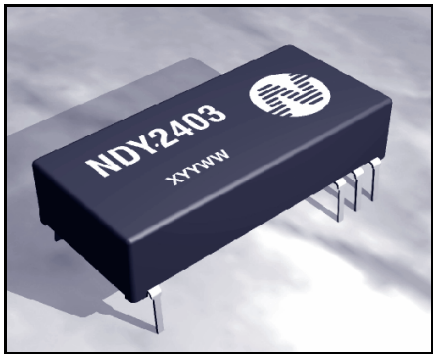
C&D TECHNOLOGIES
Power Solutions

# LOW VOLTAGE NDY SERIES

Isolated 3W Wide Input DC-DC Converters




## FEATURES

- Industry Standard Footprint
- 1kVDC Isolation
- Single Isolated Output
- Short Circuit Protection
- Low Profile 24 Pin Case
- Efficiency to 71%
- Power Density 0.90W/cm$^3$
- 2:1 Wide Input Range
- 24V & 48V Input
- 3.3V Output
- Footprint 4.73cm$^2$
- Operating Temperature Range -40°C to +85°C
- Load and Line Regulation <1%
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated
- Customs Solutions Available

## DESCRIPTION

The NDY series is a range of low profile DC-DC converters offering a single regulated output over a 2:1 input voltage range. All parts deliver 3W output power up to 85°C without heatsinking. A flyback oscillator design with isolated feedback is used to give regulation over the full operating range of 25% to 100% of full load. It is strongly recommended that external capacitors be used on input and output to guarantee performance over full load and input voltage range. Connection pins are formed from a tin plated alloy 42 leadframe.

## SELECTION GUIDE

| | Nominal Input Voltage | Rated Output Voltage | Output Current | | Input Current | Power Consumption | Efficiency | Isolation Capacitance | MTTF[3] |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min Load | Full Load | Full Load | 0% Load | | | |
| Order Code | (V) | (V) | (mA) | (mA) | (mA) | (mA) | (%) | (pF) | kHrs |
| **NDY2403** | 24 | 3.3 | 227 | 909 | 178 | 110 | 70 | 30 | 1671 |
| **NDY4803** | 48 | 3.3 | 227 | 909 | 87 | 120 | 71 | 30 | 1676 |

## INPUT CHARACTERISTICS[1]

| Parameter | Conditions | MIN | TYP | MAX | Units |
|---|---|---|---|---|---|
| Voltage Range | NDY2403 | 18 | 24 | 36 | V |
| | NDY4803 | 36 | 48 | 72 | |
| Reflected Ripple Current | NDY2403 | | 180 | 360 | mA p-p |
| | NDY4803 | | 140 | 290 | |

## OUTPUT CHARACTERISTICS

| Parameter | Conditions | MIN | TYP | MAX | Units |
|---|---|---|---|---|---|
| Rated Power | | | | 3 | W |
| Voltage Set Point Accuracy | With external input/output capacitors, refer to in-house test circuit | | ±1.5 | ±5.0 | % |
| Line Regulation | Low line to high line, with external input/output capacitors, refer to to in-house test circuit | | 0.05 | 0.25 | % |
| Load Regulation | 25% load to 100% load, with external input/output capacitors, refer to to in-house test circuit | | 0.6 | 0.5 | % |
| Ripple[2] | BW = 20Hz to 300kHz With external input/output capacitors, refer to to in-house test circuit | | 80 | 120 | mV rms |
| Noise & Ripple | BW = DC to 100MHz With external input/output capacitors, refer to to recommended test circuit | | | 180 | mV p-p |

## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Short-circuit protection | continuous |
| Input voltage 24 types | 40V |
| Input voltage 48 types | 80V |
| Lead temperature 1.5mm from case for 10 seconds | 300°C |
| Minimum Load | 25% of rated load |
| Internal Dissipation | 1.7W |

## ISOLATION CHARACTERISTICS

| Parameter | Conditions | MIN | TYP | MAX | Units |
|---|---|---|---|---|---|
| Isolation Test Voltage | Flash tested for 1 second | 1000 | | | VDC |
| Resistance | Viso=1000VDC | 1 | | | GΩ |

## GENERAL CHARACTERISTICS

| Parameter | Conditions | MIN | TYP | MAX | Units |
|---|---|---|---|---|---|
| Switching Frequency | 100% load $V_{IN}$ nominal | 160 | | 220 | kHz |
| | 25% load $V_{IN}$ nominal | 290 | | 560 | |

## ENVIRONMENTAL

| Parameter | Conditions | MIN | TYP | MAX | Units |
|---|---|---|---|---|---|
| Operation | | –40 | | 85 | °C |
| Storage | | –50 | | 130 | °C |
| Cooling | Free air convection | | | | |

1 Measured at full load with external input/output capacitors, refer to in-house test circuit.
2 For lower ripple refer to recommended circuit for reduced ripple in application notes.
3 Calculated using MIL-HDBK-217F with nominal input voltage at full load.
All specifications typical at $T_A$=25°C, nominal input voltage and rated output current unless otherwise specified.

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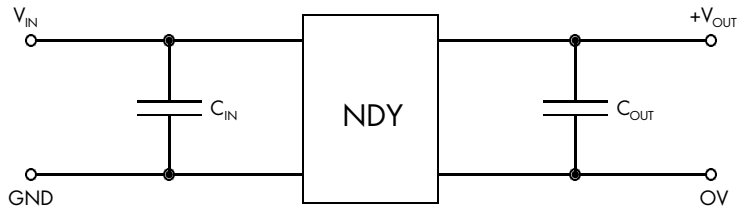
## RECOMMENDED TEST CIRCUIT

### EXTERNAL CAPACITANCE

Although these converters will work without external capacitors, they are necessary in order to guarantee the full parametric performance over the full line and load range. All parts have been tested and characterised using the following values and test circuit.

### IN-HOUSE TEST CIRCUIT

| Value | |
|---|---|
| $C_{IN}$ | $C_{OUT}$ |
| 10µF, 200V<br>Philips Part Number 151621809 | 100µF, 25V<br>Philips Part Number 13556101 |

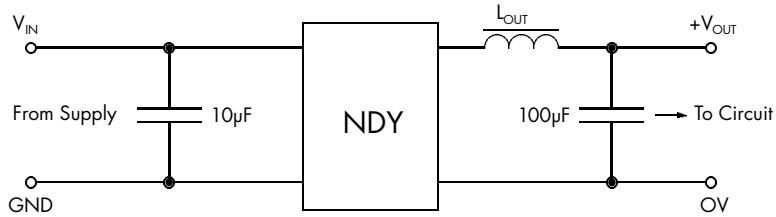



### OUTPUT LOAD

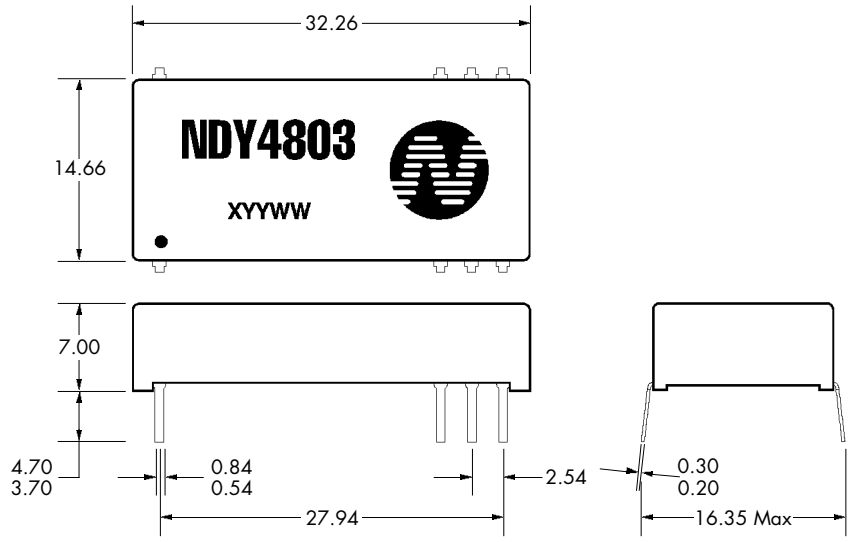
The minimum rated load across the whole input voltage range is 25% of the full load output. It is important to take care that the load does not fall below this as the output ripple will greatly increase. While this condition will not harm the device the resultant increase in output ripple could cause customers' application to malfunction.

### RECOMMENDED CIRCUIT FOR REDUCED RIPPLE

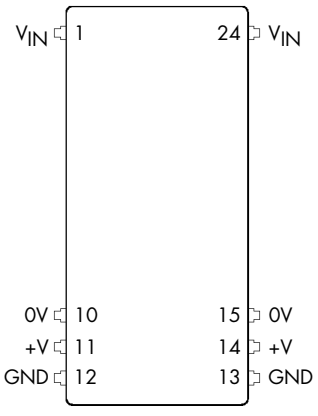
| Value | |
|---|---|
| $C_{IN}$ & $C_{OUT}$ | $L_{OUT}$ |
| Any good low esr capacitors | C&D Technologies (NCL) Ltd Part No 24100 |




## MECHANICAL DIMENSIONS




**PIN CONNECTIONS (TOP VIEW)**




Weight: 6.7g

All dimensions in mm XX.XX ± 0.25mm



Instructions for use are available from www.dc-dc.com

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