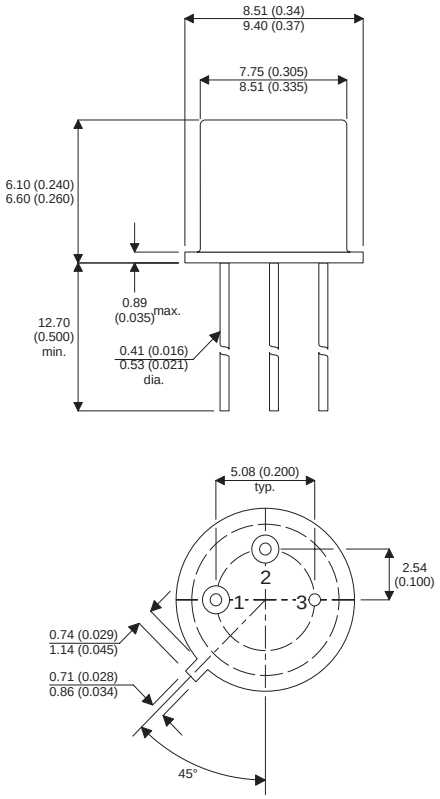
# 2N3725

# HIGH VOLTAGE, HIGH CURRENT, HIGH SPEED, NPN SWITCHING TRANSISTOR IN A HERMETICALLY SEALED TO-39 METAL PACKAGE FOR HIGH RELIABILITY APPLICATIONS

**MECHANICAL DATA**
Dimensions in mm (inches)




**TO-39 METAL**
**(TO205AD)**

**PIN OUTS**

PIN 1 – Emitter PIN 2 – Base PIN 3 – Collector

## FEATURES

- **SILICON PLANAR EPITAXIAL NPN TRANSISTOR**
- **HERMETIC METAL PACKAGE**
- **CECC SCREENING OPTIONS**
- **SPACE QUALITY LEVELS OPTIONS**
- **JAN LEVEL SCREENING OPTIONS**
- **HIGH SPEED SATURATED SWITCHING**

## APPLICATIONS:

**Hermetically sealed 2N3725 for high reliability applications. Suitable for memory application.**

**ABSOLUTE MAXIMUM RATINGS** ($T_{amb}$ = 25°C unless otherwise stated)

| | | |
|---|---|---|
| $V_{CBO}$ | Collector-base Voltage ($I_E$ = 0) | 80V |
| $V_{CES}$ | Collector-emitter Voltage ($V_{BE}$ = 0) | 80V |
| $V_{CEO}$ | Collector-emitter Voltage ($I_B$ = 0) | 50V |
| $V_{EBO}$ | Emitter-base Voltage ($I_C$ = 0) | 6V |
| $I_C$ | Collector Current | 1A |
| $P_{tot}$ | Total Power Dissipation at $T_{amb} \leq 25$ °C | 0.8W |
| | at $T_{case} \leq 25$ °C | 3.5W |
| $T_j$ | Junction Temperature | – 65 to 200 °C |
| $T_{stg}$ | Storage Temperature | – 65 to 200 °C |



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Issue 1

# 2N3725

## ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25°C unless otherwise stated)

| Parameter | | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cutoff Current ($I_E$ = 0) | $V_{CB}$ = 60 V | | | 1.7 | µA |
| | | $V_{CB}$ = 60 V $T_{amb}$ = 100 `C | | | 120 | |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage ($I_E$ = 0) | $I_C$ = 10 µA | 80 | | | V |
| $V_{(BR)CES}$ | Collector-Emitter Breakdown Voltage ($V_{BE}$ = 0) | $I_C$ = 10 µA | 80 | | | V |
| $V_{(BR)CEO}$* | Collector-Emitter Breakdown Voltage ($I_B$ = 0) | $I_C$ = 10 mA | 50 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage ($I_C$ = 0) | $I_E$ = 10 µA | 6 | | | V |
| $V_{CE(sat)}$ * | Collector-Emitter Saturation Voltage | $I_C$ = 10 mA $I_B$ = 1 mA | | 0.19 | 0.25 | V |
| | | $I_C$ = 100 mA $I_B$ = 10 mA | | 0.21 | 0.26 | |
| | | $I_C$ = 300 mA $I_B$ = 30 mA | | 0.31 | 0.4 | |
| | | $I_C$ = 500 mA $I_B$ = 50 mA | | 0.4 | 0.52 | |
| | | $I_C$ = 800 mA $I_B$ = 80 mA | | 0.5 | 0.8 | |
| | | $I_C$ = 1000 mA $I_B$ = 100 mA | | 0.6 | 0.95 | |
| $V_{BE(sat)}$ * | Base-Emitter Saturation Voltage | $I_C$ = 10 mA $I_B$ = 1 mA | | 0.64 | 0.76 | V |
| | | $I_C$ = 100 mA $I_B$ = 10 mA | | 0.75 | 0.86 | |
| | | $I_C$ = 300 mA $I_B$ = 30 mA | | 0.89 | 1.1 | |
| | | $I_C$ = 500 mA $I_B$ = 50 mA | 0.9 | | 1.2 | |
| | | $I_C$ = 800 mA $I_B$ = 80 mA | | 1.0 | 1.5 | |
| | | $I_C$ = 1000 mA $I_B$ = 100 mA | | 1.1 | 1.7 | |
| $h_{FE}$* | DC Current Gain | $I_C$ = 10 mA $V_{CE}$ = 1 V | 30 | 60 | | |
| | | $I_C$ = 100 mA $V_{CE}$ = 1 V | 60 | 90 | 150 | |
| | | $I_C$ = 300 mA $V_{CE}$ = 1 V | 40 | 60 | | |
| | | $I_C$ = 1000 mA $V_{CE}$ = 5 V | 25 | 65 | | |
| | | $I_C$ = 800 mA $V_{CE}$ = 2 V | 20 | 40 | | |
| | | $I_C$ = 500 mA $V_{CE}$ = 1 V | 35 | | | |
| $h_{fe}$ | High Frequency Current Gain (f = 100Mhz) | $I_C$ = 50 mA $V_{CE}$ = 10 V | 3 | | | |
| $C_{CBO}$ | Collector-Base Capacitance (f = 1Mhz) | $I_E$ = 0 $V_{CB}$ = 10 V | | | 10 | pF |
| $C_{EBO}$ | Emitter-Base Capacitance (f = 1Mhz) | $I_C$ = 0 $V_{CB}$ = 0.5 V | | | 55 | pF |
| $t_{on}$ | Turn-on Time | $I_C$ = 500 mA $V_{CC}$ = 30 V<br>$I_B$ = 50 mA | | | 35 | ns |
| $t_{off}$ | Turn off Time | $I_C$ = 500 mA $V_{CC}$ = 30 V<br>$I_{B1}$ = – $I_{B2}$ = 50 mA | | | 60 | ns |

* Pulsed : pulse duration = 300µs, duty cycle = 1%

## THERMAL DATA ($T_{case}$ = 25°C unless otherwise stated)

| Parameter | | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal Resistance Junction-Case | | | | 50 | °C/W |
| $R_{th\ j\text{-}amb}$ | Thermal Resistance Junction-Ambient | | | | 220 | °C/W |



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