Luxshare Precision Industry Co.,Ltd.

TEST REPORT

SCOPE OF WORK
FCC TESTING– 33841815, 33841815WT

REPORT NUMBER
251117042SZN-001

ISSUE DATE **[REVISED DATE]**
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TEST REPORT

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Intertek Report No.: 251117042SZN-001

RF Test Report

Applicant:	Luxshare Precision Industry Co.,Ltd.
Address of Applicant:	Floor 2, Block A, Sanyo New Industrial Area, West Haoyi Community, Shajing Subdistrict Office, Bao an District Shenzhen, China.
Equipment Under Test (EUT)	
Product Name:	JS620K4
Model No.:	33841815, 33841815WT
Trademark:	N/A
FCC ID:	2AYYS-JS620K4Y
Applicable Standards:	FCC CFR Title 47 Part 15C (§15.247)
Date of Test:	Nov. 17, 2025 to Jan. 09, 2026
Test Result:	PASS

Prepared and Checked by:

Tony Tang
Engineer

Approved by:

Johnny Wang
Project Engineer
Date: Jan. 21, 2026

1 Revision History

Report No.	Version No.	Description	Issued Date
251117042SZN-001	*01*	*Original*	*Jan. 21, 2026*

2 Content

3 Summary of Test Result

TEST ITEM	FCC REFERANCE	RESULT
Antenna requirement	15.203	Pass
Conducted Output Power and e.i.r.p.	15.247(b)(1)	Pass
20 dB Bandwidth	15.247(a)(1)	Pass
Occupied bandwidth	-	Pass
Carrier Frequency Separation	15.247(a)(1)	Pass
Number of Hopping Frequencies	15.247(a)(1)(iii)	Pass
Dwell time	15.247(a)(1)(iii)	Pass
Conducted Spurious Emissions & Band Edge	15.247(d)	Pass
Radiated Emission	15.247(d), 15.205 & 15.209	Pass
AC Power line conducted emission	15.207	Pass

4 General Information

4.1 Client Information

Applicant:	Luxshare Precision Industry Co.,Ltd.
Address:	Floor 2, Block A, Sanyo New Industrial Area, West Haoyi Community, Shajing Subdistrict Office, Bao an District Shenzhen, China.
Manufacturer:	Luxshare Precision Industry Co.,Ltd.
Address:	Floor 2, Block A, Sanyo New Industrial Area, West Haoyi Community, Shajing Subdistrict Office, Bao an District Shenzhen, China.

4.2 Description of Equipment Under Test (EUT)

Product Name:	JS620K4
Model No.:	33841815, 33841815WT
Description of EUT:	The EUT contains Wi-Fi 2.4G, Wi-Fi 5G, Bluetooth (dual mode) & Thread functions. This report is for BT. The worst data is listed in the report.
Operation Frequency:	2402MHz - 2480MHz
Transfer Rate:	1/2/3Mbit/s
Number of Channel:	79
Channel Separation:	1MHz
Modulation Type:	GFSK, π/4-DQPSK, 8DPSK
Modulation Technology:	FHSS
Antenna Type:	Internal Antenna
Antenna Gain:	1.16dBi (This information is provided by applicant, and the applicant is responsible for the authenticity of the provided information.)
Antenna transmit mode:	1TX, 1RX
Power Supply:	Input: DC 5.0V, 2.0A
AC Adapter:	Adapter 1 Model: PS12L050K2000UD Input: 100-240V~, 50/60Hz, 0.35A Max. Output: 5.0V⎓2.0A Adapter 2 Model: FC010A01-050020U Input: 100-240V~, 50/60Hz, 0.3A Output: 5.0V⎓2.0A

Note:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. Model No.: 33841815, 33841815WT are identical in internal construction, the electrical circuit design, PCB layout, components used and internal wiring, The only differences between them are the external appearance (color) and the model name designation.
3. Two different adapter types were tested. This report documents only the worst-case test results.
4. Radiation emission tests were conducted on two types of Equipment Under Test (EUT). The two units differed solely in the DDR and eMMC chips used. This report documents only the worst-case test results.
   The details are as follows:

Items	eMMC	DDR
sample 1	Manufacturer: FORESEE Model: FEMDNN032G-C9A55	Manufacturer: Rayson Model: RS768M32LP4D2BDS-53BT
sample 2	Manufacturer: TWSC Model: TEMBG104T10-A0S5	Manufacturer: SCY Model: DL4A24G32P4V-EC

4.3 Description of Test Facility

Name:	Intertek Testing Services Shenzhen Ltd. Longhua Branch
Address:	101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen.
The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0327
	FCC Accredited Lab Designation Number: CN1188
	IC Registration Lab CAB identifier: CN0038

5 Test Specifications

5.1 Standards or Specification

FCC CFR 47 Part 15C
ANSI C63.10-2020
KDB 558074 D01 15.247 Meas Guidance v05r02

5.2 CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	/	/

5.3 Test Channels

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
GFSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz
π/4DQPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz
8DPSK (DH1, DH3, DH5)	2402 MHz to 2480 MHz	Channel 0	Channel 39	Channel 78
		2402 MHz	2441 MHz	2480 MHz

5.4 EUT TEST STATUS

Type of Modulation	Tx Function	Description
GFSK, π/4DQPSK, 8DPSK	1Tx	1. Keep the EUT in continuously transmitting with Modulation test single 2. Keep the EUT in continuously transmitting with Modulation test Hopping Frequency.

The power setting parameter:

The worst-case power setting parameter			
Test software Version	CMD		
Modulation Mode	2402MHz	2441MHz	2480MHz
BR-1Mbps	Default	Default	Default
EDR-2Mbps	Default	Default	Default
EDR-3Mbps	Default	Default	Default

5.5 Support Equipment List and Description

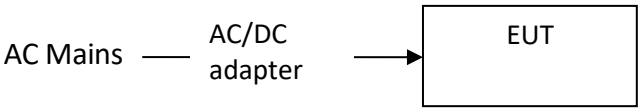
Description	Manufacturer	Model No.
-	-	-

5.6 Test environment condition:

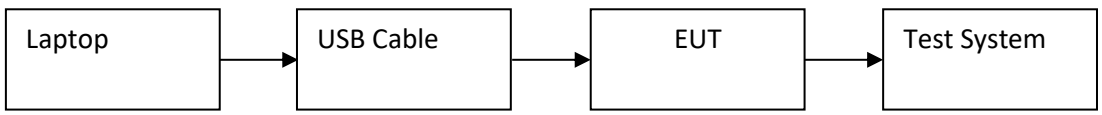
Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	120	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

5.7 Block Diagram Showing the Configuration of System Tested

Conducted Test & Radiated Test



Conducted Measurements Test



This example is connection diagram of EUT Test Setups.
For detail, please refer to test mode configuration and setup photographs for each test item.

5.8 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2025-04-21	2026-04-21
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	2025-04-21	2026-04-21
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2024-12-06 2025-12-01	2025-12-06 2026-12-01
SZ061-13	BiConiLog Antenna	ETS	3142E	00217919	2025-05-29	2028-05-29
SZ061-08	Horn Antenna	ETS	3115	00092346	2024-09-13	2027-09-13
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2024-05-05	2027-05-05
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	2025-09-11	2028-09-11
SZ185-03	EMI Receiver	R&S	ESR7	101975	2025-04-13	2026-04-13
SZ056-05	Signal Analyzer	R&S	FSV40	US40522113	2024-12-05 2025-12-01	2025-12-05 2026-12-01
SZ181-08	Microwave System Amplifier	keysight	83017A	MY57280108	2025-07-30	2026-07-30
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q13914102	2025-06-18	2028-06-18
SZ062-23	RF Cable	HUBER+SUHNER	SF104PE-1M	MY4262/4PE	2025-09-15	2026-09-15
SZ062-40	RF Cable	Talent Microwave	A50-3.5M3.5M-4.5M	22012932	2025-09-15	2026-09-15
SZ062-38	RF Cable	Talent Microwave	A50-3.5M3.5M-8M	21051695	2025-09-15	2026-09-15
SZ067-25	Notch Filter	Micro-Tronics	BRM50716	076	2025-02-22	2026-02-22
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	015	2025-04-21	2026-04-21
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2025-06-30	2026-06-30
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	2025-04-25	2026-04-25
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2025-06-30	2026-06-30

5.9 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement Uncertainty	Uncertainty
Channel Bandwidth	±3.46%
RF Output Power	±0.31dB
Conducted Unwanted Emission	±0.55dB
Spurious emission (Above 18GHz)	±5.3dB
Spurious emission (6GHz to 18GHz)	±5.1dB
Radiated emission (1GHz to 6GHz)	±4.8dB
Radiated emission (Up to 1GHz)	±4.8dB
AC Conducted emission	±3.2 dB
Temperature	±1°C
Humidity	±5%

6 Antenna requirement

6.1 Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the party responsible is used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

1. The antennas of the EUT are permanently attached.
2. There are no provisions for connection to an external antenna.

6.2 Conclusion:

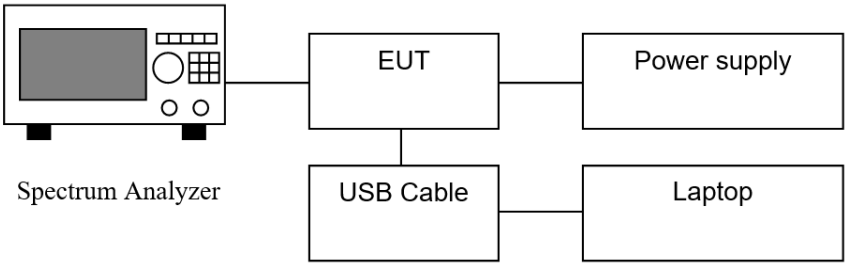
Therefore, this E.U.T complies with the requirement of Part 15.203

7 Conducted Output power and e.i.r.p.

7.1 Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. (The e.i.r.p. shall not exceed 4 W)
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

7.2 Test Setup



7.3 Test Procedure

This is an RF-conducted test to evaluate maximum peak output power. Use a direct connection between the antenna port of the unlicensed wireless device and the spectrum analyzer, through suitable attenuation. The hopping shall be disabled for this test:

a) Use the following spectrum analyzer settings:
1) Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
2) RBW > 20 dB bandwidth of the emission being measured.
3) VBW ≥ RBW.
4) Sweep: Auto.
5) Detector function: Peak.
6) Trace: Max hold.
b) Allow trace to stabilize.
c) Use the marker-to-peak function to set the marker to the peak of the emission.
d) The indicated level is the peak output power, after any corrections for external attenuators and cables.
e) A plot of the test results and setup description shall be included in the test report.

7.4 Test Results of Conducted Output power

Test Mode	Antenna	Channel	Result [dBm]	Limit [dBm]	Gain (dBi)	EIRP (dBm)	EIRP Limit [dBm]	Verdict
DH5	Ant1	2402	6.08	≤30	1.16	7.24	≤36	PASS
		2441	6.67	≤30	1.16	7.83	≤36	PASS
		2480	5.35	≤30	1.16	6.51	≤36	PASS
2DH5	Ant1	2402	8.10	≤30	1.16	9.26	≤36	PASS
		2441	8.45	≤30	1.16	9.61	≤36	PASS
		2480	7.40	≤30	1.16	8.56	≤36	PASS
3DH5	Ant1	2402	8.60	≤30	1.16	9.76	≤36	PASS
		2441	8.72	≤30	1.16	9.88	≤36	PASS
		2480	7.56	≤30	1.16	8.72	≤36	PASS

This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

8 20dB bandwidth

8.1 Limit

☐Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

☒Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

8.2 Test Procedure

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level.

d) Steps a) through c) might require iteration to adjust within the specified tolerances.

e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.

f) Set detection mode to peak and trace mode to max hold.

g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

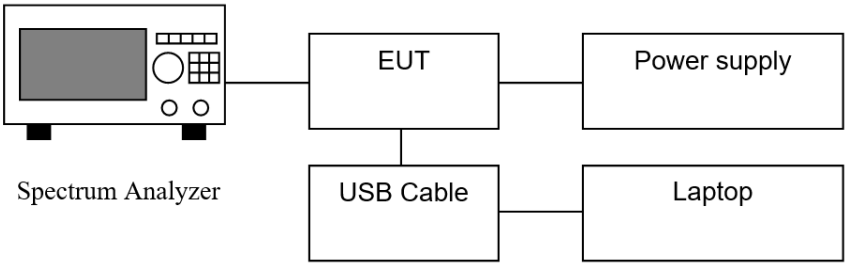
h) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.

i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).

j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "−xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

8.3 Test Setup



8.4 Test Results of 20dB bandwidth

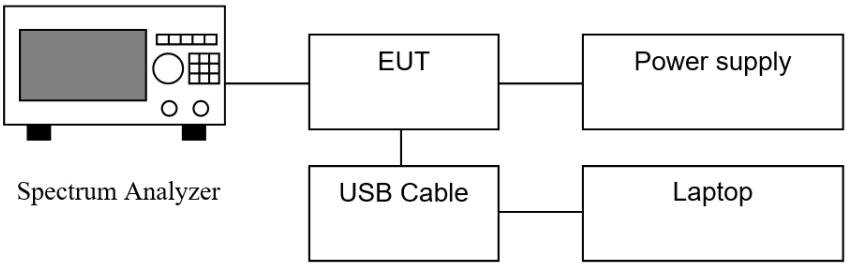
This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

9 Occupied Bandwidth

9.1 Limit

None, for reporting purposes only

9.2 Test Setup



9.3 Test Procedure

ANSI C63.10-2020 – Section 6.9.3

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

9.4 Test Results of Occupied Bandwidth

This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

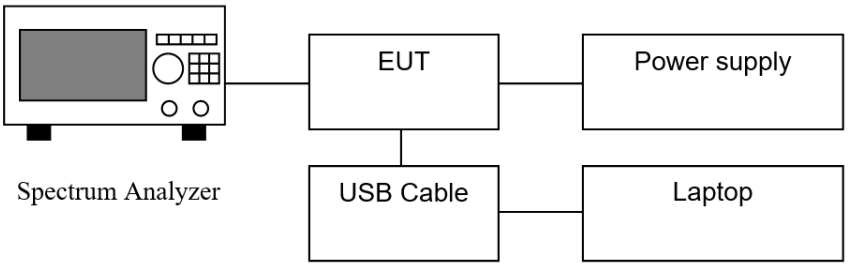
10 Carrier Frequency Separation

10.1 Limit

☐Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

☒Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

10.2 Test Setup



10.3 Test Procedure

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: Wide enough to capture the peaks of two adjacent channels.
b) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
c) Video (or average) bandwidth (VBW) ≥ RBW.
d) Sweep: Auto.
e) Detector function: Peak.
f) Trace: Max hold.
g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels. Compliance of an EUT with the appropriate regulatory limit shall be determined. A plot of the data shall be included in the test report.

10.4 Test Results of Carrier Frequency Separation

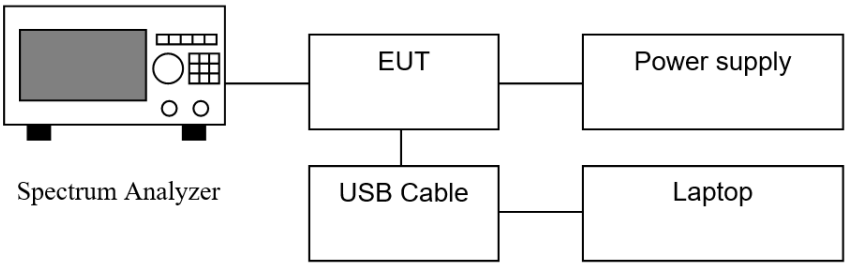
This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

11 Number of Hopping Frequencies

11.1 Limit

Number of Hopping Frequencies in the 2400-2483.5 MHz band shall use at least 15 channels.

11.2 Test Setup



11.3 Test procedure and test setup

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
b) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
c) VBW ≥ RBW.
d) Sweep: Auto.
e) Detector function: Peak.
f) Trace: Max hold.
g) Allow the trace to stabilize.

11.4 Test Results of Number of Hopping Frequencies

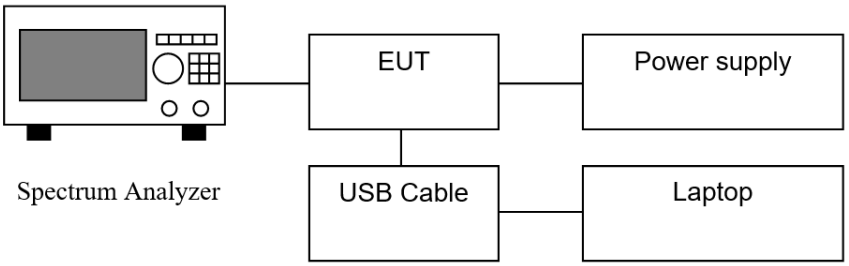
This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

12 Dwell Time

12.1 Limit

The dwell time on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

12.2 Test Setup



12.3 Test procedure and test setup

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

a) Span: Zero span, centered on a hopping channel.
b) RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
d) Detector function: Peak.
e) Trace: Max hold.

For FHSS Mode (79 Channel):
DH1 Dwell Time: Burst Width * (1600/2) * 31.6 / (channel number)
DH3 Dwell Time: Burst Width * (1600/4) * 31.6 / (channel number)
DH5 Dwell Time: Burst Width * (1600/6) * 31.6 / (channel number)

For AFHSS Mode (20 Channel):
DH1 Dwell Time: Burst Width * (800/2) * 8 / (channel number)
DH3 Dwell Time: Burst Width * (800/4) * 8 / (channel number)
DH5 Dwell Time: Burst Width * (800/6) * 8 / (channel number)

12.4 Test Results of Dwell Time

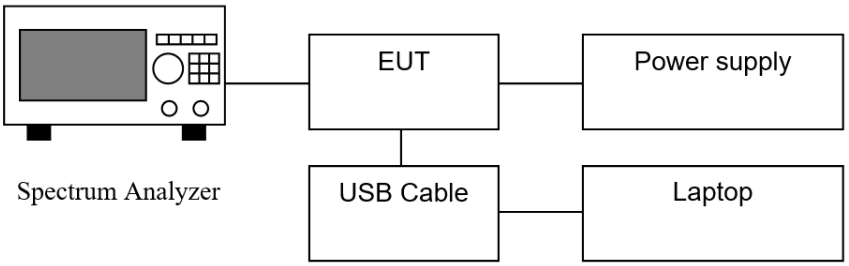
This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

13 Conducted Spurious Emissions & Band Edge

13.1 Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

13.2 Test Setup



13.3 Test Procedure

a) Connect the EMI receiver or spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described in step e)
b) Set the EUT to the lowest frequency channel (for the hopping on test, the hopping sequence shall include the lowest frequency channel).
c) Set the EUT to operate at maximum output power and 100% duty cycle, or equivalent “normal mode of operation” as specified in 6.10.3. of ANSI C63.10.
d) If using the radiated method, then use the applicable procedure(s) of 6.4, 6.5, or 6.6 of ANSI C63.10, and orient the EUT and measurement antenna positions to produce the highest emission level.
e) Perform the test as follows:
1) Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.
2) Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level.
3) Attenuation: Auto (at least 10 dB preferred).
4) Sweep time: Coupled.
5) Resolution bandwidth: 100 kHz
6) Video bandwidth: 300 kHz
7) Detector: Peak
8) Trace: Max hold
f) Allow the trace to stabilize. For the test with the hopping function turned ON, this can take several minutes to achieve a reasonable probability of intercepting any emissions due to oscillator overshoot.
g) Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.

h) Repeat step c) through step e) for every applicable modulation.
i) Set the EUT to the highest frequency channel (for the hopping on test, the hopping sequence shall include the highest frequency channel) and repeat step c) through step d).
j) The band-edge measurement shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

13.4 Test Results of Conducted Spurious Emissions & Band Edge

This result references Report No.: TBR-C-202501-0081-15 for the module [Model: EWN-8852BSN3DB, FCC ID: 2AMM6EWN-8852BSN3DB]; the module's RF configuration is unaltered in the final product.

14 Radiated Emission

14.1 Limit

Part 15.247(d), Part 15.205, Part 15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Part 15.209

Frequency (MHz)	FCC Limit (uV/m)	Measurement Distance (m)
0.009 – 0.490	2 400 / F (kHz)	300
0.490 – 1.705	24 000 / F (kHz)	30
1.705 – 30.0	30	30

Frequency (MHz)	FCC Limit (uV/m)	Measurement Distance (m)
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §15.231 and 15.241.

FCC Restricted bands of operation refer to FCC §15.205 (a):

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

14.2 Test Procedure

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) Both X and Y axes of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz).

For Radiated emission above 30MHz:

a) Th EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

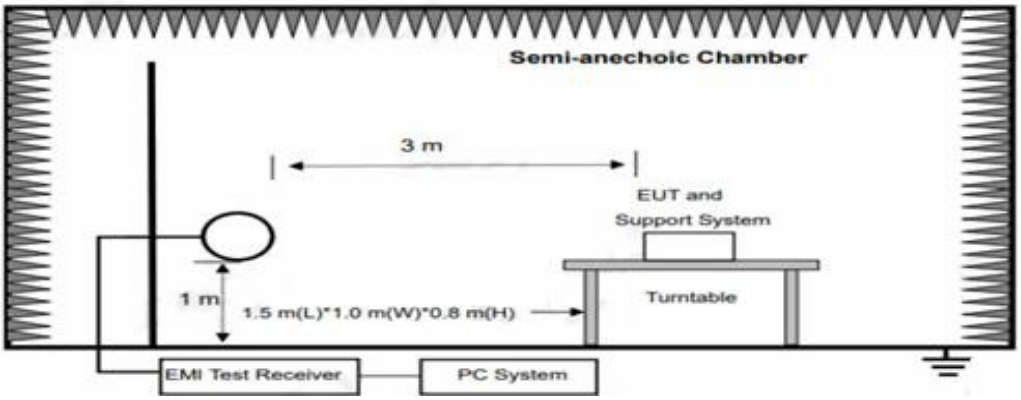
f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

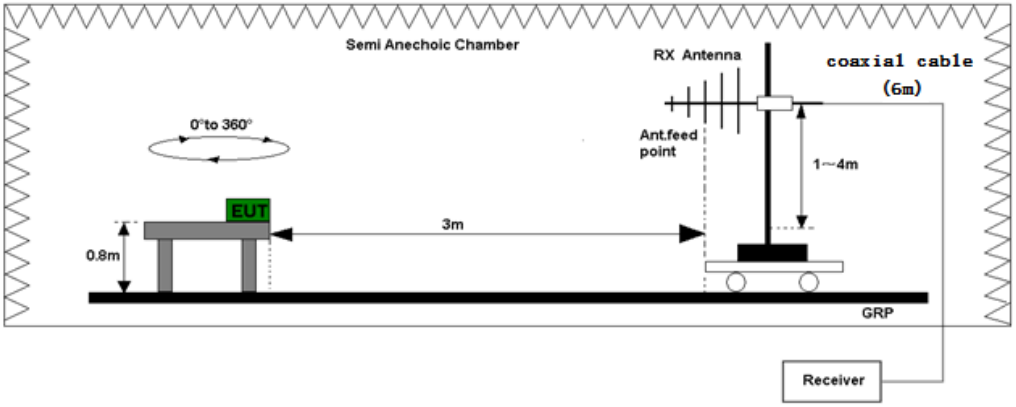
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes have been tested, but only the worst data was recorded in the report.

14.3 Test Setup

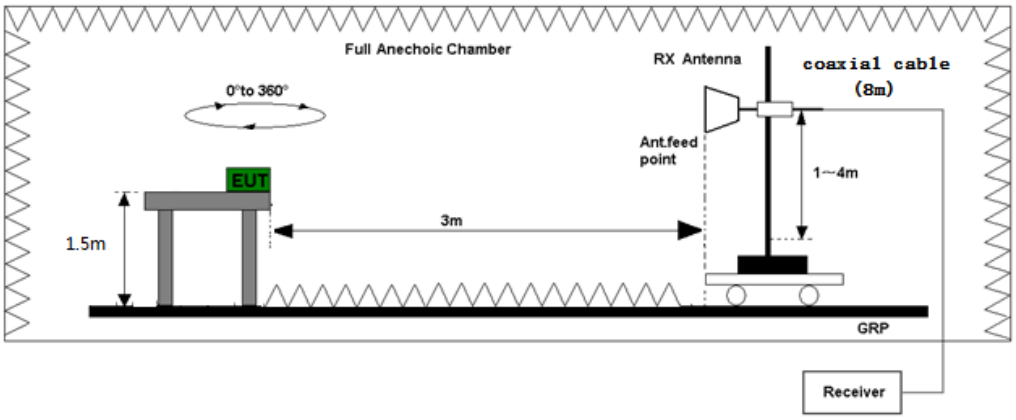
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



For Radiated emission above 1GHz:

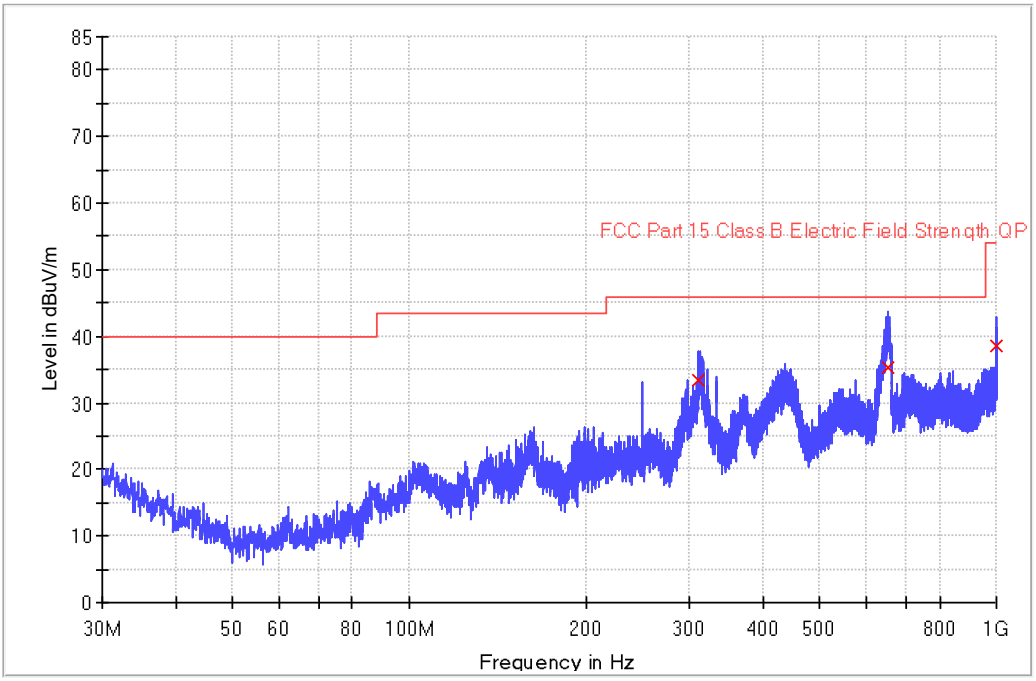


14.4 Test Results of Radiated Emissions

Below 1GHz:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Product Name:	JS620K4	**Product Model:**	33841815
Test By:	Tony Tang	**Worst Test mode:**	BT TX mode (GFSK)
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Horizontal
Test Voltage:	AC 120V, 60Hz		

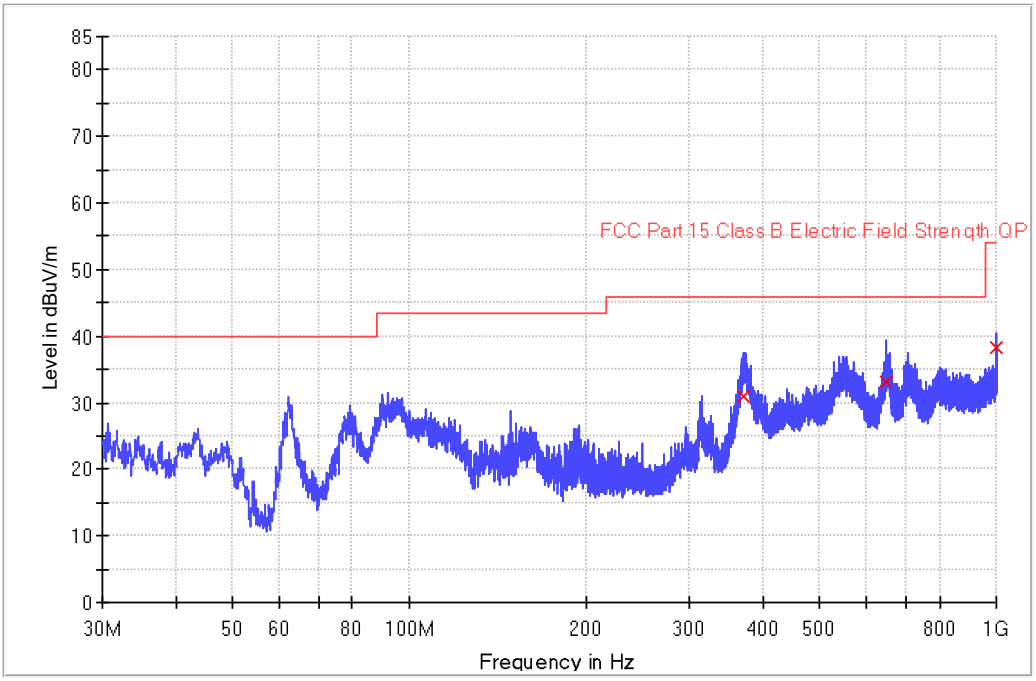


Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
310.912000	33.4	1000.0	120.000	H	20.8	12.6	46.0
651.511333	35.2	1000.0	120.000	H	29.6	10.8	46.0
998.545000	38.5	1000.0	120.000	H	33.7	15.5	54.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) – Quasi Peak (dBµV/m)

Product Name:	JS620K4	**Product Model:**	33841815
Test By:	Tony Tang	**Worst Test mode:**	BT TX mode (GFSK)
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120V, 60Hz		



Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
370.728667	31.0	1000.0	120.000	V	24.0	15.0	46.0
650.638333	33.1	1000.0	120.000	V	29.5	12.9	46.0
998.480333	38.4	1000.0	120.000	V	33.7	15.6	54.0

Remark:
1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB/m) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) – Quasi Peak (dBµV/m)

Above 1GHz:
Worst-case Modulation type: GFSK
Worst-case Results:
Test channel: Lowest channel

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2402.000	103.6	36.7	28.1	95.0	--	--
Horizontal	*4804.000	48.4	36.7	35.5	47.2	74.0	-26.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2402.000	103.6	36.7	28.1	22.5	72.5	--	--
Horizontal	*4804.000	48.4	36.7	35.5	22.5	24.7	54.0	-29.3

Test channel: Middle channel

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4882.000	51.5	36.7	35.5	50.3	74.0	-23.7
Horizontal	*7323.000	52.1	36.1	37.2	53.2	74.0	-20.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4882.000	51.5	36.7	35.5	22.5	27.8	54.0	-26.2
Horizontal	*7323.000	52.1	36.1	37.2	22.5	30.7	54.0	-23.3

Test channel: Highest channel

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2480.000	103.3	36.7	28.1	94.7	--	--
Horizontal	*4960.000	48.0	36.7	35.5	46.8	74.0	-27.2
Horizontal	*7440.000	48.6	36.1	37.2	49.7	74.0	-24.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Average Factor (-dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	**2480.000	103.3	36.7	28.1	22.5	72.2	--	--
Horizontal	*4960.000	48.0	36.7	35.5	22.5	24.3	54.0	-29.7
Horizontal	*7440.000	48.6	36.1	37.2	22.5	27.2	54.0	-26.8

NOTES:

1. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
2. Negative value in the margin column shows emission below limit.
3. Horn antenna used for the emission over 1000MHz.
4. All modes have been tested, but only the worst data was recorded in the report.
5. Tests were conducted in both the horizontal and vertical directions, but only worst-case data record in report.

* Emissions within restricted bands comply with applicable regulatory requirements. The corresponding limits are based on quasi-peak measurements for frequencies below 1000 MHz and average measurements for frequencies above 1000 MHz. Furthermore, for radio frequency emissions above 1 GHz, the measured peak level using a peak detector also meets the permitted limit, which is 20 dB above the average limit.

** Fundamental emission was measured for determining band-edge compliance of using delta measurement technique.

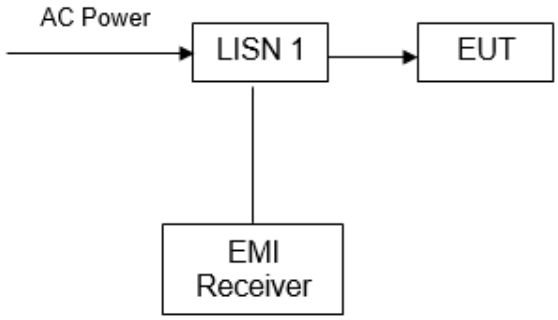
15 AC Power line conducted emission

15.1 Limit

Freq. (MHz)	Conducted Limit (dBµV)	
	Q.P.	Ave.
0.15~0.5	66 – 56*	56 – 46*
0.50~5.0	56	46
5.00~30.0	60	50

* Decreases with the logarithm of the frequency.

15.2 Test Setup

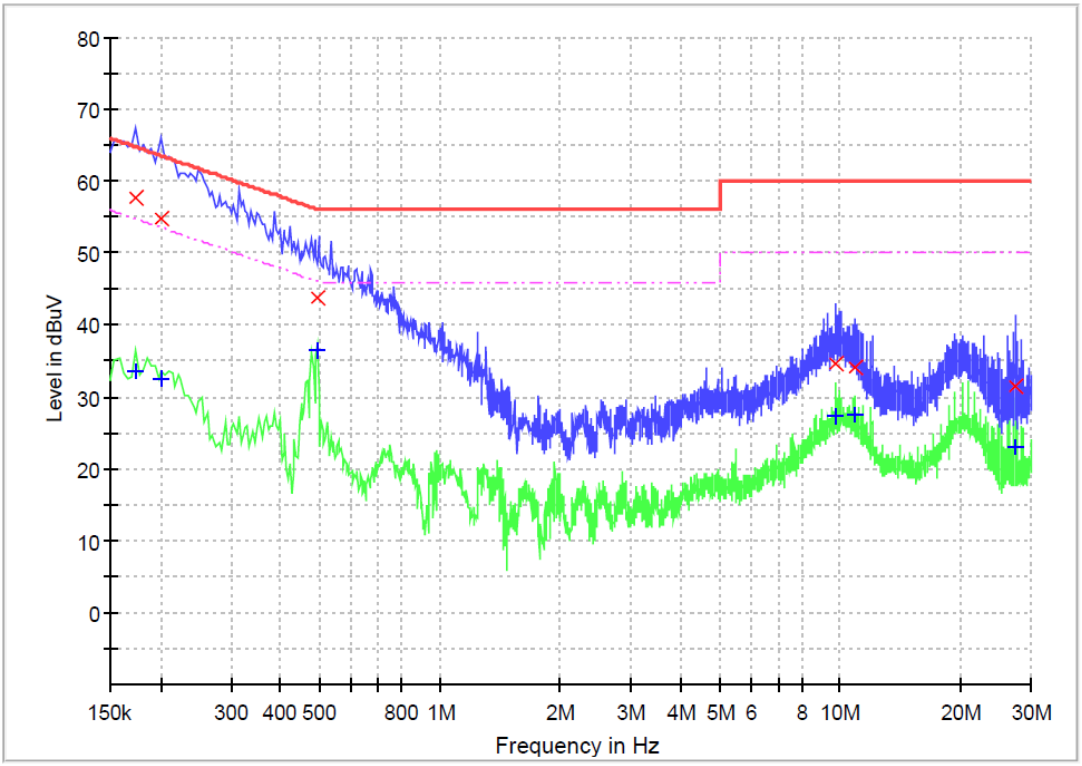


15.3 Test Procedure

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESCI) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

15.4 Test Results of AC Power line conducted emission

Product Name:	JS620K4	**Product Model:**	33841815
Test By:	Tony Tang	**Worst Test mode:**	BT TX mode (GFSK)
Test frequency:	150 kHz ~ 30 MHz	**Phase:**	Line
Test voltage:	AC 120V, 60Hz		



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.174000	57.8	9.000	L1	9.6	7.0	64.8
0.202000	54.9	9.000	L1	9.6	8.6	63.5
0.494000	43.8	9.000	L1	9.6	12.3	56.1
9.758000	34.7	9.000	L1	9.8	25.3	60.0
10.886000	34.0	9.000	L1	9.8	26.0	60.0
27.294000	31.4	9.000	L1	10.8	28.6	60.0

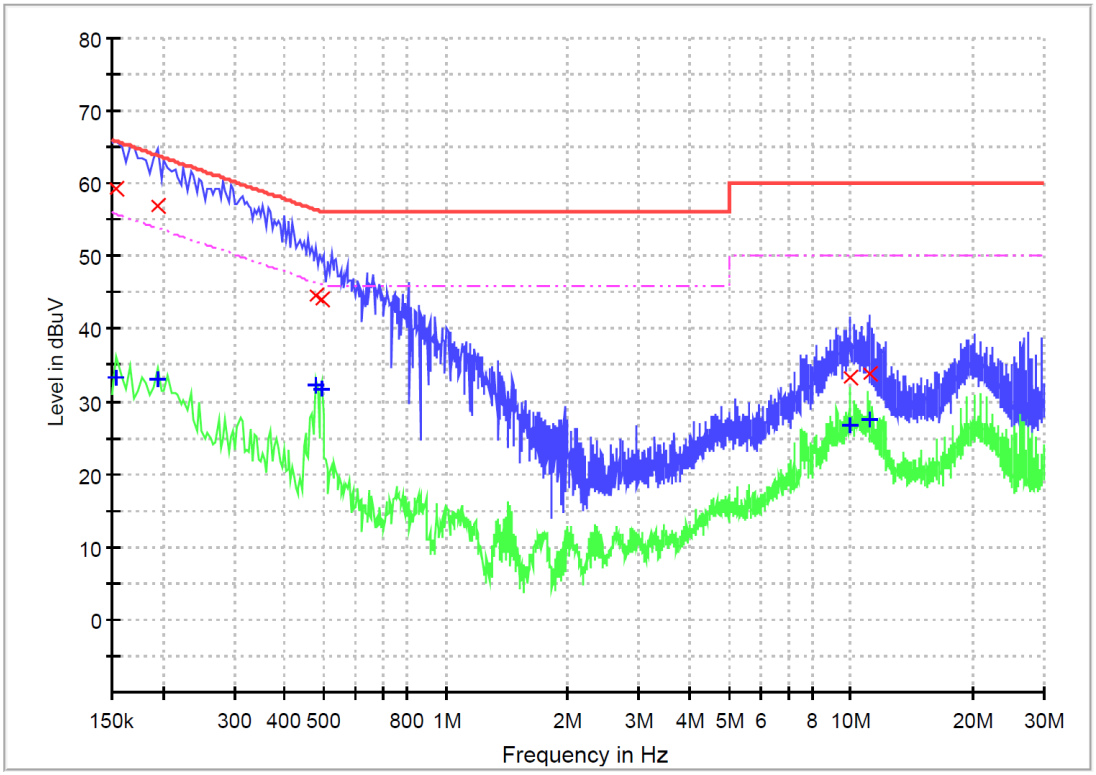
Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174000	33.5	9.000	L1	9.6	21.3	54.8
0.202000	32.6	9.000	L1	9.6	20.9	53.5
0.494000	36.4	9.000	L1	9.6	9.7	46.1
9.758000	27.3	9.000	L1	9.8	22.7	50.0
10.886000	27.6	9.000	L1	9.8	22.4	50.0
27.294000	23.1	9.000	L1	10.8	26.9	50.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) – Quasi Peak/Average (dBµV)

Product Name:	JS620K4	**Product Model:**	33841815
Test By:	Tony Tang	**Worst Test mode:**	BT TX mode (GFSK)
Test frequency:	150 kHz ~ 30 MHz	**Phase:**	Neutral
Test voltage:	AC 120V, 60Hz		



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	59.2	9.000	N	9.9	6.6	65.8
0.194000	57.0	9.000	N	9.9	6.9	63.9
0.478000	44.7	9.000	N	9.6	11.7	56.4
0.494000	44.1	9.000	N	9.5	12.0	56.1
9.966000	33.4	9.000	N	9.9	26.6	60.0
11.118000	33.7	9.000	N	9.9	26.3	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	33.4	9.000	N	9.9	22.4	55.8
0.194000	33.0	9.000	N	9.9	20.9	53.9
0.478000	32.2	9.000	N	9.6	14.2	46.4
0.494000	31.8	9.000	N	9.5	14.3	46.1
9.966000	26.8	9.000	N	9.9	23.2	50.0
11.118000	27.6	9.000	N	9.9	22.4	50.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBµV) – Quasi Peak/Average (dBµV)

********** End of Report**********