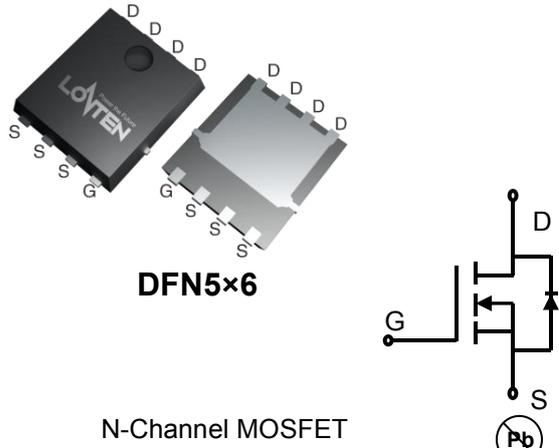# Lonten N-channel 40V, 80A, 4mΩ Power MOSFET

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 with stand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

- 40V,80A,$R_{DS(on).max}$=4mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green device available

Applications

- Motor Drives
- UPS
- DC-DC Converter

Product Summary

V_{DSS}	40V
$R_{DS(on).max}$@ V_{GS}=10V	4.0mΩ
I_D	80A

Pin Configuration

DFN5×6

N-Channel MOSFET

Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	40	V
Continuous drain current (T_C = 25°C)[1]	I_D	80	A
Continuous drain current (T_C = 100°C)[1]		58	A
Pulsed drain current[2]	I_{DM}	280	A
Gate-Source voltage	V_{GSS}	±20	V
Avalanche energy[3]	E_{AS}	544	mJ
Power Dissipation (T_C = 25°C)	P_D	50	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.5	°C/W

Package Marking and Ordering Information

Device	Device Package	Marking
LNN04R040B	DFN5×6	LNN04R040B

Electrical Characteristics $T_J = 25°C$ unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0$ V, $I_D=250uA$	40	---	---	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250uA$	1.3	---	2.5	V
Drain-source leakage current	I_{DSS}	$V_{DS}=40$ V, $V_{GS}=0$ V, $T_J = 25°C$	---	---	1	μA
		$V_{DS}=40$ V, $V_{GS}=0$ V, $T_J = 125°C$	---	---	5	μA
Gate leakage current, Forward	I_{GSSF}	$V_{GS}=20$ V, $V_{DS}=0$ V	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	$V_{GS}=-20$ V, $V_{DS}=0$ V	---	---	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10$ V, $I_D=20$ A	---	3.1	4	mΩ
		$V_{GS}=4.5$ V, $I_D=10$ A	---	3.9	6.0	mΩ
Forward transconductance	g_{fs}	$V_{DS}=5$ V , $I_D=50A$	26	---	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS} = 20$ V, $V_{GS} = 0$ V, F = 1MHz	---	7810	---	pF
Output capacitance	C_{oss}		---	677	---	
Reverse transfer capacitance	C_{rss}		---	370	---	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V$, $V_{GS}=10V$, $I_D =20$ A	---	15	---	ns
Rise time	t_r		---	17	---	
Turn-off delay time	$t_{d(off)}$		---	52	---	
Fall time	t_f		---	23	---	
Gate resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, F=1MHz	---	2.12	---	Ω
Gate charge characteristics						
Gate to source charge	Q_{gs}	$V_{DS}=20$ V, $I_D=40A$, $V_{GS}= 10$ V	---	36.4	---	nC
Gate to drain charge	Q_{gd}		---	37.3	---	
Gate charge total	Q_g		---	139	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S		---	---	80	A
Pulsed Source Current[4]	I_{SM}		---	---	280	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$, $I_S=40A$, $T_J=25℃$	---	---	1.2	V
Reverse Recovery Time	t_{rr}	$I_S=40A$, $di/dt=100A/us$, $T_J=25℃$	---	42	---	ns
Reverse Recovery Charge	Q_{rr}		---	120	---	nC

Notes:

1: The maximum junction current rating is package limited.

2: Repetitive Rating: Pulse width limited by maximum junction temperature.

3: $V_{DD}=20V$, $V_{GS}=10V$, L=1mH, $I_{AS}=33A$, $R_G=25Ω$, Starting $T_J=25℃$.

4: Pulse Test：Pulse Width ≤300μs, Duty Cycle≤2％.

Electrical Characteristics Diagrams

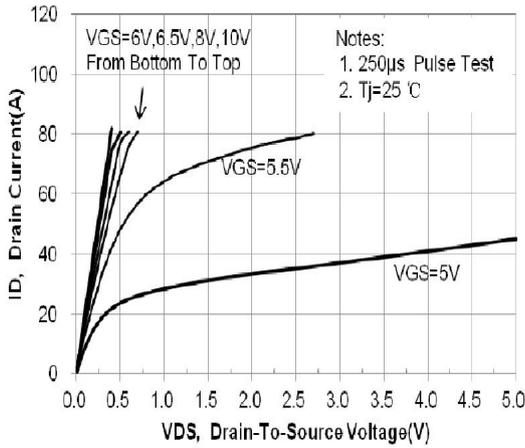Figure 1. Typ. Output Characteristics
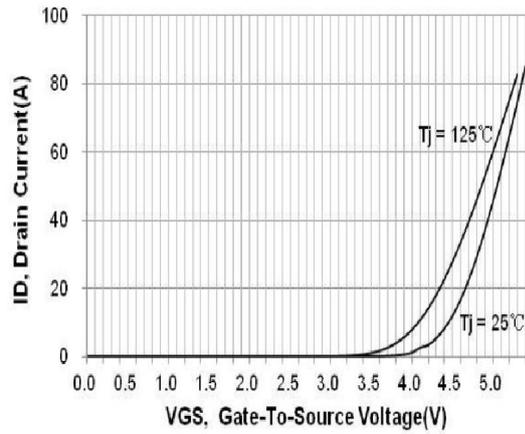
Figure 2. Transfer Characteristics
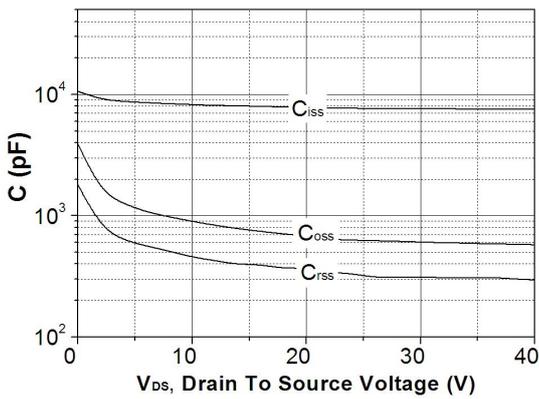
Figure 3. Capacitance   Characteristics

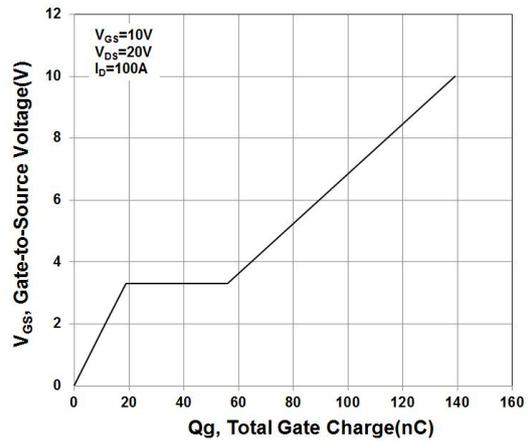Figure 4. Gate Charge Waveform

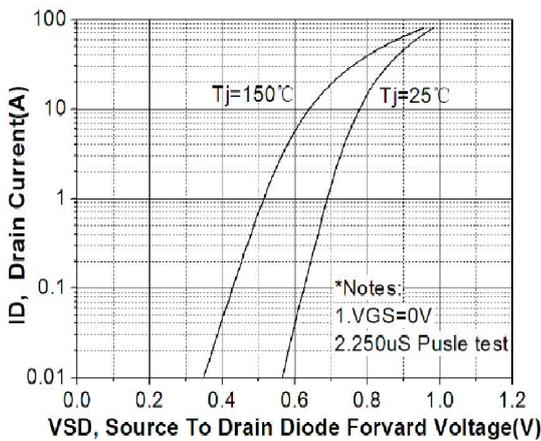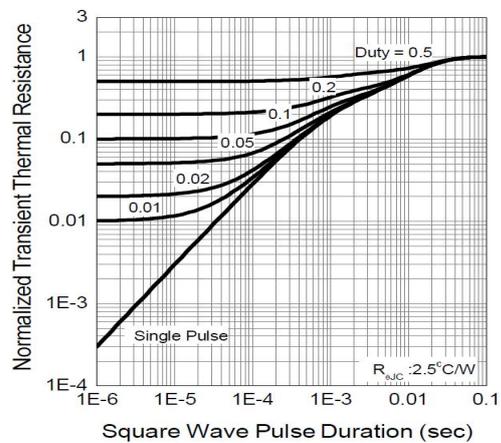Figure 5. Body-Diode Characteristics

Figure 6. Thermal Transient Impedance

Test Circuit & Waveform
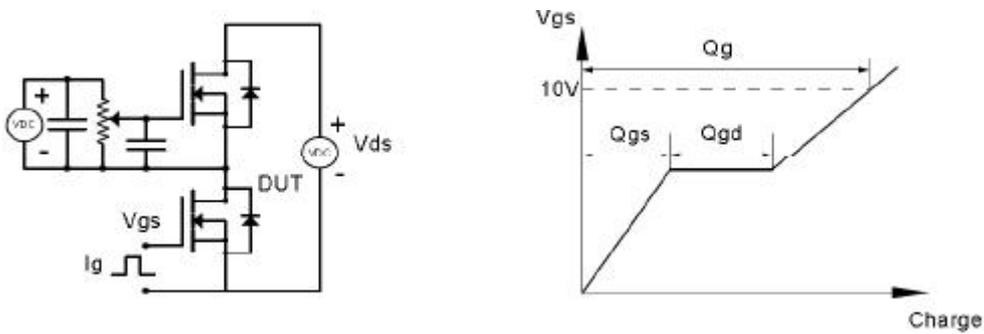
Figure 8. Gate Charge Test Circuit & Waveform

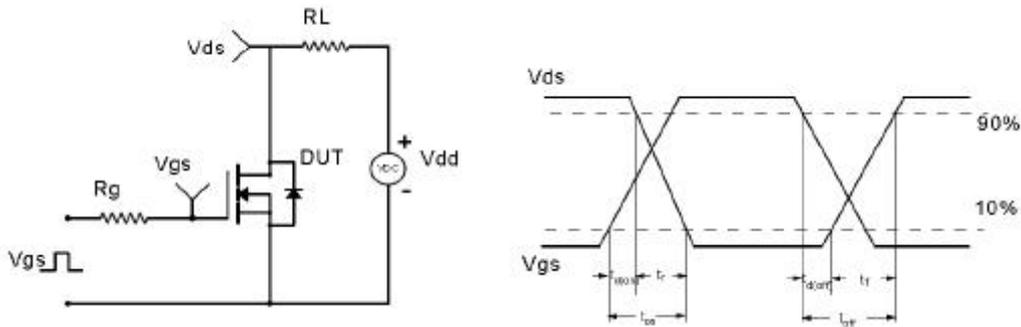Figure 9. Resistive Switching Test Circuit & Waveforms

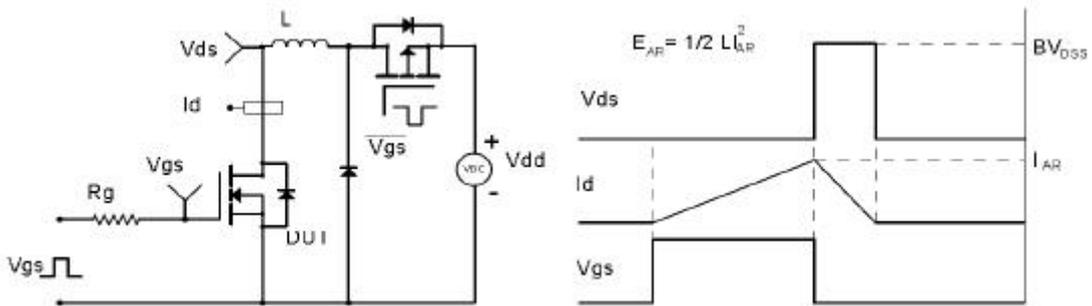Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

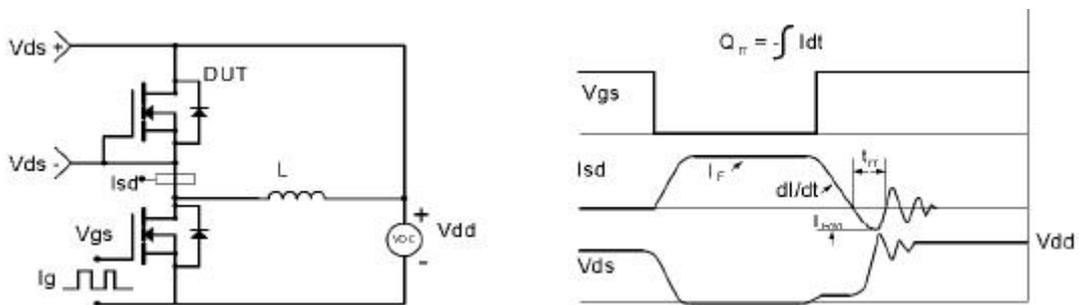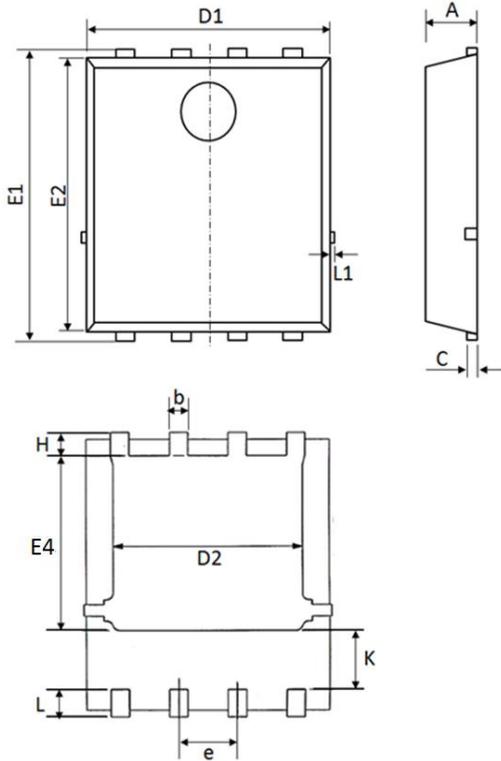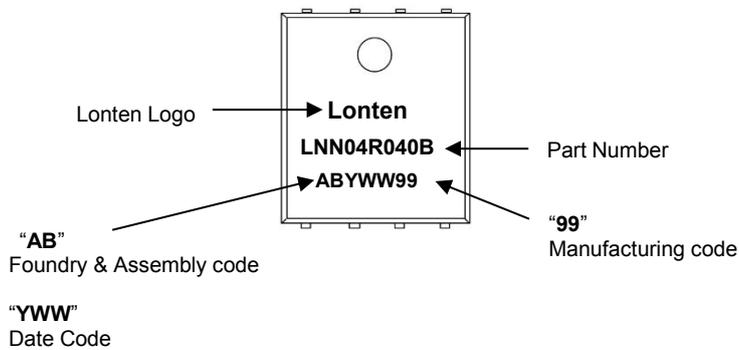Figure 11. Diode Recovery Circuit & Waveform

Mechanical Dimensions for DFN5×6

COMMON DIMENSIONS						
SYMBOL	MILLIMETERS			INCHS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1	1.1	1.2	0.039	0.043	0.047
b	0.3	0.4	0.5	0.012	0.016	0.020
C	0.154	0.254	0.354	0.006	0.010	0.014
D1	5	5.2	5.4	0.197	0.205	0.213
D2	3.8	4.1	4.25	0.150	0.161	0.167
E1	5.95	6.15	6.35	0.234	0.242	0.250
E2	5.66	5.86	6.06	0.223	0.231	0.239
E4	3.52	3.72	3.92	0.139	0.146	0.154
e	1.27 BSC			0.050 BSC		
H	0.4	0.5	0.6	0.016	0.020	0.024
L	0.5	0.6	0.7	0.020	0.024	0.028
L1	-	-	0.12	-	-	0.005
K	1.14	1.29	1.44	0.045	0.051	0.057

DFN5×6 Part Marking Information

Lonten Logo → **Lonten**

LNN04R040B ← Part Number

→ **ABYWW99** ←

"**AB**"
Foundry & Assembly code

"**99**"
Manufacturing code

"**YWW**"
Date Code

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