

Prüfbericht-Nr.: <i>Test report no.:</i>	CN20NAKC 001	Auftrags-Nr.: <i>Order no.:</i>	168290231	Seite 1 von 17 <i>Page 1 of 17</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2020-11-12	
Auftraggeber: <i>Client:</i>	Hangzhou Hikvision Digital Technology Co., Ltd. No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China			
Prüfgegenstand: <i>Test item:</i>	Wireless External Magnet Detector			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	DS-PDMCX-E-WB, DS-PDMCX-E-WBUHK, DS-PDMCX-E-WBCKV, DS-PDMCX-E-WBUVS, DS-PDMCX-E-WBKVO, DS-PDMCX-E-WBHUN			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47 CFR Part 15.203 FCC 47 CFR Part 15.231 FCC 47 CFR Part 2.1093			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2020-12-20	Refer to Photo Documentation		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A002945360-002, 003			
Prüfzeitraum: <i>Testing period:</i>	2020-12-21 to 2020-12-24			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 2.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	 Hardy Suo	genehmigt von: <i>authorized by:</i>	 Sam Lin	
Datum: <i>Date:</i>	2020-12-28	Ausstellungsdatum: <i>Issue date:</i>	2020-12-28	
Stellung / Position:	Sachverständige(r) / Expert	Stellung / Position:	Sachverständige(r) / Expert	
Sonstiges / Other:	FCC ID: 2ADTD-D2676091			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</p> <p><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>				

v05

TEST SUMMARY

5.1.1 Antenna Requirement

RESULT: Pass

5.1.2 Deactivation of the Transmission

RESULT: Pass

5.1.3 20dB Emission Bandwidth

RESULT: Pass

5.1.4 Field strength of fundamental and Unwanted Emissions in the Spurious Domain

RESULT: Pass

5.1.5 Radio Frequency Exposure Compliance

RESULT: Pass

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1. GENERAL REMARKS

1.1 COMPLEMENTARY MATERIALS

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of radio spectrum

Appendix B: Photographs of the Test Set-Up

1.2 TEST STANDARD(S)

Applied Rules: FCC 47 CFR Part 15.203
FCC 47 CFR Part 15.231
FCC 47 CFR Part 2.1093

Test Method: ANSI C63.10:2013

2. TEST SITES

2.1 TEST FACILITIES

Test Facilities: TÜV Rheinland (Shenzhen) Co., Ltd.

Address:

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China

2.2 TEST DATE

Date: 2020-12-21 to 2020-12-24

2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (TS8997)					
Equip. No.	Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
G1825795	Signal Analyzer	R&S	FSV 40	101441	10.08.2021
G1825797	Signal Generator	R&S	SMB100A	115186	10.08.2021
G1826483	Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	10.04.2021
G1826431	Shielding Room 8#	Albatross	SR8	APC17151-SR8	23.07.2021
Unwanted Emission Testing (TS9975)					
Equip. No.	Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
G1826021	EMI Test Receiver	R&S	ESR 7	102021	11.08.2021
G1826023	Signal Analyzer	R&S	FSV 40	101439	10.08.2021
G1826024	System Controller Interface	R&S	SCI-100	S10010038	N/A
G1826025	Filterbank	R&S	Wlan	100759	10.08.2021
G1826026	OSP	R&S	OSP 120	102040	N/A
G1826028	Pre-amplifier	R&S	SCU08F1	08320031	10.08.2021
G1826029	Amplifier	R&S	SCU-18F	180070	10.08.2021
G1826030	Amplifier	R&S	SCU40A	100475	10.09.2021
G1826031	Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	08.08.2022
G1826032	Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	08.08.2022
G1826036	Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
G1826037	Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
G1826433	3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.07.2021

2.4 TRACEABILITY

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.5 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.

2.6 LOCATION OF ORIGINAL DATA

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 STATUS OF FACILITY USED FOR TESTING

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. GENERAL PRODUCT INFORMATION

3.1 PRODUCT FUNCTION AND INTENDED USE

The EUT is a Wireless External Magnet Detector.

3.2 RATINGS AND SYSTEM DETAILS

Table 2: Technical Characteristics of EUT

General Information of EUT	Description
Kind of Equipment:	Wireless External Magnet Detector
Type Designation:	DS-PDMCX-E-WB, DS-PDMCX-E-WBUHK, DS-PDMCX-E-WBCKV, DS-PDMCX-E-WBUVS, DS-PDMCX-E-WBKVO, DS-PDMCX-E-WBHUN
FCC ID:	2ADTD-D2676091
Type of Equipment:	Portable device
Operating Frequency Band:	433.05 - 433.75MHz
Operating Frequencies:	433.1MHz, 433.2MHz, 433.3MHz, 433.4MHz, 433.5MHz, 433.6MHz, 433.7MHz
Modulation Type:	FSK
Antenna Type:	Integral Antenna
Antenna Number and Gain:	Antenna number: 1 Antenna Gain: -7.2dBi
Operating Voltage:	DC 3V, CR123A battery x 1
Operating Temperature Range:	-20°C ~ +60°C
<p>*Remark:</p> <p>1) As declared by manufacturer, DS-PDMCX-E-WB, DS-PDMCX-E-WBUHK, DS-PDMCX-E-WBCKV, DS-PDMCX-E-WBUVS, DS-PDMCX-E-WBKVO and DS-PDMCX-E-WBHUN are identical in electronics/electrical designs, including software & firmware, PCB layout .The only difference are model name and color of enclosure. Hence the product with model DS-PDMCX-E-WB is chosen for testing.</p> <p>2) According to ANSI C63.10 section 5.6, the frequency range is less than 1MHz, hence middle operating frequency 433.4MHz located in middle range is set for testing.</p>	

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

- A. Transmitting with operating frequency 433.4MHz
- B. Idle

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

- | | |
|---|--|
| <input checked="" type="checkbox"/> - Block Diagram | <input checked="" type="checkbox"/> - Circuit Diagram |
| <input type="checkbox"/> - PCB Layout | <input checked="" type="checkbox"/> - Bill of Material |
| <input checked="" type="checkbox"/> - Rating Label | <input checked="" type="checkbox"/> - Instruction Manual |
| <input checked="" type="checkbox"/> - Photo Documentation | |

4. TEST SET-UP AND OPERATION MODES

4.1 PRINCIPLE OF CONFIGURATION SELECTION

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 TEST OPERATION AND TEST SOFTWARE

Test operation refers to test setup in chapter 5.

Table 3: Test Environments

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage (Battery)	Relative Humidity
Normal (NTNV)	24°C	3V	Ambient
LTLV	-	-	-
LTHV	-	-	-
HTLV	-	-	-
HTHV	-	-	-

4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

The EUT was tested together with the following accessories:

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
--	--	--	--

4.4 COUNTERMEASURES TO ACHIEVE ERM COMPLIANCE

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF). No additional measures were employed to achieve compliance.

4.5 TEST SETUP DIAGRAM

Diagram of Measurement Configuration for Radiation Test

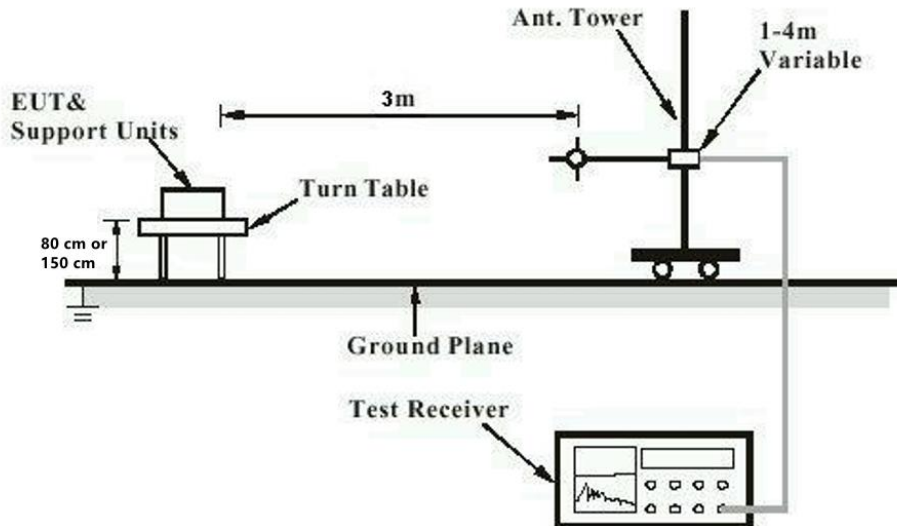
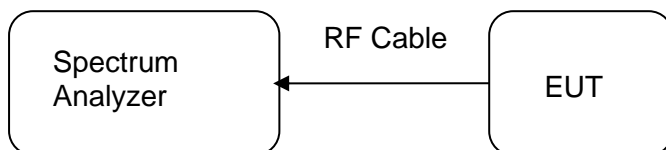


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. TEST RESULTS

5.1 Essential Requirements of Standard

5.1.1 Antenna Requirement

RESULT: **Pass**

Test standard : CFR47 FCC Part 15.203
Limit : CFR47 FCC Part 15.203
Kind of test site : Shielding Room

Test Setup

Date of testing : 2020-12-21 to 2020-12-24
Input voltage : 3V
Test environment : Normal test conditions
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 50%
Atmospheric pressure : 101.0 kPa

According to the manufacturer declared, the EUT has an integral antenna, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to compliance the provision.

Refer to EUT photo for details.

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5.1.2 Deactivation of the Transmission

RESULT: **Pass****Test Specification**

Test standard	:	CFR47 FCC Part 15.231
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (a)(1)
Limit	:	A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
Test suite	:	Shielding Room

Test Setup

Date of testing	:	2020-12-21 to 2020-12-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	24°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

5.1.3 Periodic Transmissions

RESULT: **Pass**

Test Specification

Test standard	:	CFR47 FCC Part 15.231
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (a)(3)
Limit	:	Total duration of transmissions does not exceed more than two seconds per hour.
Test suite	:	Shielding Room

Test Setup

Date of testing	:	2020-12-21 to 2020-12-24
Test environment:	:	Normal test conditions
Operation mode	:	B
Ambient temperature	:	24°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

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5.1.4 20dB Emission Bandwidth

RESULT:**Pass****Test Specification**

Test standard	:	CFR47 FCC Part 15.231
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (c)
Limit	:	CFR47 FCC Part 15.231 (c)
Test suite	:	3m Semi Anechoic Room

Test Setup

Date of testing	:	2020-12-21 to 2020-12-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	24°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

5.1.5 Field strength of fundamental and Unwanted Emissions in the Spurious Domain

RESULT: **Pass**

Test Specification

Test standard	:	CFR47 FCC Part 15.231 CFR47 FCC Part 15.205 CFR47 FCC Part 15.209
Basic standard	:	ANSI C 63.10:2013
Test requirement	:	CFR47 FCC Part 15.231 (b)(1)(2)(3)
Limit	:	CFR47 FCC Part 15.231 (b)
Test suite	:	3m Semi Anechoic Room

Test Setup

Date of testing	:	2020-12-21 to 2020-12-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	24°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

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5.1.6 Radio Frequency Exposure Compliance

RESULT: Pass**Test Specification**

Test standard : CFR47 FCC Part 2.1093

Limit : FCC KDB Publication 447498 D01 v06

Measurement Record for CFR47 FCC Part 2.1093

The minimum distance for the EUT is less than 5mm.

The maximum specified e.r.p.: 69.24dBuV/m@3m=-28.17dBm=0.002mW

According to KDB 447498 D01 v06 appendix A

Exempted Power for this device: 22mW, hence the EUT is compliance with the RF exposure.

6. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 5: System Measurement Uncertainty

Items		Extended Uncertainty
RE	Radiated emission 9 kHz - 30 MHz	±3.97 dB
	Radiated emission 30 MHz - 1 GHz	±4.30 dB
Remark: 95% Confidence Levels, K=2.		

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Appendix A

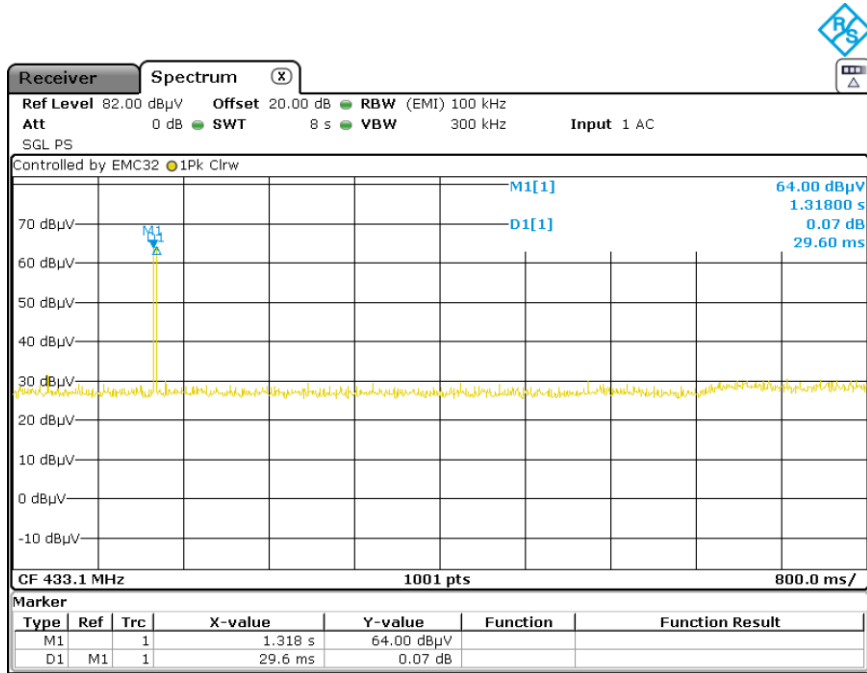
Test Results

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APPENDIX A.1: TEST RESULTS OF DEACTIVATION OF THE TRANSMISSION

Test Results

Operation Mode	Duration Time (S)	Limit (S)	Result
A	0.0296	5	Pass

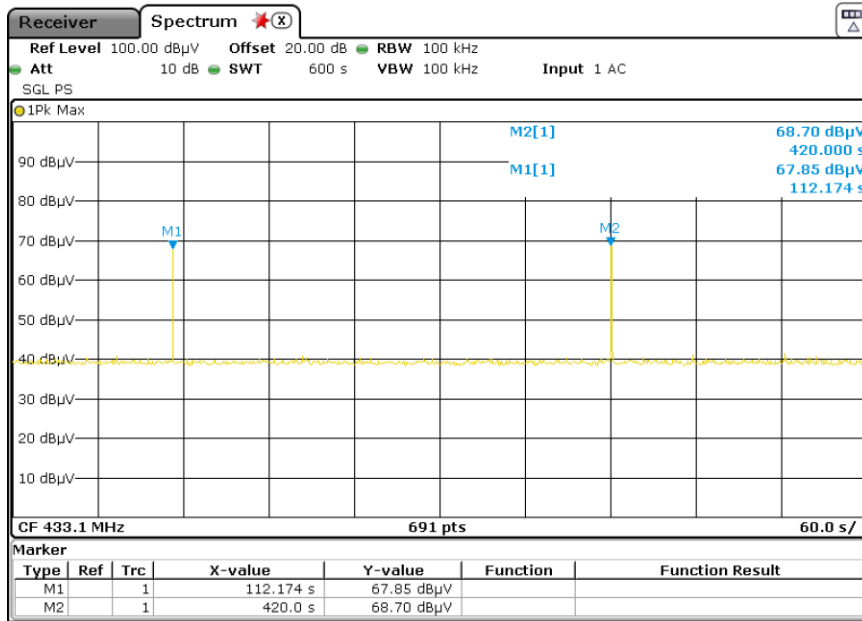
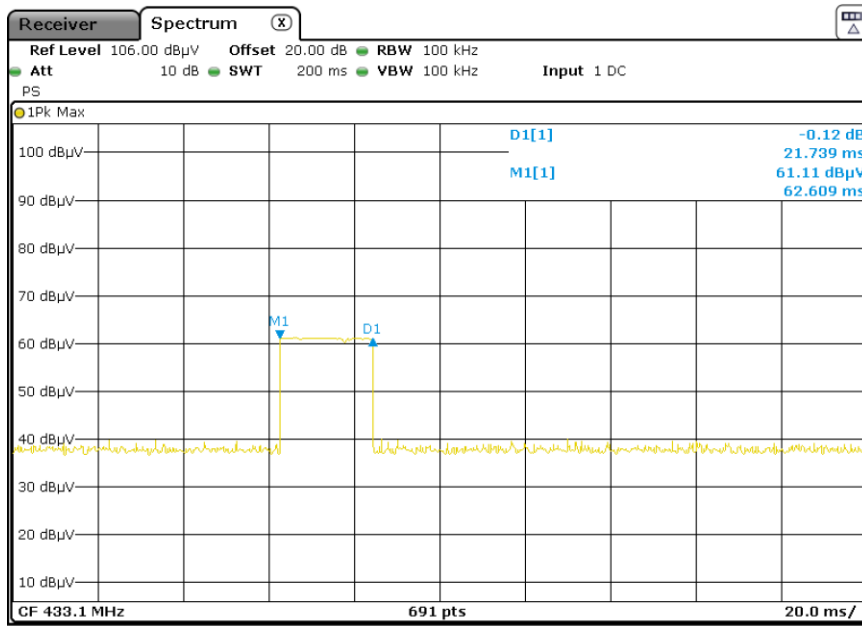


APPENDIX A.2: TEST RESULTS OF PERIODIC TRANSMISSIONS

Test Results

Operation Mode	Duration Time (S)	Limit	Result
B	0.261	2s / 1 Hour	Pass

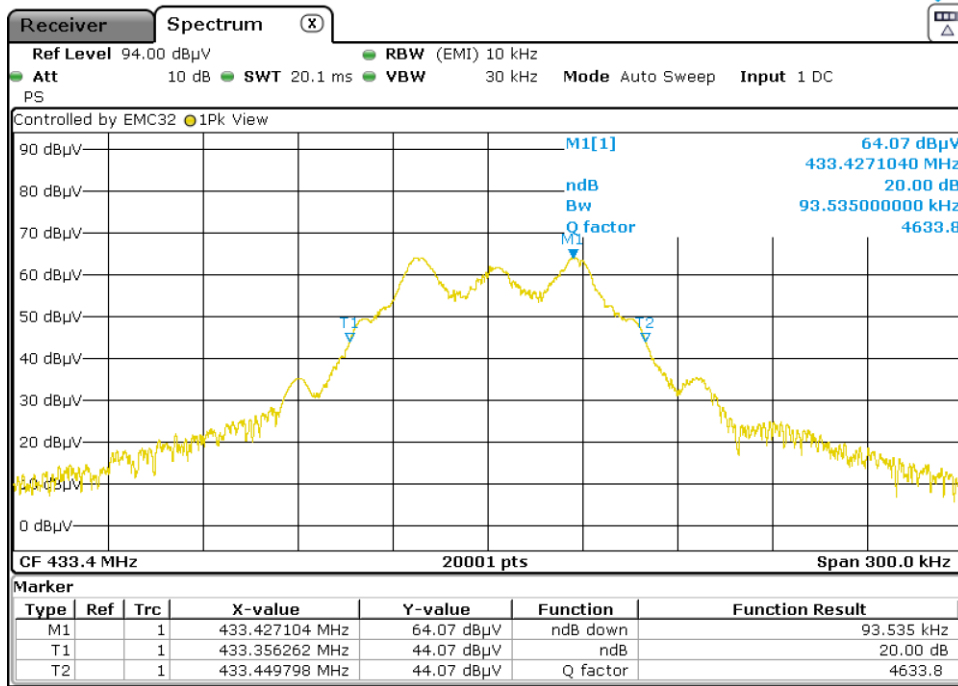
As declared by manufacturer, the EUT transmits an identical data package to the Host per 5 minutes, hence in one hour, the EUT transmits 12 data packages to the Host, and the duration time = 21.739ms * 12 = 0.261s.



APPENDIX A.3: TEST RESULTS OF 20dB EMISSION BANDWIDTH

Test Results

Operation Frequency (MHz)	20dB Emission Bandwidth (MHz)	Limit (MHz)	Result
433.4	0.094	1.084	Pass

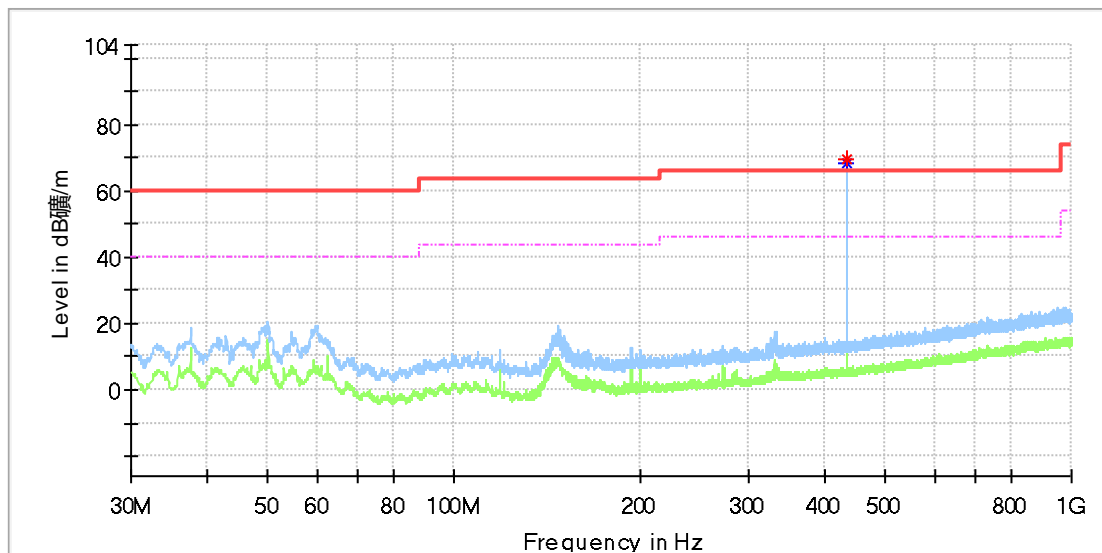


APPENDIX A.4: TEST RESULTS OF FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

A.4.1 Horizontal

EUT Information

EUT Name:	Wireless External Magnet Detector
Model:	DS-PDMCX-E-WB
Test Mode:	TX_433.4MHz
Test Voltage::	Battery
Remark:	Temp 23 Humi:49%
Test Standard:	FCC Part 15C
Tested By:	Alano Qu
Reviewed By:	Terry Yin

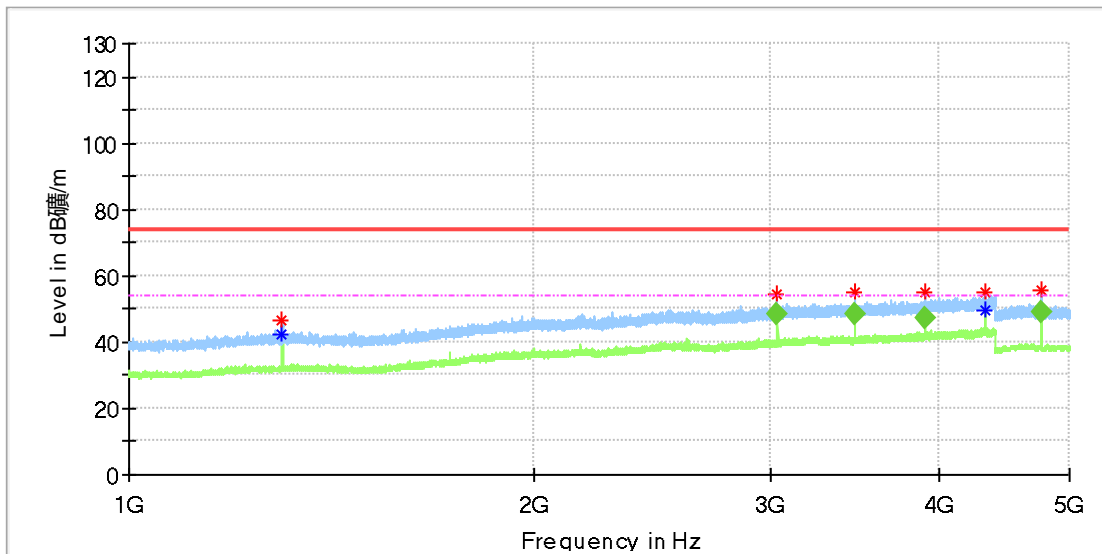


Critical_Freqs

Frequency (MHz)	MaxPeak	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height	Pol	Azimuth	Corr. (dB/m)
433.374500	---	68.05	80.8	12.75	100	H	187.0	-13.3
433.423000	69.24	---	100.8	31.56	100	H	30.0	-13.3

EUT Information

EUT Name:	Wireless External Magnet Detector
Model:	DS-PDMCX-E-WB
Test Mode:	TX_433.4MHz
Test Voltage::	Battery
Remark:	Temp 23 Humi:49%
Test Standard:	FCC Part 15C
Tested By:	Alano Qu
Reviewed By:	Terry Yin



Critical Freqs

Frequency (MHz)	MaxPeak	Average (dBµV/m)	Limit (dBµV/m)	Margin	Height	Pol	Azimuth	Corr. (dB/m)
1300.050000	46.42	---	74.00	27.58	100.0	H	345.0	1.9
1300.050000	---	42.15	54.00	11.85	100.0	H	345.0	1.9
3034.050000	54.22	---	74.00	19.78	100.0	H	164.0	8.6
3466.912500	55.03	---	74.00	18.97	100.0	H	315.0	8.9
3899.987500	55.13	---	74.00	18.87	100.0	H	296.0	10.1
4333.912500	54.98	---	74.00	19.02	100.0	H	216.0	10.5
4334.125000	---	49.41	54.00	4.59	100.0	H	296.0	10.5
4767.333333	55.92	---	74.00	18.08	100.0	H	273.0	11.8

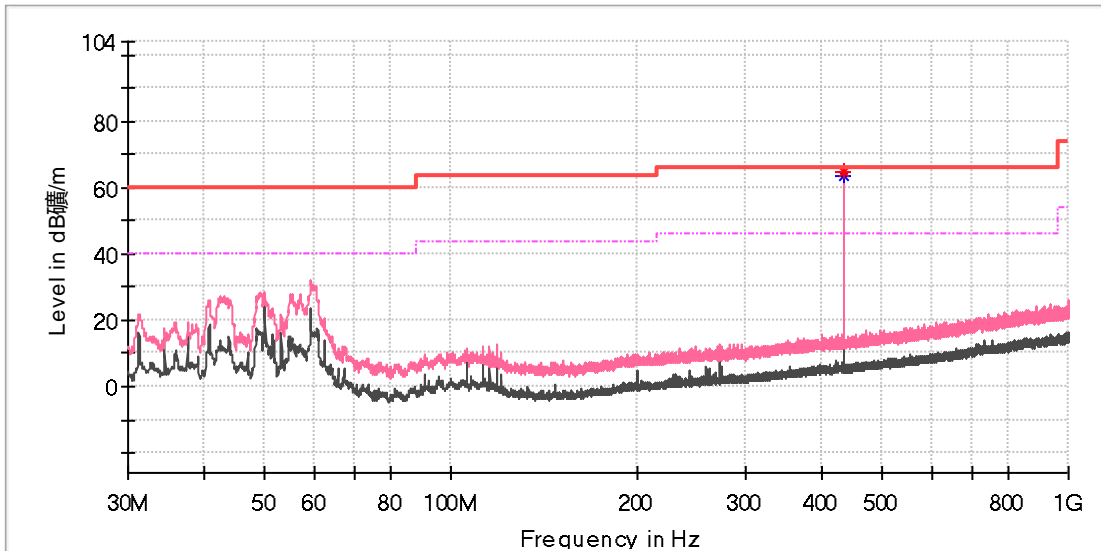
Final Result

Frequency (MHz)	QuasiPeak	Average (dBµV/m)	Limit (dBµV/m)	Margin	Height	Pol	Azimuth	Corr. (dB/m)
3033.850000	---	48.63	54.00	5.37	100.0	H	161.0	8.6
3467.306875	---	48.66	54.00	5.34	100.0	H	300.0	8.9
3900.966250	---	47.23	54.00	6.77	100.0	H	301.0	10.1
4767.683334	---	49.04	54.00	4.96	100.0	H	276.0	11.8

A.4.2 Vertical

EUT Information

EUT Name:	Wireless External Magnet Detector
Model:	DS-PDMCX-E-WB
Test Mode:	TX_433.4MHz
Test Voltage::	Battery
Remark:	Temp 23 Humi:49%
Test Standard:	FCC Part 15C
Tested By:	Alano Qu
Reviewed By:	Terry Yin

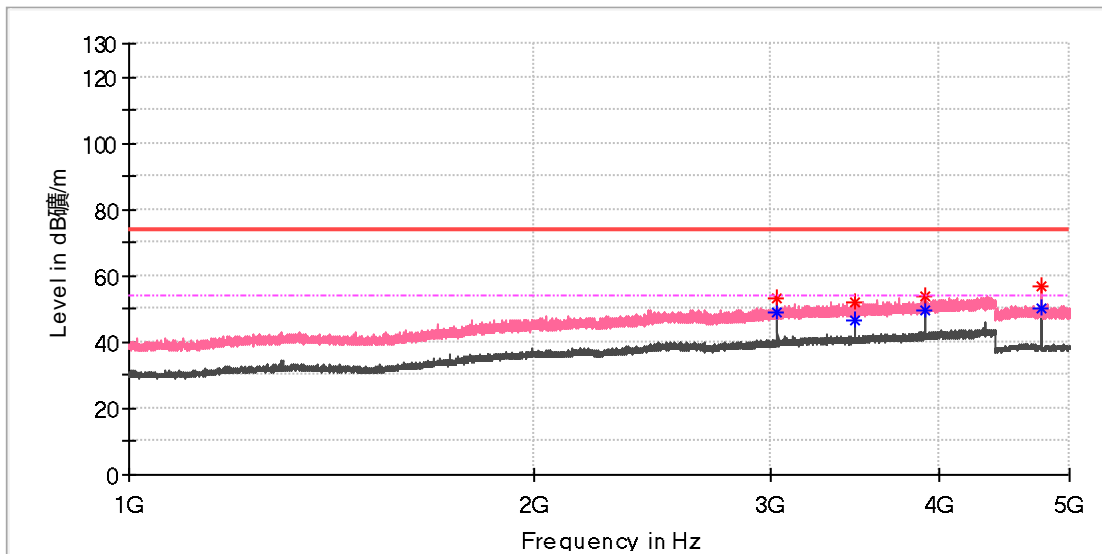


Critical Freqs

Frequency (MHz)	MaxPeak	Average (dBµV/m)	Limit (dBµV/m)	Margin	Height	Pol	Azimuth	Corr. (dB/m)
433.423000	---	63.41	80.8	17.39	100.0	V	227.0	-13.3
433.423000	64.96	---	100.8	35.84	100.0	V	227.0	-13.3

EUT Information

EUT Name:	Wireless External Magnet Detector
Model:	DS-PDMCX-E-WB
Test Mode:	TX_433.4MHz
Test Voltage:	Battery
Remark:	Temp 23 Humi:49%
Test Standard:	FCC Part 15C
Tested By:	Alano Qu
Reviewed By:	Terry Yin



Critical Freqs

Frequency (MHz)	MaxPeak	Average (dBμV/m)	Limit (dBμV/m)	Margin	Height	Pol	Azimuth	Corr. (dB/m)
3033.837500	---	48.95	54.00	5.05	100.0	V	111.0	8.6
3034.050000	53.27	---	74.00	20.73	100.0	V	130.0	8.6
3466.912500	---	46.72	54.00	7.28	100.0	V	326.0	8.9
3467.337500	51.78	---	74.00	22.22	100.0	V	326.0	8.9
3900.837500	53.62	---	74.00	20.38	100.0	V	176.0	10.1
3901.050000	---	49.43	54.00	4.57	100.0	V	336.0	10.1
4767.166667	56.75	---	74.00	17.25	100.0	V	215.0	11.8
4767.666667	---	50.15	54.00	3.85	100.0	V	199.0	11.8