

PN4275



NPN Switching Transistor

This device is designed for high speed saturated switching applications at currents to 100 mA. Sourced from Process 21. See PN2369A for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	15	V
V _{CBO}	Collector-Base Voltage	40	V
V _{EBO}	Emitter-Base Voltage	4.5	V
I _C	Collector Current - Continuous	200	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
		PN4275	
P _D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	125	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	357	°C/W

NPN Switching Transistor

(continued)

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*	$I_C = 10 \text{ mA}, I_B = 0$	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ }\mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ }\mu\text{A}, I_C = 0$	4.5		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \text{ }\mu\text{A}, I_B = 0$	40		V
I_B	Base Cutoff Current	$V_{CE} = 20 \text{ V}$		0.4	μA
I_{CBO}	Collector Cutoff Current	$V_{CB} = 20 \text{ V}, I_E = 0,$ $T_A = 65^\circ\text{C}$		10	μA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$I_C = 10 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 30 \text{ mA}, V_{CE} = 0.4 \text{ V}$ $I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$	35 30 18	120	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 30 \text{ mA}, I_B = 3.0 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 3.3 \text{ mA}$ $I_C = 100 \text{ mA}, I_B = 10 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA},$ $T_A = 65^\circ\text{C}$		0.20 0.25 0.18 0.50 0.30	V V V V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$ $I_C = 30 \text{ mA}, I_B = 3.0 \text{ mA}$ $I_C = 10 \text{ mA}, I_B = 3.3 \text{ mA}$ $I_C = 100 \text{ mA}, I_B = 10 \text{ mA}$	0.72 0.74	0.85 1.15 1.0 1.6	V V V V

SMALL SIGNAL CHARACTERISTICS

C_{ob}	Output Capacitance	$V_{CB} = 5.0 \text{ V}, f = 1.0 \text{ MHz}$		4.0	pF
h_{fe}	Small-Signal Current Gain	$I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 100 \text{ MHz}$	4.0		

SWITCHING CHARACTERISTICS

t_{on}	Turn-on Time	$V_{CC} = 3.0 \text{ V}, I_C = 10 \text{ mA},$		12	ns
t_d	Delay Time	$I_{B1} = 3.3 \text{ mA},$		9.0	ns
t_r	Rise Time	$V_{BE (off)} = -3.0 \text{ V}$		7.0	ns
t_{off}	Turn-off Time	$V_{CC} = 3.0 \text{ V}, I_C = 10 \text{ mA}$		12	ns
t_s	Storage Time	$I_{B1} = I_{B2} = 3.3 \text{ mA}$		8.0	ns
t_f	Fall Time	$V_{BE (off)} = -3.0 \text{ V}$		8.0	ns
t_s	Storage Time	$I_C = I_{B1} = I_{B2} = 10 \text{ mA}$		13	ns

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