

NPN DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/504

Devices

2N6283

2N6284

Qualified Level

JAN
JANTX
JANTXV

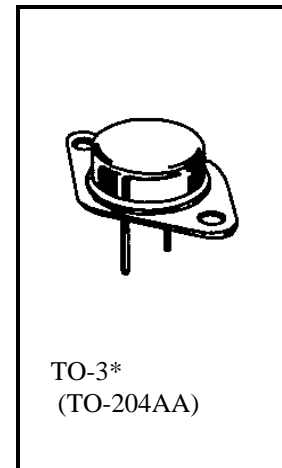
MAXIMUM RATINGS

| 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 ⁽¹⁾ | P_T | @ $T_C = +25^{\circ}C$ | 175 | W |
| | | @ $T_C = +100^{\circ}C$ | 87.5 | W |
| Operating & Storage Junction Temperature Range | T_J, T_{stg} | -65 to +200 | | $^{\circ}C$ |

THERMAL CHARACTERISTICS

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

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



*See appendix A for package outline

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

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

OFF CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|---|---------------|-----------------------|------------|------|
| ON CHARACTERISTICS ⁽²⁾ | | | | |
| Forward-Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ $I_C = 20 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ | h_{FE} | 1,500 1,250 500 | 18,000 | |
| Collector-Emitter Saturation Voltage $I_C = 20 \text{ Adc}, I_B = 200 \text{ mAdc}$ $I_C = 10 \text{ Adc}, I_B = 40 \text{ mAdc}$ | $V_{CE(sat)}$ | | 3.0 2.0 | Vdc |
| Base-Emitter Saturation Voltage $I_C = 20 \text{ Adc}, I_B = 200 \text{ mAdc}$ | $V_{BE(sat)}$ | | 4.0 | Vdc |
| Base-Emitter Voltage $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}$ | V_{BE} | | 2.8 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|--|------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}, f = 1.0 \text{ MHz}$ | $ h_{fe} $ | 8.0 | 80 | |
| Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 10 \text{ Adc}, V_{CE} = 3.0 \text{ Vdc}, f = 1.0 \text{ kHz}$ | h_{fe} | 700 | | |
| Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$ | C_{obo} | | 300 | pF |

SWITCHING CHARACTERISTICS

| | | | | |
|---|-----------|--|-----|---------------|
| Turn-On Time $V_{CC} = 30 \text{ Vdc}; I_C = 10 \text{ Adc}; I_B = 40 \text{ mAdc}$ | t_{on} | | 2.0 | μs |
| Turn-Off Time $V_{CC} = 30 \text{ Vdc}; I_C = 10 \text{ Adc}; I_{B1} = I_{B2} = 40 \text{ mAdc}$ | t_{off} | | 10 | μs |

SAFE OPERATING AREA

| | | | | |
|--|--|--|--|--|
| DC Tests $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$ | | | | |
| Test 1 $V_{CE} = 8.75 \text{ Vdc}, I_C = 20 \text{ Adc}$ | | | | |
| Test 2 $V_{CE} = 30 \text{ Vdc}, I_C = 5.8 \text{ Adc}$ | | | | |
| Test 3 $V_{CE} = 80 \text{ Vdc}, I_C = 100 \text{ mAdc}$ 2N6283 $V_{CE} = 100 \text{ Vdc}, I_C = 100 \text{ mAdc}$ 2N6284 | | | | |

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