



**THE DATASHEET OF  
DMP2022LSSQ-13**



## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
-20V	13mΩ @ V <sub>GS</sub> = -10V	-9.3A
	16mΩ @ V <sub>GS</sub> = -4.5V	-8.3A
	22mΩ @ V <sub>GS</sub> = -2.5V	-7.2A

## Description

This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

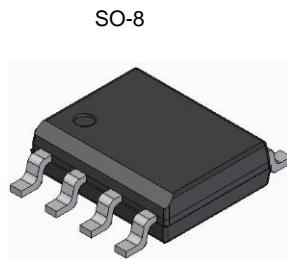
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features

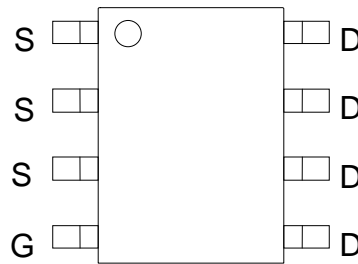
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

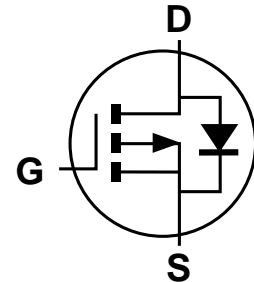
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208③
- Weight: 0.074g (Approximate)



Top View



Pin-Out Top View



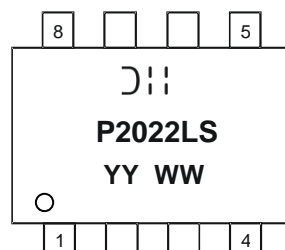
Equivalent Circuit

## Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
DMP2022LSSQ-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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



☺☺☺ = Manufacturer's Marking  
 P2022LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Year (ex: 19 = 2019)  
 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
Drain Current (Note 6)	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-9.3 -7.4	A
Pulsed Drain Current (Note 7)			I <sub>DM</sub>	-35	A
Avalanche Current, L = 0.3mH			I <sub>AS</sub>	-18	A
Avalanche Energy, L = 0.3mH			E <sub>AS</sub>	48.6	mJ

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.6	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	74	°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 8)</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	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-0.6	-0.77	-1.1	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	8	13	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A
		—	11	16		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -9A
		—	17	22		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -8A
Forward Transconductance	g <sub>fs</sub>	—	28	—	S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -10A
Diode Forward Voltage (Note 8)	V <sub>SD</sub>	-0.5	-0.68	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -3A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	2575	—	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	326	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	261	—	pF	
Gate Resistance	R <sub>G</sub>	—	10.9	—	Ω	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz
<b>SWITCHING CHARACTERISTICS (Note 9)</b>						
Total Gate Charge	Q <sub>g</sub>	—	28.1 60.2	—	nC	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A
Gate-Source Charge	Q <sub>gs</sub>	—	5.9	—		V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A
Gate-Drain Charge	Q <sub>gd</sub>	—	7.4	—		V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A
Turn-On Delay Time	t <sub>D(ON)</sub>	—	4.5	15	ns	V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω
Turn-On Rise Time	t <sub>R</sub>	—	3.3	20		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	197	216		
Turn-Off Fall Time	t <sub>F</sub>	—	60.5	153		

- Notes:
- Device mounted on 2 oz. Copper pads on FR-4 PCB.
  - Pulse width ≤10μs, Duty Cycle ≤1%.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

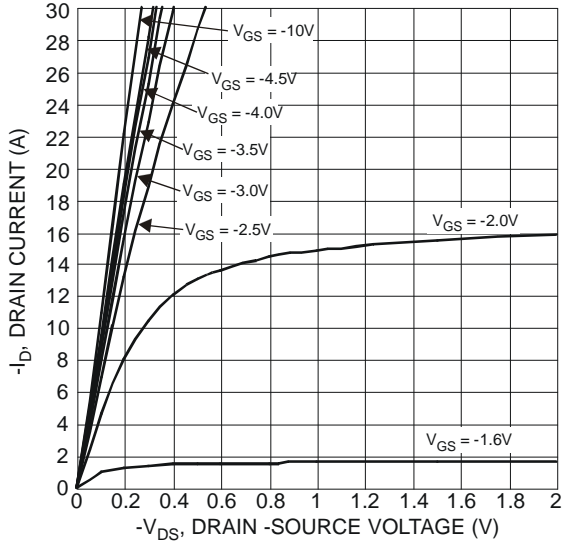


Figure 1 Typical Output Characteristics

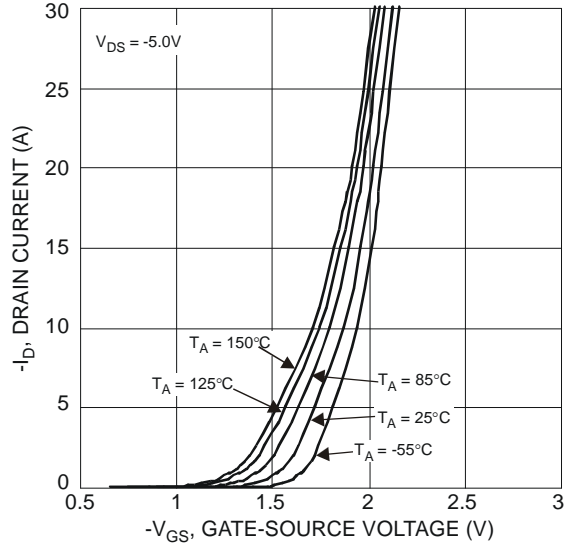


Figure 2 Typical Transfer Characteristics

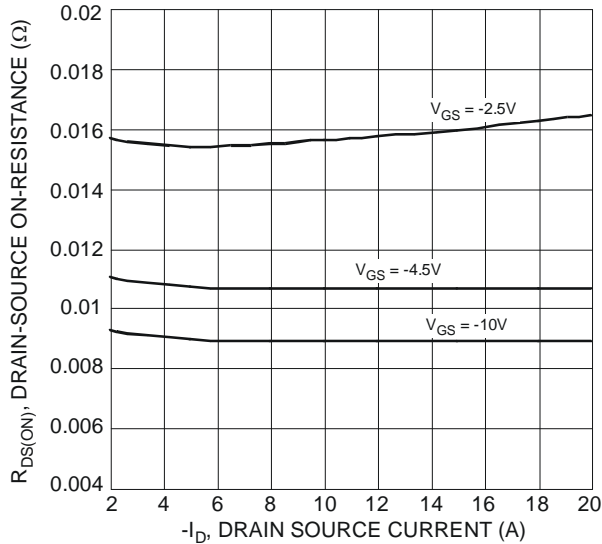


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

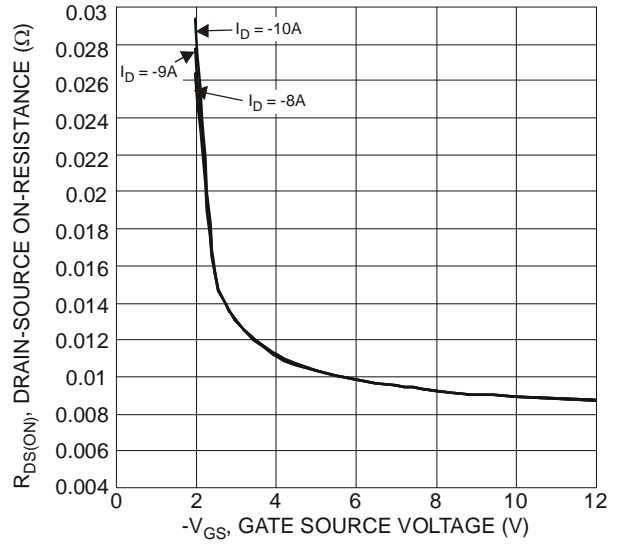


Figure 4 Typical Transfer Characteristics

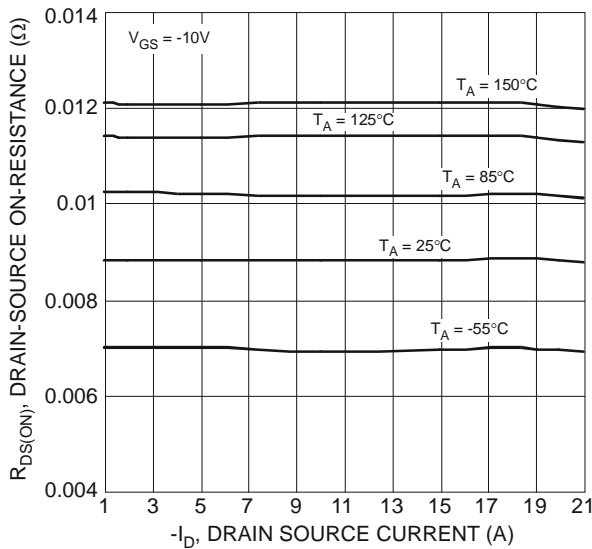


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

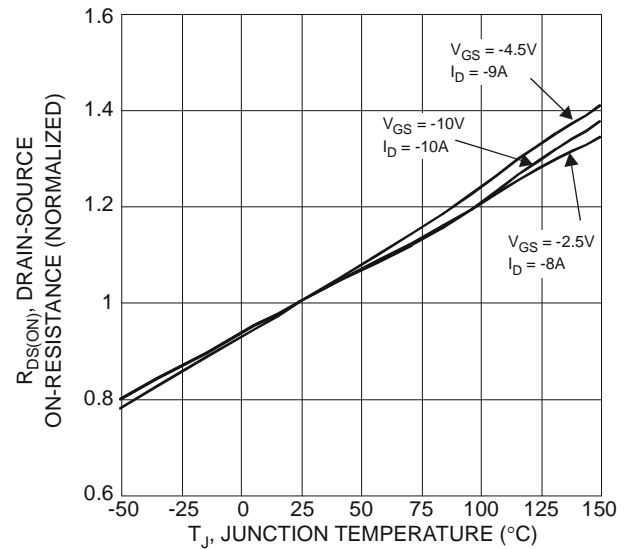


Figure 6 On-Resistance Variation with Temperature

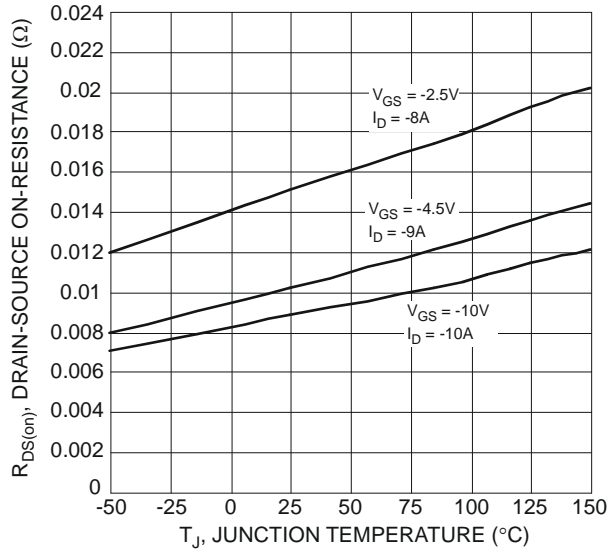


Figure 7 On-Resistance Variation with Temperature

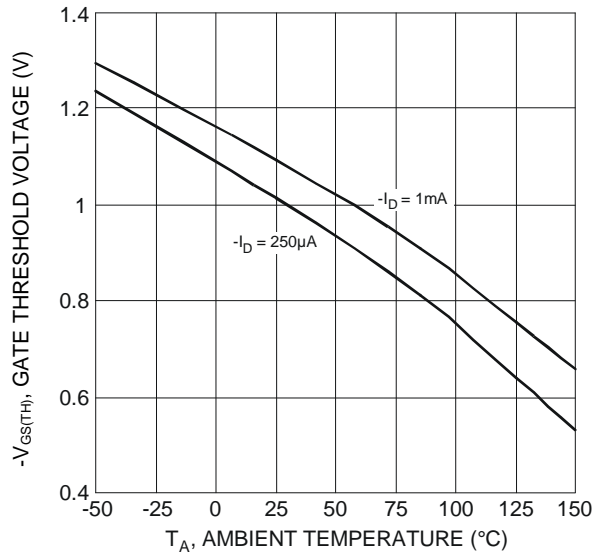


Figure 8 Gate Threshold Variation vs. Ambient Temperature

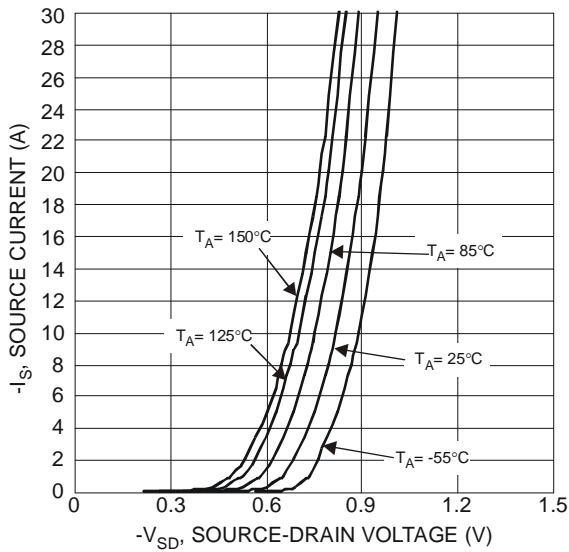


Figure 9 Diode Forward Voltage vs. Current

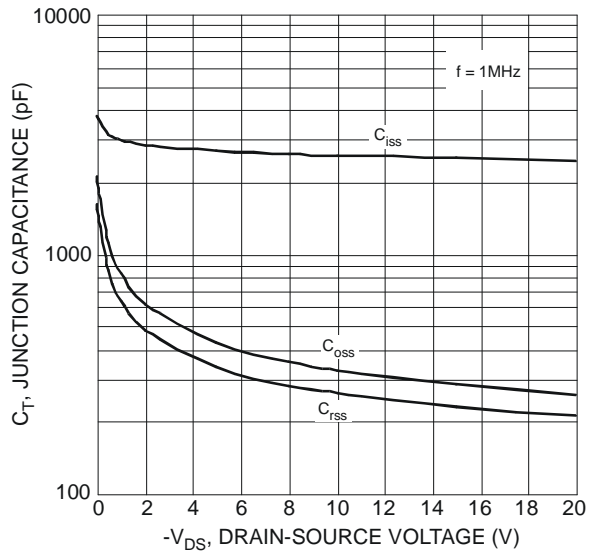


Figure 10 Typical Junction Capacitance

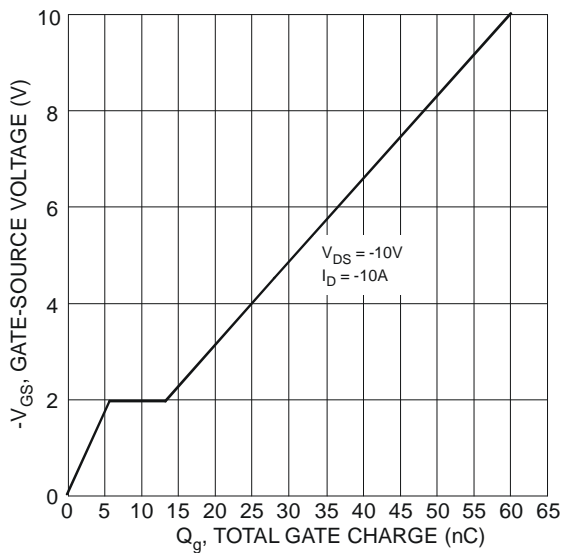


Figure 11 Gate-Charge Characteristics

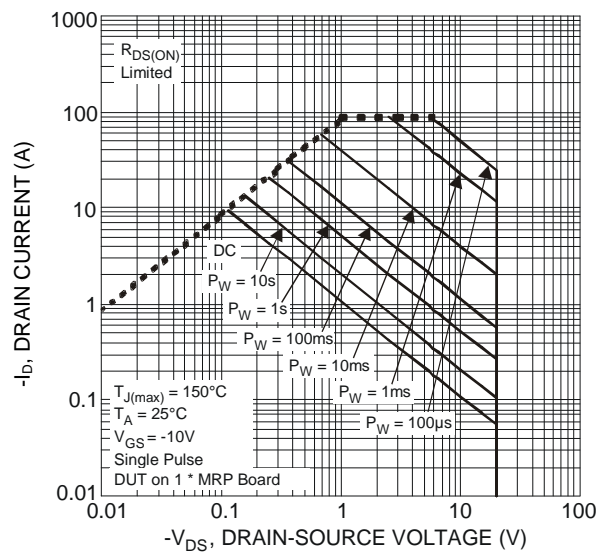
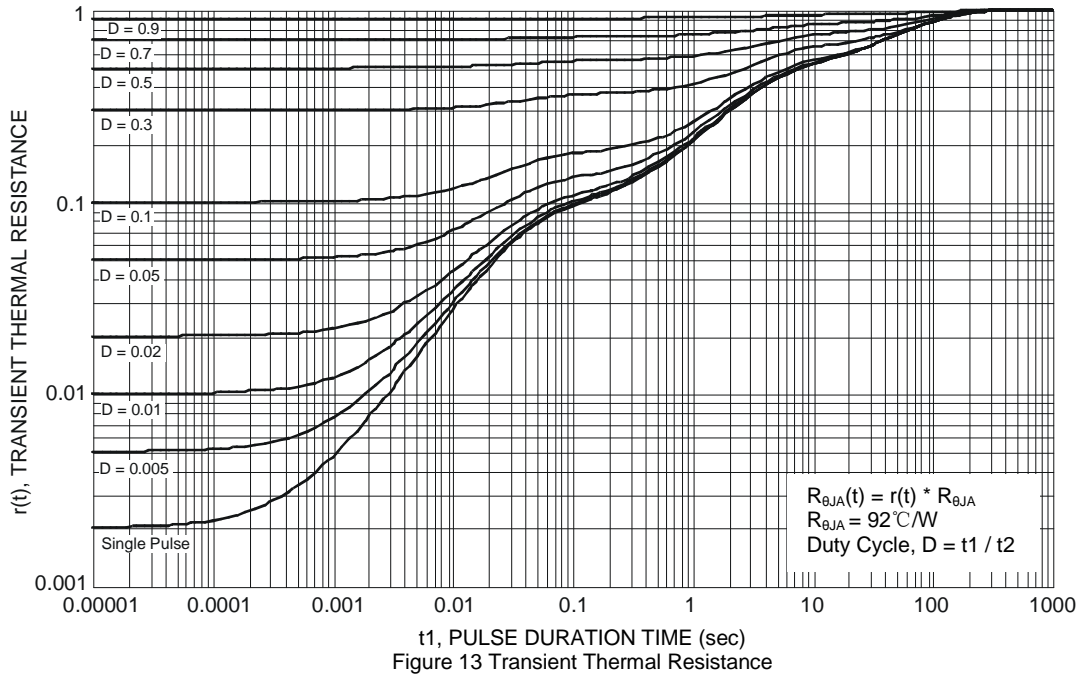


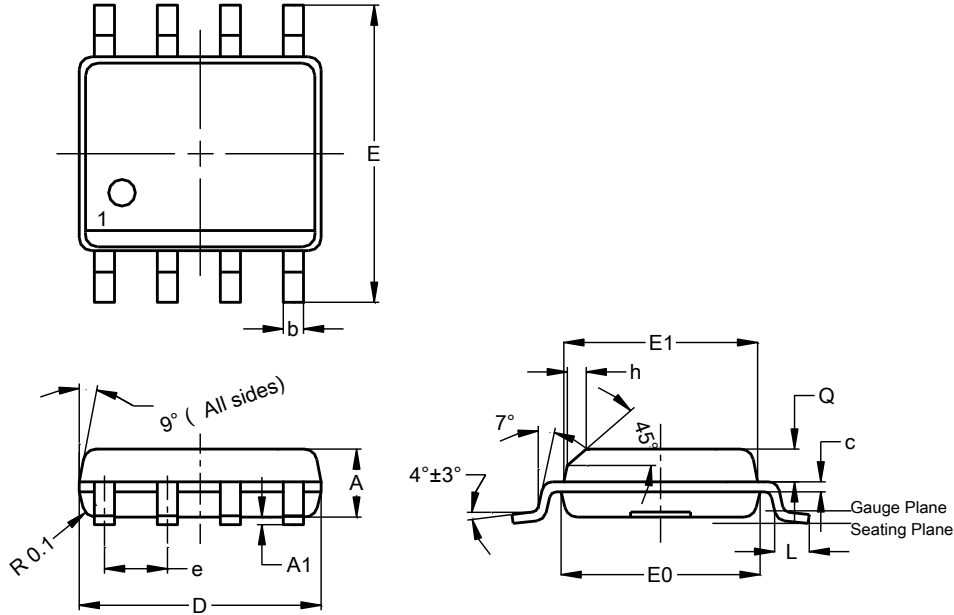
Figure 12 SOA, Safe Operation Area



**Package Outline Dimensions**

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

SO-8



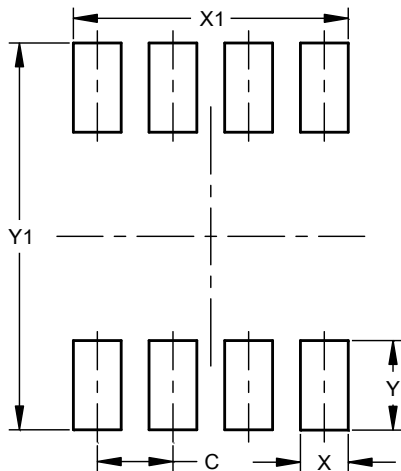
SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65

**All Dimensions in mm**

**Suggested Pad Layout**

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

SO-8



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

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