Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D T_A = +25°C
60V	3Ω @ V_{GS} = 10V	310mA
	4Ω @ V_{GS} = 5V	270mA

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface-Mount Package
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet (DMN65D8LQ)**

Description and Applications

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) 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.

Mechanical Data

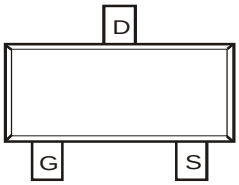
- Package: SOT23
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208. Lead Free Plating. Matte Tin Finish Annealed over Alloy 42 Leadframe (e3)
- Terminal Connections: See Diagram
- Weight: 0.008487 grams (Approximate)



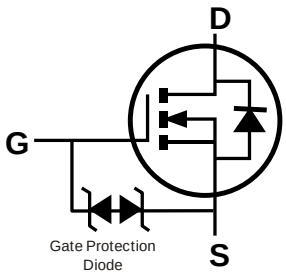
SOT23 (Standard)



Top View



Top View
Pin Configuration



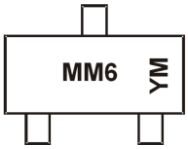
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN65D8L-7	SOT23 (Standard)	3,000	Tape & Reel
DMN65D8L-13	SOT23 (Standard)	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



MM6 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ or $\underline{Y}$ = Year (ex: L = 2024)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2012	…	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	Z	…	L	M	N	P	R	S	T	U	V	W

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

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	310 240	mA
Continuous Drain Current (Note 6) V_{GS} = 5V	Steady State	T_A = +25°C T_A = +70°C	I_D	270 210	mA
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	800	mA
Maximum Body Diode Continuous Current (Note 6)			I_S	310	mA

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation	(Note 6)	P_D	370	mW
	(Note 5)		540	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	348	°C/W
	(Note 5)		241	
Thermal Resistance, Junction to Case	(Note 5)	$R_{\theta JC}$	91	
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 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	µA	V_{DS} = 60V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±5	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.2	—	2.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	1.9	3	Ω	V_{GS} = 10V, I_D = 0.115A
		—	2.2	4	Ω	V_{GS} = 5V, I_D = 0.115A
Forward Transconductance	g_{FS}	80	290	—	ms	V_{DS} = 10V, I_D = 0.115A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	22	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	3.2	—		
Reverse Transfer Capacitance	C_{rss}	—	2.0	—		
Gate Resistance	R_g	—	79.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 10V)	Q_g	—	0.87	—	nC	V_{GS} = 10V, V_{DS} = 30V, I_D = 150mA
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	0.43	—		
Gate-Source Charge	Q_{gs}	—	0.11	—		
Gate-Drain Charge	Q_{gd}	—	0.11	—		
Turn-On Delay Time	$t_{D(ON)}$	—	2.7	—	ns	V_{DD} = 30V, I_D = 0.115A, V_{GEN} = 10V, R_{GEN} = 25Ω
Turn-On Rise Time	t_R	—	2.8	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	12.6	—		
Turn-Off Fall Time	t_F	—	7.3	—		

Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

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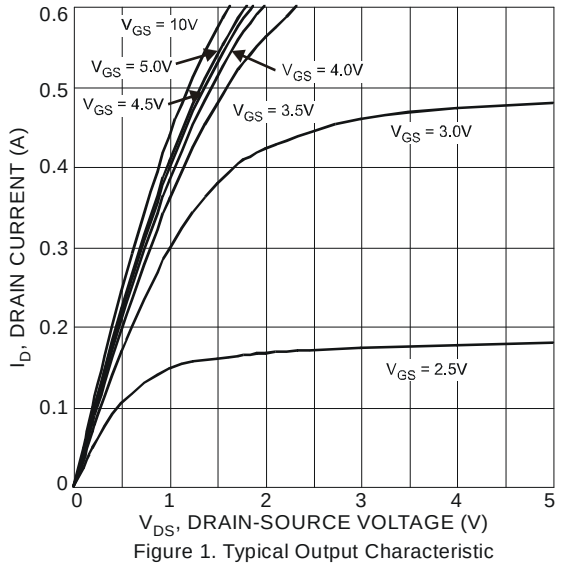

Figure 1. Typical Output Characteristic

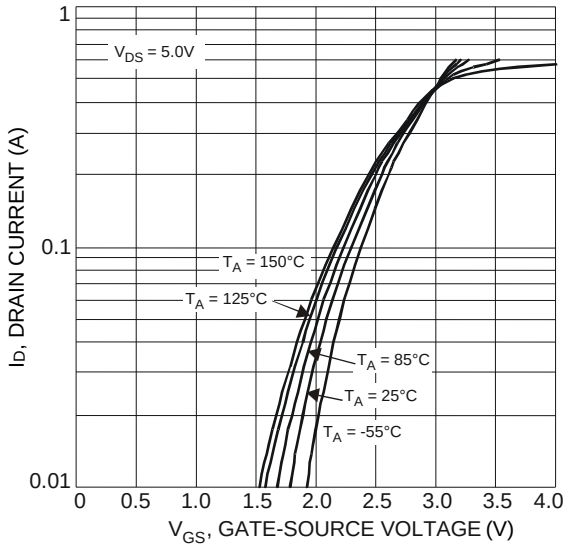

Figure 2. Typical Transfer Characteristics

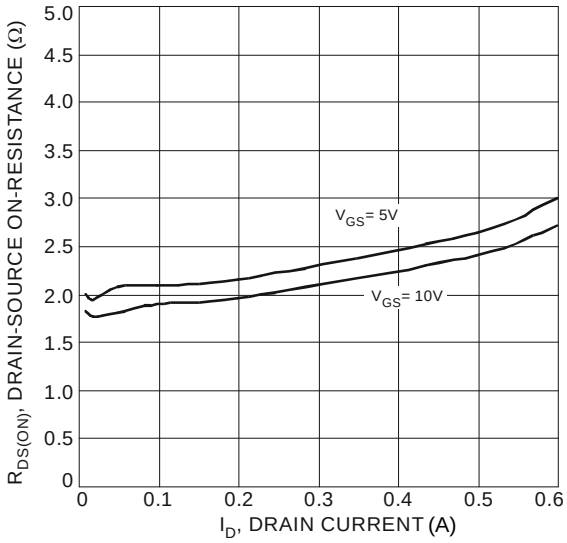

Figure 3. Typical On-Resistance vs. Drain Current and Temperature

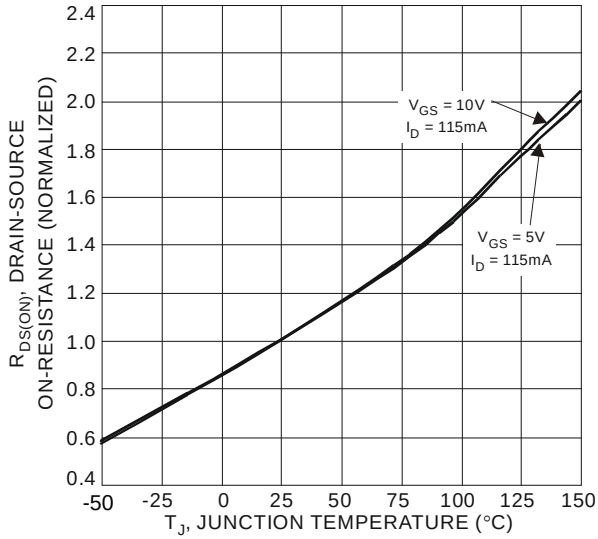

Figure 4. On-Resistance Variation with Temperature

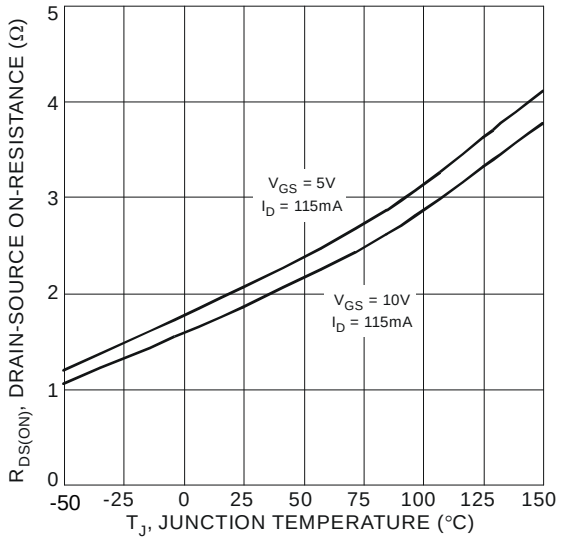

Figure 5. On-Resistance Variation with Temperature

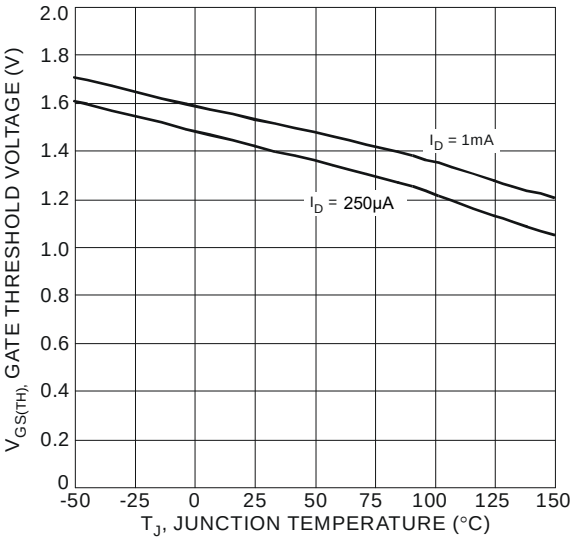

Figure 6. Gate Threshold Variation vs. Junction Temperature

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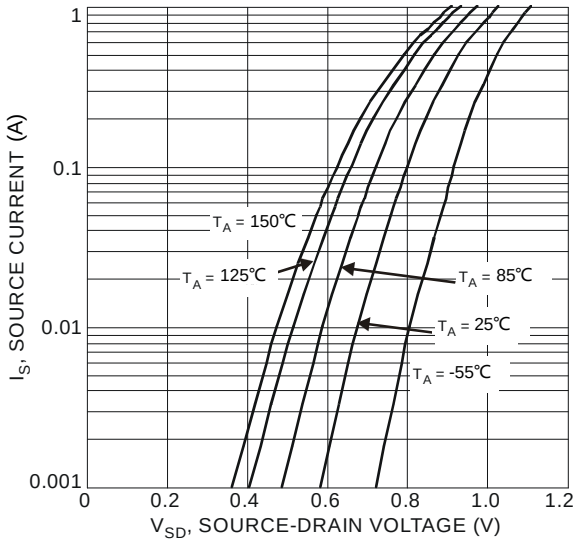

Figure 7. Diode Forward Voltage vs. Current

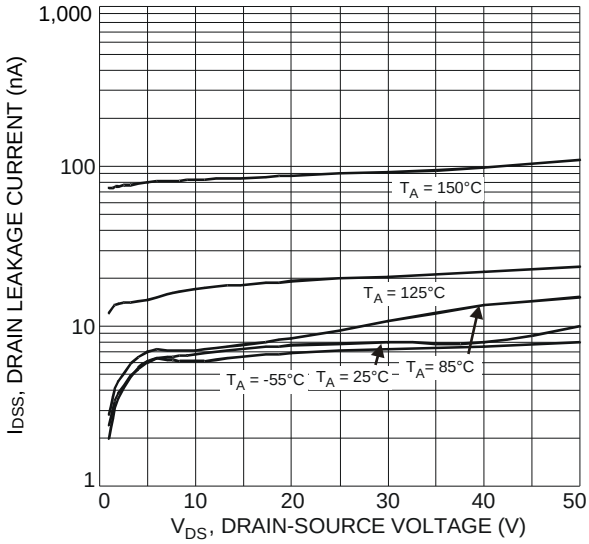

Figure 8. Typical Drain-Source Leakage Current vs. Voltage

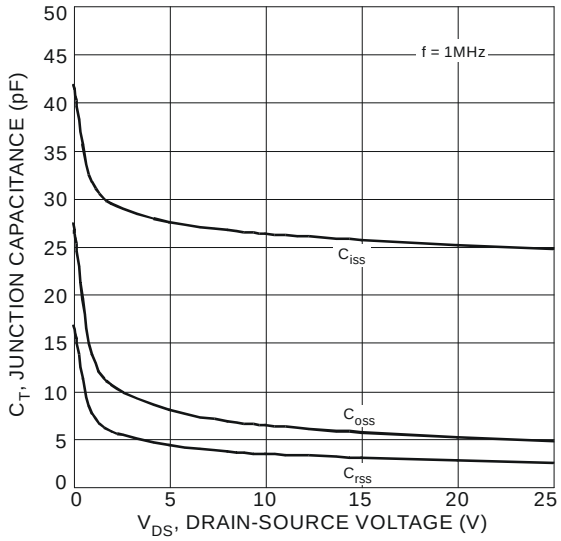

Figure 9. Typical Junction Capacitance

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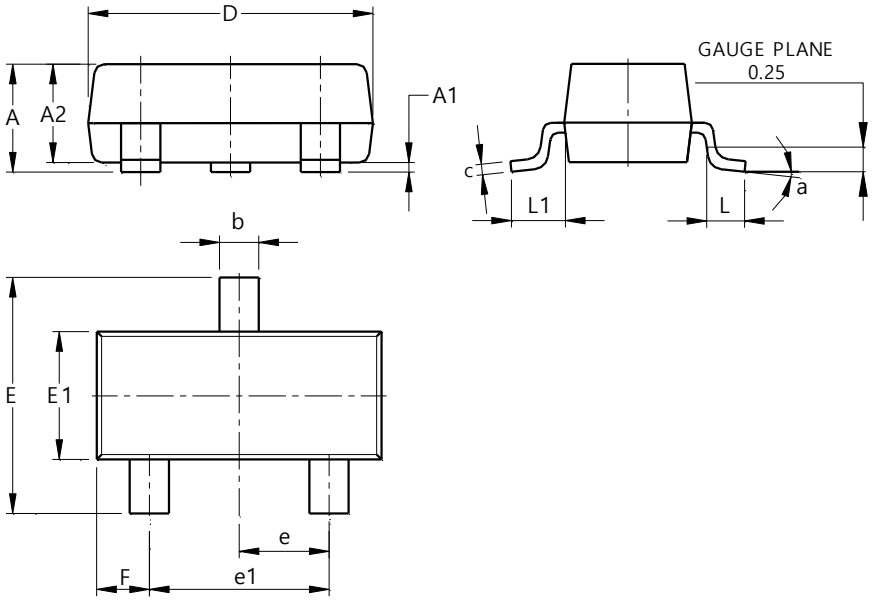
Package Outline Dimensions

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

SOT23 (Standard)

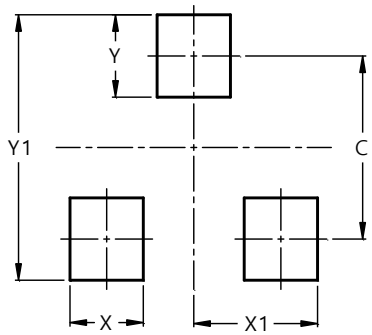


SOT23 (Standard)			
Dim	**Min**	**Max**	**Typ**
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23 (Standard)



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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