30DAW4_1.5R series

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

DC-DC Converter 30 Watt

- 2"x 1" package style
- 4:1 wide input voltage
- Operating temperature range: -40°C to +105°C
- 1500VDC isolation
- Up to 90% efficiency
- Short-circuit protection
- (SCP) Overcurrent protection
- Overvoltage protection

Introducing our new high-performance DC-DC converter 30DAW4_1.5R series. Designed in a compact 2"x1" package style with an ultra-wide 4:1 input voltage range. Engineered for reliability, it operates smoothly across a broad temperature range from -40°C to +105°C and offers robust 1500VDC isolation. With up to 90% efficiency and built-in protection features - including short-circuit, overcurrent, and overvoltage protection - this series delivers outstanding performance for demanding industrial, communication, and transportation applications.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

Common specifications

Short circuit protection	Input voltage range, continuous, self recovery
Over voltage protection	Input voltage range 110 % (min.)
Over current protection	Input voltage range 110 % (min.)
Switching frequency	300 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)
Humidity	5~95% RH (non-condensing)
Mtbf: (mil-hdbk-217f@25°c)	1,000,000 hours
Case material	Aluminum alloy
Package dimensions	50.80 x 25.40 x 12.00mm
Weight	30g (typ.)
Cooling method	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 • 5VDC output • Other Output		970/60 1454/60 1420/6 480/20 718/20 710/5	993/100 1488/100 1488/16 490/35 736/35 744/10	mA
Reflected ripple current	Rated input voltage		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
Undervoltage protection	24VDC nominal input 48VDC nominal input	5.5 12.0	6.5 15.5		VDC
Start time	Nominal input and constant resistance load		10		ms
Ctrl	Turn off module Turn on module Input current when off	Connected GND or (0-1.2V) No connected or (3.5-12V)	5	8	mA
Input filter	PI filter				

Example:
30DAW4_2405S1.5R
30 = 30Watt; D = DIP; A = Series; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation; R = Revised version

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		80	120	mVp-p
Cross regulation rate	Dual output, main circuit 50% loaded, auxiliary circuit 10% -100% loaded			±5	%
Transient recovery time	25% load step change, nominal input voltage		300	500	µs
Transient response deviation	25% Load Step Change, nominal input voltage		±5	±8	%
Temperature coefficient	Full Load		±0.01	±0.02	%/°C
Trim	input voltage range		±10.0		%

Isolation specifications

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

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. Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at Ta = 25 °C, humidity <75% RH, nominal input voltage, and output rated load;
6. All indicator testing methods in this manual are based on our company's corporate standards;
7. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
8. Product specifications are subject to change without prior notice.

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EMC specifications			
EMI	CE	CISPR32/EN55032 CLASS B (EMC Recommended Circuit 4-2)	
EMI	RE	CISPR32/EN55032 CLASS B (EMC Recommended Circuit 4-2)	
EMS	ESD	EN61000-4-2 Air ± 8kV , Contact ± 6kV	perf. Criteria B
EMS	RS	EN61000-4-3 10V/m	perf. Criteria A
EMS	EFT	EN61000-4-4 ±2kV	perf. Criteria B
EMS	Surge	EN61000-4-5 ±1kV	perf. Criteria B
EMS	CS	EN61000-4-6 10Vrms	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)
	30DAW4_2403S1.5R	24 (9-36)	40	3.3	6000	85	10000
	30DAW4_2405S1.5R	24 (9-36)	40	5	6000	86	10000
	30DAW4_2409S1.5R	24 (9-36)	40	9	3333	88	4700
	30DAW4_2412S1.5R	24 (9-36)	40	12	2500	88	2700
	30DAW4_2415S1.5R	24 (9-36)	40	15	2000	90	1680
	30DAW4_2424S1.5R	24 (9-36)	40	24	1250	90	680
	30DAW4_4803S1.5R	48 (18-75)	80	3.3	6000	86	10000
	30DAW4_4805S1.5R	48 (18-75)	80	5	6000	87	10000
	30DAW4_4812S1.5R	48 (18-75)	80	12	2500	88	2700
	30DAW4_4815S1.5R	48 (18-75)	80	15	2000	89	1680
	30DAW4_4824S1.5R	48 (18-75)	80	24	1250	87	680

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)
	30DAW4_2405D1.5R	24 (9-36)	40	±5	±3000	86	#2000
	30DAW4_2412D1.5R	24 (9-36)	40	±12	±1250	89	#1250
	30DAW4_2415D1.5R	24 (9-36)	40	±15	±1000	89	#680
	30DAW4_2424D1.5R	24 (9-36)	40	±24	±625	89	#470
	30DAW4_4805D1.5R	48 (18-75)	80	±5	±3000	86	#2000
	30DAW4_4812D1.5R	48 (18-75)	80	±12	±1250	88	#1250
	30DAW4_4815D1.5R	48 (18-75)	80	±15	±1000	89	#680

Please note:

1. The input end of the extended package is equipped with anti-reverse protection function, and its full load efficiency will be reduced by 2%;
2. The maximum capacities load „#" means that the positive and negative outputs are connected to the same capacitance.
3. Please add suffix „/CM" for chassis mounting option, or add suffix „DR/" for DIN rail option (i.e. 30DAW4_2424D1.5R/CM).

Typical characteristics

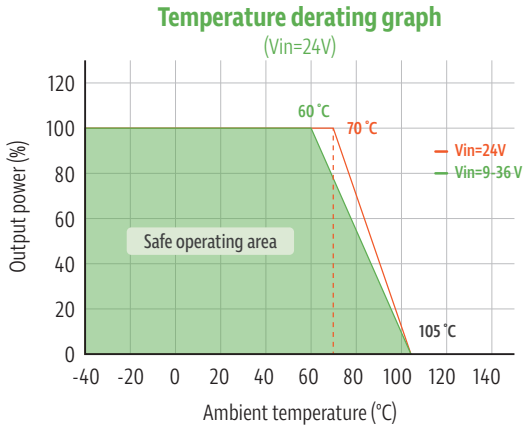


Figure 1

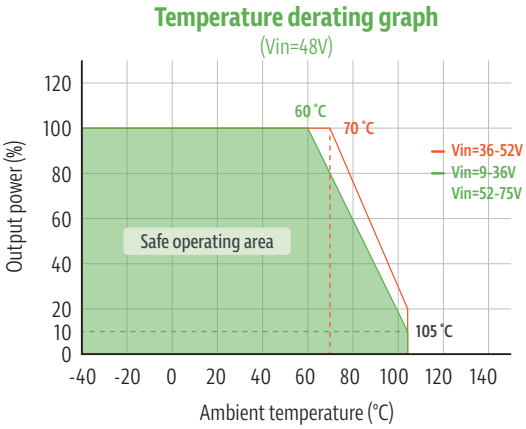
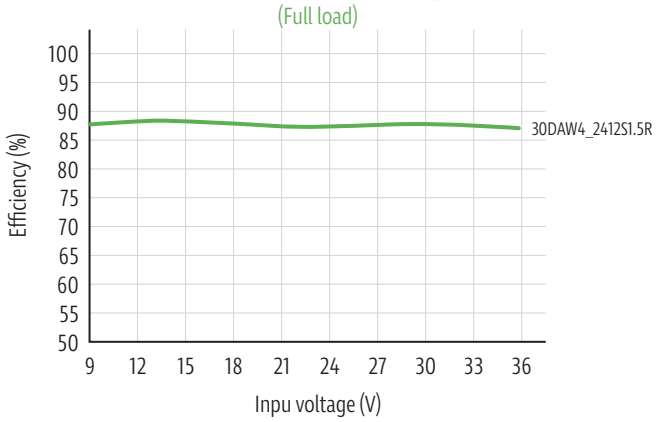


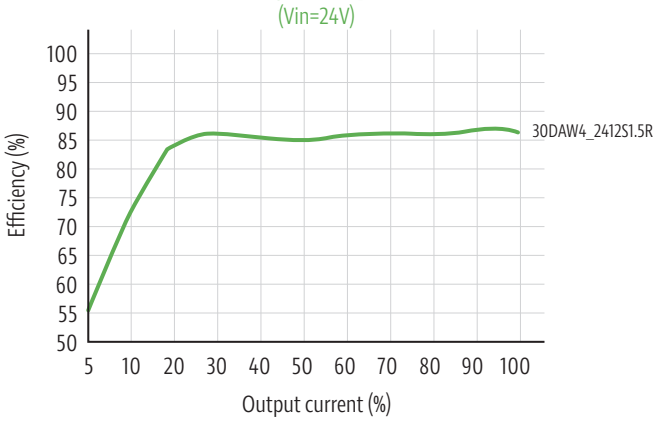
Figure 2

Typical characteristics

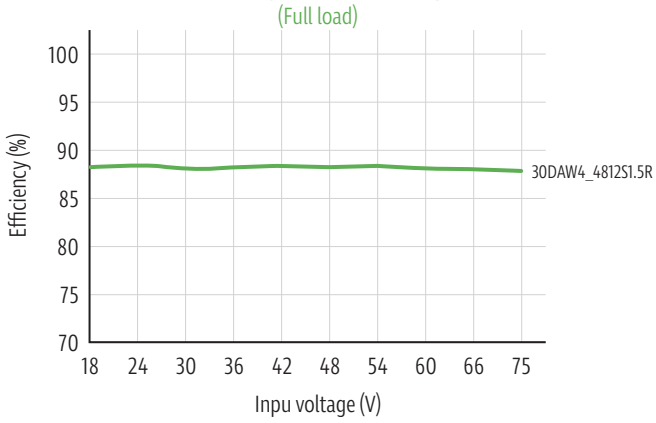
Efficiency vs input voltage
(Full load)



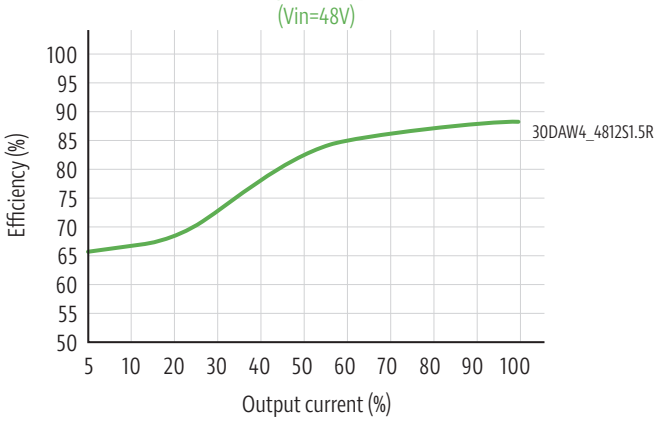
Efficiency vs output load
(Vin=24V)



Efficiency vs input voltage
(Full load)



Efficiency vs output load
(Vin=48V)



Typical circuit design and application

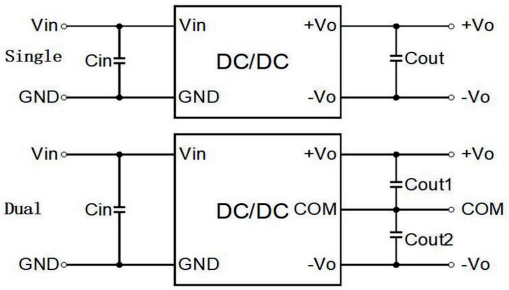


Figure 3

Recommended capacitive load value table

Vin	24V	48V
Cin	100uF	100uF
Cout (1/2)	220uF	100uF

EMI recommended components

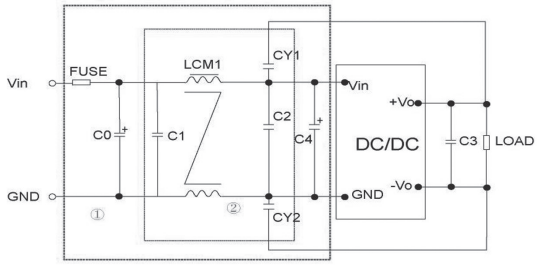


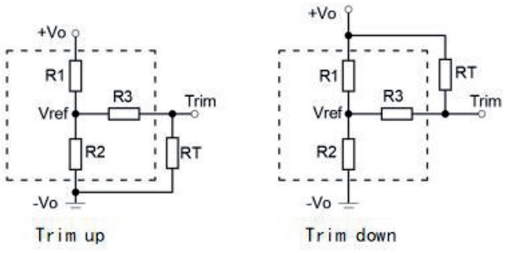
Figure 4

EMI Recommended component parameters

Vin (VDC)	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	20D470K	14D101K
C0, C4	680uF/50V	470uF/100V
C1/C2	4.7uF/50V	2.2uF/100V
C3	Refer to the Cout parameters in Figure 3	
LCM1	1mH	
CY1/CY2	1nF/2KV	

Note: Part 1 of Figure 4 is used for EMS testing; part 2 is used for EMI filtering and can be selected according to requirements.

Trim



Trim resistor connections (dashed line shows internal resistor network)

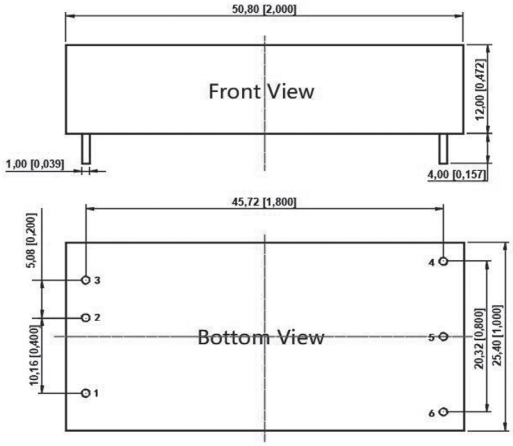
Vout (V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

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

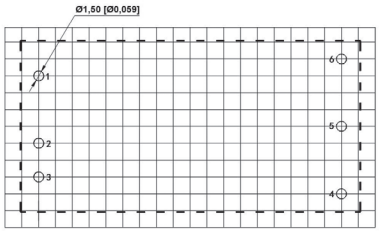
$$Down: Rt = \frac{nR1}{R1-n} - R3 \qquad n = \frac{Vo-Vref}{Vref} * R2$$

Note: All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 3. 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. The product does not support output parallel power boosting.

Mechanical dimensions



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

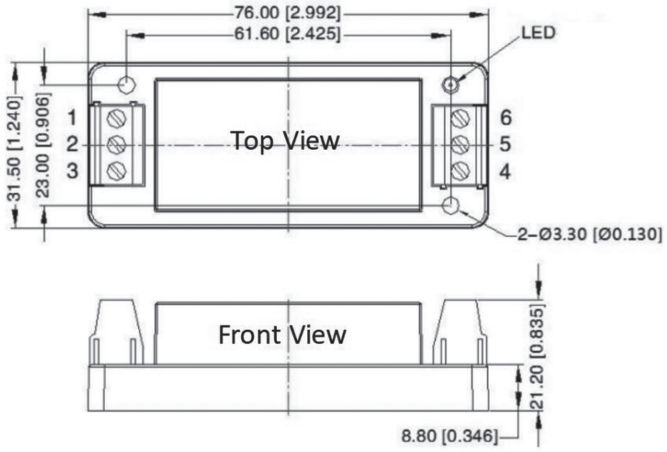


The grid distance is 2.54 x 2.54mm

Pin definition table

Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	-Vo	COM
6	Trim	-Vo

Chassis mounting package dimensions

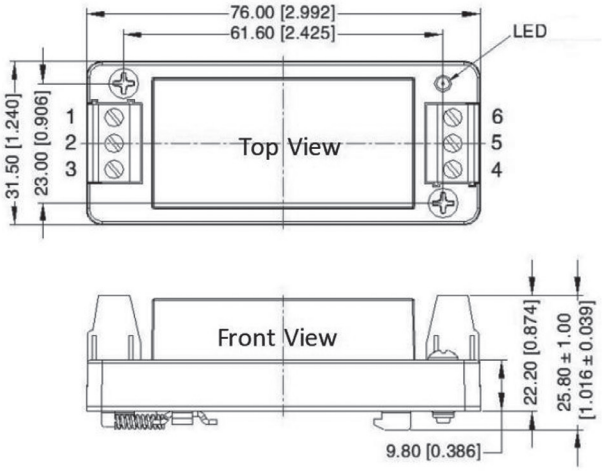


Pin definition table

Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	-Vo	COM
6	Trim	-Vo

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

DIN rail package dimensions



Pin definition table

Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	-Vo	COM
6	Trim	-Vo

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