



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

- $BV_{CEO} > -100V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -115mV @ -1A$
- $R_{CE(sat)} = 75m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified up to $-10A$ for a High Gain Hold-up
- Complementary NPN Type: DIODES™ NK-FZT853

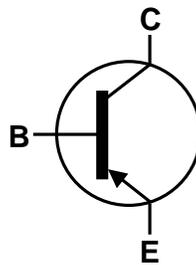
Mechanical Data

- 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)

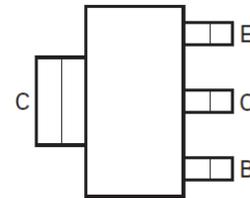
SOT223 (Type DN)



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 _{CB0}	-140	V
Collector-Emitter Voltage	V _{CEO}	-100	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-5	A
Peak Pulse Current	I _{CM}	-10	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	3.0	W
		24	
		1.6	mW/°C
		12.8	
Thermal Resistance, Junction to Ambient	R _{θJA}	42	°C/W
	R _{θJA}	78	
Thermal Resistance, Junction to Lead	R _{θJL}	8.84	
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	≥ 4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
5. For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as Note 5, except the device is surface mounted on 25mm x 25mm with 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

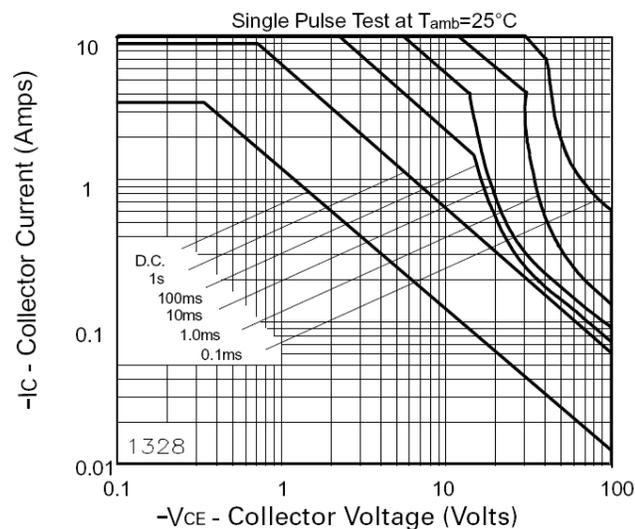


Figure 1. Safe Operating Area

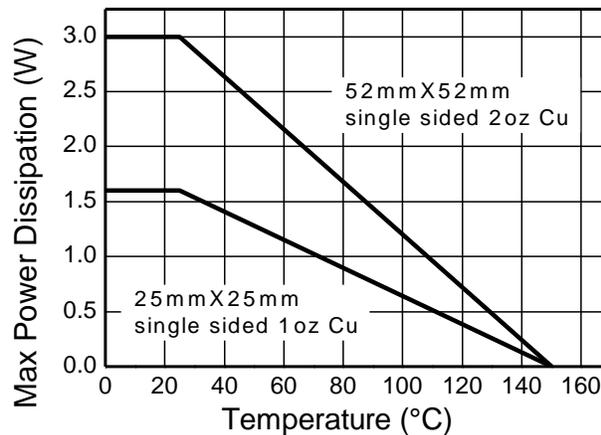


Figure 2. Derating Curve

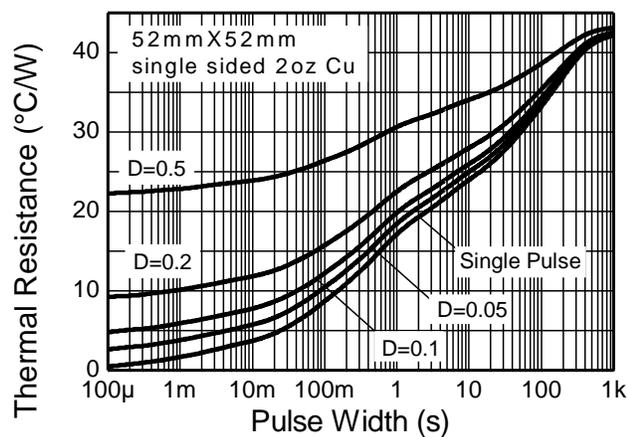


Figure 3. Transient Thermal Impedance

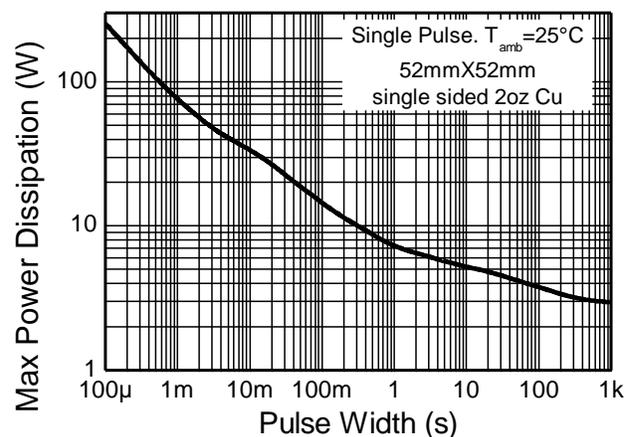


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-140	-170	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-140	-170	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-100	-120	—	V	I _C = -1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8	—	V	I _E = -100μA
Collector Cutoff Current	I _{CB0}	—	<-1	-50	nA	V _{CB} = -100V
		—	—	-1	μA	V _{CB} = -100V, T _A = +100°C
Collector Cutoff Current	I _{CER}	—	<-1	-50	nA	V _{CE} = -100V, R ≤ 1kΩ
		—	—	-1	μA	V _{CE} = -100V, T _A = +100°C
Emitter Cutoff Current	I _{EBO}	—	<-1	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	100	200	—	—	I _C = -10mA, V _{CE} = -1V
		100	200	300		I _C = -1A, V _{CE} = -1V
		50	90	—		I _C = -3A, V _{CE} = -1V
		30	50	—		I _C = -4A, V _{CE} = -1V
		—	15	—		I _C = -10A, V _{CE} = -1V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-20	-50	mV	I _C = -100mA, I _B = -10mA
		—	-90	-115		I _C = -1A, I _B = -100mA
		—	-160	-220		I _C = -2A, I _B = -200mA
		—	-300	-420		I _C = -4A, I _B = -400mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-1,010	-1,170	mV	I _C = -4A, I _B = -400mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	-925	-1,160	mV	I _C = -4A, V _{CE} = -1V
Transitional Frequency	f _T	—	125	—	MHz	I _C = -100mA, V _{CE} = -10V f = 50MHz
Output Capacitance	C _{obo}	—	65	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{on}	—	110	—	ns	V _{CC} = -10V, I _C = -2A I _{B1} = -I _{B2} = -200mA
	t _{off}	—	460	—		

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

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

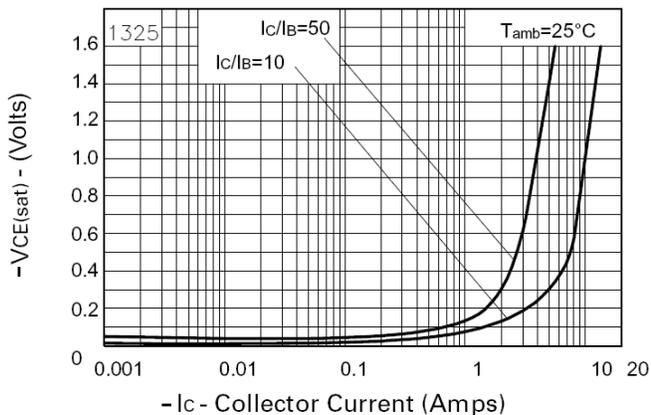


Figure 5. $V_{CE(sat)}$ v I_c

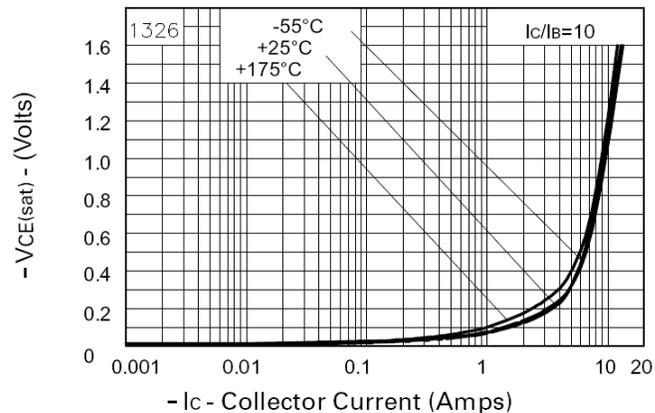


Figure 6. $V_{CE(sat)}$ v I_c

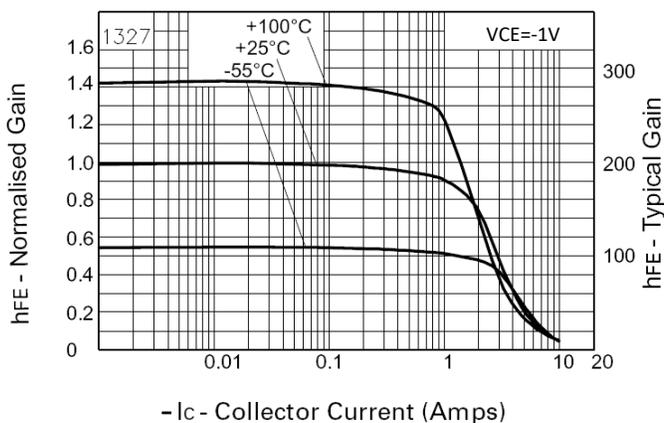


Figure 7. h_{FE} v I_c

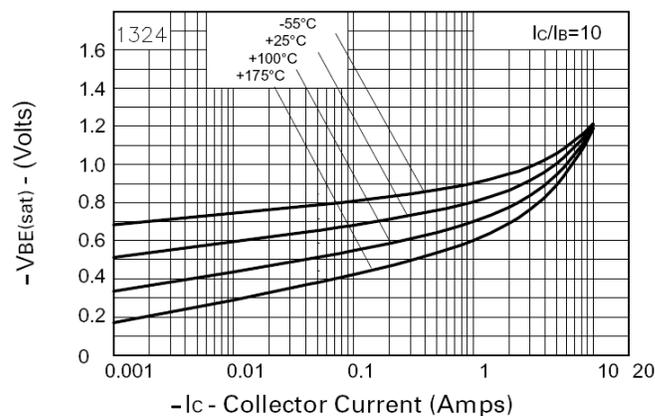


Figure 8. $V_{BE(sat)}$ v I_c

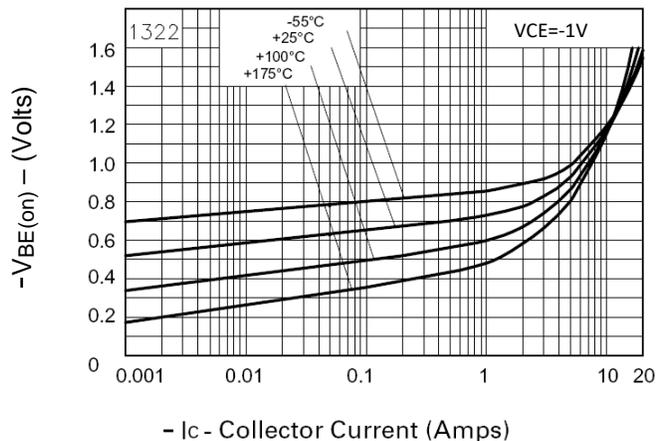
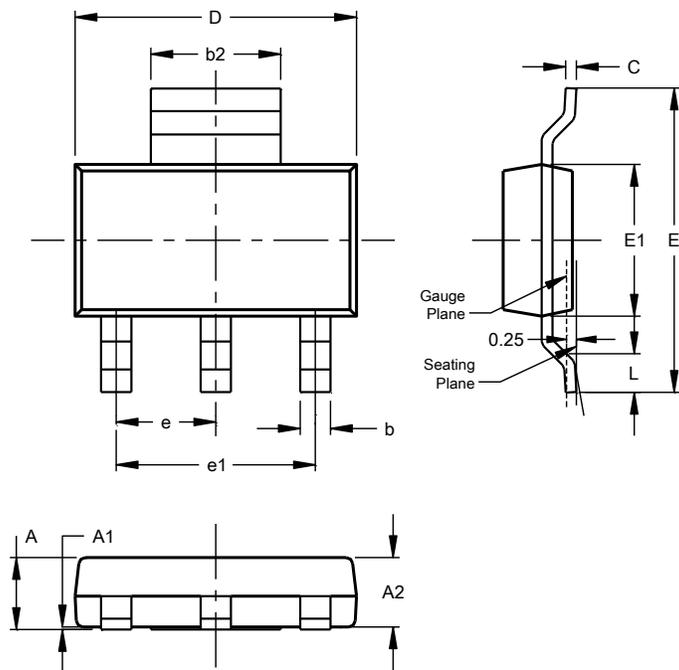


Figure 9. $V_{BE(on)}$ v I_c

Package Outline Dimensions

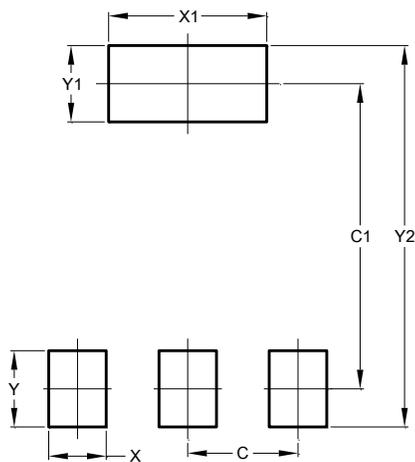
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Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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