Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_A = +25°C
60V	85mΩ @ V_{GS} = 10V	2.5A
	120mΩ @ V_{GS} = 4.5V	2.0A

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 and is ideal for use in:

- DC-DC Converters
- Power Management Functions
- Backlighting

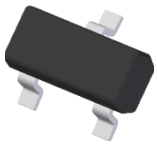
Features and Benefits

- N MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN6075SQ is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

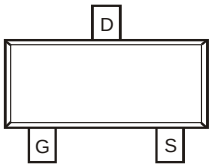
Mechanical Data

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

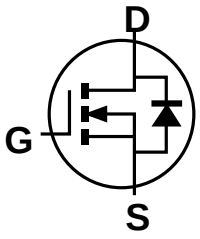
SOT23



Top View



Top View



Equivalent Circuit

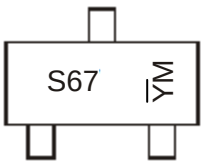
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN6075SQ-7	SOT23	3000/Tape & Reel
DMN6075SQ-13	SOT23	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

SOT23



S67 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: G = 2019)
M = Month (ex: 9 = September)

Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	G	H	I	J	K	L	M	N	O

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}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 5) V_{GS} = 10V	Steady State	T_A = +25°C	I_D	2.0	A
		T_A = +70°C		1.5	
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C	I_D	2.5	A
		T_A = +70°C		2.0	
Maximum Body Diode Forward Current (Note 5)			I_S	2.0	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	12	A
Pulsed Source Current (10µs Pulse, Duty Cycle = 1%)			I_{SM}	12	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.8	W
	T_A = +70°C		0.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	157	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.15	W
	T_A = +70°C		0.7	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	110	°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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	1.0	µA	V_{DS} = 60V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	69	85	mΩ	V_{GS} = 10V, I_D = 3.2A
		—	75	120		V_{GS} = 4.5V, I_D = 2.8A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 2.5A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	606	—	pF	V_{DS} = 20V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	32.6	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	24.6	—	pF	
Gate Resistance	R_g	—	1.5	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 10V)	Q_g	—	12.3	—	nC	V_{DS} = 30V, I_D = 3A
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	5.6	—	nC	
Gate-Source Charge	Q_{gs}	—	1.7	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.9	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	3.5	—	ns	V_{GS} = 10V, V_{DS} = 30V, R_g = 20Ω, R_L = 50Ω
Turn-On Rise Time	t_R	—	4.1	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	35	—	ns	
Turn-Off Fall Time	t_F	—	11	—	ns	

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1-inch square copper plate.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

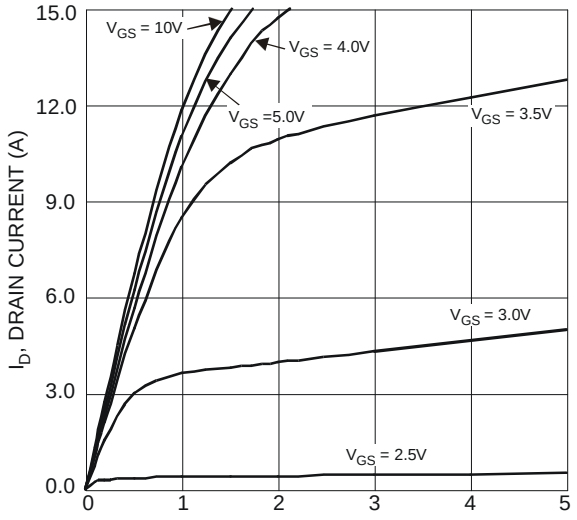


Figure 1 Typical Output Characteristics

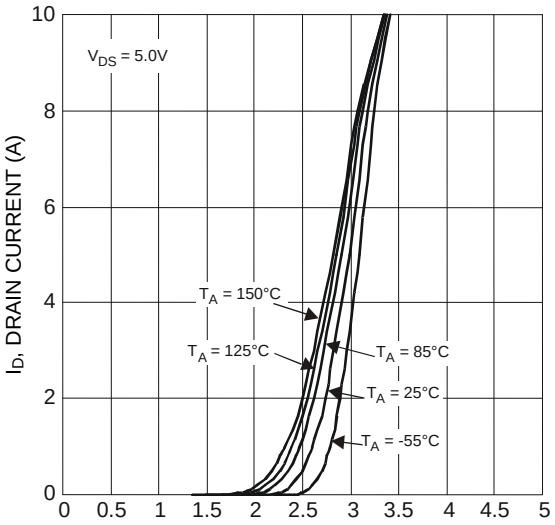


Figure 2 Typical Transfer Characteristics

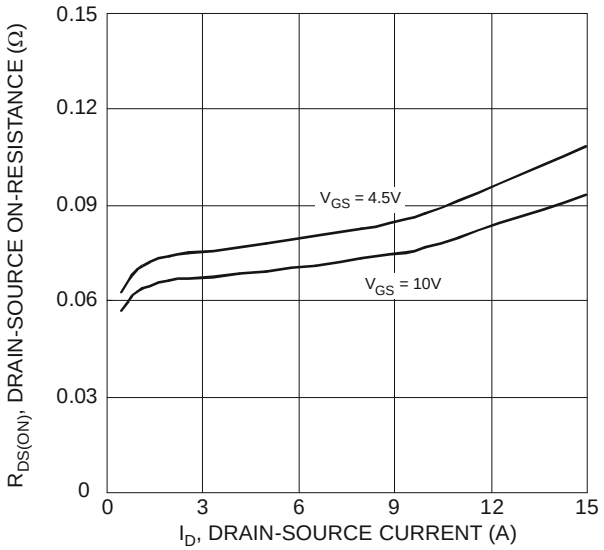


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

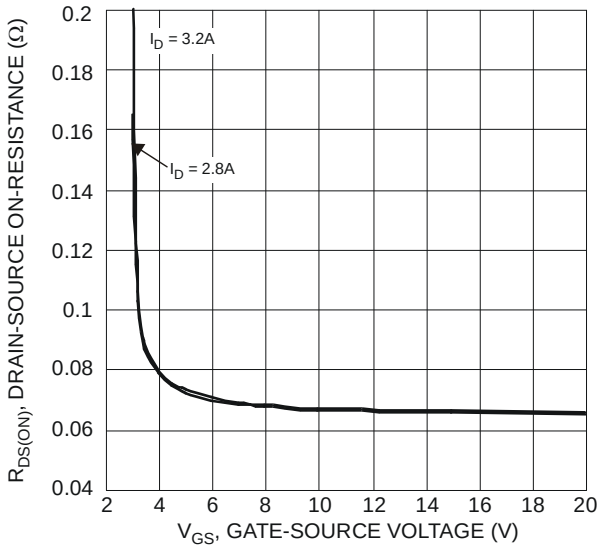


Figure 4 Typical Transfer Characteristics

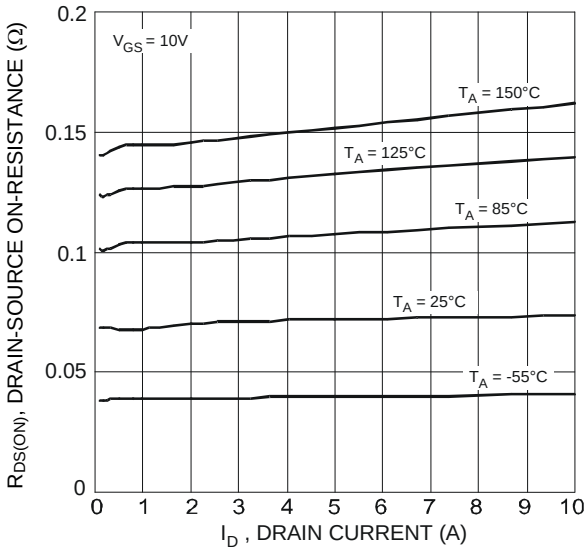


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

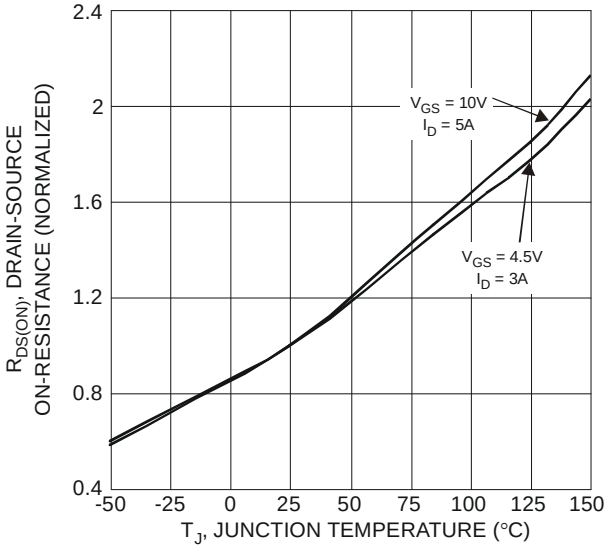


Figure 6 On-Resistance Variation with Temperature

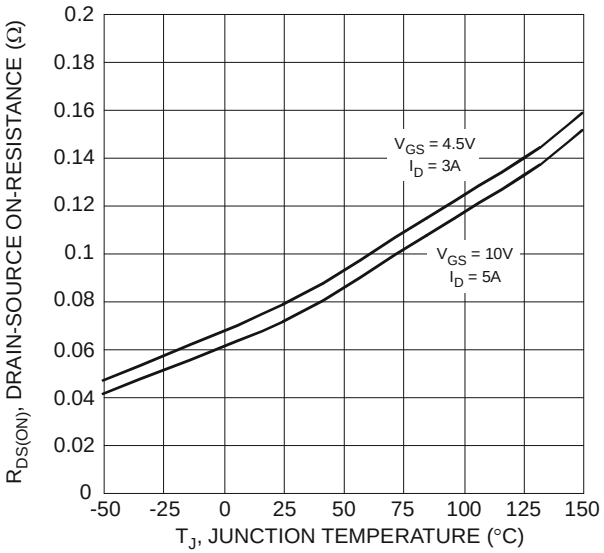


Figure 7 On-Resistance Variation with Temperature

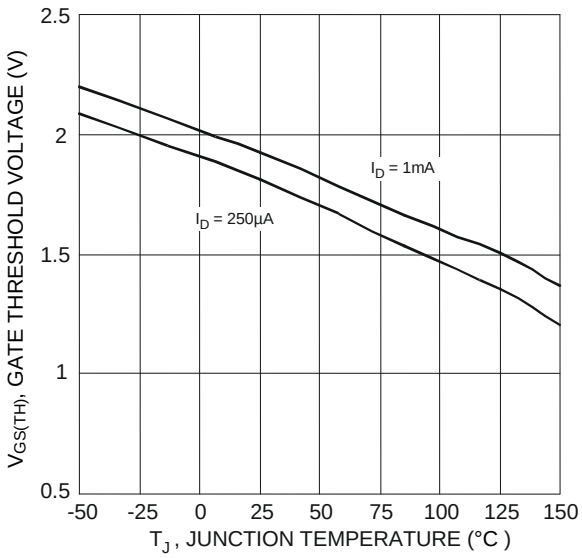


Figure 8 Gate Threshold Variation vs. Junction Temperature

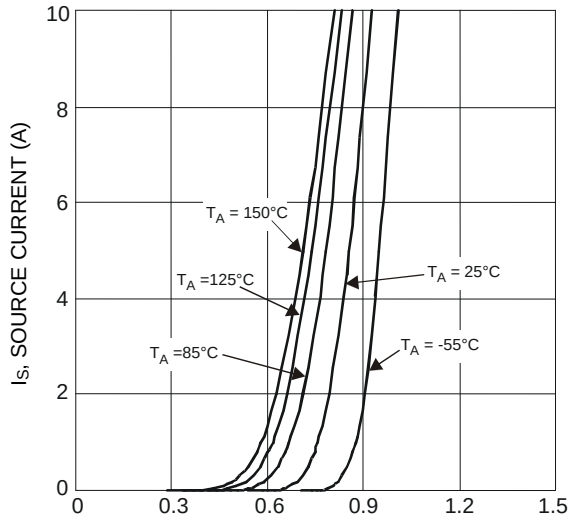


Figure 9 Diode Forward Voltage vs. Current

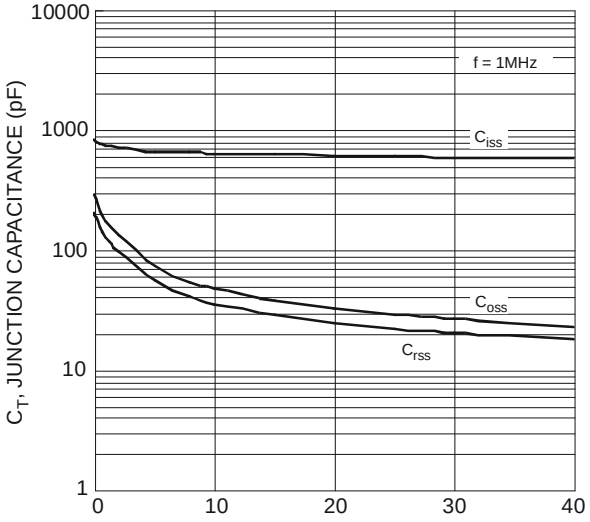


Figure 10 Typical Junction Capacitance

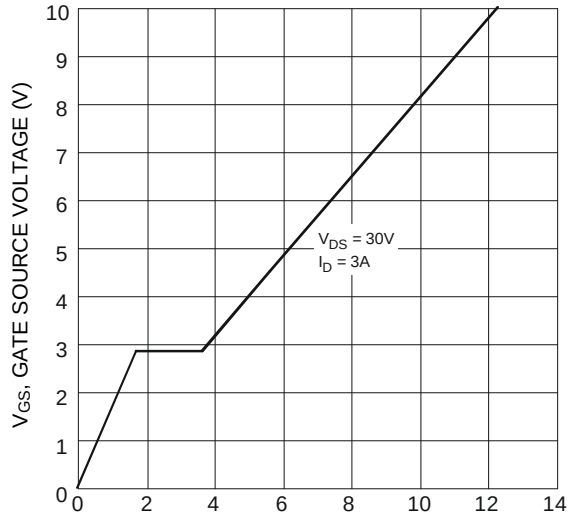


Figure 11 Gate Charge

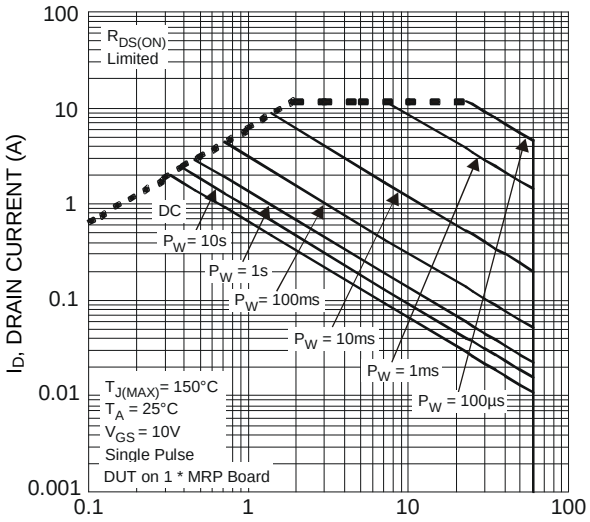


Figure 12 SOA, Safe Operation Area

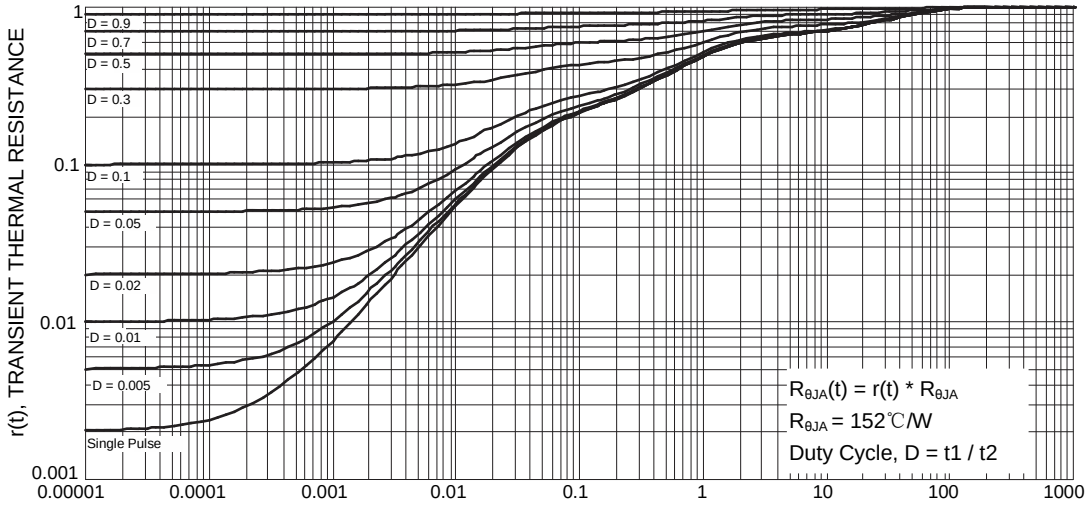
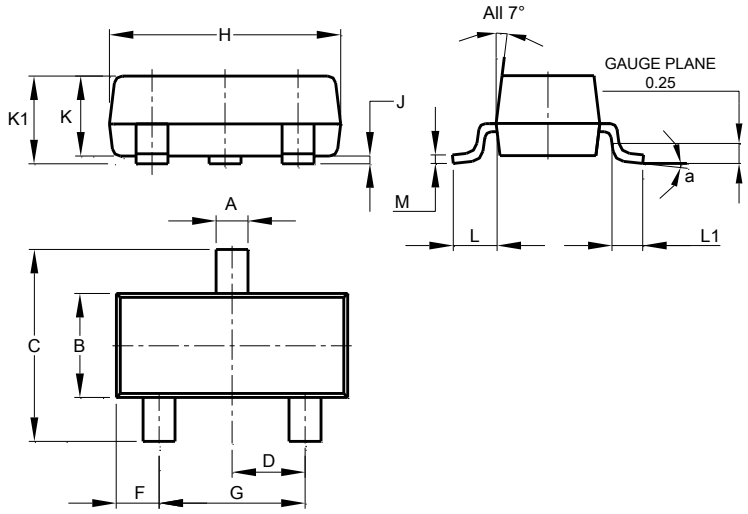


Figure 13 Transient Thermal Resistance

Package Outline Dimensions

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

SOT23

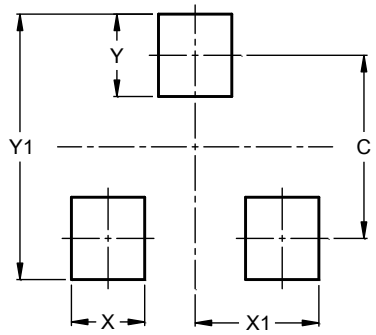


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



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

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