



ACL230: Long Life 10W 30V 350mA Power Supply with status relay

Feature summary

- Long Life: Demonstrated over 70 years of service life at 40°C.
- Electrolytic capacitor free
- Rated output current: 0.35 A_{DC} (galvanically isolated)
- Output Voltage: 5 V – 29 V
- Integrated current good supervisor
- Operating temperature: -40°C – 50°C
- Transient protection by MOV
- No-load power dissipation: 0.5 W

Product description

The ACL230 is a long-life 350mA constant current LED power supply for output voltages between 5V – 29V. The product is particularly designed for high reliable applications, where LED driver replacement is a tedious task. The product has demonstrated over 70 years of lifetime.

An internal status relay informs whether the LED current can be output. If the required LED current cannot be output, the relay drops out. This allows faults in critical lighting equipment to be signalled.

Typical applications range from safety lighting, indoor lighting, led signage.

The power supply offers good output current stability over the output voltage range. The unit has a wide temperature range between -40°C and 50°C.

Specification overview

Description	Value
Input	
AC Input Voltage	230 V _{ac}
AC Phases	1
Output	
LED Current	350mA _{dc}
LED Voltage	5-29 V _{dc}
No Load Voltage	30.8 V _{dc}
Relay	
Relay ON I _{LED}	230mA
Relay OFF I _{LED}	=170mA
Relay Capability	230V / 2A / 60 W
Protection	
Input Fuse	yes
Short circuit protection	yes
Input Overvoltage suppressor	MOV
Operating Temperature	-40 - 50°C

Ordering information

Order code	Relay
ACL230	yes
ACL230-NR	no
Customization available. Contact DPS.	

Engineering standards

Applied engineering standards
IEC 62368-1
IEC 61010-1
IEC 61010-2-201



1 Functional description

1.1 Overview

The ACL230 is a long-life 350mA constant current LED power supply for output voltages between 5V – 29V. The product is particularly designed for high reliable applications, where LED driver replacement is a tedious task. The product has demonstrated over 70 years of lifetime.

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1.2 Protections

The following output protections are in place:

- **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 Metal oxide Varistor:** The converter features an input Metal Oxide Varistor (MOV) for transient protection.

1.3 Ordering Information

The following ordering options are available. When the device should be used for Modbus applications, we recommend to use the DCP48M.

Ordercode	$I_{LED,nom}$	U_{led}	EAN
ACL230	350	5 - 29 V	0735654853978
Customisation available. Contact DPS.			



2 Pinout

The pinout of the converter is depicted in Figure 1.

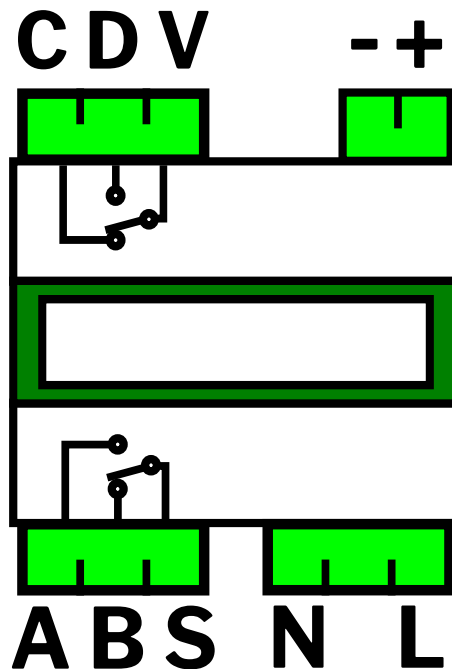


Figure 1: ACL230 connection Diagram

2.1 Pin description

Pin	Functional description
Input	
N	AC Neutral
L	AC Conductor
Output	
-	Negative Output LED
+	Positive Output LED
Top Relay Connection	
V	Relay Midpoint
C	Relay Normally Open (NO)
D	Relay Normally Closed (NC)
Bottom Relay Connection	
S	Relay Midpoint
A	Relay Normally Open (NO)
B	Relay Normally Closed (NC)





2.2 Output Paralleling

For increased output power, outputs can be easily paralleled. An internal output diode is present.



3 Specification

The specification for ACL230 is shown in the following table. If not otherwise specified the following parameters have been used: $T_{amb}=25^{\circ}\text{C}$, $U_{in}=30\text{ V}_{dc}$ and $U_{out}=5\text{ V}_{dc}$.

	Min	Typ	Max	Unit
Eingang				
Input				
Eingangsspannung Input Voltage	200	230	250	V_{ac}
Anzahl Phasen Number Phases	1	1	1	V_{ac}
Sicherungstyp Fuse Type	2410-750			
Sicherung ersetzbar Fuse Replaceable	No			
Ausgang LED				
Output LED				
LED Strom LED Current	0.33	0.35	0.37	A_{dc}
Regelstrategie Control Strategy	Constant Current with voltage limit			
Spannungsbereich Voltage Range	5		29	V_{dc}
Spannungsbereich Voltage $I_{LED}=0$	30	30.8	36	V_{dc}
Spannung, max Output Voltage _{max}	$0.9 U_{in}$			V_{dc}
Relay				
Relais				
Relay schließt Relais closing		0.23	0.25	A_{dc}
Relay öffnet Relais opening	0.15	0.17		A_{dc}
Relay Schaltspannung AC Relais Voltage AC			250	V_{ac}
Relay Schaltspannung DC Relais Voltage DC			30	V_{dc}
Relay Strom Relais Current			2	A_{ac}
Relay Leistung Relais Power			60	W





ACL230

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	Min	Typ	Max	Unit
Gehäuse Case				
Montageform Mounting Type		Din Rail		
Breite Width		53.5		mm
Länge Length		90		mm
Höhe Height		58		mm
Technische Merkmale Technical Characteristics				
Elektrolytkondensatoren Electrolytic Capacitors		No electrolytic capacitors		



4 Measurements

4.1 Output Current

The LED output current of ACL230 is depicted over the output voltage range.

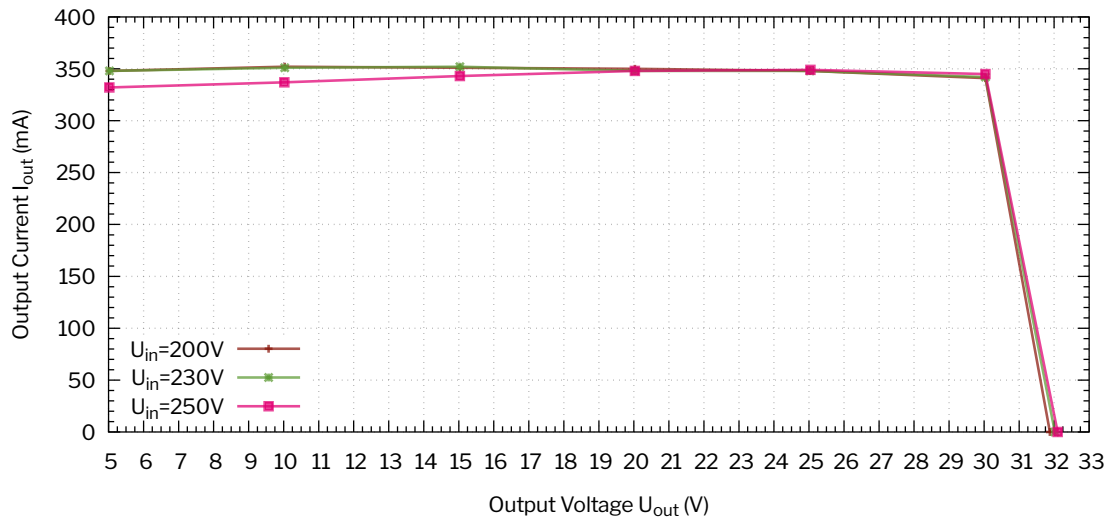


Figure 2: The output current of ACL230 depicted over the output voltage range.

4.2 Efficiency

The ACL230's conversion efficiency is depicted over the output power range in Figure 3.

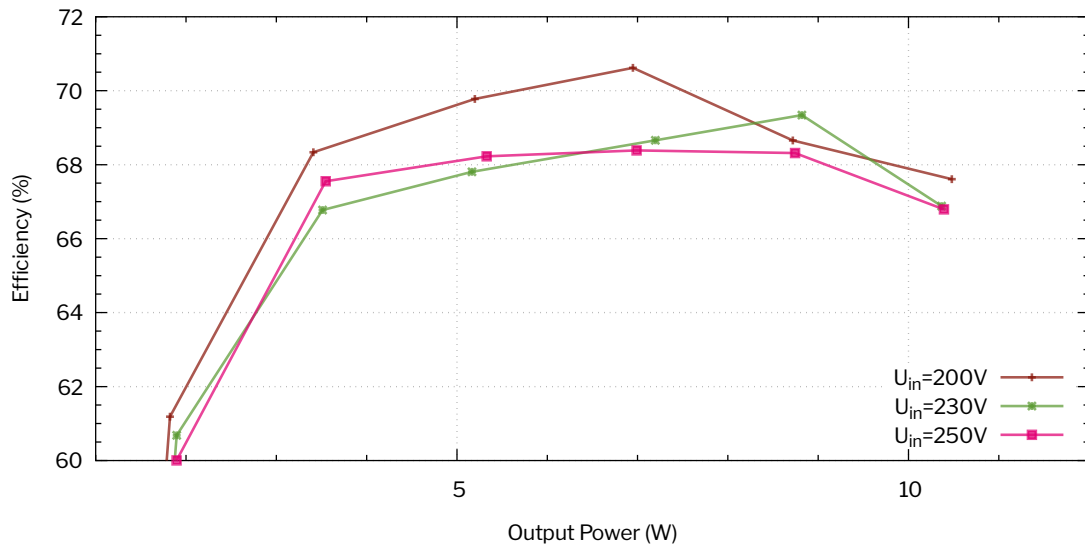


Figure 3: The ACL230's conversion efficiency is depicted over the output voltage range.



4.3 Losses

The ACL230 output losses are depicted over the output voltage range in Figure 4.

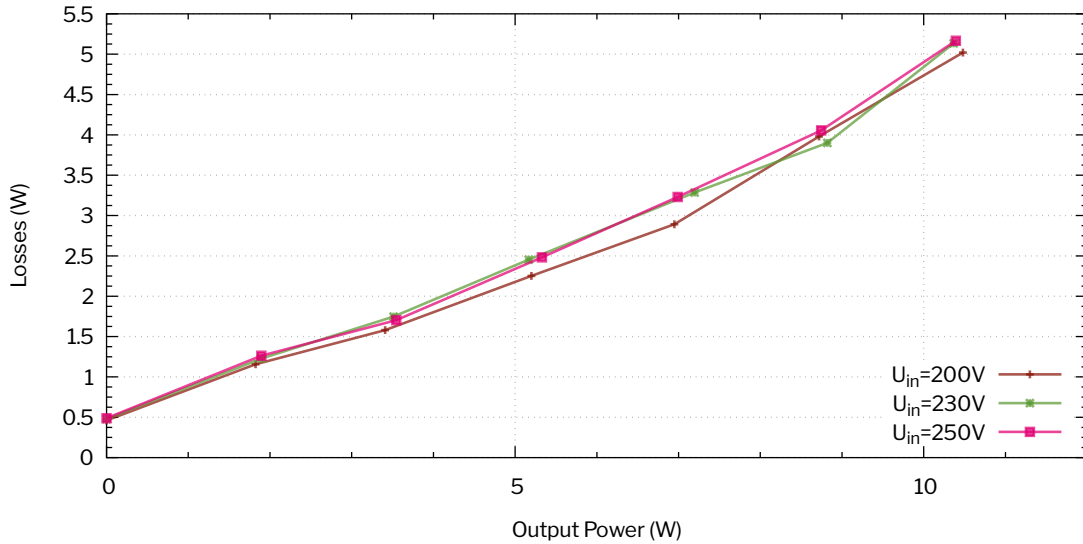


Figure 4: The LED output losses are depicted over the output voltage range.

4.4 Power Facotor

The ACL230 power factor is depicted over the output voltage range in Figure 5.

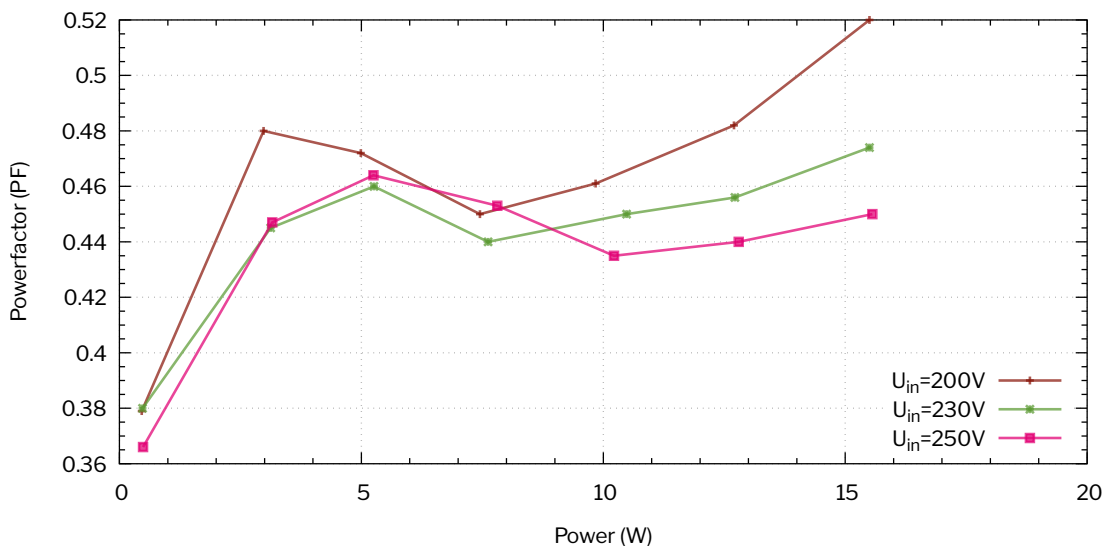


Figure 5: The LED output losses are depicted over the output voltage range.



4.5 Relay State

The ACL230 relay state is depicted over the LED current in Figure 6.

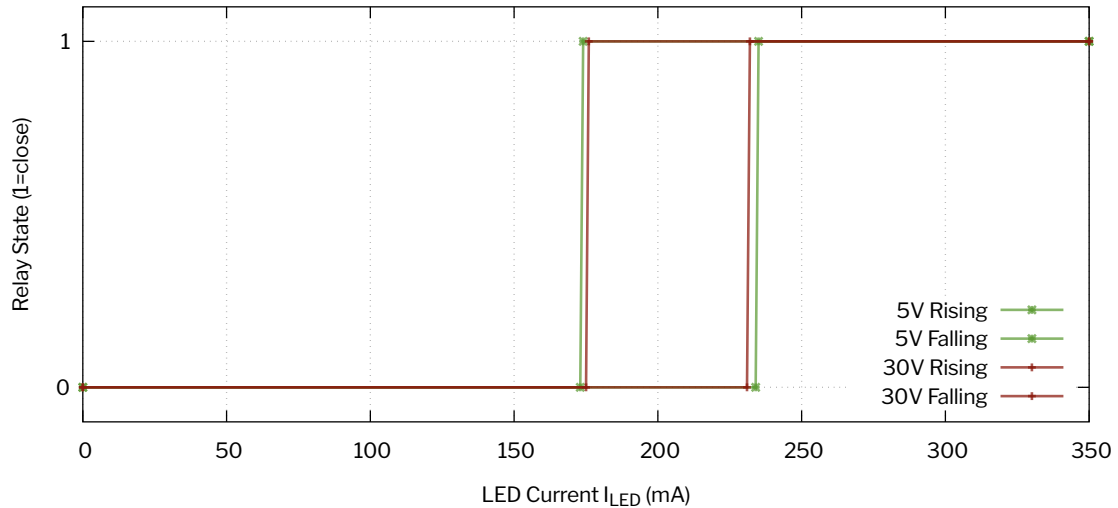


Figure 6: The LED output losses are depicted over the output voltage range.

4.6 LED Ripple Current

The ACL230 ripple is plotted over the output range. The LED current has a ripple on intention to increase EMC compliance. The Ripple current is not visible to the human eye. See also flicker measurement in section 4.7 on page 10.

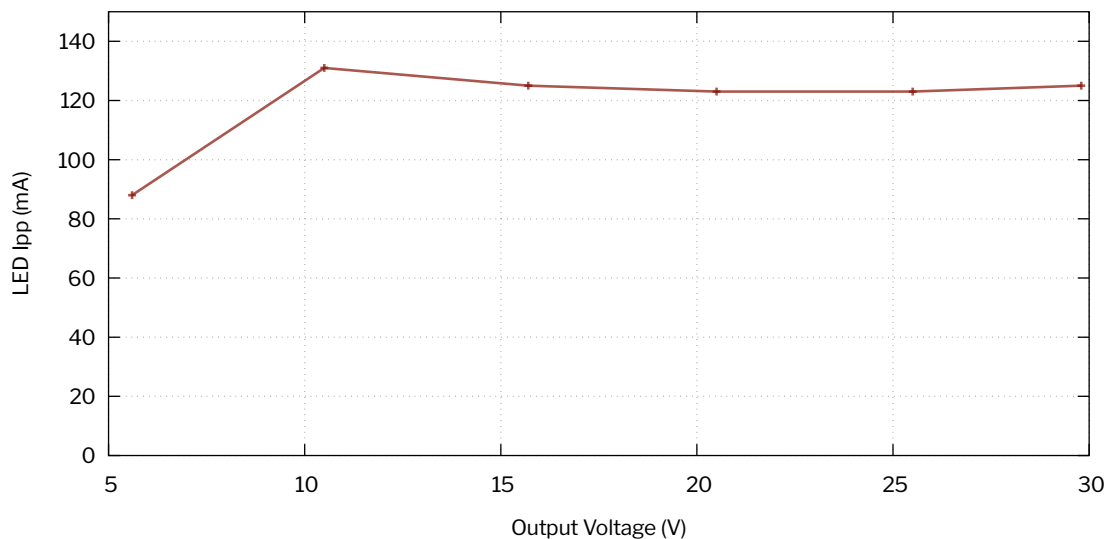


Figure 7: ACL230's LED current ripple.



4.7 Flicker Assessment According to CIE TN 006:2016

The flicker was determined according to the SVN standard (CIE TN 006:2016). The higher this value, the greater the risk of perceiving stroboscopic effects. At a value of 1, 50

The calculated flicker value was 0.14, which indicates that this converter has very good flicker characteristics. The EU's mandated Eco-Design limit is 0.4, so this standard is very well met.

4.8 Inrush Current

The ACL230's inrush current is depicted in figure 8.

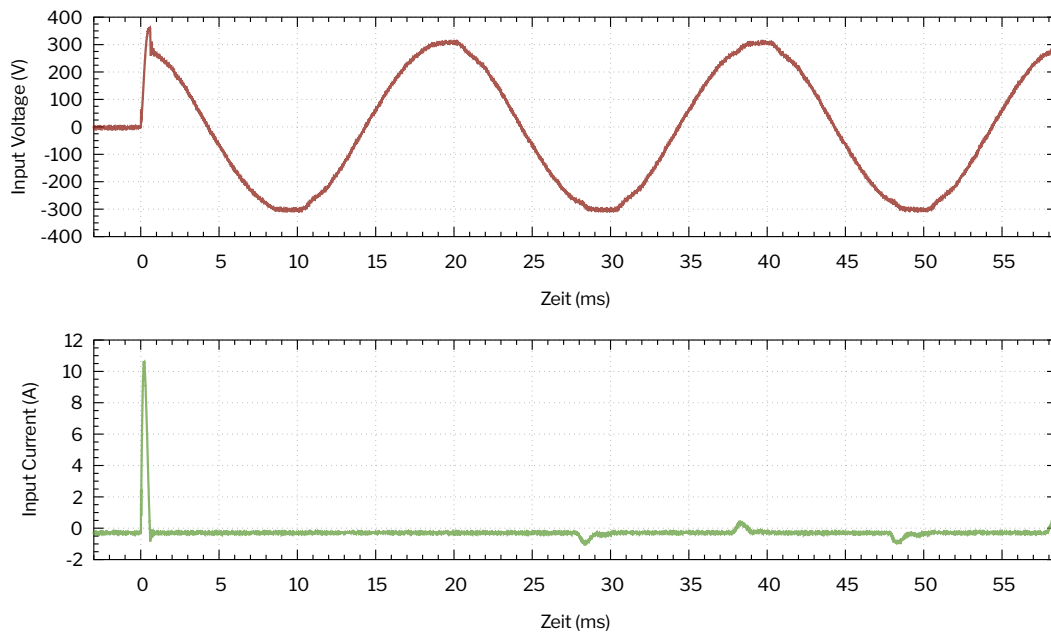


Figure 8: ACL230's inrush current.



4.9 Steady State

The ACL230's steady state operation is shown in the Figure 9. The input and output voltages and currents are shown.

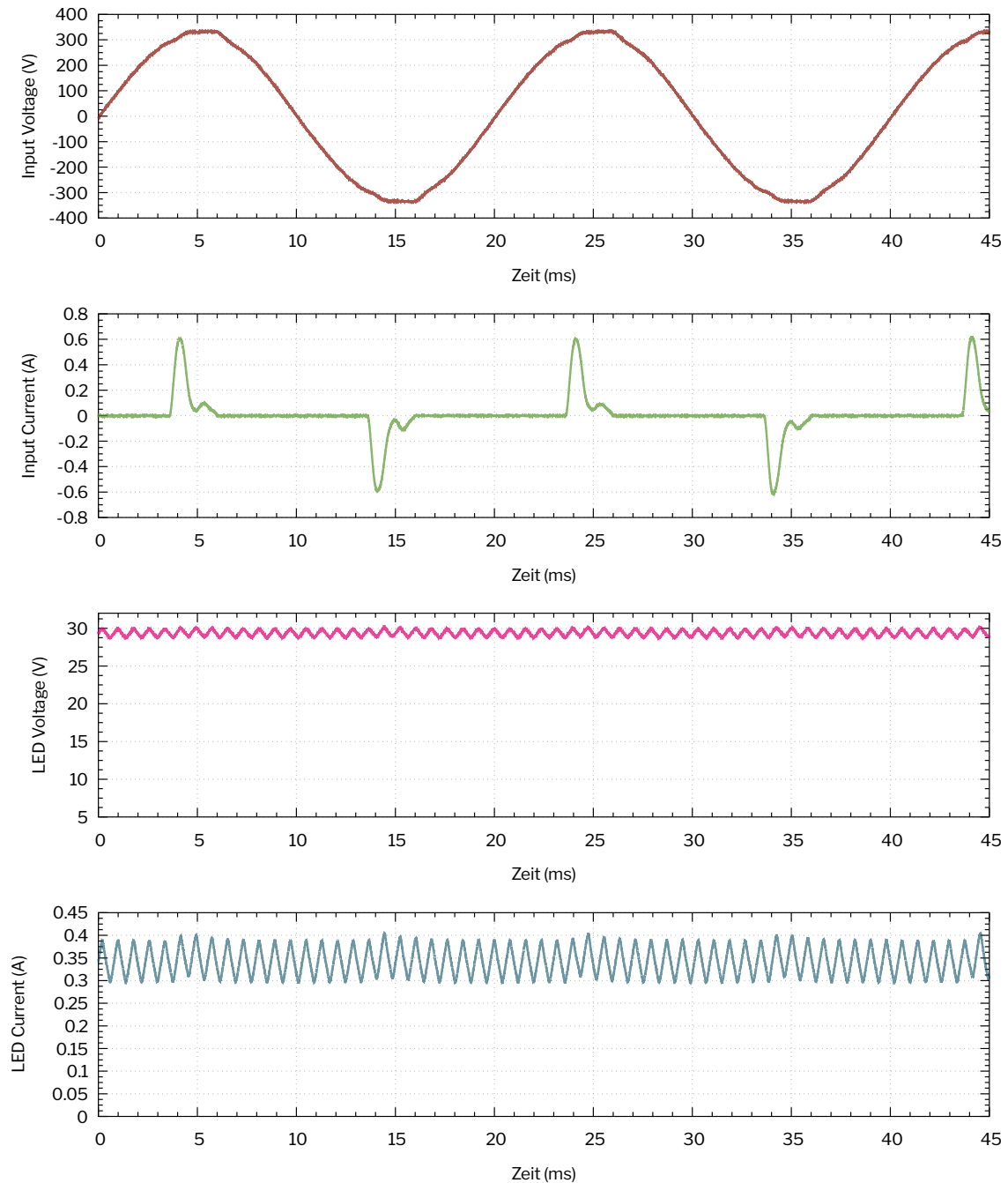


Figure 9: ACL230's input and output voltages and currents.



4.10 Turnon

The ACL230's turnon (AC is connected) is shown in the Figure ??.

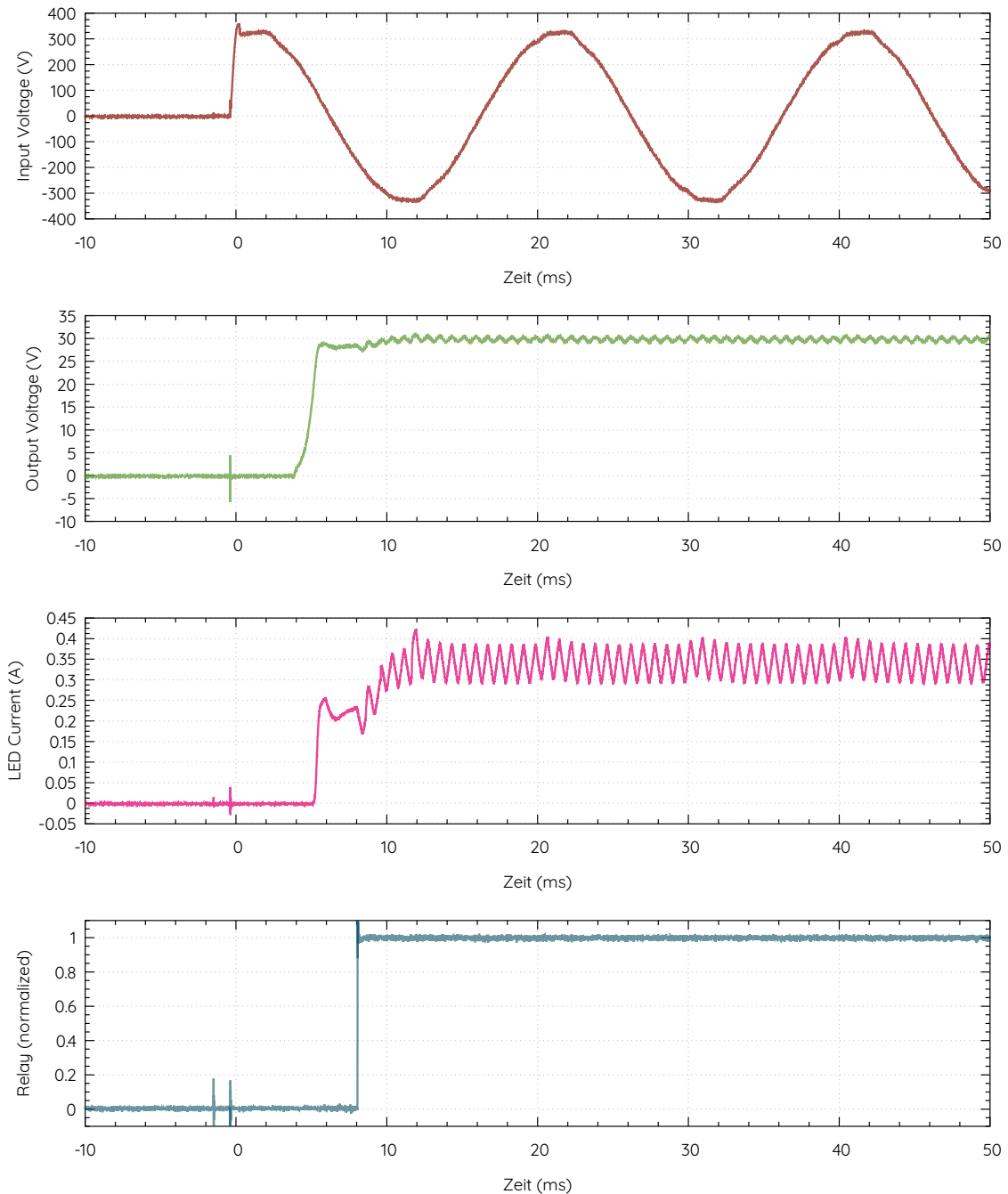


Figure 10: ACL230's AC turnon (connection) is shown.



4.11 Turnoff

The ACL230's turnoff (AC is disconnected) is shown in the Figure 11.

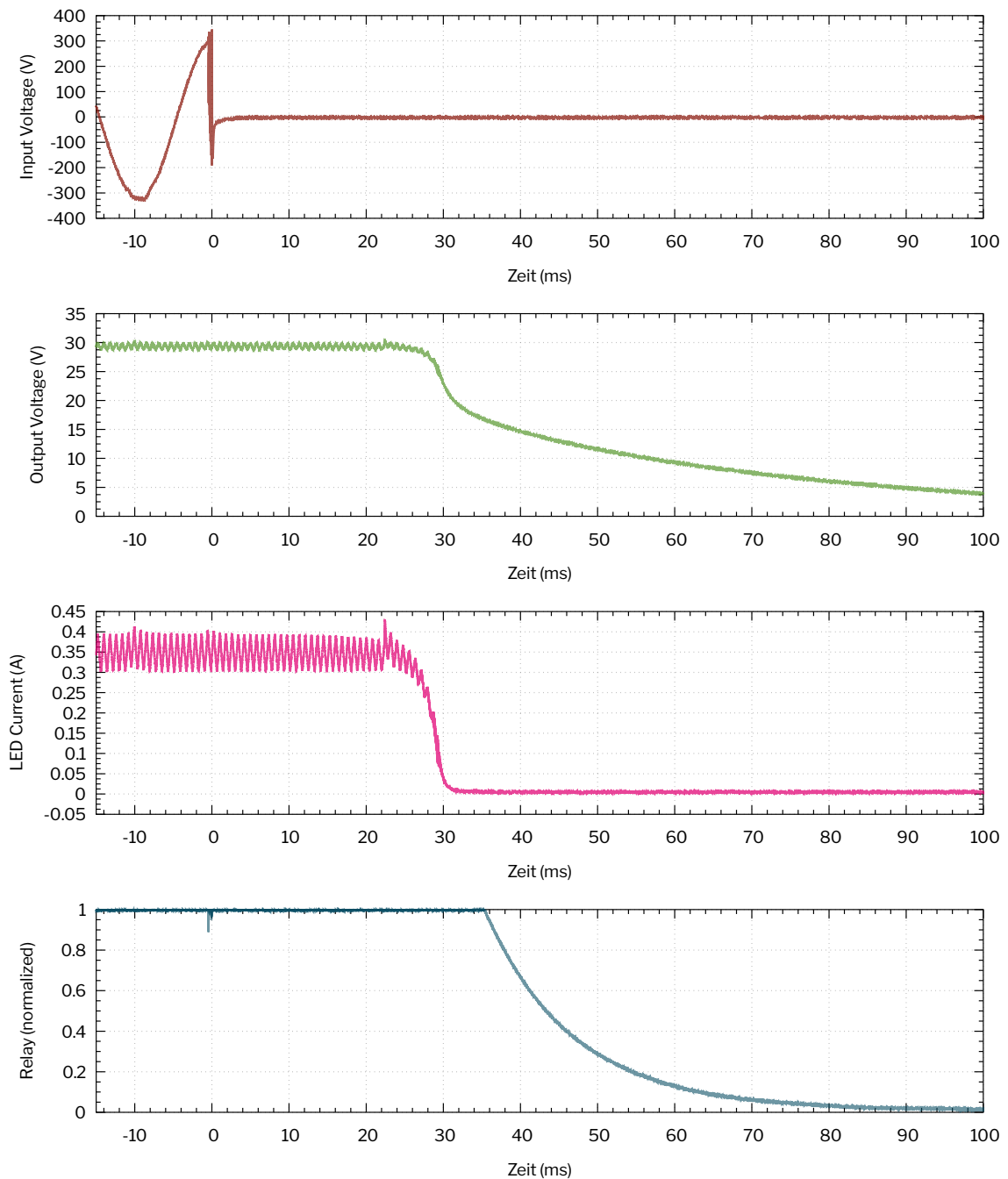


Figure 11: ACL230's AC turnff (disconnection) is shown.



4.12 Temperature

The ACL230's operation under different temperatures is shown in Figure 12. Additionally the input voltage is varied

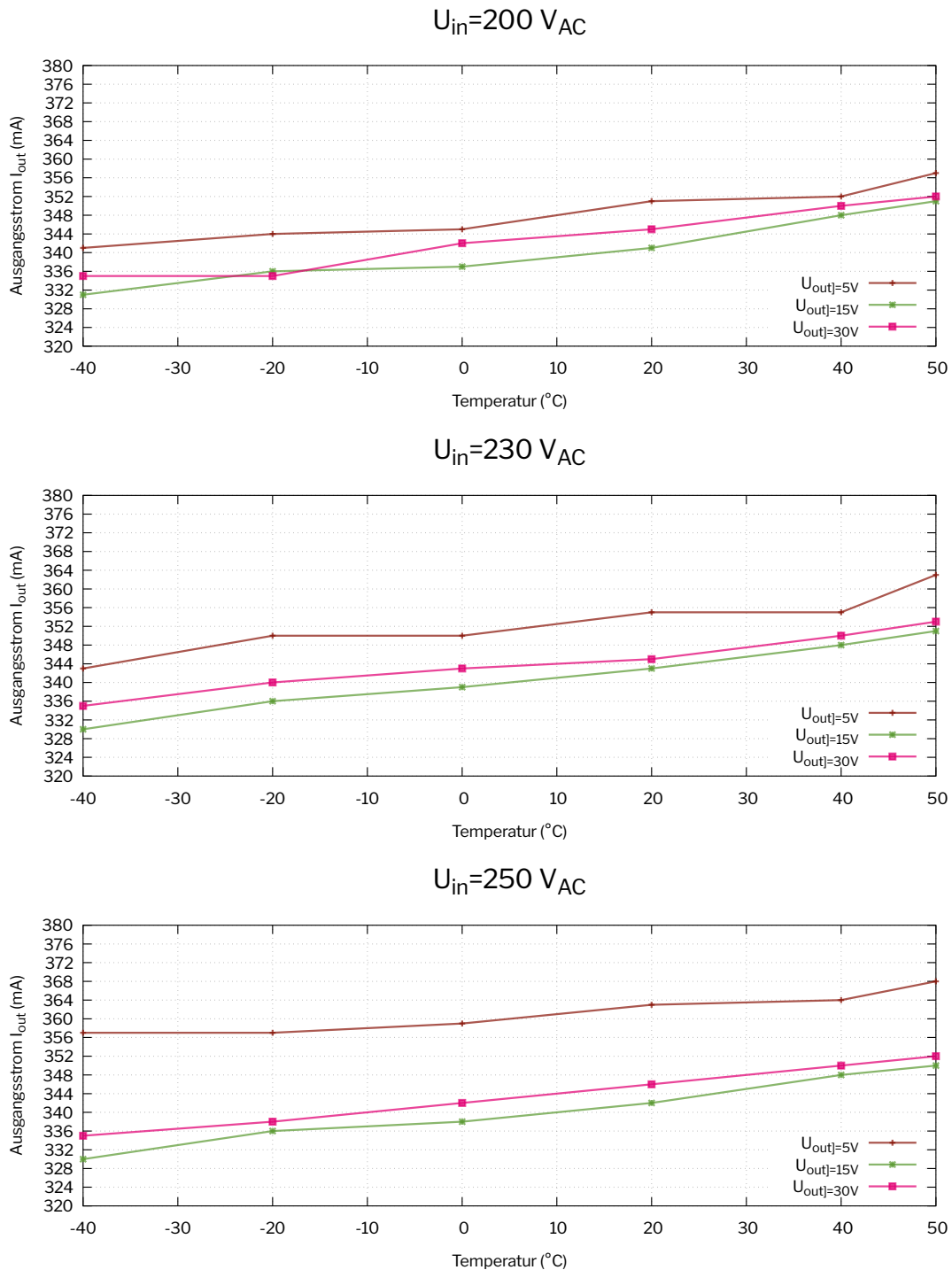


Figure 12:



5 EMC Measurements

5.1 Conducted Emissions AC INPUT

The average and quasipeak EMC conducted line emission of the AC input are depicted in 13. 14.

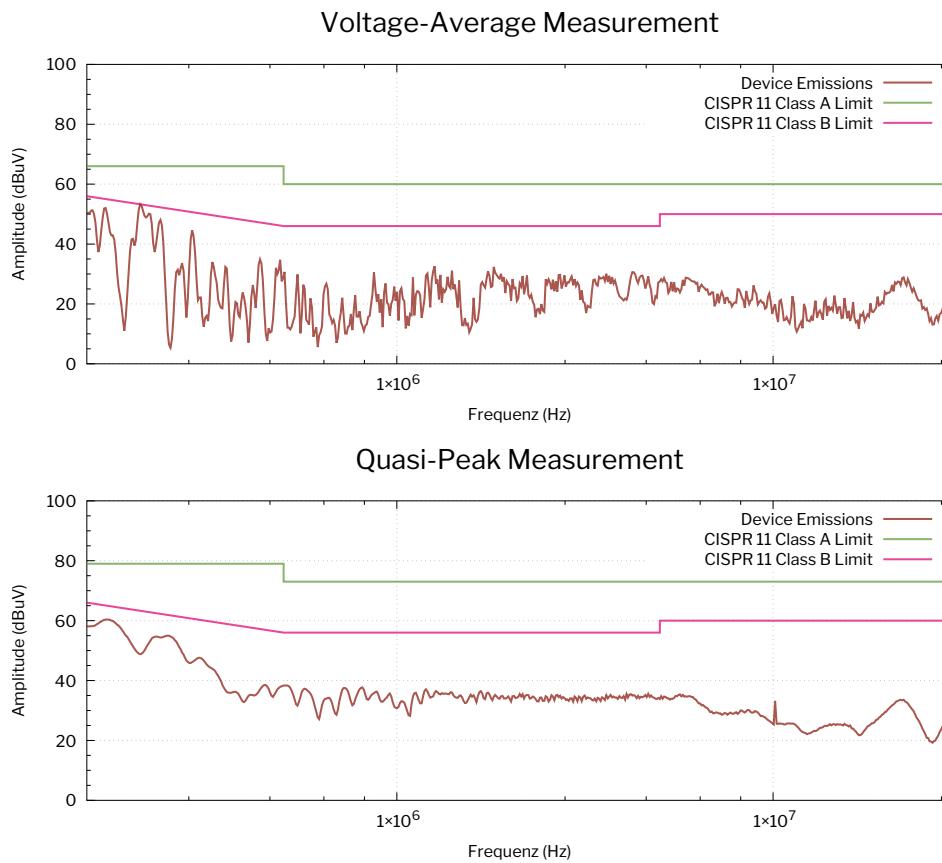


Figure 13: ACL230input (AC) line emissions.



5.2 Conducted Emissions LED Output

The average and quasipeak EMC conducted line emission of the LED output are depicted in 13.

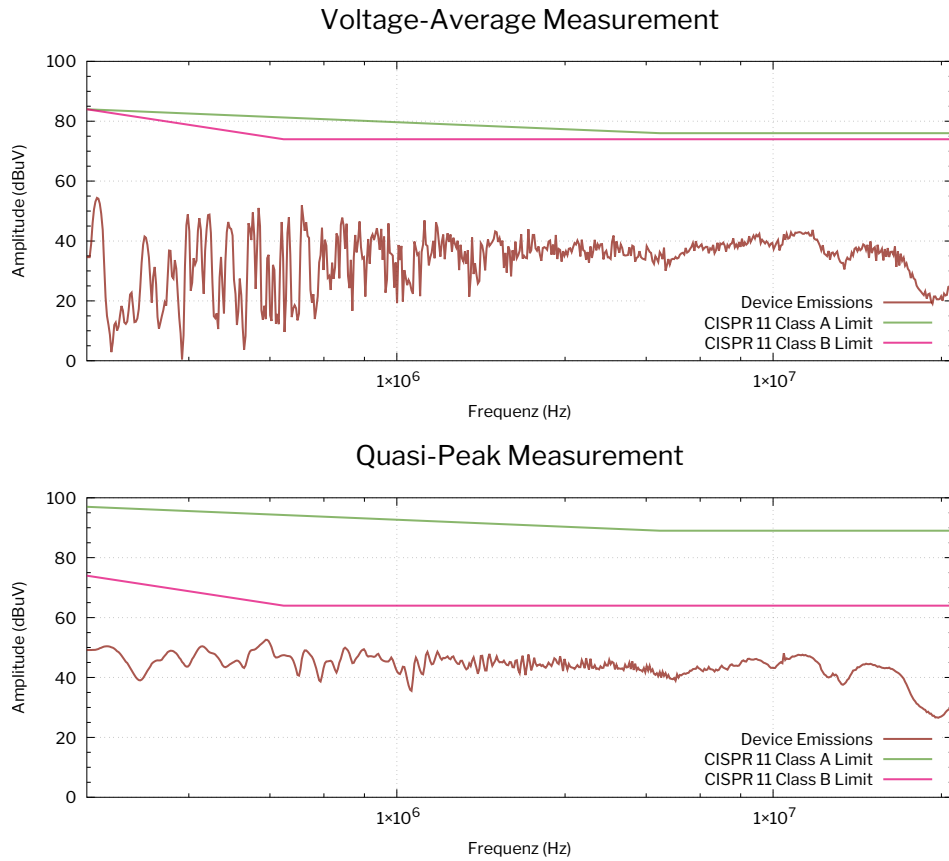


Figure 14: ACL230output (LED) line emissions.



6 Case

The case drawing is shown in Figure 15.

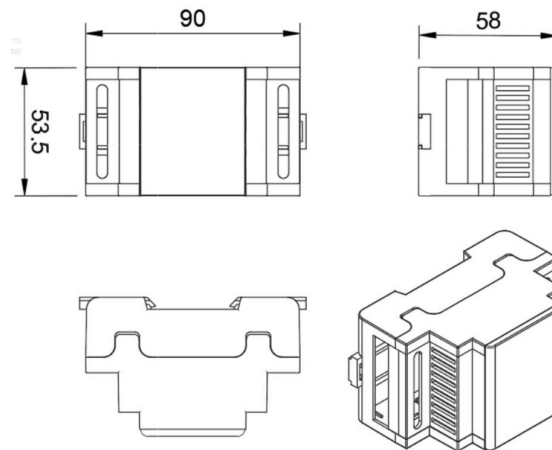


Figure 15: ACL230's 3D View.

7 Product label

The Label for the ACL230 is depicted in the following Figure 16.

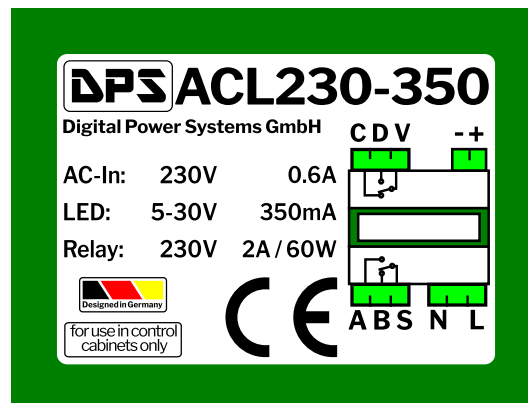


Figure 16: ACL230 Product label

All ACL230 configurations share the same product label. The configuration may change due to a different order number.



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:

`datasheet (ät) digitalpowersystems (döt) eu`

8.2 Revision History

The revision history is depicted in the following table.

Date	Changes in Revision
16.2.2021	Initial Release
3.5.2021	Updated Connection Diagram
8.1.2022	Changed Pinout
5.11.2024	Updated Datasheet to new DPS corporate look

8.3 Contact Information

This is a product of the Digital Power Systems GmbH (DPS). Visit our website:
<https://digitalpowersystems.eu/contact-us/>

