



## FEATURES

- RoHS Compliant
- Single Isolated Output
- 1kVDC Isolation
- Efficiency up to 80%
- Power Density 1.45W/cm<sup>3</sup>
- UL 94V-0 Package Material
- Footprint from 0.69cm<sup>2</sup>
- Industry Standard Pinout
- 24V & 48V Input
- 5V, 9V, 12V and 15V Output
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated with Toroidal Magnetics
- No External Components Required
- Custom Solutions Available

## DESCRIPTION

The NME series of DC/DC Converters is particularly suited to isolating and/or converting DC power rails. The galvanic isolation allows the device to be configured to provide an isolated negative rail in systems where only positive rails exist.

## SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Efficiency	Isolation Capacitance	MTTF	Package Style	
	V	V	mA	%	pF	kHrs		
NME2405DC	24	5	200	70	40	201	DIP	
NME2409DC	24	9	111	75	59	185		
NME2412DC	24	12	83	80	78	163		
NME2415DC	24	15	66	80	79	136		
NME2405SC	24	5	200	70	40	201	SIP	
NME2409SC	24	9	111	75	59	185		
NME2412SC	24	12	83	80	78	163		
NME2415SC	24	15	66	80	79	136		
<b>Obsolete</b>								<b>Recommended Alternative</b>
NME4805DC	48	5	200	70	32	213	DIP	MER1S4805SC
NME4809DC	48	9	111	75	50	194	DIP	MER1S4809SC
NME4812DC	48	12	83	80	76	164	DIP	MER1S4812SC
NME4815DC	48	15	66	80	75	140	DIP	MER1S4815SC
NME4805SC	48	5	200	70	32	213	SIP	MER1S4805SC
NME4809SC	48	9	111	75	50	194	SIP	MER1S4809SC
NME4812SC	48	12	83	80	76	164	SIP	MER1S4812SC
NME4815SC	48	15	66	80	75	140	SIP	MER1S4815SC

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, 24V input types	21.6	24	26.4	V
	Continuous operation, 48V input types	43.2	48	52.8	

## OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power <sup>2</sup>	T <sub>A</sub> =0°C to 70°C			1.0	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High V <sub>IN</sub> to low V <sub>IN</sub>			1.2	%/%
Load Regulation <sup>2</sup>	10% load to rated load, 5V output types			15	%
	10% load to rated load, all other output types			10	
Ripple and Noise	BW=DC to 20MHz, all output types			150	mV p-p

## ABSOLUTE MAXIMUM RATINGS

Short-circuit protection <sup>3</sup>	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V <sub>IN</sub> , NME24 types	28V
Input voltage V <sub>IN</sub> , NME48 types	54V

1. Calculated using MIL-HDBK-217F with nominal input voltage at full load.
  2. See derating curve.
  3. Supply voltage must be disconnected 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.



### ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso= 500VDC	1			GΩ

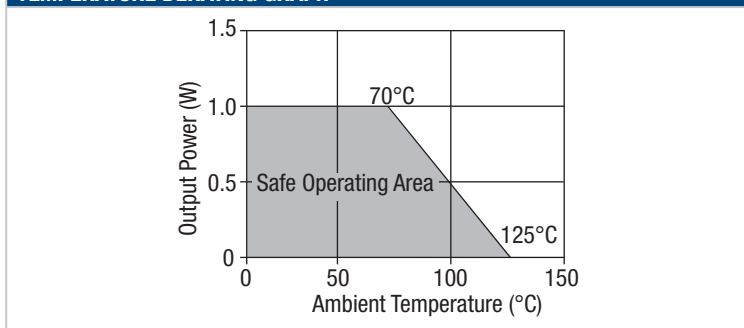
### GENERAL CHARACTERISTICS

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

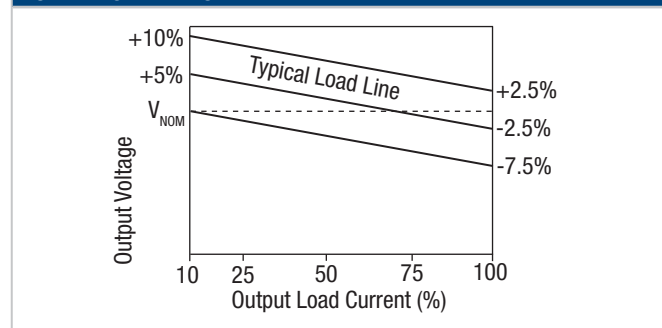
### TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	0		70	°C
Storage		-55		150	
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 NME series of DC/DC converters are all 100% production tested at their stated isolation voltage. This is 1kVDC for 1 second.

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 NME 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

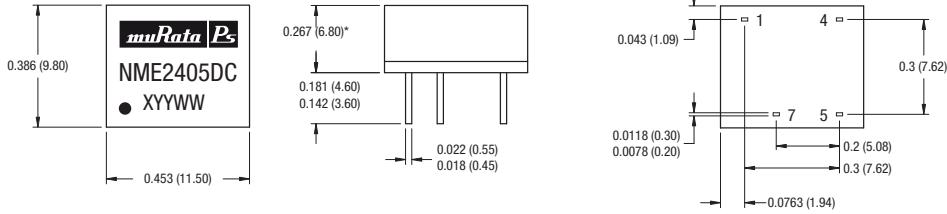
It is well known that repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials, construction and environment. The NME series has toroidal isolation transformers, with no additional insulation between 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.

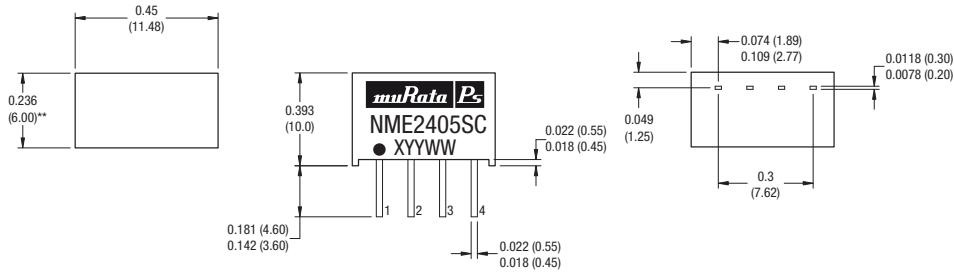
## PACKAGE SPECIFICATIONS

### MECHANICAL DIMENSIONS

#### DIP Package



#### SIP Package



### PIN CONNECTIONS - 8 PIN DIP

Pin	Function
1	-VIN
4	+VIN
5	+VOUT
7	-VOUT

### PIN CONNECTIONS - 4 PIN SIP

Pin	Function
1	-VIN
2	+VIN
3	-VOUT
4	+VOUT

\* 0.303 (7.70) for 48V variants

\*\* 0.3 (7.50) for 48V variants

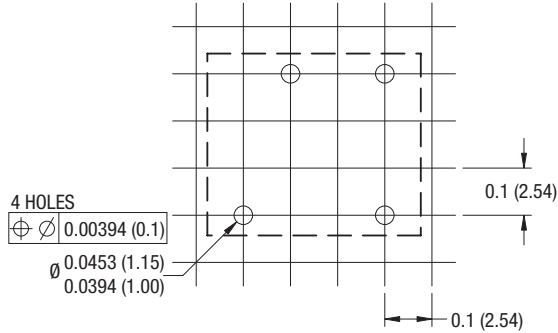
All dimensions in inches  $\pm 0.01$  (mm  $\pm 0.25$ mm). All pins on a 0.1 (2.54) pitch and within  $\pm 0.01$  (0.25) of true position.

Weight: 1.48g (DIP) 1.30g (SIP)

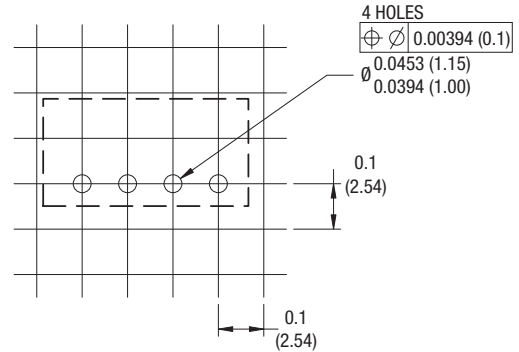
**PACKAGE SPECIFICATIONS (continued)**

**RECOMMENDED FOOTPRINT DETAILS**

8 Pin DIP Package

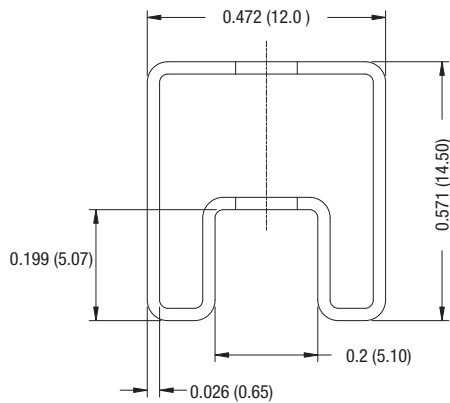


4 Pin SIP Package

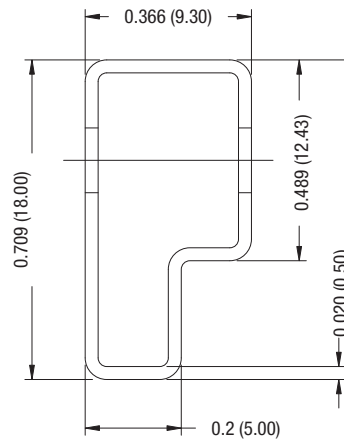


**TUBE OUTLINE DIMENSIONS**

8 Pin DIP Tube



4 Pin SIP Tube



Unless otherwise stated all dimensions in inches (mm)  $\pm 0.5$ mm.  
 Tube length (8 Pin DIP) : 20.47 (520mm  $\pm 2$ mm).  
 Tube length (4 Pin SIP) : 20.47 (520mm  $\pm 2$ mm).

Tube Quantity : 35

**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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