

## Product Summary

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

## 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)**
- **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
- Solenoid / Relay Drivers for Automotive Applications
- Stepper Motor Drivers and Print Head Drivers

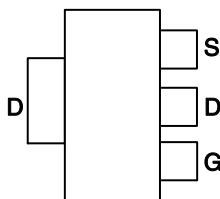
## Mechanical Data

- 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  $\text{E3}$
- Weight: 0.112 grams (Approximate)

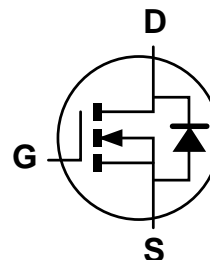
SOT223 (Type DN)



Top View



Pin Out Top View



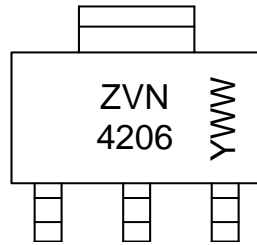
Equivalent Circuit

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZVN4206GTA	SOT223	1,000	Tape & Reel
ZVN4206GTC	SOT223	4,000	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



ZVN 4206 = 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 (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	1	A
Pulsed Drain Current	$I_{DM}$	8	A

## Thermal Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

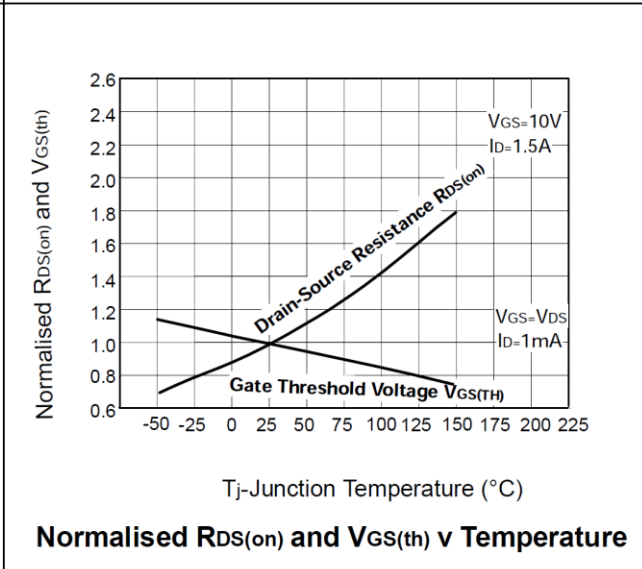
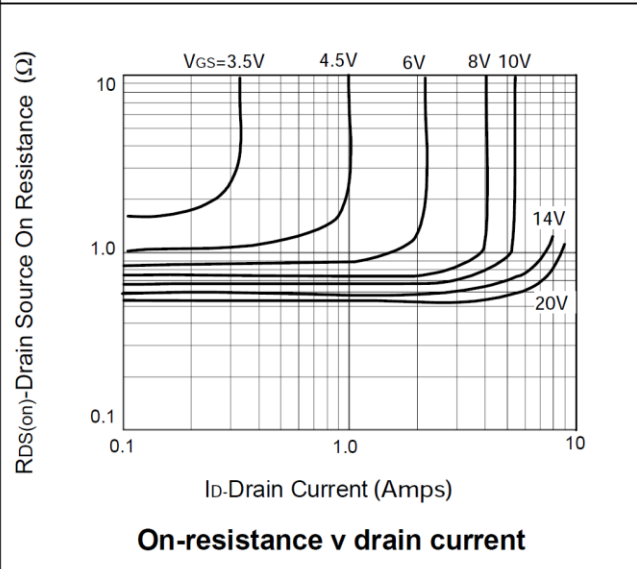
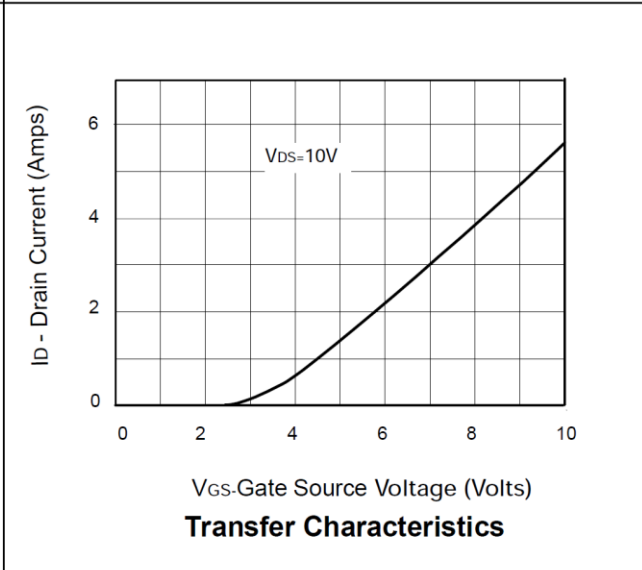
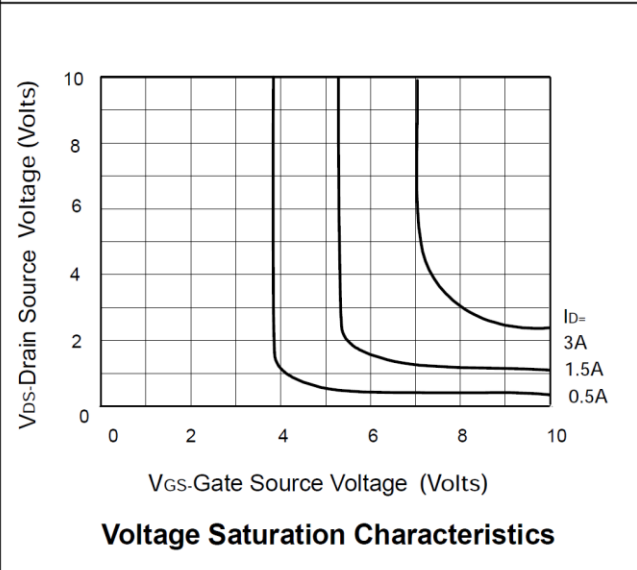
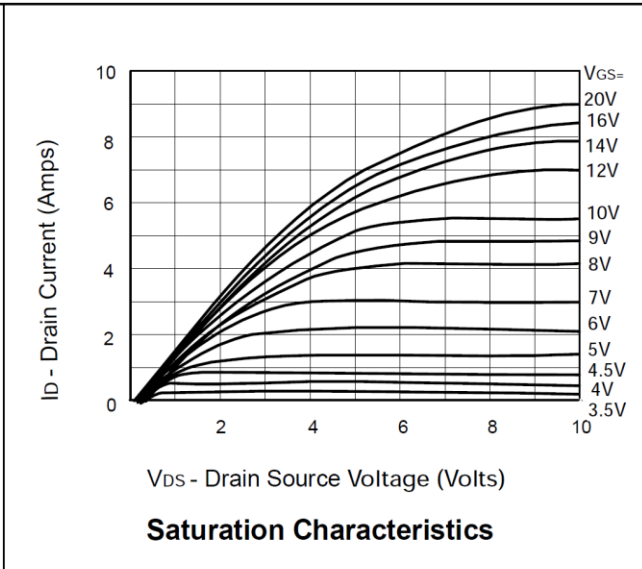
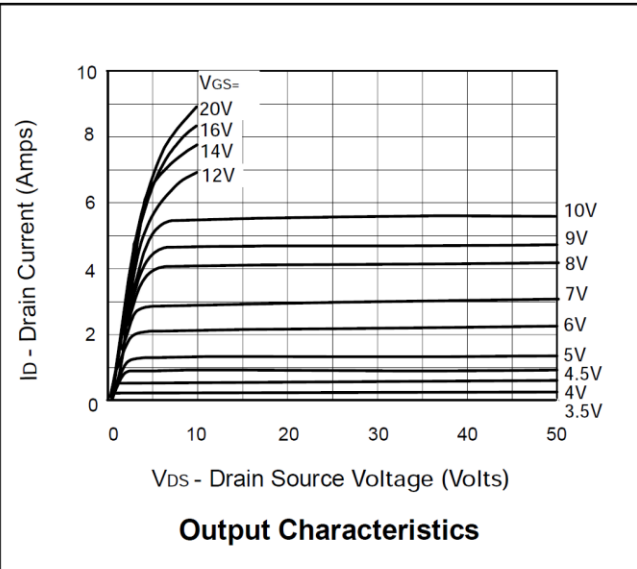
Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = +25^\circ\text{C}$	$P_{tot}$	2	W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

## Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

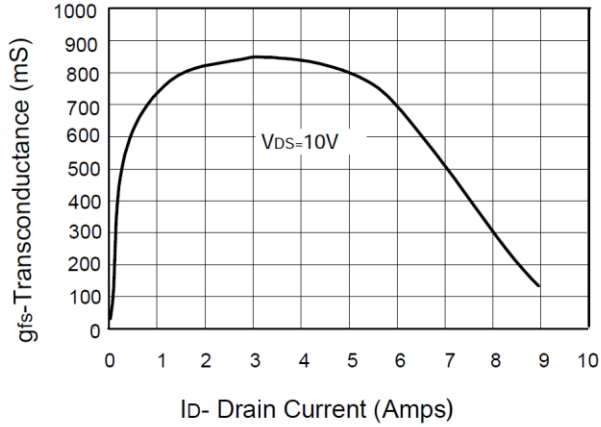
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	60	—	—	V	$I_D = 1\text{mA}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	10 100	$\mu\text{A}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$ $V_{DS} = 48\text{V}, V_{GS} = 0\text{V}, T = +125^\circ\text{C}$ (Note 6)
Gate-Body Leakage	$I_{GSS}$	—	—	100	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.3	—	3	V	$I_D = 1\text{mA}, V_{DS} = V_{GS}$
<b>ON CHARACTERISTICS</b>						
On-State Drain Current (Note 5)	$I_{D(on)}$	3	—	—	A	$V_{DS} = 25\text{V}, V_{GS} = 10\text{V}$
Static Drain-Source On-State Resistance (Note 5)	$R_{DS(on)}$	—	—	1	$\Omega$	$V_{GS} = 10\text{V}, I_D = 1.5\text{A}$
		—	—	1.5		$V_{GS} = 5\text{V}, I_D = 0.5\text{A}$
Forward Transconductance (Notes 5, 6)	$g_{fs}$	300	—	—	mS	$V_{DS} = 25\text{V}, I_D = 1.5\text{A}$
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance (Note 6)	$C_{iss}$	—	—	100	pF	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
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	$V_{DD} \approx 25\text{V}, V_{GEN} = 10\text{V}$ $I_D = 1.5\text{A}$
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=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$ .  
 6. Sample test.  
 7. Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator.

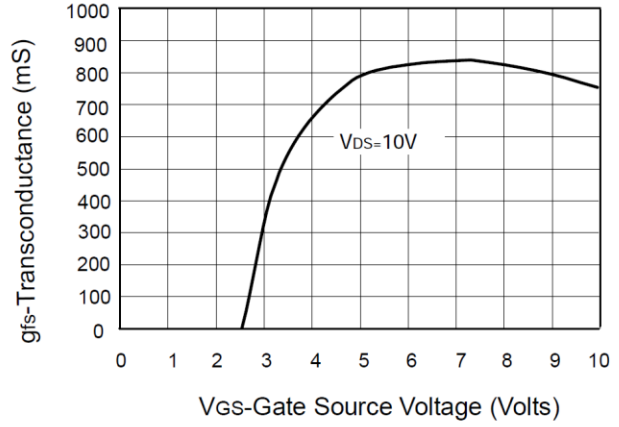
**Typical Characteristics**



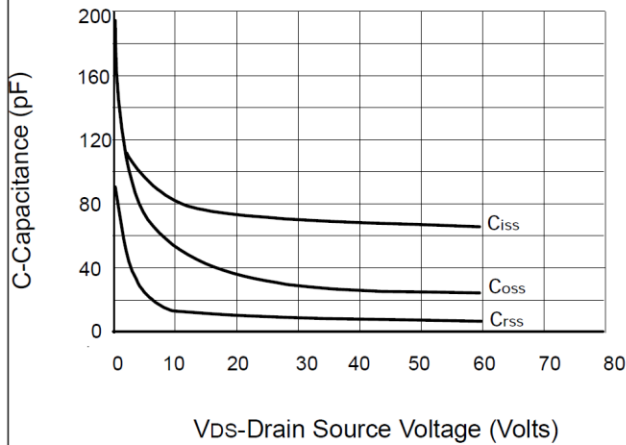
**Typical Characteristics** (continued)



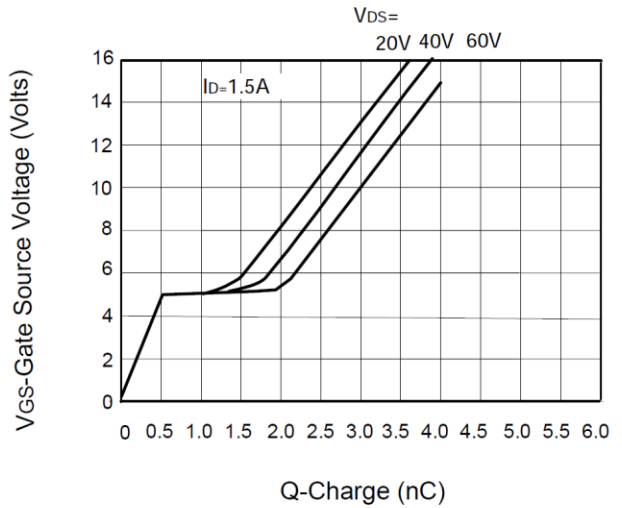
**Transconductance v drain current**



**Transconductance v gate-source voltage**



**Capacitance v drain-source voltage**

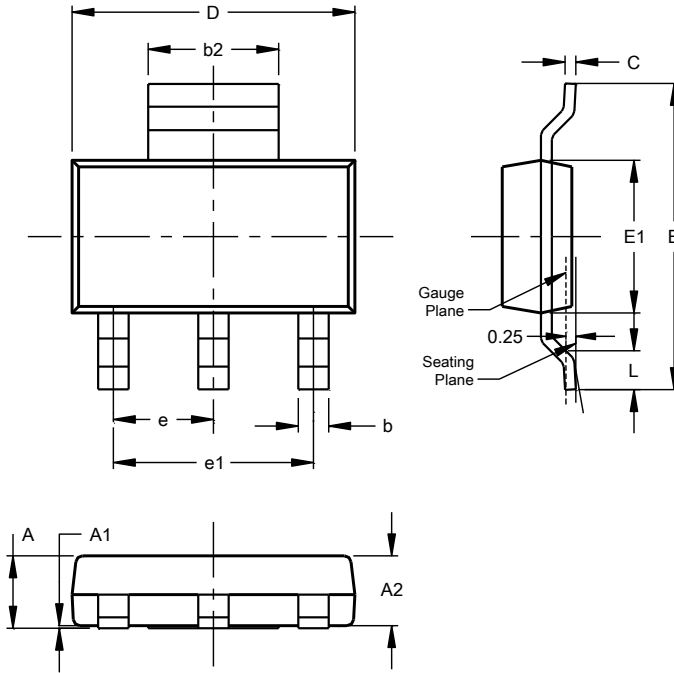


**Gate charge v gate-source voltage**

**Package Outline Dimensions**

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

**SOT223 (Type DN)**

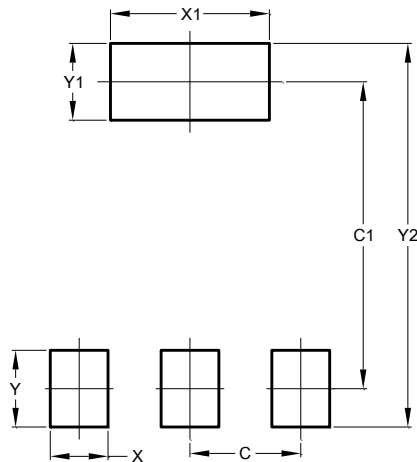


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

**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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