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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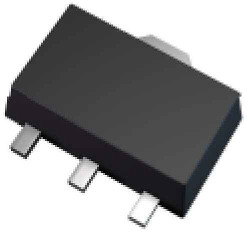
Features

- BV_{CEO} > -100V
- BV_{ECO} > -7V
- I_C = -2A High Continuous Collector Current
- I_{CM} = -3A Peak Collector Current
- $V_{CE(SAT)}$ < 130mV @ -1A
- $R_{CE(SAT)}$ = 100mΩ for a Low Equivalent On-Resistance
- Complementary NPN Type: NK-ZXTN19100CZ

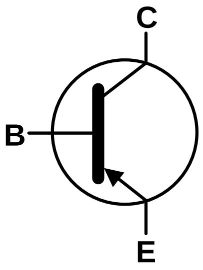
Mechanical Data

- 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)

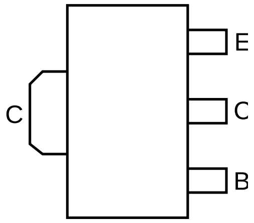
SOT89



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}	-110	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	-110	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	-2	A
Peak Pulse Current	I_{CM}	-3	A
Base Current	I_B	-1	A

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

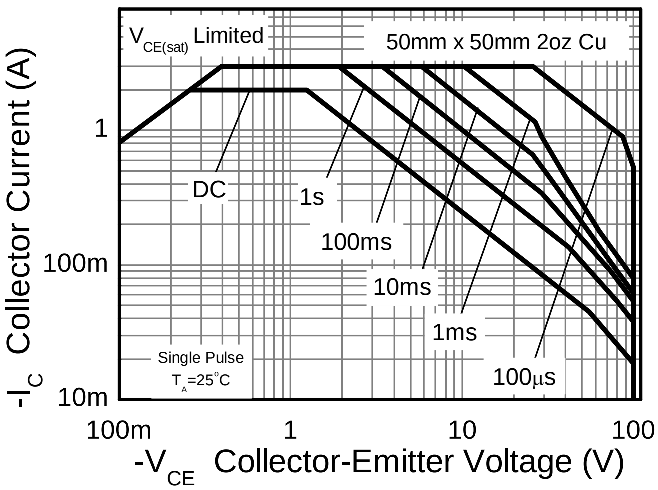
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P_D	1.1 8.8	W mW/°C
	(Note 7)		1.8 14.4	
	(Note 8)		2.4 19.2	
	(Note 9)		4.46 35.7	
Thermal Resistance, Junction to Ambient Air	(Note 6)	$R_{\theta JA}$	117	°C/W
	(Note 7)		68	
	(Note 8)		51	
	(Note 9)		28	
Thermal Resistance, Junction to Lead	(Note 10)	$R_{\theta JL}$	4.7	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 11)

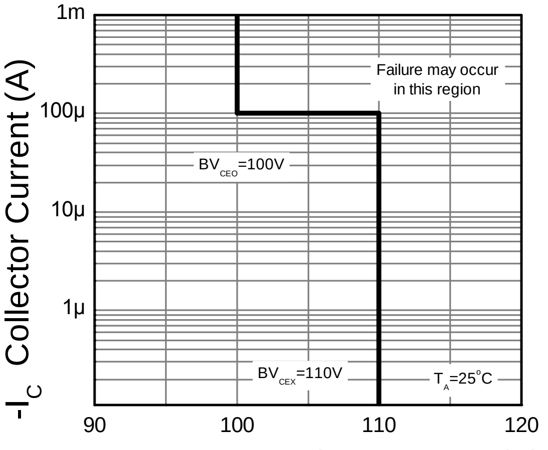
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 0.6mm 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 1oz copper.
8. Same as Note 6, except the device is mounted on 50mm x 50mm 2oz copper.
9. Same as Note 8, except the device is measured at t<5 seconds.
10. Thermal resistance from junction to solder-point (on the exposed collector pad).
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

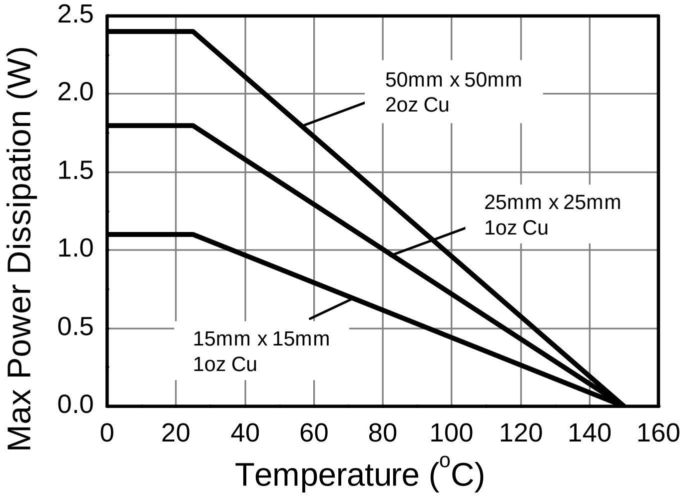
Thermal Characteristics and Derating Information



Safe Operating Area

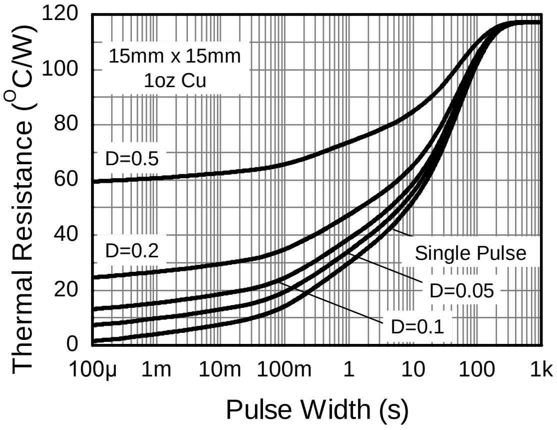


Safe Operating Area

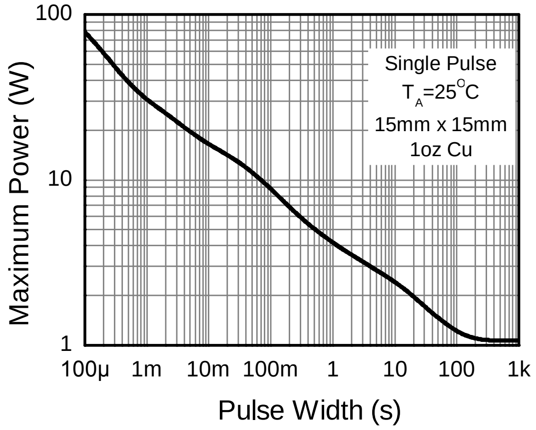


Derating Curve

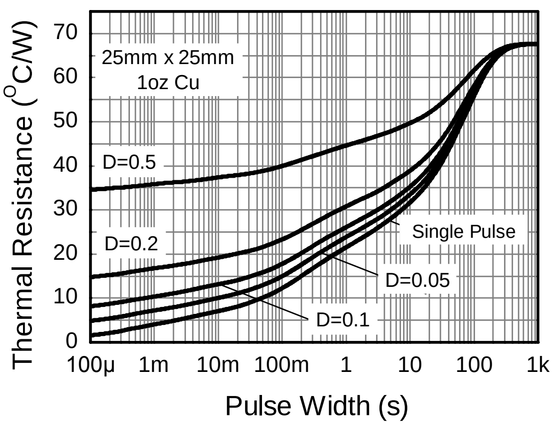
Thermal Characteristics and Derating Information (Cont.)



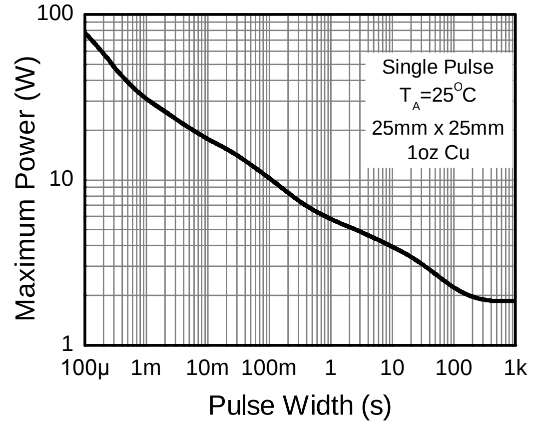
Transient Thermal Impedance



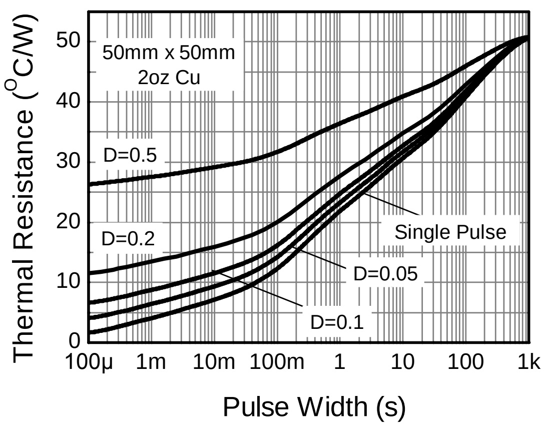
Pulse Power Dissipation



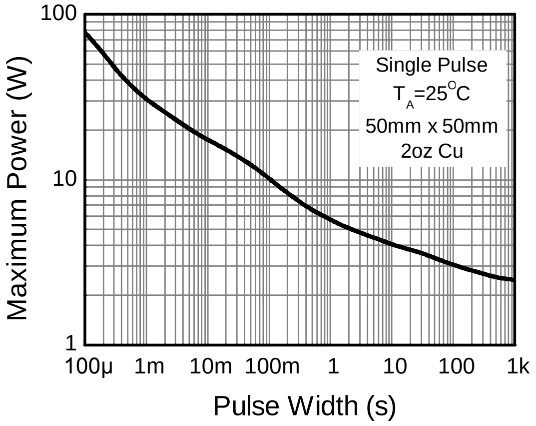
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



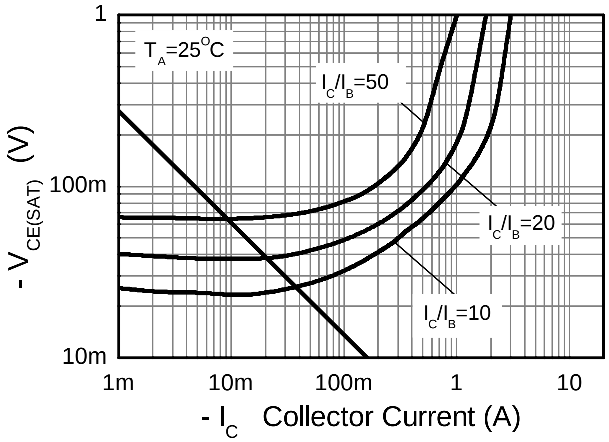
Pulse Power Dissipation

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

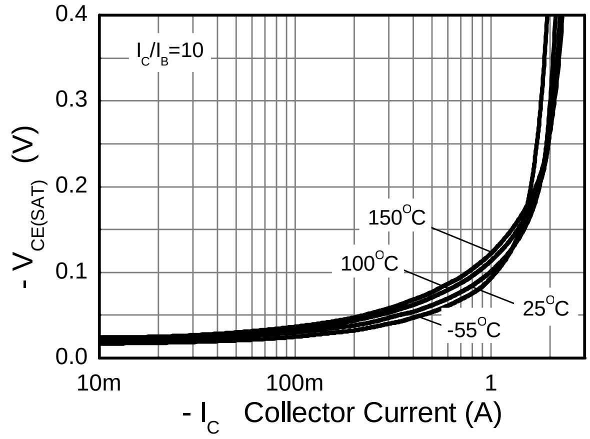
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-110	-135	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage	BV_{CEX}	-110	-135	—	V	$I_E = -100\mu A$, $R_{BC} < 1k\Omega$ or $0.25V > V_{BC} > -0.25V$
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	-100	-135	—	V	$I_C = -10mA$
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECX}	-7	-8.3	—	V	$I_E = -100\mu A$, $R_{BC} < 1k\Omega$ or $0.25V > V_{BC} > -0.25V$
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECO}	-7	-8.7	—	V	$I_E = -100\mu A$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.3	—	V	$I_E = -100\mu A$
Collector-Base Cutoff Current	I_{CBO}	—	<1	-50 -0.5	nA µA	$V_{CB} = -110V$ $V_{CB} = -110V$, $T_A = +100°C$
Emitter Cutoff Current	I_{EBO}	—	<1	-50	nA	$V_{EB} = -5.6V$
DC Current Transfer Static Ratio (Note 12)	h_{FE}	200 70 20	300 130 25	500 — —	—	$I_C = -100mA$, $V_{CE} = -2V$ $I_C = -1A$, $V_{CE} = -2V$ $I_C = -2A$, $V_{CE} = -2V$
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(SAT)}$	—	-100 -100 -180 -220	-130 -125 -230 -295	mV	$I_C = -500mA$, $I_B = -20mA$ $I_C = -1A$, $I_B = -100mA$ $I_C = -1A$, $I_B = -50mA$ $I_C = -2A$, $I_B = -200mA$
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(SAT)}$	—	-890	-1000	mV	$I_C = -2A$, $I_B = -200mA$
Base-Emitter Turn-on Voltage (Note 12)	$V_{BE(ON)}$	—	-840	-950	mV	$I_C = -2A$, $V_{CE} = -2V$
Transitional Frequency	f_T	—	142	—	MHz	$I_E = -100mA$, $V_{CE} = -10V$ f = 50MHz
Input Capacitance	C_{IBO}	—	291	400	pF	$V_{EB} = -0.5V$, f = 1MHz,
Output Capacitance	C_{OBO}	—	23.5	40	pF	$V_{CB} = -10V$, f = 1MHz,
Delay Time	t_D	—	24.7	—	ns	$I_C = -500mA$, $V_{CC} = -10V$, $I_{B1} = -I_{B2} = -50mA$ $R_B = 100\Omega$, $R_C = 20\Omega$
Rise Time	t_R	—	22.4	—	ns	
Storage Time	t_S	—	660	—	ns	
Fall Time	t_F	—	107	—	ns	

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

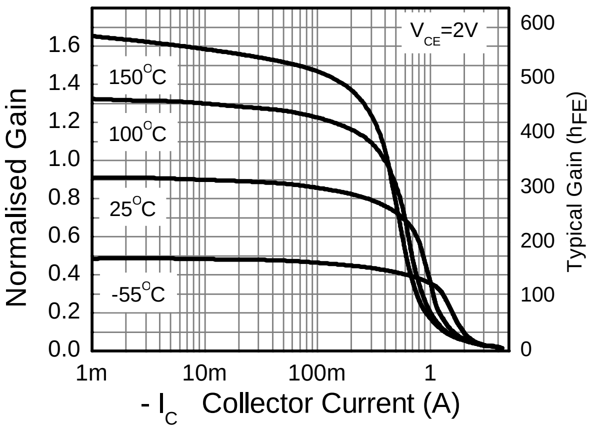
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



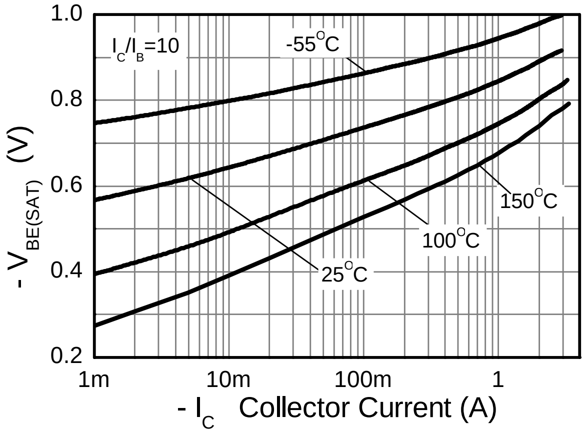
$V_{CE(SAT)}$ v I_C



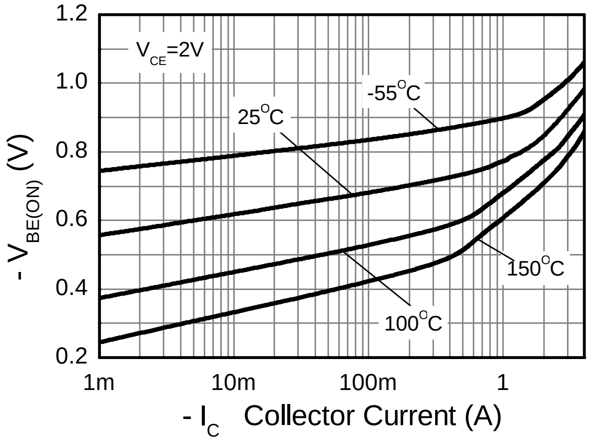
$V_{CE(SAT)}$ v I_C



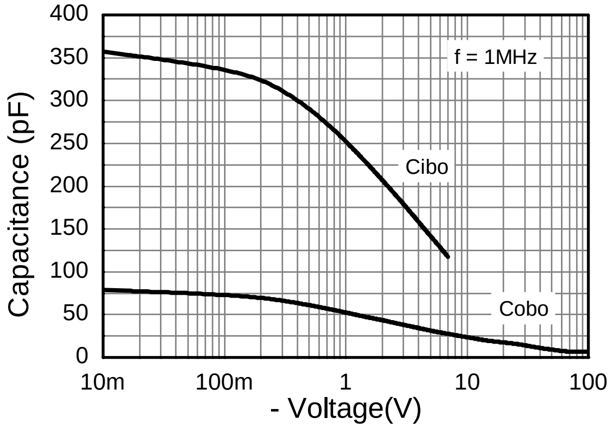
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



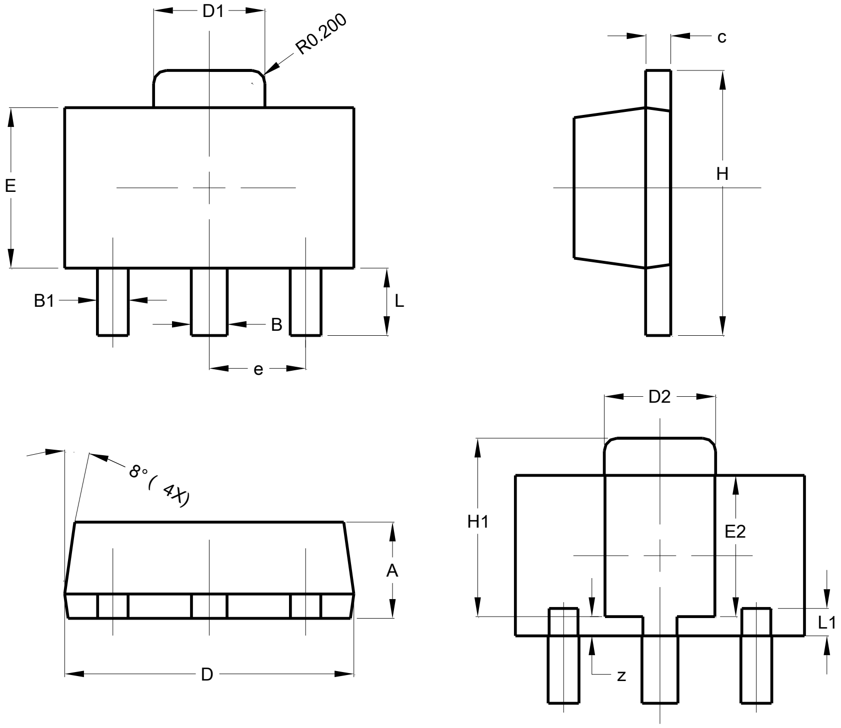
$V_{BE(ON)}$ v I_C



Capacitance v Voltage

Package Outline Dimensions

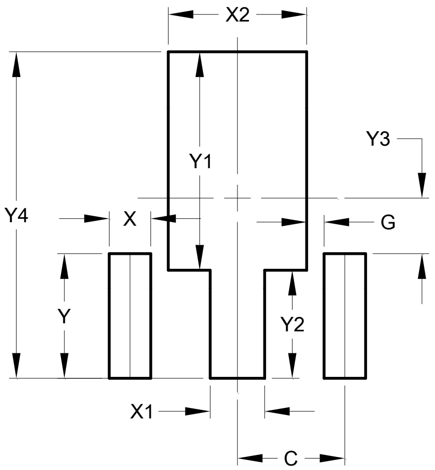
SOT89



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.