

Product Feature

- ◆ Package Type: 2"X 1"
- ◆ Input voltage range: 4:1
- ◆ Operating temperature range: -40°C - +105°C
- ◆ Isolation voltage: 1600VDC
- ◆ High efficiency up: 93% (Typ.)
- ◆ Input undervoltage protection, output short circuit, over current, and over voltage protection mechanisms.
- ◆ Product Applications: Industrial, Power, Instrumentation, Communication, Rail Transit, etc



Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%)Typ.	Capacitive Load (μF)Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA)Max.		
SURB 2405 LD-80WR4	24 (9-36)	40	5	16000	91	20000
SURB 2412 LD-80WR4	24 (9-36)	40	12	6667	92	5000
SURB 2415 LD-80WR4	24 (9-36)	40	15	5333	93	3500
SURB 2424 LD-80WR4	24 (9-36)	40	24	3333	93	2000
SURB 4805 LD-80WR4	48 (18-75)	80	5	16000	92	20000
SURB 4812 LD-80WR4	48 (18-75)	80	12	6667	93	5000
SURB 4815 LD-80WR4	48 (18-75)	80	15	5333	93	3500
SURB 4824 LD-80WR4	48 (18-75)	80	24	3333	93	2000

Note:

1. Suffix plus "H" means plus heat sink package, plus "A2S " for extended wiring package, suffix plus "A4S" for extended rail type package;
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.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
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)			
Input Filter		PI filter			
Hot plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
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	5VDC Output	--	±3	±10	%
	nominal input voltage	Other Output	--	±3	±5	
Overvoltage protection	input voltage range		110	--	180	%
Over Current Protection	input voltage range		110	140	--	%
Short-Circuit Protection	input voltage range		Continuous, Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1600	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	See Fig 1	-40	--	+105	°C
Storage Temperature		-55	--	+125	°C
Storage Humidity	Non-condensing	5	--	95	%RH
Soldering Profile	1.5mm from case for 10 sec	--	--	300	°C
Switching Frequency	PWM	--	300	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K Hours

Mechanical Specifications

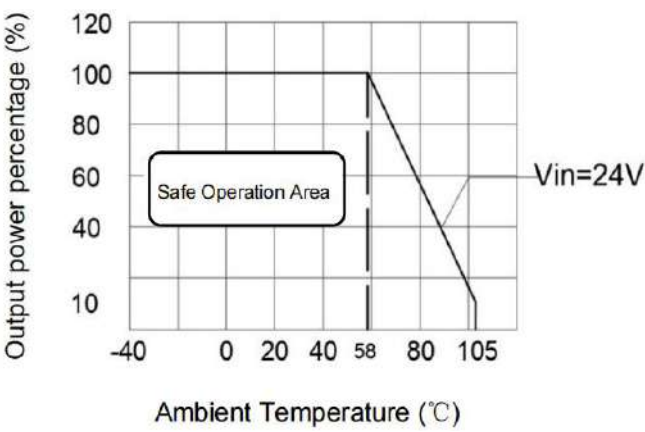
Case Material	Aluminum alloy, black anodized coating
Package Dimensions	50.80 x 25.40 x 12.00mm
Weight	41.0g (Typ.)
Cooling Method	Free air convection

EMC Specifications

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

Typical Characteristic Curves

Temperature Derating Curve Figure1

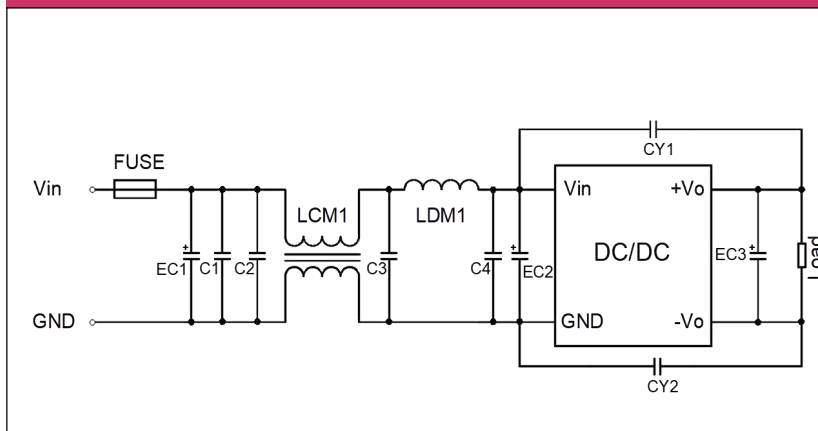


Typical Circuit Design And Application

Application Circuit (Figure 2)	Recommended capacitive load value table				
	Vout (VDC)	EC1 (uF)	EC2 (uF)	C3 (uF)	C4 (uF)
	5	680μF	330uF/35V	10uF/16V	0.1uF/16V
	12/15	680μF	150μF/35V	10μF/25V	0.1μF/25V
	24/28	680μF	100μF/50V	10μF/50V	0.1μF/50V

EMC Recommended Circuit (Figure 3)

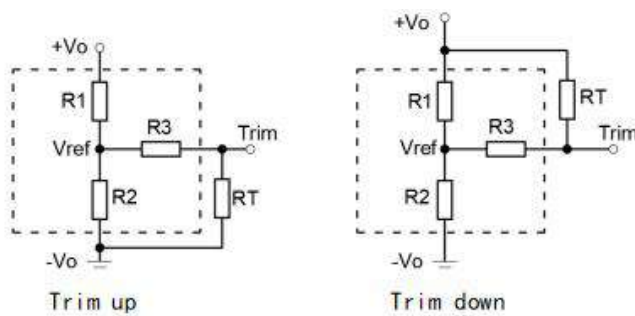
EMI Recommended component parameters



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

Application Circuit (Figure 4)

Trim Recommended component parameters



Trim resistor connections
(dashed line shows internal resistor network)

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

Up: $R_t = \frac{nR_2}{R_2 - n} - R_3$	$n = \frac{V_{ref}}{V_o - V_{ref}} * R_1$
Down: $R_t = \frac{nR_1}{R_1 - n} - R_3$	$n = \frac{V_o - V_{ref}}{V_{ref}} * R_2$

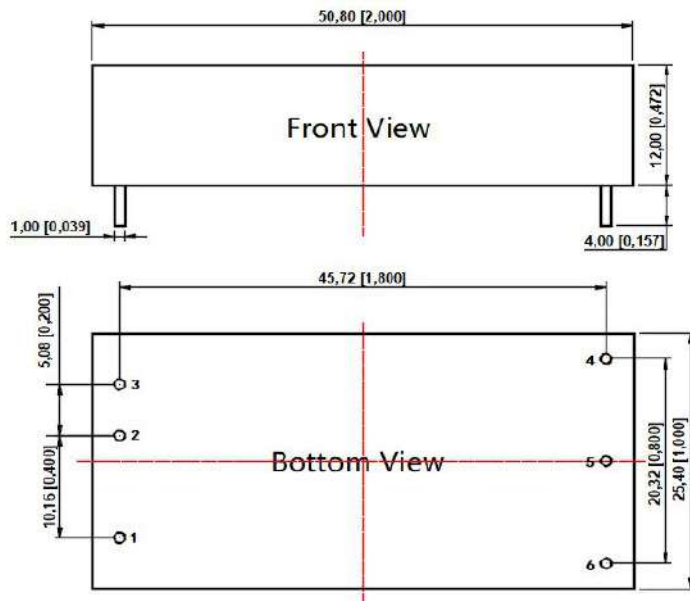
Note:

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.

Dimensions and Recommended Layout

Dimensions



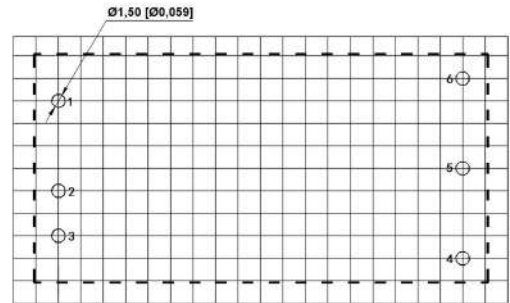
Note:

Unit: mm[inch]

Pin section tolerances: $\pm 0.10 [\pm 0.004]$

General tolerances: $\pm 0.50 [\pm 0.020]$

PCB Printing Layout

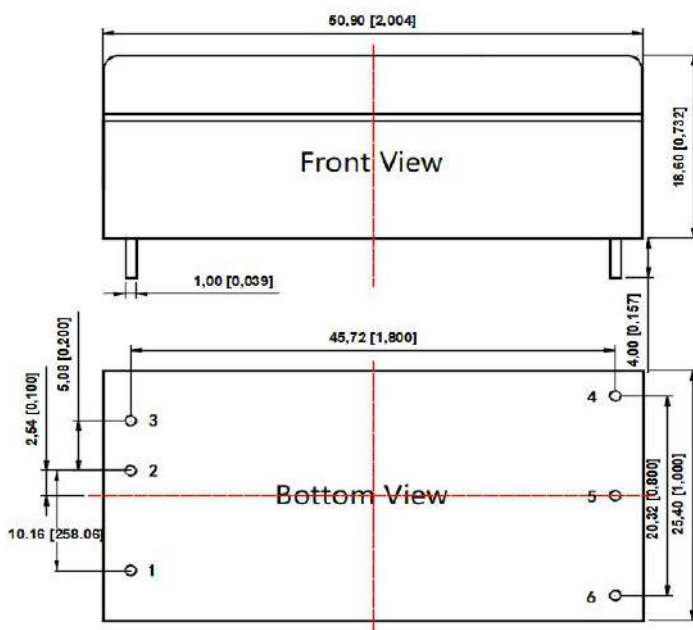


The grid distance is 2.54 x 2.54mm

Pin Definition Table

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

H Dimensions



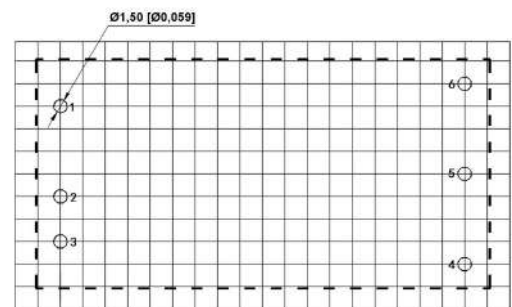
Note:

Unit: mm[inch]

Pin section tolerances: $\pm 0.10 [\pm 0.004]$

General tolerances: $\pm 0.50 [\pm 0.020]$

PCB Printing Layout

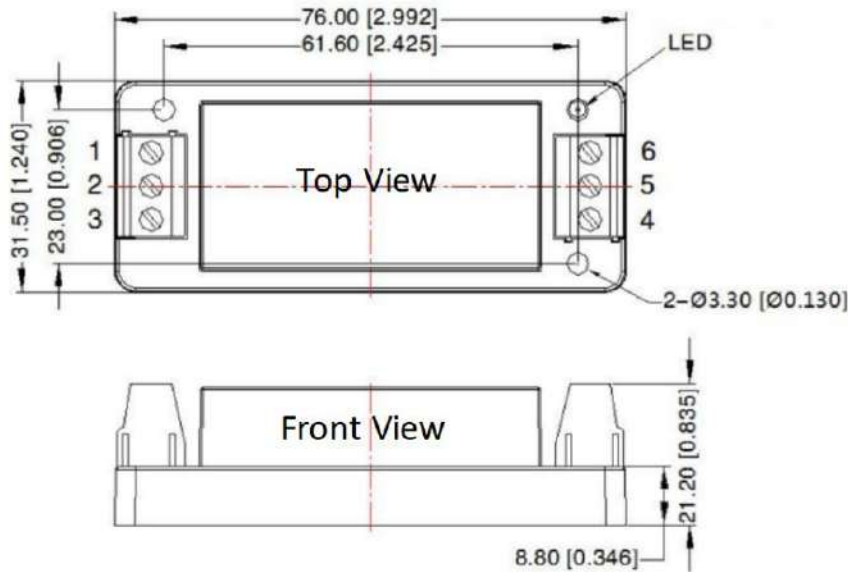


The grid distance is 2.54 x 2.54mm

Pin Definition Table

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

A2S Dimensions



Pin Definition Table

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

Note:

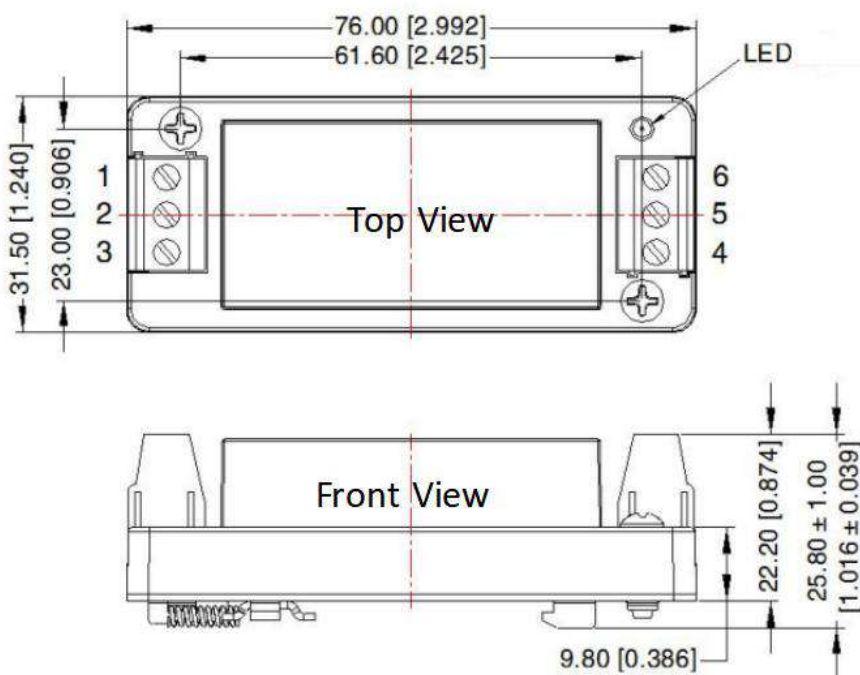
Unit: mm[inch]

Wire range: 24-12 AWG

Tightening torque: Max 0.4 N·m

General tolerances: $\pm 1.00[\pm 0.039]$

A4S 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: $\pm 1.00[\pm 0.039]$

Note:

- ✧ 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 manual are measured at Ta=25 °C, humidity<75% RH, nominal input voltage, and output rated load;
- ✧ All indicator testing methods in this manual are based on our company's corporate standards;
- ✧ Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- ✧ Product specifications are subject to change without prior notice.