

Page 1 of 49

Report No.: HK2412107614-E

FCC Test Report

Test Report On Behalf of Shenzhen Kuangxiang Technology Co.,Ltd. For BLUETOOTH SPEAKER WHITE NOISE Model No.: K6S

FCC ID: 2BL9Y-K6S

Prepared For:

Shenzhen Kuangxiang Technology Co.,Ltd.

807, No. 51 Pingxin North Road, Shangmugu, Community, Pinghu Street, Longgang District, ShenzhenCity, Guangdong Province, China

Prepared By:

Shenzhen HUAK Testing Technology Co., Ltd. 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

 Date of Test:
 Dec. 10, 2024 ~ Mar. 19, 2025

 Date of Report:
 Mar. 19, 2025

 Report Number:
 HK2412107614-E

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Report No.: HK2412107614-E

Test Result Certification

Applicant's Name.....

Address

Manufacturer's Name:

Address :

Shenzhen Kuangxiang Technology Co.,Ltd.

807, No. 51 Pingxin North Road, Shangmugu, Community, Pinghu Street, Longgang District, ShenzhenCity, Guangdong Province, China

Shenzhen Semetor Electronics Co.,Ltd.

8th/9th Floor, Hongwei Technology Building, Building B, No. 2 Weiling Road, Egongling Community, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China

Product Description

Trade Mark	N/A what the man the m	
Product Name:	BLUETOOTH SPEAKER WHITE NOISE	
Model and/or Type Reference	: K6S	
Standards	47 CER ECC Part 15 Subpart C 15 247	

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Date of Test	
Date (s) of Performance of Tests	Dec. 10, 2024 ~ Mar. 19, 2025
Date of Issue	Mar. 19, 2025
Test Result	Pass

Testing Engineer

Len Liao

Technical Manager

Sliver Wan

Authorized Signatory

ason Mou

Jason Zhou

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Mar. 19, 2025	Jason Zhou
WTESTING WTE	The KTESTIC	TESTIN.	K TESTIN
HUM	HUM	HUM	HUM

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1. Summary

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

1.2. Test Description

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.215	20dB Bandwidth& 99% Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247 (a) (1)	Pseudorandom Frequency Hopping Sequence	PASS
FCC Part 15.247(a)(1)(iii)	Number of Hopping Frequency& Time of Occupancy	PASS
FCC Part 15.247(a)(1)	Frequency Separation	PASS
FCC Part 15.205/15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge Compliance of RF Emission	PASS

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1.3. Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd. Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization :

A2LA Accreditation Code is 4781.01. FCC Designation Number is CN1229. Canada IC CAB identifier is CN0045. CNAS Registration Number is L9589.

1.4. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen HUAK Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for HUAK laboratory is reported:

Test	Measurement Uncertainty	Notes	
Transmitter power conducted	±0.37dB	(1)	
Transmitter power Radiated	±3.35dB	(1)	
Conducted spurious emission 9KHz-40 GHz	±2.20dB	(1)	
Occupied Bandwidth	±3.68%	(1)	
Radiated Emission 30~1000MHz	±3.90dB	(1)	
Radiated Emission Above 1GHz	±4.28dB	(1)	
Conducted Disturbance0.15~30MHz	±2.71dB	(1)	

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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2. General Information

2.1. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

	The			
HUAK	Normal Temperature:	HUAK HUAK	25°C	HUAK
8	Relative Humidity:		55 %	
TING	Air Pressure:	à	101 kPa	

2.2. General Description of EUT

Product Name:	BLUETOOTH SPEAKER WHITE NO	DISE
Model/Type Reference:	K6S	STING TESTING
Series Model:	N/A N/A	C HUAK IL OHUAN
Model Difference:	N/A	<u> </u>
Power Supply:	DC5V from Type-C or DC3.7V from I	battery
Version:	Supported EDR	HUNKTE
Modulation:	GFSK, π/4DQPSK	-11/6
Operation Frequency:	2402MHz~2480MHz	HUANTES
Channel Number:	79	O HURL
Channel Separation:	1MHz	TESTING
Antenna Type:	PCB Antenna	TESTING ALTESTING
Antenna Gain:	-0.58dBi	O HUMA
Hardware Version:	V1.0	
Software Version:	V1.0	TESTING
Noto:	Upr	War-

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Antenna gain Refer to the antenna specifications.

3. The cable loss data is obtained from the supplier.

4. The test results in the report only apply to the tested sample.

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2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

There are 79 channels provided to the EUT and Channel 00/39/78 was selected for testing.

Operation Frequency:

NG	Channel	-olG	F	requency (MHz)	
	00			2402	
HUAKIL	01	HUDA	w O	2403	HUAKIC
	:	STING		STING :	
TOG	38	Dim	-TING HUAN	2440	STING ()
	39			2441	
	40			2442	
	÷			÷	
AKTESTING	77	NK TESTING	NK TESTING	2479	AKTESTING
	78			2480	

Note: The line display in grey were the channel selected for testing

Preliminary tests were performed in each mode and packet length of BT, and found worst case as bellow, finally test were conducted at those mode and recorded in this report.

Test Items	Worst Case		
Conducted Emissions	Charging mode		
Radiated Emissions and Band Edge	DH5 low channel		
Maximum Conducted Output Power	DH5/2DH5		
20dB Bandwidth & 99% Bandwidth	DH5/2DH5		
Frequency Separation	DH5/2DH5 Middle channel		
Number of hopping frequency	DH5/2DH5		
Time of Occupancy (Dwell Time)	DH1/DH3/DH5 Middle channel 2DH1/2DH3/2DH5 Middle channel		
Out-of-band Emissions	DH5/2DH5		

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2.4. Equipments Used during the Test

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Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interva
K TI.TOV	L.I.S.N.	R&S	ENV216	HKE-002	2024/02/20	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2024/02/20	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2024/02/20	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2024/02/20	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2024/02/20	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2024/02/20	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2024/02/20	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2024/02/20	1 Year
9	6dB Attenuator	Pasternack	6db	HKE-184	2024/02/20	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2024/02/20	1 Year
11	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2024/02/21	2 Year
12	Loop Antenna	COM-POWER	AL-130R	HKE-014	2024/02/21	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	9	/
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	TESTING /	esting (
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/10	1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/10	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	, 🔍	/
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2024/02/20	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	STING /	X TESTING

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Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interva
1.	L.I.S.N.	R&S	ENV216	HKE-002	2025/02/19	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2025/02/19	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2025/02/19	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2025/02/19	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2025/02/19	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2025/02/19	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2025/02/19	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2025/02/19	1 Year
9	6dB Attenuator	Pasternack	6db	HKE-184	2025/02/19	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2025/02/19	1 Year
11.00	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2025/02/19	2 Year
12	Loop Antenna	COM-POWER	AL-130R	HKE-014	2025/02/19	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2025/02/19	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/ MUAK TEST	1
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	9	/
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2025/02/19	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2025/02/19	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2025/02/19	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2025/02/19	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/10	⁰ 1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/10	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.5.39	HKE-083	TESTING /	testing (
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2025/02/19	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

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2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

2.7. Description of Test Setup

Operation of EUT during Conducted and Radiation below 1GHz testing:



Operation of EUT during Radiation above 1GHz testing:

EUT

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.

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2.8. Description of Support Units

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

Item	Equipment	Trade Mark	Model/Type No.	Specification	Note
1	BLUETOOTH SPEAKER WHITE NOISE	N/A	K6S	N/A	EUT
2	Adapter	N/A	RCE-3005CL	Input: AC110-240V, 50/60Hz, 0.85A USB-C: DC5V/3A, 9V/3A, 12V/2.5A	Accessory
UAKTEST	NG HUNK TEST	ic (M)	JE TESTING	ESTING HUAR TESTING	HUANTESTING
Grang	<u> </u>		Plan	-STEVG	

Note:

- All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
 Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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HUAK TESTING

3.1. Conducted Emissions Test

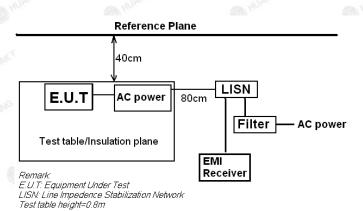
Limit

According to FCC CFR Title 47 Part 15 Subpart C Section 15.207 and RSS Gen 8.8, AC Power Line Conducted Emissions Limits for License-Exempt Radio Apparatus as below:

TESTING		Limit (dBuV)				
	requency range (MHz)	Quasi-peak	Average			
3	0.15-0.5	66 to 56*	56 to 46*			
STIN	0.5-5	56 🔷 🔘	46			
CO HUAN	5-30	60	50			

* Decreases with the logarithm of the frequency.

Test Configuration



Test Procedure

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5. All support equipments received AC power from a second LISN, if any.
- 6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.

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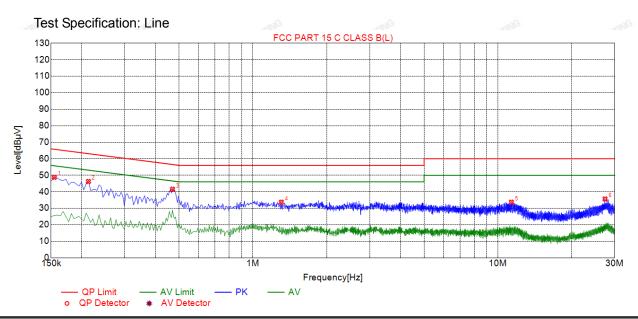


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Test Results

All modes have been tested, only the worst result was reported as below:



Suspected List

2	NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре
	1	0.1545	48.75	19.83	65.75	17.00	28.92	PK	L
1007	2	0.2130	46.25	19.85	63.09	16.84	26.40	PK	L
	3	0.4695	41.56	19.84	<u>56.52</u>	14.96	21.72	PK	L
	4	1.3065	33.7 <mark>0</mark>	19.91	56.00	22.30	13.79	PK	L
8	5	11.3595	<mark>33.6</mark> 9	19.89	60.00	26.31	13.80	PK	L
5	6	27.3840	35.64	20.21	60.00	24.36	15.43	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

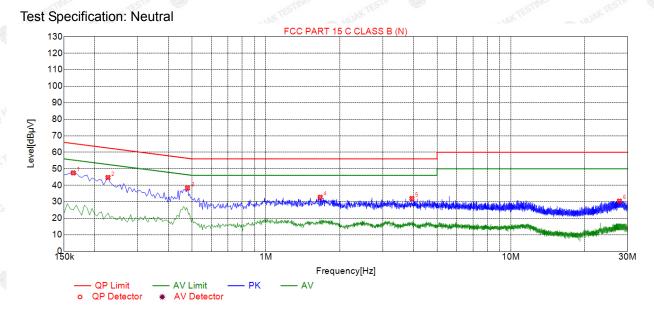
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Suspected List

. L													
<	NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре				
	1	0.1635	47.50	19.68	<mark>65.28</mark>	17.78	27.82	PK	Ν				
	2	0.2265	44.71	19.73	62.58	17.87	24.98	PK	Ν				
	3	0.4785	38.28	19.73	<mark>56.37</mark>	18.09	18.55	PK	Ν				
	4	1.6665	32.75	19.81	56.00	23.25	12.94	PK	Ν				
	5	3.9435	31.95	19.97	56.00	24.05	11.98	PK	Ν				
	6	27.7485	30.40	20.32	60.00	29.60	10.08	PK	Ν				

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

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3.2. Radiated Emissions and Band Edge

<u>Limit</u>

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Except when the requirements applicable to a given device state otherwise, emissions from License-Exempt transmitters shall comply with the field strength limits shown in table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission

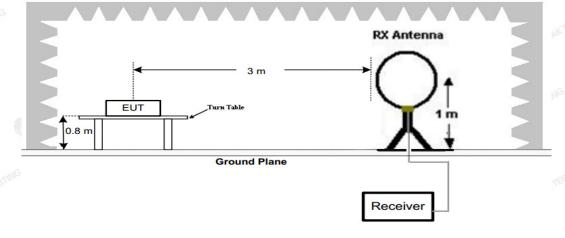
Unwanted emissions that fall into restricted bands shall comply with the limits specified in RSS-Gen; and Unwanted emissions that do not fall within the restricted frequency bands shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

	rau		
Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	n ^{ic} 3	54.0	500

Radiated Emission Limits

Test Configuration

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz

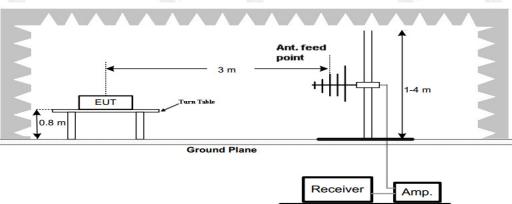


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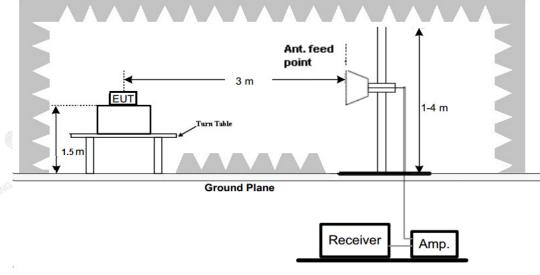


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(B) Radiated Emission Test Set-Up, Frequency below 1000MHz

(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

- The EUT was placed on turn table which is 0.8m above ground plane for below 1GHz test, and on a low permittivity and low loss tangent turn table which is 1.5m above ground plane for above 1GHz test.
- 2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0 degrees to 360 degrees to acquire the highest emissions from EUT.
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat above procedures until all frequency measurements have been completed.

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FICATION

Test Results

Remark:

- 1. Radiated Emission measured at GFSK, $\pi/4$ DQPSK mode from 9 KHz to 10th harmonic of fundamental and recorded worst case at GFSK DH5 mode.
- 2. There is no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.
- 3. For below 1GHz testing recorded worst at GFSK DH5 low channel.

Below 1GHz Test Results:



8	Suspe							_		
		Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	
	NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
)`	1	44.564565	-13.72	36.18	22.46	40.00	17.54	100	314	Horizontal
	2	82.432432	-18.19	40.97	22.78	40.00	17.22	100	177	Horizontal
5	3	158.16816	-17.83	45.88	28.05	43.50	15.45	100	291	Horizontal
	4	197.97797	-14.86	45.84	30.98	43.50	12.52	100	117	Horizontal
	5	273.71371	-12.65	38.55	25.90	46.00	20.10	100	328	Horizontal
β	6	371.78178	-9.92	35.06	25.14	46.00	20.86	100	106	Horizontal

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

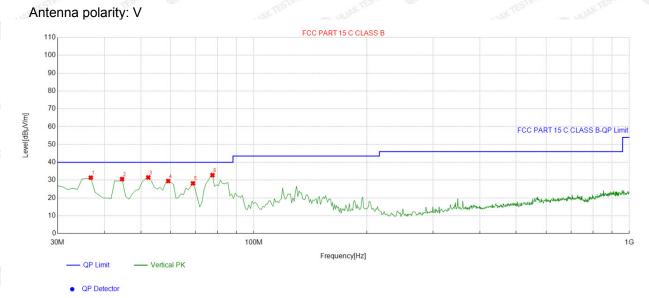
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Report No.: HK2412107614-E



Suspected List

1										
ų		Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	
	NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
	1	36.796797	-14.57	45.95	31.38	40.00	8.62	100	138	Vertical
	2	44.564565	-13.72	44.27	30.55	40.00	9.45	100	80	Vertical
	3	52.332332	-13.35	44.85	31.50	40.00	8.50	100	71	Vertical
	4	59.129129	-13.54	43.02	29.48	40.00	10.52	100	360	Vertical
	5	68.838839	-16.41	44.62	28.21	40.00	11.79	100	77	Vertical
	6	77.577578	-18.02	50.81	32.79	40.00	7.21	100	166	Vertical

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

Harmonics and Spurious Emissions

Frequency Range (9 kHz-30MHz)

TIN	Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)
	STREE STREE	JACIL STING	- HUAKTL
	- WAKTE	- UU-V TEN	- wyak The
	•	· · · ·	
	-		TESTING

Note: 1. Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor

The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

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В АР

For 1GHz to 25GHz

CH Low (2402MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	B HUAK TES
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	ر (dB)	Detecto Type
4804.00	51.16	-3.65	47.51	74.00	-26.49	peak
4804.00	45.09	-3.65	41.44	54.00	-12.56	AVG
7206.00	52.82	-0.95	51.87	74.00	-22.13	peak
7206.00	42.79	-0.95	41.84	54.00	-12.16	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4804.00	53.03	-3.65	49.38	74.00	-24.62	peak
4804.00	46.24	-3.65	42.59	54.00	-11.41	AVG
7206.00	52.18	-0.95	51.23	74.00	-22.77	peak
7206.00	41.32	-0.95	40.37	54.00	-13.63	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

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CH Middle (2441MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
4882.00	54.12	-3.54	50.58	74.00	-23.42	peak
4882.00	o 44.47	-3.54	40.93	54.00	-13.07	AVG
7323.00	53.93	-0.81	53.12	74.00	-20.88	peak
7323.00	43.08	-0.81	42.27	54.00	-11.73	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Vertical:		OH0		O ¹⁰ O		
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4882.00	51.72	-3.54	48.18	74.00	-25.82	peak
4882.00	43.19	-3.54	39.65	54.00	-14.35	AVG
7323.00	52.06	-0.81	51.25	74.00	-22.75	peak
7323.00	43.12	-0.81	42.31	54.00	-11.69	AVG

Margin = Level-Limit.

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CH High (2480MHz)

HUAK TESTING

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	UI.	120	1110	

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.00	54.71	-3.43	51.28	74.00	-22.72	peak
4960.00	46.92	-3.43	43.49	54.00	-10.51	AVG
7440.00	53.08	-0.77	52.31	74.00	-21.69	peak
7440.00	42.14	-0.77	41.37	54.00	-12.63	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Vertical:

vortioui.		60702783	State /	60232	750	00000
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
4960.00	51.06	-3.43	47.63	74.00	-26.37	peak
4960.00	46.47	-3.43	43.04	54.00	-10.96	AVG
7440.00	51.98	-0.77	51.21	74.00	-22.79	peak
7440.00	41.51	-0.77	40.74	54.00	-13.26	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Remark :

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.

(3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) The emissions are attenuated more than 20dB below the permissible limits are not recorded in the report.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m (PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m (PK Value) <54 dBuV/m (AV Limit), the Average Detected not need to completed.

(7)All modes of operation were investigated and the worst-case emissions are reported.

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Radiated Band Edge Test:

Hopping

Horizontal (Worst case):

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310.00	53.69	-5.81	47.88	74 NOA	-26.12	peak
2310.00	1	-5.81	O T	54	1 🔘	AVG
2390.00	54.72	-5.84	48.88	74	-25.12	peak
2390.00	WAX TESTING	-5.84	TESTING / MAXITE	54	NKTSTING	AVG

Margin = Level-Limit.

/ertical:						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310.00	54.18	-5.81	48.37	74	-25.63	peak
2310.00	/	-5.81	· /	54	1	AVG
2390.00	54.36	-5.84	48.52	74	-25.48	peak
2390.00	HUAKIL	-5.84	TES HUAK IL	54	HUAKTED	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2483.50	54.07	-5.81	48.26	74	-25.74	peak
2483.50	1	-5.81		54	1	AVG
2500.00	55.32	-6.06	49.26	74	-24.74	peak
2500.00	1	-6.06	The second secon	54	/	AVG
Remark: Facto	r = Cable loss +	Antenna fac	tor + Attenuator – Pr	eamplifier; Level	= Reading +	Factor;

Horizontal (Worst case):

Margin = Level-Limit.

/ertical:						
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2483.50	55.09	-5.81	49.28	74	-24.72	peak
2483.50	/	-5.81	β /	54	STING /	AVG
2500.00	53.57	-6.06	47.51	74 1 100	-26.49	peak
2500.00	/	-6.06	0 ľ	54	1 🔘	AVG
		163		-6°D	1	

Remark: Factor = Cable loss + Antenna factor + Attenuator - Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.

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NO Hopping

Operation Mode: TX CH Low (2402MHz)

Horizontal (Worst case):

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310.00	53.02	-5.81	47.21	74	-26.79	peak
2310.00	1	-5.81	O T	54	/)	AVG
2390.00	53.18	-5.84	47.34	74	-26.66	peak
2390.00	WAX TESTING	-5.84	TESTING / WAX TES	54	LOK TSTING	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

Vertical:						
Frequency	Meter Reading	Factor	Emission Level	Limits 🌑	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310.00	53.39	-5.81	47.58	74	-26.42	peak
2310.00	/	-5.81	1	54 mm	1	AVG
2390.00	53.68	-5.84	47.84	74	-26.16	peak
2390.00	A multime 1	-5.84	10 HOL	54	HUAR /	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Level-Limit.

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Operation Mode: TX CH High (2480MHz)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2483.50	53.22	-5.81	47.41	74	-26.59	peak
2483.50	TESTING	-5.81	/ resting	54	1	AVG
2500.00	53.54	-6.06	47.48	74	-26.52	peak
2500.00	1	-6.06	/	54	1	AVG

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2483.50	53.97	-5.81	48.16	74	-25.84	peak
2483.50	ALTESTING /	-5.81	WAK TESTING	54	/	AVG
2500.00	53.71	-6.06	47.65	74	-26.35	peak
2500.00	1	-6.06	/	54	/	AVG

Margin = Level-Limit.

Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Remark:

1. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

2. In restricted bands of operation, the spurious emissions below the permissible value more than 20dB.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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3.3. Maximum Peak Conducted Output Power

<u>Limit</u>

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW. 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.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



<u>Test Results</u>

Туре	Channel	Maximum Peak Conducted Output Power (dBm)	Limit (dBm)	Result
TESTING	00	1.55	TESTING	
GFSK	39	1.23	21.00	Pass
	78	0.63	- all	
STING	00	2.28	HUAKTES	STR
π/4DQPSK	39	1.98	21.00	Pass
	78	1.36	TESTING	

Note: The test results including the cable loss.

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3.4. 20dB Bandwidth

<u>Limit</u>

For frequency hopping systems operating in the 2400MHz-2483.5MHz no limit for 20dB bandwidth.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 KHz RBW and 100 KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

RBW=1% to 5% of the OBW VBW=approximately 3 X RBW Detector=Peak Trace Mode: Max Hold

Use the 99% power bandwidth function of the instrument to measure the Occupied Bandwidth and recoded.

Test Configuration



Test Results

Modulation	Channel	20dB Bandwidth (MHz)	Result
163	CH00	1.053	-csmvG
GFSK	CH39	1.041	A HUAK TE
	CH78	1.038	Deep
-csTNG	CH00	1.359	Pass
π/4DQPSK	CH39	1.326	O HUAN
	CH78	1.338	

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Test plot as follows:



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3.5. Frequency Separation

Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25 KHz or the 2/3*20dB bandwidth of the hopping channel, whichever is greater.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 KHz RBW and 100 KHz VBW.

Test Configuration



Test Results

Modulation	Channel	Channel Separation (MHz)	Limit(MHz)	Result
GFSK	CH39	1.002	0.702	Pass
	CH40	1.002	0.702	
π/4DQPSK	CH39	0.004	0.006	Pass
	CH40	0.994	0.906	

Note: We have tested all mode at high, middle and low channel, and recorded worst case at middle

Test plot as follows:

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3.6. Number of Hopping Frequency

<u>Limit</u>

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 2400MHz to 2483.5MHz.

Test Configuration



Test Results

He	ALC	A HO	A HO	
Modulation	Number of Hopping Channel	Limit	Result	
GFSK	79	NIC	Desig	
π/4DQPSK	79	≥15	Pass	

Test plot as follows:

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STING	TESTING O	1 STING	TESTING OF		NG TESTING	_
CO WAX IL		GFSK N pectrum Analyzer - Swept SA	lodulation	- WALTL	C HUAN	-
	un RL Start	Freq 2.400000000 GHz PNO: Fast IFGain:Low Free Run Atten: 30 dB	ALIGNAUTO 10:22:11 AM Dec 12, 3 Avg Type: Log-Pwr TRACE 12 3 Avg Hold:>100/100 Type Muse Det P NH			
MNG		iiv Ref 20.00 dBm	ΔMkr1 78.657 0 M 0.124 0			
NUAK TESTING	0.00 -10.0	LAANAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	የሰፋሐሲስአስብፋሌዮስስአሰብክለስአስደስለስ ሰበአሳላ በ	2.441750000 GHz		
۳	-20.0 -30.0 -40.0	«3 NAMABARAKANAA I KAMAANAA KAMAANAKA KAKA KAKANA KANAA	<u>anna kean dana karat karatar ang ang ang ang ang ang ang ang ang ang</u>	Start Freq 2.40000000 GHz		
UAK ESTING	-50.0 4 -60.0 4 -70.0			Stop Freq 2.483500000 GHz		
	4000 7000 Start: ##Res Мисям0	2.40000 GHz BW 100 kHz #VBW 300 kHz	Stop 2.48350 G Sweep 8.000 ms (1001 p	Hz CF Step ots) 8.350000 MHz		0
TING	<u>1</u> Δ	ΣE TRC SCL X Y 2 1 f (Δ) 78,657 0 MHz (Δ) 0,124 dB 1 f 2.401 670 0 GHz -18.165 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto Man		
TING	4 5 6 7			0 Hz		HUAK
HUAKTEST	9 10 11			v ×		
	MSG	π/4DQPSk	STATUS C Modulation			-
Blen	LXI RL	Pectrum Analyzer - Swept SA RF 50.0 AC SENSE:INT Freq 2.400000000 GHz	ALIGNAUTO 10:21:43 AM Dec 12, 4 Avg Type: Log-Pwr TRACE 2 2 Avg Hold:>100/100 Type M	2024 4 5 5 MMM	and	1
NUAK TESTIN	10 dB/	IFGain:Low Atten: 30 dB	ΔMkr1 79.074 5 M -1.581 (Auto Tune		
	Log 10.0 0.00			Center Freq 2.441750000 GHz		
UAKESTING	-10.0 -20.0 -30.0	ahan milli baranga tikuka baranga ang panganah 2	normatique of the strend and the str	2 Start Freq 2.40000000 GHz		
	-40.0 +			Stop Freq		0
TING	-70.0 Start 1	2.40000 GHz	Stop 2.48350 G	2.483500000 GHz		. 1
STING	#Res MKR MD	2.40000 GHz BW 100 kHz #VBW 300 kHz 2 1 f (Δ) 73.074 5 MHz (Δ) -1.581 dB 1 f 2.401 503 0 GHz -16.372 dBm	Stop 2.48350 G Sweep 8.000 ms (1001 p FUNCTION VIDTH FUNCTION VALUE			HUAN
HUAKTES	2 3 4 5 6	1 T 2.401 503 0 GHz -15.372 dBm		Freq Offset 0 Hz		
	7 8 9 10 11			•		
TING	MSG	TIME	STATUS	×	TING	

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3.7. Time of Occupancy (Dwell Time)

<u>Limit</u>

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with 1MHz RBW and 3MHz VBW, Span 0Hz.

Test Configuration



Test Results

Modulation	Packet	Pulse time (ms)	Dwell time (second)	Limit (second)	Result
	DH1	0.374	0.120	HUAKIL	WTESTING
GFSK	DH3	1.630	0.261	0.40	Pass
	DH5	2.879	0.307	KTESTING	
K TESTING	2-DH1	0.385	0.123	* TESTING	LAK TESTING
π/4DQPSK	2-DH3	1.637	0.262	0.40	Pass
	2-DH5	2.884	0.308		

Note:

1. We have tested all mode at high, middle and low channel, and recoreded worst case at middle channel.

Dwell time=Pulse time (ms) × (1600 ÷ 2 ÷ 79) ×31.6 Second for DH1, 2-DH1
Dwell time=Pulse time (ms) × (1600 ÷ 4 ÷ 79) ×31.6 Second for DH3, 2-DH3
Dwell time=Pulse time (ms) × (1600 ÷ 6 ÷ 79) ×31.6 Second for DH5, 2-DH5

Test plot as follows:

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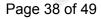
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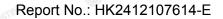
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3.8. Out-of-Band Emissions

HUAK TESTING

<u>Limit</u>

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these setting are made of the in-band reference level, band edge and out-of-band emissions.

Test Configuration



Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

We measured all conditions (DH1, DH3, DH5) and recorded worst case at DH5 and 2DH5

Test plot as follows:

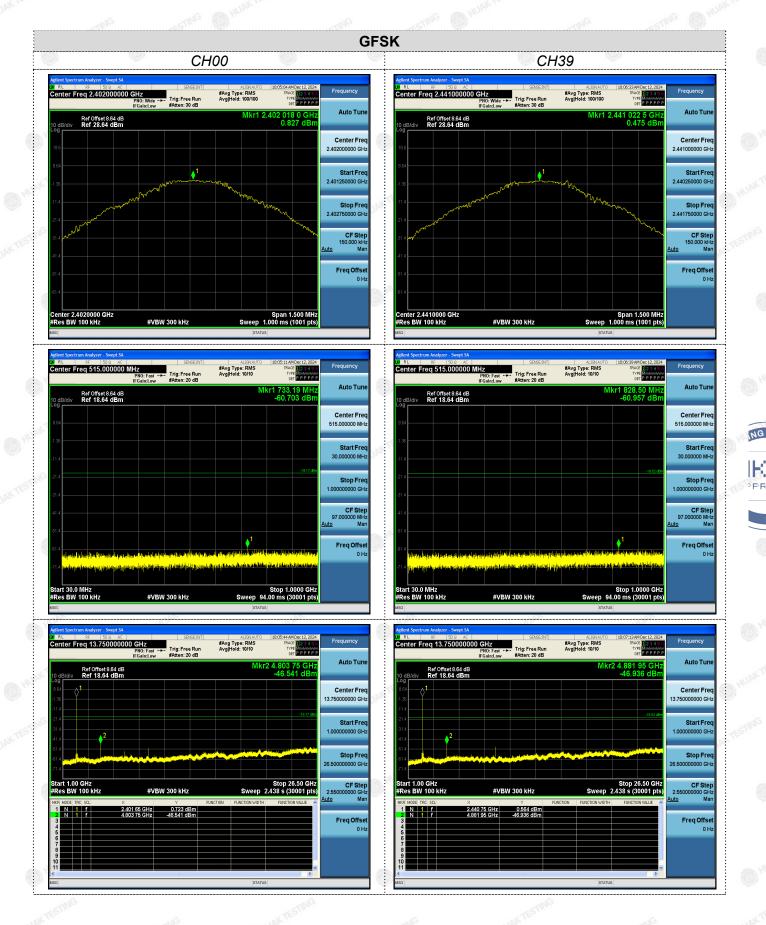
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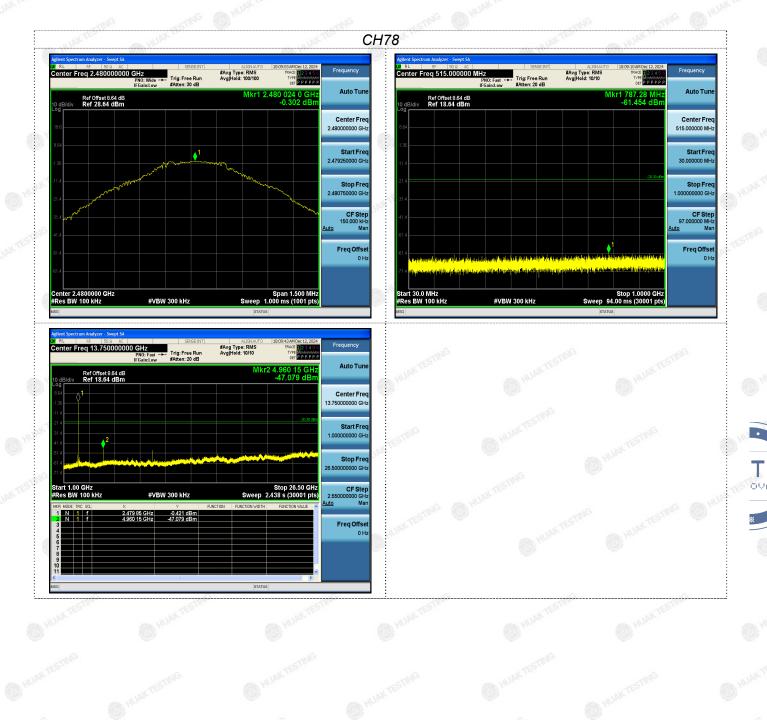
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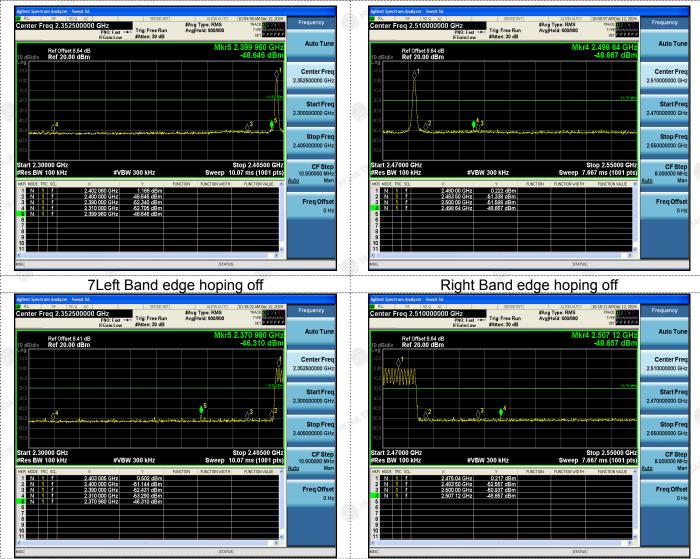
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Left Band edge hoping on

Right Band edge hoping on

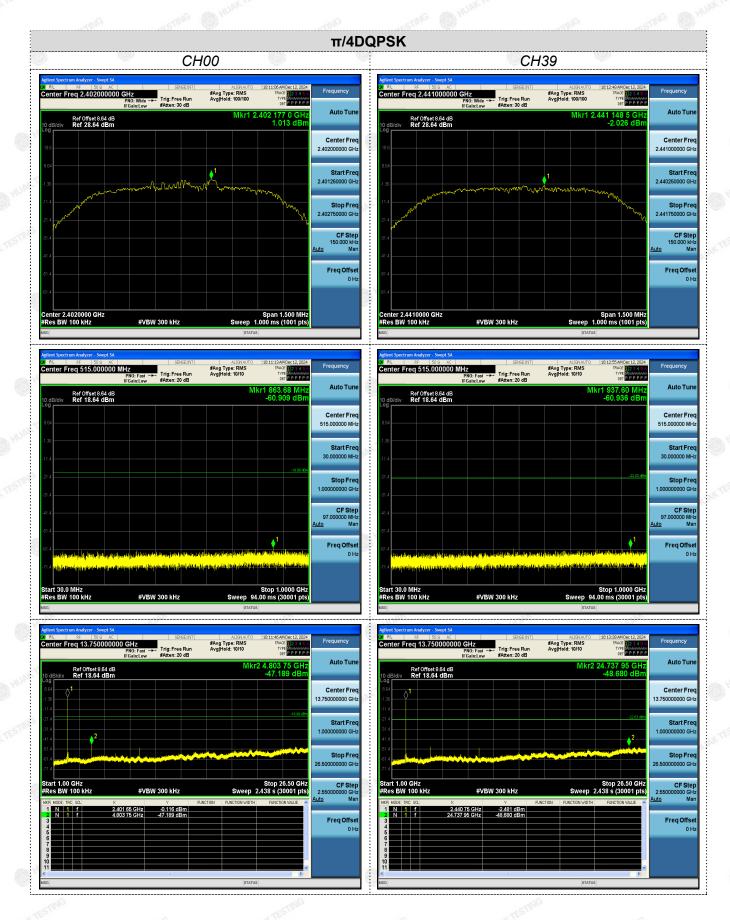
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RL RF 50.0 AC SEP nter Freq 2.352500000 GHz PR0: Fast ++ IFGain:Low #Atten: 30		PPPPP	RL RF 50 Ω AC SENSE.NT enter Freq 2.510000000 GHz PR0: Fast →→ IF63in:Low #Atten: 30 dB	ALIGNALITO 10:14:22:44 Dec 12, 2024 #Avg Type: RMS TRACE 12:3:45 C Avg[Hold: 800/800 Det PPPPP	Frequency
Ref Offset 8.64 dB IB/div Ref 20.00 dBm	Mkr5 2.399 960 -47.739		Ref Offset 8.64 dB 0 dB/div Ref 20.00 dBm	Mkr4 2.504 48 GHz -48.534 dBm	Auto Tu
		Center Freq 2.352500000 GHz			Center F 2.510000000
ρ 		5 Start Freq 2.30000000 GHz			Start F 2.470000000
		Stop Freq 2.405000000 GHz			Stop F 2.550000000
rt 2,30000 GHz es BW 100 kHz #VBW 300 kHz MODELTREI SCL X Y		01 pts) 10.500000 MHz	start 2.47000 GHz Res BW 100 kHz #VBW 300 kHz	Stop 2.55000 GHz Sweep 7.667 ms (1001 pts) FUNCTION VIDTH FUNCTION VALUE	CF S 8.000000 uto
N 1 7 2.402 060 GHz 0.986 di N 1 7 2.400 000 GHz 47.739 di N 1 7 2.390 000 GHz 47.739 di N 1 7 2.390 000 GHz 5.586 di N 1 7 2.390 000 GHz 4.5386 di N 1 7 2.399 960 GHz 47.739 di	Bm Bm Bm	Freq Offset 0 Hz	No. T 2.480 16 GHz 0.046 dBm 2 N 1 f 2.483 50 GHz 45.2688 dBm 3 N 1 f 2.500 48 GHz 43.00 dBm 4 N 1 f 2.504 48 GHz 48.534 dBm 6 6 6 6 6 6 7 8 8 6 6 6	RUNCTION RUNCTION WIDTH PUNCTION VALUE A	Freq Of
	STATUS			STATUS	
Left Band	edge hoping off		Right Band e	dge hoping off	
nt Spectrum Analyzer - Swept SA LL RF S0 0 AC SPA Iter Freq 2.352500000 GHz PNO: Fast IFGain:Low #Atten: 30		PPPPP	Stent Spectrum Analyzer - Snept SA RL RZ Spectrum Analyzer - Snept SA Senter Freq 2.510000000 GHz PR0: Fast → FrGain.tow #Atten: 30 dB	ALIGNAUTO 10:20:14 AM Dec 12, 2024 #Avg Type: RMS TRACE 12, 2024 Avg[Hold: 800/800 TVPE Det P P P P	Frequency Auto T
Ref Offset 8.41 dB B/div Ref 20.00 dBm	Mkr5 2.385 470 -48.912		Ref Offset 8.64 dB 0 dB/div Ref 20.00 dBm	Mkr4 2.518 00 GHz -48.578 dBm	Autor
		Center Freq 2.352500000 GHz		-19.85 cbm	Center 2.510000000
A4	⁵ ³ ³ ³	230000000 GHz		4	Start 2.470000000
	aluan ana ang ang ang ang ang ang ang ang a	2.405000000 GHz			Stop 2.550000000
rt 2.30000 GHz s BW 100 kHz #VBW 300 kHz MODEL TRO SCI	Stop 2.4050 Sweep 10.07 ms (100 FUNCTION VIDTH FUNCTION VIDTH	01 pts) 10.500000 MHz #	ttart 2.47000 GHz Res BW 100 kHz #VBW 300 kHz #KM M00E TPC SQL X Y	Stop 2.55000 GHz Sweep 7.667 ms (1001 pts) FUNCTION VIDTH FUNCTION VALUE	CF \$ 8.000000 uto
N 1 f 2.401850 GHz -2.337 dE N 1 f 2.400000 GHz -5.185 dE N 1 f 2.390 000 GHz -51.814 dE N 1 f 2.310 000 GHz -51.914 dE N 1 f 2.385 470 GHz -48.912 dE	3m 3m	Freq Offset 0 Hz	1 N 1 7 2.471 20 GHz 0.149 dBm 2 N 1 7 2.455 GHz 5.127 dBm 3 N 1 f 2.500 00 GHz 5.52 65 dBm 4 N 1 f 2.518 00 GHz 48.572 dBm 6 6 7 8 8 8		Freq O
			9 10 10 10 10 10 10 10 10 10 10 10 10 10 10 1		

Left Band edge hoping on

Right Band edge hoping on

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3.9. Pseudorandom Frequency Hopping Sequence

Test Applicable

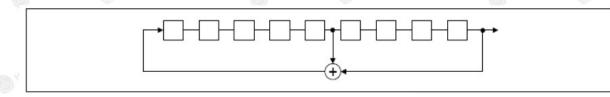
For 47 CFR Part 15C section 15.247 (a) (1):

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. 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 hop-ping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

EUT Pseudorandom Frequency Hopping Sequence Requirement

The pseudorandom frequency hopping sequence may be generated in a nice-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, for example: 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

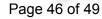
An example of pseudorandom frequency hopping sequence as follows:

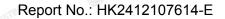
0	2	4	6	62	64	78	1		73	75 77
						1		7		
						1				
					18	1				
				L				J		

Each frequency used equally one the average by each transmitter.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

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3.10. Antenna Requirement

Standard Applicable

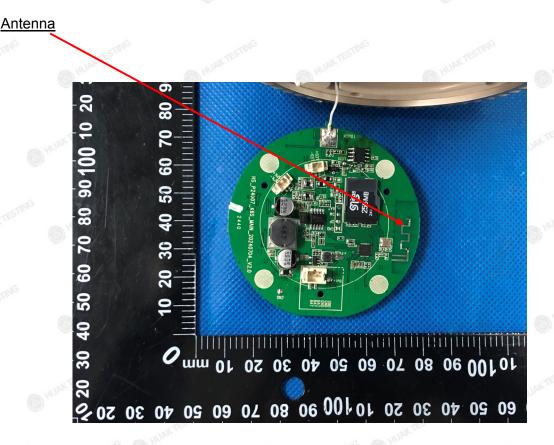
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to Statement below for Compliance

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is a PCB Antenna, is a permanently attached antenna on the PCB. It conforms to the standard requirements. The directional gains of antenna used for transmitting is -0.58dBi.



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4. Test Setup Photos of the EUT



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5. Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos

-----End of test report-----

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