

30DBW4 Series

30W - Single Output - Wide Input - Isolated & Regulated
DIP DC-DC Converter

DC-DC Converter

30 Watt

- ⊕ High efficiency up to 90%
- ⊕ 4:1 wide input voltage range
- ⊕ Isolation voltage 1500VDC
- ⊕ Six-sided metal shield
- ⊕ Short circuit protection (SCP) (automatic recovery)
- ⊕ Operating temperature: -40°C to +85°C
- ⊕ Internal SMD construction
- ⊕ Industry standard pinout
- ⊕ Meet CISPR22/EN55022 CLASS A

The 30DBW4 series offer 30W of output, wide input voltage of 9-36VDC, 18-75VDC, and features 1500VDC isolation, six-sided metal shield over current and short circuit protection.

All models are particularly suited to tele-communications, industrial, test equipments power etc.



Common specifications

Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C~+125°C
Temp. rise allowed at full load:	105°C, Operating Temperature curve range
Lead temperature range:	300°C MAX, 1.5mm from case for 10 sec
Switching frequency (PWM mode):	300kHz TYP, Nominal input, full load
Storage humidity range:	5% MIN, 95% MAX
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F @25°C):	>1,000,000 hours

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input/Output, tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		2000		pF

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 perf. Criteria B	Contact ±4KV		
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(3))	
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to recommended circuit(3))	
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	

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 24VDC input - 5V output - Others • 48VDC input - 5V output - Others		1420/120 1420/30		mA mA
Reflected ripple current			30		mA
Input impulse voltage (1sec. max)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Input filter			PI		
Start-up time	Nominal input & constant resistance load		10		ms
Ctrl*	• Models ON • Models OFF • Input current (OFF)		Ctrl suspended or connected to TTL high level (2.5-12VDC) Ctrl pin connected to GND or low level (0-1.2VDC) 1		mA

* The CTRL pin voltage is referenced to GND.

Example:

30DBW4_2415S1.5

30 = 30Watt; D = DIP; B = series; W4 = wide input (4:1) 9-36Vin; 15Vout; S = single output; 1.5 = 1500VDC isolation

Note:

- Input voltage can't exceed this value, or will cause the permanent damage.
- The load shouldn't be less than 5%, otherwise ripple will increase dramatically.
- Max. Capacitive Load is tested on Vin-nominal and full load.
- The CTRL pin voltage is referenced to GND.
- All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
- In this datasheet, all the test methods of indications are based on corporate standards.
- Only typical models listed, other models may be different, please contact our technical person for more details.

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Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±3	%
Line regulation	Full load, low to high		±0.2	±0.5	%
Load regulation	5% to 100% load		±0.5	±1	%
Cross regulation	from 10% to 100% load (dual output)			±5	%
Transient recovery time	25% load step change	300		500	µs
Transient response deviation	25% load step change		±3	±5	%
Temperature drift	100% full load		±0.02		%/°C
Ripple and noise*	20MHz Bandwidth		85	100	mV
Trim			±10		%Vo
Over current protection	Input voltage range		150		%Io
Short circuit protection	Input voltage range		Hiccup, continuous, auto-recovery		
Over voltage protection	• 5V output • 12V output • 15V output		6.1 15 18		VDC

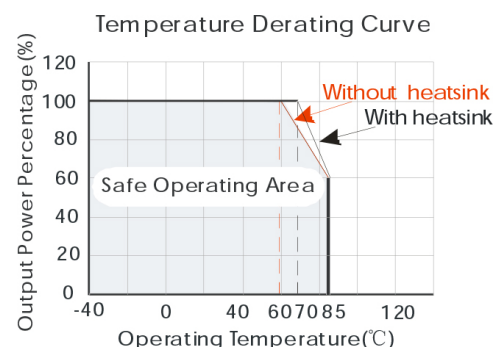
* Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA]		Efficiency [% , Typ.]	Capacitor load [µF, Max]
	Nominal	Range	Max ⁽¹⁾		Max	Min		
30DBW4_2405S1.5	24	9-36	40	5	6000	300	88	6000
30DBW4_2412S1.5	24	9-36	40	12	2500	125	88	2500
30DBW4_2415S1.5	24	9-36	40	15	2000	100	90	1100
30DBW4_4805S1.5	48	18-75	80	5	6000	300	88	6000
30DBW4_4812S1.5	48	18-75	80	12	2500	125	88	2500
30DBW4_4815S1.5	48	18-75	80	15	2000	100	89	1100
30DBW4_2405D1.5	24	9-36	40	±5	±3000	±150	86	±2000
30DBW4_2412D1.5	24	9-36	40	±12	±1250	±63	89	±1250
30DBW4_2415D1.5	24	9-36	40	±15	±1000	±50	90	±680
30DBW4_4805D1.5	48	18-75	80	±5	±3000	±150	86	±2000
30DBW4_4812D1.5	48	18-75	80	±12	±1250	±63	87	±1250
30DBW4_4815D1.5	48	18-75	80	±15	±1000	±50	87	±680

Add suffix "H" for heatsink mounted, for example 30DBW4_2405S1.5H

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

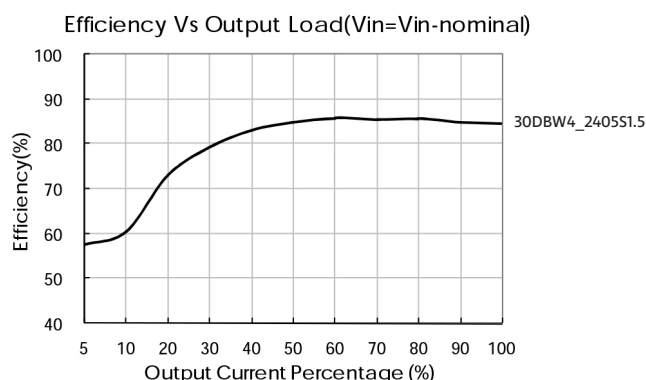
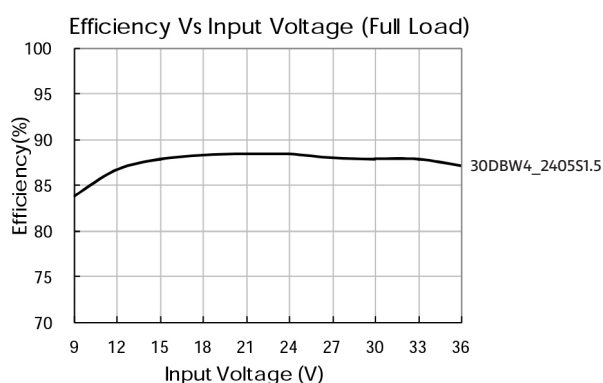
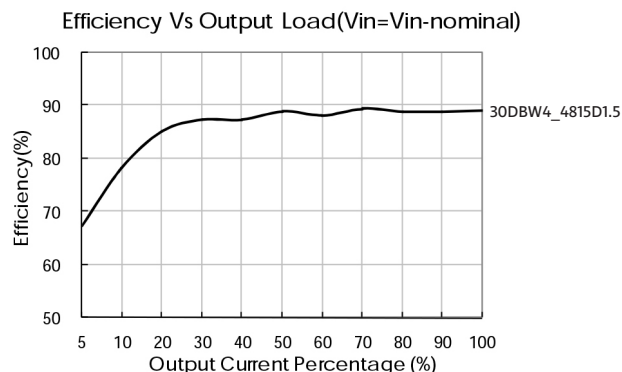
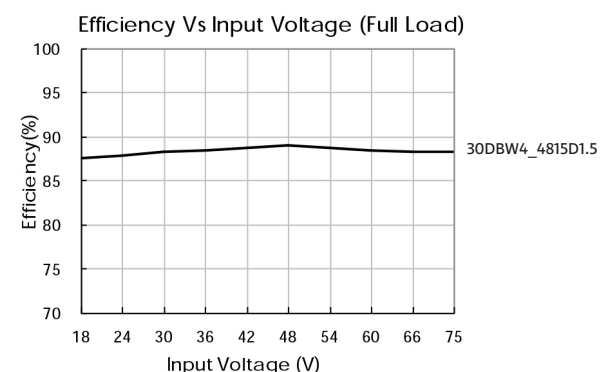
Typical characteristics



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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.

Vout (VDC)	Cout (μF)	Cin (μF)
5	10	10
12/15	10	4.7

Dual Output

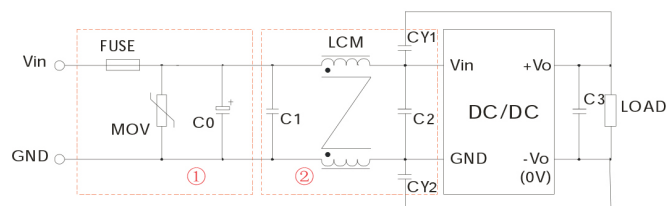


Single Output



figure 1

EMC recommended circuit



Note:

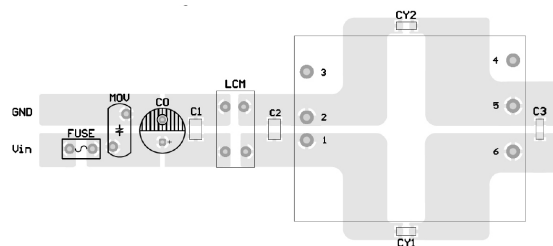
In Figure 1, part ① is used for EMS test, part ② for EMI filtering. Choose according to requirements.

Recommended external circuit parameters	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	S14K35	S14K60
C0	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	2.2μF/100V
C3	Refer to the Cout in Typical application	
LCM	1mH (FL2D-30-102)	
CY1, CY2	1nF/2KV	

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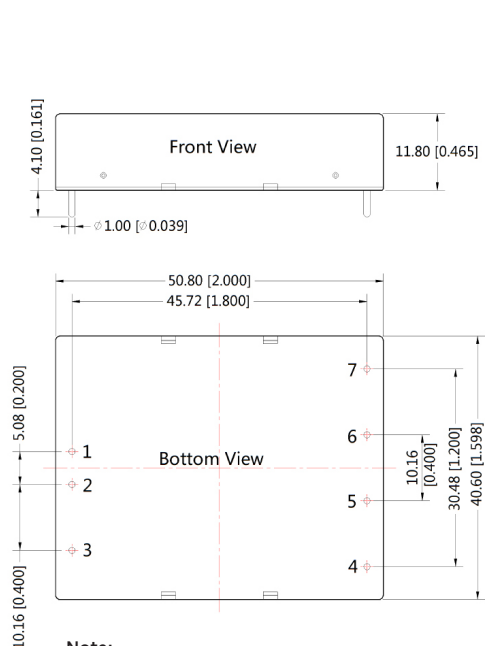
EMC recommended circuit PCB layout



Note:

Note: the min. distance of the bonding pads between input & output isolation capacitors (CY1/CY2) shall be $\geq 2\text{mm}$.

Mechanical dimensions (no heatsink) Recommended footprint



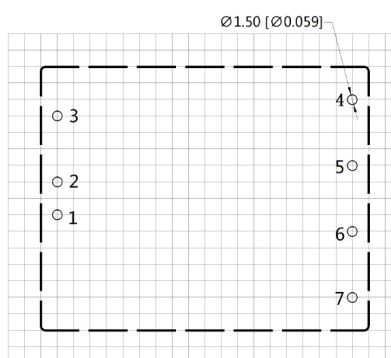
Note:

Unit: mm[inch]

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

General tolerances: $\pm 0.25\text{mm}$ [$\pm 0.010\text{inch}$]

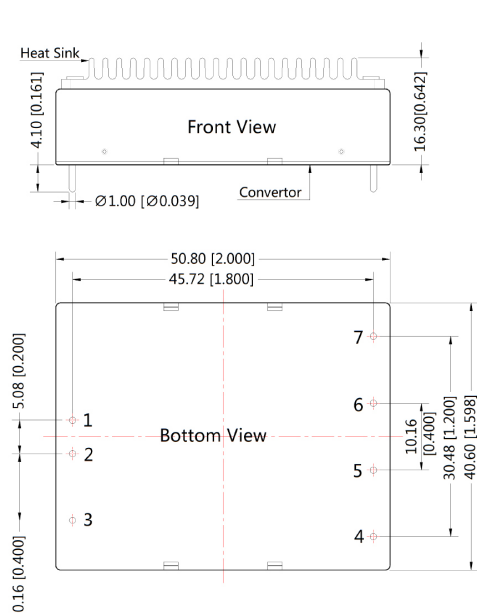
THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

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

Mechanical dimensions (with heatsink)



THIRD ANGLE PROJECTION

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

Note:

Unit: mm[inch]

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

If use heatsinks, make sure there is enough space for a specific size in the above graph.