

Report No.: SUCR250500040202

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### **TEST REPORT**

**Application No.:** SUCR2505000402IT

Applicant: Shanghai Sunmi Technology Co.,Ltd.

**Address of Applicant:** Room 505, No. 388, Song Hu Road, Yang Pu District, Shanghai, China

Shanghai Sunmi Technology Co.,Ltd. Manufacturer:

Room 505, No. 388, Song Hu Road, Yang Pu District, Shanghai, China Address of Manufacturer:

**EUT Description:** Wireless Data Terminal

Model No.: TF41A Trade Mark: **SUNMI** 

FCC ID: 2AH25M3W

Standards: FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

June 16, 2025 **Date of Receipt:** 

**Date of Test:** June 17, 2025 to June 20, 2025

Date of Issue: June 24, 2025

Test Result: PASS \*

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Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Wireless Laboratory

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In the configuration tested, the EUT detailed in this report complied with the standards specified



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### Version

Revision Record							
Version Description Date Remark							
01	Original	June 24, 2025	/				

Authorized for issue by:		
Tested By	Hayley Zhang	
	Hayley ZhangProject Manager	
Approved By	Cloud Peng	
	Cloud Peng/Technical Manager	



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1 Test Summary

Test Item	FCC Rule No.	Test Method	Test Result	Result
Antenna Requirement	15.203/15.247(b)		Clause 3.1	Reference report SUCR250100002402
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013 Section 6.2	Clause 3.2	PASS
Duty cycle		ANSI C63.10 2013 Section 11.6	Clause 3.3	
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013 Section11.9.1.3	Clause 3.4	
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013 Section 11.8 Option 2 / 6.9.3	Clause 3.5	Reference report
Power Spectral Density	15.247 (e)	ANSI C63.10 2013 Section 11.10.2	Clause 3.6	50CR250100002402
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013 Section 11.13.3	Clause 3.7	
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013 Section 11.11	Clause 3.8	
Radiated Spurious Emissions	15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 3.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.205/15.209	ANSI C63.10 2013 Section 11.12	Clause 3.10	PASS

#### Remark:

This test report (Report No.: SUCR250500040202 issue on 2025/06/24) is based on the original test report (Report No.: SUCR250100002401 issue on 2025/05/27).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only the ac power line conducted emission and radiated spurious emissions based on the worst case of the original report with report number SUCR250100002401 issue on 2025/05/27, other test data in this report are based on the previous report with report number SUCR250100002401 issue on 2025/05/27.



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#### 2 General Information

#### 2.1 Details of Client

Applicant: Shanghai Sunmi Technology Co.,Ltd.	
Address of Applicant: Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,C	
Manufacturer:	Shanghai Sunmi Technology Co.,Ltd.
Address of Manufacturer:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China

#### 2.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.			
Address:  South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park Area, China (Jiangsu) Pilot Free Trade Zone				
Post code:	215000			
Test engineer:	Ives Cheng, King-p Li			

#### 2.3 Test Facility

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

• A2LA (Certificate No. 6336.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• Innovation, Science and Economic Development Canada

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• FCC -Designation Number: CN1312

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an

accredited testing laboratory. Designation Number: CN1312.

Test Firm Registration Number: 717327



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### 2.4 General Description of EUT

Hardware Version:	V1.2					
Software Version:	T602AA_EVT_14.0_SUNMI_202503131820.00-00					
Power Supply:	3.87V from battery					
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 2 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 0 to 39.					
Bluetooth version:	Bluetooth V5.3					
Modulation Type:	GFSK					
Number of Channel:	40					
Datas Turat	⊠Provided by client					
Rates Type*:	1M PHY 2M PHY					
Antenna Type:	FPC Antenna					
	2.64dBi					
Antenna Gain:	Note: The antenna gain are derived from the gain information report provided by the manufacturer.					
RF Cable:	1dB					
Remark:						
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy,						

As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy suitability, reliability or/and integrity of the information.



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Operation Frequency of each channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

#### Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency					
BLE 1M:						
The Lowest channel(CH0)	2402MHz					
The Middle channel(CH19)	2440MHz					
The Highest channel(CH39)	2480MHz					
BLE 2	2M:					
The Lowest channel(CH1)	2404MHz					
The Middle channel(CH19)	2440MHz					
The Highest channel(CH38)	2478MHz					



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#### 2.5 Test Environment

Environment Parameter	101 kPa Selected Values During Tests				
Relative Humidity	44-46 % RH Ambient				
Value	Temperature(℃) Voltage(V)				
NTNV	22~23	3.87			
Remark:					

NV: Normal Voltage NT: Normal Temperature

### 2.6 Description of Support Units

The EUT has been tested as an independent unit.



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### 3 Equipment List

<u> </u>	Equipment					
Cond	ducted Emission at Main	s Terminals				
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
2	LISN	R&S	ENV216	SUWI-01-19-03	5/8/2025	5/7/2026
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	5/8/2025	5/7/2026
6	Test Software	Tonscend	JS32- CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
RF C	onducted Test					
1	Shielding Room	Brilliant-emc	N/A	SUWI-04-08-01	11/9/2022	11/8/2025
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	5/8/2025	5/7/2026
9	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-15	11/21/2024	11/20/2025
7	MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	1/15/2025	1/14/2026
8	Signal Generator	ROHDE&SCHWARZ	SMW200A	SUWI-01-07-08	3/27/2025	3/26/2026
10	MXG Vector Signal Generator	ROHDE&SCHWARZ	SMR20	SUWI-01-33-01	3/17/2025	3/16/2026
3	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-13	5/8/2025	5/7/2026
11	Wideband Radio Communication Test Ststion	Anritsu	MT8000A	SUWI-01-34-02	11/19/2024	11/18/2025
12	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/19/2024	11/18/2025
5	Power meter	Anritsu	ML2495A	SUWI-01-31-01	11/19/2024	11/18/2025
6	Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	11/19/2024	11/18/2025
4	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/15/2025	1/14/2026
13	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2/13/2025	2/12/2026
14	Temperature Chamber	GIANT FORCE	ICT-017-40- SP-SD	SUWI-01-13-02	5/7/2025	5/6/2026
15	Measurement Software	TST	TST 272 V2.0	SUWI-03-55-03	NCR	NCR
RF R	adiated Test					
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	6/3/2023	6/2/2026
4	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	1/20/2025	1/19/2026
5	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	11/21/2024	11/20/2025
6	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	1/15/2025	1/14/2026
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	8/22/2024	8/21/2026
9	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	5/7/2025	5/6/2027
10	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/7/2025	5/6/2027
11	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/7/2025	5/6/2027



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12	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	1/16/2025	1/15/2026
13	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	1/16/2025	1/15/2026
14	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	1/20/2025	1/19/2026
15	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	5/8/2025	5/7/2026
16	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/19/2024	11/18/2025
17	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	5/8/2025	5/7/2026
18	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	11/19/2024	11/18/2025
3	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	1/16/2025	1/15/2026
7	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/15/2025	1/14/2026
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2/13/2025	2/12/2026
19	Measurement Software	Tonscend	JS32-RSE 4.0.0.1	SUWI-02-09-06	NCR	NCR

Remark: NCR=No Calibration Requirement.



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### 4 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty				
1	Total RF power, conducted	±0.54dB				
2	RF power density, conducted	±1.03dB				
3	Spurious emissions, conducted	±0.54dB				
4	Radio Frequency	1%				
5	Duty Cycle	±0.37%				
6	Occupied Bandwidth	1%				
7	Conduction Emission	± 2.90dB (150kHz to 30MHz)				
		± 3.13dB (9k -30MHz)				
0	Dadiated Emission	± 4.8dB (30M -1GHz)				
8	Radiated Emission	± 4.8dB (1GHz to 18GHz)				
		± 4.80dB (Above 18GHz)				

#### Remark:

The U<sub>lab</sub> (lab Uncertainty) is less than U<sub>cispr/ETSI</sub> (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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#### 5 Test results and Measurement Data

#### 5.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(b)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna is FPC Antenna and no consideration of replacement. The best case gain of the antenna is 2.64dBi.

Note:

The antenna gain are derived from the gain information report provided by the manufacturer. Remark:

As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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#### 5.2 AC Power Line Conducted Emissions

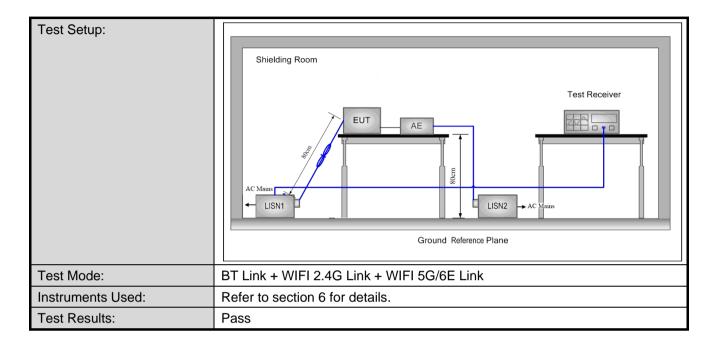
Test Requirement:	47 CFR Part 15C Section	า 15.207	
Test Method:	ANSI C63.10: 2013 Sect	ion 6.2	
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30	kHz	
Limit:	F	Limit (d	BuV)
	Frequency range(MHz)	Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the loga	arithm of the frequency.	
Test Procedure:	room.  2) The EUT was connect Impedance Stabilizati impedance. The power connected to a second plane in the same was multiple socket outlet single LISN provided.  3) The tabletop EUT was ground reference plane placed on the horizor.  4) The test was performed the EUT shall be 0.4 vertical ground reference plane. The unit under test and be mounted on top of the the closest points of the and associated equip.  5) In order to find the may and all of the interface.	ted to AC power source through ion Network) which provides a per cables of all other units of a the LISN 2, which was bonded by as the LISN 1 for the unit be strip was used to connect must the rating of the LISN was not a placed upon a non-metallic the ne. And for floor-standing arranged with a vertical ground referm from the vertical ground reference plane was bonded to the LISN 1 was placed 0.8 m from the LISN 1 was placed 0.8 m from the LISN 1 and the EUT. All of ment was at least 0.8 m from the LISN 1 and the EUT. All of ment was at least 0.8 m from the cast of the cast o	gh a LISN 1 (Line a 50Ω/50μH + 5Ω linear the EUT were to the ground reference eing measured. A altiple power cables to a of exceeded. Table 0.8m above the angement, the EUT was sence plane. The rear of ference plane. The horizontal ground m the boundary of the plane for LISNs is distance was between ther units of the EUT at the LISN 2.



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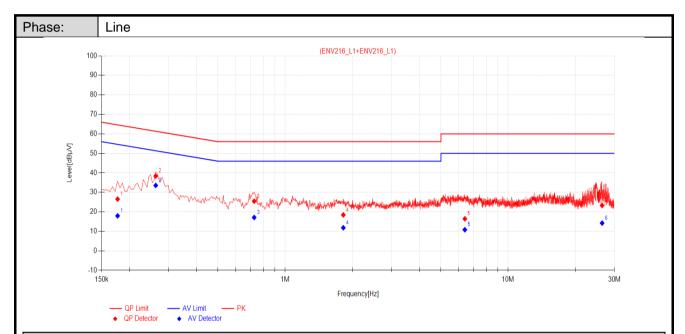
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#### Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



Final	Final Data List											
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict	
1	0.1770	10.08	16.47	26.55	64.63	38.08	7.86	17.94	54.63	36.69	PASS	
2	0.2625	10.07	28.31	38.38	61.35	22.97	23.48	33.55	51.35	17.80	PASS	
3	0.7260	10.06	15.40	25.46	56.00	30.54	7.05	17.11	46.00	28.89	PASS	
4	1.8240	9.85	8.58	18.43	56.00	37.57	1.98	11.83	46.00	34.17	PASS	
5	6.4005	9.81	6.61	16.42	60.00	43.58	1.01	10.82	50.00	39.18	PASS	
6	26.4390	9.64	13.65	23.29	60.00	36.71	4.58	14.22	50.00	35.78	PASS	

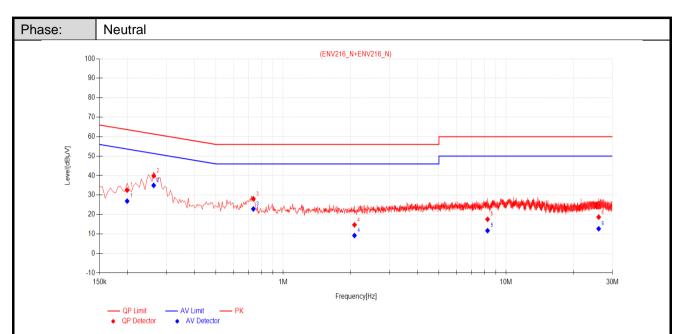
#### Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Value = Reading[dB $\mu$ V] + Factor(Lisn factor[dB] + cable loss[dB]).
- 3. Margin = Limit[dB $\mu$ V] Value[dB $\mu$ V]



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Final	Data List										
NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1995	10.08	22.42	32.50	63.63	31.13	16.80	26.88	53.63	26.75	PASS
2	0.2625	10.08	29.79	39.87	61.35	21.48	24.89	34.97	51.35	16.38	PASS
3	0.7350	10.06	17.97	28.03	56.00	27.97	12.79	22.85	46.00	23.15	PASS
4	2.0895	9.91	4.76	14.67	56.00	41.33	-0.73	9.18	46.00	36.82	PASS
5	8.2635	9.80	7.73	17.53	60.00	42.47	1.89	11.69	50.00	38.31	PASS
6	26.0520	9.65	9.03	18.68	60.00	41.32	3.02	12.67	50.00	37.33	PASS

#### Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Value =Reading[dB $\mu$ V] + Factor(Lisn factor[dB] + cable loss[dB]).
- 3. Margin = Limit[dBµV] Value[dBµV]



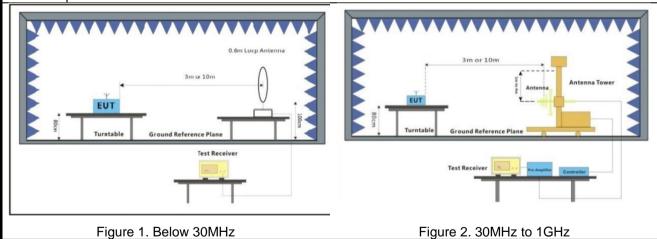
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### 5.3 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section	n 15.209 and 15.2	05					
Test Method:	ANSI C63.10 :2013 Sec	tion 11.12						
Test Site:	Measurement Distance:	3m (Semi-Anecho	ic Chamber)					
Test Frequency:	9kHz ~ 25GHz							
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/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			
	Remark: 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.							

#### Test Setup:





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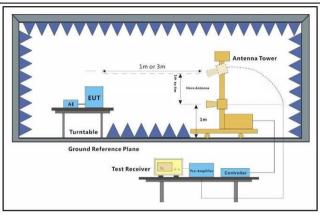


Figure 3. Above 1 GHz

#### Test Procedure:

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 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 (Distance from antenna to EUT is 1m for measurements >18GHz).
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. Test the EUT in the lowest channel, the middle channel ,the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.
- j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported
- k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.
- I. At a measurement distance of 1 meter the limit line was increased by 20\*LOG(3/1) = 9.54 dB.

#### **Test Configuration:**

Measurements below 30MHz

- RBW = 10 kHz
- VBW = 30 kHz
- Detector = Peak & Average & Quasi-peak
- Trace mode = max hold

Measurements Below 1000MHz

- RBW = 120 kHz
- VBW = 300 kHz



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	Detector = Quasi-peak						
	Trace mode = max hold						
	Peak Measurements Above 1000 MHz						
	• RBW = 1 MHz						
	• VBW ≥ 3 MHz						
	Detector = Peak						
	Sweep time = auto						
	Trace mode = max hold						
	Average Measurements Above 1000MHz						
	• RBW = 1 MHz						
	<ul> <li>VBW = 10 Hz, when duty cycle is no less than 98 percent.</li> </ul>						
	<ul> <li>VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum</li> </ul>						
	transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.						
Exploratory Test	Transmitting with GFSK modulation.						
Mode:	Charge + Transmitting mode.						
Final Test Mode:	Transmitting with GFSK modulation.						
	Pretest the EUT at Charge + Transmitting mode,						
	For below 1GHz part, through pre-scan all channels, but only the worst case is recorded in the report.						
Instruments Used:	Refer to section 6 for details						
Test Results:	Pass						
The detailed test data	see: Appendix						



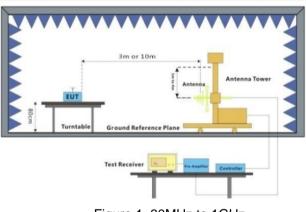
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#### 5.4 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15	5.209 and 15.205	
Test Method:	ANSI C63.10: 2013 Section	11.12	
Test Site:	Measurement Distance: 3m	(Semi-Anechoic Cham	ber)
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 10Uz	54.0	Average Value
	Above 1GHz	74.0	Peak Value

#### Test Setup:



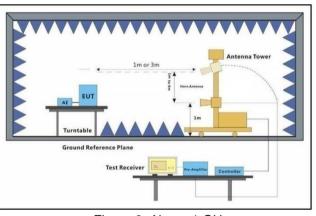


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz

#### Test Procedure:

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 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.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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



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	<ul> <li>h. Test the EUT in the lowest channel , the Highest channel</li> <li>i. 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.</li> <li>j. Repeat above procedures until all frequencies measured was complete.</li> </ul>
Test Configuration:	<ul> <li>Measurements Below 1000MHz</li> <li>RBW = 120 kHz</li> <li>VBW = 300 kHz</li> <li>Detector = Quasi-peak</li> <li>Trace mode = max hold</li> <li>Peak Measurements Above 1000 MHz</li> <li>RBW = 1 MHz</li> <li>VBW ≥ 3 MHz</li> <li>Detector = Peak</li> <li>Sweep time = auto</li> <li>Trace mode = max hold</li> <li>Average Measurements Above 1000MHz</li> <li>RBW = 1 MHz</li> <li>VBW = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>VBW ≥ 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.</li> </ul>
Exploratory Test Mode:	Transmitting with GFSK modulation. Charge + Transmitting mode.
Final Test Mode:	Transmitting with GFSK modulation.  Pretest the EUT at Charge + Transmitting mode.  Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see	e: Appendix



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### 6 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



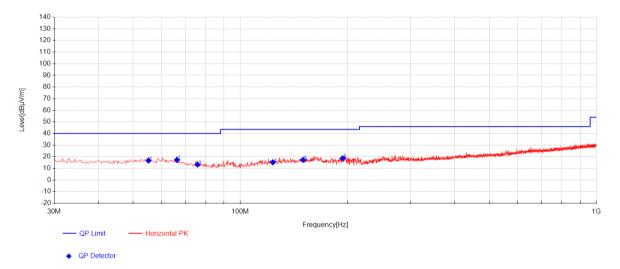
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### 7 Appendix

Radiated Spurious Emissions Radiated emission below 1GHz Worst case Mode:

**BLE 1M\_Channel 39** 

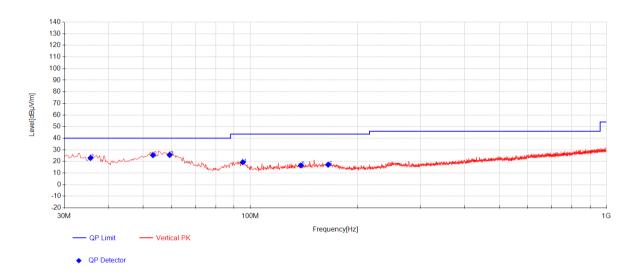


Final	Final Data List										
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	55.22	32.14	18.20	-33.62	16.72	40.00	23.28	169	18	Horizontal	
2	66.375	33.59	17.23	-33.47	17.35	40.00	22.65	234	166	Horizontal	
3	75.8325	31.41	15.25	-33.37	13.29	40.00	26.71	187	252	Horizontal	
4	123.3625	30.79	17.31	-32.89	15.21	43.50	28.29	252	267	Horizontal	
5	150.0375	30.92	19.10	-32.69	17.33	43.50	26.17	166	182	Horizontal	
6	193.6875	35.82	15.13	-32.30	18.65	43.50	24.85	178	283	Horizontal	



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Final	Final Data List										
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	35.5775	38.66	18.26	-33.94	22.98	40.00	17.02	155	194	Vertical	
2	53.28	40.86	18.17	-33.65	25.39	40.00	14.61	291	318	Vertical	
3	59.3425	41.54	17.57	-33.56	25.54	40.00	14.46	187	326	Vertical	
4	95.2325	38.13	14.35	-33.19	19.29	43.50	24.21	264	0	Vertical	
5	138.64	30.89	18.46	-32.78	16.58	43.50	26.92	122	78	Vertical	
6	165.315	30.79	18.87	-32.48	17.18	43.50	26.32	152	1	Vertical	

#### Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Value = Reading(dB $\mu$ V) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit( $dB\mu V/m$ ) – Value( $dB\mu V/m$ )

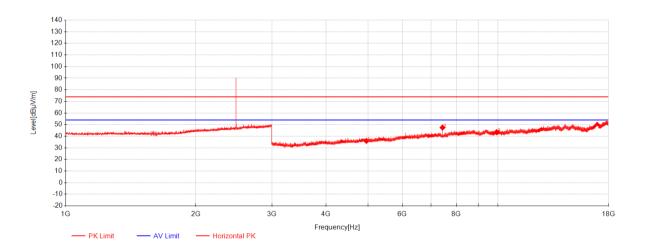
2) All channels have been tested, but only the worst case data displayed in this report.



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# Transmitter emission Above 1GHz BLE 1M\_Channel 39



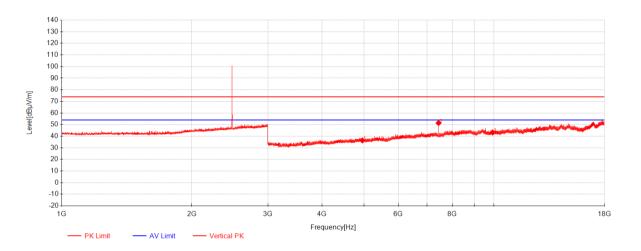
Data	Data List										
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity			
1	4960	44.21	33.11	-41.36	35.96	74.00	38.04	Horizontal			
2	7440	48.81	36.53	-37.85	47.49	74.00	26.51	Horizontal			
3	9920	38.13	37.88	-32.55	43.46	74.00	30.54	Horizontal			



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#### **BLE 1M\_Channel 39**



Data	Data List										
NO.	Frequency [MHz]	Reading [dΒμV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity			
1	4960	44.62	33.11	-41.36	36.37	74.00	37.63	Vertical			
2	7440	52.74	36.53	-37.85	51.42	74.00	22.58	Vertical			
3	9920	37.91	37.88	-32.55	43.24	74.00	30.76	Vertical			

#### Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading(dBµV) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit( $dB\mu V/m$ ) – Level( $dB\mu V/m$ )

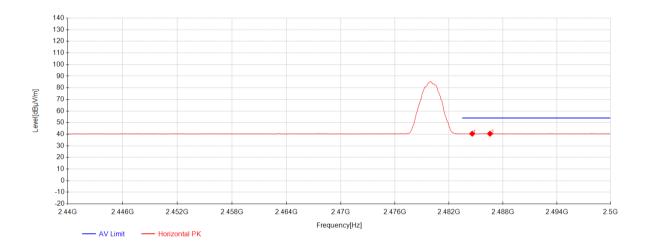
- 2) All channels have been tested, but only the worst case data displayed in this report.
- 3) Both peak and average measured complies with the limit line, so test result is "PASS"



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# Restricted bands around fundamental frequency BLE 1M\_Channel 39



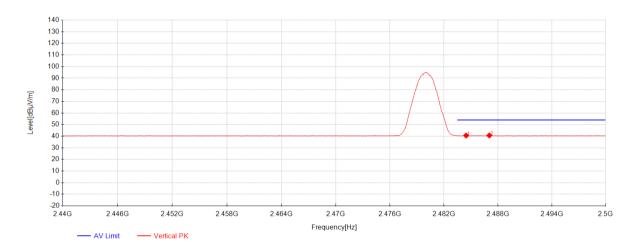
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.58	36.36	27.37	-23.27	40.46	54.00	13.54	Horizontal
2	2486.56	36.37	27.37	-23.27	40.47	54.00	13.53	Horizontal



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#### BLE 1M\_Channel 39



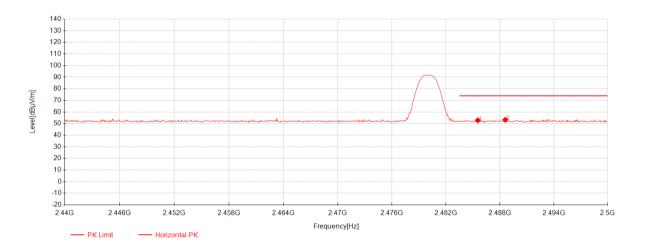
Data List									
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity	
1	2484.46	36.50	27.37	-23.27	40.60	54.00	13.40	Vertical	
2	2487.04	36.57	27.37	-23.27	40.67	54.00	13.33	Vertical	



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#### BLE 1M\_Channel 39



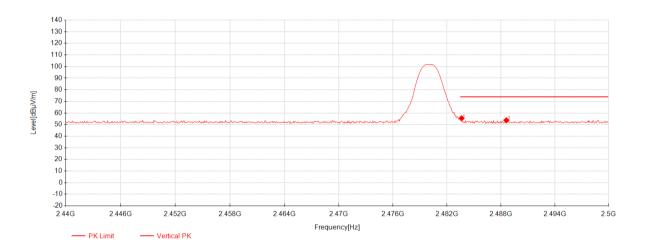
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2485.54	48.75	27.37	-23.27	52.85	74.00	21.15	Horizontal
2	2488.6	49.22	27.37	-23.27	53.33	74.00	20.67	Horizontal



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#### **BLE 1M\_Channel 39**



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.62	51.37	27.36	-23.27	55.46	74.00	18.54	Vertical
2	2488.6	49.62	27.37	-23.27	53.73	74.00	20.27	Vertical

#### Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:

Level = Reading( $dB\mu V$ ) + AF(dB/m) + Factor(dB):

AF = Antenna Factor(dB/m)

Factor = Cable Factor(dB) - Preamplifier gain(dB)

Margin = Limit( $dB\mu V/m$ ) – Level( $dB\mu V/m$ )

2) Both peak and average measured complies with the limit line, so test result is "PASS"

---End of Report---