

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
-30V	4.0m Ω @ $V_{GS} = -10V$	-16.2A
	6.5m Ω @ $V_{GS} = -4.5V$	-12.8A

Description and Applications

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

- Backlighting
- Power Management Functions
- DC-DC Converters



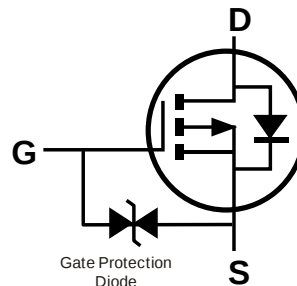
Top View

Features and Benefits

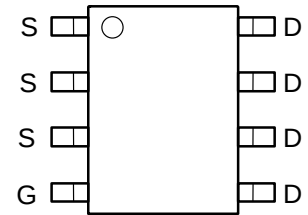
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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)



Internal Schematic



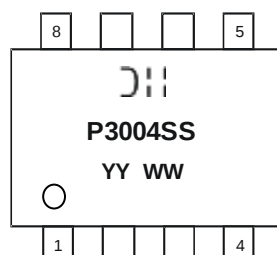
Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3004SSS-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, see <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



= Manufacturer's Marking
 P3004SS = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY= Year (ex: 17 = 2017)
 WW = Week (01 to 53)

Maximum Ratings (@T_A = +25°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, V _{GS} = 10V (Note 6)	Steady State	T _A = +25°C T _A = +70°C	I _D	-16.2 -13.0	A
	t < 10s	T _A = +25°C T _A = +70°C		-23.4 -18.7	
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	-1.8	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	-110	A
Avalanche Current, L=0.1mH (Note 7)			I _{AS}	-44	A
Avalanche Energy, L=0.1mH (Note 7)			E _{AS}	98	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.2	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R _{θJA}	103	°C/W
	t < 10s		50	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R _{θJA}	79	°C/W
	t < 10s		38	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	11	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-2.5	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.2	4.0	mΩ	V _{GS} = -10V, I _D = -20A
		—	5.2	6.5		V _{GS} = -4.5V, I _D = -15A
Diode Forward Voltage	V _{SD}	—	-0.7	-1.2	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	7693	—	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	1426	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	966	—	pF	
Gate Resistance	R _g	—	5.4	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	73	—	nC	V _{DS} = -15V, I _D = -20A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	156	—	nC	
Gate-Source Charge	Q _{gs}	—	23	—	nC	
Gate-Drain Charge	Q _{gd}	—	34	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	8.3	—	ns	V _{DD} = -15V, V _{GS} = -10V, R _g = 1Ω, I _D = -20A
Turn-On Rise Time	t _R	—	6.8	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	267	—	ns	
Turn-Off Fall Time	t _F	—	223	—	ns	
Reverse Recovery Time	t _{RR}	—	31	—	ns	I _F = -10A, dI/dt = 100A/μs
Reverse Recovery Charge	Q _{RR}	—	25	—	nC	

- 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.

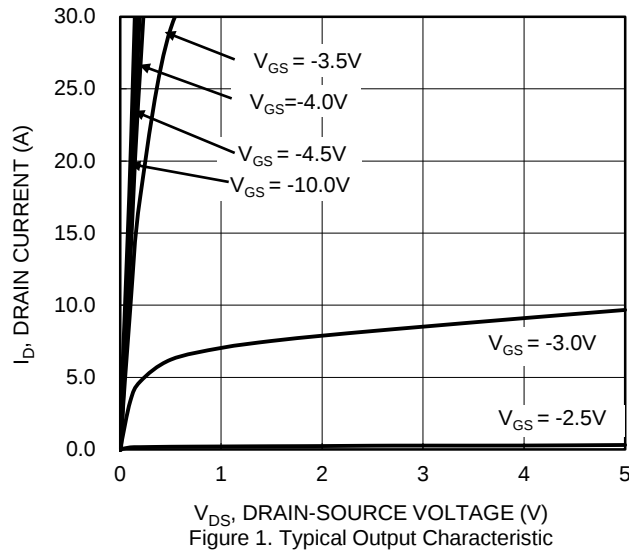


Figure 1. Typical Output Characteristic

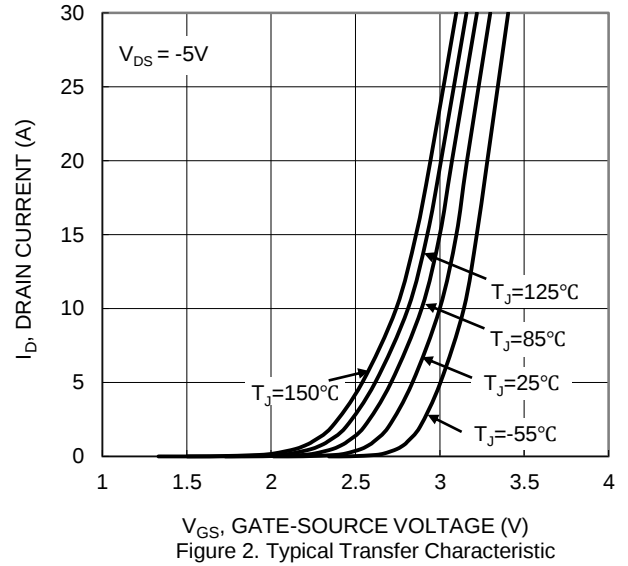


Figure 2. Typical Transfer Characteristic

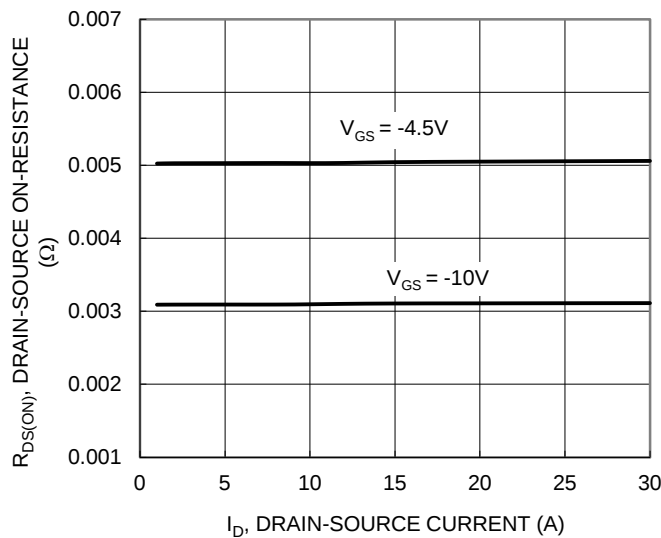


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

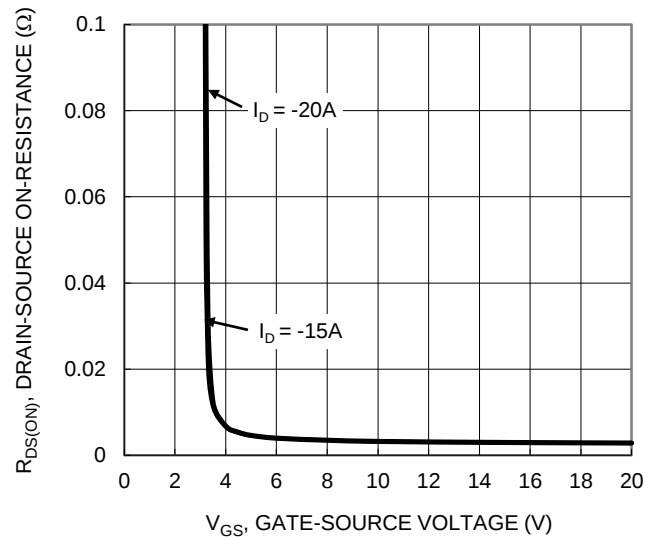


Figure 4. Typical Transfer Characteristic

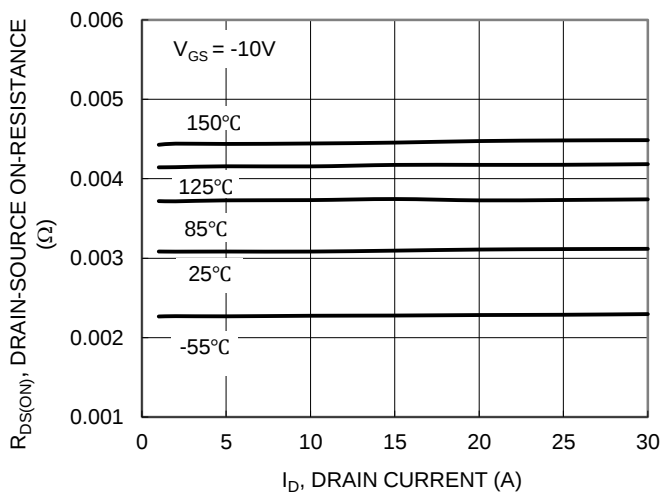


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

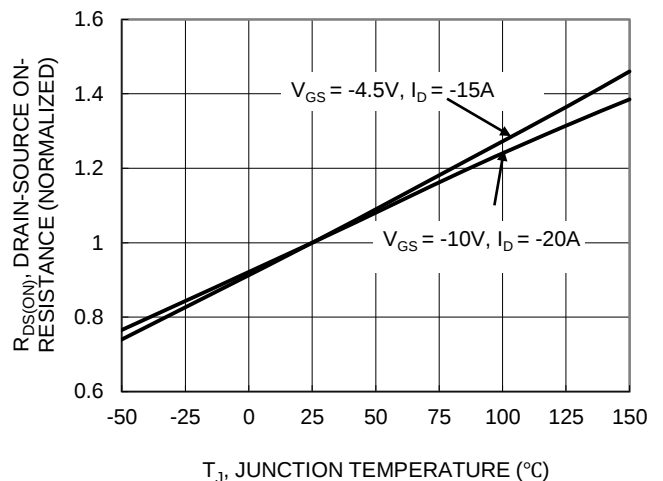
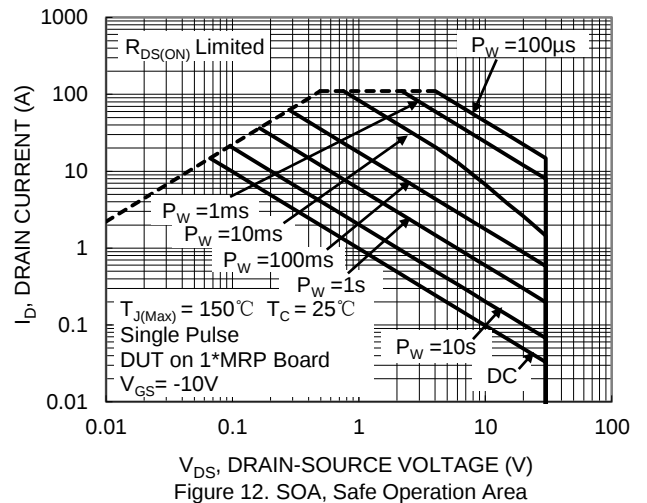
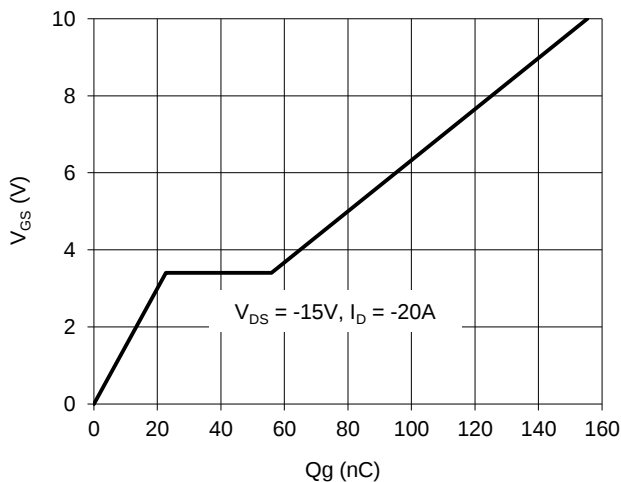
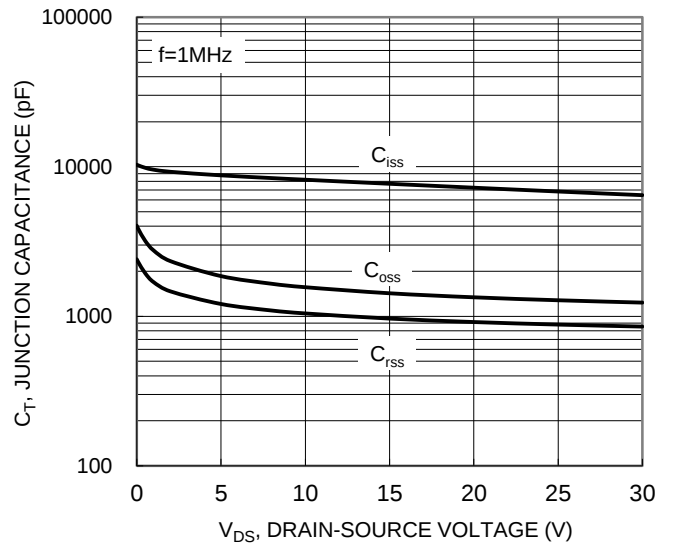
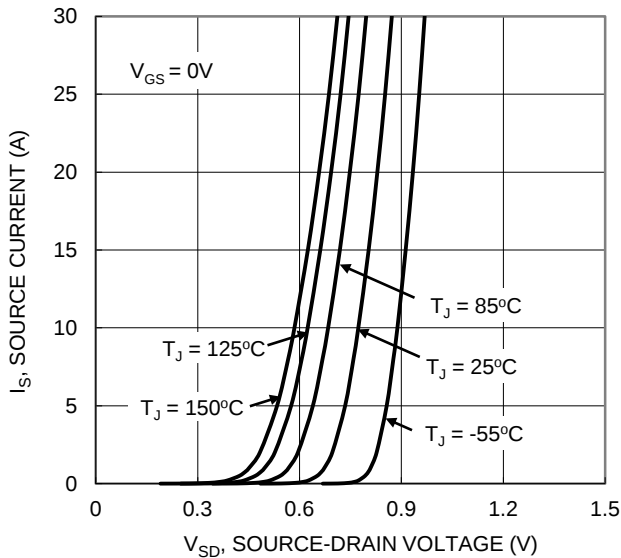
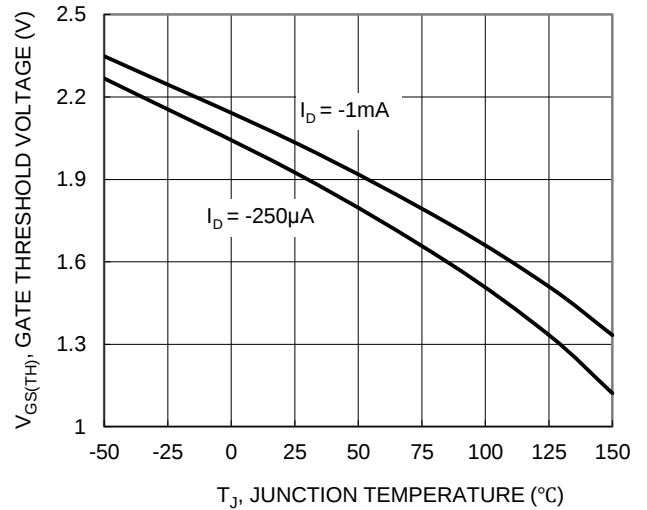
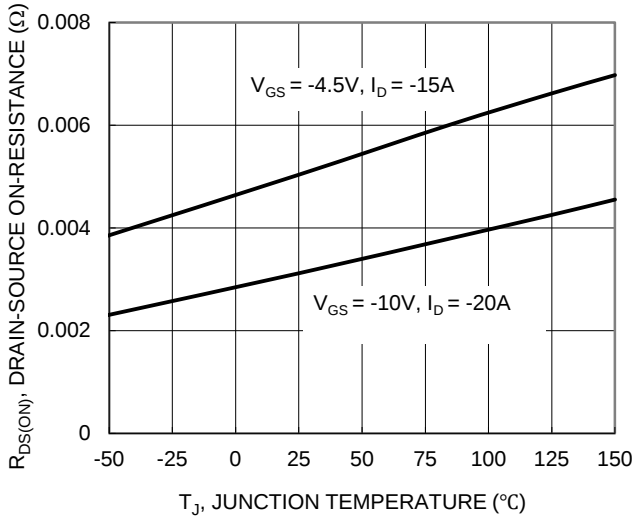


Figure 6. On-Resistance Variation with Junction Temperature



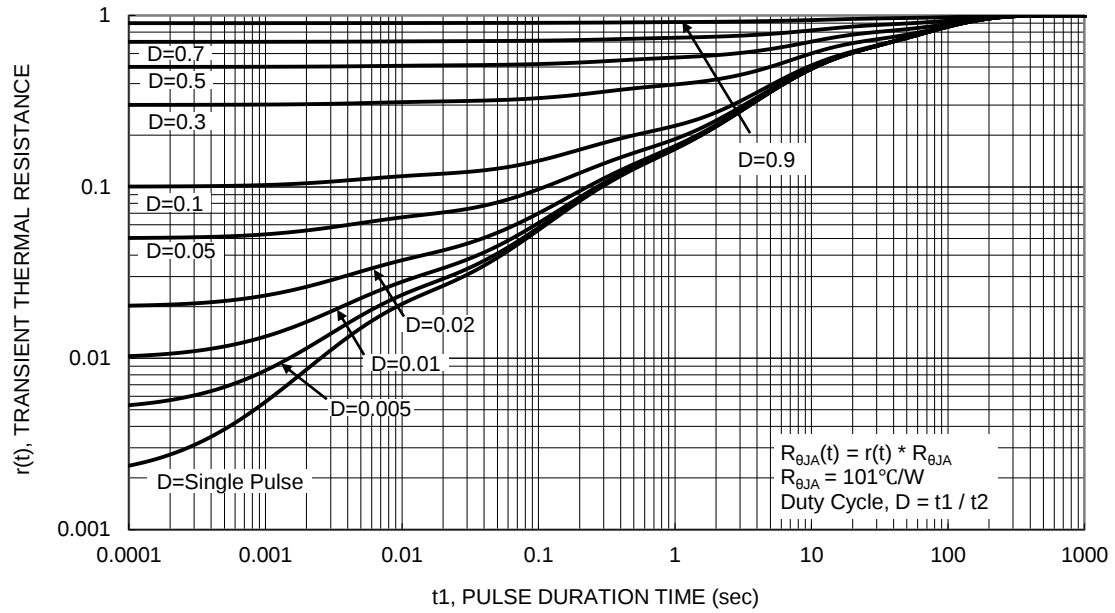
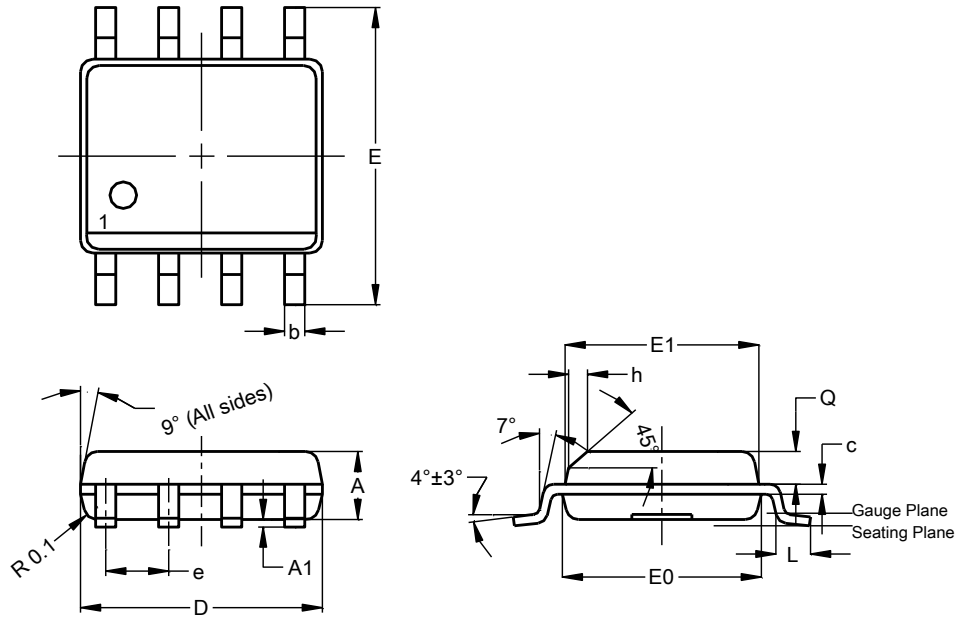


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

SO-8

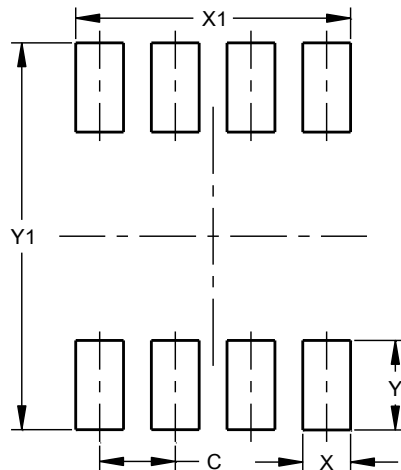


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

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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