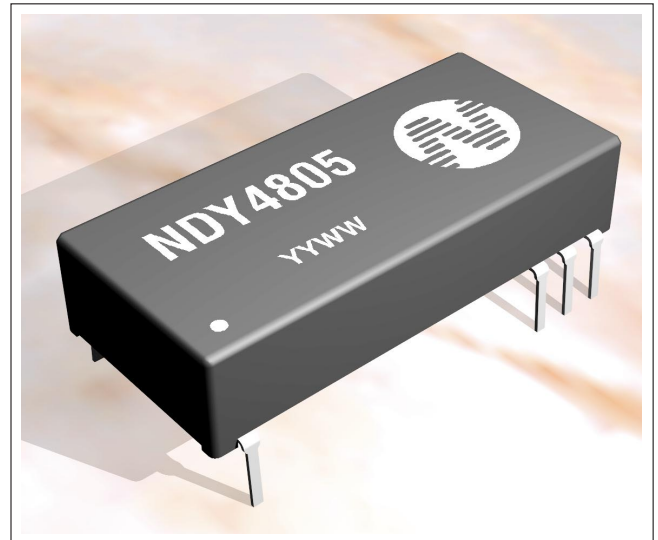


features

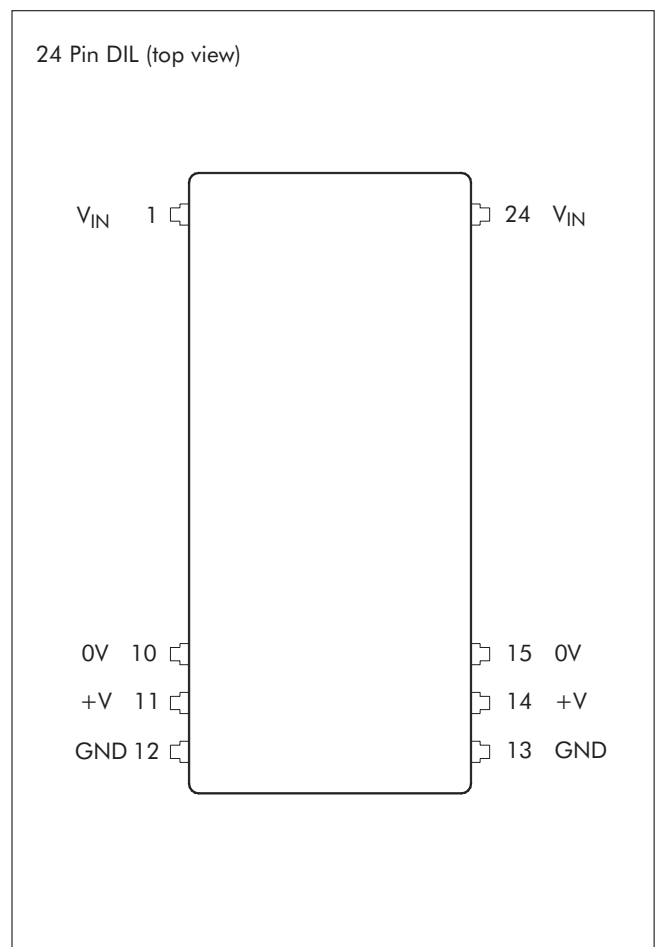
- Industry Standard Footprint
- 1kVDC Isolation
- Single Isolated Output
- Short Circuit Protection
- Low Profile 24 Pin Case
- Efficiency to 83%
- Power Density 0.90W/cm³
- 2:1 Wide Input Range
- 5V, 12V, 24V & 48V Input
- 5V, 9V, 12V & 15V Output
- Footprint 4.73cm²
- UL 94V-0 Package Materials
- Operating Temperature Range 40°C to 85°C
- Load and Line Regulation <1%
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated
- Custom 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, except the 4.5V to 9V input voltage range which should be derated to 2W at the lower input voltage. 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 (see application notes for recommended values). The plastic case and encapsulant materials are rated to UL 94V-0 and the connection pins are formed from a tin plated alloy 42 leadframe.



pin connections



PRELIMINARY

Notice : This is not a final specification.
Some parametric limits may be subject to change.

NDY SERIES

Isolated 3W Wide Input Single Output DC-DC Converters

absolute maximum ratings

Short-circuit protection	continuous
Input voltage 05 types	10V
Input voltage 12 types	20V
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 output

family characteristics - input

Specifications typical at T_A = 25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MAX	Units
Voltage range	All NDY05 types	4.5	5	9	VDC
	All NDY12 types	9	12	18	
	All NDY24 types	18	24	30	
	All NDY48 types	30	48	60	
Output ripple Current	All NDY05 types when 100μA at input		400	500	mA p-p
	All NDY12 types when 100μA at input		150	200	
	All NDY24 types when 10μA at input		290	300	
	All NDY48 types when 10μA at input		100	120	

Isolated 3W Wide Input Single Output DC-DC Converters

family characteristics - output

Specifications typical at T_A 25°C, nominal input voltage and rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MA	Units
Rated Power	All NDY05 types when V _{IN} 4.5 to V	see derating curve			W
	All NDY05 types when V _{IN} to 9V			3	
	All NDY12, 24 and 48 types)			3	
Voltage Set Point Accuracy	With external input output capacitors, refer to recommended test circuit		±1	±5	%
Efficiency (Full load)	With external input output capacitors, refer to recommended test circuit	see electrical specifications			%
Efficiency (IN load)		0	5	0	
Line Regulation	Low line to high line, With external input output capacitors, refer to recommended test circuit		0.05	0.5	%
Load Regulation	25% load to 100% load, With external input output capacitors, refer to recommended test circuit		0.2	0.5	%
Ripple	W 20 to 300k With external input output capacitors, refer to recommended test circuit		5	10	mV rms
Noise	W DC to 100 With external input output capacitors, refer to recommended test circuit		50	100	mV p-p

family characteristics - isolation

Specifications typical at T_A 25°C, nominal input voltage rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MA	Units
Isolation Test Voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso 500VDC	1			GΩ

family characteristics - general

Specifications typical at T_A 25°C, nominal input voltage rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MA	Units
Switching Frequency	100% load, V _{IN} nominal	80		220	k
	25% load, V _{IN} nominal	290		50	
Package Weight			.2		g

NDY SERIES

Isolated 3W Wide Input Single Output DC-DC Converters

family characteristics - temperature

specifications typical at T_A 25°C, nominal input voltage rated output current unless otherwise specified.

Parameter	Conditions	MIN	TYP	MA	Units
operation		-40		85	°C
storage		-50		130	°C

electrical specifications

specifications typical at T_A 25°C, nominal input voltage at full load unless otherwise specified.

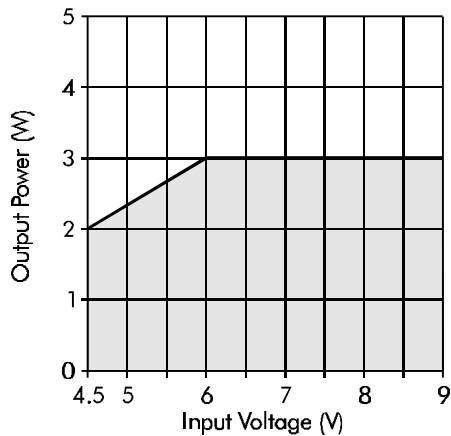
Order Code	Nominal Input Voltage	Rated Output Voltage	Output Current ¹		Input Current	Efficiency ²	Isolation Capacitance
			MIN Load	Full Load	Full Load		
	(V)	(V)	(mA)	(mA)	(mA)	(%)	(p)
NDY0505	5	5	100 - 150	400 - 00	15	5	40
NDY0509	5	9	55 - 83	222 - 333	5 3	1	52
NDY0512	5	12	42 - 2	1 - 250	548	3	43
NDY0515	5	15	33 - 50	133 - 200	533	5	44
NDY1205	12	5	150	00	3 2	9	3
NDY1209	12	9	83	333	320	8	52
NDY1212	12	12	2	250	31	9	44
NDY1215	12	15	50	200	308	81	4
NDY2405	24	5	150	00	1 4	2	3
NDY2409	24	9	83	333	15	80	52
NDY2412	24	12	2	250	154	81	44
NDY2415	24	15	50	200	150	83	54
NDY4805	48	5	150	00	8	2	35
NDY4809	48	9	83	333	8	80	52
NDY4812	48	12	2	250		81	44
NDY4815	48	15	50	200		82	53

¹ refer to power derating graph.

² measured at full load with external input output capacitors, refer to recommended test circuit.

typical characteristics

NDY05 series power derating curve



Note : All data taken at T_A 25°C.

terminology

line regulation

The percentage change in output voltage between low input voltage and high input voltage, measured with fixed output load

ie. A 5V output part with an output voltage of 5.05V high input voltage and 5.03V low input voltage would have a line regulation of 0.4%.

line regulation

$$\frac{V_{OUT} (Low Input V) - V_{OUT} (High Input V)}{V_{OUT} (Nominal)} \times 100\%$$

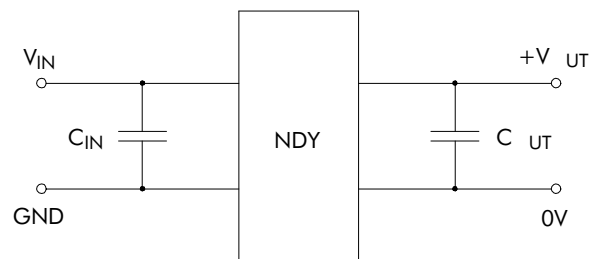
Where V_{UT} (Nominal) is 5V.

application notes

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 recommended values and test circuit.

recommended test circuit



Input Voltage	Capacitance Value	
	C _{IN}	C _{OUT}
5V & 12V	100μ , 25V Philips Part No. 1355 101	100μ , 25V Philips Part No. 1355 101
24V & 48V	10μ , 200V Philips Part No. 151 2109	

output load

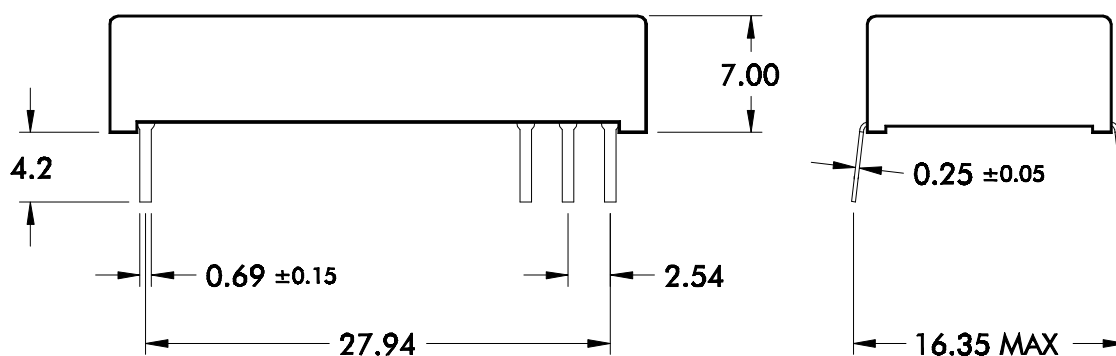
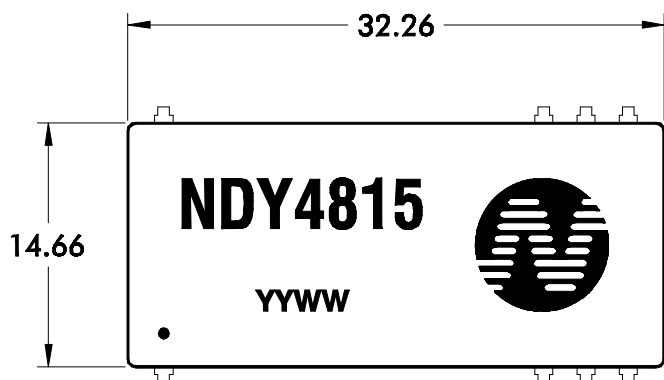
The minimum rated load across the whole input voltage range is 25% of the full load output. It is important to take care that the load does not fall below this as the output ripple will greatly increase. If a lower output power version is required then try using the NDL series of 2W wide input DC-DC converters or contact Newport Components for a custom part.

NDY SERIES

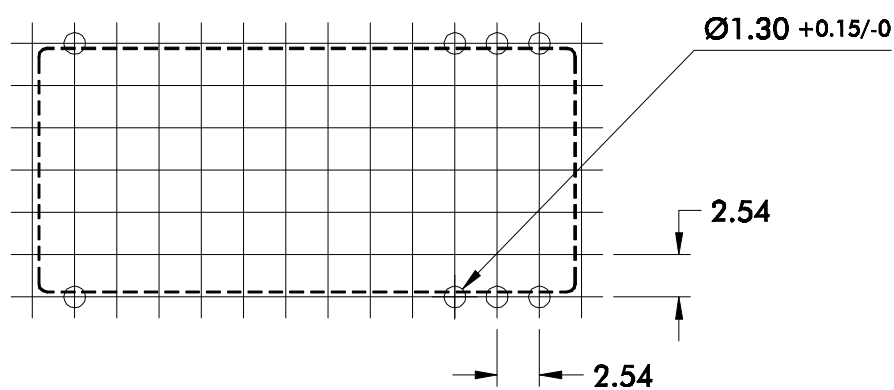
Isolated 3W Wide Input Single Output DC-DC Converters

outline dimensions

24 Pin DIL package style



recommended footprint details



All pins on a 2.54mm pitch.

All dimensions in mm . ±0.50, . ±0.25.