

FCC TEST REPORT

FCC ID: 2A5LD-MD32

Product : Scan translation pen
MD063, MD022, MD032, MD034, MD035, MD043, MD044,
Model Name : MD062, MD072, MD082, MD31, MD32, MD33, MD34,
MD35, MD36, MD37
Brand : N/A
Report No. : NCT24016289E

Prepared for

Shenzhen Mengdou Intelligent Technology Co., Ltd.

4th floor, building A2, Jiushun Industrial Park, liaokeng, Minsheng 1st Road, Shiyan street, Bao'an District, Shenzhen, China

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Mengdou Intelligent Technology Co., Ltd.
Address : 4th floor, building A2, Jiushun Industrial Park, liaokeng, Minsheng 1st Road, Shiyan street, Bao'an District, Shenzhen, China
Manufacture's name : Shenzhen Mengdou Intelligent Technology Co., Ltd.
Address : 4th floor, building A2, Jiushun Industrial Park, liaokeng, Minsheng 1st Road, Shiyan street, Bao'an District, Shenzhen, China
Product name : Scan translation pen
Model name : MD063, MD022, MD032, MD034, MD035, MD043, MD044, MD062, MD072, MD082, MD31, MD32, MD33, MD34, MD35, MD36, MD37
Standards : FCC CFR47 Part 15 Section 15.247
KDB558074 D01 15.247 Meas Guidance v05r02
Test procedure : ANSI C63.10:2013
Date of Receipt : Apr. 12, 2024
Test Date : Apr. 12, 2024 - Apr. 24, 2024
Date of Issue : Apr. 24, 2024

This device described above has been tested by NCT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Test Engineer:


Keven Wu / Engineer

Technical Manager:



Henry Wang / Manager

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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS

Remark:

1. The EUT is powered by full-charged battery during the test.

2.1 Test Site

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27

The certificate is valid until 2028.01.07

The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L8251

Designation Number: CN1347

Test Firm Registration Number: 894804

Accredited by A2LA, June 14, 2023

The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0150

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.

Site Location : A101&B2, Fuqiao 6th Area , Xintian Community, Fuhai Street,
Baoan District, Shenzhen, China

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Scan translation pen
Model Name	:	MD32
Model Difference	:	MD022, MD032, MD034, MD035, MD043, MD044, MD062, MD063, MD072, MD082, MD31, MD33, MD34, MD35, MD36, MD37 (All models have same circuits diagram, PCB Layout, construction and rated power, only different is the model name.)
Sample ID	:	NCT24016289#
Sample(s) Status:	:	Engineering Sample
Operating Frequency	:	802.11b/g/n (20MHz): 2412~2462MHz; BLE: 2402-2480MHz
Number of Channels	:	802.11b/g/n (20MHz): 11 Channels; BLE: 40 Channels
Type of Modulation	:	WIFI 2.4G: 802.11b(DSSS): CCK, DQPSK, DBPSK 802.11g(OFDM): BPSK, QPSK, 16-QAM, 64-QAM 802.11n(OFDM): BPSK, QPSK, 16-QAM, 64-QAM BLE: GFSK
Antenna Installation	:	Internal Antenna
Antenna Gain	:	3.09 dBi
Power Supply	:	DC 3.85V from Battery, DC 5V from Adapter
Hardware Version	:	N/A
Software Version	:	N/A
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

WIFI 2.4G							
Channel Lists							
802.11b/ g/ n(20MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452	/	/
02	2417	06	2437	10	2457	/	/
03	2422	07	2442	11	2462	/	/
04	2427	08	2447	/	/	/	/

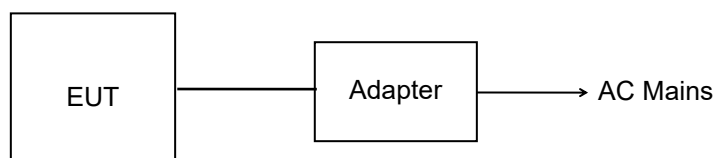
BLE							
Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

Note:

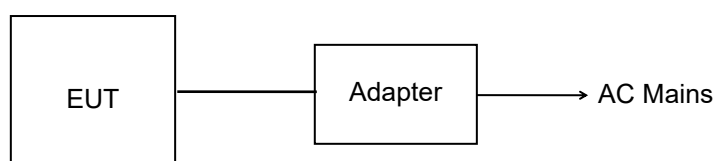
1. Test of channel was included the lowest, middle and highest frequency in highest data rate and to perform the test, then record on this report.

3.3 Test Setup Configuration

Conducted Emission



Radiated Emission



3.4 Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

WIFI 2.4G	
Pretest Mode	Description
	802.11b/g/n(20MHz)
Low Channel	2412MHz
Middle Channel	2437MHz
Middle Channel	2462MHz

BLE	
Pretest Mode	Pretest Mode
Low Channel	2402MHz
Middle Channel	2440MHz
High Channel	2480MHz

4 Equipment During Test

4.1 Equipments List

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2023/6/21	2024/6/20
LISN	ENV 216	102796	Rohde & Schwarz	2023/6/21	2024/6/20
LISN	VN1-13S	004023	CRANAGE	2023/6/21	2024/6/20
Cable	RG223-1500MM	NA	RG	2023/6/21	2024/6/20

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2023/6/21	2024/6/20
Amplifier (30MHz-1GHz)	BBV 9743 B	00374	SCHNWARZBECK	2023/6/21	2024/6/20
Bilog Antenna (30MHz-1GHz)	VULB9162	00473	SCHNWARZBECK	2023/3/19	2025/3/18
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHNWARZBECK	2023/3/19	2025/3/18
Preamplifier (1GHz-18GHz)	BBV 9718D	0024	SCHNWARZBECK	2023/6/21	2024/6/20
Spectrum Analyzer (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2023/6/21	2024/6/20
Preamplifier (18GHz-40GHz)	BBV 9721	0056	SCHNWARZBECK	2023/6/21	2024/6/20
Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2023/3/19	2025/3/18
Loop Antenna (9KHz-30MHz)	FMZB 1513-60	00115	SCHNWARZBECK	2023/6/21	2024/6/20
Amplifier (9KHz-30MHz)	CVP 9222 C BBV 9745	00109	CHNWARZBECK	2023/6/21	2024/6/20
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2023/6/21	2024/6/20

Comprehensive tester	CWM500	104995	Rohde & Schwarz	2023/6/21	2024/6/20
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2023/6/21	2024/6/20
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2023/6/21	2024/6/20
Power Sensor	TR1029-2	512364	Techoy	2023/6/21	2024/6/20
RF Swith	TR1029-1	512364	Techoy	2023/6/21	2024/6/20
Cable	DA800-4000MM	NA	DA	2023/6/21	2024/6/20
Cable	DA800-11000MM	NA	DA	2023/6/21	2024/6/20

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	AUDIX	e3	6.120718
2	EMC radiation test system	AUDIX	e3	6.120718
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

Peak Output Power Test Equipment

Peak Output Power					
Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
Power Meter	E4419B	230480	Agilent	2023/6/21	2024/6/20
RF Cable	MWX322	MY50510202	1305G006	2023/6/21	2024/6/20
10dB Attenuator	2AS102-K10S3	N/A	Rosenberger	2023/6/21	2024/6/20

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	Scan translation pen	N/A	C6	N/A	EUT
2	Notebook	Lenovo	G475	GB14477457	AE
3	Adapter	GAT	GAT-0501000U	N/A	AE

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

5 Conducted Emission

Test Requirement	: FCC CFR 47 Part 15 Section 15.207&RSS-Gen § 8.8
Test Method	: ANSI C63.10: 2013
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

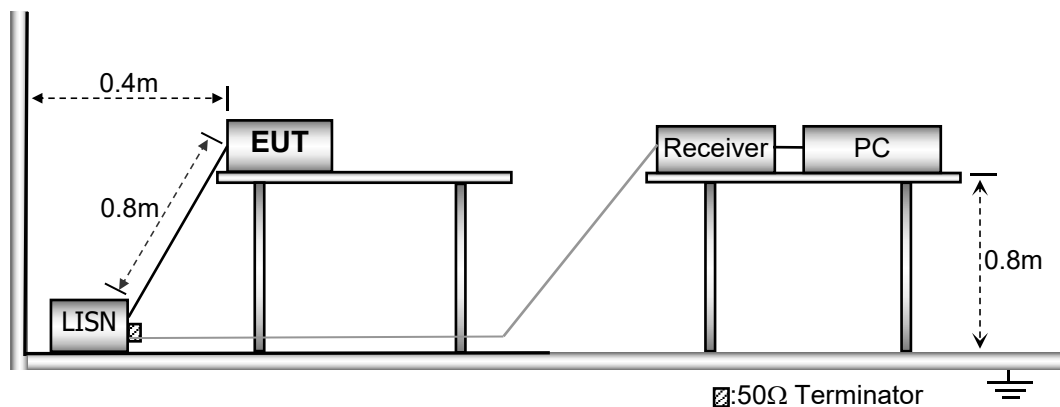
5.1 E.U.T. Operation

Operating Environment :

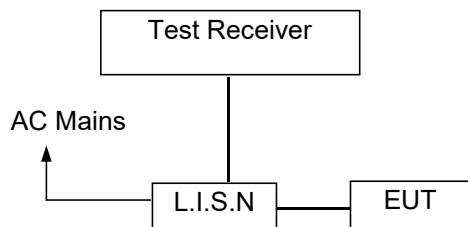
Temperature	: 25.5 °C
Humidity	: 51 % RH
Atmospheric Pressure	: 101.2kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

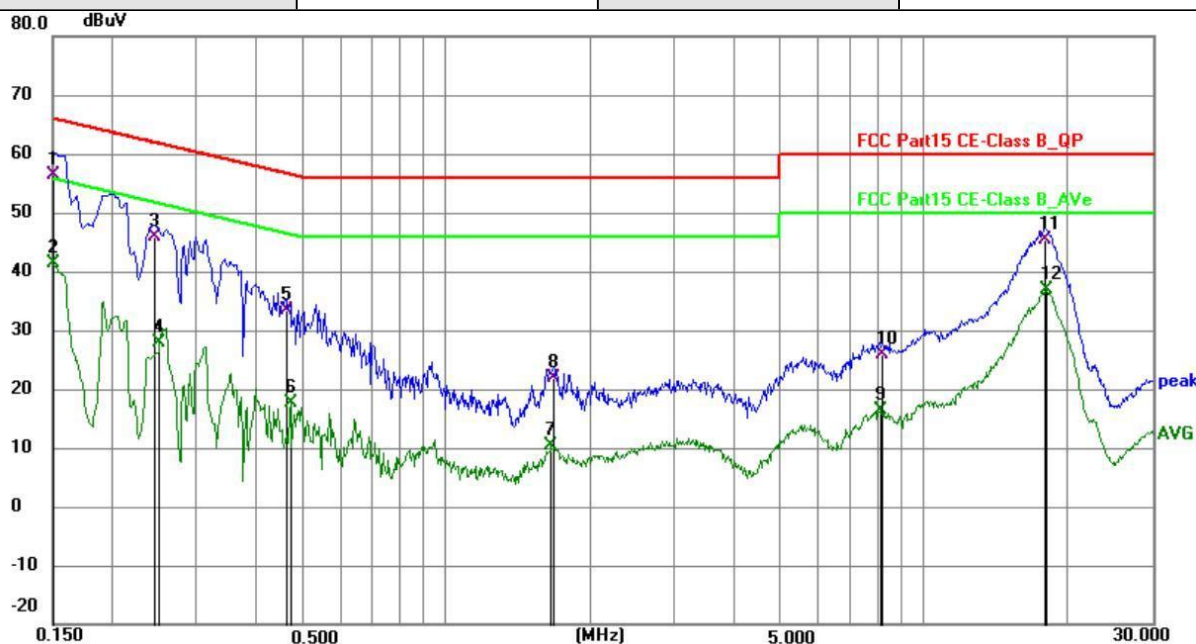
5.7 Conducted Emission Test Result

Pass.

All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.

All modes of WIFI and BLE were Pre tested, and only WIFI worst 802.11b Low Channel and BLE worst Low Channel were reported in the report.

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	DC 5V from Adapter	Test Mode :	802.11b 2412MHz

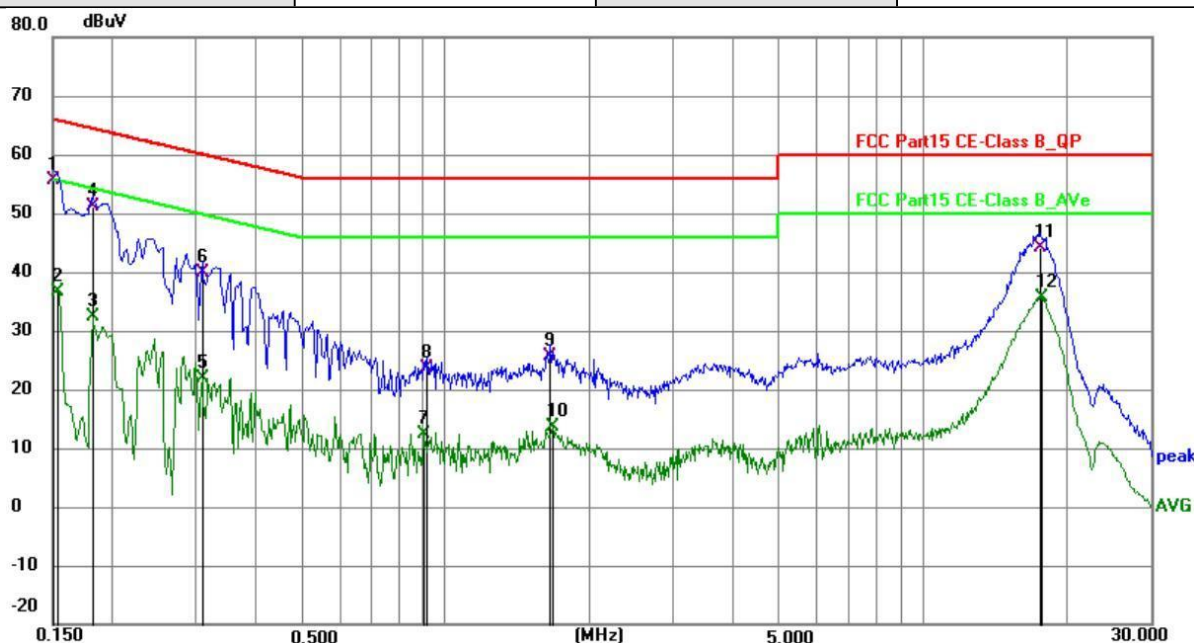


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.1500	46.31	10.19	56.50	66.00	-9.50	QP
2	0.1500	31.14	10.19	41.33	56.00	-14.67	AVG
3	0.2445	35.79	10.20	45.99	61.94	-15.95	QP
4	0.2507	17.62	10.19	27.81	51.73	-23.92	AVG
5	0.4605	23.11	10.26	33.37	56.68	-23.31	QP
6	0.4694	7.27	10.26	17.53	46.52	-28.99	AVG
7	1.6620	0.13	10.24	10.37	46.00	-35.63	AVG
8	1.6755	11.58	10.24	21.82	56.00	-34.18	QP
9	8.1284	6.12	10.32	16.44	50.00	-33.56	AVG
10	8.1825	15.51	10.32	25.83	60.00	-34.17	QP
11	17.8530	35.53	9.88	45.41	60.00	-14.59	QP
12	17.9564	26.94	9.88	36.82	50.00	-13.18	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	DC 5V from Adapter	Test Mode :	802.11b 2412MHz

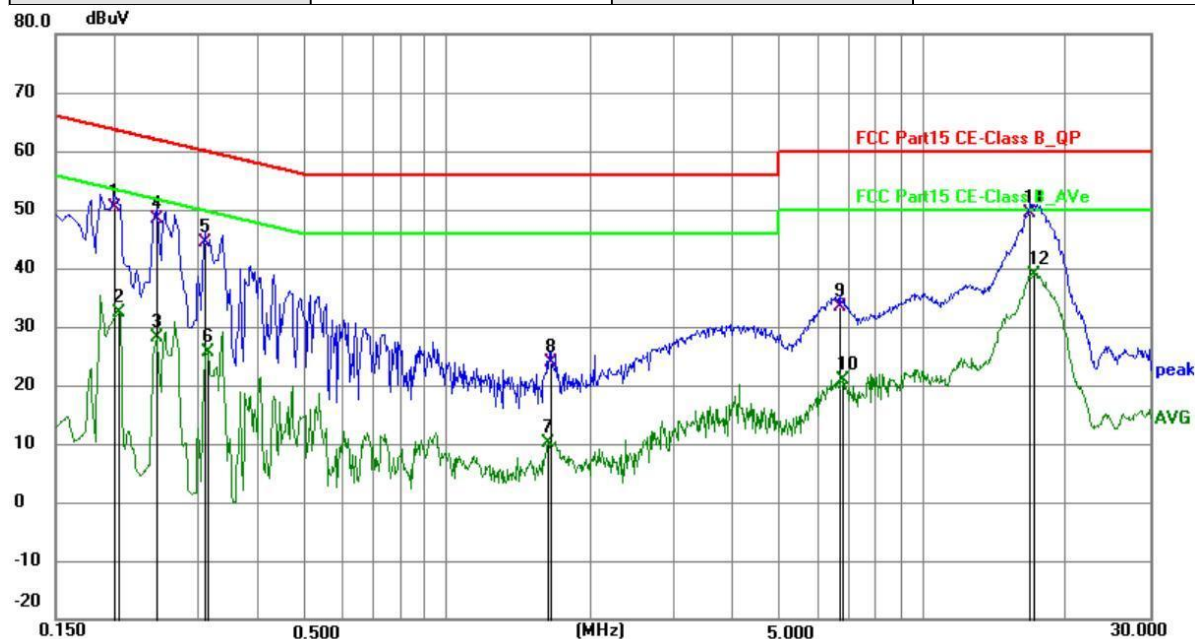


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1 *	0.1500	45.51	10.10	55.61	66.00	-10.39	QP
2	0.1532	26.61	10.12	36.73	55.82	-19.09	AVG
3	0.1814	22.23	10.17	32.40	54.42	-22.02	AVG
4	0.1815	40.91	10.17	51.08	64.42	-13.34	QP
5	0.3074	11.81	10.14	21.95	50.04	-28.09	AVG
6	0.3075	29.63	10.14	39.77	60.04	-20.27	QP
7	0.9014	2.21	10.25	12.46	46.00	-33.54	AVG
8	0.9150	13.26	10.26	23.52	56.00	-32.48	QP
9	1.6620	15.27	10.29	25.56	56.00	-30.44	QP
10	1.6754	3.28	10.29	13.57	46.00	-32.43	AVG
11	17.6595	34.35	9.89	44.24	60.00	-15.76	QP
12	17.7225	25.77	9.89	35.66	50.00	-14.34	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	DC 5V from Adapter	Test Mode :	BLE 2402MHz

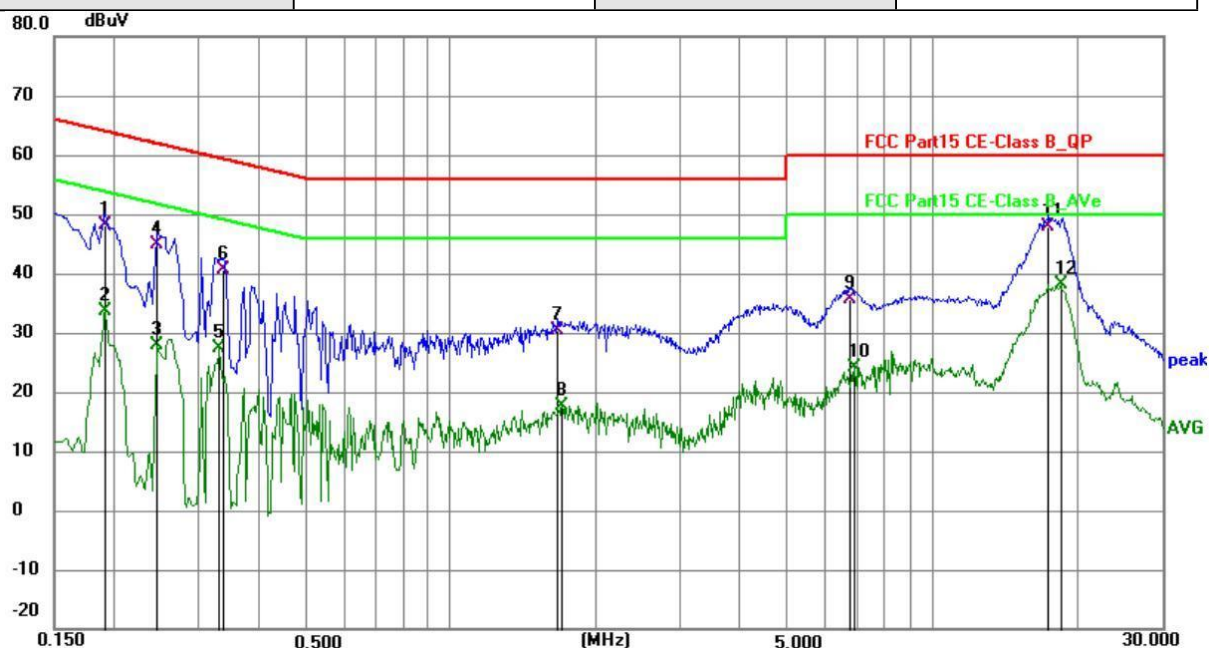


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1995	40.29	10.21	50.50	63.63	-13.13	QP
2	0.2040	22.16	10.21	32.37	53.45	-21.08	AVG
3	0.2444	18.04	10.20	28.24	51.95	-23.71	AVG
4	0.2445	38.06	10.20	48.26	61.94	-13.68	QP
5	0.3075	34.09	10.18	44.27	60.04	-15.77	QP
6	0.3120	15.36	10.19	25.55	49.92	-24.37	AVG
7	1.6305	-0.06	10.24	10.18	46.00	-35.82	AVG
8	1.6530	13.61	10.24	23.85	56.00	-32.15	QP
9	6.7065	23.01	10.27	33.28	60.00	-26.72	QP
10	6.7830	10.55	10.27	20.82	50.00	-29.18	AVG
11 *	16.8315	39.46	9.90	49.36	60.00	-10.64	QP
12	17.1464	28.96	9.89	38.85	50.00	-11.15	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	DC 5V from Adapter	Test Mode :	BLE 2402MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1905	37.87	10.18	48.05	64.01	-15.96	QP
2	0.1905	23.33	10.18	33.51	54.01	-20.50	AVG
3	0.2444	17.62	10.17	27.79	51.95	-24.16	AVG
4	0.2445	34.81	10.17	44.98	61.94	-16.96	QP
5	0.3300	17.21	10.16	27.37	49.45	-22.08	AVG
6	0.3345	30.35	10.16	40.51	59.34	-18.83	QP
7	1.6665	20.17	10.29	30.46	56.00	-25.54	QP
8	1.7024	7.33	10.29	17.62	46.00	-28.38	AVG
9	6.7470	25.36	10.29	35.65	60.00	-24.35	QP
10	6.9134	13.81	10.30	24.11	50.00	-25.89	AVG
11	17.4120	37.89	9.91	47.80	60.00	-12.20	QP
12 *	18.5055	28.31	9.89	38.20	50.00	-11.80	AVG

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247&RSS-247 § 5.5
Test Method : ANSI C63.10:2013
Test Result : PASS
Measurement Distance : 3m
Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

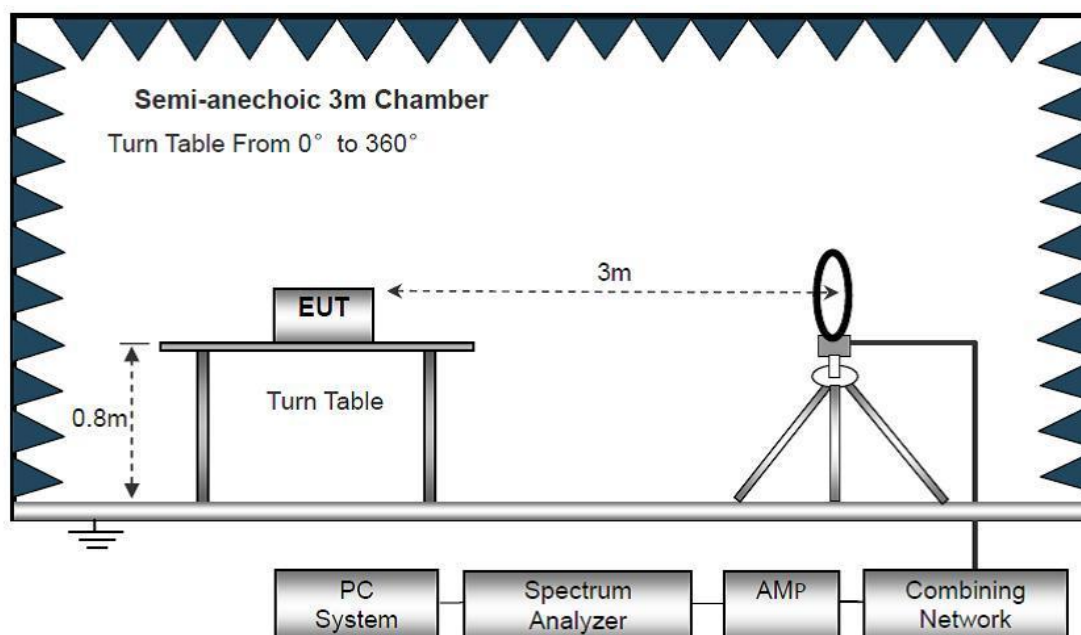
Operating Environment :

Temperature : 23.5 °C
Humidity : 51.1 % RH
Atmospheric Pressure : 101.2kPa

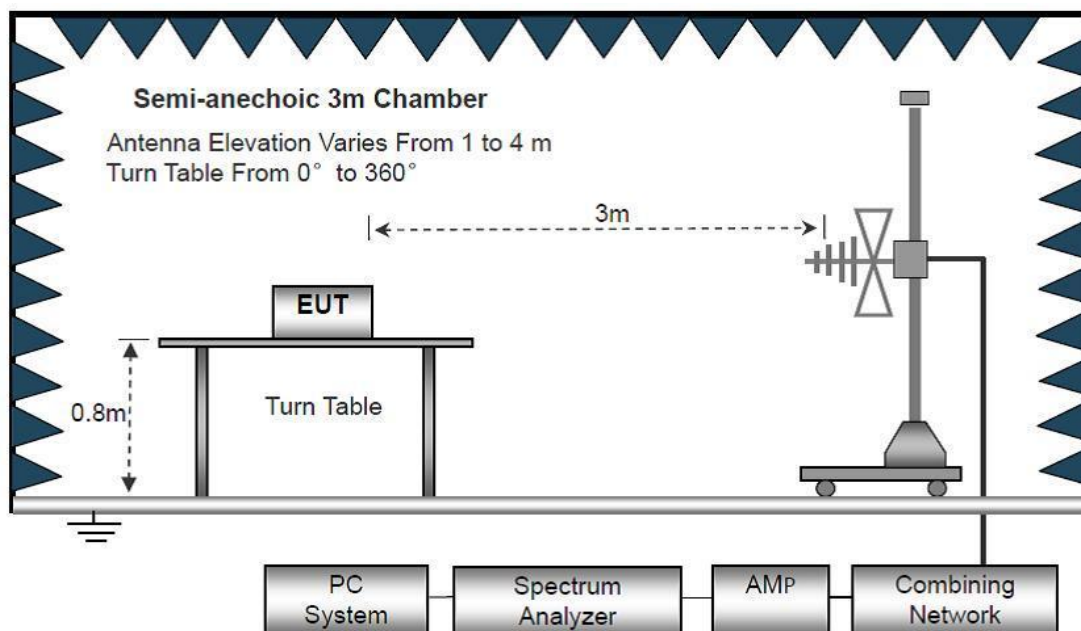
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

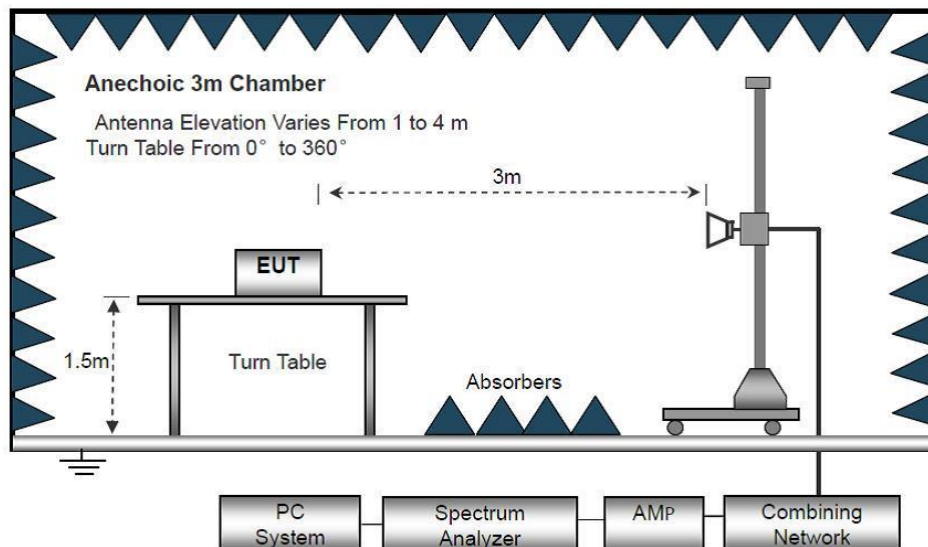
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2013.
2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.
7. Test Procedure of measurement (For Above 1GHz):
 - 1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).
 - 2) Change the antenna polarization and repeat 1) with vertical polarization.
 - 3) Make a hardcopy of the spectrum.
 - 4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
 - 5) Change the analyser mode to Clear/ Write and found the cone of emission.
 - 6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.
 - 7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.
 - 8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.
8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

For Average Measurement:

VBW=10Hz, when duty cycle is no less than 98 percent.

VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(μ s)	1/T(KHz)	Average Correction Factor	VBW Setting
2412-2462	100	-	-	0	10Hz

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq.	Ant.Pol.	Emission Level	Limit 3m	Over
(MHz)	H/V	(dBuV/m)	(dBuV/m)	(dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance} / \text{test distance})$ (dB);

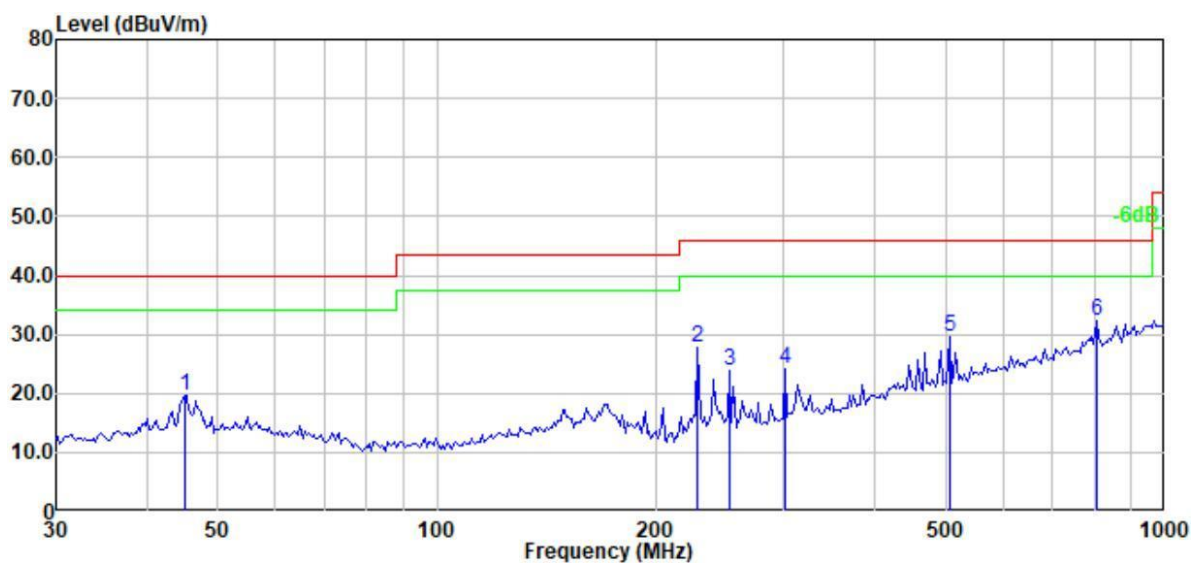
Limit line = Specific limits (dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Pass.

Note: All modes of WIFI and BLE were Pre tested, and only WIFI worst 802.11b Low Channel and BLE worst Low Channel were reported in the report.

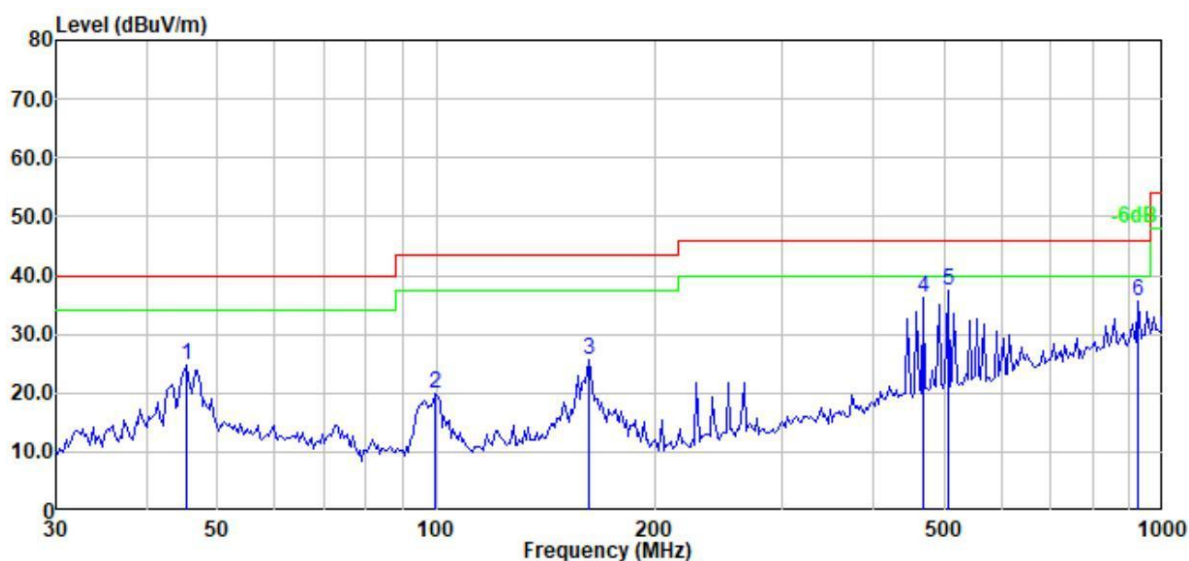
Temperature:	26°C	Relative Humidity:	53%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage :	DC 3.85V	Test Mode :	802.11b 2412MHz



Remark: Level=Reading Level + Factor; Factor = Antenna Factor + Cable Loss - Pre-amplifier.

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	45.095	31.97	19.58	-12.39	40.00	-20.42	Horizontal	QP
2	228.617	41.13	27.66	-13.47	46.00	-18.34	Horizontal	QP
3	252.252	36.33	23.91	-12.42	46.00	-22.09	Horizontal	QP
4	300.699	34.55	24.11	-10.44	46.00	-21.89	Horizontal	QP
5	505.789	35.24	29.59	-5.65	46.00	-16.41	Horizontal	QP
6	804.252	31.44	32.41	0.97	46.00	-13.59	Horizontal	QP

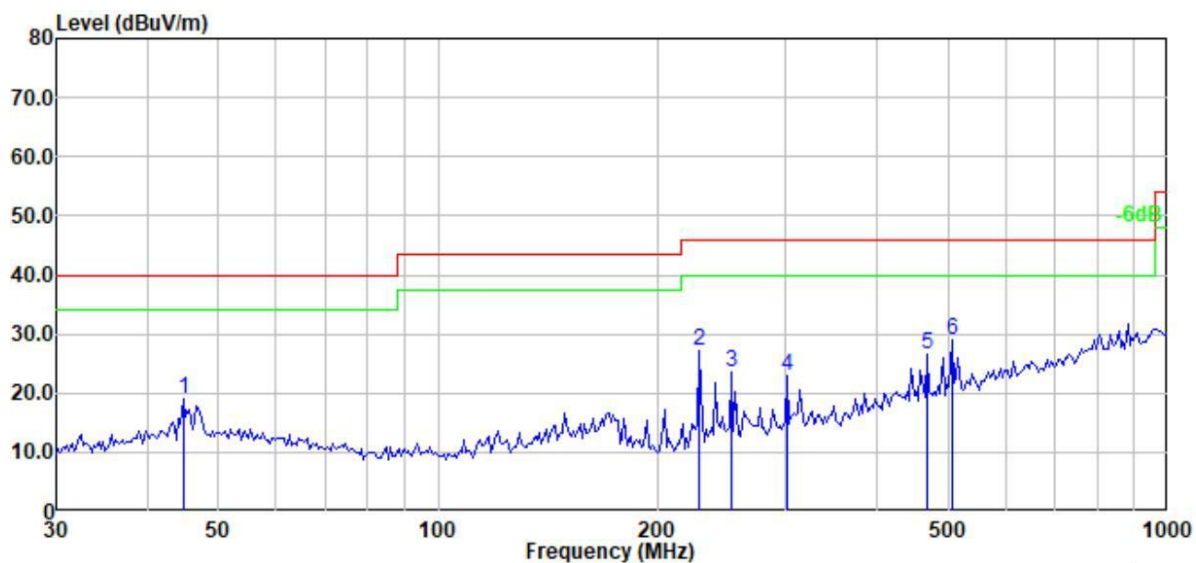
Temperature:	26°C	Relative Humidity:	53%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage :	DC 3.85V	Test Mode :	802.11b 2412MHz



Remark: Level=Reading Level + Factor; Factor = Antenna Factor + Cable Loss - Pre-amplifier.

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	45.413	37.15	24.76	-12.39	40.00	-15.24	Vertical	QP
2	99.768	35.35	19.98	-15.37	43.50	-23.52	Vertical	QP
3	162.020	36.99	25.71	-11.28	43.50	-17.79	Vertical	QP
4	468.165	42.52	36.31	-6.21	46.00	-9.69	Vertical	QP
5	505.789	43.17	37.52	-5.65	46.00	-8.48	Vertical	QP
6	925.613	32.95	35.52	2.57	46.00	-10.48	Vertical	QP

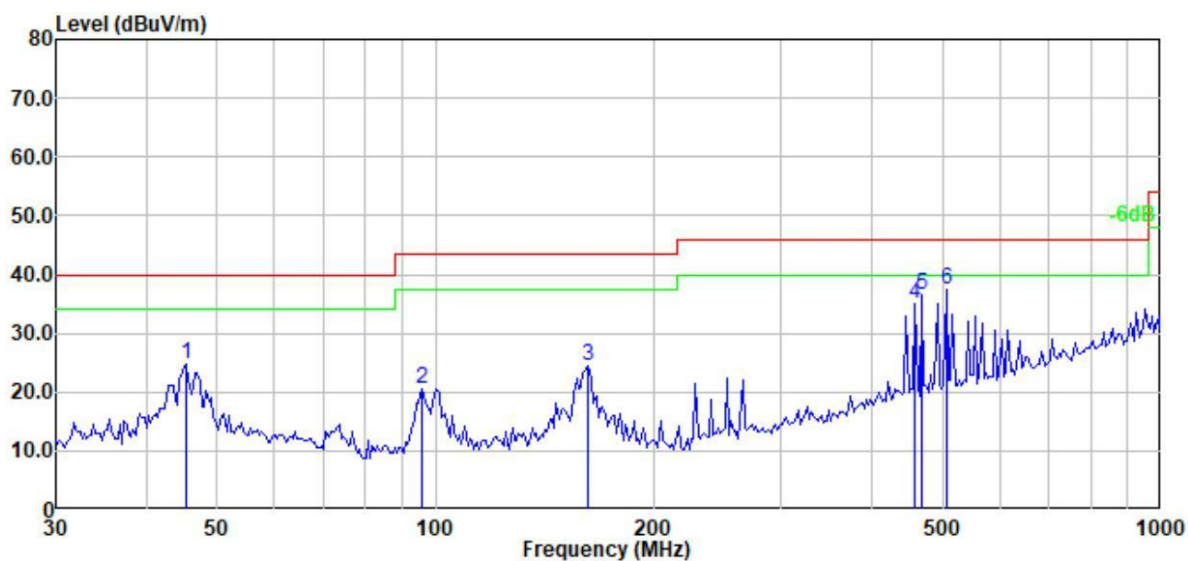
Temperature:	26°C	Relative Humidity:	53%
Pressure:	101kPa	Polarization:	Horizontal
Test Voltage :	DC 3.85V	Test Mode :	BLE 2402MHz



Remark: Level=Reading Level + Factor; Factor = Antenna Factor + Cable Loss - Pre-amplifier.

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	44.779	31.50	19.12	-12.38	40.00	-20.88	Horizontal	QP
2	228.617	40.59	27.12	-13.47	46.00	-18.88	Horizontal	QP
3	252.252	35.88	23.46	-12.42	46.00	-22.54	Horizontal	QP
4	300.699	33.33	22.89	-10.44	46.00	-23.11	Horizontal	QP
5	468.165	32.70	26.49	-6.21	46.00	-19.51	Horizontal	QP
6	505.789	34.57	28.92	-5.65	46.00	-17.08	Horizontal	QP

Temperature:	26°C	Relative Humidity:	53%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage :	DC 3.85V	Test Mode :	BLE 2402MHz



Remark: Level=Reading Level + Factor; Factor = Antenna Factor + Cable Loss - Pre-amplifier.

	Read			Limit	Over		
Freq	Level	Level	Factor	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	45.413	37.19	24.80	-12.39	40.00	-15.20	Vertical QP
2	95.649	36.13	20.65	-15.48	43.50	-22.85	Vertical QP
3	162.020	35.82	24.54	-11.28	43.50	-18.96	Vertical QP
4	458.399	41.40	35.12	-6.28	46.00	-10.88	Vertical QP
5	468.165	42.77	36.56	-6.21	46.00	-9.44	Vertical QP
6	505.789	43.12	37.47	-5.65	46.00	-8.53	Vertical QP

Test Frequency 1GHz-25GHz:

(WIFI: 802.11b Worst Case)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
802.11b Low Channel: 2412MHz									
V	4824	51.85	34.11	5.04	32.44	55.22	74.00	-18.78	Pk
V	4824	38.67	34.11	5.04	32.44	42.04	54.00	-11.96	AV
V	7236	41.98	32.57	6.30	35.89	51.60	74.00	-22.4	Pk
V	7236	26.77	32.57	6.30	35.89	36.39	54.00	-17.61	AV
V	9648	36.53	32.96	7.56	38.40	49.53	74.00	-24.47	Pk
V	9648	24.58	32.96	7.56	38.40	37.58	54.00	-16.42	AV
V	12060	32.67	32.06	8.92	39.01	48.54	74.00	-25.46	Pk
V	12060	24.32	32.06	8.92	39.01	40.19	54.00	-13.81	AV
H	4824	46.44	34.11	5.04	32.44	49.81	74.00	-24.19	Pk
H	4824	35.39	34.11	5.04	32.44	38.76	54.00	-15.24	AV
H	7236	40.12	32.57	6.30	35.89	49.74	74.00	-24.26	Pk
H	7236	25.89	32.57	6.30	35.89	35.51	54.00	-18.49	AV
H	9648	39.75	32.96	7.56	38.40	52.75	74.00	-21.25	Pk
H	9648	24.44	32.96	7.56	38.40	37.44	54.00	-16.56	AV
H	12060	35.65	32.06	8.92	39.01	51.52	74.00	-22.48	Pk
H	12060	26.09	32.06	8.92	39.01	41.96	54.00	-12.04	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
802.11b Middle Channel: 2437MHz									
V	4824	50.76	34.08	5.08	32.57	54.33	74.00	-19.67	Pk
V	4824	36.72	34.08	5.08	32.57	40.29	54.00	-13.71	AV
V	7236	44.75	32.62	6.34	35.95	54.42	74.00	-19.58	Pk
V	7236	34.26	32.62	6.34	35.95	43.93	54.00	-10.07	AV
V	9648	40.87	32.93	7.58	38.40	53.92	74.00	-20.08	Pk
V	9648	30.83	32.93	7.58	38.40	43.88	54.00	-10.12	AV
V	12060	41.56	31.97	8.89	39.04	57.52	74.00	-16.48	Pk
V	12060	28.38	31.97	8.89	39.04	44.34	54.00	-9.66	AV
H	4824	47.24	34.08	5.08	32.57	50.81	74.00	-23.19	Pk
H	4824	31.16	34.08	5.08	32.57	34.73	54.00	-19.27	AV
H	7236	41.29	32.62	6.34	35.95	50.96	74.00	-23.04	Pk
H	7236	30.17	32.62	6.34	35.95	39.84	54.00	-14.16	AV
H	9648	43.76	32.93	7.58	38.40	56.81	74.00	-17.19	Pk
H	9648	26.26	32.93	7.58	38.40	39.31	54.00	-14.69	AV
H	12060	35.52	31.97	8.89	39.04	51.48	74.00	-22.52	Pk
H	12060	25.66	31.97	8.89	39.04	41.62	54.00	-12.38	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
802.11b High Channel: 2462MHz									
V	4824	51.54	34.08	5.08	32.57	55.11	74.00	-18.89	Pk
V	4824	35.87	34.08	5.08	32.57	39.44	54.00	-14.56	AV
V	7236	45.65	32.62	6.34	35.95	55.32	74.00	-18.68	Pk
V	7236	34.66	32.62	6.34	35.95	44.33	54.00	-9.67	AV
V	9648	43.76	32.93	7.58	38.40	56.81	74.00	-17.19	Pk
V	9648	31.62	32.93	7.58	38.40	44.67	54.00	-9.33	AV
V	12060	42.91	31.97	8.89	39.04	58.87	74.00	-15.13	Pk
V	12060	26.49	31.97	8.89	39.04	42.45	54.00	-11.55	AV
H	4824	47.27	34.08	5.08	32.57	50.84	74.00	-23.16	Pk
H	4824	35.64	34.08	5.08	32.57	39.21	54.00	-14.79	AV
H	7236	43.42	32.62	6.34	35.95	53.09	74.00	-20.91	Pk
H	7236	33.13	32.62	6.34	35.95	42.80	54.00	-11.20	AV
H	9648	43.50	32.93	7.58	38.40	56.55	74.00	-17.45	Pk
H	9648	28.16	32.93	7.58	38.40	41.21	54.00	-12.79	AV
H	12060	37.63	31.97	8.89	39.04	53.59	74.00	-20.41	Pk
H	12060	23.68	31.97	8.89	39.04	39.64	54.00	-14.36	AV

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

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

Emission Level = Reading + Factor

Margin=Emission Level-Limit

BLE

GFSK Low Channel (2402MHz)								
Detector: Peak Value								
Frequency	Reading Level	Ant. Factor	Cable Loss	Pre-Amp. Gain (dB)	Emission Level	Limit	Margin	Polarity
(MHz)	(dBuV)	(dB/m)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	(H/V)
4804	53.38	30.16	6.66	38.32	51.88	74.00	-22.12	V
4804	51.23	30.16	6.66	38.32	49.73	74.00	-24.27	H
7206	52.29	30.22	6.69	38.49	50.71	74.00	-23.29	V
7206	53.43	30.22	6.69	38.49	51.85	74.00	-22.15	H
9608	54.37	30.59	6.72	39.15	52.53	74.00	-21.47	V
9608	54.63	30.59	6.72	39.15	52.79	74.00	-21.21	H
Detector: Average Value								
4804	41.47	30.16	6.66	38.32	39.97	54.00	-14.03	V
4804	41.54	30.16	6.66	38.32	40.04	54.00	-13.96	H
7206	40.36	30.22	6.69	38.49	38.78	54.00	-15.22	V
7206	41.24	30.22	6.69	38.49	39.66	54.00	-14.34	H
9608	41.17	30.59	6.72	39.15	39.33	54.00	-14.67	V
9608	40.27	30.59	6.72	39.15	38.43	54.00	-15.57	H
GFSK Middle Channel (2440MHz)								
Detector: Peak Value								
Frequency	Reading Level	Ant. Factor	Cable Loss	Pre-Amp. Gain (dB)	Emission Level	Limit	Margin	Polarity
(MHz)	(dBuV)	(dB/m)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	(H/V)
4880	54.44	30.18	6.68	38.52	52.78	74.00	-21.22	V
4880	52.28	30.18	6.68	38.52	50.62	74.00	-23.38	H
7320	51.19	30.22	6.73	39.46	48.68	74.00	-25.32	V
7320	51.49	30.22	6.73	39.46	48.98	74.00	-25.02	H
9760	52.19	30.54	6.81	40.71	48.83	74.00	-25.17	V
9760	52.14	30.54	6.81	40.71	48.78	74.00	-25.22	H

Detector: Average Value								
4880	39.42	30.18	6.68	38.52	37.76	54.00	-16.24	V
4880	39.32	30.18	6.68	38.52	37.66	54.00	-16.34	H
7320	40.47	30.22	6.73	39.46	37.96	54.00	-16.04	V
7320	39.18	30.22	6.73	39.46	36.67	54.00	-17.33	H
9760	39.14	30.54	6.81	40.71	35.78	54.00	-18.22	V
9760	40.33	30.54	6.81	40.71	36.97	54.00	-17.03	H
GFSK High Channel (2480MHz)								
Detector: Peak Value								
Frequency	Reading Level	Ant. Factor	Cable Loss	Pre-Amp. Gain (dB)	Emission Level	Limit	Margin	Polarity
(MHz)	(dBuV)	(dB/m)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	(H/V)
4960	52.52	30.33	6.68	38.52	51.01	74.00	-22.99	V
4960	50.57	30.33	6.68	38.52	49.06	74.00	-24.94	H
7440	53.23	30.34	6.73	39.46	50.84	74.00	-23.16	V
7440	51.57	30.34	6.73	39.46	49.18	74.00	-24.82	H
9920	52.35	30.68	6.81	40.71	49.13	74.00	-24.87	V
9920	51.29	30.68	6.81	40.71	48.07	74.00	-25.93	H
Detector: Average Value								
4960	40.58	30.33	6.75	40.18	37.48	54.00	-16.52	V
4960	39.36	30.33	6.75	40.18	36.26	54.00	-17.74	H
7440	39.18	30.34	6.79	41.23	35.08	54.00	-18.92	V
7440	38.45	30.34	6.79	41.23	34.35	54.00	-19.65	H
9920	39.66	30.68	6.83	42.17	35.00	54.00	-19.00	V
9920	40.13	30.68	6.83	42.17	35.47	54.00	-18.53	H

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

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

Emission Level = Reading + Factor

Margin=Emission Level-Limit

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

(WIFI: 802.11b Worst Case)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
Low Channel: 2412MHz									
H	2390	57.45	35.17	3.48	27.49	53.25	74.00	-20.75	PK
H	2390	49.36	35.17	3.48	27.49	45.16	54.00	-8.84	AV
H	2400	60.08	35.16	3.49	27.52	55.93	74.00	-18.07	PK
H	2400	49.55	35.16	3.49	27.52	45.40	54.00	-8.60	AV
V	2390	57.63	35.17	3.48	27.49	53.43	74.00	-20.57	PK
V	2390	50.32	35.17	3.48	27.49	46.12	54.00	-7.88	AV
V	2400	59.38	35.16	3.49	27.52	55.23	74.00	-18.77	PK
V	2400	50.19	35.16	3.49	27.52	46.04	54.00	-7.96	AV
High Channel: 2462MHz									
H	2483.5	57.56	35.11	3.56	27.75	53.76	74.00	-20.24	PK
H	2485.5	48.76	35.11	3.56	27.75	44.96	54.00	-9.04	AV
H	2483.5	59.58	35.10	3.57	27.80	55.85	74.00	-18.15	PK
H	2485.5	49.65	35.10	3.57	27.80	45.92	54.00	-8.08	AV
V	2483.5	58.31	35.11	3.56	27.75	54.51	74.00	-19.49	PK
V	2485.5	49.65	35.11	3.56	27.75	45.85	54.00	-8.15	AV
V	2483.5	58.81	35.10	3.57	27.80	55.08	74.00	-18.92	PK
V	2485.5	50.22	35.10	3.57	27.80	46.49	54.00	-7.51	AV

BLE

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type
Low Channel: 2402MHz									
H	2390	57.24	35.17	3.48	27.49	53.04	74.00	-20.96	PK
H	2390	49.36	35.17	3.48	27.49	45.16	54.00	-8.84	AV
H	2400	60.12	35.16	3.49	27.52	55.97	74.00	-18.03	PK
H	2400	49.28	35.16	3.49	27.52	45.13	54.00	-8.87	AV
V	2390	57.45	35.17	3.48	27.49	53.25	74.00	-20.75	PK
V	2390	50.11	35.17	3.48	27.49	45.91	54.00	-8.09	AV
V	2400	59.21	35.16	3.49	27.52	55.06	74.00	-18.94	PK
V	2400	50.03	35.16	3.49	27.52	45.88	54.00	-8.12	AV
High Channel: 2480MHz									
H	2483.5	57.37	35.11	3.56	27.75	53.57	74.00	-20.43	PK
H	2485.5	48.48	35.11	3.56	27.75	44.68	54.00	-9.32	AV
H	2483.5	59.32	35.10	3.57	27.80	55.59	74.00	-18.41	PK
H	2485.5	49.29	35.10	3.57	27.80	45.56	54.00	-8.44	AV
V	2483.5	58.15	35.11	3.56	27.75	54.35	74.00	-19.65	PK
V	2485.5	49.45	35.11	3.56	27.75	45.65	54.00	-8.35	AV
V	2483.5	58.59	35.10	3.57	27.80	54.86	74.00	-19.14	PK
V	2485.5	50	35.10	3.57	27.80	46.27	54.00	-7.73	AV