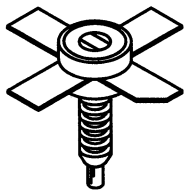
MRA1000-7L

The RF Line
UHF Power Transistor

. . . designed primarily for wideband, large-signal output and driver amplifier stages to 1000 MHz.

- Designed for Class A Linear Power Amplifiers
- Specified 19 Volt, 1000 MHz Characteristics:
  Output Power — 7.0 Watts
  Power Gain — 9.0 dB Min, Small-Signal
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

9.0 dB, TO 1000 MHz
7.0 WATTS BROADBAND
UHF POWER TRANSISTOR



CASE 145D, STYLE 1
(.380 SOE)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	28	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	42 0.25	Watts W/°C
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T_C = 70°C)	$R_{\theta JC}$	4.0	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 20 mA, I_B = 0)	$V_{(BR)CEO}$	28	—	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 20 mA, V_{BE} = 0)	$V_{(BR)CES}$	50	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 20 mA, I_E = 0)	$V_{(BR)CBO}$	50	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 5.0 mA, I_C = 0)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 19 V, I_E = 0)	I_{CBO}	—	—	15	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 A, V_{CE} = 5.0 V)	h_{FE}	20	—	90	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 24 V, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	22	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Small-Signal Gain (V_{CE} = 19 V, f = 1.0 GHz, I_C = 1.2 A)	G_{SS}	9.0	10	—	dB
Load Mismatch (V_{CE} = 19 V, I_C = 1.2 A, P_{out} = 7.0 W, f = 1.0 GHz, Load VSWR = ∞:1, All Phase Angles)	ψ	No Degradation in Output Power			
Overdrive (V_{CE} = 19 V, I_C = 1.2 A, f = 1.0 GHz) (No degradation)	$P_{in_{over}}$	—	—	3.5	W
Output Power, 1.0 dB Compression Point (V_{CE} = 19 V, f = 1.0 GHz, I_C = 1.2 A)	$P_{o1\ dB}$	7.0	—	—	W

TYPICAL CHARACTERISTICS

V_{CE} (Volts)	I_C (mA)	f (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			Mag	∠ϕ	Mag	∠ϕ	Mag	∠ϕ	Mag	∠ϕ
19	1200	0.5	0.95	174	1.08	56	0.02	48	0.70	−179
		0.6	0.94	173	1.01	48	0.03	47	0.70	−177
		0.7	092	171	0.97	38	0.03	45	0.71	−176
		0.8	0.90	169	0.97	26	0.03	40	0.72	−175
		0.9	0.87	168	0.99	11	0.03	32	0.76	−174
		1.0	0.83	168	0.99	−9.0	0.03	30	0.82	−174

Table 1. Common Emitter S-Parameters

Freq. (MHz)	Z^*_{OL} (Ohms)		Z_{IN} (Ohms)	
	Re	Im	Re	Im
500	8.69	−0.51	1.30	2.53
600	8.69	−1.14	1.59	3.01
700	8.39	−1.74	2.05	3.88
800	8.01	−2.21	2.67	4.63
900	7.00	−2.74	3.40	5.19
1000	4.95	−2.64	4.61	5.17

V_{CC} = 19 V, P_O = 7.0 W

Table 2. Z_{IN} and Z_{OL}* versus Frequency

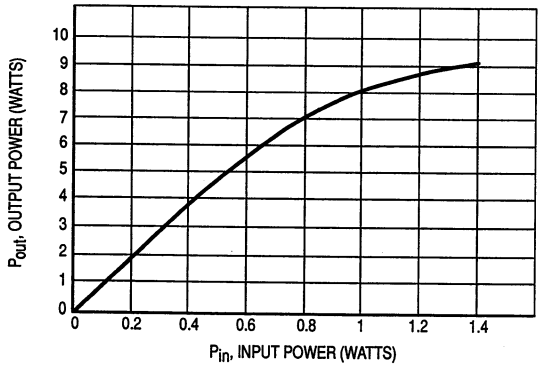
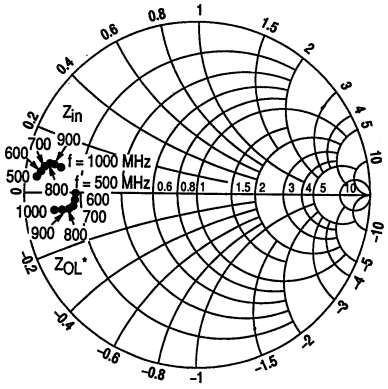
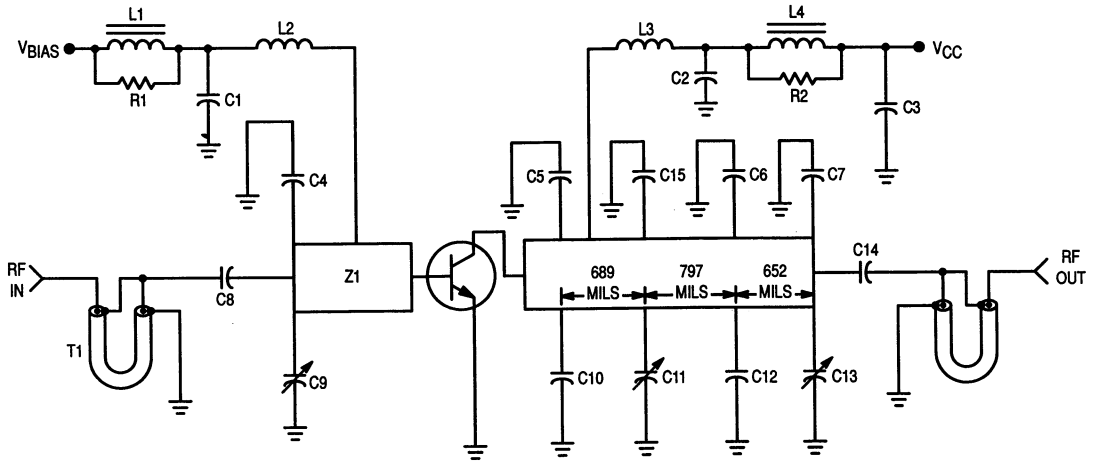


Figure 3. Power Output versus Power Input



V_{CC} = 19 V, P_O = 7.0 W, Z_O = 50 Ohms

Figure 4. Series Equivalent Input/Output Impedance



L1 — 7T, 20 Gauge on 200 Mil Ferrite Torroid
L2 — 7T, 20 Gauge, 100 Mil Dia.
L3 — 5T, 20 Gauge, 100 Mil Dia.
L4 — 8T, 20 Gauge, on 200 Mil Ferrite Torroid
R1, R2 — 15 Ohm, 1/4 Watt
C1, C2 — 500 pF ATC
C3 — 25 µF, Electrolytic
C4 — 3.3 pF ATC
C5 — 5.6 pF ATC
C6 — 1.6 pF ATC
C7 — 1.2 pF ATC
C8 — 33 pF ATC
C9, C13 — 0.3–1.3 pF Johanson
C10 — 6.2 pF ATC
C11 — 1.0–16 pF Johanson
C12 — 3.0 pF ATC
C14 — 33 pF ATC
C15 — 18 pF ATC
T1, T2 — 50 Ohm, ℓ = 2000 Mils
Z1 — 12.5 Ohm, ℓ = 914 Mils, 32 Mil, Teflon (ε_r = 2.55)
Z2 — 12.5 Ohm, ℓ = 2392 Mils, 32 Mil, Teflon (ε_r = 2.55)

Figure 5. 1.0 GHz Test Circuit

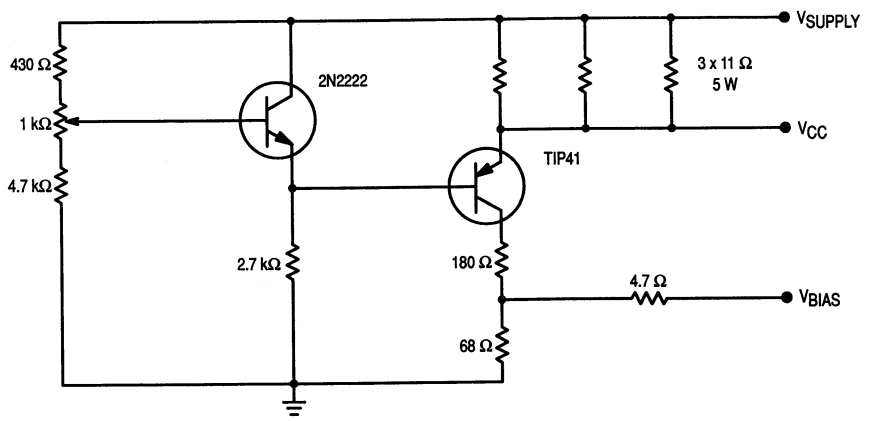
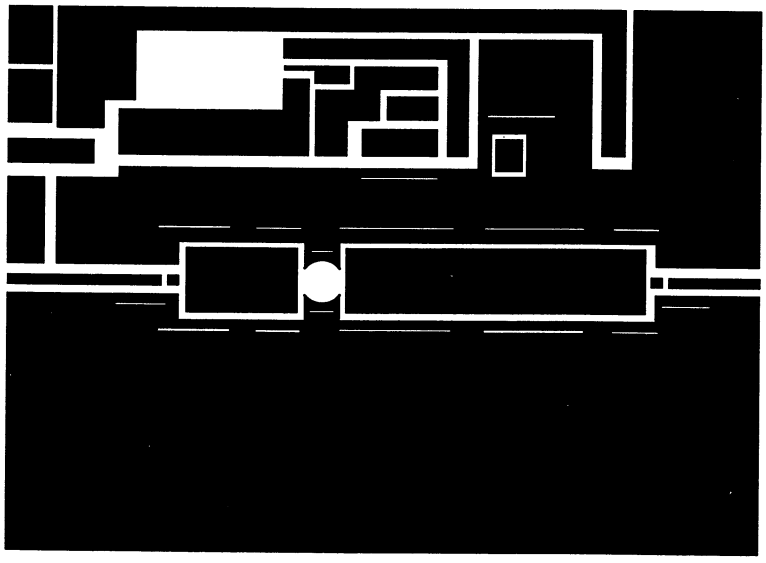


Figure 6. Bias Circuit



(Not to Scale)

Board Material = 1/32″, Glass Teflon, K = 2.55

Figure 7. Test Circuit Mask

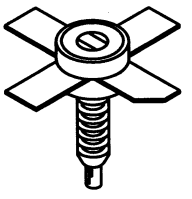
MRA1000-14L

The RF Line
UHF Power Transistor

. . . designed primarily for wideband, large-signal output and driver amplifier stages to 1000 MHz.

- Designed for Class A Linear Power Amplifiers
- Specified 19 Volt, 1000 MHz Characteristics:
  Output Power — 14 Watts
  Power Gain — 8.0 dB, Small-Signal
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

8.0 dB, TO 1000 MHz
14 WATTS BROADBAND
UHF POWER TRANSISTOR



CASE 145D, STYLE 1
(.380 SOE)

2

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	28	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	83 0.48	Watts W/°C
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T_C = 70°C)	$R_{\theta JC}$	2.1	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 25 mA, I_B = 0)	$V_{(BR)CEO}$	28	—	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 25 mA, V_{BE} = 0)	$V_{(BR)CES}$	50	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 25 mA, I_E = 0)	$V_{(BR)CBO}$	50	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 5.0 mA, I_C = 0)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 19 V, I_E = 0)	I_{CBO}	—	—	20	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 A, V_{CE} = 5.0 V)	h_{FE}	20	—	90	—

(continued)

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 24 V, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	40	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Small-Signal Gain (V_{CE} = 19 V, P_{in} = 1.0 mW, f = 1.0 GHz, I_C = 2.4 A)	G_{SS}	8.0	—	—	dB
Load Mismatch (V_{CE} = 19 V, I_C = 2.4 A, P_{out} = 14 W, f = 1.0 GHz, Load VSWR = ∞:1, All Phase Angles)	Ψ	No Degradation in Output Power			
Overdrive (V_{CE} = 19 V, I_C = 2.4 A, f = 1.0 GHz) (No degradation)	$P_{in\,over}$	—	—	7.0	W
Output Power, 1.0 dB Compression Point (V_{CE} = 19 V, f = 1.0 GHz, I_C = 2.4 A)	$P_{o1\,dB}$	14	—	—	W

TYPICAL CHARACTERISTICS

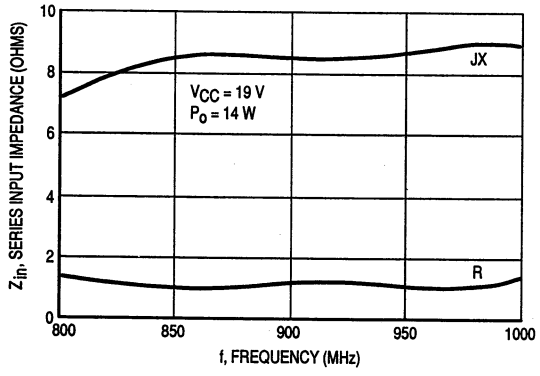


Figure 1. Input Impedance versus Frequency

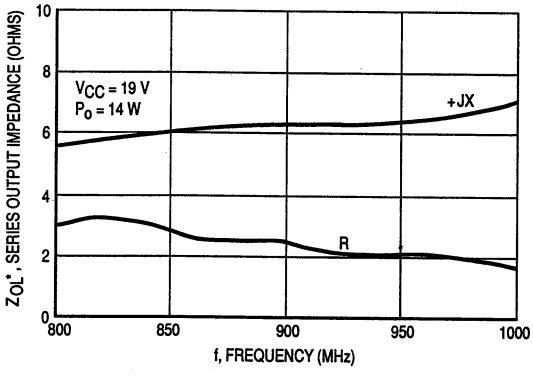


Figure 2. Output Impedance versus Frequency

V_{CE} (Volts)	I_C (mA)	f (GHz)	S_{11}		S_{21}		S_{12}		S_{22}	
			Mag	∠ϕ	Mag	∠ϕ	Mag	∠ϕ	Mag	∠ϕ
19	2400	0.5	0.98	175	0.56	57	0.02	69	0.84	177
		0.6	0.97	174	0.53	50	0.02	69	0.83	177
		0.7	0.96	173	0.50	41	0.03	66	0.83	176
		0.8	0.96	172	0.52	39	0.03	64	0.83	176
		0.9	0.94	168	0.50	18	0.03	58	0.83	176
		1.0	0.91	165	0.52	1.0	0.03	60	0.85	175

Table 1. Common Emitter S-Parameters

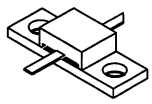
MRAL1720-20

The RF Line
Microwave Power Transistor

. . . designed primarily for wideband, large-signal output and driver amplifier stages in the 1.7 to 2.0 GHz frequency range.

- Designed for Class C, Common Base Power Amplifiers
- Specified 22 Volt, 2.0 GHz Characteristics:
  Output Power — 2.0 to 20 Watts
  Power Gain — 6.0 to 7.5 dB Min
  Collector Efficiency — 35 to 40%, Min
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

6.0 to 7.5 dB
1.7 to 2.0 GHz
2.0 TO 20 WATTS BROADBAND
MICROWAVE POWER TRANSISTOR



CASE 394, STYLE 1

2

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CES}	42	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Collector Current — Continuous	I_C	8.0	Adc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, RF, Junction to Case	$R_{\theta JC}$	2.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 160 mA, V_{BE} = 0)	$V_{(BR)CES}$	42	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 2.0 mA, I_C = 0)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 22 V, I_E = 0)	I_{CBO}	—	—	4.0	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 0.8 A, V_{CE} = 5.0 V)	h_{FE}	10	—	100	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 28 V, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	(1)	pF
FUNCTIONAL TESTS					
Common-Base Amplifier Power Gain (V_{CE} = 22 V, P_{out} = 20 W, f = 1.7 & 2.0 GHz)	G_{PB}	6.0	—	—	dB
Collector Efficiency (V_{CE} = 22 V, P_{out} = 20 W, f = 1.7 & 2.0 GHz)	η_c	40	—	—	%

NOTE:
1. Not measurable because of output matching network.

TYPICAL CHARACTERISTICS

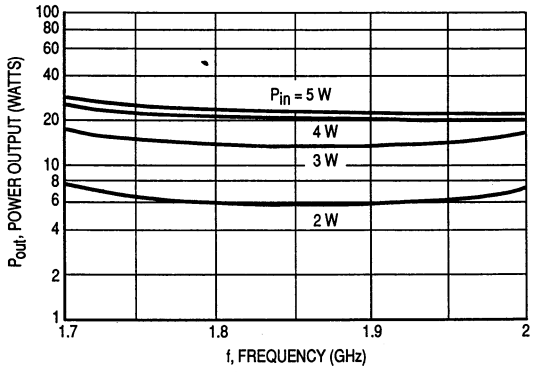


Figure 1. Power Output versus Frequency

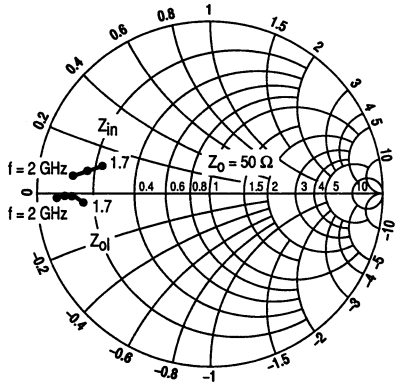


Figure 2. Series Equivalent Input/Output Impedance
V_{CC} = 22 V

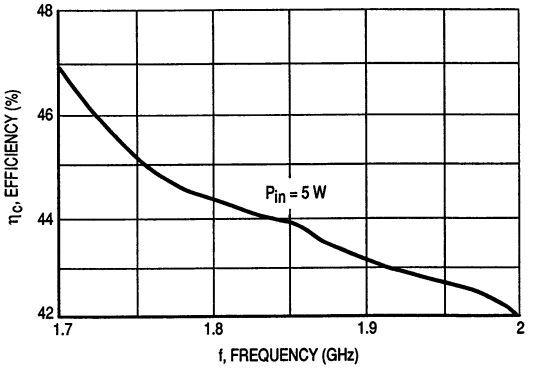


Figure 3. Efficiency versus Frequency

2

The graph shown below displays MTTF in hours x ampere^2 emitter current for each of the devices. Life tests at elevated temperatures have correlated to better than ±10% to the theoretical prediction for metal failure. Sample MTTF calculations based on operating conditions are included below.

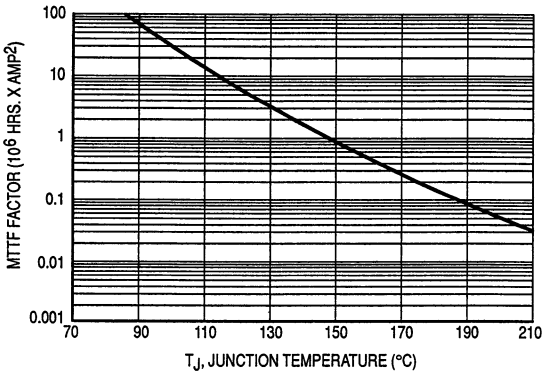
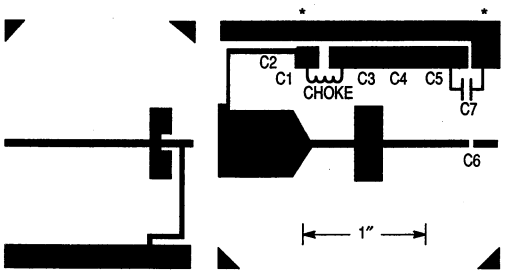


Figure 4. MTTF Factor versus Junction Temperature



*Foil wrap or plate around to ground plane.
(1) Bypass capacitor to ground (100 pF ceramic chip).
(2) Use V_{CC} bypass of 100 pF chip, 0.1 µF chip and 5.0 µF.
Board material 0.020 inch glass teflon $\varepsilon_r = 2.55$.

1) C1, C5 = 0.1 µF chip capacitor
2) C2, C3, C4 = 120 pF
3) C6 = 100 pF (ATC)
4) C7 = 50 µF 50 WV Electrolytic
5) * = 1.0 mil Shim thru ground plane
6) Material = Glass/Teflon
$\varepsilon_r = 2.55$
Thickness = .020 in.
1.0 oz copper

Figure 5. Test Circuit Board Photomaster (Not to Scale)

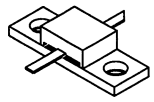
MRAL2023-3
MRAL2023-6

The RF Line
Microwave Power Transistors

. . . designed primarily for wideband, large-signal output and driver amplifier stages in the 2.0 – 2.3 GHz frequency range.

- Designed for Class C, Common Base Power Amplifiers
- Specified 22 Volt, 2.3 GHz Characteristics:
  Output Power — 1.5 to 12 Watts
  Power Gain — 6.8 to 8.0 dB Min
  Collector Efficiency — 35 to 40% Min
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

6.8 to 8.0 dB
2.0–2.3 GHz
1.5 TO 12 WATTS BROADBAND
MICROWAVE POWER TRANSISTORS



CASE 394, STYLE 1
(MRA .25)

MAXIMUM RATINGS

Rating	Symbol	-3	-6	Unit
Collector-Base Voltage	V_{CES}	42		Vdc
Emitter-Base Voltage	V_{EBO}	3.5		Vdc
Collector Current — Continuous	I_C	0.5	1.25	Adc
Operating Junction Temperature	T_J	200		°C
Storage Temperature Range	T_{stg}	−65 to +150		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max		Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	16	8.0	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$				Vdc
(I_C = 20 mA, V_{BE} = 0)	MRAL2023-3		42	—	—	
(I_C = 50 mA, V_{BE} = 0)	MRAL2023-6		42	—	—	
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$				Vdc
(I_E = 0.4 mA, I_C = 0)	MRAL2023-3		3.5	—	—	
(I_E = 1.0 mA, I_C = 0)	MRAL2023-6		3.5	—	—	
Collector Cutoff Current	MRAL2023-3	I_{CBO}	—	—	0.5	mAdc
(V_{CB} = 22 V, I_E = 0)	MRAL2023-6		—	—	1.25	
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 0.2 A, V_{CE} = 5.0 V)	MRAL2023-3		10	—	90	
(I_C = 0.5 A, V_{CE} = 5.0 V)	MRAL2023-6		10	—	90	
DYNAMIC CHARACTERISTICS						
Output Capacitance	MRAL2023-3	C_{ob}	—	—	5.0	pF
(V_{CB} = 22 V, I_E = 0, f = 1.0 MHz)	MRAL2023-6		—	—	10.0	
FUNCTIONAL TESTS						
Common-Base Amplifier Power Gain		G_{PB}				dB
(V_{CE} = 22 V, P_{out} = 3.0 W, f = 2.0 & 2.3 GHz)	MRAL2023-3		8.0	—	—	
(V_{CE} = 22 V, P_{out} = 6.0 W, f = 2.0 & 2.3 GHz)	MRAL2023-6		6.8	—	—	
Collector Efficiency		η_C				%
(V_{CE} = 22 V, P_{out} = 3.0 W, f = 2.0 & 2.3 GHz)	MRAL2023-3		40	—	—	
(V_{CE} = 22 V, P_{out} = 6.0 W, f = 2.0 & 2.3 GHz)	MRAL2023-6		40	—	—	

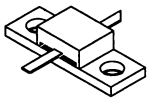
MRAL2023-18

The RF Line
Microwave Power Transistor

. . . designed primarily for wideband, large-signal output and driver amplifier stages in the 2.0 – 2.3 GHz frequency range.

- Designed for Class C, Common Base Power Amplifiers
- Specified 22 Volt, 2.3 GHz Characteristics:
  Output Power — 18 Watts
  Power Gain — 7.0 dB Min
  Collector Efficiency — 35%, Min
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

7.0 dB
2.0–2.3 GHz
18 WATTS BROADBAND
MICROWAVE POWER TRANSISTOR



CASE 394, STYLE 1
(MRA .25)

2

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CES}	42	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Collector Current — Continuous	I_C	4.0	Adc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	°C/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 160 mA, V_{BE} = 0)	$V_{(BR)CES}$	42	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 2.0 mA, I_C = 0)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector Cutoff Current (V_{CB} = 22 V, I_E = 0)	I_{CBO}	—	—	4.0	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 800 mA, V_{CE} = 5.0 V)	h_{FE}	10	—	100	—
FUNCTIONAL TESTS					
Common-Base Amplifier Power Gain (V_{CE} = 22 V, P_{out} = 18 W, f = 2.0 & 2.3 GHz)	G_{PB}	7.0	—	—	dB
Collector Efficiency (V_{CE} = 22 V, P_{out} = 18 W, f = 2.0 & 2.3 GHz)	η_C	35	—	—	%

TYPICAL CHARACTERISTICS

The graph shown below displays MTTF in hours x ampere^2 emitter current for each of the devices. Life tests at elevated temperatures have correlated to better than ±10% to the theoretical prediction for metal failure. Divide MTTF by I_C^2 for MTTF in a particular application.

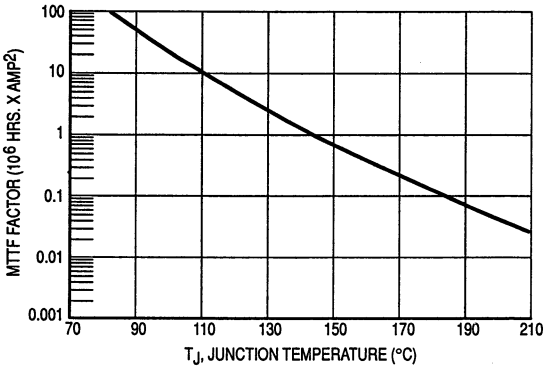
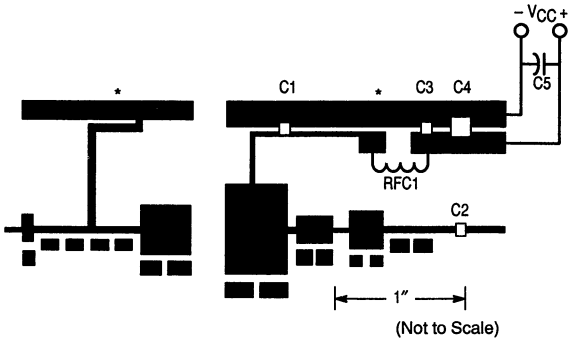


Figure 1. MTTF Factor versus Junction Temperature



Board material — 0.018″ dielectric thickness teflon fiberglass.
* — Ground area to backside of board.
C1, C2, C3 — 100 pF porcelain ceramic chip.
C4 — 0.1 µF ceramic chip.
C5 — 50 µF, 50 V electrolytic.
RFC1 — 5 turns #28 AWG, ~0.125″ dia.

Figure 2. Test Circuit Boards

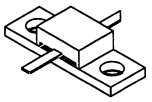
MRAL2327-3
MRAL2327-12

The RF Line
Microwave Power Transistors

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

- Designed for Class C, Common Base Power Amplifiers
- Specified 22 Volt, 2.7 GHz Characteristics:
  Output Power — 1.3 to 12 Watts
  Power Gain — 5.5 to 6.8 dB Min, Common Base
  Collector Efficiency — 30 to 40% Min
- Built-In Matching Network for Broadband Operation
- Gold Metallization for Improved Reliability
- Diffused Ballast Resistors

5.5 to 6.8 dB
2.3–2.7 GHz
1.3 TO 12 WATTS BROADBAND
MICROWAVE POWER TRANSISTORS



CASE 394, STYLE 1
(MRA .25)

2

MAXIMUM RATINGS

Rating	Symbol	Max	Unit
Collector-Base Voltage	V_{CES}	44	Vdc
Emitter-Base Voltage	V_{EBO}	3.5	Vdc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	−65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	-3	-12	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	16	4.5	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$				Vdc
(I_C = 20 mA, V_{BE} = 0)	MRAL2327-3		42	—	—	
(I_C = 80 mA, V_{BE} = 0)	MRAL2327-12		42	—	—	
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$				Vdc
(I_C = 1.0 mA, I_E = 0)	MRAL2327-3		38	—	—	
(I_C = 8.0 mA, I_E = 0)	MRAL2327-12		38	—	—	
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$				Vdc
(I_E = 0.4 mA, I_E = 0)	MRAL2327-3		3.5	—	—	
(I_E = 2.0 mA, I_E = 0)	MRAL2327-12		3.5	—	—	
Collector Cutoff Current	MRAL2327-3	I_{CBO}	—	—	0.5	mAdc
(V_{CB} = 22 V, I_E = 0)	MRAL2327-12		—	—	2.0	
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 200 mA, V_{CE} = 5.0 V)	MRAL2327-3		10	—	100	
(I_C = 800 mA, V_{CE} = 5.0 V)	MRAL2327-12		10	—	100	
FUNCTIONAL TESTS						
Common-Base Amplifier Power Gain		G_{PB}				dB
(V_{CE} = 22 V, P_{out} = 3.0 W, f = 2.7 GHz)	MRAL2327-3		6.6	—	—	
(V_{CE} = 22 V, P_{out} = 12 W, f = 2.7 GHz)	MRAL2327-12		6.8	—	—	
Collector Efficiency		η_c				%
(V_{CE} = 22 V, P_{out} = 3.0 W, f = 2.7 GHz)	MRAL2327-3		35	—	—	
(V_{CE} = 22 V, P_{out} = 12 W, f = 2.7 GHz)	MRAL2327-12		40	—	—	

TYPICAL CHARACTERISTICS

MRAL2327-3

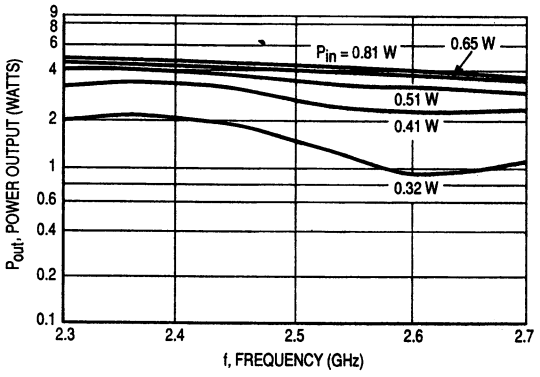


Figure 1. Power Output versus Frequency

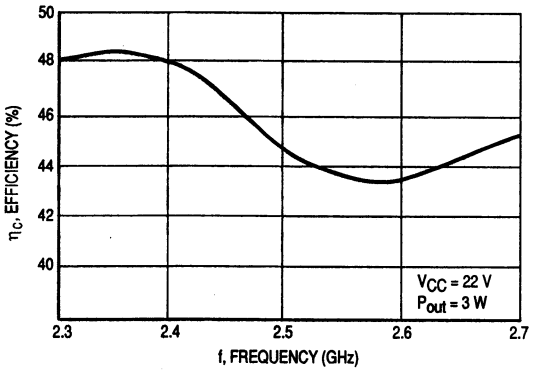


Figure 2. Collector Efficiency versus Frequency

MRAL2327-12

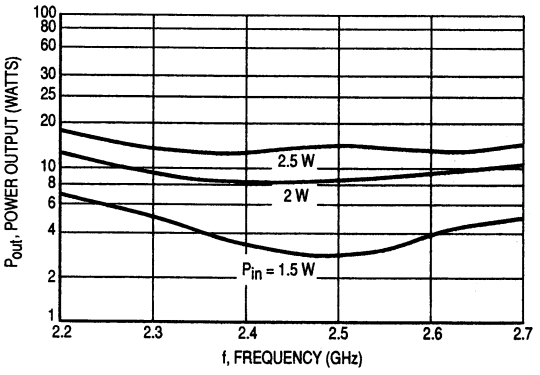


Figure 3. Power Output versus Frequency

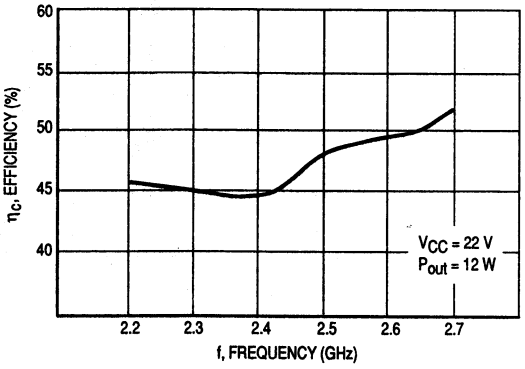
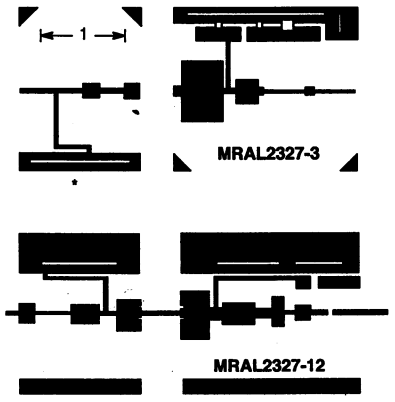


Figure 4. Collector Efficiency versus Frequency

2



Board material — 0.018″ dielectric thickness Teflon fiberglass
* Ground through to back side of board
C1, C3 — 100 pF porcelain ceramic chip
C4 — 0.1 µF ceramic chip
C5 — 50 µF, 50 V electrolytic
RFC1 — 5 turns #22 AWG, ~0.125 dia.

Figure 5. Circuit Boards (Not to Scale)

The graph shown below displays MTTF in hours x ampere^2 emitter current for each of the devices. Life tests at elevated temperatures have correlated to better than ±10% to the theoretical prediction for metal failure. Divide MTTF by I_C^2 for MTTF in a particular applications.

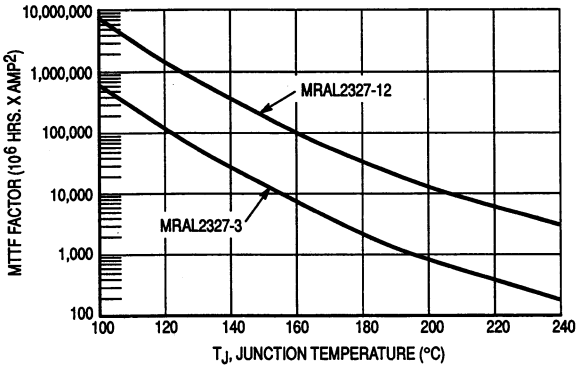


Figure 6. MTTF Factor versus Junction Temperature

2