

## Product Summary

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = +25^\circ C$
-20V	750m $\Omega$ @ $V_{GS} = -4.5V$	-0.6A
	1050m $\Omega$ @ $V_{GS} = -2.5V$	-0.5A
	1500m $\Omega$ @ $V_{GS} = -1.8V$	-0.45A

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The DMP2900UWQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

## Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP.

- DC-DC converters
- Load switches
- Power-management functions

## Mechanical Data

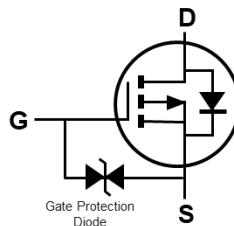
- Package: SOT323
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Terminals: Finish—Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 **e3**
- Weight: 0.006 grams (Approximate)



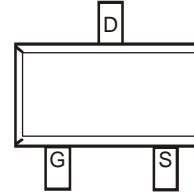
SOT323



Top View



Equivalent Circuit



Top View

## Ordering Information (Note 4)

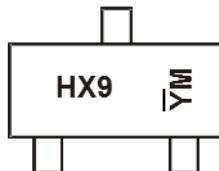
Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMP2900UWQ-7	SOT323	3,000	Tape & Reel
DMP2900UWQ-13	SOT323	10,000	Tape & Reel

Notes:

- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 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.
- Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

SOT323



HX9 = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: M = 2025)

M = Month (ex: 9 = September)

Date Code Key

Year	2022	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	J	-	M	N	P	R	S	T	U	V	W	X
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	$V_{GSS}$	$\pm 6$	V
Continuous Drain Current (Note 5) $V_{GS} = 4.5\text{V}$	$I_D$	-0.6 -0.5	A
Maximum Body Diode Forward Current (Note 5)	$I_S$	-0.45	A
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	-2.5	A

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	$P_D$	0.3	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	393	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)	$P_D$	0.5	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	272	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 5. Device mounted on FR-4 substrate PCB, 2oz copper, with 1inch square copper plate.  
 6. Device mounted on FR-4 substrate PCB, 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	$\text{BV}_{\text{DSS}}$	-20	—	—	V	$V_{\text{GS}} = 0\text{V}$ , $I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$	$I_{\text{DSS}}$	—	—	-100	nA	$V_{\text{DS}} = -20\text{V}$ , $V_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	$I_{\text{GSS}}$	—	—	$\pm 2.0$	$\mu\text{A}$	$V_{\text{GS}} = \pm 4.5\text{V}$ , $V_{\text{DS}} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	$V_{\text{GS(TH)}}$	-0.5	—	-1.0	V	$V_{\text{DS}} = V_{\text{GS}}$ , $I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{\text{DS(ON)}}$	—	—	0.75	$\Omega$	$V_{\text{GS}} = -4.5\text{V}$ , $I_D = -430\text{mA}$
		—	—	1.05		$V_{\text{GS}} = -2.5\text{V}$ , $I_D = -300\text{mA}$
		—	—	1.5		$V_{\text{GS}} = -1.8\text{V}$ , $I_D = -150\text{mA}$
Diode Forward Voltage	$V_{\text{SD}}$	—	—	-1.2	V	$V_{\text{GS}} = 0\text{V}$ , $I_S = -150\text{mA}$
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	$C_{\text{iss}}$	—	49	—	pF	$V_{\text{DS}} = -16\text{V}$ , $V_{\text{GS}} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{\text{oss}}$	—	12	—	pF	
Reverse Transfer Capacitance	$C_{\text{rss}}$	—	3.4	—	pF	
Total Gate Charge	$Q_g$	—	0.7	—	nC	$V_{\text{GS}} = -4.5\text{V}$ , $V_{\text{DS}} = -10\text{V}$ $I_D = -250\text{mA}$
Gate-Source Charge	$Q_{\text{gs}}$	—	0.1	—	nC	
Gate-Drain Charge	$Q_{\text{gd}}$	—	0.1	—	nC	
Turn-On Delay Time	$t_{\text{D(on)}}$	—	16	—	ns	$V_{\text{DD}} = -10\text{V}$ , $V_{\text{GS}} = -4.5\text{V}$ $R_L = 47\Omega$ , $R_G = 10\Omega$ $I_D = -200\text{mA}$
Turn-On Rise Time	$t_r$	—	15	—	ns	
Turn-Off Delay Time	$t_{\text{D(off)}}$	—	213	—	ns	
Turn-Off Fall Time	$t_f$	—	89	—	ns	$I_f = 1.0\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$
Reverse-Recovery Time	$t_{\text{RR}}$	—	10.5	—	ns	
Reverse-Recovery Charge	$Q_{\text{RR}}$	—	1.8	—	nC	

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

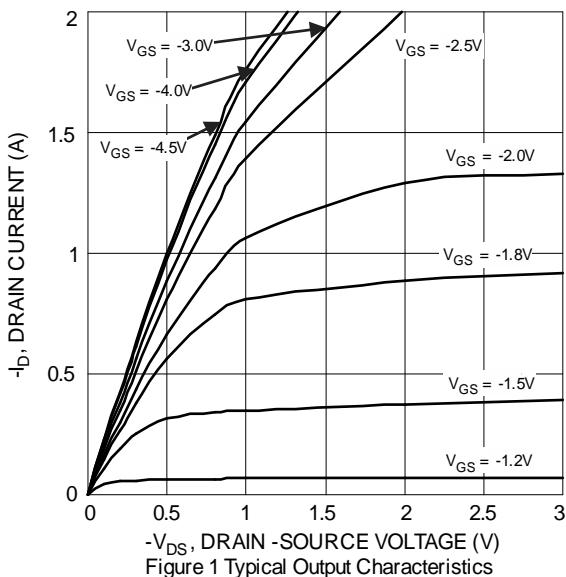


Figure 1 Typical Output Characteristics

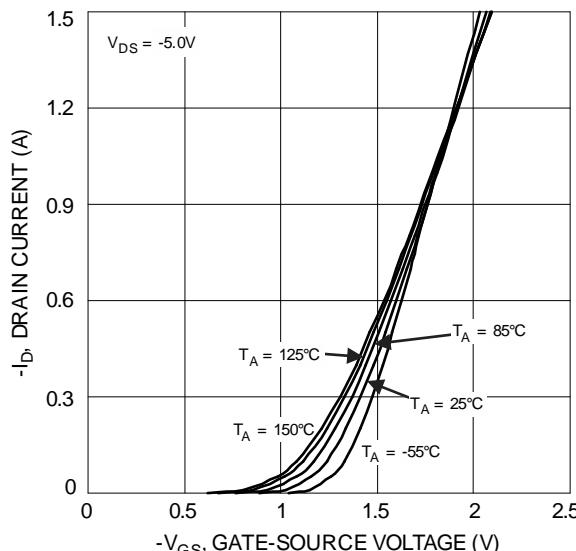


Figure 2 Typical Transfer Characteristics

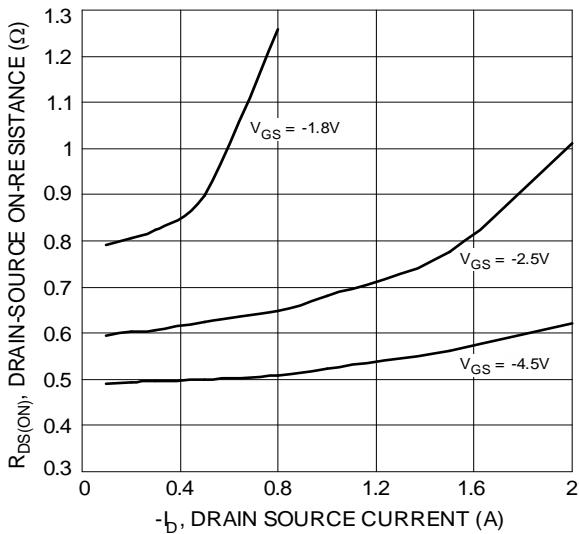


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

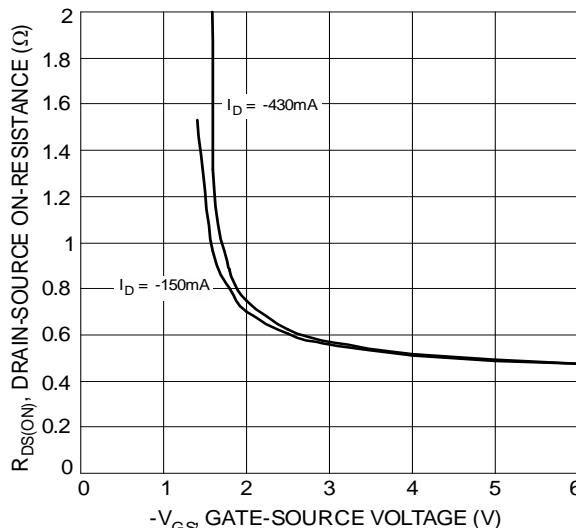


Figure 4 Typical Drain-Source On-Resistance  
vs. Gate-Source Voltage

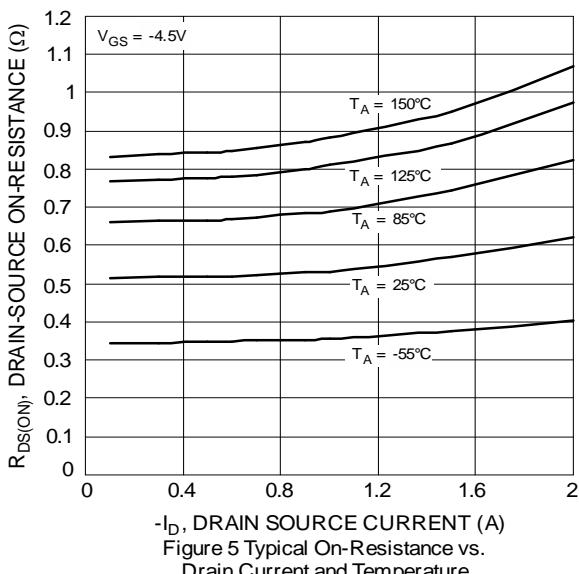


Figure 5 Typical On-Resistance vs.  
Drain Current and Temperature

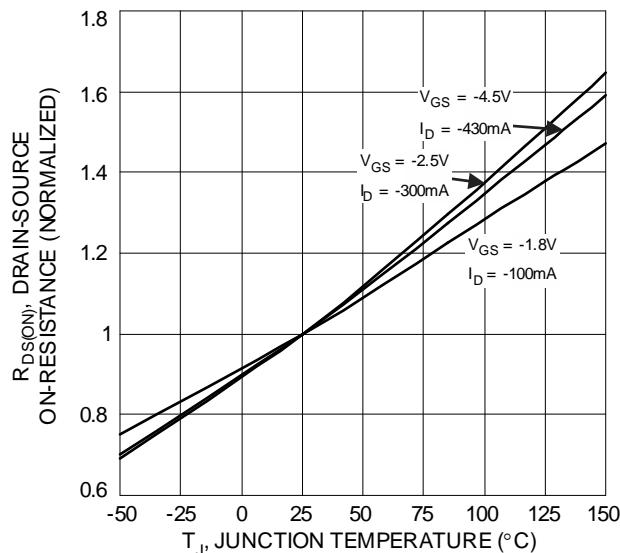
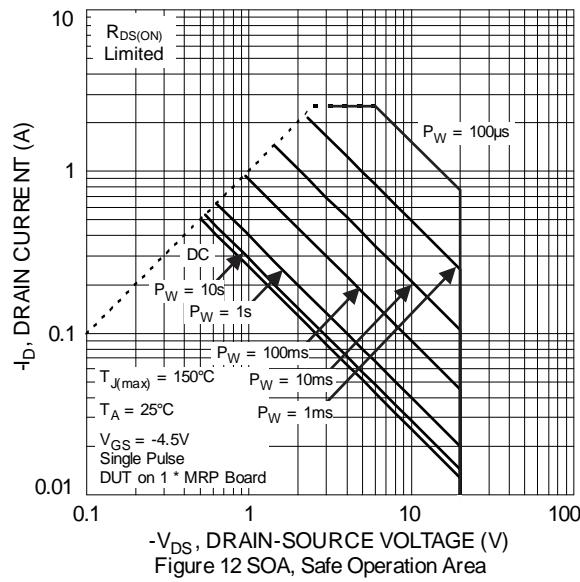
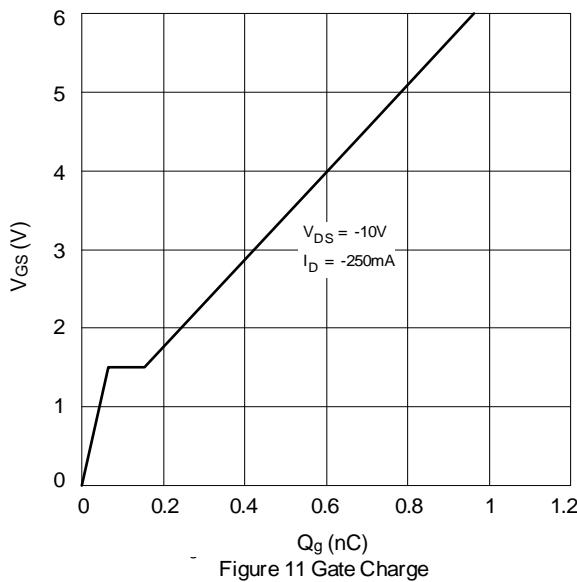
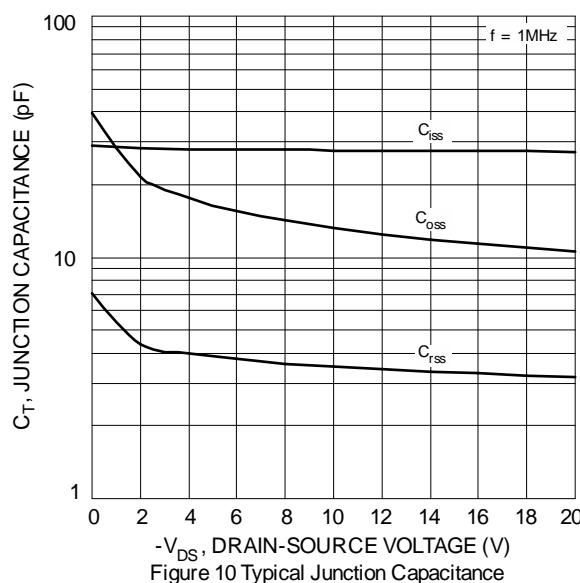
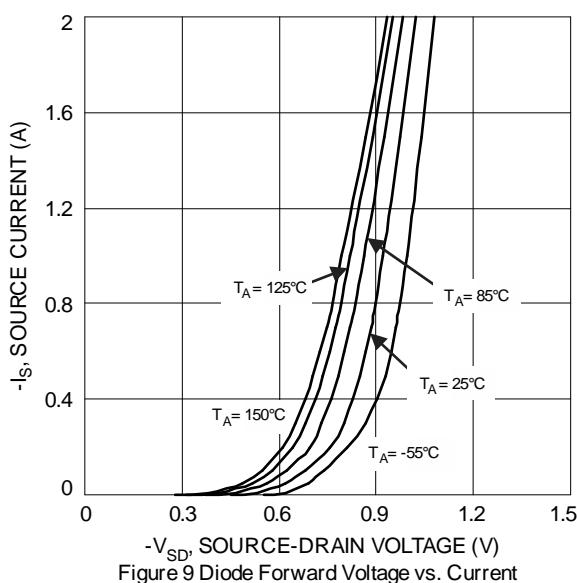
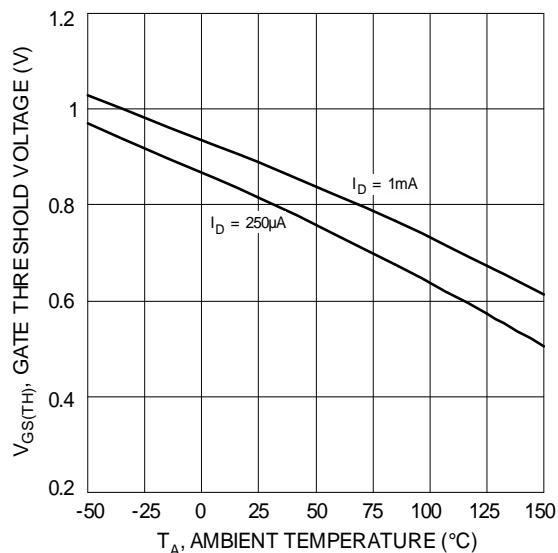
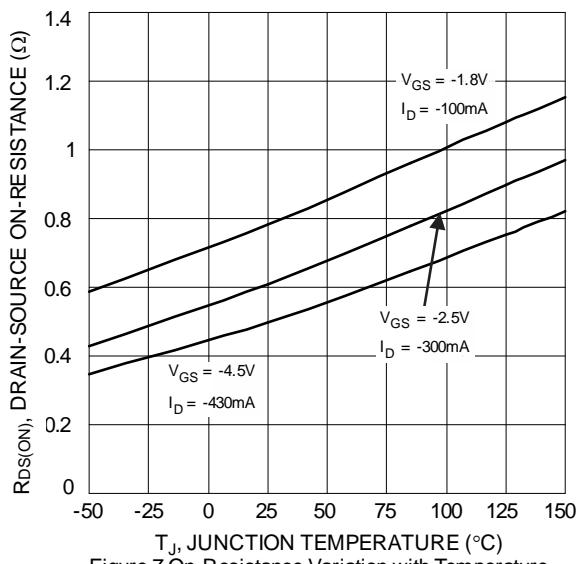


Figure 6 On-Resistance Variation with Temperature



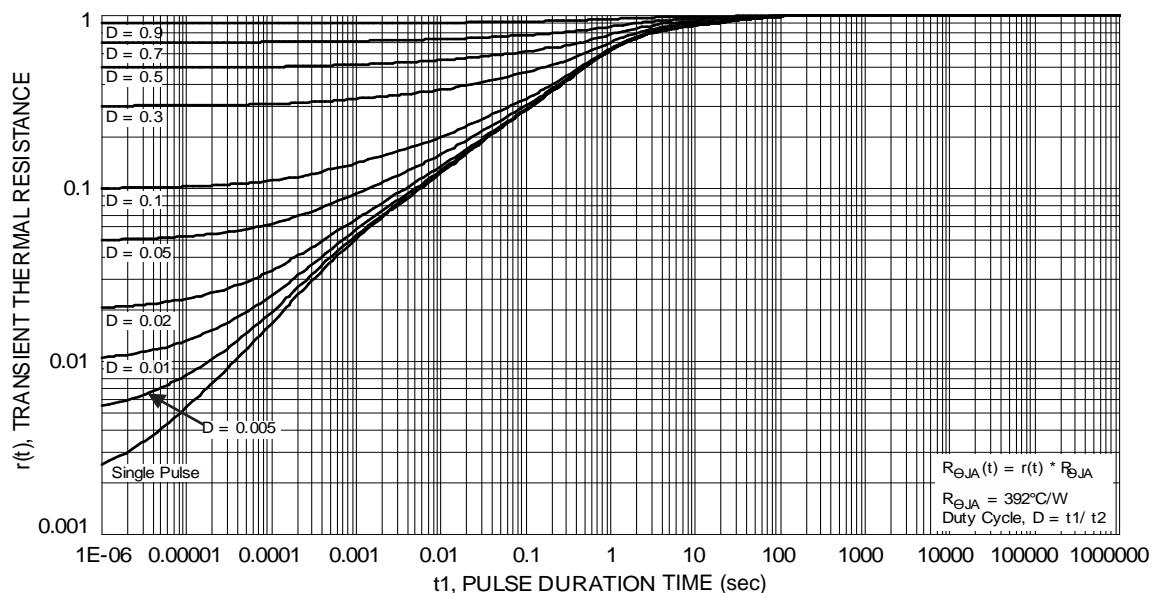
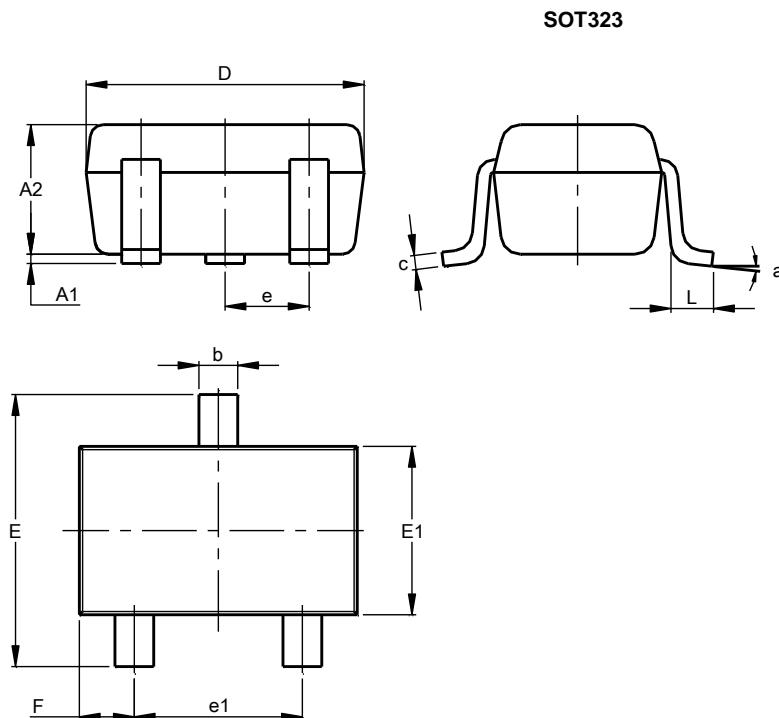


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

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

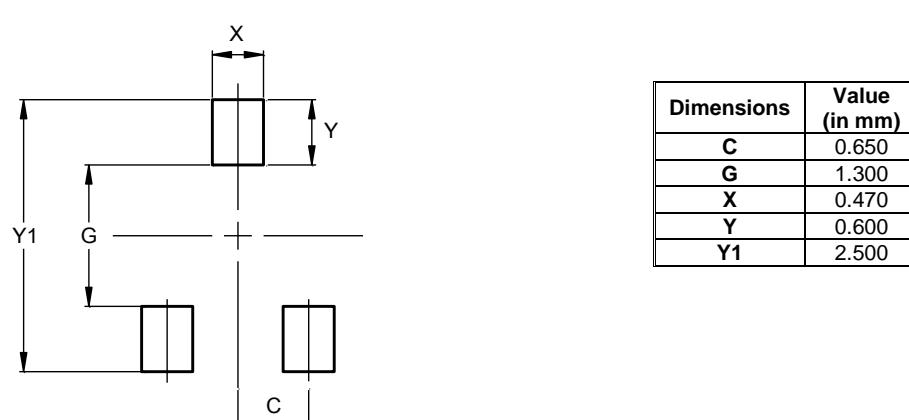


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--

All Dimensions in mm

## Suggested Pad Layout

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



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