



## FEATURES

- RoHS compliant
- Efficiency to 85%
- Power density up to 0.85W/cm<sup>3</sup>
- Single or dual output
- UL 94V-0 package material
- No heatsink required
- Footprint from 1.17cm<sup>2</sup>
- Industry standard pinout
- Power sharing on dual output
- 3kVDC isolation (1 minute)
- 24V & 48V input
- 5V, 9V, 12V and 15V output
- Internal SMD construction
- Fully encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors

## DESCRIPTION

The NMV series offers single or dual output versions in the same size package as the popular NMA series. The higher isolation is particularly useful in control type applications where the standard 1kV is not sufficient.

Order Code	SELECTION GUIDE										RECOMMENDED ALTERNATIVES (Click to view the MEV1 data sheet)
	Nominal Input Voltage	Output Voltage	Output Current	Load Regulation (Max)	Ripple & Noise (Max)	Efficiency	Isolation Capacitance	MTTF	Package Style		
	V	V	mA	%	mV p-p	%	pF	kHrs			
<b>NOT RECOMMENDED FOR NEW DESIGNS:</b>											
<b>NMV2412SC</b>	24	$\pm 12$	±42	10	150	80	65	134	SIP		<b>MEV1D2412SC</b>
<b>NMV2405SAC</b>	24	5	200	15	150	70	33	201	SIP		<b>MEV1S2405SC</b>
<b>OBsolete:</b>											
<b>NMV2405DAC</b>	24	5	200	15	150	70	33	201	DIP		<b>MEV1S2405DC</b>
<b>NMV2409DAC</b>	24	9	111	10	150	80	40	185	DIP		<b>MEV1S2409DC</b>
<b>NMV2412DAC</b>	24	12	84	10	150	80	55	163	DIP		<b>MEV1S2412DC</b>
<b>NMV2415DAC</b>	24	15	67	10	150	80	70	136	DIP		<b>MEV1S2415DC</b>
<b>NMV2409SAC</b>	24	9	111	10	150	80	40	185	SIP		<b>MEV1S2409SC</b>
<b>NMV2412SAC</b>	24	12	84	10	150	80	55	163	SIP		<b>MEV1S2412SC</b>
<b>NMV2415SAC</b>	24	15	67	10	150	80	70	136	SIP		<b>MEV1S2415SC</b>
<b>NMV4805DAC</b>	48	5	200	15	150	70	48	213	DIP		<b>MEV1S4805SC</b>
<b>NMV4809DAC</b>	48	9	111	10	150	80	59	194	DIP		<b>MEV1S4809SC</b>
<b>NMV4812DAC</b>	48	12	84	10	150	80	70	169	DIP		<b>MEV1S4812SC</b>
<b>NMV4815DAC</b>	48	15	67	10	150	80	81	140	DIP		<b>MEV1S4815SC</b>
<b>NMV4805SAC</b>	48	5	200	15	150	70	48	213	SIP		<b>MEV1S4805SC</b>
<b>NMV4809SAC</b>	48	9	111	10	150	80	59	194	SIP		<b>MEV1S4809SC</b>
<b>NMV4812SAC</b>	48	12	84	10	150	80	70	169	SIP		<b>MEV1S4812SC</b>
<b>NMV4815SAC</b>	48	15	67	10	150	80	81	140	SIP		<b>MEV1S4815SC</b>
<b>NMV2405DC</b>	24	$\pm 5$	$\pm 100$	15	150	70	45	194	DIP		<b>MEV1D2405DC</b>
<b>NMV2409DC</b>	24	$\pm 9$	$\pm 55$	10	150	80	52	166	DIP		<b>MEV1D2409DC</b>
<b>NMV2412DC</b>	24	$\pm 12$	$\pm 42$	10	150	80	65	134	DIP		<b>MEV1D2412DC</b>
<b>NMV2415DC</b>	24	$\pm 15$	$\pm 33$	10	150	80	70	101	DIP		<b>MEV1D2415DC</b>
<b>NMV2405SC</b>	24	$\pm 5$	$\pm 100$	15	150	70	45	194	SIP		<b>MEV1D2405SC</b>
<b>NMV2409SC</b>	24	$\pm 9$	$\pm 55$	10	150	80	52	166	SIP		<b>MEV1D2409SC</b>
<b>NMV2415SC</b>	24	$\pm 15$	$\pm 33$	10	150	80	70	101	SIP		<b>MEV1D2415SC</b>
<b>NMV4805DC</b>	48	$\pm 5$	$\pm 100$	15	150	70	45	205	DIP		<b>MEV1D4805SC</b>
<b>NMV4809DC</b>	48	$\pm 9$	$\pm 55$	10	150	80	58	175	DIP		<b>MEV1D4809SC</b>
<b>NMV4812DC</b>	48	$\pm 12$	$\pm 42$	10	150	80	68	137	DIP		<b>MEV1D4812SC</b>
<b>NMV4815DC</b>	48	$\pm 15$	$\pm 33$	10	150	80	75	102	DIP		<b>MEV1D4815SC</b>
<b>NMV4805SC</b>	48	$\pm 5$	$\pm 100$	15	150	70	45	205	SIP		<b>MEV1D4805SC</b>
<b>NMV4809SC</b>	48	$\pm 9$	$\pm 55$	10	150	80	58	175	DIP		<b>MEV1D4809SC</b>
<b>NMV4812SC</b>	48	$\pm 12$	$\pm 42$	10	150	80	68	137	DIP		<b>MEV1D4812SC</b>
<b>NMV4815SC</b>	48	$\pm 15$	$\pm 33$	10	150	80	75	102	DIP		<b>MEV1D4815SC</b>

## INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	Continuous operation, 24V input types	21.6	24	26.4	V
	Continuous operation, 48V input types	43.2	48	52.8	

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

2. 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.



For full details go to  
[www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)

## ABSOLUTE MAXIMUM RATINGS

Short-circuit protection <sup>2</sup>	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage $V_{IN}$ , NMV24 types	28V
Input voltage $V_{IN}$ , NMV48 types	54V

## OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power <sup>1</sup>	$T_A=0^\circ\text{C}$ to $70^\circ\text{C}$			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High $V_{IN}$ to low $V_{IN}$			1.2	%/%

## ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 minute	3000			VDC
Resistance	$V_{ISO}=1000\text{VDC}$	1			$\Omega$

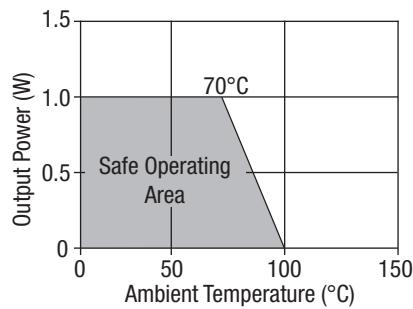
## GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	All input types		100		kHz

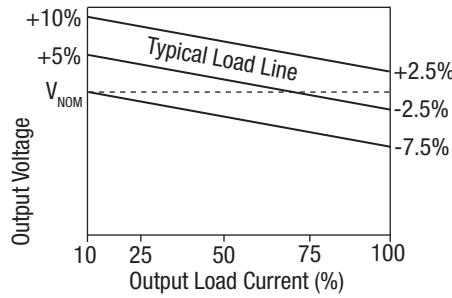
## TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	0		70	
Storage		-55		150	$^\circ\text{C}$
Cooling	Free air convection				

## TEMPERATURE DERATING GRAPH



## TOLERANCE ENVELOPE



## TECHNICAL NOTES

### ISOLATION VOLTAGE

'Hi Pot Test', 'Flash Tested', 'Withstand Voltage', 'Proof Voltage', 'Dielectric Withstand Voltage' & 'Isolation Test Voltage' are all terms that relate to the same thing, a test voltage, applied for a specified time, across a component designed to provide electrical isolation, to verify the integrity of that isolation.

Murata Power Solutions NMV series of DC/DC converters are all 100% production tested at their stated isolation voltage. This is 3kVDC for 1 minute.

A question commonly asked is, "What is the continuous voltage that can be applied across the part in normal operation?"

For a part holding no specific agency approvals, such as the NMV series, both input and output should normally be maintained within SELV limits i.e. less than 42.4V peak, or 60VDC. The isolation test voltage represents a measure of immunity to transient voltages and the part should never be used as an element of a safety isolation system. The part could be expected to function correctly with several hundred volts offset applied continuously across the isolation barrier; but then the circuitry on both sides of the barrier must be regarded as operating at an unsafe voltage and further isolation/insulation systems must form a barrier between these circuits and any user-accessible circuitry according to safety standard requirements.

### REPEATED HIGH-VOLTAGE ISOLATION TESTING

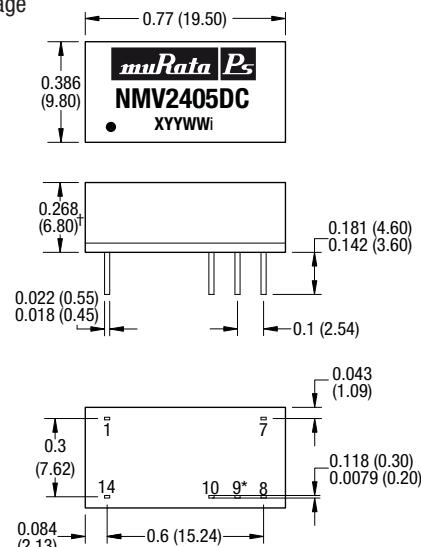
It is well known that repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials, construction and environment. The NMV series has toroidal isolation transformers, with no additional insulation between primary and secondary windings of enameled wire. While parts can be expected to withstand several times the stated test voltage, the isolation capability does depend on the wire insulation. Any material, including this enamel (typically polyurethane) is susceptible to eventual chemical degradation when subject to very high applied voltages thus implying that the number of tests should be strictly limited. We therefore strongly advise against repeated high voltage isolation testing, but if it is absolutely required, that the voltage be reduced by 20% from specified test voltage.

This consideration equally applies to agency recognized parts rated for better than functional isolation where the wire enamel insulation is always supplemented by a further insulation system of physical spacing or barriers.

## PACKAGE SPECIFICATIONS

### MECHANICAL DIMENSIONS

DIP package



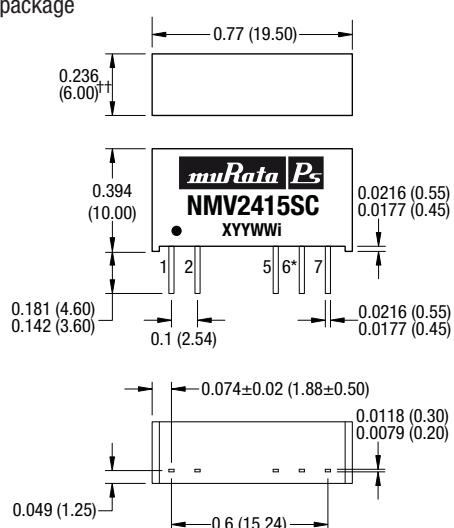
† 0.303 (7.70) for 48V variants

†† 0.300 (7.50) for 48V variants

\* Pin not fitted on single output variants.

All dimensions in inches  $\pm 0.01$  (mm  $\pm 0.25$ mm). All pins on a 0.1 (2.54) pitch and within  $\pm 0.01$  (0.25) of true position.

SIP package



Weight: 2.11g (DIP and SIP)

### PIN CONNECTIONS

#### Single output variants

14 Pin DIP	
Pin	Function
1	-V <sub>IN</sub>
7	NC
8	+V <sub>OUT</sub>
10	-V <sub>OUT</sub>
14	+V <sub>IN</sub>

7 Pin SIP	
Pin	Function
1	+V <sub>IN</sub>
2	-V <sub>IN</sub>
5	-V <sub>OUT</sub>
7	+V <sub>OUT</sub>

#### Dual output variants

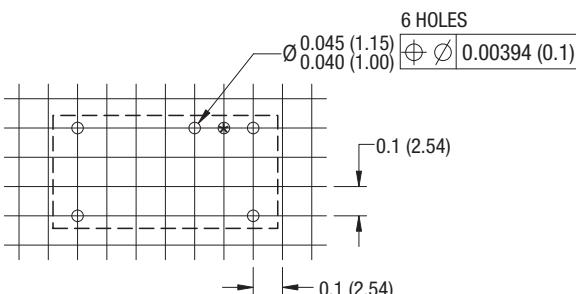
14 Pin DIP	
Pin	Function
1	-V <sub>IN</sub>
7	NC
8	+V <sub>OUT</sub>
9	0V
10	-V <sub>OUT</sub>
14	+V <sub>IN</sub>

7 Pin SIP	
Pin	Function
1	+V <sub>IN</sub>
2	-V <sub>IN</sub>
5	-V <sub>OUT</sub>
6	0V
7	+V <sub>OUT</sub>

## PACKAGE SPECIFICATIONS (continued)

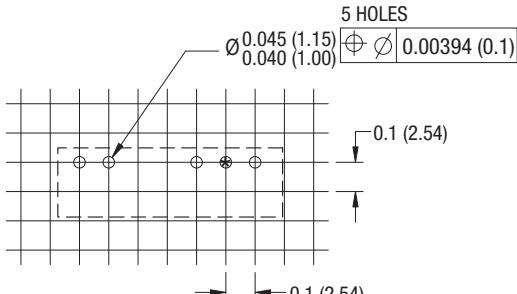
### RECOMMENDED FOOTPRINT DETAILS

14 Pin DIP Package



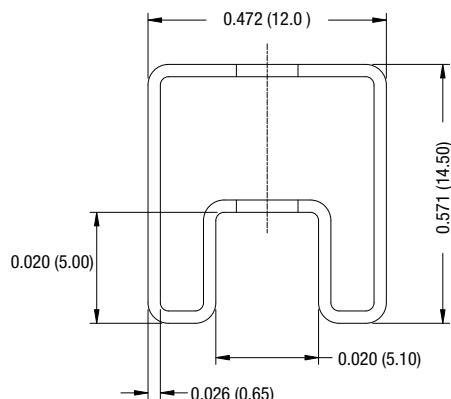
\*Hole not required for single output variants.

7 Pin SIP Package



### TUBE OUTLINE DIMENSIONS

14 Pin DIP Tube

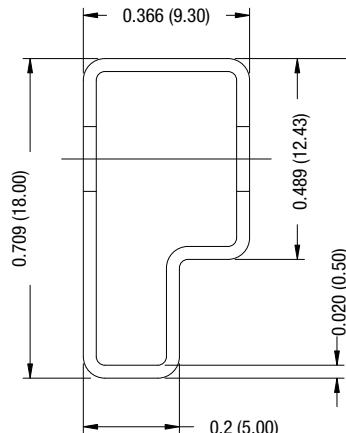


Unless otherwise stated all dimensions in inches (mm)  $\pm 0.5\text{mm}$ .

Tube length (14 Pin DIP) : 20.47 (520mm  $\pm 2\text{mm}$ ).

Tube length (7 Pin SIP) : 20.47 (520mm  $\pm 2\text{mm}$ ).

7 Pin SIP Tube



Tube Quantity : 25

### RoHS COMPLIANCE INFORMATION



This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.

For further information, please visit [www.murata-ps.com/rohs](http://www.murata-ps.com/rohs)

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ISO 9001 and 14001 REGISTERED



This product is subject to the following [operating requirements](#) and the [Life and Safety Critical Application Sales Policy](#). Refer to: <http://www.murata-ps.com/requirements/>

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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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