

11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

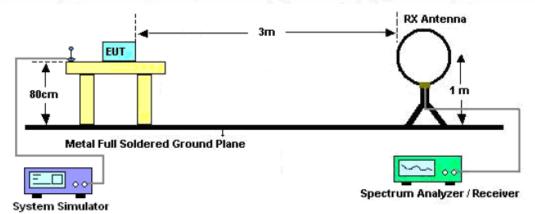
- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

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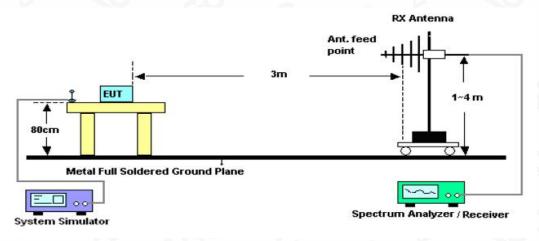


11.2. TEST SETUP

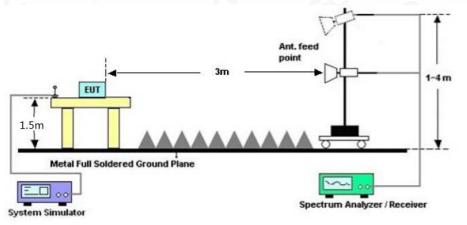
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

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

Note: All modes were tested for restricted band radiated emission,

the test records reported below are the worst result compared to other modes.

11.4. TEST RESULT

Radiated emission below 30MHz

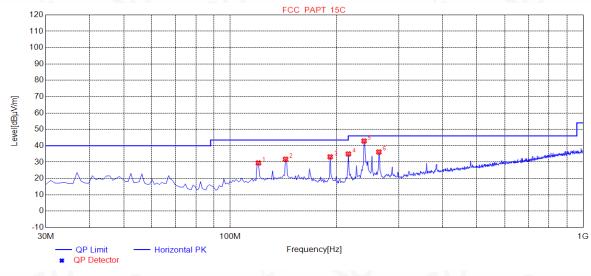
The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHz	Antenna	Horizontal

Radiated emission from 30MHz to 1000MHz



			0					
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	120.2100	29.47	13.48	43.50	14.03	100	86	Horizontal
2	143.4900	31.76	14.88	43.50	11.74	100	83	Horizontal
3	191.9900	33.20	12.43	43.50	10.30	100	136	Horizontal
4	216.2400	34.99	13.05	46.00	11.01	100	309	Horizontal
5	239.5200	42.90	14.81	46.00	3.10	100	309	Horizontal
6	263.7700	36.18	14.88	46.00	9.82	100	317	Horizontal

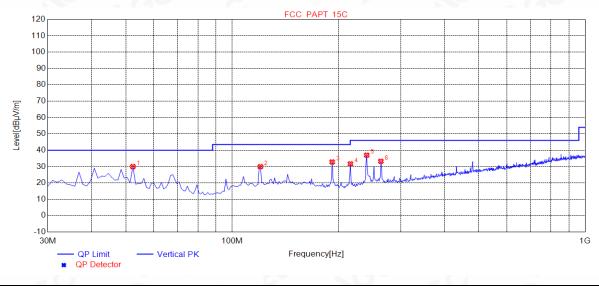
RESULT: PASS

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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHz	Antenna	Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	30.01	11.49	40.00	9.99	100	80	Vertical
2	120.2100	29.96	13.48	43.50	13.54	100	328	Vertical
3	191.9900	32.84	12.43	43.50	10.66	100	75	Vertical
4	216.2400	31.70	13.05	46.00	14.30	100	125	Vertical
5	240.4900	37.00	14.84	46.00	9.00	100	1	Vertical
6	263.7700	33.25	14.88	46.00	12.75	100	347	Vertical

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

3. All test modes had been pre-tested. The 802.11b at low channel is the worst case and recorded in the report.

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Temperature	25°C	Relative Humidity	58%			
Pressure	960hPa	Test Voltage	Normal Voltage			
Test Mode	802.11b with date rate 1 2412MHz	Antenna	Horizontal			

Radiated emission above 1GHz

(dB) 0.08	(dBµV/m) 55.43	(dBµV/m) 74	(dB) -18.57	Value Type
	55.43	74	-18 57	
0.00			-10.57	peak
0.08	45.24	54	-8.76	AVG
2.21	51.52	74	-22.48	peak
2.21	41.85	54	-12.15	AVG
8				
- 61	3			G
	2.21 2.21	2.21 51.52 2.21 41.85	2.21 51.52 74 2.21 41.85 54	2.21 51.52 74 -22.48 2.21 41.85 54 -12.15

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHz	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Value Type
4824.000	56.26	0.08	56.34	74	-17.66	peak
4824.000	47.21	0.08	47.29	54	-6.71	AVG
7236.000	51.49	2.21	53.7	74	-20.3	peak
7236.000	42.68	2.21	44.89	54	-9.11	AVG
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Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHz	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4874.000	56.34	0.14	56.48	74	-17.52	peak
4874.000	45.87	0.14	46.01	54	-7.99	AVG
7311.000	51.02	2.36	53.38	74	-20.62	peak
7311.000	40.94	2.36	43.3	54 ©	-10.7	AVG
- 6	8			- 6	®	
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHz	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4874.000	55.16	0.14	55.3	74	-18.7	peak
4874.000	46.37	0.14 💿	46.51	54	-7.49	AVG
7311.000	50.12	2.36	52.48	74	-21.52	peak
7311.000	40.56	2.36	42.92	54	-11.08	AVG
C.	(8)			G	8	
- 60	C			2	Ο.	
emark:					C	
actor = Anten	na Factor + Cable	Loss – Pre-	amplifier.	3		- 61

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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHz	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4924.000	55.13	0.22	55.35	74	-18.65	peak
4924.000	42.57	0.22	42.79	54	-11.21	AVG
7386.000	49.34	2.64	§ 51.98	74	-22.02	peak
7386.000	40.15	2.64	42.79	54	-11.21	AVG
.C			10	- C	8	
emark:						

EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHz	Antenna	Vertical

Meter Reading	Factor	Emission Level	Limits	Margin 💿	Value Type
(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
56.28	0.22	56.5	74	-17.5	peak
45.37	0.22	45.59	54	-8.41	AVG
51.16	2.64	53.8	74	-20.2	peak
42.91	2.64	45.55	54	-8.45	AVG
	60	8		9	<u>6</u>
	56.28 45.37 51.16	56.28 0.22 45.37 0.22 51.16 2.64	56.28 0.22 56.5 45.37 0.22 45.59 51.16 2.64 53.8	56.28 0.22 56.5 74 45.37 0.22 45.59 54 51.16 2.64 53.8 74	56.28 0.22 56.5 74 -17.5 45.37 0.22 45.59 54 -8.41 51.16 2.64 53.8 74 -20.2

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RESULT: PASS

Note:

The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

All test modes had been pre-tested. The 802.11b mode is the worst case and recorded in the report.

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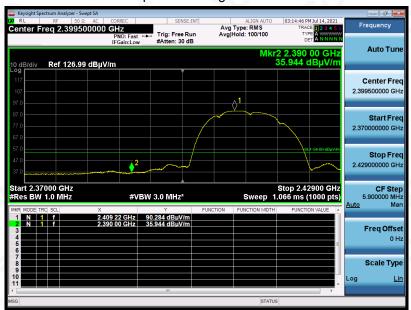
Test result for band edge emission at restricted bands

EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

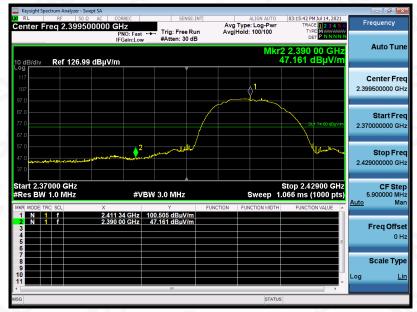
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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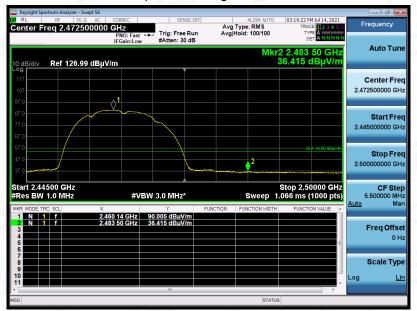
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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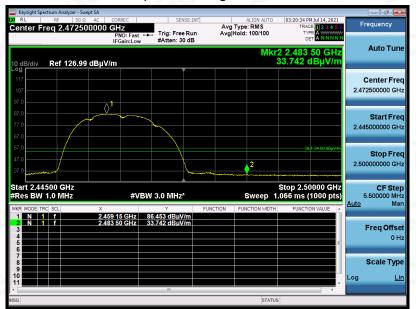
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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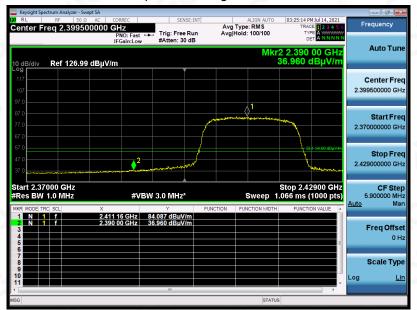
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

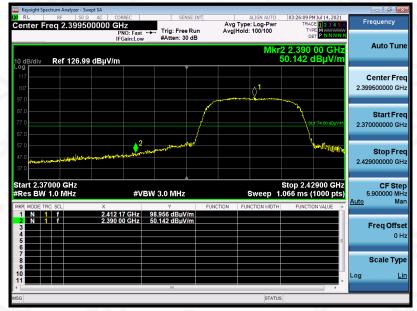
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

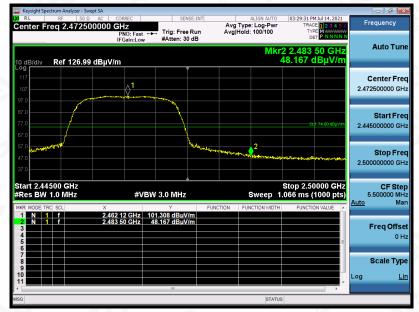
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

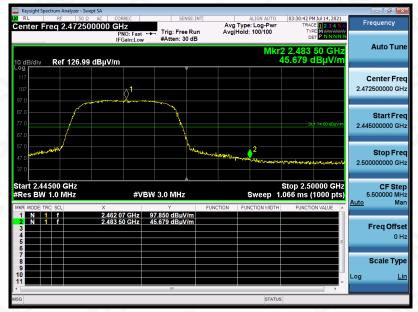
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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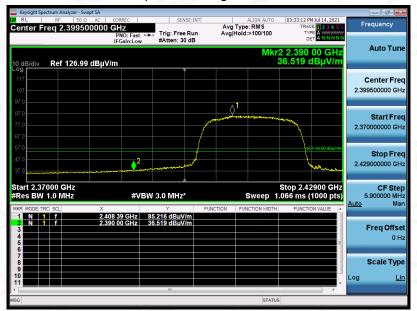
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 with data rate 6.5 2412MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 with data rate 6.5 2412MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

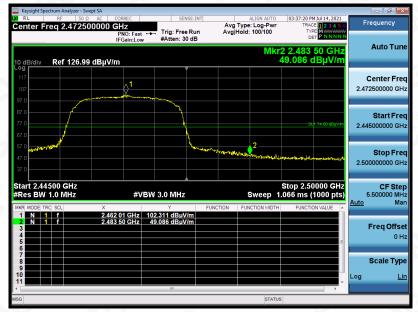
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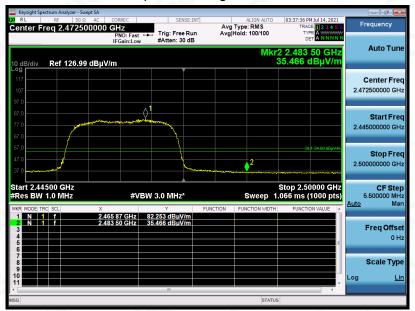
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 with data rate 6.5 2462MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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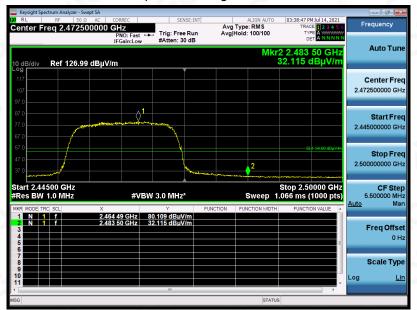
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EUT	2.4G Wifi & Bluetooth Module	Model Name	C-3L-M
Temperature	25°C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n20 with data rate 6.5 2462MHz	Antenna	Vertical

Test Graph for Peak Measurement



Test Graph for Average Measurement



RESULT: PASS

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12. LINE CONDUCTED EMISSION TEST

12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

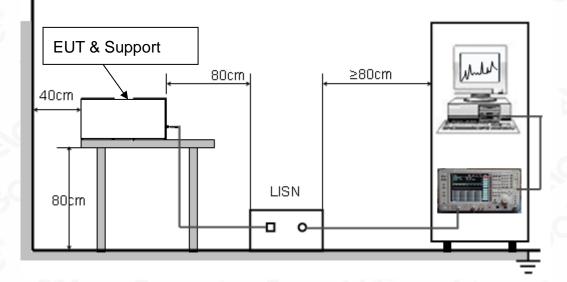
Francisco	Maximum RF Line Voltage				
Frequency	Q.P (dBµV)	Average (dBµV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

Note:

1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 Ohm load; the second scan had Line 1 connected to a 50 Ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

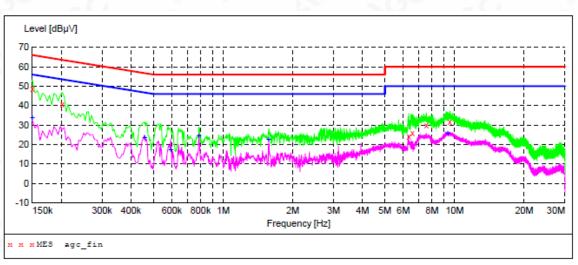
12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less – 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case was reported on the Summary Data page.

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12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST



Line Conducted Emission Test Line 1-L

MEASUREMENT RESULT: "agc fin"

2021/7/9 16:55 Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000 0.202000 6.342000 6.578000 7.550000 9.542000	48.80 40.80 24.10 25.80 29.70 31.60	6.9 6.5 7.7 7.7 7.7 7.8	66 64 60 60 60 60	17.2 22.7 35.9 34.2 30.3 28.4	QP QP QP	L1 L1 L1 L1 L1 L1

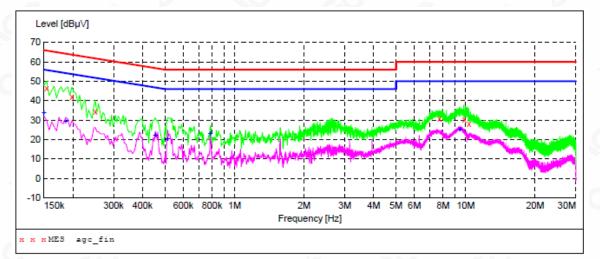
MEASUREMENT RESULT: "agc fin2"

2021/7/9 16:55 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000 0.458000 0.594000 0.786000 1.574000 9.334000	33.70 23.50 17.40 24.40 22.50 25.70	6.9 5.5 5.4 5.4 6.8 7.8	56 47 46 46 50		AV AV AV AV	L1 L1 L1 L1 L1 L1

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Line Conducted Emission Test Line 2-N

MEASUREMENT RESULT: "agc_fin"

2021/7/9 16:53

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.154000	46.20	6.9	66	19.6	-	Ν
0.198000	41.90	6.6	64	21.8		N
0.250000	34.10	6.3	62	27.7	QP	N
7.694000	30.60	7.9	60	29.4	QP	N
9.854000	30.50	7.9	60	29.5	QP	N
10.346000	28.10	8.0	60	31.9	QP	Ν

MEASUREMENT RESULT: "agc_fin2"

2021/7/9	16:52					
-	lcy Level Hz dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line
M	Hz dBµV	аb	ασμν	ав		
0.1500	00 34.00	6.9	56		AV	N
0.1860	00 29.60	6.6	54	24.6	AV	N
0.4540	00 22.40	5.5		24.4	AV	N
0.5140	00 20.60	5.4	46	25.4	AV	N
0.7860	00 23.00	5.4	46	23.0	AV	N
9.4380	00 25.50	7.8	50	24.5	AV	N

RESULT: PASS

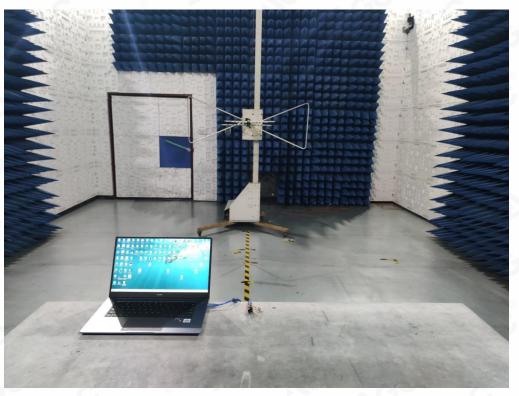
Note: All test modes had been pre-tested. The 802.11b at low channel is the worst case and recorded in the report.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



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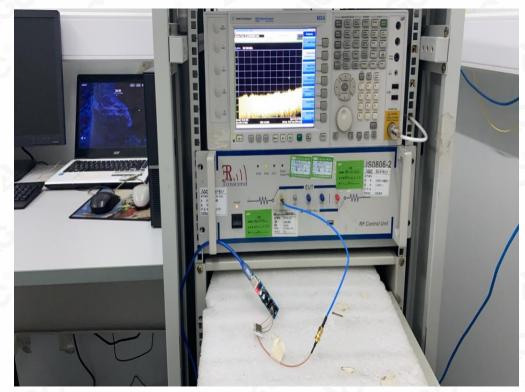


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CONDUCTED EMISSION TEST SETUP

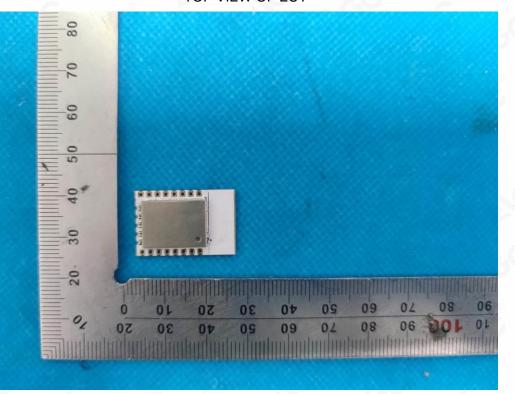
CONDUCTED TEST SETUP



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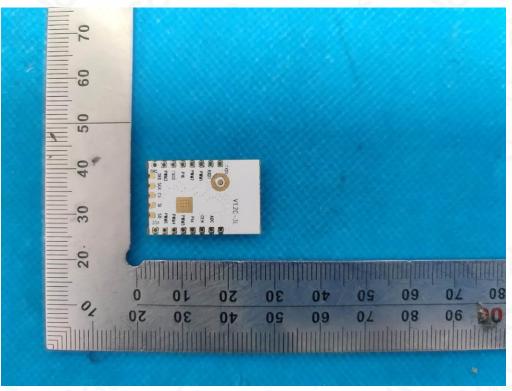


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APPENDIX B: PHOTOGRAPHS OF EUT TOP VIEW OF EUT

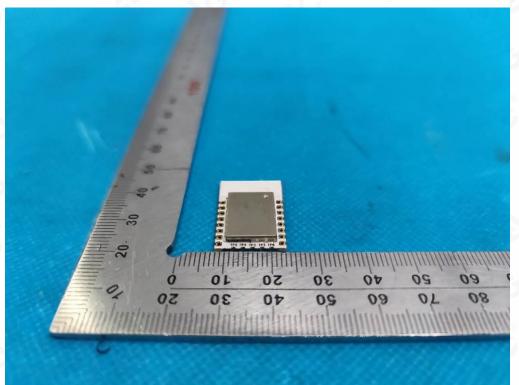
BOTTOM VIEW OF EUT



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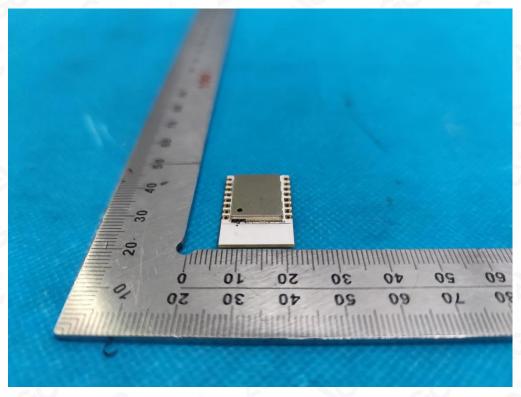


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FRONT VIEW OF EUT

BACK VIEW OF EUT

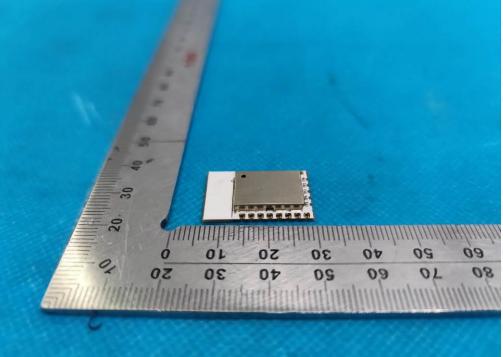


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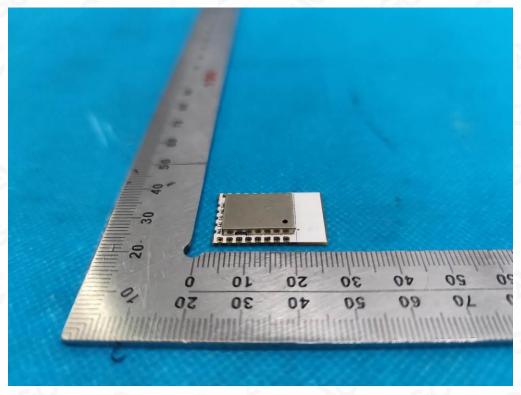




LEFT VIEW OF EUT



RIGHT VIEW OF EUT

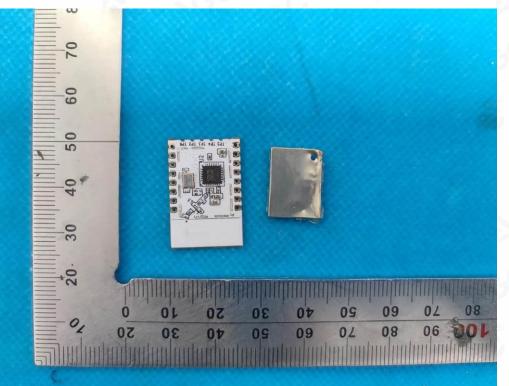


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OPEN VIEW OF EUT



INTERNAL VIEW-1 OF EUT



----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.

5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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