

**DUAL N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR**
**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
50V	1.6Ω @ V <sub>GS</sub> = 10V	360mA
	2.5Ω @ V <sub>GS</sub> = 4.5V	250mA

**Description and Applications**

This new generation MOSFET has been designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc

**Features and Benefits**

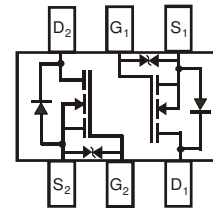
- Dual N-Channel MOSFET
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected to 2kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMN53D0LDWQ](#))**

**Mechanical Data**

- Case: SOT363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208③
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)



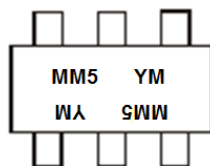
Top View


 Top View  
Internal Schematic

**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMN53D0LDW-7	SOT363	3000/Tape & Reel
DMN53D0LDW-13	SOT363	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/>.

**Marking Information**


MM5 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: 1 = 2021)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2014	...	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	B	...	I	J	K	L	M	N	O	P	R	S

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	50	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (Note 5)	I <sub>D</sub>	360	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	310	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	411	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	50	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	1.0	μA	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	—	—	10	μA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	0.8	—	1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	1.0	1.6	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 500mA
		—	1.0	2.5		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 200mA
		—	1.4	4.5		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 100mA
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	—	0.8	1.4	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 500mA
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	—	46	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	5.3	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	4.0	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	0.6	—	nC	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 10V, I <sub>D</sub> = 250mA
Gate-Source Charge	Q <sub>gs</sub>	—	0.2	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	0.1	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	2.7	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 25Ω, I <sub>D</sub> = 200mA
Turn-On Rise Time	t <sub>R</sub>	—	2.5	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	19	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	11	—	ns	
		—	11	—		

- Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
6. Short duration pulse test used to minimize self-heating effect.  
7. Guaranteed by design. Not subject to product testing.

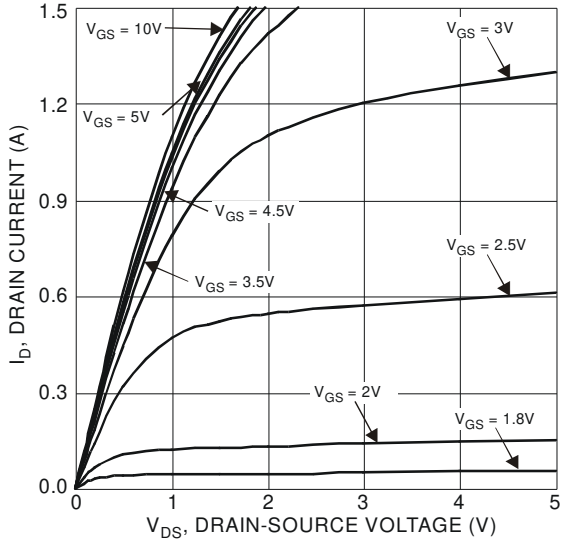


Figure 1 Typical Output Characteristics

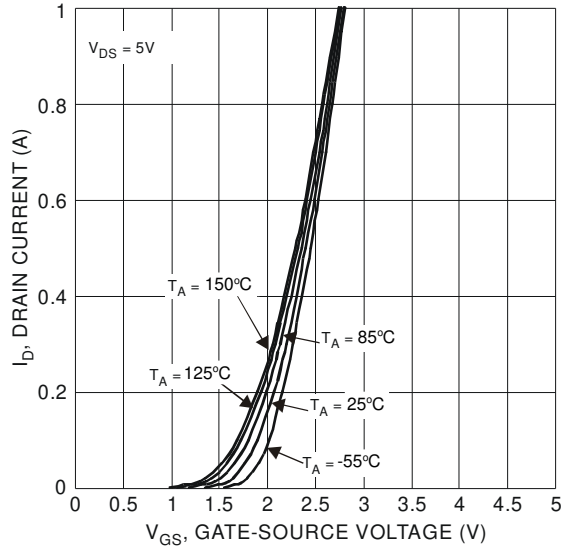


Figure 2 Typical Transfer Characteristics

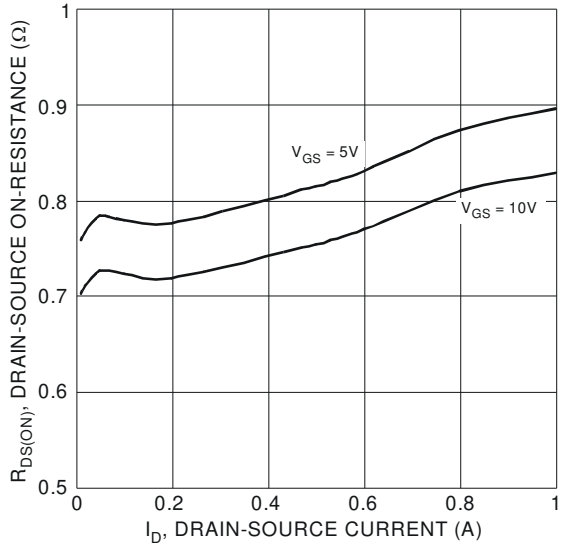


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

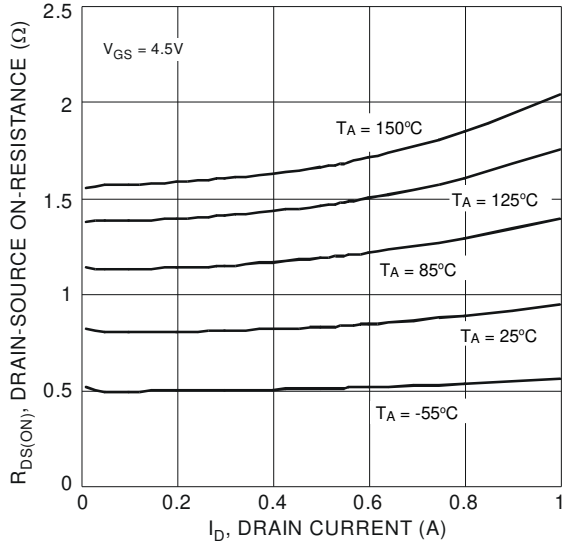


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

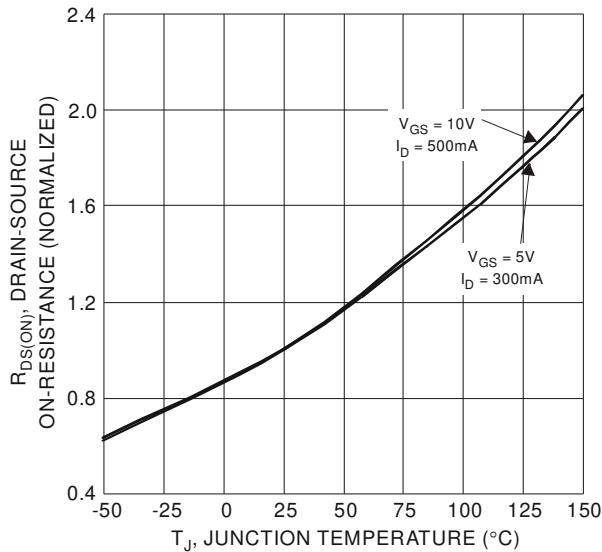


Figure 5 On-Resistance Variation with Temperature

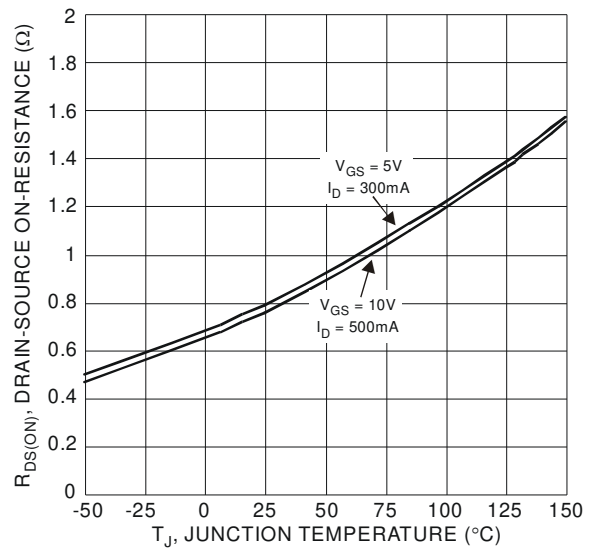


Figure 6 On-Resistance Variation with Temperature

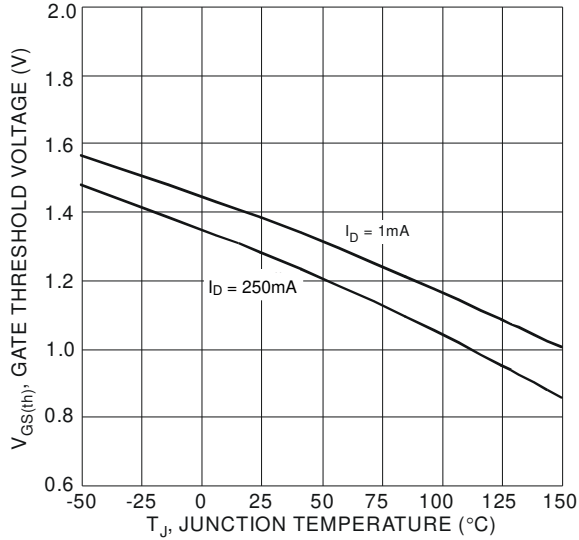


Figure 7 Gate Threshold Variation vs. Ambient Temperature

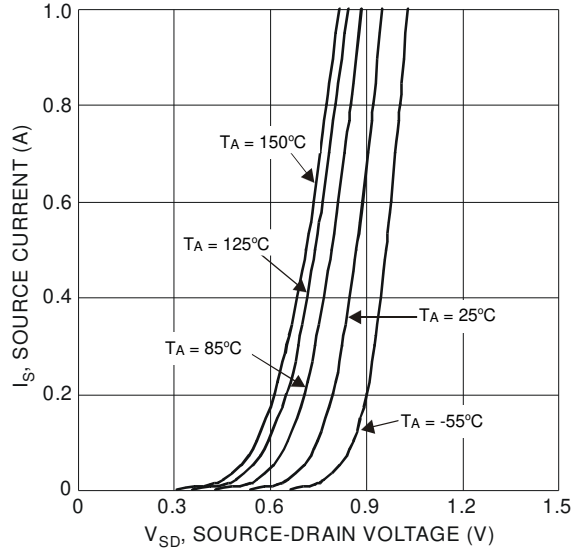


Figure 8 Diode Forward Voltage vs. Current

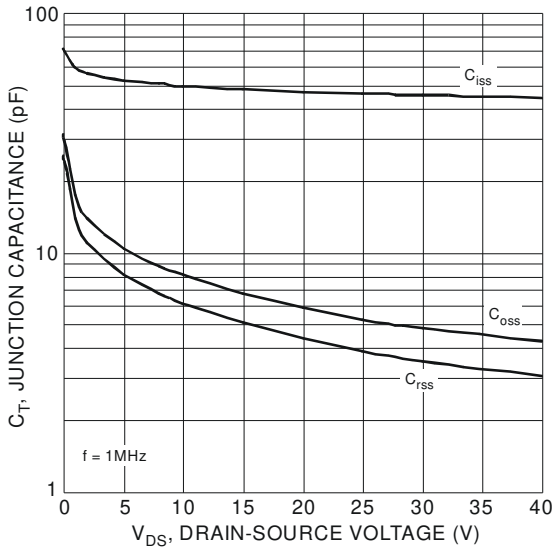


Figure 9 Typical Junction Capacitance

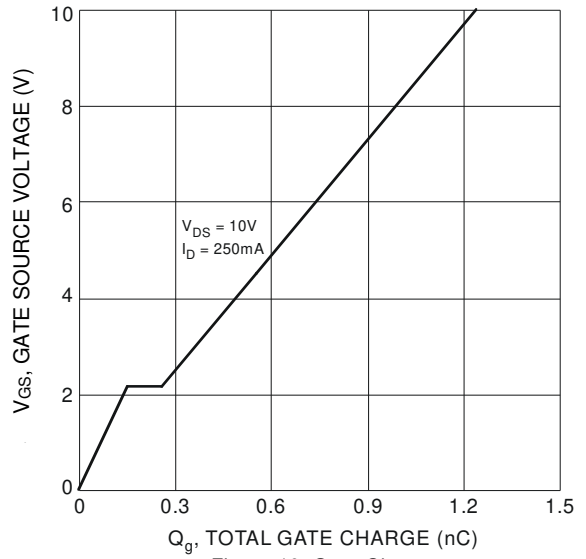
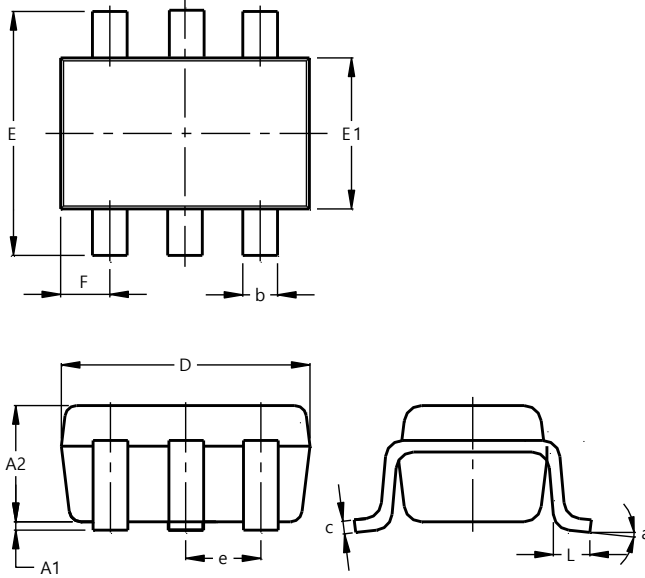


Figure 10 Gate Charge

**Package Outline Dimensions**

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

**SOT363**

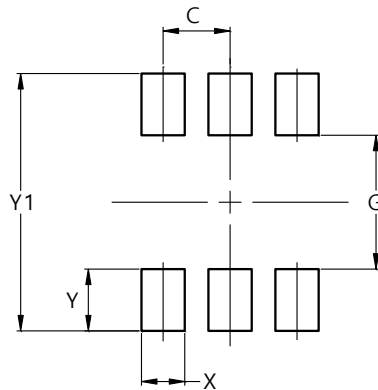


SOT363			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT363**



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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