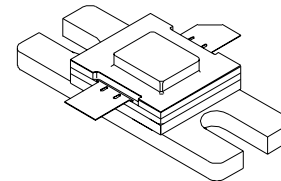




## SD1542

### RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- DESIGNED FOR HIGH POWER PULSED IFF AND DME APPLICATIONS
- 600 W (typ.) IFF 1030/1090 MHz
- 550W (min.) DME 1025 - 1150 MHz
- 5.6 dB min. GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER 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**  
SD1542

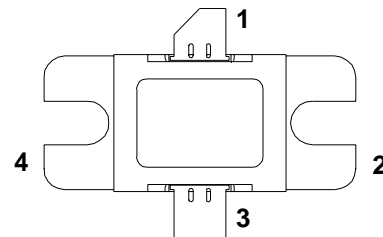
**BRANDING**  
SD1542

#### 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.

#### PIN CONNECTION



1. Collector  
2. Base

3. Emitter  
4. Base

#### 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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ELECTRICAL SPECIFICATION (T<sub>CASE</sub> = 25 °C)

STATIC

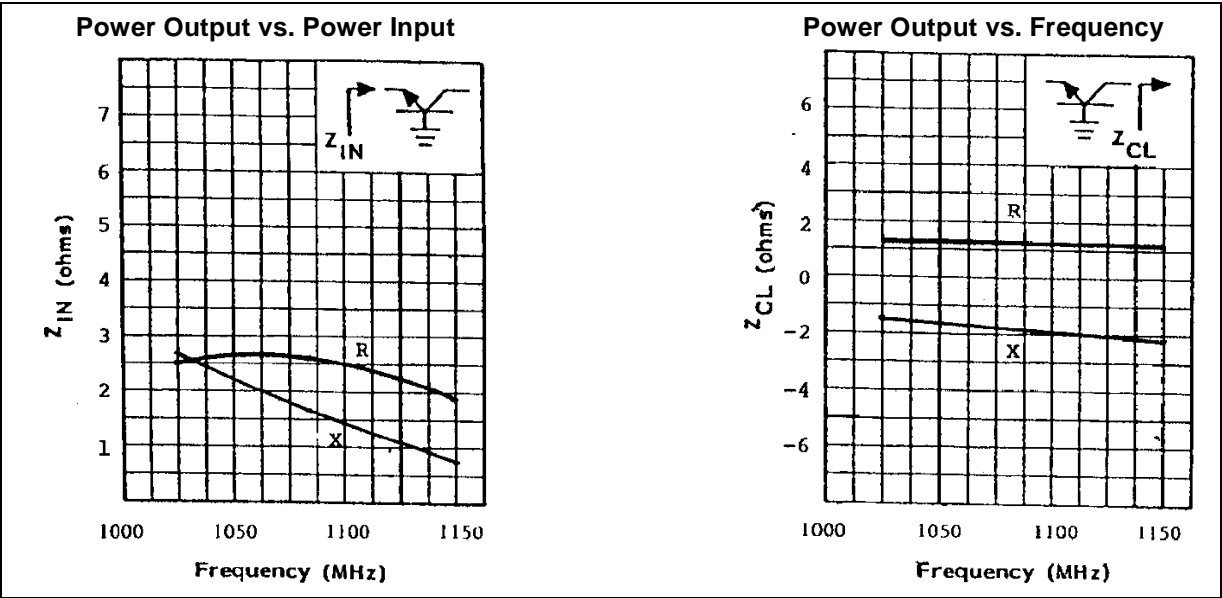
Symbol	Test Conditions	Min.	Typ.	Max.	Unit
BV <sub>CBO</sub>	I <sub>C</sub> = 25mA    I <sub>E</sub> = 0mA	65			V
BV <sub>EBO</sub>	I <sub>E</sub> = 10mA    I <sub>C</sub> = 0mA	3.5			V
BV <sub>CES</sub>	I <sub>C</sub> = 50mA    V <sub>BE</sub> = 0V	65			V
I <sub>CES</sub>	V <sub>CE</sub> = 50V    I <sub>E</sub> = 0mA			35	mA
h <sub>FE</sub>	V <sub>CE</sub> = 5V    I <sub>C</sub> = 0.25A	5		200	

DYNAMIC

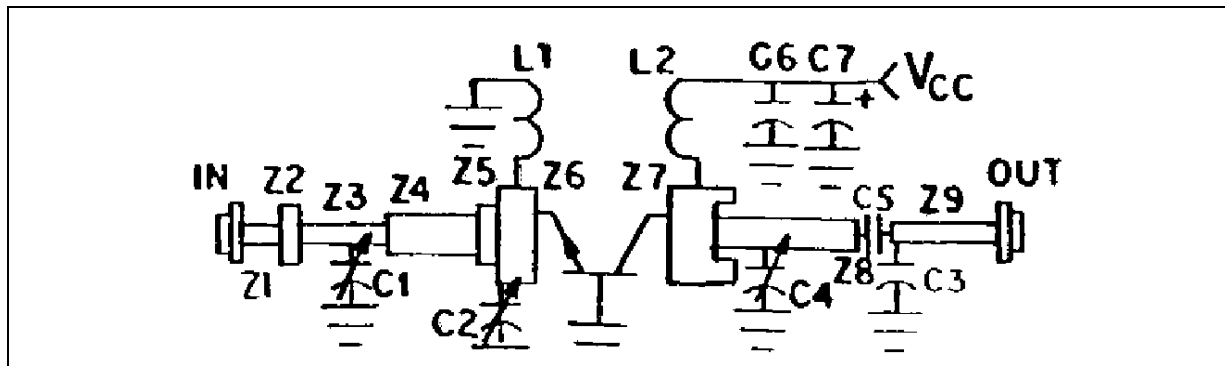
Symbol	Test Conditions	Min.	Typ.	Max.	Unit
P <sub>OUT</sub>	f = 1025 - 1150 MHz    P <sub>IN</sub> = 150 W    V <sub>CE</sub> = 50 V	550			W
G <sub>p</sub>	f = 1025 - 1150 MHz    P <sub>IN</sub> = 150 W    V <sub>CE</sub> = 50 V	5.6			dB

Note: Pulse width = 10 μs, Duty Cycle = 1%

TYPICAL PERFORMANCE



## TEST CIRCUIT

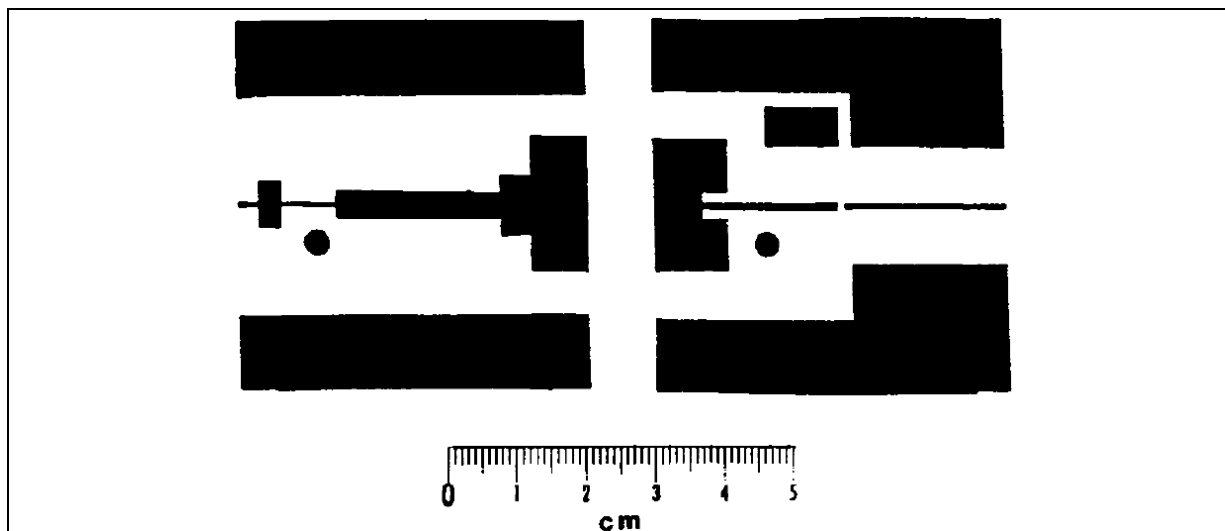


## COMPONENT PART LIST

COMPONENT	DESCRIPTION
C1	0.4 - 2.5pF Johanson Gigatrim
C2, C3, C4	0.6 - 4.5pF Johanson Gigatrim
C5	82pF Chip Capacitor, 0.055 Sq.
C6	Pair of 820pF Chip Capacitors, 0.11 Sq.
C7	1000 $\mu$ F Electrolytic
L1	Loop, #18 Tinned, 0.36 Wide x 0.27 above Circuit
L2	4 3/4 Turns, #24 Enameled, Close Wound, 0.075 I.D.
Z1	50 $\Omega$ (0.02 Wide)
Z2	0.250 x 0.120
Z3	50 $\Omega$ 0.020 x 0.330; C1 tapped 0.15 from Load
Z4	0.145 x 0.920
Z5	0.325 x 0.180
Z6	0.730 x 0.315
Z7	0.710 x 0.425 with 0.140 x 0.150 cutout
Z8	0.035 x 0.780; C4 Tapped 0.36 from Cen
Z9	50 $\Omega$ (0.02 Wide)
BOARD	3M EPSILAM10, 0.032 THK., 1 OZ

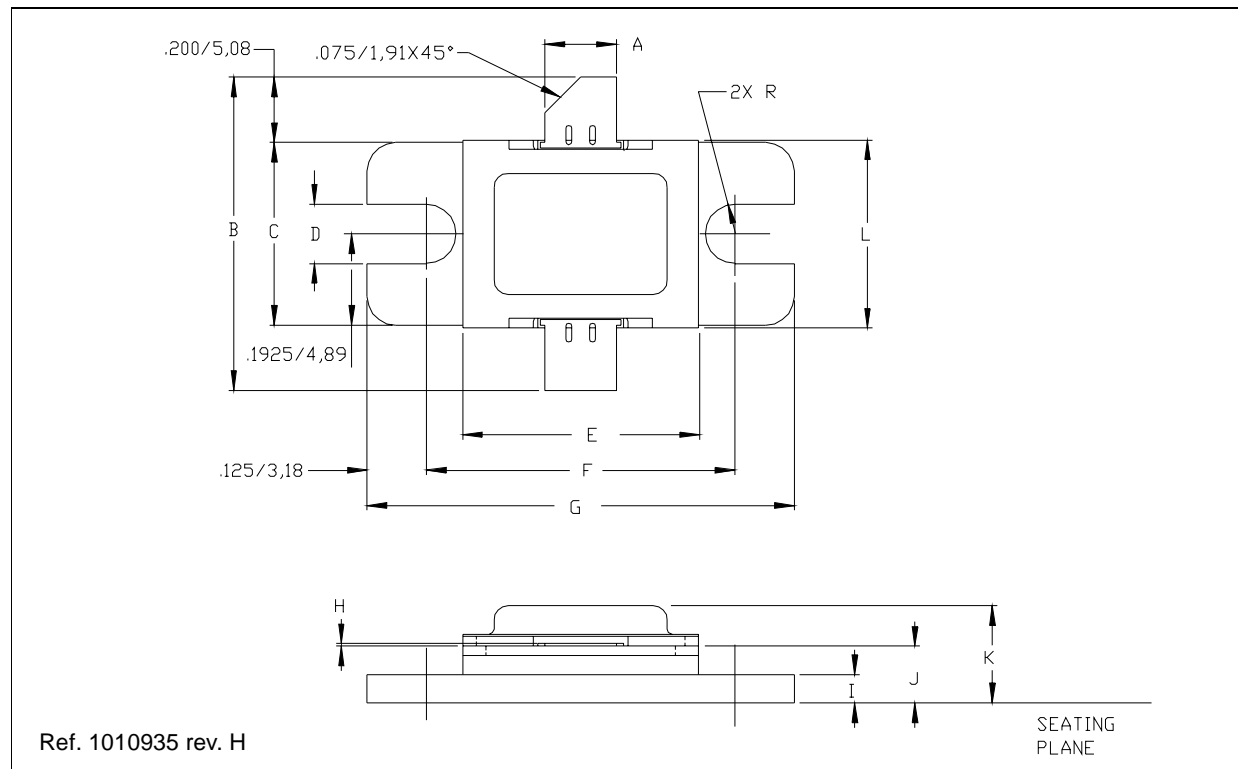
Note: All Dimensions in Inches Unless Otherwise specified  
C1, C4 Cold End Terminated Through Eyelet.

## PC BOARD LAYOUT



## M112 (.400 x .500 2LFL) MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	3.68		3.93	0.145		0.155
B	19.56		21.08	0.770		0.830
C	9.65		9.91	0.380		0.390
D	3.05		3.43	0.120		0.135
E	12.57		12.88	0.495		0.507
F	16.26		16.64	0.640		0.655
G	22.73		22.99	0.895		0.905
H	0.05		0.15	0.002		0.006
I	1.40		1.65	0.055		0.065
J	2.79		3.30	0.110		0.130
K			5.84			0.230
L	10.03		10.34	0.395		0.407



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