

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$ $T_A = +25^\circ\text{C}$
60V	80m $\Omega$ @ $V_{GS}=10\text{V}$	3.5A
	150m $\Omega$ @ $V_{GS}=4.5\text{V}$	2.5A

## Description

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.

## Applications

- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

## Features and Benefits

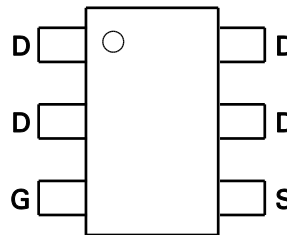
- Low On-Resistance
- Fast Switching Speed
- Low Gate Drive
- Low Threshold
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Available**

## Mechanical Data

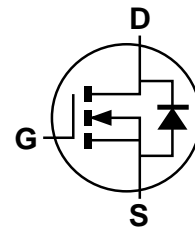
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208
- Weight: 0.018 grams (Approximate)



Top View



Pin Out - Top View



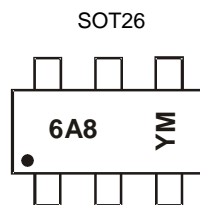
Equivalent Circuit

## Ordering Information (Note 4 & 5)

Part Number	Compliance	Case	Quantity per reel
ZXMN6A08E6QTA	Automotive	SOT26	3,000

- Note:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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/](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



6A8 = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: C = 2015)  
 M or  $\bar{M}$  = Month (ex: 9 = September)

### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022
Code	C	D	E	F	G	H	I	J

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

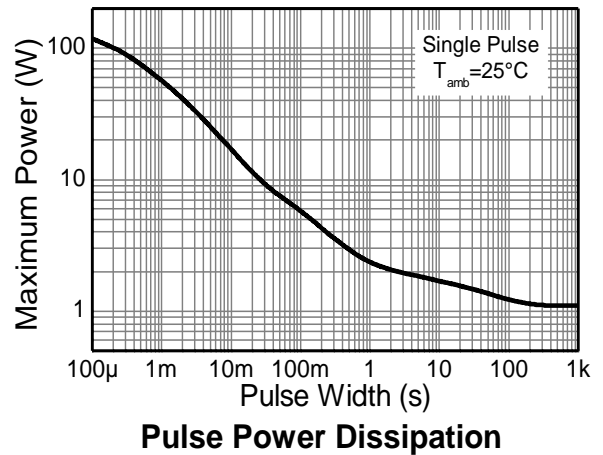
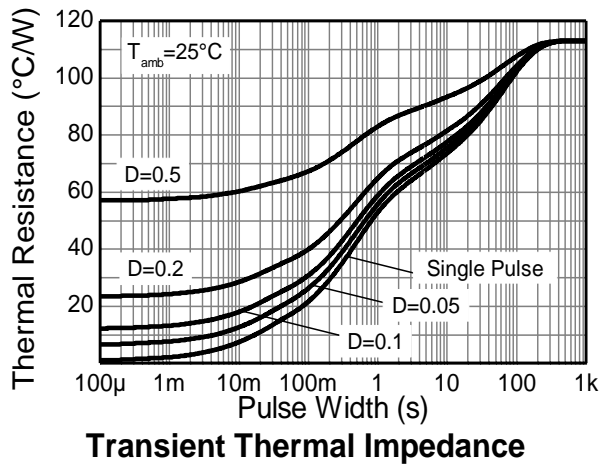
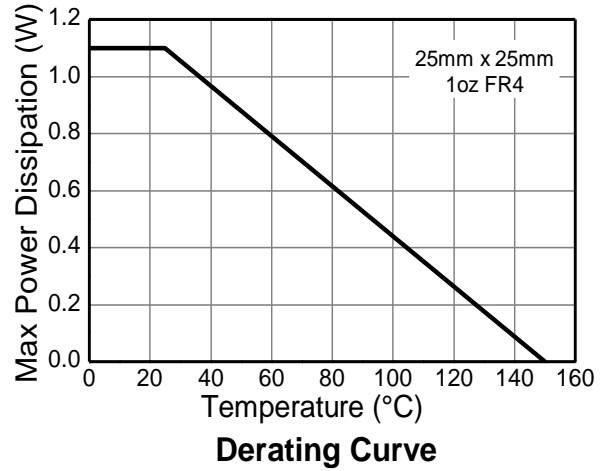
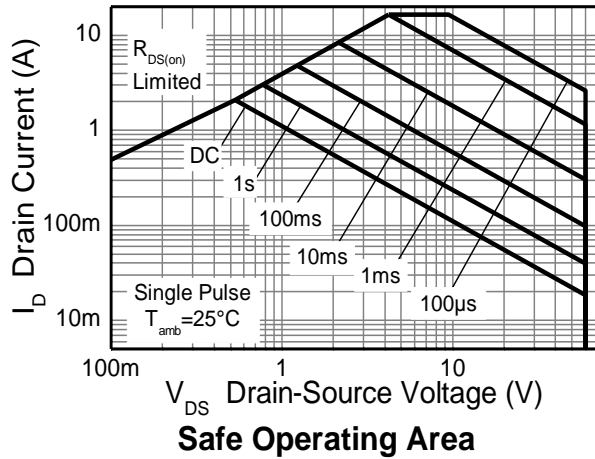
Characteristic			Symbol	Value	Unit	
Drain-Source Voltage			V <sub>DSS</sub>	60	V	
Gate-Source Voltage			V <sub>GS</sub>	±20	V	
Continuous Drain Current	V <sub>GS</sub> = 10V	(Note 7)	I <sub>D</sub>	3.5	A	
		T <sub>A</sub> = +70°C (Note 7)		2.8		
		(Note 6)		2.8		
Pulsed Drain Current	V <sub>GS</sub> = 10V	(Note 8)	I <sub>DM</sub>	16	A	
Continuous Source Current (Body diode)			(Note 7)	I <sub>S</sub>	2.6	A
Pulsed Source Current (Body diode)			(Note 8)	I <sub>SM</sub>	16	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)		P <sub>D</sub>	1.1	W mW/°C
				8.8	
	(Note 7)			1.7 13.6	
Thermal Resistance, Junction to Ambient	(Note 6)		R <sub>θJA</sub>	113	°C/W
	(Note 7)			73	
Operating and Storage Temperature Range			T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
6. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  7. Same as Note 6, except the device is measured at t ≤ 10 seconds.
  8. Same as Note 6, except the device is pulsed with D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.

**Thermal Characteristics**

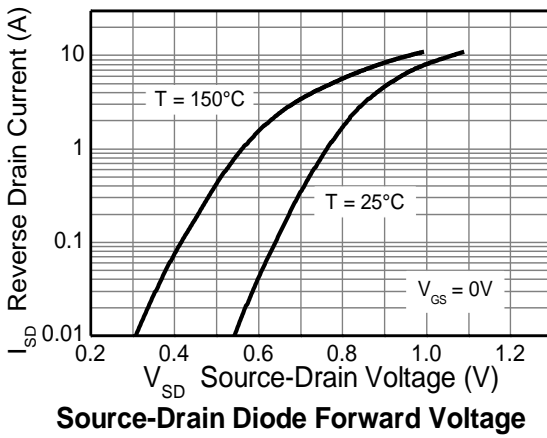
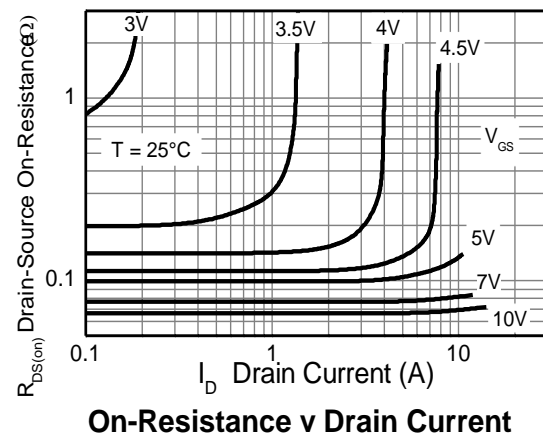
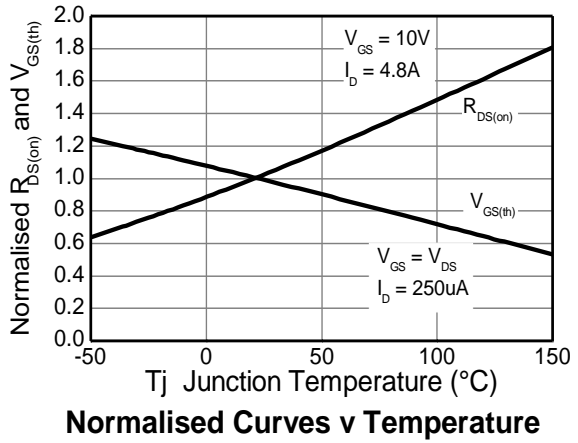
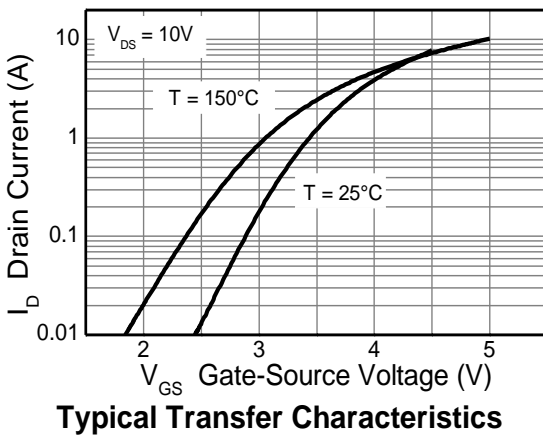
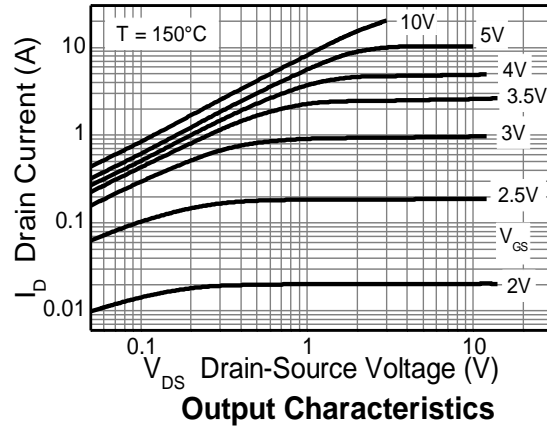
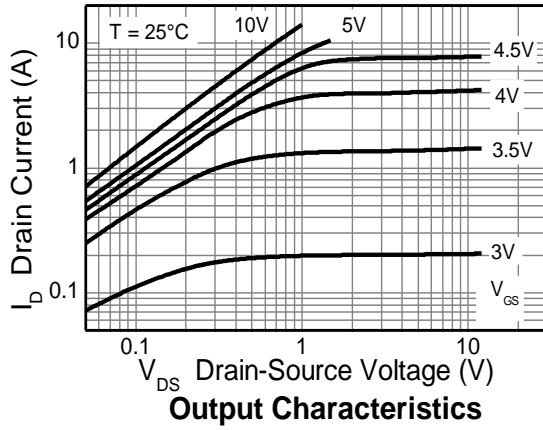


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

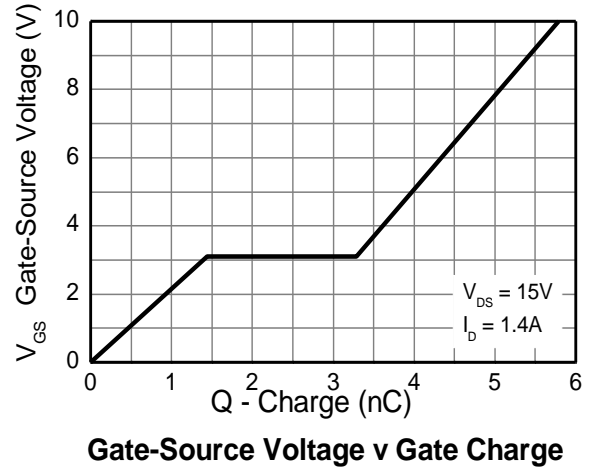
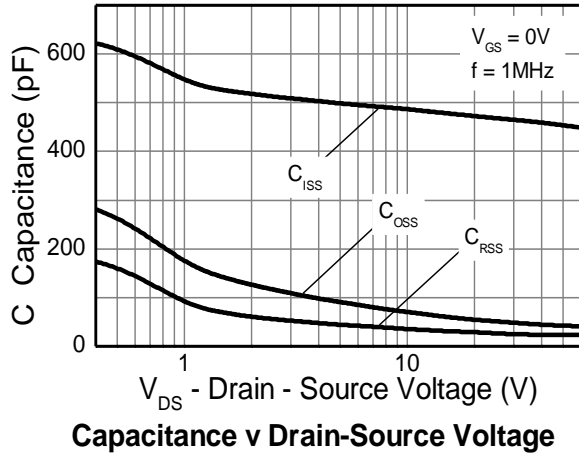
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	60	—	—	V	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	0.5	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	1	—	—	V	I <sub>D</sub> = 250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 9)	R <sub>DS(on)</sub>	—	0.067	0.08	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.8A
			0.1	0.15		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.2A
Forward Transconductance (Notes 9 & 10)	g <sub>fs</sub>	—	6.6	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 4.8A
Diode Forward Voltage (Note 9)	V <sub>SD</sub>	—	0.88	1.2	V	I <sub>S</sub> = 4A, V <sub>GS</sub> = 0V, T <sub>J</sub> = +25°C
Reverse Recovery Time (Note 10)	t <sub>rr</sub>	—	19.2	—	ns	I <sub>F</sub> = 1.4A, di/dt = 100A/μs,
Reverse Recovery Charge (Note 10)	Q <sub>rr</sub>	—	30.3	—	nC	T <sub>J</sub> = +25°C
<b>DYNAMIC CHARACTERISTICS (Note 10)</b>						
Input Capacitance	C <sub>iss</sub>	—	459	—	pF	V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	44.2	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	24.1	—	pF	
Total Gate Charge (Note 11)	Q <sub>g</sub>	—	3.7	—	nC	V <sub>GS</sub> = 4.5V
Total Gate Charge (Note 11)	Q <sub>g</sub>	—	5.8	—	nC	V <sub>GS</sub> = 10V
Gate-Source Charge (Note 11)	Q <sub>gs</sub>	—	1.4	—	nC	
Gate-Drain Charge (Note 11)	Q <sub>gd</sub>	—	1.9	—	nC	
Turn-On Delay Time (Note 11)	t <sub>D(on)</sub>	—	2.6	—	ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V I <sub>D</sub> = 1.5A, R <sub>G</sub> ≅ 6Ω
Turn-On Rise Time (Note 11)	t <sub>r</sub>	—	2.1	—	ns	
Turn-Off Delay Time (Note 11)	t <sub>D(off)</sub>	—	12.3	—	ns	
Turn-Off Fall Time (Note 11)	t <sub>f</sub>	—	4.6	—	ns	

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.  
 10. For design aid only, not subject to production testing.  
 11. Switching characteristics are independent of operating junction temperatures.

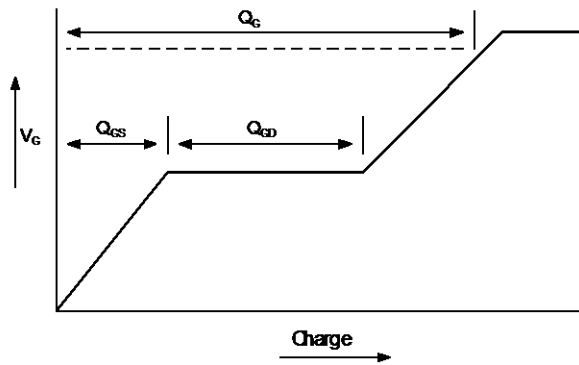
**Typical Characteristics**



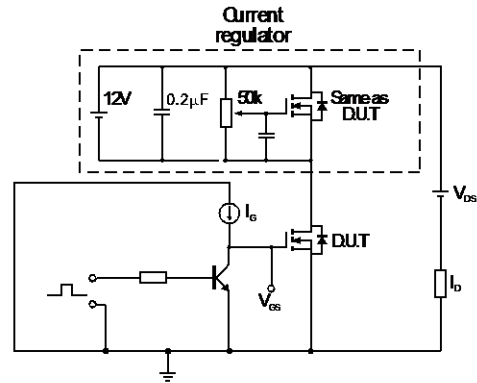
**Typical Characteristics (cont.)**



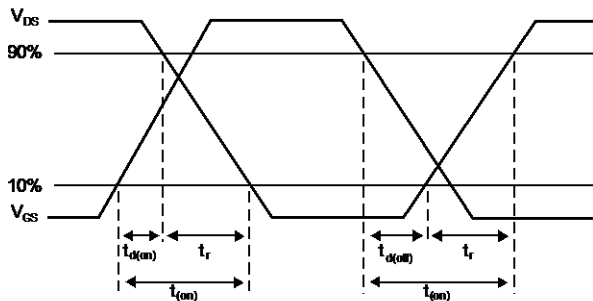
**Test Circuits**



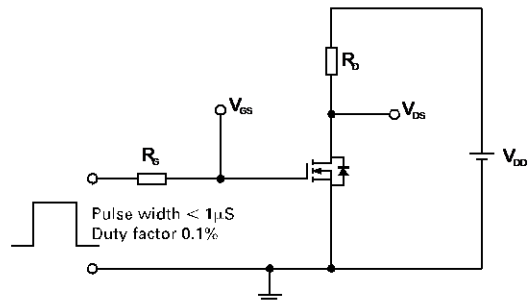
**Basic gate charge waveform**



**Gate charge test circuit**



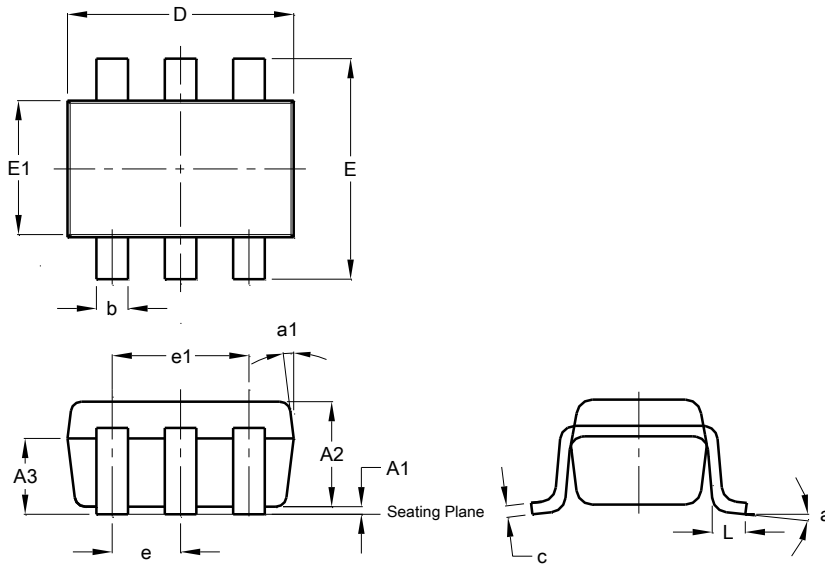
**Switching time waveforms**



**Switching time test circuit**

## Package Outline Dimensions

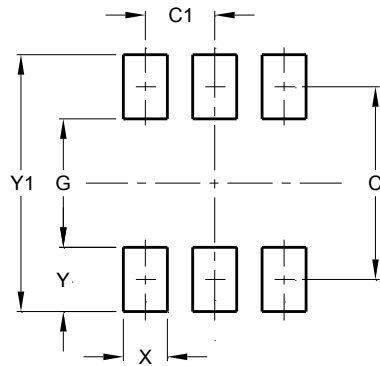
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
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	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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