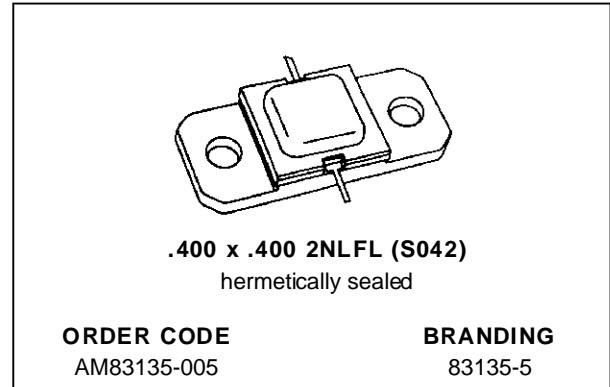


RF & MICROWAVE TRANSISTORS S-BAND RADAR APPLICATIONS

- 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

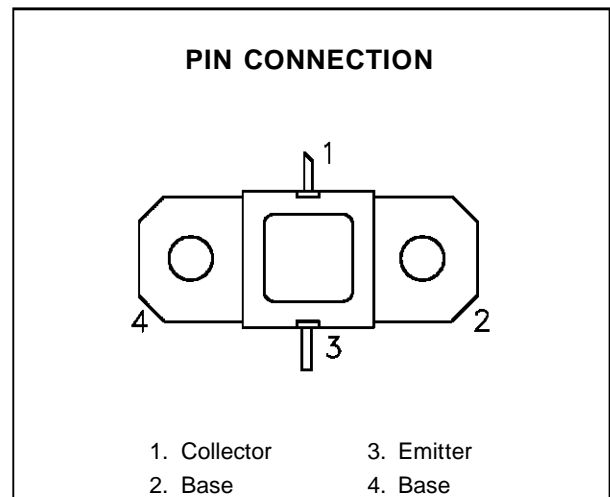


DESCRIPTION

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.



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

Symbol	Parameter	Value	Unit
P _{DISS}	Power Dissipation* (T _c ≤ 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
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*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)

STATIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
BV_{CBO}	$I_{\text{C}} = 4 \text{ mA}$	$I_{\text{E}} = 0 \text{ mA}$		50	—	—	V
BV_{EBO}	$I_{\text{E}} = 2 \text{ mA}$	$I_{\text{C}} = 0 \text{ mA}$		3.5	—	—	V
BV_{CER}	$I_{\text{C}} = 4 \text{ mA}$	$R_{\text{BE}} = 10 \Omega$		50	—	—	V
I_{CES}	$V_{\text{CE}} = 30 \text{ V}$			—	—	2.0	mA
h_{FE}	$V_{\text{CE}} = 5 \text{ V}$	$I_{\text{C}} = 500 \text{ mA}$		10	—	—	—

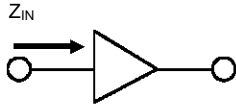
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	$f = 3.1 - 3.5 \text{ GHz}$	$P_{\text{IN}} = 1.5 \text{ W}$	$V_{\text{CC}} = 30 \text{ V}$	5.0	6.0	—	W
h_{c}	$f = 3.1 - 3.5 \text{ GHz}$	$P_{\text{OUT}} = 5.0 \text{ W}$	$V_{\text{CC}} = 30 \text{ V}$	27	—	—	%
P_{G}	$f = 3.1 - 3.5 \text{ GHz}$	$P_{\text{OUT}} = 5.0 \text{ W}$	$V_{\text{CC}} = 30 \text{ V}$	5.2	6.4	—	dB

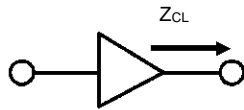
Note: Pulse Width = $100 \mu\text{S}$
Duty Cycle = 10%

IMPEDANCE DATA

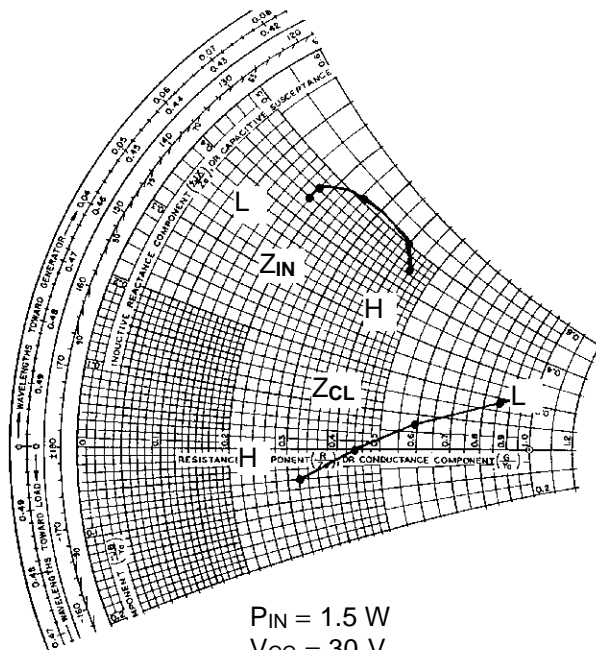
TYPICAL INPUT IMPEDANCE



TYPICAL COLLECTOR LOAD IMPEDANCE

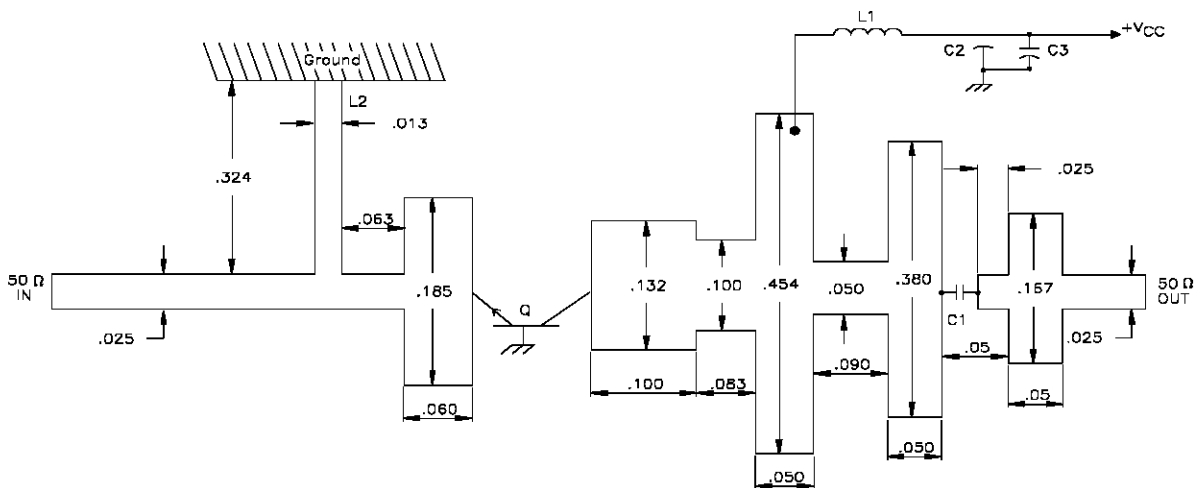


FREQ.	Z _{IN} (Ω)	Z _{CL} (Ω)
L = 2.7 GHz	9.0 + j 22.0	48.0 + j 11.5
ù = 2.9 GHz	9.0 + j 23.0	43.0 + j 9.0
M = 3.1 GHz	12.5 + j 25.0	30.0 + j 3.0
ù = 3.3 GHz	20.0 + j 25.0	21.5 + 0.0
H = 3.5 GHz	22.0 + j 22.5	16.0 - j 3.0



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

TEST CIRCUIT

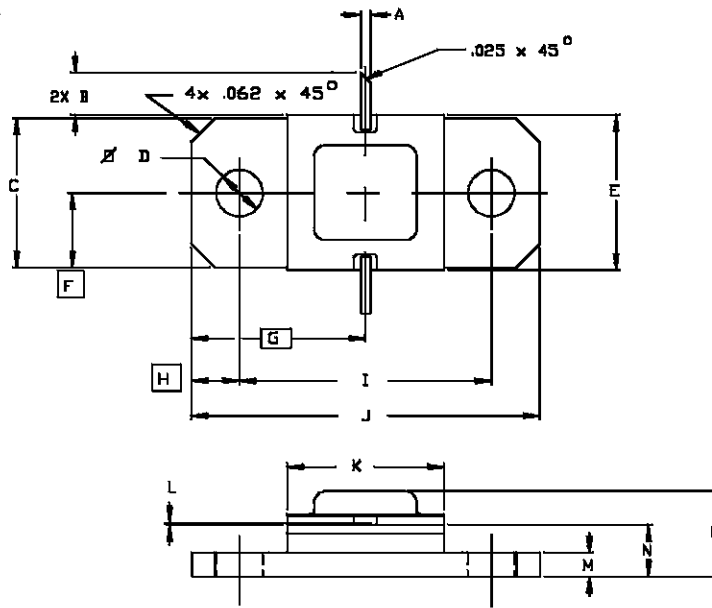


All dimensions are in inches.
 Substrate Material: .025 tick Al₂O₃ (Er = 9.6)

- 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
UDCS Doc. No. 1011416



SGS-THOMSON MICROELECTRONICS		CONT'D			
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.020/0,51	.030/0,76	K	.395/10,03	.415/10,54
B	.100/2,54		L	.004/0,10	.006/0,18
C	.376/9,53	.396/10,06	M	.052/1,32	.072/1,83
D	.110/2,79	.130/3,30	N	.118/3,00	.131/3,33
E	.395/10,03	.407/10,34	P		.230/5,84
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			

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