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

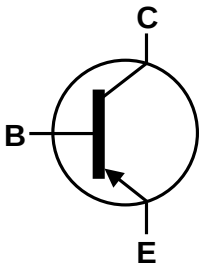
- BV_{CEO} > -100V
- BV_{ECO} > -7V
- I_C = -1A Continuous Collector Current
- I_{CM} = -3A Peak Collector Current
- $V_{CE(SAT)}$ < -225mV @ -1A
- $R_{CE(SAT)}$ = 155mΩ for a Low Equivalent On-Resistance
- Complementary NPN Type: NK-ZXTN25100DZ

Mechanical Data

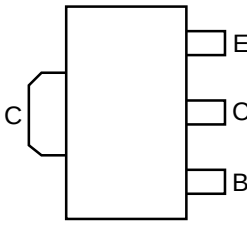
- Case: SOT89
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.05 grams (Approximate)

SOT89

Top View



Device Symbol



Top View
Pin Out

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	-115	V
Collector-Emitter Voltage	V_{CEO}	-100	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	-7	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-1	A
Peak Pulse Current	I_{CM}	-3	A
Base Current	I_B	-500	mA

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

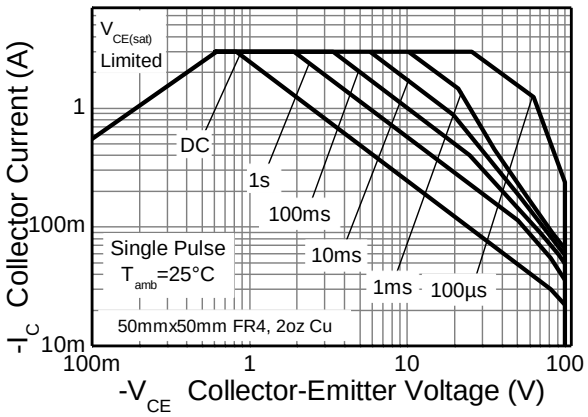
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	1.1 8.8	W mW/°C
	(Note 6)		1.8 14.4	
	(Note 7)		2.4 19.2	
	(Note 8)		4.46 35.7	
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	117	°C/W
	(Note 6)		68	
	(Note 7)		51	
	(Note 8)		28	
Thermal Resistance, Junction to Lead	(Note 9)	$R_{\theta JL}$	7.95	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

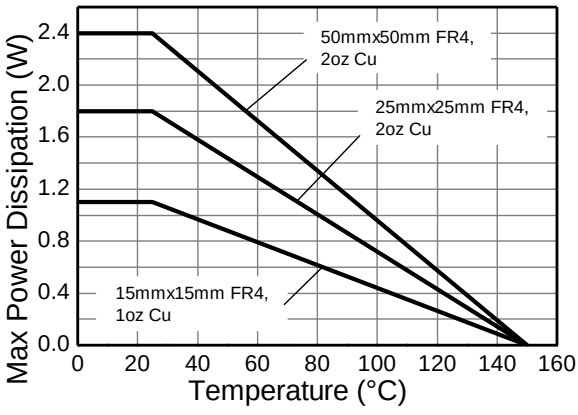
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 0.6mm 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 50mm x 50mm 2oz copper.
8. Same as Note 7, except the device is measured at t<5 seconds.
9. Thermal resistance from junction to solder-point (on the exposed collector pad).
10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

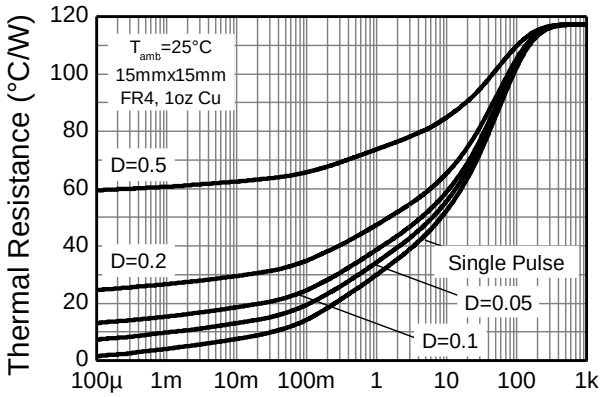


Safe Operating Area

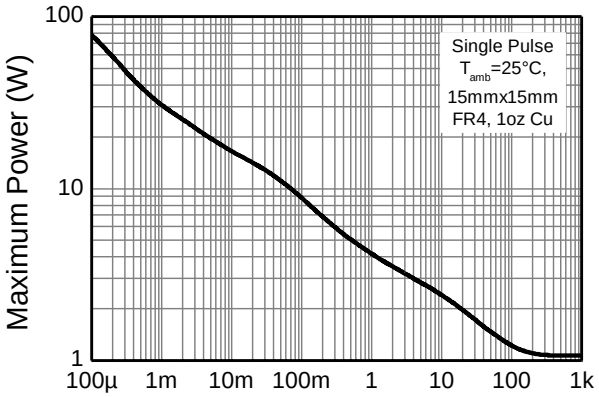


Derating Curve

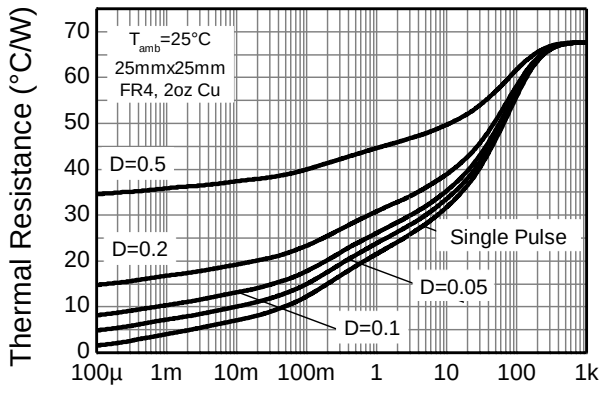
Thermal Characteristics and Derating Information (Continued)



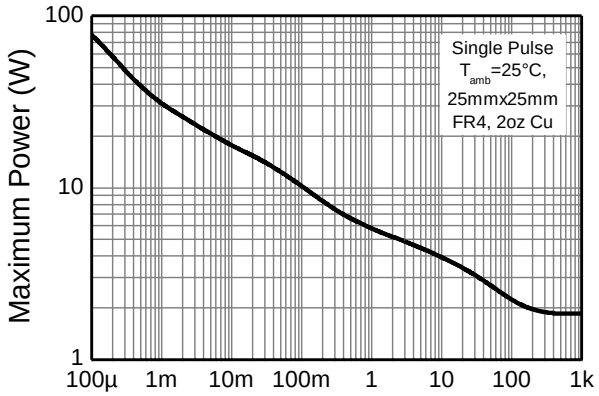
Transient Thermal Impedance



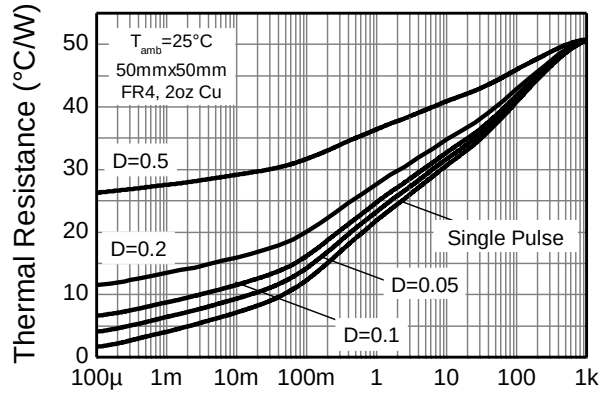
Pulse Power Dissipation



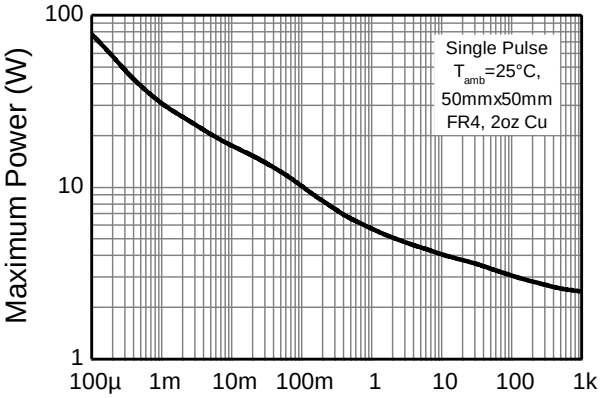
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



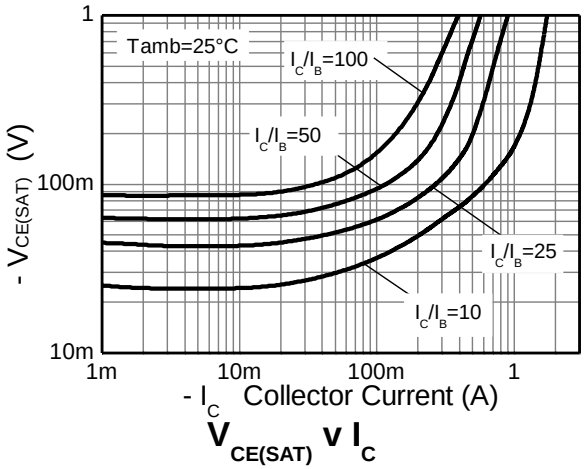
Pulse Power Dissipation

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

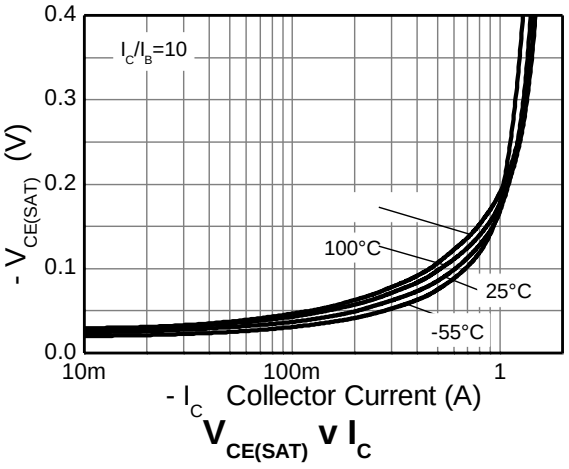
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-115	-180	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-100	-140	—	V	I_C = -10mA
Emitter-Collector Breakdown Voltage (reverse blocking)	BV_{ECX}	-7	-8.3	—	V	I_E = -100μA, R_{BC} <1kΩ or -0.25V > V_{BC} > 0.25V
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECO}	-7	-8.8	—	V	I_E = -100μA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.4	—	V	I_E = -100μA
Collector-Base Cutoff Current	I_{CBO}	—	<-1	-50 -0.5	nA μA	V_{CB} = -115V V_{CB} = -115V, T_A = +100°C
Collector-Emitter Cutoff Current	I_{CEX}	—	—	-100	nA	V_{CE} = -90V, R_{BE} <1kΩ or -0.25V < V_{BE} < 1V
Emitter Cutoff Current	I_{EBO}	—	<1	-50	nA	V_{EB} = -5.6V
DC current transfer Static ratio (Note 11)	h_{FE}	200 180 110 20	350 320 190 35	500 — — —	—	I_C = -10mA, V_{CE} = -2V I_C = -100mA, V_{CE} = -2V I_C = -500mA, V_{CE} = -2V I_C = -1A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(SAT)}$	—	-140 -80 -180 -155	-210 -115 -315 -225	mV	I_C = -100mA, I_B = -1mA I_C = -500mA, I_B = -50mA I_C = -500mA, I_B = -20mA I_C = -1A, I_B = -100mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(SAT)}$	—	-860	-950	mV	I_C = -1A, I_B = -100mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(ON)}$	—	-800	-900	mV	I_C = -1A, V_{CE} = -2V
Transitional Frequency	f_T	—	180	—	MHz	I_E = -20mA, V_{CE} = -15V f = 100MHz
Input Capacitance	C_{IBO}		153	—	pF	V_{EB} = -0.5V, f = 1MHz,
Output Capacitance	C_{OBO}	—	14.1	20	pF	V_{CB} = -10V, f = 1MHz,
Delay Time	t_D	—	15.8	—	ns	I_C = -500mA, V_{CC} = -10V, I_{B1} = -I_{B2} = -50mA
Rise Time	t_R	—	41	—	ns	
Storage Time	t_S	—	411	—	ns	
Fall Time	t_F	—	89	—	ns	

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

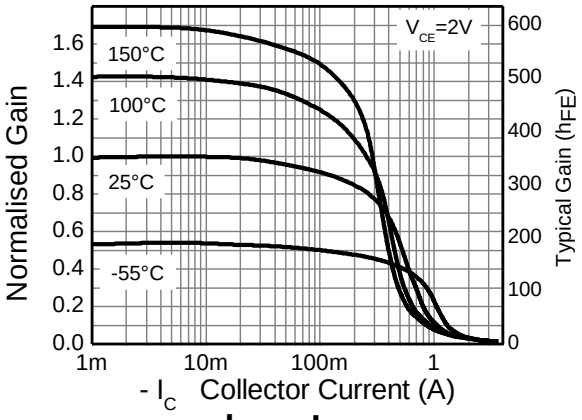
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



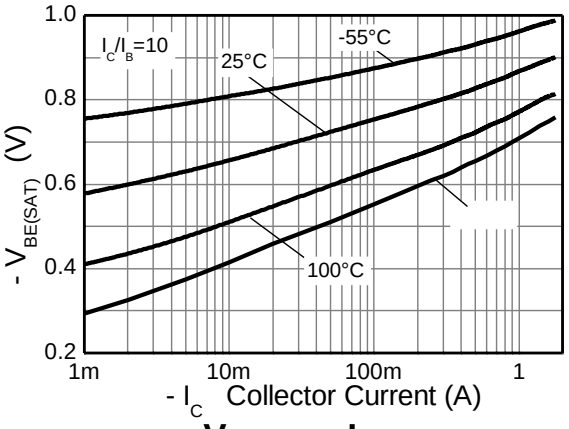
$V_{CE(SAT)}$ v I_C



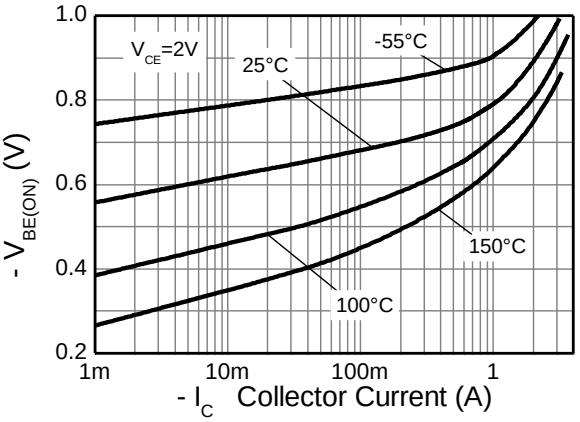
$V_{CE(SAT)}$ v I_C



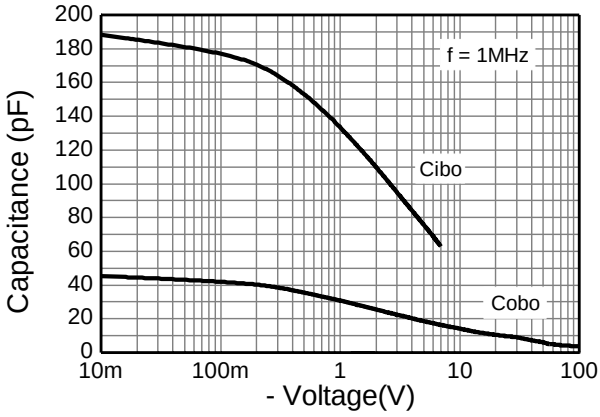
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



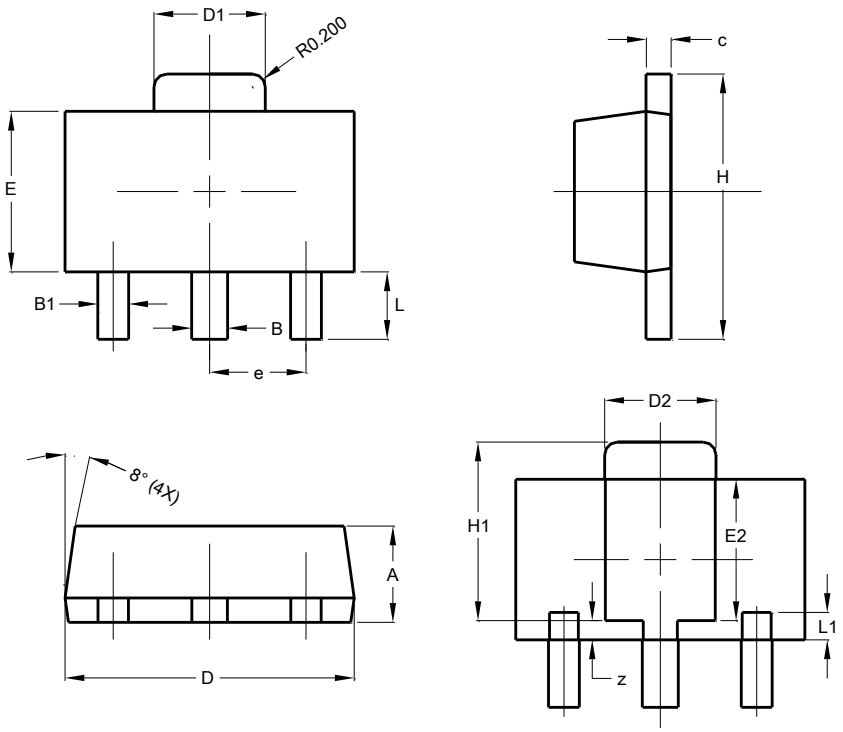
$V_{BE(ON)}$ v I_C



Capacitance v Voltage

Package Outline Dimensions

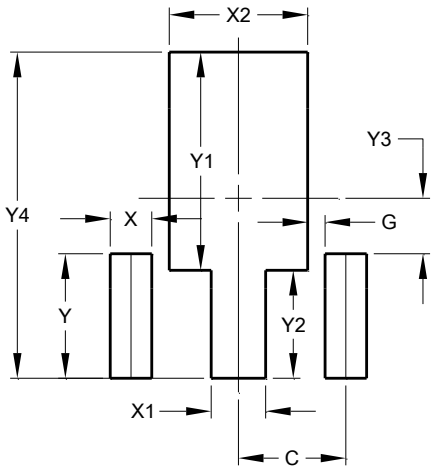
SOT89



SOT89			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

Suggested Pad Layout

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.