

2N5306



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	25	V
V _{CBO}	Collector-Base Voltage	25	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
		2N5306	
P _D	Total Device Dissipation Derate above 25°C	625	mW
		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

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(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*	$I_C = 10 \text{ mA}, I_B = 0$	25		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 0.1 \mu\text{A}, I_E = 0$	25		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 0.1 \mu\text{A}, I_C = 0$	12		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 25 \text{ V}, I_E = 0$ $V_{CB} = 25 \text{ V}, I_E = 0, T_A = 100 \text{ }^\circ\text{C}$		0.1 20	μA μA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 12 \text{ V}, I_C = 0$		0.1	μA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 2.0 \text{ mA}$ $V_{CE} = 5.0 \text{ V}, I_C = 100 \text{ mA}$	7,000 20,000	70,000	
$V_{CE(sat)}$	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	$I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$ $I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 10 \text{ MHz}$	7,000 6.0		

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