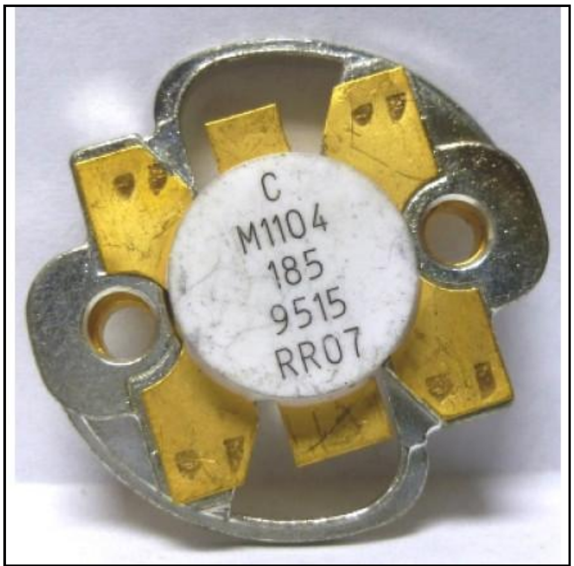
MRF247

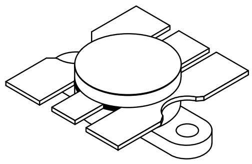
75 W, 175 MHz
CONTROLLED Q
RF POWER
TRANSISTOR
NPN SILICON



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



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°C (1) Derate above 25°C	P_D	250 1.43	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

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

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

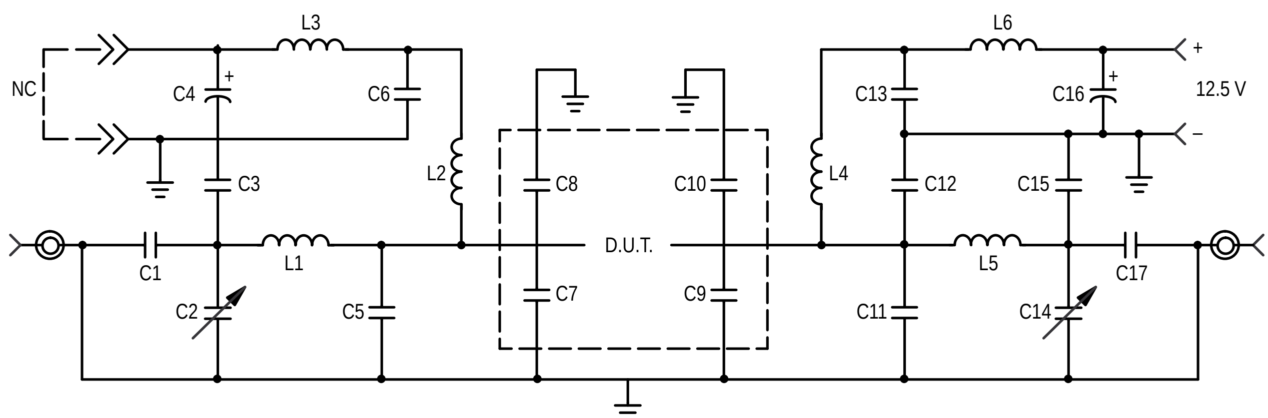
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, I_B = 0)	$V_{(BR)CEO}$	18	—	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 50 mAdc, V_{BE} = 0)	$V_{(BR)CES}$	36	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	$V_{(BR)EBO}$	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°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = 5.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	10	75	150	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 15 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	—	235	300	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 12.5 Vdc, P_{out} = 75 Watts, f = 175 MHz)	G_{PE}	7.0	8.5	—	dB
Collector Efficiency (V_{CC} = 12.5 Vdc, P_{out} = 75 Watts, f = 175 MHz)	η	55	60	—	%
Load Mismatch (V_{CC} = 12.5 Vdc, P_{out} = 75 Watts, f = 175 MHz, VSWR = 30:1 All Phase Angles)	ψ	No Degradation in Output Power			



C1, C17	330 pF ATC 100 mil Ceramic Capacitor	C11	150 pF Standard Unelco Clamped Mica Capacitor
C2, C14	Johansen 1–20 pF Trimmer Capacitor	C12	33 pF Mini–Unelco Clamped Mica Capacitor
C3	40 pF Standard Unelco Clamped Mica Capacitor	C15	27 pF Mini–Unelco Clamped Mica Capacitor
C4, C16	Sprague 10 µF – 35 Vdc Electrolytic Capacitor	L1	2 Turns, 16 AWG Enameled, IDIA 0.13″
C5	80 pF Standard Unelco Clamped Mica Capacitor	L2, L4	4 Turns, 18 AWG Enameled, IDIA 0.18″
C6, C13	91 pF Mini–Unelco Clamped Mica Capacitor	L3, L6	VK 200 with Ferrite Bead
C7, C8	240 pF ATC 100 mil Ceramic Capacitor	L5	2 Turns, 16 AWG Enameled, IDIA 0.15″
C9, C10	180 pF ATC 100 mil Ceramic Capacitor		

Figure 1. Output Power versus Input Power

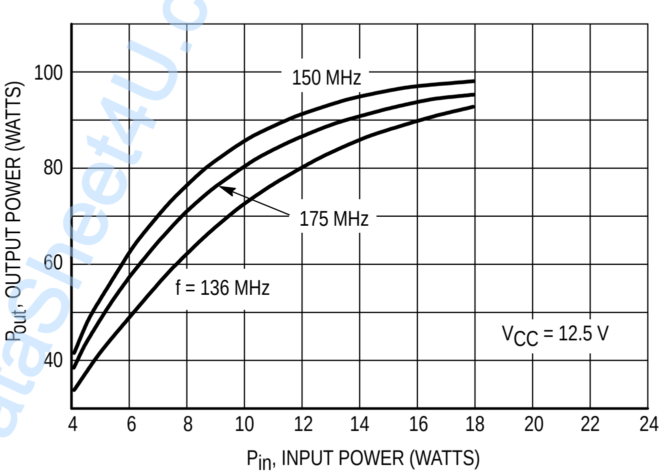


Figure 2. Output Power versus Input Power

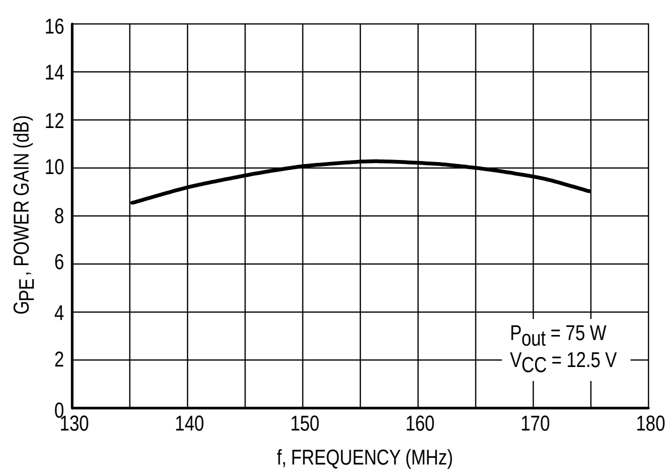


Figure 3. Power Gain versus Frequency

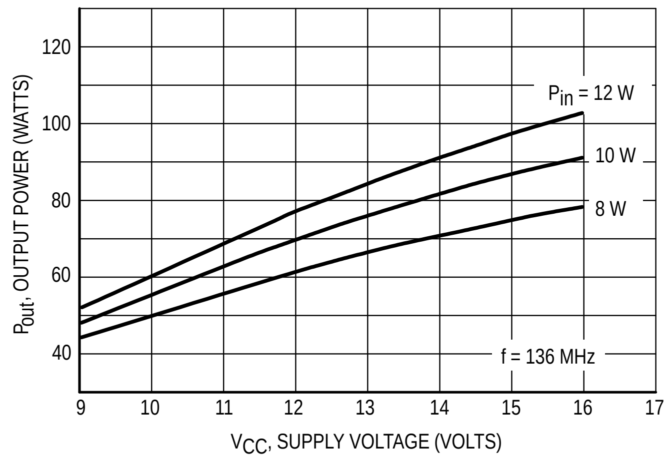


Figure 4. Output Power versus Supply Voltage

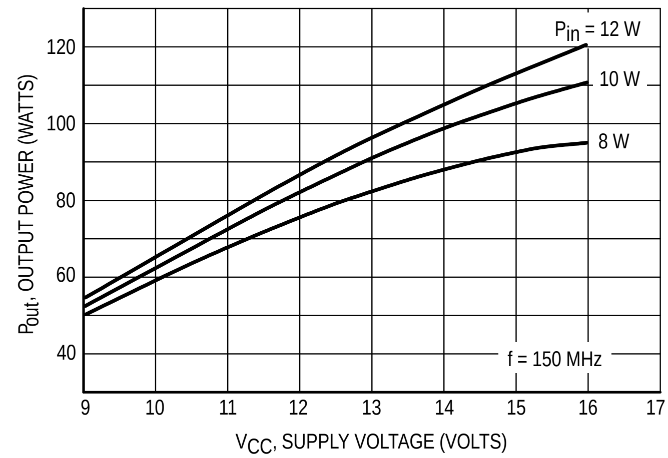


Figure 5. Output Power versus Supply Voltage

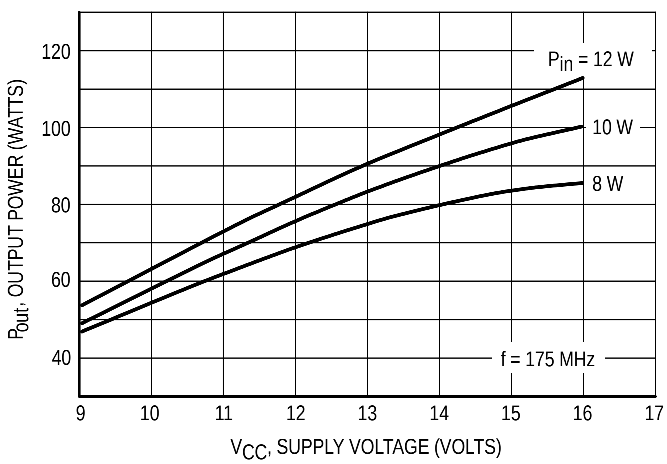


Figure 6. Output Power versus Supply Voltage