

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
80V	16.5mΩ @ V _{GS} = 10V	9.7A
	20mΩ @ V _{GS} = 4.5V	8.8A

Features and Benefits

- 100% Unclamped Inductive Switch (UIS) Test in Production
- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

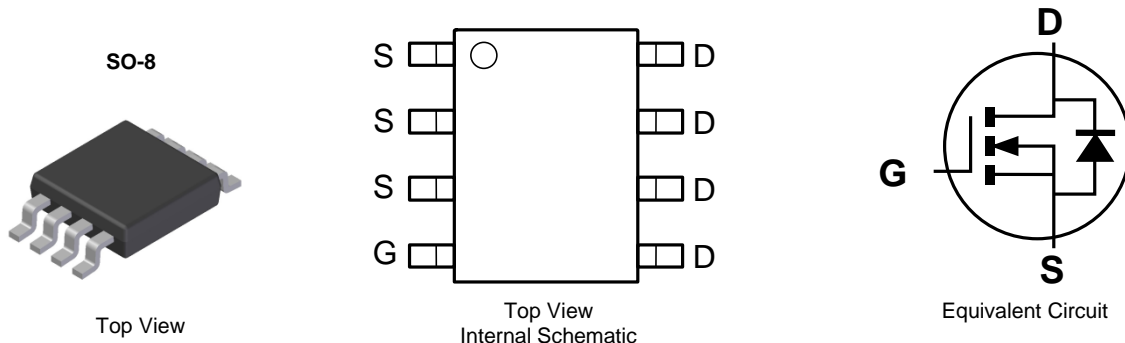
Description and Applications

This new generation N-Channel Enhancement Mode MOSFET is designed to minimize R_{DS(ON)}, yet maintain superior switching performance. This device is ideal for use in:

- Notebook Battery Power Management
- Loadswitches
- Backlighting
- Power Management Functions
- DC-DC Converters

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 (E3)
- Weight: 0.074 grams (Approximate)

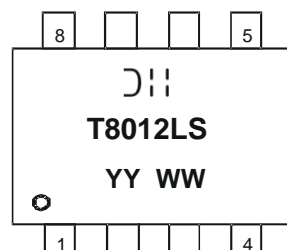


Ordering Information (Note 4)

Part Number	Case	Packaging
DMT8012LSS-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
T8012LS = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Year (ex: 16 = 2016)
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}	80	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	9.7	A
		I_D	7.8	A
Maximum Continuous Body Diode Forward Current (Note 6)	$t < 10\text{s}$ $T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_S	11.6	A
		I_S	9.3	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	80	A	
Avalanche Current, $L=0.1\text{mH}$	I_{AS}	11.6	A	
Avalanche Energy, $L=0.1\text{mH}$	E_{AS}	10.2	mJ	

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

Characteristic	Symbol	Value	Units	
Total Power Dissipation (Note 5)	P_D	1.5	W	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State $t < 10\text{s}$	$R_{\theta JA}$	80	$^\circ\text{C/W}$
		$R_{\theta JA}$	48	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)	P_D	2	W	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State $t < 10\text{s}$	$R_{\theta JA}$	53	$^\circ\text{C/W}$
		$R_{\theta JA}$	37	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	6.5	$^\circ\text{C/W}$	
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}	80	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 64\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	12.7	16.5	m Ω	$V_{GS} = 10\text{V}, I_D = 12\text{A}$
		—	15	20		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
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}	—	1,949	—	pF	$V_{DS} = 40\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{OSS}	—	177	—		
Reverse Transfer Capacitance	C_{RSS}	—	10	—		
Gate Resistance	R_G	—	0.7	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_G	—	15	—	nC	$V_{DS} = 40\text{V}, I_D = 12\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_G	—	34	—		
Gate-Source Charge	Q_{GS}	—	6	—		
Gate-Drain Charge	Q_{GD}	—	4.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	4.9	—	ns	$V_{DD} = 40\text{V}, V_{GS} = 10\text{V}, I_D = 12\text{A}, R_G = 1.6\Omega$
Turn-On Rise Time	t_R	—	3.8	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	16.5	—		
Turn-Off Fall Time	t_F	—	3.5	—		

- 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 1-inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

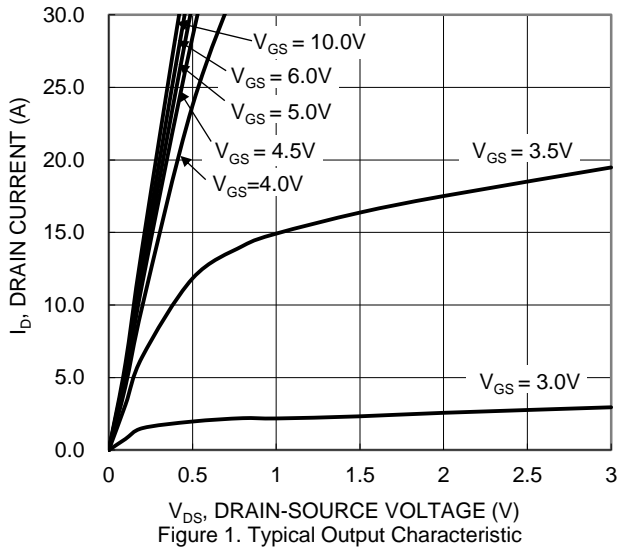


Figure 1. Typical Output Characteristic

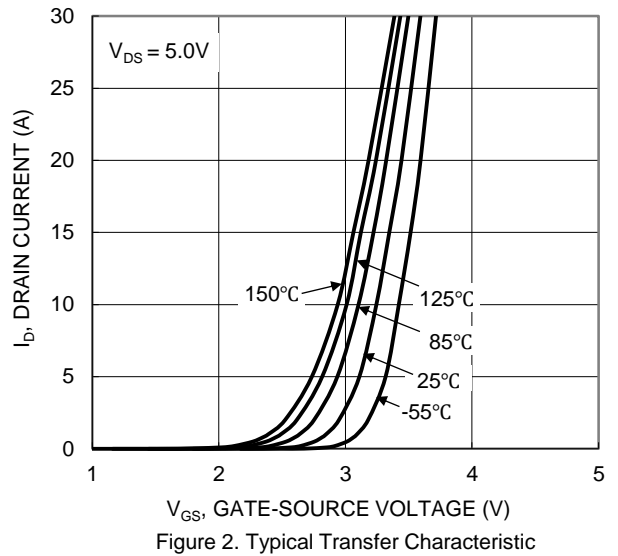


Figure 2. Typical Transfer Characteristic

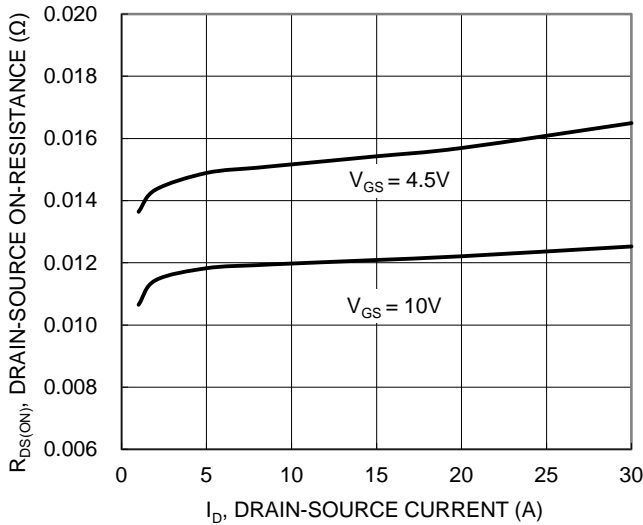


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

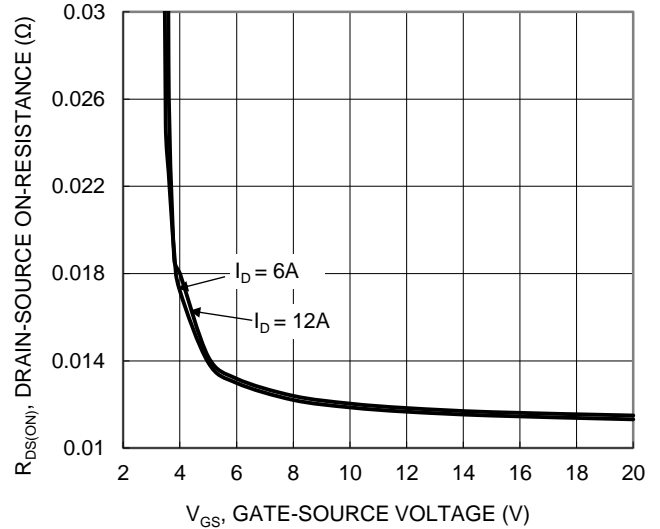


Figure 4. Typical Transfer Characteristic

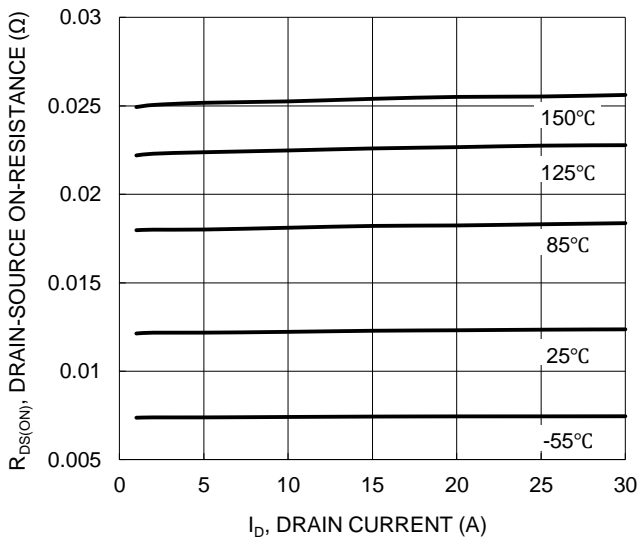


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

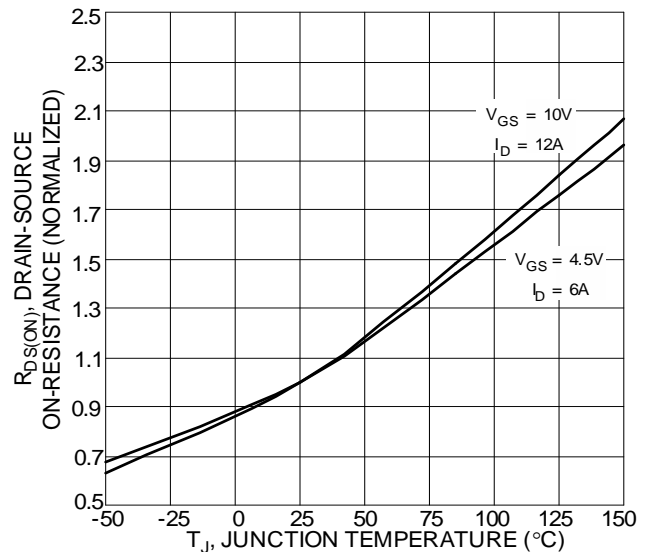


Figure 6 On-Resistance Variation with Temperature

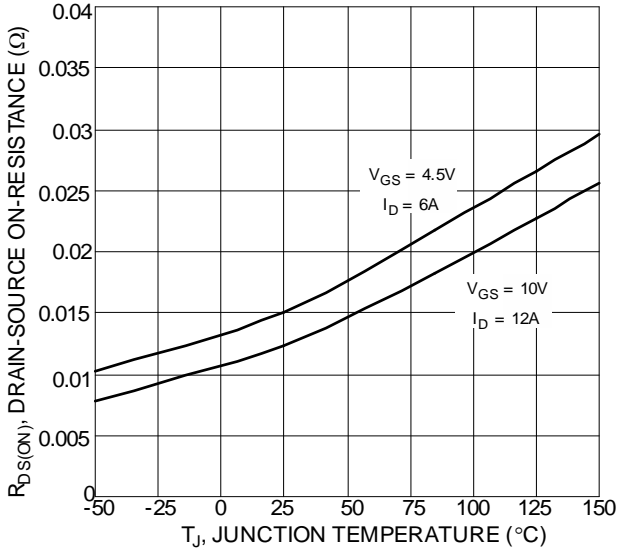


Figure 7 On-Resistance Variation with Temperature

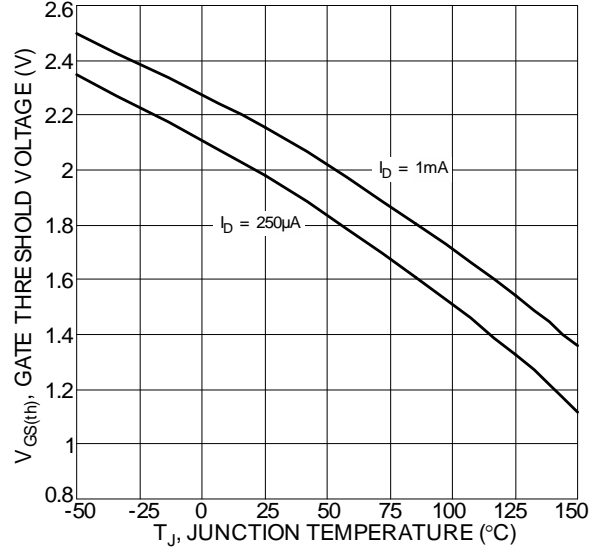


Figure 8 Gate Threshold Variation vs. Ambient Temperature

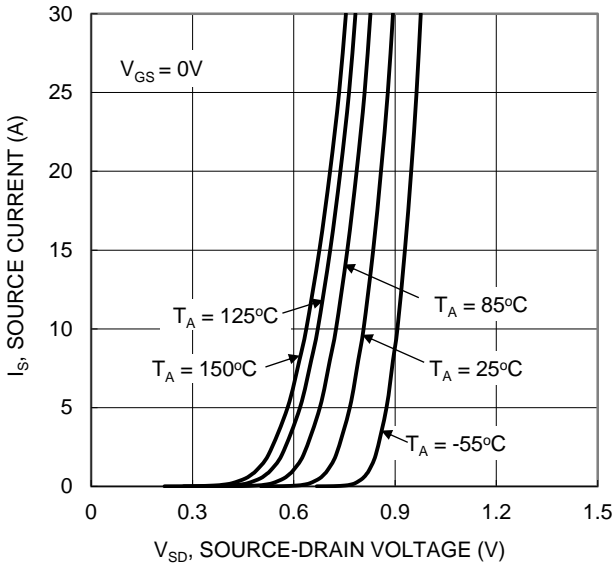


Figure 9. Diode Forward Voltage vs. Current

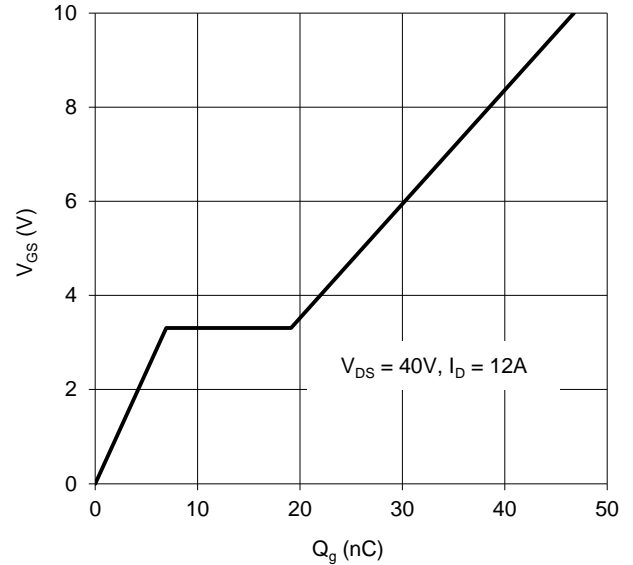


Figure 10. Gate Charge

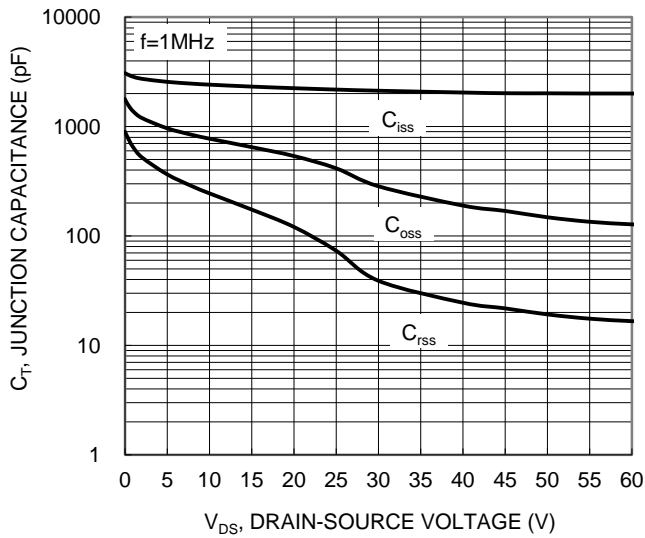


Figure 11. Typical Junction Capacitance

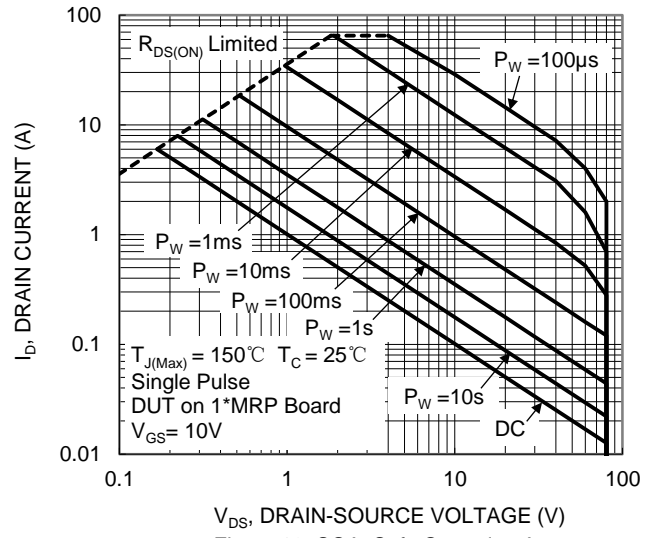


Figure 12. SOA, Safe Operation Area

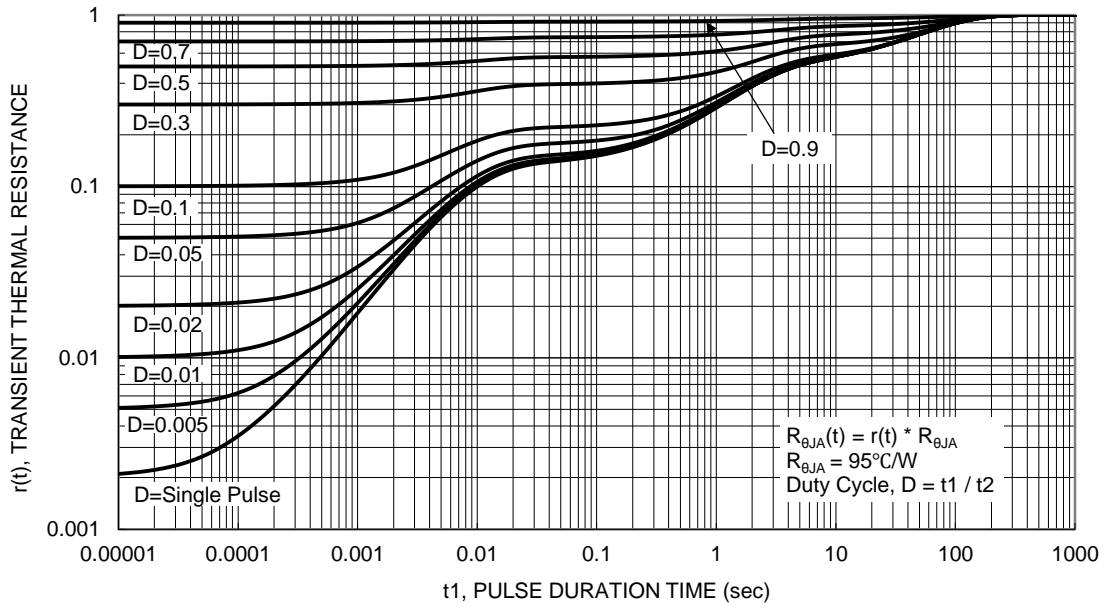
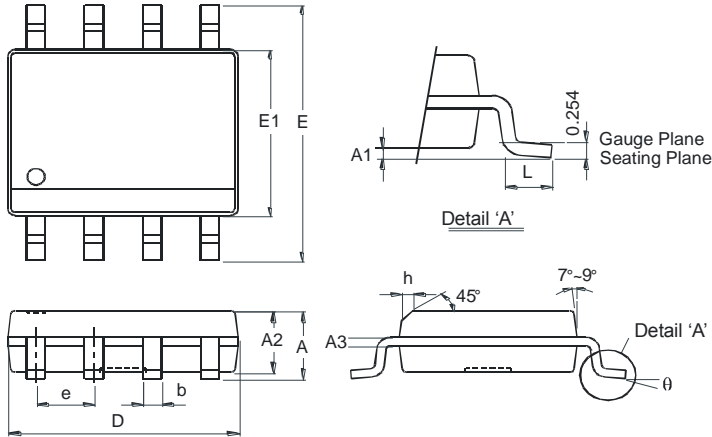


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

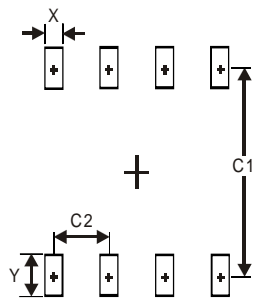


SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

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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