



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



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Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of Automotive Applications.

Features

- $BV_{CEO} > 15V$
- Maximum Continuous Collector Current $I_C = 6A$
- $V_{CE(SAT)} < 30mV @ 1A$
- $R_{CE(SAT)} = 19m\Omega$ Typical
- High Power Dissipation SOT23 Package
- High Peak Current
- Low Saturation Voltage
- 60V Forward Blocking Voltage

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 2086 
- Weight: 0.008 grams (Approximate)

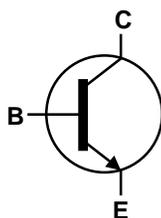
Applications

- DC - DC Converters
- MOSFET and IGBT Gate Driving
- Motor Drive
- Relay, Lamp and Solenoid Drive

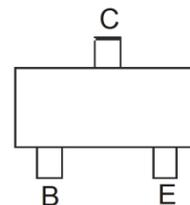
SOT23 (Type DN)



Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

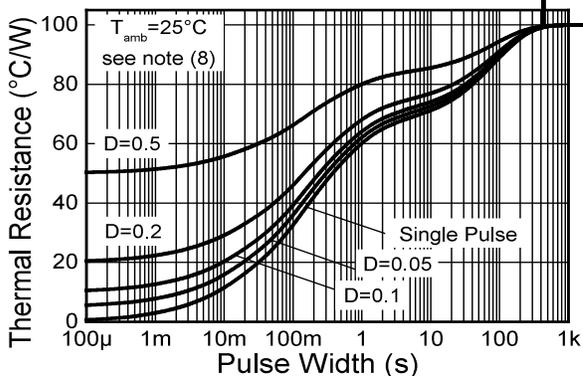
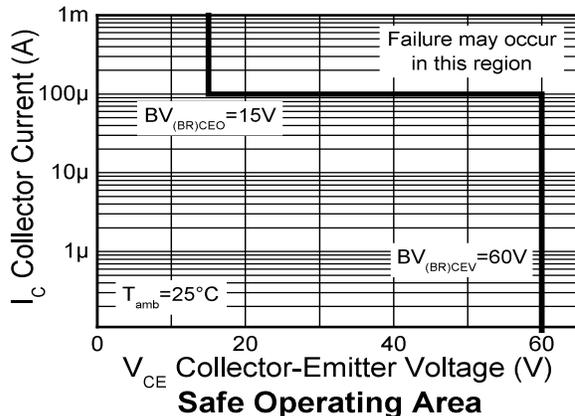
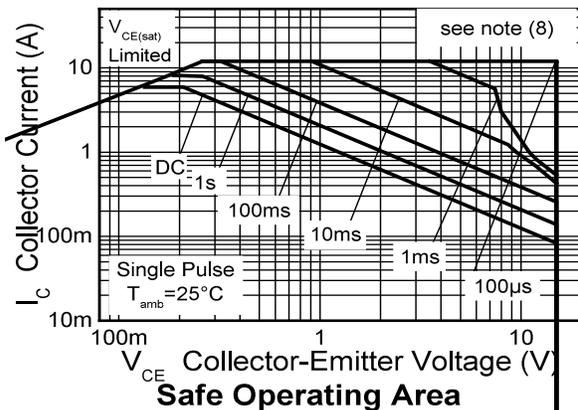
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEV}	60	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Base Current	I_B	1.2	A
Peak Pulse Current	I_{CM}	12	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

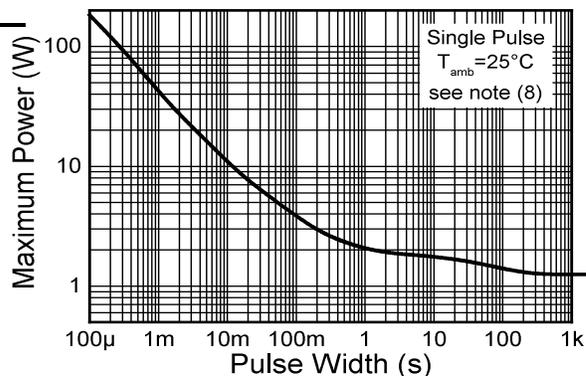
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	0.73	W mW/ $^\circ\text{C}$
		5.84	
		1.05	
		8.4	
		1.25	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	9.6	$^\circ\text{C/W}$
		1.81	
		14.5	
		171	
		119	
Operating and Storage Temperature Range	T_J, T_{STG}	100	$^\circ\text{C}$
		69	
		-55 to +150	

- Notes:
6. For a device mounted with the collector lead on 15mm × 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
 7. Mounted on 25mm × 25mm 1.6mm FR-4 PCB with a high coverage of single sided 2oz copper in still air conditions.
 8. Mounted on 50mm × 50mm 1.6mm FR-4 PCB with a high coverage of single sided 2oz copper in still air conditions.
 9. Same as note (8), except measured at $t < 5$ seconds.

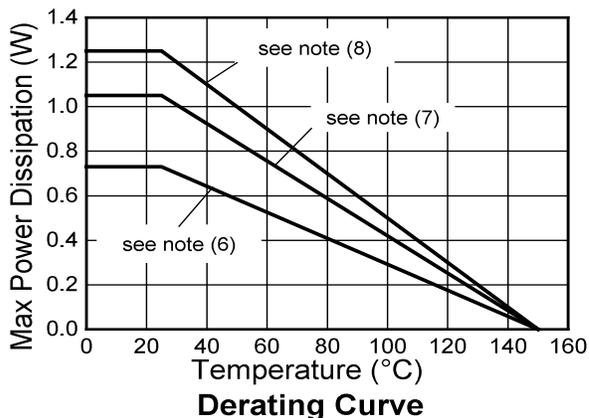
Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Transient Thermal Impedance



Pulse Power Dissipation



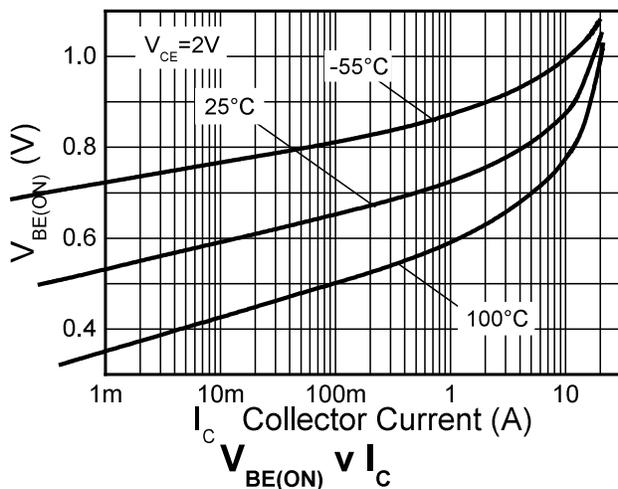
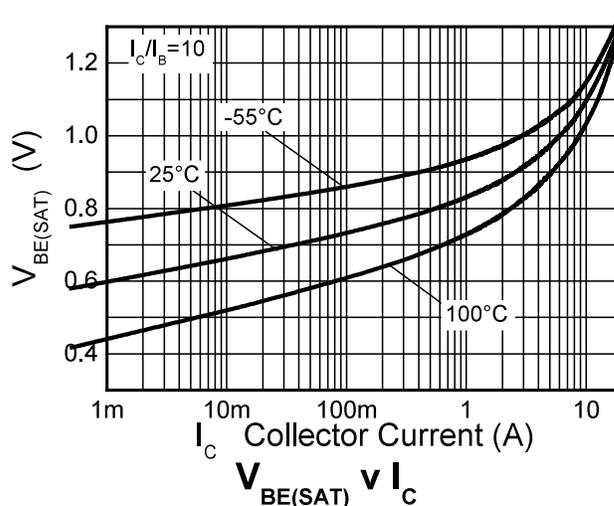
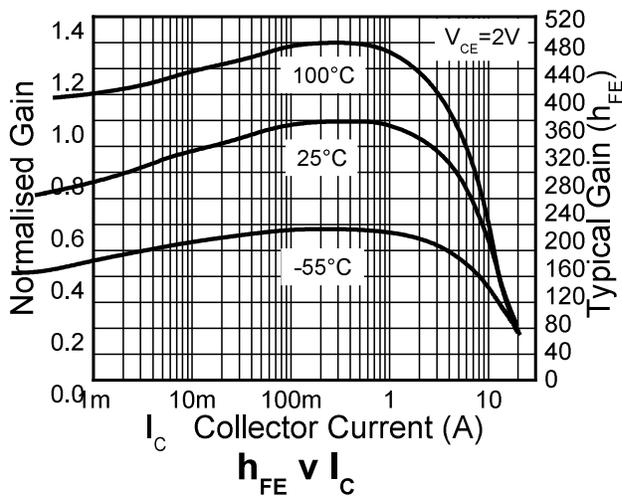
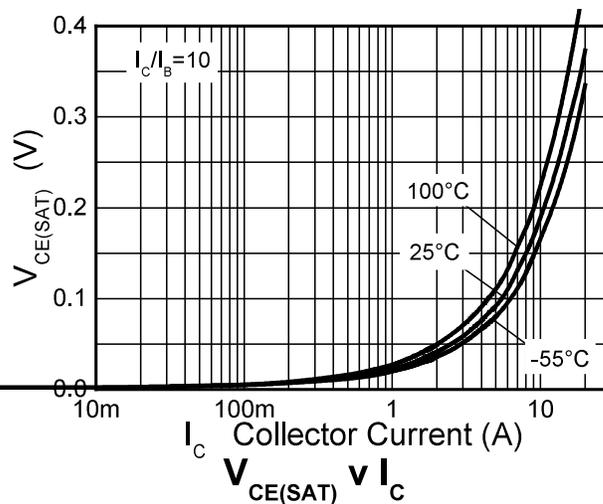
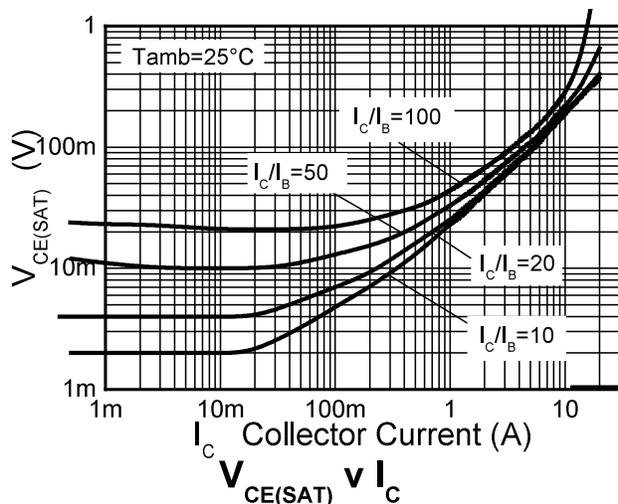
Derating Curve

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

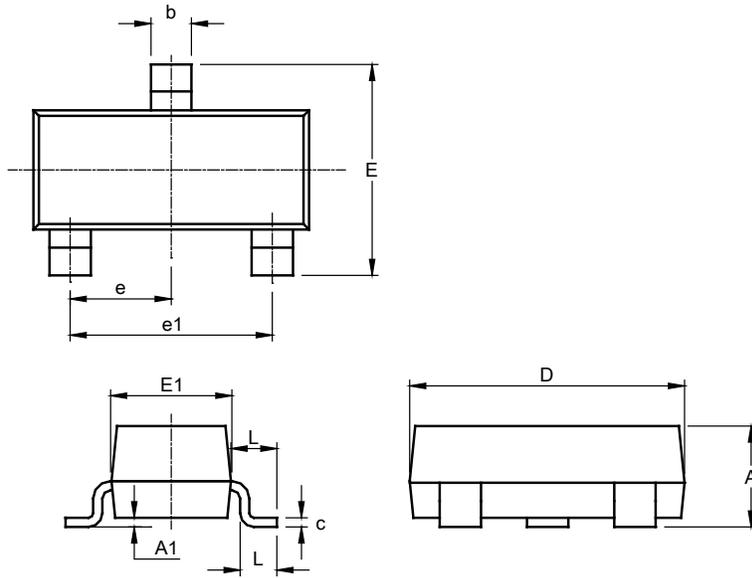
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	60	85	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEV}	60	85	—	V	$I_C = 100\mu\text{A}$, $R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	15	23	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	—	< 1	20	nA	$V_{CB} = 48\text{V}$
Collector-Emitter Cutoff Current	I_{CEV}	—	—	100	nA	$V_{CE} = 48\text{V}$, $R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter-Base Cutoff Current	I_{EBO}	—	< 1	10	nA	$V_{EB} = 6\text{V}$
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	160	300	—	—	$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}$
		200	350	560		$I_C = 500\text{mA}$, $V_{CE} = 2\text{V}$
		190	330	—		$I_C = 3\text{A}$, $V_{CE} = 2\text{V}$
		150	280	—		$I_C = 6\text{A}$, $V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	7	15	mV	$I_C = 0.1\text{A}$, $I_B = 5\text{mA}$
		—	22	30		$I_C = 1\text{A}$, $I_B = 100\text{mA}$
		—	70	90		$I_C = 3\text{A}$, $I_B = 60\text{mA}$
		—	130	180		$I_C = 6\text{A}$, $I_B = 120\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	0.83	0.93	V	$I_C = 3\text{A}$, $I_B = 60\text{mA}$
		—	0.89	0.98		$I_C = 6\text{A}$, $I_B = 120\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(on)}$	—	0.81	0.91	V	$I_C = 6\text{A}$, $V_{CE} = 2\text{V}$
Output Capacitance	C_{OBO}	—	56	—	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Transition Frequency	f_T	—	235	—	MHz	$V_{CE} = 2\text{V}$, $I_C = 500\text{mA}$, $f = 50\text{MHz}$
Delay Time	t_d	—	15	—	ns	$V_{CC} = 5\text{V}$, $I_C = 3\text{A}$, $I_{B1} = -I_{B2} = 150\text{mA}$
Rise Time	t_r	—	38.5	—		
Storage Time	t_{stg}	—	213	—		
Fall Time	t_f	—	19.7	—		

 Note: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

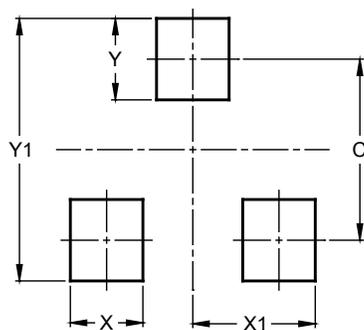


Package Outline Dimensions



SOT23 (Type DN)			
Dim	Min	Max	Typ
A	0.89	1.12	1.00
A1	0.01	0.10	0.05
b	0.30	0.51	0.45
c	0.08	0.20	0.10
D	2.80	3.04	3.00
E	2.10	2.64	2.42
E1	1.20	1.40	1.37
e	0.95 REF		
e1	1.90 REF		
L	0.25	0.60	0.30
L1	0.45	0.62	0.54
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9