DCC48xx

Ultrathin 48V 1A DIN RAIL Buck Converter

DCC4805, DCC4812 & DCC4824
Product image

Feature summary

- Buck converter
- 8.8mm DIN Rail width
- 1 A output current max.
- 5V, 12V or 24V output voltage
- Wide input voltage:
  - $U_{in,min}=U_{out}+4$ V
  - $U_{in,max}=48$ V
- Input reverse polarity protection
- Output short proof
- Power Good Indicator: LED

Product description

The DCC48xx device is a 48V input 5V / 12V / 24V DIN Rail Buck converter providing 1A of output current. It's intended use are tight control cabinets, requiring an aditional lower output voltage. The functional input voltage ranges from 2V above the desired output voltage to 48V. When the output voltage is present, a green led lights up.

The device is resiliant to typical operating failures: Input reverse polarity, output short circuit, open circuit, moderate input transients and moderate output transients.

The device offers solid output voltage stability over the complete output current range. The device may be operated at ambient temperatures between -40°C und 50°C.

Specification overview

Description	Value
Input	
Input Voltage min	U_{out}+4 V
Input Voltage max	53 V
Output	
Output Voltage Tolerance Dynamic typ.	2 %
Output Current max.	1 A
Power Good Indicator	Green LED
Protection	
Input Fuse	yes
Input Reverse polarity protection	yes
Short circuit protection	yes
Input Overvoltage supressor	TVS

Ordering information

Ordercode	Description
DCC4824	U_{out} = 24 V
DCC4812	U_{out} = 12 V
DCC4805	U_{out} = 5 V
Customization available. Contact DPS.	

Engineering standards

Applied engineering standards	
IEC 55032	IEC 61000-4-2
IEC 61000-4-3	IEC 61000-4-4
IEC 61000-4-5	IEC 61000-4-6
IEC 61000-4-7	IEC 61000-4-8

1 Functional description

1.1 Overview

The DCC48xx device is a 48V input 5V / 12V / 24V DIN Rail Buck converter providing 1A of output current. It's intended use are tight control cabinets, requiring an aditional lower output voltage. The functional input voltage ranges from 2V above the desired output voltage to 48V. When the output voltage is present, a green led lights up.

The device is resiliant to typical operating failures: Input reverse polarity, output short circuit, open circuit, moderate input transients and moderate output transients.

The device offers solid output voltage stability over the complete output current range. The device may be operated at ambient temperatures between -40°C und 50°C.

1.2 Protections

The following output protections are in place:

- **Input Reverse polarity:** The input may be connected in reverse polarity with an input of $U_{in,max}$ = -48 V.
- **Short circuit proof:** The output of the converter can be shortcircuited without problems for infinite time.
- **Open circuit proof** The output may be operated in open circuit for infinite time.
- **Input TVS diode** The converter features an input TVS diode for protection.

1.3 Ordering Information

The ordering information is summarized in below table.

Ordercode	Description	EAN
DCC4824	Output Voltage U_{out} = 24 V	0735654854029
DCC4812	Output Voltage U_{out} = 12 V	0735654854036
DCC4805	Output Voltage U_{out} = 5 V	0735654854043
Customisation available. Contact DPS.		

2 Pinout

The pinout of the converter is depicted in Figure 1.

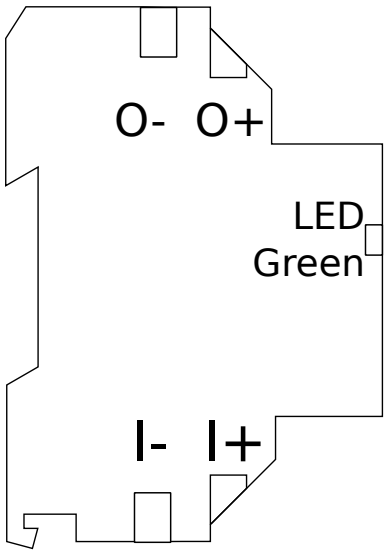

Figure 1: Connection diagram of the power supply

Pin	Functional description
Input	
I- I+	Negative Input Pin Positive Input Pin
Output	
O- O+	Negative Output Pin Positive Output Pin
Indicator	
LED	A green LED is on, when the output is good.

3 Specification

The specification is shown in the following table. If not otherwise specified the following parameters have been used: T_{amb}=25°C.

	Min	Typ	Max	Unit
Eingang Input				
Eingangsspannung (I_{Load}=1A) Input Voltage (I_{Load}=1A)	U_{out} + 4 V		53	V_{dc}
Eingangsspannung (I_{Load}=0A) Input Voltage (I_{Load}=0A)	U_{out} + 2 V		53	V_{dc}
Eingangskapazität Input Capacitance	10	19.8	40	µF
TVS Schutzdiode TVS Protection Diode		1SMA4758A		
Ausgang Output				
Ausgangsstrom Output Current	1			A_{dc}
DCC4824 DCC4824				
Ausgangsspannung Output Voltage	23.7	24	24.8	V_{dc}
Schutzvorkehrung Protection Device		none		
DCC4824 DCC4812				
Ausgangsspannung Output Voltage	11.8	12	12.6	V_{dc}
Schutzvorkehrung Protection Device		none		
DCC4824 DCC4805				
Ausgangsspannung Output Voltage	4.8	5	5.6	V_{dc}
Schutzvorkehrung Protection Device		none		
Gehäuse Case				
Montageform Mounting Type		DIN RAIL		
Hutschienenbreite Cabinet width		8.8		mm
Montagehöhe Mounting Style		Fuse box style		

	Min	Typ	Max	Unit
Sicherheitsfeatures Safety Features				
Verpolungsschutz Reverse polarity protection		yes		
Eingangsspannung bei Verpolung max. Input Voltage Reverse max.			- 48	V_{dc}
Kurzschlussschutz Short circuit protection		yes		
Leerlaufschutz Open circuit protection		yes		
Betriebsbedingungen Operating Conditions				
Temperaturbereich I_{out}=0.3 A Temperature Range I_{out}=0.3 A	-40		50	°C
Temperaturbereich I_{out}=1 A Temperature Range I_{out}=1 A	-40		30	°C

4 Measurements

4.1 DCC4824 - 24V Output

4.1.1 Efficiency

The efficiency of DC4824 is depicted in Figure 2.

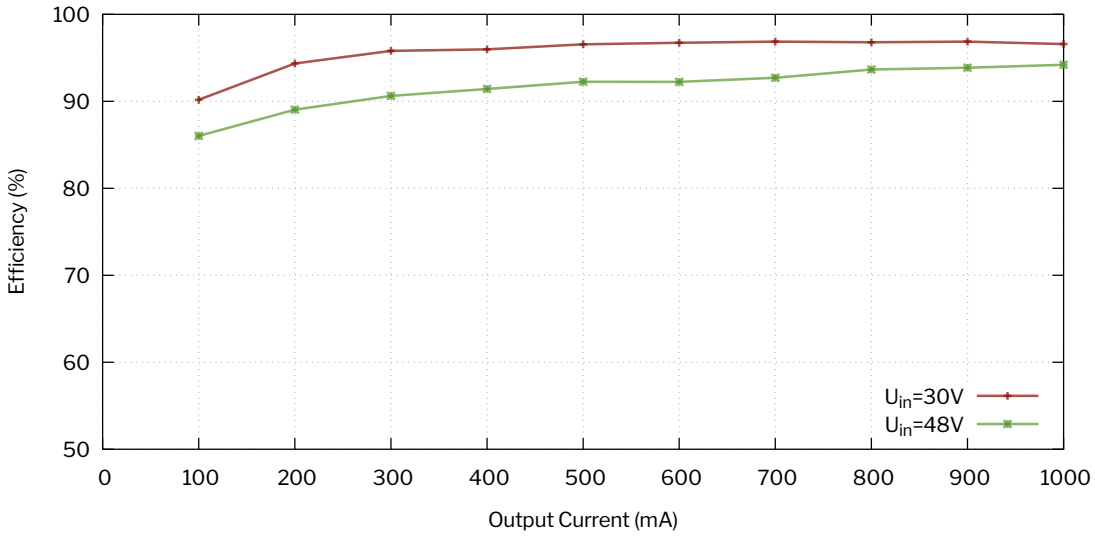

Figure 2: Efficiency of the 24V Variant over Output Current

4.1.2 Losses

The electrical losses are depicted in Figure 3.

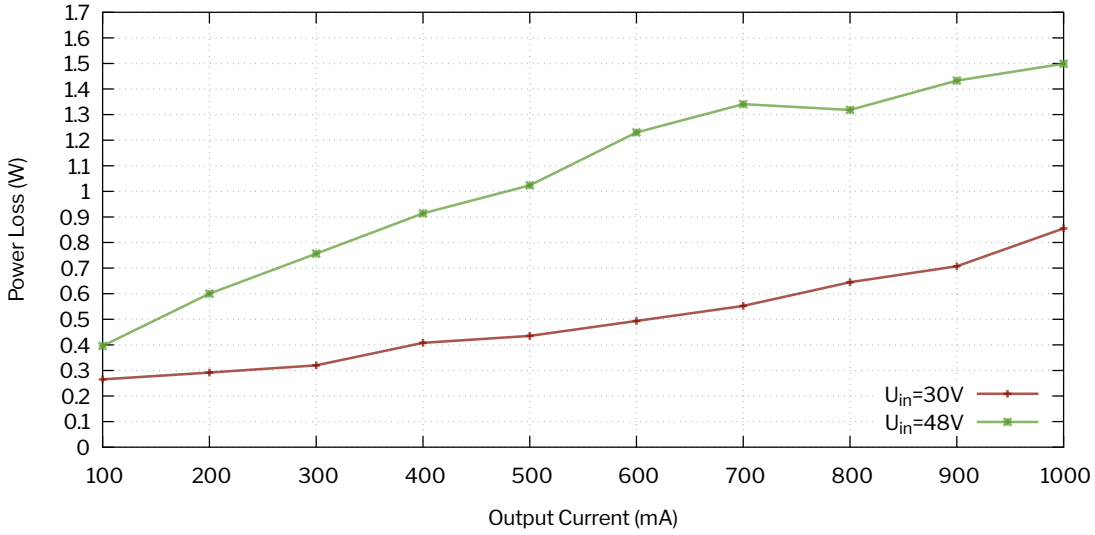

Figure 3: Power Loss of the 24V Variant over Output Current

4.1.3 Transient

Figures 4 show the reaction of the output voltage over time if a 1kHz 0-1A current swing is applied to the output terminals via an electronic load. All measurements done at a Supply Voltage of 30V.

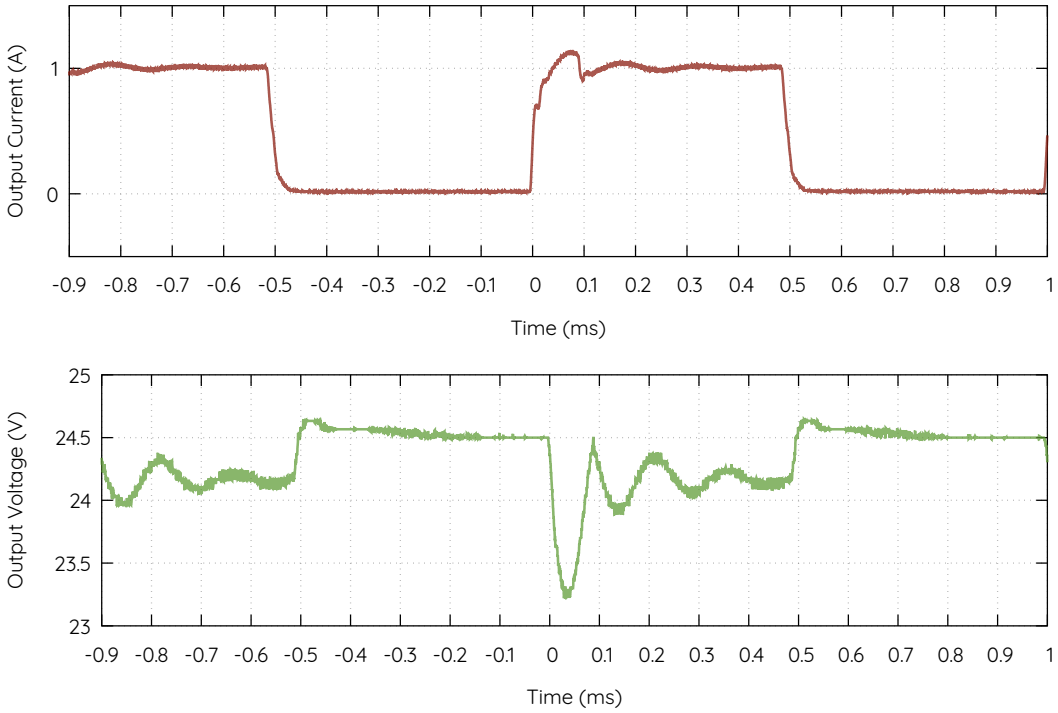

Figure 4: Output voltage behaviour to load current transient

4.2 DCC4812 - 12V Output

4.2.1 Efficiency

The efficiency is depicted in Figure 5.

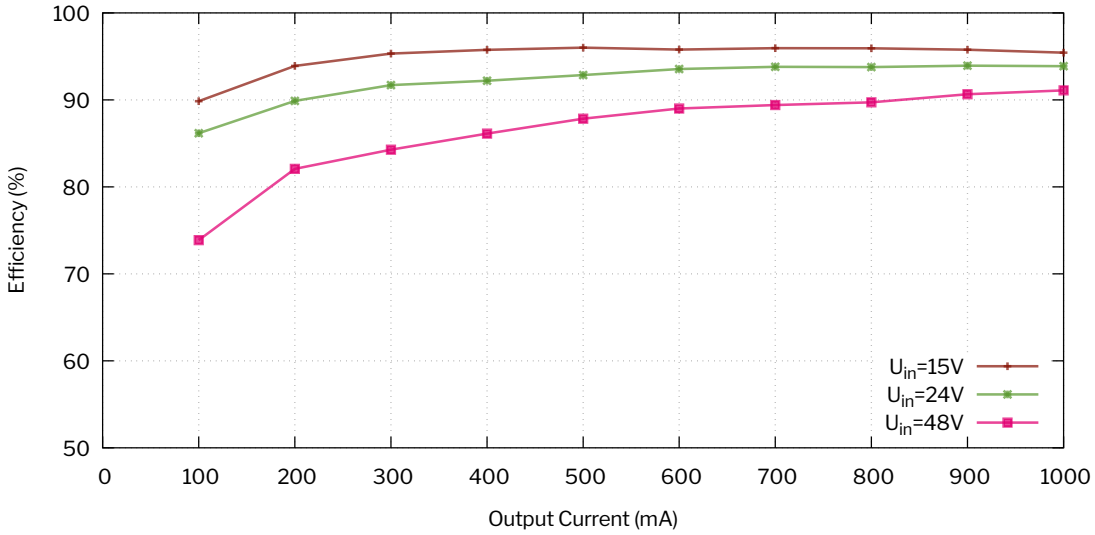

Figure 5: Efficiency of the 12V Variant over Output Current

4.2.2 Losses

The electrical losses are depicted in Figure 6.

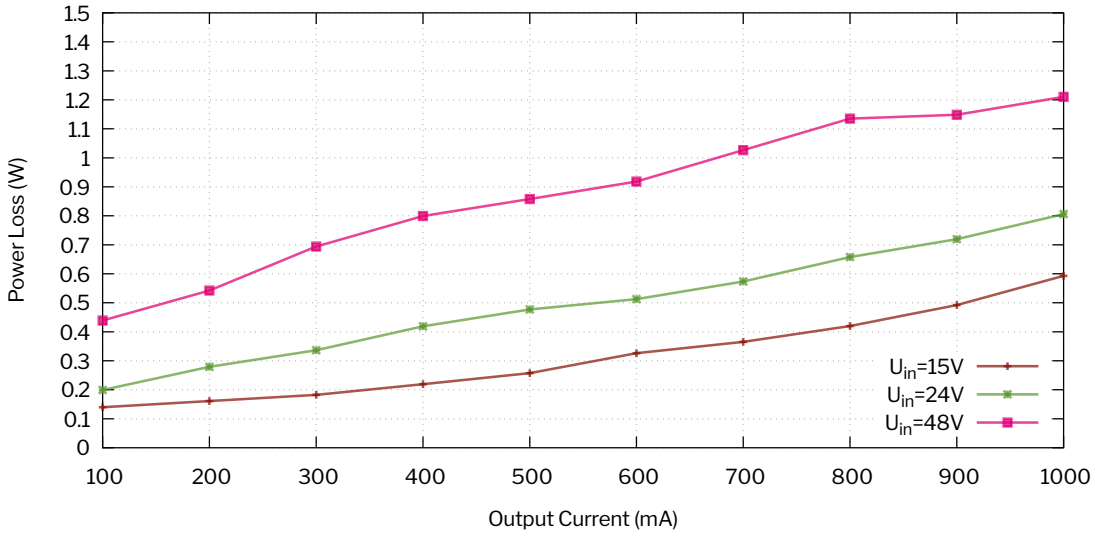

Figure 6: Power Loss of the 12V Variant over Output Current

4.2.3 Transient

Figures 7 show the reaction of the output voltage over time if a 1kHz 0-1A current swing is applied to the output terminals via an electronic load. All measurements done at a Supply Voltage of 30V.

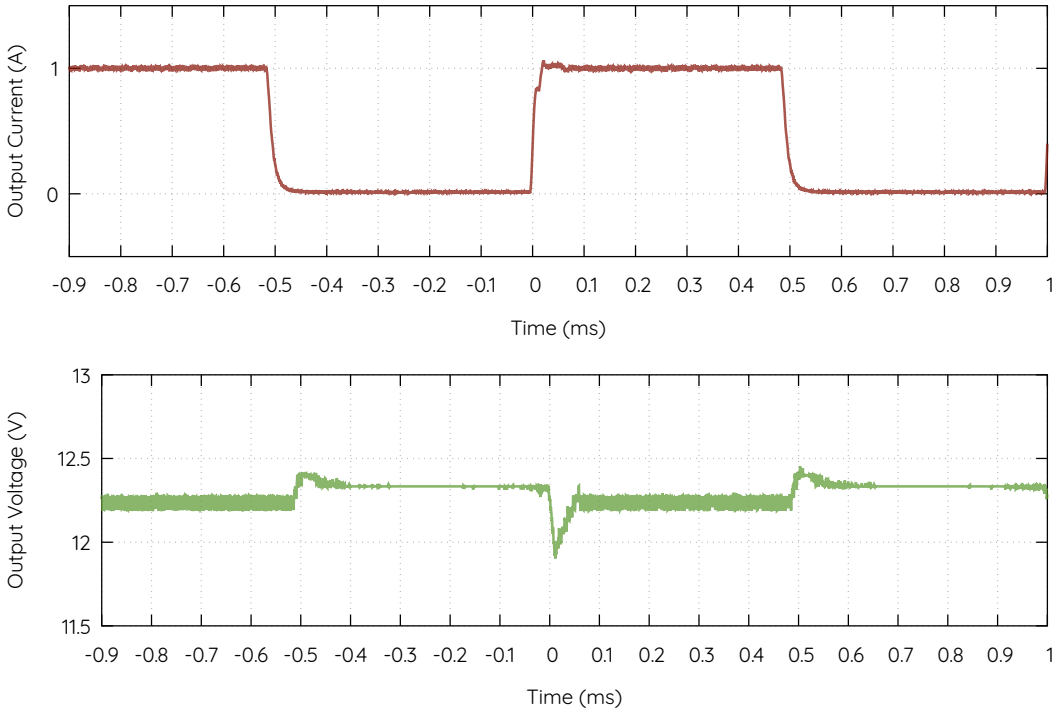

Figure 7: Output voltage behaviour to load current transient

4.3 DCC4805 - 5V Output

4.3.1 Efficiency

The efficiency is depicted in Figure 8.

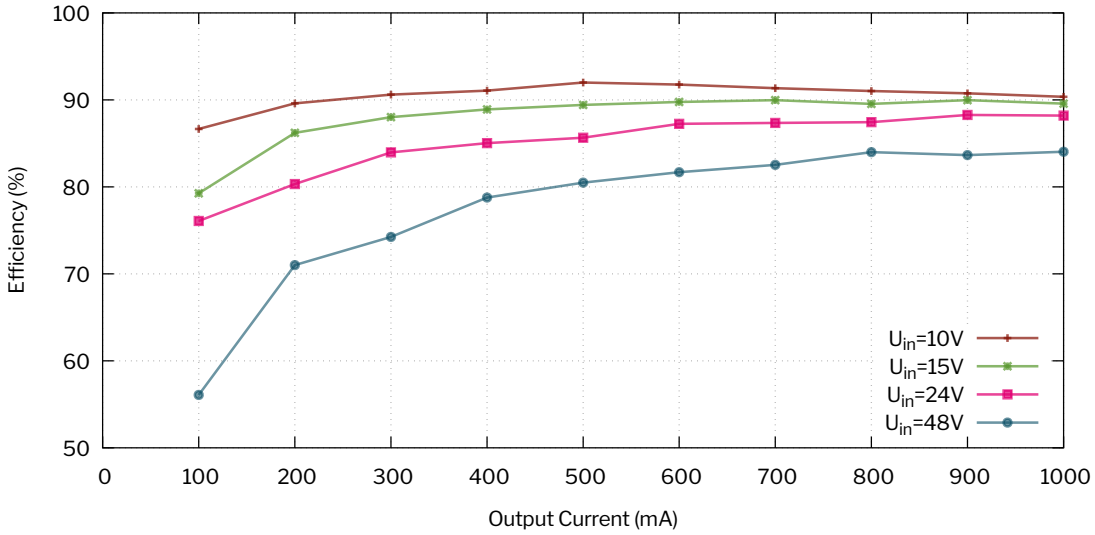

Figure 8: Efficiency of the 5V Variant over Output Current

4.3.2 Losses

The electrical losses are depicted in Figure 9.

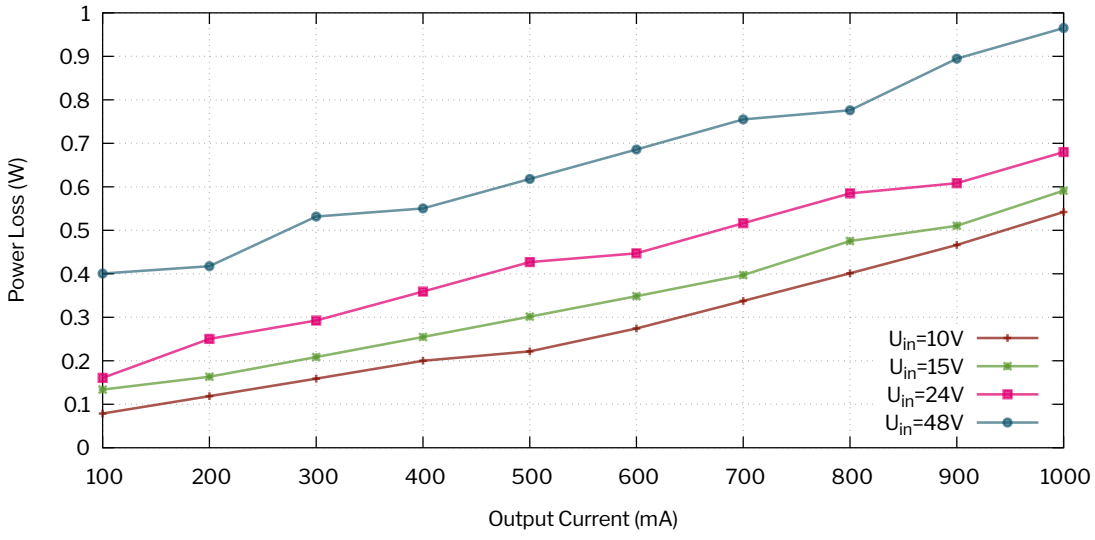

Figure 9: Power Loss of the 5V Variant over Output Current

4.3.3 Transient

Figures 10 show the reaction of the output voltage over time if a 1kHz 0-1A current swing is applied to the output terminals via an electronic load. All measurements done at a Supply Voltage of 30V.

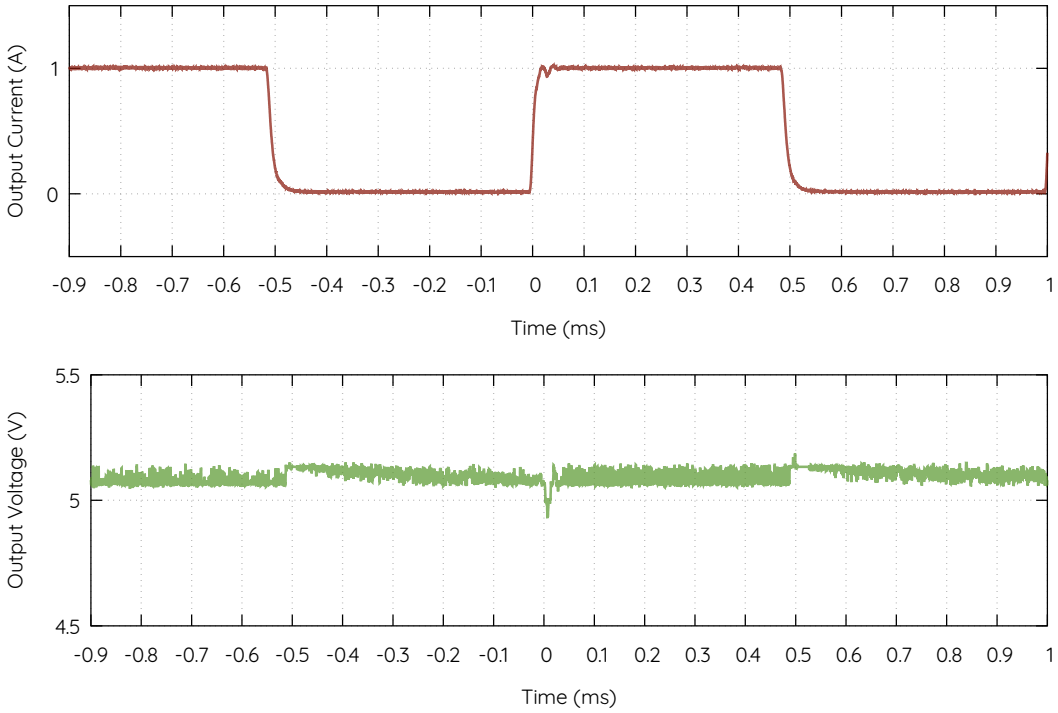

Figure 10: Output voltage behaviour to load current transient

5 EMC Measurements

5.1 Average Conducted Emission Line

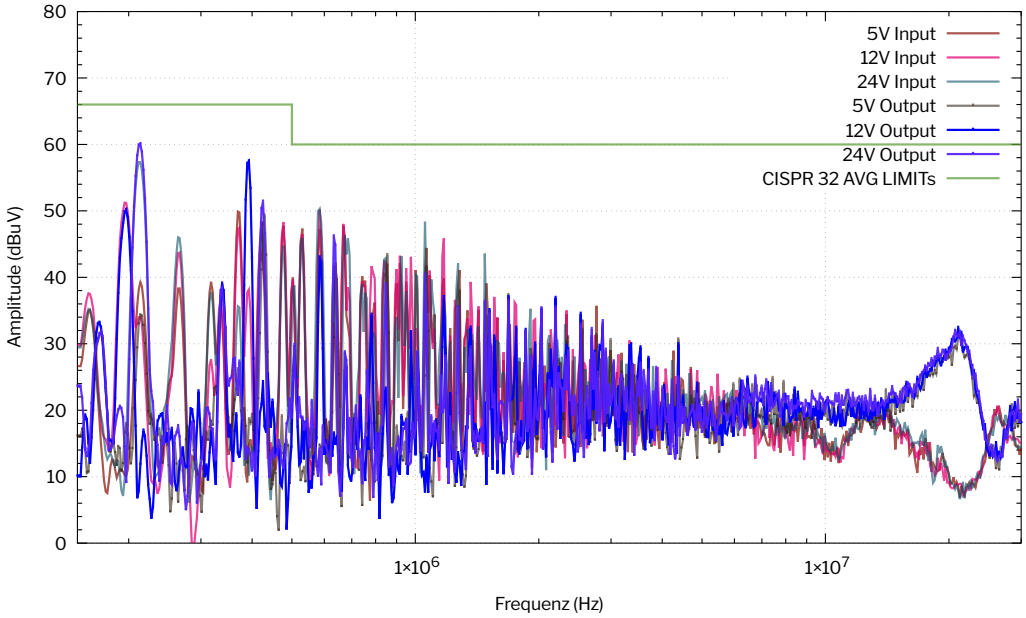

Figure 11: Conducted Input Average

5.2 Average Conducted Emission Quasipeak

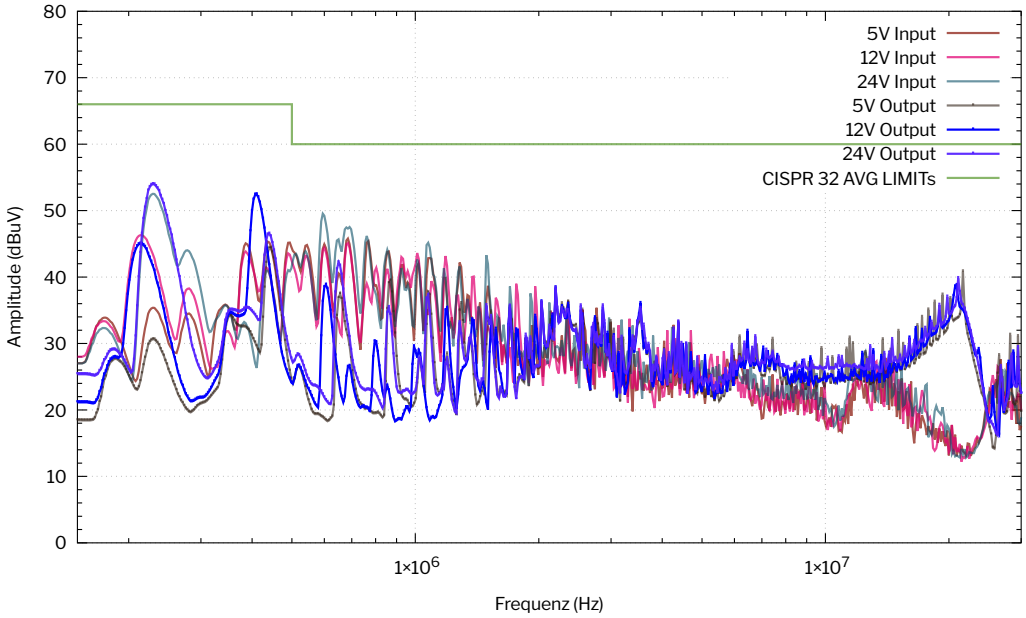

Figure 12: Conducted Output emissions

6 Case

The case drawing is shown in Figure 13. 3D Files can be downloaded on Digital Power Systems Website.

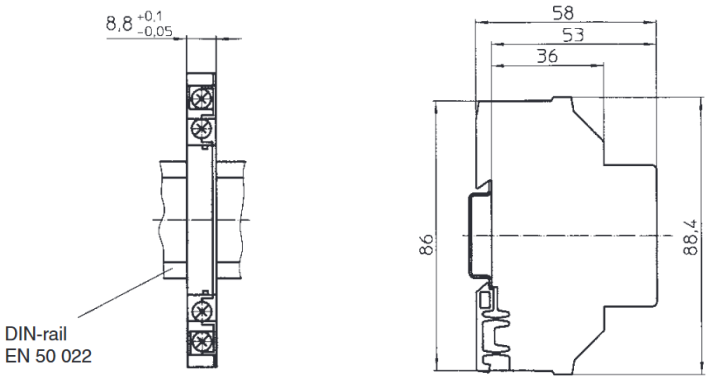

Figure 13: Drawing of the product case.

7 Product label

7.1 DCC4824

The Label of the DCC4824 is depicted in the following figure 14

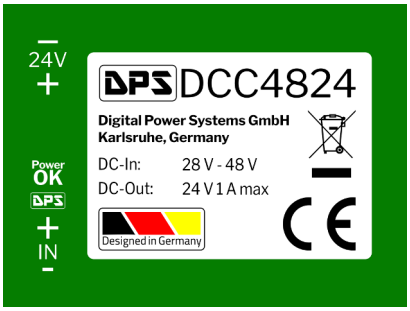

Figure 14: The product label of the DCC4824.

Figure 15: EAN-13 CODE of the DCC4824.

7.2 DCC4812

The Label for the DCC4812 is depicted in the following figure 16

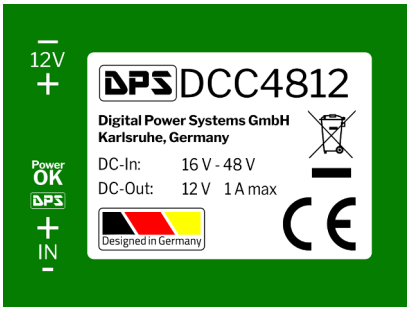

Figure 16: The product label of the DCC4812.

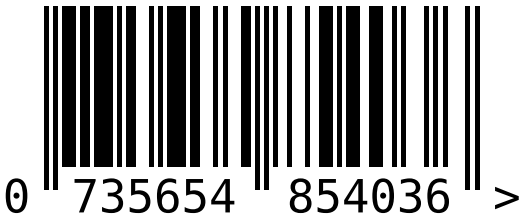

Figure 17: EAN-13 CODE of the DCC4812.

7.3 DCC4805

The Label for the DCC4805 is depicted in the following figure 18

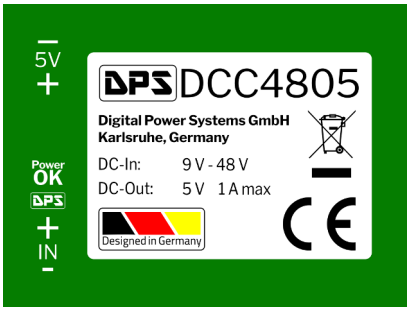

Figure 18: The product label of the DCC4805.

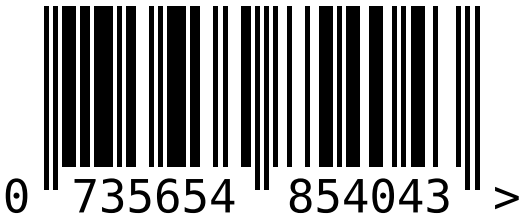

Figure 19: EAN-13 CODE of the DCC4805.

8 Document

8.1 Datasheet Quality

Digital Power Systems aims for the highest datasheet quality. We value your feedback to improve this document. Please email:

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8.2 Revision History

The document may change at any time wihtout prior notice. To obtain the latest information, please go to digitalpowersystems.eu to download the latest datasheet.

The revision history is depicted in the following table.

Date	Changes in Revision
28.10.2022	Initial release
19.01.2023	Product images updated
9.01.2024	Product images updated, EMC Emissions added, EAN Codes added.
11.06.2024	Clarified Specification (Output Protection, Input Voltage Range)
22.10.2024	Updated Titlepage with Input Voltage Range
22.10.2024	Changed axis label from German to English language
22.10.2024	Updated Page Design (Made links clickable)

8.3 Contact Information

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https://digitalpowersystems.eu/