


Prüfbericht-Nr.: <i>Test report no.:</i>	CN21VP2G 002	Auftrags-Nr.: <i>Order no.:</i>	168321010	Seite 1 von 17 Page 1 of 17	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-06-01		
Auftraggeber: <i>Client:</i>	KEE TAT INNOVATIVE TECHNOLOGY HOLDINGS LTD Dongshan Management District, Qishi Town, Dongguan City, Guangdong Province, China, 523000				
Prüfgegenstand: <i>Test item:</i>	2 Channel RF Remote				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	RS2004 (Trademark: Novelty)				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.231	RSS-210 Issue 10 April 2020			
	CFR47 FCC Part 15: Subpart B Section 15.209	RSS-Gen Issue 5 February 2021			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-06-23	Refer to Photo Documentation			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003070254-003				
Prüfzeitraum: <i>Testing period:</i>	2021-07-08 – 2021-08-26				
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>		genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2022-01-01	<small>Signed by: Alex Lan</small>	Ausstellungsdatum: <i>Issue date:</i> 2022-01-12	<small>Signed by: Winnie Hou</small>		
Stellung / Position:	Senior Project Engineer	Stellung / Position:	Technical Certifier		
Sonstiges / Other:	FCC ID: 2A2WY-RS2004 IC: 27625-RS2004 HVIN: RS2004				
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 3 = satisfactory	4 = ausreichend N/A = nicht anwendbar N/A = not applicable	5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
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. <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>					

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 99% Bandwidth

RESULT: Pass

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

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: Photographs of the Test Set-Up

Appendix B: Test Results

2. TEST SITES

2.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.

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

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

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	2022-08-09
OSP	R&S	OSP 150	101017	2021-12-10
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	2021-12-10
Wideband Power Sensor	R&S	NRP-Z81	105677	2022-08-09
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	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09
Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
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

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Radiated Emission (3m chamber)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
3m SAC	ETS-Lindgren	SAC3	CT001632-Q1362	2021-08-23
EMI Test Receiver	R&S	ESR7	102111	2021-12-16
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier (1-18GHz)	FIT	SCU-18F	180077	2021-08-16
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2022-12-12
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

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 basis using in house standards or comparisons.

2.5 MEASUREMENT UNCERTAINTY

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF Power (conducted)	± 2.5 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	± 6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	± 6 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 5.34 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.56 dB
Temperature	± 1 °C
Humidity	± 5 %
Voltage (DC)	± 1 %
Voltage (AC, <10kHz)	± 2 %

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2.6 LOCATION OF ORIGINAL DATA

The original copies of all test data taken during actual testing were attached at Appendix A & B 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 RF Remote, which support 433MHz wireless technology.
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	Value
Kind of Equipment:	2 Channel RF Remote
Type Designation:	RS2004
Trademark:	Novelty
FCC ID:	2A2WY-RS2004
IC:	27625-RS2004
HVIN:	RS2004
Operating Voltage:	Battery operated (3Vdc, 2 x AAA)
Technical Specification	
Operating Frequency:	433.92 MHz (Transmitter only)
Type of Modulation:	ASK
Channel Number:	1 channel
Antenna Type:	Printed Antenna
Antenna Gain:	0dBi

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

- A. Transmitting mode
- B. Idle

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

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3.5 SUBMITTED DOCUMENTS

- Application Form
- User Manual
- IC Label and Location Info
- Schematics

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. All tests were performed according to the procedures in ANSI C63.10: 2013 & ANSI C63.4: 2014.

Table 3: Test channel and frequency

Mode	Test Channels
ASK	433.92MHz

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
Laptop	Lenovo	T480	PF-16A6N8
Adapter	HUAWEI	HW-050100C01	N/A
Roller Blind	Kee Tat Innovative Technology Holdings Ltd	C2002	N/A

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

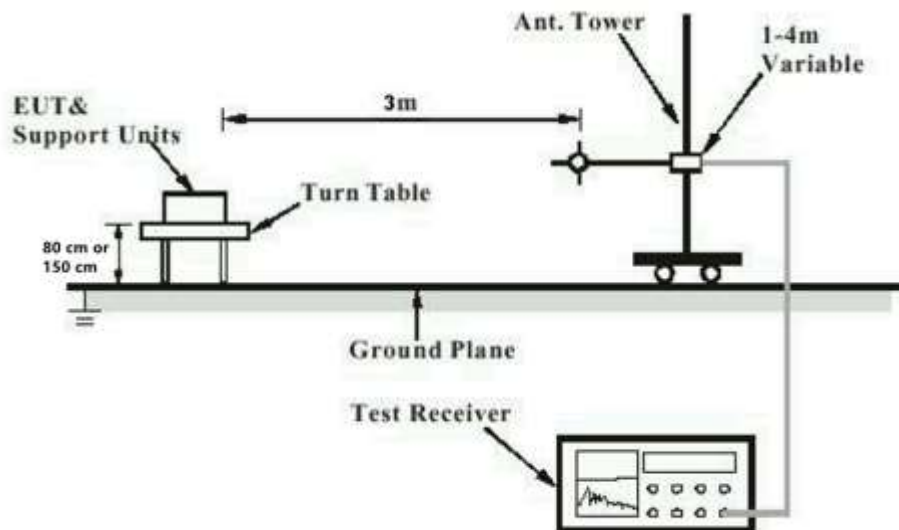
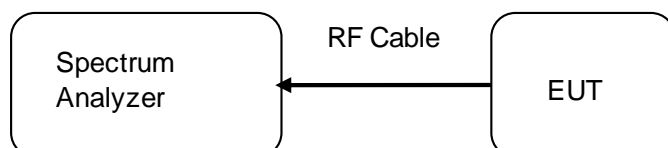


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. TEST RESULTS

5.1 Essential Requirements of Standard

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard	:	Part 15.203 RSS-Gen Clause 6.7
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an integral antenna, the directional gain of antenna is 0dBi, 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.

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5.1.2 Deactivation of the Transmission

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

Test standard	: FCC Part 15.231(a)(1)
Basic standard	: ANSI C63.10: 2013
Limit	: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of after released.
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2021-08-26
Input voltage	: Battery operated
Operation mode	: A
Ambient temperature	: 25 °C
Relative humidity	: 56 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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5.1.3 20dB Emission Bandwidth

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

Test standard : FCC Part 15.231(c)
RSS-Gen Issue 5

Basic standard : ANSI C63.10: 2013

Limit : FCC Part 15.231(c)

Kind of test site : Shielded Room

Test Setup

Date of testing : 2021-08-26

Input voltage : Battery operated

Operation mode : A

Ambient temperature : 25 °C

Relative humidity : 56 %

Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

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5.1.4 99% Bandwidth

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

Test standard : RSS-Gen Clause 6.6
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2021-08-26
Input voltage : Battery operated
Operation mode : A
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

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

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

Test standard	FCC Part 15.231(b) (1)(2)(3) FCC Part 15.205 FCC Part 15.209 RSS-Gen Issue 5 RSS-210 Issue 10
Basic standard	ANSI C63.10: 2013
Limits	FCC Part 15.231(b)
Kind of test site	3m Semi-anechoic Chamber

Test Setup

Date of testing	2021-08-24 ~ 2021-08-26
Input voltage	Battery operated
Operation mode	A
Ambient temperature	Refer to test result
Relative humidity	Refer to test result
Atmospheric pressure	101 kPa

For the measurement records, refer to the appendix B.

6. Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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Appendix A.1: Set-up for Radiated Spurious Emission, below 1 GHz



Appendix A.2: Set-up for Radiated Spurious Emission, above 1 GHz



Appendix A.3: Set-up for Radiated Emissions, below 1 GHz



Appendix A.4: Set-up for Radiated Emissions, above 1 GHz



Appendix B

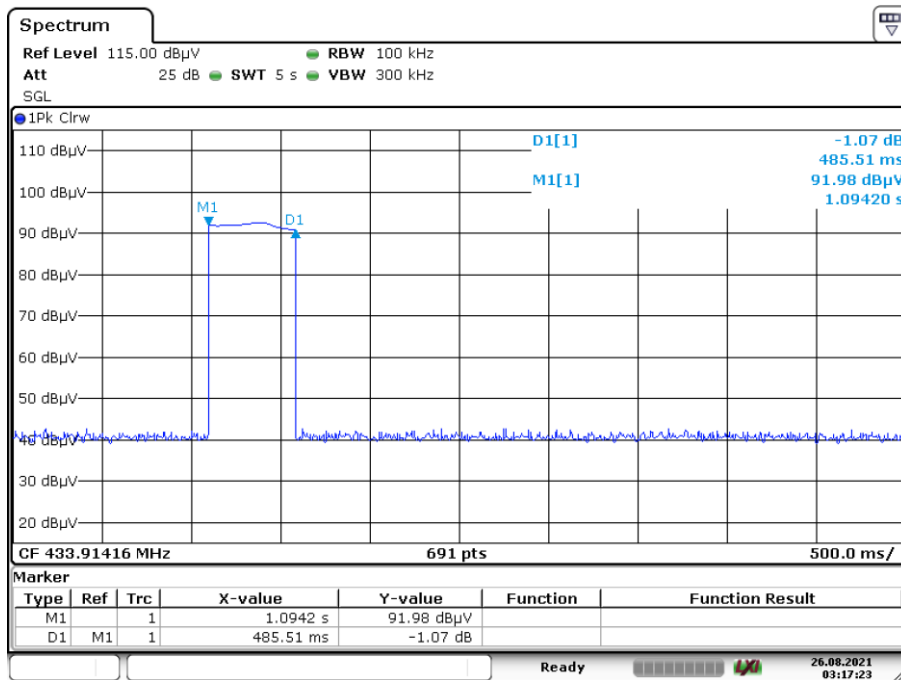
Test Results

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

Test Results

Operation Mode	Duration Time (S)	Limit (S)	Result
A	0.4855	5	Pass

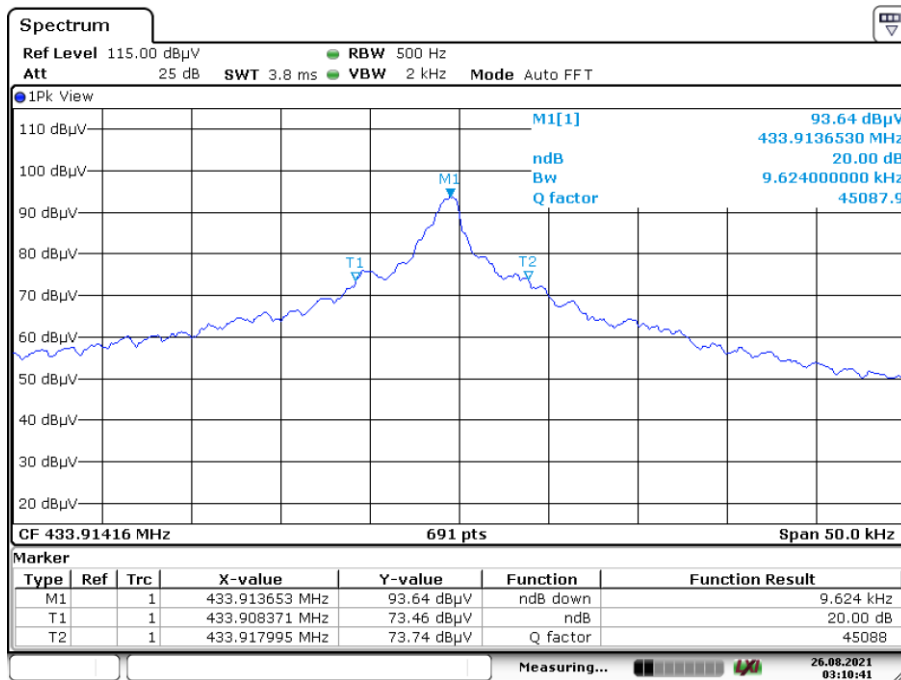


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APPENDIX B.2: TEST RESULTS OF 20dB EMISSION BANDWIDTH

Test Results

Operation Frequency (MHz)	20dB Emission Bandwidth (MHz)	Limit (MHz)	Result
433.92	0.0096	1.085	Pass

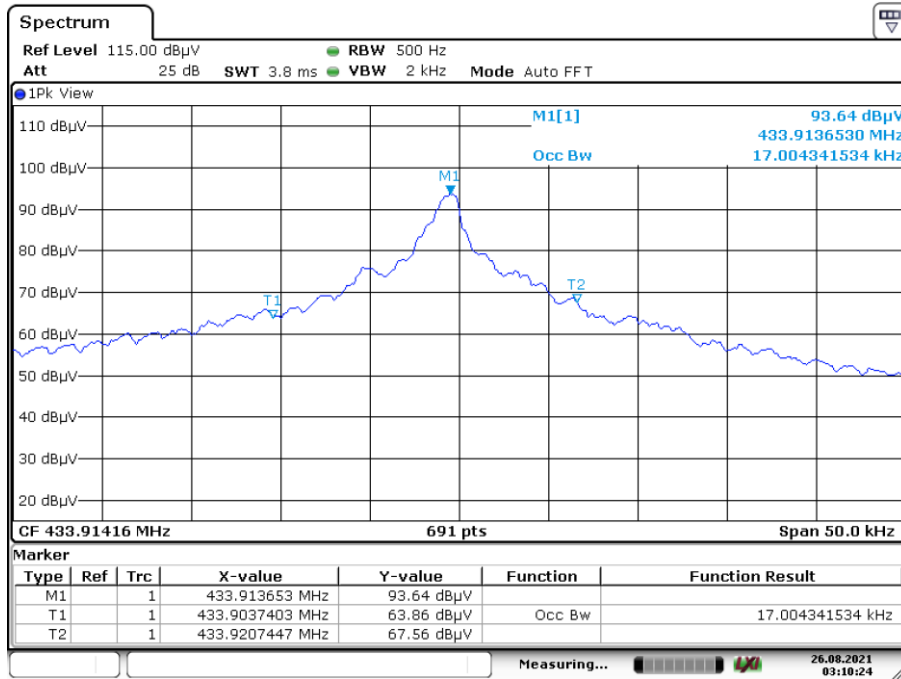


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APPENDIX B.3: TEST RESULTS OF 99% BANDWIDTH

Test Results

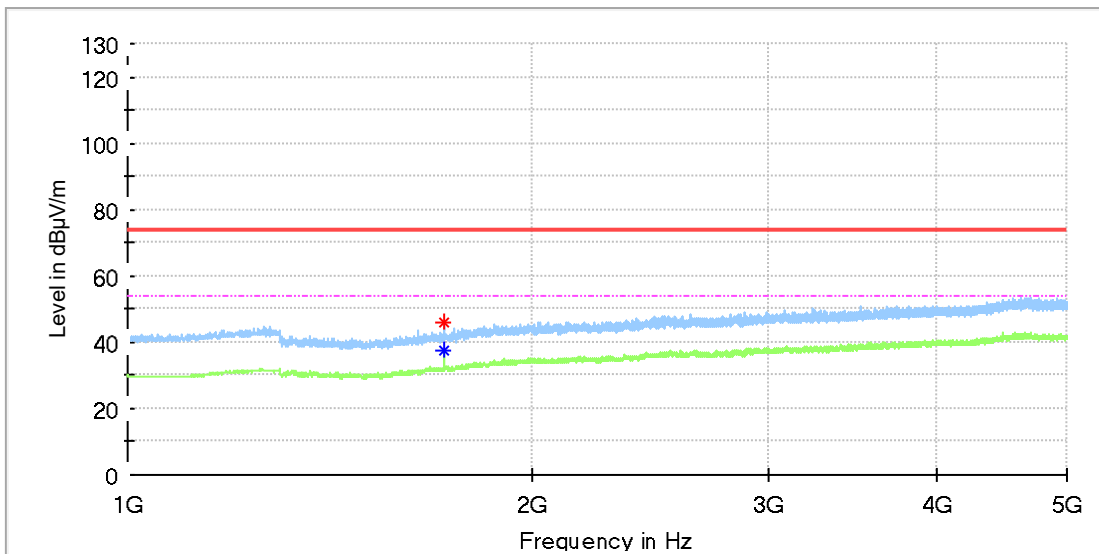
Operation Frequency (MHz)	99% Bandwidth (MHz)	Result
433.92	0.017	Pass



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EUT Information

EUT Name: 2 channel RF remote
 Model: RS2004
 Test Mode: 433MHz
 Test Voltage:: Battery
 Remark: Temp 23 Humi:51%
 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/m)
1719.950000	45.83	---	74.00	28.17	100.0	H	42.0	3.4
1719.950000	---	37.71	54.00	16.29	100.0	H	42.0	3.4

Final Result

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