

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ Max}$	$I_D \text{ Max}$ $T_A = 25^\circ\text{C}$
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.

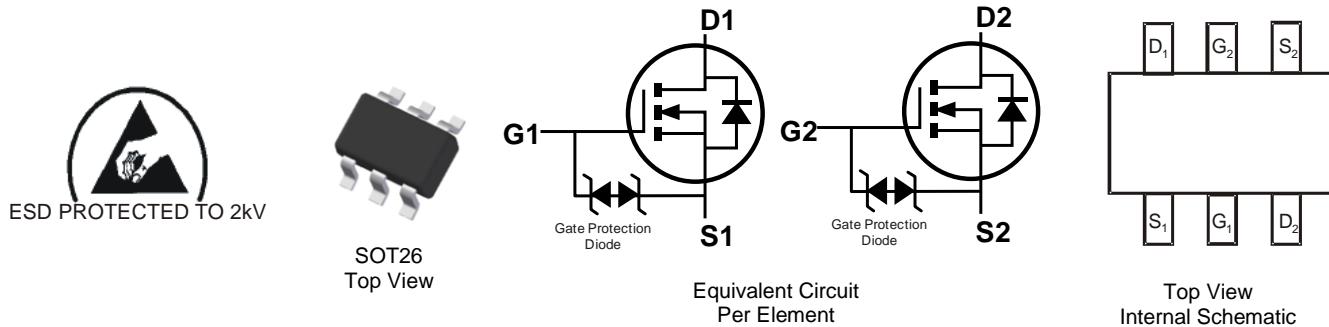
- DC-DC Converters
- Power Management Functions
- Analog Switch

## 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 (E3)
- Weight: 0.015 grams (Approximate)



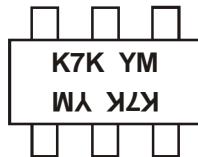
## Ordering Information (Note 4)

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 (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units		
Drain-Source Voltage	$V_{DSS}$	60	V		
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V		
Continuous Drain Current (Note 6) ( $V_{GS} = 10\text{V}$ )	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	510 400	mA
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	580 470	mA
Continuous Drain Current (Note 6) ( $V_{GS} = 4\text{V}$ )	Steady State	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	390 300	mA
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	$I_D$	440 340	mA
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	850	mA		
Maximum Body Diode Continuous Current	$I_S$	1.2	A		

## Thermal Characteristics

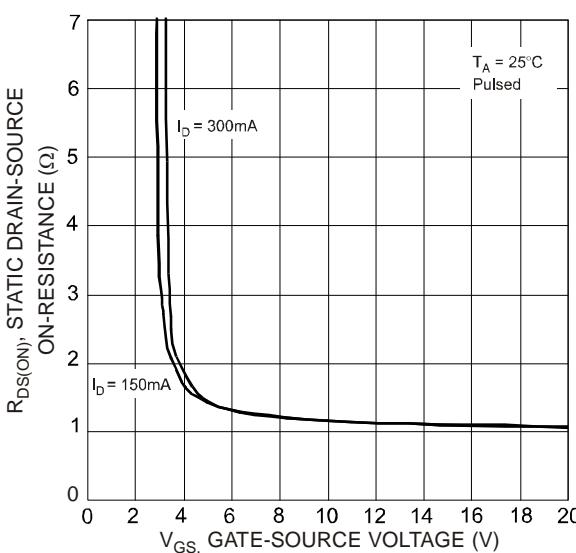
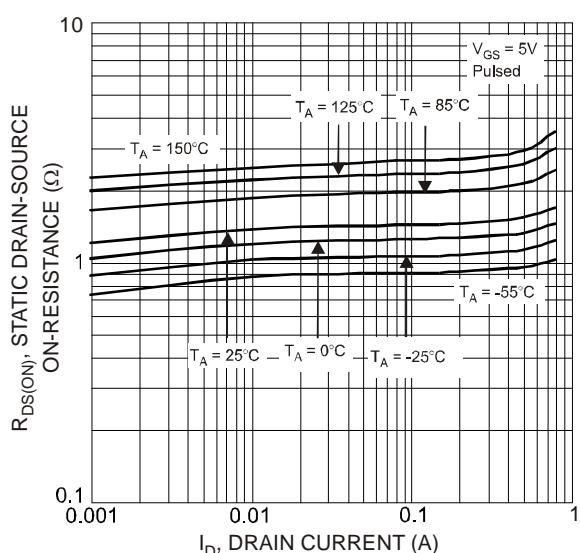
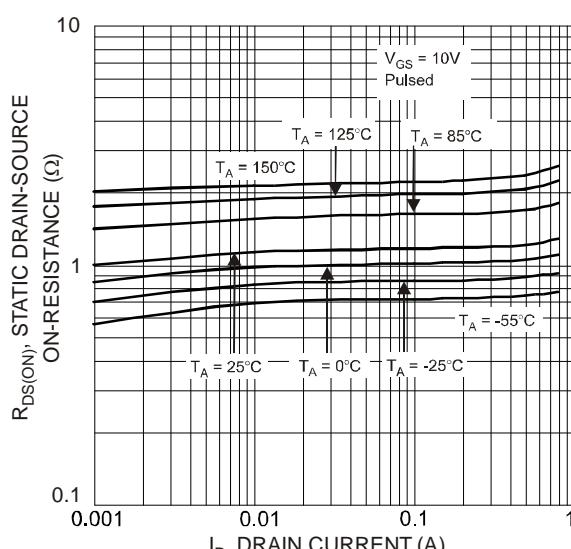
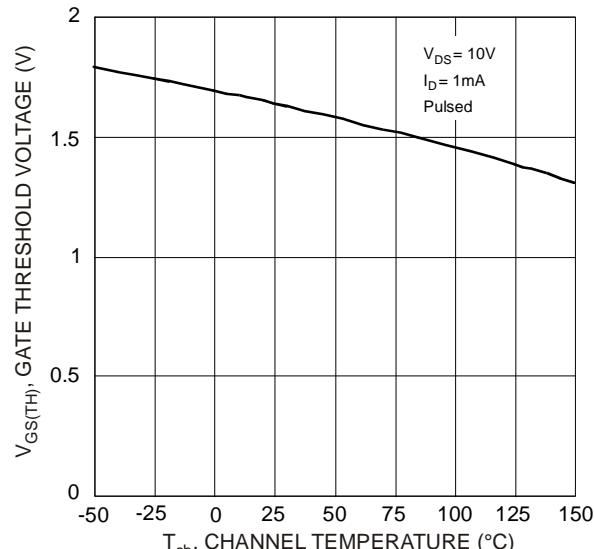
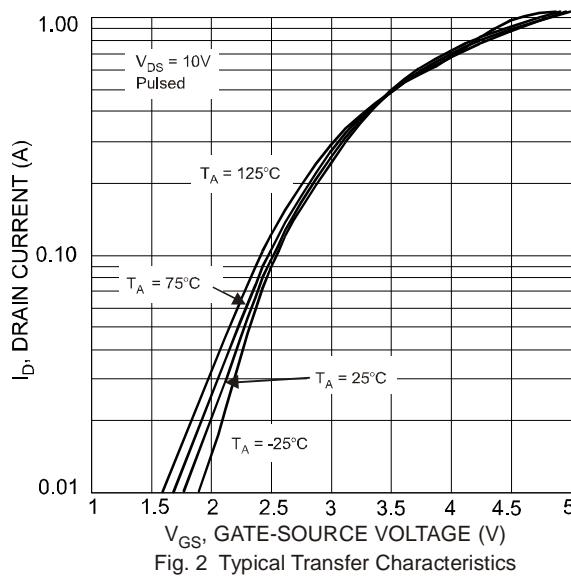
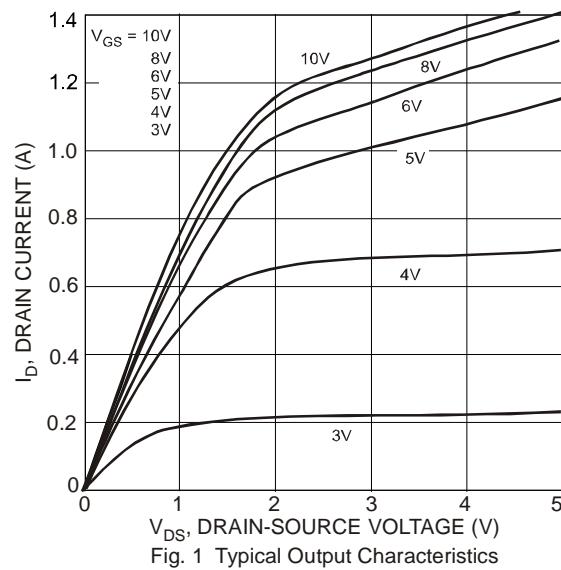
Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	157	$^\circ\text{C/W}$
	$t < 10\text{s}$	121	
Total Power Dissipation (Note 6)	$P_D$	0.98	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	113	$^\circ\text{C/W}$
	$t < 10\text{s}$	88	
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	26	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.  
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

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

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



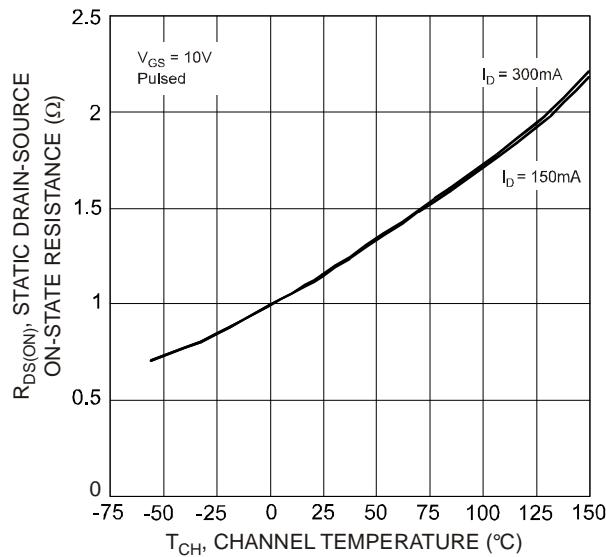


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

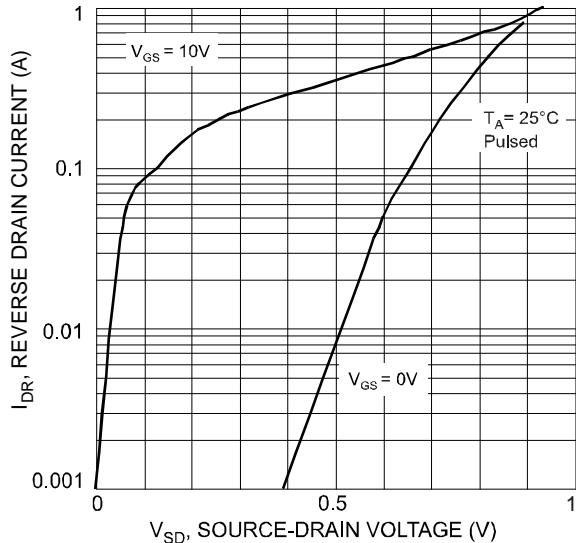


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

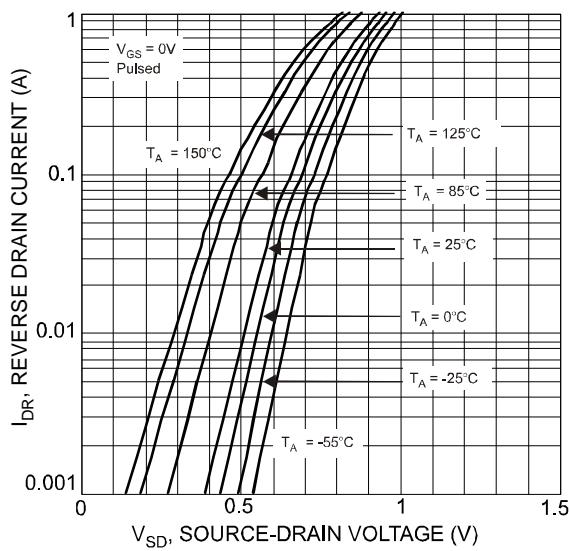


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

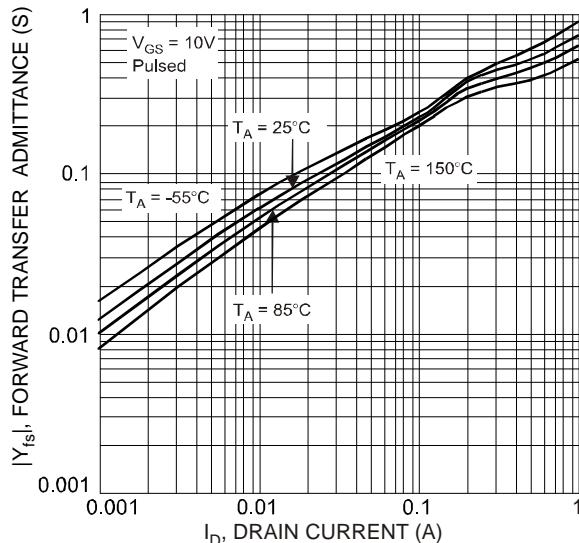
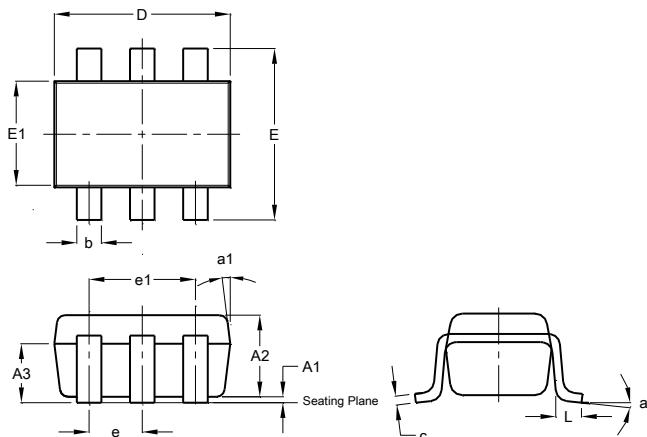


Fig. 10 Forward Transfer Admittance vs. Drain Current

## Package Outline Dimensions

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

SOT26



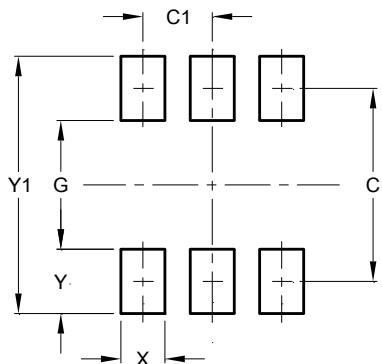
SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	—	—	0.95
e1	—	—	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	—	—	8°
a1	—	—	7°

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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