SOT223 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

Product Summary

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

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)**
- **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.

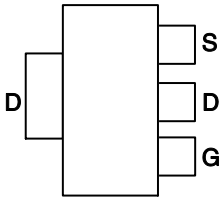
- Automotive relay drivers
- Stepper motor drivers

Mechanical Data

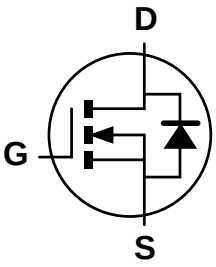
- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)

Top View



Pin Out Top View



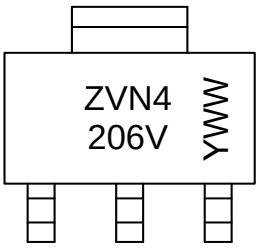
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZVN4206GVTA	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



ZVN4206V = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 1= 2021)
WW or $\overline{WW}$ = 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.)

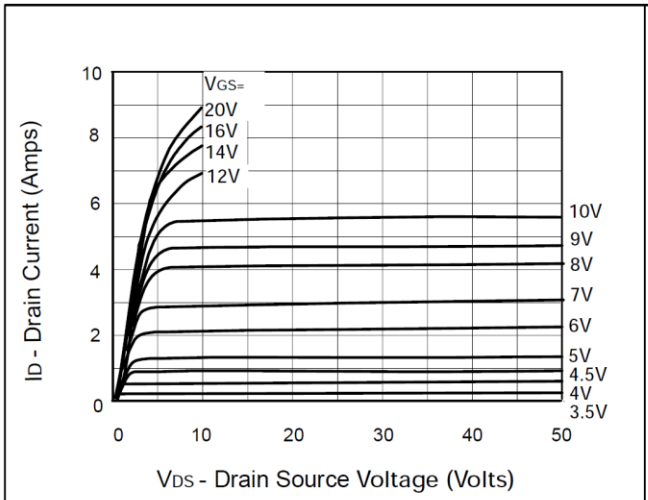
Characteristic	Symbol	Value	Unit
Power Dissipation at T_A= +25°C	P_{tot}	2	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

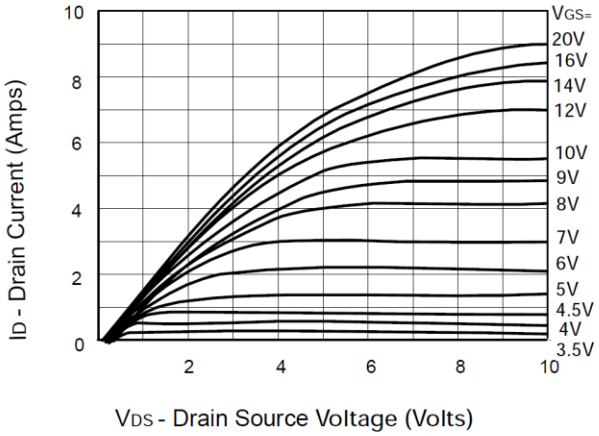
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	I_D = 1mA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	10 100	μA	V_{DS} = 60V, V_{GS} = 0V V_{DS} = 48V, V_{GS} = 0V , T=+125°C (Note 6)
Gate-Body Leakage	I_{GSS}	—	—	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.

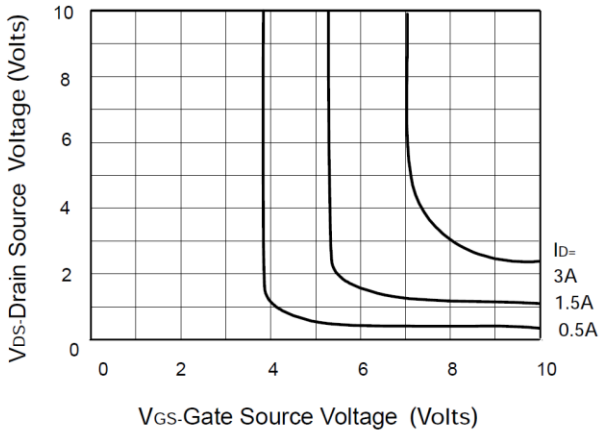
Typical Characteristics



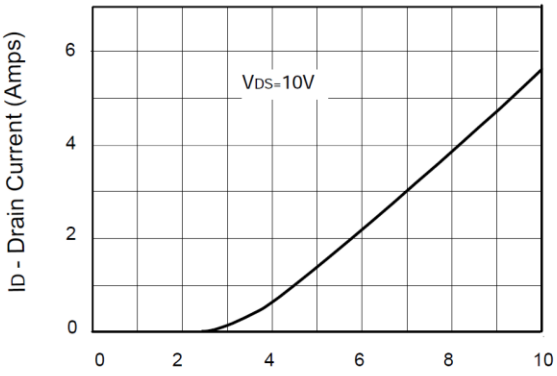
Output Characteristics



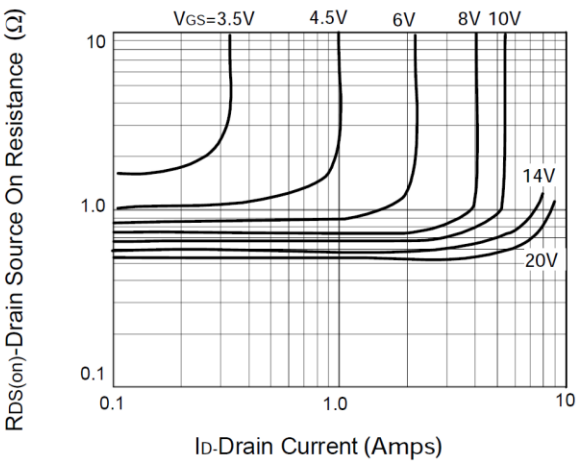
Saturation Characteristics



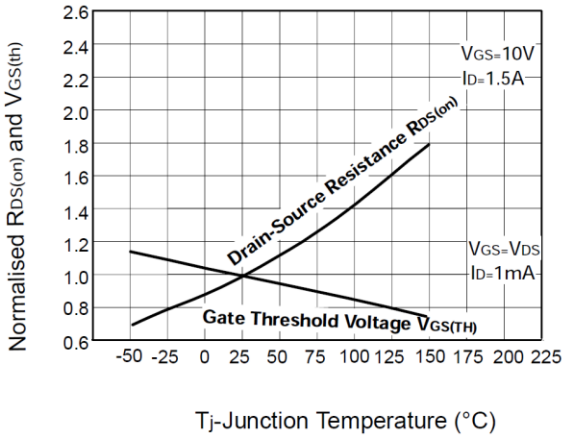
Voltage Saturation Characteristics



Transfer Characteristics

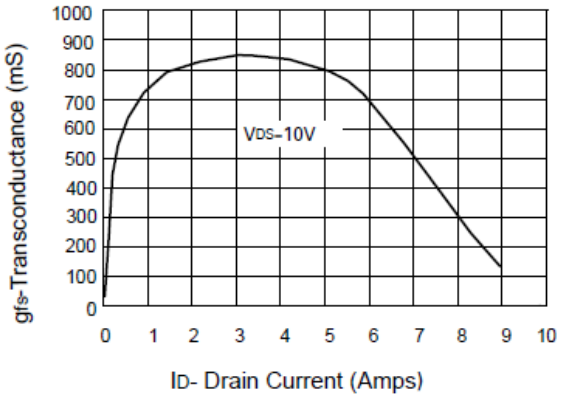


On-resistance v drain current

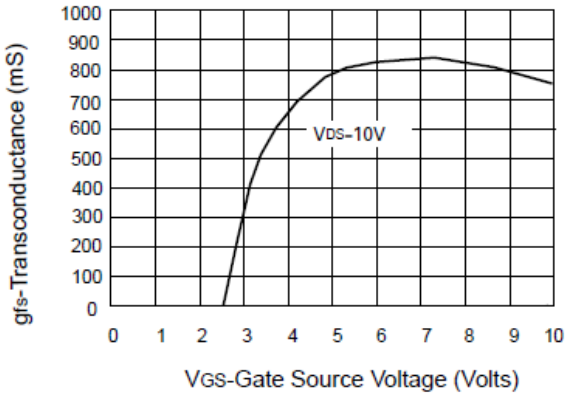


Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature

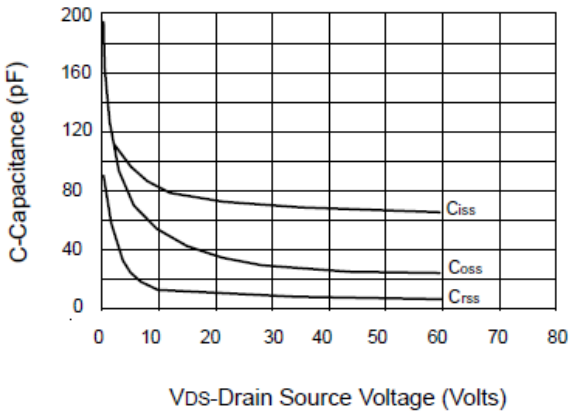
Typical Characteristics (continued)



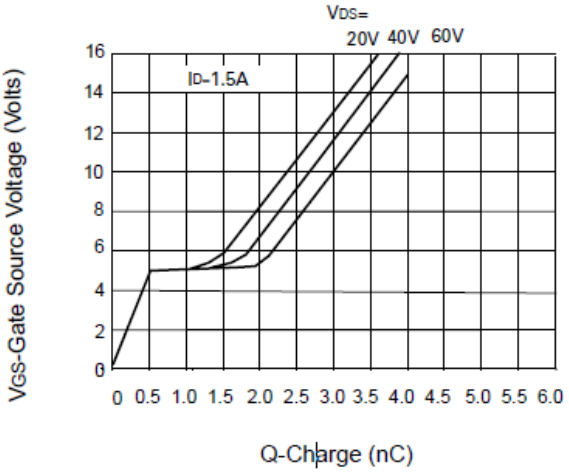
Transconductance v drain current



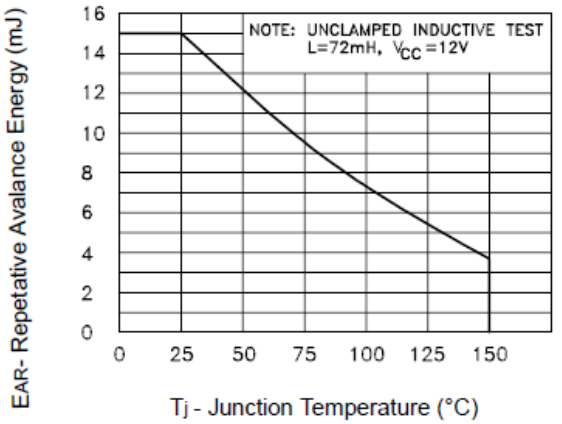
Transconductance v gate-source voltage



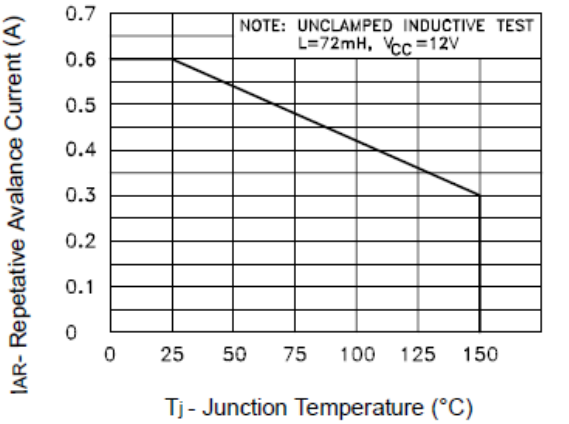
Capacitance v drain-source voltage



Gate charge v gate-source voltage



Maximum repetative avalanche energy v Junction Temperature

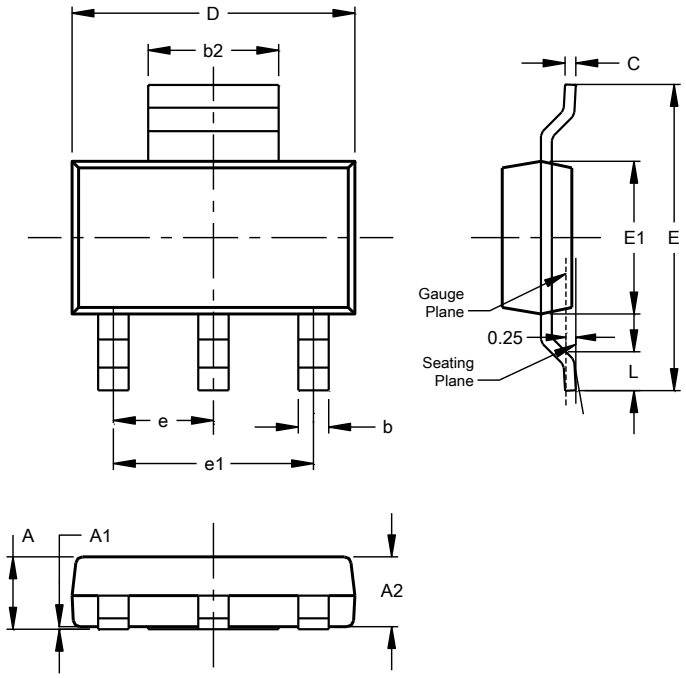


Maximum repetative avalanche current v Junction Temperature

Package Outline Dimensions

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

SOT223 (Type DN)

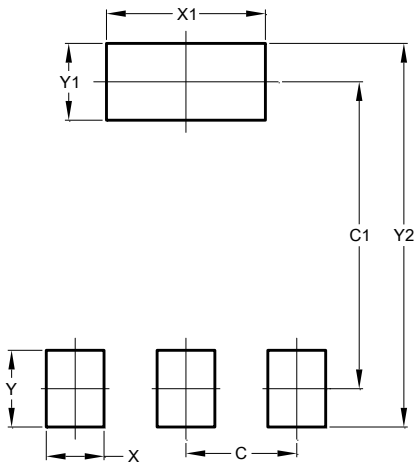


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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