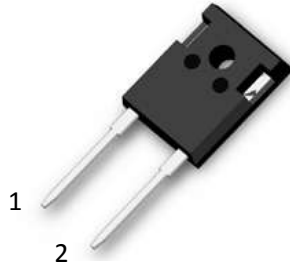
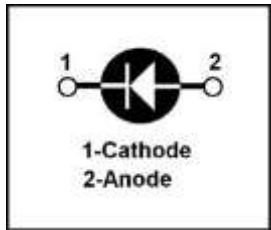



## 1200V 60A Ultra-Fast Recovery Diode

<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> 1200V 60A FRED</p> <p><b>TO-247 Pin Configuration</b></p> <div style="text-align: center;">     </div> <div style="text-align: right; margin-top: 10px;">  </div>
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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>	1200	V
Maximum Repetitive Reverse Voltage	V <sub>R(RM)</sub>	1200	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>	84	A
Non-Repetitive Surge Forward Current(T <sub>J</sub> = 45°C, t=10ms, 50Hz, Sine)	I <sub>FSM</sub>	500	A
Power Dissipation	P <sub>D</sub>	312	W
Junction Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 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>	0.4	°C/W

**Package Marking and Ordering Information**

Device	Device Package	Marking
LDB120U60W4	TO-247	LDB120U60W4

**Electrical Characteristics**

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{RM}$	Reverse Leakage Current	$V_R=1200\text{V}$	--	--	10	$\mu\text{A}$
		$V_R=1200\text{V}, T_J=125^\circ\text{C}$	--	--	1000	$\mu\text{A}$
$V_F$	Forward Voltage	$I_F=60\text{A}$	--	2.8	3.3	V
		$I_F=60\text{A}, T_J=125^\circ\text{C}$	--	2.3	--	V
$t_{rr}$	Reverse Recovery Time	$I_F=1\text{A}, V_R=30\text{V}, di_F/dt=-200\text{A}/\mu\text{s}$	--	27	--	ns
		$I_F=0.5\text{A}, I_R=1\text{A}, I_{RR}=0.25\text{A}$	--	65	80	ns
$t_{rr}$	Reverse Recovery Time	$V_R=600\text{V}, I_F=60\text{A}$	--	75	--	ns
$I_{RRM}$	Max. Reverse Recovery Current	$di_F/dt=-200\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	--	9	--	A
$t_{rr}$	Reverse Recovery Time	$V_R=600\text{V}, I_F=30\text{A}$	--	180	--	ns
$I_{RRM}$	Max. Reverse Recovery Current	$di_F/dt=-200\text{A}/\mu\text{s}, T_J=125^\circ\text{C}$	--	17	--	A

**Electrical Characteristics Diagrams**

Figure 1. Forward Voltage Drop vs Forward Current

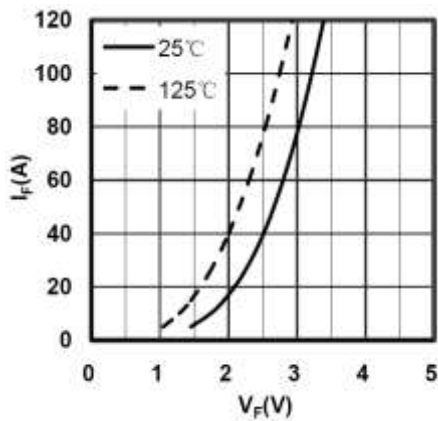


Figure 2. Reverse Recovery Time vs  $di_F/dt$

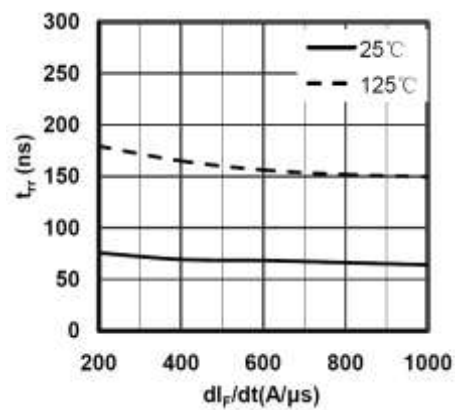


Figure 3. Reverse Recovery Current vs diF/dt

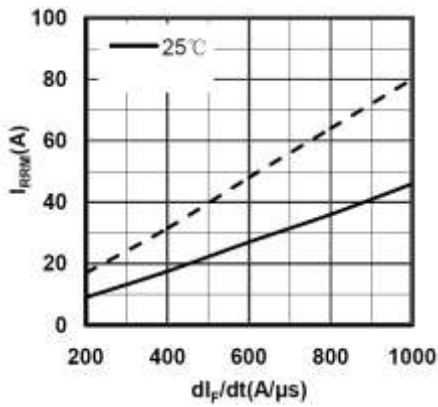


Figure 4. Reverse Recovery Charge vs diF/dt

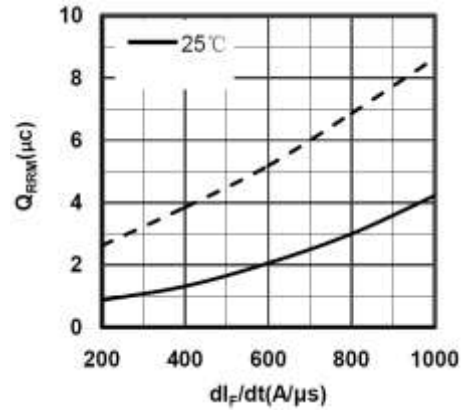


Figure 5. Forward current vs Case temperature

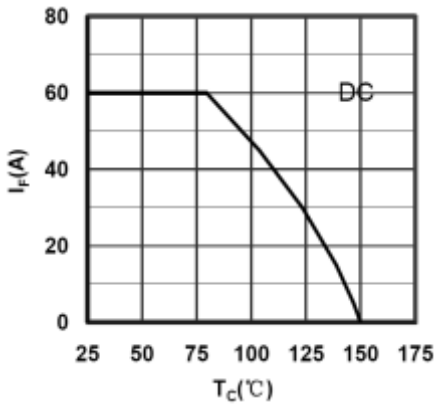


Figure 6. Transient Thermal Impedance

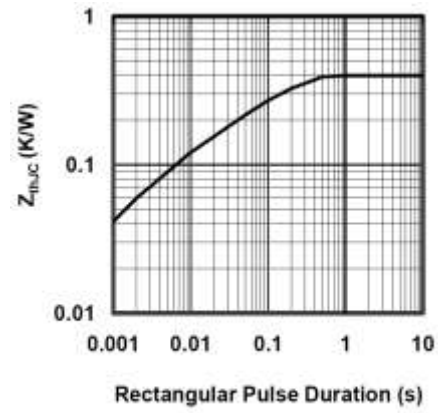


Figure 6. Transient Thermal Impedance

Figure 7. Diode Reverse Recovery Test Circuit and Waveform

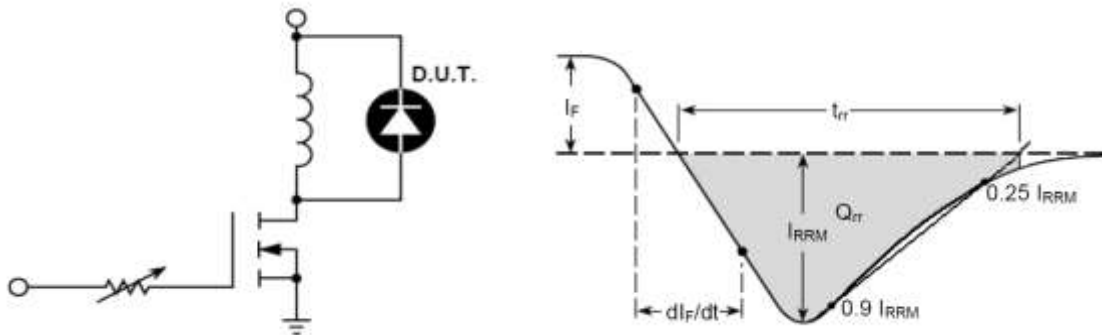
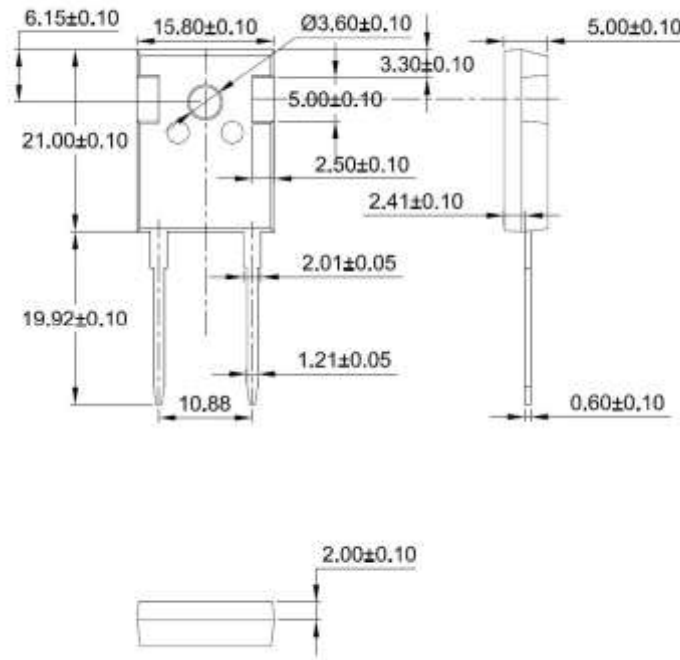
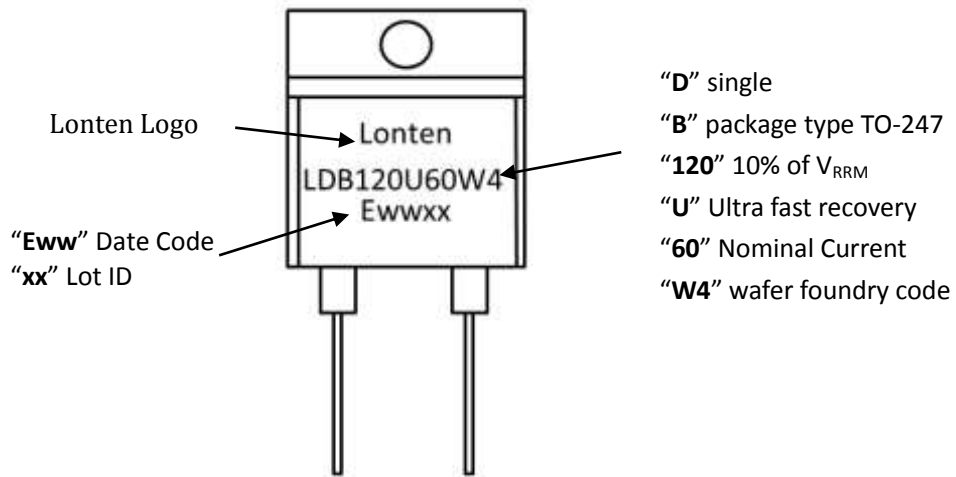


Figure 8. Package Outline

Dimensions in Millimeters



**Marking Information**



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