



6DAW4_3 series

6W - Dual Output - 4:1 Ultra Wide Input - Isolated & Regulated
DIP DC-DC Converter

DC-DC Converter

6 Watt

- ⊕ High efficiency up to 88%
- ⊕ Operating temperature: -40°C to +85°C
- ⊕ Wide input range (4:1)
- ⊕ 3kVDC input/output isolation
- ⊕ Short circuit protection (SCP)
- ⊕ Meets IEC60950, UL60950, EN60950
- ⊕ No-load power consumption as low as 0.12W
- ⊕ Over-voltage protection
- ⊕ Over-current protection
- ⊕ Input under-voltage protection
- ⊕ Meet CISPR32/EN55032 CLASS A
- ⊕ Industry standard pin-out
- ⊕ RoHS compliance

The 6DAW4_3 series of isolated 6W DC-DC converter products with 4:1 input voltage. They feature efficiencies of up to 88%, 3000VDC input to output isolation, operating ambient temperature of -40°C to +85°C, input under-voltage protection, output short-circuit protection.

The products meet CLASS A of CISPR32/EN55032 EMI standards, they are widely used in applications such as industrial control, electrical power, instrumentation and telecommunication fields.



Common specifications

Short circuit protection:	Continuous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C / Derating if the temperature is ≥71°C (see Typical characteristics)
Storage temperature range:	-55°C ~+125°C
Temperature rise at full load:	40°C TYP
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:	Plastic(UL94-V0)
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Dimensions/Weight:	31.60 × 20.30 × 10.20 mm - 13g (typ.)

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	24VDC input: • 3.3V output • other output	320/10	329/16	329/16	mA
		298/10	320/16	320/16	mA
Reflected ripple current	48VDC input: • 3.3V output • other output	158/4	162/7	162/7	mA
		147/4	154/7	154/7	mA
Input impulse voltage (1sec. max.)	• 24VDC input • 48VDC input	-0.7	50	100	VDC
		-0.7	100	100	VDC
Start-up voltage	• 24VDC input • 48VDC input	9	18	18	VDC
		18	18	18	VDC
Under-voltage turn-off	• 24VDC input • 48VDC input	5.5	6.5	6.5	VDC
		12	15.5	15.5	VDC
Starting time	Nominal input & constant resistance load		10		ms
Input filter	Pi				
Hot plug	Unavailable				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		1000		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	• 5%-100% load • 0%-5% load Single output Dual output	±1	±3	±3	%
		±1	±3	±3	%
		±2	±5	±5	%
Balance of output voltage	Dual output, balanced loa	±0.5	±1.5	±1.5	%
Line regulation (at full load)	Input voltage from low to high • positive output • negative output	±0.2	±0.5	±0.5	%
		±0.5	±1	±1	%
		±0.5	±1	±1	%
Load regulation*	from 5% to 100% load • positive output • negative output	±0.5	±1	±1	%
		±0.5	±1.5	±1.5	%
		±0.5	±1.5	±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	500	μs
Transient Response Deviation	25% load step change	±3	±5	±5	%
Temperature coefficient	full load			±0.03	%/°C
Ripple & Noise**	20MHz Bandwidth	85	120	120	mVp-p
Over-voltage protection	Input voltage range	110		160	%Vo
Over-current protection	Input voltage range • 24V output • others	110	220	290	%Io
		110	140	190	%Io
		110	140	190	%Io
Switching frequency	PWM mode	300			KHz

* When testing from 0%-100% load, working conditions load regulation index of ±5%

** 0%-5% load ripple&Noise is no more than 5%Vo. Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

Example:

6DAW4_2405D3

6 = 6Watt; D = DIP; A = series; W4 = wide input (4:1) 9-36Vin;
24 = 24Vin; 05 = 5Vout; D = Dual Output; 3 = 3000VDC isolation

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EMC specifications

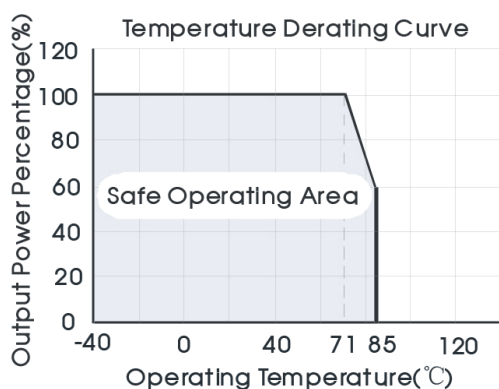
EMI	CE	CISPR32/EN55032 CLASS A (without external components) CLASS B (External Circuit Refer to EMC recommended circuit, 2)			
EMI	RE	CISPR32/EN55032 CLASS A (without external components) CLASS B (External Circuit Refer to recommended circuit, 2)			
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria 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	Voltage dips	IEC/EN61000-4-29	0%-70%	perf. Criteria B (short interruptions and voltage variations immunity)	

Product Selection Guide

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Current [mA]		Efficiency [% , Typ.]	Max. Capacitive Load [µF]
	Nominal	Range	Max*		Max	Min		
6DAW4_2405S3	24	9-36	40	5	1200	0	79	2200
6DAW4_2409S3	24	9-36	40	9	667	0	82	1000
6DAW4_2412S3	24	9-36	40	12	500	0	82	680
6DAW4_2415S3	24	9-36	40	15	400	0	84	680
6DAW4_2424S3	24	9-36	40	24	250	0	84	680
6DAW4_4803S3	48	18-72	80	3.3	1500	0	77	2200
6DAW4_4805S3	48	18-72	80	5	1200	0	81	2200
6DAW4_4812S3	48	18-72	80	12	500	0	85	680
6DAW4_4815S3	48	18-72	80	15	400	0	86	680
6DAW4_4824S3	48	18-72	80	24	250	0	85	680
6DAW4_2405D3	24	9-36	40	±5	±600	0	78	680
6DAW4_2412D3	24	9-36	40	±12	±250	0	81	330
6DAW4_2415D3	24	9-36	40	±15	±200	0	82	220

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

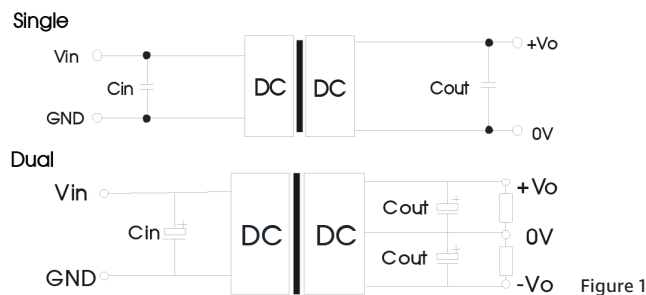
Typical characteristics



Typical application

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

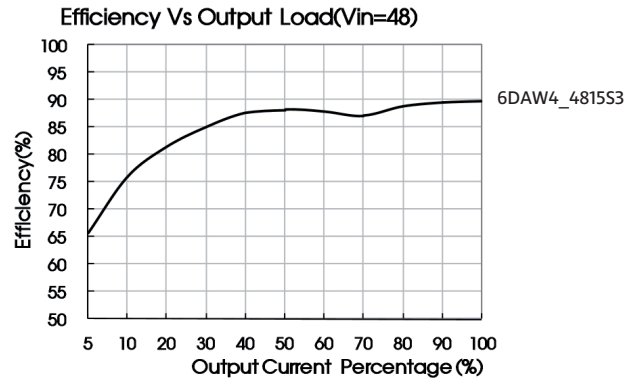
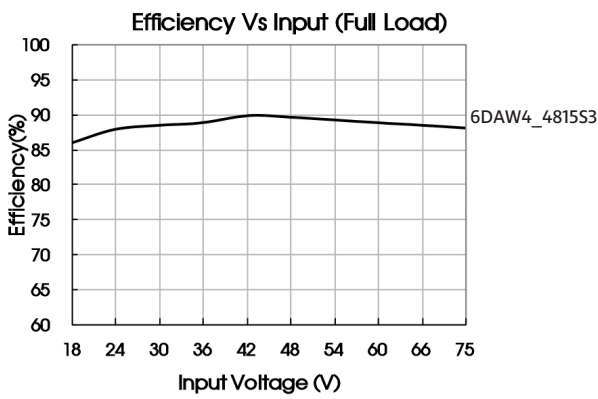
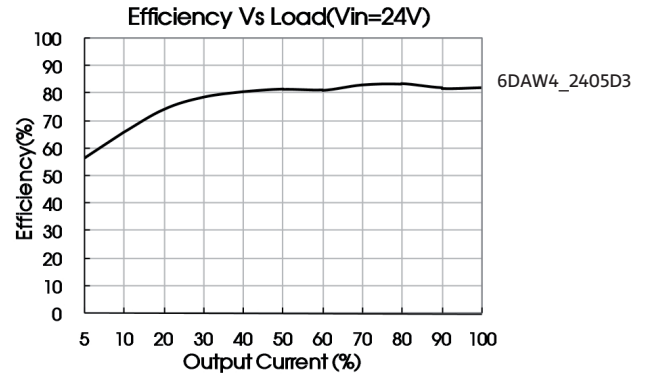
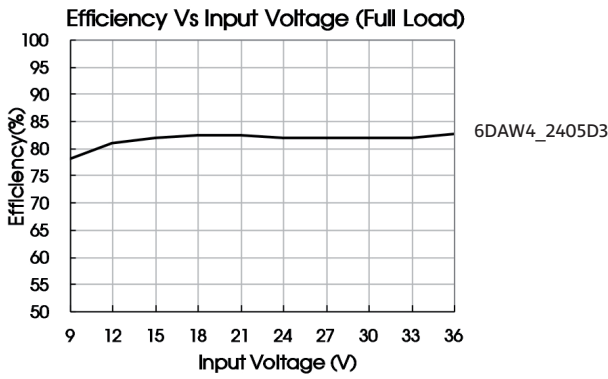


Vin (VDC)	Cin (µF)	Cout (µF)
24	100	10
48	10~47	10

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Efficiency



EMC solution-recommended circuit

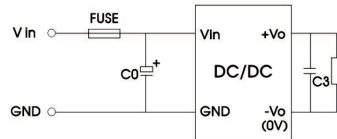
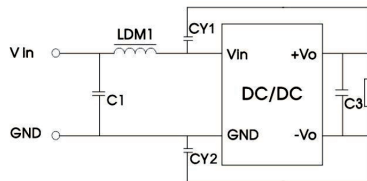
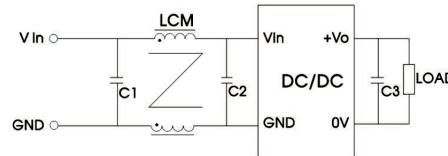


Fig. 3-1

Dual



Single



Notes: Part 1① is used for EMS test and part 2② for EMIfiltering; selected based on needs.

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

Dual

Parameters	Vin: 24V
FUSE	Choose according to actual input current
MOV	S20K30
C0	1000μF/50V
C1	1μF/50V
C3	Refer to the Cout in Typical application
LDM1	4.7μH
CY1, CY2	1nF/3KV

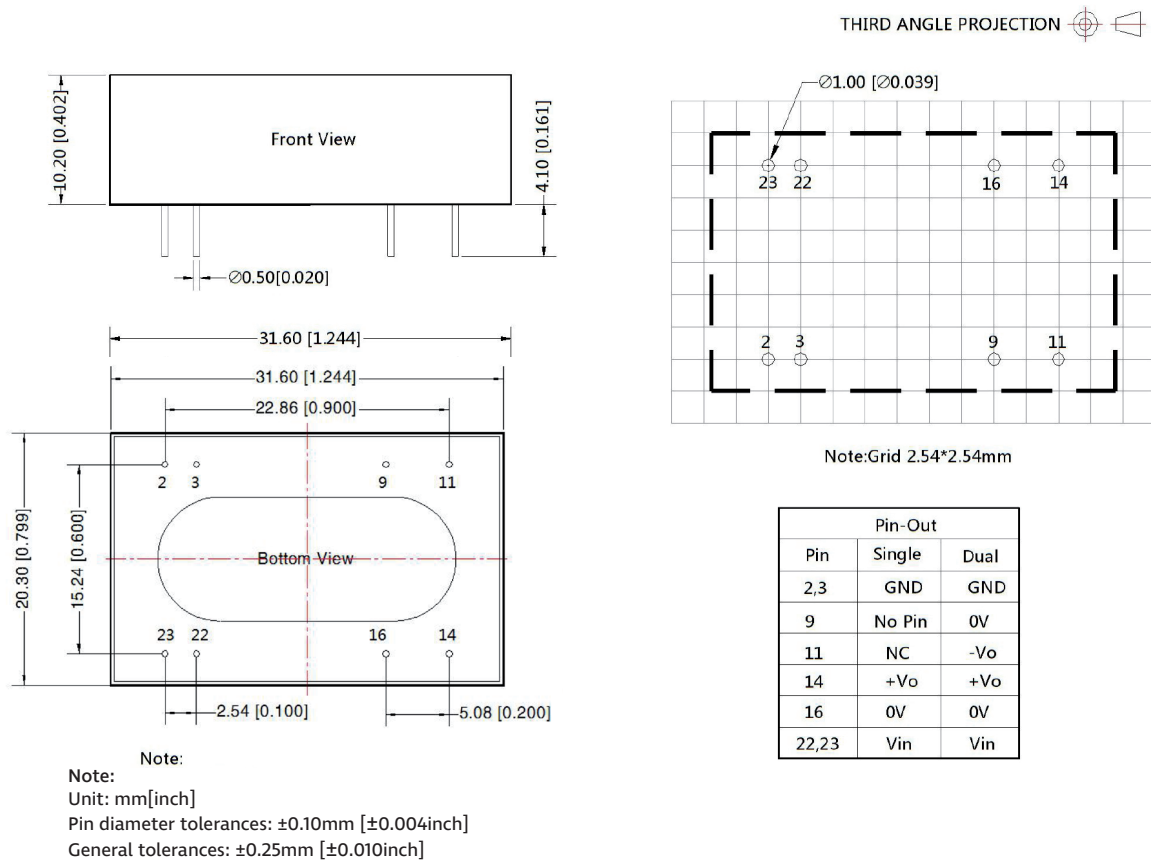
Single

Parameters	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	330μF/50V	330μF/100V
C1, C2	2.2μF/50V	2.2μF/100V
LCM	2.2μH	
C3	Refer to the Cout in Typical application	

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Mechanical dimensions



Note:

1. The max. capacitive load should be tested within the input voltage range and under full load conditions;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of $T_a = 25\%$, humidity $< 75\%RH$ when inputting nominal voltage and outputting rated load;
3. The recommended unbalance degree of the dual output module load is $\leq \pm 5\%$; if the degree exceeds $\pm 5\%$, the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
6. We can provide product customization service;
7. Specifications of this product are subject to changes without prior notice.