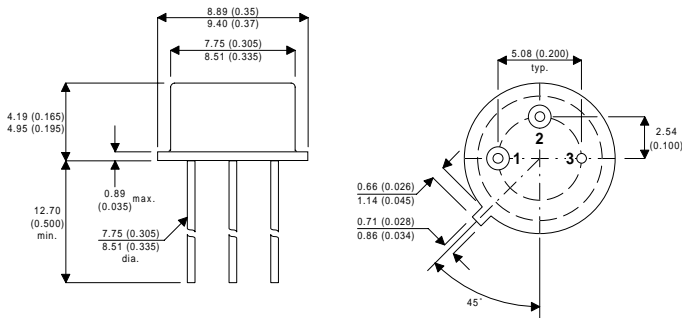


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO-39**

Pin 1 – Emitter      Pin 2 – Base      Pin 3 – Collector

**HIGH SPEED  
MEDIUM VOLTAGE  
SWITCH**

**DESCRIPTION**

The 2N4033 is a silicon epitaxial planar PNP transistors in jedec TO-39 metal case intended for use in switching applications.

**ABSOLUTE MAXIMUM RATINGS**  $T_{case} = 25^{\circ}C$  unless otherwise stated

$V_{CEO}$	Collector – Emitter Voltage	-80V
$V_{CBO}$	Collector – Base Voltage	-80V
$V_{EBO}$	Emitter – Base Voltage	-5V
$I_C$	Continuous Collector Current	-1A
$P_D$	Total Device Dissipation at $T_A = 25^{\circ}C$	0.8W
	Derate above $25^{\circ}C$	4.56 mW/ $^{\circ}C$
$P_D$	Total Device Dissipation at $T_C = 25^{\circ}C$	4W
	Derate above $25^{\circ}C$	22.8mW/ $^{\circ}C$
$T_{stg}$	Operating and Storage Temperature Range	-65 to +200 $^{\circ}C$

**THERMAL CHARACTERISTICS**

$R_{thj-case}$	Thermal Resistance Junction-case	Max	25	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	140	°C/W

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cut Off Current	$V_{CB} = -60V$		-50	nA
		$T_A = 150^{\circ}C$		-50	$\mu A$
$I_{EBO}$	Emitter Cut Off Current	$V_{EB} = -5V$		-10	$\mu A$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage <sup>1</sup>	$I_C = -150mA$ $I_B = -15mA$		-0.15	V
		$I_C = -500mA$ $I_B = -50mA$		0.50	
$V_{BE(sat)}$	Base Emitter Saturation Voltage <sup>1</sup>	$I_C = -150mA$ $I_B = -15mA$		-0.9	V
$V_{BE(on)}$	Base Emitter on Voltage	$I_C = -500mA$ $V_{CE} = -0.5V^1$		-1.1	V
$V_{(BR)CEO}$	Collector Emitter Breakdown Voltage	$I_C = -10mA$	-80		V
$V_{(BR)CBO}$	Collector Base Breakdown Voltage	$I_C = -10\mu A$	-80		V
$V_{(BR)EBO}$	Emitter Base Breakdown Voltage	$I_E = -10\mu A$	-5.0		V
$h_{FE}$	DC Current Gain	$I_C = -100mA$ $V_{CE} = -5.0V$ @-55°C <sup>1</sup>	40		—
		$I_C = -100\mu A$ $V_{CE} = -5.0V$	75		
		$I_C = -100mA$ $V_{CE} = -5.0V^1$	100	300	
		$I_C = -500mA$ $V_{CE} = -5.0V^1$	70		
		$I_C = -1.0A$ $V_{CE} = -5.0V^1$	25		

**SMALL SIGNAL CHARACTERISTICS**

$C_{obo}$	Output Capacitance	$V_{CE} = -10V$ $f = 1MHz$		20	pF
$C_{ibo}$	Input Capacitance	$V_{EB} = -0.5V$ $f = 1MHz$		110	
$h_{fe}$	Small Signal Gain	$I_C = -50mA$ $V_{CE} = -10V$ $f = 100MHz$	1.5	5.0	—

**SWITCHING CHARACTERISTICS**

$t_{on}$	Turn On Time	$I_C = -500mA$ $I_{B1} = -I_{B2} = -50mA$		100	ns
$t_f$	Fall Time			50	
$t_s$	Storage Time			350	

<sup>1</sup>Pulse test  $t_p = 300\mu s$ ,  $\delta = 1\%$