

## Test Report

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                   |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <b>Product</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | UPCS Transceiver in Wireless Handheld Microphone                                                                                                                                                                                                                                                                                  |  |  |
| <b>Name and address of the applicant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Panasonic Corporation of North America                                                                                                                                                                                                                                                                                            |  |  |
| <b>Name and address of the manufacturer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Panasonic System Networks Co., Ltd.<br>1-62, 4-chome, Minoshima, Hakata-ku<br>Fukuoka 812-8531, Japan                                                                                                                                                                                                                             |  |  |
| <b>Model</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | K-SHH14                                                                                                                                                                                                                                                                                                                           |  |  |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3.7V DC (Secondary Battery)                                                                                                                                                                                                                                                                                                       |  |  |
| <b>Trademark</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Panasonic                                                                                                                                                                                                                                                                                                                         |  |  |
| <b>Serial number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | /                                                                                                                                                                                                                                                                                                                                 |  |  |
| <b>Additional information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | DECT 6.0                                                                                                                                                                                                                                                                                                                          |  |  |
| <b>Tested according to</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>FCC Part 15, subpart D</b><br>Isochronous UPCS Device, 1920 – 1930 MHz<br><b>Industry Canada RSS 213, Issue 3</b><br>2 GHz License-exempt Personal Communications Service Devices (LE-PCS)                                                                                                                                     |  |  |
| <b>Order number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 296983                                                                                                                                                                                                                                                                                                                            |  |  |
| <b>Tested in period</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2015.12.07 to 2015.12.08                                                                                                                                                                                                                                                                                                          |  |  |
| <b>Issue date</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2015.12.08                                                                                                                                                                                                                                                                                                                        |  |  |
| <b>Name and address of the testing laboratory</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <div style="display: flex; align-items: center;">  <div> <p>FCC No: 994405<br/>IC OATS: 2040D-1</p> <p>TEL: +47 22 96 03 30<br/>FAX: +47 22 96 05 50</p> </div> </div> <p>Instituttveien 6<br/>Kjeller, Norway</p> |  |  |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 10px; text-align: center;">  <p>Prepared by [Frode Sveinsen]</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;">  <p>Approved by [G. Suhanthakumar]</p> </div> </div> |                                                                                                                                                                                                                                                                                                                                   |  |  |
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## 1 INFORMATION

### 1.1 Tested Item

|                                     |                                               |
|-------------------------------------|-----------------------------------------------|
| Name :                              | Panasonic                                     |
| Model name :                        | K-SHH14                                       |
| FCC ID :                            | ACJ9TAK-SHH14                                 |
| Industry Canada ID :                | N/A                                           |
| Serial number :                     | /                                             |
| Hardware identity and/or version:   | ES2                                           |
| Software identity and/or version :  | V0.02R02(PP_US)                               |
| Tested to IC Radio Standard (RSS) : | RSS-213 Issue 3, RSS-GEN Issue 4              |
| Test Site IC Reg. Number :          | IC 2040D-1                                    |
| Frequency Range :                   | 1921.536 – 1928.448 MHz                       |
| Number of Channels :                | 5 RF Channels, 5x12 = 60 TDMA Duplex Channels |
| Type of Modulation :                | Digital (Gaussian Frequency Shift Keying)     |
| Conducted Output Power :            | 6.9 mW (Burst Power)                          |
| Antenna Connector :                 | None                                          |
| Number of Antennas :                | 1                                             |
| Antenna Diversity Supported :       | No                                            |
| Power Supply :                      | Secondary Battery (3.7V Li-Ion)               |
| Interface :                         | None                                          |

### 1.2 Description of Tested Device

The EUT is a DECT Handheld Microphone (Portable Part) and is an initiating device as described in ANSI C63.17 and is designed to operate together with a DECT Receiver (Fixed Part), which is the responding device.

The EUT has already been certified, this report is an update to verify a change in the access protocol. The only change is that maximum transmit time on same frequency and time window has been changed to 7.5 hours.

### 1.3 Test Environment

|                      |                              |
|----------------------|------------------------------|
| Temperature:         | 20.5 – 21.9 °C               |
| Relative humidity:   | 32 – 42 %                    |
| Normal test voltage: | 3.7 V DC (Secondary Battery) |

All tests were performed with a fully charged battery.  
The values are the limit registered during the test period.

### 1.4 Test Engineer(s)

Frode Sveinsen

### 1.5 Test Equipment

See list of test equipment in clause 6.

### 1.6 Other Comments

The Monitoring and Time and Spectrum Window Access tests were performed with Test Set-Up 6 (Ref. clause 5). A clock signal from the companion device was used to synchronize the Pulse Pattern Generator and the Spectrum Analyzer to the start of the DECT time window. The EUT was limited by administrative commands to operate on only two frequency carriers. For the tests where the EUT was required to operate on only one frequency carrier, one carrier was blocked by applying a CW interfering signal from RF Generator 3.

Since the EUT was programmed to operate on only two RF carriers, it was only necessary with two RF generators for the monitoring tests, however a third generator was applied for the tests that required specific time slots to be blocked.

The test was performed in conducted mode with a temporary antenna connector.

## 2 TEST REPORT SUMMARY

### 2.1 General

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 15D for Isochronous UPCS Devices and Industry Canada RSS-213 Issue 3 / RSS-GEN Issue 4 / RSP-100 Issue 10.

All tests were conducted in accordance with ANSI C63.4-2014 and ANSI C63.17-2013.

A description of the test facility is on file with the FCC and Industry Canada.

- |                                                                |                                                     |
|----------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> New Submission                        | <input checked="" type="checkbox"/> Production Unit |
| <input checked="" type="checkbox"/> Class II Permissive Change | <input type="checkbox"/> Pre-production Unit        |
| <b>PUF</b> Equipment Code                                      | <input type="checkbox"/> Family Listing             |

### 2.2 Test Summary

| Name of test          | FCC CFR 47<br>Paragraph # | IC RSS-213<br>Paragraph # | Verdict  |
|-----------------------|---------------------------|---------------------------|----------|
| Transmission duration | 15.323(c)(3)              | 4.3.4(b)                  | Complies |



#### THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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### 3 TEST RESULTS

#### 3.1 Acknowledgements and Transmission Duration

**Measurement Procedure:**

Transmission Duration: ANSI C63.17, clause 8.2.2

The **Transmission Duration** test is performed by monitoring the slot in use and measuring the time until the EUT changes to a different slot.

**Test Results:**

**Transmission Duration**

| Test ref. to ANSI C63.17 clause 8.2.2                      | Observation   | Verdict |
|------------------------------------------------------------|---------------|---------|
| b) Transmission duration on same time and frequency window | 7:29:59 hours | Pass    |

Comment: The EUT stops transmitting after 7 hours 29 minutes and 59 seconds.

**Limits, FCC 15.323(c)(3) and (4)**

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.

## 4 Measurement Uncertainty

| Measurement Uncertainty Values                   |           |                |
|--------------------------------------------------|-----------|----------------|
| Test Item                                        |           | Uncertainty    |
| Output Power                                     |           | ±0.5 dB        |
| Power Spectral Density                           |           | ±0.5 dB        |
| Out of Band Emissions, Conducted (RBW < 100 kHz) | < 3.6 GHz | ±0.6 dB        |
|                                                  | > 3.6 GHz | ±0.9 dB        |
| Spurious Emissions, Radiated                     | < 1 GHz   | ±2.5 dB        |
|                                                  | > 1 GHz   | ±2.2 dB        |
| Emission Bandwidth                               |           | ±4 %           |
| Power Line Conducted Emissions                   |           | +2.9 / -4.1 dB |
| Spectrum Mask Measurements                       | Frequency | ±5 %           |
|                                                  | Amplitude | ±1.0 dB        |
| Frequency Error                                  |           | ±0.6 ppm       |
| Timing and Jitter Measurements                   |           | ±2.0 ns        |
| Frame Timing Measurements                        |           | ±1.4 ppm       |
| Receiver Blocking Levels                         |           | ±1.0 dB        |
| Temperature Uncertainty                          |           | ±1 °C          |

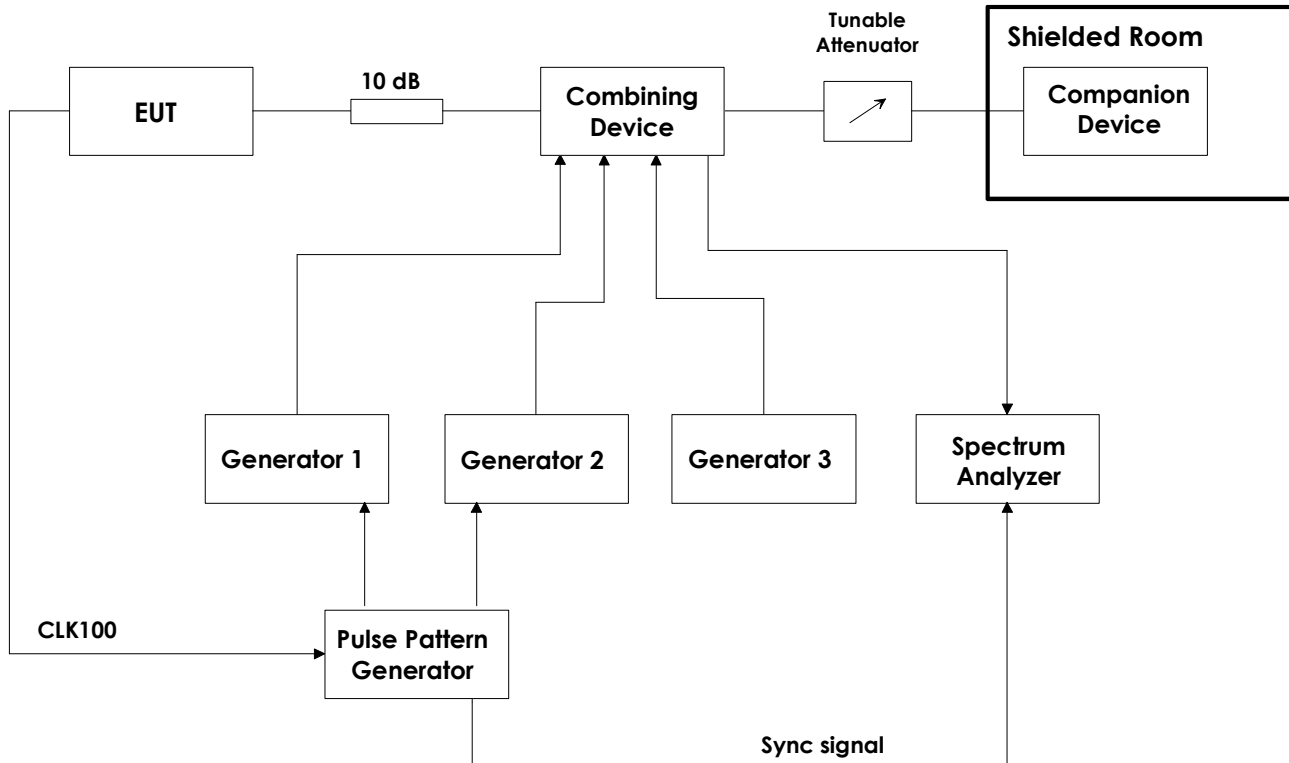
All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

## Revision history

| Version | Date       | Comment                | Sign |
|---------|------------|------------------------|------|
| 1.0     | 2015.12.08 | Version for TCB review | FS   |
|         |            |                        |      |

## 5 Test Setups

### 5.1 Monitoring Tests



Test equipment: 1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 19, 23, 24, 25, 26

#### Test Set-Up 6

This test setup is used for all Monitoring and Time and Spectrum Access Procedure tests. The path loss from the signal generators to the EUT is measured with a power meter before the testing is started.

The CLK100 is used to synchronize the Pulse-/ Pattern generator to the start of the DECT frame, this signal always comes from the base station. If the EUT is a DECT Portable Part (i.e. a handset) the CLK100 signal will come from the Companion Device.

The sync signal to the Spectrum Analyzer is the CLK100 signal that is regenerated in the Pulse-/ Pattern Generator, this is used to synchronize the Spectrum Analyzer to the DECT frame when in zero span. The Pulse-/ Pattern Generator is used for tests that require time synchronized pulses or blocking of specific time slots.

## 6 Test Equipment Used

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 Testhouse.

| No. | Model number | Description               | Manufacturer    | Ref. no. | Cal. date  | Cal. Due   |
|-----|--------------|---------------------------|-----------------|----------|------------|------------|
| 1   | FSP30        | Spectrum Analyzer         | Rohde & Schwarz | LR 1551  | 2015.04.27 | 2017.04.27 |
| 2   | SME03        | Signal generator          | Rohde & Schwarz | LR 1238  | 2015.05    | 2017.05    |
| 3   | SMIQ03B      | Signal generator          | Rohde & Schwarz | LR 1516  | 2015.05    | 2017.05    |
| 4   | SMHU52       | Signal generator          | Rohde & Schwarz | LR 1240  | Cal b4 use |            |
| 6   | 81104A       | Pulse-/ Pattern Generator | Agilent         | LR 1502  | 2015.05    | 2016.05    |
| 9   | 6810.17A     | Attenuator                | Suhner          | LR 1187  | Cal b4 use |            |
| 10  | 745-69       | Step Attenuator           | Narda           | LR 1442  | N/A        |            |
| 11  | WE 1506A     | Power Splitter            | Weinchel        | LR 244   | Cal b4 use |            |
| 12  | WE 1506A     | Power Splitter            | Weinchel        | LR 245   | Cal b4 use |            |
| 13  | H-9          | Hybrid                    | Anzac           | LR 86    | Cal b4 use |            |
| 14  | H-9          | Hybrid                    | Anzac           | LR 257   | Cal b4 use |            |
| 18  | 6812B        | AC Power Source           | Agilent         | LR 1515  | Cal b4 use |            |
| 19  | Model 87 V   | Multimeter                | Fluke           | N-4672   | 2015.10    | 2016.10    |
| 23  | NRP-Z81      | Wideband Power Sensor     | Rohde & Schwarz | LR 1644  | 2015.11.03 | 2016.11.03 |