

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C
-600V	13Ω @ V <sub>GS</sub> = -10V	-0.25A

## Description and Applications

This MOSFET is designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Motor Control
- Backlighting
- AC-DC Converters

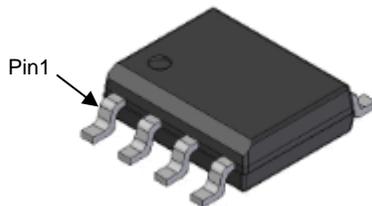
## Features and Benefits

- Low On-Resistance
- High BV<sub>DSS</sub> Rating for Power Application
- Low Input Capacitance
- Fast Switching
- High Efficiency
- **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@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

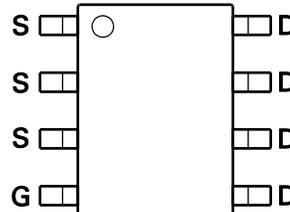
## Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.076 grams (Approximate)

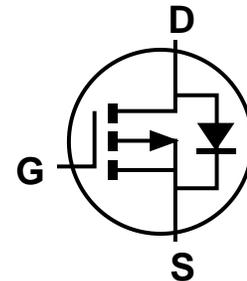
SO-8 (Standard B)



Top View



Pin-Out  
Top View



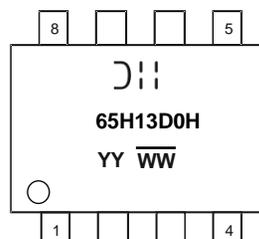
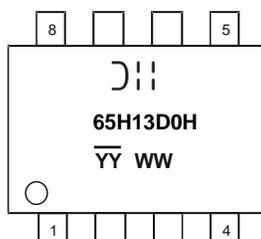
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP65H13D0HSS-13	SO-8 (Standard B)	4,000 / 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  
 65H13D0H = Product Type Marking Code  
 YYWW or YYWW = Date Code Marking  
 YY or YY = Year (ex: 21 = 2021)  
 WW or WW = Week (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage (Note 5)	V <sub>DSS</sub>	-600	V
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V	I <sub>D</sub>	T <sub>A</sub> = +25°C -0.25 T <sub>A</sub> = +70°C -0.20	A
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	T <sub>A</sub> = +25°C -0.25 T <sub>A</sub> = +70°C -0.20	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	-2	A
Pulsed Source Current (10µs Pulse, Duty Cycle = 1%)	I <sub>SM</sub>	-2	A
Peak Diode Recovery dv/dt (Note 8)	dv/dt	5	V/ns

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation, @T <sub>A</sub> = +25°C (Note 6)	P <sub>D</sub>	1.9	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 6)	R <sub>θJA</sub>	65	°C/W
Power Dissipation, @T <sub>A</sub> = +25°C (Note 7)	P <sub>D</sub>	1.25	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 7)	R <sub>θJA</sub>	100	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 9)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-650	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	µA	V <sub>DS</sub> = -650V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 9)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-2	-3	-4	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	10.5	13	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -0.25A
Diode Forward Voltage	V <sub>SD</sub>	—	-0.7	-1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.25A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	582	—	pF	V <sub>DS</sub> = -25V, f = 1MHz, V <sub>GS</sub> = 0V
Output Capacitance	C <sub>oss</sub>	—	45	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	3.3	—		
Gate Resistance	R <sub>g</sub>	—	12.7	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	13.4	—	nC	V <sub>DD</sub> = -520V, I <sub>D</sub> = -0.25A, V <sub>GS</sub> = -10V
Gate-Source Charge	Q <sub>gs</sub>	—	2	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	4.9	—		
Turn-On Delay Time	t <sub>d(ON)</sub>	—	16	—	ns	V <sub>DD</sub> = -325V, V <sub>GS</sub> = -10V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = -0.25A
Turn-On Rise Time	t <sub>R</sub>	—	10	—		
Turn-Off Delay Time	t <sub>d(OFF)</sub>	—	44	—		
Turn-Off Fall Time	t <sub>F</sub>	—	85	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	160	—	ns	I <sub>S</sub> = -1A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	1	—	µC	

- Notes:
5. HTRB V<sub>DS</sub> maximum is -480V.
  6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square pad layout.
  7. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
  8. Guaranteed by design. Not subject to production testing.
  9. Short duration pulse test used to minimize self-heating effect.

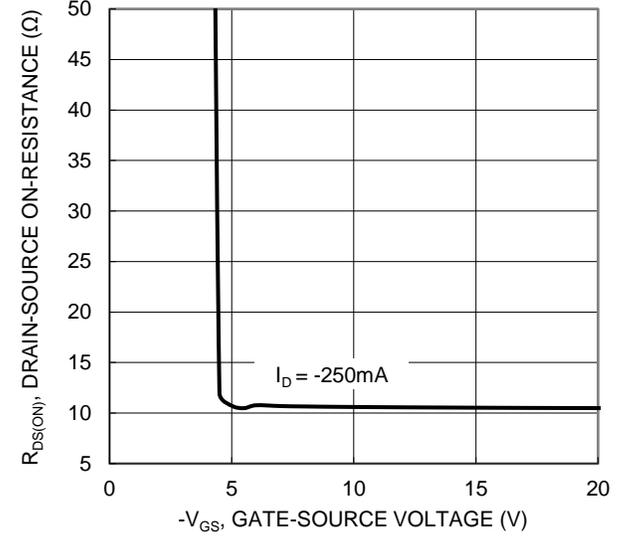
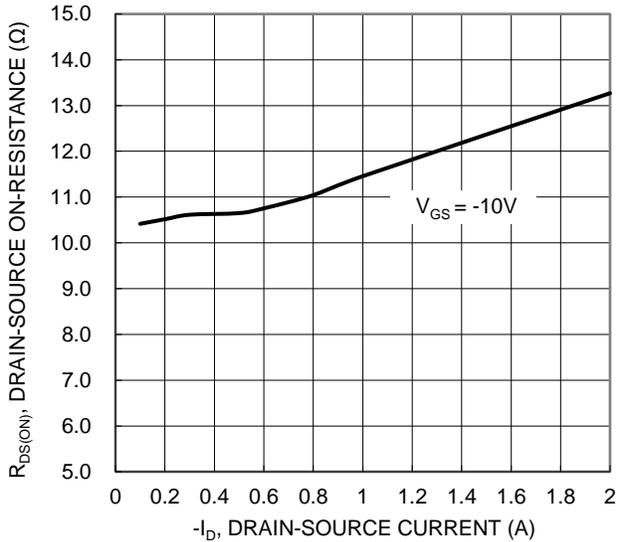
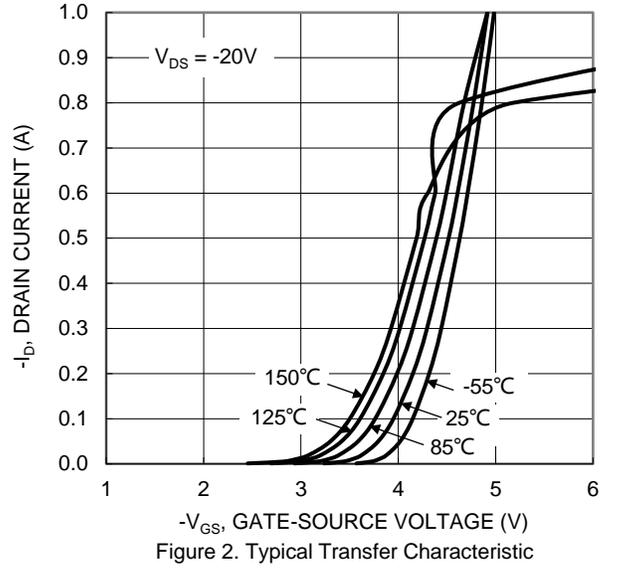
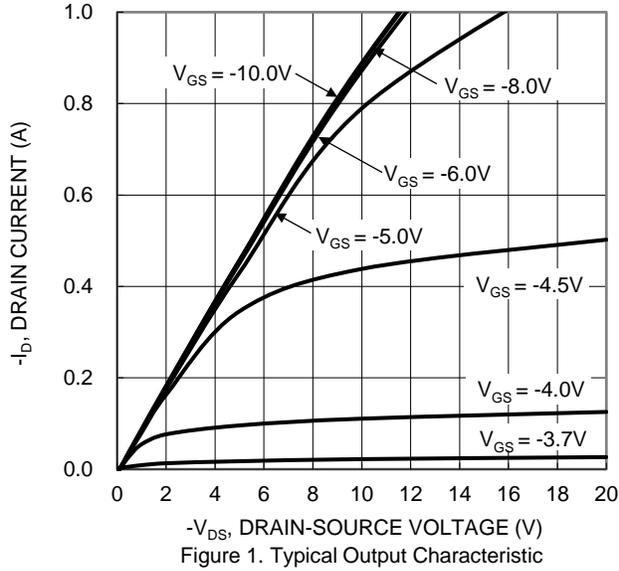


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

Figure 4. Typical Transfer Characteristic

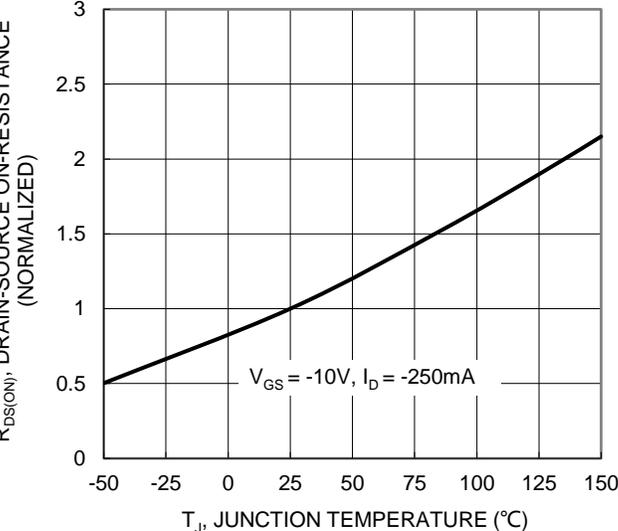
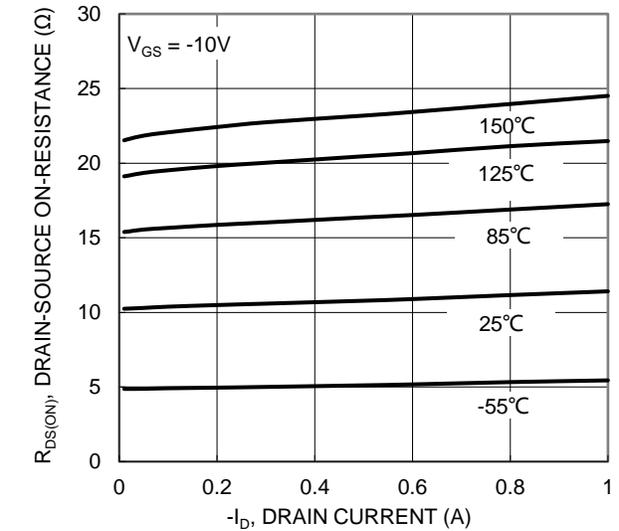


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

Figure 6. On-Resistance Variation with Temperature

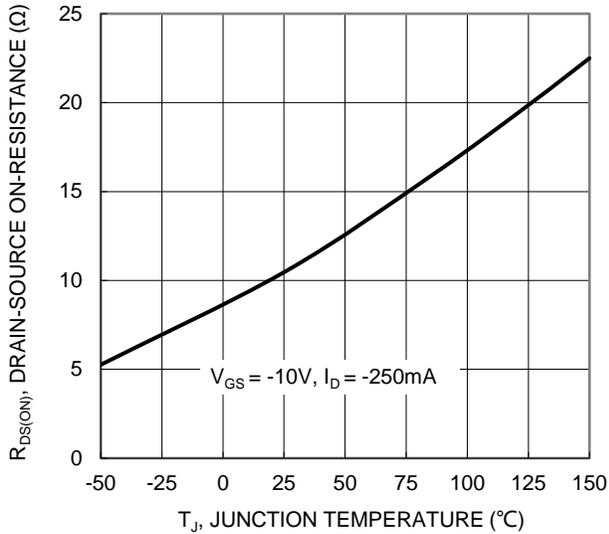


Figure 7. On-Resistance Variation with Temperature

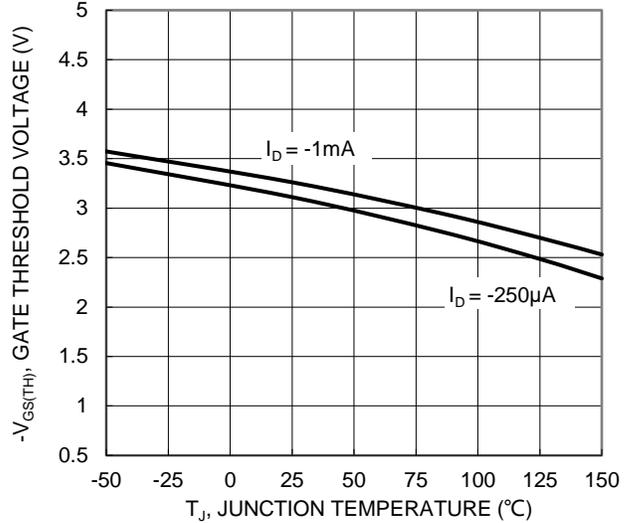


Figure 8. Gate Threshold Variation vs. Temperature

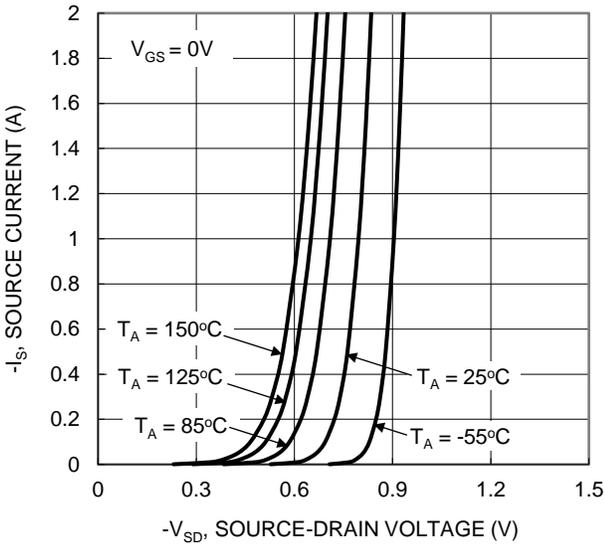


Figure 9. Diode Forward Voltage vs. Current

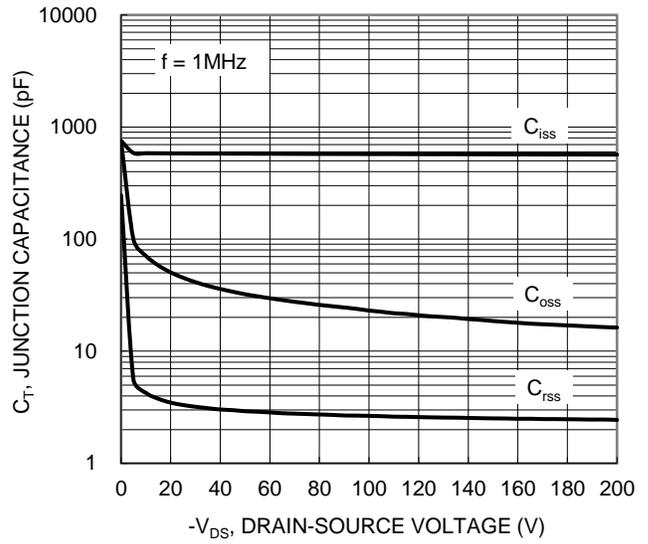


Figure 10. Typical Junction Capacitance

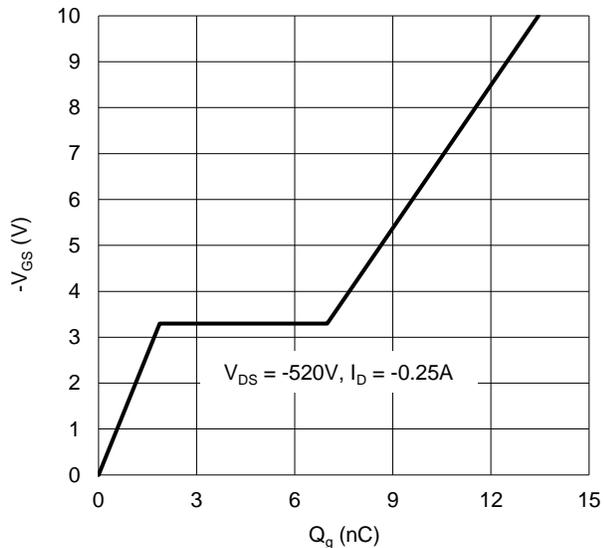


Figure 11. Gate Charge

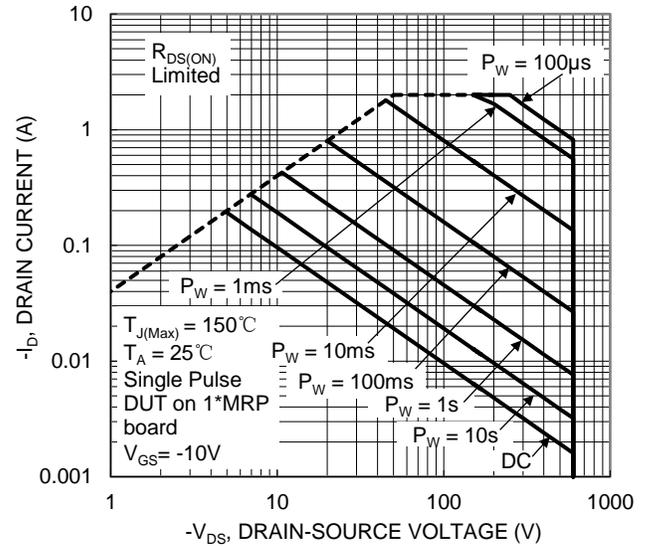


Figure 12. SOA, Safe Operation Area

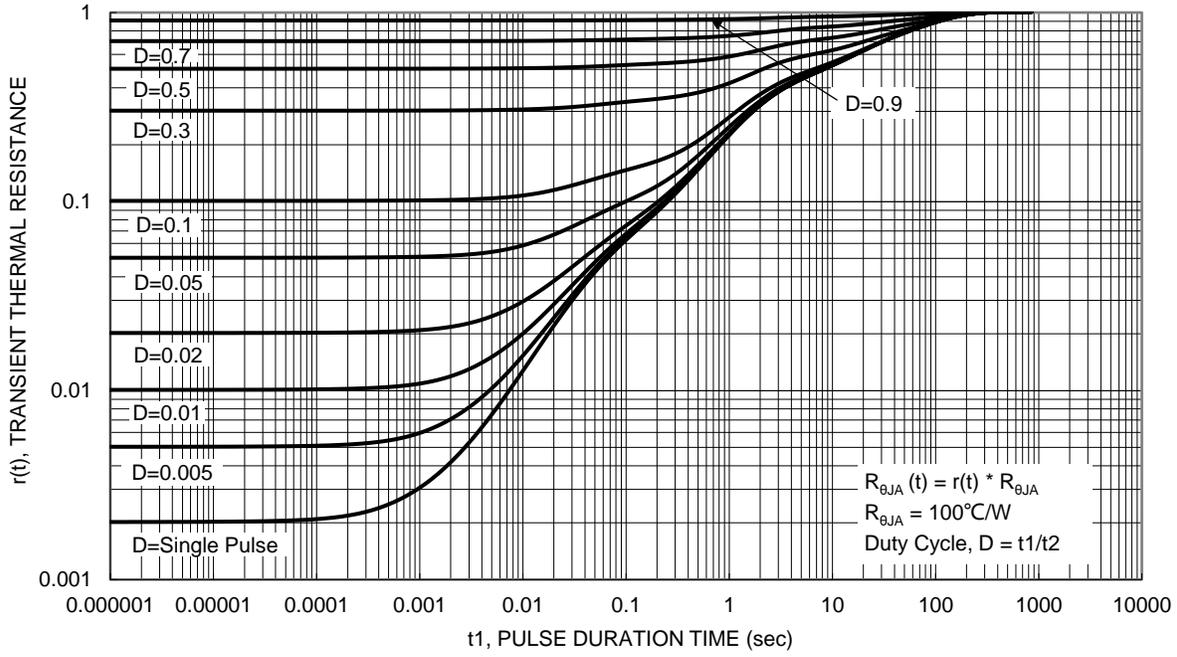
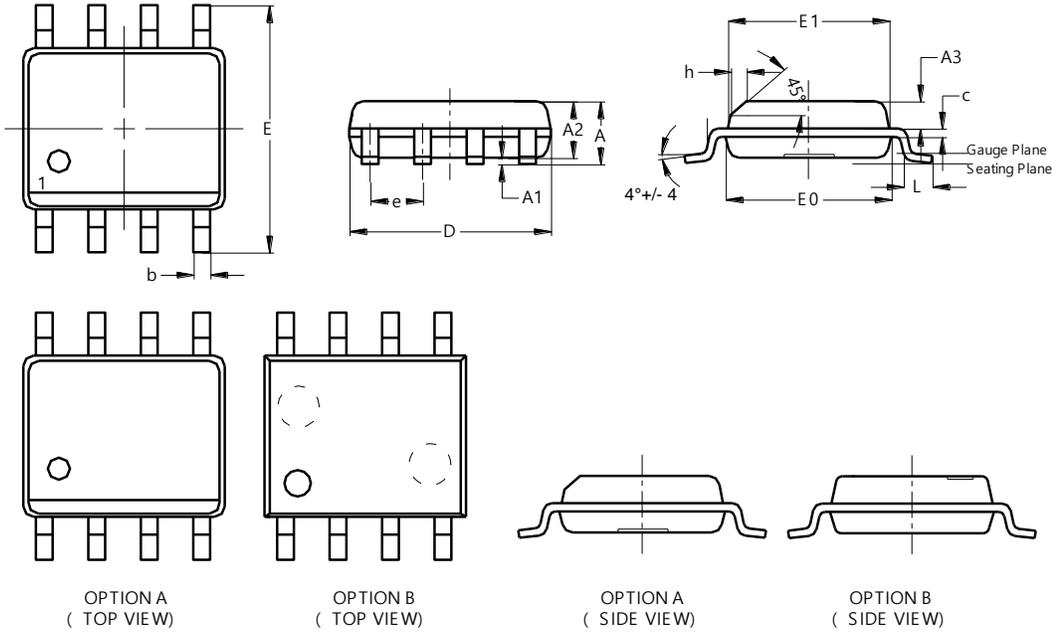


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**SO-8 (Standard B)**

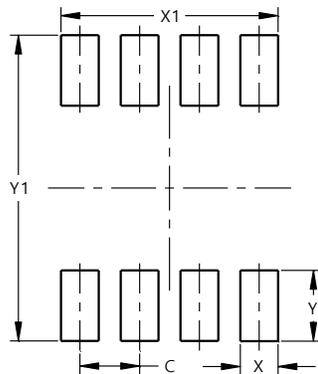


SO-8 (Standard B)			
Dim	Min	Max	Typ
A	1.35	1.75	1.45
A1	0.10	0.25	0.15
A3	0.60	0.70	0.65
b	0.30	0.51	0.40
c	0.15	0.25	0.20
D	4.70	5.10	4.90
E	5.80	6.20	6.00
E1	3.80	3.90	3.85
E0	3.80	4.00	3.90
e	--	--	1.27
h	--	--	0.35
L	0.40	1.27	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SO-8 (Standard B)**



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

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