

100V N-CHANNEL ENHANCEMENT MODE VERTICAL MOSFET IN SOT223

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _A = +25°C
100V	0.54Ω @ V _{GS} = 10V	1.67A
	0.75Ω @ V _{GS} = 5V	1.42A

Description and Applications

This MOSFET is designed to minimize the on-state resistance yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- DC-DC converters
- Solenoids/relay driver for automotive applications

Features and Benefits

- BV_{DSS} > 100V
- R_{DS(ON)} ≤ 0.54Ω @ V_{GS} = 10V
- Maximum Continuous Drain Current I_D = 1.67A
- **Lead-Free Finish; 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/>

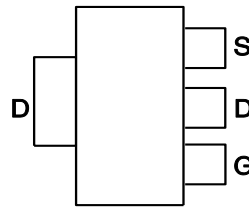
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

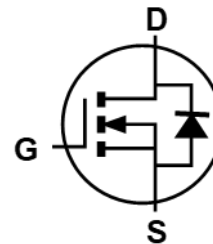
SOT223 (Type DN)



Top View



Pin Out - Top View



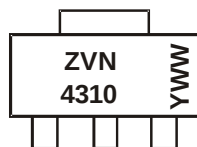
Equivalent Circuit

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZVN4310GTA	SOT223 (Type DN)	1,000	Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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



ZVN4310 = Product Type Marking Code
 YWW = Date Code Marking
 Y or $\bar{Y}$ = Last Digit of Year (ex: 4 = 2024)
 WW or $\bar{WW}$ = Week Code (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	1.67	A
Pulsed Drain Current (Note 6)	I_{DM}	12	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	3	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	41.7	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	8.84	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DS}	100	—	—	V	$V_{GS} = 0V, I_D = 1mA$
Zero Gate Voltage Drain Current, $T_J = +25^\circ\text{C}$	I_{DSS}	—	—	10 100	μA μA	$V_{DS} = 100V, V_{GS} = 0V$ $V_{DS} = 80V, V_{GS} = 0V, T_A = +125^\circ\text{C}$
Gate-Source Leakage	I_{GSS}	—	—	± 20	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
On-State Drain Current	$I_{D(ON)}$	9	—	—	A	$V_{GS} = 10V, V_{DS} = 10V$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	$V_{DS} = V_{GS}, I_D = 1mA$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	0.4 0.5	0.54 0.75	Ω	$V_{GS} = 10V, I_D = 3.3A$ $V_{GS} = 5V, I_D = 1.5A$
Forward Transconductance	g_{fs}	0.6	—	—	S	$V_{DS} = 10V, I_D = 3.3A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	—	350	pF	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0MHz$
Output Capacitance	C_{oss}	—	—	140	pF	
Reverse Transfer Capacitance	C_{rss}	—	—	20	pF	
Turn-On Delay Time	$t_{D(ON)}$	—	—	8	ns	$V_{DD} = 25V, I_D = 3A, V_{GEN} = 10V,$ $R_{GS} = 50\Omega$
Turn-On Rise Time	t_R	—	—	25	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	—	30	ns	
Turn-Off Fall Time	t_F	—	—	16	ns	

- Notes:
- For a device mounted on 50mm X 50mm X 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air condition.
 - Device mounted on minimum recommended pad layout test board, 10 μs pulse duty cycle = 1%.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).
 - Short duration pulse test used to minimize self-heating effect.

Electrical Characteristics

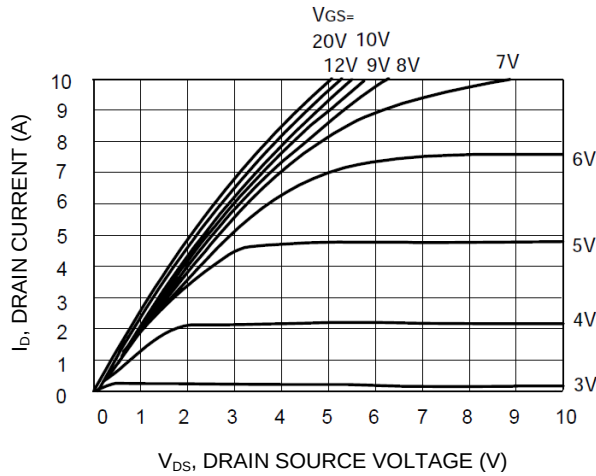


Figure 1. Saturation Characteristics

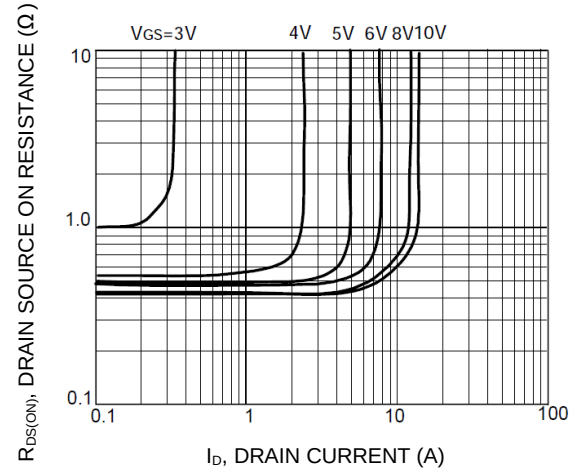


Figure 2. On-Resistance vs. Drain Current

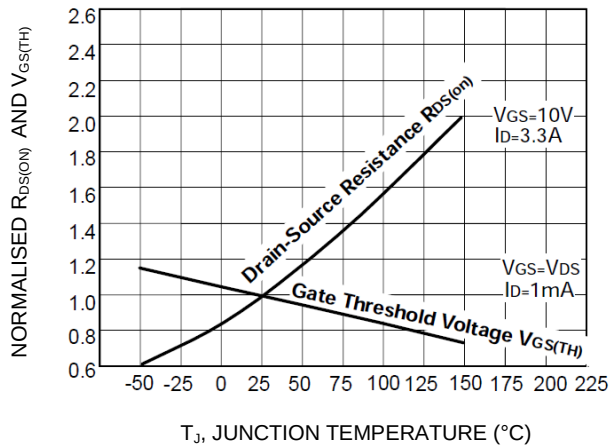


Figure 3. Normalised $R_{DS(ON)}$ and $V_{GS(TH)}$ vs. Temperature

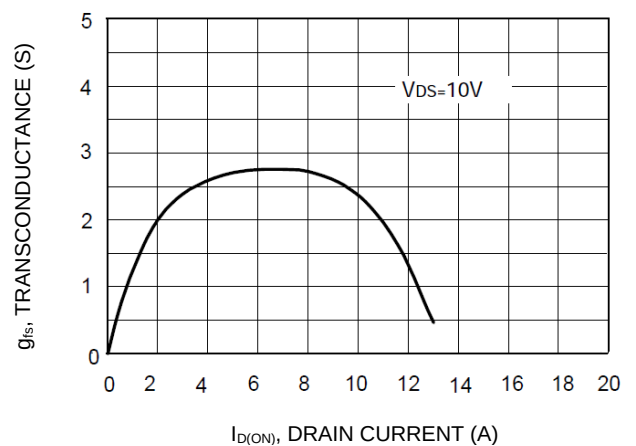


Figure 4. Transconductance vs. Drain Current

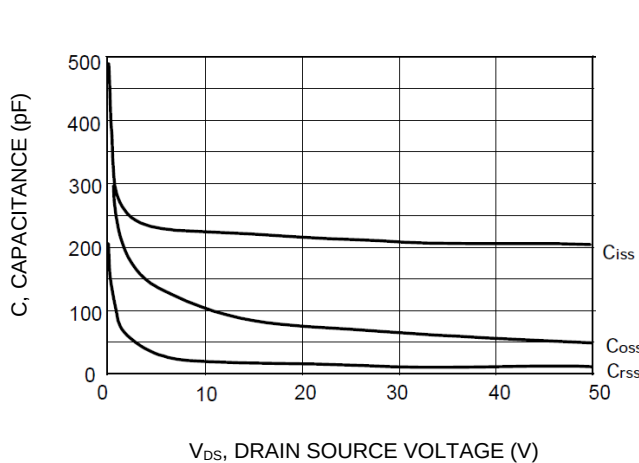


Figure 5. Capacitance vs. Drain-Source Voltage

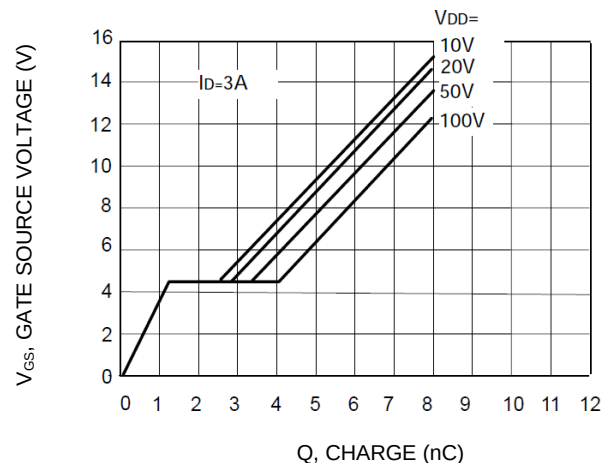
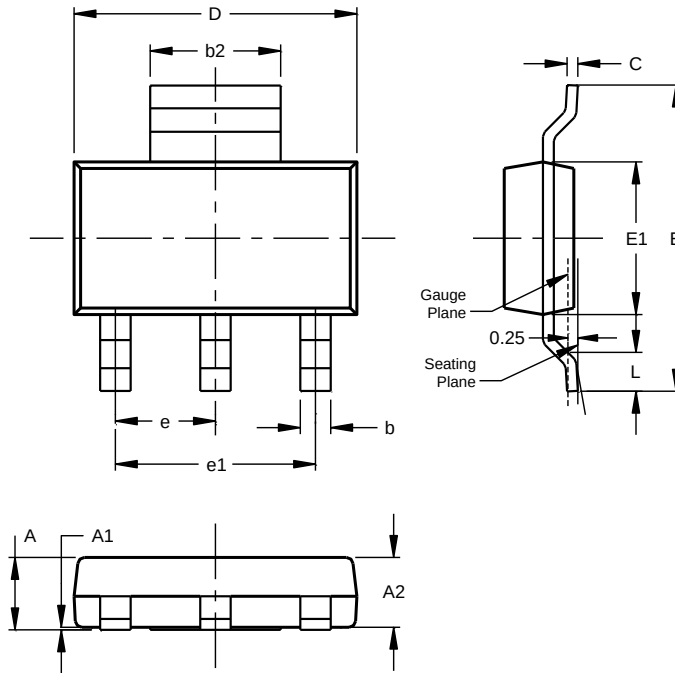


Figure 6. Gate Charge vs. Gate-Source Voltage

Package Outline Dimensions

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

SOT223 (Type DN)

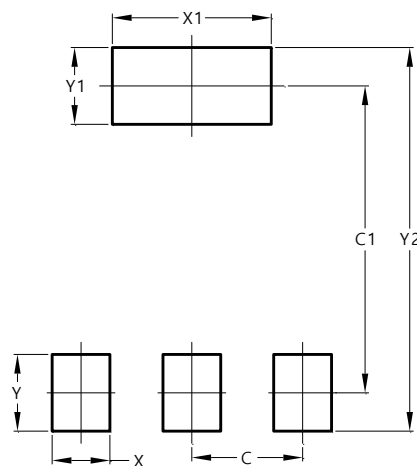


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT223 (Type DN)



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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