TEST REPORT

Application No.:	SUCR2602000104TL
Applicant:	Shanghai Sunmi Technology Co.,Ltd.
Address of Applicant:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Manufacturer:	Shanghai Sunmi Technology Co.,Ltd.
Address of Manufacturer:	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
EUT Description:	Smart POS System
Model No.:	T670A
Trade Mark:	SUNMI
FCC ID:	2AH25T670A
Standards:	FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C
Date of Receipt:	2026-02-03
Date of Test:	2026-02-13 to 2026-02-28
Date of Issue:	2026-03-02
Test Result :	**PASS ***

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

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Revision Record			
Version	**Description**	***Date***	***Remark***
01	Original	2026-03-02	/

Authorized for issue by:				
Tested By		**Hayley Zhang/Project Engineer**		
Approved By		**Cedar Cheng /Reviewer**		

Contents

1 Test Summary 4
2 General Information 5
2.1 Test Location 5
2.2 Test Facility 5
2.3 General Description of EUT 6
2.4 Test Environment 8
2.5 Description of Support Units 8
3 Equipment List 9
4 Measurement Uncertainty (95% confidence levels, k=2) 10
5 Test results and Measurement Data 11
5.1 Antenna Requirement 11
5.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence . 12
5.3 AC Power Line Conducted Emissions 14
5.4 Radiated Spurious Emissions 18
5.5 Restricted bands around fundamental frequency 21
6 Photographs - Setup Photos 22
7 Appendix 23

1 Test Summary

Test Item	FCC Rule No.	Test Method	Result
Antenna Requirement	15.203/15.247(b)	--	PASS
AC Power Line Conducted Emission	15.207	ANSI C63.10-2020/Cor1-2023 Section 6.2	PASS
Radiated Spurious emissions	15.247(d); 15.205/15.209	ANSI C63.10-2020/Cor1-2023 Section 6.4 / 6.5 / 6.6	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d); 15.205/15.209	ANSI C63.10-2020/Cor1-2023 Section 7.8.8	PASS

Remark:

This test report (Report No.: SUCR260200010402 issue on 2026/03/02) is based on the original test report (Report No.: SUCR250300015102 issue on 2025/04/28) .
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, and only the worst mode data will be reflected in the report
Therefore in this report only AC Power Line Conducted Emission, Radiated Spurious emissions and Restricted bands around fundamental frequency were performed based on the worst case of the original report with report number SUCR250300015102 issue on 2025/04/28, and other test data in this report are refer to the previous report with report number SUCR250300015102 issue on 2025/04/28.

2 General Information

2.1 Test Location

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

2.2 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).

- **FCC (Designation Number: CN1312)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized as an accredited testing laboratory.

Test Firm Registration Number: 717327

- **ISED (CAB Identifier: CN0120)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 27594

2.3 General Description of EUT

Power Supply:	3.87V from battery
Operation Frequency:	2400MHz~2483.5MHz fc = 2402 MHz + N * 1 MHz, where: -fc = “Operating Frequency” in MHz, -N = “Channel Number” with the range from 0 to 78.
Bluetooth version:	Bluetooth V5.1
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Antenna Type:	Internal Antenna
Antenna Gain:	1.94dBi
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.
Remark: Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.	

Operation Frequency of each channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

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
The Lowest channel(CH0)	2402MHz
The Middle channel(CH39)	2441MHz
The Highest channel(CH78)	2480MHz

2.4 Test Environment

Environment Parameter	101.0 kPa Selected Values During Tests	
Relative Humidity	44~46 % RH Ambient	
Value	**Temperature(℃)**	**Voltage(V)**
NTNV	22~23	3.87V
Remark: NV: Normal Voltage NT: Normal Temperature		

2.5 Description of Support Units

The EUT has been tested as an independent unit.

3 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	2026/1/14	2027/1/13
2	LISN	R&S	ENV216	SUWI-01-19-03	2025/5/8	2026/5/7
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	2025/5/8	2026/5/7
4	Test Software	Tonscend	JS32-CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2023/6/3	2026/6/2
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2026/1/14	2027/1/13
3	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	2025/11/21	2026/11/20
4	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2026/1/14	2027/1/13
5	Signal Generator	ROHDE&SCHWARZ	SMW100A	SUWI-01-18-01	2026/1/14	2027/1/13
6	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	VULB 9168	SUWI-01-11-04	2025/9/10	2027/9/9
7	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2025/5/7	2027/5/6
8	Receiving antenna	SCHWRZBECK MESS-ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2025/5/7	2027/5/6
9	Active Loop Antenna	SCHWRZBECK MESS-ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2025/5/7	2027/5/6
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2026/1/14	2027/1/13
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2026/1/14	2027/1/13
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2026/1/14	2027/1/13
13	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	2025/11/21	2026/11/20
14	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	2025/8/25	2026/8/24
15	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	2025/8/26	2026/8/25
16	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	2025/11/21	2026/11/20
17	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	2026/1/14	2027/1/13
18	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	2026/1/14	2027/1/13
19	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2026/2/11	2027/2/10
20	Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-06	NCR	NCR
21	RF Control unit	Tonscend	JS0806-1	SUWI-02-20-01	NCR	NCR
22	RFCables	Tonscend	NA	SUWI-01-03-02	NCR	NCR

Remark: NCR=No Calibration Requirement.

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

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 2.90dB (150kHz to 30MHz)
2	Radiated Emission	± 3.13dB (9k -30MHz)
		± 4.80dB (30M -1GHz)
		± 4.80dB (1GHz to 18GHz)
		± 4.80dB (Above 18GHz)

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (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.

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 Internal Antenna on the main PIFA and no consideration of replacement. The best case gain of the antenna is 1.94dBi.

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.

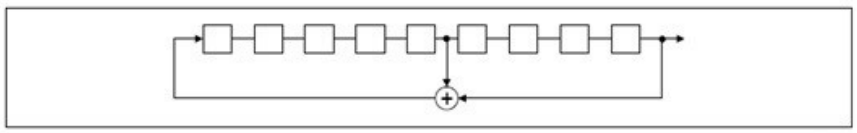
5.2 Other requirements Frequency Hopping Spread Spectrum System Hopping Sequence

5.2.1 Test Requirement:

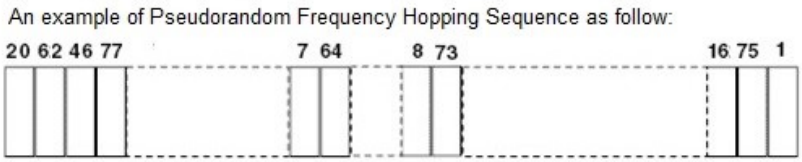
47 CFR Part 15, Subpart C 15.247(a)(1),(g),(h)

5.2.2 Conclusion

Standard Requirement:
The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.
The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.
Compliance for section 15.247(a)(1):
According to Technical Specification, the pseudo random sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.
> Number of shift register stages: 9
> Length of pseudo-random sequence: 29 -1 = 511 bits
> Longest sequence of zeros: 8 (non-inverted signal)
Linear Feedback Shift Register for Generation of the PRBS sequence
An example of Pseudorandom Frequency Hopping Sequence as follow:



Linear Feedback Shift Register for Generation of the PRBS sequence



Each frequency used equally on the average by each transmitter.
According to Technical Specification, the receivers are designed to have input and IF bandwidths that match the hopping channel bandwidths of any transmitters and shift frequencies in synchronization with the transmitted signals.
Compliance for section 15.247(g):
According to Technical Specification, the system transmits the packet with the pseudorandom hopping frequency with a continuous data and the short burst transmission from the RF system is also transmitted under the frequency hopping system with the pseudorandom hopping frequency system.

Compliance for section 15.247(h):
According to Technical specification, the system incorporates with an adaptive system to detect other user within the spectrum band so that it individually and independently to avoid hopping on the occupied channels. The system is designed not have the ability to coordinated with other FHSS System in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitter.

5.3 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207
Test Method:	ANSI C63.10-2020/Cor1-2023 Section 6.2
Test Frequency Range:	150kHz to 30MHz
Receiver Setup:	RBW = 9kHz, VBW = 30kHz

Limit:

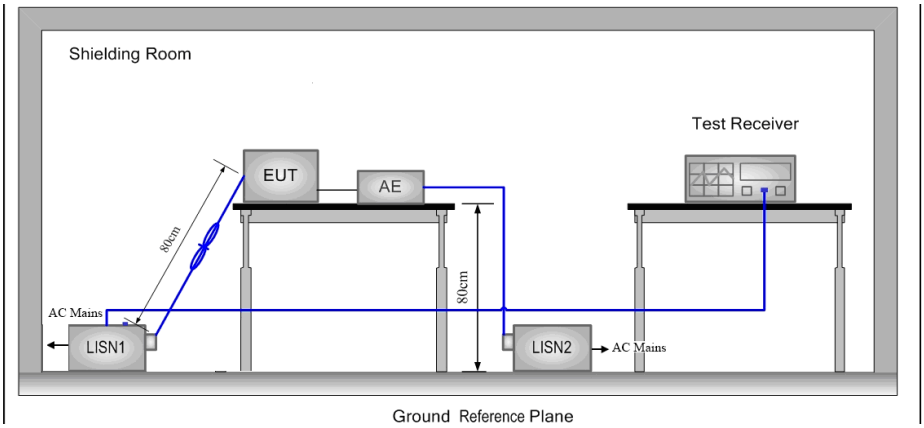
Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Procedure:

1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10-2020/Cor1-2023 on conducted measurement.

Test Setup:



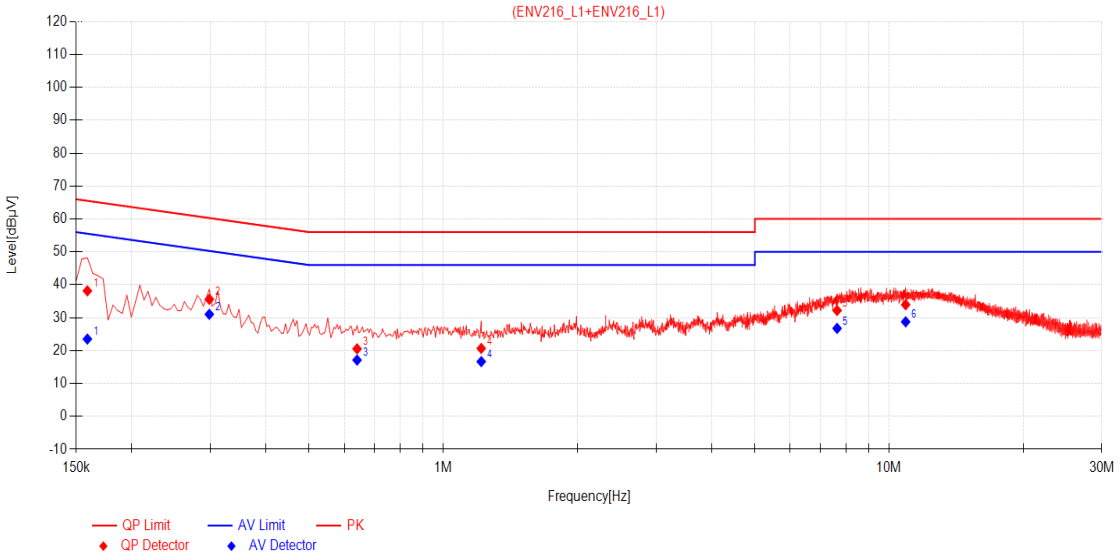
Test Mode: Non-hopping transmitting mode with all kind of modulation and all kind of data type at the lowest, middle, high channel.

	Adapter + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation at the lowest channel is the worst case. Adapter + Transmitting mode Only the worst case is recorded in the report.
Instruments Used:	Refer to section 3 for details.
Test Results:	Pass

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.

Phase:	Line

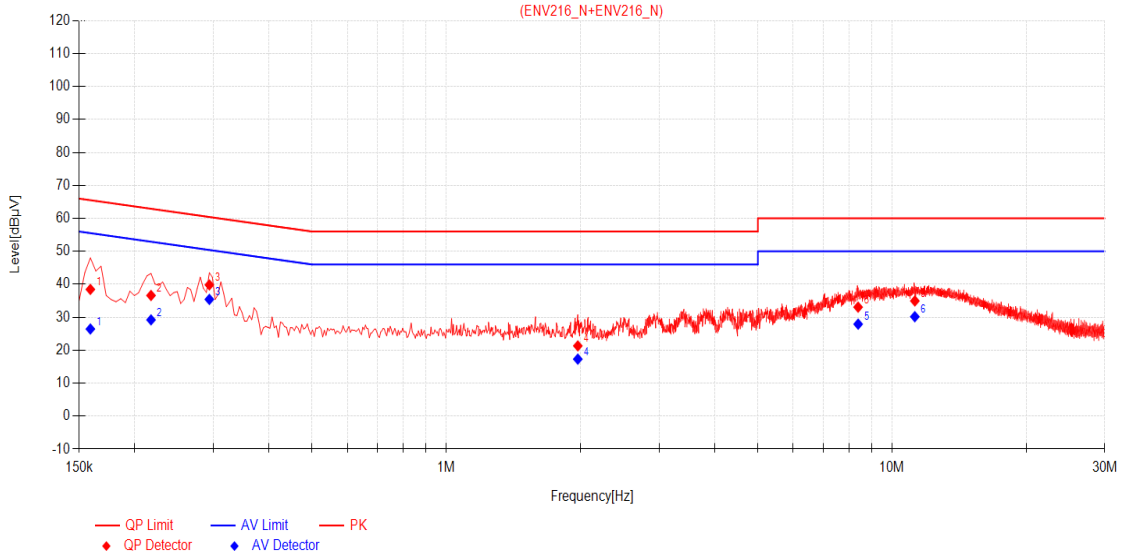


Final Data List

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	0.1590	9.96	28.19	38.15	65.52	27.37	13.54	23.50	55.52	32.02	PASS
2	0.2985	9.95	25.64	35.59	60.28	24.69	21.07	31.02	50.28	19.26	PASS
3	0.6405	9.94	10.59	20.53	56.00	35.47	7.17	17.11	46.00	28.89	PASS
4	1.2165	9.93	10.72	20.65	56.00	35.35	6.72	16.65	46.00	29.35	PASS
5	7.6470	10.36	21.83	32.19	60.00	27.81	16.38	26.74	50.00	23.26	PASS
6	10.8960	10.34	23.60	33.94	60.00	26.06	18.41	28.75	50.00	21.25	PASS

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

Phase:	Neutral



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	0.1590	9.96	28.49	38.45	65.52	27.07	16.48	26.44	55.52	29.08	PASS
2	0.2175	9.97	26.63	36.60	62.91	26.31	19.24	29.21	52.91	23.70	PASS
3	0.2940	9.96	29.85	39.81	60.41	20.60	25.46	35.42	50.41	14.99	PASS
4	1.9725	9.93	11.38	21.31	56.00	34.69	7.37	17.30	46.00	28.70	PASS
5	8.3940	10.38	22.69	33.07	60.00	26.93	17.53	27.91	50.00	22.09	PASS
6	11.2515	10.54	24.41	34.95	60.00	25.05	19.63	30.17	50.00	19.83	PASS

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

5.4 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10-2020/Cor1-2023 Section 6.4 / 6.5 / 6.6				
Test Site:	Measurement Distance: 3m (Semi-Anechoic 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:

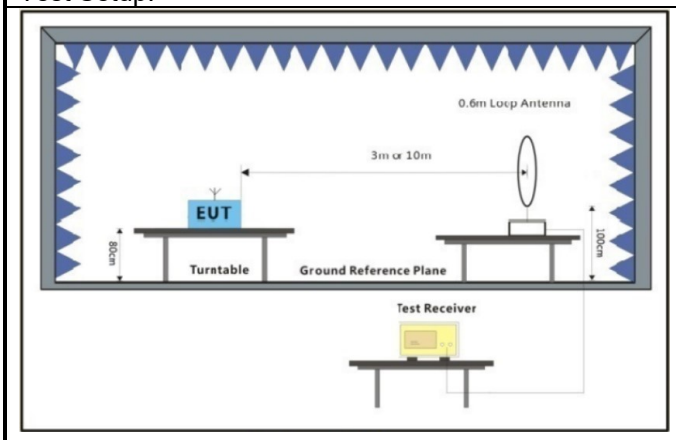


Figure 1. Below 30MHz

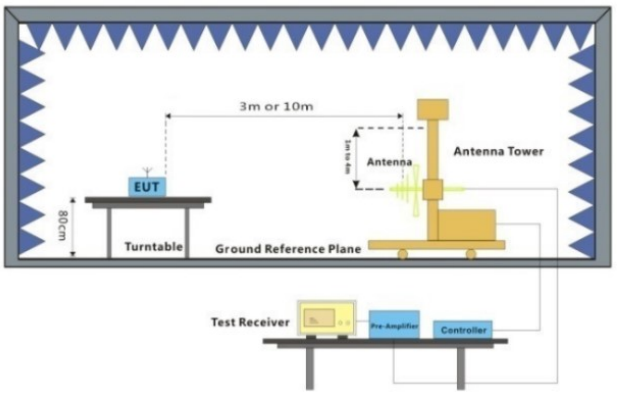


Figure 2. 30MHz to 1GHz

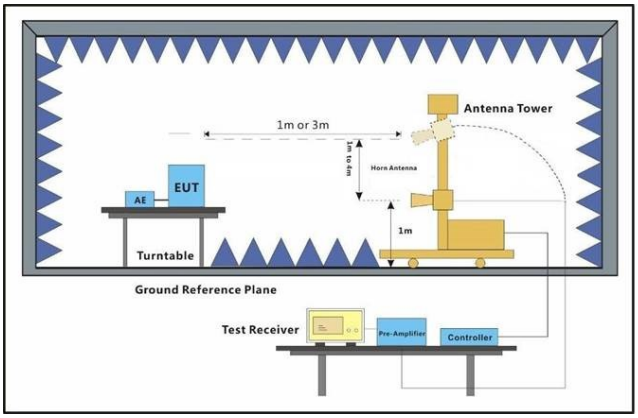


Figure 3. Above 1 GHz	
Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed 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 (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. l. 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 • 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 Use duty cycle correction factor method per 15.35(c). Duty cycle = On time / 100 milliseconds On time = $N_1*L_1 + N_2*L_2…+N_{N-1}*L_{N-1} + N_N*L_N$ Where N_1 is number of type 1 pulese, L_1 is length of type 1 pulses, etc. Average Value = Peak Value +20*log(Duty cycle).

Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Adapter + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case. Pretest the EUT at Adapter + 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 3 for details
Test Results:	Pass
The detailed test data see: **Appendix**	

5.5 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10-2020/Cor1-2023 Section 7.8.8		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
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 1GHz	54.0	Average Value
		74.0	Peak Value

Test Setup:

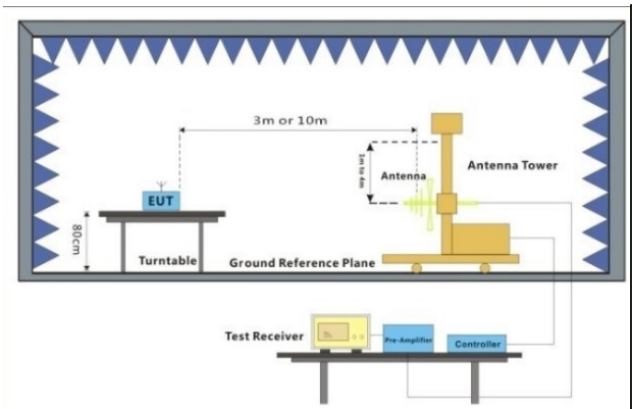


Figure 1. 30MHz to 1GHz

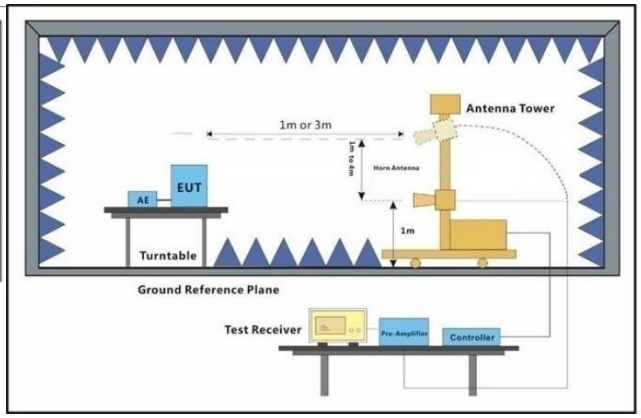


Figure 2. Above 1 GHz

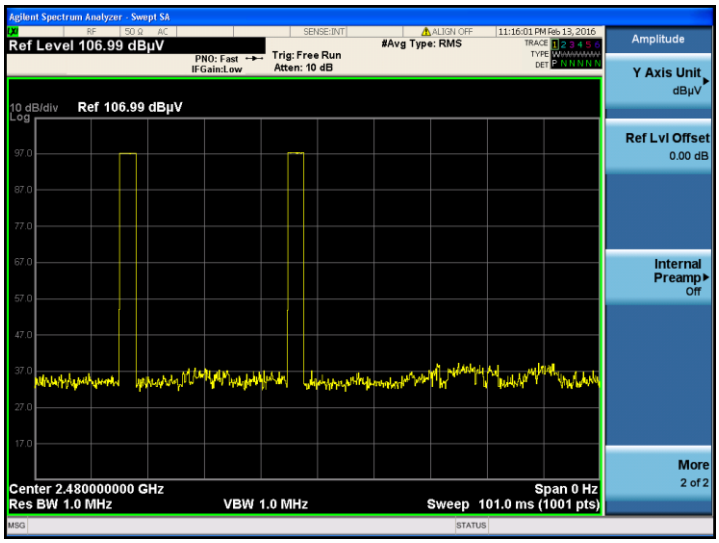
Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating 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. h. Test the EUT in the lowest channel , the Highest channel. 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. j. Repeat above procedures until all frequencies measured was complete.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • 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 Use duty cycle correction factor method per 15.35(c). Duty cycle = On time / 100 milliseconds On time = N_1*L_1 + N_2*L_2…+N_{N-1}*L_{N-1} + N_N*L_N Where N_1 is number of type 1 pulese, L_1 is length of type 1 pulses, etc. Average Value = Peak Value +20*log(Duty cycle).
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type Adapter + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the DH5 of data type and GFSK modulation is the worst case. Pretest the EUT at Adapter + Transmitting mode, Only the worst case is recorded in the report.
Instruments Used:	Refer to section 3 for details
Test Results:	Pass
The detailed test data see: **Appendix**	

6 Photographs - Setup Photos

Refer to Appendix_Photographs of Test Setup for SUCR2602000104TL.

7 Appendix



Count Pulses=2

Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	0.988	0.945	>=0.945	Pass
Pi/4DQPSK	SISO	HOPP	2DH5	1.001	1.305	>=0.87	Pass
8DPSK	SISO	HOPP	3DH5	1.001	1.313	>=0.875	Pass

Note:
Channel separation correction
DH5: Channel Separation <1MHz, Channel separation correction=1/0.988=1.012
2DH5: Channel Separation ≥1MHz, Channel separation correction=1
3DH5: Channel Separation ≥1MHz, Channel separation correction=1
Overlapping channel correction
DH5: Overlapping channel correction = 0, 20dB Bandwidth < Channel Separation
2DH5: Overlapping channel correction = 1, 20dB Bandwidth > Channel Separation
3DH5: Overlapping channel correction = 1, 20dB Bandwidth > Channel Separation

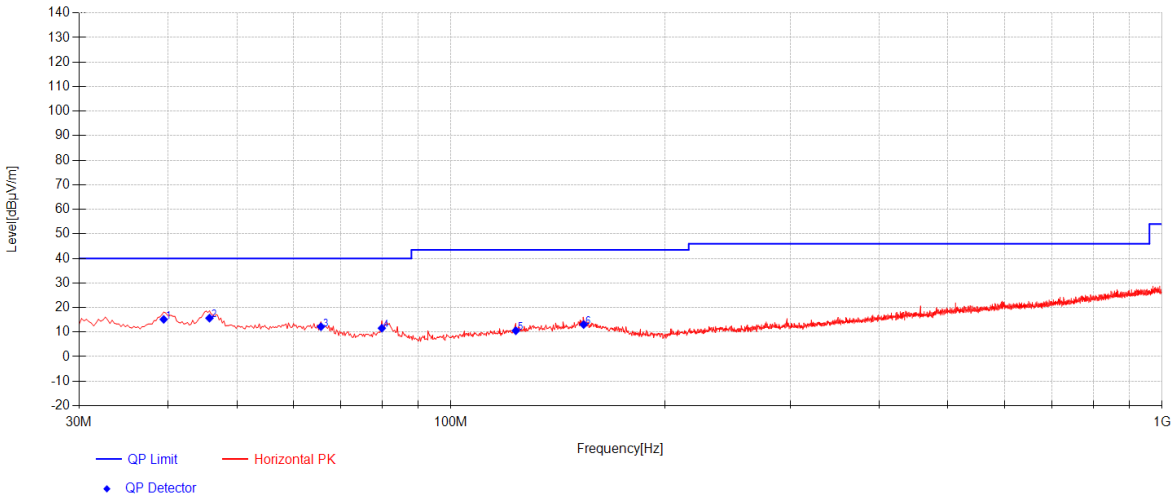
Test mode	Dwell time per 100 ms	Channel separation correction	Overlapping channel correction	Maximum dwell time
DH5	2*2.838	1.012	0	5.744
2DH5	2*2.838	1	1	11.352
3DH5	2*2.838	1	1	11.352

Note: Maximum dwell time per 1MHz= Dwell time per 100 ms per Channel*(Channel separation correction+ Overlapping channel correction)

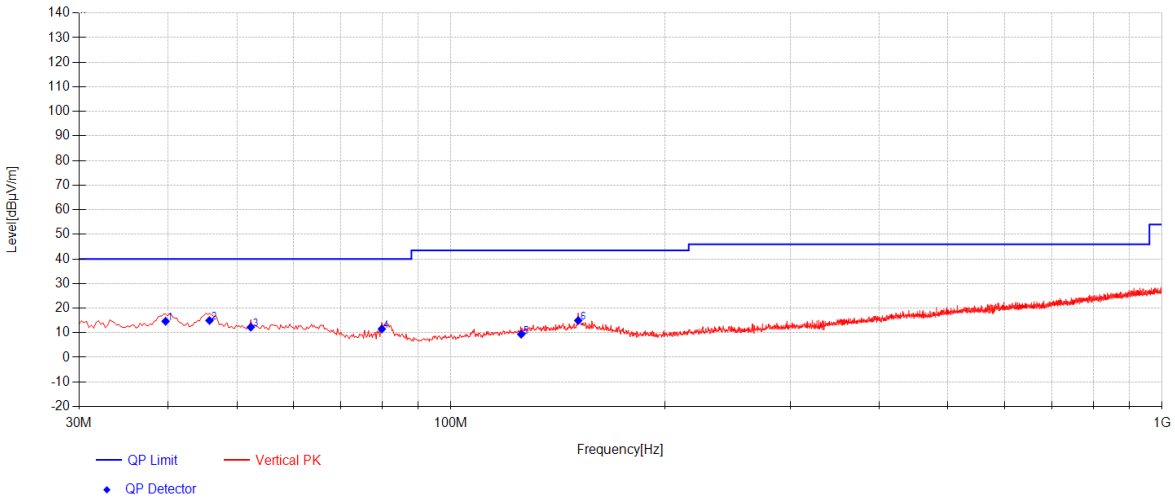
Test Mode	Correction Factor
DH5	-24.82
2DH5	-18.90
3DH5	-18.90

Correction Factor=20*log(Maximum dwell time in 100 ms/100)

Radiated Spurious Emissions
Radiated emission below 1GHz
Worst case Mode: GFSK _ Channel 78



Final Data List								
NO.	Frequency [MHz]]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	39.4575	44.55	-42.70	13.30	15.15	40.00	24.85	Horizontal
2	45.7625	45.02	-42.69	13.34	15.67	40.00	24.33	Horizontal
3	65.6475	43.42	-42.47	11.21	12.16	40.00	27.84	Horizontal
4	79.955	44.89	-42.44	9.11	11.56	40.00	28.44	Horizontal
5	123.3625	40.92	-41.90	11.52	10.54	43.50	32.96	Horizontal
6	153.675	41.86	-41.60	12.81	13.06	43.50	30.44	Horizontal



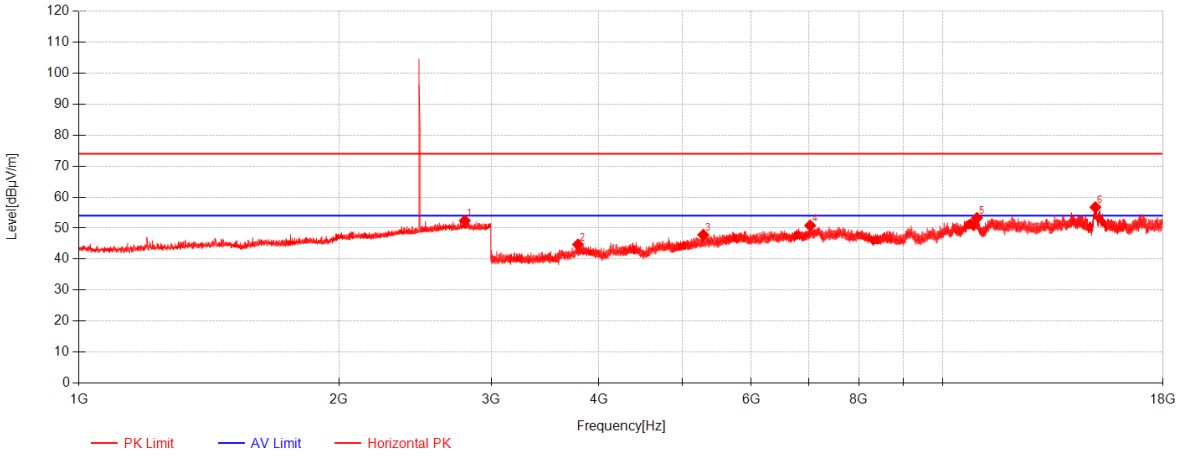
Final Data List								
NO.	Frequency [MHz]]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	39.7	43.99	-42.70	13.35	14.64	40.00	25.36	Vertical
2	45.7625	44.30	-42.69	13.34	14.95	40.00	25.05	Vertical
3	52.31	41.82	-42.65	13.09	12.26	40.00	27.74	Vertical
4	79.955	44.86	-42.44	9.11	11.53	40.00	28.47	Vertical
5	125.545	39.58	-41.85	11.66	9.39	43.50	34.11	Vertical
6	151.0075	43.79	-41.59	12.77	14.96	43.50	28.54	Vertical

Remark:

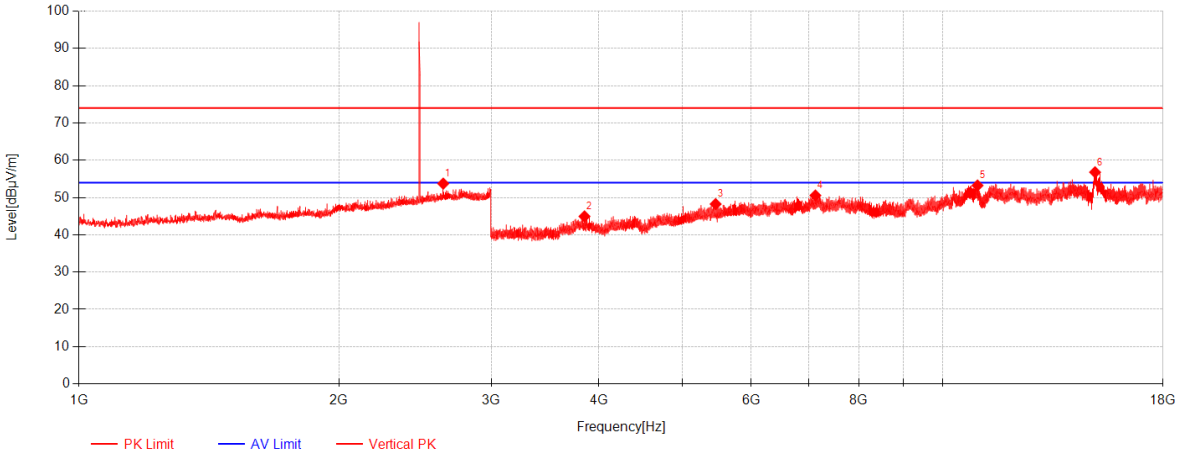
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:
   Level = Reading(dBµV) + AF(dB/m) + Factor(dB):
   AF = Antenna Factor(dB/m)
   Factor = Cable Factor(dB) - Preamplifier gain(dB)
   Margin = Limit(dBµV/m) – Level(dBµV/m)
2) All channels have been tested, but only the worst case data displayed in this report.

Transmitter emission Above 1GHz

GFSK_Channel 78



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2796.5	40.72	28.29	-16.59	52.42	74.00	21.58	Horizontal
-	-	-	-	-	27.60	54.00	26.40	-
2	3781.875	58.54	29.73	-43.56	44.71	74.00	29.29	Horizontal
-	-	-	-	-	19.89	54.00	34.11	-
3	5281.875	57.29	31.79	-41.25	47.83	74.00	26.17	Horizontal
-	-	-	-	-	23.01	54.00	30.99	-
4	7023.375	55.61	35.88	-40.66	50.83	74.00	23.17	Horizontal
-	-	-	-	-	26.01	54.00	27.99	-
5	10959.75	53.59	40.14	-40.47	53.26	74.00	20.74	Horizontal
-	-	-	-	-	28.44	54.00	25.56	-
6	15028.125	52.01	40.59	-35.86	56.74	74.00	17.26	Horizontal
-	-	-	-	-	31.92	54.00	22.08	-



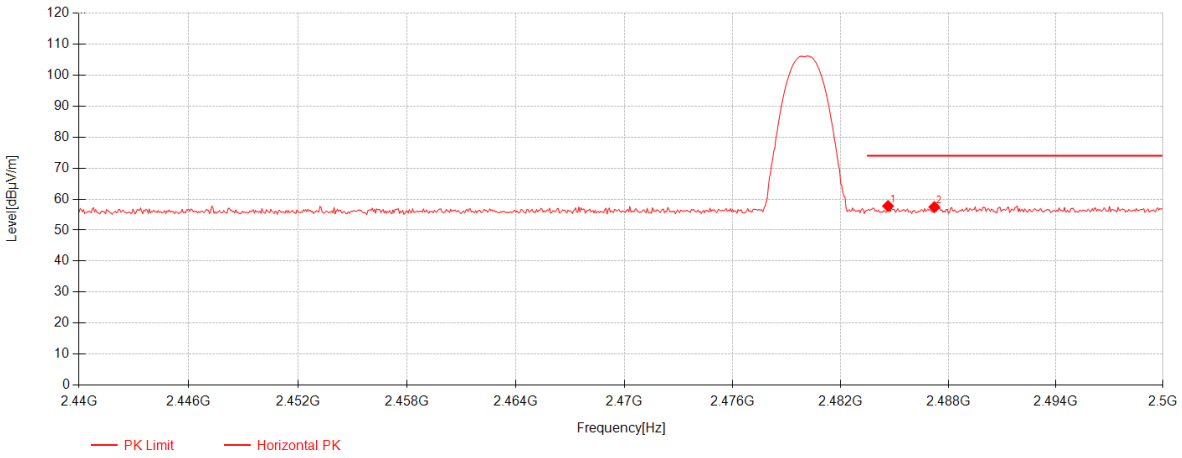
Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2640	43.09	27.90	-17.25	53.74	74.00	20.26	Vertical
-	-	-	-	-	28.92	54.00	25.08	-
2	3847.875	58.76	29.70	-43.51	44.95	74.00	29.05	Vertical
-	-	-	-	-	20.13	54.00	33.87	-
3	5459.25	56.91	32.24	-40.90	48.25	74.00	25.75	Vertical
-	-	-	-	-	23.43	54.00	30.57	-
4	7122.75	55.00	36.13	-40.57	50.56	74.00	23.44	Vertical
-	-	-	-	-	25.74	54.00	28.26	-
5	10975.125	53.55	40.12	-40.43	53.24	74.00	20.76	Vertical
-	-	-	-	-	28.42	54.00	25.58	-
6	15016.125	52.03	40.64	-35.87	56.80	74.00	17.20	Vertical
-	-	-	-	-	31.98	54.00	22.02	-

Remark:

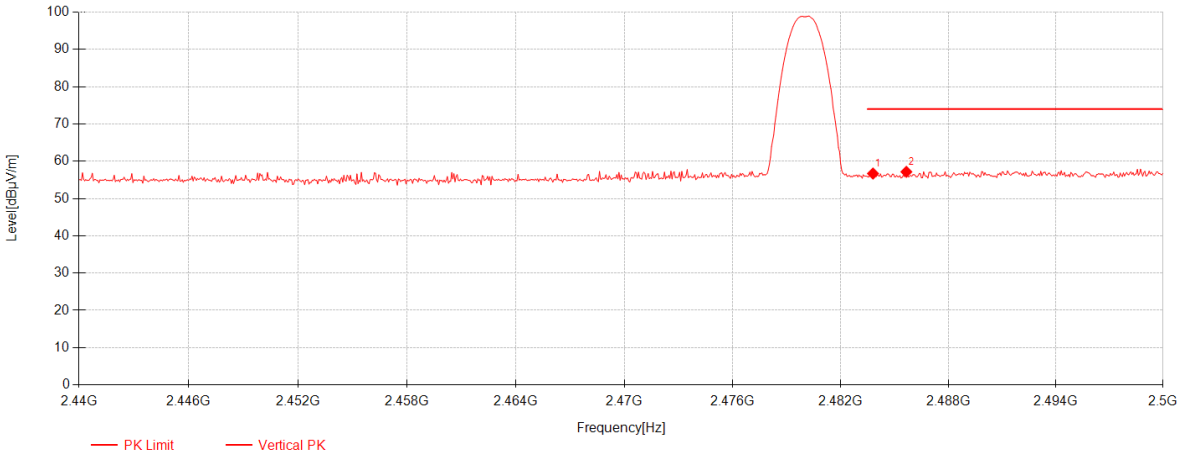
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier gain. The basic equation with a sample calculation is as follows:
   Level = Reading(dBµV) + AF(dB/m) + Factor(dB):
   AF = Antenna Factor(dB/m)
   Factor = Cable Factor(dB) - Preamplifier gain(dB)
   Margin = Limit(dBµV/m) – Level(dBµV/m)
2) All channels have been tested, but only the worst case data displayed in this report.

Restricted bands around fundamental frequency

GFSK_Channel 78



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.64	47.58	27.74	-17.55	57.77	74.00	16.23	Horizontal
-	-	-	-	-	32.95	54.00	21.05	-
2	2487.22	47.24	27.75	-17.55	57.44	74.00	16.56	Horizontal
-	-	-	-	-	32.62	54.00	21.38	-



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.8	46.52	27.74	-17.55	56.71	74.00	17.29	Vertical
-	-	-	-	-	31.89	54.00	22.11	-
2	2485.66	46.98	27.74	-17.55	57.17	74.00	16.83	Vertical
-	-	-	-	-	32.35	54.00	21.65	-

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(dBµV/m) – Level(dBµV/m)

--- End of Report---