



**THE DATASHEET OF
DMN10H220L-7**



Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
100V	220mΩ @ V _{GS} = 10V	1.6A
	250mΩ @ V _{GS} = 4.5V	1.3A

Features and Benefits

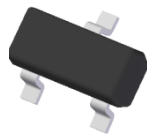
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet ([DMN10H220LQ](#))**

Description and Applications

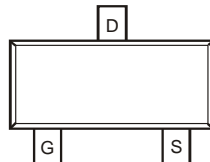
This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Load switches

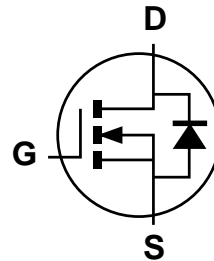
SOT23 (Standard)



Top View



Pin Configuration



Equivalent Circuit

Ordering Information

Part Number	Package	Packing	
		Qty.	Carrier
DMN10H220L-7	SOT23 (Standard)	3000	Tape & Reel
DMN10H220L-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



N1H = Marking Code
 YM = Date Code Marking
 Y or Y = Year (ex: K = 2023)
 M = M (ex: 9 = September)

Date Code Key

Year	2013	...	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	A	...	K	L	M	N	P	R	S	T	U	V

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	Unit
Drain-Source Voltage		V _{DSS}	100	V
Gate-Source Voltage		V _{GSS}	±16	V
Continuous Drain Current (Note 5) V _{GS} = 10V	(Note 6) T _A = +25°C T _A = +70°C	I _D	1.6 1.3	A
	(Note 5) T _A = +25°C T _A = +70°C	I _D	1.4 1.1	A
Maximum Continuous Body Diode Forward Current (Note 6)		I _S	0.6	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)		I _{DM}	8	A

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	1.3	W
	T _A = +70°C		0.8	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	94	°C/W
	(Note 5)		177	
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}	100	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 100V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	160	220	mΩ	V _{GS} = 10V, I _D = 1.6A
			190	250		
Diode Forward Voltage	V _{SD}	—	0.7	1.2	V	V _{GS} = 0V, I _S = 1.1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	401	—	pF	V _{DS} = 25V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	22	—		
Reverse Transfer Capacitance	C _{rss}	—	17	—		
Gate Resistance	R _g	—	2.1	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	4.1	—	nC	V _{DS} = 50V, I _D = 1.6A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	8.3	—		
Gate-Source Charge	Q _{gs}	—	1.5	—		
Gate-Drain Charge	Q _{gd}	—	2	—		
Turn-On Delay Time	t _{D(ON)}	—	6.8	—	ns	V _{DS} = 50V, V _{GS} = 4.5V, R _G = 6.8Ω, I _D = 1A
Turn-On Rise Time	t _R	—	8.2	—		
Turn-Off Delay Time	t _{D(OFF)}	—	7.9	—		
Turn-Off Fall Time	t _F	—	3.6	—		
Reverse Recovery Time	t _{RR}	—	17	—	ns	I _F = 1.1A, di/dt = 100A/μs
Reverse Recovery Charge	Q _{RR}	—	9.8	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

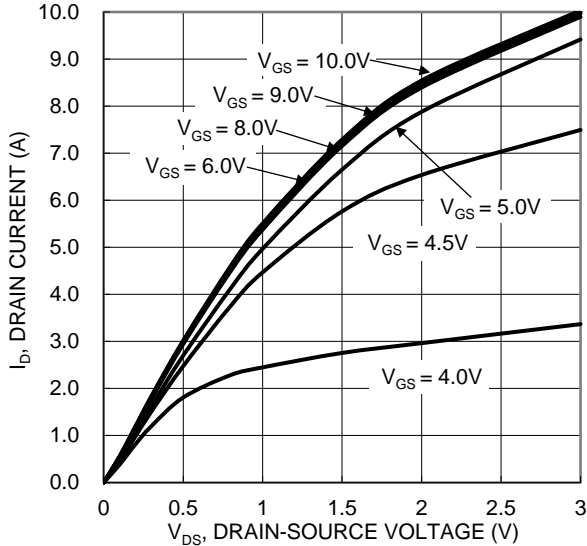


Figure 1. Typical Output Characteristic

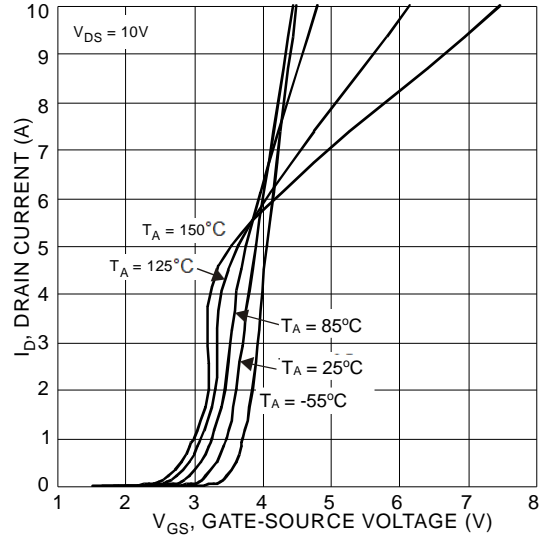


Figure 2 Typical Transfer Characteristics

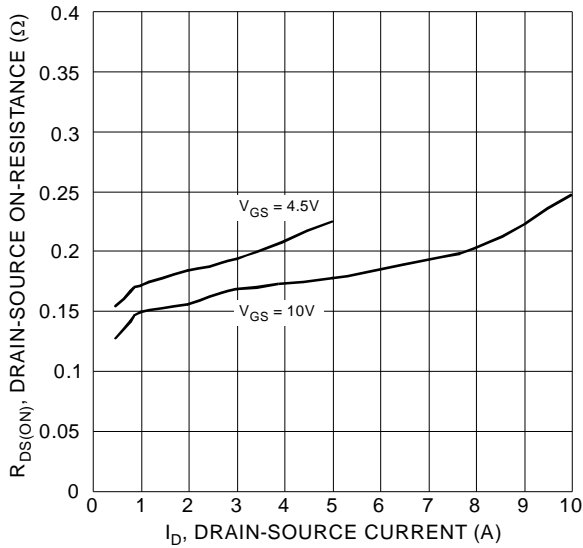


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

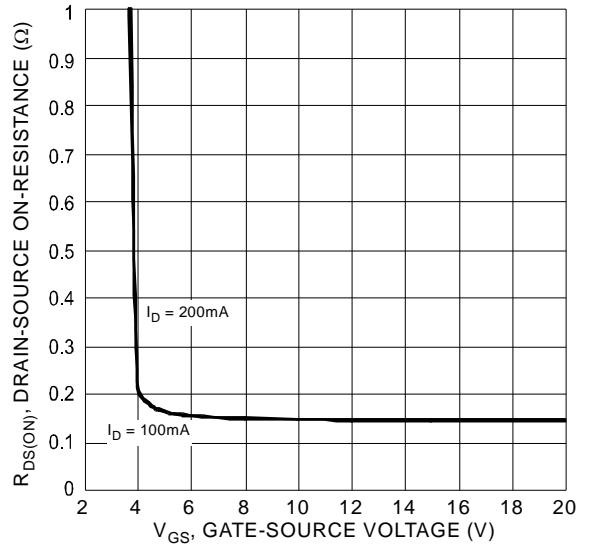


Figure 4 Typical Transfer Characteristic

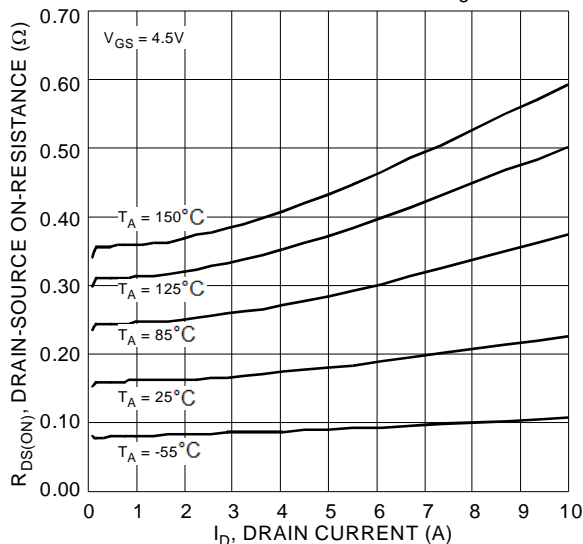


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

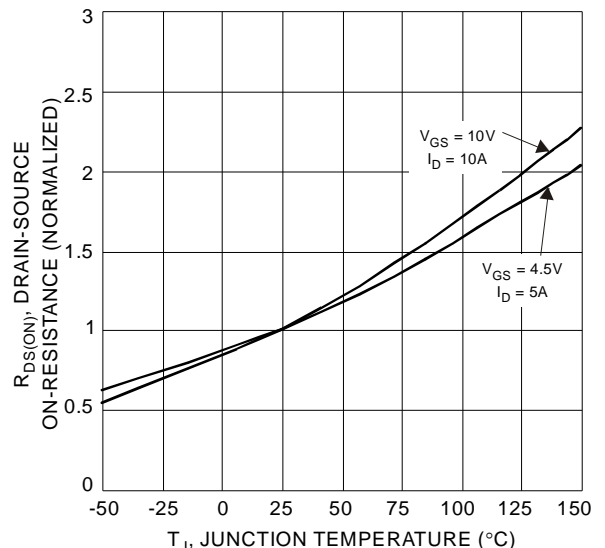


Figure 6 On-Resistance Variation with Temperature

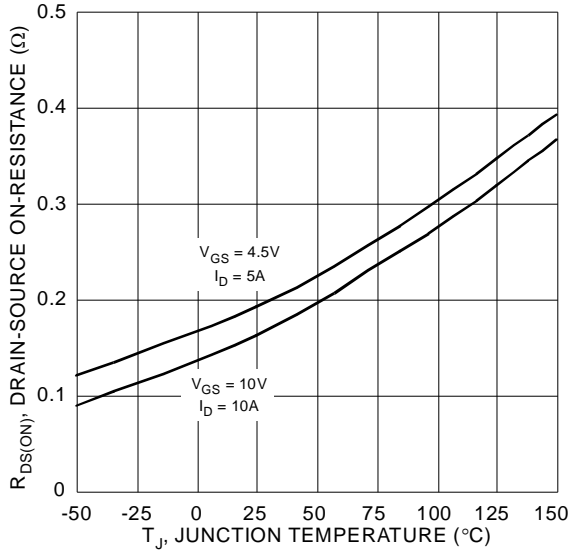


Figure 7 On-Resistance Variation with Temperature

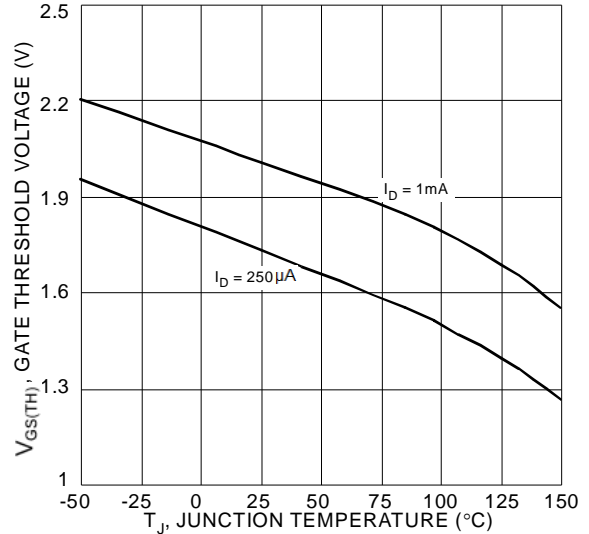


Figure 8 Gate Threshold Variation vs. Ambient Temperature

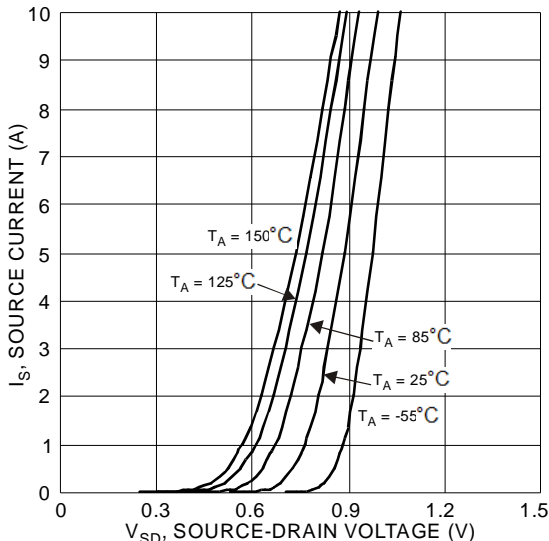


Figure 9 Diode Forward Voltage vs. Current

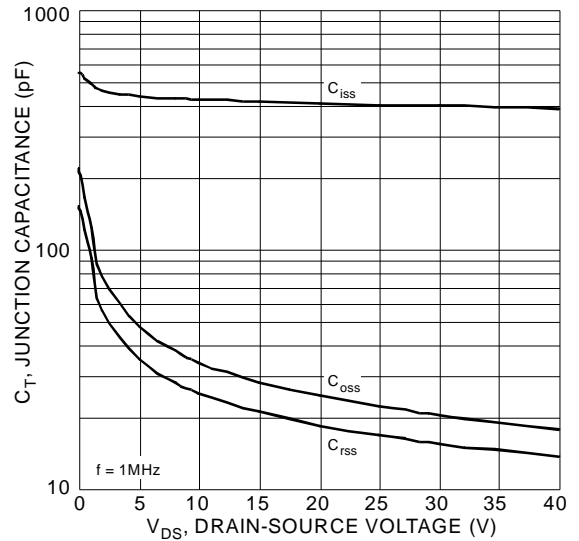


Figure 10 Typical Junction Capacitance

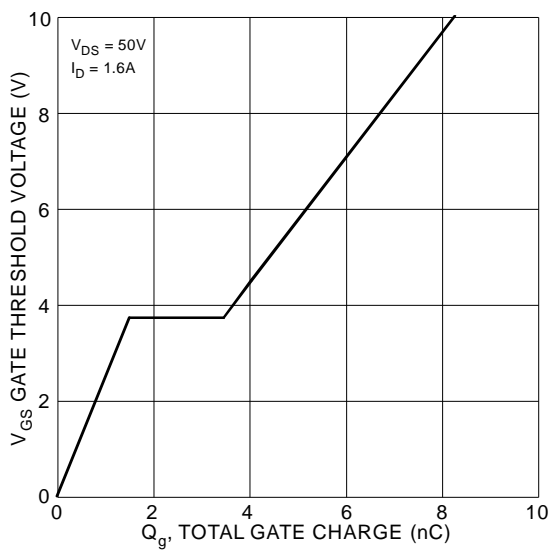


Figure 11 Gate Charge

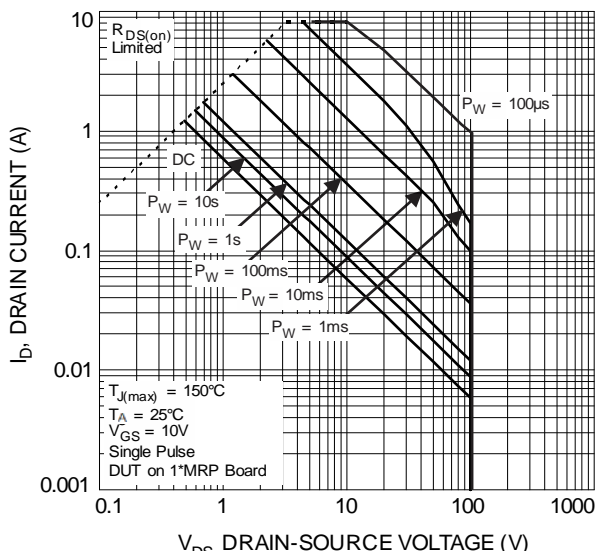
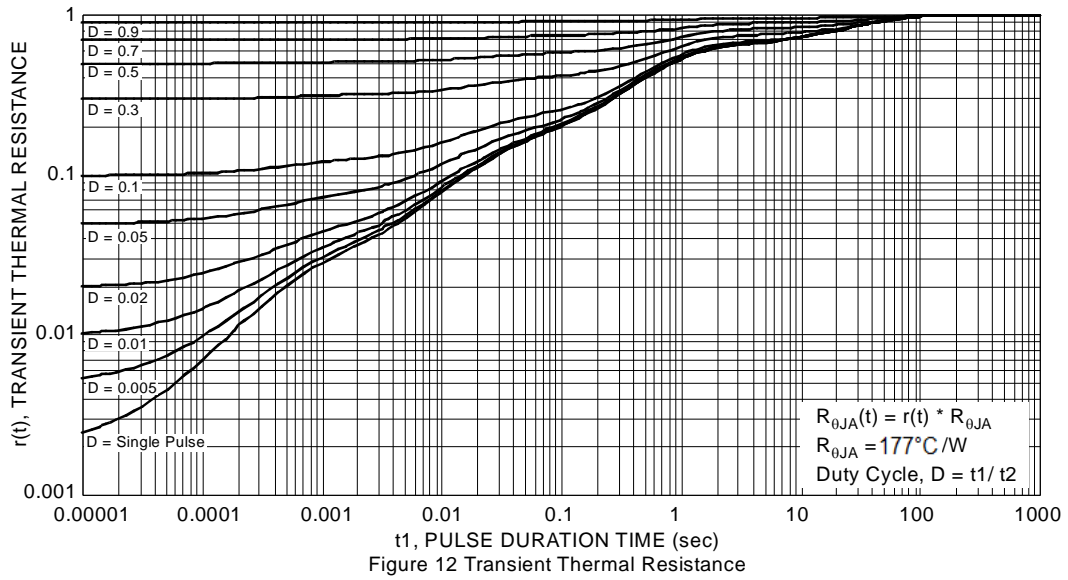


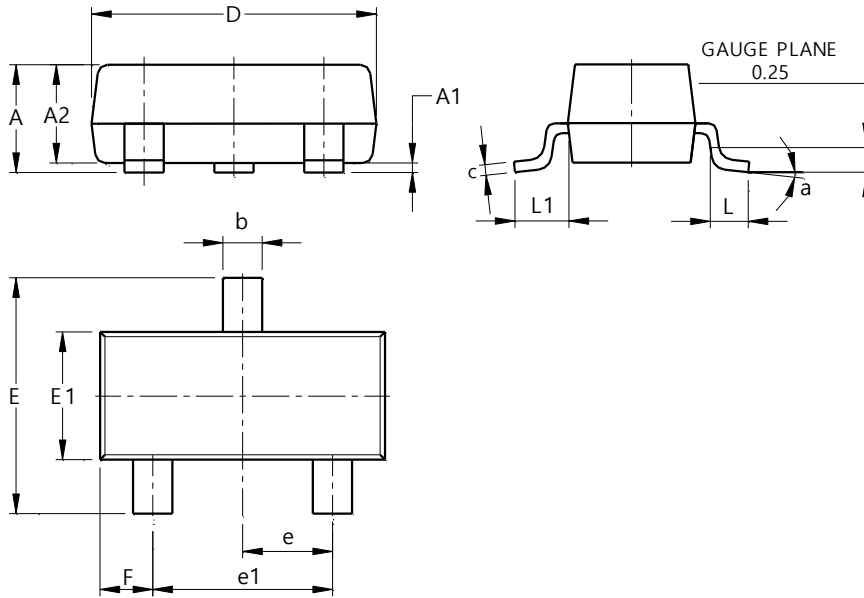
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

SOT23 (Standard)

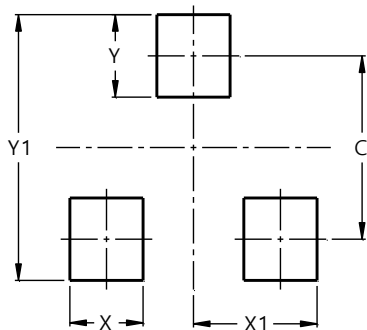


SOT23 (Standard)			
Dim	Min	Max	Typ
A	0.90	1.15	1.025
A1	0.00	0.10	0.05
A2	0.85	1.10	0.975
b	0.30	0.51	0.40
c	0.080	0.202	0.11
D	2.80	3.00	2.90
E	2.25	2.55	2.40
E1	1.20	1.40	1.30
e	0.89	1.03	0.915
e1	1.78	2.05	1.83
F	0.40	0.60	0.535
L1	0.45	0.61	0.55
L	0.25	0.55	0.40
a	0°	8°	--
All Dimensions in mm			

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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