60V P-CHANNEL ENHANCEMENT MODE VERTICAL DMOSFET

Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D T_A = +25°C
-60V	5Ω @ V_{GS}= -10V	-450mA

Description and Applications

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

- Load switches
- DC-DC converters

Features and Benefits

- Low On-Resistance
- Fast Switching Speed
- **Lead-Free Finish; RoHS compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

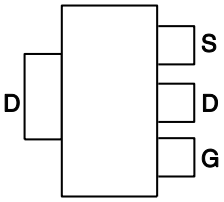
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound; 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 e3
- Weight: 0.112 grams (Approximate)

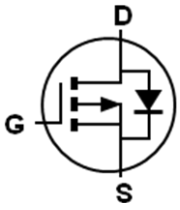
SOT223 (Type DN)



Top View



Top View
Pin Out



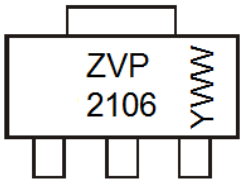
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZVP2106GTA	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



ZVP2106 = Product Type Marking Code
YWW = Date Code Marking
Y or Y = Year (ex: 2 = 2022)
WW or WW = Week (01 to 53)

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Maximum Ratings (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	-60	V
Gate Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	I_D	-450	mA
Pulsed Drain Current	I_{DM}	-4	A

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

Characteristic	Symbol	Value	Units
Power Dissipation	P_{TOT}	2	W
Storage Temperature Range	T_{STG}	-55 to +150	°C

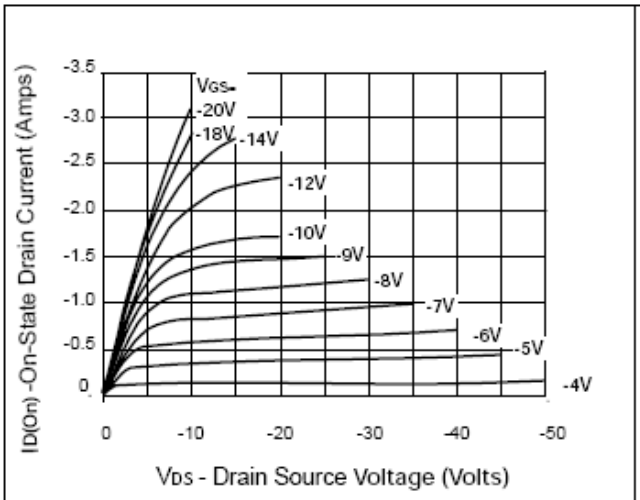
Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	I_D = -1mA, V_{GS} = 0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1.5	—	-3.5	V	I_D = -1mA, V_{DS} = V_{GS}
Gate-Body Leakage	I_{GSS}	—	—	20	nA	V_{GS} = ±20V, V_{DS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	µA	V_{DS} = -60V, V_{GS} = 0V
				-100	µA	V_{DS} = -48V, V_{GS} = 0V, T = +125°C (Note 6)
On-State Drain Current (Note 5)	$I_{D(on)}$	-1	—	—	A	V_{DS} = -18V, V_{GS} = -10V
Static Drain-Source On-State Resistance (Note 5)	$R_{DS(on)}$	—	—	5	Ω	V_{GS} = -10V, I_D = -500mA
Forward Transconductance (Notes 5 & 6)	g_{fS}	150	—	—	mS	V_{DS} = -18V, I_D = -500mA
Dynamic Characteristics (Note 6)						
Input Capacitance	C_{iss}	—	—	100	pF	V_{DS} = -18V, V_{GS} = 0V, f = 1MHz
Common Source Output Capacitance	C_{oss}	—	—	60		
Reverse Transfer Capacitance	C_{rss}	—	—	20		
Turn-On Delay Time (Note 7)	$t_{d(on)}$	—	—	7	ns	V_{DD} = -18V, I_D = -500mA
Rise Time (Note 7)	t_r	—	—	5		
Turn-Off Delay Time (Note 7)	$t_{d(off)}$	—	—	12		
Fall Time (Note 7)	t_f	—	—	15		

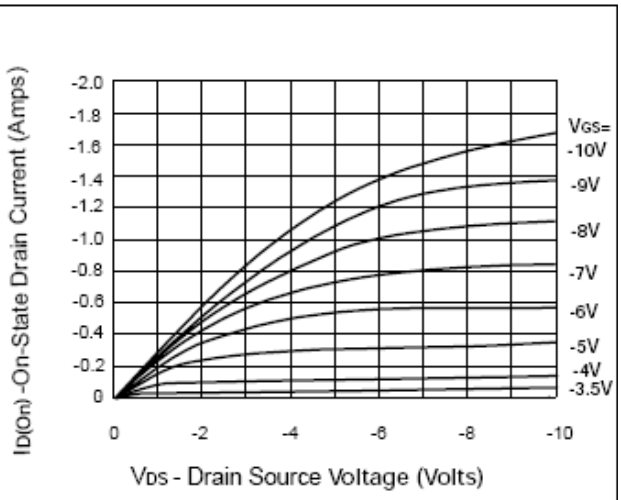
Notes: 5. Measured under pulsed conditions. Width = 300µs. Duty cycle ≦ 2%.
6. Sample Test.
7. Switching times measured with 50Ω source impedance and < 5ns rise time on a pulse generator.

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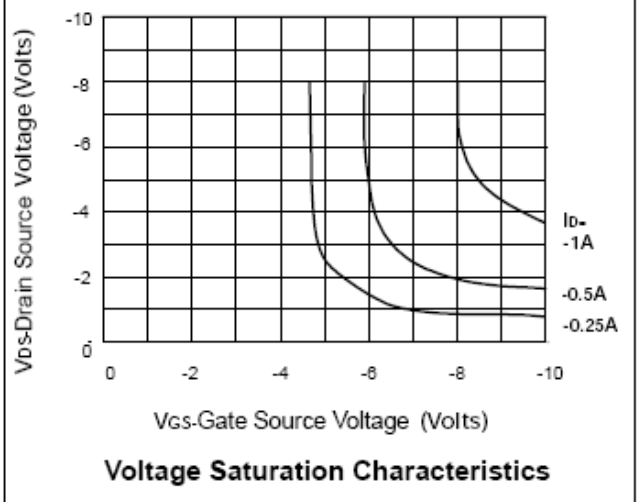
Typical Characteristics



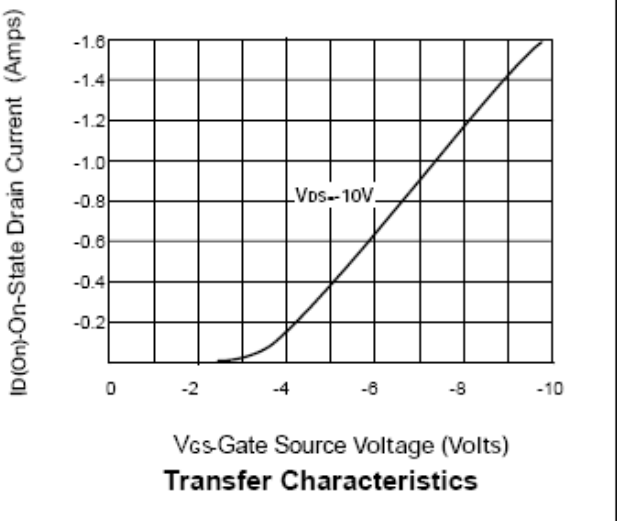
Output Characteristics



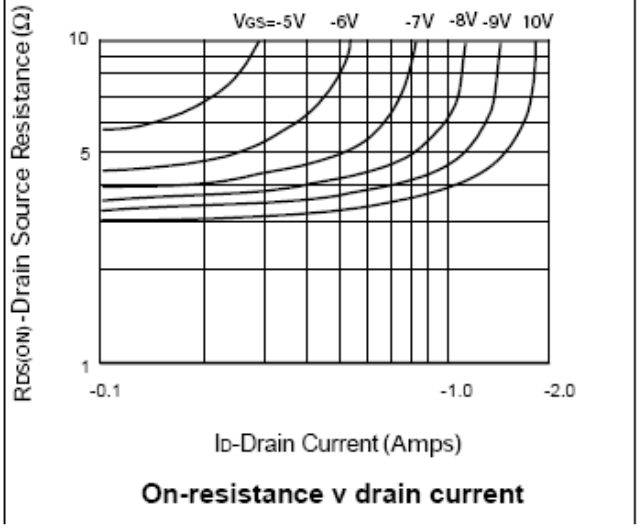
Saturation Characteristics



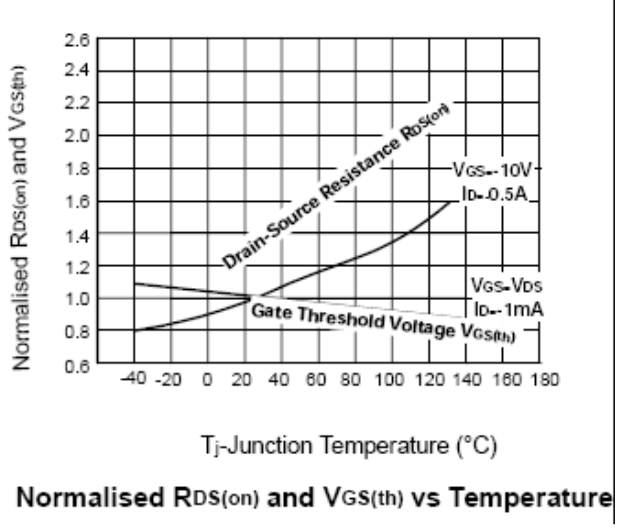
Voltage Saturation Characteristics



Transfer Characteristics



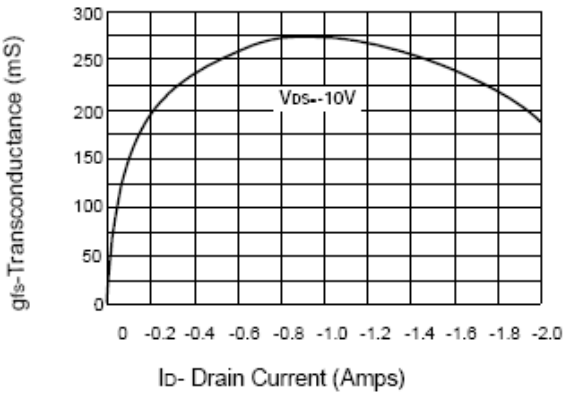
On-resistance v drain current



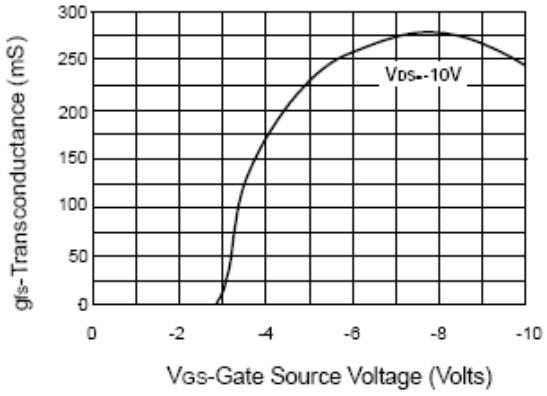
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature

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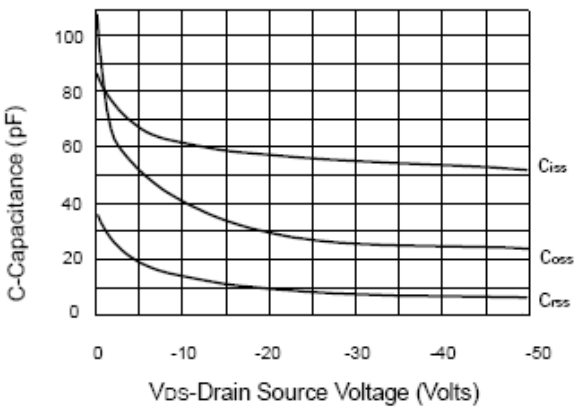
Typical Characteristics (continued)



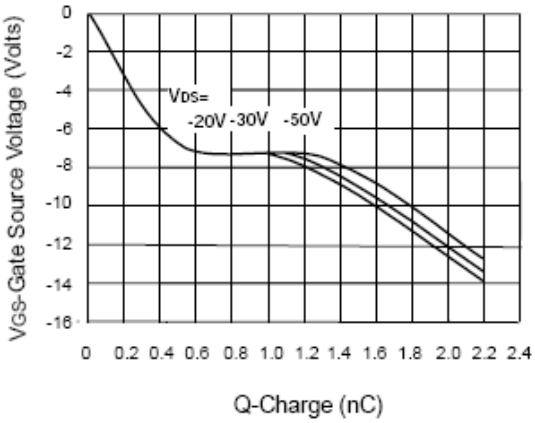
Transconductance v drain current



Transconductance v gate-source voltage



Capacitance v drain-source voltage



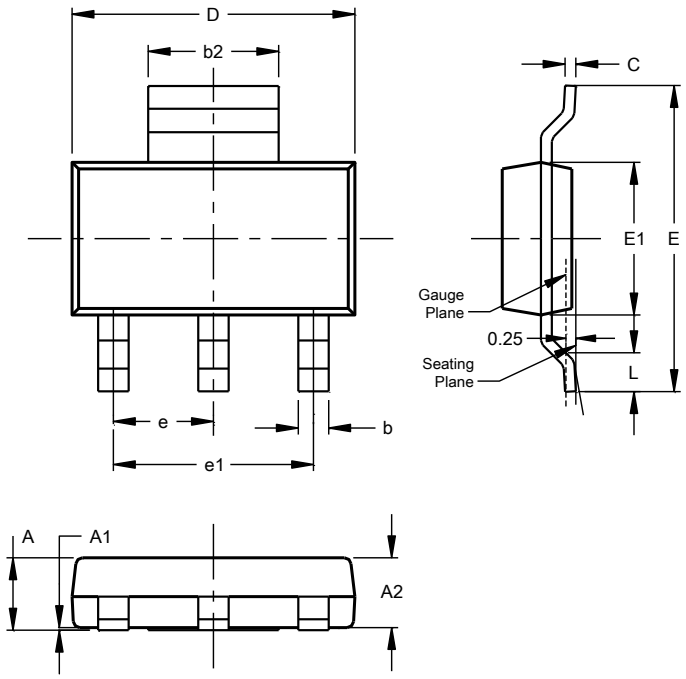
Gate charge v gate-source voltage

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Package Outline Dimensions

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

SOT223 (Type DN)

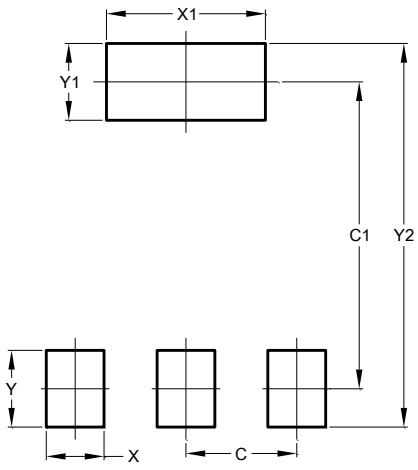


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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