



USB-C-3A product photography

Feature summary

- Constant Current Buck converter 8.8mm DIN Rail width
- 3A output current
- 95% peak-efficiency
- Wide input voltage:
 - $U_{in,min}=10\text{ V}$
 - $U_{in,max}=28\text{ V}$
- Input reverse polarity protection
- Output short proof
- Power Good LED
- Low Conducted Emissions

Product description

The USB-C-3A (Ultrathin 8.8mm 10V-28V DIN Rail USB C power supply) is a 10 V to 28V input 3A DIN Rail buck converter providing low ripple constant voltage output for USB C devices. It's intended use are tight control cabinets, to supply usb devices with voltage. A green power good LED indicates the presence of an output voltage.

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

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

Specification overview

Description	Value
Input	
Input Voltage min	10 V
Input Voltage max	28 V
Output	
Voltage	5.2 V
Current Voltage	3 A
Power Good Indicator	Green LED
Peak Efficiency	95 %
Protection	
Input Fuse	yes
Input Reverse polarity protection	yes
Short circuit protection	yes
Input Overvoltage supressor	TVS
Mechanical	
Dimensions LxWxH (mm)	8.8 x 88.4 x 58

Ordering information

Ordercode	Description
USB-C-3A	Default option
Customisation 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 USB-C-3A (Ultrathin 8.8mm 10V-28V DIN Rail USB C power supply) is a 10 V to 28V input 3A DIN Rail buck converter providing low ripple constant voltage output for USB C devices. It's intended use are tight control cabinets, to supply usb devices with voltage. A green power good LED indicates the presence of an output voltage.

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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 $U_{in,max} = -48\text{ V}$.
- **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.
- **Output TVS diode** The converter features an output TVS diode for protection.



2 Pinout

The pinout of the converter is depicted in Figure 1.

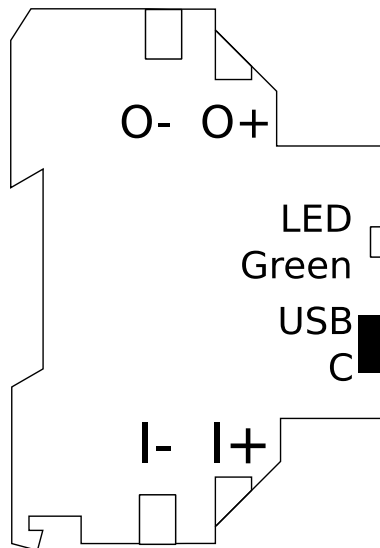


Figure 1: Anschlussdiagramm des Netzteils

Pin	Functional description
Input	
I-	Negative Input Pin
I+	Positive Input Pin (10V-28V)
Output	
O-	Negative Output Pin
O+	Positive Output Pin (5 V)
USB C	USB C Power 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: $T_{amb}=25^{\circ}\text{C}$.

	Min	Typ	Max	Unit
Eingang Input				
Eingangsspannung Input Voltage	11		28	V _{dc}
Eingangskapazität Input Capacitance		30		μF
Eingangs-Standy-Strom (lastlos) Input Standby Current (no load)	0.8		3	mA
Zener Schutzdiode Eingang Zener Protection Input	1SMA4751A			
Ausgang Output				
Ausgangsspannung Output Voltage	5	5.15	5.3	V
Wandlungseffizienz Conversion Efficiency		93	95	%
Zener Schutzdiode Ausgang Zener Protection Output	1SMA4734A			
Ausgangsstrom Output Current			3000	mA _{dc}
Gehäuse Case				
Montageform Mounting Type	Din Rail			
Breiteinheiten Mounting Width	8.8			mm
Montagehöhe Mounting Height	Household Installation BOX			
Sicherheitsfeatures Safety Features				
Verpolungsschutz Reverse polarity protection	yes			
Neg. Eingangsspannung Negative Input Voltage			- 28	V _{dc}
Kurzschlusschutz Short circuit protection	yes			
Leerlaufschutz Open circuit protection	yes			
Betriebsbedingungen Operating Conditions				
Temperaturbereich Temperature Range	-40		50	°C





USB-C-3A

Ultrathin 8.8mm 10V-28V DIN Rail USB C power supply

	Min	Typ	Max	Unit
Technische Merkmale Technical Characteristics				
Elektrolytkondensatoren Electrolytic Capacitors	No electrolytic capacitors			



4 Measurements

4.1 Measurement Conditions

The measurement conditions are noted in table 3, if not otherwise noted in the specific measurement.

	Min	Typ	Max	Unit
Input				
Input Voltage	23.5	24	24.5	V _{dc}
Environment				
Temperature	20	22	24	°C
Humidity	30	27	90	% _{rel}

Table 3: Measurement Conditions, if not otherwise noted.

4.2 Output Voltage Stability

The output voltage is measured over the operation range in Figure 2.

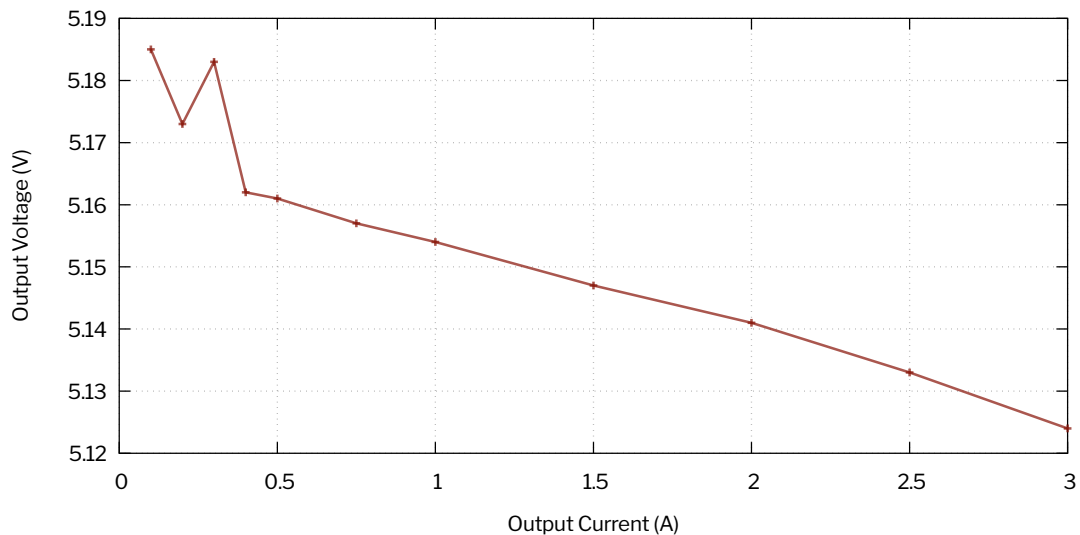


Figure 2: Output Voltage stability over Output Current



4.3 Output Voltage Ripple

The output voltage ripple is measured over the operation range and plotted in Figure 3. The low power ripple is explained by the ICs pulse skipping mode.

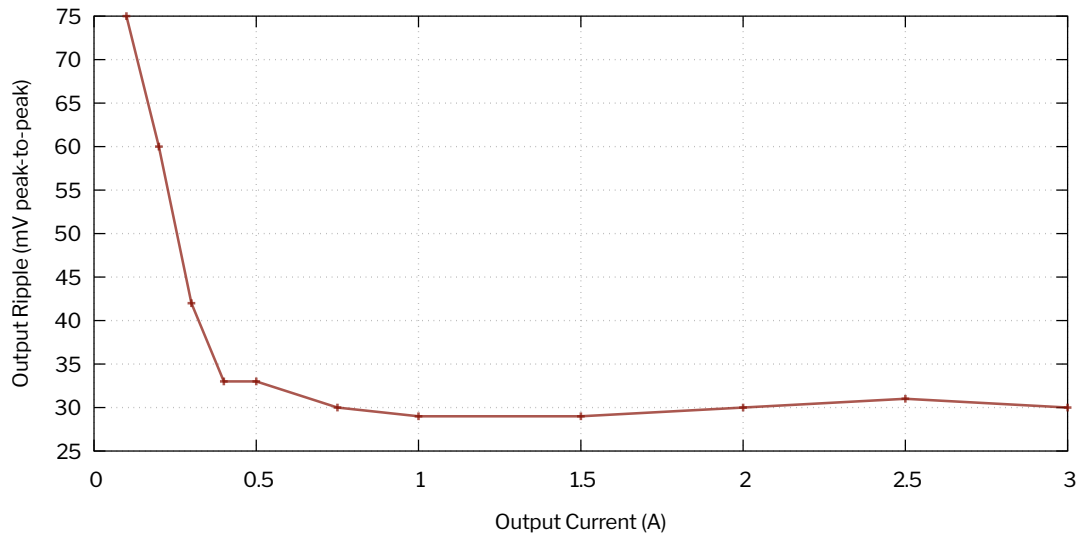


Figure 3: The output voltage ripple is measured over the output current range.

4.4 Conversion Efficiency2

The conversion efficiency is plotted over the operation range.

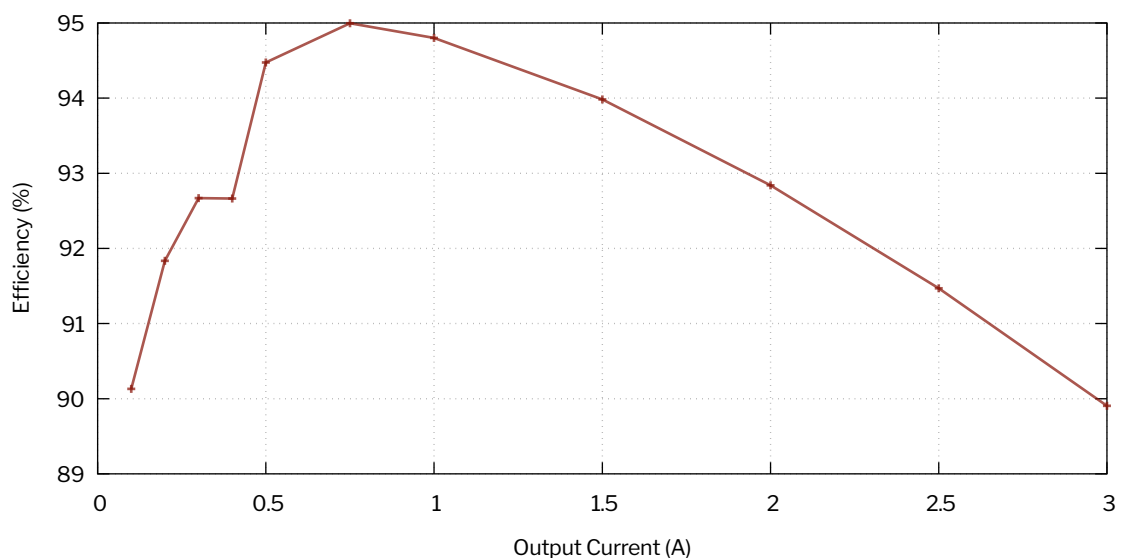


Figure 4: Conversion Efficiency Output Current



4.5 Input Standby Current

The input standby current over the output voltage is plotted over the input voltage range.

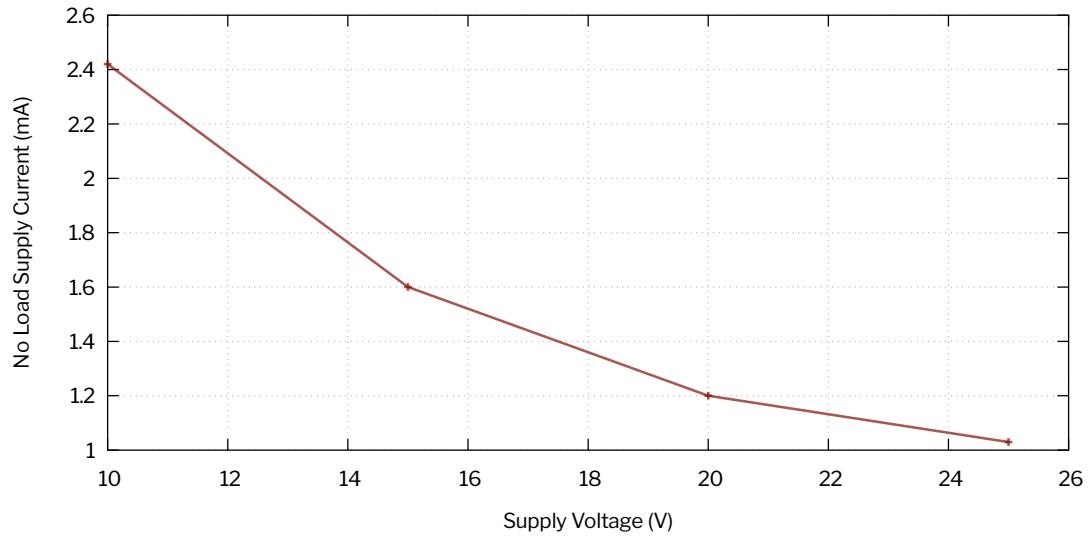


Figure 5: Standby Current over Input Voltage



4.6 Step Response

For the step response the output current was changed from 0 A to 3 A. The output voltage is shown in the subsequent figure 6.

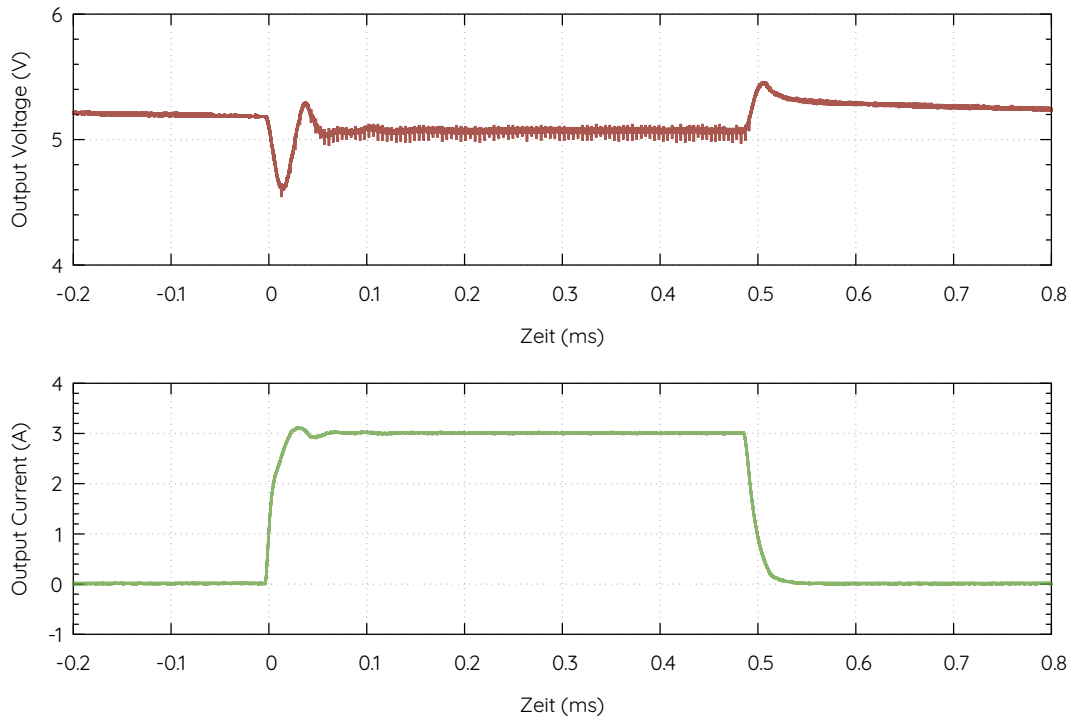


Figure 6: Transient response



5 EMC Measurements

The AVG EMC Conducted Line Emissions are shown over the operational range under full load.

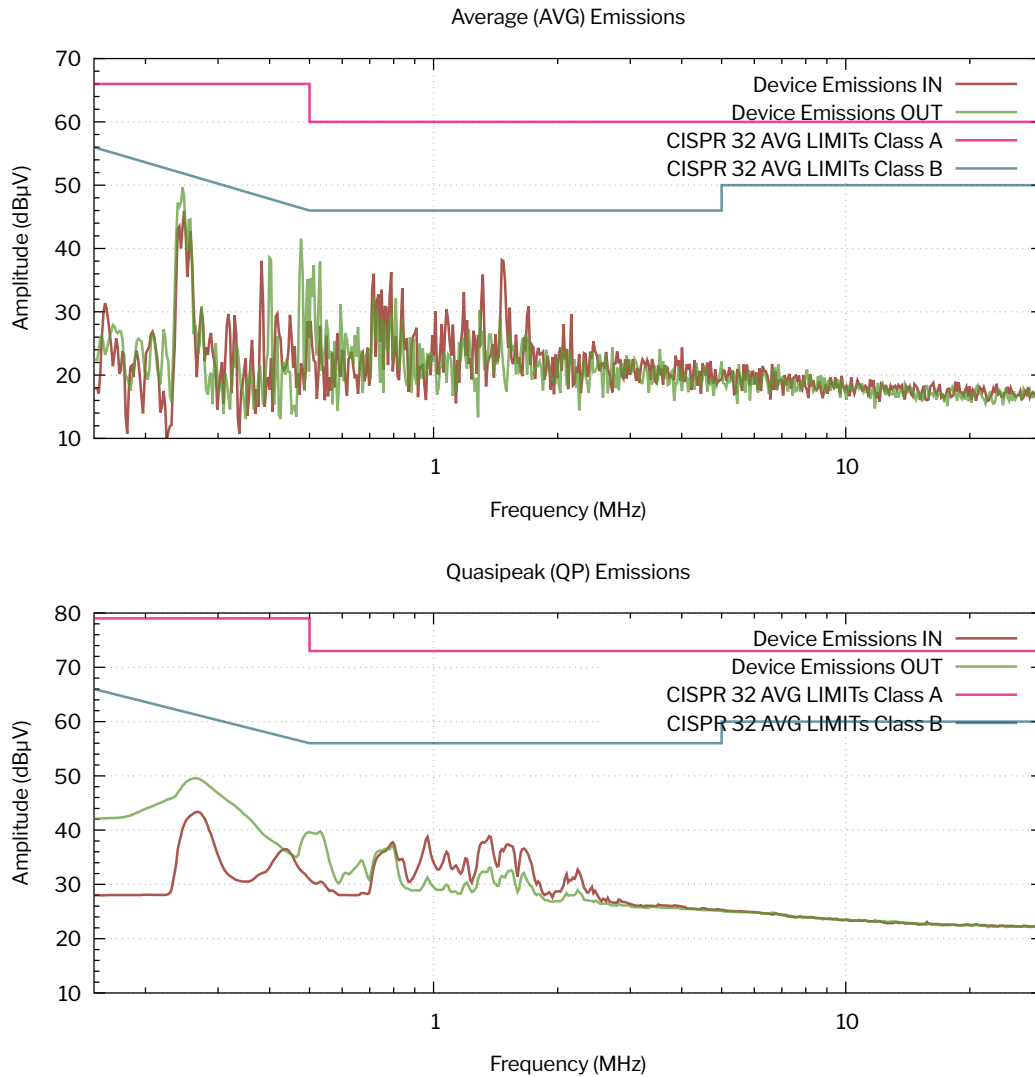


Figure 7: Overview of EMC Device conducted emissions.



6 Case

The case drawing of the USB-C-3A is shown in Figure 8.

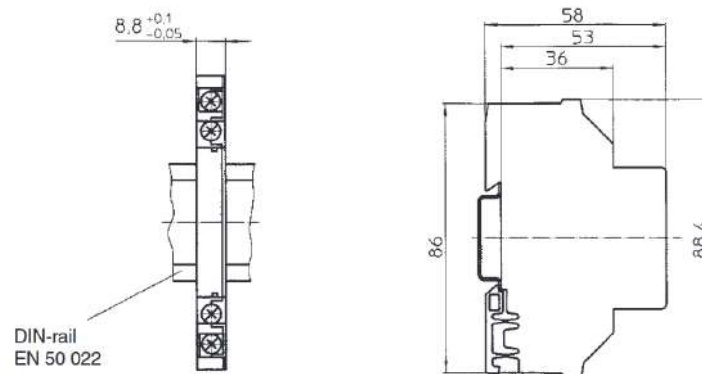


Figure 8: Product case.

7 Product label

The Label for the USB-C-3A is depicted in the following Figure 9.

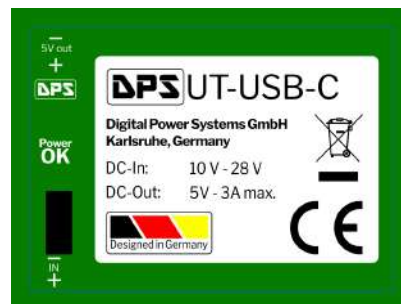


Figure 9: The product label USB-C-3A.





8 Revision History

The revision history is depicted in the following table.

Date	Changes in Revision
29.9.2023	Initial Release
30.10.2023	EMC Conducted Emissions Updated





USB-C-3A

Ultrathin 8.8mm 10V-28V DIN Rail USB C power supply

9 Contact Information

This is a product of the Digital Power Systems GmbH (DPS).

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