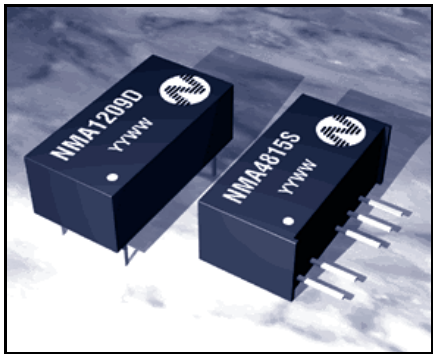
C&D TECHNOLOGIES
Power Solutions

NMA 5V & 12V SERIES

Isolated 1W Dual Output DC-DC Converters



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^3
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint from 1.17cm^2
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Fully Encapsulated
- No External Components Required
- MTTF 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 1watt.

SELECTION GUIDE

	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	MTTF[1]	Package Style
Order Code	(V)	(V)	(mA)	(mA)	(%)	(pF)	kHrs	
NMA0505D	5	5	±100	289	69	28	1697	DIP
NMA0509D	5	9	±55	270	75	32	682	
NMA0512D	5	12	±42	266	77	34	343	
NMA0515D	5	15	±33	263	78	36	188	
NMA0505S	5	5	±100	289	69	28	1697	SIP
NMA0509S	5	9	±55	270	75	32	682	
NMA0512S	5	12	±42	266	77	34	343	
NMA0515S	5	15	±33	263	78	36	188	
NMA1205D	12	5	±100	120	69	33	559	DIP
NMA1209D	12	9	±55	113	74	46	375	
NMA1212D	12	12	±42	111	75	55	243	
NMA1215D	12	15	±33	110	76	54	154	
NMA1205S	12	5	±100	120	69	33	559	SIP
NMA1209S	12	9	±55	113	74	46	375	
NMA1212S	12	12	±42	111	75	55	243	
NMA1215S	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[2]	T_A= –40°C to 120°C			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line Regulation	High V_{IN} to low V_{IN}		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[3]	1 second
Internal power dissipation	450mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V_{IN}, NMA05 types	7V
Input voltage V_{IN}, 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_A=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		GΩ

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

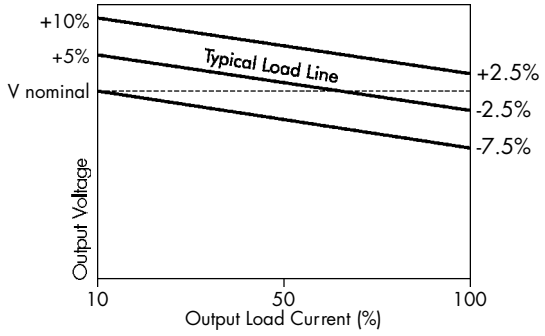
PIN	
1	GND
7	NC
8	0V
9	+V
11	–V
14	V_{IN}

7 Pin SIP

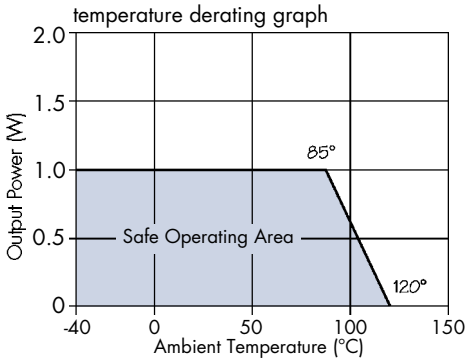
PIN	
1	V_{IN}
2	GND
4	–V
5	0V
6	+V

PERFORMANCE CHARACTERISTICS

tolerance envelope



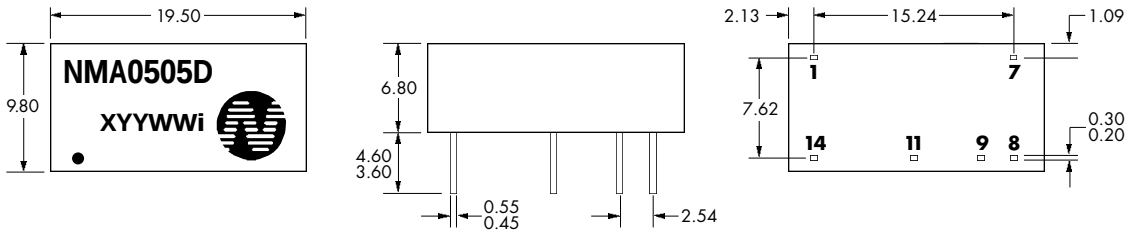
temperature derating graph



MECHANICAL DIMENSIONS

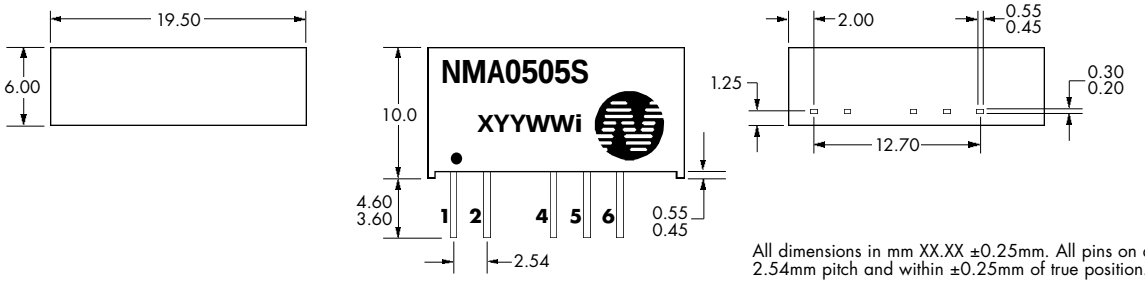
14 Pin DIP

Weight: 2.4g



7 Pin SIP

Weight: 2.1g



All dimensions in mm XX.XX ±0.25mm. All pins on a 2.54mm pitch and within ±0.25mm of true position.

Instructions for use are available from www.dc-dc.com

C&D Technologies (NCL) Ltd
Tanners Drive, Blakelands North
Milton Keynes MK14 5BU, England
Tel: +44 (0)1908 615232
Fax:+44 (0)1908 617545
email: info@cdtechno-ncl.com

C&D Technologies (NCL), Inc.
5816 Creedmoor Road, Raleigh
NC 27612, USA
Tel: +1 (919) 571-9405
Fax: +1 (919) 571-9262
email: info@us.cdtechno-ncl.com

www: http://www.dc-dc.com

C&D TECHNOLOGIES
Power Solutions