

# **NPN Darlington Power Silicon Transistor** 2N6300 & 2N6301

#### **Features**

- Available in JAN, JANTX, and JANTXV per MIL-PRF-19500/539
- TO-66 (TO-213AA) Package



# **Maximum Ratings**

Ratings	Symbol	2N6300 2N6301		Units
Collector - Emitter Voltage	V <sub>CEO</sub>	60	80	Vdc
Collector - Base Voltage	r - Base Voltage V <sub>CBO</sub> 60 80		80	Vdc
Emitter - Base Voltage	V <sub>EBO</sub>	5.0		Vdc
Base Current	ΙB	120		mAdc
Collector Current	IC	8.0		Adc
Total Power Dissipation @ $T_C = +0  ^{\circ}C$ @ $T_C = +100  ^{\circ}C$	P <sub>T</sub>	75 37		W
Operating & Storage Temperature Range	T <sub>op</sub> , T <sub>stg</sub>	-55 to +200		°C

## **Thermal Characteristics**

Characteristics	Symbol	Maximum	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.66	°C/W

# Electrical Characteristics ( $T_C = 25$ °C unless otherwise noted)

OFF Characteristics		Symbol	Mimimum	Maximum	Units
Collector - Emitter Breakdown Voltag	e 2N6300 2N6301	V <sub>(BR)</sub> CEO	60 80		Vdc
Collector - Emitter Cutoff Current $V_{CE} = 30 \text{ Vdc}$ $V_{CE} = 40 \text{ Vdc}$	2N6300 2N6301	ICEO		0.5 0.5	mAdc
Collector - Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ $V_{CE} = 80 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$	2N6300 2N6301	ICEX		10 10	μAdc
Emitter - Base Cutoff Current $V_{EB} = 5.0  \text{Vdc}$		I <sub>EBO</sub>		5.0	mAdc



Revision Date: 10/12/2011

New Product



## **Electrical Characteristics -con't**

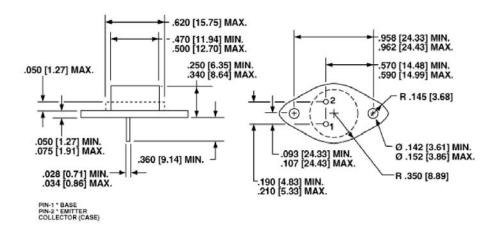
	(2)				
ON Characteristics		Symbol	Minimum	Maximum	Unit
Forward Current Trans $I_C = 1.0 \text{ Adc, } V_{CF} = 1.0 \text{ Adc}$			500		
$I_C = 4.0 \text{ Adc, } V_{CF} = 4.0 \text{ Adc, } $		H <sub>FE</sub>	750	18,000	
$I_C = 8.0 \text{ Adc, } V_{CF} = 1.0 \text{ Adc, } $		<sub>E</sub>	100	10,000	
Collector - Emitter Sati		+			
$I_C = 4.0 \text{ Adc}, I_B =$	3	V <sub>CE(sat)</sub>		2.0	Vdc
$I_C = 8.0 \text{ Adc}, I_B = 8.0 \text{ Adc}$		CEISau		3.0	,
Base - Emitter Saturati	on Voltage				
$I_C = 8.0 \text{ Adc}, I_B = 8.0 \text{ Adc}$	80 mVdc	V <sub>BE(sat)</sub>		4.0	Vdc
Base-Emitter Voltage					
$I_C = 4.0 \text{ Adc}, V_{CE}$	= 3.0 Vdc	V <sub>BE(on)</sub>		2.8	Vdc
DYNAMIC Charact	eristics				
	n Emitter Small-Signal Short-Circuit				
Forward Current Transfer Ratio $I_C = 3.0 \text{ Adc}, V_{CF} = 3.0 \text{ Vdc}, f = 1.0 \text{ MHz}$		h <sub>fe</sub>	25	350	
0 02		''fe	20	330	
Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 3.0$ Adc, $V_{CF} = 3.0$ Vdc, $f = 1.0$ kHz		h <sub>fe</sub>	300		
Output Capacitance		1			
$V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz } \le f \le 1.0 \text{ MHz}$		C <sub>obo</sub>		200	pF
Switching Characte	eristics				
Tum-on Time					
$V_{CC} = 30 \text{ Vdc}, I_{C} = 4.0 \text{ Adc}, I_{B1} = 16 \text{ mAdc}$		τon		2.0	μs
Tum-Off Time	- 4 0 Ado I — 16 mAdo			0.0	
SAFE OPERATING A	= 4.0 Adc, I <sub>B1</sub> = 16 mAdc	τoff		8.0	μs
DC Tests:	$T_C = +25 ^{\circ}\text{C}$ , 1 Cycle, $t = 1.0 ^{\circ}\text{s}$				
Test 1: Test 2:	$V_{CE} = 8.0 \text{ Vdc}, I_{C} = 8.0 \text{ Adc}$ $V_{CF} = 20 \text{ Vdc}, I_{C} = 2.0 \text{ Adc}$				
Test 2:	$V_{CE} = 20 \text{ Vdc}, I_{C} = 2.0 \text{ Adc}$ $V_{CF} = 60 \text{ Vdc}, I_{C} = 100 \text{ mAdc}$	2N6300			
16313.	$V_{CE} = 80 \text{ Vdc}, I_{C} = 100 \text{ mAdc}$ $V_{CF} = 80 \text{ Vdc}, I_{C} = 100 \text{ mAdc}$	2N6300 2N6301			
	√CE = 00 √dc, 1C = 100 IIIAdc	2110301			

(1) Pulse Test: Pulse Width = 300  $\mu$ s, Duty Cycle  $\leq$ 2.0%.

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## **Outline Drawing**



NOTE: Dimensions in Inches [mm]

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