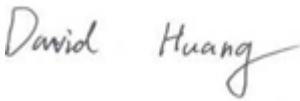


RF TEST REPORT



Report No.: Q181127S005-FCC-R

Supersede Report No.: N/A

Applicant	Shenzhen Haixinwang Electronic Co., Ltd.	
Product Name	Festival Stick Wireless Speaker	
Model No.	HXWW502ZD	
Serial No.	HXWW502JD, AR-ELCFSS, AR-ELCFSSBK-BMI, AR-ELCFSS-BMI , BB2288, HXWW502S, HW502	
Test Standard	FCC Part 15.247, ANSI C63.10: 2013	
Test Date	December 05 to 12, 2018	
Issue Date	December 13, 2018	
Test Result	☒ Pass ☐ Fail	
Equipment complied with the specification	☒	
Equipment did not comply with the specification	☐	
		
Aaron Liang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
Q181127S005-FCC-R	NONE	Original	December 13, 2018

2. Customer information

Applicant Name	Shenzhen Haixinwang Electronic Co., Ltd.
Applicant Add	2nd floor, Building 56, Baotian industrial park, Xixiang, Bao'an District, Shenzhen, China
Manufacturer	Shenzhen Haixinwang Electronic Co., Ltd.
Manufacturer Add	2nd floor, Building 56, Baotian industrial park, Xixiang, Bao'an District, Shenzhen, China

3. Test site information

Test Lab A:

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

Test Lab B:

Lab performing tests	Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories
Lab Address	No. 34, Chenwulu Section, Guantai Rd., Houjie Town, Dongguan City, Guangdong 523942, China
FCC Test Site No.	749762
IC Test Site No.	5936A-1
Test Software	ADT_Radiated_V7.6.15.9.2

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.

4. Equipment under Test (EUT) Information

Description of EUT:	Festival Stick Wireless Speaker
Main Model:	HXWW502ZD
Serial Model:	HXWW502JD, AR-ELCFSS, AR-ELCFSSBK-BMI, AR-ELCFSS-BMI , BB2288, HXWW502S, HW502
Date EUT received:	Decmeber 03, 2018
Test Date(s):	December 05 to 12, 2018
Equipment Category :	DSS
Antenna Gain:	0dBi
Antenna Type:	PCB antenna
Type of Modulation:	Bluetooth: GFSK, π /4DQPSK, 8DPSK
RF Operating Frequency (ies):	Bluetooth: 2402-2480 MHz
Max. Output Power:	3.930dBm
Number of Channels:	Bluetooth: 79CH
Port:	Please refer to the user' s manual

Test Report	Q181127S005-FCC-R
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Input Power: USB: 5V

Trade Name : HXWW

FCC ID: 2ARTV-AR-ELCFSS

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.247(a)(1)	Channel Separation	Compliance
§15.247(a)(1)	20 dB Bandwidth	Compliance
§15.247(b)(1)	Peak Output Power	Compliance
§15.247(a)(1)(iii)	Number of Hopping Channel	Compliance
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliance
§15.247(d)	Band Edge& Restricted Band	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Emissions& Restricted Band	Compliance

Measurement Uncertainty

Emissions		
Test Item	Description	Uncertainty
Band Edge& Restricted Band and Radiated Emissions& Restricted Band	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. Measurements, Examination And Derived Results

6.1 Antenna Requirement

Applicable Standard

According to § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the 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 6 dBi.

Antenna Connector Construction

The EUT has 1 antenna:

A permanently attached PCB antenna gain is 0dBi for Bluetooth.

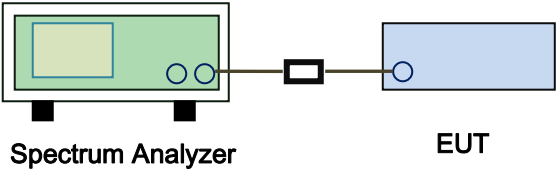
The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 Channel Separation

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1021mbar
Test date :	December 12, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247(a)(1)	a)	Channel Separation < 20dB BW and 20dB BW < 25KHz ; Channel Separation Limit=25KHz Chanel Separation < 20dB BW and 20dB BW > 25kHz ; Channel Separation Limit=2/3 20dB BW	
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: - The EUT must have its hopping function enabled - Span = wide enough to capture the peaks of two adjacent channels - Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span - Video (or Average) Bandwidth (VBW) ≥ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.		

Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

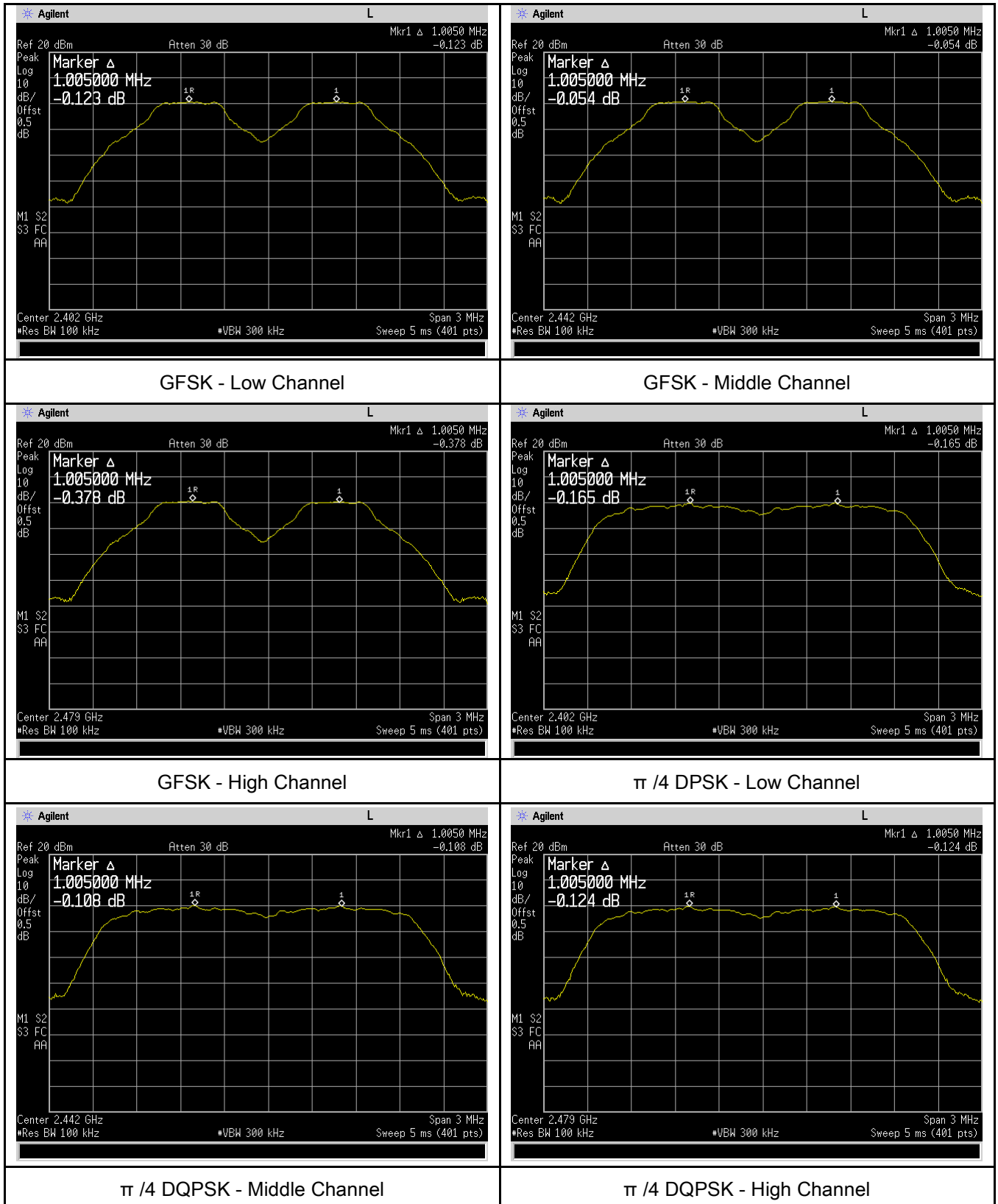
Test Plot ☒ Yes (See below) ☐ N/A

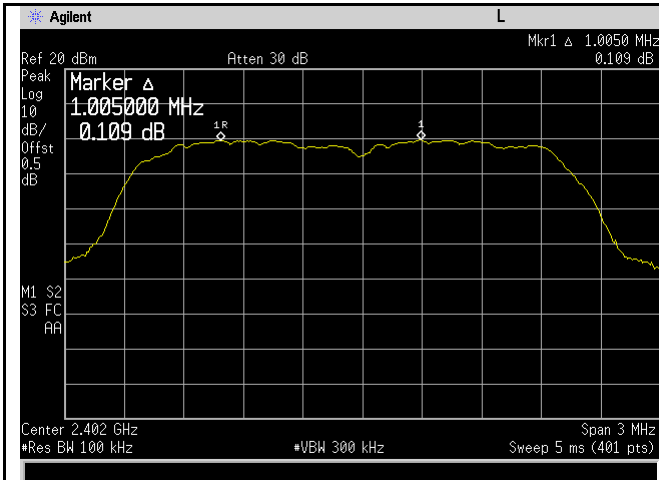
Channel Separation measurement result

Type/ Modulation	CH	CH Frequency (MHz)	CH Separation (MHz)	Limit (MHz)	Result
CH Separation GFSK	Low Channel	2402	1.005	0.777	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.770	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.774	Pass
	Adjacency Channel	2479			
CH Separation $\pi/4$ DQPSK	Low Channel	2402	1.005	0.959	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.951	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.956	Pass
	Adjacency Channel	2479			
CH Separation 8DPSK	Low Channel	2402	1.005	0.959	Pass
	Adjacency Channel	2403			
	Mid Channel	2440	1.005	0.955	Pass
	Adjacency Channel	2441			
	High Channel	2480	1.005	0.962	Pass
	Adjacency Channel	2479			

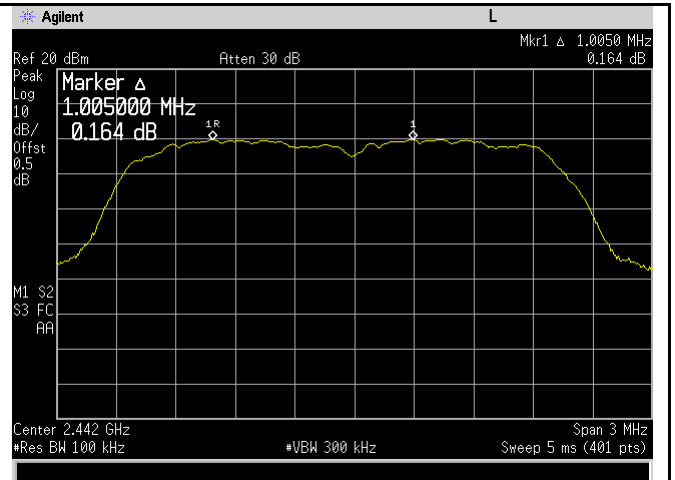
Test Plots

Channel Separation measurement result

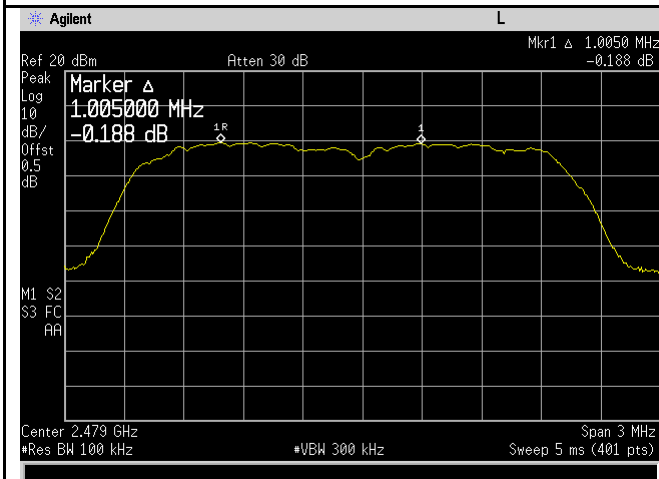




8DPSK - Low Channel



8DPSK - Middle Channel

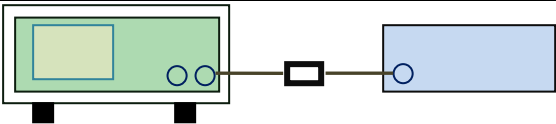


8DPSK - High Channel

6.3 20dB Bandwidth

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1021mbar
Test date :	December 12, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a) (1)	a)	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.	
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Use the following spectrum analyzer settings: - Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel - RBW $\geq$ 1% of the 20 dB bandwidth - VBW $\geq$ RBW - Sweep = auto - Detector function = peak - Trace = max hold. - The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference		

	marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

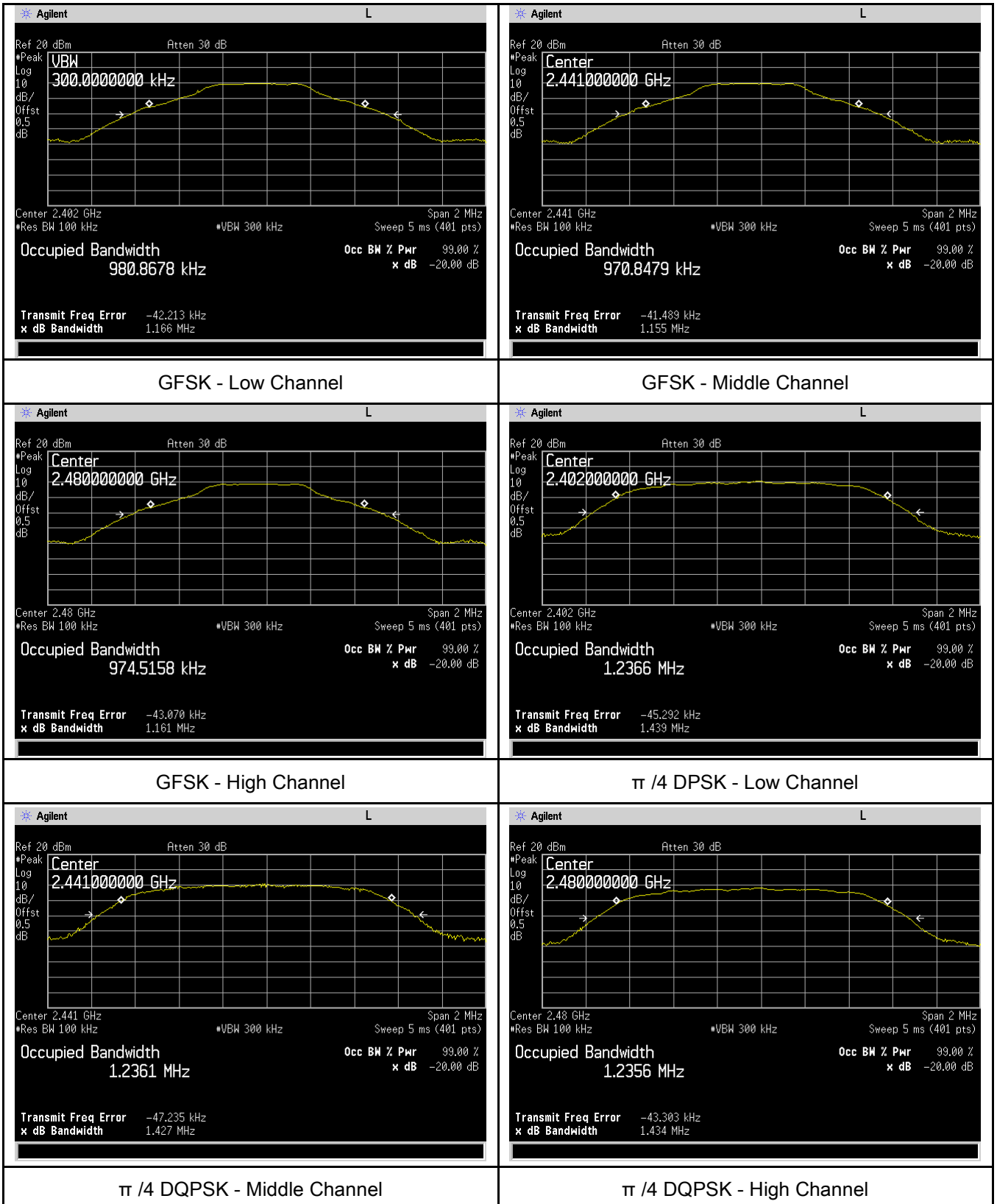
Test Plot ☒ Yes (See below) ☐ N/A

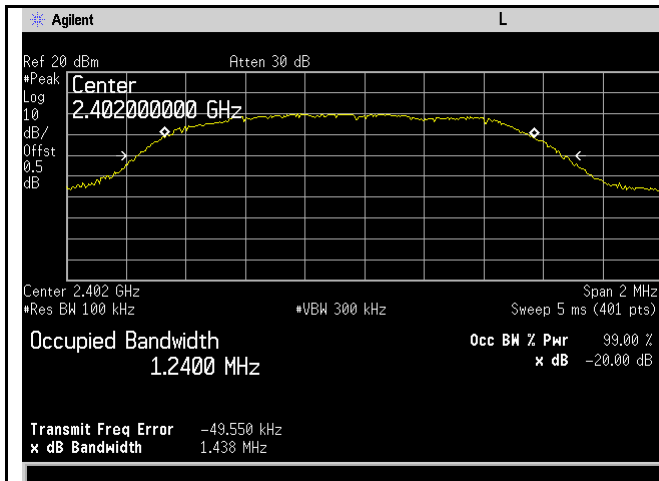
Measurement result

Modulation	CH	CH Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GFSK	Low	2402	1.166	0.981
	Mid	2441	1.155	0.971
	High	2480	1.161	0.975
$\pi/4$ DQPSK	Low	2402	1.439	1.2366
	Mid	2441	1.427	1.2361
	High	2480	1.434	1.2356
8-DPSK	Low	2402	1.438	1.2400
	Mid	2441	1.432	1.2415
	High	2480	1.443	1.2419

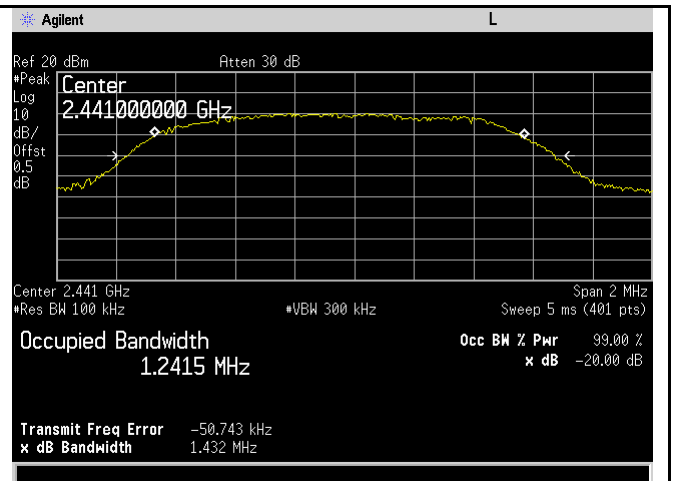
Test Plots

20dB Bandwidth measurement result

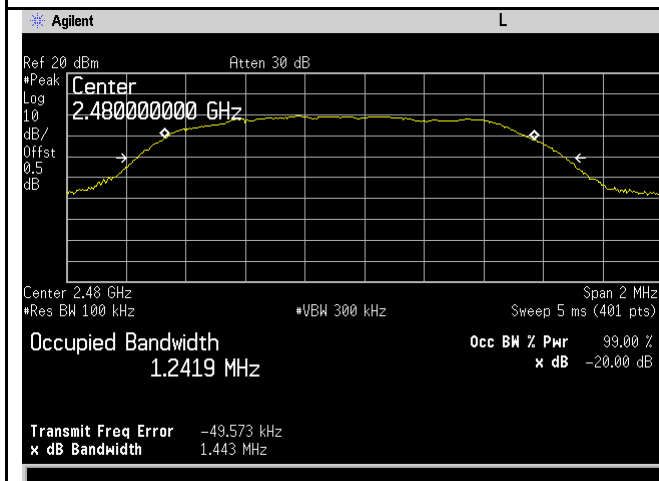




8DPSK - Low Channel



8DPSK - Middle Channel



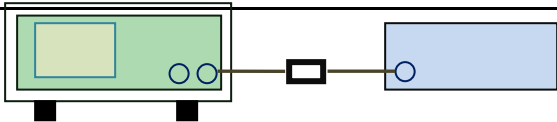
8DPSK - High Channel

6.4 Peak Output Power

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1021mbar
Test date :	December 12, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b) (3)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☒
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☒
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & < 50 channels: ≤ 0.25 Watt	☐
	f)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt	☐

Test Setup	 Spectrum Analyzer EUT
------------	--

Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. <u>Use the following spectrum analyzer settings:</u> - Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel - RBW $>$ the 20 dB bandwidth of the emission being measured - VBW $\geq$ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow the trace to stabilize.
----------------	---

	- Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power (see the note above regarding external attenuation and cable loss). The limit is specified in one of the subparagraphs of this Section. Submit this plot. A peak responding power meter may be used instead of a spectrum analyzer.
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

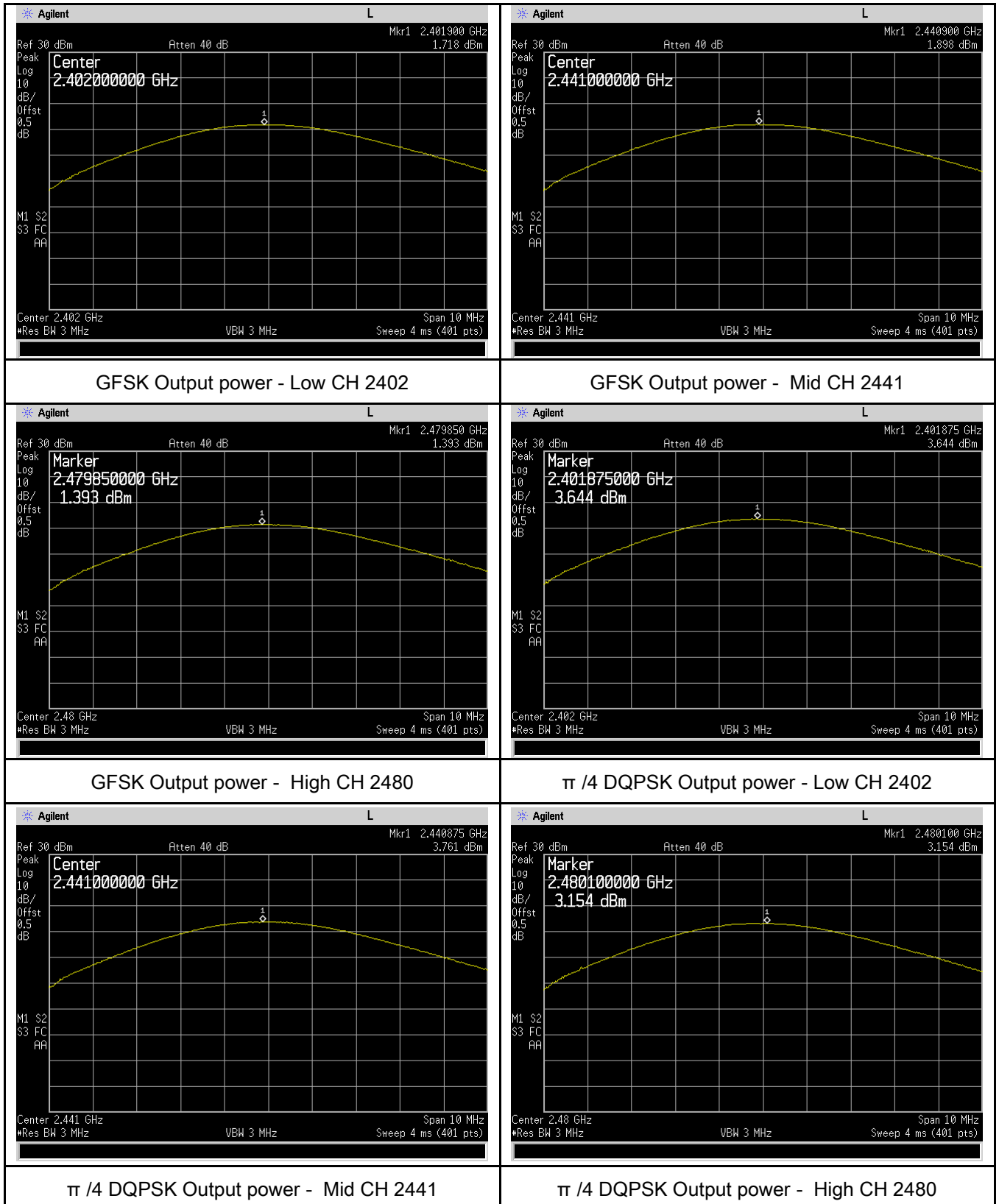
Test Plot ☒ Yes (See below) ☐ N/A

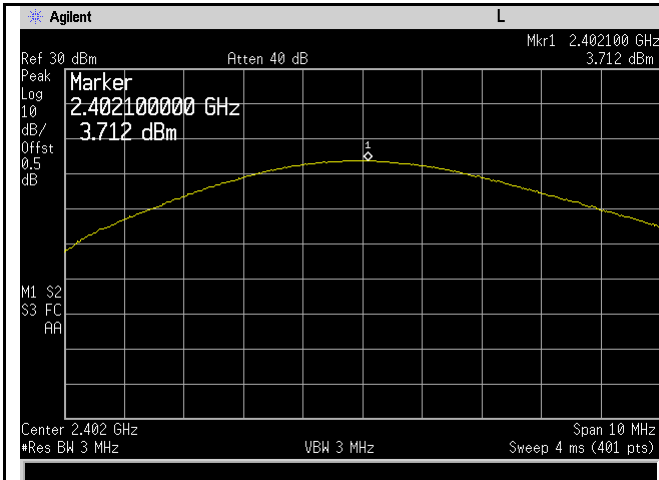
Peak Output Power measurement result

Type	Modulation	CH	Frequency (MHz)	Conducted Power (dBm)	Limit (mW)	Result
Output power	GFSK	Low	2402	1.718	125	Pass
		Mid	2441	1.898	125	Pass
		High	2480	1.393	125	Pass
	$\pi/4$ DQPSK	Low	2402	3.644	125	Pass
		Mid	2441	3.761	125	Pass
		High	2480	3.154	125	Pass
	8-DPSK	Low	2402	3.712	125	Pass
		Mid	2441	3.930	125	Pass
		High	2480	3.204	125	Pass

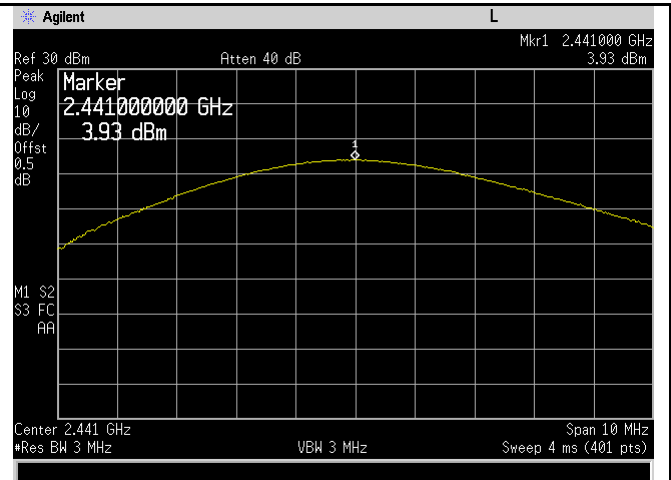
Test Plots

Output Power measurement result

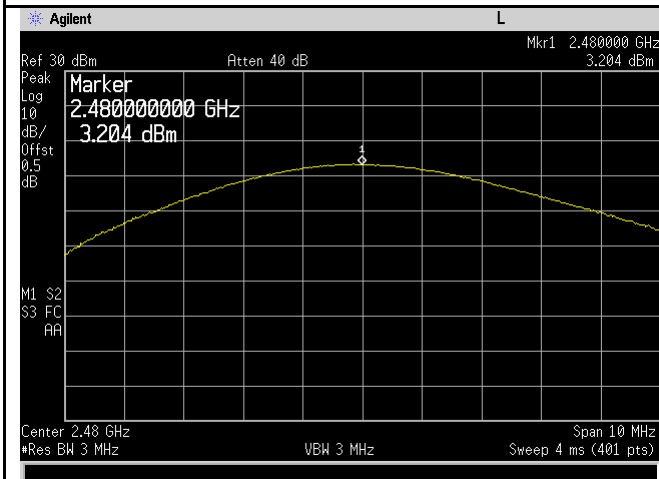




8DPSK Output power - Low CH 2402



8DPSK Output power - Mid CH 2441

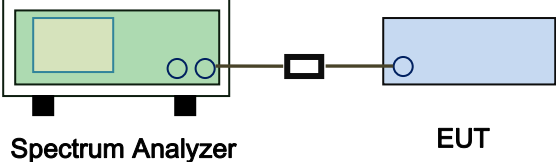


8DPSK Output power - High CH 2480

6.5 Number of Hopping Channel

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1021mbar
Test date :	December 12, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(a) (1)(iii)	a)	FHSS in 2400-2483.5MHz $\geq$ 15 channels	☒
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. <u>Use the following spectrum analyzer settings:</u> The EUT must have its hopping function enabled. - Span = the frequency band of operation - RBW $\geq$ 1% of the span - VBW $\geq$ RBW - Sweep = auto - Detector function = peak - Trace = max hold - Allow trace to fully stabilize. - It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).		
Remark			
Result	☒ Pass ☐ Fail		

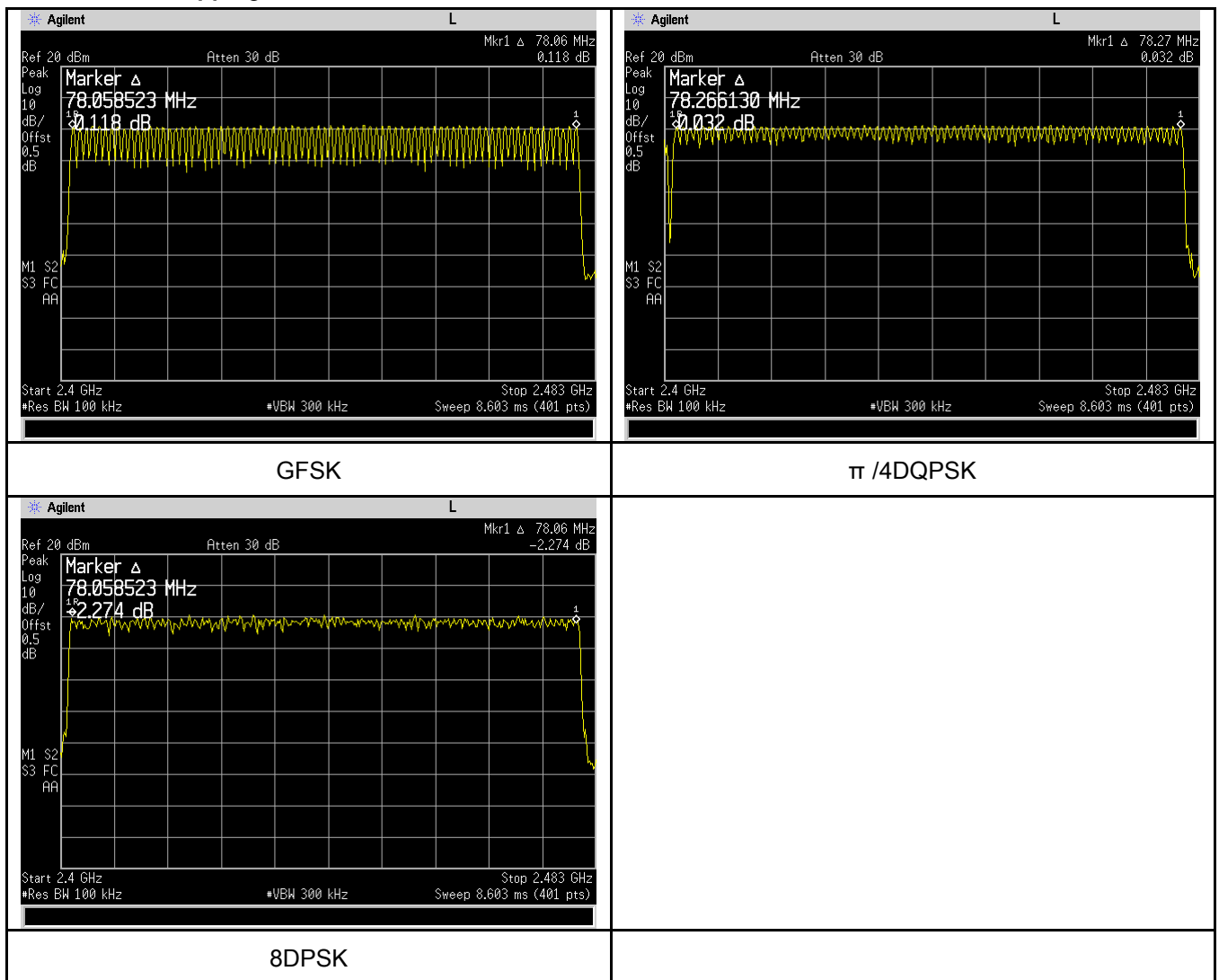
Test Data ☒ Yes ☐ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Number of Hopping Channel measurement result

Type	Modulation	Frequency Range	Number of Hopping Channel	Limit
Number of Hopping Channel	GFSK	2400-2483.5	79	15
	$\pi/4$ DQPSK	2400-2483.5	79	15
	8-DPSK	2400-2483.5	79	15

Test Plots

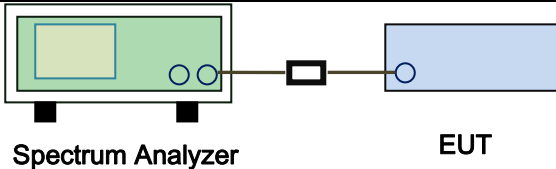
Number of Hopping Channels measurement result



6.6 Time of Occupancy (Dwell Time)

Temperature	25°C
Relative Humidity	53%
Atmospheric Pressure	1021mbar
Test date :	December 12, 2018
Tested By :	Aaron Liang

Requirement(s):

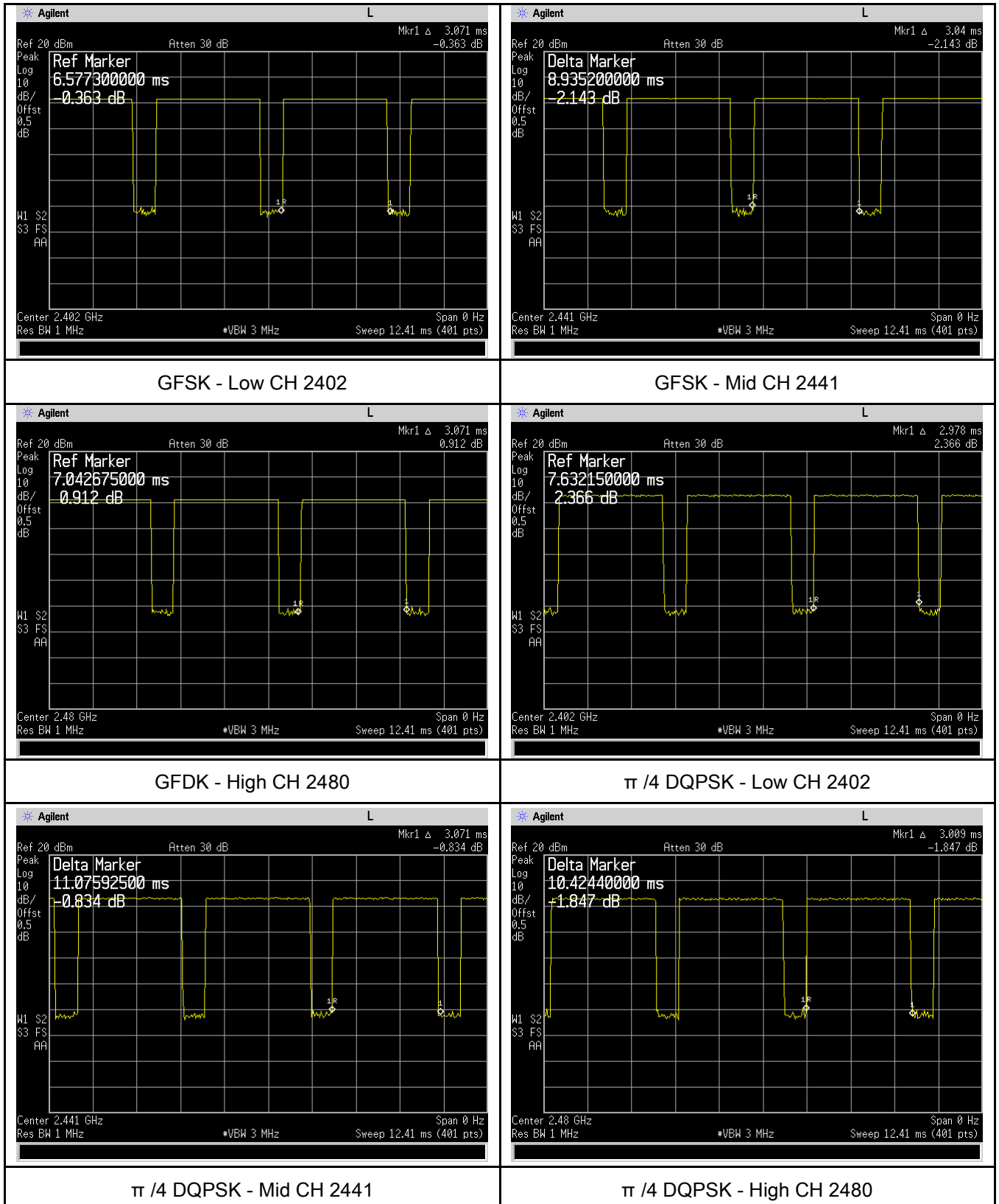
Spec	Item	Requirement	Applicable
§15.247(a) (1)(iii)	a)	Dwell Time < 0.4s	☒
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. <u>Use the following spectrum analyzer</u> - Span = zero span, centered on a hopping channel - RBW = 1 MHz - VBW ≥ RBW - Sweep = as necessary to capture the entire dwell time per hopping channel - Detector function = peak - Trace = max hold - use the marker-delta function to determine the dwell time		
Remark			
Result	☒ Pass ☐ Fail		

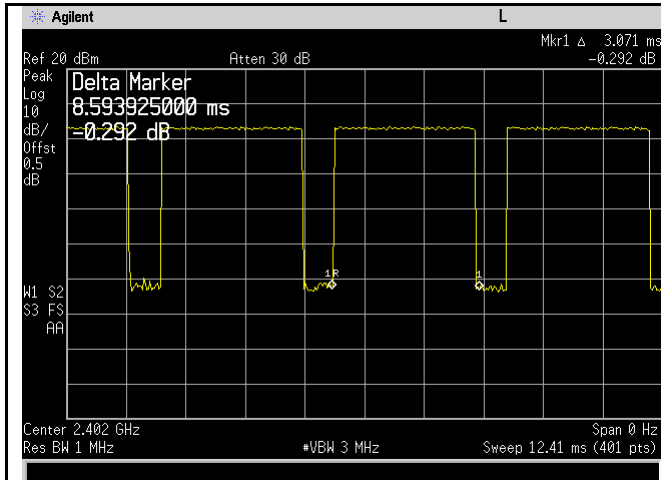
Test Data ☒ Yes ☐ N/A
 Test Plot ☒ Yes (See below) ☐ N/A

Type	Modulation	CH	Pulse Width (ms)	Dwell Time (ms)	Limit (ms)	Result
Dwell Time	GFSK	Low	3.071	327.573	400	Pass
		Mid	3.040	324.267	400	Pass
		High	3.071	327.573	400	Pass
	π /4 DQPSK	Low	2.978	317.653	400	Pass
		Mid	3.071	327.573	400	Pass
		High	3.009	320.960	400	Pass
	8-DPSK	Low	3.071	327.573	400	Pass
		Mid	3.071	327.573	400	Pass
		High	3.071	327.573	400	Pass
Note: Dwell time=Pulse Time (ms) $\times$ (1600 $\div$ 6 $\div$ 79) $\times$ 31.6						

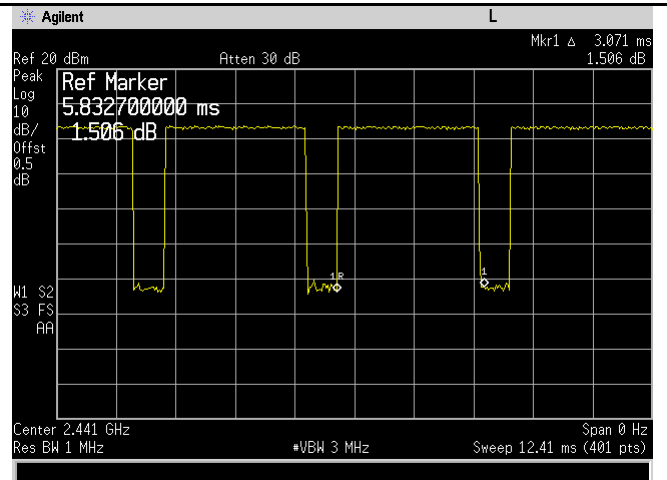
Test Plots

Dwell Time measurement result

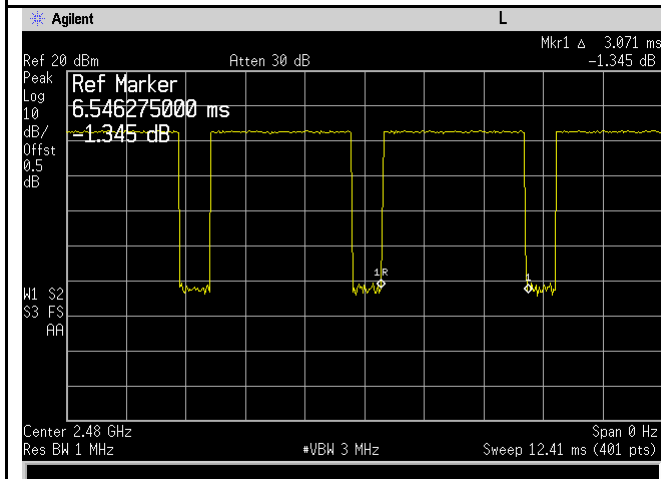




8DPSK - Low CH 2402



8DPSK - Mid CH 2441



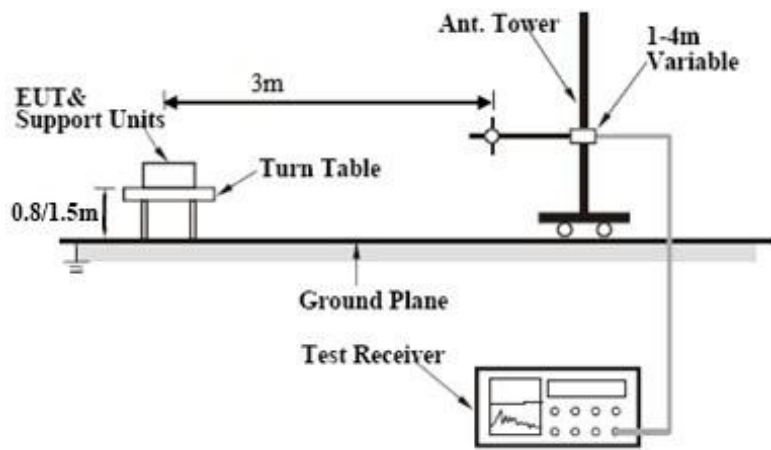
8DPSK - High CH 2480

6.7 Band Edge & Restricted Band

Temperature	26 °C
Relative Humidity	55%
Atmospheric Pressure	1020mbar
Test date :	December 11, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(d)	a)	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 conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. □	☒

Test Setup	
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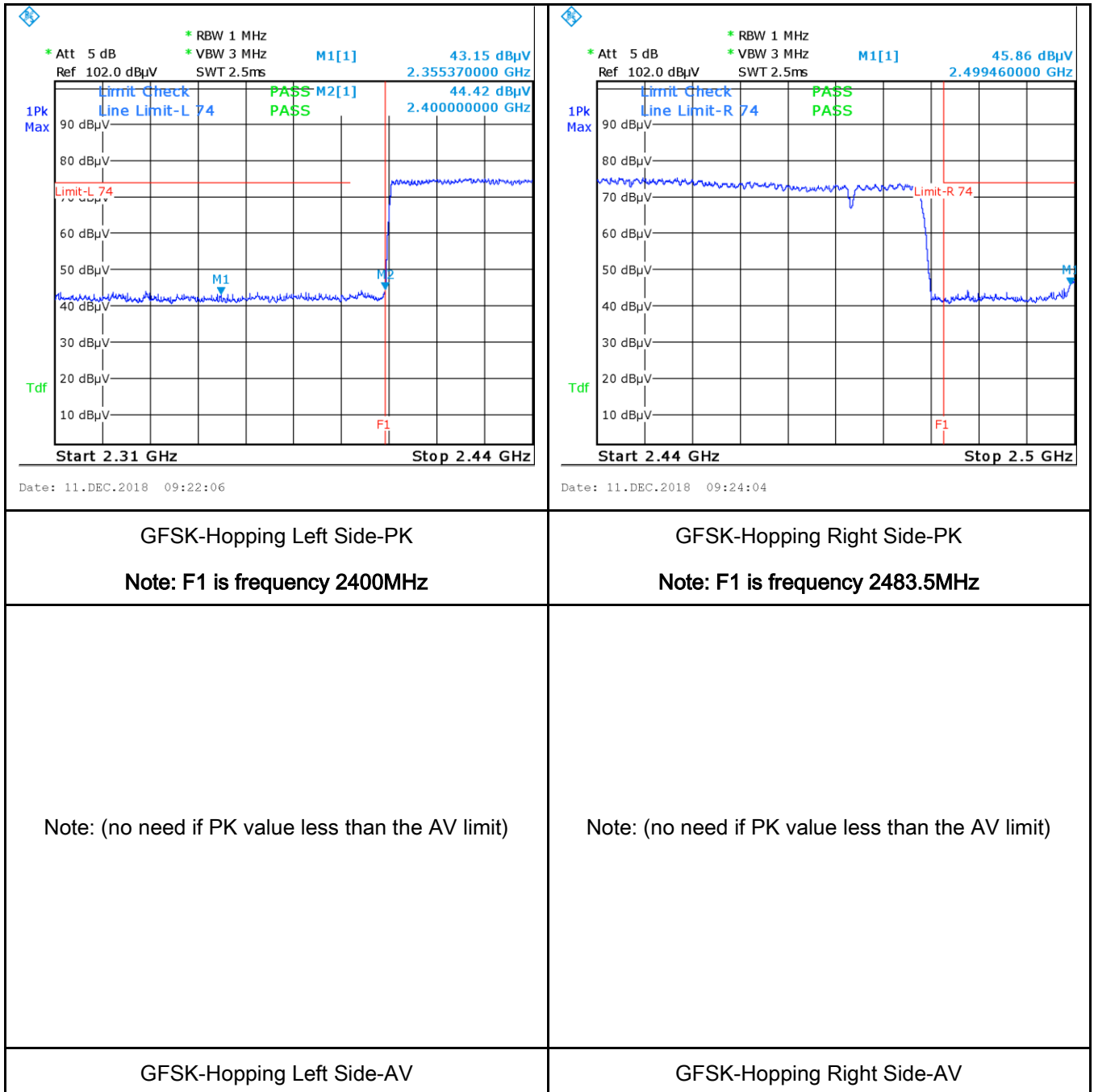
Test Procedure	The test follows FCC Public Notice DA 00-705 Measurement Guidelines. Radiated Method Only 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range,
----------------	--

	and make sure the instrument is operated in its linear range. - 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. b. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. - 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. - 5. Repeat above procedures until all measured frequencies were complete.
Remark	
Result	☒ Pass ☐ Fail

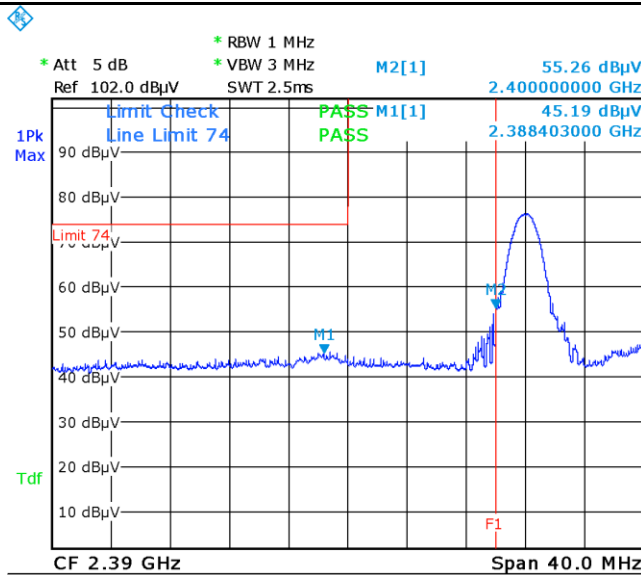
Test Data ☐ Yes ☒ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Test Plots

GFSK Mode:



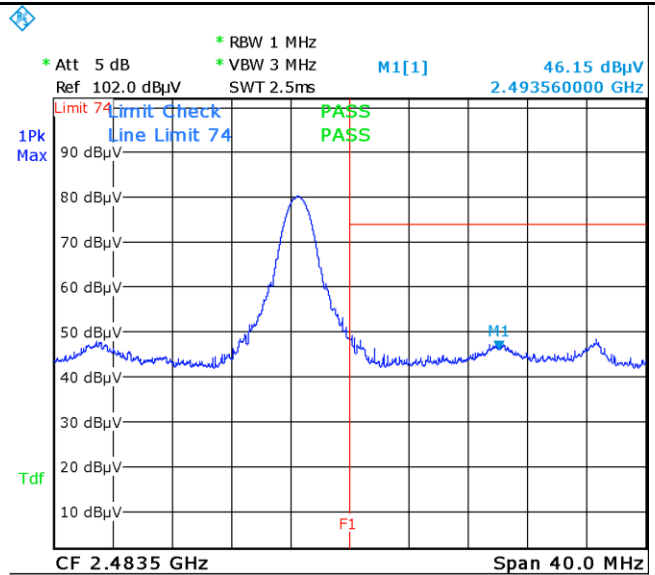
Note: Both Horizontal and vertical polarities were investigated.



Date: 11.DEC.2018 09:17:29

GFSK-Left Side-PK

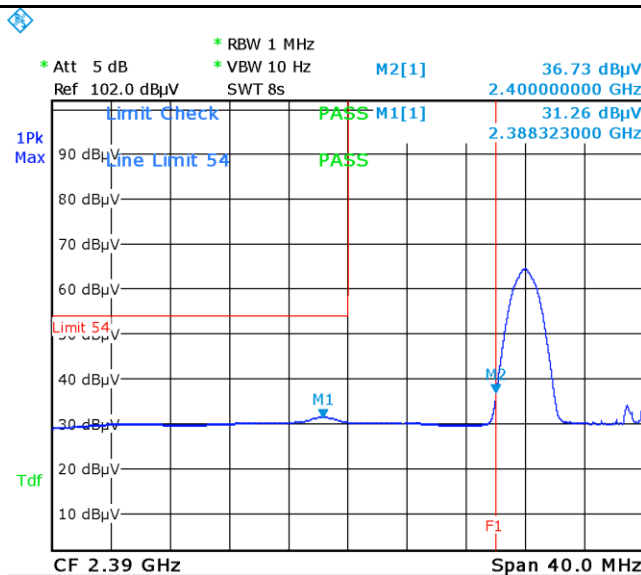
Note: F1 is frequency 2400MHz



Date: 11.DEC.2018 09:14:11

GFSK-Right Side-PK

Note: F1 is frequency 2483.5MHz



Date: 11.DEC.2018 09:19:42

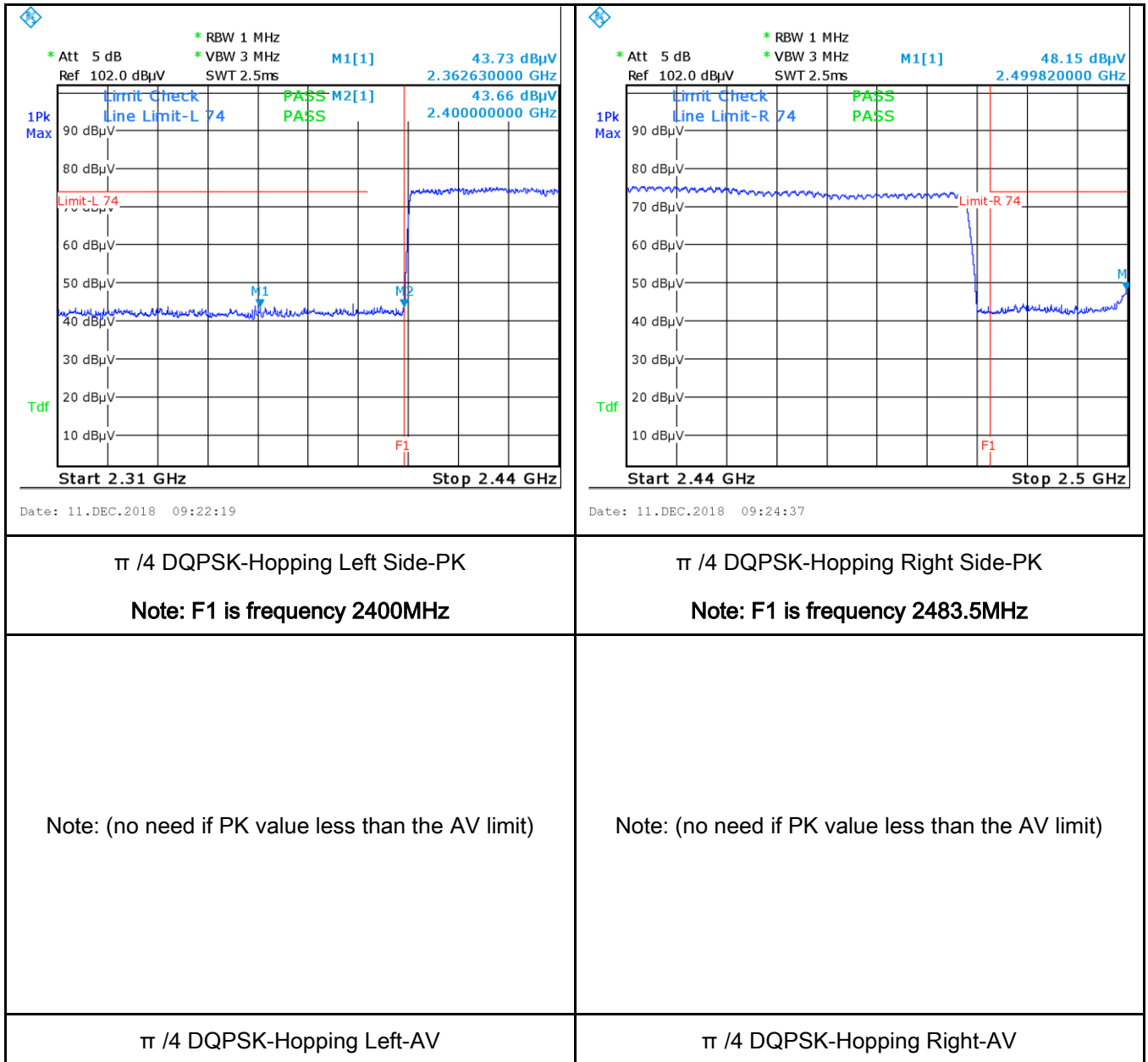
GFSK-Left Side-AV

Note: (no need if PK value less than the AV limit)

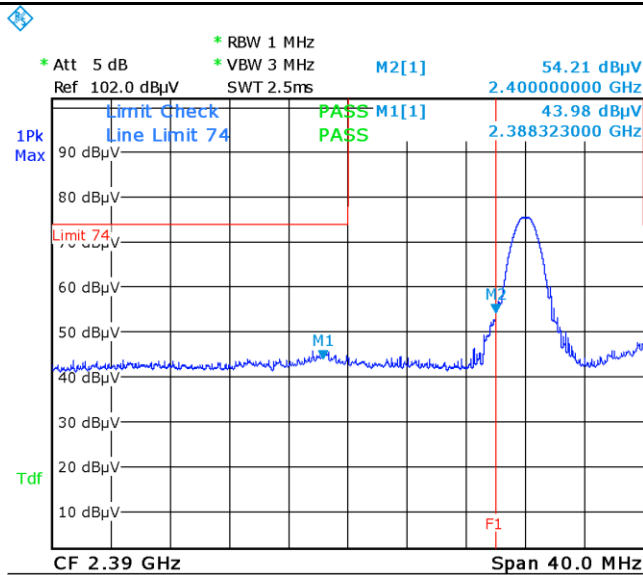
GFSK-Right Side-AV

Note: Both Horizontal and vertical polarities were investigated.

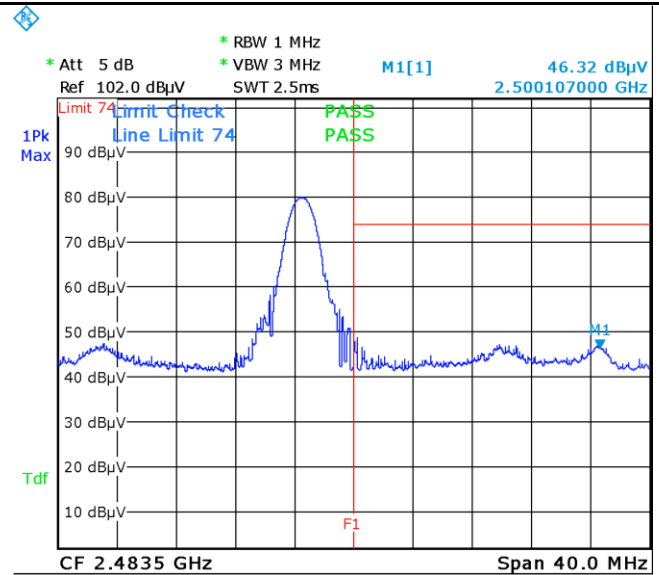
$\pi/4$ DQPSK Mode:



Note: Both Horizontal and vertical polarities were investigated.



Date: 11.DEC.2018 09:18:54



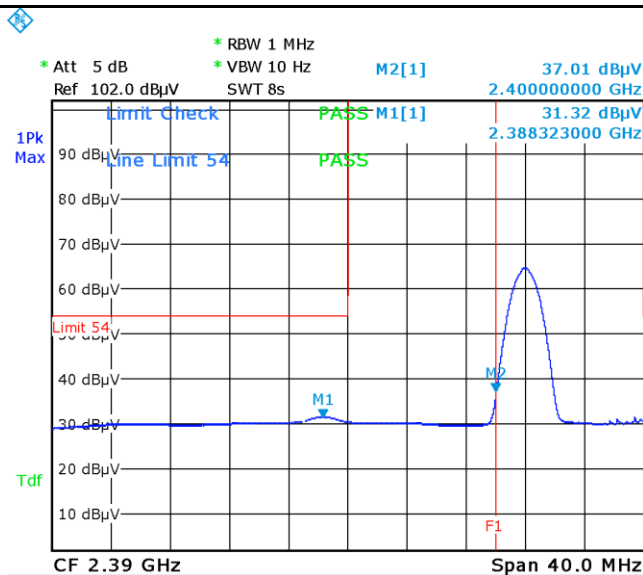
Date: 11.DEC.2018 09:14:23

$\pi/4$ DQPSK-Left Side-PK

Note: F1 is frequency 2400MHz

$\pi/4$ DQPSK-Right Side-PK

Note: F1 is frequency 2483.5MHz



Date: 11.DEC.2018 09:20:06

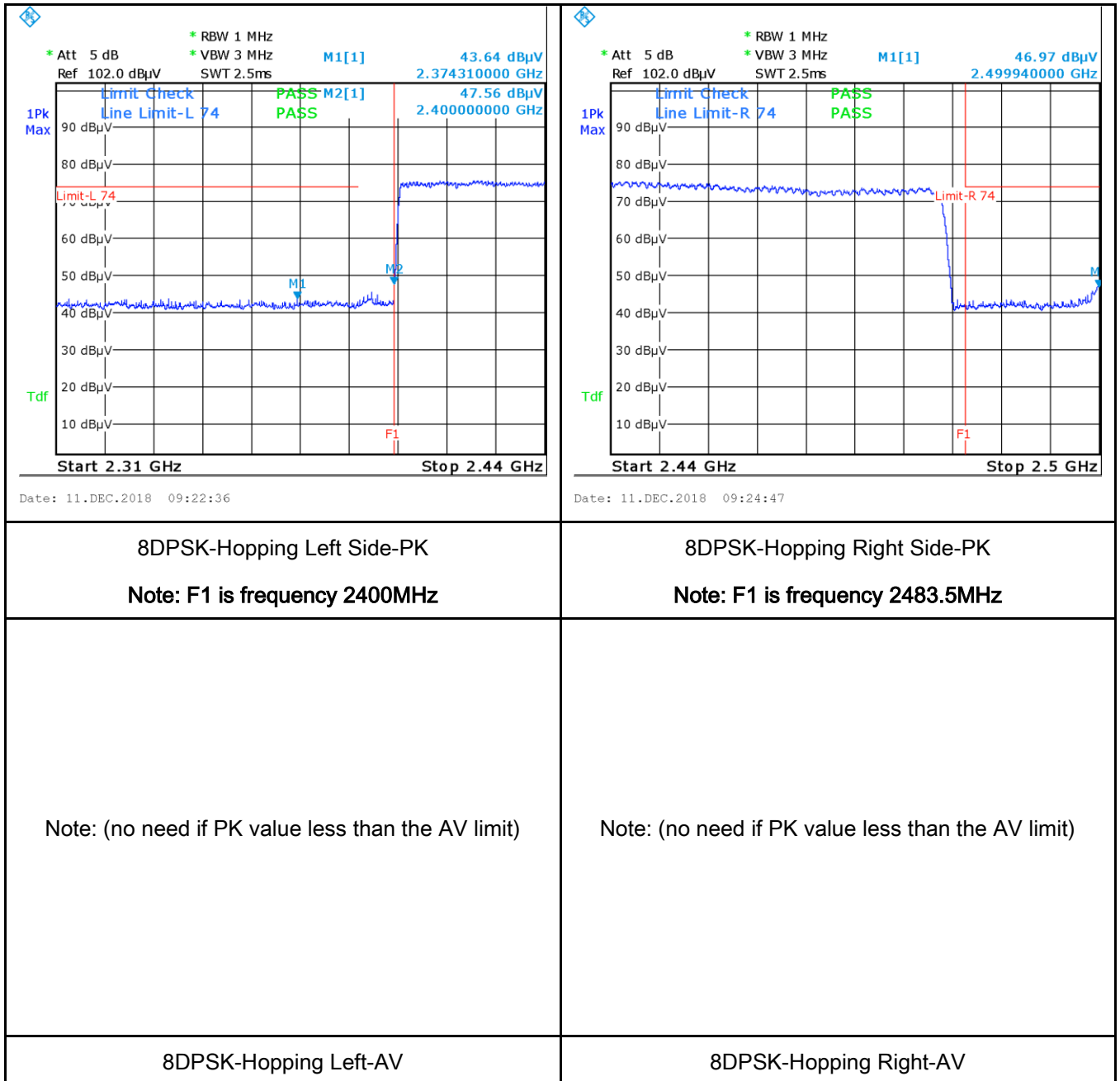
Note: (no need if PK value less than the AV limit)

$\pi/4$ DQPSK-Left Side-AV

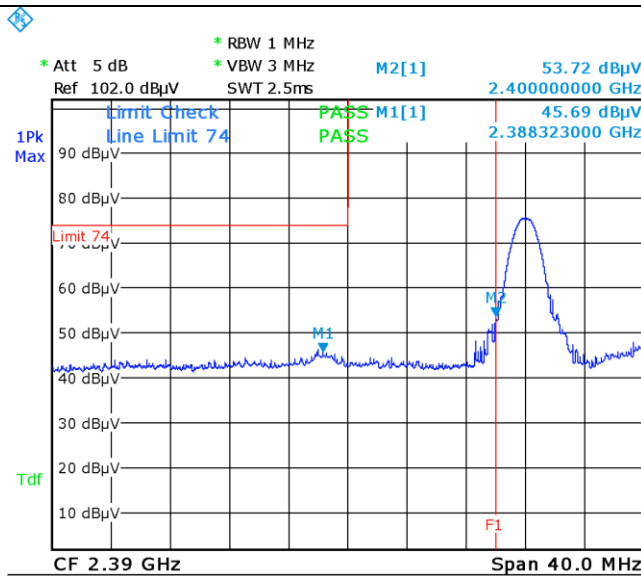
$\pi/4$ DQPSK-Right Side-AV

Note: Both Horizontal and vertical polarities were investigated.

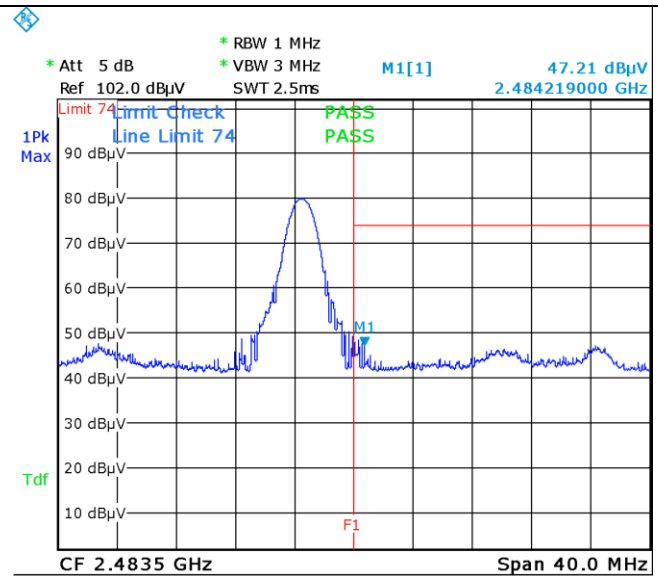
8-DPSK Mode:



Note: Both Horizontal and vertical polarities were investigated.



Date: 11.DEC.2018 09:19:24



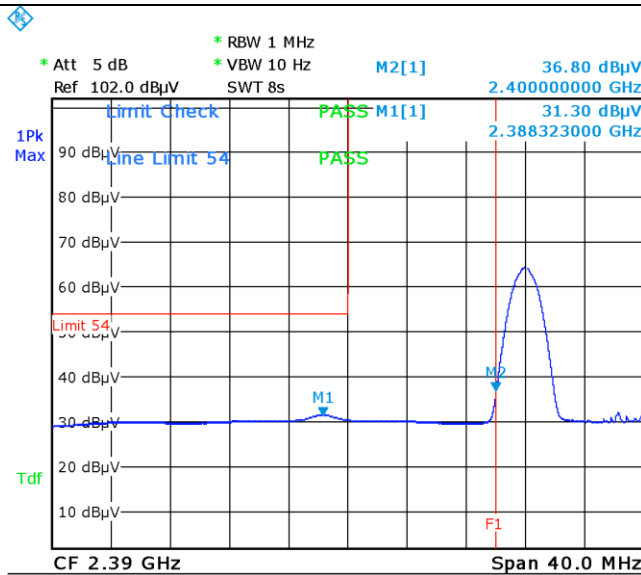
Date: 11.DEC.2018 09:14:35

8DPSK-Left Side-PK

Note: F1 is frequency 2400MHz

8DPSK-Right Side-PK

Note: F1 is frequency 2483.5MHz



Date: 11.DEC.2018 09:20:26

Note: (no need if PK value less than the AV limit)

8DPSK-Left Side-AV

8DPSK-Right Side-AV

Note: Both Horizontal and vertical polarities were investigated.

6.8 AC Power Line Conducted Emissions

Temperature	26 °C
Relative Humidity	55%
Atmospheric Pressure	1020mbar
Test date :	December 11, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable		
47CFR§15.207, RSS210 (A8.1)	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu]H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.			
		Frequency ranges (MHz)		Limit (dBµV)	
				QP	Average
		0.15 ~ 0.5		66 – 56	56 – 46
		0.5 ~ 5		56	46
5 ~ 30	60	50			

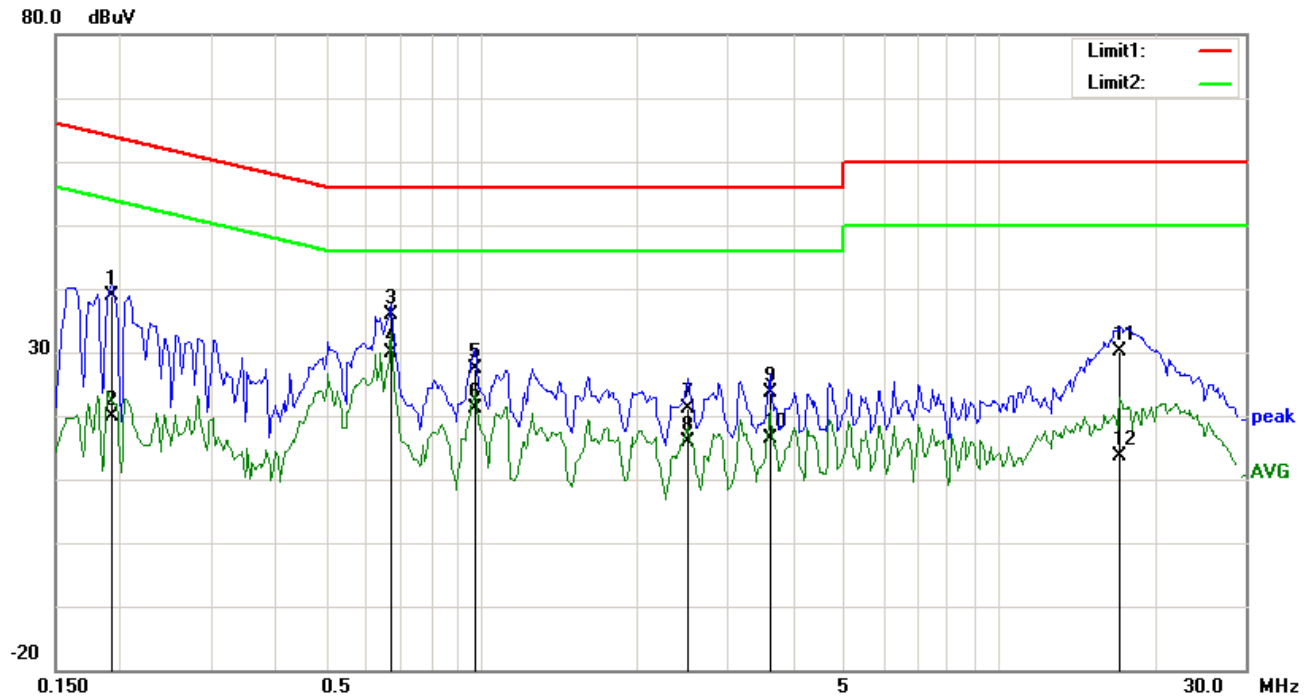
Test Setup	Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.
------------	--

Procedure	- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. - The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss
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	coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. The EUT was switched on and allowed to warm up to its normal operating condition. 6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver. 7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz. 8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A
 Test Plot ☒ Yes (See below) ☐ N/A

Test Mode: Bluetooth Mode

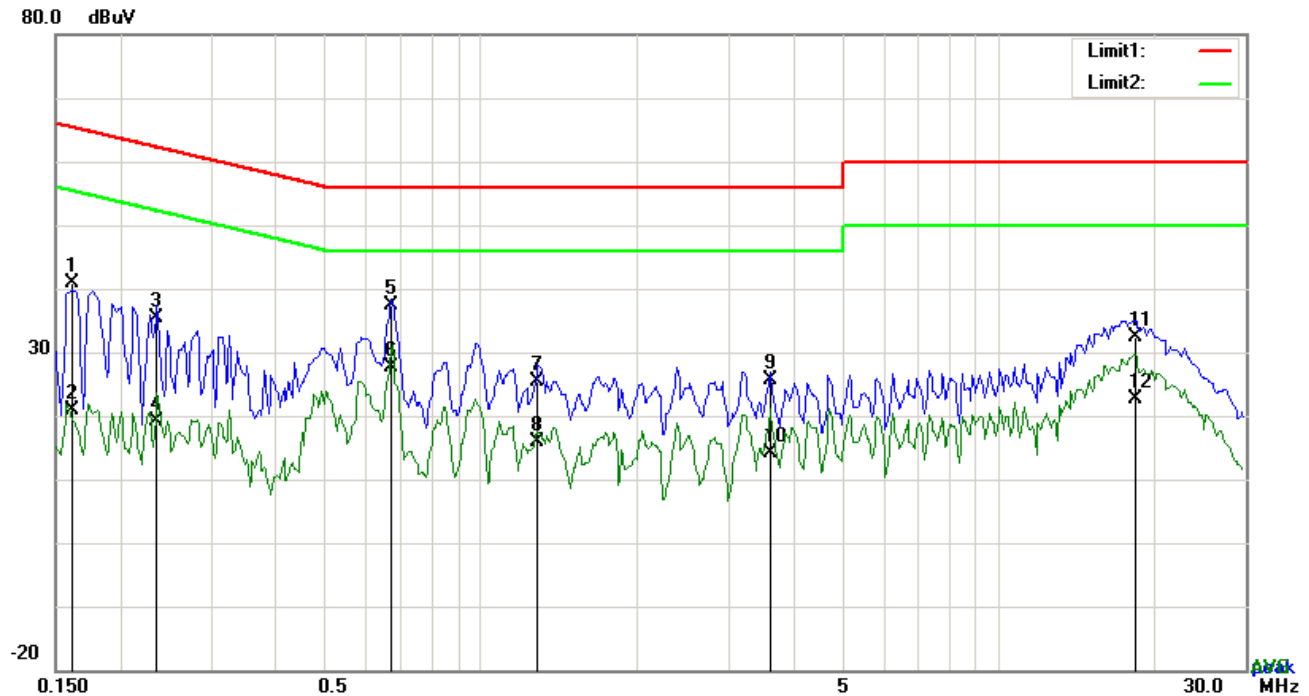


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1929	28.79	QP	10.03	38.82	63.91	-25.09
2	L1	0.1929	9.87	AVG	10.03	19.90	53.91	-34.01
3	L1	0.6687	25.77	QP	10.03	35.80	56.00	-20.20
4	L1	0.6687	19.80	AVG	10.03	29.83	46.00	-16.17
5	L1	0.9729	17.33	QP	10.03	27.36	56.00	-28.64
6	L1	0.9729	11.03	AVG	10.03	21.06	46.00	-24.94
7	L1	2.5056	11.18	QP	10.05	21.23	56.00	-34.77
8	L1	2.5056	5.83	AVG	10.05	15.88	46.00	-30.12
9	L1	3.6045	13.49	QP	10.06	23.55	56.00	-32.45
10	L1	3.6045	6.43	AVG	10.06	16.49	46.00	-29.51
11	L1	17.1375	19.91	QP	10.26	30.17	60.00	-29.83
12	L1	17.1375	3.49	AVG	10.26	13.75	50.00	-36.25

Test Mode: Bluetooth Mode

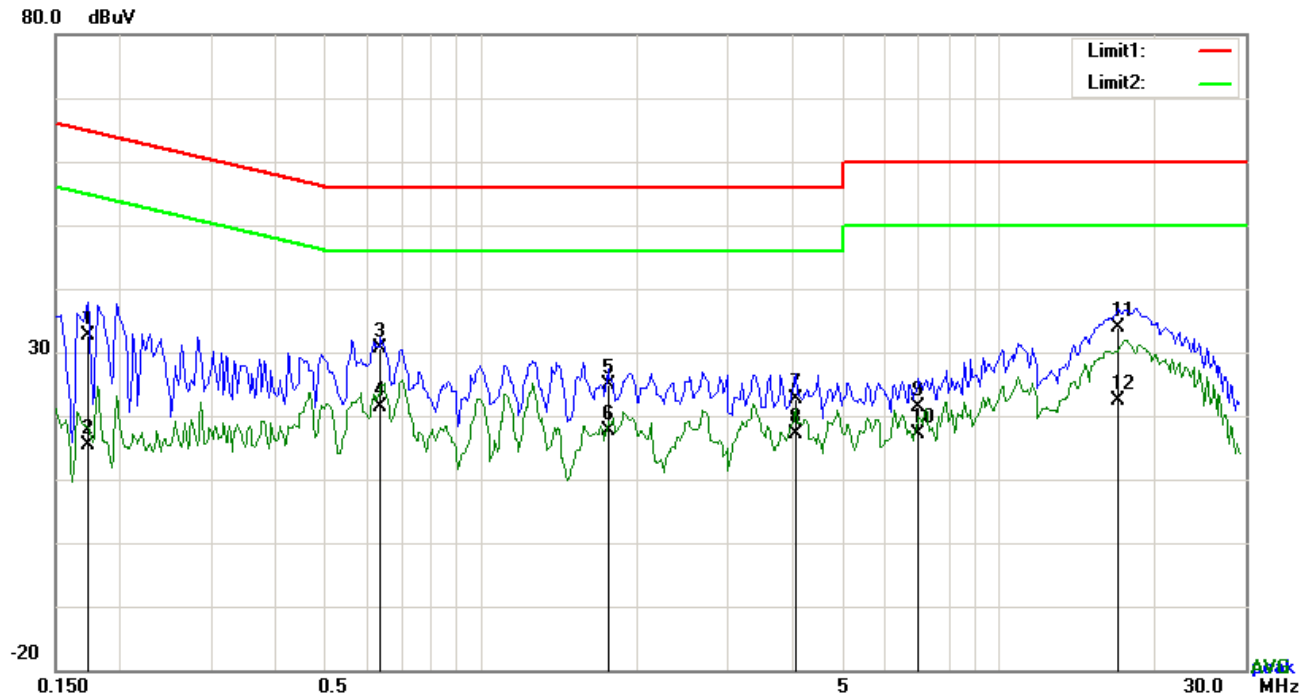


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1617	30.84	QP	10.02	40.86	65.38	-24.52
2	N	0.1617	10.96	AVG	10.02	20.98	55.38	-34.40
3	N	0.2358	25.39	QP	10.02	35.41	62.24	-26.83
4	N	0.2358	9.13	AVG	10.02	19.15	52.24	-33.09
5	N	0.6687	27.28	QP	10.02	37.30	56.00	-18.70
6	N	0.6687	17.60	AVG	10.02	27.62	46.00	-18.38
7	N	1.2849	15.25	QP	10.03	25.28	56.00	-30.72
8	N	1.2849	5.97	AVG	10.03	16.00	46.00	-30.00
9	N	3.6084	15.58	QP	10.06	25.64	56.00	-30.36
10	N	3.6084	4.10	AVG	10.06	14.16	46.00	-31.84
11	N	18.3972	22.09	QP	10.24	32.33	60.00	-27.67
12	N	18.3972	12.51	AVG	10.24	22.75	50.00	-27.25

Test Mode: Bluetooth Mode

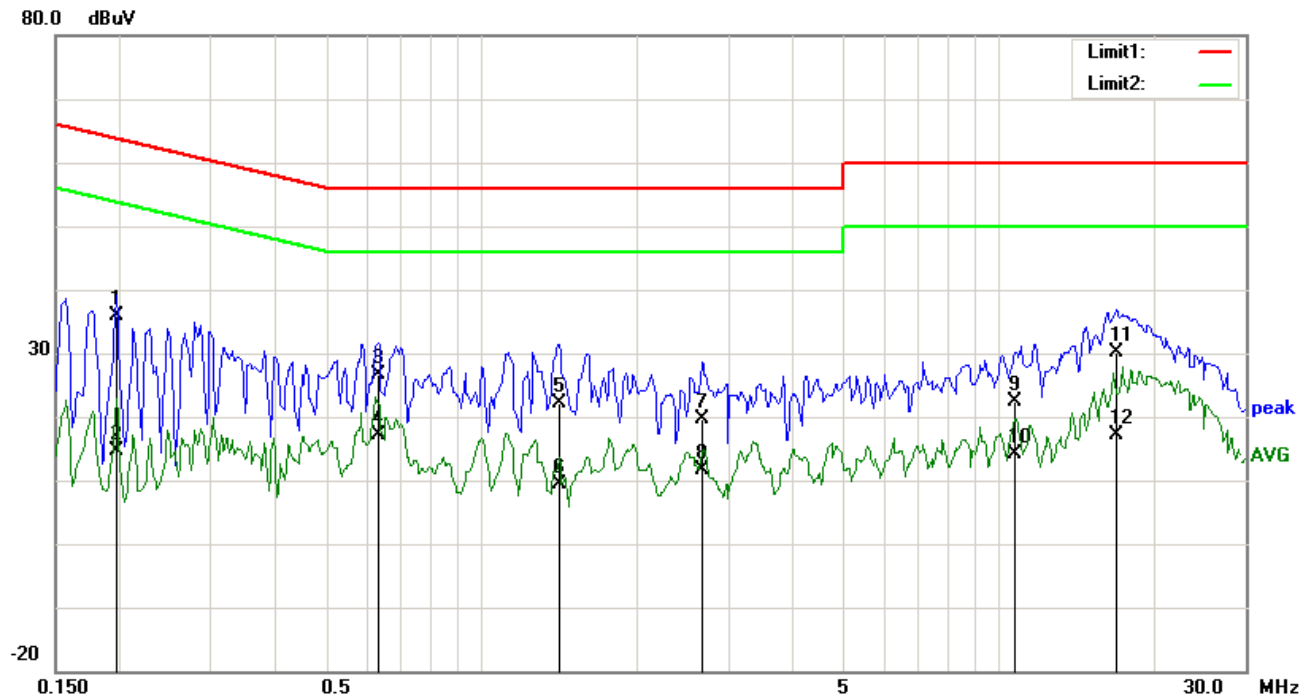


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.1734	22.60	QP	10.02	32.62	64.80	-32.18
2	L1	0.1734	5.47	AVG	10.02	15.49	54.80	-39.31
3	L1	0.6375	20.57	QP	10.02	30.59	56.00	-25.41
4	L1	0.6375	11.43	AVG	10.02	21.45	46.00	-24.55
5	L1	1.7568	14.94	QP	10.04	24.98	56.00	-31.02
6	L1	1.7568	7.65	AVG	10.04	17.69	46.00	-28.31
7	L1	4.0491	12.69	QP	10.06	22.75	56.00	-33.25
8	L1	4.0491	7.02	AVG	10.06	17.08	46.00	-28.92
9	L1	7.0014	11.18	QP	10.10	21.28	60.00	-38.72
10	L1	7.0014	7.07	AVG	10.10	17.17	50.00	-32.83
11	L1	17.0478	23.66	QP	10.22	33.88	60.00	-26.12
12	L1	17.0478	12.06	AVG	10.22	22.28	50.00	-27.72

Test Mode: Bluetooth Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

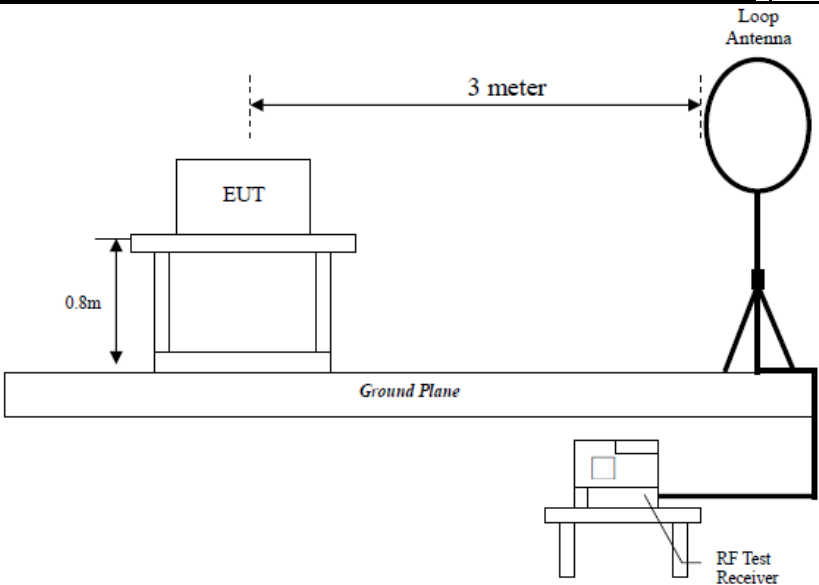
No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.1968	25.98	QP	10.02	36.00	63.74	-27.74
2	N	0.1968	4.66	AVG	10.02	14.68	53.74	-39.06
3	N	0.6336	16.55	QP	10.02	26.57	56.00	-29.43
4	N	0.6336	7.11	AVG	10.02	17.13	46.00	-28.87
5	N	1.4136	12.01	QP	10.03	22.04	56.00	-33.96
6	N	1.4136	-0.70	AVG	10.03	9.33	46.00	-36.67
7	N	2.6733	9.62	QP	10.05	19.67	56.00	-36.33
8	N	2.6733	1.47	AVG	10.05	11.52	46.00	-34.48
9	N	10.7805	12.32	QP	10.15	22.47	60.00	-37.53
10	N	10.7805	3.97	AVG	10.15	14.12	50.00	-35.88
11	N	16.8684	19.87	QP	10.22	30.09	60.00	-29.91
12	N	16.8684	6.91	AVG	10.22	17.13	50.00	-32.87

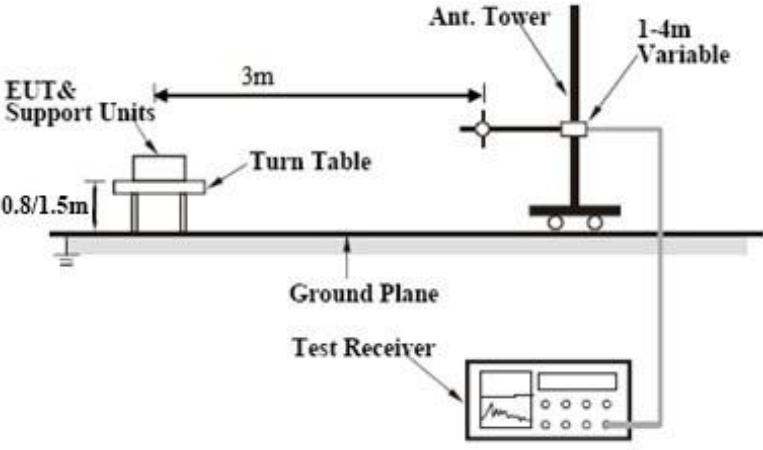
6.9 Radiated Emissions & Restricted Band

Temperature	26 °C
Relative Humidity	55%
Atmospheric Pressure	1020mbar
Test date :	December 11, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable																
47CFR§15.205, §15.209, §15.247(d)	a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges																	
		<table><tr><th>Frequency range (MHz)</th><th>Field Strength (µV/m)</th></tr><tr><td>0.009~0.490</td><td>2400/F(KHz)</td></tr><tr><td>0.490~1.705</td><td>24000/F(KHz)</td></tr><tr><td>1.705~30.0</td><td>30</td></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table>		Frequency range (MHz)	Field Strength (µV/m)	0.009~0.490	2400/F(KHz)	0.490~1.705	24000/F(KHz)	1.705~30.0	30	30 – 88	100	88 – 216	150	216 960	200	Above 960	500
		Frequency range (MHz)		Field Strength (µV/m)															
		0.009~0.490		2400/F(KHz)															
		0.490~1.705		24000/F(KHz)															
		1.705~30.0		30															
		30 – 88		100															
		88 – 216		150															
		216 960		200															
Above 960	500																		

Test Setup	 The diagram illustrates the test setup for radiated emissions. It shows an Equipment Under Test (EUT) placed on a stand that is 0.8m high. A Loop Antenna is positioned 3 meters away from the EUT. The entire setup is on a Ground Plane. An RF Test Receiver is connected to the antenna.
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Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. - The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Result:

Test Mode:	Transmitting Mode
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Frequency range: 9KHz - 30MHz

Freq.	Detection	Factor	Reading	Result	Limit@3m	Margin
(MHz)	value	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
--	--	--	--	--	--	>20
--	--	--	--	--	--	>20

Note:

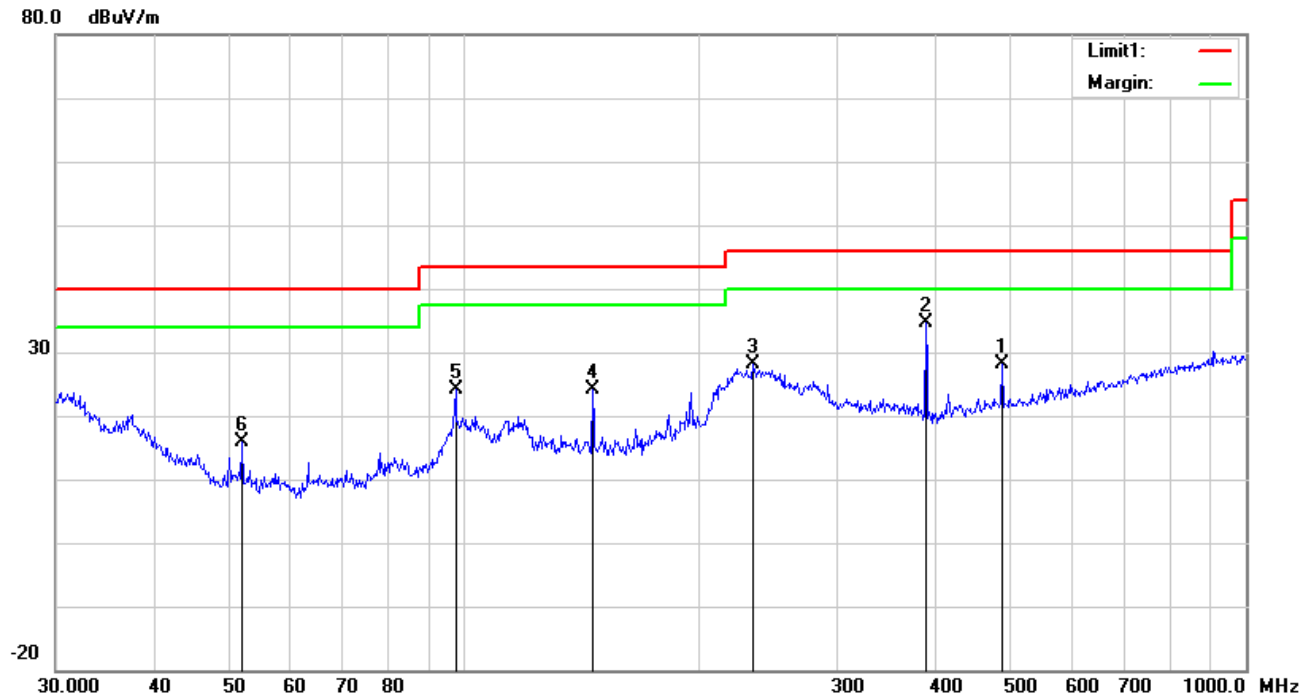
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Test Mode: Bluetooth Mode

30MHz -1GHz



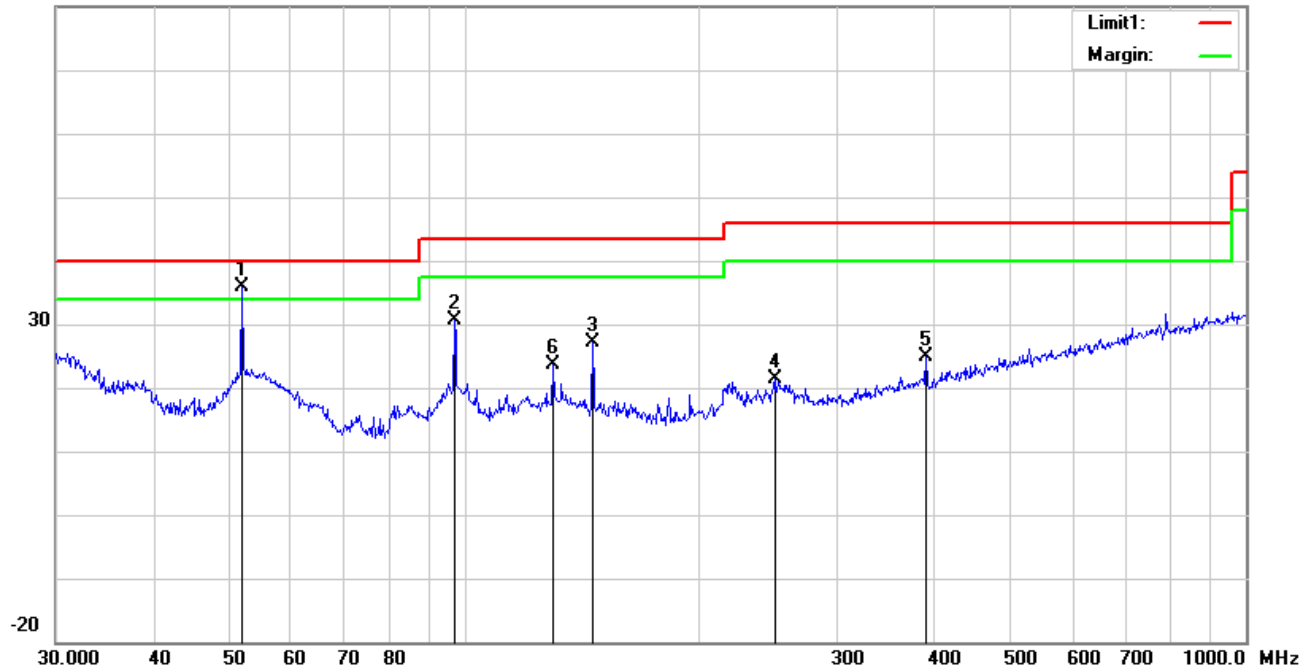
Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr ee
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	H	487.3151	30.25	17.45	21.84	2.35	28.21	46.00	-17.79	100	42
2	H	389.3549	39.22	15.48	22.04	2.02	34.68	46.00	-11.32	100	355
3	H	234.1684	37.26	11.62	22.32	1.65	28.21	46.00	-17.79	100	65
4	H	145.8611	32.58	12.60	22.37	1.31	24.12	43.50	-19.38	200	80
5	H	97.4560	35.64	9.79	22.32	1.05	24.16	43.50	-19.34	100	271
6	H	52.0251	29.42	8.18	22.39	0.79	16.00	40.00	-24.00	100	70

30MHz -1GHz

80.0 dBuV/m



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
		(MHz)	(dBuV/m)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	V	52.0251	49.20	8.18	22.39	0.79	35.78	40.00	-4.22	200	195
2	V	97.1148	42.25	9.71	22.32	1.04	30.68	43.50	-12.82	100	102
3	V	145.8611	35.56	12.60	22.37	1.31	27.10	43.50	-16.40	100	165
4	V	249.4250	30.60	11.41	22.29	1.70	21.42	46.00	-24.58	100	73
5	V	389.3549	29.43	15.48	22.04	2.02	24.89	46.00	-21.11	100	42
6	V	129.9226	31.47	13.26	22.38	1.20	23.55	43.50	-19.95	100	10

Above 1GHz

Test Mode:	Transmitting Mode
------------	-------------------

Low Channel: 8DPSK Mode (Worst Case) (2402 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4804	45.44	AV	V	33.39	7.22	48.46	37.59	54	-16.41
4804	44.24	AV	H	33.39	7.22	48.46	36.39	54	-17.61
4804	68.34	PK	V	33.39	7.22	48.46	60.49	74	-13.51
4804	63.76	PK	H	33.39	7.22	48.46	55.91	74	-18.09
11808	23.86	AV	V	40.26	11.86	47.95	28.03	54	-25.97
11808	22.11	AV	H	40.26	11.86	47.95	26.28	54	-27.72
11808	43.79	PK	V	40.26	11.86	47.95	47.96	74	-26.04
11808	42.51	PK	H	40.26	11.86	47.95	46.68	74	-27.32

Middle Channel: 8DPSK Mode (Worst Case) (2441 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4882	46.13	AV	V	33.62	7.53	48.36	38.92	54	-15.08
4882	46.12	AV	H	33.62	7.53	48.36	38.91	54	-15.09
4882	70.97	PK	V	33.62	7.53	48.36	63.76	74	-10.24
4882	63.49	PK	H	33.62	7.53	48.36	56.28	74	-17.72
8979	32.9	AV	V	38.19	10.22	48.47	32.84	54	-21.16
8979	28.84	AV	H	38.19	10.22	48.47	28.78	54	-25.22
8979	54.87	PK	V	38.19	10.22	48.47	54.81	74	-19.19
8979	53.88	PK	H	38.19	10.22	48.47	53.82	74	-20.18

High Channel: 8DPSK Mode (Worst Case) (2480 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4960	43.22	AV	V	33.89	7.86	48.31	36.66	54	-17.34
4960	48.98	AV	H	33.89	7.86	48.31	42.42	54	-11.58
4960	71.17	PK	V	33.89	7.86	48.31	64.61	74	-9.39
4960	67.33	PK	H	33.89	7.86	48.31	60.77	74	-13.23
17849	12.4	AV	V	43.08	20.23	44.33	31.38	54	-22.62
17849	9.61	AV	H	43.08	20.23	44.33	28.59	54	-25.41
17849	31.06	PK	V	43.08	20.23	44.33	50.04	74	-23.96
17849	30.58	PK	H	43.08	20.23	44.33	49.56	74	-24.44

Note:

- 1, The testing has been conformed to $10 \times 2480 \text{ MHz} = 24,800 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- 4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

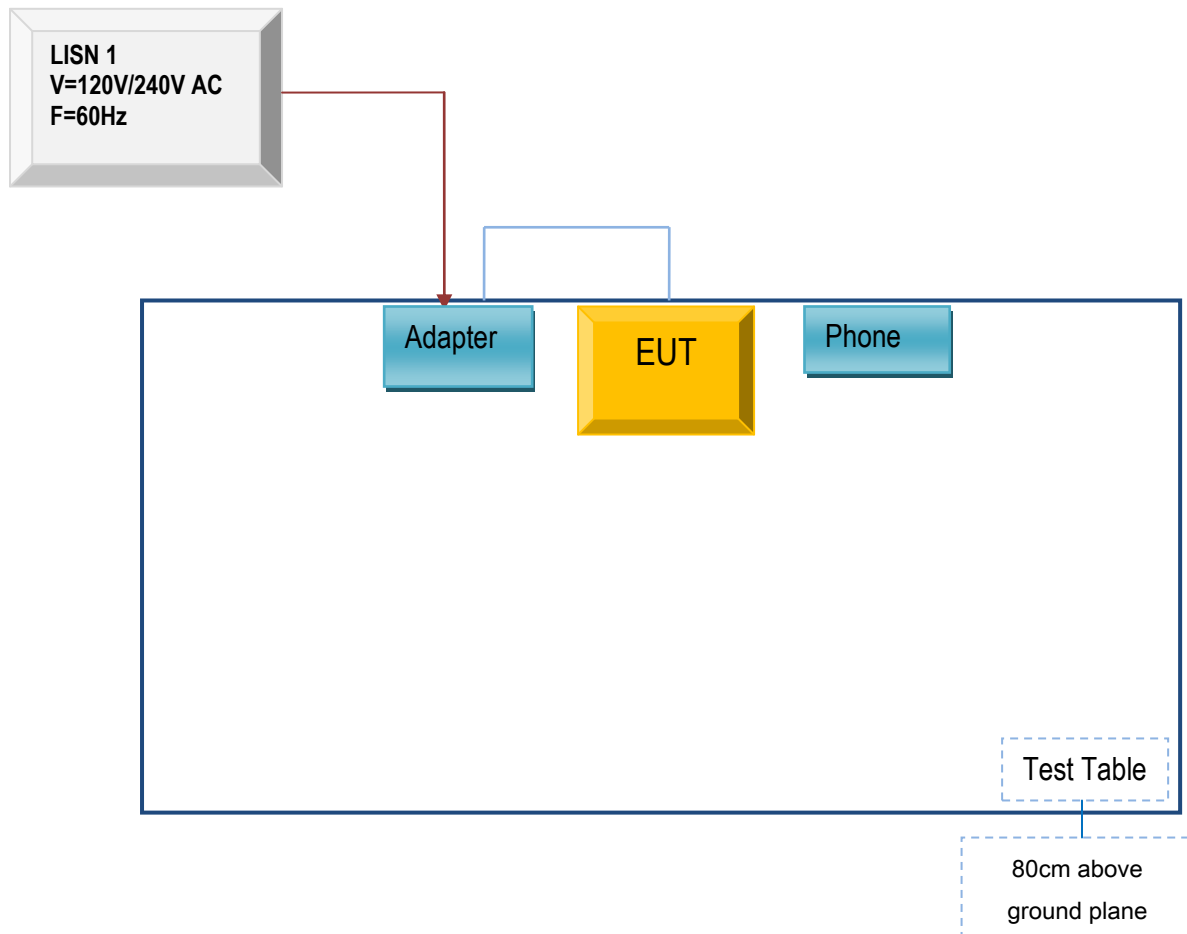
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due
AC Line Conducted Emissions				
EMI test receiver	ESCS30	8471241027	01/05/2018	01/04/2019
Artificial Mains Network	8127	8127713	01/05/2018	01/04/2019
ISN	ISN T800	34373	01/05/2018	01/04/2019
Radiated Emissions				
EMI test receiver	ESL6	1300.5001K06-100262-eQ	01/05/2018	01/04/2019
Active Antenna	AL-130	121031	02/08/2018	02/07/2019
3m Semi-anechoic Chamber	9m*6m*6m	N/A	10/18/2018	10/17/2019
Signal Amplifier	8447E	443008	01/25/2018	01/24/2019
MXA signal analyzer	N9020A	MY49100060	01/05/2018	01/04/2019
Horn Antenna	HAH-118	71259	01/26/2018	01/25/2019
Horn Antenna	HAH-118	71283	02/02/2018	02/01/2019
AMPLIFIER	EM01G26G	60613	01/25/2018	01/24/2019
AMPLIFIER	Emc012645	980077	01/05/2018	01/04/2019
Bilog Antenna (30MHz~6GHz)	JB6	A110712	02/08/2018	02/07/2019
RF Conducted				
DC Power Supply	E3640A	MY40004013	01/05/2018	01/04/2019
MXA Signal Analyzer	N9020A	MY49100060	01/05/2018	01/04/2019
MXG Vector Signal Generator	N5182A	MY50140530	01/05/2018	01/04/2019
Series Signal Generator	E4421B	US40051152	05/12/2018	05/11/2019
RF control unit	JS0806-0806-2	188060112	04/25/2018	04/24/2019
Wireless Connectivity Tester	CMW270	1201.0002K75-101601-PE	04/25/2018	04/24/2019
Weinschel	1580-1	TL177	01/05/2018	01/04/2019
Universal Radio Communica	CMU200	121393	02/11/2018	02/10/2019

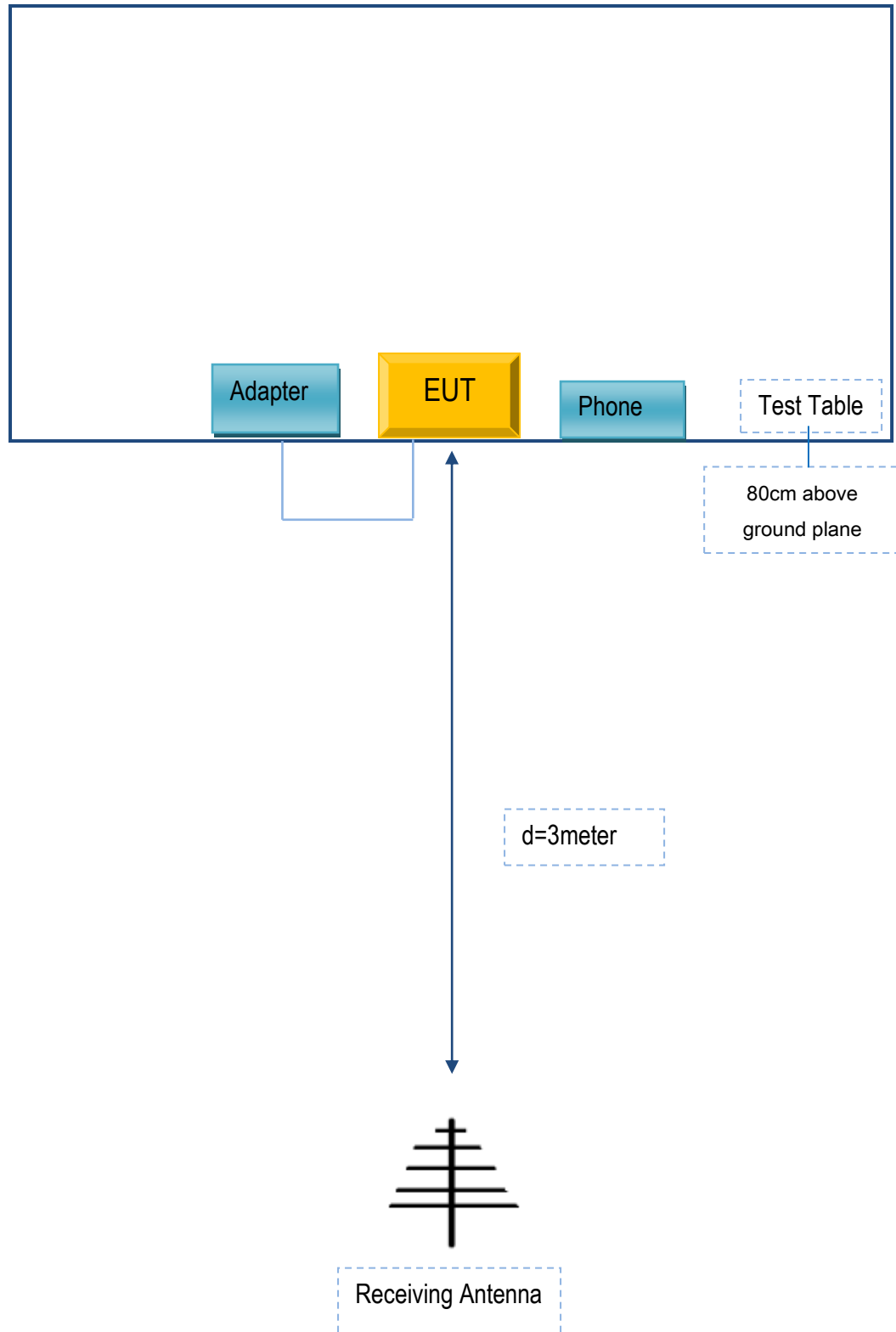
Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

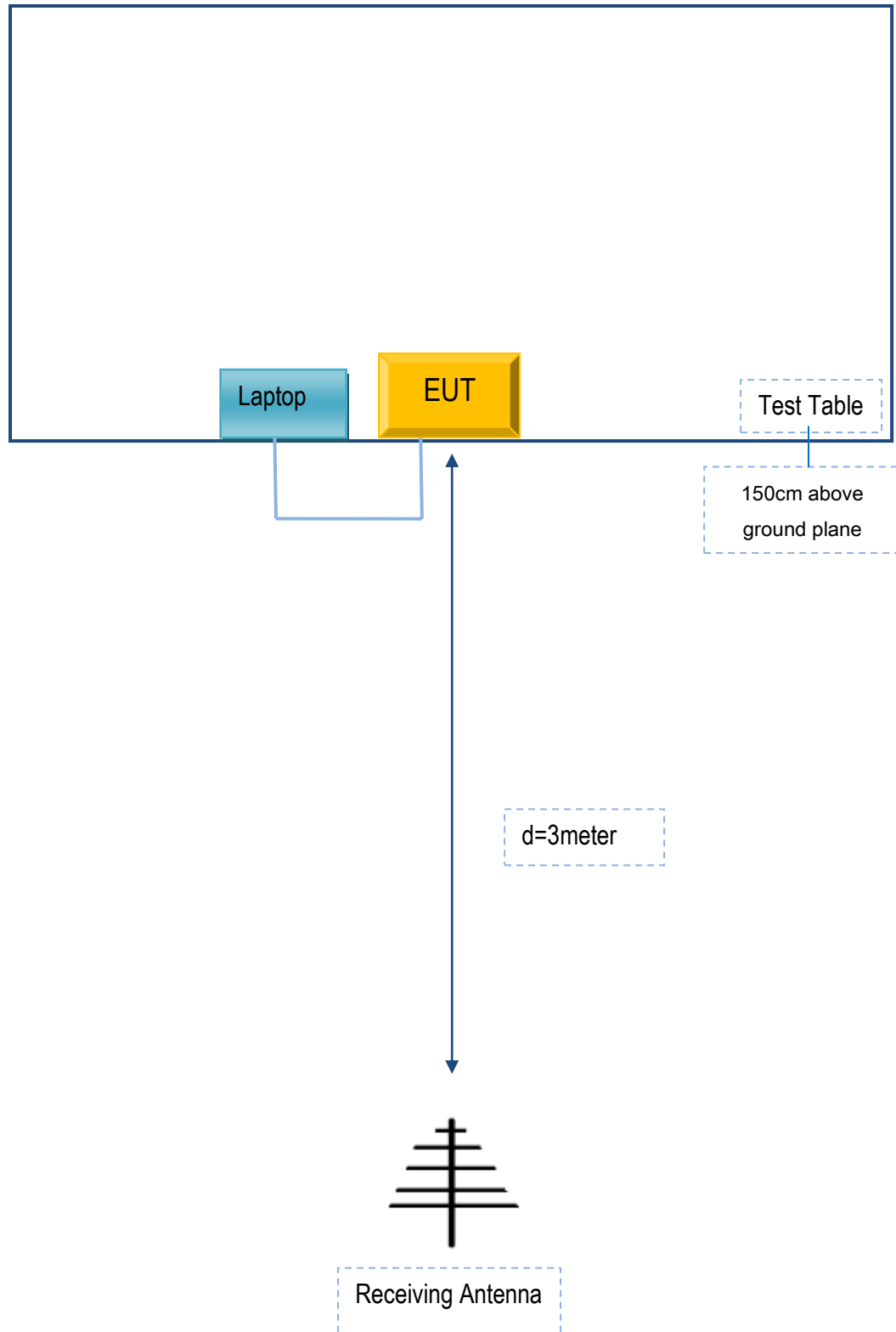
Block Configuration Diagram for AC Line Conducted Emissions



Block Configuration Diagram for Radiated Emissions (Below 1GHz) .



Block Configuration Diagram for Radiated Emissions (Above 1GHz) .



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Lenovo	Laptop	E40	N/A
Huawei	Phone	Honor 9	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	N/A

Annex C. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

Annex D. DECLARATION OF SIMILARITY

Shenzhen Haixinwang Electronic Co., Ltd.

To: SIEMIC, INC
775 Montague Expressway Milpitas, CA 95035, USA

Declaration Letter

Dear Sir,

For our business issue and marketing requirement, we would like to list serial model numbers on the reports, as following:

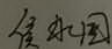
Model No: HXWW502ZD , HXWW502JD
AR-ELCFSS , AR-ELCFSSBK-BMI , AR-ELCFSS-BMI
BB2288 , HXWW502S, HW502

We declare that : HXWW502ZD , HXWW502JD
AR-ELCFSS , AR-ELCFSSBK-BMI , AR-ELCFSS-BMI
BB2288 , HXWW502S, HW502, all models the same PCB , accessories ,the difference of these is listed as below:

Main Model No	Serial Model No	Difference
HXWW502ZD	HXWW502JD	Model and colour
	AR-ELCFSS	
	AR-ELCFSSBK-BMI	
	AR-ELCFSS-BMI	
	BB2288	
	HXWW502S	
	HW502	

Thank you!

Sincerely,

Client's signature : 

Client's name / title : Shenzhen Haixinwang Electronic Co., Ltd.

Contact information / address : 2nd floor, Building 56, Baotian industrial park, Xixiang, Bao'an District,
Shenzhen, Guangdong, China