2N3818 (SILICON)

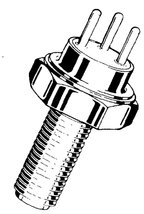
The RF Line

NPN SILICON RF POWER TRANSISTOR

. . . designed for applications to 150 MHz.

- High Collector-Emitter Sustaining Voltage –
  $V_{CE(sus)}$ = 80 Vdc (Min)
- Power Output –
  P_{out} = 15 Watts at 100 MHz
- Power Gain –
  G_{PE} = 7.0 dB (Typ) at 100 MHz with 15 Watts RF Power Output

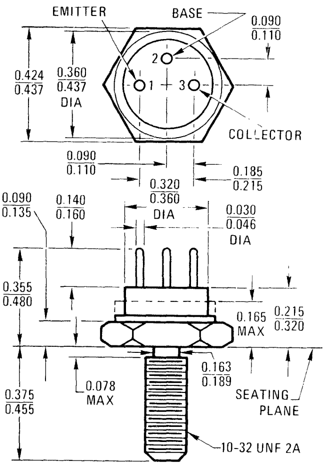
15 W - 100 MHz
RF POWER
TRANSISTOR
NPN SILICON



MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	60	Vdc
Collector-Base Voltage	V_{CB}	60	Vdc
Emitter-Base Voltage	V_{EB}	4.0	Vdc
Collector Current – Continuous	I_C	2.0	Adc
Base Current – Continuous	I_B	1.0	mAdc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	25 167	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +175	°C
Power Input (Nominal)	P_{in}	5.0	Watts
Power Output (Nominal)	P_{out}	20	Watts

Note 1. The maximum ratings as given for dc conditions can be exceeded on a pulse basis. See electrical characteristics.



To convert inches to millimeters multiply by 25.4
All JEDEC dimensions and notes apply
STYLE 1. All leads isolated from case

CASE 36
TO-60

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage(1) (I_C = 0.25 Adc, I_B = 0)	$V_{CEO(sus)}$	40	–	–	Vdc
Collector-Emitter Sustaining Voltage(1) (I_C = 0.25 Adc, R_{BE} = 0)	$V_{CES(sus)}$	80	100	–	Vdc
Collector-Emitter Current	I_{CES}				mAdc
(V_{CE} = 60 Vdc, V_{BE} = 0)		–	–	0.5	
(V_{CE} = 50 Vdc, V_{BE} = 0, T_C = 175°C)		–	–	1.0	
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0)	I_{CBO}	–	–	1.0	μAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	–	–	100	μAdc
ON CHARACTERISTICS					
DC Current Gain	h_{FE}				–
(I_C = 400 mAdc, V_{CE} = 2.0 Vdc)		5.0	–	50	
(I_C = 1.0 Adc, V_{CE} = 2.0 Vdc)		5.0	–	–	
Collector-Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 250 mAdc)	$V_{CE(sat)}$	–	–	0.5	Vdc
Base-Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 250 mAdc)	$V_{BE(sat)}$	–	–	2.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain—Bandwidth Product (V_{CE} = 2.0 Vdc, I_C = 400 mAdc, f = 50 MHz)	f_T	150	–	–	MHz
Output Capacitance (V_{CB} = 25 Vdc, I_E = 0, f = 100 kHz)	C_{ob}	–	–	40	pF
FUNCTIONAL TEST					
Power Input — Test Circuit Figure 5 (P_{out} = 15 W, f = 100 MHz, V_{CE} = 25 Vdc, I_C(max) = 1.0 Adc)	P_{in}	–	3.0	3.75	Watts
Efficiency — Test Circuit Figure 5 (P_{out} = 15 W, f = 100 MHz, V_{CE} = 25 Vdc, I_C(max) = 1.0 Adc)	η	60	70	–	%

(1)Pulse Test: Pulse Width ≤100 μs, Duty Cycle = 2.0%.

FIGURE 1 — OUTPUT POWER versus FREQUENCY

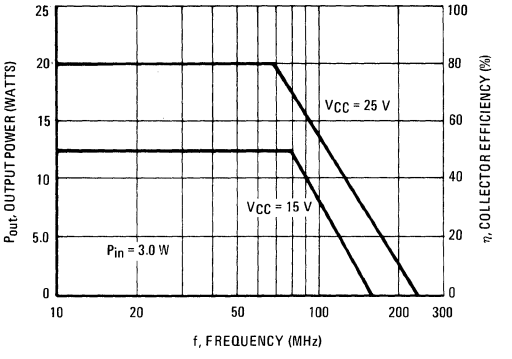


FIGURE 2 — OUTPUT CHARACTERISTICS versus INPUT POWER

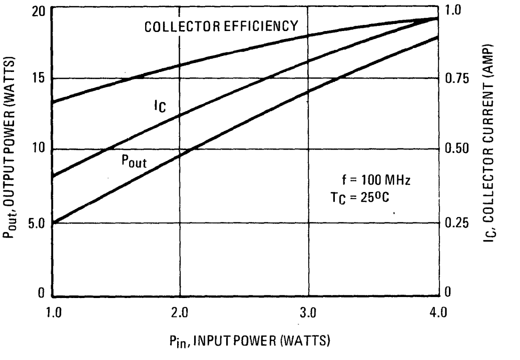


FIGURE 3 — OUTPUT POWER versus COLLECTOR VOLTAGE

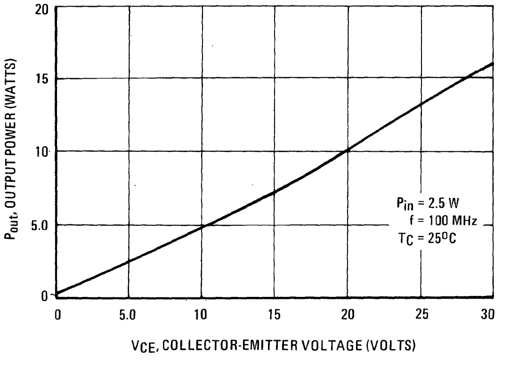


FIGURE 4 — OUTPUT POWER versus INPUT POWER

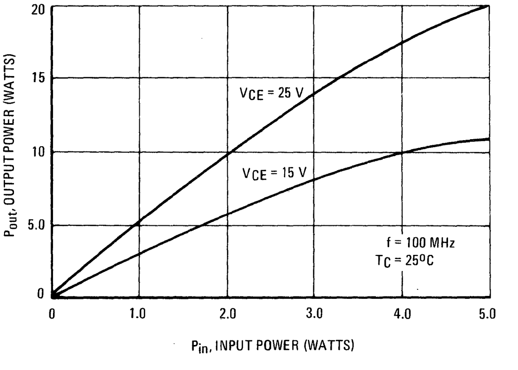


FIGURE 5 — TEST CIRCUIT

L1: 5 Turns #16 AWG, tinned wire 1/4" ID, 3/8" long, tapped 2-3/4 Turns from ground.
L3: 2 Turns #10 AWG, tinned wire, 1/2" ID, 1/4" long.