2N5862 (SILICON)

The RF Line

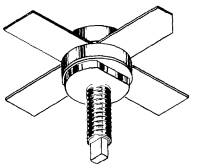
NPN SILICON RF POWER TRANSISTOR

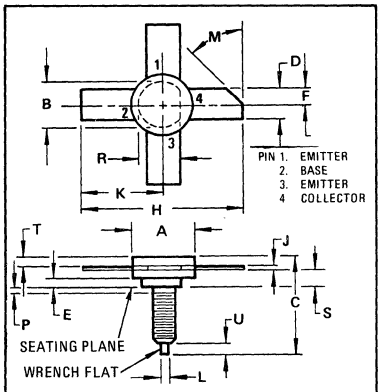
. . . designed for VHF power amplifier applications in military and industrial equipment. Particularly suited for use in Class AB, B, or C amplifier applications to 175 MHz.

- High Output Power Capability – 90 Watts Peak Output for 15 Watts (Typ) Input @ f = 150 MHz
- Balanced Emitter Construction to Provide the Designer with the device Technology that Assures Ruggedness and Resists Transistor Damage Caused by Load Mismatch.
- Stripline Packaging for Lower Lead Inductance and Better Broadband Capability

90 WATTS PEAK - 150 MHz

NPN SILICON RF POWER TRANSISTOR





DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	12.57	12.90	0.459	0.508
B	10.54	10.80	0.415	0.425
C	21.21	21.46	0.835	0.845
D	5.59	5.84	0.220	0.230
E	1.83	1.98	0.072	0.078
F	2.79	2.92	0.110	0.115
H	26.42	28.70	1.040	1.130
J	0.10	0.15	0.004	0.006
K	13.21	14.35	0.520	0.565
L	1.65	1.90	0.065	0.075
M	45° NOM		45° NOM	
P	–	1.27	–	0.050
R	9.78	10.01	0.385	0.394
S	3.89	4.45	0.153	0.175
T	2.03	2.29	0.080	0.090
U	2.54	3.30	0.100	0.130

NOTE: 145A-02 USES 10-32NF2A STUD.
CASE 145A-02

*MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	35	Vdc
Collector-Base Voltage	V_{CB}	65	Vdc
Emitter-Base Voltage	V_{EB}	4.0	Vdc
Collector Current – Continuous	I_C	8.0	Adc
Total Device Dissipation @ T_C=50°C Derate above 50°C	P_D	80 533	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

*Indicates JEDEC Registered Data

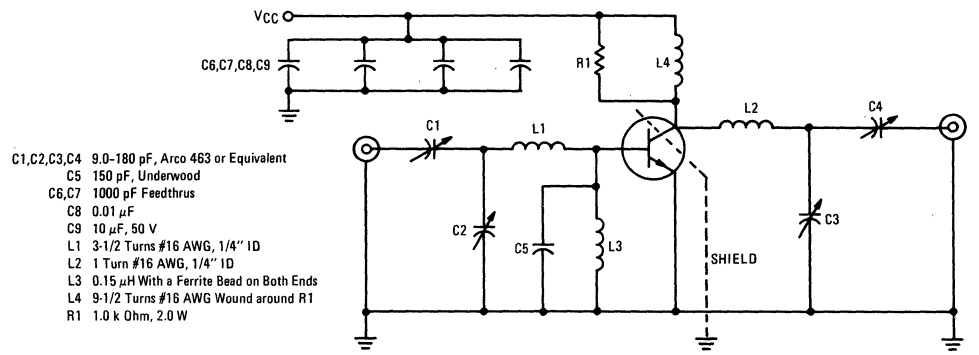
*** ELECTRICAL CHARACTERISTICS** (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ① (I_C = 200 mAdc, I_B = 0)	BV_{CEO}	35	–	–	Vdc
Collector-Emitter Breakdown Voltage (I_C = 200 mAdc, V_{BE} = 0)	BV_{CES}	65	–	–	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 mAdc, I_C = 0)	BV_{EBO}	4.0	–	–	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, V_{BE} = 0, T_C = 125°C)	I_{CES}	–	–	10	mAdc
Collector Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)	I_{CBO}	–	–	2.0	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 3.0 Adc, V_{CE} = 5.0 Vdc)	h_{FE}	5.0	–	–	–
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 30 Vdc, I_E = 0, f = 0.1 to 1.0 MHz)	C_{ob}	–	90	130	pF
FUNCTIONAL TEST (Circuit Tuned at 90 Watts Peak, V_{CC} = 27 Vdc and not retuned for 13.5 Vdc Carrier Power Test)					
Power Input (P_{out} = 90 W Peak, V_{CC} = 27 Vdc, f = 150 MHz, 33.3% Duty Cycle Square Wave, Power Source Modulated)	$P_{in(peak)}$	–	15	–	Watts
Power Gain CW (Carrier Power) (P_{out} = 24 W, V_{CC} = 13.5 Vdc, f = 150 MHz, Circuit Tuned at 90 W Peak, V_{CC} = 27 Vdc)	G_{PE}	5.0	–	–	dB
Power Gain (V_{CC} = 27 Vdc, f = 150 MHz, P_{out} = 75 W, I_C = 4.1 Adc, Circuit Tuned at 90 W Peak, V_{CC} = 27 Vdc)	G_{PE}	7.0	–	–	dB
Collector Efficiency (P_{out} = 75 W, V_{CC} = 27 Vdc, f = 150 MHz, I_C = 4.1 Adc)	η	60	–	–	%
Load Mismatch (P_{out} = 75 W, CW, V_{CC} = 27 Vdc, f = 150 MHz, 10% Duty Cycle, 10 ms Pulse, VSWR 10:1, all angles)	Less Than 5% Change in Power Readings Before and After Mismatch Tests.				

① Pulsed through 25 mH Inductor.

*Indicates JEDEC Registered Data

FIGURE 1 – 150 MHz TEST CIRCUIT



C1,C2,C3,C4 9.0-180 pF, Arco 463 or Equivalent
C5 150 pF, Underwood
C6,C7 1000 pF Feedthrus
C8 0.01 μF
C9 10 μF, 50 V
L1 3-1/2 Turns #16 AWG, 1/4" ID
L2 1 Turn #16 AWG, 1/4" ID
L3 0.15 μH With a Ferrite Bead on Both Ends
L4 9-1/2 Turns #16 AWG Wound around R1
R1 1.0 k Ohm, 2.0 W

OUTPUT POWER versus FREQUENCY

FIGURE 2 – V_{CC} = 13.5 Vdc

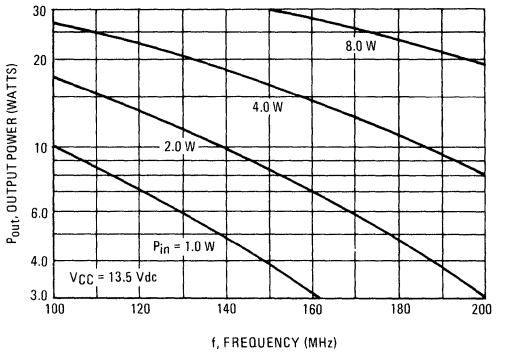


FIGURE 3 – V_{CC} = 27 Vdc

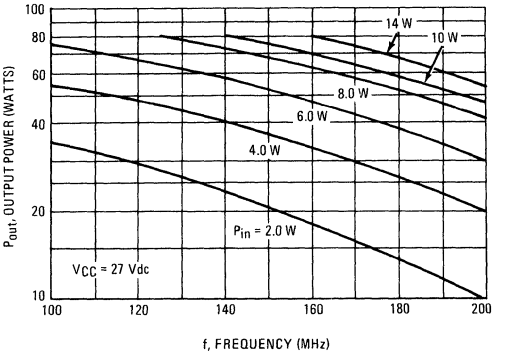


FIGURE 4 – OUTPUT POWER versus INPUT POWER

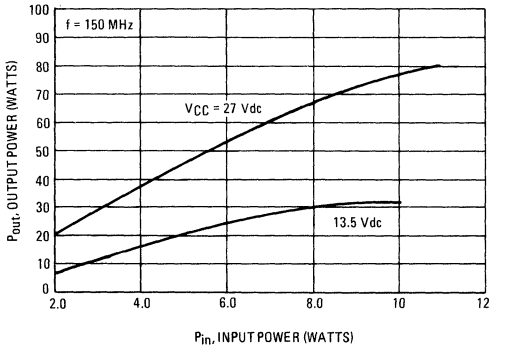
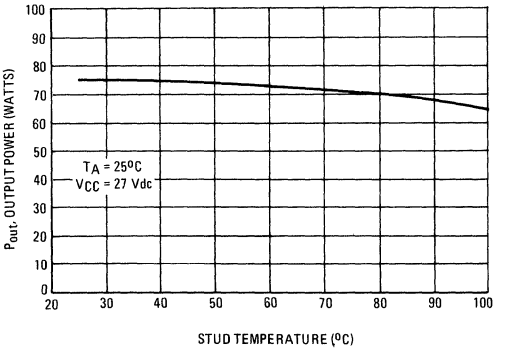


FIGURE 5 – OUTPUT POWER versus STUD TEMPERATURE



PARALLEL INPUT RESISTANCE versus FREQUENCY

FIGURE 6 – V_{CC} = 13.5 Vdc, P_{out} = 25 W

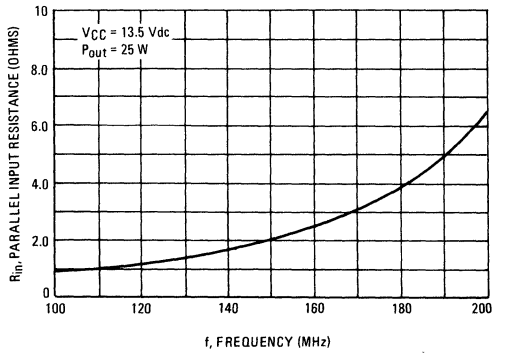
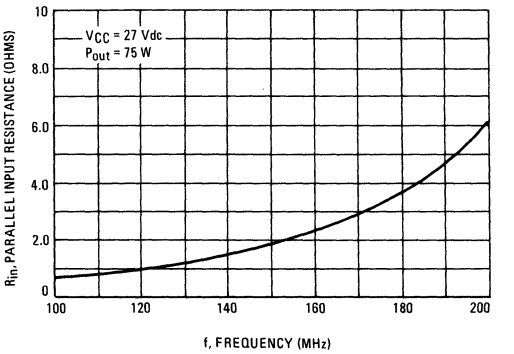


FIGURE 7 – V_{CC} = 27 Vdc, P_{out} = 75 W



PARALLEL INPUT CAPACITANCE versus FREQUENCY

FIGURE 8 – V_{CC} = 13.5 Vdc, P_{out} = 25 W

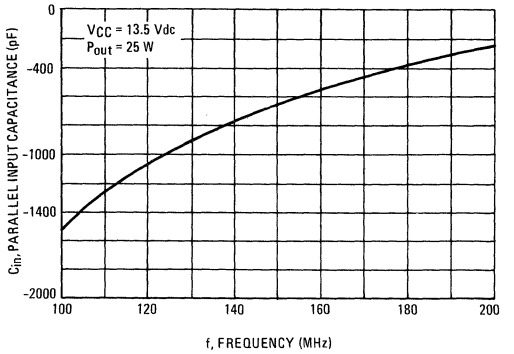
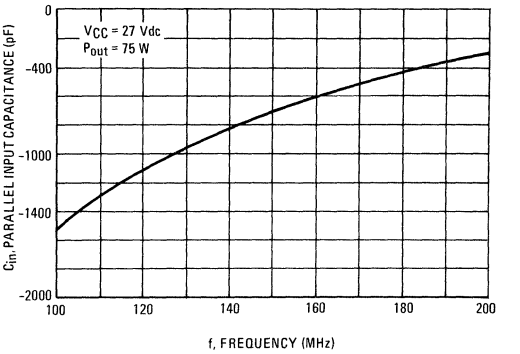


FIGURE 9 – V_{CC} = 27 Vdc, P_{out} = 75 W



PARALLEL OUTPUT CAPACITANCE versus FREQUENCY

FIGURE 10 – V_{CC} = 13.5 Vdc, P_{out} = 25 W

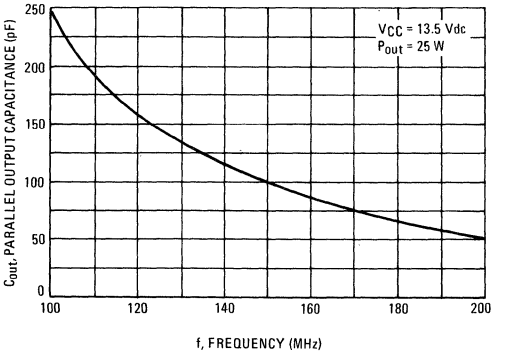


FIGURE 11 – V_{CC} = 27 Vdc, P_{out} = 75 W

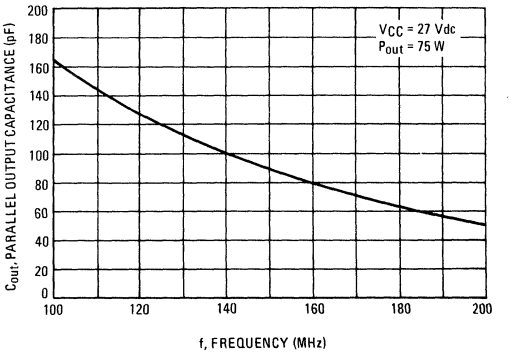


FIGURE 12 – OUTPUT POWER versus SUPPLY VOLTAGE