LMNDD10N20 200V N-Channel MOSFET

Features

- 200V,8A, $R_{DS(ON)}$ =400mΩ@V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- V_{GS} Guaranteed ±25V
- Green Device Available
- TO-252-2L package design

These devices are well suited for high efficiency fast switching applications.

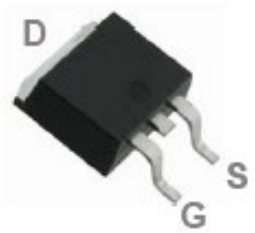
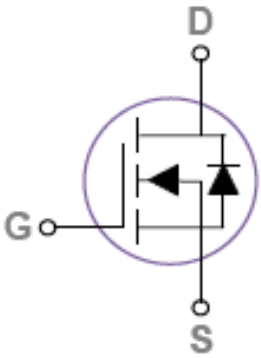
Product Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Applications

- Networking
- Load Switch
- LED Applications
- Li Battery Pack Applications

Pin Configuration

LMNDD10N20DF (TO252-2L)	
	
Description	
Gate	
Source	
Drain	

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Ordering Information

Part Number	P/N	PKG Code	Pb Free Code	Package	Quantity Reel
LMNDD10N20DF	LMNDD10N20	D	F	TO-252-2L	2500 pcs

Marking Information

Part Marking	Part Number	LFC code
DD10N20 XWMMMM	DD10N20	XWMMMM

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		200	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current	T_A=25ºC	8	A
		T_A=100ºC	5	
I_{DM}	Pulsed Drain Current		32	A
P_D	Power Dissipation(T_C=25ºC)		50	W
	Power Dissipation(Derate above 25ºC)		0.4	W/ºC
T_J	Operating Junction Temperature Range		-55 to +150	ºC
T_{STG}	Storage Temperature Range		-55 to +150	ºC
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	ºC/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.5	ºC/W

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Electrical Characteristics

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	200			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	3	4	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±25V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=160V, V_{GS}=0V			1	uA
		V_{DS}=160V, V_{GS}=0V, T_J=125ºC			30	
I_S	Continuous Source Current	V_G=V_D=0, Force Current			8	A
I_{SM}	Pulsed Source Current				32	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=4A		320	400	mΩ
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A			1.3	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=1A, di/dt=100A/us		67		ns
Q_{rr}	Reverse Recovery Charge			114		nC
Dynamic						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz		500	730	pF
C_{oss}	Output Capacitance			41	60	
C_{rss}	Reverse Transfer Capacitance			16	30	
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz		3	6	Ω
Q_g	Total Gate Charge	V_{DS}=100V, V_{GS}=10V, I_D=4A		10	15	nC
Q_{gs}	Gate-Source Charge			2.6	4	
Q_{gd}	Gate-Drain Charge			2.5	5	
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, I_D=1A, V_{GS}=10V, R_G=6Ω		9	16	ns
T_r				8	15	
$t_{d(off)}$	Turn-Off Time			18	33	
T_f				3	6	

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Typical Performance Characteristics

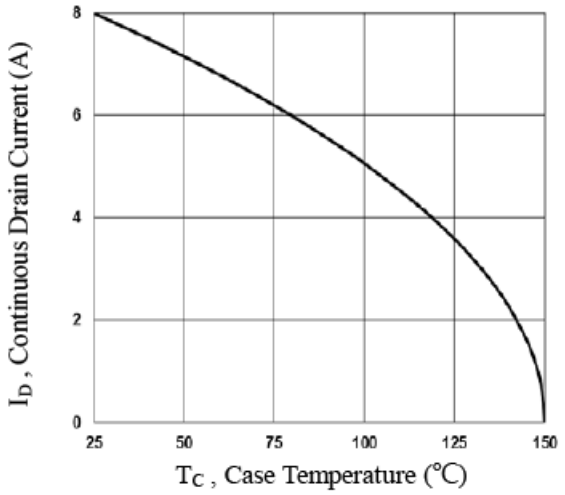

Fig.1 Continuous Drain Current vs. T_c

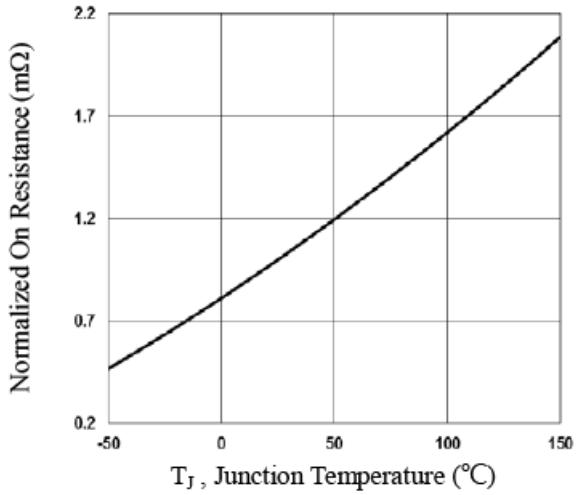

Fig.2 Normalized RDSON vs. T_J

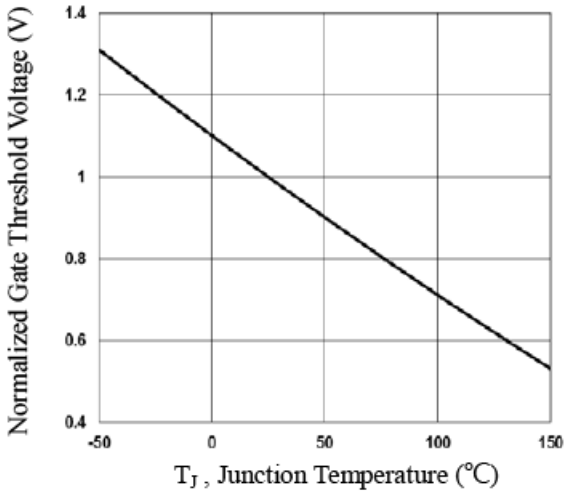

Fig.3 Normalized V_{th} vs. T_J

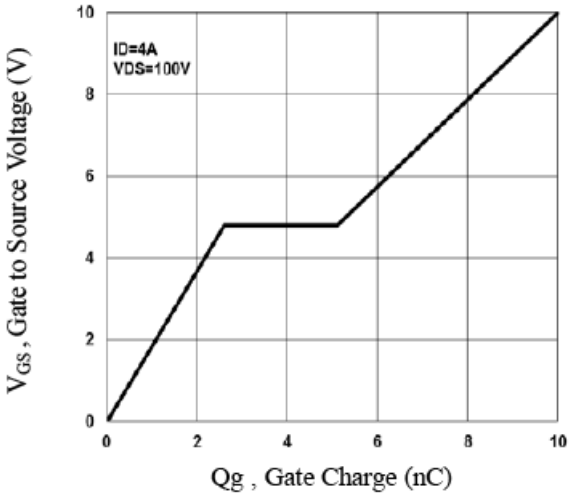

Fig.4 ate Charge Waveform

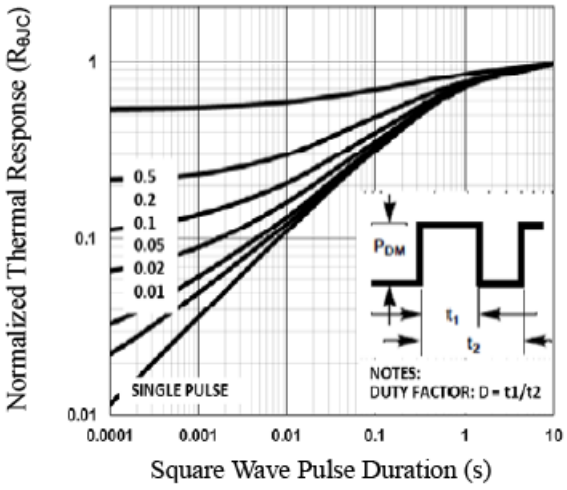

Fig.5 Normalized Transient Impedance

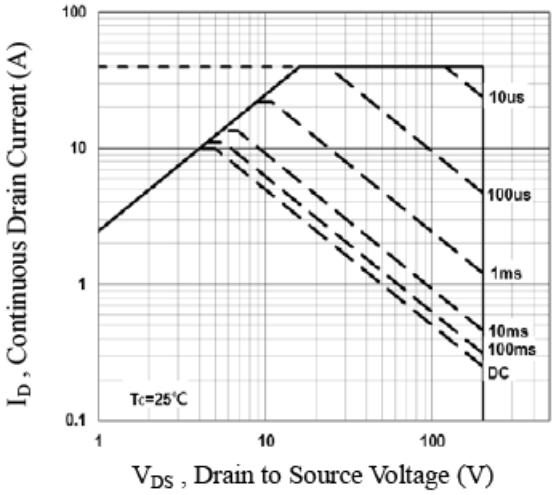

Fig.6 Maximum Safe Operation Area

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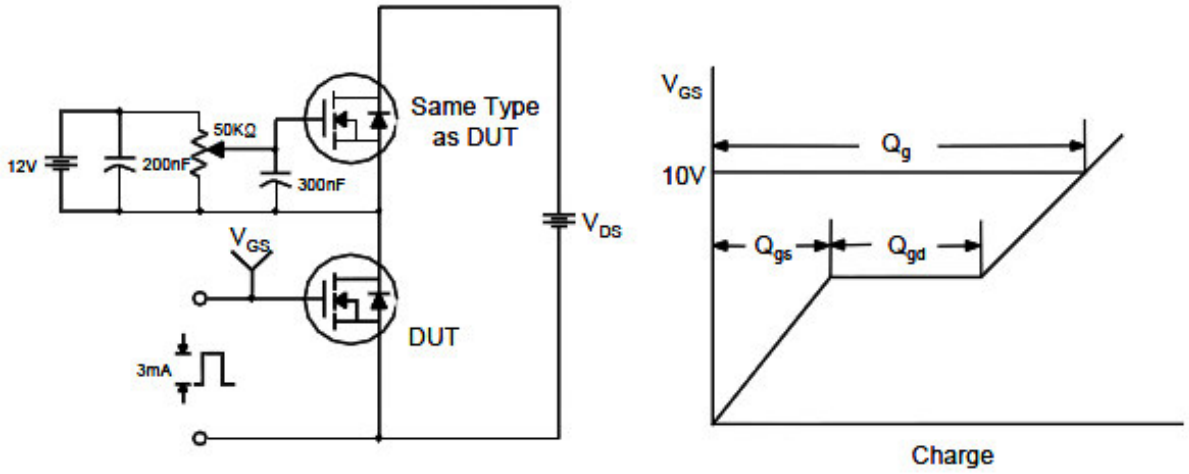
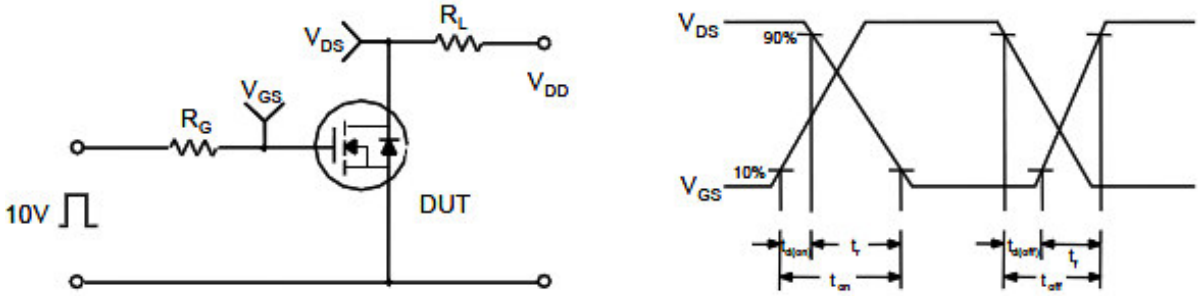
Typical Performance Characteristics (continue.)

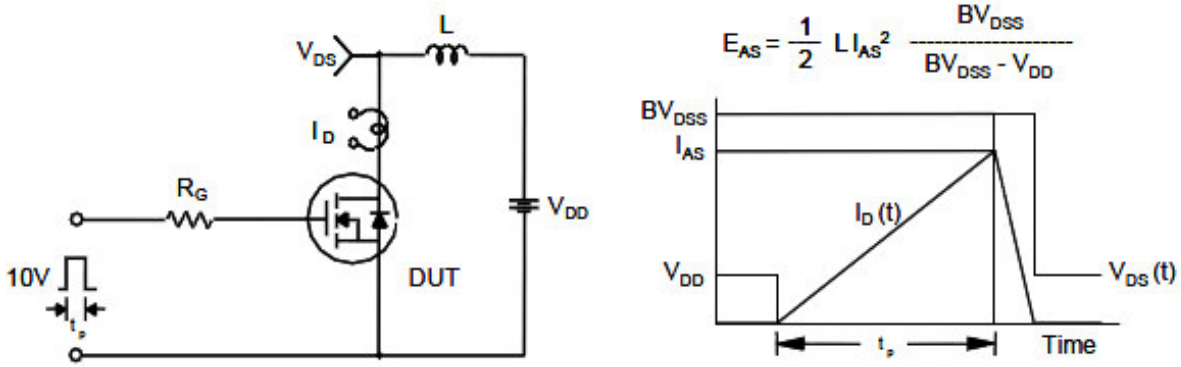
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



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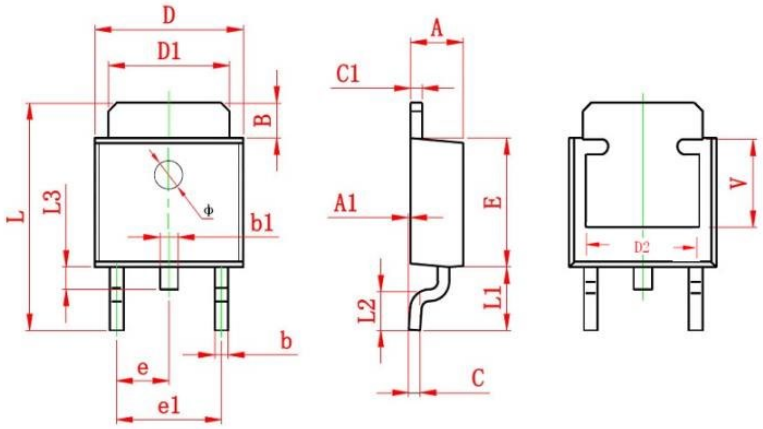
Package Dimension

TO-252-2L



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.130	0.000	0.005
B	0.890	1.270	0.035	0.050
b	0.640	0.880	0.025	0.035
b1	0.640	0.880	0.025	0.035
C	0.430	0.580	0.017	0.023
C1	0.430	0.600	0.017	0.024
D	6.350	6.730	0.250	0.265
D1	5.200	5.520	0.205	0.217
E	5.200	6.220	0.205	0.244
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	9.400	10.400	0.370	0.409
L1	3.100 REF		0.122 REF	
L2	1.400	1.780	0.055	0.070
L3	0.600	1.000	0.024	0.039
L4	0.600	1.100	0.024	0.043
V	5.350 REF		0.211 REF	
D2	4.830 REF		0.190 REF	

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