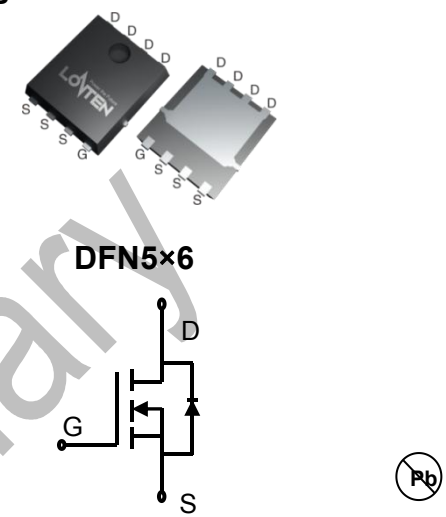


Lonten N-channel 60V, 83A, 3.6mΩ Power MOSFET

<p>Description These N-Channel enhancement mode power field effect transistors are using split 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.</p> <p>Features</p> <ul style="list-style-type: none"> ◆ 60V,83A, $R_{DS(on),max} = 3.6m\Omega @ V_{GS} = 10V$ ◆ Improved dv/dt capability ◆ Fast switching ◆ 100% EAS Guaranteed ◆ Green device available <p>Applications</p> <ul style="list-style-type: none"> ◆ Motor Drives ◆ UPS ◆ DC-DC Converter 	<p>Product Summary</p> <table style="width: 100%; border: none;"> <tr> <td style="padding: 2px;">V_{DSS}</td> <td style="padding: 2px;">60V</td> </tr> <tr> <td style="padding: 2px;">$R_{DS(on),max} @ V_{GS}=10V$</td> <td style="padding: 2px;">3.6mΩ</td> </tr> <tr> <td style="padding: 2px;">I_D</td> <td style="padding: 2px;">83A</td> </tr> </table> <p>Pin Configuration</p> <div style="text-align: center;">  <p>DFN5×6</p> <p>N-Channel MOSFET</p> </div>	V_{DSS}	60V	$R_{DS(on),max} @ V_{GS}=10V$	3.6mΩ	I_D	83A
V_{DSS}	60V						
$R_{DS(on),max} @ V_{GS}=10V$	3.6mΩ						
I_D	83A						

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Continuous drain current ($T_c = 25^\circ C$) ($T_c = 100^\circ C$)	I_D	83	A
		60	A
Pulsed drain current ¹⁾	I_{DM}	249	A
Gate-Source voltage	V_{GSS}	± 20	V
Avalanche energy ²⁾	E_{AS}	28.8	mJ
Power Dissipation	P_D	57	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-Case	$R_{\theta JC}$	2.2	$^\circ C/W$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	55	$^\circ C/W$

Package Marking and Ordering Information

Device	Device Package	Marking	Units/Reel
LSGN06R036HWB	DFN5X6	06R036HW	5000

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}	$V_{GS}=0\text{ V}, I_D=250\mu\text{A}$	60	---	---	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0	3.0	4.0	V
Drain-source leakage current	I_{DSS}	$V_{DS}=60\text{ V}, V_{GS}=0\text{V}$	---	---	1	μA
Gate leakage current, Forward	I_{GSSF}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	---	---	100	nA
Gate leakage current, Reverse	I_{GSSR}	$V_{GS}=-20\text{ V}, V_{DS}=0\text{ V}$	---	---	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=20\text{ A}$	---	2.9	3.6	m Ω
Forward transconductance	g_{fs}	$V_{DS}=5\text{V}, I_D=20\text{A}$	---	66	---	S
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS}=30\text{ V}, V_{GS}=0\text{ V},$ $F=1\text{MHz}$	---	3511	---	pF
Output capacitance	C_{oss}		---	1176	---	
Reverse transfer capacitance	C_{rss}		---	67	---	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=30\text{V}, V_{GS}=10\text{V}, I_D=20\text{A}$ $R_G=3\Omega$	---	20.3	---	ns
Rise time	t_r		---	9.6	---	
Turn-off delay time	$t_{d(off)}$		---	61	---	
Fall time	t_f		---	15.2	---	
Gate resistance	R_g	$V_{GS}=0\text{ V}, V_{DS}=0\text{ V}, F=1\text{MHz}$	---	1.1	---	Ω
Gate charge characteristics						
Gate to source charge	Q_{gs}	$V_{DS}=30\text{V}, I_D=20\text{A},$ $V_{GS}=10\text{ V}$	---	15.5	---	nC
Gate to drain charge	Q_{gd}		---	9.5	---	
Gate charge total	Q_g		---	48	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I_S		---	---	47.5	A
Pulsed Source Current ³⁾	I_{SM}		---	---	142.5	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=20\text{A}, T_J=25^\circ\text{C}$	---	---	1.2	V
Reverse recovery time	t_{rr}	$I_F=20\text{A}, dI_F/dt=100\text{ A}/\mu\text{s}$	---	24	---	ns
Reverse recovery charge	Q_{rr}		---	85	---	nC

Notes:

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

 2: $V_{DD}=50\text{V}, V_{GS}=10\text{V}, L=0.1\text{mH}, I_{AS}=24\text{A}$, Starting $T_J=25^\circ\text{C}$.

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

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

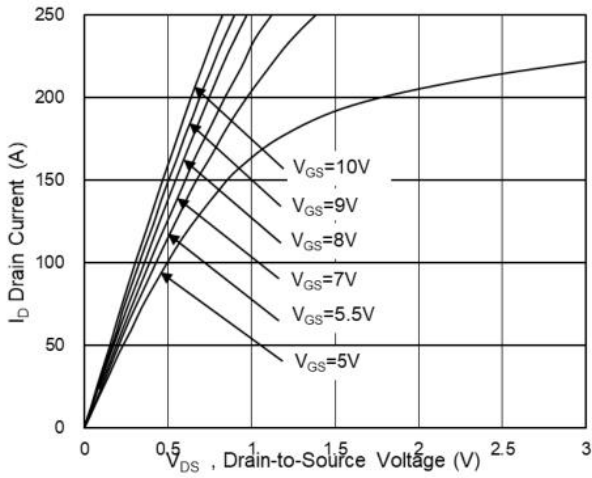


Figure 2. Transfer Characteristics

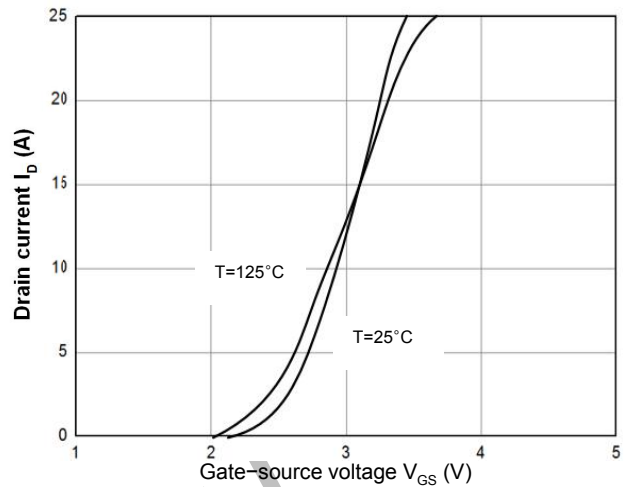


Figure 3. Capacitance Characteristics

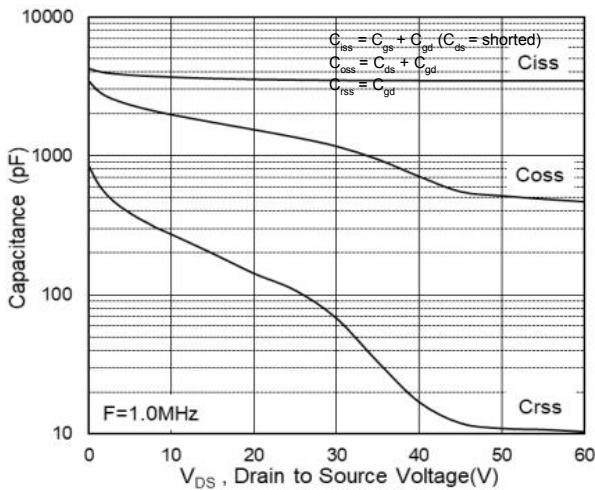


Figure 4. Gate Charge Waveform

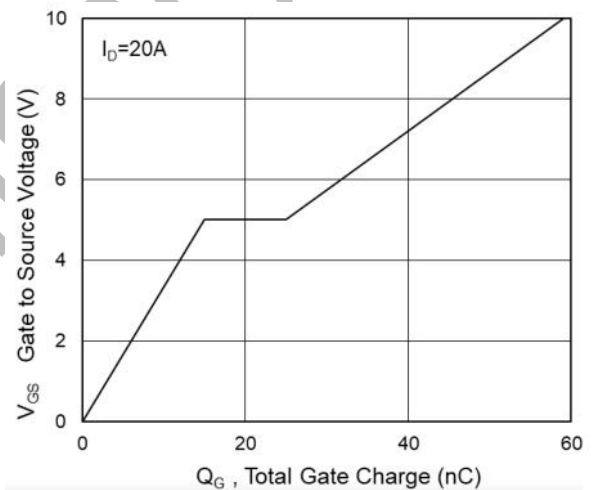


Figure 5. Body-Diode Characteristics

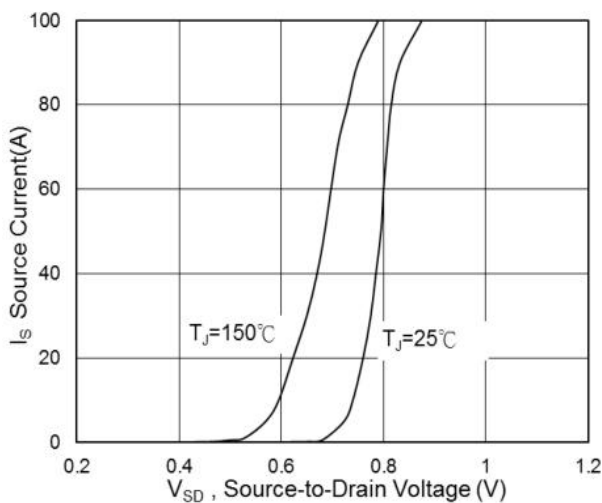


Figure 6. Rdson-Drain Current

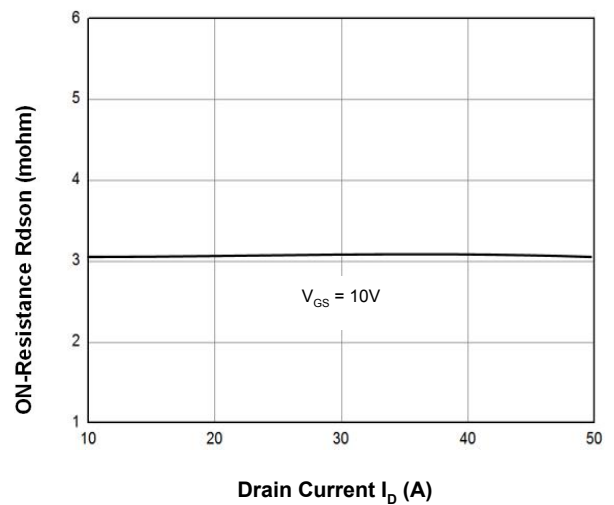


Figure 7. R_{ds(on)}-Junction Temperature

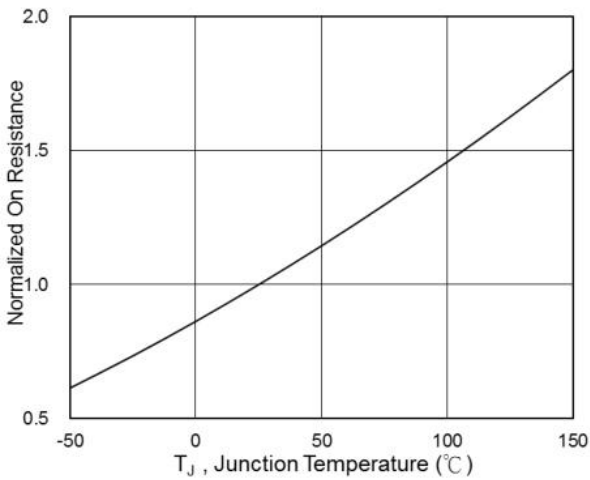


Figure 8. V_{GS(th)}-Junction Temperature

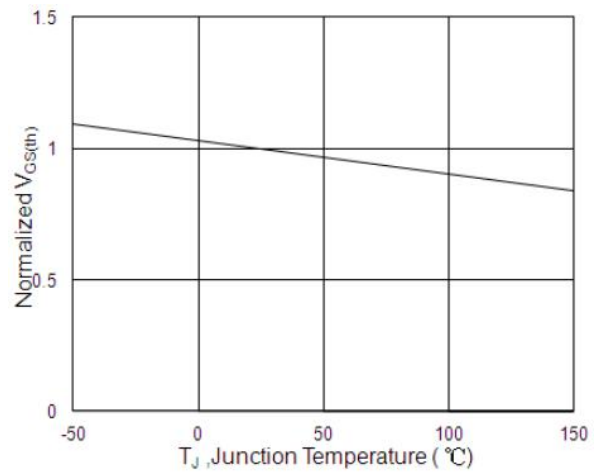


Figure 9. On-Resistance vs. Gate-to-Source voltage

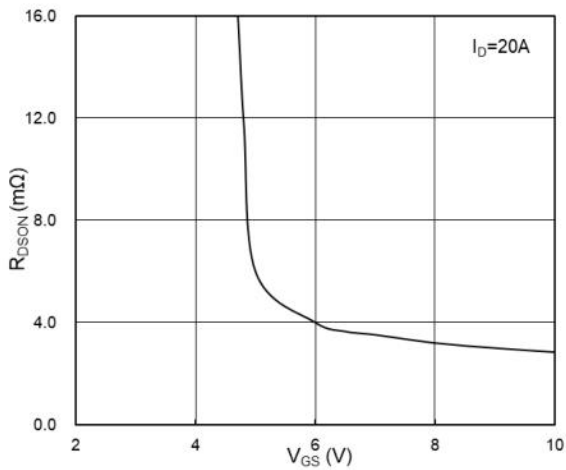


Figure 10: Safe Operating Area

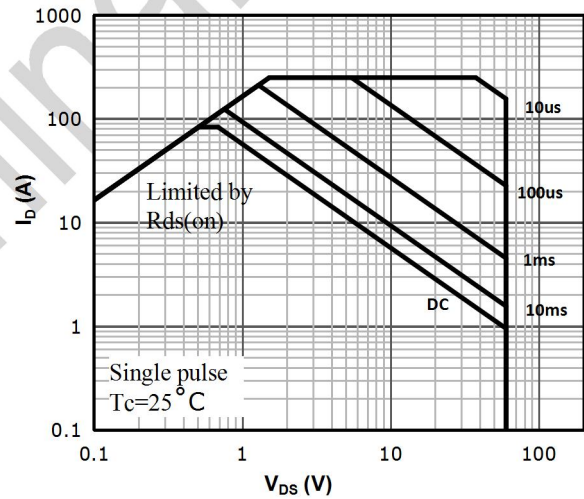
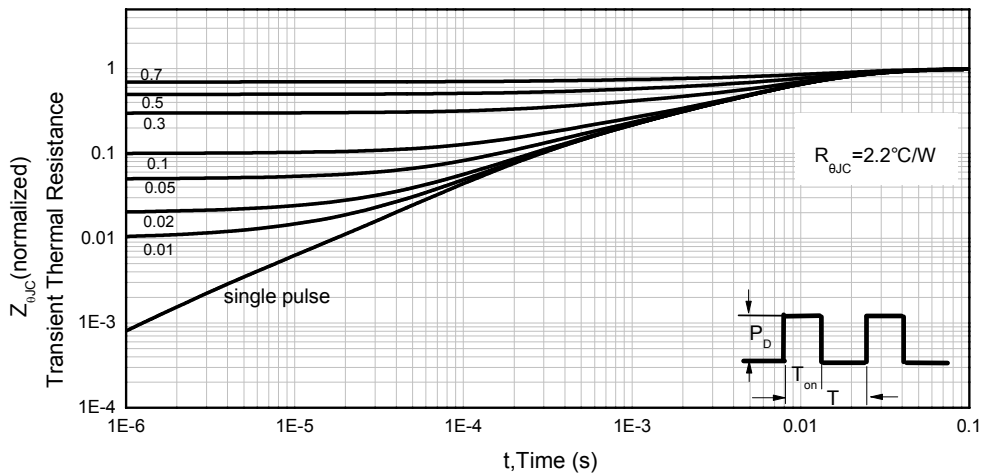
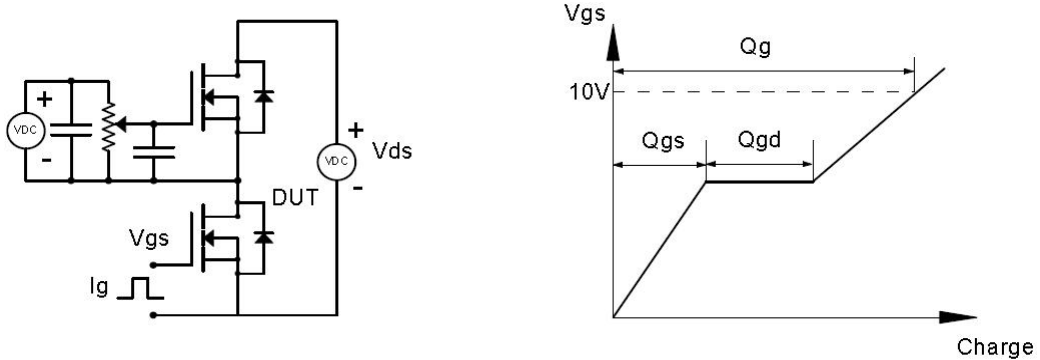


Figure 11. Normalized Maximum Transient Thermal Impedance (R_{thJC})

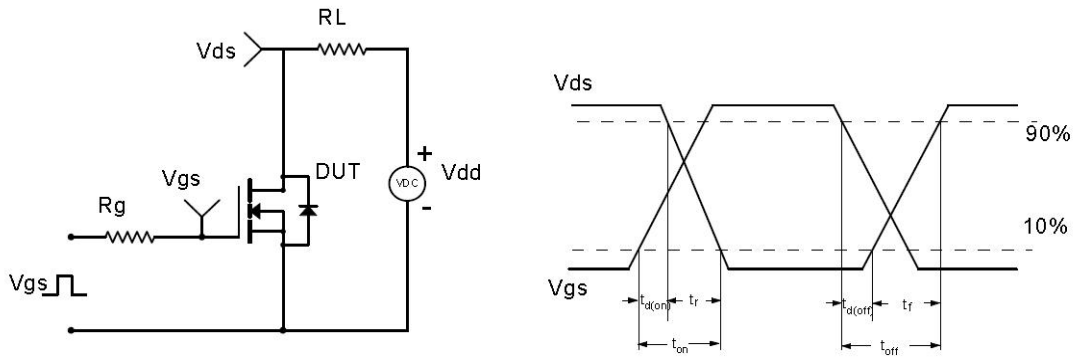


Test Circuit & Waveforms

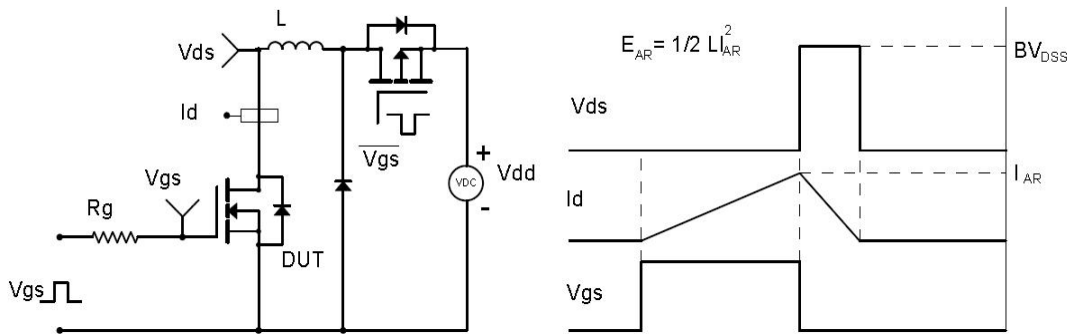
Gate Charge Test Circuit & Waveform



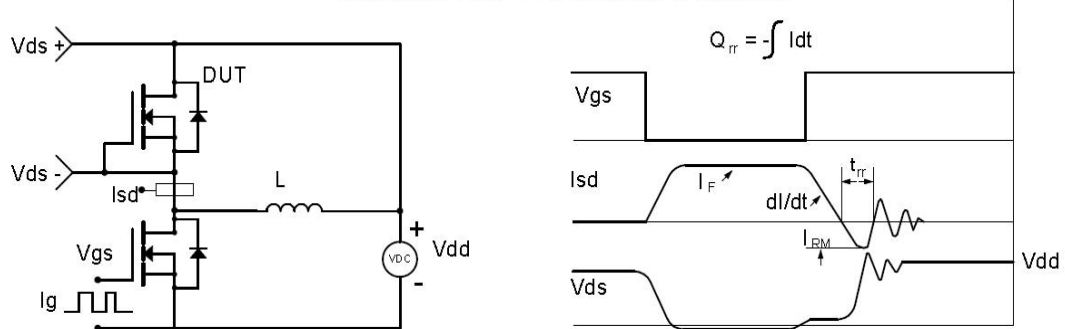
Resistive Switching Test Circuit & Waveforms



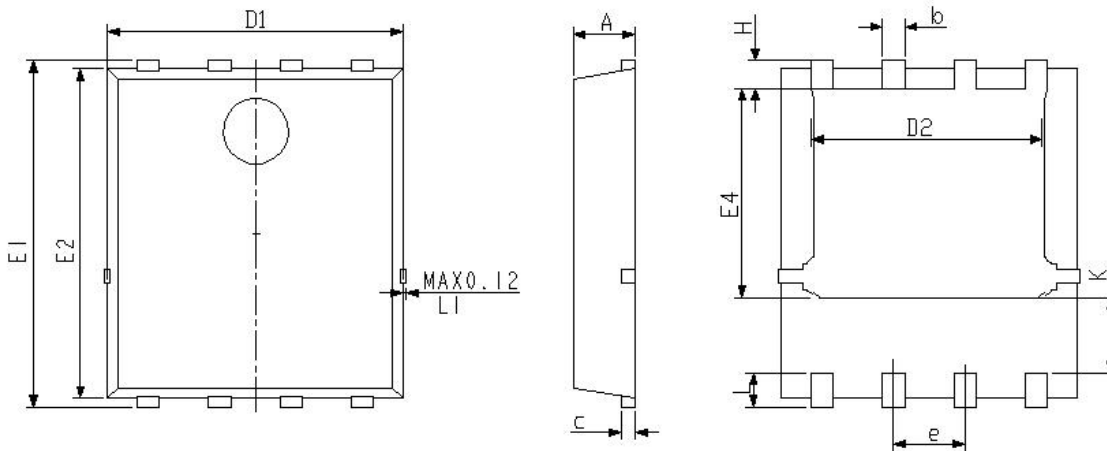
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Mechanical Dimensions for DFN5×6



DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES	
SYMBOL	MIN	MAX	MIN	MAX
A	0.85	1.20	0.033	0.047
b	0.30	0.51	0.012	0.020
c	0.15	0.35	0.006	0.014
D1	4.80	5.40	0.189	0.213
D2	3.70	4.55	0.146	0.179
E1	5.95	6.35	0.234	0.250
E2	5.45	6.06	0.215	0.239
E4	3.30	3.92	0.130	0.154
e	1.27BSC		0.05BSC	
L	0.3	0.71	0.012	0.028
H	0.38	0.71	0.015	0.028
K	1.15	1.45	0.045	0.057

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