



30DM1W4_1.5 series

30W - Single Output DC-DC Converter - Ultra Wide Input - Isolated & Regulated

DC-DC Converter

30 Watt

- ⊕ Wide input voltage range (4:1)
- ⊕ 30W output power
- ⊕ Up to 91% efficiency
- ⊕ Continuous short circuit protection, self-recovery
- ⊕ Very fast output start up
- ⊕ Switching frequency 280kHz
- ⊕ Input under voltage, output over voltage, short circuit, over current protection
- ⊕ 1500VDC isolation voltage
- ⊕ Operating temperature: -40°C to +105°C
- ⊕ International standard pin-out

Introducing our new 30DM1W4_1.5 series, engineered to deliver high performance and reliability across a wide range of applications. With a versatile 4:1 wide input voltage range and 30W output power, these modules offer exceptional flexibility and power delivery to meet your needs. Achieving up to 91% efficiency, these modules ensure optimal energy use, reducing waste and maximizing performance. They are designed with continuous short circuit protection and self-recovery, safeguarding your devices and ensuring uninterrupted operation.

Featuring a very fast output start-up, our power modules deliver rapid and stable power, ideal for applications requiring quick response times. Operating at a switching frequency of 280kHz, they provide efficient power conversion with minimal noise. With comprehensive protection features, including input under voltage, output over voltage, short circuit, and over current protection, these modules offer robust security for your systems. The 1500VDC isolation voltage further enhances safety and reliability. Operating in a broad temperature range from -40°C to +105°C, these modules are built to withstand harsh environments, ensuring consistent and reliable performance.



Common specifications	
Short circuit protection	Hiccup, continuous, self-recovery
Over load protection	110%~260%Io
Over voltage protection	120%~200%Vo
Switching frequency	280 kHz (typ.)
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-55°C ~+125°C
Humidity	5~95% RH (no condensing)
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Case material	Aluminum metal case
Weight	18 g (typ.)
Cooling	Free air convection

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	Input voltage range, 0%~100% load - Vo		±1	±3	%
Voltage regulation	Nominal load, full voltage range - Vo		±0.2	±0.5	%
Load regulation	10% ~ 100% nominal load Vo		±0.5	±1	%
Ripple & noise*	20MHz bandwidth, twisted pair method		50	100	mV
Dynamic response**	≤6V output other output		±5 ±3	±8 ±5	500us
Output voltage adjustment	Available (if with trim pin)			±10	%

Note: *Ripple & noise is tested by twisted pair method.

** 25% nominal load step change @nominal input

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Stand-by consumption	Other output @nominal input		1		W
	24V output @nominal input		0.08		
Input filter	Pi filter				
Input under-voltage protection	30DM1W4_24XXS1.5		7		V
	30DM1W4_48XXS1.5		13		
CTRL*	Module turn-on CTRL suspended or TTL high level (3.3 - 12VDC) Module turn-off CTRL connect to -Vin or low level (0 - 1.2VDC) Input current when switched off 2mA (typ.)				

Note: *The voltage of the CTRL control pin is relative to the input pin -Vin.

Isolation specifications		
Item	Test condition	
Isolation voltage	Input to output ≤ 1mA / 1min	1500VDC
Insulation resistance	Input to output ≥ 1000MΩ	500VDC
Isolation capacitor	Input to output @100kHz/0.1V	1nF

- The product should be used under the specification range, otherwise it will cause permanent damage to it.
- If the product worked beyond the load range or below the minimum load, we cannot ensure that the performance of product is in accordance with all the indexes in this datasheet;
- Unless otherwise specified, data in this datasheet should be tested under conditions of Ta = 25°C, humidity <75% when inputting nominal voltage and outputting rated load (pure resistance load);
- All index testing methods in this datasheet are based on our company's corporate standards
- The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
- The product specification may be changed at any time without prior notice.

Example:

30DM1W4_2405S1.5

30 = 30Watt; D = DIP; M1 = Series; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation

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EMC specifications				
EMC	EMI	CE	CISPR22/EN55032	CLASS B (see recommended circuit photo 3)
EMC	EMI	RE	CISPR22/EN55032	CLASS B (see recommended circuit photo 3)
EMC	EMS	RS	IEC/EN61000-4-3	10V/m Perf. Criteria A
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s Perf. Criteria A
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV Perf. Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	±2kV Perf.Criteria B (see recommended circuit photo 3)
EMC	EMS	EFT	IEC/EN61000-4-4	±2kV Perf.Criteria B (see recommended circuit photo 3)

Product Selection Guide

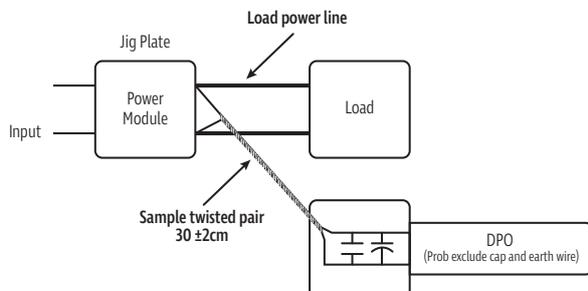
Approval	Model	Input Voltage Nominal (VDC)	Input Voltage Range (VDC)	Output Voltage Vo/Io (VDC)	Output Current Vo/Io (mA) Max./Min.	Max. Capacitive Load (uF)	Ripple & Noise typ./max. (mVp-p)	Efficiency (%) @full load, nominal input voltage (typ.)
	30DM1W4_2403S1.5	24	9-36	3.3	6000/0	10000	50/100	87
	30DM1W4_2405S1.5	24	9-36	5	6000/0	10000	50/100	88
	30DM1W4_2406S1.5	24	9-36	6	5000/0	8000	50/100	89
	30DM1W4_2409S1.5	24	9-36	9	3333/0	3000	50/100	90
	30DM1W4_2412S1.5	24	9-36	12	2500/0	2000	50/100	90
	30DM1W4_2415S1.5	24	9-36	15	2000/0	1500	50/100	90
	30DM1W4_2424S1.5	24	9-36	24	1250/0	750	50/100	90
	30DM1W4_4803S1.5	48	18-75	3.3	6000/0	10000	50/100	87
	30DM1W4_4805S1.5	48	18-75	5	6000/0	10000	50/100	88
	30DM1W4_4809S1.5	48	18-75	9	3333/0	3000	50/100	90
	30DM1W4_4812S1.5	48	18-75	12	2500/0	2000	50/100	91
	30DM1W4_4815S1.5	48	18-75	15	2000/0	1500	50/100	91
	30DM1W4_4824S1.5	48	18-75	24	1250/0	750	50/100	90

Note:

1. Suffix /R is with control pin option and output adjustment pin together, /C is for control function only, /T for adjustment function, /N suffix refers to no extra functions;
2. Use suffix /H for heatsink option, /CM for chassis mounting option, /DR for DIN-Rail mounting option, DIN-Rail width is: 35mm; Example: 30DM1W4_4824S1.5/H/CM/DR
3. Max capacitive load is, when the power supply is fully loaded, the max capacity could be connected to output, if exceed, the power supply cannot start-up;

Ripple & noise test: (twisted pair method 20MHz bandwidth)

Twisted pair method (20MHz bandwidth)



Test Method:

1. Connect the twisted pair, set the oscilloscope bandwidth to 20MHz, use a 100M bandwidth probe, and terminate with a 0.1uF polypropylene capacitor and a 10uF high-frequency low-resistance electrolytic capacitor in parallel. Configure the oscilloscope to sample mode.
2. Connect the input terminal to the power supply and the output terminal to the electronic load using a jig plate. Use a 30cm (± 2 cm) sampling line, and select the power line from appropriately insulated wires of the corresponding diameter according to the output current flow.

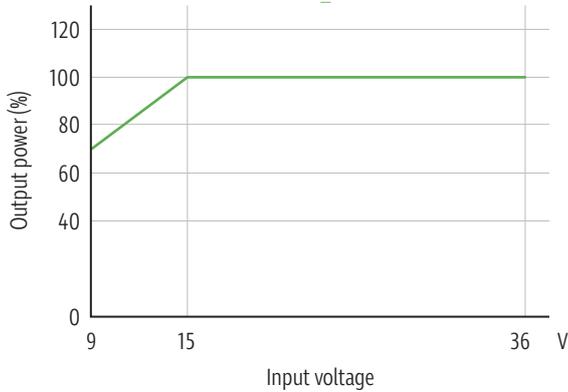
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Typical characteristics

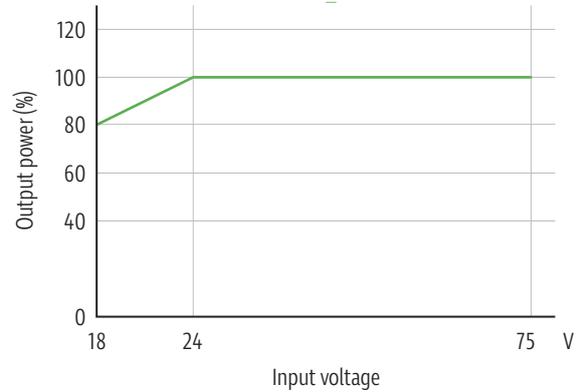
Input voltage derating curve

30DM1W4_24XXS1.5



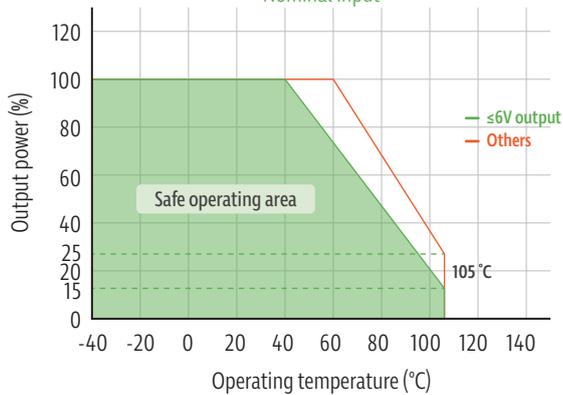
Input voltage derating curve

30DM1W4_48XXS1.5



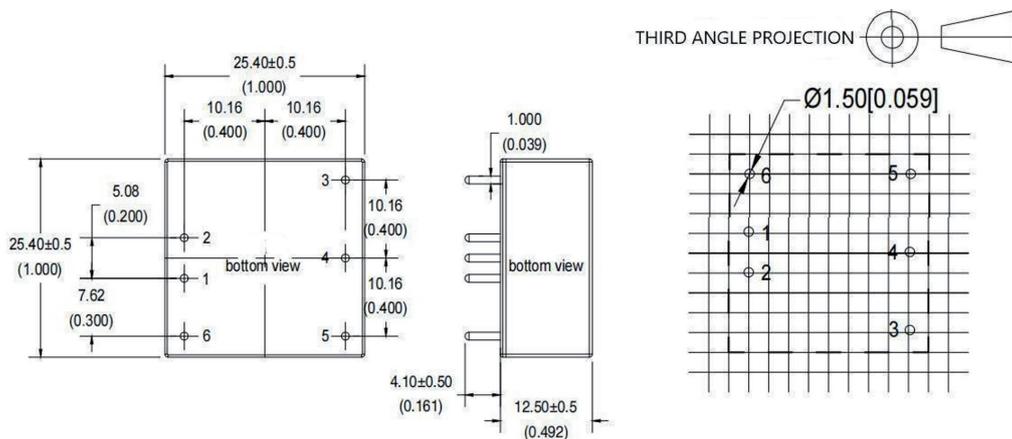
Temperature derating graph

Nominal input



Note: During the actual application of the product, it is necessary to ensure that the surface temperature of the shell is $\leq 110^{\circ}\text{C}$, and the product can be judged to be in a stable working range.

Standard packing dimensions



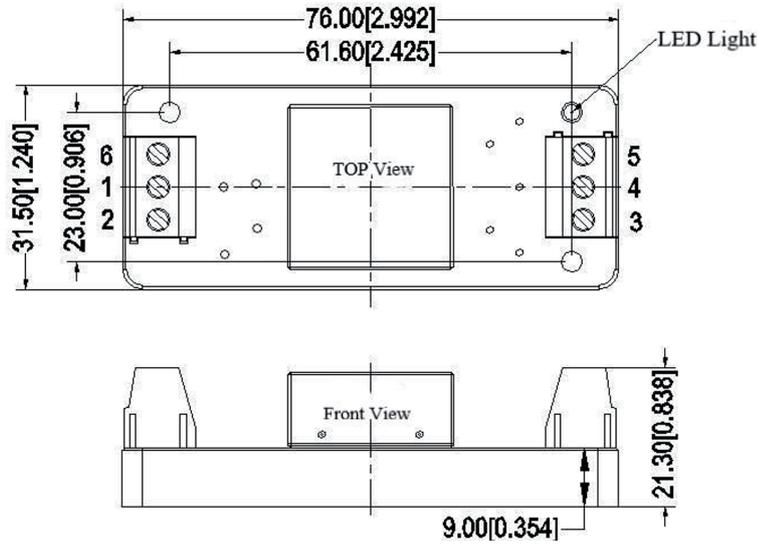
Grid: 2.54 x 2.54mm
Unit: mm [inch]
Pin tolerance: $\pm 0.10\text{mm}$ [$\pm 0.004\text{inch}$]
General tolerance: $\pm 0.50\text{mm}$ [$\pm 0.020\text{inch}$]

Pin	1	2	3	4	5	6
30DM1W4_xxyyS1.5	-Vin	+Vin	+Vout	NP	GND	NP
30DM1W4_xxyyS1.5/C	-Vin	+Vin	+Vout	NP	GND	Ctrl
30DM1W4_xxyyS1.5	-Vin	+Vin	+Vout	Trim	GND	NP
30DM1W4_xxyyS1.5/R	-Vin	+Vin	+Vout	Trim	GND	Ctrl

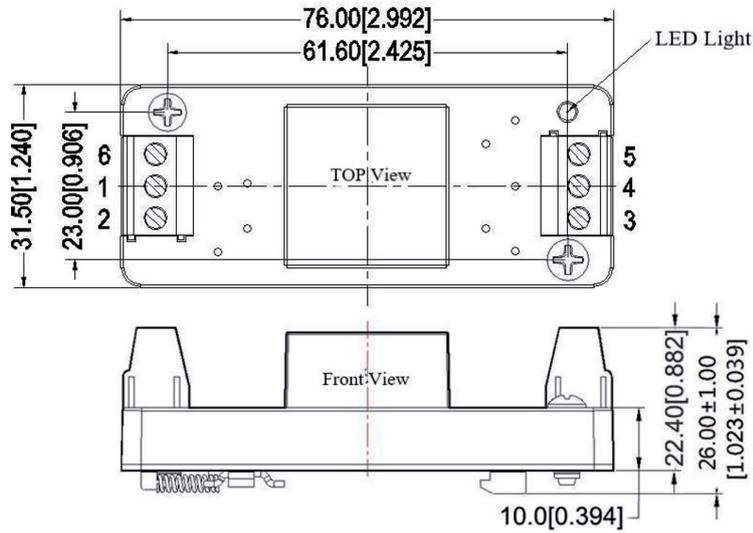
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Chassis mounting packing dimensions



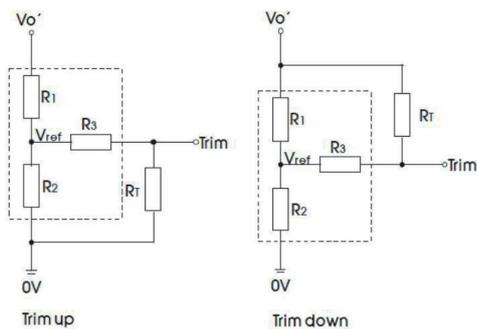
DIN rail packing dimensions



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The use of trim and the calculation of trim resistance



Calculating Trim resistor values:

$$\text{up: } R_T = \frac{\alpha R_2}{R_2 - \alpha} - R_3$$

$$\alpha = \frac{V_{ref}}{V_{o'} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{\alpha R_1}{R_1 - \alpha} - R_3$$

$$\alpha = \frac{V_{o'} - V_{ref}}{V_{ref}} \cdot R_2$$

RT= Trim Resistor value;

a= self-defined parameter, no actual meaning;

Vo' is the actual voltage to increase or decrease;

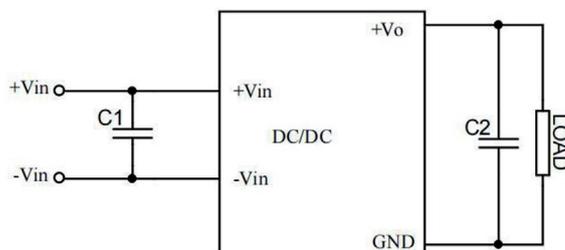
The circuit for Trim (the dashed area is the inside of product)

Vout (VDC)	R1 (kΩ)	R2 (kΩ)	R3 (kΩ)	Vref (V)
3.3	4.22	2.55	12	1.25
5	5.1	5.1	20	2.5
6	6.2	4.44	20	2.5
9	9.31	3.58	24	2.5
12	18	4.75	33	2.5
15	18	3.6	25.5	2.5
24	30	3.48	30	2.5

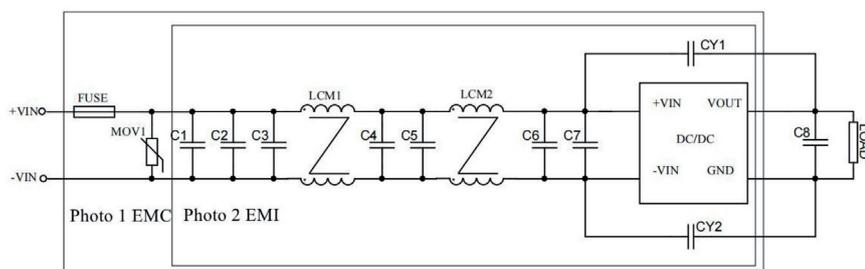
Recommended circuit

1. DC-DC test circuit:

All products of this series are tested according to the recommended test circuit. C1: 100uF/100V; C2: 100uF/50V



EMC external recommended circuit



Component	30DM1W4_24xxS1.5	30DM1W4_48xxS1.5
FUSE	According to customer's request	
MOV1	14D560K	14D101K
C1	1000uF/50V	470uF/100V
C7	470uF/50V	470uF/100V
C2/C3/C4/C5/C6	10uF/50V	10uF/100V
LCM1	5mH	5mH
LCM2	250uH	250uH
C8	100uF/50V	100uF/100V
CY1, CY2	2.2nF/2000V	2.2nF/2000V