MOTOROLA

MRF426
MRF426A

The RF Line

3

NPN SILICON RF POWER TRANSISTOR

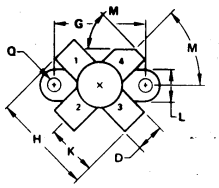
. . . designed for high gain driver and output linear amplifier stages in 1.5 to 30 MHz HF/SSB equipment.

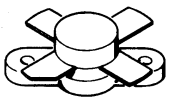
- Specified 28 Volt, 30 MHz Characteristics –
  Output Power = 25 W (PEP)
  Minimum Gain = 22 dB
  Efficiency = 35%
- Intermodulation Distortion @ 25 W (PEP) –
  IMD = –30 dB (Max)
- 100% Tested for Load Mismatch at All Phase Angles With 30:1 VSWR
- Class A and AB Characterization
- BLX 13 Equivalent

25 W (PEP) – 30 MHz

RF POWER TRANSISTOR

NPN SILICON





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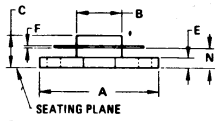


STYLE 1:
PIN 1. EMITTER
2. BASE
3. EMITTER
4. COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	24.64	24.89	0.970	0.980
B	9.40	9.91	0.370	0.390
C	5.82	7.14	0.229	0.281
D	5.46	5.97	0.215	0.235
E	2.16	2.67	0.085	0.105
F	0.10	0.15	0.004	0.006
G	18.29	18.54	0.720	0.730
H	20.07	20.57	0.790	0.810
K	10.03	10.29	0.395	0.405
L	6.22	6.48	0.245	0.255
M	40°	50°	40°	50°
N	3.81	4.57	0.150	0.180
Q	2.87	3.30	0.113	0.130

CASE 211-07

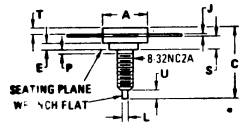
MAXIMUM RATINGS

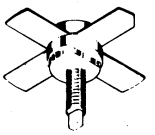
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	35	Vdc
Collector-Base Voltage	V_{CBO}	65	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current – Continuous	I_C	3.0	Adc
Withstand Current – 5 s	–	6.0	Adc
Total Device Dissipation @ T_C = 25°C (1) Derate above 25°C	P_D	70 0.4	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.5	°C/W

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





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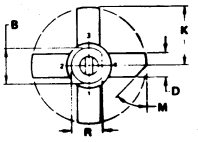


STYLE 1:
PIN 1 EMITTER
2 BASE
3 EMITTER
4 COLLECTOR

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	–	9.78	0.370	0.385
B	–	8.38	0.320	0.330
C	–	20.07	0.670	0.790
D	–	5.97	0.215	0.235
E	–	–	0.070	–
J	0.08	0.18	0.003	0.007
K	12.45	–	0.490	–
L	1.40	1.78	0.055	0.070
M	45° NOM		45° NOM	
P	–	1.27	–	0.050
R	7.59	7.80	0.299	0.307
S	4.01	4.52	0.158	0.178
T	2.11	2.54	0.083	0.100
U	2.49	3.35	0.098	0.132

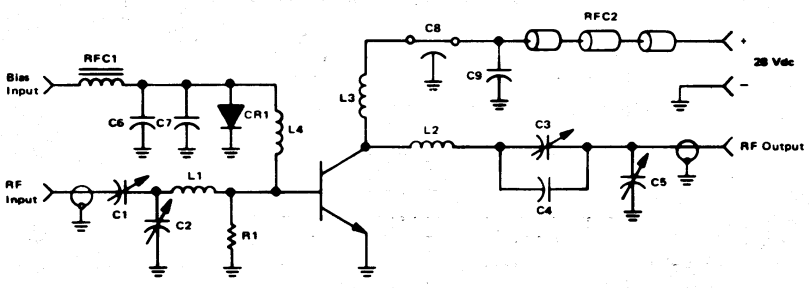
CASE 145A-09

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 50 mAdc, I_B = 0)	BV_{CEO}	35	–	–	Vdc
Collector-Base Breakdown Voltage (I_C = 50 mAdc, I_E = 0)	BV_{CBO}	65	–	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	BV_{EBO}	4.0	–	–	Vdc
Collector Cutoff Current (V_{CE} = 28 Vdc, V_{BE} = 0)	I_{CES}	–	–	10	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 5.0 Vdc	h_{FE}	10	35	–	–
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 30 Vdc, I_E = 0, f = 1.0 MHz)	C_{ob}	–	60	80	pF
FUNCTIONAL TESTS (SSB)					
Common-Emitter Amplifier Gain (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	G_{PE}	22	25	–	dB
Collector Efficiency (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	η	35	–	–	%
Intermodulation Distortion (1) (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA)	$IMD_{(d3)}$	–	–35	–30	dB
Load Mismatch (V_{CC} = 28 Vdc, P_{out} = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 25 mA, VSWR 30:1 at All Phase Angles		No Degradation in Output Power			
CLASS A PERFORMANCE					
Intermodulation Distortion (1) and Power Gain (V_{CC} = 28 Vdc, P_{out} = 8 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I_{CQ} = 1.2 Adc)	G_{PE} $IMD_{(d3)}$ $IMD_{(d5)}$	– – –	23.5 –40 –55	– – –	dB

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

FIGURE 1 – 30 MHz LINEAR TEST CIRCUIT



C1, C2 – ARCO 469 190-780 pF
C3, C4 – ARCO 464 25-280 pF
C5 – 120 pF Dipped Mica
C6, C7 – 100 µF 15 Vdc
C8 – 680 pF F.T. Allen Bradley
C9 – 1.0 µF 35 V Tantalum

CR1 – IN4997

L1 – 3 Turns #16 0.25" ID
L2 – 6 Turns #16 0.5" ID
L3 – 7 Turns #20 0.38" ID
L4 – 10 µH Molded Choke Delevan

RFC1 – Ferroxcube VK200/20-4B
RFC2 – 3-Ferroxcube 5653065-3B
RF – Input/Output Connectors UG83 A/µ
R1 – 10 Ω 1/2 Watt 10%

Adjust Bias (Base) for I_{CQ} = 20 mA with No RF Applied

FIGURE 2 – OUTPUT POWER versus INPUT POWER

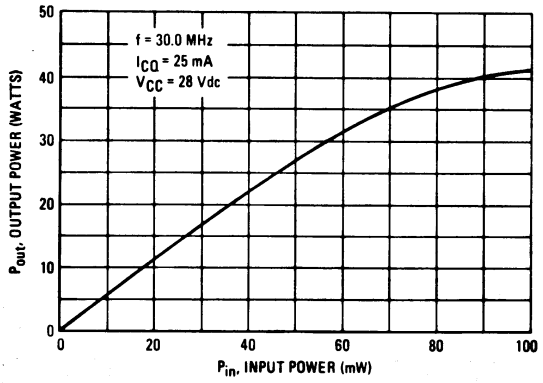


FIGURE 3 – OUTPUT POWER versus SUPPLY VOLTAGE

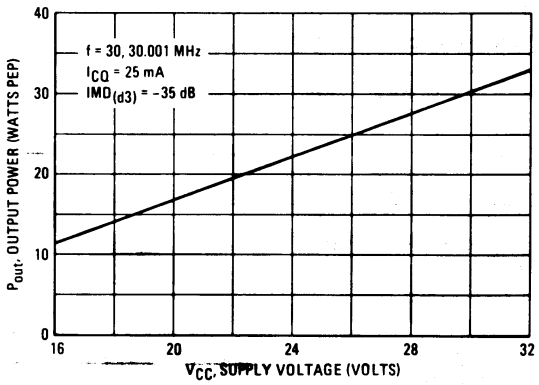


FIGURE 4 – POWER GAIN versus FREQUENCY

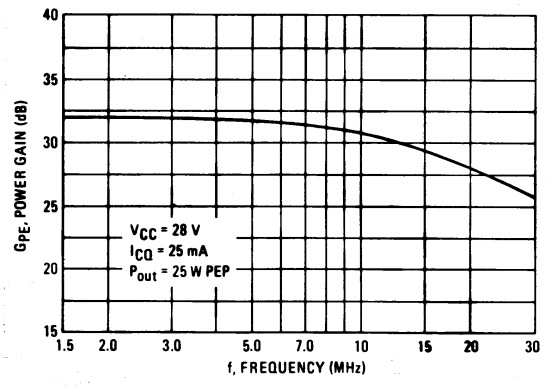


FIGURE 5 – INTERMODULATION DISTORTION versus OUTPUT POWER

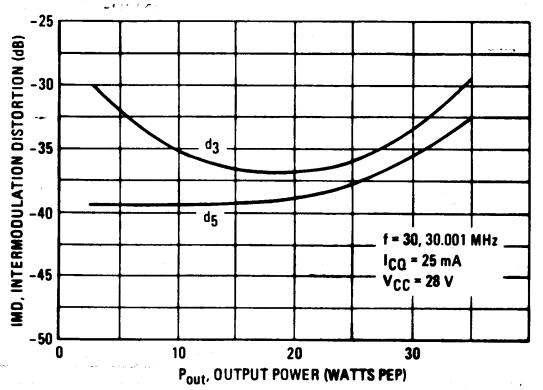


FIGURE 6 – DC SAFE OPERATING AREA

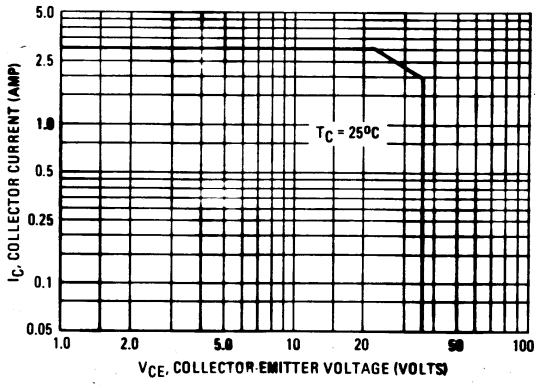


FIGURE 7 – OUTPUT CAPACITANCE versus FREQUENCY

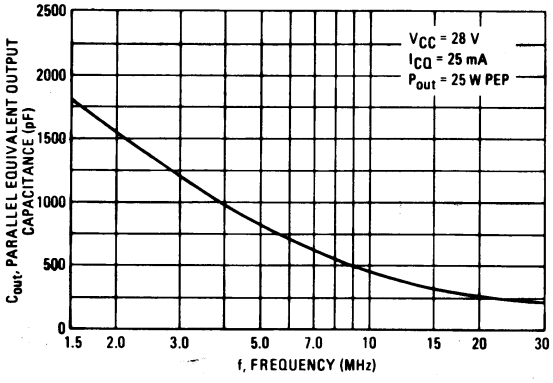


FIGURE 8 – OUTPUT RESISTANCE versus FREQUENCY

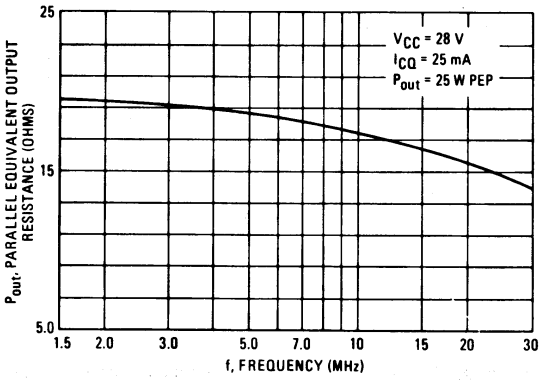


FIGURE 9 – SERIES EQUIVALENT INPUT IMPEDANCE