2W, DC/DC Power Converter
SDG02S

Introduction

The SDG02S series are unregulated SIP7 package DC/DC converters with single or dual outputs, and 6KVDC isolation. These converters feature reinforced insulation, low isolation capacitance, low leakage current, continuous short circuit protection, and wide operating temperature range. They are widely used in industrial and medical applications where high isolation is needed.

Features

- Rated power: 2W Max
- Input voltage range ±10%
- Unregulated output
- Creepage & clearance >5mm
- Isolation capacitance 4pF
- High efficiency, up to 84%
- Isolation 4.2KVAC or 6KVDC
  Operating temperature range: -40 ~ +105°C ambient
- RoHS compliant
- Patient leakage current
  2uA max
- Compact SIP7 package
- Continuous short circuit protection
- Meet EN 60601-1
  IEC EN 62368-1
- 3 year warranty

2W, DC/DC Power Converter
SDG02S

Part numbers

Model Number	Input Voltage [VDC] ±10%	Output Voltage (VDC)	Output Current (mA) Max	Output Current (mA) Min	Efficiency (%) Typ.	Capacitive Load (uF) Max.
SDG02S0505	5	5	400	8	80	220
SDG02S0509	5	9	222	6	80	220
SDG02S0512	5	12	168	4	82	220
SDG02S0515	5	15	136	3	82	220
SDG02S0505D	5	±5	±200	±4	81	100
SDG02S0509D	5	±9	±110	±3	81	100
SDG02S0512D	5	±12	±80	±2	82	100
SDG02S0515D	5	±15	±70	±2	82	100
SDG02S1205	12	5	400	8	81	220
SDG02S1209	12	9	222	6	80	220
SDG02S1212	12	12	168	4	83	220
SDG02S1215	12	15	136	3	80	220
SDG02S1205D	12	±5	±200	±4	80	100
SDG02S1209D	12	±9	±110	±3	81	100
SDG02S1212D	12	±12	±80	±2	83	100
SDG02S1215D	12	±15	±70	±2	80	100
SDG02S2405	24	5	400	8	80	220
SDG02S2409	24	9	222	6	80	220
SDG02S2412	24	12	168	4	82	220
SDG02S2415	24	15	136	3	81	220
SDG02S2424	24	24	83	2	81	220
SDG02S2405D	24	±5	±200	±4	80	100
SDG02S2409D	24	±9	±110	±3	81	100

SDG02S2412D	24	±12	±80	±2	82	100
SDG02S2415D	24	±15	±70	±2	81	100

* Only typical models are listed. Other models may be available upon request.

Electrical characteristics

Unless otherwise indicated, specifications are measured at T_A=25°C, nominal input voltage, full load after warm up.

Parameter	Condition	Min.	Type	Max.	Unit	Notes
Input current Full load	V_{IN}=5V V_{IN}=12V V_{IN}=24V	-	453 199 101	-	mA	
Input current No load	V_{IN}=5V V_{IN}=12V V_{IN}=24V	-	98 70 35	-	mA	
Reflected ripple current		-	15	-	mA	
Surge voltage 1 second max	V_{IN}=5V V_{IN}=12V V_{IN}=24V	-0.7 -0.7 -0.7	-	9 18 30	VDC	
Output voltage accuracy	All models	Refer to graphic in “Characteristic Curves” section				
Line regulation For VIN change of ±1%		-	-	±1.5	%	
Load regulation IOUT=10% to 100% of IOUT, rated	V_{OUT}=3.3, 5V Others	-	-	20 15	%	
Temperature coefficiency	Full load	-	±0.02	-	%/°C	
Output ripple and noise	20MHz bandwidth	-	100	150	mVp-p	
Output short circuit protection		Continuous, automatic recovery				

Input filter		Capacitor
Hot plug		None

* Dual output models need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

2W, DC/DC Power Converter
SDG02S

General Specifications

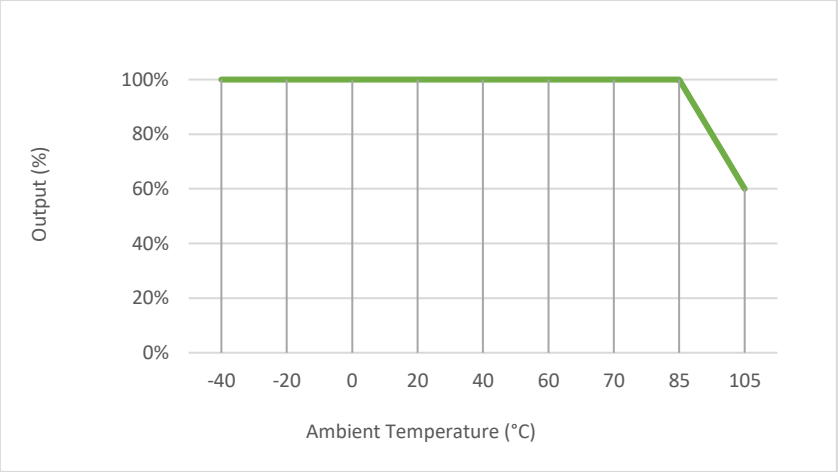
Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current 1mA Max	I/P to O/P I/P to O/P	4200 6000	- -	- -	VAC VDC
Isolation resistance 500VDC	250VAC, 50/60Hz	-	-	2	uA
Isolation capacitance 100KHz, 0.1V	I/P to O/P	1000	-	-	M ohm
Creepage & Clearance distance	I/P to O/P	-	4	-	pF
Operating temperature		5	-	-	mm
Storage temperature	See “Derating Curve”	-40	-	+105	°C
Temperature rise at case		-55	-	+125	°C
Storage humidity	Full load	-	25	-	°C
Switching frequency	Non-condensing	5	-	95	%RH
Pin soldering resistance 1.5mm away from case for 10 sec	Full load	-	220	-	KHz
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z			
Case material		Black plastic UL94-V0			
Cooling method		Free air convection			
Design based on standards		EN/IEC 62368-1, EN/ES 60601-1			

EMC	Emissions Immunity	CISPR32, EN55032 Class A with External CircuitEN 60601-1-2, CISPR 11 Class B with External Circuit IEC EN 61000-4-2, air ±15kV, contact ±8KV, Criteria B EN 60601-1-2 air ±15KV, contact ±8KV, Criteria B
MTBF	MIL-HDBK-217F	>19,360,000 Hours, T_A=25°C
Size & Weight		19.50 x 9.80 x 12.50 mm, 4.2g Typ.

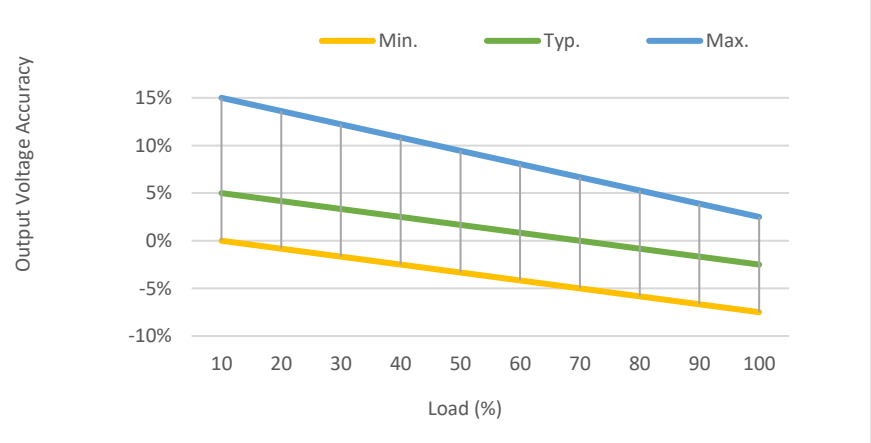
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



Output Voltage Accuracy vs Load



Recommended External Circuit

Typical Application Circuit

*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

Figure 1: Typical Application circuit

Recommended components spec

Input voltage	5V	12V	24V
C_{IN}	4.7uF, 16V	2.2uF, 25V	1uF, 50V

Output voltage	5V	9, 12V	15, 24V	±5, ±9V	±12, ±15V
C_{OUT}	10uF, 16V	2.2uF, 25V	1uF, 50V	4.7uF, 16V	1uF, 25V

Circuit for EMC Enhancement

*Use this application circuit to meet Class B EMC performance.

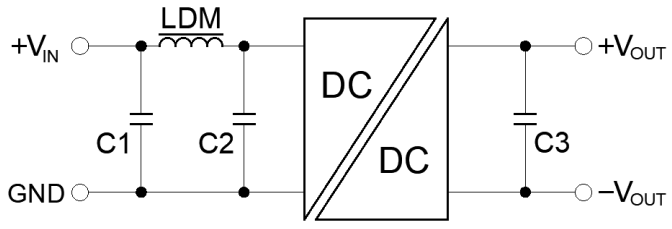
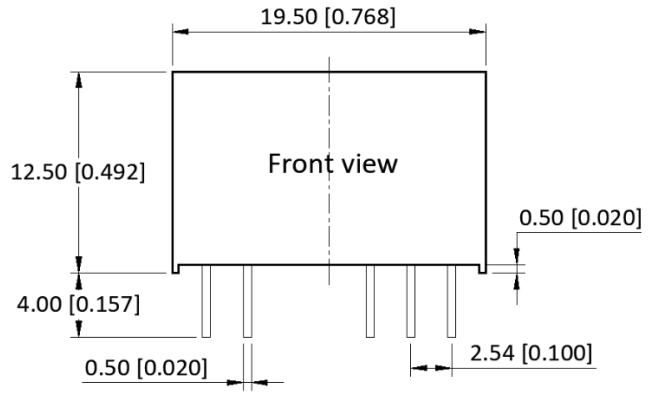


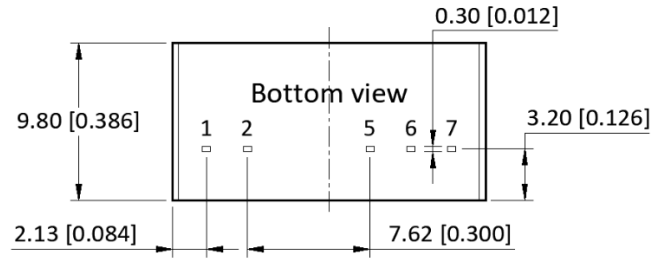
Figure 2: Circuit for EMC Enhancement

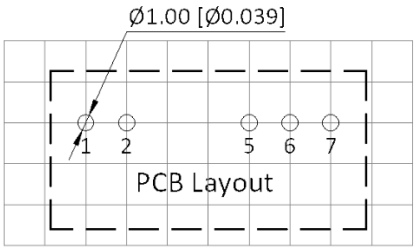
Recommended components spec

Output voltage	C1, C2	LDM	C3
Spec	4.7uF, 50V	6.8uH	refer to C_{OUT} in [Table 1]

Mechanical Specifications







Pin Definition

Pin #	Single Out	Dual Out
1	V_{IN}	V_{IN}
2	GND	GND
5	0V	$-V_{OUT}$
6	No Pin	0V
7	$+V_{OUT}$	$+V_{OUT}$

*** Unless otherwise specified unit: mm [inch]**

*** General tolerance: ±0.50 [±0.020]**

*** Pin thickness: ±0.10 [±0.004]**

*** Footprint grid 2.54 x 2.54 mm**

Ordering information

Ordering can be done via www.summit-electronics.com or via info@summit-electronics.com. Please contact us for more information. Customisation of the product is available on request.

Technical support

For all product questions please contact us via info@summit-electronics.com

Document revision

Rev	Date	Changes
2025v0.1	27-08-2025	First issue of document