



### 200V N-CHANNEL ENHANCEMENT MODE VERTICAL MOSFET IN SOT223

## **Product Summary**

BV <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub> T <sub>A</sub> = +25°C
200V	10Ω @ V <sub>GS</sub> = 10V	0.32A

## **Features and Benefits**

- V<sub>(BR)DSS</sub> > 200V
- R<sub>DS(on)</sub> ≤ 10 Ω @ V<sub>GS</sub> = 10V
- 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-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

## **Description and Applications**

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

- DC-DC Converters
- Automotive Solenoids / Relay Drivers

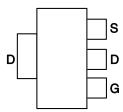
### **Mechanical Data**

- Package: SOT223 (Type DN)
- 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 <a>3</a>
- Weight: 0.112 grams (Approximate)

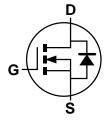




Top View



Pin Out - Top



**Equivalent Circuit** 

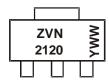
### Ordering Information (Note 4)

Part Number	Backago	Packing		
Part Number	Package	Qty.	Carrier	
ZVN2120GTA	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**



$$\label{eq:ZVN2120} \begin{split} & \text{ZVN2120} = \text{Product Type Marking Code} \\ & \text{YWW} = \text{Date Code Marking} \\ & \text{Y or } \overline{\text{Y}} = \text{Last Digit of Year (ex: 1= 2021)} \\ & \text{WW or } \overline{\text{WW}} = \text{Week Code (01~53)} \end{split}$$



## Maximum Ratings (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	200	V
Gate-Source Voltage	$V_{GSS}$	±20	V
Continuous Drain Current	I <sub>D</sub>	0.32	A
Pulsed Drain Current	I <sub>DM</sub>	2	А
Power Dissipation	$P_{D}$	2	W
Operating and Storage Temperature Range	$T_{J}, T_{STG}$	-55 to +150	°C

# Electrical Characteristics (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

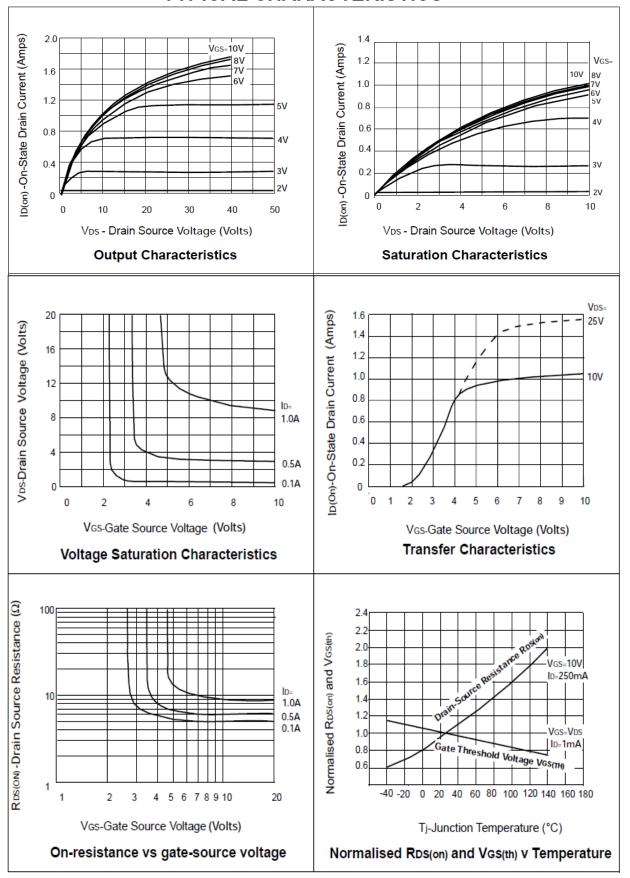
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 5)							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	200	•	-	V	$V_{GS} = 0V$ , $I_D = 1mA$	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	10 100	μA μA	V <sub>DS</sub> = 200V, V <sub>GS</sub> = 0V V <sub>DS</sub> = 160V, V <sub>GS</sub> = 0V, T <sub>J</sub> = +125°C (Note 7)	
Gate-Source Leakage	I <sub>GSS</sub>	-	-	±20	nA	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$	
On-State Drain Current (Note 6)	I <sub>D(on)</sub>	500	-	-	mA	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 25V	
ON CHARACTERISTICS (Note 5)							
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	•	3	V	$V_{DS} = V_{GS}$ , $I_D = 1mA$	
Static Drain-Source On-Resistance (Note 6)	R <sub>DS(on)</sub>	1	1	10	Ω	$V_{GS} = 10V, I_D = 250mA$	
Forward Transconductance (Notes 6, 7)	<b>g</b> fs	100	-	-	mS	$V_{DS} = 25V, I_{D} = 250mA$	
DYNAMIC CHARACTERISTICS (Note 7)							
Input Capacitance	C <sub>iss</sub>	1	ı	85	рF	V 05V V 0V	
Output Capacitance	Coss		-	20	pF	$V_{DS} = 25V, V_{GS} = 0V,$ f = 1.0MHz	
Reverse Transfer Capacitance	C <sub>rss</sub>	-	į	7	pF	1 = 1.0WHZ	
Turn-On Delay Time (Note 8)	t <sub>D(on)</sub>		-	8	ns		
Turn-On Rise Time (Note 8)	t <sub>R</sub>	-	-	8	ns	V 25V I 250mA	
Turn-Off Delay Time (Note 8)	t <sub>D(off)</sub>	-	•	20	ns	$V_{DD} = 25V, I_D = 250mA$	
Turn-Off Fall Time (Note 8)	t <sub>F</sub>	-	-	12	ns		

Notes:

- 5. Short duration pulse test used to minimize self-heating effect.
- 6. Measured under pulsed conditions. Width=300ms. Duty cycle ≤2%.
- Guaranteed by design. Not subject to product testing.
  Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator.</li>

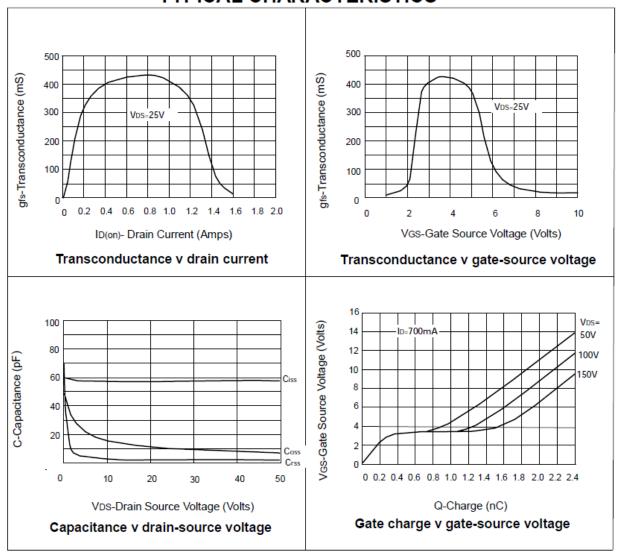


## TYPICAL CHARACTERISTICS





# TYPICAL CHARACTERISTICS

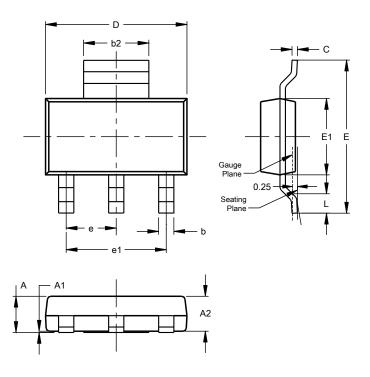




# **Package Outline Dimensions**

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

### SOT223 (Type DN)

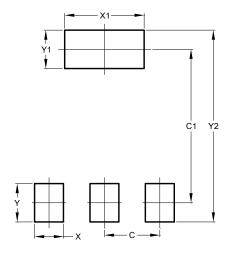


SOT223 (Type DN)				
Dim	Min	Max	Тур	
Α		1.70		
A1	0.01	0.15		
A2	1.50	1.68	1.60	
b	0.60	0.80	0.70	
b2	2.90	3.10		
C	0.20	0.32		
D	6.30	6.70		
ш	6.70	7.30		
E1	3.30	3.70		
е			2.30	
e1			4.60	
L	0.85			
All Dimensions in mm				

# **Suggested Pad Layout**

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

### SOT223 (Type DN)



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



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