2N5016 (SILICON)

The RF Line

NPN SILICON RF POWER TRANSISTOR

. . . designed for VHF and UHF power amplifier applications in military and industrial equipment. Suited for use in Class B or C amplifier applications to 600 MHz.

- High Power Output — P_{out} = 15 W (Min) @ f = 400 MHz
- Balanced Emitter Construction to Assure Ruggedness and Resist Transistor Damage Due to Load Mismatch
- Large-Signal Impedance Data Provided to Simplify Matching Network Design

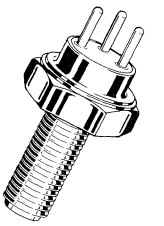
*MAXIMUM RATINGS

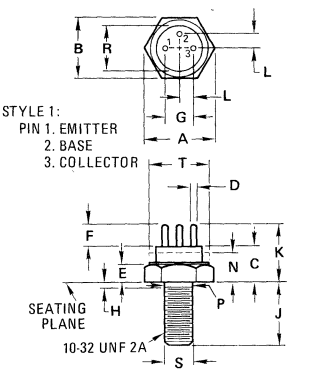
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CB}	65	Vdc
Emitter-Base Voltage	V_{EB}	4.0	Vdc
Collector Current - Continuous	I_C	4.5	Adc
Base Current-Continuous	I_B	1.5	Adc
Total Device Dissipation @ T_C = 50°C Derate above 50°C	P_D	30 0.2	Watts W/°C
Operating and Storage Junction Temperature Range	T_J,T_{stg}	-65 to +200	°C

*Indicates JEDEC Registered Data.

15 W-400 MHz
RF POWER
TRANSISTOR

NPN SILICON





DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	12.57	13.08	0.495	0.515
B	10.77	11.10	0.424	0.437
C	5.46	8.13	0.215	0.320
D	0.762	1.17	0.030	0.046
E	2.29	3.43	0.090	0.135
G	4.70	5.46	0.185	0.215
H	–	1.98	–	0.078
J	9.53	11.56	0.375	0.455
K	9.02	12.19	0.355	0.480
L	2.29	2.79	0.090	0.110
N	–	4.19	–	0.165
P	4.14	4.80	0.163	0.189
R	8.13	9.14	0.320	0.360
T	9.14	11.10	0.360	0.437

All JEDEC dimensions and notes apply

CASE 36
TO-60

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (1) (I_C = 200 mAdc, I_B = 0)	$V_{CEO(sus)}$	30	–	–	Vdc
Collector-Emitter Sustaining Voltage (1) (I_C = 200 mAdc, R_{BE} = 30 ohms)	$V_{CER(sus)}$	40	–	–	Vdc
Collector Cutoff Current (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 1.5 Vdc) (V_{CE} = 30 Vdc, $V_{EB(off)}$ = 1.5 Vdc, T_C = 150°C)	I_{CEV}	 – –	 – –	 10 10	mAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	–	–	5.0	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 500 mAdc, V_{CE} = 4.0 Vdc) (I_C = 4.5 Adc, V_{CE} = 4.0 Vdc)	h_{FE}	 10 3.0	 – –	 200 –	
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product (2) (I_C = 500 mAdc, V_{CE} = 15 Vdc, f = 400 MHz)	f_T	500	–	–	MHz
Output Capacitance (V_{CB} = 30 Vdc, I_E = 0, f - 1.0 MHz)	C_{ob}	–	20	25	pF
FUNCTIONAL TEST					
Power Input (P_{out} = 15 W, V_{CC} = 28 Vdc, f = 400 MHz)	P_{in}	–	–	5.0	Watt
Collector Efficiency (P_{in} = 5.0 W, P_{out} = 15 W, V_{CC} = 28 Vdc, f = 400 MHz)	η	50	–	–	%

*Indicates JEDEC Registered Data.

(1) Pulsed thru 25 mH Inductor @ 50% Duty Cycle.
(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

FIGURE 1 – 400 MHz POWER OUTPUT TEST CIRCUIT

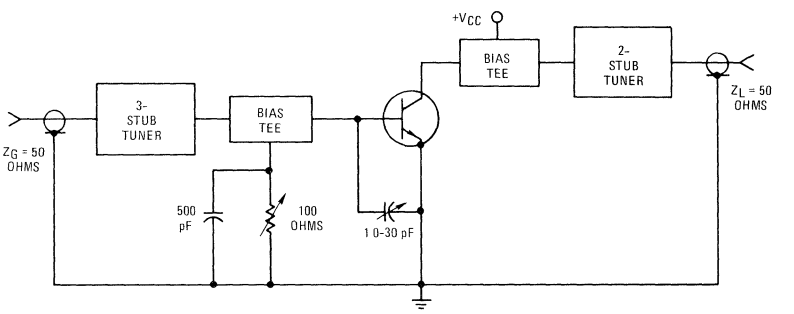


FIGURE 2 – POWER OUTPUT versus FREQUENCY

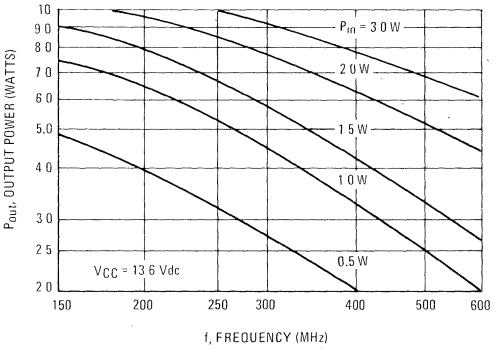


FIGURE 3 – POWER OUTPUT versus FREQUENCY

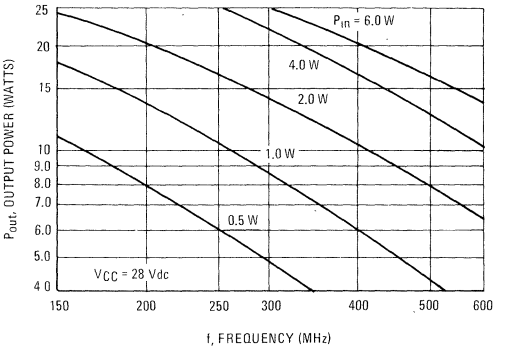


FIGURE 4 – POWER OUTPUT versus POWER INPUT

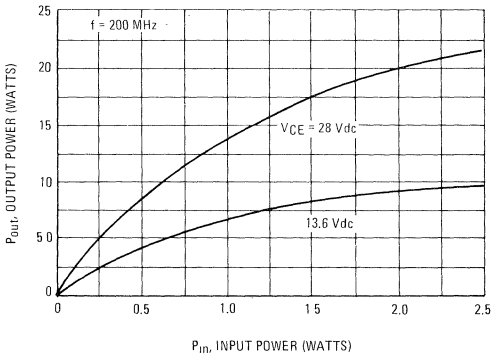


FIGURE 5 – POWER OUTPUT versus POWER INPUT

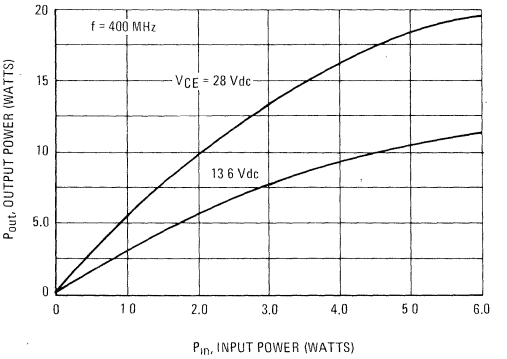


FIGURE 6 – POWER OUTPUT versus POWER INPUT

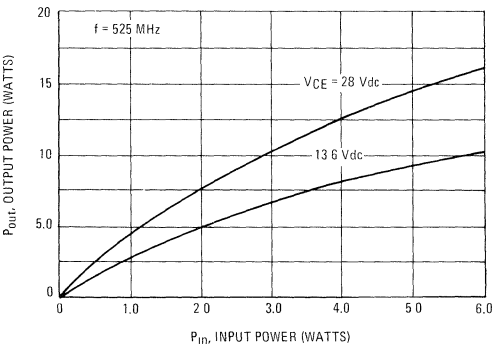
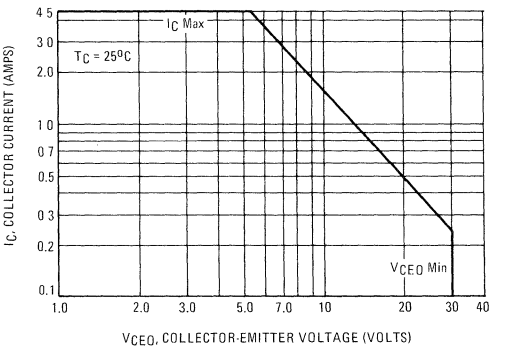


FIGURE 7 – DC SAFE OPERATING AREA



PARALLEL EQUIVALENT INPUT CAPACITANCE versus FREQUENCY

FIGURE 8 – V_{CC} = 13.6 Vdc

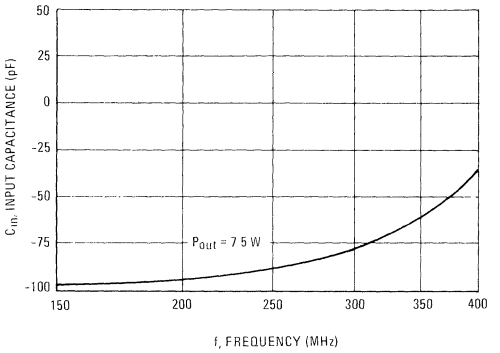
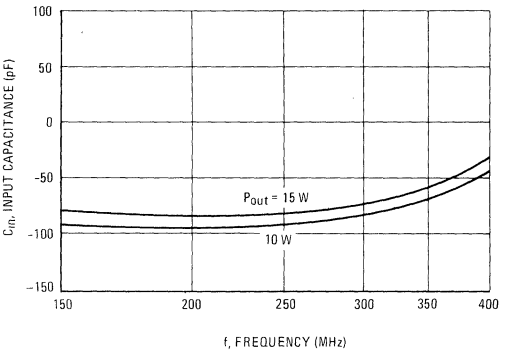


FIGURE 9 – V_{CC} = 28 Vdc



PARALLEL EQUIVALENT INPUT RESISTANCE versus FREQUENCY

FIGURE 10 – V_{CC} = 13.6 Vdc

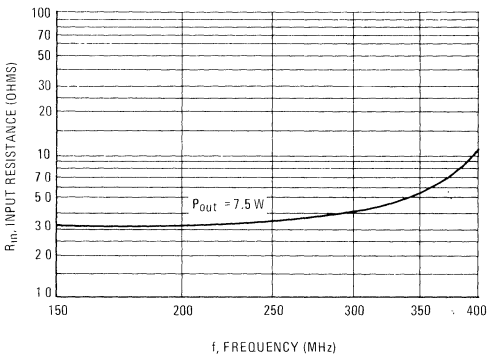
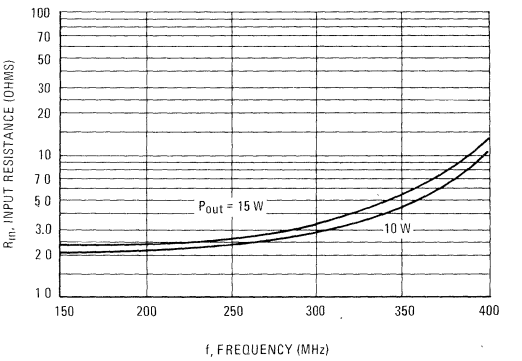


FIGURE 11 – V_{CC} = 28 Vdc



PARALLEL EQUIVALENT OUTPUT CAPACITANCE versus FREQUENCY

FIGURE 12 – V_{CC} = 13.6 Vdc

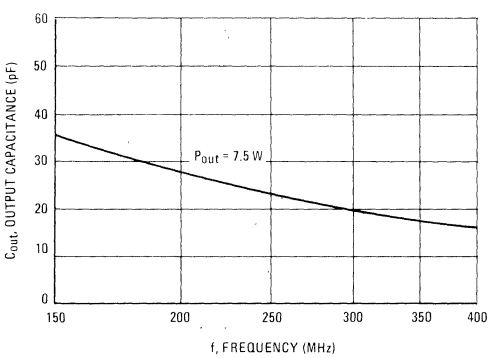


FIGURE 13 – V_{CC} = 28 Vdc