



MRF485

The RF Line

15 W (PEP) – 15 W (CW) – 30 MHz

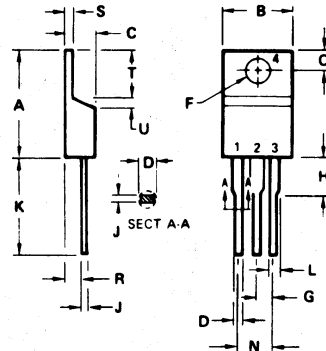
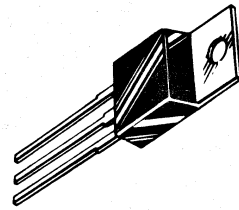
RF POWER TRANSISTOR

NPN SILICON

NPN SILICON RF POWER TRANSISTOR

...designed primarily for use in single sideband linear amplifier output applications and other communications equipment operating to 30 MHz.

- Characterized for Single Sideband and Large-Signal Amplifier Applications Utilizing Low-Level Modulation
- Specified 28 V, 30 MHz Characteristics –
 Output Power = 15 W (PEP)
 Minimum Efficiency = 40% (SSB)
 Minimum Power Gain = 10 dB (PEP & CW)



STYLE 1:
 PIN 1. BASE
 2. COLLECTOR
 3. EMITTER
 4. COLLECTOR

NOTE:
 DIM. L & H APPLIES TO ALL LEADS.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	15.11	15.75	0.595	0.620
B	9.78	10.03	0.385	0.395
C	4.06	4.82	0.160	0.190
D	0.64	0.89	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.41	2.67	0.095	0.105
H	2.79	3.30	0.110	0.130
J	0.36	0.56	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.14	1.27	0.045	0.050
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.14	1.39	0.045	0.055
T	5.97	6.48	0.235	0.255
U	0.76	1.27	0.030	0.050

CASE 221A-02
 TO-220AB

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	35	Vdc
Collector-Base Voltage	V_{CBO}	65	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current – Continuous	I_C	1.0	Adc
Total Device Dissipation @ $T_C = 50^\circ\text{C}$ (1) Derate above 50°C	P_D	30 0.3	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	$R_{\theta JC}$	3.33	$^\circ\text{C}/\text{W}$

(1) These devices are designed for RF operation. The total device dissipation rating applies only when the devices are operated as RF amplifiers.

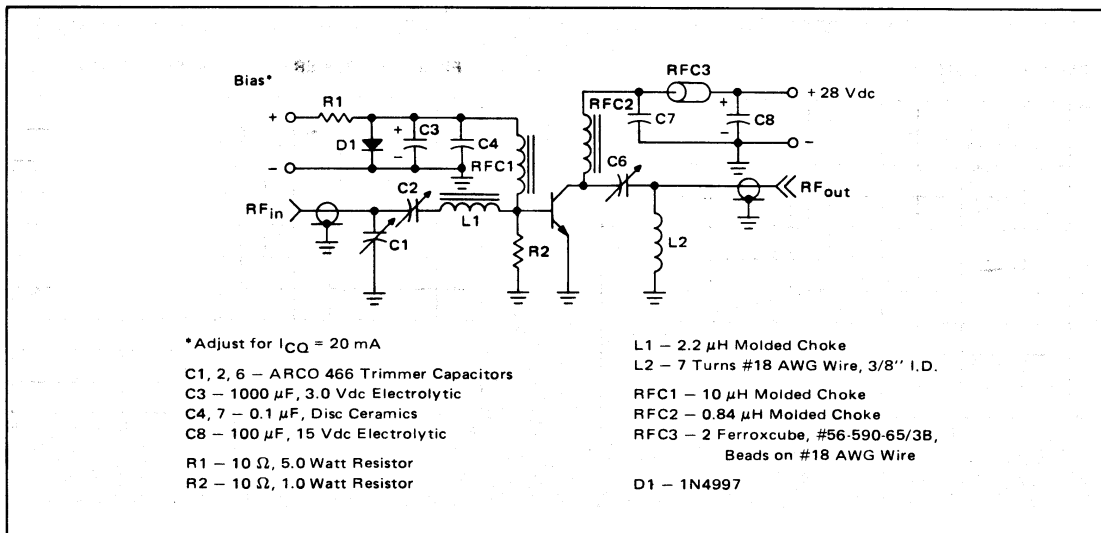
MRF485

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 20 \text{ mAdc}, I_B = 0$)	BV_{CEO}	35	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 50 \text{ mAdc}, V_{BE} = 0$)	BV_{CES}	60	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 5.0 \text{ mAdc}, I_C = 0$)	BV_{EBO}	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 25 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	—	1.0	mAdc
Collector-Cutoff Current ($V_{CE} = 28 \text{ Vdc}, V_{BE} = 0$)	I_{CES}	—	—	5.0	mAdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 500 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	10	30	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance ($V_{CB} = 28 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{ob}	—	85	100	pF
FUNCTIONAL TESTS (SSB)					
Common-Emitter Amplifier Power Gain ($V_{CC} = 28 \text{ Vdc}, P_{out} = 15 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 20 \text{ mA}$)	G_{pE}	10	13	—	dB
Collector Efficiency ($V_{CC} = 28 \text{ Vdc}, P_{out} = 15 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 20 \text{ mA}$)	η	40	—	—	%
Intermodulation Distortion (1) ($V_{CC} = 28 \text{ Vdc}, P_{out} = 15 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, I_{CQ} = 20 \text{ mA}$)	$IMD(d3)$	—	-35	-30	%
Load Mismatch ($V_{CC} = 28 \text{ Vdc}, P_{out} = 15 \text{ W (PEP)}, f_1 = 30 \text{ MHz}, f_2 = 30.001 \text{ MHz}, VSWR = 30:1 \text{ All Angles}$)	↓	No Degradation in Output Power			

(1) To MIL-STD-1311 Version A, Test Method 2204B, Two Tone, Reference Each Tone.

FIGURE 1 – COMMON-EMITTER TEST CIRCUIT



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FIGURE 2 – OUTPUT POWER versus INPUT POWER

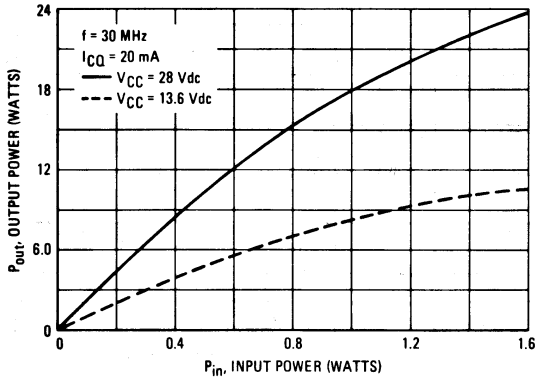


FIGURE 3 – INTERMODULATION DISTORTION versus OUTPUT POWER

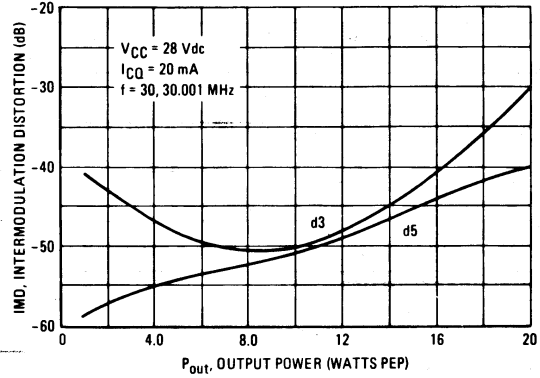


FIGURE 4 – OUTPUT POWER versus SUPPLY VOLTAGE

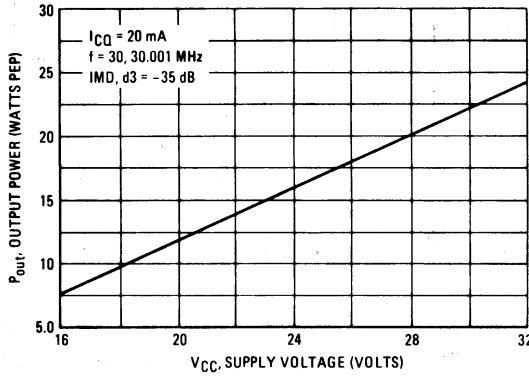


FIGURE 5 – OUTPUT CAPACITANCE versus FREQUENCY

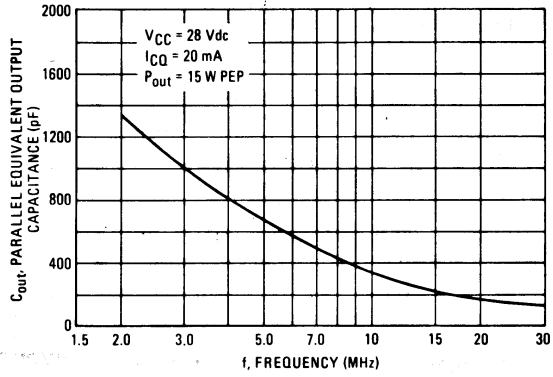


FIGURE 6 – OUTPUT RESISTANCE versus FREQUENCY

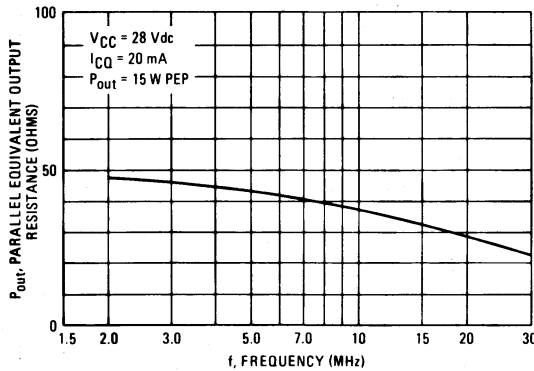


FIGURE 7 – POWER GAIN versus FREQUENCY

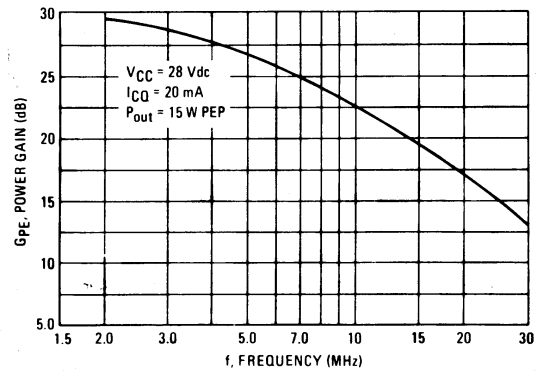


FIGURE 8 – SERIES EQUIVALENT INPUT IMPEDANCE

