

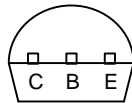
# 2N4401

## NPN General Purpose Amplifier

### Features

- Through Hole Package
- Capable of 600mWatts of Power Dissipation

Pin Configuration  
Bottom View



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

Symbol	Parameter	Min	Max	Units
<b>OFF CHARACTERISTICS</b>				
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage* ( $I_C=1.0mA$ , $I_B=0$ )	40		Vdc
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ( $I_C=10mA$ , $I_E=0$ )	60		Vdc
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage ( $I_E=0.1mA$ , $I_C=0$ )	6.0		Vdc
$I_{BL}$	Base Cutoff Current ( $V_{CE}=35Vdc$ , $V_{BE}=0.4Vdc$ )		0.1	$\mu A$
$I_{CEX}$	Collector Cutoff Current ( $V_{CE}=35Vdc$ , $V_{BE}=0.4Vdc$ )		0.1	$\mu A$

### ON CHARACTERISTICS

$h_{FE}$	DC Current Gain* ( $I_C=0.1mA$ , $V_{CE}=1.0Vdc$ ) ( $I_C=1.0mA$ , $V_{CE}=1.0Vdc$ ) ( $I_C=10mA$ , $V_{CE}=1.0Vdc$ ) ( $I_C=150mA$ , $V_{CE}=1.0Vdc$ ) ( $I_C=500mA$ , $V_{CE}=1.0Vdc$ )	20 40 80 100 40	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage ( $I_C=150mA$ , $I_B=15mA$ ) ( $I_C=500mA$ , $I_B=50mA$ )		0.4 0.75	Vdc
$V_{BE(sat)}$	Base-Emitter Saturation Voltage ( $I_C=150mA$ , $I_B=15mA$ ) ( $I_C=500mA$ , $I_B=50mA$ )	0.75	0.95 1.2	Vdc

### SMALL-SIGNAL CHARACTERISTICS

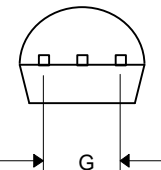
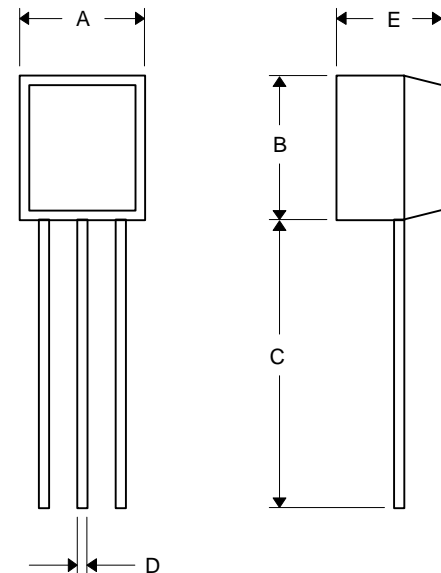
$f_T$	Current Gain-Bandwidth Product ( $I_C=20mA$ , $V_{CE}=10Vdc$ , $f=100MHz$ )	250		MHz
$C_{cb}$	Collector-Base Capacitance ( $V_{CB}=5.0Vdc$ , $I_E=0$ , $f=100kHz$ )		6.5	pF
$C_{eb}$	Emitter-Base Capacitance ( $V_{BE}=0.5Vdc$ , $I_C=0$ , $f=100kHz$ )		30.0	pF

### SWITCHING CHARACTERISTICS

$t_d$	Delay Time	( $V_{CC}=30Vdc$ , $V_{BE}=0.2Vdc$ )	15	ns
$t_r$	Rise Time	( $I_C=150mA$ , $I_{B1}=15mA$ )	20	ns
$t_s$	Storage Time	( $V_{CC}=30Vdc$ , $I_C=150mA$ )	225	ns
$t_f$	Fall Time	( $I_{B1}=I_{B2}=15mA$ )	30	ns

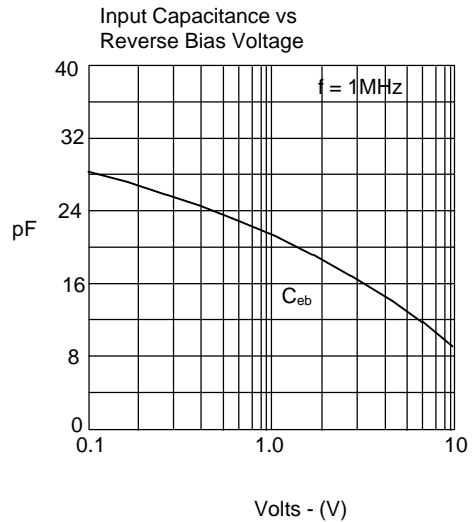
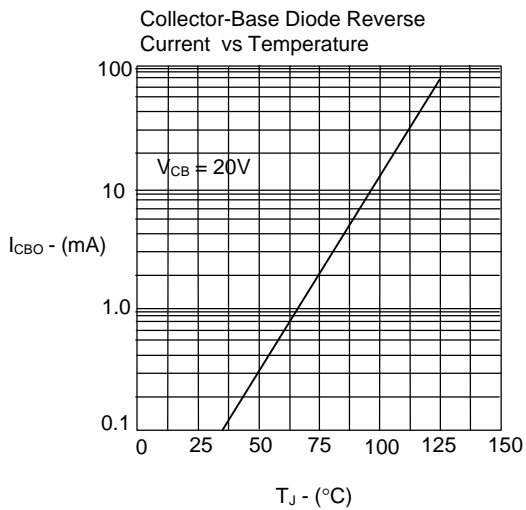
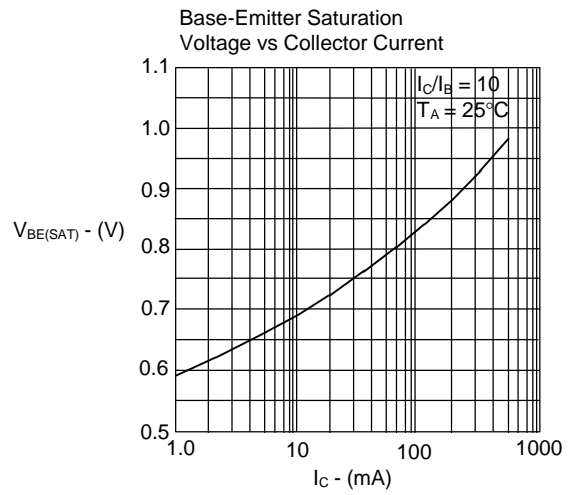
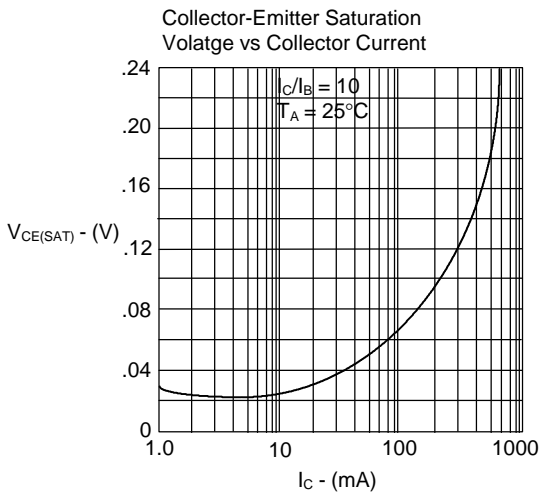
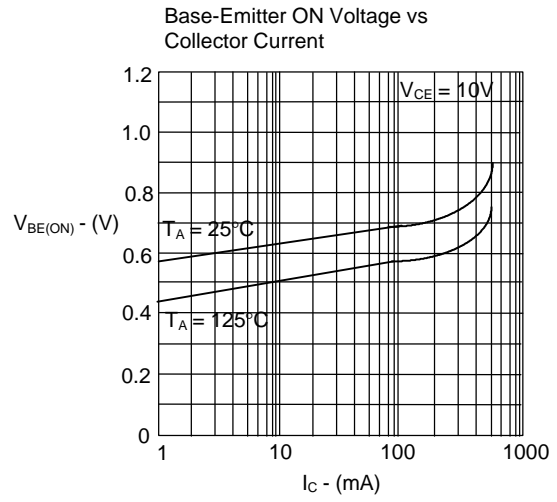
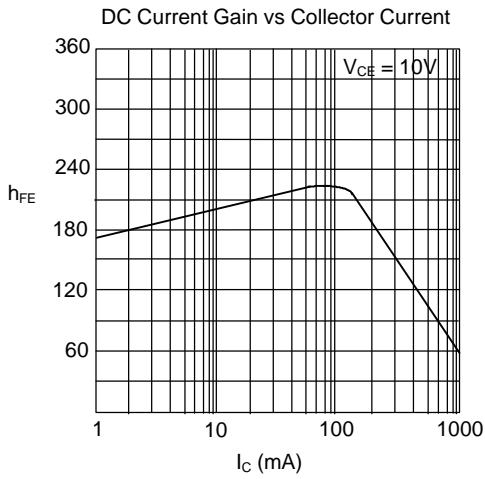
\*Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

### TO-92



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.175	.185	4.45	4.70	
B	.175	.185	4.46	4.70	
C	.500	---	12.7	---	
D	.016	.020	0.41	0.63	
E	.135	.145	3.43	3.68	
G	.095	.105	2.42	2.67	

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