



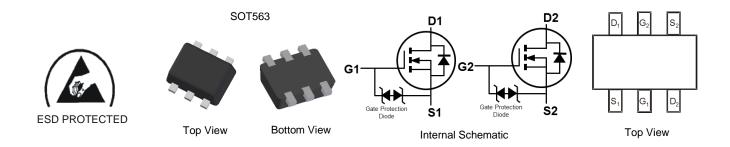
DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surface-Mount Package
- ESD Protected Gate
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please <u>contact us</u> or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

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 Lead Frame. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.003 grams (Approximate)



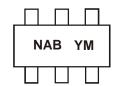
Ordering Information (Note 4)

Part Number	Poekage	Packing			
Fait Number	Package	Qty.	Carrier		
DMN2004VK-7	SOT563	3000	Tape & Reel		
DMN2004VK-7B	SOT563	8000	Tape & Reel (Note 5)		
DMN2004VK-13	SOT563	10000	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/.
- 5. Change the pitch from 4mm to 2mm in T& R.

Marking Information



NAB = Product Type Marking Code YM = Date Code Marking Y = Year (ex: K = 2023)

M = Month (ex: 9 = September)

Date Code Key

Year	2010		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	Χ		K	L	М	N	Р	R	S	T	U	V
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

	Characteristic	Symbol	Value	Unit	
Drain-Source Voltage			VDSS	20	V
Gate-Source Voltage			Vgss	±8	V
Drain Current (Note 6)	Steady State	$T_A = +25^{\circ}C$ $T_A = +85^{\circ}C$	lD	540 390	mA
Pulsed Drain Current (10µs Pulse,	Duty Cycle = 1%)	I _{DM}	1.5	Α	

Thermal Characteristics (TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	PD	250	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	TJ, TSTG	-55 to +150	°C

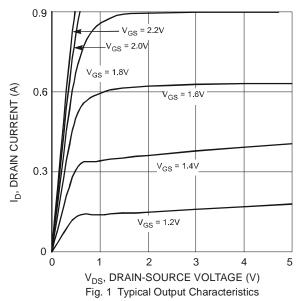
Electrical Characteristics (T_A = +25°C, unless otherwise specified.)

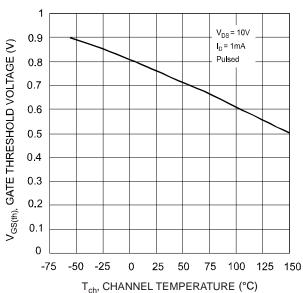
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 7)	, ,	l.			l .		
Drain-Source Breakdown Voltage	BV _{DSS}	20	_	_	V	$V_{GS} = 0V, I_{D} = 10\mu A$	
Zero Gate Voltage Drain Current	IDSS	_	_	1	μΑ	V _{DS} = 16V, V _{GS} = 0V	
Gate-Source Leakage	Igss	_	_	±1	μΑ	$V_{GS} = \pm 4.5V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 7)							
Gate Threshold Voltage	VGS(TH)	0.5	_	1.0	V	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	
			0.4	0.55		$V_{GS} = 4.5V, I_{D} = 540mA$	
Static Drain-Source On-Resistance	RDS(ON)	_	0.5	0.70	Ω	$V_{GS} = 2.5V, I_D = 500mA$	
			0.7	0.9		$V_{GS} = 1.8V, I_{D} = 350mA$	
Forward Transfer Admittance	Y _{fs}	200	_	_	ms	$V_{DS} = 10V, I_D = 0.2A$	
Diode Forward Voltage	VsD	0.5	_	1.4	V	V _G S = 0V, I _S = 115mA	
DYNAMIC CHARACTERISTICS (Note 8)							
Input Capacitance	Ciss		_	150	pF	101/11/	
Output Capacitance	Coss		_	25	pF	$V_{DS} = 16V, V_{GS} = 0V$ - f = 1.0MHz	
Reverse Transfer Capacitance	Crss		_	20	pF	1 = 1.01/11/12	
SWITCHING CHARACTERISTICS (Note 8)							
Turn-On Delay Time	td(ON)	_	8.0	1	ns	V 40V D 470	
Rise Time	t _R		13.3		ns	$V_{DD} = 10V, R_L = 47\Omega,$ $V_{DD} = 200 \text{mA}. V_{GEN} = 4.5V.$	
Turn-Off Delay Time	tD(OFF)	_	53.5	_	ns	$R_{G} = 200 \text{ mA. VGEN} = 4.5 \text{ V},$ $R_{G} = 10 \Omega$	
Fall Time	t _F		36.1	_	ns	NG = 1022	

Notes:

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







V_{SS} = 5V Pulsed

T_A = 150°C

T_A = 125°C

T_A = 85°C

T_A = 85°C

T_A = -55°C

T_A = -55°C

Fig. 3 Gate Threshold Voltage vs. Channel Temperature

I_D, DRAIN CURRENT (A)
Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

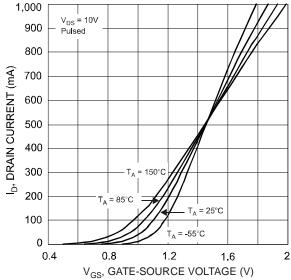


Fig. 2 Reverse Drain Current vs. Source-Drain Voltage

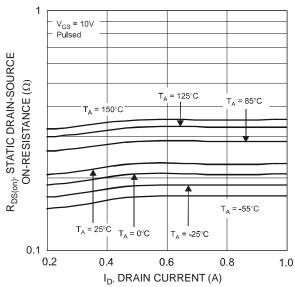


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

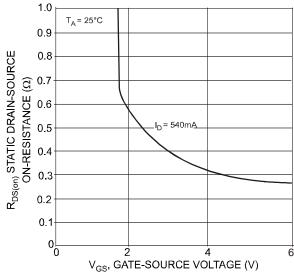


Fig. 6 Static Drain-Source, On-Resistance vs. Gate-Source Voltage

0.2





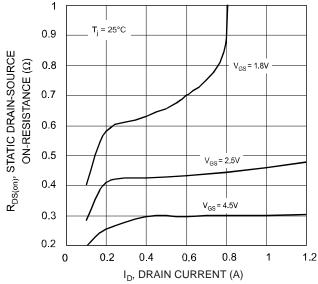
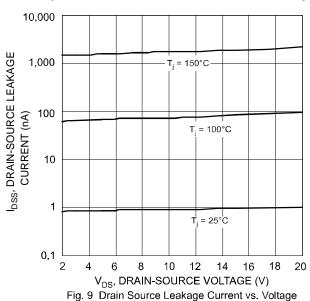
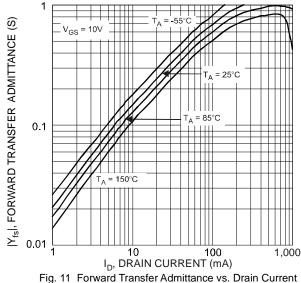


Fig. 7 On-Resistance vs. Drain Current and Gate Voltage





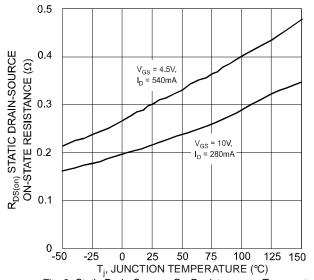


Fig. 8 Static Drain-Source, On-Resistance vs. Temperature

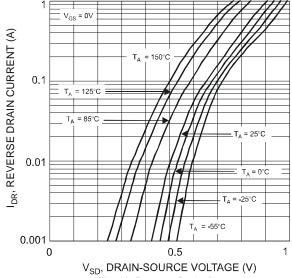
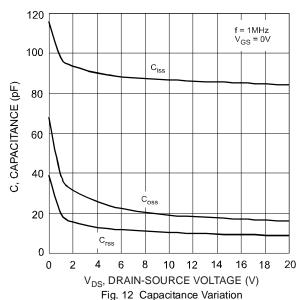


Fig. 10 Reverse Drain Current vs. Source-Drain Voltage

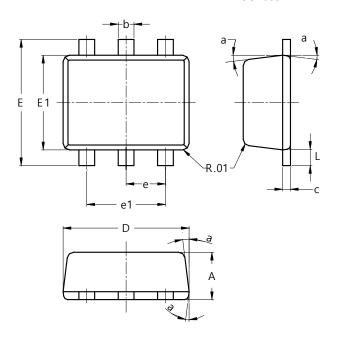




Package Outline Dimensions

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

SOT563

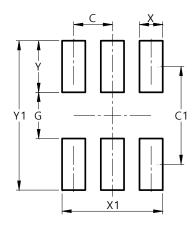


SOT563							
Dim	Min Max Typ						
Α	0.55	0.60					
b	0.15	0.30	0.20				
С	0.10	0.18	0.11				
D	1.50	1.70	1.60				
E	1.55	1.70	1.60				
E1	1.10	1.25	1.20				
е			0.50				
e1	0.90	1.10	1.00				
L	0.10	0.30	0.20				
а	8°	9°	7°				
All Dimensions in mm							

Suggested Pad Layout

 $\label{prop:lease} Please see \ http://www.diodes.com/package-outlines.html \ for \ the \ latest \ version.$

SOT563



Dimensions	Value (in mm)
С	0.500
C1	1.270
G	0.600
Х	0.300
X1	1.300
Υ	0.670
Y1	1.940



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