







ISO/IEC17025Accredited Lab.

Report No.: FCC 1412195-02 File reference No.: 2015-01-05

Applicant: US HIGHTECH INC

Product: Tablet PC

Model No: UH682D UH682 UH682A UH682B UH682C UH682E UH683

UH683A UH683B UH683C UH683D UH683E UHxxxxx (x

refers to 0-9, or any letter between A and Z)

Trademark: N/A

Test Standards: FCC Part 15 Subpart C, Paragraph 15.247

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4&FCC Part 15 Subpart C,

Paragraph 15.247 regulations for the evaluation o

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung Manager

Dated: January 05, 2015

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

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Report No: FCC1412195-02 Page 2 of 87

Date: 2015-01-05



Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The 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.:899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-02.

Date: 2015-01-05



Test Report Conclusion

Content

1.0	General Details	4
1.1	Test Lab Details.	4
1.2	Applicant Details.	4
1.3	Description of EUT	4
1.4	Submitted Sample	4
1.5	Test Duration.	5
1.6	Test Uncertainty.	5
1.7	Test By	5
2.0	List of Measurement Equipment.	6
3.0	Technical Details	7
3.1	Summary of Test Results.	7
3.2	Test Standards	7
4.0	EUT Modification.	7
5.0	Power Line Conducted Emission Test.	8
5.1	Schematics of the Test.	8
5.2	Test Method and Test Procedure.	8
5.3	Configuration of the EUT	8
5.4	EUT Operating Condition.	9
5.5	Conducted Emission Limit.	9
5.6	Test Result.	9
6.0	Radiated Emission test.	12
6.1	Test Method and Test Procedure.	12
6.2	Configuration of the EUT	12
6.3	EUT Operation Condition.	12
6.4	Radiated Emission Limit.	13
7.0	20dB Bandwidth Measurement.	22
8.0	Maximum Peak Output Power	34
9.0	Carrier Frequency Separation.	40
10.0	Number of Hopping Channel	44
11.0	Time of Occupancy (Dwell Time)	48
12.0	Out of Band Measurement.	61
13.0	Antenna Requirement.	76
14.0	FCC Label.	77
15.0	Photo of Test Setup and EUT View	78

Date: 2015-01-05



1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District,

Shenzhen, CHINA.

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: US HIGHTECH INC

Address: 12658 TORREY BLUFF DR. #287, SAN DIEGO, CALIFORNIA 92130, USA

Telephone: 858-222-1199 Fax: 858-726-2688

1.3 Description of EUT

Product: Tablet PC

Manufacturer: Shenzhen DSO MicroElectronics CO., LTD

Address: Goldlonghua Plaza Commercial Bldg Rm 1502, No. 3 East Longuan Rd., Longhua

District, Shenzhen, China

Brand Name: N/A

Model Number: UH682D

Additional Model Name UH682 UH682A UH682B UH682C UH682E UH683 UH683A UH683B UH683C

UH683D UH683E UHxxxxx (x refers to 0-9, or any letter between A and Z)

Additional Trade Name N/A

Type of Modulation GFSK, 月/4DQPSK, 8DPSK

Frequency range 2402-2480MHz

Channel Spacing 1MHz Number of Channel 79

Frequency Selection By software

Antenna type Integral Antenna used, the antenna gain is 1.97dBi

1.4 Submitted Sample: 1 Sample

The report refers only to the sample tested and does not apply to the bulk.

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Report No: FCC1412195-02 Page 5 of 87

Date: 2015-01-05



1.5 Test Duration:

2014-12-24 to 2015-01-05

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

Page 6 of 87

Report No: FCC1412195-02

Date: 2015-01-05



2.0 Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2014-08-21	2015-08-20
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2014-08-22	2015-08-21
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2014-08-22	2015-08-21
Ultra Broadband ANT	R&S	HL562	100157	2014-08-23	2015-08-22
ESDV Test Receiver	R&S	ESDV	100008	2014-08-22	2015-08-21
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2014-08-21	2015-08-20
System Controller	CT	SC100	-		
Printer	EPSON	РНОТО ЕХЗ	CFNH234850		
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-
Loop Antenna	EMCO	6502	00042960	2014-08-22	2015-08-21
ESPI Test Receiver	R&S	ESI26	838786/013	2014-08-22	2015-08-21
3m OATS			N/A	2014-08-21	2015-08-20
Horn Antenna	R&S	BBHA 9170	BBHA9170265	2014-08-23	2015-08-22
Horn Antenna	R&S	BBHA 9120D	9120D-631	2014-08-23	2015-08-22
Power meter	Anritsu	ML2487A	6K00003613	2014-08-22	2015-08-21
Power sensor	Anritsu	MA2491A	32263	2014-08-22	2015-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2014-08-23	2015-08-22
LISN	AFJ	LS16C	10010947251	2014-08-21	2015-08-20
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2014-08-22	2015-08-21
9*6*6 Anechoic			N/A	2014-08-21	2015-08-20
EMI Test Receiver	RS	ESCS30	100139	2014-08-22	2015-08-21

Date: 2015-01-05



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and	15.247(d),15.205(a),	PASS	Complies
Restricted bands	15.209 (a),15.109		
Conducted Emissions	15.207(a), 15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

Note: A Switching power supply was selected by the test lab for full tests. When export, no power

supply is provided to the EUT.

Switching Power Supply Model: GFP101U-050200-Q;

Rating: Input: 100-240V~, 50/60Hz, 0.28A, Output: DC5V, 2A

Switching Power Supply Manufacturer: GME

3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

Page 8 of 87

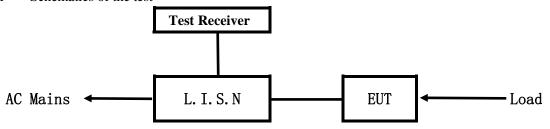
Report No: FCC1412195-02

Date: 2015-01-05



5. Power Line Conducted Emission Test

5.1 Schematics of the test

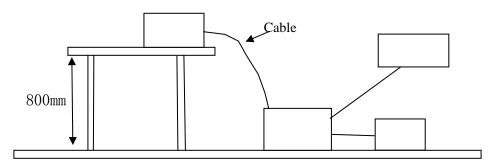


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~60Hz Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

Date: 2015-01-05



A. EUT

Device	Manufacturer	Model	FCC ID
	Shenzhen DSO	UH682D UH682 UH682A UH682B UH682C UH682E	
Tablet PC	MicroElectronics	UH683 UH683A UH683B UH683C UH683D UH683E	2ACRMUH682D
	CO., LTD	UHxxxxx (x refers to 0-9, or any letter between A and Z)	

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
Passive				
Earphone				
Monitor	SAMSUNG	PH2450	-	
Power				
Supply	GME	GFP101U-050200-Q	VOC	

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

5.5 Power line conducted Emission Limit according to Paragraph 15.107, 15.207

Frequency	Class A Lim	its (dB µ V)	Class B Limits (dB \mu V)		
(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	60.0	50.0	

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

The report refers only to the sample tested and does not apply to the bulk.

Date: 2015-01-05



A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

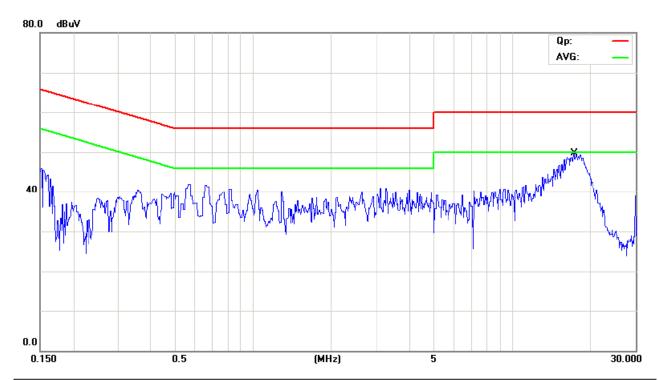
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Keep Bluetooth Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	17.2927	31.80	11.21	43.01	60.00	-16.99	QP	
2		17.2927	15.30	11.21	26.51	50.00	-23.49	AVG	

Date: 2015-01-05



B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

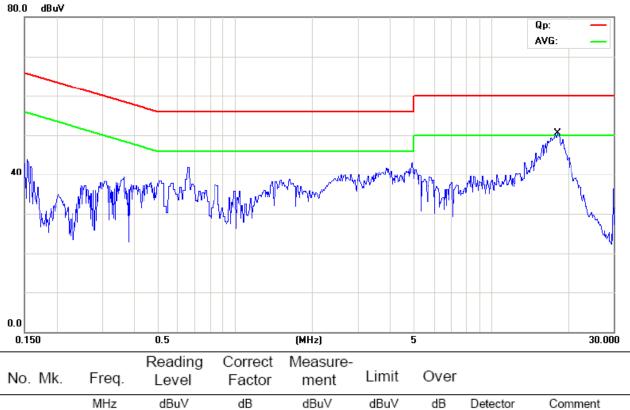
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Keep Bluetooth Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



Report No: FCC1412195-02 Page 12 of 87

Date: 2015-01-05



6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup Distance = 3m Computer Pre -Amplifier EUT Turn-table Receiver

- 6.2 Configuration of The EUT

 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.

Report No: FCC1412195-02 Page 13 of 87

Date: 2015-01-05



6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.109. 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 5. After pre-scanning, **GFSK** was the worse case. The test data of this mode was recorded.

Report No: FCC1412195-02 Page 14 of 87

Date: 2015-01-05



Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal/ In Vertical (30MHz----1000MHz)

EUT set Condition: Charging and Keep Bluetooth Transmitting

Results: Pass

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
79.040	27.97	Н	40.00
93.480	30.09	Н	40.00
67.640	29.47	Н	46.00
94.640	30.29	V	40.00
64.640	32.10	V	40.00
44.480	31.22	V	46.00

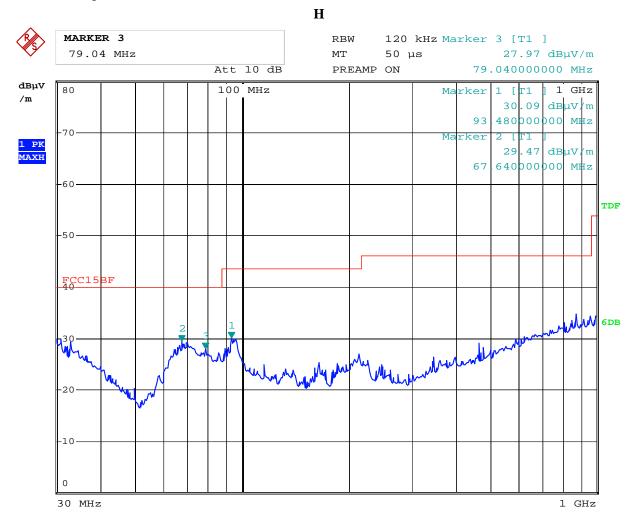
Page 15 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Test Figure:



Date: 26.DEC.2014 15:46:04

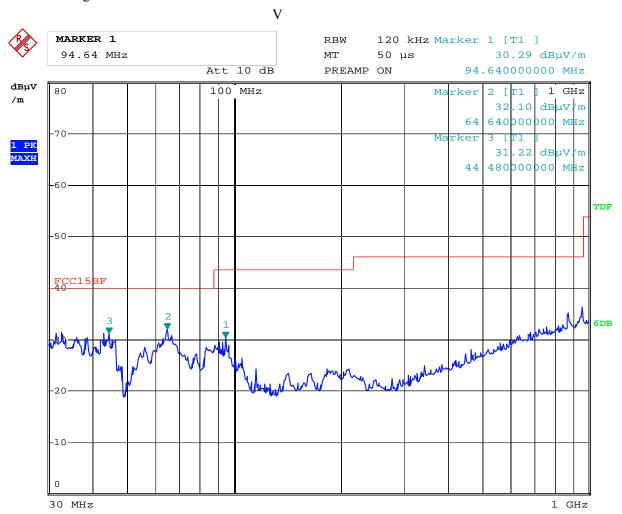
Page 16 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Test Figure:



Date: 26.DEC.2014 15:43:48

Report No: FCC1412195-02 Page 17 of 87

Date: 2015-01-05



Operation Mode: Transmitting under Low Channel (2402MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)
	Level@3m (db # v/m)	Antenna I Olarity	
4804		Н	74(Peak)/ 54(AV)
4804	-	V	74(Peak)/ 54(AV)
7206	-	H/V	74(Peak)/ 54(AV)
9608	-	H/V	74(Peak)/ 54(AV)
12010	-	H/V	74(Peak)/ 54(AV)
14412	-	H/V	74(Peak)/ 54(AV)
16814		H/V	74(Peak)/ 54(AV)
19216	1	H/V	74(Peak)/ 54(AV)
21618		H/V	74(Peak)/ 54(AV)
24020		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting g under Middle Channel (2441MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
4882		Н	74(Peak)/ 54(AV)
4882	1	V	74(Peak)/ 54(AV)
7323	-	H/V	74(Peak)/ 54(AV)
9764		H/V	74(Peak)/ 54(AV)
12205		H/V	74(Peak)/ 54(AV)
14646		H/V	74(Peak)/ 54(AV)
17087		H/V	74(Peak)/ 54(AV)
19528		H/V	74(Peak)/ 54(AV)
21969		H/V	74(Peak)/ 54(AV)
24410		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

Report No: FCC1412195-02 Page 18 of 87

Date: 2015-01-05



Operation Mode: Transmitting under High Channel (2480MHz)

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
4960	1	Н	74(Peak)/ 54(AV)
4960	•	V	74(Peak)/ 54(AV)
7440	-	H/V	74(Peak)/ 54(AV)
9920	-	H/V	74(Peak)/ 54(AV)
12400	-	H/V	74(Peak)/ 54(AV)
14880		H/V	74(Peak)/ 54(AV)
17360		H/V	74(Peak)/ 54(AV)
19840		H/V	74(Peak)/ 54(AV)
22320		H/V	74(Peak)/ 54(AV)
24800		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

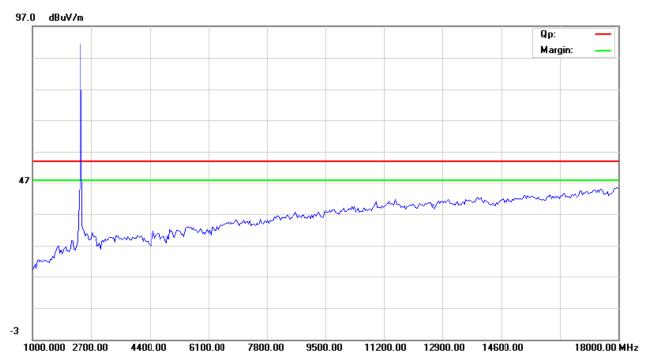
^{2.} Remark "---" means that the emissions level is too low to be measured

Date: 2015-01-05

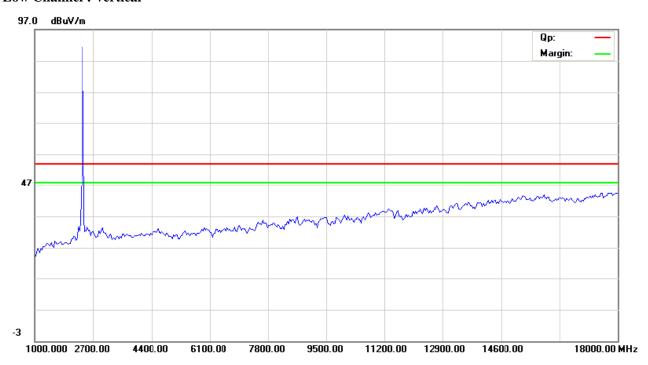


Please refer to the following test plots for details:

Low Channel: Horizontal



Low Channel: Vertical



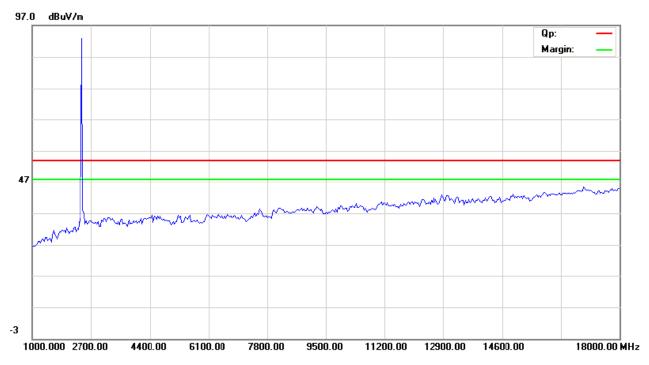
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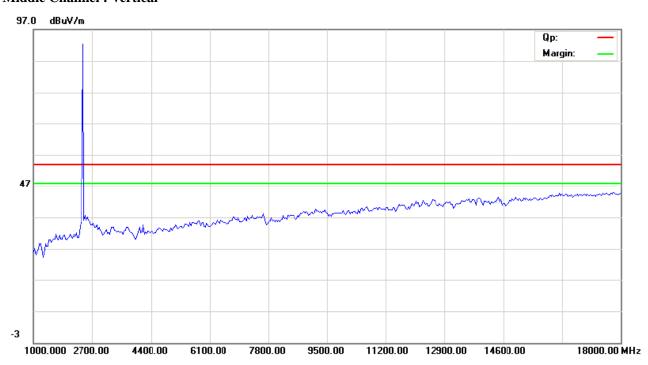
Date: 2015-01-05



Middle Channel: Horizontal



Middle Channel: Vertical



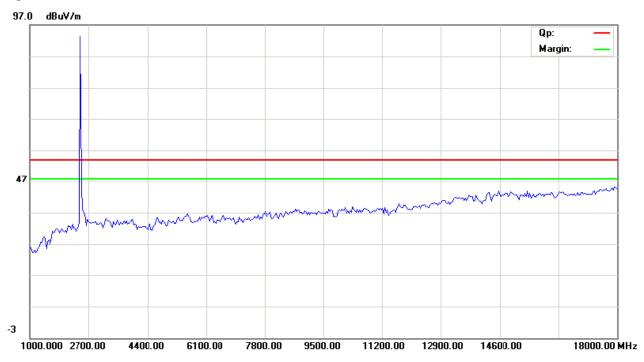
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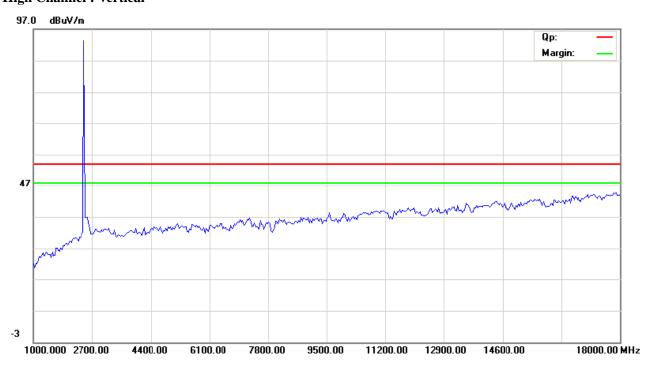
Date: 2015-01-05



High Channel: Horizontal



High Channel: Vertical



Note: for the radiated emissions above 18G, it is the floor noise.

The report refers only to the sample tested and does not apply to the bulk.

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Report No: FCC1412195-02 Page 22 of 87

Date: 2015-01-05



7.0 20dB Bandwidth Measurement

7.1 Regulation

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

7.2 Limits of 20dB Bandwidth Measurement

N/A

7.3 Test Procedure.

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span =3MHz, RBW =30kHz, VBW=100kHz, Sweep = auto Detector function = peak ,Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

7.4 Test Result

Type of Modulation: GFSK

Type of Moduluson CLS1										
EUT	EUT Tablet PC		C M		Iodel	UH682D UH682 UH682A UH682B UH682C				
					UH682E	UH683 UH683A UH683B UH683C				
						UH683D	UH683E UHxxxxx (x refers to 0-9, or			
							any letter between A and Z)			
Mode	Mode Keep Transmitting		nitting	Input Voltage		120V				
Temperat	Temperature 24 deg. C,		C,	Humidity		56% RH				
Channel	Channel Frequency (MHz)		Bandy	20 dB Bandwidth (kHz)		m Limit Iz)	Pass/ Fail			
Low	v 2402 8		872				Pass			
Middle	2441 87		872		-	Pass				
High	2480 85				-	Pass				

Page 23 of 87

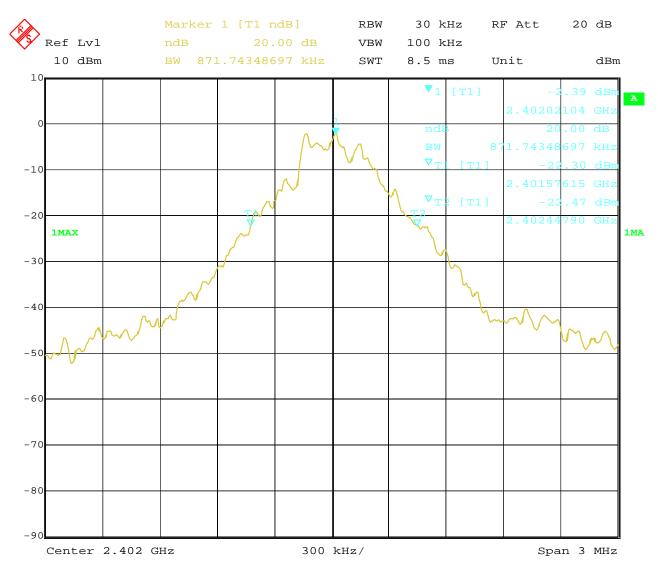
Report No: FCC1412195-02

Date: 2015-01-05



Test Figure:

1. Condition: Low Channel



Date: 4.JAN.2015 11:39:43

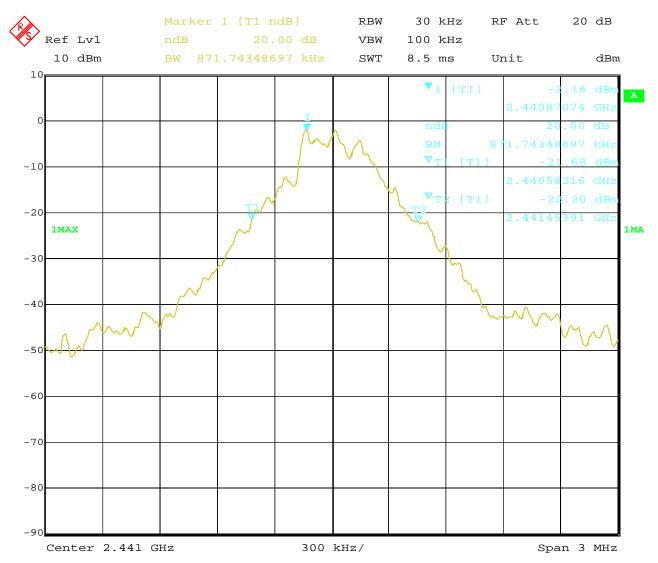
Page 24 of 87

Report No: FCC1412195-02

Date: 2015-01-05



2. Condition: Middle Channel



Date: 4.JAN.2015 11:48:30

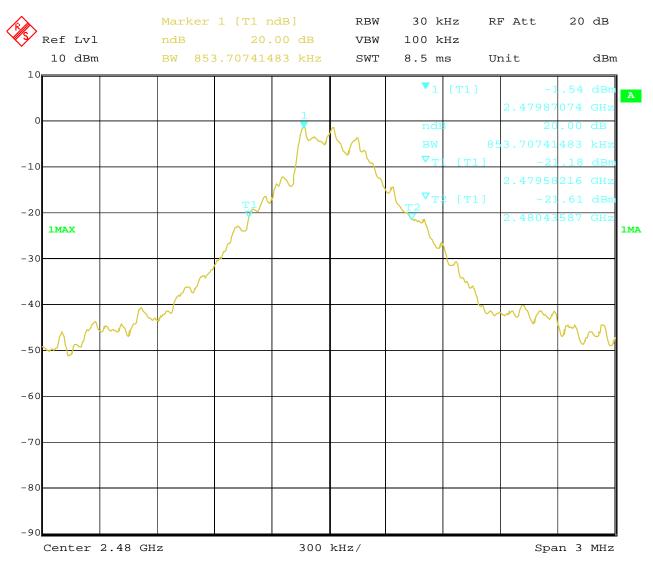
Page 25 of 87

Report No: FCC1412195-02

Date: 2015-01-05



3. High Channel



Date: 4.JAN.2015 11:49:47

Report No: FCC1412195-02 Page 26 of 87

Date: 2015-01-05



Test Result

Type of Modulation: $\pi/4DQPSK$

EUT	EUT Tablet PC		Model		UH682D UH682 UH682A UH682B UH682C					
						UH682E UH683 UH683A UH683B UH683C				
					UH683D UH683E UHxxxxx (x refers to 0-9, or any					
						letter between A and Z)				
Mode	Mode Keep Transmittin		ing	Input Voltage		120V				
Temperat	Temperature 24 deg. C,			Humidity		56% RH				
Channel	Ch	Channel Frequency (MHz)		20 dB Bandwidth (kHz)		Maximum Limit (kHz)	Pass/ Fail			
Low		2402	1214				Pass			
Middle		2441	1214				Pass			
High		2480		1220			Pass			

Page 27 of 87

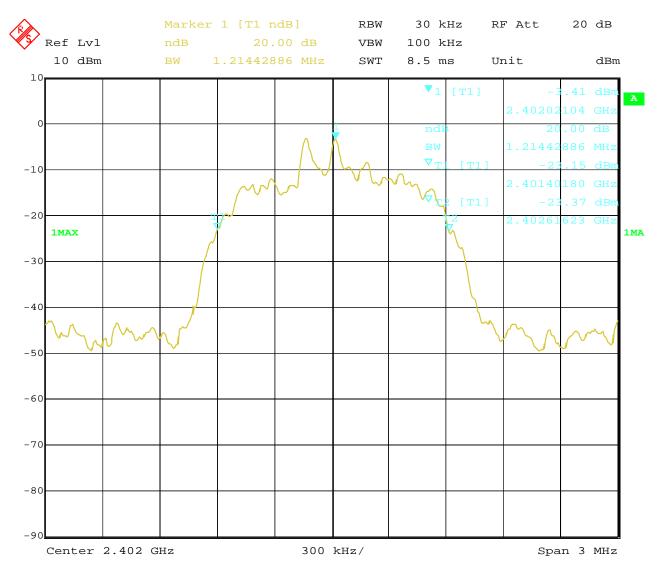
Report No: FCC1412195-02

Date: 2015-01-05



Test Figure:

1. Condition: Low Channel



Date: 4.JAN.2015 11:40:58

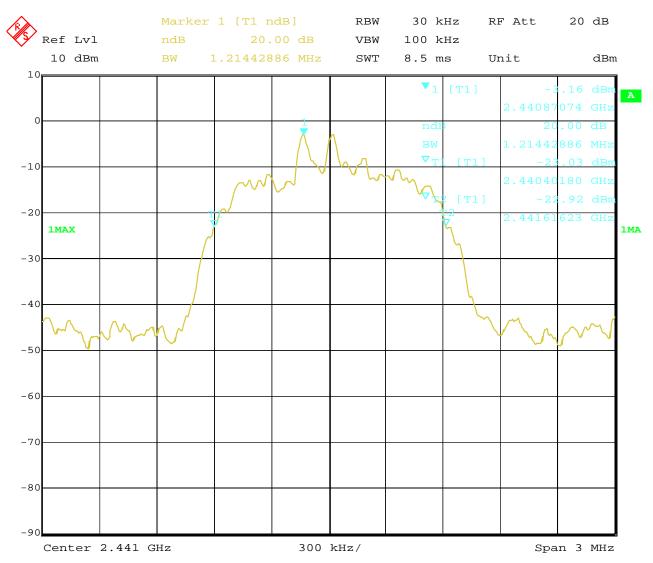
Page 28 of 87

Report No: FCC1412195-02

Date: 2015-01-05



2. Condition: Middle Channel



Date: 4.JAN.2015 11:46:46

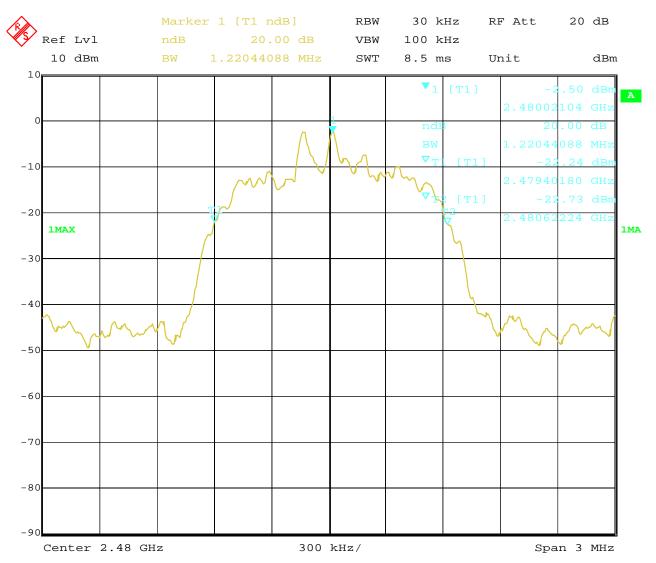
Page 29 of 87

Report No: FCC1412195-02

Date: 2015-01-05



3. High Channel



Date: 4.JAN.2015 11:50:57

Report No: FCC1412195-02 Page 30 of 87

Date: 2015-01-05



Test Result

Type of Modulation: 8DPSK

				T					
EUT	EUT Tablet PC		Model		UH682D UH682 UH682A UH682B UH682C				
					UH	UH682E UH683 UH683A UH683B UH683C			
					UH683	D UH683E UHxxxxx (x refers to 0-9, or any		
					letter between A and Z)				
Mode	Mode Keep Transmitti		ng	Input Voltage	120V				
Temperat	Temperature 24 deg. C,			Humidity		56% RH			
Channel	Channel Frequency (MHz)			20 dB Bandwidth (kHz)		Maximum Limit (kHz)	Pass/ Fail		
Low		2402		1214			Pass		
Middle		2441 12		1214			Pass		
High		2480		1214			Pass		

Page 31 of 87

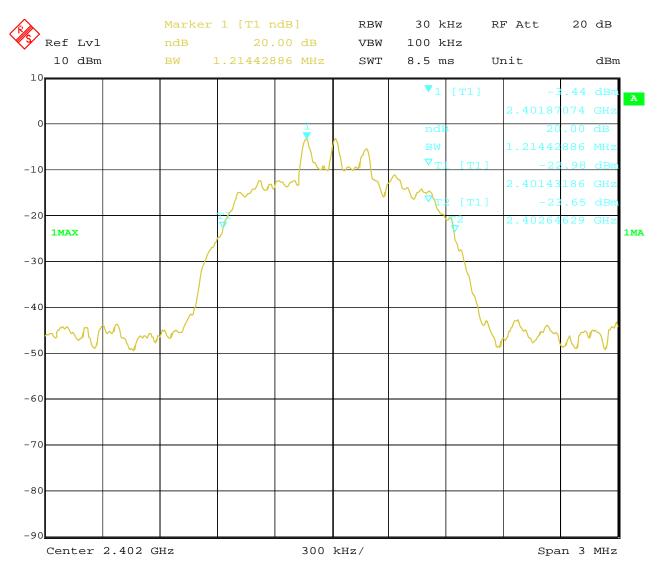
Report No: FCC1412195-02

Date: 2015-01-05



Test Figure:

1. Condition: Low Channel



Date: 4.JAN.2015 11:42:39

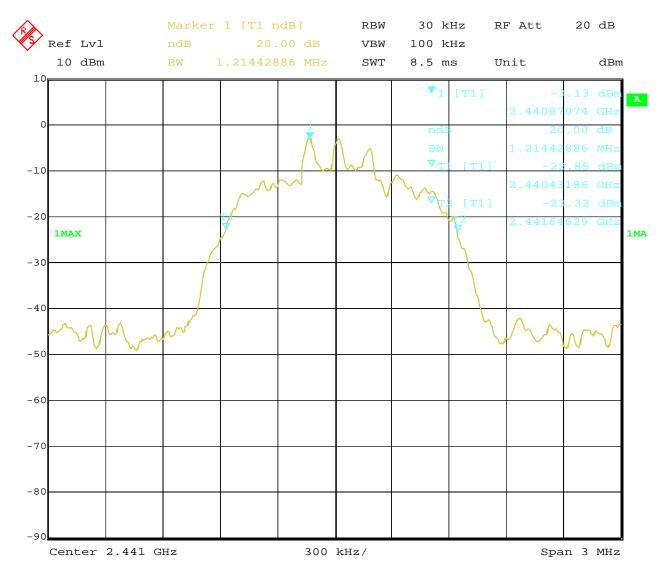
Page 32 of 87

Report No: FCC1412195-02

Date: 2015-01-05



2. Condition: Middle Channel



Date: 4.JAN.2015 11:45:10

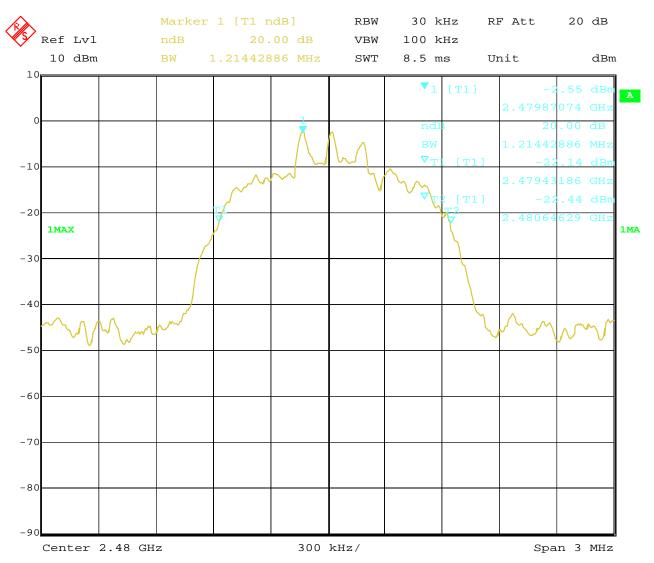
Page 33 of 87

Report No: FCC1412195-02

Date: 2015-01-05



3. High Channel



Date: 4.JAN.2015 11:52:13

Report No: FCC1412195-02 Page 34 of 87

Date: 2015-01-05



8. Maximum Peak Output Power

8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), 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.

8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel; RBW > the 20 dB bandwidth of the emission being measured; VBW= 10MHz, RBW=3MHz; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
- 4. Repeat above procedures until all frequencies measured were complete.

Note: the Peak and Average power were measured.

Date: 2015-01-05



8.4Test Results

Type of Modulation: GFSK

EUT Tablet PC		Tablet PC		Model		UH682D UH682 UH682A UH682B UH682C			
								3A UH683B UH683C	
						UH68	3D UH683E UHxx	xxx (x refers to 0-9, or	
						any letter between A and Z)			
Mode		Keep Transmitting	g	Input Voltage			120V		
Temperatur	re 24 deg. C, Humidity		56% RH						
	Cl	Channel Frequency (MHz)		Max. Power Output (dBm)	Peak Power	Pass/ Fail	
Channel				Peak Ave			Limit		
						rage	(dBm)		
Low		2402		-1.70	-1.70 -4.		30	Pass	
Middle		2441		-0.70 -4.0		07	30	Pass	
High		2480		-0.20 -3.5		52	30	Pass	

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

Type of Modulation: $\sqrt{1/4}$ DQPSK

EUT		Tablet PC		Model		UH682D UH682 UH682A UH682B UH682C			
						UH682E UH683 UH683A UH683B UH683C			
						UH683D UH683E UHxxxxx (x refers to 0-9, or			
			any letter between A and Z)						
Mode	ode Keep Transmitting Input Voltage		tage	120V					
Temperatu	Temperature 24 deg. C,			Humidity		56% RH			
Channel	Cl	Channel Frequency		Peak Power Output (c		Bm)	Peak Power Limit	Pass/ Fail	
Chamici		(MHz)		Peak	Ave	rage	(dBm)		
Low		2402		-2.40	-5.	12	21	Pass	
Middle		2441		-1.70 -4.		76	21	Pass	
High		2480		-1.05	-4.	08	21	Pass	

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

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Report No: FCC1412195-02 Page 36 of 87

Date: 2015-01-05



Type of Modulation: 8DPSK

<u>-3 pe or 1:10 a</u>										
EUT	EUT Tablet PC			Model		UH682D UH682 UH682A UH682B UH682C				
				UH682E UH683 UH683A UH683B UH6						
						UH68	UH683D UH683E UHxxxxx (x refers to 0-9, or			
						any letter between A and Z)				
Mode	Mode Keep Transmitting		g	Input Voltage		120V				
Temperatu	Temperature 24 deg.			Humidity		56% RH				
Champal	Cl	nannel Frequency	P	Peak Power Output		(dBm)	Peak Power Limit	Pass/ Fail		
Channel	Channel (MHz)			Peak Av		erage	(dBm)			
Low		2402		-1.81	-1.81 -:		21	Pass		
Middle		2441		-1.31 -5		5.09	21	Pass		
High		2480		-0.91	-4	1.51	21	Pass		

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

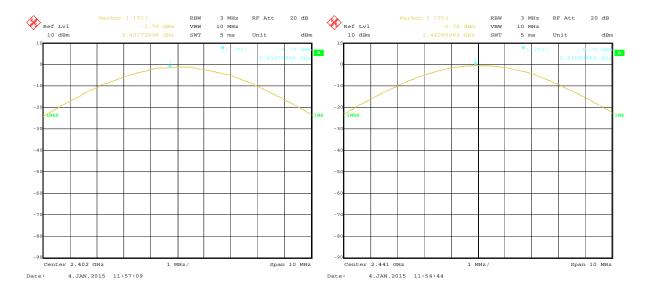
Page 37 of 87

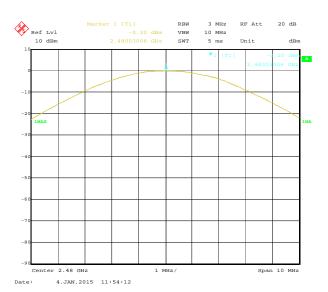
Report No: FCC1412195-02

Date: 2015-01-05



GFSK Mode Peak Power Test Plots





Page 38 of 87

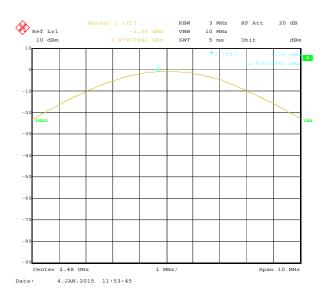
Report No: FCC1412195-02

Date: 2015-01-05



Π /4DQPSK Mode Peak Power Test Plots





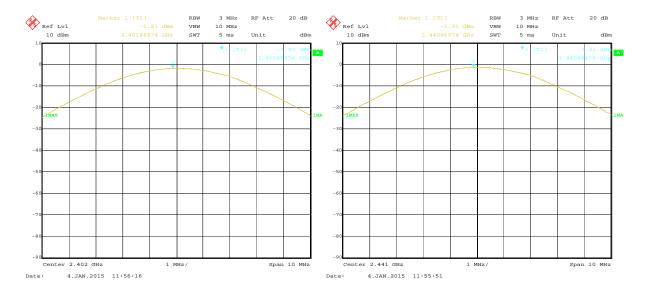
Page 39 of 87

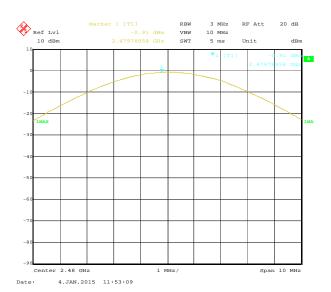
Report No: FCC1412195-02

Date: 2015-01-05



8DPSK Mode Peak Power Test Plots





Date: 2015-01-05



Page 40 of 87

9. Carrier Frequency Separation

9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

9.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW) \geq 1% of the span; Video (or Average) Bandwidth (VBW) \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.

Date: 2015-01-05

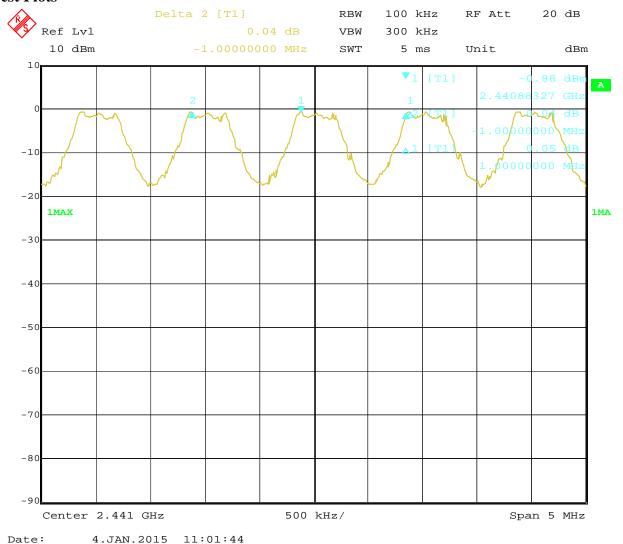


9.4Test Result

Type of Modulation: GFSK

EUT	Tablet PC	N	Model	UH682D UH682 UH682A U	H682B UH682C
			UH682E UH683 UH683A UH		H683B UH683C
				UH683D UH683E UHxxxxx (x	refers to 0-9, or any
				letter between A a	nd Z)
Mode	Hopping On	Inpu	ut Voltage 120V		
Temperature	24 deg. C,	Нι	ımidity	56% RH	
Carrier Frequency Separation			Limit	Pass/ Fail	
	1000kHz		≥ 2	5 kHz or 20 dB bandwidth	Pass

Test Plots



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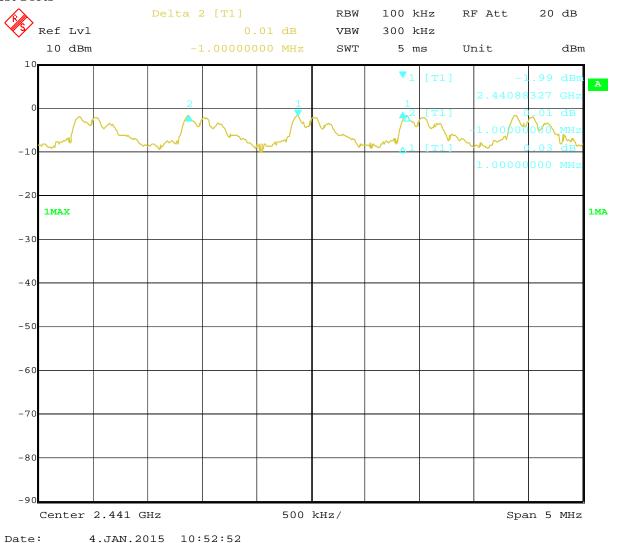
Date: 2015-01-05



Type of Modulation: JI/4DQPSK

EUT	Tablet PC	Model		UH682D UH682 UH682A UH682B UH682C UH682E		
		UH683 UH6		UH683 UH683A UH683B UH683C UH683D UH683E		
			UHxxxxx (x refers to 0-9, or any		y letter between A and Z)	
Mode	Hopping On	Input	Voltage	120V		
Temperature	24 deg. C,	Hun	nidity	56% RH	I	
Carrier Frequency Separation				Limit	Pass/ Fail	
	1000 kHz ≥ 25			kHz or 2/3 of 20 dB bandwidth	Pass	

Test Plots



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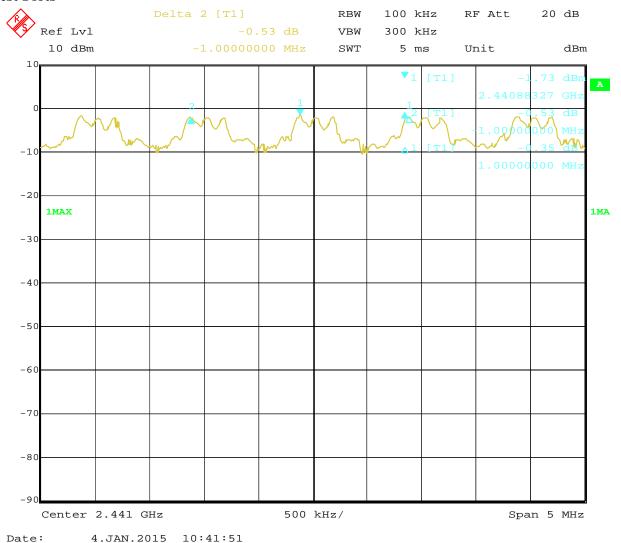
Date: 2015-01-05



Type of Modulation: 8DPSK

EUT	Tablet PC	Model		UH682D UH682 UH682A UH682B UH682C UH682E		
				UH683 UH683A UH683B UH683C UH683D UH683E		
				UHxxxxx (x refers to 0-9, or any letter between A and Z)		
Mode	Hopping On	Input Voltage		120V		
Temperature	24 deg. C,	Humid	ity	56% RH		
Carrier Frequency Separation		Limit	Pass/ Fail			
	1000 kHz		\geqslant	25 kHz or 2/3 of 20 dB bandwidth	Pass	

Test Plots



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Date: 2015-01-05



Page 44 of 87

10. Number of Hopping Channels

10.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

10.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

10.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW=100 kHz, VBW= 300 kHz;

Sweep = auto; Detector function = peak; Trace = max hold

3. Record the number of hopping channels.

Date: 2015-01-05

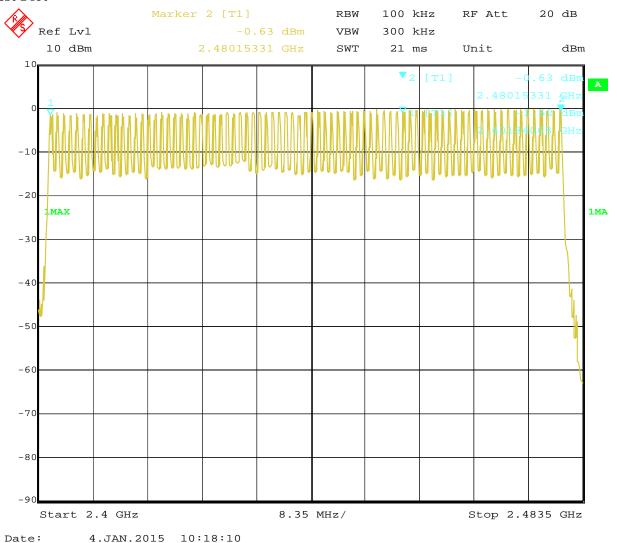


10.4Test Result

Type of Modulation: GFSK

EUT	Tablet P	C	Model	Model UH682D UH682 UH682A UH682B UH682C UH682E			
				UH683 UH683A UH683B UH683C UH683D UH683E			
				UHxxxxx (x refers to 0-9, or any letter between A and Z)			
Mode	Hopping	On	Input Voltage	120V			
Temperature	24 deg. 0	C,	Humidity			56% RH	
Operating Fr	equency	Number of hopping channels		ng	Limit	Pass/ Fail	
2402-2480)MHz	79			≥ 15	Pass	

Test Plot



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Page 46 of 87

Report No: FCC1412195-02

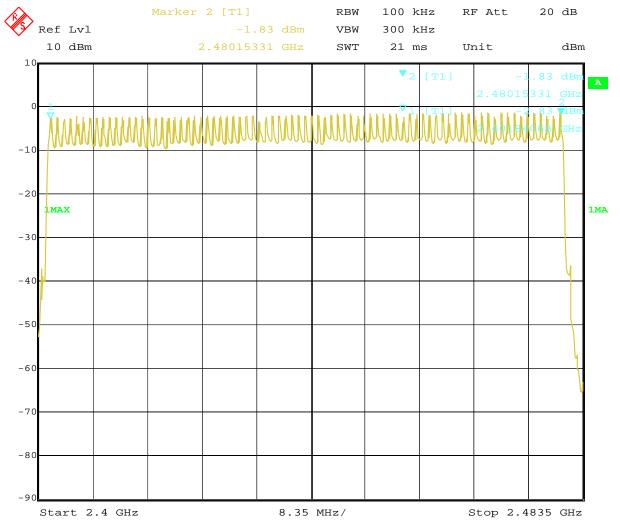
Date: 2015-01-05



Type of Modulation: $\pi/4DQPSK$

EUT	Table	t PC	Model Model		Model UH682D UH682 UH682A UH682B UH682C UH682E		
				UH683 UH683A UH		1683B UH683C UH683D UH683E	
			U		UHxxxxx (x refers to 0-9, or any letter between A and Z)		
Mode	Hoppin	ng On Input Voltage			120V		
Temperature	24 deg	g. C,	Humidity	56% RH			
Operating Freq	luency	Number of hopping channels			Limit	Pass/ Fail	
2402-2480N	ſНz	79			≥ 15	Pass	

Test Plot



Date: 4.JAN.2015 10:22:45

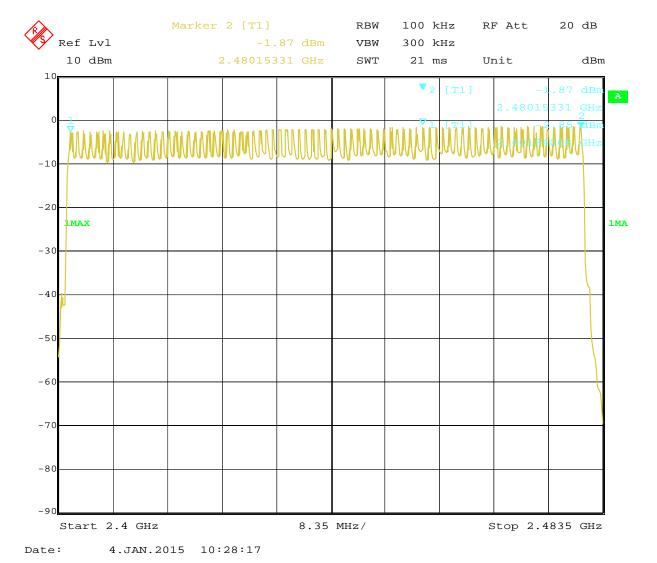
Date: 2015-01-05



Type of Modulation: 8DPSK

EUT	Tabl	Tablet PC Model		UH682D UH682 UH682A UH682B UH682C UH682E		
				UH683 UH683A UH683B UH683C UH683D UH683E		
				UHxxxxx (x refers	to 0-9, or any letter between A and	
				Z)		
Mode	Норр	ing On	Input Voltage	120V		
Temperature	24 d	eg. C,	Humidity		56% RH	
Operating Frequ	iency	Number of hopping channels		Limit	Pass/ Fail	
2402-2480M	Hz	79		≥ 15	Pass	

Test Plot



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Date: 2015-01-05



Page 48 of 87

11. Time of Occupancy (Dwell Time)

11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

11.2 Limits of Carrier Frequency Separation

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

11.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: 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
- 3. Measure the dwell time using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.
- 5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

Report No: FCC1412195-02 Page 49 of 87

Date: 2015-01-05



11.4 Test Result

Type of Modulation: GFSK

EUT		Tablet PC	Model	UH682D UH682 UH682A UH682B UH682C			
				UH682E UI	UH682E UH683 UH683A UH683B UH683C		
				UH683D UH68	UH683D UH683E UHxxxxx (x refers to 0-9, or any		
				letter between A and Z)			
Mode	Keep Transmitting		g Input Voltage	120V			
Temperatur	re :	24 deg. C,	Humidity	56% RH			
Channel	Rea	ading	Hoping	Rate	Actual	Limit	
Low	2.9	97ms	266.667	hop/s	0.317s	0.4s	
Middle	2.9	99ms	266.667	hop/s	0.319s	0.4s	
High	2.9	97ms	266.667	hop/s	0.317s	0.4s	

Actual = Reading \times (Hopping rate / Number of channels) \times Test period, Test period = 0.4 [seconds / channel] \times 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

Note: DH5 was the worse case

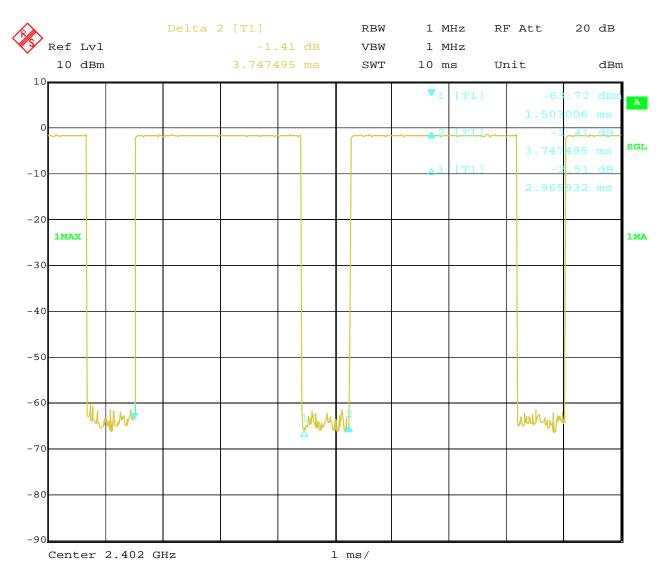
Page 50 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Test Plots: Low Channel:



Date: 4.JAN.2015 11:58:35

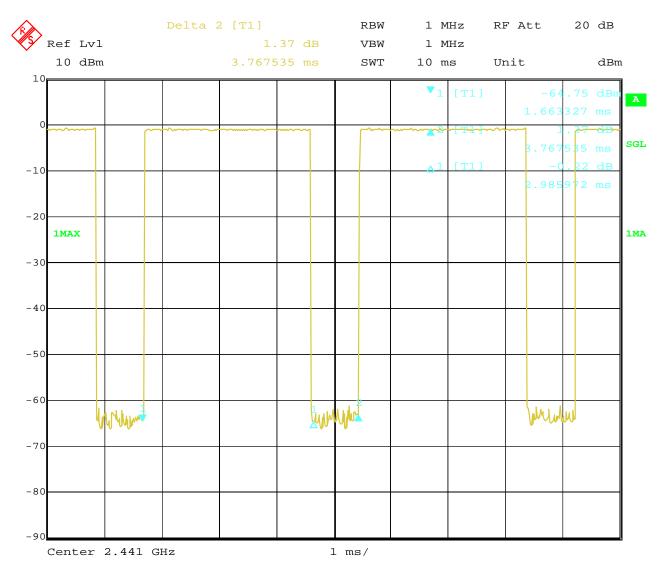
Page 51 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Middle Channel:



Date: 4.JAN.2015 13:59:41

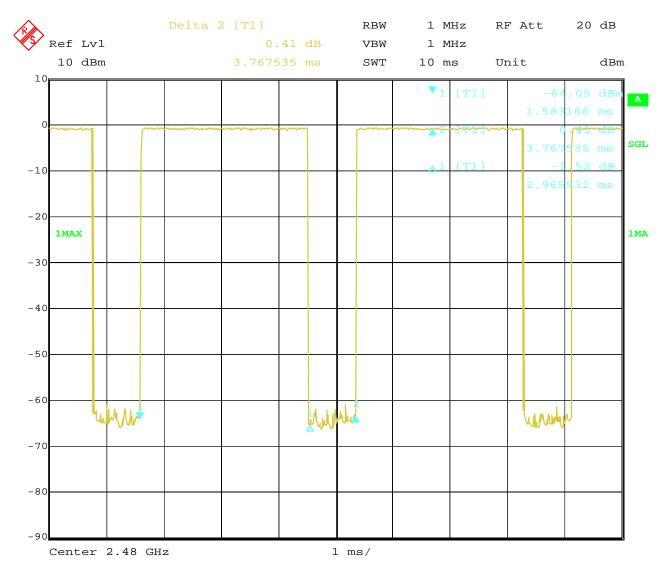
Page 52 of 87

Report No: FCC1412195-02

Date: 2015-01-05



High Channel



Date: 4.JAN.2015 14:01:49

Report No: FCC1412195-02 Page 53 of 87

Date: 2015-01-05



Test Result

Type of Modulation: Л/4DQPSK

EUT	Tablet PC	Model	Model UH682D UH682 UH682A UH682B UH682C				
			UH6	UH682E UH683 UH683A UH683B UH683C			
			UH683E	UH683D UH683E UHxxxxx (x refers to 0-9, or any			
				letter between A and Z)			
Mode	Keep Transmitt	ing Input Voltag	ge	120V			
Temperatur	re 24 deg. C,	Humidity		56% RH			
Channel	Reading	Hoping	Rate	Actual	Limit		
Low	2.97ms	266.667	hop/s	0.317s	0.4s		
Middle	2.97ms	266.667	hop/s	0.317s	0.4s		
High	2.99ms	266.667	hop/s	0.319s	0.4s		

Actual = Reading \times (Hopping rate / Number of channels) \times Test period ,Test period = 0.4 [seconds / channel] \times 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

Note: DH5 was the worse case

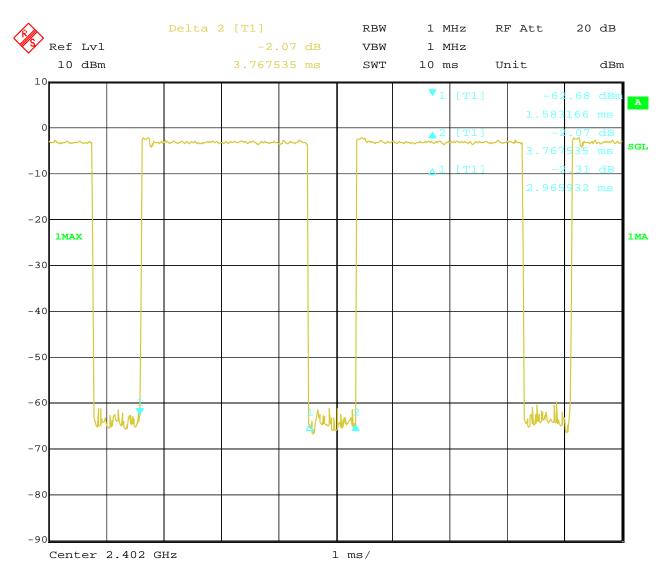
Page 54 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Test Plots: Low Channel:



Date: 4.JAN.2015 13:52:46

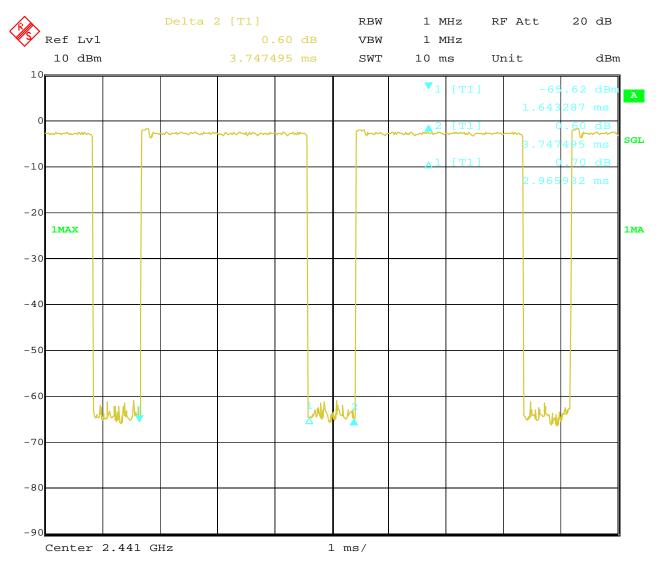
Page 55 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Middle Channel:



Date: 4.JAN.2015 13:58:21

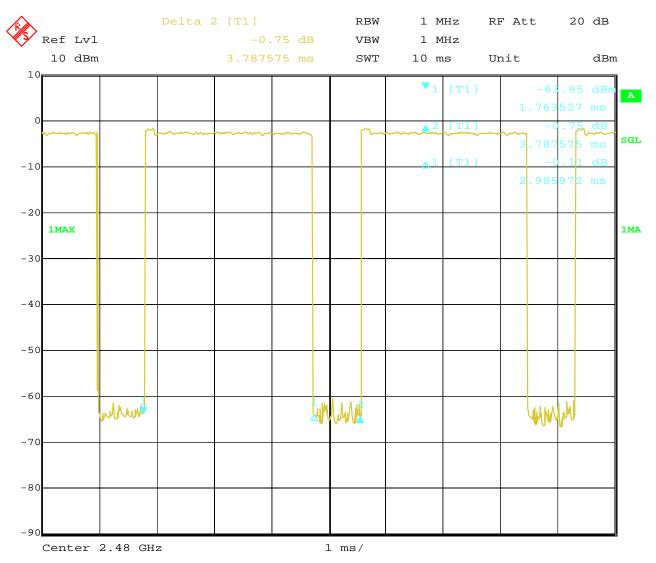
Page 56 of 87

Report No: FCC1412195-02

Date: 2015-01-05



High Channel



Date: 4.JAN.2015 14:02:54

Report No: FCC1412195-02 Page 57 of 87

Date: 2015-01-05



Type of Modulation: 8DPSK

			ı				
EUT	Tablet PC		Model	UH682D UH682 UH682A UH682B UH682C			
				UH682E UH683 UH683A UH683B UH6			
				UH683	UH683D UH683E UHxxxxx (x refers to 0-9, or a		
				letter between A and Z)			
Mode	Keep Transmitt	eep Transmitting Input Voltage		120V			
Temperatur	re 24 deg. C,		Humidity	56% RH			
Channel	Reading		Hoping Rate		Actual	Limit	
Low	3.01ms		266.667 hop/s		0.321s	0.4s	
Middle	3.01ms	266.667 hop/s			0.321s	0.4s	
High	2.99ms		266.667 hop/s		0.319s	0.4s	

Actual = Reading \times (Hopping rate / Number of channels) \times Test period, Test period = 0.4 [seconds / channel] \times 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 μ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

Note: DH5 was the worse case

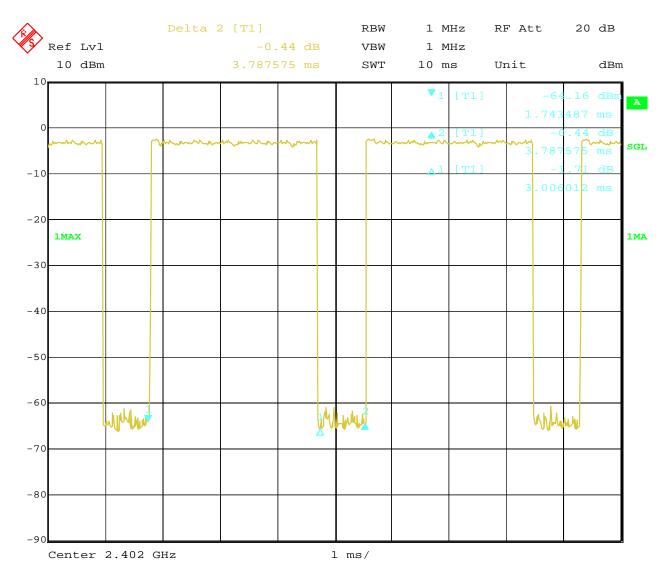
Page 58 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Test Plots: Low Channel:



Date: 4.JAN.2015 13:53:47

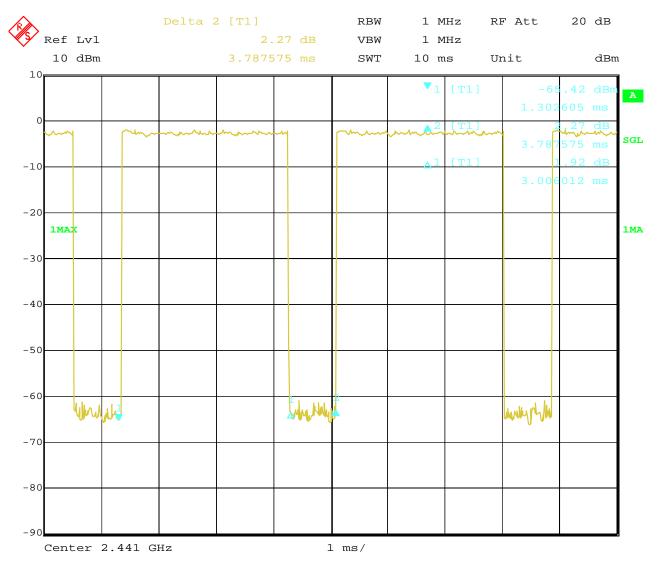
Page 59 of 87

Report No: FCC1412195-02

Date: 2015-01-05



Middle Channel:



Date: 4.JAN.2015 13:57:26

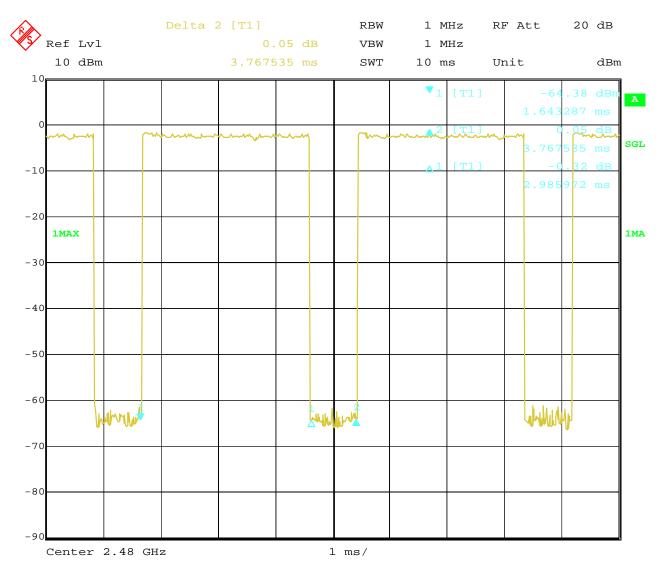
Page 60 of 87

Report No: FCC1412195-02

Date: 2015-01-05



High Channel



Date: 4.JAN.2015 14:04:01

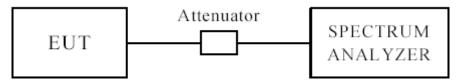
Report No: FCC1412195-02 Page 61 of 87

Date: 2015-01-05



12 Out of Band Measurement

12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

12.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

12.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of Radiated emission test. Peak values with RBW=VBW=1MHz and PK detector.

For bandage test, the spectrum set as follows: RBW=100 kHz, VBW=300 kHz. A conducted measurement used

Note: 1. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

Date: 2015-01-05

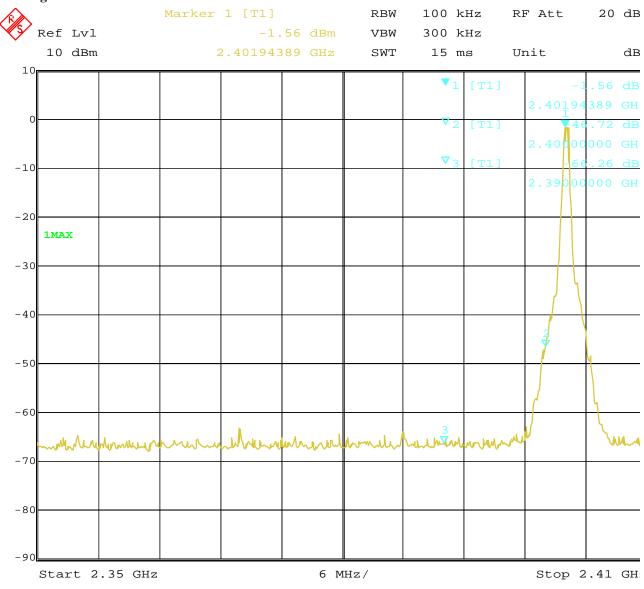


Type of Modulation: GFSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:27:16

Date: 2015-01-05

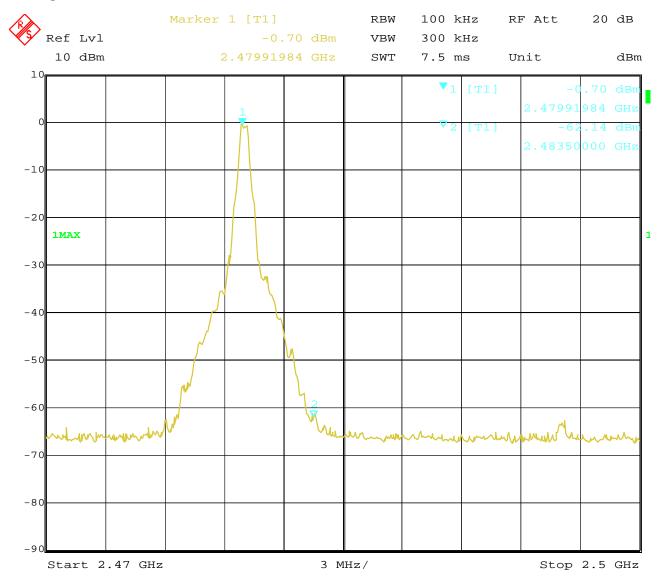


Type of Modulation: GFSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:26:28

Date: 2015-01-05

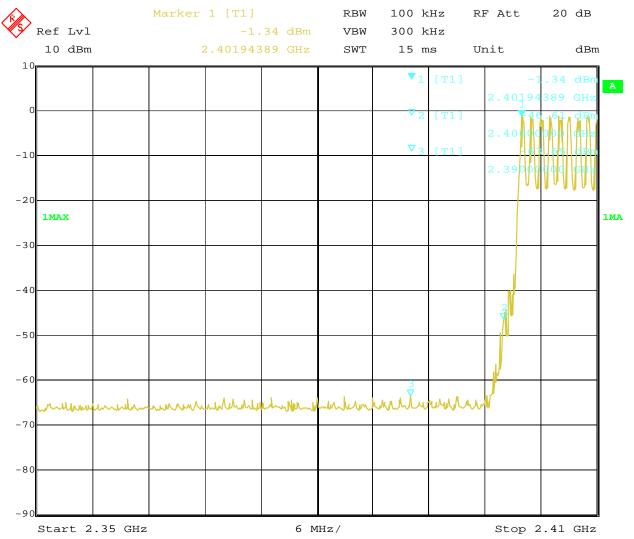


Type of Modulation: GFSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:37:37

Date: 2015-01-05

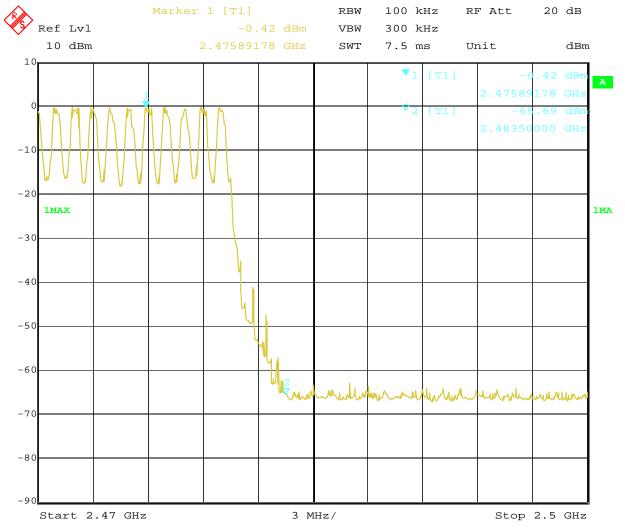


Type of Modulation: GFSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:15:23

Date: 2015-01-05

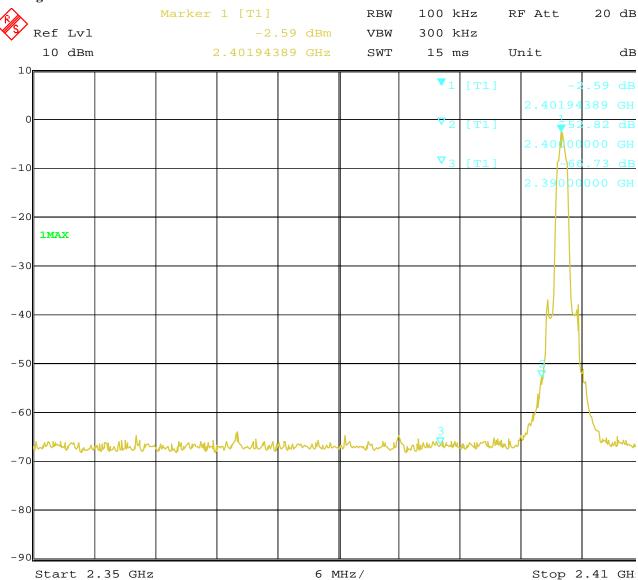


Type of Modulation: $\sqrt{1/4}$ DQPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:27:48

Date: 2015-01-05

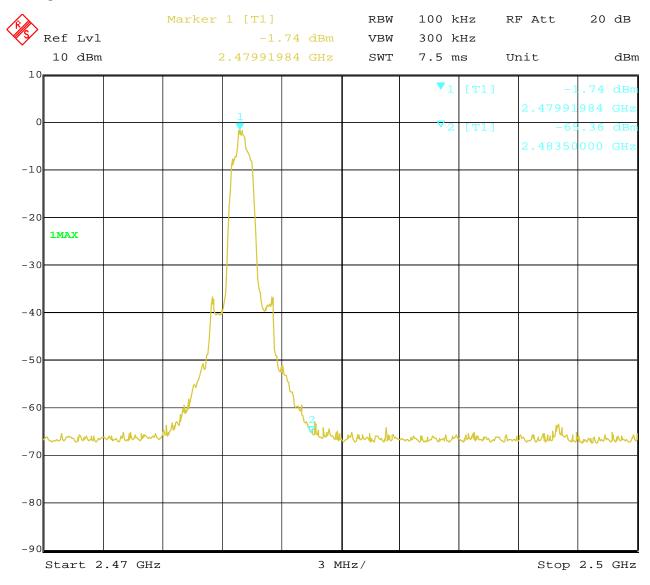


Type of Modulation: JI/4DQPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:25:05

Date: 2015-01-05

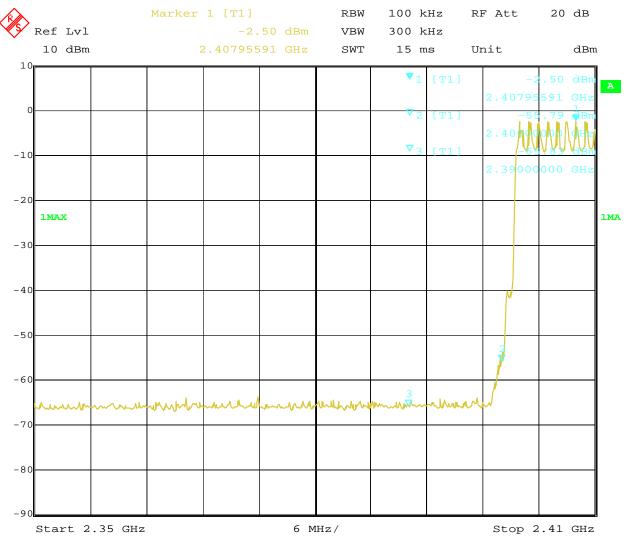


Type of Modulation: $\sqrt{1/4}$ DQPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:35:50

Date: 2015-01-05

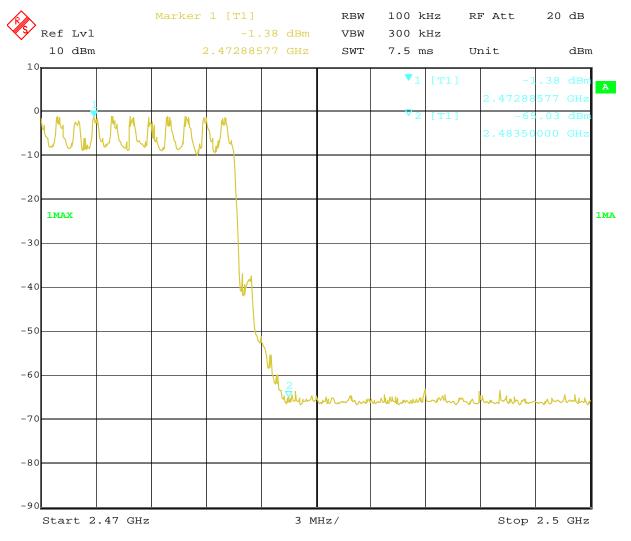


Type of Modulation: JI/4DQPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:19:17

Date: 2015-01-05

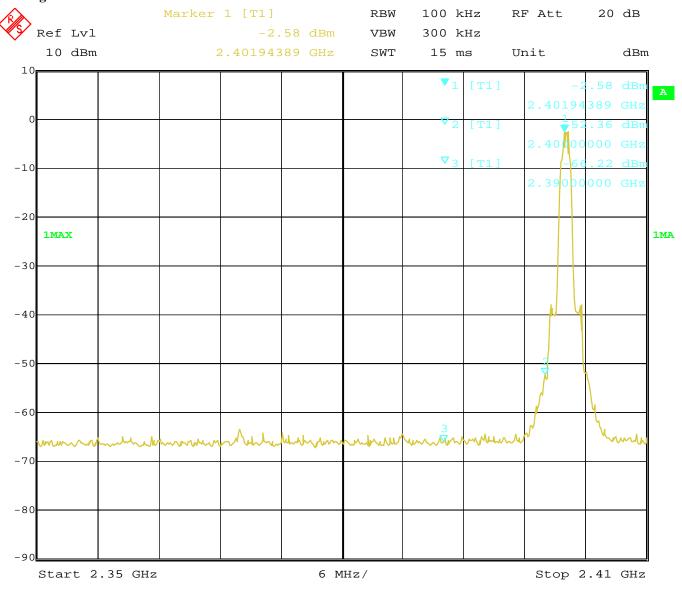


Type of Modulation: 8DPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Low Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:29:30

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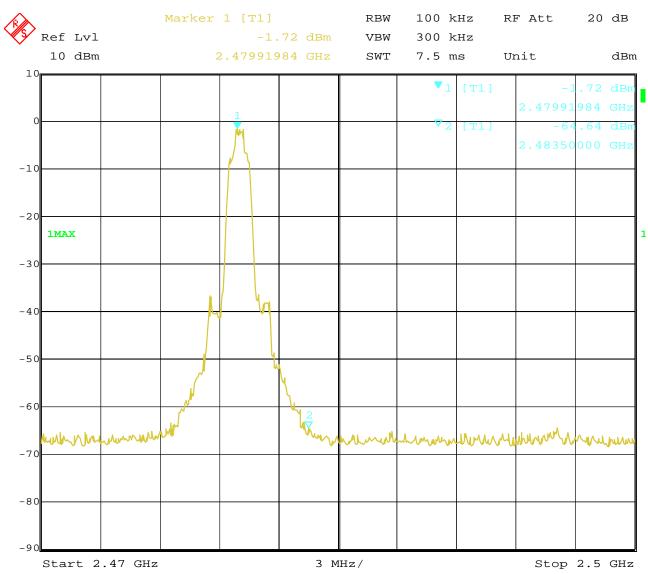


Type of Modulation: 8DPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	High Channel
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:23:47

Date: 2015-01-05

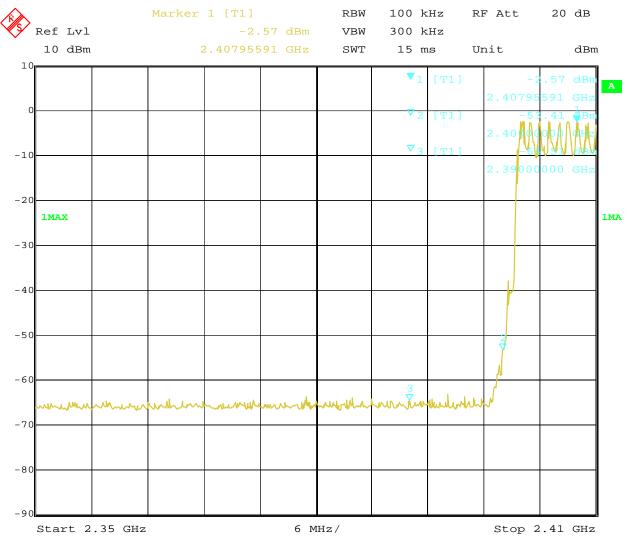


Type of Modulation: 8DPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:32:34

Date: 2015-01-05

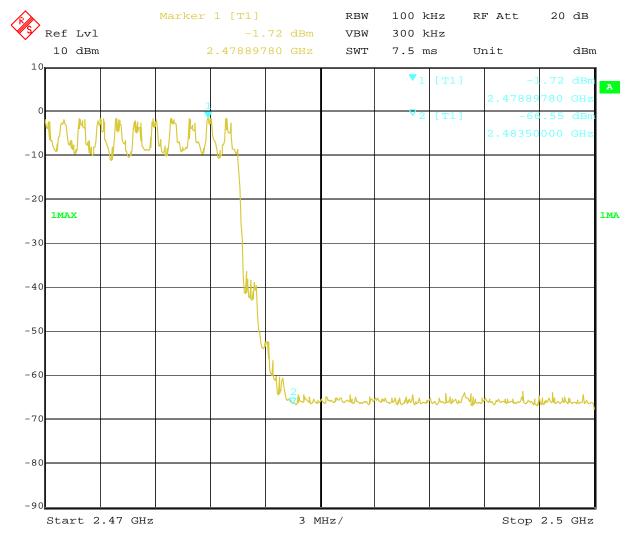


Type of Modulation: 8DPSK

12.4 Out of Band Test Result

Product:	Tablet PC	Test Mode:	Hopping mode
Mode	Keeping Transmitting	Input Voltage	120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 4.JAN.2015 11:23:00

Report No: FCC1412195-02 Page 74 of 87

Date: 2015-01-05



GFSK Mode (Worse case)

Restricted band Measurement 10.4

EUT	Tablet PC		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBμV/m)	42.21(H)/ 43.75(V)	T ::4	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	54(dBμV/m)
2390MHz	PK (dBμV/m)	36.17(H)/37.30 (V)	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

10.4 Restricted band Measurement

EUT	Tablet PC		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5MHz	PK (dBµV/m)	38.41(H)/ 38.92(V)	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

Page 75 of 87

Report No: FCC1412195-02

Date: 2015-01-05



GFSK Hopping Mode (Worse case)

12.4 Restricted band Measurement

EUT	Tablet PC		Test Mode:	Hopping On
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400MHz	PK (dBµV/m)	40.19(H)/ 41.26(V)	T ::4	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	$54(dB\mu V/m)$
2390MHz	PK (dBµV/m)	36.67(H)/37.62 (V)	Limit	$74(dB\mu V/m)$
	AV (dBμV/m)			$54(dB\mu V/m)$

12.4 Restricted band Measurement

EUT	Tablet PC		Test Mode:	Hopping On
Mode	Keeping Transmitting		Input Voltage	AC120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5MHz	PK (dBµV/m)	37.78(H)/38.28(V)	T ::4	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	$54(dB\mu V/m)$

Note: for restricted band measurement, only the GFSK Mode data was recorded and it was the worse case.

Date: 2015-01-05



Page 76 of 87

13.0 Antenna Requirement

13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2 Antenna Connected constructions

Integral antenna used and it was classified as permanent attached antenna. The maximum Gain of the antennas is 1.97dBi.

Report No: FCC1412195-02 Page 77 of 87

Date: 2015-01-05



14.0 FCC ID Label

FCC ID: 2ACRMUH682D

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



Page 78 of 87

Report No: FCC1412195-02

Date: 2015-01-05



15.0 Photo of testing

Conducted Emission Test Setup:

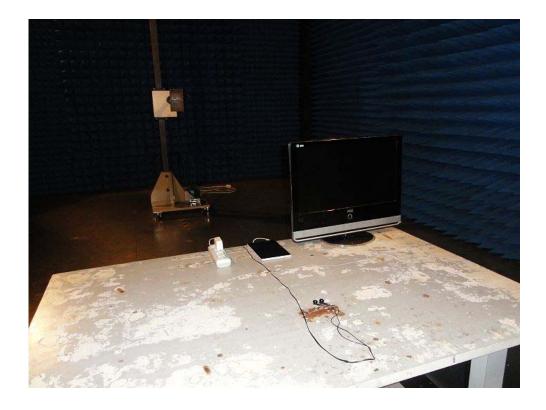


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Radiated Emission Test Setup:





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Photographs - EUT

Outside view





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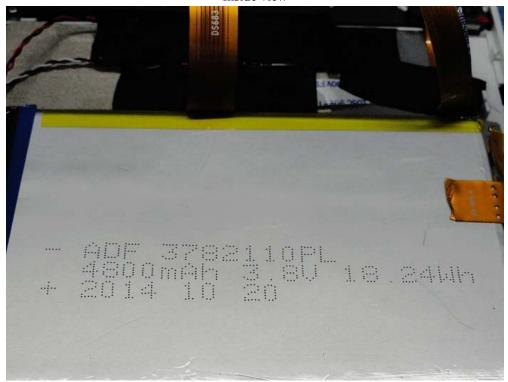
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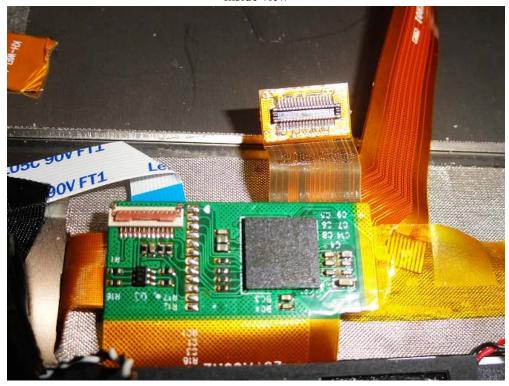
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End of the report

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