



3DAW_3 Series

3W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 3 Watt

- ⊕ Wide 2:1 Input voltage range
- ⊕ High efficiency up to 86%
- ⊕ Isolation voltage 3kVDC
- ⊕ Short circuit protection (SCP)
- ⊕ Operating Temperature Range: -40°C to +85°C
- ⊕ EN60950 approval

The 3DAW_3 series are isolated 3W DC-DC products with 2:1 input voltage and conventional voltage output. The product has a relatively compact DIP package and features high efficiency, operating temperature of -40°C ~+85°C, remote control and continuous short-circuit protection.

The smaller size and fine cost design make the converter an ideal solution in communication, instruments, and industrial electronics applications.



Common specifications

Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	25°C TYP
Cooling:	Free air convection
Operating temperature:	-40°C~+85°C (derating if the temperature is ≥85°C (see typical characteristics)
Operation case temperature:	+110°C MAX
Storage temperature range:	-55°C to +125°C
Storage humidity range:	< 95%
Lead temperature range:	300°C MAX, 1.5mm from case for 10 sec
No-load power consumption:	50mW TYP / 150mW MAX
Temperature coefficient:	-40°C to +85°C ambient 0.015 %/°C MAX
Operating Frequency:	100kHz MIN
Case material:	Non-conductive black plastic [UL94-V0]
Switching frequency (PFM mode):	100% load, nominal input voltage: 200KHz TYP
MTBF (MIL-HDBK 217F):	+25°C: 1,000,000 hours MIN
Weight:	14g

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load / no load)	• 5VDC input		752/40	863/45	mA
	• 12VDC input		314/30	348/35	mA
	• 24VDC input		152/15	165/20	mA
	• 48VDC input		77/5	85/10	mA
Reflected ripple current	• 5VDC input		20		mA
	• 12VDC input		30		mA
	• 24VDC input		30		mA
	• 48VDC input		30		mA
Input impulse Voltage (1sec. max.)	• 5VDC input	-0.7		12	VDC
	• 12VDC input	-0.7		25	VDC
	• 24VDC input	-0.7		50	VDC
	• 48VDC input	-0.7		100	VDC
Starting Voltage	• 5VDC input			4.5	VDC
	• 12VDC input			9	VDC
	• 24VDC input			18	VDC
	• 48VDC input			36	VDC
Input filter	Pi filter				
Hot plug	Unavailable				

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output accuracy	5%-100% load		±1	±3	%
Output accuracy	No load		±1.5	±5	%
Balance of output voltage	Dual output, balanced load		±0.5	±1	%
Line regulation	Full load, input voltage from low to high		±0.2	±0.5	%
Load regulation	20% to 100% full load		±0.2	±0.5	%
Transient Recovery Time	25% load step change		±2	±5	%
Temperature coefficient	full load		±0.02	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth • 24VDC output • others		100	150	mVp-p
			50	80	mVp-p

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 min, leak current <1mA	3000			VDC
Isolation resistance	500VDC, input to output	1000			MΩ
Isolation capacitance	100KHz/0.1V		30	50	pF

Example:

3DAW_2405D3

3 = 3Watt; D = DIP; A = series; W = wide input (2:1) 18-36Vin;
24 = Vin; 05 = 5Vout; D = Dual Output; 3 = 3000VDC isolation

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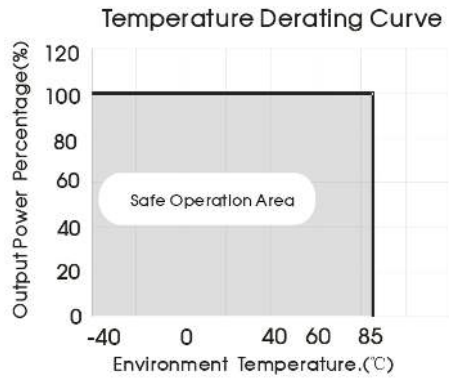
EMC specifications				
EMI	CE	CISPR22/EN55022	CLASS B	(External circuit refer to EMC recommended circuit ⁽²⁾)
EMI	RE	CISPR22/EN55022	CLASS B	(External circuit refer to EMC recommended circuit ⁽²⁾)
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (External circuit refer to EMC recommended circuit ⁽¹⁾)
EMS	Surge immunity	IEC/EN61000-4-5	±2KV	perf. Criteria B (External circuit refer to EMC 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 [V]	Output Voltage [VDC]	Output Current [mA, max]	Efficiency [%, typ]	Max. Capacitive Load [µF]
3DAW_0505S3	5	5	600	74	4700
3DAW_0512S3	5	12	250	77	2700
3DAW_0515S3	5	15	200	77	2200
3DAW_1203S3	12	3.3	909	74	4700
3DAW_1205S3	12	5	600	81	4700
3DAW_1212S3	12	12	250	83	2700
3DAW_1215S3	12	15	200	82	2200
3DAW_1224S3	12	24	125	83	1800
3DAW_2403S3	24	3.3	909	78	4700
3DAW_2405S3	24	5	600	81	4700
3DAW_2412S3	24	12	250	86	2700
3DAW_2415S3	24	15	200	86	2200
3DAW_2424S3	24	24	125	85	1800
3DAW_4803S3	48	3.3	909	76	4700
3DAW_4805S3	48	5	600	82	2200
3DAW_4812S3	48	12	250	86	1800
3DAW_4815S3	48	15	200	86	1000
3DAW_0505D3	5	±5	±300	76	2200
3DAW_0512D3	5	±12	±125	78	1800
3DAW_0515D3	5	±15	±100	78	1000
3DAW_1205D3	12	±5	±300	81	2200
3DAW_1209D3	12	±9	±166	84	2000
3DAW_1212D3	12	±12	±125	84	1800
3DAW_1215D3	12	±15	±100	85	1000
3DAW_2405D3	24	±5	±300	82	2200
3DAW_2412D3	24	±12	±125	84	1800
3DAW_2415D3	24	±15	±100	84	1000
3DAW_4803D3	48	±3.3	±454	76	4700
3DAW_4805D3	48	±5	±300	82	2200
3DAW_4812D3	48	±12	±125	84	1800
3DAW_4815D3	48	±15	±100	85	1000

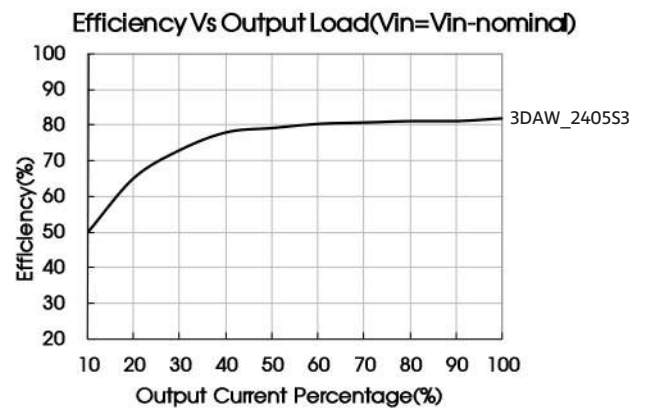
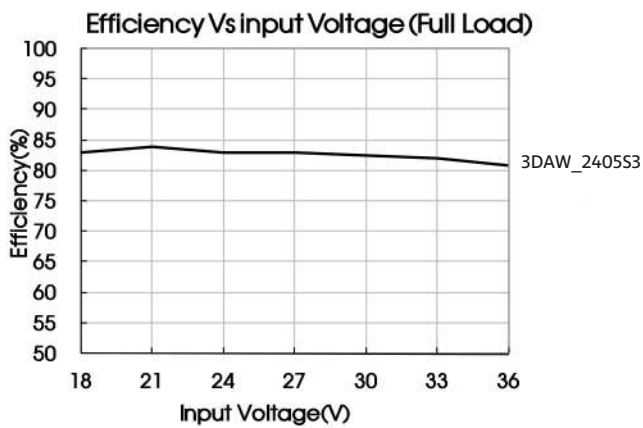
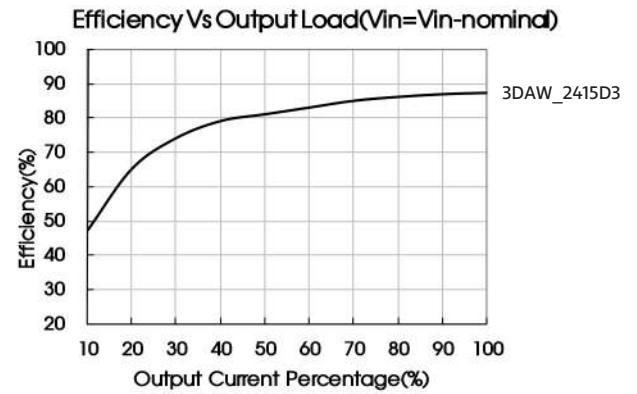
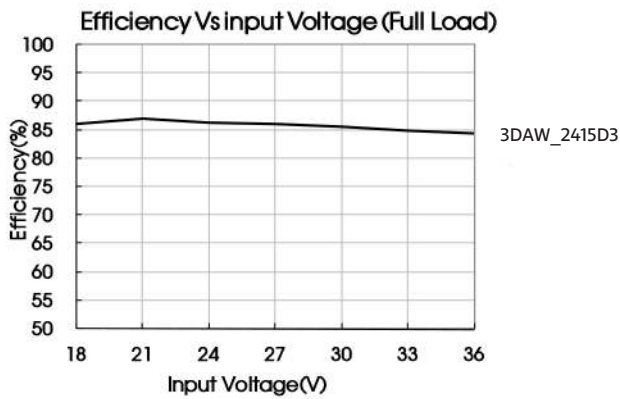
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Typical characteristics



Efficiency



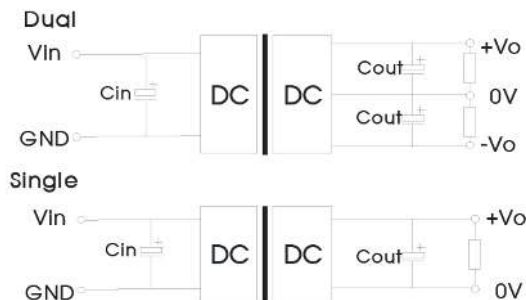
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Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 1) before delivery.

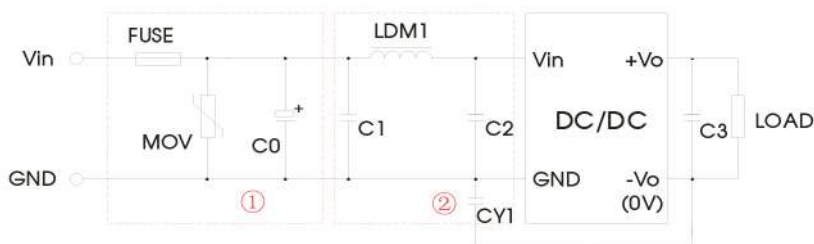
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors C_{in} and C_{out} or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



Vin	5V/12V	24V/48V
Cin	100 μ F	10 μ F~47 μ F
Vout	10 μ F	

Figure 1

EMC solution-recommended circuit



Note:

Part 1 is used for EMS test and part 2 for EMI filtering; selected based on needs.
If there are no recommended parameters, the model does not require the external component.

Parameter description:

Model	Vin: 5V	Vin: 12V	Vin: 24V	Vin: 48V
FUSE	Slow blown fuses according to the actual input current selections of the clients			
MOV	--	S14K20	S20K30	S14K60
C0	1000 μ F/16V	1000 μ F/25V	330 μ F/50V	330 μ F/100V
C1	4.7 μ F/50V			4.7 μ F/100V
LDM1	12 μ H			
C2	4.7 μ F/50V			4.7 μ F/100V
C3	10 μ F			
CY1	1nF/3KV			

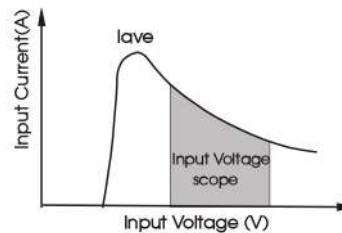
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Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module.

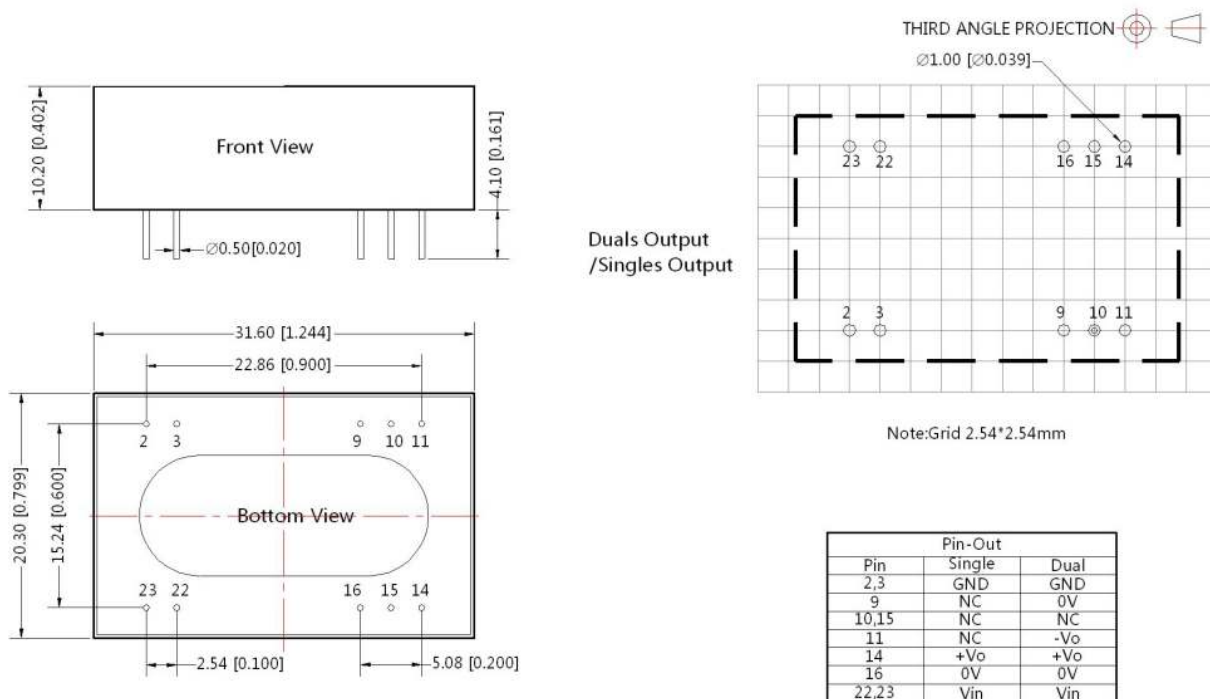
Generally: $V_{in}=5V$ $I_{ave}=1297mA$
 $V_{in}=12V$ $I_{ave}=649mA$
 $V_{in}=24V$ $I_{ave}=307mA$
 $V_{in}=48V$ $I_{ave}=158mA$



Output load requirements

To ensure that the module can work efficiently and reliably, its output min. load shall be no lower than 5% of the rated load when using, or the output ripple may increase rapidly. Ensure that the product working load must be higher than 5% of the rated load.

Mechanical dimensions/foot-



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

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 affect the reliability of the product;
2. The recommended unbalance degree of the dual output module load is $\leq \pm 5\%$; if the degree exceeds $\pm 5\%$, than the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact our technicians directly for specific information;
3. The maximum capacitive load offered were tested at nominal input voltage and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ C$, humidity<75%RH with nominal input voltage and rated output load;
6. All index testing methods in this datasheet are based on Company's corporate standards;
7. 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;
8. We can provide product customization service;
9. Specifications are subject to change without prior notice.