

# 2N6286 & 2N6287



## PNP Darlington Power Silicon Transistor

Rev. V3

### Features

- Available in JAN, JANTX and JANTXV per MIL-PRF-19500/505
- TO-3 (TO-204AA) Package
- Designed for General Purpose Amplifier and Low-Frequency Switching Applications



### Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = -100 \text{ mA dc}$ 2N6286 2N6287	$V_{(BR)CEO}$	V dc	-80 -100	—
Collector - Emitter Cutoff Current	$V_{CE} = -40 \text{ V dc}$ , 2N6286 $V_{CE} = -50 \text{ V dc}$ , 2N6287	$I_{CEO}$	mA dc	—	-1.0
Collector - Emitter Cutoff Current	$V_{CE} = -80 \text{ V dc}$ , $V_{BE} = +1.5 \text{ V dc}$ , 2N6286 $V_{CE} = -100 \text{ V dc}$ , $V_{BE} = +1.5 \text{ V dc}$ , 2N6287	$I_{CEX1}$	$\mu\text{A dc}$	—	-10
Emitter - Base Cutoff Current	$V_{EB} = -7 \text{ V dc}$	$I_{EBO}$	mA dc	—	-2.5
Forward Current Transfer Ratio	$V_{CE} = -3 \text{ V dc}$ ; $I_C = -1 \text{ A dc}$ $V_{CE} = -3 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$ $V_{CE} = -3 \text{ V dc}$ ; $I_C = -20 \text{ A dc}$	$h_{FE}$	-	1,500 1,250 300	18,000
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	$V_{CE} = -3 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$	$V_{BE}$	V dc	—	-2.8
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = -80 \text{ V dc}$ , $V_{BE} = +1.5 \text{ V dc}$ , 2N6286 $V_{CE} = -100 \text{ V dc}$ , $V_{BE} = +1.5 \text{ V dc}$ , 2N6287	$I_{CEX2}$	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
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = -3 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$	$h_{FE4}$	-	150	
<b>Dynamic Characteristics</b>					
Magnitude of Common - Emitter 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	$V_{CE} = -3 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$ ; $f = 1.0 \text{ kHz}$	$h_{fe}$	-	300	—
Open Circuit Output Capacitance	$V_{CB} = -10 \text{ V dc}$ ; $I_E = 0$ ; $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{obo}$	pF	—	400
<b>Switching Characteristics</b>					
Turn-On Time	$V_{CC} = -30 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$ ; $I_B = -40 \text{ mA dc}$	$t_{on}$	$\mu\text{s}$	—	2.0
Turn-Off Time	$V_{CC} = -30 \text{ V dc}$ ; $I_C = -10 \text{ A dc}$ ; $I_{B1} = I_{B2} = -40 \text{ mA dc}$	$t_{off}$	$\mu\text{s}$	—	10

1

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# 2N6286 & 2N6287



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Rev. V3

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

Ratings	Symbol	2N6286	2N6287	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 @ $T_C = +25^\circ\text{C}$ <sup>(1)</sup> @ $T_C = +100^\circ\text{C}$	$P_T$	175 87.5		W
Operating & Storage Temperature Range	$T_J, T_{STG}$	-65 to +200		$^\circ\text{C}$

(1) Derate linearly @ 1.16 W/  $^\circ\text{C}$  above  $T_C > +25^\circ\text{C}$ .

### Thermal Characteristics

Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.855 $^\circ\text{C/W}$

### Safe Operating Area

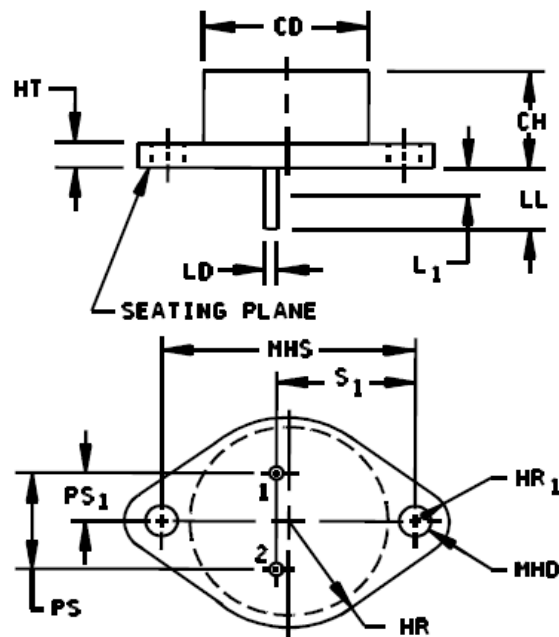
DC Tests:	$T_C = +25^\circ\text{C}$ ; $t = 1.0$ s; 1 Cycle		
Test 1:	$V_{CE} = -8.75$ V dc; $I_C = -20$ A dc		
Test 2:	$V_{CE} = -30$ V dc; $I_C = -5.8$ A dc		
Test 3:	$V_{CE} = -80$ Vdc; $I_C = -100$ mA dc	2N6286	
	$V_{CE} = -100$ Vdc; $I_C = -100$ mA dc	2N6287	

# 2N6286 & 2N6287

## PNP Darlington Power Silicon Transistor

Rev. V3

### Outline Drawing (TO-3)



#### NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Body contour is optional within zone defined by CD.
4. These dimensions shall be measured at points .050 inch (1.27 mm) to .055 inch (1.40 mm) below seating plane.
5. Both terminals.
6. At both ends.
7. Two holes.
8. Terminal 1 is the emitter, terminal 2 is base. The collector shall be electrically connected to the case.
9. LD applies between  $L_1$  and LL. Diameter is uncontrolled in  $L_1$ .
10. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi x$  symbology.

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

# 2N6286 & 2N6287



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Rev. V3

### Outline Drawing (TO-3)

Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD		.875		22.23	3
CH	.250	.360	6.35	9.14	
HR	.495	.525	12.57	13.34	
HR <sub>1</sub>	.131	.188	3.33	4.78	
HT	.060	.135	1.52	3.43	
LD	.038	.043	0.97	1.09	5, 9
LL	.312	.500	7.92	12.7	5
L <sub>1</sub>		.050		1.27	5, 9
MHD	.151	.165	3.84	4.19	7
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	4
PS <sub>1</sub>	.205	.225	5.21	5.72	
S <sub>1</sub>	.655	.675	16.64	17.15	

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

# 2N6286 & 2N6287



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Rev. V3

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