BORN SEMICONDUCTOR

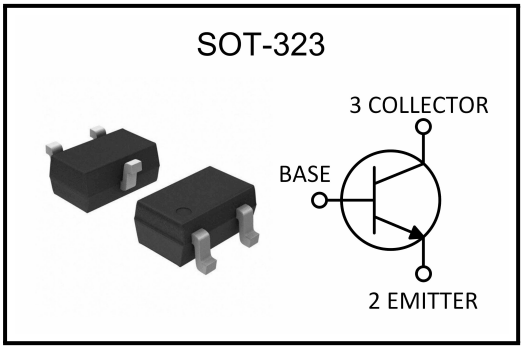
MMST3904

NPN Plastic-Encapsulate Transistor

Features

- V_{CE}=40V
- I_C=0.2A
- f_T=300MHZ @V_{CE}=20V, I_C=10mA,f=100MHz

Package



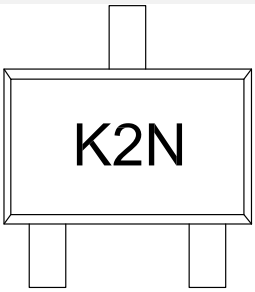
Description

- As complementary type the PNP transistor MMST3906 is recommended
- High Stability and High Reliability
- SOT-323 Plastic Package.

Applying

- Amplifiers and switching

Marking



Ordering information

Order code	PacAMkage	Marking	Base qty	Delivery mode
MMST3904	SOT-323	K2N	3K	Tape and reel

Absolute Maximum Ratings @T_A=25°C unless otherwise noted

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	0.2	A
P_C	Collector Power Dissipation	225	mW
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55 to + 150	°C

BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

Specifications are subject to change without notice.
Please refer to http://*www.born-tw.com* for current information.

Revision: 2022-Jan-1-A

MMST3904

NPN Plastic-Encapsulate Transistor

Electrical Characteristics (T_A=+25°C, unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	I_C=100μA, I_E=0	60	–	–	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C=1mA,I_B=0	40	–	–	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_E=100μA,I_C=0	6	–	–	
I_{CBO}	Collector cut-off current	V_{CB}=30V,I_E=0	–	–	0.1	μA
I_{EBO}	Emitter cut-off current	V_{EB}=5V, I_C=0	–	–	0.1	
$h_{FE(1)}$	DC current gain	V_{CE}=1V,I_C=0.1mA	40	–	–	
$h_{FE(2)}$		V_{CE}=1V,I_C=10mA	100	–	300	
$h_{FE(3)}$		V_{CE}=1V,I_C=100mA	30	–	–	
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C=10mA,I_B=1mA	–	–	0.2	V
		I_C=50mA,I_B=5mA	–	–	0.285	
$V_{BE(sat)}$	Base-emitter saturation voltage	I_C=10mA,I_B=1mA	–	–	0.85	
		I_C=50mA,I_B=5mA	–	–	0.95	
$V_{BE(on)}$	Base-Emitter on Voltage	V_{CE}=1V,I_C=10mA	–	–	1.00	
C_c	Collector Capacitance	V_{CB}=5V,I_E=0mA , f=100KHZ∼1MHZ	–	–	5	PF
C_e	Emitter Capacitance	V_{EB}=0.5V,I_C=0mA , f=100KHZ∼1MHZ	–	–	15	PF
f_T	Transition frequency	V_{CE}=20V,I_C=10mA ,f=100MHZ	300	–	–	MHZ
F	Noise figure	V_{CE}=5V,I_C=-100μA , R_S=1KΩ,f=10HZ∼15.7KHZ	–	5	–	dB
t_{on}	Turn-ontime	$I_{C(on)}$=10mA, $I_{B(on)}$=1mA, $I_{B(off)}$=-1mA, V_{CC}=3V, V_{BE}=0.5V	–	–	65	nS
t_d	Delay time		–	–	35	
t_r	Rise time		–	–	35	
t_f	Fall time		–	–	50	
t_{off}	Turn-off time		–	–	240	
t_s	Storage time		–	–	200	
$h_{FE(2)}$ Rank	A(100-300)	L(140-270)				

Note:Pulse test: pulse width≤300us, duty cycle≤2.0%

BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

MMST3904

NPN Plastic-Encapsulate Transistor

Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 :I_C—— V_{CE}

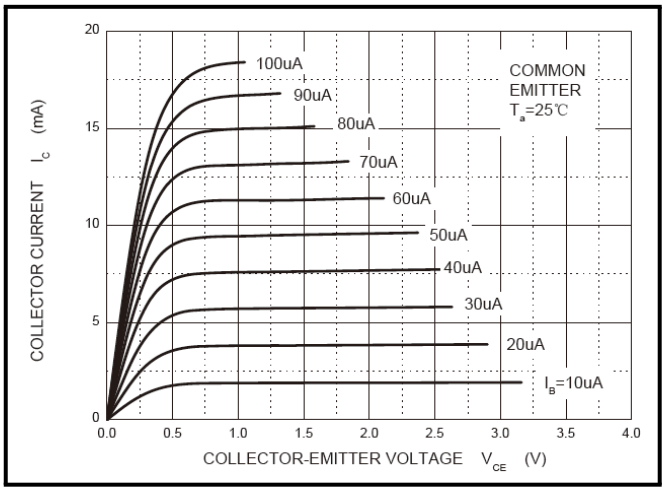


Figure 2 :$V_{BE(sat)}$ ——I_C

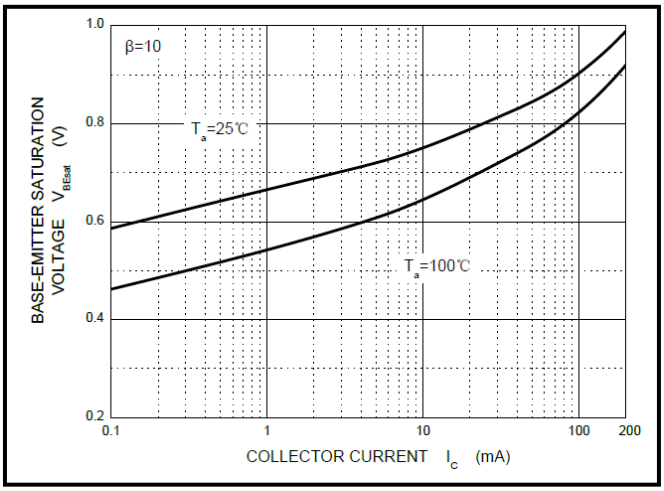


Figure 3 : $V_{CE(sat)}$—— I_C

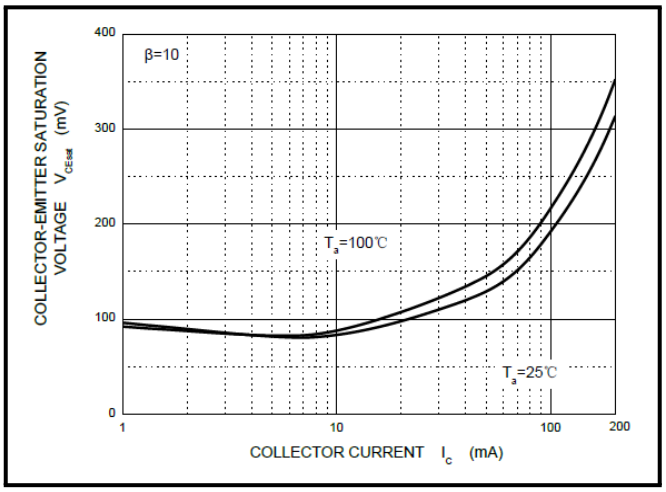


Figure 4 :H_{FE}——I_C

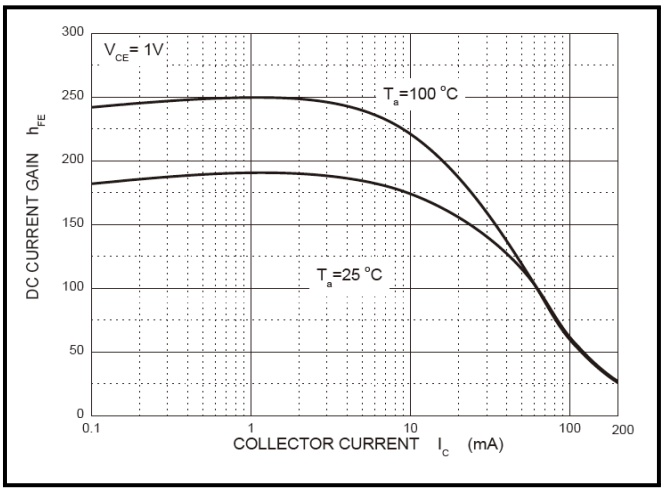


Figure 5 : I_C——V_{BE}

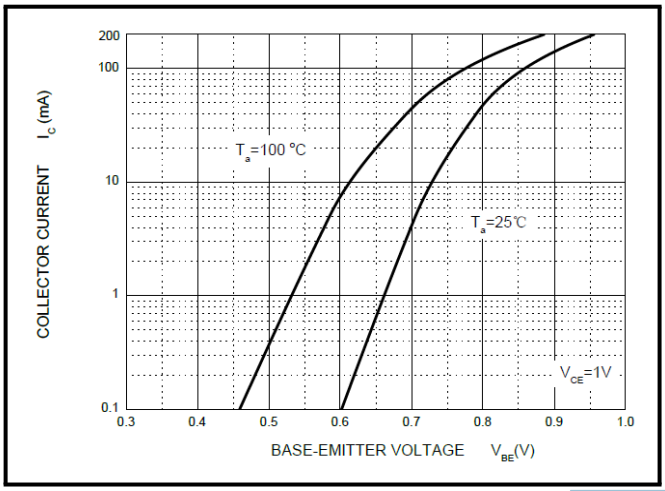
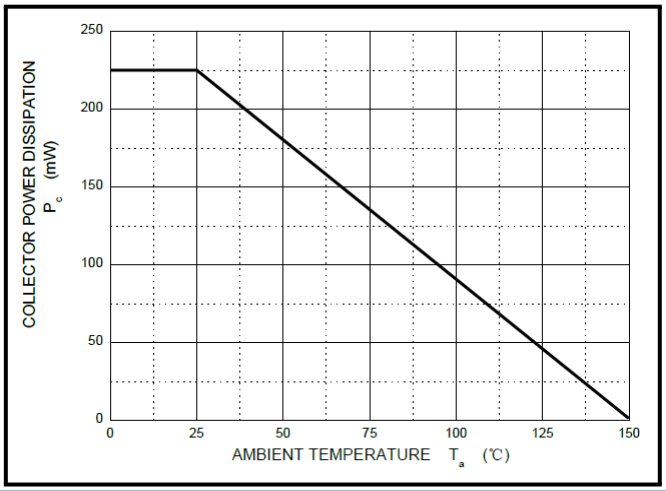


Figure 6 : P_C——T_a

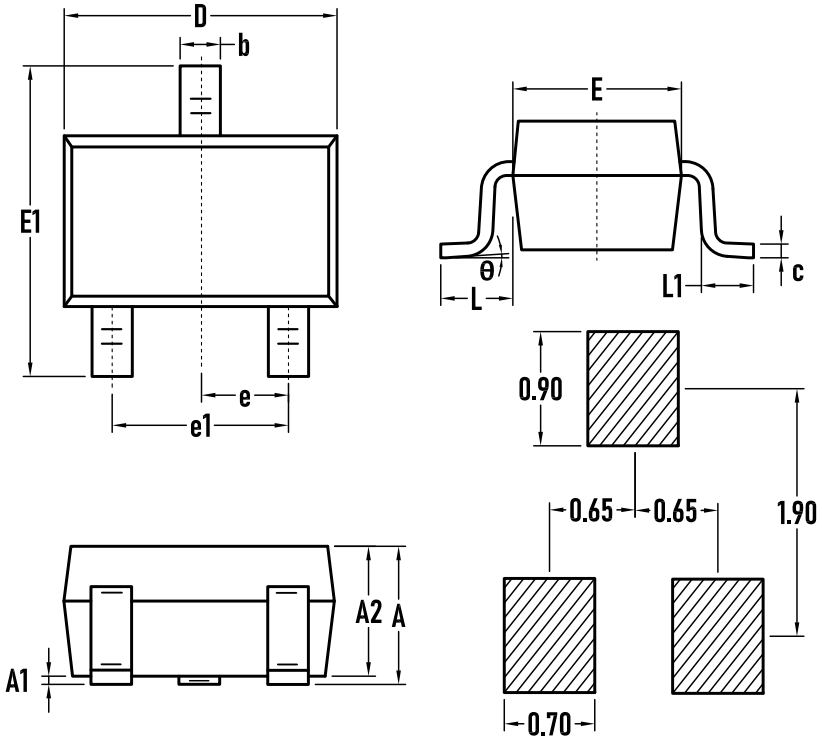


BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

MMST3904

NPN Plastic-Encapsulate Transistor

Outline Drawing - SOT-323



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.30	0.40
c	0.08	0.12	0.15
D	2.00	2.10	2.20
E1	2.15	2.30	2.45
E	1.15	1.25	1.35
e	0.650Typ.		
e1	1.20	1.30	1.40
L	0.26	0.36	0.46
θ	0	4°	8°

BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

Specifications are subject to change without notice.
Please refer to http://*www.born-tw.com* for current information.