

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-30V	32mΩ @ V _{GS} = -10V	-5.8A
	50mΩ @ V _{GS} = -4.5V	-4.6A

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:

- DC-DC Converters
- Power Management Functions
- Backlighting

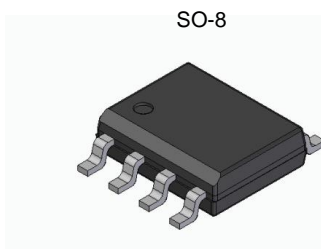
Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The DMP3037LSSQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

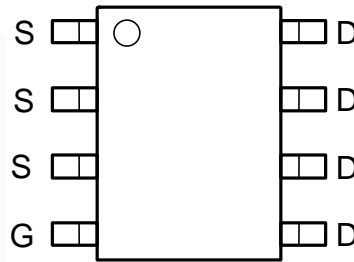
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

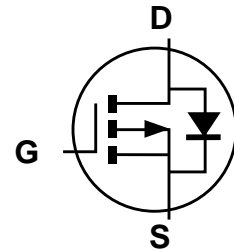
- Case: SO-8
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.072 grams (Approximate)



Top View



Top View
Pin-Out



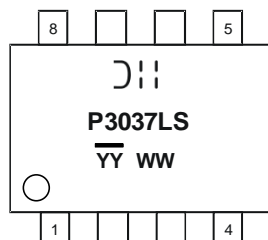
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3037LSSQ-13	SO-8	2500/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



⌋⌋ = Manufacturer's Marking
 P3037LS = Product Type Marking Code
 YYWW or YYWW = Date Code Marking
 YY or YY = Year (ex: 19 = 2019)
 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}	-30	V	
Gate-Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current (Note 6) $V_{GS} = -10\text{V}$	I_D	$T_A = +25^\circ\text{C}$	-5.8	A
		$T_A = +70^\circ\text{C}$	-4.6	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	-40	A	
Avalanche Current (Note 7) $L = 0.1\text{mH}$	I_{AS}	-17	A	
Avalanche Energy (Note 7) $L = 0.1\text{mH}$	E_{AS}	15	mJ	

Thermal Characteristics

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)	P_D	$T_A = +25^\circ\text{C}$	1.2	W
		$T_A = +70^\circ\text{C}$	0.8	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	Steady State	100	$^\circ\text{C/W}$
		$t < 10\text{s}$	58	
Total Power Dissipation (Note 6)	P_D	$T_A = +25^\circ\text{C}$	1.6	W
		$T_A = +70^\circ\text{C}$	1.0	
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	Steady State	77	$^\circ\text{C/W}$
		$t < 10\text{s}$	45	
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	10		
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 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	-1.0	μA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
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	$V_{GS(TH)}$	-1.0	—	-2.4	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	19	32	m Ω	$V_{GS} = -10\text{V}, I_D = -6\text{A}$
			28	50		$V_{GS} = -4.5\text{V}, I_D = -5\text{A}$
Diode Forward Voltage	V_{SD}	—	-0.75	-1.2	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	969	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	138	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	102	—	pF	
Gate Resistance	R_g	—	13	—	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	—	17.3	—	nC	$V_{DS} = -15\text{V}, I_D = -7\text{A}$
Total Gate Charge ($V_{GS} = -4.5\text{V}$)	Q_g	—	8.2	—	nC	$V_{DS} = -15\text{V}, I_D = -7\text{A}$
Gate-Source Charge	Q_{gs}	—	2.5	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.8	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.7	—	ns	
Turn-On Rise Time	t_r	—	5	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	43	—	ns	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$ $R_L = 2.15\Omega, R_{GEN} = 3\Omega$
Turn-Off Fall Time	t_f	—	20	—	ns	
Body Diode Reverse Recovery Time	t_{RR}	—	13.6	—	ns	$I_S = -7\text{A}, dI/dt = 100\text{A}/\mu\text{s}$
Body Diode Reverse Recovery Charge	Q_{RR}	—	3.4	—	nC	$I_S = -7\text{A}, dI/dt = 100\text{A}/\mu\text{s}$

- 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 1 inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

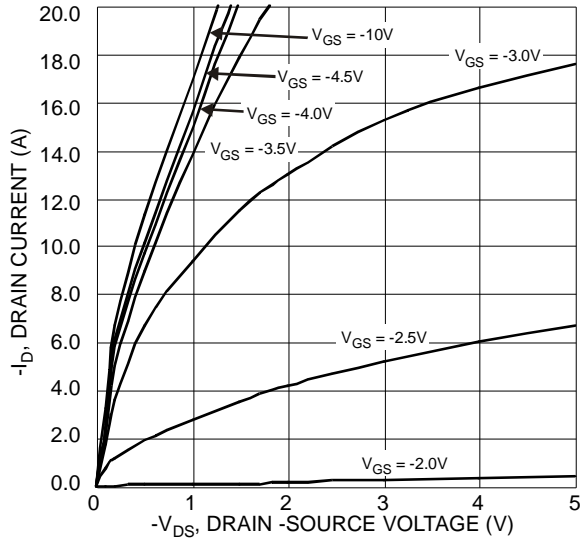


Figure 1 Typical Output Characteristics

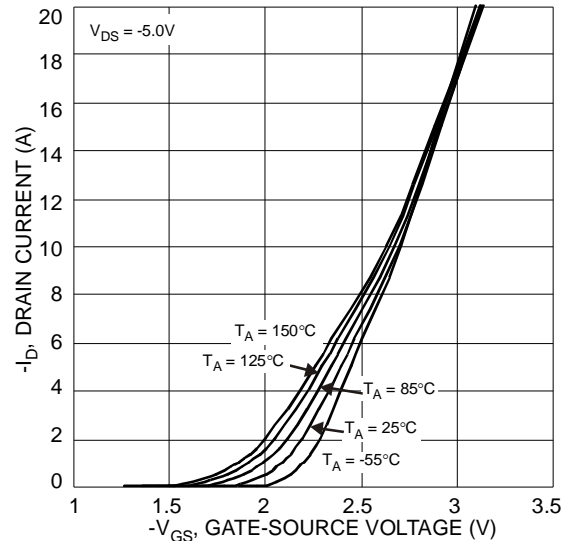


Figure 2 Typical Transfer Characteristics

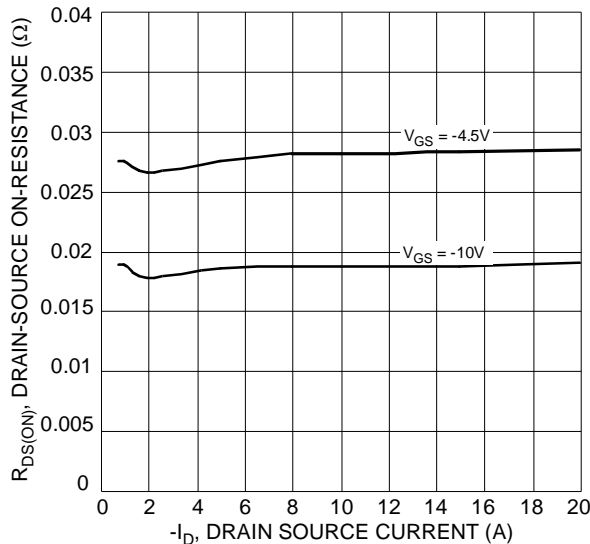


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

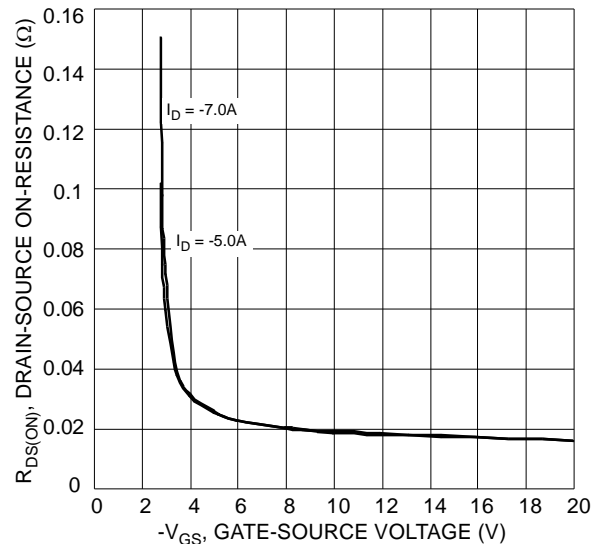


Figure 4 Typical Transfer Characteristics

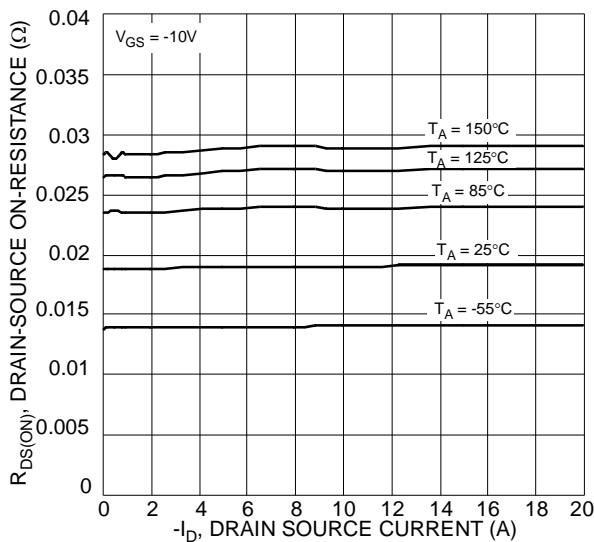


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

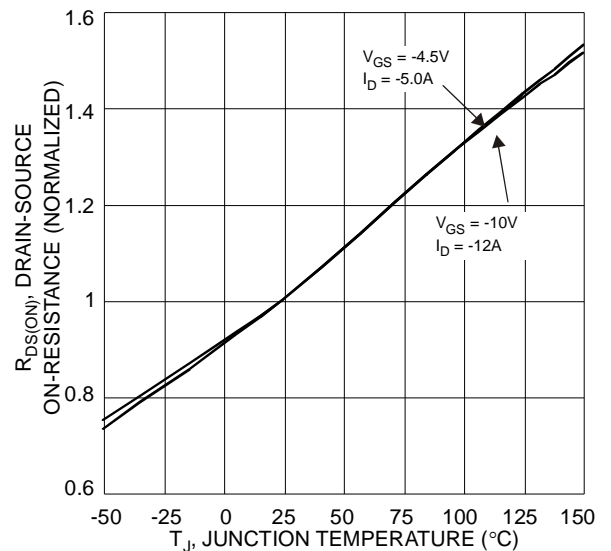


Figure 6 On-Resistance Variation with Temperature

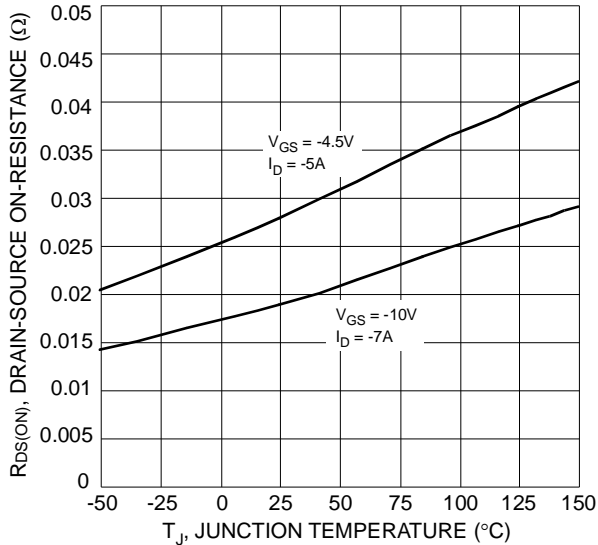


Figure 7 On-Resistance Variation with Temperature

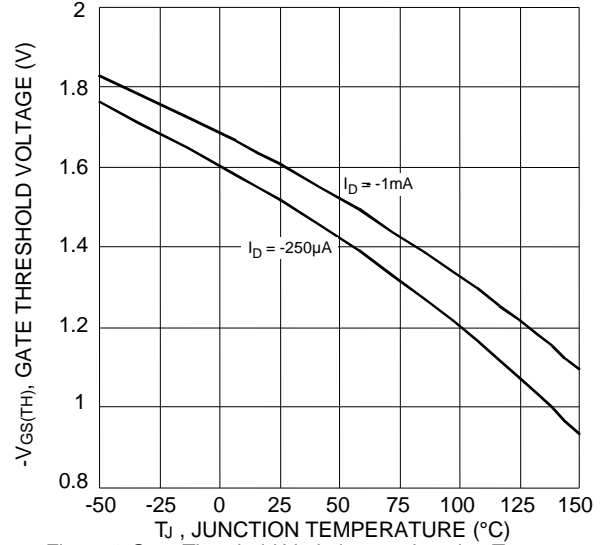


Figure 8 Gate Threshold Variation vs. Junction Temperature

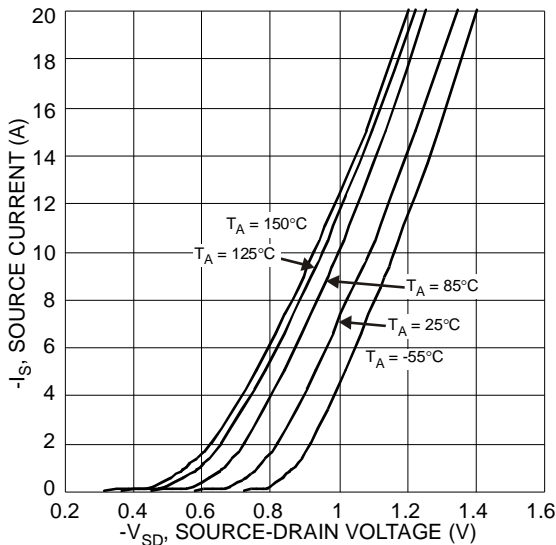


Figure 9 Diode Forward Voltage vs. Current

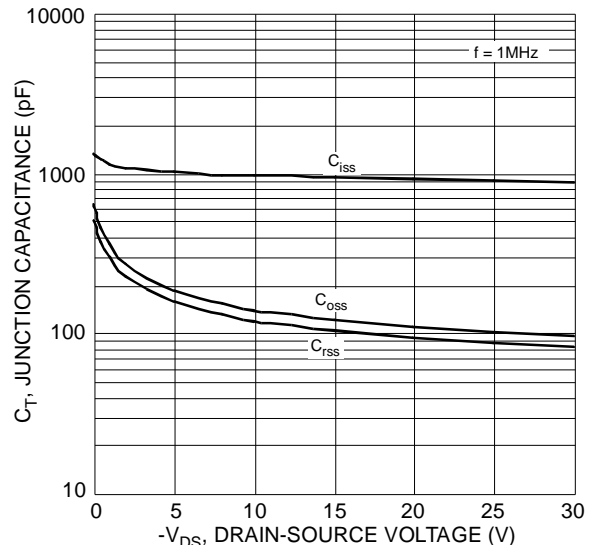


Figure 10 Typical Junction Capacitance

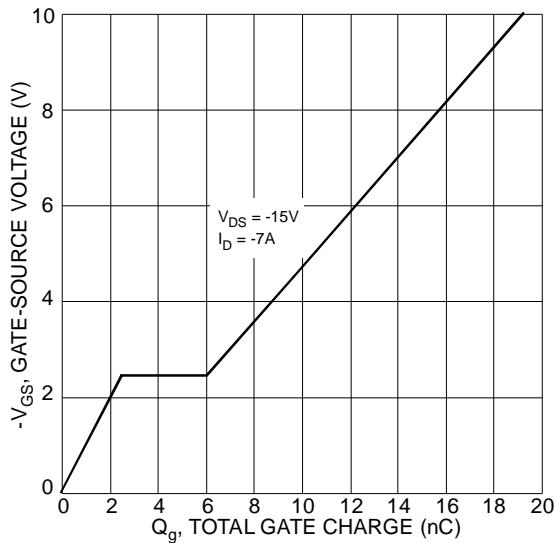


Figure 11 Gate-Charge Characteristics

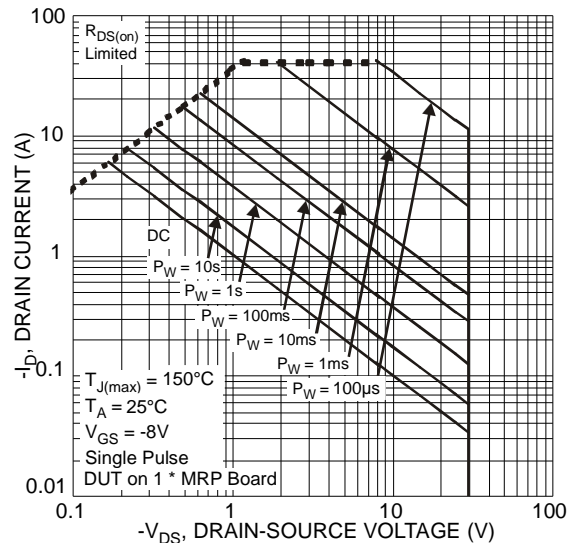


Figure 12 SOA, Safe Operation Area

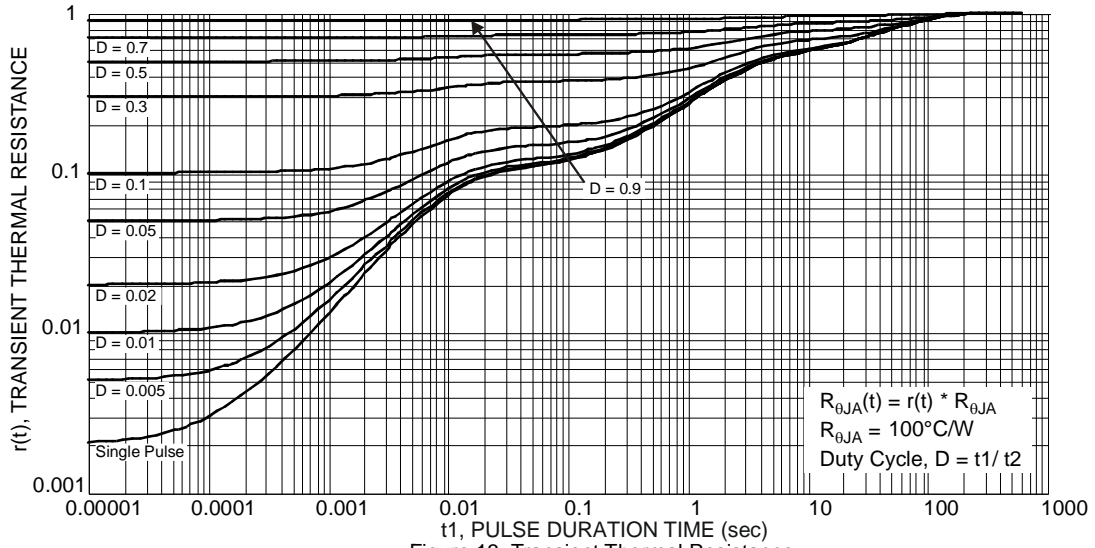
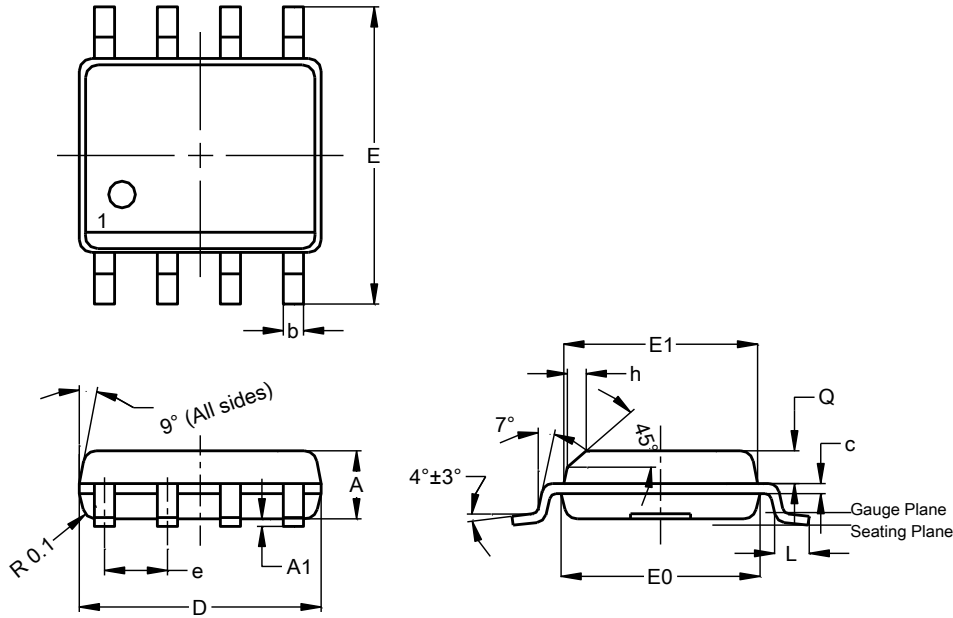


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

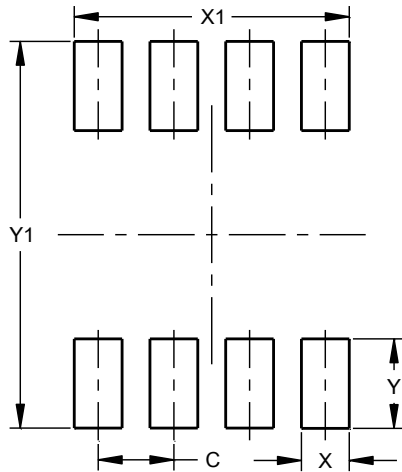


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

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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