DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = 25°C
20V	3.0mΩ @ V_{GS}= 4.5V	240mA
	6.0mΩ @ V_{GS}= 1.8V	170mA

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

Features and Benefits

- Dual N-Channel MOSFET
- Low On-Resistance:
  - 3.0 Ω @ 4.5V
  - 4.0 Ω @ 2.5V
  - 6.0 Ω @ 1.8V
  - 10 Ω @ 1.5V
- Very Low Gate Threshold Voltage, 1.05V max
- Low Input Capacitance
- Fast Switching Speed
- Ultra-Small Surface Mount Package
- ESD Protected Gate (HBM 300V)
- **Lead, Halogen, and Antimony Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

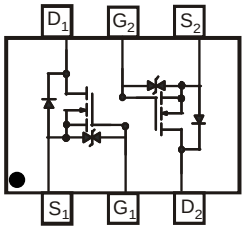
Mechanical Data

- Case: SOT-963
- 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: 0.0027 grams (approximate)

ESD PROTECTED

SOT-963

Top View



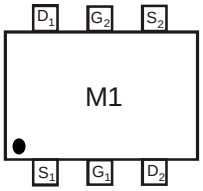
Top View
Schematic and Transistor Diagram

Ordering Information (Note 3)

Part Number	Case	Packaging
DMN26D0UDJ-7	SOT-963	10,000/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 (Note 4)



M1 = Product Type Marking Code

Notes: 4. Package is non-polarized. Parts may be on reel in orientation illustrated, 180° rotated, or mixed (both ways).

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}	±10	V
Continuous Drain Current (Note 5) V_{GS} = 4.5V	Steady State	T_A = 25°C T_A = 70°C	I_D	240 190	mA
Continuous Drain Current (Note 5) V_{GS} = 1.8V	Steady State	T_A = 25°C T_A = 70°C	I_D	180 140	mA
Pulsed Drain Current - T_P = 10µs			I_{DM}	805	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	409	°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 6)						
Drain-Source Breakdown Voltage	BV_{DSS}	20	—	—	V	V_{GS} = 0V, I_D = 100µA
Zero Gate Voltage Drain Current @ T_C = 25°C	I_{DSS}	—	—	500	nA	V_{DS} = 20V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±1 ±100	µA nA	V_{GS} = ±10V, V_{DS} = 0V V_{GS} = ±5V, V_{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	$V_{GS(th)}$	0.45	0.8	1.05	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	1.8	3.0	Ω	V_{GS} = 4.5V, I_D = 100mA
		—	2.5	4.0		V_{GS} = 2.5V, I_D = 50mA
		—	3.4	6.0		V_{GS} = 1.8V, I_D = 20mA
		—	4.7	10.0		V_{GS} = 1.5V, I_D = 10mA
		—	9.5	—		V_{GS} = 1.2V, I_D = 1mA
Forward Transconductance	$\|Y_{fs}\|$	180	240	—	mS	V_{DS} =10V, I_D = 0.1A
Source-Drain Diode Forward Voltage	V_{SD}	0.5	0.8	1.0	V	V_{GS} = 0V, I_S = 10mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C_{iss}	—	14.1	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	2.9	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	1.6	—	pF	
SWITCHING CHARACTERISTICS, V_{GS} = 4.5V (Note 7)						
Turn-On Delay Time	$t_{d(on)}$	—	3.8	—	ns	V_{GS} = 4.5V, V_{DD} = 10V I_D = 200mA, R_G = 2.0Ω
Rise Time	t_r	—	7.9	—		
Turn-Off Delay Time	$t_{d(off)}$	—	13.4	—		
Fall Time	t_f	—	15.2	—		

Notes:
5. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch with minimum recommended pad layout; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com.
6. Short duration pulse test used to minimize self-heating effect.
7. Switching characteristics are independent of operating junction temperature. Guaranteed by design, not subject to production testing.

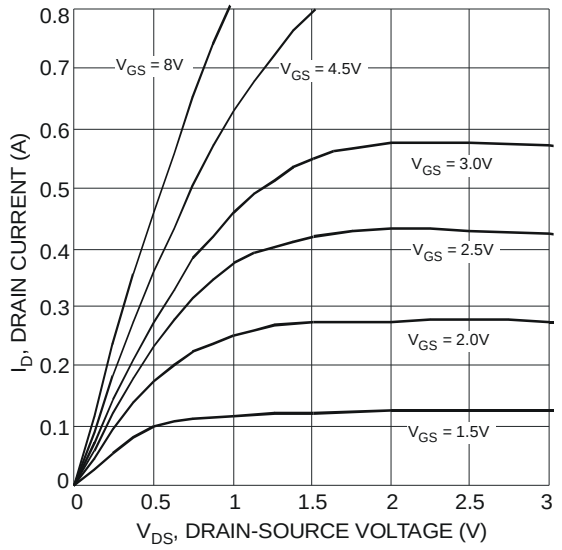


Fig. 1 Typical Output Characteristic

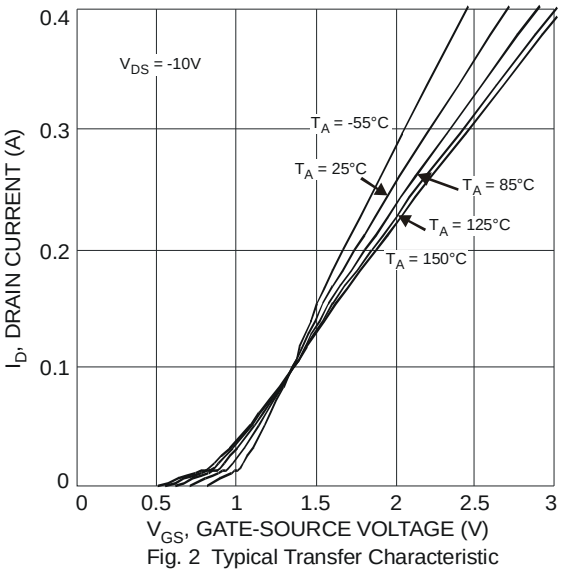


Fig. 2 Typical Transfer Characteristic

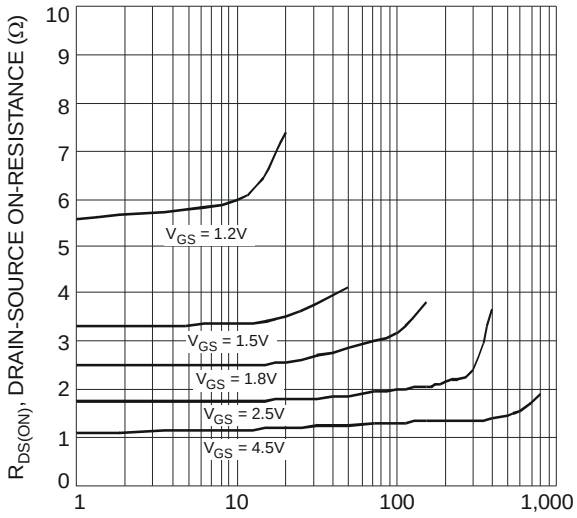


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

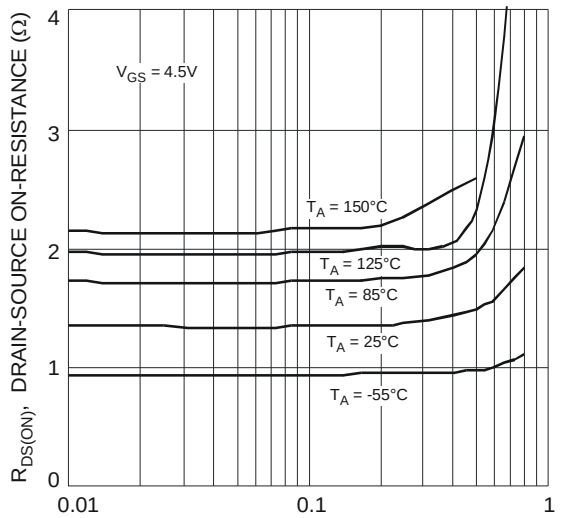


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

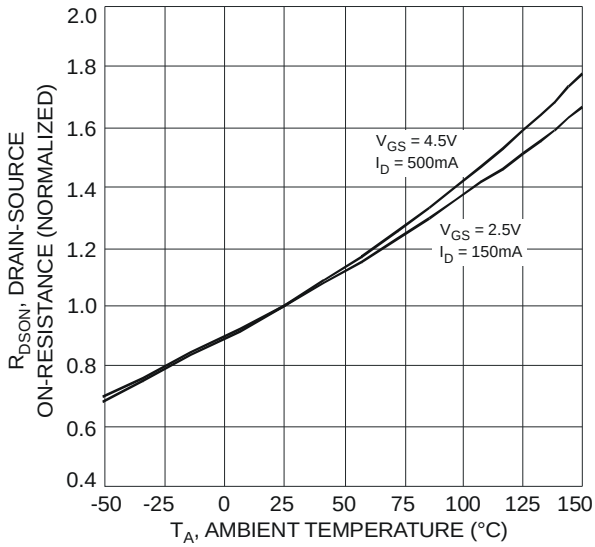


Fig. 5 On-Resistance Variation with Temperature

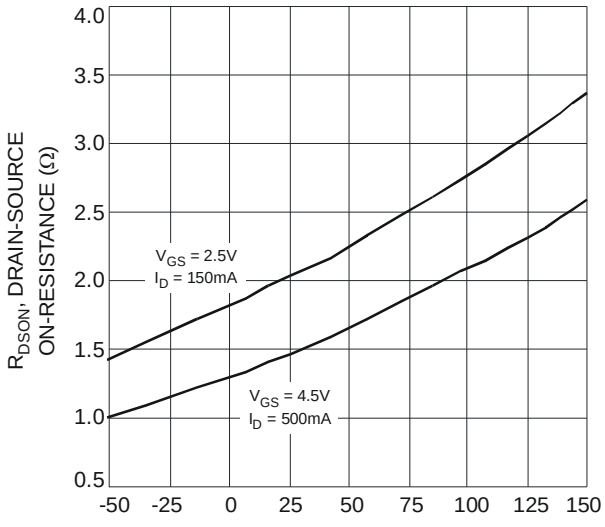


Fig. 6 On-Resistance Variation with Temperature

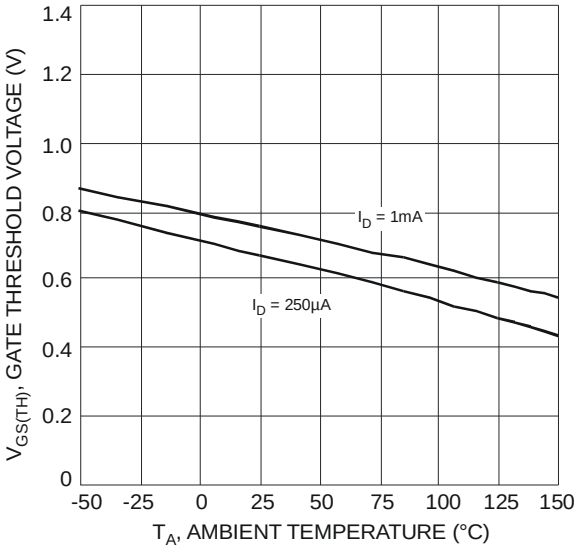


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

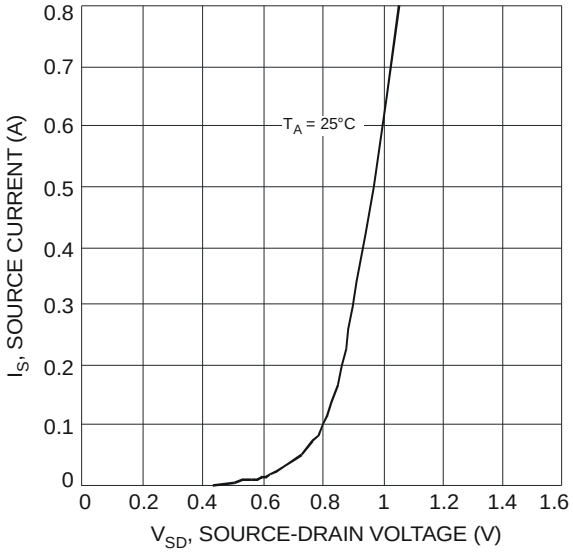


Fig. 8 Diode Forward Voltage vs. Current

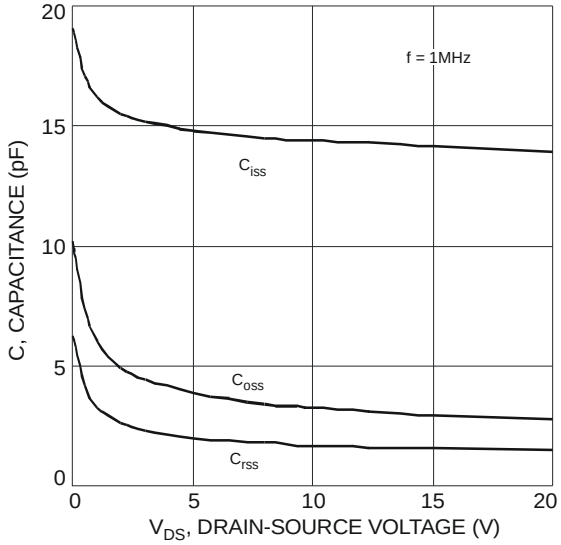


Fig. 9 Typical Total Capacitance

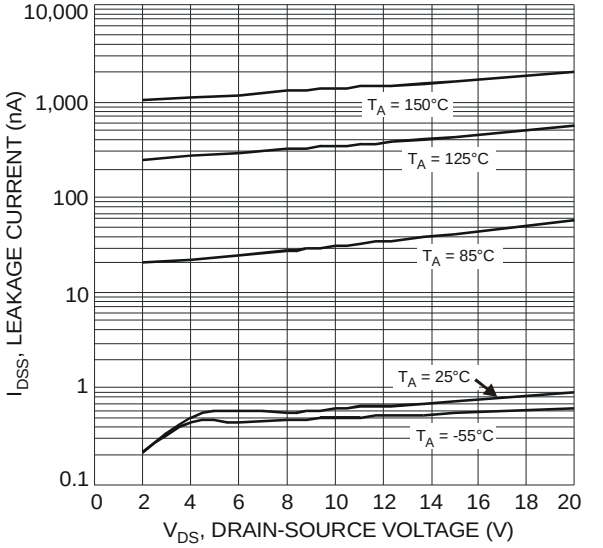
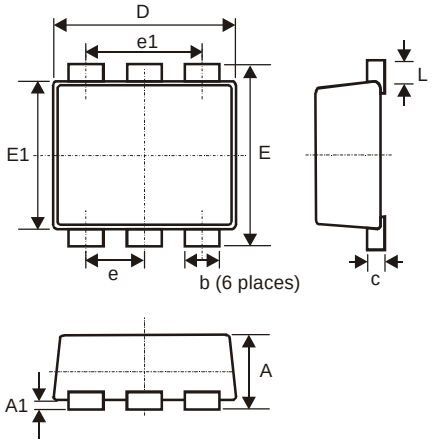


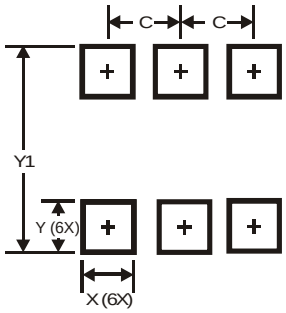
Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

Package Outline Dimensions



SOT-963			
Dim	**Min**	**Max**	**Typ**
A	0.40	0.50	0.45
A1	0	0.05	-
c	0.120	0.180	0.150
D	0.95	1.05	1.00
E	0.95	1.05	1.00
E1	0.75	0.85	0.80
L	0.05	0.15	0.10
b	0.10	0.20	0.15
e	0.35 Typ		
e1	0.70 Typ		
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.350
X	0.200
Y	0.200
Y1	1.100