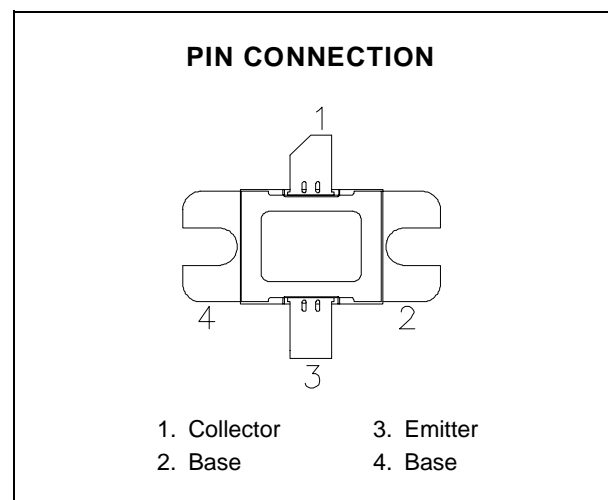
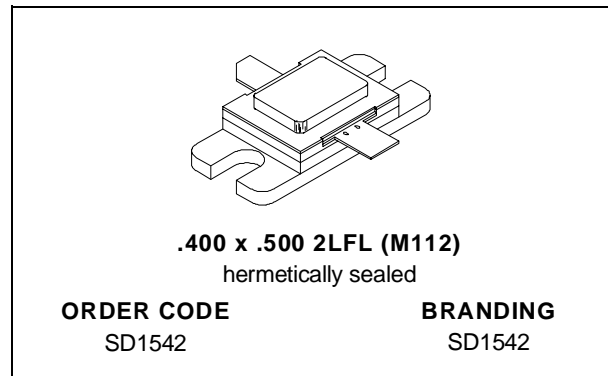


RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- 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 | $^{\circ}C/W$ |
|---------------|----------------------------------|------|---------------|

SD1542

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 | — |

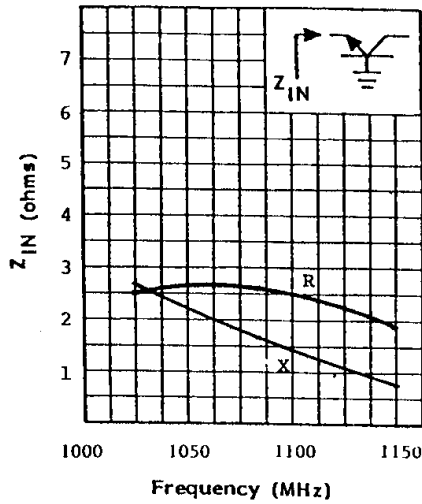
DYNAMIC

| 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 |

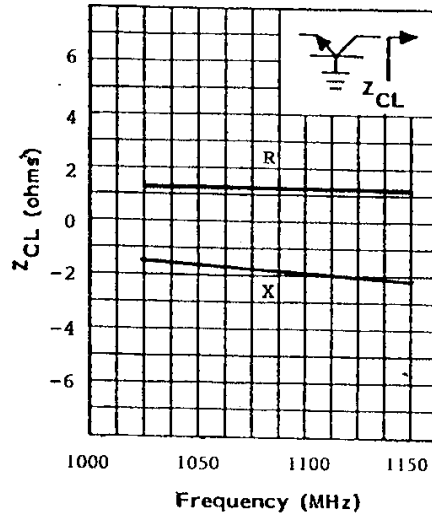
Note: Pulse Width = 10μSec, Duty Cycle = 1%

IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



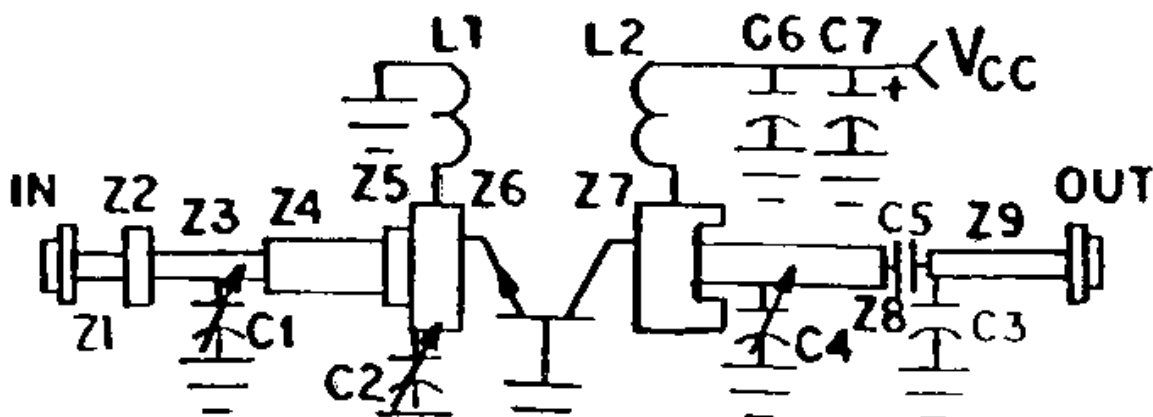
TYPICAL COLLECTOR LOAD IMPEDANCE



| 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

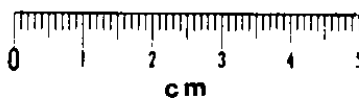
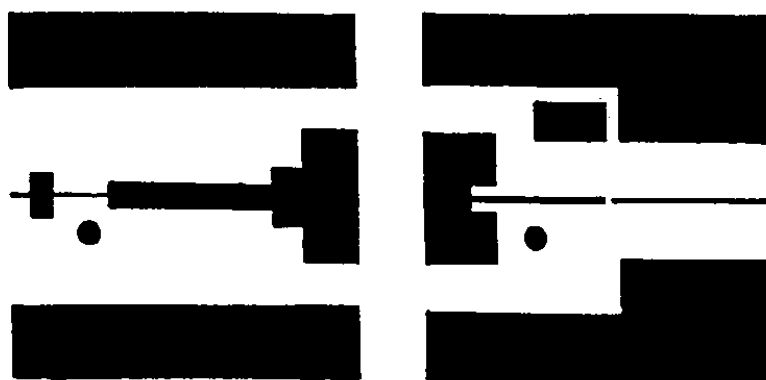


All Dimensions are in inches Unless Otherwise Specified

| | | | |
|---------|-----------------------------------------------------|--------|---------------------------------------------|
| C1 | : 0.4 - 2.5pF Johanson Gigatrim | 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 |

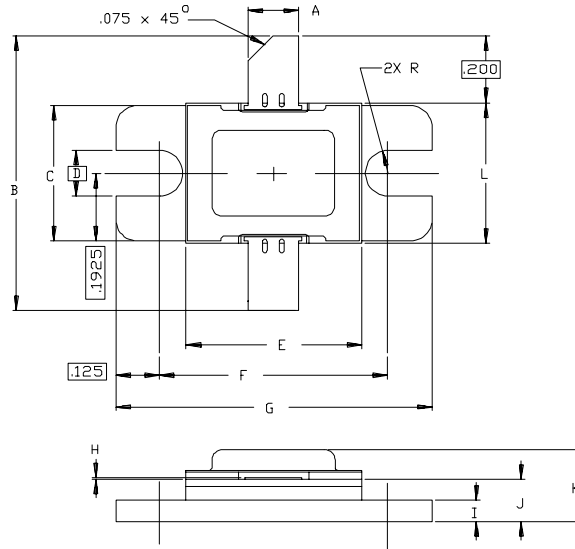
PC BOARD LAYOUT

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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