

60V N-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25^\circ C$
100V	80m Ω @ $V_{GS}=10V$	3.5A
	150m Ω @ $V_{GS}=4.5V$	2.5A

Description and Applications

This MOSFET has been 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
- Power management functions
- Disconnect switches
- Motor control

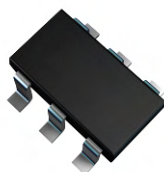
Features and Benefits

- Low on-resistance
- Fast switching speed
- Low gate drive
- Low threshold
- “Green” component and RoHS compliant (Note 1)
- Qualified to AEC-Q101 Standards for High Reliability

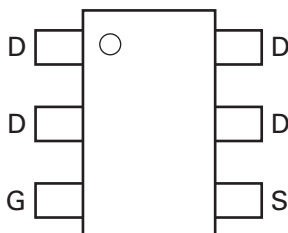
Mechanical Data

- Case: SOT23-6
- 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
- Weight: 0.018 grams (approximate)

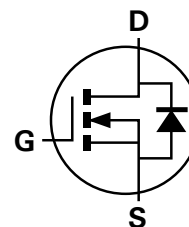
SOT23-6



Top View



Pin Out - Top View

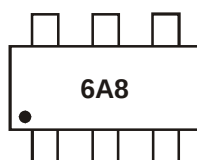


Equivalent Circuit

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A08E6TA	See below	7	8	3,000

Notes: 1. Diodes, Inc. defines “Green” products as those which are RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.’s “Green” Policy can be found on our website. For packaging details, go to our website.

Marking Information


6A8 = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

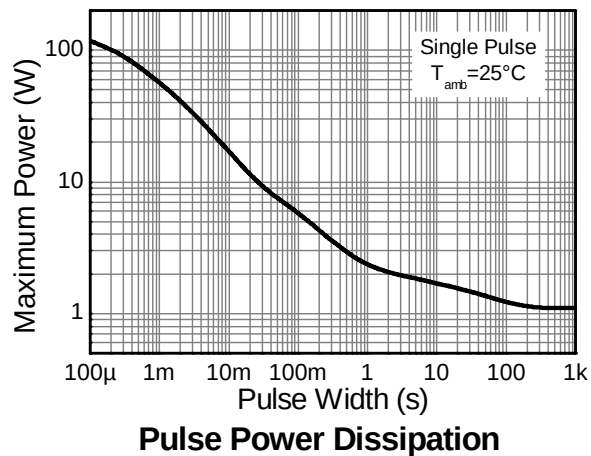
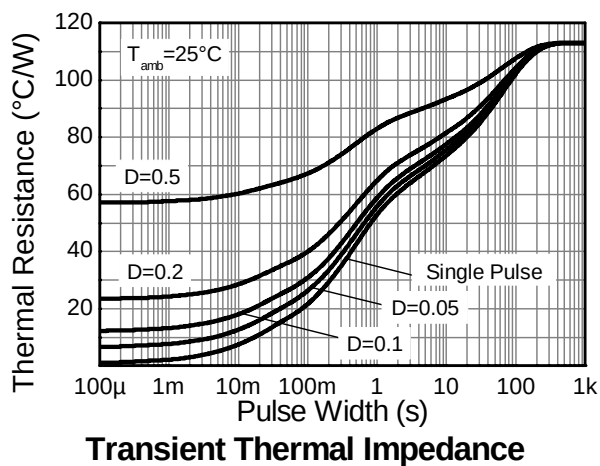
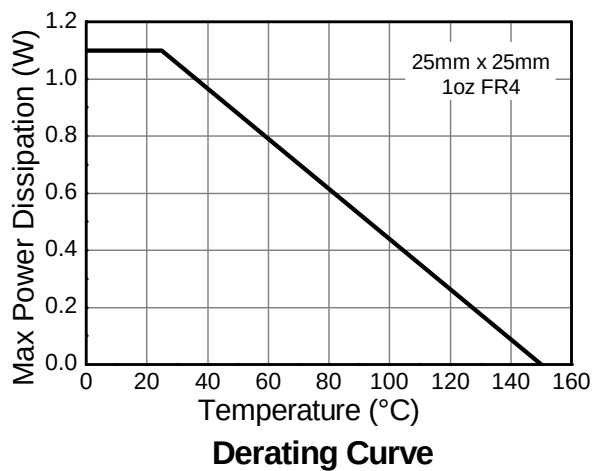
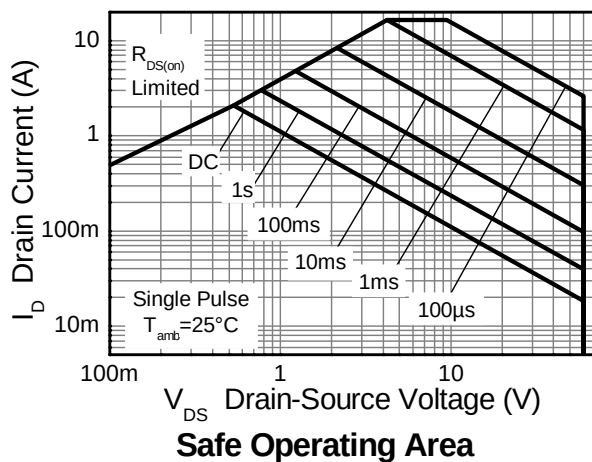
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V _{DSS}	60	V
Gate-Source voltage			V _{GS}	±20	V
Continuous Drain current	V _{GS} = 10V	(Note 3)	I _D	3.5	A
		T _A = 70°C (Note 3)		2.8	
		(Note 2)		2.8	
Pulsed Drain current	V _{GS} = 10V	(Note 4)	I _{DM}	16	A
Continuous Source current (Body diode)		(Note 3)	I _S	2.6	A
Pulsed Source current (Body diode)		(Note 4)	I _{SM}	16	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 2)	P _D	1.1	W mW/°C
			8.8	
	(Note 3)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Note 1)	R _{θJA}	113	°C/W
	(Note 3)		73	
Operating and storage temperature range		T _J , T _{STG}	-55 to 150	°C

- Notes:
2. 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.
 3. Same as note (2), except the device is measured at t ≤ 10 sec.
 4. Same as note (2), 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

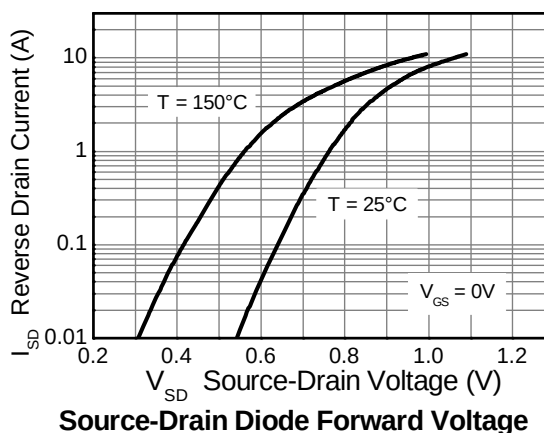
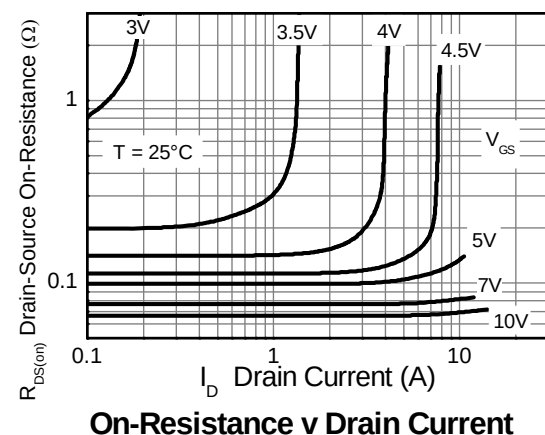
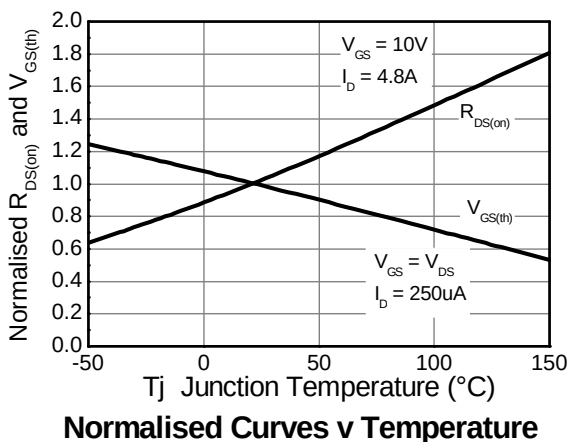
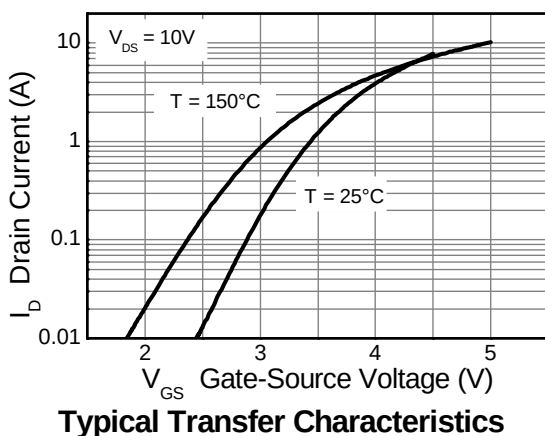
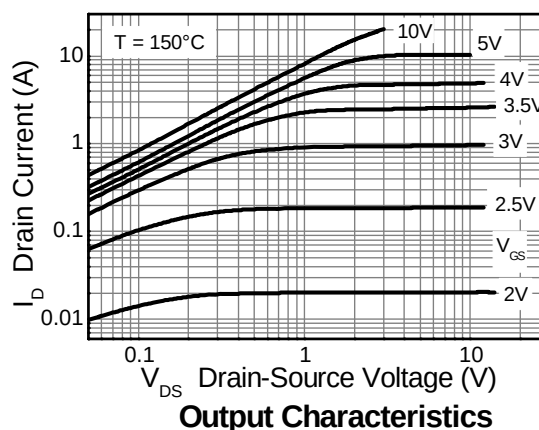
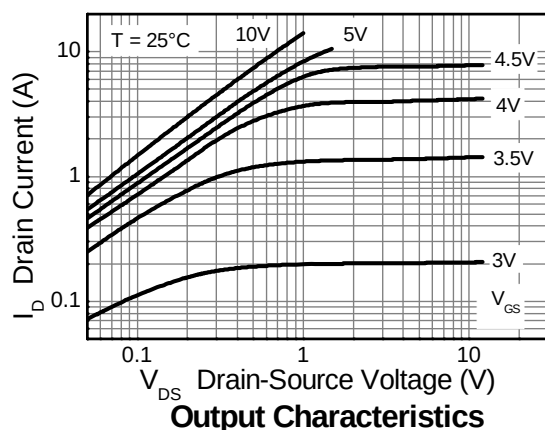


Electrical Characteristics @T_A = 25°C unless otherwise specified

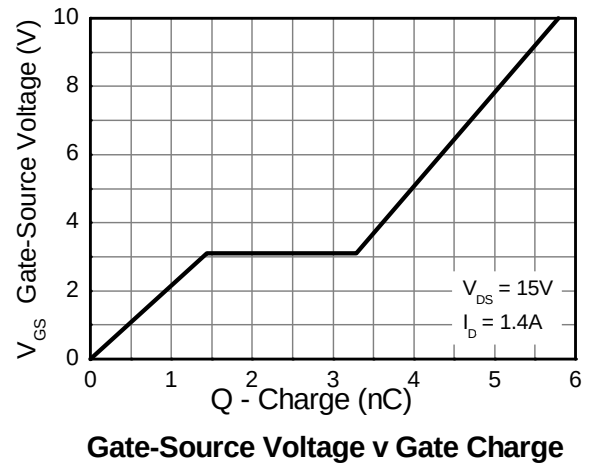
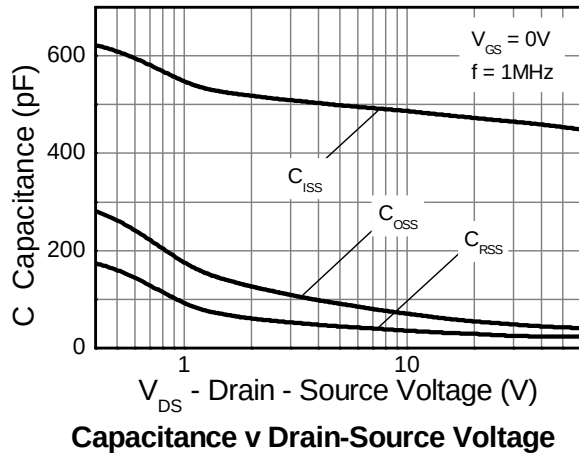
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	I _D = 250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 60V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(th)}	1.0	—	—	V	I _D = 250μA, V _{DS} = V _{GS}	
Static Drain-Source On-Resistance (Note 5)	R _{DS (ON)}	—	0.067	0.080	Ω	V _{GS} = 10V, I _D = 4.8A	
			0.100	0.150		V _{GS} = 4.5V, I _D = 4.2A	
Forward Transconductance (Notes 5 & 6)	g _{fs}	—	6.6	—	S	V _{DS} = 15V, I _D = 4.8A	
Diode Forward Voltage (Note 5)	V _{SD}	—	0.88	1.2	V	I _S = 4A, V _{GS} = 0V, T _J = 25°C	
Reverse recovery time (Note 6)	t _{rr}	—	19.2	—	ns	I _F = 1.4A, di/dt = 100A/μs, T _J = 25°C	
Reverse recovery charge (Note 6)	Q _{rr}	—	30.3	—	nC		
DYNAMIC CHARACTERISTICS (Note 6)							
Input Capacitance	C _{iss}	—	459	—	pF	V _{DS} = 40V, V _{GS} = 0V f = 1MHz	
Output Capacitance	C _{oss}	—	44.2	—	pF		
Reverse Transfer Capacitance	C _{rss}	—	24.1	—	pF		
Total Gate Charge (Note 7)	Q _g	—	3.7	—	nC	V _{GS} = 4.5V	V _{DS} = 30V I _D = 1.4A
Total Gate Charge (Note 7)	Q _g	—	5.8	—	nC	V _{GS} = 10V	
Gate-Source Charge (Note 7)	Q _{gs}	—	1.4	—	nC		
Gate-Drain Charge (Note 7)	Q _{gd}	—	1.9	—	nC		
Turn-On Delay Time (Note 7)	t _{D(on)}	—	2.6	—	ns	V _{DD} = 30V, V _{GS} = 10V I _D = 1.5A, R _G ≅ 6.0Ω	
Turn-On Rise Time (Note 7)	t _r	—	2.1	—	ns		
Turn-Off Delay Time (Note 7)	t _{D(off)}	—	12.3	—	ns		
Turn-Off Fall Time (Note 7)	t _f	—	4.6	—	ns		

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

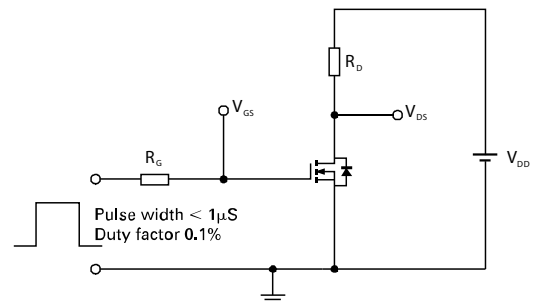
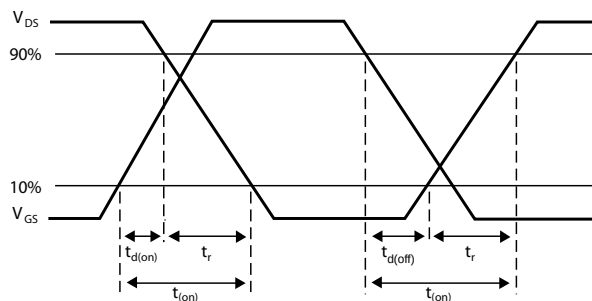
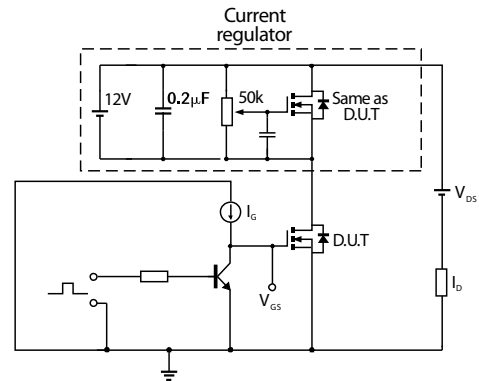
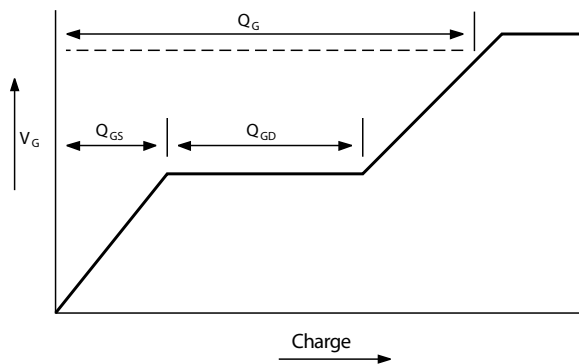
Typical Characteristics



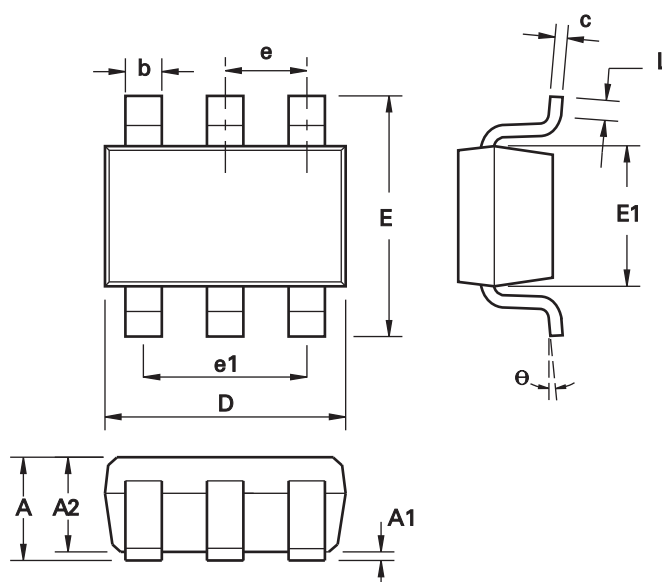
Typical Characteristics – continued



Test Circuits

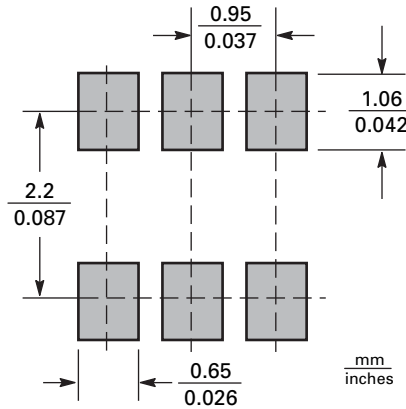


Package Outline Dimensions



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.354	0.0570
A1	0.00	0.15	0.00	0.0059
A2	0.90	1.30	0.0354	0.0511
b	0.20	0.50	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.70	3.10	0.1062	0.1220
E	2.20	3.20	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
L	0.10	0.60	0.0039	0.0236
e	0.95 REF		0.0374 REF	
e1	1.90 REF		0.0748 REF	
θ	0°	30°	0°	30°

Suggested Pad Layout



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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9