20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

 $V_{(BR)DSS}$ = 20 $V: R_{DS}(_{on})$ =0.06 $\Omega; I_{D}$ = 4.1A

DESCRIPTION

This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.



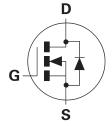
SOT23

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- · Low gate drive
- SOT23 package

APPLICATIONS

- DC-DC converters
- Power management functions
- Disconnect switches
- Motor control

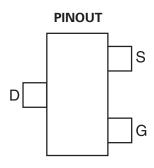


ORDERING INFORMATION

DEVICE	REEL	TAPE	QUANTITY	
	SIZE	WIDTH	PER REEL	
ZXMN2A14FTA	7″	8mm	3000 units	

DEVICE MARKING

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-Source Voltage	V _{DSS}	20	V	
Gate-Source Voltage	V _{GS}	±12	V	
Continuous Drain Current @ V _{GS} =4.5V; T _A =25°C ^(b)	I _D	4.1	Α	
@ V _{GS} =4.5V; T _A =70°C ^(b)		3.3	Α	
@ V _{GS} =4.5V; T _A =25°C ^(a)		3.4	Α	
Pulsed Drain Current (c)	I _{DM}	19	Α	
Continuous Source Current (Body Diode) (b)	Is	1.7	Α	
Pulsed Source Current (Body Diode) (c)	I _{SM}	19	Α	
Power Dissipation at T _A =25°C ^(a)	P _D	1	W	
Linear Derating Factor		8	mW/°C	
Power Dissipation at T _A =25°C ^(b)	P _D	1.5	W	
Linear Derating Factor		12	mW/°C	
Operating and Storage Temperature Range	T _j , T _{stg}	-55 to +150	°C	

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient ^(a)	$R_{\Theta JA}$	125	°C/W
Junction to Ambient ^(b)	$R_{\Theta JA}$	82	°C/W

NOTES

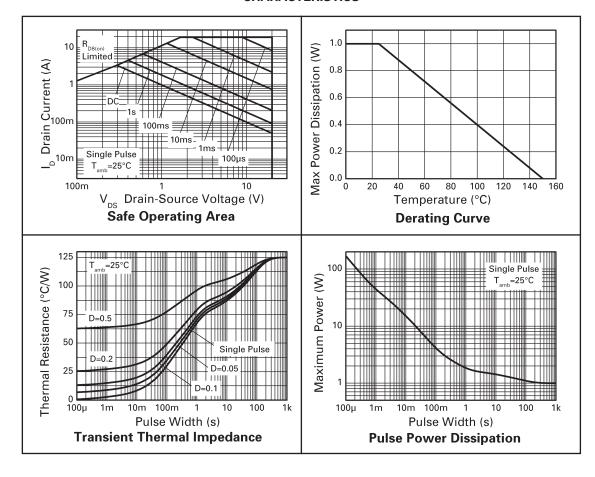
(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.



⁽b) For a device surface mounted on FR4 PCB measured at $t \le 5$ sec.

⁽c) Repetitive rating - 25mm x 25mm FR4 PCB, D=0.02, pulse width 300 µs - pulse width limited by maximum junction temperature.

CHARACTERISTICS



ZETEX SEMICONDUCTORS

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

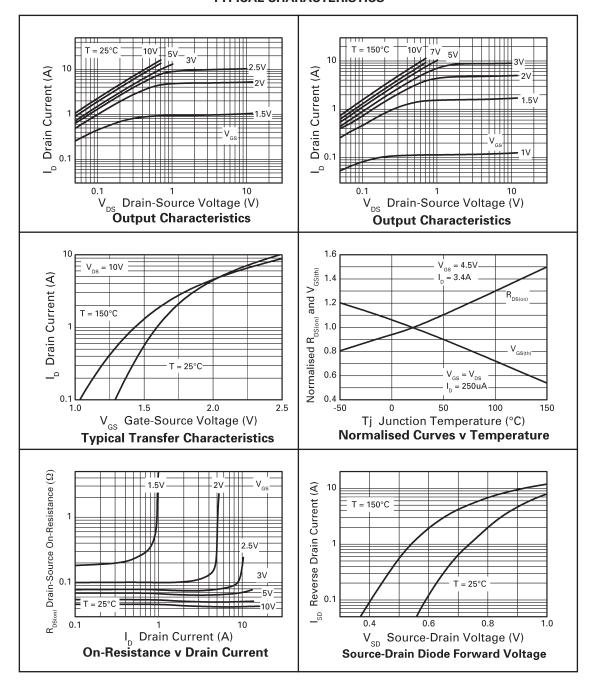
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS	
STATIC	<u> </u>	1					
Drain-Source Breakdown Voltage	V _{(BR)DSS}	20			V	I _D =250μA, V _{GS} =0V	
Zero Gate Voltage Drain Current	I _{DSS}			1	μΑ	V _{DS} =20V, V _{GS} =0V	
Gate-Body Leakage	I _{GSS}			100	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$	
Gate-Source Threshold Voltage	V _{GS(th)}	0.7			V	I _D =250μA, V _{DS} = V _{GS}	
Static Drain-Source On-State	R _{DS(on)}			0.060	Ω	V _{GS} =4.5V, I _D =3.4A	
Resistance ⁽¹⁾				0.110	Ω	V _{GS} =2.5V, I _D =2.5A	
Forward Transconductance (1) (3)	g _{fs}		9.4		S	V _{DS} =10V,I _D =3.4A	
DYNAMIC (3)		•				•	
Input Capacitance	C _{iss}		544		pF		
Output Capacitance	C _{oss}		132		pF	V _{DS} = 10V, V _{GS} =0V,	
Reverse Transfer Capacitance	C _{rss}		85		pF	f=1MHz	
SWITCHING ^{(2) (3)}		•			•		
Turn-On Delay Time	t _{d(on)}		4.0		ns		
Rise Time	t _r		5.3		ns	$V_{DD} = 10V, V_{GS} = 4.5V$	
Turn-Off Delay Time	t _{d(off)}		16.6	ns	I _D = 1A		
Fall Time	t _f		9.5		ns	$R_G \cong 6.0\Omega$	
Total Gate Charge	Qg		6.6		nC		
Gate-Source Charge	Q _{gs}		1.2		nC	$V_{DS} = 10V, V_{GS} = 4.5V,$	
Gate-Drain Charge	Q_{gd}		2.1		nC	I _D =3.4A	
SOURCE-DRAIN DIODE							
Diode Forward Voltage (1)	V _{SD}		0.85	0.95	V	$T_J = 25^{\circ}C, I_S = (3.3)A,$	
						V _{GS} =0V	
Reverse Recovery Time (3)	t _{rr}		11.4		ns	T _J =25°C, I _F =(1.7)A,	
Reverse Recovery Charge (3)	Q _{rr}		4.6		nC	di/dt= 100A/μs	

NOTES

- (1) Measured under pulsed conditions. Pulse width $\leq 300 \mu s;$ duty cycle $\leq\!2\%.$
- (2) Switching characteristics are independent of operating junction temperature.
- (3) For design aid only, not subject to production testing.

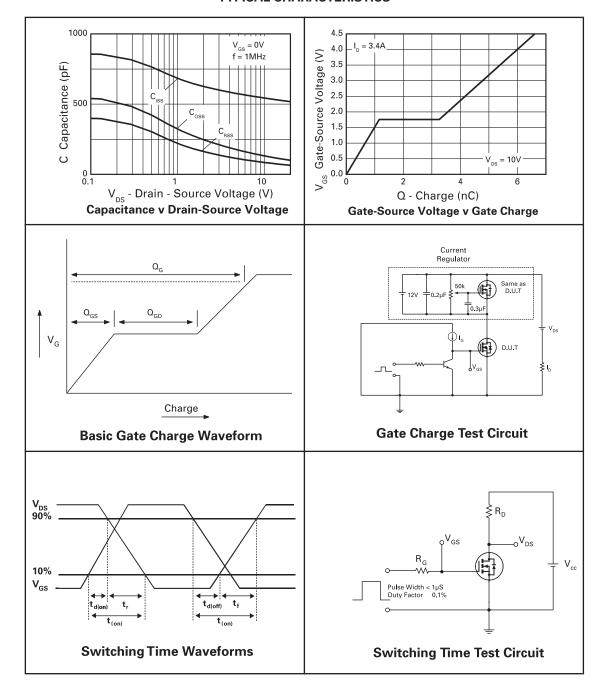


TYPICAL CHARACTERISTICS





TYPICAL CHARACTERISTICS





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- "Not recommended for new designs"Device is still in production to support existing designs and production
- "Obsolete"Production has been discontinued

Datasheet status key:

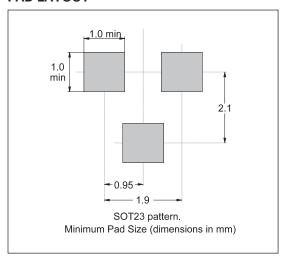
- "Draft version"This term denotes a very early datasheet version and contains highly provisional
- information, which may change in any manner without notice.
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PACKAGE OUTLINE

3 EADS D

PAD LAYOUT



Controlling dimensions are in millimetres. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	MILLIMETRES		INCHES			MILLIMETRES		INCHES	
	MIN	MAX	MIN	MAX	DIM	MIN	MAX	MIN	MAX
Α	2.67	3.05	0.105	0.120	Н	0.33	0.51	0.013	0.020
В	1.20	1.40	0.047	0.055	K	0.01	0.10	0.0004	0.004
С	_	1.10	_	0.043	L	2.10	2.50	0.083	0.0985
D	0.37	0.53	0.015	0.021	M	0.45	0.64	0.018	0.025
F	0.085	0.15	0.0034	0.0059	N	0.95 NOM		0.0375 NOM	
G	1.90	NOM	0.075	NOM	θ	10° TYP		10° TYP	

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