

2N5160

The RF Line

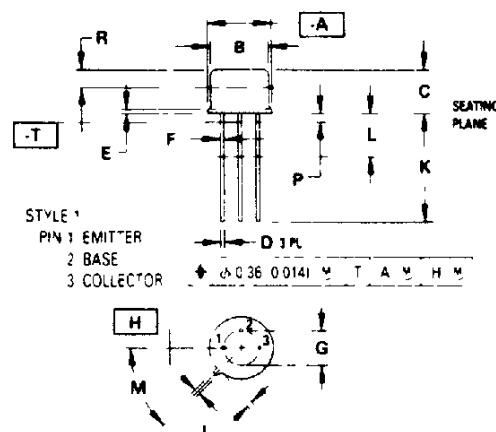
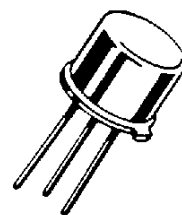
PNP SILICON RF POWER TRANSISTOR

... designed for amplifier, frequency multiplier or oscillator applications in military and industrial equipment. Suitable for use as Class A, B, or C output driver, or pre-driver stages in VHF and UHF.

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$I_C = -400 \text{ mA}$
POWER TRANSISTOR

PNP SILICON



STYLE 1
PIN 1 EMITTER
2 BASE
3 COLLECTOR

NOTES

- 1 DIMENSIONING AND TOLERANCING PER ANSI Y14.5M 1982
- 2 CONTROLLING DIMENSION INCH
- 3 DIMENSION J MEASURED FROM DIMENSION A MAXIMUM
- 4 DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING
- 5 DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K. MINIMUM LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K. MINIMUM

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.51	9.39	0.335	0.370
B	7.75	8.50	0.305	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	1.04	0.009	0.041
F	0.41	0.48	0.016	0.019
G	5.08 BSC		0.200 BSC	
H	0.72	0.86	0.028	0.034
J	0.74	1.14	0.029	0.045
K	12.70	19.05	0.500	0.750
L	6.35		0.250	
M	45 BSC		45 BSC	
P		1.27		0.050
R	2.54		0.100	

CASE 79-04
TO-205AD
(TO-39)

***MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-40	Vdc
Collector-Base Voltage	V_{CB}	-60	Vdc
Emitter-Base Voltage	V_{EB}	-4.0	Vdc
Collector Current	I_C	-0.4	Adc
Total Device Dissipation (at $T_C = 25^\circ\text{C}$ Derate above 25°C)	P_D	5.0 28.6	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

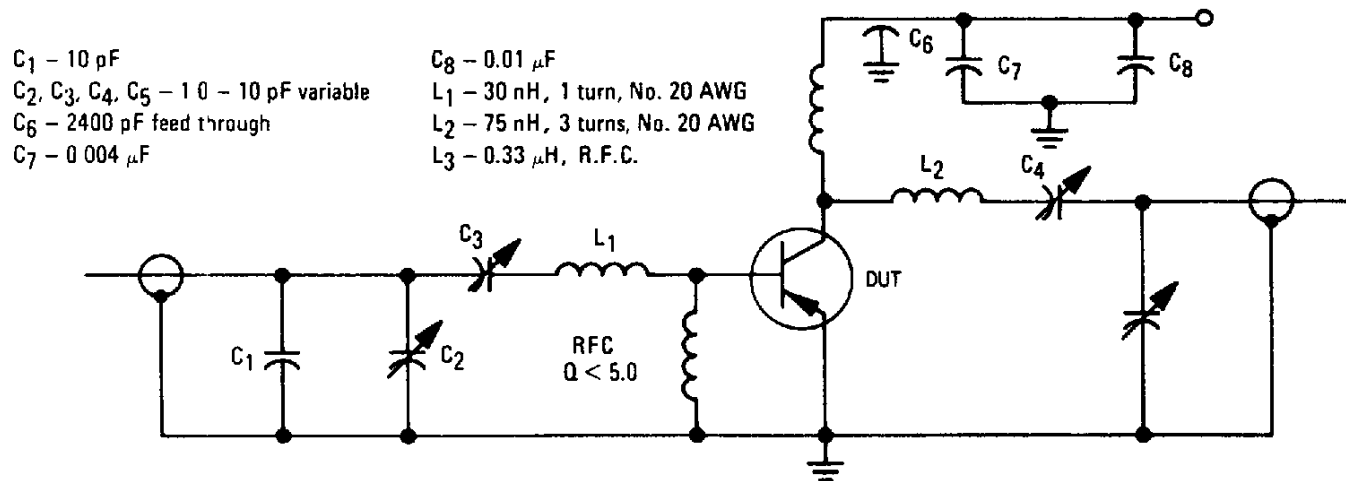
*Indicates JEDEC Registered Data

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage ($I_C = -5.0 \text{ mA}$, $I_B = 0$)	$V_{CEO(sus)}$	-40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = -0.1 \text{ mA}$, $I_C = 0$)	$V_{(BR)EBO(sus)}$	-4.0	—	—	Vdc
Collector Cutoff Current ($V_{CE} = -28 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	—	—	-20	μA
Collector Cutoff Current ($V_{CE} = -60 \text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	—	—	-0.1	mA
Collector Cutoff Current ($V_{CB} = -28 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	-1.0	μA
ON CHARACTERISTICS					
DC Current Gain ($I_C = -50 \text{ mA}$, $V_{CE} = -5.0 \text{ Vdc}$)	h_{FE}	10	—	—	—
DYNAMIC CHARACTERISTICS					
Current-Gain — Bandwidth Product ($I_C = -50 \text{ mA}$, $V_{CE} = -15 \text{ Vdc}$, $f = 200 \text{ MHz}$)	f_T	500	900	—	MHz
Collector-Base Capacitance ($V_{CB} = -28 \text{ Vdc}$, $I_E = 0$, $f = 0.1$ to 1.0 MHz)	C_{cb}	—	2.5	4.0	pF
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CE} = -28 \text{ Vdc}$, $P_{in} = 0.16 \text{ Watt}$, $f = 400 \text{ MHz}$) ($V_{CE} = -28 \text{ Vdc}$, $P_{in} = 50 \text{ mW}$, $f = 175 \text{ MHz}$)	G_{PE}	8.0 —	8.8 14.5	— —	dB
Power Output ($V_{CE} = -28 \text{ Vdc}$, $P_{in} = 0.16 \text{ Watt}$, $f = 400 \text{ MHz}$) ($V_{CE} = -28 \text{ Vdc}$, $P_{in} = 50 \text{ mW}$, $f = 175 \text{ MHz}$)	P_{out}	1.0 —	1.2 1.4	— —	Watt
Collector Efficiency ($V_{CE} = -28 \text{ Vdc}$, $P_{in} = 0.16 \text{ Watt}$, $f = 400 \text{ MHz}$)	η	45	55	—	%

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FIGURE 1 — 400-MHz TEST CIRCUIT



versus FREQUENCY

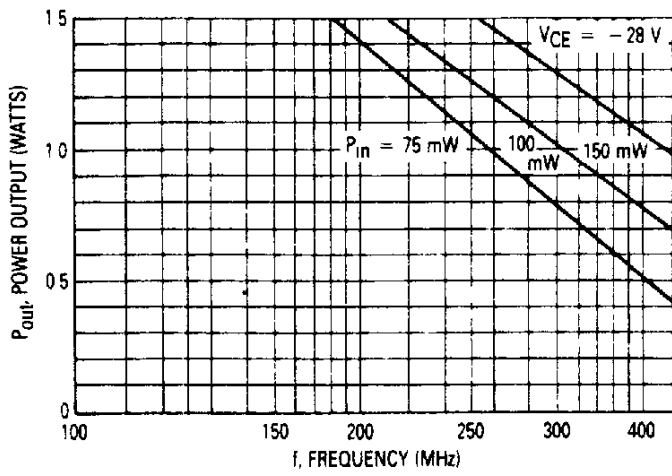


FIGURE 4 — PARALLEL INPUT IMPEDANCE versus FREQUENCY

versus POWER INPUT

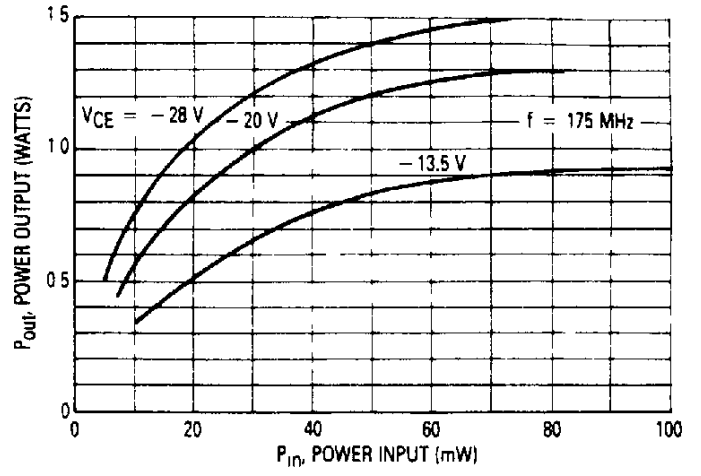


FIGURE 5 — PARALLEL INPUT IMPEDANCE versus FREQUENCY

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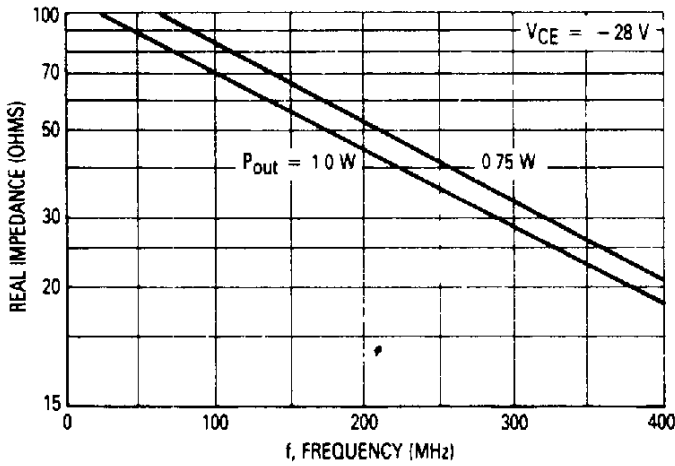


FIGURE 6 — PARALLEL OUTPUT CAPACITANCE versus FREQUENCY

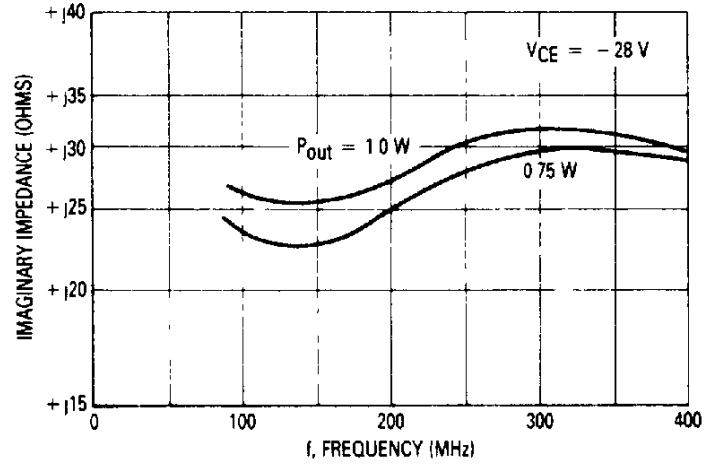


FIGURE 7 — CURRENT-GAIN — BANDWIDTH PRODUCT versus COLLECTOR CURRENT

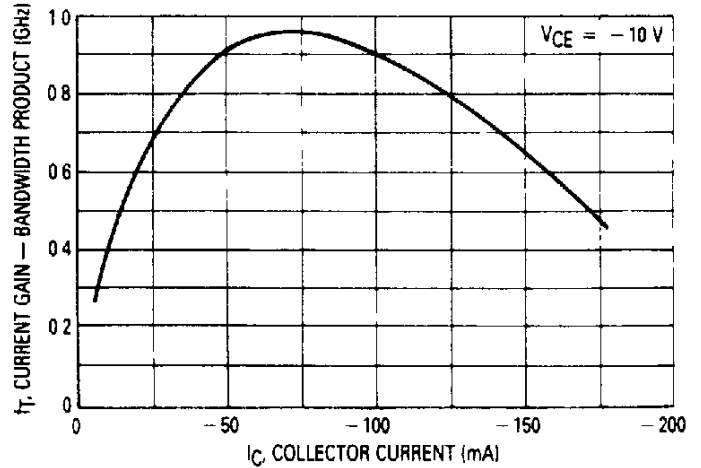
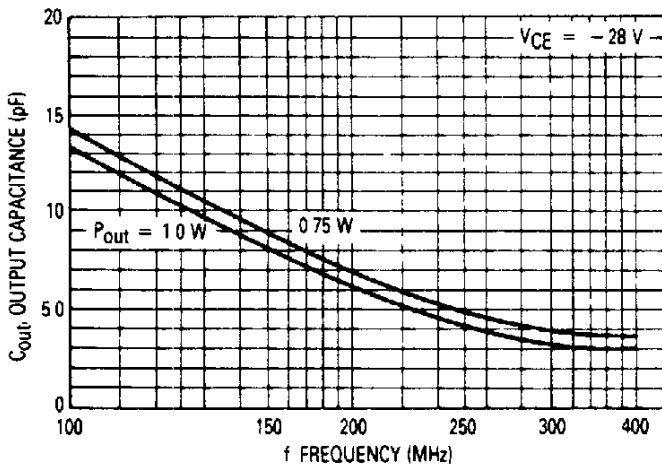


FIGURE 8 – 2N5160 300-MHz COMPLEMENTARY POWER OUTPUT CIRCUIT

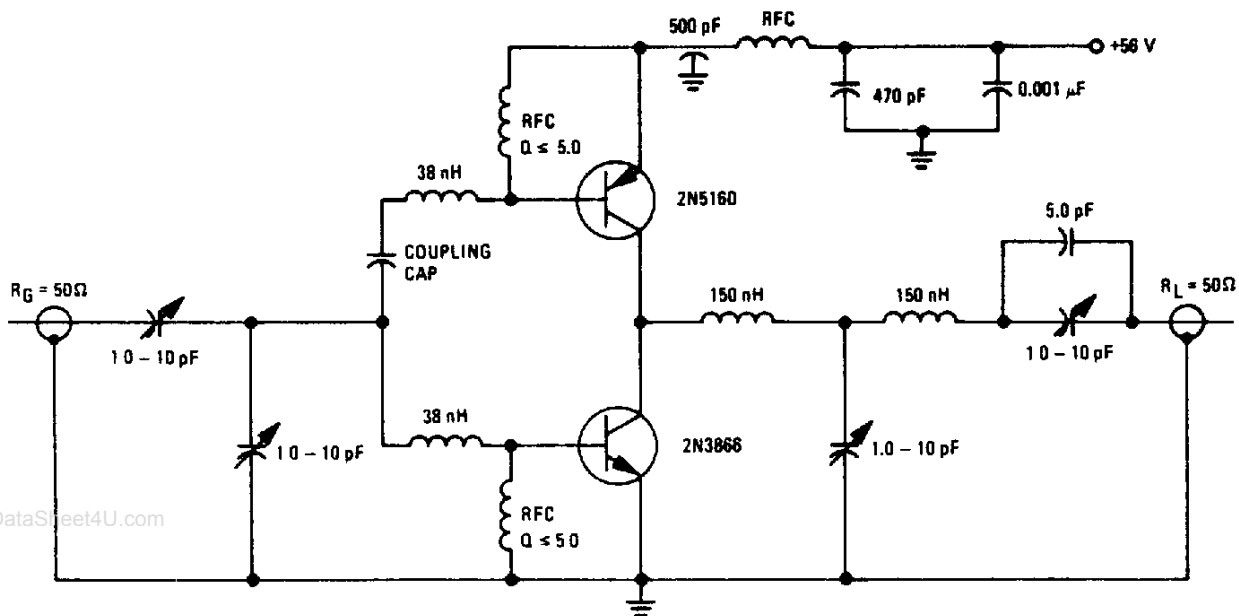


FIGURE 9 – COMPLEMENTARY CIRCUIT – POWER OUTPUT versus POWER INPUT

