



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



企业QQ二维码

Product Summary

BV _{DSS}	R _{DS(ON)} MAX	I _D MAX T _A = +25°C
40V	34mΩ @ V _{GS} = 10V	6.5A
	59mΩ @ V _{GS} = 4.5V	4.8A

Features and Benefits

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage

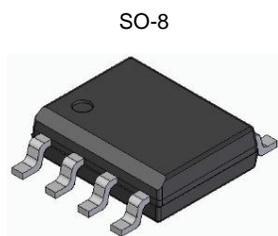
Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

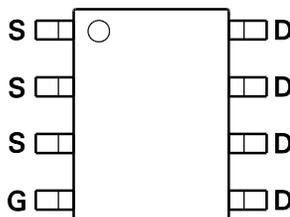
- Backlighting
- Power Management Functions
- DC-DC Converters

Mechanical Data

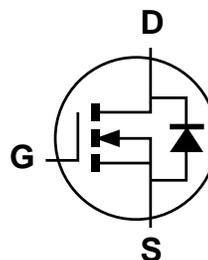
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed Over Copper Leadframe. Solderable per MIL-STD-202, Method 208③
- Weight: 0.008 grams (Approximate)



Top View



Top View



Equivalent Circuit

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	Steady State T _A = +25°C	6.5
		T _A = +70°C	5.2
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	6.5	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	36	A
Avalanche Current L = 0.1mH	E _{AS}	19	mJ
Avalanche Energy L = 0.1mH	I _{AS}	18	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.4	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	84.8	°C/W
Total Power Dissipation (Note 6)	P _D	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	58.9	°C/W
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	33.9	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	40	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	3.0	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance	R _{DS(ON)}	—	18.4	34	mΩ	V _{GS} = 10V, I _D = 6A
			24.5	59		V _{GS} = 4.5V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	0.87	1.1	V	I _S = 6A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	920	—	pF	V _{DS} = 20V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	76	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	59	—	pF	
Gate Resistance	R _g	—	2.1	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	7.7	8	nC	V _{DS} = 20V I _D = 6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	15.5	18	nC	
Gate-Source Charge	Q _{gs}	—	2	—	nC	
Gate-Drain Charge	Q _{gd}	—	3	—	nC	
Turn-On Delay Time	t _{d(ON)}	—	4.8	—	ns	V _{DD} = 20V, V _{GS} = 10V I _D = 1A, R _g ≅ 6.0Ω
Turn-On Rise Time	t _r	—	3	—	ns	
Turn-Off Delay Time	t _{d(OFF)}	—	23	—	ns	
Turn-Off Fall Time	t _f	—	7	—	ns	
Reverse Recovery Time	t _{RR}	—	11.9	—	ns	I _S = 2.5A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{RR}	—	4.9	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

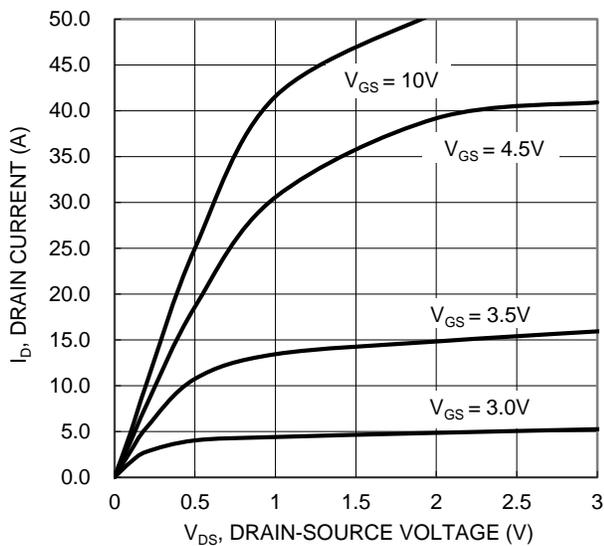


Figure 1. Typical Output Characteristic

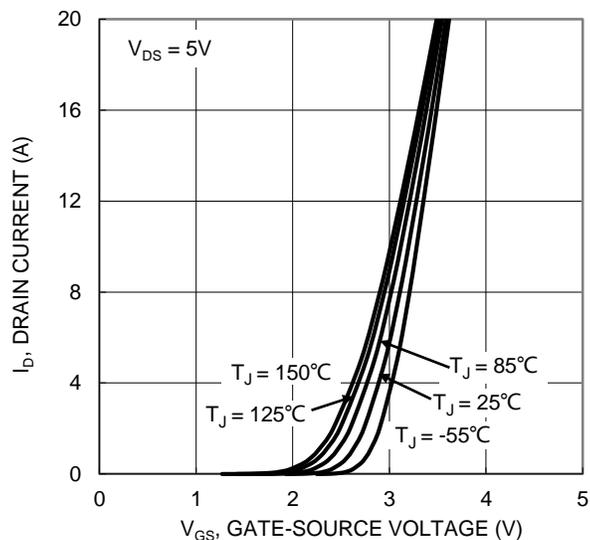


Figure 2. Typical Transfer Characteristic

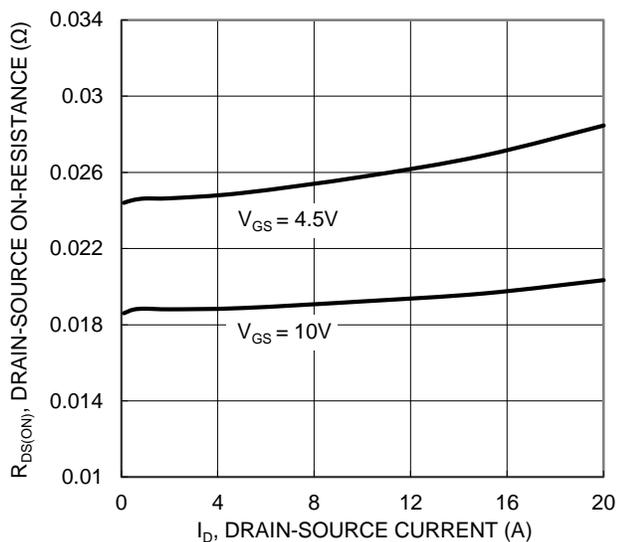


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

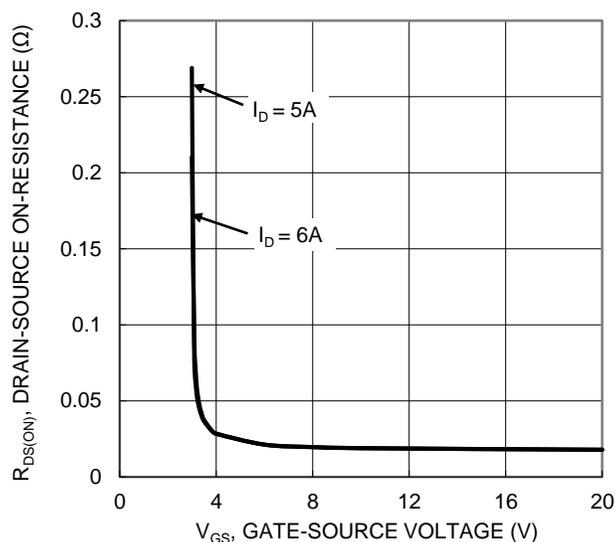


Figure 4. Typical Transfer Characteristic

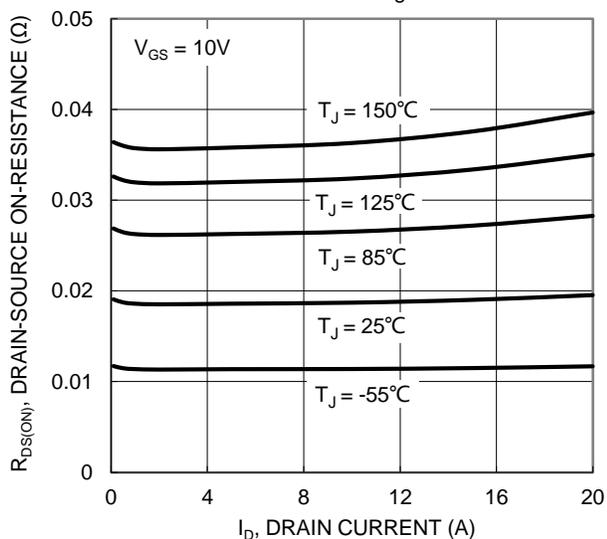


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

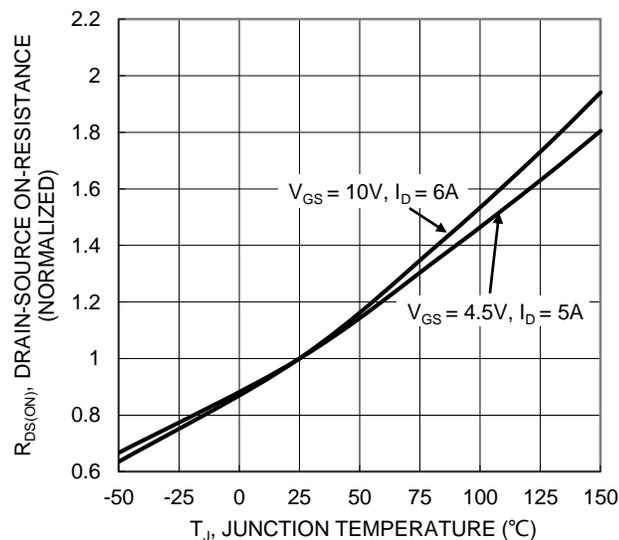


Figure 6. On-Resistance Variation with Junction Temperature

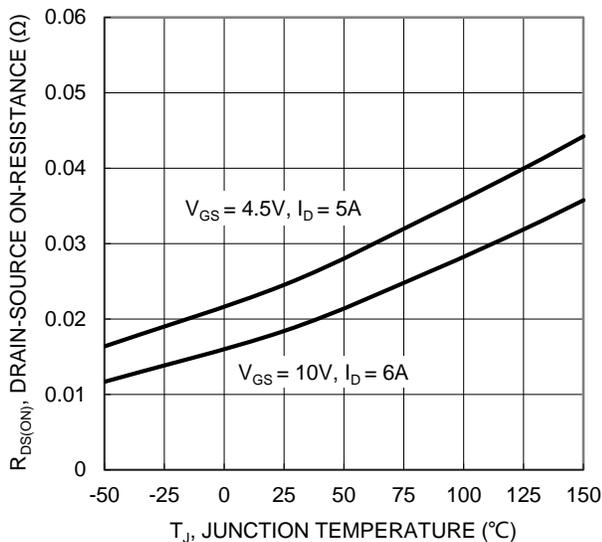


Figure 7. On-Resistance Variation with Junction Temperature

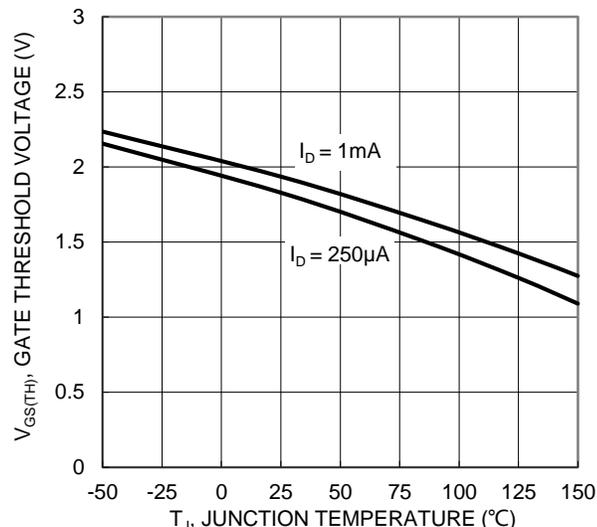


Figure 8. Gate Threshold Variation vs. Junction Temperature

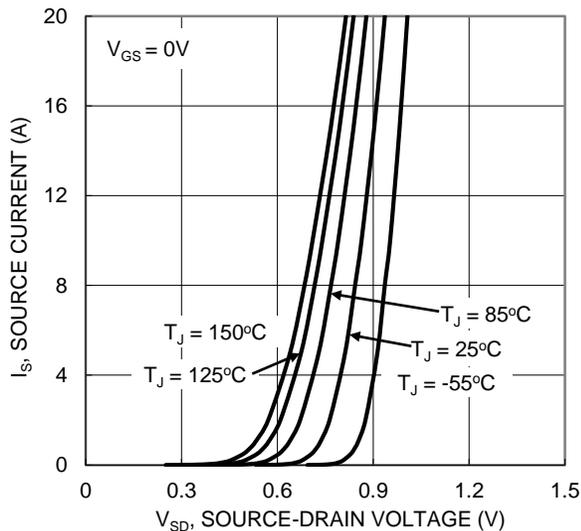


Figure 9. Diode Forward Voltage vs. Current

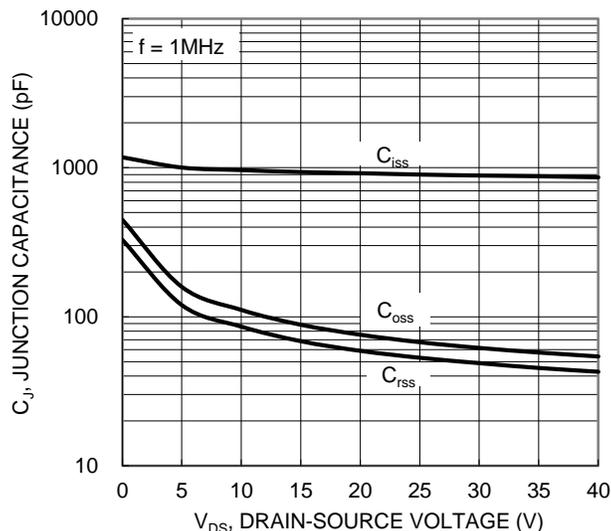


Figure 10. Typical Junction Capacitance

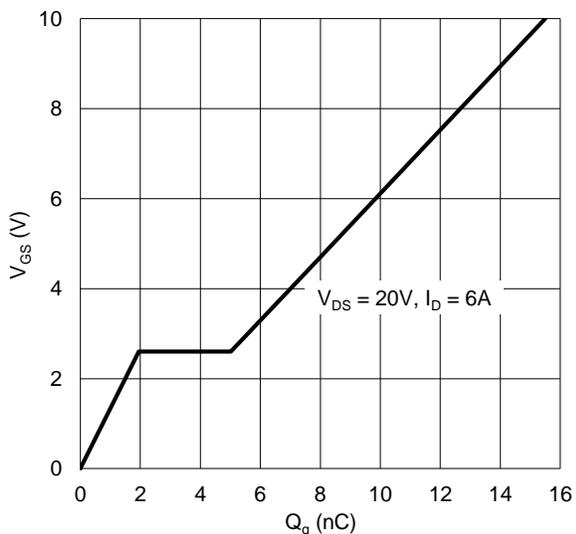


Figure 11. Gate Charge

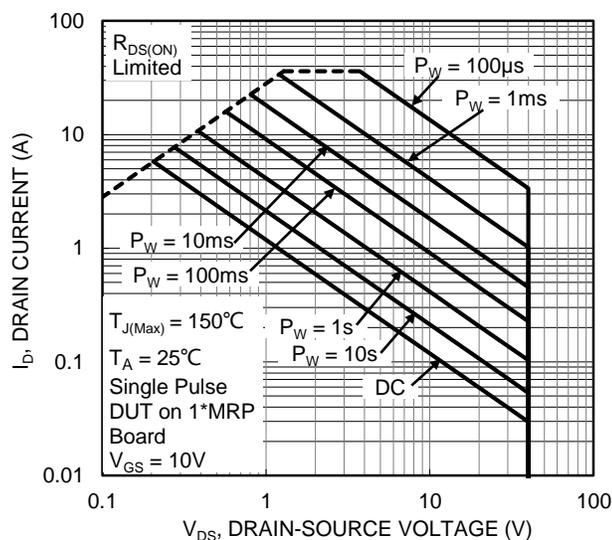


Figure 12. SOA, Safe Operation Area

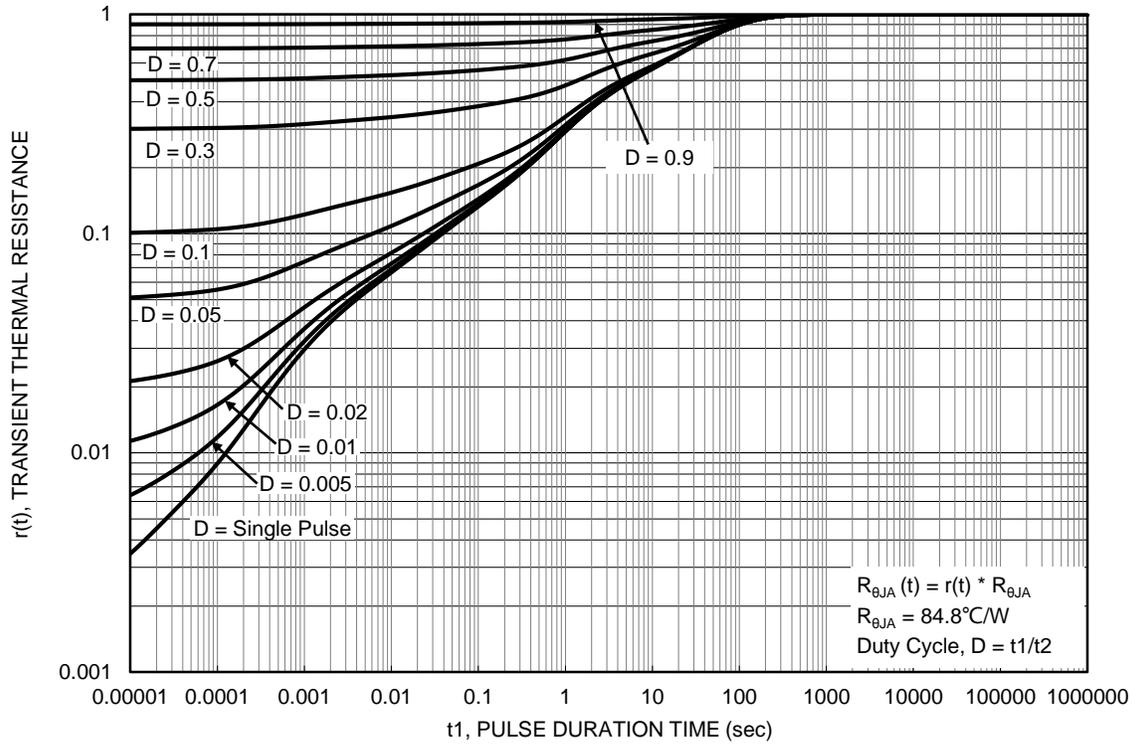
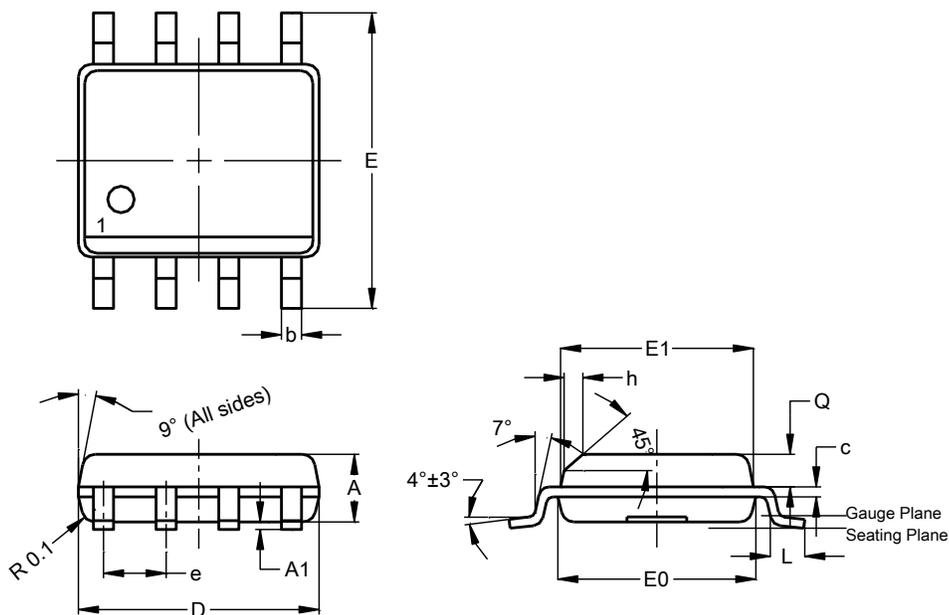


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

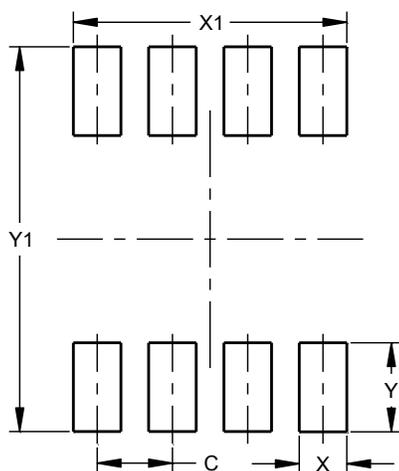
SO-8



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