

Description

The FDMC3612 is the new generation trench N-channel MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

V_{DSS}	100V
I_D	12A
$R_{DS(ON)}$	75m Ω @ $V_{GS}=10V$

Features

- High - speed switching
- Excellent gate charge x $R_{DS(ON)}$ product (FOM)
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

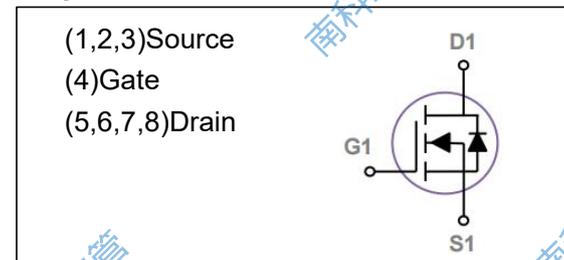
Applications

- Networking
- Load Switch
- LED Applications

Outline



Equivalent



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
FDMC3612	PDFN3.3x3.3-8L	FDMC3612	5000

Absolute Maximum Ratings

Parameter	Symbol	N	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ^(Note2)	I_D	$T_C=25^\circ C$	12
		$T_C=70^\circ C$	9.4
-Pulsed ^(Note 1- Note 2)	I_{DM}	48	A
Single Pulse Avalanche Energy ^(Note 3)	E_{AS}	8	mJ
Maximum Power Dissipation	P_D	$T_C=25^\circ C$	28
		$T_C=70^\circ C$	22
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	62	$^\circ C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	4.8	$^\circ C/W$

Electrical Characteristics (T_C=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	1.2	1.7	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A		75	87	mΩ
		V _{GS} =4.5V, I _D =8A		82	95	mΩ
Forward Transconductance	g _{FS}	V _{GS} =10V, I _D =3A		8.5		S
DYNAMIC CHARACTERISTICS <small>Note4</small>						
Input Capacitance	C _{ISS}	V _{DS} =25V,		1050		pF
Output Capacitance	C _{OSS}	V _{GS} =0V,		50		pF
Reverse Transfer Capacitance	C _{RSS}	f =1.0MHz		40		pF
Total Gate Charge	Q _g	V _{DS} =50V, I _D =2A, V _{GS} =10V		19		nC
Gate-Source Charge	Q _{gs}			3.5		nC
Gate-Drain Charge	Q _{gd}			3.9		nC
SWITCHING CHARACTERISTICS <small>Note4</small>						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =50V,		17.6		ns
Rise Time	t _r	I _D =1A,		6.8		ns
Turn-Off Delay Time	t _{D(OFF)}	V _{GS} =10V,		40		ns
Fall Time	t _f	R _{GEN} =3.5Ω		4		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =10A			1.0	V

Notes:

- 1、Pulse Test Width < 300us, Duty Cycle < 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Starting T_J=25°C, L=0.1mH, V_{DD}=50V, V_{GS}=10V, R_G=25Ω
- 4、Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

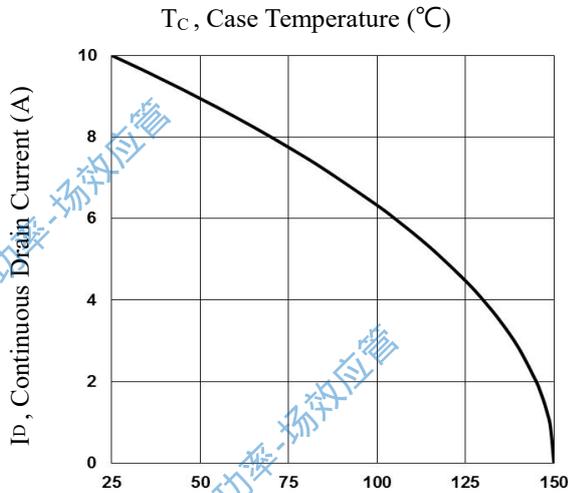


Fig.2 Normalized R_{DS(on)} vs. T_J

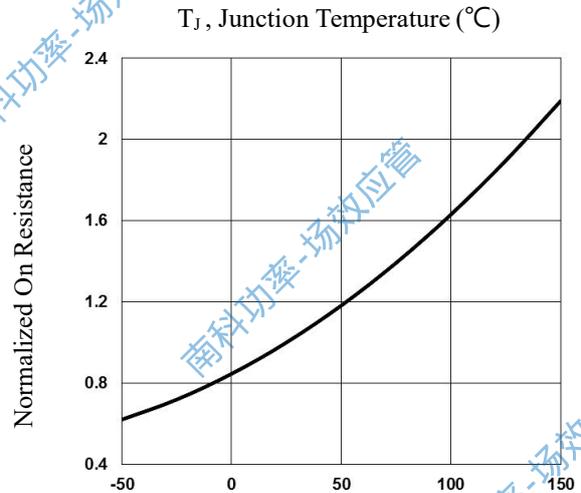


Fig.3 Normalized V_{th} vs. T_J

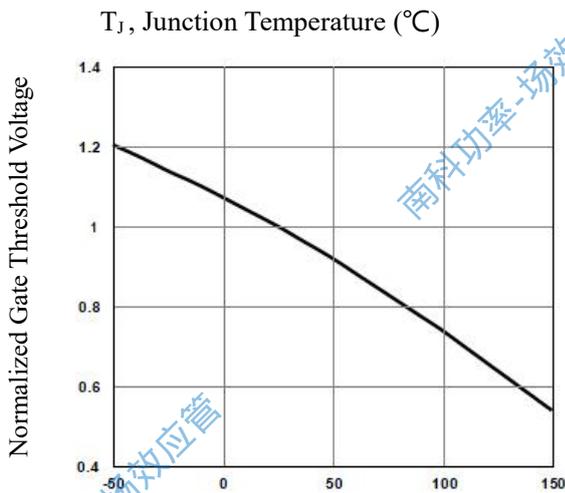


Fig.4 Gate Charge Waveform

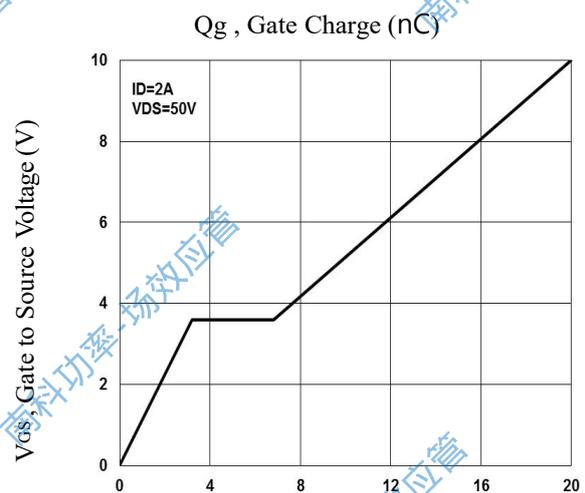


Fig.5 Normalized Transient Impedance

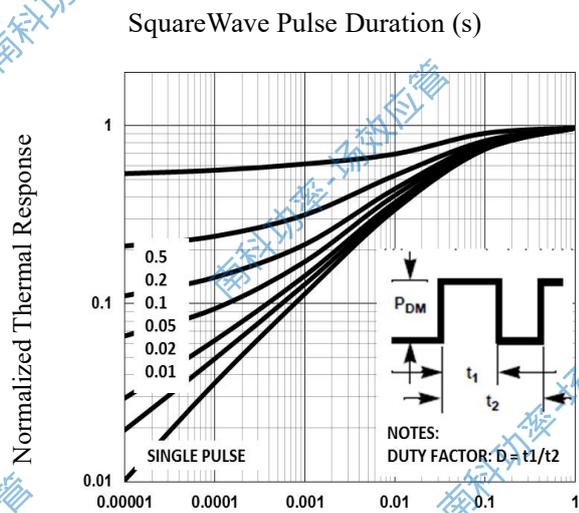


Fig.6 Maximum Safe Operation Area

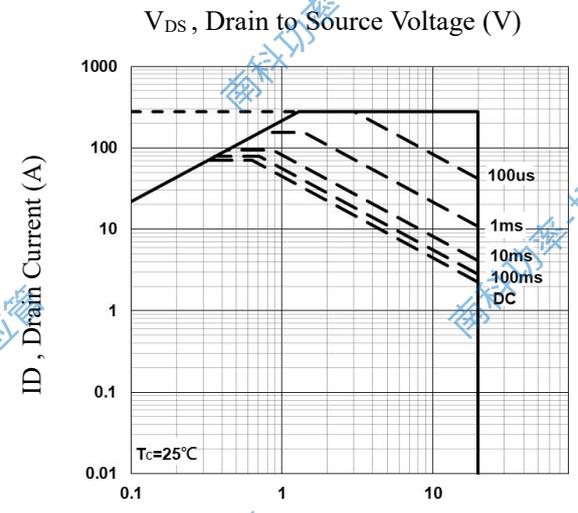


Figure 7a. Switching Test Circuit

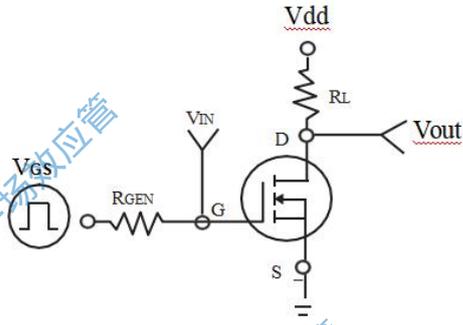


Figure 7b. Switching Waveforms

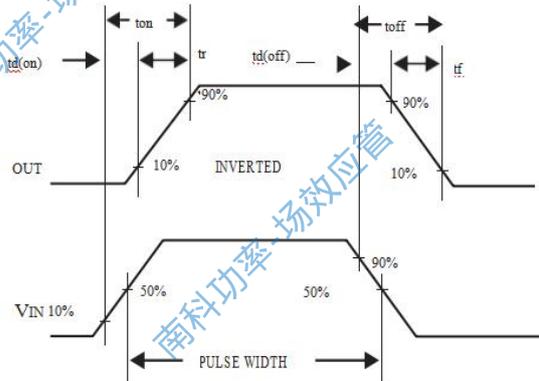


Figure 8 a. Unclamped Inductive Test Circuit

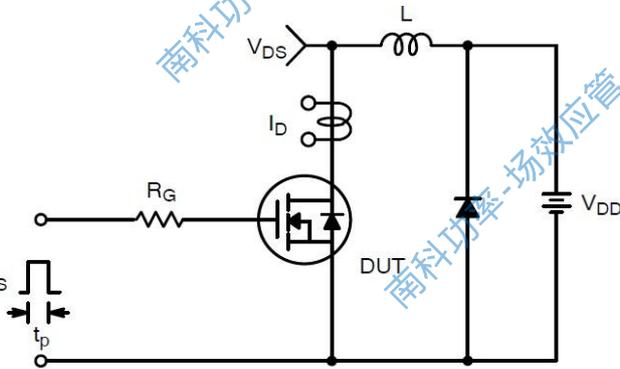
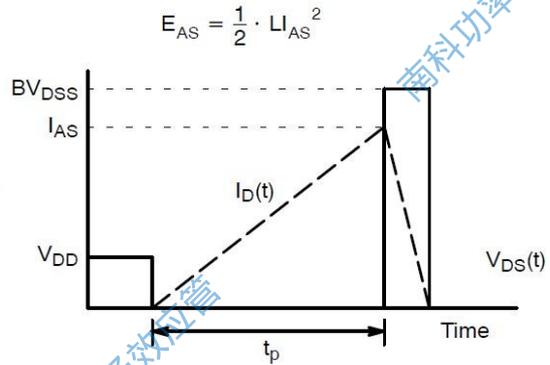


Figure 8 b. Unclamped Inductive Waveforms

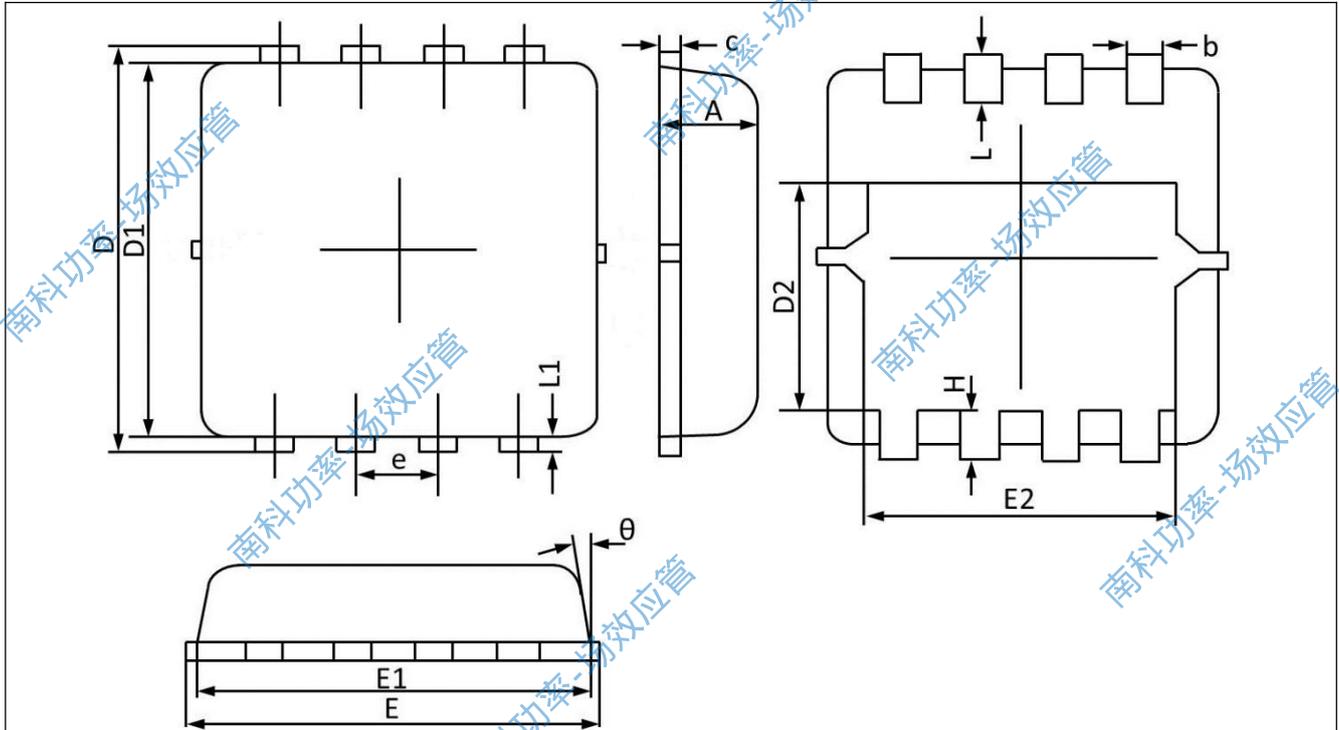


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PDFN3.3x3.3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.250	0.014	0.010
c	0.250	0.100	0.010	0.004
D	3.500	3.050	0.138	0.120
D1	3.200	2.900	0.126	0.114
D2	1.950	1.350	0.077	0.053
E	3.400	3.000	0.134	0.118
E1	3.300	2.900	0.130	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.750	0.300	0.030	0.012
L	0.600	0.300	0.024	0.012
L1	0.200	0.060	0.008	0.002
θ	14°	6°	14°	6°