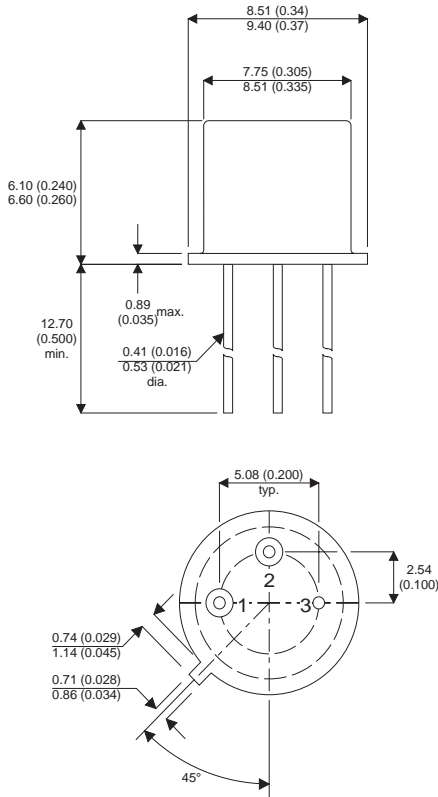


**MECHANICAL DATA**

Dimensions in mm (inches)



**PNP SILICON EPITAXIAL TRANSISTOR**

**APPLICATIONS**

- General Purpose Industrial Applications

**DESCRIPTION**

The BFX38-41 are Silicon Planar Epitaxial PNP transistors in Jedec TO39 metal case, designed for a wide variety of applications.

**TO39 PACKAGE**

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

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{case} = 25^{\circ}C$ unless otherwise stated)		<b>BFX38 BFX39</b>	<b>BFX40 BFX41</b>
$V_{CBO}$	Collector – Base Voltage	-55V	-75V
$V_{CEO}$	Collector – Emitter Voltage	-55V	-75V
$V_{EBO}$	Emitter – Base Voltage		-5V
$I_C$	Collector Current		-1A
$P_{tot}$	Total Power Dissipation $T_{amb} < 25^{\circ}C$ $T_{case} < 25^{\circ}C$		0.8W 4W
$T_{stg}, T_j$	Storage and Junction Temperature		-55 to 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.

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Issue 1

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$ Collector Cutoff Current	<b>BFX38</b> $V_{CB} = -40\text{V}$ $I_E = 0$		-0.2	-50	nA
	<b>BFX39</b> $T_{amb} = 125^\circ\text{C}$		-0.25	-50	$\mu\text{A}$
	<b>BFX40</b> $V_{CB} = -50\text{V}$ $I_E = 0$		-0.2	-50	nA
	<b>BFX41</b> $T_{amb} = 125^\circ\text{C}$		-0.25	-50	$\mu\text{A}$
$V_{(BR)CBO}$ Collector-Base Breakdown Voltage	<b>BFX38</b> $I_C = -10\mu\text{A}$ $I_E = 0$	-55			V
	<b>BFX39</b>				
	<b>BFX40</b> $I_C = -10\mu\text{A}$ $I_E = 0$	-75			V
	<b>BFX41</b>				
$V_{CEO(SUS)^*}$ Collector Emitter Sustaining Voltage	<b>BFX38</b> $I_C = -10\text{mA}$ $I_B = 0$	-55			V
	<b>BFX39</b>				
	<b>BFX40</b> $I_C = -10\text{mA}$ $I_B = 0$	-75			V
	<b>BFX41</b>				
$V_{(BR)EBO}$ Emitter - Base Breakdown Voltage	<b>ALL</b> $I_E = -10\mu\text{A}$ $I_C = 0$	-5			V
$V_{CE(SAT)^*}$ Collector- Emitter Saturation Voltage	<b>ALL</b> $I_C = -150\text{mA}$ $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ $I_B = -50\text{mA}$		-0.12	-0.15	V
			-0.3	-0.5	
$V_{BE(SAT)^*}$ Base - Emitter Saturation Voltage	<b>ALL</b> $I_C = -150\text{mA}$ $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ $I_B = -50\text{mA}$		-0.8	-0.9	V
			-0.9	-1.1	
$h_{FE}^*$ DC Current Gain	<b>BFX38 BFX40</b> $I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	60	90		—
	$I_C = -100\text{mA}$ $V_{CE} = -5\text{V}$	85	130		
	$I_C = -500\text{mA}$ $V_{CE} = -5\text{V}$	60	120		
	<b>BFX39 BFX41</b> $I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	30	45		
	$I_C = -100\text{mA}$ $V_{CE} = -5\text{V}$	40	70		
	$I_C = -500\text{mA}$ $V_{CE} = -5\text{V}$	25	65		
	$I_C = -1\text{A}$ $V_{CE} = -5\text{V}$				
	<b>BFX38</b>	30			
	<b>BFX39</b>	15			
	<b>BFX40</b>	25			
<b>BFX41</b>	10				
	$I_C = -100\text{mA}$ $V_{CE} = -5\text{V}$ $T_{amb} = -55^\circ\text{C}$				
	<b>BFX38 BFX40</b>	30			
	<b>BFX39 BFX41</b>	15			

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Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_T$	Transitions Frequency $I_C = -50\text{mA}$ $V_{CE} = -10\text{V}$ $f = 100\text{MHz}$	100	150		MHz
$C_{EBO}$	Emitter - Base Capacitance $I_C = 0$ $V_{EB} = -0.5\text{V}$ $f = 1\text{MHz}$		75	120	pF
$C_{CBO}$	Collector - Base Capacitance $I_E = 0$ $V_{CB} = -0.5\text{V}$ $f = 1\text{MHz}$		15	20	
$t_{on}$	Turn-on time $I_C = -500\text{mA}$ $V_{CC} = -30\text{V}$ $I_{B1} = -50\text{mA}$		33	100	ns
$t_s$	Storage Time $I_C = -500\text{mA}$ $V_{CC} = -30\text{V}$ $I_{B1} = I_{B2} = -50\text{mA}$		160	350	
$t_f$	Fall Time $I_C = -500\text{mA}$ $V_{CC} = -30\text{V}$ $I_{B1} = -I_{B2} = -50\text{mA}$		27	50	

\* Pulsed: pulse duration = 300 $\mu$ s, duty cycle = 1%

### THERMAL CHARACTERISTICS

$R_{\theta th(j-case)}$	Thermal Resistance Junction to case			44	$^{\circ}\text{C/W}$
$R_{\theta th(j-amb)}$	Thermal Resistance Junction to ambient			219	$^{\circ}\text{C/W}$