Prüfbericht-Nr.: *Test Report No.:*	**60187980-002**	**Auftrags-Nr.:** *Order No.:*	3268115_030	Seite 1 von 31 *Page 1 of 31*
Kunden-Referenz-Nr.: *Client Reference No.:*	—	**Auftragsdatum:** *Order date:*	28.08.2018	
Auftraggeber: *Client:*	TÜV Rheinland InterCert Kft., Váci út 48/a-b, H-1132 BUDAPEST			
Prüfgegenstand: *Test item:*	DIGITAL (IP) LPR CAMERA			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	FREEWAYCAM03 (FCC ID: XCW-FREEWAYCAM-03)			
Auftrags-Inhalt: *Order content:*	Prüfung der elektromagnetischen Verträglichkeit EMV / Test of electromagnetic compatibility EMC			
Prüfgrundlage: *Test specification:*	Komplettprüfung / Complete test 47 CFR FCC Part 15 Subpart B — — —			
Wareneingangsdatum: *Date of receipt:*	03.08.2018			
Prüfmuster-Nr.: *Test sample No.:*	A000205634-002			
Prüfzeitraum: *Testing period:*	10.10.2018 - 11.10.2018			
Ort der Prüfung: *Place of testing:*	Nürnberg / Nuremberg			
Prüflaboratorium: *Testing laboratory:*	EMV Labor / EMC test lab			
Prüfergebnis*: *Test result*:*	PASS			

geprüft von / *tested by:*			**kontrolliert von /** *reviewed by:*		
04.04.2019	Oliver Wagner, SV		04.04.2019	Dr. Tobias Wirth, SV	
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Der Prüfbericht 60187980-002 ersetzt den Prüfbericht 60187980-001 (FCC ID hinzugefügt)/
The test report 60187980-002 replaces the test report 60187980-001 (FCC ID added)

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Prüfbericht-Nr.: 60187980-002
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Liste der verwendeten Prüfmittel
List of used test equipment

Prüfmittel *Test equipment*		**Prüfmittel-Nr. / ID-Nr.** *Equipment No. / ID-No.*	**Nächste Kalibrierung** *Next calibration*
Absorberhalle *Anechoic chamber*	SAC 10	2728890	04.2019
Messantenne *Antenna*	3115	2728607	01.2020
Messantenne *Antenna*	VULB 9168	2728787	08.2019
Steuereinheit Mast *Antenna mast/Slide bar*	NCD	2733253	—
Umschaltmatrix *Commutation relay*	KRE-3005-ESCU	2732065	01.2019
Umschaltmatrix *Commutation relay*	KRM4-5811-T-S1	09331	—
Netznachbildung *LISN*	ESH2-Z5	2728096	11.2019
Impulsbegrenzer 10 dB *Limitor*	ESH3-Z2	2732546	01.2019
Vorverstärker *Preamplifier*	BBV 9718B	2888179	09.2020
Messempfänger *Receiver*	ESI 40	2728600	09.2020
Messempfänger *Receiver*	ESU 26	2723865	07.2019
Messempfänger *Receiver*	ESU 8	2728148	08.2019
Steuereinheit Mast *Turntable*	CO3000	2732515	—

Produktbeschreibung
Product description

1	**Prüfgegenstand** *Test item*	DIGITAL (IP) LPR CAMERA
2	**Modellbezeichnung** *Model*	FREEWAYCAM03
3	**Baugleiche Modelle** *Identical types*	—
4	**Beschreibung** *Description*	—
5	**Seriennummer** *Serial number*	1188D95
6	**Hersteller** *Manufacturer*	ARH Inc.
7	**Bemessungsspannung** *Rated voltage*	24-28 VAC
8	**Bemessungsfrequenz** *Rated frequency*	50/60 Hz
9	**Bemessungsstrom** *Rated current*	—
10	**Bemessungsleistung** *Rated power consumption*	20 W
11	**Gerätekategorie** *Equipment categorie*	—
12	**Anzahl der Phasen** *Number of phases*	1
13	**Schutzklasse** *Protection class*	III - Schutzkleinspannung/Safety extra-low voltage
14	**Abmessungen** *Dimensions*	390x167x155
15	**Gewicht** *Weight*	—
16	**Sonstiges** *Other*	—

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*
17	**Funkstörspannung** *Conducted voltage emissions* 47 CFR FCC Part 15 Subpart B Section 15.107	*Details in protocol number:* #1290 *Operating mode*: Videostream *EUT:* FREEWAYCAM03 (A000205634-002) *Terminals:* Netzleitung / Supply line Remarks: —	P ☒ F ☐ N/A ☐ N/T ☐

Grenzwerte
Limits

Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)]	Mittelwert *Average* [dB(µV)]
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

**Decreases with the logarithm of the frequency.*

For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms LISN. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)]	Mittelwert *Average* [dB(µV)]
0.15 – 0.5	79	66
0.5 – 30	73	60

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*
	Methode *Method* *The test setup was according to ANSI C63.4. The EUT was placed on a non-conducting table at a height of 0.8 m above the reference ground plane and 0.4 m away from the conducting walls of a shielded room. The Artificial Mains Network (AMN) was placed 0.8 m away from the boundary of the unit under test and bonded to the ground reference plane. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. Supporting units were connected to other AMN if necessary. Conducted voltage measurements on all mains lines were made at the output of the AMN. The whole required frequency range was investigated for maximum conducted interferences.*		

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*
18	**Funkstörfeldstärke** *Radiated disturbance* 47 CFR FCC Part 15 Section 15.109	*Details in protocol number:* #1117 *Operating mode*: Videostream *EUT:* FREEWAYCAM03 (A000205634-002) *Terminals:* Gehäuse / Enclosure *Remarks:* —	P ☒ F ☐ N/A ☐ N/T ☐

Grenzwerte
Limits

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)/m]
30 – 88	40
88 – 216	43.5
216 – 960	46
Above 960	54

The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following, using measurement instrumentation employing a CISPR quasi-peak detector.

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)/m]
30 – 88	39.1
88 – 216	43.5
216 – 960	46.4
Above 960	49.5

Note: For frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function.
When average radiated emission measurements are specified, there also is a limit on the peak level of the radio frequency emissions which is 20 dB above the maximum permitted average emission limit. (see § 15.35 Measurement detector functions and bandwidths)

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*

Methode
Method

The test setup was according to ANSI C63.4. Measurements were made in a 10-meter semi-anechoic chamber. The EUT was placed on a non-conducting table at a height of 0.8 m above the reference ground plane. Preliminary measurements were performed with a receiver employing a peak detector at an antenna to EUT distance of 3 m or 10 m as defined by the standard. The EUT was continuously rotated 360° about its azimuth to determine the position of the highest emissions. The measurement antenna was adjusted between 1 m and 4 m above ground to find the maximum signal strength. These measurements were done in both horizontal and vertical polarizations. After this, final measurements with a receiver employing a quasi-peak detector were performed by rotating the EUT 360° and adjusting the receive antenna height from 1 m to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity.

The quasi-peak emission limits are calculated from the field strength limit of this section using this formula:

$$Emission\ level\ \left(\frac{dB\mu V}{m}\right) = 20\ log\ Emission\ level\ \left(\frac{\mu V}{m}\right)$$

When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade as per §15.31(f)(1). For this documentation a distance extrapolation factor was added to the limit that was calculated using this formula:

$$Emission\ limit_{new}\ \left(\frac{dB\mu V}{m}\right) = Emission\ limit_{old} + 20\ log\ \left(\frac{d_1}{d_2}\right)$$

Where

d_1: *old distance* $(e.g.\ 3\ m)$

d_2: *new distance* $(e.g.\ 10\ m)$

The field strength is calculated by adding the antenna factor and cable loss. The basic equation with a sample calculation is as follows:

E = U + AF + CA

For example:

Frequency (MHz)	*Receiver reading U (dBµV)*	*Correction antenna factor AF + cable loss CA (dB)*	*Field strength E (dBµV/m)*
320	*15.9*	*15.8*	*31.7*

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*
19	**Funkstörfeldstärke** *Radiated disturbance* 47 CFR FCC Part 15 Subpart B 15.109	*Details in protocol number:* #1120 *Operating mode*: Videostream *EUT:* FREEWAYCAM03 (A000205634-002) *Terminals:* Gehäuse / Enclosure *Remarks:* —	P ☒ F ☐ N/A ☐ N/T ☐

Grenzwerte
Limits

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)/m]
30 – 88	40
88 – 216	43.5
216 – 960	46
Above 960	54

The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following, using measurement instrumentation employing a CISPR quasi-peak detector.

Frequenz *Frequency* [MHz]	Quasi-Spitzenwert *Quasi-peak* [dB(µV)/m]
30 – 88	39.1
88 – 216	43.5
216 – 960	46.4
Above 960	49.5

Note: For frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function.
When average radiated emission measurements are specified, there also is a limit on the peak level of the radio frequency emissions which is 20 dB above the maximum permitted average emission limit. (see § 15.35 Measurement detector functions and bandwidths)

Absatz *Clause*	Anforderungen - Prüfungen / *Requirements - Tests*	Messergebnisse - Bemerkungen *Measuring results - Remarks*	Bewertung *Evaluation*

Methode
Method

The test setup was according to ANSI C63.4. Measurements were made in a 10-meter semi-anechoic chamber. The EUT was placed on a non-conducting table at a height of 0.8 m above the reference ground plane. Preliminary measurements were performed with a receiver employing a peak detector at an antenna to EUT distance of 3 m or 10 m as defined by the standard. The EUT was continuously rotated 360° about its azimuth to determine the position of the highest emissions. The measurement antenna was adjusted between 1 m and 4 m above ground to find the maximum signal strength. These measurements were done in both horizontal and vertical polarizations. After this, final measurements with a receiver employing a quasi-peak detector were performed by rotating the EUT 360° and adjusting the receive antenna height from 1 m to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity.

The quasi-peak emission limits are calculated from the field strength limit of this section using this formula:

$$Emission\ level\ \left(\frac{dB\mu V}{m}\right) = 20\ log\ Emission\ level\ \left(\frac{\mu V}{m}\right)$$

When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade as per §15.31(f)(1). For this documentation a distance extrapolation factor was added to the limit that was calculated using this formula:

$$Emission\ limit_{new}\ \left(\frac{dB\mu V}{m}\right) = Emission\ limit_{old} + 20\ log\ \left(\frac{d_1}{d_2}\right)$$

Where

d_1: *old distance* $(e.g.\ 3\ m)$

d_2: *new distance* $(e.g.\ 10\ m)$

The field strength is calculated by adding the antenna factor and cable loss. The basic equation with a sample calculation is as follows:

E = U + AF + CA

For example:

Frequency (MHz)	*Receiver reading U (dBµV)*	*Correction antenna factor AF + cable loss CA (dB)*	*Field strength E (dBµV/m)*
320	*15.9*	*15.8*	*31.7*

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20 **Änderungsverzeichnis**
Change history

Rev. No.	List of revisions	Date Author
1	First edition (60187980-001)	2018-10-11 Oliver Wagner
2	Second edition (60187980-002): • FCC ID added	2019-04-04 Oliver Wagner

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21	**Kalibrierung** ***Calibration***
	Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons. *All measurement equipment calibrations are traceable to DKD or where calibration is performed outside Germany, to equivalent nationally recognized standards organizations.*
22	**Registrierung** ***Registration***
	The measurement facilities for conducted and for radiated disturbance measurement of the TRLP, have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules. Measurement data will be accepted in conjunction with applications for Certification under Parts 15 and 18 of the Commission's Rules. *FCC Registration-Number:* **939976** Bundesnetzagentur Registriernummer: BNetzA-CAB-17/21-16
23	**Verifizierung** ***Verification***
	Pursuant to 47 CFR part 15 - RADIO FREQUENCY DEVICES, Section 15.19. *This device shall bear the following statement in a conspicuous location on the device:* This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
24	**Angewendete Standards** ***Applied Standards***
	According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: - *Title 47 CFR FCC Part 15 Subpart B* - *ANSI C63.4-2014 (Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz)* - *ICES-003:2016 (Issue 6) (Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement)* *For frequencies f ≤ 1000 MHz the test setup and test was done according to: ANSI C63.4-2014.* *For frequencies f > 1000 MHz the test setup and test was done according to ANSI C63.4-2014.*

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25 **Testkonfiguration**
Equipment used during test

Prüfgegenstand
Equipment under test

Nr. *No.*	Produktart *Product type*	Hersteller *Manufacturer*	Modell *Model*	Kommentare *Comments*
1	DIGITAL (IP) LPR CAMERA	ARH Inc.	FREEWAYCAM03	—

Hilfsmittel / Peripherie
Auxiliary Equipment / Peripherals

Nr. *No.*	Produktart *Product type*	Hersteller *Manufacturer*	Modell *Model*	Kommentare *Comments*
1	Notebook	Medion	MD 96290	

26 **Ein-/Ausgabeanschlüsse**
Input/Output ports

Nr. *No.*	Name	Art* *Type**	Kabel-länge *Cable length*	Kabel geschirmt *Cable shielded*	Kommentare *Comments*
1	Enclosure	N/E	—	—	None
2	Power	AC	2 m	No	24 VAC, 60 Hz
	Ethernet	TP	2 m	Yes	—

* AC = AC Power Port
DC = DC Power Port
N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

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27 **Interne Betriebsfrequenzen**
Internal operating frequencies

Nr. / *No.*	Frequenz / *Frequency*	Beschreibung / *Description*
1	766 MHz	ARM Dual Core 2x766Mhz

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705–108	1000
108–500	2000
500–1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

28 **Betriebsarten**
Operating modes

The EUT has been connected with peripherals pursuant ANSI C63.4 and was operated in a configuration to maximize its emission characteristics in a typical application.

Nr. / *No.*	Beschreibung / *Description*
1	Videostream *Videostream*

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29	**Prüfaufbau** *EUT configuration*
	Der Prüfaufbau erfolgte entsprechend den Angaben der genannten EMV-Normen. Die Messungen und Tests wurden unter "worst case"-Bedingungen durchgeführt, d.h. es wurden typische Anordnungen und Betriebszustände gewählt bzw. angenommen, die maximale Störaussendung und Störempfindlichkeit vermuten lassen (sogenannte "Ungünstigste Konfiguration"). Einzelheiten der Geräteeinstellungen sind u.a. der Fotodokumentation zu entnehmen. Soweit nicht anders angegeben, gelten diese Angaben für alle nachfolgenden Messungen. *The test setup was made in accordance with mentioned EMC standards.* *Measurements and tests were executed under "worst case" conditions. Typical EUT arrangements or operating modes were chosen or assumed which let suspect maximum emission or susceptibility (a so called "unfavourable configuration").* *Details of test setup or adjustments are (particularly) shown inside the photo documentation.* *As far as not mentioned otherwise these statements are valid for all following tests.*
30	**Besondere EMV-Massnahmen** *Special EMC measures*
	Keine / None
31	**Klimatische Bedingungen** ***Climatic conditions***
	Umgebungstemperatur *Ambient Temperature* 15 - 35 °C Relative Luftfeuchte *Relative Humidity* 30 - 60 % Luftdruck *Air pressure* 860 - 1060 mbar

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32	**Aussage zur Messunsicherheit** *Statement of the measurement uncertainty*
	Die in diesem Dokument genannten Daten und Ergebnisse sind wahr und genau. Der Leser wird darauf hingewiesen, dass innerhalb der Kalibriergrenzen der Geräte und Einrichtungen Fehler auftreten können. Die Messunsicherheit wurde für alle Prüfungen in diesem Prüfbericht gemäß CISPR 16-4 "Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit – Teil 4-2: Unsicherheiten, Statistik und Modelle zur Ableitung von Grenzwerten (Störmodell) – Messgeräte-Unsicherheit" berechnet und ist im Qualitätssicherungssystem gemäß ISO / IEC 17025 dokumentiert. Darüber hinaus können Veränderungen bei den Bauteilen und im Herstellungsprozess zu einer zusätzlichen Abweichung führen. Der Hersteller ist alleine verantwortlich dafür, dass zukünftige Geräte die einschlägigen Normen und Standards einhalten. *The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the quality system acc. to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation.* *The manufacturer has the sole responsibility of continued compliance of the device.*

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33 **Messunsicherheiten**
Measurement uncertainties

Folgende Messunsicherheiten wurden nach CISPR 16-4-2 ermittelt. Es handelt sich um die erweiterte Messunsicherheit, mit einer Wahrscheinlichkeit von 95%, dass die Werte im zugeordneten Intervall liegen (k = 2).
The following measurement uncertainties have been calculated in accordance with CISPR 16-4-2. The stated values are the expanded uncertainty values, the measurand lies within the assigned range of values with a probability of 95% (k = 2).

Measurement procedure	U_{Lab}
Measurement of conducted emissions at the power supply connection to LISN in the frequency range 9k-150kHz (CISPR Band A)	2.3 dB
Measurement of conducted emissions at the power supply connection to LISN in the frequency range 150k-30MHz (CISPR Band B) with 150 ohm Delta LISN	3.3 dB
Measurement of conducted emissions at the power supply connection to LISN in the frequency range 150k-30MHz (CISPR Band B)	2.2 dB
Measurement of conducted emissions at the power supply connection to voltage probes in the frequency range 9k-30MHz (CISPR Band A and B)	2.0 dB
Measurement of conducted emissions at telecommunication connection to ISN in the frequency range 150k-30MHz (CISPR Band B) ISN CAT 5	3.3 dB
Measurement of conducted emissions at the telecommunication connection to ISN in the frequency range 150k-30MHz (CISPR Band B) ISN CAT 6 Shielded	2.6 dB
Measurement of conducted emissions at the telecommunications connection to current clamps in the frequency range 150k-30MHz (CISPR Band B)	2.2 dB
Measurement of interference power in the frequency range 30-300MHz (CISPR Band C)	2.9 dB
Measurement of interference power in the frequency range 30-300MHz (CISPR Band C) CDNE	2.6 dB
Measurement of magnetic emissions in the frequency range 9k-150kHz (CISPR Band A) with frame antenna HFH2 (small loop antenna)	1.6 dB
Measurement of magnetic emissions in the frequency range 9k-150kHz (CISPR Band A) with frame antenna HL562 (3-axis loop antenna)	1.6 dB
Measurement of the field strength in the frequency range 30-1000MHz (CISPR Band C and D) with 10m distance with VULB 9168 Vertical	4.5 dB
Measurement of the field strength in the frequency range 30-1000MHz (CISPR band C and D) with 10m distance with VULB 9168 Horizontal	4.4 dB
Measurement of the field strength in the frequency range 1-18GHz (CISPR Band E) with 3m distance with HL025 1-6GHz	5.0 dB
Measurement of the field strength in the frequency range 1-18GHz (CISPR Band E) with 3m distance with HL025 6-18GHz	5.3 dB

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Funkstörspannung Conducted voltage emissions	**PASS**
Prüfungsbezeichnung u. -nummer *Test name and number*	Conducted voltage emissions in operating mode videostream #1290
Datum des Tests *Test date*	11.10.2018
Angewendete Norm *Applied Standard*	47 CFR FCC Part 15 Subpart B Section 15.107
Prüfmethode *Test method*	ANSI C63.4-2014
Temperatur (°C) *Temperature*	24.1
Luftfeuchte (% rH) *Humidity*	33.6
Luftdruck (mbar) *Air pressure*	988.0
Bearbeiter *Tested by*	Wagner
Modellbezeichnung *Model*	FREEWAYCAM03
Prüfmuster-Nr. *Test sample No.:*	A000205634-002
Betriebsart *Operating mode*	Videostream
Anschlüsse *Tested terminals*	Netzleitung / Supply line
Grenzwert *Limit*	47 CFR Part 15 section 15.107 Class B
Bemerkung *Remarks*	—
Version der Prüfsoftware *Version of testing software*	3.17.0.29

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Verwendete Prüfmittel
Used test equipment

Typ	**Hersteller** *Manufacturer*	**Modell**	**ID**	**Kalibriert am** *Last calibration*	**Kalibriert bis** *Next calibration*
Impulsbegrenzer 10 dB *Limitor*	Rohde & Schwarz	ESH3-Z2	2732546	16.01.2017	16.01.2019
Netznachbildung *LISN*	Rohde & Schwarz	ESH2-Z5	2728096	25.11.2016	25.11.2019
Messempfänger *Receiver*	Rohde & Schwarz	ESU 8	2728148	21.08.2018	21.08.2019
Schirmkabine *Shielded room*	TDK	SR 2	—	17.11.2016	17.11.2018

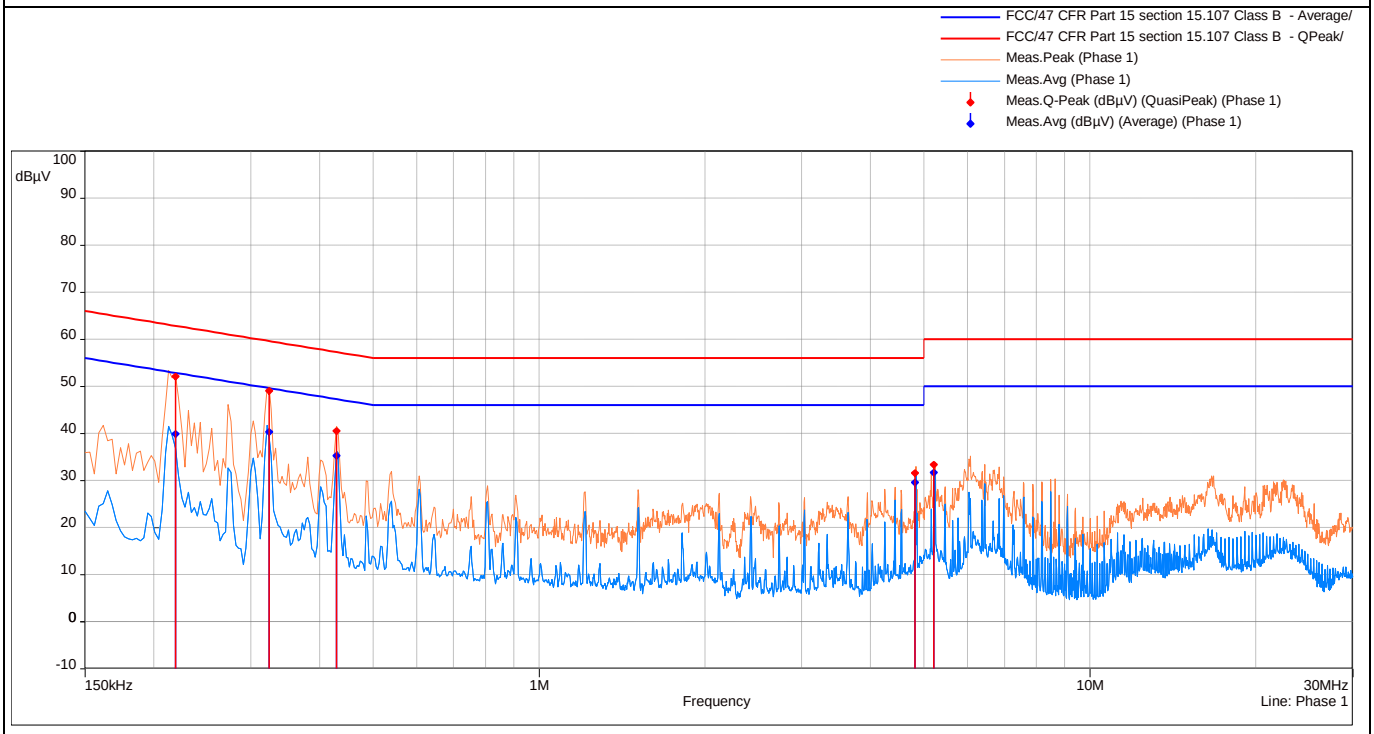
Prüfparameter zu Funkstörspannung **#1290**
Test parameter of Conducted voltage emissions
Conducted voltage emissions in operating mode videostream, A000205634-002, FREEWAYCAM03

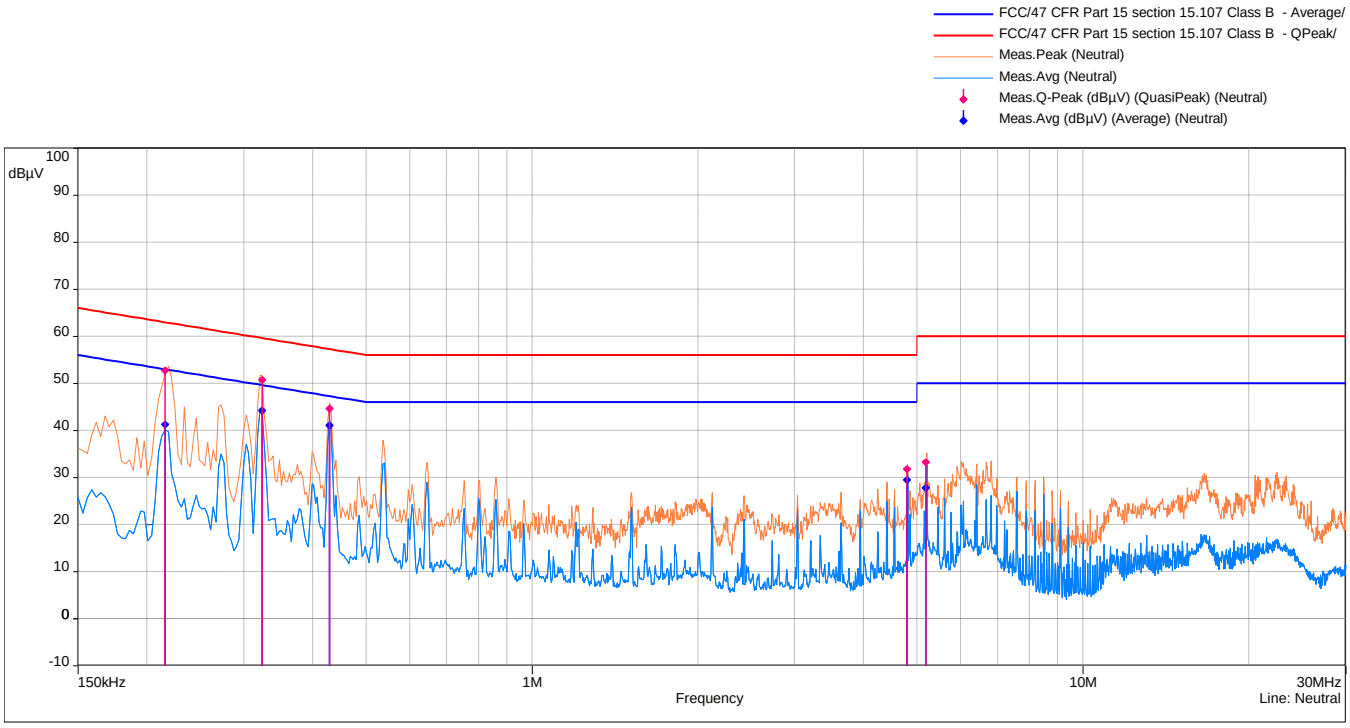
Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
150kHz	30MHz	3kHz	Phase 1	10 ms	9kHz

Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
150kHz	30MHz	3kHz	Neutral	10 ms	9kHz

ZUSATZDOKUMENTATION
ADDITIONAL DOCUMENTATION

Messdiagramme zu Funkstörspannung **#1290**
Graphical presentation of Conducted voltage emissions
Conducted voltage emissions in operating mode videostream, A000205634-002, FREEWAYCAM03





ZUSATZDOKUMENTATION
ADDITIONAL DOCUMENTATION

Messdiagramme zu Funkstörspannung **#1290**
Graphical presentation of Conducted voltage emissions
Conducted voltage emissions in operating mode videostream, A000205634-002, FREEWAYCAM03

Messdaten zu Funkstörspannung **#1290**
Measurement data of Conducted voltage emissions
Conducted voltage emissions in operating mode videostream, A000205634-002, FREEWAYCAM03

Average (10)

Frequency (MHz)	Meas.Avg (dBµV)	Limit (dBµV)	Meas.-Lim (dB)	Line	Comments	Correction (dB)
0.2175	39.93	52.86	-12.93	Phase 1	Pass	10.06
0.32325	40.29	49.60	-9.31	Phase 1	Pass	10.07
0.429	35.31	47.27	-11.96	Phase 1	Pass	10.08
4.81725	29.58	46.00	-16.42	Phase 1	Pass	10.22
5.21475	31.66	50.00	-18.34	Phase 1	Pass	10.23
0.21675	41.29	52.97	-11.68	Neutral	Pass	10.06
0.32325	44.26	49.60	-5.34	Neutral	Pass	10.07
0.429	41.10	47.27	-6.17	Neutral	Pass	10.08
4.79325	29.48	46.00	-16.52	Neutral	Pass	10.22
5.19075	27.81	50.00	-22.19	Neutral	Pass	10.23

QuasiPeak (10)

Frequency (MHz)	Meas.Q-Peak (dBµV)	Limit (dBµV)	Meas.-Lim (dB)	Line	Comments	Correction (dB)
0.2175	52.14	62.86	-10.72	Phase 1	Pass	10.06
0.32325	49.06	59.60	-10.54	Phase 1	Pass	10.07
0.429	40.57	57.27	-16.70	Phase 1	Pass	10.08
4.81725	31.54	56.00	-24.46	Phase 1	Pass	10.22
5.21475	33.42	60.00	-26.58	Phase 1	Pass	10.23
0.21675	52.75	62.97	-10.22	Neutral	Pass	10.06
0.32325	50.76	59.60	-8.85	Neutral	Pass	10.07
0.429	44.63	57.27	-12.64	Neutral	Pass	10.08
4.79325	31.77	56.00	-24.23	Neutral	Pass	10.22
5.19075	33.31	60.00	-26.69	Neutral	Pass	10.23

Bemerkungen / *Remarks*:

Margin value = Measurement value – Limit value

ANLAGE zum Prüfbericht-Nr.: 60187980-002
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Funkstörfeldstärke Radiated disturbance	**PASS**
Prüfungsbezeichnung u. -nummer *Test name and number*	Radiated disturbance (30 MHz - 1 GHz) in operating mode videostream #1117
Datum des Tests *Test date*	10.10.2018
Angewendete Norm *Applied Standard*	47 CFR FCC Part 15 Section 15.109
Prüfmethode *Test method*	ANSI C63.4-2014
Temperatur (°C) *Temperature*	24.0
Luftfeuchte (% rH) *Humidity*	40.1
Luftdruck (mbar) *Air pressure*	981.0
Bearbeiter *Tested by*	Wagner
Modellbezeichnung *Model*	FREEWAYCAM03
Prüfmuster-Nr. *Test sample No.:*	A000205634-002
Betriebsart *Operating mode*	Videostream
Anschlüsse *Tested terminals*	Gehäuse / Enclosure
Grenzwert *Limit*	47 CFR Part 15 section 15.109
Bemerkung *Remarks*	—
Version der Prüfsoftware *Version of testing software*	3.17.0.29

ANLAGE zum Prüfbericht-Nr.: 60187980-002
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Verwendete Prüfmittel
Used test equipment

Typ	**Hersteller** *Manufacturer*	**Modell**	**ID**	**Kalibriert am** *Last calibration*	**Kalibriert bis** *Next calibration*
Absorberhalle *Anechoic chamber*	TDK	SAC 10	2728890	13.04.2018	13.04.2019
Messantenne *Antenna*	Schwarzbeck	VULB 9168	2728787	31.08.2016	31.08.2019
Umschaltmatrix *Commutation relay*	MTS Systemtechnik	KRE-3005-ESCU	2732065	29.01.2018	29.01.2019
Messempfänger *Receiver*	Rohde & Schwarz	ESU 26	2723865	31.07.2018	31.07.2019

Prüfparameter zu Funkstörfeldstärke **#1117**
Test parameter of Radiated disturbance
Radiated disturbance (30 MHz - 1 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03

Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
30MHz	1GHz	30kHz	Horizontal	20 ms	120kHz

Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
30MHz	1GHz	30kHz	Vertical	20 ms	120kHz

ANLAGE zum Prüfbericht-Nr.: 60187980-002
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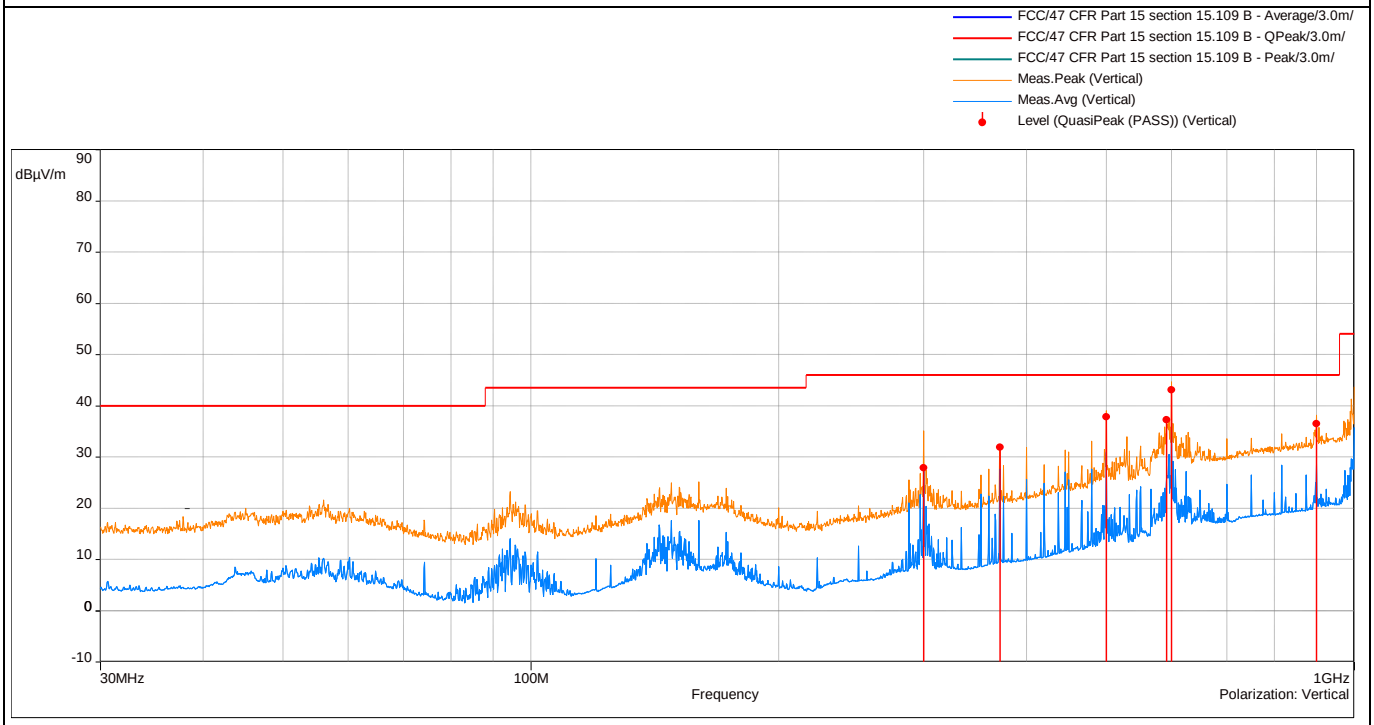
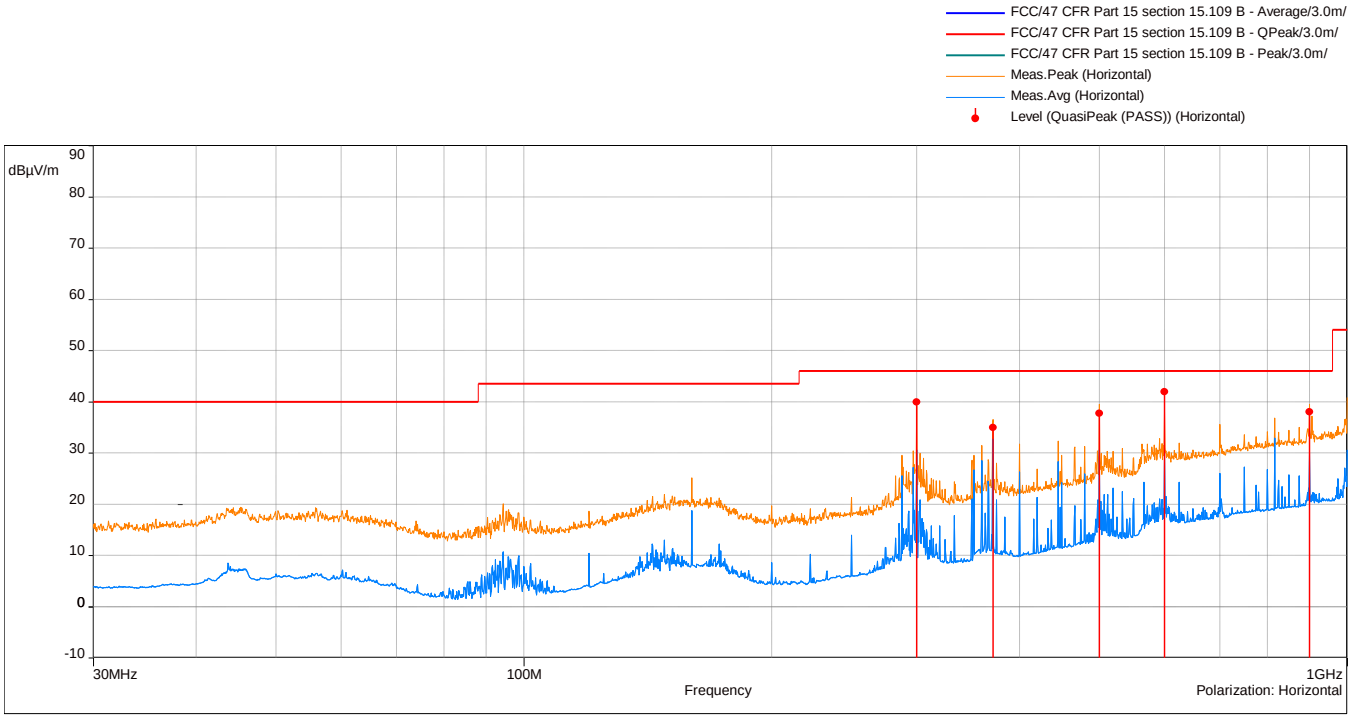
Messdiagramme zu Funkstörfeldstärke **#1117**
Graphical presentation of Radiated disturbance
Radiated disturbance (30 MHz - 1 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03





ZUSATZDOKUMENTATION
ADDITIONAL DOCUMENTATION

Messdiagramme zu Funkstörfeldstärke **#1117**
Graphical presentation of Radiated disturbance
Radiated disturbance (30 MHz - 1 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03

Messdaten zu Funkstörfeldstärke **#1117**
Measurement data of Radiated disturbance
Radiated disturbance (30 MHz - 1 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03

QuasiPeak (PASS) (11)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	Correction (dB)
300	39.95	46.00	-6.05	1.00	57.10	Horizontal	15.98
371.25	35.01	46.00	-10.99	1.00	25.30	Horizontal	17.76
500.01	37.76	46.00	-8.24	1.63	32.80	Horizontal	20.52
600	41.97	46.00	-4.03	1.23	24.20	Horizontal	22.85
900	38.07	46.00	-7.93	1.44	2.50	Horizontal	26.70
300	27.86	46.00	-18.14	2.97	2.90	Vertical	15.98
371.25	31.91	46.00	-14.09	1.62	268.60	Vertical	17.76
499.98	37.82	46.00	-8.18	1.00	111.90	Vertical	20.52
591.48	37.28	46.00	-8.72	1.00	300.40	Vertical	22.50
600	43.07	46.00	-2.93	1.00	243.70	Vertical	22.85
900	36.49	46.00	-9.51	2.00	100.50	Vertical	26.70

Bemerkungen / *Remarks*:

Margin value = Measurement value – Limit value

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Funkstörfeldstärke Radiated disturbance	**PASS**
Prüfungsbezeichnung u. -nummer *Test name and number*	Radiated disturbance (1 GHz - 6 GHz) in operating mode videostream #1120
Datum des Tests *Test date*	10.10.2018
Angewendete Norm *Applied Standard*	47 CFR FCC Part 15 Subpart B 15.109
Prüfmethode *Test method*	ANSI C63.4-2014
Temperatur (°C) *Temperature*	24.9
Luftfeuchte (% rH) *Humidity*	39.4
Luftdruck (mbar) *Air pressure*	978.0
Bearbeiter *Tested by*	Wagner
Modellbezeichnung *Model*	FREEWAYCAM03
Prüfmuster-Nr. *Test sample No.:*	A000205634-002
Betriebsart *Operating mode*	Videostream
Anschlüsse *Tested terminals*	Gehäuse / Enclosure
Grenzwert *Limit*	47 CFR Part 15 section 15.109
Bemerkung *Remarks*	—
Version der Prüfsoftware *Version of testing software*	3.17.0.29

ANLAGE zum Prüfbericht-Nr.: 60187980-002
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Verwendete Prüfmittel
Used test equipment

Typ	**Hersteller** *Manufacturer*	**Modell**	**ID**	**Kalibriert am** *Last calibration*	**Kalibriert bis** *Next calibration*
Absorberhalle *Anechoic chamber*	TDK	SAC 10	2728890	13.04.2018	13.04.2019
Messantenne *Antenna*	EMCO	3115	2728607	11.01.2017	11.01.2020
HF-Kabel *Cable*	TRLP	N-SMA	LTG_1815	30.07.2018	30.07.2021
Vorverstärker *Preamplifier*	Schwarzbeck	BBV 9718B	2888179	21.09.2019	21.09.2020
Messempfänger *Receiver*	Rohde & Schwarz	ESI 40	2728600	05.09.2018	05.09.2020

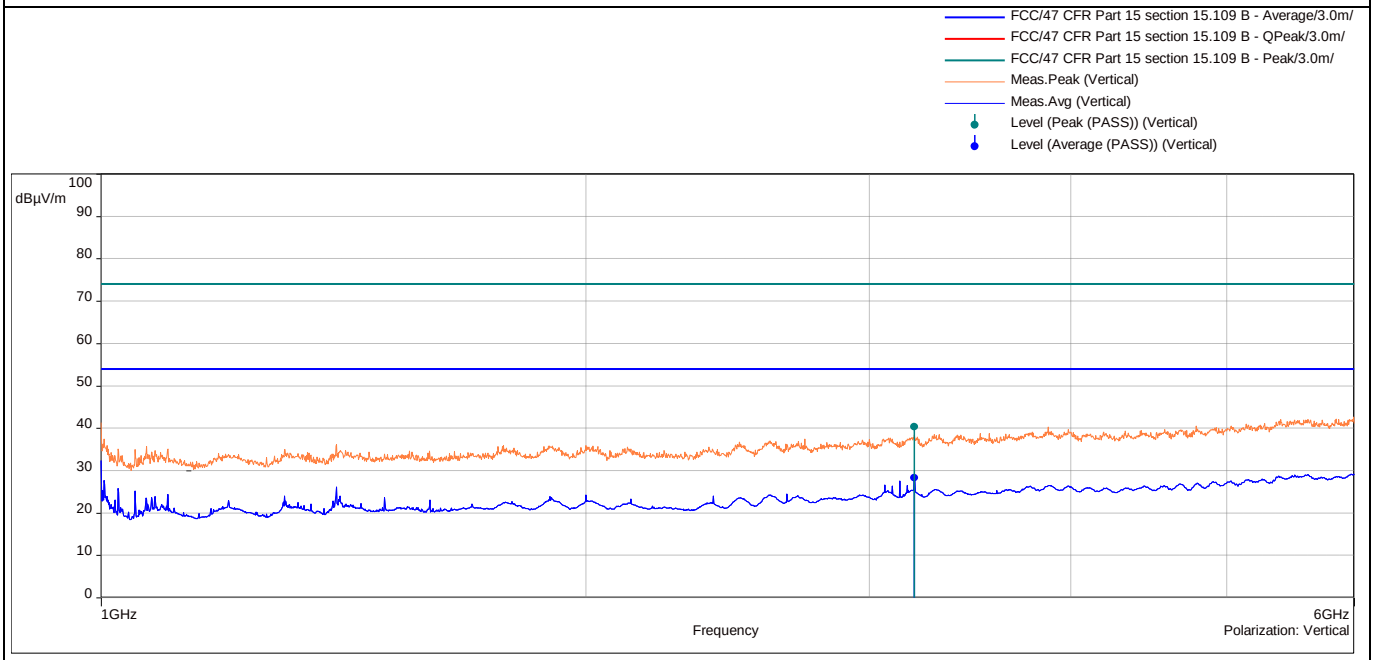
Prüfparameter zu Funkstörfeldstärke **#1120**
Test parameter of Radiated disturbance
Radiated disturbance (1 GHz - 6 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03

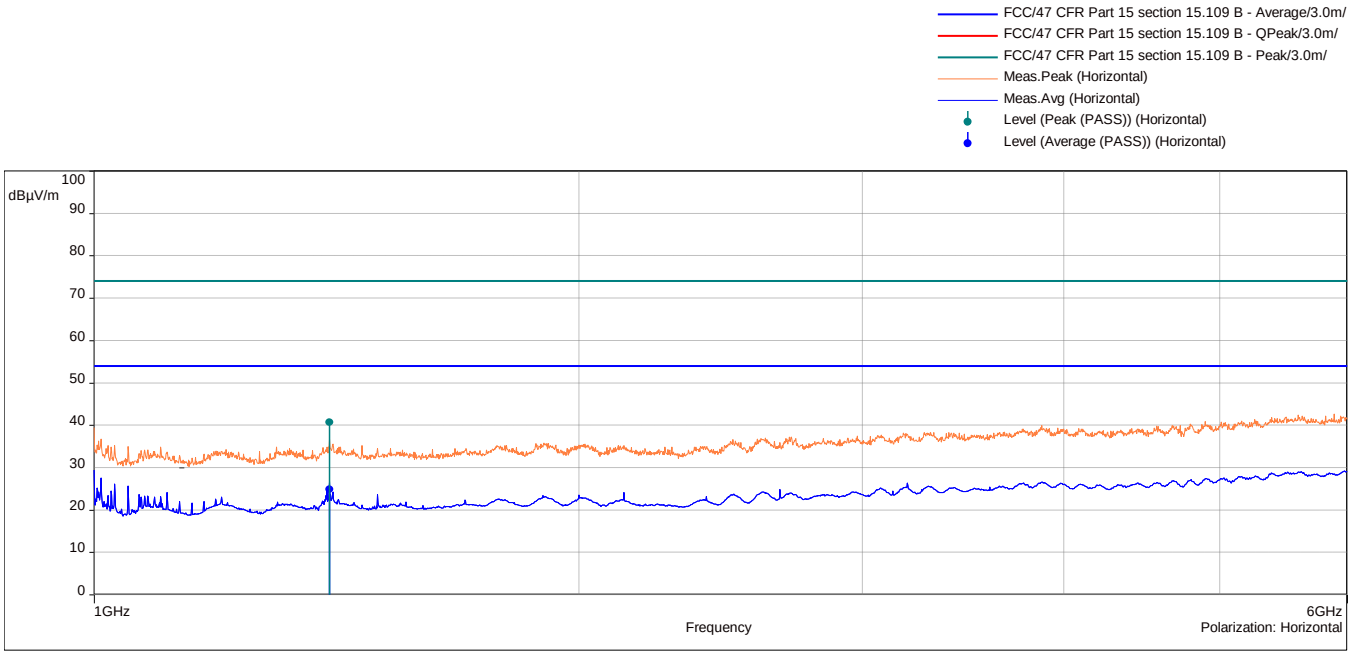
Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
1GHz	6GHz	300kHz	Horizontal	5 ms	1MHz

Startfrequenz *Start Frequency*	Stopfrequenz *Stop Frequency*	Schrittweite *Frequency step*	Anschluss *Terminal*	Durchlaufzeit *Sweep time*	ZF-Bandbreite *IF bandwidth*
1GHz	6GHz	300kHz	Vertical	5 ms	1MHz

ZUSATZDOKUMENTATION
ADDITIONAL DOCUMENTATION

Messdiagramme zu Funkstörfeldstärke **#1120**
Graphical presentation of Radiated disturbance
Radiated disturbance (1 GHz - 6 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03





ZUSATZDOKUMENTATION
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Messdaten zu Funkstörfeldstärke **#1120**
Measurement data of Radiated disturbance
Radiated disturbance (1 GHz - 6 GHz) in operating mode videostream, A000205634-002, FREEWAYCAM03

Average (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (m) (dB)	Azimuth (°)	Pol.	Correction (dB)
1399.9	24.93	54.00	-29.07	1.14	297.40	Horizontal	-7.18
3199.9	28.38	54.00	-25.62	1.99	3.20	Vertical	-2.00

Peak (PASS) (2)

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (m) (dB)	Azimuth (°)	Pol.	Correction (dB)
1399.9	40.78	74.00	-33.22	1.14	297.40	Horizontal	-7.18
3199.9	40.37	74.00	-33.63	1.99	3.20	Vertical	-2.00

Bemerkungen / *Remarks*:

Margin value = Measurement value – Limit value

ANLAGE zum Prüfbericht-Nr.: 60187980-002
APPENDIX to Test Report No.:

FOTODOKUMENTATION
PHOTO DOCUMENTATION

Ende des Prüfberichts
End of test report