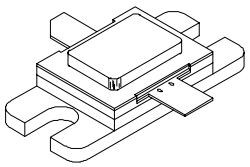
SGS-THOMSON MICROELECTRONICS

SD1542

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

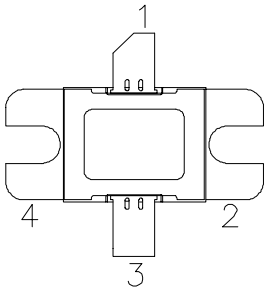
- DESIGNED FOR HIGH POWER PULSED IFF AND DME APPLICATIONS
- 600 WATTS (typ.) IFF 1030/1090 MHz
- 550 WATTS (min.) DME 1025 - 1150 MHz
- 5.6 dB MIN. GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INTERNAL INPUT/OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetically sealed

ORDER CODE	BRANDING
SD1542	SD1542

PIN CONNECTION



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

DESCRIPTION

The SD1542 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1542 is designed for applications requiring high peak power and low duty cycles such as IFF and DME. The SD1542 is packaged in a hermetic metal/ceramic package with internal input/output matching, resulting in improved broadband performance and a low thermal resistance.

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	40	A
P_{DISS}	Power Dissipation	1350	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.06	°C/W

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0mA	65	—	—	V
BV_{CES}	I_C = 50mA	V_{BE} = 0V	65	—	—	V
BV_{EBO}	I_E = 10mA	I_C = 0mA	3.5	—	—	V
I_{CES}	V_{CE} = 50V	I_E = 0mA	—	—	35	mA
h_{FE}	V_{CE} = 5V	I_C = .25A	5	—	200	—

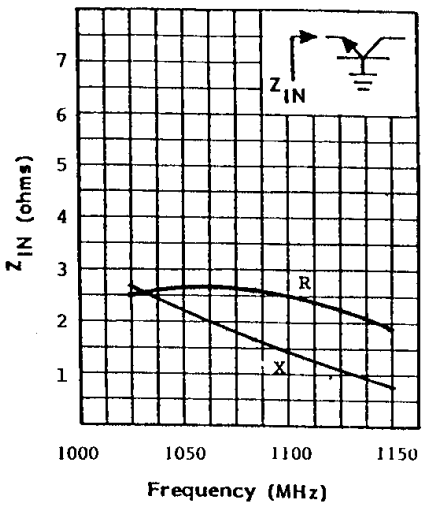
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1025 — 1150MHz	P_{IN} = 150 W	V_{CE} = 50 V	550	—	—	W
G_P	f = 1025 — 1150MHz	P_{IN} = 150 W	V_{CE} = 50 V	5.6	—	—	dB

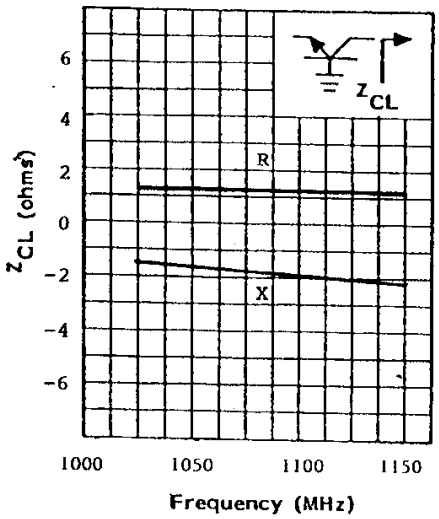
Note: Pulse Width = 10μSec, Duty Cycle = 1%

IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



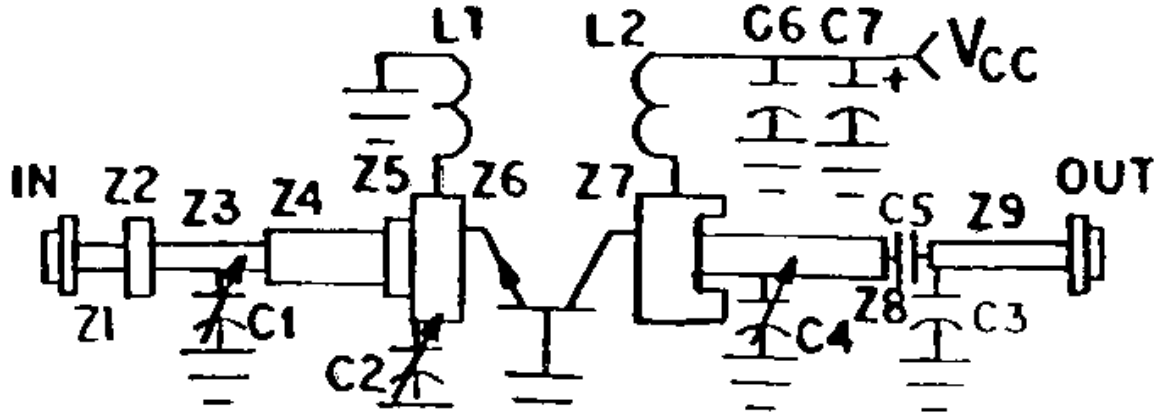
TYPICAL COLLECTOR LOAD IMPEDANCE



FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
1020 MHz	1.78 + j 3.0	1.33 – j 2.7
1090 MHz	1.57 + j 2.1	1.64 – j 3.4
1150 MHz	1.55 + j 1.4	1.93 – j 4.0

P_{IN} = 150 W
V_{CE} = 50 V

TEST CIRCUIT



All Dimensions are in inches Unless Otherwise Specified

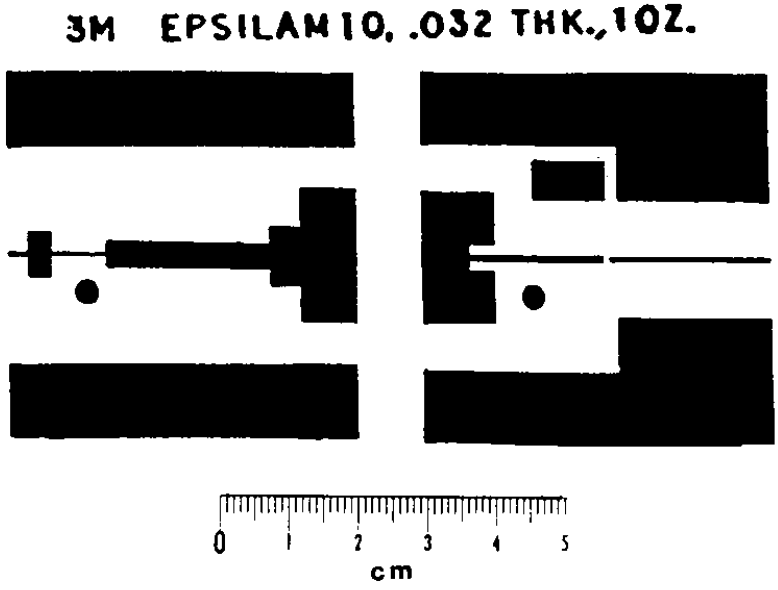
C1 : 0.4 - 2.5pF Johanson Gigatrim
C2, C3, C4 : 0.6 - 4.5pF Johanson Gigatrim
C5 : 82pF Chip Capacitor, .055 Sq.
C6 : Pair of 820pF Chip Capacitors, .11 Sq.
C7 : 1000µF Electrolytic

L1 : Loop, #18 Tinned, .36 Wide x .27 Above Circuit
L2 : 4 3/4 Turns, #24 Enameled, Close Wound, .075 I.D.

Z1 : 50Ω (.02 Wide)
Z2 : .250 x .120
Z3 : 50Ω, .020 x .330; C1 Tapped .15 From Load
Z4 : .145 x .920
Z5 : .325 x .180
Z6 : .730 x .315
Z7 : .710 x .425 with .140 x .150 Cutout
Z8 : .035 x .780; C4 Tapped .36 from Center
Z9 : 50Ω (.02 Wide)

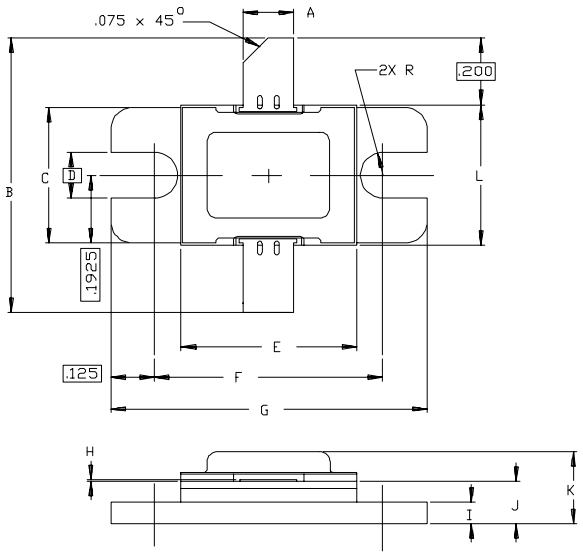
C1, C4 : Cold End Terminated Through Eyelet

PC BOARD LAYOUT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0112



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.145/3,68	.155/3,93
B	.750/19,05	
C	.380/9,65	.390/9,91
D	.130/3,30	
E	.495/12,57	.507/12,88
F	.640/16,26	.655/16,64
G	.890/22,61	.910/23.11
H	.002/0,05	.006/0,15
I	.055/1,40	.065/1,65
J	.115/2,92	.135/3,43
K		.230/5,84
L	.395/10,03	.407/10,34