Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
50V	2.0Ω @ V_{GS} = 5.0V	300mA
	2.5Ω @ V_{GS} = 2.5V	200mA

Features and Benefits

- Low On-Resistance
- Very Low Gate Threshold Voltage (1.0V max)
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up 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 refer to the related automotive grade (Q-suffix) part. A listing can be found at https://www.diodes.com/products/automotive/automotive-products/.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High-Reliability. https://www.diodes.com/quality/product-definitions/**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (DMN5L06KQ)**

Description and Applications

This new generation 50V N-channel enhancement mode MOSFET is designed to minimize $R_{DS(on)}$ yet maintain superior switching performance. This device is ideal for use in Notebook battery power management and load switches.

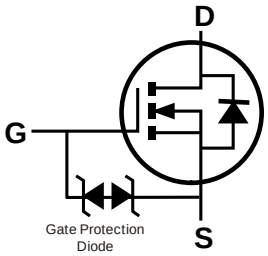
- Load Switches
- Level Switches

Mechanical Data

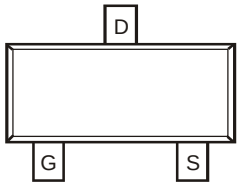
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Annealed over Alloy 42 Lead-Frame. Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)

SOT23

Top View



Equivalent Circuit



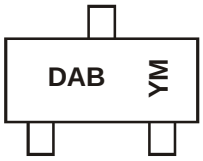
Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN5L06K-7	SOT23	3000/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 http://www.diodes.com/products/packages.html.

Marking Information



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

Date Code Key

Year	2006	~	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	T	~	H	I	J	K	L	M	N	O	P	Q

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}	±20	V
Drain Current (Note 5) Continuous Pulsed (Note 6)	I_D	300 800	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	350	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\Theta JA}$	357	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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	BV_{DSS}	50	—	—	V	V_{GS} = 0V, I_D = 10μA
Zero Gate Voltage Drain Current @ T_C = +25°C	I_{DSS}	—	—	60	nA	V_{DS} = 50V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	1 500 50	μA nA nA	V_{GS} = ±12V, V_{DS} = 0V V_{GS} = ±10V, V_{DS} = 0V V_{GS} = ±5V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	0.49	—	1.0	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	— — —	2.71 1.56 1.19	3.0 2.5 2.0	Ω	V_{GS} = 1.8V, I_D = 50mA V_{GS} = 2.5V, I_D = 50mA V_{GS} = 5.0V, I_D = 50mA
On-State Drain Current	$I_{D(ON)}$	0.5	1.4	—	A	V_{GS} = 10V, V_{DS} = 7.5V
Forward Transconductance	$\|Y_{fs}\|$	200	—	—	mS	V_{DS} =10V, I_D = 0.2A
Source-Drain Diode Forward Voltage	V_{SD}	0.5	0.7	1.4	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	—	50	pF	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	—	25	pF	
Reverse Transfer Capacitance	C_{rss}	—	—	5.0	pF	

Notes: 5. Device mounted on FR-4 PCB
6. Pulse width ≤10mS, Duty Cycle ≤1%.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing

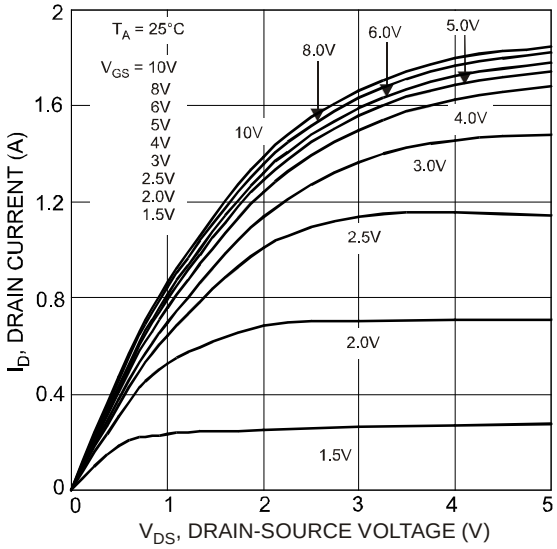


Fig. 1 Typical Output Characteristics

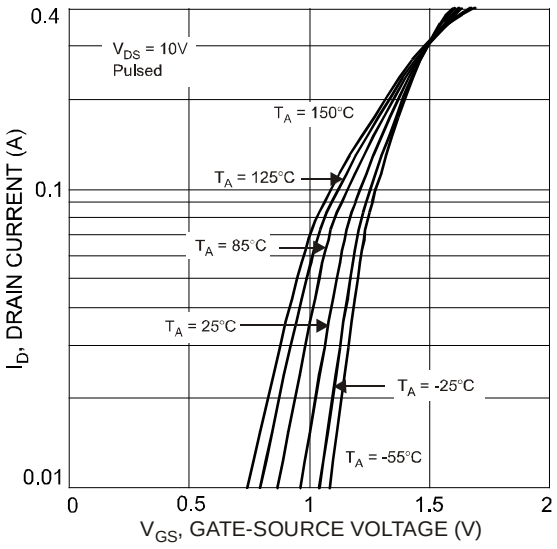


Fig. 2 Typical Transfer Characteristics

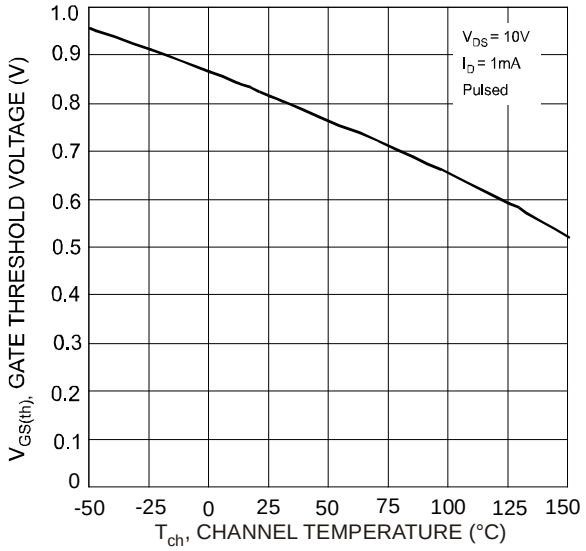


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

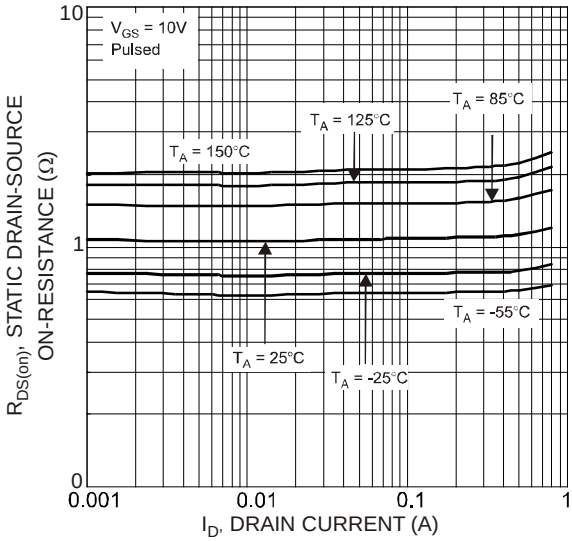


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

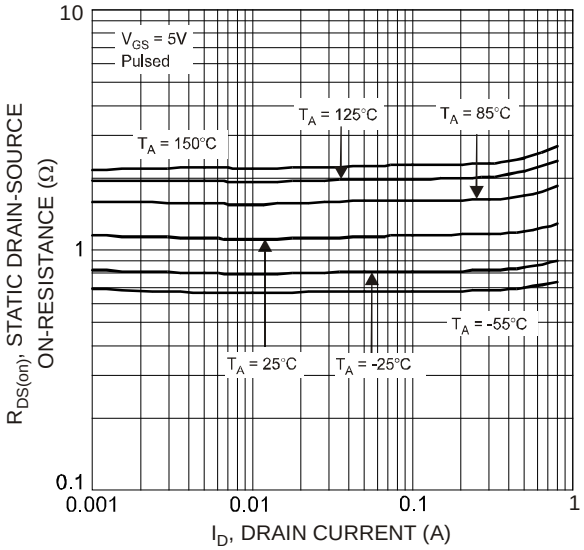


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

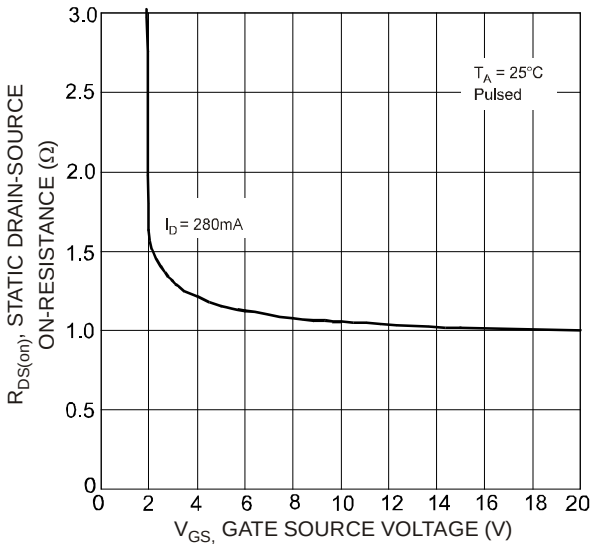


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

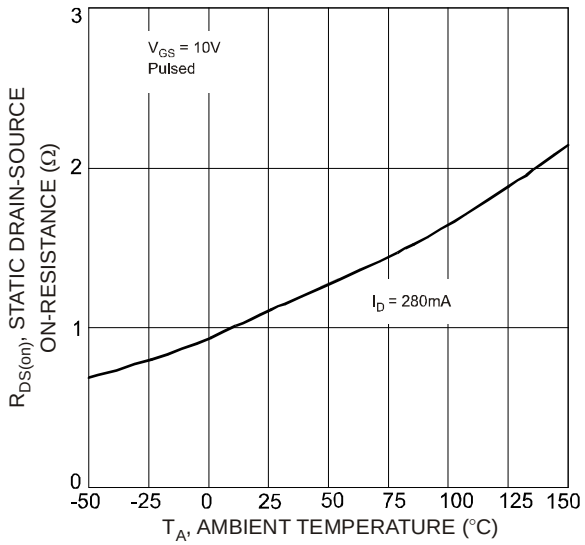


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

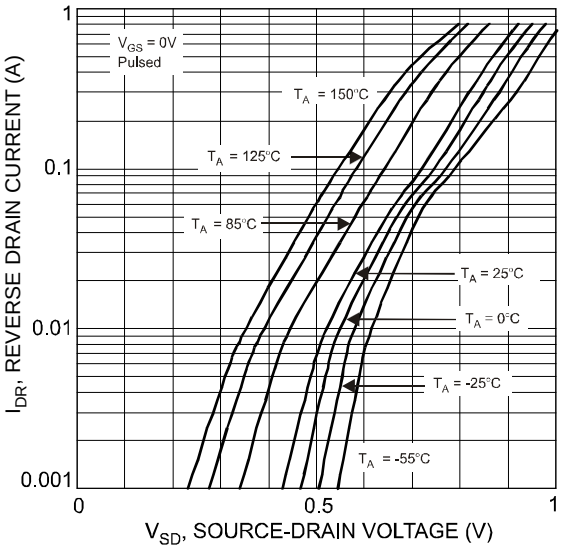


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

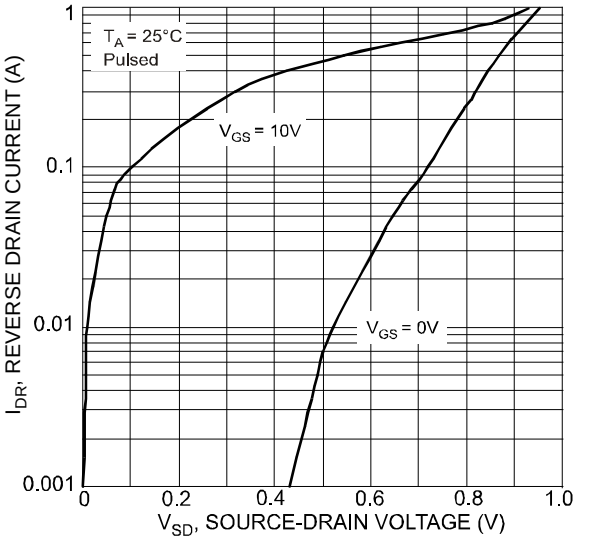


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

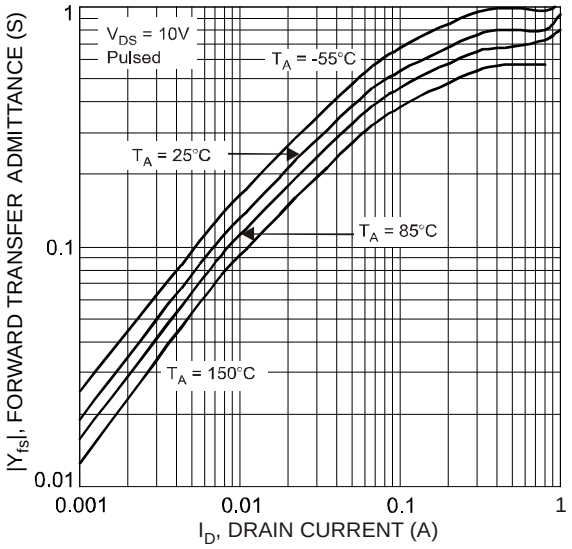


Fig.10 Forward Transfer Admittance vs. Drain Current

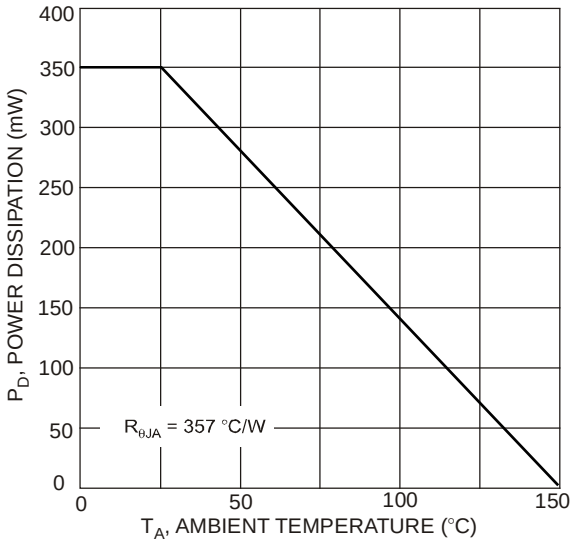


Fig. 11 Derating Curve - Total

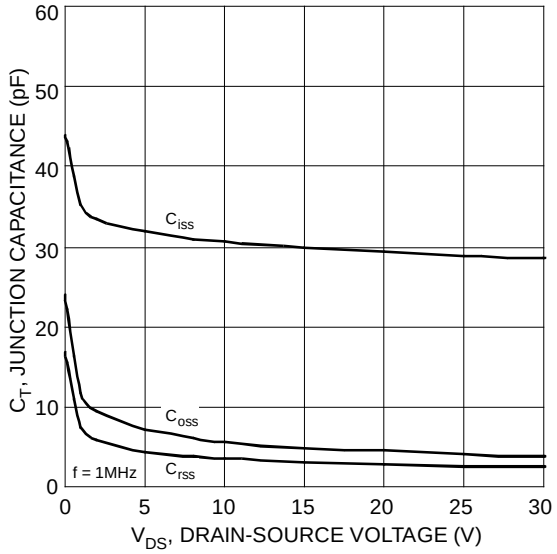
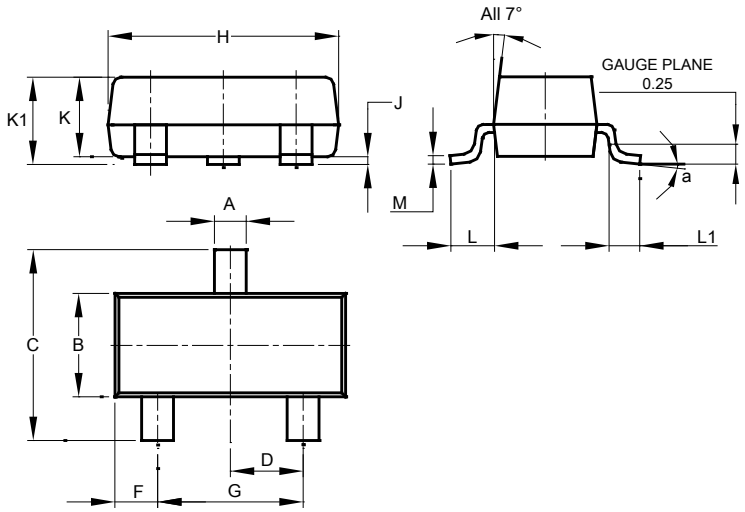


Figure 12 Typical Junction Capacitance

Package Outline Dimensions

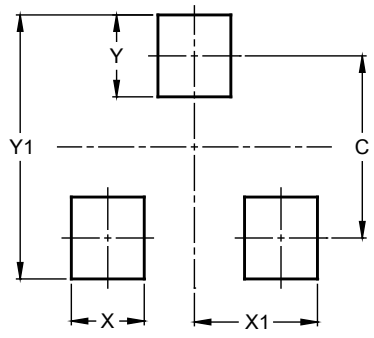
Please see http://www.diodes.com/package-outlines.html for the latest version.



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

Suggested Pad Layout

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



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

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