

**MRF233 (SILICON)**

**The RF Line**

**NPN SILICON RF POWER TRANSISTORS**

... designed for 12.5 Volt, mid-band large-signal amplifier applications in industrial and commercial FM equipment operating in the 40 to 100 MHz range.

- Specified 12.5 Volt, 90 MHz Characteristics –  
 Output Power = 15 Watts  
 Minimum Gain = 10 dB  
 Efficiency = 55%
- 100% Tested for Load Mismatch at all Phase Angles with 30:1 VSWR
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Characterized with Parallel Equivalent Large-Signal Impedance Parameters

**MAXIMUM RATINGS**

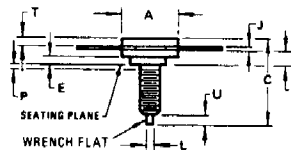
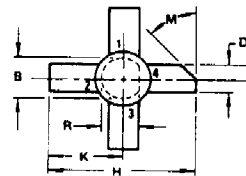
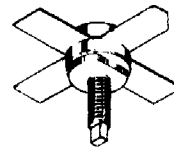
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	18	Vdc
Collector-Base Voltage	V <sub>CBO</sub>	36	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	4.0	Vdc
Collector Current – Continuous	I <sub>C</sub>	3.5	A <sub>dc</sub>
Total Device Dissipation @ T <sub>C</sub> = 25°C (1)	P <sub>D</sub>	50	Watts
Derate Above 25°C	–	285	mW/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +200	°C
Stud Torque (2)	–	6.5	In-lb

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	3.5	°C/W

(1) These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as Class C RF amplifiers.  
 (2) For Repeated Assembly use 5 in. Lb.

15 W – 90 MHz  
**RF POWER TRANSISTOR**  
 NPN SILICON



STYLE 1  
 PIN 1 EMITTER  
 2 BASE  
 3 EMITTER  
 4 COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	9.78	0.370	0.385
B	8.13	8.38	0.320	0.330
C	18.03	19.05	0.710	0.750
D	5.59	5.84	0.220	0.230
E	1.78	2.03	0.070	0.080
F	2.79	2.82	0.110	0.115
H	26.42	28.70	1.040	1.130
J	0.10	0.15	0.004	0.006
K	13.21	14.35	0.520	0.565
L	1.40	1.65	0.055	0.065
M	45° NDM	45° NDM	–	–
P	1.27	–	0.050	–
R	7.69	7.90	0.300	0.307
S	4.01	4.52	0.158	0.178
T	2.16	2.41	0.085	0.095
U	2.54	3.30	0.100	0.130

NOTE  
 CASE 145A-01 USE 8-32NC2A STUD  
 CASE 145A-01



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**MRF233 (continued)**

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted).

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage ( $I_C = 100 \text{ mA dc}$ , $I_B = 0$ )	$BV_{CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ( $I_C = 50 \text{ mA dc}$ , $V_{BE} = 0$ )	$BV_{CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 5.0 \text{ mA dc}$ , $I_C = 0$ )	$BV_{EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 15 \text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	—	—	1.0	mA dc
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = 1.0 \text{ A dc}$ , $V_{CE} = 5.0 \text{ Vdc}$ )	$h_{FE}$	5.0	—	—	—
<b>DYNAMIC CHARACTERISTICS</b>					
Output Capacitance ( $V_{CB} = 12.5 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{ob}$	—	100	120	pF
<b>FUNCTIONAL TESTS (Figure 1)</b>					
Common-Emitter Amplifier Power Gain ( $V_{CC} = 12.5 \text{ Vdc}$ , $P_{out} = 15 \text{ W}$ , $f = 90 \text{ MHz}$ )	$G_{pE}$	10	—	—	dB
Collector Efficiency ( $V_{CC} = 12.5 \text{ Vdc}$ , $P_{out} = 15 \text{ W}$ , $f = 90 \text{ MHz}$ )	$\eta$	55	—	—	%
Load Mismatch ( $V_{CC} = 12.5 \text{ Vdc}$ , $P_{out} = 15 \text{ W}$ , $f = 90 \text{ MHz}$ , $T_C \leq 25^\circ\text{C}$ )	—	VSWR > 30:1 Through All Phase Angles in a 3 Second Interval After Which Devices Will Meet $G_{pE}$ Test Limits			

