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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## 2N3904

### NPN General Purpose Amplifier

#### Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Capable of 625mW of Power Dissipation and 200mA  $I_C$
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Through Hole Package
- Halogen free available upon request by adding suffix "-HF"
- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C

#### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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##### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ( $I_C=1.0mA$ , $I_B=0$ )	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_C=10\mu A$ , $I_E=0$ )	60		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_E=10\mu A$ , $I_C=0$ )	6.0		Vdc
$I_{BL}$	Base Cutoff Current ( $V_{CE}=30V$ , $V_{BE}=3.0V$ )		50	nAdc
$I_{CEX}$	Collector Cutoff Current ( $V_{CE}=30V$ , $V_{BE}=3.0V$ )		50	nAdc

##### ON CHARACTERISTICS

$h_{FE}$	DC Current Gain* ( $I_C=0.1mA$ , $V_{CE}=1.0V$ ) ( $I_C=1.0mA$ , $V_{CE}=1.0V$ ) ( $I_C=10mA$ , $V_{CE}=1.0V$ ) ( $I_C=50mA$ , $V_{CE}=1.0V$ ) ( $I_C=100mA$ , $V_{CE}=1.0V$ )	40 70 100 60 30	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=10mA$ , $I_B=1.0mA$ ) ( $I_C=50mA$ , $I_B=5.0mA$ )		0.2 0.4	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_C=10mA$ , $I_B=1.0mA$ ) ( $I_C=50mA$ , $I_B=5.0mA$ )	0.65	0.85 0.95	Vdc

##### SMALL-SIGNAL CHARACTERISTICS

$f_T$	Current Gain-Bandwidth Product ( $I_C=10mA$ , $V_{CE}=20V$ , $f=100MHz$ )	250		MHz
$C_{obo}$	Output Capacitance ( $V_{CB}=5.0V$ , $I_E=0$ , $f=1.0MHz$ )		4.0	pF
$C_{ibo}$	Input Capacitance ( $V_{BE}=0.5V$ , $I_C=0$ , $f=1.0MHz$ )		8.0	pF
NF	Noise Figure ( $I_C=100\mu A$ , $V_{CE}=5.0V$ , $R_S=1.0k\Omega$ $f=10Hz$ to $15.7kHz$ )		5.0	dB

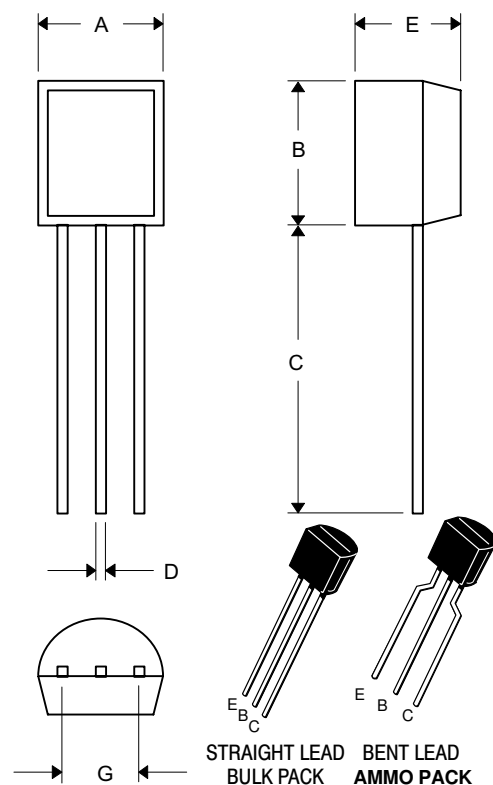
##### SWITCHING CHARACTERISTICS

$t_d$	Delay Time	( $V_{CC}=3.0V$ , $V_{BE}=0.5V$ )	35	ns
$t_r$	Rise Time	( $I_C=10mA$ , $I_B=1.0mA$ )	35	ns
$t_s$	Storage Time	( $V_{CC}=3.0V$ , $I_C=10mA$ )	200	ns
$t_f$	Fall Time	( $I_B=I_{B2}=1.0mA$ )	50	ns

\*Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

Symbol	Characteristic	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	°C/W

#### TO-92

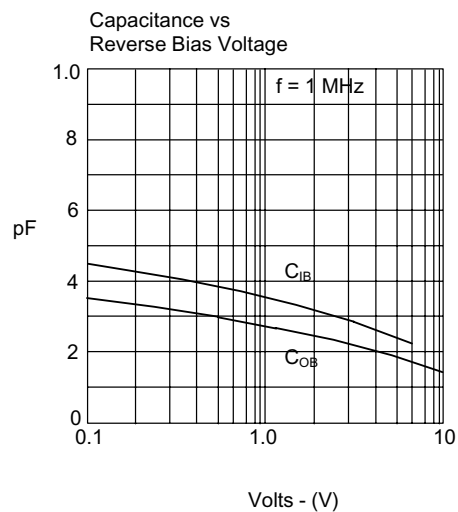
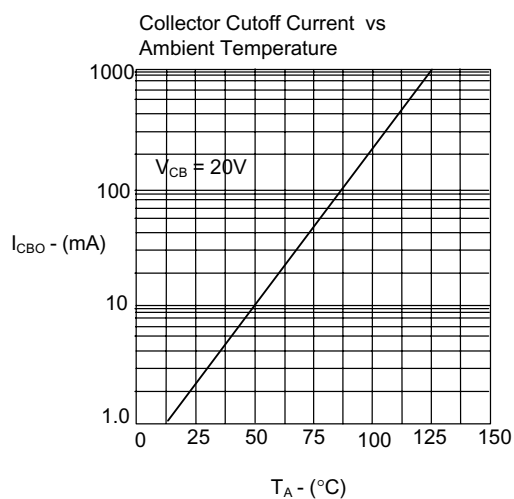
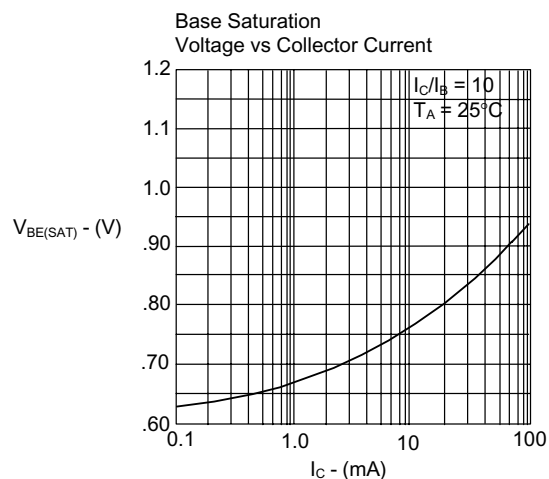
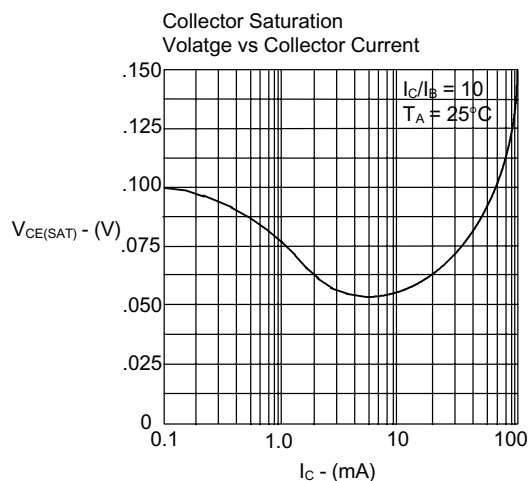
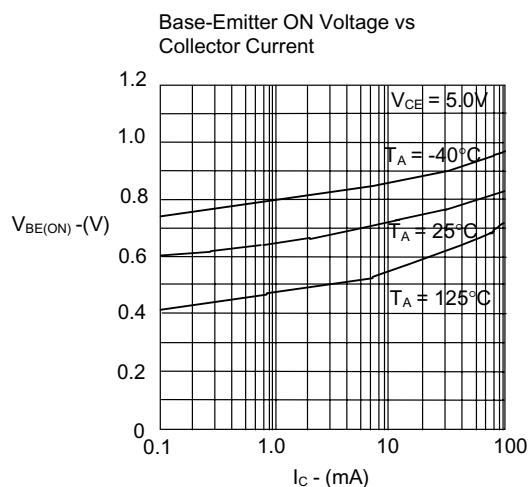
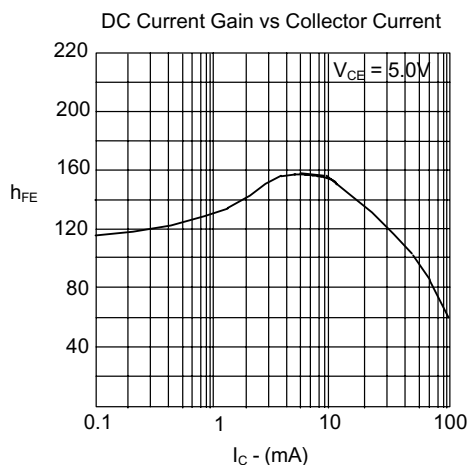


#### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.185	4.45	4.70	
B	.175	.185	4.45	4.70	
C	.500	---	12.70	---	
D	.016	.020	0.41	0.63	
E	.135	.145	3.43	3.68	
G	.095	.105	2.42	2.67	Straight Lead
	.173	.220	4.40	5.60	Bent Lead

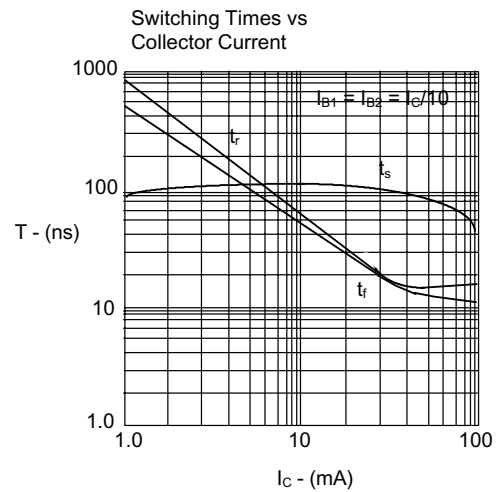
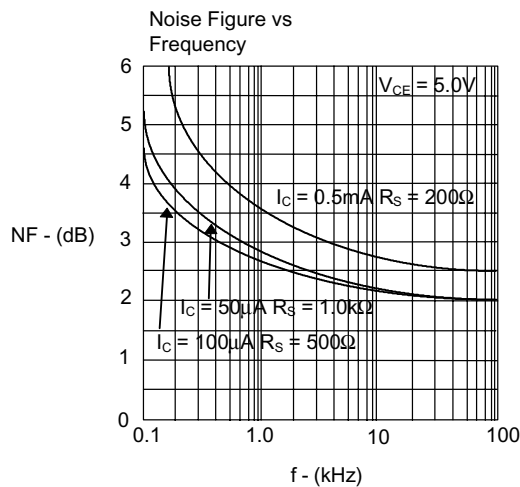
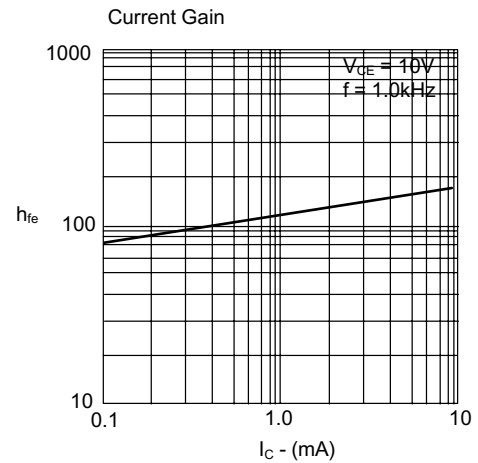
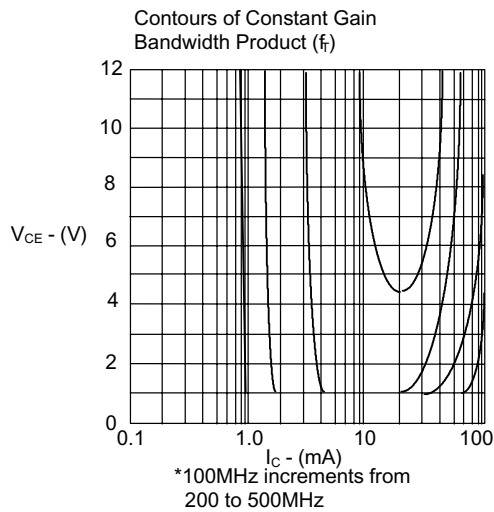
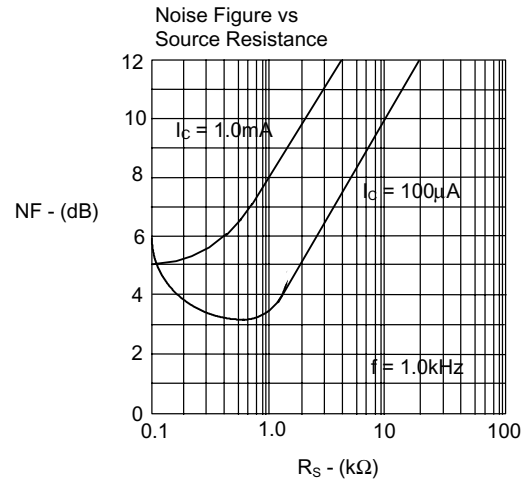
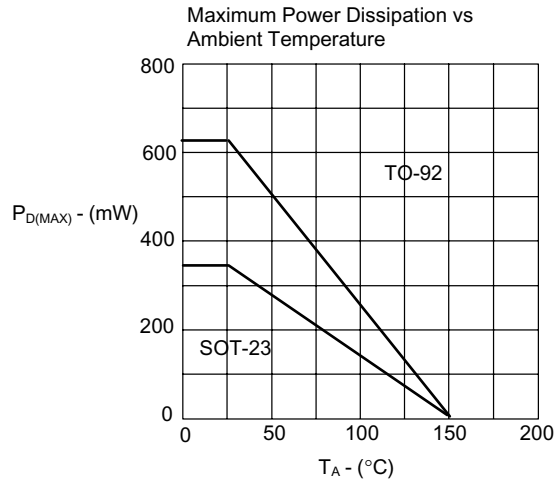
\* For ammo packing detailed specification, click here to visit our website of product packaging for details.

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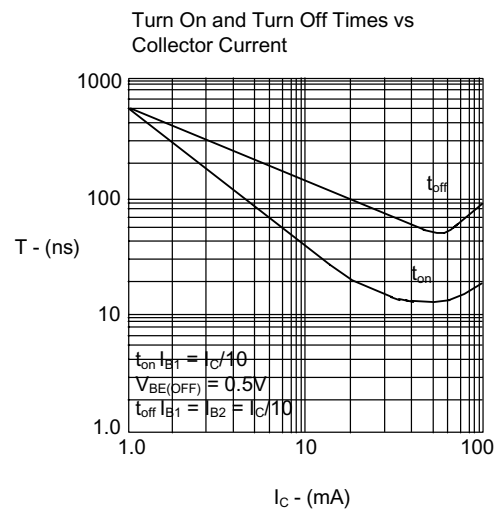
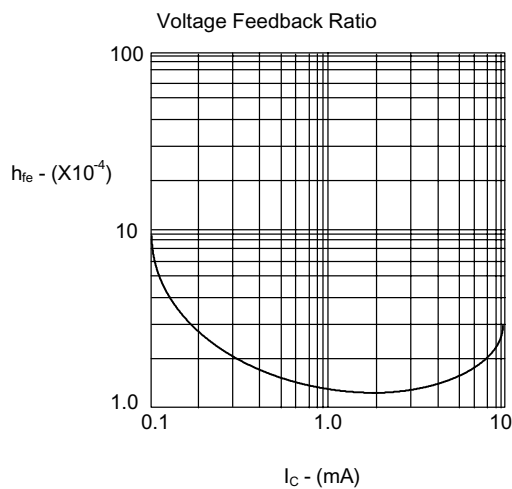
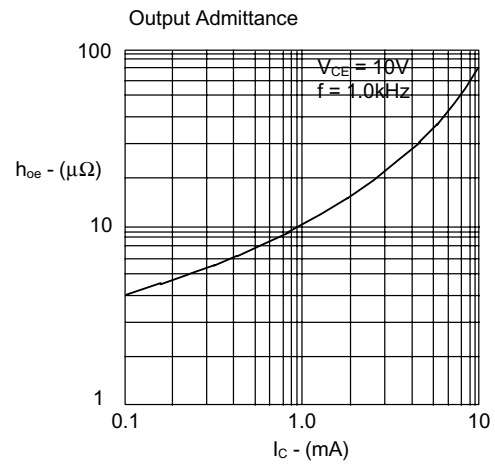
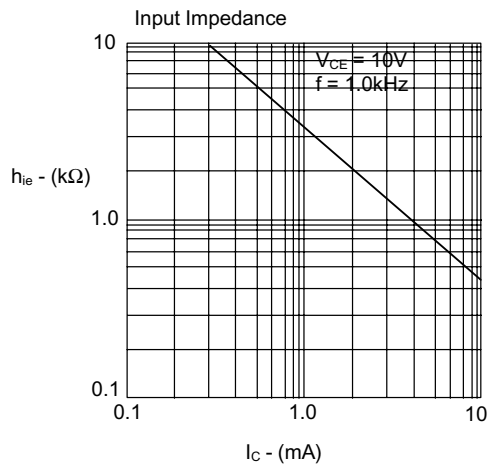




# 2N3904



2N3904



## Ordering Information :

Device	Packing
Part Number-AP	Ammo Packing: 20Kpcs/Carton
Part Number-BP	Bulk: 100Kpcs/Carton

Note : Adding "-HF" suffix for halogen free, eg. Part Number-AP-HF

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