

30DAWE_1.5 series

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



- ⊕ Efficiency up to 90%
- ⊕ 2:1 wide input voltage range
- ⊕ Output over current, over voltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ 1.5kVDC isolation
- ⊕ No-load power consumption as low as 0.14W
- ⊕ Operating temperature range: -40°C ~ +80°C
- ⊕ Six-sided metal shield
- ⊕ Industry standard pinout
- ⊕ Meet CISPR32/EN55032 CLASS A, without extra components
- ⊕ EN/UL60950 approved



Common specifications

Short circuit protection:	Hiccup, continous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+80°C
Storage temperature range:	-55°C~+125°C
Pin soldering resistance temperature:	300°C MAX, 1.5mm from case for 10 sec
Vibration:	10-55Hz, 2G, 30 Min. along X, Y and Z
Storage humidity range:	5-95%RH
Switching frequency (PWM mode):	300KHz TYP
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F@25°C):	1000 K hours MIN
Weight:	27.8g
Dimensions:	50.80 × 25.40 × 11.80 mm

① Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Reflected ripple current			40		mA
Surge voltage (1 sec. max)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Start-up voltage	• 24VDC input • 48VDC input			18 36	VDC VDC
Start-up time	Nominal input & constant resistance load		10		ms
Input filter	Pi				
Hot plug	Unavailable				
Ctrl ⁽¹⁾	• Module on • Module off • Input current when off		Ctrl pin open or pulled high (3.5-12VDC) Ctrl pin pulled low to GND (0-1.2VDC)		
			5	8	mA

① The Ctrl pin voltage is referenced to input GND.

Example:

30DAWE_2415S1.5

30 = 30Watt; D = DIP; A = series; W = wide input (2:1) 18-36Vin;
E = cost effective; 15Vout; S = single output; 1.5 = 1500VDC isolation

DC-DC Converter

30 Watt

The 30DAWE_1.5 series are isolated 30W DC-DC products with a wide 2:1 input voltage and feature efficiencies of up to 90%, input to output isolation is tested with 1500VDC and the converters safely operate ambient temperature of -40°C to +80°C, output short-circuit, over-voltage, over-current protection. They meet CLASS A of CISPR32/EN55032 EMI standards without external components.

They are widely used in applications such as data transmission device, battery power supply device, tele-communication device, distributed power supply system, hybrid module system, remote control system, industrial robot fields.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	5%-100% load 0%-5% load	±1 ±1		±3 ±5	% %
Line regulation	Full load, input voltage low to high		±0.2	±0.5	%
Load regulation ⁽¹⁾	5%-100% load		±0.5	±1	%
Transient recovery time	25% load step change		300	500	µs
Transient response deviation	25% load step change • 3.3/5/±5VDC output • others		±5 ±3	±8 ±5	% %
Temperature drift	100% full load			±0.03	%/°C
Ripple & Noise ⁽³⁾	20MHz Bandwidth		50	100	mVp-p
Trim	Input voltage range (24V/48V input series)		±10		%Vo
Over voltage protection	Input voltage range (all models; except 30DAWE_12110S1.5)	110		160	%Vo
Over current protection	Input voltage range	110		190	%Io

① Load regulation for 0%-100% load is ±5%;

② The "parallel cable" method is used for Ripple and Noise test.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and leakage current less than 1 mA	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz/0.1V		2000		pF

Note:

- 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 Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see „Features“ and „EMC“;
- 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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EMC specifications				
EMI	CE	CISPR32/EN550232	CLASS A (without external components) CLASS B (see EMC compliance circuit ②)	
EMI	RE	CISPR32/EN55032	CLASS A (without external components) CLASS B (see EMC compliance 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 (see EMC compliance circuit ①)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±2KV (see EMC compliance circuit ①)	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

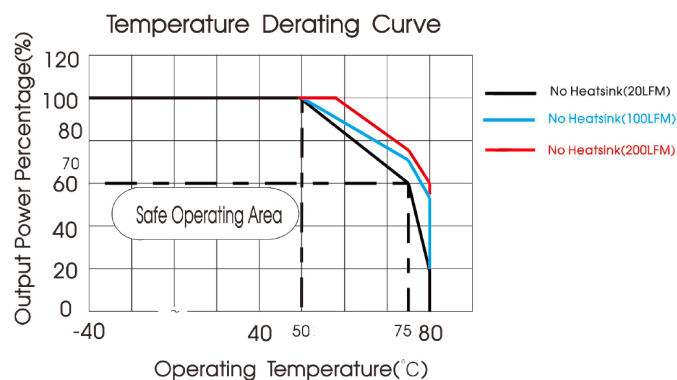
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max]	Input Current [mA, typ/max]		Efficiency ⁽²⁾ [%, Typ.]	Capacitive load [μF, Max]
	Nominal	Range	Max ⁽¹⁾			Full load	No load		
30DAWE_2403S1.5	24	18-36	40	3.3	6000	1471/1507	60/100	85	10000
30DAWE_2405S1.5	24	18-36	40	5	6000	1421/1453	60/100	88	10000
30DAWE_2409S1.5	24	18-36	40	9	3333	1389/1489	6/12	86	4700
30DAWE_2412S1.5	24	18-36	40	12	2500	1389/1489	6/12	88	2700
30DAWE_2415S1.5	24	18-36	40	15	2000	1389/1489	6/12	90	1680
30DAWE_2424S1.5	24	18-36	40	24	1250	1389/1489	6/12	90	680
30DAWE_4803S1.5	48	36-75	80	3.3	6000	727/745	20/30	86	10000
30DAWE_4805S1.5	48	36-75	80	5	6000	711/727	20/35	88	10000
30DAWE_4812S1.5	48	36-75	80	12	2500	711/727	5/10	88	2700
30DAWE_4815S1.5	48	36-75	80	15	2000	711/727	5/10	89	1680
30DAWE_4824S1.5	48	36-75	80	24	1250	711/727	5/10	89	680

① Exceeding the maximum input voltage may cause permanent damage;

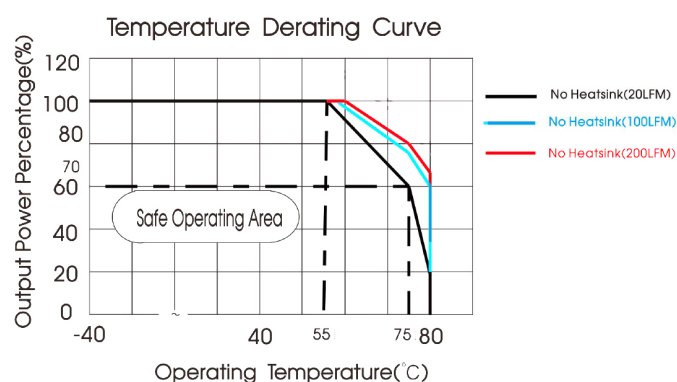
② Efficiency is measured In nominal input voltage and rated output load.

Typical characteristics

3VDC/5VDC output



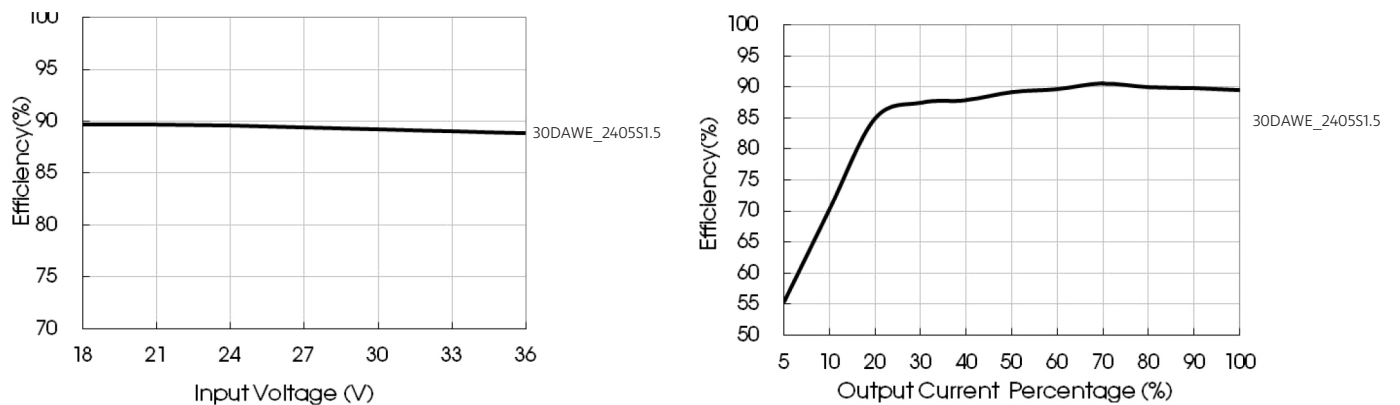
9VDC/12VDC/15VDC/24VDC output



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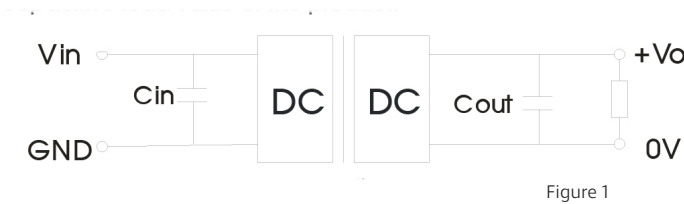
Efficiency



Typical application

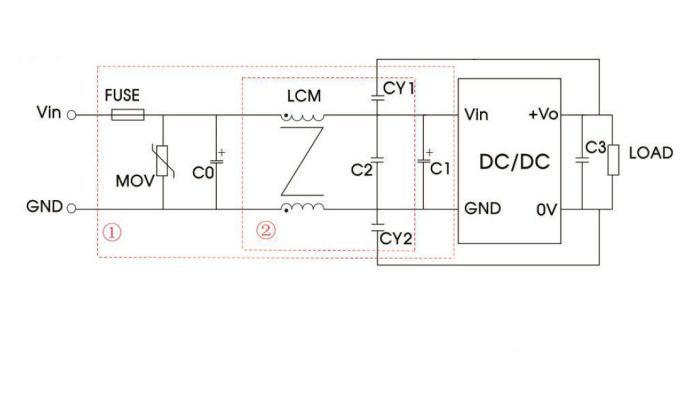
All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 1.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} 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.



output voltage (VDC)	Cout (µF)	Cin (µF)
3.3/5/9	220	100
12/15/24	100	

EMC recommended circuit



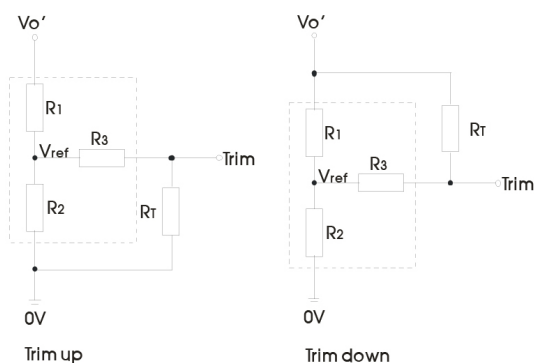
Parameter description		
Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	680µF/50V	330µF/100V
C1	330µF/50V	330µF/100V
C2	4.7µF/50V	2.2µF/100V
C3	Refer to Cout in figure 1	
LCM	1mH	
CY1、CY2	1nF/2KV	

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Trim

Trim Function for Output Voltage Adjustment (open if unused)



Calculating Trim resistor values:

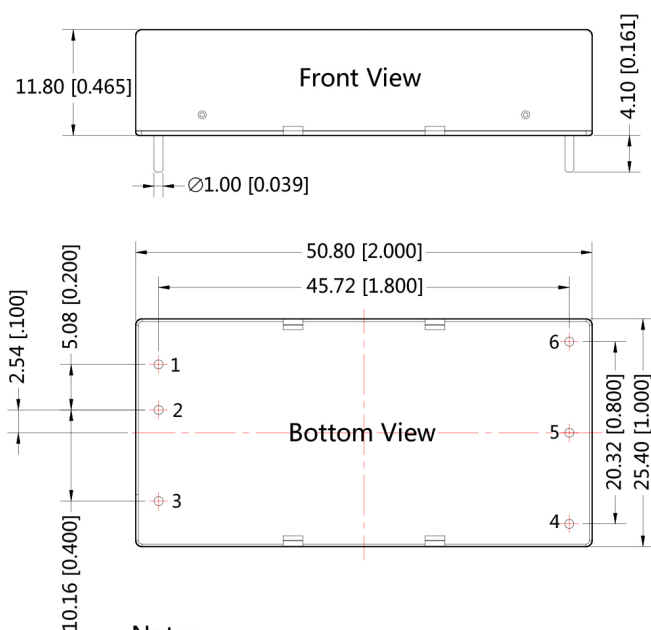
$$\begin{aligned} \text{up: } R_T &= \frac{\alpha R_2}{R_2 - \alpha} - R_3 & \alpha &= \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1 \\ \text{down: } R_T &= \frac{\alpha R_1}{R_1 - \alpha} - R_3 & \alpha &= \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2 \end{aligned}$$

R_T = Trim resistance;
 α = self-defined parameter;
 V_o' = desired output voltage.

TRIM resistor connection (dashed line shows internal resistor network)

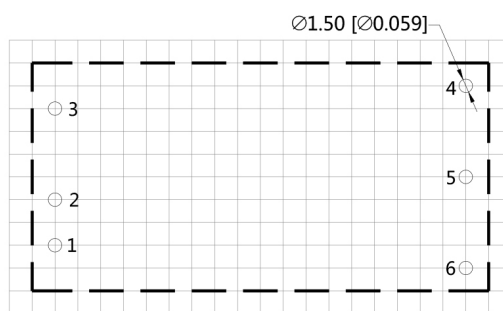
Vout(VDC)	R1(K Ω)	R2(K Ω)	R3(K Ω)	Vref(V)
3.3	4.801	2.87	12.4	1.24
5	2.883	2.87	10	2.5
9	7.500	2.87	15	2.5
12	11.000	2.87	15	2.5
15	14.494	2.87	15	2.5
24	24.872	2.87	17.8	2.5

Mechanical dimensions



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

THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	Vin
2	GND
3	Ctrl
4	Trim
5	0V
6	+Vo