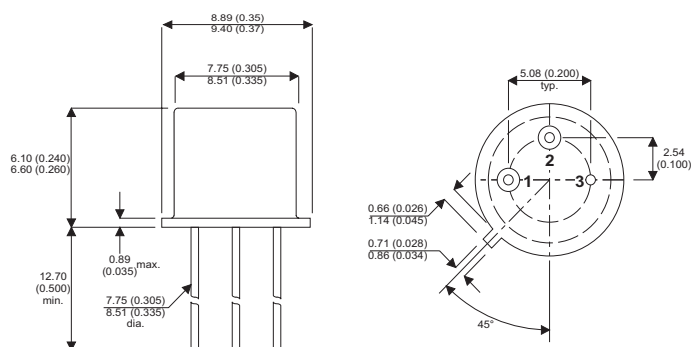


**MECHANICAL DATA**

Dimensions in mm (inches)



**HIGH SPEED  
MEDIUM VOLTAGE  
SWITCHES**

**DESCRIPTION**

The 2N5152 and the 2N5154 are silicon epitaxial planar NPN transistors in jedec TO-39 metal case intended for use in switching applications.

The complementary PNP types are the 2N5151 and 2N5153 respectively

**TO-39**

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

**ABSOLUTE MAXIMUM RATINGS**

(T<sub>CASE</sub> = 25°C unless otherwise stated)

		2N5152	2N5154
V <sub>CBO</sub>	Collector – Base Voltage (I <sub>E</sub> = 0)		100V
V <sub>CEO</sub>	Collector – Emitter Voltage (I <sub>B</sub> = 0)		80V
V <sub>EBO</sub>	Emitter – Base Voltage (I <sub>C</sub> = 0)		6V
I <sub>C</sub>	Continuous Collector Current		5A
I <sub>C(PK)</sub>	Peak Collector Current		10A
I <sub>B</sub>	Base Current		1A
P <sub>tot</sub>	Total Dissipation at T <sub>case</sub> = 25°C		1W
	T <sub>case</sub> = 50°C		10W
	T <sub>case</sub> = 100°C		6.7W
T <sub>stg</sub>	Operating and Storage Temperature Range		-65 to +200°C
T <sub>j</sub>	Junction temperature		200°C

**ELECTRICAL CHARACTERISTICS FOR 2N5152** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$ Collector Cut Off Current	$V_{CE} = 60V$ $V_{BE} = 0$			1	$\mu A$
	$V_{CE} = 100V$ $V_{BE} = 0$			1	mA
$I_{CEV}$ Collector Cut Off Current	$V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$			500	$\mu A$
$I_{CEO}$ Collector Cut Off Current	$V_{CE} = 40V$ $I_B = 0$			50	
$I_{EBO}$ Emitter Cut Off Current	$V_{EB} = 5V$ $I_C = 0$			1	$\mu A$
	$V_{EB} = 6V$ $I_C = 0$			1	mA
$V_{CEO(SUS)}$ Collector Emitter Saturation Voltage	$I_C = 100mA$ $I_B = 0$	80			V
$V_{CE(sat)}$ Collector Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			0.75	
	$I_C = 5A$ $I_B = 500mA$			1.5	
$V_{BE(sat)}$ Base Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			1.45	
	$I_C = 5A$ $I_B = 500mA$			2.2	
$V_{BE}$ Base Emitter Voltage	$I_C = 2.5A$ $V_{CE} = 5V$			1.45	
$h_{FE}$ DC Current Gain	$I_C = 50mA$ $V_{CE} = 5V$	20			90
	$I_C = 2.5A$ $V_{CE} = 5V$	30			
	$I_C = 5A$ $V_{CE} = 5V$	20			
	$T_{case} = -55^{\circ}C$ $I_C = 2.5A$ $V_{CE} = 5V$	15			
$C_{CBO}$ Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$			250	pF
$h_{FE}$ Small Signal Current Gain	$I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$	20			
	$I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$	3			
$t_{on}$ Turn On Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$		0.5		$\mu s$
$t_{off}$ Turn Off Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$		1.3		$\mu s$

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

**THERMAL DATA**

$R_{thj-case}$ Thermal Resistance Junction-case	Max	15	$^{\circ}C/W$
$R_{thj-amb}$ Thermal Resistance Junction-ambient	Max	175	$^{\circ}C/W$

**ELECTRICAL CHARACTERISTICS FOR 2N5154** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CES}$ Collector Cut Off Current	$V_{CE} = 60V$ $V_{BE} = 0$			1	$\mu A$
	$V_{CE} = 100V$ $V_{BE} = 0$			1	mA
$I_{CEV}$ Collector Cut Off Current	$V_{CE} = 60V$ $T_{case} = 150^{\circ}C$ $V_{BE} = -2V$			500	$\mu A$
$I_{CEO}$ Collector Cut Off Current	$V_{CE} = 40V$ $I_B = 0$			50	
$I_{EBO}$ Emitter Cut Off Current	$V_{EB} = 5V$ $I_C = 0$			1	$\mu A$
	$V_{EB} = 6V$ $I_C = 0$			1	mA
$V_{CEO(SUS)}$ Collector Emitter Saturation Voltage	$I_C = 100mA$ $I_B = 0$	80			V
$V_{CE(sat)}$ Collector Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			0.75	
	$I_C = 5A$ $I_B = 500mA$			1.5	
$V_{BE(sat)}$ Base Emitter Saturation Voltage	$I_C = 2.5A$ $I_B = 250mA$			1.45	
	$I_C = 5A$ $I_B = 500mA$			2.2	
$V_{BE}$ Base Emitter Voltage	$I_C = 2.5A$ $V_{CE} = 5V$			1.45	
$h_{FE}$ DC Current Gain	$I_C = 50mA$ $V_{CE} = 5V$	50			200
	$I_C = 2.5A$ $V_{CE} = 5V$	70			
	$I_C = 5A$ $V_{CE} = 5V$	40			
	$T_{case} = -55^{\circ}C$ $I_C = 2.5A$ $V_{CE} = 5V$	35			
$C_{CBO}$ Collector Base Capacitance	$I_E = 0$ $V_{CB} = 10V$ $f = 1MHz$			250	pF
$h_{FE}$ Small Signal Current Gain	$I_C = 0.1A$ $V_{CE} = 5V$ $f = 1KHz$	50			
	$I_C = 0.5A$ $V_{CE} = 5V$ $f = 20MHz$	3.5			
$t_{on}$ Turn On Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = 0.5A$		0.5		$\mu s$
$t_{off}$ Turn Off Time	$I_C = 5A$ $V_{CC} = 30V$ $I_{B1} = -I_{B2} = 0.5A$		1.3		$\mu s$

\* Pulse test  $t_p = 300\mu s$ ,  $\delta < 2\%$

**THERMAL DATA**

$R_{thj-case}$	Thermal Resistance Junction-case	Max	15	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	175	$^{\circ}C/W$