

Product Feature

- ◆ Package Type: DIP24
- ◆ Operating ambient temperature range: -40°C - +85°C
- ◆ I/O isolation test voltage: 1.5K VDC
- ◆ Wide 4: 1 input voltage range
- ◆ High efficiency: 88%
- ◆ Input under-voltage, output over-voltage, short-circuit, over-current protection
- ◆ Industry standard pin-out

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency(%/Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current(mA) Max./Min.		
SURB 1203 ZP-6WR4	12 (4.5-18)	20	3.3	1500/0	76	1800
SURB 1205 ZP-6WR4	12 (4.5-18)	20	5	1200/0	80	1000
SURB 1209 ZP-6WR4	12 (4.5-18)	20	9	667/0	81	1000
SURB 1212 ZP-6WR4	12 (4.5-18)	20	12	500/0	82	470
SURB 1215 ZP-6WR4	12 (4.5-18)	20	15	400/0	83	220
SURB 1224 ZP-6WR4	12 (4.5-18)	20	24	250/0	86	100
SURB 2403 ZP-6WR4	24 (9-36)	40	3.3	1500/0	77	1800
SURB 2405 ZP-6WR4	24 (9-36)	40	5	1200/0	82	1000
SURB 2409 ZP-6WR4	24 (9-36)	40	9	667/0	83	1000
SURB 2412 ZP-6WR4	24 (9-36)	40	12	500/0	85	470
SURB 2415 ZP-6WR4	24 (9-36)	40	15	400/0	86	220
SURB 2424 ZP-6WR4	24 (9-36)	40	24	250/0	86	100
SURA 2405 ZP-6WR4	24 (9-36)	40	±5	±600/0	82	#680
SURA 2409 ZP-6WR4	24 (9-36)	40	±9	±333/0	84	#220
SURA 2412 ZP-6WR4	24 (9-36)	40	±12	±250/0	85	#330
SURA 2415 ZP-6WR4	24 (9-36)	40	±15	±200/0	88	#220
SURA 2424 ZP-6WR4	24 (9-36)	40	±24	±125/0	86	#100
SURB 4803 ZP-6WR4	48(18-75)	80	3.3	1500/0	80	1800
SURB 4805 ZP-6WR4	48(18-75)	80	5	1200/0	84	1000
SURB 4809 ZP-6WR4	48(18-75)	80	9	667/0	85	680
SURB 4812 ZP-6WR4	48(18-75)	80	12	500/0	87	470

SURB 4815 ZP-6WR4	48(18-75)	80	15	400/0	88	220
SURB 4824 ZP-6WR4	48(18-75)	80	24	2500/0	87	100
SURA 4805 ZP-6WR4	48(18-75)	80	±5	±600/0	83	#680
SURA 4812 ZP-6WR4	48(18-75)	80	±12	±250/0	87	#330
SURA 4815 ZP-6WR4	48(18-75)	80	±15	±200/0	88	#220

#each output

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current(Full load/no-load)	24VDC Input	--	302/5	333/12	mA
	48VDC Input	--	156/4	160/8	
Reflected Ripple Current	24VDC Input	--	20	--	
	48VDC Input	--	20	--	
Surge Voltage (1sec. max.)	24VDC Input	-0.7	--	50	VDC
	48VDC Input	-0.7	--	100	
Start-up Voltage	24VDC Input	--	--	9	
	48VDC Input	--	--	18	
Input under-voltage protection	24VDC Input	5.5	6.5	--	
	48VDC Input	12	15.5	--	
Input Filter		Capacitor filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%-100%Load		--	±1.0	±3.0	%
Linear Regulation	Full Load,Input Voltage Range	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1.0	
Load Regulation	5%-100% Load	Vo1	--	±0.5	±1.0	
		Vo2	--	±0.5	±1.5	
Ripple & Noise	20MHz Bandwidth		--	--	100	mVp-p
Instantaneous Recovery Time	25% Load Step Change,nominal input voltage		--	300	500	us
Transient Response Deviation			--	±5	±8	&
Temperature Drift Coefficient	Full load		--	--	±0.03	%/°C
Over-current protection	Input Voltage range		110	140	--	%
Over-voltage protection			110	--	160	
Short-Circuit Protection			Continuous, Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric strength Test for 1 minute with a Leakage current of 1mA max.	1500	--	--	VDC
Insulation Resistance	Input-output, resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitors	Input-Output, 100KHz/0.1V	--	1000	--	Pf
Operating Temperature	See Fig 1	-40	--	+85	C°
Storage Temperature		-55	--	+125	C°
Storage Humidity	Non-condensing	5	--	95	%RH
Pin welding Resistance Temperature	Welding time:10s(Max.)	--	--	300	°C
Switching Frequency		--	300	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000			K Hours

Mechanical Specifications

Case Material	Aluminum alloy
Package Dimensions	32.00*20.30*10.20mm
Weight	13g (Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR32/EN55032/ CLASS A (without extra components)CLASS B ((see Fig.3-②for recommended circuit)	CLASS B
	RE	CISPR32/EN55032/ CLASS A (without extra components)CLASS B ((see Fig.3-②for recommended circuit)	CLASS B
EMS	ESD	IEC/EN61000-4-2 Contact±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4 ±2KV ((Tee Fig.3-①for recommended circuit)	Perf.Criteria B
	Surge	IEC/EN61000-4-5 line to line±2KV ((Tee Fig.3-①for recommended circuit)	Perf.Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A

Typical Characteristic Curves

Temperature Derating Curve (Fig.1)

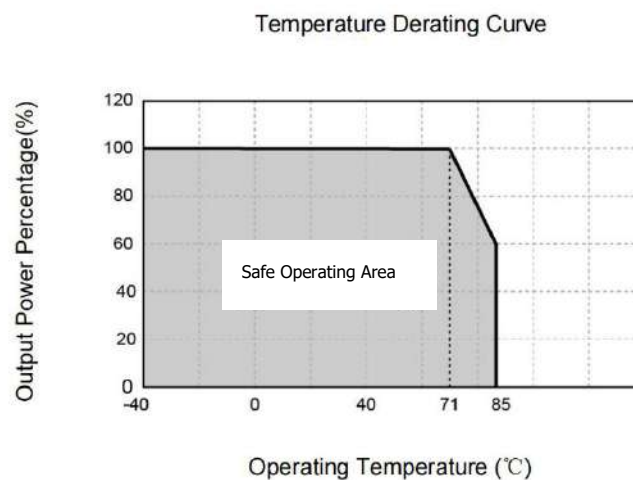


Fig. 1

Typical Circuit Design And Application

Fig.2

Recommended component parameters

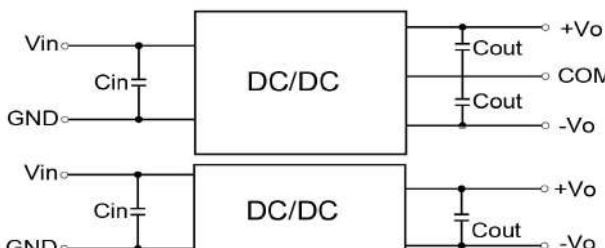
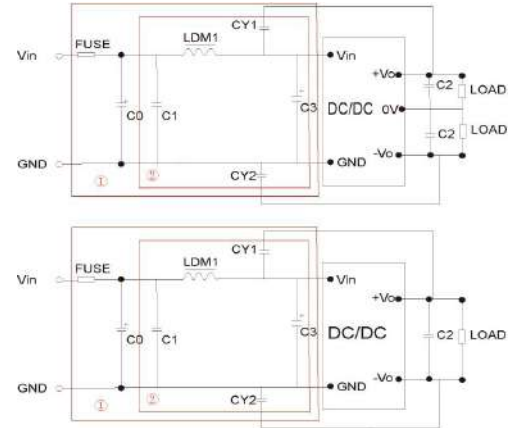
	Vin	12V	24V	48V
	Cin	100uF	100uF	10uF-47uF
	Cout	10uF	10uF	10uF

Fig. 3

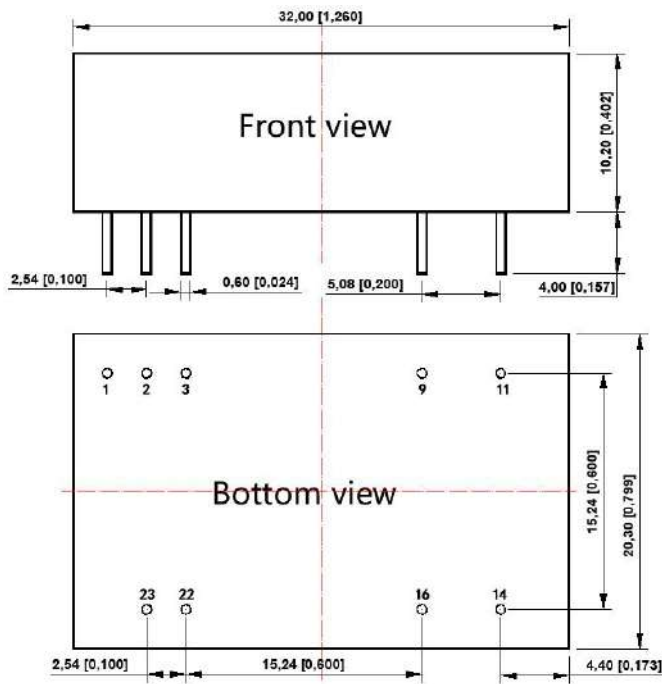
EMI Recommended component parameters

 Note: Part ① in the Fig. 3 is for EMS test; Part ② is for EMI filtering; Part ① and Part ② can be added based on actual requirement.	Part No.	24VDC	24VDC	48VDC
	FUSE	Choose according to actual input current		
	C0、C3	330μF/50V	330μF/50V	330μF/100V
	C1	1μF/50V	1μF/50V	1μF/100V
	C2	Referring to the Cout parameter in Fig.2		
	LCM	4.7uH		
	CY1/CY2	1nF/2KV		

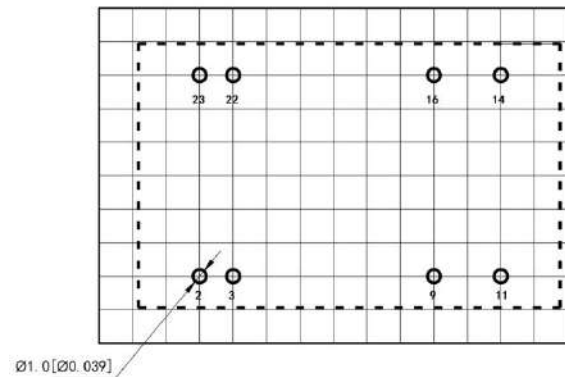
All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. Capacitive load value of the product.

Dimensions and Recommended Layout

Dimensions



PCB Printing Layout



Note: Grid 2.54*2.54mm

Pin Definition Table

Pin	Single	Dual
2、3	GND	GND
9	No pin	COM
11	NC	-Vo
14	+Vo	+Vo
16	-Vo	COM
22、23	Vin	Vin

Note:

Unit: mm[inch]

Pin section tolerances: ± 0.10 [± 0.004]

General tolerances: ± 0.50 [± 0.020]

Note:

- Maximum capacitive loads are tested in the input voltage range and under full load conditions;
- Unless otherwise specified, the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
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