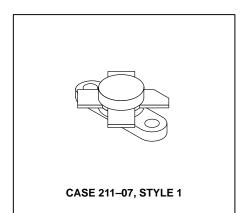
# The RF Line NPN Silicon RF Power Transistor

... 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

# **MRF426**

25 W (PEP), 30 MHz RF POWER TRANSISTOR NPN SILICON



#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	VCEO	35	Vdc
Collector–Base Voltage	V <sub>СВО</sub>	65	Vdc
Emitter–Base Voltage	V <sub>EBO</sub>	4.0	Vdc
Collector Current — Continuous	IC	3.0	Adc
Withstand Current — 5 s	_	6.0	Adc
Total Device Dissipation @ T <sub>C</sub> = 25°C (1) Derate above 25°C	PD	70 0.4	Watts W/°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

### THERMAL CHARACTERISTICS

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

# **ELECTRICAL CHARACTERISTICS** (T<sub>C</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 50 mAdc, I <sub>B</sub> = 0)	V <sub>(BR)</sub> CEO	35	_	_	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = 50 mAdc, I <sub>E</sub> = 0)	V(BR)CBO	65	_	_	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 mAdc, I <sub>C</sub> = 0)	V(BR)EBO	4.0	_	_	Vdc
Collector Cutoff Current (V <sub>CE</sub> = 28 Vdc, V <sub>BE</sub> = 0)	ICES	_	_	10	mAdc

NOTE: (continued)

1. This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.

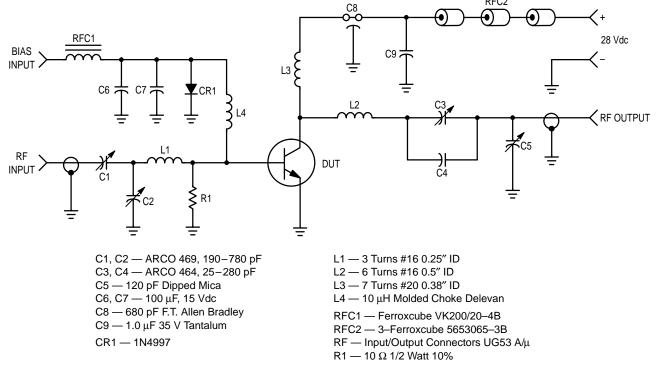


# **ELECTRICAL CHARACTERISTICS** — **continued** ( $T_C = 25$ °C unless otherwise noted.)

Characteristic	Symbol	Min	Тур	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 5.0 Vdc)	hFE	10	35	_	_
DYNAMIC CHARACTERISTICS					
Output Capacitance (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	_	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)	GPE	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 (2) ( $V_{CC} = 28 \text{ Vdc}$ , $P_{out} = 25 \text{ W}$ (PEP), f1 = 30 MHz, f2 = 30.001 MHz, $I_{CQ} = 25 \text{ mA}$ )	IMD <sub>(d3)</sub>	_	-35	-30	dB
Load Mismatch (V <sub>CC</sub> = 28 Vdc, P <sub>Out</sub> = 25 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I <sub>CQ</sub> = 25 mA, VSWR 30:1 at All Phase Angles)	Ψ	No Degradation in Output Power			
CLASS A PERFORMANCE					
Intermodulation Distortion (2) and Power Gain (V <sub>CC</sub> = 28 Vdc, P <sub>out</sub> = 8.0 W (PEP), f1 = 30 MHz, f2 = 30.001 MHz, I <sub>CQ</sub> = 1.2 Adc)	GPE IMD(d3) IMD(d5)		23.5 -40 -55		dB

#### NOTE:

<sup>2.</sup> To Mil-Std-1311 Version A, Test Method 2204B, Two Tone, Reference each Tone.



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

Figure 1. 30 MHz Linear Test Circuit

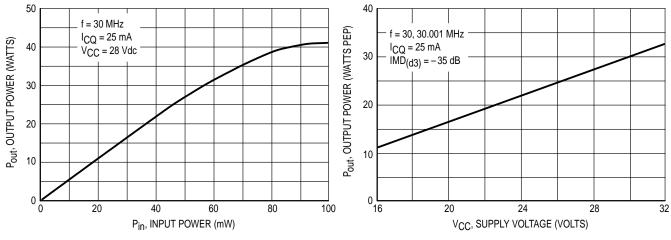


Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Supply Voltage

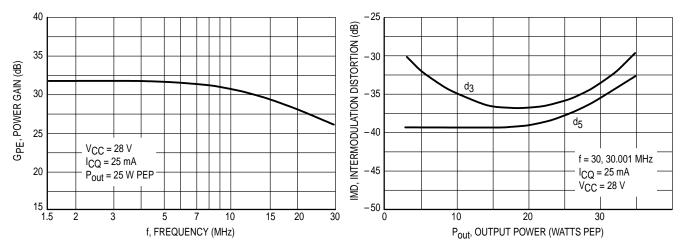


Figure 4. Power Gain versus Frequency

Figure 5. Intermodulation Distortion versus Output Power

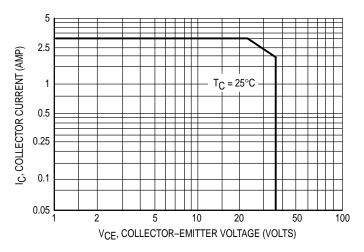


Figure 6. DC Safe Operating Area

MOTOROLA RF DEVICE DATA **MRF426** 

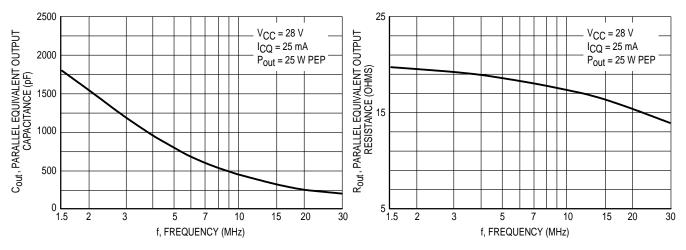


Figure 7. Output Capacitance versus Frequency

Figure 8. Output Resistance versus Frequency

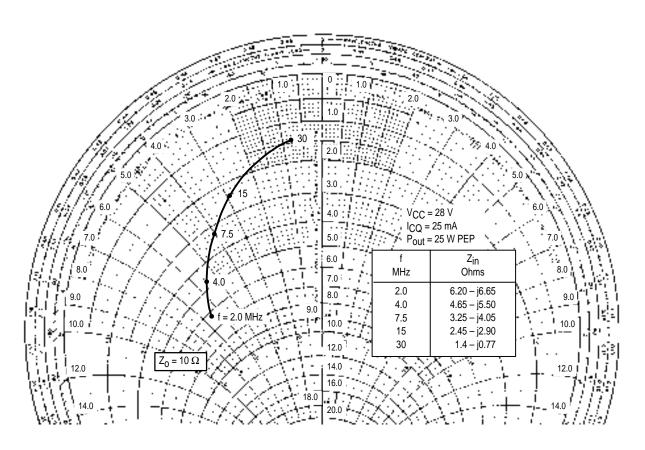
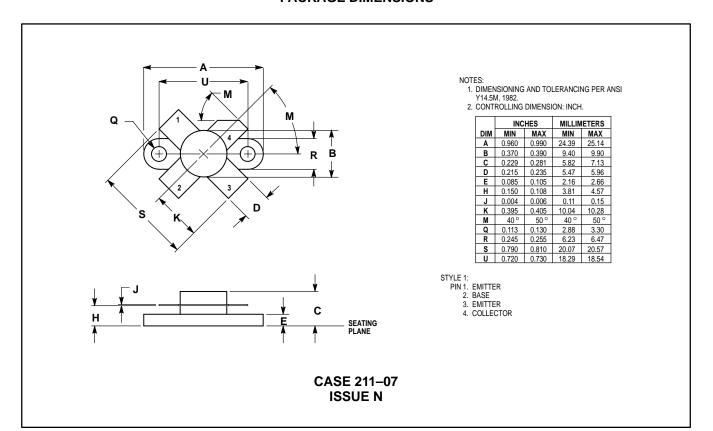


Figure 9. Series Equivalent Input Impedance

## **PACKAGE DIMENSIONS**



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