GAPTEC®

30DMW4_1.5 series

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

DC-DC Converter　　　　30 Watt

- High efficiency up to 88%
- 4:1 wide input voltage range
- I/O Isolation 1500VDC
- Short circuit protection (SCP)
- Operating temperature range: -40°C to +85°C
- Input under-voltage, over-current, over voltage protection
- Industry standard pinout
- UL62368-1, IEC62368 approved

The 30DMW4_1.5 series offers 30W of output, 4:1 wide input voltage of 18-75VDC and features 1500VDC isolation, converter safety operate ambient temperature of -40°C to +85°C, input under voltage protection as well as over current, over voltage and short circuit protection.

They are ideally and widely used in applications such as industrial control, electric power, instruments and communications.

SHORT CIRCUIT PROTECTED · RoHS compliant 6/6 · UL-62368-1 approved

Common specifications

Cooling:	Free air convection
Short circuit protection:	Continuous, hiccup, automatic recovery
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
Vibration:	10-150Hz, 5G, 0.75mm. along X, Y and Z
Switching frequency* (PWM mode):	270kHz TYP
Storage humidity range:	5% MIN, 95% MAX
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F @25°C):	>1000Khours
Dimensions:	25.40 × 25.40 × 11.70 mm
Weight:	18.4g

* 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
Input current	full load/no load		710/8	735/15	mA
Reflected ripple current*	Nominal input		40		mA
Surge voltage	Nominal input	-0.7		100	VDC
Startup voltage	Nominal input			18	VDC
Input under voltage protection	Nominal input	12	15.5		VDC
Input filter			PI		
Start-up time	Nominal input & constant resistance load		10		ms
Ctrl*	• Module on	Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	• Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	• Input current when off		2	7	mA

* The control pin voltage is referenced to input GND.

Example:
30DMW4_4815S1.5
30 = 30Watt; D = DIP; M = series; W4 = wide input (4:1) 18-75Vin; 15Vout; S = single output; 1.5 =1500VDC isolation

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy			±1	±3	%
Line regulation	Full load, low to high		±0.2	±0.5	%
Load regulation	5% to 100% load		±0.5	±1	%
Transient recovery time	25% load step change nominal input		250	500	us
Transient response deviation	25% load step change • 5V output • Others		±3 ±3	±8 ±5	% %
Temperature drift	100% full load			±0.03	%/°C
Ripple and noise	20MHz Bandwidth • 5V/12V/15V output • 24V output		60 60	120 150	mV mV
Trim		90		110	%Vo
Over voltage protection	Input voltage range	110		160	%Vo
Over current protection	Input voltage range	110	170	260	%Io

Isolation specifications

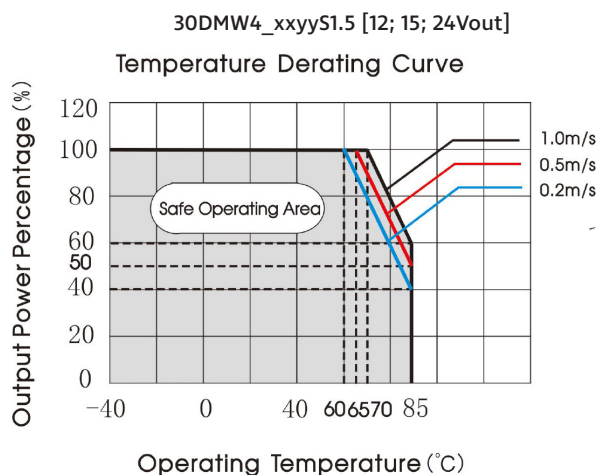| Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V			2000	pF

EMC specifications

EMI	CE	CISPR22/EN55032 (see EMC rec. circuit, ②)		CLASS B
EMI	RE	CISPR22/EN55032 (see EMC rec. circuit, ②)		CLASS B
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria B
EMS	EFT	IEC/EN61000-4-4 (see EMC rec. circuit, ①)	±2KV	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5 (see EMC rec. circuit, ①)	line to line ±2KV	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 V.r.m.s	perf. Criteria B

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Specifications subject to change without notice.

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| Part Number | Input Voltage [VDC] | | Output Voltage [VDC] | Output Current [mA] | | Efficiency [%, Typ.] | Capacitor load [µF, Max] |
	Nominal	Range		Max	Min		
30DMW4_4805S1.5	48	18-75	5	6000	0	88	7200
30DMW4_4812S1.5	48	18-75	12	2500	0	88	2000
30DMW4_4815S1.5	48	18-75	15	2000	0	88	1500
30DMW4_4824S1.5	48	18-75	24	1250	0	88	470

Typical characteristics

30DMW4_xxyyS1.5 [5Vout]

30DMW4_xxyyS1.5 [12; 15; 24Vout]

30DMW4_xxyyS1.5 [5Vout]

30DMW4_xxyyS1.5 [12; 15; 24Vout]
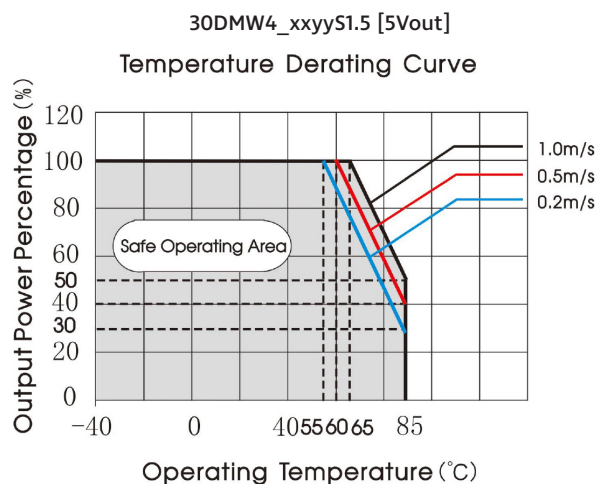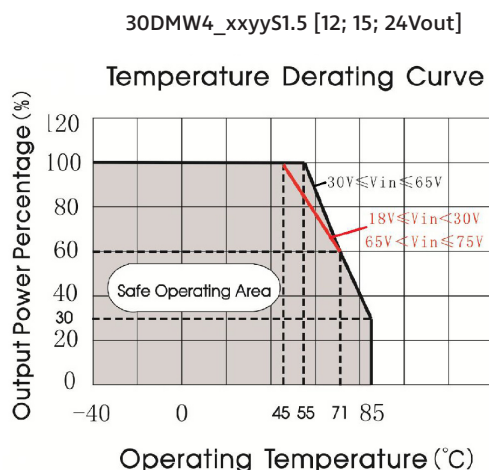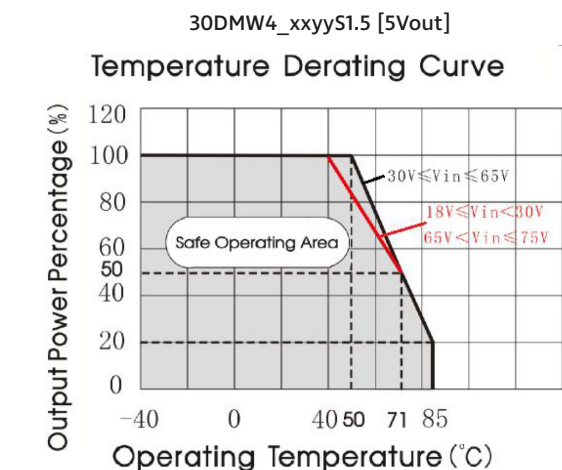
Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown on the right.

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.
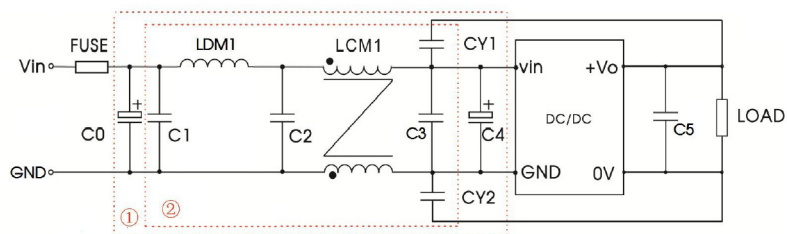

Vout	Cin (µF)	Cout (µF)
5/12/15	100	100
24	100	47

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EMC compliance circuit


We use Part ① in Fig. 3 for Immunity tests and Part ② for Emissions test.
Selecting based on needs.

CY1, CY2Model	Vin: 48V
FUSE	Choose according to actual input current
C0, C4	470µF/100V
C1	10µF/100V
LDM1	22uH/3A
C2	22uF/100V
LCM1	1.4mH/3A
C3	22uF/100V
C5	Refer to the Cout, typical application
CY1, CY2	1nF/2KV

Trim

Trim function for output voltage adjustment (open if unused)

Trim up

Trim down

TRIM resistor connection
(dashed line shows internal resistor network)
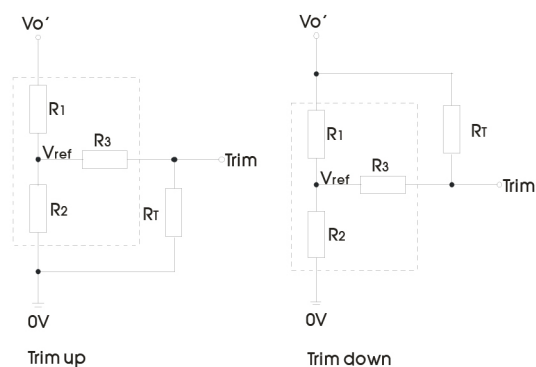
Calculating Trim resistor values:

$$\text{up:} \quad R_T = \frac{aR_2}{R_2-a} - R_3 \qquad a = \frac{Vref}{Vo'-Vref} \cdot R_1$$

$$\text{down:} \quad R_T = \frac{aR_1}{R_1-a} - R_3 \qquad a = \frac{Vo'-Vref}{Vref} \cdot R_2$$

R_T is Trim resistance

a is a self-defined parameter, with no real meaning.

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
5	8.832	2.87	10	1.24
12	11.00	2.87	8.2	2.5
15	14.40	2.87	10	2.5
24	24.87	2.87	7.5	2.5

The products do not support parallel connection of their output.

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Mechanical dimensions (no heatsink)

THIRD ANGLE PROJECTION

Front View

4.10 [0.161]

11.70 [0.461]

ϕ1.00 [0.039]

Bottom View

5.08 [0.200]

7.62 [0.300]

20.32 [0.800]

25.40 [1.000]

20.32 [0.800]
25.40 [1.000]

ϕ1.50 [ϕ0.059]

Note:Grid 2.54*2.54mm

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

Pin-Out	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V
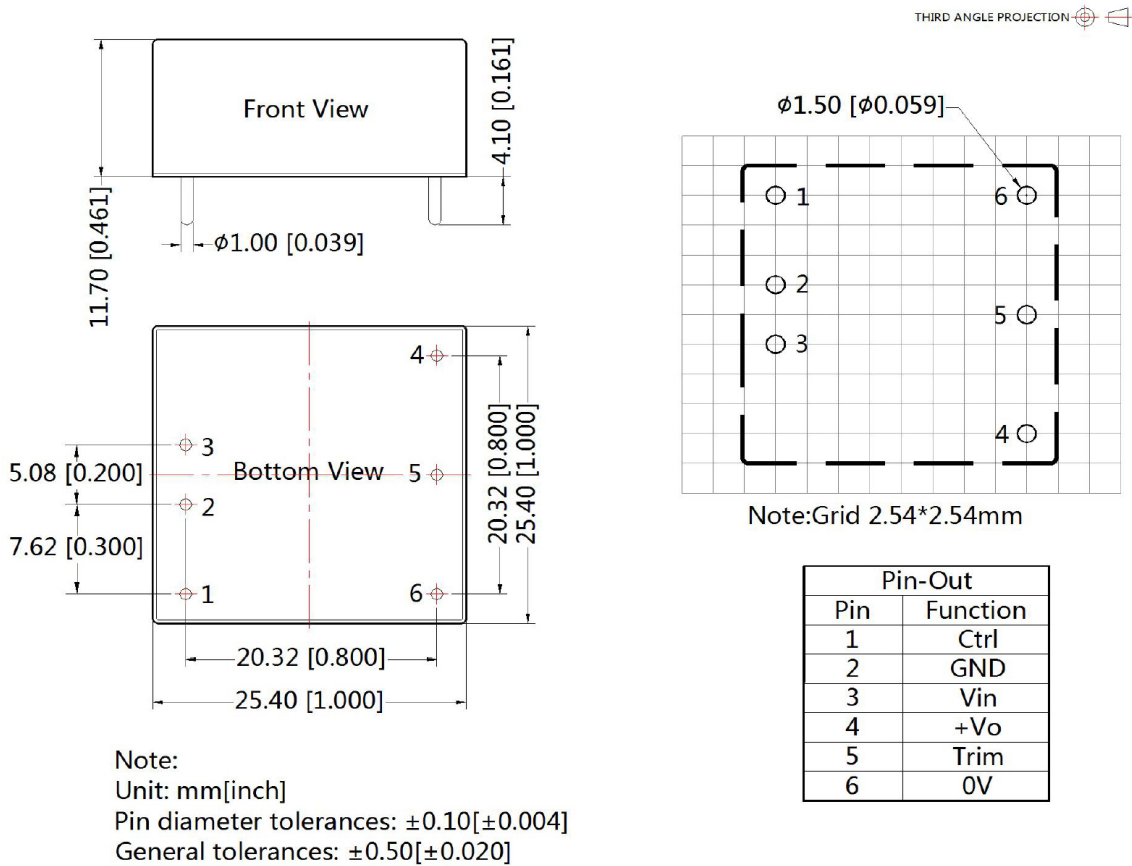
Note:
1. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage
   and rated output load unless otherwise specified.
2. In this datasheet, all the test methods of indications are based on corporate
   standards.
3. Only typical models listed, other models may be different, please contact our
   technical person for more details.
4. Specifications subject to change without notice.

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