Lonten N-channel 30V, 5.8A, 26mΩ 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

- 30V,5.8A,$R_{DS(ON).max}$=26mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- Green device available

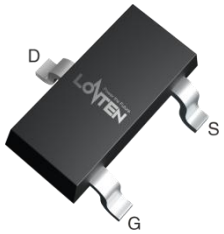
Applications

- PWM application
- Load switch
- Power management

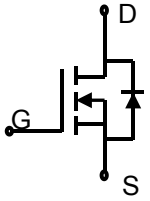
Product Summary

V_{DSS}	30V
$R_{DS(on).max}$@ V_{GS}=10V	26mΩ
I_D	5.8A

Pin Configuration



SOT-23-3



N-Channel MOSFET

Absolute Maximum Ratings

T_A = 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Continuous drain current (T_A = 25°C)	I_D	5.8	A
Continuous drain current (T_A = 100°C)		3.7	A
Pulsed drain current[1)]	I_{DM}	23.2	A
Gate-Source voltage	V_{GSS}	±12	V
Power Dissipation (T_A = 25°C)	P_D	1.4	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-Ambient	$R_{\theta JA}$	89	°C/W

Package Marking and Ordering Information

Device	Device Package	Marking
LNSA3400	SOT-23-3	3400

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	30	---	---	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	0.65	1.0	1.35	V
Drain-source leakage current	I_{DSS}	V_{DS}=30 V, V_{GS}=0 V, T_J = 25°C	---	---	1	μA
		V_{DS}=24 V, V_{GS}=0 V, T_J = 125°C	---	---	10	μA
Gate leakage current, Forward	I_{GSSF}	V_{GS}=12 V, V_{DS}=0 V	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	V_{GS}=-12 V, V_{DS}=0 V	---	---	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=5.8 A	---	18	26	mΩ
		V_{GS}=4.5 V, I_D=5 A	---	20	32	mΩ
		Vgs=2.5V, Id=4A	---	31	52	mΩ
Forward transconductance	g_{fs}	V_{DS} =5 V , I_D=5.8A	---	30	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, F = 1MHz	---	494	---	pF
Output capacitance	C_{oss}		---	62.4	---	
Reverse transfer capacitance	C_{rss}		---	53.7	---	
Gate resistance	R_g	V_{GS}=0V,V_{DS}=0V,f=1MHz	---	4.2	---	mΩ
Turn-on delay time	$t_{d(on)}$	V_{DD} = 15V,V_{GS}=10V, I_D =5.8 A, Rg=10Ω	---	7.6	---	ns
Rise time	t_r		---	113.2	---	
Turn-off delay time	$t_{d(off)}$		---	44.4	---	
Fall time	t_f		---	13.6	---	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=15V, I_D=5.8A, V_{GS}= 10V	---	3.3	---	nC
Gate to drain charge	Q_{gd}		---	2.1	---	
Gate charge total	Q_g		---	13.6	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S		---	---	5.8	A
Pulsed Source Current[2)]	I_{SM}		---	---	23.2	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=5.8A, T_J=25℃	---	---	1.2	V

Notes:

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

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

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

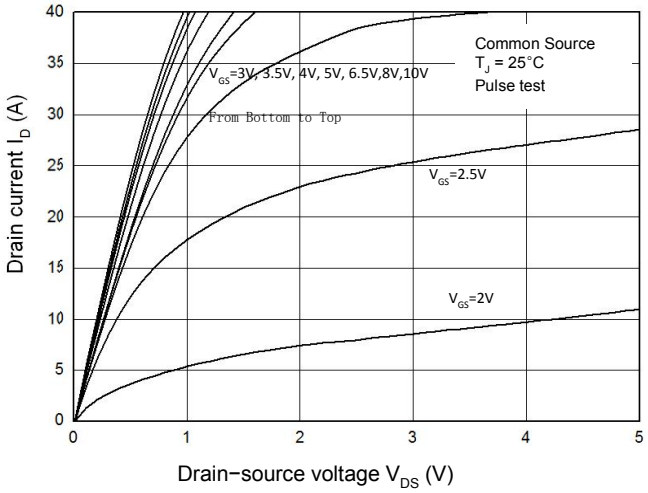


Figure 2. Transfer Characteristics

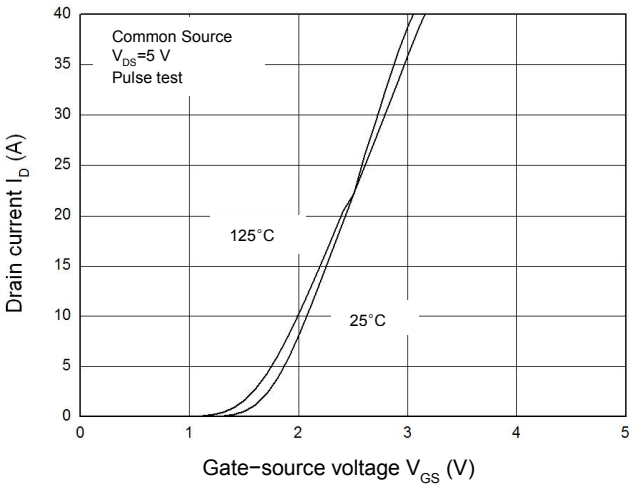


Figure 3. Capacitance Characteristics

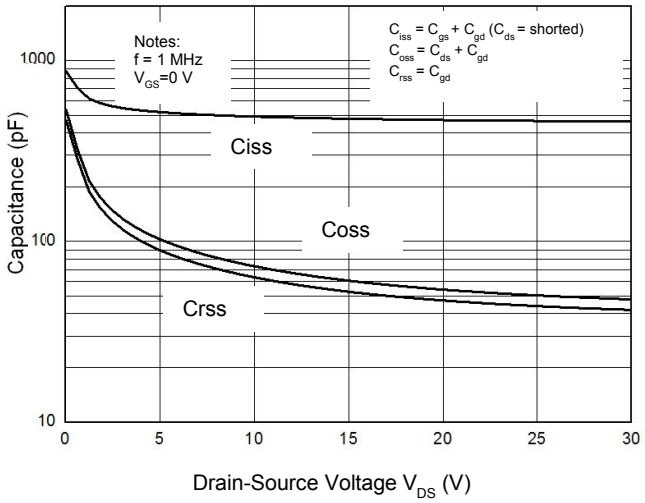


Figure 4. Gate Charge Waveform

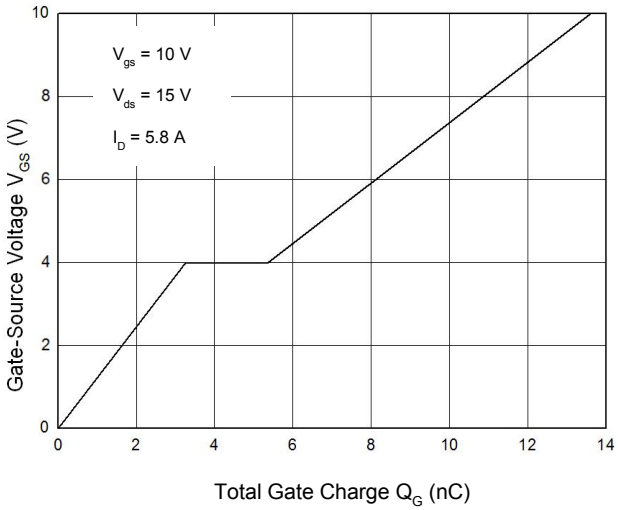


Figure 5. Body-Diode Characteristics

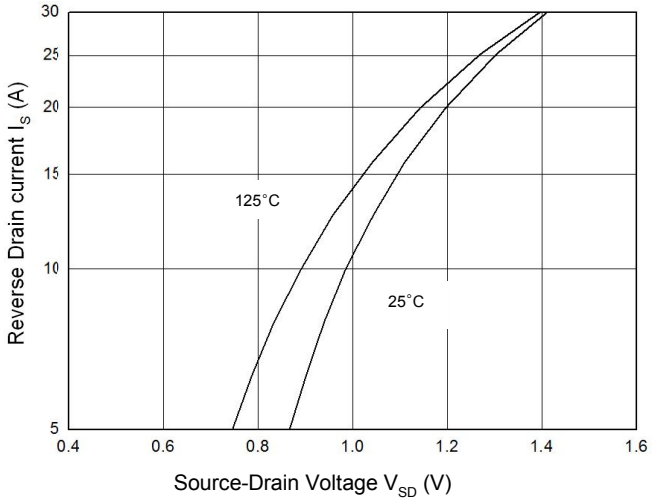


Figure 6. Rdson-Drain Current

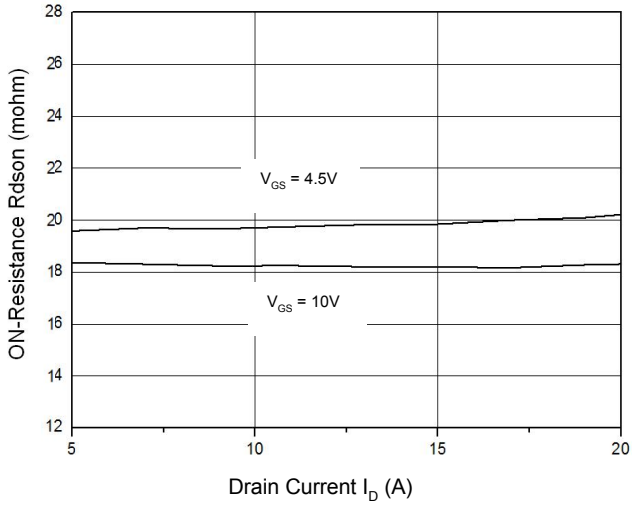


Figure 7. Rdson-Junction Temperature(℃)

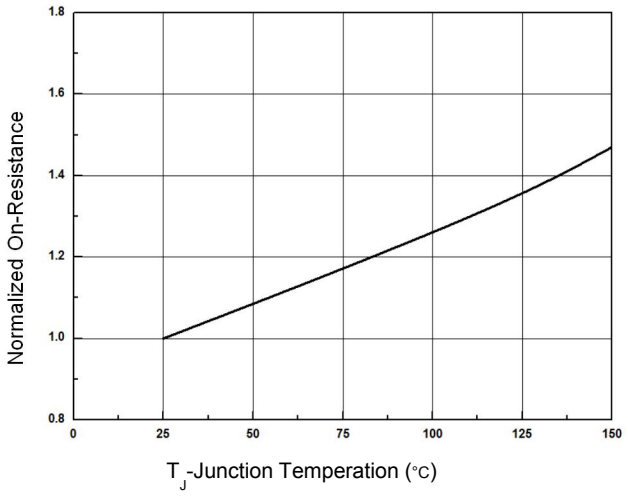


Figure 8. Maximum Safe Operating Area

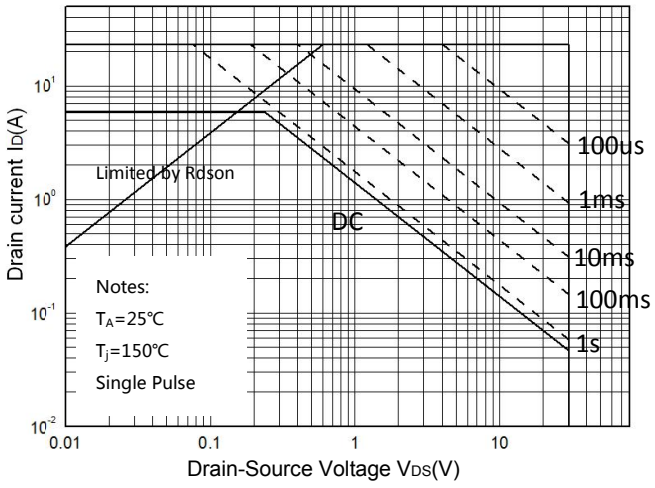
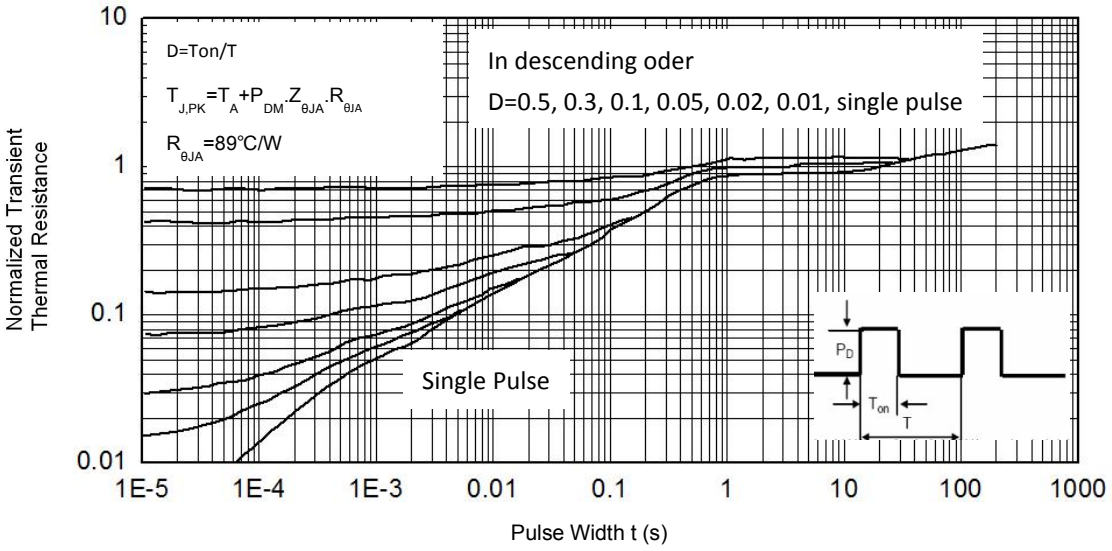


Figure 9. Normalized Maximum Transient Thermal Impedance (RthJA)



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

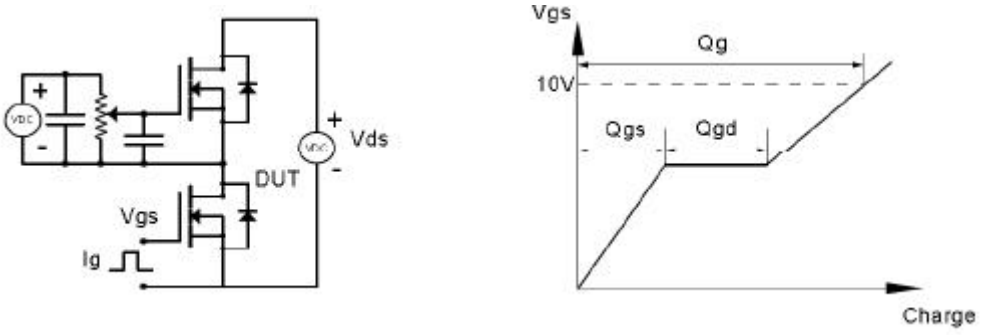


Figure 9. Resistive Switching Test Circuit & Waveforms

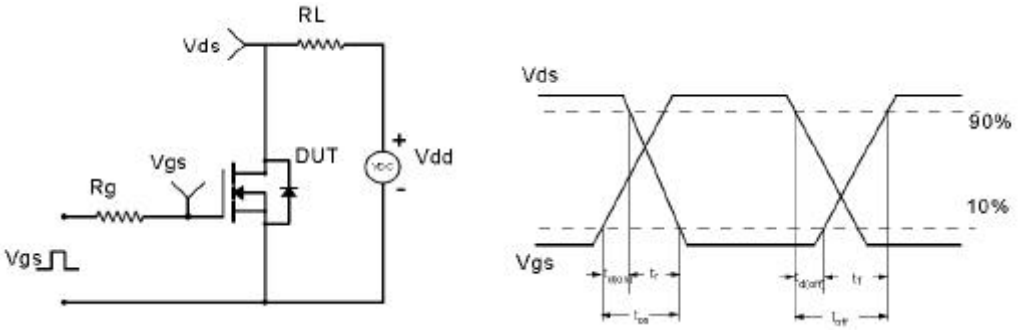


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

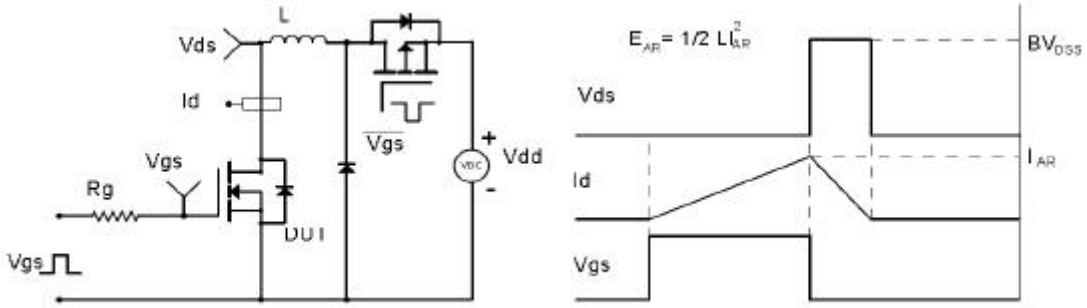
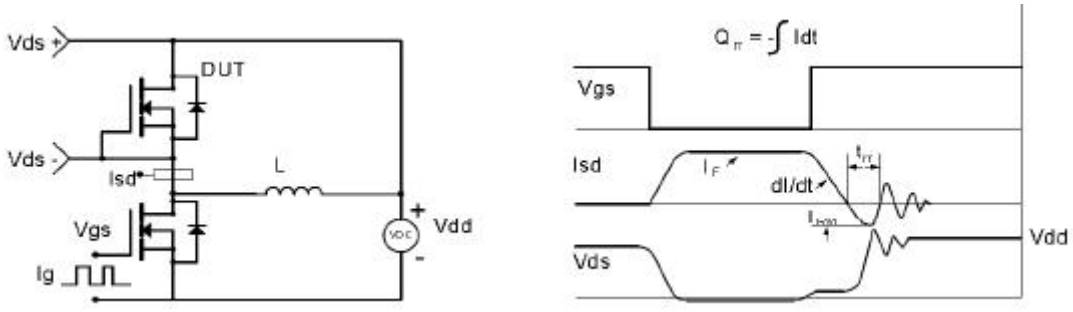
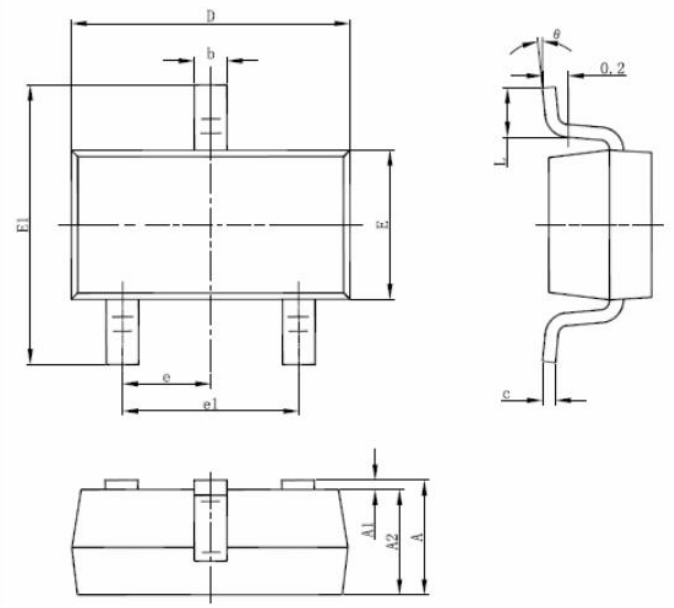


Figure 11. Diode Recovery Circuit & Waveform

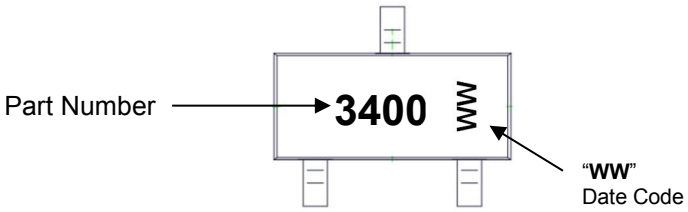


Mechanical Dimensions for SOT-23-3



COMMON DIMENSIONS				
SYMBOL	MILLIMETERS		INCHS	
	MIN	MAX	MIN	MAX
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
A2	1.00	1.20	0.039	0.047
b	0.30	0.50	0.012	0.020
c	0.04	0.21	0.002	0.008
D	2.80	3.00	0.110	0.118
E	1.50	1.70	0.059	0.067
E1	2.60	3.00	0.102	0.118
e	0.95 TYP.		0.037 TYP.	
e1	1.90 TYP.		0.075 TYP.	
L	0.25	0.55	0.010	0.022
θ	0°	8°	0°	8°

SOT-23-3 Part Marking Information



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