

Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	I_D $T_A = +25^\circ\text{C}$
-30V	80mΩ @ $V_{GS} = -10\text{V}$	-4.0A
	140mΩ @ $V_{GS} = -4.5\text{V}$	—

Description

This new generation Trench MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance.

Applications

- Power management functions
- Portable Equipment
- Battery Charging

Features and Benefits

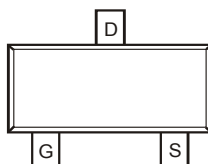
- Low On-Resistance
- Fast Switching Speed
- 4.5V Gate Drive Capability
- Thermally Enhanced SOT23 package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

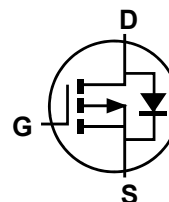
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe
Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (approximate)



Top View



Pin Configuration



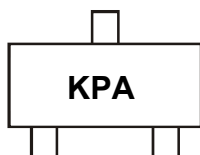
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
ZXMP3F30FHTA	Standard	SOT23	3,000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



KPA = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: A = 2013)
M = Month (ex: 9 = September)

Date Code Key

Year	2008	2009	2010	2011	2012	2013	2014	2015
Code	V	W	X	Y	Z	A	B	C

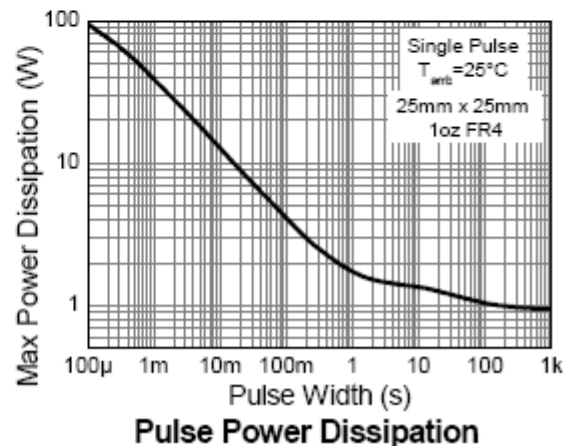
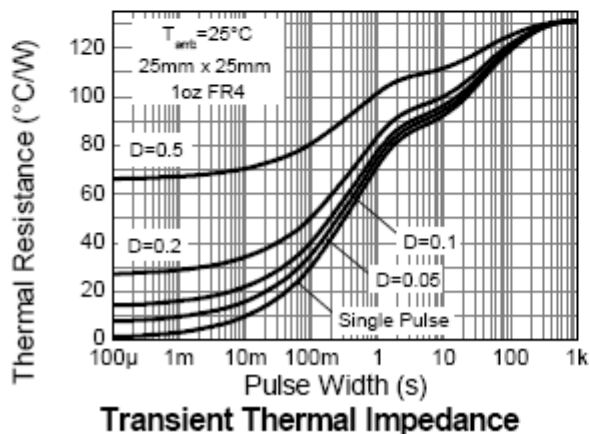
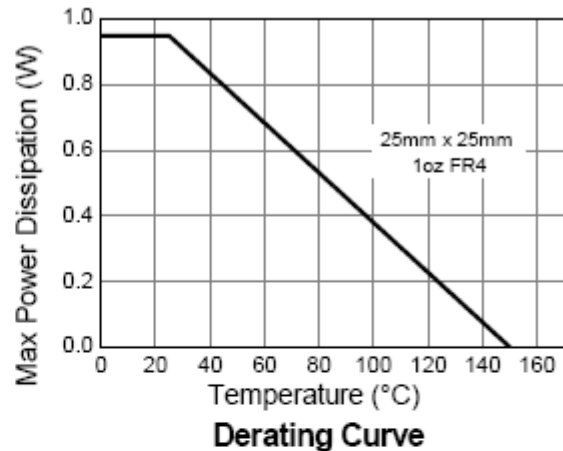
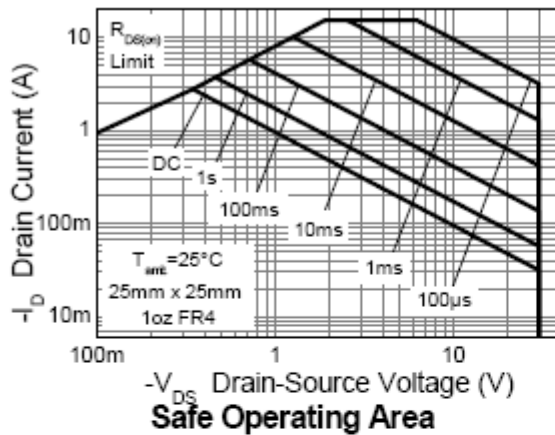
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic		Symbol	Value	Units
Drain-Source Voltage		V _{DSS}	-30	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current, V _{GS} = -10V	T _A = +25°C (Note 6)	I _D	-3.4	A
	T _A = +70°C (Note 6)		-2.7	
	T _A = +25°C (Note 5)		-2.8	
	T _L = +25°C (Note 8)		-4.0	
Pulsed Drain Current (Note 7)		I _{DM}	-15.3	A
Continuous Source Current (Body Diode) (Note 6)		I _S	-2	A
Pulsed Source Current (Body Diode) (Note 7)		I _{SM}	-15.3	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5) Linear Derating Factor	T _A = +25°C (Note 5)	P _D	0.95	W
			7.6	mW/°C
	T _A = +25°C (Note 6)		1.4	W
			11.2	mW/°C
	T _L = +25°C (Note 8)		1.96	W
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	131	°C/W
	(Note 6)		89	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

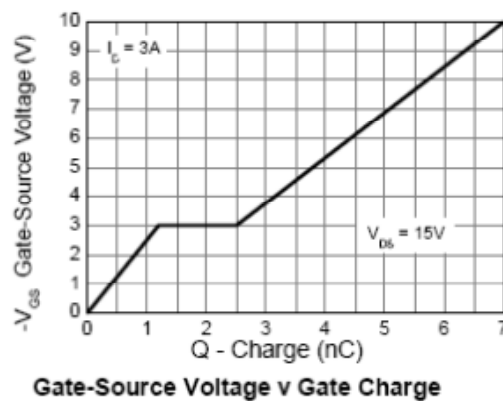
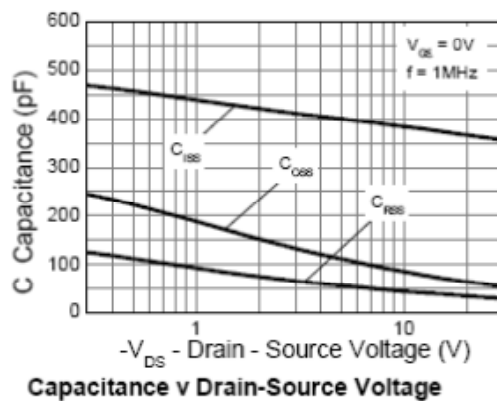
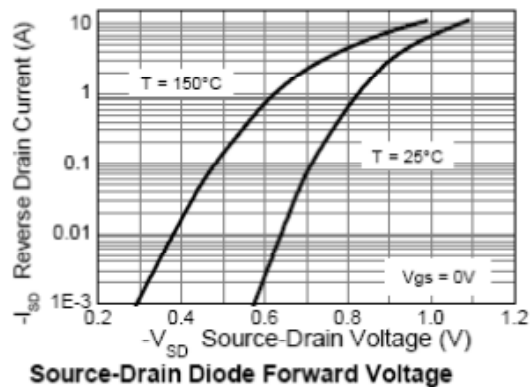
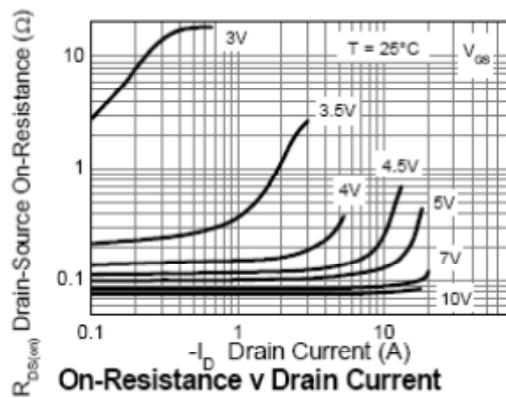
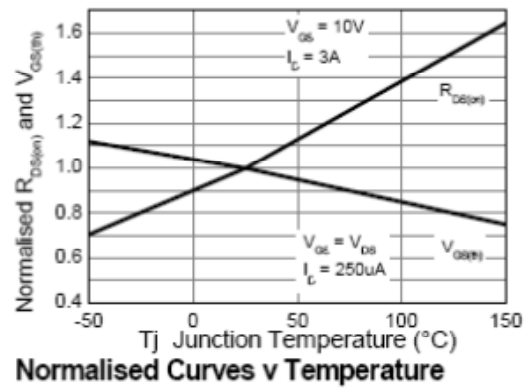
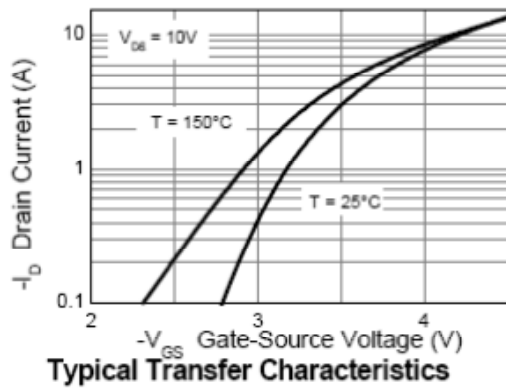
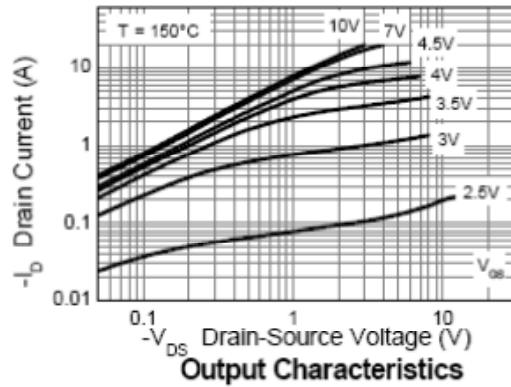
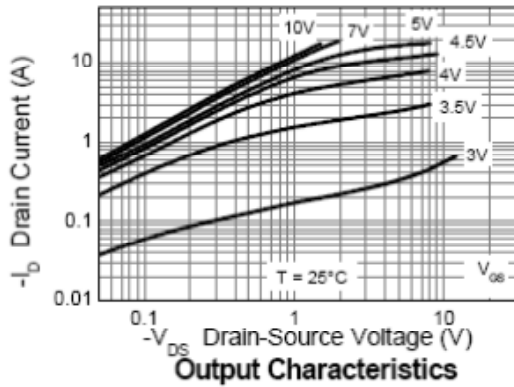


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

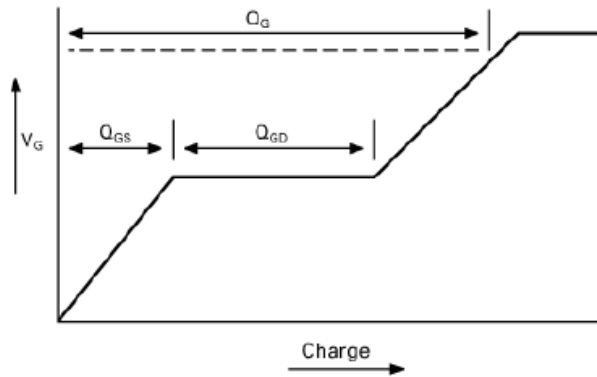
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	-30	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	nA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	-1	—	-3	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance (Note 9)	R _{DS (ON)}	—	—	80 140	mΩ	V _{GS} = -10V, I _D = -2.5A V _{GS} = -4.5V, I _D = -1.9A
Forward Transconductance (Note 9 & 10)	g _{fs}	—	5	—	S	V _{DS} = -15V, I _D = -3A
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.8	-1.2	V	V _{GS} = 0V, I _S = -1.7A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	370	—	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	72	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	38	—	pF	
GATE CHARACTERISTICS						
Total Gate Charge	Q _g	—	7	—	nC	V _{DS} = -15V, V _{GS} = -10V, I _D = -3A
Gate-Source Charge	Q _{gs}	—	1.2	—		
Gate-Drain Charge	Q _{gd}	—	1.3	—		
SWITCHING CHARACTERISTICS (Note 10 & 11)						
Turn-On Delay Time	t _{d(on)}	—	1.3	—	ns	V _{DS} = -15V, V _{GS} = -10V, I _D = -1A, R _G = 6.0Ω
Rise Time	t _r	—	2.6	—		
Turn-Off Delay Time	t _{d(off)}	—	49	—		
Fall Time	t _f	—	22	—		
SOURCE-DRAIN DIODE CHARACTERISTICS (Note 11)						
Reverse Recovery Time	t _{rr}	—	14.6	—	ns	I _S = -1.5A, di/dt=100A/μs
Reverse Recovery Charge	Q _{rr}	—	9.5	—	nC	

- Notes:
- 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.
 - Mounted on FR4 PCB measured at t ≤ 10 sec.
 - Repetitive rating on 25mm x 25mm FR4 PCB, D=0.02, pulse width 300μs – pulse width limited by maximum junction temperature.
 - Thermal resistance from junction to solder-point (at the end of the drain lead).
 - Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - Switching characteristics are independent of operating junction temperature.
 - For design aid only, not subject to production testing.

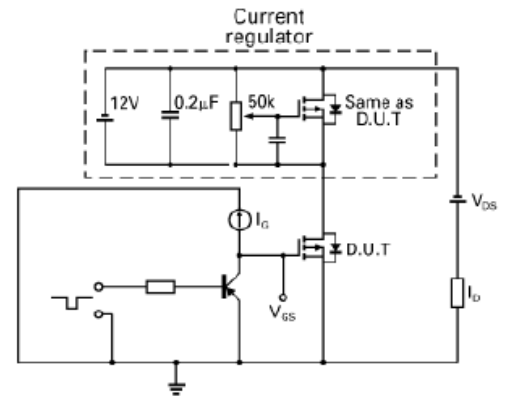
Typical Characteristics



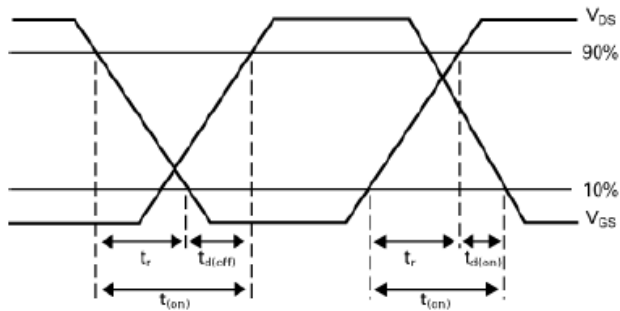
Test Circuits



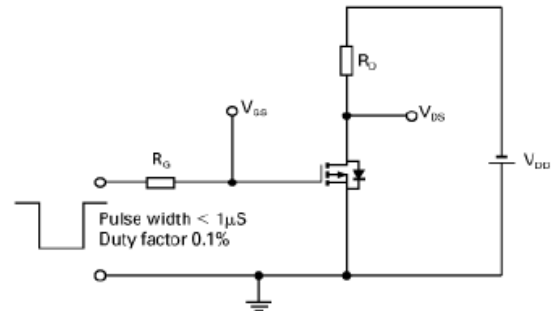
Basic gate charge waveform



Gate charge test circuit



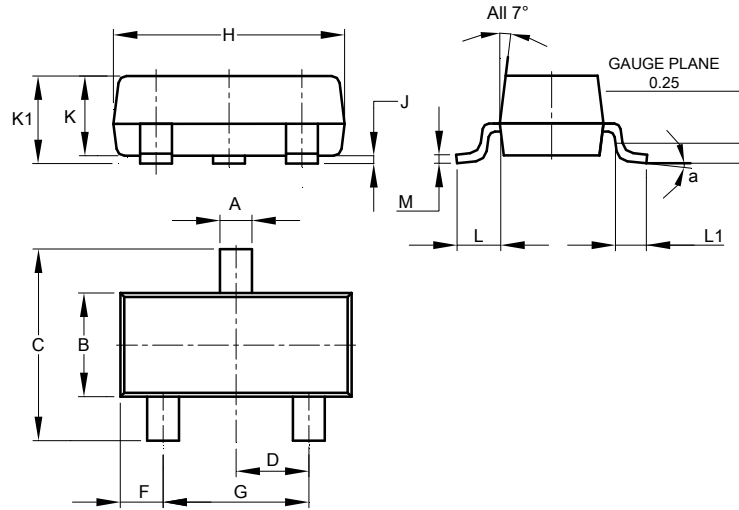
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

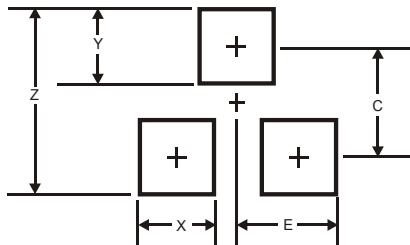
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
α	8°		
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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