

10W, DC/DC Power Converter

SDV10D

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Introduction

The SDV10D series are 1.5KV isolated 10Watt DC/DC converters with compact DIP 24PIN 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, remote on/off control, under voltage, over voltage, over current, and short circuit protections. These converters are ideally suitable for battery operated equipment, measurement equipment, telecom, wireless network, industrial control system, where isolated.

Features

- Rated power: 10W Max
- Input voltage range: 2:1
- Regulated output
- High efficiency up to 88%
- Isolation voltage 1.5KVDC
- Remote On/Off control
- Standby power 0.11W
- Operating temperature range: -40 ~ +85°C ambient
- RoHS compliant
- Compact DIP24 package
- Under voltage, over voltage, over current, and short circuit protection
- Meet UL/EN/IEC 62368-1
- 3 year warranty

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Part numbers

Model Number	Input Voltage [VDC]			V _{OUT} [VDC]	Output Current [mA]		Efficiency [%] Typ.	Capacitive Load [uF] Max.
	Nom.	Range	*Max.		Max.	Min.		
SDV10D0503	5	4.5~9	12	3.3	2400	0	83	1200
SDV10D0505	5	4.5~9	12	5	2000	0	83	1000
SDV10D0512	5	4.5~9	12	12	833	0	85	470
SDV10D0515	5	4.5~9	12	15	667	0	85	330
SDV10D0524	5	4.5~9	12	24	416	0	87	100
SDV10D0505D	5	4.5~9	12	±5	±1000	0	82	1000
SDV10D0512D	5	4.5~9	12	±12	±416	0	86	470
SDV10D0515D	5	4.5~9	12	±15	±333	0	87	330
SDV10D1203	12	9-18	20	3.3	2400	0	87	1200
SDV10D1205	12	9-18	20	5	2000	0	83	1000
SDV10D1212	12	9-18	20	12	833	0	87	470
SDV10D1215	12	9-18	20	15	667	0	87	330
SDV10D1224	12	9-18	20	24	416	0	88	100
SDV10D1205D	12	9-18	20	±5	±1000	0	83	1000
SDV10D1212D	12	9-18	20	±12	±416	0	87	470
SDV10D1215D	12	9-18	20	±15	±333	0	87	330
SDV10D2403	24	18-36	40	3.3	2400	0	87	1200
SDV10D2405	24	18-36	40	5	2000	0	83	1000
SDV10D2412	24	18-36	40	12	833	0	87	470
SDV10D2415	24	18-36	40	15	667	0	87	330
SDV10D2424	24	18-36	40	24	416	0	88	100
SDV10D2405D	24	18-36	40	±5	±1000	0	83	1000
SDV10D2412D	24	18-36	40	±12	±416	0	87	470

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SDV10D2415D	24	18-36	40	±15	±333	0	87	330
SDV10D4803	48	36-75	80	3.3	2400	0	87	1200
SDV10D4805	48	36-75	80	5	2000	0	83	1000
SDV10D4812	48	36-75	80	12	833	0	87	470
SDV10D4815	48	36-75	80	15	667	0	87	330
SDV10D4824	48	36-75	80	24	416	0	88	100
SDV10D4805D	48	36-75	80	±5	±1000	0	83	1000
SDV10D4812D	48	36-75	80	±12	±416	0	87	470
SDV10D4815D	48	36-75	80	±15	±333	0	87	330

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

* Input voltage exceed the Max. value may cause permanent damage.

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Electrical characteristics

Unless otherwise indicated, specifications are measured at $T_A=25^{\circ}\text{C}$, nominal input voltage, full load after warm up.

Parameter	Condition	Min.	Type	Max.	Unit	Note
Reflected ripple current	$V_{IN, Nom} = 5V$		60			
	$V_{IN, Nom} = 12V$	-	50	-	mA	
	$V_{IN, Nom} = 24V$		40			
	$V_{IN, Nom} = 48V$		30			
Input voltage surge 1 second max	$V_{IN, Nom} = 5V$	-0.7		15		
	$V_{IN, Nom} = 12V$	-0.7	-	25	VDC	
	$V_{IN, Nom} = 24V$	-0.7		50		
	$V_{IN, Nom} = 48V$	-0.7		100		
Startup input voltage	$V_{IN, Nom} = 5V$			4.5		
	$V_{IN, Nom} = 12V$	-	-	9	VDC	
	$V_{IN, Nom} = 24V$			18		
	$V_{IN, Nom} = 48V$			36		
Input under voltage shutdown	$V_{IN, Nom} = 5V$	3	4			
	$V_{IN, Nom} = 12V$	5.5	6.5	-	VDC	
	$V_{IN, Nom} = 24V$	12	15.5			
	$V_{IN, Nom} = 48V$	25	30.5			
Startup time		-	10	-	mS	
Remote On/Off control "Ctrl" pin open or logic high [ON] "Ctrl" pin grounded or logic low [OFF]	Logic high	3.5	-	12	VDC	Positive Logic
	Logic low	0	-	0.7	VDC	

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Output voltage accuracy $I_{OUT}=0$ to 100%	Main output		± 0.5	± 2	%	
	Other output	-	± 1.0	± 3		
Line regulation Full load, $V_{IN} = V_{IN, Min}$ to $V_{IN, Max}$	Main output		± 0.2	± 0.5	%	
	Other output	-	± 0.5	± 1.0		
Load regulation $I_{OUT}=5\%$ to 100% of I_{OUT} , rated	Main output		± 0.5	± 1.0	%	
	Other output	-	± 0.5	± 1.5		
Output ripple and noise 20MHz bandwidth	$V_{OUT}=3.3, 5V$		40	80	mVp-p	
	Others	-	40	100		
Cross regulation I_{OUT} , main=50% of I_{OUT} , rated, I_{OUT} , other=10% to 100% of I_{OUT} , rated	Dual output	-	-	± 5	%	
Temperature coefficient	Full load	-	-	± 0.03	%/ $^{\circ}C$	
Dynamic load response $I_{OUT}=25\% \sim 50\% \sim 75\%$ of I_{OUT} , rated	Peak deviation**	-	± 5	± 8	% V_{OUT}	** $V_{OUT}=3.3, 5V$
	Peak deviation		± 3	± 5	% V_{OUT}	
	Recovery time		300	500	μS	

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Output over voltage protection		110	-	160	% V _{OUT}	
Output over current protection	V _{OUT} =3.3, 5V	110	160	230	% I _{OUT}	
	Others	110	140	190		
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	-	2000	-	pF	
Switching frequency* Full load		-	312.5	-	KHz	PWM mode
Operating temperature	See "Derating Curve"	-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	
Cooling method		Free air convection				
Case material		Aluminum alloy				

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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		UL/EN/IEC 62368-1
Safety certifications		IEC/EN 62368-1
EMC		CISPR32, EN55032 Class B with external circuit IEC/EN61000-4-2, 3, 4, 5, 6
Size, and Weight	Default option	32.0 x 20.3 x 11.1 mm, 12.7g

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

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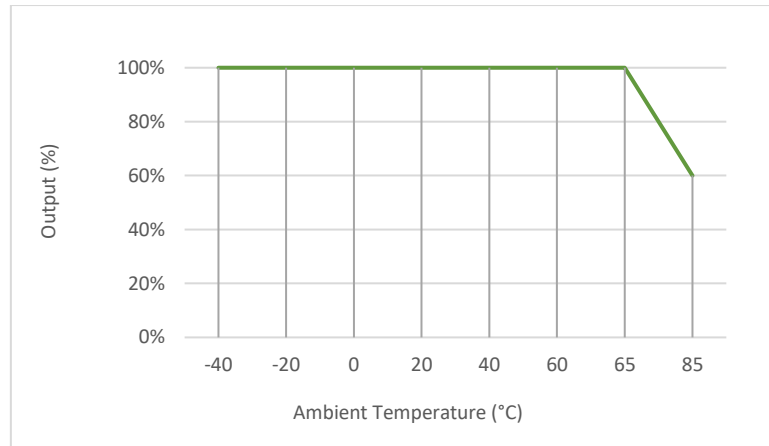
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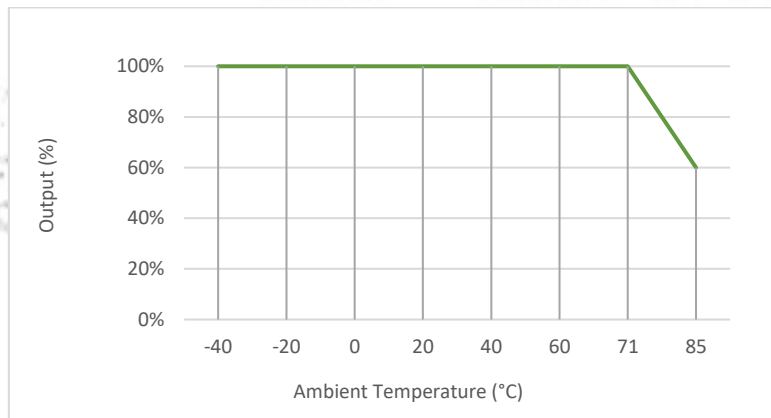
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



$V_{OUT} = \pm 5V$



$V_{OUT} = \text{Others}$

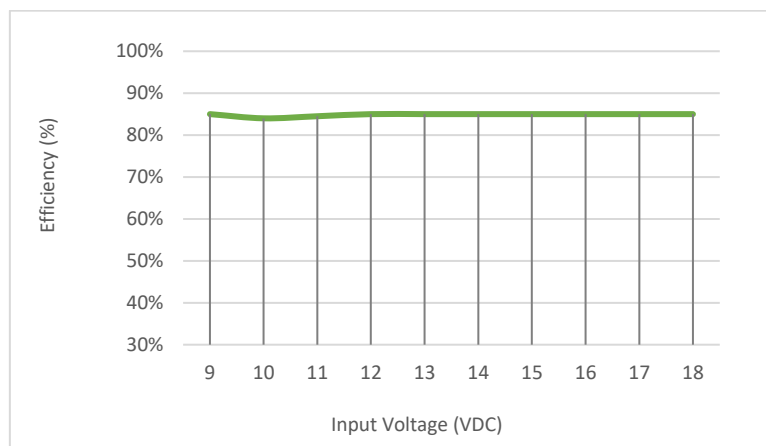
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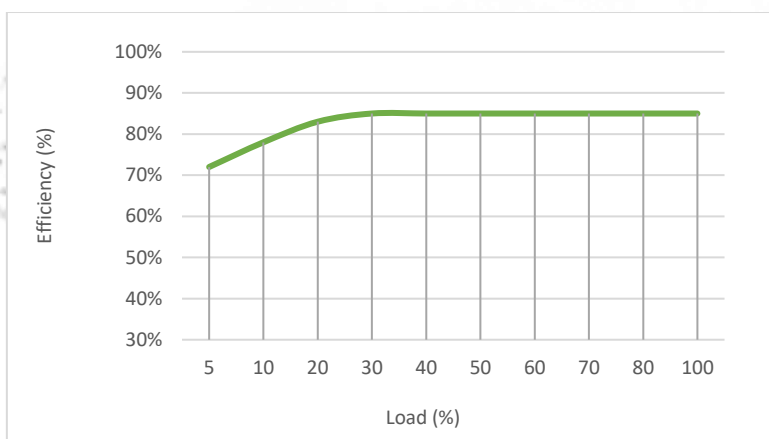


Efficiency Curve

Efficiency vs Input Voltage



SDV10D2405, with full Load



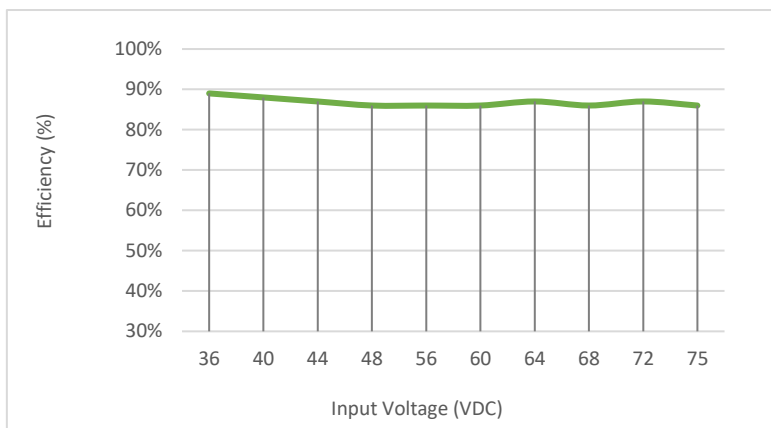
SDV10D4812, with full Load

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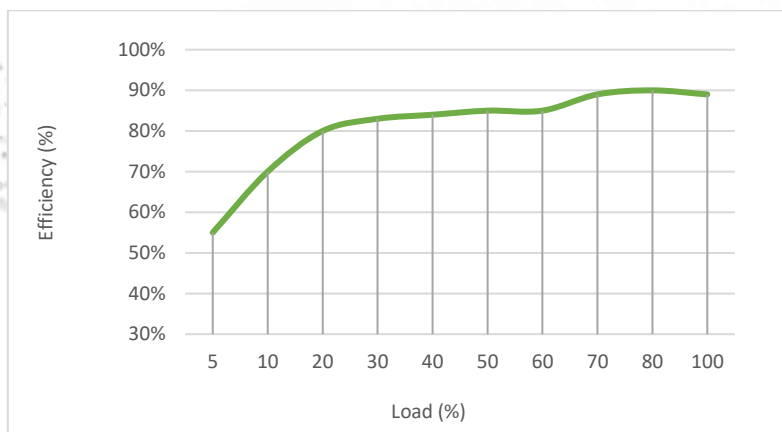
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Efficiency vs Load



SDV10D2405, with nominal input voltage



SDV10D4812, with nominal input voltage

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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.

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

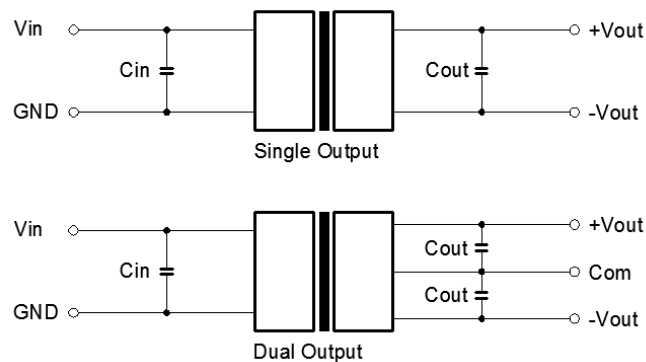


Figure 1: Typical Application circuit

Recommended component spec

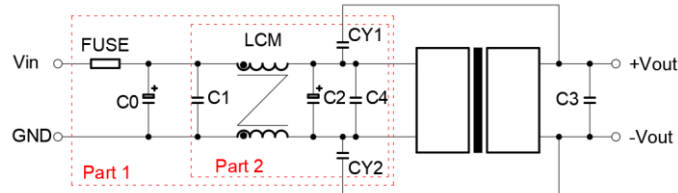
Input voltage	12, 24V	48V
C_{IN}	100uF, 35V	10...47uF, 100V
C_{OUT}	10uF	10uF

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EMC Enhancement for EN55032 Class B

$V_{IN}=3.3, 5V$



$V_{IN}=Others$

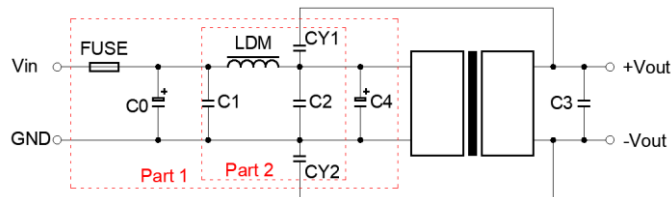


Figure 2. Circuit for EMC enhancement

Recommended component spec

Component	LCM1	LDM1	C0, C4	C1, C2	CY1, CY2
$V_{IN}=12V$	1.4~1.7mH	10uH	470uF, 35V	10uF, 50V	1nF, 2KV
$V_{IN}=24V$	1.4~1.7mH	10uH	330uF, 50V	10uF, 50V	1nF, 2KV
$V_{IN}=48V$	1.4~1.7mH	10uH	330uF, 100V	10uF, 100V	1nF, 2KV

* Fuse to be selected according to application needs.

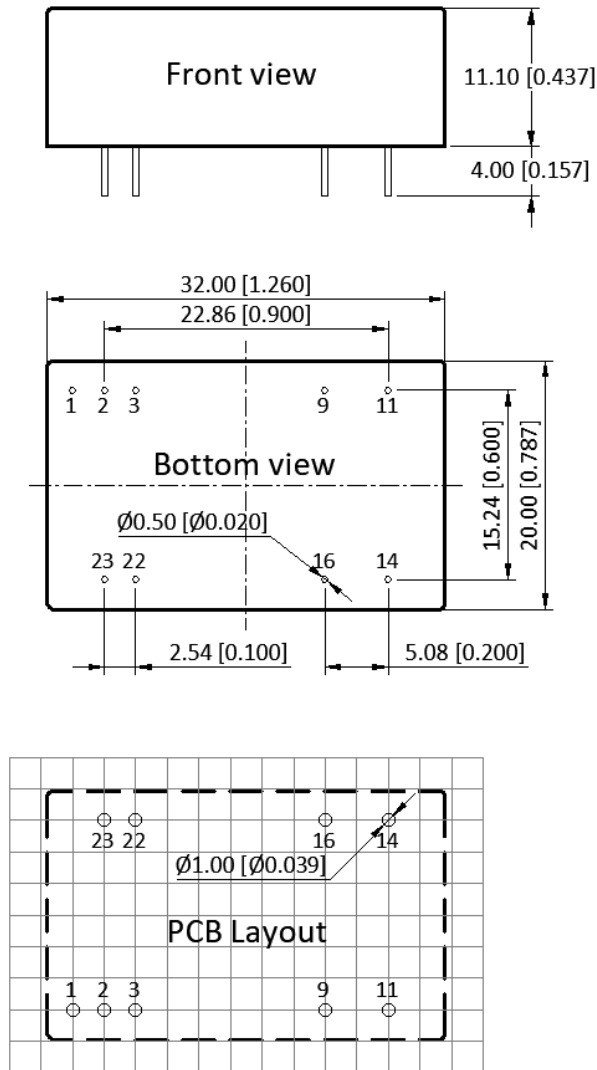
* C3 refer to C_{OUT} in Table 1

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Mechanical Specifications



Pin Definition

Pin #	Single Out	Dual Out
1	Ctrl	Ctrl
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