

60V N-CHANNEL ENHANCEMENT MODE VERTICAL MOSFET

Features and Benefits

- $V_{(BR)DSS} > 60V$
- $R_{DS(ON)} \leq 2\Omega$ @ $V_{GS} = 10V$
- Maximum Continuous Drain Current $I_D = 0.71A$
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

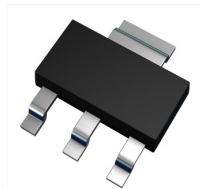
Applications

- DC-DC Converters
- Solenoids / Relay Driver for Automotive

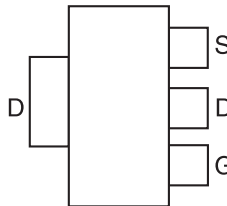
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (e3)
- Weight: 0.112 grams (Approximate)

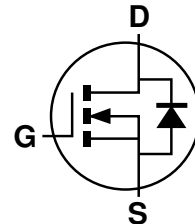
SOT223



Top View



Pin Out - Top



Equivalent Circuit

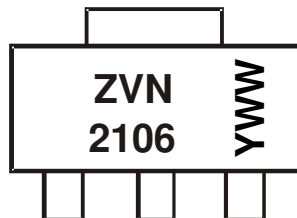
Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZVN2106GTA	ZVN2106	7	8	1,000

- 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 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



ZVN2106 = Product Type Marking Code
YWW = Date Code Marking
Y or Y = Last Digit of Year (ex: 5= 2015)
WW or 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 _{GSS}	±20	V
Continuous Drain Current	I _D	0.71	A
Pulsed Drain Current (Note 6)	I _{DM}	8	A

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

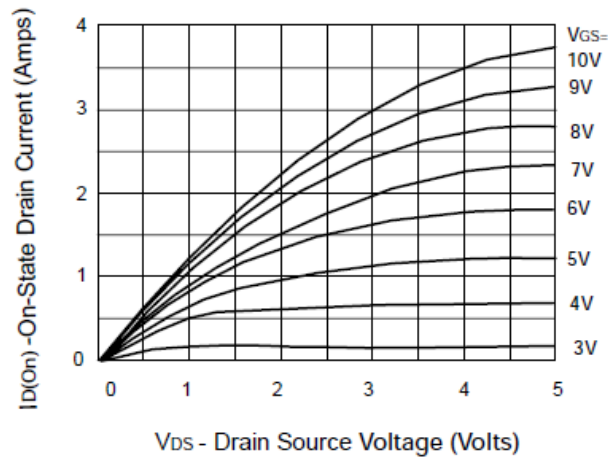
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	2	W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

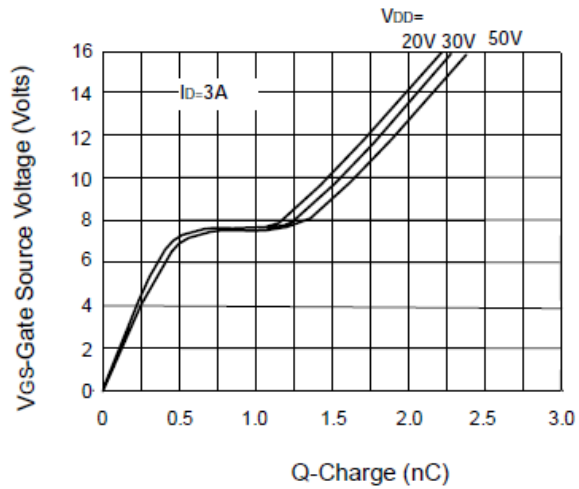
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	-	-	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	500 100	nA μA	V _{DS} = 60V, V _{GS} = 0V V _{DS} = 48V, V _{GS} = 0V, T _A = +125°C
Gate-Source Leakage	I _{GSS}	-	-	±20	nA	V _{GS} = ±20V, V _{DS} = 0V
On-State Drain Current	I _{D(ON)}	2	-	-	A	V _{GS} = 10V, V _{DS} = 18V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.8	-	2.4	V	V _{DS} = V _{GS} , I _D = 1mA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	2	Ω	V _{GS} = 10V, I _D = 1.0A
Forward Transconductance	g _{fs}	0.3	-	-	S	V _{DS} = 18V, I _D = 1.0A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	-	-	75	pF	V _{DS} = 18V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	-	45	pF	
Reverse Transfer Capacitance	C _{rss}	-	-	20	pF	
Turn-On Delay Time	t _{D(ON)}	-	-	7	ns	V _{DD} = 18V, I _D = 1A, V _{GEN} = 10V, R _{GS} = 50Ω
Turn-On Rise Time	t _R	-	-	8	ns	
Turn-Off Delay Time	t _{D(OFF)}	-	-	12	ns	
Turn-Off Fall Time	t _F	-	-	15	ns	

- Notes:
5. For a device mounted on 50mm x 50mm x 1.6mm FR-4 PCB with high coverage of single sided 2oz copper, in still air condition.
 6. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.

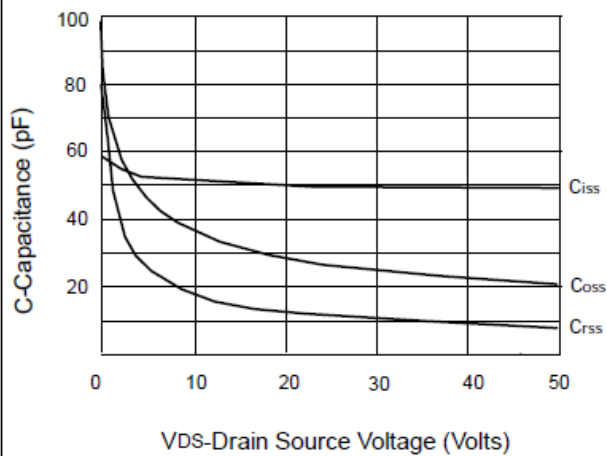
Typical Characteristics



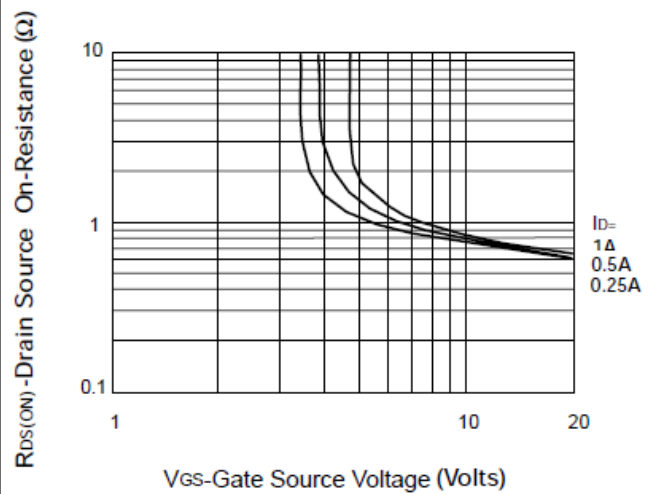
Saturation Characteristics



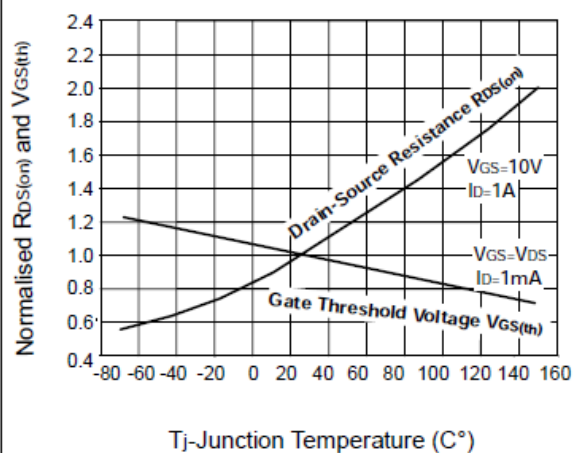
Gate charge v gate-source voltage



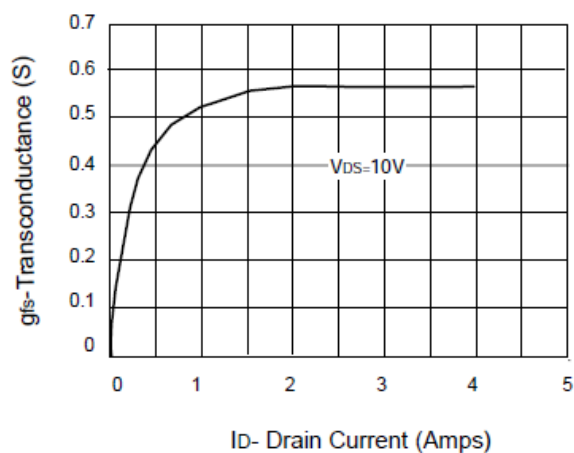
Capacitance v drain-source voltage



On-resistance v gate-source voltage



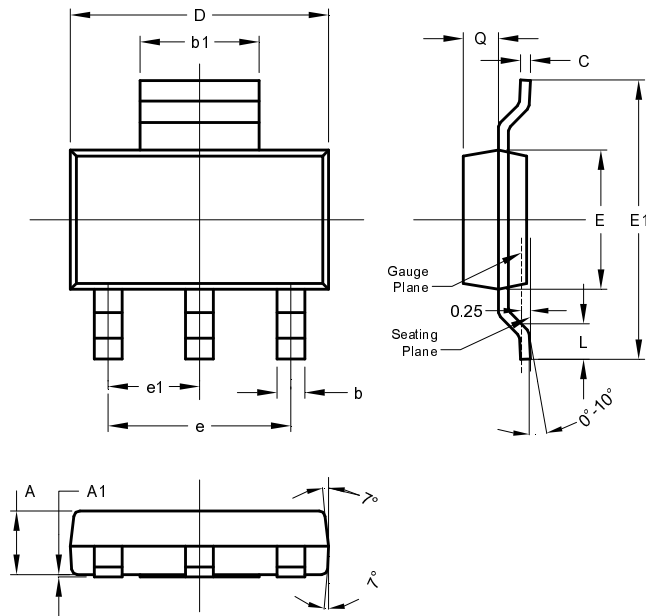
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature



Transconductance v drain current

Package Outline Dimensions

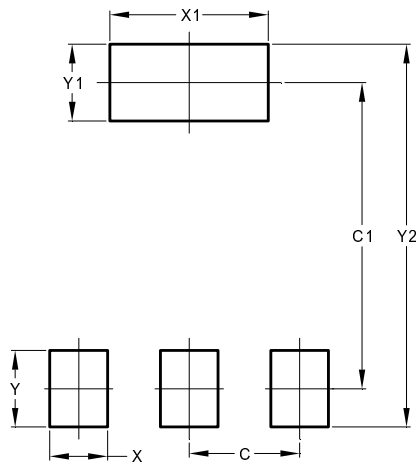
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
Y2	8.00

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