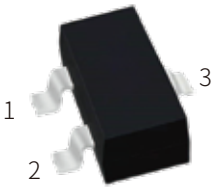
MMBT4403

Plastic-Encapsulate Transistor (PNP)

FEATURES

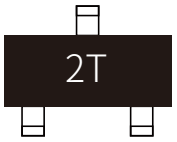
- Power Dissipation of 300mW
- High Stability and High Reliability



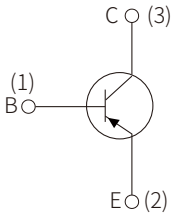
SOT-23

MECHANICAL DATA

- SOT-23 small outline plastic package
- Epoxy UL: 94V-0
- Mounting position: Any



Marking



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

MAXIMUM RATINGS (T_A=25°C)

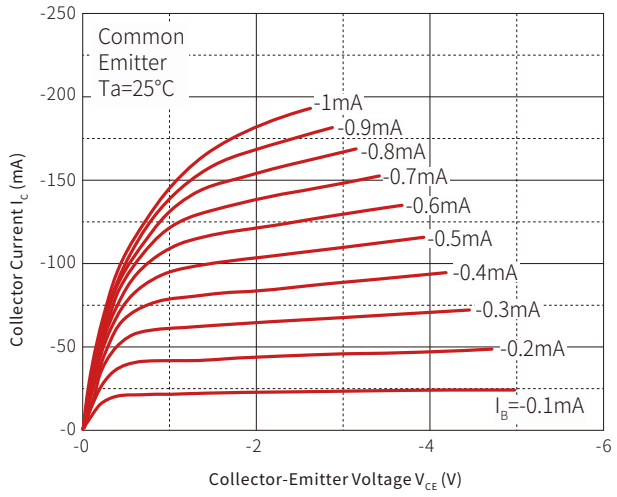
Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	
Emitter-Base Voltage	V_{EBO}	-5	
Collector Current	I_C	-600	mA
Collector Power Dissipation	P_C	300	mW
Thermal Resistance From Junction To Ambient	$R_{\theta JA}$	417	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

ELECTRICAL CHARACTERISTICS (T_A=25°C)

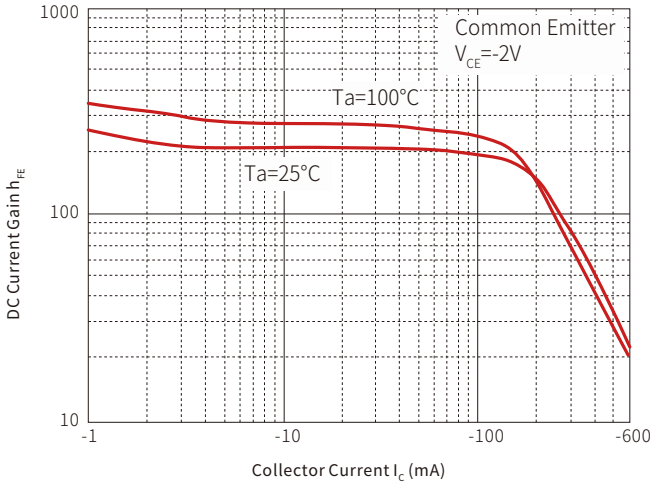
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-100uA,I_E=0	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=-1mA,I_B=0	-40			
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-100uA,I_C=0	-5			
Collector cut-off current	I_{CEX}	V_{CE}= -35V, $V_{EB(off)}$=-0.4V			-100	nA
Collector cut-off current	I_{CBO}	V_{CB}= -35V, I_E=0			-100	
Emitter cut-off current	I_{EBO}	V_{EB}=-4V, I_C=0			-100	
DC current gain	$h_{FE(1)}$	V_{CE}=-1V, I_C=-0.1mA	30			
	$h_{FE(2)}$	V_{CE}=-1V, I_C=-1mA	60			
	$h_{FE(3)}$	V_{CE}=-1V, I_C=-10mA	100			
	$h_{FE(4)}$	V_{CE}=-2V, I_C=-150mA	100		300	
	$h_{FE(5)}$	V_{CE}=-2V, I_C=-500mA	20			
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-150mA, I_B=-15mA			-0.40	V
	$V_{CE(sat)}$	I_C=-500mA, I_B=-50mA			-0.75	
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=-150mA, I_B=-15mA			-0.95	
	$V_{BE(sat)}$	I_C=-500mA, I_B=-50mA			-1.30	
Transition frequency	f_T	V_{CE}=-10V,I_C=-20mA, f=100MHz	200			MHz
Delay time	td	V_{CC}=-30V, $V_{BE(off)}$=-0.5V I_C=-150mA, , I_{B1}=-15mA			15	nS
Rise time	tr				20	
Storage time	ts	V_{CC}=-30V, I_C=-150mA, I_{B1}=I_{B2}=-15mA			225	
Fall time	tf				60	

TYPICAL CHARACTERISTICS

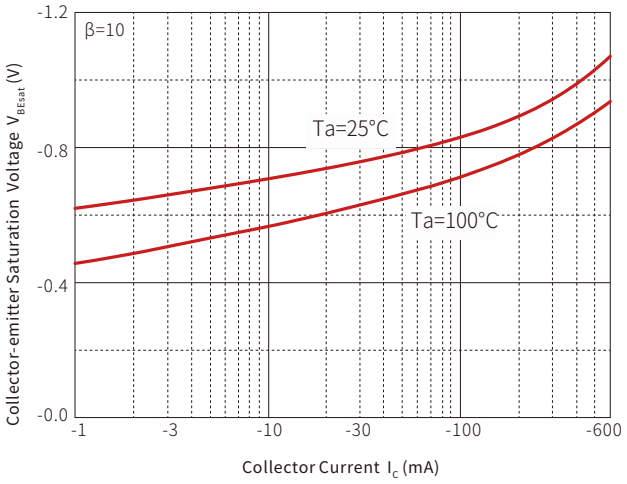
Static Characteristic



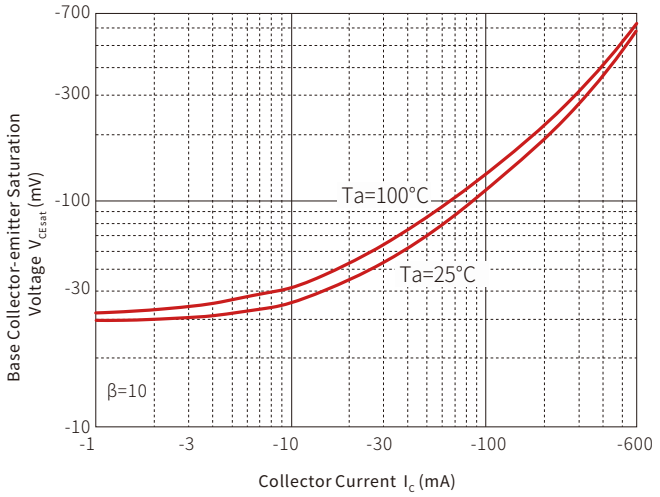
h_{FE} ——— I_C



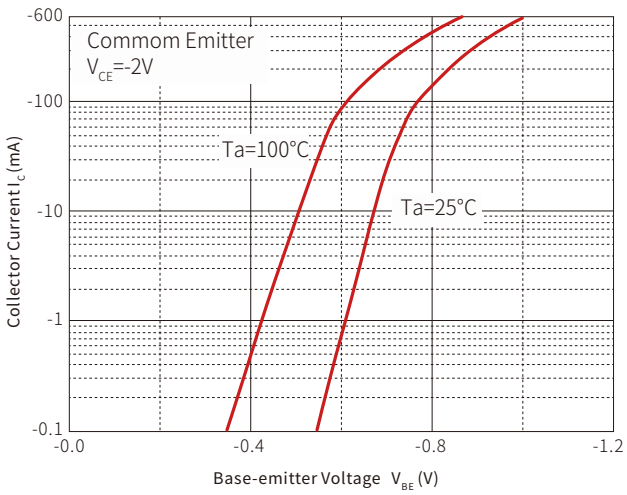
$V_{BE\ sat}$ ——— I_C



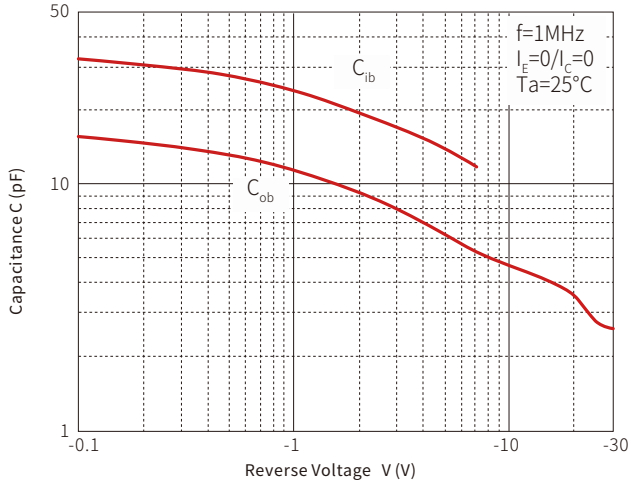
$V_{CE\ sat}$ ——— I_C



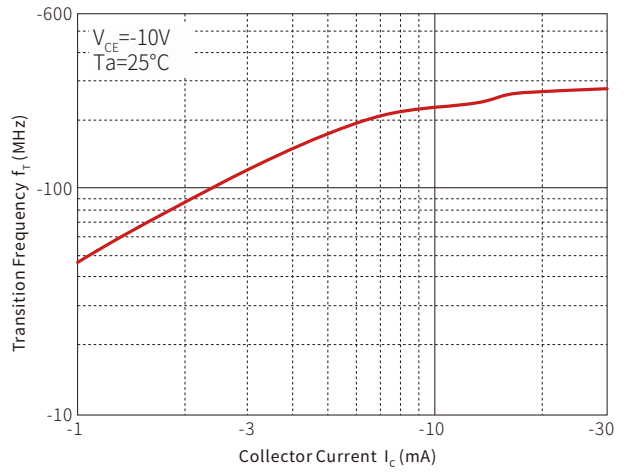
I_C ——— V_{BE}



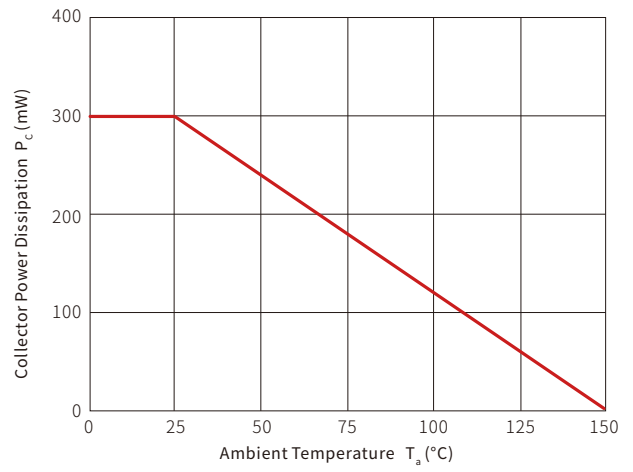
C_{ob}/C_{ib} ——— V_{CB}/V_{EB}



f_T ——— I_C

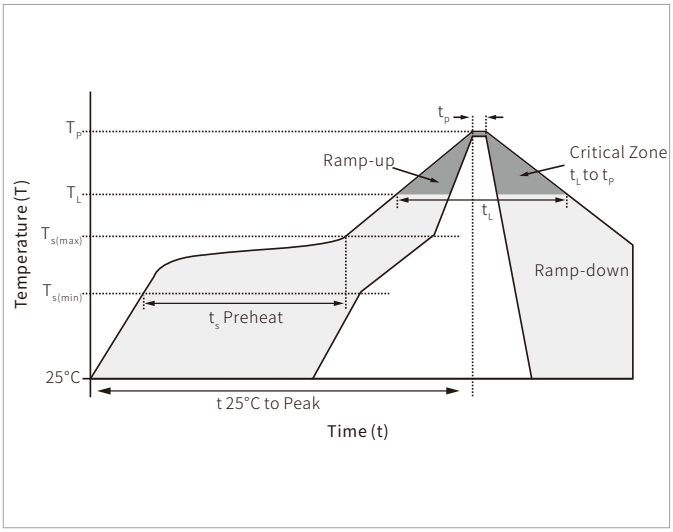


P_C ——— T_a

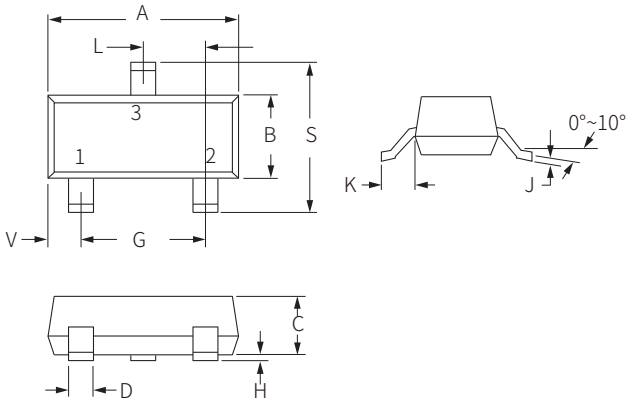


SOLDERING PARAMETERS

Reflow Condition		Lead–free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C

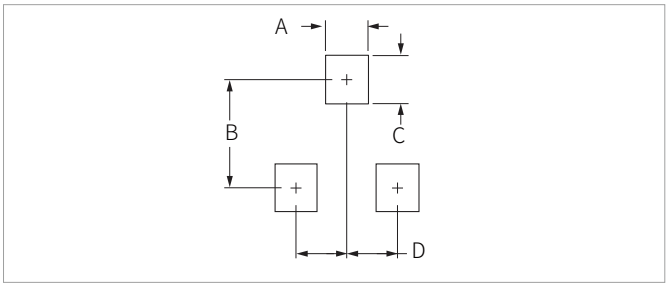


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.65	0.083	0.104
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
MMBT4403	SOT-23	3000PCS	7”

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