

6W, DC/DC Power Converter

SDU06D

SUMMIT
ELECTRONICS



Introduction

The SDU06D series are 1.5KV isolated 6Watt 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: 6W Max
- Input voltage range 4:1
- Regulated single or dual out
- High efficiency up to 88%
- Standby power 0.12W only
- 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
- 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.		
SDU06D2403	24	9~36	40	3.3	1500	0	77	1800
SDU06D2405	24	9~36	40	5	1200	0	82	1000
SDU06D2409	24	9~36	40	9	667	0	83	680
SDU06D2412	24	9~36	40	12	500	0	85	470
SDU06D2415	24	9~36	40	15	400	0	86	220
SDU06D2424	24	9~36	40	24	250	0	86	100
SDU06D2405D	24	9~36	40	±5	±600	0	82	680
SDU06D2409D	24	9~36	40	±9	±333	0	84	220
SDU06D2412D	24	9~36	40	±12	±250	0	85	330
SDU06D2415D	24	9~36	40	±15	±200	0	88	220
SDU06D2424D	24	9~36	40	±24	±125	0	86	100
SDU06D4803	48	18~75	80	3.3	1500	0	80	1800
SDU06D4805	48	18~75	80	5	1200	0	84	1000
SDU06D4809	48	18~75	80	9	667	0	85	680
SDU06D4812	48	18~75	80	12	500	0	87	470
SDU06D4815	48	18~75	80	15	400	0	88	220
SDU06D4824	48	18~75	80	24	250	0	87	100
SDU06D4805D	48	18~75	80	±5	±600	0	83	680
SDU06D4812D	48	18~75	80	±12	±250	0	87	330
SDU06D4815D	48	18~75	80	±15	±200	0	88	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 Full load	$V_{IN, Nom}=24V$	-	302	-	mA	
	$V_{IN, Nom}=48V$		156			
Input current No load	$V_{IN, Nom}=24V$	-	5	-	mA	
	$V_{IN, Nom}=48V$		4			
Reflected ripple current		-	20	-	mA	
Input voltage surge 1 second max	$V_{IN, Nom} = 24V$	-0.7	-	50	Vdc	
	$V_{IN, Nom} = 48V$	-0.7		100		
Startup input voltage	$V_{IN, Nom} = 24V$	-	-	9	Vdc	
	$V_{IN, Nom} = 48V$			18		
Input under voltage shutdown	$V_{IN, Nom} = 24V$	5.5	6.5	-	Vdc	
	$V_{IN, Nom} = 48V$	14.0	15.5			
Output voltage accuracy		-	± 1	± 3	%	
Output voltage balance Dual output with balanced load		-	± 0.5	± 1.5	%	
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		

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Temperature coefficient	Full load	-	-	0.03	%/°C	
Output ripple and noise 20MHz bandwidth, peak to peak		-	60	85	mV	
Cross regulation Dual output, IOUT, main=50% of IOUT, rated, IOUT, other=10% to 100% of IOUT, rated		-	-	±5	%	
Dynamic load response IOUT=25%~50%~75% of IOUT, rated	Peak deviation** Peak deviation Recovery time	-	±5 ±3 300	±8 ±5 500	% V _{OUT} % V _{OUT} μs	**V _{OUT} =3.3V, 5V, ±5V
Output over voltage protection		110	-	160	% V _{OUT}	
Output over current protection		110	140	190	% I _{OUT}	
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	-	1000	-	pF	
Switching frequency*	Full load	-	300	-	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 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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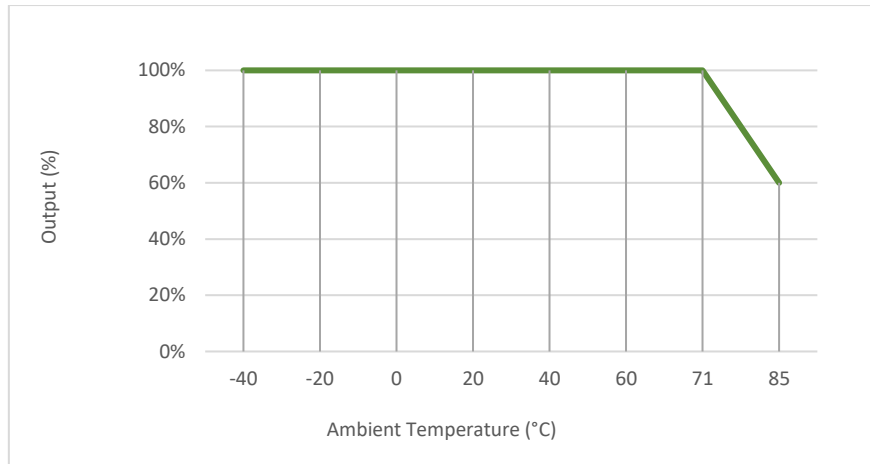
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Characteristics Curves

Derating Curve

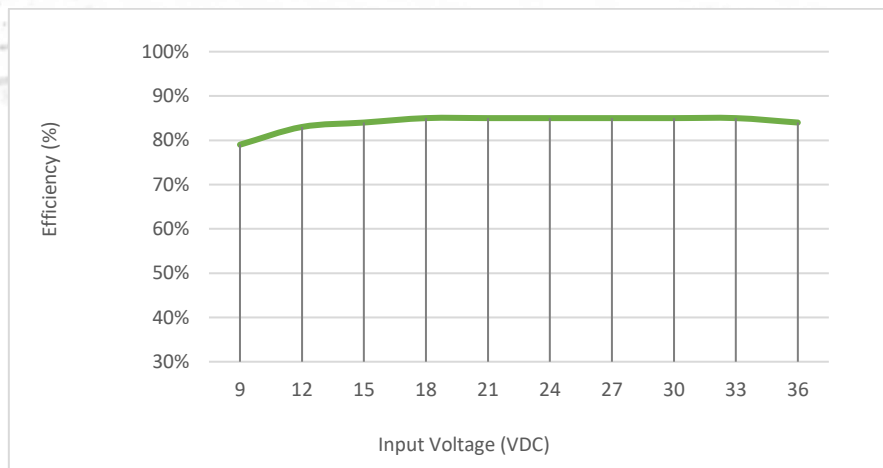
Output vs Ambient Temperature



No heatsink

Efficiency Curve

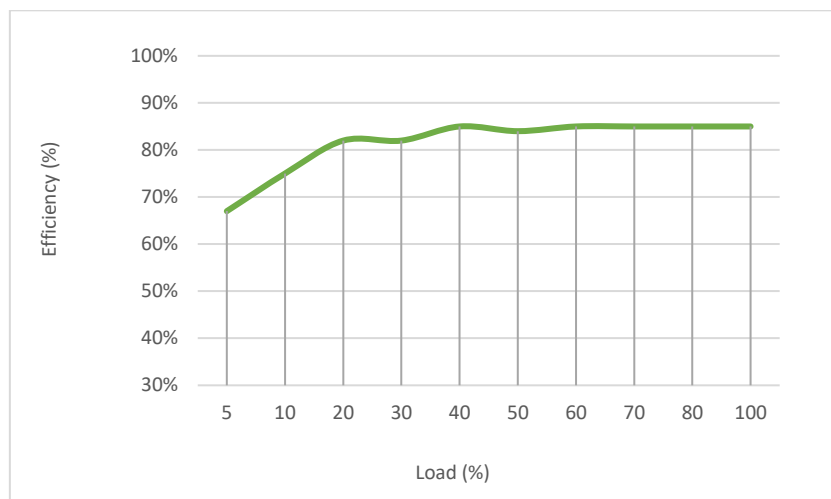
Efficiency vs Input Voltage



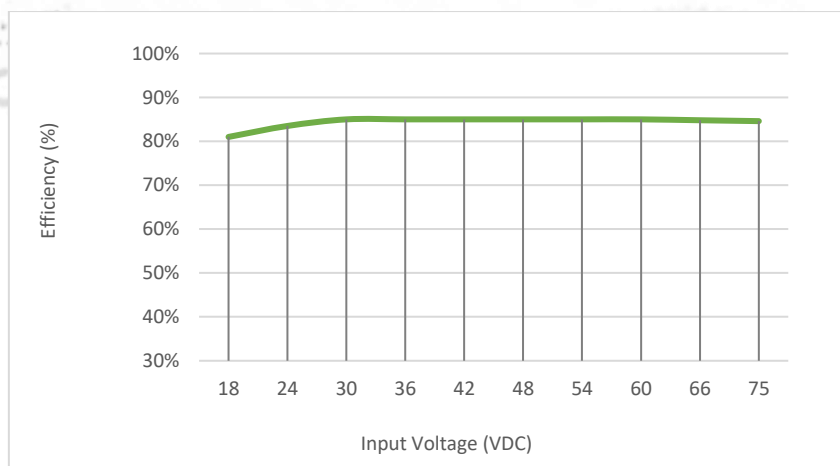
SDU06D2405, with full Load

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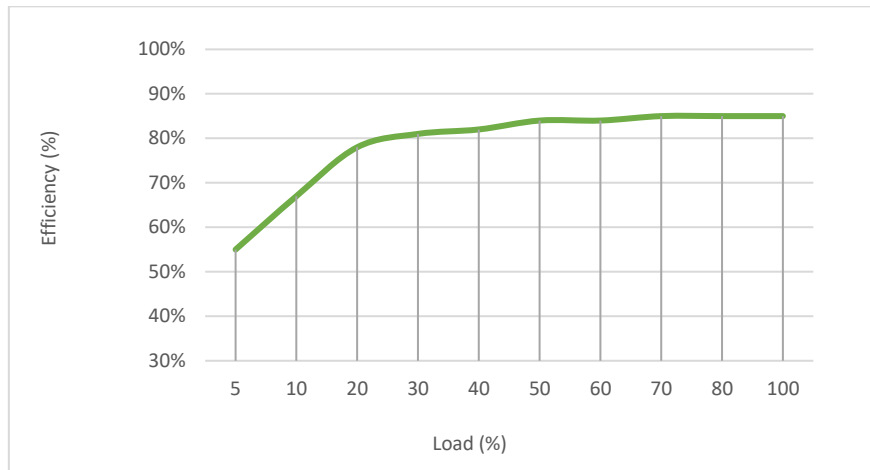
SDU06D2405, with nominal input voltage



SDU06D4815D, with full Load

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SDU06GD4815D, 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.

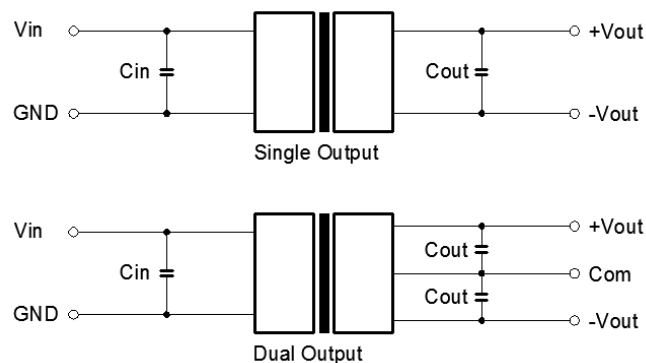


Figure 1: Typical External circuit

Recommended component spec

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

Circuit for EMC Enhancement

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

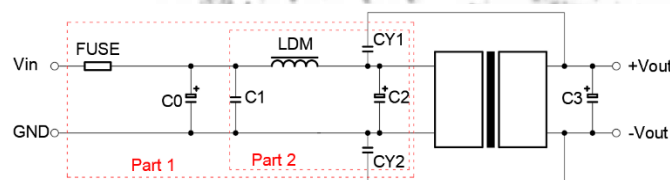


Figure 2: Circuit for EMC Enhancement

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Recommended component spec

Component	LDM	C0, C2	C1	CY1, CY2
V_{IN}=24V	4.7uH	330uF, 50V	1uF, 50V	1nF, 2KV
V_{IN}=48V	4.7uH	330uF, 100V	1uF, 100V	1nF, 2KV

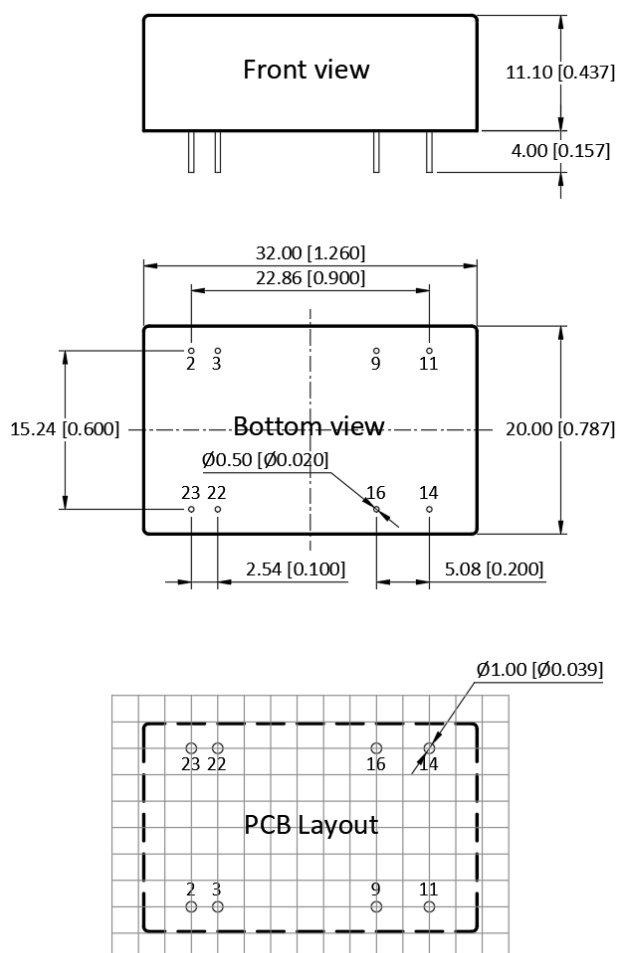
* "Fuse" to be selected according to application needs. "C4" refer to relative C_{OUT} values in Table 1.

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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