This converter is NOT recommended for new design-ins

50DAW_1.5 series

50W - Single Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 50 Watt

- Efficiency up to 93%
- Wide input range (2:1)
- High and low temperature characteristics
- Short Circuit Protection (SCP) (Automatic Recovery)
- Output over current protection
- Output over voltage protection
- Input over- under voltage protection
- 1500VDC isolation
- Operating temp. range: -40°C ~ +85°C
- Six-sided metal shield
- Industry standard pinout
- Industrial level specifications
- High EMC performance

The 50DAW_1.5 series offer 50W of output, with 2:1 ultra wide input voltage of 18-36VDC, 36-75VDC, and features 1500VDC isolation, over current, over voltage and short-circuit protection, as well as six sided metal shielding.

All models are particularly suited to industrial, tele-communications, test equipments power.

Common specifications

Short circuit protection:	Hiccup, continous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C (with derating ≥55°C)
Storage temperature range:	-55°C~+125°C
Temperature rise allowed at full load:	105°C
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	5% MIN, 95% MAX
Switching frequency:	300kHz TYP, Nominal input, 100% load
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F@25°C):	1000 K hours MIN
Safety certification:	UL/EN60950 (Pending)
Weight:	35g
Shake:	10-55Hz, 10G, 30 Min. along X, Y and Z

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and leakage current less than 1 mA	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	100KHz/0.1V		2000		pF

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input filter	PI				
Input surge voltage (1 sec. max.)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Input under voltage protection Start-up voltage	• 24VDC input • 48VDC input		17.5 35.8	18 36	VDC VDC
Input under voltage protection Under voltage shut-down	• 24VDC input • 48VDC input	16 33			VDC VDC
Input over voltage protection Start-up voltage	• 24VDC input • 48VDC input			36 75	VDC VDC
Input over voltage protection Over voltage shutdown	• 24VDC input • 48VDC input	39 79			VDC VDC
Start-up time	Nominal input & constant resistance load		10		ms
Ctrl [1]	• Models ON • Models OFF • Input current (models OFF)	Ctrl open or connect TTL high level(3-12VDC) Ctrl connect GND Ctrl* or low level(0-1.2VDC) 1			 mA

1. The CTRL pin voltage is referenced to GND.

Note:
1. Min. load shouldn't be less than 5%, otherwise ripple maybe increase dramatically. Operation under minimum load will not damage the converter, however, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All specifications are measured at TA = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on corporate standards.
5. All characteristics are for listed model, non-standard models may perform differently, please contact our technical person for more detail.
6. Specifications subject to change without prior notice.

Example:
50DAW_2415S1.5
50 = 50Watt; D = DIP; A = series; W = wide input (2:1); 24 = 18-36Vin; 15 = 15Vout; S = single output; 1.5 = 1500VDC isolation

50DAW_1.5 series

50W - Single Output - Wide Input - Isolated & Regulated
DC-DC Converter

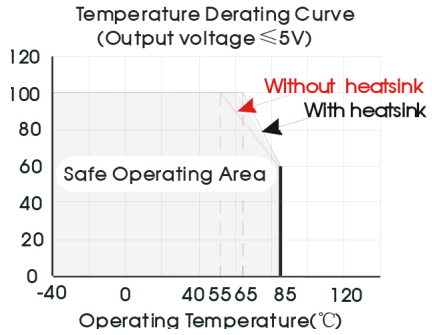
Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output power		2.5		50	W
Line regulation	Full load, Input voltage from low to high		±0.2	±0.5	%
Load regulation	10% to 100% load		±0.5	±1	%
Output voltage accuracy	Refer to recommended circuit		±1	±3	%
Temperature drift	100% full load		±0.02		%/°C
Ripple*	20MHz Bandwidth		50	75	mVp-p
Noise*	20MHz Bandwidth		100	150	mVp-p
Transient recovery time	- Main output 50% - Supplement output 25% to 100% load		300	500	µ¥s
Transient response deviation	- Main output 50% - Supplement output 25% to 100% load		±3	±5	%
Over current protection	Full input voltage	120	130	160	%
Trim			±10%		VDC
Output over voltage protection**	Full input voltage • 3.3VDC output • 5VDC output • 12VDC output • 15VDC output • 24VDC output		 3.9 6.2 15 18 30		 VDC VDC VDC VDC VDC

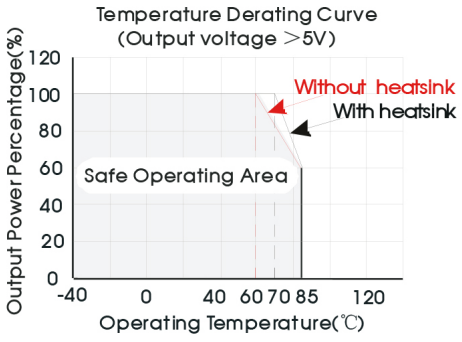
EMC specifications				
EMI	CE	CISPR22/EN55022 CLASS B (External Circuit Refer to recommended circuit)		
EMI	RE	CISPR22/EN55022 CLASS B (External Circuit Refer to recommended circuit)		
EMS	ESD	IEC/EN61000-4-2 perf. Criteria B	Contact ±4KV/ Air ±8KV	
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria B
EMS	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max]	Input Current [mA, typ]		Reflected Ripple [mA, typ]	Efficiency [%, Typ.]	Capacitive load [µF, Max]
	Nominal	Range	Max[1]			Full load	No load			
50DAW_2403S1.5	24	18-36	40	3.3	10000	1511	42	40	91	27000
50DAW_2405S1.5	24	18-36	40	5	10000	2240	59	40	93	18900
50DAW_2412S1.5	24	18-36	40	12	4167	2240	85	40	93	3700
50DAW_2415S1.5	24	18-36	40	15	3333	2240	90	40	93	2000
50DAW_2424S1.5	24	18-36	40	24	2083	2289	45	40	93	1000
50DAW_4803S1.5	48	36-75	80	3.3	10000	756	30	30	91	27000
50DAW_4805S1.5	48	36-75	80	5	10000	1120	50	30	93	18900
50DAW_4812S1.5	48	36-75	80	12	4167	1120	34	30	93	3700
50DAW_4815S1.5	48	36-75	80	15	3333	1120	50	30	93	2000
50DAW_4824S1.5	48	36-75	80	24	2083	1132	30	30	92	1000

1. Input voltage can't exceed this value, or will cause the permanent damage.

Typical characteristics





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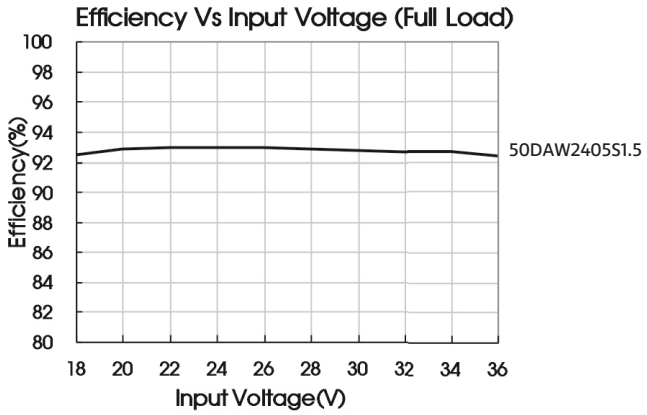
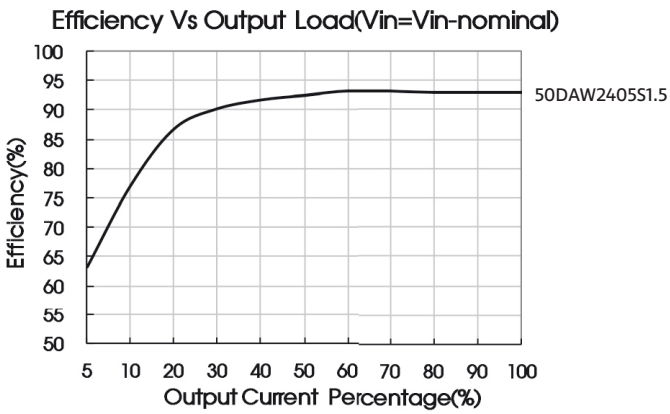
Efficiency curve



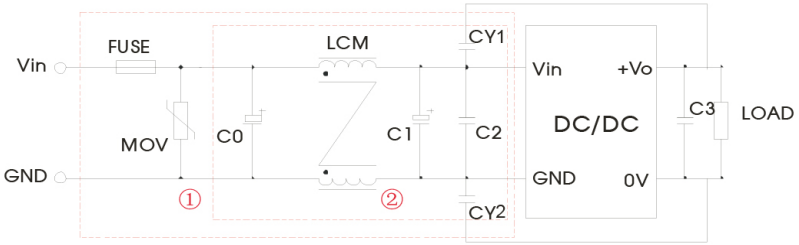


Typical application

Vout (VDC)	Cin (µF)	Cout (µF)
3.3/5	100	220
12/15	100	100
24	100	47

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.

EMC solution-recommended circuit



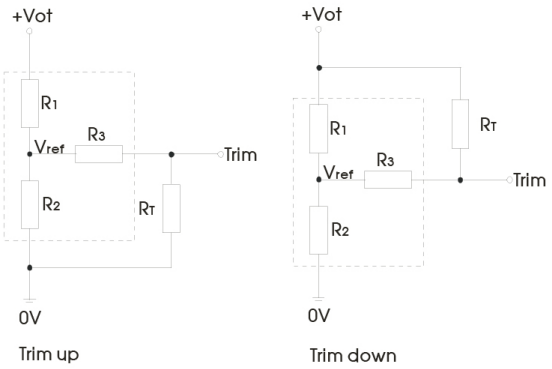
Note:
Part ◯1 in the Fig. 3 is used for EMS test and part◯2 for EMI filtering; selected based on needs.

Parameter description:

Model	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	680µF/50V	330µF/100V
LCM	2.2mH	
C1	330µF/50V	330µF/100V
C2	4.7uF/50V	2.2uF/100V
CY1, CY2	Y1 Safety capacitor 3.3nF/250VAC	
C3	Refer to the Cout in typical application	

Trim

Application of Trim and calculation of Trim resistance



Calclation formula for resistance of trim:

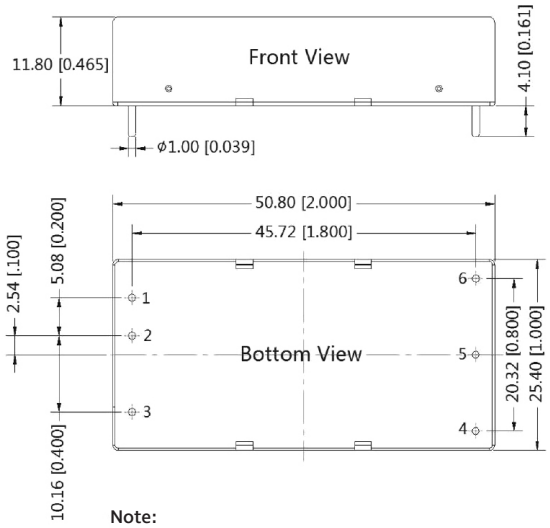
$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{Vref}{Vo' - Vref} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{Vo' - Vref}{Vref} \cdot R_2$$

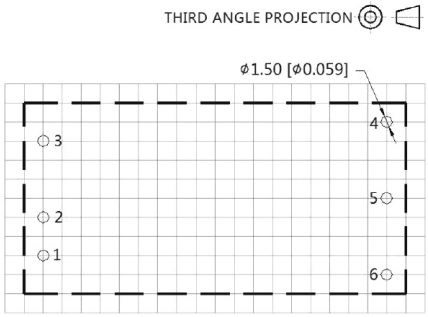
Note:
Value for R1, R2, R3, and Vref refer to the table below.
RT: Resistance of Trim
a: User-defined parameter, no actual meanings.

Parameter	Vo 3.3 (VDC)	Vo 5 (VDC)	Vo 12 (VDC)	Vo 15 (VDC)	Vo 24 (VDC)
R1 (KΩ)	4.788	2.87	11	15	20
R2 (KΩ)	2.87	2.87	2.87	3	2.308
R3 (KΩ)	12.4	10	15	17.4	15
Vref (V)	1.24	2.5	2.5	2.5	2.5

Mechanical dimensions & footprint



Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10mm [±0.004inch]
Pin height tolerances: ±0.50mm [±0.020inch]
General tolerances: ±0.3mm [±0.012inch]



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	Vin
2	GND
3	Ctrl
4	Trim
5	0V
6	+Vo