

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Max	$I_D$ Max $T_A = 25^\circ\text{C}$
60V	2.4Ω @ $V_{GS} = 10\text{V}$	510mA
	4.0Ω @ $V_{GS} = 4\text{V}$	390mA

## 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
- Power Management Functions
- Analog Switch

## Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

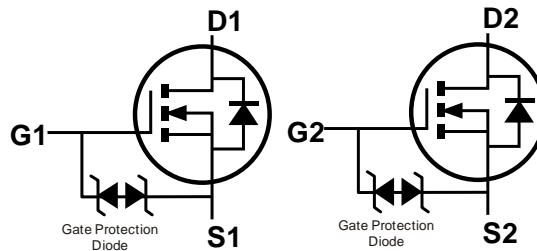
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 Ⓜ3
- Weight: 0.015 grams (Approximate)



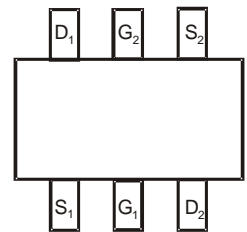
ESD PROTECTED TO 2kV



SOT26  
Top View



Equivalent Circuit  
Per Element



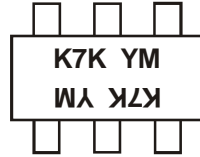
Top View  
Internal Schematic

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN601DMK-7	SOT26	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



K7K = Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: S = 2005)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2005	---	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Code	S	---	B	C	D	E	F	G	H	I	J	K	L

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>	60	V
Gate-Source Voltage			V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) (V <sub>GS</sub> = 10V)	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	510 400	mA
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	580 470	mA
Continuous Drain Current (Note 6) (V <sub>GS</sub> = 4V)	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	390 300	mA
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	440 340	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	850	mA
Maximum Body Diode Continuous Current			I <sub>S</sub>	1.2	A

## Thermal Characteristics

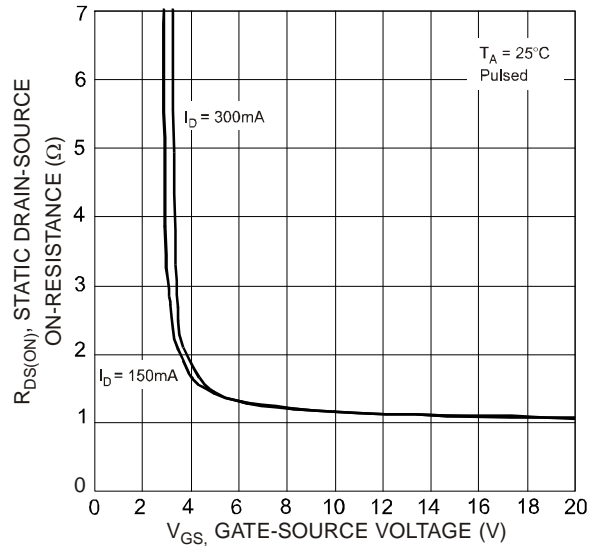
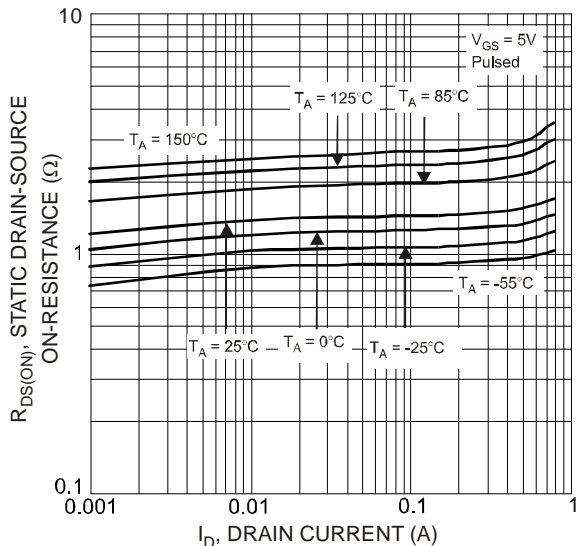
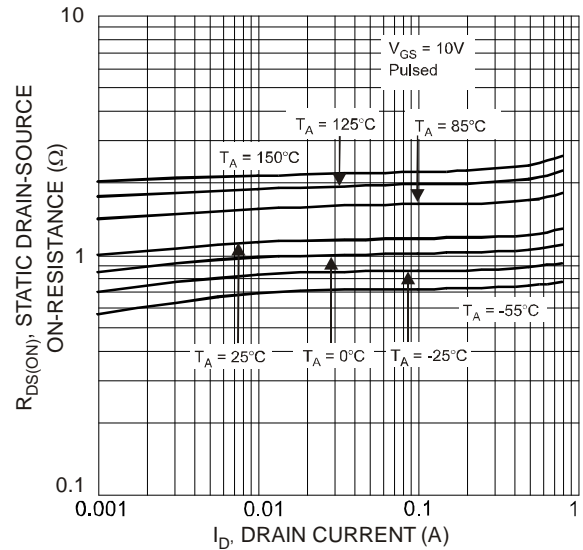
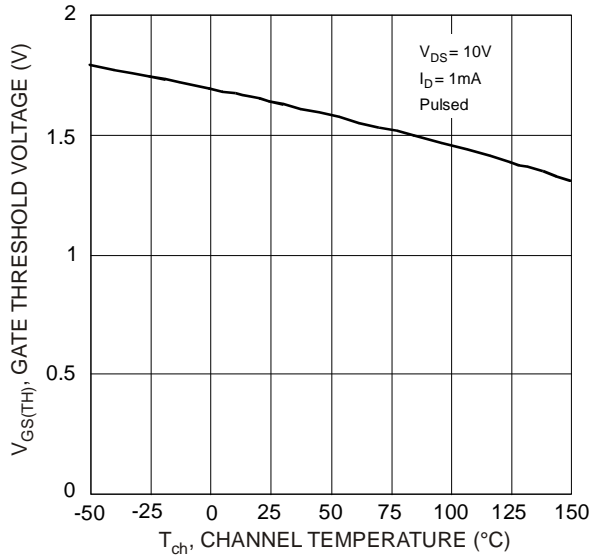
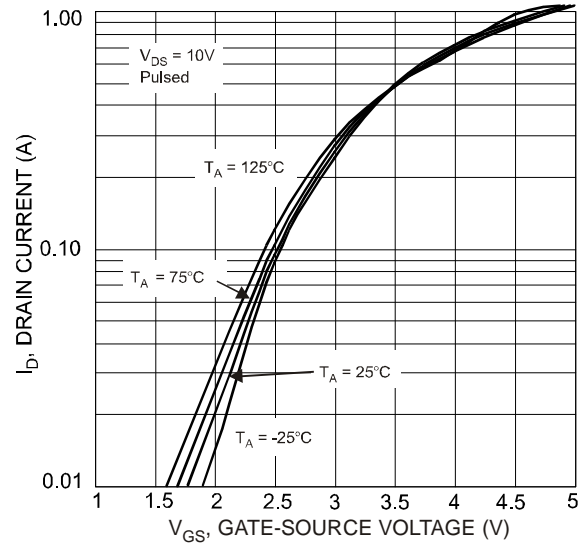
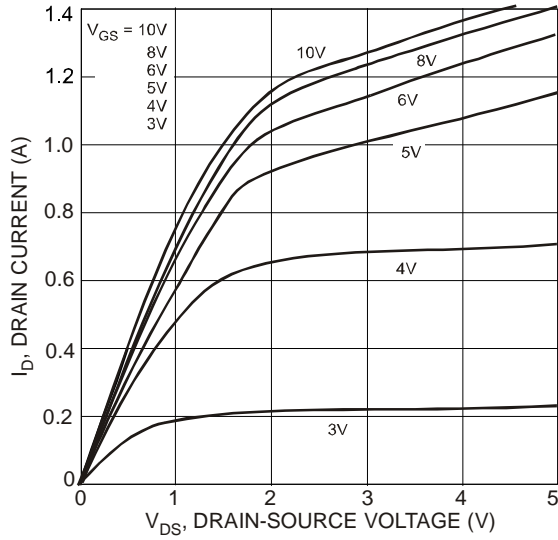
Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P <sub>D</sub>	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	157	°C/W
	t < 10s		121	
Total Power Dissipation (Note 6)		P <sub>D</sub>	0.98	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R <sub>θJA</sub>	113	°C/W
	t < 10s		88	
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	26	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate

**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>	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 10μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1.0	1.6	2.5	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	2.4	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 200mA
				4.0		V <sub>GS</sub> = 4V, I <sub>D</sub> = 200mA
Forward Transfer Admittance	Y <sub>fs</sub>	100	—	—	mS	V <sub>DS</sub> = 10V, I <sub>D</sub> = 200mA
Diode Forward Voltage	V <sub>SD</sub>	0.5	—	1.4	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 115mA
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	C <sub>iss</sub>	—	30	50	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	5	25	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	3	5.0	pF	
Gate Resistance	R <sub>g</sub>	—	133	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	304	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 250mA
Gate-Source Charge	Q <sub>gs</sub>	—	84	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	203	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	3.9	—	nS	V <sub>DS</sub> = 30V, I <sub>D</sub> = 0.2A, V <sub>GS</sub> = 10V, R <sub>G</sub> = 25Ω, R <sub>L</sub> = 150Ω
Turn-On Rise Time	t <sub>R</sub>	—	3.4	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	15.7	—		
Turn-Off Fall Time	t <sub>F</sub>	—	9.9	—		

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



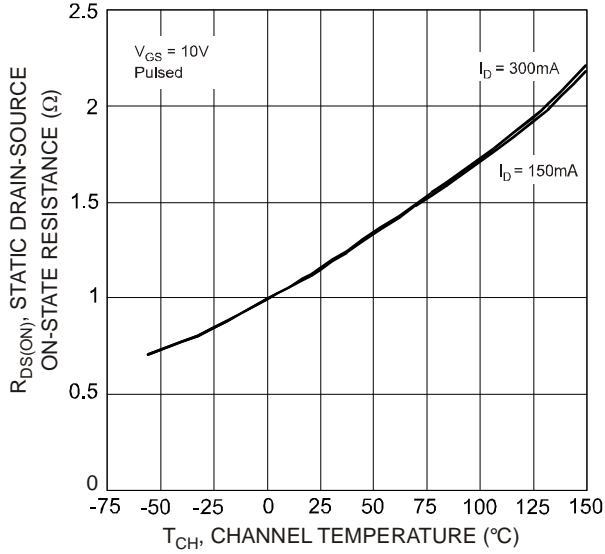


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

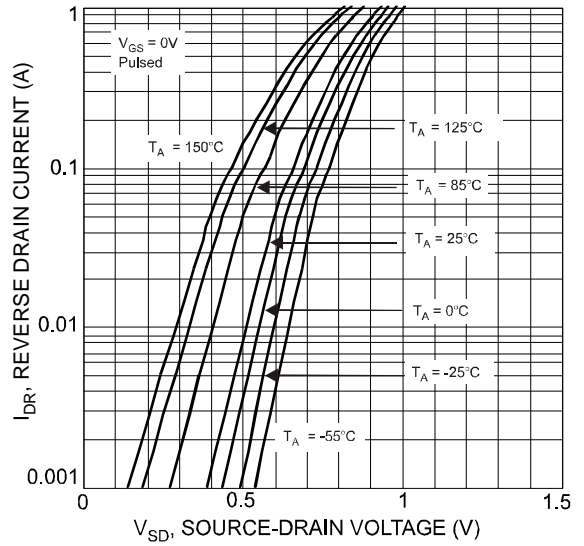


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

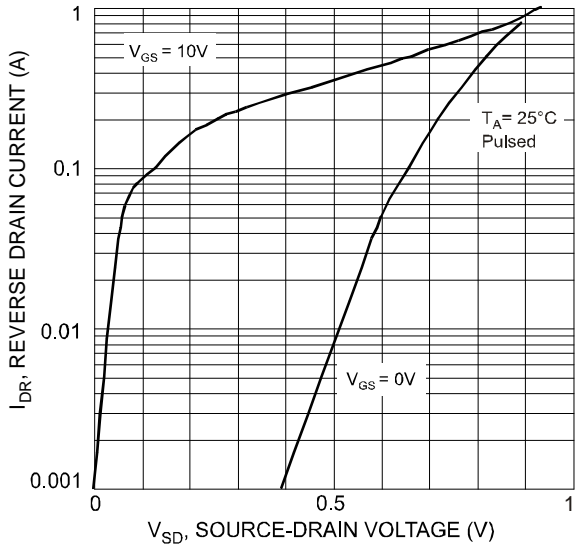


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

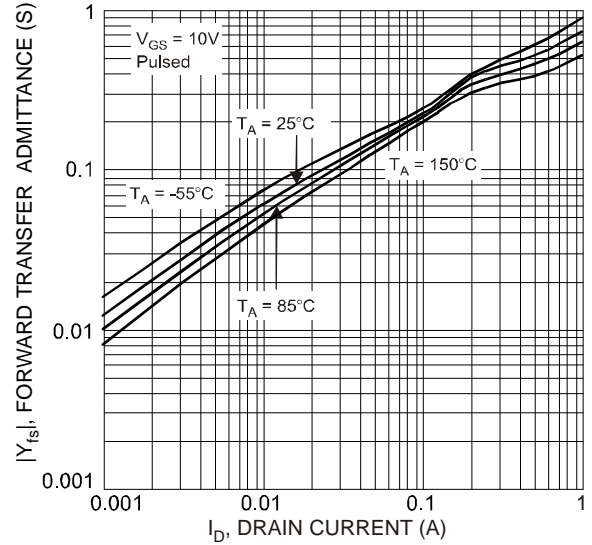
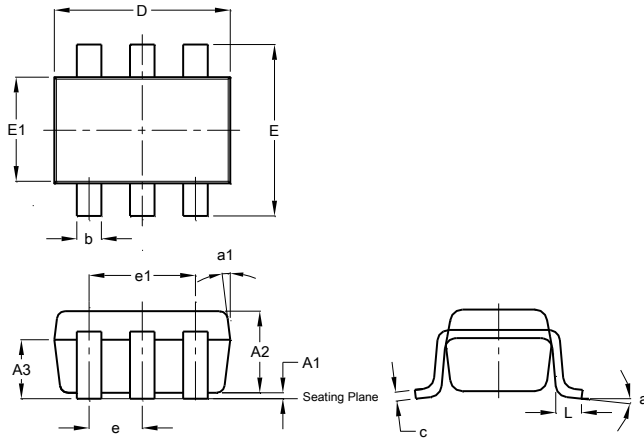


Fig.10 Forward Transfer Admittance vs. Drain Current

**Package Outline Dimensions**

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

**SOT26**

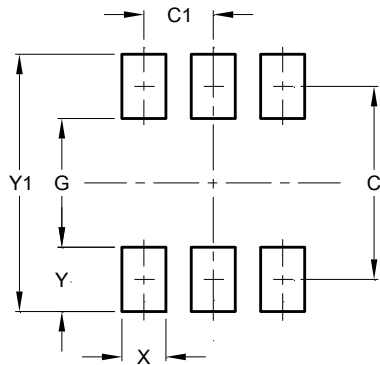


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	—	—	0.95
e1	—	—	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	—	—	8°
a1	—	—	7°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT26**



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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