

## NRND

## DC/DC Ultra Wide Input Converter UCU 15 Series



- \* I/O isolation of 150Vdc
- \* Pi-filter at input
- \* Continuous short circuit proof
- \* Efficiency up to 84%
- \* No derating up to 71°C
- \* Low output ripple and noise
- \* Low silhouette
- \* Metal case with a non conductive base plate, six-sides shielded
- \* Shut down and output adjust functions standard
- \* Safety Meets IEC/EN/UL 62368-1

**CE** **UL** **US**  
E195564

### Product Range

| Model         | Input<br>nominal | Input<br>range | lin @ Uin nom.<br>full load | lin @ Uin nom.<br>no load | Uout   | Output<br>Iout max. | Efficiency<br>typ. | Max.<br>capacity |
|---------------|------------------|----------------|-----------------------------|---------------------------|--------|---------------------|--------------------|------------------|
| <b>Single</b> |                  |                |                             |                           |        |                     |                    |                  |
| UCU24-0315    | 24Vdc            | 9...36Vdc      | 545mA                       | 15mA                      | 3.3Vdc | 3000mA              | 10W                | 76%              |
| UCU24-0515    | 24Vdc            | 9...36Vdc      | 810mA                       | 15mA                      | 5.0Vdc | 3000mA              | 15W                | 77%              |
| UCU24-1215    | 24Vdc            | 9...36Vdc      | 780mA                       | 15mA                      | 12Vdc  | 1250mA              | 15W                | 80%              |
| UCU24-1515    | 24Vdc            | 9...36Vdc      | 780mA                       | 15mA                      | 15Vdc  | 1000mA              | 15W                | 80%              |
| UCU48-0315    | 48Vdc            | 18...72Vdc     | 270mA                       | 10mA                      | 3.3Vdc | 3000mA              | 10W                | 76%              |
| UCU48-0515    | 48Vdc            | 18...72Vdc     | 410mA                       | 10mA                      | 5.0Vdc | 3000mA              | 15W                | 77%              |
| UCU48-1215    | 48Vdc            | 18...72Vdc     | 390mA                       | 10mA                      | 12Vdc  | 1250mA              | 15W                | 80%              |
| UCU48-1515    | 48Vdc            | 18...72Vdc     | 390mA                       | 10mA                      | 15Vdc  | 1000mA              | 15W                | 80%              |

**Not Recommended for New Design**

## Dual

|              |       |            |       |      |                    |                    |              |     |
|--------------|-------|------------|-------|------|--------------------|--------------------|--------------|-----|
| UCU24-050515 | 24Vdc | 9...36Vdc  | 810mA | 20mA | +5.0Vdc<br>-5.0Vdc | +1500mA<br>-1500mA | 7.5W<br>7.5W | 77% |
| UCU24-121215 | 24Vdc | 9...36Vdc  | 780mA | 20mA | +12Vdc<br>-12Vdc   | +625mA<br>-625mA   | 7.5W<br>7.5W | 80% |
| UCU24-151515 | 24Vdc | 9...36Vdc  | 780mA | 20mA | +15Vdc<br>-15Vdc   | +500mA<br>-500mA   | 7.5W<br>7.5W | 80% |
| UCU48-050515 | 48Vdc | 18...72Vdc | 400mA | 15mA | +5.0Vdc<br>-5.0Vdc | +1500mA<br>-1500mA | 7.5W<br>7.5W | 79% |
| UCU48-121215 | 48Vdc | 18...72Vdc | 380mA | 15mA | +12Vdc<br>-12Vdc   | +625mA<br>-625mA   | 7.5W<br>7.5W | 82% |
| UCU48-151515 | 48Vdc | 18...72Vdc | 380mA | 15mA | +15Vdc<br>-15Vdc   | +500mA<br>-500mA   | 7.5W<br>7.5W | 82% |

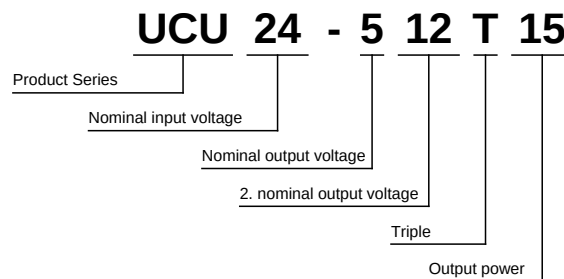
## Triple

|              |       |            |       |      |                            |                            |                        |     |
|--------------|-------|------------|-------|------|----------------------------|----------------------------|------------------------|-----|
| UCU24-512T15 | 24Vdc | 9...36Vdc  | 780mA | 20mA | 5.0Vdc<br>+12Vdc<br>-12Vdc | 1500mA<br>+310mA<br>-310mA | 7.5W<br>3.75W<br>3.75W | 80% |
| UCU24-515T15 | 24Vdc | 9...36Vdc  | 780mA | 20mA | 5.0Vdc<br>+15Vdc<br>-15Vdc | 1500mA<br>+250mA<br>-250mA | 7.5W<br>3.75W<br>3.75W | 80% |
| UCU48-512T15 | 48Vdc | 18...72Vdc | 380mA | 15mA | 5.0Vdc<br>+12Vdc<br>-12Vdc | 1500mA<br>+310mA<br>-310mA | 7.5W<br>3.75W<br>3.75W | 82% |
| UCU48-515T15 | 48Vdc | 18...72Vdc | 380mA | 15mA | 5.0Vdc<br>+15Vdc<br>-15Vdc | 1500mA<br>+250mA<br>-250mA | 7.5W<br>3.75W<br>3.75W | 82% |

Notes:

Measured at nominal input voltage

## Nomenclature



## Specifications

All values refer to an ambient temperature of 25°C and nominal rated values where nothing else is specified.

### Input Specifications

| Characteristic                   | Conditions      | min       | typ     | max   | unit             |
|----------------------------------|-----------------|-----------|---------|-------|------------------|
| $U_{IN}$ Input voltage           | $T_A < T_{MAX}$ | See       | product | range | Vdc              |
| $U_{UVLO}$ Under voltage lockout |                 |           |         |       | Vdc              |
| Max. input current at full load  |                 | See       | product | range | A                |
| No load input current            | $I_o = 0$       | See       | product | range | mA               |
| Inrush current                   |                 |           |         |       | A <sup>2</sup> s |
| Input surge voltage              |                 | 24V / 48V |         |       | Vdc              |

## Output Specifications

| Characteristic |                              | Conditions | min                                 | typ   | max | unit   |
|----------------|------------------------------|------------|-------------------------------------|-------|-----|--------|
| $U_{ACC}$      | Output voltage accuracy      |            | Single:±1, Dual:±1/±3, Triple:±2/±3 |       |     | %      |
|                | Output voltage adjust        |            |                                     |       |     | %      |
|                | Line regulation              |            | Single/Dual: ±0.2, Triple: ±1       |       |     | %      |
|                | Load regulation              |            | Single/Dual: ±0.2, Triple: ±1       |       |     | %      |
|                | Cross regulation             |            |                                     |       |     | %      |
|                | Load transient recovery time |            |                                     |       | 500 | us     |
|                | Load transient error band    |            |                                     |       | 1   | %      |
|                | Temperature coefficient      |            |                                     | ±0.02 |     | %/K    |
|                | Ramp up time                 |            |                                     |       |     | ms     |
|                | Start up time                |            |                                     | 300   |     | ms     |
|                | Ripple and noise             |            | 75                                  |       |     | mVpp   |
|                | Current limit                |            |                                     |       |     | % Inom |
|                | Over voltage protection      |            |                                     |       |     | % Unom |
|                | Short circuit protection     |            |                                     |       |     | % Inom |
|                | Short circuit characteristic |            | continuous                          |       |     |        |

## General Specifications

| Characteristic |                      | Conditions                | min                       | typ | max | unit |
|----------------|----------------------|---------------------------|---------------------------|-----|-----|------|
| $U_{ISO}$      | Isolation voltage    | in/out, in/case, out/case | 500                       |     |     | Vdc  |
| $R_{ISO}$      | Isolation resistance |                           | > 1G                      |     |     | Ohm  |
| $C_{ISO}$      | Isolation capacity   |                           | 1000                      |     |     | pF   |
| $F_{SW}$       | Switching frequency  |                           | 300                       |     |     | kHz  |
|                | Approvals            |                           |                           |     |     |      |
|                | Safety Approvals     |                           | UL / cUL File No. E195564 |     |     |      |
|                | MTBF                 |                           | >1'300'000                |     |     | h    |
|                | Case material        |                           | Copper, black coated      |     |     |      |
|                | Compound material    |                           | UL 94V-0                  |     |     |      |
|                | PCB material         |                           | UL 94V-0                  |     |     |      |
|                | Weight               |                           | 57                        |     |     | gr   |
|                | Dimensions           |                           | 50.8 x 50.8 x 10.2        |     |     | mm   |
|                | Soldering infos      |                           | 275°C for 10              |     |     | s    |

## EMC Specifications

| Characteristic |               | Conditions          |                     |
|----------------|---------------|---------------------|---------------------|
|                | EMC conducted | See EMC information | EN 55022/11 Class A |

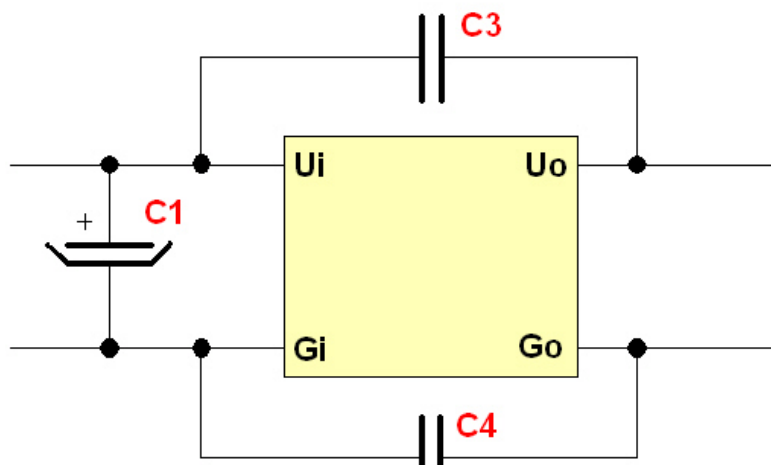
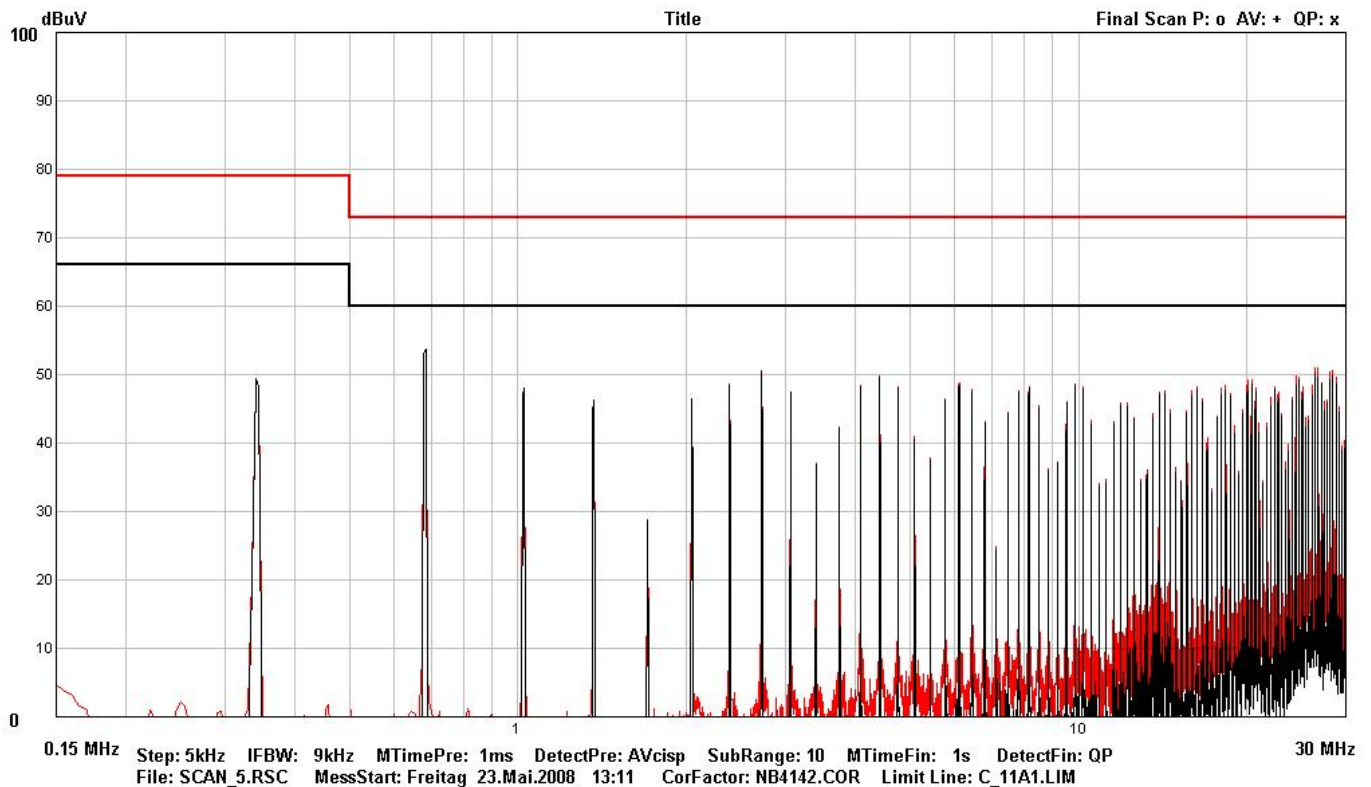
## Environmental Specifications

| Characteristic   |                        | Conditions              | min        | typ | max | unit |
|------------------|------------------------|-------------------------|------------|-----|-----|------|
| T <sub>AMB</sub> | Operation temperature  | Max. case temp. < 100°C | -25...+70  |     |     | °C   |
| T <sub>AMB</sub> | Storage temperature    |                         | -40...+100 |     |     | °C   |
| T <sub>SD</sub>  | Thermal shutdown range |                         | -          |     |     | °C   |

Own notes

# EMC information

EMC emissions conducted, EN 55022/11 Class A, Example:

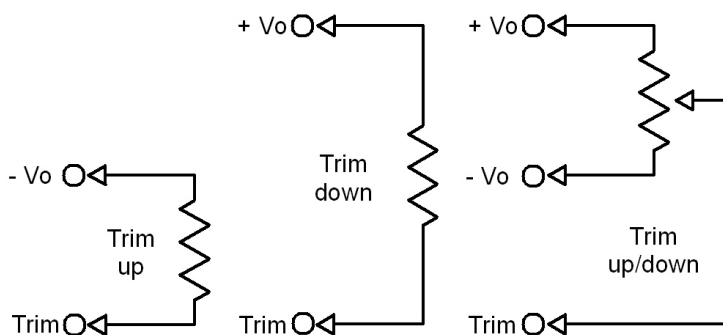


This was achieved with the following filter:

Input: 24V  
C1 100uF

Input: 48V  
C1 100uF  
C2 680pF ceramic disk  
C3 680pF ceramic disk

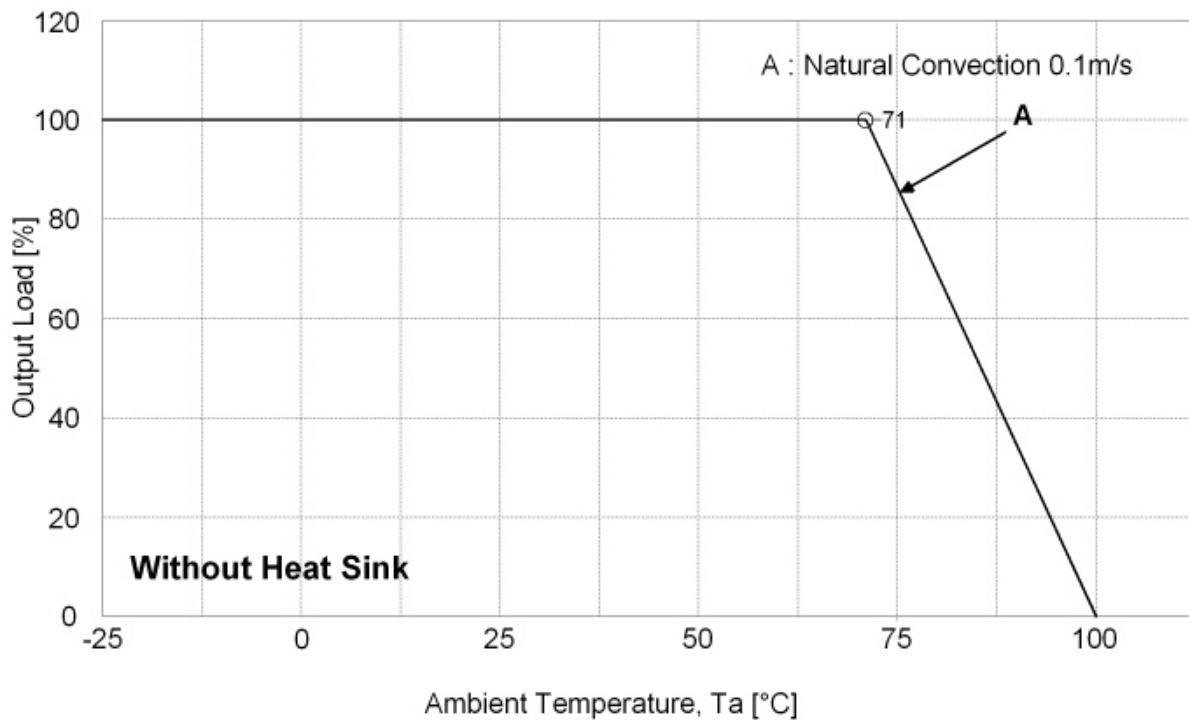
## Trimming



**Not Recommended for New Design**

## Derating

The operating case temperature range of UCU 15 series is -25...+70°C. When operating the UCU 15 series, proper derating or cooling is needed. The following curves are the derating curves of UCU 15. Please note that these are relative values in a test environment. Ambient temperature can not be exactly defined in an application, only the case temperature. Please ask the factory for a suitable heat sink.



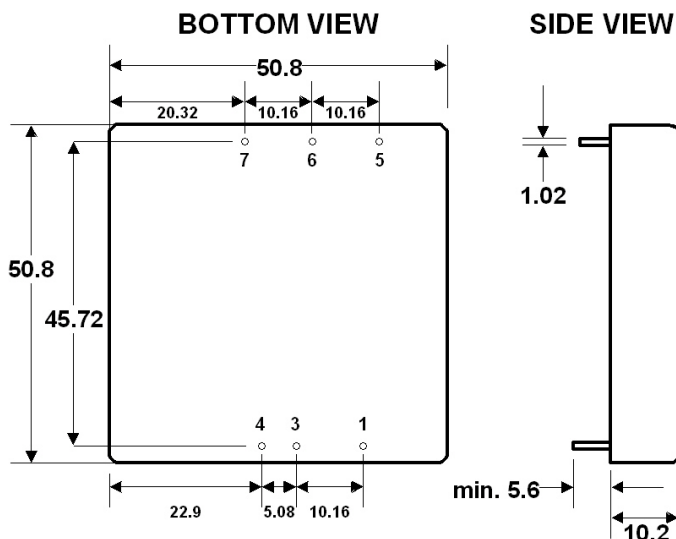
## Own notes

## Case

Normal tolerance 1/10  $\pm 0.5$  mm, 1/100  $\pm 0.25$  mm; Pin tolerance  $\pm 0.05$  mm diameter

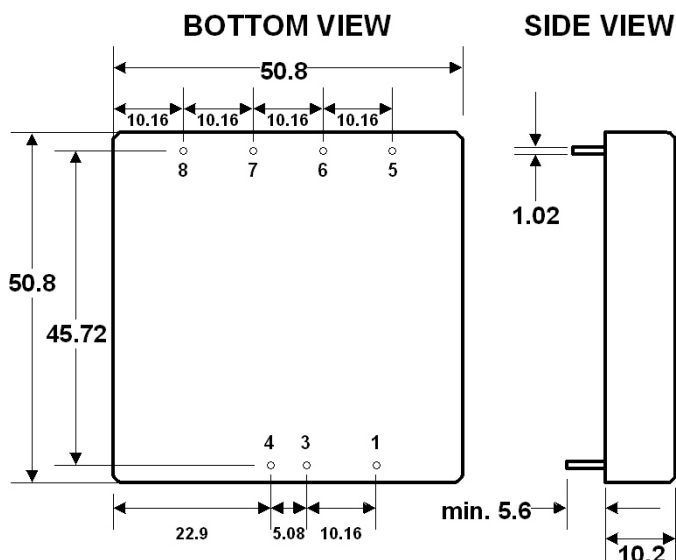
NP = No pin, NC = Not connected, NA = Not available for electrical contact, do not connect, (opt) = optional

single output C5



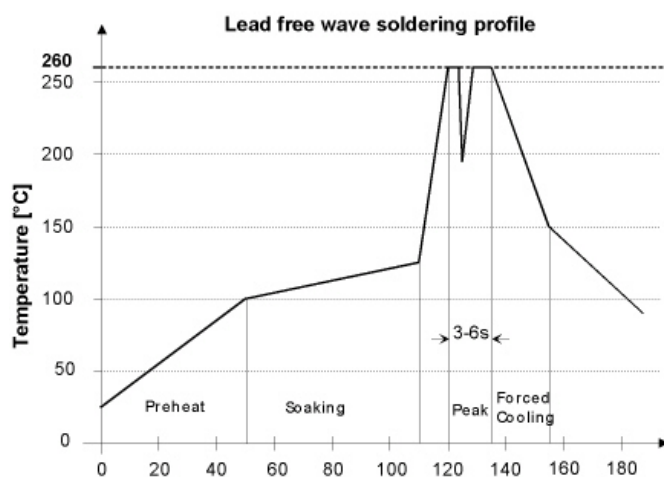
| Pin | Single |
|-----|--------|
| 1   | on/off |
| 3   | -Vi    |
| 4   | +Vi    |
| 5   | Trim   |
| 6   | -Vo    |
| 7   | +Vo    |

Dual & triple output C6/C7



| Pin | Single | Dual   | Triple | Pin |
|-----|--------|--------|--------|-----|
| 1   |        | on/off | on/off | 1   |
| 3   |        | -Vi    | -Vi    | 3   |
| 4   |        | +Vi    | +Vi    | 4   |
| 5   |        | Trim   | -Vo2   | 5   |
| 6   |        | -Vo    | Com    | 6   |
| 7   |        | Com    | +5Vo   | 7   |
| 8   |        | +Vo    | +Vo2   | 8   |

## Soldering



1. Soldering Materials: Sn/Cu/Ni
2. Preheat: 1.4 °C/s (From 30°C to 100°C)
3. Soaking: 0.5 °C/s (From 100°C to 130°C), 60  $\pm$  20s
4. Peak temperature: 260°C, above 250°C 3~6s
5. Forced cooling: -10.0 °C/s (From 260°C to 150°C)

**Not Recommended for New Design**

## Cleaning

The modules are cleanable with the today's known and in the electronics industry usually used products. Due to the different cleaning processes and new available products, we highly recommend to do a compatibility test when using the converters the first time.

## Own notes

Notice: All statements, technical information, and recommendations related to FABRIMEX's products are based on information believed to be reliable, but the accuracy or completeness thereof is not guaranteed. Before utilizing the product, the user should determine the suitability of the product for its intended use.

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The logo for EXISTA, featuring the word "EXISTA" in a bold, sans-serif font. The "E" is dark blue, and the "XISTA" part is a lighter blue/cyan color.