

Isolated 3W Wide Input Dual Output DC-DC Converters

NDT SERIES



FEATURES

- Industry Standard Footprint
- 1kVDC Isolation
- Dual Isolated Output
- Short Circuit Protection
- Low Profile 24 Pin Case
- Efficiency to 81%
- Power Density 0.90W/cm³
- 2:1 Wide Input Range
- 24V & 48V Input
- 12V & 15V Output
- Footprint 4.73cm²
- UL 94V-0 Package Materials
- Operating Temperature Range -40°C to 85°C
- Load and Line Regulation <1% on Both Outputs
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated
- Custom Solutions Available

DESCRIPTION

The NDT series is a range of low profile DC-DC converters offering dual outputs 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 application notes for guidance). The plastic case is rated to UL 94V-0 and encapsulant to UL 94V-1 and the connection pins are formed from a tin plated alloy 42 leadframe.

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	Nominal Input	Rated Output	Output	Current	Input Current	iciency²	olation ipacitance	
	Voltage	Voltage	Min Load ³	Full Load	Full Load	E	န္ဂ	MTTF ⁴
Order Code	(∨)	(V)	(mA)	(mA)	(mA)	(%)	(pF)	kHrs
NDTD2412	24	12	±31	±125	156	79	30	2075
NDTD2415	24	15	±25	±100	155	80	30	2080
NDTD4812	48	12	±31	±125	77	81	30	2090
NDTD4815	48	15	±25	±100	77	81	30	2045

INDUIT CHADACTEDISTICS

Parameter	Conditions	MIN	TYP	MAX	Units	
Voltage Range	24V input types	18	24	36	VDC	
	48V input types	36	48	75		
Reflected Ripple	24V input types with 10µF at input		200	250	mA n-n	
Current	48V input types with 10µF at input		125	150		

OUTPUT CHARACTERISTICS¹

Parameter	Conditions	MIN	ТҮР	MAX	Units
Rated Power				3	W
Voltage Set Point Accuracy	With external input/output capacitors, refer to recommended test circuit		±1	±5	%
Line Regulation	Low line to high line, with external input/output capacitors, refer to recommended test circuit		0.15	0.5	%
Load Regulation	25% load to 100% load, with external input/output capacitors, refer to recommended test circuit		0.2	0.5	%
Ripple	BW = 20Hz to 300kHz With external input/output capacitors, refer to recommended test circuit		15	30	mV rms
Ripple & Noise	BW = DC to 20MHz With external input/output capacitors, refer to recommended test circuit		90	150	mV p-p
Cross Regulation	% voltage change on negative output when positive load varies from 12% to 50% with negative load fixed at 50%		2.1	3.0	%

ABSOLUTE MAXIMUM RATINGS

Short circuit protection over temperature range and input voltage range	continuous
Input Voltage, 24V types	40V
Input Voltage, 48V types	80V
Lead temperature 1.5mm from case for 10 seconds	300°C
Minimum Load	25% of rated output

Parameter	Conditions	MIN	ТҮР	MAX	Units		
Isolation Test Voltage	Flash tested for 1 second	1000			VDC		
Resistance	Viso=1KVDC	1			G		

GENERAL CHARACTERISTICS¹

Parameter	Conditions	MIN	ТҮР	MAX	Units
Switching Frequency	100% load V _{IN} nominal	100	125	150	↓H
Switching Trequency	25% load V _{IN} nominal	410	500	590	

ENVIRONMENTAL¹

Conditions	MIN	ITP	MAX	Units
	-40		85	°C
	-50		130	°C
100% Load		28		°C
1	100% Load	-40 -50	-40 -50 100% Load 28	Min ITP MAX -40 85 -50 130 100% Load 28

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

2 Measured at full load with external input/output capacitors, refer to test circuit.

A lower lad is entirely safe but higher levels of output ripple will be experienced.
Calculated using MIL-HDBK-217F with nominal input voltage at full load.

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TERMINOLOGY **PIN CONNECTIONS** 24 Pin DIL (top view) **LINE REGULATION** The percentage change in output voltage between low input voltage and high input voltage, measured with fixed output load -V_{IN} ⊑ 2 ie. A 5V output part with an output voltage of 5.05V @ high input voltage and 5.03V @ -V_{IN} € 3 low input voltage would have a line regulation of 0.4%. line regulation = $\frac{V_{OUT} (Low Input V) - V_{OUT} (High Input V)}{V_{OUT} (Nominal Input V)} \times 100\%$ Where V_{OUT} (Nominal Input V) is 5V. Common C 9 **APPLICATION NOTES** –Vout 🕻 11 **EXTERNAL CAPACITANCE TEST CIRCUIT** Although these converters will work +V_{OUT} without external capacitors, they are VIN -0 necessary in order to guarantee the full **PACKAGING DETAILS** parametric performance over the COUT **Order Code** Packaging Style full line and load range. All parts have NDT CIN. -0 NDTDXXXX been tested and characterised 0V using the following values and test circuit COUT **TUBE OUTLINE DIMENSIONS** \circ Value റ GND CIN C_{OUT} -V_{OUT} 0.657±0.022 10µF, 200V (16.70±0.55) 47µF, 25V **MECHANICAL DIMENSIONS** - 1.270(32.26) 0.200 - 0.100(2.54) (5.08) **NDTD2412** 0.577(14.66) 0.031±0.006 (0.80 ± 0.15) XYYWW Tube Length: 20.472±0.079(520mm±2mm) Tube Material: Antistatic coated clear pvc. **RECOMMENDED FOOTPRINT DETAILS** 0.275(7.00) 0.012(0.30) 0.185(4.70) 0.033(0.84) 0.008(0.20) 0.145(3.70) 0.021(0.54) Ø^{0.057(1.45)} 0.051(1.30) 0.185 - 0.900(22.86) -0.600(15.25)Max-(4.70)-0.100(2.54) 8 Holes + Ø0.1 All pins on a 0.100(2.54) pitch and within 0.010(0.25) of true position Weight: 6.5g Unless otherwise stated all dimensions in inches ±0.010 (mm ±0.25mm).

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23 ⊐ +V_{IN}

22 - +VIN

16 Common

14 ⊐ +V_{OUT}

Tube

QTY

15

0.815±0.022

(20.70±0.55)

0.657±0.031 (16.70±0.80)

0.217±0.001

(5.50±0.25)

4

0.100(2.54)

 0.268 ± 0.022 6.80±0.55