

PN3645



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	60	V
V _{CBO}	Collector-Base Voltage	60	V
V _{EBO}	Emitter-Base Voltage	5.0	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
		PN3645	
P _D	Total Device Dissipation	625	mW
	Derate above 25°C	5.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3	°C/W
R _{θJA}	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
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	60		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \text{ } \mu\text{A}, I_E = 0$	60		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	5.0		V
I_{CES}	Collector-Cutoff Current	$V_{CB} = 50 \text{ V}, I_E = 0$ $V_{CB} = 50 \text{ V}, I_E = 0, T_A = 65^\circ\text{C}$		35 2.0	nA μA
I_{BL}	Base-Cutoff Current	$V_{CE} = 50 \text{ V}, I_C = 0$		35	nA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$V_{CE} = 10 \text{ V}, I_C = 0.1 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 150 \text{ mA}$ $V_{CE} = 2.0 \text{ V}, I_C = 300 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 50 \text{ mA}$	40 80 100 100 20 80	300	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$ $I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$		0.25 0.4	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50 \text{ mA}, I_B = 2.5 \text{ mA}$ $I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$		1.0 1.3	V V

SMALL SIGNAL CHARACTERISTICS

C_{ob}	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 140 \text{ kHz}$		8.0	pF
C_{ib}	Input Capacitance	$V_{BE} = 0.5 \text{ V}, f = 140 \text{ kHz}$		35	pF
h_{fe}	Small-Signal Current Gain	$I_C = 20 \text{ mA}, V_{CE} = 20 \text{ V},$ $f = 100 \text{ MHz}$	2.0		

SWITCHING CHARACTERISTICS

t_{on}	Turn-on Time	$V_{CC} = 30 \text{ V}, I_C = 300 \text{ mA},$ $I_{B1} = 30 \text{ mA}$		40	ns
t_d	Delay Time			25	ns
t_r	Rise Time			35	ns
t_{off}	Turn-off Time	$V_{CC} = 30 \text{ V}, I_C = 300 \text{ mA}$ $I_{B1} = I_{B2} = 30 \text{ mA}$		100	ns
t_s	Storage Time			70	ns
t_f	Fall Time			50	ns

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