



PNP DARLINGTON POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/501

Devices

2N6051

2N6052

Qualified Level

**JAN
JANTX
JANTXV**

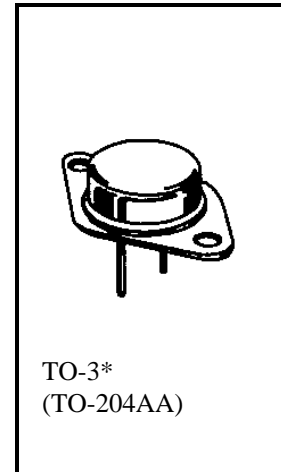
MAXIMUM RATINGS

| Ratings | Symbol | 2N6051 | 2N6052 | Unit |
|------------------------------------------------|-------------------------|-------------|--------|-------------|
| Collector-Emitter Voltage | V_{CEO} | 80 | 100 | Vdc |
| Collector-Base Voltage | V_{CBO} | 80 | 100 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 5.0 | | Vdc |
| Base Current | I_B | 0.2 | | Adc |
| Collector Current | I_C | 12 | | Adc |
| Total Power Dissipation ⁽¹⁾ | @ $T_C = +25^{\circ}C$ | 150 | | W |
| | @ $T_C = +100^{\circ}C$ | 75 | | W |
| Operating & Storage Junction Temperature Range | T_{op}, T_{stg} | -55 to +175 | | $^{\circ}C$ |

THERMAL CHARACTERISTICS

| Characteristics | Symbol | Max. | Unit |
|--------------------------------------|-----------------|------|---------------|
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.0 | $^{\circ}C/W$ |

1) Derate linearly at 1.0 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 $I_C = 100$ mAdc | 2N6051 2N6052 | $V_{(BR)CEO}$ | 80 100 | Vdc |
| Collector-Emitter Cutoff Current $V_{CE} = 40$ Vdc $V_{CE} = 50$ Vdc | 2N6051 2N6052 | I_{CEO} | 1.0 1.0 | mAdc |
| Collector-Emitter Cutoff Current $V_{CE} = 80$ Vdc, $V_{BE} = 1.5$ Vdc $V_{CE} = 100$ Vdc, $V_{BE} = 1.5$ Vdc | 2N6051 2N6052 | I_{CEX} | 0.5 0.5 | mAdc |
| Emitter-Base Cutoff Current $V_{EB} = 5.0$ Vdc | | I_{EBO} | 2.0 | mAdc |

ELECTRICAL CHARACTERISTICS (con't)

| Characteristics | Symbol | Min. | Max. | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------|------------|------|
| ON CHARACTERISTICS ⁽²⁾ | | | | |
| Forward-Current Transfer Ratio I _C = 1.0 Adc, V _{CE} = 3.0 Vdc I _C = 6.0 Adc, V _{CE} = 3.0 Vdc I _C = 12 Adc, V _{CE} = 3.0 Vdc | h _{FE} | 1,000 1,000 150 | 18,000 | |
| Collector-Emitter Saturation Voltage I _C = 12 Adc, I _B = 120 mAdc I _C = 6.0 Adc, I _B = 24 mAdc | V _{CE(sat)} | | 3.0 2.0 | Vdc |
| Base-Emitter Saturation Voltage I _C = 12 Adc, I _B = 120 mAdc | V _{BE(sat)} | | 4.0 | Vdc |
| Base-Emitter Voltage I _C = 6.0 Adc, V _{CE} = 3.0 Vdc | V _{BE} | | 2.8 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|-------|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I _C = 5.0 Adc, V _{CE} = 3.0 Vdc, f = 1.0 MHz | h _{fe} | 10 | 250 | |
| Small-Signal Short-Circuit Forward Current Transfer Ratio I _C = 5.0 Adc, V _{CE} = 3.0 Vdc, f = 1.0 kHz | h _{fe} | | 1,000 | |
| Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz | C _{obo} | | 300 | pF |

SWITCHING CHARACTERISTICS

| | | | | |
|------------------------------------------------------------------------------------------------------------------|------------------|--|-----|----|
| Turn-On Time V _{CC} = 30 Vdc; I _C = 5.0 Adc; I _B = 20 mAdc | t _{on} | | 2.0 | μs |
| Turn-Off Time V _{CC} = 30 Vdc; I _C = 5.0 Adc; I _{B1} = I _{B2} = 20 mAdc | t _{off} | | 10 | μs |

SAFE OPERATING AREA

| | |
|--------------------------------------------------------------------------|-----------|
| DC Tests T _C = +25°C + 10°C -0°, 1 Cycle, t ≥ 1.0 s | |
| Test 1 V _{CE} = 12.5 Vdc, I _C = 12 Adc | All Types |
| Test 2 V _{CE} = 30 Vdc, I _C = 5.0 Adc | All Types |
| Test 3 V _{CE} = 70 Vdc, I _C = 200 mAdc | 2N6051 |
| V _{CE} = 90 Vdc, I _C = 155 mAdc | 2N6052 |

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