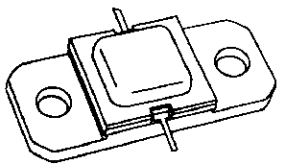
SGS-THOMSON MICROELECTRONICS

AM83135-005

RF & MICROWAVE TRANSISTORS S-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 5.2 dB GAIN



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

ORDER CODE	BRANDING
83135-005	83135-5

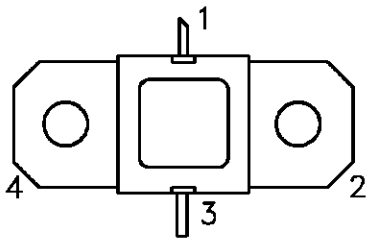
DESCRIPTION

The AM83135-005 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 5:1 output VSWR. Low RF thermal resistance, refractory/gold metallization, and computerized automatic wire bonding techniques ensure high reliability and product consistency.

The AM83135-005 is supplied in the AMPAC™ 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* ($T_C \leq 100°C$)	40	W
I_C	Device Current*	1.8	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

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	3.75	°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 = 4 mA	I_E = 0 mA	50	—	—	V
BV_{EBO}	I_E = 2 mA	I_C = 0 mA	3.5	—	—	V
BV_{CER}	I_C = 4 mA	R_{BE} = 10 Ω	50	—	—	V
I_{CES}	V_{CE} = 30 V		—	—	2.0	mA
h_{FE}	V_{CE} = 5 V	I_C = 500 mA	10	—	—	—

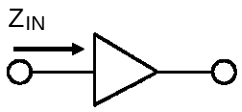
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.1 – 3.5 GHz	P_{IN} = 1.5 W	V_{CC} = 30 V	5.0	6.0	—	W
ηc	f = 3.1 – 3.5 GHz	P_{OUT} = 5.0 W	V_{CC} = 30 V	27	—	—	%
P_G	f = 3.1 – 3.5 GHz	P_{OUT} = 5.0 W	V_{CC} = 30 V	5.2	6.4	—	dB

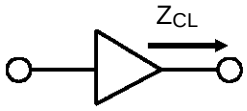
Note: Pulse Width = 100μS
Duty Cycle = 10%

IMPEDANCE DATA

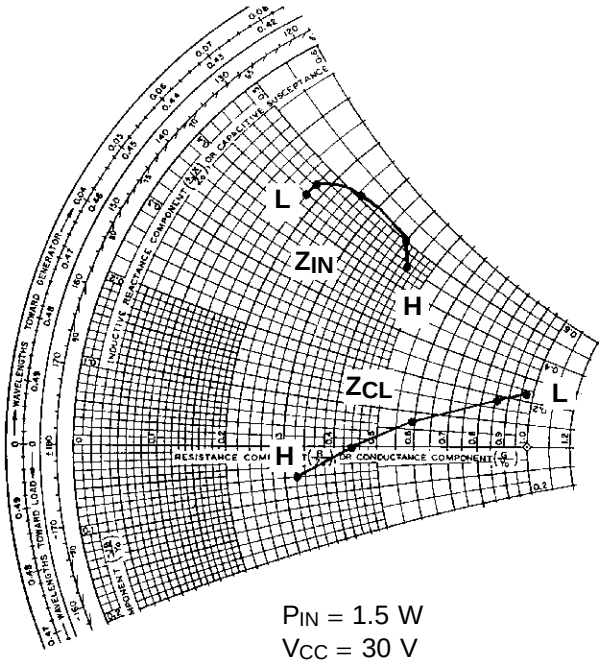
TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE

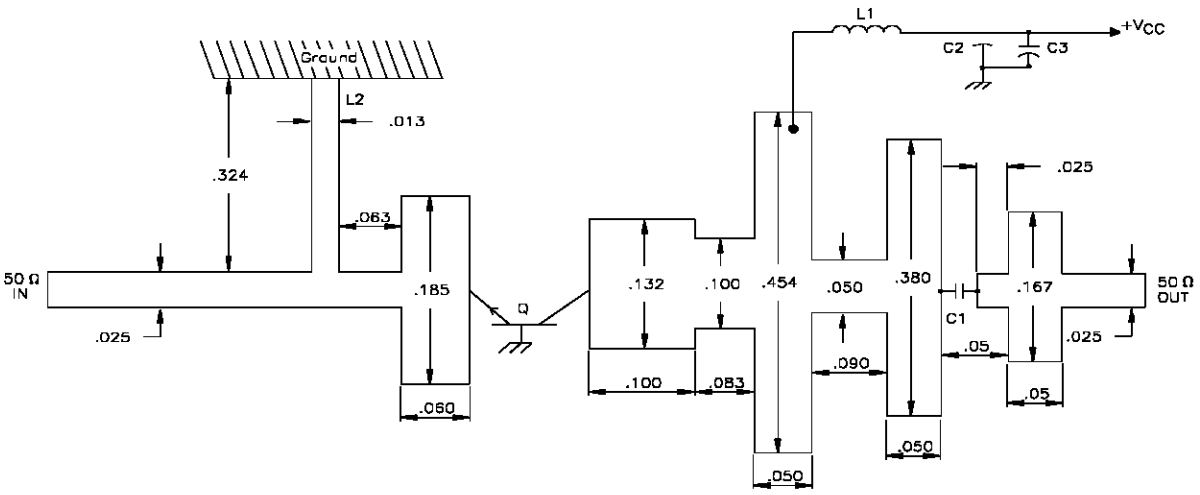


FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
L = 2.7 GHz	9.0 j 22.0	48.0 + j 11.5
• = 2.9 GHz	9.0 j 23.0	43.0 + j 9.0
M = 3.1 GHz	12.5 + j 25.0	30.0 + j 3.0
• = 3.3 GHz	20.0 + j 25.0	21.5 + 0.0
H = 3.5 GHz	22.0 + j 22.5	16.0 – j 3.0



P_{IN} = 1.5 W
V_{CC} = 30 V
Normalized to 50 ohms

TEST CIRCUIT



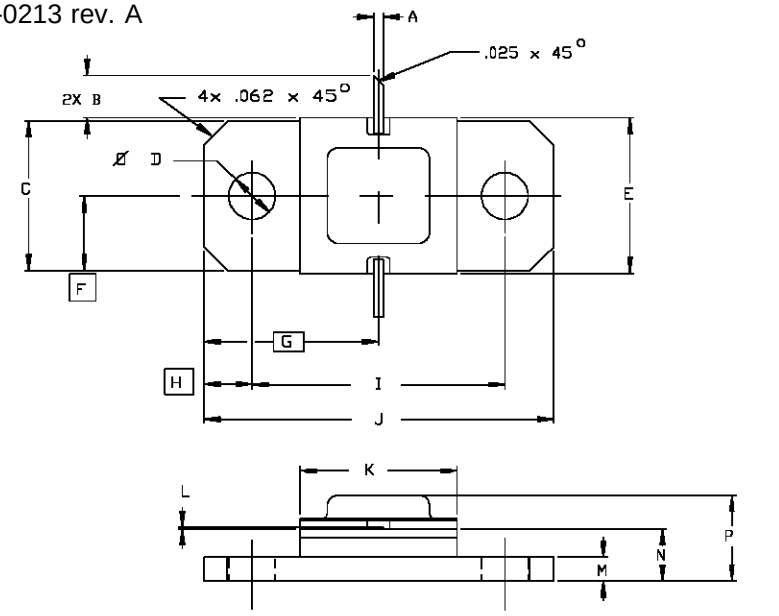
All dimensions are in inches.
Substrate Material: .025 tick Al_2O_3 (Er = 9.6)

C1 : 100 pF Chip Capacitor (Note: Mounted on its thin side)
C2 : 1500 pF RF Feedthru
C3 : 100 mF Electrolytic

L1 : No. 32 Wire, 2 Turns 1/16" I.D.
L2 : Printed Choke

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0213 rev. A



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.020/0,51	.030/0,76
B	.100/2,54	
C	.376/9,55	.396/10,06
D	.110/2,79	.130/3,30
E	.395/10,03	.407/10,34
F	.193/4,90	
G	.450/11,43	
H	.125/3,18	
I	.640/16,26	.660/16,76
J	.890/22,61	.910/23,11

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K	.395/10,03	.415/10,54
L	.004/0,10	.006/0,18
M	.052/1,32	.072/1,83
N	.118/3,00	.131/3,33
P		.230/5,84