



## TECHNICAL DATA

### PNP POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/441

#### Devices

2N3740

2N3741

#### Qualified Level

JAN  
JANTX  
JANTXV

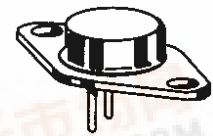
#### MAXIMUM RATINGS

| Ratings                                                   | Symbol         | 2N3740      | 2N3741 | Unit               |
|-----------------------------------------------------------|----------------|-------------|--------|--------------------|
| Collector-Emitter Voltage                                 | $V_{CEO}$      | 60          | 80     | Vdc                |
| Collector-Base Voltage                                    | $V_{CBO}$      | 60          | 80     | Vdc                |
| Emitter-Base Voltage                                      | $V_{EBO}$      | 7.0         |        | Vdc                |
| Base Current                                              | $I_B$          | 2.0         |        | Adc                |
| Collector Current                                         | $I_C$          | 4.0         |        | Adc                |
| Total Power Dissipation @ $T_C = +25^{\circ}\text{C}$ (1) | $P_T$          | 25          |        | W                  |
| @ $T_C = +100^{\circ}\text{C}$                            |                | 14          |        | 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 | $R_{\theta JC}$ | 7.0  | $^{\circ}\text{C/W}$ |

1) Derate linearly @143 mW/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$



TO-66 (TO-213AA)

\*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>$I_C = 100 \text{ mAdc}$                                                                                | 2N3740<br>2N3741 | $V_{(BR)CEO}$ | 60<br>80   | Vdc              |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 40 \text{ Vdc}$<br>$V_{CE} = 60 \text{ Vdc}$                                                     | 2N3740<br>2N3741 | $I_{CEO}$     | 10<br>10   | $\mu\text{Adc}$  |
| Collector-Emitter Cutoff Current<br>$V_{CE} = 60 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$<br>$V_{CE} = 80 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ | 2N3740<br>2N3741 | $I_{CEX}$     | 300<br>300 | $\eta\text{Adc}$ |
| Collector-Base Cutoff Current<br>$V_{CB} = 60 \text{ Vdc}$<br>$V_{CB} = 80 \text{ Vdc}$                                                        | 2N3740<br>2N3741 | $I_{CBO}$     | 100<br>100 | $\eta\text{Adc}$ |
| Emitter-Base Cutoff Current<br>$V_{EB} = 7.0 \text{ Vdc}$                                                                                      |                  | $I_{EBO}$     | 100        | $\eta\text{Adc}$ |



2N3740, 2N3741 JAN SERIES

**ELECTRICAL CHARACTERISTICS (con't)**

| Characteristics                                                                                                                                                                                                                                                                                            | Symbol        | Min.                        | Max.       | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|------------|------|
| <b>ON CHARACTERISTICS <sup>(2)</sup></b>                                                                                                                                                                                                                                                                   |               |                             |            |      |
| Forward-Current Transfer Ratio<br>$I_C = 100 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$<br>$I_C = 250 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$<br>$I_C = 500 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$<br>$I_C = 1.0 \text{ Adc}, V_{CE} = 1.0 \text{ Vdc}$<br>$I_C = 4.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$ | $h_{FE}$      | 40<br>30<br>20<br>10<br>3.0 | 120        |      |
| Collector-Emitter Saturation Voltage<br>$I_C = 250 \text{ mAdc}, I_B = 25 \text{ mAdc}$<br>$I_C = 1.0 \text{ Adc}, I_B = 125 \text{ mAdc}$                                                                                                                                                                 | $V_{CE(sat)}$ |                             | 0.4<br>0.6 | Vdc  |
| Base-Emitter Voltage<br>$I_C = 250 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$                                                                                                                                                                                                                                 | $V_{BE(on)}$  |                             | 1.0        | Vdc  |

**DYNAMIC CHARACTERISTICS**

|                                                                                                                                                                 |            |     |     |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|-----|----|
| Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio<br>$I_C = 100 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$ | $ h_{fe} $ | 1.0 | 12  |    |
| Small-Signal Short-Circuit Forward Current Transfer Ratio<br>$I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$                              | $h_{fe}$   | 25  | 250 |    |
| Output Capacitance<br>$V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$                                                           | $C_{obo}$  |     | 100 | pF |

**SWITCHING CHARACTERISTICS**

|                                                                                                |           |  |     |         |
|------------------------------------------------------------------------------------------------|-----------|--|-----|---------|
| Turn-On Time<br>$V_{CC} = 30 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_B = 0.1 \text{ Adc}$        | $t_{on}$  |  | 400 | $\mu s$ |
| Turn-Off Time<br>$V_{CC} = 30 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_B = I_C = 0.1 \text{ Adc}$ | $t_{off}$ |  | 1.0 | $\mu s$ |

**SAFE OPERATING AREA**

|                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>DC Tests</b><br>$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$<br><b>Test 1</b><br>$V_{CE} = 6.25 \text{ Vdc}, I_C = 4.0 \text{ Adc}$<br><b>Test 2</b><br>$V_{CE} = 20 \text{ Vdc}, I_C = 1.25 \text{ Adc}$<br><b>Test 3</b><br>$V_{CE} = 50 \text{ Vdc}, I_C = 150 \text{ mAdc}$ 2N3740<br>$V_{CE} = 65 \text{ Vdc}, I_C = 150 \text{ mAdc}$ 2N3741 |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|

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