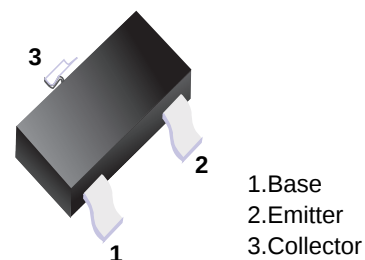


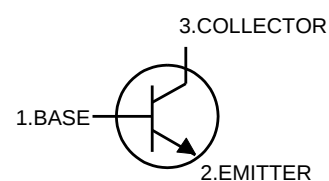
NPN General Purpose Transistor

■ Features

- General purpose transistor.



■ Simplified outline(SOT-323)



■ Absolute Maximum Ratings $T_a = 25^{\circ}\text{C}$

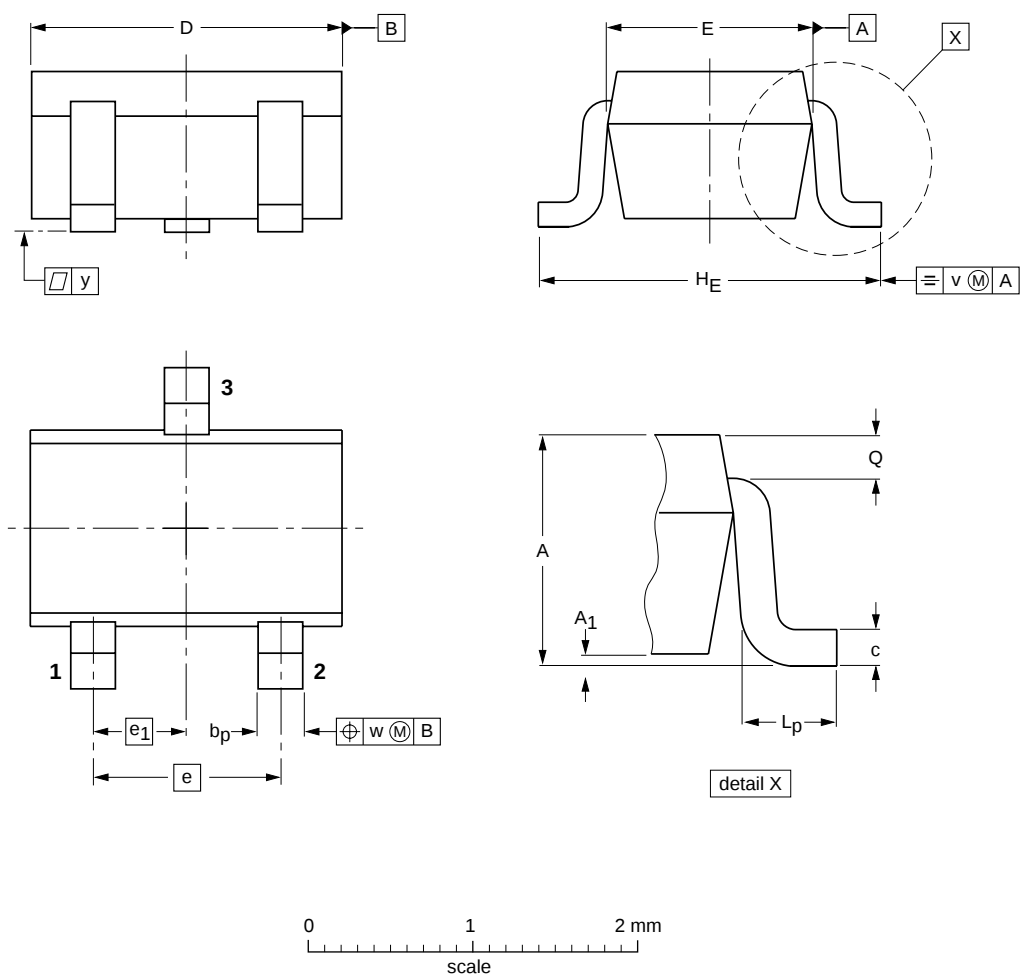
Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	40	V
Collector-base voltage	V_{CBO}	75	V
Emitter-base voltage	V_{EBO}	6.0	V
Collector current	I_C	600	mA
Total Device Dissipation FR-5 Board	P_D	150	mW
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	833	$^{\circ}\text{C}/\text{W}$
Junction temperature	T_j	150	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^{\circ}\text{C}$

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1.0 \text{ mA}, I_B = 0$	40			V
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10 \text{ } \mu\text{A}, I_E = 0$	75			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	6			V
Base cutoff current	I_{BL}	$V_{CE} = 60 \text{ V}, V_{EB} = 3.0 \text{ V}$			20	nA
Collector cutoff current	I_{CEX}	$V_{CE} = 60 \text{ V}, V_{EB} = 3.0 \text{ V}$			10	nA
DC current gain *	H_{FE}	$I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$	100		300	
Collector-emitter saturation voltage *	$V_{CE(sat)}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$			0.3	V
		$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$			1.0	
Base-emitter saturation voltage *	$V_{BE(sat)}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$	0.6		1.2	
		$I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$			2.0	
Current-gain-bandwidth product	f_r	$I_C = 20 \text{ mA}, V_{CE} = 20 \text{ V}, f = 100 \text{ MHz}$	300			MHz
Output capacitance	C_{obo}	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$			8.0	pF
Input capacitance	C_{ibo}	$V_{EB} = 0.5 \text{ V}, I_C = 0, f = 1.0 \text{ MHz}$			30	pF
Input impedance	h_{ie}	$V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$	0.25		1.25	k Ω
Voltage feedback ratio	h_{re}	$V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$			4.0	$\times 10^{-4}$
Small-signal current gain	h_{fe}	$V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$	75		375	
Output admittance	h_{oe}	$V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$	25		200	μmhos
Noise figure	NF	$V_{CE} = 10 \text{ V}, I_C = 100 \text{ } \mu\text{A}, R_s = 1.0 \text{ k}\Omega, f = 1.0 \text{ kHz}$			4.0	dB
Delay time	t_d	$V_{CC} = 3.0 \text{ V}, V_{BE} = -0.5 \text{ V},$ $I_C = 150 \text{ mA}, I_{B1} = 15 \text{ mA}$			10	ns
Rise time	t_r				25	ns
Storage time	t_s	$V_{CC} = 30 \text{ V}, I_C = 150 \text{ mA},$ $I_{B1} = I_{B2} = 15 \text{ mA}$			225	ns
Fall time	t_f				60	ns

* Pulse test: pulse width $\leq 300 \text{ } \mu\text{s}$, duty cycle $\leq 2.0\%$.

■ SOT-323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2