

3W, DC/DC Power Converter

SDU03D



Introduction

The SDU03D 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 4:1 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 4:1
- Regulated 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
- Six side metal shielding
- Compact DIP24 package
- Short circuit protection
- Designed to meet UL62368-1, IEC/EN62368-1
- 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.		
SDU03D2403	24	9~36	40	3.3	909	45	75	2700
SDU03D2405	24	9~36	40	5	600	30	80	2200
SDU03D2409	24	9~36	40	9	333	17	80	1000
SDU03D2412	24	9~36	40	12	250	12	81	680
SDU03D2415	24	9~36	40	15	200	10	82	680
SDU03D2424	24	9~36	40	24	125	6	82	470
SDU03D2405D	24	9~36	40	±5	±300	±15	80	1000
SDU03D2412D	24	9~36	40	±12	±125	±6	81	330
SDU03D2415D	24	9~36	40	±15	±100	±5	82	220
SDU03D4803	48	18~75	80	3.3	909	45	76	2700
SDU03D4805	48	18~75	80	5	600	30	79	2200
SDU03D4809	48	18~75	80	9	333	17	81	1000
SDU03D4812	48	18~75	80	12	250	12	82	680
SDU03D4815	48	18~75	80	15	200	10	83	680
SDU03D4824	48	18~75	80	24	125	6	81	470
SDU03D4805D	48	18~75	80	±5	±300	±15	80	1000
SDU03D4812D	48	18~75	80	±12	±125	±6	82	330
SDU03D4815D	48	18~75	80	±15	±100	±5	83	220

* 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
Input current	$V_{IN, Nom}=24\text{V}$	-	155	-	mA	
Full load	$V_{IN, Nom}=48\text{V}$		77			
Input current	$V_{IN, Nom}=24\text{V}$	-	10	-	mA	
No load	$V_{IN, Nom}=48\text{V}$		8			
Reflected ripple current		-	30	-	mA	
Input voltage surge	$V_{IN, Nom} = 24\text{V}$	-0.7	-	50	Vdc	
1 second max	$V_{IN, Nom} = 48\text{V}$	-0.7		100		
Startup input voltage	$V_{IN, Nom} = 24\text{V}$	-	-	9	Vdc	
	$V_{IN, Nom} = 48\text{V}$			18		
Output voltage accuracy	5% to 100% load	-	± 1.0	± 3	%	
	No load		± 1.5	± 5		
Line regulation	Main output	-	± 0.2	± 0.5	%	
Full load, $V_{IN} = V_{IN, Min}$ to $V_{IN, Max}$	Other output		± 0.5	± 1.0		
Load regulation	Main output	-	± 0.5	± 1.0	%	
$I_{OUT}=5\%$ to 100% of $I_{OUT, rated}$	Other output		± 0.5	± 1.5		
Temperature coefficient	Full load	-	-	0.03	%/ $^{\circ}\text{C}$	
Output ripple and noise		-	50	100	mV	
20MHz bandwidth, peak to peak						

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Dynamic load response IOUT=25%~50%~75% of IOUT, rated	Peak deviation	-	±2	±5	% V _{OUT}	
	Recovery time		0.5	3	mS	
Output short circuit protection		Continuous, automatic recovery, hiccup				

* 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	-	250	-	KHz	
Operating temperature	See "Derating Curve"	-40	-	+85	°C	
Storage temperature		-55	-	+125	°C	
Storage humidity	None condensing	5	-	95	%RH	
Pin soldering temperature		-	-	300	°C	
Vibration		IEC/EN61373 – Category 1, Grade B				
Cooling method		Free air convection				
Case material		Aluminum alloy				
MTBF	MIL-HDBK- 217F	>1,000,000 Hours, T _A =25°C				

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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
Size, and Weight		32 x 20 x 11.1 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.

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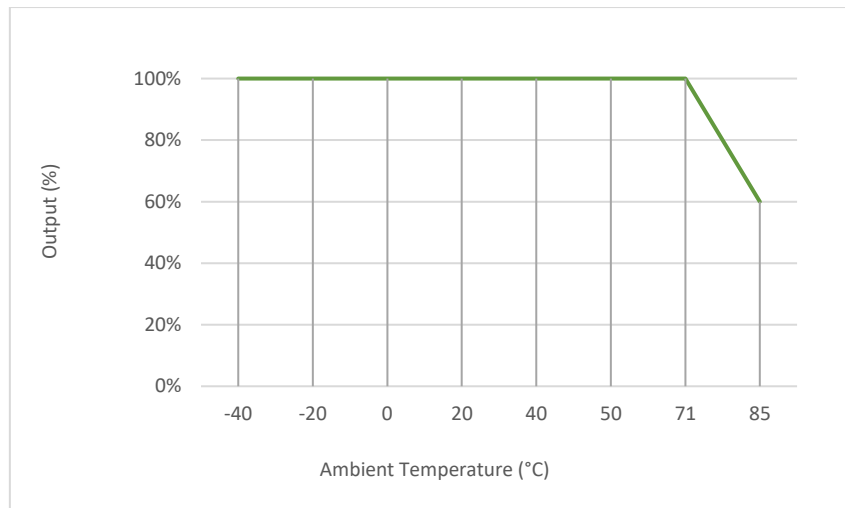
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Characteristics Curves

Derating Curve

Output vs Ambient Temperature



No heatsink

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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.

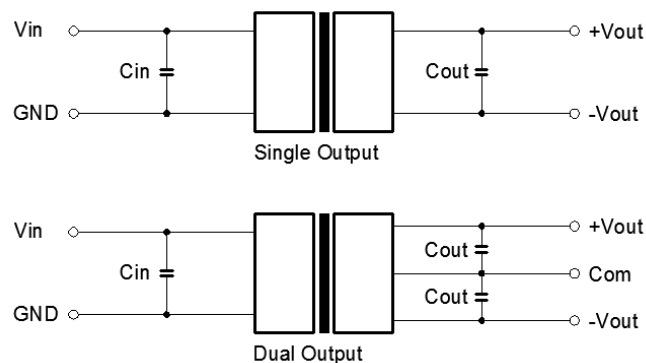


Figure 1: Typical External circuit

Recommended component spec

Input voltage	24, 48V
C_{IN}	10...47 μ F, 100V
C_{OUT}	10 μ F, 50V

Circuit for EMC Enhancement

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

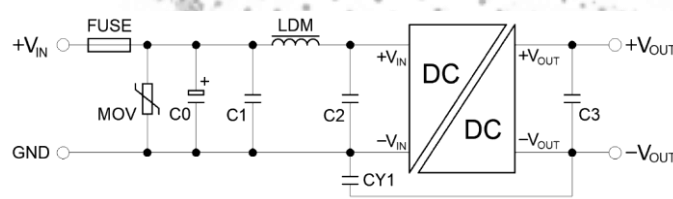


Figure 2: Circuit for EMC Enhancement

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Recommended component spec

Component	MOV	LDM	C0	C1, C2	C3	CY1
V_{IN}=24V	S20K30	12uH	330uF, 50V	4.7uF, 50V	10uF, 50V	1nF, 2KV
V_{IN}=48V	S14K60	12uH	330uF, 100V	4.7uF, 100V	10uF, 50V	1nF, 2KV

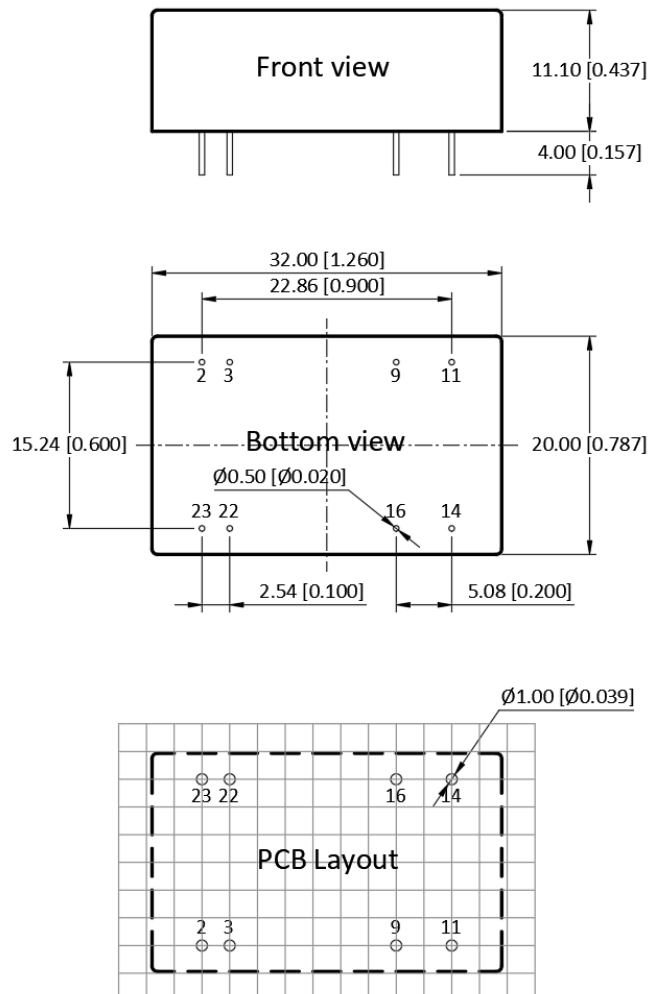
* "Fuse" to be selected according to application needs. "C3" refer to relative C_{OUT} values in Table 1.

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Mechanical Specifications



Pin Definition

Pin #	Single Out	Dual Out
2, 3	GND	GND
9	No pin	COM
11	No connection	-V _{OUT}
14	+V _{OUT}	+V _{OUT}
16	0V	COM
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