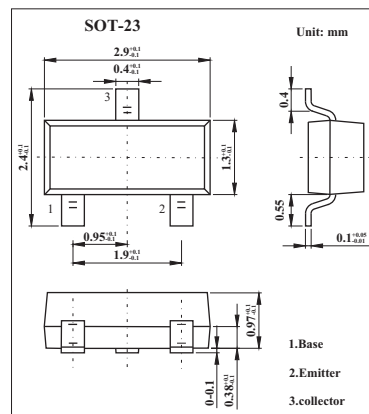


MMBT4403

■ Features

- Ideal for Medium Power Amplification and Switching
- Complementary NPN Type Available (MMBT4401)



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

Parameter	Symbol	Rating	Unit
Collector-base voltage	V_{CB0}	-40	V
Collector-emitter voltage	V_{CEO}	-40	V
Emitter-base voltage	V_{EB0}	-5	V
Collector current	I_C	-600	mA
Total Device Dissipation Alumina Substrate	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

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

Parameter	Symbol	Test conditons	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1.0\text{ mA}, I_B = 0$	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	-5			V
Collector cut-off current	I_{CBO}	$V_{CB} = -35\text{ V}, I_E = 0$			-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -4\text{ V}, I_C = 0$			-0.1	μA
DC current gain *	h_{FE}	$I_C = -0.1\text{ mA}, V_{CE} = -1.0\text{ V}$	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 *	$V_{BE(sat)}$	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$			-0.95	V
		$I_C = 500\text{ mA}, I_B = 50\text{ mA}$			-1.3	
Transition frequency	f_T	$I_C = 20\text{ mA}, V_{CE} = 10\text{ V}, f = 100\text{ MHz}$	200			MHz
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 $\leq 2.0\%$.

MMBT4403

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test conditons	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 100μA, I _E = 0	-40			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 1.0 mA, I _B = 0	-40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = 100μA, I _C = 0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} = -35 V, I _E = 0			-0.1	μA
Emitter cut-off current	I _{EBO}	V _{EB} = -4V, I _C = 0			-0.1	μA
DC current gain *	h _{FE}	I _C = -0.1 mA, V _{CE} = -1.0 V I _C = -1.0 mA, V _{CE} = -1.0 V I _C = -10 mA, V _{CE} = -1.0 V I _C = -150 mA, V _{CE} = -2.0 V I _C = -500 mA, V _{CE} = -2.0 V	30 60 100 100 20		300	
Collector-emitter saturation voltage *	V _{CE(sat)}	I _C = -150 mA, I _B = -15 mA I _C = -500 mA, I _B = -50 mA			-0.4 -0.75	V
Base-emitter saturation voltage *	V _{BE(sat)}	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA			-0.95 -1.3	V
Transition frequency	f _r	I _C = 20 mA, V _{CE} = 10 V, f = 100 MHz	200			MHz
Delay time	t _d	V _{CC} = 30 V, V _{EB} = 2.0 V,			15	ns
Rise time	t _r	I _C = 150 mA, I _{B1} = 15 mA			20	ns
Storage time	t _s	V _{CC} = 30 V, I _C = 150 mA,			225	ns
Fall time	t _f	I _{B1} = I _{B2} = 15 mA			30	ns

* Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

■ Marking

Marking	2T
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