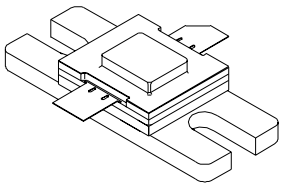
SD1542

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

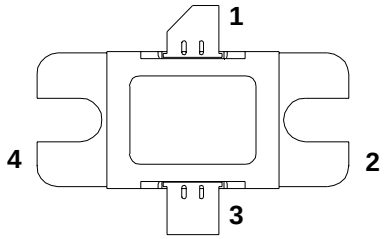
- DESIGNED FOR HIGH POWER PULSED IFF AND DME APPLICATIONS
- 600 W (typ.) IFF 1030/1090 MHz
- 550W (min.) DME 1025 - 1150 MHz
- 5.6 dB min. GAIN
- REFRACTORY GOLD METALLIZATION
- EMITTER BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD VSWR CAPABILITY AT SPECIFICIED OPERATING 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 SPECIFICATION (T_{CASE} = 25 °C)

STATIC

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
BV_{CBO}	I_C = 25mA I_E = 0mA	65			V
BV_{EBO}	I_E = 10mA I_C = 0mA	3.5			V
BV_{CES}	I_C = 50mA V_{BE} = 0V	65			V
I_{CES}	V_{CE} = 50V I_E = 0mA			35	mA
h_{FE}	V_{CE} = 5V I_C = 0.25A	5		200	

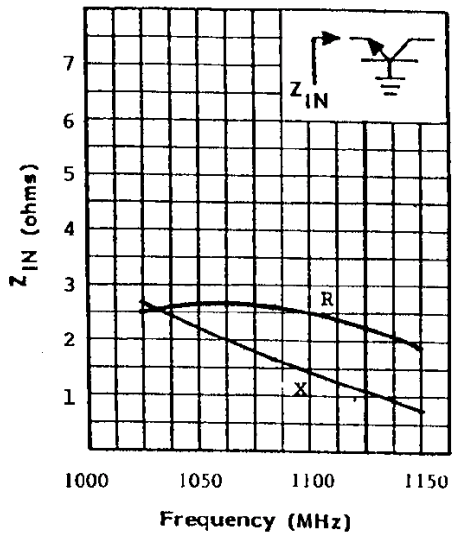
DYNAMIC

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

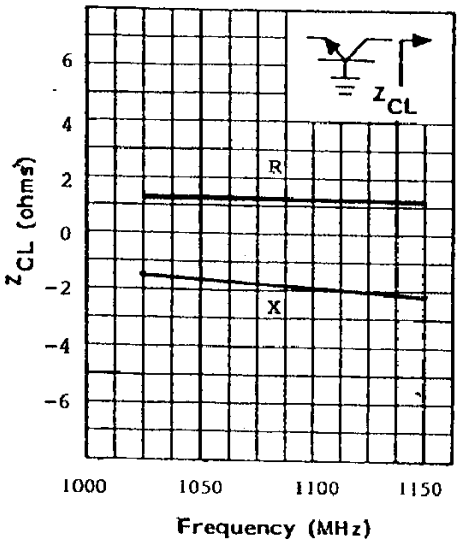
Note: Pulse width = 10 µs, Duty Cycle = 1%

TYPICAL PERFORMANCE

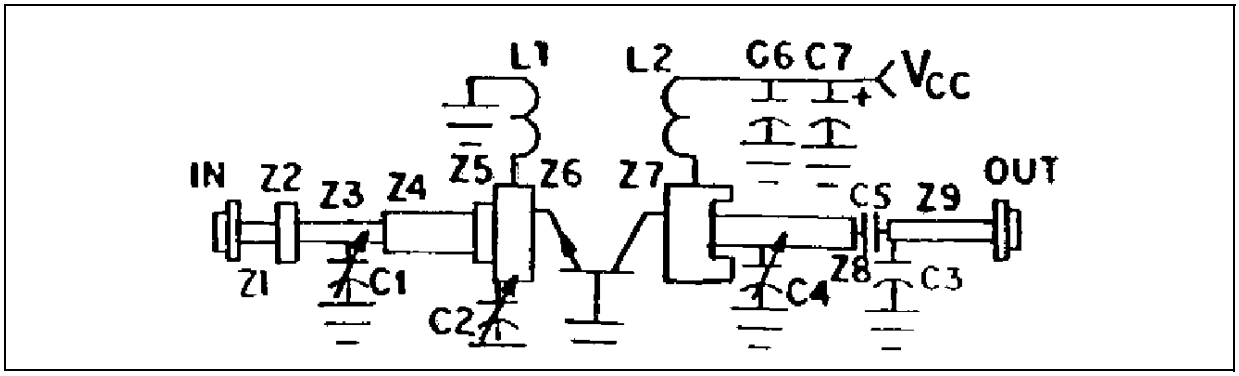
Power Output vs. Power Input



Power Output vs. Frequency



TEST CIRCUIT

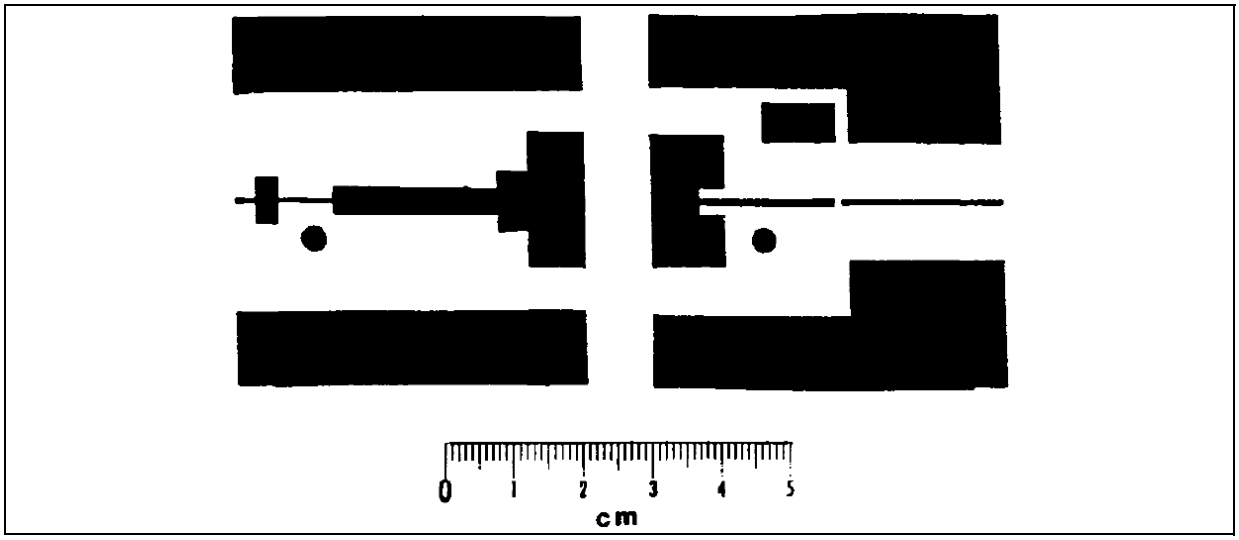


COMPONENT PART LIST

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 μF 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 Ω (0.02 Wide)
Z2	0.250 x 0.120
Z3	50 Ω 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 Ω (0.02 Wide)
BOARD	3M EPSILAM10, 0.032 THK., 1 OZ

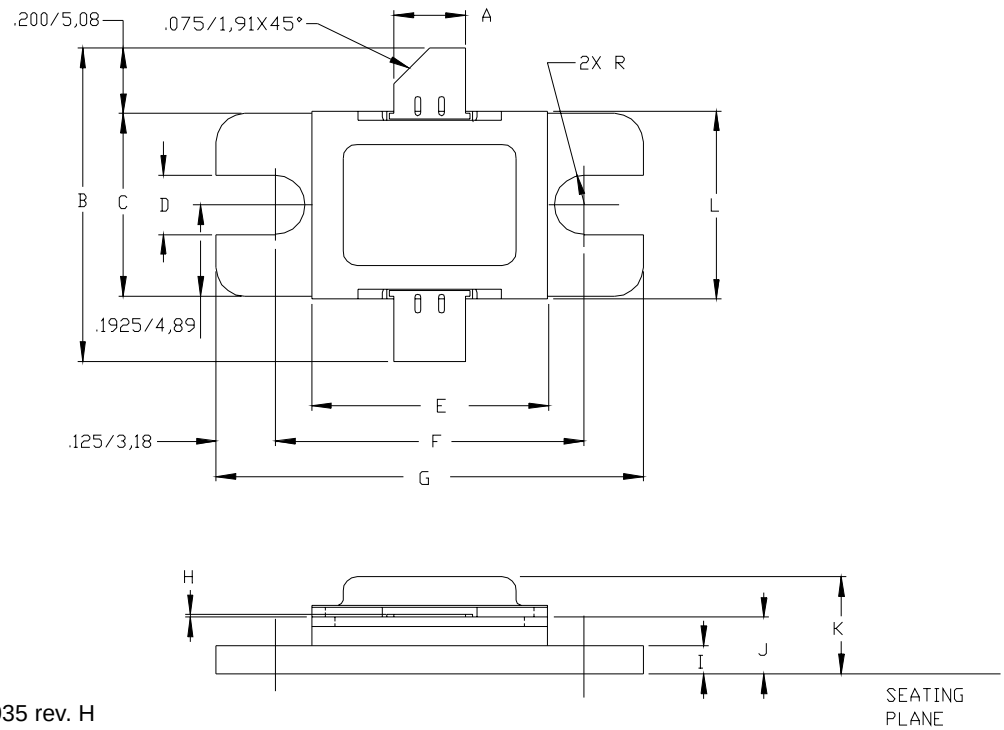
Note: All Dimensions in Inches Unless Otherwise specified
C1, C4 Cold End Terminated Through Eyelet.

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



Ref. 1010935 rev. H