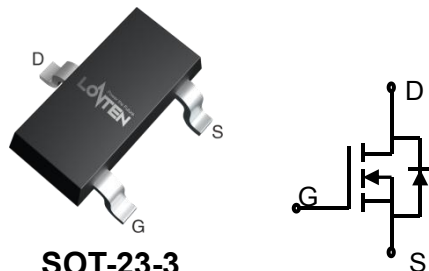



Lonten N-channel 30V, 5.8A, 26mΩ Power MOSFET

<p>Description</p> <p>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.</p> <p>Features</p> <ul style="list-style-type: none"> ◆ 30V,5.8A,$R_{DS(ON),max}=26m\Omega@V_{GS}=10V$ ◆ Improved dv/dt capability ◆ Fast switching ◆ Green device available <p>Applications</p> <ul style="list-style-type: none"> ◆ PWM application ◆ Load switch ◆ Power management 	<p>Product Summary</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px;">V_{DSS}</td> <td style="padding: 2px;">30V</td> </tr> <tr> <td style="padding: 2px;">$R_{DS(on),max}@V_{GS}=10V$</td> <td style="padding: 2px;">26mΩ</td> </tr> <tr> <td style="padding: 2px;">I_D</td> <td style="padding: 2px;">5.8A</td> </tr> </table> <p>Pin Configuration</p> <div style="text-align: center;">  <p>SOT-23-3</p> <p>N-Channel MOSFET</p> </div> <div style="text-align: right;">  </div>	V_{DSS}	30V	$R_{DS(on),max}@V_{GS}=10V$	26mΩ	I_D	5.8A
V_{DSS}	30V						
$R_{DS(on),max}@V_{GS}=10V$	26mΩ						
I_D	5.8A						

Absolute Maximum Ratings $T_A = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Continuous drain current ($T_A = 25^\circ C$)	I_D	5.8	A
Continuous drain current ($T_A = 100^\circ C$)		3.7	A
Pulsed drain current ¹⁾	I_{DM}	23.2	A
Gate-Source voltage	V_{GSS}	± 12	V
Power Dissipation ($T_A = 25^\circ C$)	P_D	1.4	W
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	89	$^\circ C/W$

Package Marking and Ordering Information

Device	Device Package	Marking
LNSA3400	SOT-23-3	3400

Electrical Characteristics
 $T_J = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0\text{ V}, I_D=250\mu\text{A}$	30	---	---	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.65	1.0	1.35	V
Drain-source leakage current	I_{DSS}	$V_{DS}=30\text{ V}, V_{GS}=0\text{ V}, T_J = 25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24\text{ V}, V_{GS}=0\text{ V}, T_J = 125^\circ\text{C}$	---	---	10	μA
Gate leakage current, Forward	I_{GSSF}	$V_{GS}=12\text{ V}, V_{DS}=0\text{ V}$	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	$V_{GS}=-12\text{ V}, V_{DS}=0\text{ V}$	---	---	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=5.8\text{ A}$	---	18	26	m Ω
		$V_{GS}=4.5\text{ V}, I_D=5\text{ A}$	---	20	32	m Ω
		$V_{GS}=2.5\text{ V}, I_D=4\text{ A}$	---	31	52	m Ω
Forward transconductance	g_{fs}	$V_{DS} = 5\text{ V}, I_D=5.8\text{ A}$	---	30	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V},$ $F = 1\text{ MHz}$	---	494	---	pF
Output capacitance	C_{oss}		---	62.4	---	
Reverse transfer capacitance	C_{rss}		---	53.7	---	
Gate resistance	R_g	$V_{GS}=0\text{V}, V_{DS}=0\text{V}, f=1\text{MHz}$	---	4.2	---	m Ω
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 15\text{V}, V_{GS}=10\text{V}, I_D = 5.8\text{ A},$ $R_g=10\Omega$	---	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}	$V_{DS}=15\text{V}, I_D=5.8\text{A},$ $V_{GS}= 10\text{V}$	---	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}	$V_{GS}=0\text{V}, I_S=5.8\text{A}, T_J=25^\circ\text{C}$	---	---	1.2	V

Notes:

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

 2: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

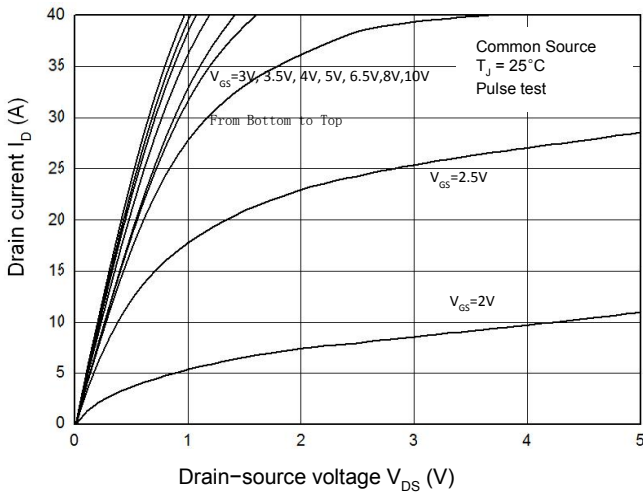


Figure 2. Transfer Characteristics

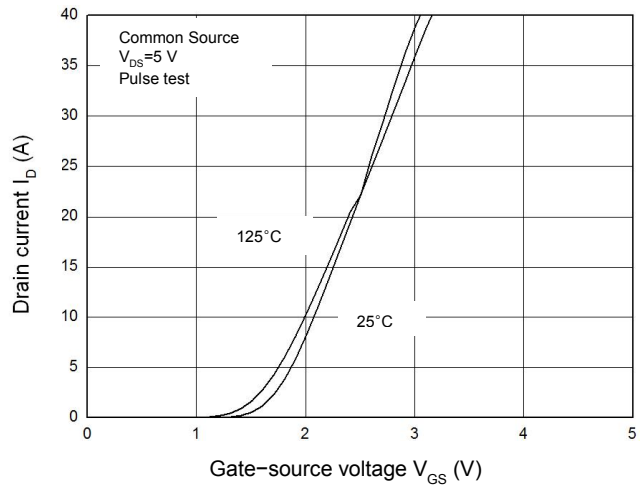


Figure 3. Capacitance Characteristics

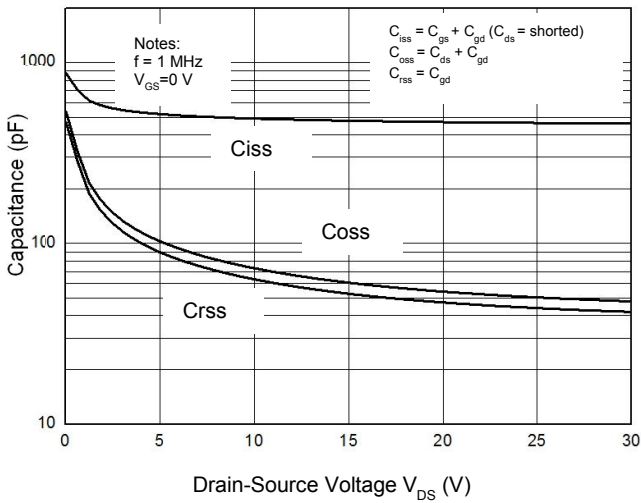


Figure 4. Gate Charge Waveform

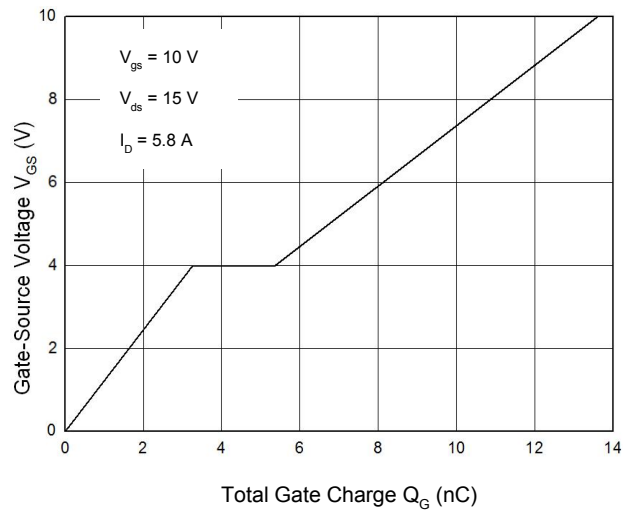


Figure 5. Body-Diode Characteristics

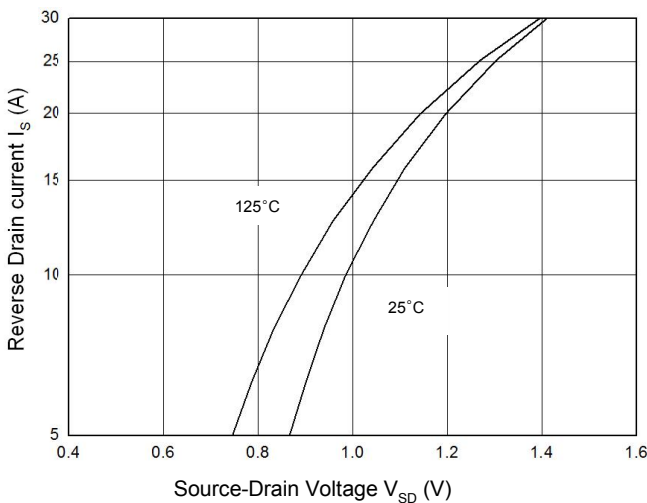


Figure 6. Rds(on)-Drain Current

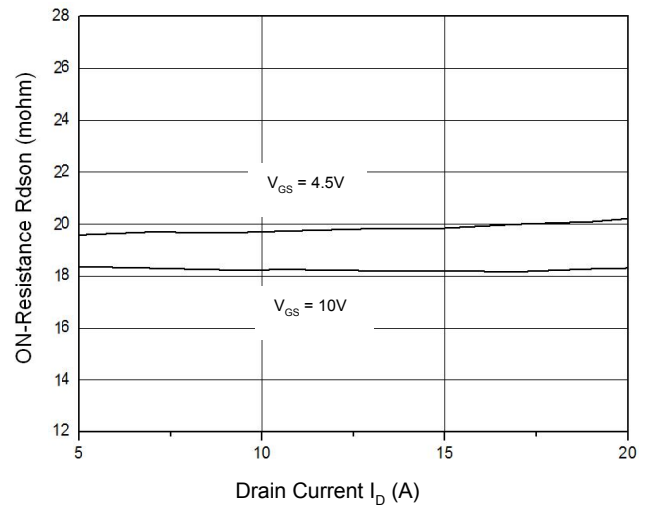


Figure 7. Rdson-Junction Temperature(°C)

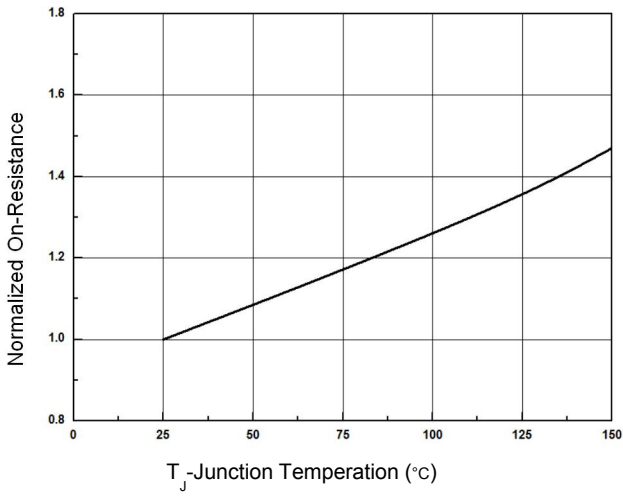


Figure 8. Maximum Safe Operating Area

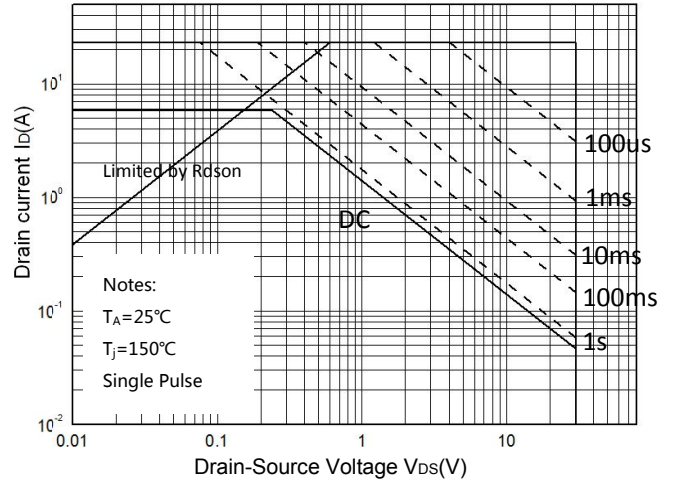
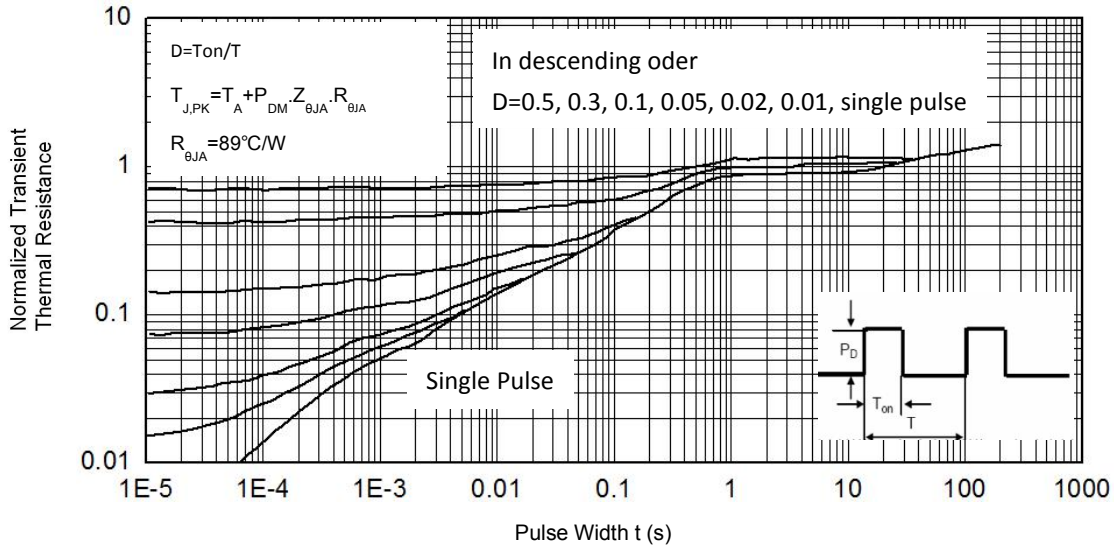


Figure 9. Normalized Maximum Transient Thermal Impedance (RthJA)



Test Circuit & Waveform

Figure 8. Gate Charge Test Circuit & Waveform

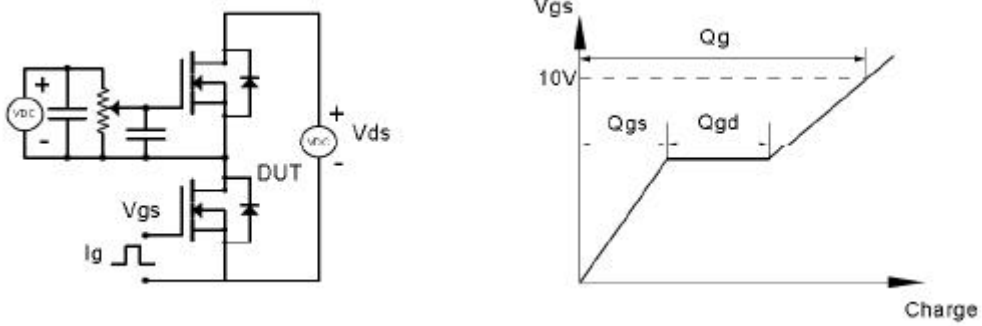


Figure 9. Resistive Switching Test Circuit & Waveforms

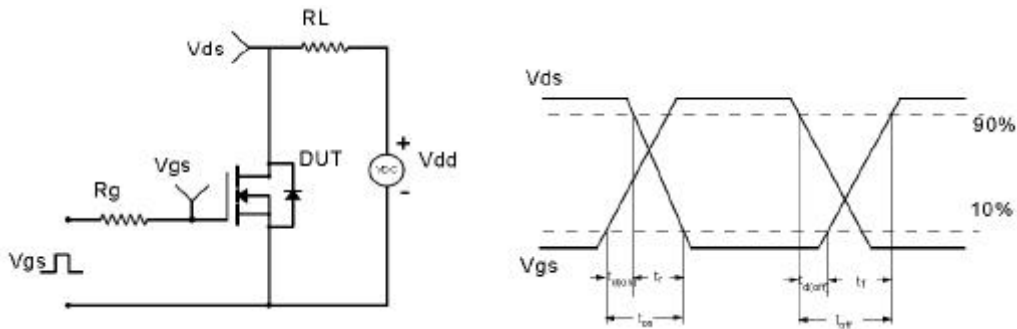


Figure 10. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

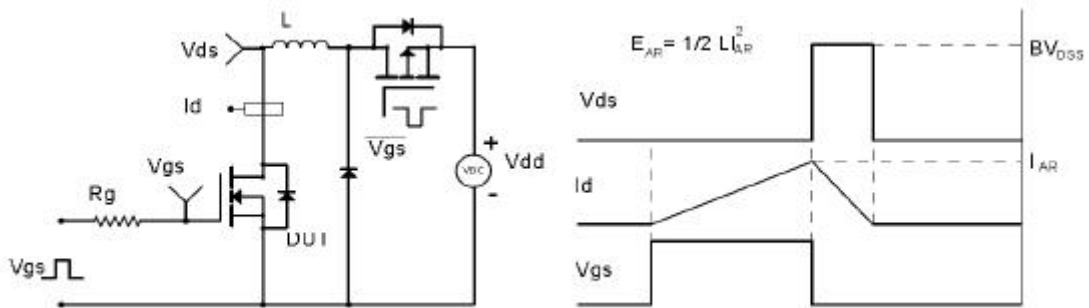
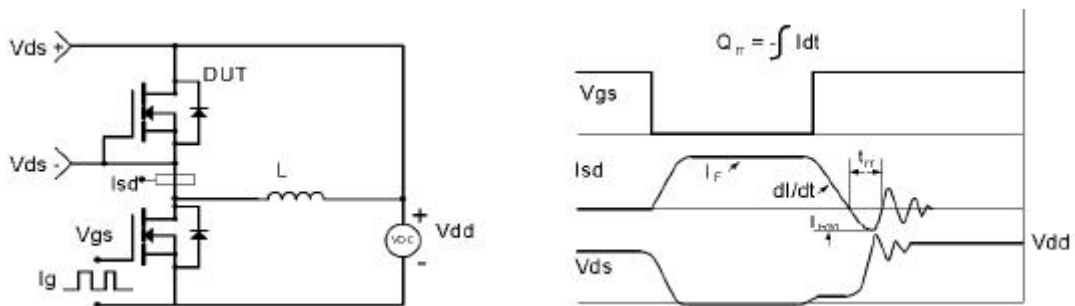
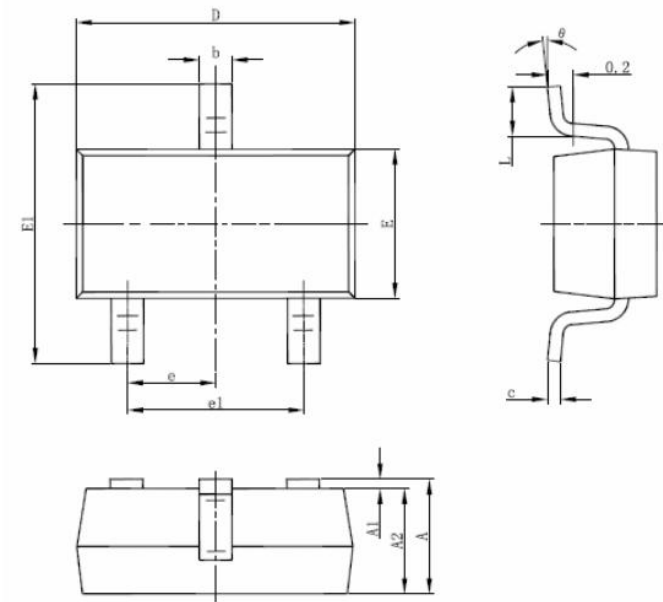


Figure 11. Diode Recovery Circuit & Waveform

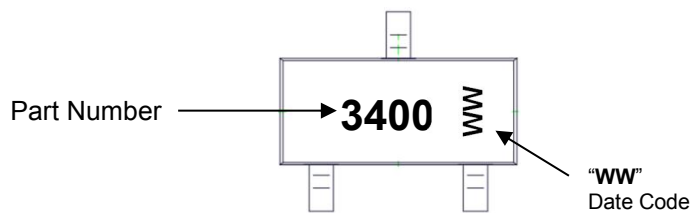


Mechanical Dimensions for SOT-23-3



SYMBOL	COMMON DIMENSIONS			
	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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