

Product Summary

BV_{DSS}	R_{Ds(ON)} Max	I_D Max T_A = +25°C
60V	2Ω @ V _{GS} = 10V	0.3A
	3Ω @ V _{GS} = 5V	0.2A

Description and Applications

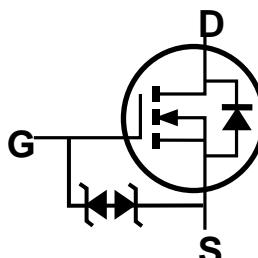
This MOSFET is designed to minimize the on-state resistance (R_{Ds(ON)}), yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- Power Management Functions

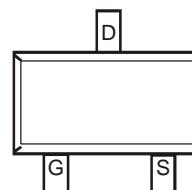


Top View

SOT523



Gate Protection Diode



Top View
Pin Out Configuration

Features

- Low On-Resistance: R_{Ds(ON)}
- 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: SOT523
- 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 Leadframe. Solderable per MIL-STD-202, Method 208 ③
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)

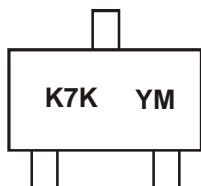
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN601TK-7	SOT523	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 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



K7K = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

Year	2005	2006	...	2014	2015	2016	2017	2018	2019	2020	2021	
Code	S	T	...	B	C	D	E	F	G	H	I	
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	Unit	
Drain-Source Voltage	V_{DSS}	60	V	
Gate-Source Voltage	V_{GSS}	± 20	V	
Drain Current (Note 5)	Continuous Pulsed (Note 6)	I_D	300 800	mA

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

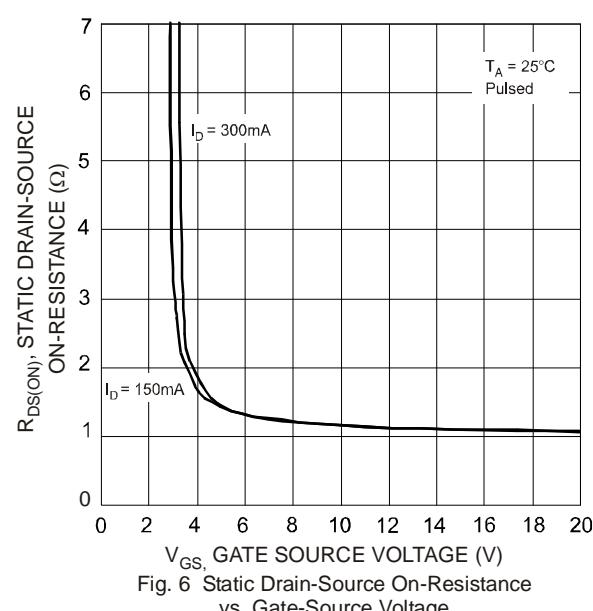
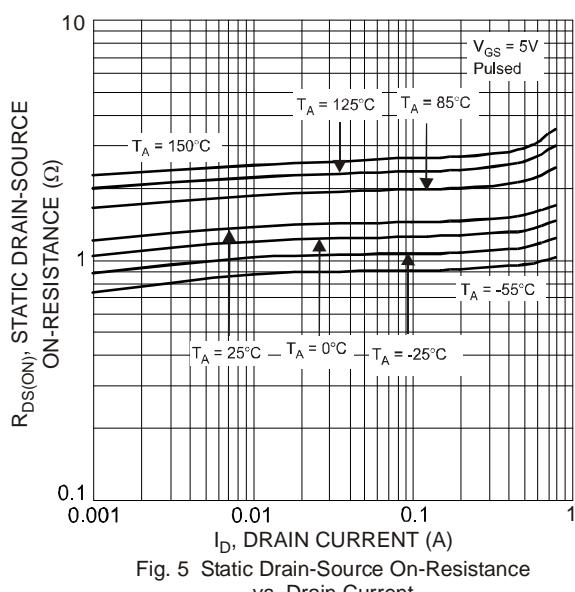
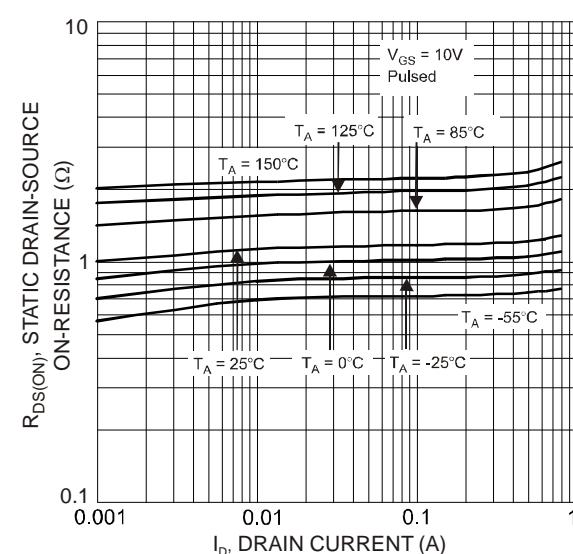
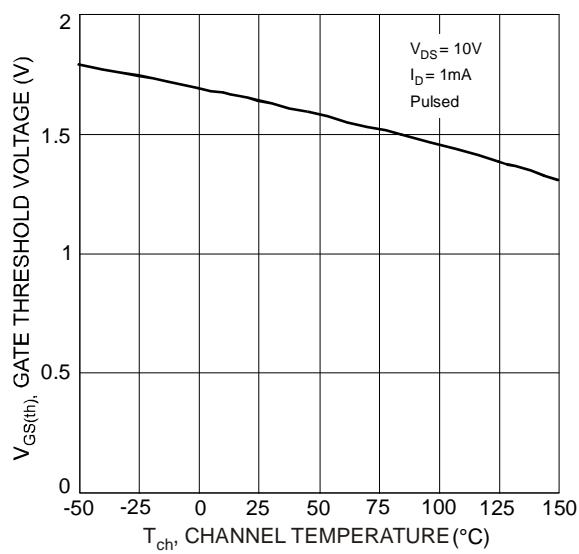
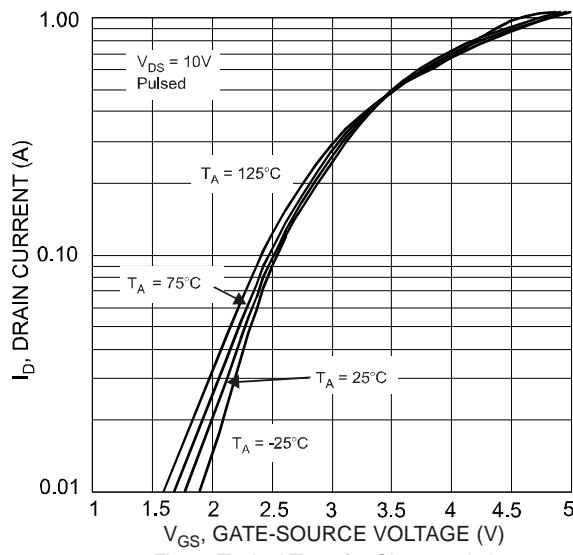
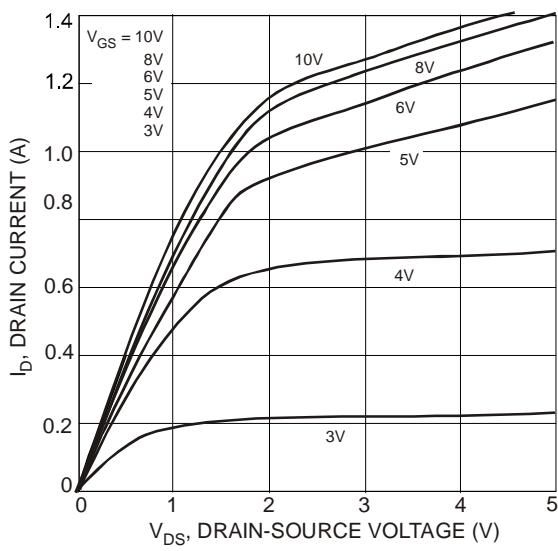
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$V_{GS} = 0\text{V}$, $I_D = 10\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	μA	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	1.6	2.5	V	$V_{DS} = 10\text{V}$, $I_D = 1\text{mA}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	2.0 3.0	Ω	$V_{GS} = 10\text{V}$, $I_D = 0.5\text{A}$ $V_{GS} = 5\text{V}$, $I_D = 0.05\text{A}$
Forward Transfer Admittance	$ Y_{FS} $	80	—	—	ms	$V_{DS} = 10\text{V}$, $I_D = 0.2\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{ISS}	—	—	50	pF	$V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{OSS}	—	—	25	pF	
Reverse Transfer Capacitance	C_{RSS}	—	—	5.0	pF	
Turn-On Delay Time	$t_{D(ON)}$	—	3.4	—	ns	$V_{DD} = 25\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\Omega$, $I_D = 500\text{mA}$
Turn-On Rise Time	t_R	—	2.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	11.0	—	ns	
Turn-Off Fall Time	t_F	—	4.9	—	ns	

Notes:

5. Device mounted on FR-4 PCB.
6. Pulse width $\leq 10\mu\text{s}$, Duty Cycle $\leq 1\%$.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.



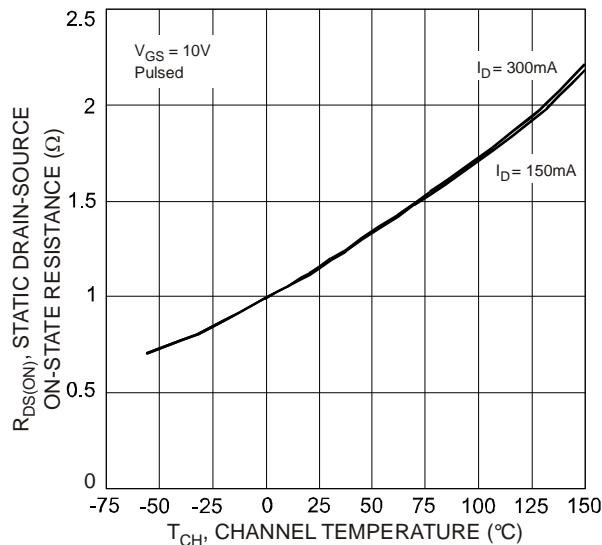


Fig. 7 Static Drain-Source On-State Resistance vs. Channel Temperature

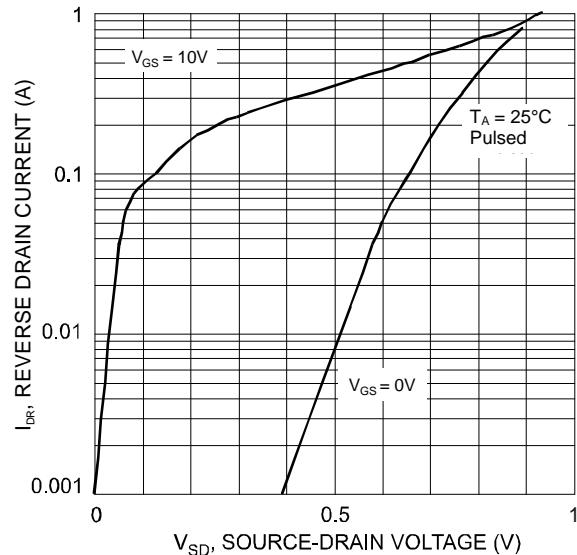


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

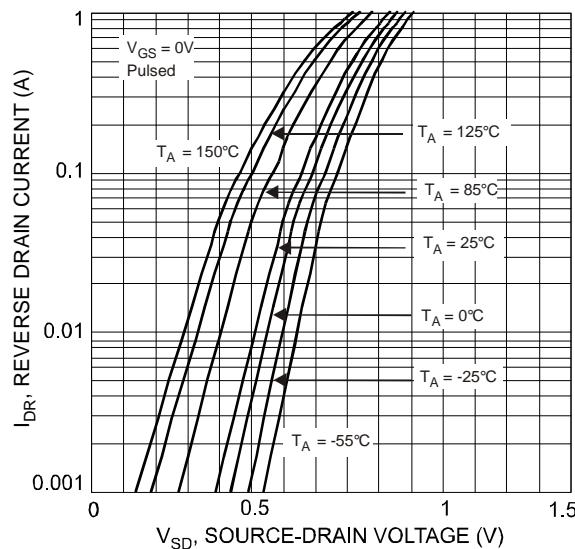


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

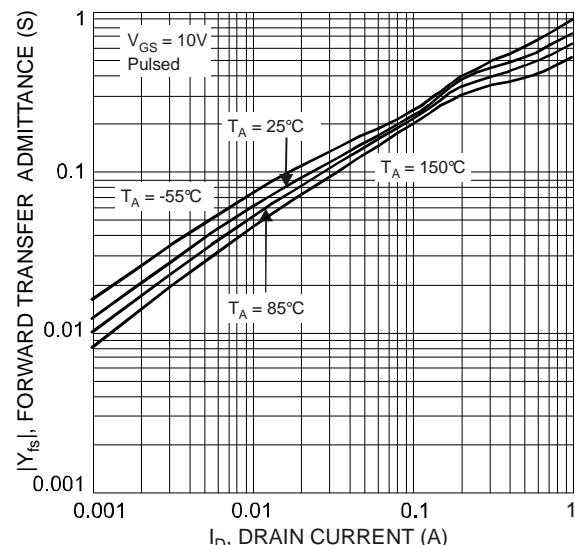
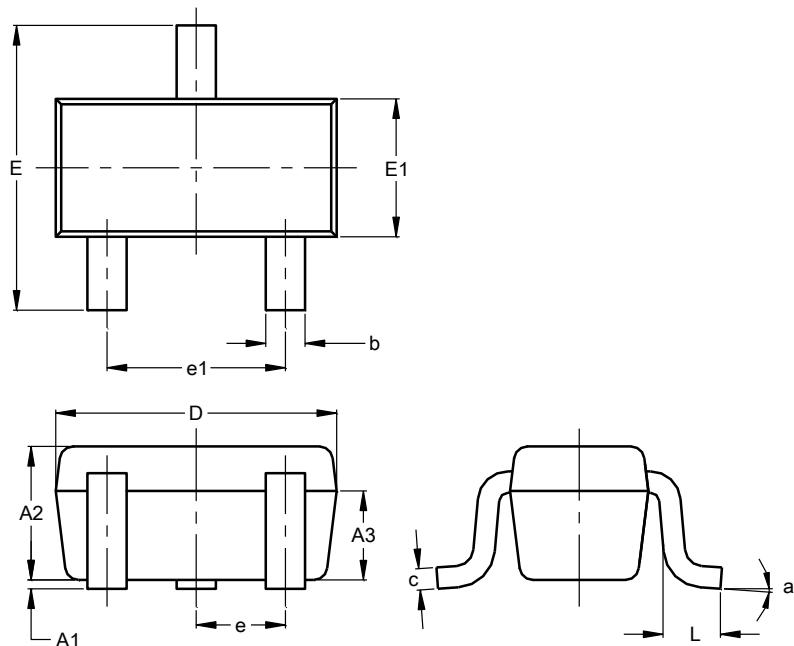


Fig. 10 Forward Transfer Admittance vs. Drain Current

Package Outline Dimensions

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

SOT523



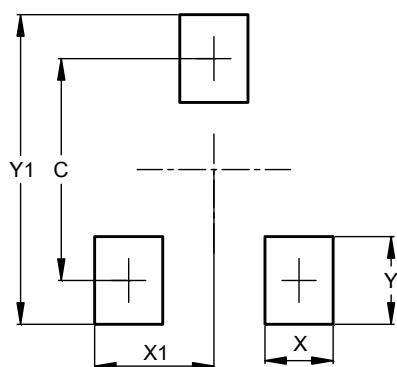
SOT523			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°

All Dimensions in mm

Suggested Pad Layout

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

SOT523



Dimensions	Value
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

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