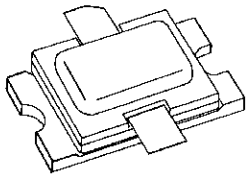
SGS-THOMSON MICROELECTRONICS

AM2931-110

RF & MICROWAVE TRANSISTORS S-BAND RADAR APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- 3:1 VSWR CAPABILITY
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} =105 W MIN. WITH 6.2 dB GAIN



.400 x .500 2L SFL (S138)
hermetically sealed

ORDER CODE	BRANDING
AM2931-110	2931-110

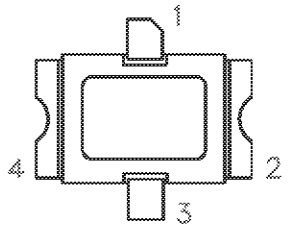
DESCRIPTION

The AM2931-110 is a high power silicon bipolar NPN transistor specifically designed for S-Band radar pulsed output and driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles and temperatures and can withstand a 3:1 output VSWR. Low RF thermal resistance, refractory/gold metallization, and computerized automatic wire bonding techniques ensure high reliability and product consistency (including phase characteristics).

The AM2931-110 is supplied in the BIGPAC™ Hermetic Metal/Ceramic package with internal Input/Output 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* ($T_C \leq 100°C$)	375	W
I_C	Device Current*	12	A
V_{CC}	Collector-Supply Voltage*	48	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*	0.40	°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 = 40mA	I_E = 0mA	55	—	—	V
BV_{EBO}	I_E = 8mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 40mA	R_{BE} = 10Ω	55	—	—	V
I_{CES}	V_{BE} = 0V	V_{CE} = 42V	—	—	30	mA
h_{FE}	V_{CE} = 5V	I_C = 4A	30	—	—	—

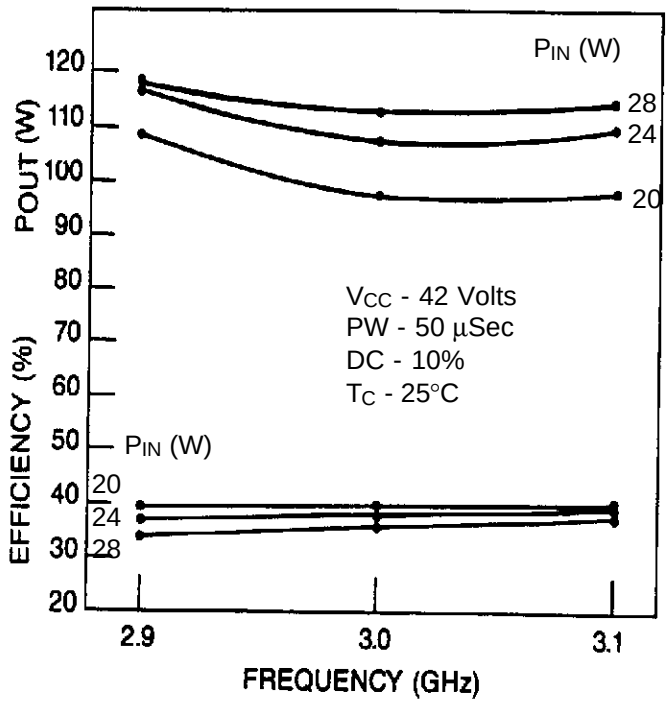
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 2900 — 3100MHz	P_{IN} = 25W	V_{CC} = 42V	105	115	—	W
ηc	f = 2900 — 3100MHz	P_{IN} = 25W	V_{CC} = 42V	32	40	—	%
G_P	f = 2900 — 3100MHz	P_{IN} = 25W	V_{CC} = 42V	6.2	6.6	—	dB

Note: Pulse Width = 50 µSec
Duty Cycle = 10%

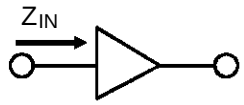
TYPICAL PERFORMANCE

TYPICAL BROADBAND PERFORMANCE

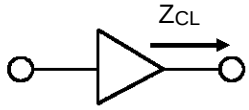


IMPEDANCE DATA

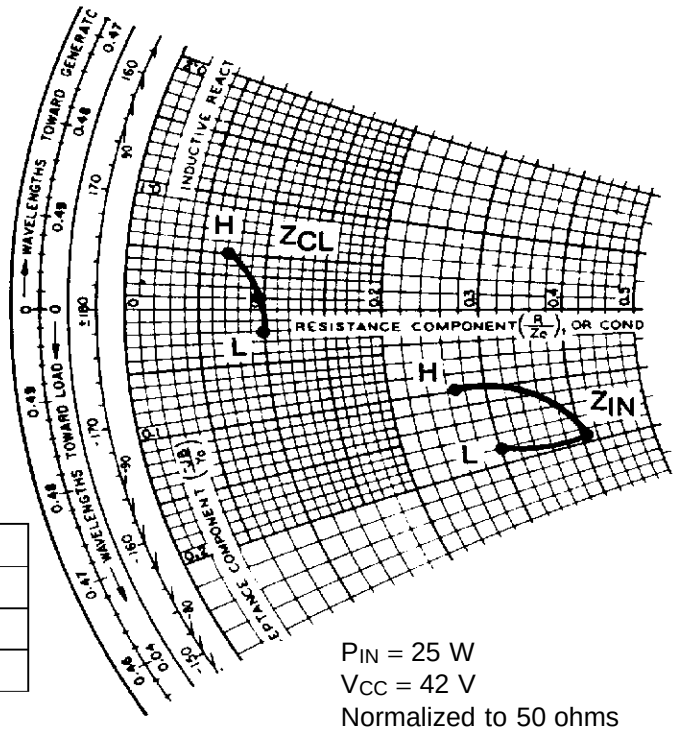
TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE

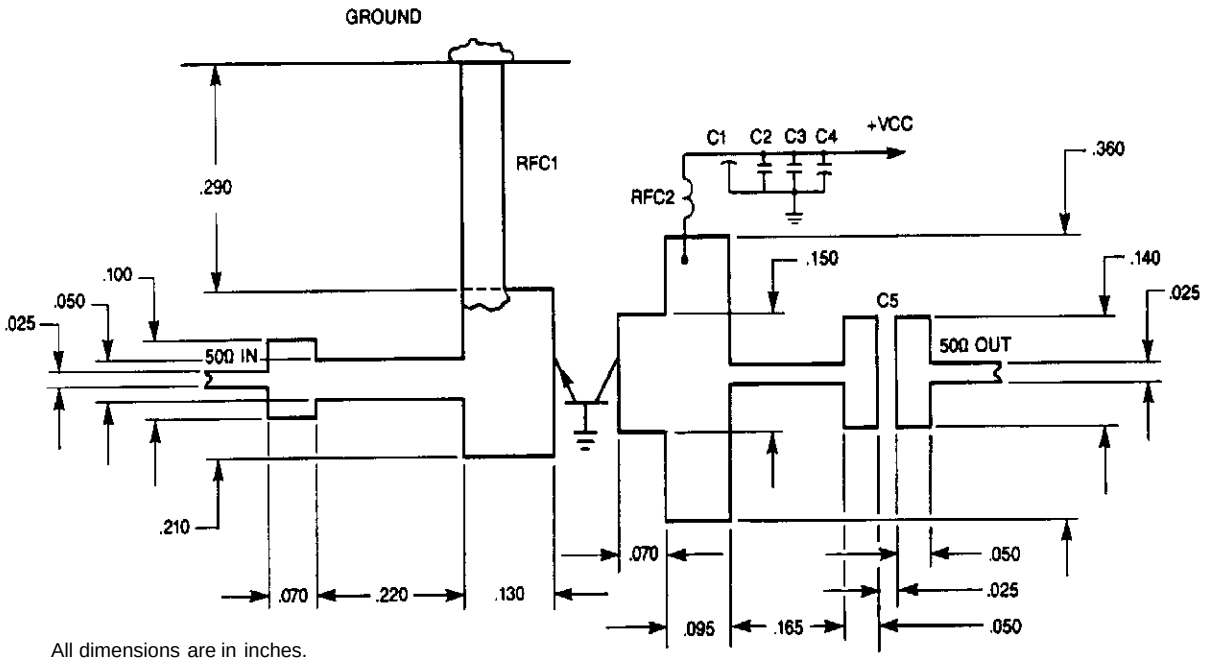


FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
L = 2.9 GHz	15.0 – j 9.0	5.0 – j 1.0
M = 3.0 GHz	20.0 – j 9.5	4.8 + j 0.5
H = 3.1 GHz	13.5 – j 5.0	3.5 + j 2.5



P_{IN} = 25 W
V_{CC} = 42 V
Normalized to 50 ohms

TEST CIRCUIT

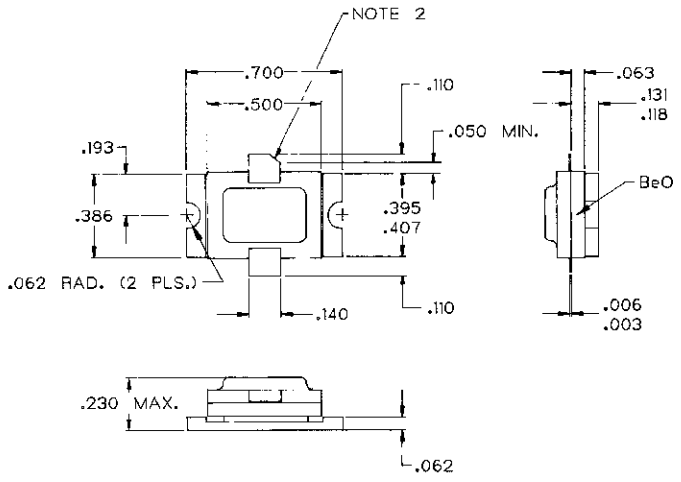


All dimensions are in inches.
Substrate material: .025 thick Al_2O_3 (Er = 9.6)

C1 : 1500 pF RF Feedthrough
C2 : 1 µF, CK06 CapacitorC
C3 : 1 µF, Tantalum Capacitor
C4 : 100 µF Electrolytic Capacitor, 63V
C5 : 22 pF Chip Capacitor (bridge at location indicated)
RFC1 : Gold Plated Nickel Strap, 0.060 Inch Wide, 0.005 Inch Thick, 0.290 Inch Long
RFC2 : No. 26 Wire, 2 Turn .0.80 Inch I.D.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: 103-000737A



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

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