BORN SEMICONDUCTOR

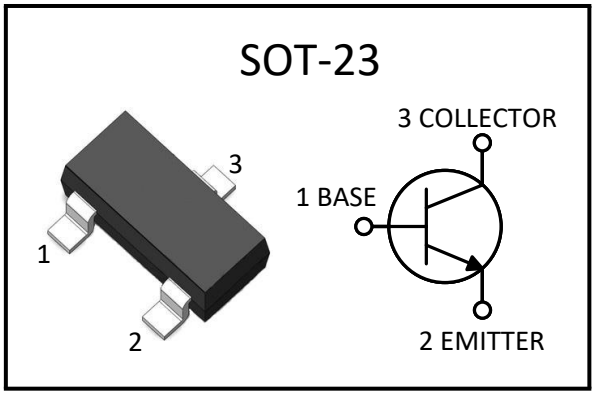
13001

NPN Plastic-Encapsulate Transistor

Features

- V_{CE}=420V
- I_C=200mA
- f_T=8MHZ @V_{CE}=20V, I_C=20mA,f=1MHZ

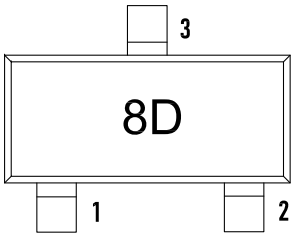
Package



General Description

- Power switching applications
- Epitaxial planar die constructio
- SOT-23 Plastic Package

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
13001	SOT-23	8D	3K	Tape and reel

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	600	V
V_{CEO}	Collector-Emitter Voltage	420	V
V_{EBO}	Emitter-Base Voltage	7	V
I_C	Collector Current	200	mA
P_C	Collector Power Dissipation	300	mW
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	400	°C/W
T_J	Junction Temperature Range	-55 to +150	°C
T_{stg}	Storage Temperature Range	-55 to +150	°C

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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	600	–	–	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	I_C=1mA,I_B=0	420	–	–	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	I_E=100μA,I_C=0	7	–	–	
I_{CBO}	Collector cut-off current	V_{CB}=600V,I_E=0	–	–	100	uA
I_{CEO}	Collector cut-off current	V_{CE}=400V,I_B=0	–	–	200	
I_{EBO}	Emitter cut-off current	V_{EB}=7V,I_C=0	–	–	100	
$h_{FE(1)}$	DC current gain	V_{CE}=20V,I_C=20mA	18	–	30	–
$h_{FE(2)}$	DC current gain	V_{CE}=10V,I_C=0.25mA	5	–	–	–
$V_{CE(sat)}$	Collector-emitter saturation voltage	I_C=50mA,I_B=10mA	–	–	0.5	V
$V_{BE(sat)}$	Base-emitter saturation voltage		–	–	1.2	
f_T	Transition frequency	V_{CE}=20V,I_C=20mA,f=1MHz	8	–	–	MHz
t_f	Fall time	V_{CC}=45V,I_C=50mA,	–	–	0.3	uS
t_s	Storage time	I_{B1}=-I_{B2}=5mA	–	–	1.5	uS

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

Figure 1 :Static Characteristics

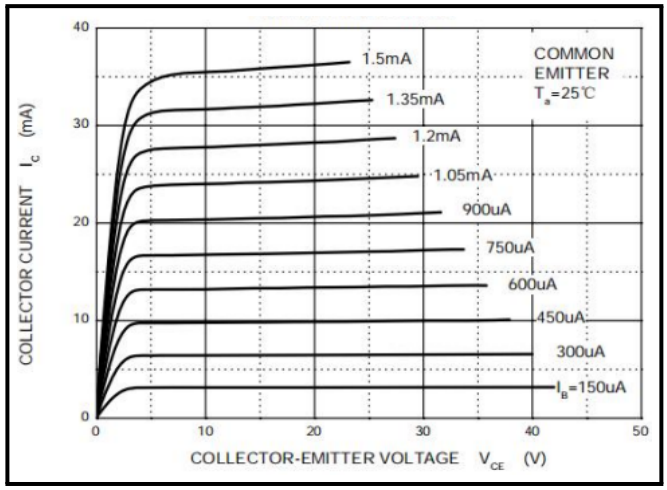


Figure 2 :h_{FE}—— I_C

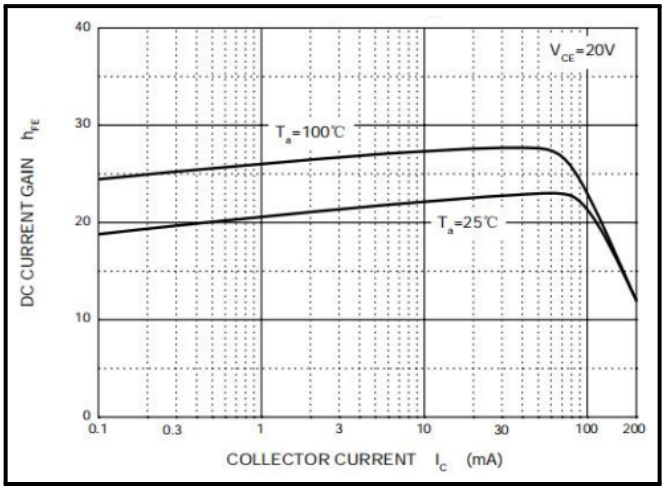


Figure 3 : $V_{CE(sat)}$—— I_C

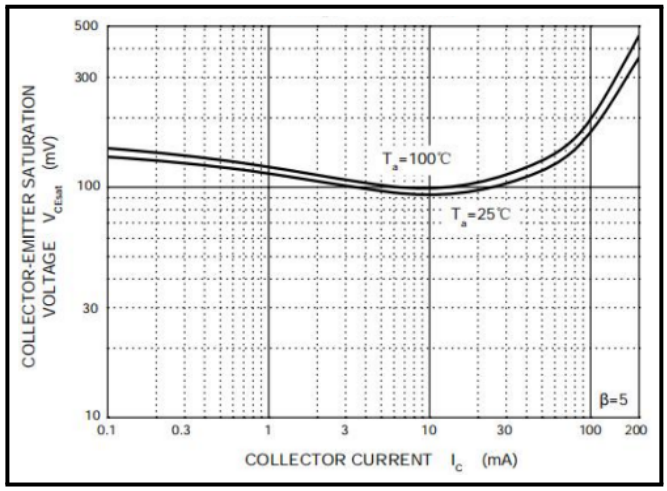
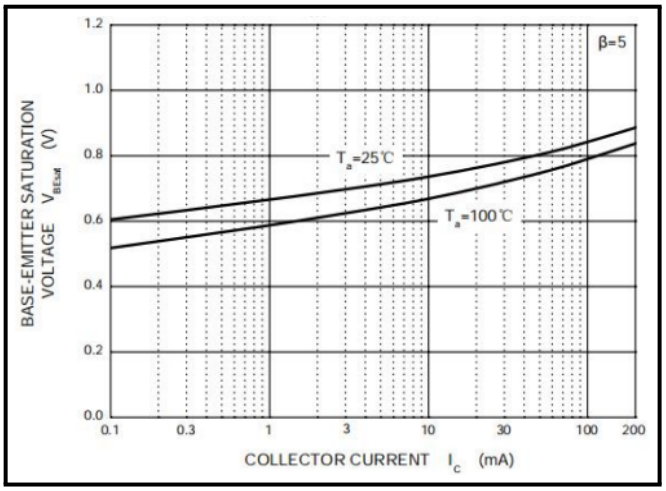


Figure 4 : $V_{BE(sat)}$—— I_C



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

Figure 5 :I_C—— V_{BE}

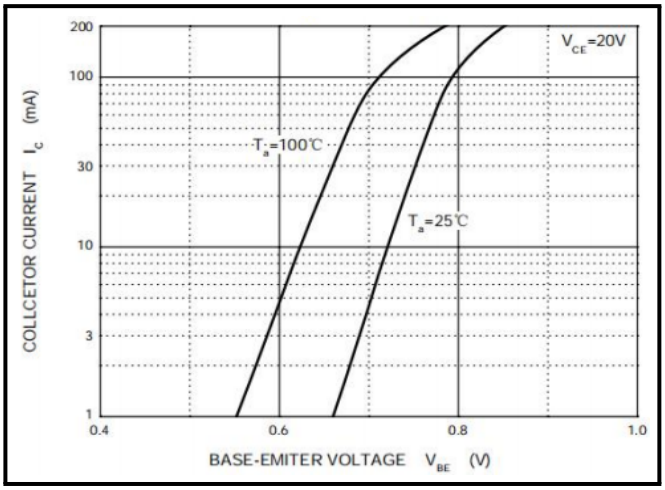


Figure 6 :C_{ob}/C_{ib}—— V_{CB}/V_{EB}

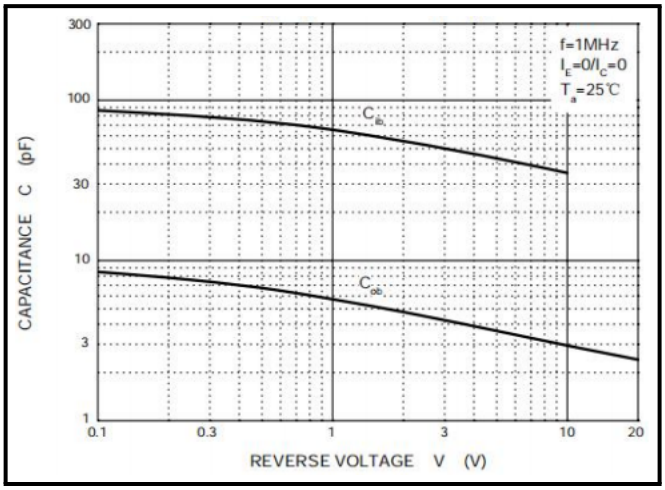
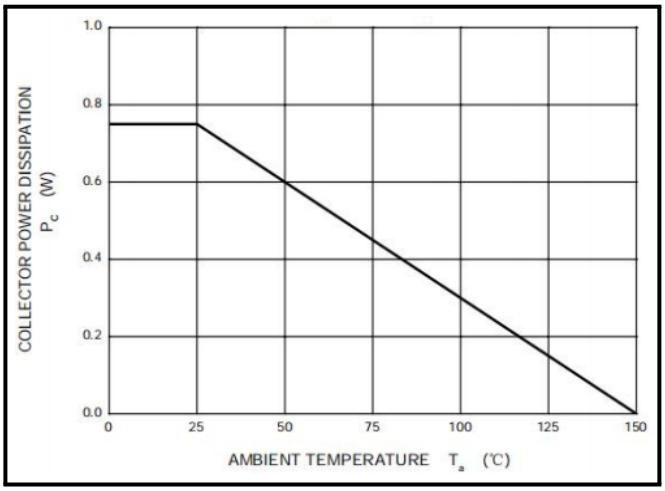


Figure 7:P_C—— T_A

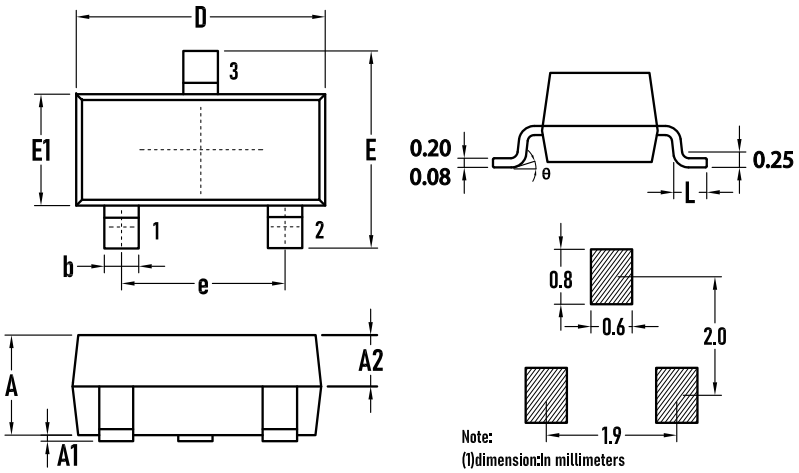


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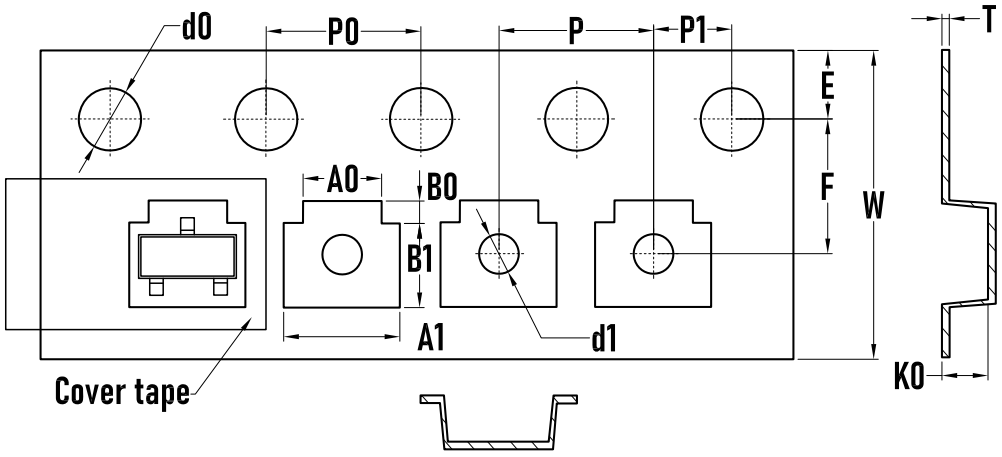
NPN Plastic-Encapsulate Transistor

Outline Drawing - SOT-23



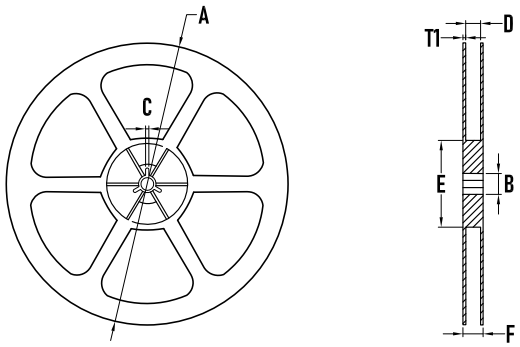
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.01	–	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	–	8°

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

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