SOT223 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

Product Summary

BV_{DSS}	$R_{DS(on)}$	I_D T_A = +25°C
60V	0.33Ω @ V_{GS}= 10V	2.1A

Features and Benefits

- BV_{DSS}=60V
- $R_{DS(on)}$ = 0.33Ω
- **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
- Solenoids/relay driver for automotive applications
- Stepper motor drivers

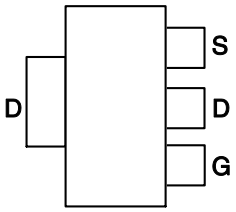
Mechanical Data

- Package: SOT223 (Type DN)
- Package Material: Molded Plastic, 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)

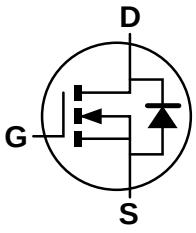
SOT223(Type DN)



Top View



Pin Out - Top View



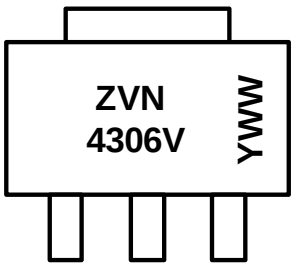
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
ZVN4306GVTA	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



ZVN4306V = 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)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	2.1	A
Pulsed Drain Current	I_{DM}	15	A
Power Dissipation	P_{tot}	3	W
Avalanche Current-Repetitive	I_{AR}	1	A
Avalanche Energy-Repetitive	E_{AR}	25	mJ
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	V_{GS} = 0V, I_D = 1mA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	10 100	µA µA	V_{DS} = 60V, V_{GS} = 0V V_{DS} = 48V, V_{GS} = 0V, T= +125°C (Note 6)
Gate-Body Leakage	I_{GSS}	-	-	20	nA	V_{GS} = ±20V, V_{DS} = 0V
On-State Drain Current (Note 5)	$I_{D(on)}$	12	-	-	A	V_{GS} = 10V, V_{DS} = 10V
ON CHARACTERISTICS						
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.3	-	3	V	V_{DS} = V_{GS}, I_D = 1mA
Static Drain-Source On-State Resistance (Note 5)	$R_{DS(on)}$	-	0.22	0.33	Ω	V_{GS} = 10V, I_D =3A
		-	0.32	0.45	Ω	V_{GS} = 5V, I_D =1.5A
Forward Transconductance (Notes 5, 6)	g_{fs}	0.7	-	-	S	V_{DS} = 25V, I_D = 3A
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 6)	C_{iss}	-	-	350	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Common Source Output Capacitance (Note 6)	C_{oss}	-	-	140	pF	
Reverse Transfer Capacitance (Note 6)	C_{rss}	-	-	30	pF	
Turn-On Delay Time (Notes 6, 7)	$t_{D(on)}$	-	-	8	ns	V_{DD} ≈25V, V_{GEN}=10V, I_D=3A
Rise Time (Notes 6, 7)	t_R	-	-	25	ns	
Turn-Off Delay Time (Notes 6, 7)	$t_{D(off)}$	-	-	30	ns	
Fall Time (Notes 6, 7)	t_F	-	-	16	ns	

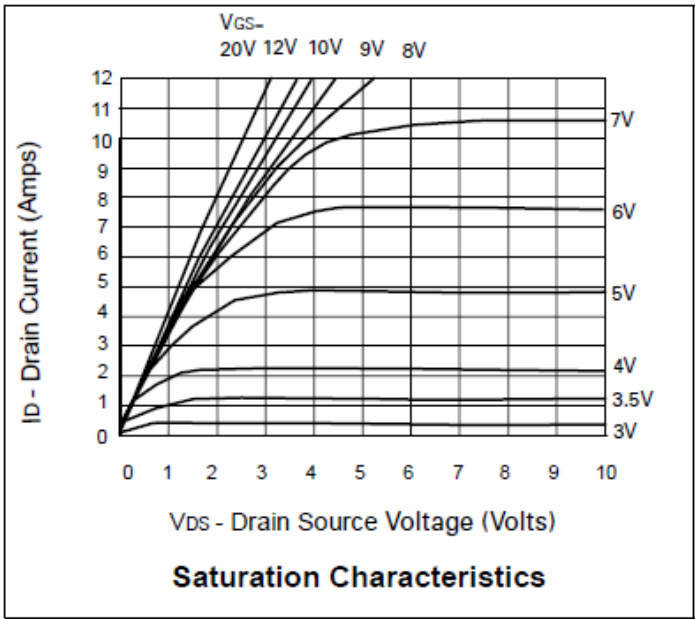
Drain-Source Diode Characteristics

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Diode Forward Voltage (Note 5)	V_{SD}	-	0.82	-	V	I_S=0.32A, V_{GS}=0
Reverse Recovery Time	T_{RR}	-	112	-	ns	I_F=0.32A, V_{GS}=0, I_R=0.1A

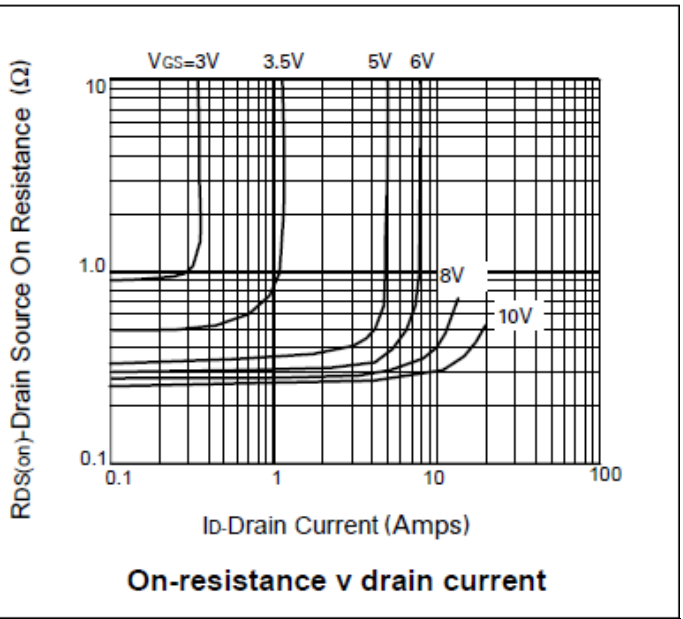
Notes: 5. Measured under pulsed conditions. Width=300µs. Duty cycle ≤2%
6. Sample test.
7. Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator. Spice parameter data is available upon request for this device.

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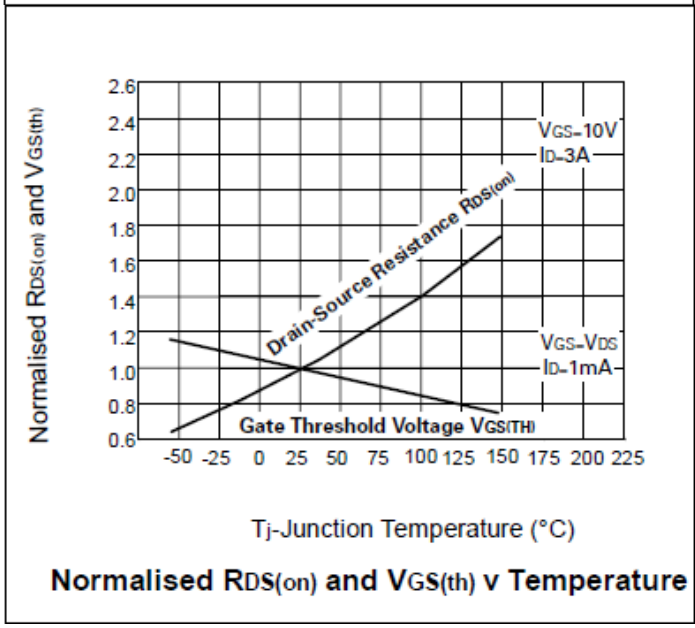
Typical Characteristics



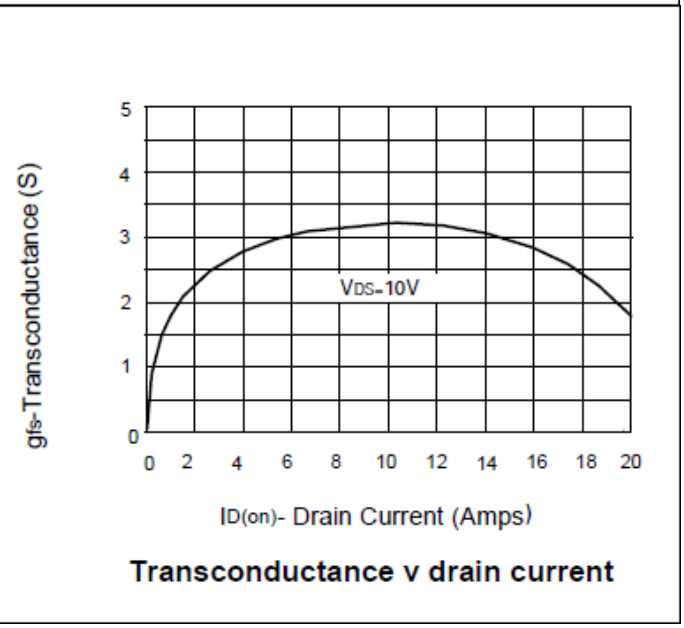
Saturation Characteristics



On-resistance v drain current



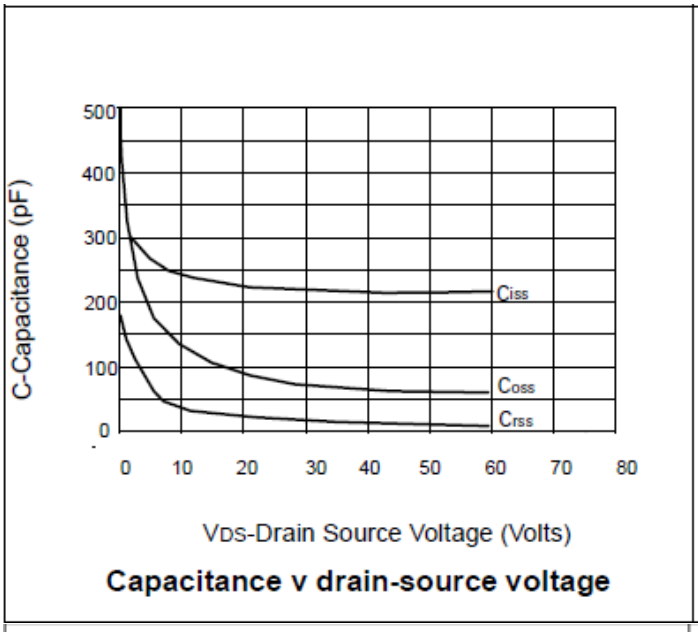
Normalised RDS(on) and VGS(th) v Temperature



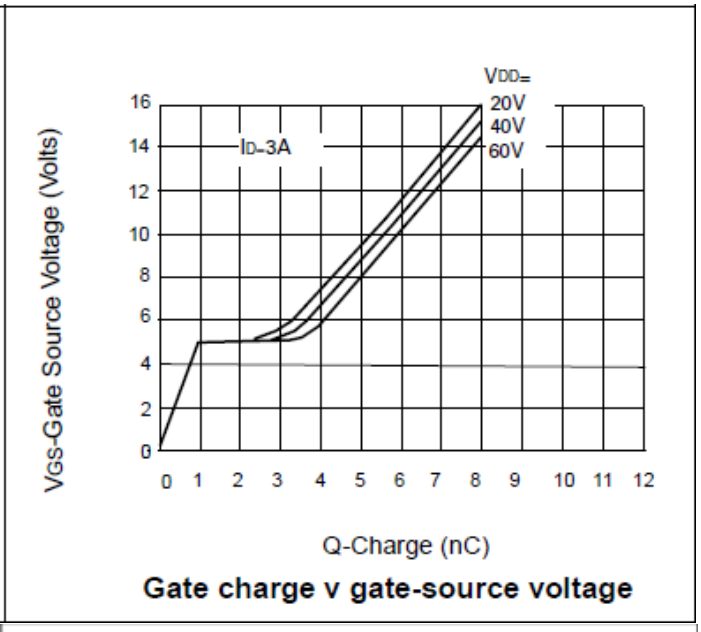
Transconductance v drain current

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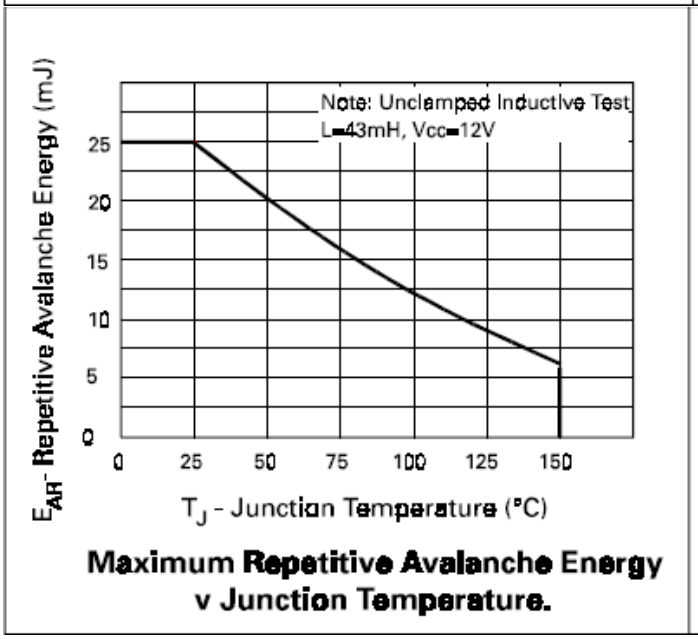
Typical Characteristics



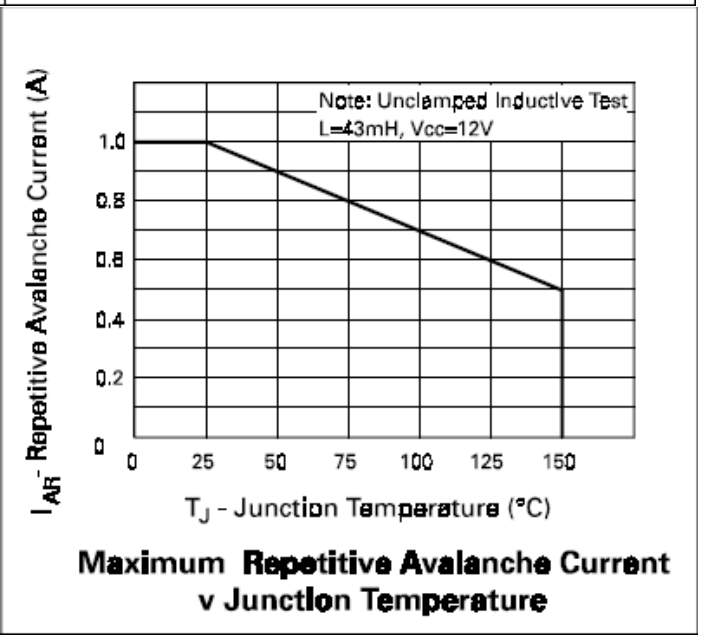
Capacitance v drain-source voltage



Gate charge v gate-source voltage



Maximum Repetitive Avalanche Energy v Junction Temperature.



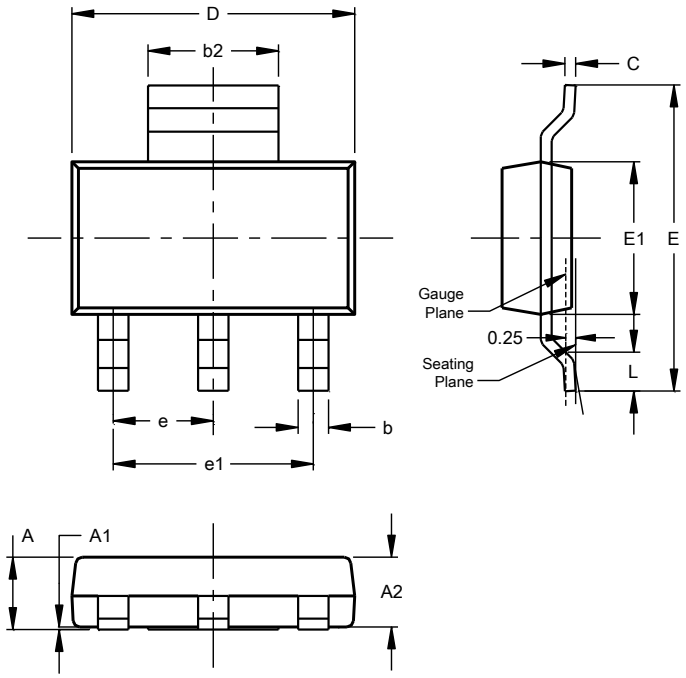
Maximum Repetitive Avalanche Current v Junction Temperature

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Package Outline Dimensions

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

SOT223 (Type DN)

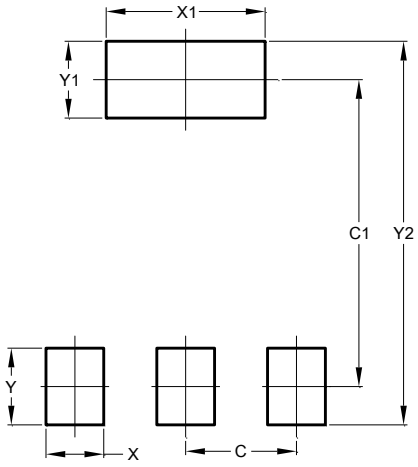


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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