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

- $BV_{CEO} > 60V$
- $I_C = 3.0A$ High Continuous Current
- Extremely Low Equivalent On-Resistance; $R_{CE(SAT)}$ 62mΩ at 2A
- Complementary PNP Type: NK-DPLS350E

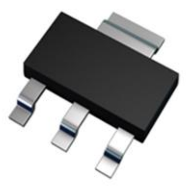
Mechanical Data

- 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)

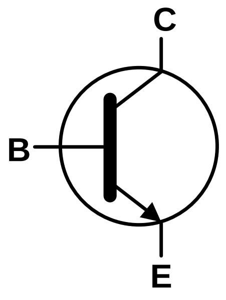
Applications

- Ideal for Medium Power Switching or Amplification Applications

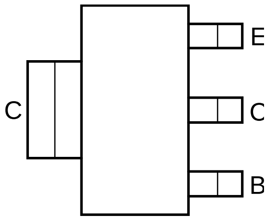
SOT223



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}	60	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	3	A
Peak Pulse Collector Current	I_{CM}	5	A
Peak Pulse Base Current	I_{BM}	1	A

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

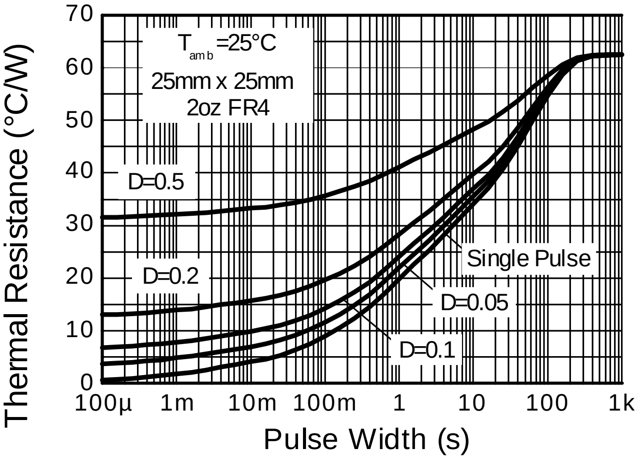
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3	W
	(Note 6)		2	
	(Note 7)		1	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
	(Note 6)		62.5	
	(Note 7)		125	
Thermal Resistance, Junction to Leads	(Note 8)	$R_{\theta JL}$	15	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

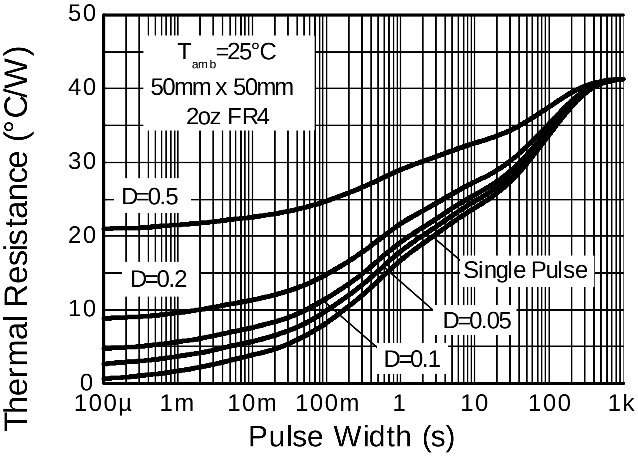
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

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 mounted on 25mm x 25mm 2oz copper.
7. Same as Note (5), except mounted on minimum recommended pad (MRP) layout.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

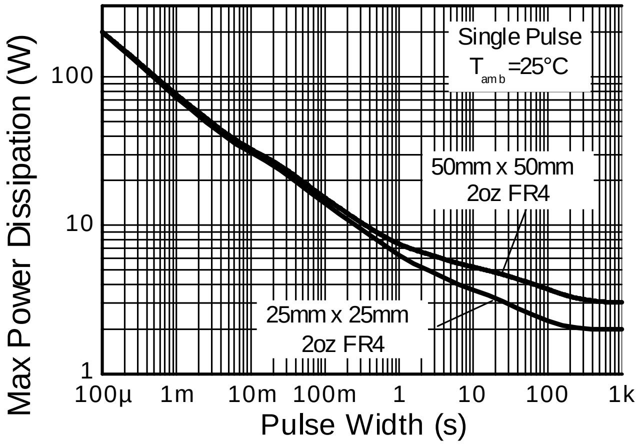
Thermal Characteristics and Derating Information



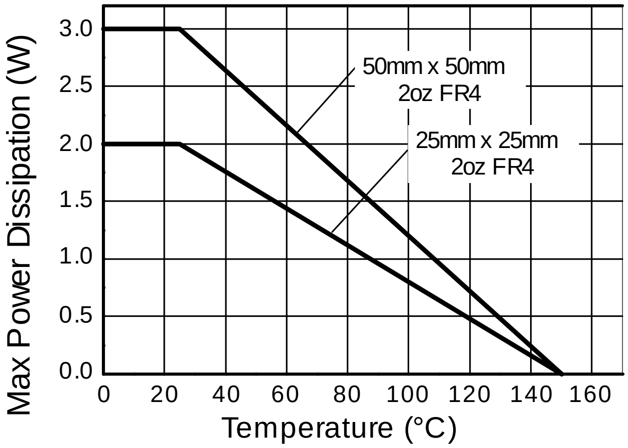
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	50	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	—	V	I_E = 100µA
Collector-Base Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB} = 50V, I_E = 0
		—	—	50	µA	V_{CB} = 50V, I_E = 0, T_A = +150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 10)						
DC Current Gain	h_{FE}	200	—	—	—	V_{CE} = 2V, I_C = 0.5A
		200	—	—		V_{CE} = 2V, I_C = 1A
		100	—	—		V_{CE} = 2V, I_C = 2A
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	90	mV	I_C = 0.5A, I_B = 50mA
		—	—	170		I_C = 1A, I_B = 50mA
		—	—	290		I_C = 2A, I_B = 200mA
Equivalent On-Resistance	$R_{CE(SAT)}$	—	62	145	mΩ	I_C = 2A, I_B = 200mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	1.2	V	I_C = 2A, I_B = 200mA
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	1.1	V	V_{CE} = 2V, I_C = 1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz
Output Capacitance	C_{obo}	—	—	30	pF	V_{CB} = 10V, f = 1MHz

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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

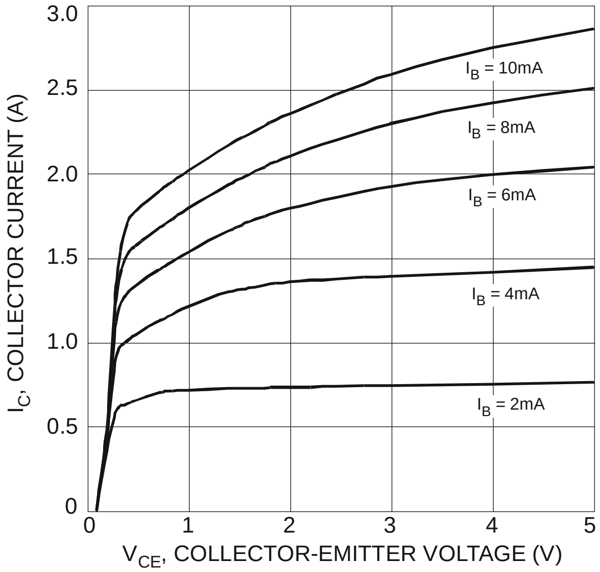


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

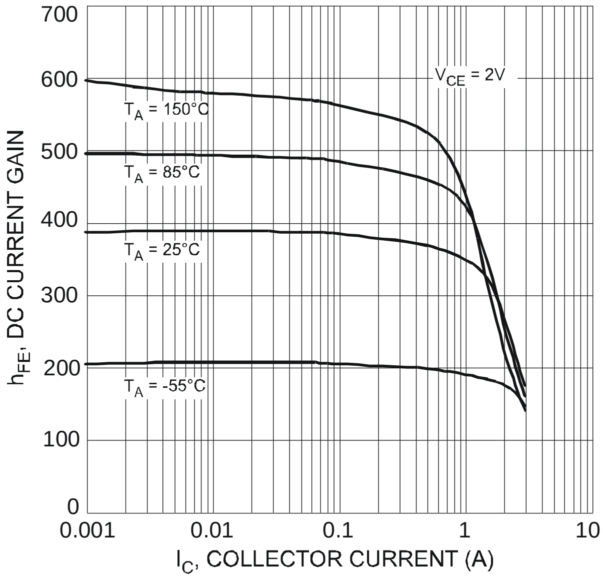


Fig. 3 Typical DC Current Gain vs. Collector Current

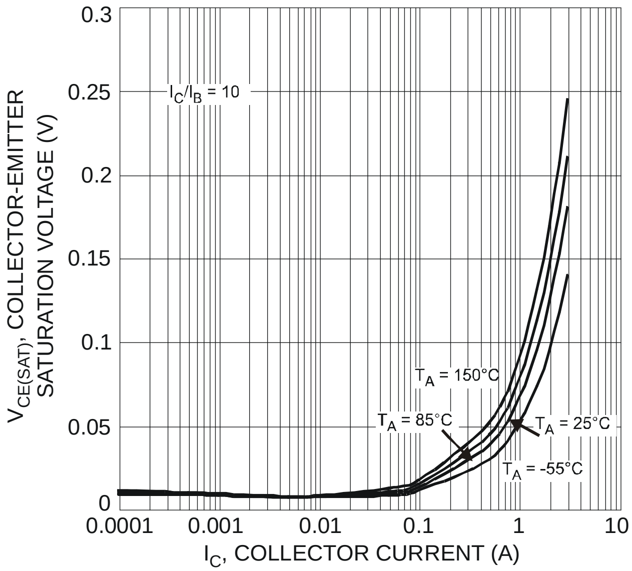


Fig. 4 Typical Collector-Emitter Saturation Voltage
vs. Collector Current

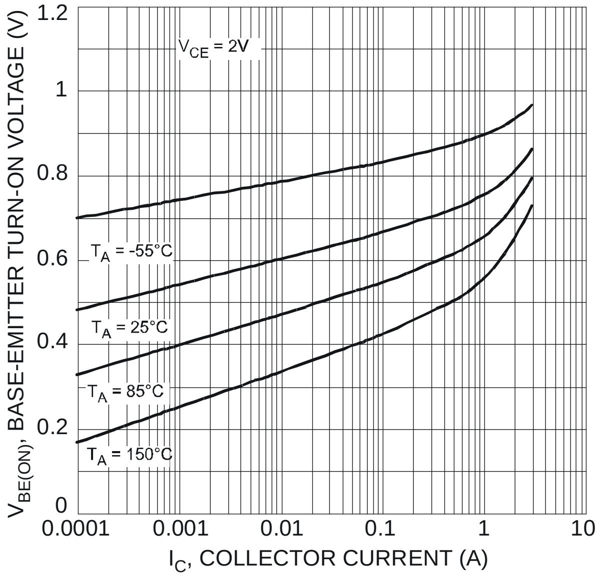


Fig. 5 Typical Base-Emitter Turn-On Voltage
vs. Collector Current

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

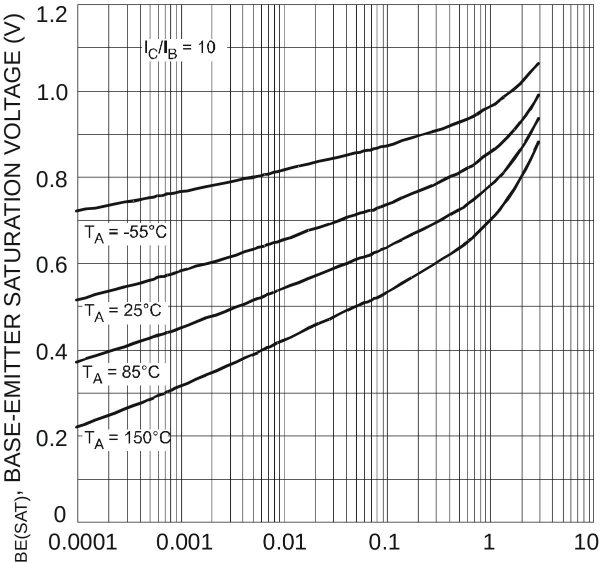


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

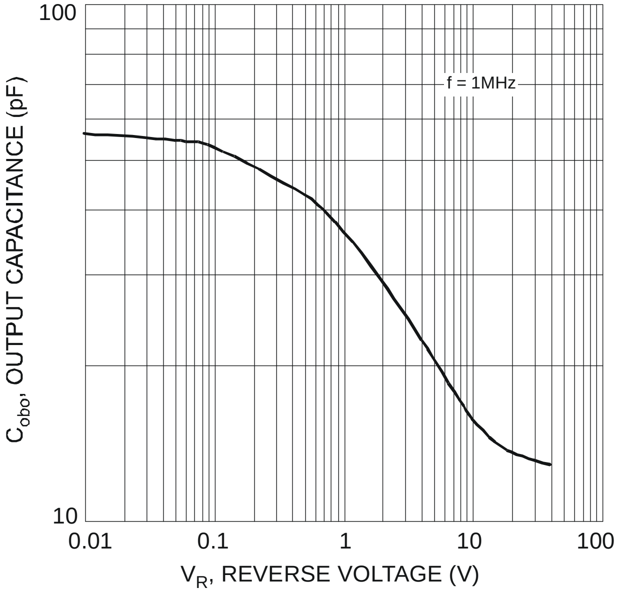


Fig. 7 Typical Output Capacitance Characteristics

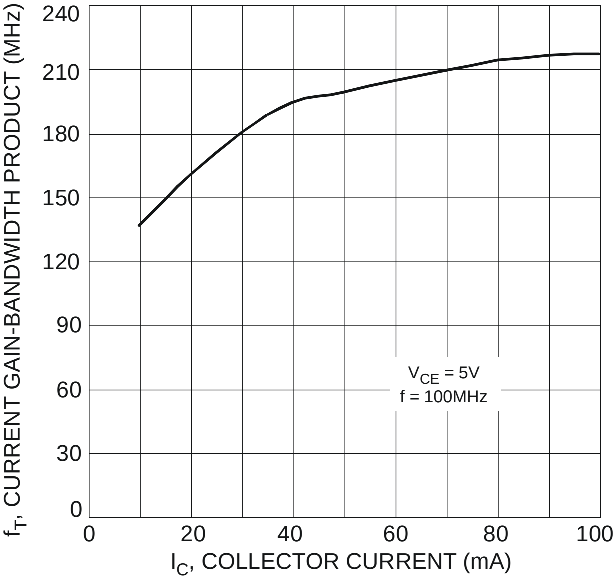
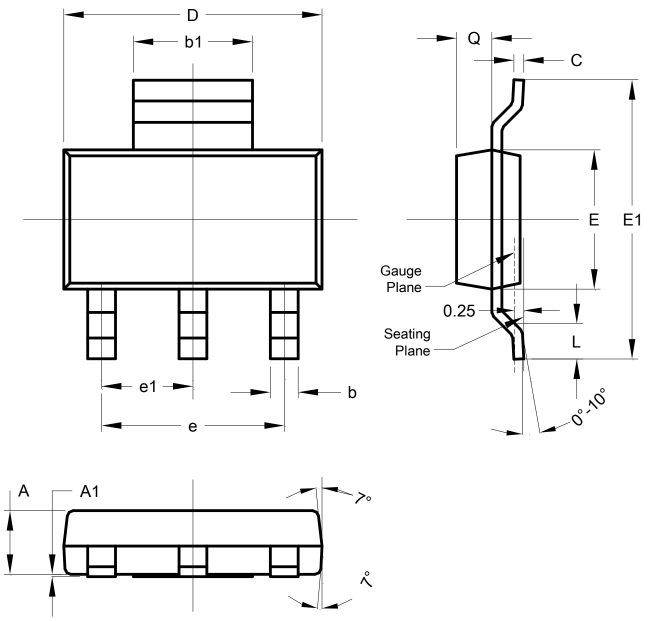


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

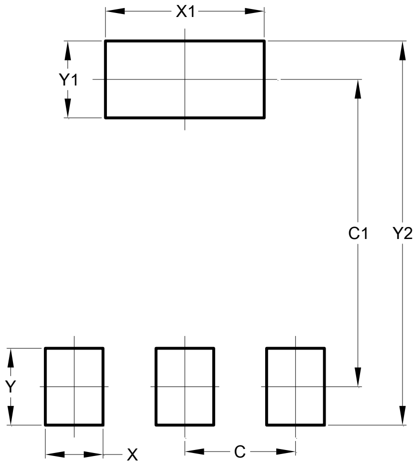
SOT223



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

SOT223



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