3W, DC/DC Power Converter

SDV03S

Introduction

The SDV03S series are 1.5KV isolated 3Watt DC/DC converters with a compact SIP8 package. Designed with high efficiency, they operate in a wide temperature range from -40°C to +85°C. Other features include wide 2:1 input voltage range, remote On/Off control, under voltage, over current and short circuit protections. These converters are ideally suitable for battery operated equipment, measurement equipment, telecom, wireless network, industrial control system.

Features

- Rated power: 3W Max
- Input voltage range: 2:1
- Regulated single or dual output
- High efficiency up to 83%
- Isolation voltage 1.5KVDC
- Operating temperature range: -40 ~ +85°C ambient
- No external components required for operating
- RoHS compliant
- Compact SIP8 package
- Remote ON/OFF
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty

3W, DC/DC Power Converter
SDV03S

Part numbers

Model Number	Input Voltage [VDC]			V_{OUT} [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF]
	Nom.	Range	*Max.		Max.	Min.		Max.
SDV03S0503	5	4.5~9	11	3.3	758	38	68	1800
SDV03S0505	5	4.5~9	11	5	500	25	73	2200
SDV03S0509	5	4.5~9	11	9	278	14	74	1000
SDV03S0512	5	4.5~9	11	12	208	10	77	680
SDV03S0515	5	4.5~9	11	15	167	8	74	470
SDV03S0524	5	4.5~9	11	24	104	5	76	330
SDV03S0505D	5	4.5~9	11	±5	±250	±13	74	1000
SDV03S0509D	5	4.5~9	11	±9	±167	±10	76	680
SDV03S0512D	5	4.5~9	11	±12	±104	±5	77	470
SDV03S0515D	5	4.5~9	11	±15	±83	±4	77	330
SDV03S0524D	5	4.5~9	11	±24	±52	±3	76	220
SDV03S1203	12	9~18	20	3.3	758	38	75	2700
SDV03S1205	12	9~18	20	5	600	30	76	2200
SDV03S1209	12	9~18	20	9	333	17	79	1000
SDV03S1212	12	9~18	20	12	250	13	82	680
SDV03S1215	12	9~18	20	15	200	10	83	470
SDV03S1224	12	9~18	20	24	125	6	81	330
SDV03S1205D	12	9~18	20	±5	±300	±15	78	1000
SDV03S1209D	12	9~18	20	±9	±167	±8	78	680
SDV03S1212D	12	9~18	20	±12	±125	±6	79	470
SDV03S1215D	12	9~18	20	±15	±100	±5	80	330
SDV03S2403	24	18~36	40	3.3	758	38	74	2700
SDV03S2405	24	18~36	40	5	600	30	81	2200

SDV03S2409	24	18~36	40	9	333	17	83	2200
SDV03S2412	24	18~36	40	12	250	13	83	1000
SDV03S2415	24	18~36	40	15	200	10	83	680
SDV03S2424	24	18~36	40	24	125	6	83	470
SDV03S2405D	24	18~36	40	±5	±300	±15	79	1000
SDV03S2409D	24	18~36	40	±9	±167	±8	81	680
SDV03S2412D	24	18~36	40	±12	±125	±6	83	470
SDV03S2415D	24	18~36	40	±15	±100	±5	83	330
SDV03S4803	48	36~75	80	3.3	758	38	75	2700
SDV03S4805	48	36~75	80	5	600	30	76	2200
SDV03S4812	48	36~75	80	12	250	13	80	680
SDV03S4815	48	36~75	80	15	200	10	84	470
SDV03S4824	48	36~75	80	24	125	6	82	330
SDV03S4805D	48	36~75	80	±5	±300	±15	79	1000
SDV03S4812D	48	36~75	80	±12	±125	±6	82	470
SDV03S4815D	48	36~75	80	±15	±100	±5	82	330

* Only typical models are listed. Other models may be available upon request.
* Input voltage exceed the Max. value may cause permanent damage.
* For dual output models, max capacitive load stipulated in the above list is for each output.
* Standard models in this series are 1.5KV isolation. See SDV03S series for 3KV isolation models.

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	Note
Input current Full load	$V_{IN, Nom}$ = 5V $V_{IN, Nom}$ = 12V $V_{IN, Nom}$ = 24V $V_{IN, Nom}$ = 48V	-	805 314 154 78	-	mA	
Input current No load	$V_{IN, Nom}$ = 5V $V_{IN, Nom}$ = 12V $V_{IN, Nom}$ = 24V $V_{IN, Nom}$ = 48V	-	40 30 20 5	85 40 40 15	mA	
Reflected ripple current	$V_{IN, Nom}$ = 5V, 12V $V_{IN, Nom}$ = 24V, 48V	-	20 55	-	mA	
Input voltage surge 1 second max	$V_{IN, Nom}$ = 5V $V_{IN, Nom}$ = 12V $V_{IN, Nom}$ = 24V $V_{IN, Nom}$ = 48V	-0.7 -0.7 -0.7 -0.7	-	12 25 50 100	Vdc	
Startup input voltage	$V_{IN, Nom}$ = 5V $V_{IN, Nom}$ = 12V $V_{IN, Nom}$ = 24V $V_{IN, Nom}$ = 48V	-	-	4.5 9 18 36	Vdc	
Output voltage accuracy	V_{OUT}=3.3V, 5V All others	-	±2 ±1	±5 ±3	%	
Line regulation Full load, V_{IN} = $V_{IN, Min}$ to $V_{IN, Max}$		-	±0.2	±0.5	%	
Load regulation		-	±0.5	±1.0	%	

IOUT=5% to 100% of IOUT, rated						
Temperature coefficiency	Full load	-	0.02	0.03	%/°C	
Dynamic load response IOUT=25%~50%~75% of IOUT, rated	Peak deviation Recovery time	-	±2.5 0.5	±5 3	% V_{OUT} mS	
Output ripple and noise	20MHz bandwidth	-	80	150	mVp-p	
Remote On/Off control "Ctrl" pin open or logic high [ON] "Ctrl" pin grounded or logic low [OFF]	Logic high Logic low Ctrl pin current	3.5 0 -	- - 5	12 0.7 10	VDC VDC mA	Positive Logic
Output short circuit protection		Continuous, automatic recovery				

* Operating with less than 5% of rated load will not cause damage to the converters, but the performances data may not fall into the specifications, and stable operating is not assured.

General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit	Notes
Isolation voltage Tested for 1 minute	Input to Output	1500	-	-	VDC	
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	Input to Output	-	120	-	pF	
Switching frequency	Full load	-	250	-	KHz	
Operating temperature	No derating	-40	-	+85	°C	
Storage temperature		-55	-	+125	°C	
Storage humidity	None condensing	5	-	95	%RH	
Pin soldering resistance 1.5mm away from case for 10 sec		-	-	300	°C	
Case material		Black plastic UL94-V0				
Cooling method		Free air convection				
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z				
MTBF	MIL-HDBK-217F	>1,000,000 Hours, T_A=25°C				
Design based on standards		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 62368-1				
EMC	CE & RE	CISPR32, EN55032 Class B with [Fig 2]				

[Fig x] means connected with external circuit as shown in the Recommended External Circuit section	ESD RS EFT Surge CS	IEC/EN61000-4-2, Contact ±4kV, Criteria B IEC/EN61000-4-3, 10V/m, Criteria A IEC/EN61000-4-4, ±2kV, Criteria B [Fig 1] IEC/EN61000-4-5, Line to Line ±2kV, Criteria B [Fig 1] IEC/EN61000-4-6, 3Vrms, Criteria A
Size & Weight		22x9.5x12mm, 4.5g

* Switching frequency is measured at full load. The converter reduces the switching frequency at low load (less than 50% load) for better efficiency.

Recommended External Circuit

Typical External Circuit

*Models in this series are 100% tested in production using this circuit.

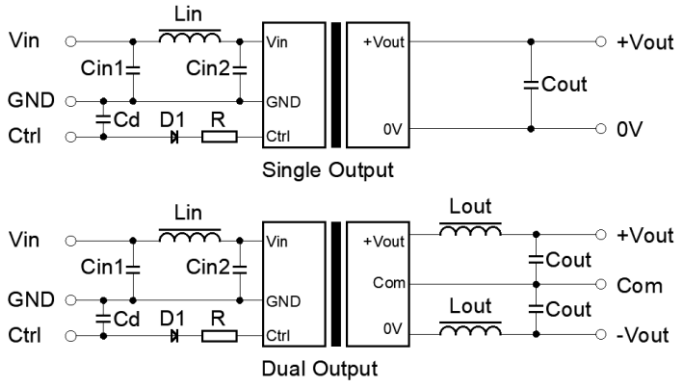


Figure 1: Typical Application Circuit

Recommended Component Spec

Item	V_{IN}=5V, 12V	V_{IN}=24V, 48V
Cin1	100uF	10uF
Cin2	47uF	1uF
Cout	100uF	100uF
Cd	47nF, 100V	47nF, 100V
Lin	4.7uH~12uH	4.7uH~12uH
Lout	2.2uH~10uH	2.2uH~10uH

EMC Enhancement for EN55032 Class B

*External circuits within block “Part 1” is to improve EMS, “Part 2” to improve EMI test performance, “Part 3” to use the remote on/off control function.

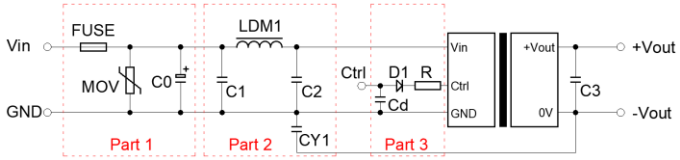


Figure 2. Circuit for EMC Enhancement

Recommended component spec

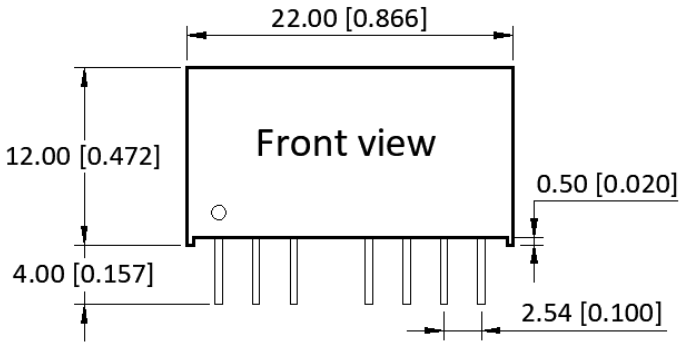
Items	C0	C1, C2	Cd	CY1	D1	LDM1	MOV
V_{IN}=5V	1K uF, 25V	4.7uF, 50V	47nF, 100V	1nF, 2KV	60V, 1A	12uH	-
V_{IN}=12V	1K uF, 25V	4.7uF, 50V	47nF, 100V	1nF, 2KV	60V, 1A	12uH	14D390K
V_{IN}=24V	330uF, 50V	4.7uF, 50V	47nF, 100V	1nF, 2KV	60V, 1A	12uH	14D560K
V_{IN}=48V	330uF, 100V	4.7uF, 100V	47nF, 100V	1nF, 2KV	60V, 1A	12uH	14D101K

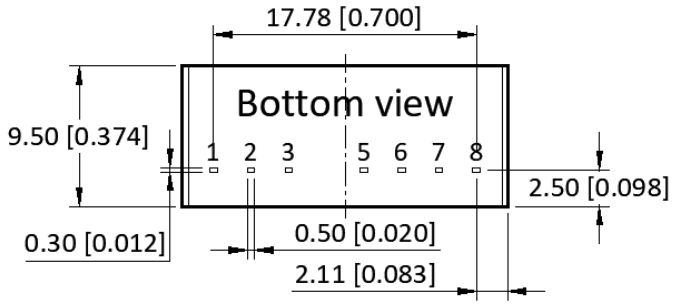
*C3 refer to C_{OUT} in above Figure 1, FUSE to be selected according to application needs.

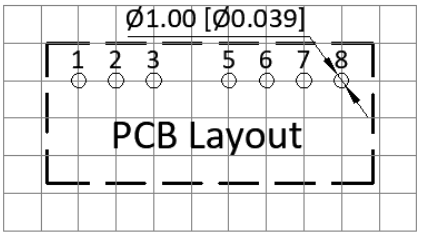
*Resistor R may be calculated using following formula: $R = \frac{V_C - V_D - 1.0}{I_C} - 300$

*V_C is the Ctrl to GND voltage, V_D is voltage drop on D1, I_C is current flow into Ctrl.

Mechanical Specifications







Pin Definition

Pin #	Single Out	Dual Out
1	GND	GND
2	V_{IN}	V_{IN}
3	Ctrl	Ctrl
5	No connection	No connection
6	$+V_{OUT}$	$+V_{OUT}$
7	$-V_{OUT}$ [0V]	COM
8	NC	$-V_{OUT}$

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

*** General tolerance: ±0.25 [±0.010]**

*** 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	26-08-2025	First issue of document