



**THE DATASHEET OF  
DMN60H080DS-13**



## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	Package	I <sub>D</sub> T <sub>A</sub> = +25°C
600V	100Ω @ V <sub>GS</sub> = 10V	SOT23	80mA

## Description

This new generation uses advanced planar technology MOSFET, provides excellent high voltage and fast switching, making it ideal for small-signal and level shift applications.

## Applications

- Motor controls
- Backlighting
- DC-DC converters
- Power-management functions



SOT23



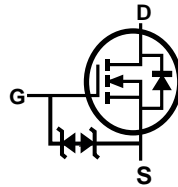
Top View

## Features

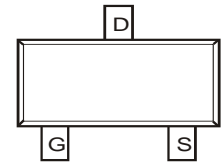
- Low Input Capacitance
- High BV<sub>DSS</sub> Rating for Power Application
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

## 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 Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)



Equivalent Circuit

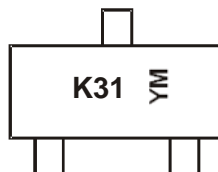

 Top View  
Pin Configuration

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN60H080DS-7	SOT23	3000	Tape & Reel
DMN60H080DS-13	SOT23	10000	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



K31 = Product Type Marking Code  
 YM or YM = Date Code Marking  
 Y or Y = Year (ex: L = 2024)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2017	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	E	-	L	M	N	P	R	S	T	U	V	W

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	600	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	70	mA
		T <sub>A</sub> = +70°C		56	
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	80	mA
		T <sub>A</sub> = +70°C		70	
Continuous Drain Current (Note 5) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	40	mA
		T <sub>A</sub> = +70°C		32	
Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	50	mA
		T <sub>A</sub> = +70°C		40	
Pulsed Drain Current @ T <sub>SP</sub> = +25°C (Note 7)			I <sub>DM</sub>	0.2	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation @T <sub>A</sub> = +25°C (Note 5)	P <sub>D</sub>	0.70	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 5)	R <sub>θJA</sub>	174	°C/W
Power Dissipation, @T <sub>A</sub> = +25°C (Note 6)	P <sub>D</sub>	1.10	W
Thermal Resistance, Junction to Ambient @T <sub>A</sub> = +25°C (Note 6)	R <sub>θJA</sub>	99	°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 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.5	—	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
		1.5	—	2.6	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 8μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	67	100	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 60mA
		—	95	290		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 60mA
Forward Transfer Admittance	Y <sub>fs</sub>	—	76	—	ms	V <sub>DS</sub> = 10V, I <sub>D</sub> = 60mA
Diode Forward Voltage	V <sub>SD</sub>	—	—	1.5	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 50mA
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	25	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	5.2	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	1.4	—		
Total Gate Charge	Q <sub>g</sub>	—	1.7	—	nC	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 300V I <sub>D</sub> = 0.01A
Gate-Source Charge	Q <sub>gs</sub>	—	0.3	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	0.9	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	7	—	ns	V <sub>DD</sub> = 300V, V <sub>GS</sub> = 10V R <sub>GEN</sub> = 3.3Ω I <sub>D</sub> = 60mA
Turn-On Rise Time	t <sub>r</sub>	—	10	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	21	—		
Turn-Off Fall Time	t <sub>f</sub>	—	158	—		
Reverse Recovery Time	t <sub>RR</sub>	—	189.1	—		
Reverse Recovery Charge	Q <sub>RR</sub>	—	32	—	nC	V <sub>R</sub> = 300V, I <sub>F</sub> = 0.06A di/dt = 100A/μs

- Notes:
- Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
  - Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. copper, single sided.
  - Repetitive rating, pulse width limited by junction temperature, 10μs pulse, duty cycle = 1%.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

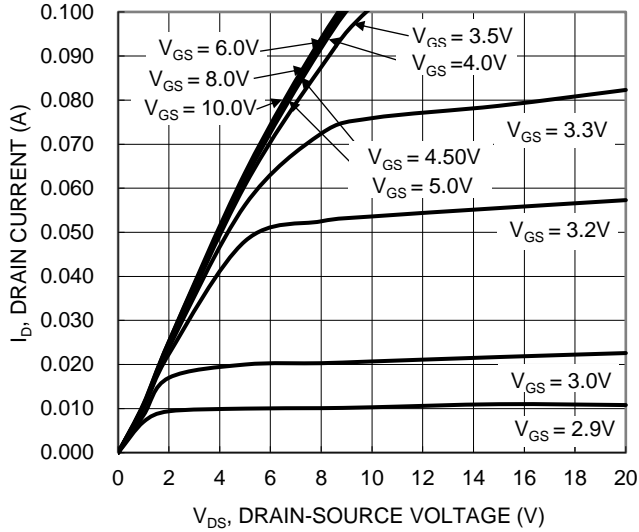


Figure 1. Typical Output Characteristic

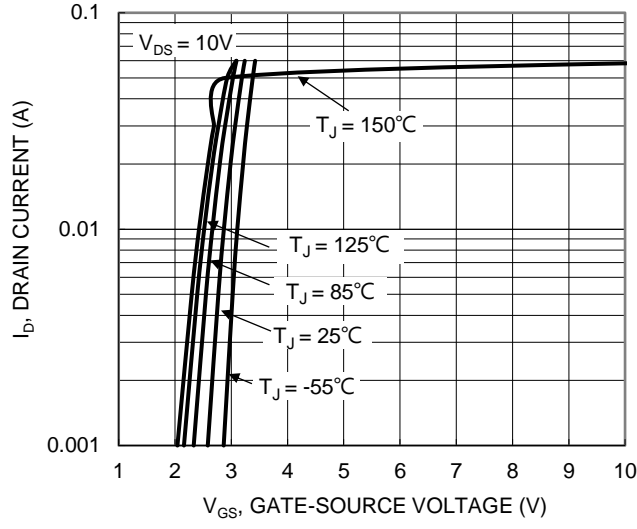


Figure 2. Typical Transfer Characteristic

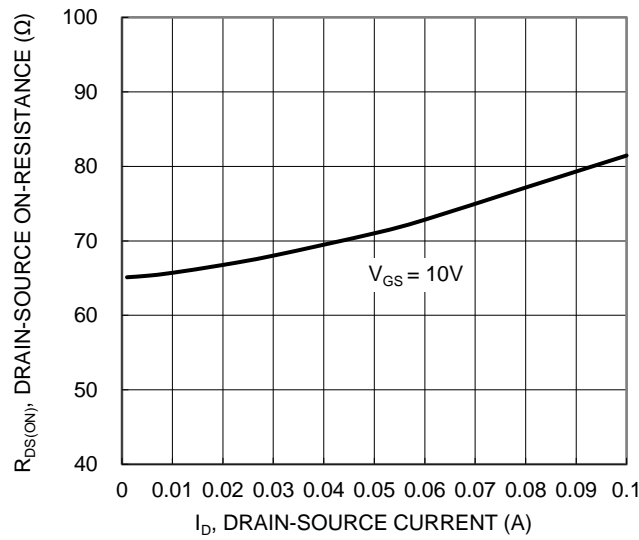


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

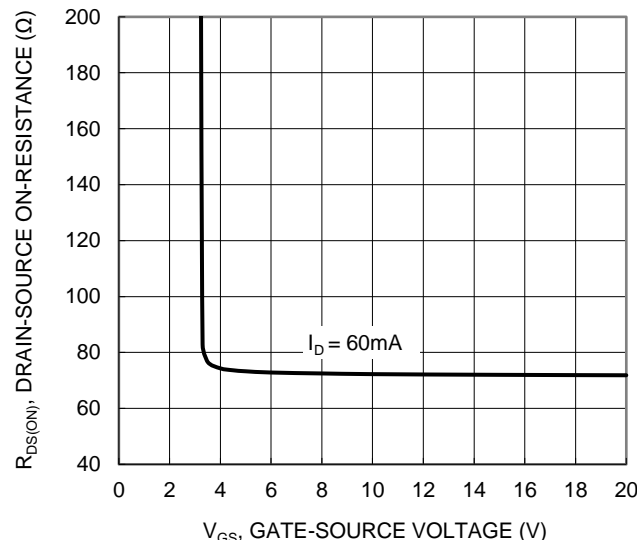


Figure 4. Typical Transfer Characteristic

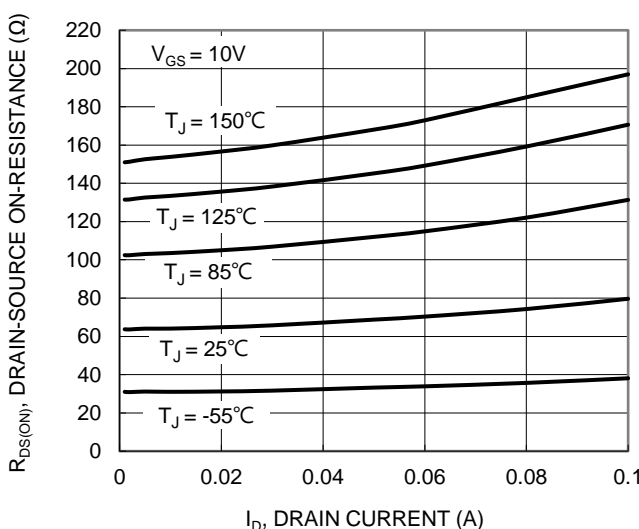


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

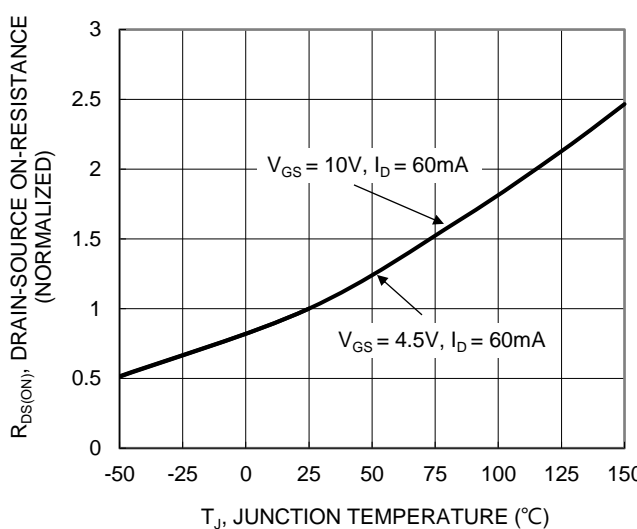


Figure 6. On-Resistance Variation with Temperature

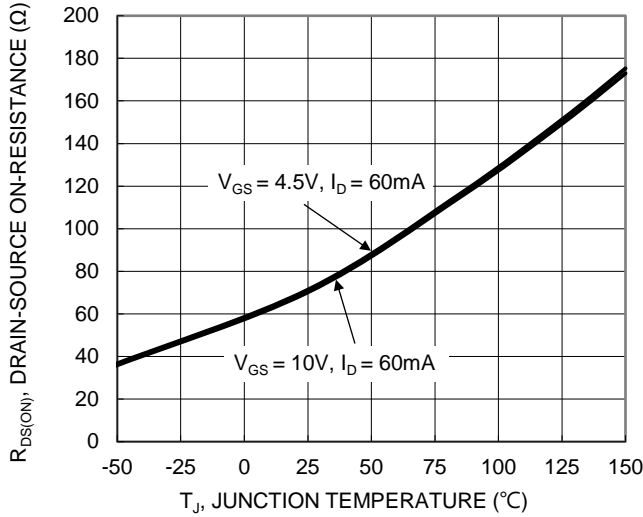


Figure 7. On-Resistance Variation with Temperature

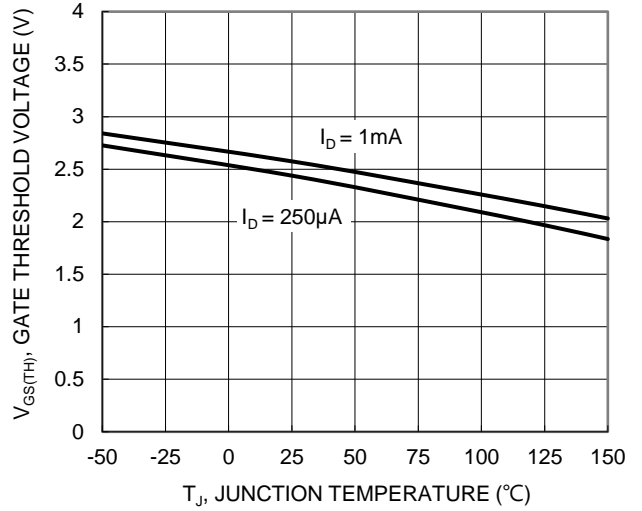


Figure 8. Gate Threshold Variation vs. Junction Temperature

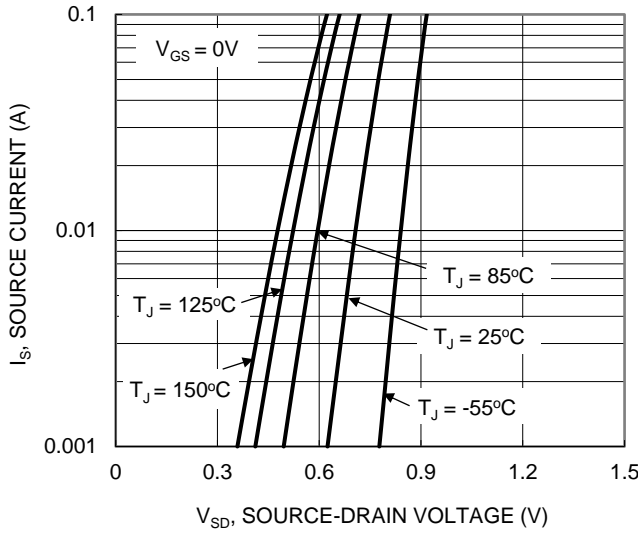


Figure 9. Diode Forward Voltage vs. Current

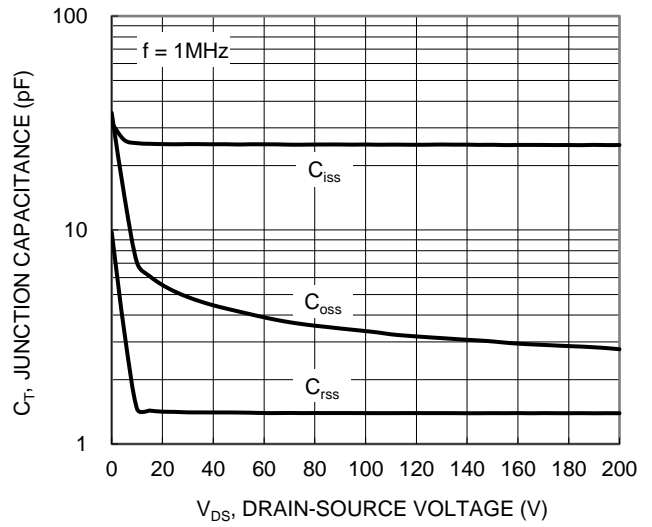


Figure 10. Typical Junction Capacitance

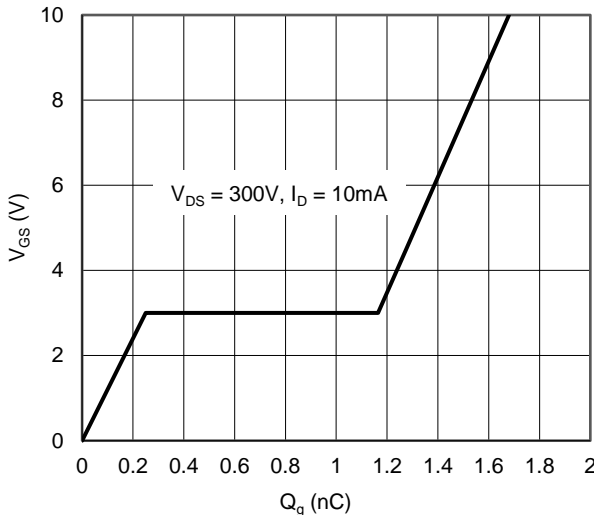


Figure 11. Gate Charge

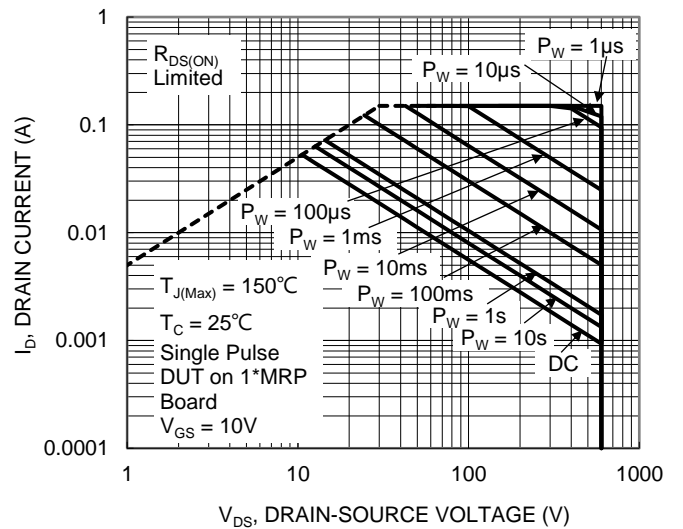


Figure 12. SOA, Safe Operation Area

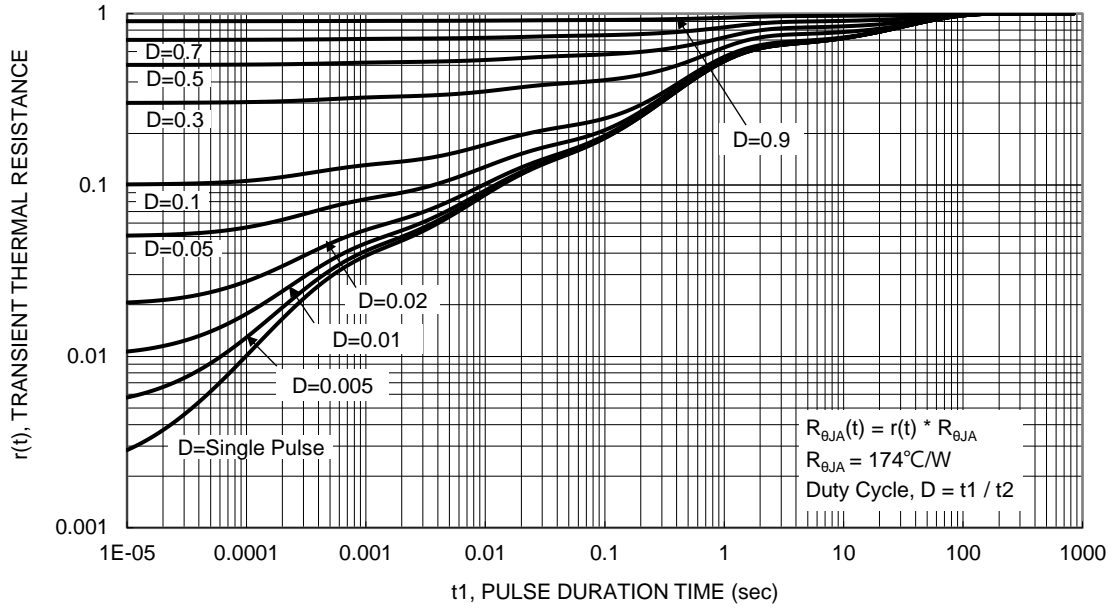
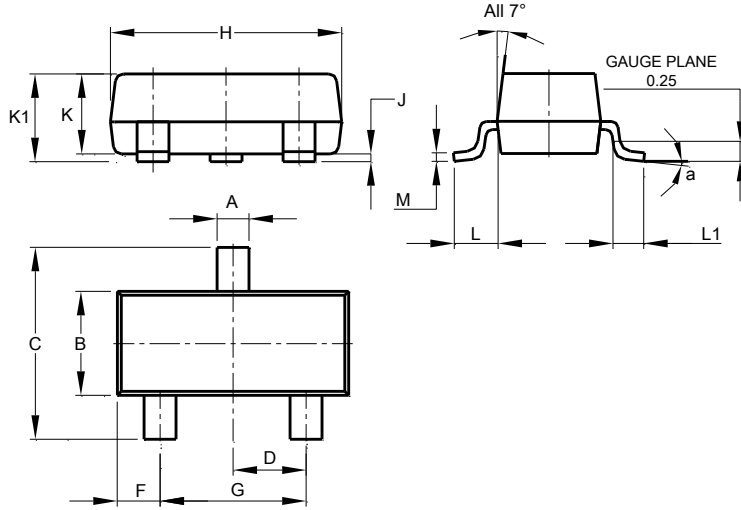


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**SOT23**

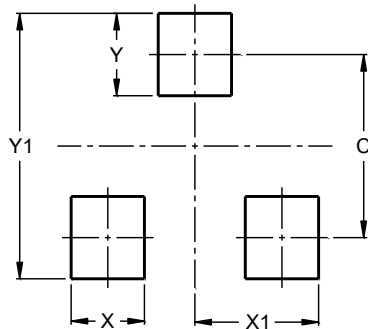


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

**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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