





DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _A = +25°C
20V	0.99Ω @ $V_{GS} = 4.5V$	450mA
	1.2Ω @ $V_{GS} = 2.5V$	400mA
	1.8Ω @ V _{GS} = 1.8V	330mA
	2.4Ω @ V _{GS} = 1.5V	300mA

Description and Applications

This 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.

- General Purpose Interfacing Switch
- Power Management Functions
- DC-DC Converters
- Analog Switch

Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Very Low Gate Threshold Voltage, 1.0V Max
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surface Mount Package 1mm x 1mm
- Low Package Profile, 0.45mm Maximum Package Height
- ESD Protected Gate
- 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
- PPAP Capable (Note 4)

Mechanical Data

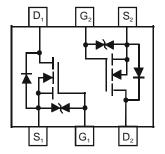
- Case: SOT963
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish Matte Tin Annealed over Copper Leadframe.
 Solderable per MIL-STD-202, Method 208 ³
- Weight: 0.027 grams (Approximate)





SOT963

Top View



Top View Schematic and Transistor Diagram

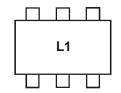
Ordering Information (Note 5)

Part Number	Case	Packaging
DMN2990UDJQ-7	SOT963	10K/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 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



L1 = Product Type Marking Code



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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	20	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current (Note 6) V _{GS} = 4.5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	450 350	mA
Continuous Drain Current (Note 6) V _{GS} = 1.8V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	330 220	mA
Pulsed Drain Current (Note 7)			I _{DM}	800	mA

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P_{D}	350	mW
Thermal Resistance, Junction to Ambient	$R_{ hetaJA}$	360	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

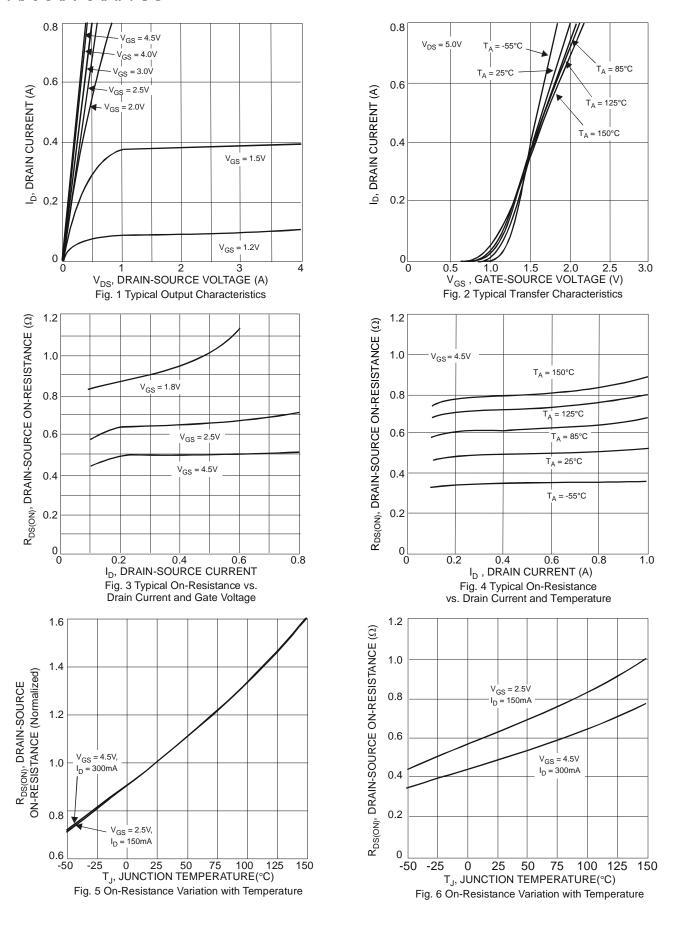
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	20	-	-	V	$V_{GS} = 0V$, $I_D = 250\mu A$	
Zoro Coto Voltogo Proin Current @T- 125°C	I _{DSS}	-	-	50	nA	$V_{DS} = 5V$, $V_{GS} = 0V$	
Zero Gate Voltage Drain Current @T _C = +25°C			-	100		$V_{DS} = 16V, V_{GS} = 0V$	
Gate-Source Leakage	I _{GSS}	-	-	±100	nA	$V_{GS} = \pm 5V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	0.4	-	1.0	٧	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
		-	0.60	0.99		$V_{GS} = 4.5V, I_D = 100mA$	
		-	0.75	1.2		$V_{GS} = 2.5V, I_D = 50mA$	
Static Drain-Source On-Resistance	R _{DS(ON)}	-	0.90	1.8	Ω	$V_{GS} = 1.8V, I_D = 20mA$	
	()	-	1.2	2.4		$V_{GS} = 1.5V, I_D = 10mA$	
		-	2.0	-		$V_{GS} = 1.2V, I_D = 1mA$	
Forward Transfer Admittance	Y _{fs}	180	-	-	ms	$V_{DS} = 10V, I_D = 400mA$	
Diode Forward Voltage (Note 7)	V_{SD}	-	0.6	1.0	V	$V_{GS} = 0V, I_{S} = 150mA$	
DYNAMIC CHARACTERISTICS (Note 9)						•	
Input Capacitance	C _{iss}	-	27.6	-	рF	10/1/	
Output Capacitance	Coss	-	4.0	-	pF	$V_{DS} = 16V, V_{GS} = 0V,$ - f = 1.0MHz	
Reverse Transfer Capacitance	C _{rss}	-	2.8	-	рF	T = 1.0WH IZ	
Total Gate Charge	Q_g	-	0.5	-	nC	V 45V V 40V	
Gate-Source Charge	Q_{gs}	-	0.07	-	nC	$V_{GS} = 4.5V, V_{DS} = 10V,$ $I_{D} = 250mA$	
Gate-Drain Charge	Q_{gd}	-	0.07	-	nC		
Turn-On Delay Time	t _{D(ON)}	-	4.0	-	ns		
Turn-On Rise Time	t _R	-	3.3	-	ns	$V_{DD} = 10V, V_{GS} = 4.5V,$	
Turn-Off Delay Time	t _{D(OFF)}	-	19.0	-	ns	$R_{L} = 47\Omega, R_{g} = 10\Omega,$ $I_{D} = 200\text{mA}$	
Turn-Off Fall Time	t _F	-	6.4	-	ns		

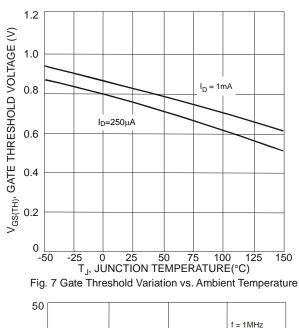
Notes: 6. Device mounted on FR-4 PCB, with minimum recommended pad layout.

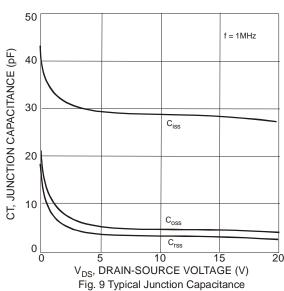
- 7. Device mounted on minimum recommended pad layout test board, 10µs pulse duty cycle = 1%.
- 8. Short duration pulse test used to minimize self-heating effect.
- 9. Guaranteed by design. Not subject to product testing.

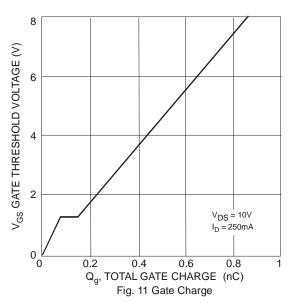


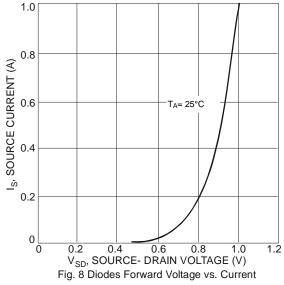












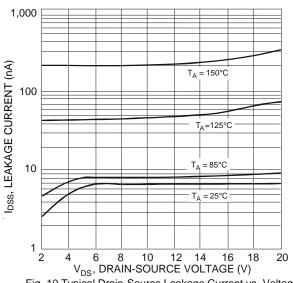
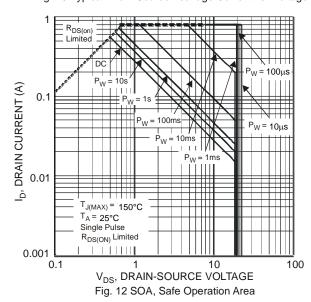


Fig. 10 Typical Drain-Source Leakage Current vs. Voltage





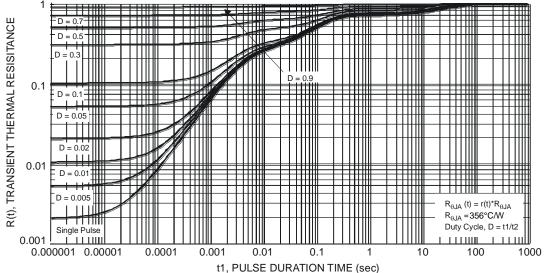


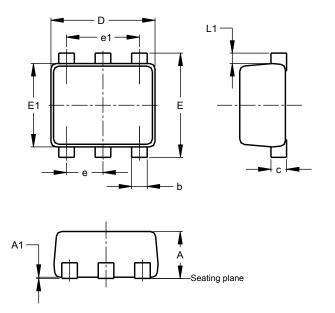
Fig. 13 Transient Thermal Resisitance



Package Outline Dimensions

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

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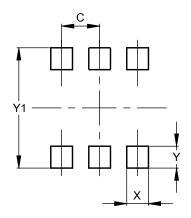


SOT963					
Dim	Min	Max	Тур		
Α	0.40	0.50	0.45		
A1	0.00	0.05			
b	0.10	0.20	0.15		
С	0.120	0.180	0.150		
ם	0.95	1.05	1.00		
Е	0.95	1.05	1.00		
E1	0.75	0.85	0.80		
е			0.35		
e1			0.70		
L1	0.05	0.15	0.10		
All Dimensions in mm					

Suggested Pad Layout

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

SOT963



Dimensions	Value (in mm)		
С	0.350		
Х	0.200		
Y	0.200		
Y1	1 100		



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