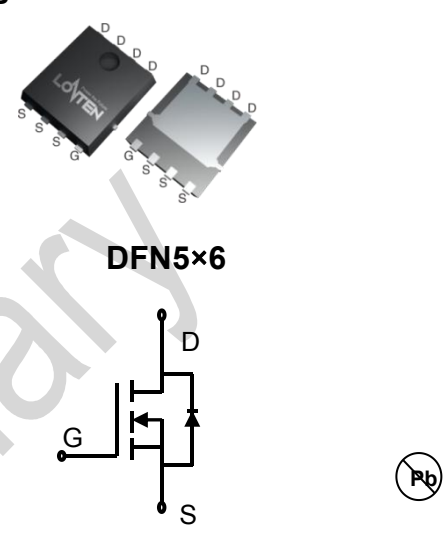


## Lonten N-channel 100V, 43A, 9.8mΩ Power MOSFET

<p><b>Description</b></p> <p>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><b>Features</b></p> <ul style="list-style-type: none"> <li>◆ 100V,43A, <math>R_{DS(on),max} = 9.8m\Omega @ V_{GS} = 10V</math></li> <li>◆ Improved dv/dt capability</li> <li>◆ Fast switching</li> <li>◆ 100% EAS Guaranteed</li> <li>◆ Green device available</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>◆ Motor Drives</li> <li>◆ UPS</li> <li>◆ DC-DC Converter</li> </ul>	<p><b>Product Summary</b></p> <table> <tr> <td><math>V_{DSS}</math></td><td>100V</td></tr> <tr> <td><math>R_{DS(on),max} @ V_{GS}=10V</math></td><td>9.8mΩ</td></tr> <tr> <td><math>I_D</math></td><td>43A</td></tr> </table> <p><b>Pin Configuration</b></p>  <p>DFN5×6</p> <p>N-Channel MOSFET</p>	$V_{DSS}$	100V	$R_{DS(on),max} @ V_{GS}=10V$	9.8mΩ	$I_D$	43A
$V_{DSS}$	100V						
$R_{DS(on),max} @ V_{GS}=10V$	9.8mΩ						
$I_D$	43A						

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100	V
Continuous drain current ( $T_C = 25^\circ C$ ) ( $T_C = 100^\circ C$ )	$I_D$	43	A
		34	A
Pulsed drain current <sup>1)</sup>	$I_{DM}$	129	A
Gate-Source voltage	$V_{GSS}$	$\pm 20$	V
Avalanche energy <sup>2)</sup>	$E_{AS}$	3.2	mJ
Power Dissipation	$P_D$	48	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	$R_{\theta JC}$	2.6	$^\circ C/W$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	50	$^\circ C/W$

**Package Marking and Ordering Information**

Device	Device Package	Marking	Units/Reel
LSGN10R098WB	DFN5X6	10R098WB	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 <sub>DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> =250uA	100	---	---	V
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	3	4	V
Drain-source leakage current	I <sub>DSS</sub>	V <sub>DS</sub> =100 V, V <sub>GS</sub> =0V	---	---	1	μA
Gate leakage current, Forward	I <sub>GSSF</sub>	V <sub>GS</sub> =20 V, V <sub>DS</sub> =0 V	---	---	100	nA
Gate leakage current, Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-20 V, V <sub>DS</sub> =0 V	---	---	-100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10 V, I <sub>D</sub> =20 A	---	7.8	9.8	mΩ
Dynamic characteristics						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0 V, F = 1MHz	---	2553	---	pF
Output capacitance	C <sub>oss</sub>		---	302	---	
Reverse transfer capacitance	C <sub>rss</sub>		---	12.5	---	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 50V, V <sub>GS</sub> =10V, I <sub>D</sub> = 20A R <sub>G</sub> =3.3Ω	---	7.9	---	ns
Rise time	t <sub>r</sub>		---	3.9	---	
Turn-off delay time	t <sub>d(off)</sub>		---	28.2	---	
Fall time	t <sub>f</sub>		---	5.8	---	
Gate charge characteristics						
Gate to source charge	Q <sub>gs</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> = 10 V	---	6.4	---	nC
Gate to drain charge	Q <sub>gd</sub>		---	5.7	---	
Gate charge total	Q <sub>g</sub>		---	42	---	
Drain-Source diode characteristics and Maximum Ratings						
Continuous Source Current	I <sub>S</sub>		---	---	40	A
Pulsed Source Current <sup>3)</sup>	I <sub>SM</sub>		---	---	120	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A, T <sub>J</sub> =25℃	---	---	1.2	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =20A, dI <sub>F</sub> /dt=100 A/μs	---	45.2	---	ns
Reverse recovery charge	Q <sub>rr</sub>		---	166	---	nC

**Notes:**

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

2:  $V_{DD}=25\text{ V}, V_{GS}=10\text{ V}, L=0.1\text{ mH}, I_{AS}=8\text{ A},$  Starting  $T_J=25^{\circ}\text{C}$ .

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

## Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

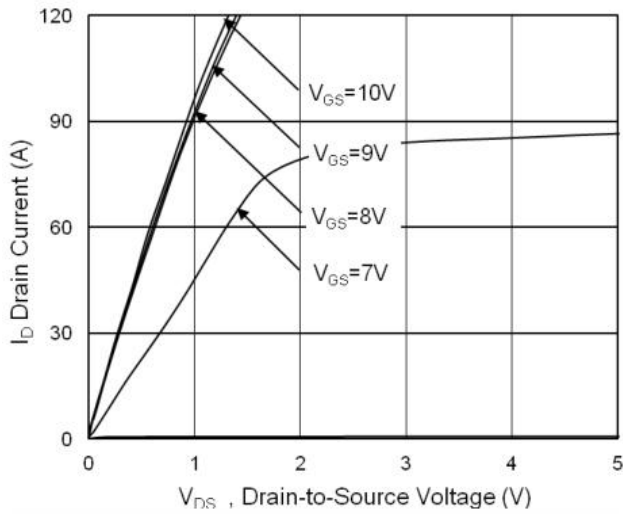


Figure 2. Transfer Characteristics

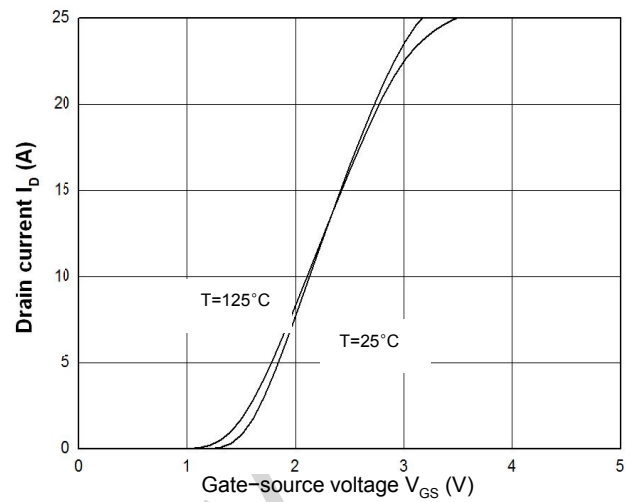


Figure 3. Capacitance Characteristics

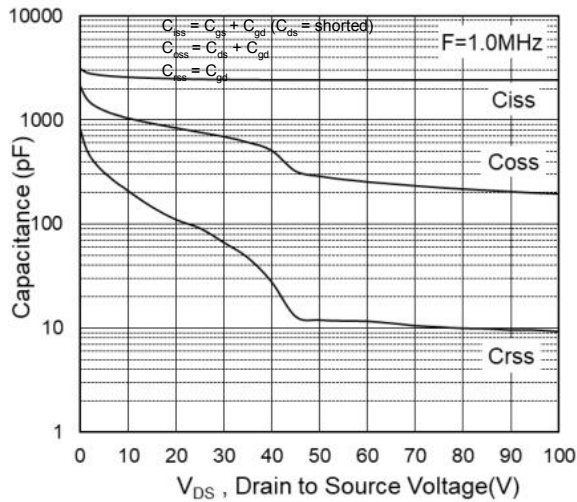


Figure 4. Gate Charge Waveform

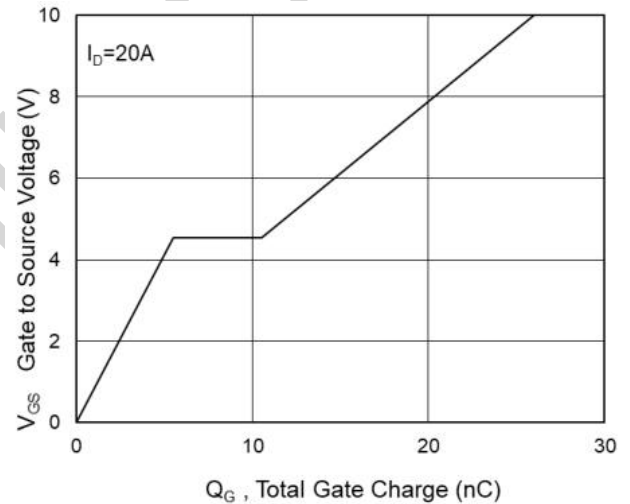


Figure 5. Body-Diode Characteristics

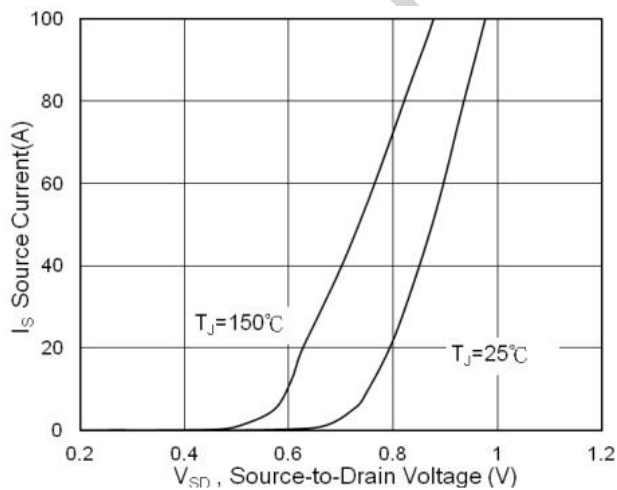


Figure 6. Rdson-Drain Current

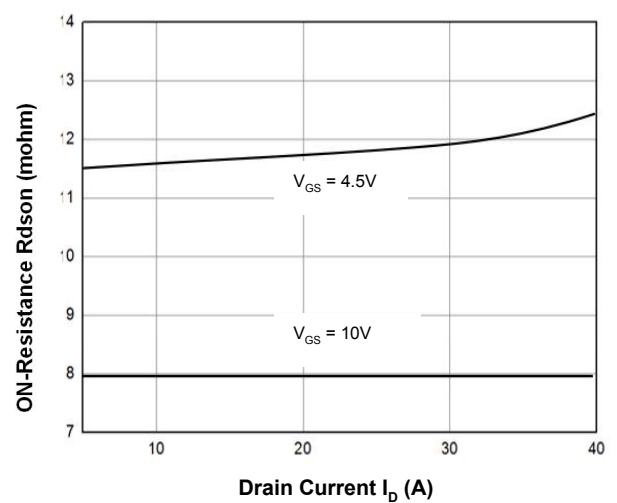


Figure 7.  $R_{DS(on)}$ -Junction Temperature

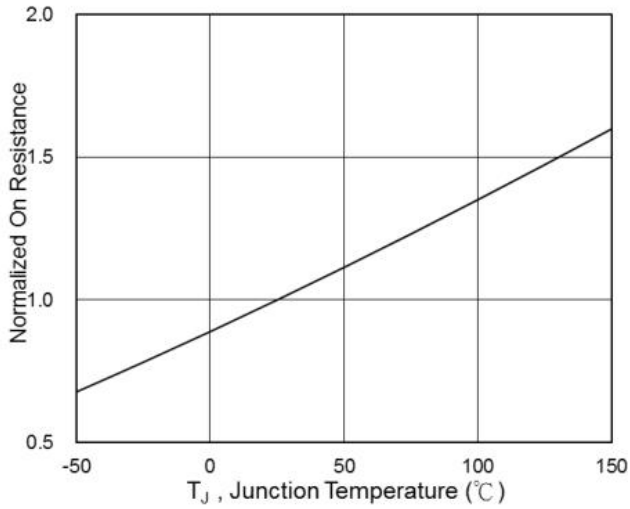


Figure 8.  $V_{GS(th)}$ -Junction Temperature

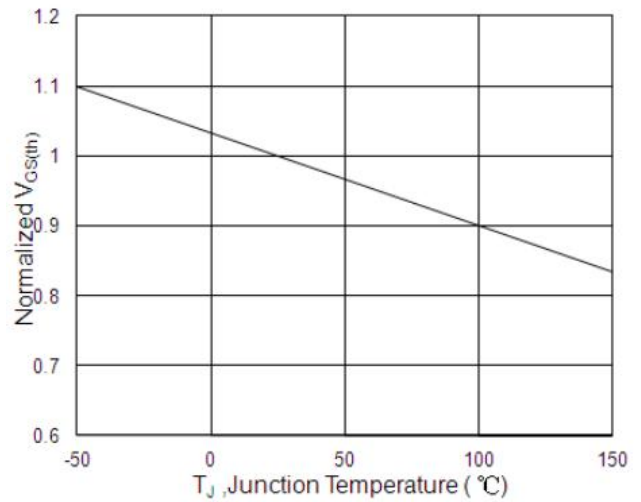


Figure 9. On-Resistance vs. Gate-to-Source voltage

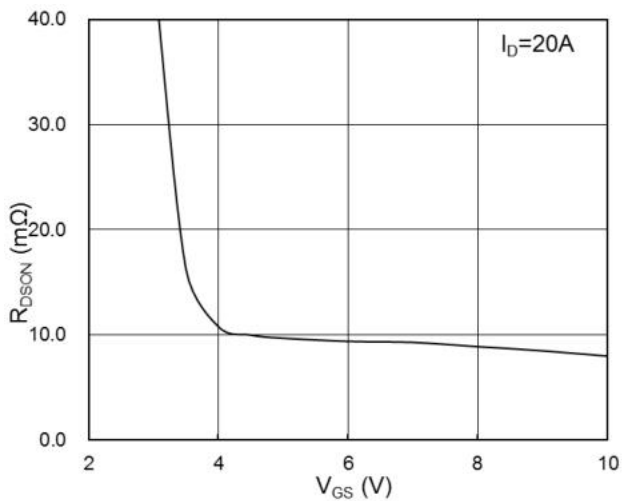


Figure 10: Safe Operating Area

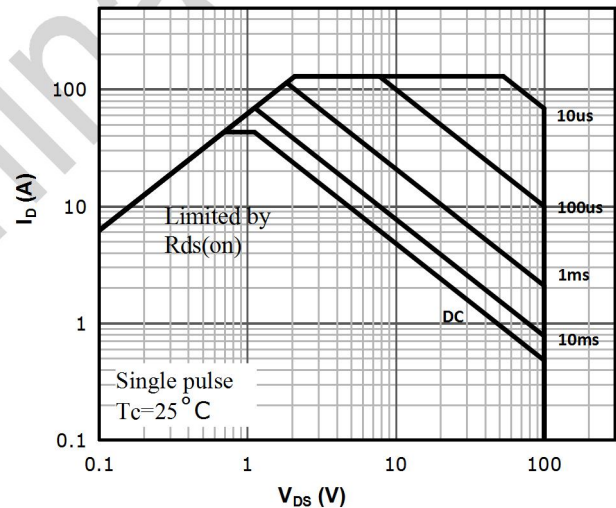
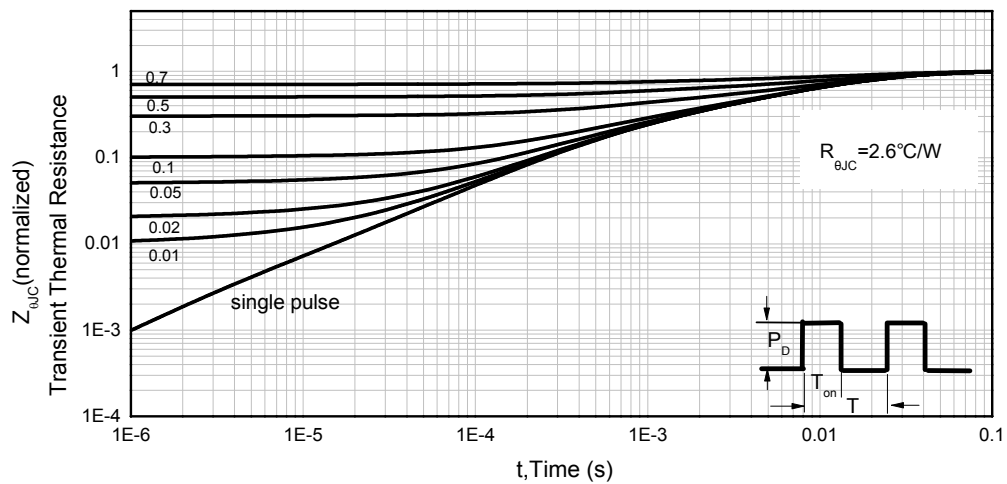
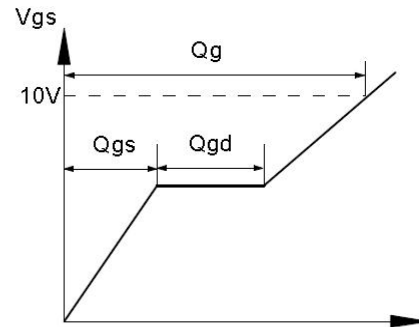
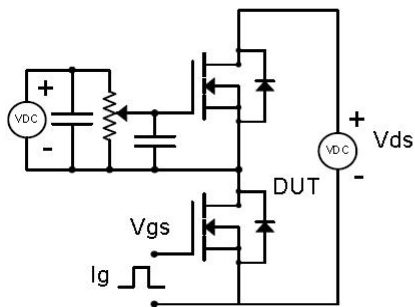


Figure 11. Normalized Maximum Transient Thermal Impedance ( $R_{thJC}$ )

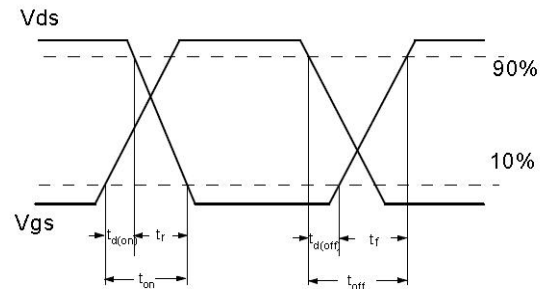
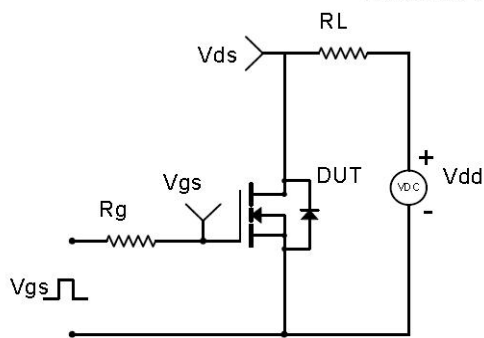


## Test Circuit & Waveforms

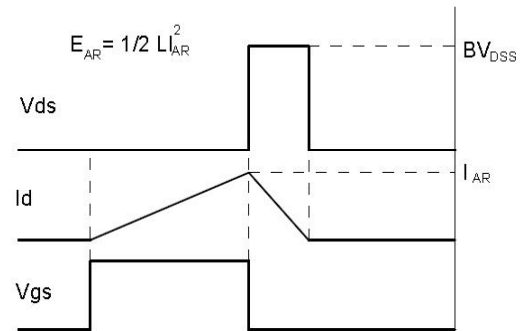
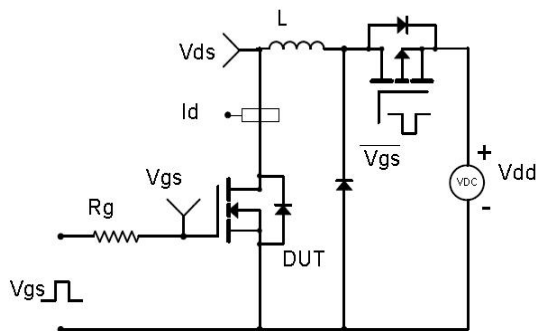
Gate Charge Test Circuit & Waveform



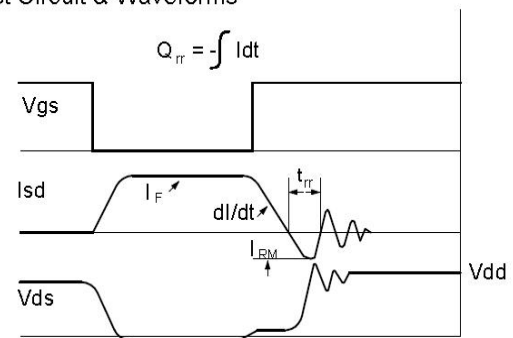
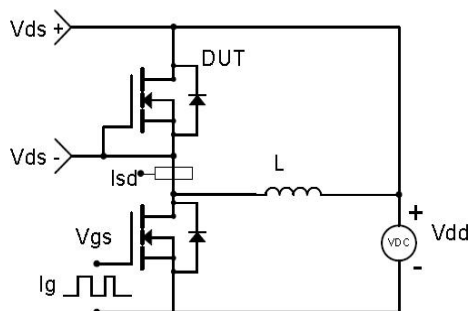
Resistive Switching Test Circuit & Waveforms



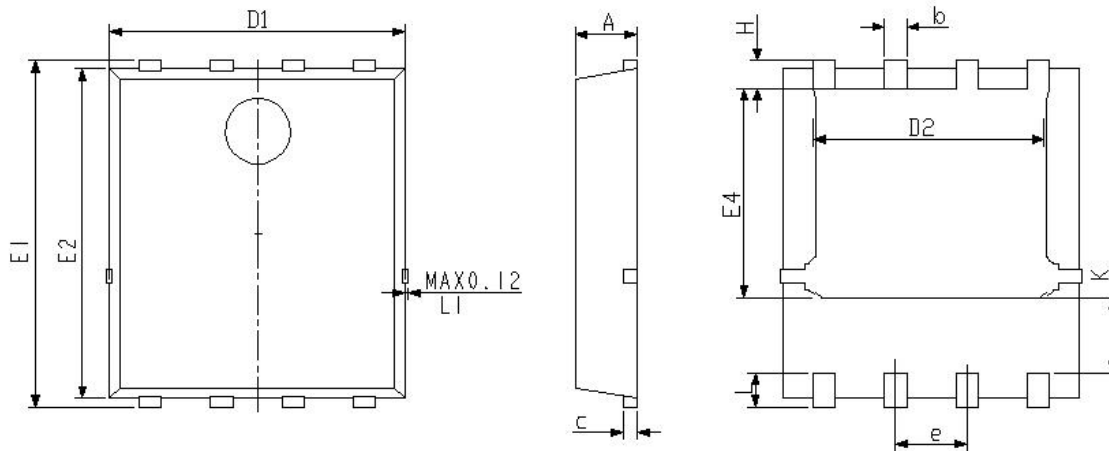
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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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