



10DAW4_3 Series

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

DC-DC Converter 10 Watt

- ⊕ High efficiency up to 87%
- ⊕ 4:1 wide input voltage range
- ⊕ Short circuit protection (SCP)
- ⊕ Output over voltage protection
- ⊕ Output over current protection
- ⊕ Input under voltage protection
- ⊕ 3kVDC isolation
- ⊕ Operating temperature range: -40°C ~ +85°C
- ⊕ Six-sided metal shield
- ⊕ Industry standard pinout
- ⊕ Meet CISPR22/EN55022 CLASS A
- ⊕ IEC60950, UL60950, EN60950 approval

The 10DAW4_3 series offers 10W of output, with 4:1 ultra wide input voltage of 9-36VDC or 18-75VDC, and features 3000VDC isolation, over current, over voltage and short-circuit protection, as well as six sided metal shielding.

All models are widely suited for industrial control, electric power, instruments, communication fields etc.



Common specifications	
Short circuit protection:	Hiccup, continuous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C (see typ. characteristics)
Storage temperature range:	-55°C~+125°C
Case temperature:	105°C MAX
Storage humidity range:	5% MIN, 95% MAX
Pin welding resistance temperature:	300°C MAX, 1.5mm from case for 10 sec
Switching frequency (PWM mode)*:	350kHz TYP
Case material:	Plastic (UL94-V0)
MTBF (MIL-HDBK-217F@25°C):	1000 K hours MIN
Weight:	24g

* This series of products using reduced frequency technology, the switching frequency is test value of full load. When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and leakage current less than 1 mA	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100kHz/0.1V		500		pF

Note:

1. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not The maximum capacitive load offered were tested at nominal input voltage and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25, humidity <75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
5. We can provide product customization service;
6. Specifications are subject to change without prior notice.

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±3	%
Line regulation	Full load, Input voltage from low to high • positive output • negative output		±0.2 ±0.5	±0.5 ±1	%
Load regulation	5% to 100% load • positive output • negative output		±0.5 ±0.5	±1 ±1.5	%
Cross regulation	Dual output, main circuit with 50% load, auxiliary circuit with 10%-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% full load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth 5% to 100% load		60	120	mVp-p
Over voltage protection	Input voltage range	110	130	160	%Vo
Over current protection	Input voltage range	110	140	190	%Vo

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

Example:

10DAW4_2415S3
 10 = 10Watt; D = DIP; A = series; W4 = wide input (4:1) 9-36Vin;
 15Vout; S = single output; 3 = 3000VDC isolation

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Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load / no-load)	24VDC input				mA
	• 3.3V output • Others				
Reflected ripple current	48VDC input		40		mA
	• 24VDC input • 48VDC input		30		
Surge voltage (1sec. max.)	24VDC input	-0.7		50	VDC
	• 48VDC input	-0.7		100	VDC
Start-up voltage	24VDC input			9	VDC
	• 48VDC input			18	VDC
Under voltage protection	24VDC input	5.5	6.5		VDC
	• 48VDC input	12	15.5		VDC
Start-up time	Nominal input & constant resistance load		10		ms
Input filter	Pi filter				
Hot plug	Unavailable				
Ctrl ⁽¹⁾	• Models ON	Ctrl suspended or connected to TTL high level (3.5-12VDC)			
	• Models OFF	Ctrl pin connected to GND or low level (0-1.2VDC)			
	• Input current (Models OFF)		5	8	mA

1. The voltage of Ctrl pin is relative to input pin GND.

EMC specifications					
EMI	CE	CISPR22/EN55022 CLASS A (Bare component) CLASS B (External Circuit Refer to EMC recommended circuit, ⁽²⁾)			
EMI	RE	CISPR22/EN55022 CLASS A (Bare component) CLASS B (External Circuit Refer to recommended circuit, ⁽²⁾)			
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV perf. Criteria B		
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A	
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (External Circuit Refer to recommended circuit, ⁽¹⁾)	
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to recommended circuit, ⁽¹⁾)	
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A	
EMS	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0%-70%	perf. Criteria B	

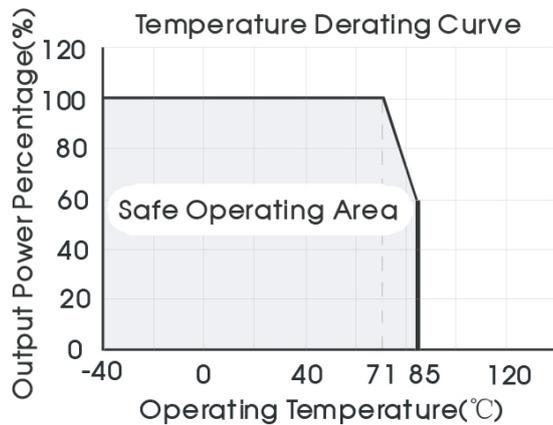
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max]	Efficiency [%, Typ.]	Capacitive load [μF, Max]
	Nominal	Range	Max ⁽¹⁾				
10DAW4_2403S3	24	9-36	40	3.3	2400	79	5400
10DAW4_2405S3	24	9-36	40	5	2000	82	5400
10DAW4_2409S3	24	9-36	40	9	1111	85	680
10DAW4_2412S3	24	9-36	40	12	833	86	470
10DAW4_2415S3	24	9-36	40	15	667	87	330
10DAW4_2424S3	24	9-36	40	24	416	87	100
10DAW4_4803S3	48	18-75	80	3.3	2400	79	5400
10DAW4_4805S3	48	18-75	80	5	2000	82	5400
10DAW4_4812S3	48	18-75	80	12	833	86	470
10DAW4_4815S3	48	18-75	80	15	667	87	330
10DAW4_4824S3	48	18-75	80	24	416	87	100
10DAW4_2405D3	24	9-36	40	±5	±1000	82	1000
10DAW4_2412D3	24	9-36	40	±12	±416	86	330
10DAW4_2415D3	24	9-36	40	±15	±333	87	220
10DAW4_4805D3	48	18-75	80	±5	±1000	82	1000
10DAW4_4812D3	48	18-75	80	±12	±416	86	330
10DAW4_4815D3	48	18-75	80	±15	±333	87	220

1. Absolute maximum rating without damage on the converter, but it isn't recommended.

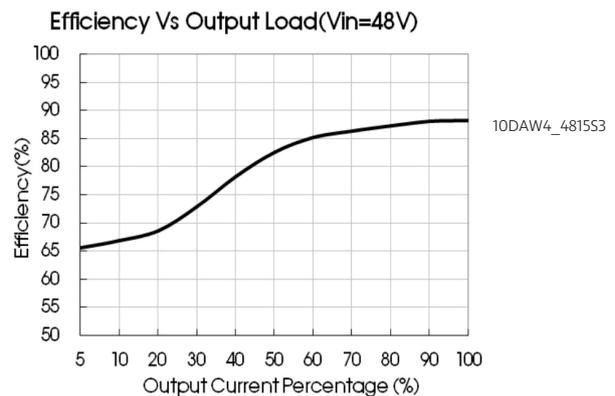
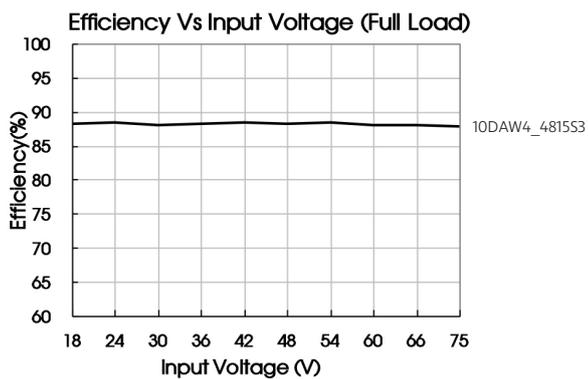
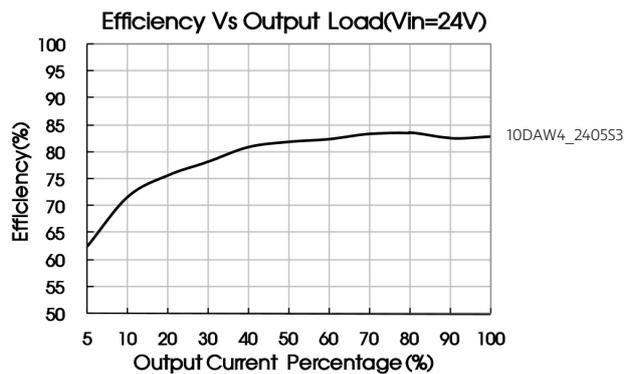
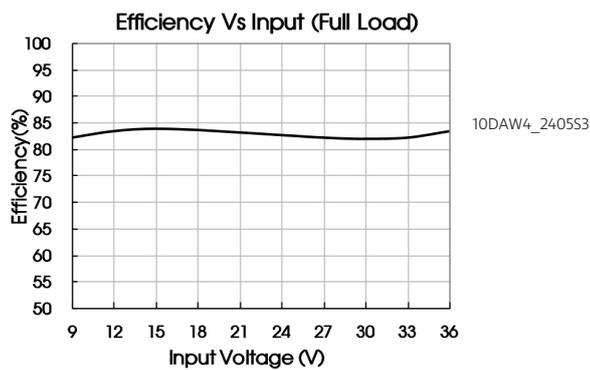
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Typical characteristics



Efficiency curves



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Typical application

All the DC/DC converters of this series are tested according to the recommended circuit before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors C_{in} and C_{out} or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



C_{in} (μF)	C_{out} (μF)
10 - 47	10

EMC solution-recommended circuit

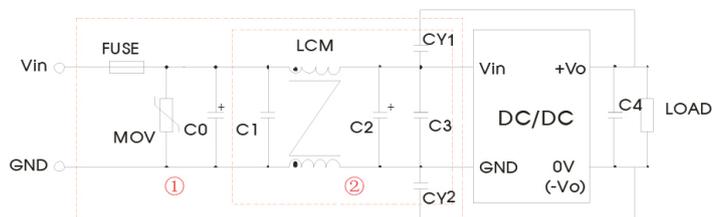


Figure 1

Note:
In Figure 1, part ① is used for EMS test, part ② for EMI filtering.
Choose according to requirements.

Model	10DAW4_S3		10DAW4_D3	
	Vin: 24V	Vin: 48V	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current			
MOV	S20K30	S14K60	S20K30	S14K60
C0	680 μF /50V	680 μF /100V	680 μF /50V	680 μF /100V
C1	1 μF /50V	1 μF /100V	1 μF /50V	1 μF /100V
C2	330 μF /50V	330 μF /100V	330 μF /50V	330 μF /100V
C3	4.7 μF /50V	4.7 μF /100V	4.7 μF /50V	4.7 μF /100V
LCM	4.7mH		6.8mH	
C4	Refer to the C_{out} in Typical application			
CY1, CY2	1nF/3KV		1nF/3KV	

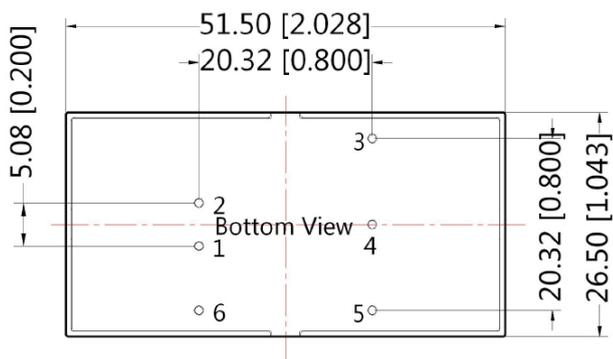
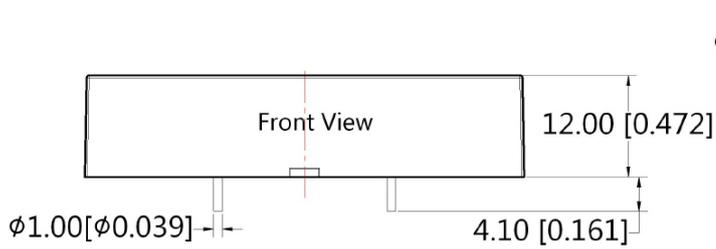
It is not allowed to connect modules output in parallel to enlarge the power.

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Mechanical dimensions

Recommended layout

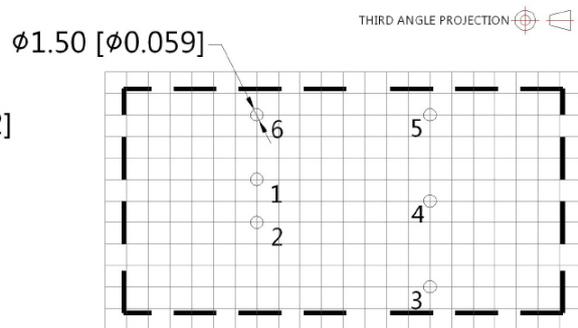


Note:

Unit: mm[inch]

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

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



Note : Grid 2.54*2.54mm

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