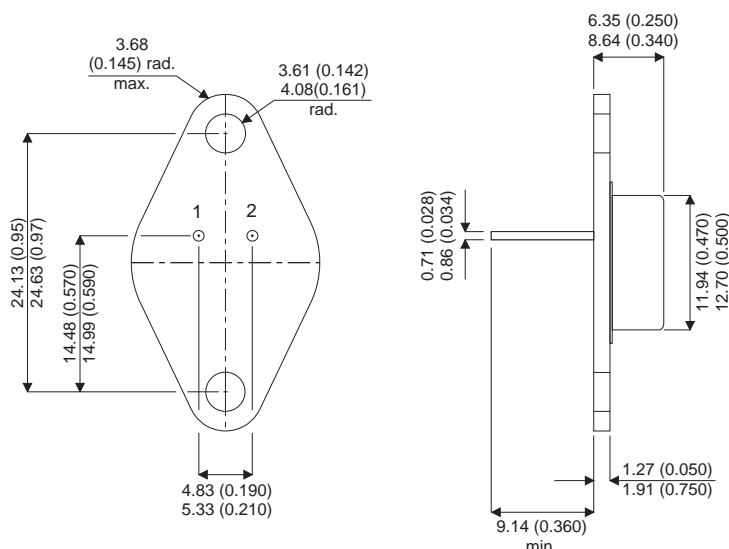


**MECHANICAL DATA**

Dimensions in mm (inches)



**DARLINGTON SILICON  
POWER TRANSISTORS**

Designed for general purpose amplifier and low frequency switching applications.

**FEATURES**

- High DC Current Gain
- Monolithic Construction with Built-in Base-Emitter Shunt Resistors

**TO-66 (TO-213AA)**

Pin 1 –Base      Pin 2 –Emitter      Case – Collector

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_C = 25^\circ\text{C}$ unless otherwise stated)		2N6300	2N6301	
$V_{CEO}$	Collector – Emitter Voltage	60V	80V	
$V_{CBO}$	Collector – Base Voltage	60V	80V	
$V_{EBO}$	Emitter – Base Voltage		5V	
$I_C$	Collector Current		Continuous	8A
			Peak	16A
$I_B$	Base Current		120mA	
$P_D$	Total Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	100W	75W	
		0.571W/ $^\circ\text{C}$	0.428W/ $^\circ\text{C}$	
$T_{STG}, T_J$	Operating and Storage Junction Temperature Range	-65 to +200 $^\circ\text{C}$		
$T_{\theta JC}$	Thermal Resistance – Junction - Case	1.75 $^\circ\text{C}/\text{W}$	2.33 $^\circ\text{C}/\text{W}$	

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

**ELECTRICAL CHARACTERISTICS 2N6300** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>					
$V_{CEO(sus)}$	Collector – Emitter Sustaining Voltage <sup>1</sup>	$I_C = 100mA$ $I_B = 0$	60		V
$I_{CEO}$	Collector Cut-off Current	$V_{CE} = 30V$ $I_B = 0$		0.5	mA
$I_{CEX}$	Collector Cut-off Current	$V_{CE} = \text{Rated } V_{CB}$ $V_{BE(off)} = 1.5V$ $T_C = 150^{\circ}C$		0.5 5.0	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{BE} = 5V$ $I_C = 0$		2.0	mA
<b>ON CHARACTERISTICS <sup>1</sup></b>					
$h_{FE}$	DC Current Gain	$V_{CE} = 3V$ $I_C = 4A$	750		18000
		$V_{CE} = 3V$ $I_C = 8A$	100		
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	$I_C = 4A$ $I_B = 16mA$		2.0	V
		$I_C = 8A$ $I_B = 80mA$		3.0	
$V_{BE(sat)}$	Base – Emitter Saturation Voltage	$I_C = 8A$ $I_B = 80mA$		4.0	V
$V_{BE(on)}$	Base – Emitter On Voltage	$V_{CE} = 3V$ $I_C = 4A$		2.8	V
<b>DYNAMIC CHARACTERISTICS</b>					
$C_{ob}$	Output Capacitance	$V_{CB} = 10V$ $I_E = 0$ $f = 0.1MHz$			200 pF
$ h_{fe} $	Magnitude of Common Emitter Small Signal Short Circuit Current Transfer Ratio	$V_{CE} = 3V$ $I_C = 3A$ $f = 1MHz$	4.0		—
$h_{fe}$	Small Signal Current Gain	$V_{CE} = 3V$ $I_C = 3A$ $f = 1kHz$	300		—

**Notes**

1 Pulse test:  $t_p = 300\mu s$  , Duty Cycle = 2%

**ELECTRICAL CHARACTERISTICS 2N6301** ( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
<b>OFF CHARACTERISTICS</b>						
$V_{\text{CEO(sus)}}$	Collector – Emitter Sustaining Voltage <sup>1</sup>	$I_{\text{C}} = 100\text{mA}$	$I_{\text{B}} = 0$	80	V	
$I_{\text{CEO}}$	Collector Cut-off Current	$V_{\text{CE}} = 40\text{V}$	$I_{\text{B}} = 0$		0.5 mA	
$I_{\text{CEX}}$	Collector Cut-off Current	$V_{\text{CE}} = \text{Rated } V_{\text{CB}}$	$V_{\text{BE(off)}} = 1.5\text{V}$ $T_{\text{C}} = 150^{\circ}\text{C}$		0.5 mA	
$I_{\text{EBO}}$	Emitter Cut-off Current	$V_{\text{BE}} = 5\text{V}$	$I_{\text{C}} = 0$		2 mA	
<b>ON CHARACTERISTICS <sup>1</sup></b>						
$h_{\text{FE}}$	DC Current Gain	$V_{\text{CE}} = 3\text{V}$	$I_{\text{C}} = 4\text{A}$	750	18000	—
		$V_{\text{CE}} = 3\text{V}$	$I_{\text{C}} = 8\text{A}$	100		
$V_{\text{CE(sat)}}$	Collector – Emitter Saturation Voltage	$I_{\text{C}} = 4\text{A}$	$I_{\text{B}} = 16\text{mA}$		2.0	V
		$I_{\text{C}} = 8\text{A}$	$I_{\text{B}} = 80\text{mA}$		3.0	
$V_{\text{BE(sat)}}$	Base – Emitter Saturation Voltage	$I_{\text{C}} = 8\text{A}$	$I_{\text{B}} = 80\text{mA}$		4.0	V
$V_{\text{BE(on)}}$	Base – Emitter On Voltage	$V_{\text{CE}} = 3\text{V}$	$I_{\text{C}} = 4\text{A}$		2.8	V
<b>DYNAMIC CHARACTERISTICS</b>						
$C_{\text{ob}}$	Output Capacitance	$V_{\text{CB}} = 10\text{V}$ $f = 0.1\text{MHz}$	$I_{\text{E}} = 0$		200	pF
$ h_{\text{fe}} $	Magnitude of Common Emitter Small Signal Short Circuit Current Transfer Ratio	$V_{\text{CE}} = 3\text{V}$ $I_{\text{C}} = 3\text{A}$ $f = 1\text{MHz}$		4.0		—
$h_{\text{fe}}$	Small Signal Current Gain	$V_{\text{CE}} = 3\text{V}$ $f = 1\text{kHz}$	$I_{\text{C}} = 3\text{A}$	300		—

**Notes**

1 Pulse test:  $t_{\text{p}} = 300\mu\text{s}$ , Duty Cycle = 2%