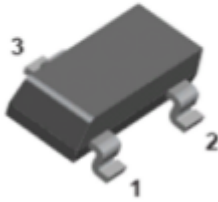
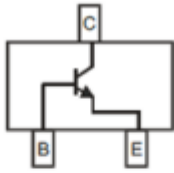


NPN General Purpose Amplifier



SOT-23

Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic insertion

Application

- Signal amplification
- Switching circuit

Mechanical data

- **Package:** SOT-23
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102

■ Maximum Ratings (T_a=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Device marking code				2X
Collector-base voltage	V _{CB0}	V	I _C =10mA, I _E =0	60
Collector-emitter voltage	V _{CE0}	V	I _C = 1mA, I _B =0	40
Emitter-base voltage	V _{EB0}	V	I _E =100μA, I _C =0	6
Collector current	I _C	mA		600
Power dissipation	P _D	mW		300
Junction temperature	T _J	°C		-55 to +150
Storage temperature	T _{STG}	°C		-55 to +150



MMBT4401

■ Electrical Characteristics (T_a=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V _{(BR)CBO}	V	I _C =10mA, I _E =0	60		
Collector-emitter breakdown voltage	V _{(BR)CEO}	V	I _C = 1mA, I _B =0	40		
Emitter-base breakdown voltage	V _{(BR)EBO}	V	I _E =100μA, I _C =0	6		
Collector-base cut-off current	I _{CBO}	nA	V _{CB} =60V			100
Collector-emitter cut-off current	I _{CEO}	nA	V _{CE} =35V			100
Emitter-base cut-off current	I _{EBO}	nA	V _{EB} =3V			100
DC current gain	h _{FE}		V _{CE} =1V, I _C =150mA	100		300
Collector-emitter saturation voltage	V _{CE(sat)}	V	I _C =150mA, I _B =15mA			0.4
Base-emitter saturation voltage	V _{BE(sat)}	V	I _C =150mA, I _B =15mA			0.95
Transition frequency	f _T	MHz	V _{CE} =10V, I _C =20mA, f=100MHz	250		
Delay time	t _d	ns	V _{CC} =30V, I _C =150mA, V _{BE} =0.2V, I _{B1} =15mA			15
Rise time	t _r	ns				20
Storage time	t _s	ns	V _{CC} =30V, I _C =150mA, I _{B1} =-I _{B2} =15mA			225
Fall time	t _f	ns				60

■ Thermal Characteristics

Parameter	Symbol	Unit	Value
Thermal resistance, junction-to-ambient	R _{θJ-A} ⁽¹⁾	°C/W	417
Thermal resistance, junction-to-case	R _{θJ-C} ⁽¹⁾	°C/W	334

Note:

(1) Device mounted on PCB, single-sided copper, with standard footprint



MMBT4401

Characteristics

Fig 1: Static Characteristics

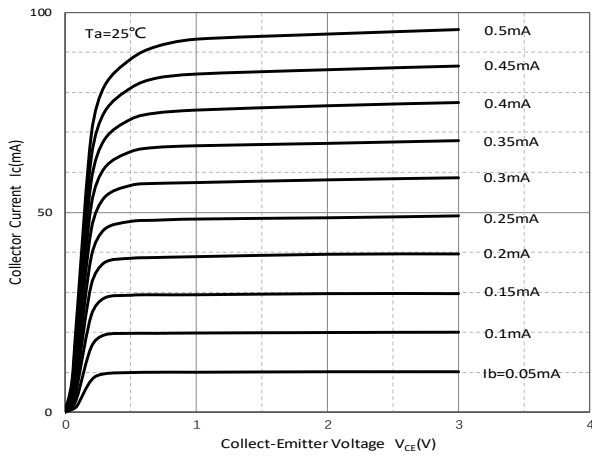


Fig 2: DC Current Gain

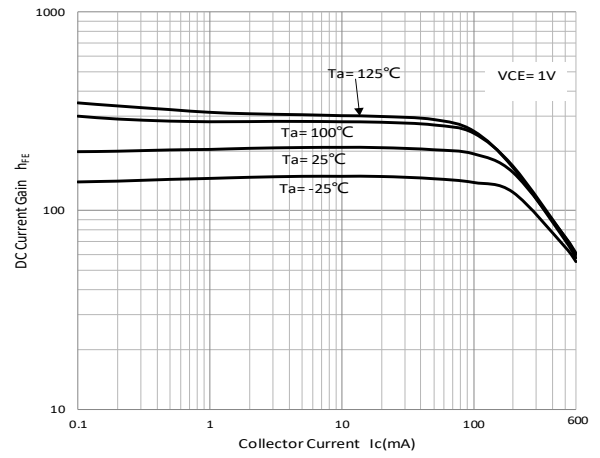


Fig 3: Collector-Emitter Saturation Voltage

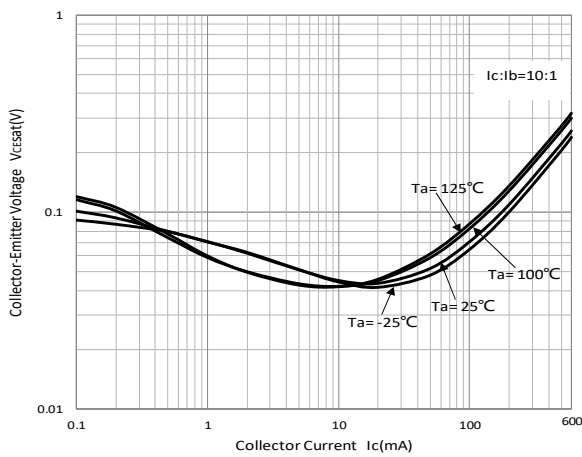


Fig 4: Base-Emitter Saturation Voltage

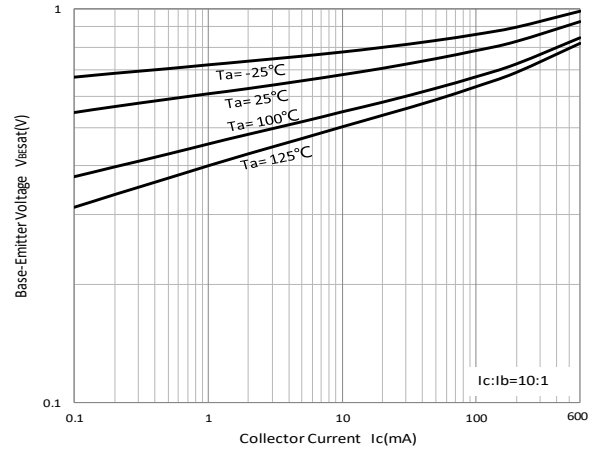


Fig 5: Base-Emitter On Voltage

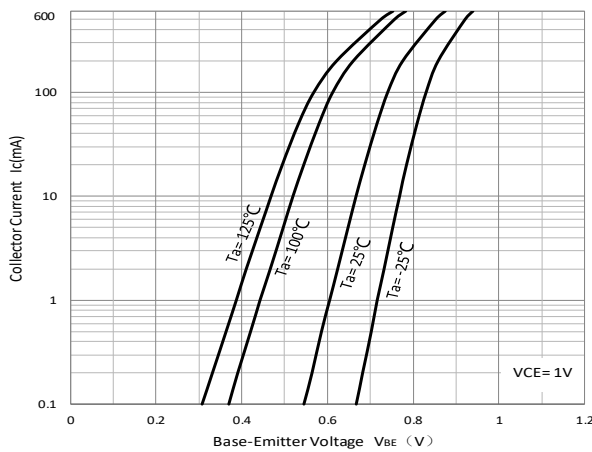


Fig 6: Cob/Cib-VCB/VEB

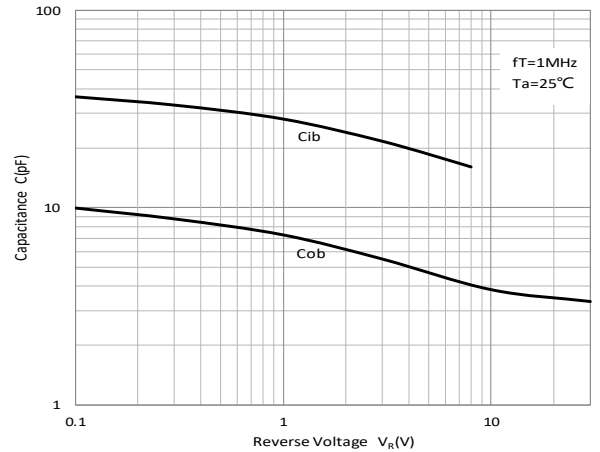
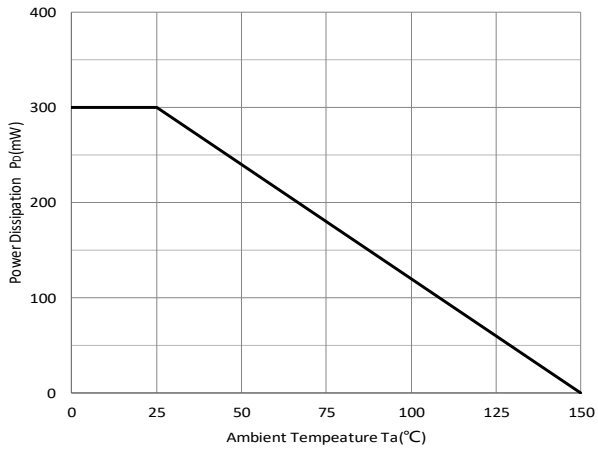




Fig 7: P_D-T_a Curve



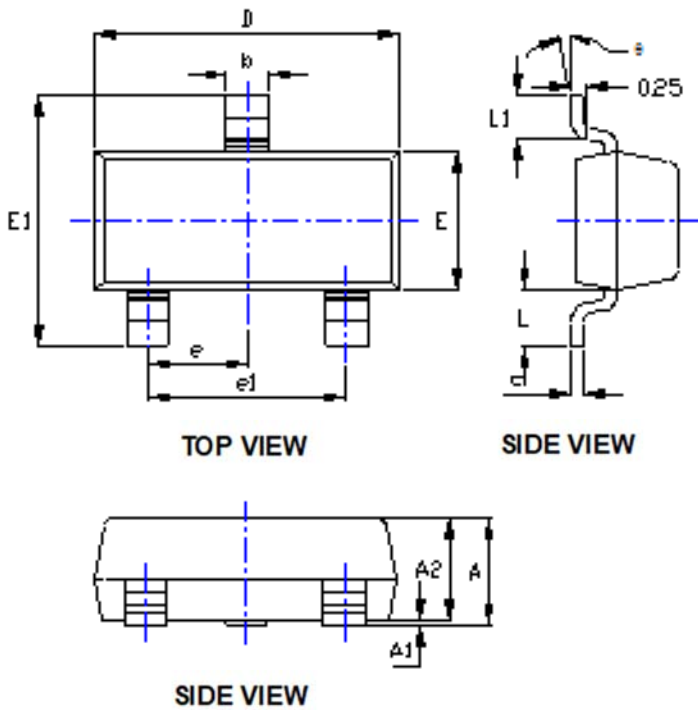


MMBT4401

■ Ordering Information

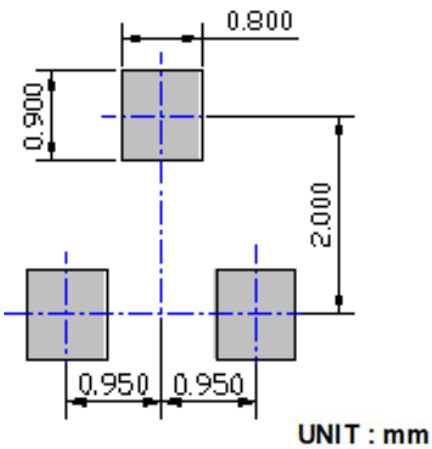
Preferred P/N	Packing code	Unit weight(g)	Minimum package(pcs)	Inner box quantity(pcs)	Outer carton quantity(pcs)	Delivery mode
MMBT4401	F2	Approximate 0.008	3000	30000	120000	7" reel
MMBT4401	F4	Approximate 0.008	10000	/	210000	13" reel

■ Outline Dimensions



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	0.500
θ	0°	8°	0°	8°

■ Suggested Pad Layout





MMBT4401

Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function, or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com) , or consult your nearest Yangjie's sales office for further assistance.