

NPN Darlington Power Silicon Transistor

Rev. V1

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/518
- TO-66 (TO-213AA) Package



Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	$I_C = 100 \text{ mAdc}$, 2N6300 $I_C = 100 \text{ mAdc}$, 2N6301	$V_{(BR)CEO}$	Vdc	60 80	—
Collector - Emitter Cutoff Current	$V_{CE} = 30 \text{ Vdc}$, 2N6300 $V_{CE} = 40 \text{ Vdc}$, 2N6301	I_{CEO}	μAdc	—	500 500
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ Vdc}$, $V_{BE} = 1.5 \text{ Vdc}$, 2N6300 $V_{CE} = 80 \text{ Vdc}$, $V_{BE} = 1.5 \text{ Vdc}$, 2N6301	I_{CEX}	μAdc	—	10 10
Emitter - Base Cutoff Current	$V_{EB} = 6 \text{ Vdc}$	I_{EBO}	μAdc	—	500
On Characteristics¹					
Forward Current Transfer Ratio	$I_C = 1 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$ $I_C = 4 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$ $I_C = 8 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$	H_{FE}	-	500 700 100	18,000
Collector - Emitter Saturation Voltage	$I_C = 4 \text{ Adc}$, $I_B = 16 \text{ Adc}$ $I_C = 8 \text{ Adc}$, $I_B = 80 \text{ Adc}$	$V_{CE(SAT)}$	Vdc	—	2.0 3.0
Base - Emitter Saturation Voltage	$I_C = 8 \text{ Adc}$, $I_B = 80 \text{ Adc}$	$V_{CE(SAT)}$	Vdc	—	4.0
Base - Emitter Voltage	$I_C = 1 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$	$V_{BE(ON)}$	Vdc	—	2.8
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 3 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$, $f = 1.0 \text{ kHz}$	$ H_{FE} $	-	25	350
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 3 \text{ Adc}$, $V_{CE} = 3 \text{ Vdc}$, $f = 1.0 \text{ kHz}$	$ H_{FE} $	-	300	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{OBO}	pF	—	200
Switching Characteristics					
Turn-On Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 4.0 \text{ Adc}$; $I_{B1} = 16 \text{ mAdc}$	T_{ON}	μs	—	2.0
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 4.0 \text{ Adc}$; $I_{B1} = 16 \text{ mAdc}$	T_{OFF}	μs	—	8.0
Safe Operating Area					
DC Tests:	$T_C = +25 \text{ }^\circ\text{C}$, 1 Cycle, $t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 8.0 \text{ Vdc}$, $I_C = 8.0 \text{ Adc}$				
Test 2:	$V_{CE} = 20 \text{ Vdc}$, $I_C = 2.0 \text{ Adc}$				
Test 3:	$V_{CE} = 60 \text{ Vdc}$, $I_C = 100 \text{ Adc}$, 2N6300				
	$V_{CE} = 80 \text{ Vdc}$, $I_C = 100 \text{ Adc}$, 2N6301				

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

Absolute Maximum Ratings

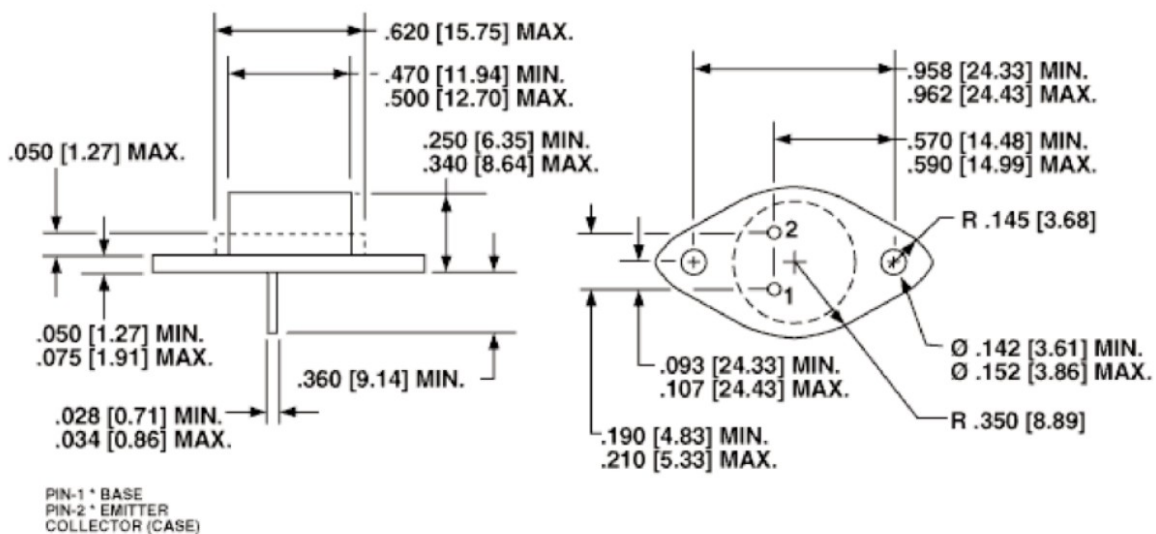
Ratings	Symbol	Value
Collector - Emitter Voltage 2N6300 2N6301	V_{CEO}	60 Vdc 80 Vdc
Collector - Base Voltage 2N6300 2N6301	V_{CBO}	60 Vdc 80 Vdc
Emitter - Base Voltage	V_{EBO}	5 Vdc
Base Current	I_B	120 mAdc
Collector Current	I_C	8 Adc
Total Power Dissipation @ $T_C = 0^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	P_T	75 W 37 W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-55°C to $+200^\circ\text{C}$

1. Derate linearly @ 143 mW / °C between $T_C = 25^\circ\text{C}$ and $T_C = 200^\circ\text{C}$

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.66°C/W

Outline Drawing



NOTE: Dimensions in Inches [mm]

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