



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

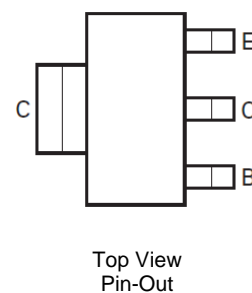
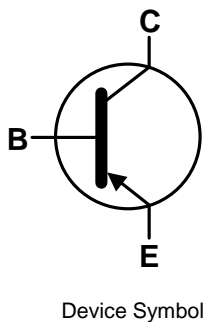
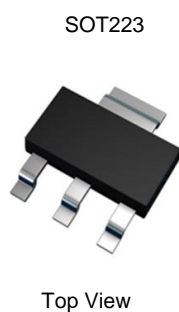
- $BV_{CEO} > -200V$
- $I_C = -2A$ High Continuous Collector Current
- $I_{CM} = -5A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -160mV @ I_C = -1A$
- $R_{SAT} = 135m\Omega$ for a Low Equivalent On-Resistance
- Enhanced Switching Performance

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 
- Weight: 0.112 grams (Approximate)

Applications

- DC-DC Conversion



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-220	V
Collector-Emitter Voltage	V _{CEO}	-200	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-2	A
Peak Pulse Current	I _{CM}	-5	A
Base Current	I _B	-1	A

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

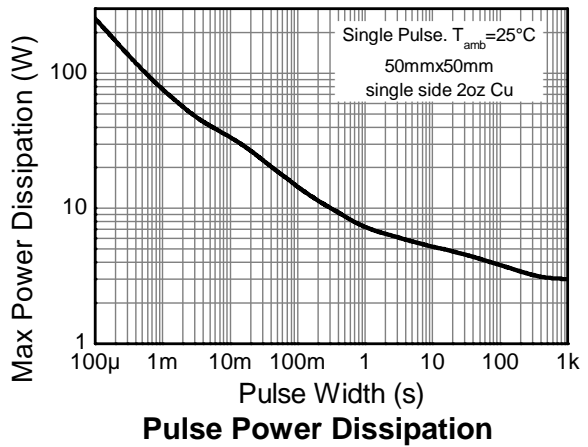
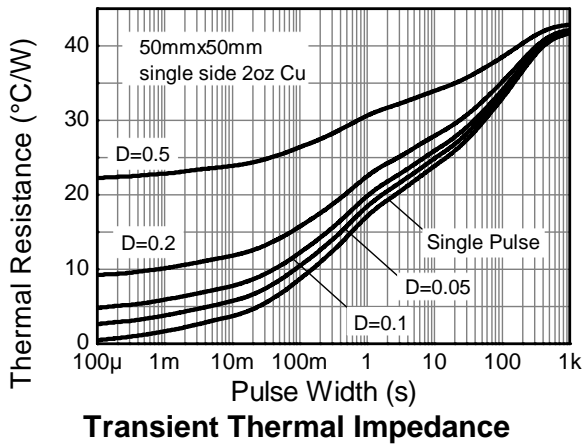
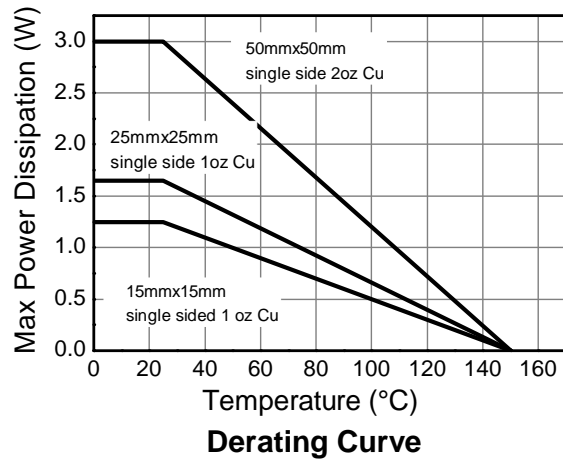
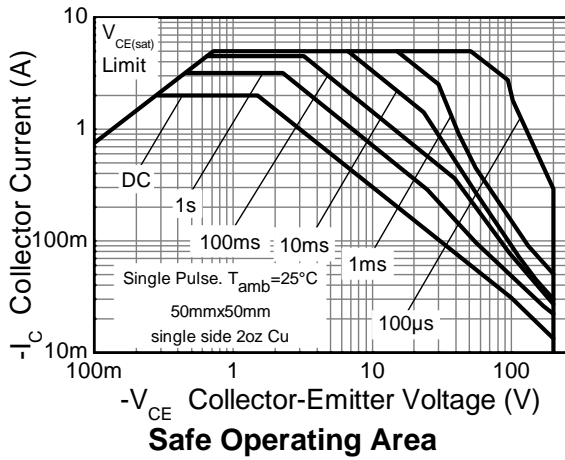
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	1.25
		(Note 6)	1.65
		(Note 7)	3.0
		(Note 8)	5.8
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	100
		(Note 6)	76
		(Note 7)	41.6
		(Note 8)	21.5
Thermal Resistance, Junction to Lead	R _{θJL}	10.5	°C/W
Operating and Storage 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:
- For a device mounted with the collector lead on 15mm x 15mm 1oz. copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz. copper.
 - Same as Note 5, except the device is mounted on 50mm x 50mm 2oz. copper.
 - Same as Note 7, except measured at t<5 seconds.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

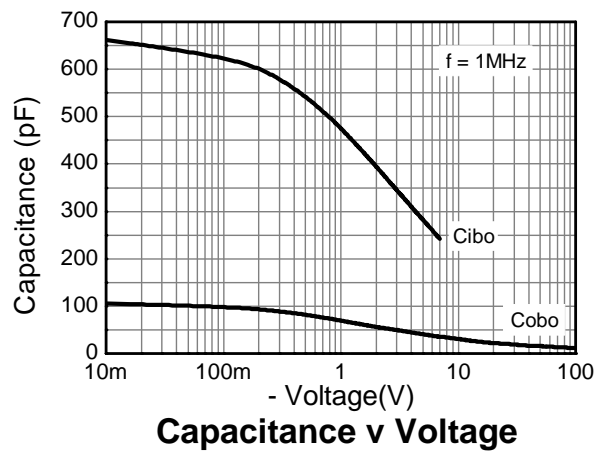
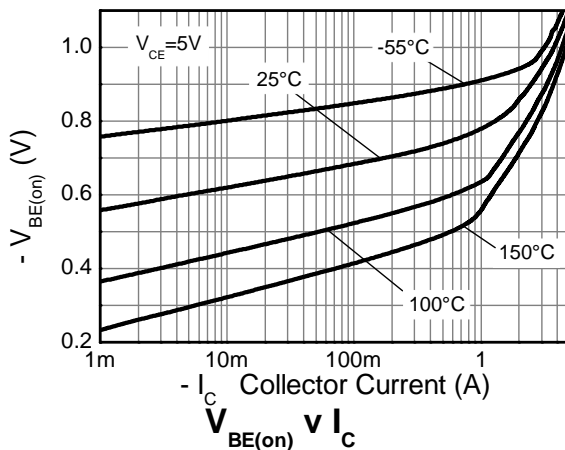
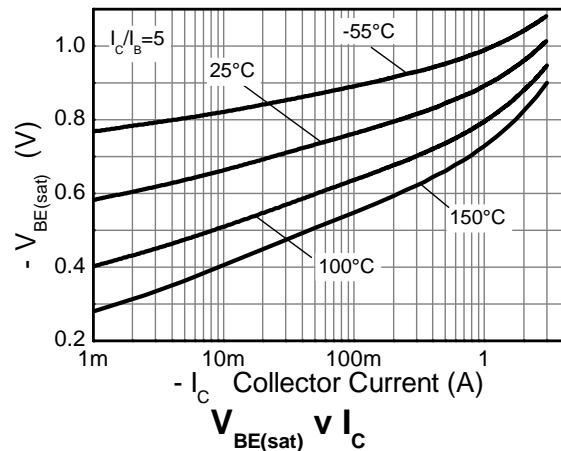
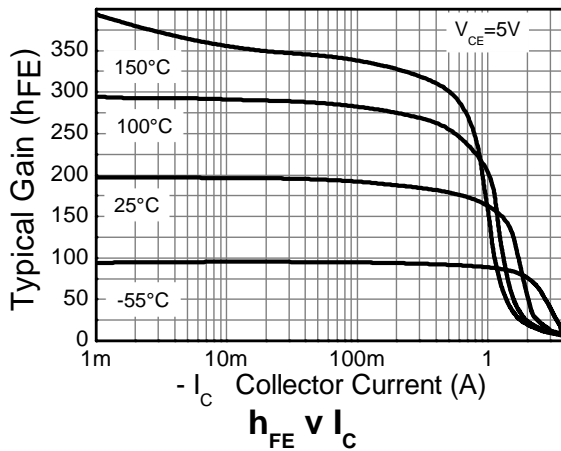
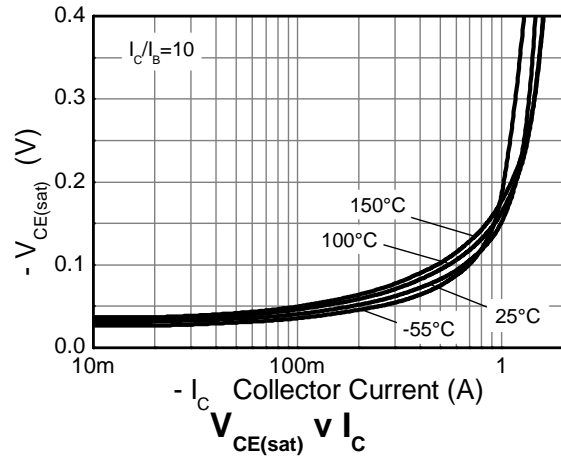
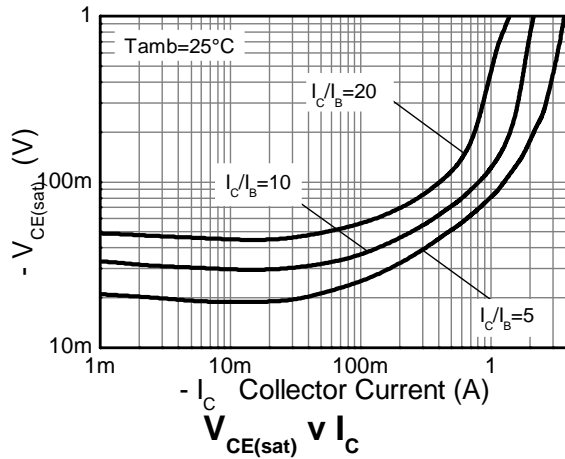


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

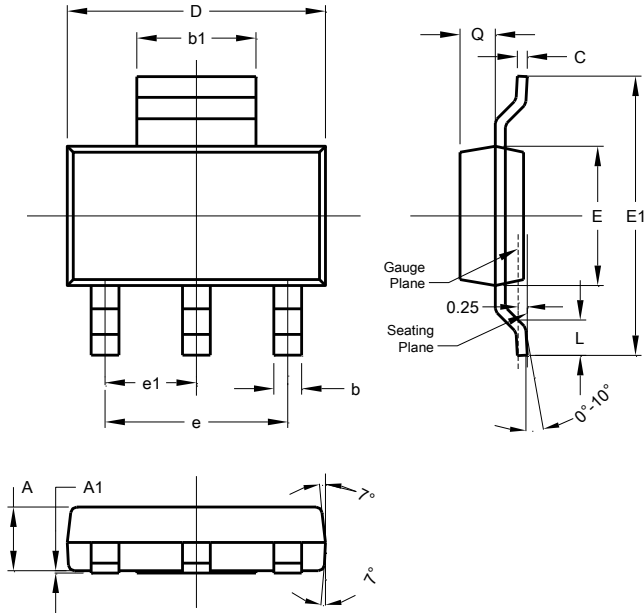
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-220	-245	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CER}	-220	-245	-	V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-200	-225	-	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.4	-	V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	-	< -1	-50	nA	$V_{CB} = -200\text{V}$
Emitter Cut-Off Current	I_{EBO}	-	< -1	-10	nA	$V_{CB} = -200\text{V}$, $T_A = +100^\circ\text{C}$
DC Current Transfer Static Ratio (Note 11)	h_{FE}	100	195	-	-	$I_C = -10\text{mA}$, $V_{CE} = -5\text{V}$
		100	170	300		$I_C = -1\text{A}$, $V_{CE} = -5\text{V}$
		20	50	-		$I_C = -2\text{A}$, $V_{CE} = -5\text{V}$
		-	5	-		$I_C = -5\text{A}$, $V_{CE} = -5\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	-	-37	-50	mV	$I_C = -0.1\text{A}$, $I_B = -10\text{mA}$
		-	-130	-155		$I_C = -0.5\text{A}$, $I_B = -25\text{mA}$
		-	-135	-160		$I_C = -1\text{A}$, $I_B = -100\text{mA}$
		-	-180	-275		$I_C = -2\text{A}$, $I_B = -400\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	-	-955	-1,100	mV	$I_C = -2\text{A}$, $I_B = -400\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	-	-860	-1,000	mV	$I_C = -2\text{A}$, $V_{CE} = -5\text{V}$
Transitional Frequency (Note 11)	f_T	-	105	-	MHz	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$, $f = 50\text{MHz}$
Output Capacitance	C_{obo}	-	31	-	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Delay Time	t_d	-	21	-	ns	$V_{CC} = -50\text{V}$, $I_C = -1\text{A}$, $I_{B1} = -I_{B2} = -100\text{mA}$
Rise Time	t_r	-	18	-		
Storage Time	t_s	-	680	-		
Fall Time	t_f	-	75	-		

 Note: 11. 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.)

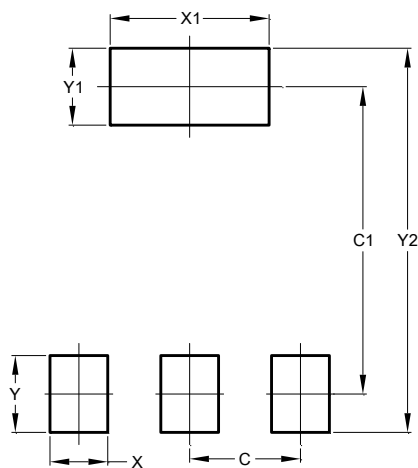


Package Outline Dimensions



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout



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

For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.