SOT223 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOSFET

Product Summary

BV_{DSS}	Max $R_{DS(ON)}$	Max I_D T_A = +25°C
240V	5.5Ω @ V_{GS} = 10V	500mA

Features and Benefits

- 240 Volt BVDS
- Extremely Low $R_{DS(ON)}$ = 4.3Ω
- Low Threshold and Fast Switching
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZVN4424GQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Description and Applications

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Earth recall and dialing switches
- Electronic hook switches
- Battery-powered equipment
- Telecoms and high-voltage DC-DC converters

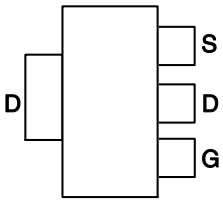
Mechanical Data

- Package: SOT223
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals 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)

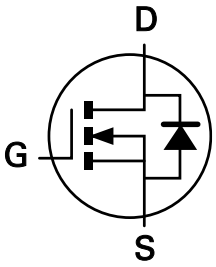
SOT223 (Type DN)



Top View



Pinout Top View



Equivalent Circuit

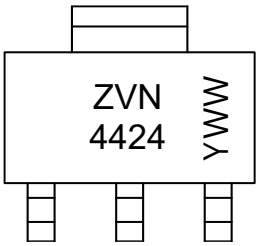
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
ZVN4424GTA	SOT223 (Type DN)	1,000	Tape & Reel
ZVN4424GQTA	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

SOT223 (Type DN)



ZVN 4424 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 5 = 2025)
WW or $\overline{WW}$ = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	240	V
Gate-Source Voltage	V_{GS}	±40	V
Continuous Drain Current	I_D	500	mA
Pulsed Drain Current	I_{DM}	1.5	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = +25°C	P_{TOT}	2.5	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}	240	—	—	V	I_D = 1mA, V_{GS} = 0
Zero Gate Voltage Drain Current	I_{DSS}	—	—	10 100	μA	V_{DS} = 240V, V_{GS} = 0 V_{DS} = 190V, V_{GS} = 0, T_A = +125°C
Gate-Body Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±40V, V_{DS} = 0
Gate-Source Threshold Voltage	$V_{GS(TH)}$	0.8	1.3	1.8	V	I_D = 1mA, V_{DS} = V_{GS}
ON CHARACTERISTICS						
On-State Drain Current (Note 5)	$I_{D(ON)}$	0.8	1.4	—	A	V_{DS} = 10V, V_{GS} = 10V
Static Drain-Source On-State Resistance (Note 5)	$R_{DS(ON)}$	—	4	5.5	Ω	V_{GS} = 10V, I_D = 500mA
		—	4.3	6		V_{GS} = 2.5V, I_D = 100mA
Forward Transconductance (Notes 5 & 6)	g_{fs}	0.4	0.75	—	S	V_{DS} = 10V, I_D = 0.5A
DYNAMIC CHARACTERISTICS						
Input Capacitance (Note 6)	C_{iss}	—	110	200	pF	V_{DS} = 25V, V_{GS} = 0 f = 1MHz
Output Capacitance (Note 6)	C_{oss}	—	15	25	pF	
Reverse Transfer Capacitance (Note 6)	C_{rss}	—	3.5	15	pF	
Turn-On Delay Time (Notes 6 & 7)	$t_{D(ON)}$	—	2.5	5	ns	V_{DD} = 50V, V_{GEN} = 10V I_D = 0.25A
Turn-On Rise Time (Notes 6 & 7)	t_R	—	5	8	ns	
Turn-Off Delay Time (Notes 6 & 7)	$t_{D(OFF)}$	—	40	60	ns	
Turn-Off Fall Time (Notes 6 & 7)	t_F	—	16	25	ns	

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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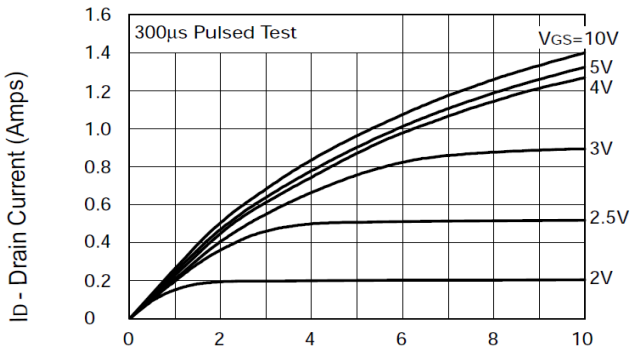
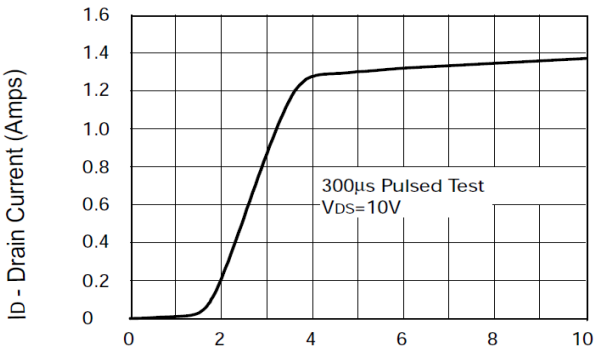
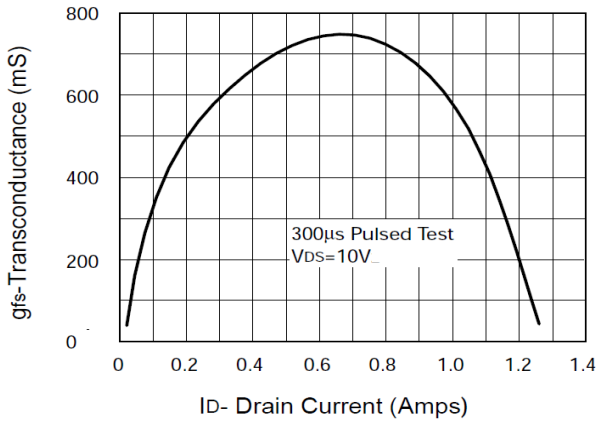
Typical Characteristics



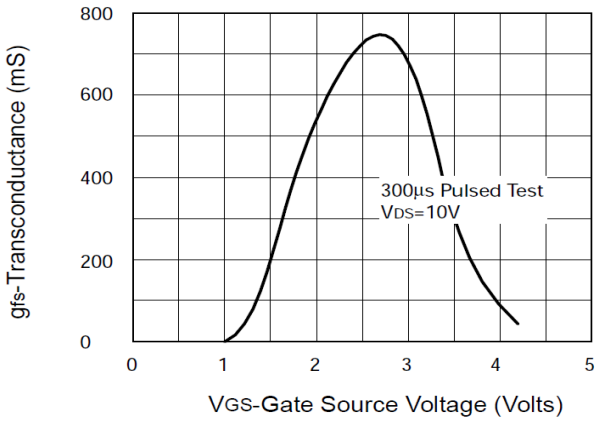
Saturation Characteristics



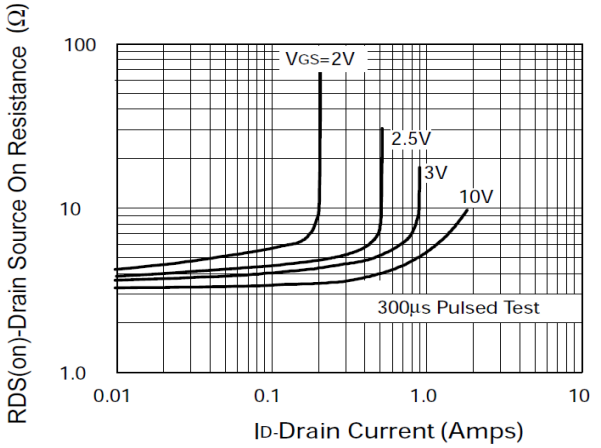
Transfer Characteristics



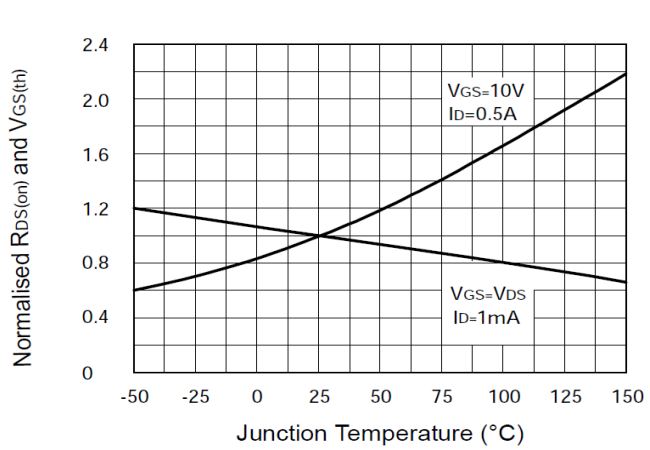
Transconductance v drain current



Transconductance v gate-source voltage



On-resistance vs Drain Current



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

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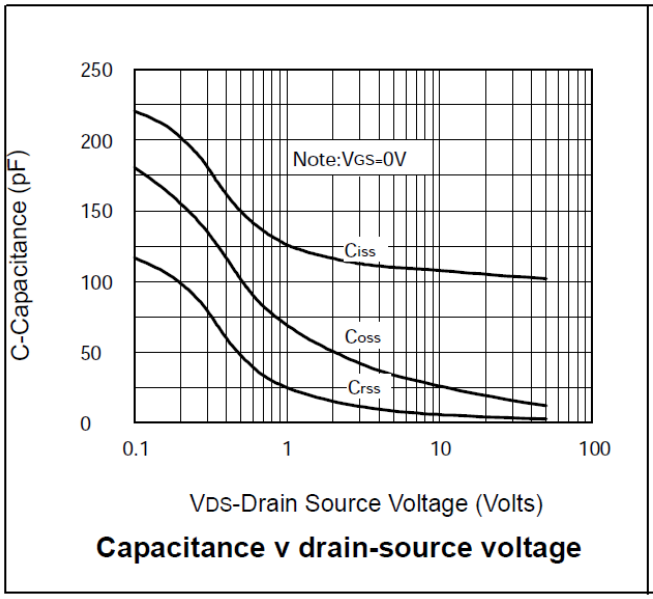
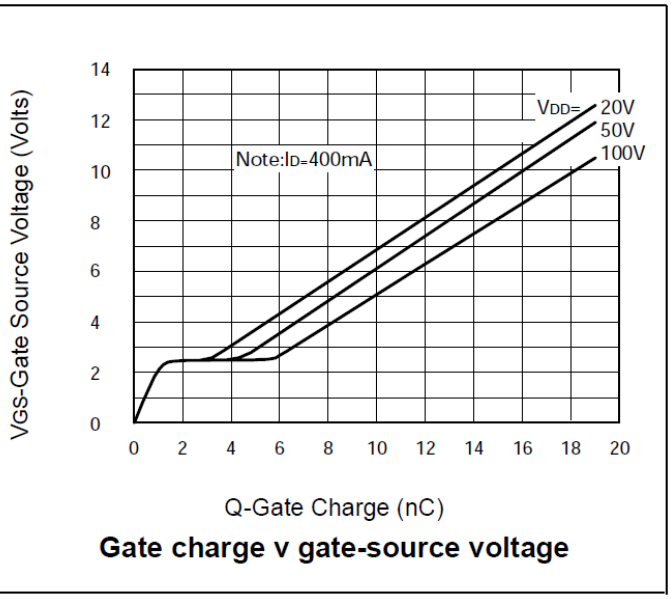
Typical Characteristics (continued)



Capacitance v drain-source voltage



Gate charge v gate-source voltage

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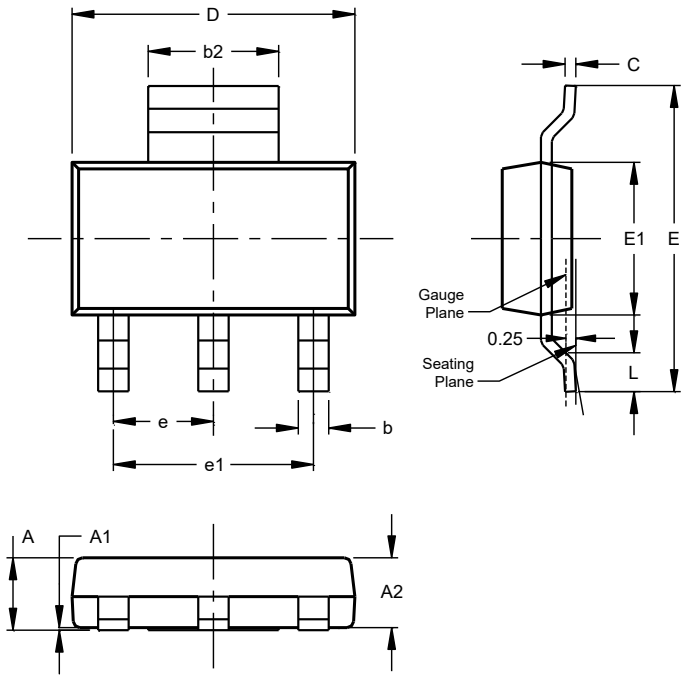
Package Outline Dimensions

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

SOT223 (Type DN)

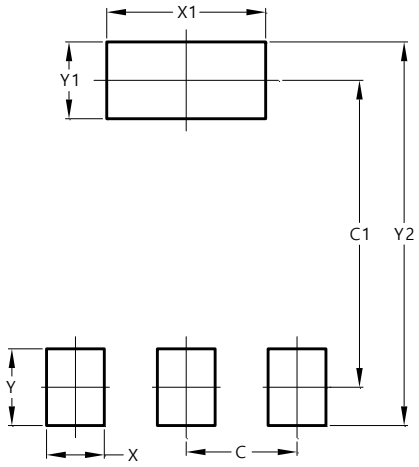


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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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