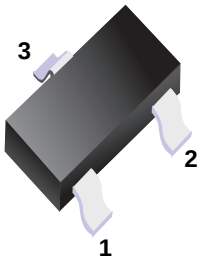
MMST3904

NPN Transistor



1.Base
2.Emitter
3.Collector

■ Simplified outline(SOT-323)

■ Features

- Collector Current Capability I_C=0.2A
- Collector Emitter Voltage V_{CEO}=40V

■ Marking

Marking	K2N

■ Absolute Maximum Ratings Ta = 25℃

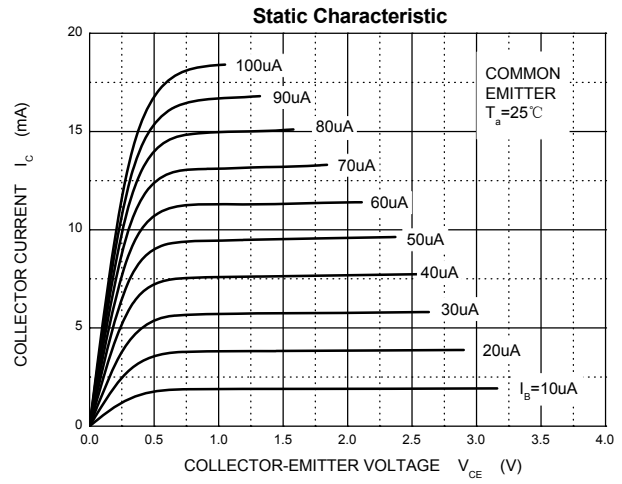
Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	60	V
Collector - Emitter Voltage	V_{CEO}	40	
Emitter - Base Voltage	V_{EBO}	5	
Collector Current - Continuous	I_C	200	mA
Collector Power Dissipation	P_C	200	mW
Thermal Resistance From Junction To Ambient	$R_{\Theta JA}$	625	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

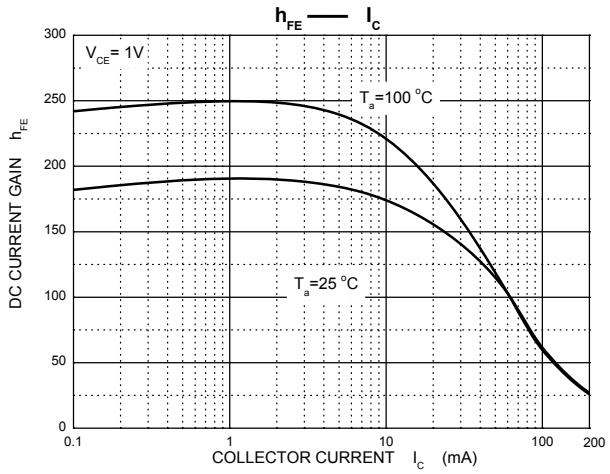
■ Electrical Characteristics Ta = 25℃

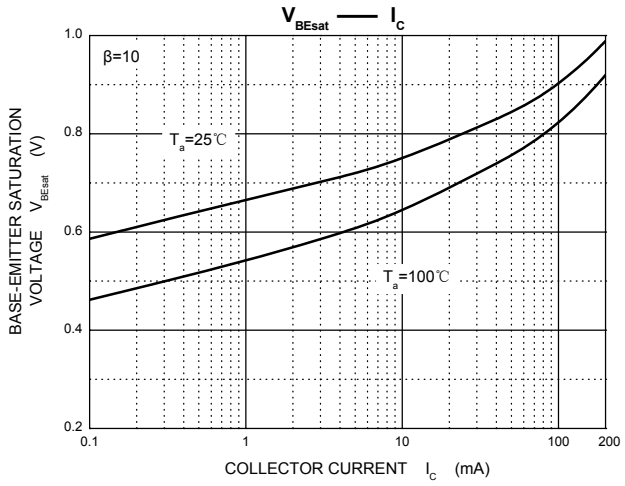
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 μA， I_E= 0 (Note.1)	60			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA， I_B= 0 (Note.1)	40			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100μA， I_C= 0 (Note.1)	5			
Collector-base cut-off current	I_{CBO}	V_{CB}= 60 V , I_E= 0 (Note.1)			60	nA
Collector- emitter cut-off current	I_{CEO}	V_{CE}= 40 V , I_E= 0 (Note.1)			700	
Collector- emitter cut-off current	I_{CEX}	V_{CE}= 30 V ,$V_{BE(off)}$= 3V			50	
Emitter cut-off current	I_{EBO}	V_{EB}= 5V , I_C=0			100	
Collector-emitter saturation voltage (Note.1)	$V_{CE(sat)}$	I_C=10 mA, I_B=1 mA			0.25	V
		I_C=50 mA, I_B=5 mA			0.3	
Base - emitter saturation voltage (Note.1)	$V_{BE(sat)}$	I_C=10 mA, I_B=1 mA			0.85	
		I_C=50 mA, I_B=5 mA			0.95	
DC current gain (Note.1)	$h_{FE(1)}$	V_{CE}= 1V, I_C= 100 uA	40			
	$h_{FE(2)}$	V_{CE}= 1V, I_C= 1 mA	70			
	$h_{FE(3)}$	V_{CE}= 1V, I_C= 10 mA	100		300	
	$h_{FE(4)}$	V_{CE}= 1V, I_C= 50 mA	60			
Delay time	t_d	V_{CC}=3V, $V_{BE(off)}$=0.5V I_C=10mA, I_{B1}=1mA			35	nS
Rise time	t_r				35	
Storage time	t_s	V_{CC}=3V, I_C=10mA, I_{B1}= I_{B2}=1mA			225	
Fall time	t_f				75	
Collector input capacitance	C_{ib}	V_{EB}= 0.5V, I_E= 0,f=1MHz			8	pF
Collector output capacitance	C_{ob}	V_{CB}= 5V, I_E= 0,f=1MHz			4	
Transition frequency	f_T	V_{CE}= 20V, I_C= 10mA,f=100MHz	300			MHz

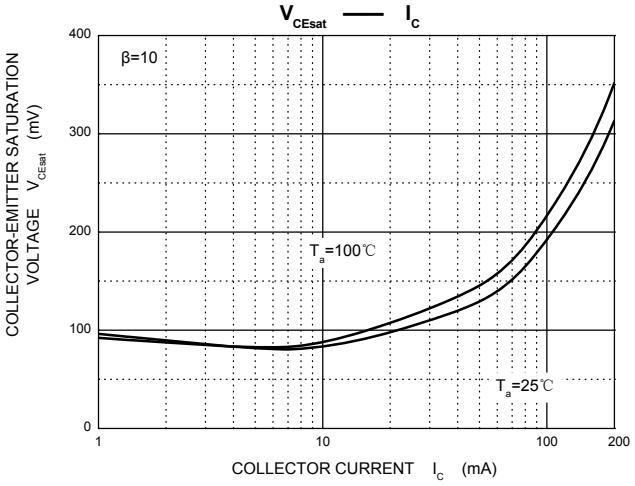
Note.1: Pulse test: pulse width ≤300μs,duty cycle≤ 2.0%.

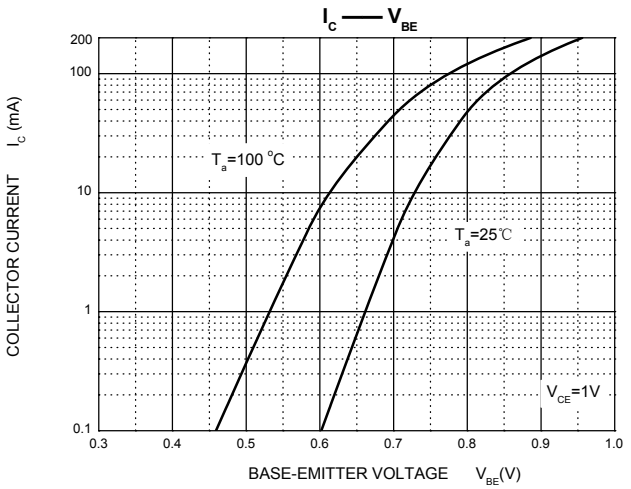
■ Typical Characterisitics

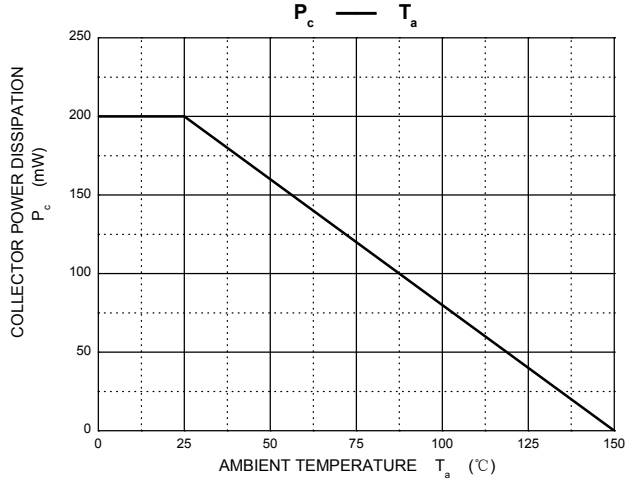




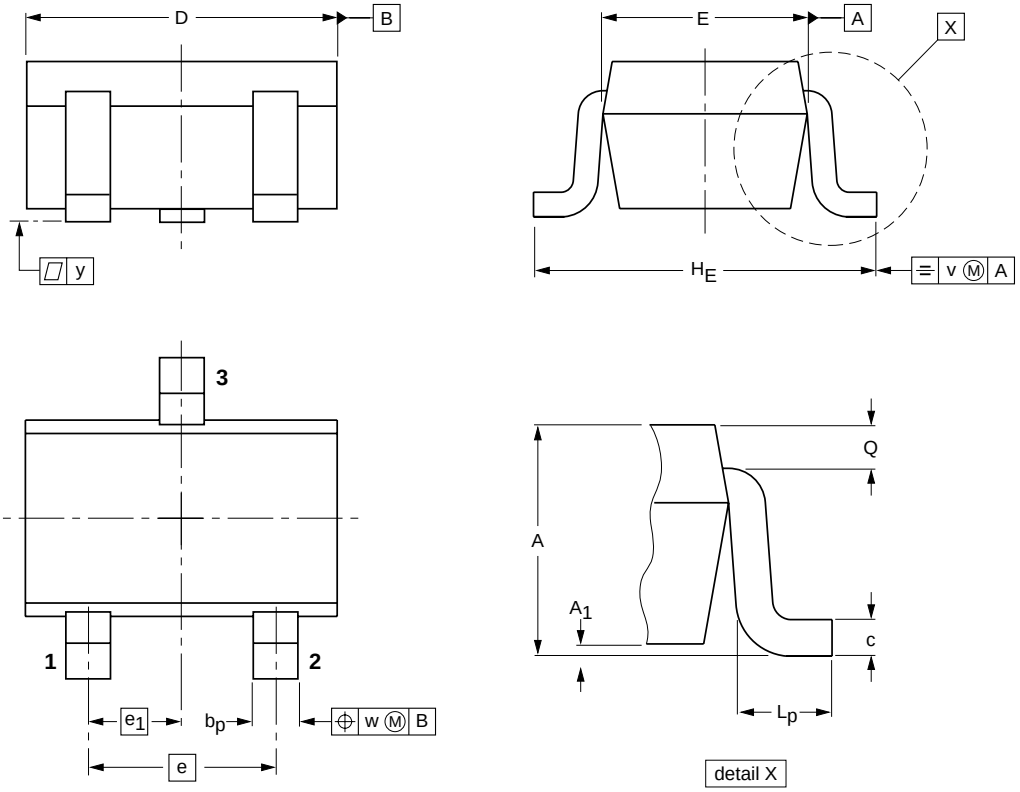








■ SOT-323



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 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2