



40DAWE4_1.5R series

40W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 40 Watt

- ⊕ 2" x 1" package
- ⊕ 4:1 input voltage range:
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ 1500VDC isolation
- ⊕ Up to 90% efficiency
- ⊕ Short circuit protection (SCP)
- ⊕ Over current protection
- ⊕ Over voltage protection

Introducing our new high-performance DC-DC converter 40DAWE4_1.5R series in compact 2"x1" package. Designed for demanding applications, this converter features a wide 4:1 input voltage range and operates reliably from -40°C up to +105°C. With reinforced 1500VDC isolation and up to 90% efficiency, it ensures safe and efficient power conversion. Integrated protection functions include short circuit protection (SCP), overcurrent protection, and overvoltage protection – delivering robust performance in critical environments.



Common specifications	
Short circuit protection	Input voltage range, continuous, self recovery
Over-current protection	110 (min.) 140 (typ.) % input voltage range
Switching frequency	300 kHz (typ.) PWM
Operation temperature	-40°C ~+105°C (with derating)
Storage temperature	-50°C ~+125°C
Soldering profile	+300°C (1.5mm from case for 10 sec)
Storage humidity	95% RH
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Case material	Aluminum alloy, black anodized coating
Package dimensions	50.80 x 25.40 x 11.80mm
Weight	30.00g (ttyp.)
Cooling method	Free air convection

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (full load/ no-load)	24VDC nominal input		1938/60	1984/100	mA
	• 5VDC Output • Other Output		1893/12	1938/25	
Reflected ripple current	Rated input voltage			40	mA
	48VDC nominal input			968/25	
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	15.5		
Start time	Nominal input and constant resistance load		10	150	ms
Ctrl	turn off module	connected GND or (0-1.2V)			mA
	turn on module	No connected or (3.5-12V)			
Input Filter	Input current when off		5	8	mA
	PI filter				

Example:

40DAWE4_2405S1.5R

40 = 40Watt; D = DIP; A = Series; WE4 = 4:1 input range; 24 = 24Vin;
05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation; R = Revised series

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		100	200	mVp-p
	20MHz bandwidth 0%-5% load			5	
	5VDC output			3	
	Other output				
Cross regulation rate	Dual output, main circuit 50% loaded, auxiliary circuit 10%-100% loaded			±5	%
Transient recovery time	25% load step change, nominal input voltage		250	500	µs
Transient response deviation	25% Load step change, nominal input voltage		±5	±8	%
Temperature coefficient	Full load		±0.01	±0.02	%/°C
Trim	Input voltage range		±10.0	--	%

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, 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;
- 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 manual are measured at $T_a = 25^\circ\text{C}$, humidity $< 75\% \text{ RH}$, nominal input voltage, and output rated load;
- All indicator testing methods in this datasheet are based on our corporate standards;
- Product specifications are subject to change without prior notice.

40DAWE4_1.5R series

40W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

EMC specifications							
EMC	EMI	CE	CISPR32/EN55032 CLASS B (EMC Recommended Circuit 4-2)				
EMC	EMI	RE	CISPR32/EN55032 CLASS B (EMC Recommended Circuit 4-2)				
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	B
EMC	EMS	Surge	EN61000-4-5	$\pm 1kV$	perf.	Criteria	B
EMC	EMS	CS	EN61000-4-6	10Vrms	perf.	Criteria	A

Product Selection Guide

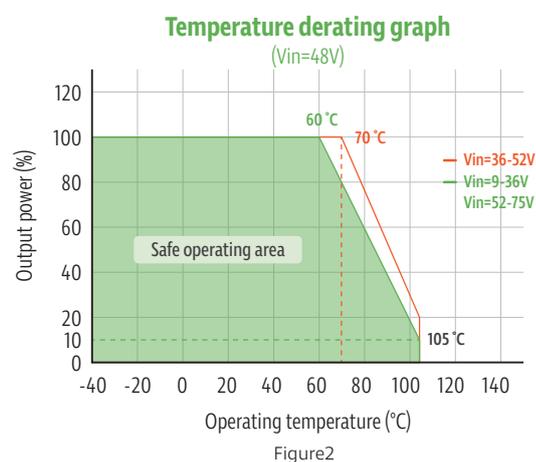
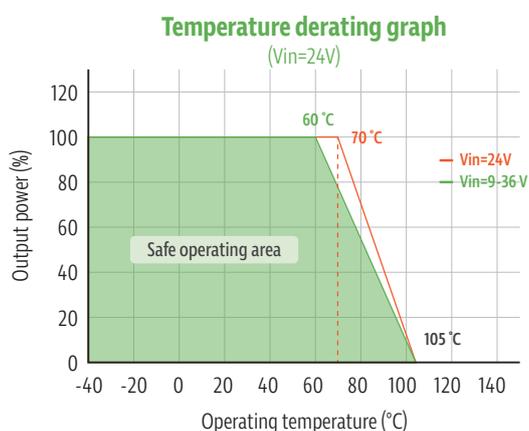
Approval	Part number	Input Voltage Nominal Range (VDC)	Input Voltage max. (VDC)	Output Voltage (VDC)	Output Current (mA) max.	Efficiency (%) full load, (typ.)	Max. Capacitive Load (μF) max.
	40DAWE4_2405S1.5R	24 (9-36)	40	5	8000	86	15000
	40DAWE4_2409S1.5R	24 (9-36)	40	9	4444	87	4700
	40DAWE4_2412S1.5R	24 (9-36)	40	12	3333	88	3000
	40DAWE4_2415S1.5R	24 (9-36)	40	15	2666	90	2200
	40DAWE4_2424S1.5R	24 (9-36)	40	24	1666	90	1300
	40DAWE4_4805S1.5R	48 (18-75)	80	5	8000	86	15000
	40DAWE4_4812S1.5R	48 (18-75)	80	12	3333	88	3000
	40DAWE4_4815S1.5R	48 (18-75)	80	15	2666	90	2200
	40DAWE4_4824S1.5R	48 (18-75)	80	24	1666	90	1300

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 (μF) max.
	40DAWE4_2412D1.5R	24 (9-36)	40	± 12	± 1666	87	1000
	40DAWE4_2415D1.5R	24 (9-36)	40	± 15	± 1333	87	680
	40DAWE4_2424D1.5R	24 (9-36)	40	± 24	± 833	87	470
	40DAWE4_4812D1.5R	48 (18-75)	80	± 12	± 1666	87	1000
	40DAWE4_4815D1.5R	48 (18-75)	80	± 15	± 1333	87	680
	40DAWE4_4824D1.5R	48 (18-75)	80	± 24	± 833	87	470

Note:

- Please use suffix /CM for chassis mounting option; use suffix /DR for DIN rail mounting option (i.e. 40DAWE4_4824D1.5R/DR).
- The input end of the extended package is equipped with anti-reverse protection function, and its full load efficiency will be reduced by 2%;
- The maximum Capacities load „#“ means that the positive and negative outputs are connected to the same capacitance.

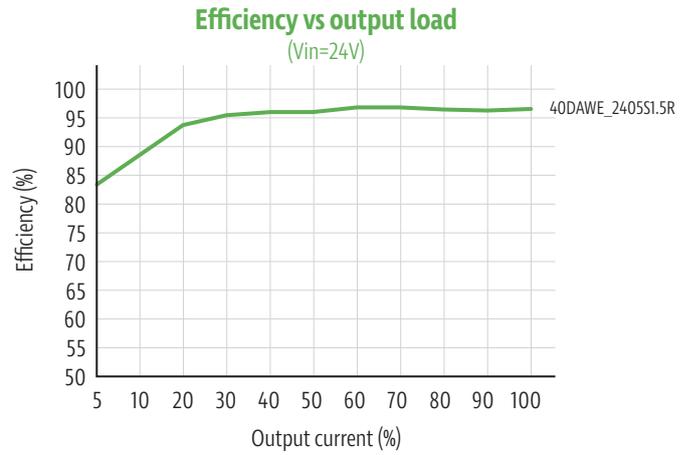
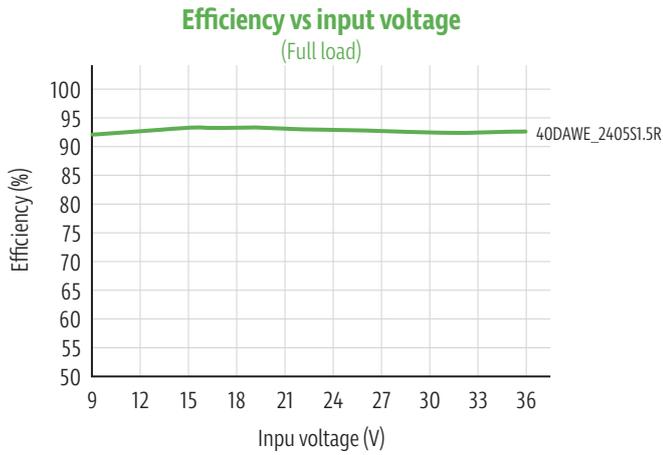
Typical characteristics



40DAWE4_1.5R series

40W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

Typical characteristics



Typical circuit design and application

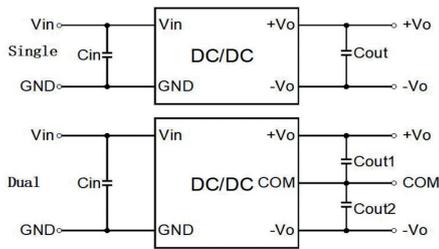


Figure3

Recommended component parameters

	24V	48V
Vin	24V	48V
Cin	330uF	100uF
Cout	330uF	220uF

EMI recommended component parameters

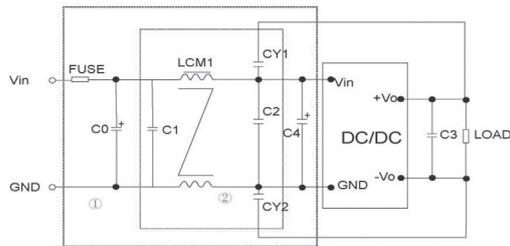


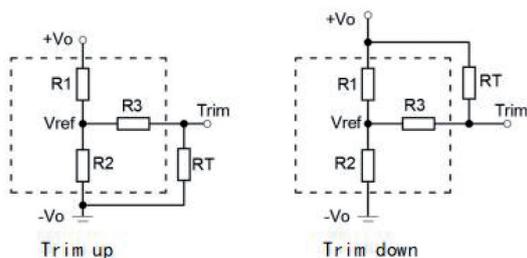
Fig 4

EMI recommended component parameters

Vin (VDC)	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
C0, C4	680µF/50V	470µF/100V
C1, C2	4.7µF/50V	2.2µF/100V
C3	Refer to the Cout parameters in Figure 3	
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



Trim resistor connections (dashed line shows internal resistor network)

Vout (V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	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

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

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

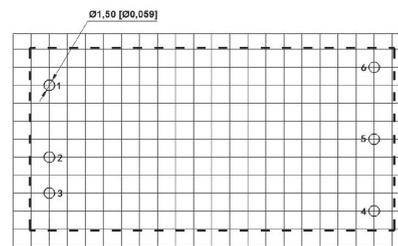
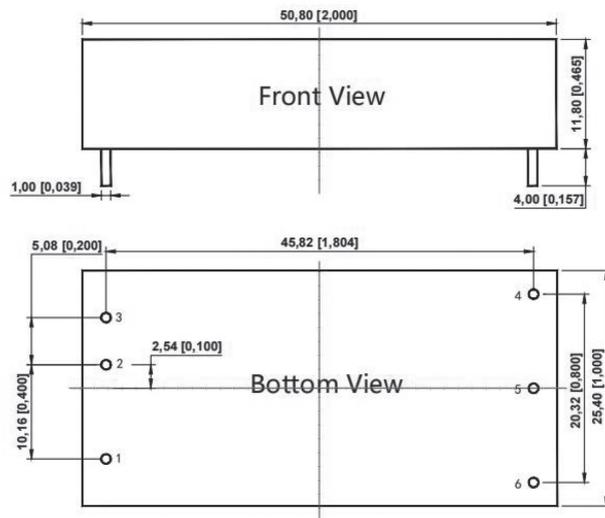
Down : $R_t = \frac{nR_1}{R_1 - n} - R_3$

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

40DAWE4_1.5R series

40W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

Mechanical dimensions



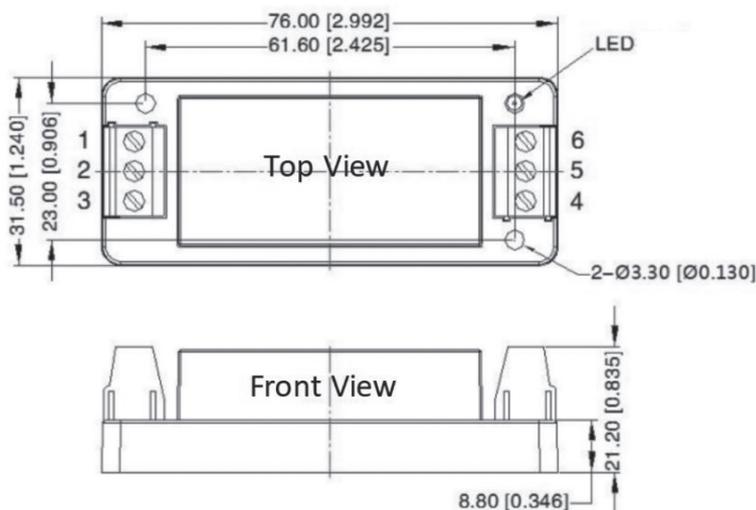
Note: The grid distance is 2.54 x 2.54mm

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

Pin definition table

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

Chassis mounting dimensions



Pin definition table

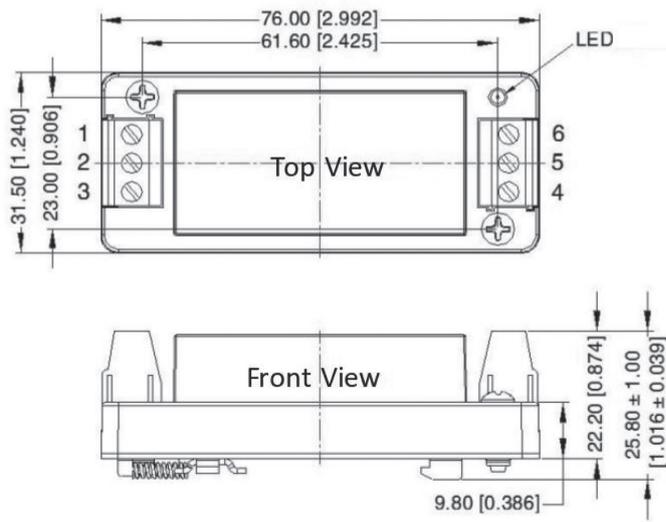
Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	-Vo	COM
6	Trim	-Vo

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

40DAWE4_1.5R series

40W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DIN rail mounting dimensions



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