

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
MM4019
The RF Line
PNP SILICON HIGH FREQUENCY TRANSISTOR

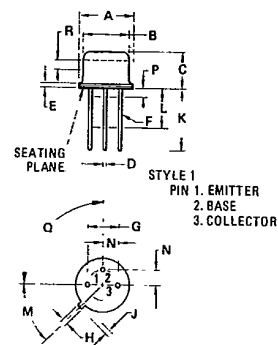
... designed for amplifier and oscillator applications in military and industrial equipment. Suitable for use as output, driver or pre-driver stages in UHF and VHF equipment.

- Specified 175 MHz, 28 Vdc Characteristics —
 Output Power = 2.5 Watts
 Efficiency = 50%

2.5 W — 175 MHz
HIGH FREQUENCY
TRANSISTOR
PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CB}	60	Vdc
Emitter-Base Voltage	V_{EB}	4.0	Vdc
Collector Current — Continuous	I_C	1.0	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	5.0 28.6	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.406	0.533	0.016	0.021
E	0.229	3.18	0.009	0.125
F	0.406	0.483	0.016	0.019
G	4.83	5.33	0.190	0.210
H	0.711	0.864	0.028	0.034
J	0.737	1.02	0.029	0.040
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° NOM	—	45° NOM	—
P	—	1.27	—	0.050
Q	90° NOM	—	90° NOM	—
R	2.54	—	0.100	—

All JEDEC dimensions and notes apply.

 CASE 79-02
 TO-39

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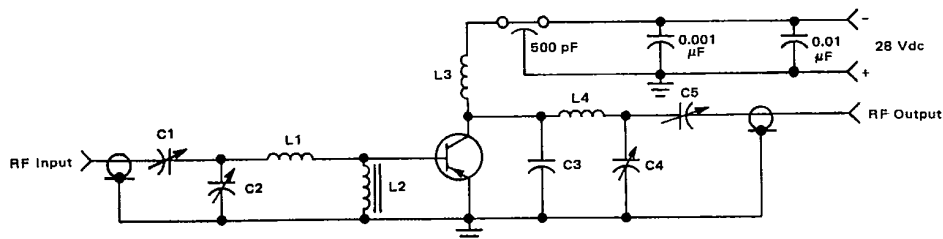
MM4019

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 10 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	40	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10 \text{ mAdc}$, $I_E = 0$)	$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 0.1 \text{ Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 30 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	—	0.1	mAdc
Emitter Cutoff Current ($V_{BE} = 4.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	—	0.1	mAdc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 250 \text{ mAdc}$, $V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	10	—	—	—
Collector-Emitter Saturation Voltage ($I_C = 250 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$)	$V_{CE(sat)}$	—	—	1.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product ($I_C = 100 \text{ mAdc}$, $V_{CE} = 28 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	—	750	—	MHz
Output Capacitance ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{ob}	—	7.5	—	pF
FUNCTIONAL TEST					
Power Input ($P_{out} = 2.5 \text{ W}$, $V_{CC} = 28 \text{ Vdc}$, $f = 175 \text{ MHz}$)	P_{in}	—	—	0.25	Watt
Power Output ($P_{in} = 0.5 \text{ W}$, $V_{CC} = 28 \text{ Vdc}$, $f = 400 \text{ MHz}$)	P_{out}	—	2.0	—	Watts
Collector Efficiency ($P_{out} = 2.5 \text{ W}$, $V_{CC} = 28 \text{ Vdc}$, $f = 175 \text{ MHz}$)	η	50	—	—	%

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FIGURE 1 — 175 MHz TEST CIRCUIT



- C1,C2 3.0-30 pF, ARCO 461 or equivalent.
 C3 40 pF
 C4,C5 5.0-80 pF, ARCO 462 or equivalent.
 L1 80 nH, 3 Turns #18 AWG, 1/4" I.D., 1/4" Length
 L2 Ferrite Choke, VK-200 Ferroxcube, $Q < 5$
 L3 0.15 μ H, RF Choke
 L4 27 nH, 2 Turns #18 AWG, 1/4" I.D., 3/8" Length