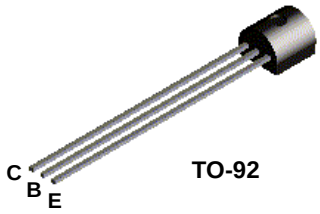
FAIRCHILD SEMICONDUCTOR TM

Discrete POWER & Signal Technologies

2N5307



TO-92

NPN Darlington Transistor

This device is designed for applications requiring extremely high current gain at currents to 1.0 A. Sourced from Process 05. See MPSA14 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	40	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current - Continuous	1.2	A
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
		2N5307	
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

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NPN Darlington 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	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 0.1 µA, I_E = 0	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 0.1 µA, I_C = 0	12		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 40 V, I_E = 0 V_{CB} = 40 V, I_E = 0, T_A = 100 °C		0.1 20	µA µA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 12 V, I_C = 0		0.1	µA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	V_{CE} = 5.0 V, I_C = 2.0 mA V_{CE} = 5.0 V, I_C = 100 mA	2,000 6,000	20,000	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 200 mA, I_B = 0.2 mA		1.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 200 mA, I_B = 0.2 mA		1.6	V
$V_{BE(on)}$	Base-Emitter On Voltage	I_C = 200 mA, V_{CE} = 5.0 V		1.5	V
SMALL SIGNAL CHARACTERISTICS					
C_{cb}	Collector-Base Capacitance	V_{CB} = 10 V, f = 1.0 MHz		10	pF
h_{fe}	Small-Signal Current Gain	I_C =2.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz I_C =2.0 mA, V_{CE} = 5.0 V, f = 10 MHz	2,000 6.0		

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