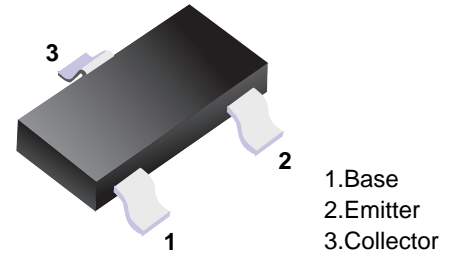


■ NPN Transistors

■ Features

- Ideal for Medium Power Amplification and Switching
- Complementary PNP Type Available (MMBT4403)



■ Simplified outline(SOT-23)

■ Marking

Marking	2X
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■ Absolute Maximum Ratings Ta = 25°C

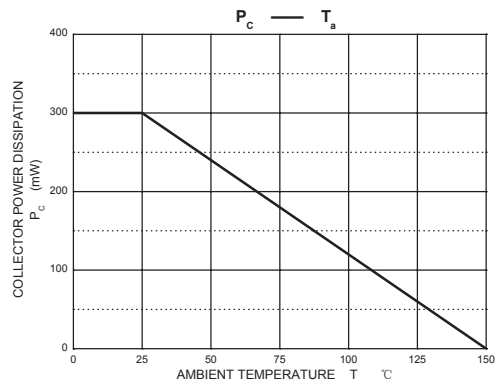
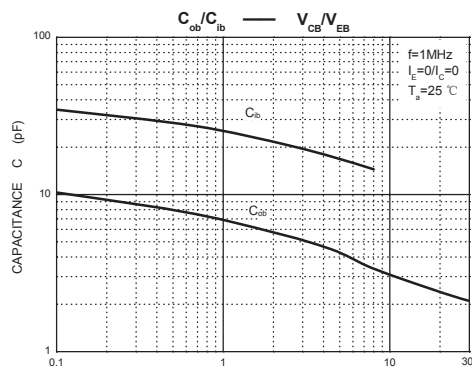
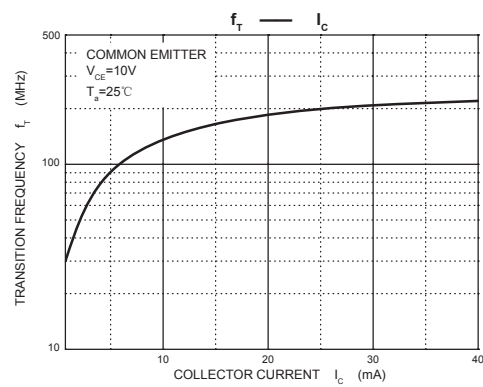
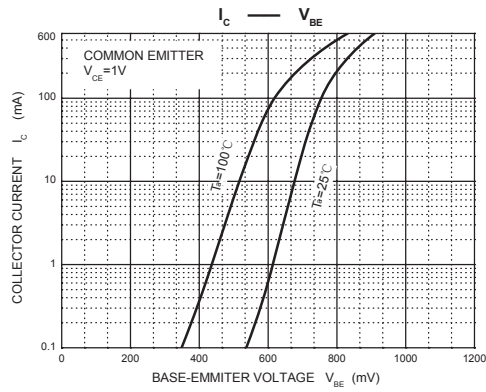
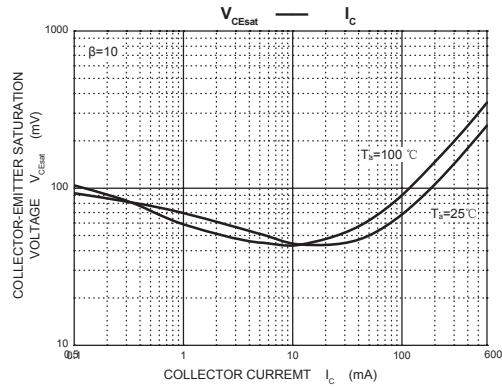
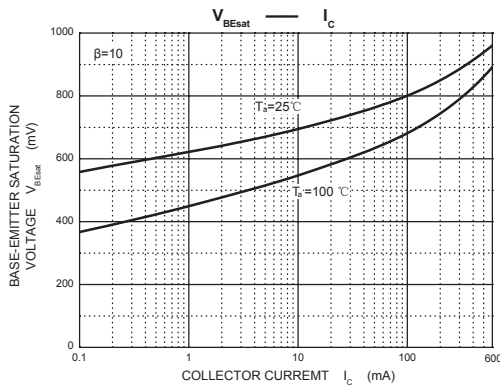
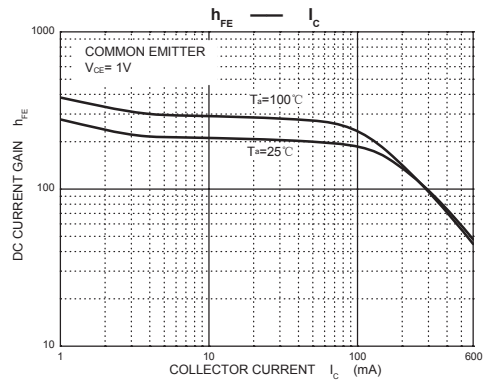
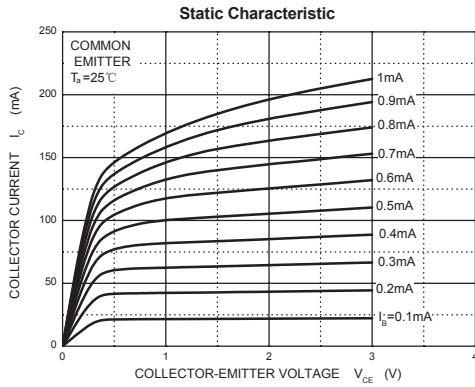
Parameter	Symbol	Rating	Unit
Collector-base voltage	V _{CB0}	60	V
Collector-emitter voltage	V _{CEO}	40	V
Emitter-base voltage	V _{EBO}	6.0	V
Collector current	I _C	600	mA
Total Device Dissipation Alumina Substrate	P _D	300	mW
Thermal Resistance, Junction to Ambient	R _{θJA}	417	°C/W
Junction and Storage Temperature	T _J , T _{stg}	-55 to 150	°C

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 100μA, I _E = 0	60			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	6.0			V
Collector cut-off current	I _{CBO}	V _{CB} = 50 V, I _E = 0			0.1	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 5V, I _C = 0			0.1	μA
DC current gain *	h _{FE}	I _C = 0.1 mA, V _{CE} = 1.0 V	20			
		I _C = 1.0 mA, V _{CE} = 1.0 V	40			
		I _C = 10 mA, V _{CE} = 1.0 V	80			
		I _C = 150 mA, V _{CE} = 1.0 V	100		300	
		I _C = 500 mA, V _{CE} = 2.0 V	40			
Collector-emitter saturation voltage *	V _{CE(sat)}	I _C = 150 mA, I _B = 15 mA			0.4	V
		I _C = 500 mA, I _B = 50 mA			0.75	
Base-emitter saturation voltage *	V _{BE(sat)}	I _C = 150 mA, I _B = 15 mA	0.75		0.95	V
		I _C = 500 mA, I _B = 50 mA			1.2	
Transition frequency	f _T	I _C = 20 mA, V _{CE} = 10 V, f = 100 MHz	250			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	
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	

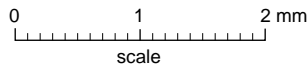
* Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

■ Typical Characteristics



Package Outline

SOT-23



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 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-23	Tape/Reel, 7" reel	3000	EIA-481-1