

Prüfbericht-Nr.: Test Report No.:	50164543 001	Auftrags-Nr.: Order No.:	174078397	Seite 1 von 15 Page 1 of 15
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date.:	22 Jan, 2017	
Auftraggeber: Client:	Sam Ash Music Corporation 262 Duffy Avenue Hicksville New York United States			
Prüfgegenstand: Test item:	USB Digital Wireless System (Receiver unit)			
Bezeichnung / Typ-Nr.: Identification / Type No.:	RXD2			
Auftrags-Inhalt: Order content:	TUV Rheinland - EMC Service			
Prüfgrundlage: Test specification:	FCC 47 CFR Part 15 (October 1, 2017) Subpart B Test method was quoted from ANSI C63.4:2014.			
Wareneingangsdatum: Date of receipt:	22 Jan, 2017			
Prüfmuster-Nr.: Test sample No.:	174078397-001			
Prüfzeitraum: Testing period:	Refer to the test report			
Ort der Prüfung: Place of testing:	Refer to section 2.1			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Guangdong) Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
2018.07.13 Arthur Liu/PM <i>Arthur Liu</i>		2018.07.13 Storm Shu/Reviewer <i>Storm Shu</i>		
Datum Date	Name/Stellung Name/Position	Unterschrift Signature	Datum Date	Name/Stellung Name/Position
Sonstiges / Other:				
FCC ID: CCRRXD2				
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 specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable 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>				

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TEST SUMMARY

5.1 CONDUCTED EMISSION FOR FCC 47 CFR PART 15 SECTION 15.107(A)*RESULT: Pass***5.2 RADIATED EMISSION FOR FCC 47 CFR PART 15 SECTION 15.109(A)***RESULT: Pass*

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1 General Remarks

When applying the basic standards in this test report, please refer to the applied generic or product family standards for edition information:

For dated basic standards, only the edition cited applies. For undated basic standards, the latest edition (including any amendments) applies.

1.1 Complementary Materials

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

Appendix 1: Test Result

Appendix 2: List of Test and measurement Instruments

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Guangdong) Ltd. EMC Laboratory

No.102, 1F of Southwest and No.205, 2F of West Warehouse Building, No.767 Tianyuan Road, Tianhe District, Guangzhou, Guangdong, P.R. China

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Refer to attached Appendix 2.

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

Uncertainty of conducted emissions measurements 2.68 dB

Uncertainty of radiated emissions measurements 5.16 dB (30-1000 MHz).

The reported expanded uncertainty is based on a standard uncertainty multiply by a coverage factor $k=2$, providing a level of confidence of approximately 95%.

2.6 Sample Calculations

Calculation of test results for conducted emission measurement:

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.318000	---	32.65	49.76	17.11	1000.	9.000	L1	GND	10.1
0.318000	34.05	---	59.76	25.71	1000.	9.000	L1	GND	10.1

Frequency (MHz) = Emission frequency in MHz

Level (dBuV) = Reading converted to dBuV and correction Factor added (QuasiPeak or CAverage)

Reading (dBuV) = Level (dBuV) – Corr. (dB) (Uncorrected Analyzer/Receiver reading)

Corr (dB) = LISN Factor (including extended outlet insertion loss if > 0.5dB) + Cable loss

Limit (dBuV) = Limit stated in standard

Margin (dB) = Limit (dBuV) – Level (dBuV)

Detector: QP= Quasi-Peak; AVG= Average; PK= Peak

e.g.: 32.65dBuV(Level)= 22.55dBuV(Reading) + 10.1dB(Corr.)

17.11dB(Margin)= 49.76dBuV(Limit) - 32.65dBuV(Level)

Calculation of test results for radiated emission measurement:

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)	Comment
34.960000	16.4	1000.0	120.000	V	14.4	23.6	40.0	

Frequency (MHz) = Emission frequency in MHz

Level (dBuV/m) = Reading converted to dBuV and correction Factor added (QuasiPeak)

Reading (dBuV/m) = Level (dBuV/m) – Corr. (dB) (Uncorrected Analyzer/Receiver reading)

Corr (dB) = Antenna factor + Cable loss – Pre-amplifier gain

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Limit (dBuV/m) – Level (dBuV/m)

Detector: QP= Quasi-Peak; AVG= Average; PK= Peak

e.g.: 16.4dBuV/m(Level)= 2.0dBuV/m(Reading) + 14.4dB(Corr.)

23.6dB(Margin)= 40.0dBuV/m(Limit) – 16.4dBuV/m(Level)

2.7 Location of original data

The original copies of all test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangdong) file for certification follow-up purposes.

2.8 Status of facility used for testing

TÜV Rheinland (Guangdong) Ltd. is listed on the US Federal Communications Commission list of facilities approved to perform measurements, whose designation number is CN1207.

3 General Product Information

The submitted sample RXD2 is a wireless receiver, it use digital modulation technics. Therefore, full tests were performed on RXD2. The type number RXD1 on appendix 1 represent RXD2.

3.1 Product Function and Intended Use

Refer to Technical Documentation and User Manual.

3.2 Ratings and System Details

Type Designation:	RXD2
Rated Input:	DC 5.0V via USB port(Receiver)
Ports:	DC input; enclosure
Cable Type:	Unshielded
Protection Class:	III

Refer to the Technical Documentation for further information.

3.3 Independent Operation Modes

The basic operating modes as below:

Mode A	Receiving,connecting with PC and playing audio signal
Mode B	Standby

Refer to the Technical Documentation for further information

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3.4 Submitted Documents

Circuit Diagram
PCB layout
Part List
Rating Label
User Manual

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

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

Refer to Test set-up in chapter 5.

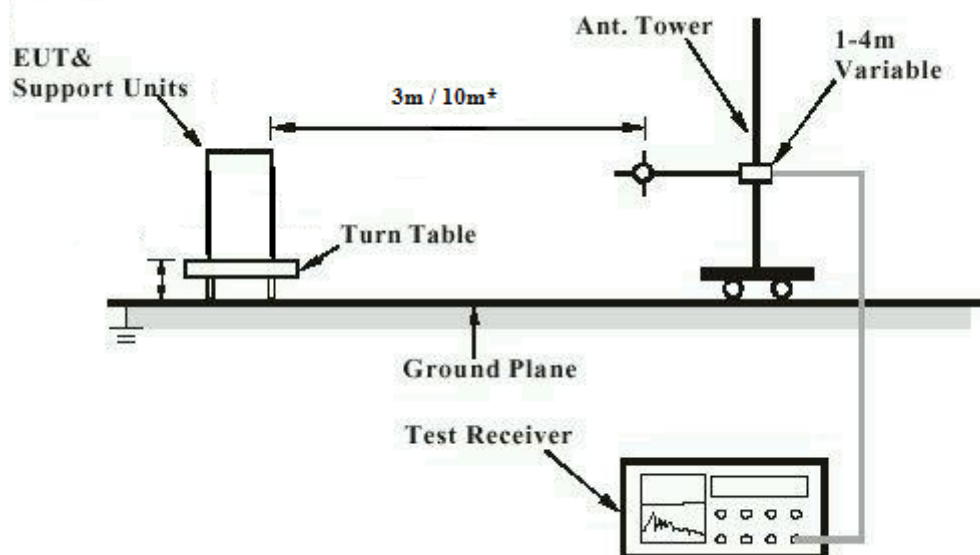
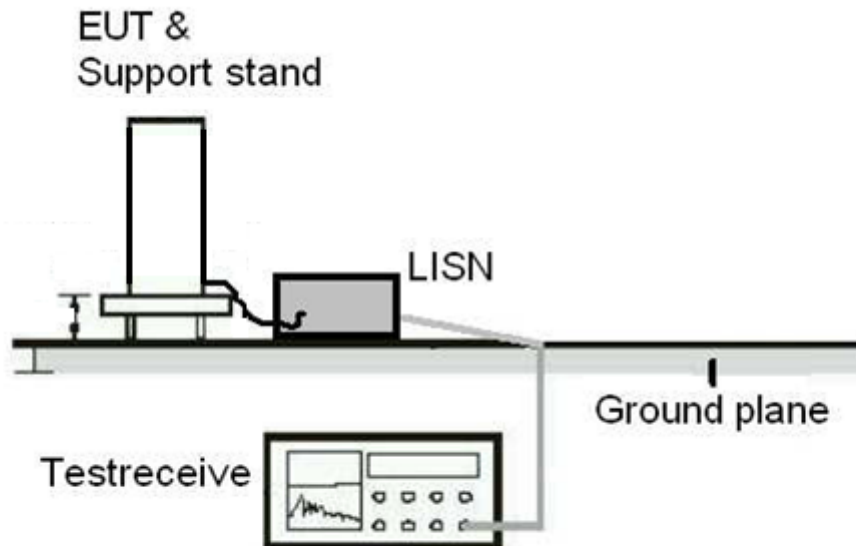
4.3 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Notebook	Lenovo	ThinkPad X260	PC0DZSKR	N/A

4.4 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

4.5 Test set-up



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5 Test Results of Emissions

5.1 Conducted Emission for FCC 47 CFR Part 15 Section 15.107(a)

RESULT:**Pass**

Date of testing : Refer to appendix 1
Test procedure : ANSI C63.4:2014, Clause 7.2
Equipment class : B
Limits : FCC 47 CFR Part 15 Subpart B Section 15.107 (a), limit for Class B equipment.

Test Setup

Input voltage : Powered by PC:AC120V,60Hz
Operation mode : A
Temperature : Refer to appendix 1
Humidity : Refer to appendix 1

Test procedure:

For tabletop device, the EUT and its peripherals were placed on a wooden table, 0.8cm above the horizontal reference plane and 40cm away from vertical reference plane in a shielded room. For floor-standing device, the EUT shall be placed either directly on the reference ground plane or on insulating material as described in ANSI C63.4 Clause 6.3.2.1. The EUT was connected to input power source through a line impedance stabilization network (LISN). The excess length of the power cord between the EUT and the LISN shall be folded back and forth at the center of the lead to form a bundle not exceeding 40cm in length.

The EUT was tested in a typical model of operation in accordance with ANSI C63.4:2014, Pre-test was performed in peak and average detection mode. final measurement was performed using quasi-peak and average detection on the live and neutral lines with the worst case.

The test software Rohde & Schwarz EMC32 was used during the test.

If the result of the measurement with the Quasi Peak detector is below the Average limit, the measurement with Average Detector may be omitted.

Refer to appendix 1 for test result.

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5.2 Radiated Emission for FCC 47 CFR Part 15 Section 15.109(a)**RESULT:****Pass**

Date of testing	:	Refer to appendix 1
Test procedure	:	ANSI C63.4:2014, Clause 8.3
Equipment class	:	B
Limits	:	FCC 47 CFR Part 15 Subpart B section 15.109 (a), limit for Class B equipment.

Test Setup

Input voltage	:	DC 5.0V via USB port(Receiver)
Operation mode	:	A
Temperature	:	Refer to appendix 1
Humidity	:	Refer to appendix 1

Test procedure:

For tabletop device, the and its peripherals were placed on a wooden table, 80cm above ground plane in semi-anechoic chamber. For floor-standing equipment, the EUT and all cables shall be insulated, if required, from the ground plane by up to 12mm of insulating material in semi-anechoic chamber.

The EUT was set 3 meters away from the receiving antenna, which was mounted on a variable-height antenna tower. Test shall be made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height shall be varied from 1m to 4m. The table was rotated 360 degrees to detect the suspected emission frequency points. The position of the worst radiation case with both horizontal and vertical receiving antenna polarization was recorded together with the suspected emission frequency points above-mentioned.

The EUT was tested in a typical model of operation in accordance with ANSI C63.4:2014, Pre-test was performed in peak detection mode. Final measurement was performed using quasi-peak detection with the worst case.

The test software Rohde & Schwarz EMC32 was used during the test.

Refer to the attached appendix 1.

6 Photographs of the Test Set-Up

Photograph 1: Set-up for Conducted Emission



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Photograph 2: Set-up for Radiated Emission (30MHz-6GHz)



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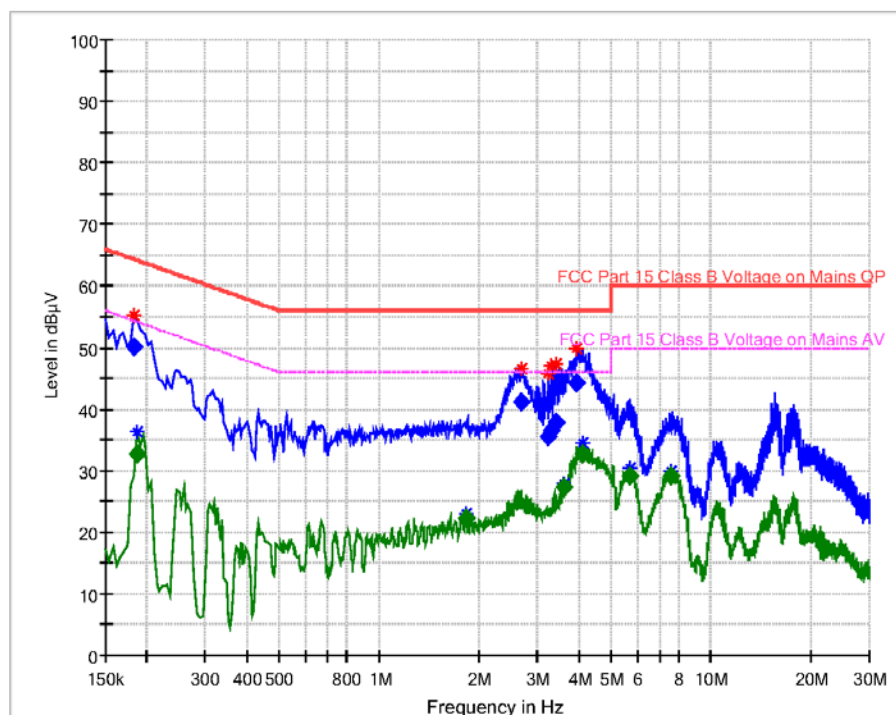
EMC Test Record (EMISSION)

Common Information

Manufacturer: Samson
Test Item: USB wireless system receiver
Identification: Stage XPD1(Transmitter: Stage HXD1,Receiver: Stage RXD1)
Test Standard: FCC Part 15
Test Detail: Conducted Emission
Operation Mode: On
Climate Condition: 22 °C; 50 %RH; 101 kPa.
Test Voltage/ Freq.: AC 120V/60 Hz
Port / Line: AC Mains
Receipt No.: 174078397
Report No.: /
Result: Pass
Comment: /

Hardware Setup: 1phase LISN ENV 216 to ESCI 3
Level Unit: dBµV

Subrange	Detectors	IF Bandwidth	Step Size	Meas. Time	Receiver
150kHz - 30MHz	Peak; Average	9kHz	4.5kHz	10ms	ESCI 3



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Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.182000	50.06	---	64.39	14.34	1000.	9.000	N	OFF	9.6
0.186000	---	32.67	54.21	21.54	1000.	9.000	N	OFF	9.6
1.834000	---	22.32	46.00	23.68	1000.	9.000	N	OFF	9.6
2.674000	41.28	---	56.00	14.72	1000.	9.000	L1	OFF	9.6
3.222000	35.47	---	56.00	20.53	1000.	9.000	L1	OFF	9.7
3.314000	36.49	---	56.00	19.51	1000.	9.000	L1	OFF	9.7
3.414000	37.96	---	56.00	18.04	1000.	9.000	L1	OFF	9.8
3.602000	---	27.34	46.00	18.66	1000.	9.000	L1	OFF	9.7
3.946000	44.26	---	56.00	11.74	1000.	9.000	L1	OFF	9.7
4.126000	---	32.82	46.00	13.18	1000.	9.000	L1	OFF	9.8
5.674000	---	29.14	50.00	20.86	1000.	9.000	N	OFF	9.7
7.566000	---	29.08	50.00	20.92	1000.	9.000	N	OFF	9.8

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Note: frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 6GHz -26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 6GHz were reported.

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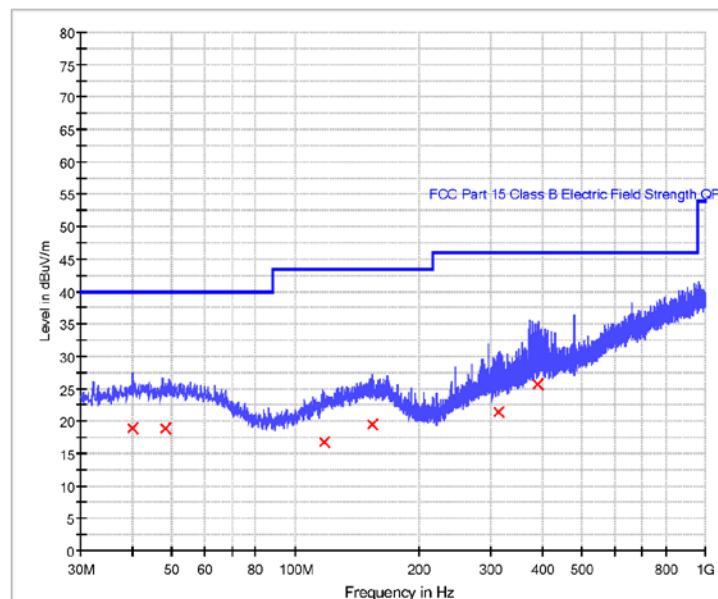
EMC Test Service Hotline: +86-20-28391188

EMC Test Record (Emission)

Common Information

Manufacturer:	Samson
Test Item:	USB wireless system receiver
Identification:	Stage XPD1(Transmitter: Stage HXD1,Receiver: Stage RXD1)
Test Standard:	FCC Part 15
Test Detail:	Radiated Emission
Operation Mode:	Transmitter and Receiver
Climate Condition:	21 °C, 52 %, 101 kPa
Test Voltage/ Freq:	DC 3.0V(battery powered),DV5.0V(USB powered)
Receipt No:	174078397
Report No:	/
Result:	Pass
Comment:	Test distance is 3m; Horizontal

Subrange 1	
Frequency range:	30M-1000MHz
Receiver:	ESCI 3
Transducer:	VULB9168



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Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)	Comment
40.200000	18.9	1000.0	120.000	H	20.6	21.1	40.0	
48.200000	18.8	1000.0	120.000	H	20.6	21.2	40.0	
117.560000	16.8	1000.0	120.000	H	18.9	26.7	43.5	
154.160000	19.4	1000.0	120.000	H	21.3	24.1	43.5	
312.760000	21.4	1000.0	120.000	H	21.9	24.6	46.0	
389.760000	25.7	1000.0	120.000	H	24.2	20.3	46.0	

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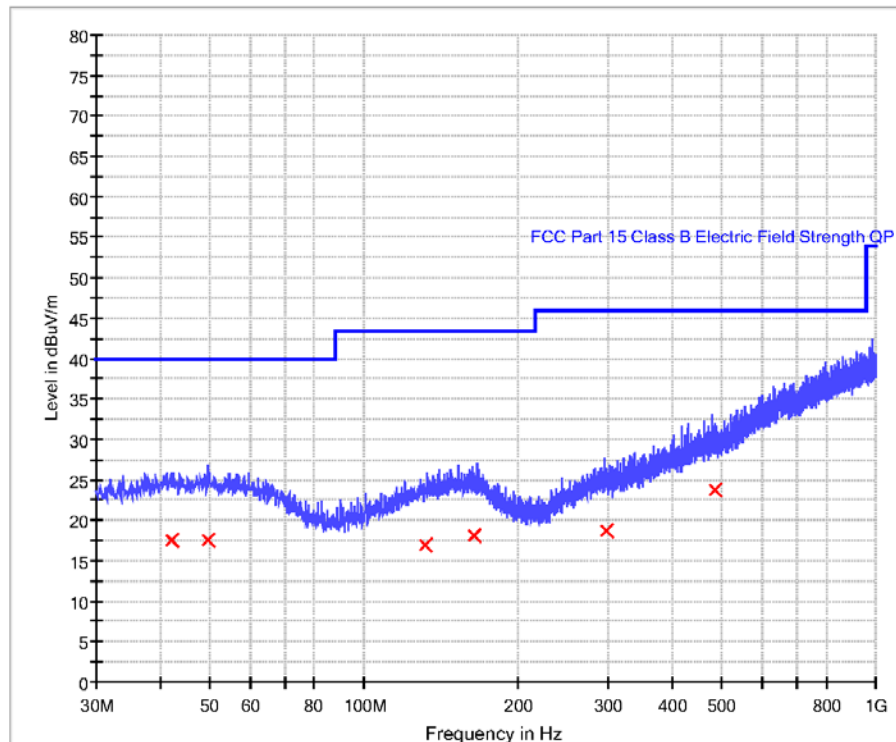
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EMC Test Service Hotline: +86-20-28391188

EMC Test Record (Emission)

Common Information

Manufacturer:	Samson
Test Item:	USB wireless system receiver
Identification:	Stage XPD1(Transmitter: Stage HXD1,Receiver: Stage RXD1)
Test Standard:	FCC Part 15
Test Detail:	Radiated Emission
Operation Mode:	Transmitter and Receiver
Climate Condition:	21 °C, 52 %, 101 kPa
Test Voltage/ Freq:	DC 3.0V(battery powered),DC 5.0V(USB powered)
Receipt No:	174078397
Report No:	/
Result:	Pass
Comment:	Test distance is 3m; Vertical
Subrange 1	
Frequency range:	30M-1000MHz
Receiver:	ESCI 3
Transducer:	VULB9168



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Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)	Comment
42.240000	17.5	1000.0	120.000	V	20.6	22.5	40.0	
49.760000	17.6	1000.0	120.000	V	20.6	22.4	40.0	
131.960000	17.0	1000.0	120.000	V	19.9	26.5	43.5	
163.840000	18.1	1000.0	120.000	V	21.2	25.4	43.5	
298.200000	18.6	1000.0	120.000	V	21.6	27.4	46.0	
484.560000	23.7	1000.0	120.000	V	26.5	22.3	46.0	

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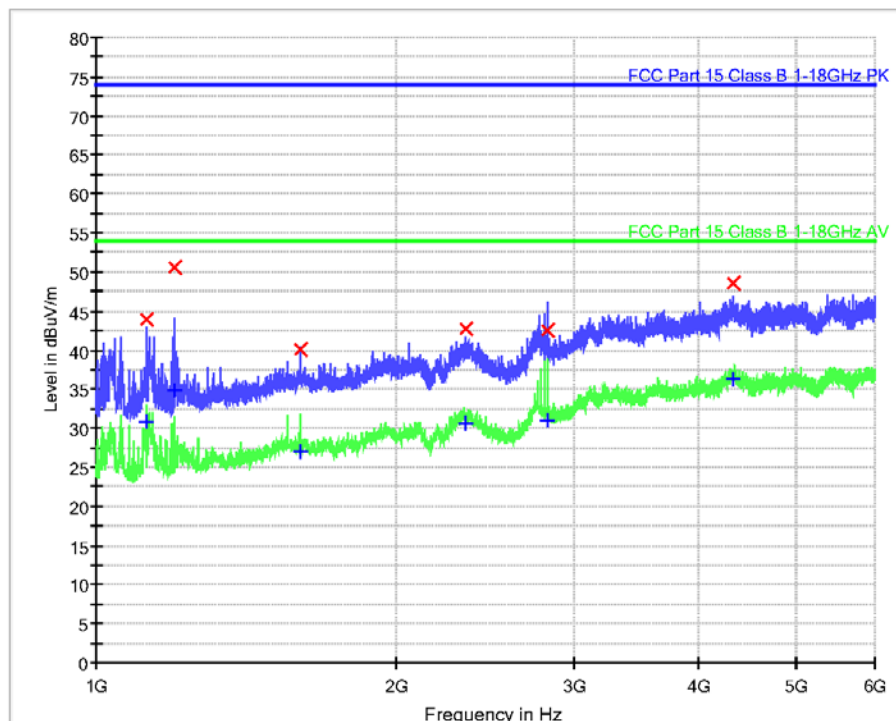
EMC Test Record (Emission)

Common Information

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Test Item:	USB wireless system receiver
Identification:	Stage XPD1(Transmitter: Stage HXD1,Receiver: Stage RXD1)
Test Standard:	FCC Part 15
Test Detail:	Radiated Emission
Operation Mode:	Transmitter and Receiver
Climate Condition:	21 °C, 52 %, 101 kPa
Test Voltage/ Freq:	DC 3.0V(battery powered),DC 5.0V(USB powered)
Receipt No:	174078397
Report No:	/
Result:	Pass
Comment:	Horizontal

Subrange 1	
Frequency Range:	1GHz-6GHz
Receiver:	TUV FSP30
Transducer:	TUV SAC HF907/ TUV FSP30-TUV SAC HF907

RTTETT_RREF001-A02-07_Above 1GHz_With PreAMP EXT& Notch filter



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Limit and Margin PK

Frequency (MHz)	MaxPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBuV/m)	Comment
1124.000000	44.0	1000.0	1000.000	H	-16.9	30.0	74.0	
1198.000000	50.5	1000.0	1000.000	H	-16.3	23.5	74.0	
1599.000000	40.2	1000.0	1000.000	H	-14.1	33.9	74.0	
2341.000000	42.7	1000.0	1000.000	H	-11.0	31.4	74.0	
2822.000000	42.5	1000.0	1000.000	H	-9.6	31.5	74.0	
4328.000000	48.6	1000.0	1000.000	H	-3.9	25.4	74.0	

Limit and Margin AV

Frequency (MHz)	Average (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBuV/m)	Comment
1124.000000	30.7	1000.0	1000.000	H	-16.9	23.3	54.0	
1198.000000	34.8	1000.0	1000.000	H	-16.3	19.2	54.0	
1599.000000	27.1	1000.0	1000.000	H	-14.1	26.9	54.0	
2341.000000	30.6	1000.0	1000.000	H	-11.0	23.4	54.0	
2822.000000	31.1	1000.0	1000.000	H	-9.6	22.9	54.0	
4328.000000	36.2	1000.0	1000.000	H	-3.9	17.8	54.0	

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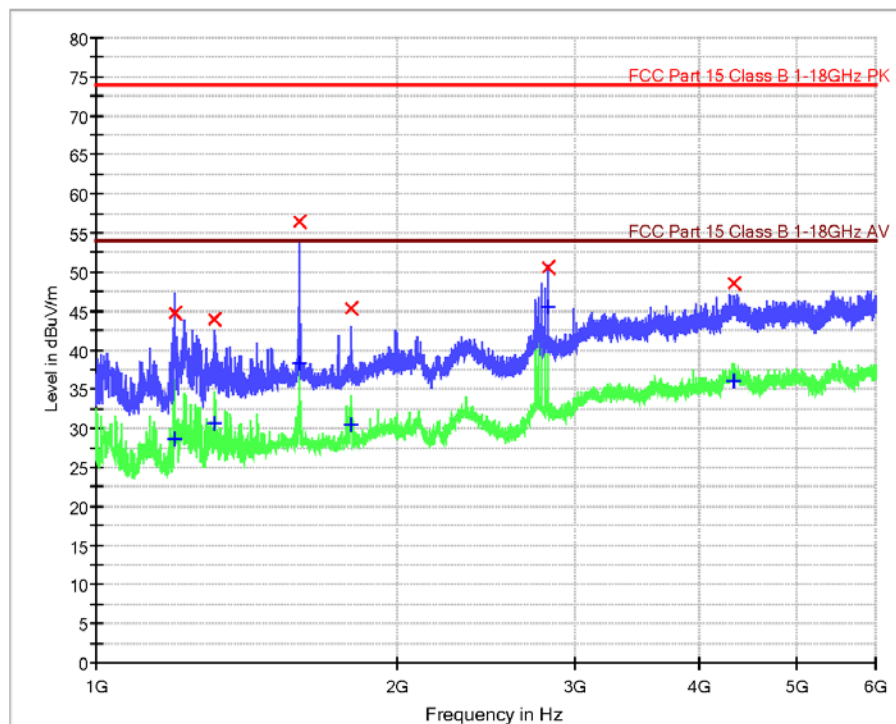
EMC Test Record (Emission)

Common Information

Manufacturer:	Samson
Test Item:	USB wireless system receiver
Identification:	Stage XPD1(Transmitter: Stage HXD1,Receiver: Stage RXD1)
Test Standard:	FCC Part 15
Test Detail:	Radiated Emission
Operation Mode:	Transmitter and Receiver
Climate Condition:	21 °C, 52 %, 101 kPa
Test Voltage/ Freq:	DC 3.0V(battery powered),DV5.0V(USB powered)
Receipt No:	174078397
Report No:	/
Result:	Pass
Comment:	Vertical

Subrange 1	
Frequency Range:	1GHz-6GHz
Receiver:	TUV FSP30
Transducer:	TUV SAC HF907/ TUV FSP30-TUV SAC HF907

RTTETT_RREF001-A02-07_Above 1GHz_With PreAMP EXT& Notch filter



Tested by: Chris Liang
20180504

Reviewed by: Jacky Chen
20180507

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TUV Rheinland (Guangdong) Ltd.

EMC Test Service Hotline: +86-20-28391188

Limit and Margin PK

Frequency (MHz)	MaxPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBuV/m)	Comment
1197.000000	44.8	1000.0	1000.000	V	-16.3	29.2	74.0	
1314.000000	43.9	1000.0	1000.000	V	-16.0	30.1	74.0	
1595.000000	56.4	1000.0	1000.000	V	-14.1	17.6	74.0	
1798.000000	45.4	1000.0	1000.000	V	-13.2	28.6	74.0	
2822.000000	50.5	1000.0	1000.000	V	-9.6	23.5	74.0	
4324.000000	48.7	1000.0	1000.000	V	-3.9	25.3	74.0	

Limit and Margin AV

Frequency (MHz)	Average (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBuV/m)	Comment
1197.000000	28.7	1000.0	1000.000	V	-16.3	25.3	54.0	
1314.000000	30.5	1000.0	1000.000	V	-16.0	23.5	54.0	
1595.000000	38.3	1000.0	1000.000	V	-14.1	15.7	54.0	
1798.000000	30.3	1000.0	1000.000	V	-13.2	23.7	54.0	
2822.000000	45.6	1000.0	1000.000	V	-9.6	8.4	54.0	
4324.000000	36.1	1000.0	1000.000	V	-3.9	17.9	54.0	

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Test Equipment	Model	Manufacturer	Serial No.	Last Calibration	Calibration Interval
TÜV Rheinland (Guangdong) Ltd. EMC Laboratory					
Disturbance Voltage					
EMI Test Receiver	ESCI 3	Rohde&Schwarz	100216	16.Mar.2018	1 Year
Two-Line V-Network	ENV216	Rohde&Schwarz	100195	16.Mar.2018	1 Year
Pulse Limiter	ESH3-Z2	Rohde&Schwarz	100701	16.Mar.2018	1 Year
Test software	EMC32	Rohde&Schwarz	V9.26	/	/
Radiated Emission					
EMI Test Receiver	ESCI 3	Rohde&Schwarz	100216	16.Mar.2018	1 Year
Trilog-Broadband Antenna	VULB9168	Schwarzbeckmess-elektronik	684	21.Apr.2017	2 Years
Double-Ridged Horn Antenna	HF907	Rohde & Schwarz	100377	27.Oct.2015	2 Years
Pre-Amplifier(1-18GHz)	AFS44-00101800-25-10P-44	MITEQ	1934457	16.Mar.2018	1 Year
Band Reject Filter	BRM50702	Micro-Tronics	023	07.Jul.2018	1 Year
Test software	EMC32	Rohde&Schwarz	V9.25	/	/

☐: Not Used

☒: Used