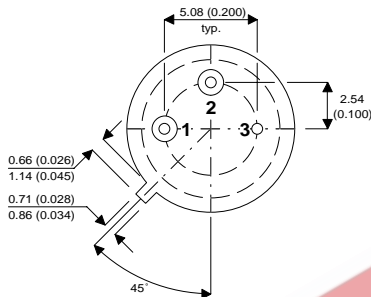
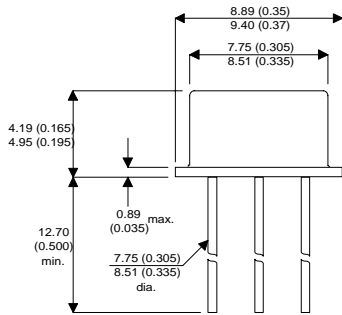


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO39 PACKAGE**

Pin 1 = Emitter      Pin 2 = Base      Pin 3 = Collector

**HIGH VOLTAGE  
NPN TRANSISTORS**

**FEATURES**

- DUAL SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HIGH VOLTAGE

**APPLICATIONS:**

These devices are particularly suited as drivers in high-voltage low current inverters, switing and series regulators.

**ABSOLUTE MAXIMUM RATINGS**

( $T_{case} = 25^{\circ}C$  unless otherwise stated)

		2N3439	2N3440
$V_{CBO}$	Collector – Base Voltage ( $I_E = 0$ )	450V	300V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )	350V	250V
$V_{EBO}$	Emitter – Base Voltage ( $I_C = 0$ )		7V
$I_C$	Collector Current		1A
$I_B$	Base Current		0.5A
$P_{tot}$	Total Power Dissipation at $T_{case} \leq 25^{\circ}C$ $T_{amb} \leq 50^{\circ}C$		5W 1W
$T_{stg}$	Storage Temperature		-55 to 200°C
$T_j$	Junction Temperature		200°C

**ELECTRICAL CHARACTERISTICS** ( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{\text{CEO(sus)}}^*$ Collector – Emitter Sustaining Voltage ( $I_{\text{B}} = 0$ )	$I_{\text{C}} = 50\text{mA}$ <b>2N3439</b>	350			V
	$I_{\text{C}} = 50\text{mA}$ <b>2N3440</b>	250			
$I_{\text{CEO}}$ Collector Cut-off Current ( $I_{\text{B}} = 0$ )	$V_{\text{CE}} = 300\text{V}$ <b>2N3439</b>			20	$\mu\text{A}$
	$V_{\text{CE}} = 200\text{V}$ <b>2N3440</b>			50	
$I_{\text{CEX}}$ Collector Cut-off Current ( $V_{\text{BE}} = -1.5\text{V}$ )	$V_{\text{CE}} = 450\text{V}$ <b>2N3439</b>			500	$\mu\text{A}$
	$V_{\text{CE}} = 300\text{V}$ <b>2N3440</b>			500	
$I_{\text{CBO}}$ Collector – Base Cut-off Current ( $I_{\text{E}} = 0$ )	$V_{\text{CB}} = 350\text{V}$ <b>2N3439</b>			20	$\mu\text{A}$
	$V_{\text{CB}} = 250\text{V}$ <b>2N3440</b>			20	
$I_{\text{EBO}}$ Emitter Cut-off Current ( $I_{\text{C}} = 0$ )	$V_{\text{EB}} = 6\text{V}$			20	$\mu\text{A}$
$V_{\text{CE(sat)}}^*$ Collector – Emitter Saturation Voltage	$I_{\text{C}} = 50\text{mA}$ $I_{\text{B}} = 4\text{mA}$			0.5	V
$V_{\text{BE(sat)}}^*$ Base – Emitter Saturation Voltage	$I_{\text{C}} = 50\text{mA}$ $I_{\text{B}} = 4\text{mA}$			1.3	V
$h_{\text{FE}}^*$ DC Current Gain	$I_{\text{C}} = 20\text{mA}$ $V_{\text{CE}} = 10\text{V}$	40		160	—
	$I_{\text{C}} = 2\text{mA}$ $V_{\text{CE}} = 10\text{V}$ <b>2N3439 only</b>	30			—

\* Pulse test  $t_{\text{p}} = 300\mu\text{s}$ ,  $\delta \leq 2\%$

**DYNAMIC CHARACTERISTICS** ( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_{\text{T}}$ Transition Frequency	$I_{\text{C}} = 10\text{mA}$ $V_{\text{CE}} = 10\text{V}$ $f = 5\text{MHz}$	15			MHz
$C_{\text{ob}}$ Output Capacitance	$V_{\text{CB}} = 10\text{V}$ $f = 1\text{MHz}$			10	pF
$h_{\text{fe}}$ Small Signal Current Gain	$I_{\text{C}} = 5\text{mA}$ $V_{\text{CE}} = 10\text{V}$ $f = 1\text{kHz}$	25			—

**THERMAL DATA**

Parameter	Min.	Typ.	Max.	Unit
$R_{\theta\text{JA}}$ Thermal Resistance Junction to Ambient			175	$^{\circ}\text{C/W}$
$R_{\theta\text{JC}}$ Thermal Resistance Junction to Case			35	$^{\circ}\text{C/W}$