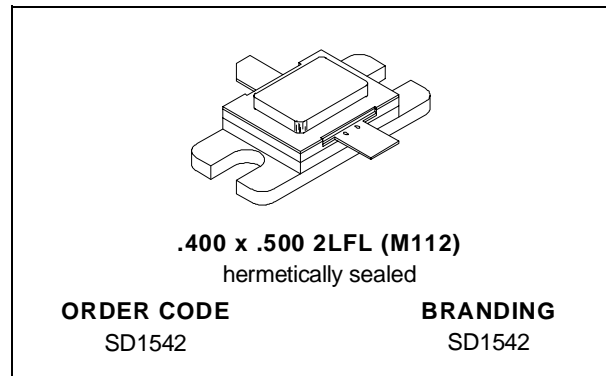
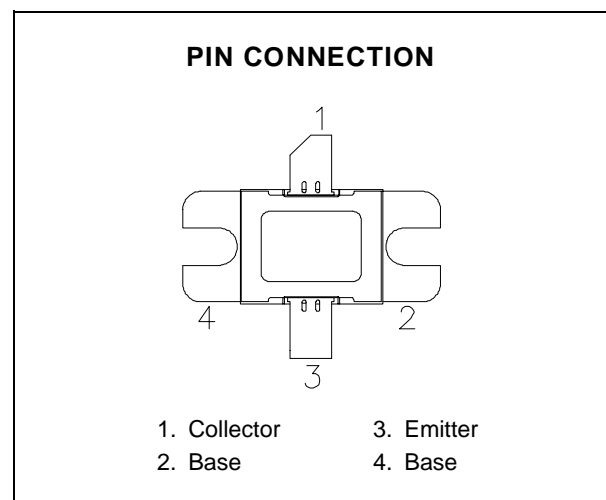


**RF & MICROWAVE TRANSISTORS  
AVIONICS APPLICATIONS**

- 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


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

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	$^{\circ}C$
$T_{STG}$	Storage Temperature	- 65 to +200	$^{\circ}C$

**THERMAL DATA**

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.06	$^{\circ}C/W$
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# SD1542

## ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)

### STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV <sub>CBO</sub>	I <sub>C</sub> = 25mA	I <sub>E</sub> = 0mA	65	—	—	V
BV <sub>CES</sub>	I <sub>C</sub> = 50mA	V <sub>BE</sub> = 0V	65	—	—	V
BV <sub>EBO</sub>	I <sub>E</sub> = 10mA	I <sub>C</sub> = 0mA	3.5	—	—	V
I <sub>CES</sub>	V <sub>CE</sub> = 50V	I <sub>E</sub> = 0mA	—	—	35	mA
h <sub>FE</sub>	V <sub>CE</sub> = 5V	I <sub>C</sub> = .25A	5	—	200	—

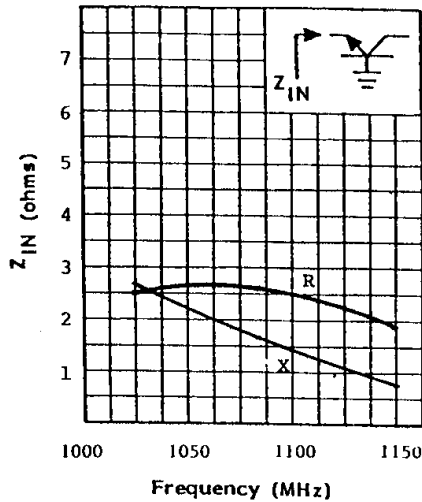
### DYNAMIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
P <sub>OUT</sub>	f = 1025 — 1150MHz	P <sub>IN</sub> = 150 W V <sub>CE</sub> = 50 V	550	—	—	W
G <sub>P</sub>	f = 1025 — 1150MHz	P <sub>IN</sub> = 150 W V <sub>CE</sub> = 50 V	5.6	—	—	dB

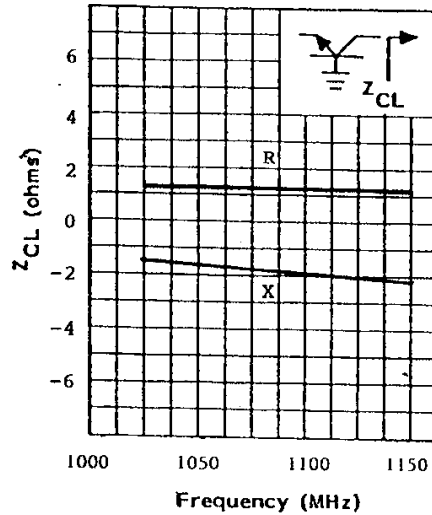
Note: Pulse Width = 10μSec, Duty Cycle = 1%

### IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



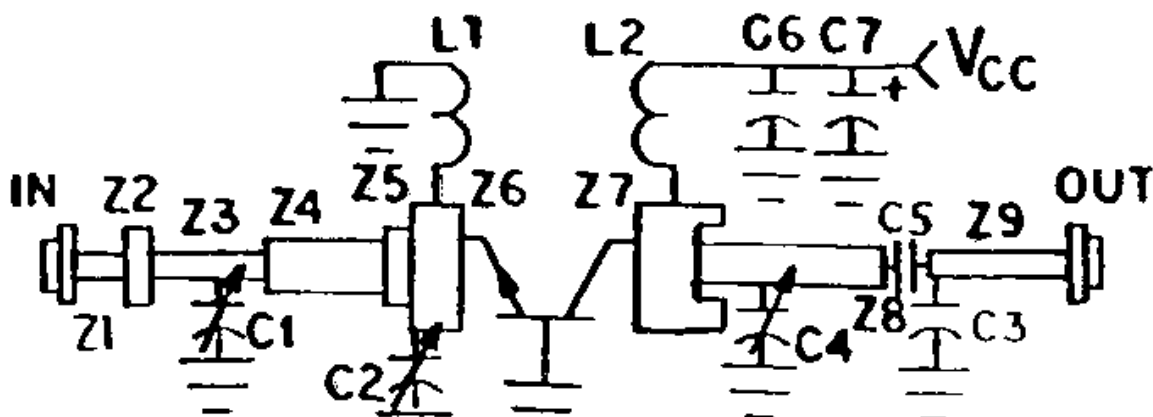
TYPICAL COLLECTOR LOAD IMPEDANCE



FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (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<sub>IN</sub> = 150 W  
V<sub>CE</sub> = 50 V

## TEST CIRCUIT

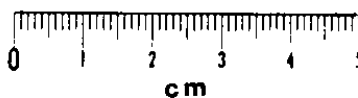
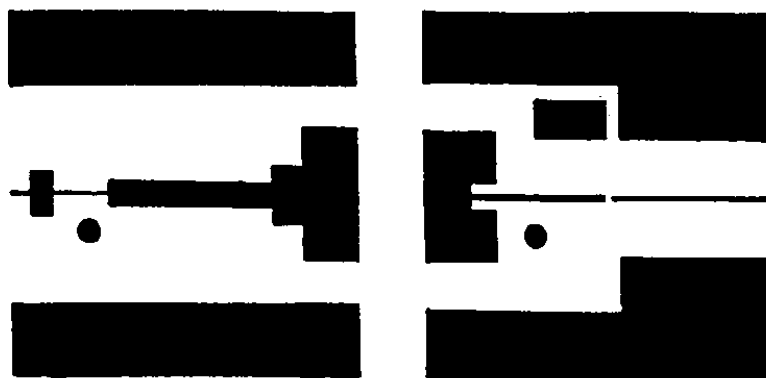


All Dimensions are in inches Unless Otherwise Specified

C1	: 0.4 - 2.5pF Johanson Gigatrim	Z1	: 50Ω (.02 Wide)
C2, C3,		Z2	: .250 x .120
C4	: 0.6 - 4.5pF Johanson Gigatrim	Z3	: 50Ω, .020 x .330; C1 Tapped .15 From Load
C5	: 82pF Chip Capacitor, .055 Sq.	Z4	: .145 x .920
C6	: Pair of 820pF Chip Capacitors, .11 Sq.	Z5	: .325 x .180
C7	: 1000μF Electrolytic	Z6	: .730 x .315
L1	: Loop, #18 Tinned, .36 Wide x .27 Above Circuit	Z7	: .710 x .425 with .140 x .150 Cutout
L2	: 4 3/4 Turns, #24 Enameled, Close Wound, .075 I.D.	Z8	: .035 x .780; C4 Tapped .36 from Center
		Z9	: 50Ω (.02 Wide)
		C1, C4	: Cold End Terminated Through Eyelet

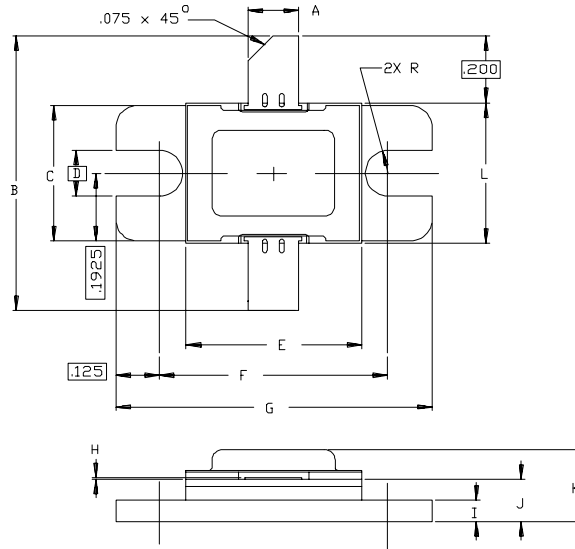
## PC BOARD LAYOUT

3M EPSILAM 10, .032 THK., 10Z.



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

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