

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
60V	3Ω @ V _{GS} = 10V	300mA
	4Ω @ V _{GS} = 5V	260mA

Features and Benefits

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface-Mount Package
- ESD Protected Gate, 1kV (HBM)
- **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 refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.
- This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>

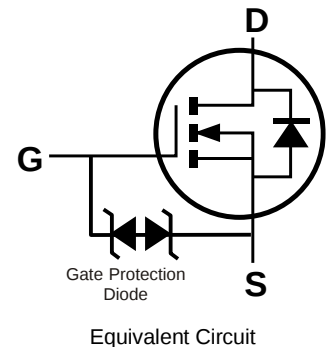
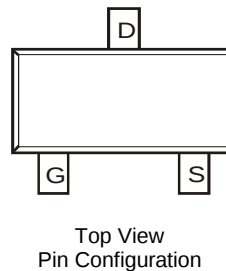
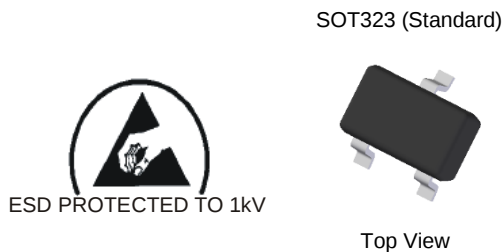
Description and Applications

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: SOT323
- Package 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 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

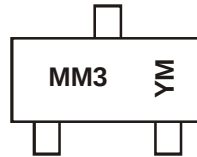


Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMN65D8LW-7	SOT323 (Standard)	3,000	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



MM3 = Product Type Marking Code
 YM = Date Code Marking
 Y or $\bar{Y}$ = Year (ex: M = 2025)
 M or $\bar{M}$ = Month (ex: 7 = July)

Date Code Key

Year	2011	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	Y	-	M	N	P	R	S	T	U	V	W	X

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_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
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	300 230	mA
Continuous Drain Current (Note 6) V _{GS} = 5V	Steady State	T _A = +25°C T _A = +70°C	I _D	260 210	mA
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	800	mA
Maximum Body Diode Continuous Current (Note 6)			I _S	300	mA

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

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P _D	300	mW
	(Note 6)		432	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	398	°C/W
	(Note 6)		290	
Thermal Resistance, Junction to Case	(Note 5)	R _{θJC}	142	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.

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} = 0, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = 60V, V _{GS} = 0
Gate-Body Leakage	I _{GSS}	—	—	±5.0	μA	V _{GS} = ±20V, V _{DS} = 0
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)}	—	2	3	Ω	V _{GS} = 10V, I _D = 0.115A
		—	2.5	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} = 0, I _S = 115mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	22.0	—	pF	V _{DS} = 25V, V _{GS} = 0, 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} = 0, V _{GS} = 0, f = 1.0MHz
Total Gate Charge V _{GS} = 10V	Q _g	—	0.87	—	nC	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: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

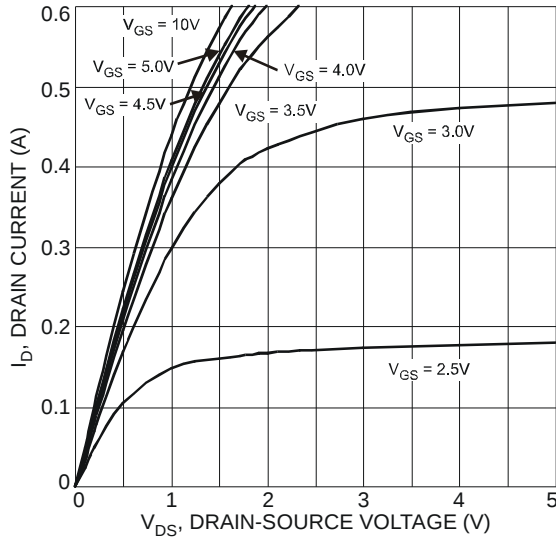


Figure 1 Typical Output Characteristic

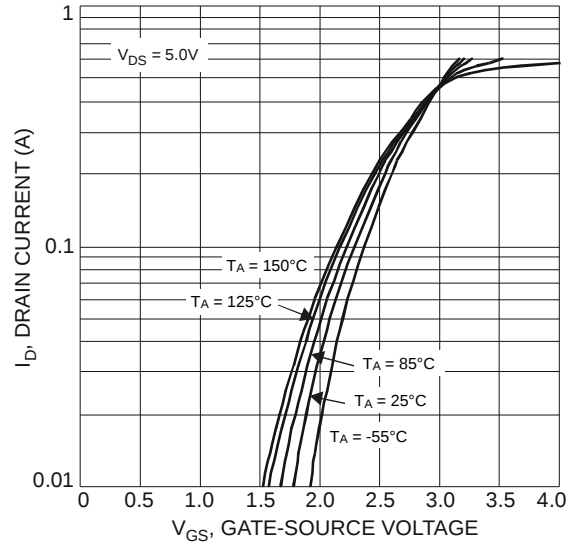


Figure 2 Typical Transfer Characteristics

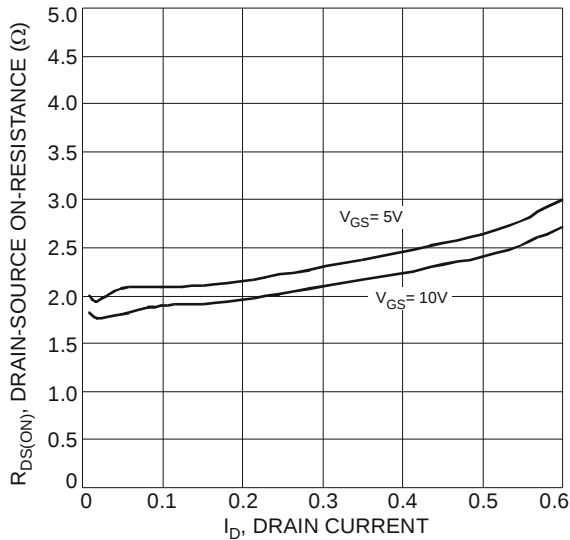


Figure 3 Typical On-Resistance vs. Drain Current and Temperature

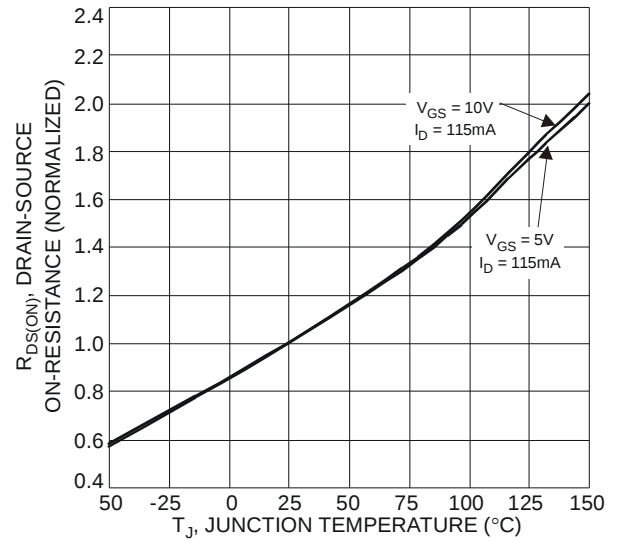


Figure 4 On-Resistance Variation with Temperature

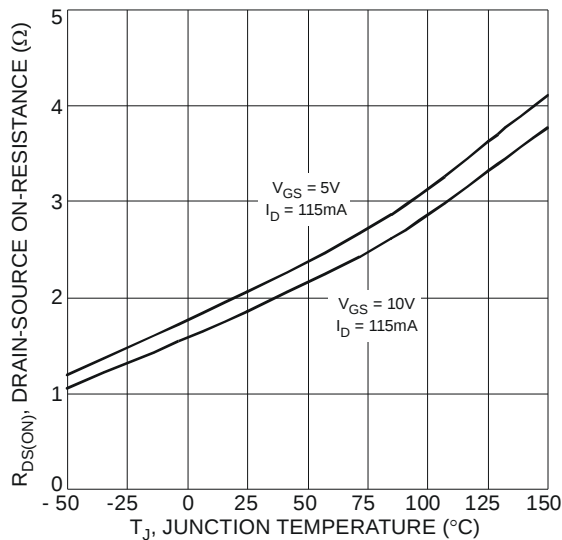


Figure 5 On-Resistance Variation with Temperature

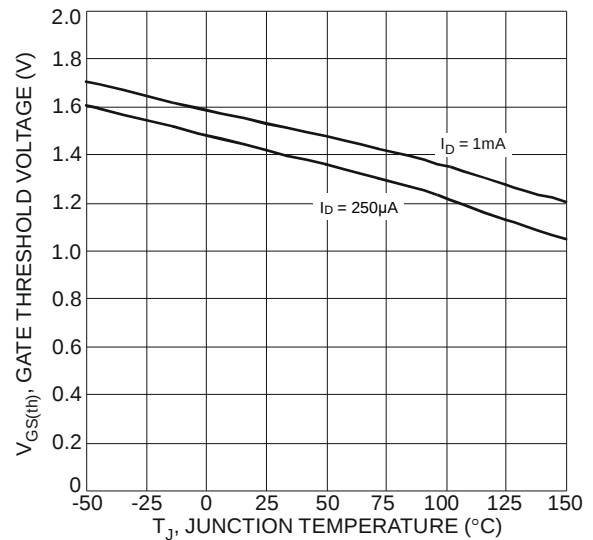


Figure 6 Gate Threshold Variation vs. Junction Temperature

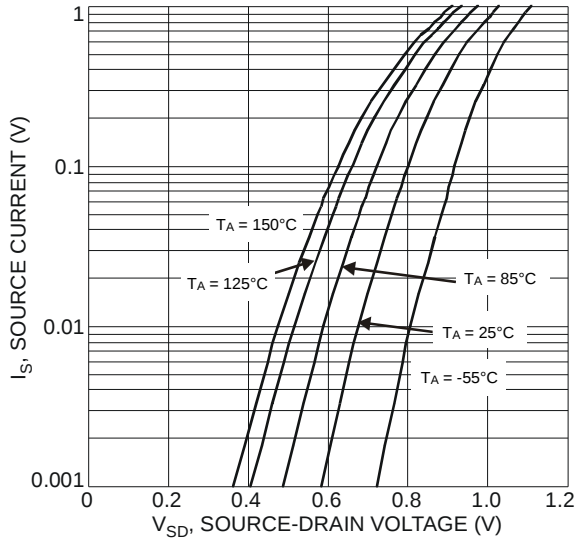


Figure 7 Diode Forward Voltage vs. Current

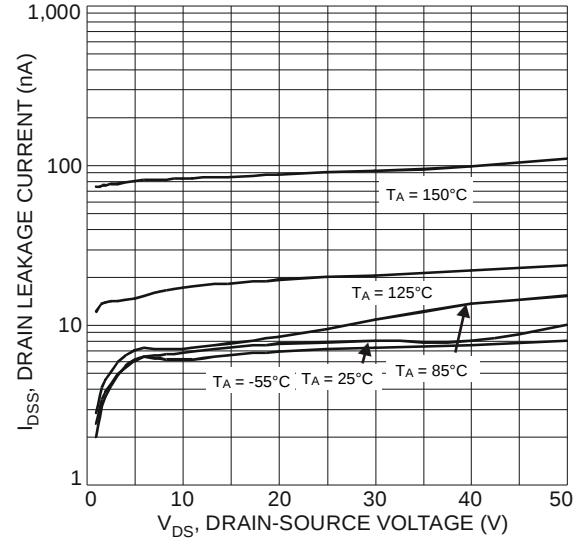


Figure 8 Typical Drain-Source Leakage Current vs. Voltage

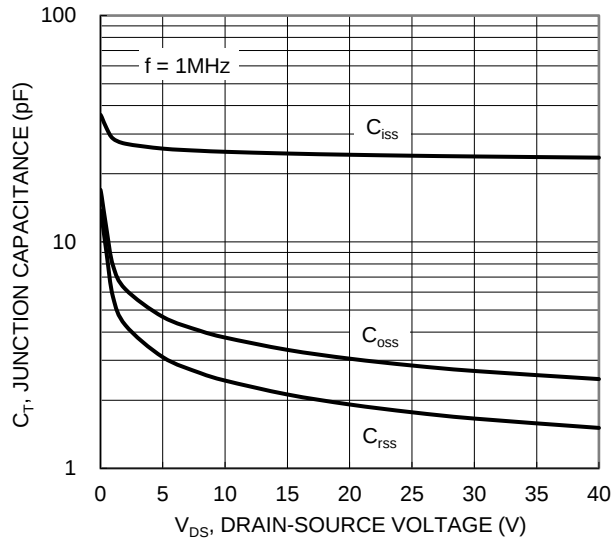


Figure 9 Typical Junction Capacitance

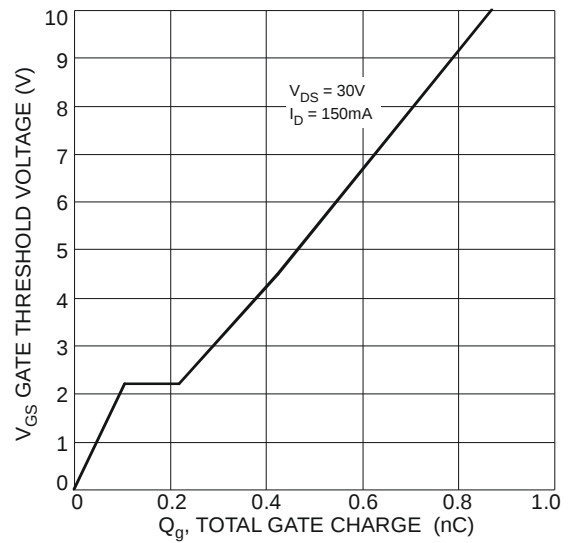
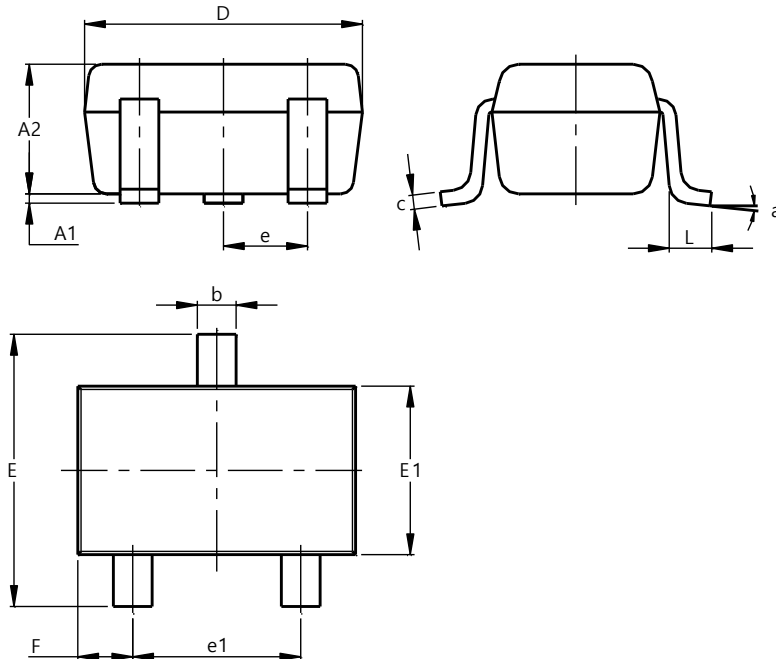


Figure 10 Gate Charge

Package Outline Dimensions

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

SOT323 (Standard)

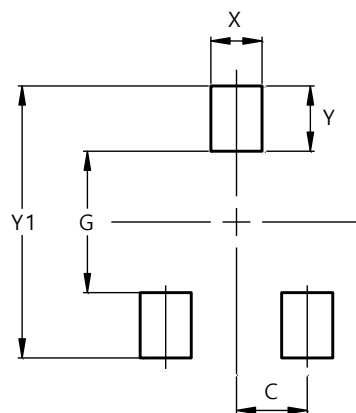


SOT323 (Standard)			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.80	1.00	0.90
b	0.20	0.40	0.30
c	0.08	0.18	0.13
D	1.80	2.20	2.00
E	2.00	2.45	2.225
E1	1.15	1.35	1.25
e	--	--	0.65
e1	1.20	1.40	1.30
F	0.25	0.475	0.3625
L	0.25	0.46	0.355
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323 (Standard)



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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