

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Features

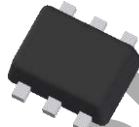
- Dual N-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage, 1.0V Max
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **ESD Protected up to 2kV**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMN5L06VKQ](#))**

Mechanical Data

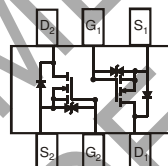
- Package: SOT563
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)



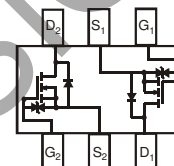
ESD protected up to 2kV



SOT563
Top View



DMN5L06VK



DMN5L06VAK
DMN5010VAK

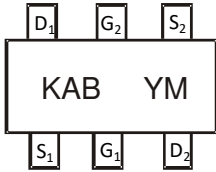
Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN5L06VK-7	SOT563	3,000	Tape & Reel
DMN5L06VK-7A	SOT563	3,000	Tape & Reel
DMN5L06VK-13	SOT563	10,000	Tape & Reel
DMN5L06VK-13A	SOT563	10,000	Tape & Reel
DMN5L06VAK-7	SOT563	3,000	Tape & Reel
DMN5L06VAK-7A	SOT563	3,000	Tape & Reel
DMN5L06VAK-13	SOT563	10,000	Tape & Reel
DMN5L06VAK-13A	SOT563	10,000	Tape & Reel
DMN5010VAK-7	SOT563	3,000	Tape & Reel
DMN5010VAK-7A	SOT563	3,000	Tape & Reel
DMN5010VAK-13	SOT563	10,000	Tape & Reel
DMN5010VAK-13A	SOT563	10,000	Tape & Reel

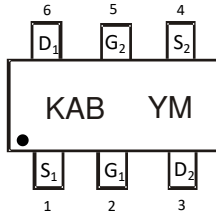
- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- 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 (Notes 5 & 6)

DMN5L06VK-7/-13 (Note 5)

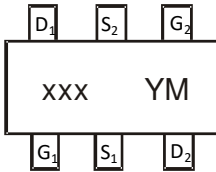


DMN5L06VK-7A/-13A (Note 6)

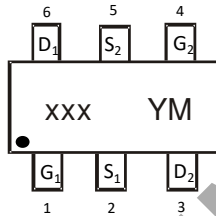


KAB= DMN5L06VK Product Type
Marking Code
YM= Date Code Marking
Y = Year (ex: J = 2022)
M = Month (ex: 9 = September)

**DMN5L06VAK-7/-13 (Note 5)
DMN5010VAK-7/-13 (Note 5)**



**DMN5L06VAK-7A/-13A (Note 6)
DMN5010VAK-7A/-13A (Note 6)**



xxx = Product Type Marking Code:
KAE or KAE or KAC
YM= Date Code Marking
Y = Year (ex: J = 2022)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	...	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	T	...	J	K	L	M	N	O	P	R	S	T
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

- Notes: 5. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).
6. Part number with suffix 7A and 13A designates devices marked with a Pin 1 indicator. There is no other difference between both devices.

NOT RECOMMENDED FOR NEW DESIGN

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain Source Voltage	V _{DSS}	50	V
Drain-Gate Voltage R _{GS} ≤ 1.0MΩ	V _{DGR}	50	V
Gate-Source Voltage	V _{GSS}	±20	V
		±40	
Drain Current (Note 7)	I _D	280	mA
	I _{DM}	1.5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 7)	P _D	250	mW
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	500	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	50	—	—	V	V _{GS} = 0V, I _D = 10μA
Zero Gate Voltage Drain Current @ T _C = +25°C	I _{DSS}	—	—	60	nA	V _{DS} = 50V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	1	μA	V _{GS} = ±12V, V _{DS} = 0V
				500	nA	V _{GS} = ±10V, V _{DS} = 0V
				50	nA	V _{GS} = ±5V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage @T _J = +25°C @T _J = +0°C to +85°C (Note 9)	V _{GS(TH)}	0.49 0.30	—	1.0 1.2	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	—	3.0	Ω	V _{GS} = 1.8V, I _D = 50mA
				2.5		V _{GS} = 2.5V, I _D = 50mA
				2.0		V _{GS} = 5.0V, I _D = 50mA
On-State Drain Current	I _{D(ON)}	0.5	1.4	—	A	V _{GS} = 10V, V _{DS} = 7.5V
Forward Transconductance	Y _{fs}	200	—	—	mS	V _{DS} = 10V, I _D = 0.2A
Source-Drain Diode Forward Voltage	V _{SD}	0.5	—	1.4	V	V _{GS} = 0V, I _S = 115mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	—	50	pF	V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	—	25	pF	
Reverse Transfer Capacitance	C _{rss}	—	—	5.0	pF	

- Notes:
7. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design. Not subject to product testing.

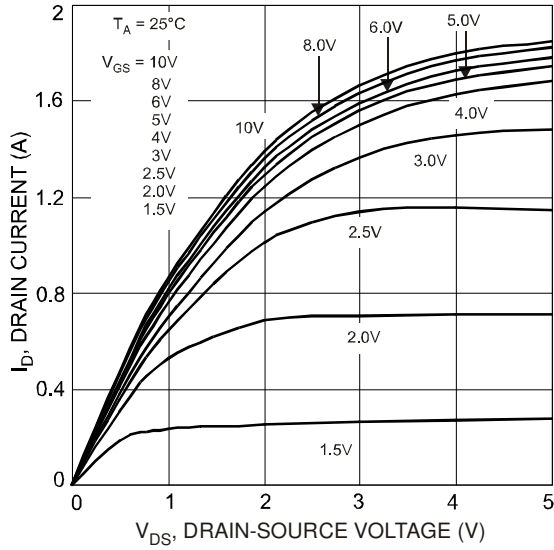


Fig. 1 Typical Output Characteristics

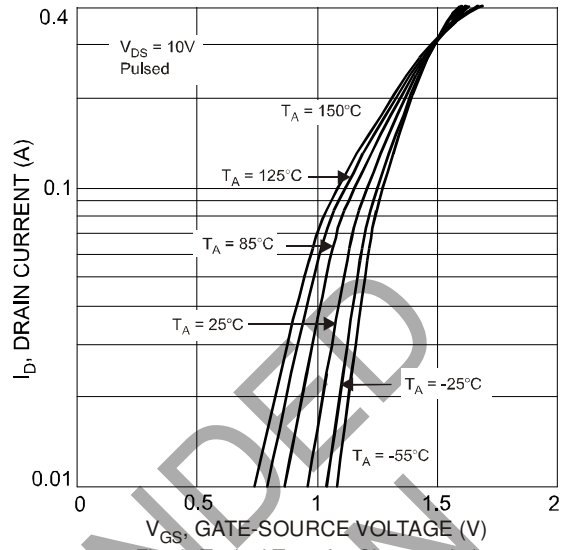


Fig. 2 Typical Transfer Characteristics

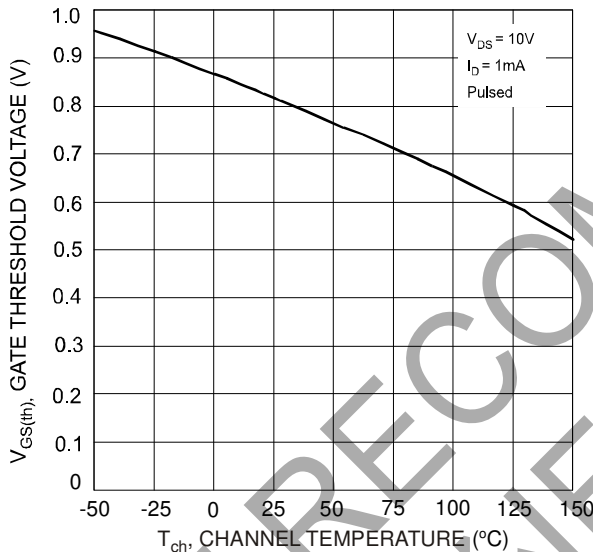


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

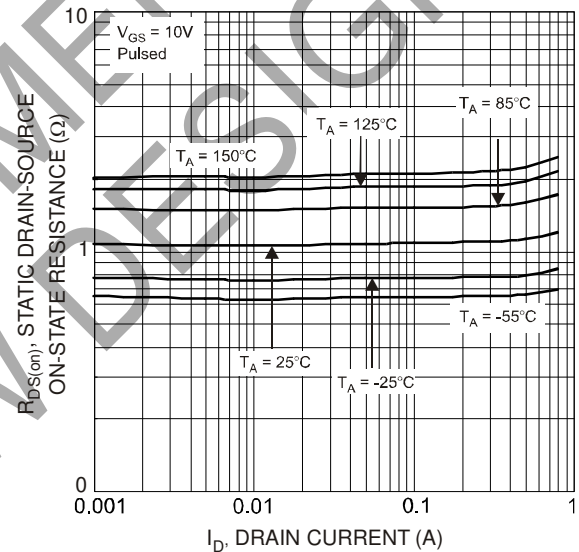


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

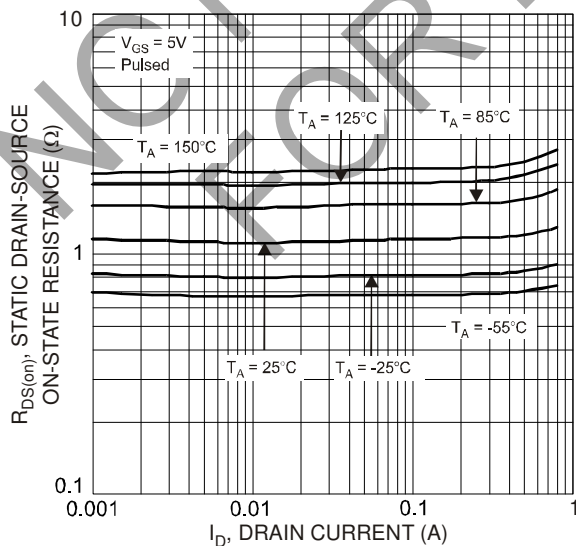


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

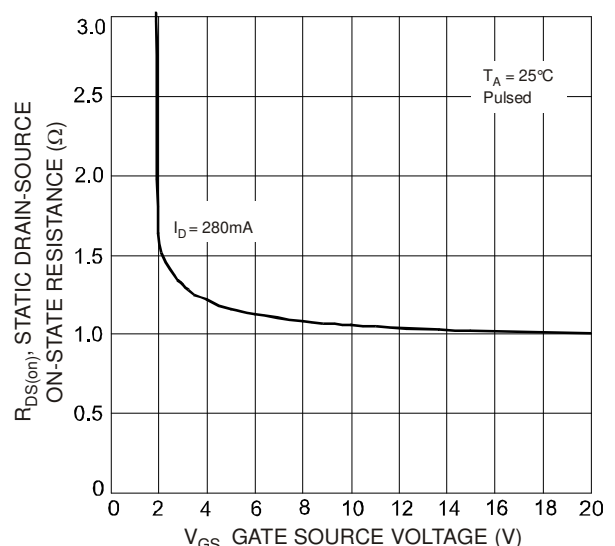


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

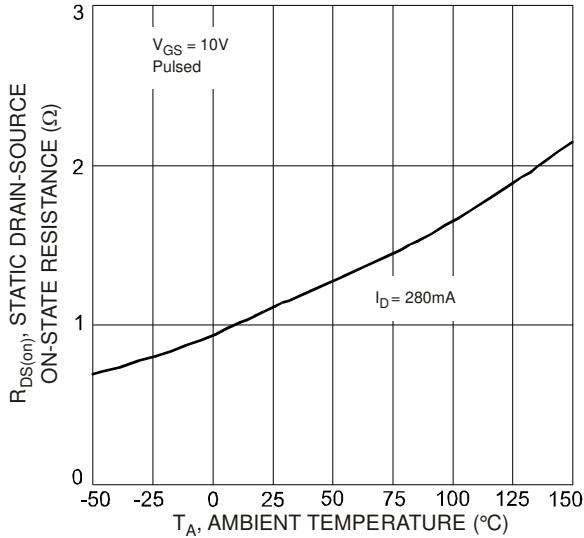


Fig. 7 Static Drain-Source On-State Resistance vs. Ambient Temperature

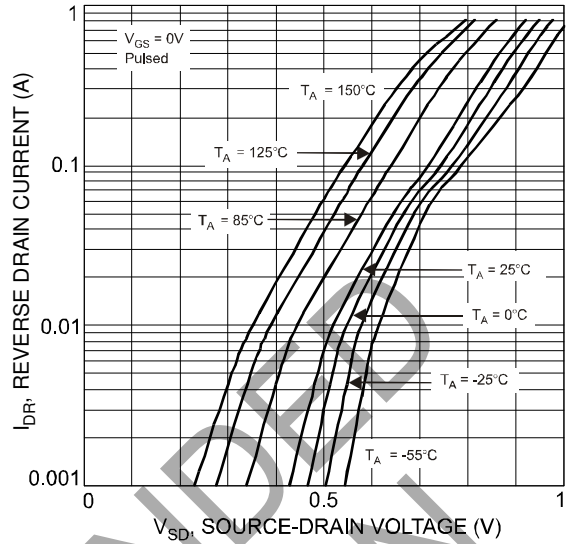


Fig. 8 Reverse Drain Current vs. Source-Drain Voltage

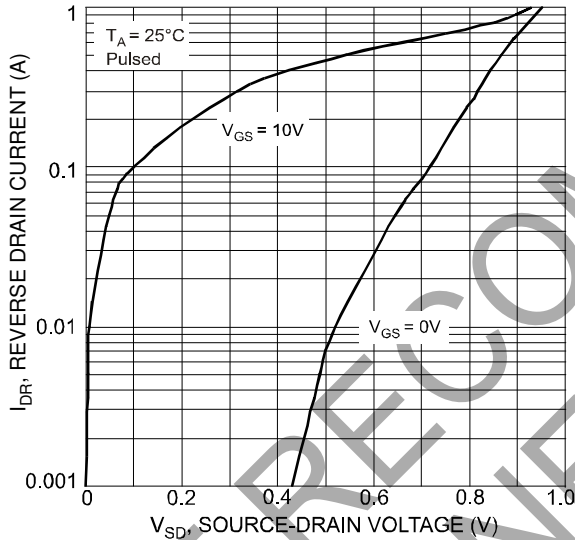


Fig. 9 Reverse Drain Current vs. Source-Drain Voltage

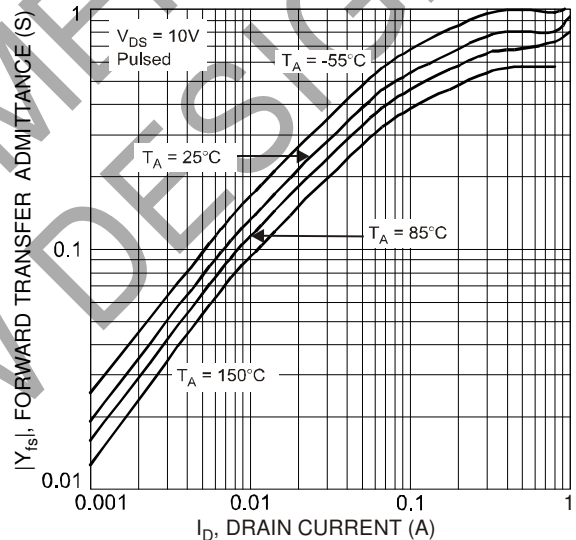


Fig. 10 Forward Transfer Admittance vs. Drain Current

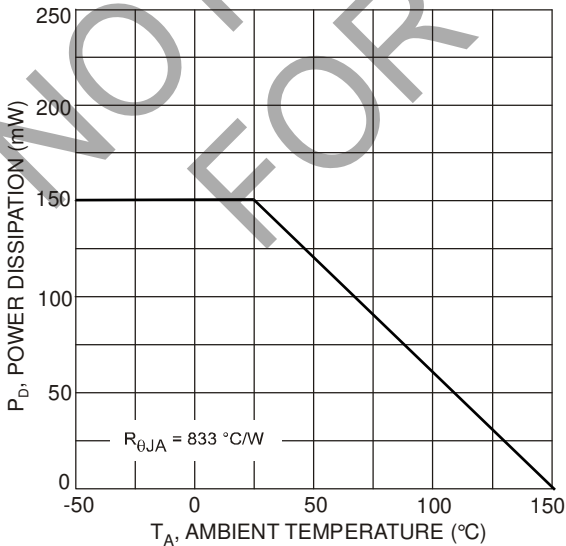
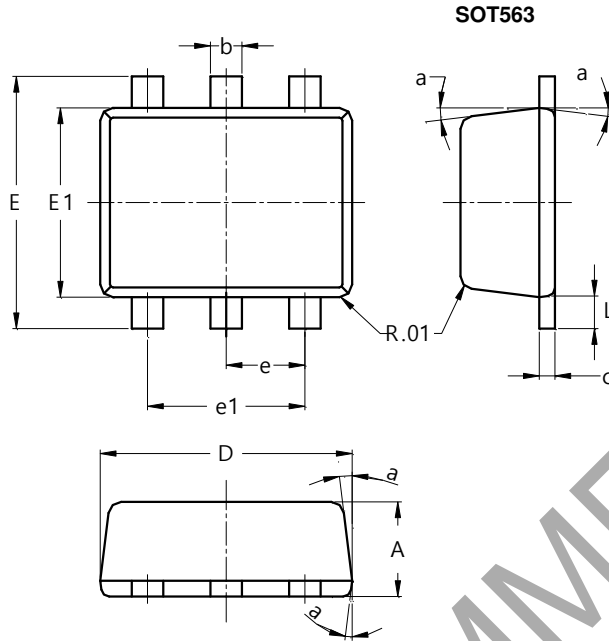


Fig. 11 Derating Curve - Total

Package Outline Dimensions

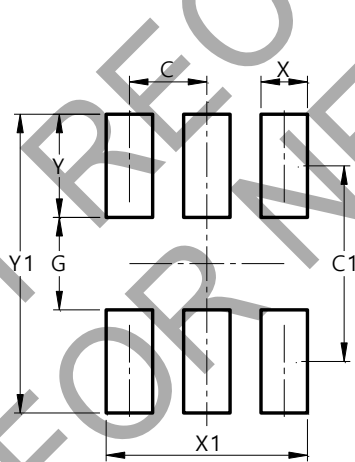
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940

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