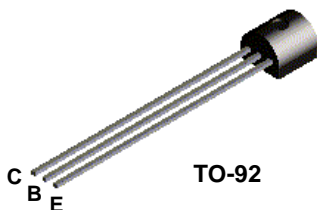


**PN3638  
PN3638A**



**PNP General Purpose Amplifier**

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 500 mA. Sourced from Process 63. See PN2907A for characteristics.

**Absolute Maximum Ratings\***

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	25	V
V <sub>CBO</sub>	Collector-Base Voltage	25	V
V <sub>EBO</sub>	Emitter-Base Voltage	4.9	V
I <sub>C</sub>	Collector Current - Continuous	800	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

\*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.

**Thermal Characteristics**

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		PN3638/A	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W

# PNP General Purpose Amplifier

(continued)

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## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	25		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage*	$I_C = 100 \text{ } \mu\text{A}, I_B = 0$	25		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	25		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	4.0		V
$I_{CES}$	Collector-Cutoff Current	$V_{CE} = 15 \text{ V}, I_E = 0$ $V_{CE} = 15 \text{ V}, I_E = 0, T_A = 65^\circ\text{C}$		35 2.0	nA $\mu\text{A}$

## ON CHARACTERISTICS\*

$h_{FE}$	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_C = 50 \text{ mA}$ <b>PN3638</b> <b>PN3638A</b> $V_{CE} = 2.0 \text{ V}, I_C = 300 \text{ mA}$ <b>PN3638</b> <b>PN3638A</b> $V_{CE} = 10 \text{ V}, I_C = 100 \text{ mA}$ <b>PN3638</b> <b>PN3638A</b> $V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}$ <b>PN3638A</b>	30 100 30 20 20 80 100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$ $I_C = 300 \text{ mA}, I_B = 30 \text{ mA}$		0.25 1.0	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$ $I_C = 300 \text{ mA}, I_B = 30 \text{ mA}$	0.8	1.1 2.0	V V

## SMALL SIGNAL CHARACTERISTICS

$C_{ob}$	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 1.0 \text{ MHz}$ <b>PN3638</b> <b>PN3638A</b>		20 10	pF pF
$C_{ib}$	Input Capacitance	$V_{BE} = 0.5 \text{ V}, f = 1.0 \text{ MHz}$ <b>PN3638</b> <b>PN3638A</b>		65 25	pF pF
$h_{fe}$	Small-Signal Current Gain	$I_C = 50 \text{ mA}, V_{CE} = 3.0 \text{ V},$ $f = 100 \text{ MHz}$ <b>PN3638</b> <b>PN3638A</b> $I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 1.0 \text{ kHz}$ <b>PN3638</b> <b>PN3638A</b>	1.0 1.5 25 100		
$h_{ie}$	Input Impedance	$I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 1.0 \text{ kHz}$		2.0	k $\Omega$
$h_{oe}$	Output Admittance			1.2	$\mu\text{mhos}$
$h_{re}$	Voltage Feedback Ratio	<b>PN3638</b> <b>PN3638A</b>		26 15	$\times 10^{-4}$ $\times 10^{-4}$

## SWITCHING CHARACTERISTICS

$t_{on}$	Turn-on Time	$V_{CC} = 10 \text{ V}, I_C = 300 \text{ mA},$ $I_{B1} = 30 \text{ mA}$	75		ns
$t_d$	Delay Time		20		ns
$t_r$	Rise Time		70		ns
$t_{off}$	Turn-off Time	$V_{CC} = 10 \text{ V}, I_C = 300 \text{ mA}$	170		ns
$t_s$	Storage Time	$I_{B1} = I_{B2} = 30 \text{ mA}$	140		ns
$t_f$	Fall Time		70		ns

\*Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$