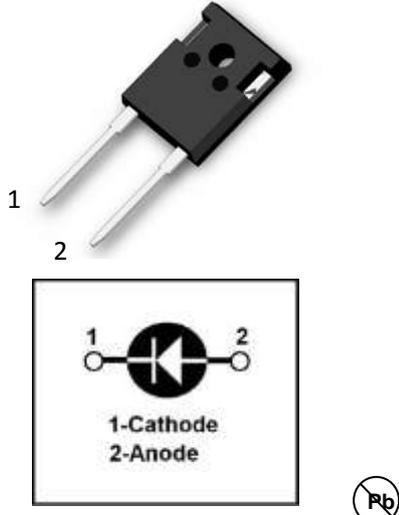


## 600V 60A Ultra-Fast Recovery Diode

<p><b>Description</b> FRED from Lonten utilizes advanced processing techniques to achieve ultra-fast recovery times and higher forward current. Its soft recovery characteristics and high reliability suit for wide industrial applications.</p> <p><b>Features</b></p> <ul style="list-style-type: none"> <li>◆ Ultra-fast Recovery Time</li> <li>◆ Soft Recovery Characteristics</li> <li>◆ Low Recovery Loss</li> <li>◆ Low Forward Voltage</li> <li>◆ High Surge Current Capability</li> <li>◆ Low Leakage Current</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>◆ Freewheeling, Snubber, Clamp</li> <li>◆ Inversion Welder</li> <li>◆ PFC</li> <li>◆ Plating Power Supply</li> <li>◆ Ultrasonic Cleaner and Welder</li> <li>◆ Converter &amp; Chopper</li> <li>◆ UPS</li> </ul>	<p><b>Product Summary</b> 600V 60A FRED</p> <p><b>TO-247 Pin Configuration</b></p> 
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### Absolute Maximum Ratings T<sub>C</sub> = 25°C unless otherwise noted

Parameter	Symbol	Value	Unit
Maximum D.C. Reverse Voltage	V <sub>R</sub>	600	V
Maximum Repetitive Reverse Voltage	V <sub>RRM</sub>	600	V
Average Forward Current( T <sub>c</sub> = 110°C)	I <sub>F(AV)</sub>	60	A
RMS Forward Current( T <sub>c</sub> = 110°C)	I <sub>F(RMS)</sub>	90	A
Non-Repetitive Surge Forward Current(T <sub>J</sub> = 45°C, t=10ms, 50Hz, Sine)	I <sub>FSM</sub>	600	A
Power Dissipation	P <sub>D</sub>	250	W
Junction Temperature Range	T <sub>J</sub>	-40 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-40 to +150	°C
Module-to-Sink(Recommended M3)	Torque	1.1	Nm
	Weight	6.0	g

### Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.5	°C/W

**Package Marking and Ordering Information**

Device	Device Package	Marking
LDB60U60W4	TO-247	LDB60U60W4

**Electrical Characteristics**

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{RM}$	Reverse Leakage Current	$V_R=600\text{V}$	--	--	10	$\mu\text{A}$
		$V_R=600\text{V}, T_J=125^\circ\text{C}$	--	--	1000	$\mu\text{A}$
$V_F$	Forward Voltage	$I_F=60\text{A}$	--	1.9	2.4	V
		$I_F=60\text{A}, T_J=125^\circ\text{C}$	--	1.7	--	V
$t_{rr}$	Reverse Recovery Time	$I_F=1\text{A}, V_R=30\text{V},$ $di_F/dt=-200\text{A}/\mu\text{s}$	--	25	--	ns
$t_{rr}$	Reverse Recovery Time	$V_R=300\text{V}, I_F=60\text{A}$	--	45	--	ns
$I_{RRM}$	Max. Reverse Recovery Current	$di_F/dt=-200\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	--	2.5	--	A
$t_{rr}$	Reverse Recovery Time	$V_R=300\text{V}, I_F=60\text{A}$	--	125	--	ns
$I_{RRM}$	Max. Reverse Recovery Current	$di_F/dt=-200\text{A}/\mu\text{s}, T_J=125^\circ\text{C}$	--	6.5	--	A

**Electrical Characteristics Diagrams**

Figure 1. Forward Voltage Drop vs Forward Current

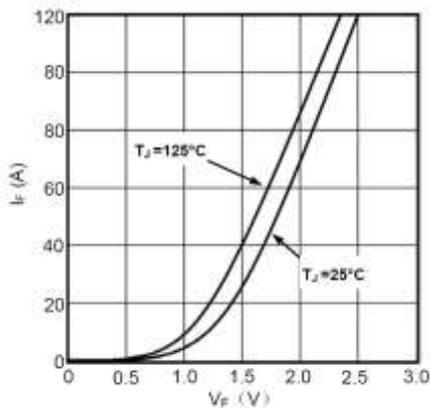


Figure 2. Reverse Recovery Time vs diF/dt

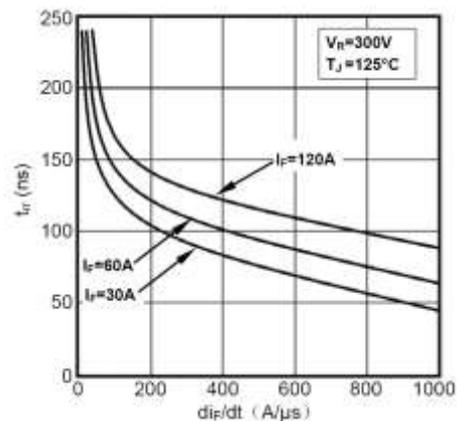


Figure 3. Reverse Recovery Current vs diF/dt

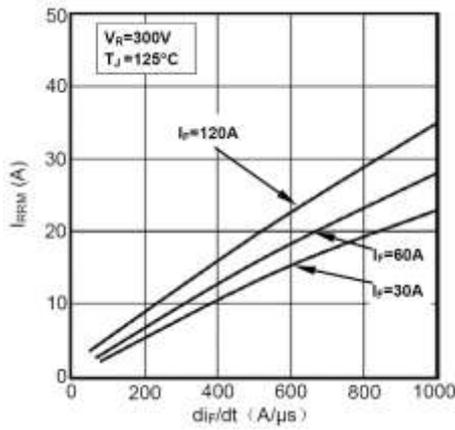


Figure 4. Reverse Recovery Charge vs diF/dt

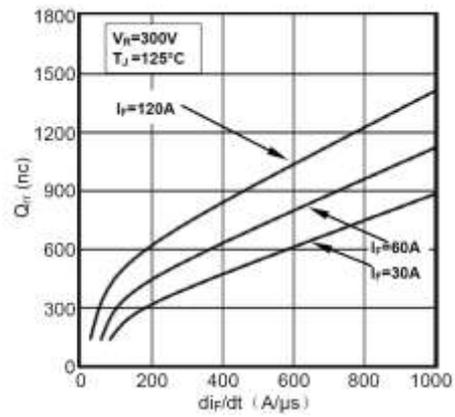


Figure 5. Dynamic Parameters vs Junction Temperature

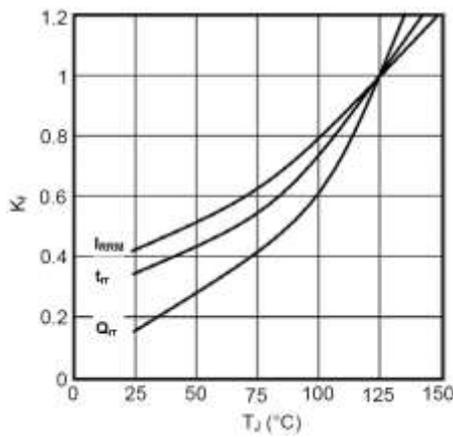


Figure 6. Transient Thermal Impedance

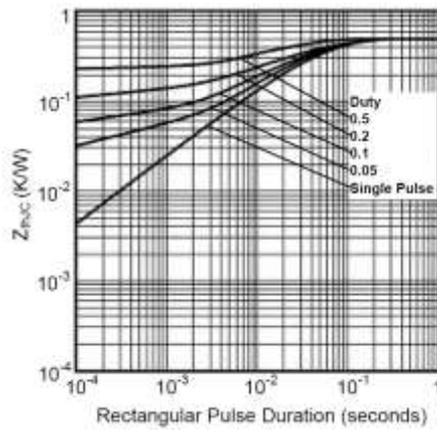


Figure 7. Diode Reverse Recovery Test Circuit and Waveform

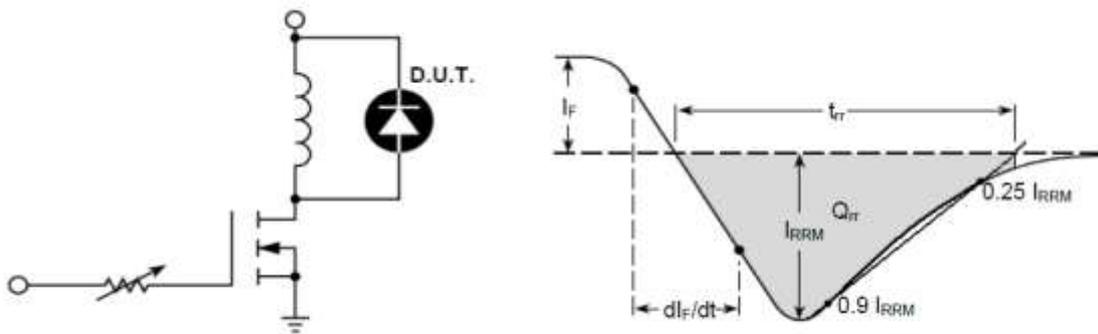
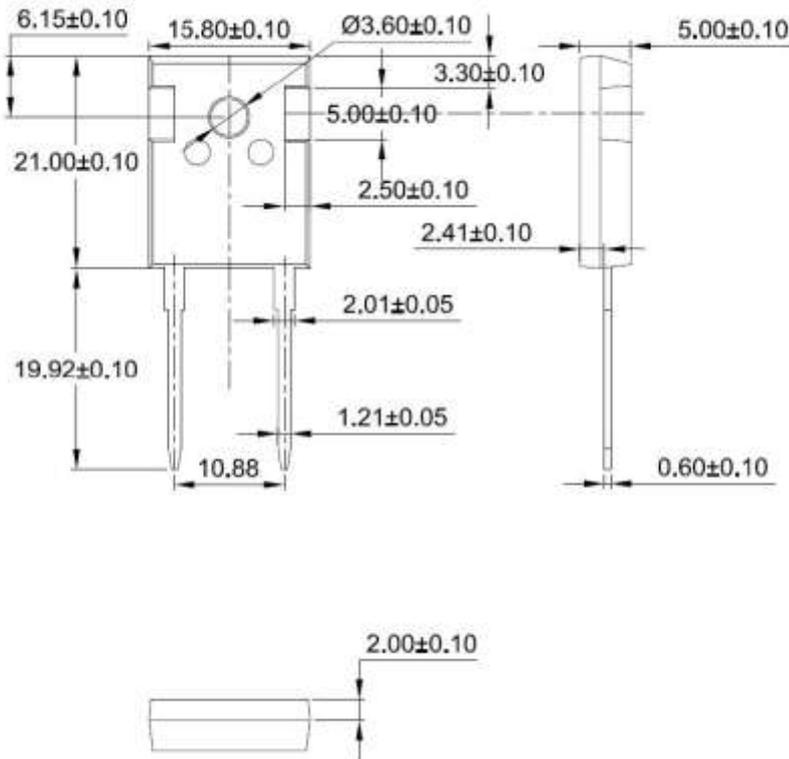
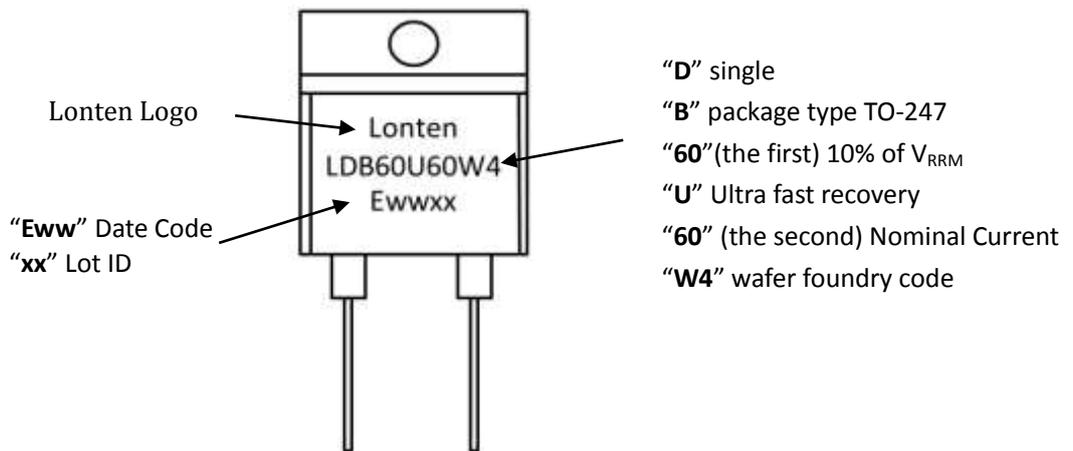


Figure 8. Package Outline

Dimensions in Millimeters



**Marking Information**



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