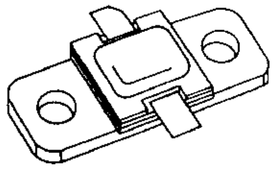
SGS-THOMSON MICROELECTRONICS

AM83135-050

RF & MICROWAVE TRANSISTORS
S-BAND RADAR APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- RUGGEDIZED VSWR 3:1 @ 1dB OVERDRIVE
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 50 W MIN. WITH 5.2 dB GAIN



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

ORDER CODE	BRANDING
AM83135-050	83135-50

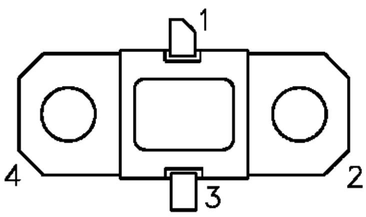
DESCRIPTION

The AM83135-050 device is a high power silicon bipolar NPN transistor specifically designed for S-Band radar pulsed output and driver applications.

This device is characterized at 10 µsec pulsewidth and 10% duty cycle, but is capable of operation over a range of pulse widths, duty cycles and temperatures and can withstand a 3:1 output VSWR with a +1 dB input overdrive. Low RF thermal resistance, refractory/gold metallization, and computerized automatic wire bonding techniques ensure high reliability and product consistency (including phase characteristics).

The AM83135-050 is supplied in the IMPAC™ Hermetic Metal/Ceramic package with internal Input/Output impedance 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* ($T_C \leq 125°C$)	312	W
I_C	Device Current*	8.0	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 (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 25mA	I_E = 0mA	55	—	—	V
BV_{EBO}	I_E = 5mA	I_C = 0mA	3.5	—	—	V
BV_{CER}	I_C = 25mA	R_{BE} = 10W	55	—	—	V
I_{CES}	V_{BE} = 0V	V_{CE} = 42V	—	—	20	mA
h_{FE}	V_{CE} = 5V	I_C = 3A	30	—	300	—

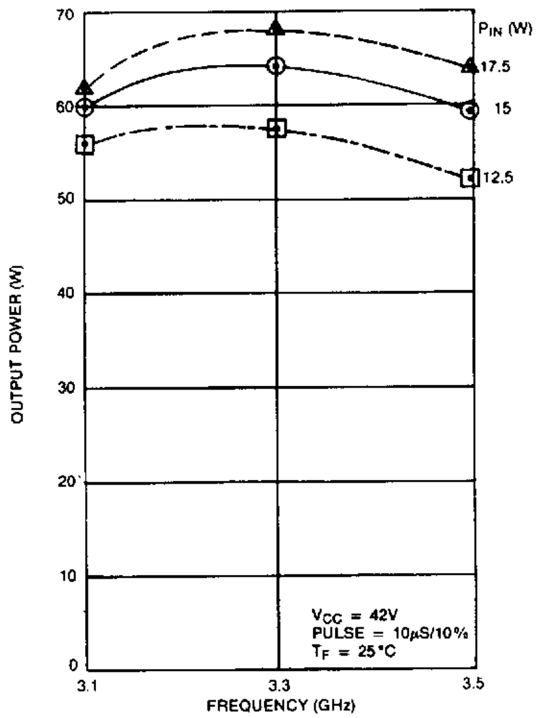
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 3.1 — 3.5GHz	P_{IN} = 15W	V_{CC} = 42V	50	—		W
η_C	f = 3.1 — 3.5GHz	P_{IN} = 15W	V_{CC} = 42V	30	—	—	%
G_P	f = 3.1 — 3.5GHz	P_{IN} = 15W	V_{CC} = 42V	5.2	—	—	dB

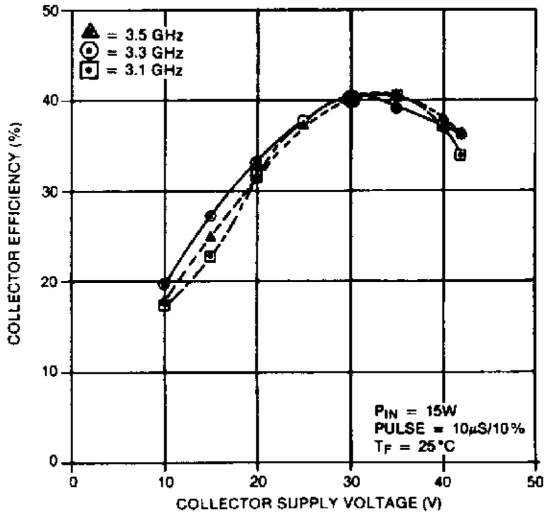
Note: Pulse Width = 10µSec
Duty Cycle = 10%

TYPICAL PERFORMANCE

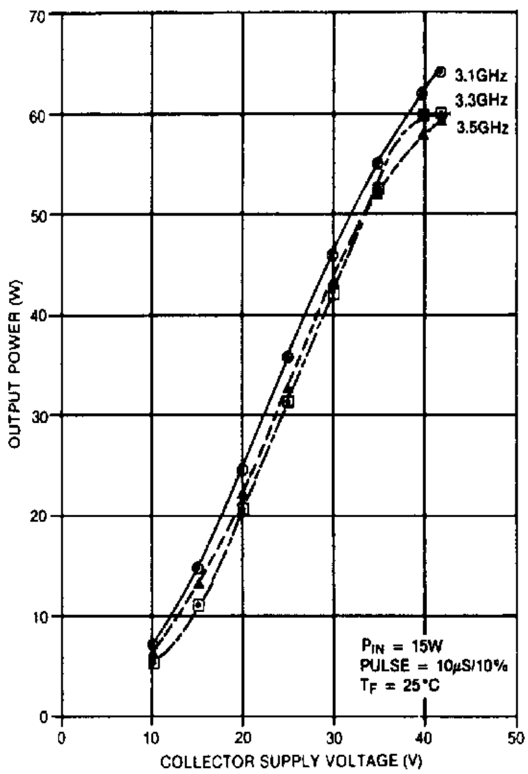
OUTPUT POWER vs FREQUENCY



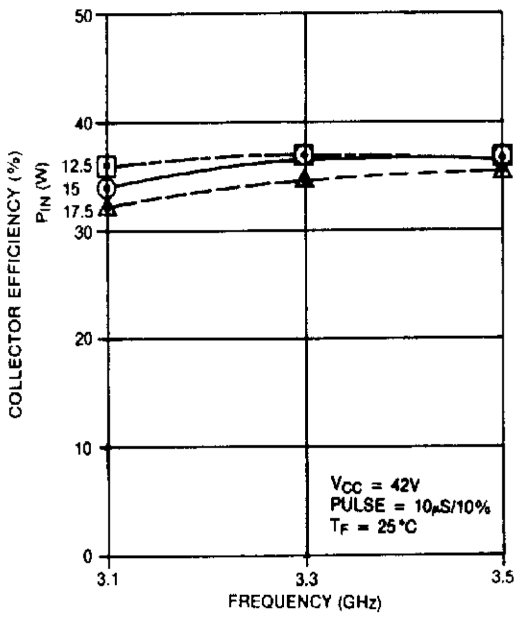
COLLECTOR EFFICIENCY vs COLLECTOR SUPPLY VOLTAGE



OUTPUT POWER vs COLLECTOR SUPPLY VOLTAGE

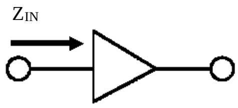


COLLECTOR EFFICIENCY vs FREQUENCY

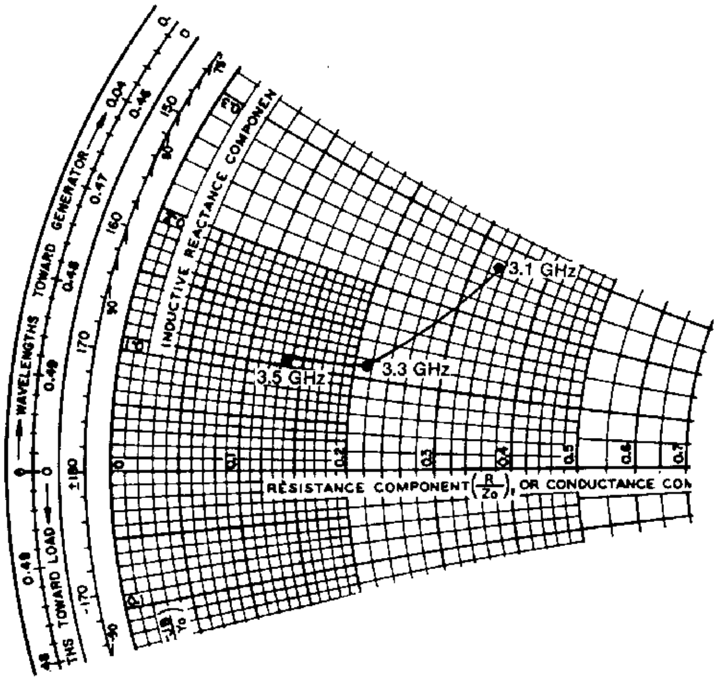


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

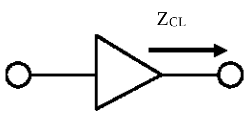


P_{IN} = 15 W
V_{CC} = 42 V
Z_O* = 50 ohms

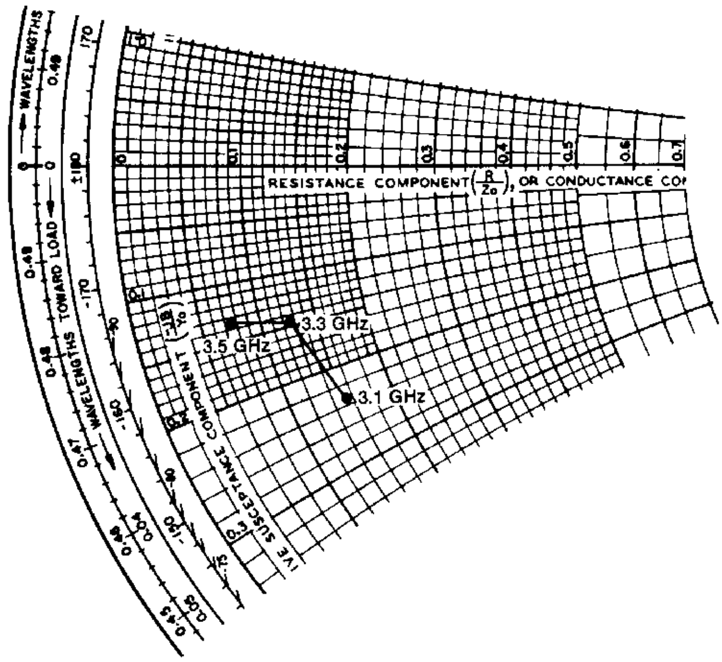


FREQ.	Z_{IN} (Ω)	Z_{CL} (Ω)
L = 3.1 GHz	16.5 + j 13.5	7.7 – j 11.8
M = 3.3 GHz	10.8 + j 5.5	6.5 – j 7.2
H = 3.5 GHz	6.7 + j 5.2	3.8 – j 6.7

TYPICAL COLLECTOR LOAD IMPEDANCE

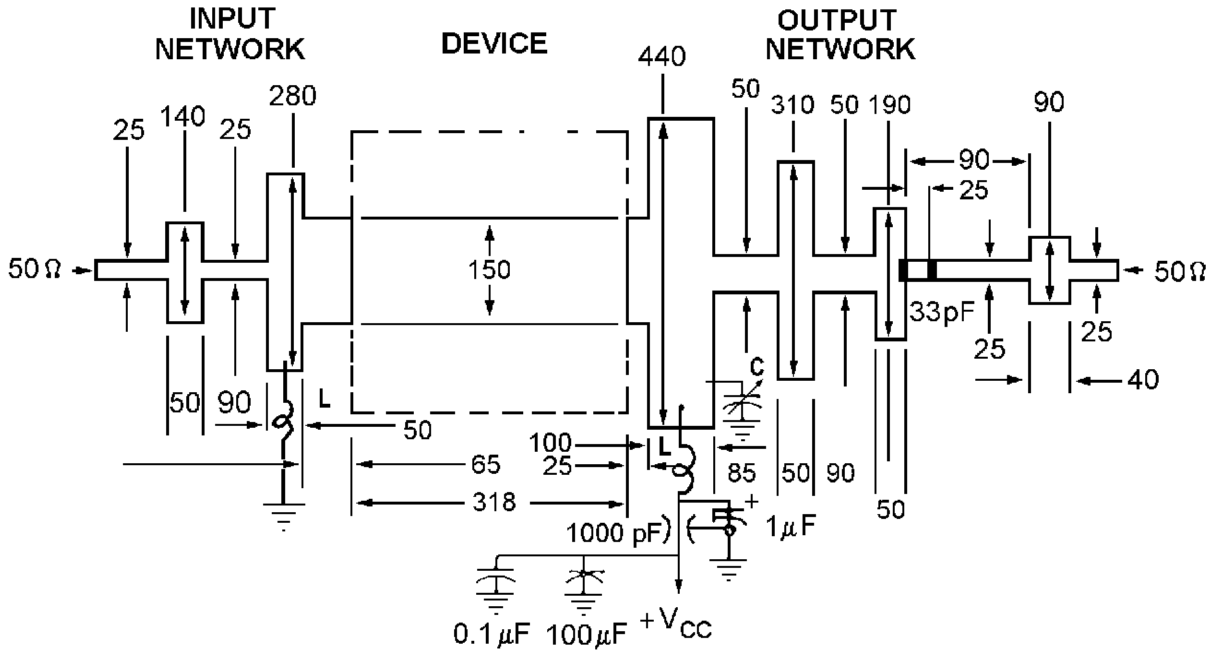


P_{IN} = 15 W
V_{CC} = 42 V
Z_O* = 50 ohms



*Normalized

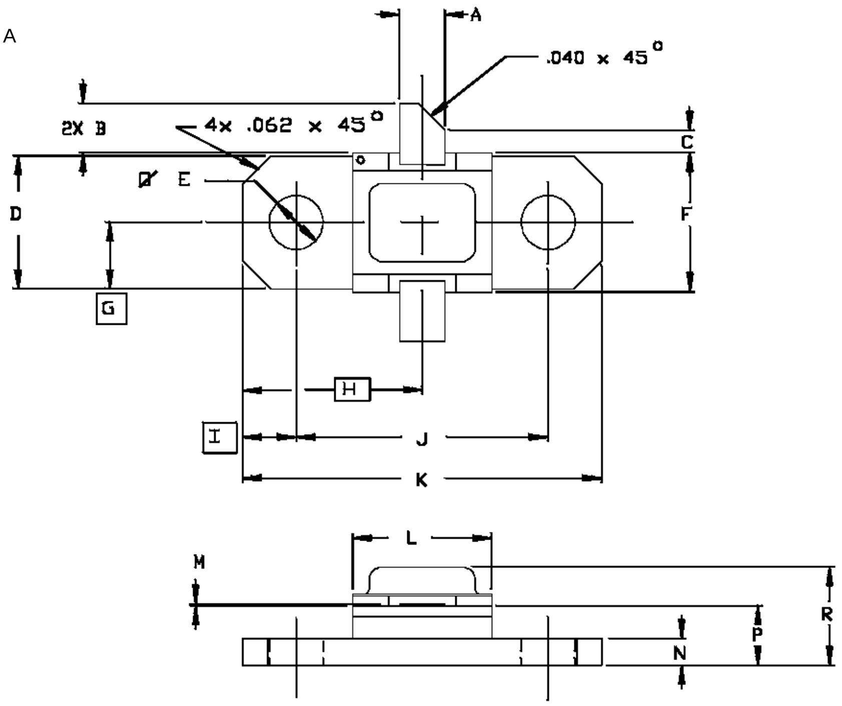
TEST CIRCUIT



All dimensions are in mils.
Substrate material: 25 mil thick Al_2O_3 (E_r = 9.6)
C - 0.3 to 1.2 pF Johanson Gigatrim
L - 1 Turn #26 wire .80 I.D.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0221
UDCS No. 1011424 rev A



SGS-THOMSON MICROELECTRONICS		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.095/2,41	.105/2,67
B	.100/2,54	.120/3,05
C	.050/1,27	
D	.286/7,26	.306/7,77
E	.110/2,79	.130/3,30
F	.306/7,77	.318/8,08
G	.148/3,76	
H	.400/10,16	
I	.119/3,02	
J	.552/14,02	.572/14,53

CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm
K	.790/20,07	.810/20,57
L	.300/7,62	.320/8,13
M	.003/0,08	.006/0,15
N	.052/1,32	.072/1,83
P	.118/3,00	.131/3,33
R		.230/5,84