

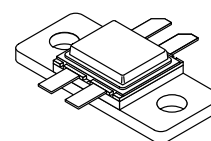
The RF Line UHF Power Transistor

Designed primarily for wideband, large-signal output and driver amplifier stages in the 500 to 1000 MHz frequency range.

- Designed for Class AB Linear Power Amplifiers
- Specified 28 Volt, 1000 MHz Characteristics:
Output Power — 50 Watts
Power Gain — 7 dB (Min), Class AB
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors
- Hermetic Package for Military/Space Applications

MRA0510-50H

7.0 dB, 500 – 1000 MHz
50 W
BROADBAND
UHF POWER TRANSISTOR



CASE 391-03, STYLE 1
(HLP-42)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage	V_{EBO}	4	Vdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	125 0.715	Watts W/ $^\circ\text{C}$
Operating Junction Temperature	T_J	200	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, RF, Junction to Case ($T_C = 70^\circ\text{C}$)	$R_{\theta JC}$	1.4	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS (1)

Collector-Emitter Breakdown Voltage ($I_C = 25\text{ mA}$, $V_{BE} = 0$)	$V_{(BR)CES}$	60	-	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 25\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	60	-	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	4	-	-	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 25\text{ mA}$, $R_{BE} = 1\ \Omega$)	$V_{(BR)CER}$	50	-	-	Vdc
Collector Cutoff Current ($V_{CB} = 30\text{ V}$, $I_E = 0$)	I_{CBO}	-	-	25	mAdc

(1) Each transistor chip measured separately.

(continued)

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS (1)					
DC Current Gain ($I_C = 1\text{ A}$, $V_{CE} = 5\text{ V}$)	h_{FE}	20	–	80	–
DYNAMIC CHARACTERISTICS (1)					
Output Capacitance ($V_{CB} = 28\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$)	C_{ob}	–	–	24	pF
FUNCTIONAL TESTS (2)					
Common–Emitter Amplifier Power Gain ($V_{CE} = 28\text{ V}$, $P_{out} = 50\text{ W}$, $f = 1\text{ GHz}$, $I_{CQ} = 2 \times 120\text{ mA}$)	G_{PE1}	7	–	–	dB
Load Mismatch ($V_{CE} = 28\text{ V}$, $I_{CQ} = 2 \times 120\text{ mA}$, $P_{out} = 50\text{ W}$, $f = 1\text{ GHz}$, Load VSWR = 5:1, All Phase Angles)	ψ	No Degradation in Output Power			
Broadband Power Gain ($V_{CE} = 28\text{ V}$, $P_{out} = 45\text{ W}$, $f = 500\text{ MHz}$ and 1 GHz , $I_{CQ} = 2 \times 120\text{ mA}$)	G_{PE2}	6.5	–	–	dB

- (1) Each transistor chip measured separately.
- (2) Both transistor chips operating in push–pull amplifier.

TYPICAL CHARACTERISTICS

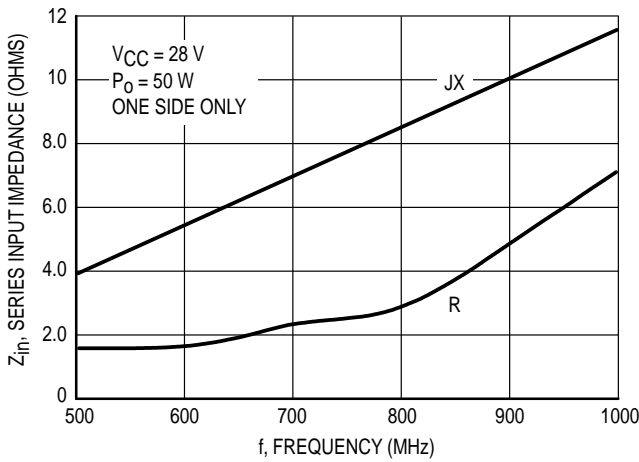


Figure 1. Input Impedance versus Frequency

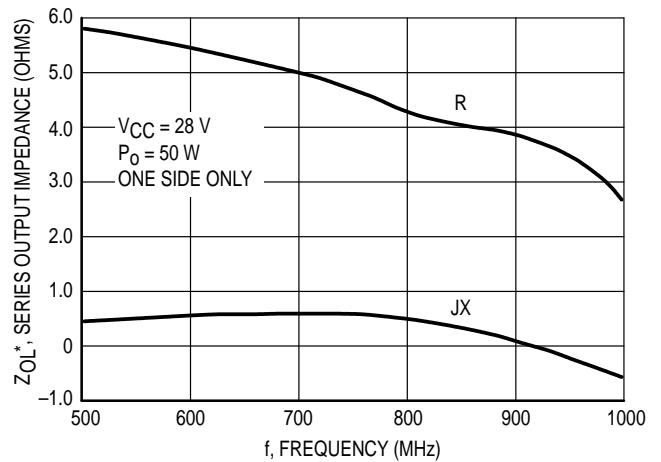
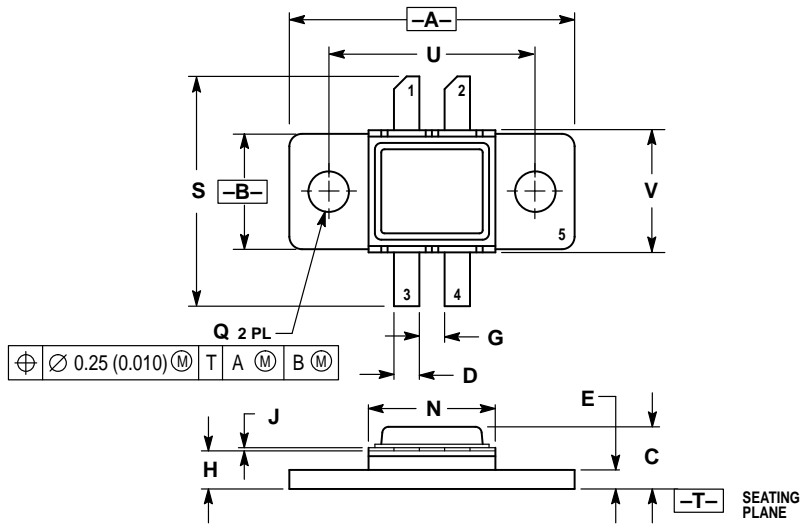


Figure 2. Output Impedance versus Frequency

PACKAGE DIMENSIONS




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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.895	0.905	22.73	22.99
B	0.380	0.390	9.65	9.91
C	0.172	0.208	4.37	5.28
D	0.075	0.085	1.91	2.16
E	0.055	0.065	1.40	1.65
G	0.075	0.085	1.91	2.16
H	0.115	0.125	2.92	3.18
J	0.003	0.006	0.08	0.15
N	0.393	0.403	9.98	10.24
Q	0.123	0.133	3.13	3.38
S	0.705	0.745	17.91	18.92
U	0.650 BSC		16.51 BSC	
V	0.393	0.403	9.98	10.24

- STYLE 1:
 PIN 1. COLLECTOR
 2. COLLECTOR
 3. BASE
 4. BASE
 5. EMITTER

**CASE 391-03
 ISSUE C**

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MRA0510-50H/D