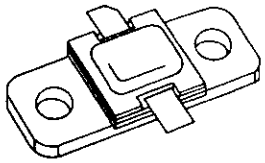
SGS-THOMSON MICROELECTRONICS

AM80814-005

RF & MICROWAVE TRANSISTORS L-BAND RADAR APPLICATIONS

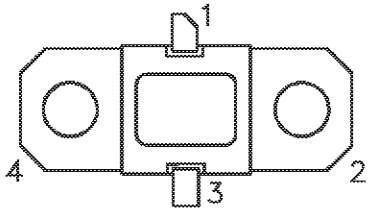
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- 5:1 VSWR CAPABILITY
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 5.0 W MIN. WITH 8.5 dB GAIN



.310 x .310 2LFL (S064)
hermetically sealed

ORDER CODE	BRANDING
AM80814-005	80814-5

PIN CONNECTION



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

DESCRIPTION

The AM80814-005 device is a high power Class C transistor specifically designed for L-Band radar pulsed driver applications.

This device is capable of operation over a wide range of pulse widths, duty cycles and temperatures and is capable of withstanding 5:1 output VSWR at rated RF conditions. Low thermal resistance and computerized automatic wire bonding techniques ensure high reliability and product consistency.

The AM80814-005 is supplied in the IMPAC™ Hermetic Metal/Ceramic package with internal Input/Output matching structures.

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*	1.0	A
V_{CC}	Collector-Supply Voltage*	28	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*	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 = 1mA	I_E = 0mA	48	—	—	V
BV_{EBO}	I_E = 1mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	IC = 5mA	R_{BE} = 10Ω	48	—	—	V
I_{CES}	V_{BE} = 0V	V_{CE} = 28V	—	—	500	mA
h_{FE}	V_{CE} = 5V	I_C = 250mA	30	—	300	—

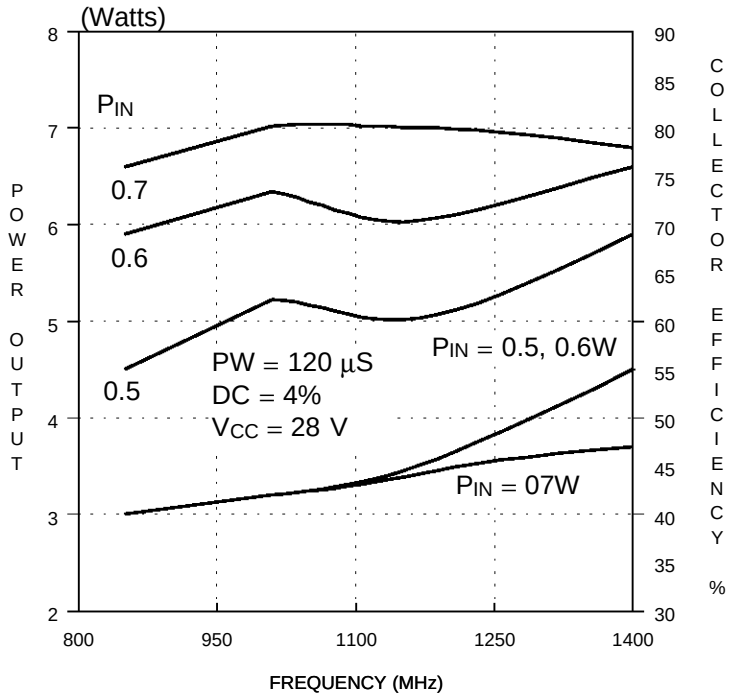
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 850 — 1400MHz	P_{IN} = 0.7W	V_{CC} = 28V	5.0	5.7	—	W
ηc	f = 850 — 1400MHz	P_{IN} = 0.7W	V_{CC} = 28V	35	40	—	%
G_P	f = 850 — 1400MHz	P_{IN} = 0.7W	V_{CC} = 28V	8.5	9.0	—	dB

Note: Pulse Width = 120µS
Duty Cycle = 4%

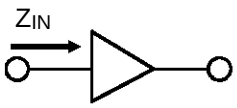
TYPICAL PERFORMANCE

POWER OUTPUT & COLLECTOR EFFICIENCY vs FREQUENCY

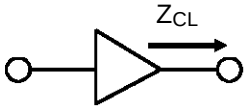


IMPEDANCE DATA

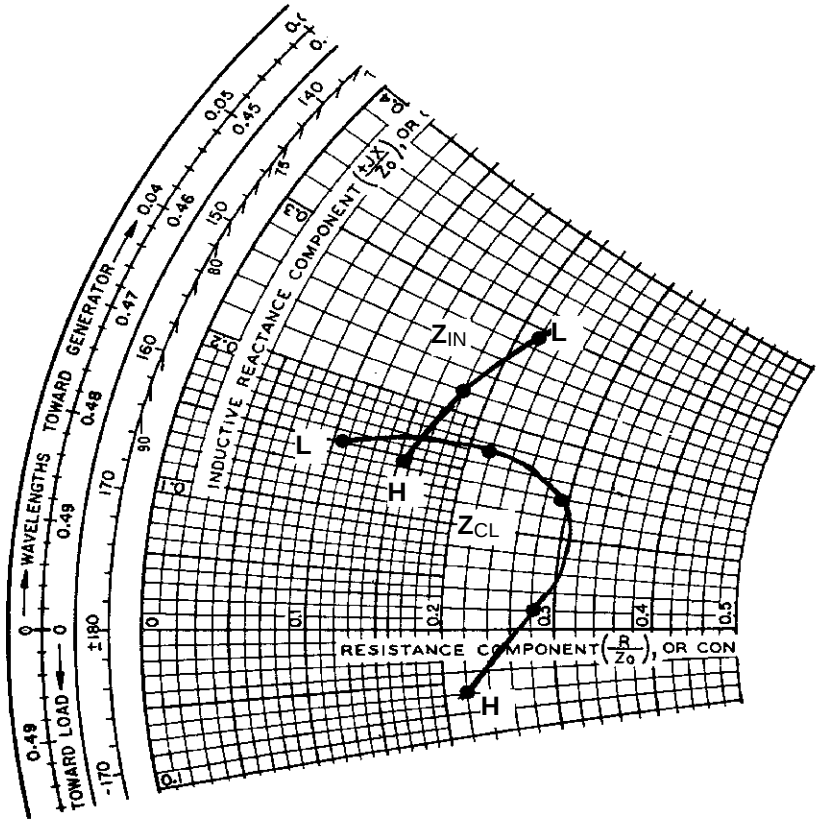
TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE

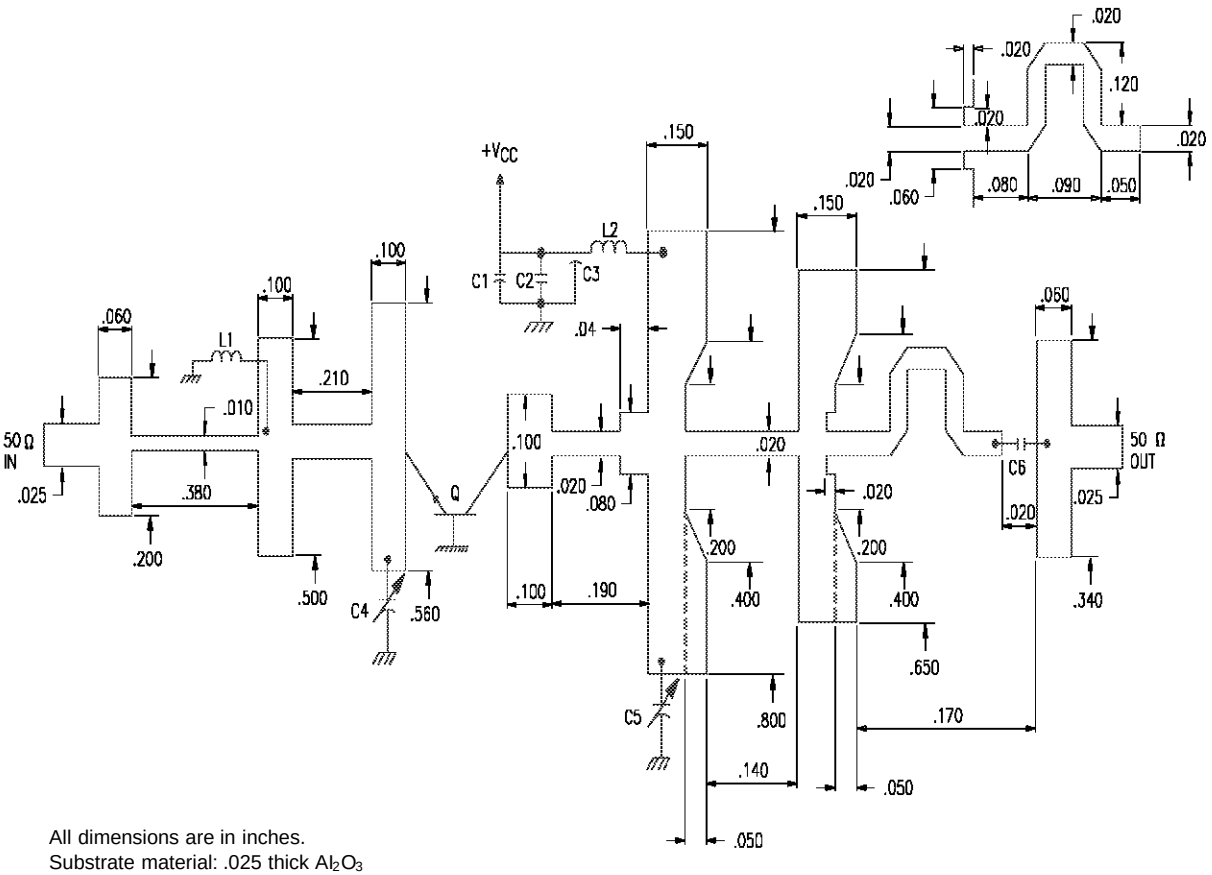


P_{IN} = 0.7 W
V_{CC} = 28 V
Normalized to 50 ohms



FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
L = 0.85 GHz	0.22 + j 0.29	0.13 + j 0.15
• = 1.0 GHz	0.21 + j 0.25	0.18 + j 0.18
• = 1.1 GHz	0.19 + j 0.22	0.23 + j 0.17
• = 1.2 GHz	0.18 + j 0.17	0.32 + j 0.16
• = 1.3 GHz	0.17 + j 0.15	0.29 + j 0.02
H = 1.4 GHz	0.16 + j 0.14	0.22 – j 0.06

TEST CIRCUIT

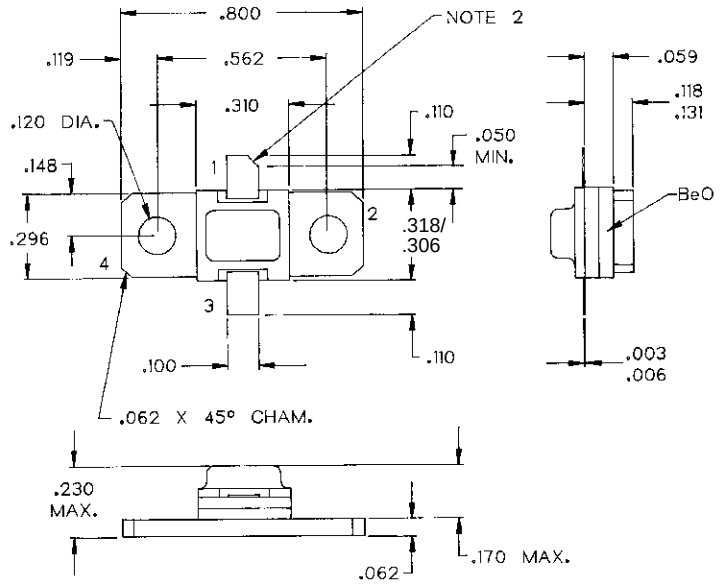


All dimensions are in inches.
Substrate material: .025 thick Al_2O_3

C1 : 100 µF Electrolytic Capacitor, 63V
C2 : .1 µF Ceramic Capacitor
C3 : Feedthrough Bypass SC! 712-022
C4 : .6 — 4.5 pF, 2 pls, Johanson Gigatrim Capacitor
C5 : .6 — 4.5 pF, 2 pls, Johanson Gigatrim Capacitor
C6 : 100 pF Chip Capacitor
L1 : No. 26 Wire, 4 Turn
L2 : No. 26 Wire, 4 Turn

PACKAGE MECHANICAL DATA

Ref.: Dwg. No.: J133100D



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