

## NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/514

### Devices

2N6274

2N6277

### Qualified Level

JAN  
JANTX  
JANTXV

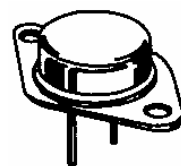
### MAXIMUM RATINGS

| Ratings                                        | Symbol                                       | 2N6274                                        | 2N6277 | Unit               |
|------------------------------------------------|----------------------------------------------|-----------------------------------------------|--------|--------------------|
| Collector-Emitter Voltage                      | $V_{CEO}$                                    | 100                                           | 150    | Vdc                |
| Collector-Base Voltage                         | $V_{CBO}$                                    | 120                                           | 180    | Vdc                |
| Emitter-Base Voltage                           | $V_{EBO}$                                    | 6.0                                           |        | Vdc                |
| Base Current                                   | $I_B$                                        | 20                                            |        | Adc                |
| Collector Current                              | $I_C$                                        | 50                                            |        | Adc                |
| Total Power Dissipation                        | @ $T_C = +25^{\circ}\text{C}$ <sup>(1)</sup> | 250                                           |        | W                  |
|                                                |                                              | @ $T_C = +100^{\circ}\text{C}$ <sup>(2)</sup> |        | 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 | $R_{\theta JC}$ | 0.7  | $^{\circ}\text{C/W}$ |

1) Derate linearly 1.43 W/ $^{\circ}\text{C}$  between  $T_C = +25^{\circ}\text{C}$  and  $T_C = +200^{\circ}\text{C}$



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>$I_C = 50 \text{ mAdc}$                            | 2N6274 | $V_{(BR)CEO}$ | 100 | Vdc             |
|                                                                                           | 2N6277 |               | 150 |                 |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 50 \text{ Vdc}$                             | 2N6274 | $I_{CEO}$     | 50  | $\mu\text{Adc}$ |
|                                                                                           | 2N6277 |               | 50  |                 |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 120 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ | 2N6274 | $I_{CEX}$     | 10  | $\mu\text{Adc}$ |
|                                                                                           | 2N6277 |               | 10  |                 |
| Emitter-Base Cutoff Current<br>$V_{EB} = 6.0 \text{ Vdc}$                                 |        | $I_{EBO}$     | 100 | $\mu\text{Adc}$ |
| Collector-Base Cutoff Current<br>$V_{CB} = 120 \text{ Vdc}$                               | 2N6274 | $I_{CBO}$     | 10  | $\mu\text{Adc}$ |
|                                                                                           | 2N6277 |               | 10  |                 |

**ELECTRICAL CHARACTERISTICS (con't)**

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

**ON CHARACTERISTICS <sup>(2)</sup>**

|                                                                                                                                                                                                   |                      |                |            |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------|------------|-----|
| Forward-Current Transfer Ratio<br>I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 4.0 Vdc<br>I <sub>C</sub> = 20 Adc, V <sub>CE</sub> = 4.0 Vdc<br>I <sub>C</sub> = 50 Adc, V <sub>CE</sub> = 4.0 Vdc | h <sub>FE</sub>      | 50<br>30<br>10 | 120        |     |
| Collector-Emitter Saturation Voltage<br>I <sub>C</sub> = 20 Adc, I <sub>B</sub> = 2.0 Adc<br>I <sub>C</sub> = 50 Adc, I <sub>B</sub> = 10 Adc                                                     | V <sub>CE(sat)</sub> |                | 1.0<br>3.0 | Vdc |
| Base-Emitter Saturation Voltage<br>I <sub>C</sub> = 20 Adc, I <sub>B</sub> = 2.0 Adc                                                                                                              | V <sub>BE(sat)</sub> |                | 1.8        | Vdc |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                                                            |                  |     |     |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit<br>Forward Current Transfer Ratio<br>I <sub>C</sub> = 1.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 10 MHz | h <sub>fe</sub>  | 3.0 | 12  |    |
| Output Capacitance<br>V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz                                                                            | C <sub>obo</sub> |     | 600 | pF |

**SWITCHING CHARACTERISTICS**

|                                                                                                                  |                  |  |      |    |
|------------------------------------------------------------------------------------------------------------------|------------------|--|------|----|
| Turn-On Time<br>V <sub>CC</sub> = 80 Vdc; I <sub>C</sub> = 20 Adc; I <sub>B</sub> = 2.0 Adc                      | t <sub>on</sub>  |  | 0.5  | μs |
| Turn-Off Time<br>V <sub>CC</sub> = 80 Vdc; I <sub>C</sub> = 20 Adc; I <sub>B1</sub> = -I <sub>B2</sub> = 2.0 Adc | t <sub>off</sub> |  | 1.05 | μs |

**SAFE OPERATING AREA**

|                                                                                                      |  |  |  |  |
|------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>DC Tests</b><br>T <sub>C</sub> = +25°C, 1 Cycle, t = 1.0 s                                        |  |  |  |  |
| <b>Test 1</b><br>V <sub>CE</sub> = 5.0 Vdc, I <sub>C</sub> = 50 Adc                      All Types   |  |  |  |  |
| <b>Test 2</b><br>V <sub>CE</sub> = 8.6 Vdc, I <sub>C</sub> = 165 mAdc                      All Types |  |  |  |  |
| <b>Test 3</b><br>V <sub>CE</sub> = 80 Vdc, I <sub>C</sub> = 29 mAdc                      2N6274      |  |  |  |  |
| <b>Test 4</b><br>V <sub>CE</sub> = 120 Vdc, I <sub>C</sub> = 110 mAdc                      2N6277    |  |  |  |  |

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