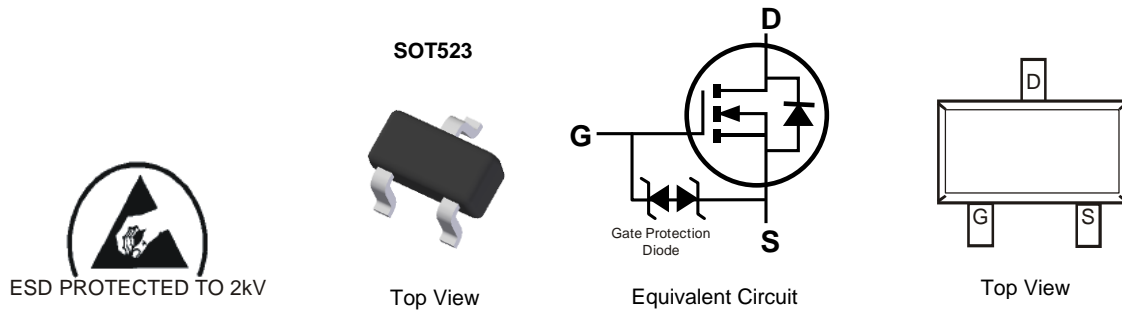


## Features

- Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- ESD Protected Gate to 2kV
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe.  
Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)

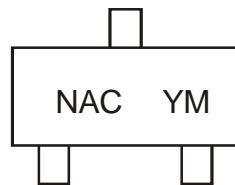


## Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
DMN55D0UT -7	Commercial	SOT523	3,000/Tape & Reel
DMN55D0UTQ -7	Automotive	SOT523	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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. Automotive products are AEC-Q10x qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



NAC = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: U = 2007)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2007	---	2015	2016	2017	2018	2019	2020	2021	2022	2023
Code	U	---	C	D	E	F	G	H	I	J	K

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	Units
Drain-Source Voltage	V <sub>DSS</sub>	50	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Drain Current (Note 6) Continuous	I <sub>D</sub>	160	mA
Pulsed Drain Current (Note 6)	I <sub>DM</sub>	560	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 6)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	625	°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</b> (Note 7)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	50	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	1.0 5.0	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.7	0.8	1.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	3.1	4	Ω	V <sub>GS</sub> = 4V, I <sub>D</sub> = 100mA
		—	4	5		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 80mA
Forward Transconductance	g <sub>FS</sub>	180	—	—	mS	V <sub>DS</sub> = 10V, I <sub>D</sub> = 100mA, f = 1.0KHz
Diode Forward Voltage	V <sub>SD</sub>	—	0.70	1.3	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 100mA
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	C <sub>ISS</sub>	—	25	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>OSS</sub>	—	5	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	2.1	—	pF	
Gate Resistance	R <sub>G</sub>	—	500	—	Ω	f = 1MHz, V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V
Total Gate Charge (V <sub>GS</sub> = 4V)	Q <sub>G</sub>	—	295	—	pC	V <sub>DS</sub> = 10V, I <sub>D</sub> = 100mA
Total Gate Charge (V <sub>GS</sub> = 8V)	Q <sub>G</sub>	—	636	—	pC	
Gate-Source Charge	Q <sub>GS</sub>	—	72	—	pC	
Gate-Drain Charge	Q <sub>GD</sub>	—	18	—	pC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	6.0	—	ns	V <sub>DD</sub> = 10V, V <sub>GS</sub> = 4V, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 100mA
Turn-On Rise Time	t <sub>R</sub>	—	4.4	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	23.4	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	11.0	—	ns	

- Notes:
6. Device mounted on FR-4 PCB, with minimum recommended pad layout.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Guaranteed by design. Not subject to product testing.

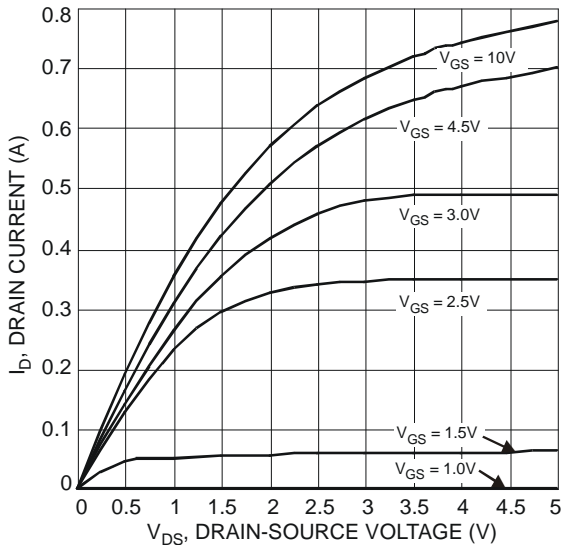


Fig. 1 Typical Output Characteristics

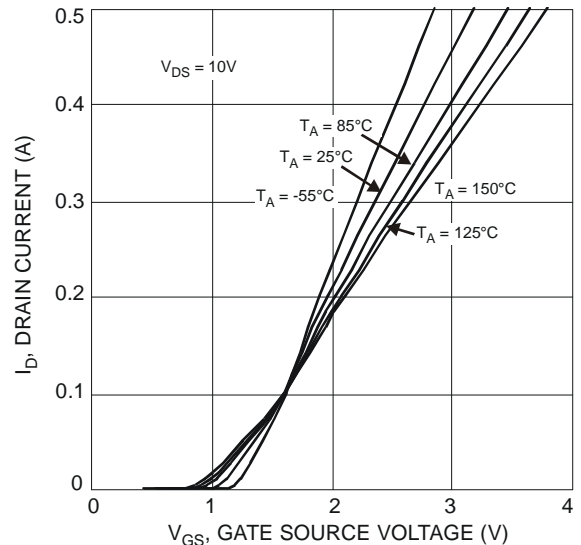


Fig. 2 Typical Transfer Characteristics

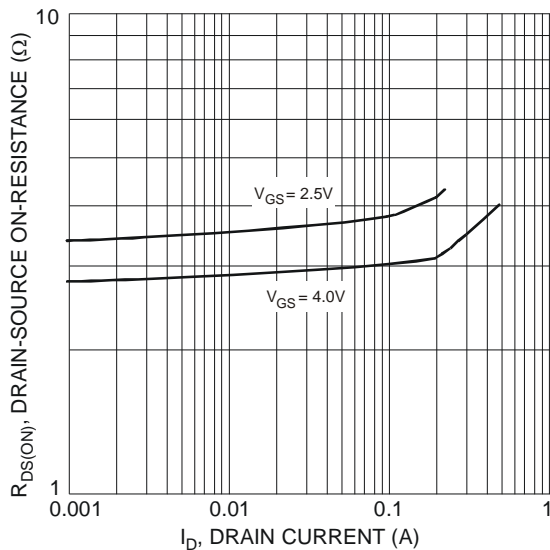


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

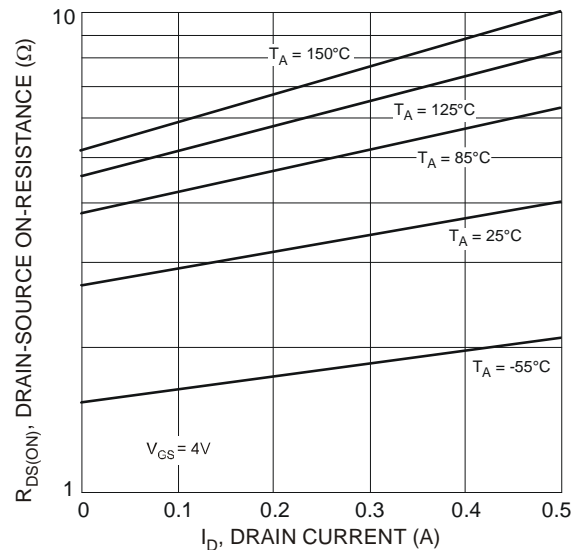


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

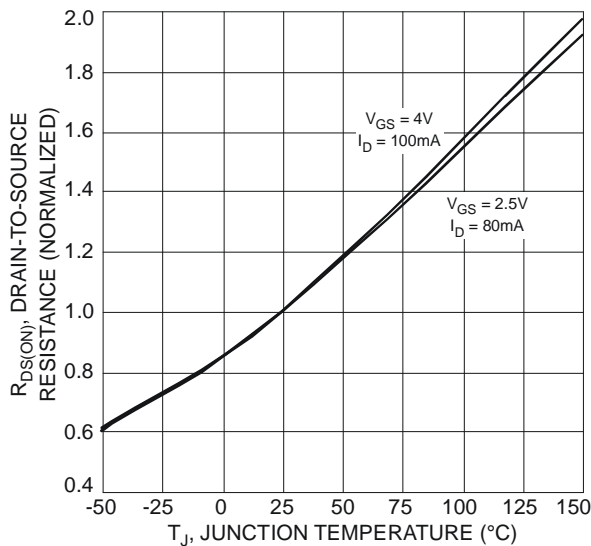


Fig. 5 On-Resistance Variation with Temperature

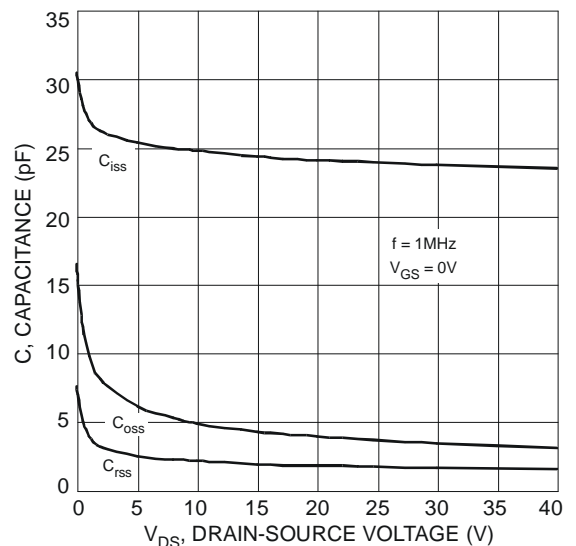


Fig. 6 Typical Capacitance

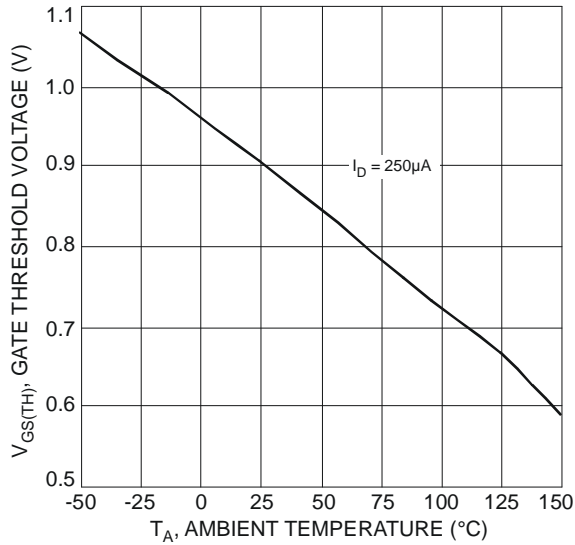


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

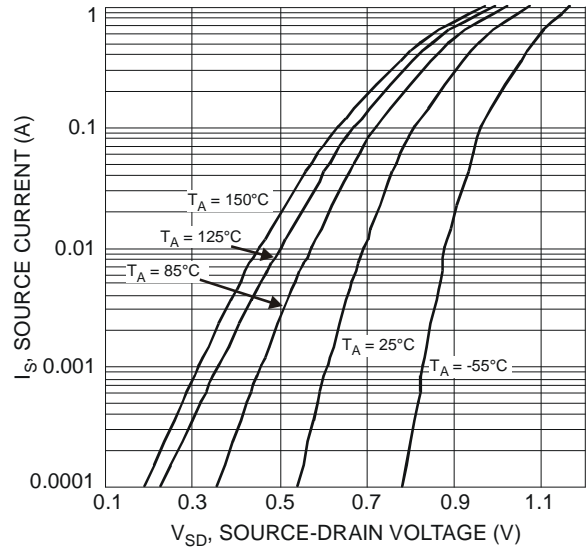


Fig. 8 Diode Forward Voltage vs. Current

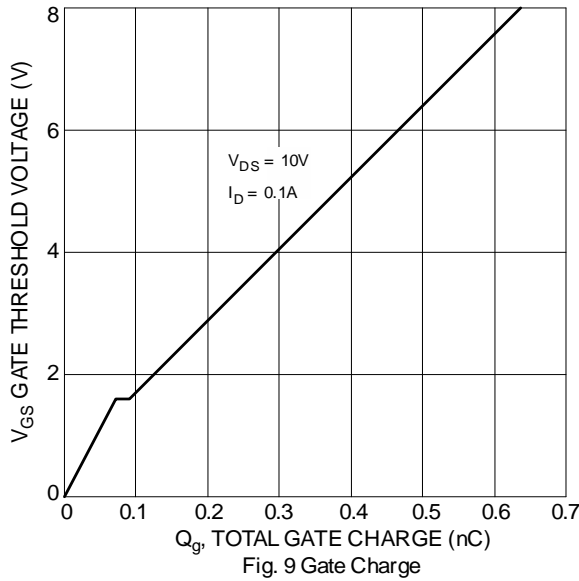


Fig. 9 Gate Charge

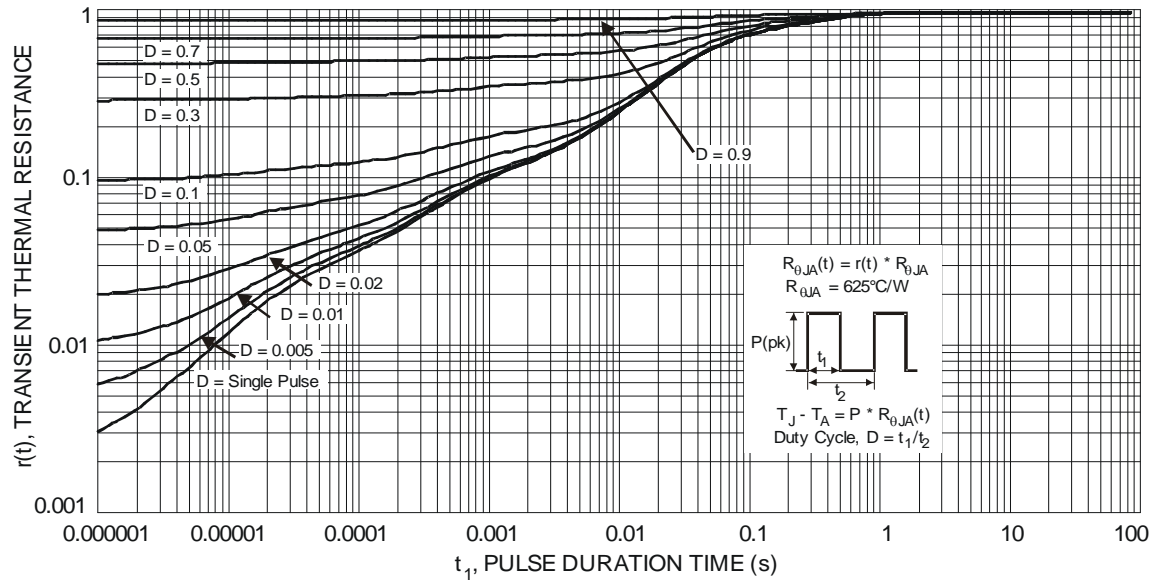
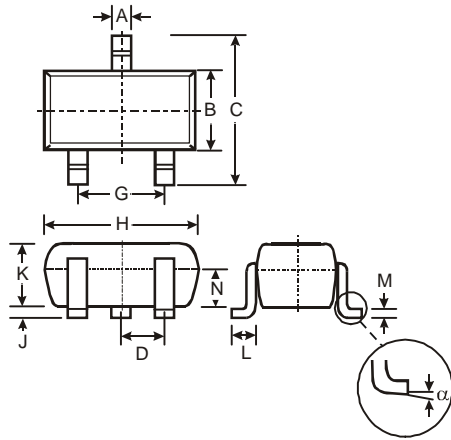


Fig. 10 Transient Thermal Response

**Package Outline Dimensions**

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

**SOT523**

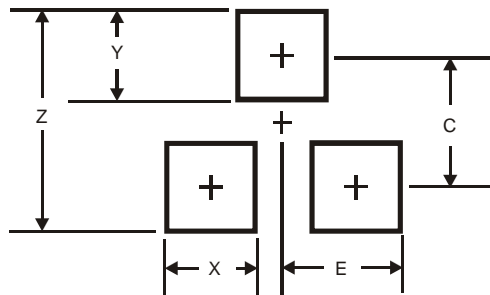


SOT523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
α	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

**SOT523**



Dimensions	Value (in mm)
Z	1.8
X	0.4
Y	0.51
C	1.3
E	0.7

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