# 2N6367 (SILICON)

## The RF Line

### NPN SILICON RF POWER TRANSISTOR

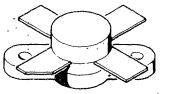
. . . designed primarily for driver applications in 12.5 volt single-sideband amplifiers from 2.0 to 30 MHz.

- Optimized for Operation from a 12.5 Volt Supply
- Power Output @ 12.5 Vdc, 30 MHz – 9.0 W (PEP)
- Intermodulation Distortion at Rated Power Output – IMD = -30 dB (Max)

**9 W (PEP) – 30 MHz**

**RF POWER TRANSISTOR**

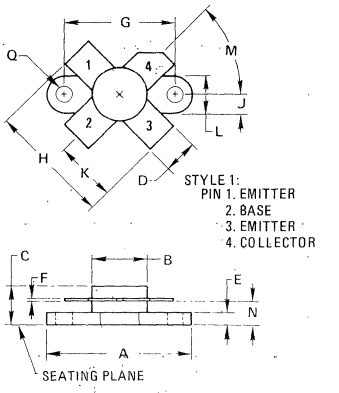
**NPN SILICON**



*MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 18 | Vdc |
| Collector-Base Voltage | $V_{CBO}$ | 36 | Vdc |
| Emitter-Base Voltage | $V_{EBO}$ | 4.0 | Vdc |
| Collector Current – Continuous | $I_C$ | 2.0 | Adc |
| Total Device Dissipation @ $T_C = 25^oC$<br>Derate above $25^oC$ | $P_D$ | 20<br>0.114 | Watts<br>$W/^oC$ |
| Storage Temperature Range | $T_{stg}$ | -65 to +200 | $^oC$ |

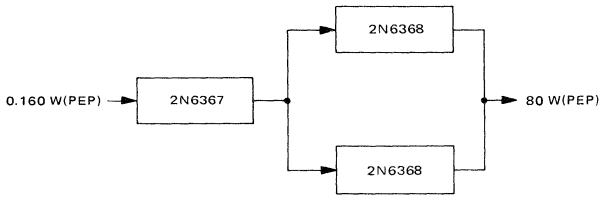
*Indicates JEDEC Registered Data.




| DIM | MILLIMETERS MIN | MILLIMETERS MAX | INCHES MIN | INCHES MAX |
|---|---|---|---|---|
| A | 24.64 | 24.89 | 0.970 | 0.980 |
| B | 9.47 | 9.73 | 0.373 | 0.383 |
| C | 6.07 | 7.14 | 0.239 | 0.281 |
| D | 5.59 | 5.84 | 0.220 | 0.230 |
| 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 | 21.59 | 22.10 | 0.850 | 0.870 |
| J | 3.12 | 3.23 | 0.123 | 0.127 |
| K | 10.80 | 11.05 | 0.425 | 0.435 |
| L | 6.22 | 6.48 | 0.245 | 0.255 |
| M | $40^0$ | $50^0$ | $40^0$ | $50^0$ |
| N | 3.81 | 4.57 | 0.150 | 0.180 |
| Q | 2.97 | 3.12 | 0.117 | 0.123 |

CASE 211-01

**TYPICAL DRIVER APPLICATION**
**2-30 MHz WIDE BAND AMPLIFIER**

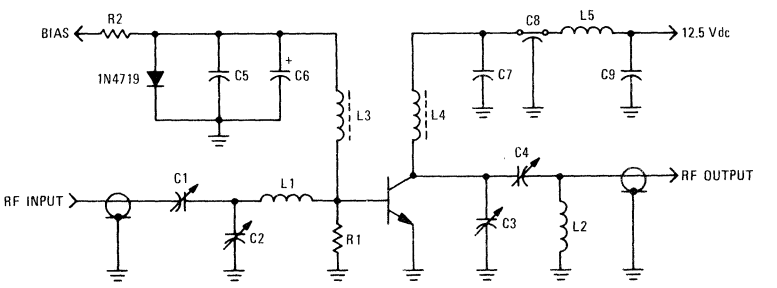


***ELECTRICAL CHARACTERISTICS** ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector-Emitter Breakdown Voltage ($I_C$ = 50 mAdc, $I_B$ = 0) | $BV_{CEO}$ | 18 | – | Vdc |
| Collector-Emitter Breakdown Voltage ($I_C$ = 50 mAdc, $V_{BE}$ = 0) | $BV_{CES}$ | 36 | – | Vdc |
| Emitter-Base Breakdown Voltage ($I_E$ = 5.0 mAdc, $I_C$ = 0) | $BV_{EBO}$ | 4.0 | – | Vdc |
| Collector Cutoff Current ($V_{CE}$ = 15 Vdc, $V_{BE}$ = 0, $T_C$ = 55°C) | $I_{CES}$ | – | 10 | mAdc |
| **ON CHARACTERISTICS** | | | | |
| DC Current Gain ($I_C$ = 500 mAdc, $V_{CE}$ = 5.0 Vdc) | $h_{FE}$ | 5.0 | 50 | – |
| **DYNAMIC CHARACTERISTICS** | | | | |
| Current-Gain – Bandwidth Product ($I_C$ = 500 mAdc, $V_{CE}$ = 12.5 Vdc, f = 50 MHz) | $f_T$ | 50 | – | MHz |
| Output Capacitance ($V_{CB}$ = 12.5 Vdc, $I_E$ = 0, f = 1.0 MHz) | $C_{ob}$ | – | 90 | pF |
| **FUNCTIONAL TESTS** | | | | |
| Common-Emitter Amplifier Power Gain ($V_{CC}$ = 12.5 Vdc, $P_{out}$ = 9.0 W(PEP), $I_{C(max)}$ = 1.0 Adc, $f_1$ = 30 MHz, $f_2$ = 30.001 MHz) | $G_{PE}$ | 14 | – | dB |
| Collector Efficiency ($V_{CC}$ = 12.5 Vdc, $P_{out}$ = 9.0 W(PEP), $I_{C(max)}$ = 1.0 Adc, $f_1$ = 30 MHz, $f_2$ = 30.001 MHz) | $\eta$ | 36 | – | % |
| Intermodulation Distortion ($V_{CC}$ = 12.5 Vdc, $P_{out}$ = 9.0 W(PEP), $I_{C(max)}$ = 1.0 Adc, $f_1$ = 30 MHz, $f_2$ = 30.001 MHz) | IMD | – | -30 | dB |

*Indicates JEDEC Registered Data

**FIGURE 1 – 30 MHz TEST CIRCUIT**




| | | | |
|---|---|---|---|
| C1, C3 | 25-280 pF, ARCO 464 OR EQUIVALENT | L2 | 5 TURNS #18 AWG, 1/4" ID, 5/16" LONG (0.13 μH) |
| C2, C4 | 170-780 pF, ARCO 469 OR EQUIVALENT | L3 | 3.3 μH |
| C5, C7, C9 | 0.1 μF | L4 | 1.0 μH |
| C6 | 500 μF TANTALUM | L5 | FERROXCUBE VK 200 20/4B |
| C8 | 680 pF FEED THRU | R1 | 10 OHMS |
| L1 | 3 TURNS #18 AWG, 1/4" ID, 1/4" LONG (60 nH) | R2 | 50 OHMS |

ADJUST BIAS FOR $I_{CQ}$ = 35 mA WITH NO RF SIGNAL APPLIED

FIGURE 2 – LINEAR OUTPUT POWER versus FREQUENCY

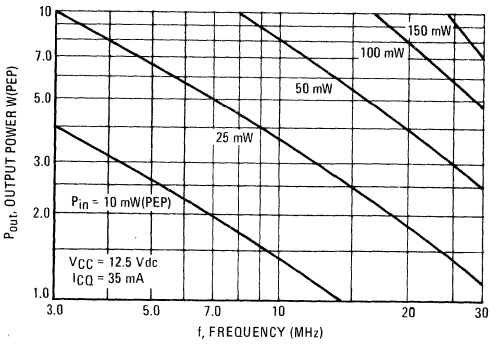



FIGURE 3 – OUTPUT POWER versus INPUT POWER

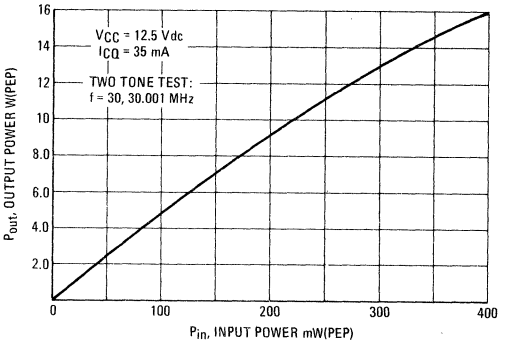



FIGURE 4 – OUTPUT POWER versus INPUT POWER

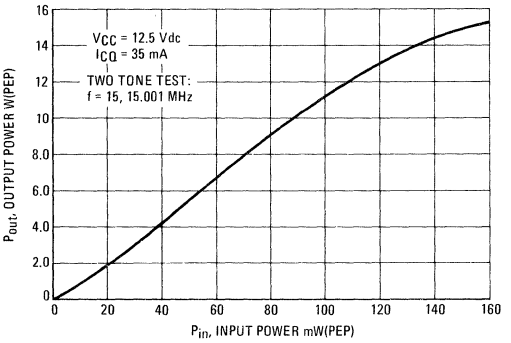



FIGURE 5 – OUTPUT POWER versus INPUT POWER

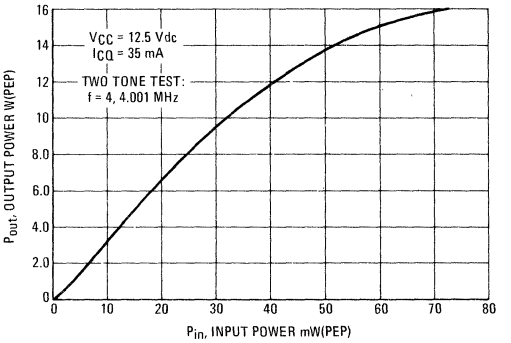



FIGURE 6 – INTERMODULATION DISTORTION versus OUTPUT POWER

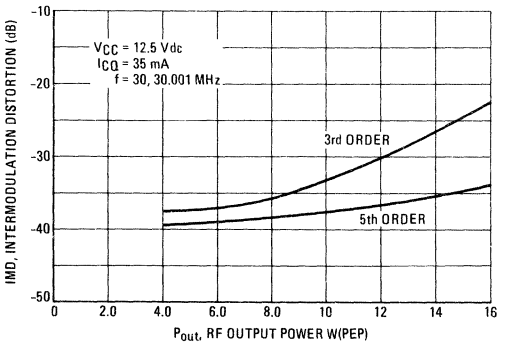



FIGURE 7 – LINEAR OUTPUT POWER versus SUPPLY VOLTAGE

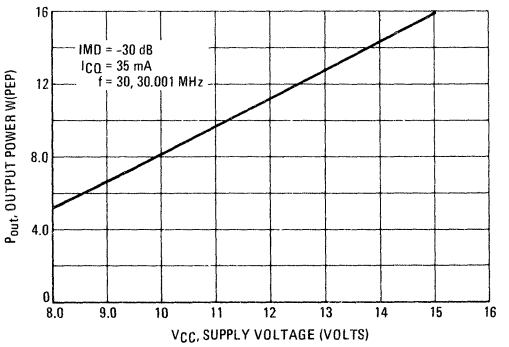


FIGURE 8 – PARALLEL EQUIVALENT INPUT RESISTANCE

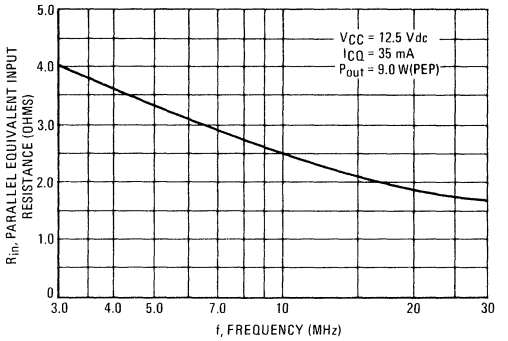



FIGURE 9 – PARALLEL EQUIVALENT INPUT CAPACITANCE

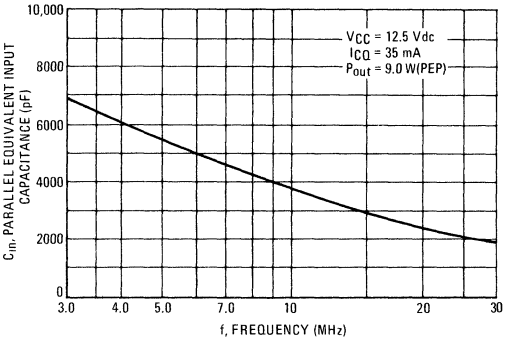



FIGURE 10 – PARALLEL EQUIVALENT OUTPUT RESISTANCE

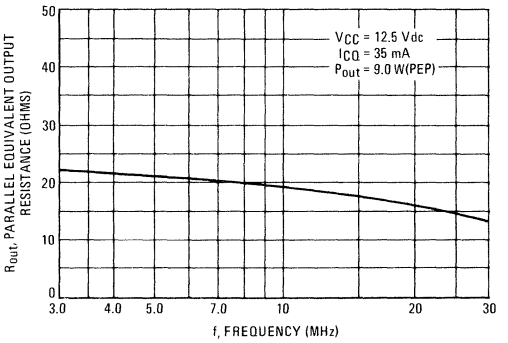



FIGURE 11 – PARALLEL EQUIVALENT OUTPUT CAPACITANCE

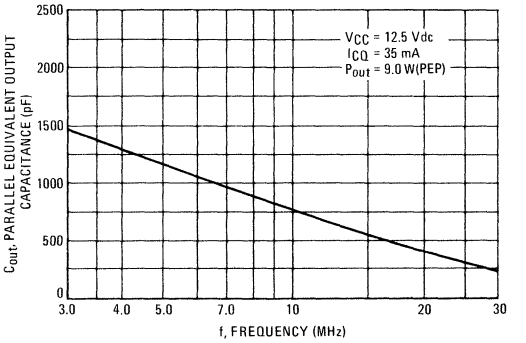



FIGURE 12 – CURRENT-GAIN – BANDWIDTH PRODUCT

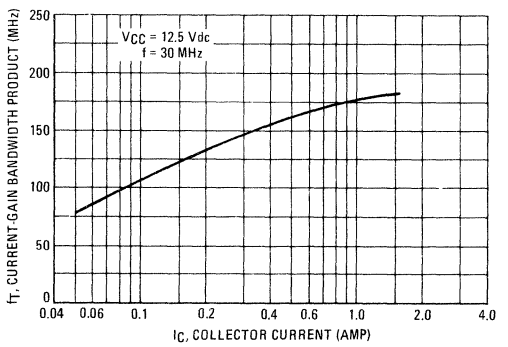



FIGURE 13 – COLLECTOR CURRENT versus BASE-EMITTER VOLTAGE

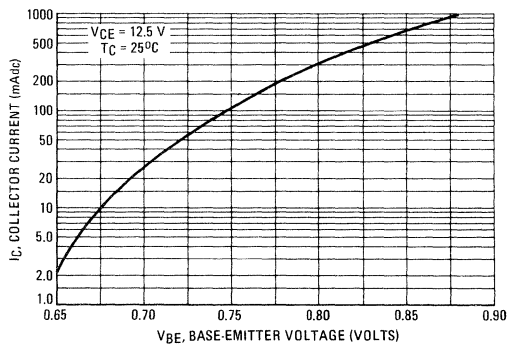


FIGURE 14 – OUTPUT CAPACITANCE

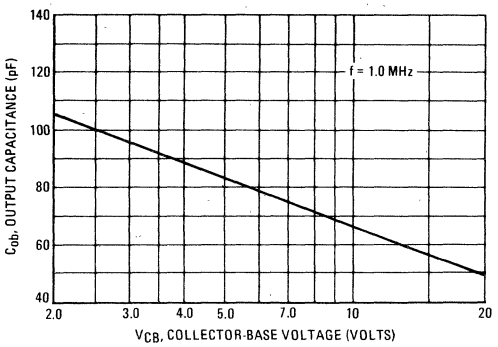



FIGURE 15 – INPUT CAPACITANCE

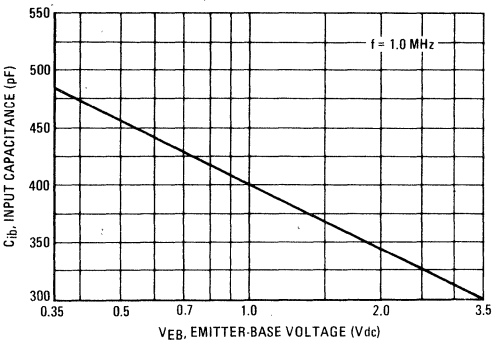



FIGURE 16 – DC SAFE OPERATING AREA

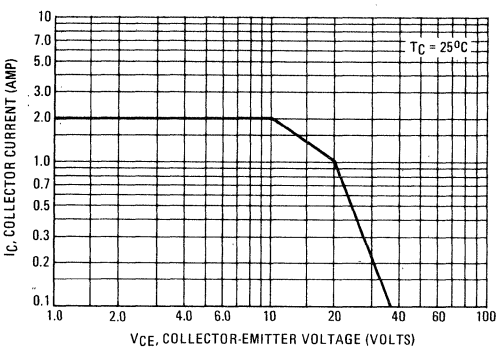



FIGURE 17 – RF POWER DISSIPATION