

## Product Summary

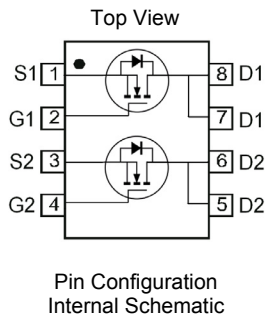
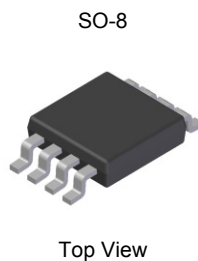
$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ max $T_A = +25^\circ\text{C}$
30V	16m $\Omega$ @ $V_{GS} = 10\text{V}$	9.8A
	22m $\Omega$ @ $V_{GS} = 4.5\text{V}$	8.4A

## 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

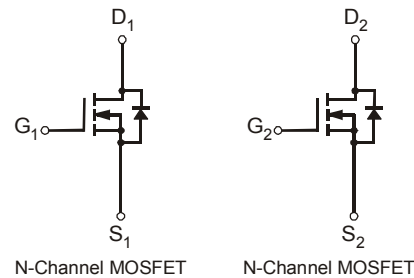


## Features and Benefits

- 100% avalanche rated part
- Low  $R_{DS(on)}$  - minimizes conduction losses
- Low  $Q_g$  - minimizes switching losses
- **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: 0.076 grams (approximate)

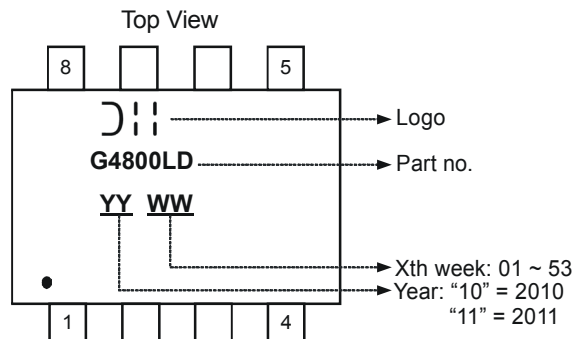


## Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DMG4800LSD-13	Standard	SO-8	2500 / Tape & Reel
DMG4800LSDQ-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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	30	V
Gate-Source Voltage			V <sub>GSS</sub>	±25	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	7.5 6.0	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	9.8 7.7	A
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	6.4 5.0	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	8.4 6.6	A
Maximum Continuous Body Diode Forward Current (Note 6)			I <sub>S</sub>	2	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I <sub>DM</sub>	42	A
Avalanche Current (Notes 7 & 8) L = 0.1mH			I <sub>AR</sub>	17	A
Repetitive Avalanche Energy (Notes 7 & 8) L = 0.1mH			E <sub>AR</sub>	14	mJ

**Thermal Characteristics**

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)			P <sub>D</sub>	1.17	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R <sub>θJA</sub>	107	°C/W
	t < 10s			61	
Total Power Dissipation (Note 6)			P <sub>D</sub>	1.5	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R <sub>θJA</sub>	83	°C/W
	t < 10s			49	
Thermal Resistance, Junction to Case			R <sub>θJC</sub>	14.5	
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 9)</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 T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	1.0	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.8	-	1.6	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	12	16	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 9A
		-	16	22		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 7A
Forward Transfer Admittance	Y <sub>fs</sub>	-	8	-	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 9A
Diode Forward Voltage	V <sub>SD</sub>	-	0.72	0.94	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iSS</sub>	-	798	-	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	128	-	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	122	-	pF	
Gate Resistance	R <sub>g</sub>	-	1.37	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	-	8.56	-	nC	V <sub>GS</sub> = 5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 9A
Gate-Source Charge	Q <sub>gs</sub>	-	1.8	-	nC	
Gate-Drain Charge	Q <sub>gd</sub>	-	2.5	-	nC	
Turn-On Delay Time	t <sub>D(on)</sub>	-	5.03	-	ns	V <sub>DD</sub> = 15V, V <sub>GEN</sub> = 10V, R <sub>L</sub> = 15Ω, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 1A
Turn-On Rise Time	t <sub>r</sub>	-	4.50	-	ns	
Turn-Off Delay Time	t <sub>D(off)</sub>	-	26.33	-	ns	
Turn-Off Fall Time	t <sub>f</sub>	-	8.55	-	ns	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - I<sub>AR</sub> and E<sub>AR</sub> rating are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Applicable to products manufactured with Data Code "1146" (Nov, 2011) and newer.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

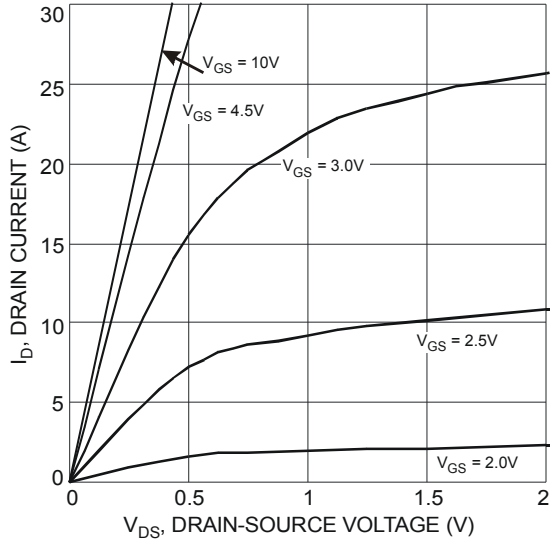


Fig. 1 Typical Output Characteristic

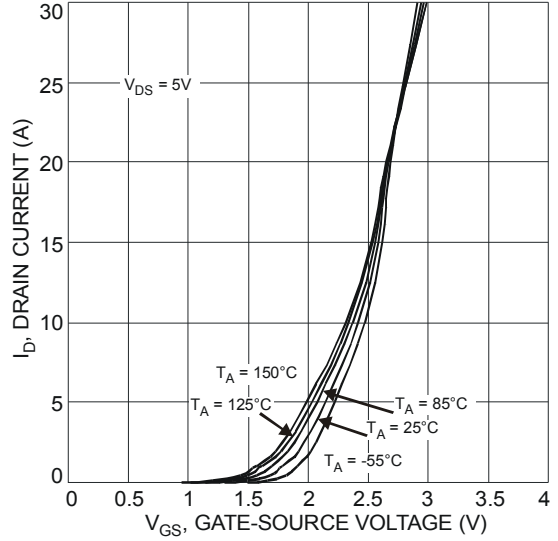


Fig. 2 Typical Transfer Characteristic

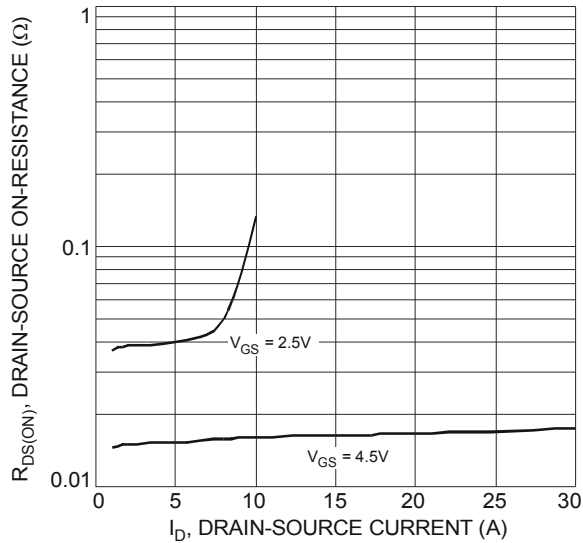


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

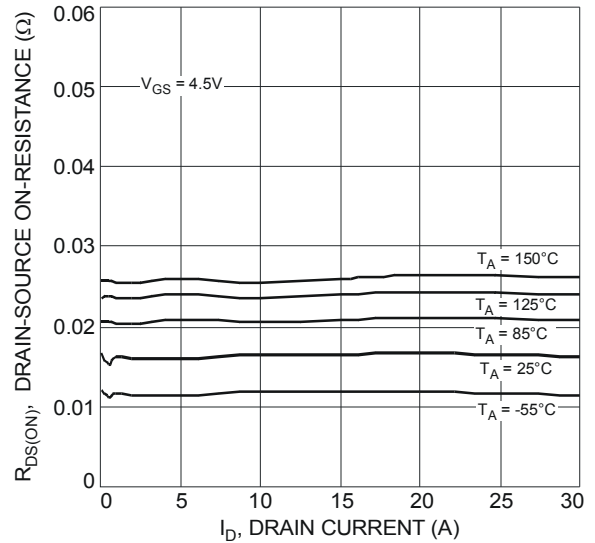


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

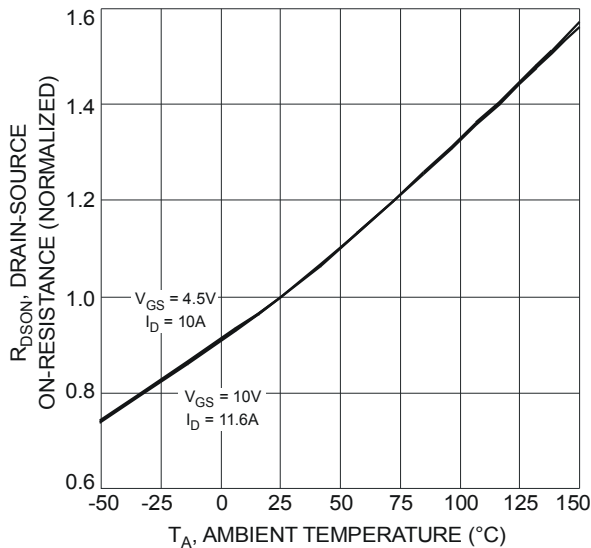


Fig. 5 On-Resistance Variation with Temperature

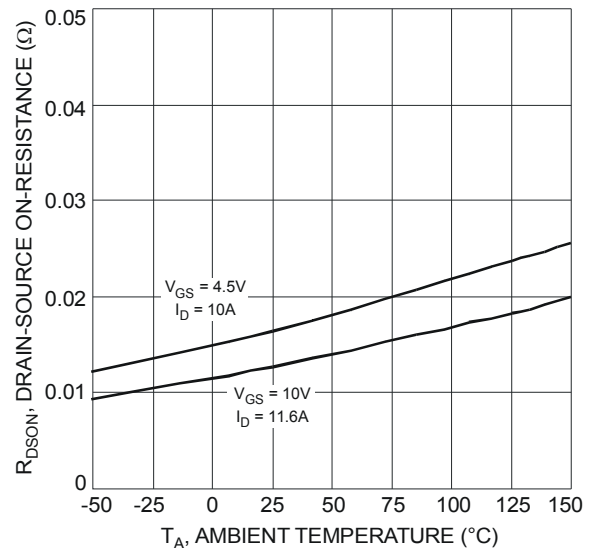


Fig. 6 On-Resistance Variation with Temperature

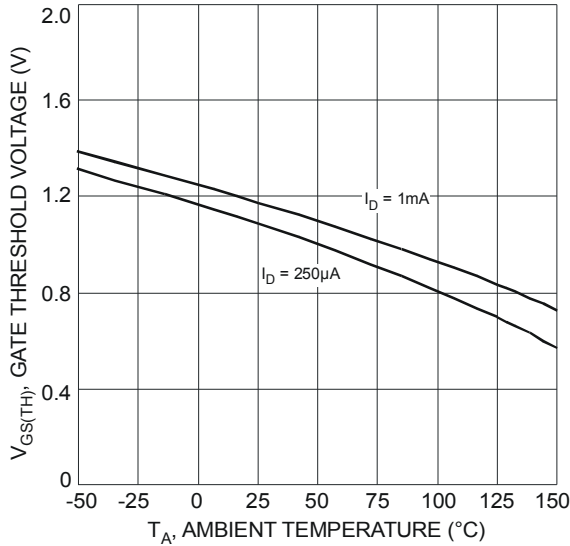


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

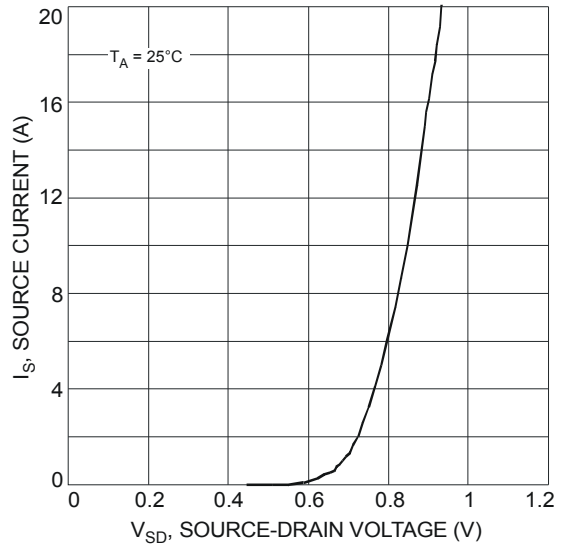


Fig. 8 Diode Forward Voltage vs. Current

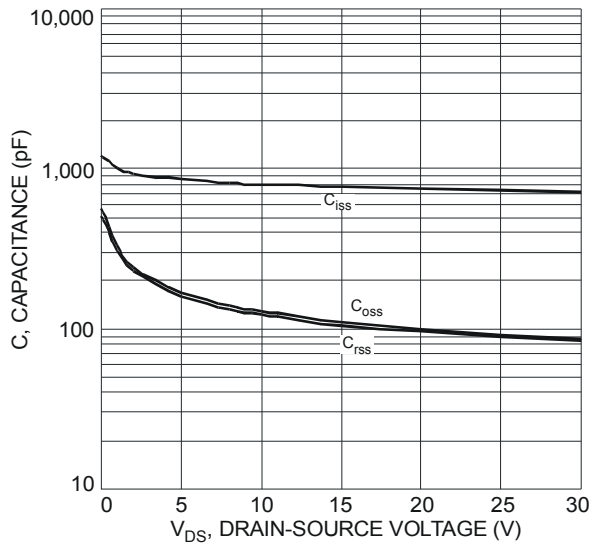


Fig. 9 Typical Total Capacitance

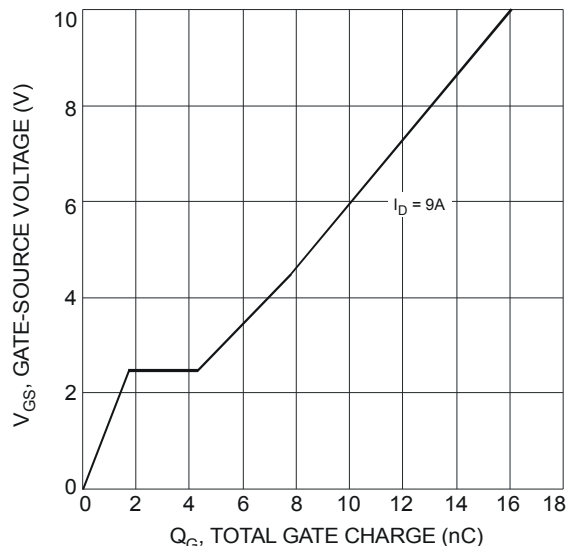


Fig. 10 Total Gate Charge

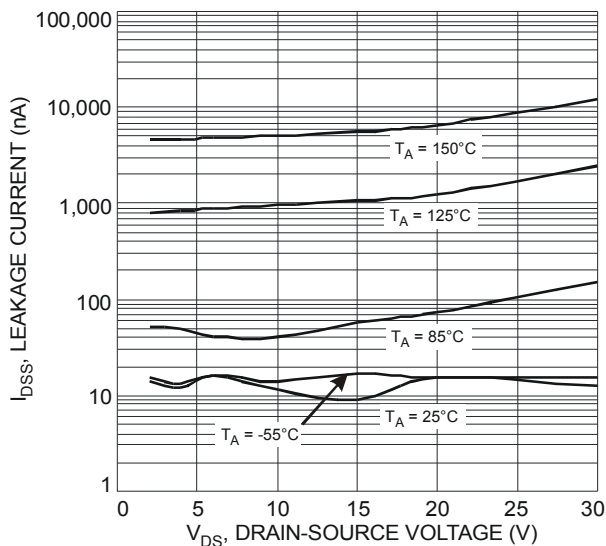


Fig. 11 Typical Leakage Current vs. Drain-Source Voltage

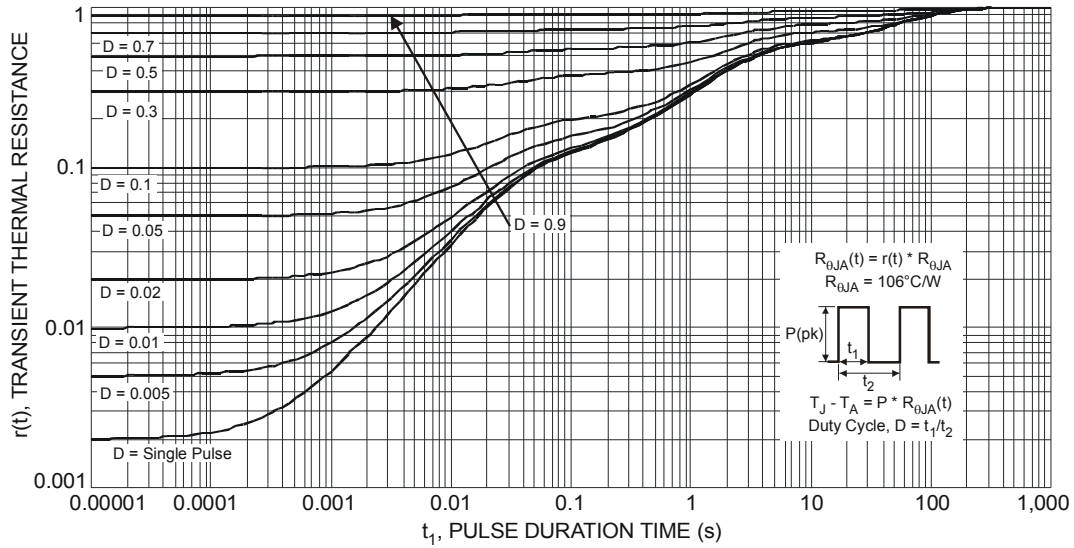
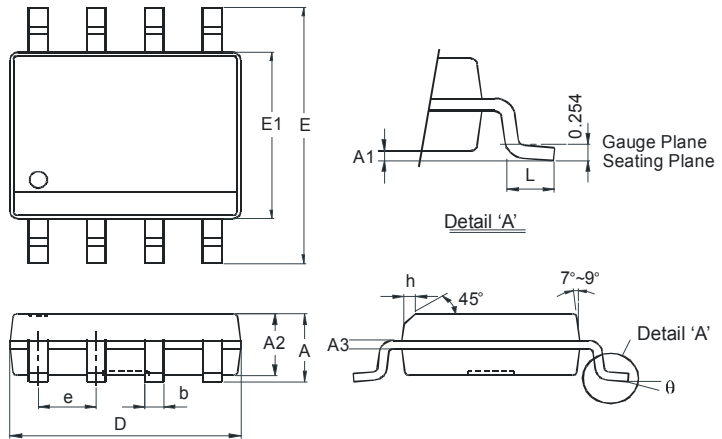


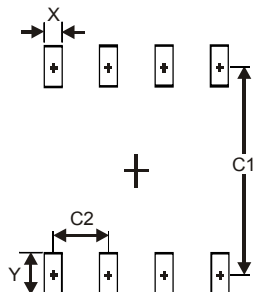
Fig. 12 Transient Thermal Response

**Package Outline Dimensions**



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**



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

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А