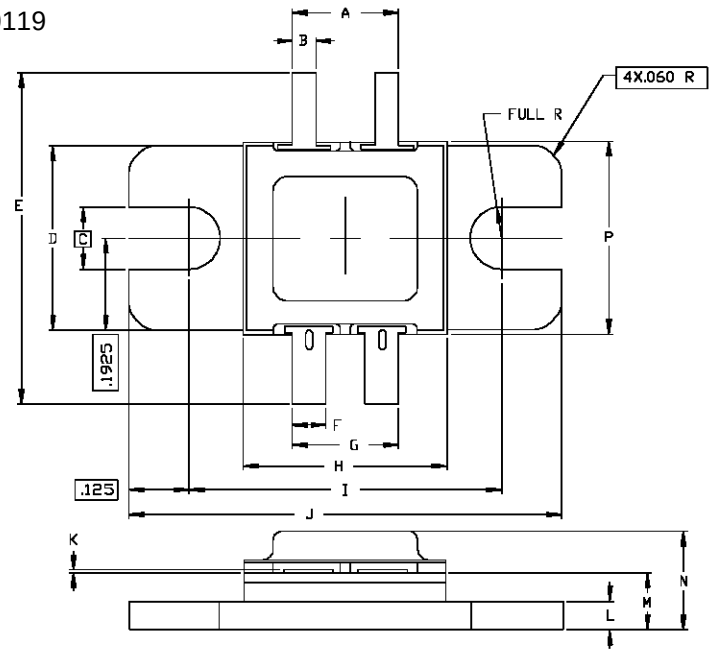
Board
Material: ROGERS Ultra-Lam Er = 2.55, Height = 0.030", 2 oz. Cu.

PHOTOMASTER OF TEST CIRCUIT



PACKAGE MECHANICAL DATA

Ref. Dwg. No.: 12-0119



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.210/5,33	.230/5,84
B	.045/1,14	.055/1,40
C	.130/3,30	
D	.380/9,65	.390/9,91
E	.770/19,56	.830/21,08
F	.070/1,78	.080/2,03
G	.215/5,46	.235/5,97
H	.420/10,67	.433/11,00
I	.645/16,38	.655/16,64
J	.895/22,73	.905/22,99

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K	.002/0,05	.006/0,15
L	.058/1,47	.065/1,65
M	.115/2,92	.130/3,30
N	----	.230/5,84
P	.395/10,03	.408/10,36