

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	$I_D$ max $T_A = +25^\circ\text{C}$
30V	21.5m $\Omega$ @ $V_{GS} = 10\text{V}$	10A
	29m $\Omega$ @ $V_{GS} = 4.5\text{V}$	8A

## Description

This MOSFET has been designed to minimize the on-state resistance ( $R_{DS(ON)}$ ) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

## Applications

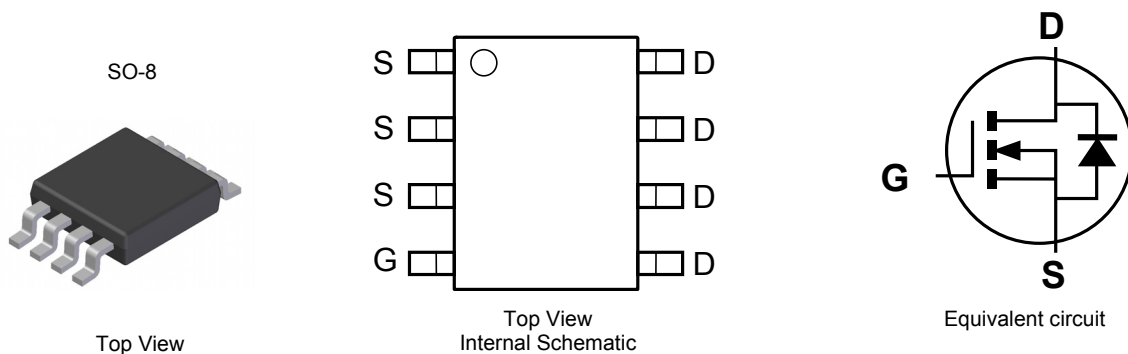
- Backlighting
- Power Management Functions
- DC-DC Converters

## Features and Benefits

- Low On-Resistance
- 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**

## 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 208  $\text{\textcircled{3}}$
- Weight: 0.074 grams (approximate)

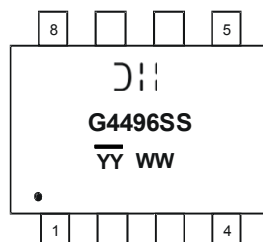


## Ordering Information (Note 4 & 5)

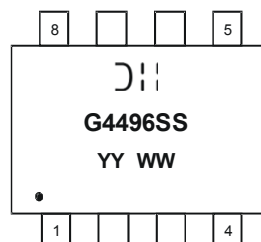
Part Number	Compliance	Case	Packaging
DMG4496SSS-13	Standard	SO-8	2500 / Tape & Reel
DMG4496SSSQ-13	Automotive	SO-8	2500 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_grade\\_definitions/](http://www.diodes.com/quality/product_grade_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



Chengdu A/T Site



Shanghai A/T Site

⌋⌋ = Manufacturer's Marking  
 G4496SS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 13 = 2013)  
 WW = Week (01 - 53)  
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 25$	V
Continuous Drain Current (Note 6)	Steady State	$T_A = +25^\circ\text{C}$	$I_D$	10	A
		$T_A = +85^\circ\text{C}$		6	
Pulsed Drain Current (Note 7)			$I_{DM}$	60	A
Avalanche Current (Notes 7 & 8)			$I_{AR}$	8	A
Repetitive Avalanche Energy (Notes 7 & 8) $L = 0.1\text{mH}$			$E_{AR}$	3.2	mJ

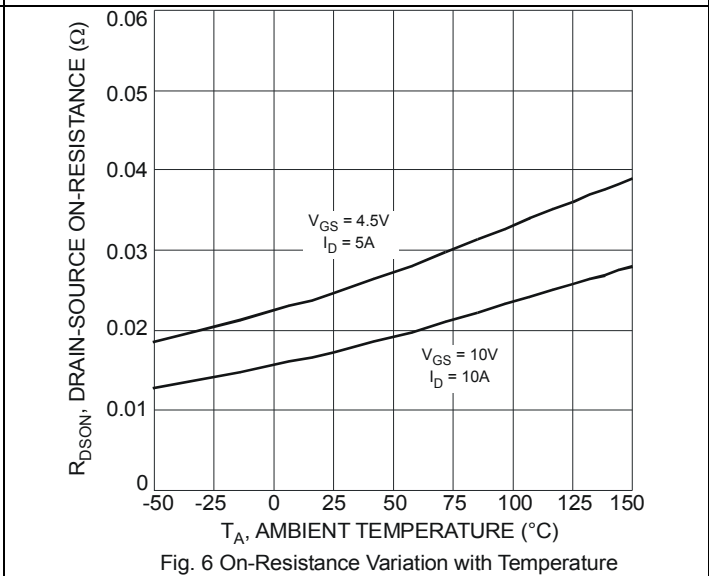
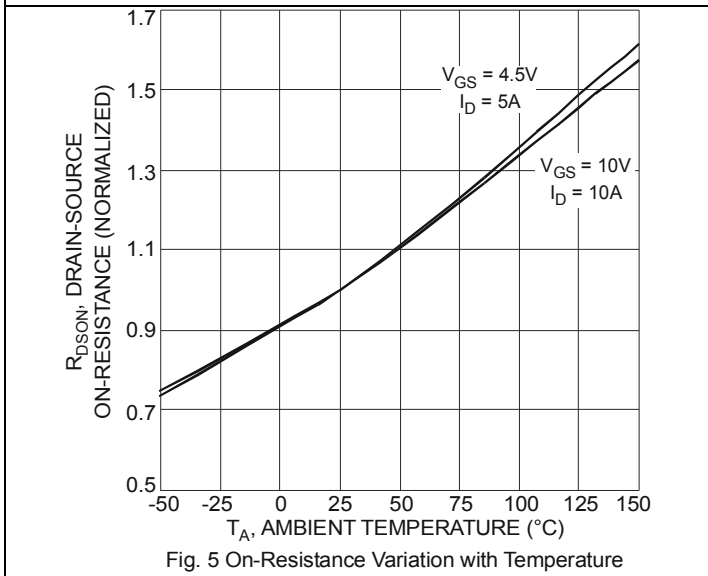
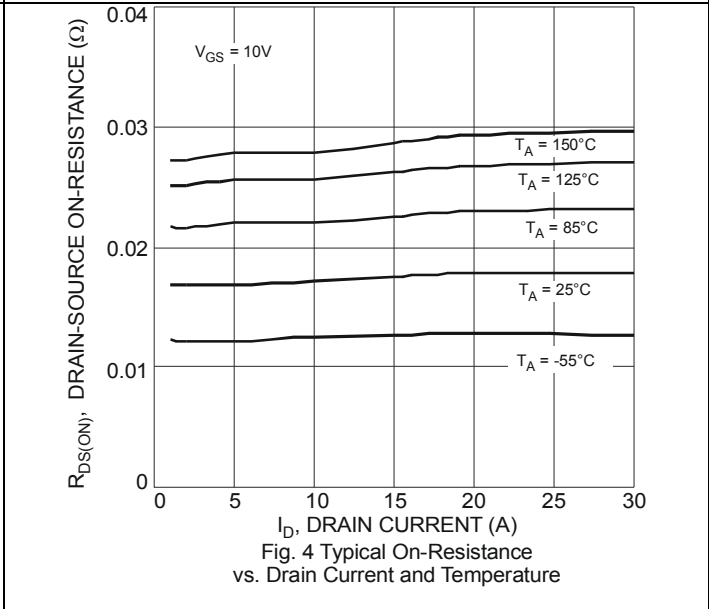
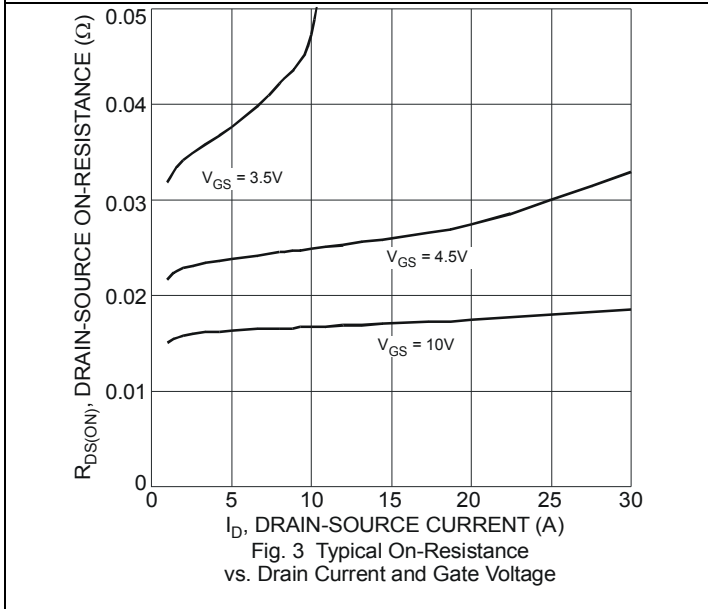
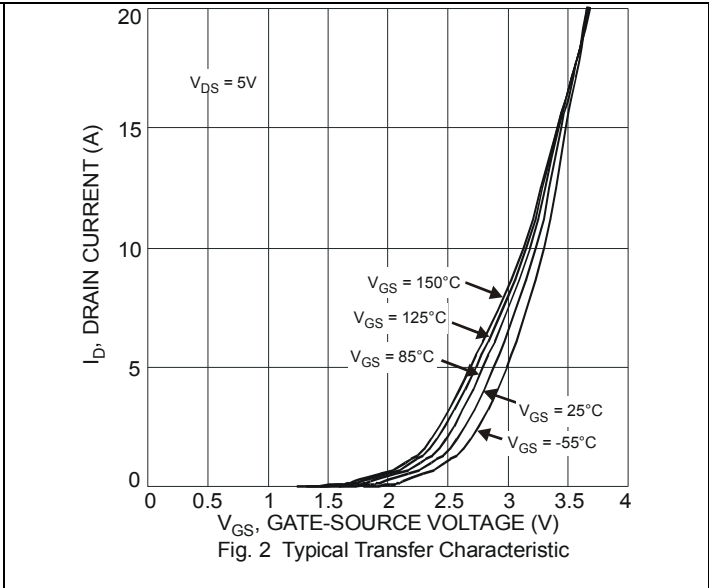
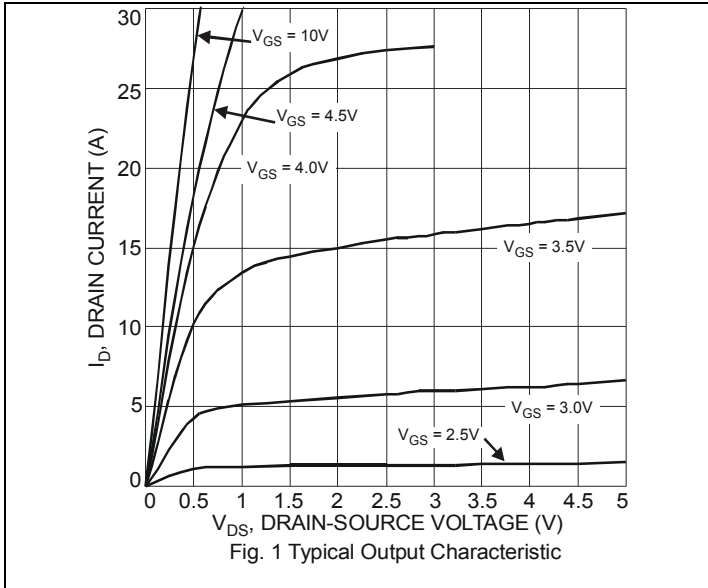
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	$P_D$	1.42	W
Thermal Resistance, Junction to Ambient @ $T_A = +25^\circ\text{C}$ (Note 6)	$R_{\theta JA}$	88.49	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	1.2	2.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	16	21.5	m $\Omega$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$
			22	29		$V_{GS} = 4.5\text{V}, I_D = 7.5\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	11.7	—	S	$V_{DS} = 5\text{V}, I_D = 10\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.70	1	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	$C_{iss}$	—	493.5	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	94.5	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	50.4	—	pF	
Gate Resistance	$R_g$	—	2.86	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	4.7	—	nC	$V_{DS} = 15\text{V}, V_{GS} = 4.5\text{V}, I_D = 10\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	10.2	—		
Gate-Source Charge	$Q_{gs}$	—	1.4	—	nC	$V_{DS} = 15\text{V}, V_{GS} = 10\text{V}, I_D = 10\text{A}$
Gate-Drain Charge	$Q_{gd}$	—	1.7	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.76	—	ns	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, R_G = 6\Omega, R_L = 15\Omega,$
Turn-On Rise Time	$t_r$	—	3.64	—		
Turn-Off Delay Time	$t_{D(off)}$	—	19.5	—		
Turn-Off Fall Time	$t_f$	—	4.9	—		

- Notes:
- Device mounted on 1 in.<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment @  $T_A = +25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.
  - Repetitive rating, pulse width limited by junction temperature.
  - $I_{AR}$  and  $E_{AR}$  rating are based on low frequency and duty cycles to keep  $T_J = 25^\circ\text{C}$
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.



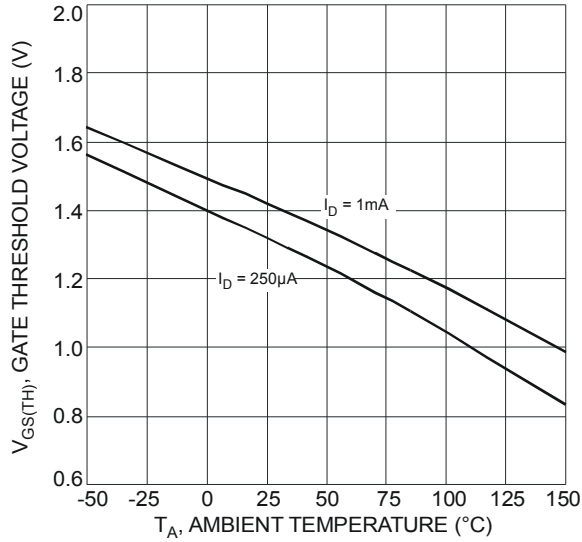


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

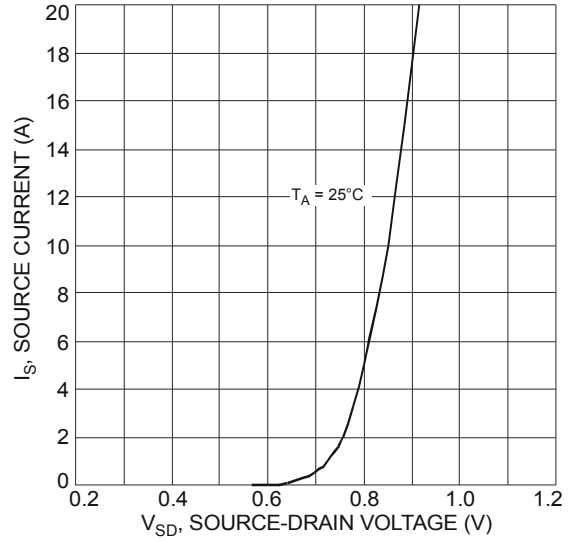


Fig. 8 Diode Forward Voltage vs. Current

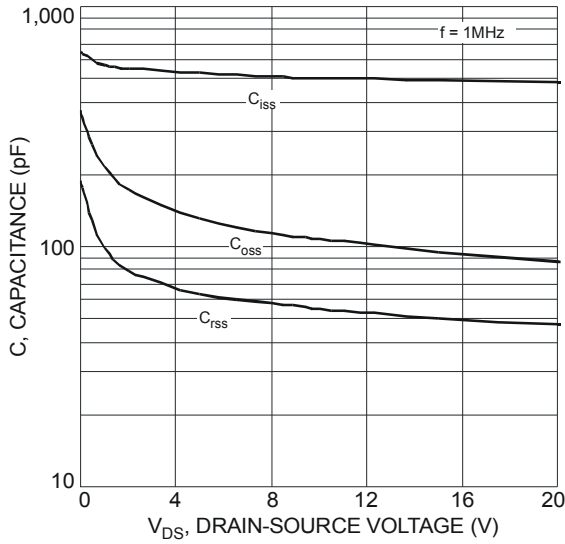


Fig. 9 Typical Total Capacitance

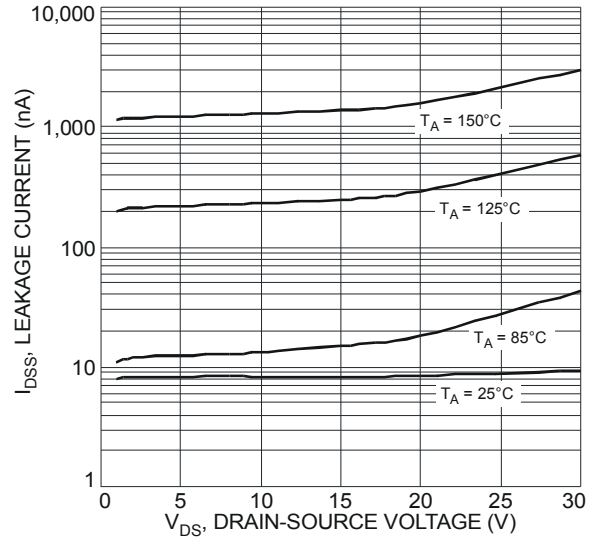


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

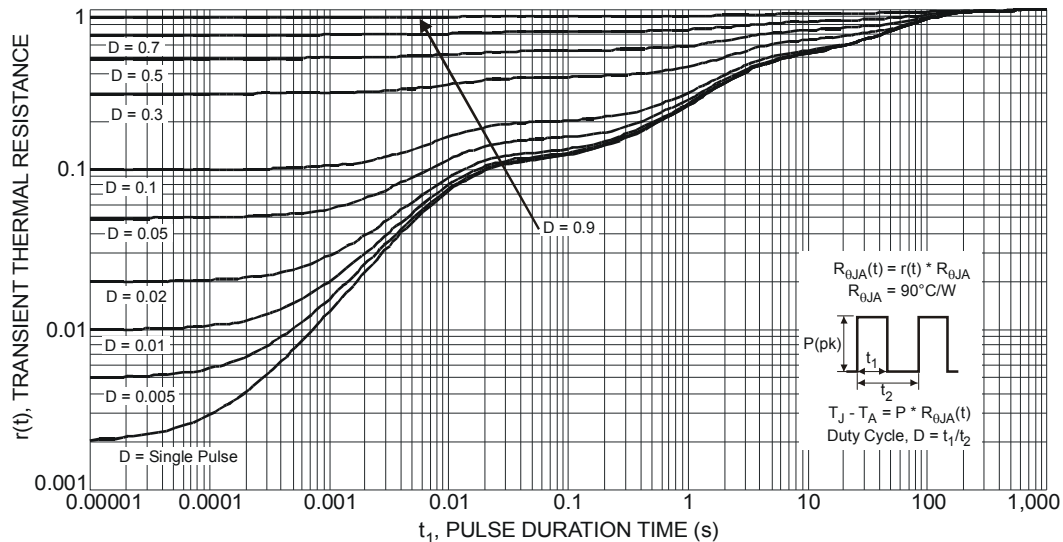
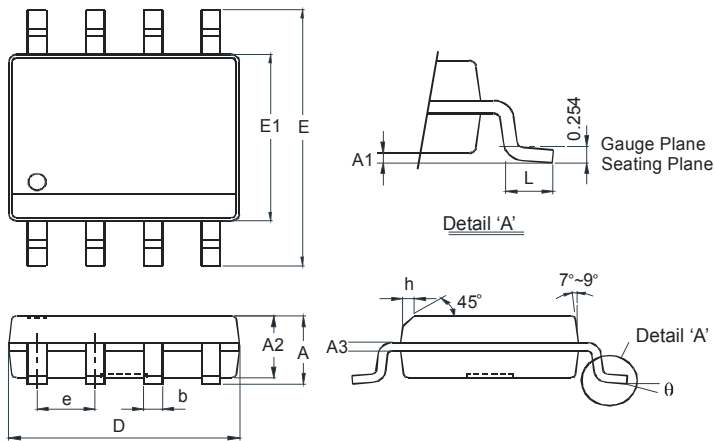


Fig. 11 Transient Thermal Response

**Package Outline Dimensions**

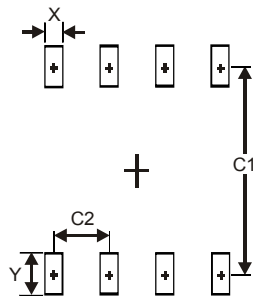
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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