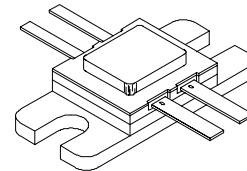


RF & MICROWAVE TRANSISTORS UHF TV LINEAR APPLICATIONS

- 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

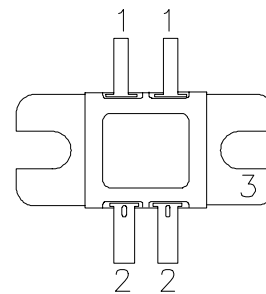
ORDER CODE
SD4010

BRANDING
SUTV200

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.

PIN CONNECTION



- | | |
|--------------|------------|
| 1. Collector | 3. Emitter |
| 2. Base | |

ABSOLUTE MAXIMUM RATINGS (T_{case} = 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
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SD4010

ELECTRICAL SPECIFICATIONS ($T_{case} = 25^{\circ}C$)

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}

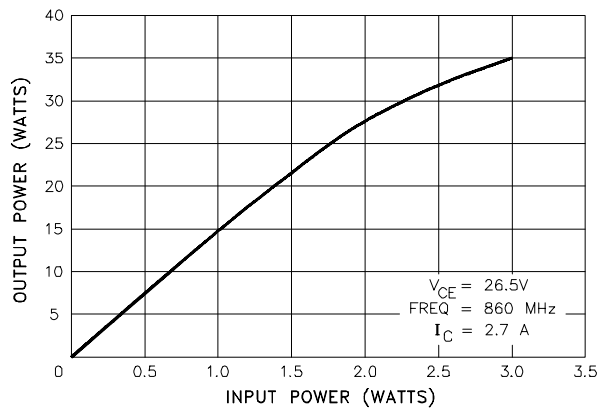
$f_2 = 900.1 MHz/ -6dB$ ref. to P_{OUT}

IMD_3 (Typ) < -36dBc

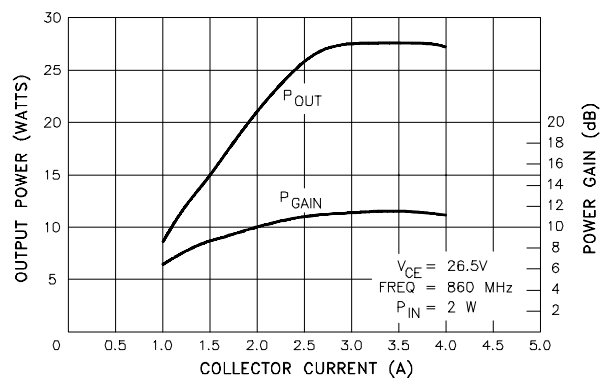
Note 3: Tested Per Side

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT

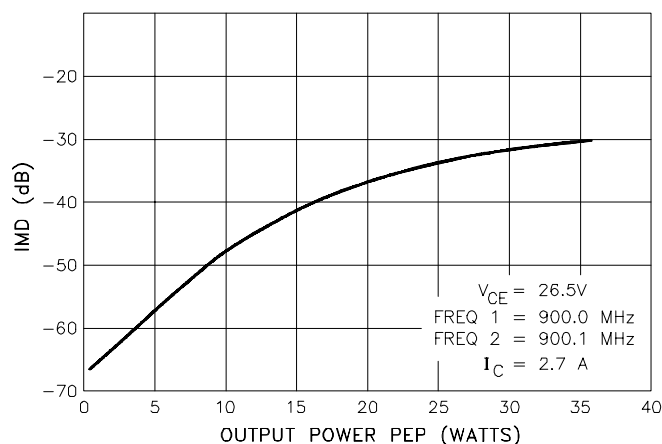


POWER OUTPUT & POWER GAIN vs
TOTAL COLLECTOR CURRENT

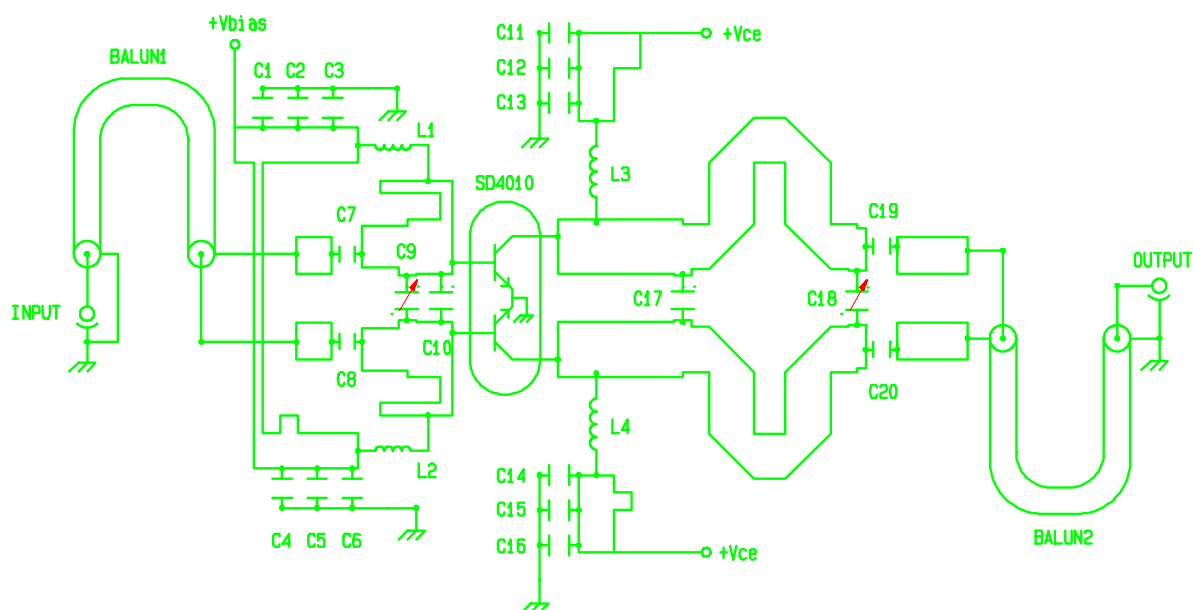


TYPICAL PERFORMANCE (cont'd)

INTERMODULATION DISTORTION vs POWER OUTPUT



TEST CIRCUIT SCHEMATIC



Balun 1, 2 : 50Ω Coaxial Cable, $\lambda/4$ @ 860 MHz

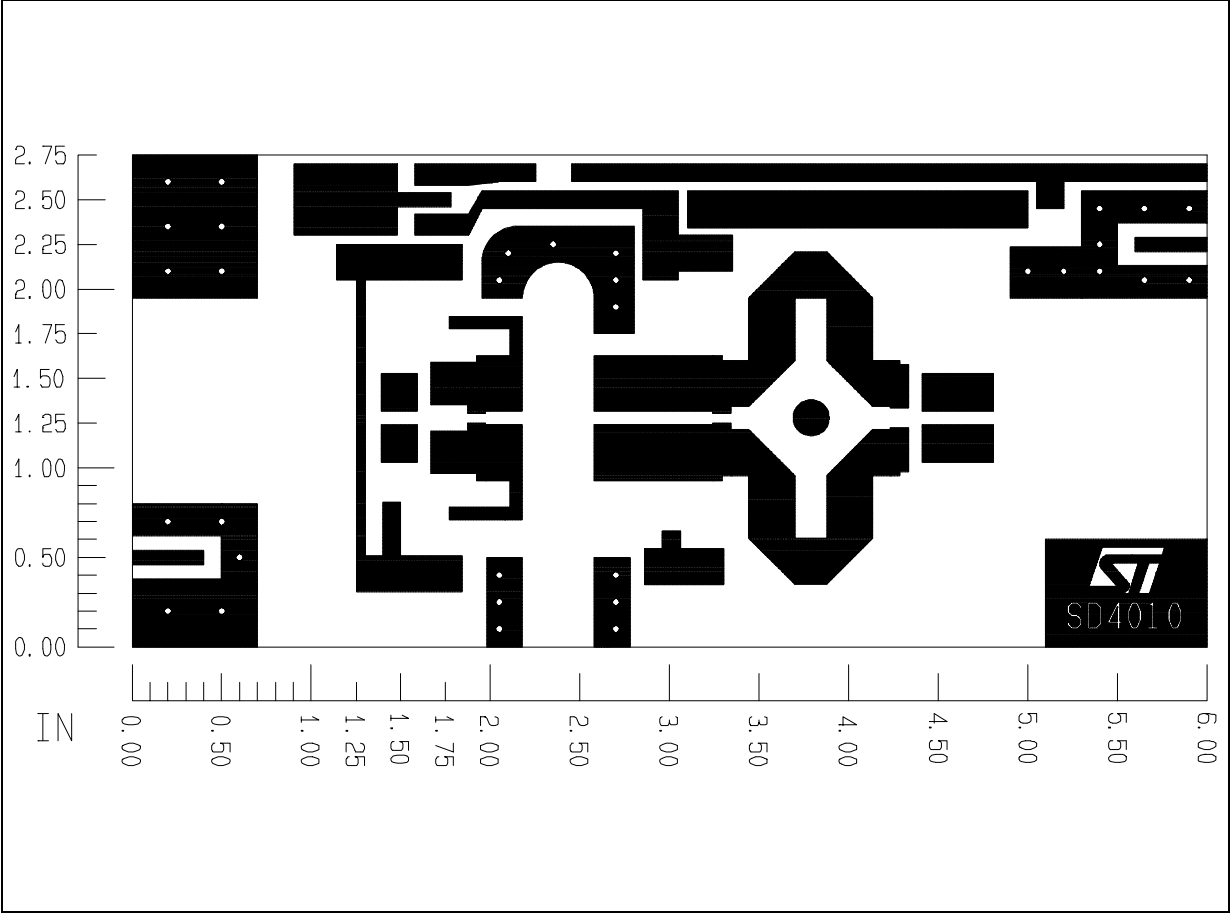
C1, C4,
 C11, C16 : $100\mu F$, 50V Electrolytic
 C2, C5,
 C12, C15 : $10\mu F$, 35V Tantalum
 C3, C6, C7 C8,
 C19, C20 : 75 pF Ceramic Chip, ATC B
 C9, C18 : 0.4 - 2.5 pF Variable, JOHANSON Giga-trim
 C10 : 2pF Ceramic Chip, ATC B
 C17 : 5pF Ceramic Chip, ATC B

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

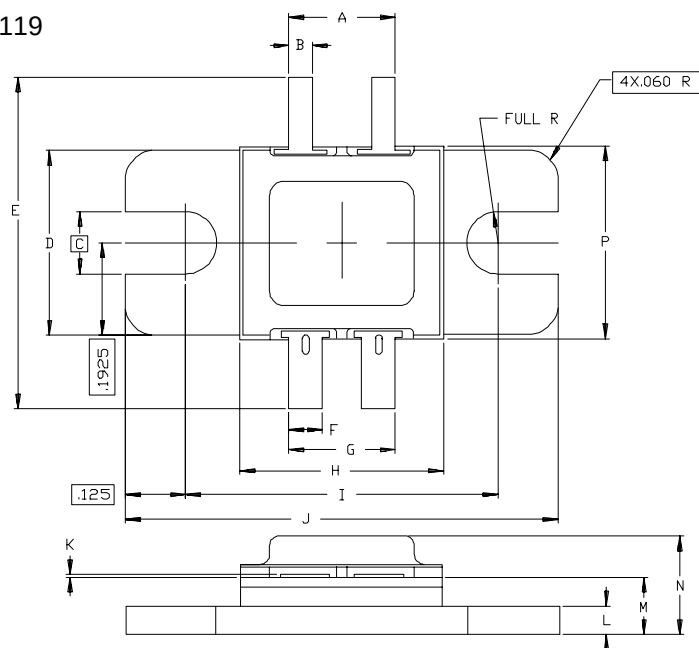
Board
 Material: ROGERS Ultra-Lam $\epsilon_r = 2.55$, Height = 0.030",
 2 oz. Cu.

PHOTOMASTER OF TEST CIRCUIT



PACKAGE MECHANICAL DATA

Ref. Dwg. No.: 12-0119



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.210/5,33	.230/5,84	K	.002/0,05	.006/0,15
B	.045/1,14	.055/1,40	L	.058/1,47	.065/1,65
C	.130/3,30		M	.115/2,92	.130/3,30
D	.380/9,65	.390/9,91	N	----	.230/5,84
E	.770/19,56	.830/21,08	P	.395/10,03	.408/10,36
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			

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