

**FEATURES**

- Wide Temperature performance at full 1 Watt load, -40°C to 85°C
- Dual Output from a Single Input Rail
- Industry Standard Pinout
- Power Sharing on Output
- 1kVDC Isolation
- Efficiency to 78%
- Power Density up to 0.85W/cm<sup>3</sup>
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint from 1.17cm<sup>2</sup>
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Fully Encapsulated
- No External Components Required
- MTF up to 2.1 Million hours
- Custom Solutions Available
- No Electrolytic or Tantalum Capacitors

**DESCRIPTION**

The NMA series of industrial temperature range DC-DC converters are the standard building blocks for on-board distributed power systems. They are ideally suited for providing dual rail supplies on primarily digital boards with the added benefit of galvanic isolation to reduce switching noise. All of the rated power may be drawn from a single pin provided the total load does not exceed 1 watt.

**SELECTION GUIDE**

	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	MTTF <sup>1</sup>	Package Style
Order Code	(V)	(V)	(mA)	(mA)	(%)	(pF)	kHrs	
<b>NMA0505D</b>	5	5	±100	289	69	28	1697	DIP
<b>NMA0509D</b>	5	9	±55	270	75	32	682	
<b>NMA0512D</b>	5	12	±42	266	77	34	343	
<b>NMA0515D</b>	5	15	±33	263	78	36	188	SIP
<b>NMA0505S</b>	5	5	±100	289	69	28	1697	
<b>NMA0509S</b>	5	9	±55	270	75	32	682	
<b>NMA0512S</b>	5	12	±42	266	77	34	343	
<b>NMA1205D</b>	12	5	±100	120	69	33	559	DIP
<b>NMA1209D</b>	12	9	±55	113	74	46	375	
<b>NMA1212D</b>	12	12	±42	111	75	55	243	
<b>NMA1215D</b>	12	15	±33	110	76	54	154	SIP
<b>NMA1205S</b>	12	5	±100	120	69	33	559	
<b>NMA1209S</b>	12	9	±55	113	74	46	375	
<b>NMA1212S</b>	12	12	±42	111	75	55	243	
<b>NMA1215S</b>	12	15	±33	110	76	54	154	

When operated **with** additional external load capacitance the rise time of the input voltage will determine the maximum external capacitance value for guaranteed start up. The slower the rise time of the input voltage the greater the maximum value of the additional external capacitance for reliable start up.

**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			20	33	mA p-p

**OUTPUT CHARACTERISTICS**

Parameter	Conditions	MIN	TYP	MAX	Units
Rated Power <sup>2</sup>	T <sub>A</sub> = -40°C to 120°C			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line Regulation	High V <sub>IN</sub> to low V <sub>IN</sub>		1.0	1.2	%/%
Load Regulation	10% load to rated load, 5V output types		10	12.5	%
	10% load to rated load, 9V output types		9	10	
	10% load to rated load, 12V output types		6.5	7.5	
	10% load to rated load, 15V output types		6	7.5	
Ripple & Noise	BW=DC to 20MHz, 5V output types		40	75	mV p-p
	BW=DC to 20MHz, 9V output types		25	50	
	BW=DC to 20MHz, 12V output types		25	50	
	BW=DC to 20MHz, 15V output types		20	50	

**ABSOLUTE MAXIMUM RATINGS**

Short-circuit duration <sup>3</sup>	1 second
Internal power dissipation	450mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V <sub>IN</sub> , NMA05 types	7V
Input voltage V <sub>IN</sub> , NMA12 types	15V

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

2 See derating curve

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

All specifications typical at T<sub>A</sub>=25°C, nominal input voltage and rated output current unless otherwise specified.

# NMA 5V & 12V SERIES

Isolated 1W Dual Output DC-DC Converters

## ISOLATION CHARACTERISTICS

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

## GENERAL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	5V input types		110		kHz
	12V input types		140		

## TEMPERATURE CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	-40		85	°C
Storage		-50		130	°C
Case Temperature Above Ambient	5V output types		33		°C
	All other output types		28		
Cooling	Free air convection				

## PIN CONNECTIONS

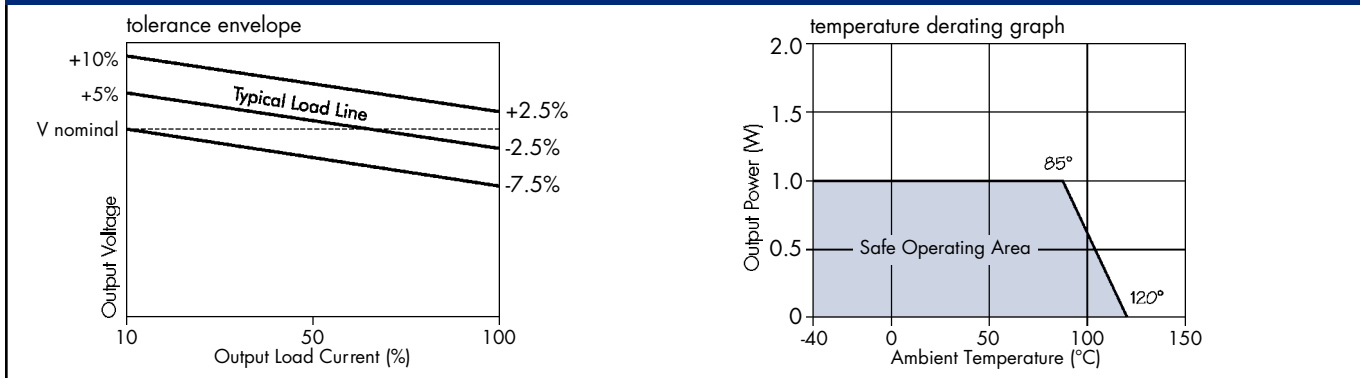
14 Pin DIP

PIN	
1	GND
7	NC
8	0V
9	+V
11	-V
14	V <sub>IN</sub>

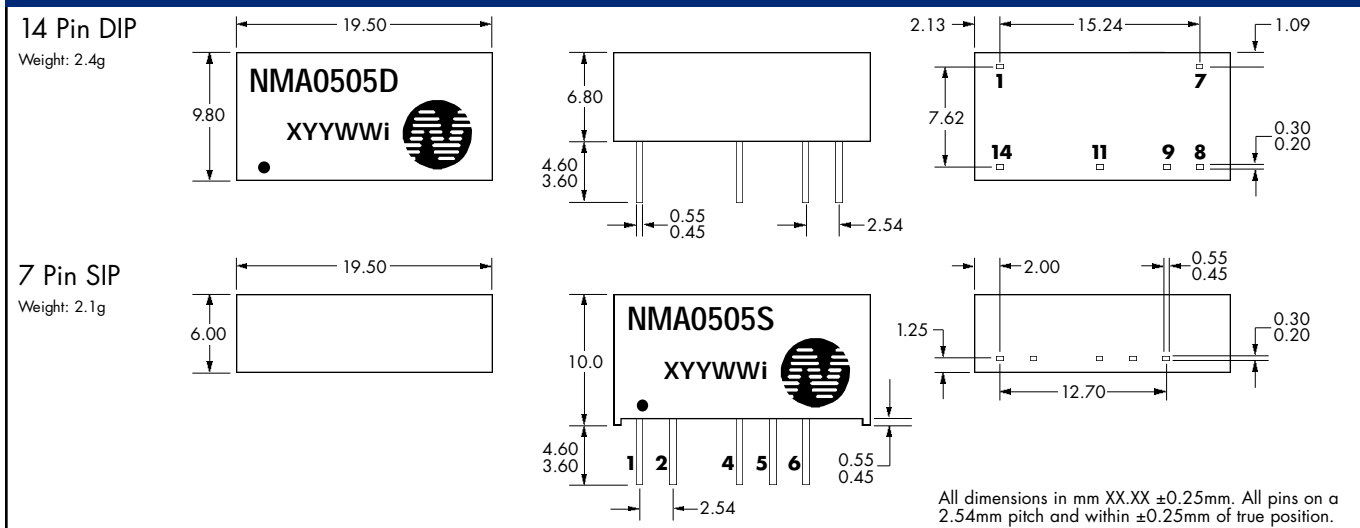
7 Pin SIP

PIN	
1	V <sub>IN</sub>
2	GND
4	-V
5	0V
6	+V

## PERFORMANCE CHARACTERISTICS



## 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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