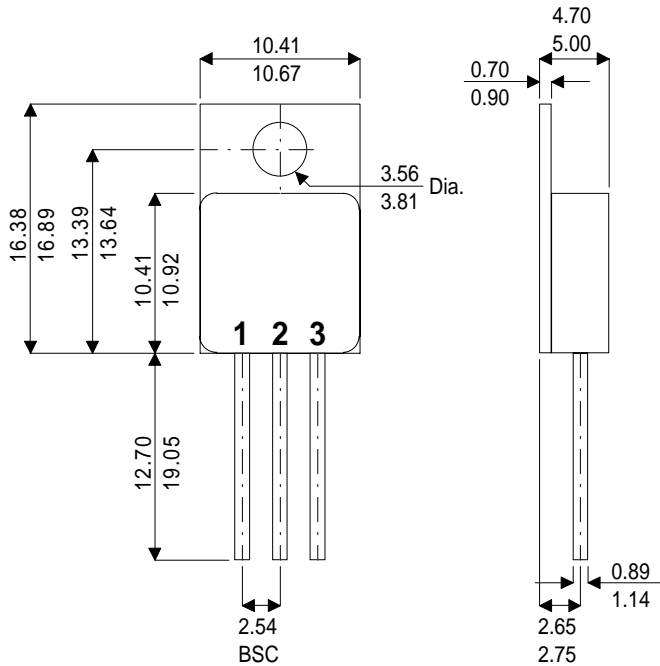


**MECHANICAL DATA**

Dimensions in mm (inches)



**HIGH SPEED  
MEDIUM VOLTAGE  
SWITCHES**

**DESCRIPTION**

The 2N5151-220M and the 2N5153-220M are silicon epitaxial planar PNP transistors in TO-220 (JEDEC TO-257AB) metal case intended for use in switching applications.

The complementary NPN types are the 2N5152-220M and 2N5154-220M respectively

**TO-220 (TO-257AB)**

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

**ABSOLUTE MAXIMUM RATINGS**

$T_{CASE} = 25^{\circ}C$  unless otherwise stated

		2N5151	2N5153
$V_{CBO}$	Collector – Base Voltage		-100V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )		-80V
$V_{EBO}$	Emitter – Base Voltage ( $I_C = 0$ )		-5.5V
$I_C$	Continuous Collector Current		-5A
$I_{C(PK)}$	Peak Collector Current		-10A
$I_B$	Base Current		-2.5A
$P_{tot}$	Total Dissipation at $T_{amb} = 25^{\circ}C$		4.4W
	$T_{case} = 50^{\circ}C$		21.4W
	$T_{case} = 100^{\circ}C$		14.3W
$T_{stg}$	Storage Temperature Range		-65 to +200°C
$T_j$	Operating Junction temperature		200°C

Semelab Plc 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.

**THERMAL DATA**

$R_{thj-case}$	Thermal Resistance Junction-case	Max	7	$^{\circ}C/W$
$R_{thj-amb}$	Thermal Resistance Junction-ambient	Max	40	$^{\circ}C/W$

**ELECTRICAL CHARACTERISTICS FOR 2N5151-220M** ( $T_{case} = 25^{\circ}C$  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	$V_{CE} = -60V$	$T_{case} = 150^{\circ}C$	-500	$\mu A$	
		$V_{BE} = 2V$				
$I_{CEO}$	Collector Cut Off Current	$V_{CE} = -40V$	$I_B = 0$	-50		
$I_{EBO}$	Emitter Cut Off Current	$V_{EB} = -4V$	$I_C = 0$	-1	$\mu A$	
		$V_{EB} = -5.5V$	$I_C = 0$	-1	mA	
$V_{CEO(SUS)}$	Collector Emitter Saturation Voltage	$I_C = -100mA$	$I_B = 0$	80		
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$I_C = -2.5A$	$I_B = -250mA$	-0.75	V	
		$I_C = -5A$	$I_B = -500mA$	-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	$I_E = 0$	$V_{CB} = -10V$		250	pF
		$f = 1MHz$				
$h_{FE}$	Small Signal Current Gain	$I_C = -0.1A$	$V_{CE} = -5V$	20		
		$f = 1KHz$				
		$I_C = -0.5A$	$V_{CE} = -5V$	3		
		$f = 20MHz$				
$t_{on}$	Turn On Time	$I_C = -5A$	$V_{CC} = 30V$		0.5	$\mu s$
		$I_{B1} = -0.5A$				
$t_{off}$	Turn Off Time	$I_C = -5A$	$V_{CC} = 30V$		1.3	$\mu s$
		$I_{B1} = -I_{B2} = 0.5A$				

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

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**ELECTRICAL CHARACTERISTICS FOR 2N5153-220M** ( $T_{case} = 25^{\circ}C$  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	$V_{EB} = -4V$ $I_C = 0$			-1	$\mu A$
	$V_{EB} = -5.5V$ $I_C = 0$			-1	mA
$V_{CEO(SUS)}$ Collector Emitter Saturation Voltage	$I_C = -100mA$ $I_B = 0$	80			
$V_{CE(sat)}$ Collector Emitter Saturation Voltage	$I_C = -2.5A$ $I_B = -250mA$			-0.75	V
	$I_C = -5A$ $I_B = -500mA$			-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  $t_p = 300\mu s$ ,  $\delta < 2\%$