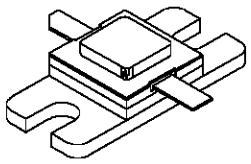
SGS-THOMSON MICROELECTRONICS

SD1538-08

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

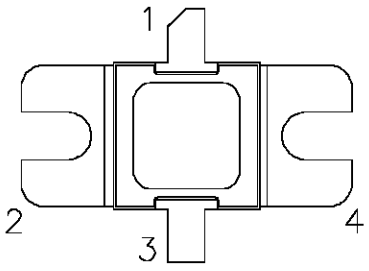
- DESIGNED FOR HIGH POWER PULSE IFF, DME, AND TACAN APPLICATIONS
- 200 W (typ.) IFF 1030 - 1090 MHz
- 150 W (min.) DME 1025 - 1150 MHz
- 140 W (typ.) TACAN 960 - 1215 MHz
- 7.8 dB MIN. GAIN
- REFRACTORY GOLD METALLIZATION
- BALLASTING AND LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT AND OUTPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .400 2LFL (M138)
hermetically sealed

ORDER CODE	BRANDING
SD1538-08	1538-8

PIN CONNECTION



1. Collector
2. Base
3. Emitter
4. Base

DESCRIPTION

The SD1538-08 is a gold metallized, silicon NPN power transistor. The SD1538-08 is designed for applications requiring high peak power and low duty cycles such as IFF, DME and TACAN. The SD1538-08 is packaged in a metal/ceramic package with internal input/output matching, resulting in improved broadband performance and 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	11	A
P_{DISS}	Power Dissipation	583	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	– 65 to +150	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.30	°C/W

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 10mA	I_E = 0mA	65	—	—	V
BV_{CES}	I_C = 25mA	V_{BE} = 0V	65	—	—	V
BV_{EBO}	I_E = 5mA	I_C = 0mA	3.5	—	—	V
I_{CES}	V_{CE} = 50V	I_E = 0mA	—	—	10	mA
h_{FE}	V_{CE} = 5V	I_C = 300mA	5	—	—	—

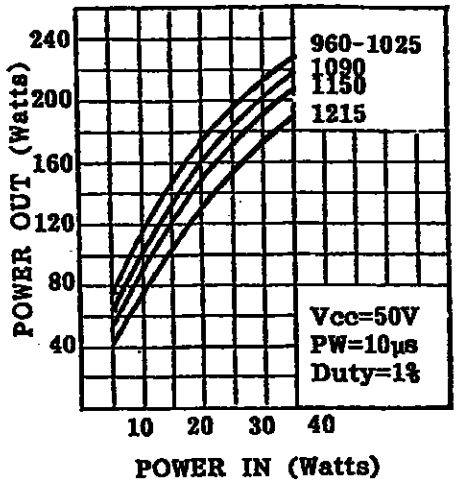
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1025 – 1150 MHz	P_{IN} = 25 W	V_{CE} = 50 V	150	—	—	W
P_G	f = 1025 – 1150 MHz	P_{IN} = 25 W	V_{CE} = 50 V	7.8	—	—	dB

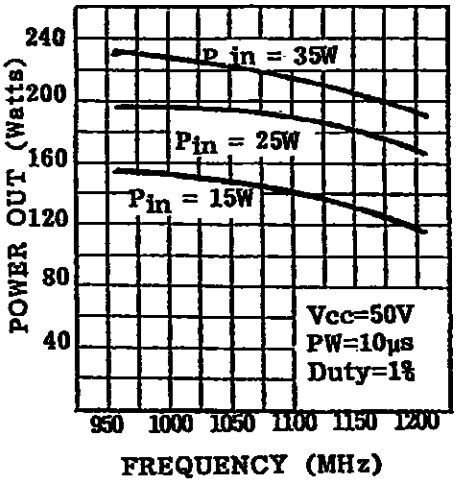
Note: Pulse Width = 10µSec, Duty Cyle = 1%

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT

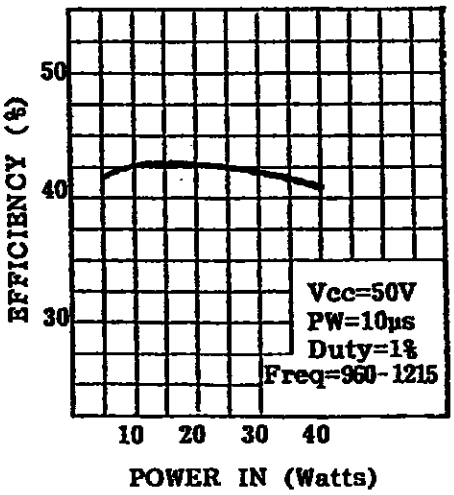


POWER OUTPUT vs FREQUENCY

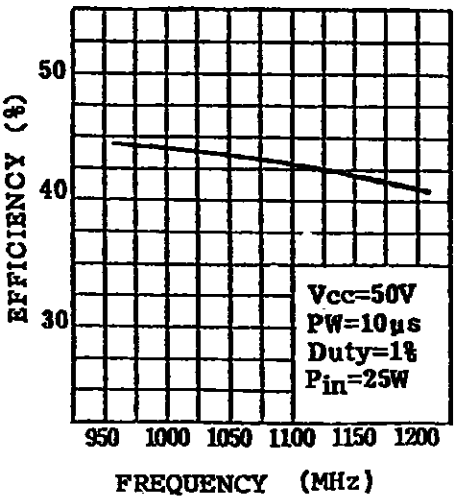


TYPICAL PERFORMANCE (cont'd)

EFFICIENCY vs POWER INPUT

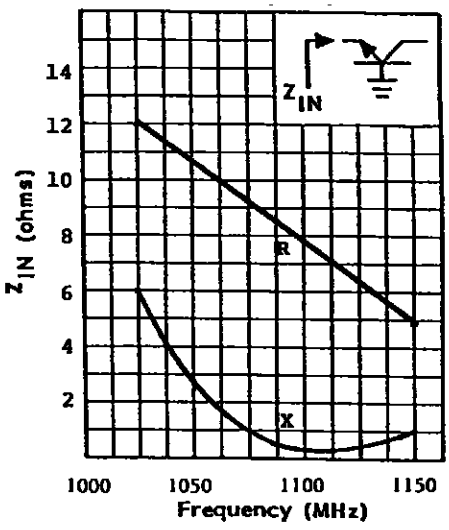


EFFICIENCY vs FREQUENCY

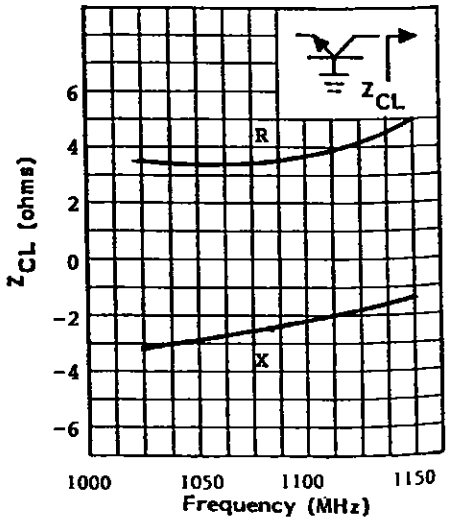


IMPEDANCE DATA

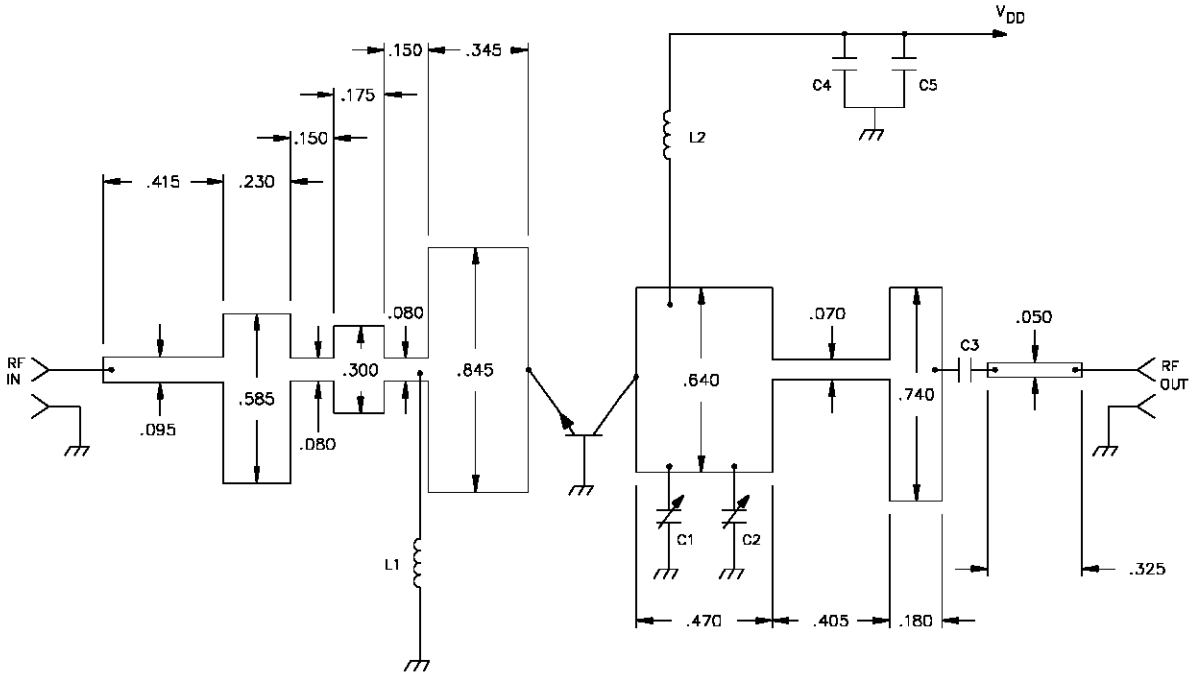
TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE



TEST CIRCUIT



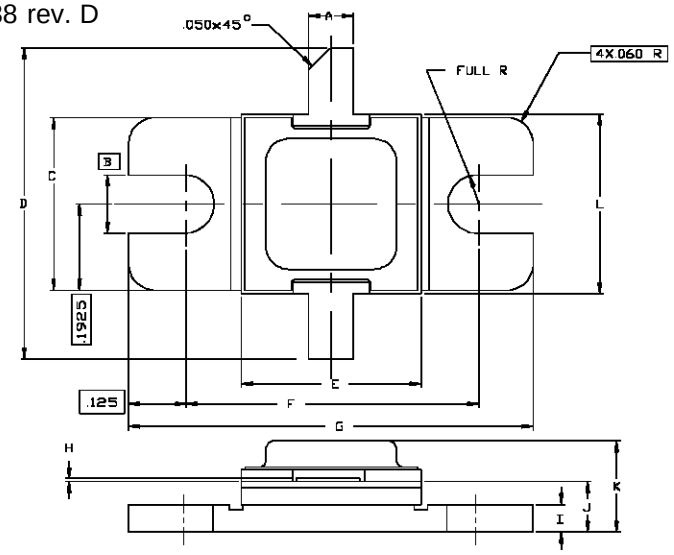
C1, C2 : .6 - 4.5pF Gigatrim
C3 : .100 x .100 120pF Chip Capacitor
C4 : .100 x .100 470pF Chip Capacitor
C5 : 100µF Electrolytic

L1 : #20 AWG
L2 : 3 Turns, #20 AWG Wound on #32 Drill Bit

Board Material: Telfon Er = 2.5, Thickness = .031”

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0138 rev. D



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.095/2,41	.105/2,67
B	.130/3,30	
C	.380/9,65	.390/9,91
D	.780/19,81	
E	.395/10,03	.407/10,33
F	.645/16,38	.655/16,64
G	.895/22,73	.905/22,99
H	.002/0,05	.006/0,15
I	.055/1,40	.065/1,65
J	.110/2,79	.130/3,30

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K		.230/5,84
L	.395/10,03	.407/10,33