

Product Summary

BV_{DSS}	$R_{DS(ON)} \text{ MAX}$	I_D $T_A = +25^\circ\text{C}$
40V	24mΩ @ $V_{GS} = 10V$	7.5A
	32mΩ @ $V_{GS} = 4.5V$	6.5A

Description

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.


Applications

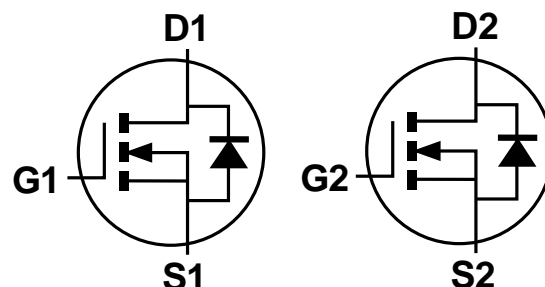
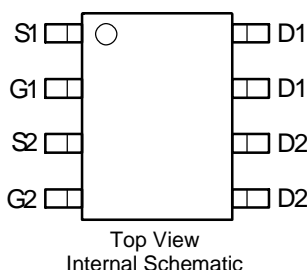
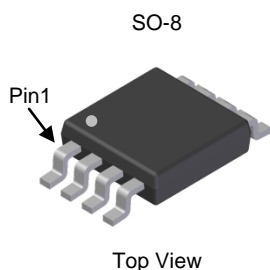
- Motor Control
- Backlighting
- Power Management Functions
- DC-DC Converters

Features

- Rated to $+175^\circ\text{C}$ – Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Low On-Resistance
- 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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMNH4026SSDQ](#))**

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 Below
- Terminals: Finish — Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 
- Weight: 0.074 grams (Approximate)



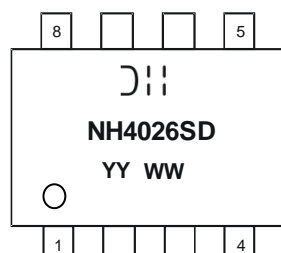
Equivalent Circuit


Ordering Information (Note 4)

Part Number	Case	Packaging
DMNH4026SSD-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



 = Manufacturer's Marking
 NH4026SD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 16 = 2016)
 WW = Week (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	40	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = +25°C T _A = +100°C	I _D	7.5 5.3	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	2.5	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	60	A
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	18	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	18	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	101	°C/W
	t < 10s		59	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	2.0	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	74	°C/W
	t < 10s		43	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	10.5	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	40	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	15	24	mΩ	V _{GS} = 10V, I _D = 6A
		—	20	32		V _{GS} = 4.5V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	0.7	1.0	V	V _{GS} = 0V, I _S = 1.0A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	1060	—	pF	V _{DS} = 20V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	84	—		
Reverse Transfer Capacitance	C _{RSS}	—	58	—		
Gate Resistance	R _g	—	1.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	8.8	—	nC	V _{DS} = 20V, I _D = 8A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	19.1	—		
Gate-Source Charge	Q _{gs}	—	3.0	—		
Gate-Drain Charge	Q _{gd}	—	2.5	—		
Turn-On Delay Time	t _{D(ON)}	—	5.3	—	ns	V _{DD} = 25V, R _L = 2.5Ω V _{GS} = 10V, R _g = 3Ω
Turn-On Rise Time	t _r	—	7.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	15.1	—		
Turn-Off Fall Time	t _f	—	4.8	—		
Body Diode Reverse Recovery Time	t _{RR}	—	10.5	—	ns	I _F = 8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	4.15	—	nC	I _F = 8A, di/dt = 100A/µs

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate
 - I_{AS} and E_{AS} rating are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

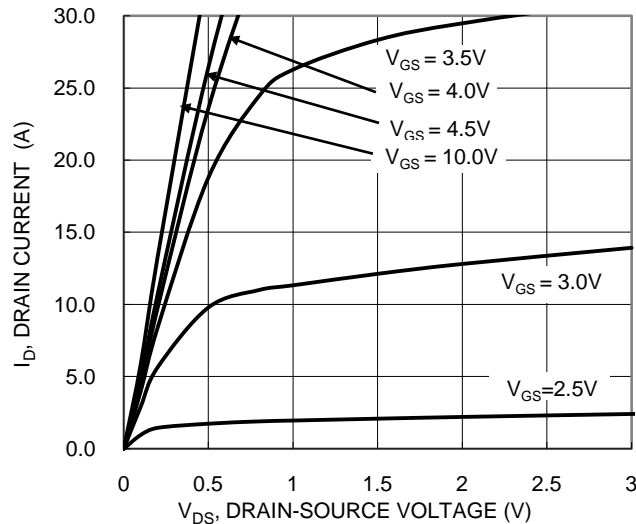


Figure 1. Typical Output Characteristic

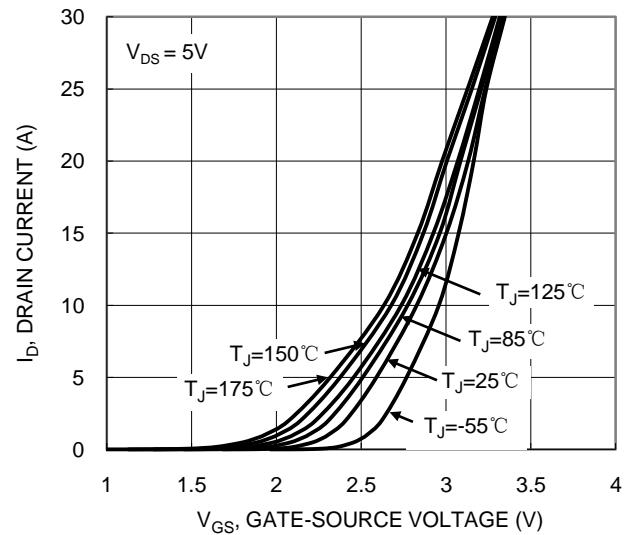


Figure 2. Typical Transfer Characteristic

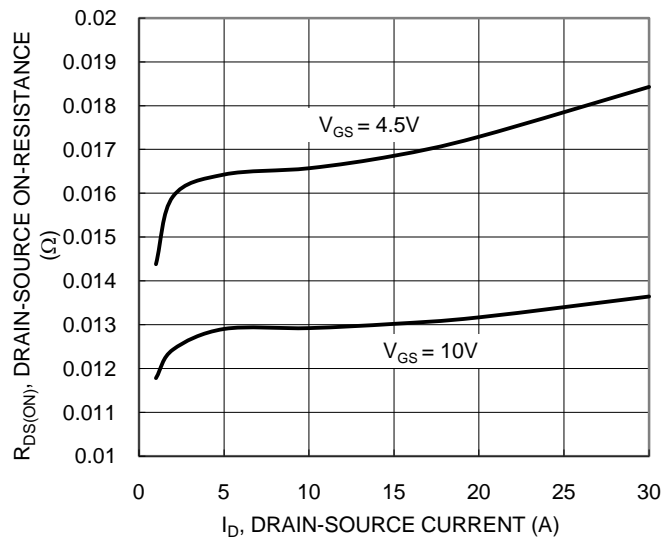


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

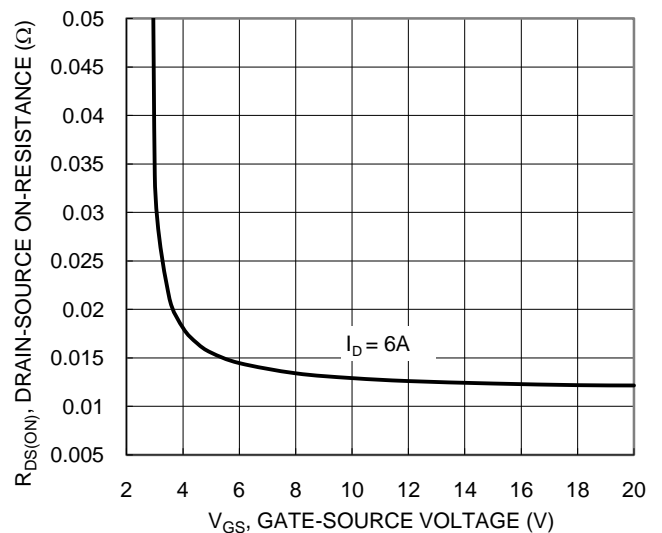


Figure 4. Typical Transfer Characteristic

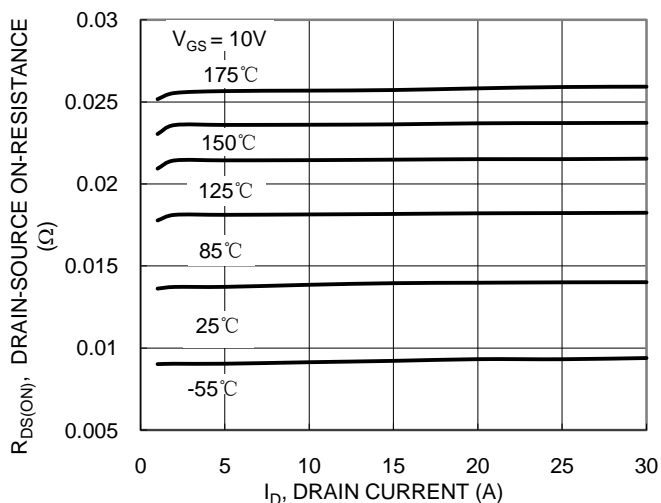


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

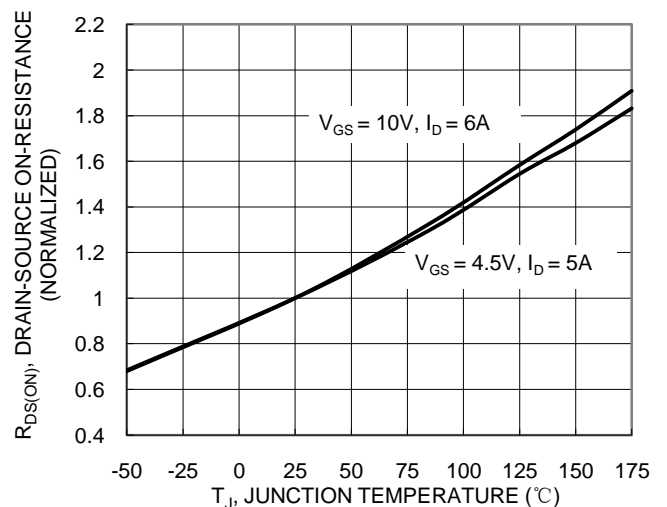
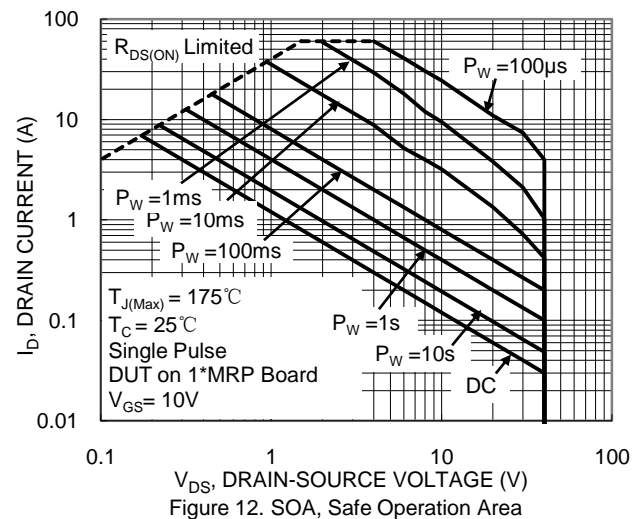
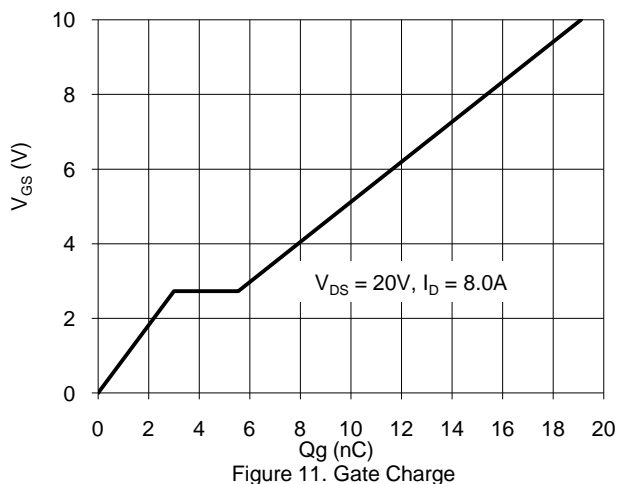
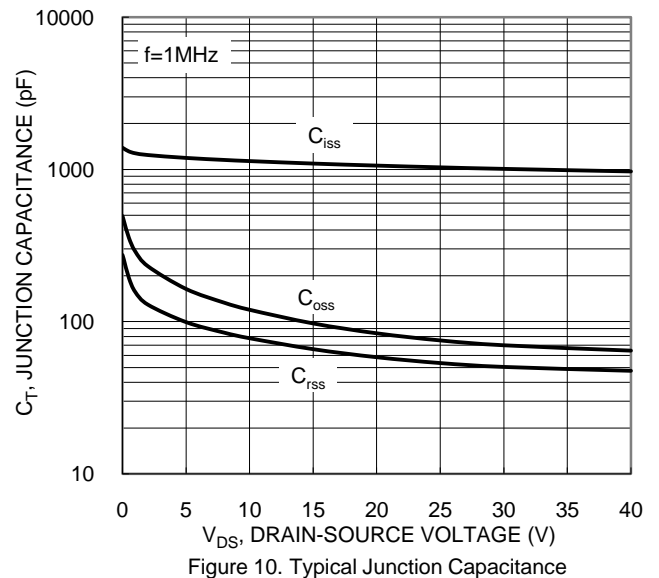
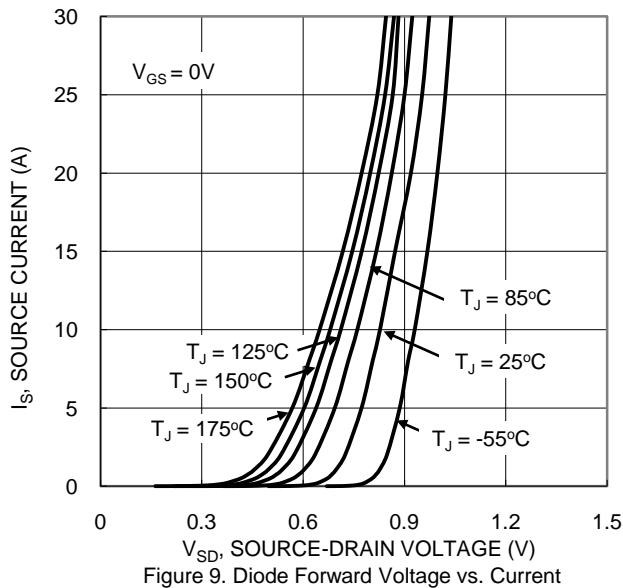
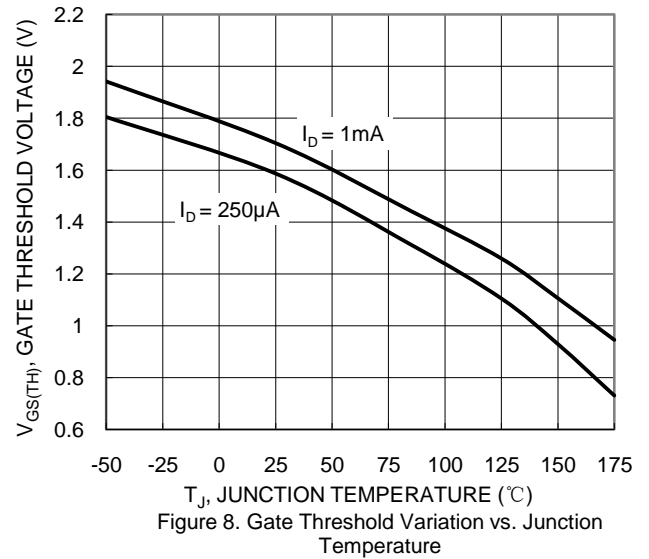
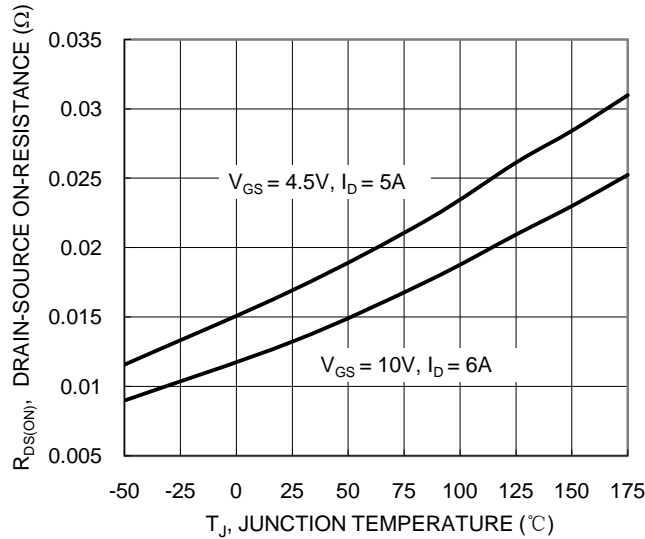


Figure 6. On-Resistance Variation with Temperature



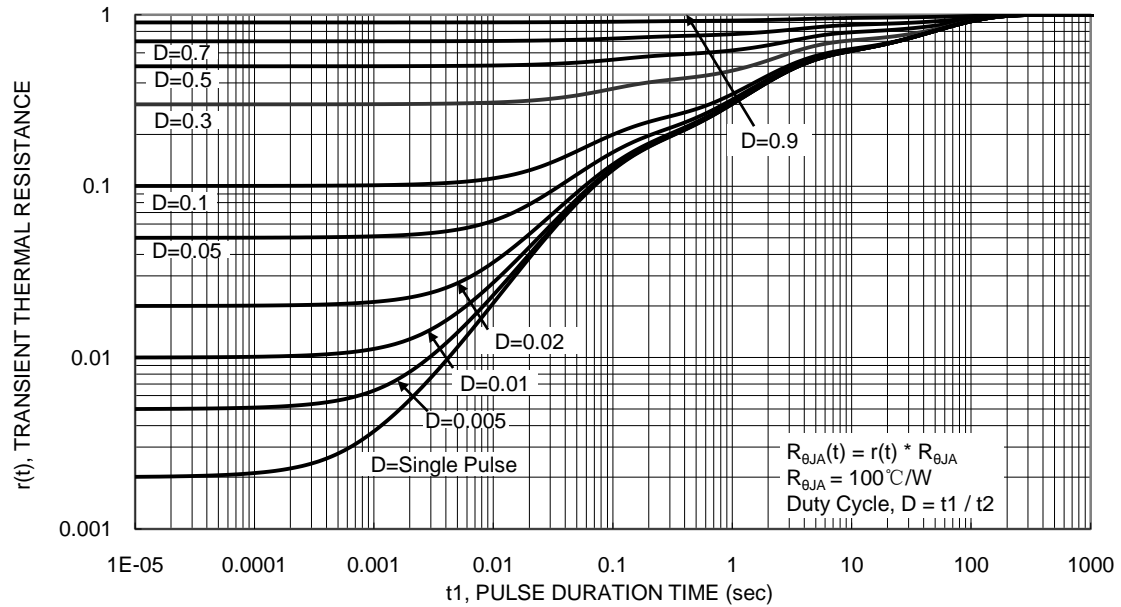
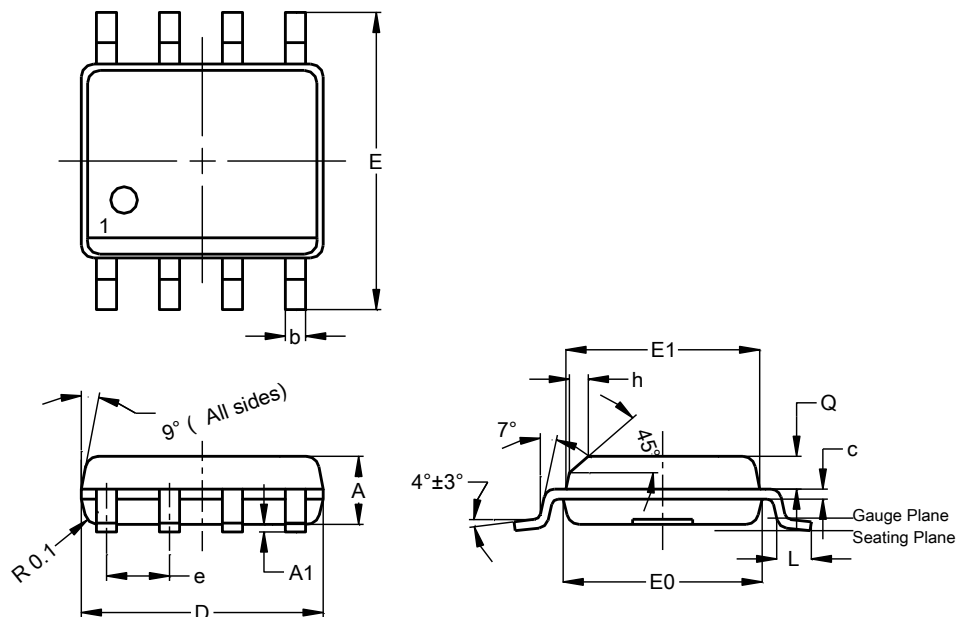


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

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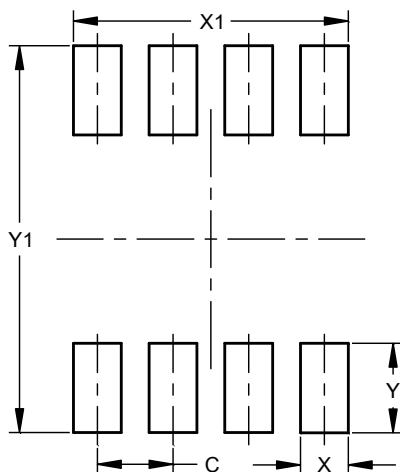


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

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

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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