



## 80DAW4\_1.6 series

80W - Single Output DC-DC Converter - Wide Input - Isolated & Regulated

### DC-DC Converter 80 Watt

- ⊕ 2" x 1" package
- ⊕ 4:1 input voltage range
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ 1600VDC isolation
- ⊕ Up to 93% efficiency
- ⊕ Undervoltage protection,
- ⊕ Short circuit protection (SCP)
- ⊕ Over current protection
- ⊕ Over voltage protection

Introducing our new 80DAW4\_1.6 series – a high-performance power solution in a compact 2" x 1" package. With a wide 4:1 input voltage range, robust 1600VDC isolation, and efficiency of up to 93%, this series delivers reliable performance even under demanding conditions. Designed to operate from -40°C to +105°C, it ensures stability across extreme environments. Built-in protections include undervoltage, short circuit (SCP), overcurrent, and overvoltage safeguards, providing peace of mind in critical applications. Engineered for industrial, power, instrumentation, communication, rail transit, and more – the 80DAW4\_1.6 series is the dependable choice for modern systems.



Common specifications	
Short circuit protection	Input voltage range, continuous, self recovery
Switching frequency	300 kHz (PWM)
Operation temperature	-40°C ~+105°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 12.00mm
Weight	41g (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, nominal input voltage, 5% -100% load		100	200	mVp-p	
Transient recovery time	25% Load step change, nominal input voltage		250	500	µs	
Transient response deviation	25% Load step change nominal input voltage • 5VDC output • Other output		±3 ±3	±10 ±5	%	
Overvoltage protection	input voltage range	110		180	%	
Over current protection	input voltage range	110	140		%	

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Input current (full load/no load)	24VDC nominal input series		3623/25	3703/50	mA	
	48VDC nominal input series		1832/25	1873/30		
Reflected ripple current	Rated input voltage			60	mA	
Impulse voltage	24VDC nominal input series	-0.7		50	VDC	
	48VDC nominal input series	-0.7		100		
Starting voltage	24VDC nominal input series			9	VDC	
	48VDC nominal input series			18		
Input undervoltage protection	24VDC nominal input series	5.5	6.5		VDC	
	48VDC nominal input series	12.0	15.5			
Start time	Nominal input and constant resistance load		10	150	ms	
Remote shutdown function	turn off module	connected GND or (0-1.2V)				
	turn on module	No connected or (3.5-12V)				

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1600			VDC	
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ	
Isolation capacitance	Input-output, 100kHz/0.1V		2000		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;
- 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 standards;
- Product specifications are subject to change without prior notice.

#### Example:

**80DAW4\_2405S1.6**  
 80 = 80Watt; D = DIP; A = Series; W4 = Wide input; 24 = 24Vin; 05 = 5Vout;  
 S = Single Output; 1.6 = 1.600VDC isolation

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EMC specifications						
EMC	EMI	CE	CISPR32/EN55032	CLASS A/CLASS B		
EMC	EMI	RE	CISPR32/EN55032	CLASS A/CLASS B		
EMC	EMS	ESD	EN61000-4-2 Air $\pm$ 8kV , Contact $\pm$ 6kV		perf.	Criteria B
EMC	EMS	RS	EN61000-4-3 10V/m		perf.	Criteria A
EMC	EMS	EFT	EN61000-4-4 $\pm$ 2kV		perf.	Criteria A
EMC	EMS	Surge	EN61000-4-5 $\pm$ 2kV		perf.	Criteria A
EMC	EMS	CS	EN61000-4-6 10Vrms		perf.	Criteria A

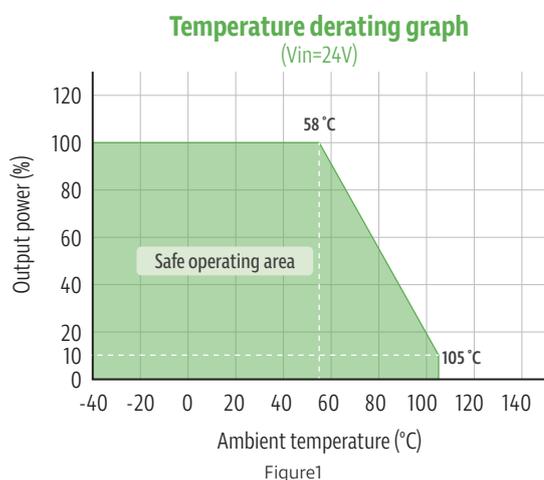
## Product Selection Guide

Approval	Part number	Input Voltage Nominal (Range) (VDC)	Input Voltage max. (VDC)	Output Voltage (VDC)	Output Current max. (mA)	Full Load Efficiency% (typ.)	Capacitive Load max. ( $\mu$ F)
	80DAW4_2405S1.6	24 (9-36)	40	5	16000	91	20000
	80DAW4_2412S1.6	24 (9-36)	40	12	6667	92	5000
	80DAW4_2415S1.6	24 (9-36)	40	15	5333	93	3500
	80DAW4_2424S1.6	24 (9-36)	40	24	3333	93	2000
	80DAW4_4805S1.6	48 (18-75)	80	5	16000	92	20000
	80DAW4_4812S1.6	48 (18-75)	80	12	6667	93	5000
	80DAW4_4815S1.6	48 (18-75)	80	15	5333	93	3500
	80DAW4_4824S1.6	48 (18-75)	80	24	3333	93	2000

Note:

1. Please use suffix /CM for chassis mounting option; Please use suffix /DR for DIN rail mounting option (i.e. 80DAW4\_4824S1.6/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



## Typical circuit design and application

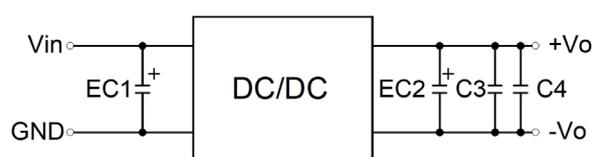


Figure2

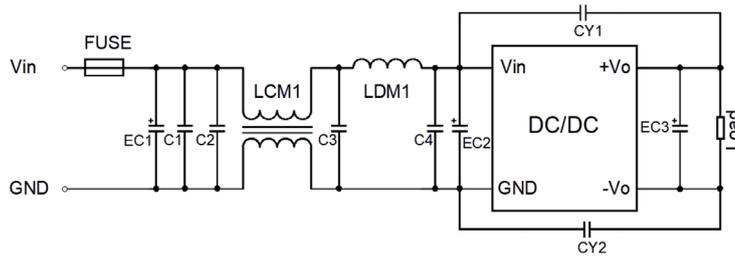
Recommended capacitive load value table

Vout (VDC)	EC1 ( $\mu$ F)	EC2 ( $\mu$ F)	C3 ( $\mu$ F)	C4 ( $\mu$ F)
5	680 $\mu$ F	330 $\mu$ F/35V	10 $\mu$ F/16V	0.1 $\mu$ F/16V
12/15	680 $\mu$ F	150 $\mu$ F/35V	10 $\mu$ F/25V	0.1 $\mu$ F/25V
24/28	680 $\mu$ F	100 $\mu$ F/50V	10 $\mu$ F/50V	0.1 $\mu$ F/50V

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### EMI recommended component parameters

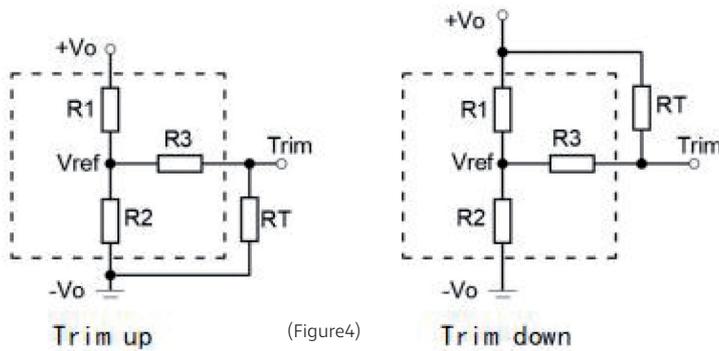


(Figure3)

EMI recommended component parameters

Device	Parameter specifications
FUSE	Choose according to actual input current
EC1	1000µF/100V
EC2	470µF/100V
EC3	330µF/50V
C1, C2	4.7µF/100V
C3, C4	20µF/100V
LCM1	10mH MIN
LDM1	2.2uH
CY1/CY2	2.2nF/3000VDC

### Trim application circuit



(Figure4)

Trim resistor connections  
(dashed line shows internal resistor network)

Trim recommended component parameters

Vout (V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
5	2.4	2.344	13.622	2.5
6	10	6.982	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

$$\text{Up: } R_t = \frac{nR_2}{R_2 - n} - R_3$$

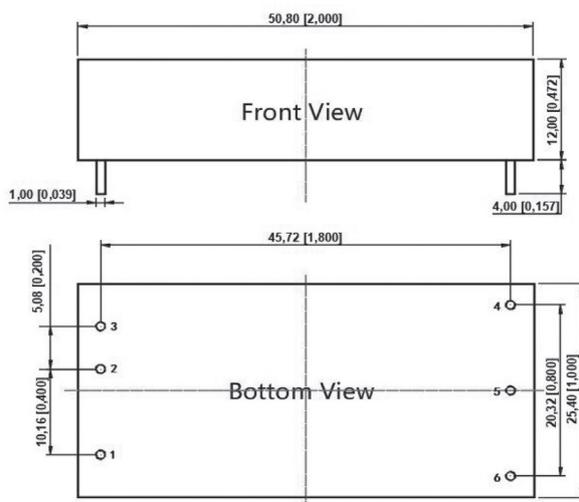
$$n = \frac{V_{ref}}{V_o - V_{ref}} * R_1$$

$$\text{Down: } R_t = \frac{nR_1}{R_1 - n} - R_3$$

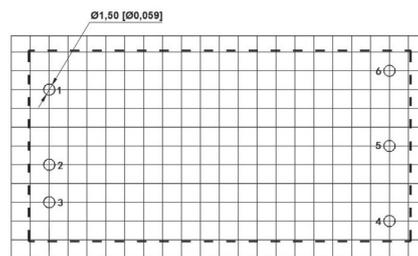
$$n = \frac{V_o - V_{ref}}{V_{ref}} * R_2$$

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  $C_{in}$  and  $C_{out}$  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 output parallel power boosting.

### Mechanical dimensions



Note:  
Unit: mm [inch]  
Pin section tolerances:  $\pm 0.10$  [ $\pm 0.004$ ]  
General tolerances:  $\pm 0.50$  [ $\pm 0.020$ ]



The grid distance is 2.54 x 2.54mm

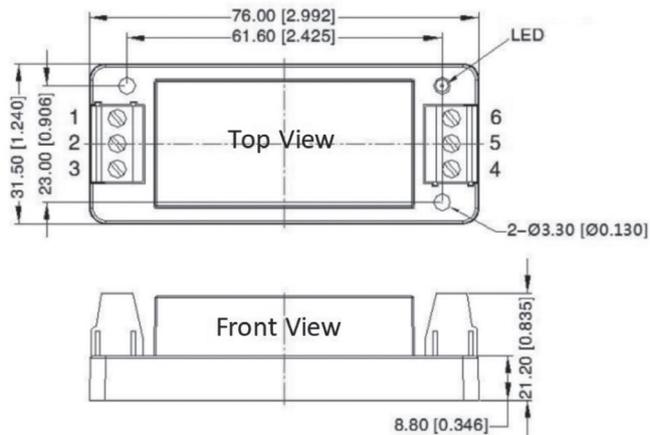
Pin definition table

Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	-Vo
6	Trim

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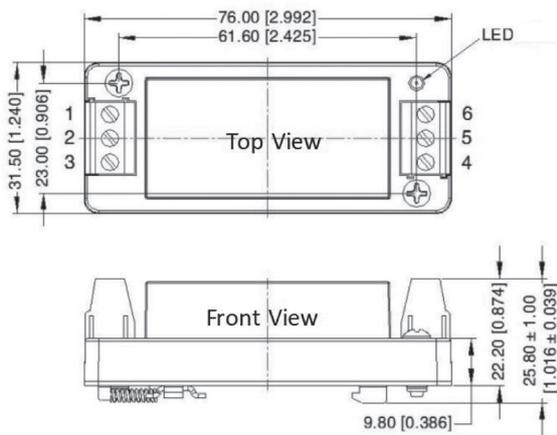
### Chassis mounting mechanical dimensions



Pin definition table	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	-Vo
6	Trim

Note:  
 Unit: mm [inch]  
 Wire range: 24-12 AWG  
 Tightening torque: Max 0.4 N·m  
 General tolerances:  $\pm 1.00$  [ $\pm 0.039$ ]

### DIN rail mechanical dimensions



Pin definition table	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	-Vo
6	Trim

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