



15DAW_1.5R series

15W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter

15 Watt

- ⊕ 2" x 1" package
- ⊕ 2:1 input voltage range
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ 1500VDC isolation
- ⊕ Up 90% efficiency
- ⊕ Short-circuit protection (SCP)
- ⊕ Overcurrent protection
- ⊕ Overvoltage protection

Introducing our new 2"x 1" DC-DC converter 15DAW_1.5R series – compact power, maximum reliability. Engineered for performance and reliability, our latest DC-DC converter delivers powerful functionality. With a 2:1 input voltage range, it adapts seamlessly to diverse application requirements, while 1500VDC isolation ensures safe and stable operation. Designed for demanding environments, it performs consistently across a wide operating temperature range from -40°C to +85°C, achieving efficiencies of up to 90%. For maximum system protection, the converter is equipped with integrated short-circuit (SCP), overcurrent, and overvoltage protection, safeguarding both your equipment and your investment. Application areas: Industry, Power, Instrumentation, Communication, Rail transit.



Common specifications	
Short circuit protection	Continuous, Self-Recovery
Switching frequency	300 kHz (typ.) PWM
Operation temperature	-40°C ~+85°C (with derating)
Storage temperature	-55°C ~+125°C
Soldering profile	+300°C (1.5mm from case for 10 sec)
Storage humidity	5~95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Input filter	PI filter
Hot plug	Unavailable
Case material	Aluminum alloy, black anodized coating
Package dimensions	50.80 x 25.40 x 11.80mm
Weight	28g (typ.)
Cooling method	Free air convection

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	5% - 100% load		±1.0	±3.0	%
Linear regulation	Vin = min. to max. @full load		±0.2	±0.5	%
Load regulation	5% - 100% load		±0.5	±1.0	%
Ripple & noise	20MHz bandwidth, 5%-100% load		50	100	mVp-p
Transient recovery time	25% Load Step Change, nominal input voltage		300	500	µs
Transient response deviation	25% Load Step Change, nominal input voltage • 3.3V, 5V output • Other output		±3.0 ±3.0	±7.0 ±5.0	%
Temperature coefficient	Full Load			±0.02	%/°C
Trim	input voltage range		±10		%Vo

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input Current (full load/no-load)	24VDC nominal input		639/30	655/50	mA
	• 3.3VDC Output		710/30	727/50	
	• 5VDC Output		702/10	718/20	
	• Other Output				
	48VDC nominal input		319/15	327/30	mA
	• 3.3VDC Output		355/15	363/30	
	• 5VDC Output		351/4	359/11	
	• Other Output				
Reflected ripple Current	Nominal input series		30		mA
Impulse voltage	24VDC nominal input	-0.7		50	VDC
	48VDC nominal input	-0.7		100	
Starting voltage	24VDC nominal input			9	VDC
	48VDC nominal input			18	
Input undervoltage protection	24VDC nominal input	5.5	6.5		VDC
	48VDC nominal input	12.0	15.5		
Start time	Nominal input and constant resistance load		10		ms
Ctrl	Turn off module	connected GND or (0 - 1.2V)			mA
	Turn on module	No connected or (3.5 - 12V)			
	Input current when off		5	8	

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, insulated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		2050		pF

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- The maximum capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this datasheet are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
- All indicator testing methods in this datasheet are based on our company's corporate standards;
- Product specifications are subject to change without prior notice.

Example:

15DAW_2405S1.5R

15 = 15Watt; D = DIP; A = Series; W = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation; R = Revised version

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EMC specifications							
EMI	CE	CISPR32/EN55032 CLASS A (without external components)/CLASS B (see Fig. 3-① for recommended circuit)					
EMI	RE	CISPR32/EN55032 CLASS A (without external components)/CLASS B (see Fig. 3-① for recommended circuit)					
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 Fig. 3-① for recommended circuit)	perf.	Criteria	B	
EMS	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig. 3-① for recommended circuit)	perf.	Criteria	B	
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf.	Criteria	A	

Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Efficiency (%) full load, (typ.)	Max. Capacitive Load (uF) max.
	15DAW_2403S1.5R	24 (18-36)	40	3.3	4000	86	4700
	15DAW_2405S1.5R	24 (18-36)	40	5	3000	88	4700
	15DAW_2409S1.5R	24 (18-36)	40	9	1667	89	2200
	15DAW_2412S1.5R	24 (18-36)	40	12	1250	89	1000
	15DAW_2415S1.5R	24 (18-36)	40	15	1000	90	820
	15DAW_2424S1.5R	24 (18-36)	40	24	625	90	270
	15DAW_4803S1.5R	48 (36-75)	80	3.3	4000	86	4700
	15DAW_4805S1.5R	48 (36-75)	80	5	3000	86	4700
	15DAW_4809S1.5R	48 (36-75)	80	9	1667	89	2200
	15DAW_4812S1.5R	48 (36-75)	80	12	1250	87	1000
	15DAW_4815S1.5R	48 (36-75)	80	15	1000	90	820
	15DAW_4824S1.5R	48 (36-75)	80	24	625	88	270

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Efficiency (%) full load, (typ.)	Max. Capacitive Load (uF) max.
	15DAW_2405D1.5R	24 (18-36)	40	±5	±1500	86	2200
	15DAW_2409D1.5R	24 (18-36)	40	±9	±834	88	1000
	15DAW_2412D1.5R	24 (18-36)	40	±12	±625	88	470
	15DAW_2415D1.5R	24 (18-36)	40	±15	±500	88	330
	15DAW_4805D1.5R	48 (36-75)	80	±5	±1500	86	2200
	15DAW_4812D1.5R	48 (36-75)	80	±12	±625	88	470
	15DAW_4815D1.5R	48 (36-75)	80	±15	±500	89	330

- Note:
1. Please use suffix /CM for chassis mounting option; Please use suffix /DR for DIN rail option (i.e. 15DAW_4815D1.5R/DR)
 2. The input end of the extended package is equipped with anti-reverse protection function, and its full load efficiency will be reduced by 2%;
 3. The maximum Capacities load „#“ means that the positive and negative outputs are connected to the same capacitance.

Typical characteristics

Temperature derating graph

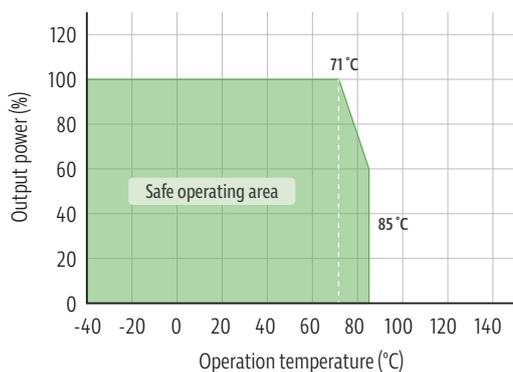


Figure1

15DAW_1.5R series

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Typical circuit design and application

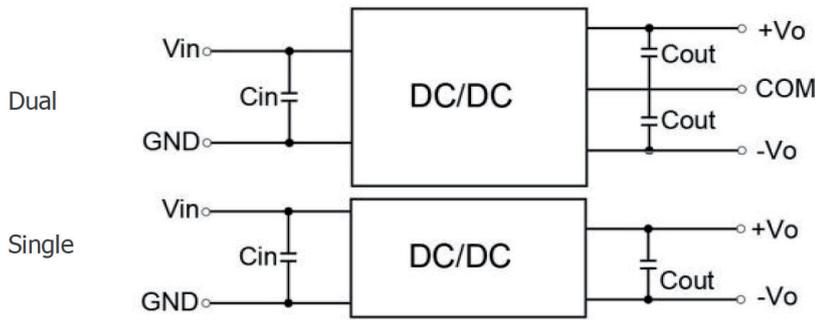


Figure2

Recommended component parameters

Vout (VDC)	Cout (μF)	Cin (μF)
3.3/5/12/15	100	100
24	47	100

EMI recommended component parameters

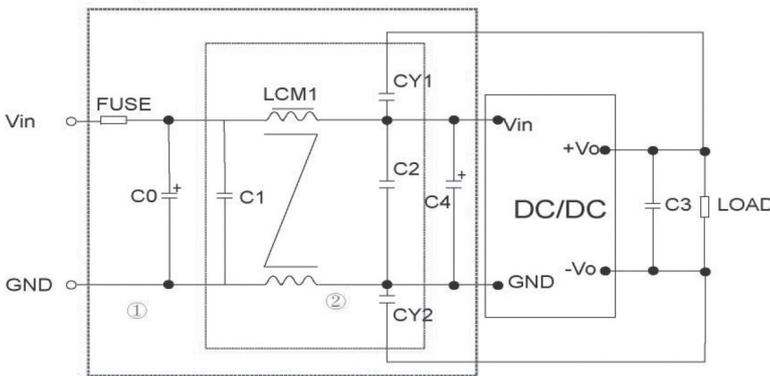


Fig 3

EMI recommended component parameters

Vin (VDC)	24VDC	48VDC
FUSE	Choose according to actual input current	
C0, C4	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Fig.2	
LCM1	1mH	
CY1, CY2	1nF/2KV	

Note: Part ① of Figure 3 is used for EMS testing; Part 2 is used for EMI filtering and can be selected according to requirements.

Trim

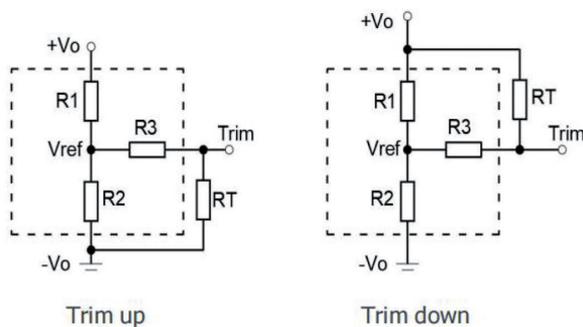


Fig 4

Trim resistor connections
(dashed line shows internal resistor network)

Trim Recommended component parameters

Vout	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
3.3	10	6.06	13.62	1.24
5	2.4	2.34	13.62	2.5
9	12	4.6	17.4	2.5
12	8.2	2.15	17.4	2.5
15	12	2.39	21.02	2.5
24	10	1.16	10.71	2.5

$$\text{Up: } R_t = \frac{nR_2}{R_2 - n} - R_3 \quad n = \frac{V_{ref}}{V_o - V_{ref}} * R_1$$

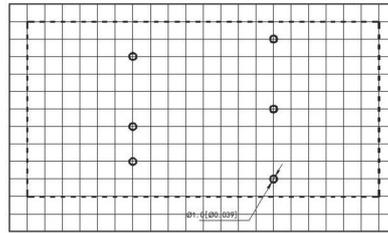
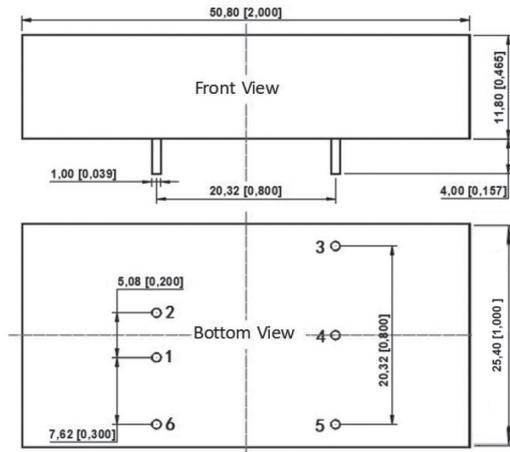
$$\text{Down: } R_t = \frac{nR_1}{R_1 - n} - R_3 \quad n = \frac{V_o - V_{ref}}{V_{ref}} * R_2$$

Note: All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 3. 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. The product does not support the use of parallel output to increase power.

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Mechanical dimensions

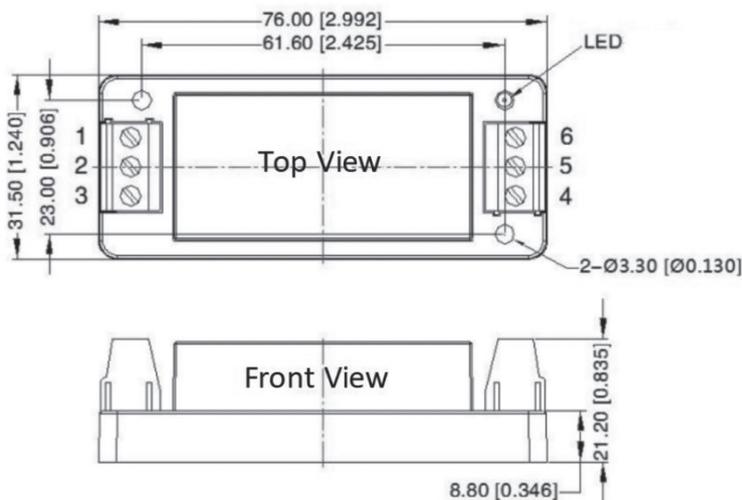


Note: The grid distance is 2.54 x 2.54mm

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	Com
5	-Vo	-Vo
6	CTRL	CTRL

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

Chassis mounting dimensions



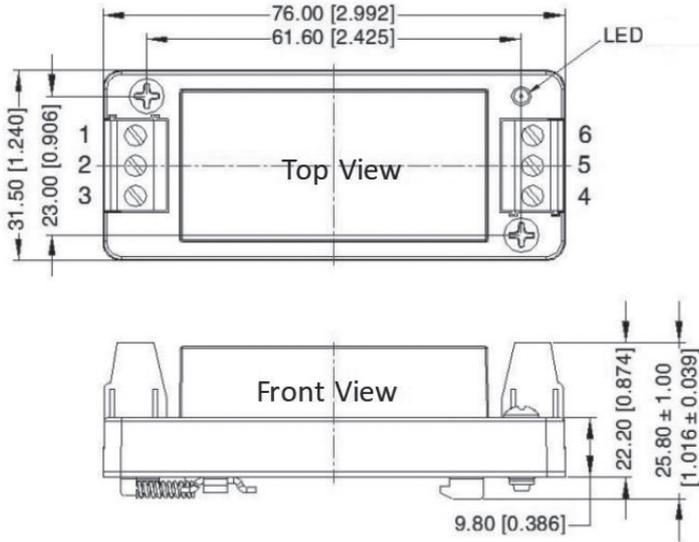
Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	Trim	COM
6	-Vo	-Vo

Note:
 Unit:mm [inch]
 Wire range:2 4-12 AWG
 Tightening torque: Max 0.4 N·m
 General tolerances: ± 1.00 [± 0.039]

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DIN rail dimensions



Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	Trim	COM
6	-Vo	-Vo

Note:
 Unit: mm [inch]
 Mounting rail: TS35
 Wire range: 24-12 AWG
 Tightening torque: Max 0.4 N·m
 General tolerances: ± 1.00 [±0.039]