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Report Template Version: V03 Report Template Revision Date: Mar.1st, 2017

Test Report

Report No. :	CQASZ20190500016EX-01		
Applicant:	Shanghai Jiangchuan International Trade Co.,Ltd.		
Address of Applicant:	Room 510, Chenxing Building, No.1023 Qinghu Road, Qingpu District, Shanghai, China		
Manufacturer:	Quanzhou Dongyin Electronic CO.,LTD		
Address of Manufacturer:	No. 1143 Nanhuan Road, Licheng District, Quanzhou City, Fujian Province, China		
Equipment Under Test (E	UT):		
Product:	Bluetooth Speakers		
Model No.:	DYE-BL13-71		
Brand Name:	N/A		
FCC ID:	2AS9G-DYEBL13		
Standards:	47 CFR Part 15, Subpart C		
Date of Test:	2019-04-27 to 2019-05-12		
Date of Issue:	2019-05-12		
Test Result :	PASS*		

Tested By: (Daisy Qin) OI) **Reviewed By:** (Aaron Ma) PPROVE Approved By: (Jack Ai)

 * In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190500016EX-01	Rev.01	Initial report	2019-05-12



2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(1)	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Carrier Frequencies Separation	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Hopping Channel Number	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Dwell Time	47 CFR Part 15, Subpart C Section 15.247 (a)(1)	ANSI C63.10 (2013)	PASS
Pseudorandom Frequency Hopping Sequence	47 CFR Part 15, Subpart C Section 15.247(b)(4)&TCB Exclusion List (7 July 2002)	ANSI C63.10 (2013)	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2013)	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 (2013)	PASS
Radiated Spurious emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2013)	PASS



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4 General Information

4.1 Client Information

Applicant:	Shanghai Jiangchuan International Trade Co.,Ltd.
Address of Applicant:	Room 510, Chenxing Building, No.1023 Qinghu Road, Qingpu District, Shanghai, China
Manufacturer:	Quanzhou Dongyin Electronic CO.,LTD
Address of Manufacturer:	No. 1143 Nanhuan Road, Licheng District, Quanzhou City, Fujian Province, China

4.2 General Description of EUT

Product Name:	Bluetooth Speakers	
Test Model No.:	DYE-BL13-71	
Trade Mark:	N/A	
Hardware Version:	V2.0	
Software Version:	V2.4	
Operation Frequency:	2402MHz~2480MHz	
Bluetooth Version:	V4.2	
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)	
Modulation Type:	GFSK, π/4DQPSK	
Transfer Rate:	1Mbps/2Mbps	
Number of Channel:	79	
Hopping Channel Type:	Adaptive Frequency Hopping systems	
Product Type:	Mobile Portable Fix Location	
Antenna Type:	PCB antenna	
Antenna Gain:	0dBi	
EUT Power Supply:	battery:DC3.7V	

Note:

There are many products, Only the model GDI-EXSNDST800 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.



Operation Frequency each of 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		

Note:

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	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz



4.3 Test Environment

Operating Environment	Operating Environment:			
Temperature:	25.0 °C			
Humidity:	53 % RH			
Atmospheric Pressure:	995mbar			
Test Mode:	Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.			

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
PC	Lenovo	ThinkPad E450C	Provide by lab	FCC ID
AC/DC Adapter	Lenovo	ADLX65NLC3A	Provide by lab	FCC SDOC



4.5 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 Huaxia 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.

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10 ⁻⁸	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8°C	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

Hereafter the best measurement capability for CQA laboratory is reported:

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



4.6 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

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

CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.



4.10 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/26	2019/9/25
Spectrum analyzer	R&S	FSU26	CQA-038	2018/10/28	2018/10/27
Preamplifier	MITEQ	AFS4-00010300-18-10P- 4	CQA-035	2018/9/26	2019/9/25
Preamplifier	MITEQ	AMF-6D-02001800-29- 20P	CQA-036	2018/11/2	2019/11/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2018/10/28	2020/10/27
Bilog Antenna	R&S	HL562	CQA-011	2018/9/26	2020/9/25
Horn Antenna	R&S	HF906	CQA-012	2018/9/26	2020/9/25
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2018/9/26	2020/9/25
Coaxial Cable (Above 1GHz)	CQA	N/A	C019	2018/9/26	2019/9/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2018/9/26	2019/9/25
Spectrum analyzer	Agilent	E4440A	CQA-103	2018/10/28	2018/10/27
Antenna Connector	CQA	RFC-01	CQA-080	2018/9/26	2019/9/25
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2018/9/26	2019/9/25
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2018/9/26	2019/9/25
EMI Test Receiver	R&S	ESPI3	CQA-013	2018/9/26	2019/9/25
LISN	R&S	ENV216	CQA-003	2018/11/5	2019/11/4
Coaxial cable	CQA	N/A	CQA-C009	2018/9/26	2019/9/25

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.



5 Test results and Measurement Data

5.1 Antenna Requirement

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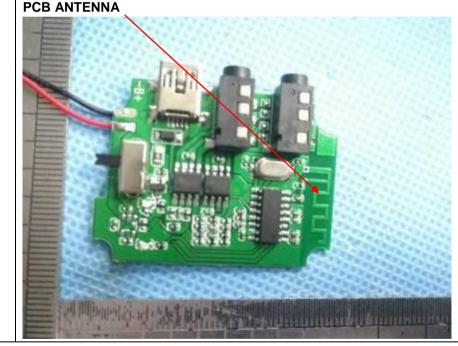
15.203 requirement:

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.

EUT Antenna:



The antenna is PCB antenna. The best case gain of the antenna is 0dBi.



5.2 Conducted Emissions

5.2 Conducted Emission	5113			
Test Requirement:	47 CFR Part 15C Section 15.2	207		
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150kHz to 30MHz			
Limit:		Limit (c	lBuV)	
	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 logarithm	n of the frequency.		
Test Procedure:	 The mains terminal disturbution. The EUT was connected to Impedance Stabilization Nei impedance. The power calls connected to a second LIS reference plane in the same measured. A multiple sock power cables to a single LI exceeded. The tabletop EUT was place on the horizontal grade on the horizontal grade on the horizontal grade of the EUT shall be 0.4 m for vertical ground reference plane. The LISN unit under test and bonded mounted on top of the group between the closest points the EUT and associated exceeded. In order to find the maximute equipment and all of the im ANSI C63.10: 2013 on context. 	b AC power source thro etwork) which provides oles of all other units of SN 2, which was bonde the way as the LISN 1 for et outlet strip was used ISN provided the rating ced upon a non-metalling of floor-standing ar round reference plane, th a vertical ground ref from the vertical ground ref from the vertical ground plane was bonded to the 1 was placed 0.8 m fr d to a ground reference und reference plane. The of the LISN 1 and the quipment was at least of the mission, the relative terface cables must be	bugh a LISN 1 (Line a $50\Omega/50\mu$ H + 5Ω line f the EUT were d to the ground or the unit being d to connect multiple g of the LISN was not c table 0.8m above the rangement, the EUT w erence plane. The read d reference plane. The read d reference plane. The read om the boundary of the plane for LISNs his distance was EUT. All other units of 0.8 m from the LISN 2.	ear e was ar e ne
Test Setup:	Shielding Room	AE UISN2 + AC Ma Ground Reference Plane	Test Receiver	
				1

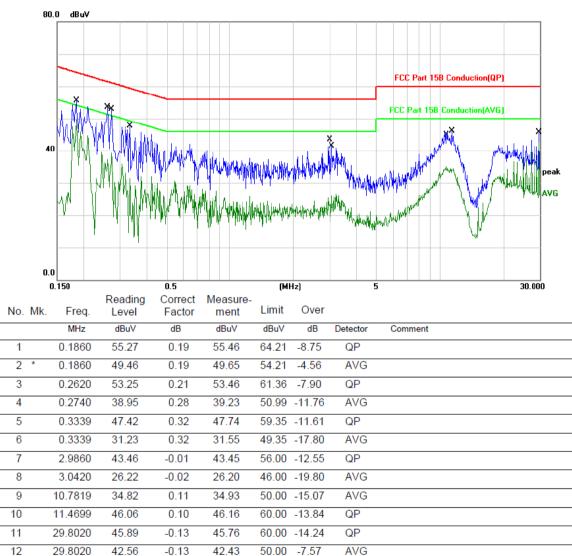


Report No.: CQASZ20190500016EX-01

Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of
	data type at the lowest, middle, high channel.
Final Test Mode:	Through Pre-scan, find the 2DH5 of data type and π /4DQPSK modulation at the lowest channel is the worst case. Only the worst case is recorded in the report.
Test Voltage:	AC 120V/60Hz
Test Results:	Pass

Measurement Data:

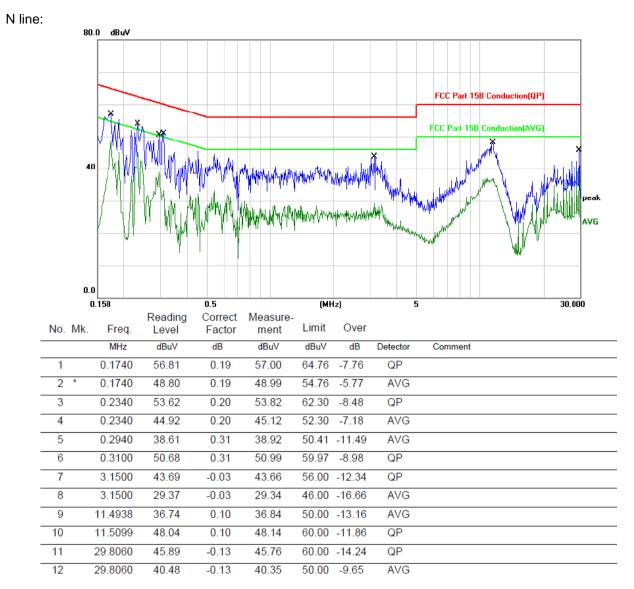
L line:



Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.





Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.



5.3 Conducted Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table
	Ground Reference Plane
	Remark: Offset=Cable loss+ attenuation factor.
Limit:	30dBm
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass



Measurement Data

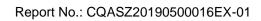
	GFSK mode	e	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-1.129	30.00	Pass
Middle	-1.290	30.00	Pass
Highest	-0.448	30.00	Pass
	π/4DQPSK me	ode	
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	-0.313	30.00	Pass
Middle	-0.262	30.00	Pass
Highest	0.441	30.00	Pass



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Test plot as follows:

Test plot as follows:	Graphs	
	Keylight Spectrum 2 Advance - Sweet 54 Keylight Spectrum 2 Advance - Sweet 54 Keylight Spectrum 2 Advance - Sweet - Swe	Avg Type: Log-Pwr 18400 120 45 0
	PND: First C Trig: Free H IFGainLow Atten: 30 dl	B Mkr1 2.401 697 GHz Next Peak
	12 dBloiv Ref 20.00 dBm	-1.129 dBm
	£.00	Next Pk Right
	4.00	Next Pk Left
	-16.0	
GFSK/LCH	-0.0	Marker Delta
	42.0	MkrCF
	015	
	-76.0	Mkr→RefLvi
	49.0	More 1 of 2
	Center 2.402000 GHz #Res BW 3.0 MHz #VBW 3.0 MHz	Span 10.00 MHz Sweep 1.066 ms (2000 pts)
	anna ⊇ Neysight Spectrum Suntyrer - Saegt Mi ■ Ny, NY S8 D≜DC CONNEC SERVEC	29/1 ALTON AUTO 12:25:25 AVI Mar 05, 2018
	Marker 1 2.440822411206 GHz PNO: Fast Trig: Free R IFGeint.ove	B
	12 dBM/w Ref 20.00 dBm	Mkr1 2.440 822 GHz -1.129 dBm
	600	Next Pk Right
	4.00	
	-16.0	Next Pk Left
GFSK/MCH	-20.0	Marker Delta
	-0.0	
	84.0	Mkr→CF
	-76.0	Mkr→RefLv
	89.0	More
	Center 2.441000 GHz #Res BW 3.0 MHz #VBW 3.0 MHz	Span 10.00 MHz 1 ef2 Sweep 1.066 ms (2000 pts)
	ann. Keysight Spectrum Endyrer - Snept SA	C Coupled
	Marker 1 2.4797323165183 CHz Warker 1 2.4797323165183 CHz PND: for Control of Charles Figure 1 2.4797323165183 CHz PND: for Control of Charles Figure 1 2.4797323165183 CHz	Avg Type: Log-Pwr TRAC 123450 Petrix Section
GFSK/HCH	12 dB/dtr Ref 20.00 dBm	Mkr1 2.479 732 GHz NextPeak -0.448 dBm
		Next Pk Right
	400	
	-16.0	Next Pk Left
	-20.0	Marker Delta
	-0.0	
	82.0	MkrCF
	76.0	Mkr→RefLvi
	89.0	
	Center 2.430000 GHz	More Span 10.00 MHz 1 of 2 Sweep 1.066 ms (2000 pts)
	#Res BW 3.0 MHz #VBW 3.0 MHz	Sweep 1.066 ms (2000 pts)





тr/4DQPSK/LCH		
		Keylight Spectrum Andyne - Songt SA Inc State - St
T/4DQPSK/ICH		Marker 1 2.401787393697 GHz Avg Type: Lop.Pwr 18x0 122436
тr/4DQPSK/ICH		IFGeint,ow Atten: 30 dB DC Matters
		Log
		Next Bk Bio
т/4DQPSK/LCH		
т/4DQPSK/LCH		
т/4DQPSK/LCH		Next Pk L
π/4DQPSK/MCH		-16.0
π/4DQPSK/MCH		
π/4DQPSK/MCH		-20.0 Marker De
тг/4DQPSK/MCH	π/4DQPSK/LCH	marker De
тг/4DQPSK/MCH		
тг/4DQPSK/MCH		42.0
т/4DQPSK/MCH		MKFC
тr/4DQPSK/MCH		810
тr/4DQPSK/MCH		
тг/4DQPSK/MCH		Mkr→Ref L
тг/4DQPSK/MCH		
тг/4DQPSK/MCH		Me
тт/4DQPSK/MCH		
тт/4DQPSK/MCH		#Res BW 3.0 MHz #VBW 3.0 MHz Sweep 1.066 ms (2000 pts)
TT/4DQPSK/MCH		
тт/4DQPSK/MCH		
TT/4DQPSK/MCH		KA NF 38 0 000 CONNEC SENSE ON AUTO 1223621 AN My 65 2019 Park Sense ON
TT/4DQPSK/MCH		Metrixer 1 24440512406203 GHz PW0: Ret C Trig: Free Run AvgHold>100100 Tric Pree Run
тт/4DQPSK/MCH		IFGainLow Atten: 30 dB DD
тг/4DQPSK/MCH		
TT/4DQPSK/MCH		
TT/4DQPSK/MCH		Next Pk Rid
TT/4DQPSK/MCH		
π/4DQPSK/MCH		
π/4DQPSK/MCH		Next Pk L
TT/4DQPSK/HCH		-160
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		2000 Morker Do
TT/4DQPSK/HCH	π/4DQPSK/MCH	Marker De
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		20
TT/4DQPSK/HCH		MKFC
TT/4DQPSK/HCH		810
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		Mkr→Ref L
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		Me
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		Center 2.441000 GHz Span 10.00 MHz Span 10.00 MHz #Res BW 3.0 MHz #VBW 3.0 MHz Sweep 1.066 ms (2000 pts)
TT/4DQPSK/HCH		
Marker 1 2.479817408704 GHz Trig: Pres Run Marker 1 2.479817408704 GHz Avg Type: Lag.Par AvgHed: 100100 Trid: Date Trig: Pres Run AvgHed: 100100 Next Per Trig: Pre Run AvgHed: 100100 Next Per Trig: Pr		
T/4DQPSK/HCH		AL IN STATE CONTECT SERVICIAL ALEXA AUTO 1223601 AM May 15, 2018 Park Service
T/4DQPSK/HCH		Matrixed 1 X-47/9817/4087/04 GHz PWD: Fast C Trig: Free Run Avg[Hold>100/100 Trig a sig
TT/4DQPSK/HCH		IFGainLow Atten: 30 dB DC BANKING
т/4DQPSK/HCH		
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		
T/4DQPSK/HCH		Next By Die
TT/4DQPSK/HCH		
TT/4DQPSK/HCH		
11/4DQFSK/11C11		
11/4DQFSK/11C11		400 Next Pk Ld
11/4DQFSK/11C11		400 Next Pk Ld
420 440 450 450 450 450 450 450 45		400 160 300
01.0	π/4DQPSK/HCH	400 160 200 Marker De
01.0	π/4DQPSK/HCH	400 160 200 Marker De
-75.0	π/4DQPSK/HCH	410 160 200 400 400 400 400 400 400 40
000 Mite Center 2.480000 GHz Span 10.00 MHz 1 0	π/4DQPSK/HCH	400 160 200 Marker De
000 Mite Center 2.480000 GHz Span 10.00 MHz 1 0	π/4DQPSK/HCH	400 Image: Constraint of the second sec
Center 2.430000 GHz Span 10.00 MHz 1 o	π/4DQPSK/HCH	400 Image: Constraint of the constra
Center 2.430000 GHz Span 10.00 MHz 1 o	π/4DQPSK/HCH	400 Image: Constraint of the second sec
Center 2.430000 GHz Span 10.00 MHz 1 o	π/4DQPSK/HCH	400 Image: Constraint of the constra
Center 2.480000 GHz Span 10.00 MHz	π/4DQPSK/HCH	100 100
	π/4DQPSK/HCH	100 100
	π/4DQPSK/HCH	400 Marker Del
was DC Coupled	π/4DQPSK/HCH	400 Image: Constraint of the second of the se



5.4 20dB Occupy Bandwidth

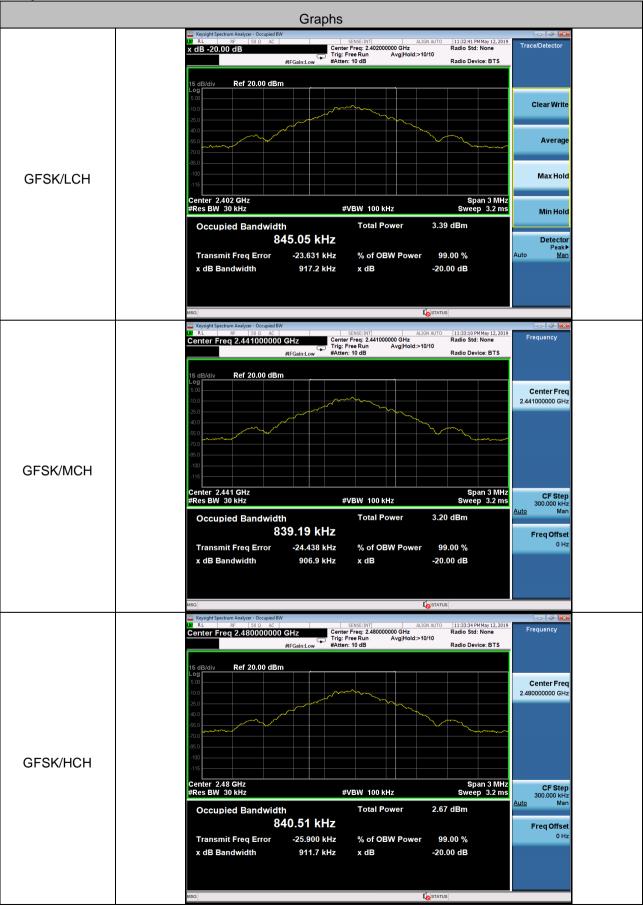
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
	Remark: Offset=Cable loss+ attenuation factor.
Limit:	NA
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

Test channel	20	0dB Occupy Bandwidth (MH	z)
rest channel	GFSK	π/4DQPSK	/
Lowest	0.9172	1.223	/
Middle	0.9069	1.227	/
Highest	0.9117	1.257	/



Test plot as follows:









5.5 Frequencies Separation

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T
	Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.
Limit:	2/3 of the 20dB bandwidth
	Remark: the transmission power is less than 0.125W.
Exploratory Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Modulation	Channel	Channel Separation (MHz)	Limit(MHz)	Result
GFSK	CH39	0.9945	25KHz or 2/3*20dB	Pass
Gron	CH40	0.9940	bandwidth	Fass
	CH39	4 0005	25KHz or 2/3*20dB	Dees
pi/4DQPSK	CH40	1.0005	bandwidth	Pass



Test plot as follows:

GFSK GFSK Tr/4DQPSK Tr/4DQPSK		Graphs
GFSK GFSK GFSK GFSK GFSK		0 4.5 err 36.9 (conc) Secret ALDR APD 32.9 (conc) 2.9 (conc) Pack Secret Matcher 1 Δ 994.497249 (kHz) File; Free Run Avg Type: Log-Par Those Th
GFSK GFSK		12 dB/dt/ Ref 20.00 dBm -0.019 dB
GFSK GFSK		
TT/4DQPSK	GESK	
Tr/4DQPSK		#Res BW 100 kHz #VBW 300 kHz Sweep 1.066 ms (2000 pts) Mkr-
TT/4DQPSK		1 Δ2 1 f Δ2 4 f 20.019 dB dB <thd< td=""></thd<>
T/4DQPSK		
TT/4DQPSK		Keynight Spectrew Readyer - Seegt M. 10
TT/4DQPSK		IFGeint.cv Trig: Pree Run AvgiHold: +100/100 DFC AvgiHold: +100/100
TT/4DQPSK		1 30 1 1 2 2 Next Pk Ri
TT/4DQPSK		ADD Next Pk I
PR es BW 100 kHz #VBW 300 kHz Sweep 1.066 ms (2000 pts) MR noot 10 kHz X Y 10 dot 11 kL Y 2 f 1 2 f 1 3 d -1.009 5 MHz (2010 - 0.033 dB 3 d -1.095 5 MHz (2010 - 1.095 6 MHz (2010 - 0.033 dB 3 d -1.795 dBm 3 d -1.095 5 MHz (2010 - 0.033 dB	π/4DQPSK	ACD Marker D
3 4 5 6 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		#Res BW 100 kHz #VBW 300 kHz Swreep 1.065 ms (2000 pts) Mkr- WR MOG TREISOL X Y FUNCTION FUNCTION W/UE
More		3 4 6 6 7 7
10 1 of 2		



5.6 Hopping Channel Number

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=Cable loss+ attenuation factor.
Limit:	At least 15 channels
Exploratory Test Mode:	hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

Mode	Hopping channel numbers	Limit
GFSK	79	≥15
π/4DQPSK	79	≥15



Test plot as follows:

	Graphs
	November Section Autom Section Autom Section Autom Section Marker Marker 12 dB/dy /r 1
GFSK/Hop	C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0
	#Res BW 100 kHz #VBW 300 kHz Sweep 7.995 ms (2000 pts)
	1 0.2 1 7 0.2 1 7 0.2 1 7 0.2 1 7 0.2 1 7 0.2 1 7 0.2 0
	was DC Coupled
	Marker 18 o b o C conc Straccht Aug Hype (Lap Part) Table (Lap Part) Table (Lap Part) Marker Marker 1 A 77.986243122 MHz Protocht (Lap Part) Aug Hype (Lap Part) Table (Lap Part) <td< td=""></td<>
	Log 1 22 4.00 Hellowersterent denter alle all and the start of the
π/4DQPSK/Hop	TE.0 Fixed-
	Start 2.40000 GHz Stop 2.48350 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 7.995 ms (2000 pts) #WE MODIFIC Soll x Y Exercise Inscreament Function with Function
	Δ2 1 f (Δ) 77.99 MHz (Δ) 1.063 dB 2 P 1 f 2.452 01 GHz -3.237 dBm 3 - -3.237 dBm - - Properties > 4 - - - - - Properties > 6 - - - - - Properties > 7 - - - - - - - 9 - <td< td=""></td<>
	10 1 of 2



5.7 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table
	Ground Reference Plane
	Remark: Offset=Cable loss+ attenuation factor.
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Limit:	0.4 Second
Test Results:	Pass

Measurement Data

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Dwell Time[ms]	Limit (ms)
GFSK	DH1	MCH	0.3803	121.696	≤400
GFSK	DH3	MCH	1.625	260.000	≤400
GFSK	DH5	MCH	2.871	306.240	≤400
π/4DQPSK	2DH1	MCH	0.3826	122.432	≤400
π/4DQPSK	2DH3	MCH	1.633	261.280	≤400
π/4DQPSK	2DH5	МСН	2.885	307.733	≤400

Remark:

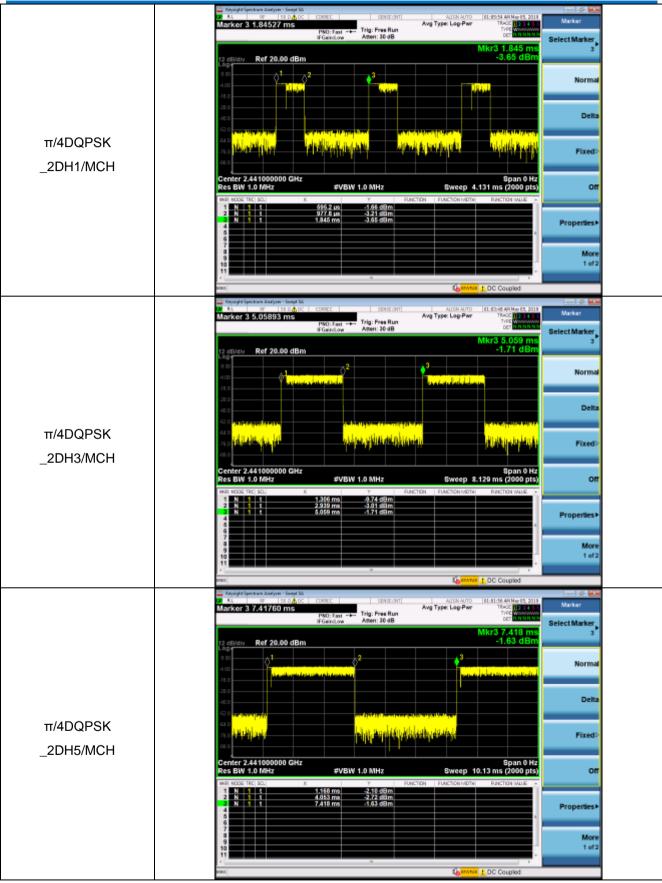
The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s DH1/2DH1 Dwell time = Burst Width(ms)*(1600/ (2*79))*31.6 DH3/2DH3 Dwell time = Burst Width (ms)*(1600/ (4*79))*31.6 DH5/2DH5 Dwell time = Burst Width (ms)*(1600/ (6*79))*31.6



Test plot as follows:

est plot as follows:	Graphs
	Keynight Spectrum Jackym - Seept Id. Mit As an in State
GFSK_DH1/MCH	12 dBith Ref 20.00 dBm -4.94 dBm 12 dBith -4.94 dBm 10 dBith
	Center 2.441000000 GHz Res BW 1.0 MHz Span 0 Hz #VBW 1.0 MHz Space 1 Span 0 Hz Sweep 4.131 ms (2000 pts) Off MR M000 TEL SCI X Y Function Function wells -
	6 6 7 8 9 9 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10
	Keysight Spectrum Sealyme - Sealy Ma Keysight Spectrum Sealyme - Sealy Ma Marker State Sealy Contect Sealy Seal And Sealy Sealy Marker Sealy Contect Sealy Sealy Marker Sealy Seal
	Microsoft Trig: Free Run Trig: Free Run <thtrig: free="" ru<="" td=""></thtrig:>
GFSK_DH3/MCH	ero ero ero
	Center 2.441000000 GHz Span 0 Hz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 8.129 ms (2000 pts) Off MR MORE TRE (SC) X Y Function Function Function wulls - 1 X Y Summer Tre (SC) X Y Function Function wulls -
	1 N 1 t 3,433 ms -1,65 dBm 2 N 1 t 5,038 ms -1,64 dBm 3 N 1 t 7,182 ms -1,64 dBm 4 5 5 5 6 5 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	More 1 1 of 2
	Magnetic Section
	PMC: Fast Trig: Free Run Proc. IFGalicitory Atten: 30 dB Mkr3 7: 904 ms 12 dB/dt/ Ref 20.00 dBm -1.65 dBm
	100 00 00 00 00 00 00 00 00 00 00 00 00
GFSK_DH5/MCH	action
	and and a state of the state of
	Center 2.441000000 GHz Span 0 Hz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.13 ms (2000 pts) MR AGE TEL (SL) X Y Function Function Function wutue MR AGE TEL (SL) X Y Function Function wutue Function wutue
	1 N 1 t 1,654 ma - 1,85 dBm 2 N 1 t 4,625 ma - 1,85 dBm 3 N 1 t 7,904 ms - 1,85 dBm 6 Mkr→RefLv1
	7 8 9 10 11
	ano LOC Coupled







5.8 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset=cable loss+ attenuation factor.
Limit:	In any 100kHz bandwidth outside the frequency band in which the spread spectrum 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 conducted or a radiated measurement.
Exploratory Test Mode:	Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Mode	Test Channel	Frequency [MHz]	Frequency Hopping	Emission Level [dBm]	Limit [dBm]	Result
		2390	Off	-34.018	-21.54	PASS
		2400	Off	-59.242	-21.54	PASS
GFSK	LCH	2390	On	-33.333	-21.54	PASS
		2400	On	-58.457	-21.54	PASS
		2483.5	Off	-53.782	-20.93	PASS
		2500	Off	-59.739	-20.93	PASS
GFSK	HCH	2483.5	On	-56.251	-21.02	PASS
		2500	On	-57.507	-21.02	PASS



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Mode	Test Channel	Frequency [MHz]	Frequency Hopping	Emission Level [dBm]	Limit [dBm]	Result
		2390	Off	-34.012	-21.56	PASS
(15050)(2400	Off	-59.567	-21.56	PASS
π/4DQPSK	LCH	2390	On	On -34.541 -21.61 PASS		
		2400	On	-57.568	-21.61	PASS
	2483.5 Off -54.167 2500 Off -59.034	2483.5	Off	-54.167	-20.90	PASS
		-20.90	PASS			
π/4DQPSK	HCH	2483.5	3.5 On -58.305 -21.02 PASS	PASS		
		2500	On	-59.534	-21.02	PASS

Test plot as follows:

	Graphs
	Moviet Service:
GFSK/LCH/No Hop	to Contract of the contract of
	Start 2.31000 GHz Stop 2.41000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.595 ms (2000 pts) Off
	MR MOR MOR Y Function Function MOR Properties Properties 1 N 1 f 2402 00 GHz -31,640 BBm Function
	More 10 10 10 10 10 10 10 10 10 10 10 10 10
	Keysight Speritors Barger - Specific Several Seve
GFSK/LCH/Hop	12 d Ref 20.00 dBm -57.341 dBm
	aco de la constancia de
	64 D 75 D 60 D 81art 2.31000 GHz Stop 2.41000 GHz
	#Res BW 100 kHz #VBW 300 kHz Bweep 9.595 ms (2000 pts) Weg Mode Tre; Sci. X Y FUNCTION MOTH RUNCTION MALE
	1 N 1 f 2.446 65 GHz - 3.540 gBm 2 N 1 f 2.460 00 GHz - 33.333 dBm 3 N 1 f 2.390 00 GHz - 68.467 dBm N 1 f 2.390 00 GHz - 67.341 dBm 6 Properties►
	7 9 10 11
	was DC Coupled



	Knydefanstear Banyen - Song BA M Sall Andor Control - Song Song - Allow Auto 12-49-54 AVI New 55, 2019 Display Line -20.93 dBm Trace/Datector Trace/Datector
	Display Line -20.93 dBm Avg Type: Log-Par Tiso Datedor PR0: Feet Cp Trig: Fee Run Avg[Hold>100160 Trig: Trig: Fee Run Avg[Hold>100160 Trig: Trig: Trig: Feet Trig: Content to C
	Mkr4 2.527 98 GHz 1 12 dBM/v Ref 20.00 dBm -56.595 dBm
	-co
	and Trace Average
	CODE WWW Character and a second
GFSK/HCH/No Hop	Max Hole
	Start 2.47000 GHz Stop 2.57000 GHz
	#Res BW 100 kHz #VBW 300 kHz Sweep 9.595 ms (2000 pts) Min Hold
	MR MODE TRC SSL X Y FUNCTION FUNCTION MOTH RUNCTION MULE - 1 N 1 1 2479 90 GHz - 4929 dBm 2 N 1 1 2443 90 GHz - 53 782 dBm
	1 N 1 f 2,479 90 GHz 4,929 dBm 2 N 1 f 2,413 50 GHz -53,172 dBm 3 N 1 f 2,550 00 GHz -57,79 gBm 4 N 1 f 2,557 99 GHz -58,595 dBm Trace On
	8 More 107
	max LOC Coupled
	Poysian Service - Ser
	iFGaint.ov Atten: 30 dB DC Bailtone Select Trace
	Mkr4 2.541 39 GHz 1 12 cBidly Ref 20.00 dBm -57.191 dBm
	400 Clear Write
	and Trace Average
GFSK/HCH/Hop	56D Max Hold
	Start 2,47000 GHz Stop 2,57000 GHz
	#Res BW 100 kHz #VBW 300 kHz Bweep 9.595 ms (2000 pts) Min Hold WR MODE TR: SQL X Y SUNCTION FUNCTION MULTIN
	1 N 1 f 2.476 95 GHz -1.019 dBm
	2 N 1 f 2413 20 Gitz -35 221 dBm 3 N 1 f 2,560 00 Gitz - 57 307 dBm N 1 f 2,541 39 Gitz - 57 307 dBm 6 2 541 39 Gitz - 57 191 dBm 6 2 541 59 Citz - 57 191 dBm
	6 7 8 Mon
	9 10 1 of 3
	mai DC Coupled
	🛶 Keysight Sperkows Analyzer - Sampt Sd. 💷 🖉 😖
	24 24 24 24 24 24 24 24 24 24 24 24
	IFGainLow Atten: 30 dB comparison Select Marker
	12 dB/dh/ Ref 20.00 dBm -57,469 dBm
	8 00 View View View View View View View View
π/4DQPSK/LCH/No Hop	Fixed:
	Start 2.31000 GHz Stop 2.41000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.595 ms (2000 pts) Of
	MOR MODE TRC SOL X Y FUNCTION FUNCTION MODE -
	1 N 1 2.401.80 GHz -1.556.0Bm 2 N 1 7.2480.00 GHz -34.012 dBm 3 N 1 7.2380.00 GHz -34.012 dBm 3 N 1 7.2380.00 GHz -34.012 dBm 4 N 1 7.2357.95 GHz -57.469 dBm
	4 N 1 / 2.357.95 GHz -57.469 dBm Properties
	7
	More
	8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10



ľ	
	Keysight Spectrum - Seed Id. Keysight Spectrum - Spectrum - Ang Type: Lap Part Marker Marker Marker Marker Marker Marker Select Marker, Select Marker,
	Mkr4 2.363 45 GHz 12 dRidiv Ref 20.00 dBm -58.629 dBm
	1 00 4 00 1 0 1
	can been and the second secon
π/4DQPSK/LCH/Hop	GID Fixed:
	Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.41000 GHz Sweep 9.595 ms (2000 pts) Orr MR MODE TR: SCL X Y FUNCTION FUNCTION MODE FUNCTION WALKE
	1 N 1 f 2.40716.0Hz -3.814.0Bm 2 N 1 f 2.40000.GHz -3.814.0Bm 3 N 1 f 2.340000.GHz -37.848.0Bm 4 N 1 f 2.3400.GHz -58.829.0Bm 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
	6 7 8 9 9 10 10 10 10
	11 A DC Coupled
	Inspirat Sector:
	Mkr4 2.544 19 GHz 1 12 dBidly Ref 20.00 dBm -57.153 dBm
	4.00 Clear Write 16.0 Clear Write
	Trace Average
π/4DQPSK/HCH/No Hop	TED Max Hold
	Start 2.47000 GHz Stop 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.595 ms (2000 pts) Min Hold Mix Mode TRC (201) X Y Function (Function mode)
	1 N 1 7 2,475 80 01Hz -0,856 01Bm 2 N 1 7 2,415 80 01Hz -0,816 10Bm 3 N 1 7 2,850 00 Hz -0,816 10Bm 3 N 1 7 2,850 00 Hz -0,816 10Bm N 1 7 2,840 00 Hz -0,816 10Bm Trace On 0 1 2,544 19 GHz -57,153 dBm Trace On 1
	67 8 9 9 9 10 More 1 of 3
	anno Coupled
	Registrative Ladge: See See See See See See See See See S
	Mkr4 2.524 28 GHz 12 dB/div Ref 20.00 dBm -57.748 dBm
π/4DQPSK/HCH/Hop	ACC MARKAN AND AND AND AND AND AND AND AND AND A
	CED HED CED CED CED CED CED CED CED C
	GLD TED GED
	Start 2.47000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.57000 GHz Sweep 9.595 ms (2000 pts) Orr MR MODE TR: SCL X Y FUNCTION INDIA FUNCTION WORK FUN
	1 N 1 f 2.475 89 GHz -1.923 dBm 2 N 1 f 2.433 99 GHz -5.303 dBm 3 N f 2.843 99 GHz -5854 dBm Properties▶ 3 N f 2.524 29 GHz -57.748 dBm Properties▶
	6 7 8 9 9 10 10 10 10
	11



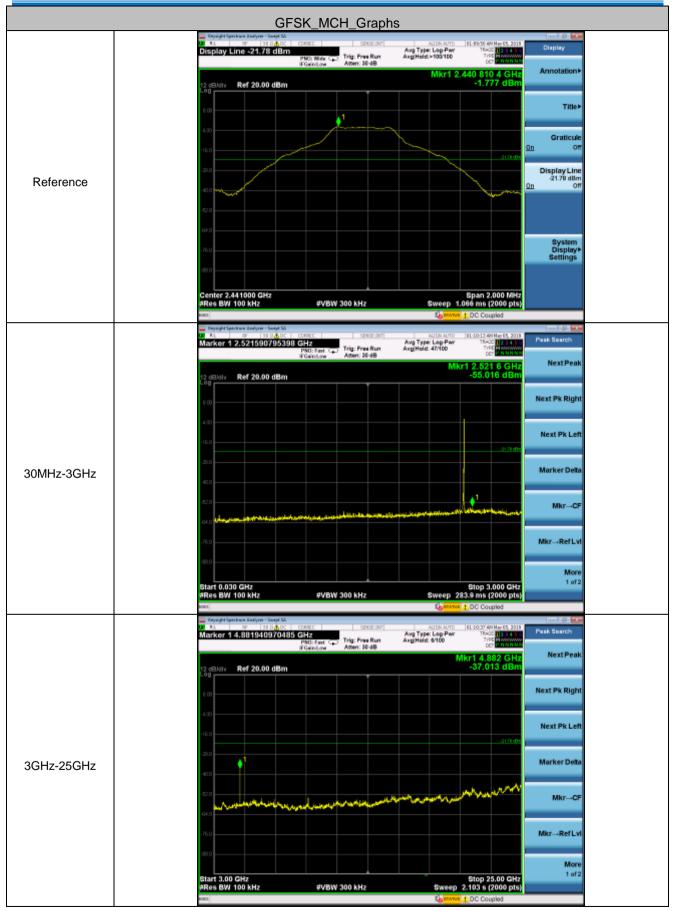
5.9 Spurious RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
	Remark: Offset=cable loss+ attenuation factor.
Limit:	In any 100kHz bandwidth outside the frequency band in which the spread spectrum 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 conducted or a radiated measurement.
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of π /4DQPSK modulation type.
Test Results:	Pass

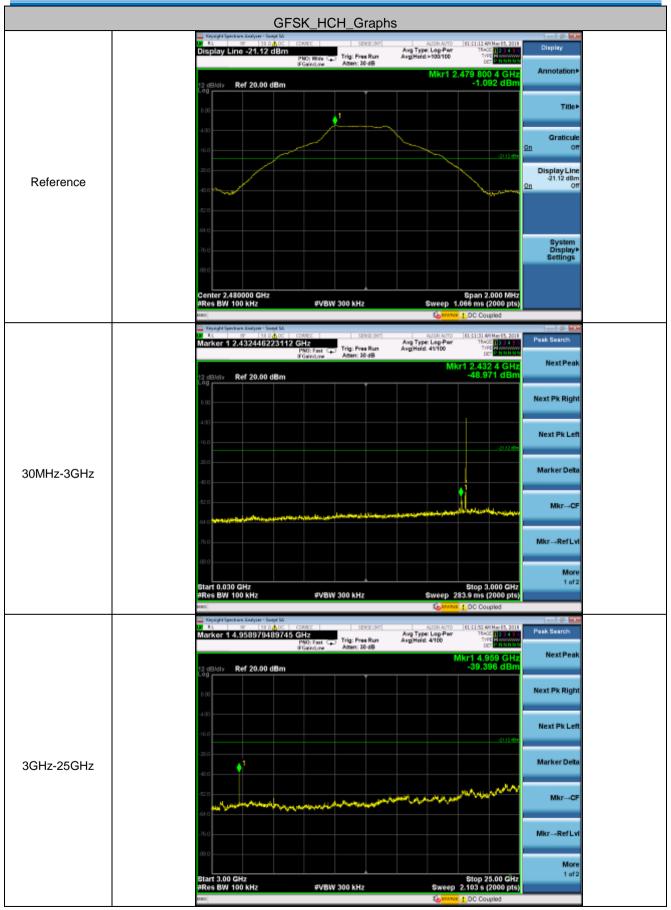


	GFSK_LCH_Graphs
	Repúblicanterez Analym - Seage IA No. NY - Seage Active Control - Seage-Series - August Autor
Reference	Proc. Trite Trig: Free Run Avg(Heid: +1031100 Tries Run Arg) Proc. Trite Trig: Free Run Avg(Heid: +1031100 Tries Run Arg) Proc. Trite Trig: Free Run Avg(Heid: +1031100 Tries Run Arg) Proc. Trite Trig: Free Run Avg(Heid: +1031100 Tries Run Avg(Heid: +1031100 Tr
	12 dB/div Ref 20.00 dBm -2.022 dBm
	e.co
	4.00 Graticule
	-16.0
	200 Display Line -22.14 dlm
	-750 System Display> Settings
	800 Settings
	Center 2.402000 GHz Bpan 2.000 MHz
	#Res BW 100 kHz #VBW 300 kHz Sweep 1.066 ms (2000 prs) #res
	Keysight Spectrum Ready In - Sough IA Key Sea (Sea (Sea (Sea (Sea (Sea (Sea (Sea
30MHz-3GHz	IFGENLOW Trig: Free Run Avgitelet: 29100 Det Control C
	Mkr1 2.433 9 GHz -46.810 dBm -46.810 dBm
	eco Next Pik Right
	430
	160 Next Pk Left
	20.0 Marker Della
	-0.0
	4220 MkrCF
	-750 Mikr→Ref Lvl
	More 1 of 2
	Start 0.030 GHz Stop 3.000 GHz Stop 3.000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep: 283.9 ms (2000 pts) msi Upstream 4,000 Coupled
	- Keynight Spectrum Lastyrer - Sough SA
3GHz-25GHz	PND: Frant C Trig: Free RunArgn/sec: \$100
	Mkr1 4,805 GHz NextPeak 12 dBkitir Ref 20.00 dBm -36.218 dBm
	em Next Pk Right
	400
	150 Next Pk Left
	2010 Marker Delta
	120 Mkr-CF
	64.0
	-750 MikrRef Lvi
	More 1 of 2
	Start 3.00 CHz Stop 25.00 CHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.103 s (2000 pts)
	and Do Coupled

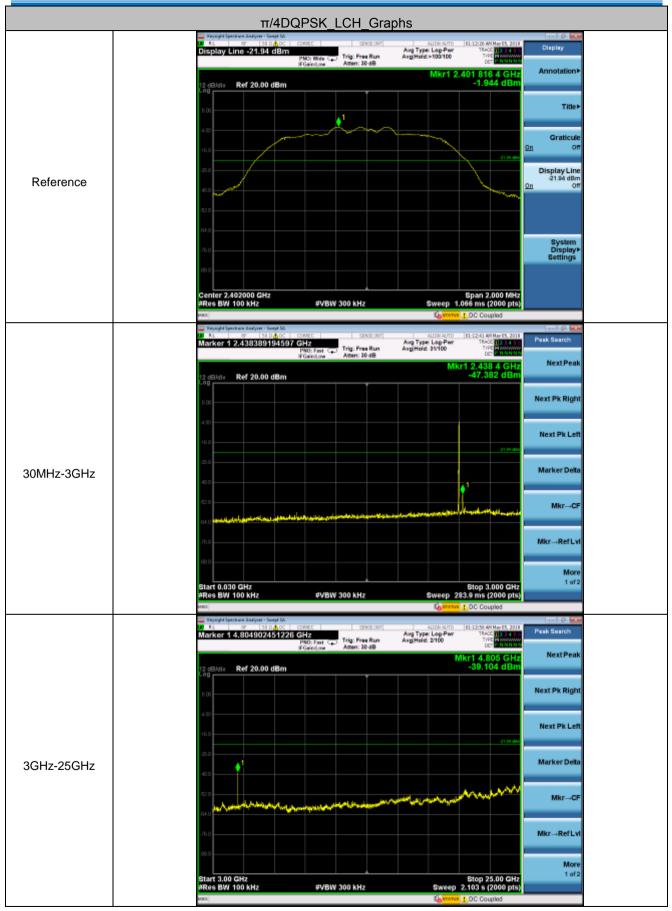




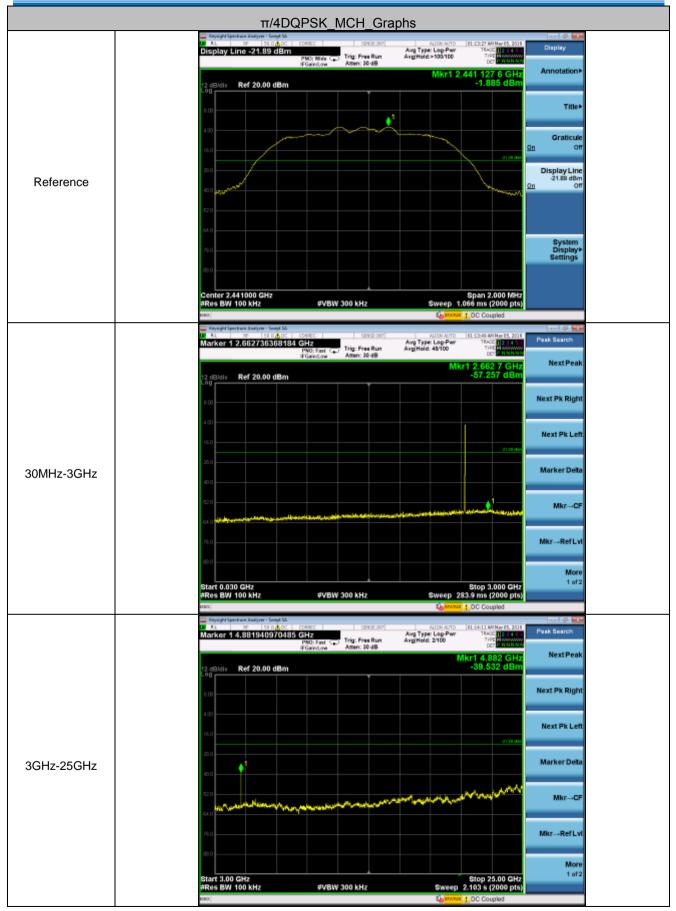














Report No.: CQASZ20190500016EX-01



Remark:Pre test 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.



5.10Other requirements Frequency Hopping Spread Spectrum System

•	equency Hopping Spread Spectrum System
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1), (h) requirement:
rate from a Pseudorandom of on the average by each trans	anel frequencies that are selected at the system hopping rdered list of hopping frequencies. Each frequency must be used equally smitter. The system receivers shall have input bandwidths that match the of their corresponding transmitters and shall shift frequencies in smitted signals.
channels during each transm receiver, must be designed to transmitter be presented with employing short transmission	pectrum systems are not required to employ all available hopping hission. However, the system, consisting of both the transmitter and the comply with all of the regulations in this section should the a continuous data (or information) stream. In addition, a system bursts must comply with the definition of a frequency hopping system hissions over the minimum number of hopping channels specified in
the system to recognize othe independently chooses and a The coordination of frequenc	nce within a frequency hopping spread spectrum system that permits or users within the spectrum band so that it individually and adapts its hopsets to avoid hopping on occupied channels is permitted. y hopping systems in any other manner for the express purpose of occupancy of individual hopping frequencies by multiple transmitters is
Compliance for section 15.	247(a)(1)
	lo-two addition stage. And the result is fed back to the input of the first with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized ges: 9 equence: $2^9 - 1 = 511$ bits
Linear Feedback Sh	nift Register for Generation of the PRBS sequence
An example of Pseudorandor 20 62 46 77	m Frequency Hopping Sequence as follow: 7 64 8 73 16 75 1
Each frequency used equally	on the average by each transmitter.
bandwidths that match the	e Specification, Bluetooth receivers are designed to have input and IF hopping channel bandwidths of any Bluetooth transmitters and shift n with the transmitted signals.
Compliance for section 15.	247(g)
pseudorandom hopping frequ	e Specification, the Bluetooth system transmits the packet with the uency with a continuous data and the short burst transmission from the nsmitted under the frequency hopping system with the pseudorandom



Compliance for section 15.247(h)

According to Bluetooth Core specification, the Bluetooth 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.

According to the Bluetooth Core specification, the Bluetooth 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.

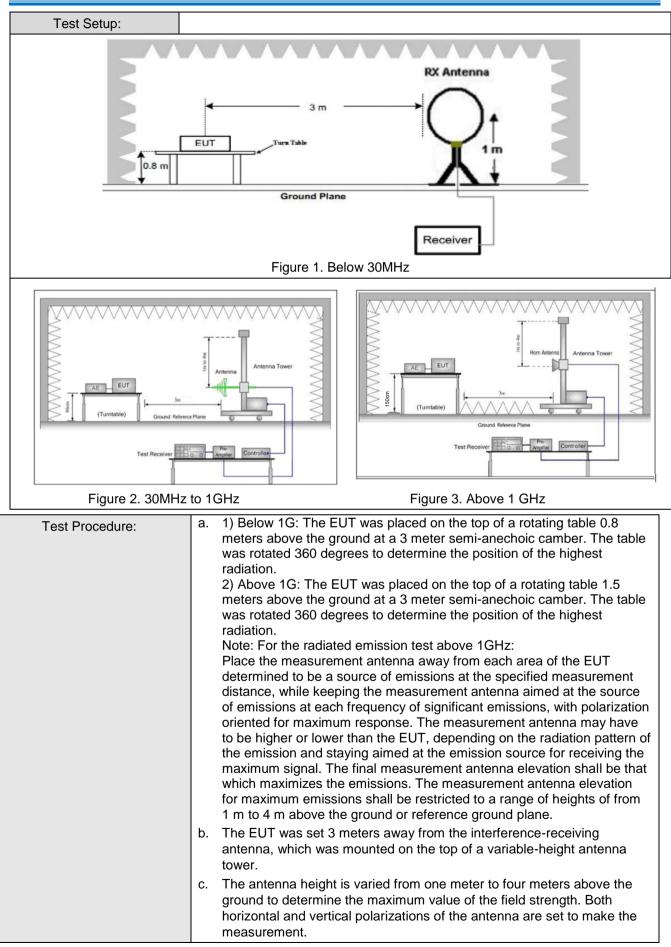


5.11 Radiated Spurious Emission & Restricted bands

Test Requirement:	47 CFR Part 15C Section	on 1	5.209 and 15.	205						
Test Method:	ANSI C63.10: 2013									
Test Site:	Measurement Distance	: 3m	n (Semi-Anech	ioic Cham	ber)					
Receiver Setup:	Frequency	Frequency Detector RBW VBW Remark								
	0.009MHz-0.090MH	z	Peak	10kHz	z 30kHz	Peak				
	0.009MHz-0.090MH	z	Average	10kHz	z 30kHz	Average				
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	z 30kHz	Quasi-peak				
	0.110MHz-0.490MH	z	Peak	10kHz	z 30kHz	Peak				
	0.110MHz-0.490MH	z	Average	10kHz	z 30kHz	Average				
	0.490MHz -30MHz		Quasi-peak	10kHz	z 30kHz	Quasi-peak				
	30MHz-1GHz		Peak	100 kH	lz 300kHz	Peak				
	Above 1GHz		Peak	1MHz	3MHz	Peak				
			Peak	1MHz	10Hz	Average				
Limit:	Frequency		eld strength crovolt/meter)	Limit (dBuV/m)	Remark	Measureme distance (m				
	0.009MHz-0.490MHz	2	400/F(kHz)	00/F(kHz) -		300				
	0.490MHz-1.705MHz	24	1000/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	Average	3							
	Above 1GHz50054.0Average3Note: 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.									





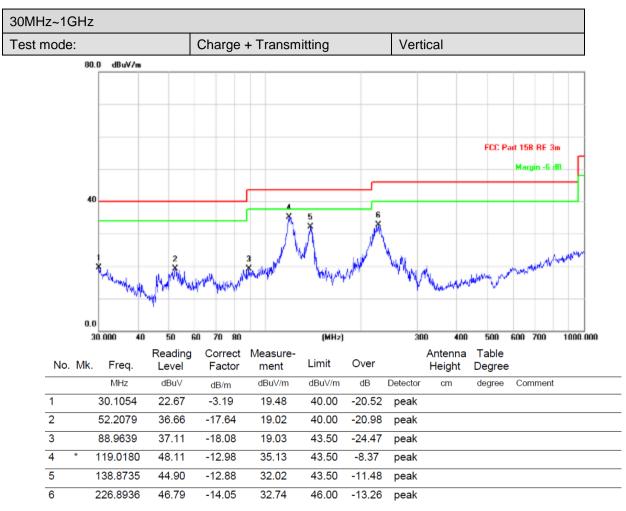




	 d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz) h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
	Non-hopping transmitting mode with all kind of modulation and all kind of data type Transmitting mode, Charge + Transmitting mode.
	Through Pre-scan, find the 2DH5 of data type and $\pi/4DQPSK$ modulation is the worst case.
f I c	Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
	Pass



5.11.1 Radiated Emission below 1GHz



Remark:

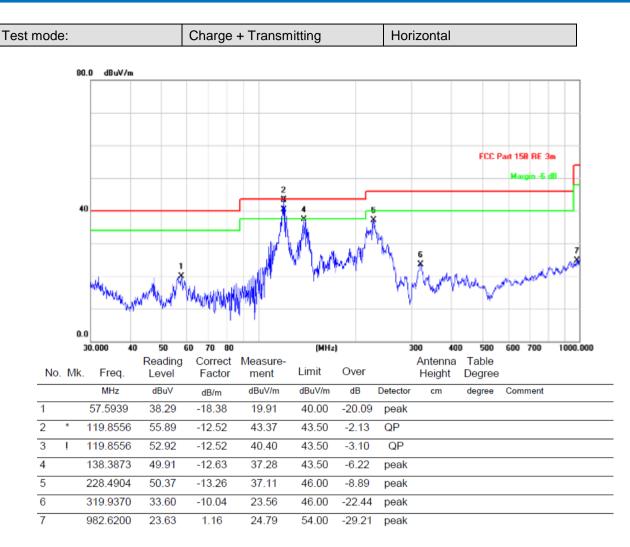
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.





Remark:

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

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.



5.11.2 Transmitter Emission above 1GHz

moo	de:	GFSK(DH5	5)	Test chann	el:	Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2390	56.15	-9.2	46.95	74	-27.05	Peak	н
2400	55.91	-9.39	46.52	74	-27.48	Peak	н
4804	51.36	-4.33	47.03	74	-26.97	Peak	н
7206	49.75	1.01	50.76	74	-23.24	Peak	Н
2390	53.34	-9.2	44.14	74	-29.86	Peak	v
2400	55.96	-9.39	46.57	74	-27.43	Peak	V
4804	53.84	-4.33	49.51	74	-24.49	Peak	V
7206	50.40	1.01	51.41	74	-22.59	Peak	V

mode:		GFSK(DH5)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	51.77	-4.11	47.66	74	-26.34	Peak	н
7323	48.44	1.51	49.95	74	-24.05	Peak	н
4882	53.46	-4.11	49.35	74	-24.65	Peak	V
7323	49.87	1.51	51.38	74	-22.62	Peak	V

mode:		GFSK(DH5)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2483.5	54.97	-9.29	45.68	74	-28.32	Peak	н
4960	51.98	-4.04	47.94	74	-26.06	Peak	н
7440	49.63	1.57	51.20	74	-22.80	Peak	н
2483.5	54.13	-9.29	44.84	74	-29.16	Peak	v
4960	50.69	-4.04	46.65	74	-27.35	Peak	V
7440	48.71	1.57	50.28	74	-23.72	Peak	V



mode:		π/4DQPSK (2DH5)		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2390	53.57	-9.2	44.37	74	-29.63	Peak	н
2400	55.66	-9.39	46.27	74	-27.73	Peak	Н
4804	51.27	-4.33	46.94	74	-27.06	Peak	Н
7206	50.57	1.01	51.58	74	-22.42	Peak	Н
2390	56.14	-9.2	46.94	74	-27.06	Peak	v
2400	56.21	-9.39	46.82	74	-27.18	Peak	V
4804	54.55	-4.33	50.22	74	-23.78	Peak	V
7206	49.87	1.01	50.88	74	-23.12	Peak	V

mode:		π/4DQPSK (2DH5)		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
4882	52.19	-4.11	48.08	74	-25.92	peak	н
7323	48.47	1.51	49.98	74	-24.02	peak	н
4882	52.34	-4.11	48.23	74	-25.77	peak	V
7323	48.57	1.51	50.08	74	-23.92	peak	V

mode:		π/4DQPSK (2DH5)		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		H/V
2483.5	54.63	-9.29	45.34	74	-28.66	Peak	н
4960	52.08	-4.04	48.04	74	-25.96	Peak	н
7440	49.94	1.57	51.51	74	-22.49	Peak	н
2483.5	55.06	-9.29	45.77	74	-28.23	Peak	v
4960	49.41	-4.04	45.37	74	-28.63	Peak	V
7440	49.44	1.57	51.01	74	-22.99	Peak	V

Remark:

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

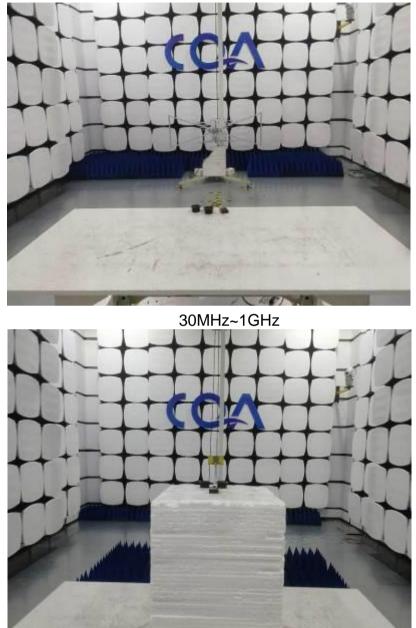
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.



6 Photographs - EUT Test Setup

6.1 Radiated Emission

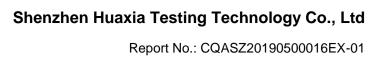


Above 1GHz



6.2 Conducted Emission







7 Photographs - EUT Constructional Details

External photos















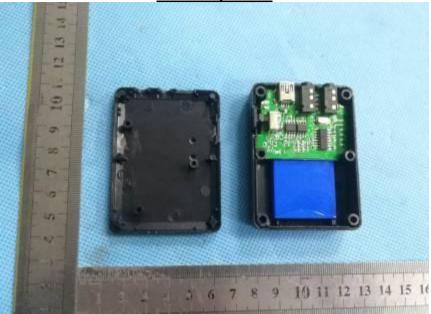


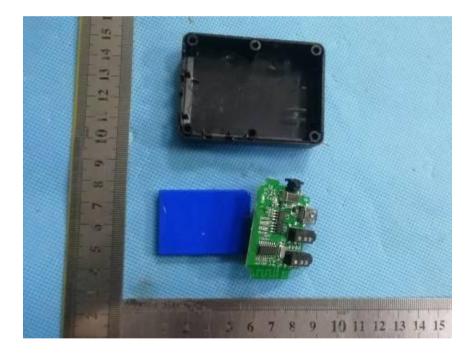




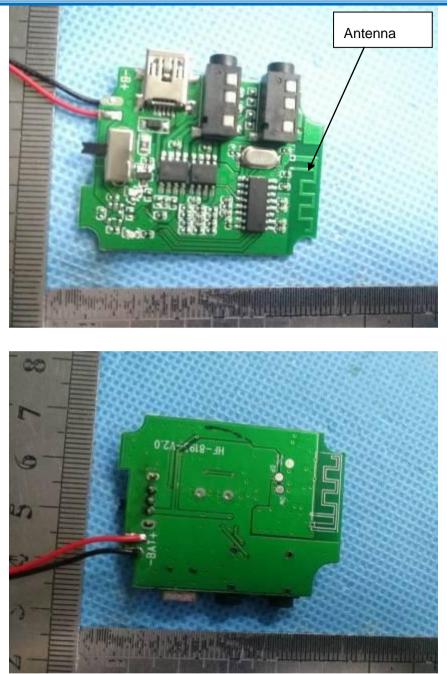


Internal photos



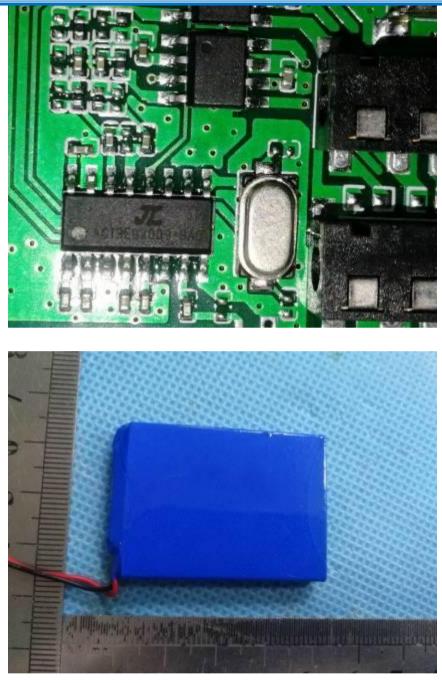








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The End