

Product Summary

BV_{DS}	$R_{DS(ON)}$ Max	I_D Max $T_A = 25^\circ\text{C}$
60V	6m Ω @ $V_{GS} = 10\text{V}$	13.5A
	8.9m Ω @ $V_{GS} = 4.5\text{V}$	11.3A

Description and Applications

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

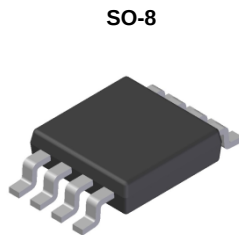
- High Frequency Switching
- Synchronous Rectification
- DC-DC Converters

Features and Benefits

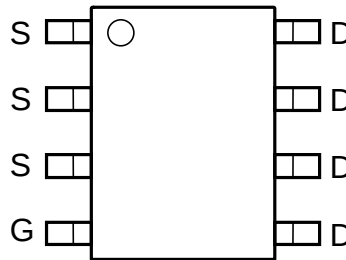
- High Conversion Efficiency
- Low $R_{DS(ON)}$ – Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

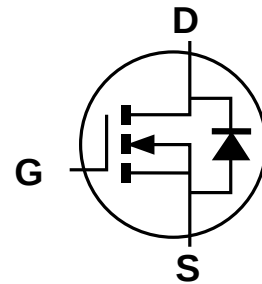
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 Ⓔ3
- Weight: 0.074 grams (Approximate)



Top View



Top View
Internal Schematic



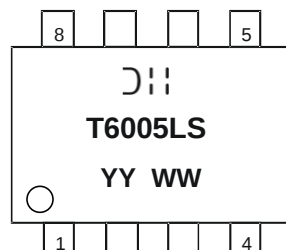
Equivalent circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6005LSS-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
 T6005LS = 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°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	60	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C T _A = +70°C	I _D	13.5 10.8	A
	t < 10s	T _A = +25°C T _A = +70°C	I _D	18.1 14.4	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	3	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	80	A
Avalanche Current, L = 1mH			I _{AS}	14.8	A
Avalanche Energy, L = 1mH			E _{AS}	98	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)		P _D	1.3	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	93	°C/W
	t < 10s		53	°C/W
Total Power Dissipation (Note 6)		P _D	1.7	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	73	°C/W
	t < 10s		41	°C/W
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	12.7	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (T_A = +25°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} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 48V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5	6	mΩ	V _{GS} = 10V, I _D = 20A
		—	5.7	7.2		V _{GS} = 6V, I _D = 20A
		—	6.7	8.9		V _{GS} = 4.5V, I _D = 12.5A
		—	0.9	1.2		V _{GS} = 0V, I _S = 20A
Diode Forward Voltage	V _{SD}	—	0.9	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	2962	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	965	—		
Reverse Transfer Capacitance	C _{rss}	—	60	—		
Gate Resistance	R _g	—	0.66	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	47.1	—	nC	V _{DD} = 30V, I _D = 20A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	23.1	—		
Gate-Source Charge	Q _{gs}	—	10.2	—		
Gate-Drain Charge	Q _{gd}	—	12.5	—		
Turn-On Delay Time	t _{D(ON)}	—	8.3	—	nS	V _{DD} = 30V, V _{GS} = 10V, I _D = 20A, R _g = 3.3Ω
Turn-On Rise Time	t _R	—	9.4	—		
Turn-Off Delay Time	t _{D(OFF)}	—	22	—		
Turn-Off Fall Time	t _F	—	8.9	—		
Body Diode Reverse Recovery Time	t _{RR}	—	40.4	—	nS	I _F = 20A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	49.7	—	nC	

- 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.

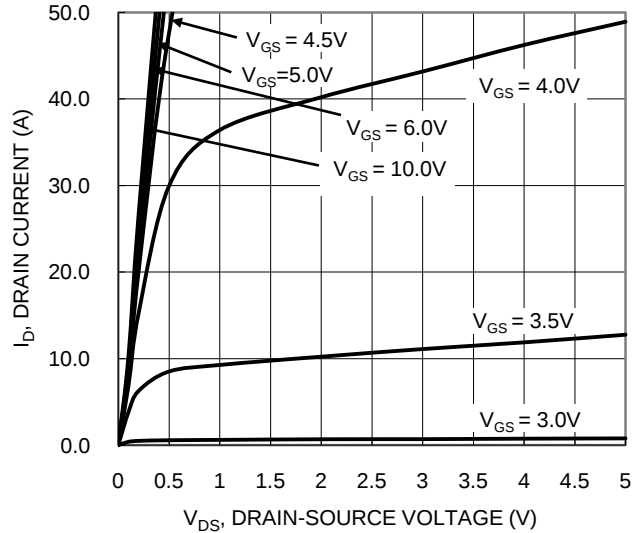


Figure 1. Typical Output Characteristic

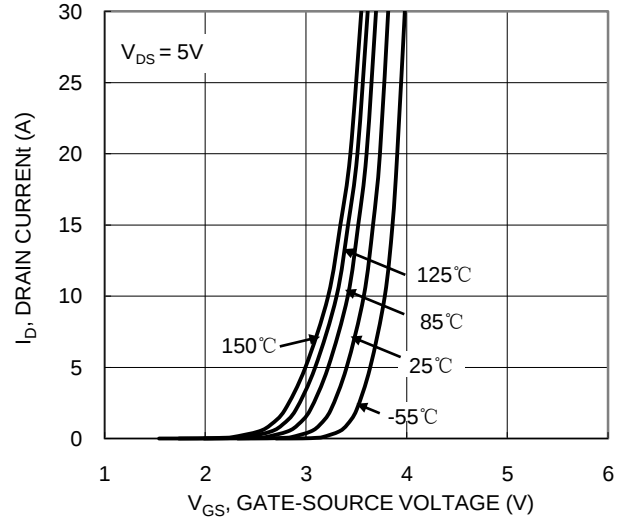


Figure 2. Typical Transfer Characteristic

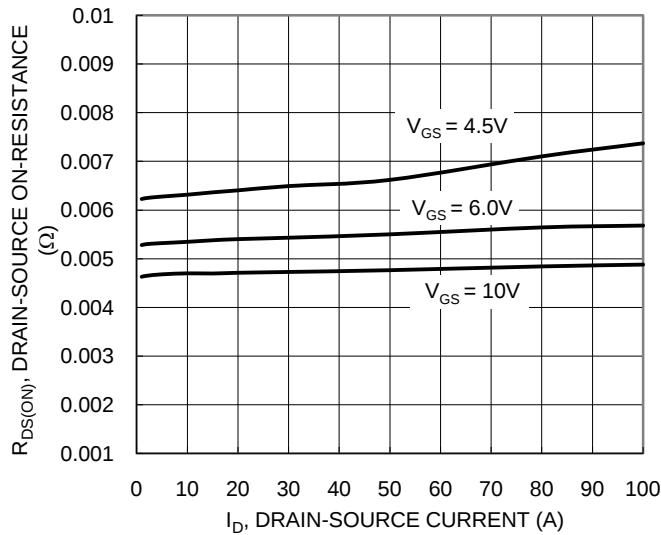


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

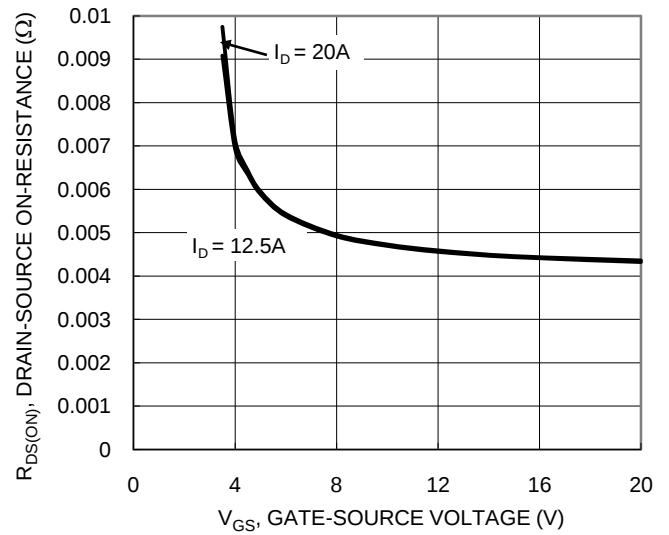


Figure 4. Typical Transfer Characteristic

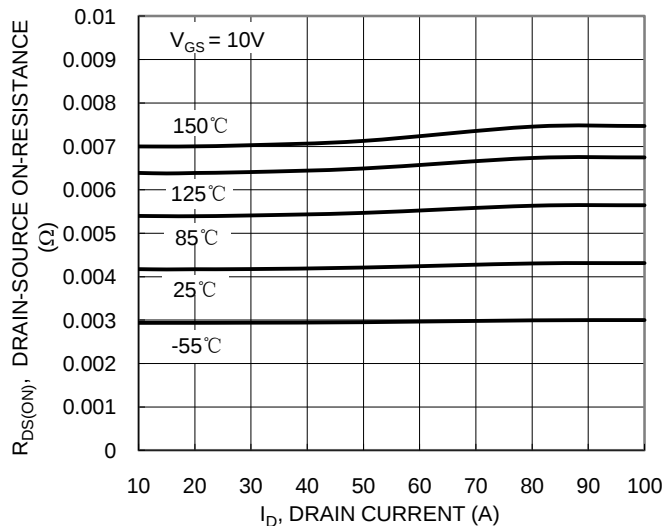


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

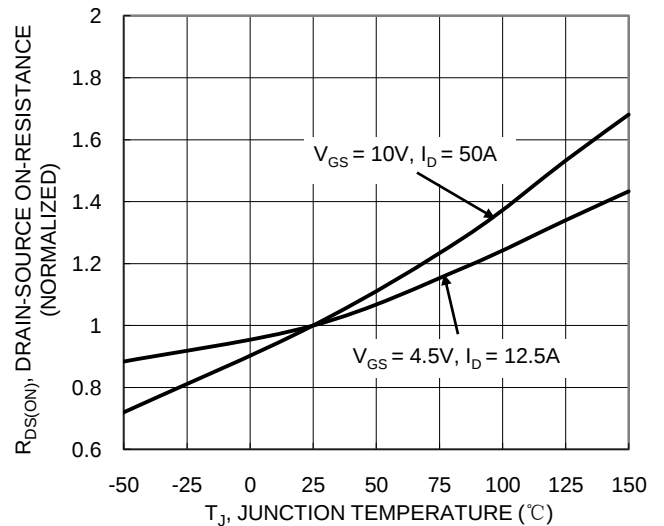
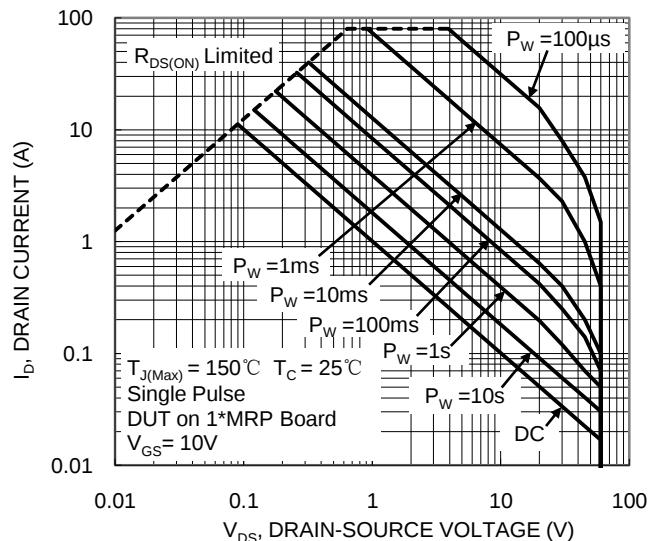
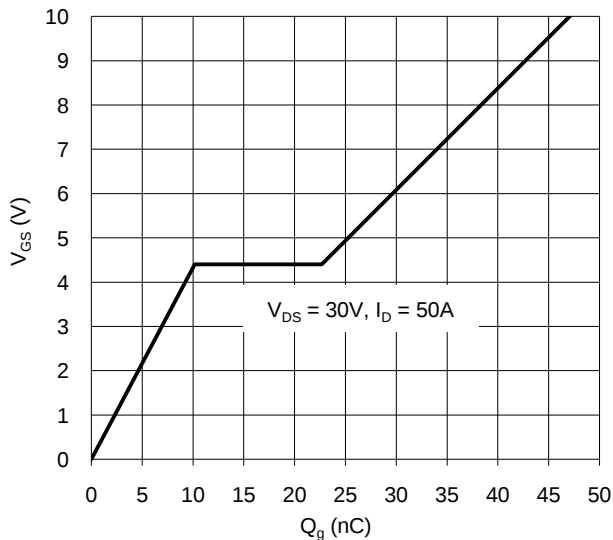
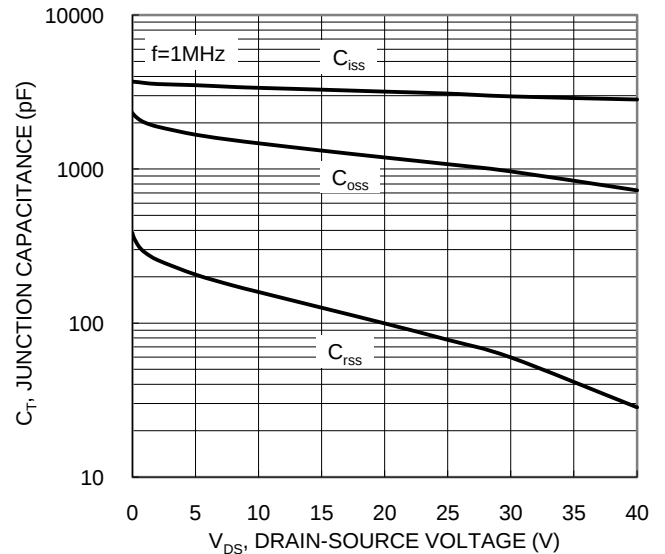
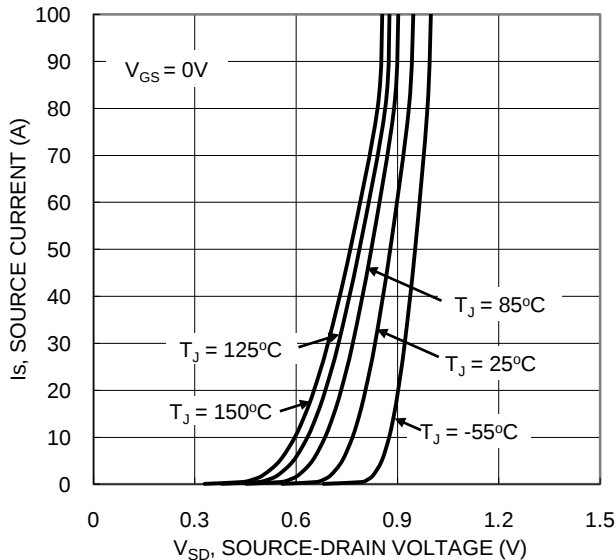
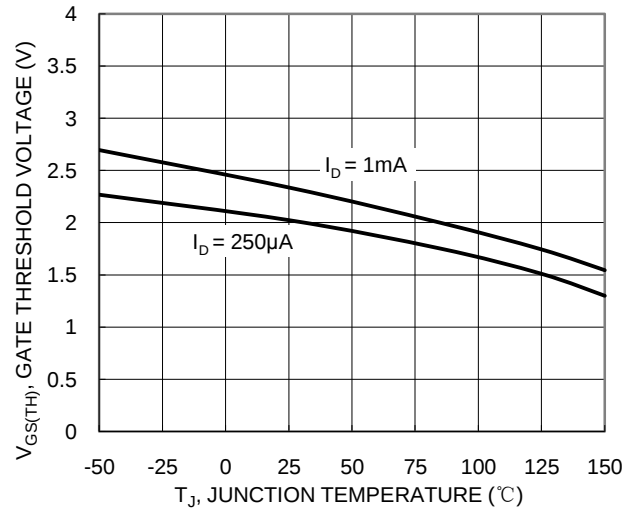
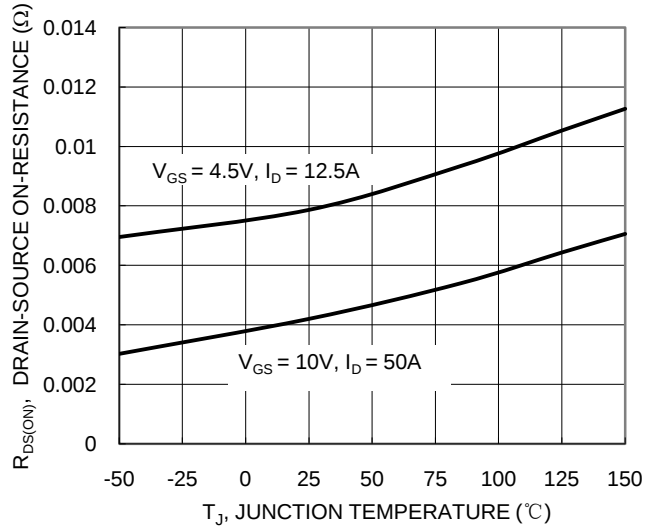


Figure 6. On-Resistance Variation with Junction Temperature



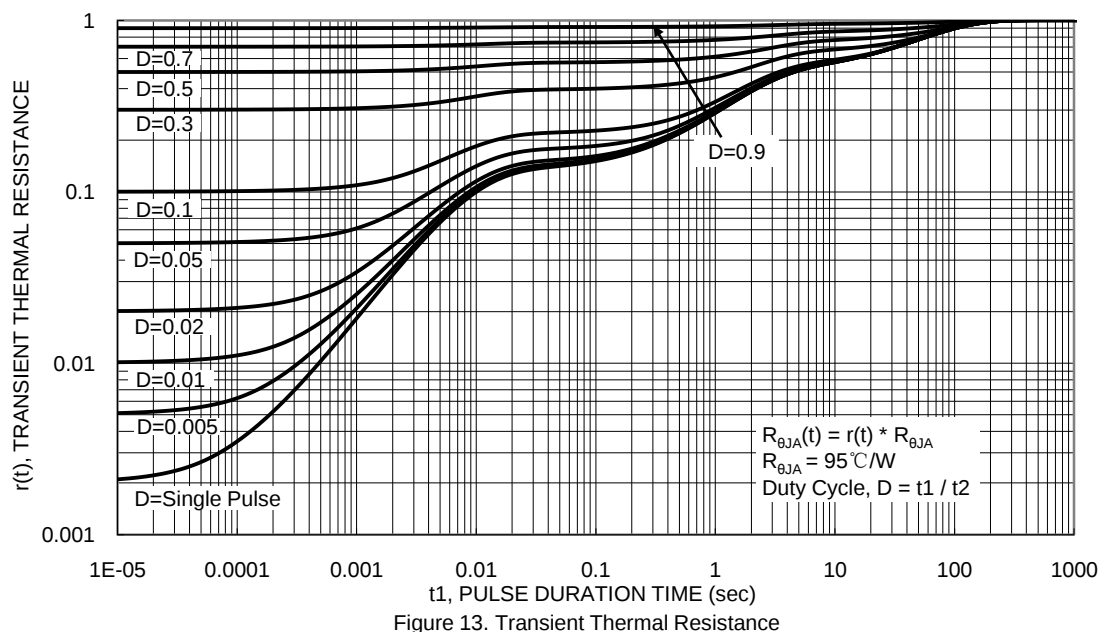
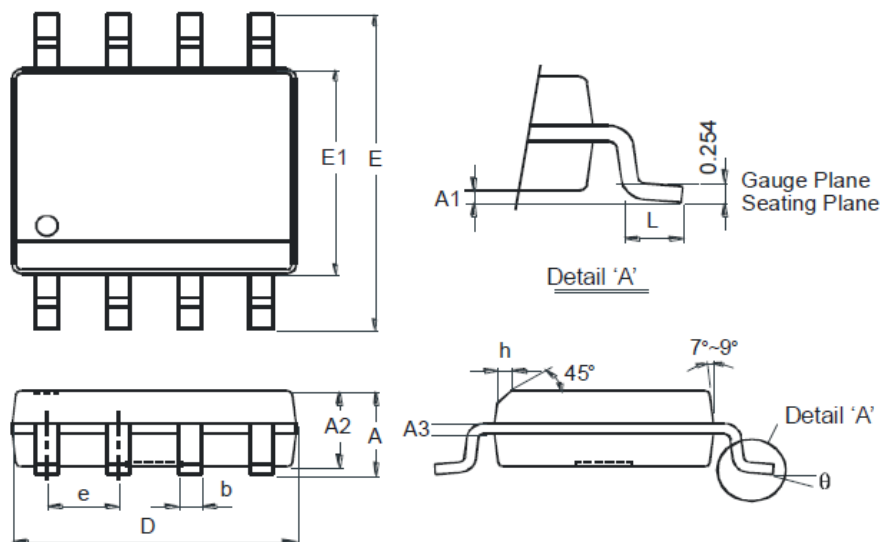


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

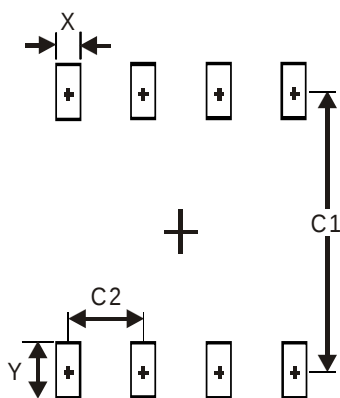


SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

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

SO-8



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

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