



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

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Description

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

Features

- $BV_{CEO} > 50V$
- $I_C = 150mA$ High Collector Current
- Ultra-Small Surface Mount Package

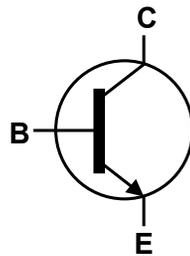
Mechanical Data

- Case: SOT523
- 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 208 
- Weight: 0.002 grams (Approximate)

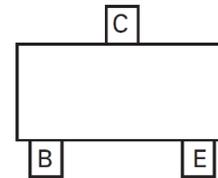
SOT523



Top View



Device Symbol



Pin-Out Top View

Absolute Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current - Continuous (Note 5)	I_c	150	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) $T_A = 25^\circ\text{C}$	P_D	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

Notes: 5. For a device mounted with the collector lead, on a minimum recommended pad layout of 1oz copper on a single-sided 1.6mm FR4 PCB. Device is measured under still air conditions whilst operating in a steady-state.
 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

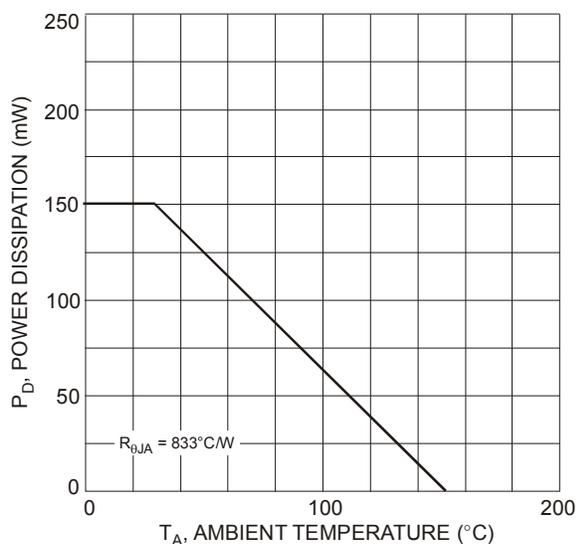
Thermal Characteristics and Derating Information


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 1)

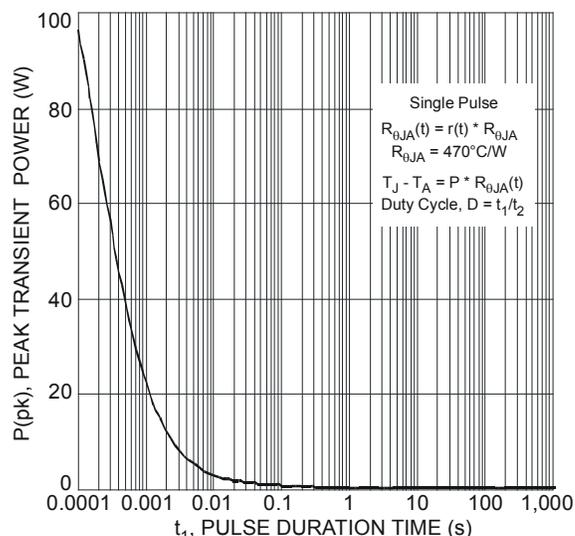


Fig. 2 Single Pulse Maximum Power Dissipation

Thermal Characteristics and Derating Information (continued)

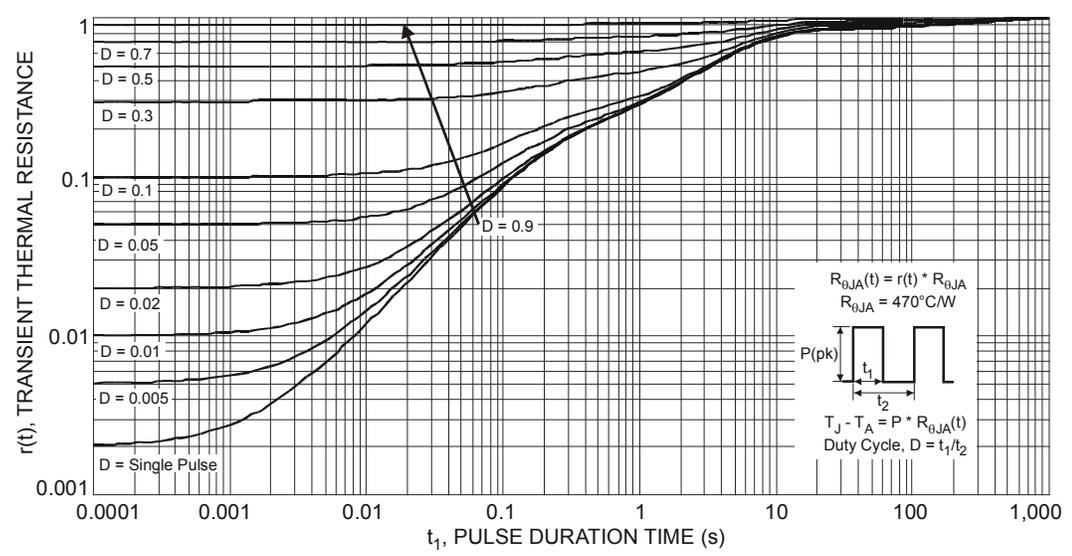
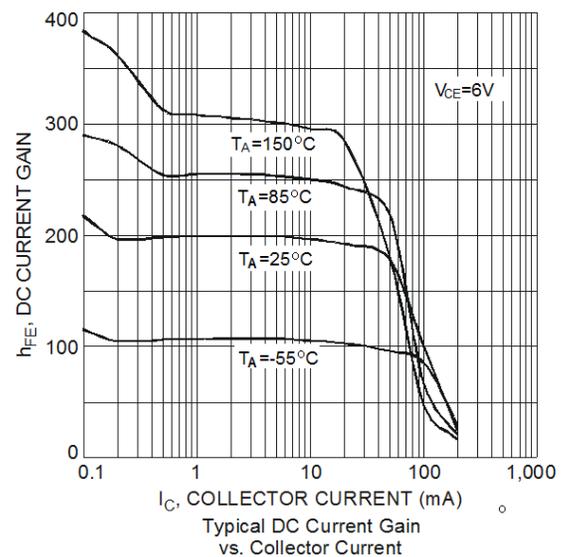
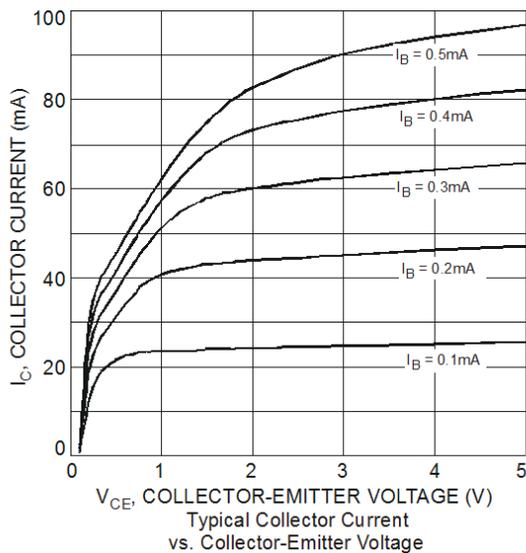


Fig. 3 Transient Thermal Response

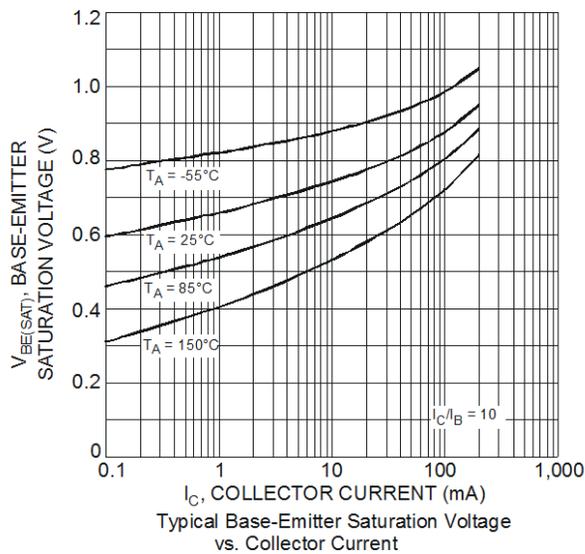
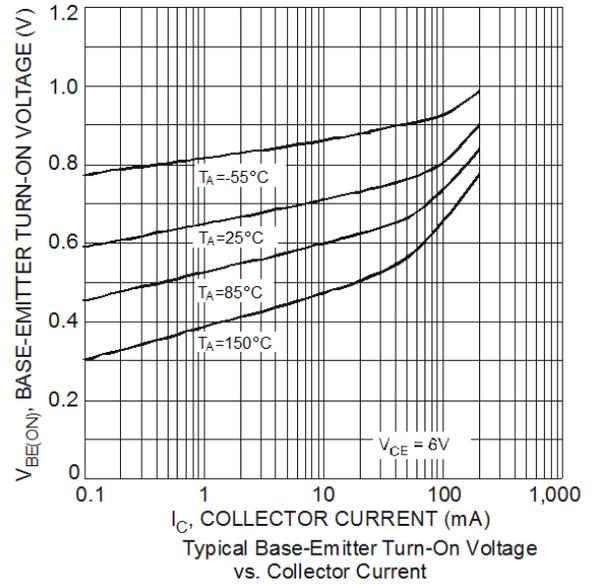
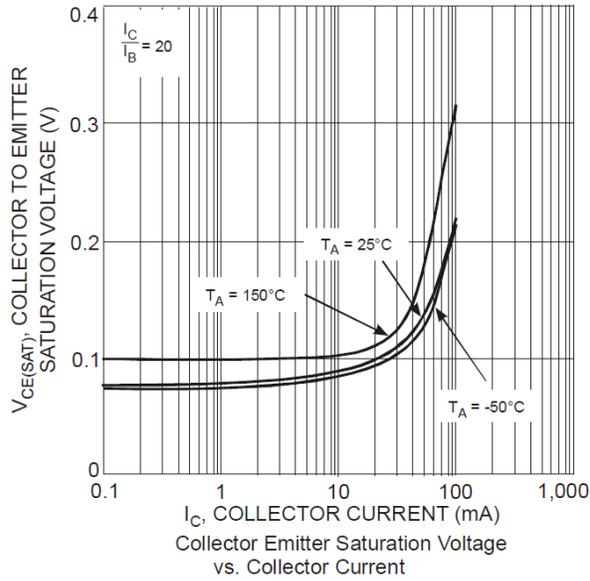
Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Collector-Base Breakdown Voltage	BV_{CBO}	60	—	—	V	$I_C = 50\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	BV_{CEO}	50	—	—	V	$I_C = 1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	$I_E = 50\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	100	nA	$V_{CB} = 60\text{V}$
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	$V_{EB} = 6\text{V}$
ON CHARACTERISTICS (Note 7)						
DC Current Gain	h_{FE}	270	—	560	—	$V_{CE} = 6\text{V}, I_C = 1\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.4	V	$I_C = 50\text{mA}, I_B = 5\text{mA}$
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	2	3.5	pF	$V_{CB} = 12\text{V}, f = 1\text{MHz}, I_E = 0$
Current Gain-Bandwidth Product	f_T	—	140	—	MHz	$V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	f_T	—	180	—	MHz	$V_{CE} = 12\text{V}, I_C = 0\text{mA}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	f_T	—	180	—	MHz	$V_{CE} = 12\text{V}, I_C = 2\text{mA}, f = 100\text{MHz}$

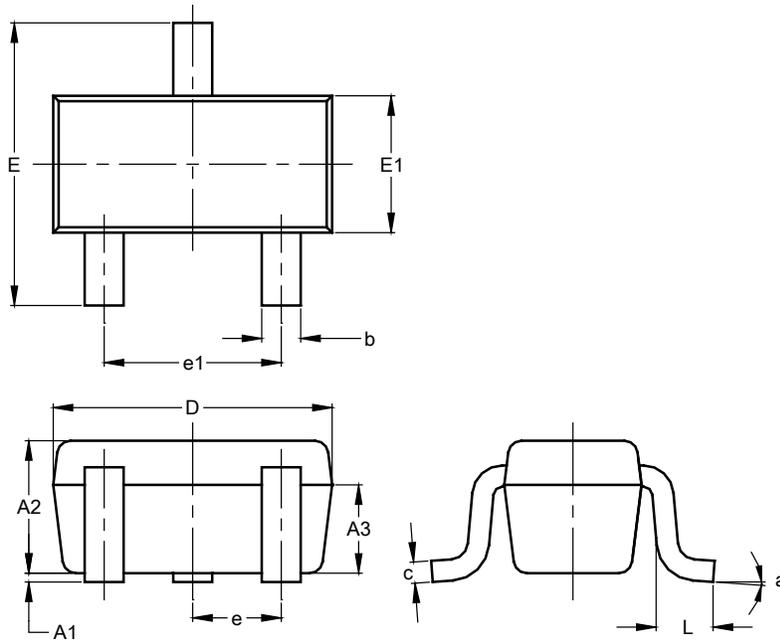
 Notes: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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


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

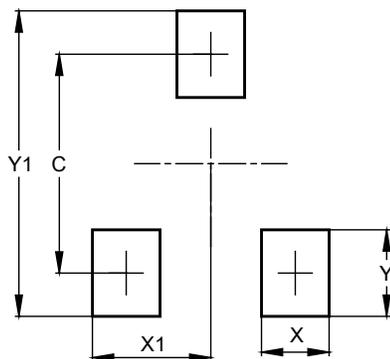


Package Outline Dimensions



SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80