

TEST REPORT

Product : Single mode Bluetooth(5.0) Module
Trade mark : Richmat
Model/Type reference : HJ8258
Serial Model : /
Report Number : EED39N81230401
FCC ID : 2AJJGHJ8258
Date of Issue : Dec 02, 2021

Test Standards	Result
☒ 47 CFR Part 15 Subpart C	PASS

Prepared for:

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NO. 78 Kongquehe 4th Road Qingdao Clothing Industry park Jimo,
Qingdao, Shandong Province 266000, China

Prepared by:

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2021-12-02

Jeff Fang

Authorized Signatory

Check No.: 2910221121

Modification Record

No.	Last Report No.	Modification Description
1	EED39N81230401	First report

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1. Test Summary

Test item	Test Requirement	Test method	Result
Antenna Requirement*	47 CFR Part 15Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission*	47 CFR Part 15Subpart C Section 15.207	ANSI C63.10-2013	N/A
Maximum conducted output power*	47 CFR Part 15Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
DTS Bandwidth*	47 CFR Part 15Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Maximum Power Spectral Density*	47 CFR Part 15Subpart C Section 15.247 (e)	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions*	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions*	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious Emissions	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

1. The product is supplied by DC power.
2. Test according to ANSI C63.4-2014 & ANSI C63.10-2013.
3. Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.
4. " * " Detailed test results, please reference reported EED32M00310701

2. Test Requirement

2.1. Test Environment

Operating Environment:	
Temperature:	21.1 °C
Humidity:	51.8 % RH
Atmospheric Pressure:	1026mbar

2.2. Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK	2402MHz ~2480 MHz	Channel 1	Channel 20	Channel 40
		2402MHz	2440MHz	2480MHz
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.			

3. General Information

3.1. Client Information

Applicant:	Qingdao Richmat Intelligence Technology Inc
Address of Applicant:	NO. 78 Kongquehe 4th Road Qingdao Clothing Industry park Jimo, Qingdao, Shandong Province 266000, China
Manufacturer:	Qingdao Richmat Intelligence Technology Inc
Address of Manufacturer:	NO. 78 Kongquehe 4th Road Qingdao Clothing Industry park Jimo, Qingdao, Shandong Province 266000, China
Factory:	Qingdao Richmat Intelligence Technology Inc
Address of Factory:	NO. 78 Kongquehe 4th Road Qingdao Clothing Industry park Jimo, Qingdao, Shandong Province 266000, China

3.2. General Description of EUT

Product Name:	Single mode Bluetooth(5.0) Module
Model No.(EUT)*:	HJ8258
Trade Mark:	Richmat
EUT Supports Radios application:	Bluetooth V5.0 BLE
Power Supply:	DC 3.0V
Sample Received Date:	Nov. 23, 21
Sample Tested Date:	Nov. 29, 21

3.3. Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	BLE 5.0
Modulation Type:	GFSK
Number of Channel:	40
Sample Type:	Mobile production
Test Software of EUT:	EMI_Tool (manufacturer declare)
Antenna Type:	PCB Antenna

Report No. : EED39N81230401

Antenna Gain ^① :	5.3dBi
Test Voltage:	DC 3.0V

Note: 1 The antenna gain is provided by the client and we Centre Testing International (Suzhou) CO., LTD. test lab is not responsible for the accuracy of the antenna gain information.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

3.4. Tested System Details

Product	Manufacturer	Model No.
Handset	Ríchmat	Model Name.: HJT53B Ble

3.5. Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
NB	ThinkPad	E490	FCC ID and DOC	CTI

3.6. Test Location

All test facilities used to collect the test data are located at Building 18, Zhihui New Town Ecological Industrial Park, No. 1206, Jinyang East Road, Lujia Town, Kunshan, Jiangsu, China.

3.7. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

A2LA-Lab Cert. No. 5734.01

Centre Testing International (Suzhou) CO., LTD. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration. Laboratories and any additional program requirements in the identified field of testing.

FCC-Designation No.:CN1290

Centre Testing International Group Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The American association for Centre Testing International Group Co., Ltd. EMC laboratory accreditation Designation No.:CN1290

Report No. : EED39N81230401

3.8. Deviation from Standards

None.

3.9. Abnormalities from Standard Conditions

None.

3.10. Other Information Requested by the Customer

None.

3.11. Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Occupied Bandwidth	0.56%
2	RF Power conducted	0.59 dB
3	Power Spectral Density, conducted	2.37 dB
4	Unwanted Emission, conducted	2.68 dB
5	All Emission, radiated	4.41 dB(30MHz-1GHz)
		4.99 dB(1GHz-18GHz)
		5.307 dB(18GHz-40GHz)
6	Temperature test	0.54°C
7	Humidity test	1.62%
8	DC and low frequency voltages test	1.14%

4. Equipment List

966 Semi-anechoic Chamber					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Receiver	R&S	ESU8	100537	2020-12-10	2021-12-09
Spectrum analyzer	R&S	FSV40	101185	2020-12-10	2021-12-09
Preamplifier (30MHz~1GHz)	SONOMA	317	393347	2020-12-04	2021-12-03
Preamplifier (1GHz~18GHz)	R&S	SCU-18D	1987397	2020-12-10	2021-12-09
Preamplifier (18GHz~40GHz)	/	MTLNA1804003 0235	12009007	2021-10-23	2022-10-22
Loop Antenna (9kHz~30MHz)	TESEQ	HLA6121	54575	2021-02-27	2022-02-26
Antenna (30MHz~1GHz)	SCHWARZBEC K	VULB9163	9163-965	2021-10-15	2022-10-14
Antenna (1GHz~18GHz)	R&S	HF907	102524	2020-12-15	2021-12-14
Antenna (18GHz~40GHz)	R&S	BBHA9170	1032	2021-10-23	2022-10-22
Band rejection filter	Xi'an xingbo	XBLBQ-DZA81	200827-1-02	/	/

5. Radio Technical Requirements Specification

5.1. Reference Documents for Testing

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

5.2. Test Results List

Test requirement	Test method	Test item	Verdict	Note
Part15C Section 15.205/15.209	ANSI C63.10 Section 6.10.5	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix A)
Part15C Section 15.205/15.209	ANSI C63.10 Section 6.4,6.5,6.6	Radiated Spurious Emissions	PASS	Appendix B)

Appendix A): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr><tr><td>Peak</td><td>1MHz</td><td>1/T</td><td>Average</td></tr></table>	Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak	Above 1GHz	Peak	1MHz	3MHz	Peak	Peak	1MHz	1/T	Average	
Frequency	Detector	RBW	VBW	Remark																	
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak																	
Above 1GHz	Peak	1MHz	3MHz	Peak																	
	Peak	1MHz	1/T	Average																	
Test Procedure:	Below 1GHz test procedure as below: a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel Above 1GHz test procedure as below: a. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter). b. Test the EUT in the lowest channel , the Highest channel c. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. d. Repeat above procedures until all frequencies measured was complete.																				
Limit:	<table><tr><td>Frequency</td><td>Limit (dBμV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>74.0</td><td>Peak Value</td></tr></table>	Frequency	Limit (dBμV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value	74.0	Peak Value
Frequency	Limit (dBμV/m @3m)	Remark																			
30MHz-88MHz	40.0	Quasi-peak Value																			
88MHz-216MHz	43.5	Quasi-peak Value																			
216MHz-960MHz	46.0	Quasi-peak Value																			
960MHz-1GHz	54.0	Quasi-peak Value																			
Above 1GHz	54.0	Average Value																			
	74.0	Peak Value																			

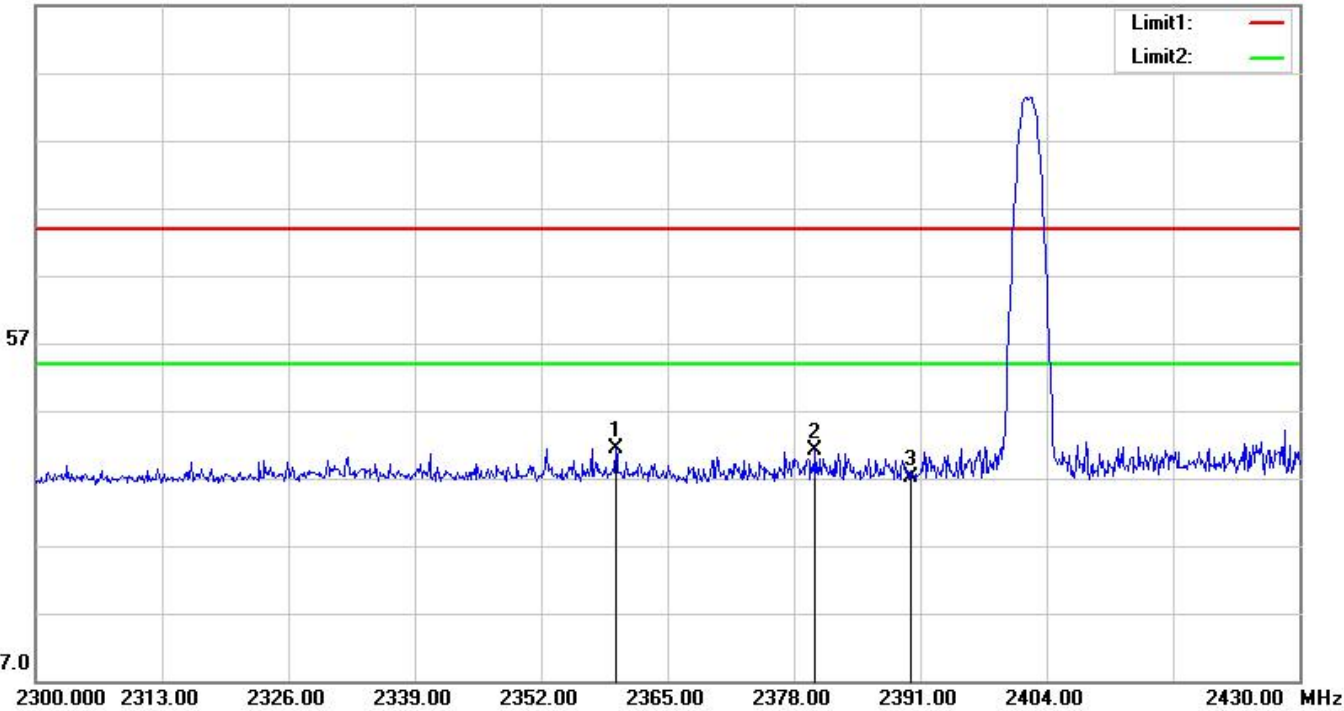
Report No. : EED39N81230401

Test plot as follows:

Mode:	BLE_1M	Channel:	2402
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph

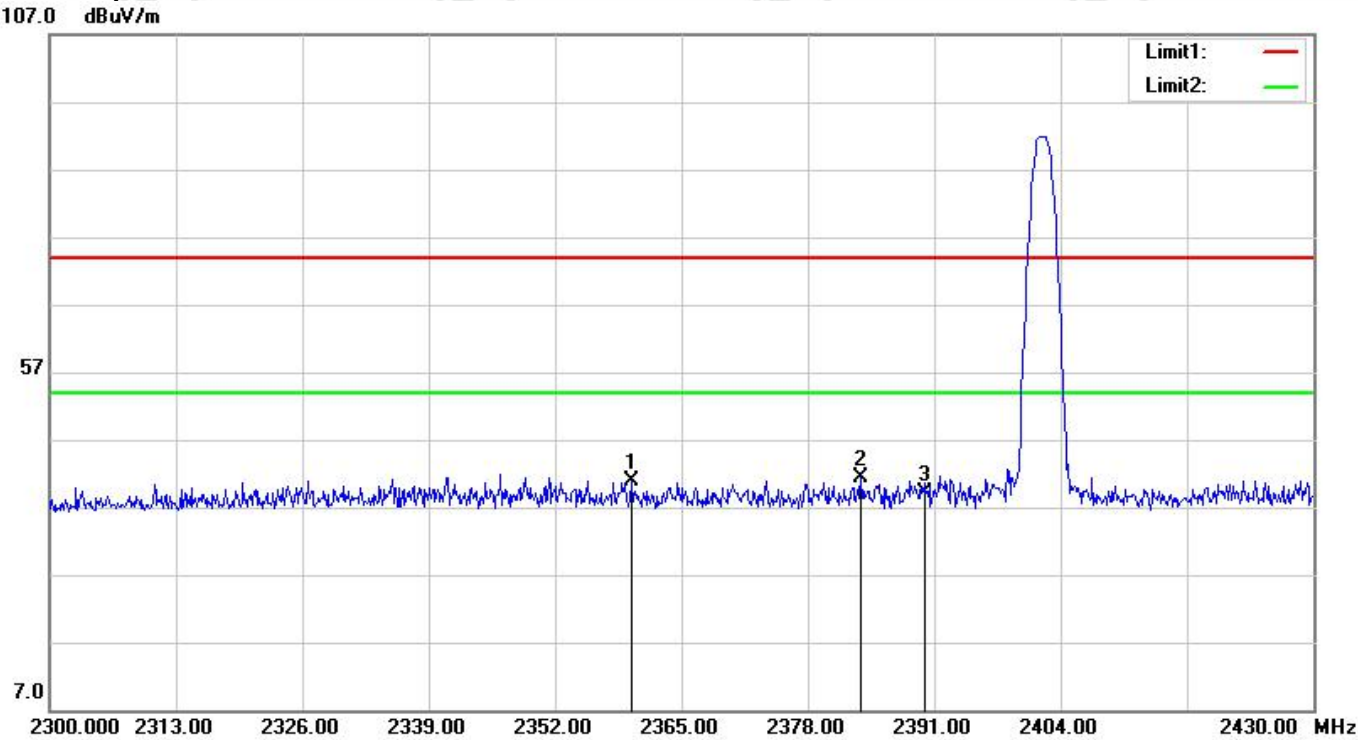
107.0 dBuV/m



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2359.670	38.82	2.63	41.45	74.00	-32.55	100	185	peak
2	2380.210	38.48	2.69	41.17	74.00	-32.83	100	179	peak
3	2390.000	34.42	2.71	37.13	74.00	-36.87	200	178	peak

Mode:	BLE_1M	Channel:	2402
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	2359.930	38.23	2.63	40.86	74.00	-33.14	100	39	peak
2	2383.460	38.66	2.70	41.36	74.00	-32.64	100	41	peak
3	2390.000	36.33	2.71	39.04	74.00	-34.96	134	360	peak

Mode:	BLE_1M	Channel:	2480
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph

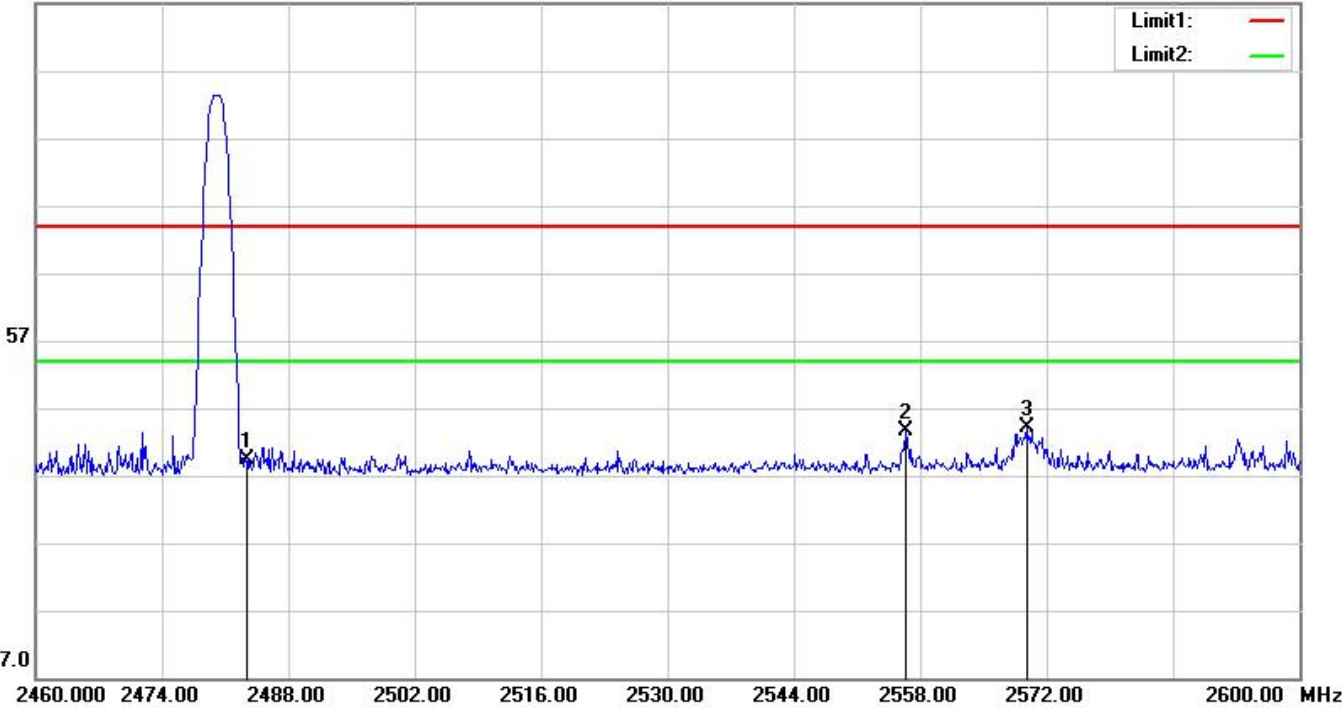
107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	36.44	2.92	39.36	74.00	-34.64	100	57	peak
2	2559.540	39.87	3.08	42.95	74.00	-31.05	200	5	peak
3	2569.340	41.62	3.10	44.72	74.00	-29.28	200	188	peak

Mode:	BLE_1M	Channel:	2480
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph
107.0 dBuV/m

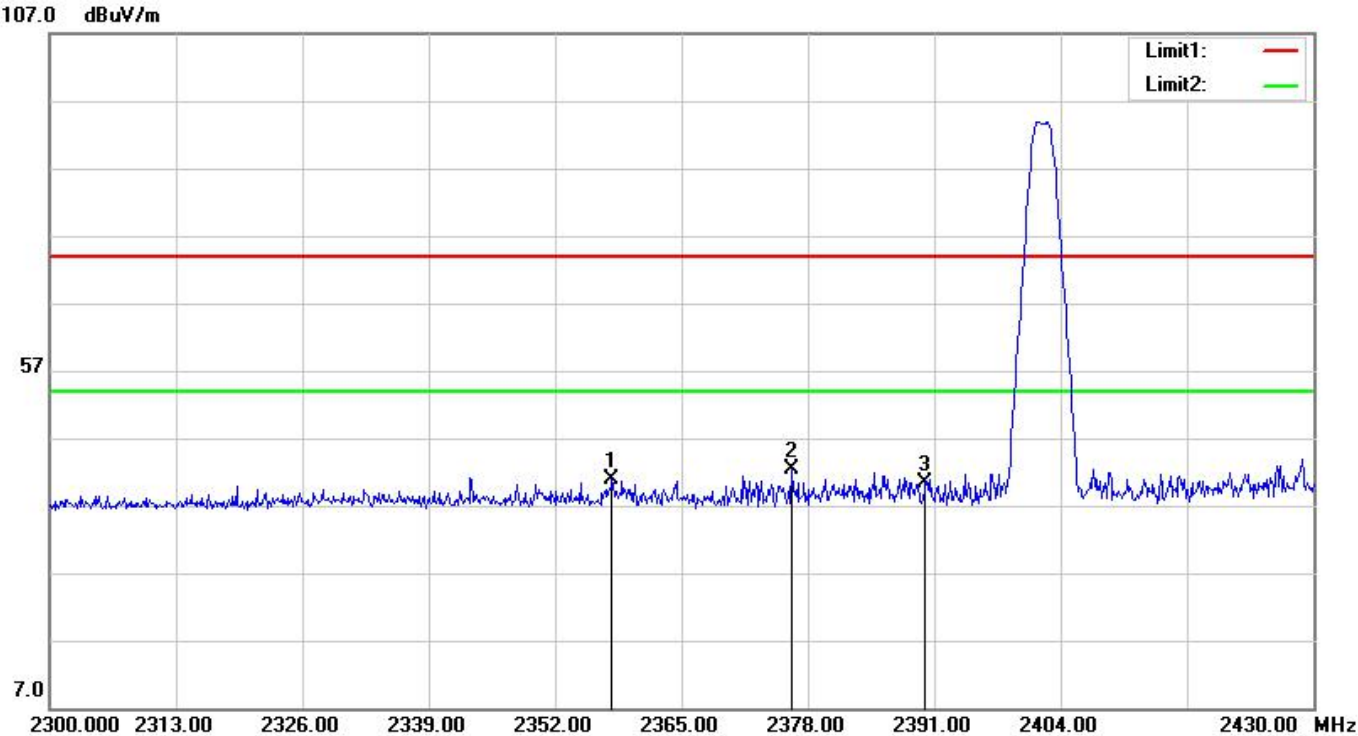


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	36.58	2.92	39.50	74.00	-34.50	100	37	peak
2	2556.460	40.52	3.07	43.59	74.00	-30.41	200	0	peak
3	2569.760	41.11	3.10	44.21	74.00	-29.79	200	70	peak

Report No. : EED39N81230401

Mode:	BLE_2M	Channel:	2402
Remark:	Horizontal	Test model No.:	HJT53B Ble

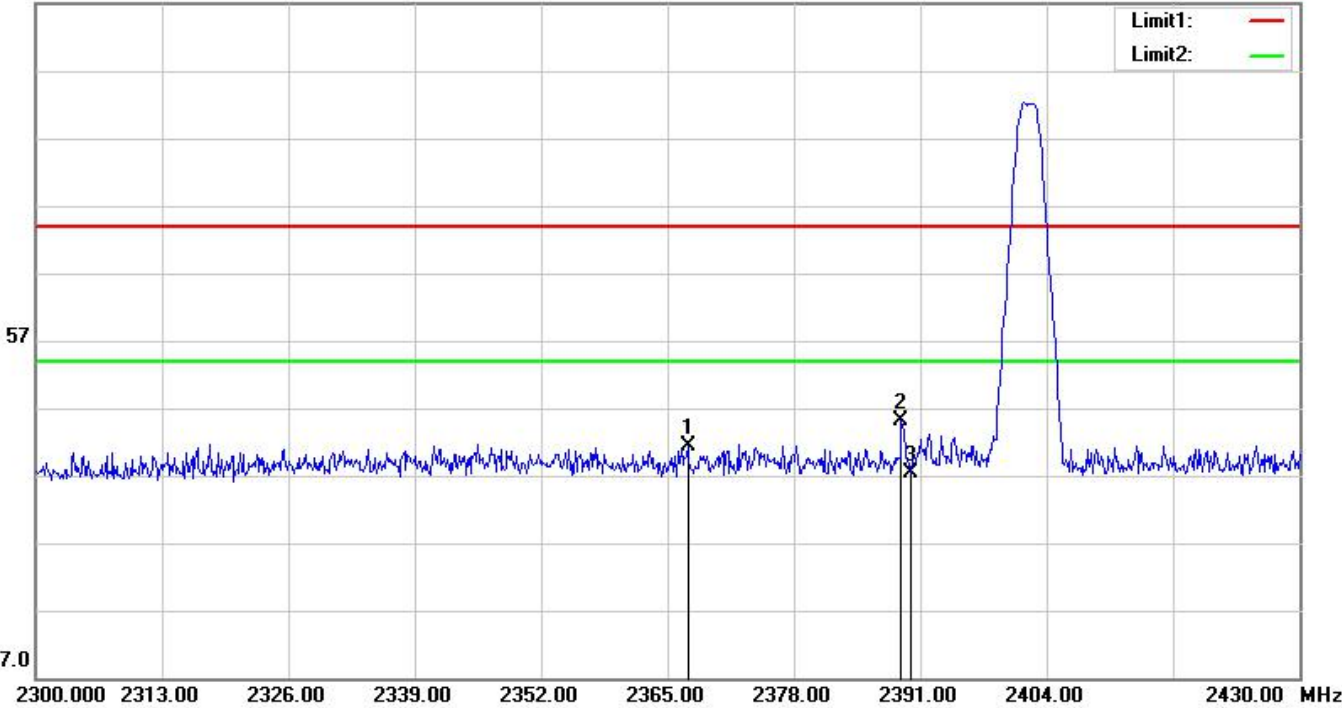
Test Graph



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2357.850	38.26	2.63	40.89	74.00	-33.11	200	334	peak
2	2376.310	39.66	2.68	42.34	74.00	-31.66	100	181	peak
3	2390.000	37.67	2.71	40.38	74.00	-33.62	100	177	peak

Mode:	BLE_2M	Channel:	2402
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph
107.0 dBuV/m

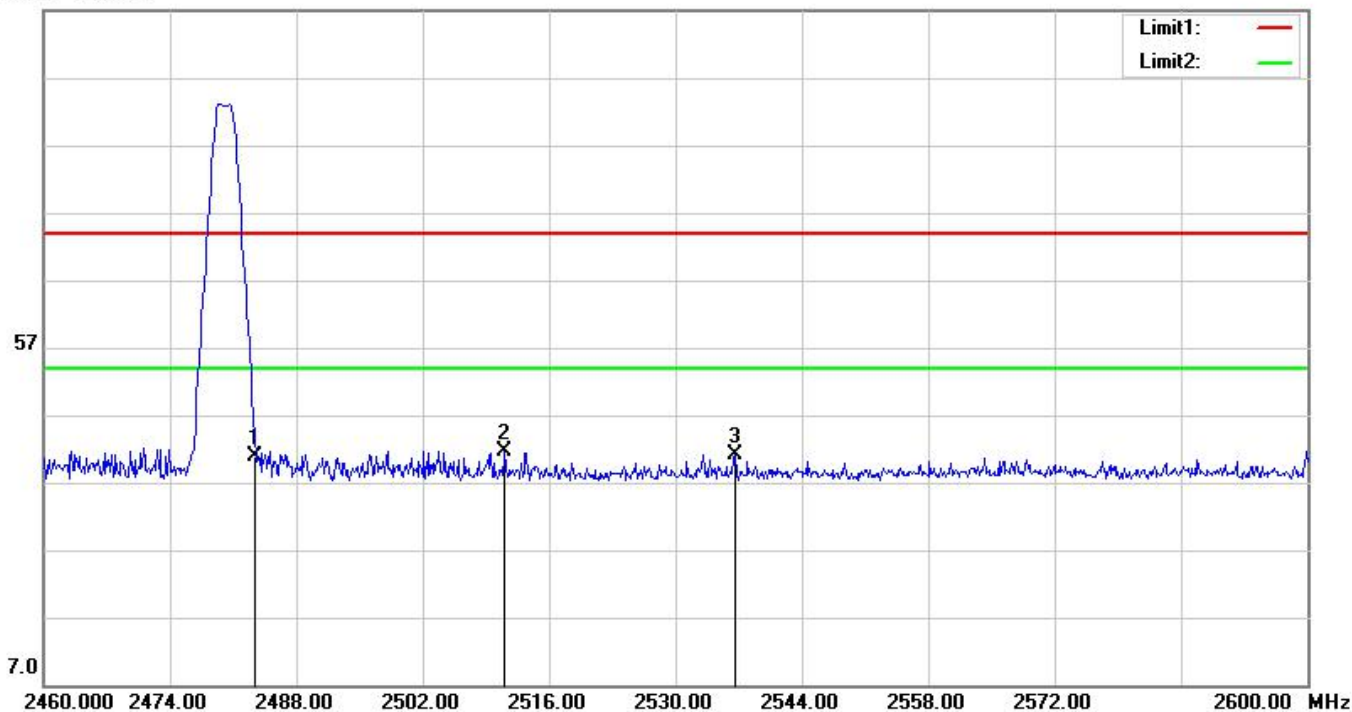


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2367.080	38.75	2.65	41.40	74.00	-32.60	100	37	peak
2	2389.050	42.34	2.71	45.05	74.00	-28.95	200	335	peak
3	2390.000	34.74	2.71	37.45	74.00	-36.55	200	266	peak

Mode:	BLE_2M	Channel:	2480
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph

107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	38.02	2.92	40.94	74.00	-33.06	100	185	peak
2	2511.100	38.70	2.97	41.67	74.00	-32.33	100	332	peak
3	2536.580	38.18	3.03	41.21	74.00	-32.79	100	328	peak

Mode:	BLE_2M	Channel:	2480
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph

107.0 dBuV/m

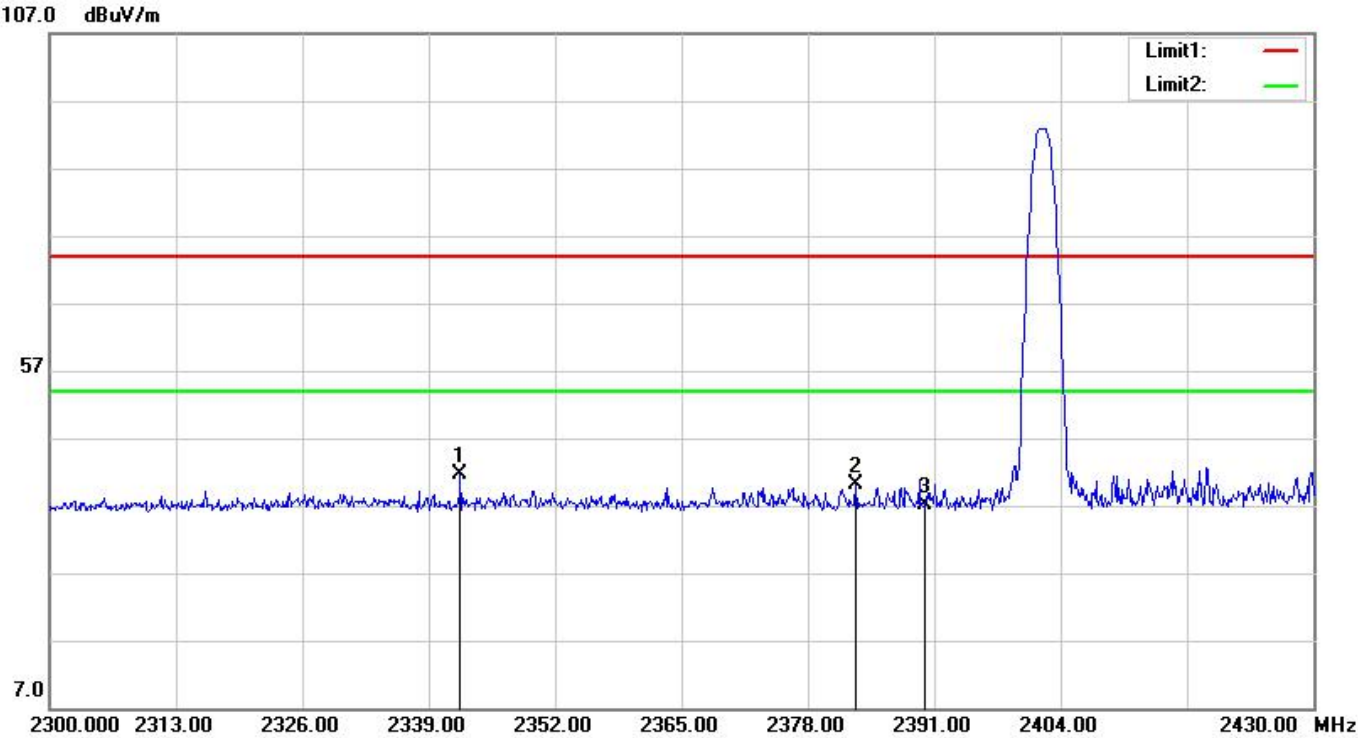


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	38.12	2.92	41.04	74.00	-32.96	200	24	peak
2	2566.400	41.83	3.09	44.92	74.00	-29.08	200	72	peak
3	2574.380	42.22	3.11	45.33	74.00	-28.67	200	129	peak

Report No. : EED39N81230401

Mode:	BLE_125kbps	Channel:	2402
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph

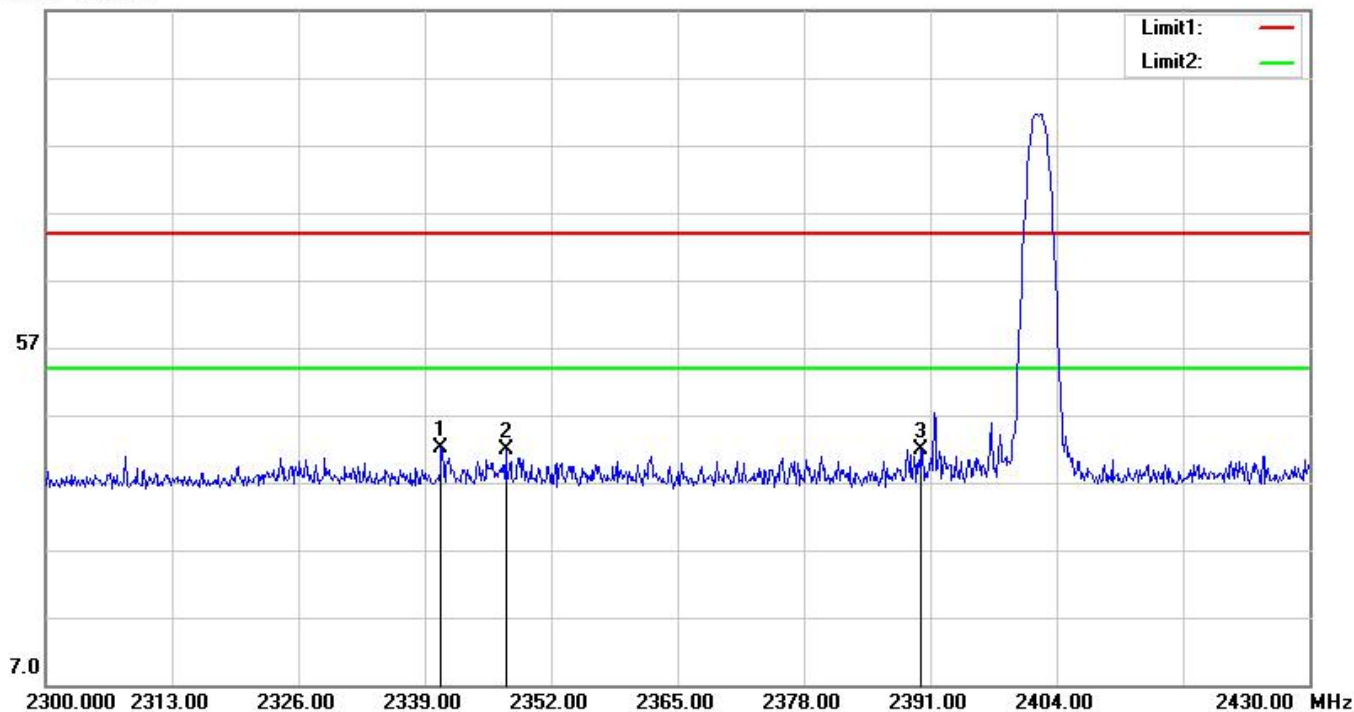


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2342.250	39.17	2.58	41.75	74.00	-32.25	200	296	peak
2	2382.940	37.51	2.69	40.20	74.00	-33.80	200	327	peak
3	2390.000	34.43	2.71	37.14	74.00	-36.86	100	188	peak

Mode:	BLE_125kbps	Channel:	2402
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph

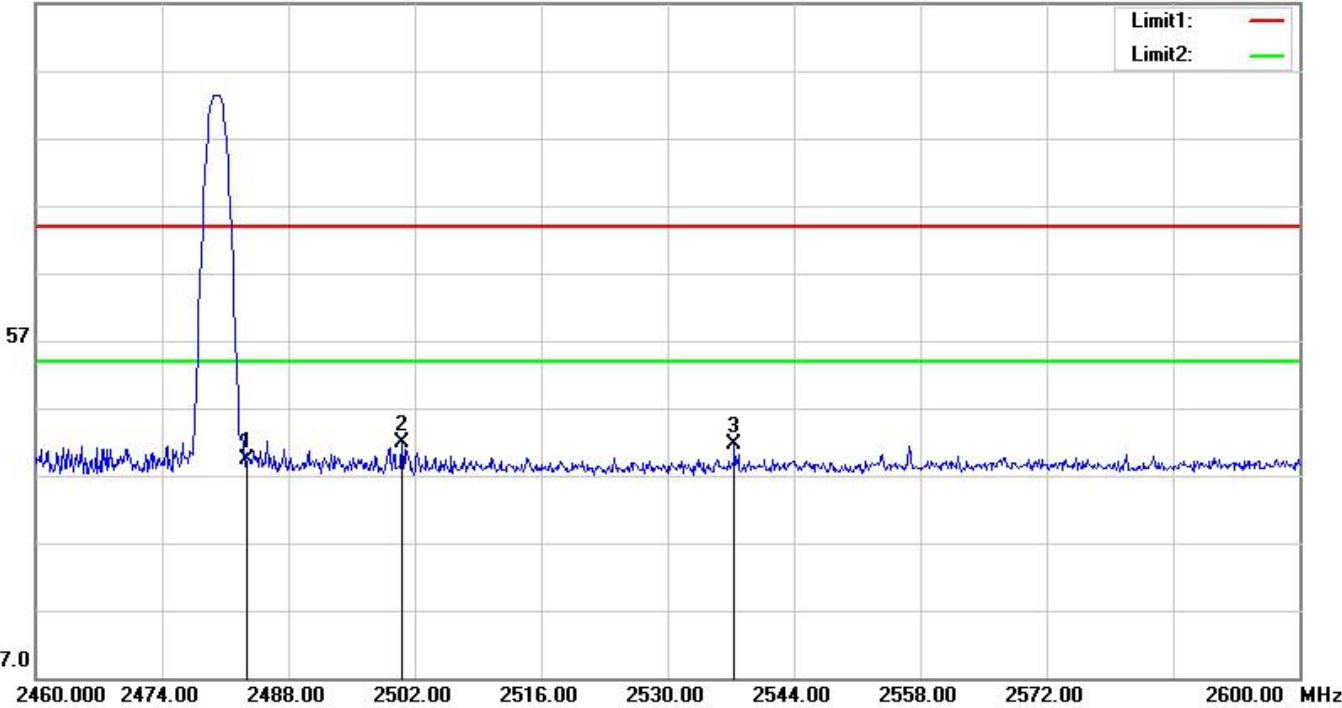
107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2340.690	39.64	2.58	42.22	74.00	-31.78	100	203	peak
2	2347.320	39.35	2.60	41.95	74.00	-32.05	100	192	peak
3	2390.000	39.21	2.71	41.92	74.00	-32.08	200	52	peak

Mode:	BLE_125kbps	Channel:	2480
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph
107.0 dBuV/m

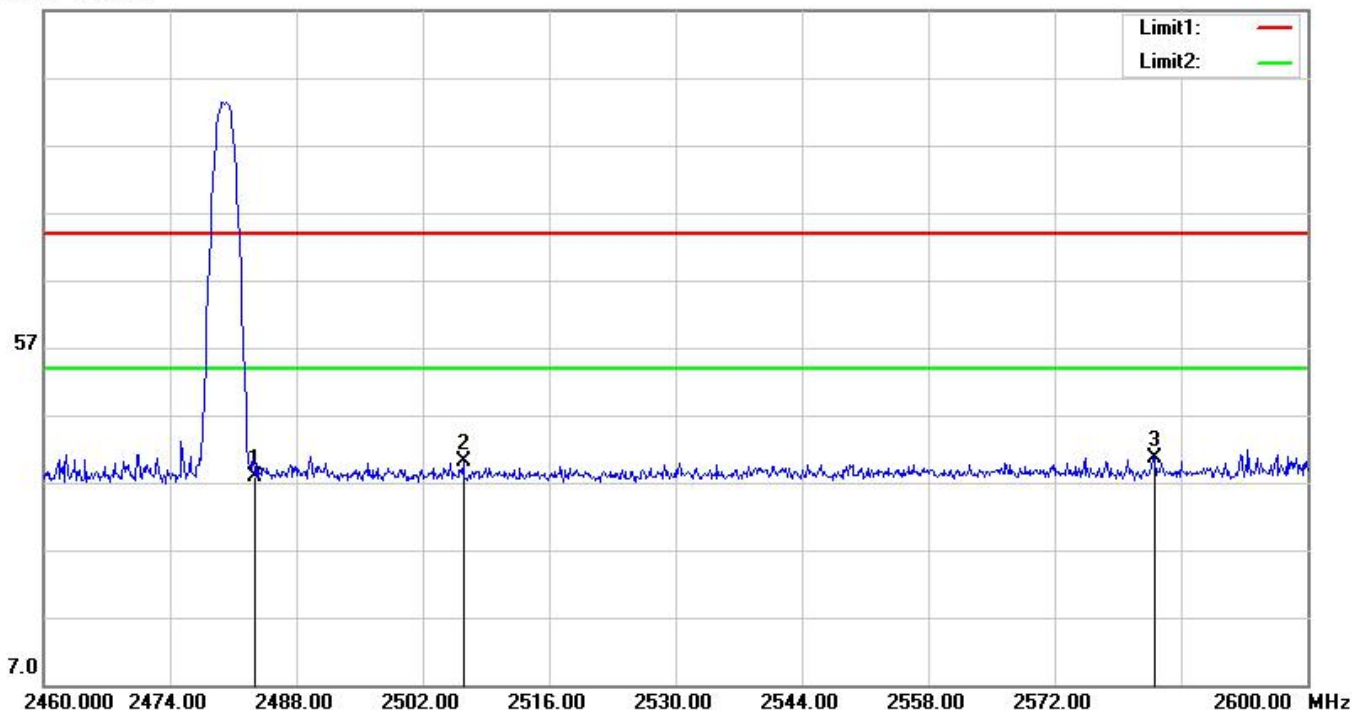


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	36.51	2.92	39.43	74.00	-34.57	117	360	peak
2	2500.600	38.88	2.95	41.83	74.00	-32.17	100	184	peak
3	2537.420	38.71	3.03	41.74	74.00	-32.26	100	334	peak

Mode:	BLE_125kbps	Channel:	2480
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph

107.0 dBuV/m

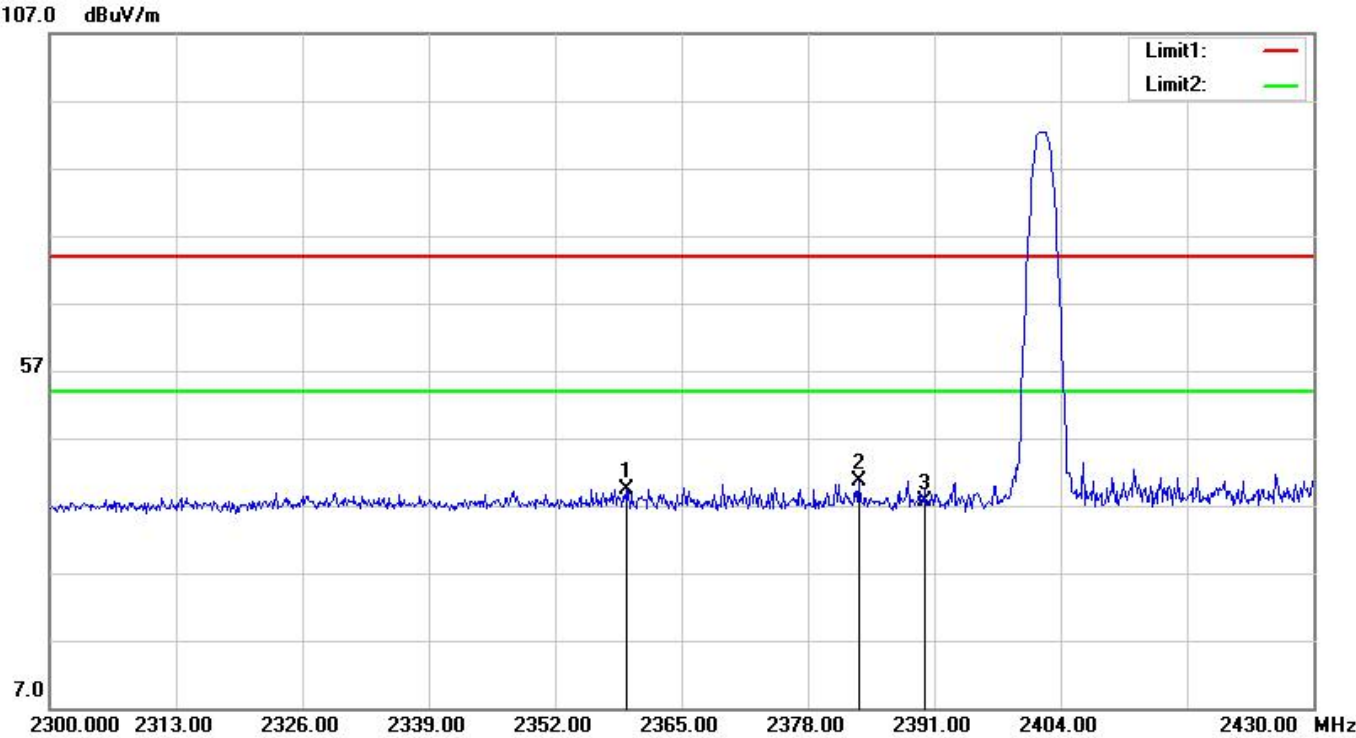


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	34.91	2.92	37.83	74.00	-36.17	100	43	peak
2	2506.480	37.12	2.96	40.08	74.00	-33.92	200	321	peak
3	2583.060	37.59	3.12	40.71	74.00	-33.29	100	207	peak

Report No. : EED39N81230401

Mode:	BLE_500kbps	Channel:	2402
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph

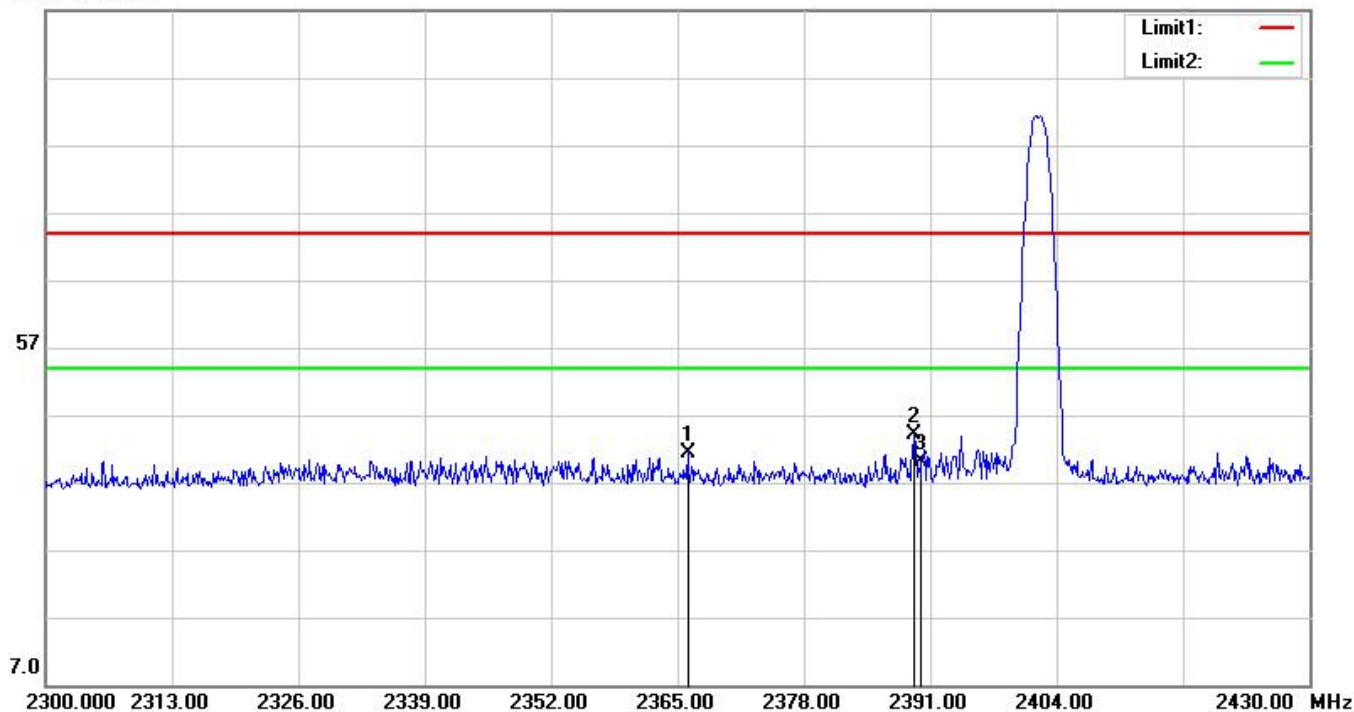


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2359.410	36.78	2.63	39.41	74.00	-34.59	100	296	peak
2	2383.200	37.82	2.69	40.51	74.00	-33.49	200	292	peak
3	2390.000	34.91	2.71	37.62	74.00	-36.38	200	288	peak

Mode:	BLE_500kbps	Channel:	2402
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph

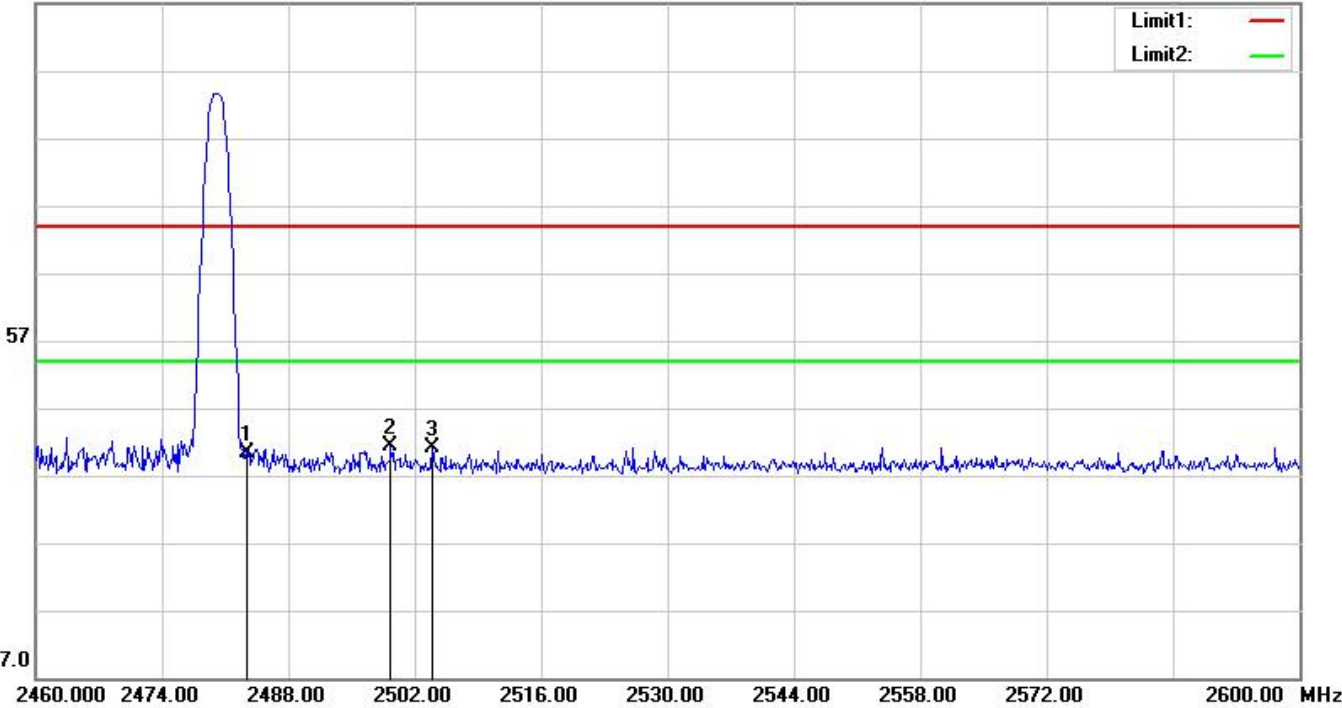
107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2366.040	38.85	2.65	41.50	74.00	-32.50	100	41	peak
2	2389.310	41.36	2.71	44.07	74.00	-29.93	200	58	peak
3	2390.000	37.42	2.71	40.13	74.00	-33.87	100	207	peak

Mode:	BLE_500kbps	Channel:	2480
Remark:	Horizontal	Test model No.:	HJT53B Ble

Test Graph
107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	37.35	2.92	40.27	74.00	-33.73	100	188	peak
2	2499.340	38.31	2.95	41.26	74.00	-32.74	200	325	peak
3	2503.960	38.28	2.96	41.24	74.00	-32.76	100	314	peak

Mode:	BLE_500kbps	Channel:	2480
Remark:	Vertical	Test model No.:	HJT53B Ble

Test Graph

107.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	37.35	2.92	40.27	74.00	-33.73	100	188	peak
2	2499.340	38.31	2.95	41.26	74.00	-32.74	200	325	peak
3	2503.960	38.28	2.96	41.24	74.00	-32.76	100	314	peak

Note:

1)As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation. So, only the peak values are measured:

2) The field strength is calculated by adding the correct Factor. The basic equation with a sample calculation is as follows:

Final Test Level = Reading +Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

Appendix B): Radiated Spurious Emissions

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	1/T	Average

Test Procedure:

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter (Above 18GHz the distance is 1 meter and table is 1.5 meter).
- Test the EUT in the lowest channel, the middle channel, the Highest channel
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
- Repeat above procedures until all frequencies measured was complete.

Limit:

Frequency	Field strength microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Report No. : EED39N81230401

Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz:

Mode:	BLE_1M	Channel:	2402
Test model No.:	HJT53B Ble		

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.0000	V	49.07	-19.93	29.14	40.00	-10.86	QP
62.9800	V	43.04	-19.48	23.56	40.00	-16.44	QP
82.3800	V	42.68	-22.65	20.03	40.00	-19.97	QP
165.8000	V	42.65	-22.47	20.18	43.50	-23.32	QP
191.9900	V	39.52	-20.00	19.52	43.50	-23.98	QP
998.0600	V	36.30	-7.35	28.95	54.00	-25.05	QP
83.3500	H	45.52	-22.40	23.12	40.00	-16.88	QP
92.0800	H	42.96	-20.28	22.68	43.50	-20.82	QP
127.9700	H	44.70	-22.16	22.54	43.50	-20.96	QP
191.9900	H	45.79	-20.00	25.79	43.50	-17.71	QP
224.9700	H	42.36	-19.35	23.01	46.00	-22.99	QP
696.3900	H	37.24	-11.03	26.21	46.00	-19.79	QP

Notes:

- 1) Through Pre-scan then find the BLE_1M -CH00 is the worst case mode and only the worst data was recorded.

Report No. : EED39N81230401

Transmitter Emission above 1GHz:

Mode:	BLE_1M	Channel:	2402
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	38.17	9.12	47.29	74.00	-26.71	200	69	peak
2	7205.000	42.74	12.01	54.75	74.00	-19.25	100	257	peak
3	7205.000	23.20	12.01	35.21	54.00	-18.79	100	257	AVG
4	9602.000	32.09	14.87	46.96	74.00	-27.04	100	9	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4995.000	41.10	9.59	50.69	74.00	-23.31	200	30	peak
2	7205.000	43.19	12.01	55.20	74.00	-18.80	200	18	peak
3	7205.000	24.19	12.01	36.20	54.00	-17.80	200	18	AVG
4	9602.000	32.51	14.87	47.38	74.00	-26.62	200	28	peak

Mode:	BLE_1M	Channel:	2440
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4876.000	42.02	9.31	51.33	74.00	-22.67	100	57	peak
2	7324.000	43.20	12.20	55.40	74.00	-18.60	200	229	peak
3	7324.000	24.39	12.20	36.59	54.00	-17.41	200	229	AVG
4	9755.000	32.86	14.75	47.61	74.00	-26.39	100	12	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4876.000	42.94	9.31	52.25	74.00	-21.75	100	179	peak
2	7324.000	40.57	12.20	52.77	74.00	-21.23	200	243	peak
3	9755.000	34.55	14.75	49.30	74.00	-24.70	189	360	peak
4	12203.000	32.64	17.63	50.27	74.00	-23.73	200	128	peak

Mode:	BLE_1M	Channel:	2480
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4961.000	42.14	9.51	51.65	74.00	-22.35	100	36	peak
2	7443.000	39.95	12.35	52.30	74.00	-21.70	200	235	peak
3	9925.000	33.65	14.61	48.26	74.00	-25.74	200	57	peak
4	12407.000	31.49	18.11	49.60	74.00	-24.40	200	17	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3992.000	44.54	7.83	52.37	74.00	-21.63	100	199	peak
2	4961.000	44.19	9.51	53.70	74.00	-20.30	100	30	peak
3	7443.000	38.84	12.35	51.19	74.00	-22.81	100	277	peak
4	9925.000	33.83	14.61	48.44	74.00	-25.56	200	351	peak

Mode:	BLE_2M	Channel:	2402
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	38.87	9.12	47.99	74.00	-26.01	200	23	peak
2	7205.000	44.40	12.01	56.41	74.00	-17.59	200	232	peak
3	7205.000	24.27	12.01	36.28	54.00	-17.72	200	232	AVG
4	9602.000	32.55	14.87	47.42	74.00	-26.58	100	7	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4808.000	42.69	9.16	51.85	74.00	-22.15	100	184	peak
2	7205.000	43.73	12.01	55.74	74.00	-18.26	200	220	peak
3	7205.000	23.70	12.01	35.71	54.00	-18.29	200	220	AVG
4	9602.000	32.19	14.87	47.06	74.00	-26.94	200	0	peak

Mode:	BLE_2M	Channel:	2440
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4876.000	41.80	9.31	51.11	74.00	-22.89	100	54	peak
2	7324.000	42.36	12.20	54.56	74.00	-19.44	100	263	peak
3	7324.000	24.78	12.20	36.98	54.00	-17.02	100	263	AVG
4	9755.000	32.37	14.75	47.12	74.00	-26.88	100	13	peak

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4791.000	42.74	9.12	51.86	74.00	-22.14	100	188	peak
2	7205.000	44.45	12.01	56.46	74.00	-17.54	200	219	peak
3	7205.000	23.84	12.01	35.85	54.00	-18.15	200	219	AVG
4	9602.000	32.47	14.87	47.34	74.00	-26.66	200	2	peak

Mode:	BLE_2M	Channel:	2480
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4961.000	41.61	9.51	51.12	74.00	-22.88	100	49	peak
2	7443.000	39.77	12.35	52.12	74.00	-21.88	100	231	peak
3	9925.000	32.81	14.61	47.42	74.00	-26.58	100	337	peak
4	12407.000	31.67	18.11	49.78	74.00	-24.22	200	46	peak

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4961.000	46.29	9.51	55.80	74.00	-18.20	100	240	peak
2	4961.000	17.34	9.51	26.85	54.00	-27.15	100	240	AVG
3	7443.000	43.09	12.35	55.44	74.00	-18.56	100	225	peak
4	7443.000	13.36	12.35	25.71	54.00	-28.29	100	225	AVG

Mode:	BLE_125kbps	Channel:	2402
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	40.99	9.12	50.11	74.00	-23.89	100	234	peak
2	7205.000	42.17	12.01	54.18	74.00	-19.82	100	260	peak
3	7205.000	24.01	12.01	36.02	54.00	-17.98	100	260	AVG
4	12016.000	33.91	17.08	50.99	74.00	-23.01	200	18	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	42.11	9.12	51.23	74.00	-22.77	100	189	peak
2	7205.000	43.35	12.01	55.36	74.00	-18.64	100	255	peak
3	7205.000	21.28	12.01	33.29	54.00	-20.71	100	255	AVG
4	9602.000	33.16	14.87	48.03	74.00	-25.97	200	0	peak

Mode:	BLE_125kbps	Channel:	2440
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4876.000	41.35	9.31	50.66	74.00	-23.34	100	48	peak
2	7324.000	44.15	12.20	56.35	74.00	-17.65	100	233	peak
3	7324.000	26.39	12.20	38.59	54.00	-15.41	100	233	AVG
4	9755.000	33.08	14.75	47.83	74.00	-26.17	200	15	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	3992.000	45.15	7.83	52.98	74.00	-21.02	100	203	peak
2	7324.000	43.33	12.20	55.53	74.00	-18.47	100	221	peak
3	7324.000	22.65	12.20	34.85	54.00	-19.15	100	221	AVG
4	9755.000	33.07	14.75	47.82	74.00	-26.18	197	360	peak

Mode:	BLE_125kbps	Channel:	2480
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4961.000	40.40	9.51	49.91	74.00	-24.09	200	84	peak
2	7443.000	39.33	12.35	51.68	74.00	-22.32	200	243	peak
3	9925.000	32.65	14.61	47.26	74.00	-26.74	200	55	peak
4	12407.000	31.39	18.11	49.50	74.00	-24.50	200	11	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2819.000	39.75	4.34	44.09	74.00	-29.91	179	360	peak
2	3992.000	42.39	7.83	50.22	74.00	-23.78	200	39	peak
3	4961.000	43.10	9.51	52.61	74.00	-21.39	100	253	peak
4	7443.000	40.85	12.35	53.20	74.00	-20.80	100	221	peak

Mode:	BLE_500kbps	Channel:	2402
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4808.000	38.82	9.16	47.98	74.00	-26.02	200	63	peak
2	7205.000	42.46	12.01	54.47	74.00	-19.53	100	261	peak
3	7205.000	25.20	12.01	37.21	54.00	-16.79	100	261	AVG
4	12016.000	30.37	17.08	47.45	74.00	-26.55	200	128	peak

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	42.52	9.12	51.64	74.00	-22.36	100	174	peak
2	7205.000	44.16	12.01	56.17	74.00	-17.83	100	256	peak
3	7205.000	23.47	12.01	35.48	54.00	-18.52	100	256	AVG
4	12016.000	32.25	17.08	49.33	74.00	-24.67	123	360	peak

Mode:	BLE_500kbps	Channel:	2440
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4876.000	42.57	9.31	51.88	74.00	-22.12	200	59	peak
2	7324.000	40.47	12.20	52.67	74.00	-21.33	100	239	peak
3	9755.000	32.27	14.75	47.02	74.00	-26.98	200	237	peak
4	12203.000	30.48	17.63	48.11	74.00	-25.89	200	126	peak

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	3975.000	42.06	7.75	49.81	74.00	-24.19	100	228	peak
2	4978.000	42.93	9.55	52.48	74.00	-21.52	100	345	peak
3	7324.000	43.01	12.20	55.21	74.00	-18.79	200	218	peak
4	7324.000	23.76	12.20	35.96	54.00	-18.04	200	218	AVG

Mode:	BLE_500kbps	Channel:	2480
Test model No.:	HJT53B Ble		

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4961.000	40.26	9.51	49.77	74.00	-24.23	200	14	peak
2	7443.000	39.85	12.35	52.20	74.00	-21.80	200	238	peak
3	9925.000	32.69	14.61	47.30	74.00	-26.70	200	65	peak
4	12407.000	30.94	18.11	49.05	74.00	-24.95	200	131	peak

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	3992.000	44.26	7.83	52.09	74.00	-21.91	100	209	peak
2	4961.000	43.77	9.51	53.28	74.00	-20.72	100	256	peak
3	7443.000	40.55	12.35	52.90	74.00	-21.10	100	223	peak
4	9925.000	35.14	14.61	49.75	74.00	-24.25	154	360	peak

Note:

1) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak values are measured:

2) The field strength is calculated by adding the correct Factor. The basic equation with a sample calculation is as follows:

Final Test Level = Reading + Correct Factor

Correct Factor = Preamplifier Factor – Antenna Factor – Cable Factor

3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.