

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>A</sub> = +25°C
60V	5Ω @ V <sub>GS</sub> = 10V	238mA
	7.5Ω @ V <sub>GS</sub> = 5V	200mA

## Description and Applications


This MOSFET has been 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
- Power-management functions

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface-Mount Package
- **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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

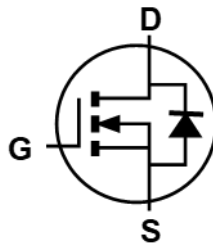
## Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 
- Terminal Connections: See Diagram
- Weight: 0.009 grams (Approximate)

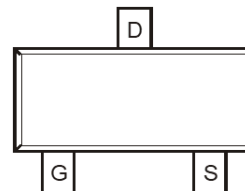
SOT23



Top View



Equivalent Circuit



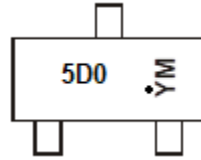
Top View

## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMN65D0L-7	SOT23	3,000	Tape & Reel
DMN65D0L-13	SOT23	10,000	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



5D0 = Product Type Marking Code

YM = Date Code Marking

• Y or  $\bar{Y}$  = Year (ex: M = 2025)

M = Month (ex: 9 = September)

### Date Code Key

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Code	M	N	P	R	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			$V_{DS}$	60	V
Gate-Source Voltage			$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	238 190	mA
Maximum Continuous Body Diode Forward Current (Note 5)			$I_S$	238	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%) (Note 5)			$I_{DM}$	1	A

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			$P_D$	0.6	mW
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		$R_{\theta JA}$	216	$^\circ\text{C/W}$
Total Power Dissipation (Note 6)			$P_D$	0.5	mW
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		$R_{\theta JA}$	276	$^\circ\text{C/W}$
Operating and Storage Temperature Range			$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$V_{GS} = 0, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1.0	$\mu\text{A}$	$V_{DS} = 60\text{V}, V_{GS} = 0$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	—	2.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	1.22	7.5	$\Omega$	$V_{GS} = 5.0\text{V}, I_D = 0.05\text{A}$
			1.18	5.0		$V_{GS} = 10\text{V}, I_D = 0.5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.8	1.5	V	$V_{GS} = 0, I_S = 115\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	49	—	pF	$V_{DS} = 25\text{V}, V_{GS} = 0$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	5.4	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	4.6	—	pF	
Gate Resistance	$R_g$	—	136	—	$\Omega$	$V_{DS} = 0, V_{GS} = 0,$ $f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = 4.5\text{V}$ )	$Q_g$	—	0.3	—	pC	$V_{DS} = 10\text{V}, I_D = 250\text{mA}$
Total Gate Charge ( $V_{GS} = 10\text{V}$ )	$Q_g$	—	0.6	—		
Gate-Source Charge	$Q_{gs}$	—	0.1	—		
Gate-Drain Charge	$Q_{gd}$	—	0.1	—		
Turn-On Delay Time	$t_{D(on)}$	—	4.1	—	ns	$V_{DD} = 30\text{V}, I_D = 0.2\text{A},$ $R_L = 150\Omega, V_{GEN} = 10\text{V},$ $R_{GEN} = 25\Omega$
Turn-On Rise Time	$t_R$	—	10	—		
Turn-Off Delay Time	$t_{D(off)}$	—	27	—		
Turn-Off Fall Time	$t_F$	—	19	—		
Reverse-Recovery Time	$t_{RR}$	—	19.7	—	ns	$I_F = 1\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse-Recovery Charge	$Q_{RR}$	—	8.1	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to product testing.

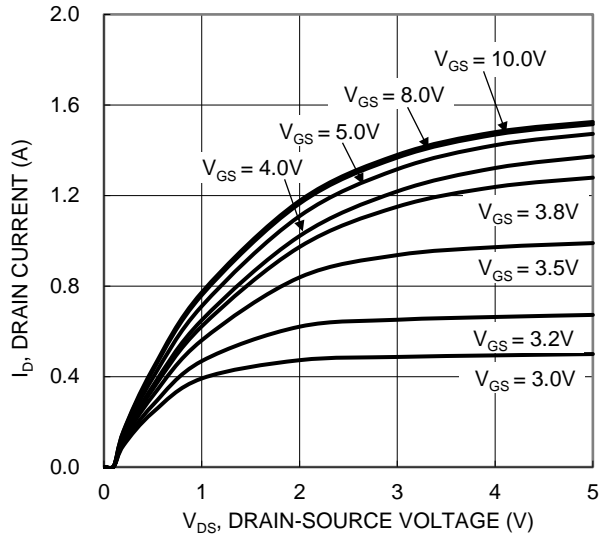


Figure 1. Typical Output Characteristic

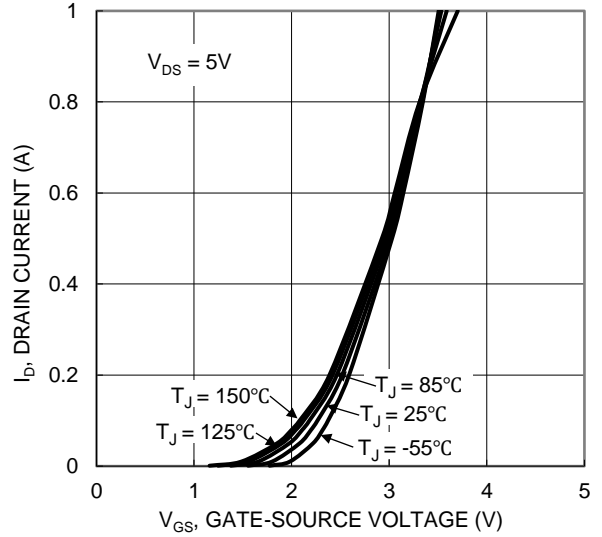


Figure 2. Typical Transfer Characteristic

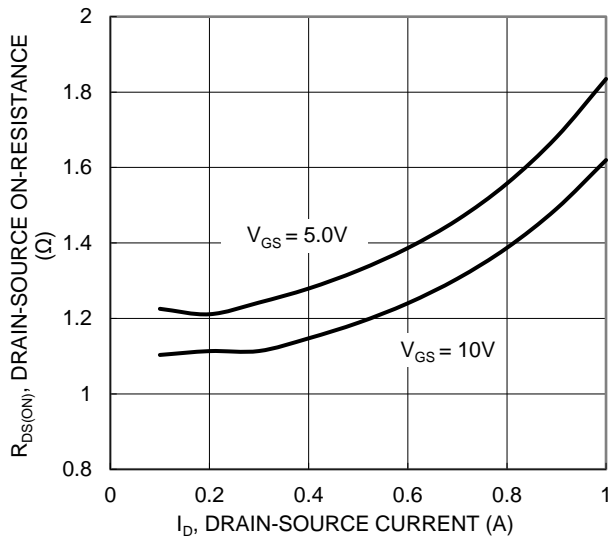


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

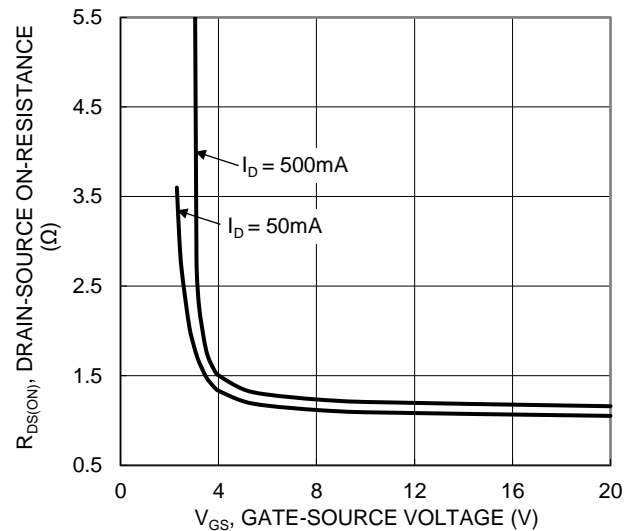


Figure 4. Typical Transfer Characteristic

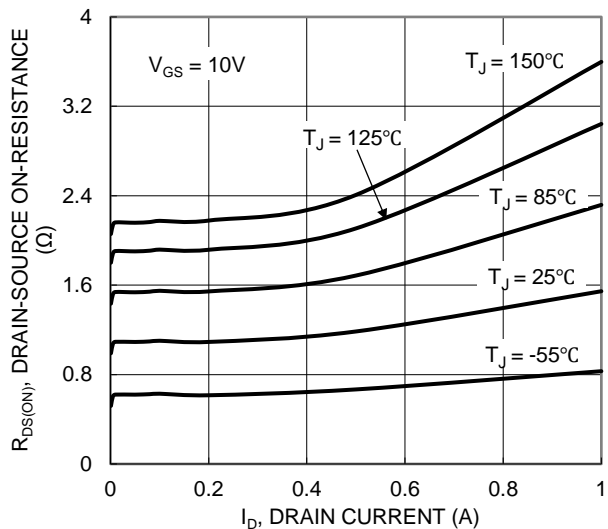


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

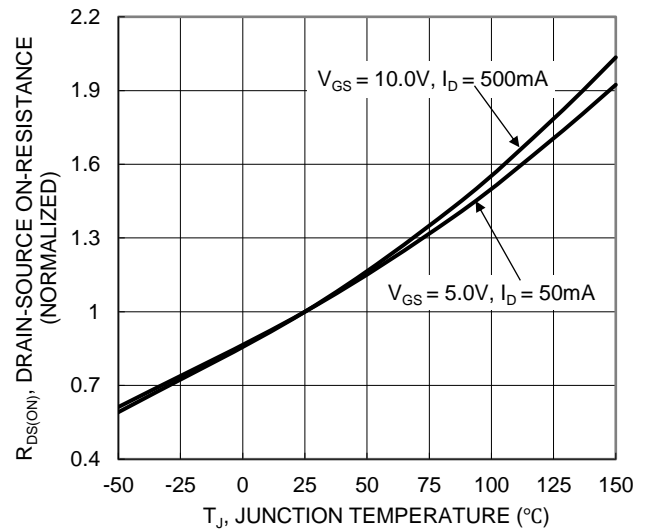


Figure 6. On-Resistance Variation with Temperature

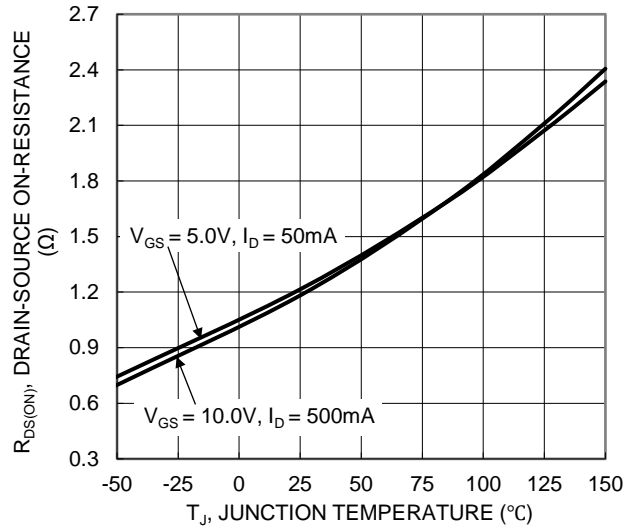


Figure 7. On-Resistance Variation with Temperature

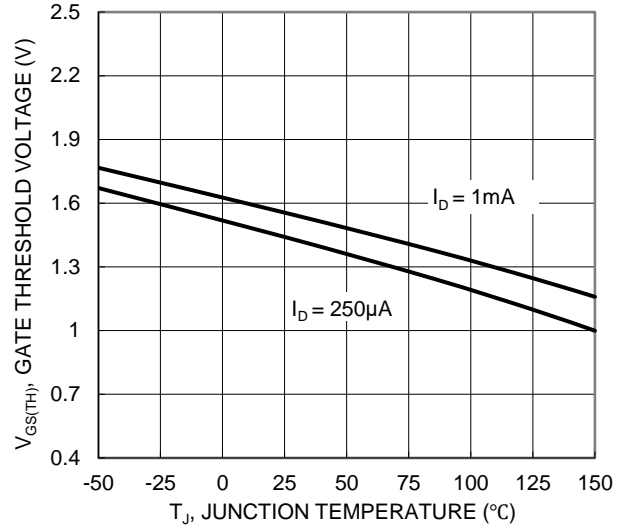


Figure 8. Gate Threshold Variation vs. Junction Temperature

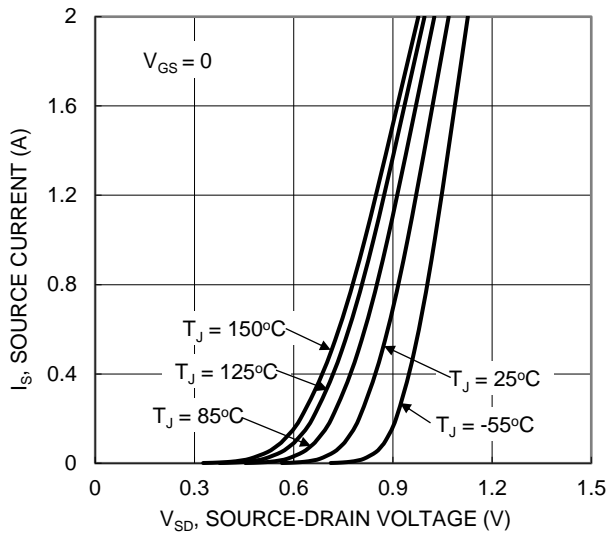


Figure 9. Diode Forward Voltage vs. Current

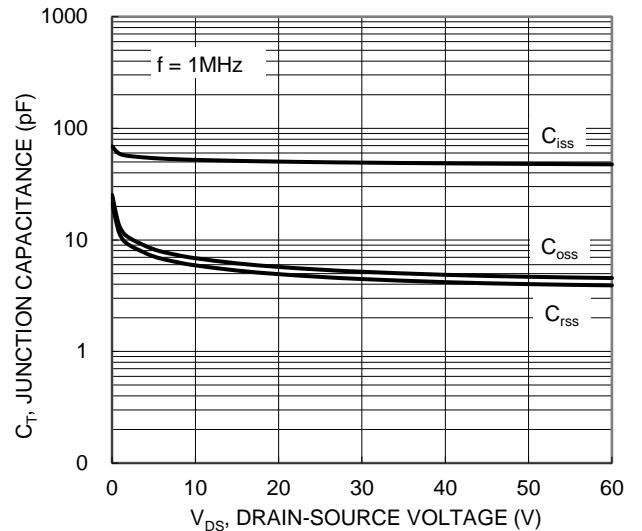


Figure 10. Typical Junction Capacitance

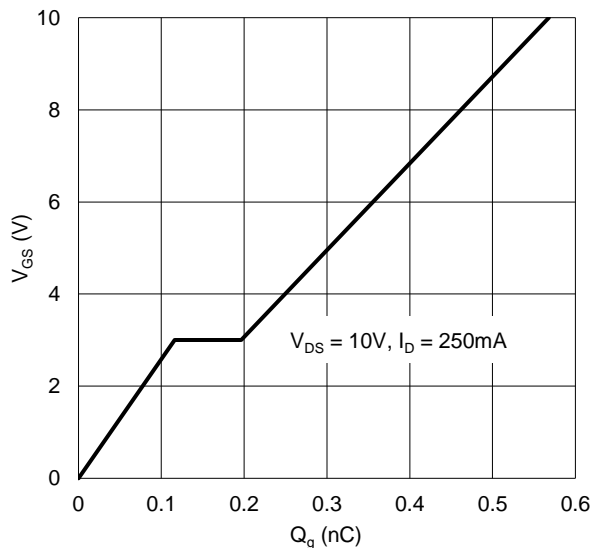


Figure 11. Gate Charge

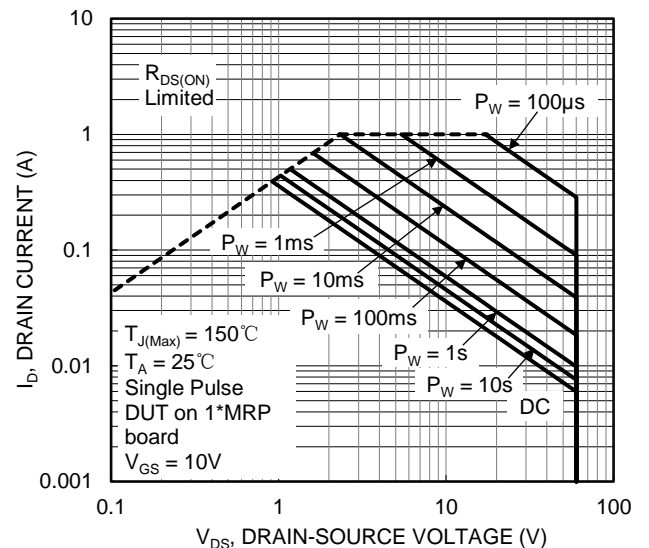


Figure 12. SOA, Safe Operation Area

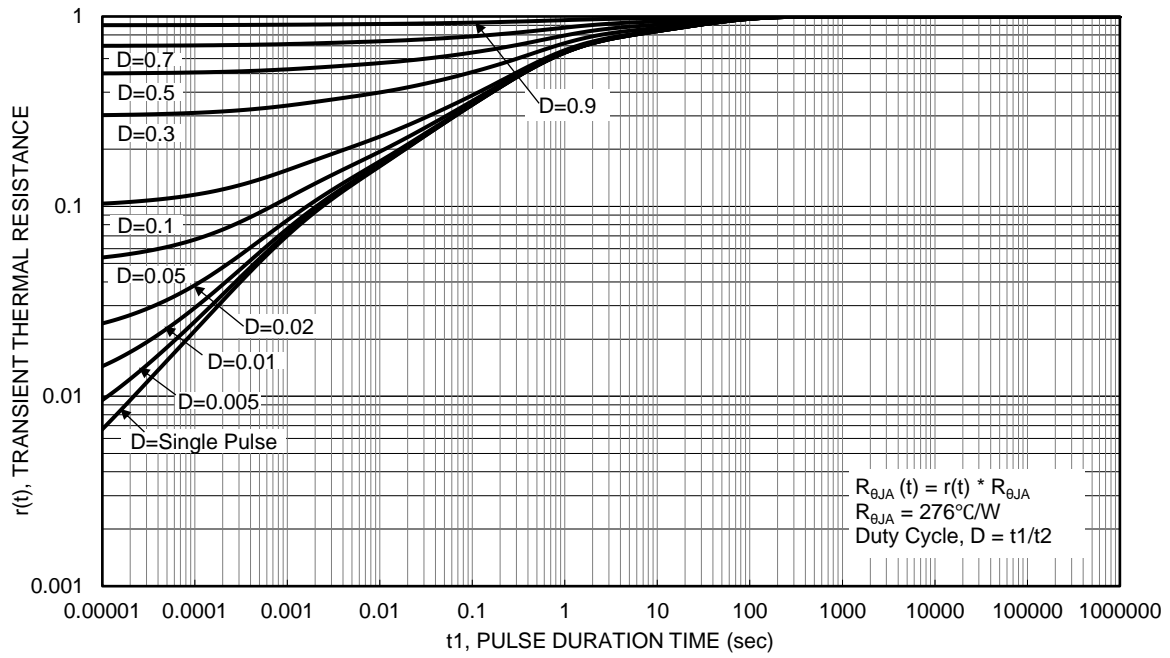
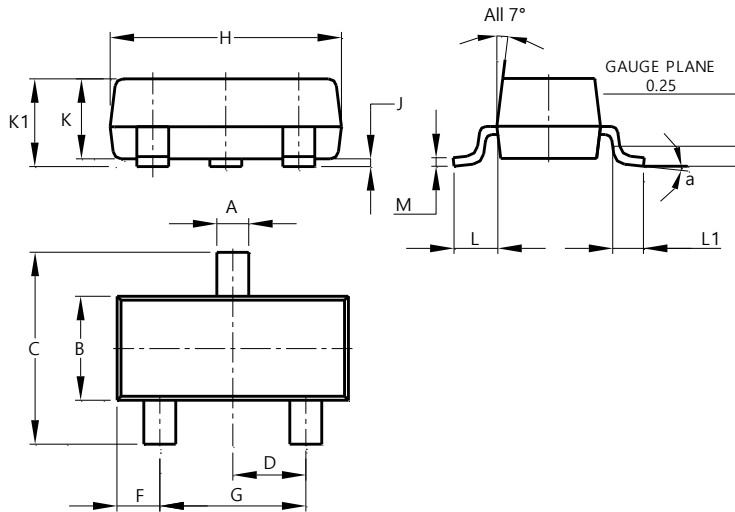


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

### SOT23

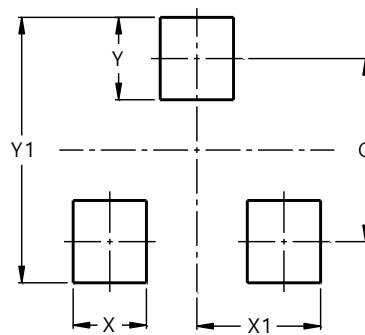


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

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

### SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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