



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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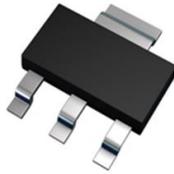
Features

- $BV_{CEO} > -140V$
- $I_C = -4A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -150mV @ -1A$
- h_{FE} Specified up to -10A for a High Gain Hold-up

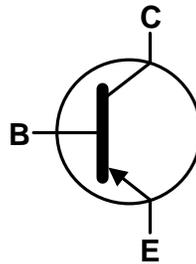
Mechanical Data

- 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 (3)
- Weight: 0.112 grams (Approximate)

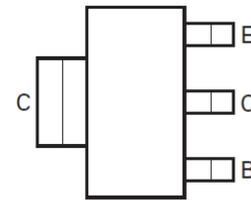
SOT223



Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-180	V
Collector-Emitter Voltage	V_{CEO}	-140	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-4	A
Peak Pulse Current	I_{CM}	-10	A

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

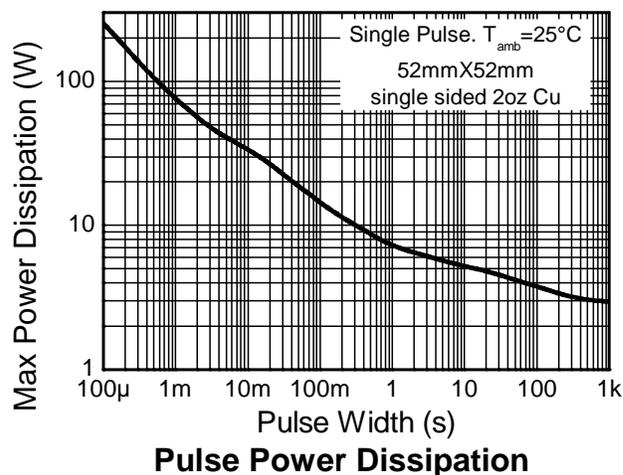
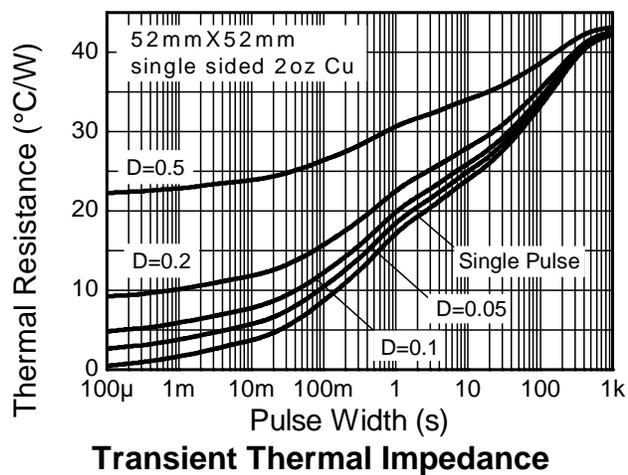
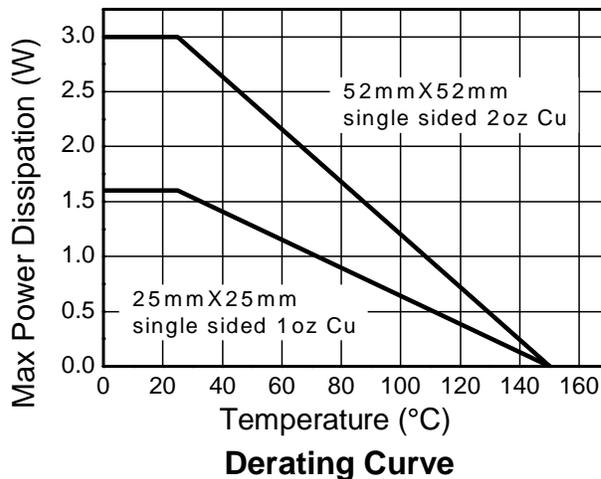
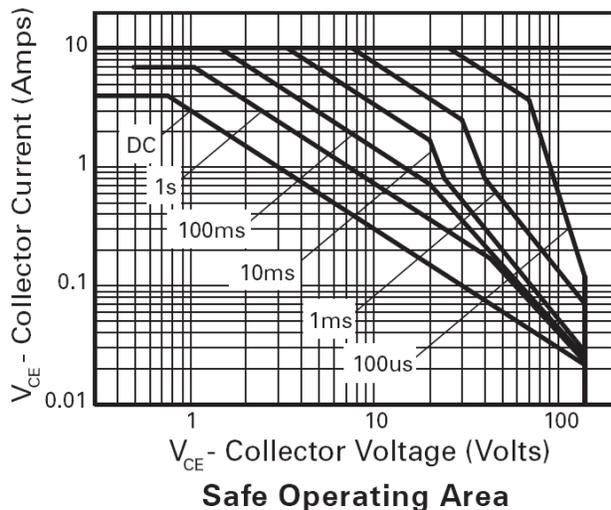
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3.0	W
			24	
Linear Derating Factor	(Note 6)		1.6	mW / $^\circ\text{C}$
			12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	$^\circ\text{C/W}$
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	(Note 7)	$R_{\theta JL}$	8.84	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 8)

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

- Notes:
5. For a device mounted with the collector lead on 52mm x 52mm 2oz copper on a single-sided 1.6mm FR4 PCB; the device is measured under still air conditions whilst operating in steady-state.
 6. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz 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

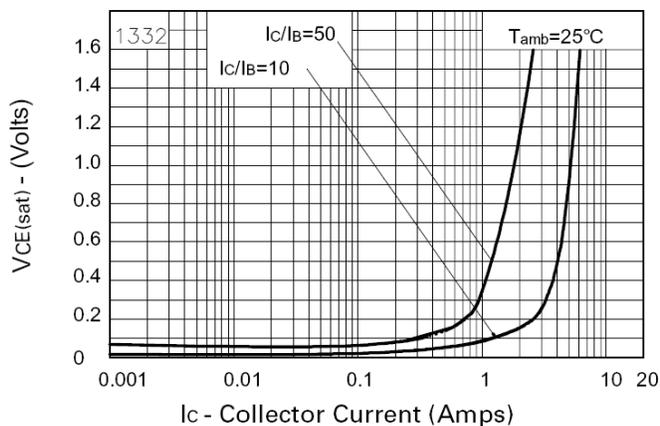


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

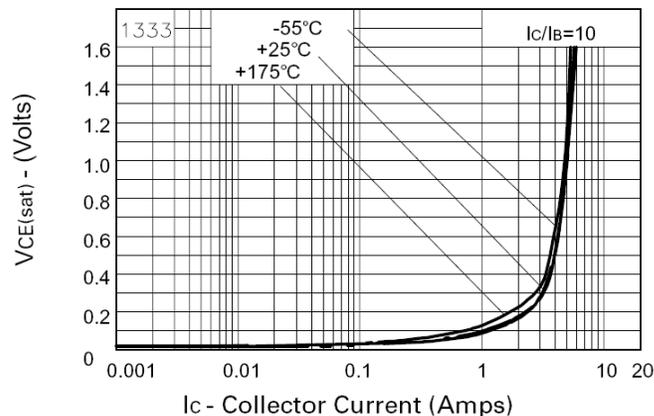
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-180	-210	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage	BV _{CER}	-180	-210	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-140	-170	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CB0}	—	<1	-50	nA	V _{CB} = -150V
		—	—	-1	μA	V _{CB} = -150V, T _A = +100°C
Collector Cut-Off Current	I _{CER} R ≤ 1kΩ	—	<1	-50	nA	V _{CE} = -150V
		—	—	-1	μA	V _{CE} = -150V, T _A = +100°C
Emitter Cut-Off Current	I _{EBO}	—	—	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	100	200	—	—	I _C = -10mA, V _{CE} = -5V
		100	200	300		I _C = -1A, V _{CE} = -5V
		75	140	—		I _C = -3A, V _{CE} = -5V
		—	10	—		I _C = -10A, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-30	-60	mV	I _C = -100mA, I _B = -5mA
		—	-70	-120		I _C = -500mA, I _B = -50mA
		—	-110	-150		I _C = -1A, I _B = -100mA
		—	-275	-370		I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-970	-1,110	mV	I _C = -3A, I _B = -300mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	-830	-950	mV	I _C = -3A, V _{CE} = -5V
Transitional Frequency (Note 9)	f _T	—	110	—	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{obo}	—	40	—	pF	V _{CB} = -20V, f = 1MHz
Switching Time	t _{ON}	—	68	—	ns	V _{CC} = -50V, I _C = -1A, -I _{B1} = I _{B2} = -100mA
	t _{OFF}	—	1,030	—		

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

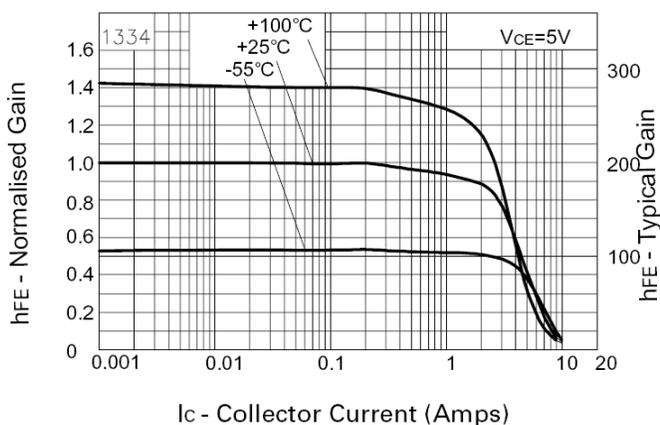
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



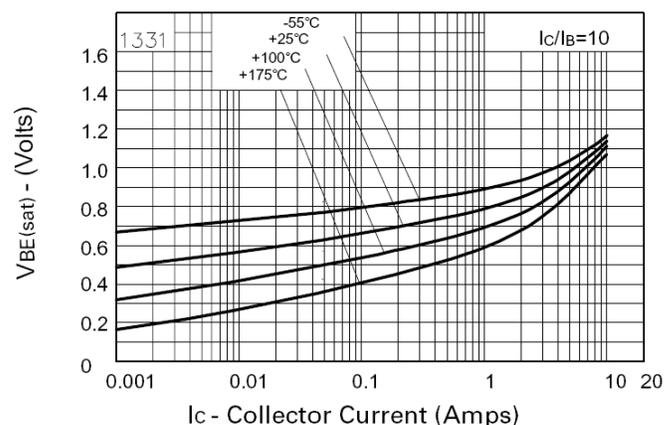
VCE(sat) v IC



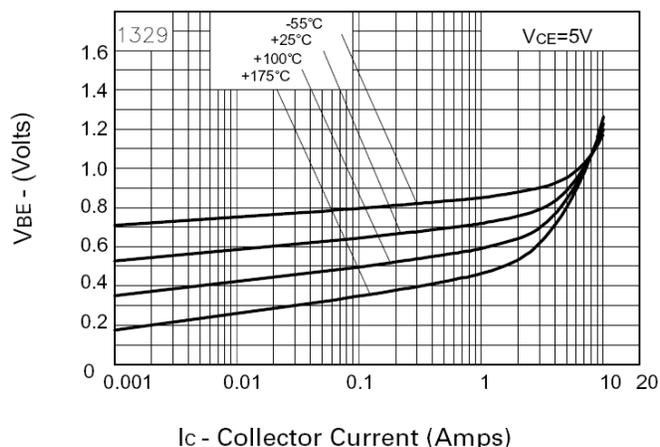
VCE(sat) v IC



hFE v IC



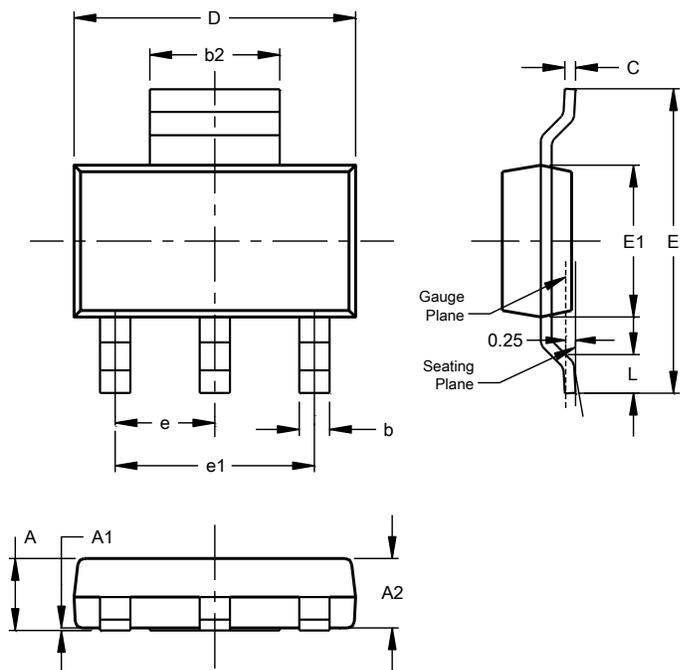
VBE(sat) v IC



VBE(on) v IC

Package Outline Dimensions

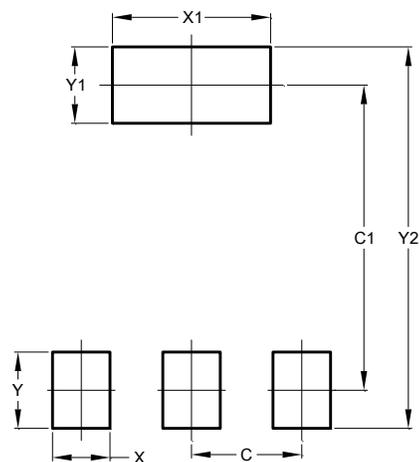
SOT223 (Type DN)



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