

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D $T_A = +25^\circ\text{C}$
40V	0.05Ω @ $V_{GS} = 10\text{V}$	7A

Description

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

Applications

- DC-DC Converters
- Audio Output Stages
- Relay and Solenoid driving
- Motor Control

Features

- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Available**

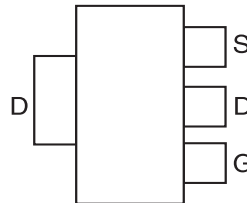
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.112 grams (approximate)

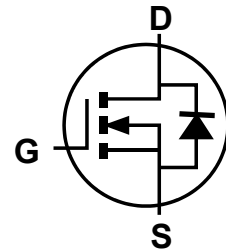
SOT223



Top View



Pin Out - Top View



Equivalent Circuit

Ordering Information (Note 4 & 5)

Part Number	Compliance	Case	Packaging
ZXMN4A06GQTA	Automotive	SOT223	1,000/Tape & Reel
ZXMN4A06GQTC	Automotive	SOT223	4,000/Tape & Reel

- Note:
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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



111 = Manufacturer's Marking
 N4A06 = Marking Code
 YWW = Date Code Marking
 Y = Year (ex: 3 = 2013)
 WW = Week (01 - 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	40	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	(Note 7)	I _D	7	A
		T _A = +70°C (Note 7)		5.6	
		(Note 6)		5	
Pulsed Drain Current	V _{GS} = 10V	(Note 8)	I _{DM}	22	A
Continuous Source Current (Body diode)			I _S	5.4	A
Pulsed Source Current (Body diode)			I _{SM}	22	A

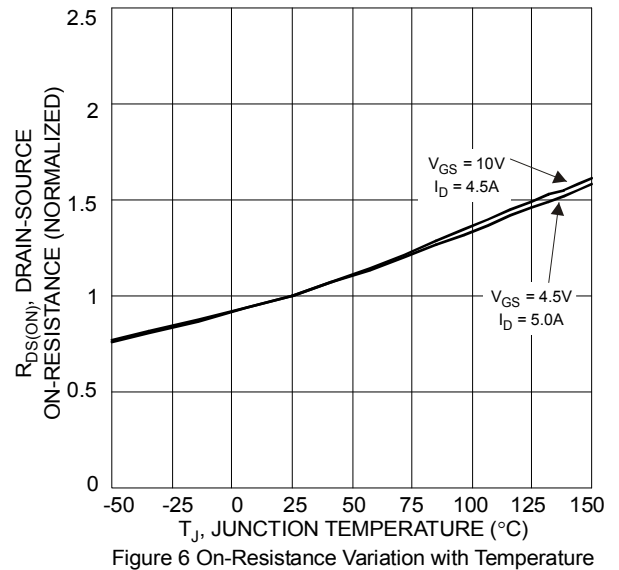
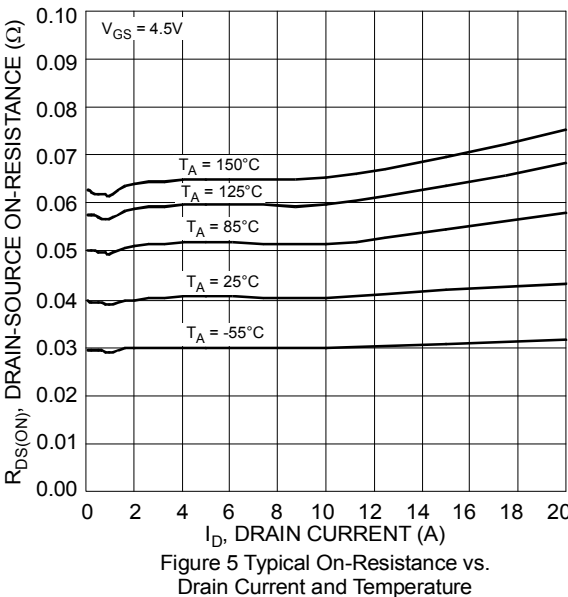
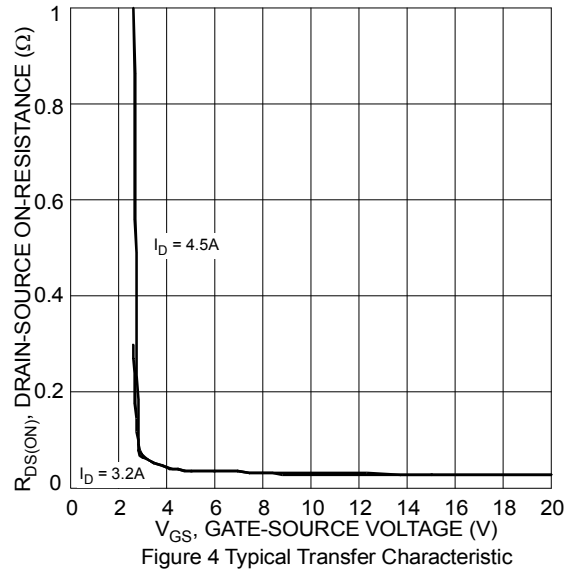
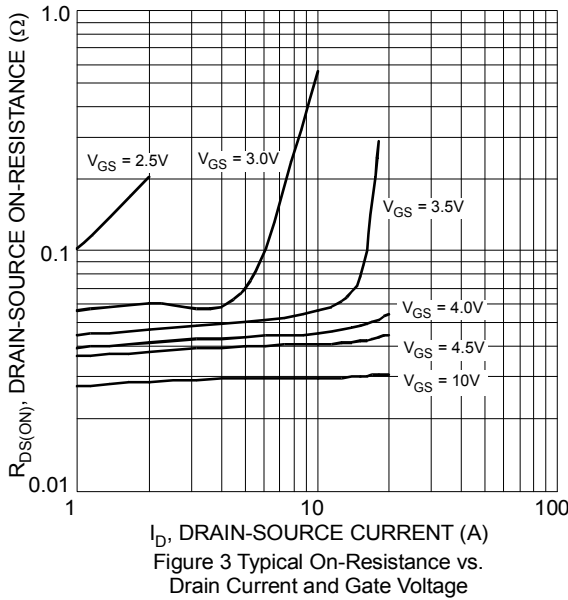
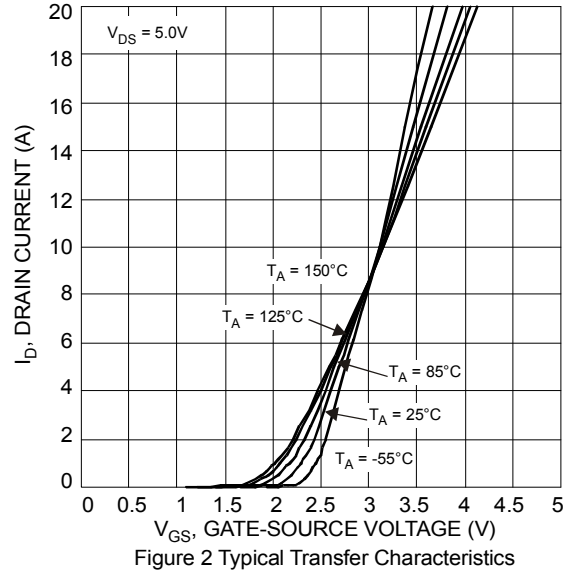
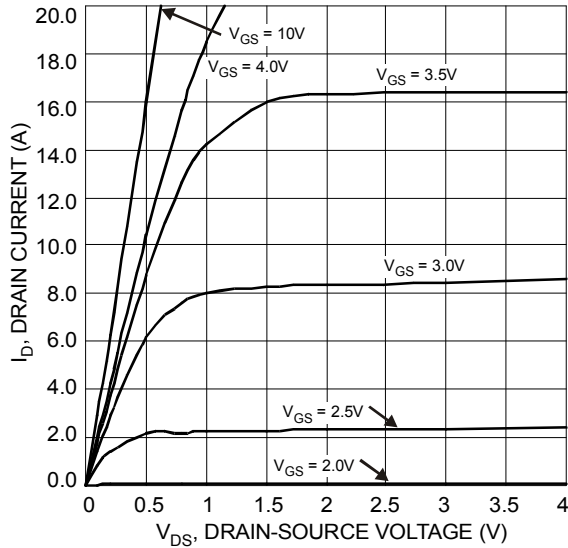
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

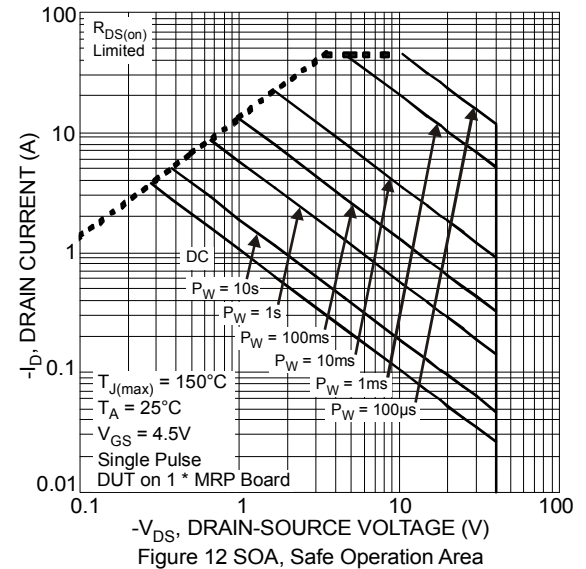
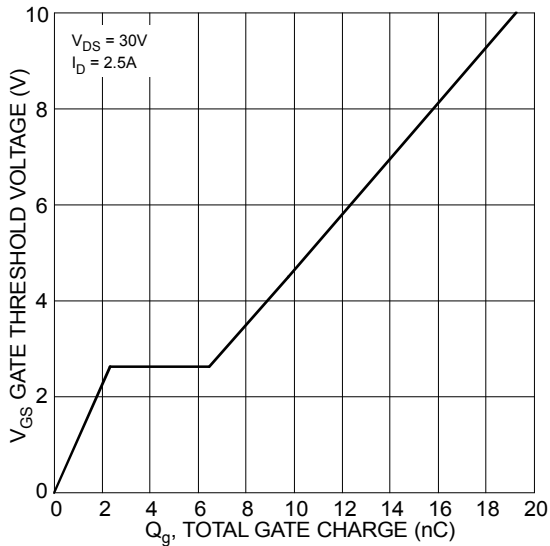
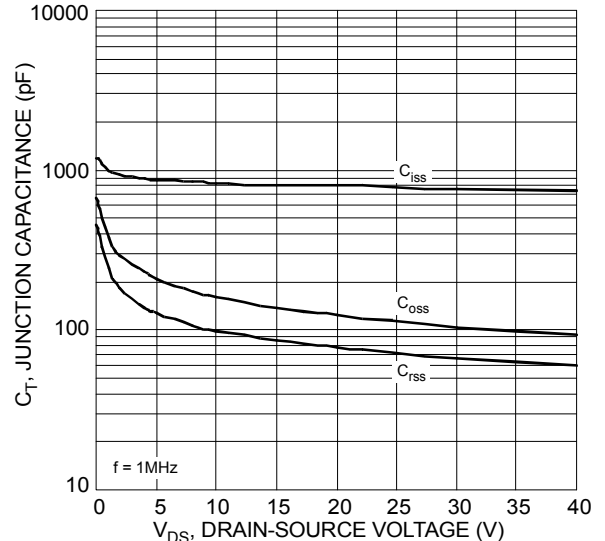
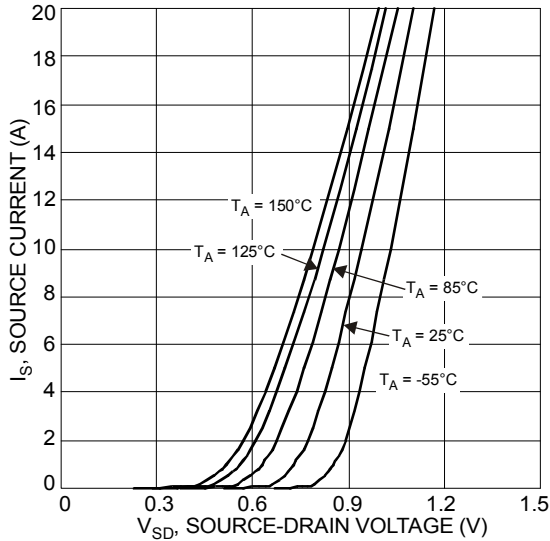
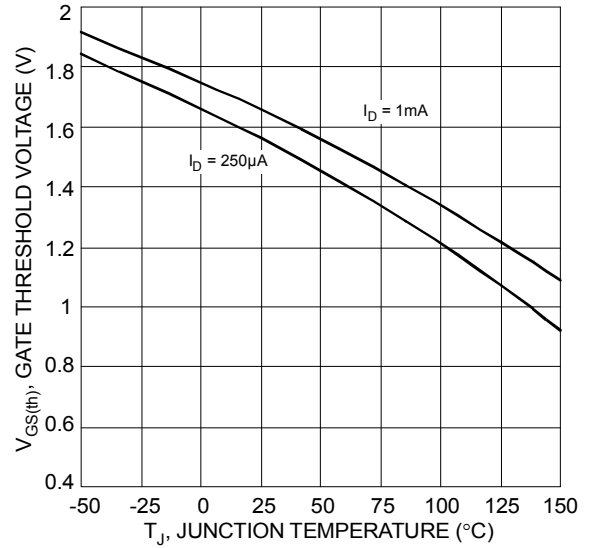
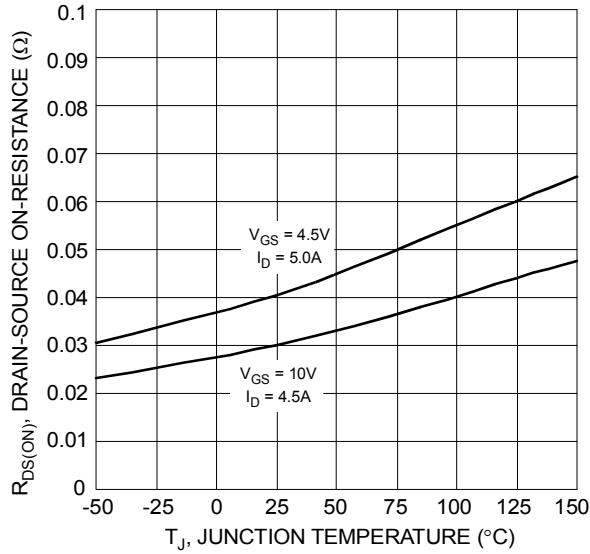
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P _D	2	W
	(Note 7)		16	
Linear Derating Factor	(Note 7)	R _{θJA}	3.9	mW/°C
	(Note 6)		31	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	62.5	°C/W
	(Note 7)		32.2	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

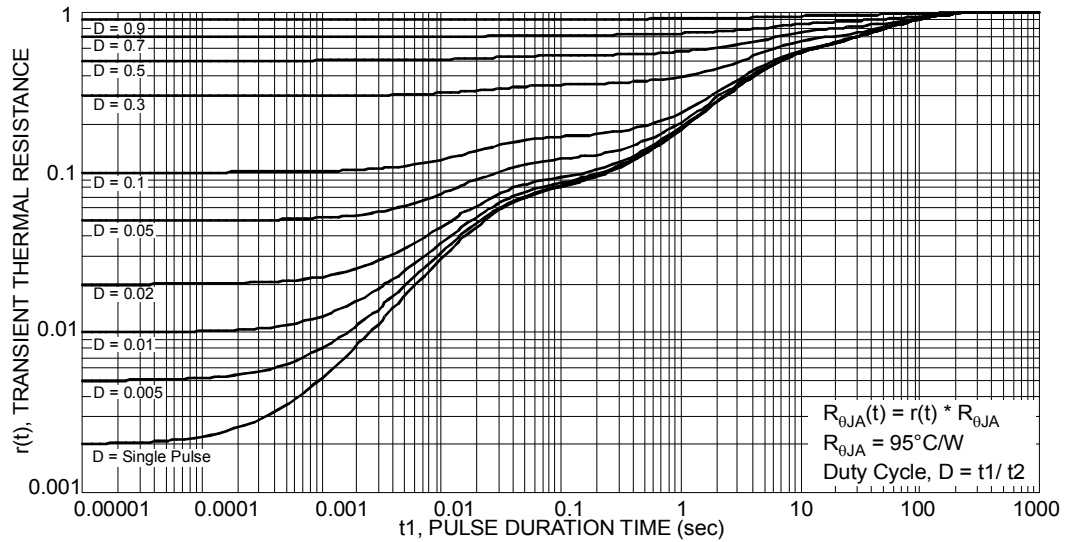
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	40	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	1	—	—	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 9)	R _{DS(ON)}	—	—	0.05	Ω	V _{GS} = 10V, I _D = 4.5A
				0.075		V _{GS} = 4.5V, I _D = 3.2A
Forward Transconductance (Notes 11)	g _{fs}	—	8.7	—	S	V _{DS} = 15V, I _D = 2.5A
Diode Forward Voltage (Note 9)	V _{SD}	—	0.8	0.95	V	I _S = 2.5A, V _{GS} = 0V, T _J = +25°C
Reverse recovery time (Note 11)	t _{rr}	—	14.5	—	ns	I _F = 2.5A, di/dt = 100A/μs,
Reverse recovery charge (Note 11)	Q _{rr}	—	7.8	—	nC	T _J = +25°C
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	746	—	pF	V _{DS} = 40V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	93	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	60	—	pF	
Total Gate Charge (Note 11)	Q _g	—	19	—	nC	V _{DS} = 30V, V _{GS} = 10V, I _D = 2.5A (refer to test circuit)
Gate-Source Charge (Note 11)	Q _{gs}	—	2.3	—	nC	
Gate-Drain Charge (Note 11)	Q _{gd}	—	4.1	—	nC	
Turn-On Delay Time (Note 11)	t _{D(on)}	—	3.4	—	ns	V _{DD} = 30V, V _{GS} = 10V I _D = 2.5A, R _G = 6Ω (refer to test circuit)
Turn-On Rise Time (Note 11)	t _r	—	2.8	—	ns	
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	20	—	ns	
Turn-Off Fall Time (Note 11)	t _f	—	7.7	—	ns	

- Notes:
- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - For a device surface mounted on FR-4 PCB measured at t ≤ 5 secs.
 - Repetitive rating 25mm x 25mm FR4 PCB, D = 0.05, pulse width 10μs - pulse width limited by maximum junction temperature.
 - Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - Switching characteristics are independent of operating junction temperatures.
 - For design aid only, not subject to production testing.

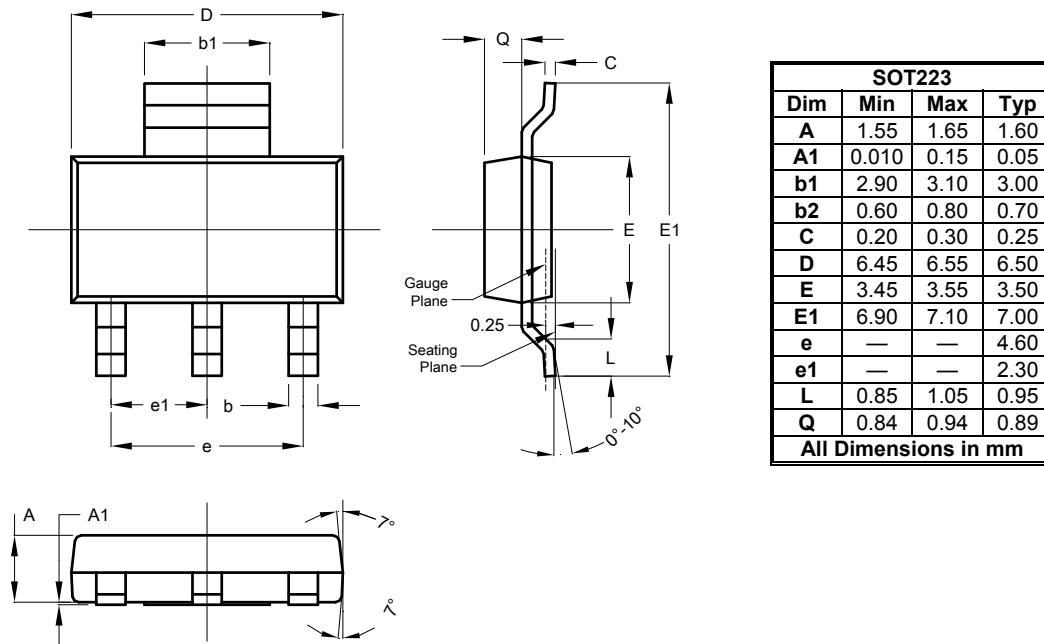






Package Outline Dimensions

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



Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



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