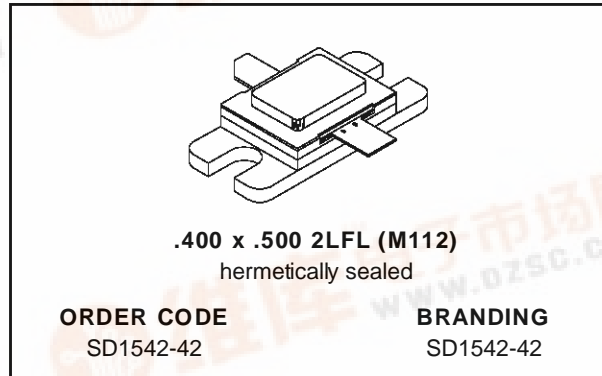




SD1542-42

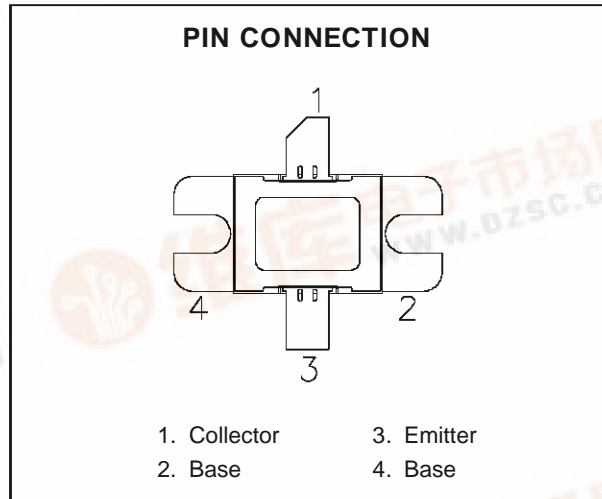
RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- 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



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.



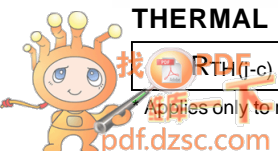
ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
V _{CC}	Collector-Supply Voltage*	55	V
I _C	Device Current* (T _C ≤ 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
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*Applies only to rated RF operation.



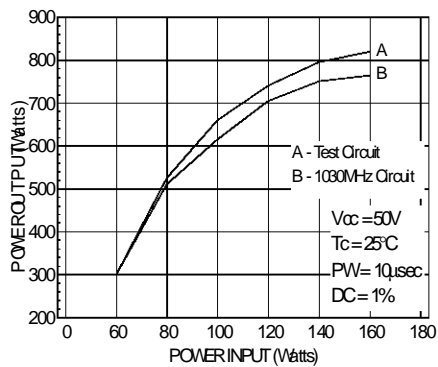
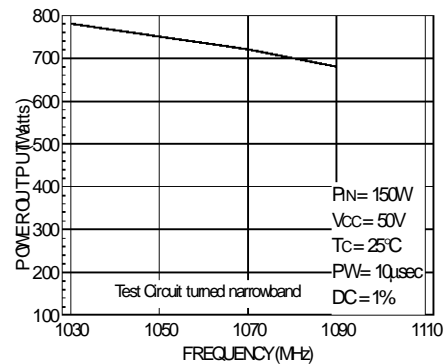
ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)**STATIC**

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

DYNAMIC

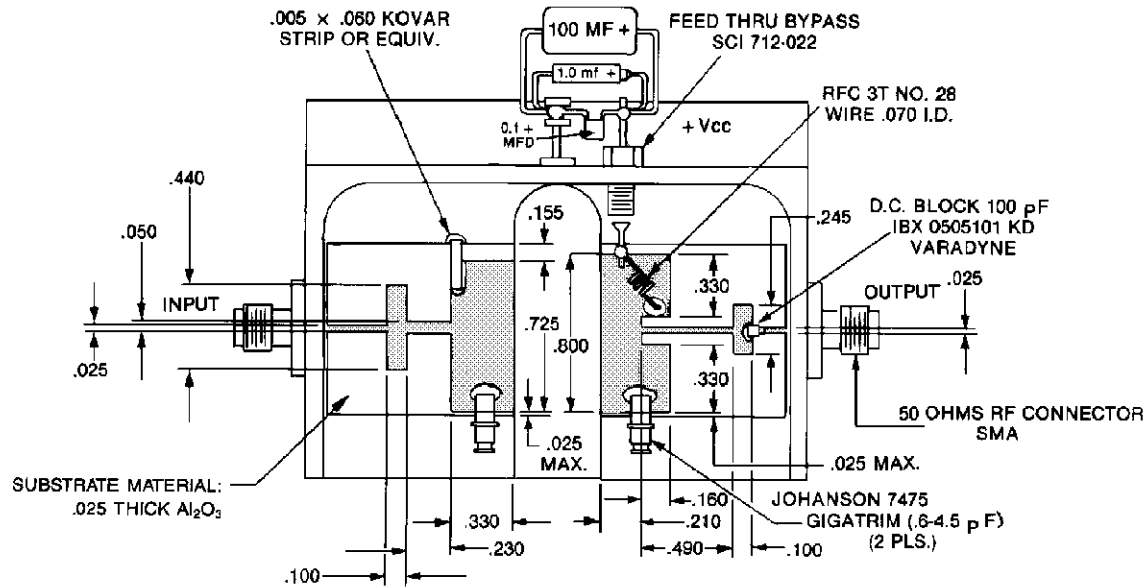
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 1090 \text{ MHz}$	$P_{IN} = 150 \text{ W}$	$V_{CC} = 50 \text{ V}$	600	680	—	W
η_C	$f = 1090 \text{ MHz}$	$P_{IN} = 150 \text{ W}$	$V_{CC} = 50 \text{ V}$	35	40	—	%
G_P	$f = 1090 \text{ MHz}$	$P_{IN} = 150 \text{ W}$	$V_{CC} = 50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

Note: Pulse Width = $10\mu\text{Sec}$, Duty Cycle = 1%

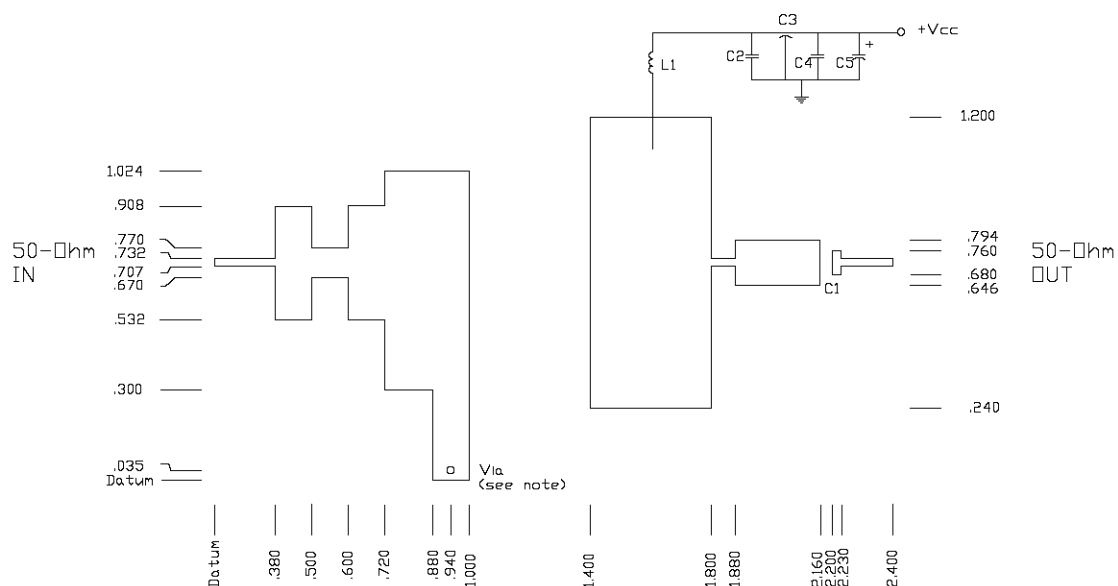
TYPICAL PERFORMANCE**POWER OUTPUT vs POWER INPUT****POWER OUTPUT vs FREQUENCY**

TEST CIRCUIT (1090 MHz)

Ref.: Dwg. No. C125410



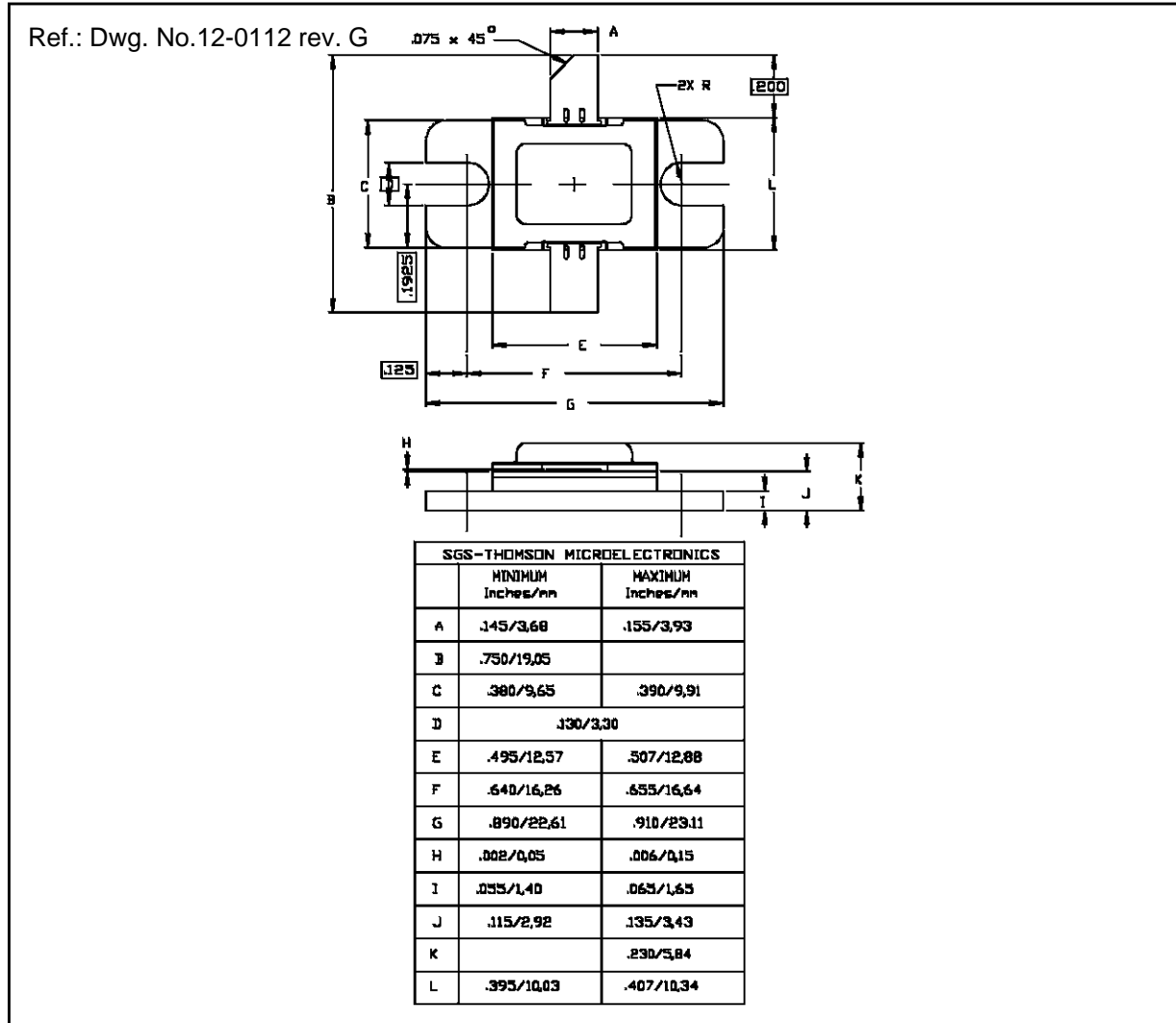
1030 MHz TYPICAL CIRCUIT



- 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



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