FCC ID: VGBOPOF2H02115 Sheet 1 of 80 Sheets ETC Report No.: 09-07-MAS-141-01



# FOR FCC Part 15, subpart D

Report No.: 09-07-MAS-141-01

Client: OPENPEAK INC.
Product: US DECT Handset
Model: OPOF2H2115

FCC ID: VGBOPOF2H02115

Manufacturer/supplier: OPENPEAK INC.

Date test item received: 2009/07/13

Date test campaign completed: 2009/07/22

Date of issue: 2009/07/22

The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.

Total number of pages of this test report: 80 pages

Total number of pages of photos: External photos 2 pages

Internal photos 7 pages Setup photos 1 pages

Test Engineer	Checked By	Approved By
JohnLi	Joe Hieh	Win-Po Jean
John Li	Joe Hsieh	Winpo Tsai

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# **1 GENARAL INFORMATION**

# 1.1 Testing Laboratory

Name: Electronic Testing Center, Taiwan

Address: No. 8, Lane 29, Wenming Rd., Leshan Tsuen, Guishan Shiang,

Taoyuan Country, 33383, Taiwan, R.O.C.

Telephone: 886-3-3280026 Fax: 886-3-3276188

NVLAP lab registration #: 200133-0 IC OATS registration #: IC 2949-1

E-Mail: <a href="mailto:hsieh@etc.org.tw">hsieh@etc.org.tw</a>

# 1.2 Client Information

Name: OPENPEAK INC.

Address: 5355 Town Center Road, Suite 301 Boca Raton, FL 33486

USA

Telephone: +1 561 281 8698 Contact person: Yuval Shohet

#### 1.3 Manufacturer

Name: OPENPEAK INC.

Address: 5355 Town Center Road, Suite 301 Boca Raton, FL 33486

USA

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#### 2 TEST INFORMATION

# 2.1 Description of Tested Device(s)

The tested equipment is a DECT base station that complies with ETSI EN 300175. The frequencies have been reprogrammed to comply with the FCC and IC requirements to an Isochronous UPCS device after FCC Part 15D and Industry Canada RSS-213 Issue 2.

The EUT is a responding device as described in ANSI C63.17 and is designed to operate together with a DECT handset, which is then the initiating device.

Frequency Channel	Frequency	Test Frequency
CH4	1921.536 MHz	FL
CH3	1923.264 MHz	-
CH2	1924.992 MHz	Fм
CH1	1926.720 MHz	-
CH0	1928.448 MHz	Fн

#### 2.2 Test Environment

#### Normal test condition

Temperature:	20 - 25 °C
Relative humidty:	55 - 75%

#### **Extreme test condition (declared by manufacturer)**

Please see the manufacturer declaration form.

# **3 TEST REPORT SUMMARY**

3.1 Test Summary

Requirement	FCC Paragraph #	Required	Customer	Test
•		rtequired	Declaration	Pass
Coordination with fixed microwave	15.307(b)	$\boxtimes$	$\boxtimes$	
Cross Reference	15.309(b)			note 1
Labeling requirements	15.311,15.19(a)(3)		$\boxtimes$	
Power line Conducted Emission	15.315,15.207	$\boxtimes$		note 1
Antenna Requirement	15.317, 15.203		$\boxtimes$	
Digital Modulation Techniques	15.319(b)	$\boxtimes$	$\boxtimes$	
Peak transmit Power	15.319(c)			$\boxtimes$
Power Spectral Density	15.319(d)			$\boxtimes$
Antenna gain	15.319(e)		$\boxtimes$	
Automatic discontinuation of transmission	15.319(f)	$\boxtimes$	$\boxtimes$	
Safety exposure levels	15.319(i)	$\boxtimes$		$\boxtimes$
Emission Bandwidth	15.323(a)			$\boxtimes$
Monitoring time	15.323(c)(1)			$\boxtimes$
Monitoring threshold	15.323(c)(2)		$\boxtimes$	
Maximum transmit period	15.323(c)(3)			$\boxtimes$
System acknowledgement	15.323(c)(4)			$\boxtimes$
Least Interfered Channel, LIC	15.323(c)(5)			$\boxtimes$
Random waiting	15.323(c)(6)		$\boxtimes$	
Monitoring bandwidth and reaction time	15.323(c)(7)	$\boxtimes$		$\boxtimes$
Monitoring antenna	15.323(c)(8)		$\boxtimes$	
Monitoring threshold relaxation	15.323(c)(9)			$\boxtimes$
Duplex system LBT	15.323(c)(10)		$\boxtimes$	
Co-located device LBT	15.323(c)(11)		$\boxtimes$	
Fair access	15.323(c)(12)		$\boxtimes$	
Emissions inside and outside				
the subband	15.323(d)			
Frame period and jitter	15.323(e)	$\boxtimes$		$\boxtimes$
Carrier frequency stability	15.323(f)			$\boxtimes$

note 1: For test results, see the EMC report as attached.

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#### 3.2 Other Comments

All measurements are traceable to national standards.

The tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC CFR47 Part 15, Paragraph 15.323 for Isochronous UPCS Devices and Industry Canada RSS-213 Issue 2.

The conducted test methods have been in accordance with ANSI C63.17-1998 and ANSI C63.17-2006 Draft where applicable. Radiated tests were conducted is accordance with ANSI C63.4-2003.

Where a test method specified in this Standard cannot be followed, a test method given in ANSI C63.17 may be used by quoting the test section number. An equivalent alternative method may also be used provided that it is fully described in the test report.

Where a test is not practicable (e.g. the test for an access protocol of Section 4.3.4), the certification applicant may submit to Industry Canada the manufacturer's declaration that the access protocol has nevertheless been met in the design and prototype tests. Full justification as to why testing is not practicable should be given for Industry Canada's consideration.

A mid-band carrier frequency should normally be used for tests.

When an antenna conducted measurement is used to determine the RF output power of the device, the effective gain of the antenna intended for the device must be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 3 dBi (3 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in this standard.

Accessories and peripheral equipment that are normally required to be connected to the device in actual use, shall be so connected with representative cable lengths for the tests. Only one test using representative peripherals and accessories is required. The emission tests shall be performed with the device and accessories configured in a manner which tends to produce the maximum level of emissions within the range of variations that can be expected under normal operating conditions.

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# **4 TEST SETUP**

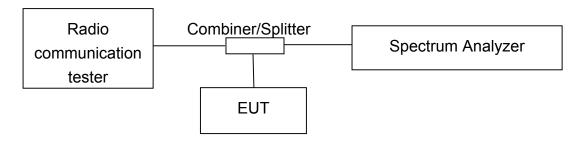
# 4.1 Frequency and Timing Measurements



# Test Set-up 1

This setup is used for measuring Frame repetition stability, Jitter, Carrier frequency stability at normal and extreme temperatures.

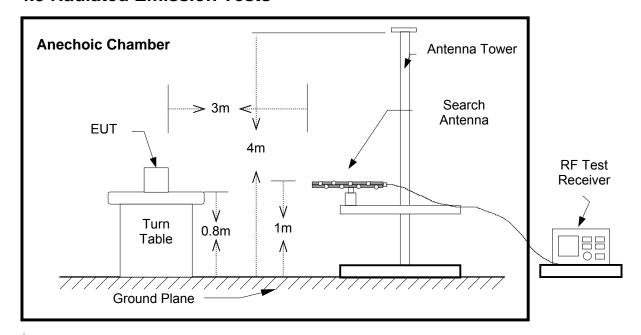
# **4.2 Conducted Emission Tests**



#### Test Set-up 2

This setup is used for all conducted emission tests.

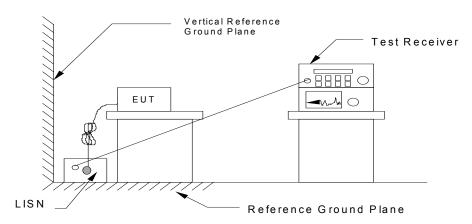
#### 4.3 Radiated Emission Tests



# Test Set-Up 3

This test setup is used for all radiated emissions tests. For frequencies below 30 MHz the measuring distance is 10 m, for all other frequencies it is 3 m. Emissions above 1 GHz were measured with the Spectrum Analyzer, Horn Antenna and the preamplifier after the antenna.

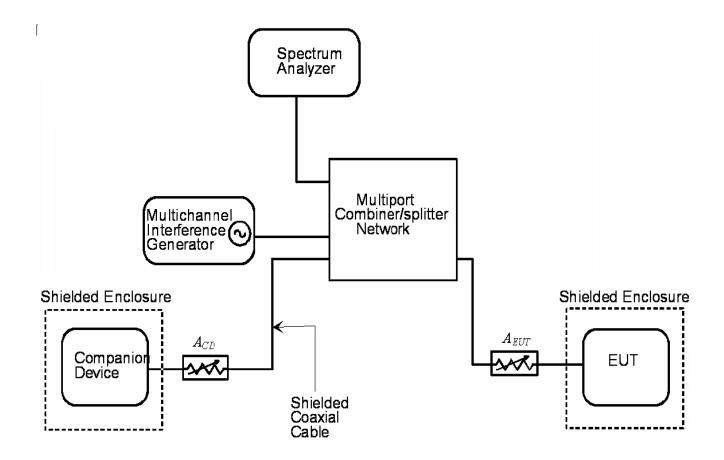
# 4.4 Power line Conducted Tests



**Test Set-Up 4** 

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# **4.5 Monitoring Tests**



**Test Set-Up 5** 

This test setup is used for all Monitoring and Time and Spectrum Access Procedure tests.

Companion Device	Ась (dВ)	EUT	А <sub>Е</sub> (dВ)
Base	50	Handset	0
Handset	30	Base	0

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# **5 TEST EQUIPMENT LIST**

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

Equipment	Manufacturer	Model No.	Next Calibration Date (MM/DD/YY)
EMI Test Receiver	Rohde & Schwarz	ESU	07/19/2010
BiLog Antenna	Schaffner	CBL 6112B	08/10/2009
Horn Antenna	EMCO	3115	12/07/2009
Horn Antenna	EMCO	3116	07/22/2009
Preamplifier	Hewlett-Packard	8449B	10/08/2009
Spectrum Analyzer	Hewlett-Packard	8564EC	10/13/2009
Spectrum Analyzer	Rohde & Schwarz	FSU46	11/24/2009
LISN	EMCO	37100/2M	02/11/2010
Test Receiver	Rohde & Schwarz	ESCS30	08/07/2009
Radio Communication Tester	Rohde & Schwarz	CTS60	03/15/2010
RF Downconverter	National Instruments	PXI-5600 (S/N: E35372)	01/15/2010
RF Downconverter	National Instruments	PXI-5600 (S/N: E224BD)	01/15/2010
64 MS/s Digitizer	National Instruments	PXI-5620 (S/N: E34BOB)	01/15/2010
64 MS/s Digitizer	National Instruments	PXI-5620 (S/N: E22946)	01/15/2010
100 MS/s AWG OSP	National Instruments	PXI-5441 (S/N: E32987)	01/15/2010
8-Bit 250 MS/s Digitizer	National Instruments	PXI-5114 (S/N: E41FBC)	01/15/2010
8-Bit 250 MS/s Digitizer	National Instruments	PXI-5114 (S/N: E41FBE)	01/15/2010
RF Upconverter	National Instruments	PXI-5610 (S/N: E4370F)	01/15/2010

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#### **6 TEST RESULT**

#### 6.1 Coordination with fixed microwave

#### 6.1.1 Standard Applicable: FCC 15.307(b)

Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the Commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

#### Result

The affidavit from UTAM, Inc. is included in the documentation supplied by the applicant:	
⊠Yes	
□No	

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# 6.2 Cross Reference

#### 6.2.1 Standard Applicable:

# 15.309(b)

The requirements of Subpart D apply only to the radio transmitter contained in the PCS device. Other aspects of the operation of a PCS device may be subject to requirements contained else where in this Chapter. In particular, a PCS device that includes digital circuitry not direct associated with the radio transmitter also is subject to the requirements for unintentional radiators in Subpart B.

#### 15.109(a)

For unintentional device, according to FCC §15.109(a), the field strength of radiated emissions from unintentional except for class A digital device radiators at a distance of 3 meters shall not exceed the following values:

idoo.			
Frequency MHz	Distance Meters	Radiated $\mu$ V/m	Radiated dB μ V/m
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
above 960	3	500	54.0

#### 6.2.2 Test Results:

This requirement is not applicable because test sample do not include digital circuitry which is not direct associated with the radio transmitter	
For test results according to FCC part 15 subpart B, see the EMC report as attached	$\boxtimes$
For test results according to FCC part 15 subpart B, see the measurement data as follow	
This requirement is covered by results of power line conducted emission test according to FCC 15.315	$\boxtimes$

Note: For radiated test, if EUT is a handset, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission as a worse case.

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# 6.3 Labeling Requirements

#### 6.3.1 Standard Applicable: FCC 15.19, RSS-213 3

The FCC Identifier shall be displayed on the label, and the device(s) shall bear the following statement in a conspicuous location on the device or in the user manual if the device is too small:

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 itself shall be of a permanent type, not a paper label, and shall last the lifetime of the equipment.

#### 6.3.2 Result

See separate documents showing the label design and the placement of the label on the EUT.

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#### 6.4 Power line Conducted Emissions

# 6.4.1 Standard Applicable:

#### FCC 15.315

An unlicensed PCS device that is designed to be connected to the public utility (AC) power line must meet the limits specified in Section 15.207.

#### FCC 15.207(a)

For an intentional radiator 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). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency MHz	Quasi Peak dB <i>μ</i> V	Average dB μ V
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

<sup>\*</sup>Decreases with the logarithm of the frequency.

#### RSS-213 6.3

The limits of AC power line conducted emissions are given is RSS-Gen, Section 7.

#### 6.4.2 Measurement Procedure

ANSI C63.4-2003 using 50 µH/50 ohms LISN.

#### 6.4.3 Test Results:

For test results according to FCC part 15 subpart B, see the EMC report as attached	$\boxtimes$
For test results according to FCC part 15 subpart B, see the measurement data as follow	

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# 6.5 Antenna Requirement

6.5.1 Standard Applicable: FCC 15.317, 15.203. RSS-213 4.1(e)
Does the EUT have detachable antenna?  [Yes]
No
If detachable, is the antenna connector non-standard?  _Yes  _No
The tested equipment has only integral antennas. The conducted tests were performed on a sample with a temporary antenna connector.

# 6.6 Digital Modulation Techniques

# 6.6.1 Standard Applicable: FCC 15.319(b), RSS-213 6.1

All transmissions must use only digital modulation techniques.

# 6.6.2 Result: Meets the requirement

Please see the declaration provided by applicant.

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#### 6.7 Peak Transmit Power

#### 6.7.1 Standard Applicable: FCC 15.319(c) & (e) same as RSS-213 6.5

(c) Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in hertz. Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

(e) The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

#### **RSS-213 4.3.1 Peak Transmit Power**

The transmitter shall be modulated with digital sequence(s) representative of those encountered in a real system operation. The peak transmit power shall be measured and recorded.

#### 6.7.2 Measurement procedure

Measurement method according to ANSI C63.17 2006 paragraph 6.1.2

6.7.3 Test Results: Complies

#### **Measurement Data:**

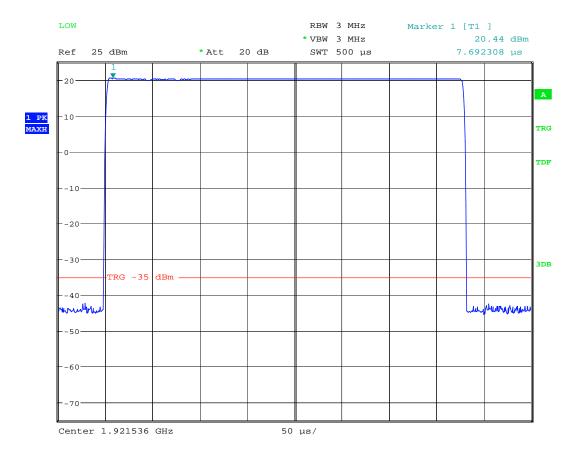
Channel	Frequency (MHz)	Maximum Peak Output Power (dBm)	Limit (dBm)
FL	1921.536	20.44	20.88
Fм	1924.992	20.44	20.88
Fн	1928.448	20.39	20.88

#### Limit:

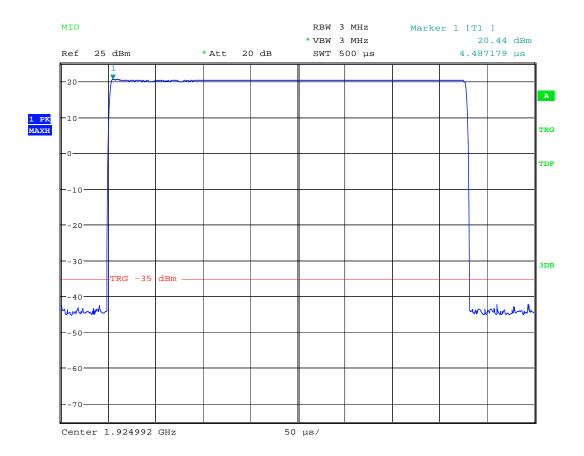
Conducted: 5 Log (B) - 10 = 20.88 dBm

Where B is the emission bandwidth in Hz measured at 26 dBm.

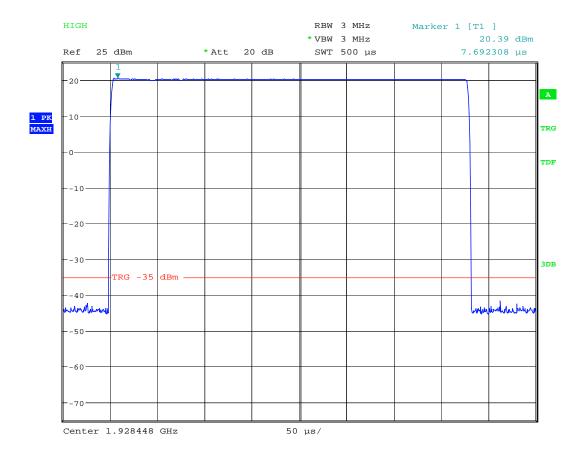
# Maximum Peak Output Power: CH FL



# Maximum Peak Output Power: CH FM



# Maximum Peak Output Power: CH FH



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# 6.8 Power Spectral Density

#### 6.8.1 Standard Applicable: FCC 15.319(d)

Power spectral density shall not exceed 3 milliwatts in any 3 kHz bandwidth as measured with a spectrum analyzer having a resolution bandwidth of 3 kHz.

#### RSS-213 4.3.2.1 Peak Power Spectral Density Test

This test is to measure the occupied bandwidth and the maximum power spectral density. With the transmitter modulated as in Section 4.3.1, obtain spectrum plots. Record the maximum spectral level of the modulated signal as the reference spectral level (dBs). Measure and record the 99% bandwidth. Measure and record the power spectral density per 3 kHz.

#### **RSS-213 6.6 Power Spectral Density**

The peak-hold power spectral density shall not exceed 12 milliwatts per any 3 kHz bandwidth. As an alternative to the peak-hold power spectral density, the time-averaged power spectral density may be measured and it shall not exceed 3 milliwatts per any 3 kHz bandwidth.

#### 6.8.2 Measurement procedure

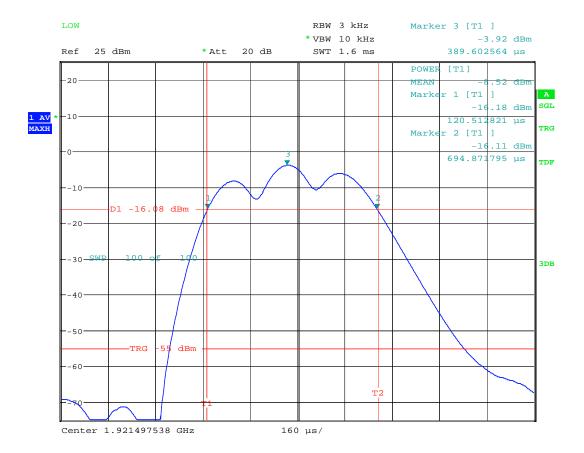
Measurement method according to ANSI C63.17 2006 paragraph 6.1.5

## 6.8.3 Test Results: Complies

#### **Measurement Data:**

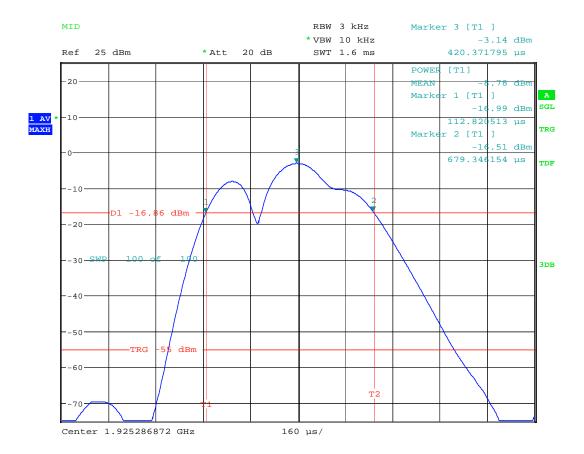
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm)
FL	1921.524	-8.52	4.77
FM	1924.998	-8.78	4.77
FH	1928.454	-7.94	4.77

# Power Spectral Density: CH FL

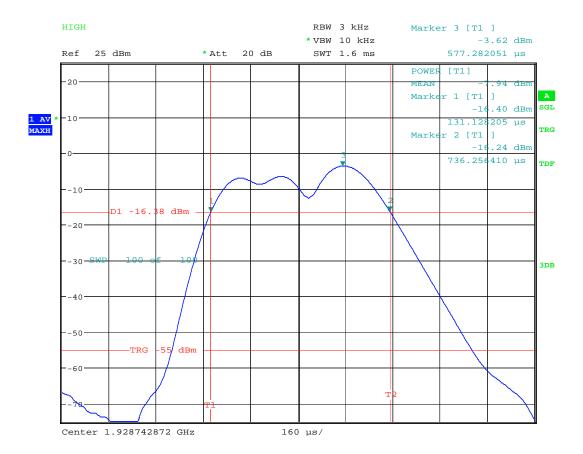


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# Power Spectral Density: CH FM



# Power Spectral Density: CH FH



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# 6.9 Antenna Gain

#### 6.9.1 Standard Applicable: FCC 15.323(e)

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

#### 6.9.2 Results: Meets the requirement

The antenna gain value provided by manufacturer is -0.52 dBi.

#### 6.10 Automatic discontinuation of transmission

#### 6.10.1 Standard Applicable: FCC 15.319(f) same as 4.3.4 (a)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude transmission of control and signaling information or use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

#### 6.10.2 Procedure

Please see the declaration provided by applicant.

#### 6.10.3 Results: Meets the requirement

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# 6.11 Safety exposure levels

# 6.11.1 Standard Applicable: FCC 15.319(i)

UPCS devices are subject to the radio frequency radiation exposure requirements specified in FCC parts 1.1307 (b), 2.1091 and 2.1093, as appropriate. All equipment shall be considered to operate in a "general population / uncontrolled environment. For portable devices tests according to IEEE 1528 are requested, if applicable.

#### 6.11.2 Measurement procedure

Consideration of radio frequency radiation exposure for EUT is done as

SAR test according OET65c (for PP)	$\boxtimes$
MPE calculation as below (for FP, Repeater)	

SAR test results: See SAR test report.

MPE calculation: not applicable

The EUT is considered as a mobile device according to OET Bulletin 65, Edition -97-01. Therefore distance to human body of min. 20 cm is determined.

The limit of Power density for General Population / Umcontrolled Exposure is 1.0 mW/cm<sup>2</sup>. Formula:

 $S = EIRP / 4\pi R^2$ 

#### Calculation:

EIRP	Radiated Power (dBm)	n.a.
EIRP	Radiated Power (mW)	n.a.
R	Distance (cm)	n.a.
S	Power Density (mW/cm²)	n.a.

#### 6.11.3 Results: Complies

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# 6.12 Emission Bandwidth B

# 6.12.1 Standard Applicable: FCC 15.323(a)

The 26 dB Bandwidth B shall be larger than 50 kHz and less than 2.5 MHz.

# 6.12.2 Measurement procedure

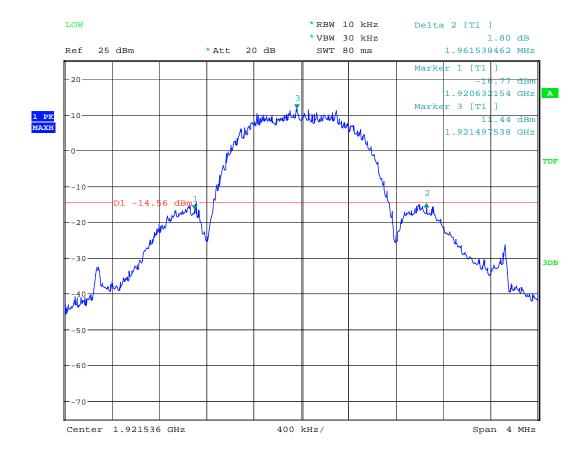
Measurement method according to ANSI C63.17 2006 paragraph 6.1.3

6.12.2 Results: Complies

#### **Measurement Data:**

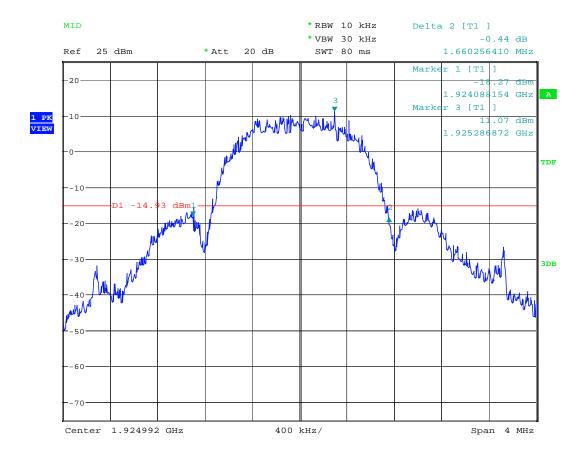
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
FL	1921.536	1.96
FM	1924.992	1.66
FH	1928.448	1.50

#### 26 dB Bandwidth B: CH FL



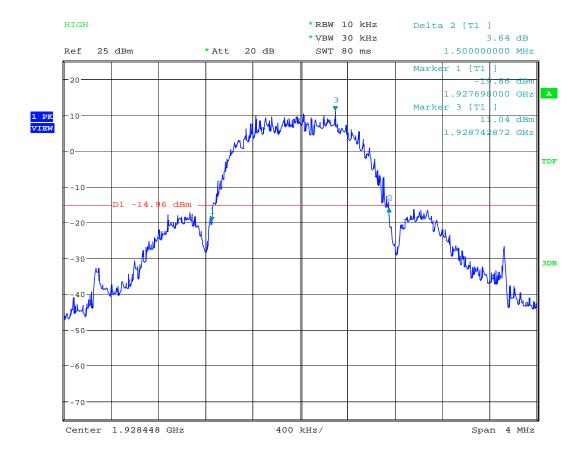
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#### 26 dB Bandwidth B: CH FM



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#### 26 dB Bandwidth B: CH FH



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# 6.13 Monitoring time

#### 6.13.1 Standard Applicable: FCC 15.323(c)(1) same as RSS-213 4.3.4 (b)(1)

Immediately prior to initiating transmission, devices must monitor the combined time and spectrum window in which they intend to transmit. For a period of at least 10 milliseconds for systems designed to use a 10 millisecond or shorter frame period or at least 20 milliseconds for systems designed to use a 20 millisecond frame period.

#### 6.13.2 Measurement procedure

Measurement method according to ANSI C63.17 2006 paragraph 7.3.4

#### 6.13.2 Results: Complies

EUT monitors the combined time and spectrum window prior to initiation of transmission.

#### **Measurement Data:**

This requirement is covered by results of Least Interfered Channel (LIC) test according to FCC 15.323(c) (5)	$\boxtimes$
--	-------------

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# 6.14 Monitoring threshold

# 6.14.1 Standard Applicable: FCC 15.323(c)(2) same as RSS-213 4.3.4 (b)(2)

The monitoring threshold must not be more than 30 dB above the thermal noise power for a bandwidth equivalent to the emission bandwidth of the device.

#### 6.14.2 Measurement procedure

Measurement method according to ANSI C63.17 2006 paragraph 7.3.1

#### 6.14.3 Result: Not apply

Note: For EUT which support LIC there is no need to measure lower threshold because it is automatically met by LIC Procedure.

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# 6.15 Maximum transmit period

# 6.15.1 Standard Applicable: FCC 15.323(C) (3) same as RSS-213 4.3.4 (b)(3)

Occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

#### 6.15.2 Measurement procedure

Measurement method according to ANSI C63.17 2006 paragraph 8.2.2

6.15.3 Test Results: Complies

#### **Measurement Data:**

	Observation	Limit
Maximum transmission time	0 hours 4 minutes	8 hours

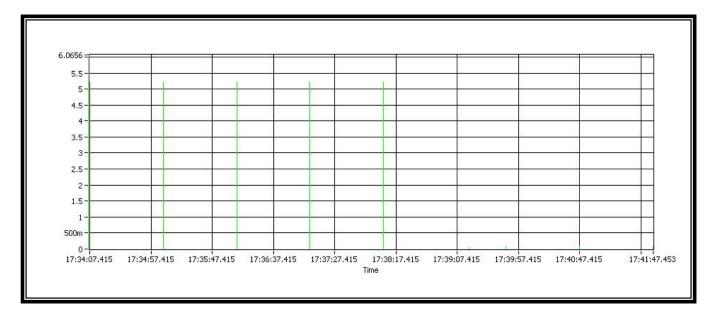
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Start to transmission time and Cease of transmission time:



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# 6.16 System Acknowledgement

# 6.16.1 Standard Applicable: FCC 15.323 (c)(4) same as RSS-213 4.3.4 (b)(4)

Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgements must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which time the access criteria must be repeated.

## 6.16.2 Measurement procedure

Measurement method according to ANSI C63.17 2006 paragraph 8

#### 6.16.3 Results: Complies

#### **Measurement Data**

<u>Unacknowledged transmission:</u>

Limit:

Requirement	Value
Change of access criteria for control information	30 s
Pause length	> 10 ms
Change of access channel	mandatory

#### Result:

Requirement	Time	Verdict
Change of access criteria for control information		n.a.
Pause length		n.a.
Change of access channel		n.a.

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# Connection acknowledgement:

#### Limit:

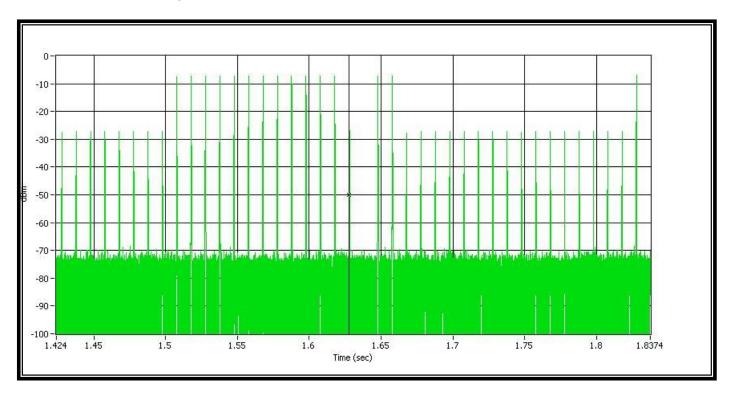
Requirement	Value
Connection acknowledgement	1 s
Termination of transmission	30 s

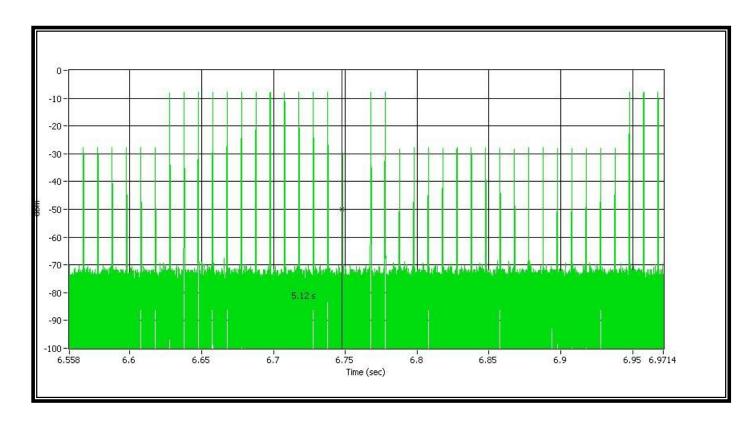
#### Result:

Requirement	Time observed	Verdict
Connection acknowledgement	5 ms	Pass
Termination of transmission	5.02 s	Pass

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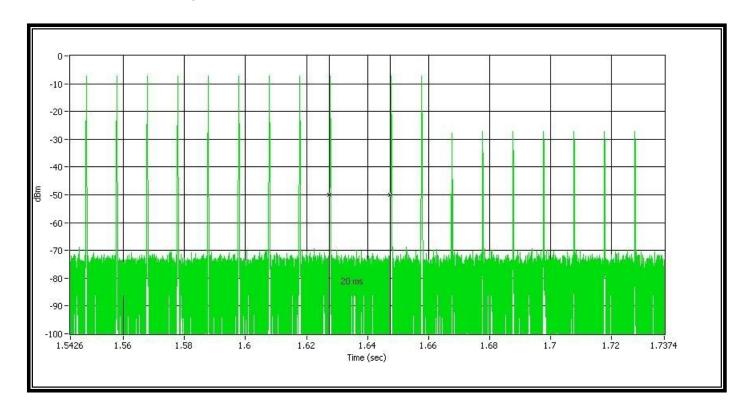
Comment: Unacknowledged transmission





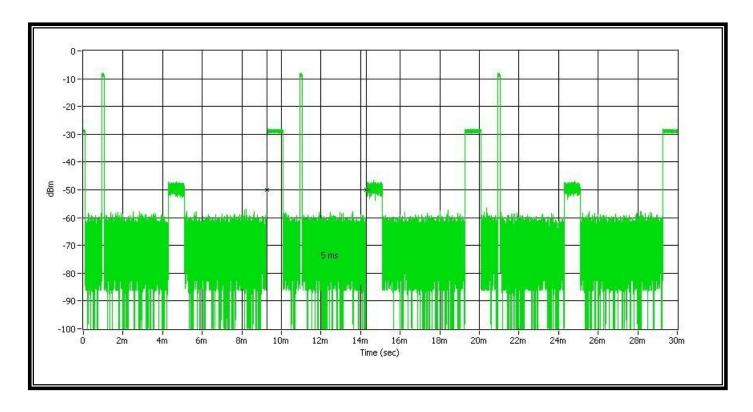
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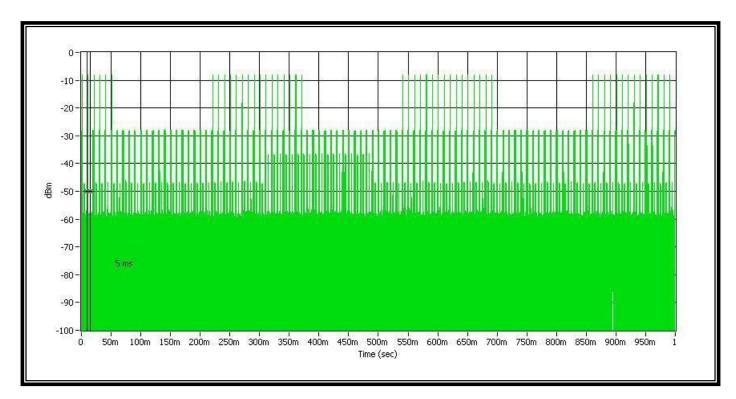
Comment: Unacknowledged transmission



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Comment: Connection acknowledgement





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Comment: Termination of transmission

