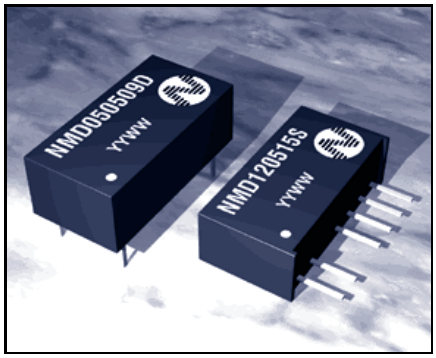
C&D TECHNOLOGIES
Power Solutions

NMD SERIES

Isolated 1W Twin Output DC-DC Converters



FEATURES

- Twin Independent Outputs
- Output/Output Isolation 1kVDC
- Power Sharing on Outputs
- Input/Output Isolation 1kVDC
- SIP & DIP Package Styles
- Efficiency to 80%
- Power Density 0.85W/cm^3
- 5V & 12V Input
- One 5V Output (V1)
- 3.3V, 5V, 9V, 12V and 15V Output (V2)
- 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 1.9 Million hours
- PCB Mounting
- Custom Solutions Available

DESCRIPTION

The NMD series of DC-DC converters are ideally suited to applications where a potential difference exists between loads, eg motor control circuits. The twin outputs offer cost and space savings by consolidating two DC-DC Converters into one package. All of the rated power may be drawn from a single output provided the total load does not exceed 1 Watt.

SELECTION GUIDE

	Nominal Input Voltage	Output Voltage 1	Output Voltage 2	Output Current 1	Output Current 2	Efficiency	MTTF[1]	Package Style
Order Code	(V)	(V)	(V)	(mA)	(mA)	(%)	kHrs	
NMD050503D	5	5	3.3	100	152	70	1615	DIP
NMD050503S	5	5	3.3	100	152	70	1615	SIP
NMD050505D	5	5	5	100	100	70	1615	DIP
NMD050505S	5	5	5	100	100	70	1615	SIP
NMD050509D	5	5	9	100	56	80	669	DIP
NMD050509S	5	5	9	100	56	80	669	SIP
NMD050512D	5	5	12	100	42	80	339	DIP
NMD050512S	5	5	12	100	42	80	339	SIP
NMD050515D	5	5	15	100	34	80	187	DIP
NMD050515S	5	5	15	100	34	80	187	SIP
NMD120505D	12	5	5	100	100	70	489	DIP
NMD120505S	12	5	5	100	100	70	489	SIP
NMD120509D	12	5	9	100	56	80	343	DIP
NMD120509S	12	5	9	100	56	80	343	SIP
NMD120512D	12	5	12	100	42	80	229	DIP
NMD120512S	12	5	12	100	42	80	229	SIP
NMD120515D	12	5	15	100	34	80	148	DIP
NMD120515S	12	5	15	100	34	80	148	SIP

i When operated **without** additional external load capacitance, the output voltage of the devices is guaranteed to be within 95% of its steady state value within 100ms after the input voltage has reached 95% of its steady state value, **irrespective of the rise time of the input voltage**.

ii 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	

OUTPUT CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Rated Power[2]	T_A= 0°C to 125°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, 3.3V output types			15	%
	10% load to rated load, 5V output types			15	
	10% load to rated load, 9V output types			10	
	10% load to rated load, 12V output types			10	
	10% load to rated load, 15V output types			10	
Ripple & Noise	BW=DC to 20MHz, All output types			75	mV p-p

ABSOLUTE MAXIMUM RATINGS

Short-circuit duration[3]	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V_{IN}, NMD05 types	7V
Input voltage V_{IN}, NMD12 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.

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ISOLATION CHARACTERISTICS

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

GENERAL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	All input types		100		kHz

TEMPERATURE CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	0		70	°C
Storage		–55		150	°C
Cooling	Free air convection				

PIN CONNECTIONS

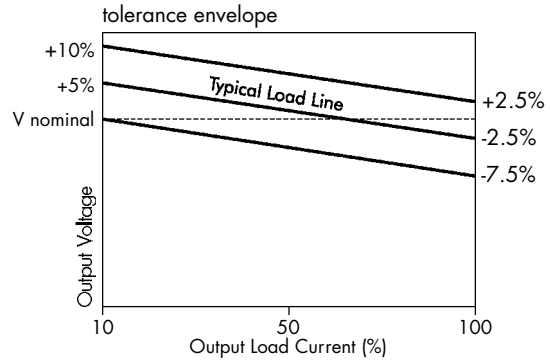
14 Pin DIP

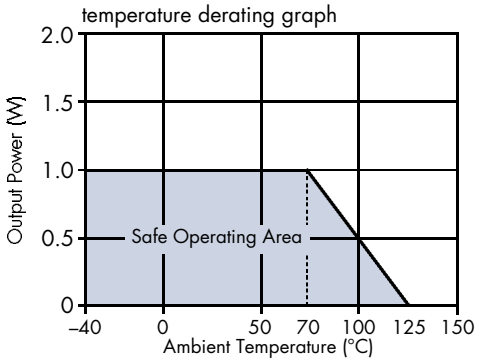
PIN	
1	GND
7	NC
8	0V
9	+V2
10	0V
11	+V1
14	V_{IN}

7 Pin SIP

PIN	
1	V_{IN}
2	GND
4	+V1
5	0V
6	+V2
7	0V

PERFORMANCE CHARACTERISTICS

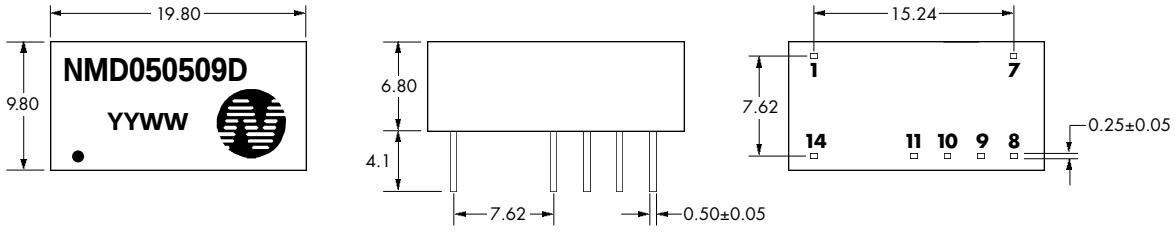




MECHANICAL DIMENSIONS

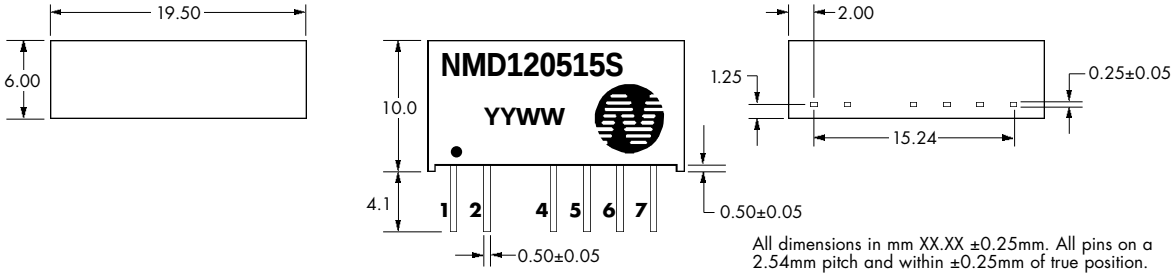
14 Pin DIP

Weight: 2.3g



7 Pin SIP

Weight: 2.3g



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

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