

MOTOROLA SC (XSTRS/R F)

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T-33-15

**MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA**

MRF848

Advance Information

The RF Line

NPN SILICON RF POWER TRANSISTOR

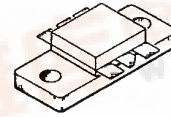
... designed for 12.5 Volt UHF large-signal, common base amplifier applications in industrial and commercial FM equipment operating in the range of 804-960 MHz.

- Motorola Advanced Amplifier Concept Package
- Specified 12.5 Volt, 870 MHz Characteristics
Output Power = 60 Watts
Minimum Gain = 4.0 dB
Efficiency = 60%
- Double Input/Output Matched for Wideband Performance and Simplified External Matching
- Series Equivalent Large-Signal Characterization
- Gold Metallized, Emitter Ballasted for Long Life and Resistance to Metal Migration
- Silicon Nitride Passivated

60 W 800-960 MHz

**RF POWER
TRANSISTOR**

NPN SILICON



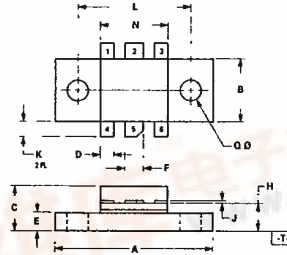
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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	16	Vdc
Collector-Base Voltage	V _{CB0}	36	Vdc
Emitter-Base Voltage	V _{EBO}	4.0	Vdc
Collector-Current — Continuous	I _C	14	Adc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	175 1.0	Watts W/°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R _{θJC}	1.00	°C/W



- NOTES
1. DIMENSIONS A AND B ARE DATUMS AND T IS A DATUM PLANE.
 2. POSITIONAL TOLERANCE FOR Ø HOLES

Ⓢ	Ⓢ	Ⓢ	Ⓢ
Ⓢ	Ⓢ	Ⓢ	Ⓢ
 3. DIMENSION -D- FOUR PLACES
 4. DIMENSIONING -F- TWO PLACES
 5. DIMENSIONING AND TOLERANCING PER Y14.5M, 1982
 6. CONTROLLING DIMENSION INCH
- STYLE 1
PIN 1. BASE
2. EMITTER
3. BASE
4. BASE
5. COLLECTOR
6. BASE

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.51	25.02	0.965	0.985
B	9.91	10.41	0.390	0.410
C	6.85	7.35	0.270	0.290
D	1.91	2.28	0.075	0.090
E	2.42	2.92	0.095	0.115
F	5.47	5.96	0.210	0.230
H	3.94	4.44	0.155	0.175
J	0.10	0.15	0.004	0.006
K	2.29	2.54	0.090	0.116
L	18.41	BSC	0.725	BSC
N	10.54	11.04	0.415	0.435
O	3.18	3.42	0.125	0.135

CASE 333A

This document contains information on a new product. Specifications and information herein are subject to change without notice.



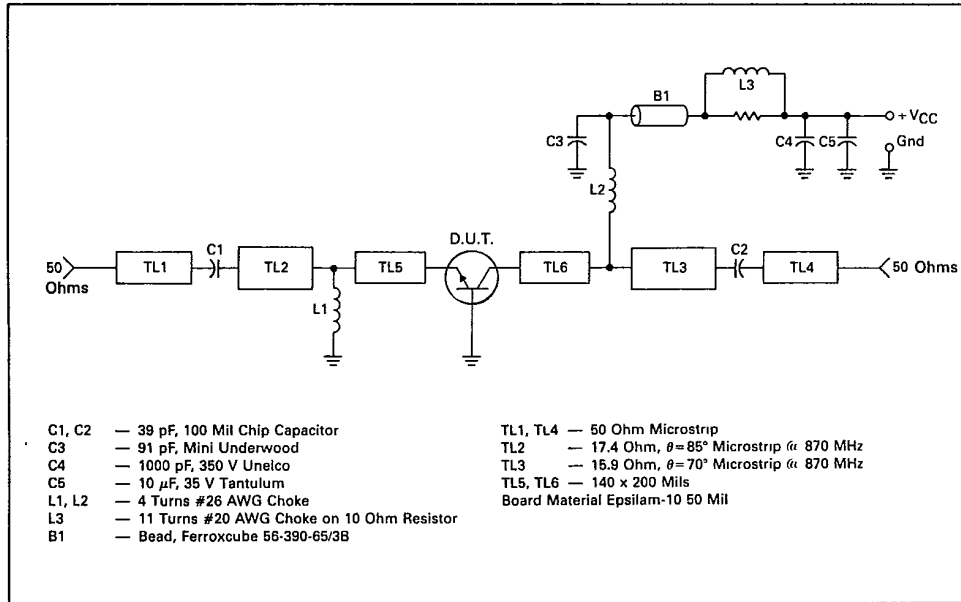
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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 50 mA _{dc} , I _B = 0)	V _{(BR)CEO}	16	—	—	V _{dc}
Collector-Emitter Breakdown Voltage (I _C = 50 mA _{dc} , V _{BE} = 0)	V _{(BR)CES}	36	—	—	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 5.0 mA _{dc} , I _C = 0)	V _{(BR)EBO}	4.0	—	—	V _{dc}
Collector Cutoff Current (V _{CE} = 15 V _{dc} , V _{BE} = 0, T _C = 25°C)	I _{CES}	—	—	10	mA _{dc}
ON CHARACTERISTICS					
DC Current Gain (I _C = 2.0 A _{dc} , V _{CE} = 5.0 V _{dc})	h _{FE}	20	50	150	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V _{CB} = 12.5 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{ob}	—	88	110	pF
FUNCTIONAL TESTS					
Common-Base Amplifier Power Gain (V _{CC} = 12.5 V _{dc} , P _{out} = 60 W, f = 870 MHz)	G _{pb}	4.0	4.8	—	dB
Collector Efficiency (V _{CC} = 12.5 V _{dc} , P _{out} = 60 W, f = 870 MHz)	η	60	68	—	%
Output Mismatch Stress (V _{CC} = 15.5 V _{dc} , P _{in} = 24 W, f = 870 MHz, VSWR = 10:1, all phase angles)	ψ	No degradation in output power			

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FIGURE 1 — 800–870 MHz BROADBAND TEST CIRCUIT



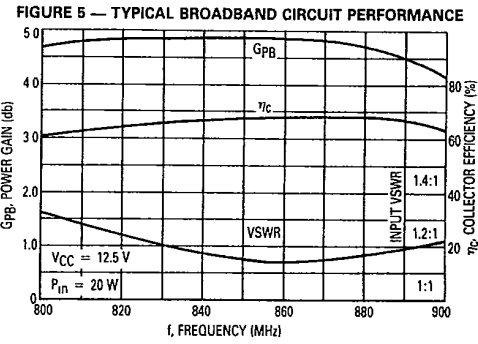
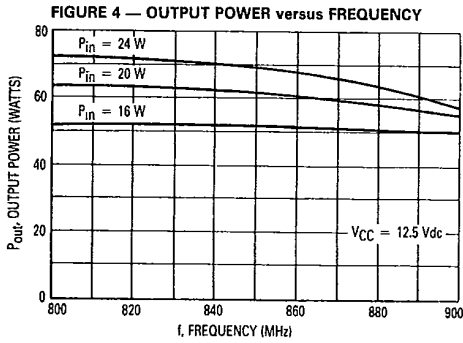
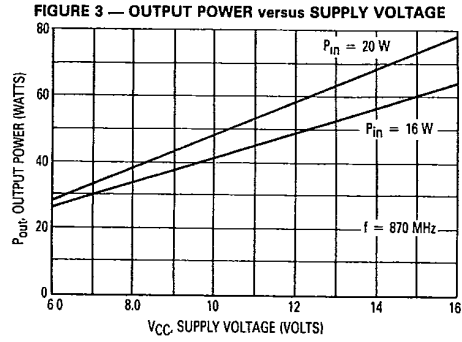
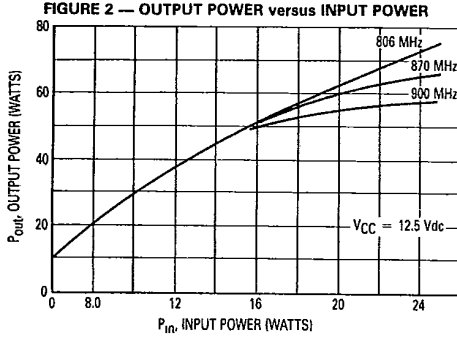


FIGURE 6 — INPUT/OUTPUT IMPEDANCE

$P_{out} = 60 \text{ Watts}, V_{CC} = 12.5 \text{ Vdc}$

f MHz	Z_{in} Ohms	Z_{OL}^* Ohms
800	$7.16 + j8.2$	$4.5 + j4.8$
835	$8.7 + j6.9$	$5.45 + j5.0$
870	$8.76 + j6.17$	$6.75 + j5.1$
900	$8.25 + j6.06$	$10.2 + j4.0$

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

