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} > 20V
- I_C = 7.5A Continuous Current
- Low Saturation Voltage $V_{CE(sat)}$ < 35mV @ 1A
- R_{sat} = 27mΩ for a Low Equivalent On-Resistance

Mechanical Data

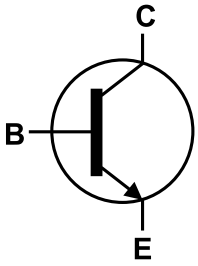
- Case: SOT89
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.05 grams (Approximate)

Application

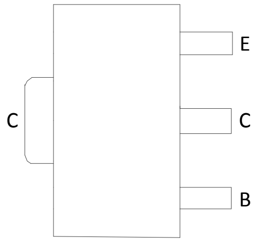
- Emergency lighting circuits
- Motor driving
- Camera strobe
- Boost converter
- CCFL backlight inverters
- MOSFET gate drivers
- LED Driving

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}	70	V
Collector-emitter voltage (forward blocking voltage)	V_{CEX}	70	V
Collector-Base Voltage	V_{CBS}	20	V
Emitter-Collector voltage (reverse blocking)	V_{ECX}	6	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	7.5	A
Peak Pulse Collector Current (single pulse)	I_{CM}	20	A
Base Current	I_B	1	A

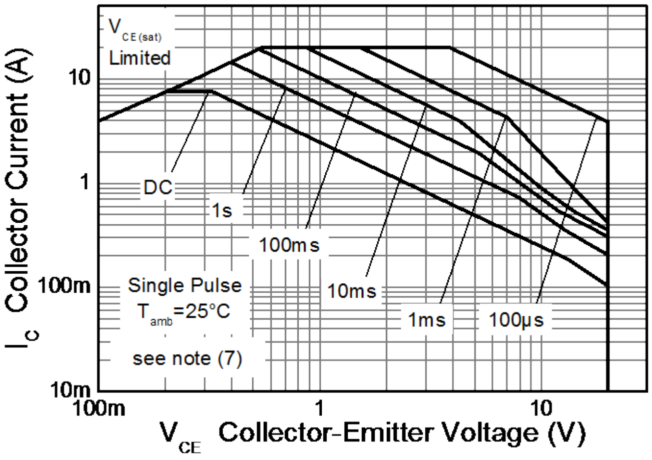
Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	1.1 1.8	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	1.8 14.4	W mW/°C
Power Dissipation (Note 7) Linear Derating Factor	P_D	2.4 19.2	W mW/°C
Power Dissipation (Note 8) Linear Derating Factor	P_D	4.46 35.7	W mW/°C
Power Dissipation (Note 9) Linear Derating Factor	P_D	27.8 222	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	117	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	68	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	51	°C/W
Thermal Resistance, Junction to Ambient (Note 8)	$R_{\theta JA}$	28	°C/W
Operating and Storage Temperature Range (Note 9)	T_J, T_{STG}	-55 to +150	°C

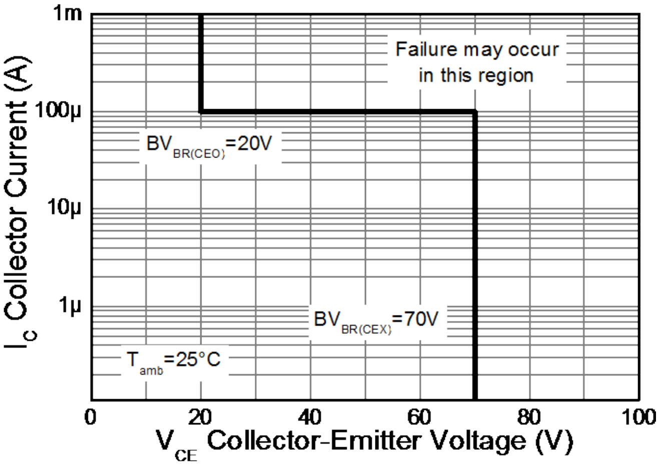
Notes:

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.
9. Junction to case (collector tab). Typical.

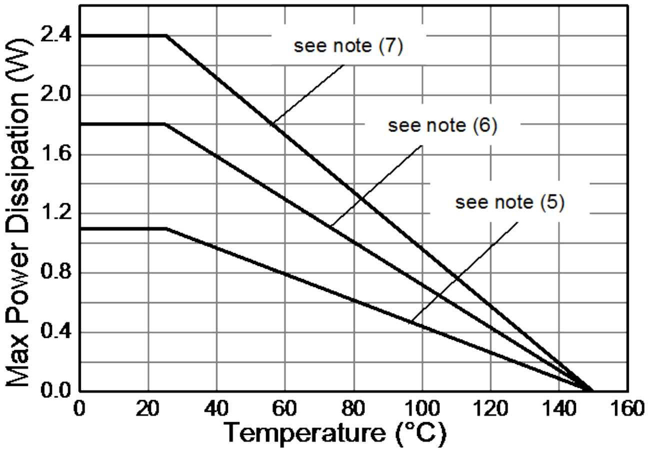
Thermal Characteristics and Derating Information



Safe Operating Area

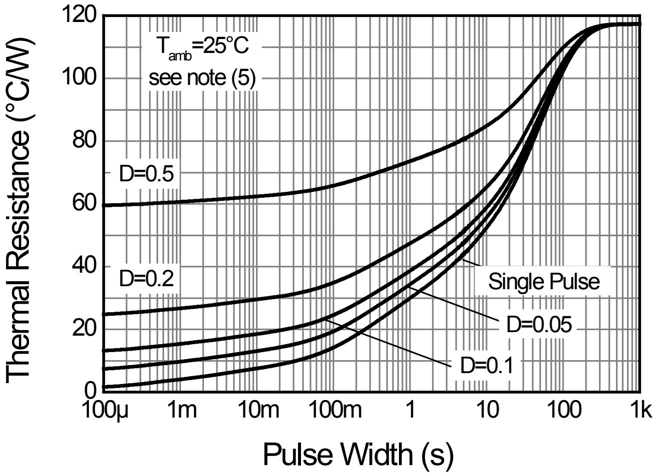


Safe Operating Area

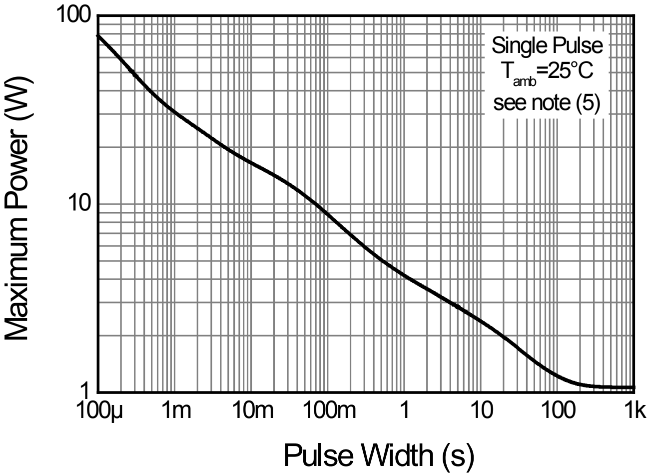


Derating Curve

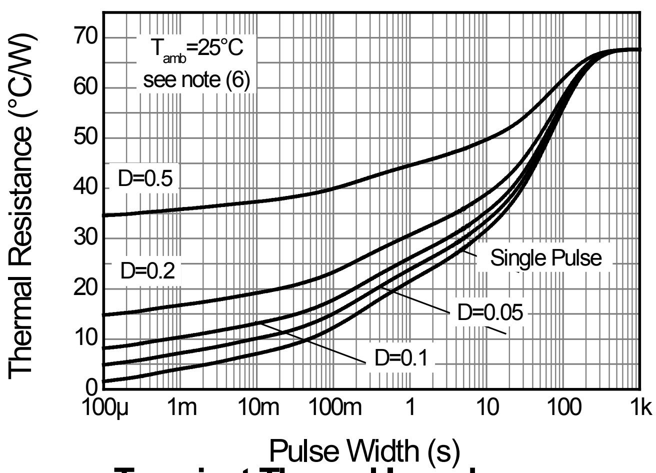
Thermal Characteristics and Derating Information



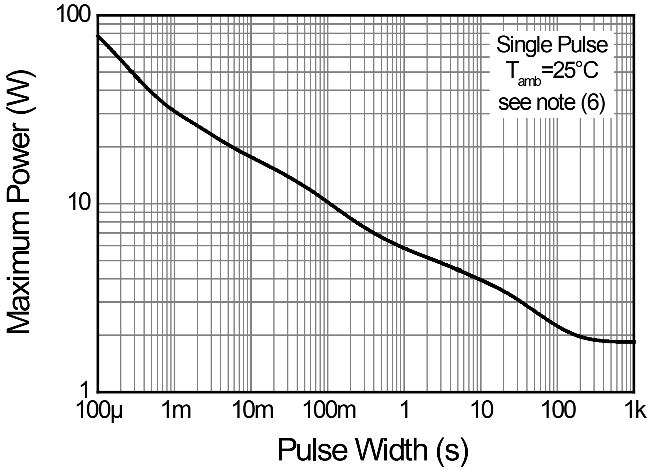
Transient Thermal Impedance



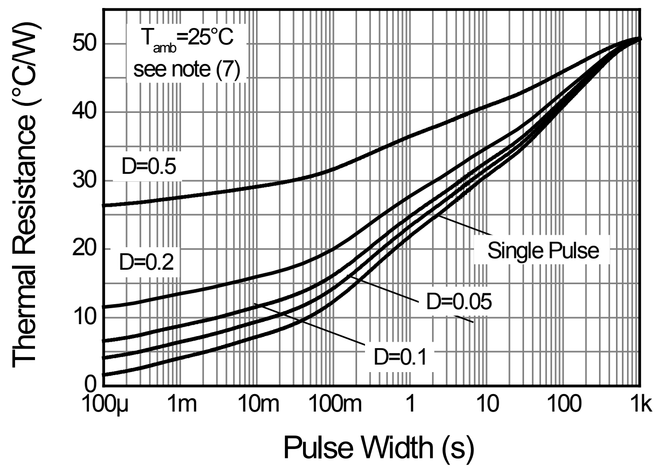
Pulse Power Dissipation



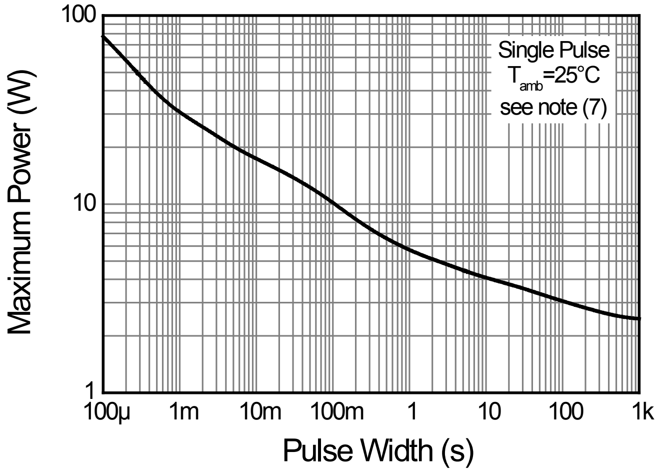
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



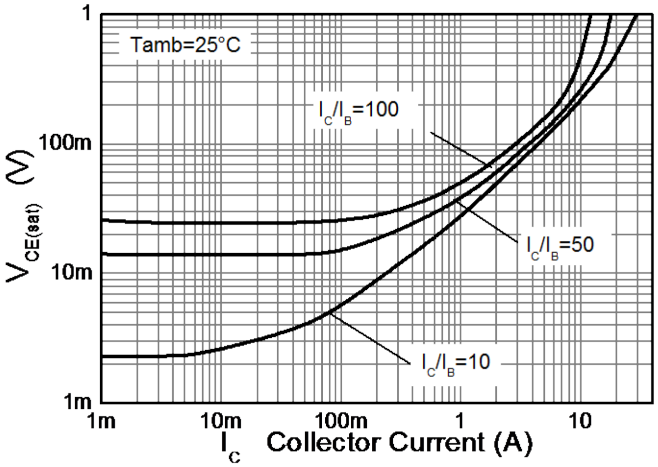
Pulse Power Dissipation

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

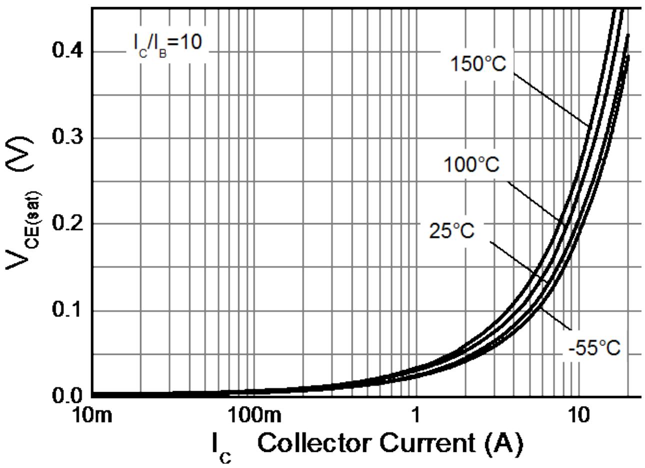
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	70	100	—	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (forward blocking)	BV_{CEX}	70	100	—	V	$I_C = 100\mu A$, $R_{BE} \le 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Collector- Emitter Breakdown Voltage (Note 10)	BV_{CEO}	20	30	—	V	$I_C = 10mA$
Emitter-Collector Breakdown Voltage (reverse blocking)	BV_{ECX}	6	8.4	—	V	$I_E = 100\mu A$, $R_{BC} \le 1k\Omega$ or $0.25V > V_{BE} > -0.25V$
Emitter-Collector Breakdown Voltage (reverse blocking)	BV_{ECO}	4.5	5.7	—	V	$I_E = 100\mu A$
Emitter-Base Breakdown Voltage	BV_{EBO}	7.0	8.4	—	V	$I_E = 100\mu A$
Collector-Base Cut-Off Current	I_{CBO}	—	1	50 0.5	nA μA	$V_{CB} = 70V$ $V_{CB} = 70V$, Tamb=100°C
Collector-Emitter Cut-Off current	I_{CEX}	—	—	100	nA	$V_{CE} = 70V$, $R_{BE} \le 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Emitter-Base Cut-Off Current	I_{EBO}	—	1	50	nA	$V_{EB} = 5.6V$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	26 50 75 60 83 155	32 70 100 80 105 200	mV	$I_C = 1A$, $I_B = 100mA$ $I_C = 1A$, $I_B = 10mA$ $I_C = 2A$, $I_B = 20mA$ $I_C = 2A$, $I_B = 40mA$ $I_C = 4A$, $I_B = 400mA$ $I_C = 7.5A$, $I_B = 375mA$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	1000	1100	mV	$I_C = 7.5A$, $I_B = 375mA$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	870	1000	mV	$I_C = 7.5A$, $V_{CE} = 2V$
DC Forward Gain (Note 10)	h_{FE}	300 260 150 50 —	450 390 210 75 35	900 — — — —	—	$I_C = 100mA$, $V_{CE} = 2V$ $I_C = 2A$, $V_{CE} = 2V$ $I_C = 7.5A$, $V_{CE} = 2V$ $I_C = 15A$, $V_{CE} = 2V$ $I_C = 20A$, $V_{CE} = 2V$
Transitional frequency	f_T	—	160	—	MHz	$I_C = 50mA$, $V_{CE} = 10V$ f = 100MHz
Input Capacitance	C_{ibo}	—	297	400	pF	$V_{EB} = 0.5V$, f = 1MHz
Output Capacitance	C_{obo}	—	32.6	40	pF	$V_{CB} = 10V$, f = 1MHz
Delay time	t_d	—	129	—	ns	$I_C = 1A$, $V_{CC} = 10V$, $I_{B1} = -I_{B2} = 10mA$
Rise time	t_r		96			
Storage time	t_s		398			
Fall time	t_f		90			

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

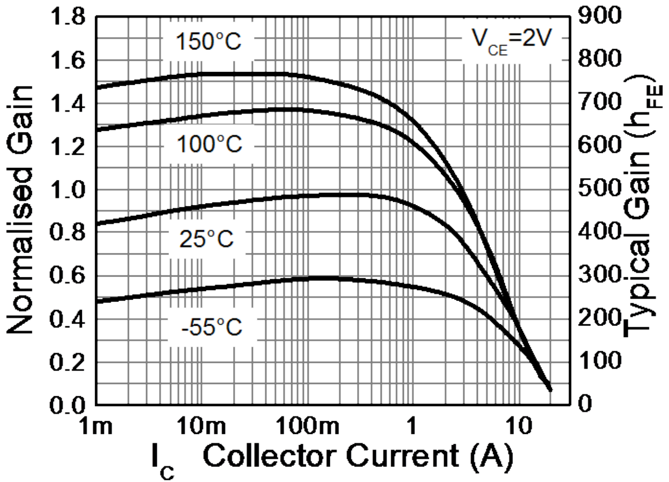
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



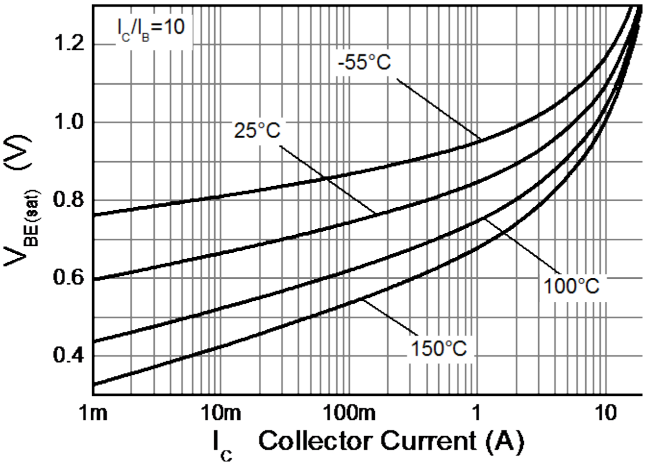
$V_{CE(sat)}$ v I_C



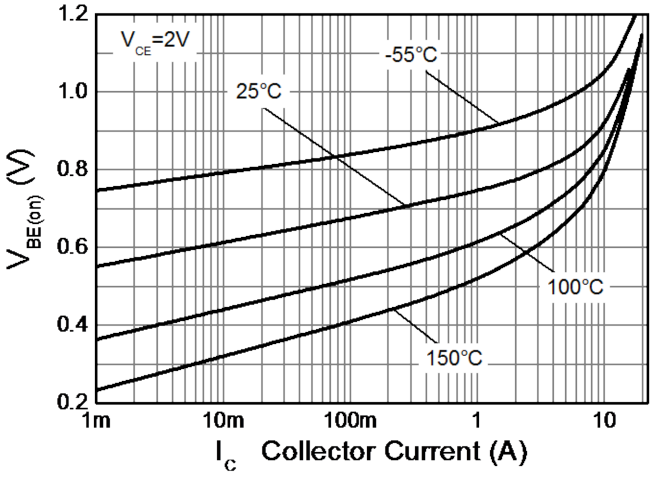
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



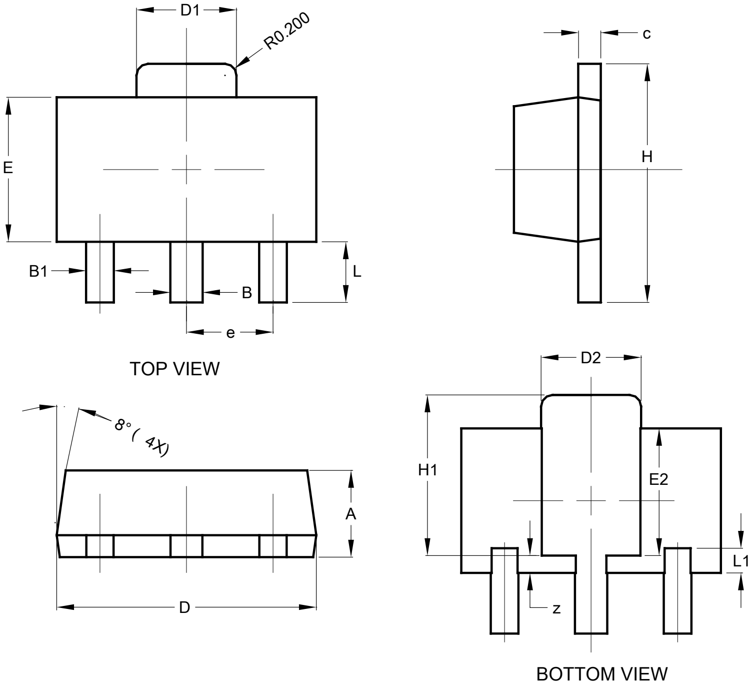
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

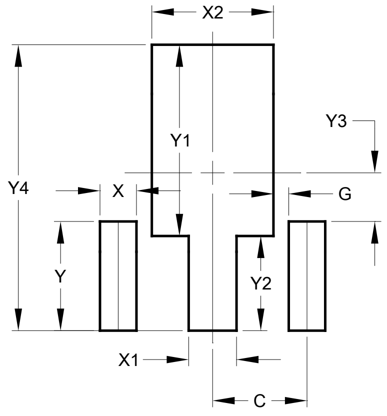
SOT89



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