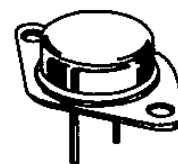


**NPN DARLINGTON POWER SILICON TRANSISTOR**
**Qualified per MIL-PRF-19500/504**
**Devices**
**2N6283**
**2N6284**
**Qualified Level**
**JAN  
JANTX  
JANTXV**
**MAXIMUM RATINGS**

| Ratings                                        | Symbol         | 2N6583      | 2N6284 | Unit               |
|------------------------------------------------|----------------|-------------|--------|--------------------|
| Collector-Emitter Voltage                      | $V_{CEO}$      | 80          | 100    | Vdc                |
| Collector-Base Voltage                         | $V_{CBO}$      | 80          | 100    | Vdc                |
| Emitter-Base Voltage                           | $V_{EBO}$      | 7.0         |        | Vdc                |
| Base Current                                   | $I_B$          | 0.5         |        | Adc                |
| Collector Current                              | $I_C$          | 20          |        | Adc                |
| Total Power Dissipation <sup>(1)</sup>         | $P_T$          | 175         |        | W                  |
|                                                |                | 87.5        |        | W                  |
| Operating & Storage Junction Temperature Range | $T_J, T_{stg}$ | -65 to +200 |        | $^{\circ}\text{C}$ |

**THERMAL CHARACTERISTICS**

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

1) Derate linearly @ 1.17 W/ $^{\circ}\text{C}$  above  $T_C > +25^{\circ}\text{C}$ 

**TO-3\*  
(TO-204AA)**

\*See appendix A for package outline

**ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$  unless otherwise noted)**

| Characteristics | Symbol | Min. | Max. | Unit |
|-----------------|--------|------|------|------|
|-----------------|--------|------|------|------|

**OFF CHARACTERISTICS**

|                                                                                                                                                 |                  |               |            |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|------------|------|
| Collector-Emitter Breakdown Voltage<br>$I_C = 100 \text{ mAdc}$                                                                                 | 2N6283<br>2N6284 | $V_{(BR)CEO}$ | 80<br>100  | Vdc  |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 40 \text{ Vdc}$<br>$V_{CE} = 50 \text{ Vdc}$                                                      | 2N6283<br>2N6284 | $I_{CEO}$     | 1.0<br>1.0 | mAdc |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 80 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$<br>$V_{CE} = 100 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ | 2N6283<br>2N6284 | $I_{CEX}$     | 5.0<br>5.0 | mAdc |
| Emitter-Base Cutoff Current<br>$V_{EB} = 7.0 \text{ Vdc}$                                                                                       |                  | $I_{EBO}$     | 2.5        | mAdc |

**ELECTRICAL CHARACTERISTICS (con't)**

| Characteristics                                                                                                                                                                                   | Symbol               | Min.                  | Max.       | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------|------------|------|
| <b>ON CHARACTERISTICS <sup>(2)</sup></b>                                                                                                                                                          |                      |                       |            |      |
| Forward-Current Transfer Ratio<br>I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 3.0 Vdc<br>I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 3.0 Vdc<br>I <sub>C</sub> = 20 Adc, V <sub>CE</sub> = 3.0 Vdc | h <sub>FE</sub>      | 1,500<br>1,250<br>500 | 18,000     |      |
| Collector-Emitter Saturation Voltage<br>I <sub>C</sub> = 20 Adc, I <sub>B</sub> = 200 mAdc<br>I <sub>C</sub> = 10 Adc, I <sub>B</sub> = 40 mAdc                                                   | V <sub>CE(sat)</sub> |                       | 3.0<br>2.0 | Vdc  |
| Base-Emitter Saturation Voltage<br>I <sub>C</sub> = 20 Adc, I <sub>B</sub> = 200 mAdc                                                                                                             | V <sub>BE(sat)</sub> |                       | 4.0        | Vdc  |
| Base-Emitter Voltage<br>I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 3.0Vdc                                                                                                                         | V <sub>BE</sub>      |                       | 2.8        | Vdc  |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                                                          |                  |     |     |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio<br>I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 3.0 Vdc, f = 1.0 MHz | h <sub>fe</sub>  | 8.0 | 80  |    |
| Small-Signal Short-Circuit Forward Current Transfer Ratio<br>I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 3.0 Vdc, f = 1.0 kHz                             | h <sub>fe</sub>  | 700 |     |    |
| Output Capacitance<br>V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz                                                                | C <sub>obo</sub> |     | 300 | pF |

**SWITCHING CHARACTERISTICS**

|                                                                                                                 |                  |  |     |    |
|-----------------------------------------------------------------------------------------------------------------|------------------|--|-----|----|
| Turn-On Time<br>V <sub>CC</sub> = 30 Vdc; I <sub>C</sub> = 10 Adc; I <sub>B</sub> = 40 mAdc                     | t <sub>on</sub>  |  | 2.0 | μs |
| Turn-Off Time<br>V <sub>CC</sub> = 30 Vdc; I <sub>C</sub> = 10 Adc; I <sub>B1</sub> = I <sub>B2</sub> = 40 mAdc | t <sub>off</sub> |  | 10  | μs |

**SAFE OPERATING AREA****DC Tests**T<sub>C</sub> = +25°C, 1 Cycle, t = 1.0 s**Test 1**V<sub>CE</sub> = 8.75 Vdc, I<sub>C</sub> = 20 Adc**Test 2**V<sub>CE</sub> = 30 Vdc, I<sub>C</sub> = 5.8 Adc**Test 3**V<sub>CE</sub> = 80 Vdc, I<sub>C</sub> = 100 mAdc 2N6283V<sub>CE</sub> = 100 Vdc, I<sub>C</sub> = 100 mAdc 2N6284

(2) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.