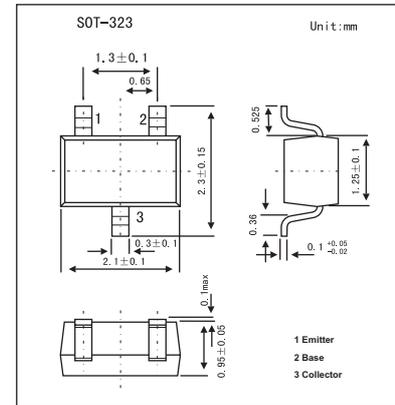
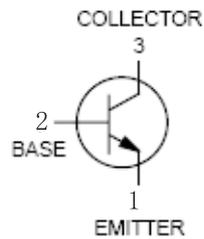


## Switching Transistor

## MMBT4403W

## ■ Features

- Switching transistor.
- PNP Silicon.

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

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	$V_{CE0}$	-40	V
Collector-base voltage	$V_{CB0}$	-40	V
Emitter-base voltage	$V_{EB0}$	-5	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	$^\circ\text{C}$

## MMBT4403W

■ Electrical Characteristics  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Testconditions	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	$V_{(BR)CBO}$	$I_C = -0.1\text{ mA}, I_E = 0$	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -0.1\text{ mA}, I_C = 0$	-5			V
Base cutoff current	$I_{BEV}$	$V_{CE} = -35\text{ V}, V_{EB} = -0.4\text{ V}$			-0.1	$\mu\text{A}$
Collector cutoff current	$I_{CEX}$	$V_{CE} = -35\text{ V}, V_{EB} = -0.4\text{ V}$			-0.1	$\mu\text{A}$
DC current gain	HFE	$I_C = -0.1\text{ mA}, V_{CE} = -1.0\text{ V}$	30			
		$I_C = -1.0\text{ mA}, V_{CE} = -1.0\text{ V}$	60			
		$I_C = -10\text{ mA}, V_{CE} = -1.0\text{ V}$	100			
		$I_C = -150\text{ mA}, V_{CE} = -2.0\text{ V}^*$	100		300	
		$I_C = -500\text{ mA}, V_{CE} = -2.0\text{ V}^*$	20			
Collector-emitter saturation voltage *	$V_{CE(sat)}$	$I_C = -150\text{ mA}, I_B = -15\text{ mA}$			-0.4	V
		$I_C = -500\text{ mA}, I_B = -50\text{ mA}$			-0.75	
Base-emitter saturation voltage *	$V_{BE(sat)}$	$I_C = -150\text{ mA}, I_B = -15\text{ mA}$	-0.75		-0.95	
		$I_C = -500\text{ mA}, I_B = -50\text{ mA}$			-1.3	
Current-gain-bandwidth product	$f_T$	$I_C = -20\text{ mA}, V_{CE} = -10\text{ V}, f = 100\text{ MHz}$	200			MHz
Collector-base capacitance	$C_{cb}$	$V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$			8.5	pF
Emitter-base capacitance	$C_{eb}$	$V_{BE} = -0.5\text{ V}, I_C = 0, f = 1.0\text{ MHz}$			30	pF
Input impedance	$h_{ie}$	$I_C = -1.0\text{ mA}, V_{CE} = -10\text{ V}, f = 1.0\text{ kHz}$	1.5		15	$\text{k}\Omega$
Voltage feedback ratio	$h_{re}$	$I_C = -1.0\text{ mA}, V_{CE} = -10\text{ V}, f = 1.0\text{ kHz}$	0.1		8.0	$\times 10^{-4}$
Small-signal current gain	$h_{fe}$	$I_C = -1.0\text{ mA}, V_{CE} = -10\text{ V}, f = 1.0\text{ kHz}$	60		500	
Output admittance	$h_{oe}$	$I_C = -1.0\text{ mA}, V_{CE} = -10\text{ V}, f = 1.0\text{ kHz}$	1.0		100	$\mu\text{mhos}$
Delay time	$t_d$	$V_{CC} = -30\text{ V}, V_{EB} = -2.0\text{ V},$			15	ns
Rise time	$t_r$	$I_C = -150\text{ mA}, I_{B1} = -15\text{ mA}$			20	ns
Storage time	$t_s$	$V_{CC} = -30\text{ V}, I_C = -150\text{ mA},$			225	ns
Fall time	$t_f$	$I_{B1} = I_{B2} = -15\text{ mA}$			30	ns

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

## ■ Marking

Marking	2T
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