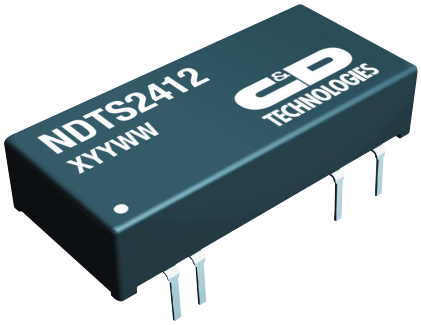
NDTS SERIES

Isolated 3W Single Output DC/DC Converters



FEATURES

- Industry Standard Footprint
- Single Isolated Output
- Short Circuit Protection
- Operating temperature range –40°C to +85°C
- Low profile 24 Pin Case
- Efficiency to 78%
- 2:1 Wide Input Range
- 24V & 48V Input
- 3.3V, 5V, 12V & 15V Output
- Footprint 4.73cm²
- UL94V-0 Package Materials
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated

DESCRIPTION

The NDTS 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 (see recommended filter circuit for 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.

SELECTION GUIDE

Order Code	Input Voltage	Rated Output Voltage	Output Current		Input Current	Efficiency (min)	Isolation Capacitance	MTTF[2]
			Min Load	Full Load				
	V (nom.)	V	mA	mA	mA	%	pF	kHrs
NDTS2403	24	3.3	227	909	172	71	32	1671
NDTS2405	24	5	150	600	156	78	32	1673
NDTS2412	24	12	63	250	149	80	35	1650
NDTS2415	24	15	50	200	147	84	35	1617
NDTS4803	48	3.3	227	909	87	71	32	1676
NDTS4805	48	5	150	600	83	75	32	1668
NDTS4812	48	12	63	250	76	80	40	1631
NDTS4815	48	15	50	200	75	80	40	1600

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	All NDTS24 types	18	24	36	V
	All NDTS48 types	36	48	72	
Reflected ripple current[1]	All NDTS24 types		40	50	mA p-p
	All NDTS48 types		30	40	

OUTPUT CHARACTERISTICS

Parameter	Conditions		Min.	Typ.	Max.	Units
Voltage set point accuracy	With external input/output capacitors			±1	±3	%
Line regulation	Low line to high line with external input/ output capacitors			0.15	0.5	%
Load regulation	Minimum load to rated load with external input/ output capacitors	3.3V & 5V outputs		0.8	1.2	%
		12V & 15V outputs		0.1	0.5	%
Ripple	BW = 20Hz to 300kHz with external input/ output capacitors			15	30	mV rms
Ripple & noise	BW = DC to 20MHz with external input/ output capacitors			90	150	mV p-p

GENERAL CHARACTERISTICS

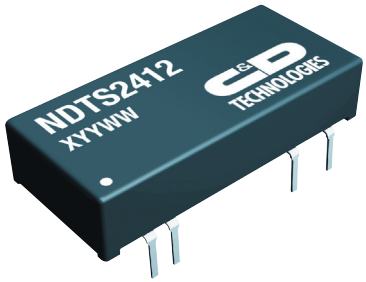
Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	100% to 25% load, V_{IN} min to max	100		590	kHz

ABSOLUTE MAXIMUM RATINGS

Short-circuit protection	Continuous
Lead temperature 1.5mm from case for 10 seconds	300°C
Minimum output load for specification[1]	25% of rated output
Input voltage 24 types	40V
Input voltage 48 types	80V
Free air space	10mm min. around component

1. Please refer to relected ripple current measurement circuit on page 2.
2. Calculated using MIL-HDBK-217F with nominal input voltage at full load (ground benign) at 25°C.

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



ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Flash tested for 1 second	1000			VDC
Resistance	Resistance	1			GΩ

TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Operation		-40		85	°C
Storage		-50		130	

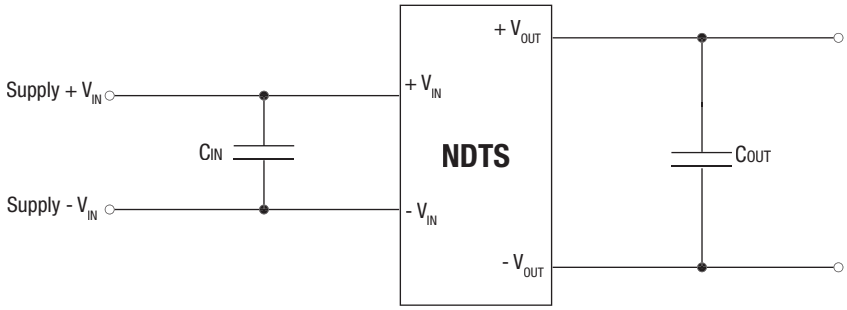
APPLICATION NOTES

Recommended Input & Output Capacitors

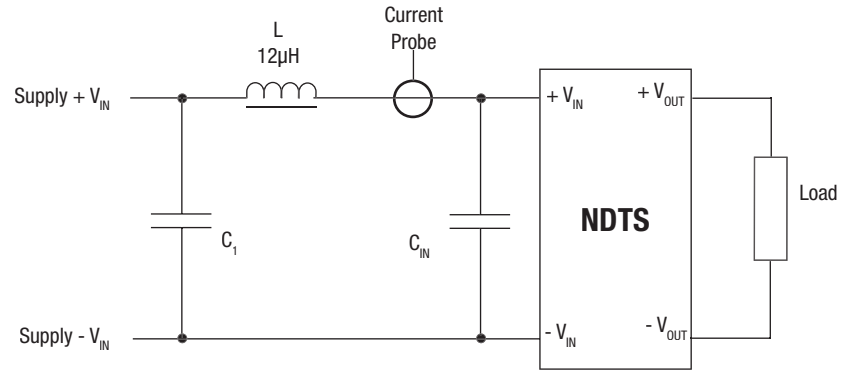
Although these converters will work without external capacitors, they are necessary in order to guarantee the full parametric performance over the full line and load range. All parts have been tested and characterized using the following values and test circuit.

Output Voltage	Value	
V	CIN	COUT
3.3 & 5	10µF, 100V	220µF, 16V
12 & 15	10µF, 100V	100µF, 25V

Test circuit



Reflected Ripple Current Measurement



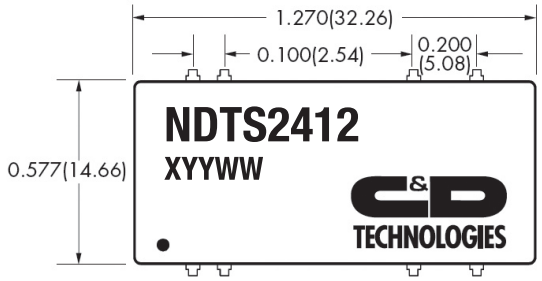
C_1 = 220µF, ESR < 0.1 Ω at 100kHz

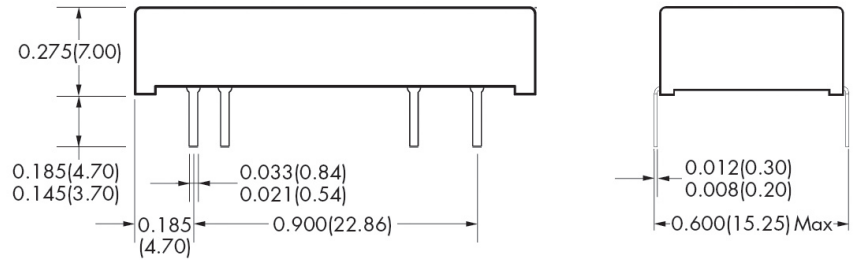
OUTPUT LOAD

The minimum rated load across the whole input voltage range is 25% of the full load output. It is important to take care and that 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.

PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS





Weight: 6.0g Typ

Unless otherwise stated all dimensions in inches ±0.010 (mm ±0.25mm).

PIN CONNECTIONS

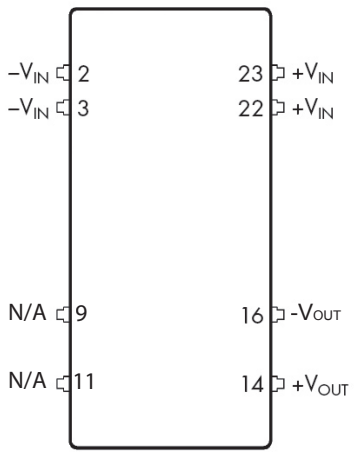
Pin	Function
2	$-V_{IN}$
3	$-V_{IN}$
9	N/A
11	N/A
14	$+V_{OUT}$
16	$-V_{OUT}$
22	$+V_{IN}$
23	$+V_{IN}$

N/A - Not available for electrical connection

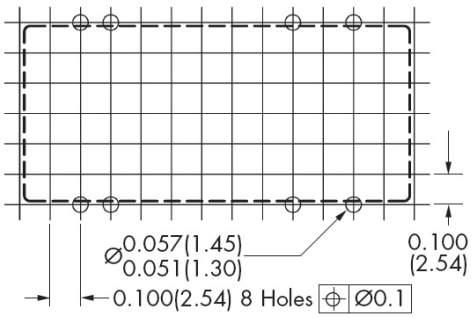
All pins on a 0.1(2.54) pitch and within ±0.01(0.25) of true position.

Unless otherwise stated all dimensions in inches(mm) ±0.01(0.25).

PIN CONNECTIONS

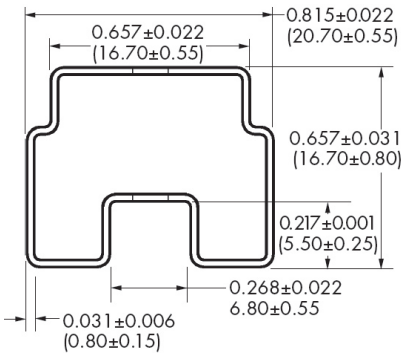


RECOMMENDED FOOTPRINT DETAILS



All pins on a 0.100(2.54) pitch and within 0.010(0.25) of true position.

TUBE OUTLINE DIMENSIONS



Tube Length: 20.472±0.79(520mm±2mm)
Tube Material: Antistatic coasted clear pvc.

PACKAGING DETAILS

Order Code	Packaging Style	Qty
NDTSXXXX	Tube	15

C&D TECHNOLOGIES

C&D Technologies (NCL) Ltd
Tanners Drive, Blakelands North
Milton Keynes MK14 5BU, UK

Tel: +44 (0)1908 615232
Fax: +44 (0)1908 617545
email: info@cdtechno-ncl.com

C&D Technologies, Inc.
3400 E Britannia Drive, Tucson,
Arizona 85706, USA

Tel: +1 (800) 547-2537
Fax: +1 (520) 741-4598
email: pedmktg@cdtechno.com