Lonten N-channel 40V, 130A, 1.85mΩ Power MOSFET

Description

These N-Channel enhancement mode power field effect transistors are using **shielded gate 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,130A,$R_{DS(on).max}$=1.85mΩ@V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green device available

Applications

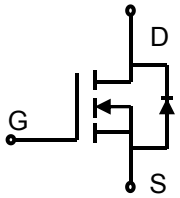
- DC-DC Converter
- Hard switchiing and high speed circuit

Product Summary

V_{DSS}	40V
$R_{DS(on).max}$@ V_{GS}=10V	1.85mΩ
I_D	130A

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)	I_D	130	A
(T_C = 100°C)		82	A
Pulsed drain current[1)]	I_{DM}	400	A
Gate-Source voltage	V_{GSS}	±20	V
Avalanche energy[2)]	E_{AS}	320	mJ
Power Dissipation	P_D	89	W
Storage Temperature Range	T_{STG}	-55 to +175	°C
Operating Junction Temperature Range	T_J	-55 to +175	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.4	°C/W

Package Marking and Ordering Information

Device	Device Package	Marking
LSGN04R018WE	DFN 5×6	04R018WE

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	1.0	---	2.2	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 = 150°C	---	---	10	mA
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=75 A,T_J = 25°C	---	1.3	1.85	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 20 V, V_{GS} = 0 V, f = 1MHz	---	3000	---	pF
Output capacitance	C_{oss}		---	895	---	
Reverse transfer capacitance	C_{rss}		---	37	---	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 20V,V_{GS}=10V, I_D =75 A	---	13	---	ns
Rise time	t_r		---	3	---	
Turn-off delay time	$t_{d(off)}$		---	52	---	
Fall time	t_f		---	24	---	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=20 V, I_D=75A, V_{GS}= 10 V	---	8	---	nC
Gate to drain charge	Q_{gd}		---	7	---	
Gate charge total	Q_g		---	40	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S		---	---	130	A
Pulsed Source Current	I_{SM}		---	---	400	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=75A, T_J=25℃	---	---	1.2	V
Reverse Recovery Time	t_{rr}	I_S=50A, di/dt=100A/us, T_J=25℃	---	35	---	ns
Reverse Recovery Charge	Q_{rr}		---	31	---	nC

Notes:

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

2: V_{DD}=20V, L=0.5mH, Starting T_J=25℃.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

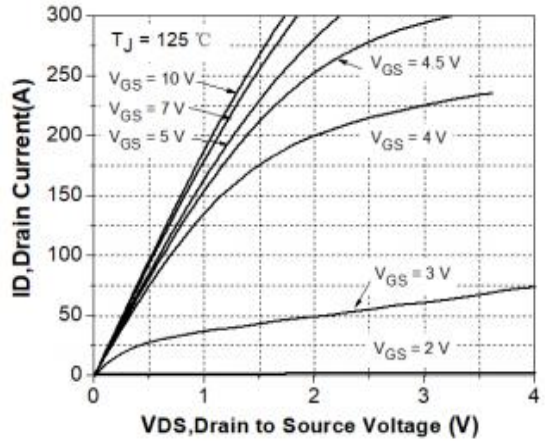


Figure 2. Transfer Characteristics

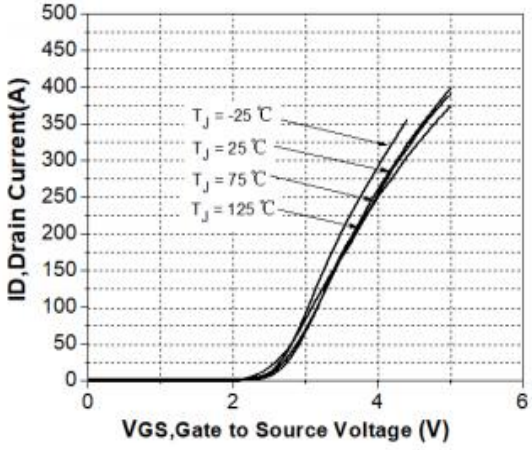


Figure 3. On-Resistance vs. Drain Current

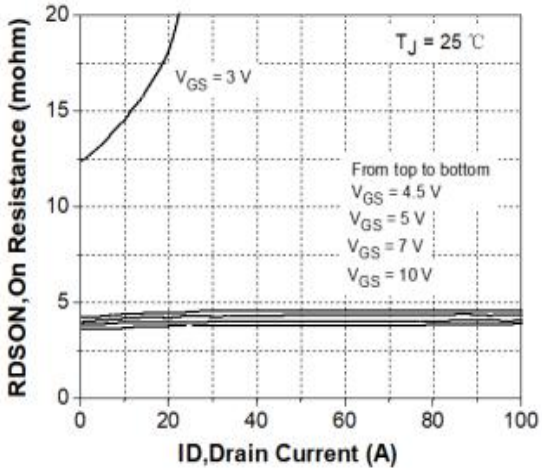


Figure 4.Breakdown Voltage vs.Temperature

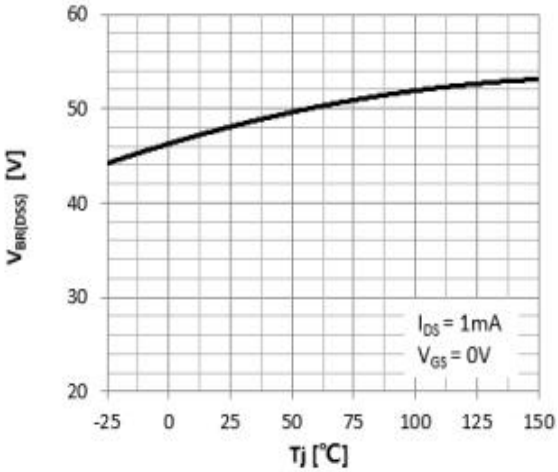


Figure 5.Threshold Voltage vs.Temperature

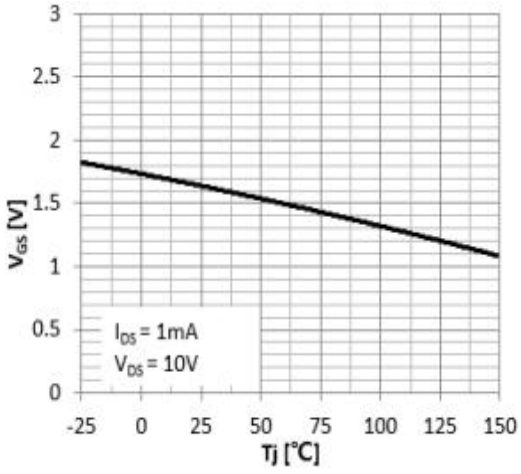


Figure 6.Power Dissipation vs.Temperature

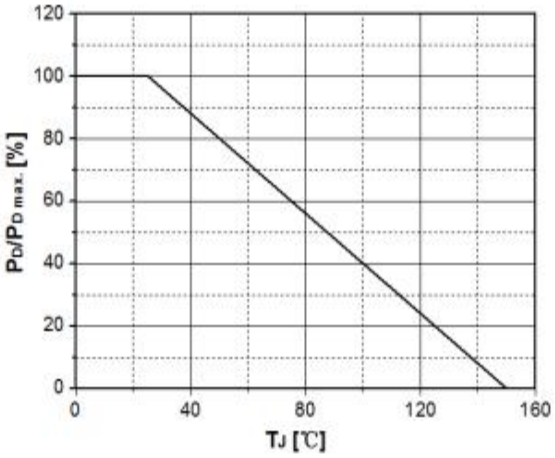


Figure 7.Capacitance Characteristics

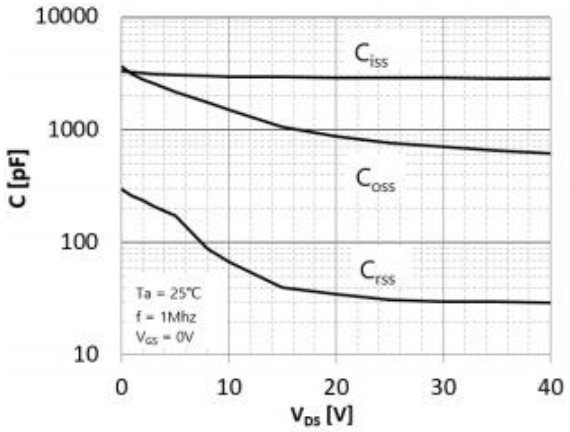


Figure 8.Gate Charge Characteristics

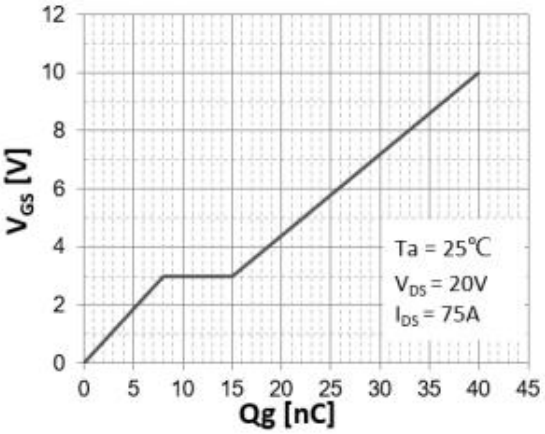


Figure 9: Safe Operating Area

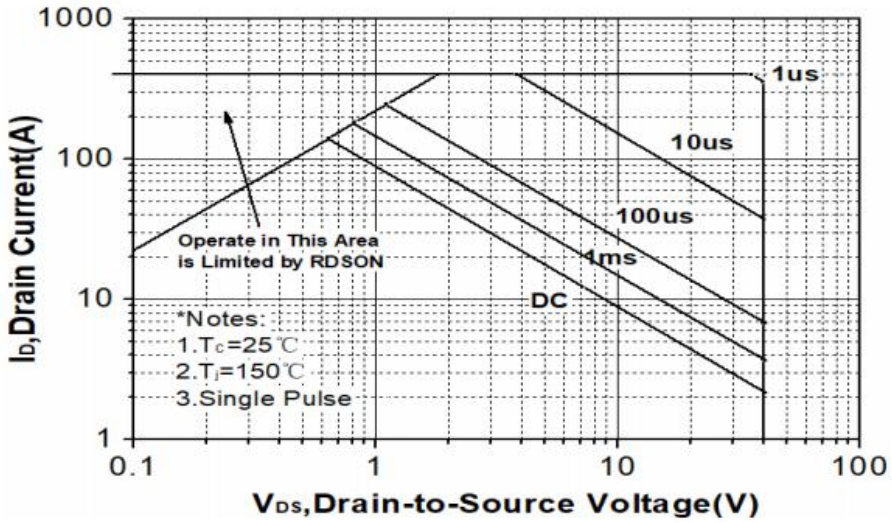
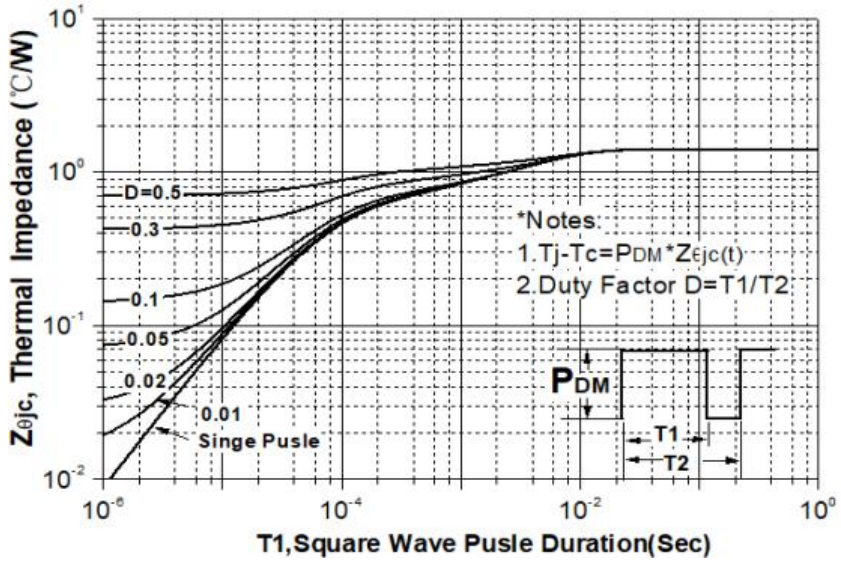
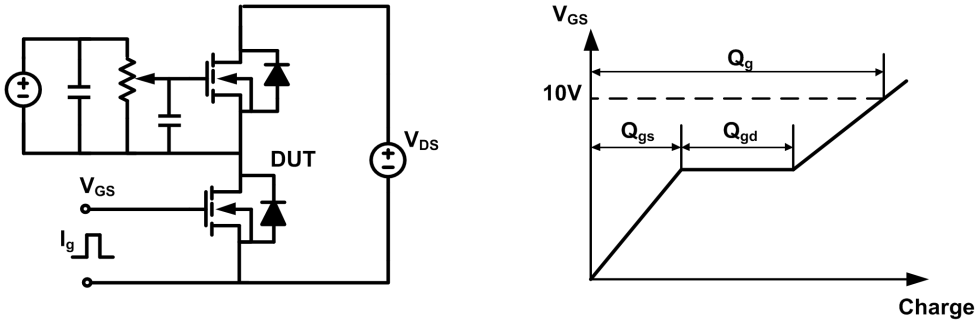


Figure 10. Normalized Maximum Transient Thermal Impedance (RthJC)

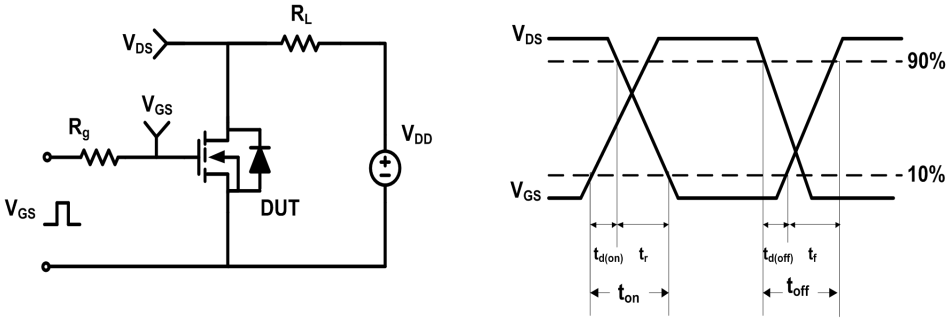


Test Circuit & Waveforms

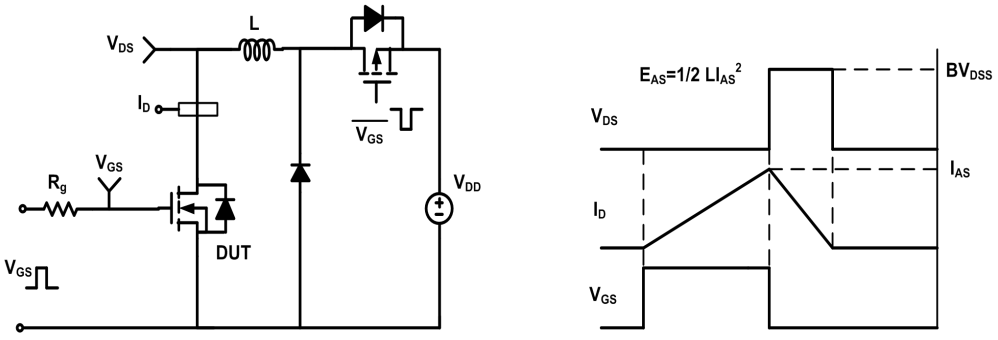
Gate Charge Test Circuit & Waveform



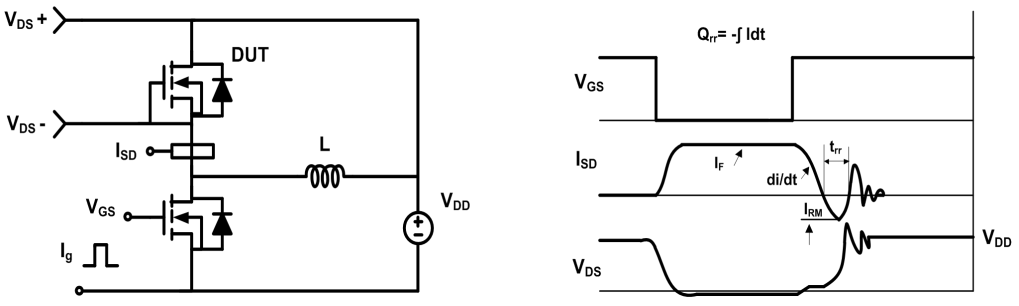
Resistive Switching Test Circuit & Waveform



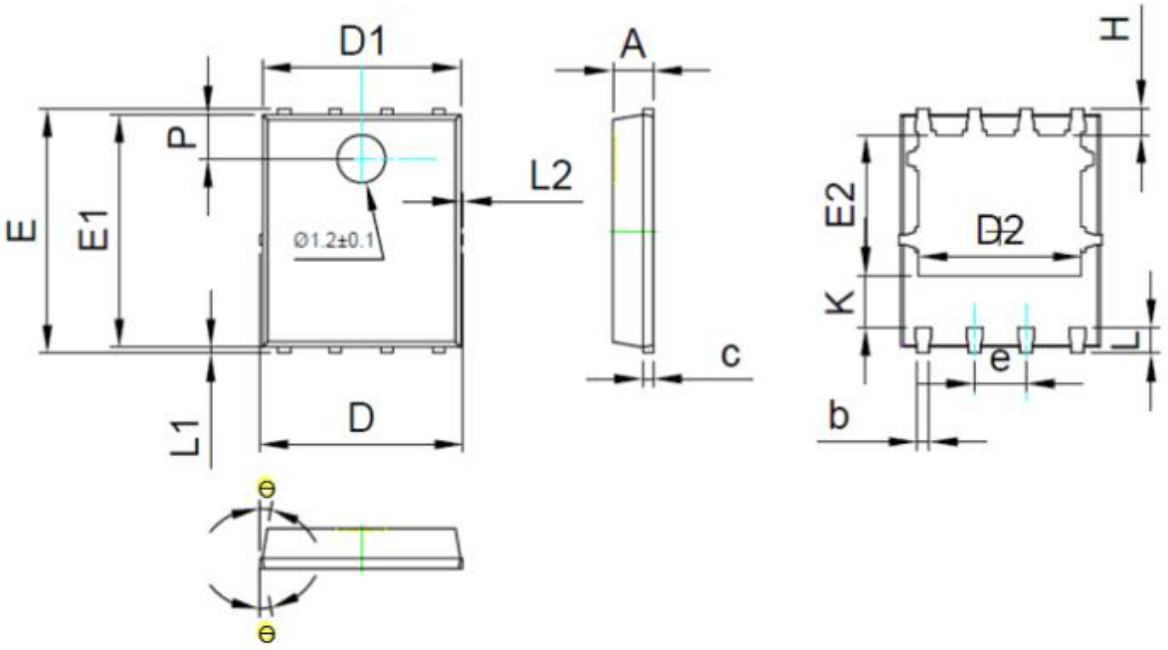
Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Mechanical Dimensions for DFN 5×6



SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.35	0.40	0.45
c	0.21	0.25	0.34
D	-	-	5.1
D1	4.85	4.90	4.95
D2	3.96	4.01	4.06
e		1.27 BSC	
E	5.95	6.00	6.05
E1	5.70	5.75	5.80
E2	3.425	3.475	3.525
H	0.60	0.65	0.70
K	1.29	-	-
L	0.60	0.65	0.70
L1	0.05	0.15	0.25
L2	-	-	0.12
θ	8°	10°	12°
P	1.05	1.10	1.15

Version Information

LSGN04R018WE

Revision:2021-11-24 ,Rev 0.1

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