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°C unless otherwise noted)

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

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Cutoff Current	T_A = +150°C V_{CE} = 80 V dc; V_{BE} = -1.5 V dc; 2N6283 V_{CE} = 100 V dc; V_{BE} = -1.5 V dc; 2N6284	I_{CEX2}	mA dc	—	5.0
Collector - Emitter Saturation Voltage	T_A = +150°C I_C = 10 A dc; I_B = 40 mA dc	$V_{CE(sat)3}$	V dc	—	2.0
	T_A = -55°C V_{CE} = 3 V dc; I_C = 10 A dc	h_{FE4}		200	

Absolute Maximum Ratings (T_A = +25°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°C(1) @ T_C = +100°C (2)	P_T	175 87.5		W
Operating & Storage Temperature Range	T_J, T_{STG}	-65 to +200		°C

(1) Derate linearly at 1.17 W/°C above T_C > +25°C (see figure 2 of MIL-PRF-19500/504).
(2) Derate linearly at .875 W/°C above T_C > +100°C.

Thermal Characteristics

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

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

Outline Drawing (TO-3)

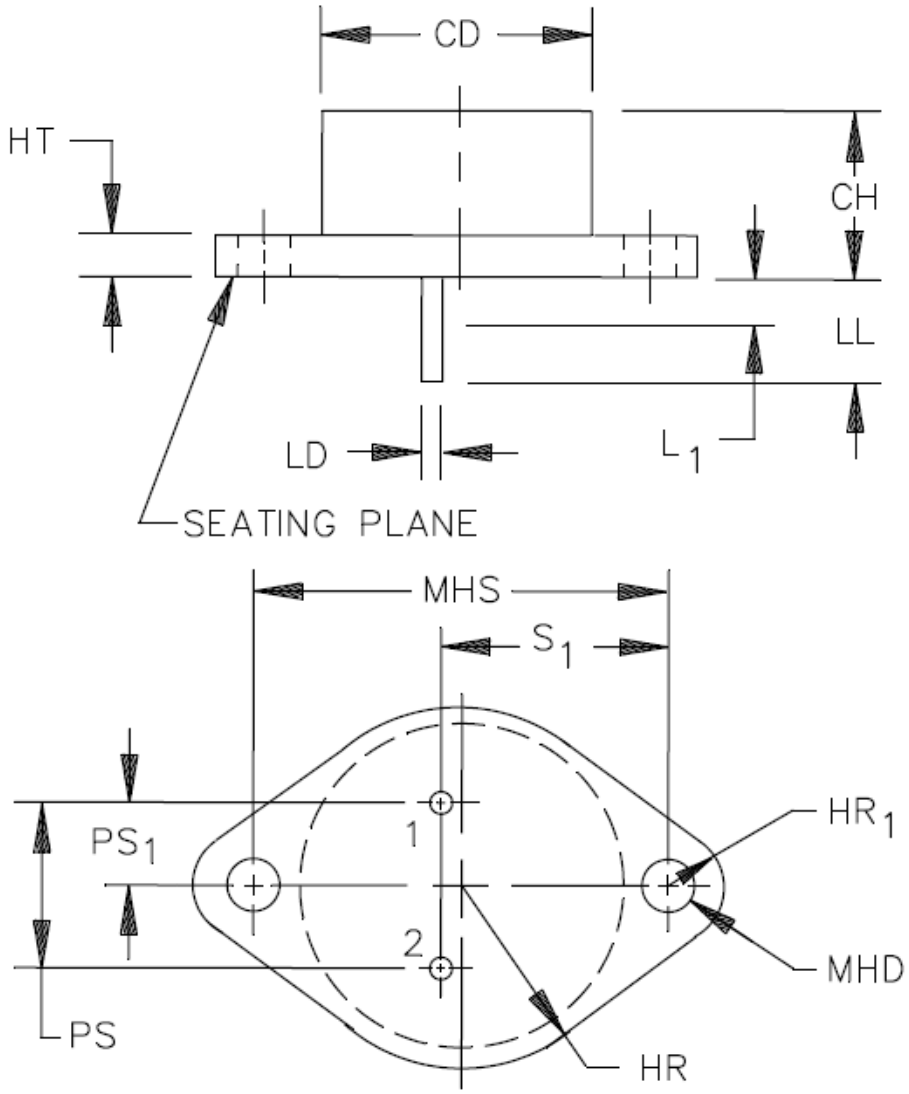

FIGURE 1. Physical dimensions (TO-204AA, similar to TO-3).

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 L_1 and LL. Lead diameter shall not exceed twice dimension LD within dimension L_1. Diameter is uncontrolled in dimension L_1.
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.