FAIRCHILD SEMICONDUCTOR TM

Discrete POWER & Signal Technologies

PN4275

TO-92

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
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	°C/W
$R_{\theta JA}$	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
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 10 mA, I_B = 0	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10 µA, I_E = 0	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	4.5		V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	I_C = 10 µA, I_B = 0	40		V
I_B	Base Cutoff Current	V_{CE} = 20 V		0.4	µA
I_{CBO}	Collector Cutoff Current	V_{CB} = 20 V, I_E = 0, T_A = 65 °C		10	µA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	I_C = 10 mA, V_{CE} = 1.0 V I_C = 30 mA, V_{CE} = 0.4 V I_C = 100 mA, V_{CE} = 1.0 V	35 30 18	120	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 1.0 mA I_C = 30 mA, I_B = 3.0 mA I_C = 10 mA, I_B = 3.3 mA I_C = 100 mA, I_B = 10 mA I_C = 10 mA, I_B = 1.0 mA, T_A = 65 °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 mA, I_B = 1.0 mA I_C = 30 mA, I_B = 3.0 mA I_C = 10 mA, I_B = 3.3 mA I_C = 100 mA, I_B = 10 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 V, f = 1.0 MHz		4.0	pF
h_{fe}	Small-Signal Current Gain	I_C = 10 mA, V_{CE} = 10 V, f = 100 MHz	4.0		
SWITCHING CHARACTERISTICS					
t_{on}	Turn-on Time	V_{CC} = 3.0 V, I_C = 10 mA,		12	ns
t_d	Delay Time	I_{B1} = 3.3 mA,		9.0	ns
t_r	Rise Time	$V_{BE\ (off)}$ = -3.0 V		7.0	ns
t_{off}	Turn-off Time	V_{CC} = 3.0 V, I_C = 10 mA		12	ns
t_s	Storage Time	I_{B1} = I_{B2} = 3.3 mA		8.0	ns
t_f	Fall Time	$V_{BE\ (off)}$ = -3.0 V		8.0	ns
t_s	Storage Time	I_C = I_{B1} = I_{B2} = 10 mA		13	ns

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