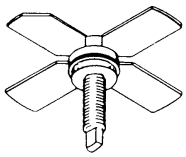
SGS-THOMSON MICROELECTRONICS

SD4011

RF & MICROWAVE TRANSISTORS UHF TV/LINEAR APPLICATIONS

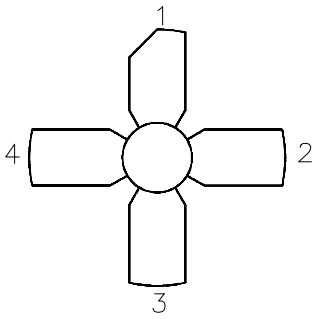
- GOLD METALLIZATION
- INTERNAL INPUT MATCHING
- COMMON EMITTER
- OVERLAY GEOMETRY
- CLASS A OPERATION
- METAL/CERAMIC PACKAGE
- P_{OUT} = 4 W MIN. WITH 8 dB GAIN



.280 4L STUD (M122)
epoxy sealed

ORDER CODE	BRANDING
SD4011	SUTV040

PIN CONNECTION



1. Collector
2. Emitter
3. Base
4. Emitter

DESCRIPTION

The SD4011 is a gold metallized NPN silicon bipolar device optimized for Class A operation in TV Band IV/V.

Suitable for a variety of other UHF linear applications, SD4011 is supplied in an industry-standard .280 stud package.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	65	V
V_{CES}	Collector-Emitter Voltage	65	V
V_{EBO}	Emitter-Base Voltage	3.5	V
I_C	Device Current	1.59	A
P_{DISS}	Power Dissipation	31.8	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	5.5	°C/W

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 5mA	I_E = 0mA	65	—	—	V
BV_{EBO}	I_E = 5mA	I_C = 0mA	3.5	—	—	V
BV_{CES}	I_C = 10mA	V_{BE} = 0V	65	—	—	V
BV_{CEO}	I_C = 5mA	I_B = 0mA	20	—	—	V
I_{CBO}	V_{CB} = 40V	I_E = 0mA	—	—	1.0	mA
h_{FE}	V_C = 5V	I_C = 800mA	20	—	200	—

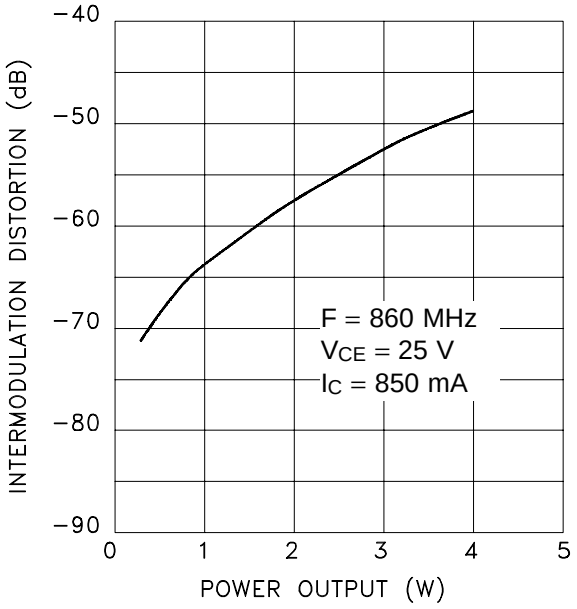
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 860 MHz	V_{CE} = 25 V	I_C = 850 mA	4	—	—	W
G_P	f = 860 MHz	V_{CE} = 25 V	I_C = 850 mA	8.0	—	—	dB
IMD_3	f = 860 MHz	V_{CE} = 25 V	I_C = 850 mA	–60	—	—	dBc
C_{OB}	f = 1 MHz	V_{CE} = 25 V		—	13	20	pF

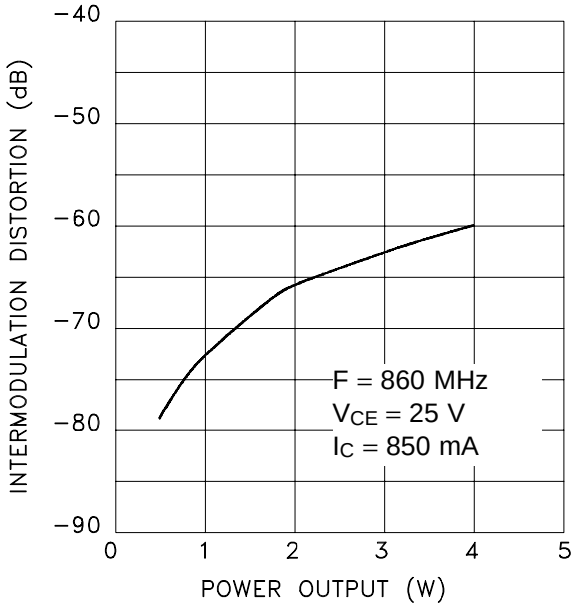
Note: P_{IN} = 0.63

TYPICAL PERFORMANCE

INTERMODULATION DISTORTION vs POWER OUTPUT



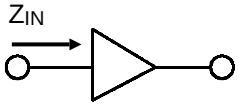
INTERMODULATION DISTORTION (3 TONES) vs POWER OUTPUT



IMPEDANCE DATA

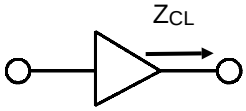
TYPICAL INPUT IMPEDANCE

Z_{IN}



TYPICAL COLLECTOR LOAD IMPEDANCE

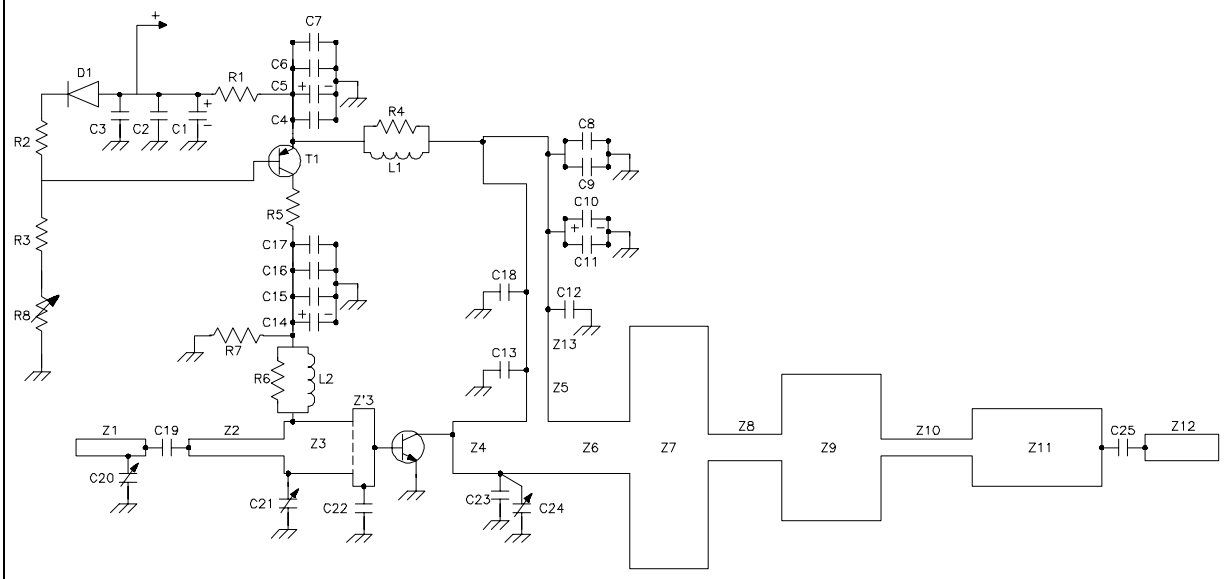
Z_{CL}



Normalized to 50 ohms

FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
470 MHz	2.26 + j 1.67	11.30 + j 5.23
600 MHz	1.93 + j 1.96	10.65 + j 2.91
700 MHz	1.40 + j 2.38	8.41 + j 6.07
860 MHz	1.19 + j 3.45	5.63 + j 4.17

TEST CIRCUIT

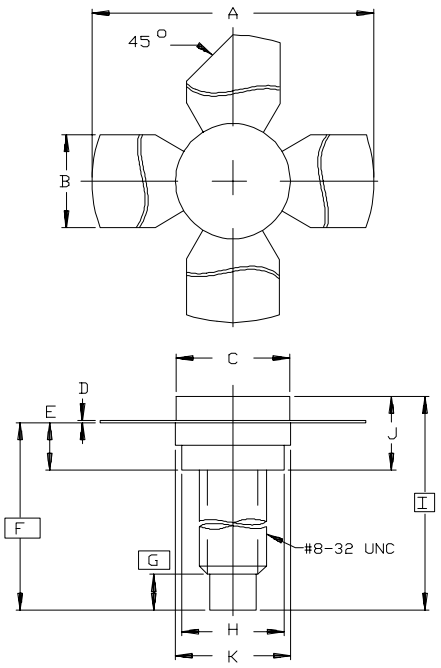


C1	:	22µF - 63V - Sprague
C2, C6, C8, C15 C3, C7 ,C9	:	4.7nF Chip LCC
C11, C16	:	100nF Chip LCC
C4, C10	:	4.7µF - 40V - Sprague
C5, C14	:	4.7µF - 63V - Sprague
C12, C17, C18	:	470pF Chip LCC
C13, C25	:	47pF ATC 100B
C19	:	47pF ATC 100A
C20	:	0.5 - 4.5pF Adjustable Airtronic
C21, C24	:	0.8 - 5pF Adjustable Johanson
C22	:	10pF ATC 100A
C23	:	15pF ATC 100B
D1	:	1N 4001 or 1N 914
L1	:	6 Turns - Wire Dia. 5/10 on 2.5mm Internal Dia.
L2	:	10 to 12 Turns on R6 - Wire Dia. 5/10
R1	:	2.2Ω - 3W - Sfernice
R2	:	100Ω - 1/2W
R3	:	510Ω - 1/2W
R4,R6	:	100Ω - 1/2W
R5,R7	:	56Ω - 1W
R8	:	3.3kΩ Adjustable
T1	:	BDX 54 B

Z1	:	50Ω transmission line - length 18mm
Z2	:	50Ω transmission line - length 22mm
Z3	:	16,4Ω transmission line - length 12mm
Z'3	:	10,5Ω transmission line - length 3.5mm
Z4	:	20Ω transmission line - length 13mm
Z5	:	50Ω transmission line - length 2.5mm
Z6	:	20Ω transmission line - length 23mm
Z7	:	4Ω transmission line - length 8% λ g at 860MHz
Z8	:	55Ω transmission line - length 7.5% λ g at 860MHz
Z9	:	7.5Ω transmission line - length 8% λ g at 860MHz
Z10	:	100Ω transmission line - length 8% λ g at 860MHz
Z11	:	20Ω transmission line - length 8% λ g at 860MHz
Z12	:	50Ω transmission line - length 5mm
Z13	:	50Ω transmission line - length 12mm

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0122



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	1.010/25,65	1.055/26,80
B	.220/5,59	.230/5,84
C	.270/6,86	.285/7,24
D	.003/0,08	.007/0,18
E	.117/2,97	.137/3,48
F	.572/14,53	
G	.130/3,30	
H	.245/6,22	.255/6,48
I	.640/16,26	
J	.175/4,45	.217/5,51
K	.275/6,99	.285/7,24