

MOTOROLA SEMICONDUCTOR TECHNICAL DATA

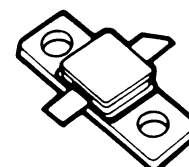
The RF Line Microwave Power Transistor

MRAL2327-12H

... designed primarily for wideband, large-signal output and driver amplifier stages in the 2.3 to 2.7 GHz frequency range.

- Designed for Class C, Common Base Power Amplifiers
- Specified 22 Volt, 2.7 GHz Characteristics:
 - Output Power — 12 Watts
 - Power Gain — 7.0 dB Min, Common Base
 - Collector Efficiency — 45% Min
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors
- Hermetic Package for Military/Space Applications

**7.0 dB
2.3–2.7 GHz
12 WATTS
BROADBAND
MICROWAVE POWER
TRANSISTOR**



**CASE 393-01
(HLP-11)**

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CES}	42	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	- 65 to + 200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 80 \text{ mA}$, $V_{BE} = 0$)	$V_{(BR)CES}$	42	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 2.0 \text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 22 \text{ V}$, $I_E = 0$)	I_{CBO}	—	—	2.0	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 800 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$)	h_{FE}	10	—	100	—
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FUNCTIONAL TESTS (1)

Common-Base Amplifier Power Gain ($V_{CE} = 22 \text{ V}$, $P_{out} = 12 \text{ W}$, $f = 2.3 \text{ \& } 2.7 \text{ GHz}$)	G_{PB}	7.0	—	—	dB
Collector Efficiency ($V_{CE} = 22 \text{ V}$, $P_{out} = 12 \text{ W}$, $f = 2.7 \text{ GHz}$)	η_c	45	—	—	%



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TYPICAL CHARACTERISTICS

Frequency MHz	Z_{IN} (Ohms)	Z_{OL}^* (Ohms)
$V_{CE} = 22 \text{ V}, P_o = 12 \text{ W}$		
2200	$14.3 + j6.7$	$10.2 - j0.5$
2300	$8.2 + j7.7$	$9.9 + j0$
2400	$9.5 + j7.1$	$9.4 + j0.4$
2500	$8.0 + j5.6$	$9.2 + j0.9$
2600	$6.9 + j5.0$	$8.7 + j0.9$
2700	$6.3 + j3.7$	$8.5 + j1.7$

Z_{OL}^* = Conjugate of the optimum load impedance into which the device operates at a given output power, voltage and frequency.

Figure 1. Series Equivalent Input/Output Impedances

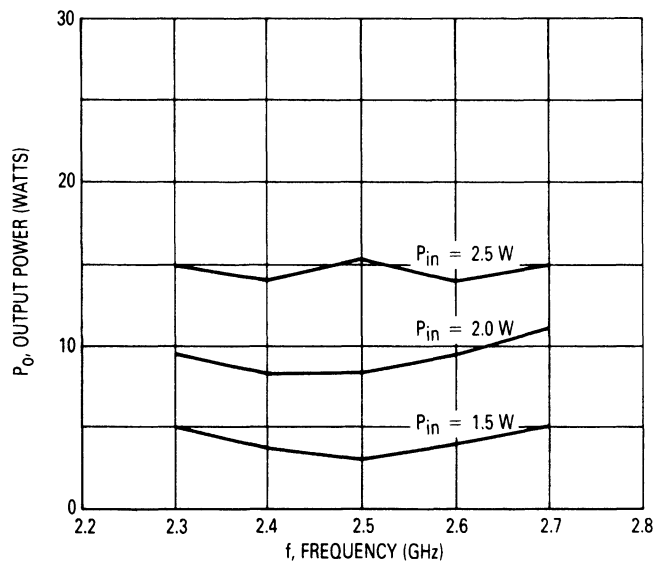
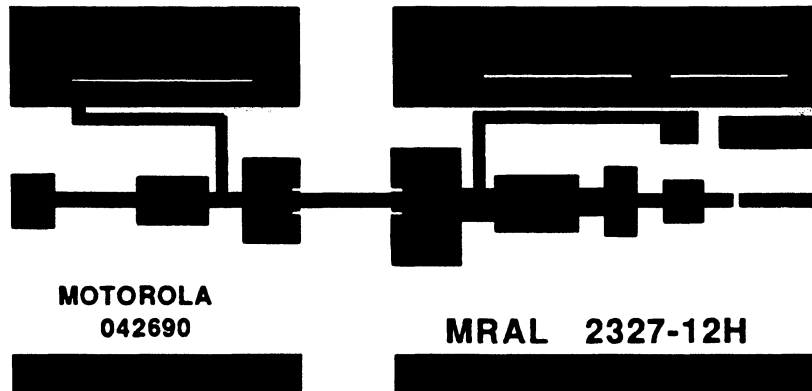


Figure 2. Output Power versus Frequency

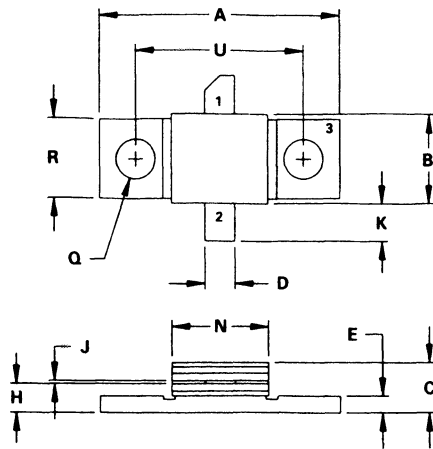


NOTE: Board material is glass teflon, 20 mils thick, cu clad 2 sides,
 $\epsilon_r = 2.55$

Figure 3. Photomaster for Test Circuit

OUTLINE DIMENSIONS

CASE 393-01 (HLP-11)




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH

STYLE 1:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.07	20.69	0.790	0.815
B	7.12	7.62	0.280	0.300
C	3.48	4.31	0.137	0.170
D	2.29	2.79	0.090	0.110
E	1.40	1.65	0.055	0.065
H	2.29	2.84	0.090	0.112
J	0.08	0.12	0.003	0.005
K	3.56	4.06	0.140	0.160
N	7.88	8.38	0.310	0.330
Q	3.18	3.42	0.125	0.135
R	6.35	6.85	0.250	0.270
U	14.03	14.52	0.552	0.572

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