

SuperTransistor –  $V_{CBO}$  400V,  $I_C$  200mA SOT-23 Plastic-Encapsulate NPN Transistors

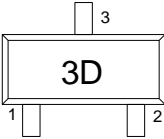
**1. Features**

- Complementary to MMBTA94
- Power dissipation of 350mW
- High stability and high reliability

**2. Mechanical Data**

- SOT-23 Small Outline Plastic Package
- Epoxy UL: 94V-0
- Mounting Position: Any

**3. Pin configuration**

Pin	Function	Outline
1	Base	
2	Emitter	
3	Collector	

**4. Specification**

**Absolute Maximum Rating & Thermal Characteristics**

Ratings at 25 °C ambient temperature unless otherwise specified.

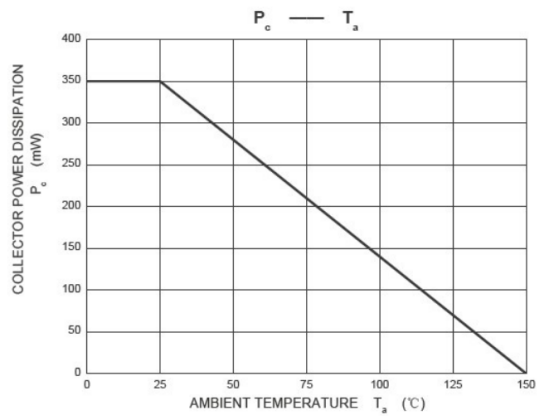
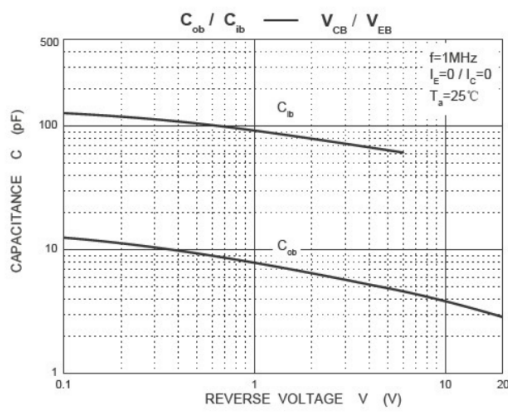
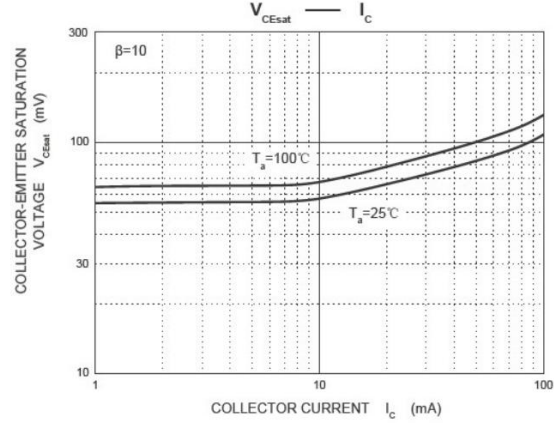
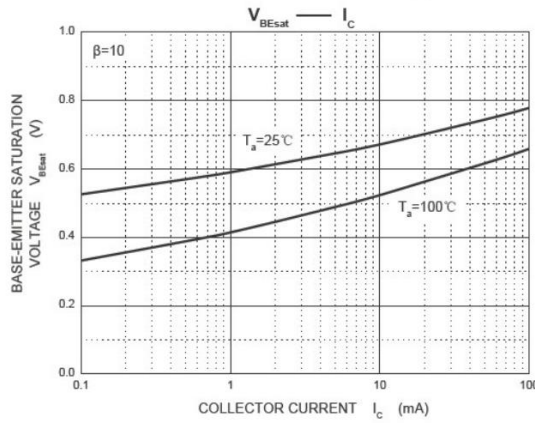
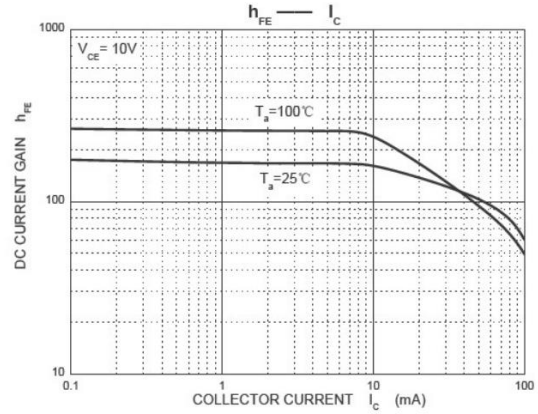
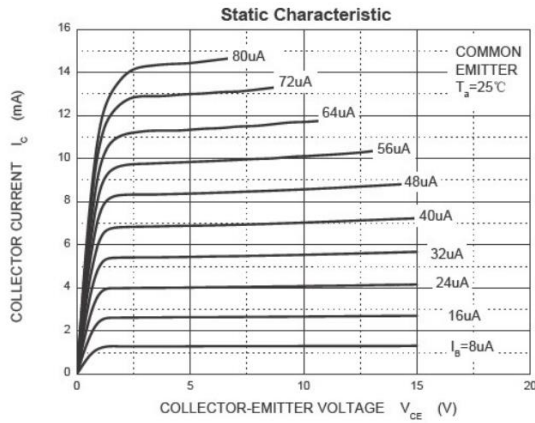
Parameters	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	400	V
Collector-Emitter Voltage	$V_{CEO}$	400	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current-Continuous	$I_C$	200	mA
Collector Power Dissipation	$P_C$	350	mW
Junction Temperature	$T_j$	150	°C
Storage Temperature	$T_{STG}$	-55~150	°C
Thermal resistance from junction to ambient	$R_{\theta JA}$	357	°C/W

Electrical Characteristics (At  $T_A = 25^\circ\text{C}$  unless otherwise specified)

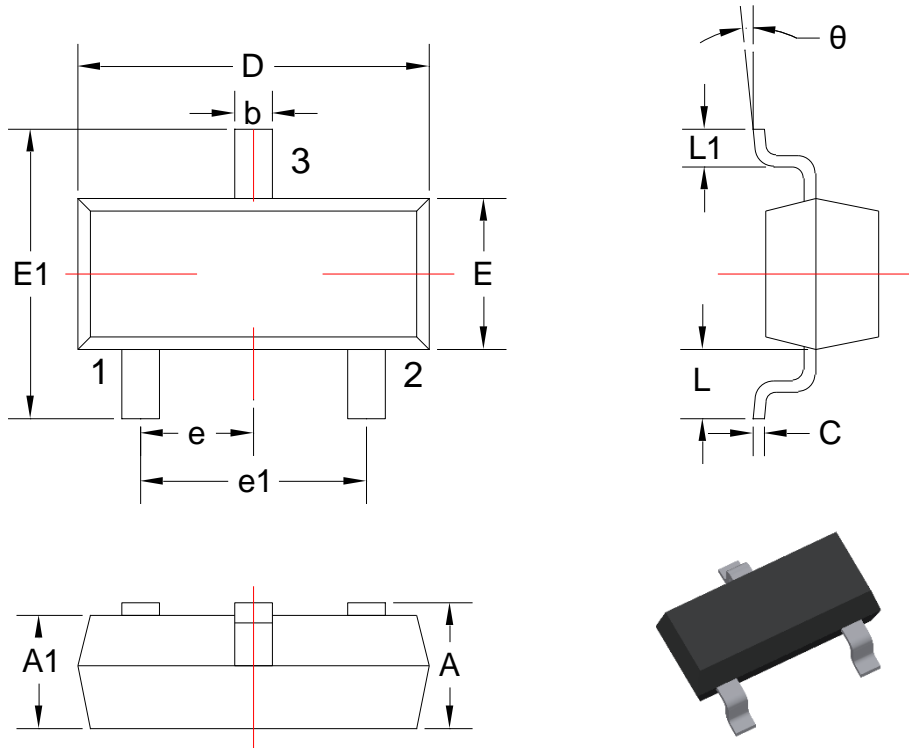
Parameters	Symbols	Test Condition	Limits			
			Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu\text{A}, I_E=0$	400			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}^*$	$I_C=1\text{mA}, I_B=0$	400			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu\text{A}, I_C=0$	6			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=400\text{V}, I_E=0$			100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0$			100	nA
DC current gain	$h_{FE1}^*$	$V_{CE}=10\text{V}, I_C=1\text{mA}$	40			
	$h_{FE2}^*$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	50		200	
	$h_{FE3}^*$	$V_{CE}=10\text{V}, I_C=50\text{mA}$	45			
	$h_{FE4}^*$	$V_{CE}=10\text{V}, I_C=100\text{mA}$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C=1\text{mA}, I_B=0.1\text{mA}$			0.40	V
		$I_C=10\text{mA}, I_B=1\text{mA}$			0.50	V
		$I_C=50\text{mA}, I_B=5\text{mA}$			0.75	V
Base -emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=10\text{mA}, I_B=1\text{mA}$			0.75	V
Collector output capacitance	$C_{OB}$	$V_{CB}=20\text{V}, I_E=0\text{mA}, f=1\text{MHz}$			7	pF
Emitter input capacitance	$C_{IB}$	$V_{EB}=0.5\text{V}, I_C=0\text{mA}, f=1\text{MHz}$			130	pF

\*Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2.0\%$

5. Typical Characteristic

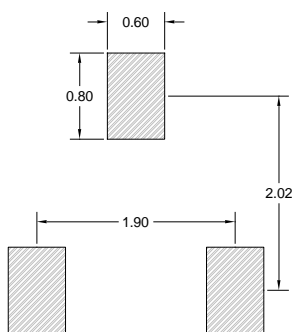


**6. Dimension and Patterns (SOT-23)**



Units: mm

Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	0.900	1.150	E1	2.250	2.550
A1	0.900	1.050	e	0.950TYP	
b	0.300	0.500	e1	1.800	2.000
c	0.080	0.150	L	0.550REF	
D	2.800	3.00	L1	0.300	0.500
E	1.200	1.400	θ	0°	8°



**Note:**

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference only
4. Unit: mm

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