

# **POWEREX<sup>®</sup>** Product Change Notification

## **LDR3\_\_50 To Be Offered as Replacement for LD43\_\_50 POW-R-BLOK™ # : 2017-024 Rev.: 00**



Date: 2017 / JUL / 21

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### **Subject of Change:**

Introduction of new part type LDR3\_\_50 to be offered as a direct replacement for Powerex LD43\_\_50 dual SCR modules. They are drop in replacements both mechanically and electrically with minor differences noted below.

### **Description of Change:**

Resulting from the transfer of the manufacturing operations for the LD43 module from the former Powerex facility located in Morocco to the Powerex manufacturing partner facility located in Poland to provide increased options in supply, Powerex will be offering a new product LDR3\_\_50 for consideration as a replacement for the LD43\_\_50 module. It is an equivalent replacement, but there will be differences in the mechanical and electrical characteristics. Please review the product data sheet and make determination as to whether this product will be a suitable replacement for use in their application. These differences include, but are not limited, to the following:

- Slightly less overall length dimension (149 mm) for the LDR3 as compared to the 150 mm overall length of the LD43.
- Slightly wider terminals (26 mm on terminals 2 & 3) for the LDR3 as compared to the terminal widths for the LD43 (25.4 mm on terminals 2 & 3)
- A slightly smaller screw depth under the terminals of 17 mm for the LDR3 as compared to the 17.5 mm depth for the LD43

This module is being developed with a manufacturing partner with a country of origin of Russia that has a quality management system that is in compliance with ISO 9001. This product is RoHS and REACH compliant and is UL Recognized.

### **Reason for Change:**

A new product is being introduced to assist with customer demand after unforeseen issues and difficulties with the transition of the LD43\_\_50 dual SCR modules from the former Powerex manufacturing facility located in Morocco which was to be transferred to the former Westinghouse site and manufacturing partner facility located in Poland earlier this year.

### **Identification of Change:**

This new product will be identified by a new part number LDR3\_\_50 and will be labeled with PRX RU. This module package has slightly different physical characteristics that differentiate it from the original LD43\_\_50 modules.

### **Time Schedule for Change:**

Delivery Begins: Third Quarter of 2017

### **Supporting Documentation:**

Attachment – LDR3\_\_50 Data Sheet

### **Quality Management system:**

The Powerex partner manufacturing facility has a quality system that is in compliance with ISO 9001. Parts will be qualified at the Powerex Youngwood, PA facility which has a quality system that is in compliance with ISO 9001 and AS9100.

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## **Recommended Replacements for LD43\_\_50 Dual SCR Modules**

<b>LD43 Part</b>	<b>Recommended Replacement</b>
LD430850	LDR30850
LD431050	LDR31050
LD431250	LDR31250
LD431450	LDR31450
LD431650	LDR31650
LD431850	LDR31850

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Differences between the LD43\_\_50 modules and LDR3\_\_50 modules include, but are not limited to, the following:

## Ratings and Electrical Characteristics:

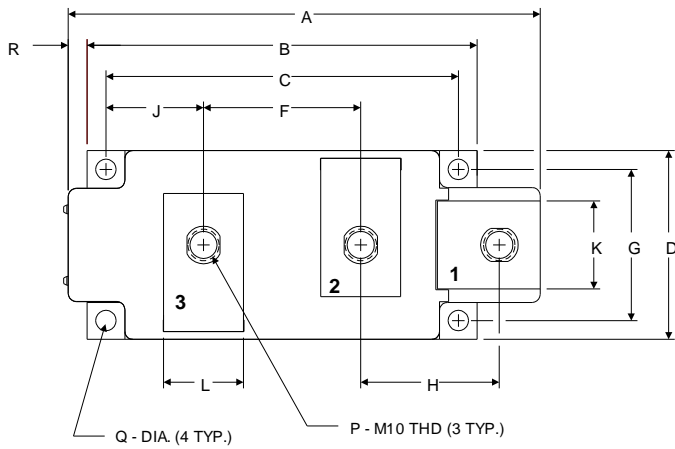
Characteristic	Symbol	LD43__50 Limit	LD43__50 Test Conditions	LDR3__50 Limit	LDR3__50 Test Conditions
Average Forward Current	$I_{T(AV)}$	500 A	180° Conduction, $T_C=86^\circ\text{C}$	500 A	180° Conduction, $T_C=85^\circ\text{C}$
RMS Forward Current	$I_{T(RMS)}$	900 A	180° Conduction, $T_C=86^\circ\text{C}$	785 A	180° Conduction, $T_C=85^\circ\text{C}$
Peak One Cycle Surge Current, Non-Repetitive	$I_{TSM}$	25,500 A	60 Hz, 0V reappplied, $T_j=125^\circ\text{C}$	17,000 A	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	$I_{TSM}$	24,450 A	50 Hz, 0V reappplied, $T_j=125^\circ\text{C}$	15,500 A	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
$I^2t$ for Fusing for One Cycle	$I^2t$	$2.70 \times 10^6 \text{ A}^2\text{sec}$	60 Hz, 0V reappplied, $T_j=125^\circ\text{C}$	$1.19 \times 10^6 \text{ A}^2\text{sec}$	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	$I^2t$	$2.90 \times 10^6 \text{ A}^2\text{sec}$	50 Hz, 0V reappplied, $T_j=125^\circ\text{C}$	$1.20 \times 10^6 \text{ A}^2\text{sec}$	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
Average Forward Gate Power	$P_{G(AV)}$	5 W		4 W	
Maximum Rate-of-Rise of On-State Current, (Repetitive)	$di/dt$	200 A/ $\mu\text{s}$	Per JEDEC Standard 397 5.2.2.6	400 A/ $\mu\text{s}$	$T= T_{jmax}$ , $V_D= 0.67 V_{DRM}$ , $I_{TM}= 2 I_{TAV}$ , Gate Pulse: $I_G= 2 \text{ A}$ , $t_{GP}= 50 \mu\text{s}$ , $di_G/dt \geq 1 \text{ A}/\mu\text{s}$
Storage Temperature	$T_{stg}$	-40 to +150 °C		-40 to +125 °C	
Repetitive Peak Forward Leakage Current	$I_{DRM}$	80 mA max	$V=V_{DRM}$ , $T_j=130^\circ\text{C}$	70 mA max	$V=V_{DRM}$ , $T_j=130^\circ\text{C}$
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	80 mA max	$V=V_{RRM}$ , $T_j=130^\circ\text{C}$	70 mA max	$V=V_{RRM}$ , $T_j=130^\circ\text{C}$
Peak On-State Voltage	$V_{TM}$	1.30 V max	$T_j=25^\circ\text{C}$ , $I_{TM}=1500 \text{ A}$	1.50 V max	$T_j=25^\circ\text{C}$ , $I_{TM}=1570 \text{ A}$
Gate Trigger Current	$I_{GT}$	200 mA max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$	250 mA max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$
Gate Trigger Voltage	$V_{GT}$	3.0 V max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$	2.50 V max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$
Peak Forward Gate Current	$I_{GTM}$	4.0 A max	$T_j=25^\circ\text{C}$	10 mA max	$T_j=130^\circ\text{C}$ , $V_D=0.67 V_{DRM}$
Peak Reverse Gate Voltage	$V_{GRM}$	5 V max.	$T_j=25^\circ\text{C}$	0.25 V max	$T_j=130^\circ\text{C}$ , $V_D=0.67 V_{DRM}$
Latching Current	$I_L$	600 mA	$T_j=25^\circ\text{C}$	1000 mA max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$
Holding Current	$I_H$	200 mA	$T_j=25^\circ\text{C}$	300 mA max	$T_j=25^\circ\text{C}$ , $V_D=12\text{V}$
Turn-Off Time	$t_q$	150 $\mu\text{s}$ typical	$I_{tm}=1000\text{A}$ , $t_p=1\text{ms}$ , $di/dt=10\text{A}/\mu\text{s}$ , $dV_r/dt=200\text{V}/\mu\text{s}$ , $V_{dr}=80\%V_{drM}$ , $V_r=50\text{V}$ , $T_j=130^\circ\text{C}$	250 $\mu\text{s}$ max	$T_j=130^\circ\text{C}$ , $dv/dt= 50 \text{ V}/\mu\text{s}$ , $I_{TM}= I_{T(AV)}$ , $di/dt= 10 \text{ A}/\mu\text{s}$ , $V_R= 100 \text{ V}$ , $V_D= 0.67 V_{DRM}$
Recovered Charge	$Q_{rr}$	1250 $\mu\text{C}$ typical	$I_{tm}=1000\text{A}$ , $t_p=1\text{ms}$ , $di/dt=10\text{A}/\mu\text{s}$ , $V_r=50\text{V}$ , $T_j=130^\circ\text{C}$	Not Available	Not Available
Recovered Charge (50% Chord)	$Q_{ra}$	960 $\mu\text{C}$ typical			
Reverse Recovery Current	$I_{rm}$	115 A typical			
Reverse Recovery Time (50% Chord)	$t_{rr}$	16 $\mu\text{s}$ typical			

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Mechanical differences between the LD43\_\_50 modules and LDR3\_\_50 modules include, but are not limited to, the following:

## OUTLINE DRAWING



Dimension	LD43 (mm)	LDR3 (mm)
A	150	149
L	25.4	26
M	17.5	17
R	6	5

