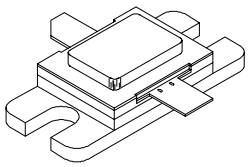
SGS-THOMSON MICROELECTRONICS

SD1542-42

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

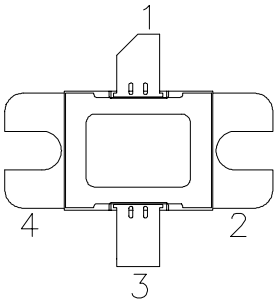
- DESIGNED FOR HIGH POWER PULSED IFF
- 600 WATTS (min.) IFF 1030 or 1090 MHz
- REFRACTORY GOLD METALLIZATION
- 6.0 dB MIN. GAIN
- LOW THERMAL RESISTANCE FOR RELIABILITY AND RUGGEDNESS
- 30:1 LOAD VSWR CAPABILITY AT SPECIFIED OPERATING CONDITIONS
- INPUT MATCHED, COMMON BASE CONFIGURATION



.400 x .500 2LFL (M112)
hermetically sealed

ORDER CODE	BRANDING
SD1542-42	SD1542-42

PIN CONNECTION



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

DESCRIPTION

The SD1542-42 is a hermetically sealed, gold metallized, silicon NPN power transistor. The SD1542-42 is designed for applications requiring high peak power and low duty cycles such as IFF. The SD1542-42 is packaged in a hermetic metal/ceramic package with internal input matching, resulting in improved broadband performance and low thermal resistance.

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V_{CC}	Collector-Supply Voltage*	55	V
I_C	Device Current* ($T_C \leq 100°C$)	45	A
P_{DISS}	Power Dissipation*	1670	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

* Applies only to rated RF operation.

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25 mA	I_E = 0 mA	65	—	—	V
BV_{CER}	I_C = 25 mA	R_{BE} = 10 Ω	65	—	—	V
BV_{EBO}	I_E = 10 mA	I_C = 0 mA	3.5	—	—	V
I_{CES}	V_{CE} = 50 V	V_{BE} = 0 V	—	—	60	mA
h_{FE}	V_{CE} = 5 V	I_C = 2 A	10	—	250	—

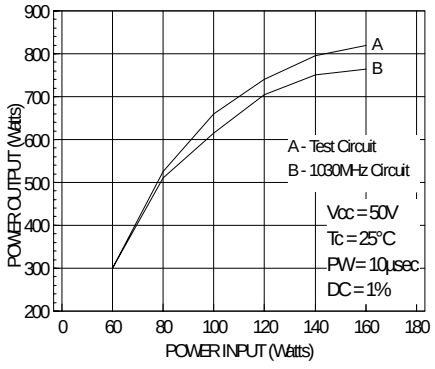
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1090 MHz	P_{IN} = 150 W	V_{CC} = 50 V	600	680	—	W
η_C	f = 1090 MHz	P_{IN} = 150 W	V_{CC} = 50 V	35	40	—	%
G_P	f = 1090 MHz	P_{IN} = 150 W	V_{CC} = 50 V	6.0	6.6	—	dB

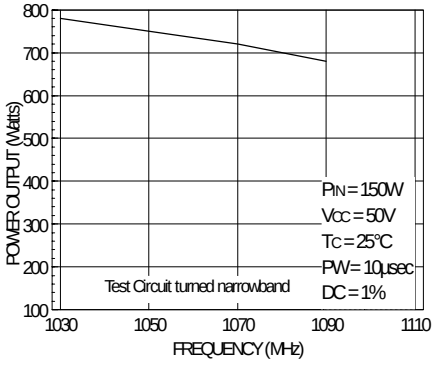
Note: Pulse Width = 10μSec, Duty Cycle = 1%

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT

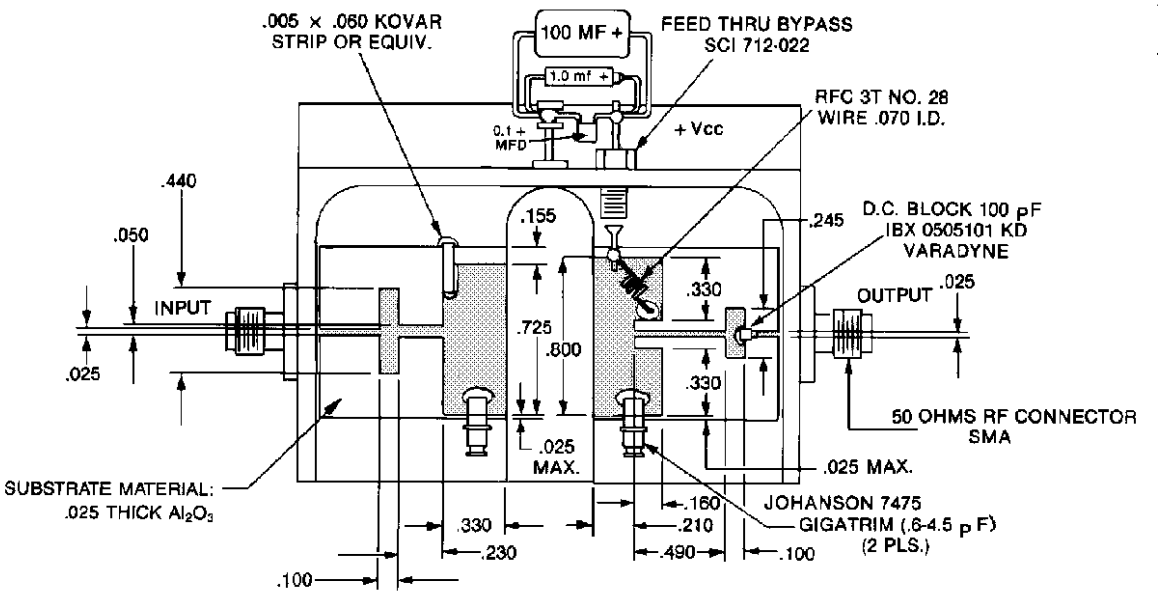


POWER OUTPUT vs FREQUENCY

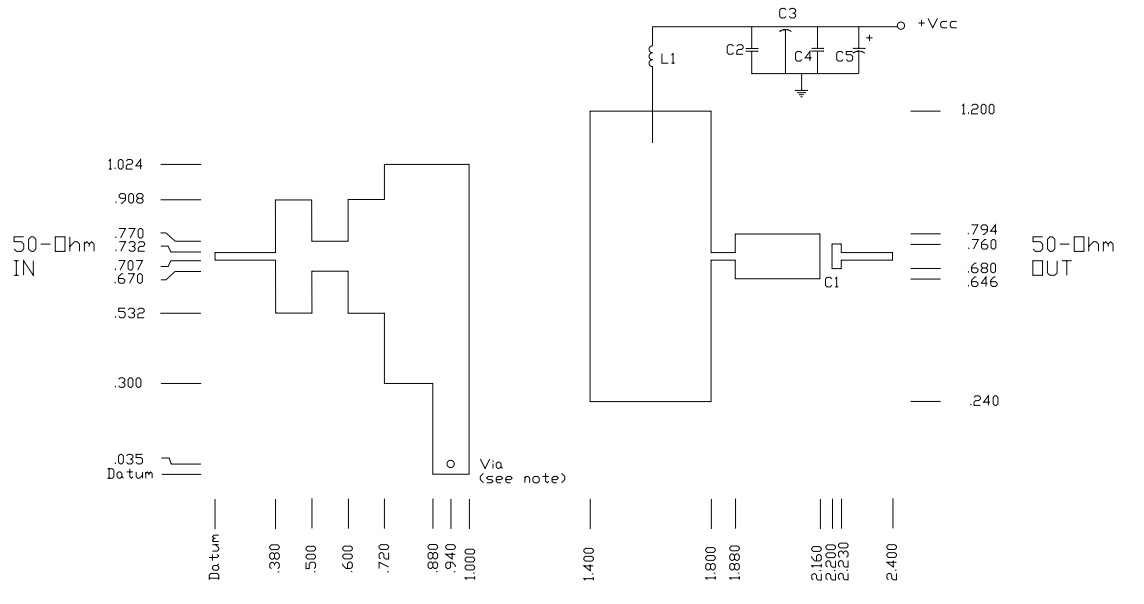


TEST CIRCUIT (1090 MHz)

Ref.: Dwg. No. C125410



1030 MHz TYPICAL CIRCUIT

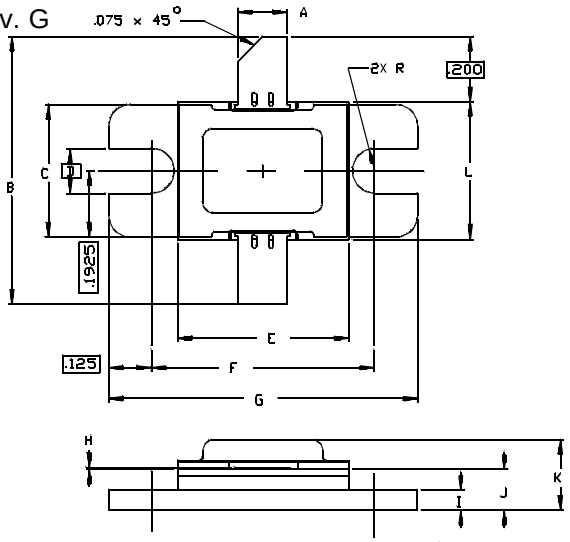


C1 DC block 100 pF chip
C2 0.1 uF Monolithic
C3 Feedthrough 1500 pF
C4 1.0 uF Film 63 V
C5 100 uF Electrolytic 63 V
L1 1/2 turn #18 wire .620 ID
Substrate:
RT Duroid 6010-2
Er=10.2 h=0.025"

Notes:
1. Insert pin in via hole for emitter ground return.
2. All dimensions are in inches.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0112 rev. G



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