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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企业微信二维码

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Features

- BV_{CEO} > -40V
- I_C = -5.5A High Continuous Current
- Low Saturation Voltage $V_{CE(sat)}$ < -30mV @ -100mA
- R_{sat} = 29mΩ for a Low Equivalent On-Resistance

Mechanical Data

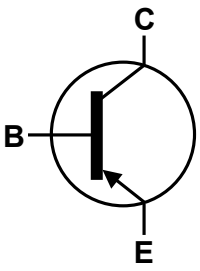
- Case: SOT89
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.05 grams (Approximate)

Application

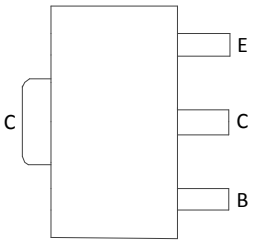
- DC-DC converters
- MOSFET gate drive
- Charging circuits
- Power switches
- Motor control

SOT89

Top View



Device Symbol



Top View
Pin Out

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

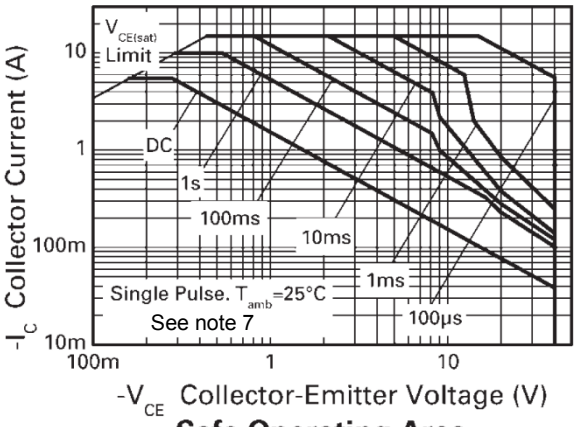
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Base Voltage	V_{CBS}	-50	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-7.5	V
Continuous Collector Current	I_C	-5.5	A
Peak Pulse Collector Current (single pulse)	I_{CM}	-15	A

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

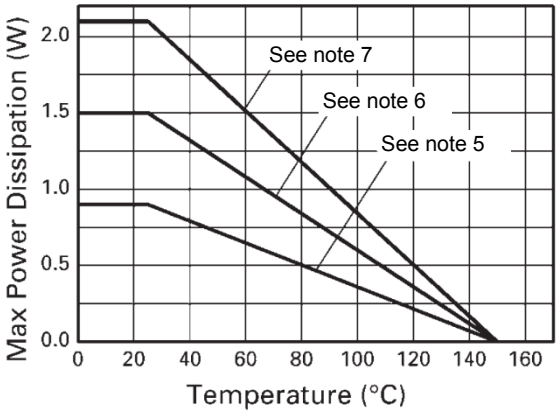
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	0.9 7.2	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	1.5 12	W mW/°C
Power Dissipation (Note 7) Linear Derating Factor	P_D	2.1 16.8	W mW/°C
Power Dissipation (Note 8) Linear Derating Factor	P_D	3 24	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	139	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	83	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	60	°C/W
Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	42	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
6. Same as note (5), except the device is mounted on 25mm x 25mm x 0.6mm single sided 1oz weight copper.
7. Same as note (5), except the device is mounted on 50mm x 50mm x 0.6mm single sided 1oz weight copper.
8. Same as note (5), except the device is measured at t<5 seconds.

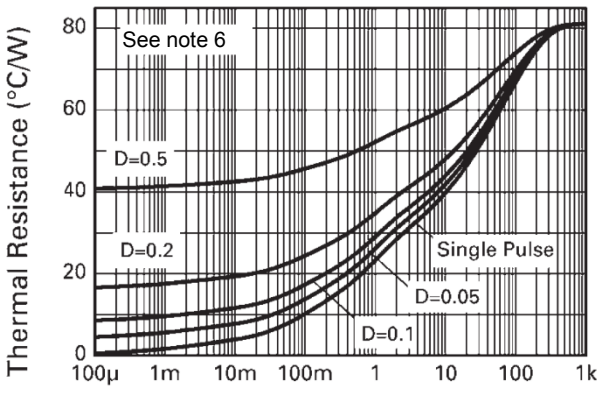
Thermal Characteristics and Derating Information



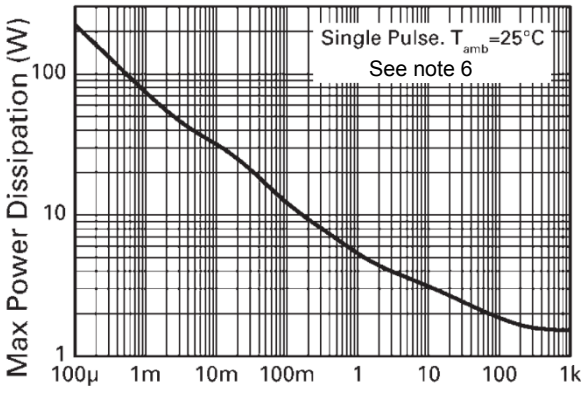
Safe Operating Area



Derating Curve



Transient Thermal Impedance



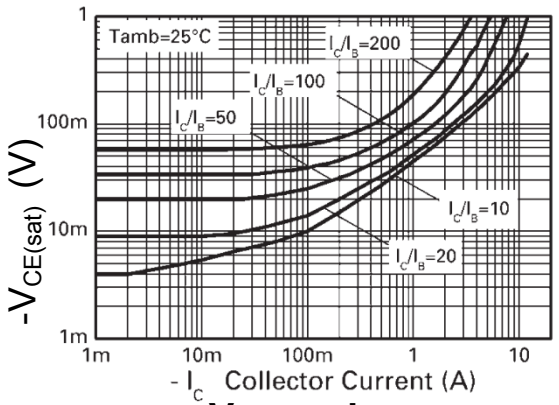
Pulse Power Dissipation

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

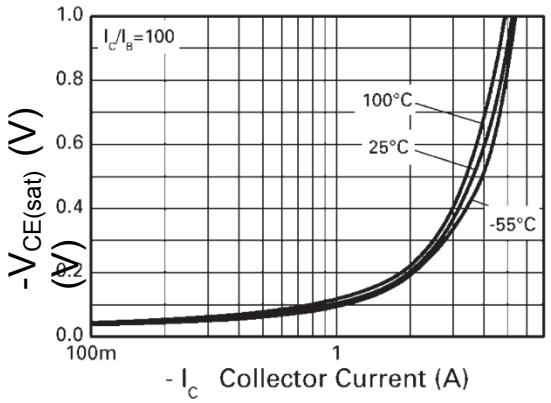
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-90	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage	BV_{CES}	-50	-90	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-40	-58	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7.5	-8.3	—	V	I_C = -100μA
Collector-Base Cut-Off Current	I_{CBO}	—	-1	-20	nA	V_{CB} = -40V
Collector-Emitter Cut-Off Current	I_{CES}	—	-1	-20	nA	V_{CB} = -32V
Emitter-Base Cut-Off Current	I_{EBO}	—	-1	-20	nA	V_{EB} = -6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	-15 -44 -50 -120 -70 -125 -130 -162	-30 -60 -70 -165 -80 -175 -175 -185	mV	I_C = -0.1A, I_B = -10mA I_C = -1A, I_B = -100mA I_C = -1A, I_B = -50mA I_C = -1A, I_B = -10mA I_C = -2A, I_B = -200mA I_C = -2A, I_B = -40mA I_C = -3.5A, I_B = -175mA I_C = -5.5A, I_B = -550mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	-820 -1000	-900 -1075	mV	I_C=-2A, I_B=-40mA I_C=-5.5A, I_B=-550mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	-778 -869	-850 -950	mV	I_C=-2A, V_{CE}=-2V I_C=-5.5A, V_{CE}=-2V
DC Current Gain (Note 9)	h_{FE}	200 200 175 110	390 350 290 175	— 550 — —	—	I_C = -10mA, V_{CE} = -2V I_C = -0.5A, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -5.5A, V_{CE} = -2V
Transitional frequency	f_T	—	152	—	MHz	I_C = -50mA, V_{CE} = -10V, f = 100MHz
Output Capacitance	C_{obo}	—	53	—	pF	V_{CB} = -10V, f = 1MHz
Switching times	t_d	—	18	—	ns	I_C=-1A, V_{CC}=-10V, I_{B1}=-I_{B2}=-100mA
	t_r		17			
	t_s		325			
	t_f		60			
Switching times	t_d	—	55	—	ns	I_C=-2A, V_{CC}=-30V, I_{B1}=-I_{B2}=-20mA
	t_r		107			
	t_s		264			
	t_f		103			

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

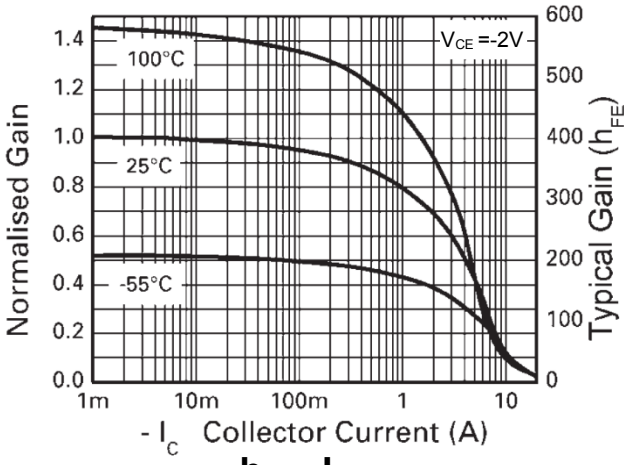
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



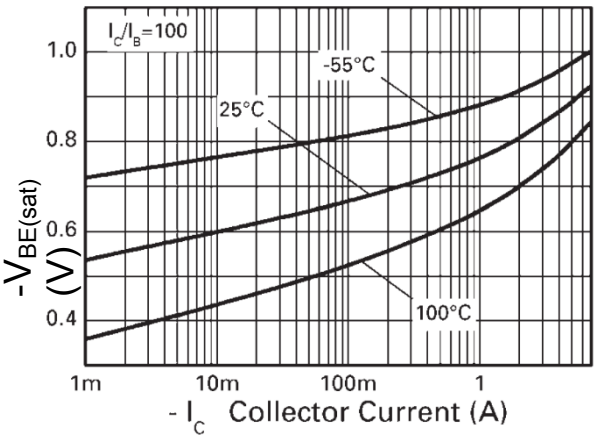
$V_{CE(sat)}$ v I_C



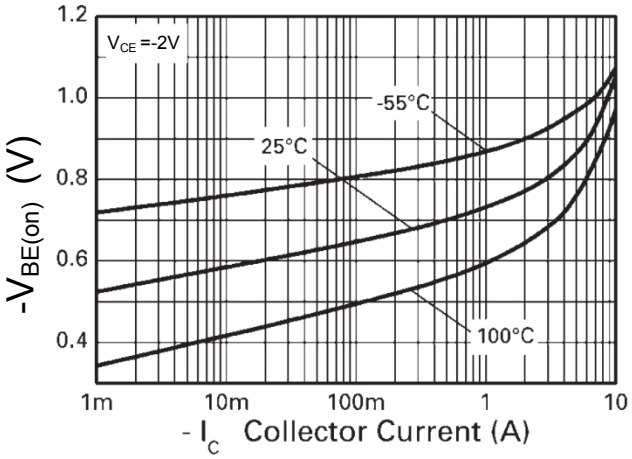
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



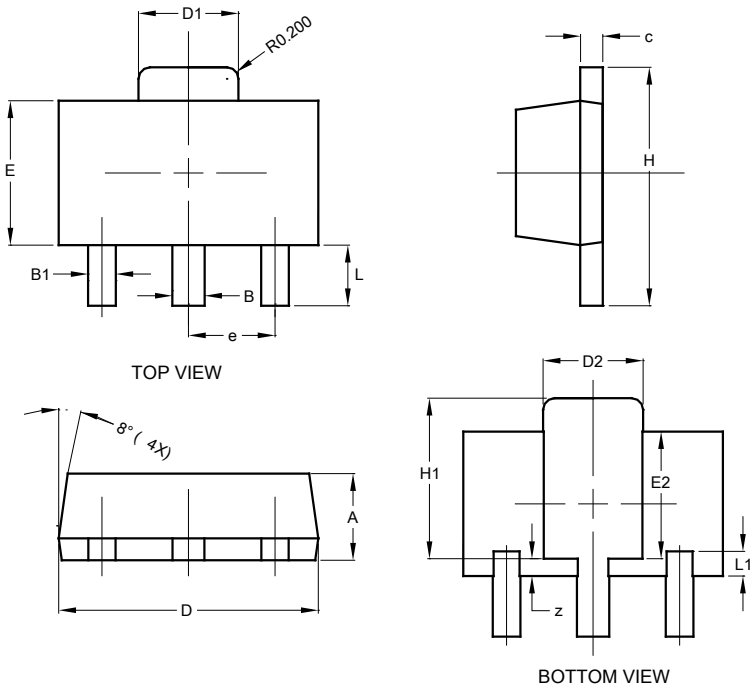
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

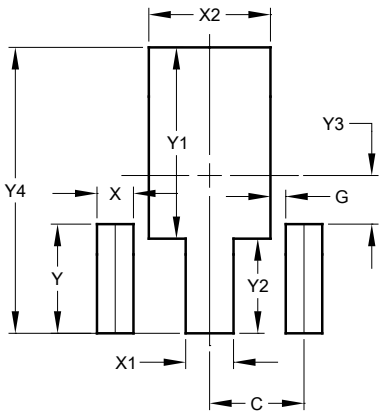
SOT89



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