

MM8009

CASE 79-02, STYLE 1
TO-39 (TO-205AD)

HIGH FREQUENCY TRANSISTOR

NPN SILICON



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	35	Vdc
Collector-Base Voltage	V_{CB0}	45	Vdc
Emitter-Base Voltage	V_{EB0}	3.0	Vdc
Collector Current — Continuous	I_C	400	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 5.71	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	3.5 20	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 15 \text{ Vdc}, I_B = 0$)	I_{CEO}	—	—	100	μAdc
Collector Cutoff Current ($V_{CE} = 35 \text{ Vdc}, V_{BE} = 0$)	I_{CES}	—	—	10	μAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 100 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	20	—	—	—
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SMALL SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = 50 \text{ mAdc}, V_{CE} = 15 \text{ Vdc}, f = 100 \text{ MHz}$)	f_T	1000	—	—	MHz
Output Capacitance ($V_{CB} = 30 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{obo}	—	2.3	3.0	pF

FUNCTIONAL TEST

Power Output (Figure 1) ($P_{in} = 316 \text{ mW}, V_{CE} = 28 \text{ Vdc}, f = 1.0 \text{ GHz}$)	P_{out}	0.9	—	—	Watt
Power Output (Oscillator) (Figure 2) ($V_{CE} = 20 \text{ Vdc}, V_{EB} = 1.5 \text{ Vdc}, f = 1.68 \text{ GHz}$) (Minimum Efficiency = 15%)	P_{out}	—	0.3	—	Watt
Collector Efficiency ($P_{in} = 316 \text{ mW}, V_{CE} = 28 \text{ Vdc}, f = 1.0 \text{ GHz}$)	η	35	—	—	%

FIGURE 1 - 1.0 GHz POWER AMPLIFIER TEST CIRCUIT

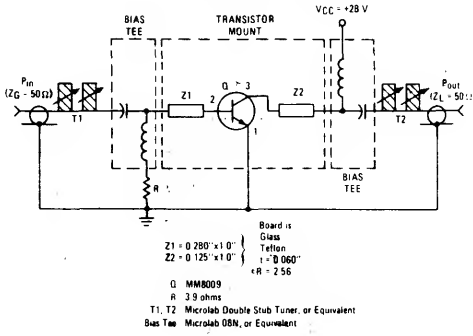


FIGURE 2 - 1.68 GHz POWER OSCILLATOR TEST CIRCUIT

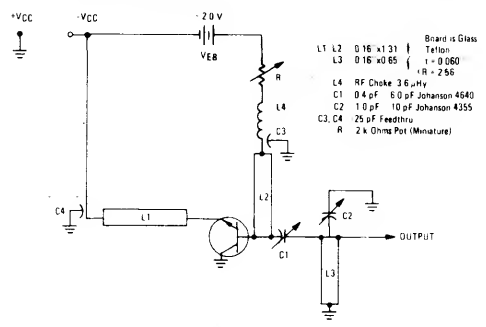


FIGURE 3 - POWER OUTPUT versus POWER INPUT

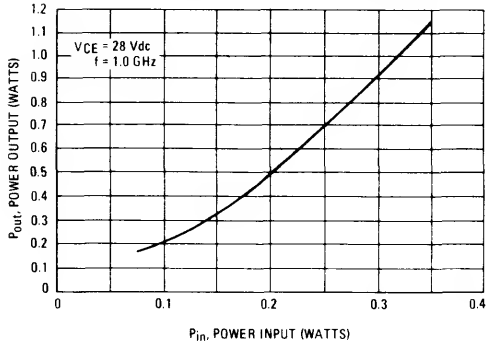


FIGURE 4 - POWER OUTPUT versus FREQUENCY

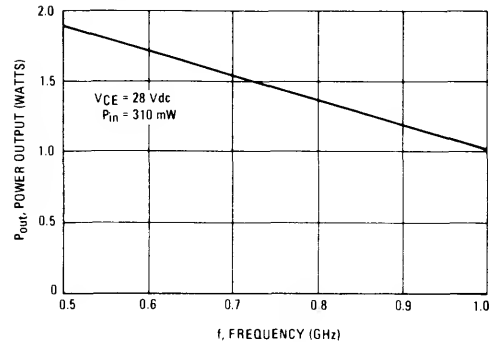


FIGURE 5 - POWER OUTPUT versus VOLTAGE

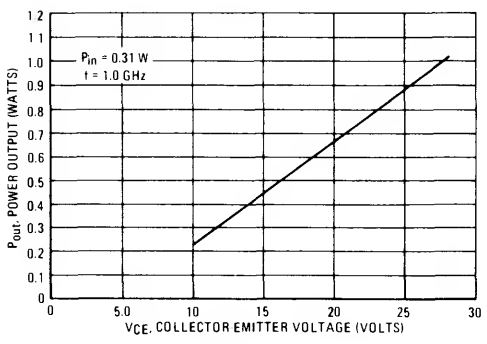
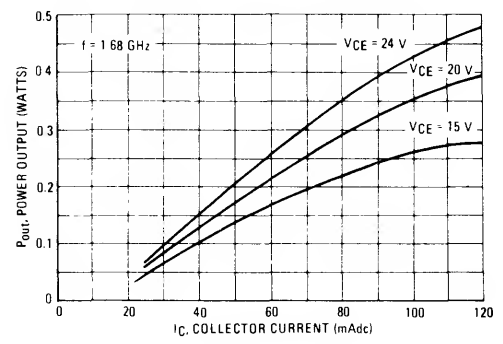


FIGURE 6 - OSCILLATOR POWER OUTPUT versus CURRENT



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FIGURE 7 – CURRENT-GAIN-BANDWIDTH PRODUCT

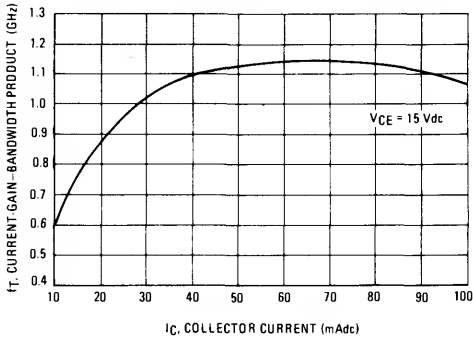


FIGURE 8 – OUTPUT CAPACITANCE versus VOLTAGE

