GAPTEC®
GREEN TECHNOLOGY

10DAW4_3 Series

10W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 10 Watt

- High efficiency up to 87%
- 4:1 wide input voltage range
- Short circuit protection (SCP)
- Output over voltage protection
- Output over current protection
- Input under voltage protection
- 3kVDC isolation
- Operating temperature range: -40°C ~ +85°C
- Six-sided metal shield
- Industry standard pinout
- Meet CISPR22/EN55022 CLASS A
- IEC60950, UL60950, EN60950 approval

The 10DAW4_3 series offers 10W of output, with 4:1 ultra wide input voltage of 9-36VDC or 18-75VDC, and features 3000VDC isolation, over current, over voltage and short-circuit protection, as well as six sided metal shielding.

All models are widely suited for industrial control, electric power, instruments, communication fields etc.

UL-60950-1 (E347551)

Common specifications

Short circuit protection:	Hiccup, continuous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C (see typ. characteristics)
Storage temperature range:	-55°C~+125°C
Case temperature:	105°C MAX
Storage humidity range:	5% MIN, 95% MAX
Pin welding resistance temperature:	300°C MAX, 1.5mm from case for 10 sec
Switching frequency (PWM mode)*:	350kHz TYP
Case material:	Plastic (UL94-V0)
MTBF (MIL-HDBK-217F@25°C):	1000 K hours MIN
Weight:	24g

* This series of products using reduced frequency technology, the switching frequency is test value of full load. When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and leakage current less than 1 mA	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz/0.1V		500		pF

Note:

1. Recommend to use module with more than 5% load, if not, the ripple of the product may exceeds the specification, but does not The maximum capacitive load offered were tested at nominal input voltage 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's corporate standards;
4. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
5. We can provide product customization service;
6. Specifications are subject to change without prior notice.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±3	%
Line regulation	Full load, Input voltage from low to high • positive output • negative output		 ±0.2 ±0.5	 ±0.5 ±1	 % %
Load regulation	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	100% full load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth 5% to 100% load		60	120	mVp-p
Over voltage protection	Input voltage range	110	130	160	%Vo
Over current protection	Input voltage range	110	140	190	%Vo

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

Example:
10DAW4_2415S3
10 = 10Watt; D = DIP; A = series; W4 = wide input (4:1) 9-36Vin; 15Vout; S = single output; 3 = 3000VDC isolation

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Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load / no-load)	24VDC input • 3.3V output • Others 48VDC input • 3.3V output • Others				 mA mA mA mA
Reflected ripple current	• 24VDC input • 48VDC input		40 30		mA mA
Surge voltage (1sec. max.)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Start-up voltage	• 24VDC input • 48VDC input			9 18	VDC VDC
Under voltage protection	• 24VDC input • 48VDC input	5.5 12	6.5 15.5		VDC VDC
Start-up time	Nominal input & constant resistance load		10		ms
Input filter	Pi filter				
Hot plug	Unavailable				
Ctrl [1]	• Models ON • Models OFF • Input current (Models OFF)	Ctrl suspended or connected to TTL high level (3.5-12VDC) Ctrl pin connected to GND or low level (0-1.2VDC)	5	8	 mA

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 (External Circuit Refer to recommended circuit,①)	±2KV	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5 (External Circuit Refer to recommended circuit,①)	±2KV	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
EMS	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29	0%-70%	perf. Criteria B

1. The voltage of Ctrl pin is relative to input pin GND.

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max]	Efficiency [%, Typ.]	Capacitive load [µF, Max]
	Nominal	Range	Max[1]				
10DAW4_2403S3	24	9-36	40	3.3	2400	79	5400
10DAW4_2405S3	24	9-36	40	5	2000	82	5400
10DAW4_2409S3	24	9-36	40	9	1111	85	680
10DAW4_2412S3	24	9-36	40	12	833	86	470
10DAW4_2415S3	24	9-36	40	15	667	87	330
10DAW4_2424S3	24	9-36	40	24	416	87	100
10DAW4_4803S3	48	18-75	80	3.3	2400	79	5400
10DAW4_4805S3	48	18-75	80	5	2000	82	5400
10DAW4_4812S3	48	18-75	80	12	833	86	470
10DAW4_4815S3	48	18-75	80	15	667	87	330
10DAW4_4824S3	48	18-75	80	24	416	87	100
10DAW4_2405D3	24	9-36	40	±5	±1000	82	1000
10DAW4_2412D3	24	9-36	40	±12	±416	86	330
10DAW4_2415D3	24	9-36	40	±15	±333	87	220
10DAW4_4805D3	48	18-75	80	±5	±1000	82	1000
10DAW4_4812D3	48	18-75	80	±12	±416	86	330
10DAW4_4815D3	48	18-75	80	±15	±333	87	220

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

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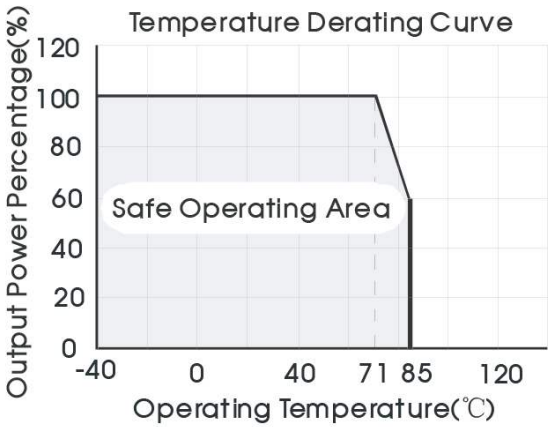
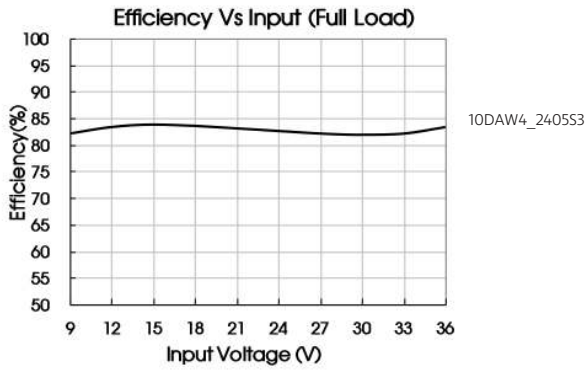
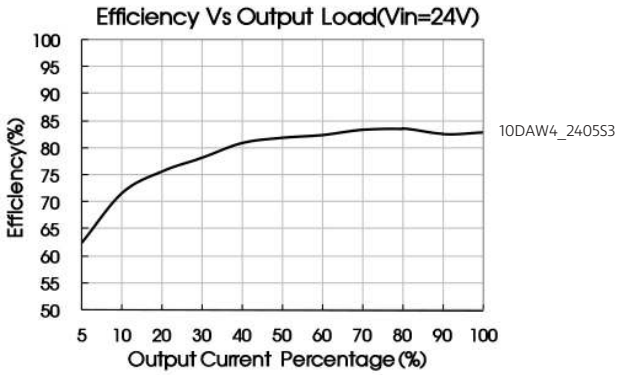
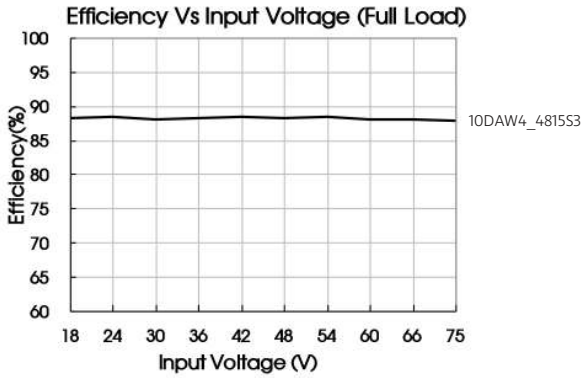
Typical characteristics

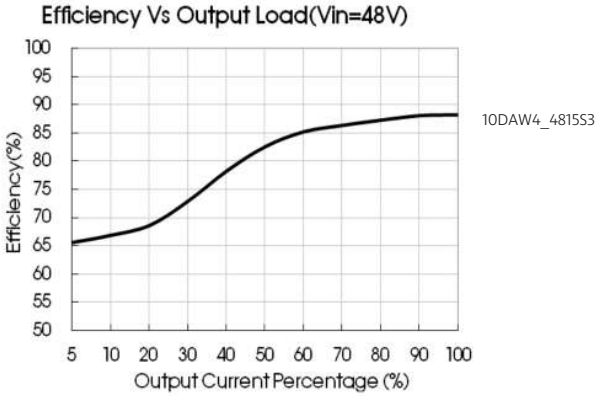


Efficiency curves









Typical application

All the DC/DC converters of this series are tested according to the recommended circuit before delivery.
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

Cin (µF)	Cout (µF)
10 - 47	10

EMC solution-recommended circuit

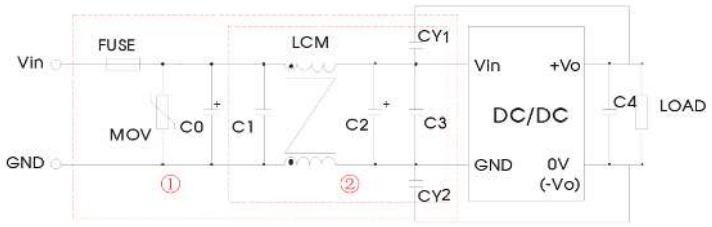


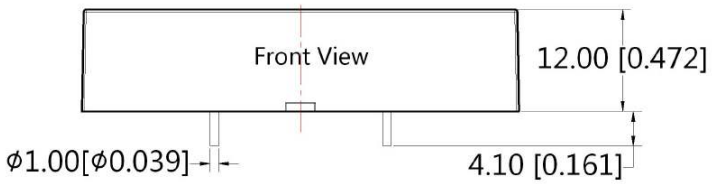
Figure 1

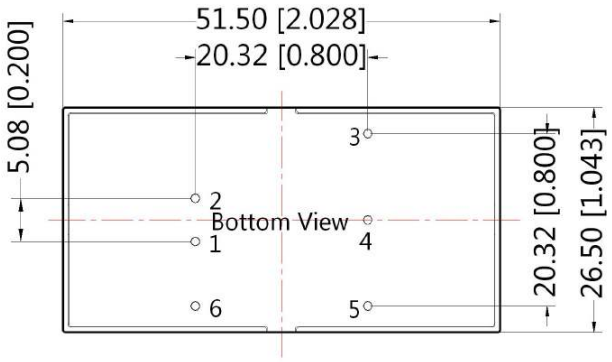
Note:
In Figure 1, part 1 is used for EMS test, part 2 for EMI filtering.
Choose according to requirements.

Model	10DAW4_S3		10DAW4_D3	
	Vin: 24V	Vin: 48V	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current			
MOV	S20K30	S14K60	S20K30	S14K60
C0	680µF/50V	680µF/100V	680µF/50V	680µF/100V
C1	1µF/50V	1µF/100V	1µF/50V	1µF/100V
C2	330µF/50V	330µF/100V	330µF/50V	330µF/100V
C3	4.7µF/50V	4.7µF/100V	4.7µF/50V	4.7µF/100V
LCM	4.7mH		6.8mH	
C4	Refer to the Cout in Typical application			
CY1, CY2	1nF/3KV		1nF/3KV	

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

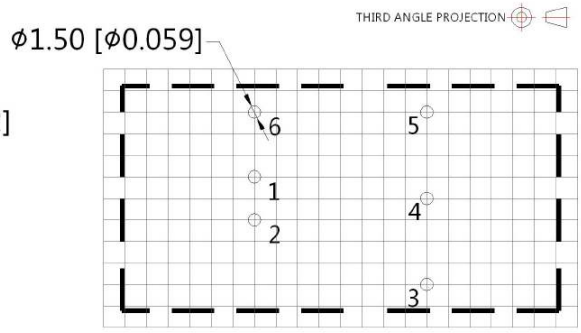
Mechanical dimensions





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

Recommended layout



Note : Grid 2.54*2.54mm

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