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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企业微信二维码

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Features

- BV_{CEO} > 45V
- BV_{CBO} > 45V
- I_C = 3.0A High Continuous Current
- hFE > 400 @ 1A and Low Saturation Voltage
- $R_{CE(SAT)}$ = 125mΩ @ 2A for Low Equivalent On-Resistance
- Very Low-Saturation Voltage

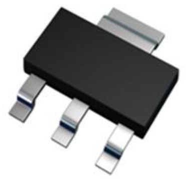
Mechanical Data

- 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)

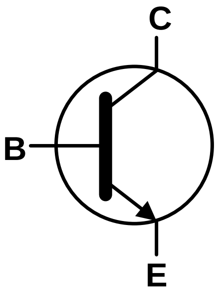
Applications

- Darlington Replacement
- Flash-Gun Convertors and Battery-Powered Circuits
- Siren Drivers, DC-DC Converters

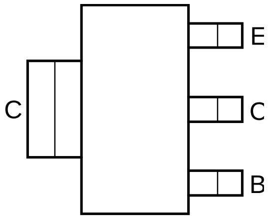
SOT223 (Type DN)



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}	45	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3	A
Peak Pulse Current	I_{CM}	6	A

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

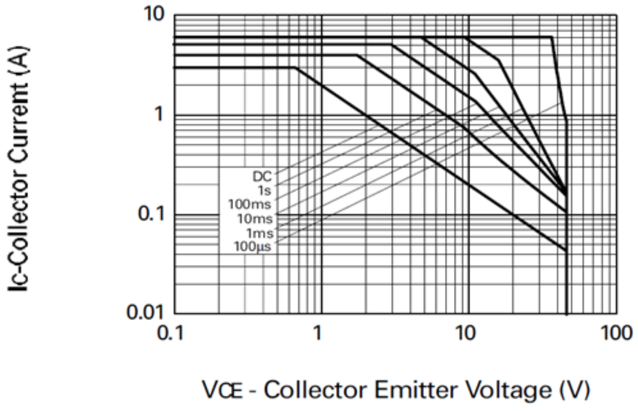
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	3.0	W
	(Note 7)		2.0	
	(Note 8)		1.6	
	(Note 9)		1.2	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	41.7	°C/W
	(Note 7)		62.5	
	(Note 8)		78.1	
	(Note 9)		104	
Thermal Resistance Junction to Lead	(Note 10)	$R_{\theta JL}$	12.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 11)

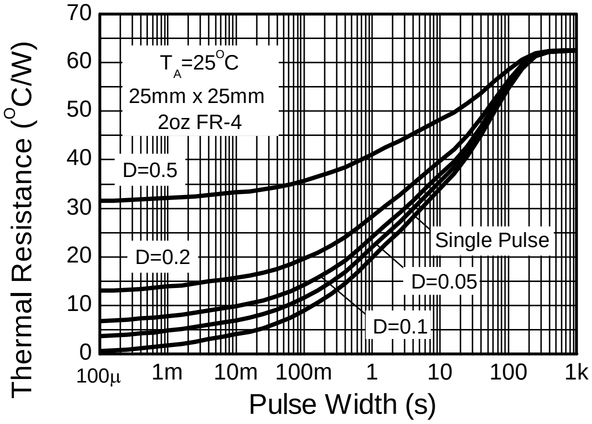
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
7. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
8. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
9. Same as Note 6, except the device is mounted on minimum recommended pad layout.
10. Thermal resistance from junction to solder-point (at the end of the collector lead).
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

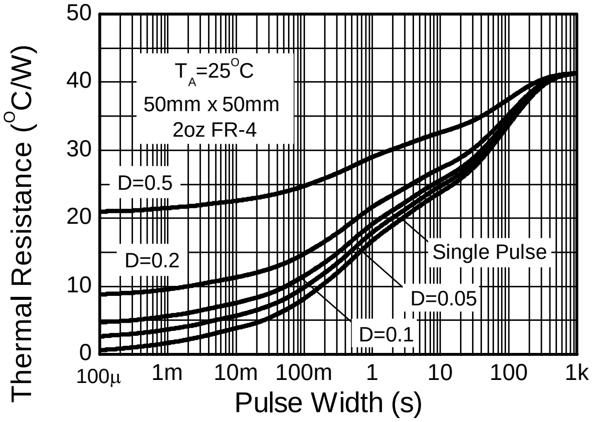
Thermal Characteristics and Derating Information



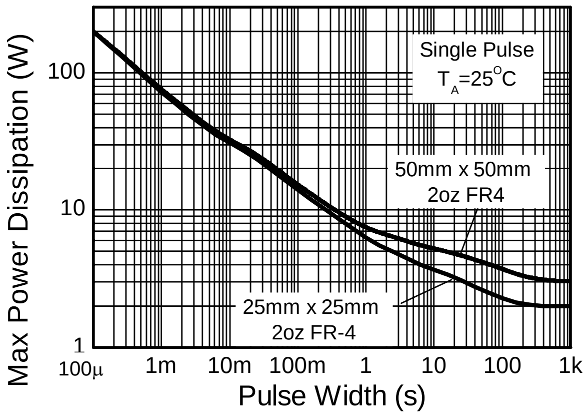
Safe Operating Area



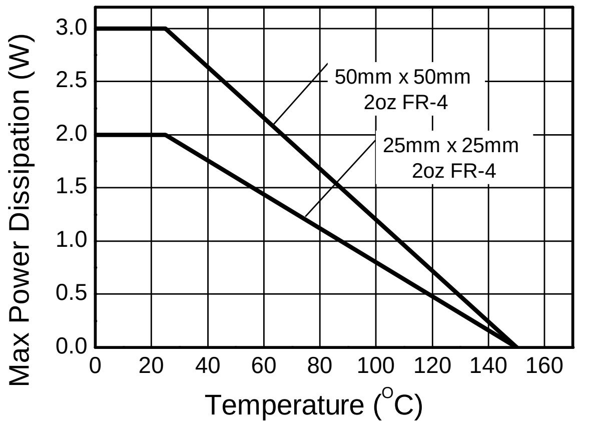
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



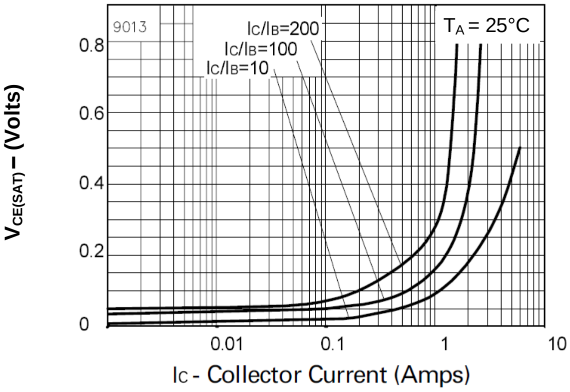
Derating Curve

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

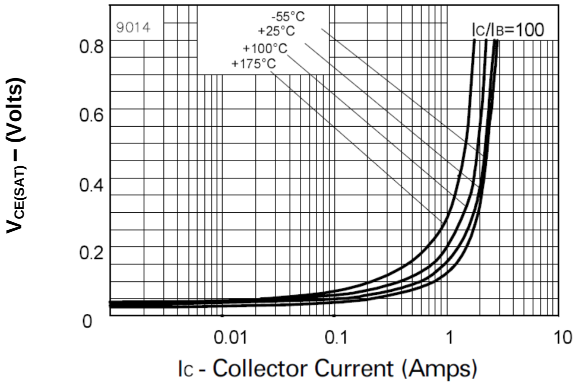
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	45	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	45	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA
Collector-Base Cut-Off Current	I_{CBO}	—	—	0.1	µA	V_{CB} = 35V
Emitter Cut-Off Current	I_{EBO}	—	—	0.1	µA	V_{EB} = 4V
DC Current Gain (Note 12)	h_{FE}	500 400 150 50	— — —	— — —	—	I_C = 0.1A, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 2A, V_{CE} = 2V I_C = 3A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(SAT)}$	— —	— —	0.10 0.50	V	I_C = 0.1A, I_B = 0.5mA I_C = 1A, I_B = 5mA
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(SAT)}$	—	—	0.9	V	I_C = 1A, I_B = 10mA
Base-Emitter Turn-On Voltage (Note 12)	$V_{BE(ON)}$	—	—	0.9	V	I_C = 1A, V_{CE} = 2V
Input Capacitance	C_{ibo}	—	200	—	pF	V_{EB} = 0.5V, f = 1MHz
Output Capacitance	C_{obo}	—	16	—	pF	V_{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f_T	150	—	—	MHz	V_{CE} = 5V, I_C = 50mA, f=50MHz
Turn-On Time	t_{ON}	—	33	—	ns	V_{CC} = 10V, I_C = 500mA I_{B1} = -I_{B2} = 50mA
Turn-Off Time	t_{OFF}	—	1,300	—	ns	

Note: 12. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

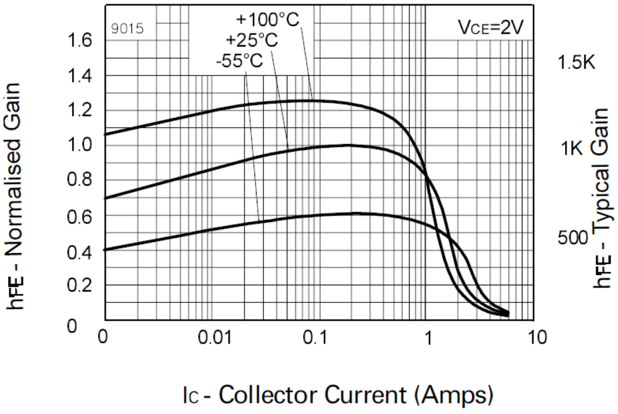
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



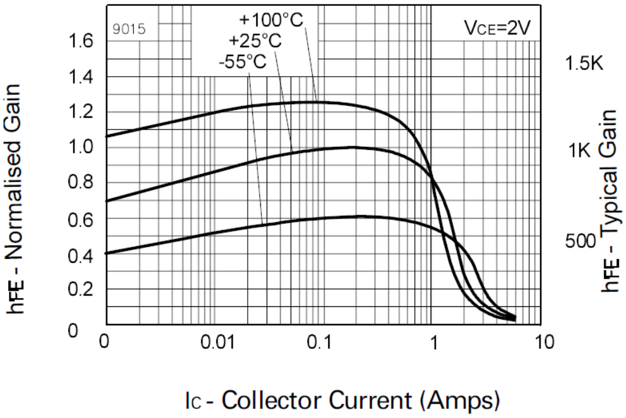
$V_{CE(SAT)}$ v I_C



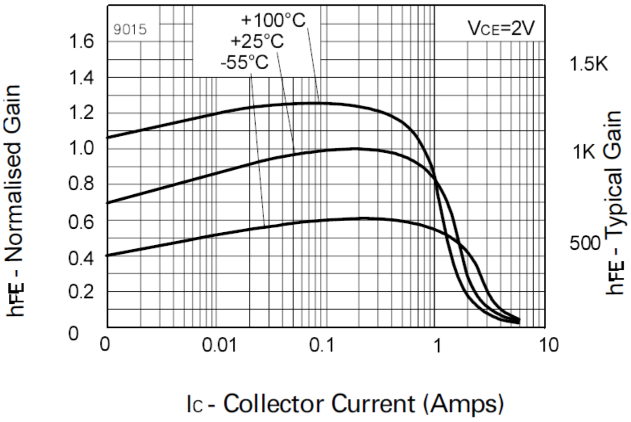
$V_{CE(SAT)}$ v I_C



hFE v IC



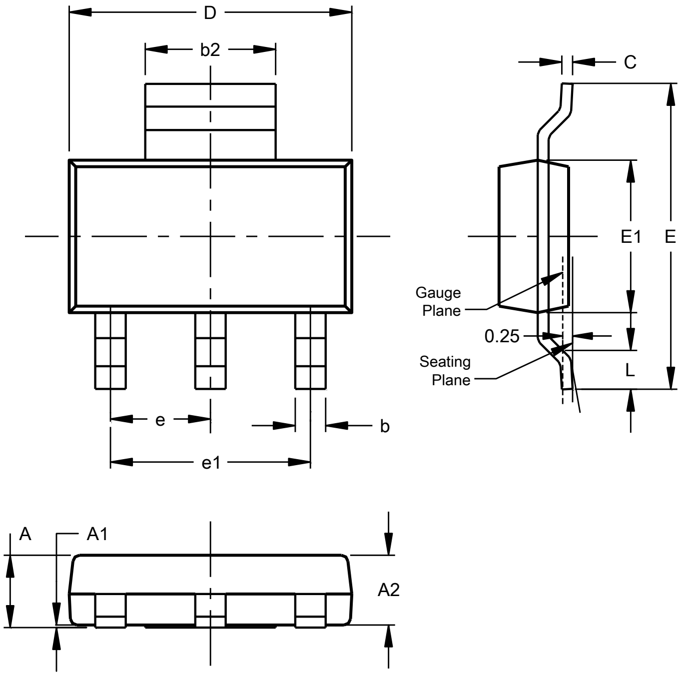
hFE v IC



hFE v IC

Package Outline Dimensions

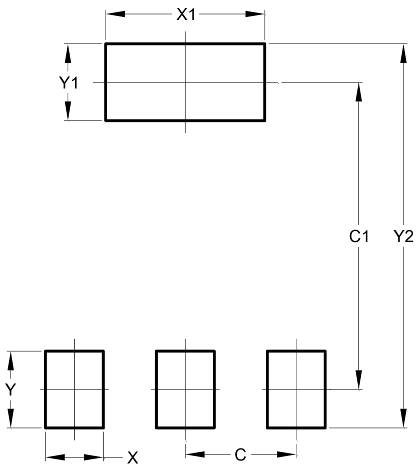
SOT223 (Type DN)



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