

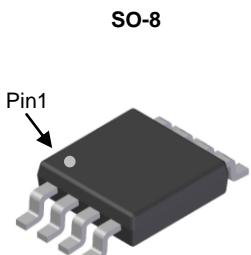
Product Summary

BV_{DSS}	$R_{DS(ON)} \text{ Max}$	$I_D \text{ Max}$ $T_A = +25^\circ\text{C}$
60V	19.5m Ω @ $V_{GS} = 10\text{V}$	7.6A
	28m Ω @ $V_{GS} = 4.5\text{V}$	6.2A

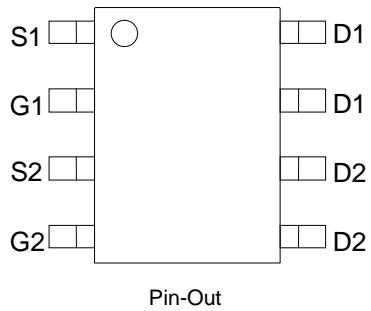
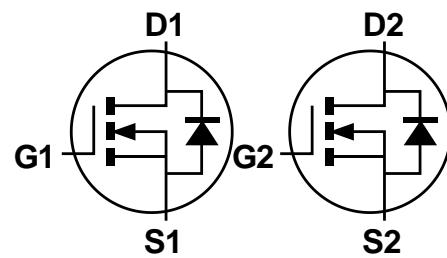
Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Power Management
- DC-DC Converters
- Motor Control



Top View


 Pin-Out
Top View


Equivalent Circuit

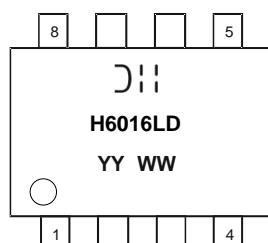
Ordering Information (Note 5)

Part Number	Case	Packaging
DMTH6016LSDQ-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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



DII = Manufacturer's Marking
 H6016LD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 16 = 2016)
 WW = Week (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, 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 7) $V_{GS} = 10\text{V}$	I_D $T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$	7.6 5.4	A
Continuous Drain Current (Note 7) $V_{GS} = 4.5\text{V}$	I_D $T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$	6.2 4.4	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	40	A
Maximum Continuous Body Diode Forward Current (Note 7)	I_S	1.7	A
Pulsed Body Diode Forward Current (10 μs Pulse, Duty Cycle = 1%)	I_{SM}	40	A
Avalanche Current, $L = 0.1\text{mH}$	I_{AS}	15.3	A
Avalanche Energy, $L = 0.1\text{mH}$	E_{AS}	11.7	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	102	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 7)	P_D	1.9	W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	78	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	14.5	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
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	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	15	19.5	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 10\text{A}$
		—	21	28		$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	864	—	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	282	—		
Reverse Transfer Capacitance	C_{rss}	—	27	—		
Gate Resistance	R_g	—	1.3	—	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	—	8.4	—	nC	$V_{DS} = 30\text{V}, I_D = 10\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	17	—		
Gate-Source Charge	Q_{gs}	—	3.1	—		
Gate-Drain Charge	Q_{gd}	—	4.3	—		
Turn-On Delay Time	$t_{D(ON)}$	—	3.4	—	ns	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, R_g = 6\Omega, I_D = 10\text{A}$
Turn-On Rise Time	t_R	—	5.2	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	13	—		
Turn-Off Fall Time	t_F	—	7	—		
Reverse Recovery Time	t_{RR}	—	22	—	ns	$I_F = 10\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	11	—		

Notes:

6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

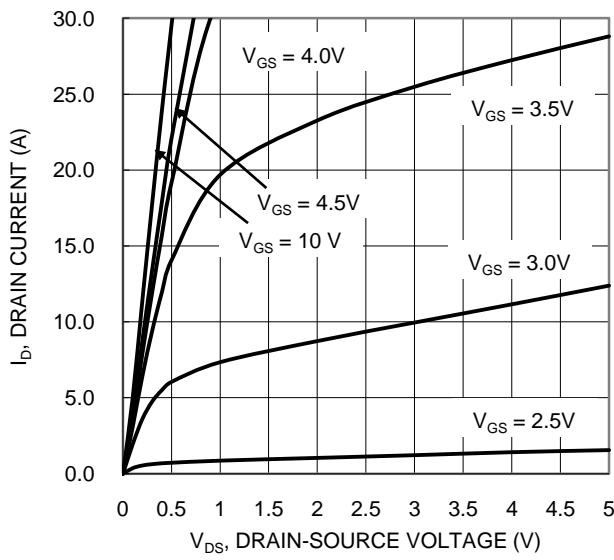


Figure 1. Typical Output Characteristic

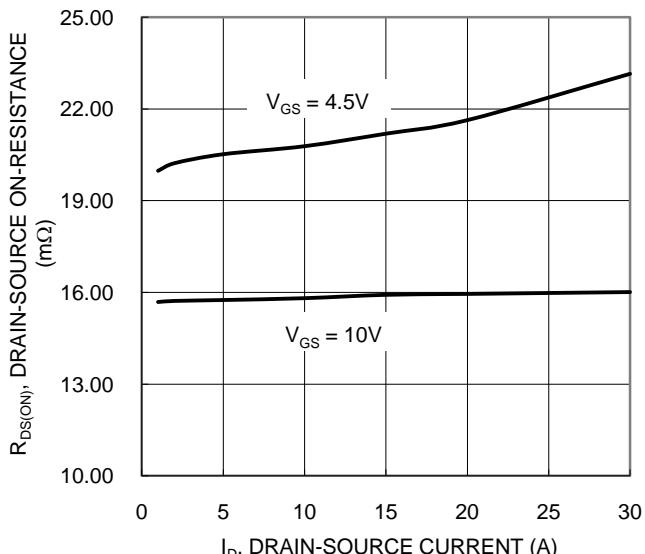


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

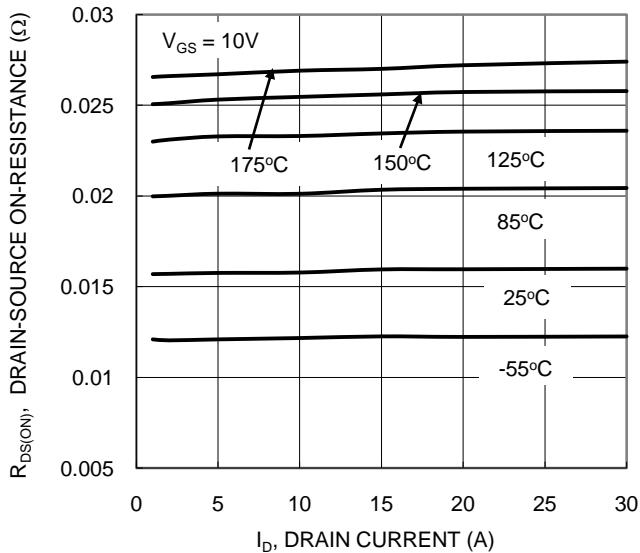


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

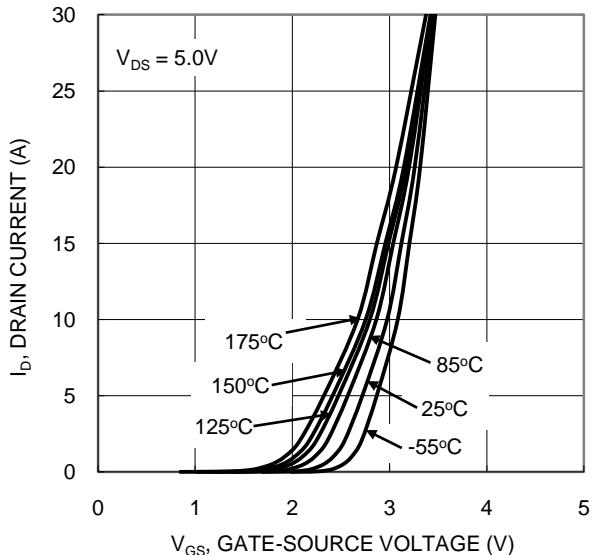


Figure 2. Typical Transfer Characteristic

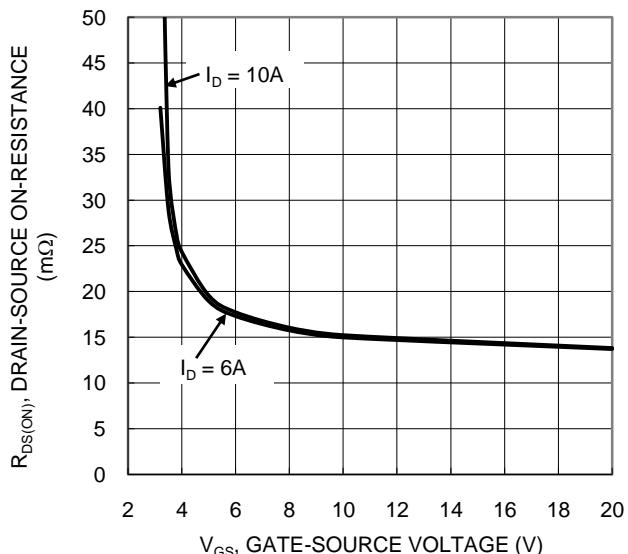


Figure 4. Typical Transfer Characteristic

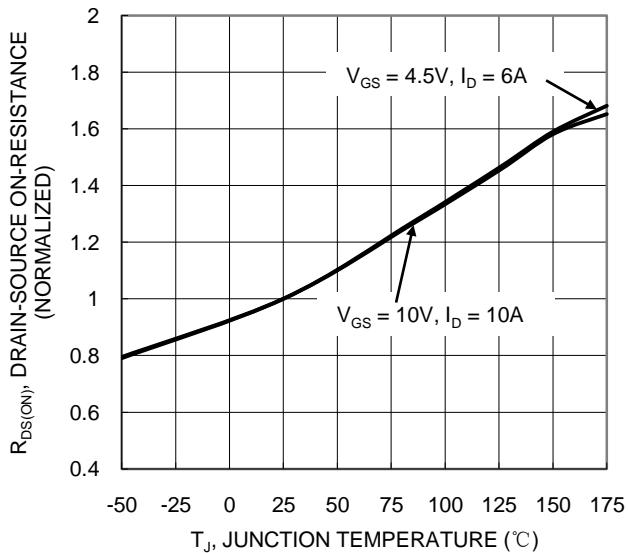
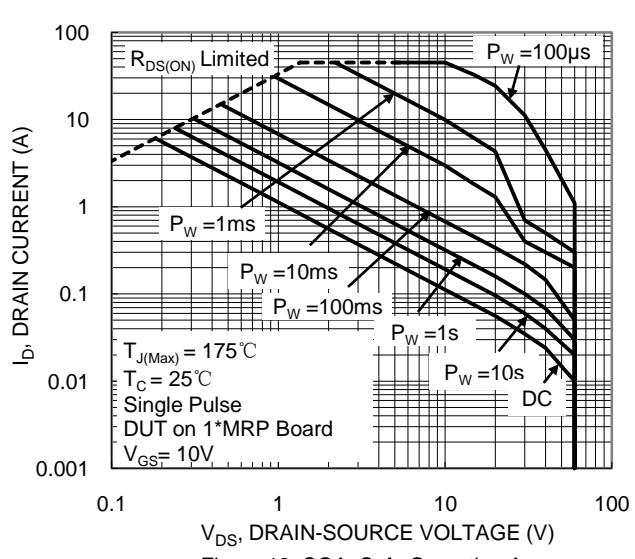
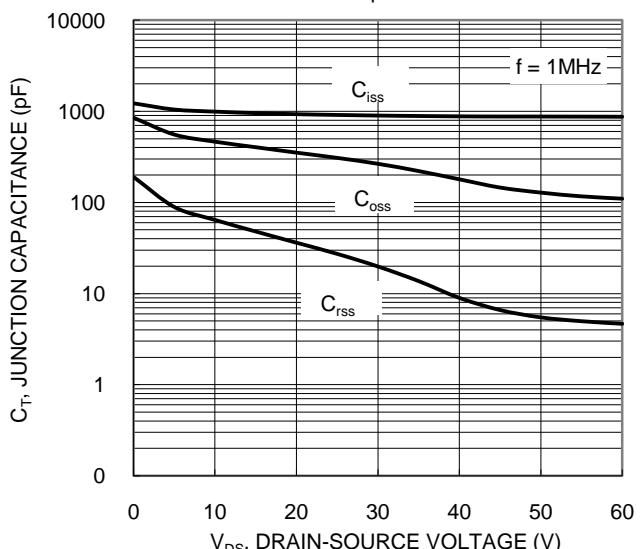
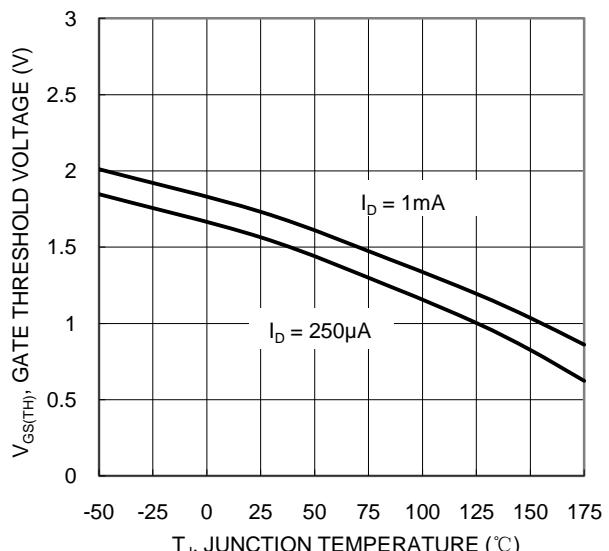
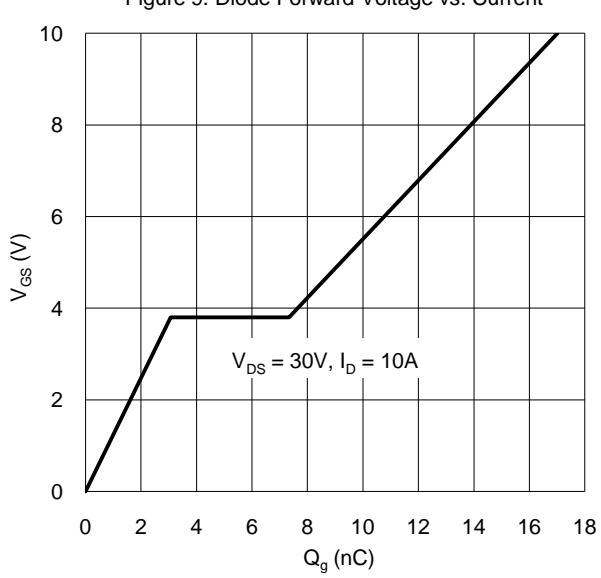
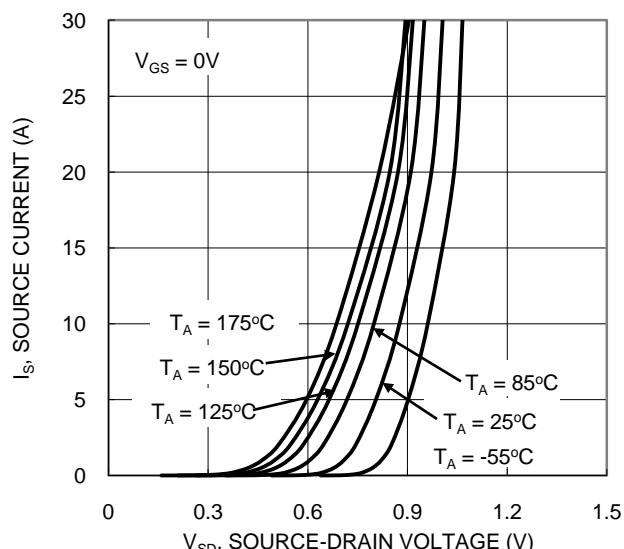
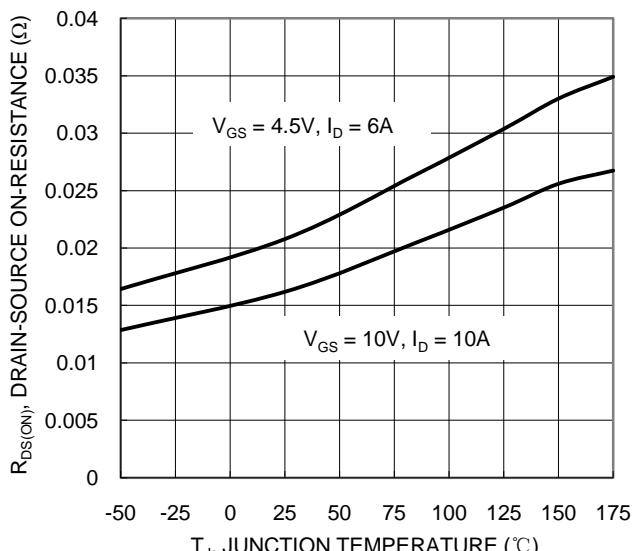


Figure 6. On-Resistance Variation with Temperature



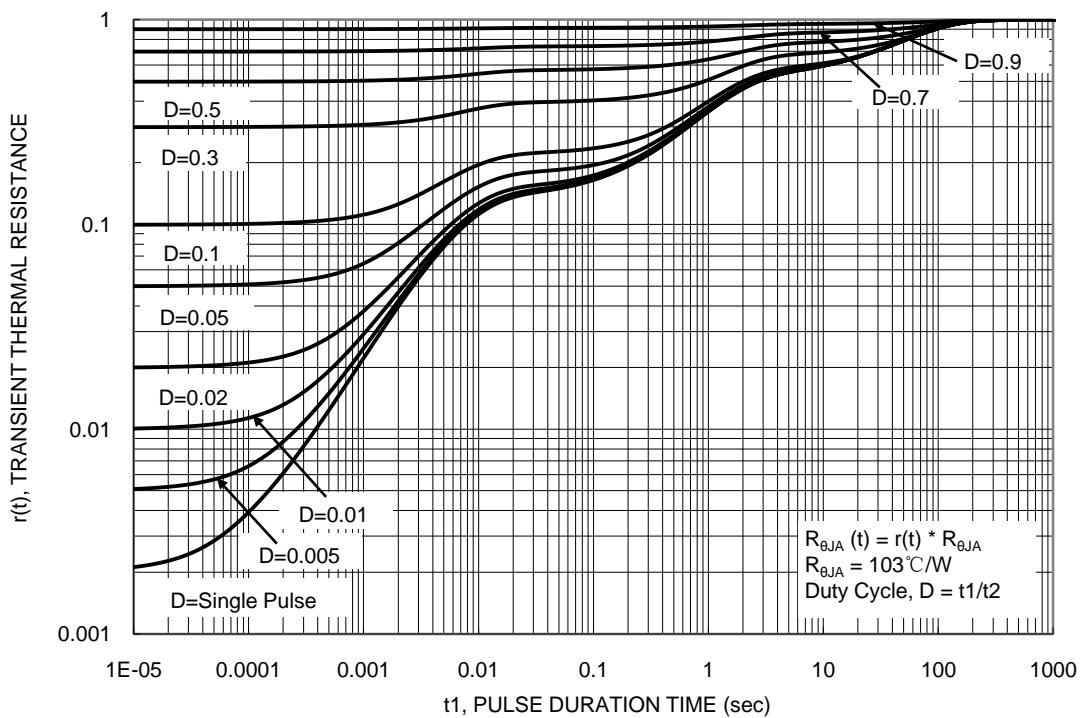
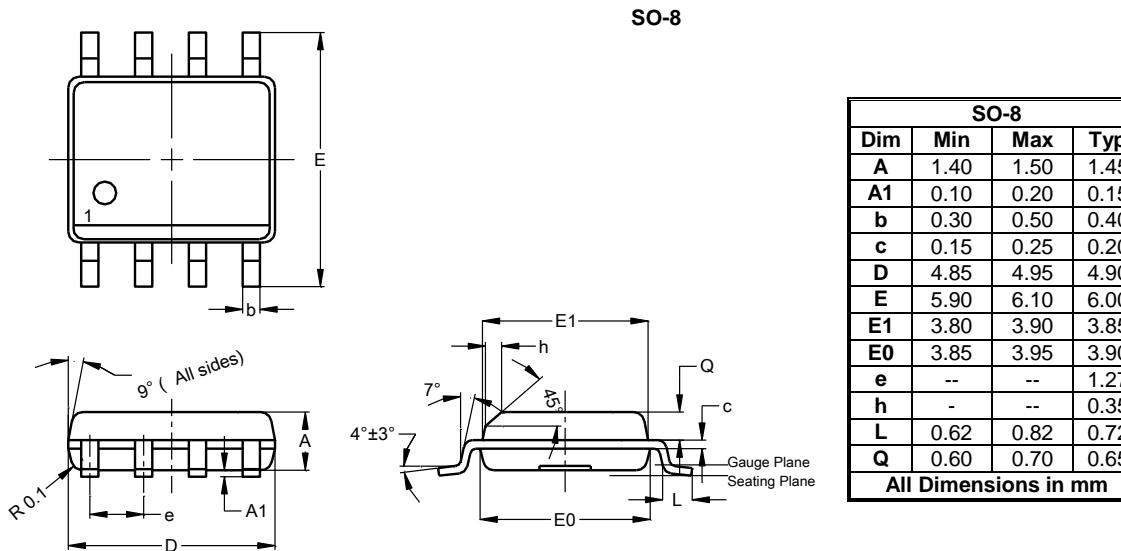


Figure 13. Transient Thermal Resistance

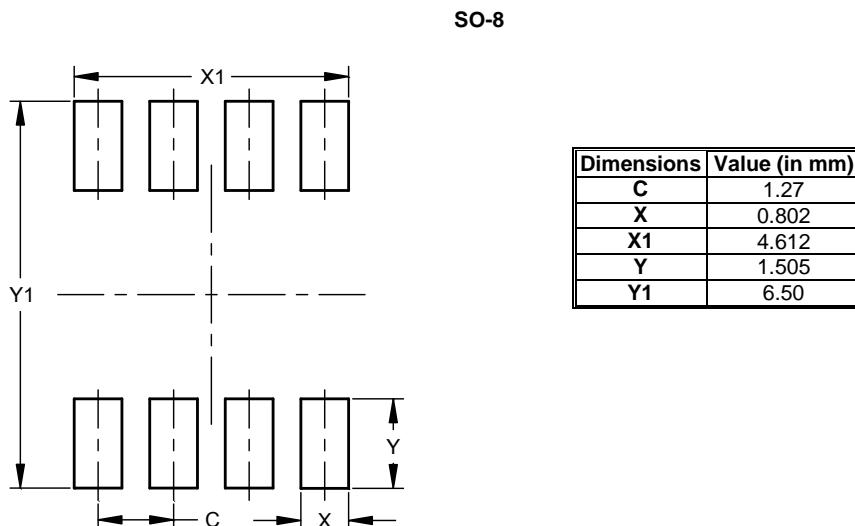
Package Outline Dimensions

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



Suggested Pad Layout

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