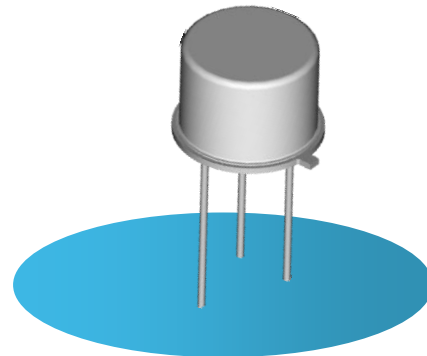


HIGH VOLTAGE NPN TRANSISTORS

2N3439 / 2N3440

- Hermetic TO39 Package
- High Voltage
- Ideally suited for drivers in high voltage low current inverters, switching and series regulators
- High Reliability Screening Options Available



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	2N3439	2N3440
V_{CBO}	Collector – Base Voltage	450V	300V
V_{CEO}	Collector – Emitter Voltage	350V	250V
V_{EBO}	Emitter – Base Voltage	7V	
I_C	Collector Current – Continuous	1.0A	
I_B	Base Current	0.5A	
P_D	Total Power Dissipation at $T_C = 25^\circ\text{C}$	5W	
	Derate Above 25°C	28.57mW/ $^\circ\text{C}$	
P_D	Total Power Dissipation at $T_A = 25^\circ\text{C}$	1.0W	
	Derate Above 25°C	5.71mW/ $^\circ\text{C}$	
T_J	Junction Temperature Range	-65 to +200 $^\circ\text{C}$	
T_{stg}	Storage Temperature Range	-65 to +200 $^\circ\text{C}$	

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient	175	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction To Case	35	$^\circ\text{C}/\text{W}$

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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HIGH VOLTAGE NPN TRANSISTORS

2N3439 / 2N3440

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

Symbols	Parameters	Test Conditions			Min.	Typ	Max.	Units
$V_{(BR)CEO}^{(1)}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$ $I_B = 0$		2N3439	350	400		V
				2N3440	250			
I_{CEO}	Collector Cut-Off Current	$V_{CE} = 300\text{V}$	$I_B = 0$	2N3439		1.0	20	μA
		$V_{CE} = 200\text{V}$		2N3440			50	
I_{CEX}	Collector Cut-Off Current	$V_{CE} = 450\text{V}$	$V_{BE} = -1.5\text{V}$	2N3439		0.001	500	
		$V_{CE} = 300\text{V}$		2N3440			500	
I_{CBO}	Collector Cut-Off Current	$V_{CB} = 350\text{V}$		2N3439		0.001	20	
		$V_{CB} = 250\text{V}$		2N3440			20	
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = 6\text{V}$ $I_C = 0$				0.001	20	
$V_{CE(\text{sat})}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = 50\text{mA}$	$I_B = 4\text{mA}$			0.15	0.5	V
$V_{BE(\text{sat})}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = 50\text{mA}$	$I_B = 4\text{mA}$			0.76	1.3	
$h_{FE}^{(1)}$	Forward-current transfer ratio	$I_C = 2\text{mA}$	$V_{CE} = 10\text{V}$	2N3439	30	114		
		$I_C = 20\text{mA}$	$V_{CE} = 10\text{V}$	2N3439	40	116	160	
				2N3440	40		160	

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

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
f_T	Transition Frequency	$I_C = 10\text{mA}$	$V_{CE} = 10\text{V}$ $f = 5\text{MHz}$	15	55		MHz
h_{fe}	Small signal forward-current transfer ratio	$I_C = 5\text{mA}$	$V_{CE} = 10\text{V}$ $f = 1.0\text{KHz}$	25	116		
C_{obo}	Output Capacitance	$V_{CB} = 10\text{V}$	$I_E = 0$ $f = 1.0\text{MHz}$		5.4	10	pF
t_{on}	Turn-On Time	$I_C = 10\text{mA}$	$V_{CC} = 200\text{V}$ $I_{B1} = 2\text{mA}$		0.35	1.0	μs
t_{off}	Turn-Off Time	$I_C = 10\text{mA}$	$V_{CC} = 200\text{V}$ $I_{B1} = -I_{B2} = 2\text{mA}$		1.45	10	

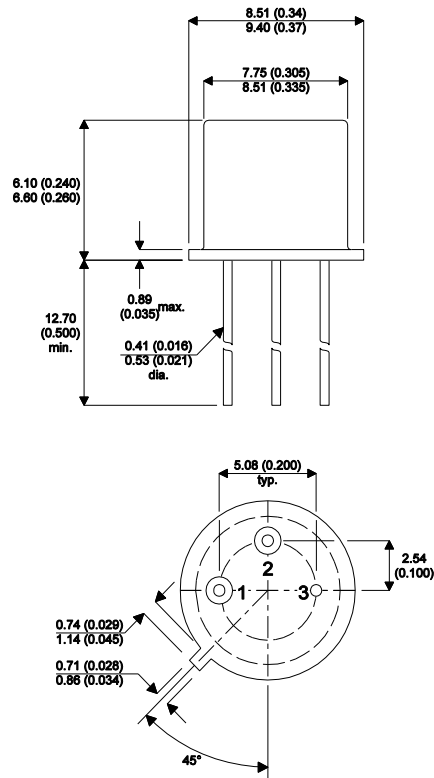
Notes

(1) Pulse Width $\leq 380\mu\text{s}$, $\delta \leq 2\%$

HIGH VOLTAGE NPN TRANSISTORS 2N3439 / 2N3440

MECHANICAL DATA

Dimensions in mm (inches)



TO-39 (TO-205AD) METAL PACKAGE
Underside View

Pin 1 - Emitter

Pin 2 - Base

Pin 3 - Collector

Lead Finish:

- Au (Gold) plated leads as standard.
- Hot solder dip options available but must be specified on purchase order.