

POWEREX[®] Product Change Notification

ND42__21 and ND42__25 POW-R-BLOK™ Are Discontinued NDR2__34 To Be Offered As Replacement

: 2021-005 Rev.: 00



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Parts Subject of Change:

Discontinuation of the ND42__21 and ND42__25 POW-R-BLOK™s, including:

- ND420621, ND420821, ND421021, ND421221, ND421421, ND421621, ND421821, ND422021
- ND420625, ND420825, ND421025, ND421225, ND421425, ND421625, ND421825

Introduction of new part type NDR2__34 to be offered as a direct replacement for the Powerex ND42__21 and ND42__25 dual SCR/diode modules. They are drop-in replacements both mechanically and electrically with minor differences noted below.

Description of Change:

Powerex originally introduced the NDR2__34 module as an alternative for the ND42__21 and ND42__25 modules to provide increased options for supply during the transfer of the manufacturing operations for the ND42 module from the former Powerex facility located in Morocco to the Powerex manufacturing partner facility located in Poland. Powerex has ended the manufacturing operations in Poland which has resulted in the discontinuation of the ND42 module products.

The NDR2 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. Some of the notable differences include, but are not limited, to the following:

- Gate connection terminals are below the surface of the lid for the NDR2 but were above the surface of the lid for the ND42 modules.
- Slightly wider terminals (18 mm on terminals 2 & 3) for the NDR2 as compared to the terminal widths for the ND42 (15.9 mm on terminals 2 & 3)
- A slightly smaller screw depth under the terminals of 12 mm for the NDR2 as compared to the 14.5 mm depth for the ND42.

Please note that the NDR2__34 modules will only be available at 1600V and 1800V blocking voltage ratings. Powerex does not yet have an alternative solution for the 2000V ND422021 or ND422025 modules at this time.

This module is being manufactured by 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. The NDR2__34 parts are UL Recognized under the Powerex UL File Number E78240.

Reason for Change:

A new product is being introduced to provide an alternative product after the discontinuation of the manufacturing operations for the ND42 modules at the former manufacturing locations in Morocco and Poland.

Identification of Change:

This new product will be identified by a new part number NDR2__34, where the space will contain a two-digit voltage code. The parts will be labeled with the logo PRX RU.

This module package has slightly different physical characteristics that differentiate it from the original ND42 modules.

Time Schedule for Change:

Delivery Begins: Fourth Quarter of 2018

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Supporting Documentation:

Attachment – NDR2__34 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.

Customer Approval for: PCN # 2021-005

- Please check the appropriate box and return this form to Powerex or our manufacturing representative within 30 days.
- According to JEDEC Standard JESD46, a lack of response to this product change notification within 30 days constitutes the customer's acceptance of the change.

We agree with this change and its schedule.

We have objection(s) as noted here:

We request additional information:

Customer:

Signature:

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Recommended Replacements for ND42__21 and ND42__25 SCR/Diode Modules

ND42 Part	Recommended Replacement
ND420621	NDR21634
ND420625	NDR21634
ND420821	NDR21634
ND420825	NDR21634
ND421021	NDR21634
ND421025	NDR21634
ND421221	NDR21634
ND421225	NDR21634
ND421421	NDR21634
ND421425	NDR21634
ND421621	NDR21634
ND421625	NDR21634
ND421821	NDR21834
ND421825	NDR21834
ND422021	To be determined
ND422025	To be determined

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Differences between the ND42__21 modules and NDR2__34 modules include, but are not limited to, the following:

Ratings and Electrical Characteristics:

Characteristic	Symbol	ND42__21 Limit	ND42__21 Test Conditions	NDR2__34 Limit	NDR2__34 Test Conditions
Average Forward Current	$I_{T(AV)}$	210 A	180° Conduction, $T_C=92^\circ\text{C}$	340 A	180° Conduction, $T_C=85^\circ\text{C}$
RMS Forward Current	$I_{T(RMS)}$	330 A	180° Conduction, $T_C=92^\circ\text{C}$	534 A	180° Conduction, $T_C=85^\circ\text{C}$
Peak One Cycle Surge Current, Non-Repetitive	I_{TSM}	10,420 A	60 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	9,000 A	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	I_{TSM}		50 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	8,500 A	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
I^2t for Fusing for One Cycle	I^2t	320,000 A ² sec	60 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	335,000 A ² sec	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	I^2t		50 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	360,000 A ² sec	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
Average Forward Gate Power	$P_{G(AV)}$	3 W		3 W	
Maximum Rate-of-Rise of On-State Current, (Repetitive)	di/dt	800 A/ μs	$T=25^\circ\text{C}$, $V_D=0.67 V_{DRM}$, $I_{TM}=\pi * I_{TAV}$, $I_G=500 \text{ mA}$, $t_{GP} > 6 \mu\text{s}$, $T_r < 0.5 \mu\text{s}$	500 A/ μs	$T= T_{jmax}$, $V_D=0.67 V_{DRM}$, $I_{TM}=2 * I_{TAV}$, Gate Pulse: $I_G=2 \text{ A}$, $t_{GP} > 50 \mu\text{s}$, $di/dt >= 1 \text{ A}/\mu\text{s}$
Storage Temperature	T_{stg}	-40 to +150 °C		-40 to +150 °C	
Repetitive Peak Forward Leakage Current	I_{DRM}	50 mA max	$V=V_{DRM}$, $T_j=130^\circ\text{C}$	40 mA max	$V=V_{DRM}$, $T_j=130^\circ\text{C}$
Repetitive Peak Reverse Leakage Current	I_{RRM}	50 mA max	$V=V_{RRM}$, $T_j=130^\circ\text{C}$	40 mA max	$V=V_{RRM}$, $T_j=130^\circ\text{C}$
Peak On-State Voltage	V_{TM}	1.40 V max	$T_j=25^\circ\text{C}$, $I_{TM}=625 \text{ A}$	1.40 V max	$T_j=25^\circ\text{C}$, $I_{TM}=785 \text{ A}$
Gate Trigger Current	I_{GT}	150 mA max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$	150 mA max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$
Gate Trigger Voltage	V_{GT}	3.0 V max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$	2.0 V max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$
Peak Forward Gate Current	I_{GTM}	4.0 A max	$T_j=25^\circ\text{C}$	6 A max	
Peak Reverse Gate Voltage	V_{GRM}	5 V max.	$T_j=25^\circ\text{C}$	5 V max	
Turn-Off Time	t_q	150 μs typical	$I_{TM}=250\text{A}$, $dV_R/dt=200\text{V}/\mu\text{s}$ Linear to $V_{DR}=80\%V_{DRM}$, $T_j=130^\circ\text{C}$	160 μs typ	$T_j=130^\circ\text{C}$, $dv/dt=50 \text{ V}/\mu\text{s}$, $I_{TM}=325 \text{ A}$, $di/dt=10 \text{ A}/\mu\text{s}$, $V_R=100 \text{ V}$, $V_D=0.67 V_{DRM}$

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Differences between the ND42__25 modules and NDR2__34 modules include, but are not limited to, the following:

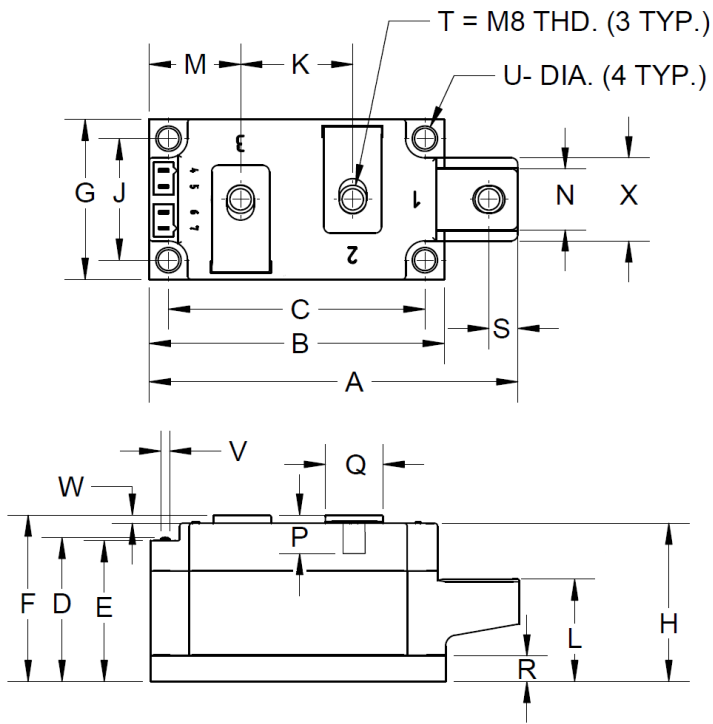
Ratings and Electrical Characteristics:

Characteristic	Symbol	ND42__25 Limit	ND42__25 Test Conditions	NDR2__34 Limit	NDR2__34 Test Conditions
Average Forward Current	$I_{T(AV)}$	250 A	180° Conduction, $T_C=89^\circ\text{C}$	340 A	180° Conduction, $T_C=85^\circ\text{C}$
RMS Forward Current	$I_{T(RMS)}$	393 A	180° Conduction, $T_C=89^\circ\text{C}$	534 A	180° Conduction, $T_C=85^\circ\text{C}$
Peak One Cycle Surge Current, Non-Repetitive	I_{TSM}	12,000 A	60 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	9,000 A	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	I_{TSM}		50 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	8,500 A	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
I^2t for Fusing for One Cycle	I^2t	720,000 A ² sec	60 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	335,000 A ² sec	60 Hz, 0V reappplied, $T_j= T_{jMAX}$
	I^2t		50 Hz, 0V reappplied, $T_j=130^\circ\text{C}$	360,000 A ² sec	50 Hz, 0V reappplied, $T_j= T_{jMAX}$
Average Forward Gate Power	$P_{G(AV)}$	3 W		3 W	
Maximum Rate-of-Rise of On-State Current, (Repetitive)	di/dt	800 A/ μs	$T=25^\circ\text{C}$, $V_D=0.67 V_{DRM}$, $I_{TM}=\pi * I_{TAV}$, $I_G=500 \text{ mA}$, $t_{GP} > 6 \mu\text{s}$, $T_r < 0.5 \mu\text{s}$	500 A/ μs	$T= T_{jmax}$, $V_D=0.67 V_{DRM}$, $I_{TM}=2 * I_{TAV}$, Gate Pulse: $I_G=2 \text{ A}$, $t_{GP} > 50 \mu\text{s}$, $di/dt >= 1 \text{ A}/\mu\text{s}$
Storage Temperature	T_{stg}	-40 to +150 °C		-40 to +150 °C	
Repetitive Peak Forward Leakage Current	I_{DRM}	50 mA max	$V=V_{DRM}$, $T_j=130^\circ\text{C}$	40 mA max	$V=V_{DRM}$, $T_j=130^\circ\text{C}$
Repetitive Peak Reverse Leakage Current	I_{RRM}	50 mA max	$V=V_{RRM}$, $T_j=130^\circ\text{C}$	40 mA max	$V=V_{RRM}$, $T_j=130^\circ\text{C}$
Peak On-State Voltage	V_{TM}	1.30 V max	$T_j=25^\circ\text{C}$, $I_{TM}=625 \text{ A}$	1.40 V max	$T_j=25^\circ\text{C}$, $I_{TM}=785 \text{ A}$
Gate Trigger Current	I_{GT}	150 mA max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$	150 mA max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$
Gate Trigger Voltage	V_{GT}	3.0 V max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$	2.0 V max	$T_j=25^\circ\text{C}$, $V_D=12\text{V}$
Peak Forward Gate Current	I_{GTM}	4.0 A max	$T_j=25^\circ\text{C}$	6 A max	
Peak Reverse Gate Voltage	V_{GRM}	5 V max.	$T_j=25^\circ\text{C}$	5 V max	
Turn-Off Time	t_q	150 μs typical	$I_{TM}=250\text{A}$, $dV_R/dt=200\text{V}/\mu\text{s}$ Linear to $V_{DR}=80\%V_{DRM}$, $T_j=130^\circ\text{C}$	160 μs typ	$T_j=130^\circ\text{C}$, $dv/dt=50 \text{ V}/\mu\text{s}$, $I_{TM}=325 \text{ A}$, $di/dt=10 \text{ A}/\mu\text{s}$, $V_R=100 \text{ V}$, $V_D=0.67 V_{DRM}$

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Mechanical differences between the ND42 modules and NDR2__34 modules include, but are not limited to, the following:



Dimension	ND42 (mm)	NDR2 (mm)
A	116	115
B	93	92
D	55.1	45
E	52.3	44
H	48.3	49.5
J	38.1	38
N	18	19
P	14.5	12
Q	15.9	18
R	10	8
S	8.9	9
U	6.35	6.5
W	3	2.5
X	N/A	26