

SOT223 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET
Product Summary

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

Description and Applications

- Automotive Relay Drivers
- Stepper Motor Driver

Features and Benefits

- Repetitive avalanche rating
- No transient protection required
- Characterized for 5V logic drive
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

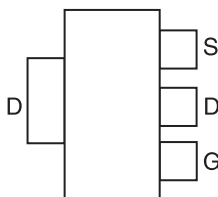
Mechanical Data

- 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 Ⓔ3
- Weight: 0.112 grams (Approximate)

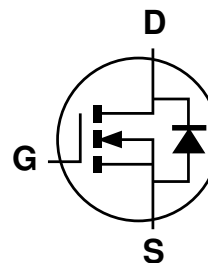
SOT223



Top View



Pin Out Top-view



Equivalent Circuit

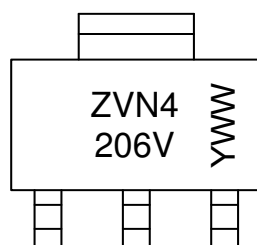
Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
ZVN4206GVTA	Standard	SOT223	1,000

- Notes:
- EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 - See 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT223



ZVN4 206V = 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_A = +25 °C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	1	A
Pulsed Drain Current	I _{DM}	8	A
Continuous Drain Current	I _D	1	A
Continuous Body Diode Current	I _{SD}	600	mA
Avalanche Current - Repetitive	I _{AR}	600	mA
Avalanche Energy - Repetitive	E _{AR}	15	mJ

Thermal Characteristics (@T_A = +25 °C, unless otherwise specified.)

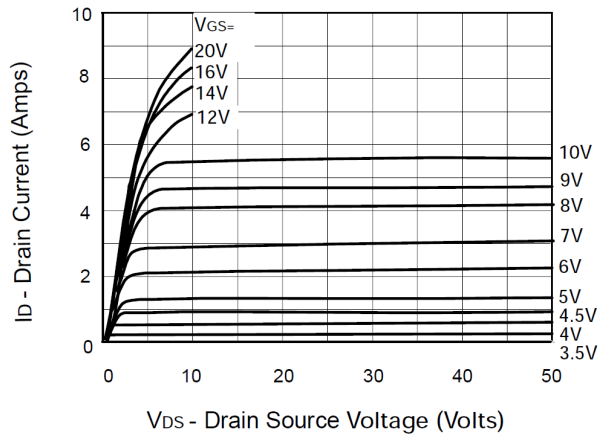
Characteristic	Symbol	Value	Unit
Power Dissipation at T _A = +25 °C	P _{tot}	2	W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25 °C, unless otherwise specified.)

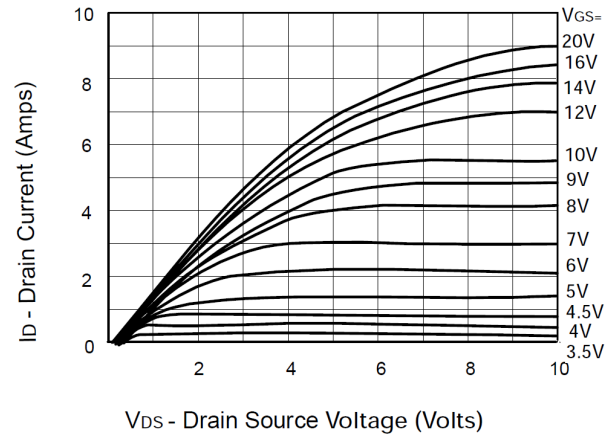
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	I _D = 1mA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	10 100	µA	V _{DS} = 60V, V _{GS} = 0V V _{DS} = 48V, V _{GS} = 0V, T = +125 °C (Note 6)
Gate-Body Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±20V, V _{DS} = 0V
Gate-Source Threshold Voltage	V _{GS(th)}	1.3	—	3	V	I _D = 1mA, V _{DS} = V _{GS}
On-State Drain Current (Note 5)	I _{D(on)}	3	—	—	A	V _{DS} = 25V, V _{GS} = 10V
Static Drain-Source On-State Resistance (Note 5)	R _{DS(on)}	—	—	1	Ω	V _{GS} = 10V, I _D = 1.5A
		—	—	1.5		V _{GS} = 5V, I _D = 0.5A
Forward Transconductance (Notes 5 & 6)	g _{fs}	300	—	—	ms	V _{DS} = 25V, I _D = 1.5A
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 6)	C _{iss}	—	—	100	pF	V _{DS} = 25 V, V _{GS} = 0V f = 1MHz
Output Capacitance (Note 6)	C _{oss}	—	—	60	pF	
Reverse Transfer Capacitance (Note 6)	C _{rss}	—	—	20	pF	
Turn-On Delay Time (Notes 6 & 7)	t _{d(on)}	—	—	8	ns	V _{DD} ≈ 25V, V _{GEN} = 10V I _D = 1.5A
Turn-On Rise Time (Notes 6 & 7)	t _r	—	—	12	ns	
Turn-Off Delay Time (Notes 6 & 7)	t _{d(off)}	—	—	12	ns	
Turn-Off Fall Time (Notes 6 & 7)	t _f	—	—	15	ns	

Notes: 5. Measured under pulsed conditions. Width=300µs. Duty cycle ≤ 2%.
6. Sample test.
7. Switching times measured with 50 Ω source impedance and <5ns rise time on a pulse generator.

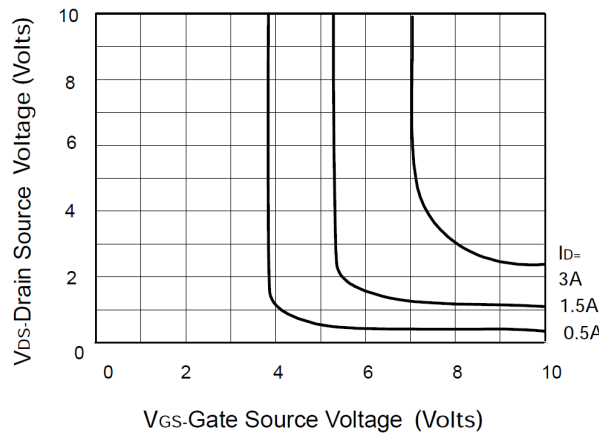
Typical Characteristics



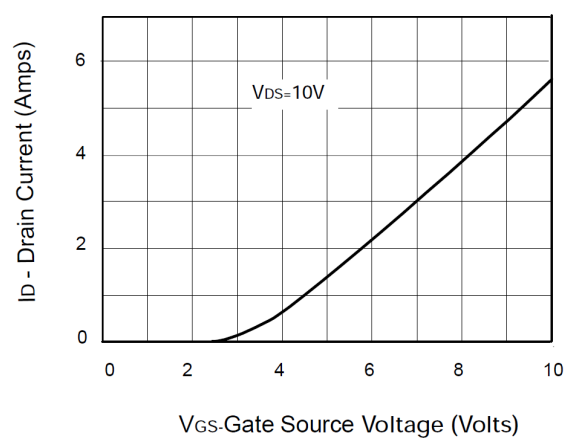
Output Characteristics



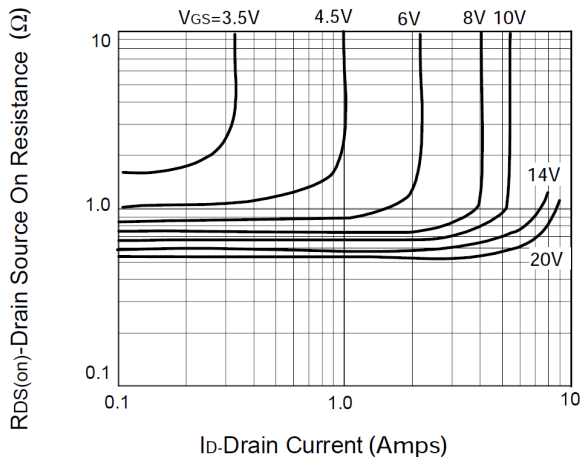
Saturation Characteristics



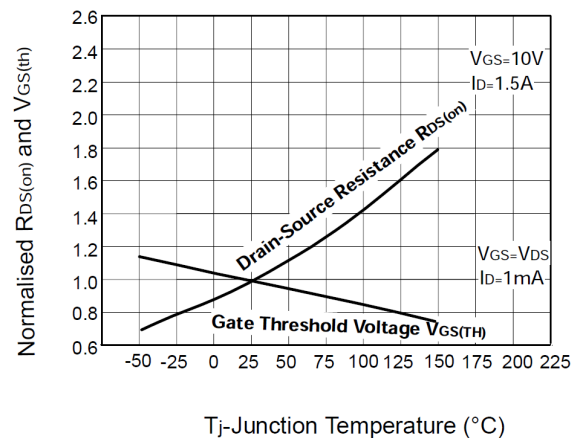
Voltage Saturation Characteristics



Transfer Characteristics

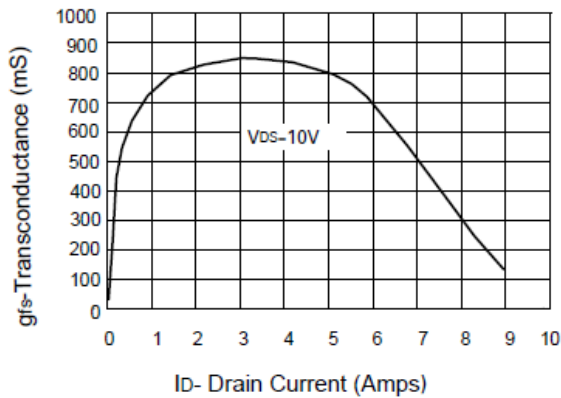


On-resistance v drain current

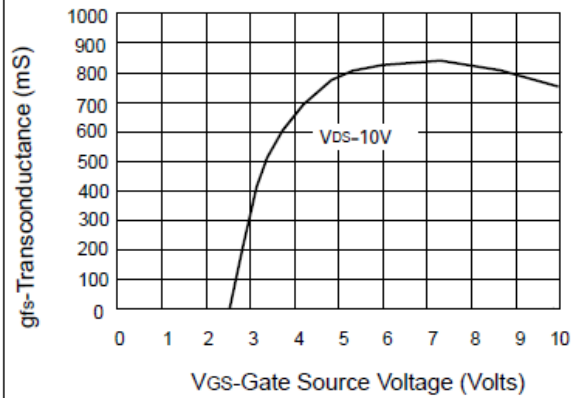


Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature

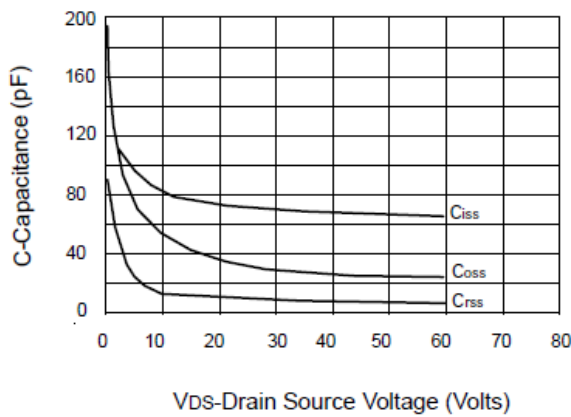
Typical Characteristics (continued)



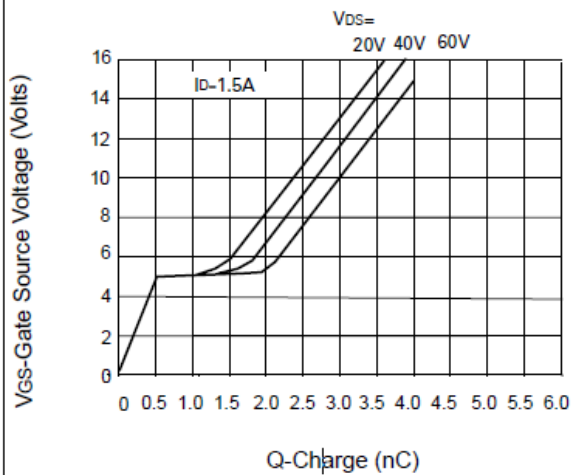
Transconductance v drain current



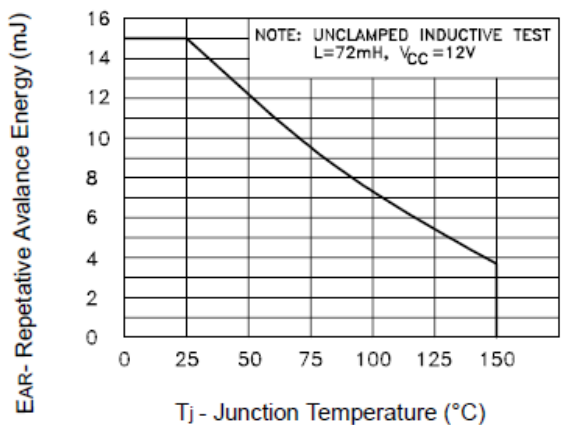
Transconductance v gate-source voltage



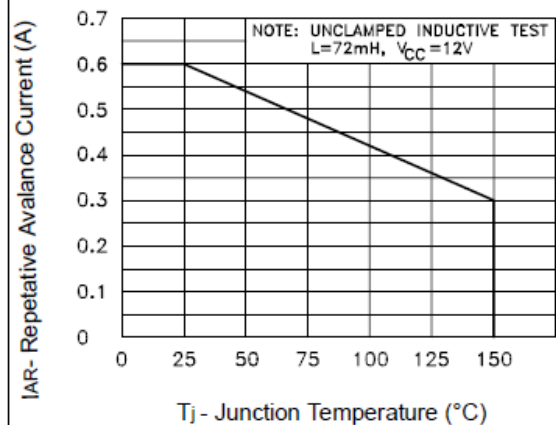
Capacitance v drain-source voltage



Gate charge v gate-source voltage



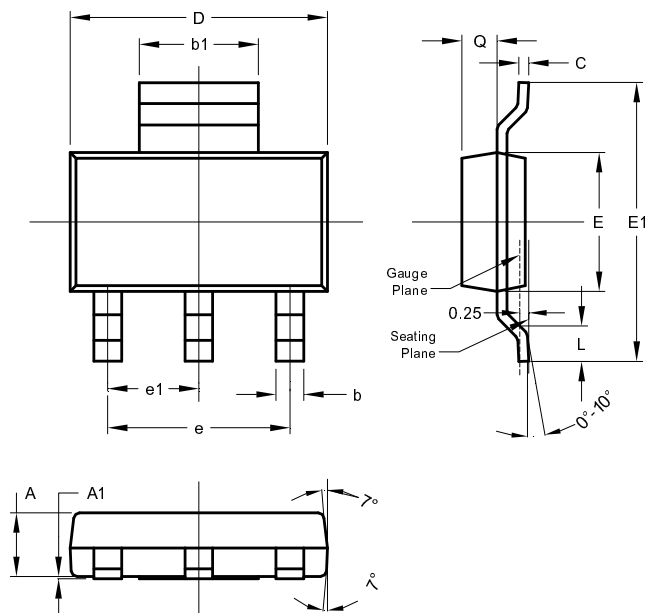
Maximum repetitive avalanche energy v Junction Temperature



Maximum repetitive avalanche current v Junction Temperature

Package Outline Dimensions

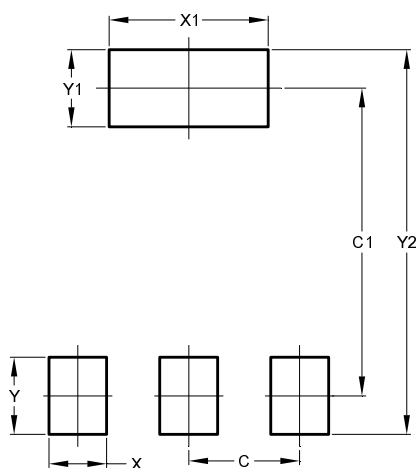
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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