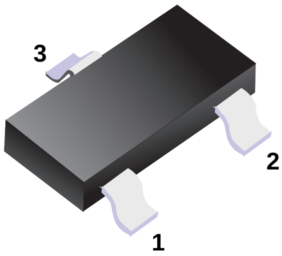
■ PNP Transistors

■ Features

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



1.Base
2.Emitter
3.Collector

■ Simplified outline(SOT-23)

■ Marking

Marking	2T

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-40	V
Collector-emitter voltage	V_{CEO}	-40	V
Emitter-base voltage	V_{EBO}	-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	℃/W
Junction and Storage Temperature	T_J, T_{stg}	-55 to150	℃

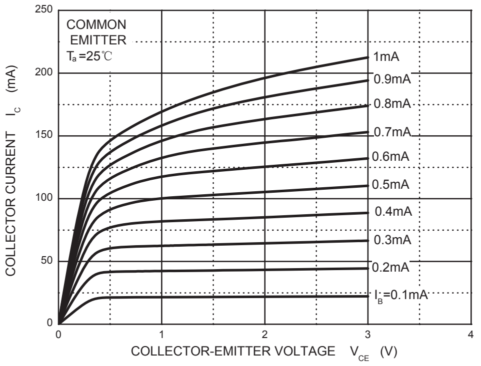
■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test conditions	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	30			
		I_C = -1.0 mA, V_{CE} = -1.0 V	60			
		I_C = -10 mA, V_{CE} = -1.0 V	100			
		I_C = -150 mA, V_{CE} = -2.0 V	100		300	
		I_C = -500 mA, V_{CE} = -2.0 V	20			
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			-1.3	
Transition frequency	f_T	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

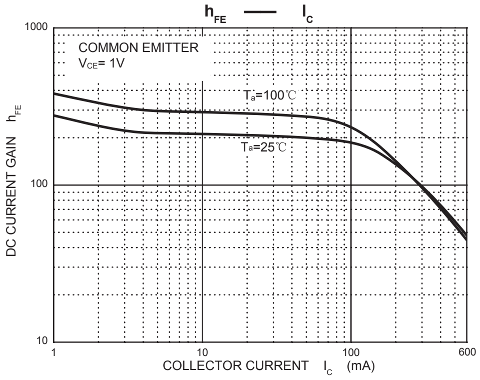
* Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

■ Typical Characterisitics

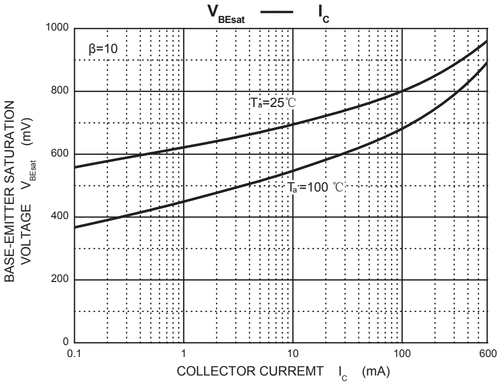
Static Characteristic



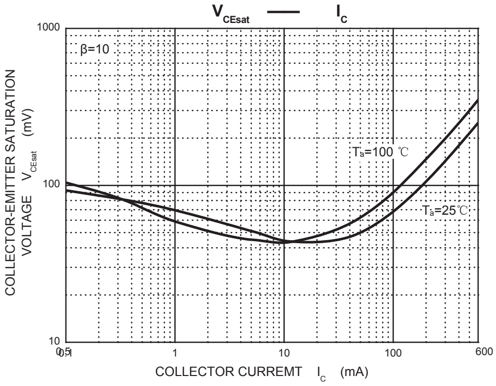
hFE — IC



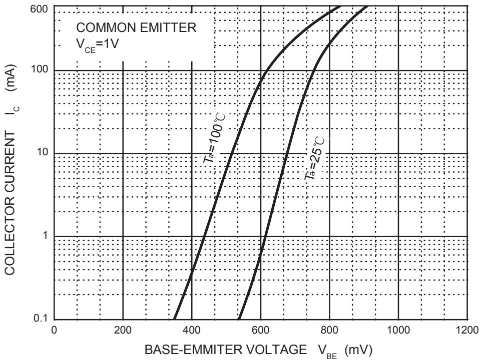
VBEsat — IC



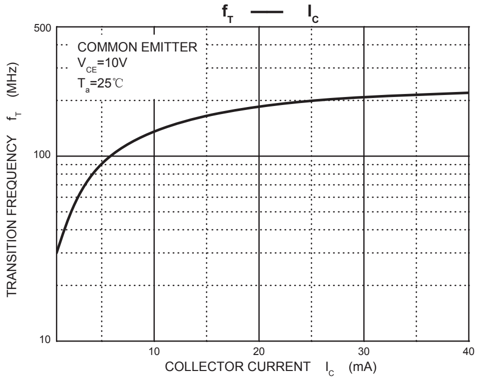
VCEsat — IC



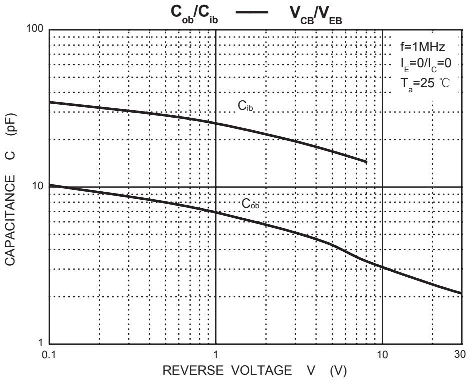
IC — VBE



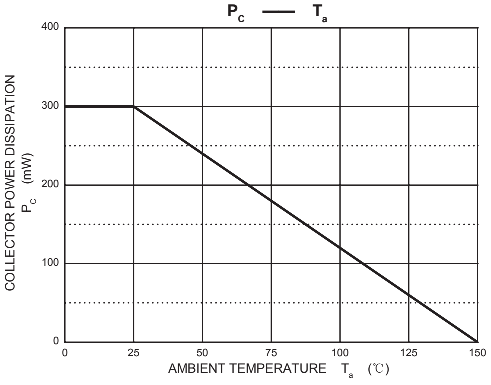
fT — IC



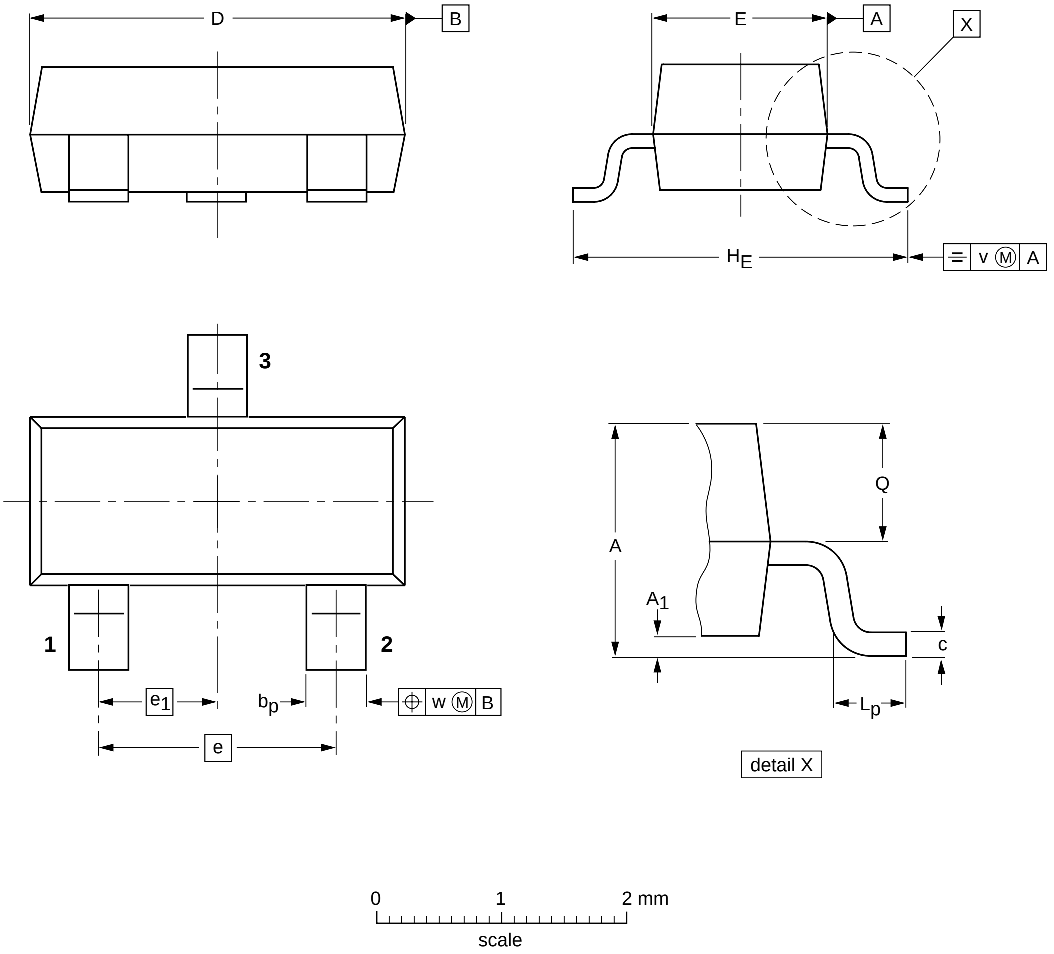
Cob/Cib — VCB/VEB



PC — Ta



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