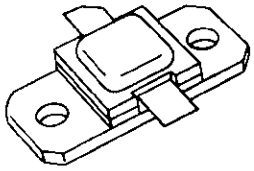
SGS-THOMSON MICROELECTRONICS

AM82731-050

RF & MICROWAVE TRANSISTORS S-BAND RADAR APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- RUGGEDIZED VSWR 3:1 @ 1 dB OVER-DRIVE
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 50 W MIN. WITH 6 dB GAIN



.400 x .400 2LFL (S036)
hermetically sealed

ORDER CODE	BRANDING
AM82731-050	82731-50

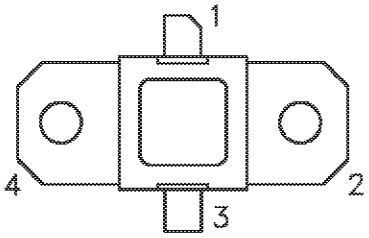
DESCRIPTION

The AM82731-050 device is a high power silicon bipolar NPN transistor specifically designed for S-Band radar pulsed output and driver applications.

The device is capable of operation over a wde range of pulse widths, duty cycles and temperatures and can withstand a 3:1 output VSWR with a +1 dB input overdrive. Low RF thermal resistance, refractory/gold metallization, and computerized automatic wire bonding techniques ensure high reliability and product consistency.

The AM82731-050 is supplied in the AMPAC™ Hermetic Metal/Ceramic package with internal Input/Output impedance matching circuitry, and is intended for military and other high reliability applications.

PIN CONNECTION



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

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

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 50°C$)	167	W
I_C	Device Current*	8	A
V_{CC}	Collector-Supply Voltage*	46	V
T_J	Junction Temperature (Pulsed RF Operation)	250	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	1.2	°C/W

*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0mA	55	—	—	V
BV_{EBO}	I_E = 5mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 25mA	R_{BE} = 10Ω	55	—	—	V
I_{CES}	V_{CE} = 40V		—	—	20	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	30	—	—	—

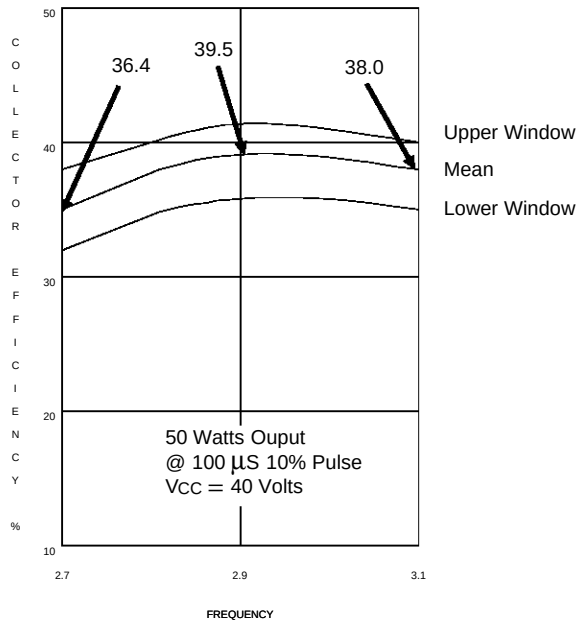
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2700 — 3100MHz	P_{IN} = 12.5W	V_{CC} = 40V	50	56	—	W
ηc	f = 2700 — 3100MHz	P_{IN} = 12.5W	V_{CC} = 40V	30	35	—	%
G_P	f = 2700 — 3100MHz	P_{IN} = 12.5W	V_{CC} = 40V	6.0	6.5	—	dB

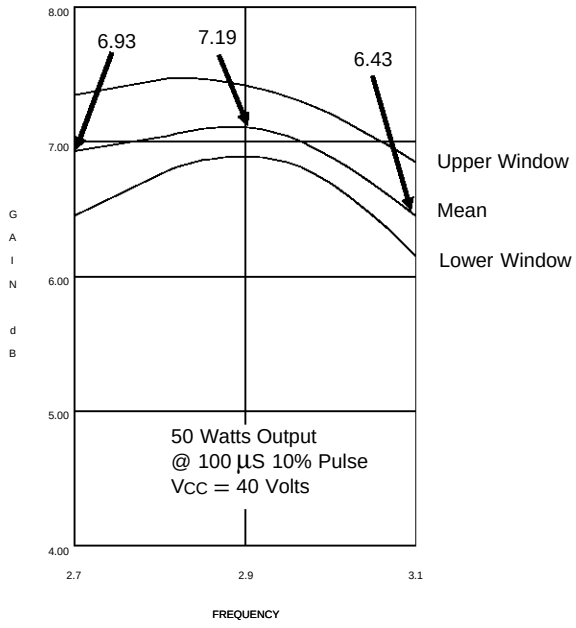
Note: Pulse Width = 100µS
Duty Cycle = 10%

TYPICAL PERFORMANCE

COLLECTOR EFFICIENCY vs FREQUENCY

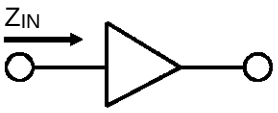


GAIN vs FREQUENCY

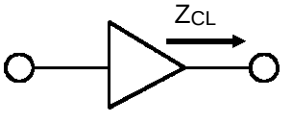


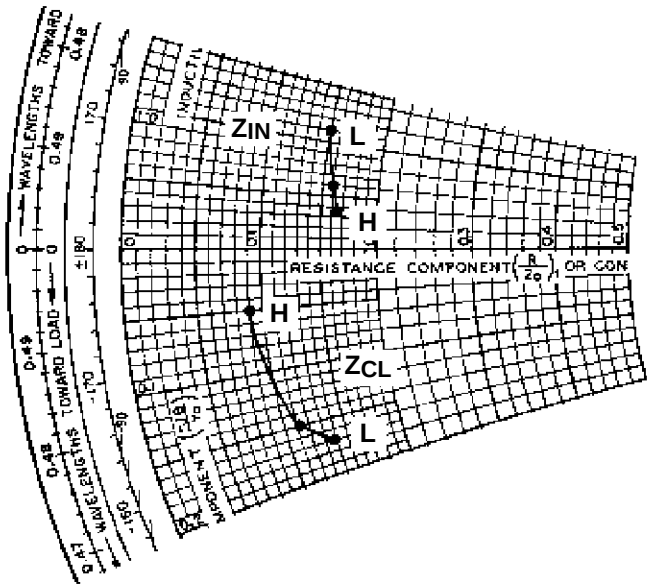
IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE

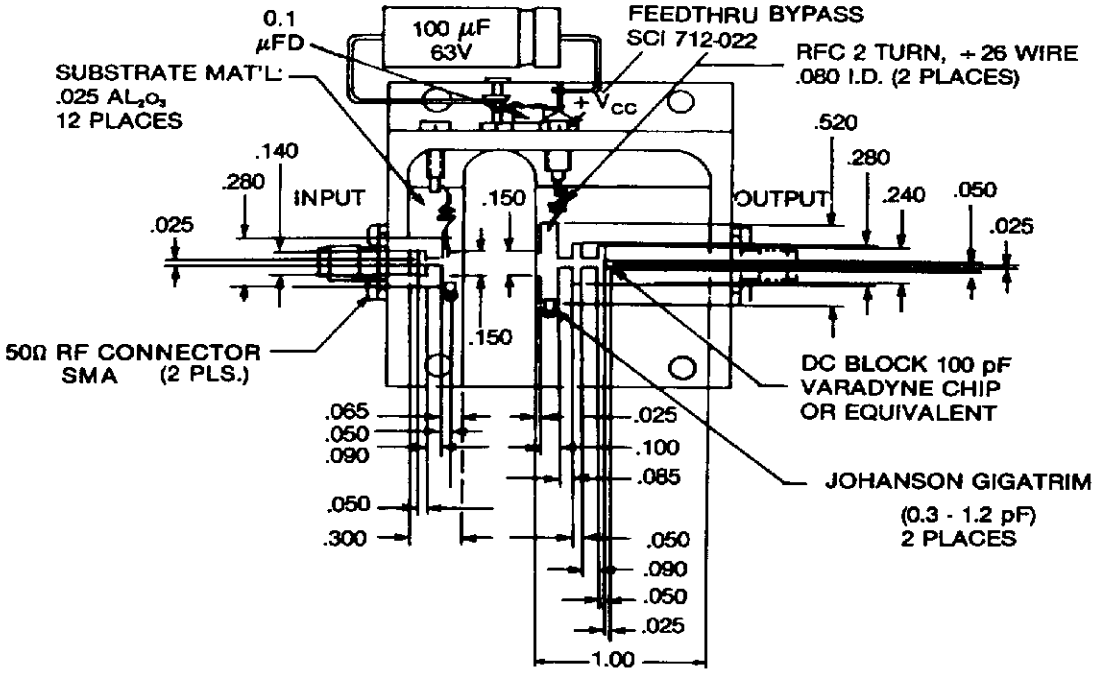




FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
L = 2.7 GHz	7.4 + j 5.4	7.1 – j 8.6
M = 2.9 GHz	7.8 + j 3.0	5.4 – j 7.4
H = 3.1 GHz	8.0 + j 2.0	4.6 – j 2.6

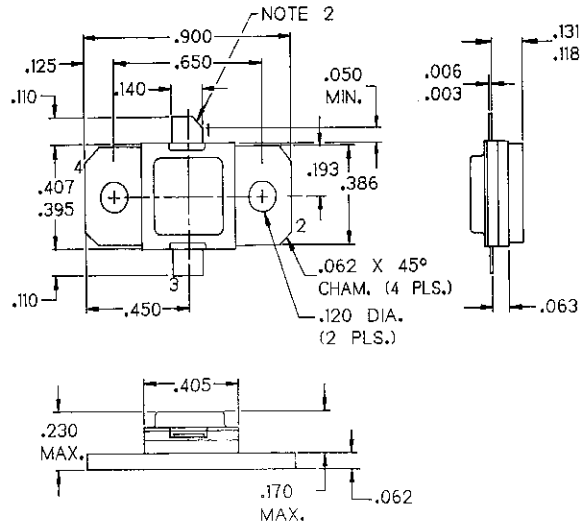
P_{IN} = 12.5 W
V_{CC} = 40 V
Z_0 = 50 ohms

TEST CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J133102E



NOTES:
1. ALL TOLERANCE ± .010 EXCEPT WHERE NOTED; DIMENSIONS IN INCHES.
2. COLLECTOR LEAD CHAMFER 45° NOM. X .040 NOM.