

## 2N5307



### 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 <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CB0</sub>	Collector-Base Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	12	V
I <sub>C</sub>	Collector Current - Continuous	1.2	A
T <sub>J</sub> , T <sub>stg</sub>	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 <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W

# NPN Darlington Transistor

(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*	$I_C = 10 \text{ mA}, I_B = 0$	40		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 0.1 \text{ }\mu\text{A}, I_E = 0$	40		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 0.1 \text{ }\mu\text{A}, I_C = 0$	12		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 40 \text{ V}, I_E = 0$ $V_{CB} = 40 \text{ V}, I_E = 0, T_A = 100 \text{ }^\circ\text{C}$		0.1 20	$\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 12 \text{ V}, I_C = 0$		0.1	$\mu\text{A}$

### ON CHARACTERISTICS\*

$h_{FE}$	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ $V_{CE} = 5.0 \text{ V}, I_C = 100 \text{ mA}$	2,000 6,000	20,000	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 200 \text{ mA}, I_B = 0.2 \text{ mA}$		1.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 200 \text{ mA}, I_B = 0.2 \text{ mA}$		1.6	V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 200 \text{ mA}, V_{CE} = 5.0 \text{ V}$		1.5	V

### SMALL SIGNAL CHARACTERISTICS

$C_{cb}$	Collector-Base Capacitance	$V_{CB} = 10 \text{ V}, f = 1.0 \text{ MHz}$		10	pF
$h_{fe}$	Small-Signal Current Gain	$I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$ $I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 10 \text{ MHz}$	2,000 6.0		

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