

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
-20V	700mΩ @ V _{GS} = -4.5V	-0.5A
	900mΩ @ V _{GS} = -2.5V	-0.48A
	1300mΩ @ V _{GS} = -1.8V	-0.4A

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 DMP2900UTQ 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 new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

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

Mechanical Data

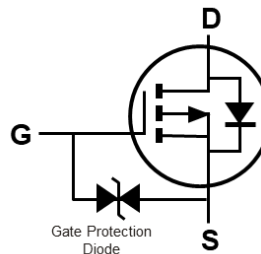
- Package: SOT523
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 Ⓔ3
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)



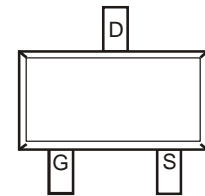
ESD PROTECTED



Top View



Equivalent Circuit



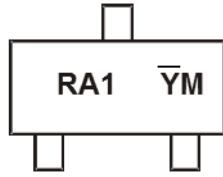
Top View

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMP2900UTQ-7	SOT523	3000	Tape & Reel
DMP2900UTQ-13	SOT523	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



RA1 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: K = 2023)
 M = Month (ex: 9 = September)

Date Code Key

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	K	L	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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-20	V
Gate-Source Voltage	V _{GSS}	±6	V
Continuous Drain Current (Note 5) V _{GS} = -4.5V	I _D	Steady State	-0.5
		T _A = +25°C T _A = +75°C	-0.4
Maximum Continuous Body Diode Forward Current (Note 5)	I _S	-0.39	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-2.5	A

Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)

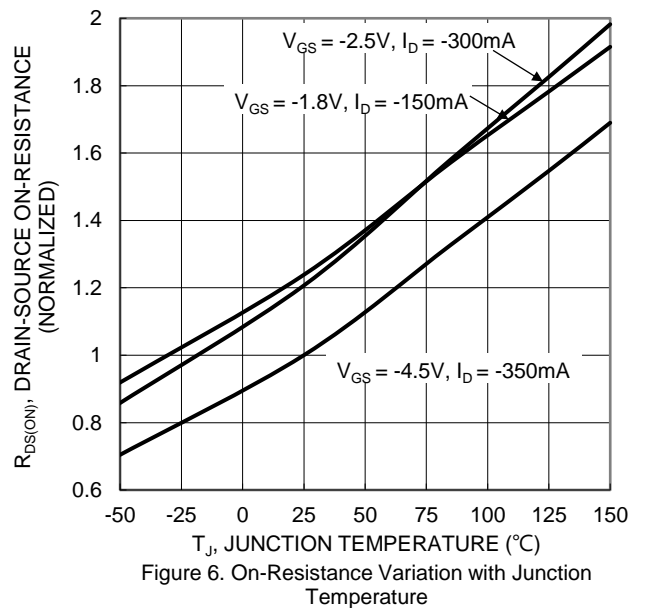
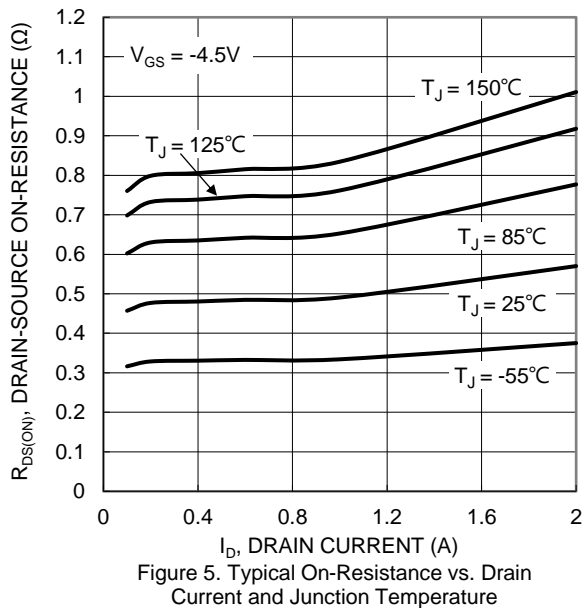
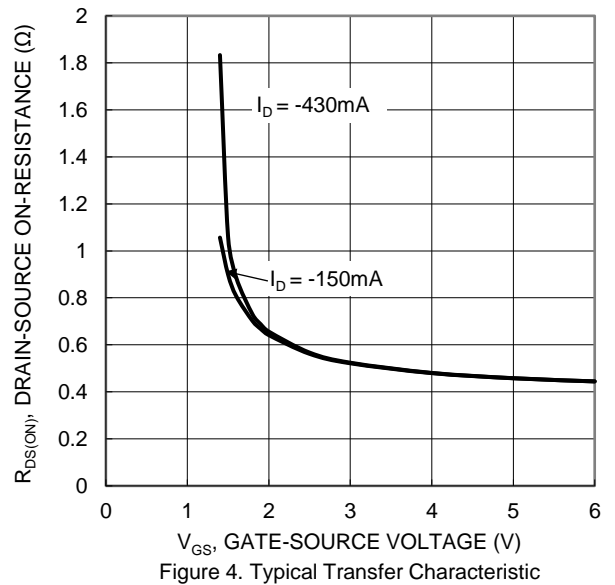
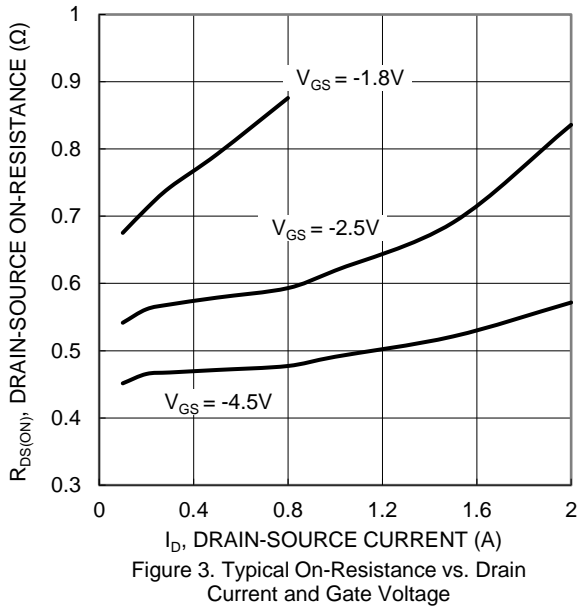
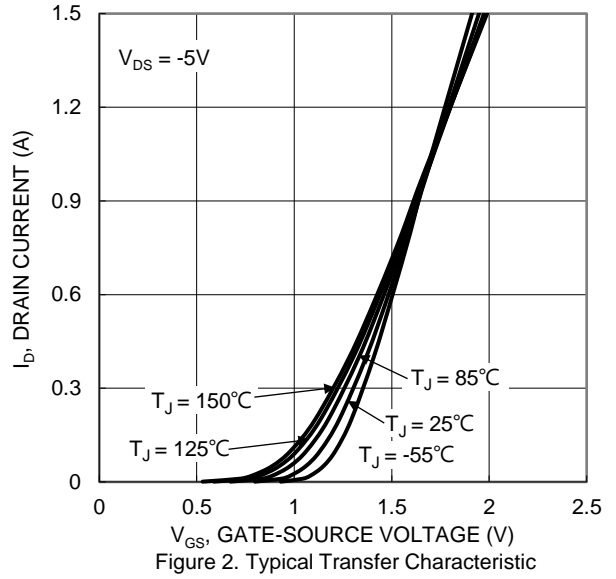
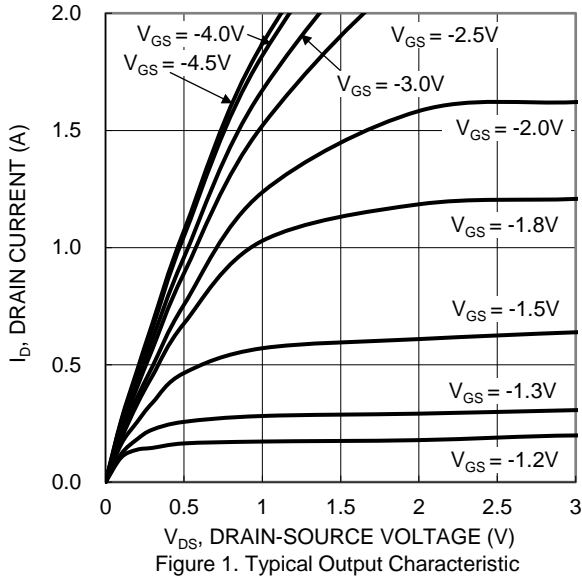
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P _D	Steady State	0.25
Thermal Resistance, Junction to Ambient (Note 6)		R _{θJA}	496
Total Power Dissipation (Note 5)	P _D	Steady State	0.32
Thermal Resistance, Junction to Ambient (Note 5)		R _{θJA}	395
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	B _V DSS	-20	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	-100	nA	V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±2.0	μA	V _{GS} = ±4.5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.5	—	-1.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	0.4	0.7	Ω	V _{GS} = -4.5V, I _D = -430mA
		—	0.5	0.9		V _{GS} = -2.5V, I _D = -300mA
		—	0.7	1.3		V _{GS} = -1.8V, I _D = -150mA
Diode Forward Voltage (Note 7)	V _{SD}	—	-0.7	-1.2	V	V _{GS} = 0V, I _S = -150mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	49	—	pF	V _{DS} = -16V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	12	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	3.4	—	pF	
Total Gate Charge	Q _g	—	0.7	—	nC	V _{GS} = -4.5V, V _{DS} = -10V I _D = -250mA
Gate-Source Charge	Q _{gs}	—	0.1	—	nC	
Gate-Drain Charge	Q _{gd}	—	0.1	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	16	—	ns	V _{DD} = -10V, V _{GS} = -4.5V R _L = 47Ω, R _G = 10Ω I _D = -200mA
Turn-On Rise Time	t _r	—	15	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	213	—	ns	
Turn-Off Fall Time	t _f	—	89	—	ns	
Reverse Recovery Time	t _{RR}	—	10.5	—	ns	
Reverse Recovery Charge	Q _{RR}	—	1.8	—	nC	I _F = -1A, di/dt = 100A/μs

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



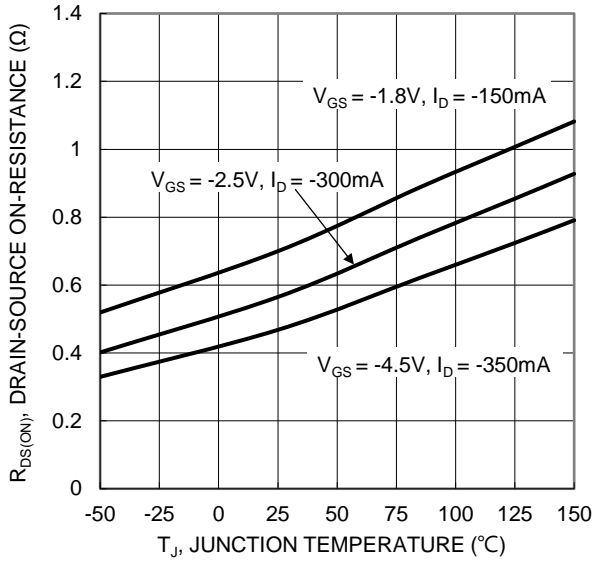


Figure 7. On-Resistance Variation with Junction Temperature

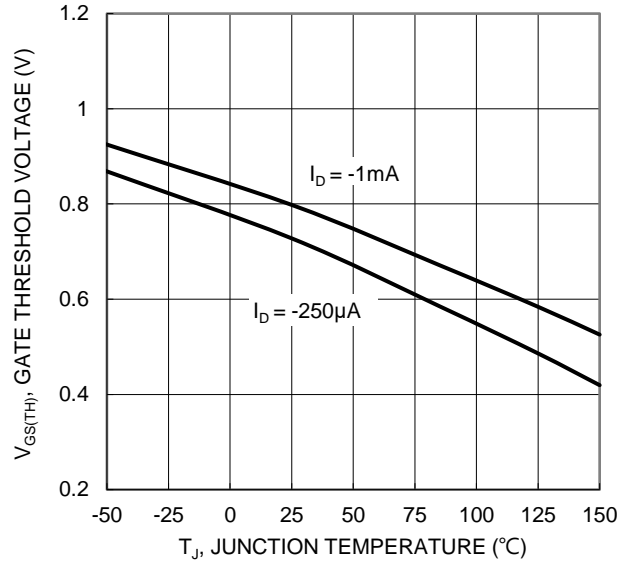


Figure 8. Gate Threshold Variation vs. Junction Temperature

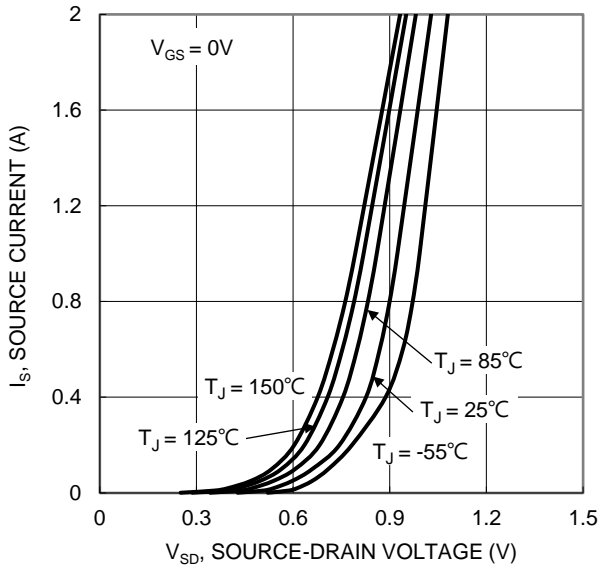


Figure 9. Diode Forward Voltage vs. Current

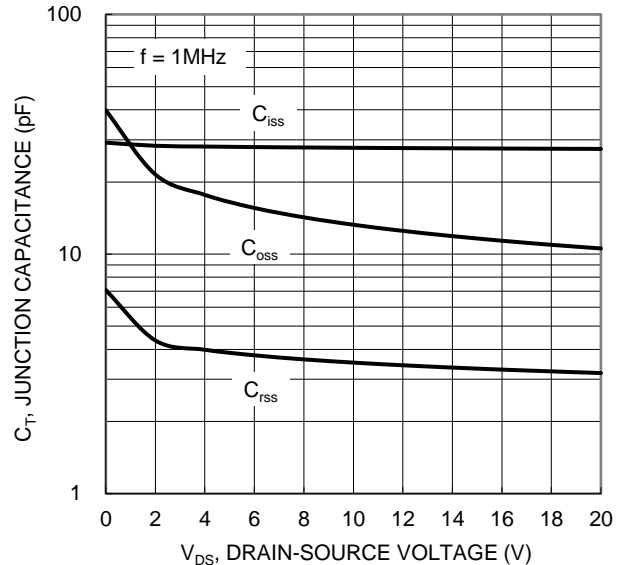


Figure 10. Typical Junction Capacitance

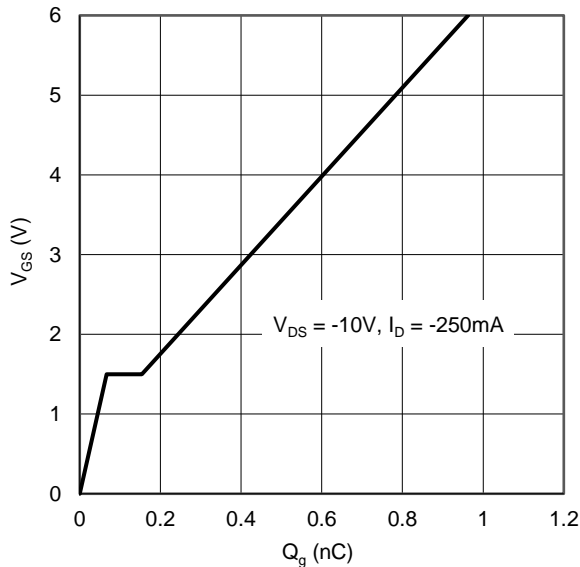


Figure 11. Gate Charge

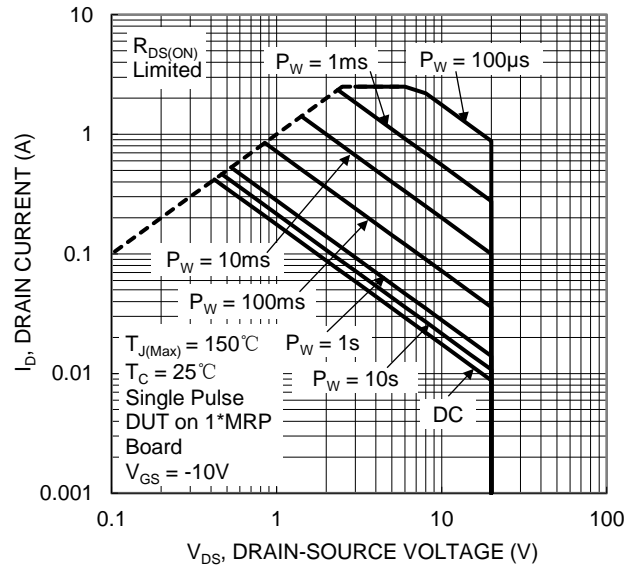


Figure 12. SOA, Safe Operation Area

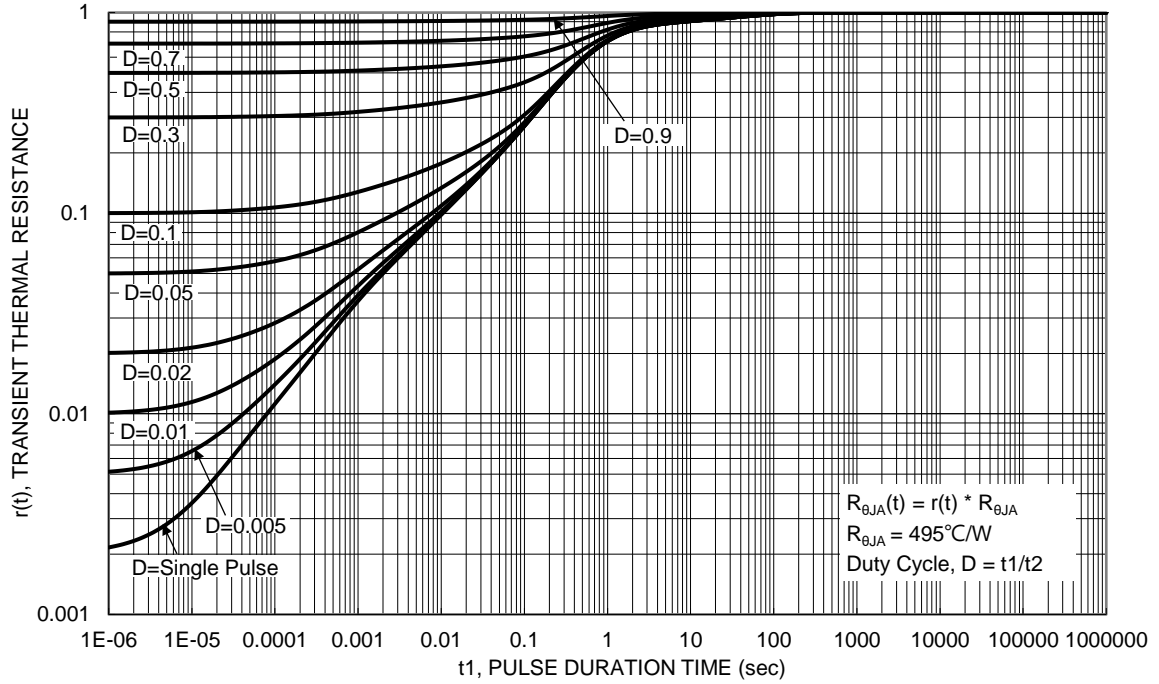
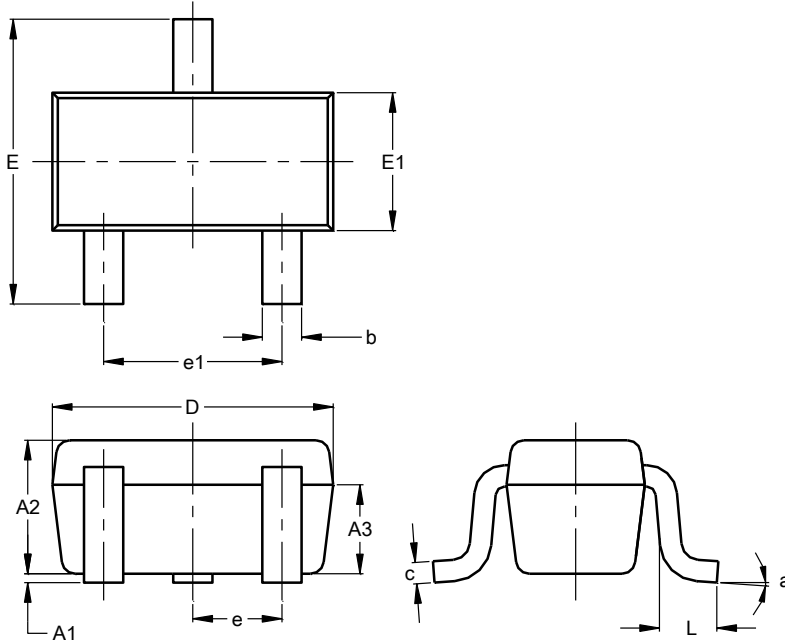


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

SOT523

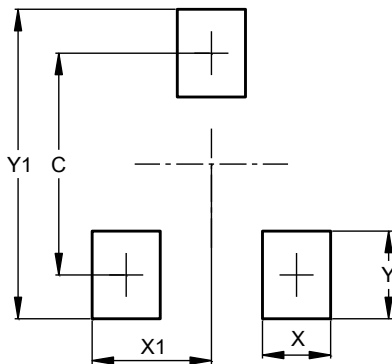


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

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

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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