

100V N-CHANNEL ENHANCEMENT MODE VERTICAL MOSFET IN SOT223
Features and Benefits

- $V_{(BR)DSS} > 100V$
- $R_{DS(on)} \leq 0.54\Omega$ @ $V_{GS} = 10V$
- Maximum continuous drain current $I_D = 1.67A$
- **“Green” component, Lead Free Finish / RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.112 grams (approximate)

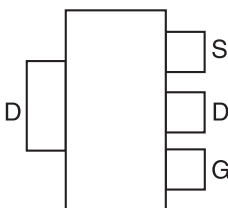
Applications

- DC-DC Converters
- Solenoids / Relay Driver for Automotive

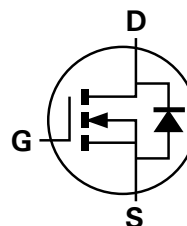
SOT223



Top View



Pin Out - Top

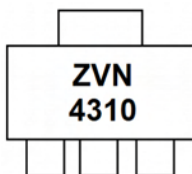


Equivalent Circuit

Ordering Information (Note 1)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZVN4310GTA	ZVN4310	7	8	1,000

Notes: 1. Diodes, Inc. defines “Green” products as those which are RoHS compliant and contain no halogens or antimony compounds. All applicable RoHS exemptions applied. Further information about Diodes Inc.’s “Green” Policy can be found on our website at [https:// www.diodes.com](https://www.diodes.com)

Marking Information


ZVN4310 = Product Type Marking Code

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}	±20	V
Continuous Drain Current	I _D	1.67	A
Pulsed Drain Current (Note 3)	I _{DM}	12	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

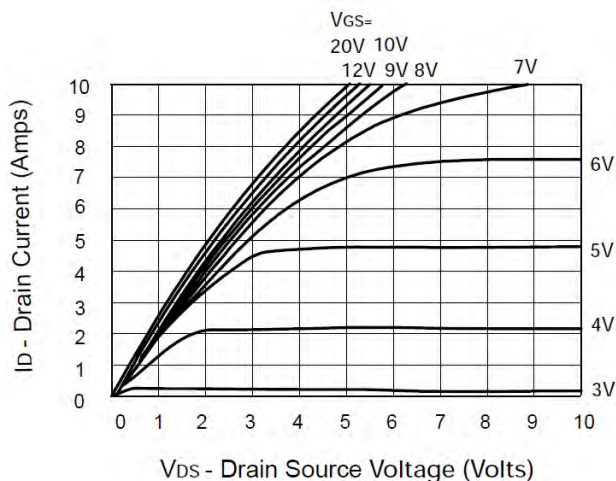
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 2)	P _D	3	W
Thermal Resistance, Junction to Ambient (Note 2)	R _{θJA}	41.7	°C/W
Thermal Resistance, Junction to Leads (Note 4)	R _{θJL}	8.84	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

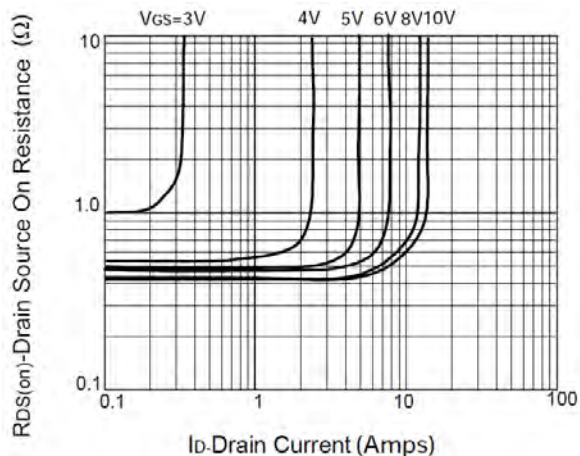
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	-	-	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current T _J = 25°C	I _{DSS}	-	-	10 100	μA μA	V _{DS} = 100V, V _{GS} = 0V V _{DS} = 80V, V _{GS} = 0V, T _A = 125°C
Gate-Source Leakage	I _{GSS}	-	-	±20	nA	V _{GS} = ±20V, V _{DS} = 0V
On-State Drain Current	I _{D(on)}	9	-	-	A	V _{GS} = 10V, V _{DS} = 10V
ON CHARACTERISTICS (Note 5)						
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 5)						
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} = 50Ω
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:
2. 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.
 3. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
 4. Thermal resistance from junction to solder-point (at the end of the drain lead).
 5. Short duration pulse test used to minimize self-heating effect.

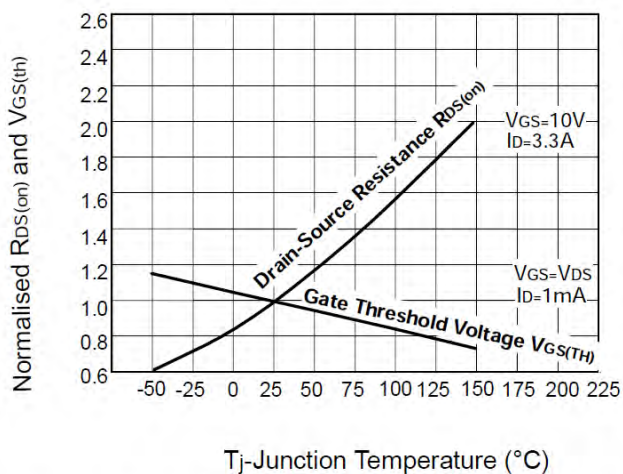
Electrical Characteristics



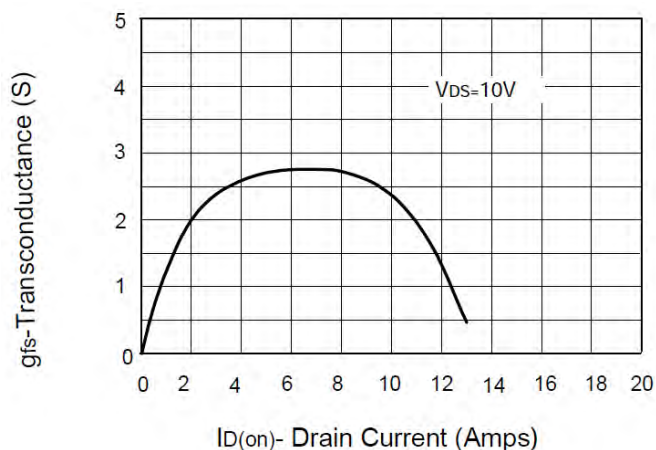
Saturation Characteristics



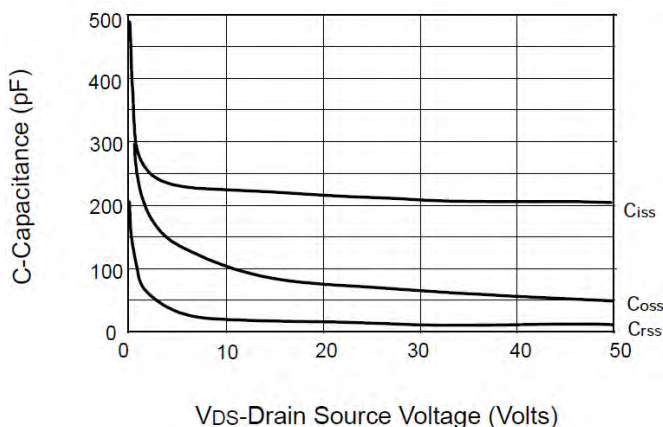
On-resistance v drain current



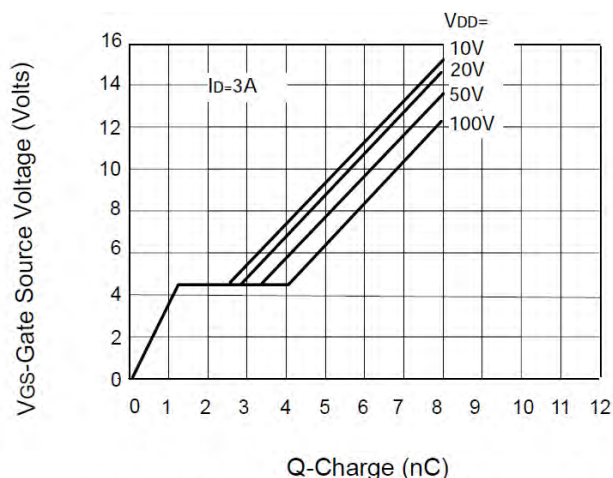
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature



Transconductance v drain current

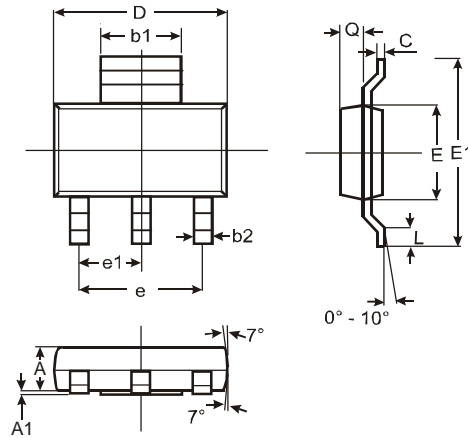


Capacitance v drain-source voltage



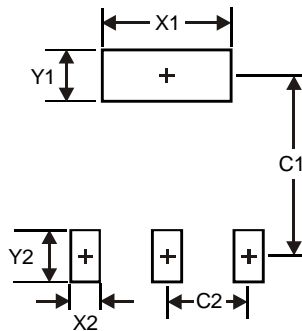
Gate charge v gate-source voltage

Package Outline Dimensions



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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