

2N6283 & 2N6284



NPN Darlington Power Silicon Transistor

Rev. V4

Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/504
- TO-3 (TO-204AA) Package
- Suitable for General Purpose High Current, High Gain Amplifier and Switching Applications



Electrical Characteristics ($T_A = +25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 100 \text{ mA dc}$ 2N6283 2N6284	$V_{(BR)CEO}$	V dc	80 100	—
Collector - Emitter Cutoff Current	$V_{CE} = 40 \text{ V dc}$, 2N6283 $V_{CE} = 50 \text{ V dc}$, 2N6284	I_{CEO}	mA dc	—	1.0
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ V dc}$, $V_{BE} = -1.5 \text{ V dc}$, 2N6283 $V_{CE} = 100 \text{ V dc}$, $V_{BE} = -1.5 \text{ V dc}$, 2N6284	I_{CEX1}	mA dc	—	0.01
Collector - Base Cutoff Current	$V_{EB} = 7 \text{ V dc}$	I_{EBO}	mA dc	—	2.5
Forward Current Transfer Ratio	$I_C = 1 \text{ A dc}$, $V_{CE} = 3 \text{ V dc}$ $I_C = 10 \text{ A dc}$, $V_{CE} = 3 \text{ V dc}$ $I_C = 20 \text{ A dc}$, $V_{CE} = 3 \text{ V dc}$	h_{FE}	-	1500 1250 500	18000
Collector - Emitter Saturation Voltage	$I_C = 20 \text{ A dc}$, $I_B = 200 \text{ mA dc}$ $I_C = 10 \text{ A dc}$, $I_B = 40 \text{ mA dc}$	$V_{CE(sat)1}$ $V_{CE(sat)2}$	V dc	—	3.0 2.0
Base - Emitter Saturation Voltage	$I_C = 20 \text{ A dc}$, $I_B = 200 \text{ mA dc}$	$V_{BE(sat)}$	V dc	—	4.0
Base - Emitter Voltage	$I_C = 10 \text{ A dc}$, $V_{CE} = 3 \text{ V dc}$	$V_{BE(on)}$	V dc	—	2.8
Dynamic Characteristics					
Magnitude of Common Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 3 \text{ V dc}$; $I_C = 10 \text{ A dc}$; $f = 1.0 \text{ MHz}$	$ h_{fe} $	-	8	80
Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 3 \text{ V dc}$; $I_C = 10 \text{ A dc}$; $f = 1 \text{ kHz}$	h_{fe}	-	700	—
Output Capacitance	$V_{CB} = 10 \text{ V dc}$; $I_E = 0$; $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{obo}	pF	—	350
Switching Characteristics					
Turn-On Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 10 \text{ A dc}$; $I_B = 40 \text{ mA dc}$	t_{on}	μs	—	2.0
Turn-Off Time	$V_{CC} = 30 \text{ Vdc}$; $I_C = 10 \text{ A dc}$; $I_{B1} = I_{B2} = 40 \text{ mA dc}$	t_{off}	μs	—	10

2N6283 & 2N6284



NPN Darlington Power Silicon Transistor

Rev. V4

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = 80\text{ V dc}; V_{BE} = -1.5\text{ V dc}; 2\text{N}6283$ $V_{CE} = 100\text{ V dc}; V_{BE} = -1.5\text{ V dc}; 2\text{N}6284$	I_{CEX2}	mA dc	—	5.0
Collector - Emitter Saturation Voltage	$T_A = +150^\circ\text{C}$ $I_C = 10\text{ A dc}; I_B = 40\text{ mA dc}$	$V_{CE(sat)3}$	V dc	—	2.0
	$T_A = -55^\circ\text{C}$ $V_{CE} = 3\text{ V dc}; I_C = 10\text{ A dc}$	h_{FE4}		200	

Absolute Maximum Ratings ($T_A = +25^\circ\text{C}$ unless otherwise noted)

Ratings	Symbol	2N6283	2N6284	Units
Collector - Emitter Voltage	V_{CEO}	80	100	V dc
Collector - Base Voltage	V_{CBO}	80	100	V dc
Emitter - Base Voltage	V_{EBO}	7		V dc
Collector Current	I_C	20		A dc
Base Current	I_B	0.5		A dc
Total Power Dissipation @ $T_C = +25^\circ\text{C}^{(1)}$ @ $T_C = +100^\circ\text{C}^{(2)}$	P_T	175 87.5		W
Operating & Storage Temperature Range	T_J, T_{STG}	-65 to +200		$^\circ\text{C}$

(1) Derate linearly at 1.17 W/ $^\circ\text{C}$ above $T_C > +25^\circ\text{C}$ (see figure 2 of MIL-PRF-19500/504).

(2) Derate linearly at .875 W/ $^\circ\text{C}$ above $T_C > +100^\circ\text{C}$.

Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.857 $^\circ\text{C/W}$

Safe Operating Area

DC Tests:	$T_C = +25^\circ\text{C} + 10^\circ\text{C}, -0^\circ; I$ Cycle; $t = 1.0\text{ s}$
Test 1:	$V_{CE} = 8.75\text{ V dc}; I_C = 20\text{ A dc}$
Test 2:	$V_{CE} = 30\text{ V dc}; I_C = 5.8\text{ A dc}$
Test 3:	$V_{CE} = 80\text{ V dc}; I_C = 100\text{ mA dc}$ 2N6283
	$V_{CE} = 100\text{ V dc}; I_C = 100\text{ mA dc}$ 2N6284

2N6283 & 2N6284

NPN Darlington Power Silicon Transistor

Rev. V4

Outline Drawing (TO-3)

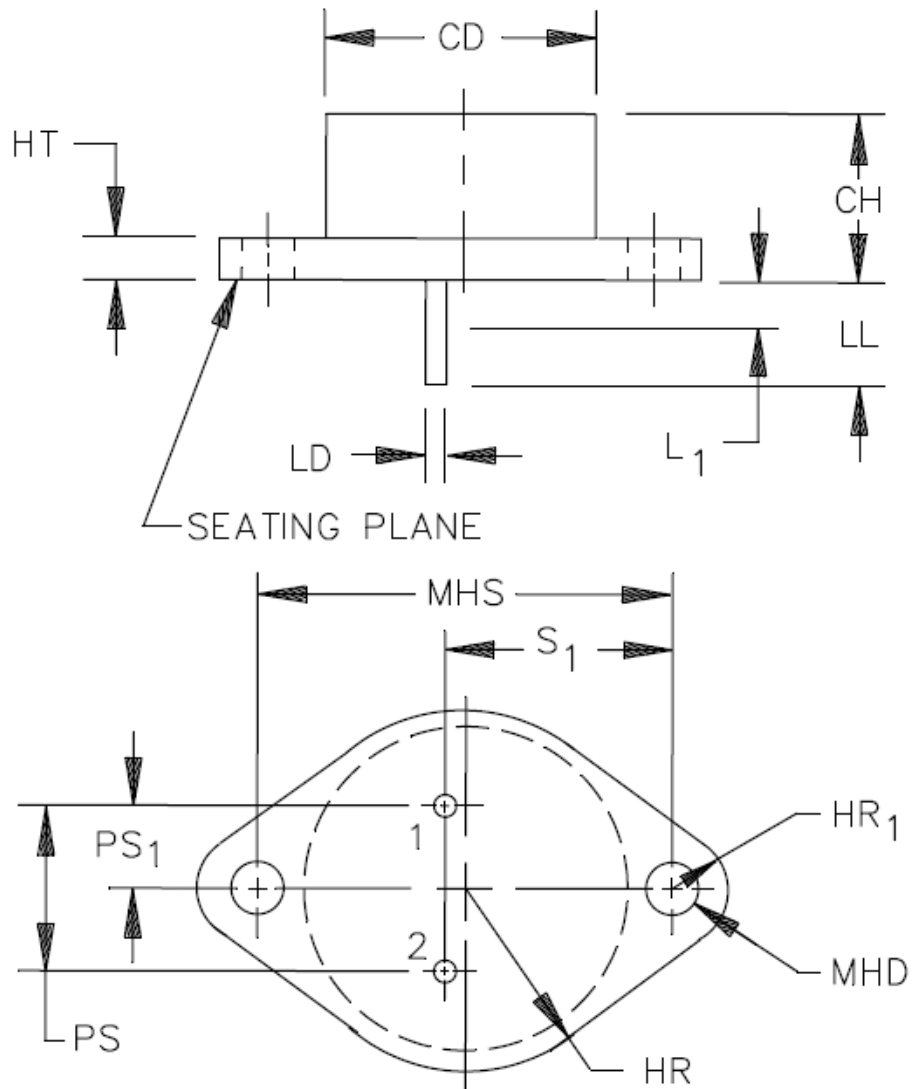


FIGURE 1. Physical dimensions (TO-204AA, similar to TO-3).

2N6283 & 2N6284



NPN Darlington Power Silicon Transistor

Rev. V4

Outline Drawing (TO-3)

Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	2
CH	.250	.360	6.35	9.14	
HR	.495	.525	12.57	13.34	
HR ₁	.131	.188	3.33	4.78	3
HT	.060	.135	1.52	3.43	
LD	.038	.043	0.97	1.09	4, 5
LL	.312	.500	7.92	12.7	4
L ₁		.050		1.27	4, 5
MHD	.151	.161	3.84	4.09	6
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	7, 8
PS ₁	.205	.225	5.21	5.72	4, 7, 8
S ₁	.655	.675	16.64	17.15	7

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Body contour is optional within zone defined by dimension CD.
3. At both ends.
4. Both terminals.
5. Dimension LD applies between L₁ and LL. Lead diameter shall not exceed twice dimension LD within dimension L₁. Diameter is uncontrolled in dimension L₁.
6. Two holes.
7. These dimensions shall be measured at points .050 inch (1.27 mm) to .055 inch (1.40 mm) below the seating plane. When gauge is not used, measurement shall be made at seating plane.
8. The seating plane of the header shall be flat within .001 inch (0.03 mm) concave to .004 inch (0.10 mm) convex inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.
9. Terminal 1 is the emitter, terminal 2 is base. The collector shall be electrically connected to the case.
10. In accordance with ASME Y14.5M, diameters are equivalent to ϕ symbology.

FIGURE 1. Physical dimensions (TO-204AA, similar to TO-3) - Continued.

VPT COMPONENTS. ALL RIGHTS RESERVED.

Information in this document is provided in connection with VPT Components products. These materials are provided by VPT Components as a service to its customers and may be used for informational purposes only. Except as provided in VPT Components Terms and Conditions of Sale for such products or in any separate agreement related to this document, VPT Components assumes no liability whatsoever. VPT Components assumes no responsibility for errors or omissions in these materials. VPT Components may make changes to specifications and product descriptions at any time, without notice. VPT Components makes no commitment to update the information and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to its specifications and product descriptions. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF VPT COMPONENTS PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, CONSEQUENTIAL OR INCIDENTAL DAMAGES, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. VPT COMPONENTS FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. VPT COMPONENTS SHALL NOT BE LIABLE FOR ANY SPECIAL, IN-DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS, WHICH MAY RESULT FROM THE USE OF THESE MATERIALS.

VPT Components products are not intended for use in medical, lifesaving or life sustaining applications. VPT Components customers using or selling VPT Components products for use in such applications do so at their own risk and agree to fully indemnify VPT Components for any damages resulting from such improper use or sale.