TEST REPORT

Report Number	:	TZ0059241202FRF17
Product Name	:	Bridge Transceiver
Model/Type reference	:	BE1521-433
FCC ID	:	2APAKBE1521
Prepared for	:	Bellman & Symfon Group AB Sodra Langebergsgatan 30, Askim 43632, Sweden

Prepared By	:	Shenzhen Tongzhou Testing Co.,Ltd. 1st Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Standards	:	FCC CFR Title 47 Part 15 Subpart C, ANSI C63.10: 2013
Date of Test	:	Feb. 20, 2025~Mar. 07, 2025
Date of Issue	:	Mar. 07, 2025

Prepared by	:	Nancy Li (File administrators)	
Reviewed by	:	Max Zhang (Technical Manager)	
Approved by	:	Andy Zhang (General Manager)	

** Report Revise Record **

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 07, 2025	Valid	Initial release

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1. GENERAL INFORMATION

1.1. Client Information

Applicant	:	Bellman & Symfon Group AB
Address	:	Sodra Langebergsgatan 30, Askim 43632, Sweden
Manufacturer	:	Bellman & Symfon Group AB
Address	:	Sodra Langebergsgatan 30, Askim 43632, Sweden

1.2. Description of Device (EUT)

Product Name	:	Bridge Transceiver
Trade Mark	:	Bellman & Symfon
Model Number	:	BE1521-433
Model Declaration	:	N/A
Test Model	:	BE1521-433
Power Supply	:	DC 5V by adapter or DC 3V by battery
Hardware version	:	BE1521_026LAY1.0
Software version	:	BE1521_033FWA1.0

1.3. Wireless Function Tested in this Report

Short Range Device		
Operation Frequency	:	433.92MHz
Modulation Technology	:	OOK
Antenna Type and Gain	:	Helix Antenna with Gain: -10dBi

Note 1: Antenna position refer to EUT Photos.
Note 2: the above information was supplied by the applicant.

1.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:
●supplied by the manufacturer

○supplied by the lab

●	Adapter	Model:	ICP06C-050-1000B
		Input:	AC100-240V, 50/60Hz, 0.3A
		Output:	DC 5V, 1A

1.5. Description of Test Facility

FCC

Designation Number: CN1275
Test Firm Registration Number: 167722
Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA

Certificate Number: 5463.01
Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC

ISED#: 22033
CAB identifier: CN0099
Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4 and CISPR 16-1-4:2010

1.6. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd’s quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.7. Measurement Uncertainty

Test Item		Uncertainty	Note
Radiation Uncertainty(9KHz~30MHz)	:	±3.26dB	(1)
Radiation Uncertainty(30MHz~1000MHz)	:	±3.92dB	(1)
Radiation Uncertainty(1GHz~40GHz)	:	±5.62dB	(1)
Occupied Channel Bandwidth	:	±3.0%	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

Test Modes:		
Mode 1	Transmitting at 433.92MHz	Record

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen Tongzhou Testing Co.,Ltd

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.
According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209, 15.231 under the FCC Rules Part 15 Subpart C.

2.3. Test Sample

Sample ID	Description
TZ0059241202–2#	Normal sample

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
/	/	/	/	/	/	/	/

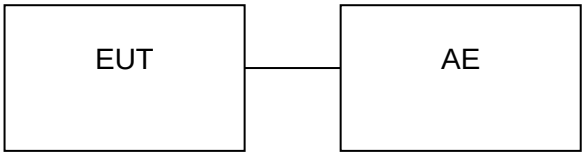
3.3. Block Diagram/Schematics

Please refer to the related document

3.4. Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

3.5. Configuration of Tested System



4. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Sample ID	Result
§15.231(a)	Transmitter Deactivation Time	TZ0059241202–2#	Compliant
§15.231(b)	Field Strength of Fundamental	TZ0059241202–2#	Compliant
§15.209&§15.205(a)	Radiated Emission	TZ0059241202–2#	Compliant
§15.231(c)	-20dB Bandwidth	TZ0059241202–2#	Compliant
§15.207(a)	Conducted Emissions	TZ0059241202–2#	Compliant
§15.203	Antenna Requirements	TZ0059241202–2#	Compliant

Remark: The measurement uncertainty is not included in the test result.

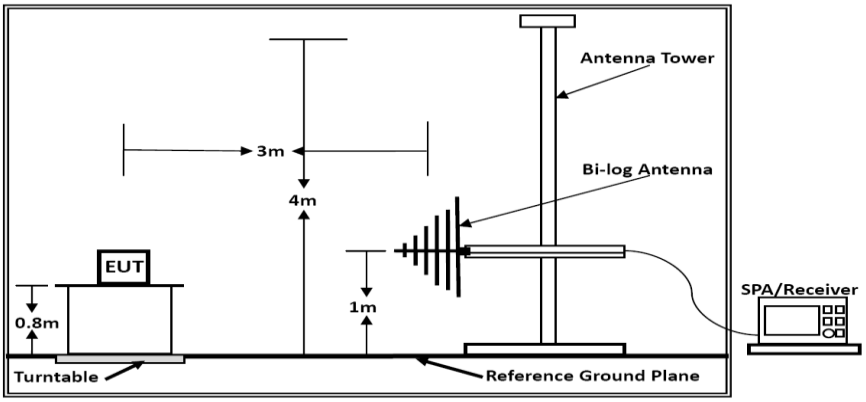
5. TEST RESULT

5.1. Bandwidth Measurement

5.1.1. Standard Applicable

According to FCC Part 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

5.1.2. Block Diagram of Test Setup



Below 1GHz

5.1.3. Test Procedures

1. Set the parameters of SPA as below:
2. Centre frequency = Operation Frequency
3. RBW=200Hz, VBW=620Hz
4. Span: 60kHz
5. Sweep time: Auto
6. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
7. Record the plots and Reported.

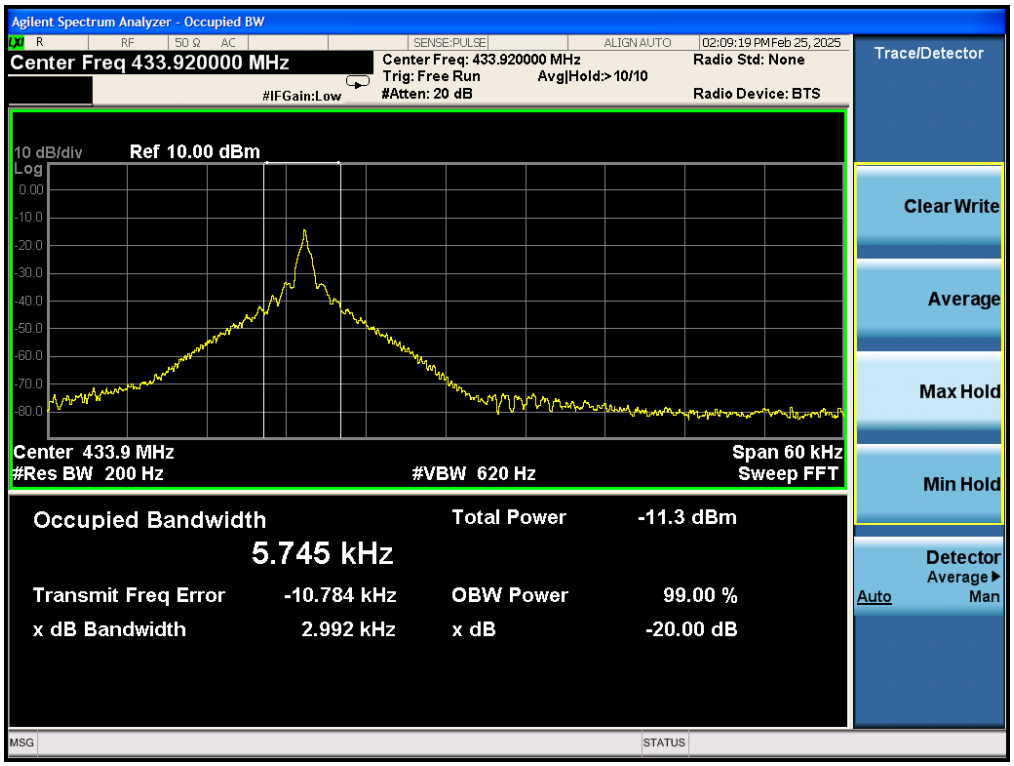
5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.1.5. Test Result

Temperature	22.8℃	Humidity	55%
Test Engineer	Tony Luo	Configurations	Mode 1

Mode	Freq (MHz)	-20dB Bandwidth (Hz)	Limit (kHz)	Conclusion
Tx Mode	433.92	2.992	1084.8	PASS

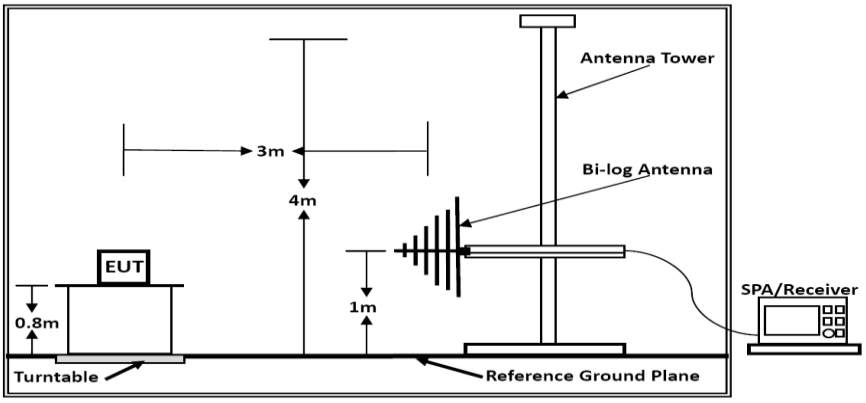


5.2. Duty Cycle Correction Factor

5.2.1. Standard Applicable

According to FCC Part 15.231 (b)(2) and 15.35 (c), For pulse operation transmitter, the averaging pulsed emissions are calculated by peak value of measured emission plus duty cycle factor.

5.2.2. Block Diagram of Test Setup



Below 1GHz

5.2.3. Test Procedures

1. Set the parameters of SPA as below:
   Centre frequency = Operation Frequency
   RBW=8MHz, VBW=50MHz
   Span: 0Hz
   Sweep time: more than two pulse trains or more than each type of pulse occupancy time
2. Set the EUT to transmit by manually operated. Use the “Delta mark” function of SPA to find the period time between two pulse trains and each type of pulse occupancy time.
3. Record the plots and Reported.

5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.5. Test Result

Temperature	22.8℃	Humidity	55%
Test Engineer	Tony Luo	Configurations	Mode 1

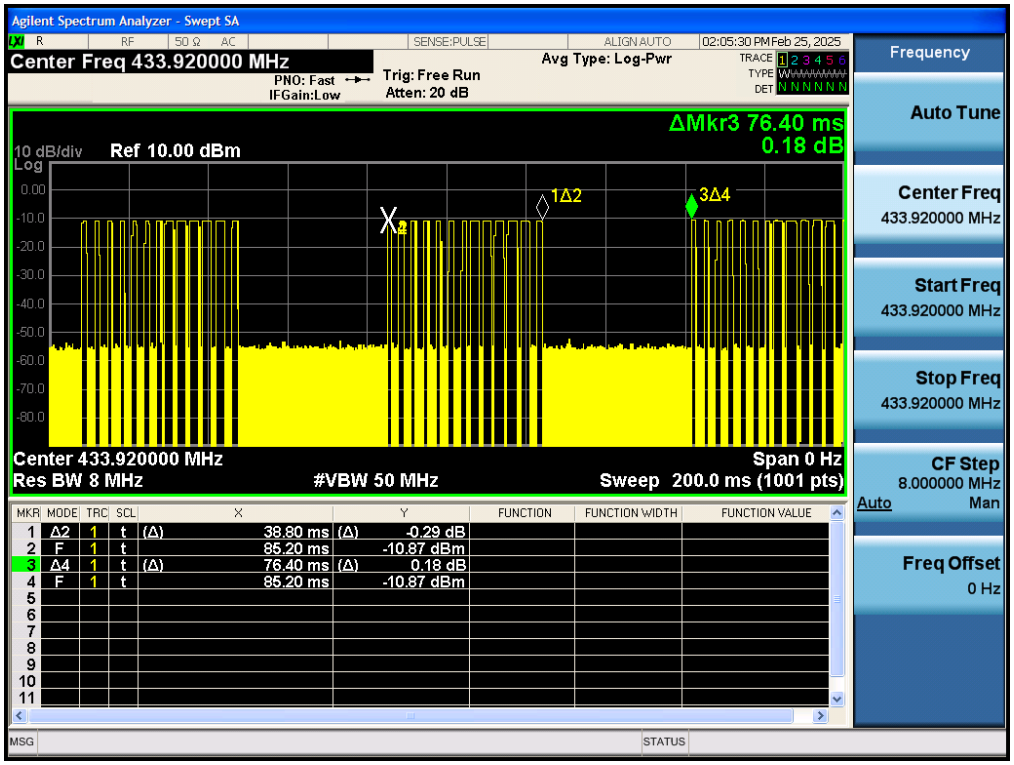
Type of Pules	Width of Pules (ms)	Quantity of Pules (pcs)	Transmission Time (ms)	Total Time (Ton) (ms)
Pules 1	0.96	8	7.68	17.68
Pules 2	2	5	10	

Test Period (Tp) (ms)	Total Time (Ton) (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
76.4	17.68	23.14	-12.71

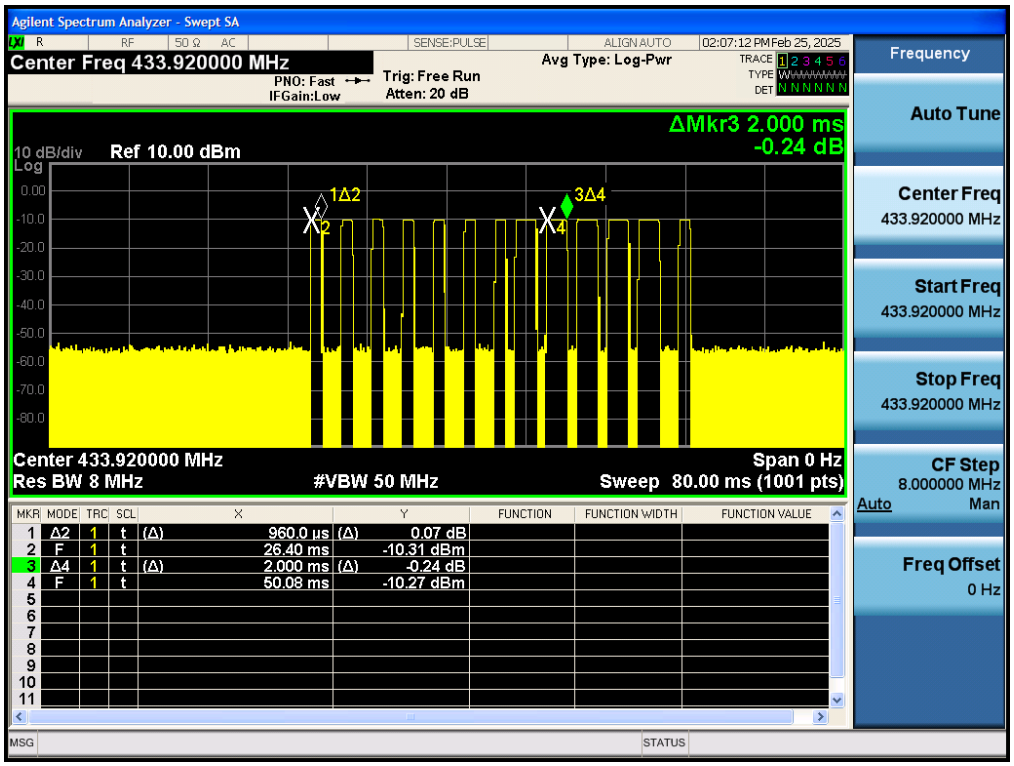
Note 1: Duty Cycle Factor=20 log (Duty Cycle) =-12.71

Note 2: The maximum reference value of the test cycle is 100ms.

Test Graphs of Pulse Emission Time Test



Test_Graph_ Full Cycle Testing Demonstration



Test_Graph_ Short/ Long Pulse_ Pulse Type 1

5.3. Transmitter Deactivation Time

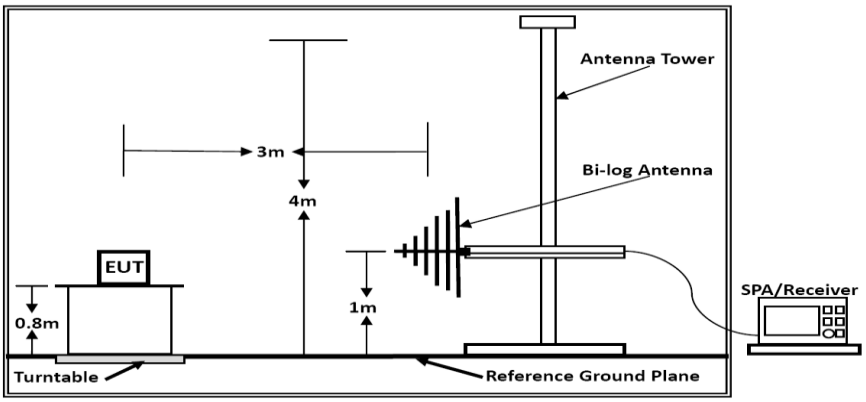
5.3.1. Standard Applicable

According to FCC Part 15.231(a):

☒ A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

☐ A transmitter activated automatically shall cease transmission within 5 seconds after activation.

5.3.2. Block Diagram of Test Setup



Below 1GHz

5.3.3. Test Procedures

1. Set the parameters of SPA as below:
2. Centre frequency = Operation Frequency
3. RBW=8MHz, VBW=50MHz Span: 0Hz Sweep time: 20s
4. Set the EUT to transmit by manually operated. Use the “View” function of SPA to find the transmission time of being released.
5. Record the data and Reported.

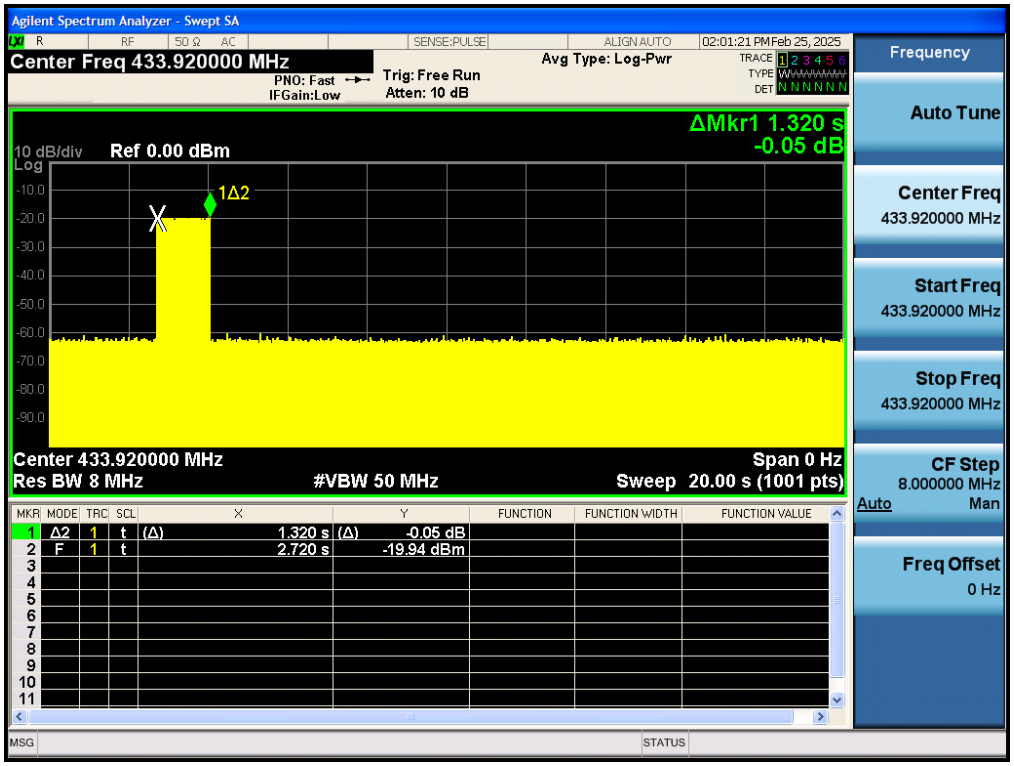
5.3.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.5. Test Result

Temperature	22.8℃	Humidity	55%
Test Engineer	Tony Luo	Configurations	Mode 1

Frequency (MHz)	Activation Time (s)	Limit: not more than 5 seconds of being released(s)	Conclusion
433.92	1.320	5	PASS



5.4. Radiated Emissions Measurement

5.4.1. Standard Applicable

15.231 (b)

Fundamental Frequency	Field Strength of Fundamental (microvolts/meter)	Field Strength of Harmonics (microvolts/meter)
40.66-40.70MHz	2250	225
70-130MHz	1250	125
130-174MHz	1250 to 3750	125 to 375
174-260MHz	3750	375
260-470MHz	3750 to 12500	375 to 1250
Above 470MHz	12500	1250

(1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

(2) Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

(3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

15.209(a):

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

5.4.2. Measuring Instruments and Setting

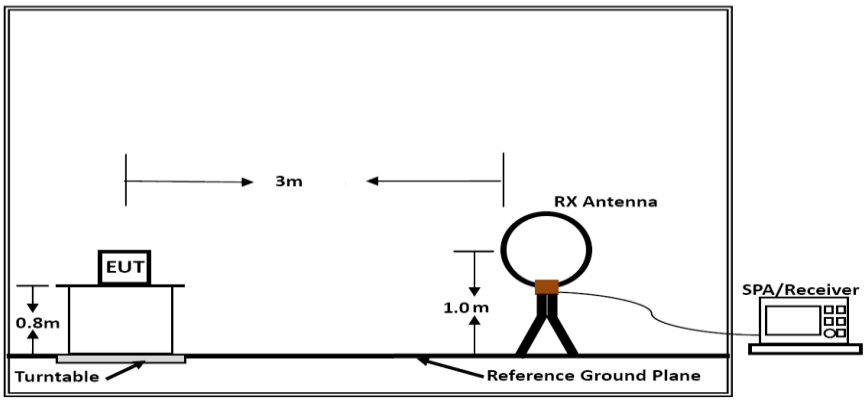
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 3 MHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 3 MHz for Average

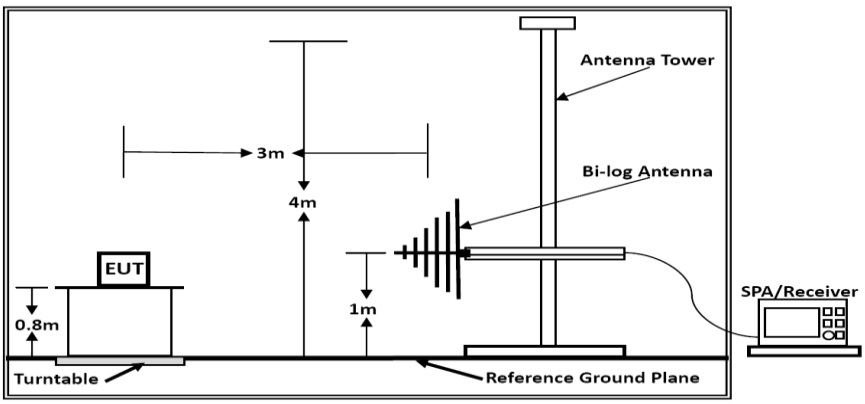
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

5.4.3. Block Diagram of Test Setup

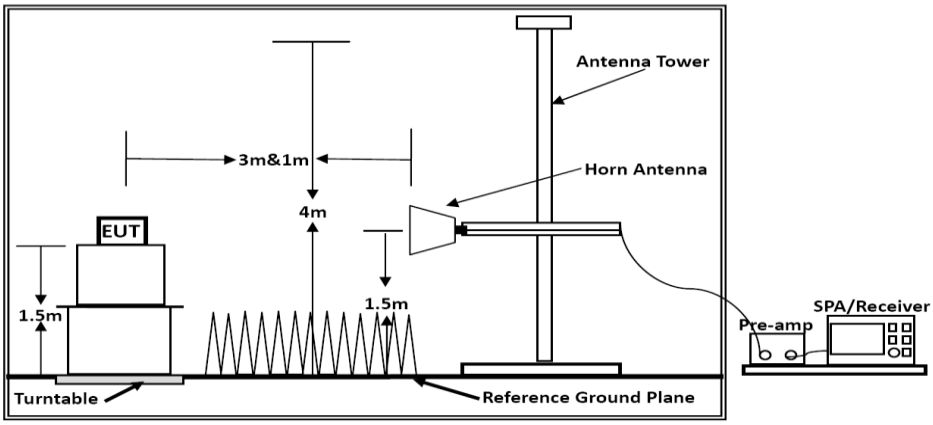
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

5.4.4. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna height is 1.0 meter.
--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions
Final measurement:
--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height changes from 1 to 3 meter.
--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
--- The final measurement will be done with QP detector with an EMI receiver.
--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 40 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height scan range is 1 meter to 2.5 meter.
--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.
Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meters. This procedure is repeated for both antenna polarizations.
--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Results

Results of Radiated Emissions (9 KHz~30MHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	Mode 1

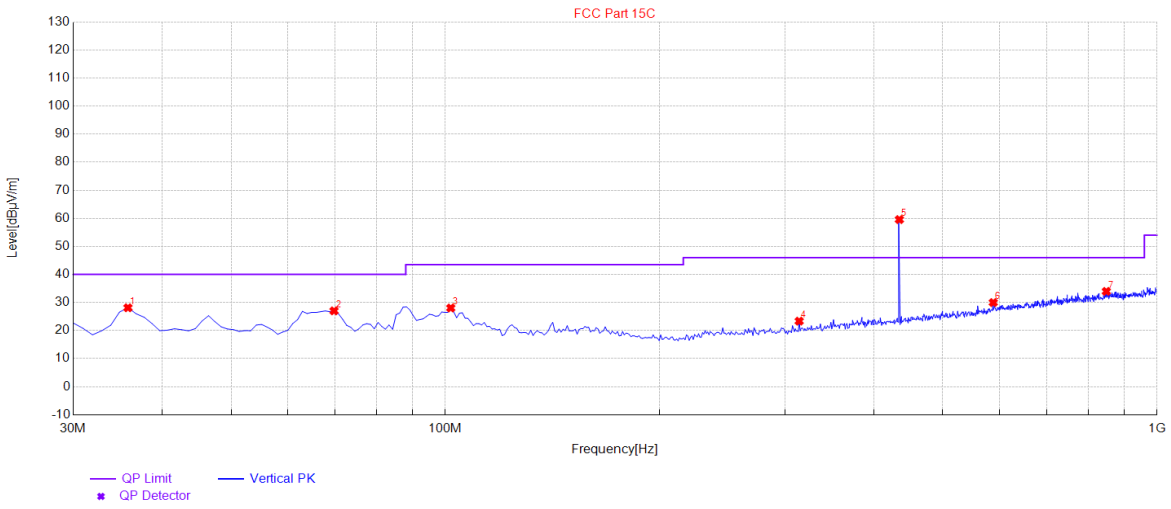
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
Limit line = specific limits (dBuV) + distance extrapolation factor.

Results of Radiated Emissions (30MHz~1GHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	Mode 1

Vertical



***Note:
1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]
2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]

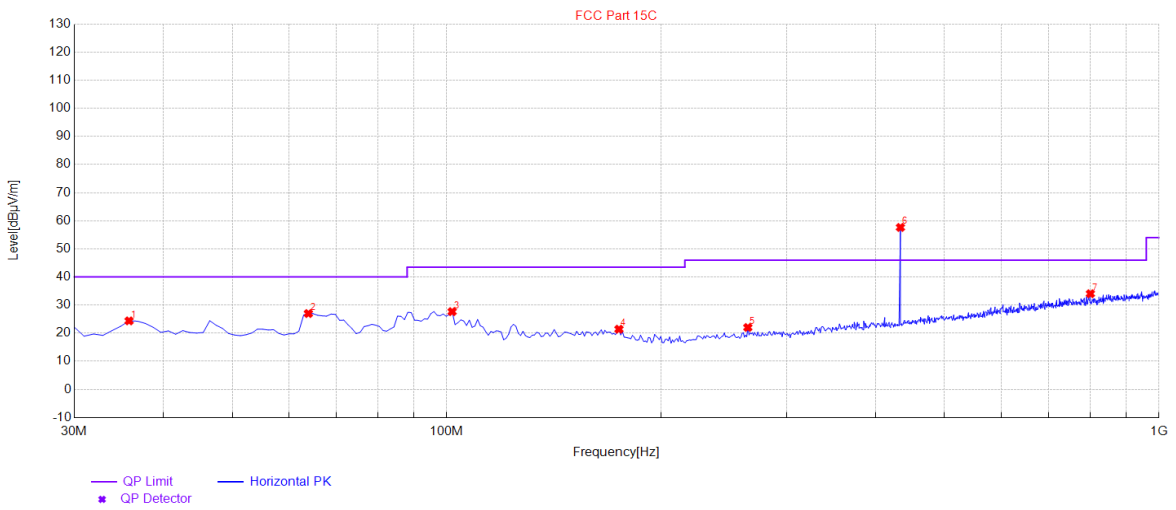
Suspected Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.82	28.11	13.91	40.00	11.89	100	190	Vertical
2	69.77	27.01	12.37	40.00	12.99	100	240	Vertical
3	101.78	28.03	12.34	43.50	15.47	100	10	Vertical
4	314.21	23.36	17.09	46.00	22.64	100	10	Vertical
5	433.92	59.56	20.42	100.82	41.26	100	300	Vertical
6	588.72	29.97	23.95	46.00	16.03	100	350	Vertical
7	848.68	33.96	28.41	46.00	12.04	100	350	Vertical

Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Duty cycle factor(dB)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Polarization
433.9200	59.56	100.82	41.26	-12.71	46.85	80.82	33.97	Vertical

Note:
1. Peak Margin [dB] = Peak Limit [dBµV/m] - Peak Level [dBµV/m]
2. Average Level [dBµV/m] = Peak Level [dBµV/m] + Duty cycle factor [dB]
3. Average Margin [dB] = Average Limit [dBµV/m] - Average Level [dBµV/m]

Horizontal



***Note:
1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]
2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]

Suspected Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.82	24.38	13.91	40.00	15.62	100	150	Horizontal
2	63.95	26.99	13.29	40.00	13.01	100	250	Horizontal
3	101.78	27.66	12.34	43.50	15.84	100	300	Horizontal
4	174.53	21.42	15.57	43.50	22.08	100	280	Horizontal
5	264.74	22.03	15.64	46.00	23.97	100	270	Horizontal
6	433.92	57.63	20.42	100.82	43.19	100	130	Horizontal
7	801.15	34.04	27.57	46.00	11.96	100	240	Horizontal

Frequency (MHz)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Duty cycle factor(dB)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Polarization
433.9200	57.63	100.82	43.19	-12.71	44.92	80.82	35.9	Horizontal

Note:
1. Peak Margin [dB] = Peak Limit [dBµV/m] - Peak Level [dBµV/m]
2. Average Level [dBµV/m] = Peak Level [dBµV/m] + Duty cycle factor [dB]
3. Average Margin [dB] = Average Limit [dBµV/m] - Average Level [dBµV/m]

Results of Radiated Emissions (1GHz-5GHz)

Temperature	25℃	Humidity	60%
Test Engineer	Tony Luo	Configurations	Harmonics Emissions/ Spurious Emission

Peak Value				
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
1729.96	35.79	74	38.24	Horizontal
2685.39	38.33	74	35.61	Horizontal
2012.18	38.40	74	35.57	Vertical
3452.73	39.27	74	34.72	Vertical

Note:
1. Margin [dB] = Limit [dBμV/m] - Level [dBμV/m]

Average Value						
Frequency (MHz)	Level (dBμV/m)	Duty cycle factor	Average value (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarization
1301.78	35.79	-12.71	23.08	54	30.92	Horizontal
1735.66	38.33	-12.71	25.62	54	28.38	Horizontal
1301.78	38.40	-12.71	25.69	54	28.31	Vertical
1735.66	39.27	-12.71	26.56	54	27.44	Vertical

Note:
1. Average value [dBμV/m] = Level [dBμV/m] + Duty cycle factor [dB]
2. Margin [dB] = Limit [dBμV/m] - Average value [dBμV/m]

5.5. AC Power line conducted emissions

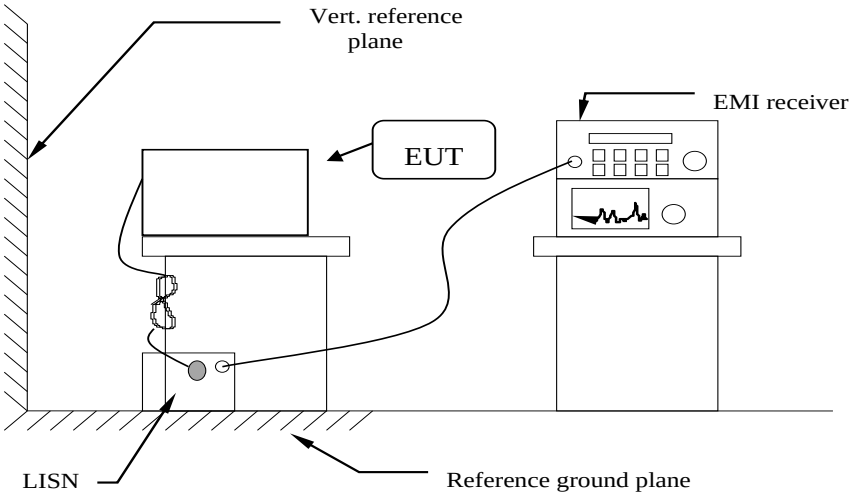
5.5.1. Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.5.2. Block Diagram of Test Setup

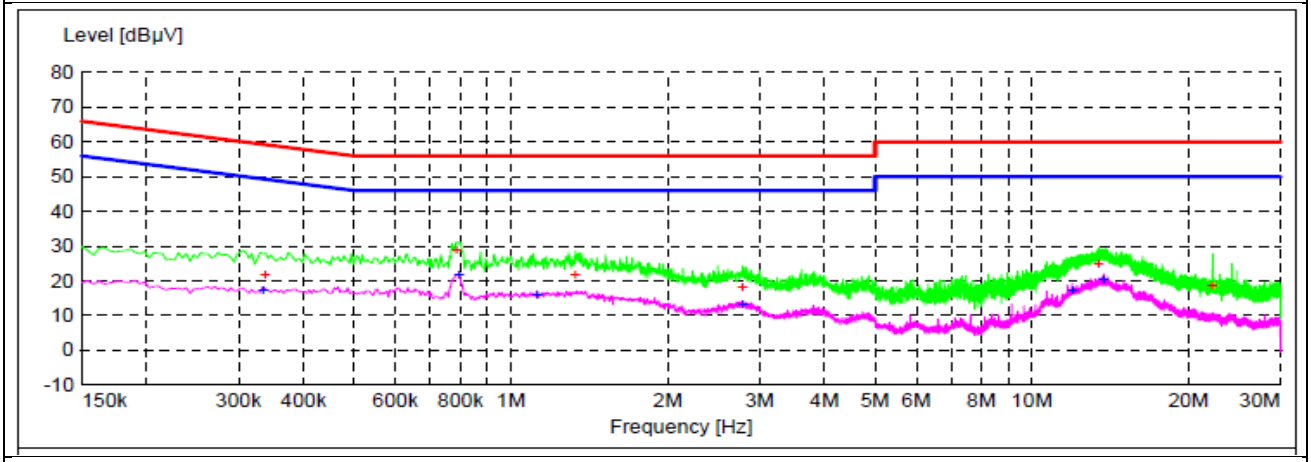


Note: the distance between LISN and Vertical reference plane is 40 cm and the distance between LISN and EUT is 80 cm.

5.5.3. Test Results

Temperature	22.5℃	Humidity	56%
Test Engineer	Allen Lai	Configurations	Mode 1

Neutral Line

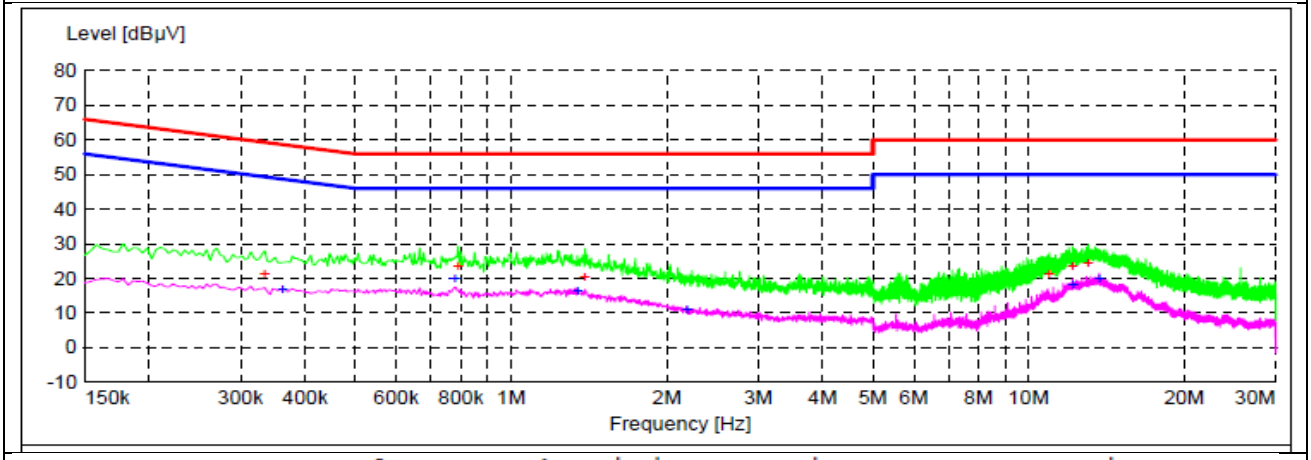


Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.338000	21.50	6.1	59	37.8	QP	N	GND
0.786000	28.70	6.2	56	27.3	QP	N	GND
1.330000	21.80	6.2	56	34.2	QP	N	GND
2.786000	17.90	6.3	56	38.1	QP	N	GND
13.418000	24.60	6.8	60	35.4	QP	N	GND
22.226000	18.60	7.5	60	41.4	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.334000	17.30	6.1	49	32.1	AV	N	GND
0.794000	21.40	6.2	46	24.6	AV	N	GND
1.122000	15.90	6.2	46	30.1	AV	N	GND
2.782000	13.00	6.3	46	33.0	AV	N	GND
11.946000	17.10	6.7	50	32.9	AV	N	GND
13.730000	20.10	6.8	50	29.9	AV	N	GND

Note:
1. Margin(dB)= Limit(dBµV) - Level(dBµV)
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

Live Line



Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.334000	21.20	6.1	59	38.2	QP	L1	GND
0.790000	23.30	6.2	56	32.7	QP	L1	GND
1.390000	20.10	6.2	56	35.9	QP	L1	GND
10.974000	21.10	6.7	60	38.9	QP	L1	GND
12.158000	23.50	6.8	60	36.5	QP	L1	GND
13.050000	24.20	6.8	60	35.8	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.362000	16.80	6.1	49	31.9	AV	L1	GND
0.778000	19.70	6.2	46	26.3	AV	L1	GND
1.342000	16.10	6.2	46	29.9	AV	L1	GND
2.182000	10.90	6.3	46	35.1	AV	L1	GND
12.166000	17.90	6.8	50	32.1	AV	L1	GND
13.694000	19.70	6.8	50	30.3	AV	L1	GND

Note:
1. Margin(dB)= Limit(dBµV) - Level(dBµV)
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 9 kHz (150 kHz—30 MHz), Step size: 4 kHz, Scan time: auto.

5.6. Antenna Requirements

5.6.1. Standard Applicable

According to antenna requirement of §15.203.
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be 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. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.6.2. Antenna Connected Construction

The antenna is an Internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.6.3. Results

Compliance

6. LIST OF MEASURING EQUIPMENTS

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2024-12-31	2025-12-30
2	Loop Antenna	schwarzbeck	FMZB1519 B	00023	2022-11-13	2025-11-12
3	Wideband Antenna	schwarzbeck	VULB 9163	958	2022/11/13	2025/11/12
4	Horn Antenna	schwarzbeck	BBHA 9120D	01989	2022/11/13	2025/11/12
5	EMI Test Receiver	R&S	ESCI	100849/003	2024-12-31	2025-12-30
6	Controller	MF	MF7802	N/A	N/A	N/A
7	Amplifier	schwarzbeck	BBV 9743	209	2024-12-31	2025-12-30
8	Amplifier	Tonscend	TSAMP-05 18SE	--	2024-12-31	2025-12-30
9	RF Cable(below 1GHz)	HUBER+SUHN ER	RG214	N/A	2024-12-31	2025-12-30
10	RF Cable(above 1GHz)	HUBER+SUHN ER	RG214	N/A	2024-12-31	2025-12-30
11	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2024-12-31	2025-12-30

Test software used:

Item	Test Software	Manufacturer	Name	Version
1	EMI Test Software	ROHDE & SCHWARZ	ES-K1	V1.71
2	RE Test software	Tonscend	JS32-RE	V5.0.0.0

7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for Internal Photos of the EUT.

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