

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D
100V	0.25Ω	2.1A

Description

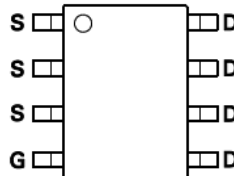
This new generation of trench MOSFETs utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high-efficiency, low-voltage, power-management applications.

Applications

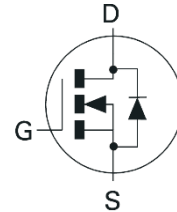
- DC-DC converters
- Power-management functions
- Disconnect switches
- Motor controls



Top View



Top View
Pin Configuration



Equivalent Circuit

Features

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SOIC Package
- **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 [contact us](mailto:contact@diodes.com) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

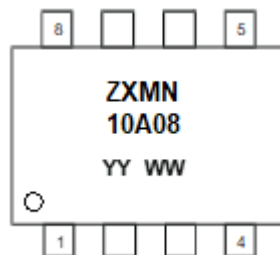
- Package: SO-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.076 grams (Approximate)

Ordering Information (Note 4)

Part Number	Package	Reel Size (inches)	Tape Width (mm)	Packing	
				Qty.	Carrier
ZXMN10A08DN8TA	SO-8	7	12	500 units	Reel
ZXMN10A08DN8TC	SO-8	13	12	2,500 units	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



ZXMN10A08 = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 23 = 2023)
 WW = Week (01 to 53)

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$V_{GS} = 10V, T_A = +25^\circ C$ (Note 5)	2.1
		$V_{GS} = 10V, T_A = +70^\circ C$ (Note 5)	1.7
		$V_{GS} = 10V, T_A = +25^\circ C$ (Note 6)	1.6
Pulsed Drain Current (Note 7)	I_{DM}	9	A
Continuous Source Current (Body Diode) (Note 5)	I_S	2.6	A
Pulsed Source Current (Body Diode) (Note 7)	I_{SM}	9	A
Power Dissipation at $T_A = +25^\circ C$ (Note 6)	P_D	1.25	W
Linear Derating Factor		10	mW/ $^\circ C$
Power Dissipation at $T_A = +25^\circ C$ (Note 5)	P_D	1.8	W
Linear Derating Factor		14.5	mW/ $^\circ C$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction to Ambient (Note 6)	$R_{\theta JA}$	100	$^\circ C/W$
Junction to Ambient (Note 5)	$R_{\theta JA}$	69	$^\circ C/W$

Electrical Characteristics (@ $T_A = +25^\circ C$, unless otherwise specified.)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
STATIC						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	$I_D = 250\mu A, V_{GS} = 0V$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	$V_{DS} = 100V, V_{GS} = 0V$
Gate-Body Leakage	I_{GSS}	—	—	100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	2.0	—	—	V	$I_D = 250\mu A, V_{DS} = V_{GS}$
Static Drain-Source On-State Resistance (Note 8)	$R_{DS(on)}$	—	—	0.25	Ω	$V_{GS} = 10V, I_D = 3.2A$ $V_{GS} = 6V, I_D = 2.6A$
		—	—	0.30		
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	5.0	—	S	$V_{DS} = 15V, I_D = 3.2A$
DYNAMIC (Note 9)						
Input Capacitance	C_{iss}	—	405	—	pF	$V_{DS} = 50V, V_{GS} = 0V$ $f = 1MHz$
Output Capacitance	C_{oss}	—	28.2	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	14.2	—	pF	
SWITCHING (Notes 9 & 10)						
Turn-On Delay Time	$t_{d(on)}$	—	3.4	—	ns	$V_{DD} = 30V, I_D = 1.2A$ $R_{\theta} \cong 6.0\Omega, V_{GS} = 10V$
Rise Time	t_r	—	2.2	—	ns	
Turn-Off Delay Time	$t_{d(off)}$	—	8	—	ns	
Fall Time	t_f	—	3.2	—	ns	
Gate Charge	Q_g	—	4.2	—	nC	$V_{DS} = 50V, V_{GS} = 5V$ $I_D = 1.2A$
Total Gate Charge	Q_g	—	7.7	—	nC	$V_{DS} = 50V, V_{GS} = 10V$ $I_D = 1.2A$
Gate-Source Charge	Q_{gs}	—	1.8	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.1	—	nC	
SOURCE-DRAIN DIODE						
Diode Forward Voltage (Note 8)	V_{SD}	—	0.87	0.95	V	$T_J = +25^\circ C, I_S = 3.2A$ $V_{GS} = 0V$
Reverse Recovery Time (Note 9)	t_{rr}	—	27	—	ns	$T_J = +25^\circ C, I_F = 1.2A$ $di/dt = 100A/\mu s$
Reverse Recovery Charge (Note 9)	Q_{rr}	—	32	—	nC	

- Notes:
5. For a device surface-mounted on FR4 PCB measured at $t \leq 5$ secs.
 6. For a device surface-mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 7. Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.02$, pulse width 300 μs – pulse width limited by maximum junction temperature.
 8. Measured under pulsed conditions. Width = 300 μs . Duty cycle $\leq 2\%$.
 9. For design aid only, not subject to production testing.
 10. Switching characteristics are independent of operating junction temperature.

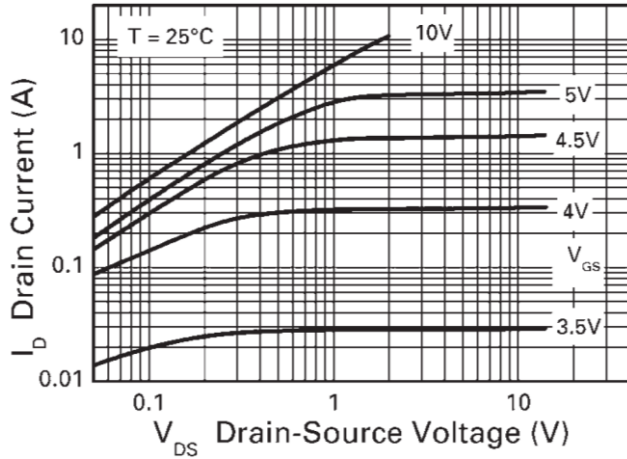


Figure 1. Output Characteristics

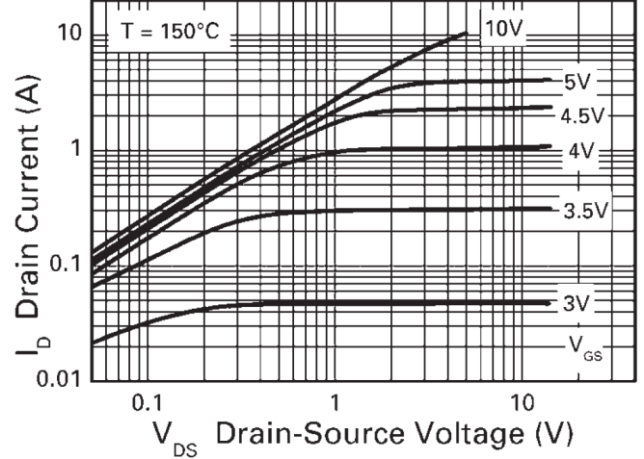


Figure 2. Output Characteristics

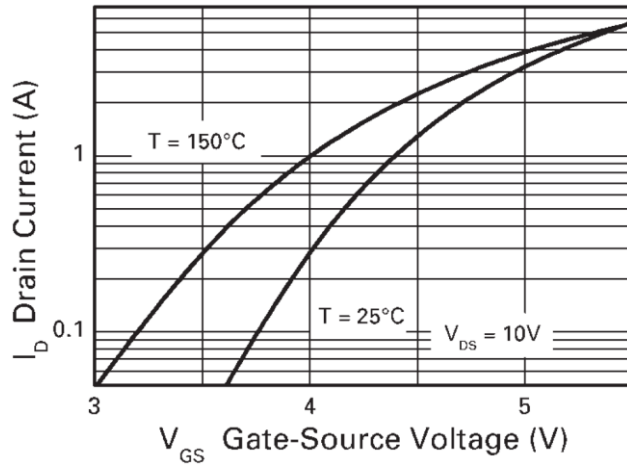


Figure 3. Typical Transfer Characteristics

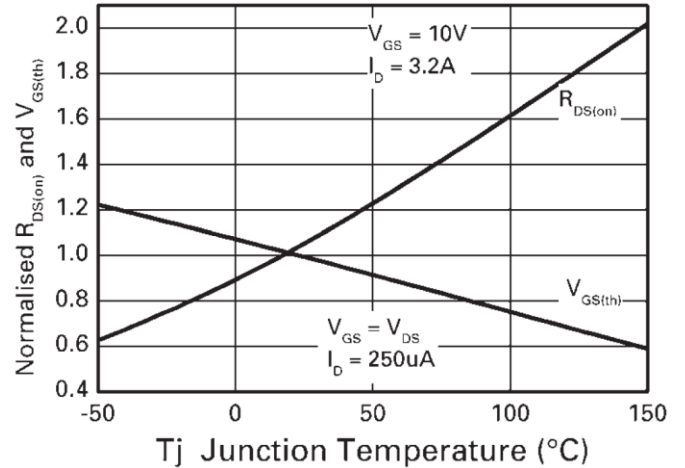


Figure 4. Normalized Curves vs. Temperature

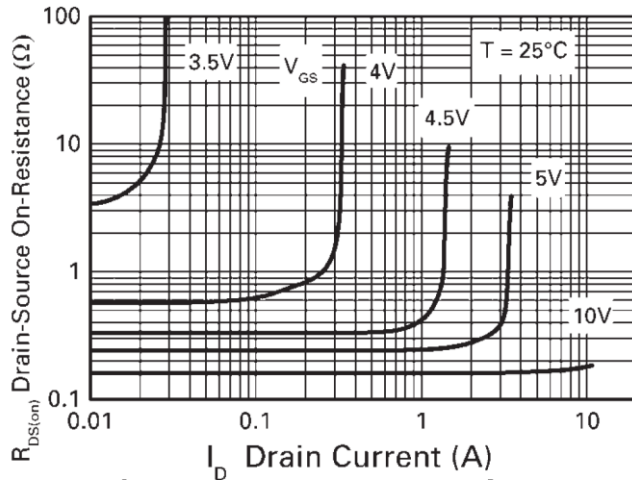


Figure 5. On-Resistance vs. Drain Current

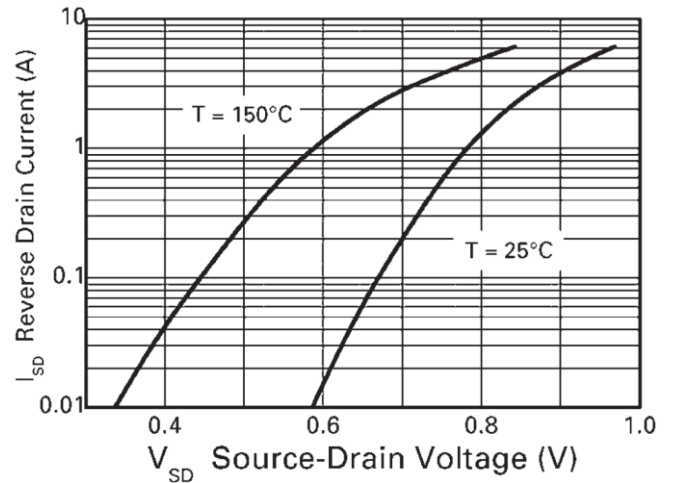


Figure 6. Source-Drain Diode Forward Voltage

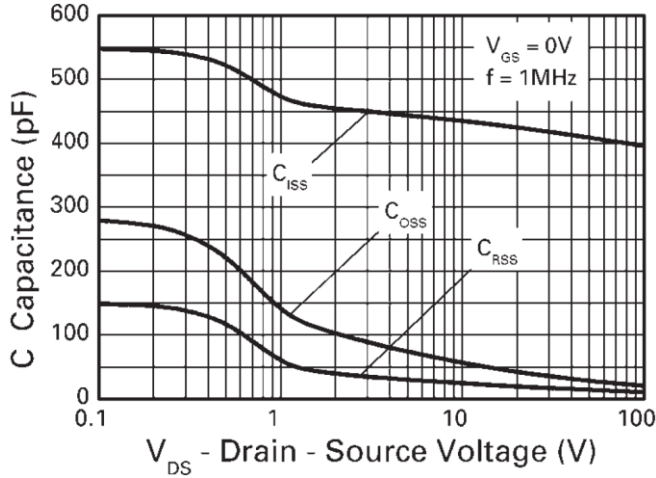


Figure 7. Capacitance vs. Drain-Source Voltage

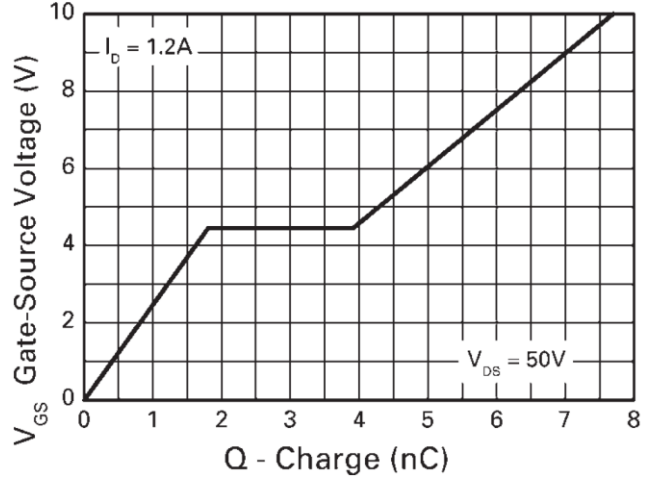


Figure 8. Gate-Source Voltage vs. Gate Charge

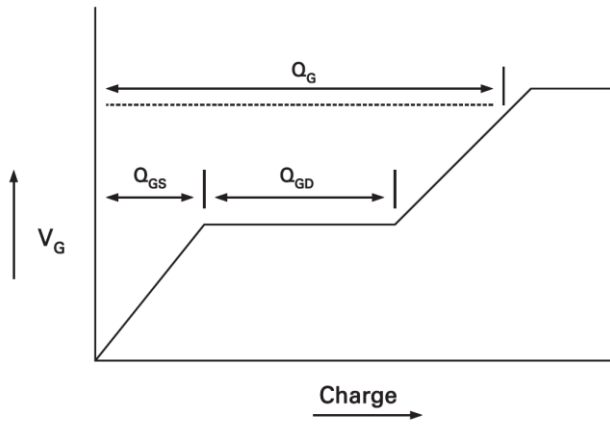


Figure 9. Basic Gate Charge Waveform

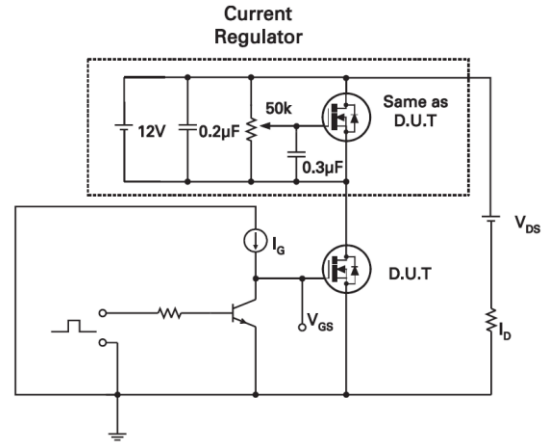


Figure 10. Gate Charge Test Circuit

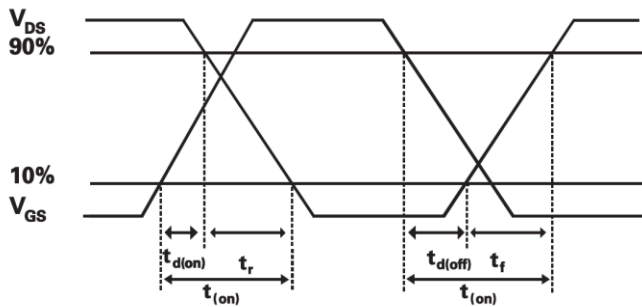


Figure 11. Switching Time Waveforms

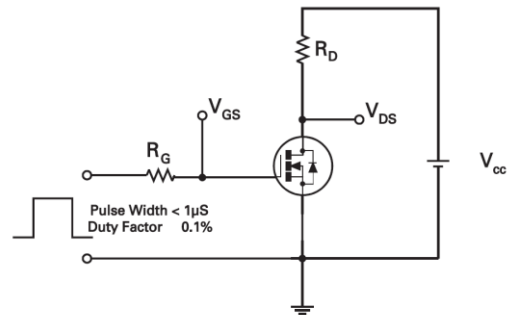
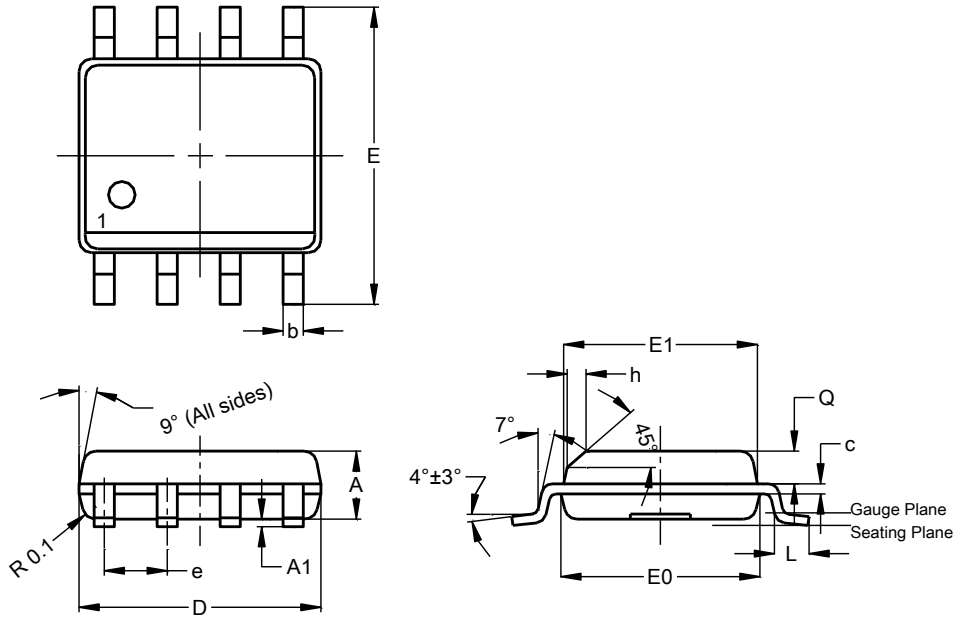


Figure 12. Switching Time Test Circuit

Package Outline Dimensions

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

SO-8

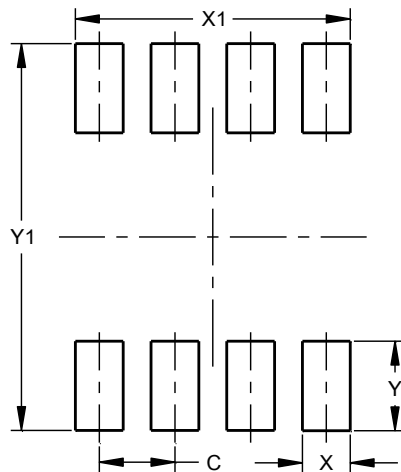


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	--	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

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

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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