

Product Summary

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

Description and Applications

This new generation MOSFET has been 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.

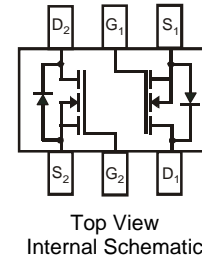
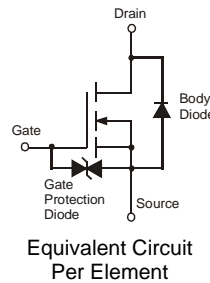
- DC-DC Converters
- Power management functions
- Analog Switch

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**
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **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
- Weight: 0.015 grams (approximate)

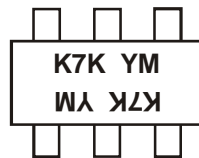


Ordering Information (Note 3)

Part Number	Case	Packaging
DMN601DMK-7	SOT26	3000/Tape & Reel

- Notes:
1. No purposefully added lead
 2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
 3. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



K7K = Marking Code
 YM = Date Code Marking
 Y = Year (ex: S = 2005)
 M = Month (ex: 9 = September)

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	S	T	U	V	W	X	Y	Z	A	B	C	D	E
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	Units
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 T _A = 70°C	I _D	510 400	mA
	t < 10s	T _A = 25°C T _A = 70°C	I _D	580 470	mA
Continuous Drain Current (Note 5) V _{GS} = 4V	Steady State	T _A = 25°C T _A = 70°C	I _D	390 300	mA
	t < 10s	T _A = 25°C T _A = 70°C	I _D	440 340	mA
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I _{DM}	850	mA
Maximum Body Diode Continuous Current			I _S	1.2	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 4)		P _D	0.7	W
Thermal Resistance, Junction to Ambient (Note 4)	Steady state	R _{θJA}	157	°C/W
	t < 10s		121	
Total Power Dissipation (Note 5)		P _D	0.98	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	113	°C/W
	t < 10s		88	
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	26	
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}	60	—	—	V	V _{GS} = 0V, I _D = 10µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(th)}	1.0	1.6	2.5	V	V _{DS} = 10V, I _D = 1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	2.4	Ω	V _{GS} = 10V, I _D = 200mA
				4.0		V _{GS} = 4V, I _D = 200mA
Forward Transfer Admittance	Y _{fs}	100	—	—	ms	V _{DS} = 10V, I _D = 200mA
Diode Forward Voltage	V _{SD}	0.5	—	1.4	V	V _{GS} = 0V, I _S = 115mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iSS}	—	30	50	pF	V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oSS}	—	5	25	pF	
Reverse Transfer Capacitance	C _{rSS}	—	3	5.0	pF	
Gate Resistance	R _g	—	133	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	304	—	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA
Gate-Source Charge	Q _{gs}	—	84	—		
Gate-Drain Charge	Q _{gd}	—	203	—		
Turn-On Delay Time	t _{D(on)}	—	3.9	—	ns	V _{DS} = 30V, I _D = 0.2A, V _{GS} = 10V, R _G = 25Ω, R _L = 150Ω
Turn-On Rise Time	t _r	—	3.4	—		
Turn-Off Delay Time	t _{D(off)}	—	15.7	—		
Turn-Off Fall Time	t _f	—	9.9	—		

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

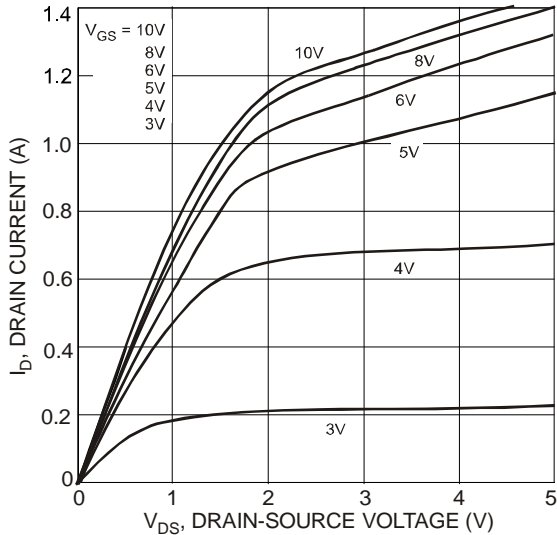


Fig. 1 Typical Output Characteristics

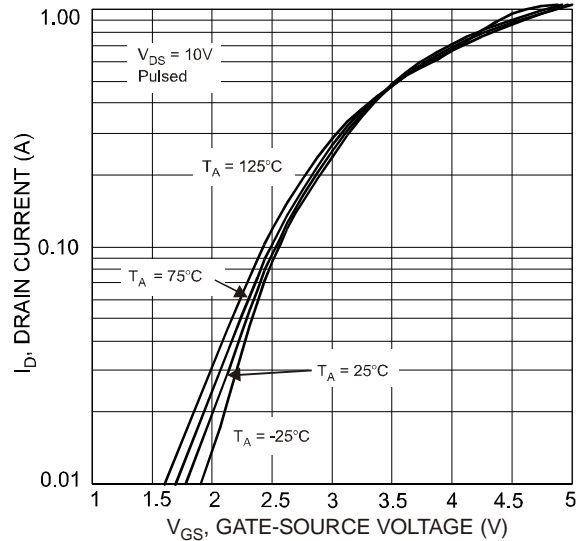


Fig. 2 Typical Transfer Characteristics

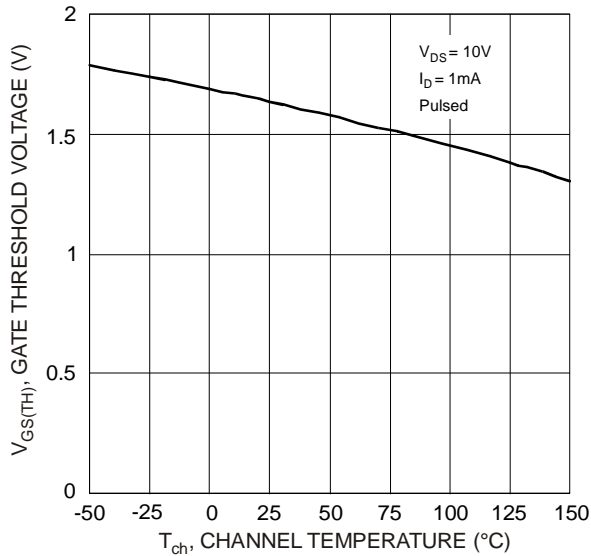


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

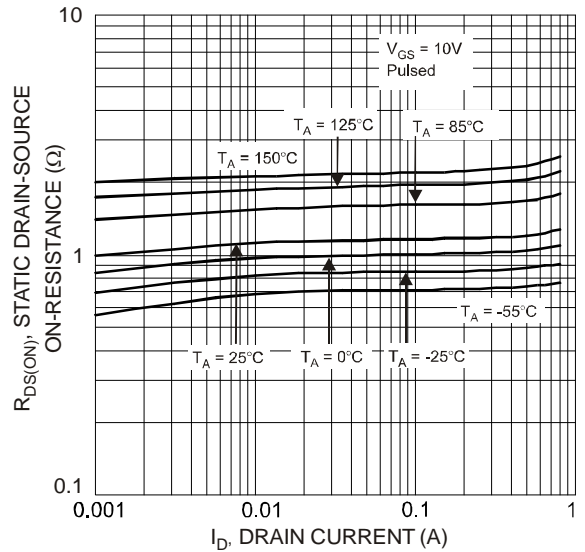


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

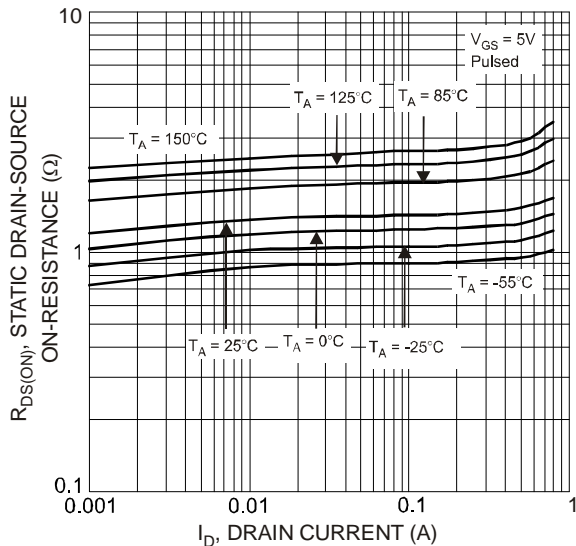


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

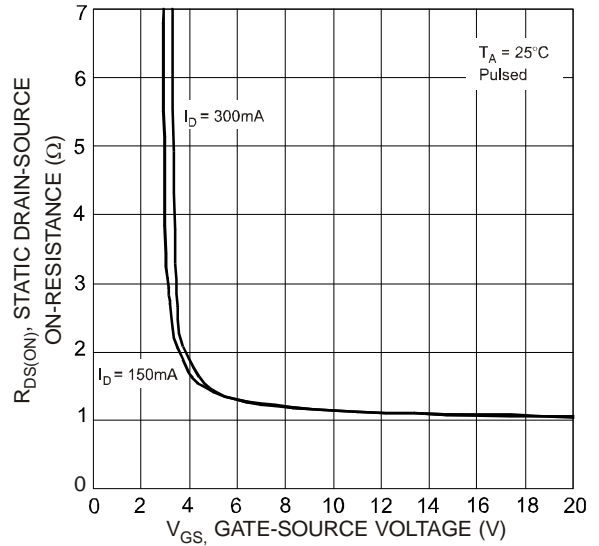


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

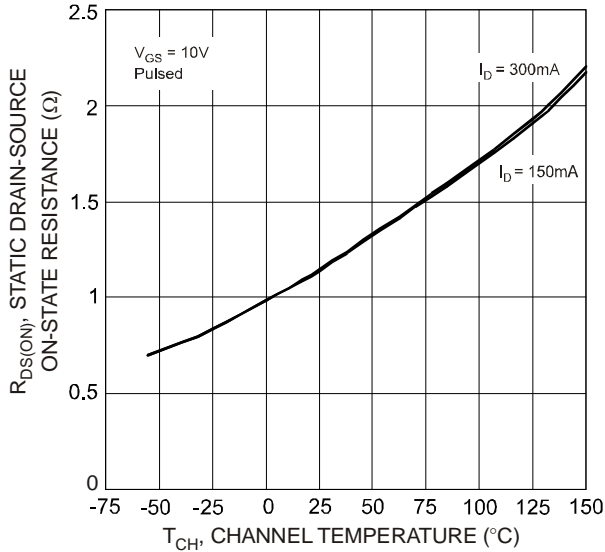


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

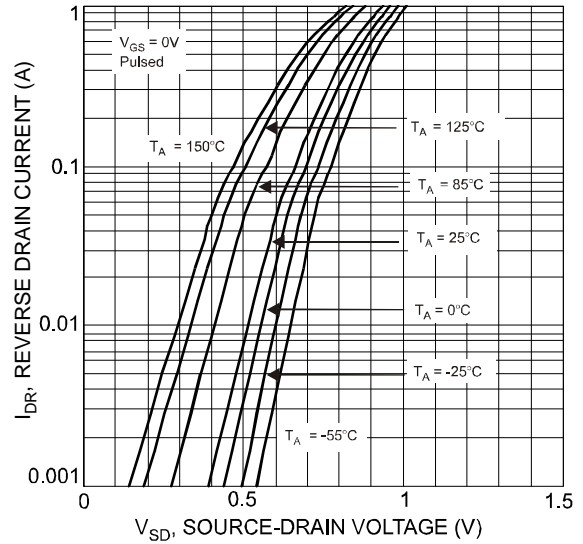


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

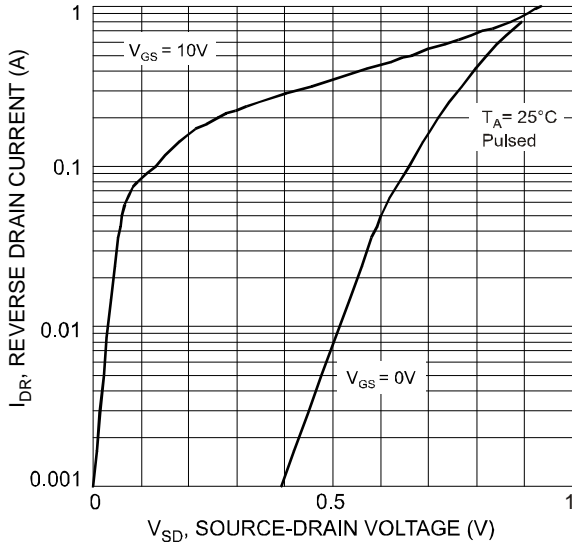


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

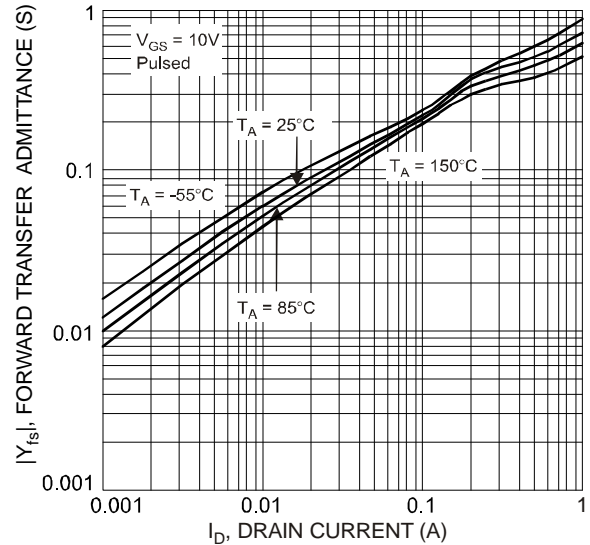
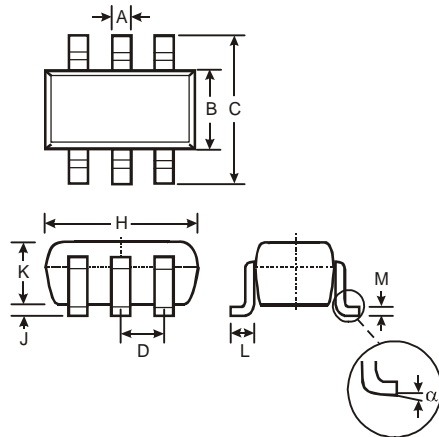


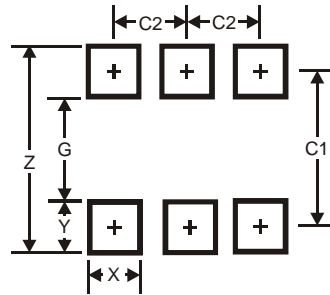
Fig.10 Forward Transfer Admittance vs. Drain Current

Package Outline Dimensions



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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