

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
60V	6.5mΩ @ V _{GS} = 10V	14.6A
	10mΩ @ V _{GS} = 4.5V	11.8A

Description and Applications

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

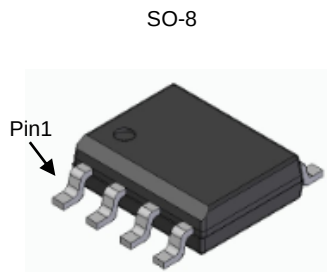
- High-Frequency Switching
- Synchronous Rectification
- DC-DC Converters

Features and Benefits

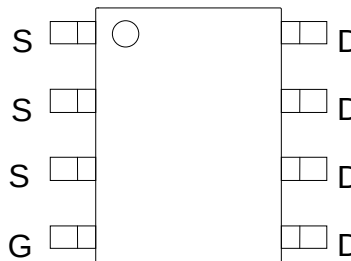
- 100% Unclamped Inductive Switching (UIS) Test in Production — Ensures More Reliable and Robust End Application
- High Conversion Efficiency
- Low R_{DS(ON)} — Minimizes On-State Losses
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact_us) or your local Diodes representative.
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

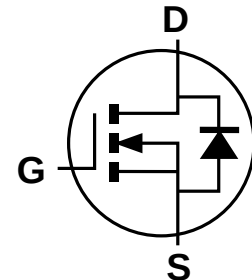
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 0.076 grams (Approximate)



Top View



Pin-Out
Top View



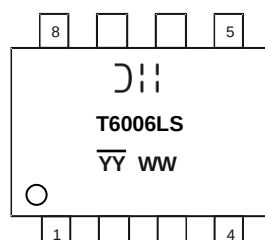
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6006LSS-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



DII = Manufacturer's Marking
 T6006LS = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 19 = 2019)
 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 5) V _{GS} = 10V	I _D	T _A = +25°C 11.9 T _A = +70°C 9.5	A
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	T _A = +25°C 14.6 T _A = +70°C 11.7	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I _{DM}	110	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	10	A
Pulsed Body Diode Forward Current (10μs Pulse, Duty Cycle = 1%)	I _{SM}	110	A
Avalanche Current, L = 0.1mH	I _{AS}	28.5	A
Avalanche Energy, L = 0.1mH	E _{AS}	40.7	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.38	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	90.3	°C/W
Total Power Dissipation (Note 6)	P _D	2.08	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	60.1	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	6.5	°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	1.74	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5.0	6.5	mΩ	V _{GS} = 10V, I _D = 20A
		—	6.7	10		V _{GS} = 4.5V, I _D = 10A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	2162	—	pF	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz
Output Capacitance	C _{oss}	—	761	—		
Reverse Transfer Capacitance	C _{rss}	—	58	—		
Gate Resistance	R _g	—	0.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	18.1	—	nC	V _{DS} = 30V, I _D = 20A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	34.9	—		
Gate-Source Charge	Q _{gs}	—	6.1	—		
Gate-Drain Charge	Q _{gd}	—	7.3	—		
Turn-On Delay Time	t _{D(ON)}	—	6.0	—	ns	V _{GS} = 10V, V _{DD} = 30V, R _G = 3Ω, I _D = 20A
Turn-On Rise Time	t _r	—	5.4	—		
Turn-Off Delay Time	t _{D(OFF)}	—	20.4	—		
Turn-Off Fall Time	t _f	—	7.8	—		
Reverse Recovery Time	t _{RR}	—	35.8	—	ns	I _F = 10A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{RR}	—	40.2	—	nC	

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

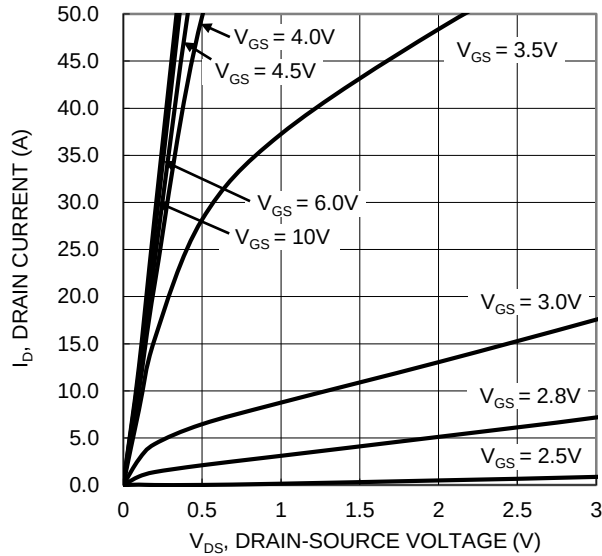


Figure 1. Typical Output Characteristic

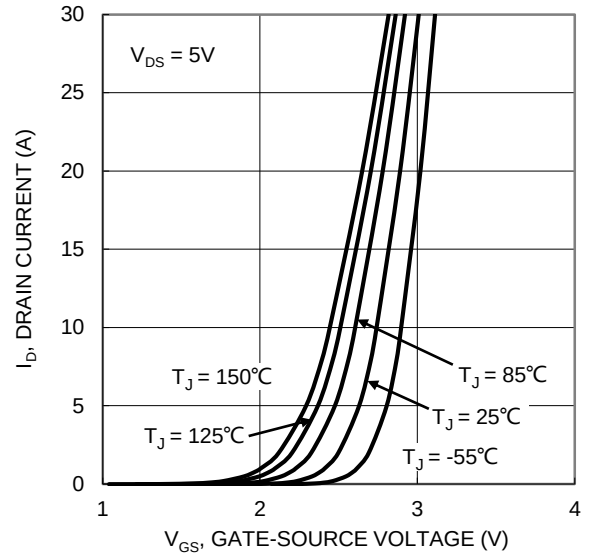


Figure 2. Typical Transfer Characteristic

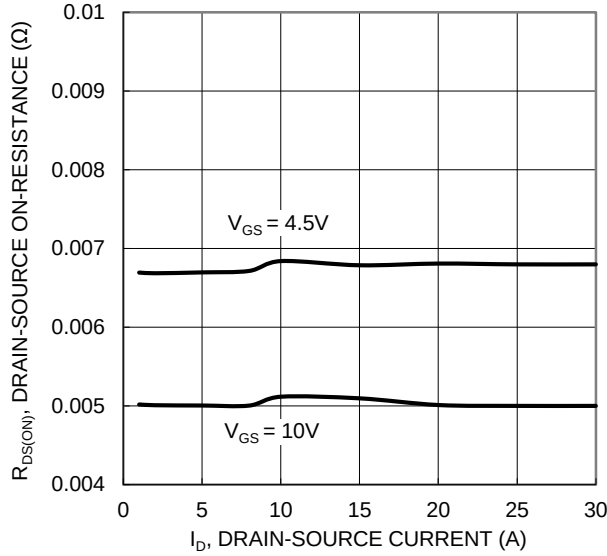


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

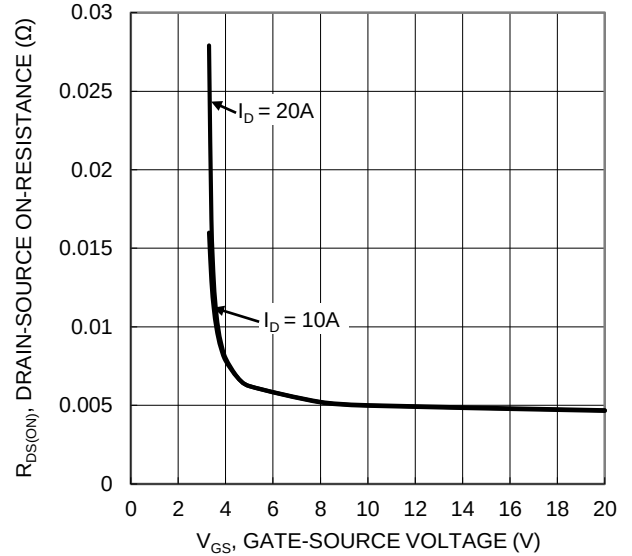


Figure 4. Typical Transfer Characteristic

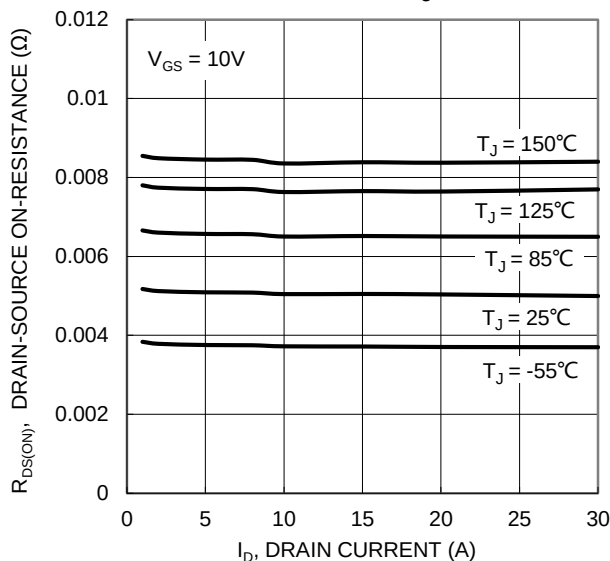


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

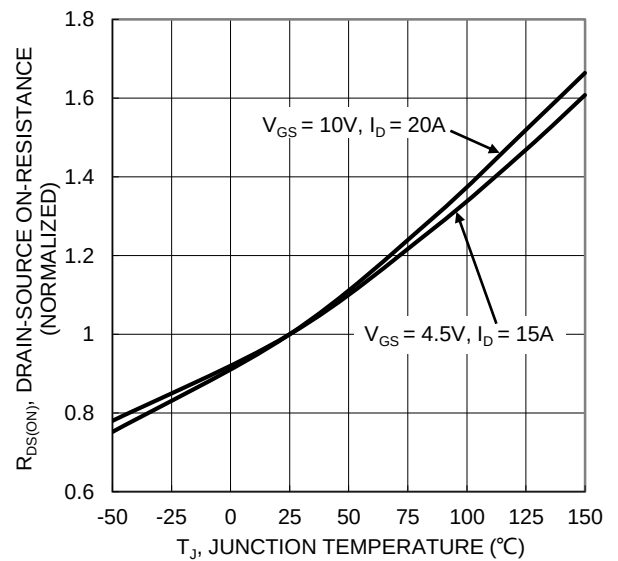


Figure 6. On-Resistance Variation with Junction Temperature

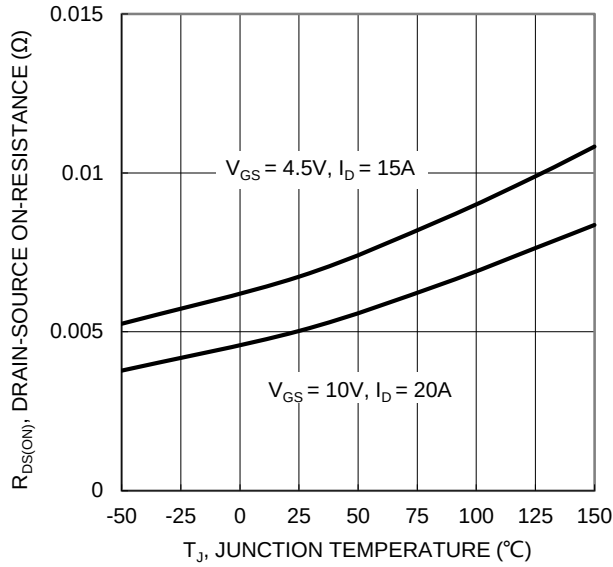


Figure 7. On-Resistance Variation with Junction Temperature

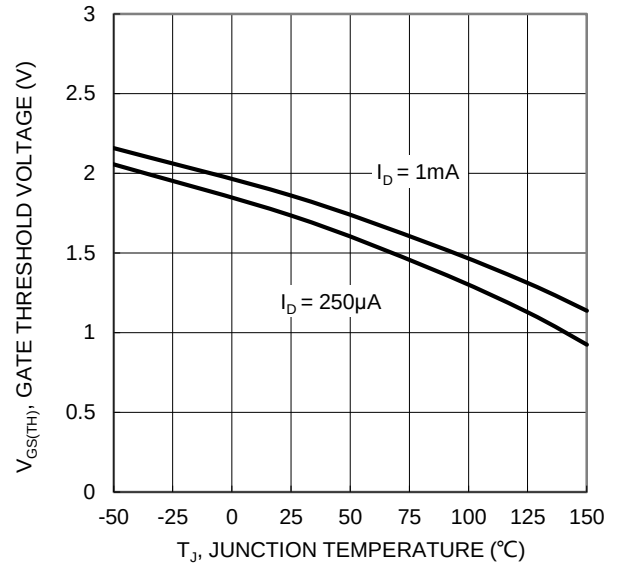


Figure 8. Gate Threshold Variation vs. Junction Temperature

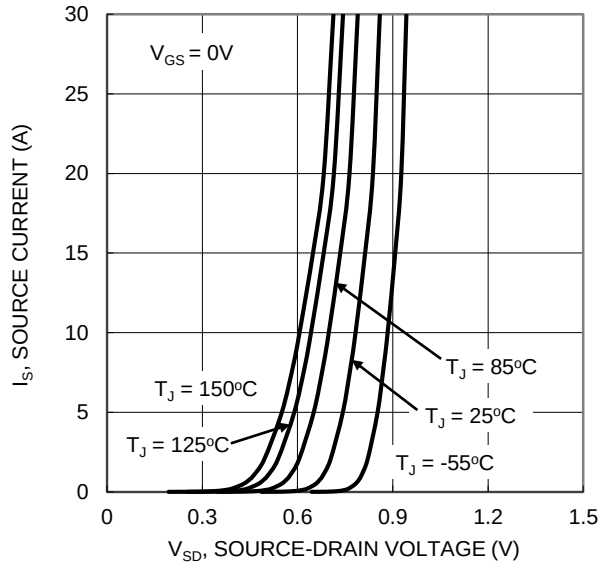


Figure 9. Diode Forward Voltage vs. Current

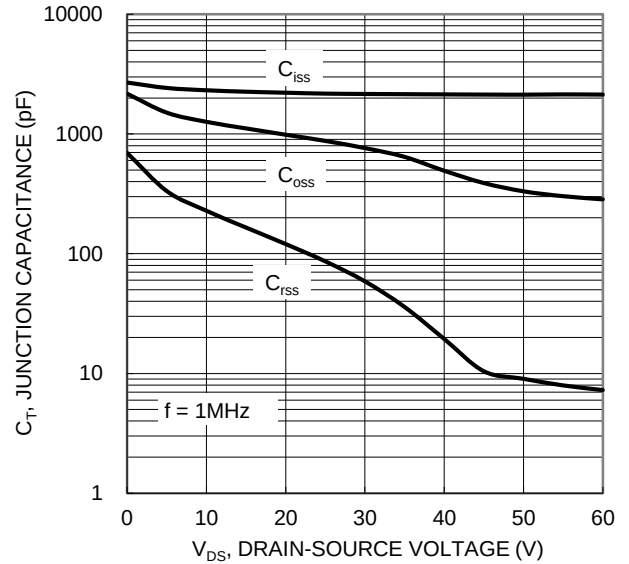


Figure 10. Typical Junction Capacitance

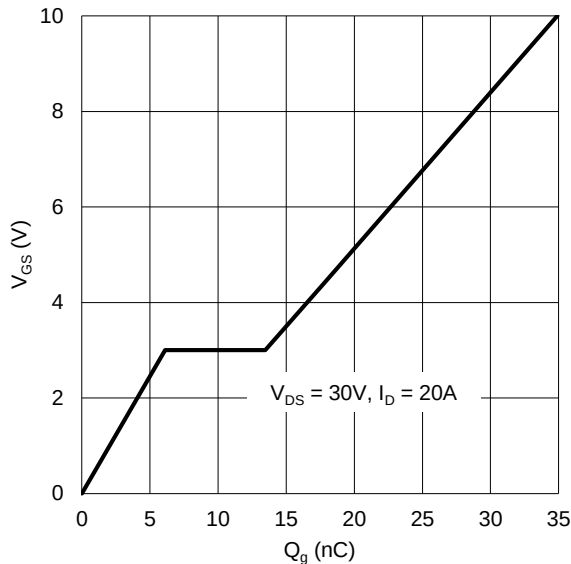


Figure 11. Gate Charge

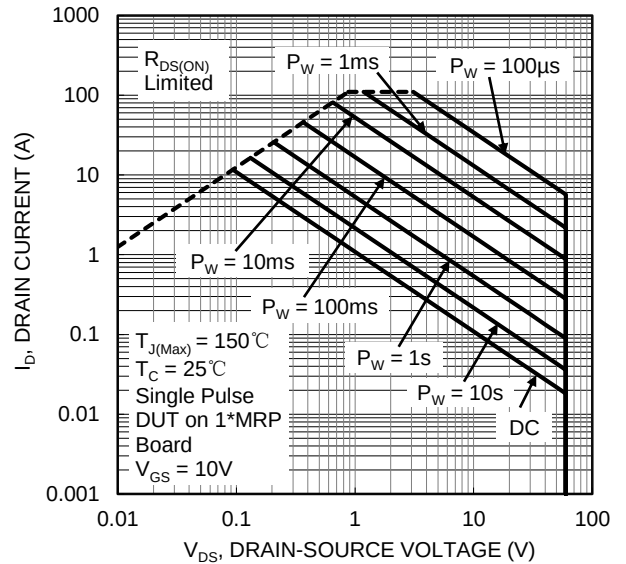


Figure 12. SOA, Safe Operation Area

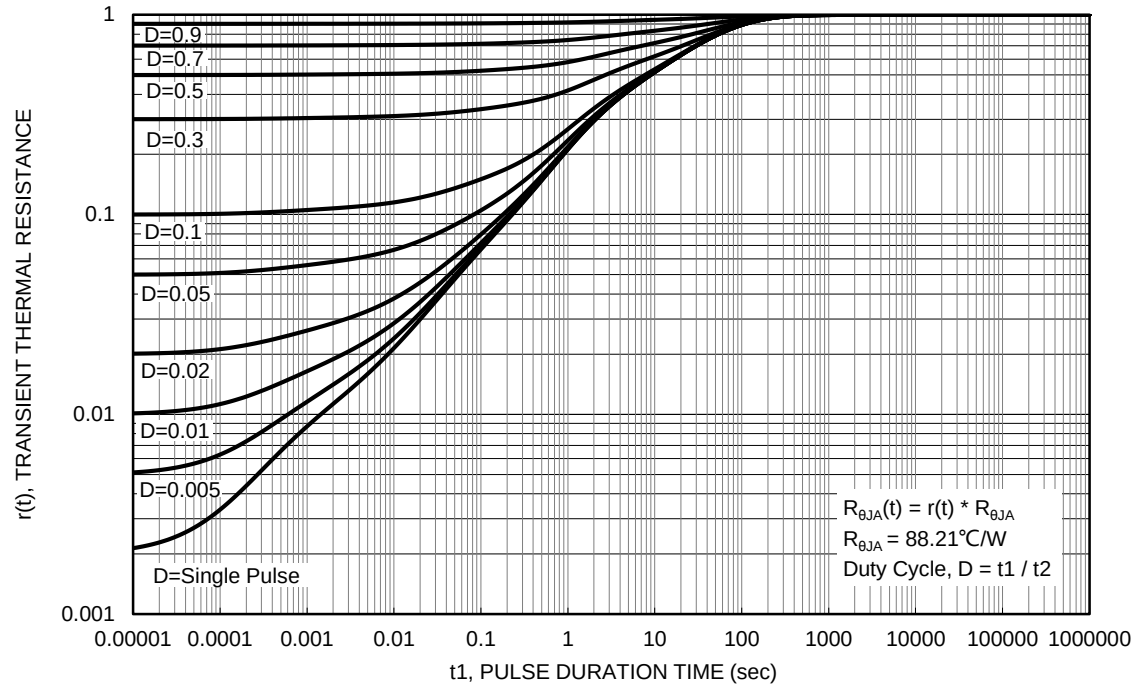


Figure 13. Transient Thermal Resistance

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

Figure 1 consists of three views of a test specimen: (a) Top view, (b) Side view, and (c) Cross-sectional view.

- (a) Top view:** Shows a rectangular specimen with rounded corners. The overall width is labeled E . The distance between the centers of the side pins is labeled b . A central circular hole is labeled 1 .
- (b) Side view:** Shows the profile of the specimen. The height is labeled A . The width of the base is labeled D . The distance between the centers of the base pins is labeled e . The height of the base pins is labeled $A1$. The top surface is chamfered at 9° on all sides. A fillet radius $R0.1$ is indicated at the base of the pins.
- (c) Cross-sectional view:** Shows the internal profile of the specimen. The top width is labeled $E1$. The height of the top flange is labeled h . The angle of the top flange is labeled 45° . The angle of the side wall is labeled 7° . The angle of the base is labeled $4^\circ \pm 3^\circ$. The distance from the top flange to the base is labeled Q . The distance from the base to the seating plane is labeled c . The distance from the base to the gauge plane is labeled L . The overall width at the base is labeled $E0$. The gauge plane and seating plane are indicated by arrows.

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			

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

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

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