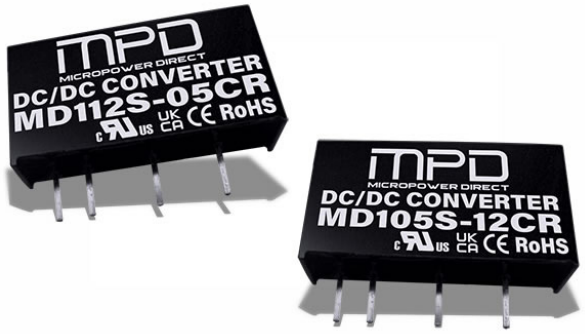
MD100CR

1W, Isolated DC/DC Converter



Key Features:

- 1W Output Power
- -40°C to +85°C Temp
- 1500VDC Isolation
- Efficiency to 75%
- 3500 kHour MTBF
- Short-Circuit Protection
- Industry Standard Pin-Out

Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

Parameter	Conditions		Min.	Typ.	Max.	Units
Input Voltage	5 VDC Input		4.75	5	5.25	VDC
	12 VDC Input		11.4	12	12.6	
	24 VDC Input		22.8	24	25.2	
Reflected Ripple Current			--	15	--	mA
Input Filter				Capacitance Filter		
Hot Plug	Unavailable					

Output

Parameter	Conditions		Min.	Typ.	Max.	Units
Voltage Accuracy	Input voltage change: ±1%		--	--	±3	%
Line Regulation	Input Voltage Variation ±1%		--	--	±0.25	
Load Regulation	10%-100% load	3.3VDC Output	--	--	±3	
		Other Output	--	--	±2	
Ripple & Noise (20Mhz Bandwidth)	5VDC Input	Other Output	--	30	75	mVp-p
		24VDC Output	--	50	100	
	12/24VDC Input	3.3/5/9/12VDC Output	--	30	100	
		15VDC Output	--	80	150	
Temperature Coefficient	Full load		--	±0.02	--	%/°C
Output Short Circuit	Continuous, self-recovery					

General

Parameter	Conditions		Min.	Typ.	Max.	Units
Isolation Voltage	60 seconds, leakage <1mA		1500	--	--	VDC
Isolation Resistance	500 VDC		1000	--	--	MΩ
Isolation Capacitance	100 KHz /0.1V		--	20	--	pF
Switching Frequency	Full load, nominal Vin	5VDC Input	--	270	--	kHz
		12/24VDC Input	--	260	--	

Environmental

Parameter	Conditions		Min.	Typ	Max.	Units
Operating Temperature Range	Derating when ≥71°C		-40		+85	°C
Storage Temperature Range			-55		+125	
Case Temperature Rise	Ta = 25°C	3.3VDC input		30		°C
		Other input		25		
Cooling	Free Air Convection					
Storage Humidity, See Note 4		Non-Condensing	5		95	%RH
Vibration						

Physical

Case Size	0.774 x 0.236 x 0.40 in
Case Material	Black plastic; flame retardant and heat resistant (UL94V-0)
Weight	0.074 oz (2.1g) Typ.

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL-HDBK-217F@25°C	3500			kHours
Pin Soldering Resistance Temperature	1.5mm away from case for 10 sec			300	°C

EMI Characteristics

Parameter	Conditions	Criteria	Level
Radiated Emissions	CISPR/EN 55032		Class B
Conducted Emissions	CISPR/EN 55032		Class B
ESD	IEC/EN 61000-4-2	B	±8kV Air, ±6kV Contact

MicroPower Direct
46 Eastman Street
Unit 1
Easton, MA 02375
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

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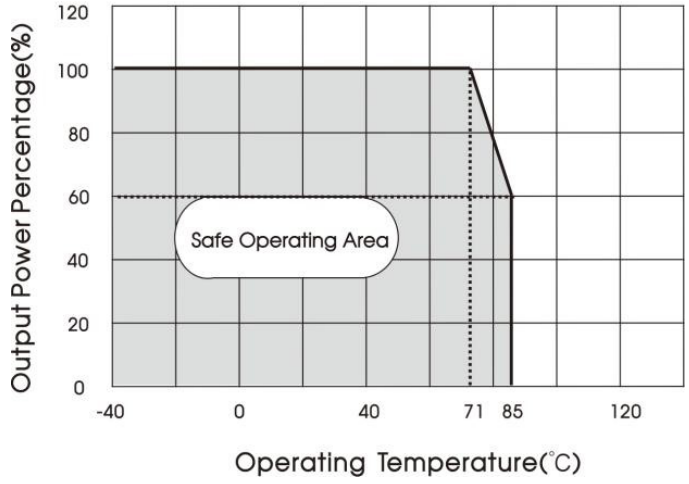
Model Selection Guide

UL	Model Number	Input				Output			Full Load Efficiency (%, Typ)	Reflected Ripple Current (mA, Typ)	Capacitive Load (uF Max) (See Note 3)
		Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min.)			
		Nominal	Range	Full-Load (Typ)	No-Load						
	MD105S-03CR	5	4.75-5.25	286	8	3.3	250	25	67	15	2400
•	MD105S-05CR	5	4.75-5.25	286	8	5	200	20	70	15	2400
	MD105S-09CR	5	4.75-5.25	282	12	9	111	12	71	15	1000
•	MD105S-12CR	5	4.75-5.25	282	12	12	84	9	72	15	560
	MD105S-15CR	5	4.75-5.25	274	18	15	67	7	73	15	560
	MD105S-24CR	5	4.75-5.25	274	18	24	41	4	73	15	100
•	MD112S-05CR	12	11.4-12.6	115	8	5	200	20	73	15	2400
	MD112S-09CR	12	11.4-12.6	115	8	9	111	12	73	15	1000
	MD112S-12CR	12	11.4-12.6	115	8	12	83	9	73	15	560
	MD112S-15CR	12	11.4-12.6	112	8	15	67	7	75	15	560
	MD124S-03CR	24	22.8-25.2	59	8	3.3	250	25	71	15	2400
	MD124S-05CR	24	22.8-25.2	58	8	5	200	20	73	15	2400
	MD124S-09CR	24	22.8-25.2	58	8	9	111	12	73	15	1000
	MD124S-12CR	24	22.8-25.2	58	8	12	83	9	73	15	560
	MD124S-15CR	24	22.8-25.2	58	8	15	67	7	73	15	560
	* MD105S-05CR, MD105S-12CR, MD112S-05CR have, UL/cUL 62368-1 recognition (UL certificate). Contact facotry for safety standard status of other models.										

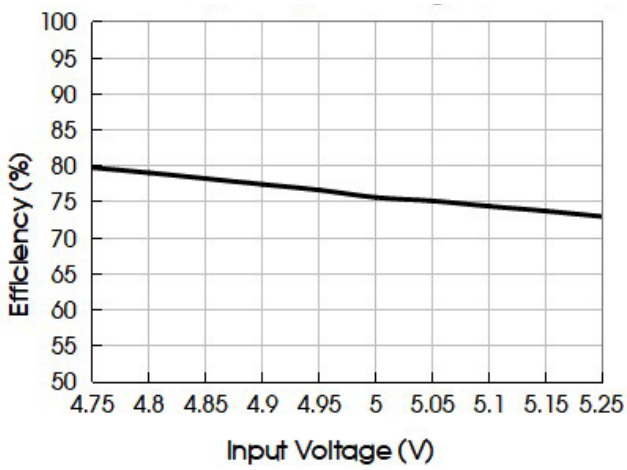
Notes:

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage.
2. The "parallel cable" method is used for ripple and noise test.
3. The maximum capacitive load is tested within the input voltage range and under full load conditions.
4. Unless otherwise specified, all indicators in this manual are measured at Ta=25 °C, humidity from 40% to 75% RH, nominal input voltage, and output rated load.

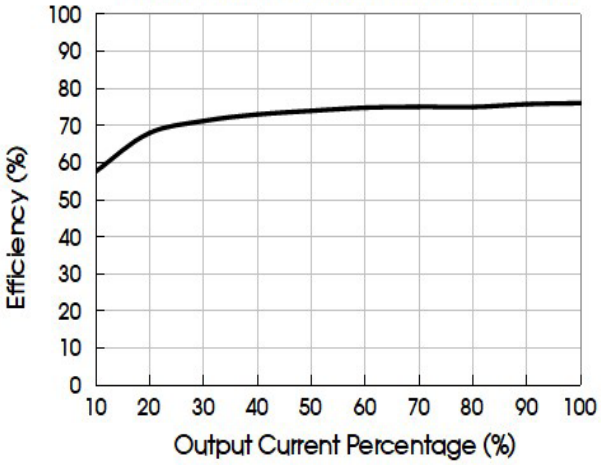
Temperature Derating



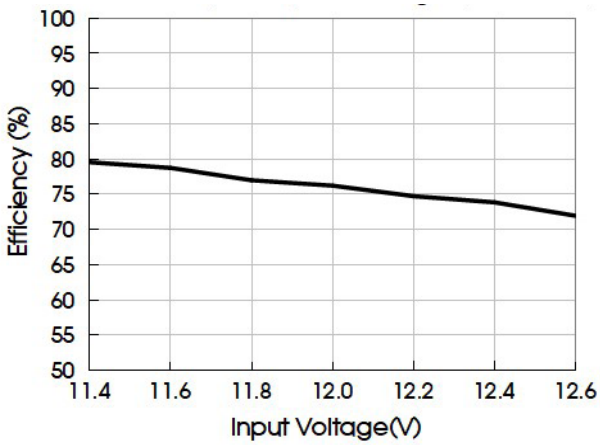
Efficiency vs Input Voltage (Full Load): MD105S-05CR



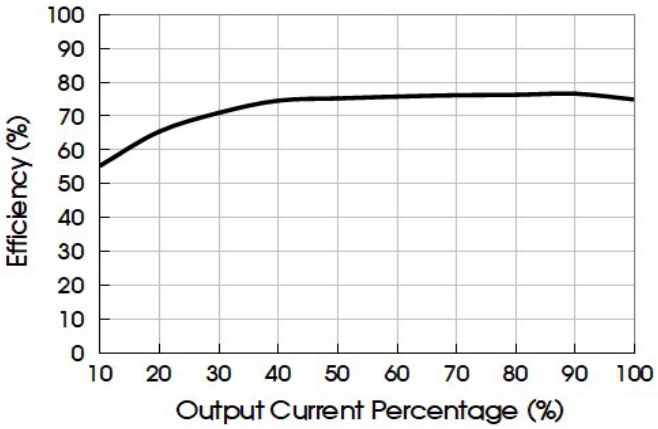
Efficiency vs Output Load (Vin=5V): MD105S-05CR



Efficiency vs Input Voltage (Full Load): MD105S-12CR



Efficiency vs Output Load (vin=12V): MD105S-12CR



Typical Application Circuit

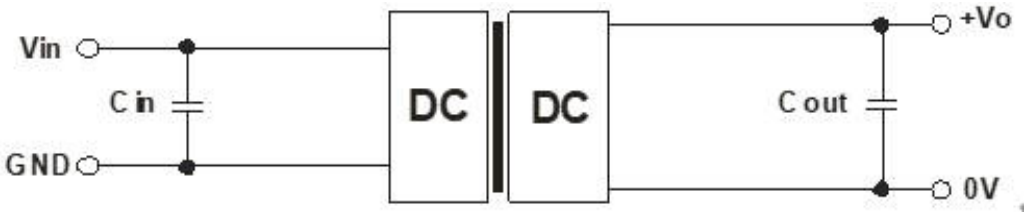


Table1:Recommended input and output capacitor values			
Vin (VDC)	**Cin**	**Output(VDC)**	**Cout**
5VDC	4.7μF/16V	3.3VDC/5VDC	10μF/16V
12VDC	2.2μF/25V	9VDC	2.2μF/16V
24VDC	1μF/50V	12VDC	2.2μF/25V
		15VDC	1μF/25V

Table. 1

EMC Application Recommended Circuit

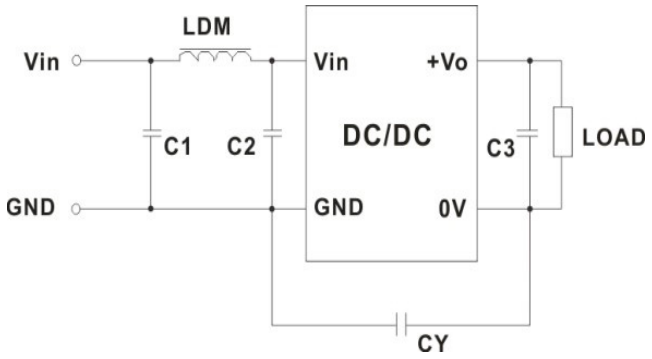
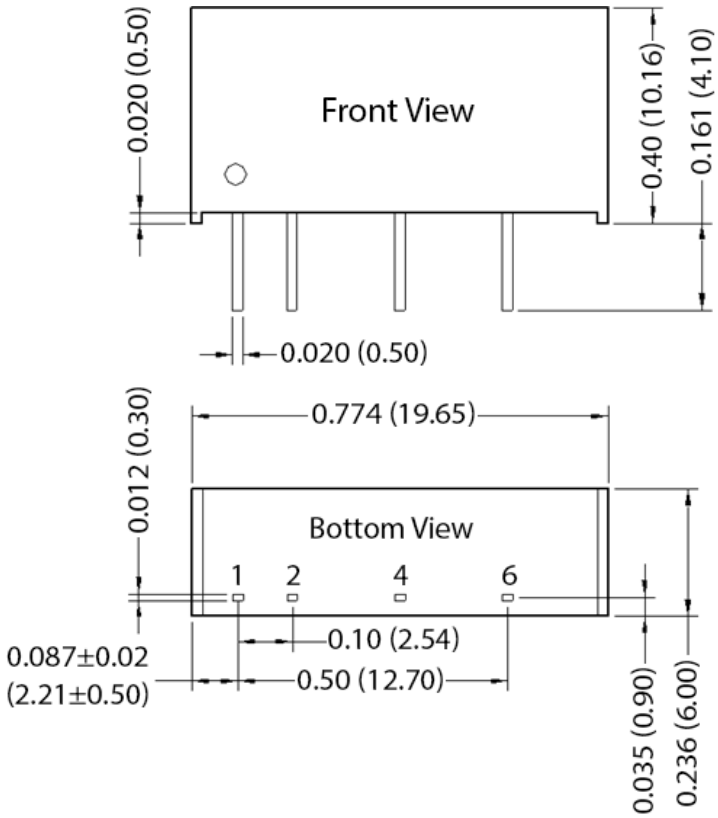
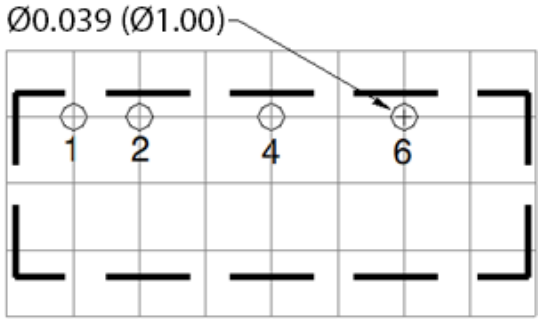


Table2:Recommended EMC filter values				
Input voltage		**5VDC**		**12/24VDC**
Output voltage		3.3/5/9VDC	12/15/24VDC	
EMI	C1/C2	4.7μF /50V	4.7μF /50V	4.7μF /50V
	CY	100pF	1000pF	270pF /2kV
	C3	Refer to the Cout in table 1		
	LDM	6.8μH		

Table. 2

Mechanical Dimensions





Pin	Function
1	Vin
2	GND
4	0V
6	+Vo

Note:

- Unit: mm (inches)
- Pin section tolerances: ±0.004 (±0.10)
- General tolerances: ±0.010 (±0.25)
- Weight: 0.074 oz (2.1g)