

## Product Summary

<b>BV<sub>DSS</sub></b>	<b>R<sub>DSON</sub> max</b>	<b>I<sub>D</sub> max</b> <b>T<sub>A</sub> = +25°C</b>
<b>-20V</b>	80mΩ @ V <sub>GS</sub> = -4.5V	-3.5A
	110mΩ @ V <sub>GS</sub> = -2.5V	-3.0A

## Description

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

## Applications

- Backlighting
- Power Management Functions
- DC-DC Converters
- Motor Control

## Features

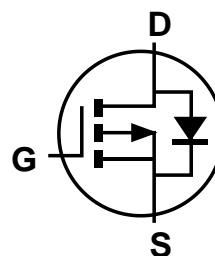
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)

## Mechanical Data

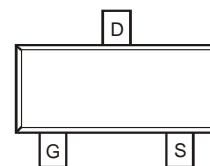
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (E3)
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)



Top View



Internal Schematic


 Top View  
 Pin Configuration

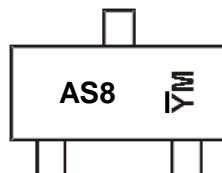
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2110U-7	SOT23	3,000/Tape & Reel
DMP2110U-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



AS8 = Product Type Marking Code

YM = Date Code Marking

Y or Y = Last Digit of Year (ex: F = 2018)

M = Month (ex: 9 = September)

### Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025			
Code	E	F	G	H	I	J	K	L	M			
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			$V_{DSS}$	-20	V
Gate-Source Voltage			$V_{GSS}$	$\pm 10$	V
Continuous Drain Current (Note 6) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-3.5 -2.8	A
Continuous Drain Current (Note 6) $V_{GS} = -2.5\text{V}$	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	-3.0 -2.4	A
Maximum Continuous Body Diode Forward Current (Note 6)			$I_S$	-1.5	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)			$I_{DM}$	-15	A

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

Characteristic			Symbol	Value	Unit
Total Power Dissipation (Note 5)			$P_D$	0.8	W
Thermal Resistance, Junction to Ambient (Note 5)			$R_{\theta JA}$	158	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)			$P_D$	1.2	W
Thermal Resistance, Junction to Ambient (Note 6)			$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range			$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**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	$BV_{DSS}$	-20	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{DSS}$	—	—	-1.0	$\mu\text{A}$	$V_{DS} = -16\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 8\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.45	—	-1.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	55	80	$\text{m}\Omega$	$V_{GS} = -4.5\text{V}, I_D = -2.8\text{A}$
			67	110		$V_{GS} = -2.5\text{V}, I_D = -2.0\text{A}$
Diode Forward Voltage	$V_{SD}$	—	-0.7	-1.0	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{iss}$	—	443	—	pF	$V_{DS} = -10\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	59	—	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	47	—	pF	
Gate Resistance	$R_G$	—	8.5	—	$\Omega$	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge	$Q_g$	—	6.0	—	nC	$V_{GS} = -4.5\text{V}, V_{DS} = -10\text{V}, I_D = -3\text{A}$
Gate-Source Charge	$Q_{gs}$	—	0.6	—	nC	
Gate-Drain Charge	$Q_{gd}$	—	1.8	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	4.0	—	ns	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V},$ $R_L = 10\Omega, R_G = 1.0\Omega, I_D = -1\text{A}$
Turn-On Rise Time	$t_R$	—	3.7	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	24.5	—	ns	
Turn-Off Fall Time	$t_F$	—	9.5	—	ns	
Reverse Recovery Time	$t_{RR}$	—	8.3	—	ns	$I_F = -1.0\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	2.0	—	nC	$I_F = -1.0\text{A}, di/dt = 100\text{A}/\mu\text{s}$

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

7. Short duration pulse test used to minimize self-heating effect.

8. Guaranteed by design. Not subject to product testing.

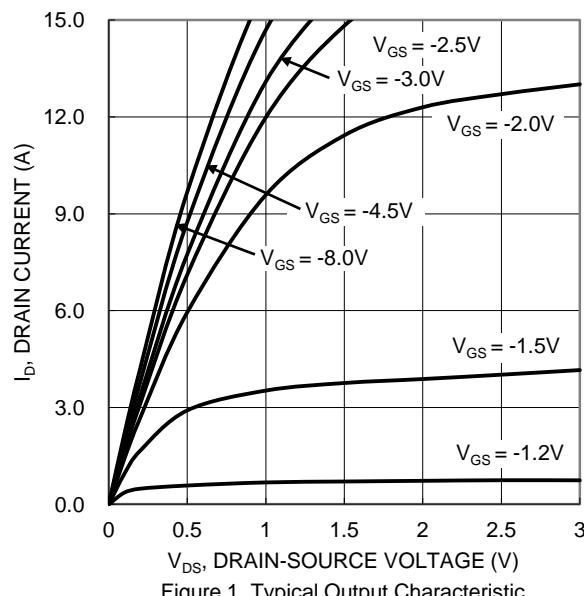


Figure 1. Typical Output Characteristic

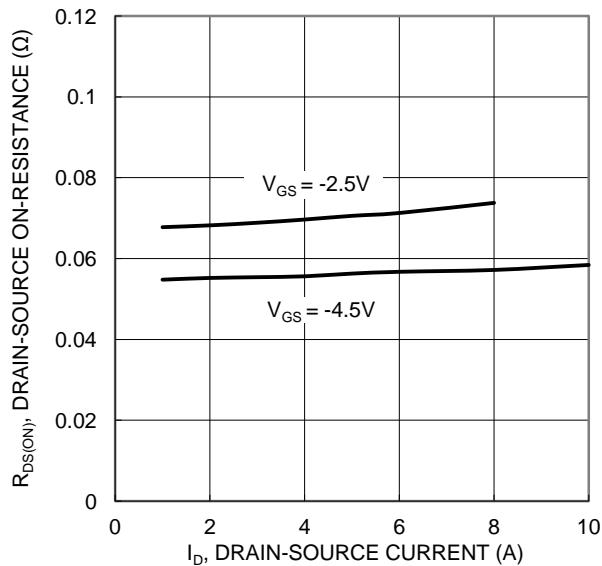


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

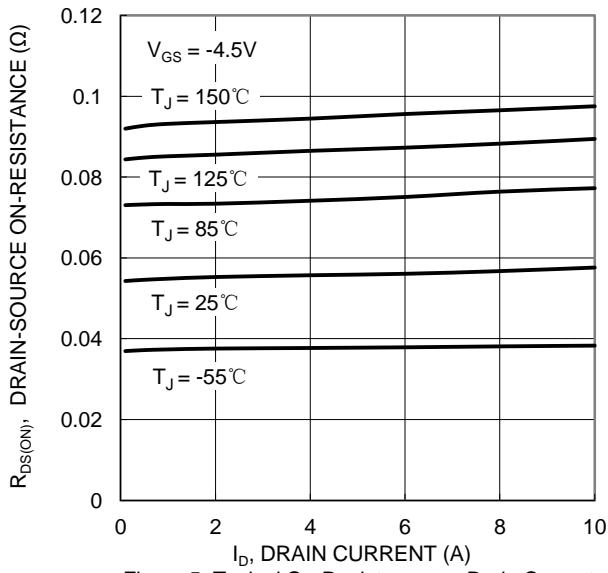


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

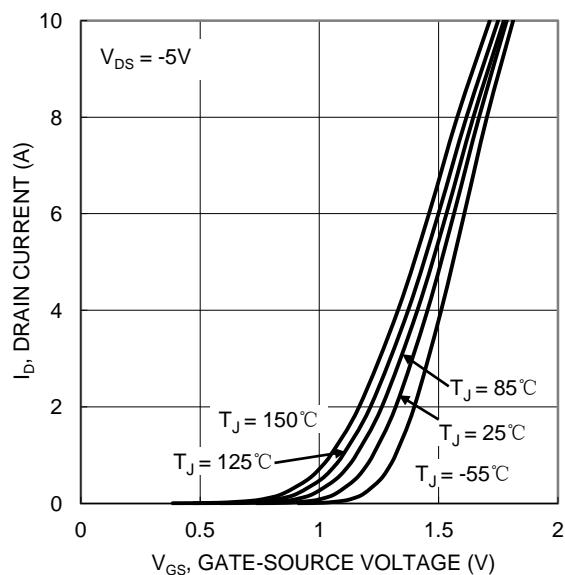


Figure 2. Typical Transfer Characteristic

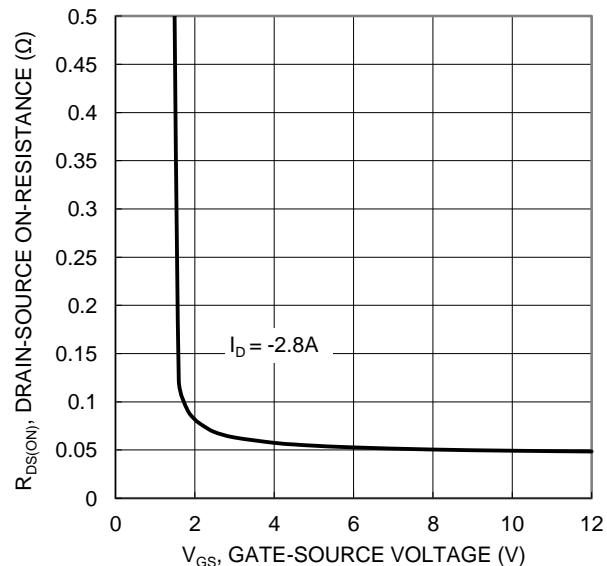


Figure 4. Typical Transfer Characteristic

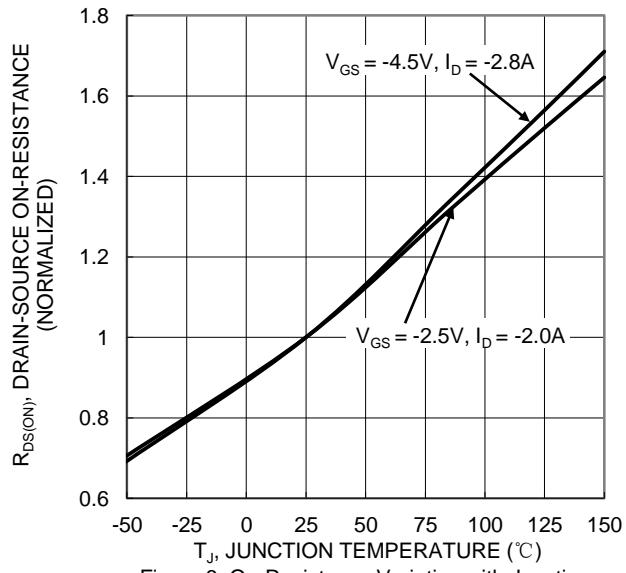


Figure 6. On-Resistance Variation with Junction Temperature

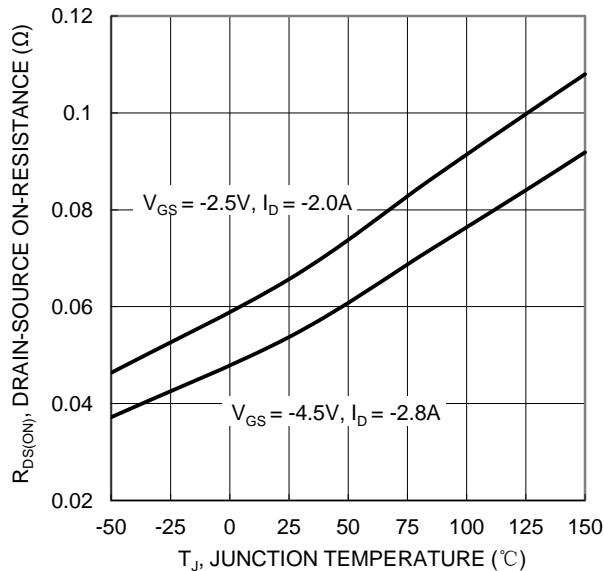


Figure 7. On-Resistance Variation with Junction Temperature

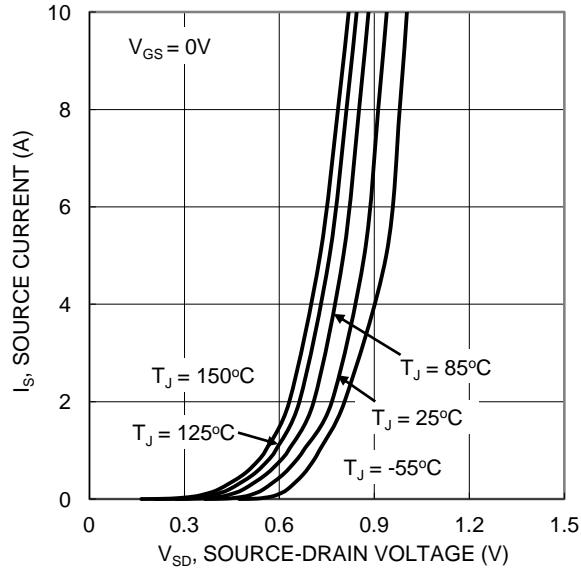


Figure 9. Diode Forward Voltage vs. Current

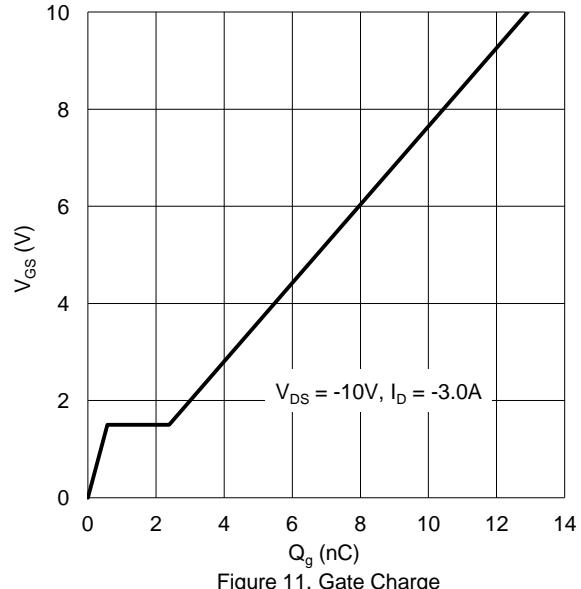


Figure 11. Gate Charge

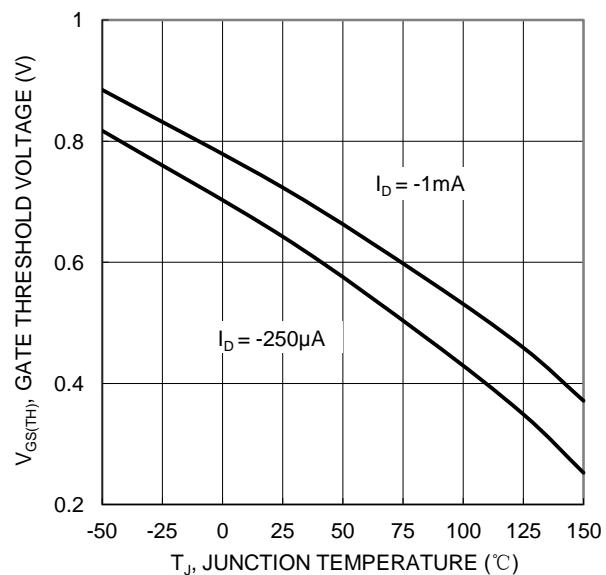


Figure 8. Gate Threshold Variation vs. Junction Temperature

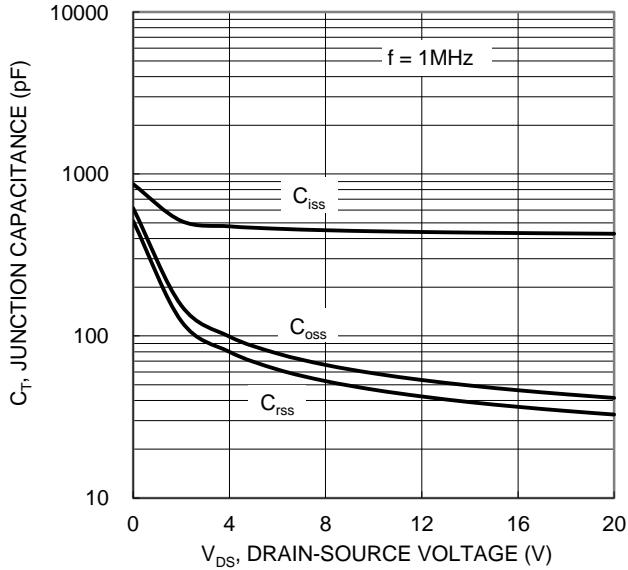


Figure 10. Typical Junction Capacitance

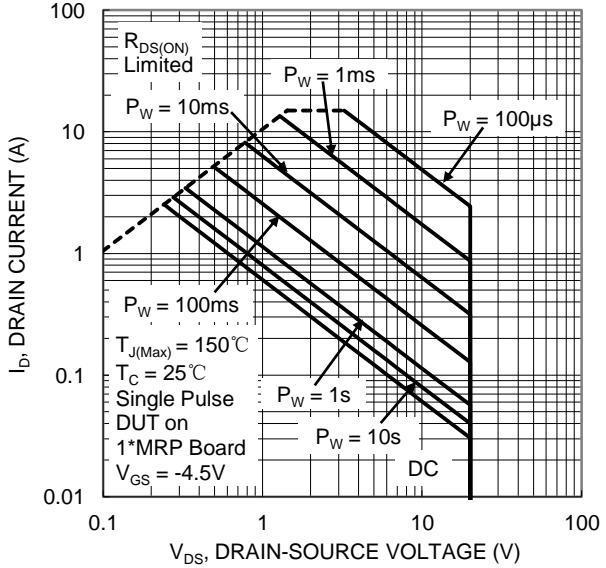


Figure 12. SOA, Safe Operation Area

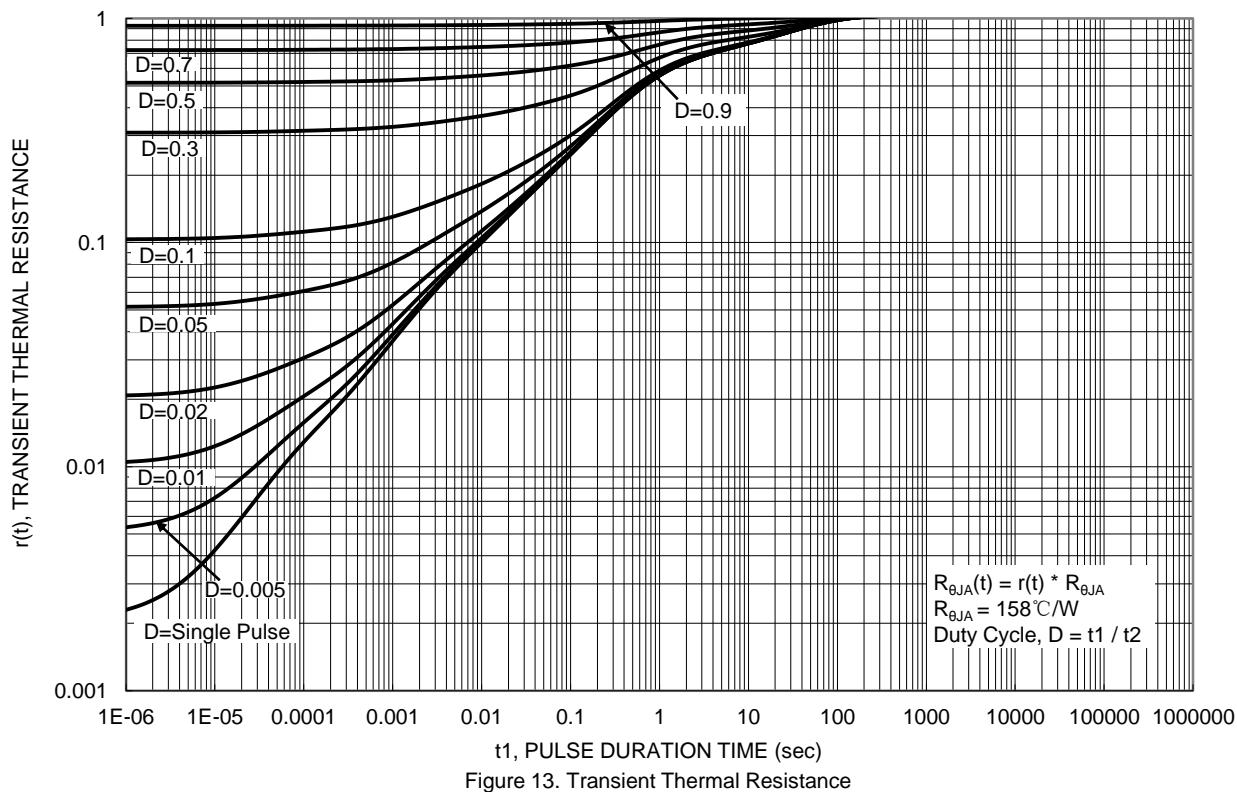
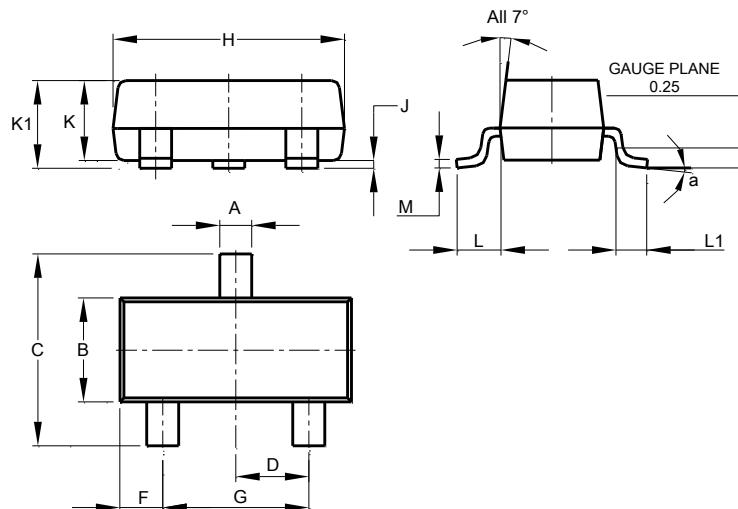


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

**SOT23**



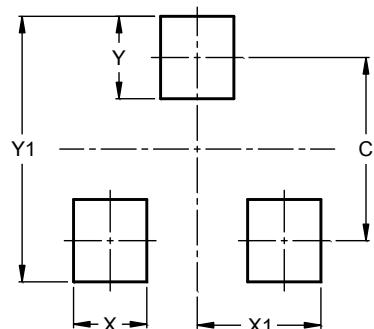
<b>SOT23</b>			
<b>Dim</b>	<b>Min</b>	<b>Max</b>	<b>Typ</b>
<b>A</b>	0.37	0.51	0.40
<b>B</b>	1.20	1.40	1.30
<b>C</b>	2.30	2.50	2.40
<b>D</b>	0.89	1.03	0.915
<b>F</b>	0.45	0.60	0.535
<b>G</b>	1.78	2.05	1.83
<b>H</b>	2.80	3.00	2.90
<b>J</b>	0.013	0.10	0.05
<b>K</b>	0.890	1.00	0.975
<b>K1</b>	0.903	1.10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

All Dimensions in mm

## Suggested Pad Layout

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

**SOT23**



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

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