

## LMN3320XF 30V N-Channel MOSFETs

### Features

- Low  $R_{DS(ON)}$
- DFN5x6-8L package
- RoHS Compliant and Halogen Free

It has been especially tailored to minimize on-state resistance and provides a superior switching performance that is well suited for high efficiency fast switching applications.

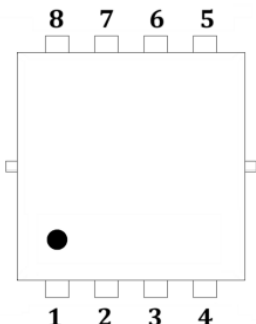
### Product Description

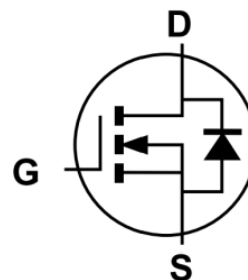
LMN1072 3320XF is an N-channel enhancement mode power MOSFET uses trench DMOS technology.

### Applications

- Power Management Application
- DC-DC Converter
- Power Load Switch

### Pin Configuration

LMN3320XF (DFN5x6-8L)	
	
PIN	Description
1, 2 & 3	Source
4	Gate
5, 6, 7 & 8	Drain



## Ordering Information

Ordering Information					
Part Number	P/N	PKG code	Pb Free code	Package	Quantity
LMN3320XF	LMN3320	X	F	DFN5x6-8L	3000 PCS

## Marking Information

Marking Information				
Part Marking	Package Code	Green Level:	Product Code:	LFC Code
332012	X	F	3320	

## Absolute Maximum Ratings

(T<sub>C</sub>=25°C Unless otherwise noted)

Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current <sup>4</sup>	T <sub>A</sub> =25°C	A
		T <sub>A</sub> =100°C	
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	240	A
E <sub>AS</sub>	Avalanche Energy, Single pulse <sup>3</sup>	144	mJ
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	W
		T <sub>A</sub> =100°C	
T <sub>J</sub>	Operating Junction Temperature	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	1.7	°C/W
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient <sup>1</sup>	62	°C/W

## Electrical Characteristics

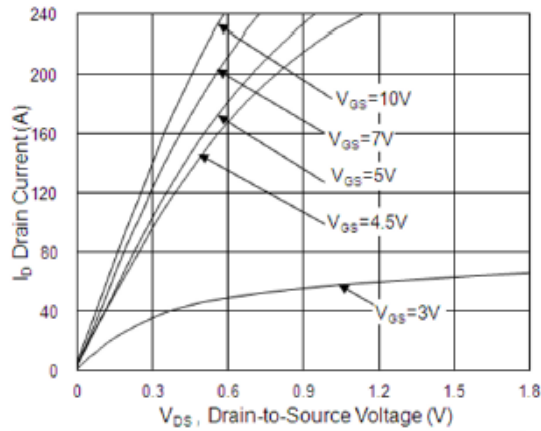
(T<sub>C</sub>=25°C Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.2	1.6	2.5	
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	uA
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		2.0	2.6	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A		2.7	3.8	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =5A		24		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			73	A
Dynamic						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =15A		112		nC
Q <sub>gs</sub>	Gate-Source Charge			13.8		
Q <sub>gd</sub>	Gate-Drain Charge			23.5		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		4345		pF
C <sub>oss</sub>	Output Capacitance			340		
C <sub>rss</sub>	Reverse Transfer Capacitance			225		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω		20.1		ns
t <sub>r</sub>				6.3		
t <sub>d(off)</sub>	Turn-Off Time			124.6		
t <sub>f</sub>				15.8		
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		1.7		Ω

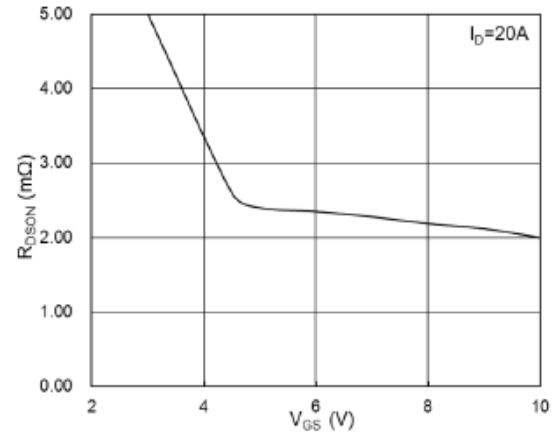
### NOTE:

1. Device mounted on FR4 board with 1 inch<sup>2</sup>, 2 oz. Cu.
2. Pulse width ≤ 300us , duty cycle ≤ 2%
3. The test condition is V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, L=0.5mH, I<sub>AS</sub>=24A
4. The maximum current rating is package limited

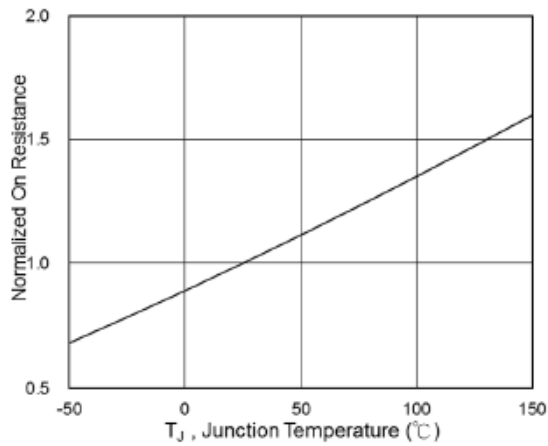
## Typical Performance Characteristics



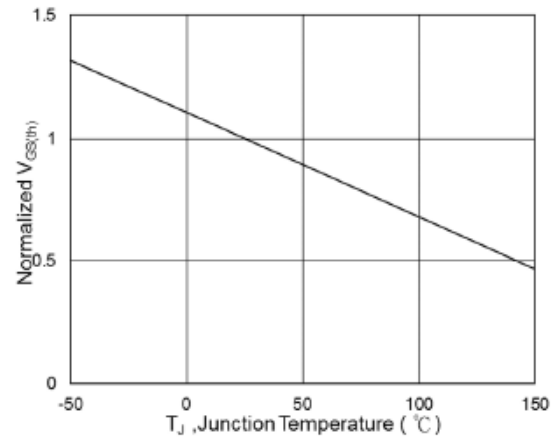
**Output Characteristics**



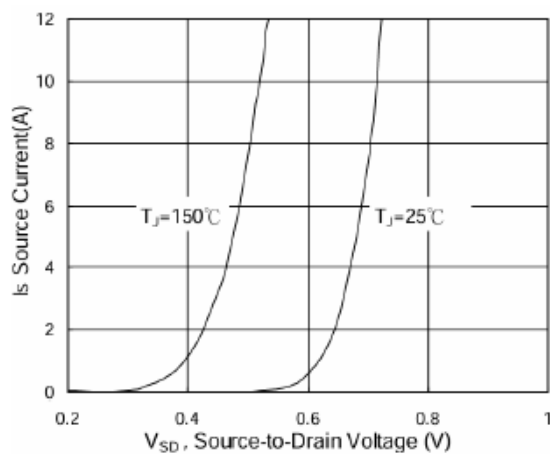
**On-Resistance vs. Gate-Source Voltage**



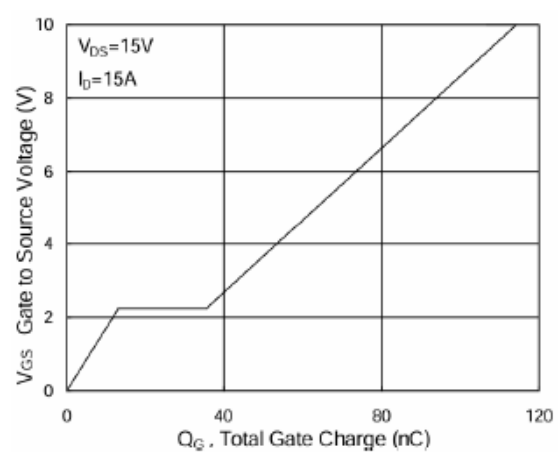
**Normalized On-Resistance vs. Temperature**



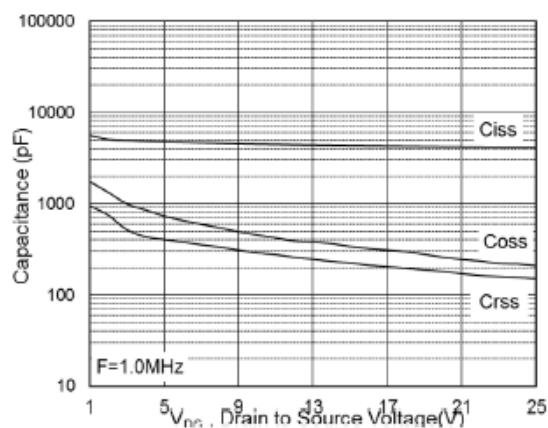
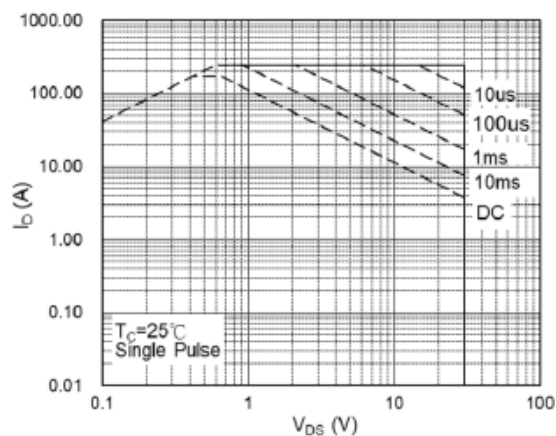
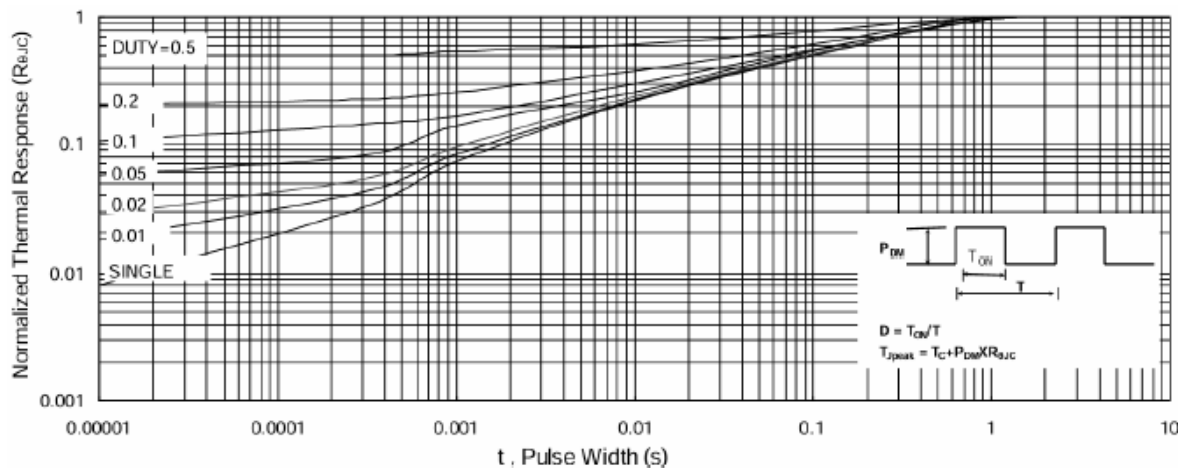
**Normalized  $V_{GS(th)}$  vs. Temperature**



**Diode Characteristics**



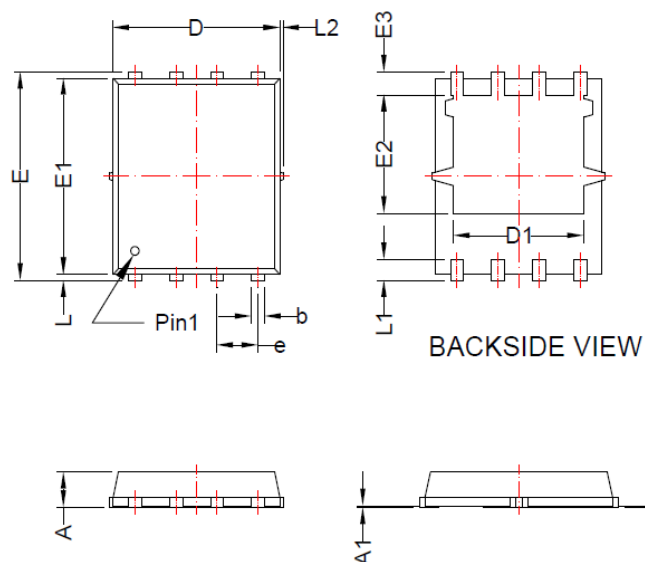
**Gate Charge Characteristics**

**Typical Performance Characteristics(continue)**

**Capacitance Characteristics**

**Safe Operating Area**

**Normalized Maximum Transient Thermal Impedance**

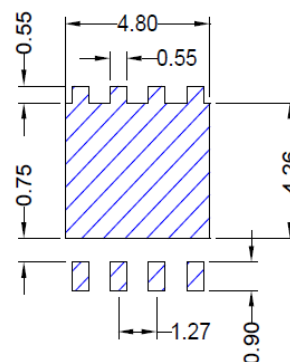
**Package Dimension:**

# **DFN5x6-8L**

## **Package Dimension**



## **Recommended Land Pattern**



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
<b>A</b>	0.80	1.20	0.031	0.047
<b>A1</b>	0.00	0.05	0.000	0.002
<b>b</b>	0.25	0.51	0.010	0.020
<b>c</b>	0.20	0.35	0.008	0.014
<b>D</b>	4.90	5.40	0.193	0.213
<b>D1</b>	3.40	4.60	0.134	0.181
<b>E</b>	5.90	6.20	0.232	0.244
<b>E1</b>	5.40	5.90	0.213	0.232
<b>E2</b>	3.20	3.80	0.126	0.150
<b>E3</b>	0.40	0.80	0.016	0.031
<b>e</b>	1.27BSC		0.050BSC	
<b>L</b>	0.10	0.25	0.004	0.010
<b>L1</b>	0.45	0.75	0.018	0.030
<b>L2</b>	-	0.15	-	0.006

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