



## 10DAW\_1.5 Series

10W - Dual/Single Output - 2:1 Wide Input - Isolated & Regulated DC-DC Converter

## DC-DC Converter 10 Watt

- ⊕ 2:1 wide input voltage range
- ⊕ Efficiency up to 90%
- ⊕ Output over voltage protection
- ⊕ 1.5KVDC input/output
- ⊕ Isolation
- ⊕ Short circuit protection (SCP) (automatic recovery)



The 10DAW\_1.5 series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range  $\leq 2:1$ )
- 2) Where isolation is necessary between input and output (Isolation Voltage  $\leq 1500\text{VDC}$ )
- 3) Where the regulation of the output voltage and the output ripple noise are demanded

### Common specifications

Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	40°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C~+125°C
Lead temperature range:	300°C MAX, 1.5mm from case for 10 sec
Vibration:	10-55Hz, 10G, 30 Min. along X, Y and Z
Storage humidity range:	< 95%
Case material:	Aluminium Alloy
MTBF:	>1,000,000 hours
Weight:	22g

### Input specifications

Item	Test condition	Min	Typ	Max	Units
Input filter	Pi				
Hot plug	unavailable				
Input current (full load / no load)	• 12VDC input - 3.3V output		857/25	880/42	mA
	• Others		980/25	1042/42	mA
	• 24VDC input - 3.3V output		428/12	440/21	mA
	• Others		481/12	515/21	mA
Input current (full load / no load)	• 48VDC input - 3.3V output		211/6	217/11	mA
	• Others		242/6	261/11	mA
Reflected ripple current	• 12VDC input		20		
	• 24VDC input		20		
	• 48VDC input		20		
Input impulse voltage (1sec. max.)	• 12VDC input	-0.7		25	VDC
	• 24VDC input	-0.7		50	VDC
	• 48VDC input	-0.7		100	VDC
Start-up voltage	• 12VDC input			9	VDC
	• 24VDC input			18	VDC
	• 48VDC input			36	VDC
Ctrl*	• Models ON		Ctrl pin floating or connected to TTL high level(3.5-12VDC)		
	• Models OFF		Ctrl connect GND or low level (0-1.2VDC)		
	• Input current (Models OFF)		1mA (TYP), 3mA (MAX)		

\* The voltage of Ctrl pin is relative to input pin GND.

### Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±2	%
Output voltage balance	Dual output, balanced loads		±0.5	±1.5	%
Line regulation	Full load, input voltage from low to high		±0.2	±0.5	%
Load regulation	5% to 100% load		±0.5	±1.0	%
Cross regulation	Dual output, main output 50% load, supplement output 10% to 100% load			±5	%
Transient recovery time	25% load step change		300	500	µs
Transient response deviation	25% load step change		±3	±5	%
Temperature coefficient	100% load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		40	80	mVp-p
Over Voltage Protection	Input voltage range	110	120	140	%Vo
Switching frequency	PWM mode		350		KHz

\* Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

### Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and leakage current less than 1 mA	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		1000		pF

### Model selection:

WCTV\_xxyyN##  
 W= Watt; C= Case; T= Type; V= Voltage Variation (omitted  $\pm 10\%$ );  
 xx= Vin; yy= Vout; N= Numbers of Output; ##= Isolation (kVDC)

### Example:

10DAW\_1205S1.5  
 10= 10Watt; D= DIP; A= series; W= wide input (2:1) 9-18Vin; 5Vout;  
 S=single output; 1.5=1500VDC

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EMC specifications				
EMI	CE	CISPR22/EN55022	CLASS A $\square$ (Without External Circuit) CLASS B $\square$ (External Circuit Refer to EMC recommended circuit ②)	
EMI	RE	CISPR22/EN55022	CLASS A $\square$ (Without External Circuit) CLASS B $\square$ (External Circuit Refer to EMC recommended circuit ②)	
EMS	ESD	IEC/EN61000-4-2	Contact $\pm$ 4KV perf. Criteria B	
EMS	RS	IEC/EN61000-4-3	10V/m perf. Criteria A	
EMS	EFT	IEC/EN61000-4-4 IEC/EN61000-4-4	$\pm$ 2KV (External Circuit Refer to EMC recommended circuit ①) $\pm$ 4KV (External Circuit Refer to EMC recommended circuit ①)	
EMS	Surge	IEC/EN61000-4-5	$\pm$ 2KV (External Circuit Refer to EMC recommended circuit ①)	
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A	
EMS	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70% perf. Criteria B	

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA]		Capacitive load** [ $\mu$ F; max.]	Efficiency [%; Typ.]
	Nominal	Range	Max*		Max	Min		
10DAW_1203S1.5	12	9-18	20	3.3	2400	120	2200	77
10DAW_1205S1.5	12	9-18	20	5	2000	100	2200	82
10DAW_1209S1.5	12	9-18	20	9	1111	55	470	85
10DAW_1212S1.5	12	9-18	20	12	833	42	470	86
10DAW_1215S1.5	12	9-18	20	15	667	33	220	87
10DAW_1224S1.5	12	9-18	20	24	416	21	100	88
10DAW_2403S1.5	24	18-36	40	3.3	2400	120	2200	77
10DAW_2405S1.5	24	18-36	40	5	2000	100	2200	84
10DAW_2409S1.5	24	18-36	40	9	1111	55	470	86
10DAW_2412S1.5	24	18-36	40	12	833	42	680	88
10DAW_2415S1.5	24	18-36	40	15	667	33	330	90
10DAW_2424S1.5	24	18-36	40	24	416	21	100	87
10DAW_4803S1.5	48	36-72	80	3.3	2400	120	2200	78
10DAW_4805S1.5	48	36-72	80	5	2000	100	2200	82
10DAW_4812S1.5	48	36-72	80	12	833	42	820	88
10DAW_4815S1.5	48	36-72	80	15	667	33	470	89
10DAW_4824S1.5	48	36-72	80	24	416	21	220	88
10DAW_1205D1.5	12	9-18	20	$\pm$ 5	$\pm$ 1000	$\pm$ 50	680	82
10DAW_1212D1.5	12	9-18	20	$\pm$ 12	$\pm$ 416	$\pm$ 21	220	86
10DAW_1215D1.5	12	9-18	20	$\pm$ 15	$\pm$ 333	$\pm$ 16	100	87
10DAW_1224D1.5	12	9-18	20	$\pm$ 24	$\pm$ 208	$\pm$ 10	47	87
10DAW_2405D1.5	24	18-36	40	$\pm$ 5	$\pm$ 1000	$\pm$ 50	680	83
10DAW_2412D1.5	24	18-36	40	$\pm$ 12	$\pm$ 416	$\pm$ 21	330	86
10DAW_2415D1.5	24	18-36	40	$\pm$ 15	$\pm$ 333	$\pm$ 16	220	88
10DAW_2424D1.5	24	18-36	40	$\pm$ 24	$\pm$ 208	$\pm$ 10	100	87
10DAW_4805D1.5	48	36-72	80	$\pm$ 5	$\pm$ 1000	$\pm$ 50	680	83
10DAW_4812D1.5	48	36-72	80	$\pm$ 12	$\pm$ 416	$\pm$ 21	470	88
10DAW_4815D1.5	48	36-72	80	$\pm$ 15	$\pm$ 333	$\pm$ 16	220	89
10DAW_4824D1.5	48	36-72	80	$\pm$ 24	$\pm$ 208	$\pm$ 10	100	88

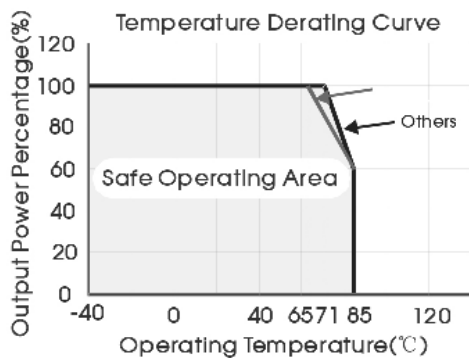
\* Input voltage can't exceed this value, or will cause permanent damage

\*\* For dual output converter, the given value is the same for each output

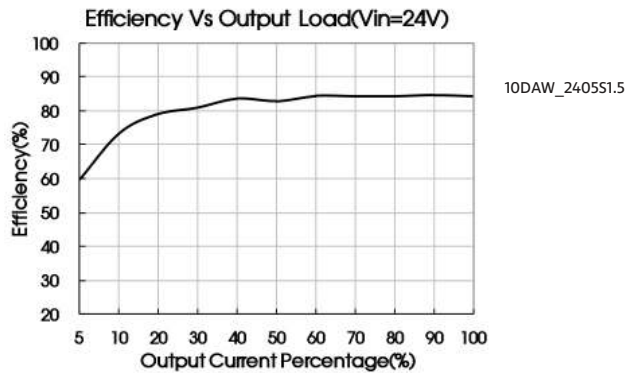
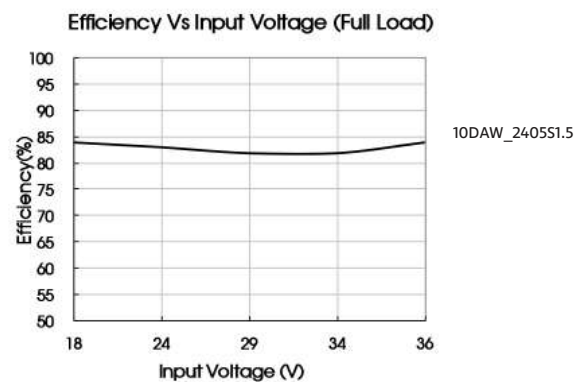
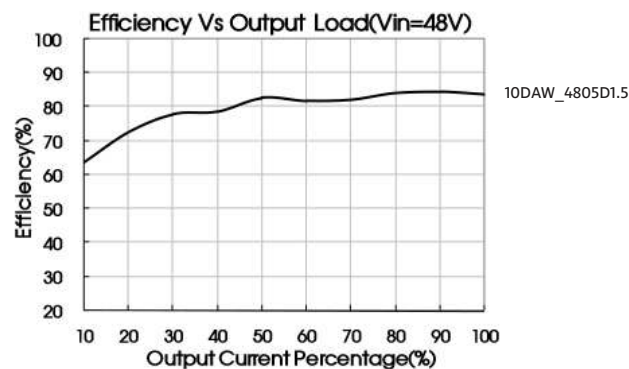
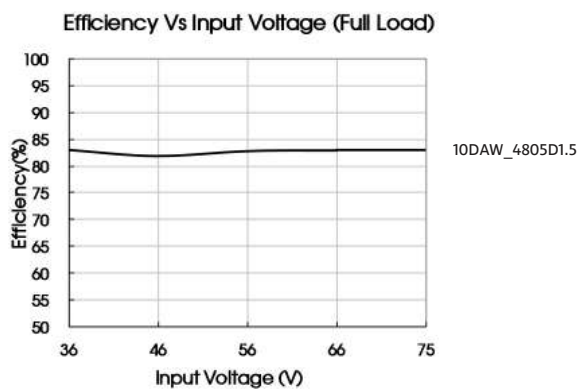
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## Typical characteristics



## Efficiency



## Recommended circuit

### Recommended Circuit

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 1) before delivery.

If a further decrease of the input and output ripple is required, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance, and ensure the capacitance should be lower than the max. capacitive load of the product.

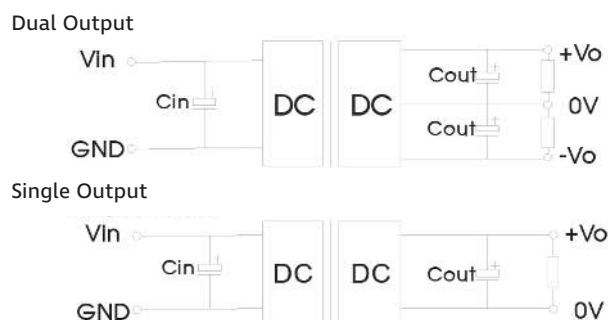


Figure 1

## 10DAW\_1.5 Series

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### EMC solution-recommended circuit

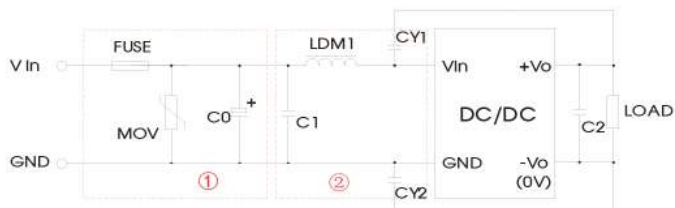


Figure 1

Note:

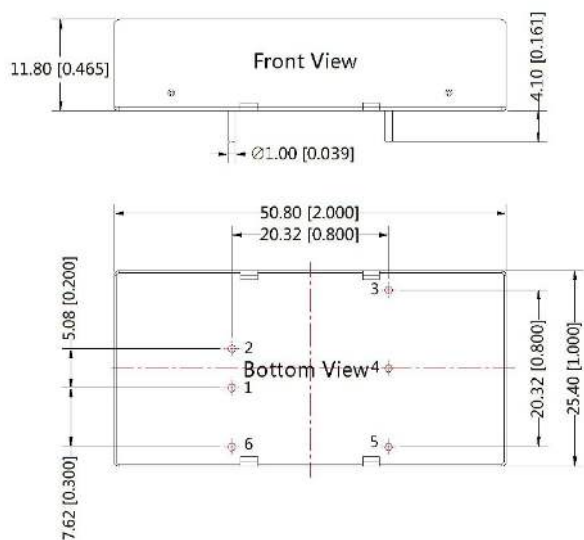
In Figure 1, part ①s for EMS test, part ②s for EMI filtering. Choose according to requirements.

Recommended external circuit parameters	Vin: 12V	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current		
MOV	S14K20	S20K30	S14K60
C0	680 $\mu$ F/25V	330 $\mu$ F/50V	330 $\mu$ F/100V
C1	1 $\mu$ F/50V		1 $\mu$ F/100V
C2	Refer to the Cout in recommended circuit		
LDM1	4.7 $\mu$ H		
CY1, CY2	1nF/2KV		

It is not allowed to connect modules output in parallel to enlarge the power.

### Mechanical dimensions

### Recommended footprint



Note:

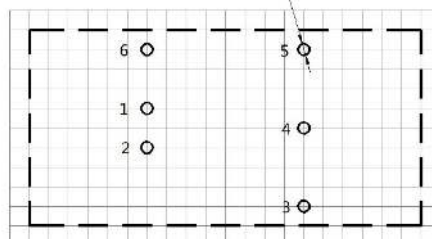
Unit: mm[inch]

Pin diameter tolerances:  $\pm 0.10$ mm [ $\pm 0.004$ inch]

General tolerances:  $\pm 0.50$ mm [ $\pm 0.020$ inch]

THIRD ANGLE PROJECTION

$\varnothing 1.50$  [ $\varnothing 0.059$ ]



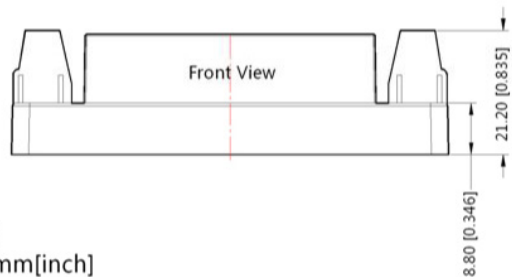
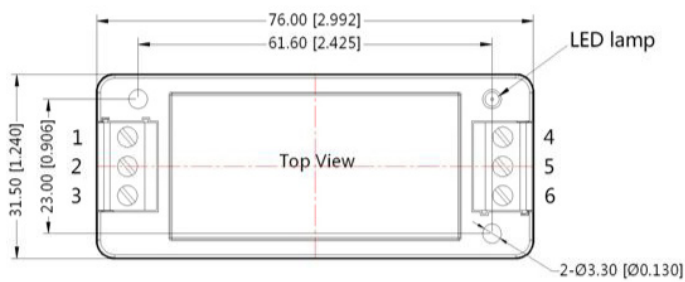
Note : Grid 2.54\*2.54mm

Pin	Pin-Out	
	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo
6	Ctrl	Ctrl

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### Chassis mounting



Note:

Unit:mm[inch]

Wire range : 24~12 AWG

General tolerances:±0.50[±0.020]

Pin-Out						
Pin	1	2	3	4	5	6
Dual	Ctrl	GND	Vin	-Vo	0V	+Vo
Single	Ctrl	GND	Vin	0V	NC	+Vo

THIRD ANGLE PROJECTION

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increased dramatically, If the product operates under min. load, it may not be guaranteed to meet all specifications listed. Operation under minimum load will not damage the converter.
2. Recommended Dual output models unbalanced load is  $\leq \pm 5\%$ , If the product operates  $> \pm 5\%$ , it may not be guaranteed to meet all specifications listed.
3. Max. Capacitive Load is tested at input voltage range and full load.
4. All specifications measured at  $T_a=25^\circ\text{C}$ , humidity $<75\%$ , nominal input voltage and rated output load unless otherwise specified.
5. In this datasheet, all test methods are based on our corporate standards.
6. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
7. Specifications of this product are subject to changes without prior notice.