



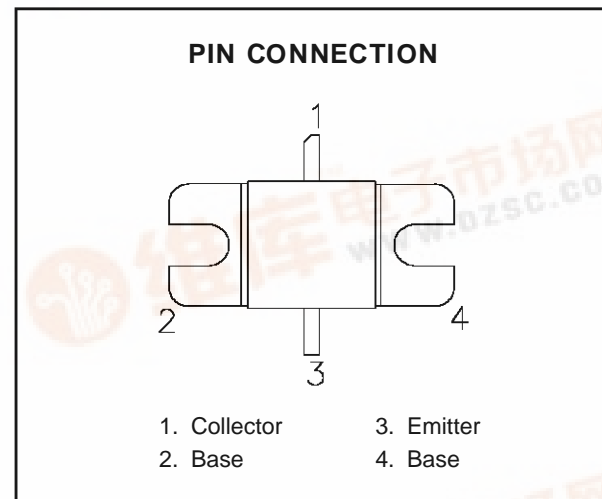
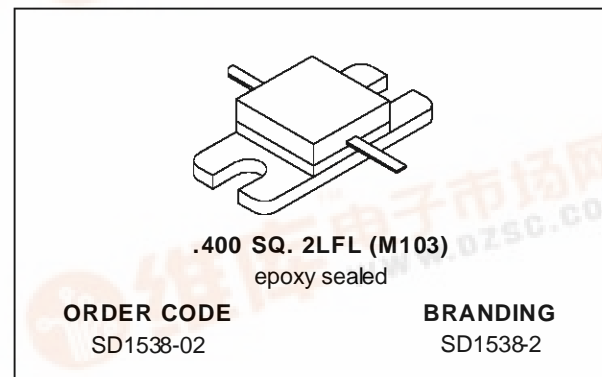
**SD1538-02**

## RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- DESIGNED FOR HIGH POWER PULSED IFF, DME, TACAN APPLICATIONS
- 200 WATTS (typ.) IFF 1030 - 1090 MHz
- 150 WATTS (min.) DME 1025 - 1150 MHz
- 140 WATTS (typ.) TACAN 960 - 1215 MHz
- 7.8 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
- INPUT/OUTPUT MATCHED, COMMON BASE CONFIGURATION

### DESCRIPTION

The SD1538-02 is a gold metallized silicon, NPN power transistor designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1538-02 is packaged in a metal/ceramic package with internal input/output matching resulting in improved broadband performance and a low thermal resistance.



### ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
V <sub>CBO</sub>	Collector-Base Voltage	65	V
V <sub>CES</sub>	Collector-Emitter Voltage	65	V
V <sub>EBO</sub>	Emitter-Base Voltage	3.5	V
I <sub>C</sub>	Device Current	11.0	A
P <sub>DISS</sub>	Power Dissipation	583	W
T <sub>J</sub>	Junction Temperature	+200	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +150	°C

### THERMAL DATA

R <sub>th(j-c)</sub>	Junction-Case Thermal Resistance	0.30	°C/W
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SD1538-02

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> = 10mA	I <sub>E</sub> = 0mA	65	—	—	V
BV <sub>CES</sub>	I <sub>C</sub> = 25mA	V <sub>BE</sub> = 0V	65	—	—	V
BV <sub>EBO</sub>	I <sub>E</sub> = 5mA	I <sub>C</sub> = 0mA	3.5	—	—	V
I <sub>CES</sub>	V <sub>CE</sub> = 50V	I <sub>E</sub> = 0mA	—	—	10	mA
h <sub>FE</sub>	V <sub>CE</sub> = 5V	I <sub>C</sub> = 300mA	5	—	—	—

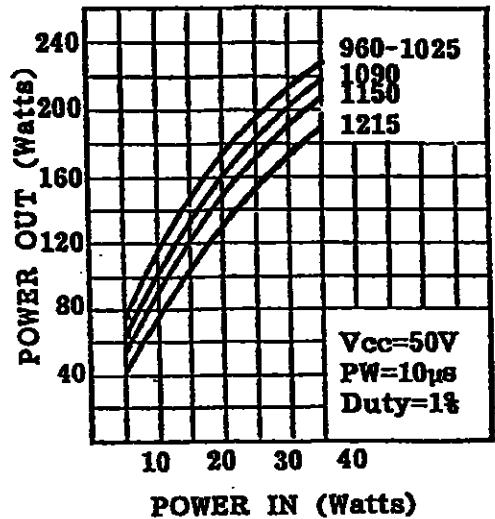
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P <sub>OUT</sub>	f = 1025 — 1150MHz	P <sub>IN</sub> = 25.0 W	V <sub>CE</sub> = 50 V	150	—	—	W
G <sub>p</sub>	f = 1025 — 1150MHz	P <sub>IN</sub> = 25.0 W	V <sub>CE</sub> = 50 V	7.8	—	—	dB

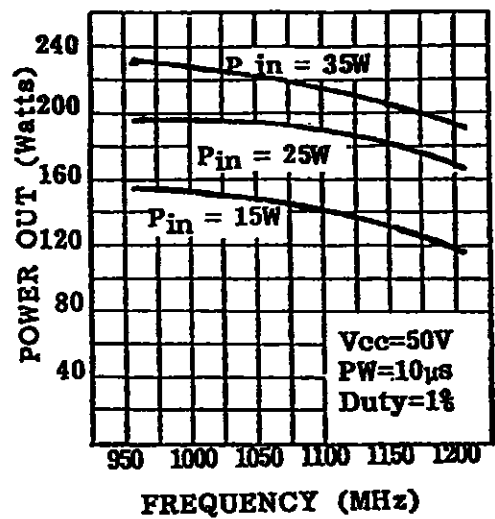
Note: Pulse Width = 10μSec, Duty Cycle = 1%  
This device is suitable for use under other pulse width/duty cycle conditions.  
Please contact the factory for specific applications assistance.

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT

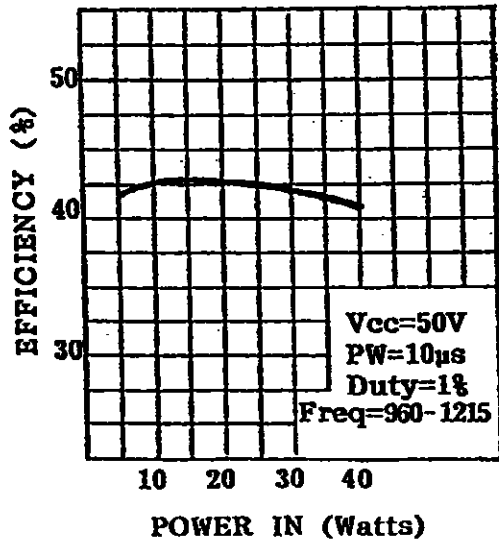


POWER OUTPUT vs FREQUENCY

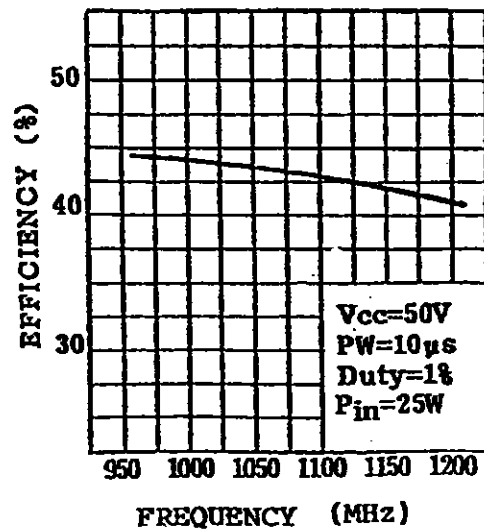


## TYPICAL PERFORMANCE (cont'd)

EFFICIENCY vs POWER INPUT

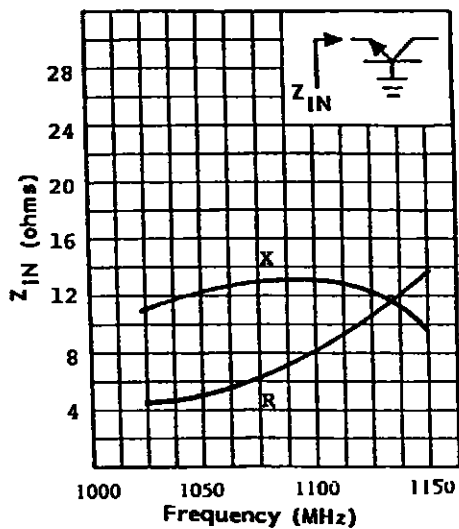


EFFICIENCY vs FREQUENCY

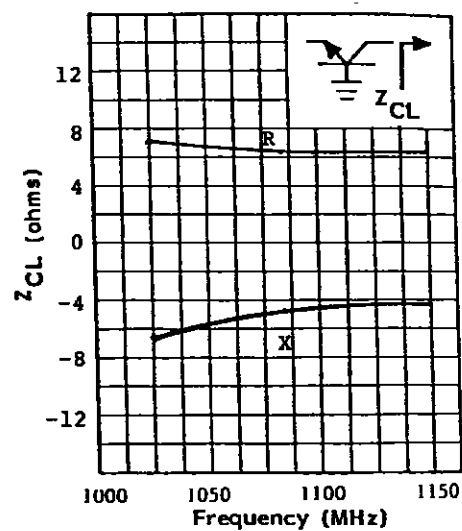


## IMPEDANCE DATA

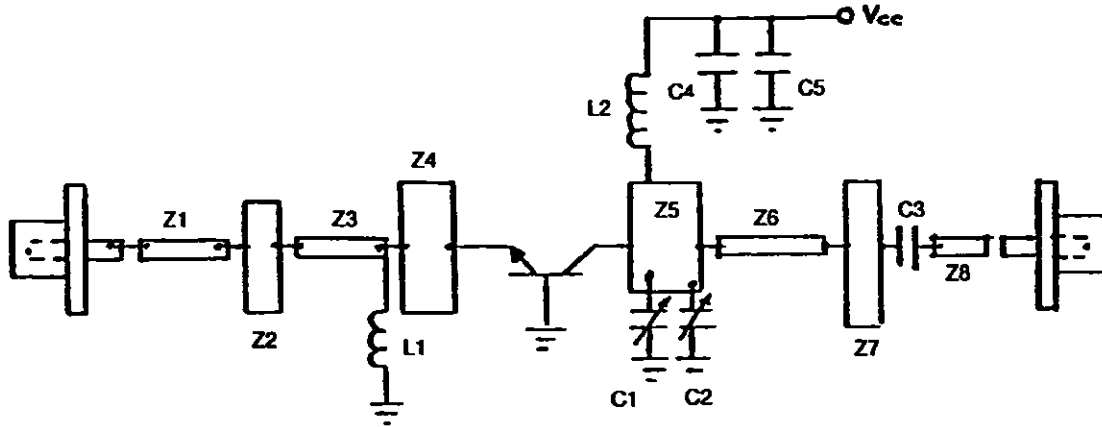
TYPICAL INPUT IMPEDANCE



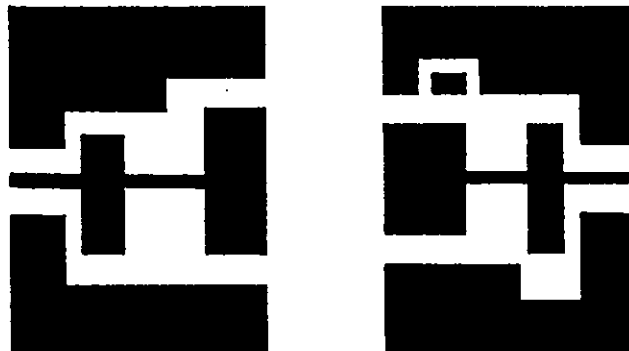
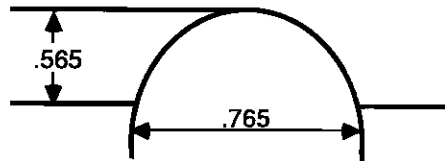
TYPICAL COLLECTOR LOAD IMPEDANCE



## TEST CIRCUIT AND PC BOARD LAYOUT

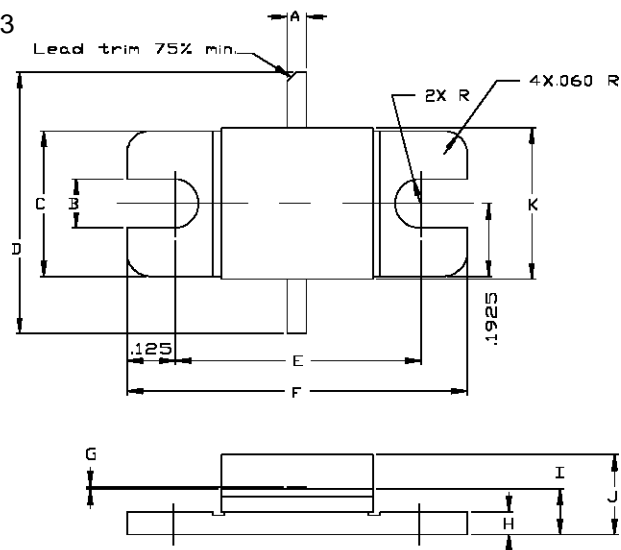


C1, C2 :	.6 - 4.5pF Gigatrim	Z1 :	.195 x .415
C3 :	.100 x .100 120pF Chip Capacitor	Z2 :	.685 x .230
C4 :	.100 x .100 470pF Chip Capacitor	Z3 :	.080 x .105
C5 :	100mF Electrolytic	Z4 :	.845 x .345
L1 :	#20 AWG	Z5 :	.640 x .470
L2 :	3 Turns, #20 AWG Wound on #32 Drill Bit	Z6 :	.070 x .405
		Z7 :	.740 x .180
		Z8 :	.50 x .325



## PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0103



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.045/1,14	.055/1,40	K	.390/9,91	.410/10,41
B	.130/3,30				
C	.380/ 9,65	.390/ 9,91			
D	.880/22,35	.920/23,37			
E	.645/16,38	.655/16,64			
F	.890/22,61	.910/23,11			
G	.002/0,05	.006/0,15			
H	.055/1,40	.065/1,65			
I	.110/2,79	.130/3,30			
J	.190/4,83	.215/5,46			

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