

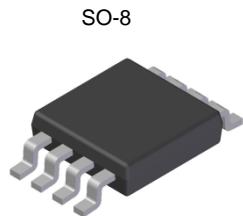
Product Summary

BV_{DSS}	R_{DS(ON)} max	I_D max T_A = +25°C
60V	9.5mΩ @ V _{GS} = 10V	10.8A
	12mΩ @ V _{GS} = 4.5V	9.6

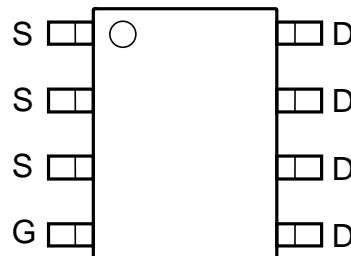
Description and Applications

This new generation MOSFET is 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.

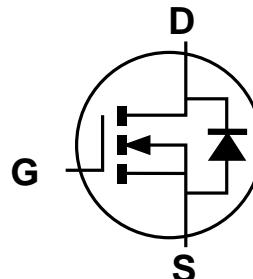
- Power Management Functions
- DC-DC Converters
- Backlighting



Top View



Top View
Internal Schematic



Equivalent circuit

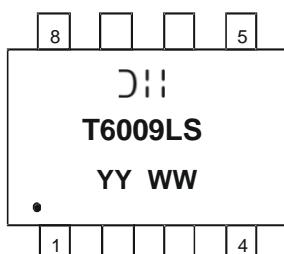
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6009LSS-13	SO-8	2,500/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 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



DII = Manufacturer's Marking
T6009LS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 15 = 2015)
WW = Week (01 to 53)

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	± 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	10.8 8.6	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	14.4 11.5	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)			I_{DM}	60	A
Avalanche Current, $L = 0.1\text{mH}$			I_{AS}	25	A
Avalanche Energy, $L = 0.1\text{mH}$			E_{AS}	31.5	mJ

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

Characteristic			Symbol	Value	Units	
Total Power Dissipation (Note 5)			P_D	1.25	W	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$t < 10\text{s}$	$R_{\theta JA}$	100	$^\circ\text{C/W}$	
	$t < 10\text{s}$		$R_{\theta JA}$	55.5	$^\circ\text{C/W}$	
Total Power Dissipation (Note 6)			P_D	1.6	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$t < 10\text{s}$	$R_{\theta JA}$	75	$^\circ\text{C/W}$	
	$t < 10\text{s}$		$R_{\theta JA}$	42	$^\circ\text{C/W}$	
Thermal Resistance, Junction to Case (Note 6)			$R_{\theta JC}$	12	$^\circ\text{C/W}$	
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
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.7	-	2	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(\text{ON})}$	-	7.2	9.5	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 13.5\text{A}$
		-	9	12		$V_{GS} = 4.5\text{V}, I_D = 11.5\text{A}$
Diode Forward Voltage	V_{SD}	-	0.9	1.2	V	$V_{GS} = 0\text{V}, I_S = 20\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1,925	-	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	438	-		
Reverse Transfer Capacitance	C_{rss}	-	41	-		
Gate Resistance	R_G	-	1.7	-	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	-	33.5	-	nC	$V_{DS} = 30\text{V}, I_D = 13.5\text{A}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	-	15.6	-		
Gate-Source Charge	Q_{gs}	-	4.7	-		
Gate-Drain Charge	Q_{qd}	-	5.3	-		
Turn-On Delay Time	$t_{D(\text{ON})}$	-	4.5	-	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, R_G = 6\Omega, I_D = 13.5\text{A}$
Turn-On Rise Time	t_R	-	8.6	-		
Turn-Off Delay Time	$t_{D(\text{OFF})}$	-	35.9	-		
Turn-Off Fall Time	t_F	-	15.7	-		
Body Diode Reverse Recovery Time	t_{RR}	-	18.2	-	ns	$I_F = 13.5\text{A}, di/dt = 400\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	Q_{RR}	-	33.1	-		

- 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. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to product testing.

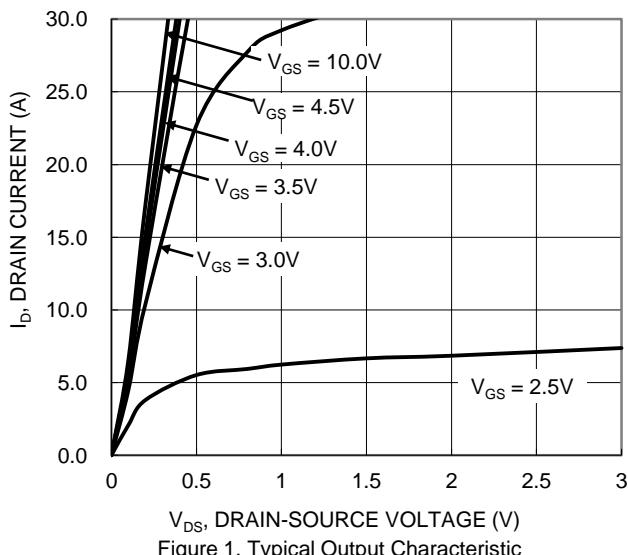


Figure 1. Typical Output Characteristic

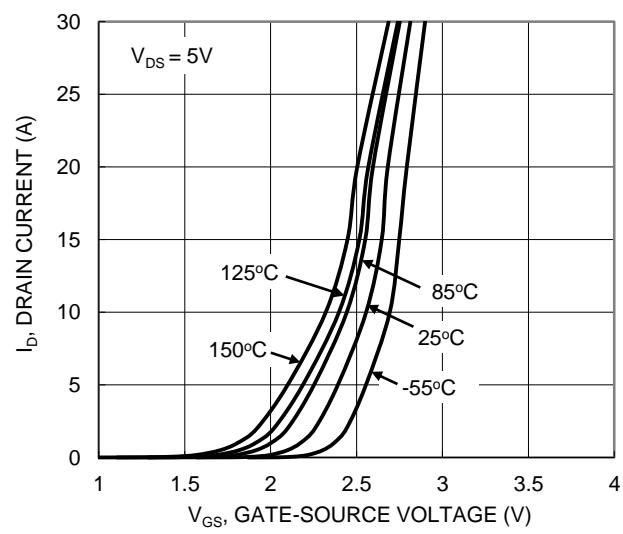


Figure 2. Typical Transfer Characteristic

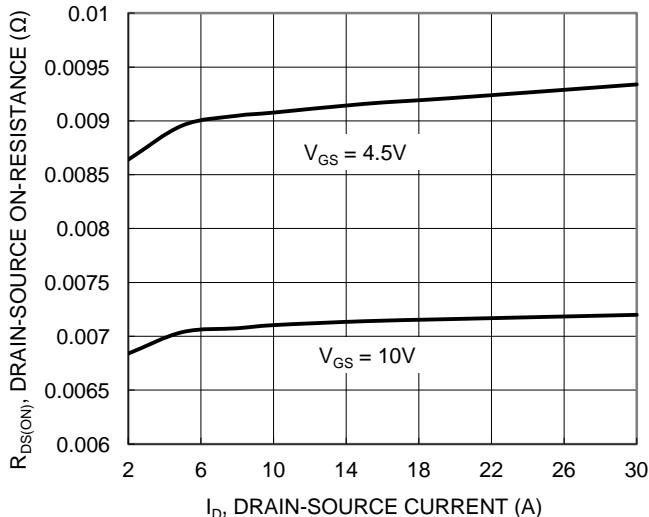


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

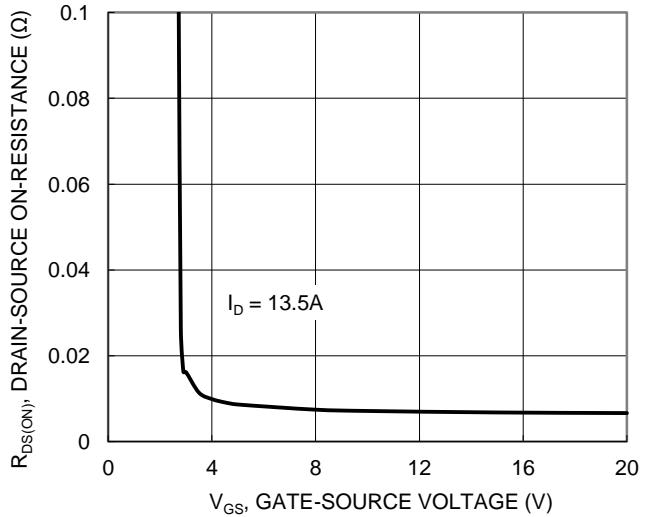


Figure 4. Typical Transfer Characteristic

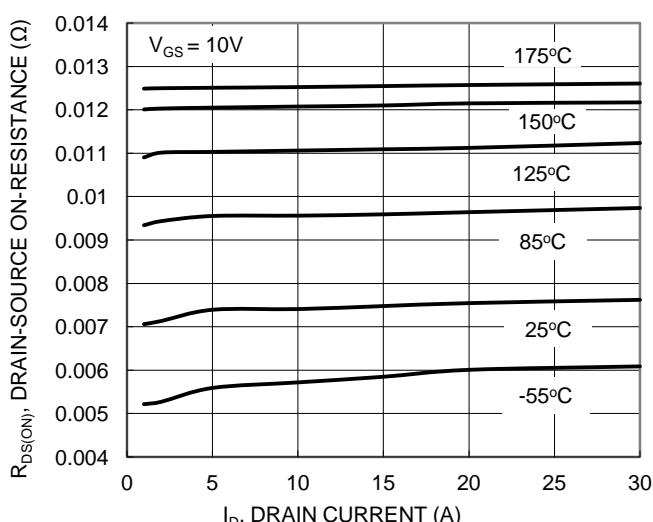


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

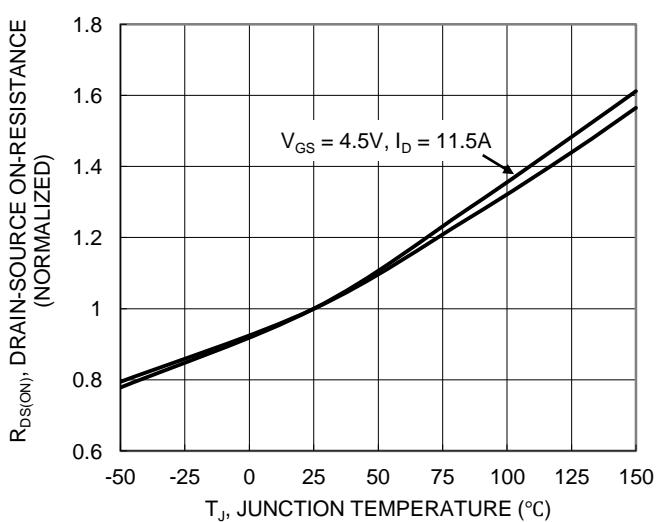


Figure 6. On-Resistance Variation with Junction Temperature

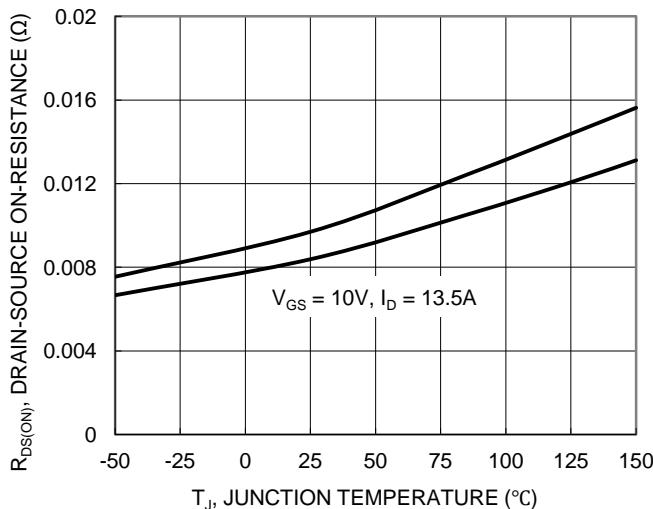


Figure 7. On-Resistance Variation with Junction Temperature

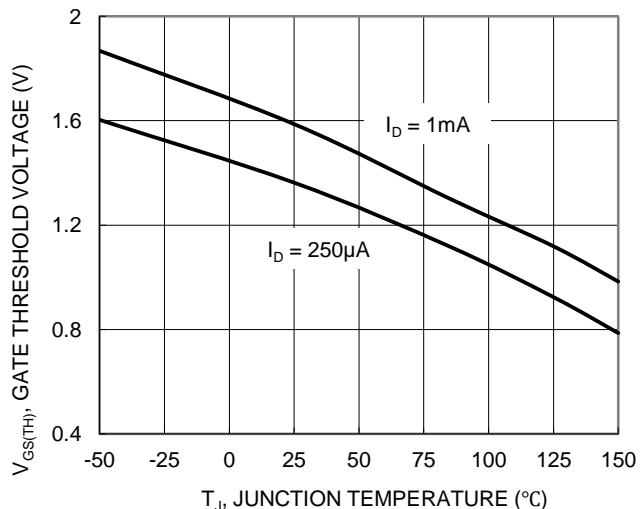


Figure 8. Gate Threshold Variation vs. Junction Temperature

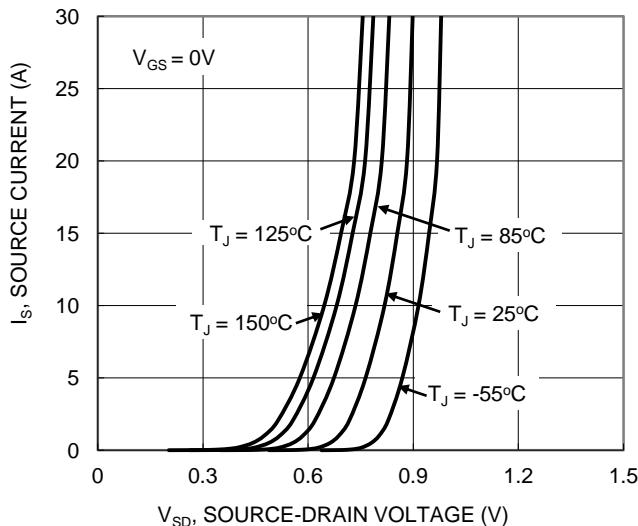


Figure 9. Diode Forward Voltage vs. Current

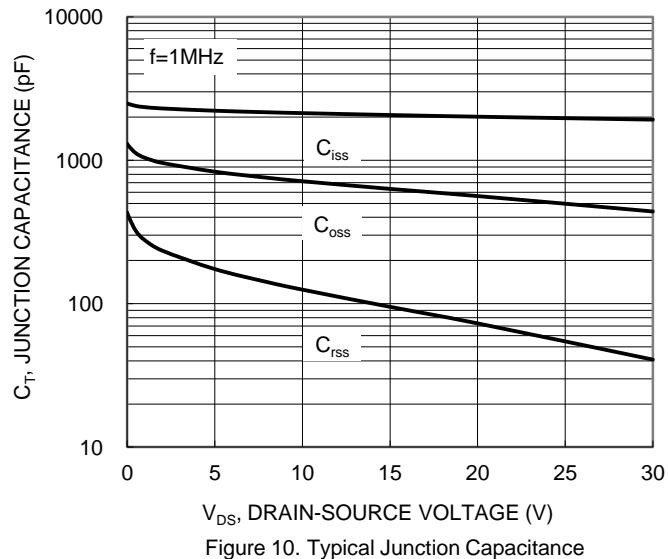


Figure 10. Typical Junction Capacitance

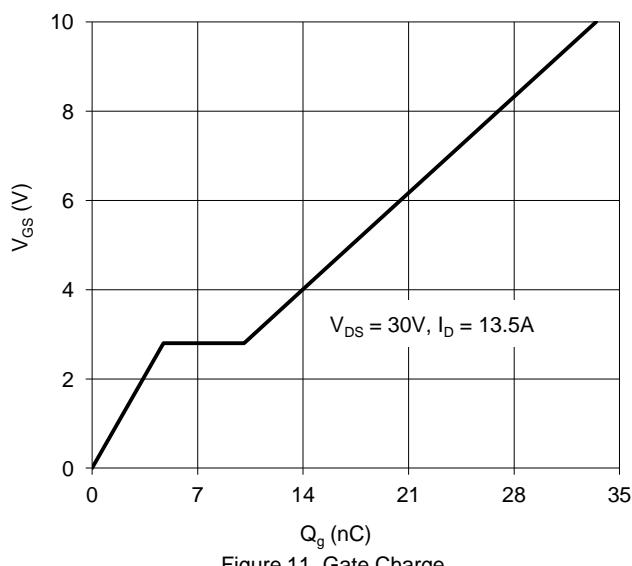


Figure 11. Gate Charge

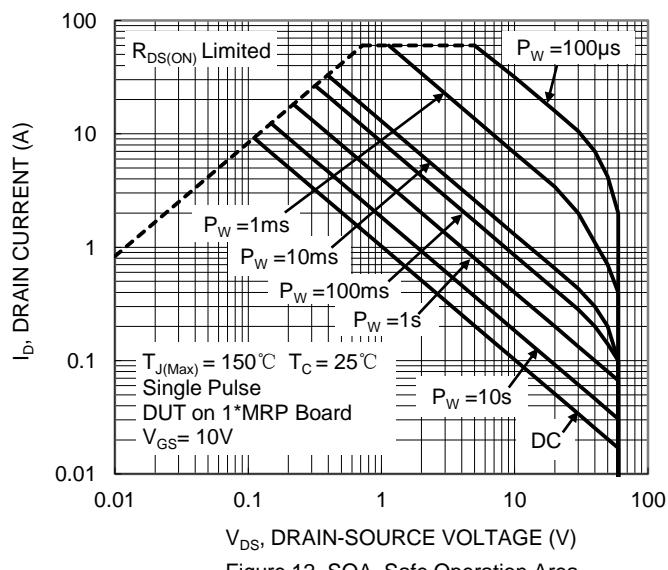


Figure 12. SOA, Safe Operation Area

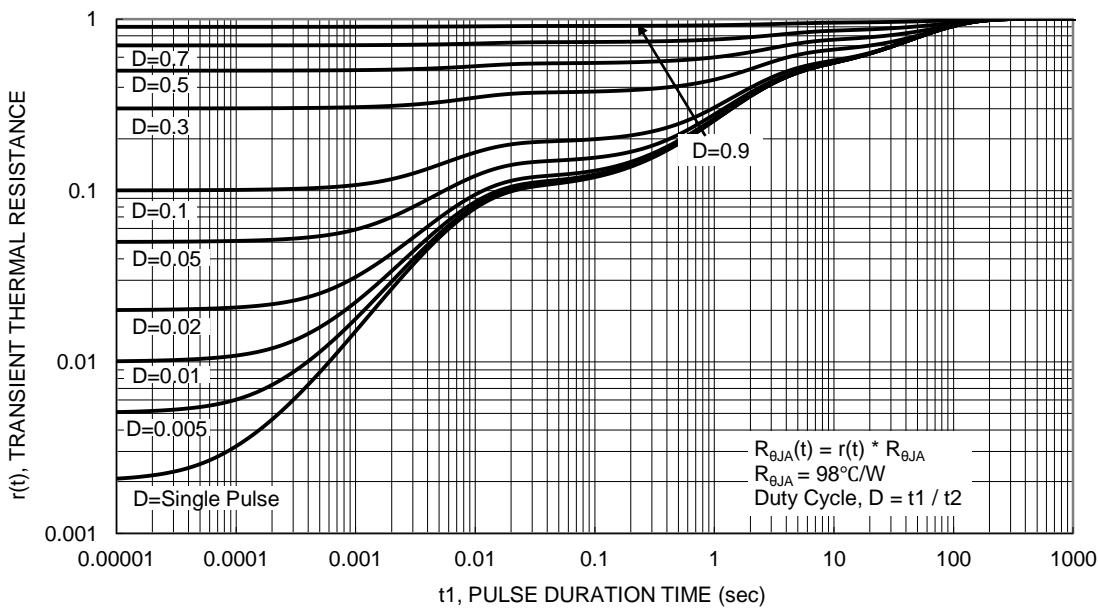
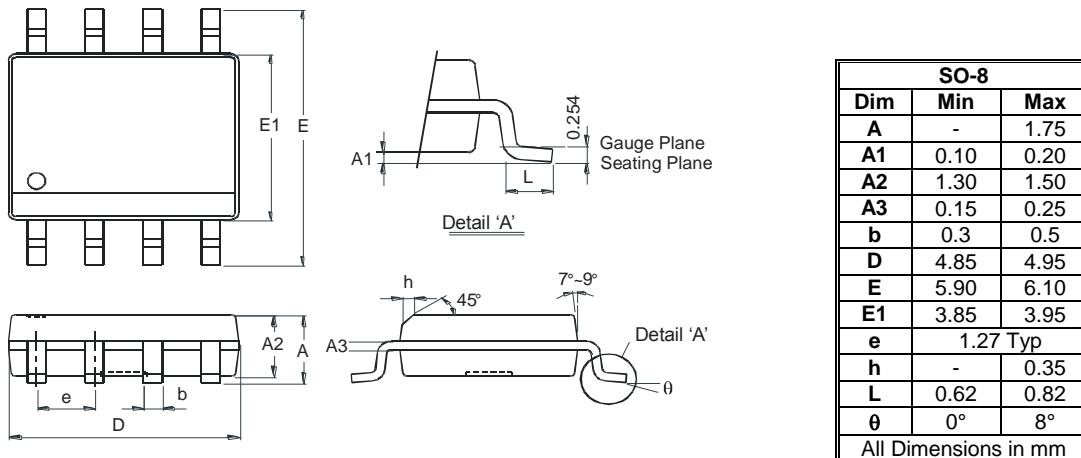


Figure 13. Transient Thermal Resistance

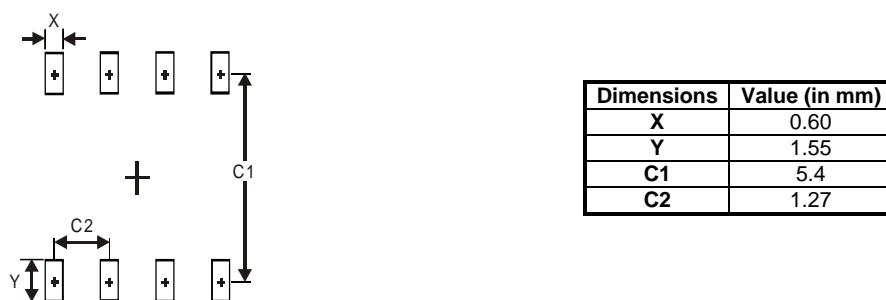
Package Outline Dimensions

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



Suggested Pad Layout

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



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