6DAMW4_6 series

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

DC-DC Converter 6 Watt

- High Efficiency up to 85%
- Operating Temperature: -40°C to +85°C
- Enhanced isolation, input to output
- 6KVDC, 2MOPP high isolation
- No-load power consumption as low as 0.12W
- Short Circuit Protection (SCP)
- Over-voltage protection
- Over-current protection
- Input under-voltage protection
- Transformer creepage 8mm, transformer clearance 5mm
- Industry standard pin-out
- RoHS Compliance
- EN60601-1 (3rd edition medical grade) approval

The 6DAMW4_6 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≤ 4:1);
2) Where isolation is necessary between input and output (isolation≤6000VDC and 2MOPP high isolation);
3) Where the regulation of the output voltage and the output ripple noise are demanded.

Common specifications

Short circuit protection:	Continuous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
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:	Black flame-retardant heat-proof plastic (UL94-V0)
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Weight:	13g
Dimensions:	31.60*20.30*10.20 mm

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	• 24VDC input • 48VDC input		309/5 154/4	317/8 159/7	mA mA
Reflected ripple current	• 24VDC input • 48VDC input		20 20		mA mA
Input impulse voltage (1sec. max.)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Starting voltage	• 24VDC input • 48VDC input			9 18	VDC VDC
Under-voltage protection	• 24VDC input • 48VDC input	5.5 12	6.5 15.5		VDC VDC
Input filter	Pi				
Hot plug	Unavailable				

Example:
6DAMW4_2405S6
6 = 6Watt; D = DIP; A = series; M = Medical; W4 = wide input (4:1)
24 = 9-36Vin; 5Vout; S = Single Output; 6 = 6000VDC isolation

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±3	%
Balance of output voltage	Dual output, balanced load		±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	%
Transient Recovery Time	25% load step change		300	500	µs
Transient Response Deviation	25% load step change		±3	±5	%
Temperature drift	full load			±0.03	%/°C
Ripple & Noise**	20MHz Bandwidth		100	180	mVp-p
Over-voltage protection	Input voltage range	110		160	%Vo
Over-current protection	Input voltage range	110	150	160	%Io
Switching frequency***	PWM mode		300		KHz

* When testing from 0% to 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; please see DC-DC Converter Application Notes for specific operation.

*** This series of products using reduced frequency technology, the switching frequency is test value for 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 1mA max	6000			VDC
Isolation resistance	Test at 500VDC	10000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		13	20	pF
Enhanced isolation	• Transformer creepage	8.0			mm
	• Transformer clearance	5.0			mm
	• PCB creepage & clearance	8.0			mm
	• Optocoupler creepage	8.0			mm

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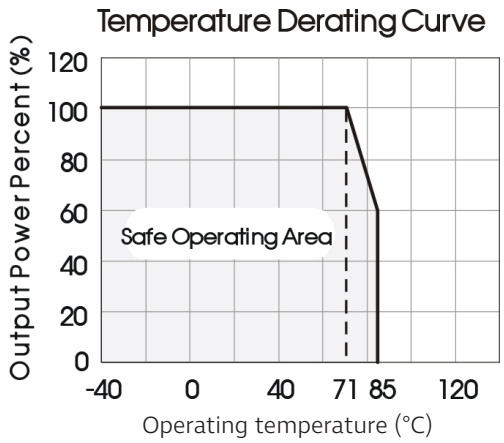
DIP DC-DC Converter

EMC specifications					
EMI	CE	CISPR32/EN55032	CLASS A	(bare component)	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B	
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, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B	

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Current [mA]		Efficiency [%, @full load]	Capacative Load [µF, max]
	Nominal	Range	Max*		Max	Min	Min/Typ	
6DAMW4_2405S6	24	9-36	40	5	1200	0	79/81	2700
6DAMW4_2406S6	24	9-36	40	6	1000	0	79/81	2200
6DAMW4_2409S6	24	9-36	40	9	667	0	81/83	1800
6DAMW4_2412S6	24	9-36	40	12	500	0	82/84	1000
6DAMW4_2415S6	24	9-36	40	15	400	0	83/85	680
6DAMW4_2418S6	24	9-36	40	18	333	0	83/85	1200
6DAMW4_2424S6	24	9-36	40	24	250	0	82/84	470
6DAMW4_4805S6	48	18-75	80	5	1200	0	79/81	2700
6DAMW4_4809S6	48	18-75	80	9	667	0	81/83	1800
6DAMW4_4812S6	48	18-75	80	12	500	0	82/84	1000
6DAMW4_4815S6	48	18-75	80	15	400	0	83/85	680
6DAMW4_4824S6	48	18-75	80	24	250	0	82/84	470

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

Typical characteristics



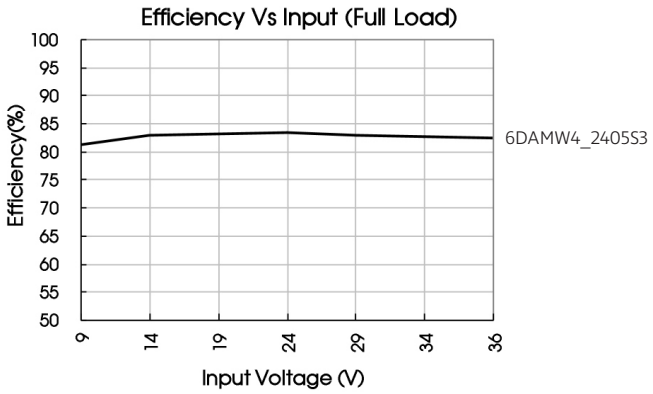
Typical application

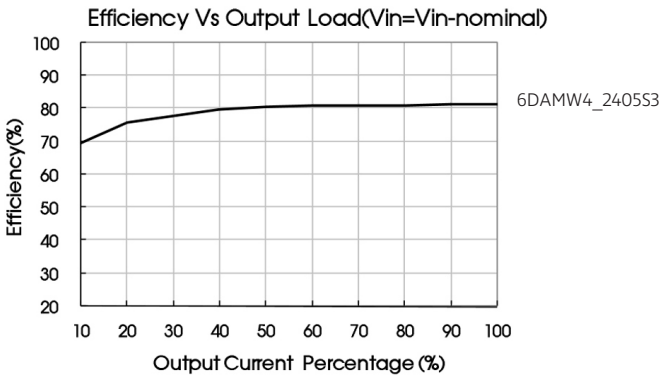
All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 1) before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

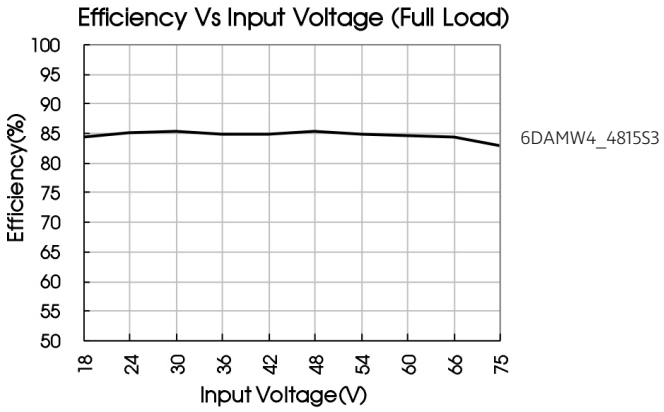
Figure 1

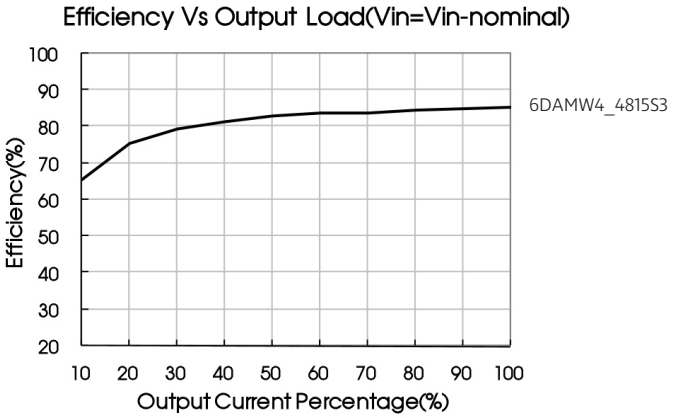
Vin	Cin	Cout
24VDC	100uF	10µF
48VDC	10µF -47µF	10µF

Efficiency

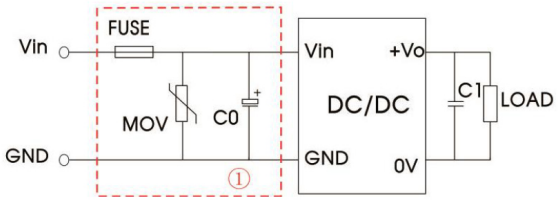








EMC solution-recommended circuit



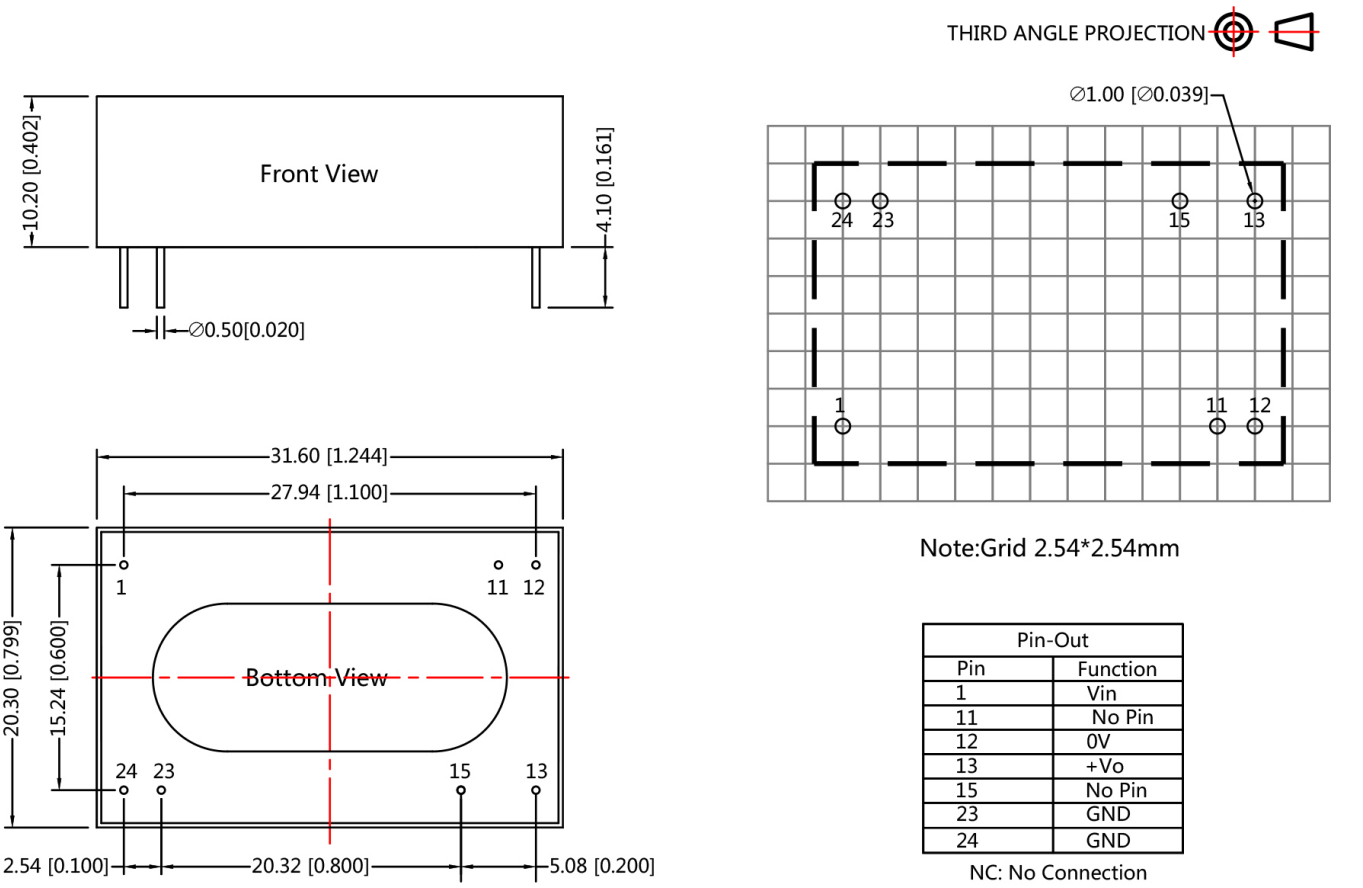
Notes: Part ① is used for EMS test.

Parameter description

Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	330μF/50V	330μF/100V
C1	Refer to the Cout in Typical application	

The product does not support output in parallel with power per liter

Mechanical dimensions



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	Vin
11	No Pin
12	0V
13	+Vo
15	No Pin
23	GND
24	GND

NC: No Connection

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

Note:
1. The max. capacitive load should be tested within the input voltage range and under full load conditions;
2. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. 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.
5. Only typical models listed, other models may be different, please contact our technical person for more details.
6. We can provide product customization service.
7. Products are related to laws and regulations: see "Features" and "EMC".
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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