

20W, DC/DC Power Converter

SDU20H

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Introduction

The SDU20H series are 1.5KV isolated 20Watt DC/DC converters with standard DIP2"x1" 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, remote on/off control, output trimming, under voltage, over voltage, over current, and short circuit protections. These converters are ideally suitable for industrial control system, measurement equipment, telecom, wireless network.

Features

- Rated power: 20W Max
- Input voltage range 4:1
- Regulated output with 10% trimming range
- High efficiency up to 90%
- Isolation voltage 1.5KVDC
- Remote On/Off control
- Operating temperature range: -40 ~ +85°C ambient
- RoHS compliant
- Standard 2"x1" package
- Six-sided metal shielding package
- Under voltage, over voltage, over current, and short circuit protection
- Designed to 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.		
SDU20H2403	24	9~36	40	3.3	5000	0	86	10000
SDU20H2405	24	9~36	40	5	4000	0	88	10000
SDU20H2409	24	9~36	40	9	2222	0	89	4700
SDU20H2412	24	9~36	40	12	1667	0	89	1600
SDU20H2415	24	9~36	40	15	1333	0	90	1000
SDU20H2424	24	9~36	40	24	834	0	90	500
SDU20H2405D	24	9~36	40	±5	±2000	0	86	4800
SDU20H2409D	24	9~36	40	±9	±1111	0	88	1000
SDU20H2412D	24	9~36	40	±12	±834	0	88	800
SDU20H2415D	24	9~36	40	±15	±667	0	88	625
SDU20H4803	48	18~75	80	3.3	5000	0	86	10000
SDU20H4805	48	18~75	80	5	4000	0	86	10000
SDU20H4809	48	18~75	80	9	2222	0	89	4700
SDU20H4812	48	18~75	80	12	1667	0	87	1600
SDU20H4815	48	18~75	80	15	1333	0	90	1000
SDU20H4824	48	18~75	80	24	834	0	88	500
SDU20H4805D	48	18~75	80	±5	±2000	0	86	4800
SDU20H4812D	48	18~75	80	±12	±834	0	88	800
SDU20H4815D	48	18~75	80	±15	±667	0	89	625

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

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

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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, $V_{IN, Nom}=24\text{V}$	$V_{OUT}=3.3\text{V}$	-	799	-	mA	
	$V_{OUT}=5\text{V}$		969			
	Others		947			
Input current Full load, $V_{IN, Nom}=48\text{V}$	$V_{OUT}=3.3\text{V}$		400	-	mA	
	$V_{OUT}=5\text{V}$		485			
	Others		474			
Input current No load	$V_{IN, Nom}=24\text{V}$		40	-	mA	
	$V_{IN, Nom}=48\text{V}$		20			
Reflected ripple current		-	30	-	mA	
Input voltage surge 1 second max	$V_{IN, Nom}=24\text{V}$	-0.7	-	50	VDC	
	$V_{IN, Nom}=48\text{V}$	-0.7		100		
Startup input voltage	$V_{IN, Nom}=24\text{V}$	-	-	9	VDC	
	$V_{IN, Nom}=48\text{V}$			18		
Startup time	Resistive load	-	10	-	mS	
Input under voltage shutdown	$V_{IN, Nom}=24\text{V}$	5.5	6.5	-	VDC	
	$V_{IN, Nom}=48\text{V}$	12	15.5			
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	-	1.2	VDC	
	Ctrl pin current	-	4	7	mA	

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Output voltage accuracy	IOUT=0% to 100%	-	±1	±3	%	
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	%	
IOUT=5% to 100% of IOUT, rated	Other output		±0.5	±1.5		
Cross regulation	Dual output models	-	-	±5	%	
+IOUT=50%, -IOUT=10% to 100%						
Output ripple and noise		-	50	100	mVp-p	
20MHz bandwidth, peak to peak						
Temperature coefficient	Full load	-	-	±0.03	%/°C	
Dynamic load response	Peak deviation**	-	±5	±8	% VOUT	**VOUT=3.3, 5, ±5V
IOUT=25%~50%~75% of IOUT, rated	Peak deviation		±3	±5	% VOUT	
	Recovery time		300	500	µs	
Output voltage trim	Trim range	-	-	±10	% VOUT	
Output over voltage protection		110	-	160	% VOUT	
Output over current protection		110	-	190	% IOUT	
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	MU20H- 2424 Others	-	2050 1050	-	pF	
Switching frequency*	Full load	-	270	-	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	
Vibration		IEC/EN61373 – Category 1, Grade B				
Cooling method		Free air convection				

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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 62368-1, UL/IEC 60950-1
EMC		CISPR32, EN55032 Class B with external circuit IEC/EN61000-4-2, 3, 4, 5, 6
Size, and Weight		50.8 x 25.4 x 12 mm, 28g

* 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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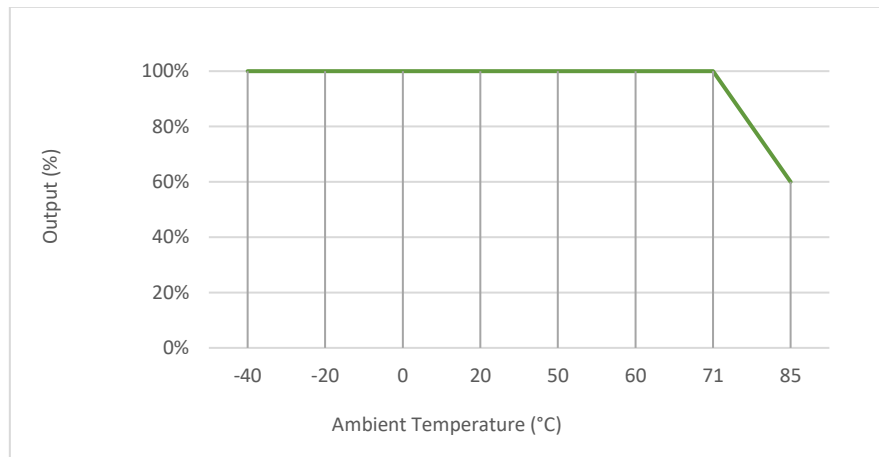
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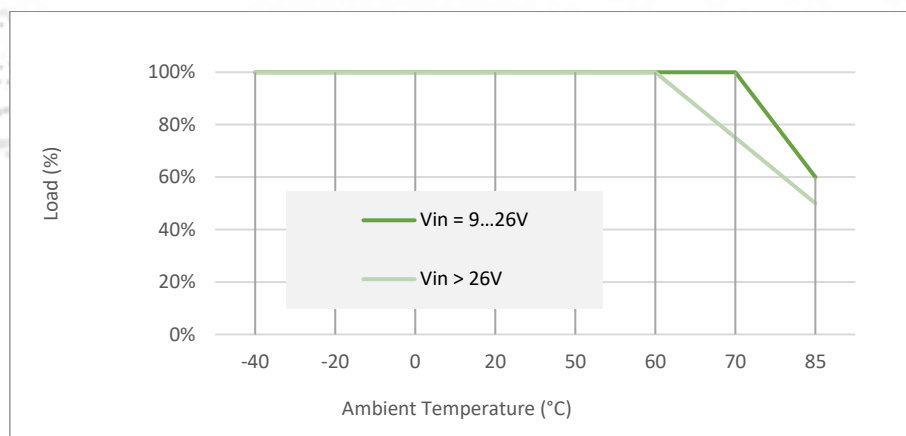
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



No heatsink



SDU30G24xx, and $V_{OUT}=12 \dots 24V$

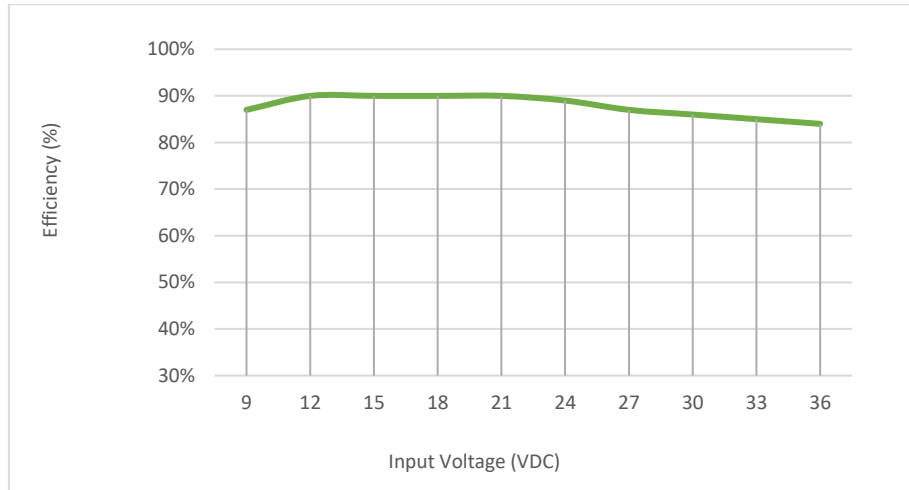
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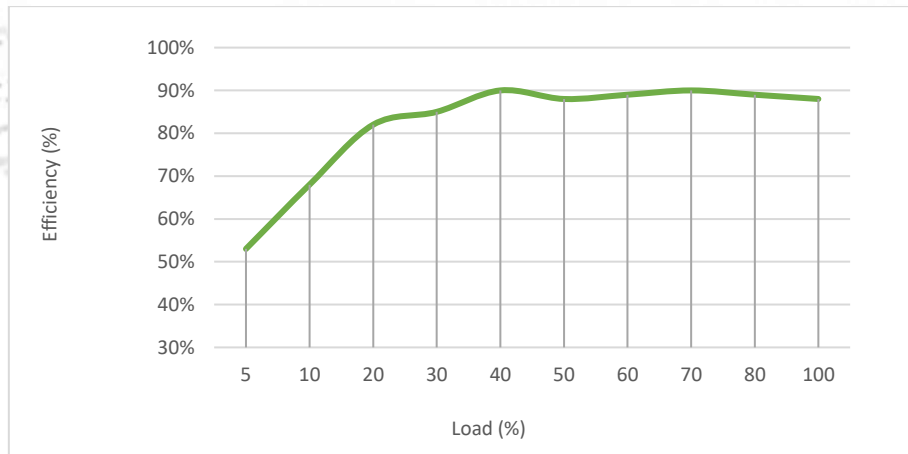
Efficiency Curve

Efficiency vs Input Voltage



SDU20H2405, with full Load

Efficiency vs Load

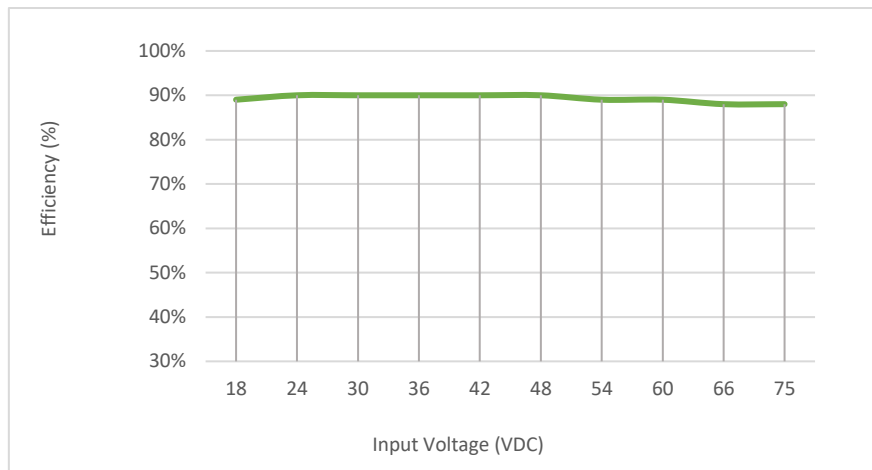


SDU20H2405, with nominal input voltage

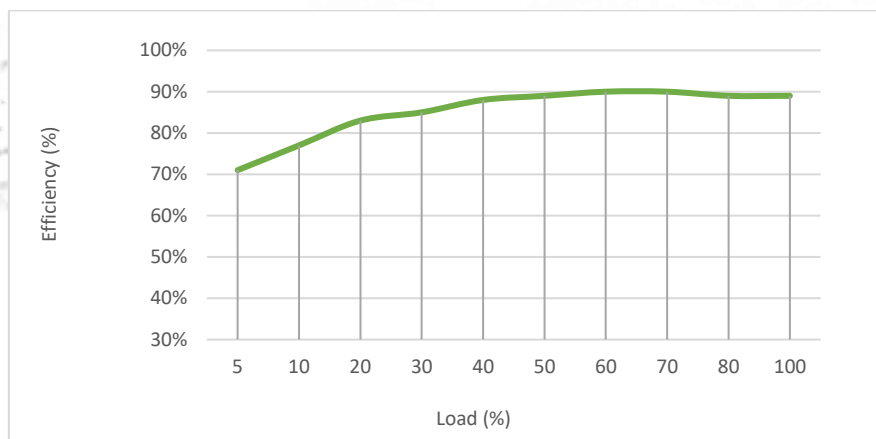
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SDU20H4815D, with full Load



SDU20H4815D, with nominal input voltage

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Recommended External Circuit

Note

*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.

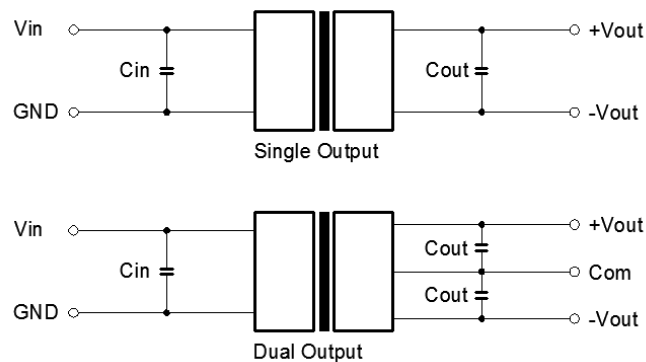


Figure 1: Typical External Circuit

Recommend component spec

Input voltage	24V	48V
C_{IN}	100uF, 50V	100uF, 100V

Recommended component spec

Output voltage	3.3, 5V	9 ... 15V	24V	±5V	±9 ... ±15V
C_{OUT}	470uF, 16V	220uF, 25V	100uF, 50V	220uF, 16V	100uF, 25V

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Circuits EMC Enhancement

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

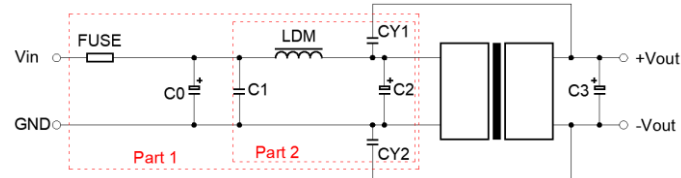


Figure 2. Circuit for EMC enhancement

Recommended component spec

Component	LDM	C0, C2	C1	CY1, CY2
$V_{IN}=24V$	4.7uH	330uF, 50V	1uF, 50V	1nF, 2KV
$V_{IN}=48V$	3.3uH	330uF, 100V	1uF, 100V	1nF, 2KV

* Fuse to be selected according to application needs.

* C3 refer to relative C_{OUT} values in Table 2.

Circuits for Output Trim

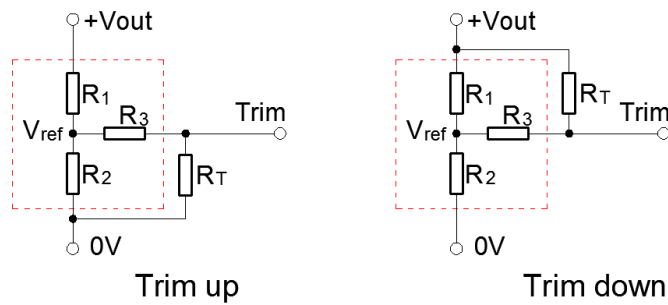
* Components within the red block are internal components of the converter.

[Table 4] Internal Component Spec

V_{OUT} [V]	R1 [K Ohm]	R2 [K Ohm]	R3 [K Ohm]	V_{ref} [V]
3.3	4.80	2.87	12.4	1.25
5	2.88	2.87	10	2.5
9	7.50	2.87	15	2.5
12	11.00	2.87	15	2.5
15	14.95	2.87	15	2.5
24	24.87	2.87	17.8	2.5

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* The formulas to calculate the desired resistance of Trim resistor “ R_T ”.

$$\text{Trim up: } R_T = \frac{a R_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{OUT} - V_{ref}} R_1$$

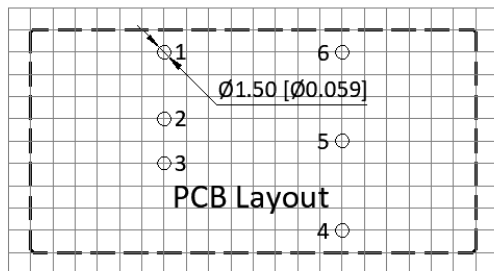
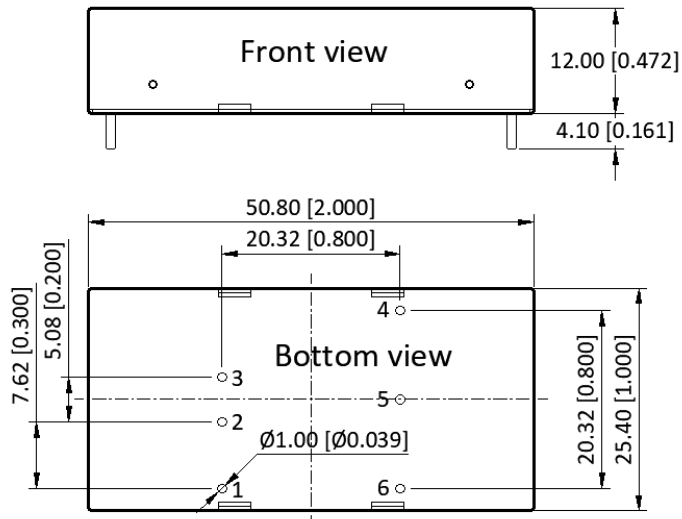
$$\text{Trim down: } R_T = \frac{a R_1}{R_1 - a} - R_3 \quad a = \frac{V_{OUT} - V_{ref}}{V_{ref}} R_2$$

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Mechanical Specifications



Pin Definition

Pin #	Single Out	Dual Out
1	Ctrl	Ctrl
2	GND	GND
3	V _{IN}	V _{IN}
4	+V _{OUT}	+V _{OUT}
5	Trim	0V
6	0V	-V _{OUT}

* 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