

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	$I_D$ $T_A = +25^\circ C$
30V	15m $\Omega$ @ $V_{GS} = 10V$	8.4A
	18m $\Omega$ @ $V_{GS} = 4.5V$	7.7A

## Description

This new generation 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

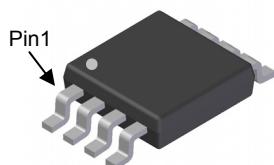
- DC-DC Converters
- Power Management Functions
- Backlighting

## Features and Benefits

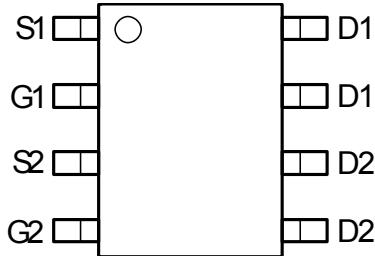
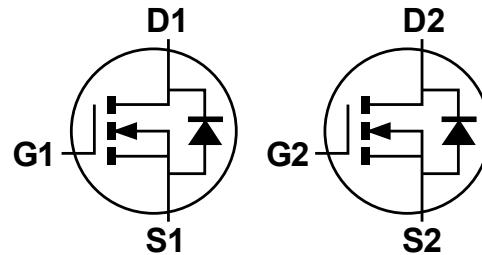
- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

## 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: See Diagram
- Terminals: Finish – Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 **63**
- Weight: 0.074 grams (approximate)



Top View

Top View  
Pin Configuration

Equivalent Circuit

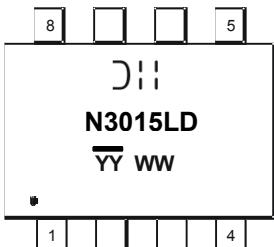
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3015LSD-13	SO-8	2,500/Tape & Reel

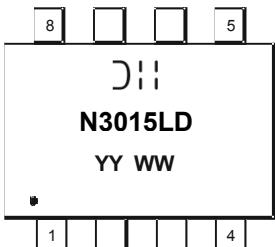
Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 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

DII = Manufacturer's Marking

N3015LD = Product Type Marking Code

YYWW = Date Code Marking

YY or YY = Year (ex: 14 = 2014)

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	Units
Drain-Source Voltage			$V_{DSS}$	30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 20$	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	8.4 6.8	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	11.0 9.0	A
Maximum Body Diode Forward Current (Note 6)			$I_S$	2.5	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)			$I_{DM}$	80	A
Avalanche Current (Notes 7) $L = 0.1\text{mH}$			$I_{AS}$	22	A
Avalanche Energy (Notes 7) $L = 0.1\text{mH}$			$E_{AS}$	25	mJ

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

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$		$P_D$	1.2	W
	$T_A = +70^\circ\text{C}$			0.8	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state		$R_{\theta JA}$	102	$^\circ\text{C/W}$
	$t < 10\text{s}$			62	
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$		$P_D$	1.6	W
	$T_A = +70^\circ\text{C}$			1.0	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state		$R_{\theta JA}$	78	$^\circ\text{C/W}$
	$t < 10\text{s}$			47	
Thermal Resistance, Junction to Case (Note 6)			$R_{\theta JC}$	14.5	
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 8)</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	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	$V_{GS(\text{TH})}$	1.3	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	—	8	15	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 12\text{A}$
		—	12	18		$V_{GS} = 4.5\text{V}, I_D = 10\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.7	1.0	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	$C_{iss}$	—	1415	—	$\text{pF}$	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	119	—		
Reverse Transfer Capacitance	$C_{rss}$	—	82	—		
Gate Resistance	$R_G$	—	2.6	3.2	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	11.3	—	$\text{nC}$	$V_{DS} = 15\text{V}, I_D = 12\text{A}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	25.1	—		
Gate-Source Charge	$Q_{gs}$	—	3.5	—		
Gate-Drain Charge	$Q_{gd}$	—	3.6	—		
Turn-On Delay Time	$t_{D(\text{on})}$	—	4.8	—	$\text{nS}$	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V}, R_L = 1.25\Omega, R_G = 3\Omega$
Turn-On Rise Time	$t_r$	—	16.5	—		
Turn-Off Delay Time	$t_{D(\text{off})}$	—	26.1	—		
Turn-Off Fall Time	$t_f$	—	5.6	—		
Body Diode Reverse Recovery Time	$t_{rr}$	—	8.5	—	$\text{nS}$	$I_S = 12\text{A}, dI/dt = 500\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	$Q_{rr}$	—	7.0	—	$\text{nC}$	$I_S = 12\text{A}, dI/dt = 500\text{A}/\mu\text{s}$

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

7. UIS in production with  $L = 0.1\text{mH}$ , starting  $T_A = +25^\circ\text{C}$ .

8. Short duration pulse test used to minimize self-heating effect.

9. Guaranteed by design. Not subject to product testing.

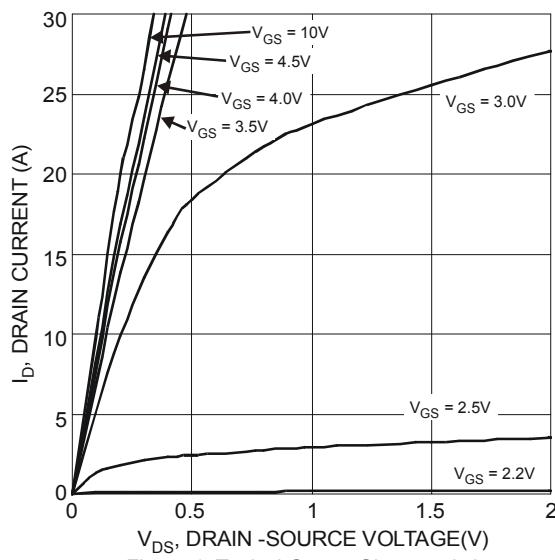


Figure 1 Typical Output Characteristics

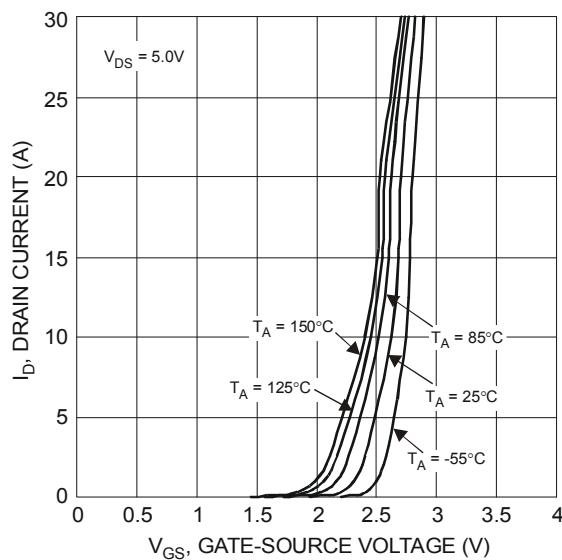


Figure 2 Typical Transfer Characteristics

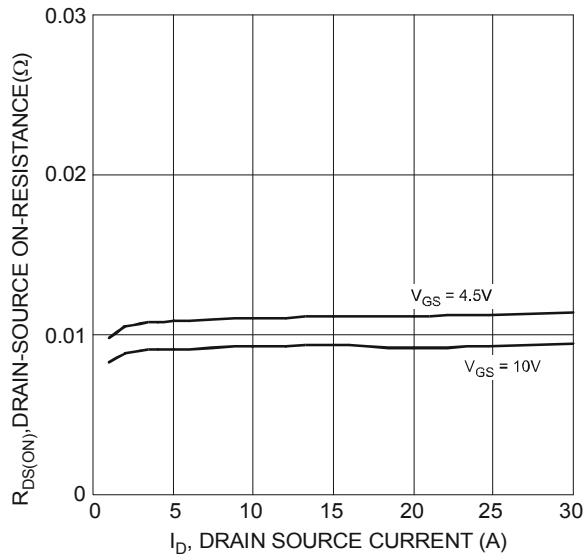


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

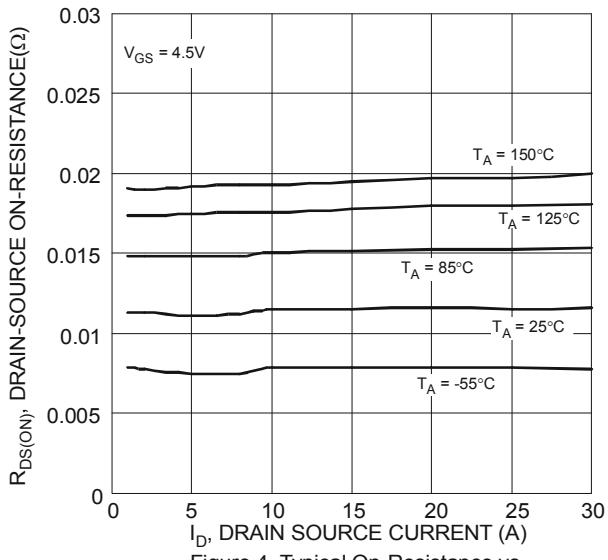


Figure 4 Typical On-Resistance vs.  
Drain Current and Temperature

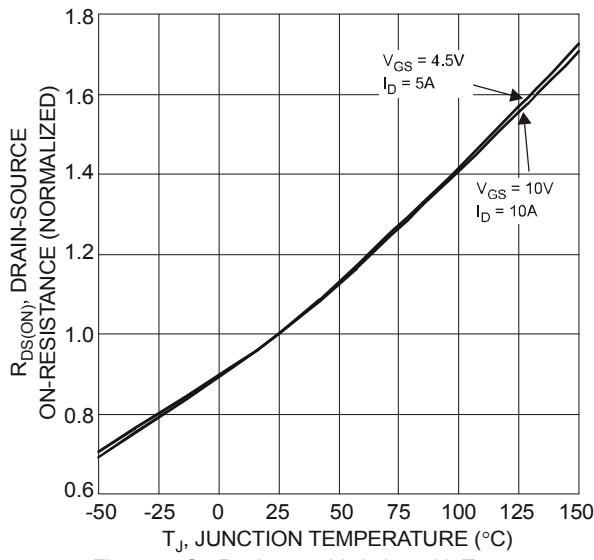


Figure 5 On-Resistance Variation with Temperature

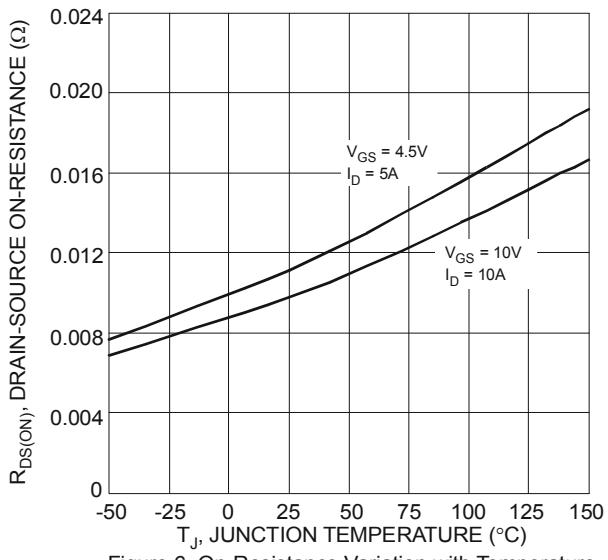


Figure 6 On-Resistance Variation with Temperature

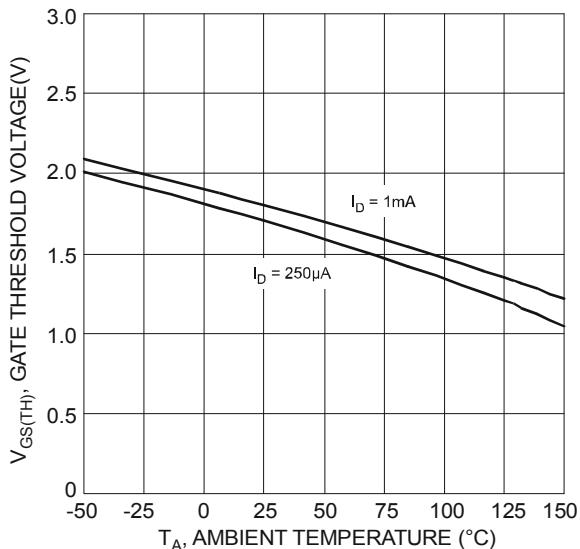


Figure 7 Gate Threshold Variation vs. Ambient Temperature

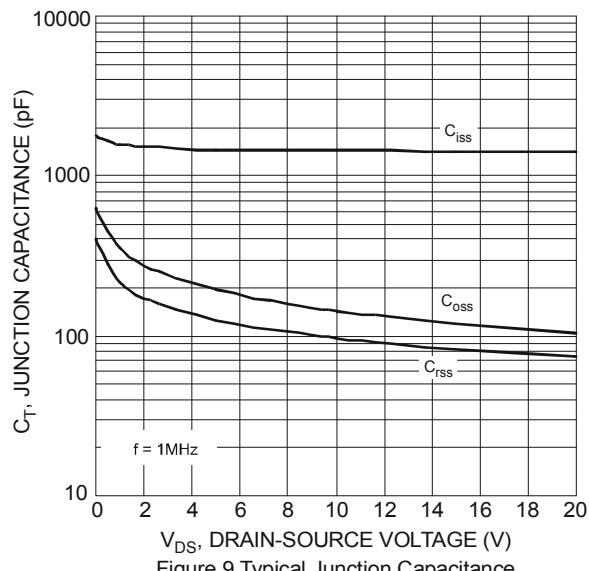


Figure 9 Typical Junction Capacitance

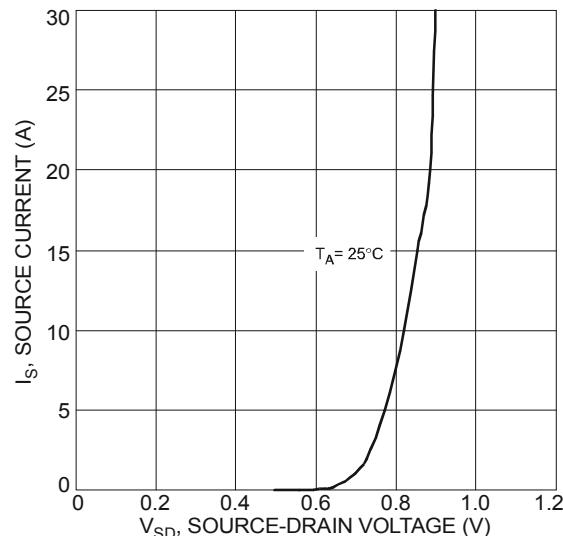


Figure 8 Diode Forward Voltage vs. Current

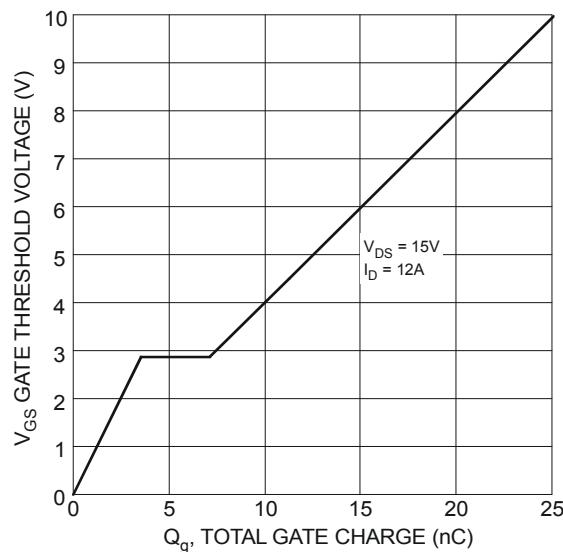


Figure 10 Gate Charge

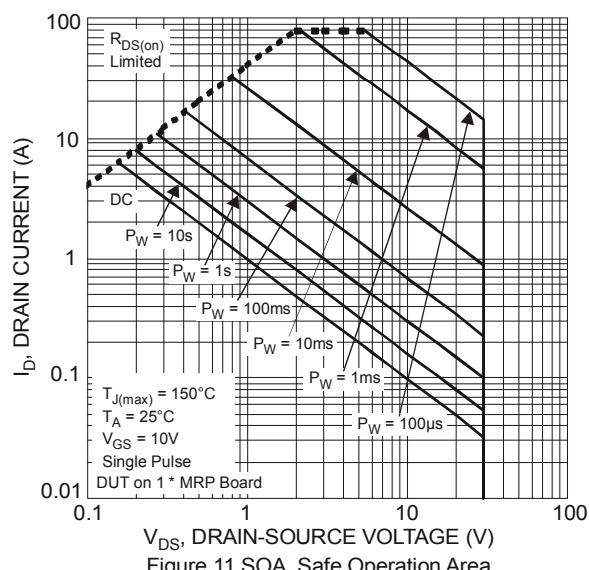


Figure 11 SOA, Safe Operation Area

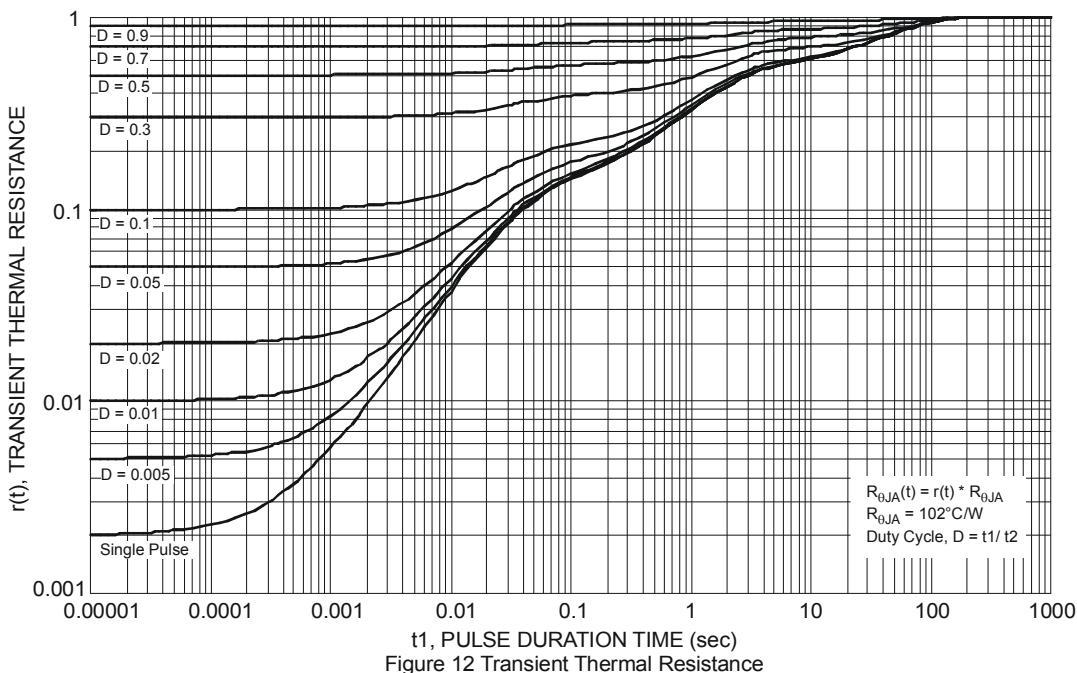
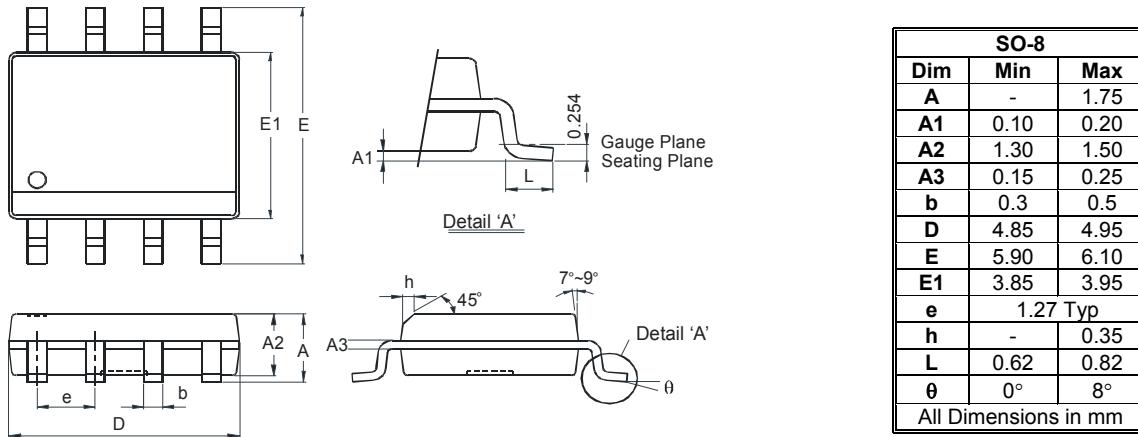


Figure 12 Transient Thermal Resistance

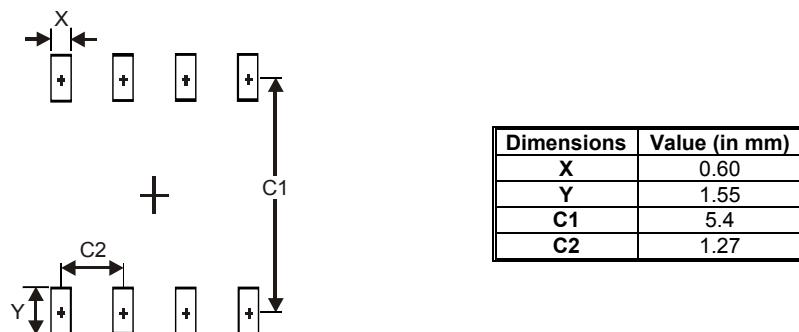
## Package Outline Dimensions

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



## Suggested Pad Layout

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



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