



**THE DATASHEET OF  
AT28C256E-15PI**



**DUAL N-CANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
20V	16mΩ @ V <sub>GS</sub> = 4.5V	9.8A
	23mΩ @ V <sub>GS</sub> = 2.5V	8.7A

**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:

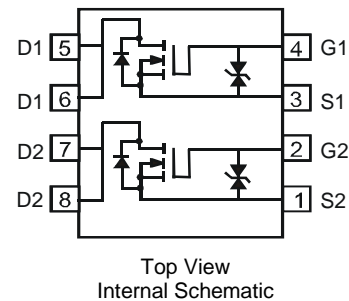
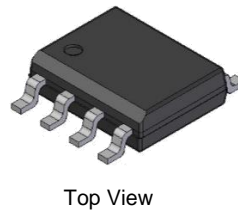
- Backlighting
- Power management functions
- DC-DC converters

**Features**

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected up to 2kV
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The DMG6898LSDQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

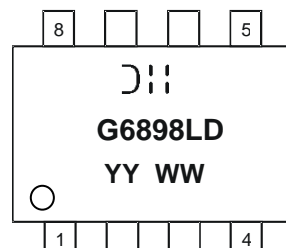
**Mechanical Data**

- Package: SO-8
- Package Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish- Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram Below
- Weight: 0.072 grams (Approximate)


**Ordering Information (Note 4)**

Part Number	Qualification	Package	Packing	
			Qty.	Carrier
DMG6898LSD-13	Commercial	SO-8	2,500	Tape & Reel
DMG6898LSDQ-13	Automotive	SO-8	2,500	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**


⌋⌋ = Manufacturer's Marking  
 G6898LD = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 22 = 2022)  
 WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5)	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	9.5	A
		T <sub>A</sub> = +85°C		7.1	
Pulsed Drain Current (Note 6)			I <sub>DM</sub>	30	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1.28	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	99.3	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1.0	μA	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.5	1.0	1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	11	16	mΩ	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 9.4A
			17	23		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 8.3A
Forward Transfer Admittance	Y <sub>fs</sub>	—	17	—	S	V <sub>DS</sub> = 5V, I <sub>D</sub> = 9.4A
Diode Forward Voltage	V <sub>SD</sub>	—	0.7	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1.3A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	1149	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	157	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	142	—	pF	
Gate Resistance	R <sub>g</sub>	—	1.51	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	11.6	—	nC	V <sub>DS</sub> = 10V, I <sub>D</sub> = 9.4A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	26	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	2.7	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	3.4	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	11.67	—	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4.5V, R <sub>GEN</sub> = 6Ω, I <sub>D</sub> = 1A
Turn-On Rise Time	t <sub>r</sub>	—	12.49	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	35.89	—	ns	
Turn-Off Fall Time	t <sub>f</sub>	—	12.33	—	ns	

- Notes:
5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
  6. Repetitive rating, pulse width limited by junction temperature.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to production testing.

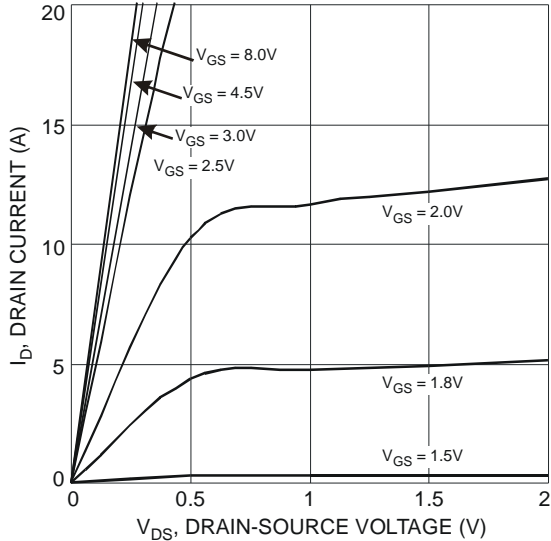


Fig. 1 Typical Output Characteristic

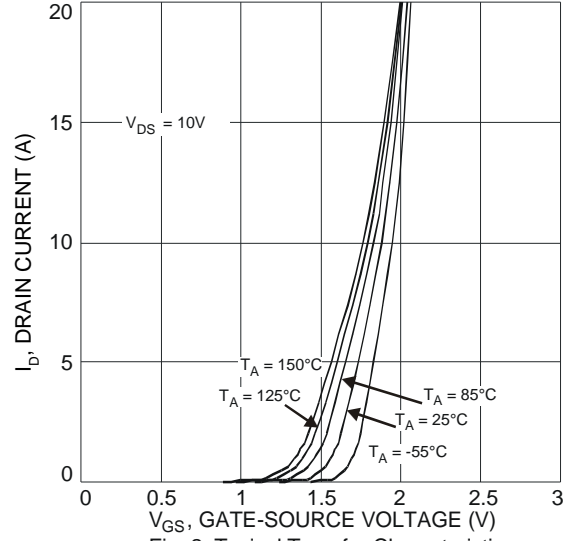


Fig. 2 Typical Transfer Characteristic

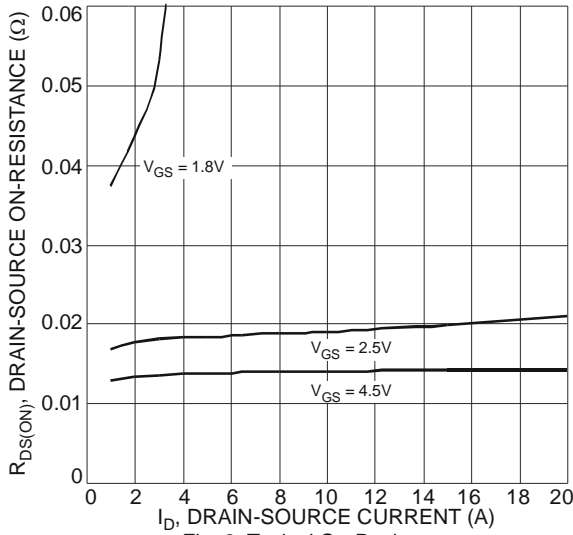


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

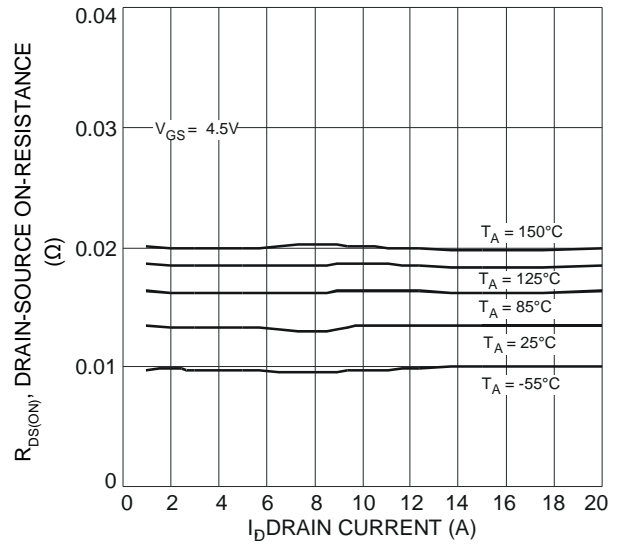


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

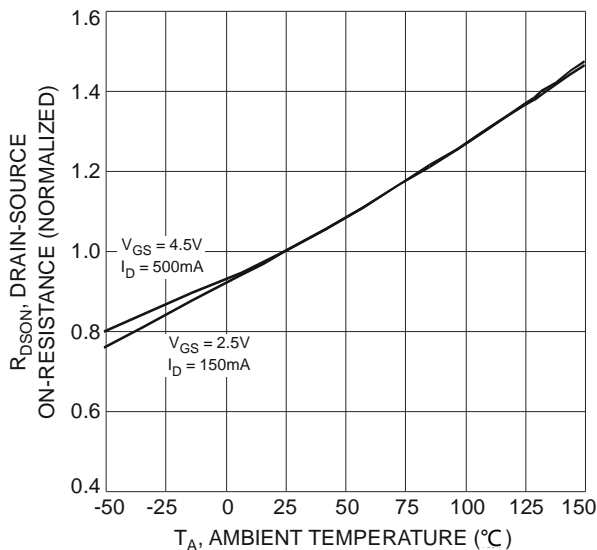


Fig. 5 On-Resistance Variation with Temperature

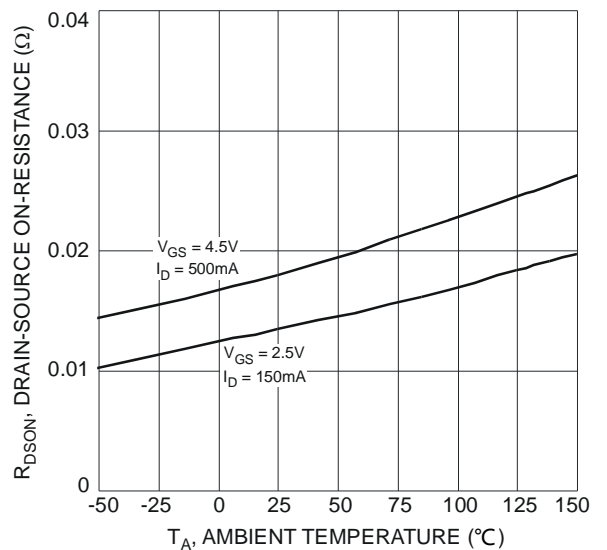


Fig. 6 On-Resistance Variation with Temperature

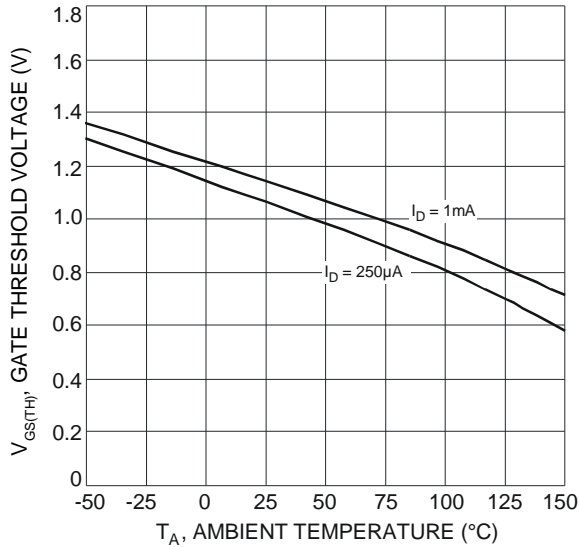


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

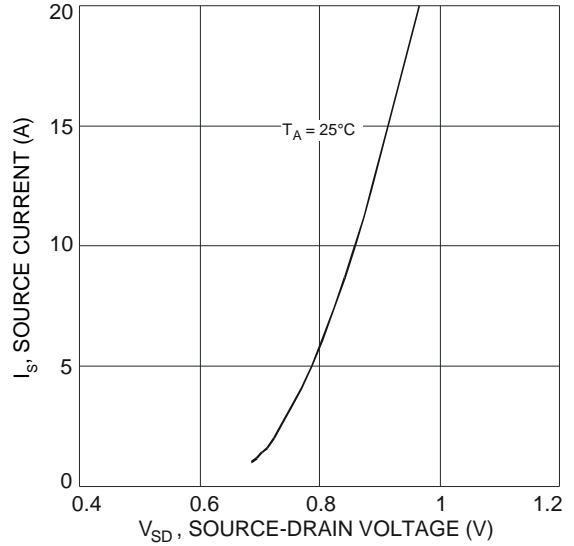


Fig. 8 Diode Forward Voltage vs. Current

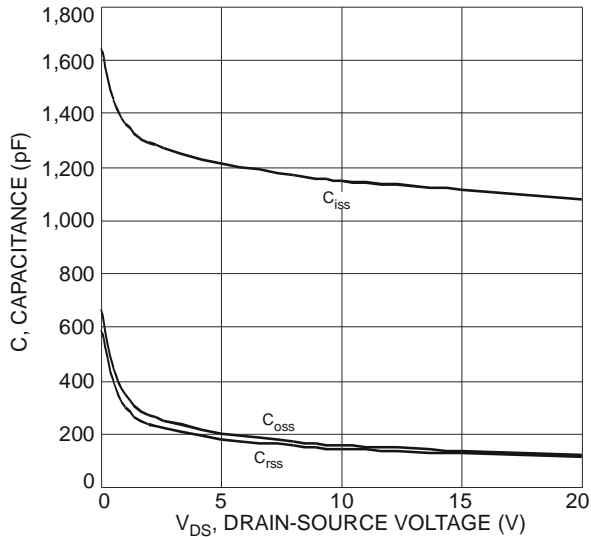


Fig. 9 Typical Total Capacitance

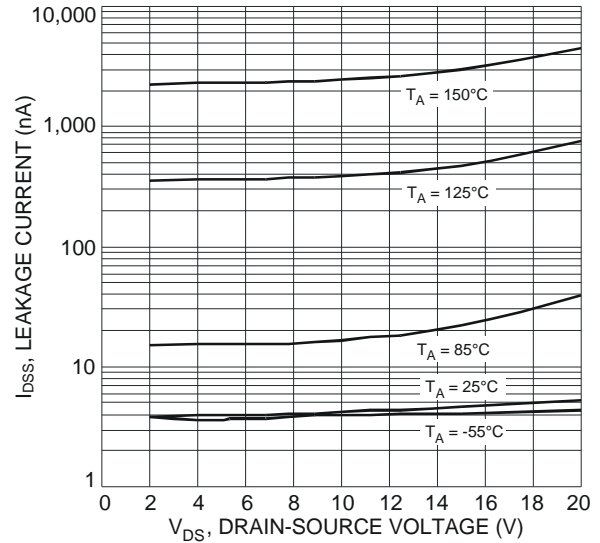


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

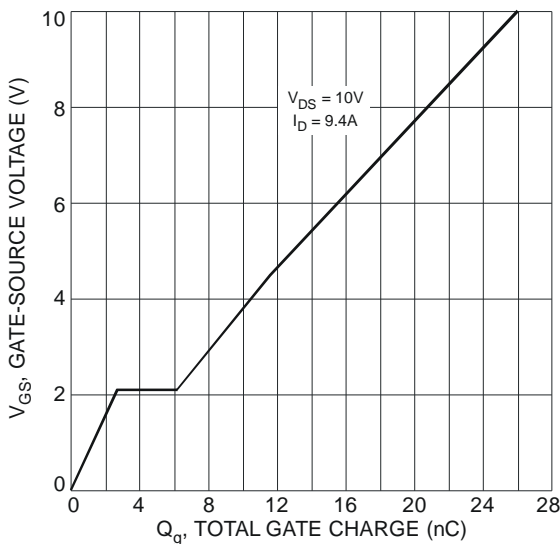
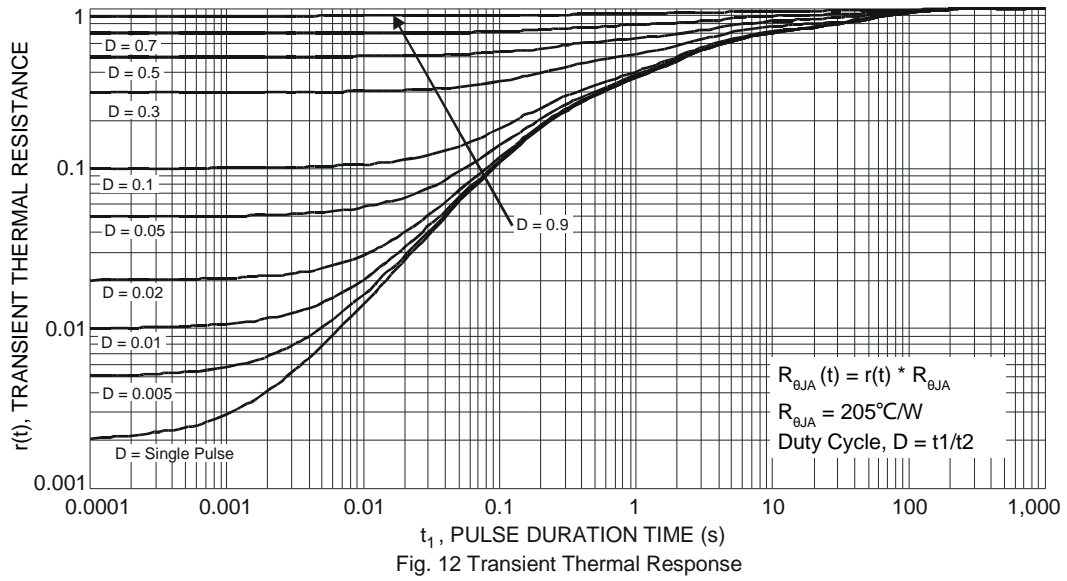


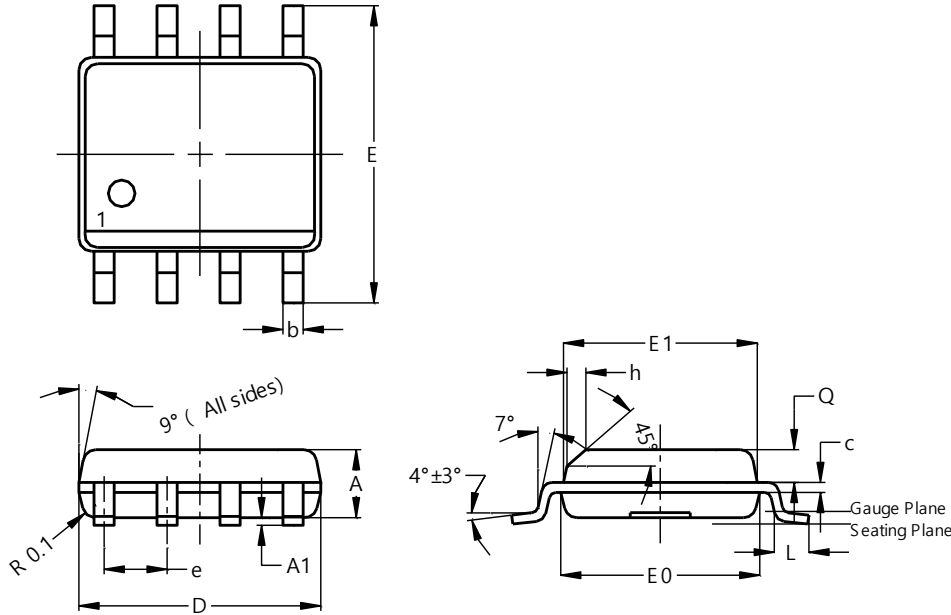
Fig. 11 Gate-Source Voltage vs. Total Gate Charge



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SO-8**

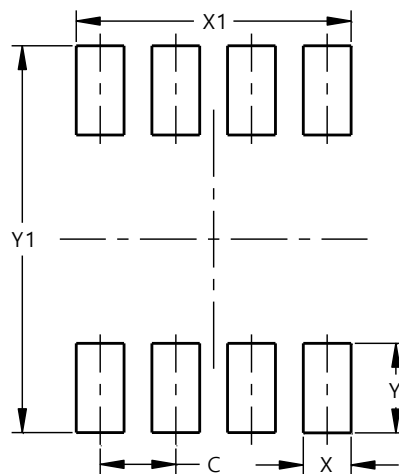


SO-8			
Dim	Min	Max	Typ
<b>A</b>	1.40	1.50	1.45
<b>A1</b>	0.10	0.20	0.15
<b>b</b>	0.30	0.50	0.40
<b>c</b>	0.15	0.25	0.20
<b>D</b>	4.85	4.95	4.90
<b>E</b>	5.90	6.10	6.00
<b>E1</b>	3.80	3.90	3.85
<b>E0</b>	3.85	3.95	3.90
<b>e</b>	--	--	1.27
<b>h</b>	--	--	0.35
<b>L</b>	0.62	0.82	0.72
<b>Q</b>	0.60	0.70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

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SO-8**



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

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