GAPTEC®
GREEN TECHNOLOGY

6DAW4_D3 Series

6W - Dual Output - 4:1 Wide Input - Isolated & Regulated
DIP DC-DC Converter



DC-DC Converter 6 Watt

- **High Efficiency up to 86%**
- **Operating Temperature: -40°C to +85°C**
- **Wide input voltage range (4:1)**
- **3KVDC Input/Output Isolation**
- **Short Circuit Protection (SCP)**
- **No-load power consumption as low as 0.12W**
- **Over-voltage protection**
- **Over-current protection**
- **Input under-voltage protection**
- **Meet CISPR22/EN55022 CLASS A**
- **Industry standard pin-out**
- **RoHS Compliance**

The 6DAW4 series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:
1) Where the voltage of the input power supply is wide range (voltage range≤ 4:1);
2) Where isolation is necessary between input and output (isolation≤3000VDC);
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 / Derating if the temperature is ≥71°C (see Typical characteristics)
Storage temperature range:	-55°C ~+125°C
Temperature rise at full load:	40°C TYP
Lead temperature range:	300°C MAX, 1.5mm from case for 10 sec
Vibration:	10-55Hz, 10G, 30 Min. along X, Y and Z
Storage humidity range:	< 95%
Case material:	Plastic(UL94-V0)
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Weight:	13g

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input filter	Pi				
Input current (full load / no load)	24VDC input: • 5V output • 12V output • 15V output		 308/5 294/5 290/5	 320/10 305/10 301/10	 mA mA mA
Reflected ripple current			20		mA
Input impulse voltage	(1sec. max.)	-0.7		50	VDC
Start-up voltage				9	VDC
Input under-voltage protections		5.5	6.5		VDC
Starting time	Nominal input & constant resistance load		10		ms
Hot plug	Unavailable				

Note:
1. At less than 5% load operating, the ripple & noise of the product is 8%Vo;
2. At 0~100% load measuring, the standard load regulation is ±5%;
3. The recommended unbalance degree of the dual output module load is ≤±5%; if the degree exceeds ±5%, the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
4. The maximum capacitive load offered were tested at nominal input voltage and full load;
5. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
6. In this datasheet, all the test methods of indications are based on corporate standards.
7. Only typical models listed, other models may be different, please contact our technical person for more details.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	5%-100% load 0%-5% load		±1 ±2	±3 ±5	% %
Balance of output voltage	Dual output, balanced loa		±0.5	±1.5	%
Line regulation (at full load)	Input voltage from low to high • positive output • negative output		 ±0.2 ±0.5	 ±0.5 ±1	 % %
Load regulation	from 5% to 100% load • positive output • negative output		 ±0.5 ±0.5	 ±1 ±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	±5	%
Temperature coefficient	full load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		70	120	mVp-p
Over-voltage protection	Input voltage range	110		160	%Vo
Over-current protection	Input voltage range	110	140	190	%Io
Switching frequency	PWM mode		300		KHz

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

Model selection:
WCTV_xxyyN##
W= Watt; **C=** Case; **T=** Type; **V=**Voltage Variation (omitted ± 10%);
xx= Vin; **yy=**Vout; **N=** Numbers of Output; **##=** Isolation (kVDC)

Example:
6DAW4_2405D3
6= 6Watt; D= DIP; A= series; W4= wide input (4:1) 9-36Vin; 5Vout; D= Dual Output; 3= 3000VDC

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com
Specifications subject to change without notice.

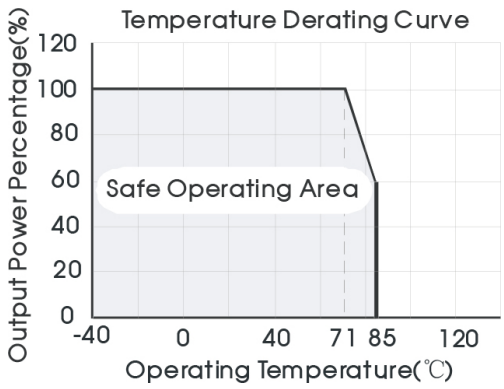
Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		1000		pF

EMC specifications					
EMI	CE	CISPR22/EN55022 CLASS A (without external components) CLASS B (External Circuit Refer to EMC recommended circuit,②)			
EMI	RE	CISPR22/EN55022 CLASS A (without external components) CLASS B (External Circuit Refer to 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	(External Circuit Refer to recommended circuit,①)
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B	(External Circuit Refer to 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	

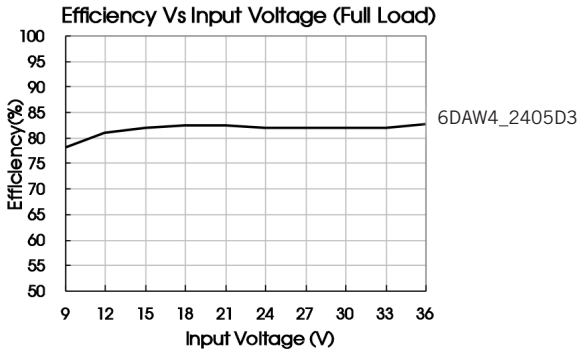
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Current [mA]		Efficiency [%, Typ.]	Max. Capacative Load [µF]
	Nominal	Range	Max*		Max	Min		
6DAW4_2405D3	24	9-36	40	±5	±600	0	81	680
6DAW4_2412D3	24	9-36	40	±12	±250	0	85	330
6DAW4_2415D3	24	9-36	40	±15	±200	0	86	220

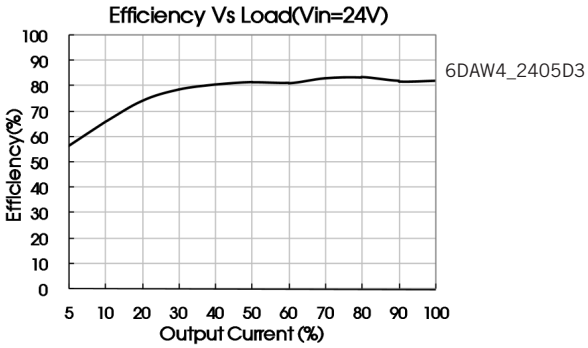
* Input voltage can't exceed this value, or it will cause permanent damage.

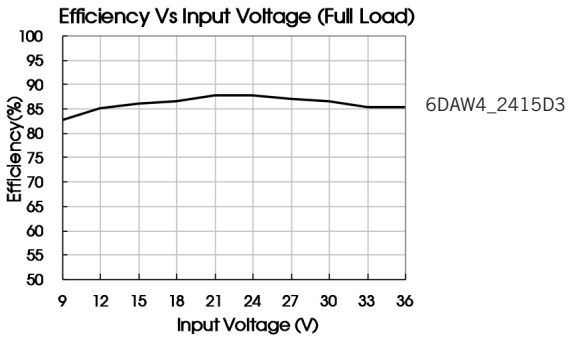
Typical characteristics

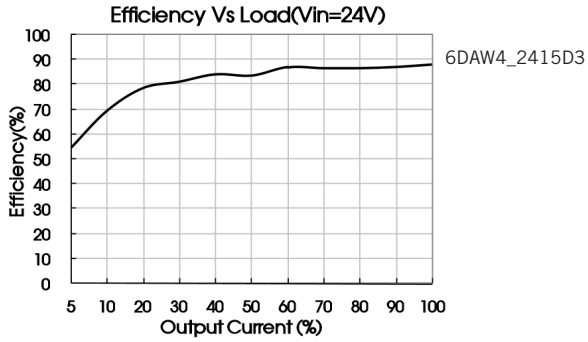


Efficiency









Typical application

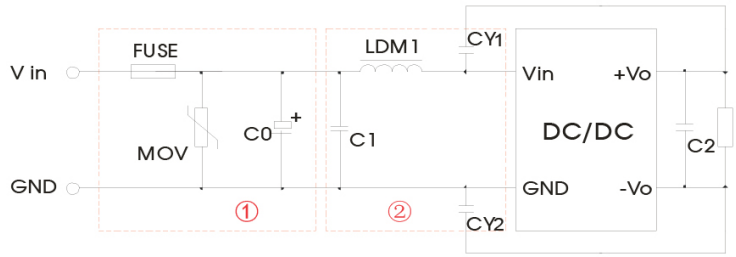
All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 1) before delivery.
If a further decrease of the input and output ripple is required, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance and ensure the capacitance should be lower than the max. capacitive load of the product.



Figure 1

Vin (VDC)	Cin (uF)	Cout (uF)
24	100	10

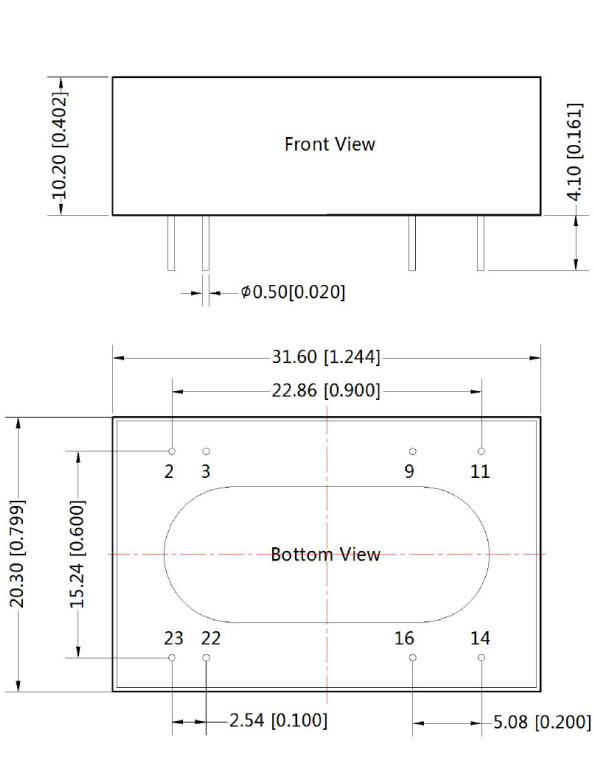
EMC solution-recommended circuit



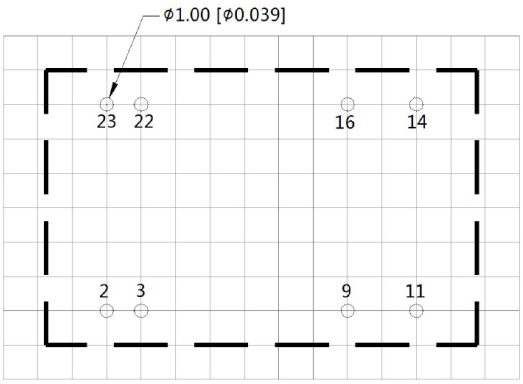
Notes: Part① is used for EMS test and part② for EMI filtering; selected based on needs.

It is not allowed to connect modules output in parallel to enlarge the power!

Mechanical dimensions



THIRD ANGLE PROJECTION



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
2,3	GND
9	0V
11	-Vo
14	+Vo
16	0V
22,23	Vin

Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10mm [±0.004inch]
General tolerances: ±0.25mm [±0.010inch]