

Product Summary

BV_{DSS}	$R_{DS(ON)}$ max	I_D max
50V	4Ω @ $V_{GS} = 4V$	160mA

Features and Benefits

- 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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

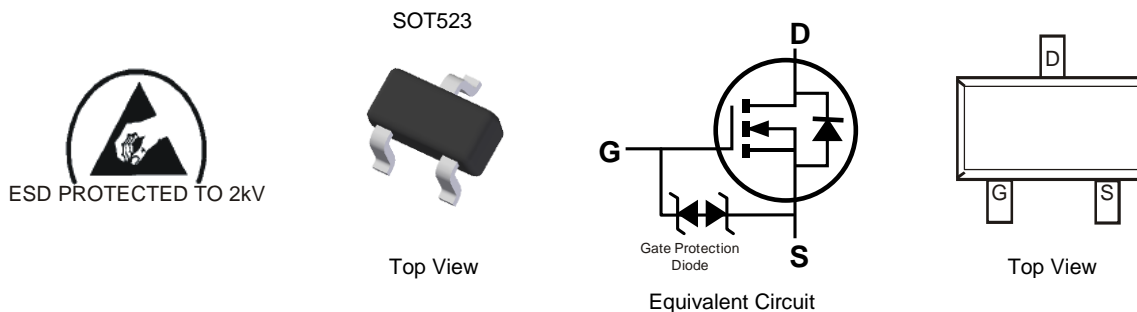
Description and Applications

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

- Motor Driving
- Power Management Functions
- Load Switching

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)

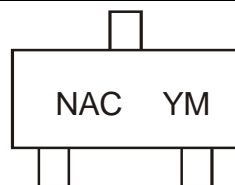


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN55D0UT-7	SOT523	3,000/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



NAC = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: H = 2020)
 M = Month (ex: 9 = September)

Date Code Key

Year	2008	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	V	...	H	I	J	K	L	M	N	O	P	R
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}	50	V
Gate-Source Voltage	V _{GSS}	±12	V
Drain Current (Note 5) Continuous	I _D	160	mA
Pulsed Drain Current (Note 5)	I _{DM}	560	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	200	mW
Thermal Resistance, Junction to Ambient	R _{θJA}	625	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	50	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 50V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	1.0 5.0	μA	V _{GS} = ±8V, V _{DS} = 0V V _{GS} = ±12V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	0.7	0.8	1.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.1	4	Ω	V _{GS} = 4V, I _D = 100mA
		—	4	5		V _{GS} = 2.5V, I _D = 80mA
Forward Transconductance	g _{FS}	180	—	—	mS	V _{DS} = 10V, I _D = 100mA, f = 1.0kHz
Diode Forward Voltage	V _{SD}	—	0.70	1.3	V	V _{GS} = 0V, I _S = 100mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iSS}	—	25	—	pF	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oSS}	—	5	—	pF	
Reverse Transfer Capacitance	C _{rSS}	—	2.1	—	pF	
Gate Resistance	R _G	—	500	—	Ω	f = 1MHz, V _{GS} = 0V, V _{DS} = 0V
Total Gate Charge (V _{GS} = 4V)	Q _G	—	295	—	pC	V _{DS} = 10V, I _D = 100mA
Total Gate Charge (V _{GS} = 8V)	Q _G	—	636	—	pC	
Gate-Source Charge	Q _{GS}	—	72	—	pC	
Gate-Drain Charge	Q _{GD}	—	18	—	pC	V _{DD} = 10V, V _{GS} = 4V, R _G = 25Ω, I _D = 100mA
Turn-On Delay Time	t _{D(ON)}	—	6.0	—	ns	
Turn-On Rise Time	t _R	—	4.4	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	23.4	—	ns	
Turn-Off Fall Time	t _F	—	11.0	—	ns	

- Notes: 5. Device mounted on FR-4 PCB, with minimum recommended pad layout.
6. Short duration pulse test used to minimize self-heating effect.
7. Guaranteed by design. Not subject to product testing.

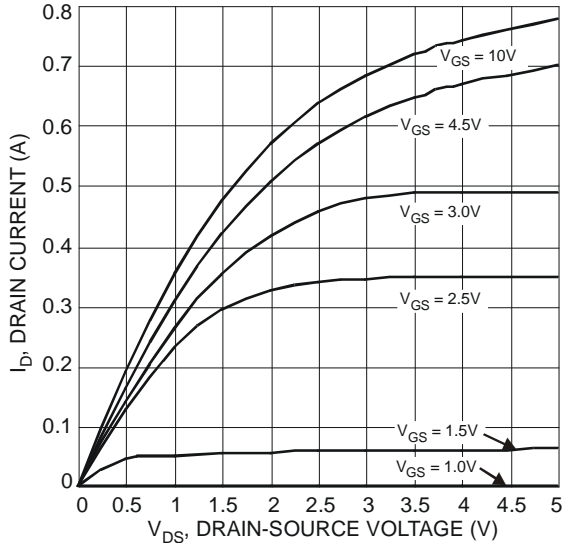


Fig. 1 Typical Output Characteristics

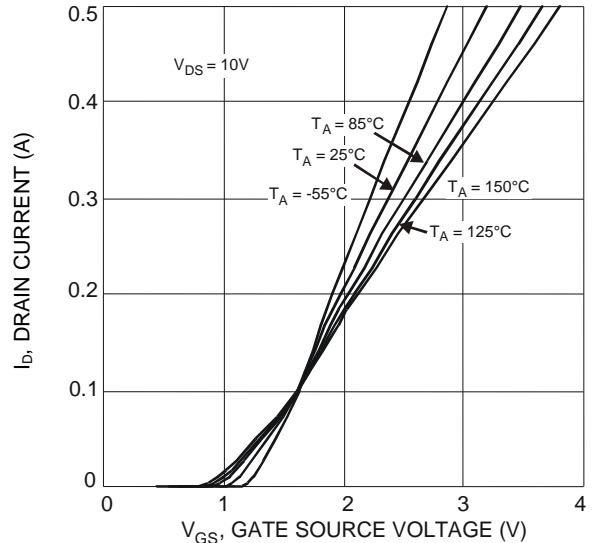


Fig. 2 Typical Transfer Characteristics

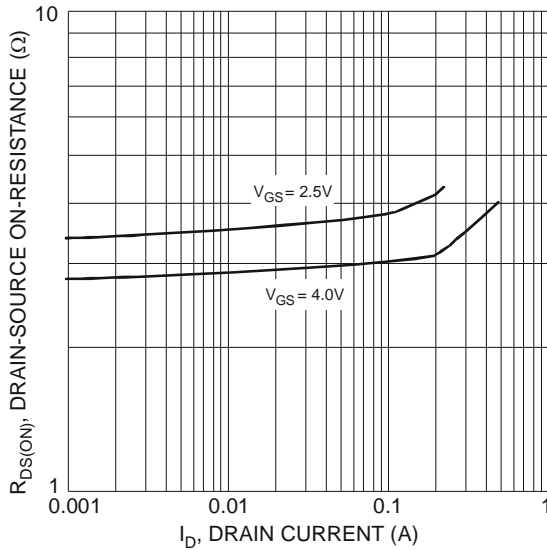


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

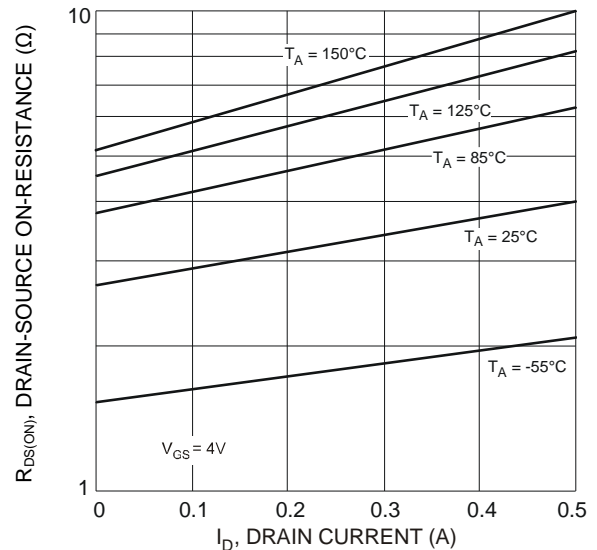


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

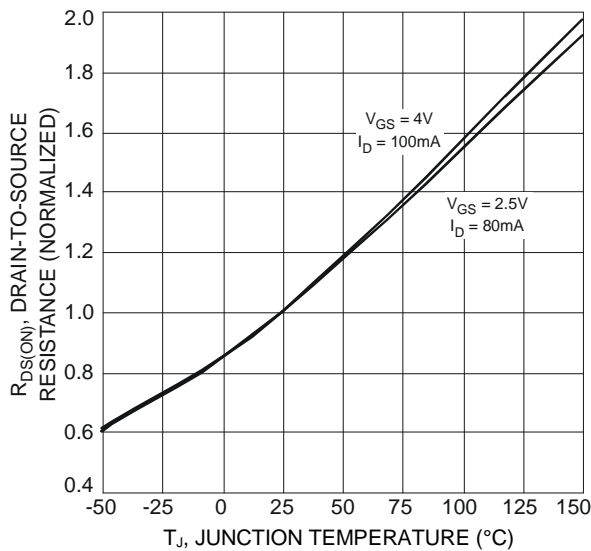


Fig. 5 On-Resistance Variation with Temperature

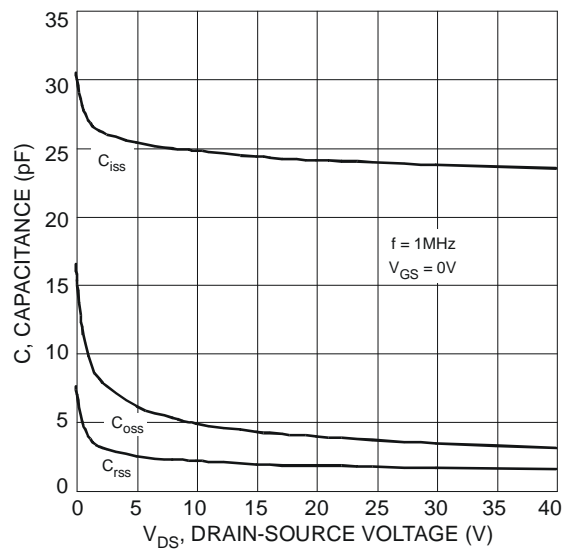


Fig. 6 Typical Capacitance

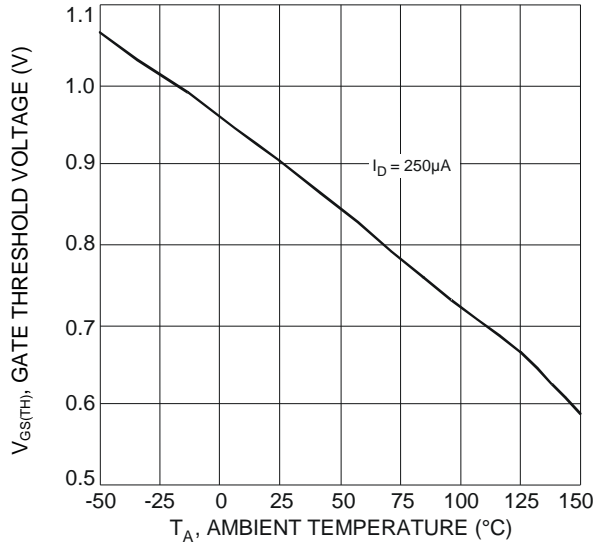


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

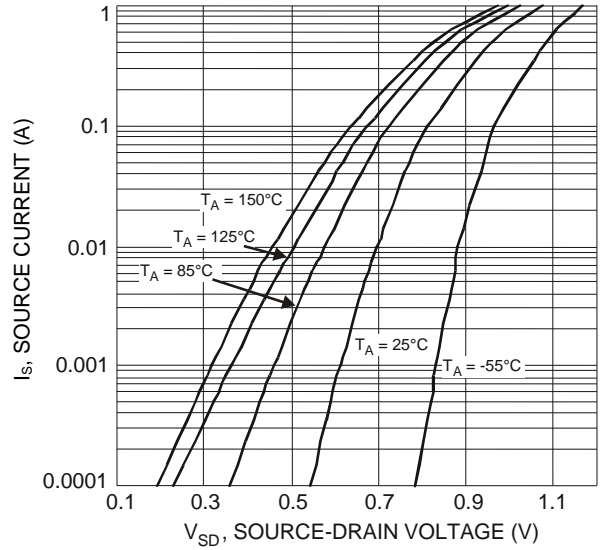


Fig. 8 Diode Forward Voltage vs. Current

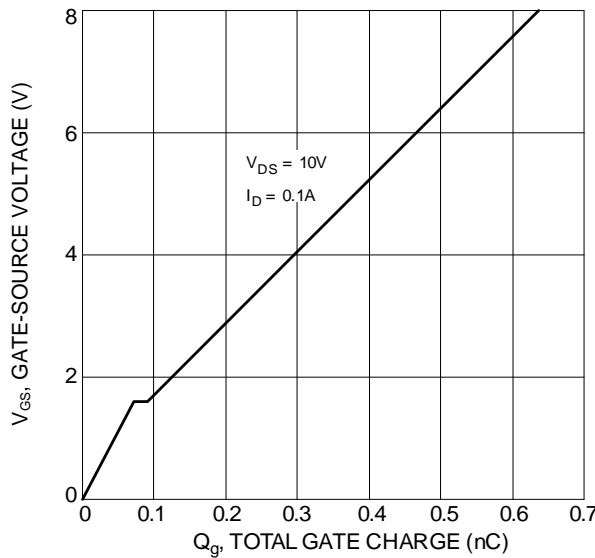


Fig. 9 Gate Charge

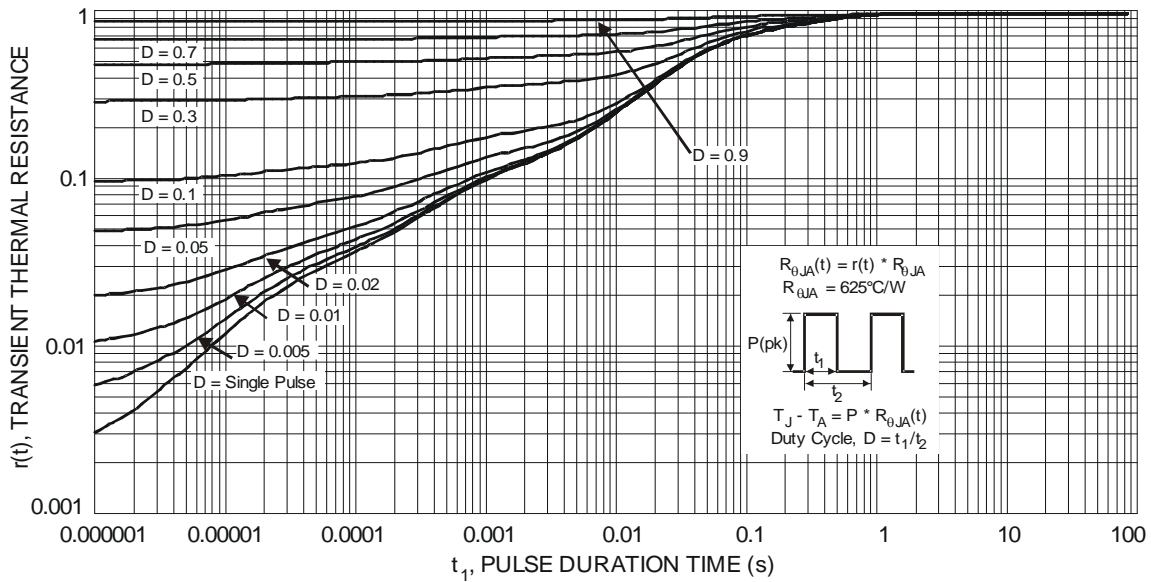
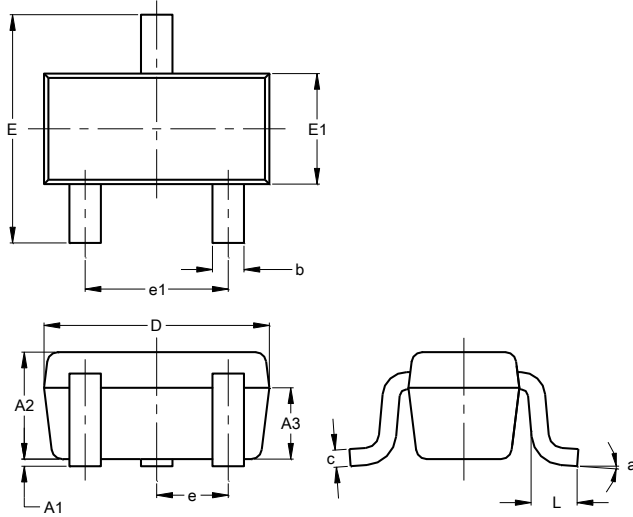


Fig. 10 Transient Thermal Response

Package Outline Dimensions

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

SOT523

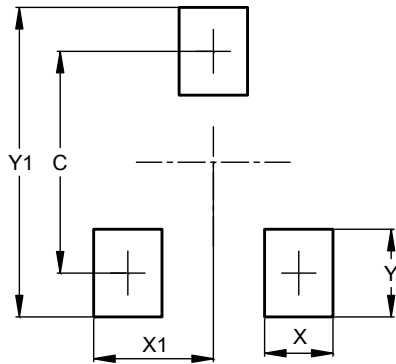


SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

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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