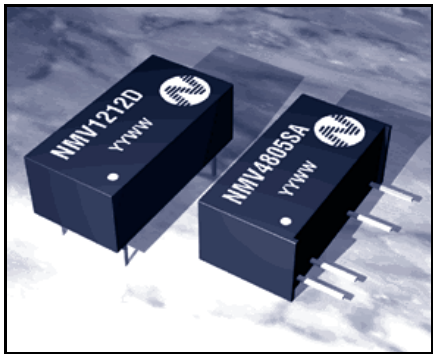
C&D TECHNOLOGIES
Power Solutions

NMV 5V & 12V SERIES

3kVDC Isolated 1W Single & Dual Output DC-DC Converters



FEATURES

- Wide Temperature performance at full 1 Watt load, –40°C to 85°C
- 3kVDC Isolation (1 minute)
- Single or Dual Output
- Industry Standard Pinout
- Power Sharing on Dual Output
- Efficiency to 78%
- Power Density up to 0.90W/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 2.9 Million hours
- Custom Solutions Available
- No Electrolytic or Tantalum Capacitors

DESCRIPTION

The NMV 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 local supplies on control system boards with the added benefit of 3kVDC galvanic isolation to reduce switching noise. Available in SIP and DIP with dual and single output pinout. All of the rated power may be drawn from a single pin on dual output variants provided the total load does not exceed 1watt.

SELECTION GUIDE

Order Code	Nominal Input Voltage (V)	Output Voltage (V)	Output Current (mA)	Input Current at Rated Load (mA)	Load Regulation (Typ) %	Load Regulation (Max) %	Ripple & Noise (Typ) mV p-p	Ripple & Noise (Max) mV p-p	Efficiency (%)	Isolation Capacitance (pF)	MTTF[1] kHrs	Package Style
NMV0505DA	5	5	200	294	14.6	15	64	80	68	23	2414	DIP
NMV0509DA	5	9	111	267	9.3	10	47	57	75	30	1173	
NMV0512DA	5	12	84	260	7.4	8.0	35	49	77	26	633	
NMV0515DA	5	15	67	256	6.7	7.3	32	44	78	27	360	
NMV0505SA	5	5	200	294	14.6	15	64	80	68	23	2414	SIP
NMV0509SA	5	9	111	267	9.3	10	47	57	75	30	1173	
NMV0512SA	5	12	84	260	7.4	8.0	35	49	77	26	633	
NMV0515SA	5	15	67	256	6.7	7.3	32	44	78	27	360	
NMV1205DA	12	5	200	121	14.6	15	64	80	69	26	624	DIP
NMV1209DA	12	9	111	113	9.3	10	47	57	74	35	490	
NMV1212DA	12	12	84	108	7.4	8.0	35	49	77	43	361	
NMV1215DA	12	15	67	108	6.7	7.3	32	44	77	42	252	
NMV1205SA	12	5	200	121	14.6	15	64	80	69	26	624	SIP
NMV1209SA	12	9	111	113	9.3	10	47	57	74	35	490	
NMV1212SA	12	12	84	108	7.4	8.0	35	49	77	43	361	
NMV1215SA	12	15	67	108	6.7	7.3	32	44	77	42	252	
NMV0505D	5	5	±100	280	9.0	10	33	40	71.5	21	1697	DIP
NMV0509D	5	9	±55	263	7.5	8.5	29	36	76	24	682	
NMV0512D	5	12	±42	256	6.8	7.5	27	32	78	26	343	
NMV0515D	5	15	±33	253	6.8	8.5	24	32	79	27	188	
NMV0505S	5	5	±100	280	9.0	10	33	40	71.5	21	1697	SIP
NMV0509S	5	9	±55	263	7.5	8.5	29	36	76	24	682	
NMV0512S	5	12	±42	256	6.8	7.5	27	32	78	26	343	
NMV0515S	5	15	±33	253	6.8	8.5	24	32	79	27	188	
NMV1205D	12	5	±100	117	9.0	10	33	40	71	27	563	DIP
NMV1209D	12	9	±55	113	7.5	8.5	29	36	74	35	377	
NMV1212D	12	12	±42	111	6.8	7.5	27	32	75	42	244	
NMV1215D	12	15	±33	110	6.8	8.5	24	32	76	41	154	
NMV1205S	12	5	±100	117	9.0	10	33	40	71	27	563	SIP
NMV1209S	12	9	±55	113	7.5	8.5	29	36	74	35	377	
NMV1212S	12	12	±42	111	6.8	7.5	27	32	75	42	244	
NMV1215S	12	15	±33	110	6.8	8.5	24	32	76	41	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	40	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	%/%

ABSOLUTE MAXIMUM RATINGS

Short-circuit duration[3]	1 second
Internal power dissipation	560mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V_{IN}, NMV05 types	7V
Input voltage V_{IN}, NMV12 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	For 1 minute	3000			VDC
Resistance	Viso=1000VDC	10			GΩ

GENERAL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	5V input types		120	135	kHz
	12V input types		150	170	

TEMPERATURE CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	-40		85	°C
Storage		-50		125	°C
Case Temperature Above Ambient	5V output types			28	°C
	All other output types			25	
Cooling	Free air convection				

PIN CONNECTIONS

Single Output Variants

14 Pin DIP

PIN	
1	GND
7	NC
8	+V
10	0V
14	V_{IN}

7 Pin SIP

PIN	
1	V_{IN}
2	GND
5	0V
7	+V

Dual Output Variants

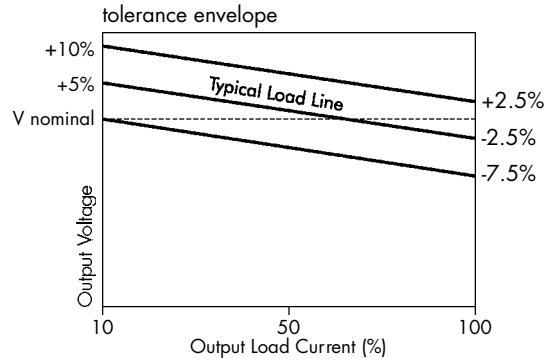
14 Pin DIP

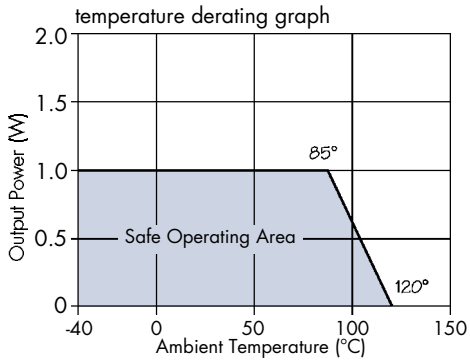
PIN	
1	GND
7	NC
8	+V
9	0V
10	–V
14	V_{IN}

7 Pin SIP

PIN	
1	V_{IN}
2	GND
5	–V
6	0V
7	+V

PERFORMANCE CHARACTERISTICS

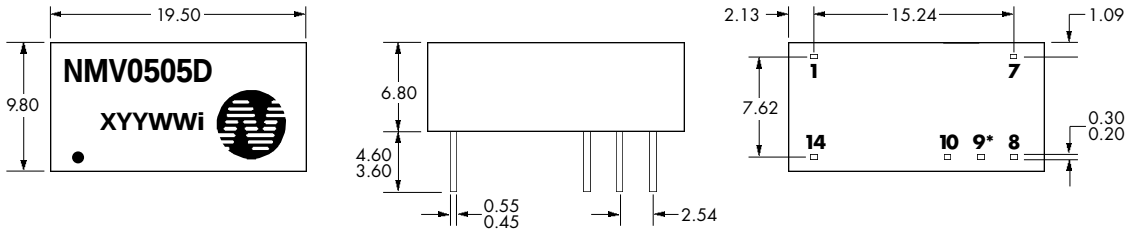




MECHANICAL DIMENSIONS

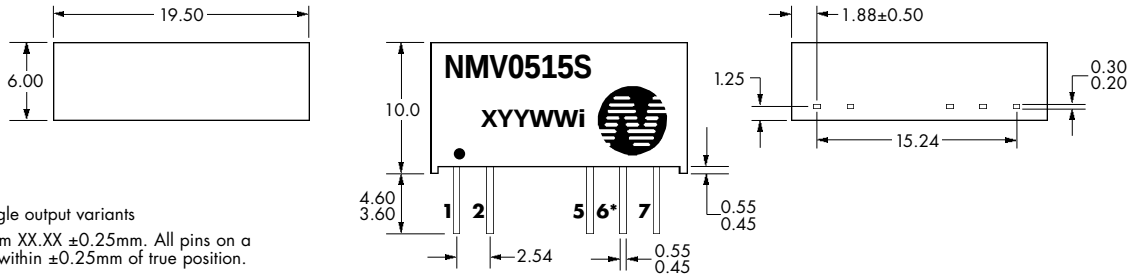
14 Pin DIP

Weight: 2.11g



7 Pin SIP

Weight: 2.11g



* Pin not fitted on single output variants

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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