Descriptions

6W isolated, DC/DC Converter

RoHS

3 Years Warranty

c UL us Report — UL62368-1

CE Report — EN62368-1

UKCA Report — BS EN62368-1

Features

- Ultra wide 4:1 input voltage range
- High efficiency up to 85%
- No-load power consumption as low as 0.12W
- Reinforced isolation, I/O isolation test voltage: 6KVDC and 2MOPP high isolation
- Leakage current < 5 μA, under 240VAC/60Hz operating conditions
- Transformer creepage distance is 8mm, transformer clearance is 5mm
- Operating ambient temperature range: -40℃ to +85℃
- Input under-voltage protection, output short circuit, over-current, over-voltage protection
- Industry standard pin-out

Applications

- Electrical Power
- Medical

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.		
UL/EN/BS EN	DWP6-H2405	24 (9-36)	40	5	1200/0	78/80	2700
EN/BS EN	DWP6-H2406			6	1000/0	79/81	2200
	DWP6-H2409			9	667/0	81/83	1800
UL/EN/BS EN	DWP6-H2412			12	500/0	82/84	1000
EN/BS EN	DWP6-H2415			15	400/0	83/85	680
EN/BS EN	DWP6-H2418			18	333/0	83/85	1200
EN/BS EN	DWP6-H2424			24	250/0	82/84	470
EN/BS EN	DWP6-H4805	48 (18-75)	80	5	1200/0	79/81	2700
	DWP6-H4809			9	667/0	81/83	1800
	DWP6-H4812			12	500/0	82/84	1000
	DWP6-H4815			15	400/0	83/85	680
	DWP6-H4824			24	250/0	82/84	470

Notes: Exceeding the maximum input voltage may cause permanent damage.

Specifications

Product Specifications	Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	24VDC input	--	309/5	317/8	mA
		48VDC input	--	154/4	159/7	
	Reflected Ripple Current	24VDC input	--	20	--	
		48VDC input	--	20	--	
	Surge Voltage (1sec. max.)	24VDC input	-0.7	--	50	VDC
		48VDC input	-0.7	--	100	
	Start-up Voltage	24VDC input	--	--	9	
		48VDC input	--	--	18	
	Input Under-voltage Protection	24VDC input	5.5	6.5	--	
		48VDC input	12	15.5	--	
	Input Filter		Pi filter			
	Hot Plug		Unavailable			
Output Specifications	Voltage Accuracy		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load	--	±0.2	±0.5	
	Load Regulation①	5%-100% load	--	±0.5	±1	
	Transient Recovery Time	25% load step change	--	300	500	μs
	Transient Response Deviation		--	±3	±5	%
	Temperature Coefficient	Full load	--	--	±0.03	%/℃
	Ripple & Noise②	20MHz bandwidth	--	100	180	mVp-p
	Over-current Protection	Input voltage range	110	150	260	%Io
	Over-voltage Protection		110	--	160	%Vo
	Short-circuit Protection		Continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength test for 1 minute with a leakage current of 1mA max.	6000	--	--	VDC
	Insulation Resistance	Input-output resistance at 500VDC	10000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100KHz/0.1V	--	13	20	pF
	Leakage Current	240VAC/60Hz	--	3.6	5	uA
	Application Part		CF Type			
	Reinforced Isolation	Transformer creepage	8.0	--	--	mm
		Transformer clearance	5.0	--	--	
		PCB creepage & clearance	8.0	--	--	
		Optocoupler creepage	8.0	--	--	
	Operating Temperature	Derating if the temperature is ≥71℃ (see Fig. 1)	-40	--	85	℃
	Storage Humidity	Without condensation	5	--	95	%RH
	Storage Temperature		-55	--	125	℃
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
	Vibration		10-55Hz, 2G, 30 Min. along X, Y and Z			
	Switching Frequency③	PWM mode(nominal, full load)	--	300	--	kHz
	Insulation Protection Grade	240VAC/60Hz	2×MOPP			

	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
Mechanical Specifications	Case Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)				
	Dimensions	31.60 × 20.30 × 10.20 mm				
	Weight	13.0g(Typ.)				
	Cooling method	Free air convection				

Note:
① Load regulation for 0%-100% load is ±5%;
② Ripple & Noise at < 5% load is 5%Vo max. The "parallel cable" method is used for Ripple and Noise test, oscilloscope using the 1X probe;
③ Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	Others	CISPR32/EN55032 CLASS A (without extra components)	
			DWP6-H2418	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
		ESD		IEC/EN61000-4-2 Contact ±6KV	perf. Criteria B
	Immunity (EMS)	EFT		IEC/EN61000-4-4 ±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
		Surge		IEC/EN61000-4-5 ±2KV (see Fig.3-① for recommended circuit)	perf. Criteria B
		CS		IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
		Immunities of voltage dip, drop and short interruption		IEC/EN61000-4-29 0-70%	perf. Criteria B

Characteristic Curve

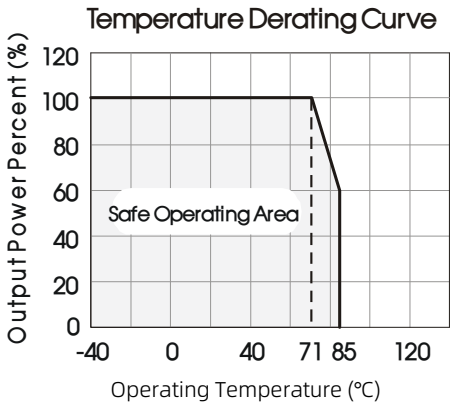
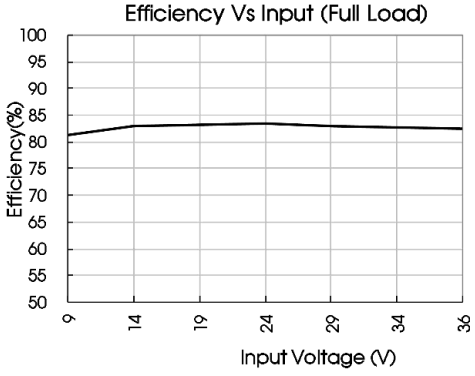


Fig. 1

DWP6-H2405



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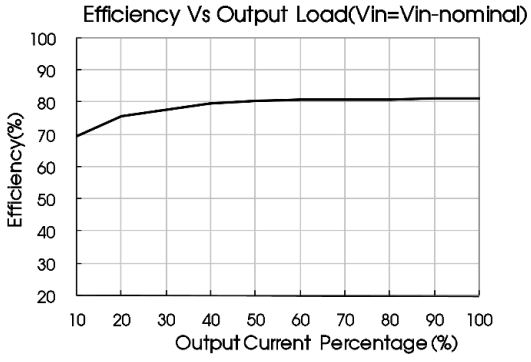

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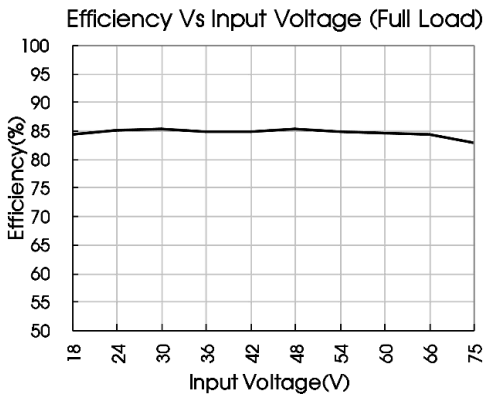

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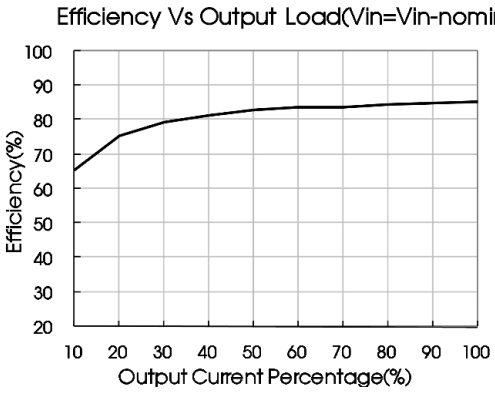


Design Reference

1.Typical application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

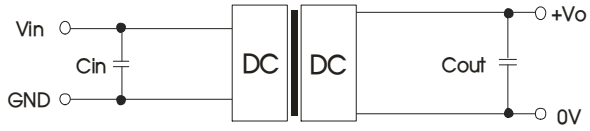


Fig. 2

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

2.EMC compliance circuit

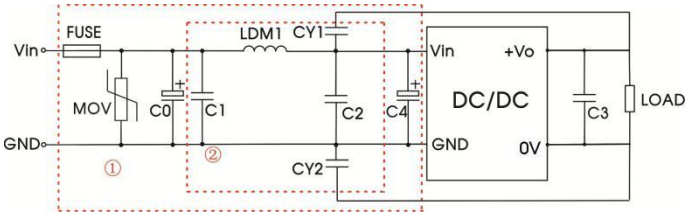


Fig. 3

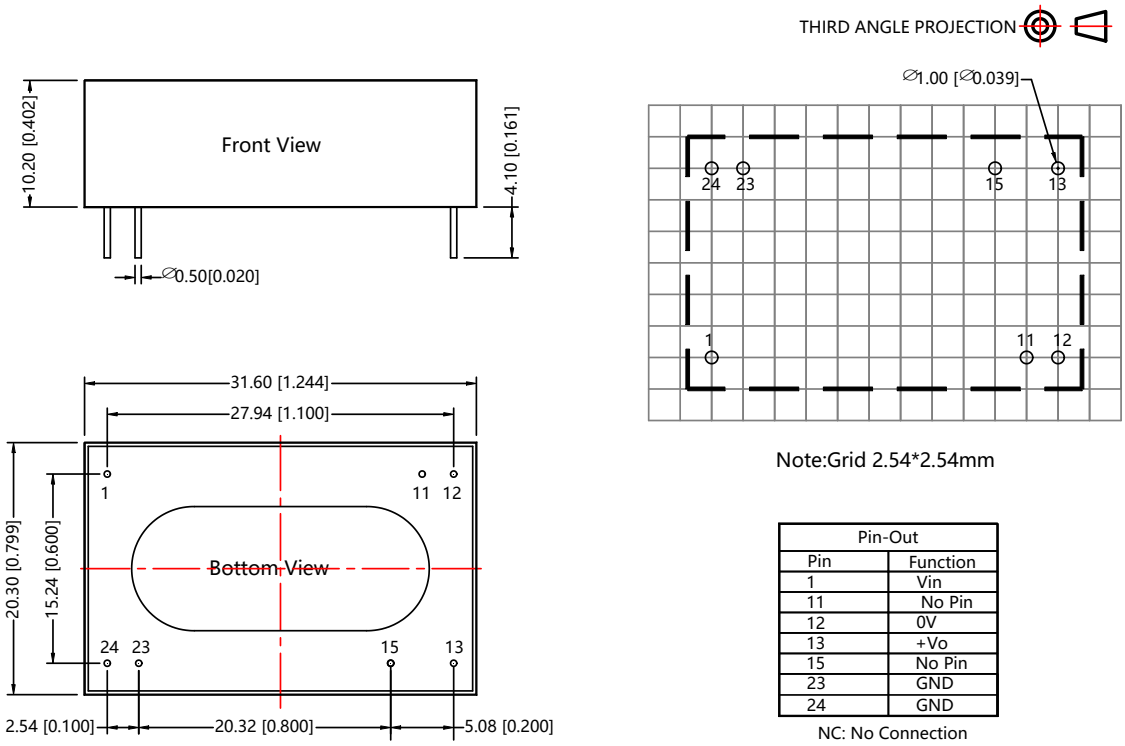
Notes: For EMC tests we use part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0, C4	330μF/50V	330μF/100V
C1, C2	10μF/50V	--
C3	Refer to the Cout in Fig.2	
LDM1	10μH	--
CY1, CY2	1nF/6KV	--

3.The products do not support parallel connection of their output

Dimensions and Recommended



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 :±0.10[± 0.004]
General tolerances:±0.50[±0.020]

Note:
1. The maximum capacitive load offered were tested at nominal input voltage range 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 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;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.