



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**

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



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## Product Summary

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = +25^\circ C$
30V	$0.025\Omega @ V_{GS} = 4.5V$	8.9A

## Description

This new generation of Trench MOSFETs from Diodes Incorporated utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

## Applications

- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

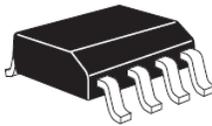
## Features

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SO-8 Package

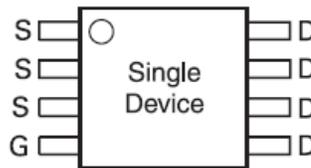
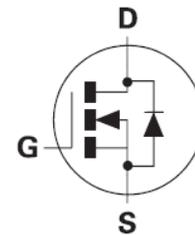
## Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208  $\text{E3}$
- Weight: 0.076 grams (Approximate)

SO-8



Top View


 Top View  
 Pin Out Configuration


Equivalent Circuit

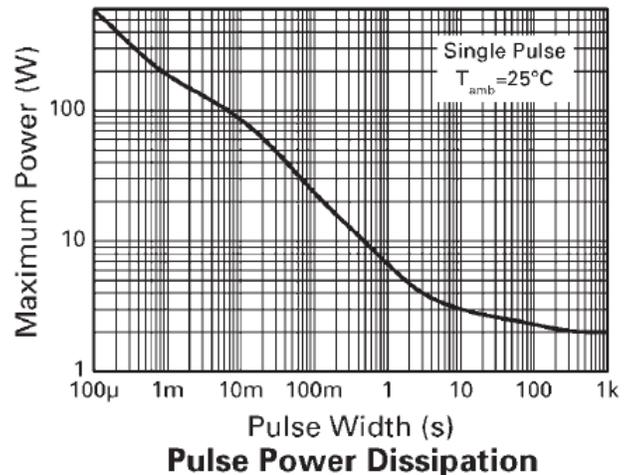
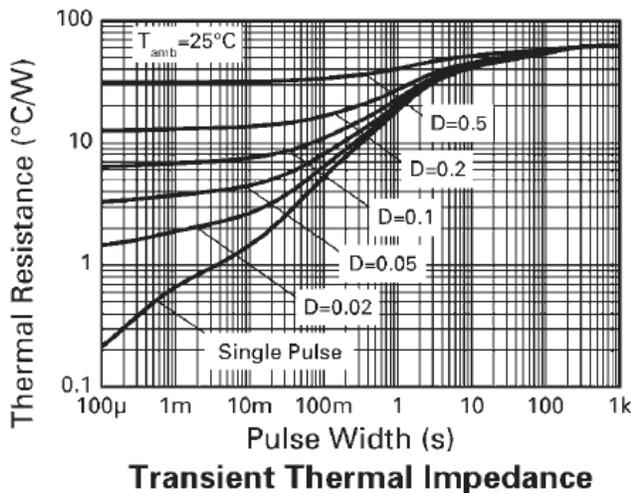
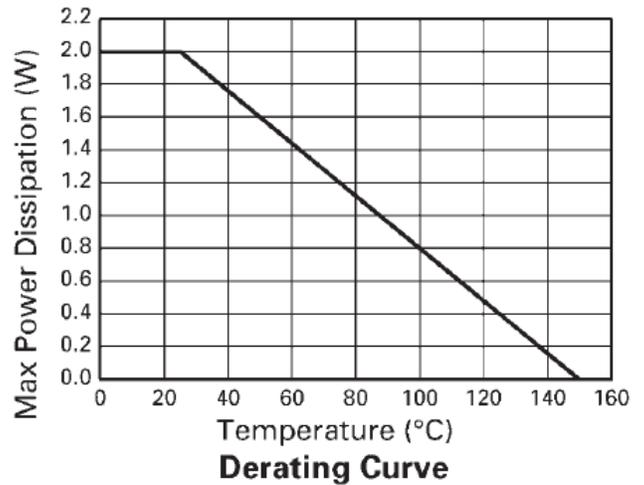
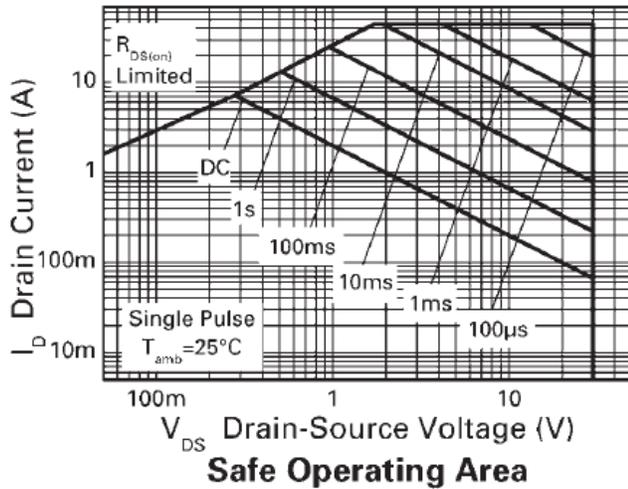
## Maximum Ratings

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current @ $V_{GS} = 4.5V$	$I_D$	$T_A = +25^\circ C$ (Note 6)	8.9
		$T_A = +70^\circ C$ (Note 6)	7.3
		$T_A = +25^\circ C$ (Note 5)	7.2
Pulsed Drain Current (Note 7)	$I_{DM}$	45	A
Continuous Source Current (Body Diode) (Note 6)	$I_S$	4.5	A
Pulsed Source Current (Body Diode) (Note 7)	$I_{SM}$	45	A
Power Dissipation at $T_A = +25^\circ C$ (Note 5)	$P_D$	2	W
Linear Derating Factor		16	mW/ $^\circ C$
Power Dissipation at $T_A = +25^\circ C$ (Note 6)	$P_D$	3	W
Linear Derating Factor		24	mW/ $^\circ C$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ C$

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	41.4	

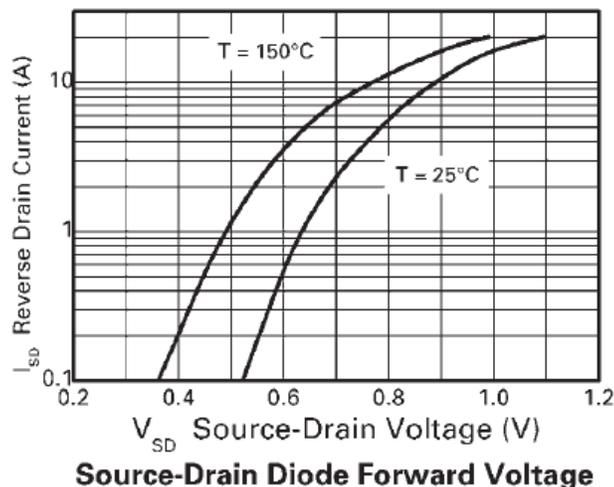
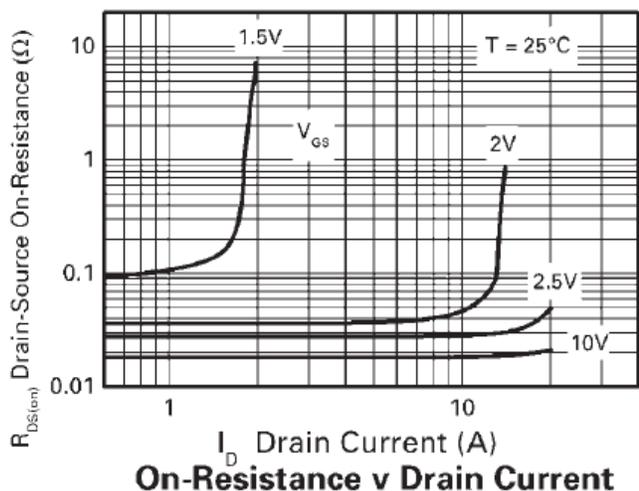
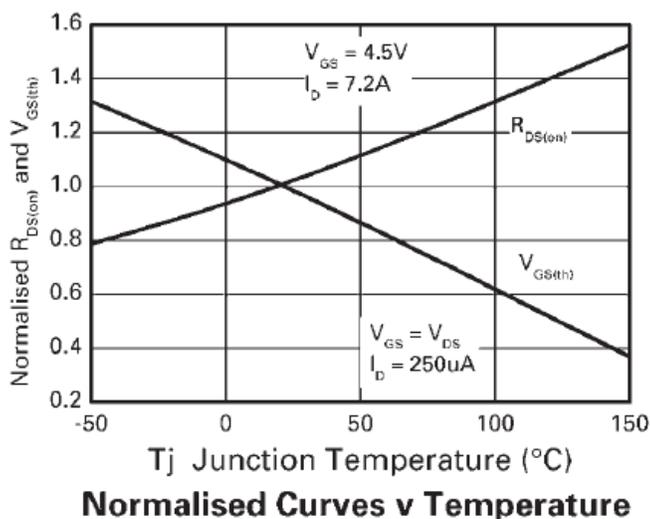
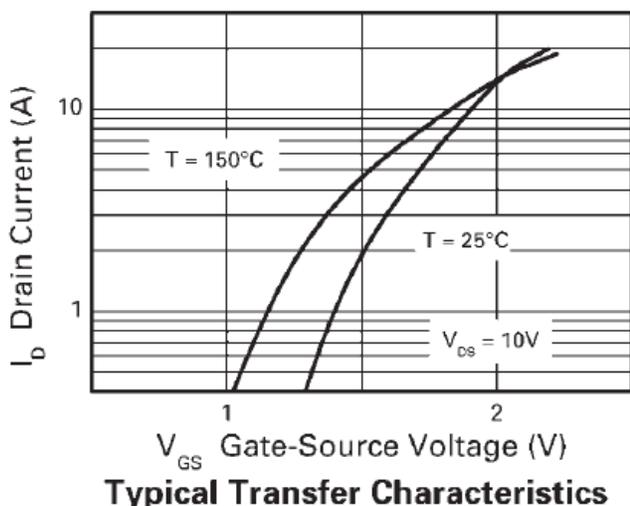
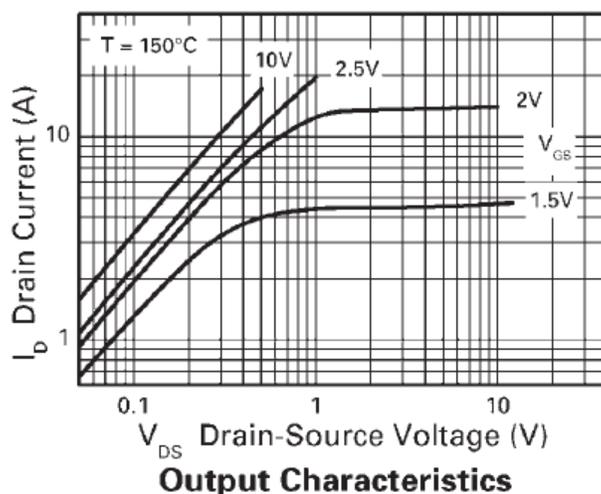
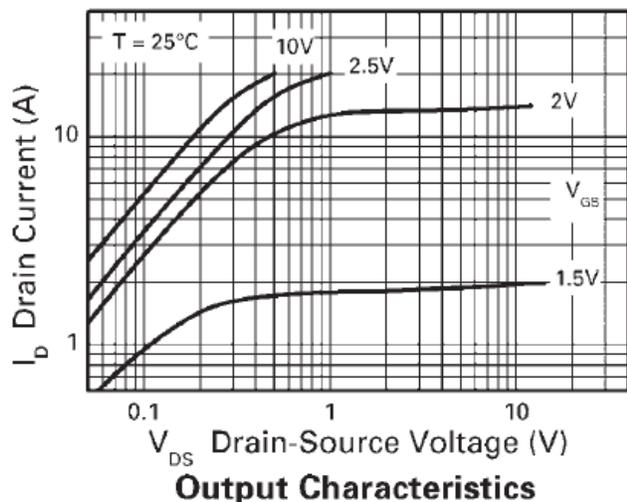
- Notes:
- For a device surface mounted on 50mm x 50mm FR-4 PCB with high coverage of single sided 2oz copper, in still air conditions.
  - For a device surface mounted on FR-4 PCB measured at  $t \leq 10$  sec.
  - Repetitive rating - 25mm x 25mm FR-4 PCB,  $D=0.02$ , pulse width 300 $\mu s$  - pulse width limited by maximum junction temperature.

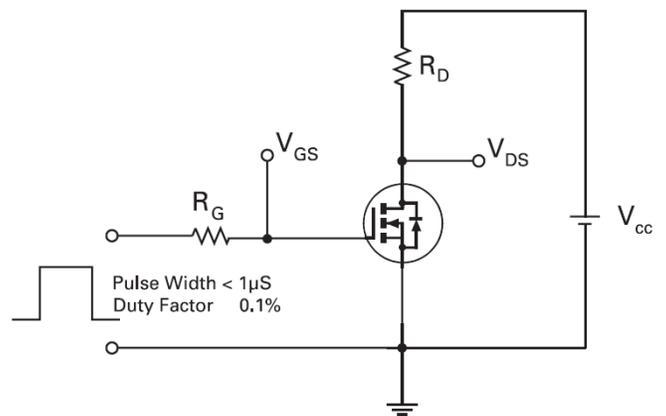
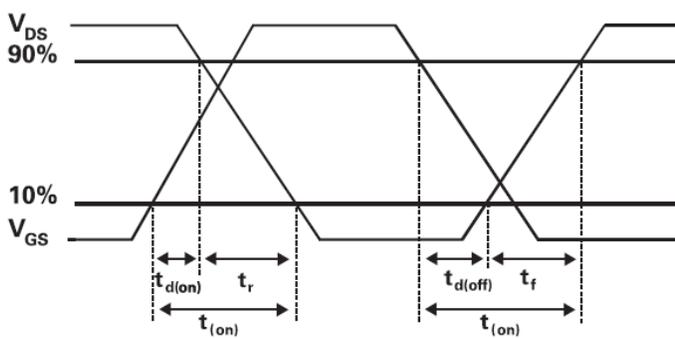
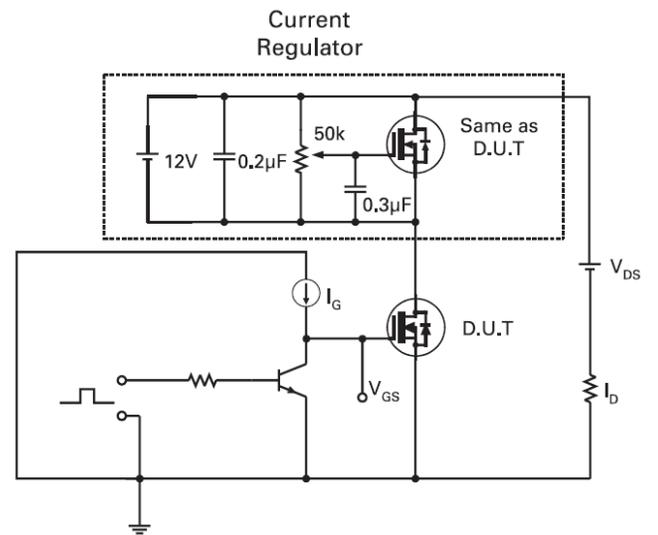
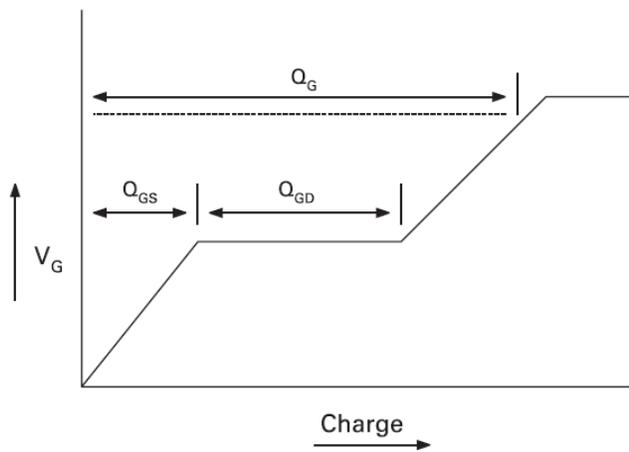
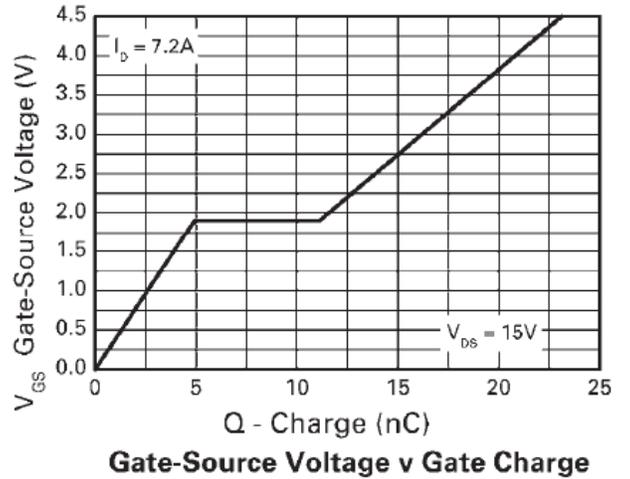
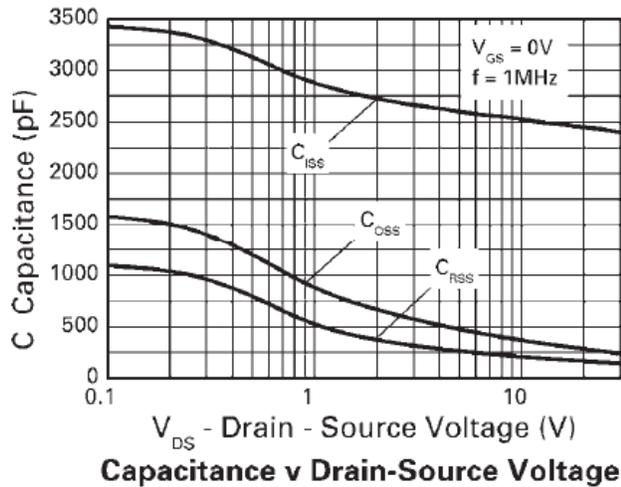


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>STATIC</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
Gate-Source Threshold Voltage	V <sub>GS(TH)</sub>	0.7	—	—	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance (Note 8)	R <sub>DS(ON)</sub>	—	0.021	0.025	Ω	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7.2A
		—	0.028	0.040		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 5.7A
Forward Transconductance (Notes 8 and 10)	g <sub>fs</sub>	—	24	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 7.2A
<b>DYNAMIC (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	—	2480	—	pF	V <sub>DS</sub> = 15V, f = 1.0MHz, V <sub>GS</sub> = 0V
Output Capacitance	C <sub>oss</sub>	—	318	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	184	—		
<b>SWITCHING (Notes 9 and 10)</b>						
Turn-On Delay Time	t <sub>D(ON)</sub>	—	9	—	ns	V <sub>DD</sub> = 15V, R <sub>G</sub> = 6.0Ω, I <sub>D</sub> = 1A, V <sub>GS</sub> = 4.5V
Rise Time	t <sub>R</sub>	—	11.5	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	40	—		
Fall Time	t <sub>F</sub>	—	16.6	—		
Total Gate Charge	Q <sub>g</sub>	—	23.1	—	nC	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7.2A
Gate-Source Charge	Q <sub>gs</sub>	—	4.9	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	6.2	—		
<b>SOURCE-DRAIN DIODE</b>						
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	—	0.85	0.95	V	T <sub>J</sub> = +25°C, I <sub>S</sub> = 8A, V <sub>GS</sub> = 0V
Reverse Recovery Time (Note 10)	t <sub>RR</sub>	—	17.9	—	ns	di/dt = 100A/μs, I <sub>F</sub> = 3.2A,
Reverse Recovery Charge (Note 10)	Q <sub>RR</sub>	—	10	—	nC	T <sub>J</sub> = +25°C

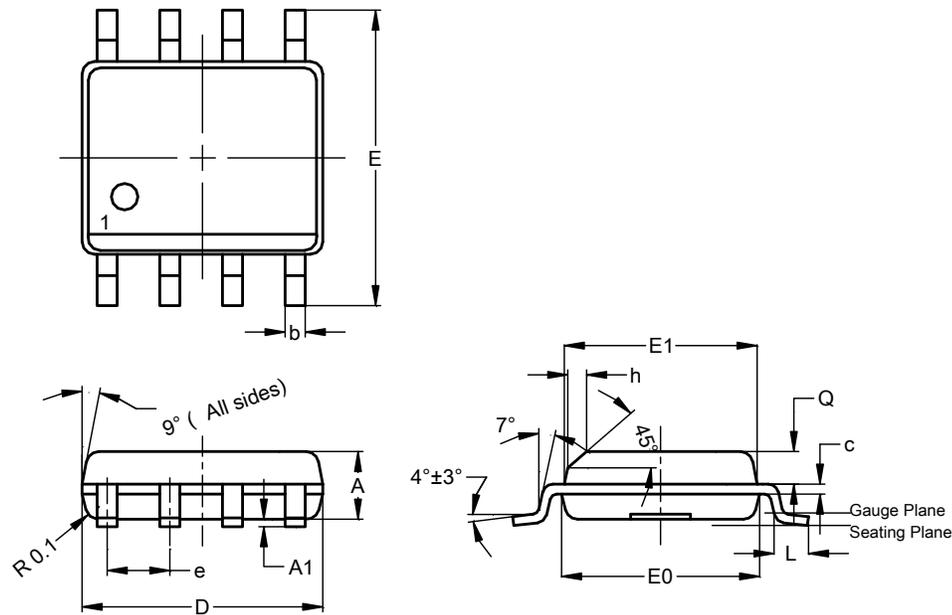
- Notes:
8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
  9. Switching characteristics are independent of operating junction temperature.
  10. For design aid only, not subject to production testing.





### Package Outline Dimensions

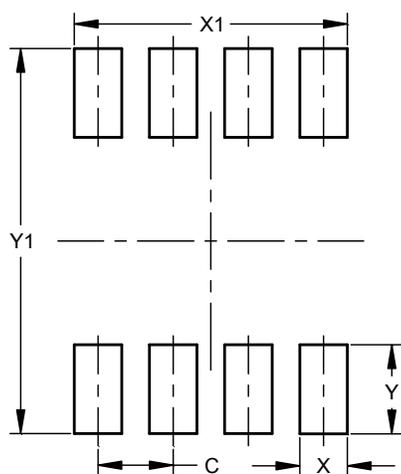
SO-8



SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

### Suggested Pad Layout

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50