

## SOT223 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

### Product Summary

$V_{(BR)DSS}$	Max $R_{DS(on)}$	Max $I_D$ $T_A = +25^\circ C$
60V	1Ω @ $V_{GS} = 10V$	1A

### Description and Applications

- DC-DC Converters
- Solenoid / Relay Drivers for Automotive Applications
- Stepper Motor Drivers and Print Head Drivers

### Features and Benefits

- Compact Geometry
- Fast Switching Speeds
- No Secondary Breakdown and Excellent Temperature Stability
- High Input Impedance and Low Current Drive
- Ease of Paralleling
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

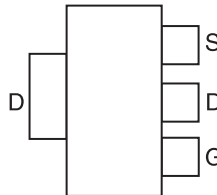
### Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208Ⓔ
- Weight: 0.112 grams (Approximate)

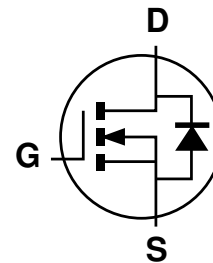
SOT223



Top View



Pin Out Top-view



Equivalent Circuit

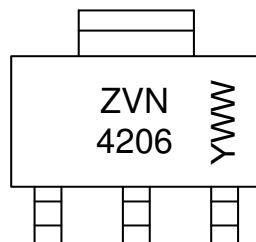
### Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
ZVN4206GTA	Standard	SOT223	1,000
ZVN4206GTC	Standard	SOT223	4,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

### Marking Information

SOT223



ZVN 4206 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{W}W$  = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	1	A
Pulsed Drain Current	I <sub>DM</sub>	8	A

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

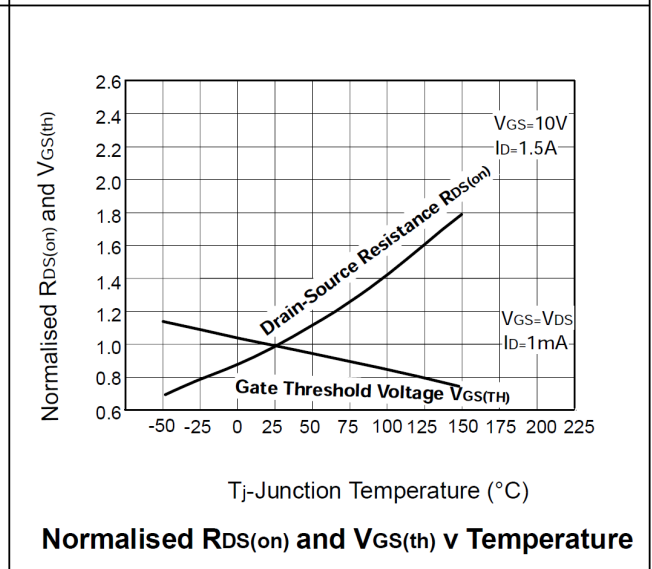
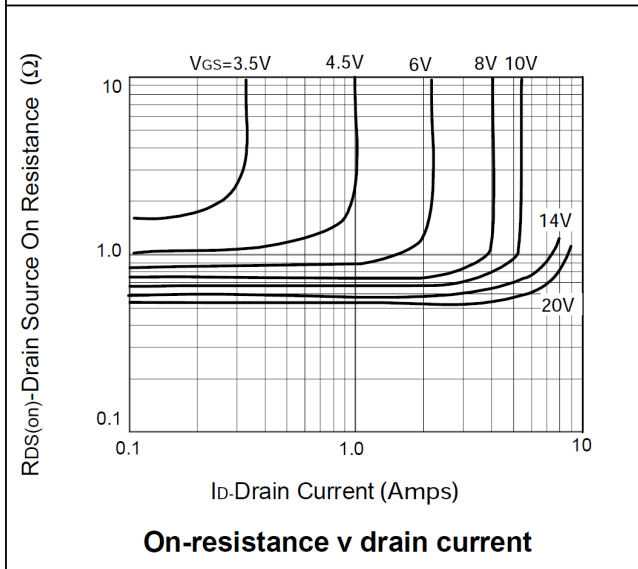
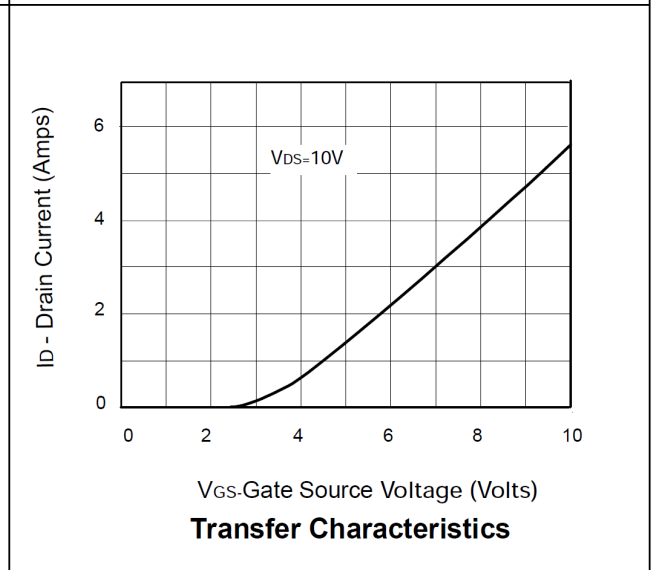
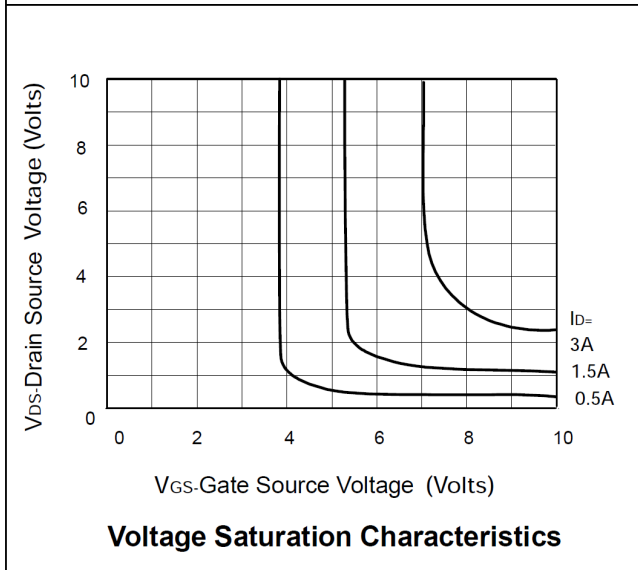
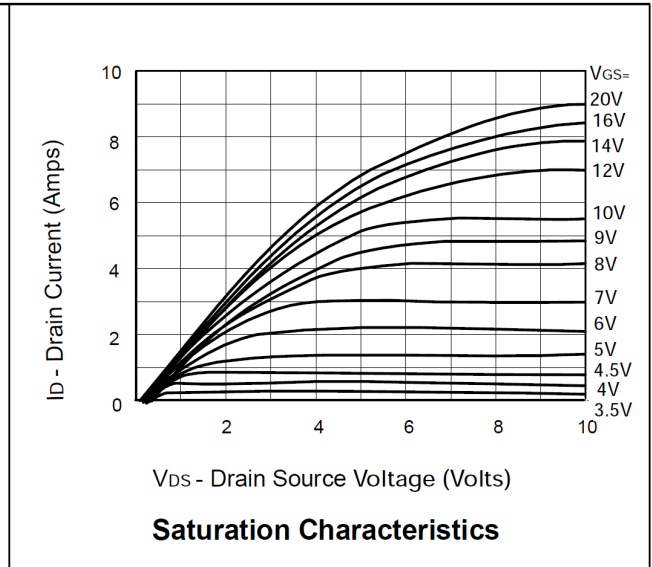
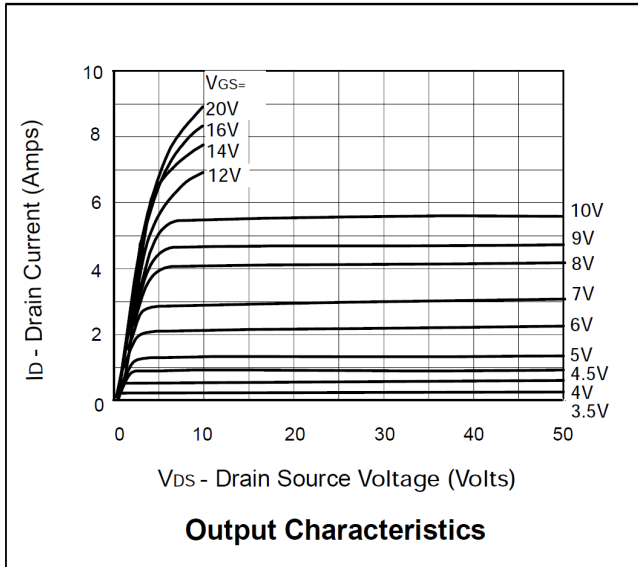
Characteristic	Symbol	Value	Unit
Power Dissipation at T <sub>A</sub> =+25°C	P <sub>tot</sub>	2	W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

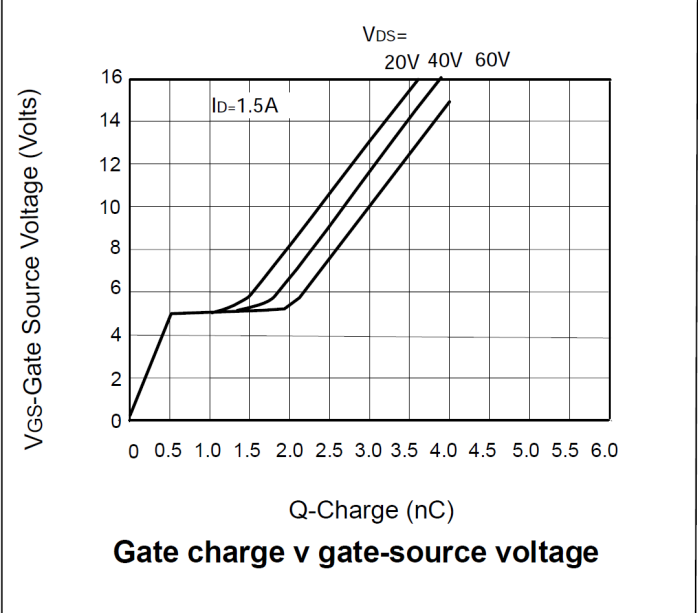
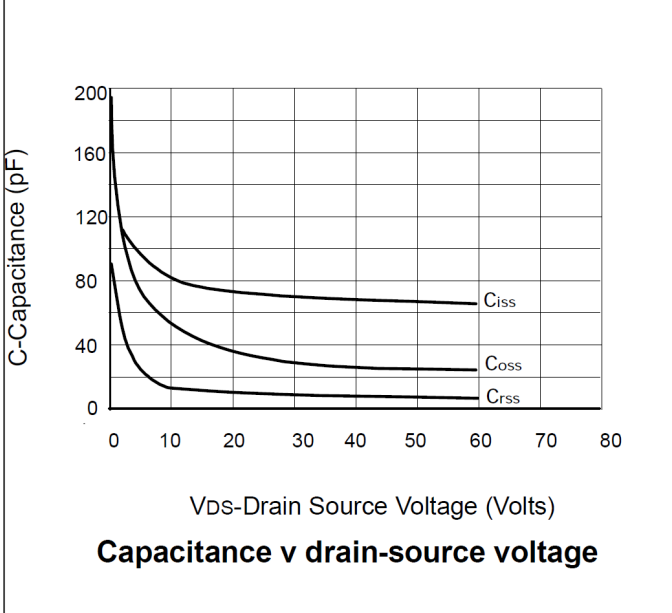
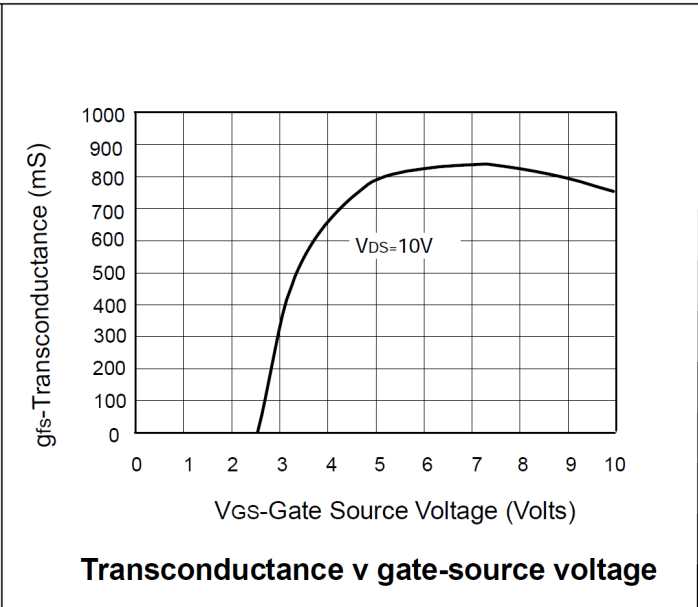
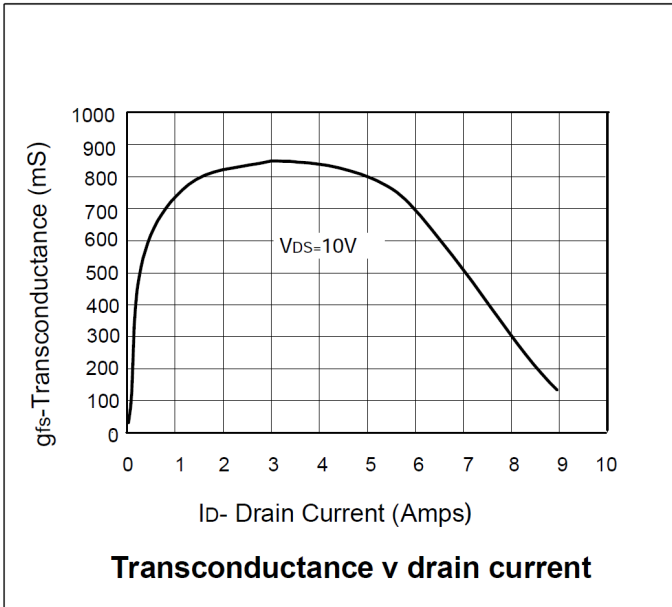
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	10 100	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V V <sub>DS</sub> = 48V, V <sub>GS</sub> = 0V, T = +125°C (Note 6)
Gate-Body Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	1.3	—	3	V	I <sub>D</sub> = 1mA, V <sub>DS</sub> = V <sub>GS</sub>
<b>ON CHARACTERISTICS</b>						
On-State Drain Current (Note 5)	I <sub>D(on)</sub>	3	—	—	A	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 10V
Static Drain-Source On-State Resistance (Note 5)	R <sub>DS(on)</sub>	—	—	1	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.5A
		—	—	1.5		V <sub>GS</sub> = 5V, I <sub>D</sub> = 0.5A
Forward Transconductance (Notes 5 & 6)	g <sub>fs</sub>	300	—	—	mS	V <sub>DS</sub> = 25V, I <sub>D</sub> = 1.5A
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance (Note 6)	C <sub>iss</sub>	—	—	100	pF	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance (Note 6)	C <sub>oss</sub>	—	—	60	pF	
Reverse Transfer Capacitance (Note 6)	C <sub>rss</sub>	—	—	20	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> = 1.5A
Turn-On Rise Time (Notes 6 & 7)	t <sub>r</sub>	—	—	12	ns	
Turn-Off Delay Time (Notes 6 & 7)	t <sub>d(off)</sub>	—	—	12	Ns	
Turn-Off Fall Time (Notes 6 & 7)	t <sub>f</sub>	—	—	15	Ns	

- 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.

**Typical Characteristics**

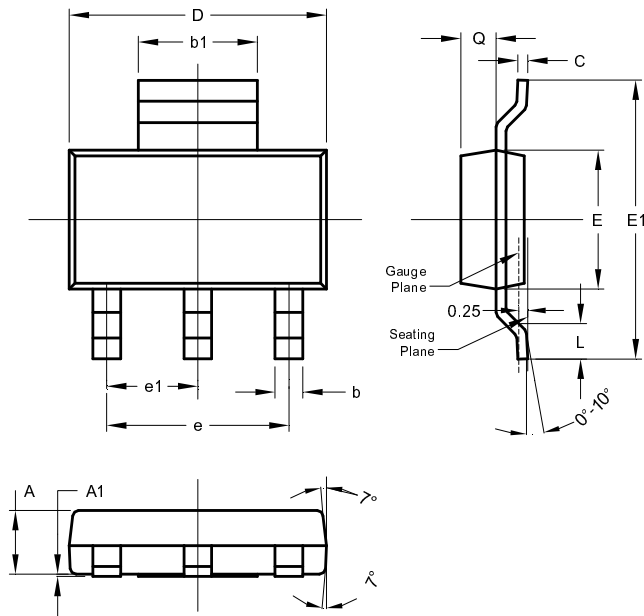


**Typical Characteristics** (continued)



**Package Outline Dimensions**

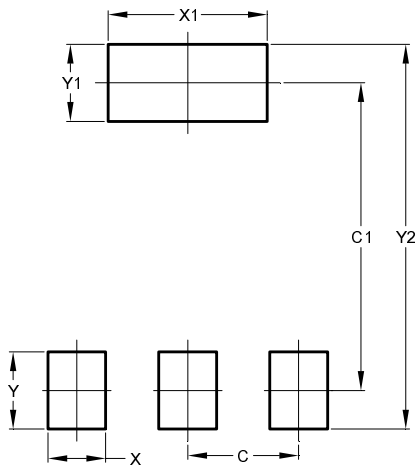
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
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**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
C2	8.00

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