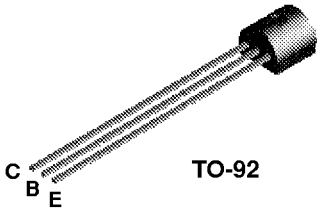
FAIRCHILD SEMICONDUCTOR™

Discrete POWER & Signal Technologies

PN3638
PN3638A



TO-92

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_{CEO}	Collector-Emitter Voltage	25	V
V_{CBO}	Collector-Base Voltage	25	V
V_{EBO}	Emitter-Base Voltage	4.9	V
I_C	Collector Current - Continuous	800	mA
T_J, T_{stg}	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_D	Total Device Dissipation Derate above 25°C	625 5.0	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	°C/W

PNP General Purpose Amplifier
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 10 mA, I_B = 0	25		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage*	I_C = 100 µA, I_B = 0	25		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10 µA, I_E = 0	25		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	4.0		V
I_{CES}	Collector-Cutoff Current	V_{CE} = 15 V, I_E = 0 V_{CE} = 15 V, I_E = 0, T_A = 65°C		35 2.0	nA µA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	V_{CE} = 1.0 V, I_C = 50 mA **PN3638** **PN3638A** V_{CE} = 2.0 V, I_C = 300 mA **PN3638** **PN3638A** V_{CE} = 10 V, I_C = 100 mA **PN3638** **PN3638A** V_{CE} = 10 V, I_C = 1.0 mA **PN3638A**	 30 100 30 20 20 80 100		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 50 mA, I_B = 2.5 mA I_C = 300 mA, I_B = 30 mA		0.25 1.0	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 50 mA, I_B = 2.5 mA I_C = 300 mA, I_B = 30 mA	 0.8	1.1 2.0	V V
SMALL SIGNAL CHARACTERISTICS					
C_{ob}	Output Capacitance	V_{CB} = 10 V, f = 1.0 MHz **PN3638** **PN3638A**		 20 10	 pF pF
C_{ib}	Input Capacitance	V_{BE} = 0.5 V, f = 1.0 MHz **PN3638** **PN3638A**		 65 25	 pF pF
h_{fe}	Small-Signal Current Gain	I_C = 50 mA, V_{CE} = 3.0 V, f = 100 MHz **PN3638** **PN3638A** I_C = 10 mA, V_{CE} = 10 V, f = 1.0 kHz **PN3638** **PN3638A**	 1.0 1.5 25 100		
h_{ie}	Input Impedance	I_C = 10 mA, V_{CE} = 10 V,		2.0	kΩ
h_{oe}	Output Admittance	f = 1.0 kHz		1.2	µmhos
h_{re}	Voltage Feedback Ratio	**PN3638** **PN3638A**		26 15	$x10^{-4}$ $x10^{-4}$
SWITCHING CHARACTERISTICS					
t_{on}	Turn-on Time	V_{CC} = 10 V, I_C = 300 mA,	75		ns
t_d	Delay Time	I_{B1} = 30 mA	20		ns
t_r	Rise Time		70		ns
t_{off}	Turn-off Time	V_{CC} = 10 V, I_C = 300 mA	170		ns
t_s	Storage Time	I_{B1} = I_{B2} = 30 mA	140		ns
t_f	Fall Time		70		ns

*Pulse Test: Pulse Width ≤300µs, Duty Cycle ≤2.0%