

The RF Line

NPN Silicon

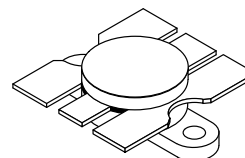
RF Power Transistor

The MRF247 is designed for 12.5 Volt VHF large-signal amplifier applications in industrial and commercial FM equipment operating to 175 MHz.

- Specified 12.5 Volt, 175 MHz Characteristics —
Output Power = 75 Watts
Power Gain = 7.0 dB Min
Efficiency = 55% Min
- Characterized With Series Equivalent Large-Signal Impedance Parameters
- Internal Matching Network Optimized for Minimum Gain Frequency Slope Response Over the Range 136 to 175 MHz
- Load Mismatch Capability at Rated P_{out} and Supply Voltage

MRF247

**75 W, 175 MHz
CONTROLLED Q
RF POWER
TRANSISTOR
NPN SILICON**



CASE 316-01, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	18	Vdc
Collector-Base Voltage	V_{CBO}	36	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Peak	I_C	20	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ (1) Derate above 25°C	P_D	250 1.43	Watts W/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (2)	$R_{\theta JC}$	0.7	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 100 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mAdc}$, $V_{BE} = 0$)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \text{ mAdc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc

- (1) This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.
(2) Thermal Resistance is determined under specified RF operating conditions by infrared measurement techniques.



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

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

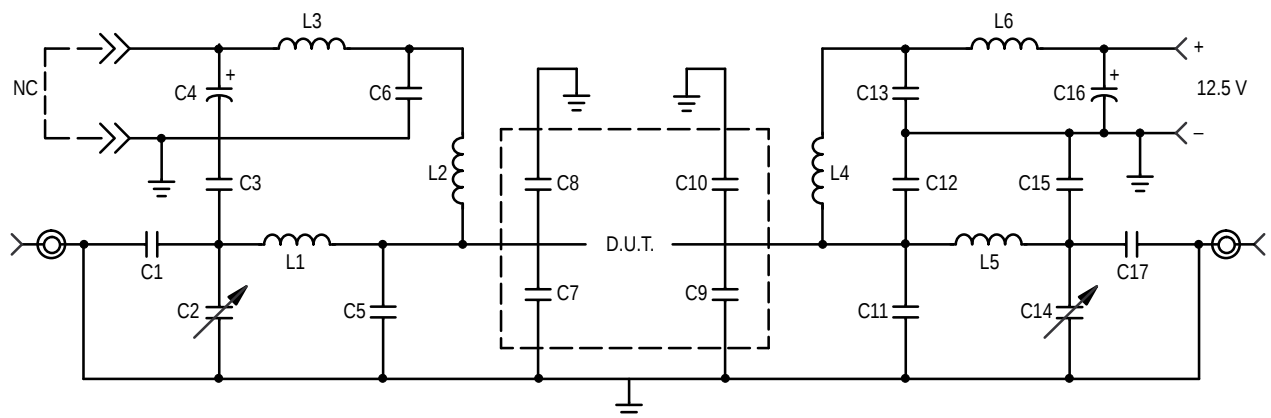
DC Current Gain ($I_C = 5.0\text{ Adc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	10	75	150	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 15\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	235	300	pF
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FUNCTIONAL TESTS

Common-Emitter Amplifier Power Gain ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 75\text{ Watts}$, $f = 175\text{ MHz}$)	G_{PE}	7.0	8.5	—	dB
Collector Efficiency ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 75\text{ Watts}$, $f = 175\text{ MHz}$)	η	55	60	—	%
Load Mismatch ($V_{CC} = 12.5\text{ Vdc}$, $P_{out} = 75\text{ Watts}$, $f = 175\text{ MHz}$, $VSWR = 30:1$ All Phase Angles)	ψ	No Degradation in Output Power			



C1, C17 330 pF ATC 100 mil Ceramic Capacitor
 C2, C14 Johansen 1–20 pF Trimmer Capacitor
 C3 40 pF Standard Unelco Clamped Mica Capacitor
 C4, C16 Sprague 10 μF – 35 Vdc Electrolytic Capacitor
 C5 80 pF Standard Unelco Clamped Mica Capacitor
 C6, C13 91 pF Mini–Unelco Clamped Mica Capacitor
 C7, C8 240 pF ATC 100 mil Ceramic Capacitor
 C9, C10 180 pF ATC 100 mil Ceramic Capacitor

C11 150 pF Standard Unelco Clamped Mica Capacitor
 C12 33 pF Mini–Unelco Clamped Mica Capacitor
 C15 27 pF Mini–Unelco Clamped Mica Capacitor
 L1 2 Turns, 16 AWG Enameled, IDIA 0.13"
 L2, L4 4 Turns, 18 AWG Enameled, IDIA 0.18"
 L3, L6 VK 200 with Ferrite Bead
 L5 2 Turns, 16 AWG Enameled, IDIA 0.15"

Figure 1. Output Power versus Input Power

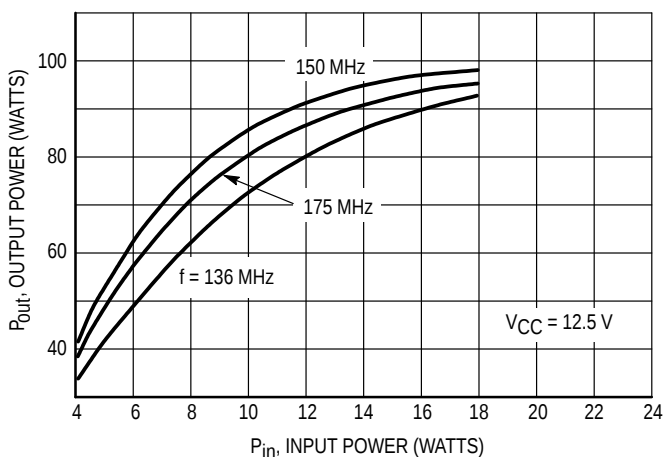


Figure 2. Output Power versus Input Power

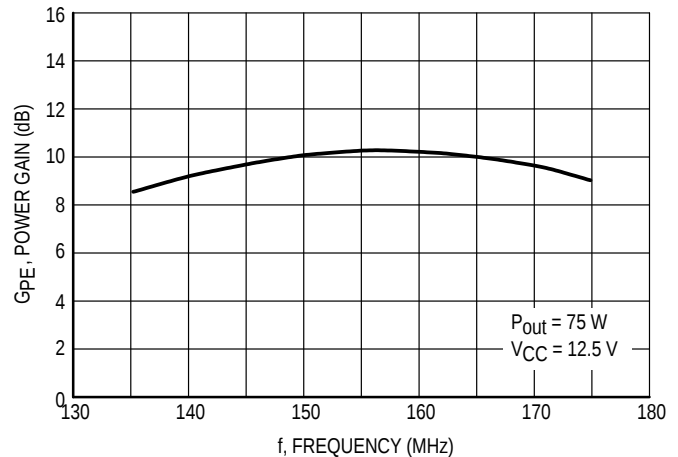


Figure 3. Power Gain versus Frequency

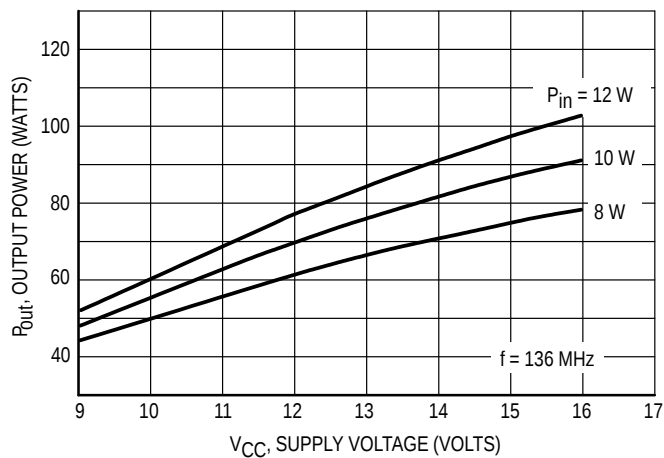


Figure 4. Output Power versus Supply Voltage

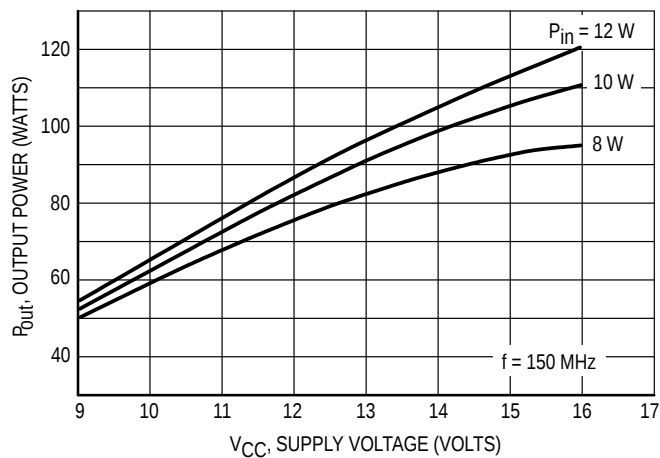


Figure 5. Output Power versus Supply Voltage

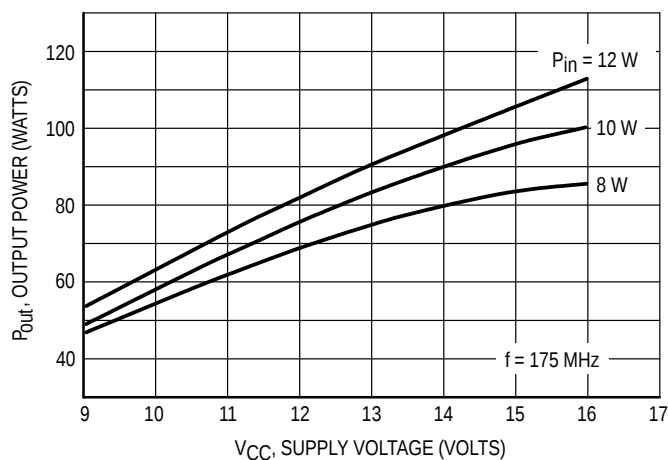


Figure 6. Output Power versus Supply Voltage

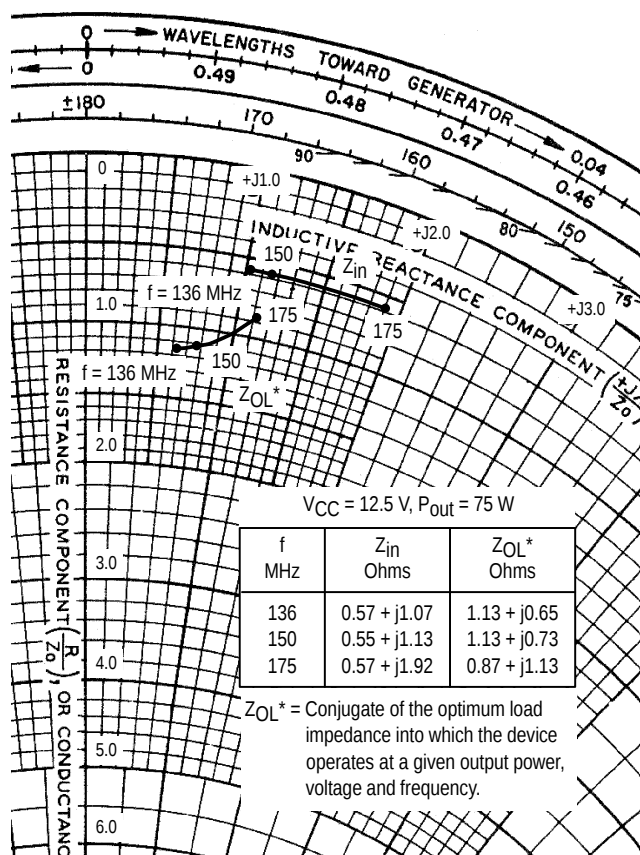
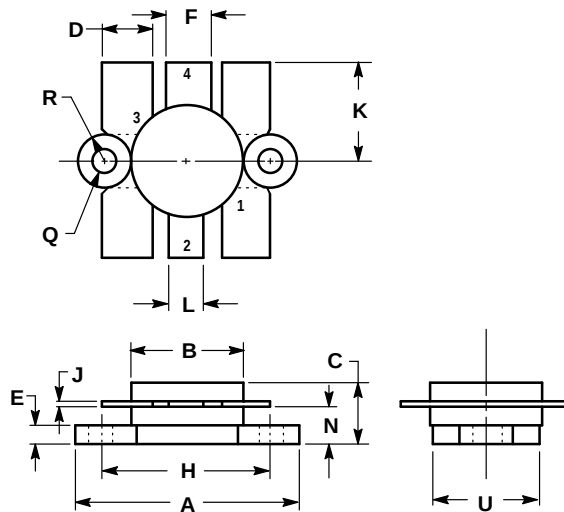


Figure 7. Series Equivalent Impedances

PACKAGE DIMENSIONS



NOTES:

1. FLANGE IS ISOLATED IN ALL STYLES.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	24.38	25.14	0.960	0.990
B	12.45	12.95	0.490	0.510
C	5.97	7.62	0.235	0.300
D	5.33	5.58	0.210	0.220
E	2.16	3.04	0.085	0.120
F	5.08	5.33	0.200	0.210
H	18.29	18.54	0.720	0.730
J	0.10	0.15	0.004	0.006
K	10.29	11.17	0.405	0.440
L	3.81	4.06	0.150	0.160
N	3.81	4.31	0.150	0.170
Q	2.92	3.30	0.115	0.130
R	3.05	3.30	0.120	0.130
U	11.94	12.57	0.470	0.495

STYLE 1:

- PIN 1. EMITTER
2. COLLECTOR
3. EMITTER
4. BASE

CASE 316-01 ISSUE D

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