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

- $BV_{CEO} > 60V$
- I_C = 1A high Continuous Current
- Low saturation voltage $V_{CE(sat)} < 500mV$ @ 1A
- Complementary PNP Type: NK-FZT591

Mechanical Data

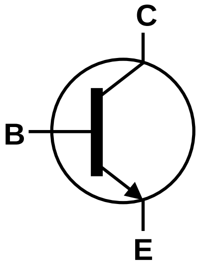
- Case: SOT223
- Case material: molded plastic. “Green” molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (approximate)

Applications

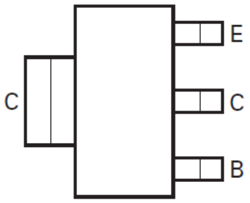
- Power MOSFET gate driving
- Low loss power switching

SOT223

Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Base Current	I_B	200	mA

Thermal Characteristics

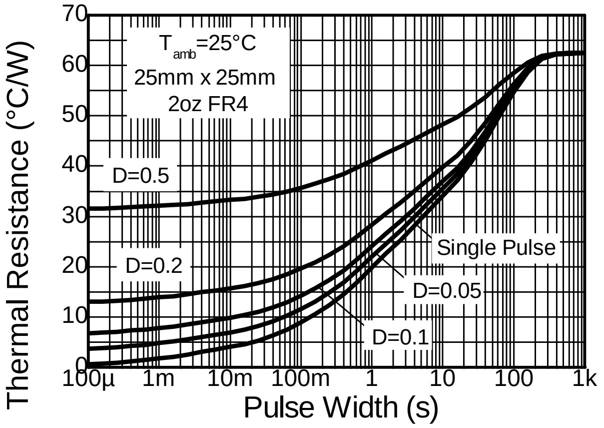
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
	(Note 6)		3	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		41.7	°C/W
Thermal Resistance, Junction to Leads (Note 7)		$R_{\theta JL}$	19.41	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

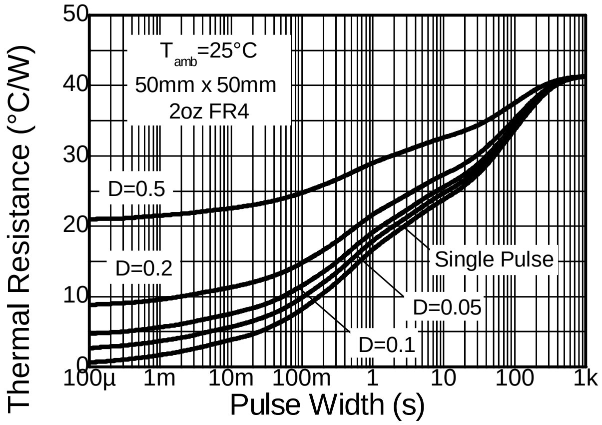
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

Notes:
5. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; device measured when operating in steady state condition.
6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 2oz weight copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

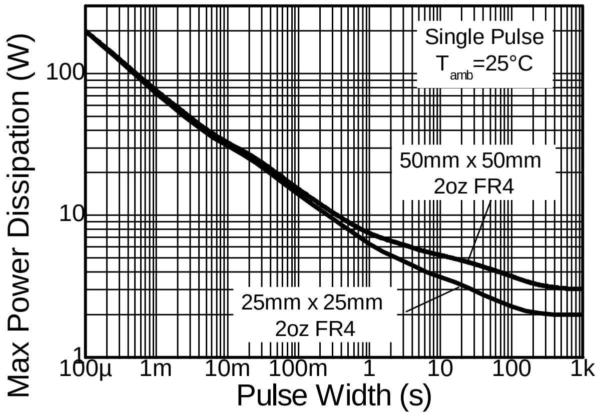
Thermal Characteristics and Derating Information



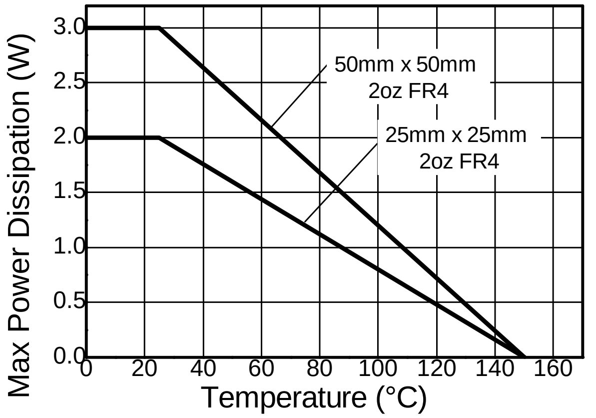
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



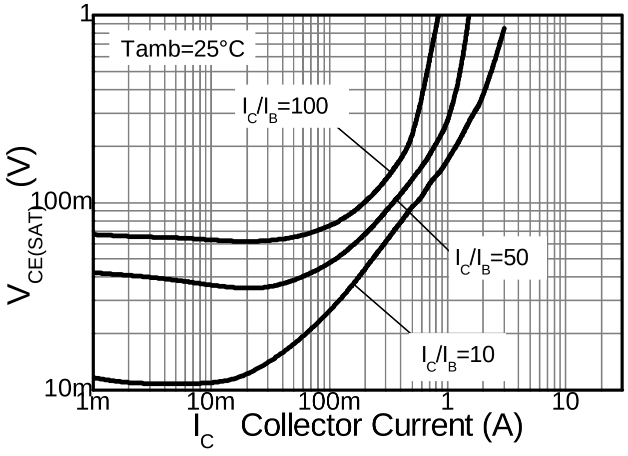
Derating Curve

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

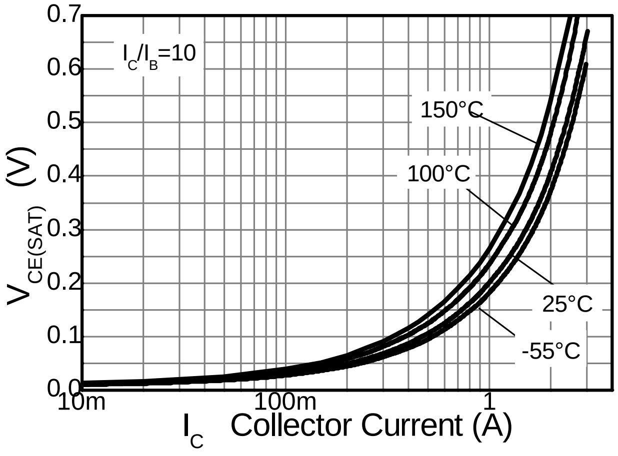
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	–	–	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	–	–	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	–	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	–	<1	100	nA	V_{CB} = 60V
Collector Cut-off Current	I_{CES}	–	<1	100	nA	V_{CES} = 60V
Emitter Cut-off Current	I_{EBO}	–	<1	100	nA	V_{EB} = 5.6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	– –	100 160	250 500	mV	I_C = 500mA, I_B = 50mA I_C =1A, I_B = 100mA
DC Current Gain (Note 9)	h_{FE}	100 100 80 30	140 150 120 40	– 300 – –		I_C = 1mA, V_{CE} = 5V I_C = 500mA, V_{CE} = 5V I_C = 1A, V_{CE} = 5V I_C = 2A, V_{CE} = 5V
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	–	830	1000	mV	I_C = 1A, V_{CE} = 5V
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	–	965	1100	mV	I_C = 1A, I_B = 100mA
Output Capacitance	C_{obo}	–	–	10	pF	V_{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f_T	150	–	–	MHz	V_{CE} = 10V, I_C = 50mA f = 100MHz

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

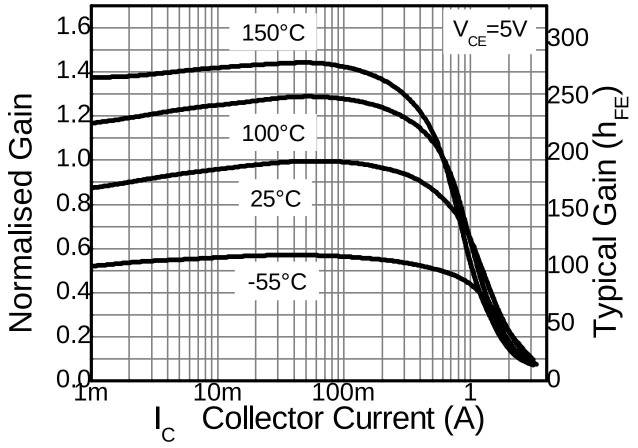
Typical Electrical Characteristics (@T$_A$ = +25°C, unless otherwise specified.)



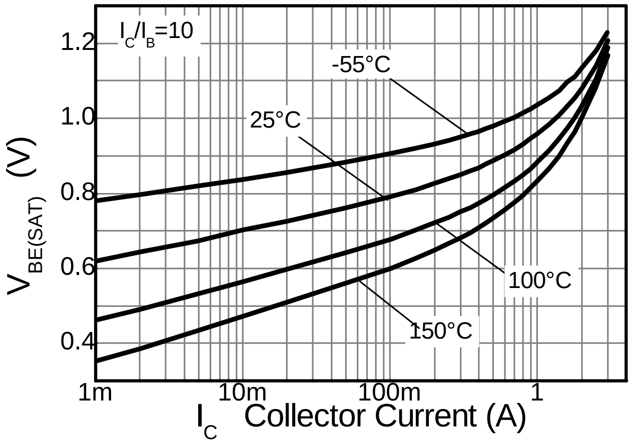
$V_{CE(SAT)}$ v I_C



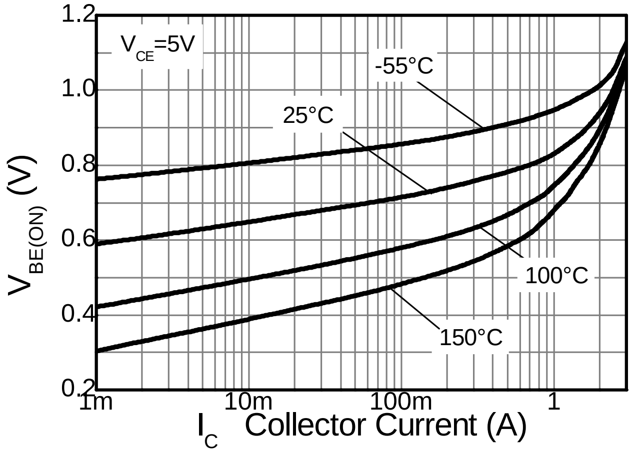
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

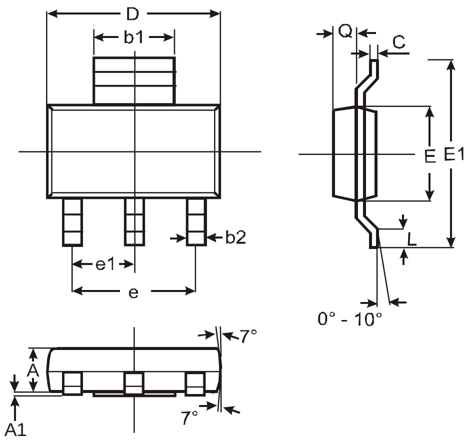


$V_{BE(SAT)}$ v I_C



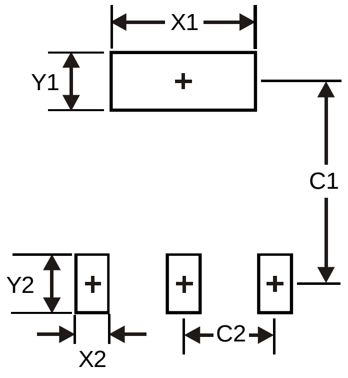
$V_{BE(ON)}$ v I_C

Package Outline Dimensions



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3