

PNP DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/527

Devices

2N6648

2N6649

2N6650

Qualified Level

JANTX
JANTXV

MAXIMUM RATINGS

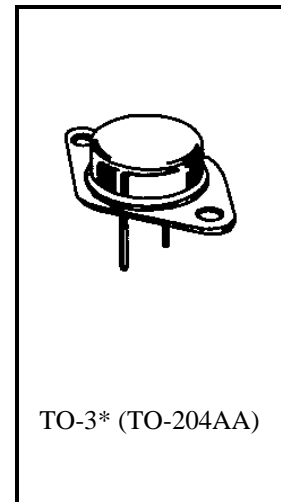
| Ratings | Symbol | 2N6648 | 2N6649 | 2N6650 | Unit |
|--|----------------|--|--------|--------|--------------------|
| Collector-Emitter Voltage | V_{CEO} | -40 | -60 | -80 | Vdc |
| Collector-Base Voltage | V_{CBO} | -40 | -60 | -80 | Vdc |
| Emitter-Base Voltage | V_{EBO} | -5.0 | | | Vdc |
| Base Current | I_B | -0.25 | | | Adc |
| Collector Current | I_C | -10 | | | Adc |
| Total Power Dissipation | P_T | @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾ | 5.0 | | W |
| | | @ $T_C = +25^{\circ}\text{C}$ ⁽²⁾ | 85 | | W |
| Operating & Storage Junction Temperature Range | T_J, T_{stg} | -65 to +175 | | | $^{\circ}\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max. | Unit |
|-------------------------------------|-----------------|------|-----------------------------|
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | 1.76 | $^{\circ}\text{C}/\text{W}$ |

1) Derate linearly 33.3 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly 567 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$



*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 $I_C = 200 \text{ mAdc}$ | 2N6648 2N6649 2N6650 | $V_{(BR)CEO}$ | -40 -60 -80 | Vdc |
| Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, R_{BB} = 100 \Omega$ | 2N6648 2N6649 2N6650 | $V_{(BR)CER}$ | -40 -60 -80 | Vdc |
| Collector-Base Cutoff Current $V_{CB} = -40 \text{ Vdc}$ $V_{CB} = -60 \text{ Vdc}$ $V_{CB} = -80 \text{ Vdc}$ | 2N6648 2N6649 2N6650 | I_{CBO} | -1.0 -1.0 -1.0 | mAdc |

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|--|-----------|------|----------------------|------|
| Emitter-Base Cutoff Current $V_{EB} = 5.0$ Vdc | I_{EBO} | | -10 | mAdc |
| Collector-Emitter Cutoff Current $V_{CE} = -40$ Vdc 2N6648 $V_{CE} = -60$ Vdc 2N6649 $V_{CE} = -80$ Vdc 2N6650 | I_{CEO} | | -1.0 -1.0 -1.0 | mAdc |
| Collector-Emitter Cutoff Current $V_{CE} = -40$ Vdc, $V_{BE} = 1.5$ Vdc 2N6648 $V_{CE} = -60$ Vdc, $V_{BE} = 1.5$ Vdc 2N6649 $V_{CE} = -80$ Vdc, $V_{BE} = 1.5$ Vdc 2N6650 | I_{CEX} | | -0.3 -0.3 -0.3 | mAdc |

ON CHARACTERISTICS ⁽³⁾

| | | | | |
|---|---------------|---------------------|--------------|-----|
| Forward-Current Transfer Ratio $I_C = -1.0$ Adc, $V_{CE} = 3.0$ Vdc $I_C = -5.0$ Adc, $V_{CE} = 3.0$ Vdc $I_C = -10$ Adc, $V_{CE} = 3.0$ Vdc | h_{FE} | 300 1,000 100 | 20,000 | |
| Collector-Emitter Saturation Voltage $I_C = -5.0$ Adc, $I_B = -10$ mAdc $I_C = -10$ Adc, $I_B = -0.1$ Adc | $V_{CE(sat)}$ | | -2.0 -3.0 | Vdc |
| Base-Emitter Voltage $I_C = -5.0$ Adc, $V_{CE} = -3.0$ Vdc $I_C = -10$ Adc, $V_{CE} = -3.0$ Vdc | $V_{BE(on)}$ | | -2.8 -4.5 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|---|------------|----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = -1.0$ Adc, $V_{CE} = -5.0$ Vdc, $f = 1.0$ MHz | $ h_{fe} $ | 50 | 400 | |
| Output Capacitance $V_{CB} = 10$ Vdc, $I_E = 0$, 100 kHz $\leq f \leq 1.0$ MHz | C_{obo} | | 300 | pF |

SWITCHING CHARACTERISTICS

| | | | | |
|---|-----------|--|-----|---------|
| Turn-On Time $V_{CC} = -30$ Vdc; $I_C = -5.0$ Adc; $I_{B1} = -20$ mAdc | t_{on} | | 2.5 | μ s |
| Turn-Off Time $V_{CC} = -30$ Vdc; $I_C = -5.0$ Adc; $I_{B1} = -I_{B2} = 20$ mAdc | t_{off} | | 10 | μ s |

SAFE OPERATING AREA

| | | | | |
|---|--------|--|--|--|
| DC Tests | | | | |
| $T_C = +25^{\circ}C$, 1 Cycle, $t = 1.0$ s | | | | |
| Test 1 | | | | |
| $V_{CE} = -8.5$ Vdc, $I_C = -10$ Adc | | | | |
| Test 2 | | | | |
| $V_{CE} = -25$ Vdc, $I_C = -3.4$ Adc | | | | |
| Test 3 | | | | |
| $V_{CE} = -40$ Vdc, $I_C = -0.9$ Adc | 2N6648 | | | |
| $V_{CE} = -60$ Vdc, $I_C = -0.3$ Adc | 2N6449 | | | |
| $V_{CE} = -80$ Vdc, $I_C = -0.14$ Adc | 2N6650 | | | |

(3) Pulse Test: Pulse Width = 300 μ s, Duty Cycle $\leq 2.0\%$.

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.