



NPN General - Purpose Amplifier

2N3904

Description

This device is designed as a general-purpose amplifier and switch. The useful dynamic range extends to 100 mA as a switch and to 100 MHz as an amplifier.

MAXIMUM RATINGS

2N3904

ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parametr	Conditions	Min	Max	Unit
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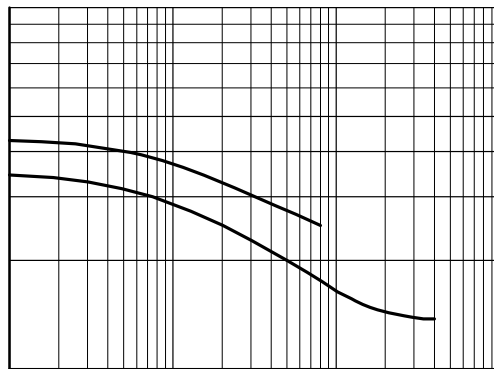
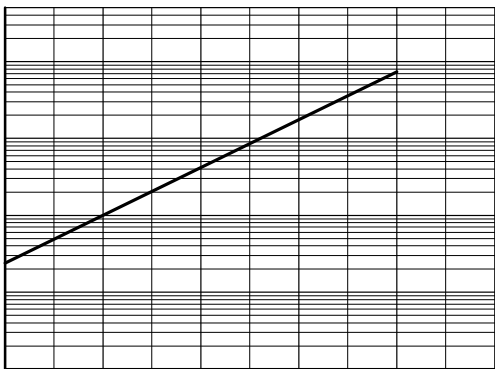
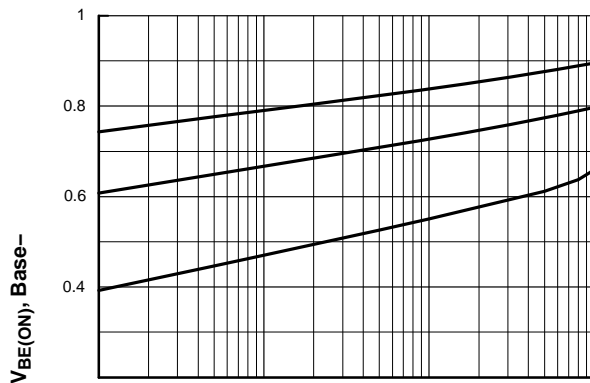
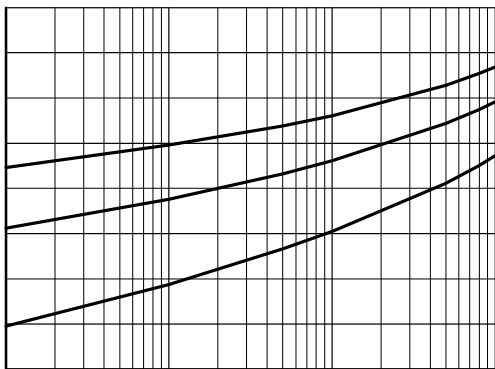
OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector–Emitter Breakdown Voltage	$I_C = 1.0\text{ mA}, I_B = 0$	40	–	V
$V_{(BR)CBO}$	Collector–Base Breakdown Voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	60	–	V
$V_{(BR)EBO}$	Emitter–Base Breakdown Voltage	$I_E = 10\ \mu\text{A}, I_C = 0$	6.0	–	V
I_{BL}	Base Cutoff Current	$V_{CE} = 30\text{ V}, V_{EB} = 3\text{ V}$	–	50	nA
I_{CEX}	Collector Cut–Off Current	$V_{CE} = 30\text{ V}, V_{EB} = 3\text{ V}$	–	50	nA

ON CHARACTERISTICS (Note 3)

h_{FE}	DC Current Gain	$I_C = 0.1\text{ mA}, V_{CE} = 1.0\text{ V}$	40	–	–
		$I_C = 1.0\text{ mA}, V_{CE} = 1.0\text{ V}$	70	–	
		$I_C = 10\text{ mA}, V_{CE} = 1.0\text{ V}$	100	300	
		$I_C = 50\text{ mA}, V_{CE} = 1.0\text{ V}$	60	–	

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

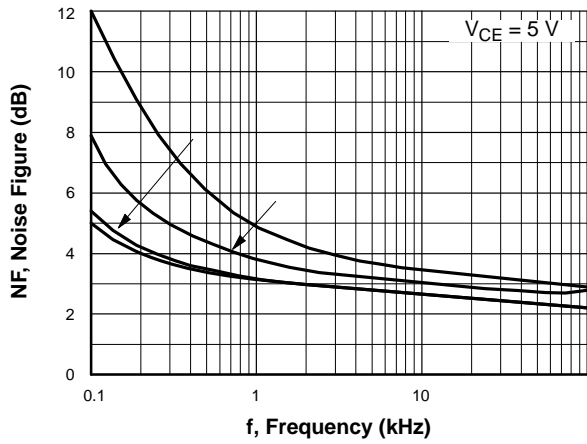
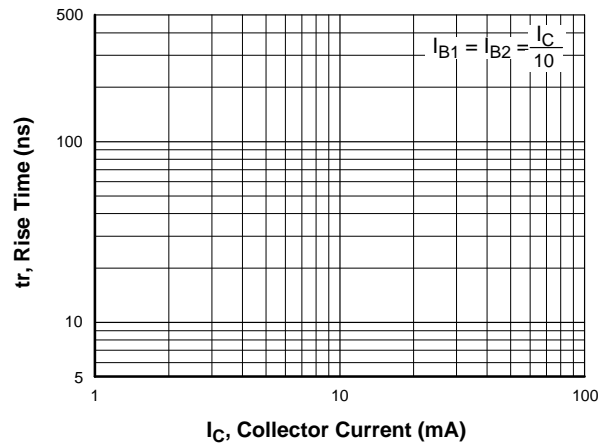
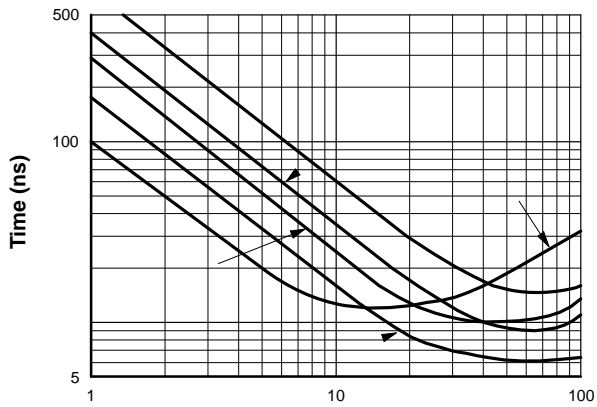
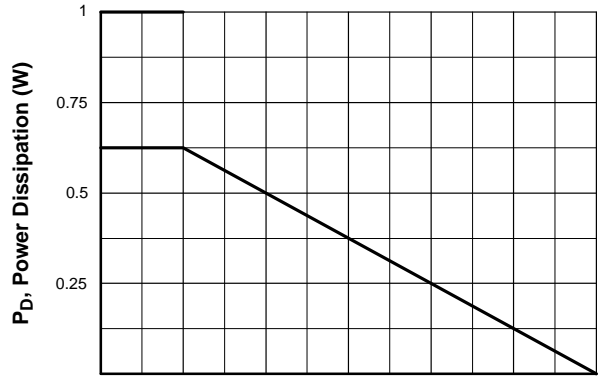
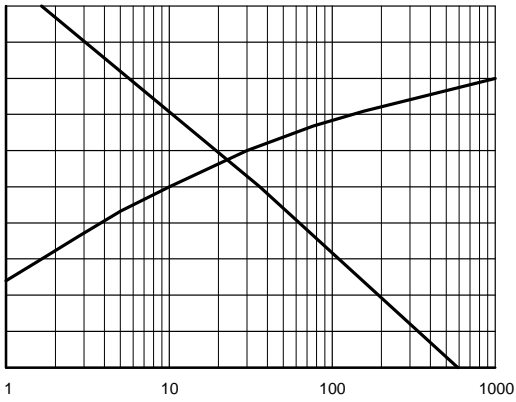
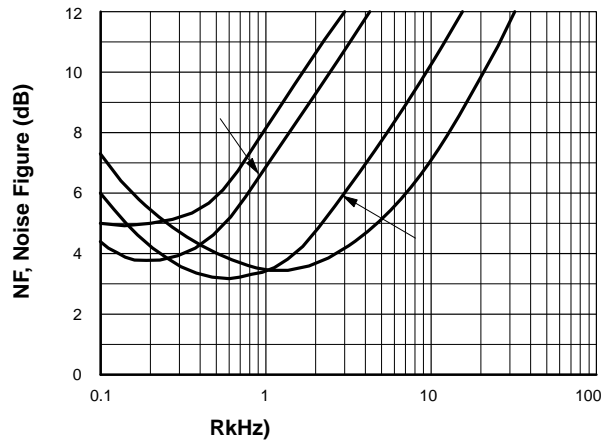
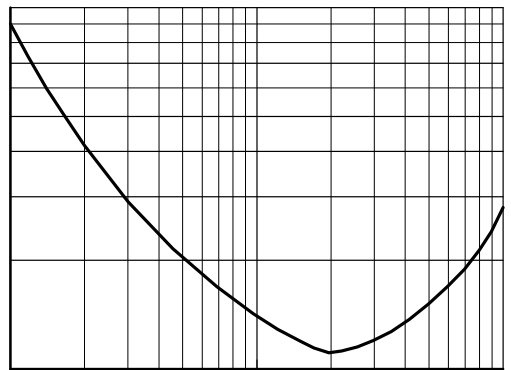
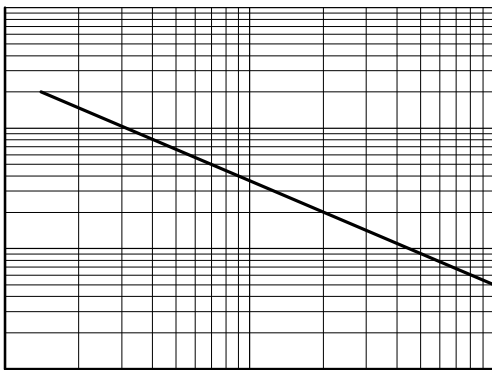
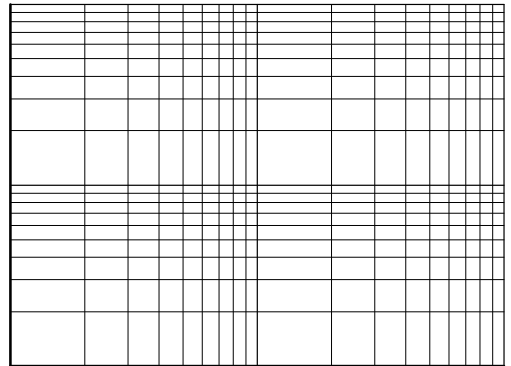


Figure 7. Noise Figure vs. Frequency



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TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



2N3904

TEST CIRCUITS

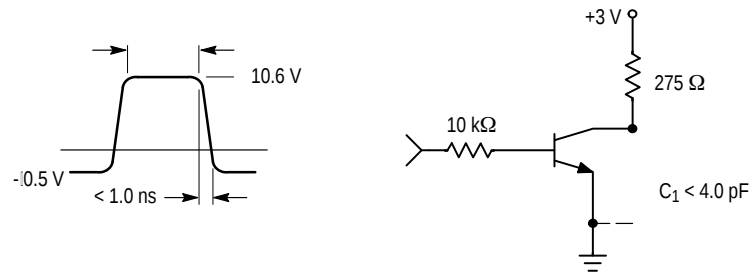
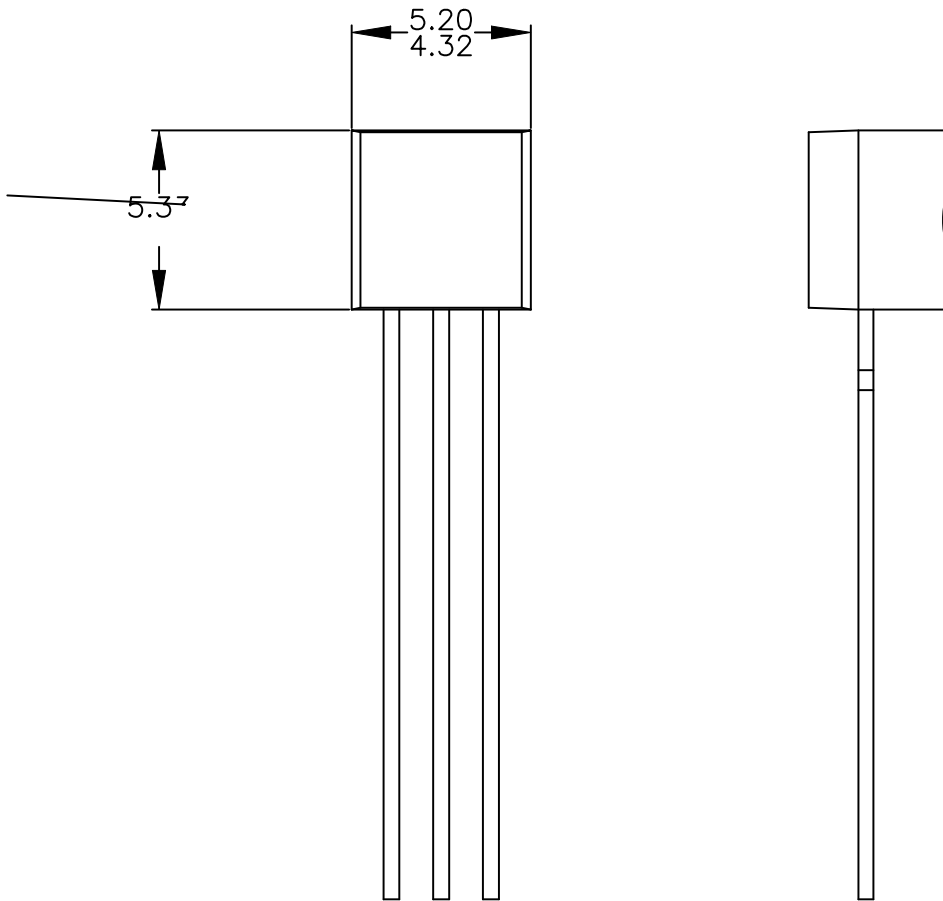


Figure 19. Delay and Rise Time Equivalent Test Circuit

Figure 20. Storage and Fall Time Equivalent Test Circuit

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DATE 30 SEP 2016

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