

FEATURES

- RoHS compliant
- Efficiency from 81%
- Power density 0.85W/cm³
- Wide temperature performance at full 1 Watt load, -40°C to 85°C
- UL 94V-0 package material
- No heatsink required
- Industry standard pinout
- Power sharing on output
- 5V & 12V input
- 5V, 9V, 12V, & 15V output
- Fully encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors

PRODUCT OVERVIEW

The MEA series is the new high performance version of our 1W NMA series. The MEA series is more efficient and offers improved regulation performance $\leq 5\%$ for applications where a wide output voltage variation can not be tolerated. They are ideally suited for providing dual rail supplies with the added benefit of galvanic isolation to reduce switching noise. All of the rated power may be drawn from a single output providing the total load does not exceed 1 watt.

SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Load Regulation (Typ)	Load Regulation (Max)	Ripple & Noise (Typ) ¹	Ripple & Noise (Max) ¹	Efficiency (Min.)	Efficiency (Typ.)	Isolation Capacitance	MTTF ²
	V	V	mA	mA	%	%	mVp-p	mVp-p	%	%	pF	kHrs
MEA1D0505SC	5	±5	±100	233	4.8	5.2	12	25	81	84.5	51	3663
MEA1D0509SC	5	±9	±55	227	3.7	4.2	9	20	83	86	53	3291
MEA1D0512SC	5	±12	±42	228	4	4.6	8	20	83	86.5	47	2860
MEA1D0515SC	5	±15	±33	225	3.7	4.5	7	20	82.5	86.5	47	2374
MEA1D1205SC	12	±5	±100	98	3.5	3.8	9	20	82	84.5	43	3352
MEA1D1209SC	12	±9	±55	95	2.4	2.8	7	20	83	86	61	3083
MEA1D1212SC	12	±12	±42	93	2.6	2.9	7	20	84.5	88.5	90	2701
MEA1D1215SC	12	±15	±33	94	2.2	2.6	7	20	83	87.5	74	2264

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	5V input types		12	20	mA p-p
	12V input types		5	10	

ABSOLUTE MAXIMUM RATINGS

Lead temperature 1.5mm from case for 10 seconds	300°C
Internal power dissipation	300mW
Input voltage V _{IN} , MEA05 types	7V
Input voltage V _{IN} , MEA12 types	15V

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	T _A = -40°C to 85°C			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High V _{IN} to low V _{IN}		1.05	1.2	%/%

ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso = 1000VDC	10			GΩ

GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	5V input types		60		kHz
	12V input types		70		

TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	-40		85	°C
Storage		-50		125	
Case Temperature above ambient	5V output types			20	
	All other output types			20	
Cooling	Free air convection				

1. See Ripple & Noise characterisation method.

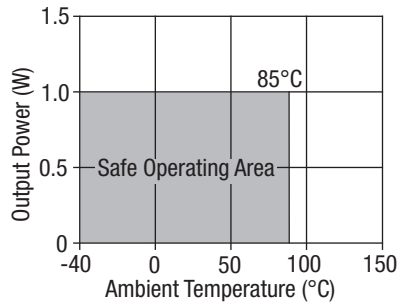
2. Calculated using MIL-HDBK-217F FN2 with nominal input voltage at full load.

All specifications typical at T_A = 25°C, nominal input voltage and rated output current unless otherwise specified.

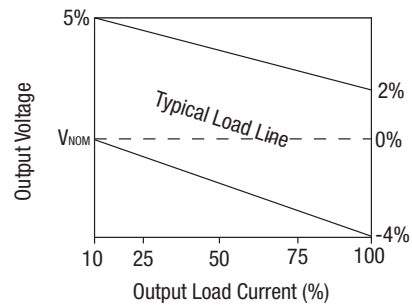


For full details go to www.murata-ps.com/rohs

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 MEA series of DC/DC converters are all 100% production tested at their stated isolation voltage. This is 1kVDC 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 MEA 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 MEA 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.

RoHS COMPLIANT 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

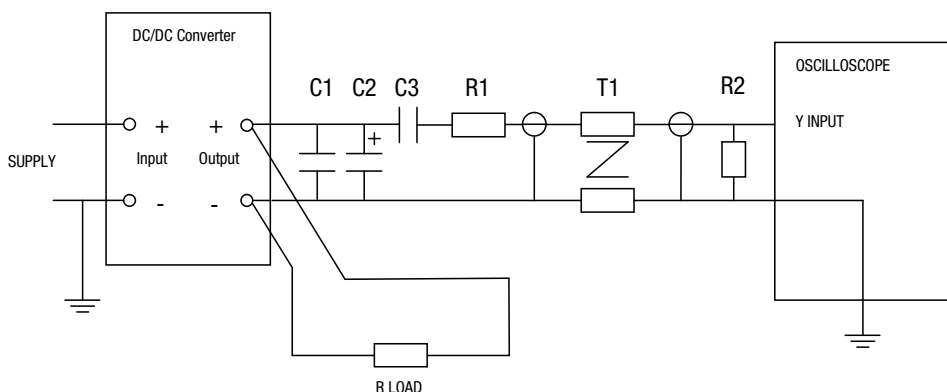
RIPPLE & NOISE CHARACTERISATION METHOD

All measurement to be taken with the following components connected to the UUT as detailed below.

50 Ohm coax cable, solder connections one end, BNC plug at the other end.

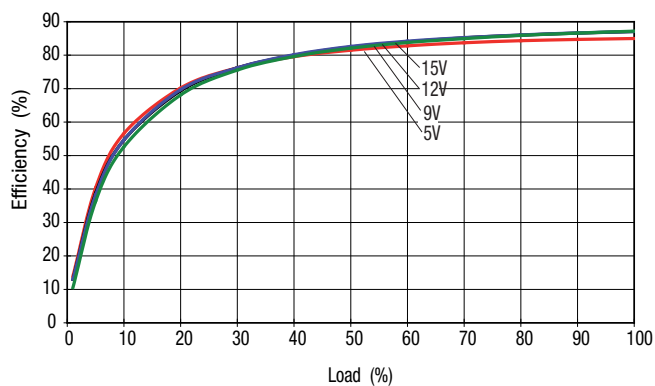
- C1 – 1µF X7R multilayer ceramic capacitor rated at minimum 3 x the output voltage of the UUT
- C2 – 10µF tantalum capacitor rated at minimum 1.5 x the output voltage of the UUT with ESR of less than 100 milliohms at 100 kHz e.g. AVX TPS series.
- C3 – 100nF multilayer ceramic capacitor, general purpose
- R1 – 450 Ohm resistor, carbon film, ±1%
- R2 – 50 Ohm BNC termination
- T1 – 3T of the coax cable through a ferrite toroid eg Ferroxcube TN32/19/13-3E25
- RLOAD – Resistive load at the UUT maximum rating. Connections via twisted wires.

Differential Mode Noise Test Schematic

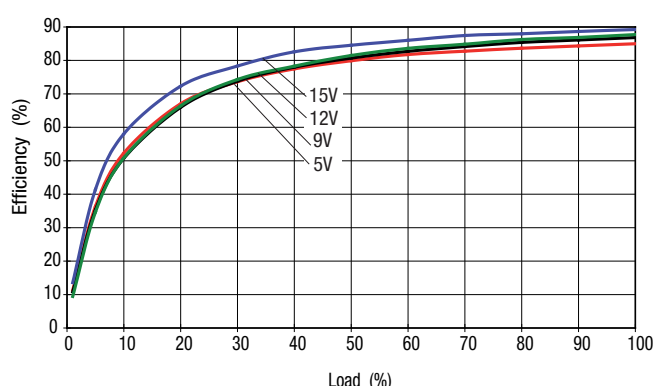


EFFICIENCY VS LOAD

MEA 5V Input Voltage

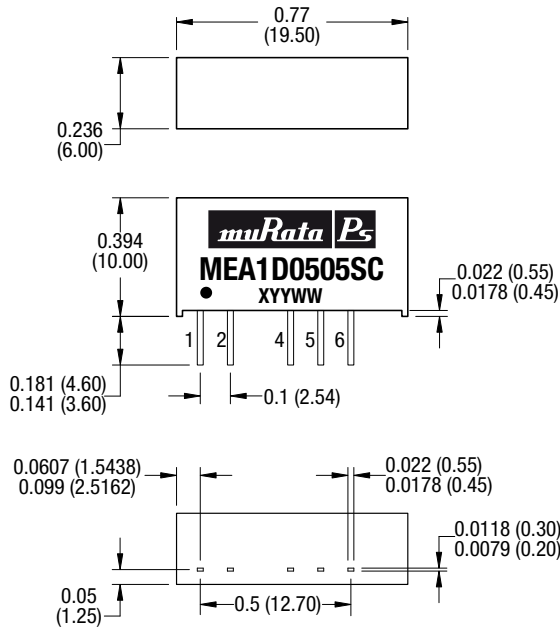


MEA 12V Input Voltage



PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS



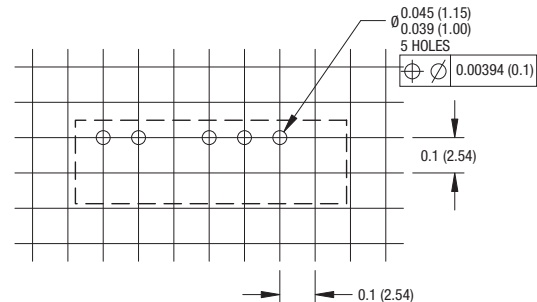
Weight: 2.3g

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

PIN CONNECTIONS

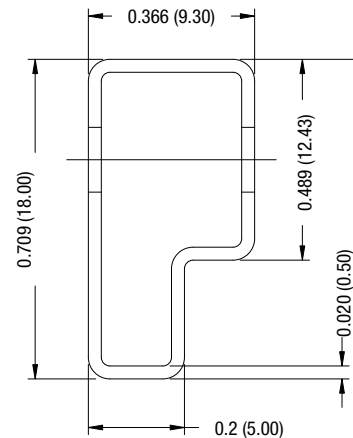
Pin	Function
1	+VIN
2	-VIN
4	-VOUT
5	OV
6	+VOUT

RECOMMENDED FOOTPRINT DETAILS



Unless otherwise stated all dimensions in inches (mm) ± 0.5 mm.

TUBE OUTLINE DIMENSIONS



Unless otherwise stated all dimensions in inches (mm) ± 0.5 mm.
Tube length : 20.47 (520mm ± 2 mm).

Tube Quantity : 25