

## FEATURES

- Wide Temperature Performance at Full 2 Watt Load, -40°C to 85°C
- Lead Frame Technology
- CECC00802 Reflow (280°C)
- Dual Isolated Output
- 1kVDC Isolation
- Efficiency to 84%
- Power Density 1.54W/cm<sup>3</sup>
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint Over Pins 3.16cm<sup>2</sup>
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- MTF up to 2.1 Million Hours
- Custom Solutions Available
- Multi Layer Ceramic Capacitors
- Lead Free Compatible

## DESCRIPTION

The NTH series of miniature surface mounted DC-DC Converters employ leadframe technology and transfer moulding techniques to bring all of the benefits of IC style packaging to hybrid circuitry. The component lead termination of this product range is lead-free compatible, therefore the converter can be soldered in a lead-free soldering process. The devices are fully compatible with CECC00802 to 280°C which allows them to be placed and reflowed with IC's, thus reducing time and cost in production. Coplanarity of the lead positions is based upon IEC 191-6:1990. The devices are suitable for all applications where high volume production is envisaged.

## SELECTION GUIDE

	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	MTTF <sup>1</sup>
Order Code <sup>5</sup>	(V)	(V)	(mA)	(mA)	(%)	(pF)	kHrs
<b>NTH0505M</b>	5	5	±200	500	80	24	1547
<b>NTH0509M</b>	5	9	±111	494	81	28	663
<b>NTH0512M</b>	5	12	±83	488	82	30	338
<b>NTH0515M</b>	5	15	±67	476	84	33	187
<b>NTH1205M</b>	12	5	±200	208	80	35	490
<b>NTH1209M</b>	12	9	±111	201	83	55	343
<b>NTH1212M</b>	12	12	±83	198	84	63	229
<b>NTH1215M</b>	12	15	±67	198	84	66	148

## INPUT CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Voltage Range	Continuous operation, 5V input types	4.5	5	5.5	V
	Continuous operation, 12V input types	10.8	12	13.2	
Reflected Ripple Current	5V input types		50		mA p-p
	12V input types		70		

## OUTPUT CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Rated Power <sup>2</sup>	T <sub>A</sub> = -40°C to 85°C			2.0	W
Output Voltage Accuracy	NTH0505	-5.0		7.5	%
	All other variants	-5.0		5.0	
Line regulation	High V <sub>IN</sub> to low V <sub>IN</sub>		1.0	1.2	%/%
Load Regulation <sup>3</sup>	10% load to rated load, 5V output types		5.0	10	%
	10% load to rated load, 9V, 12V & 15V output types		3.0	10	
Ripple and Noise	BW=DC to 20MHz, 5V output types		150	200	mV p-p
	BW=DC to 20MHz, 9V output types		100	150	
	BW=DC to 20MHz, 12V output types		80	150	
	BW=DC to 20MHz, 15V output types		70	150	

## ABSOLUTE MAXIMUM RATINGS

Short circuit duration <sup>4</sup>	1 second
Internal power dissipation	550mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input Voltage V <sub>IN</sub> , NTH05 types	7V
Input voltage V <sub>IN</sub> , NTH12 types	15V

## ISOLATION CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Isolation Test Voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso=500VDC	1	10		GΩ

## GENERAL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	All 5V input types		95		kHz
	All 12V input types		90		

1 Calculated using MIL-HDBK-217F with nominal input voltage at full load.

2 See derating curve.

3 12V input types have typically 3% less load regulation change.

4 Supply voltage must be discontinued at the end of the short circuit duration.

5 If components are required in tape and reel format suffix order code with -R, e.g. NTH0505M-R. All specifications typical at T<sub>A</sub>=25°C, nominal input voltage and rated output current unless otherwise specified.

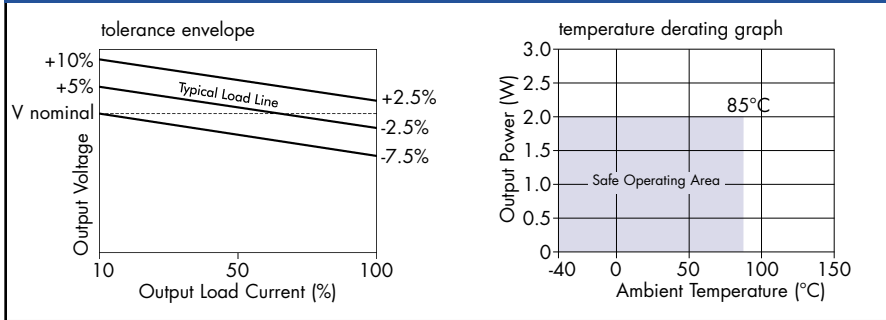
# NTH SERIES

## Isolated 2W Dual Output SM DC-DC Converters

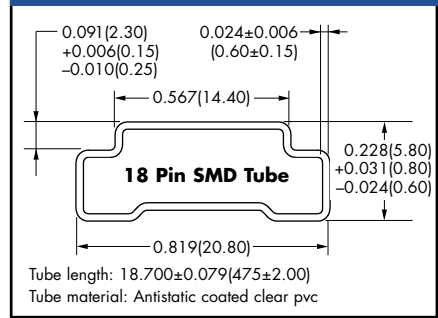
### TEMPERATURE CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	-40		85	°C
Storage		-55		125	°C
Case Temperature above ambient	All 5V output types		30		°C
	All 12V output types		25		
Cooling	Free Air Convection				

### PERFORMANCE CHARACTERISTICS



### TUBE OUTLINE DIMENSIONS

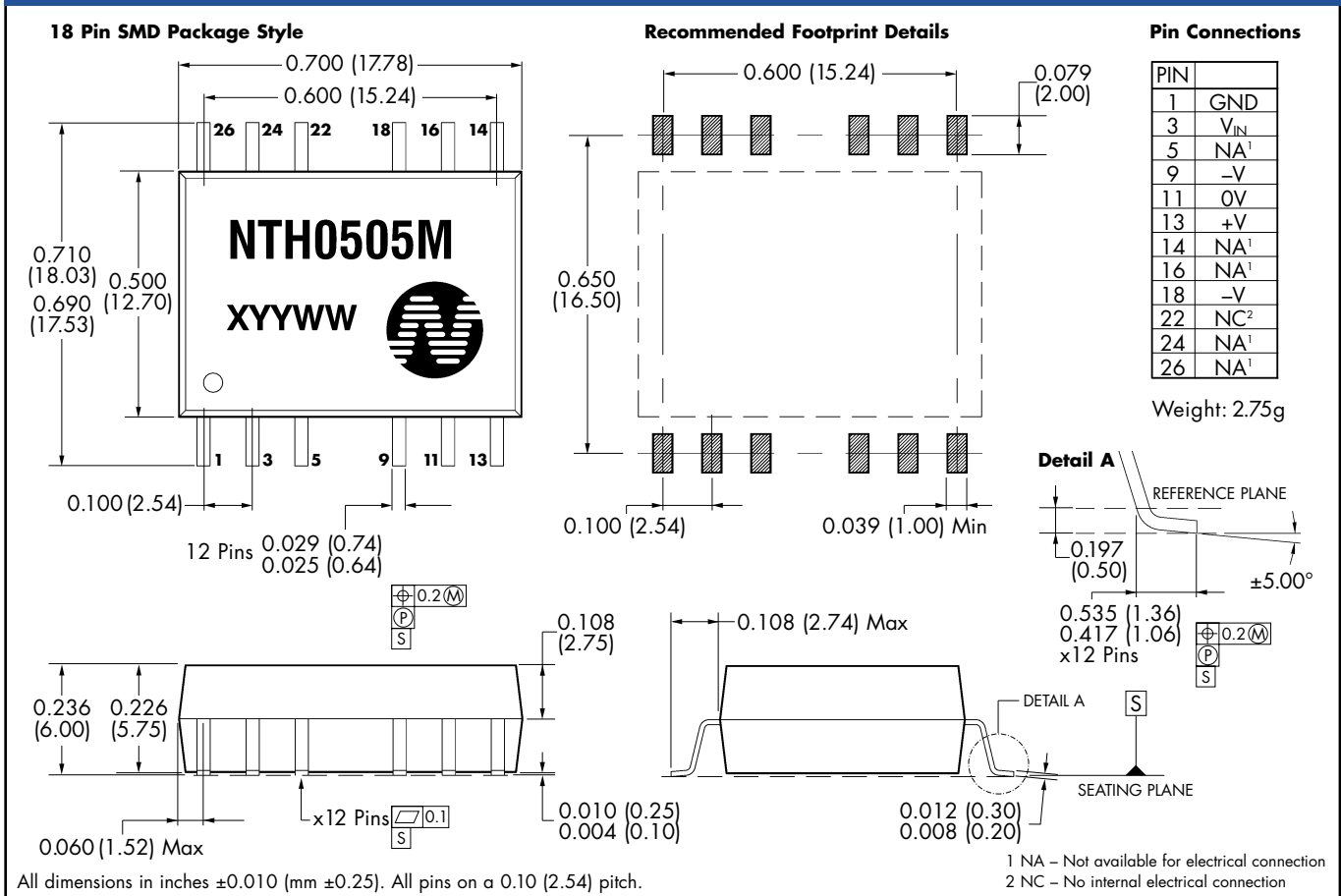


### PACKAGING DETAILS

Order Code	Packaging Style	QTY
NTHXXXXM	Tube	25
NTHXXXXM-R	Tape & Reel	400

Tape & Reel to IEC 286-3 Specifications. For tape and reeling packaging details refer to: [www.dc-dc.com/cd/products/application\\_notes.htm](http://www.dc-dc.com/cd/products/application_notes.htm)

### MECHANICAL DIMENSIONS



C&D Technologies (NCL) Limited reserve the right to alter or improve the specification, internal design or manufacturing process at any time, without notice. Please check with your supplier or visit our web site to ensure that you have the current and complete specification for your product before use.

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