

## PNP HIGH VOLTAGE SILICON TRANSISTOR

Qualified per MIL-PRF-19500/397

### Devices

2N3743

2N4930

2N4931

### Qualified Level

JAN, JANTX  
JANTXV

### MAXIMUM RATINGS

| Ratings                                        | Sym            | 2N3743                         | 2N4930 | 2N4931 | Unit               |
|------------------------------------------------|----------------|--------------------------------|--------|--------|--------------------|
| Collector-Emitter Voltage                      | $V_{CEO}$      | 300                            | 200    | 250    | Vdc                |
| Collector-Base Voltage                         | $V_{CBO}$      | 300                            | 200    | 250    | Vdc                |
| Emitter-Base Voltage                           | $V_{EBO}$      | 5.0                            |        |        | Vdc                |
| Collector Current                              | $I_C$          | 200                            |        |        | mAdc               |
| Total Power Dissipation                        | $P_T$          | $@T_A = +25^{\circ}\text{C}^1$ |        |        | W                  |
|                                                |                | $@T_C = +25^{\circ}\text{C}^2$ |        |        | 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 | $R_{\theta JC}$ | 35   | $^{\circ}\text{C/W}$ |

- 1) Derate linearly 5.71 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$
- 2) Derate linearly 28.6 mW/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$



TO-39\*  
(TO-205AD)

\*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>$I_C = 1.0 \text{ mAdc}$                                                         | 2N3743<br>2N4930<br>2N4931 | $V_{(BR)CEO}$ | 300<br>200<br>250 | Vdc              |
| Collector-Emitter Breakdown Voltage<br>$I_C = 100 \mu\text{Adc}$                                                        | 2N3743<br>2N4930<br>2N4931 | $V_{(BR)CBO}$ | 300<br>200<br>250 | Vdc              |
| Emitter-Base Breakdown Voltage<br>$I_E = 100 \mu\text{Adc}$                                                             |                            | $V_{(BR)EBO}$ | 5.0               | Vdc              |
| Collector-Base Cutoff Current<br>$V_{CB} = 250 \text{ Vdc}$<br>$V_{CB} = 150 \text{ Vdc}$<br>$V_{CB} = 200 \text{ Vdc}$ | 2N3743<br>2N4930<br>2N4931 | $I_{CBO}$     | 250<br>250<br>250 | $\eta\text{Adc}$ |

**ELECTRICAL CHARACTERISTICS (con't)**

| Characteristics                                           | Symbol    | Min. | Max. | Unit             |
|-----------------------------------------------------------|-----------|------|------|------------------|
| Emitter-Base Cutoff Current<br>$V_{EB} = 4.0 \text{ Vdc}$ | $I_{EBO}$ |      | 150  | $\eta\text{Adc}$ |

**ON CHARACTERISTICS <sup>(3)</sup>**

|                                                                                                                                                                                                                                                                                                      |               |                            |            |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|------------|-----|
| Forward-Current Transfer Ratio<br>$I_C = 0.1 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$<br>$I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$<br>$I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$<br>$I_C = 30 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$<br>$I_C = 50 \text{ mAdc}, V_{CE} = 20 \text{ Vdc}$ | $h_{FE}$      | 30<br>40<br>40<br>50<br>30 | 200        |     |
| Collector-Emitter Saturation Voltage<br>$I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$<br>$I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$                                                                                                                                                           | $V_{CE(sat)}$ |                            | 1.2<br>1.0 | Vdc |
| Base-Emitter Saturation Voltage<br>$I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$<br>$I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$                                                                                                                                                                | $V_{BE(sat)}$ |                            | 1.0<br>1.2 | Vdc |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                                                               |            |     |     |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio<br>$I_C = 10 \text{ mAdc}, V_{CE} = 20 \text{ Vdc}, f = 20 \text{ MHz}$ | $ h_{fe} $ | 2.0 | 8.0 |    |
| Small-Signal Short-Circuit Forward Current Transfer Ratio<br>$I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$                            | $h_{fe}$   | 30  | 300 |    |
| Output Capacitance<br>$V_{CB} = 20 \text{ Vdc}, I_E = 0, f \geq 0.1 \text{ MHz}$                                                                              | $C_{obo}$  |     | 15  | pF |
| Input Capacitance<br>$V_{EB} = 1.0 \text{ Vdc}, I_C = 0, f \geq 0.1 \text{ MHz}$                                                                              | $C_{ibo}$  |     | 400 | pF |

**SAFE OPERATING AREA**

|                                                                                     |           |  |
|-------------------------------------------------------------------------------------|-----------|--|
| <b>DC Tests</b><br>$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t \geq 1.0 \text{ s}$ |           |  |
| <b>Test 1</b><br>$V_{CE} = 20 \text{ Vdc}, I_C = 50 \text{ mAdc}$                   | All Types |  |
| <b>Test 2</b><br>$V_{CE} = 100 \text{ Vdc}, I_C = 10 \text{ mAdc}$                  | All Types |  |
| <b>Test 3</b><br>$V_{CE} = 300 \text{ Vdc}, I_C = 3.3 \text{ mAdc}$                 | 2N3743    |  |
| $V_{CE} = 200 \text{ Vdc}, I_C = 5.0 \text{ mAdc}$                                  | 2N4930    |  |
| $V_{CE} = 250 \text{ Vdc}, I_C = 4.0 \text{ mAdc}$                                  | 2N4931    |  |

(3) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .