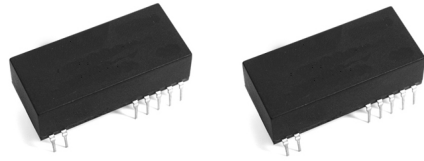


DC/DC Converter

SG_D-2W & SH_D-2W Series

2W, Fixed input voltage, isolated & unregulated dual/single output



Patent Protection



Continuous Short
Circuit Protection



FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40°C to +105°C
- High efficiency up to 83%
- DIP package
- Isolation voltage: 6K VDC
- International standard pin-out

SG_D-2W & SH_D-2W series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

1. Where the voltage of the input power supply is stable (voltage variation: $\pm 10\%V_{in}$);
2. Where isolation between input and output is necessary (isolation voltage $\leq 3000VDC$);
3. Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;
4. Typical application: preceding-stage interference isolation condition; ground-interference canceled condition; digit circuit condition; Voltage-isolation converting condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (% Min./Typ.) @ Full Load	Max. Capacitive Load* (μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
SG0505D-2W	5 (4.5-5.5)	± 5	$\pm 200/\pm 20$	72/76	100
SG0509D-2W		± 9	$\pm 111/\pm 12$	75/79	
SG0512D-2W		± 12	$\pm 84/\pm 9$	76/80	
SG0515D-2W		± 15	$\pm 67/\pm 7$	77/81	
SH0505D-2W		5	400/40	72/76	220
SH0509D-2W		9	222/23	75/79	
SH0512D-2W		12	167/17	76/80	
SH0515D-2W		15	133/14	79/83	
SG1205D-2W	12 (10.8-13.2)	± 5	$\pm 200/\pm 20$	75/79	100
SG1209D-2W		± 9	$\pm 111/\pm 12$	77/81	
SG1212D-2W		± 12	$\pm 84/\pm 9$	78/82	
SG1215D-2W		± 15	$\pm 67/\pm 7$	79/83	
SH1205D-2W		5	400/40	74/78	220
SH1209D-2W		9	222/23	77/81	
SH1212D-2W		12	167/17	78/82	
SH1215D-2W		15	133/14	79/83	
SG1515D-2W	15 (13.5-16.5)	± 15	$\pm 67/\pm 7$	73/77	100
SH1515D-2W		15	133/14	79/83	
SG2409D-2W	24 (21.6-26.4)	± 9	$\pm 111/\pm 12$	78/82	100
SG2415D-2W		± 15	$\pm 67/\pm 7$	77/81	
SH2405D-2W		5	400/40	75/79	220
SH2409D-2W		9	222/23	78/82	
SH2412D-2W		12	167/17	79/83	
SH2415D-2W		15	133/14	79/83	

Note: * The capacitive loads of positive and negative outputs are identical.

Input Specifications

DC/DC Converter

SG_D-2W & SH_D-2W

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	40/500	--	mA
	12V input	--	15/200	--	
	15V input	--	10/160	--	
	24V input	--	7/98	--	
Reflected Ripple Current	5V input	--	15	--	mA
	Others input	--	5	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy		See tolerance envelope curve(Fig. 1)				
Line Regulation	Input voltage change: $\pm 1\%$	--	--	± 1.2	--	
Balance of Output Voltage	Dual output, balanced load	--	± 0.5	± 1		
Load Regulation	10%-100% load	5VDC output	--	--	20	%
		9VDC output	--	--	15	
		12VDC output	--	--	15	
		15VDC output	--	--	15	
Ripple & Noise*	20MHz bandwidth	--	150	250	mVp-p	
Temperature Coefficient	Full load	--	--	± 0.03	%/°C	
Short Circuit Protection		Continuous, self-recovery				
Note:1. Unbalanced load of positive-negative dual output module: $\pm 5\%$; 2. * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.						

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	6000	--	--	VDC	
Isolation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input-output, 100KHz/0.1V	--	5	--	pF	
Operating Temperature	Derating when operating temperature up to 85°C, (see Fig. 2)	-40	--	105	°C	
Storage Temperature		-55	--	125		
Casing Temperature Rise	Ta=25°C, nominal input, full load output	--	25	--		
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300		
Storage Humidity	Non-condensing	--	--	95	%RH	
Switching Frequency	Full load, nominal input voltage	5VDC input	--	60	--	KHz
		Others input	--	80	--	
MTBF	MIL-HDFK-217F@25°C	3500	--	--	K hours	

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Dimensions	32.30*16.65*10.30mm
Weight	8.2g(Typ.)
Cooling Method	Free convection

EMC Specifications

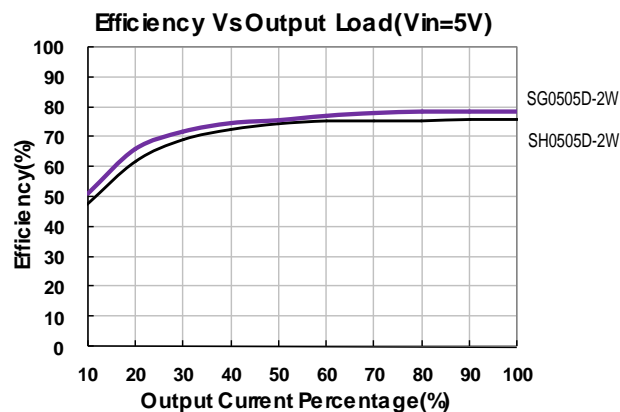
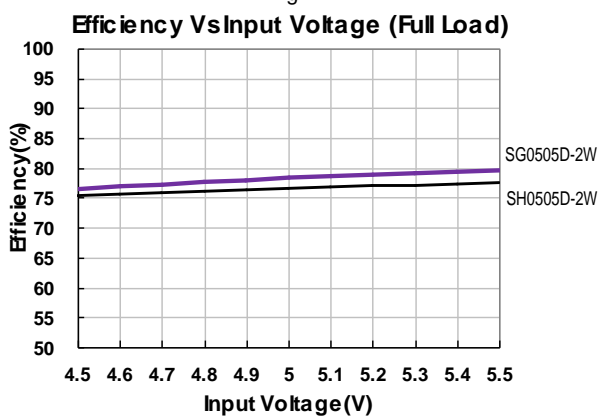
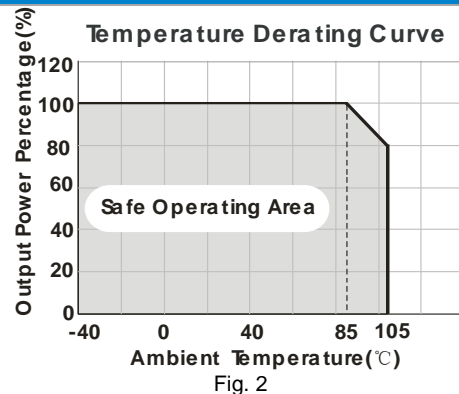
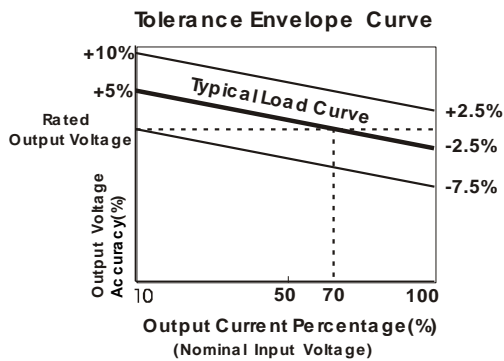
EMI	CE	CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit)
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DC/DC Converter

SG_D-2W & SH_D-2W

	RE	CISPR22/EN55022 CLASS B (see Fig. 5 for recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact $\pm 8\text{KV}$ perf. Criteria B

Product Characteristic Curve



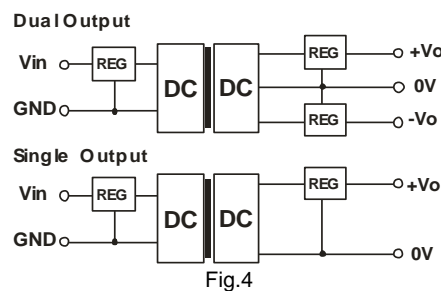
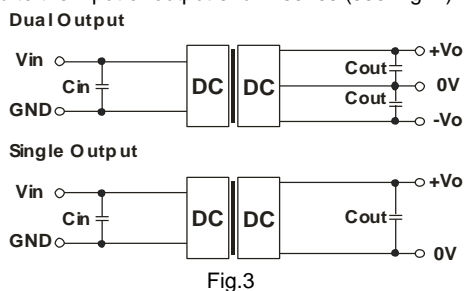
Design Reference

1. Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3.

Moreover, choosing a suitable filter capacitor is very important, **start-up problems may be caused if the capacitance is too large**. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 4).



Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout (μF)
5	4.7	5	10	± 5	4.7
12	2.2	9/12	2.2	$\pm 9/\pm 12$	1
15	2.2	15	1	± 15	0.47
24	1	--	--	--	--

DC/DC Converter

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2. EMC solution-recommended circuit

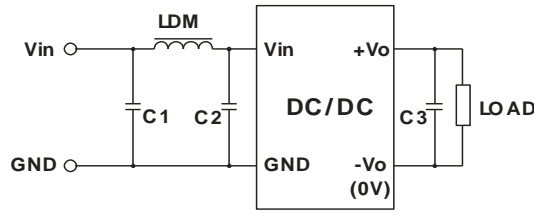


Fig. 5

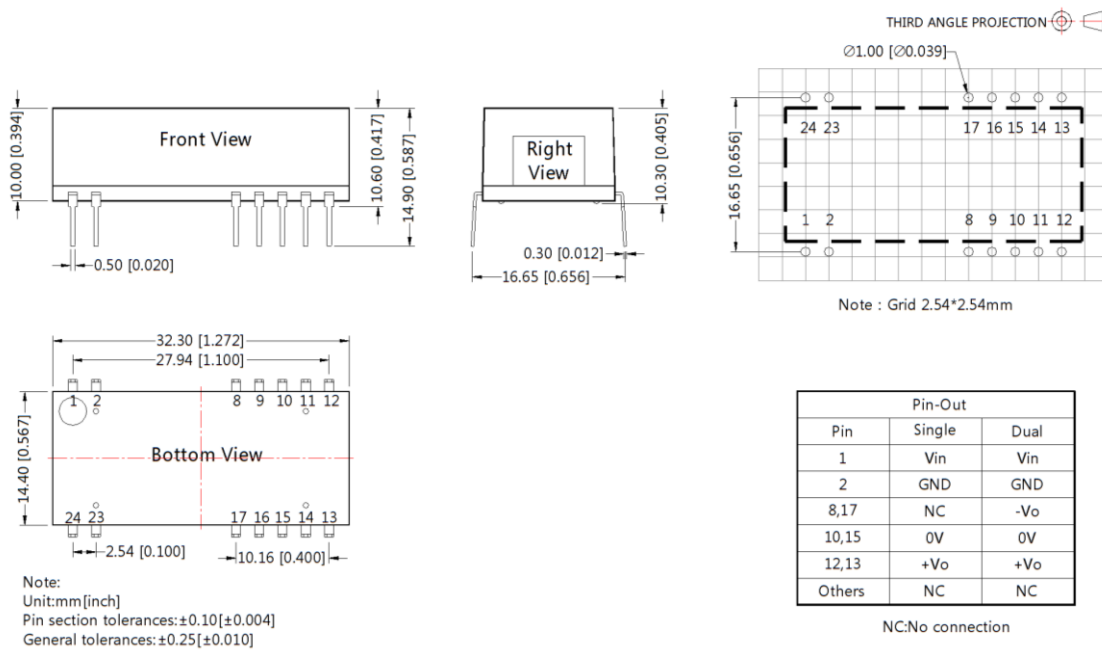
Input voltage (V)	5/12/15/24	
EMI	C1, C2	4.7μF /50V
	C3	Refer to the Cout in Fig.3
	LDM	6.8μH

3. Output load requirements

When using, the minimum load of the module output should not be less than 10% of the nominal load. **In order to meet the performance parameters of this datasheet**, please connect a 10% dummy load in parallel at the output end, the dummy load is generally a resistor, Please note that the resistor needs to be used in derating.

4. For more information please find DC-DC converter application notes on www.schmid-m.com

Dimensions and Recommended Layout



Notes:

1. **Packing information please refer to Product Packing Information which can be downloaded from www.schmid-m.com** Packing bag number: 58200017;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. **The maximum capacitive load offered were tested at nominal input voltage and full load;**
4. Unless otherwise specified, **parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75% with nominal input voltage and rated output load;**
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. **The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above.** Please contact our technicians directly for specific information;
7. We can provide product customization service;
8. Specifications are subject to change without prior notice.