BORN SEMICONDUCTOR

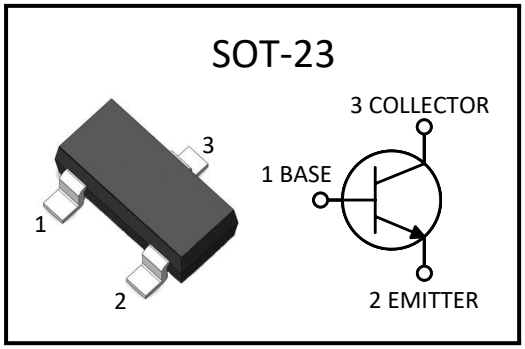
S9013

NPN Plastic-Encapsulate Transistor

Features

- V_{CE}=25V
- I_C=0.5A
- f_T=150MHZ @V_{CE}=6V, I_C=20mA,f=30MHz

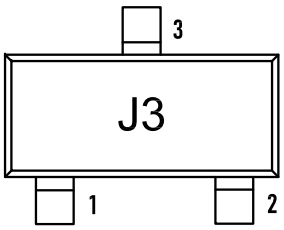
Package



Description

- Complementary to S9012
- High Stability and High Reliability
- SOT-23 Plastic Package.

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
S9013	SOT-23	J3	3K	Tape and reel

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	40	V
V_{CEO}	Collector-Emitter Voltage	25	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current	0.5	A
P_C	Collector Power Dissipation	300	mW
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55 to + 150	°C
$R_{\theta JA}$	Thermal resistance From junction to ambient	416	°C/W

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

S9013

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	40	–	–	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C=1mA,I_B=0	25	–	–	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_E=100μA,I_C=0	5	–	–	
I_{CEO}	Collector cut-off current	V_{CE}= 20V,I_B=0	–	–	0.1	uA
I_{CBO}	Collector cut-off current	V_{CB}=40V,I_E=0	–	–	0.1	
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=50mA	120	–	400	
$h_{FE(2)}$	DC current gain	V_{CE}=1V,I_C=500mA	40	–	–	
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C=500mA,I_B=50mA	–	–	0.6	V
$V_{BE(sat)}$	Base-emitter saturation voltage	I_C=500mA,I_B=50mA	–	–	1.2	
V_{BE}	Base-emitter voltage	V_{CB}=1V,I_C=10mA	–	–	0.7	
f_T	Transition frequency	V_{CE}=6V,I_C=20mA,f=30MHZ	150	–	–	MHZ
C_{ob}	Collector output capacitance	V_{CB}=6V,I_E=0V,f=1MHZ	–	–	8	PF
$h_{FE(1)}$Rank	L(120-200)	H(200-350)	J(300-400)			

BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

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

S9013

NPN Plastic-Encapsulate Transistor

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

Figure 1 : I_C—— V_{CE}

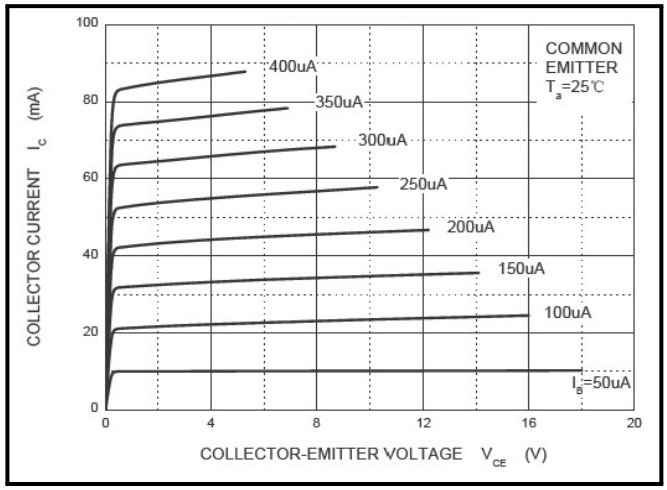


Figure 2 :h_{FE}——I_C

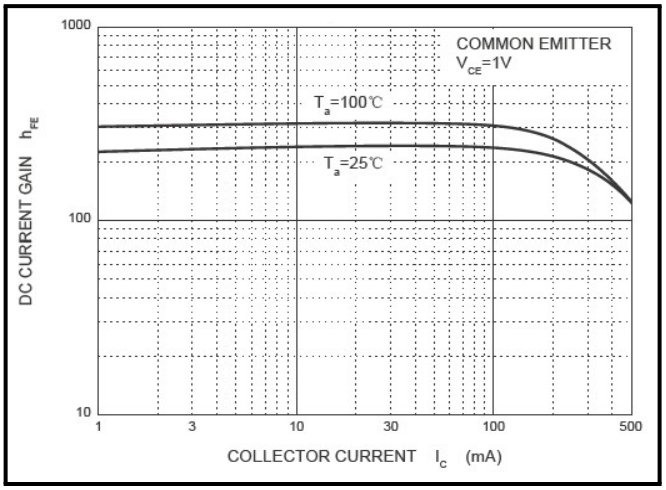


Figure 3 : $V_{BE(sat)}$—— I_C

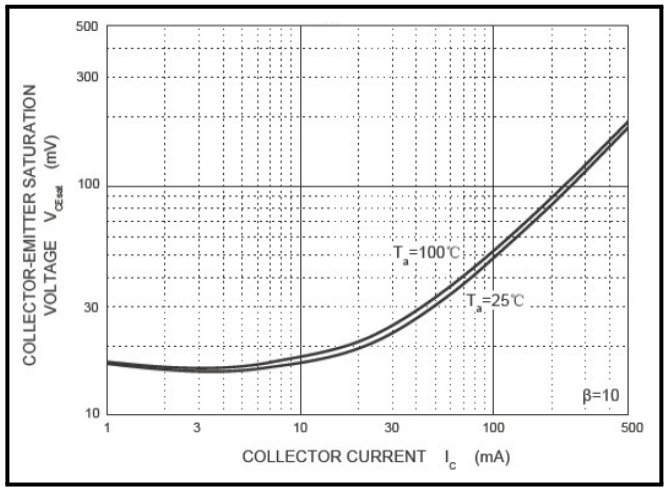


Figure 4 : $V_{CE(sat)}$——I_C

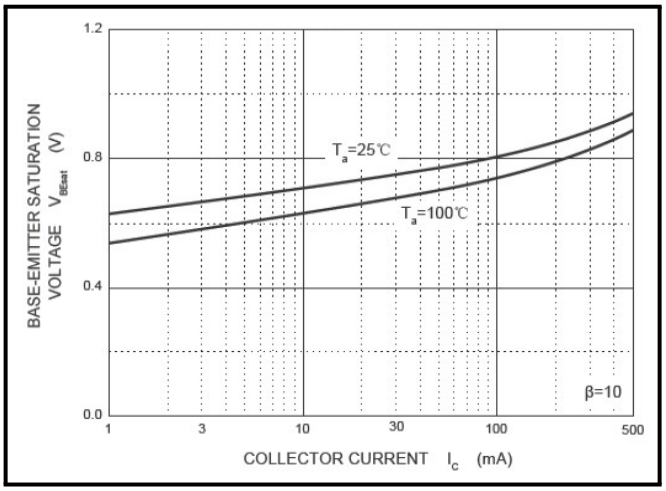


Figure 5 : I_C——V_{BE}

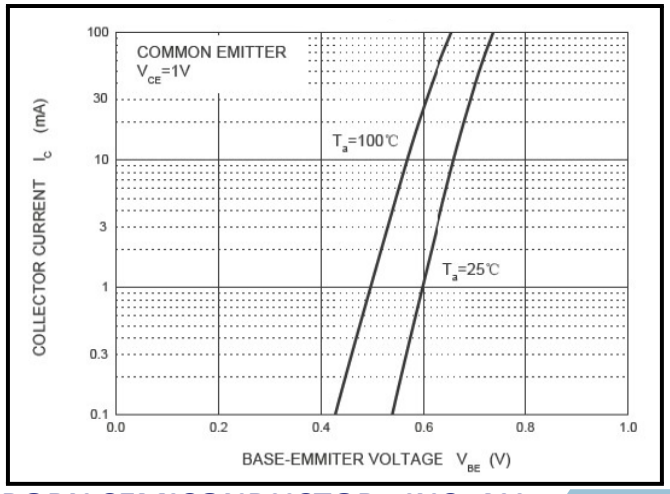
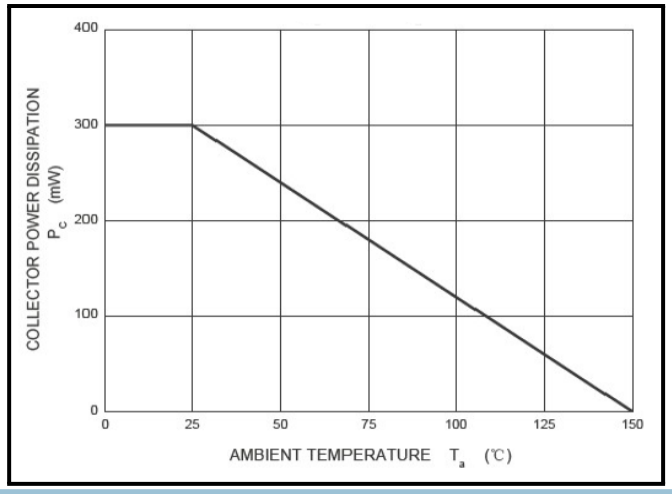


Figure 6 : P_C——T_a



BORN SEMICONDUCTOR , INC. ALL RIGHT RESERVED

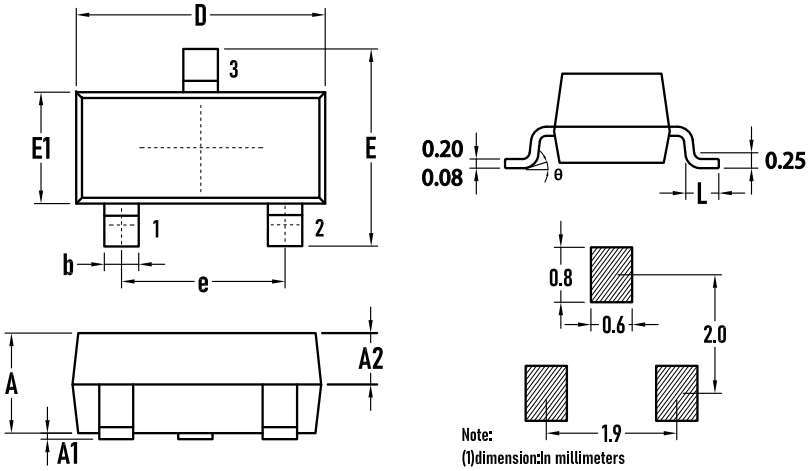
Specifications are subject to change without notice.
Please refer to http://*www.born-tw.com* for current information.

Revision: 2022-Jan-1-A

S9013

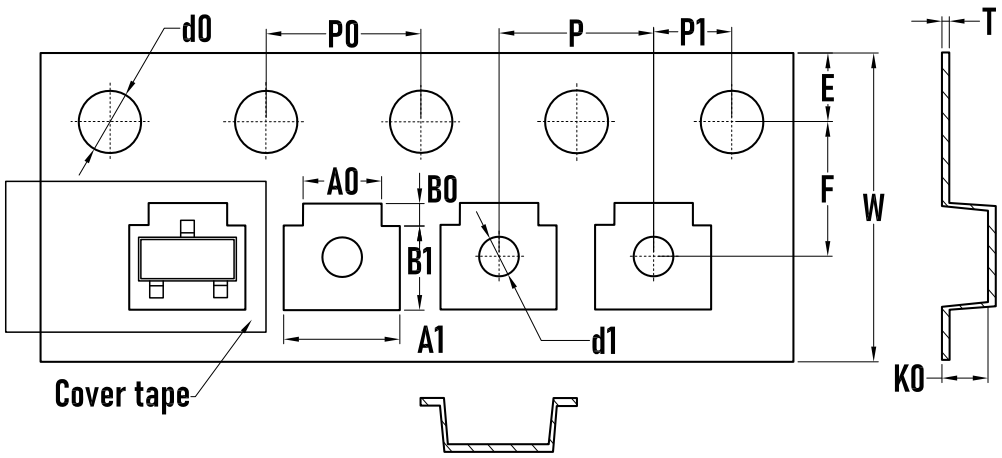
NPN Plastic-Encapsulate Transistor

Outline Drawing - SOT-23



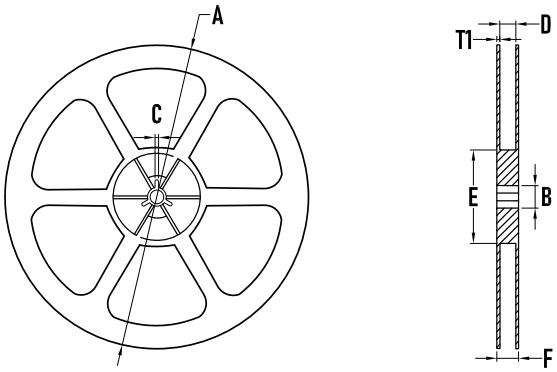
SYMBOL	MILLIMETER		
	MIN.	Typ	MAX
A	0.90	1.00	1.10
A1	0.01	–	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	–	8°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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