



10DPW4_3R series

10W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 10 Watt

- ⊕ DIP24 package
- ⊕ 4:1 input range
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ 3000VDC isolation
- ⊕ Up to 86% efficiency
- ⊕ Input undervoltage protection
- ⊕ Short-circuit protection (SCP)
- ⊕ Overvoltage protection,
- ⊕ Overcurrent protection

Introducing our new high-reliability DC-DC converter 10DPW4_3R series in compact DIP24 package. Designed for versatility and robust performance, this converter features a wide 4:1 input voltage range and operates reliably across temperatures from -40°C to +85°C. Its reinforced 3000VDC isolation ensures safety and electrical integrity in demanding industrial and commercial environments. Delivering up to 86% efficiency, it combines energy-saving performance with integrated protection functions, including input undervoltage protection, short-circuit protection (SCP), overvoltage protection, and overcurrent protection. With its compact DIP24 footprint, this converter offers easy integration into existing designs while ensuring maximum reliability and compliance with stringent application requirements.



Common specifications	
Short circuit protection	Input voltage range, continuous, self recovery
Switching frequency	300 kHz (typ.) full load, nominal input voltage
Operation temperature	-40°C ~+85°C (with derating)
Storage temperature	-55°C ~+125°C
Pin welding can withstand the highest temperature	+300°C (soldering spot is 1.5mm away from case for 10 seconds)
Storage humidity	5~95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	>1,000,000 hours
Input filter	Capacitance filter
Hot plug	Unavailable
Case material	Black flame retardant and heat-resistant plastic (UL 94V-0 rated)
Package dimensions	32.00 × 20.30 × 12.60mm
Weight	13g (typ.)
Cooling method	Free air convection

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Voltage Accuracy	0% - 100% load		±1	±3	%	
Linear Regulation	Input voltage from low limit to high limit, full load • Positive output • Negative output		±0.2 ±0.5	±0.5 ±1	%	
Load Regulation	10%- 100% load • Positive output • Negative output		±0.5 ±0.5	±1 ±1.5	%	
Ripple & noise	20MHz bandwidth		50	120	mVp-p	
Transient recovery time	25% load step change		3	5	ms	
Transient response deviation	25% load step change • 3.3/5VDC Output • other output		±5 ±3	±8 ±5	%	
Temperature Drift Coefficient	Full Load			±0.03	%/°C	
Overcurrent protection	Input voltage range • 3.3/5VDC output • other output	110	160	110	140	%Io

Note: 1. Auxiliary circuit output voltage (Vo2) maximum accuracy is ± 5%;
2. Load regulation for 0% - 100% load is ± 5%.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no-load)	24VDC nominal input		413/12	423/25	mA
	• 3.3VDC output		508/6	520/15	
	• 5VDC output		484/5	496/12	
	• other output				
Reflected ripple current	48VDC nominal input		206/5	211/20	mA
	• 3.3VDC output		254/6	260/12	
	• 5VDC output		242/4	248/8	
	• other output				
Impulse voltage	24VDC nominal input	-0.7		50	VDC
	48VDC nominal input	-0.7		100	
Starting voltage	24VDC nominal input		9		VDC
	48VDC nominal input		18		
Input undervoltage protection	24VDC nominal input	5.5	6.5		VDC
	48VDC nominal input	12	15.5		
Ctrl	Module enabled	Suspended or 3.5 - 12V open			
	Module shutdown	0-0.7V shutdown			

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			M Ω
Isolation capacitance	Input-output, 100kHz/0.1V		1200		pF

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- 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;
- Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this manual are measured at $T_a = 25^\circ\text{C}$, humidity $< 75\%$ RH, nominal input voltage, and output rated load;
- All indicator testing methods in this datasheet are based on our corporate standards;
- Product specifications are subject to change without prior notice.

Example:

10DPW4_2405S3R

10 = 10Watt; D = DIP; P = Series; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 3 = 3000VDC isolation; R = Revised version

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EMC specifications							
EMC	EMI	CE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)			
EMC	EMI	RE	CISPR32/EN55032	CLASS A (without extra components)/ CLASS B (Recommended circuit diagram 3-②)			
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	Perf. Criteria B		
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A		
EMC	EMS	EFT	IEC/EN61000-4-4	± 2kV (Recommended circuit diagram 3-①)	Perf. Criteria B		
EMC	EMS	Surge	IEC/EN61000-4-5	± 2kV (Recommended circuit diagram 3-①)	Perf. Criteria B		
EMC	EMS	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A		
EMC	EMS	Voltage sag, drop, and short-term interruption immunity	IEC/EN61000-4-29	0 - 70%	Perf. Criteria B		

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.
	10DPW4_2403S3R	24 (9-36)	40	3.3	2400	80	1200
	10DPW4_2405S3R	24 (9-36)	40	5	2000	82	1000
	10DPW4_2412S3R	24 (9-36)	40	12	833	86	470
	10DPW4_2415S3R	24 (9-36)	40	15	667	86	330
	10DPW4_2424S3R	24 (9-36)	40	24	416	86	100
	10DPW4_4803S3R	48 (18-75)	80	3.3	2400	80	1200
	10DPW4_4805S3R	48 (18-75)	80	5	2000	82	1000
	10DPW4_4812S3R	48 (18-75)	80	12	833	86	470
	10DPW4_4815S3R	48 (18-75)	80	15	667	86	330
	10DPW4_4824S3R	48 (18-75)	80	24	416	87	100

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.
	10DPW4_2405D3R	24 (9-36)	40	± 5	±1000	82	1000
	10DPW4_2412D3R	24 (9-36)	40	± 12	±416	86	470
	10DPW4_2415D3R	24 (9-36)	40	± 15	±333	86	330
	10DPW4_4805D3R	48 (18-75)	80	±5	±1000	82	1000
	10DPW4_4812D3R	48 (18-75)	80	±12	±416	86	470
	10DPW4_4815D3R	48 (18-75)	80	±15	±333	86	330

Typical characteristics

Temperature derating graph

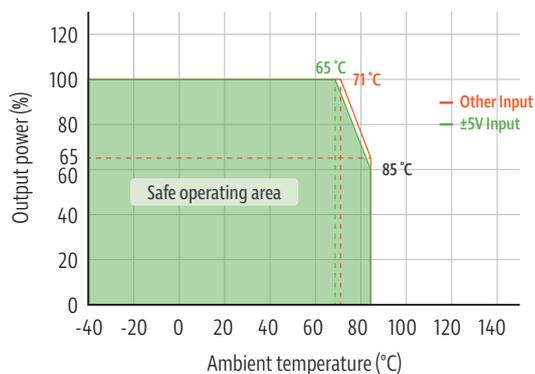
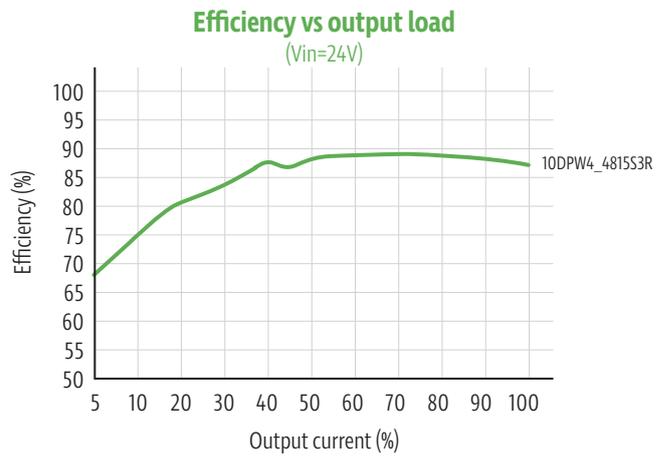
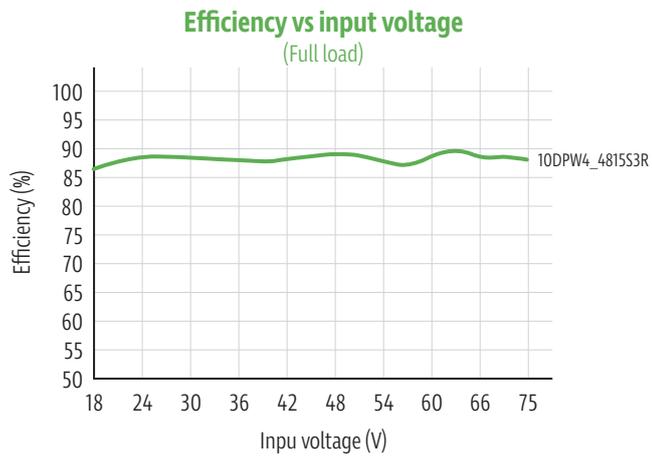
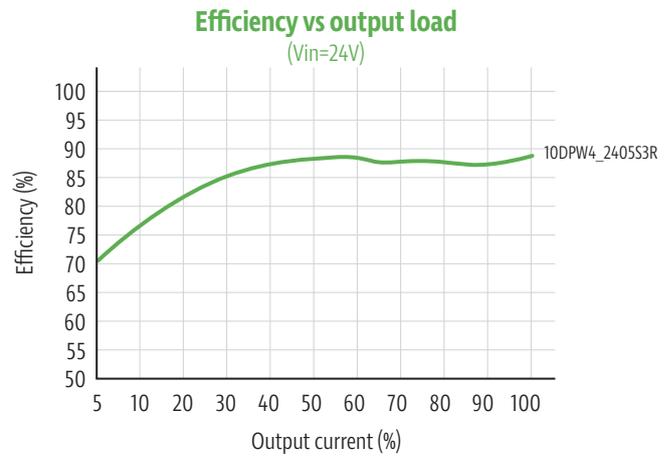
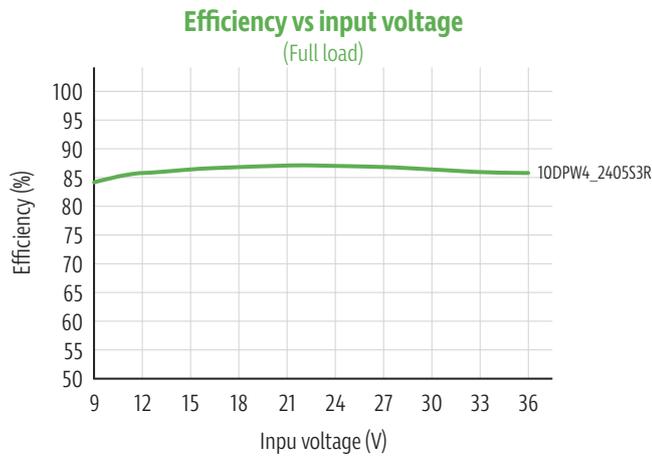


Figure 1

10DPW4_3R series

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Typical characteristics



Typical circuit design and application

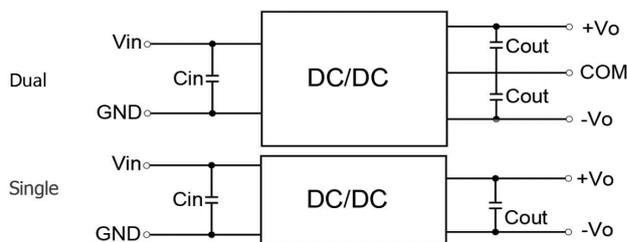


Figure 2

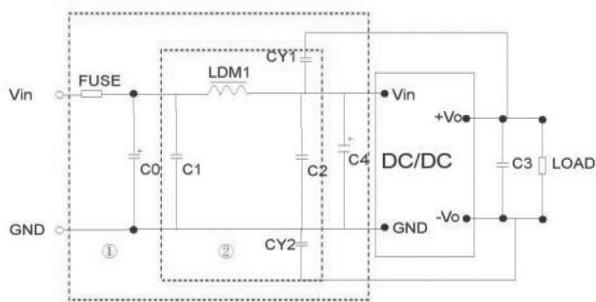
Recommended capacitive load value table

Vin	24V	48V
Cin	100uF	10-47uF
Cout	10uF	

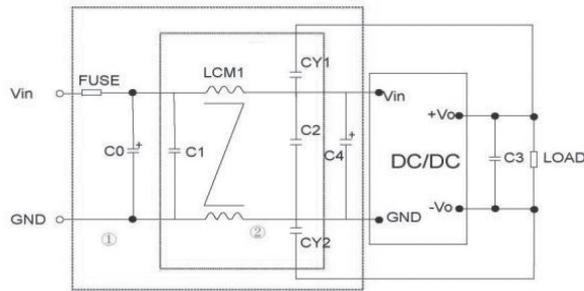
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EMI recommended component parameters



3.3VDC, 5VDC Output (Figure 3)



Other Output (Figure 4)

Note: Part ① of Figure 3 is used for EMC testing; Part 2 is used for EMI filtering and can be selected according to requirements.

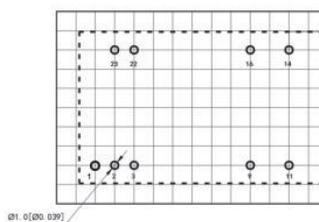
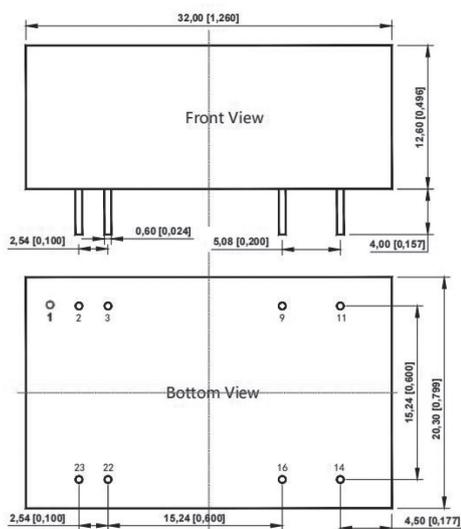
EMI recommended component parameters

Vin	24V	48V
FUSE	Select based on the actual input current of the customer	
C0, C4	330µF/50V	330µF/100V
C1, C2	10µF/50V	10µF/100V
C3	Refer to the Cout in Fig.2	
LCM1	1.4-1.7mH	
LDM1	10uH	
CY1, CY2	1nF/2KV	

Application circuit description:

- All DC-DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory.
- If further reduction of input and output ripple is required, the input and output external capacitors C0, C1, C2, C3, C4 can be increased or a capacitor with a small series equivalent impedance value can be selected.

Mechanical dimensions



Note: The grid distance is 2.54 x 2.54mm

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

Pin definition table

Pin	Single	Dual
1	CTRL	CTRL
2	GND	GND
3	GND	GND
9	NO PIN	COM
11	NC	-Vo
14	+Vo	+Vo
16	-Vo	COM
22	Vin	Vin
23	Vin	Vin

NC: Pin to be isolated from circuitry