



## 6DMW\_1.5 Series

6W - Dual/Single Output - Wide Input - Isolated & Regulated  
SMD package - DC-DC Converter

## DC-DC Converter 6 Watt

- ⊕ Efficiency up to 87%
- ⊕ 2:1 wide input voltage range
- ⊕ 1.5kVDC isolation
- ⊕ Short circuit protection (SCP)
- ⊕ No-load power consumption as low as 0.12W
- ⊕ Operating temperature: -40°C ~ +85°C
- ⊕ Input under-voltage
- ⊕ Output over-voltage
- ⊕ Output over-current
- ⊕ Meet CISPR22/EN55022
- ⊕ CLASS A (without external components)
- ⊕ Int. standard pin-out
- ⊕ UL60950, EN60950 and IEC60950 approval



The 6DMW series are isolated 6W DC-DC products with 2:1 input voltage. They feature efficiency up to 87%, 1500VDC isolation, operating temperature of -40°C to +85°C, input under-voltage protection, output over-voltage, over-current, short circuit protection and EMI meets CISPR22/EN55022 CLASS A. Widely applied in medical care, industrial control, electric power, instruments and communication fields, they 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  $\leq 1500$ VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

### Common specifications

Short circuit protection:	Continuous, automatic recovery
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
Maximum case temperature:	105°C (Operating Temperature curve range)
Storage humidity range:	< 95% (non condensing)
Vibration:	10-55Hz, 10G, 30 Min. along X, Y and Z
Switching frequency*:	300KHz TYP (PWM mode)
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F):	>1,000,000 hours
Weight:	14g

\* 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.

### Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 12VDC input		603/10	633/22	mA
	• 24VDC input				
	- 3.3V output	268/5		275/15	mA
	- others	296/5		313/15	mA
Reflected ripple current			20		mA
Surge voltage (1sec. max.)	• 12VDC input	-0.7		25	VDC
	• 24VDC input	-0.7		50	VDC
Starting voltage	• 12VDC input			9	VDC
	• 24VDC input			18	VDC
Under-voltage turn-off	• 12VDC input	5.5	6.5		VDC
	• 24VDC input	12	15.5		VDC
Input filter	Pi				
Hot plug	Unavailable				

### Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			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 - ±5V output - others		±1	±3	%
			±2	±5	%
			±1	±3	%
Output voltage balance	Dual output, balance load		±0.5	±1.5	%
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	±1	%
			±0.5	±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	μs
Transient response deviation	25% load step change • 3.3V, 5V, ±5V output • others		±5	±8	%
			±3	±5	%
Temperature drift	100% full load			±0.03	%/°C
Ripple&Noise*	20MHz Bandwidth		60	85	mVp-p
Over voltage protection	Input voltage range	110		160	%Vo
Over current protection	Input voltage range	110	140	190	%Io

\* 0%-5% load ripple&noise is no more than 5%Vo. Ripple and noise tested by "parallel cable" method. See DC-DC Converter Application Notes for specific operation.

#### Example:

**6DMW\_2405D1.5**

6 = 6Watt; D = DIP; M = series; W = wide input (2:1) 9-36Vin;  
5Vout; D = Dual Output; 1.5 = 1500VDC

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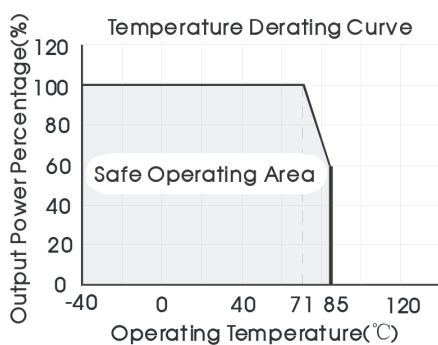
EMC specifications				
EMI	CE	CISPR22/EN55022 CLASS A (without external circuit) CLASS B (see EMC recommended circuit, ②)		
EMI	RE	CISPR22/EN55022 CLASS A (without external circuit) CLASS B (see EMC recommended circuit, ②)		
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (see EMC recommended circuit, ①)
EMS	Surge	IEC/EN61000-4-5	line to line ±2KV	perf. Criteria B (see 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 [μF, Max.]	Efficiency** [%, Typ.]
	Nominal	Range	Max*		Max	Min		
6DMW_1205S1.5	12	9-18	20	5	1200	0	1000	81
6DMW_1212S1.5	12	9-18	20	12	500	0	470	85
6DMW_2403S1.5	24	18-36	40	3.3	1500	0	1800	77
6DMW_2405S1.5	24	18-36	40	5	1200	0	1000	82
6DMW_2412S1.5	24	18-36	40	12	500	0	470	85
6DMW_2415S1.5	24	18-36	40	15	400	0	220	86
6DMW_2424S1.5	24	18-36	40	24	250	0	100	85
6DMW_1205D1.5	12	9-18	20	±5	±600	0	470	81
6DMW_1212D1.5	12	9-18	20	±12	±250	0	100	85
6DMW_2405D1.5	24	18-36	40	±5	±600	0	470	83
6DMW_2412D1.5	24	18-36	40	±12	±250	0	100	87
6DMW_2415D1.5	24	18-36	40	±15	±200	0	100	87

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

\*\* Efficiency is measured in nominal input voltage and rated output load.

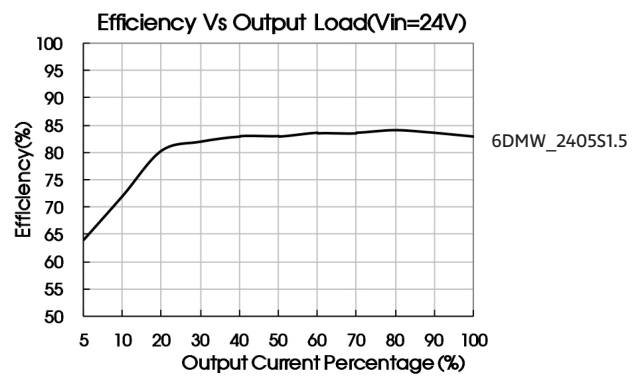
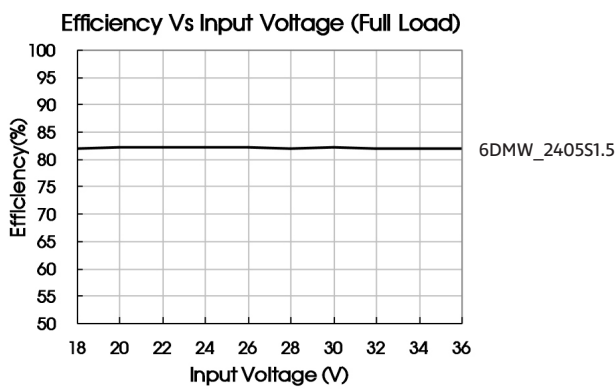
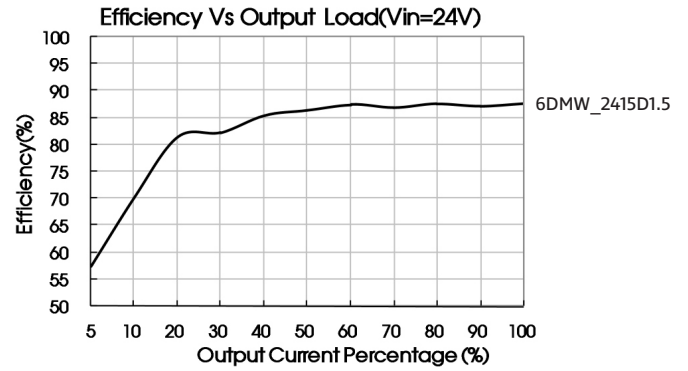
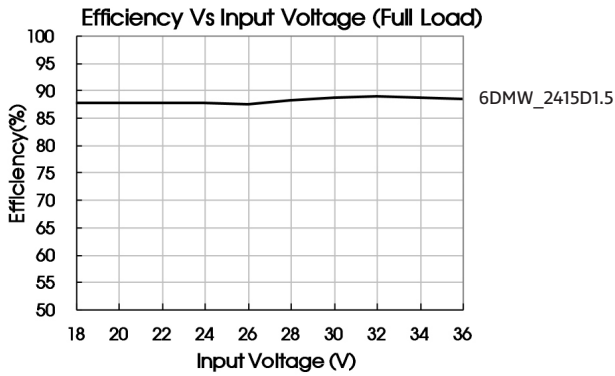
## Typical characteristics



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### Efficiency

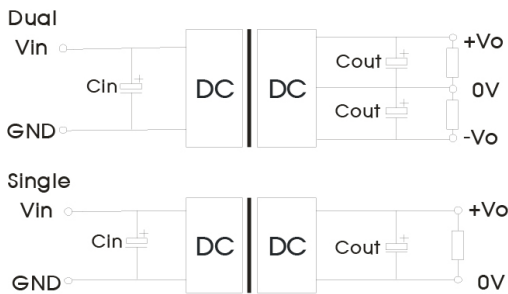


### Typical application

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.

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



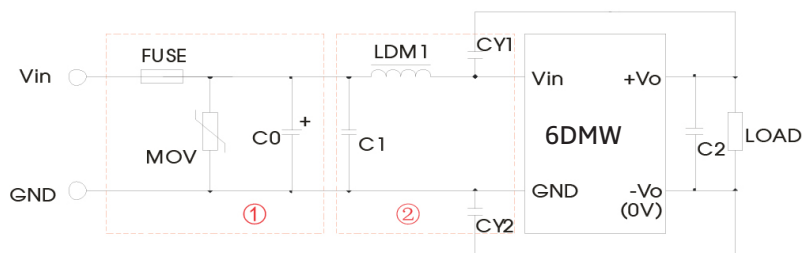
Vin (VDC)	Cin ( $\mu$ F)	Cout ( $\mu$ F)
12	100	10
24	10-47	10

Figure 1

## 6DMW\_1.5 Series

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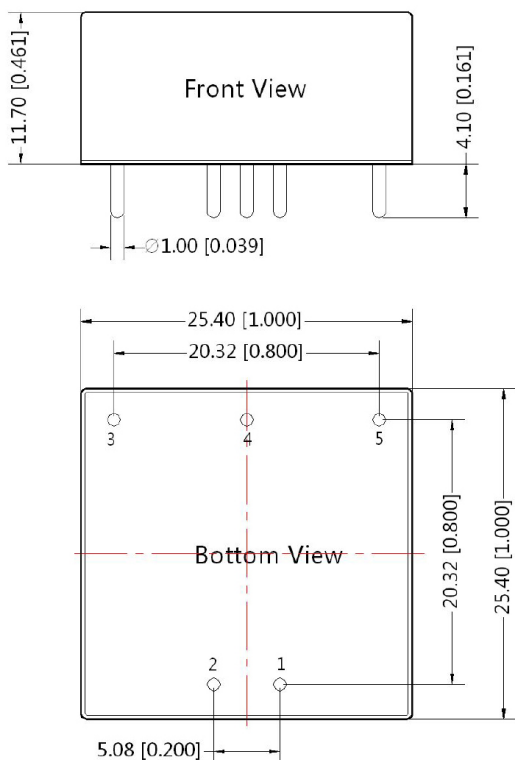
### EMC recommended circuit



Parameters	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	S14K20	S20K30
C0	1000 $\mu$ F/35V	1000 $\mu$ F/50V
C1	1 $\mu$ F/50V	
C2	Refer to the Cout in recommended circuit	
LDM1	4.7 $\mu$ H	
CY1/ CY2	1nF/2kV	

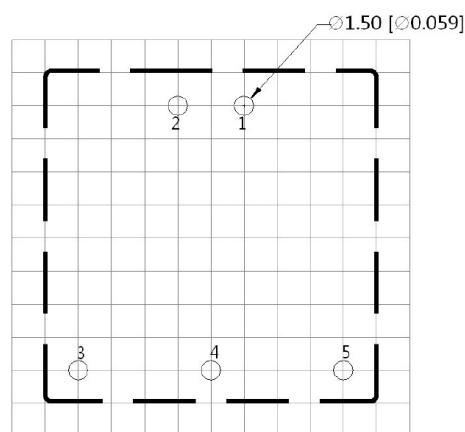
Part ① is for EMS test, part ② is for EMI filtering; parts ① can be added based on actual requirement.

### Mechanical dimensions and foot-



Note:  
Unit: mm[inch]  
Grid: 2.54\*2.54mm.  
Pin diameter tolerances:  $\pm 0.10$ mm [ $\pm 0.004$ inch]  
General tolerances:  $\pm 0.50$ mm [ $\pm 0.020$ inch]

THIRD ANGLE PROJECTION



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

Note:

- The recommended unbalance degree of the dual output module load is  $\leq \pm 5\%$ ; if the degree exceeds  $\pm 5\%$ , then the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a = 25^\circ\text{C}$ , humidity  $< 75\% \text{RH}$  with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on Company's corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Specifications are subject to change without prior notice.