3W, DC/DC Power Converter

SDV03D

Introduction

The SDV03D series are 1.5KV isolated 3Watt DC/DC converters with standard DIP24 footprint. 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, under voltage, over voltage, over current, and short circuit protections. These converters are ideally suitable for measurement equipment, telecom, wireless network, industrial control system, where isolated, tightly regulated voltages are desired.

Features

- Rated power: 3W Max
- Input voltage range 2:1
- Regulated output
- High efficiency up to 86%
- Isolation voltage 1.5KVdc
- Operating temperature range: -40 ~ +85°C ambient
- No external components required for operating
- RoHS compliant
- Six side metal shielding
- Compact DIP24 package
- Under voltage, over voltage, over current, and short circuit protection
- Meet IEC/EN/UL 62368-1 CISPR32, EN55032
- 3 year warranty

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Part numbers

Model Number	Input Voltage Range [VDC] Nom.	Min.	Max.	V_{OUT} [VDC]	I_{OUT} [mA] Max.	Efficiency [%] Typ. Min. V_{IN}	Max. V_{IN}	Capacitive Load [uF] Max.
SDV03D0505	5	4.5~9	11	5	600	30	74	4700
SDV03D0512	5	4.5~9	11	12	250	12	77	2700
SDV03D0515	5	4.5~9	11	15	200	10	77	2200
SDV03D0505D	5	4.5~9	11	±5	±300	±15	76	2200
SDV03D0509D	5	4.5-9	11	±9	±166	±8	76	1800
SDV03D0512D	5	4.5~9	11	±12	±125	±6	78	1800
SDV03D0515D	5	4.5~9	11	±15	±100	±5	78	1000
SDV03D1203	12	9~18	20	3.3	909	46	74	4700
SDV03D1205	12	9~18	20	5	600	30	81	4700
SDV03D1212	12	9~18	20	12	250	12	83	2700
SDV03D1215	12	9~18	20	15	200	10	82	2200
SDV03D1224	12	9-18	20	24	125	6	83	1800
SDV03D1205D	12	9~18	20	±5	±300	±15	81	2200
SDV03D1209D	12	9~18	20	±9	±166	±8	84	2000
SDV03D1212D	12	9~18	20	±12	±125	±6	84	1800
SDV03D1215D	12	9~18	20	±15	±100	±5	85	1000
SDV03D2403	24	18~36	40	3.3	909	46	78	4700
SDV03D2405	24	18~36	40	5	600	30	81	4700
SDV03D2409	24	18~36	40	9	333	16	81	2700
SDV03D2412	24	18~36	40	12	250	12	86	2700
SDV03D2415	24	18~36	40	15	200	10	86	2200
SDV03D2424	24	18~36	40	24	125	6	85	1800
SDV03D2405D	24	18-36	40	±5	±300	±15	82	2200
SDV03D2412D	24	18-36	40	±12	±125	±6	84	1800

SDV03D2415D	24	18-36	40	±15	±100	±5	84	1000
SDV03D4803	48	36~75	80	3.3	909	46	76	4700
SDV03D4805	48	36~75	80	5	600	30	82	4700
SDV03D4812	48	36~75	80	12	250	12	86	2700
SDV03D4815	48	36~75	80	15	200	10	86	2200
SDV03D4824	48	36-75	80	24	125	6	84	1000
SDV03D4805D	48	36~75	80	±5	±300	±15	82	2200
SDV03D4812D	48	36~75	80	±12	±125	±6	84	1800
SDV03D4815D	48	36~75	80	±15	±100	±5	85	1000
SDV03D4824D	48	36-75	80	±24	±63	±3	84	680

* Only typical models are listed. Other models may be available upon request.
* Input voltage exceed the Max. value may cause permanent damage.

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 V_{IN} =48V	-	789 316 152 77	-	mA	
Input current No load	V_{IN} =5V V_{IN} =12V V_{IN} =24V V_{IN} =48V	-	40 30 15 5	-	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	Load=5%~100% No load	-	±1.0 ±1.5	±3.0 ±5.0	%	
Line regulation Full load, V_{IN}=$V_{IN, Min}$ to $V_{IN, Max}$		-	±0.2	±0.5	%	
Load regulation I_{OUT}=5% to 100% of $I_{OUT, rated}$		-	±0.2	±0.5	%	
Output ripple and noise 20MHz bandwidth	V_{OUT}=24V Others	-	100 50	120 80	mVp-p	
Temperature coefficiency	Full load	-	±0.02	±0.03	%/°C	

Dynamic load response I_{OUT}=25%~50%~75% of $I_{OUT, rated}$	Peak deviation Recovery time	-	±2 0.5	±5 2.0	% V_{OUT} mS	
Output short circuit protection		Continuous, automatic recovery				
Input filter		PI filter				
Hot plug		None				

* 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.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit	Notes
Isolation voltage 1 minute, leakage current 1mA max.	I/P to O/P	1500	-	-	VDC	
Isolation resistance Tested at 500VDC	I/P to O/P	1000	-	-	M ohm	
Isolation capacitance 100KHz, 0.1V	I/P to O/P	-	120	-	pF	
Switching frequency* Full Load		-	200	-	KHz	
Operating temperature	See "Derating Curve"	-40	-	+85	°C	
Storage temperature	-	-55	-	+125	°C	
Storage humidity	None condensing	-	-	95	%RH	PWM mode
Pin soldering temperature	-	-	-	300	°C	
Cooling method		Free air convection				
Case material		Aluminum alloy				
MTBF	MIL-HDBK-217F	>1,000,000 Hours, T_A=25°C				

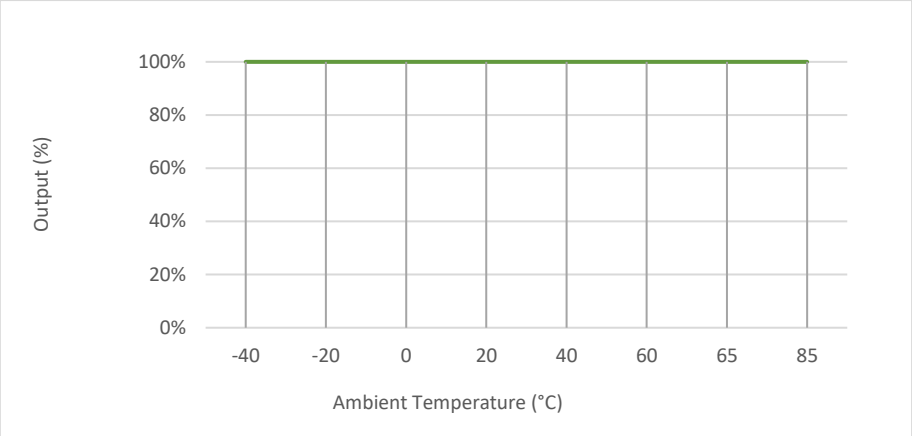
Design based on standards		UL/EN/IEC 62368-1
Safety certifications		EN/IEC 62368-1
EMC		CISPR32, EN55032 Class B with external circuit IEC/EN61000-4-2, 3, 4, 5, 6, 29
Size, and Weight	Default option	32.0 x 20.3 x 12.00 mm, 14g

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

Characteristics Curves

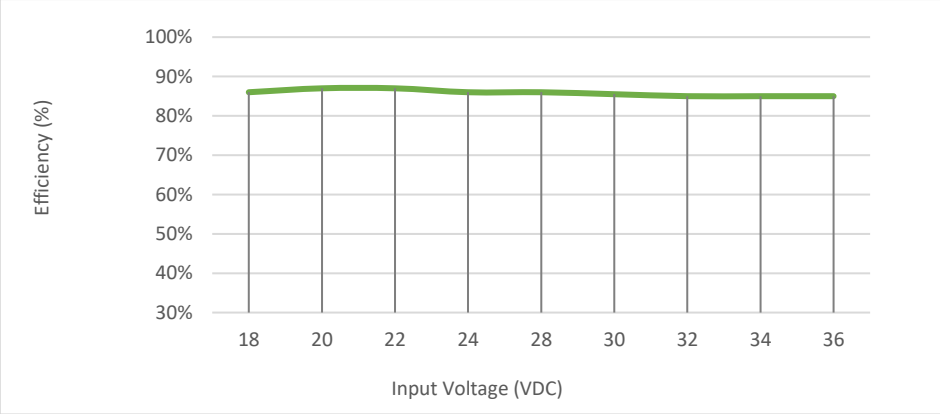
Derating Curve

Output vs Ambient Temperature



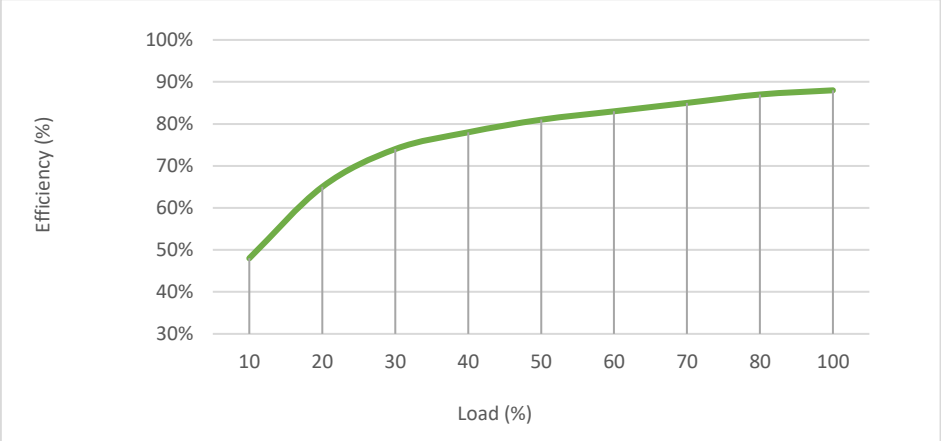
Efficiency Curve

Efficiency vs Input Voltage

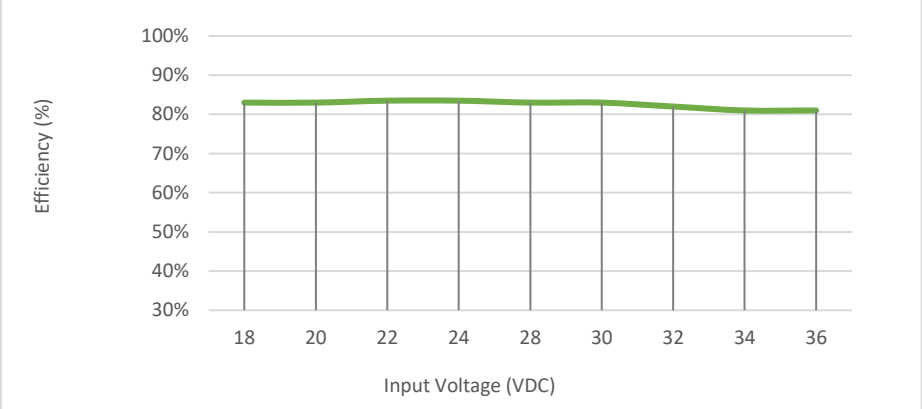


SDV03D2405, with full Load

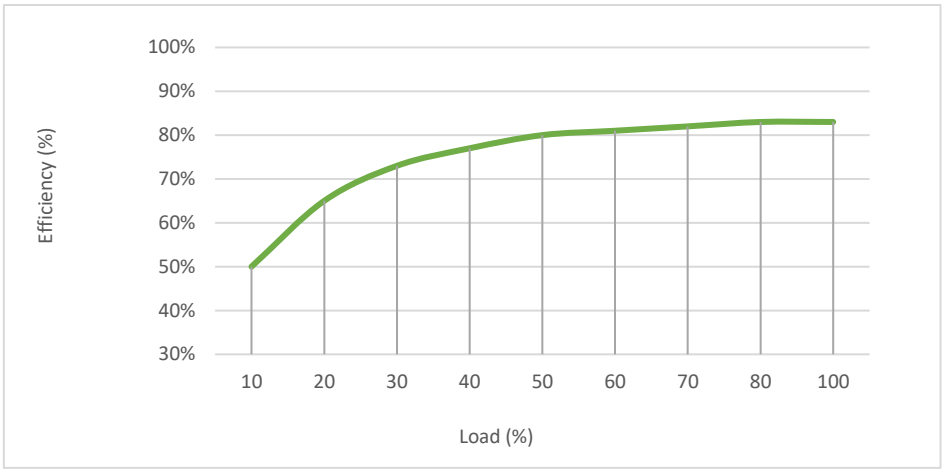
Efficiency vs Load



SDV03D2405, with nominal input voltage



SDV03D2415D, with full Load



SDV03D2415D, with nominal input voltage

Recommended External Circuit

Typical Application Circuit

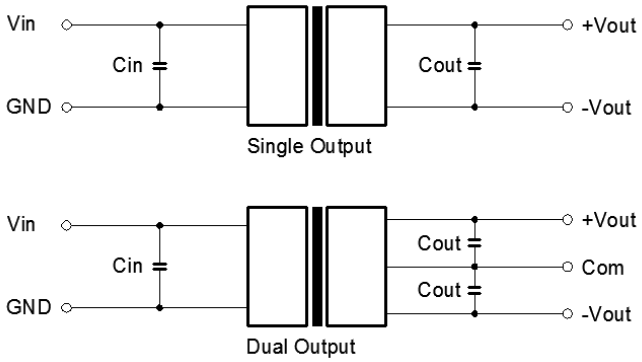


Figure 1: Typical External Circuit

Notes:

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

*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.

Recommend component specifications

Input voltage	5, 12V	24, 48V
C_{IN}	100uF	10...47uF
C_{OUT}	10uF	10uF

EMC Enhancement for EN55032 Class B

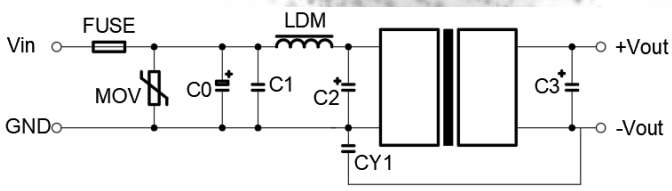


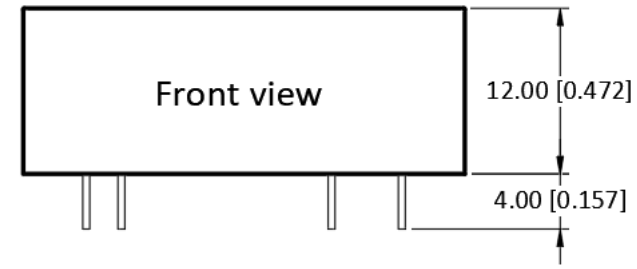
Figure 2. Circuit for EMC enhancement

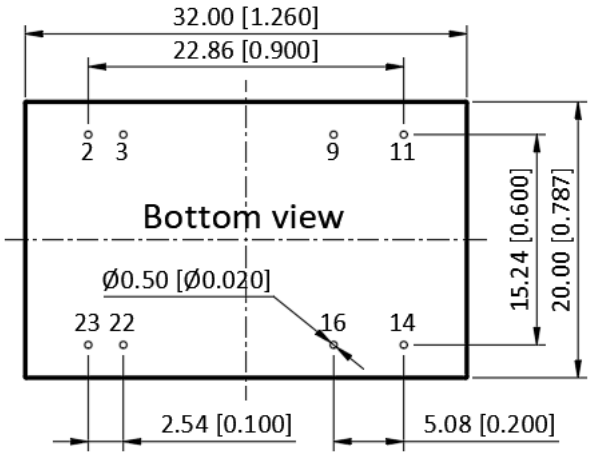
Recommended component spec

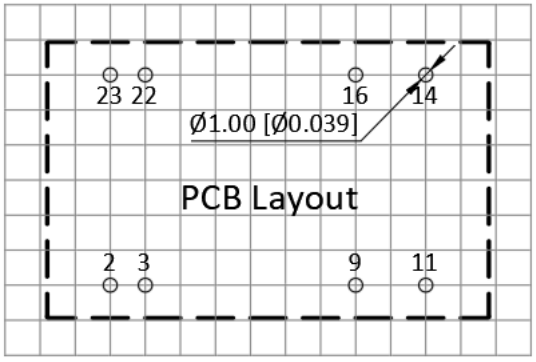
Component	LDM1	MOV	C0	C1, C2	CY1
V_{IN}=5V	12uH	-	1000uF, 16V	4.7uF, 50V	1nF, 2KV
V_{IN}=12V	12uH	14D330K	1000uF, 25V	4.7uF, 50V	1nF, 2KV
V_{IN}=24V	12uH	20D470K	330uF, 50V	4.7uF, 50V	1nF, 2KV
V_{IN}=48V	12uH	14D101K	330uF, 100V	4.7uF, 100V	1nF, 2KV

* Fuse to be selected according to application needs.
* C3 refer to C_{OUT} in Table 1

Mechanical Specifications







Pin Definition

Pin #	Single Out	Dual Out
2, 3	GND	GND
9	No Pin	0V
11	NC	$-V_{OUT}$
14	$+V_{OUT}$	$+V_{OUT}$
16	0V	0V
22, 23	V_{IN}	V_{IN}

*** 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**

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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