优尚

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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Features

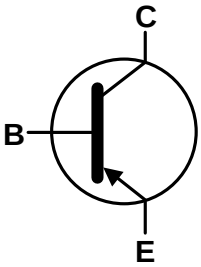
- BV_{CEO} > -40V
- I_C = -3A High Continuous Collector Current
- I_{CM} = -5A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -140mV @ -1A
- h_{FE} Specified up to -5A for a High Gain Hold-Up

Mechanical Data

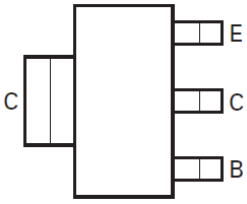
- Case: SOT223
- Case Material: Molded Plastic. “Green” Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)

Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-45	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-5	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

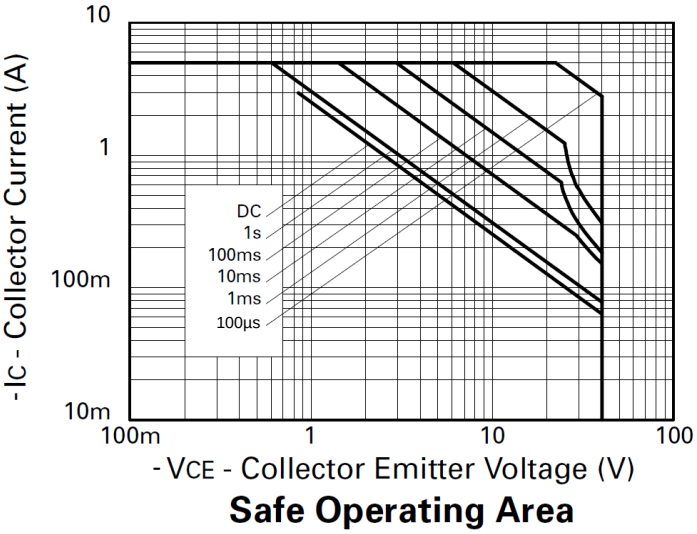
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3.0	W
	(Note 6)		2.0	
	(Note 7)		1.6	
	(Note 8)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
	(Note 6)		62.5	
	(Note 7)		78.1	
	(Note 8)		104	
Thermal Resistance, Junction to Lead	(Note 9)	$R_{\theta JL}$	10.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

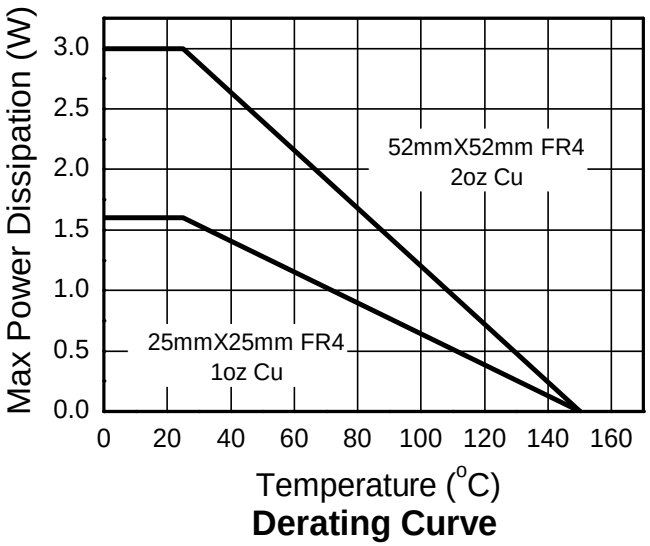
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 52mm × 52mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as note (5), except the device is mounted on 25mm × 25mm 2oz copper.
7. Same as note (5), except the device is mounted on 25mm × 25mm 1oz copper.
8. Same as note (5), except the device is mounted on minimum recommended pad layout.
9. Thermal resistance from junction to solder-point (at the end of the collector lead).
10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

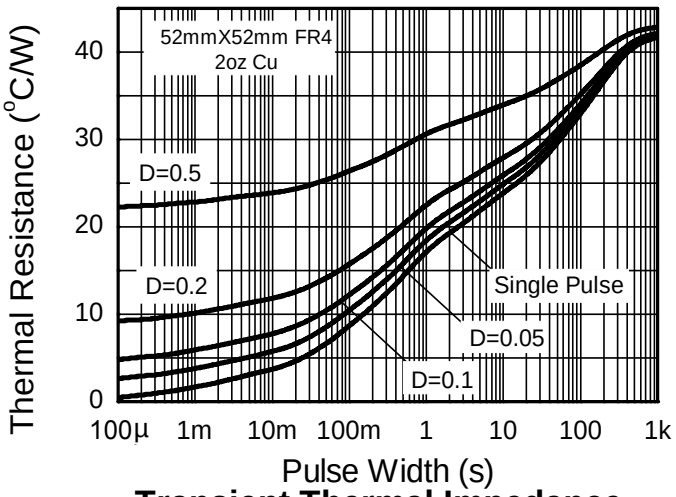
Thermal Characteristics and Derating Information



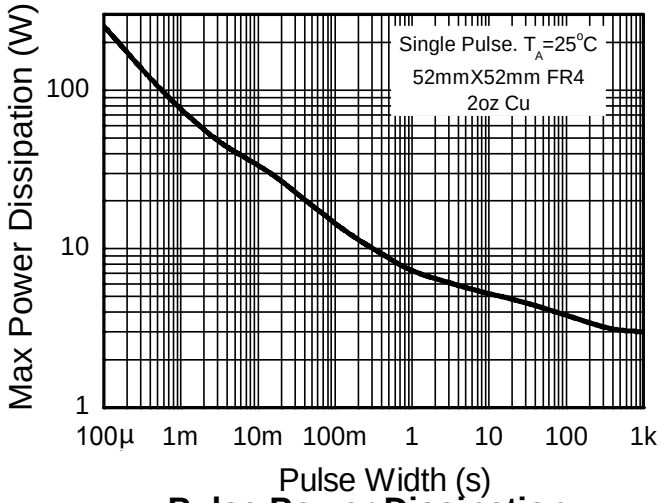
Safe Operating Area



Derating Curve



Transient Thermal Impedance



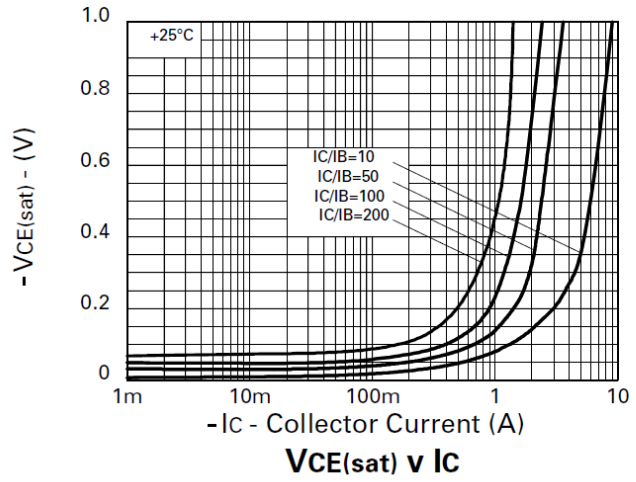
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

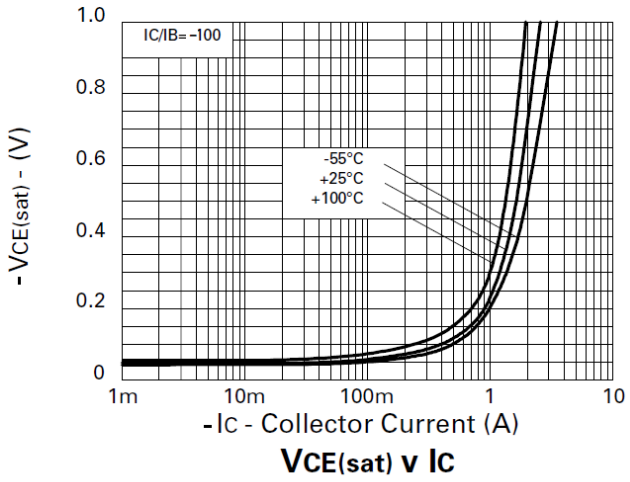
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-45	-95	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CER}	-40	-90	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-40	-85	—	V	I_C = -10mA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEV}	-40	-90	—	V	I_C = -100μA, V_{EB} = +1V
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	—	V	I_E = -100μA
Collector Cut-Off Current	I_{CBO}	—	-0.3	-100	nA	V_{CB} = -36V
Emitter Cut-Off Current	I_{EBO}	—	-0.3	-100	nA	V_{EB} = -4V
Collector Emitter Cut-Off Current	I_{CEO}	—	-0.3	-100	nA	V_{CE} = -32V
DC Current Transfer Static Ratio (Note 11)	h_{FE}	270	450	—	—	I_C = -10mA, V_{CE} = -2V
		250	400	800		I_C = -500mA, V_{CE} = -2V
		180	300	—		I_C = -2A, V_{CE} = -2V
		100	190	—		I_C = -3A, V_{CE} = -2V
		—	45	—		I_C = -5A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	—	-60	-90	mV	I_C = -100mA, I_B = -1.0mA
		—	-120	-180		I_C = -500mA, I_B = -5mA
		—	-140	-220		I_C = -1A, I_B = -20mA
		—	-170	-260		I_C = -1.8A, I_B = -70mA
		—	-200	-300		I_C = -3A, I_B = -250mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	—	-985	-1100	mV	I_C = -3A, I_B = -250mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	—	-850	-1000	mV	I_C = -3A, V_{CE} = -2V
Transitional Frequency (Note 11)	f_T	—	145	—	MHz	I_C = -50mA, V_{CE} = -10V, f = 50MHz
Output Capacitance	C_{obo}	—	40	—	pF	V_{CB} = -10V, f = 1MHz
Switching Time	t_{on}	—	170	—	ns	V_{CC} = -30V, I_C = -2A, I_B = ±20mA
	t_{off}	—	460	—		

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

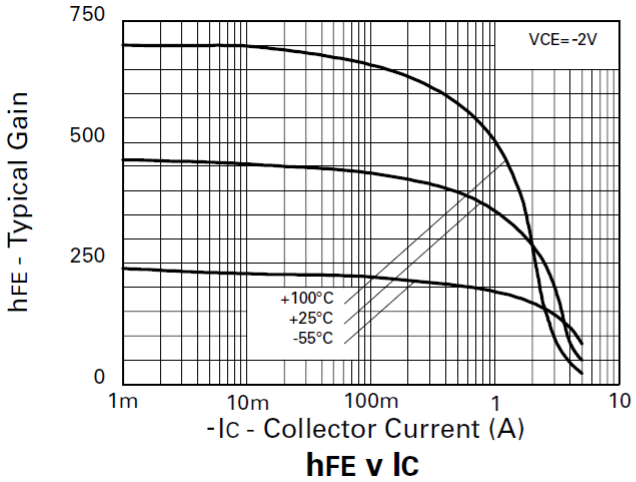
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



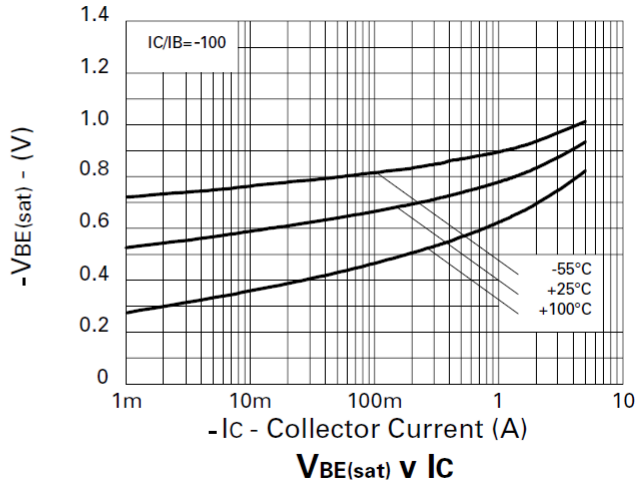
VCE(sat) v IC



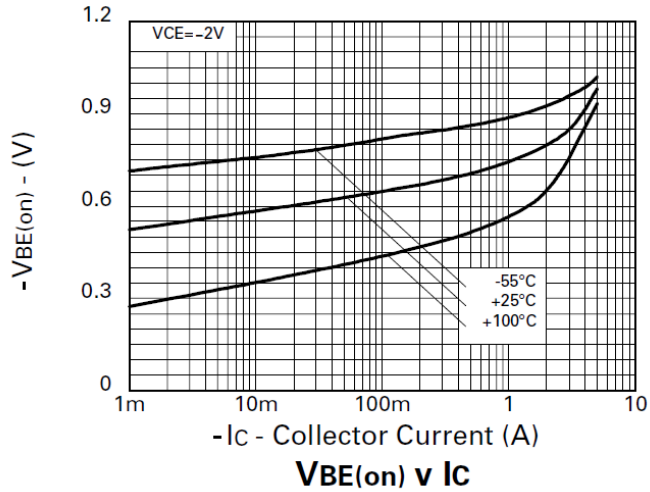
VCE(sat) v IC



hFE v IC



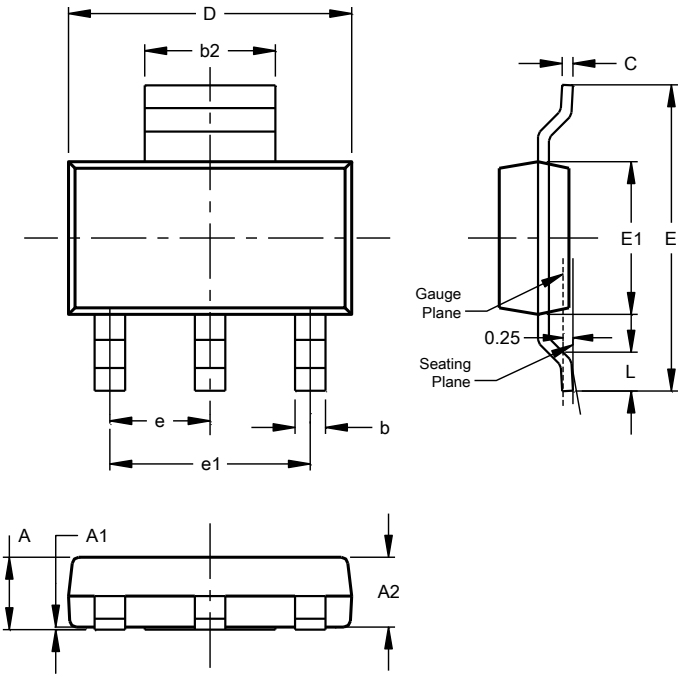
VBE(sat) v IC



VBE(on) v IC

Package Outline Dimensions

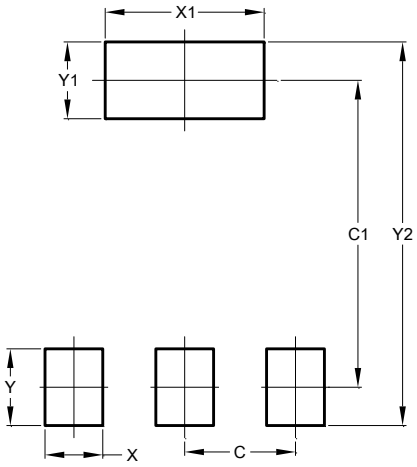
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00