Prüfbericht-Nr.: *Test report no.:*	**CN221NYR 001**	**Auftrags-Nr.:** *Order no.*:	**168396770**	**Seite 1 von 14** *Page 1 of* 14
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2022-10-31	
Auftraggeber: *Client:*	**Xiamen Hongfa Electroacoustic Co.,Ltd.** No.91-101, Sunban South Rd., Jimei North Ind. Dist., Xiamen 361021,China			
Prüfgegenstand: *Test item:*	KEY FOB			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	HF3758R35			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	FCC 47 CFR Part 15.231			
Wareneingangsdatum: *Date of sample receipt:*	2022-11-08	Refer to Photo Documentation		
Prüfmuster-Nr.: *Test sample no:*	A003371456-001~009			
Prüfzeitraum: *Testing period:*	2022-11-15 to 2022-11-24			
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			

geprüft von: *tested by:*	x Bell Hu Signed by: Bell Hu	**genehmigt von:** *authorized by:*	X Lin Lin Signed by: Lin Lin
Datum: *Date:* 2022-12-05		**Ausstellungsdatum:** *Issue date:* 2022-12-05	
Stellung */ Position:*	Sachverständige(r) / Expert	**Stellung** */ Position:*	Sachverständige(r) / Expert
Sonstiges */ Other:*	FCC ID: 2A9J4-3758R35		

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*

TEST SUMMARY

5.1.1 Antenna Requirement
RESULT: Pass
5.1.2 Deactivation of the Transmission
RESULT: Pass
5.1.3 20dB Emission Bandwidth and 99% Bandwidth
RESULT: Pass
5.1.4 Field strength of fundamental and Unwanted Emissions in the Spurious Domain
RESULT: Pass

CONTENTS

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 15.231
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 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (TS8997)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
Signal Analyzer	R&S	FSV 40	101441	2023-08-01
OSP	R&S	OSP 150	101017	2022-12-02
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	2022-12-02
Wideband Power Sensor	R&S	NRP-Z81	105677	2023-08-01
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2023-08-02
Signal Analyzer	R&S	FSV 40	101439	2023-08-01
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2023-08-01
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-08-02
Amplifier	R&S	SCU-18F	180070	2023-08-02
Amplifier	R&S	SCU40A	100475	2023-08-02
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2023-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2023-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2023-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2023-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

2.3 TRACEABILITY

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

2.4 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 basics using in house standards or comparisons.

2.5 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.

2.6 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 Remote Keyless Entry, which supports 315MHz transmitting and 125KHz Receiving.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 RATINGS AND SYSTEM DETAILS

Table 2: Technical Characteristics of EUT

General Information of EUT	Description
Kind of Equipment:	KEY FOB
Type Designation:	HF3758R35
FCC ID:	2A9J4-3758R35
Operating Frequency:	315MHz (TX)
Modulation Type:	FSK
Antenna Type:	Integral Antenna (PCB antenna, permanently attached),0 dBi
Antenna Number:	1
Operating Voltage:	DC 3V, Battery (CR2032)
Operating Temperature Range:	-20°C ~ +60°C

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

A. Transmitting with operating frequency 315MHz
B. Idle

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual
☒ Circuit Diagram
☒ Block Diagram
☒ Schematics
☐ Model Difference Letter
☒ Rating Label
☐ PCB Layout
☒ Photo Document
☒ Parts List

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)	24.6°C	3V	Ambient

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 (Below 1GHz)

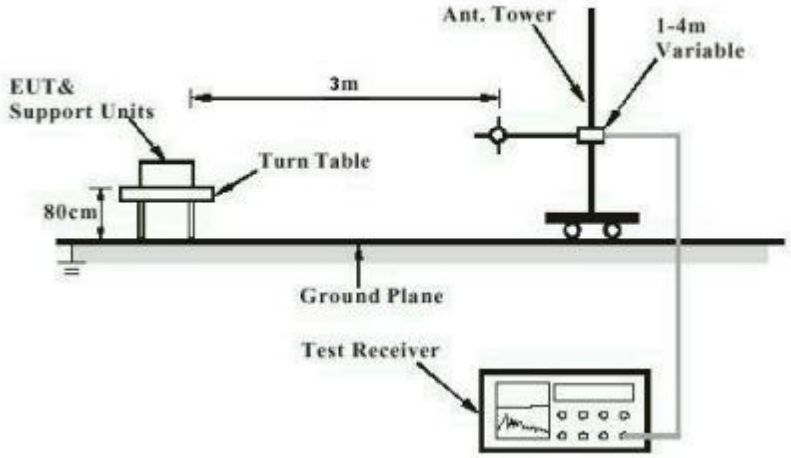
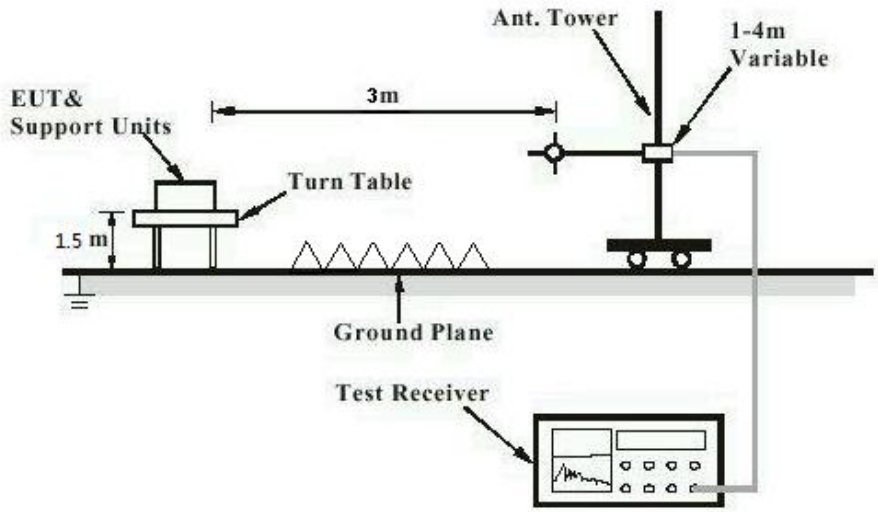


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



5. TEST RESULTS

5.1 Essential Requirements of Standard

5.1.1 Antenna Requirement

RESULT: **Pass**

Test standard : CFR47 FCC Part 15.203 and RSS-Gen Section 6.8

According to the manufacturer declared, the EUT have Integral antenna, and the antenna connector is designed with permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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 transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test suite	:	Shielding Room

Test Setup

Date of testing	:	2022-11-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	24.6°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

5.1.3 20dB Emission Bandwidth and 99% 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	:	2022-11-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	24.6°C
Relative humidity	:	55%
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

5.1.4 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	:	2022-11-22 to 2022-11-24
Test environment:	:	Normal test conditions
Operation mode	:	A
Ambient temperature	:	Refer to test data
Relative humidity	:	Refer to test data
Atmospheric pressure	:	101kPa

Conclusion:

Refer to attached Appendix A for details of test results.

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.		

7. LIST OF TABLES

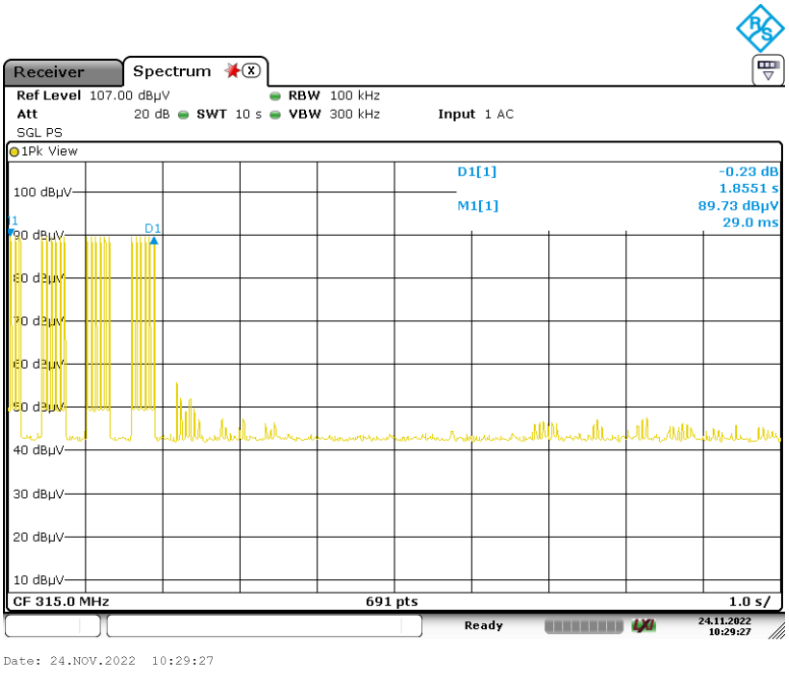
Appendix A

Test Results

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

Test Results

Operation Mode	Duration Time (S)	Limit (S)	Result
A	1.8551	5	Pass

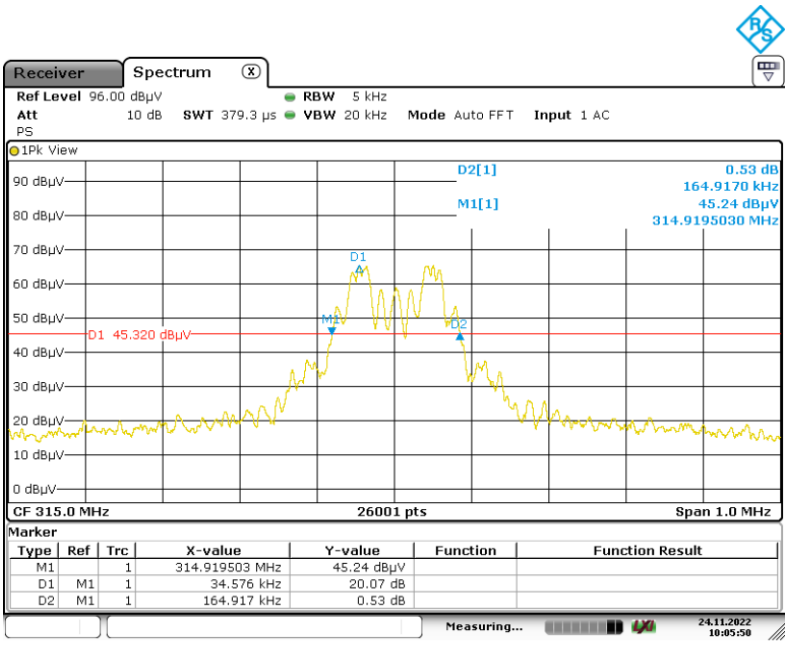


Date: 24.NOV.2022 10:29:27

APPENDIX A.3: TEST RESULTS OF 20DB EMISSION BANDWIDTH AND 99% BANDWIDTH

Test Results

Operation Freqnency (MHz)	20dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
315	0.165	0.156	0.7875	Pass



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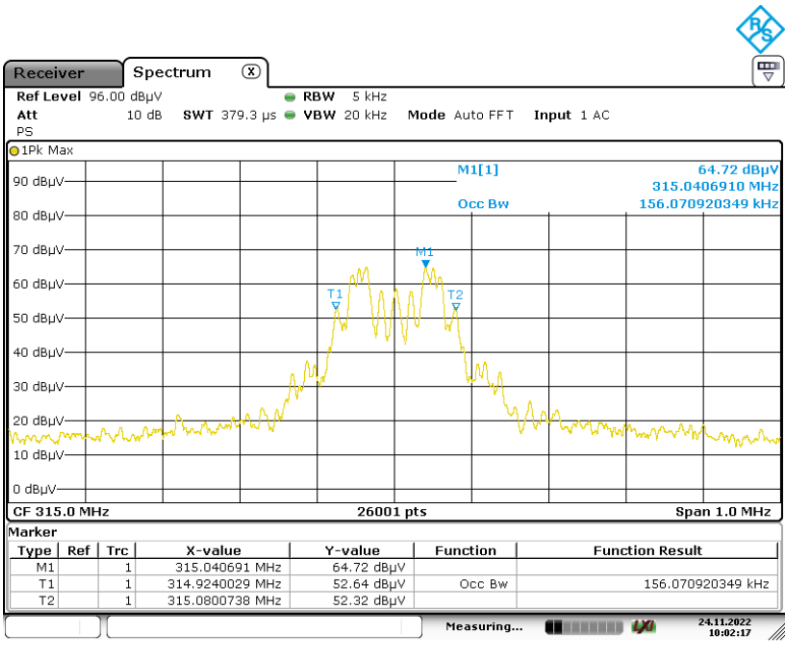


Date: 24.NOV.2022 10:02:16

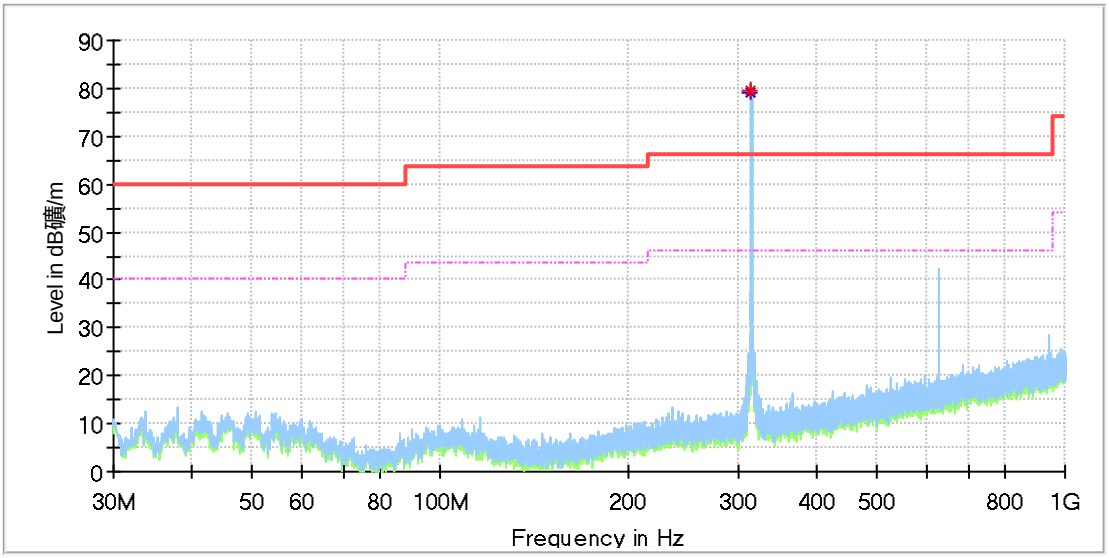
APPENDIX A.4: TEST RESULTS OF FIELD STRENGTH OF FUNDAMENTAL AND UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

A.4.1 Below 1GHz

Fundamental:

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

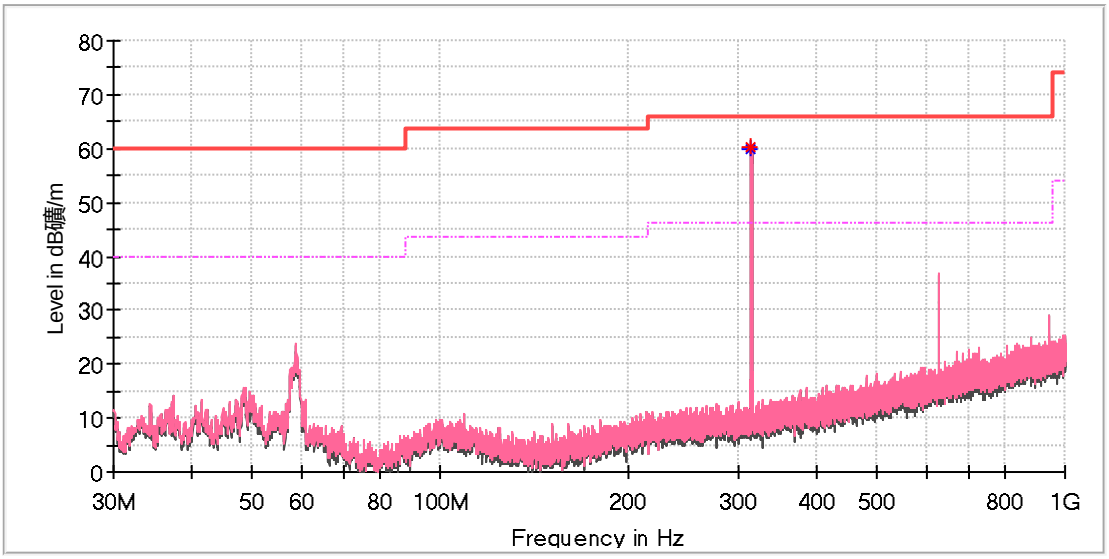
Frequency (MHz)	MaxPeak	Average (dBµV/m	Limit (dBµV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
314.956154	---	79.06	80.82	1.76	100.0	H	290.0	-16.2
314.956154	79.64	---	100.82	21.18	100.0	H	290.0	-16.2

Final_Result

Frequency (MHz)	QuasiPeak	Limit (dBµV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

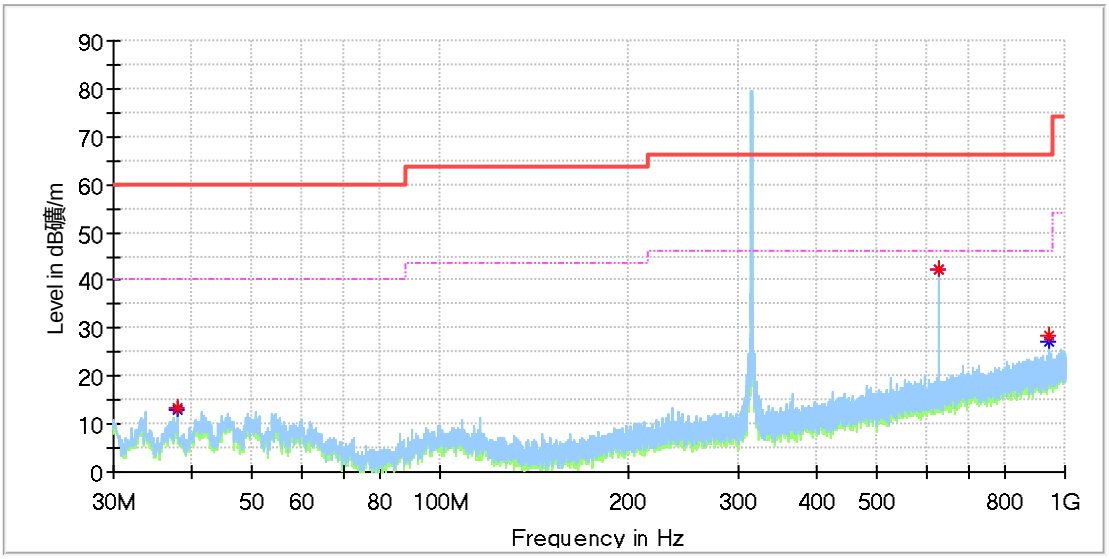
Frequency (MHz)	MaxPeak	Average (dBµV/m	Limit (dBµV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
314.956154	60.19	---	100.82	40.63	100.0	V	102.0	-16.2
314.956154	---	59.85	80.82	20.97	100.0	V	102.0	-16.2

Final_Result

Frequency (MHz)	QuasiPeak	Limit (dBµV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
37.909231	13.39	60.00	46.61	100.0	H	237.0	-21.1
37.909231	---	40.00	27.16	100.0	H	237.0	-21.1
629.945000	42.21	66.00	23.79	100.0	H	138.0	-9.7
629.945000	---	46.00	3.91	100.0	H	138.0	-9.7
945.120385	28.30	66.00	37.70	100.0	H	68.0	-4.9
945.120385	---	46.00	18.59	100.0	H	68.0	-4.9

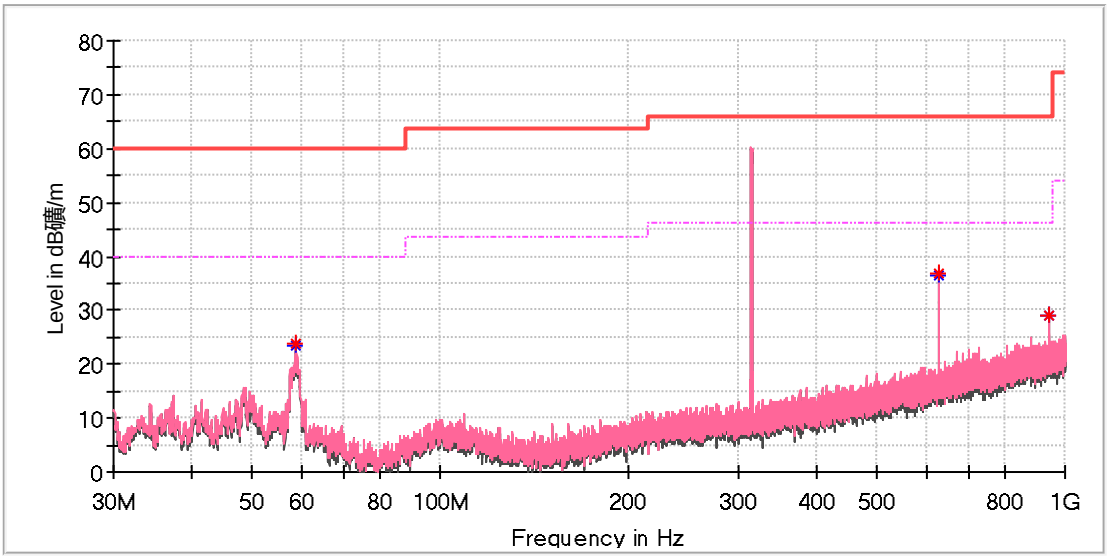
Final_Result

Frequency (MHz)	QuasiPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---

Note: the highest emission is the fundamental.

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
58.615000	---	40.00	16.45	100.0	V	114.0	-19.1
58.652308	23.69	60.00	36.31	100.0	V	114.0	-19.1
630.131539	36.83	66.00	29.17	100.0	V	29.0	-9.7
630.131539	---	46.00	9.65	100.0	V	29.0	-9.7
945.195000	29.14	66.00	36.86	100.0	V	203.0	-4.9
945.195000	---	46.00	17.10	100.0	V	203.0	-4.9

Final_Result

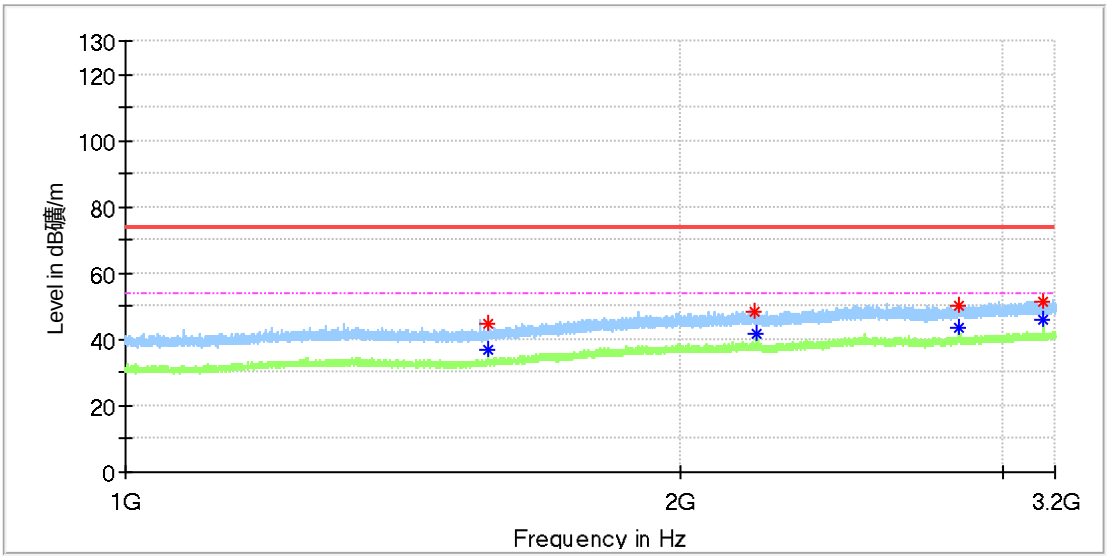
Frequency (MHz)	QuasiPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---

Note: the highest emission is the fundamental.

A.4.2 Above 1GHz

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

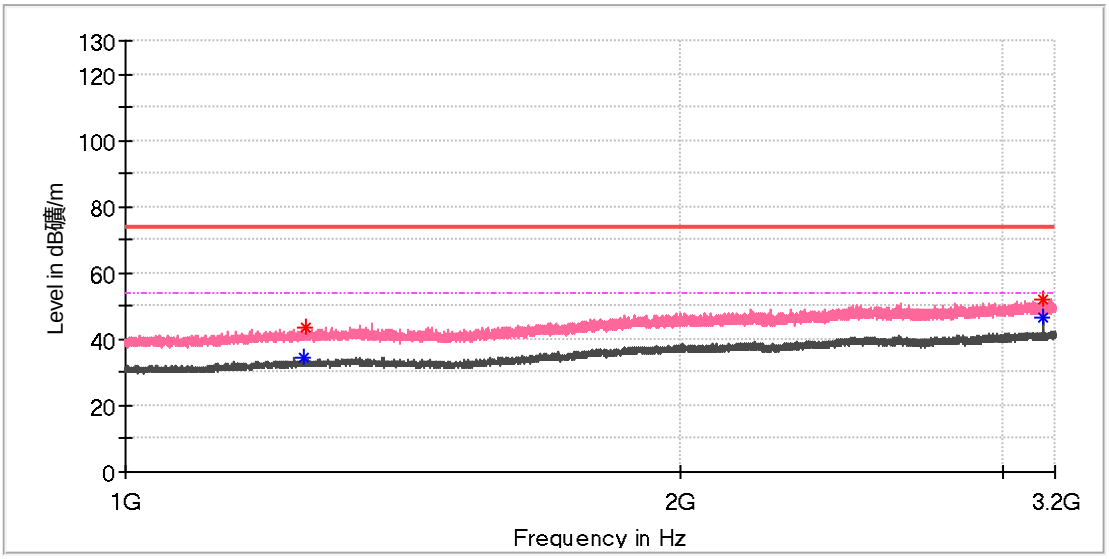
Frequency (MHz)	MaxPeak	Average (dBuV/m	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/m
1574.860000	---	37.14	54.00	16.86	150.0	H	70.0	1.8
1575.300000	44.51	---	74.00	29.49	150.0	H	43.0	1.8
2198.230000	48.48	---	74.00	25.52	150.0	H	52.0	6.3
2204.720000	---	41.87	54.00	12.13	150.0	H	143.0	6.3
2834.360000	---	43.61	54.00	10.39	150.0	H	262.0	8.1
2835.350000	50.18	---	74.00	23.82	150.0	H	262.0	8.1
3149.290000	51.51	---	74.00	22.49	150.0	H	70.0	8.5
3149.730000	---	45.87	54.00	8.13	150.0	H	70.0	8.5

Final_Result

Frequency (MHz)	MaxPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---

EUT Information

EUT Name:	Key Fob
Model:	HF3758R35
Test Mode:	315MHz
Order No/Sample No:	168396770/A003371456-014
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak	Average (dBuV/m	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/m
1248.400000	---	34.34	54.00	19.66	150.0	V	313.0	1.9
1254.100000	43.26	---	74.00	30.74	150.0	V	213.0	1.9
3149.800000	51.87	---	74.00	22.13	150.0	V	322.0	8.5
3150.700000	---	46.51	54.00	7.49	150.0	V	7.0	8.5

Final_Result

Frequency (MHz)	MaxPeak	Limit (dBuV/m	Margin	Height	Pol	Azimuth	Corr. (dB/
---	---	---	---	---		---	---