30DM2W4_1.5 series

30W - Single Output DC-DC Converter - Wide Input - Isolated

DC-DC Converter 30 Watt

- 1"X 1" housing size
- 4:1 input voltage range
- Operating temperature range: -40°C to +105°C
- 1500VDC isolation voltage
- Up to 90% efficiency
- Undervoltage protection
- Short circuit protection (SCP)
- Over current protection

Introducing our new 30DM2W4_1.5 series: A compact power solutions built for performance. Our new series is designed to combine maximum efficiency with robust protection, all within a compact 1" x 1" housing size. Offering a wide 4:1 input voltage range, it adapts effortlessly to various power sources, ensuring consistent operation even in demanding environments. With an extended operating temperature range from -40°C to +105°C, it guarantees reliability under extreme conditions. The 1500VDC isolation voltage enhances safety and durability, while its impressive efficiency of up to 90% optimizes energy use and minimizes heat generation. Built-in protections, including undervoltage protection, short circuit protection (SCP), and overcurrent protection, provide an extra layer of security, making this series the ideal choice for applications where performance and reliability are important.

Common specifications

Short circuit protection	Input voltage range, continuous, self-recovery
Over current protection	Input voltage range, 110 (min.) 170 (typ.) 260 (max.)%
Switching frequency	400 kHz (typ.) PWM
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Soldering profile	+300°C (1.5mm from case for 10 sec)
Storage Humidity	5~95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Input filter	PI filter
Hot plug	Unavailable
Case material	Aluminum alloy
Weight	21g (typ.)
Package Dimensions	25.40 x 25.40 x 12.00 mm
Cooling	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no-load)	**24VDC nominal input** • 3.3VDC Output • 5VDC Output • Other Output **48VDC nominal input** • 3.3VDC Output • Other Output		 982/6 1420/4 1388/4 497/10 710/8	 1032/20 1453/12 1420/12 520/20 735/15	mA
Reflected ripple current	24VDC nominal input 48VDC nominal input		100 40		mA
Impulse voltage	24VDC nominal input 48VDC nominal input	-0.7 -0.7		50 100	VDC
Starting voltage	24VDC nominal input 48VDC nominal input			9 18	VDC
Input undervoltage protection	24VDC nominal input 48VDC nominal input	5.5 12.0	7.5 15.5		VDC
Starting Time	24VDC Nominal input and constant resistance load 48VDC Nominal input and constant resistance load		30 10	100	ms
Ctrl	Turn off module Turn on module Input current when off	Connected GND or (0 - 1.2VDC) No connected or (3.5 - 12VDC)	2	7	mA

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	5%-100% load		±1.0	±3.0	%
Linear regulation	Vin = Min. to max. @full load		±0.2	±0.5	%
Load regulation	5%-100% load		±0.5	±1.0	%
Ripple & noise	20MHz bandwidth, 5%-100% load		100	200	mVp-p
Transient recovery time	25% load step Change, nominal input voltage		250	500	µs
Transient response deviation	25% load step Change, nominal input voltage		±3	±8	%
Temperature coefficient	Full Load			±0.03	%/°C
Trim	Input voltage range	90		110	%Vo

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	I-O, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, insulated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		2000		pF

Example:
30DM2W4_2405S1.5
30 = 30Watt; D = DIP; M2 = Series; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
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 <75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this manual are based on our company's corporate standards;
6. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
7. Product specifications are subject to change without prior notice.

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EMC specifications				
EMC	EMI	CE	CISPR32/EN55032 CLASS B (Figure 4)	
EMC	EMI	RE	CISPR32/EN55032 CLASS B (Figure 4)	
EMC	EMS	ESD	EN61000-4-2 Air ± 8kV , Contact ± 6kV	perf. Criteria B
EMC	EMS	RS	EN61000-4-3 10V/m	perf. Criteria A
EMC	EMS	EFT	EN61000-4-4 ±2kV	perf. Criteria B
EMC	EMS	Surge	EN61000-4-5 ±1kV	perf. Criteria B
EMC	EMS	CS	EN61000-4-6 3Vrms	perf. Criteria A

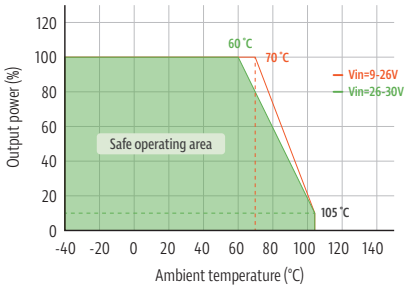
Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA) Max.	Efficiency (%) full load, (Typ.)	Max. Capacitive Load (uF) Max.
	30DM2W4_2403S1.5	24 (9-36)	40	3.3	6000	84	10000
	30DM2W4_2405S1.5	24 (9-36)	40	5	6000	88	10000
	30DM2W4_2406S1.5	24 (9-36)	40	6	5000	88	7200
	30DM2W4_2412S1.5	24 (9-36)	40	12	2500	90	1500
	30DM2W4_2415S1.5	24 (9-36)	40	15	2000	90	1000
	30DM2W4_2424S1.5	24 (9-36)	40	24	1250	90	750
	30DM2W4_4803S1.5	48 (18-75)	80	3.3	6000	83	7200
	30DM2W4_4805S1.5	48(18-75)	80	5	6000	88	7200
	30DM2W4_4812S1.5	48 (18-75)	80	12	2500	88	2000
	30DM2W4_4815S1.5	48 (18-75)	80	15	2000	88	1500
	30DM2W4_4824S1.5	48 (18-75)	80	24	1250	88	470

Please note: Please use suffix /CM to select the option for chassis mounting and suffix /DR for the DIN rail option: i.e. 30DM2W4_4824S1.5/**CM**

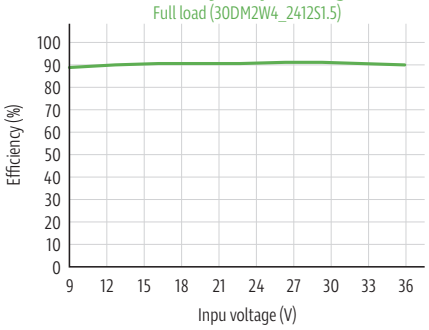
Typical characteristics

Temperature derating graph



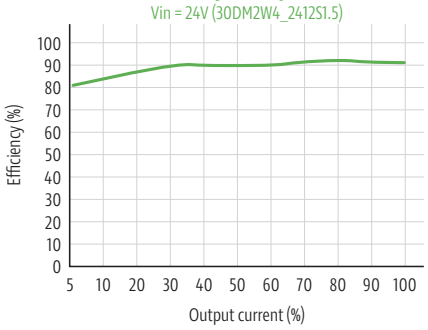
Efficiency vs input voltage

Full load (30DM2W4_2412S1.5)

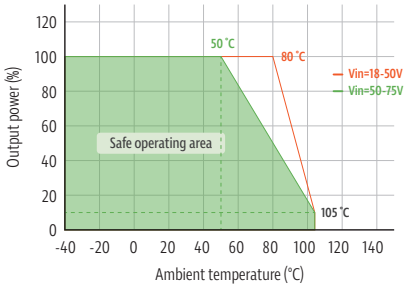


Efficiency vs output load

Vin = 24V (30DM2W4_2412S1.5)

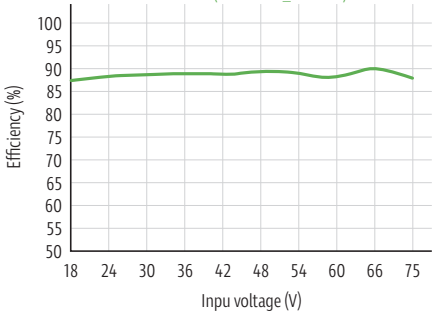


Temperature derating graph



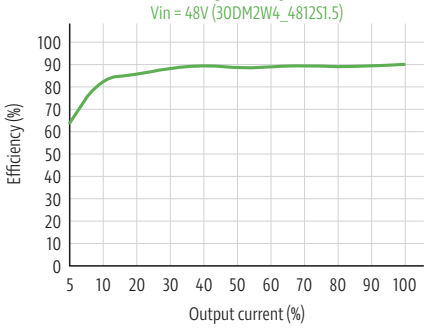
Efficiency vs input voltage

Full load (30DM2W4_4812S1.5)



Efficiency vs output load

Vin = 48V (30DM2W4_4812S1.5)



Typical circuit design and application

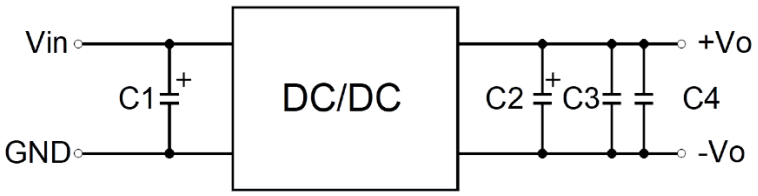


Fig 3

Recommended component parameters

Vin (VDC)	C1 (uF)	C2 (uF)	C3 (uF)	C4 (uF)
24	100uF	470uF	10uF	0.1
48	100uF	470uF	22uF	10

EMI recommended component parameters

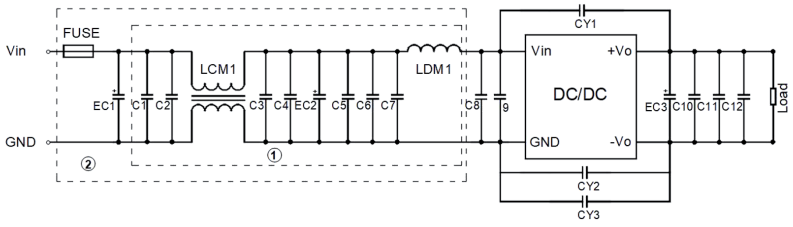
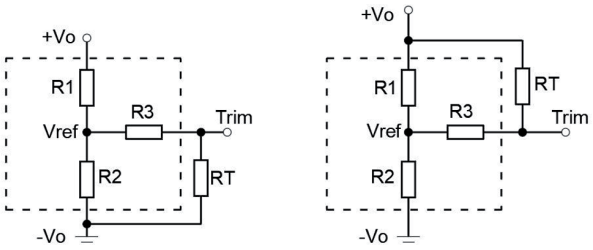


Fig 4

EMI Recommended component parameters

Vin (VDC)	24V	48V
FUSE	Choose according to actual input current	
CEC1	1000 (uF)	680 (uF)
EC2	220 (uF)	100 (uF)
C1, C2, C3, C4, C5, C6, C7	4.7 (uF)	4.7 (uF)
LCM1	0.32 (mH)	10 (mH)
LDM1	2.2 (uH)	6.8 (uH)
C8,C9	--	4 (uF)
CY2	222 (pF)	102 (pF)
CY1,CY3	2200 (pF)	2200 (pF)
EC3	470 (uF)	470 (uF)
C10	10 (uF)	22 (uF)

Trim



Trim up

Trim down

Trim resistor connections (dashed line shows internal resistor network)

Fig 5

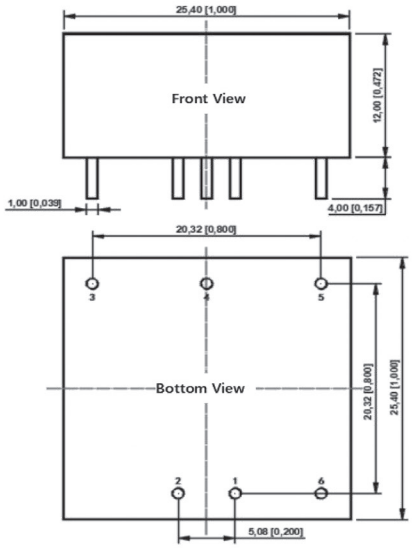
Vout (V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

$$Up: \ Rt = \frac{nR2}{R2-n} - R3 \qquad n = \frac{Vref}{Vo-Vref} * R1$$

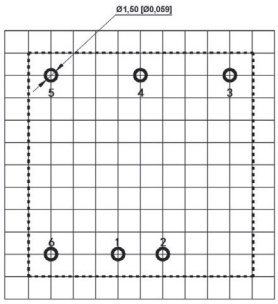
$$Down: Rt = \frac{nR1}{R1-n} - R3 \qquad n = \frac{Vo-Vref}{Vref} * R2$$

Note:
All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

Mechanical dimensions

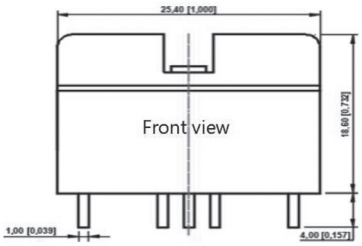


Note:
Unit: mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.50[±0.020]

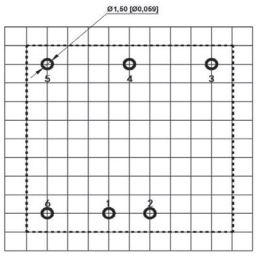


The grid distance is 2.54 x 2.54mm

Pin definition table	
Pin	Function
1	GND
2	Vin
3	+Vo
4	Trim
5	-Vo
6	Ctrl



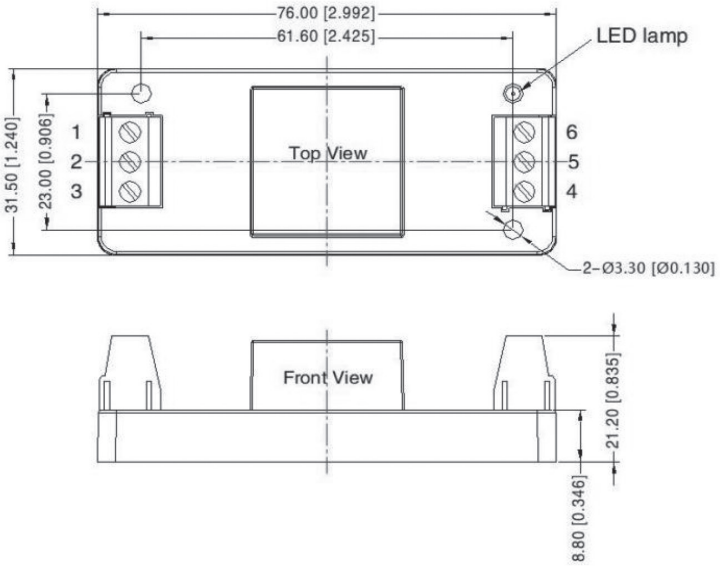
Note:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]



The grid distance is 2.54 x 2.54mm

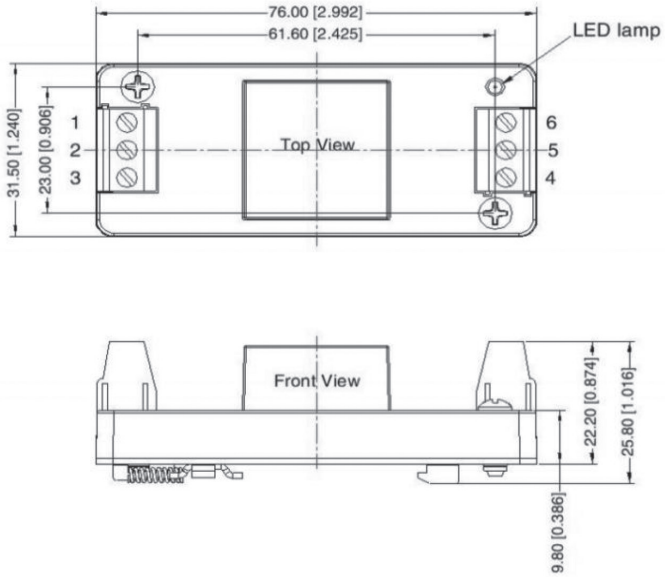
Pin definition table	
Pin	Function
1	GND
2	Vin
3	+Vo
4	Trim
5	-Vo
6	CTRL

Mechanical dimensions - Chassis and DIN rail mounting



Pin definition table	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	-Vo

Unit: mm [inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ± 1.00 [±0.039]



Pin definition table	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	-Vo

Unit: mm [inch]
Mounting rail: TS35
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ± 1.00 [±0.039]