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} > -25V
- I_C = -3A High Continuous Current
- I_{CM} = -8A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -300mV @ -1A
- Complementary NPN Type: DIODES™ NK-FZT649

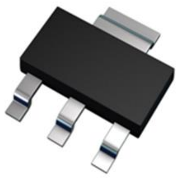
Mechanical Data

- Package: SOT223
- Package 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 ⓔ3
- Weight: 0.112 grams (Approximate)

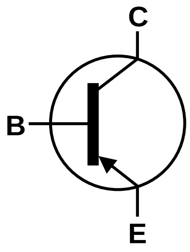
Applications

- MOSFET and IGBT gate driving

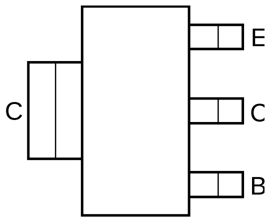
SOT223 (Type DN)



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}	-35	V
Collector-Emitter Voltage	V_{CEO}	-25	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-8	A

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

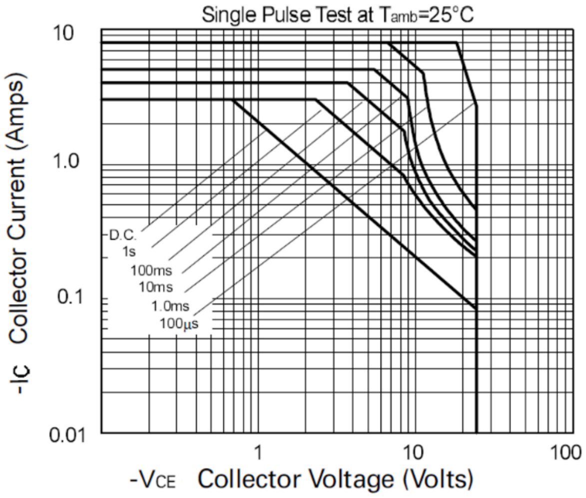
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3.0	W
	(Note 6)		2.0	
	(Note 7)		1.6	
	(Note 8)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
	(Note 6)		62.5	
	(Note 7)		78.1	
	(Note 8)		104	
Thermal Resistance Junction to Lead	(Note 9)	$R_{\theta JL}$	12.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

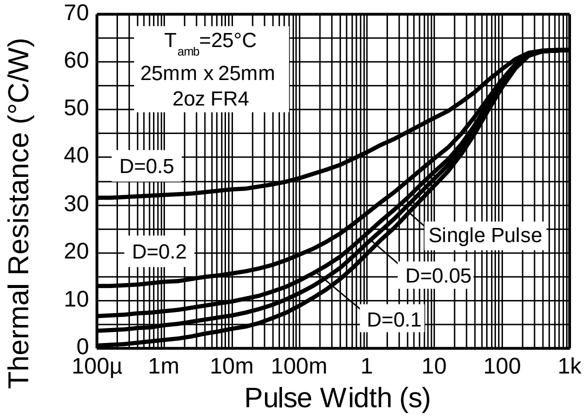
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 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 x 25mm 2oz copper.
7. Same as Note 5, except the device is mounted on 25mm x 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.

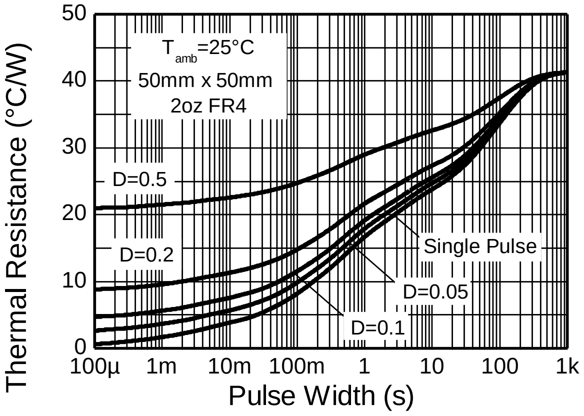
Thermal Characteristics and Derating Information



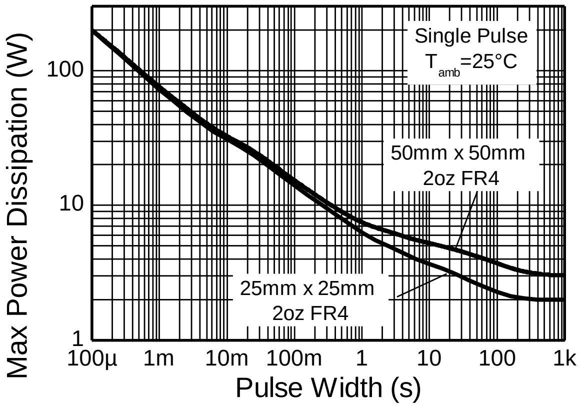
Safe Operating Area



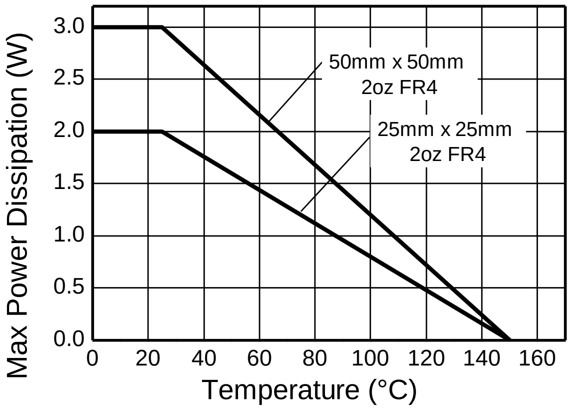
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



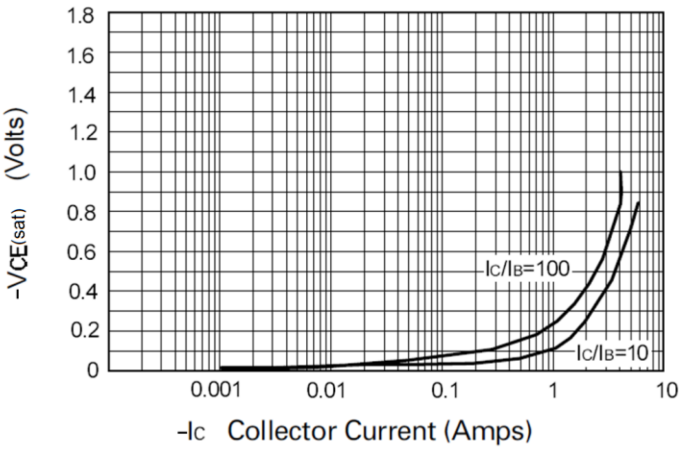
Derating Curve

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

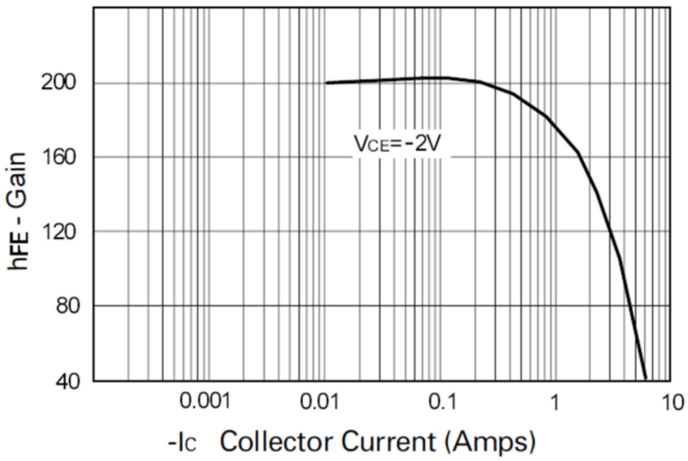
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-35	—	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-25	—	—	V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	$I_E = -100\mu A$
Collector Cut-Off Current	I_{CBO}	—	-1	-100	nA	$V_{CB} = -30V$
		—	—	-10	µA	$V_{CB} = -30V$, $T_A = +100°C$
Emitter Cut-Off Current	I_{EBO}	—	-1	-100	nA	$V_{EB} = -5.6V$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	—	-0.12	-0.3	V	$I_C = -1A$, $I_B = -100mA$
		—	-0.40	-0.6		$I_C = -3A$, $I_B = -300mA$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	—	-0.9	-1.25	V	$I_C = -1A$, $I_B = -100mA$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	—	-0.8	-1.0	V	$I_C = -1A$, $V_{CE} = -2V$
DC Current Gain (Note 11)	h_{FE}	70	200	—	—	$I_C = -50mA$, $V_{CE} = -2V$
		100	200	300		$I_C = -1A$, $V_{CE} = -2V$
		75	570	—		$I_C = -2A$, $V_{CE} = -2V$
		15	50	—		$I_C = -6A$, $V_{CE} = -2V$
Current Gain-Bandwidth Product (Note 11)	f_T	100	160	—	MHz	$V_{CE} = -5V$, $I_C = -100mA$, f = 100MHz
Turn-On Time	t_{on}	—	40	—	ns	$V_{CC} = -10V$, $I_C = -500mA$, $I_{B1} = -I_{B2} = -10mA$
Turn-Off Time	t_{off}	—	450	—	ns	
Output Capacitance	C_{obo}	—	55	100	pF	$V_{CB} = -10V$, f = 1MHz

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

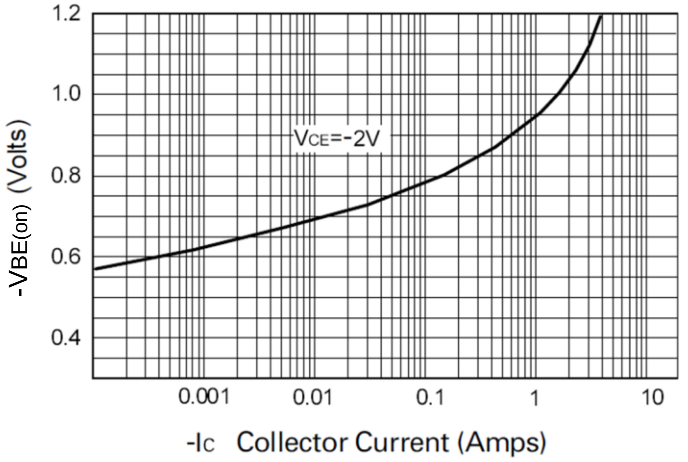
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



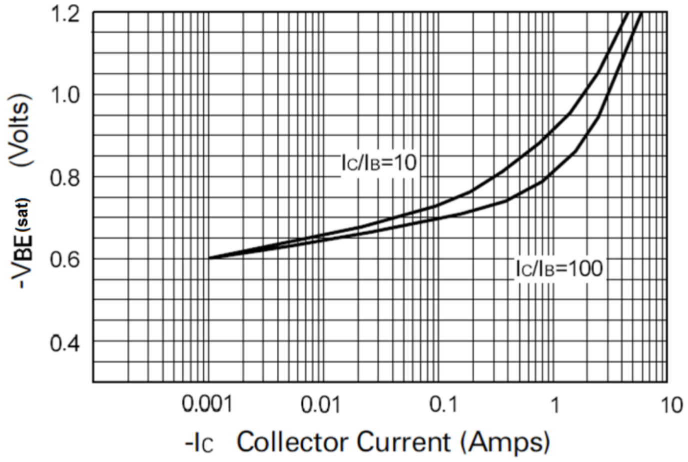
VCE(sat) v IC



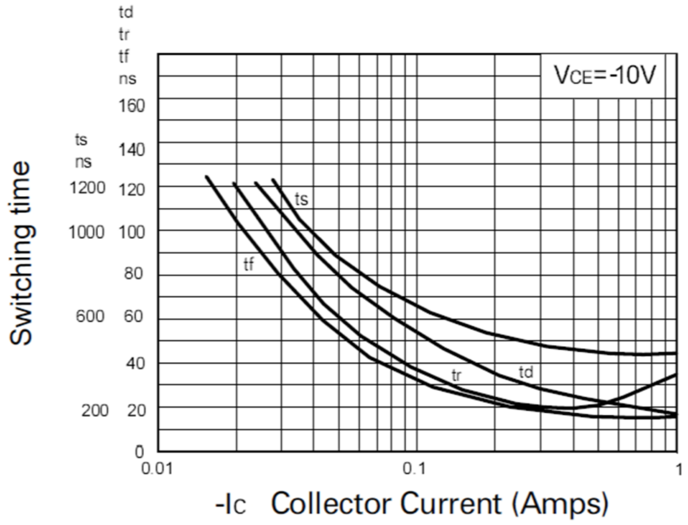
hFE v IC



VBE(on) v IC



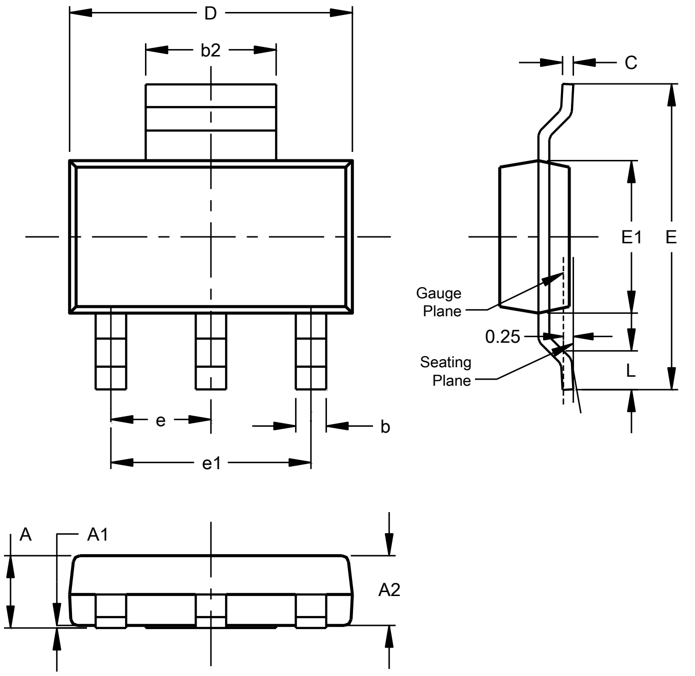
VBE(sat) v IC



Switching Speeds

Package Outline Dimensions

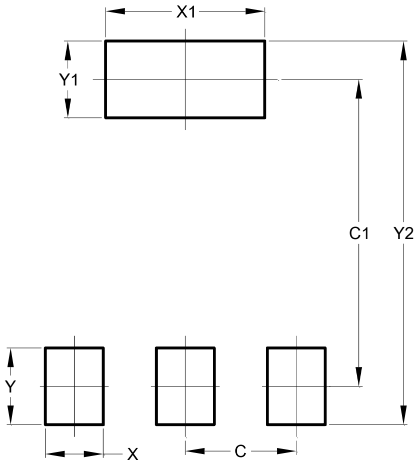
SOT223 (Type DN)



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