

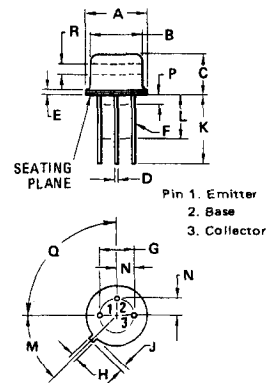
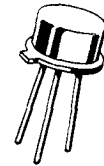
MM8009 (SILICON)

NPN SILICON RF POWER TRANSISTOR

... designed for amplifier, frequency multiplier, or oscillator applications in military and industrial equipment. Suitable for use as output, driver, or pre-driver stages in UHF equipment and as a fundamental frequency oscillator at 1.68 GHz.

- High Output Power – $P_{out} = 0.9$ Watt (Min) @ $f = 1.0$ GHz
- High Current-Gain-Bandwidth Product –
 $f_T = 1000$ MHz (Min) @ $I_C = 50$ mAdc
- Ideal for Radio Sonde Applications –
 P_{out} (Oscillator) = 300 mW (Typ) @ $f = 1.68$ GHz

NPN SILICON RF POWER TRANSISTOR



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	50	Vdc
Collector-Base Voltage	V_{CB}	55	Vdc
Emitter-Base Voltage	V_{EB}	3.0	Vdc
Collector Current – Continuous	I_C	400	mAdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	3.5 20	Watt 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-38

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

	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{A dc}$, $I_E = 0$)	BV_{CBO}	55	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{A dc}$, $I_C = 0$)	BV_{EBO}	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = 15 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	—	100	$\mu\text{A dc}$
Collector Cutoff Current ($V_{CE} = 50 \text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	—	—	10	$\mu\text{A dc}$
ON CHARACTERISTICS					
Collector-Emitter Saturation Voltage ($I_C = 100 \text{ mA dc}$, $I_B = 10 \text{ mA dc}$)	$V_{CE(sat)}$	—	—	0.5	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product ($I_C = 50 \text{ mA dc}$, $V_{CE} = 15 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	1000	—	—	MHz
Output Capacitance ($V_{CB} = 30 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}	—	1.8	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

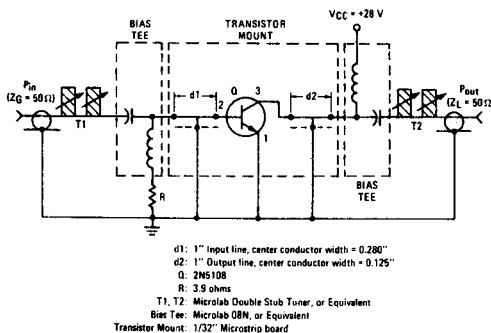
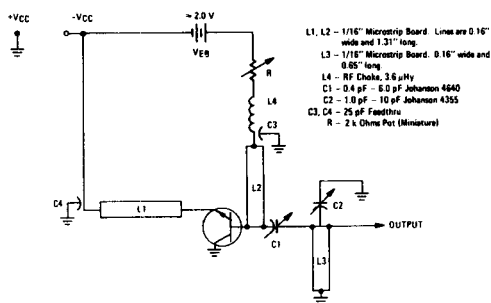


FIGURE 2 — 1.68 GHz POWER OSCILLATOR TEST CIRCUIT



MM8009 (continued)

FIGURE 3 – POWER OUTPUT versus POWER INPUT

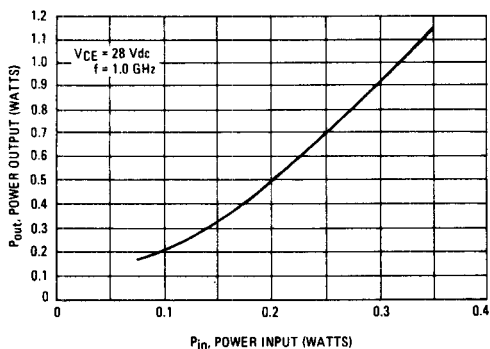


FIGURE 4 – POWER OUTPUT versus FREQUENCY

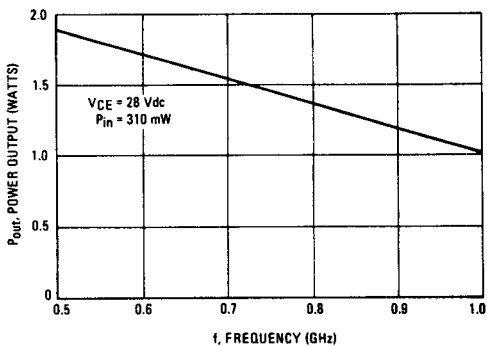


FIGURE 5 – POWER OUTPUT versus VOLTAGE

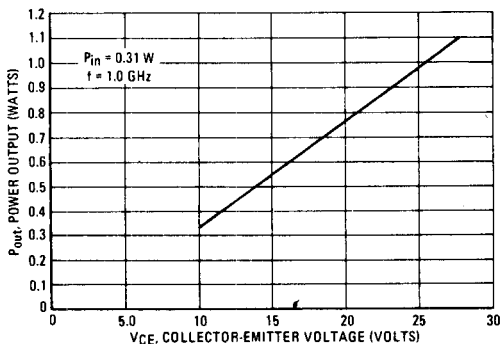


FIGURE 6 – OSCILLATOR POWER OUTPUT versus CURRENT

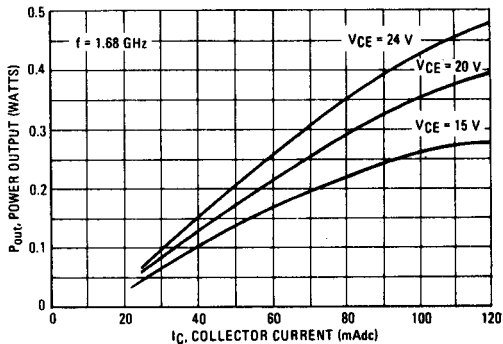


FIGURE 7 – CURRENT-GAIN-BANDWIDTH PRODUCT

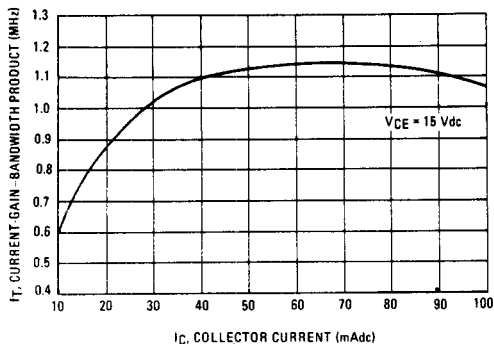
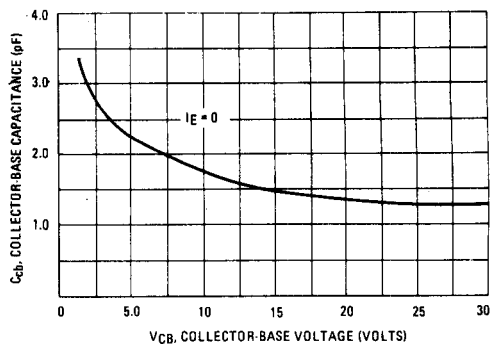


FIGURE 8 – COLLECTOR-BASE CAPACITANCE versus VOLTAGE



MM8010 (SILICON)
MM8011

For Specifications, See MM8008 Data.