

## Product Summary

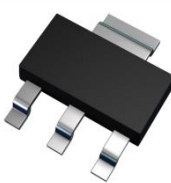
<b>BV<sub>DSS</sub></b>	<b>R<sub>DS(on)</sub></b>	<b>I<sub>D</sub></b> <b>T<sub>A</sub> = +25°C</b>
60V	0.33Ω @ V <sub>GS</sub> = 10V	2.1A

## Description and Applications

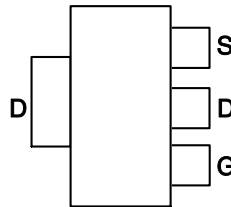
This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- DC-DC converters
- Solenoids/relay driver for automotive applications
- Stepper motor drivers

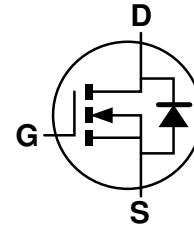
SOT223(Type DN)



Top View



Pin Out - Top View



Equivalent Circuit

## Features and Benefits

- BV<sub>DSS</sub>=60V
- R<sub>DS(on)</sub> = 0.33Ω
- **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](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

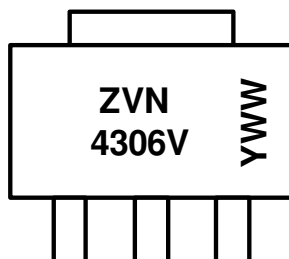
- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 Ⓔ3
- Weight: 0.112 grams (Approximate)

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZVN4306GVTA	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



ZVN4306V = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 1= 2021)  
 WW or  $\bar{W}W$  = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	2.1	A
Pulsed Drain Current	I <sub>DM</sub>	15	A
Power Dissipation	P <sub>tot</sub>	3	W
Avalanche Current-Repetitive	I <sub>AR</sub>	1	A
Avalanche Energy-Repetitive	E <sub>AR</sub>	25	mJ
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

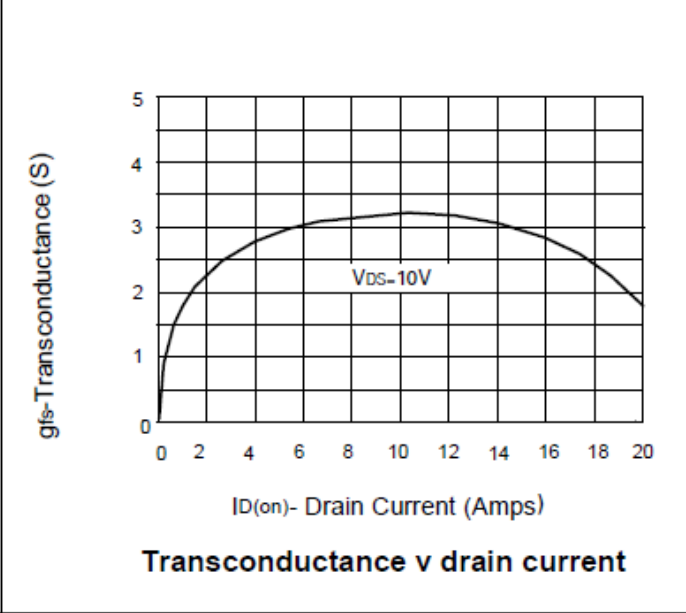
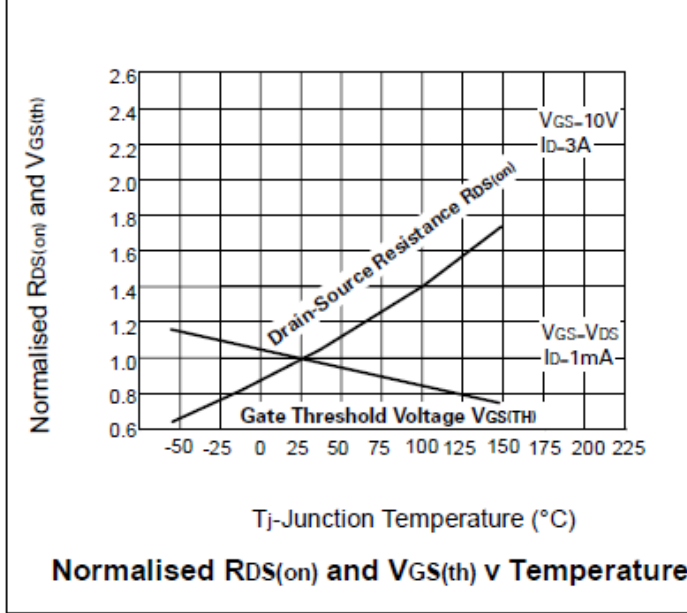
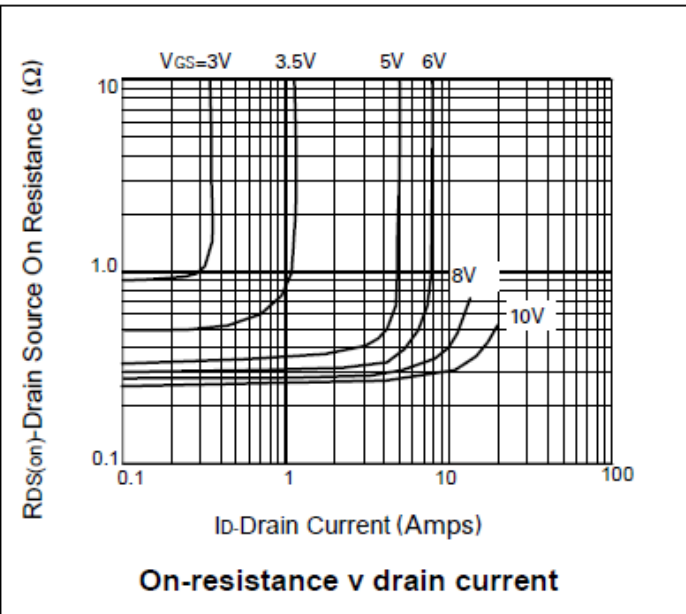
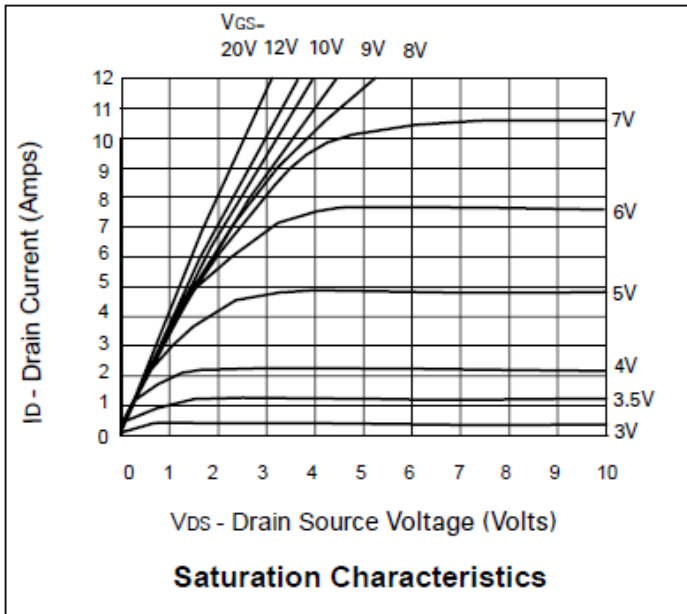
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 1mA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	10 100	μA μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V V <sub>DS</sub> = 48V, V <sub>GS</sub> = 0V, T = +125°C (Note 6)
Gate-Body Leakage	I <sub>GSS</sub>	-	-	20	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
On-State Drain Current (Note 5)	I <sub>D(on)</sub>	12	-	-	A	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 10V
<b>ON CHARACTERISTICS</b>						
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	1.3	-	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1mA
Static Drain-Source On-State Resistance (Note 5)	R <sub>DS(on)</sub>	-	0.22	0.33	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3A
		-	0.32	0.45	Ω	V <sub>GS</sub> = 5V, I <sub>D</sub> = 1.5A
Forward Transconductance (Notes 5, 6)	g <sub>fs</sub>	0.7	-	-	S	V <sub>DS</sub> = 25V, I <sub>D</sub> = 3A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance (Note 6)	C <sub>iss</sub>	-	-	350	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz
Common Source Output Capacitance (Note 6)	C <sub>oss</sub>	-	-	140	pF	
Reverse Transfer Capacitance (Note 6)	C <sub>rss</sub>	-	-	30	pF	
Turn-On Delay Time (Notes 6, 7)	t <sub>D(on)</sub>	-	-	8	ns	V <sub>DD</sub> ≈ 25V, V <sub>GEN</sub> = 10V, I <sub>D</sub> = 3A
Rise Time (Notes 6, 7)	t <sub>R</sub>	-	-	25	ns	
Turn-Off Delay Time (Notes 6, 7)	t <sub>D(off)</sub>	-	-	30	ns	
Fall Time (Notes 6, 7)	t <sub>F</sub>	-	-	16	ns	

**Drain-Source Diode Characteristics**

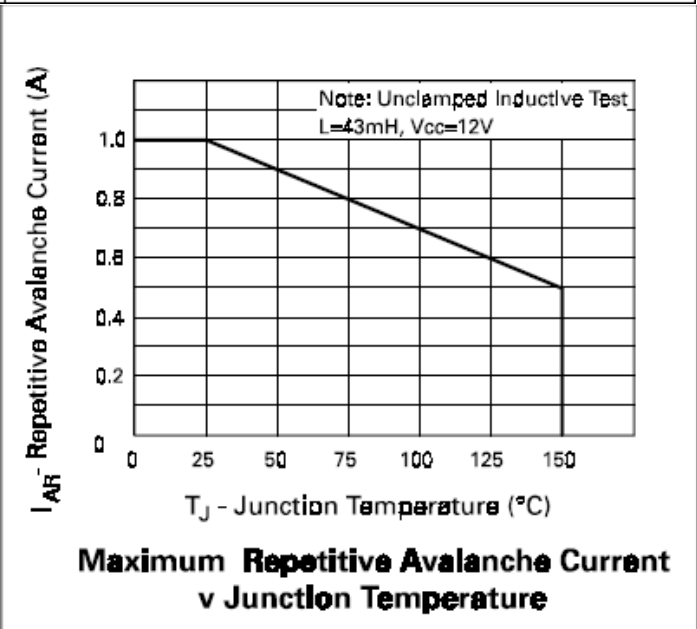
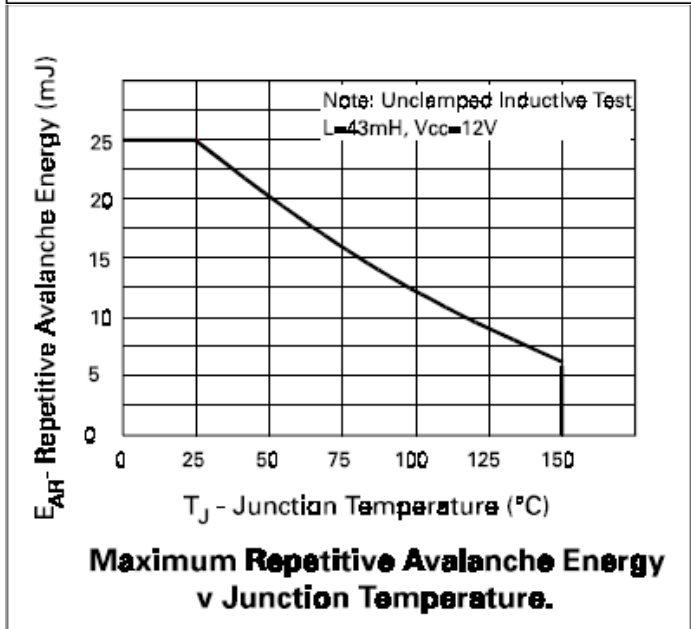
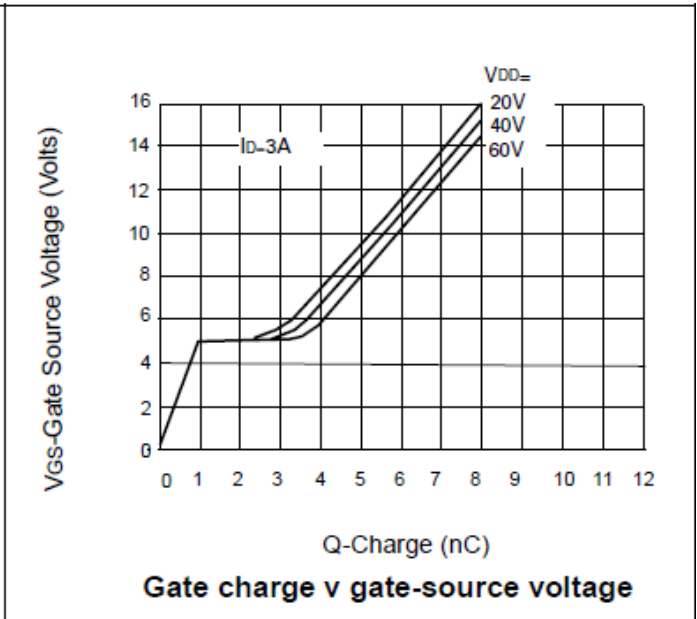
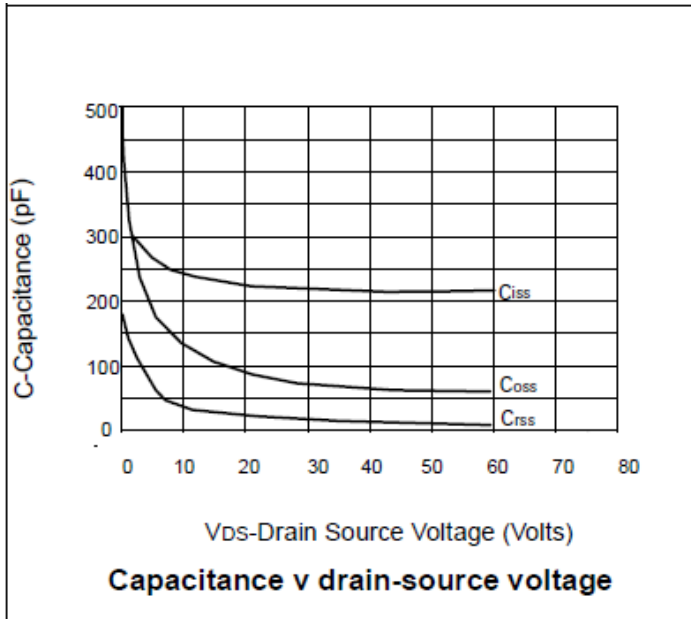
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Diode Forward Voltage (Note 5)	V <sub>SD</sub>	-	0.82	-	V	I <sub>S</sub> = 0.32A, V <sub>GS</sub> = 0
Reverse Recovery Time	T <sub>RR</sub>	-	112	-	ns	I <sub>F</sub> = 0.32A, V <sub>GS</sub> = 0, I <sub>R</sub> = 0.1A

- Notes:
5. Measured under pulsed conditions. Width=300μs. Duty cycle ≤2%
  6. Sample test.
  7. Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator. Spice parameter data is available upon request for this device.

**Typical Characteristics**



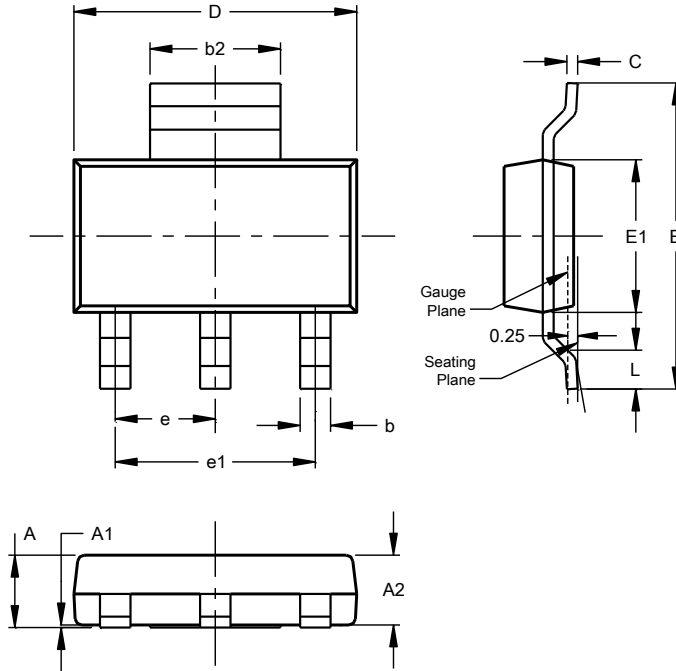
**Typical Characteristics**



## Package Outline Dimensions

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

SOT223 (Type DN)

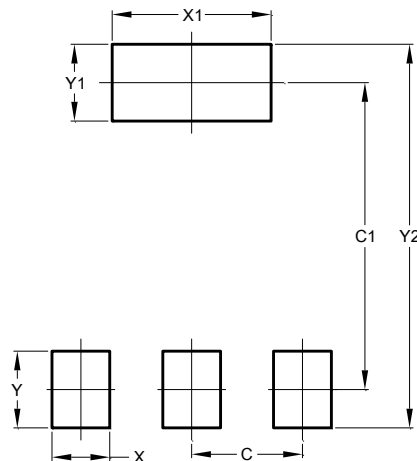


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

## 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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