# 2N6283 & 2N6284

## NPN Darlington Power Silicon Transistor

Rev. V1

### Features

- Available in JAN, JANTX, JANTXV per MIL-PRF-19500/371
- TO-3 (TO-204AA) Package

### Electrical Characteristics

| Parameter | Test Conditions | Symbol | Units | Min. | Max. |
|---|---|---|---|---|---|
| **Off Characteristics** | | | | | |
| Collector - Emitter Breakdown Voltage | $I_C$ = 100 mAdc<br>2N6283<br>2N6284 | $V_{(BR)CEO}$ | Vdc | 80<br>100 | — |
| Collector - Emitter Cutoff Current | $V_{CE}$ = 40 Vdc, 2N6283<br>$V_{CE}$ = 50 Vdc, 2N6284 | $I_{CEO}$ | mAdc | — | 1.0 |
| Collector - Emitter Cutoff Current | $V_{CE}$ = 80 Vdc, $V_{BE}$ = -1.5 Vdc, 2N6283<br>$V_{CE}$ = 100 Vdc, $V_{BE}$ = -1.5 Vdc, 2N6284 | $I_{CEX}$ | mAdc | — | 0.01 |
| Collector - Base Cutoff Current | $V_{EB}$ = 7 Vdc | $I_{EBO}$ | mAdc | — | 2.5 |
| **On Characteristics**[1] | | | | | |
| Forward Current Transfer Ratio | $I_C$ = 1 Adc, $V_{CE}$ = 3 Vdc<br>$I_C$ = 10 Adc, $V_{CE}$ = 3 Vdc<br>$I_C$ = 20 Adc, $V_{CE}$ = 3 Vdc | $H_{FE}$ | - | 1500<br>1250<br>500 | 18000 |
| Collector - Emitter Saturation Voltage | $I_C$ = 20 Adc, $I_B$ = 200 mAdc<br>$I_C$ = 10 Adc, $I_B$ = 40 mAdc | $V_{CE(SAT)}$ | Vdc | — | 3.0<br>2.0 |
| Base - Emitter Saturation Voltage | $I_C$ = 20 Adc, $I_B$ = 200 mAdc | $V_{BE(SAT)}$ | Vdc | — | 4.0 |
| Base - Emitter Voltage | $I_C$ = 10 Adc, $I_B$ = 3 Vdc | $V_{BE}$ | Vdc | — | 2.8 |
| **Dynamic Characteristics** | | | | | |
| Magnitude of Common Small-Signal Short-Circuit Forward Current Transfer Ratio | $I_C$ = 10 Adc, $V_{CE}$ = 3 Vdc, f = 1 kHz | $\lvert H_{FE} \rvert$ | - | 8 | 80 |
| Small-Signal Short-Circuit Forward Current Transfer Ratio | $I_C$ = 10 Adc, $V_{CE}$ = 3 Vdc, f = 1 kHz | $H_{FE}$ | - | 700 | — |
| Output Capacitance | $V_{CB}$ = 10 Vdc, $I_E$ = 0, 100 kHz ≤ f ≤ 1 MHz | $C_{OBO}$ | pF | — | 350 |
| **Switching Characteristics** | | | | | |
| Turn-On Time | $V_{CC}$ = 30 Vdc; $I_C$ = 10 Adc; $I_B1$ = 40 mAdc | $T_{ON}$ | µs | — | 2 |
| Turn-Off Time | $V_{CC}$ = 30 Vdc; $I_C$ = 10 Adc; $I_B1$ = $I_B2$ = 40 mAdc | $T_{OFF}$ | µs | — | 10 |
| **Safe Operating Area** | | | | | |
| DC Tests:<br>Test 1:<br>Test 2:<br>Test 3: | $T_C$ = +25 °C, I Cycle, t = 1.0 s<br>$V_{CE}$ = 8.75 Vdc, $I_C$ = 20 Adc<br>$V_{CE}$ = 30 Vdc, $I_C$ = 5.8 Adc<br>$V_{CE}$ = 80 Vdc, $I_C$ = 100 mAdc<br>$V_{CE}$ = 100 Vdc, $I_C$ = 100 mAdc | | | | |

1. Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤2.0%.

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### Absolute Maximum Ratings

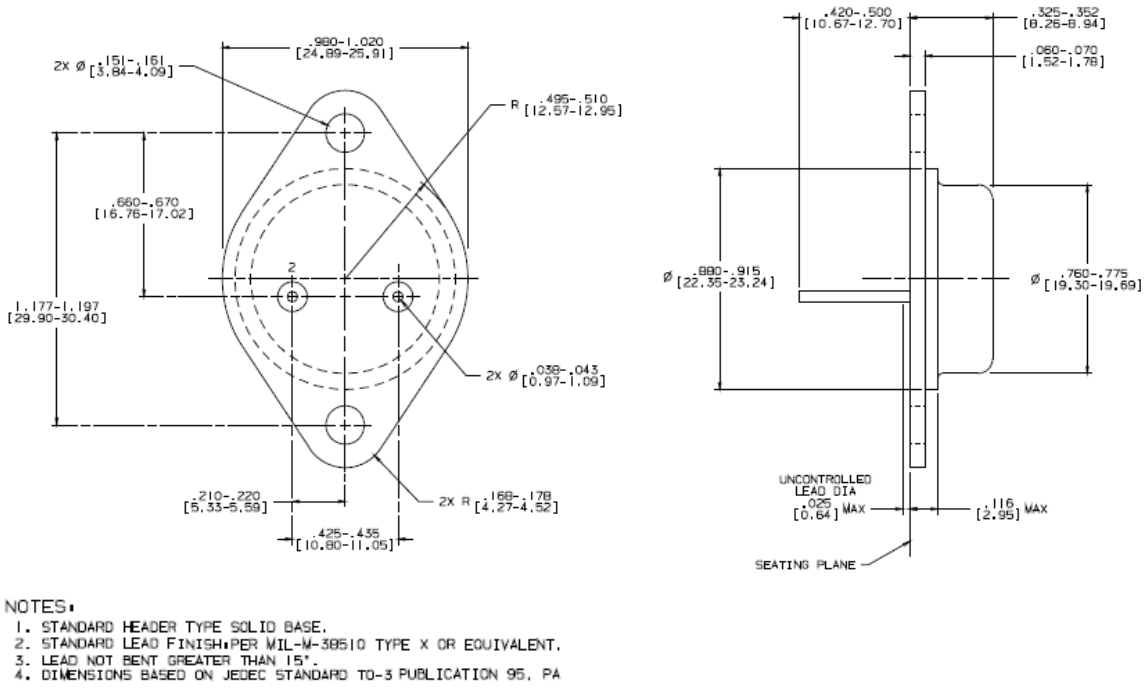
| Ratings | Symbol | 2N6283 | 2N6284 | Units |
|---|---|---|---|---|
| Collector - Emitter Voltage | $V_{CEO}$ | 80 | 100 | Vdc |
| Collector - Base Voltage | $V_{CBO}$ | 80 | 100 | Vdc |
| Emitter - Base Voltage | $V_{EBO}$ | 7 | | Vdc |
| Collector Current | $I_C$ | 20 | | Adc |
| Base Current | $I_B$ | 0.5 | | Adc |
| Total Power Dissipation<br>@ $T_A$ = +25°C[2]<br>@ $T_A$ = +100°C | $P_T$ | 175<br>87.5 | | W |
| Operating & Storage Temperature Range | $T_{OP}$, $T_{STG}$ | -65 to +200 | | °C |

2. Derate linearly @ 1 mW / °C for $T_A$ >+25°C.

### Thermal Characteristics

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

## Outline Drawing




NOTES:
1. STANDARD HEADER TYPE SOLID BASE.
2. STANDARD LEAD FINISH: PER MIL-M-38510 TYPE X OR EQUIVALENT.
3. LEAD NOT BENT GREATER THAN 15°.
4. DIMENSIONS BASED ON JEDEC STANDARD TO-3 PUBLICATION 95, PA