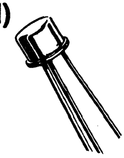
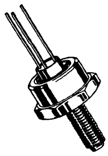
2N3375 (SILICON)
2N3553
2N3632
2N3961



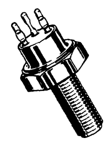
*CASE 79
(TO-39)

2N3553



**CASE 24
(TO-102)

2N3961



***CASE 36
(TO-60)

2N3375
2N3632

* Collector Connected to Case
** Collector electrically connected to case; stud electrically isolated from case
*** Stud electrically isolated from case

NPN silicon RF Power transistors, optimized for large-signal power amplifier and driver applications to 400MHz, provide wide choice of power levels and guaranteed safe operating areas.

MAXIMUM RATINGS

Rating	Symbol	2N3375	2N3553	2N3632	2N3961	Unit
Collector-Emitter Voltage	V_{CEO}	← 40 →				Vdc
Collector-Base Voltage	V_{CB}	← 65 →				Vdc
Emitter-Base Voltage	V_{EB}	← 4.0 →				Vdc
Collector Current	I_C	1.5	1.0	3.0	1.0	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	11.6 66.4	7.0 40	23 131	10 57.2	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	← -65 to +200 →				°C

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage* (I_C = 200 mAdc, I_B = 0)		$BV_{CEO(sus)}$*	40	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 0.25 mAdc, I_C = 0) (I_E = 0.1 mAdc, I_C = 0) (I_E = 1.0 mAdc, I_C = 0)	 2N3632 2N3375, 2N3553 2N3961	BV_{EBO}	 4.0 4.0 4.0	 - - -	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, I_B = 0)	 2N3375, 2N3553 2N3632	I_{CEO}	 - -	 0.1 0.25	mAdc
Collector Cutoff Current (V_{CE} = 30 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 200°C) (V_{CE} = 65 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	 2N3375, 2N3553 2N3632 2N3375, 2N3553 2N3632	I_{CEX}	 - - - -	 5.0 10 1.0 5.0	mAdc
Collector Cutoff Current (V_{CB} = 28 Vdc, I_E = 0, T_A = 150°C) (V_{CB} = 65 Vdc, I_E = 0)	 2N3961 2N3632 2N3961	I_{CBO}	 - - -	 5.0 0.5 1.0	mAdc
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)	 2N3375, 2N3553 2N3632	I_{EBO}	 - -	 0.1 0.25	mAdc

* Pulsed thru 25 mH inductor (See Figures 5 and 6).

ELECTRICAL CHARACTERISTICS (continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				-
(I_C = 250 mAdc, V_{CE} = 5.0 Vdc)	2N3375, 2N3553, 2N3632		10	-	-	
(I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)	2N3632		5.0	-	-	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 250 mAdc, I_B = 50 mAdc)	2N3553		-	-	1.0	
(I_C = 500 mAdc, I_B = 100 mAdc)	2N3375, 2N3632		-	-	1.0	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 1.0 Adc, I_B = 5.0 Adc)	2N3632		-	-	1.5	
DYNAMIC CHARACTERISTICS						
Current-Gain—Bandwidth Product		f_T				MHz
(I_C = 100 mAdc, V_{CE} = 28 Vdc, f = 100 MHz)	2N3553		-	500	-	
(I_C = 125 mAdc, V_{CE} = 28 Vdc, f = 100 MHz)	2N3961		350		-	
(I_C = 150 mAdc, V_{CE} = 28 Vdc, f = 100 MHz)	2N3375		-	500	-	
	2N3632		-	400	-	
Output Capacitance		C_{ob}				pF
(V_{CB} = 28 Vdc, I_E = 0, f = 100 kHz)	2N3961		-	8.0	10	
(V_{CB} = 30 Vdc, I_E = 0, f = 100 kHz)	2N3375, 2N3553		-	8.0	10	
	2N3632		-	16	20	

FUNCTIONAL TESTS

2N3375

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Power Input	Test Circuit Figure 7	P_{in}	-	-	1.0	Watt
Common-Emitter Amplifier Power Gain	(V_{CE} = 28 Vdc, P_{out} = 7.5 Watts, f = 100 MHz)	G_{pe}	8.75	-	-	dB
Collector Efficiency		η	65	-	-	%
Power Input	Test Circuit Figure 8	P_{in}	-	-	1.0	Watt
Common-Emitter Amplifier Power Gain	(V_{CE} = 28 Vdc, P_{out} = 3.0 Watts, f = 400 MHz)	G_{pe}	4.77	-	-	dB
Collector Efficiency		η	40	-	-	%

2N3553

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Power Input	Test Circuit Figure 9	P_{in}	-	-	0.25	Watt
Common-Emitter Amplifier Power Gain	(V_{CE} = 28 Vdc, P_{out} = 2.5 Watts, f = 175 MHz)	G_{pe}	10	-	-	dB
Collector Efficiency		η	50	-	-	%

2N3632

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Power Input	Test Circuit Figure 10	P_{in}	-	-	3.5	Watts
Common-Emitter Amplifier Power Gain	(V_{CE} = 28 Vdc, P_{out} = 13.5 Watts, f = 175 MHz)	G_{pe}	5.86	-	-	dB
Collector Efficiency		η	70	-	-	%

2N3961

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Power Input	Test Circuit Figure 11	P_{in}	-	-	0.5	Watt
Common-Emitter Amplifier Power Gain	(V_{CE} = 12.5 Vdc, P_{out} = 2.0 Watts, R_S = 50 ohms, R_L = 50 ohms, f = 135 MHz)	G_{pe}	6.0	-	-	dB
Collector Efficiency		η	60	-	-	%
Power Input	Test Circuit Figure 12	P_{in}	-	-	0.5	Watt
Common-Emitter Amplifier Power Gain	(V_{CE} = 28 Vdc, P_{out} = 4.0 Watts, R_S = 50 ohms, R_L = 50 ohms, f = 175 MHz)	G_{pe}	9.0	-	-	dB
Collector Efficiency		η	60	-	-	%

POWER OUTPUT versus FREQUENCY
COMMON EMITTER — $V_{CE} = 28$ Vdc, $T_C = 25°C$

FIGURE 1 – 2N3375

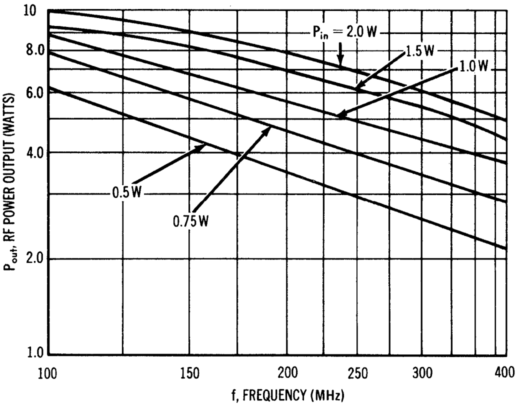


FIGURE 2 – 2N3553

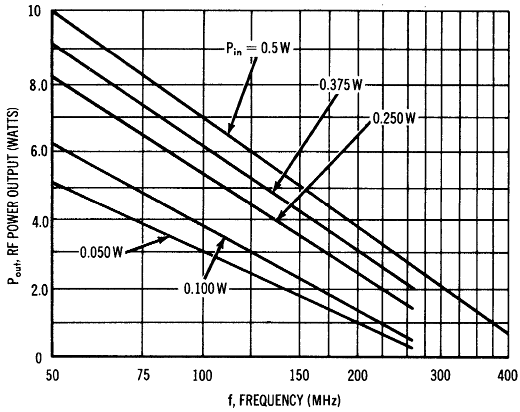


FIGURE 3 – 2N3632

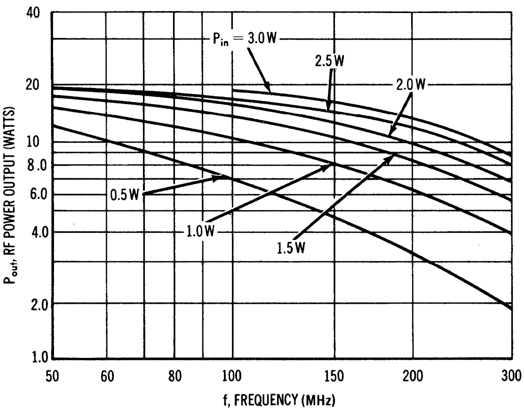
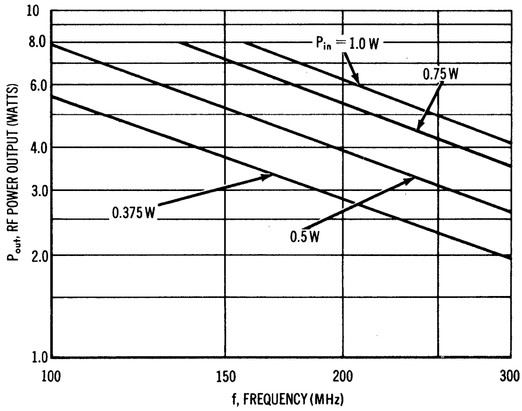


FIGURE 4 – 2N3961



$BV_{CEO(sus)}$ PULSE TEST CIRCUITS

FIGURE 5 – 2N3375, 2N3553, 2N3632

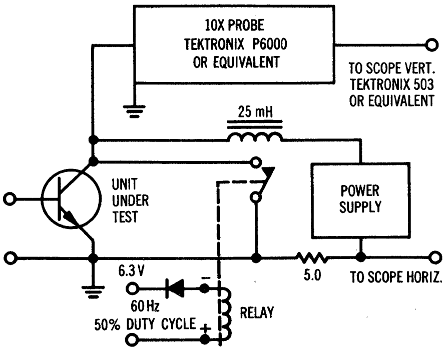
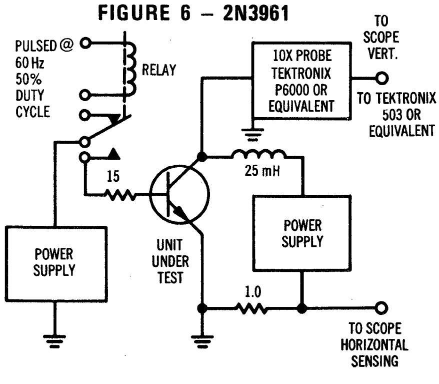
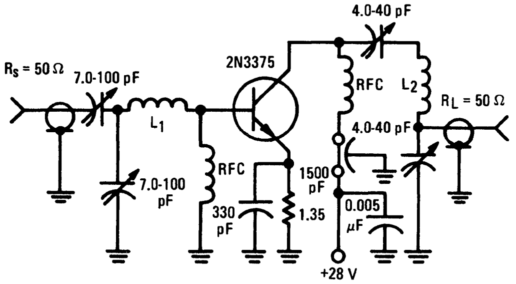


FIGURE 6 – 2N3961



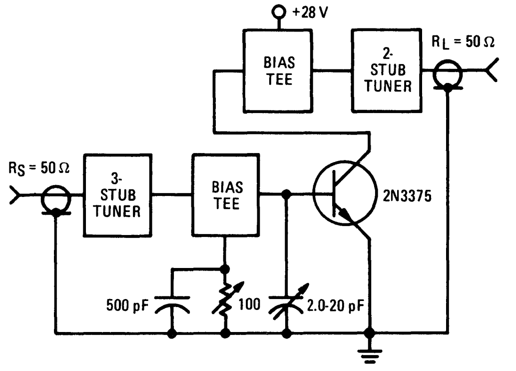
TEST CIRCUITS
2N3375

FIGURE 7 – 100 MHz



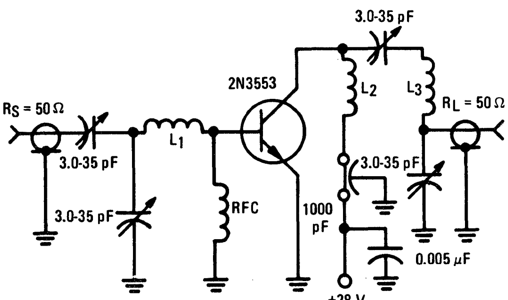
L_1: 3 turns No. 16 AWG wire ¼" I.D., 5/16" long
L_2: 5 turns No. 16 AWG wire 5/16" I.D., 7/16" long

FIGURE 8 – 400 MHz



2N3553

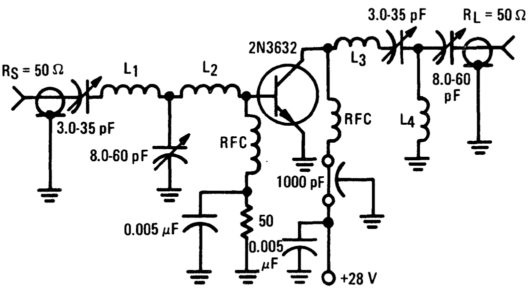
FIGURE 9 – 175 MHz



L_1: 2 turns No. 16 AWG wire 3/16" I.D., ¼" long
L_2: 2 turns No. 16 AWG wire 3/16" I.D., ¼" long
L_3: 3 turns No. 16 AWG wire 3/8" I.D., 3/8" long

2N3632

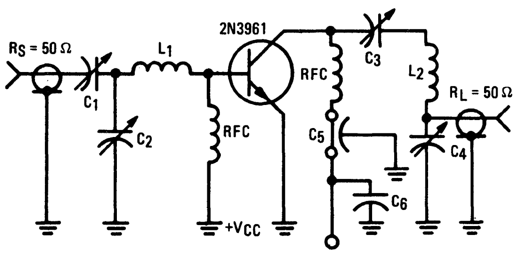
FIGURE 10 – 175 MHz



L_1, L_3: 4 turns No. 18 AWG wire ¼" I.D. 3/16" long
L_2: 1 turn No. 16 AWG wire ¼" I.D., 3/16" long
L_4: 2½ turns No. 16 AWG wire ¼" I.D., ¼" long

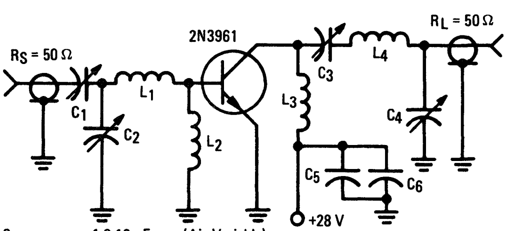
2N3961

FIGURE 11 – 135 MHz



C_1, C_3 = 5.0-50 pF (Air Variable)
C_2 = 7.0-100 pF (Air Variable)
C_4 = 1.0-30 pF (Air Variable)
C_5 = 1000 pF (Disc Ceramic)
C_6 = 0.02 µF (Disc Ceramic)
L_1 = 3 turns No. 16 AWG wire, 5/16" I.D., 5/16" long
L_2 = 5 turns No. 16 AWG wire, 7/16" I.D., 5/8" long

FIGURE 12 – 175 MHz



C_1	1.0-12 pF	(Air Variable)
C_2	1.0-30 pF	(Air Variable)
C_3	5.0-50 pF	(Air Variable)
C_4	7.0-75 pF	(Air Variable)
C_5	470 pF	(Disc Ceramic)
C_6	0.001 µF	(Disc Ceramic)
L_1, L_3, L_4	2 turns No. 18 AWG enameled wire ¼" I.D., air wound 3/16" long	
L_2	RFC, $Q_U < 1$	