



Micro Commercial Components

Micro Commercial Components  
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2N4400

NPN General Purpose Amplifier

Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- This device is designed for use as general purpose amplifiers and switches requiring collector currents to 500mA
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

Maximum Ratings\*

Symbol	Rating	Rating	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current, Continuous	600	mA
T <sub>J</sub>	Operating Junction Temperature	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature	-55 to +150	°C

Thermal Characteristics

Symbol	Rating	Max	Unit
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625 5.0	mW mW/°C
R <sub>JC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>JA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W

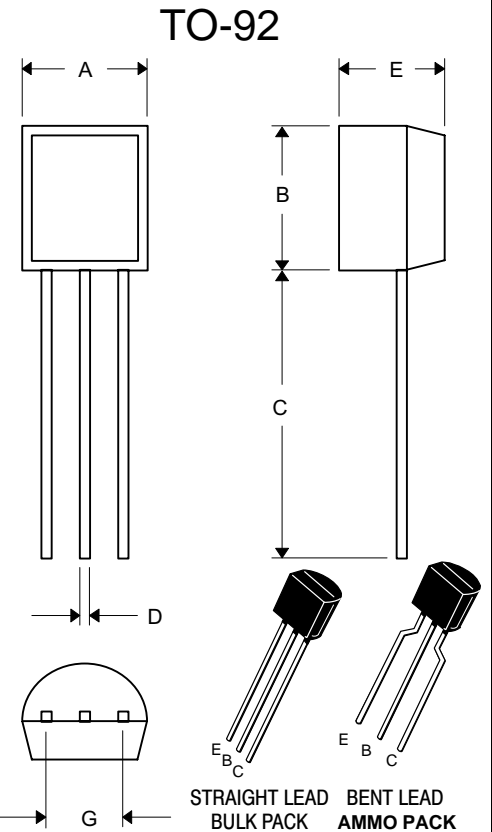
Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Max	Units
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OFF CHARACTERISTICS

V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage* (I <sub>C</sub> =1.0mA, I <sub>E</sub> =0)	40	---	Vdc
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>C</sub> =100mA, I <sub>E</sub> =0)	60	---	Vdc
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>E</sub> =100mA, I <sub>C</sub> =0)	6.0	---	Vdc
I <sub>CEX</sub>	Collector Cutoff Current (V <sub>CE</sub> =35Vdc, V <sub>EB</sub> =0.4Vdc)	---	0.1	μA
I <sub>BL</sub>	Base Cutoff Current (V <sub>CE</sub> =35Vdc, V <sub>EB</sub> =0.4Vdc)	---	0.1	μA

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.  
Notes: 1. These ratings are based on a maximum junction temperature of 150 degrees C.  
2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.



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.

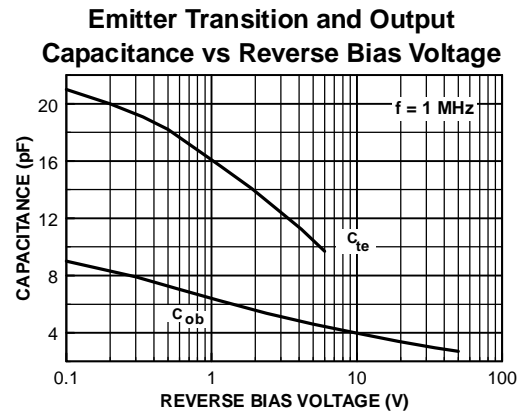
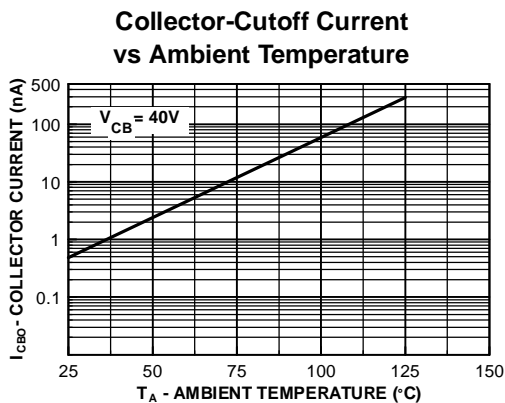
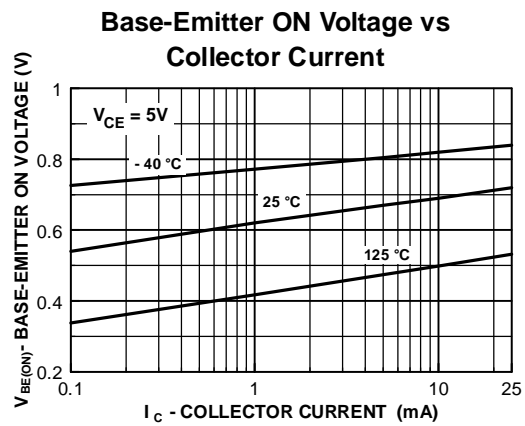
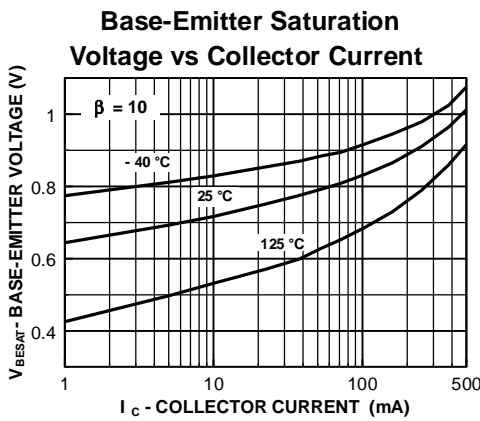
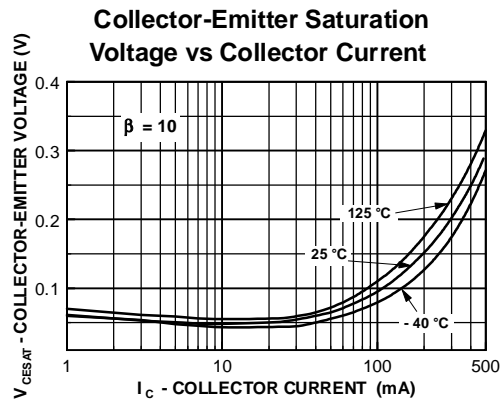
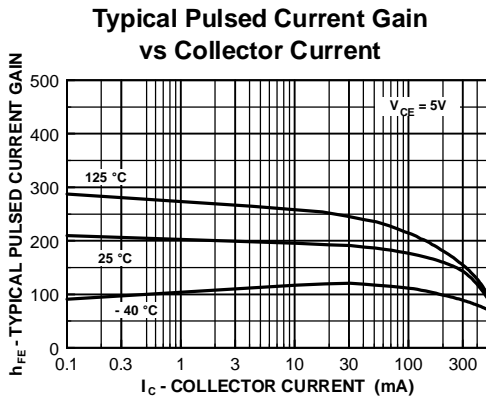
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Symbol	Parameter	Min	Max	Units
<b>ON CHARACTERISTICS</b>				
$h_{FE}$	DC Current Gain ( $V_{CE}=1.0Vdc, I_C=1.0mA$ )	40	150	---
	( $V_{CE}=1.0Vdc, I_C=10mA$ )	40		
	( $V_{CE}=1.0Vdc, I_C=150mA$ )	50		
	( $V_{CE}=2.0Vdc, I_C=500mA$ )	20		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=150mA, I_B=15mA$ )	---	0.40	Vdc
	( $I_C=500mA, I_B=50mA$ )	---	0.75	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_C=150mA, I_B=15mA$ )	0.75	0.95	Vdc
	( $I_C=500mA, I_B=50mA$ )		1.20	Vdc

<b>SMALL-SIGNAL CHARACTERISTICS</b>				
$C_{OB}$	Output Capacitance ( $V_{CB}=5.0Vdc, f=140KHz$ )	---	6.5	pF
$C_B$	Input Capacitance ( $V_{EB}=0.5Vdc, f=140KHz$ )	---	30	pF
$h_{fe}$	Small-Signal Current Gain ( $I_C=20mA, V_{CE}=10Vdc, f=100MHz$ )	2.0	---	---
$h_{fe}$	Small-Signal Current Gain ( $I_C=1.0mA, V_{CE}=10Vdc, f=1.0KHz$ )	150	200	---
$h_{ie}$	Small-Signal Current Gain ( $I_C=1.0mA, V_{CE}=10Vdc, f=1.0KHz$ )	0.5	7.5	KOHM
$h_{re}$	Small-Signal Current Gain ( $I_C=1.0mA, V_{CE}=10Vdc, f=1.0KHz$ )	0.10	8.0	$\times 10^4$
$h_{oe}$	Small-Signal Current Gain ( $I_C=1.0mA, V_{CE}=10Vdc, f=1.0KHz$ )	1.0	30	umhos

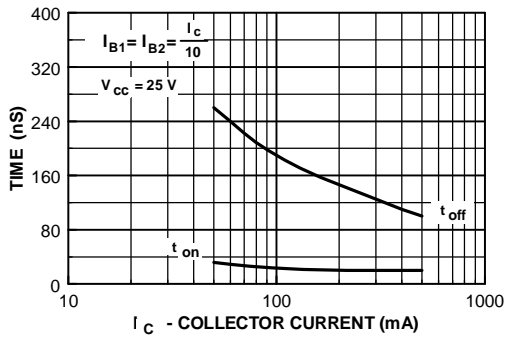
<b>SWITCHING CHARACTERISTICS</b>					
$T_d$	Delay Time	$V_{CC}=30Vdc, I_C=150mA, I_{B1}=15mA, V_{BE(off)}=2.0Vdc$	---	15	ns
$t_r$	Rise Time		---	20	ns
$t_s$	Storage Time	$V_{CC}=30Vdc, I_C=150mA, I_{B1}=I_{B2}=15mA$	---	225	ns
$t_f$	Fall Time		---	30	ns

\* Pulse Test: Pulse Width<300us, Duty Cycle<2.0%

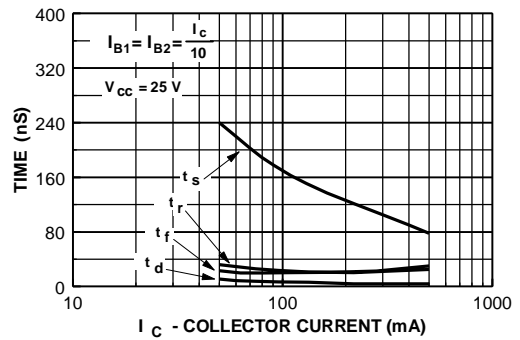


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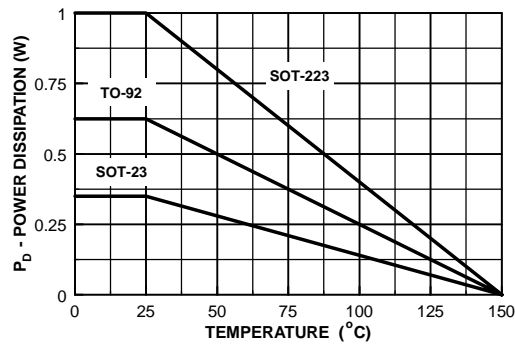
**Turn On and Turn Off Times vs Collector Current**



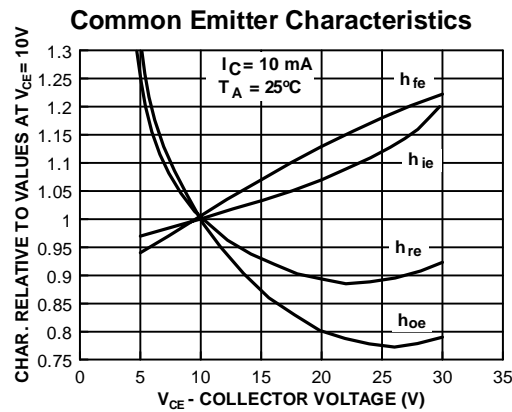
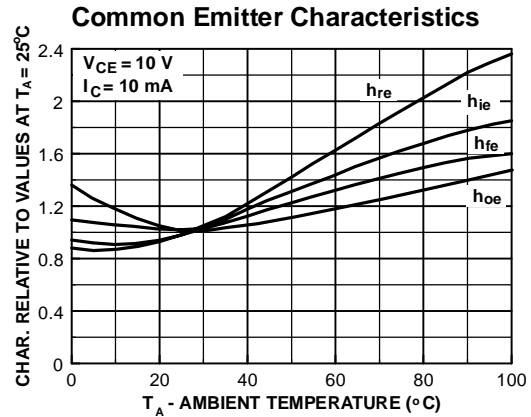
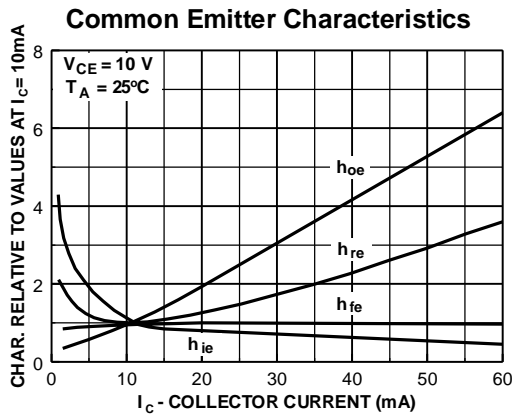
**Switching Times vs Collector Current**



**Power Dissipation vs Ambient Temperature**



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### 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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