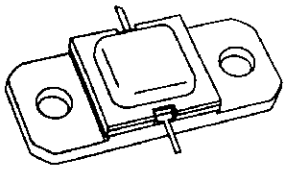
SGS-THOMSON MICROELECTRONICS

AM82731-003

RF & MICROWAVE TRANSISTORS S-BAND RADAR APPLICATIONS

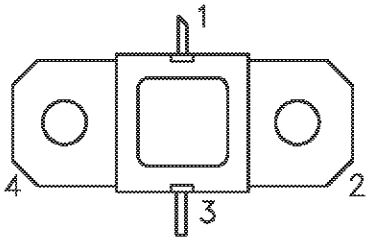
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- 10:1 VSWR CAPABILITY
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT IMPEDANCE MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 3.0 W. MIN. WITH 5.7 dB GAIN
- BANDWIDTH = 400 MHz



.400 x .400 2NLFL (S042)
hermetically sealed

ORDER CODE	BRANDING
AM 82731-003	82731-3

PIN CONNECTION



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

DESCRIPTION

The AM82731-003 device is a medium power silicon bipolar NPN transistor specifically designed for S-Band radar pulsed driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles, and temperatures and can withstand a 10:1 output VSWR. Low RF thermal resistance, refractory/gold metallization, and automatic wire bonding techniques ensure high reliability and product consistency.

The AM82731-003 is supplied in the hermetic metal/ceramic package with internal input/output impedance matching circuitry, and is intended for military and other high reliability applications.

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

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 100°C$)	23	W
I_C	Device Current*	0.9	A
V_{CC}	Collector-Supply Voltage*	34	V
T_J	Junction Temperature (Pulsed RF Operation)	250	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH}(j\text{-}c)$	Junction-Case Thermal Resistance	6.5	°C/W

*Applies only to rated RF amplifier operation

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

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 2mA	I_E = 0mA	50	—	—	V
BV_{EBO}	I_E = 1mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	I_C = 2mA	R_{BE} = 10Ω	50	—	—	V
I_{CES}	V_{CE} = 30V		—	—	2.0	mA
h_{FE}	V_{CE} = 5V	I_C = 200mA	10	—	—	—

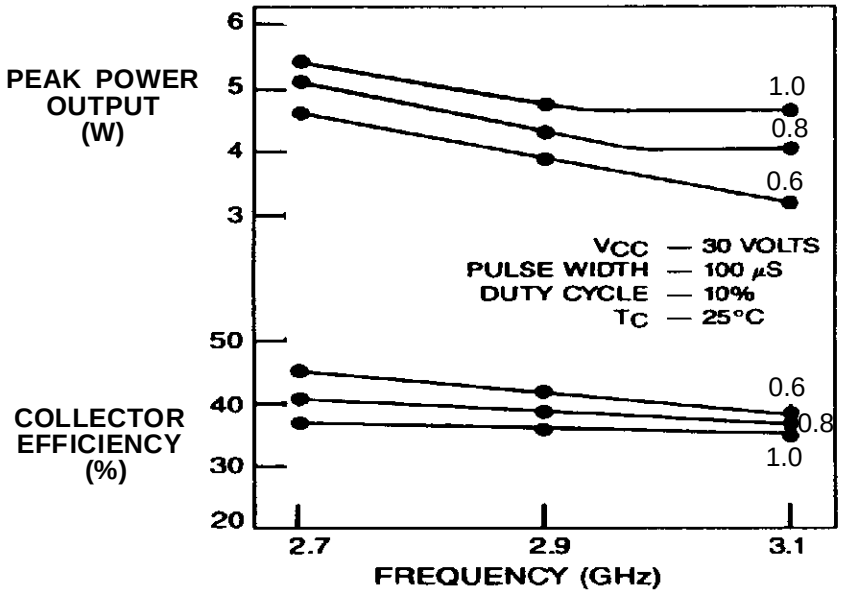
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2.7 — 3.1GHz	P_{IN} = 0.8W	V_{CC} = 30V	3.0	4.0	—	W
η_C	f = 2.7 — 3.1GHz	P_{IN} = 0.8W	V_{CC} = 30V	27	37	—	%
G_{PB}	f = 2.7 — 3.1GHz	P_{IN} = 0.8W	V_{CC} = 30V	5.7	7.0	—	dB

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

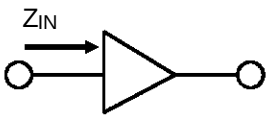
TYPICAL PERFORMANCE

TYPICAL BROADBAND PERFORMANCE

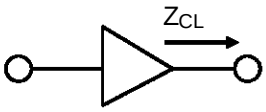


IMPEDANCE DATA

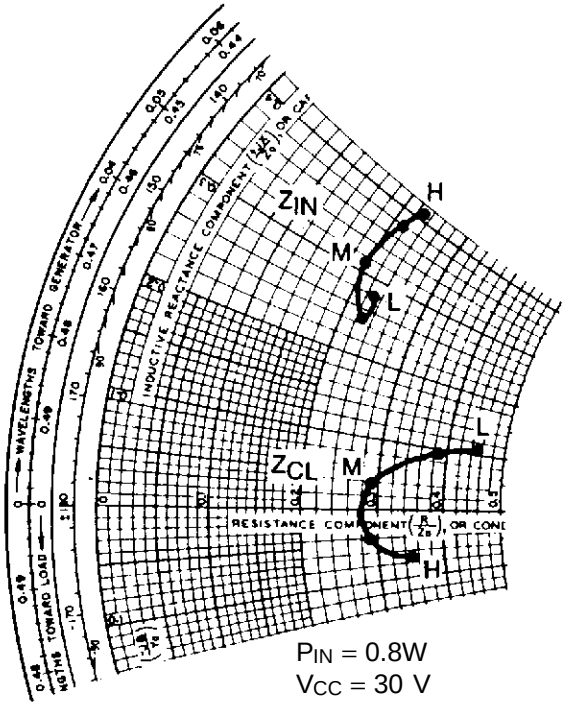
TYPICAL INPUT IMPEDANCES



TYPICAL COLLECTOR LOAD IMPEDANCES

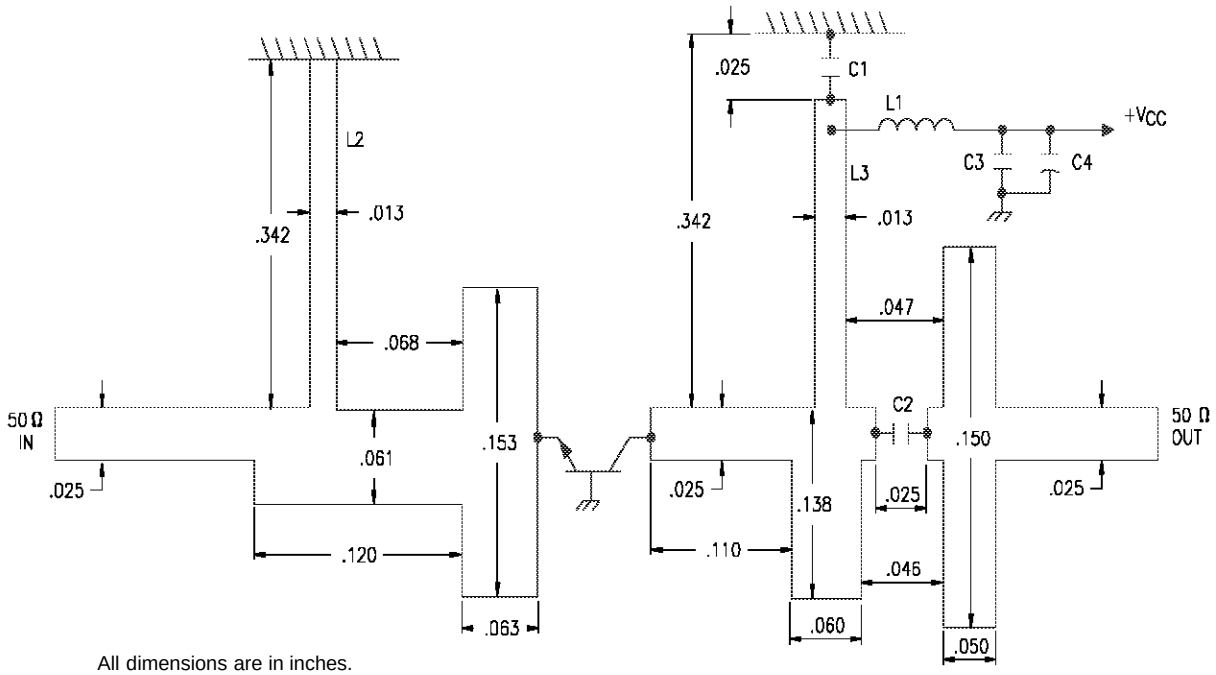


FREQ.	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
L = 2.7 GHz	11.5 + j 14.0	22.5 + j 5.5
• = 2.9 GHz	11.5 + j 12.5	19.5 + j 5.0
M = 3.1 GHz	10.0 + j 15.5	14.5 + j 2.0
• = 3.3 GHz	11.0 + j 19.0	14.5 – j 2.0
H = 3.5 GHz	11.0 + j 20.5	17.5 – j 3.5



P_{IN} = 0.8W
V_{CC} = 30 V
Normalized at 50 ohms

TEST CIRCUIT

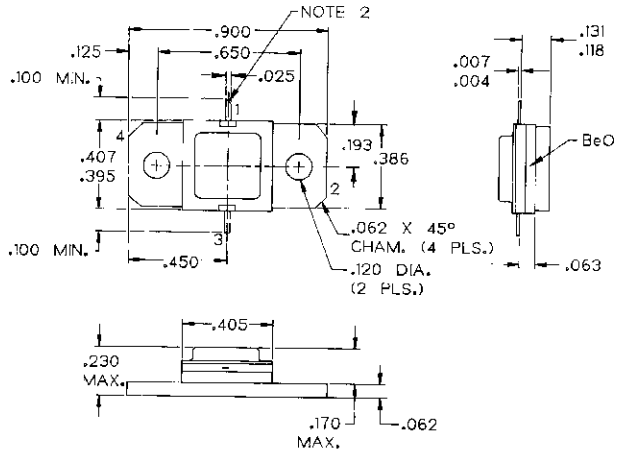


All dimensions are in inches.
Substrate material: .025 thick Al_2O_3 (Er = 9.6)

C1 : 100 pF Microwave Chip Capacitor
C2 : 100 pF Microwave Chip Capacitor (Note: Capacitor is mounted on its thin side)
C3 : 1500 pF, RF Feedthru
C4 : 100 µF, Electrolytic Capacitor
L1 : No. 32 Wire, 0.500 Inch Long
L2 : Printed RF Choke
L3 : Printed RF Choke

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J113214F



NOTES:
1. ALL TOLERANCE ± .010 EXCEPT WHERE NOTED; DIMENSIONS IN INCHES.
2. COLLECTOR LEAD SLANT CUT.