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# TEST REPORT

**Report Number: 17060844HKG-001**

Application for Original Grant of 47 CFR Part 15 Certification

**FCC ID: EW780-0146-00**

| PREPARED AND CHECKED BY: | APPROVED BY: |
|---|---|
| Signed On File<br>Yao Xin Lu, Josie<br>Engineer | Digitally signed by Jess Tang<br>Location: Intertek Testing Services Hong Kong Ltd.<br>Tang Kwan Mo, Jess<br>Lead Engineer<br>Date: July 10, 2017 |

**TEST REPORT**

## GENERAL INFORMATION

| | |
|---|---|
| **Applicant Name:** | VTech Telecommunications Ltd. |
| **Applicant Address:** | 23/F., Tai Ping Industrial Centre, Block 1,<br>57 Ting Kok Road, Tai Po,<br>Hong Kong. |
| **FCC Specification Standard:** | FCC Part 15, October 1, 2015 Edition |
| **FCC ID:** | EW780-0146-00 |
| **FCC Model(s):** | VM342-2 BU A<br>VM342 BU A, VM3x2-ab BU A, VM300 BU A, VM3x0-ab BU A |
| **Type of EUT:** | Spread Spectrum Transmitter |
| **Description of EUT:** | Baby Monitor - Baby Unit |
| **Serial Number:** | N/A |
| **Sample Receipt Date:** | June 13, 2017 |
| **Date of Test:** | June 21, 2017 to June 29, 2017 |
| **Report Date:** | July 10, 2017 |
| **Environmental Conditions:** | Temperature: +10 to 40°C<br>Humidity: 10 to 90% |

**TEST REPORT**

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**TEST REPORT**

# EXHIBIT 1 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

## 1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

### 1.1 Summary of Test Results

| TEST ITEMS | FCC PART 15 SECTION | RESULTS | DETAILS SEE SECTION |
|---|---|---|---|
| Antenna Requirement | 15.203 | Pass | 2.1 |
| Max. Conducted Output Power | 15.247(b)(1) & (4) | Pass | 4.1 |
| Max. 20dB RF Bandwidth | N/A | N/A | 4.2 |
| Min. No. of Hopping Frequencies | 15.247(a)(1)(iii) | Pass | 4.3 |
| Min. Hopping Channel Carrier Frequency Separation | 15.247(a)(1) | Pass | 4.4 |
| Average Time of Occupancy | 15.247(a)(1)(iii) | Pass | 4.5 |
| Out of Band Antenna Conducted Emission | 15.247(d) | Pass | 4.6 |
| Radiated Emission in Restricted Bands and Spurious Emissions | 15.247(d) & 15.209 & 15.109 | Pass | 4.8 |
| AC Power Line Conducted Emission | 15.207 & 15.107 | Pass | 4.9 |

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

### 1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2015 Edition

**TEST REPORT**

# EXHIBIT 2 GENERAL DESCRIPTION

## 2.0 GENERAL DESCRIPTION

### 2.1 Product Description

The VM342-2 BU A is a Baby Monitor - Baby Unit.
The Equipment Under Test (EUT) operates at frequency range of 2405MHz to 2475MHz. There are totally 32 non-overlapping channels and 17 active channels out of the 32 channels. The EUT is powered by a 100-240VAC, 50/60Hz, 200mA to 6VDC 600mA and/or 100-240VAC, 50/60Hz, 200mAto 6VDC 600mA adaptor.

The antenna used in the EUT is integral, and the test sample is a prototype.

The Model(s): VM342 BU A, VM3x2-ab BU A, VM300 BU A, VM3x0-ab BU A are the same as the Model: VM342-2 BU A in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color and model number to be sold for marketing purpose. Suffix (a, b, x) indicates different type packaging, number of baby unit and blank or color of enclosure.

The circuit description and frequency hopping algorithm are attached in the Appendix and saved with filename: descri.pdf.

### 2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in radiated emission test sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. Antenna port conducted measurements were performed according to ANSI C63.10 (2013). All other measurements were made in accordance with the procedures in 47 CFR Part 2.

### 2.3 Test Facility

The radiated emission test site, AC power line conducted measurement facility and antenna port conducted measurement facility used to collect the radiated data, AC Power Line conducted data, and conductive data are at Intertek Testing Services Hong Kong Ltd., which is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been fully placed on file with FCC.

**TEST REPORT**

# EXHIBIT 3 SYSTEM TEST CONFIGURATION

## 3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit / receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by a 100-240VAC, 50/60Hz, 200mA to 6VDC 600mA and/or 100-240VAC, 50/60Hz, 200mAto 6VDC 600mA adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable at 0.8m height from the ground plane for emission testing at or below 1GHz and 1.5m for emission measurements above 1GHz. If the baby unit attached to peripherals, they were connected and operational (as typical as possible). The parent unit was remotely located as far from the antenna and the baby as possible to ensure full power transmission from the parent unit. Else, the baby unit was wired to transmit full power with modulation.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

Radiated emission measurement for transmitter were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

**TEST REPORT**

## 3.1 Justification - Cont'd

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209. Digital circuitry used to control additional functions other than the operation of the transmitter is subject to FCC Part Section 15.109 Limits.

Detector function for radiated emissions was in peak mode. Average readings, when required, were taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.3.4.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was referred to Exhibit 4.3.4. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All relevant operation modes have been tested, and the worst case data is included in this report.

## 3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

**TEST REPORT**

3.3 Details of EUT and Description of Accessories

*Details of EUT:*

An AC adaptor and/or a battery (provided with the unit) was used to power the device. Their description are listed below.

(1) An AC adaptor (100-240VAC 50/60Hz 200mA to 6VDC 600mA, Model: SSA-5WVI-09US060060, Brand: Sunstrong) (Provided by Client)
(2) An AC adaptor (100-240VAC 50/60Hz 200mA to 6VDC 600mA, Model: S006AKU0600060, Brand: Ten Pao) (Provided by Client)

*Description of Accessories:*

(1) Parent Unit, Model: VM342-2 PU A, FCC ID: EW780-0146-01 (Provided by Client)
(2) Wide Angle Lens (Provided by Client)

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test at a level of confidence of 95% has been considered. The values of the Measurement uncertainty for radiated emission test and RF conducted measurement test are ± 5.3dB and ±0.99dB respectively. The value of the Measurement uncertainty for conducted emission test is ±4.2dB.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

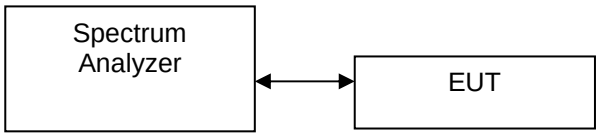
**TEST REPORT**

# EXHIBIT 4 TEST RESULTS

## 4.0 TEST RESULTS

RF Conducted measurement Test Setup by a Spectrum Analyzer.

The figure below shows the test setup, which is utilized to make these measurements.




4.1 Maximum Conducted (peak) Output Power at Antenna Terminals

☐ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

☒ The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW>20dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyzer.

(Baby Unit) Antenna Gain = 0 dBi

| Frequency (MHz) | Output in dBm | Output in mWatt |
|---|---|---|
| Low Channel: 2405 | 16.50 | 44.668 |
| Middle Channel: 2441 | 16.32 | 42.855 |
| High Channel: 2475 | 15.89 | 38.815 |

Cable loss : 0.5 dB External Attenuation : 0 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

dBm max. output level = 16.50 dBm

Limits:
☒ 0.125W (21dBm) for antennas with gains of 6dBi or less

☐ 0.25W (24dBm) for antennas with gains of 6dBi or less

☐ 1W (30dBm) for antennas with gains of 6dBi or less

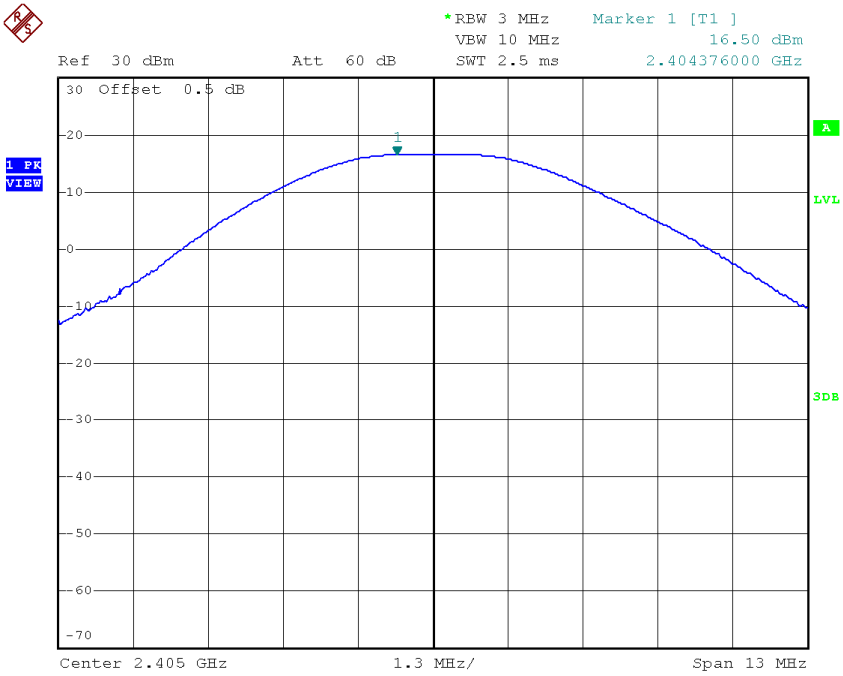
☐ ___W (___dBm) for antennas with gains more than 6dBi

The plots of conducted output power are saved as below.

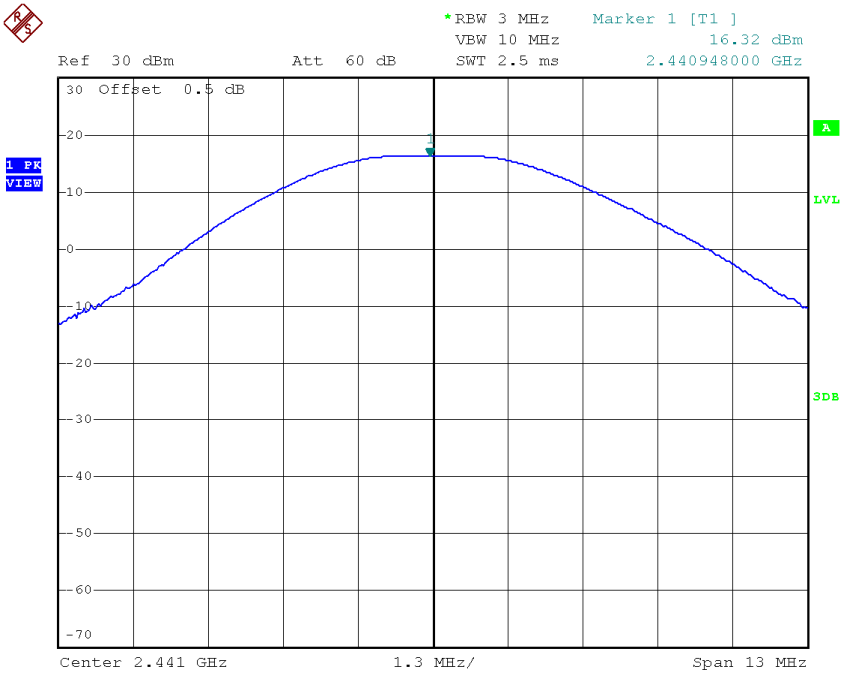
**TEST REPORT**

## PLOTS OF CONDUCTED OUTPUT POWER

Lowest Channel



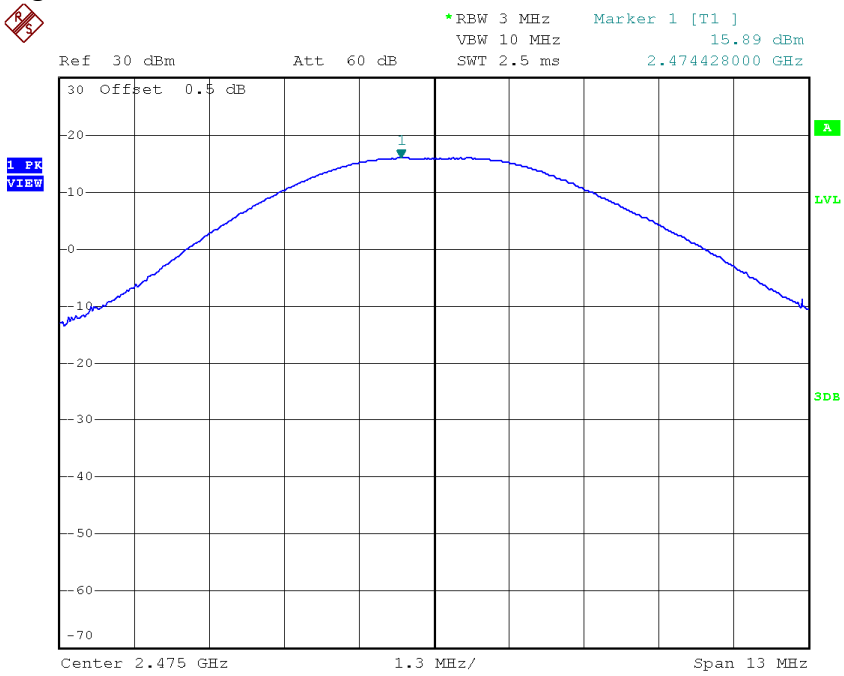

Middle Channel



## TEST REPORT

# PLOTS OF CONDUCTED OUTPUT POWER

Highest Channel



## 4.2 Maximum 20 dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.

Baby Unit

| Frequency (MHz) | 20 dB Bandwidth (kHz) |
|---|---|
| Low Channel: 2405 | 2448 |
| Middle Channel: 2441 | 2496 |
| High Channel: 2475 | 2448 |

Limits

☐ ≤500kHz for 902-928MHz

☒ N/A for 2400-2483.5MHz

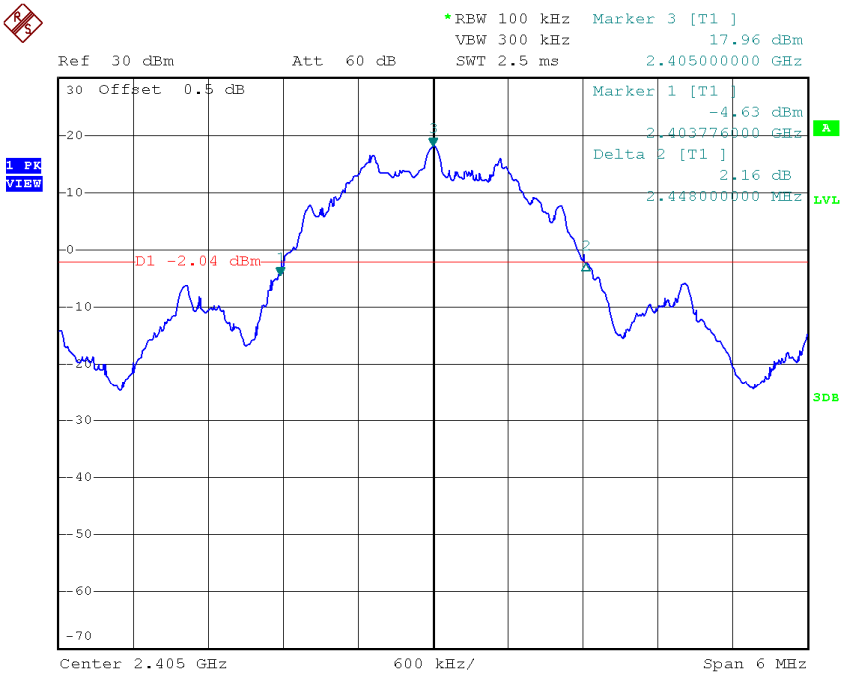
☐ ≤1MHz for 5725-5850MHz

The plots of 20dB RF bandwidth are saved as below.

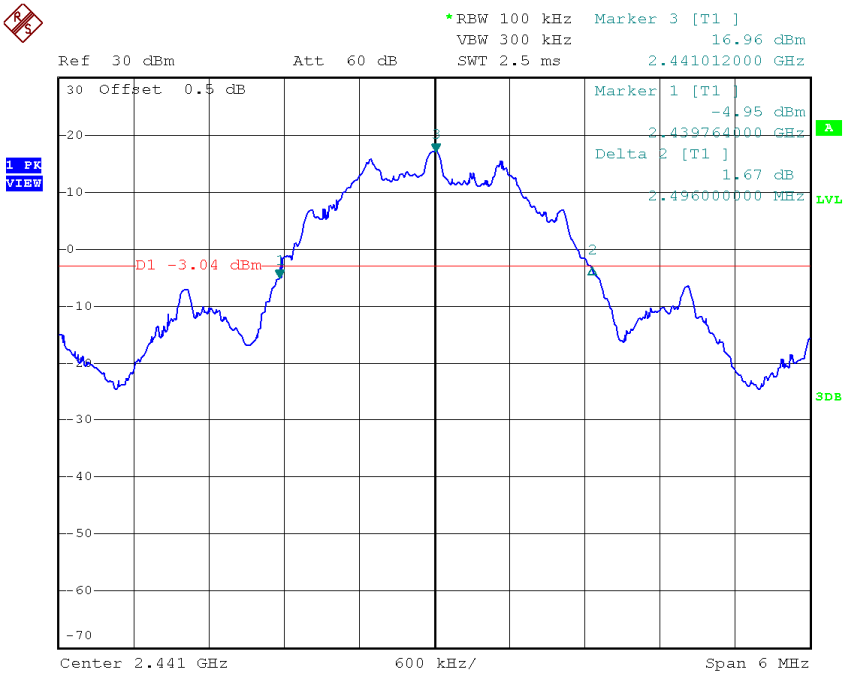
**TEST REPORT**

# PLOTS OF 20dB RF BANDWIDTH

## Lowest Channel



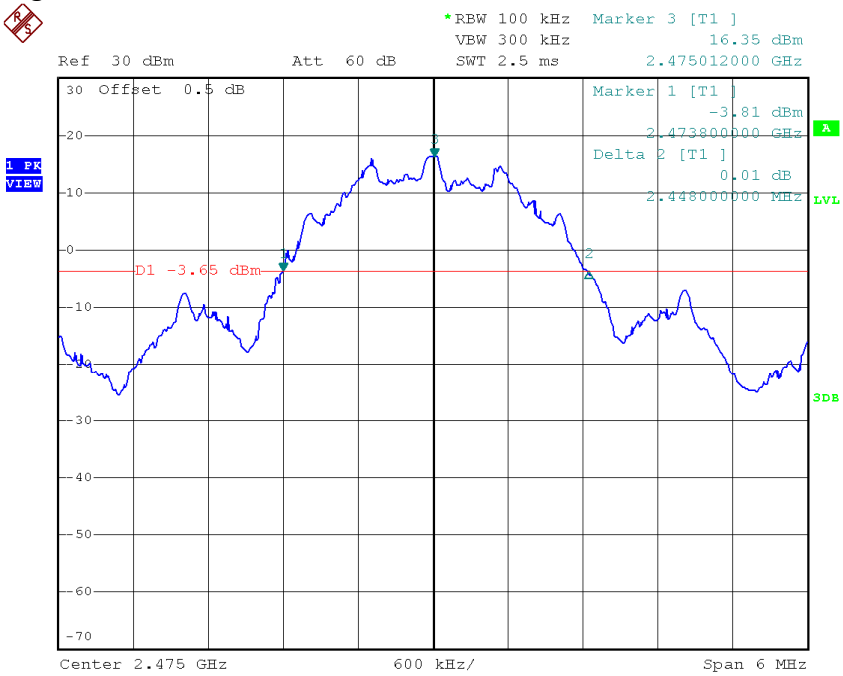

## Middle Channel



## TEST REPORT

# PLOTS OF 20dB RF BANDWIDTH

Highest Channel



**TEST REPORT**

## 4.3 Minimum Number of Hopping Frequencies

With the analyzer set to MAX HOLD readings were taken for 2-3 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

| | Baby Unit |
|---|---|
| No. of hopping channels | 17 |

Minimum Requirements:

☐ at least 50 hopping channels for 902MHz-928MHz (20 dB bandwidth of hopping channel < 250kHz)

☐ at least 25 hopping channels for 902MHz-928MHz (20 dB bandwidth of hopping channel ≥ 250kHz)

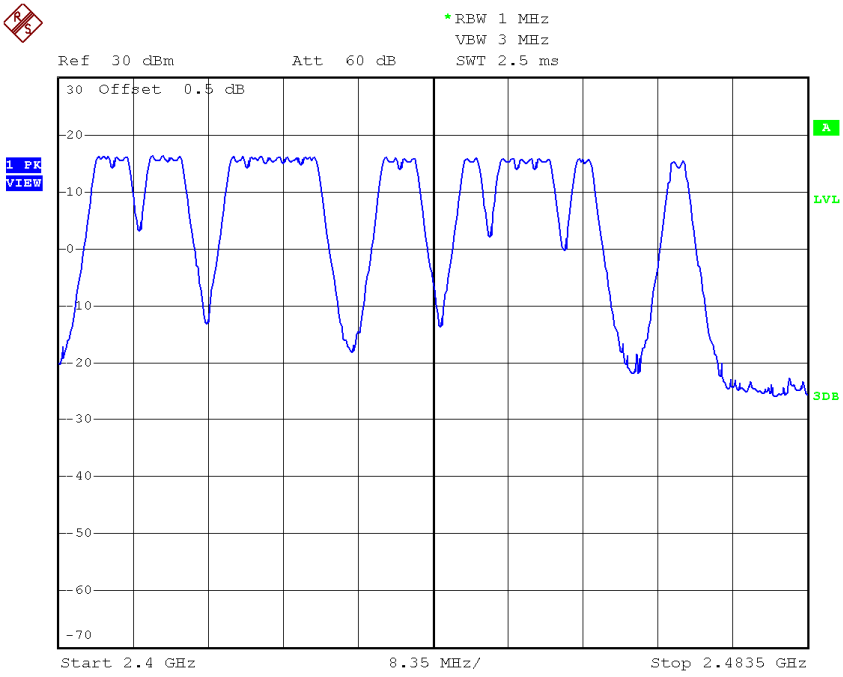
☒ at least 15 hopping channels for 2400MHz-2483.5MHz.

☐ at least 75 hopping channels for 5725MHz-5850MHz.

The plots of number of hopping frequencies are saved as below.

## TEST REPORT

# PLOTS OF NUMBER OF HOPPING FREQUENCIES



**TEST REPORT**

## 4.4 Minimum Hopping Channel Carrier Frequency Separation

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and met the requirement.

| | Baby Unit |
|---|---|
| Channel Separation (Channel 1 and Channel 2) | 2040 |

Limits:
The channel separation must be larger than:

☐ 25 kHz

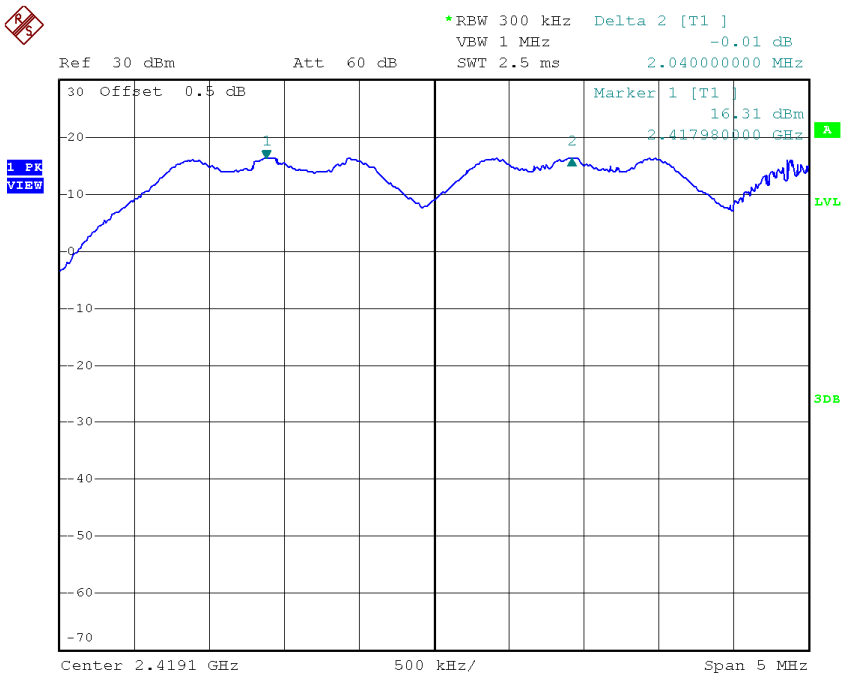
☐ 20 dB bandwidth of hopping channel: ___Hz

☒ 2/3 of 20dB bandwidth of hopping channel: 1664 kHz

The plot(s) of hopping channel carrier frequency separation is saved as below.

## TEST REPORT

# PLOTS OF HOPPING CHANNEL CARRIER FREQUENCY SEPARATION



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## 4.5 Average Channel Occupancy Time

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 1ms, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation (20 seconds for 902-928 MHz devices, if the 20dB bandwidth is less than 250kHz, 10 seconds for 902-928 MHz if the 20dB bandwidth is or greater than 250kHz, "0.4 seconds x Number of hopping channels employed" seconds for 2400-2483.5 MHz, 30 seconds for 5725-5850 MHz). The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4 seconds).

| Baby Unit (worst-case: 1 parent unit operation) | |
|---|---|
| Average Occupancy Time<br>(Traffic – in a clear RF environment) = | 1.105ms x 7 x 7 x 6.8 = 368.186ms |

Limits:
Average 0.4 seconds maximum occupancy in:

☒ 6.8 seconds (0.4 sec. x 17) for 2400MHz-2483.5MHz
(Traffic – in a clear RF environment)

☐ 20 seconds for 902MHz-928MHz ≥ 50 hopping channels

☐ 10 seconds for 902MHz-928MHz ≥ 25 hopping channels

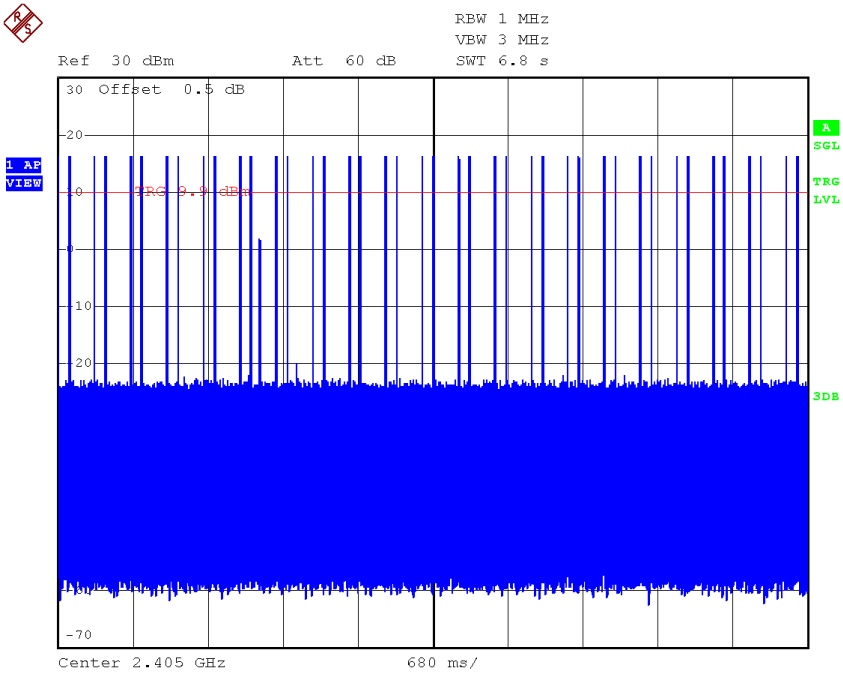
☐ 30 seconds for 5725-5850MHz

The plots of average channel occupancy time are saved as below.

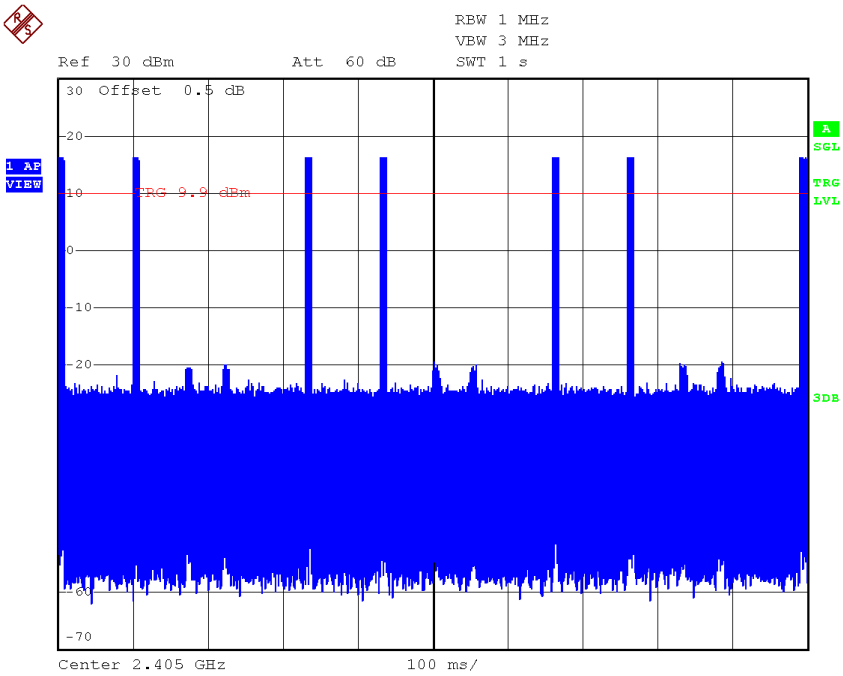
## TEST REPORT

# PLOTS AVERAGE CHANNEL OCCUPANCY TIME

Plot A



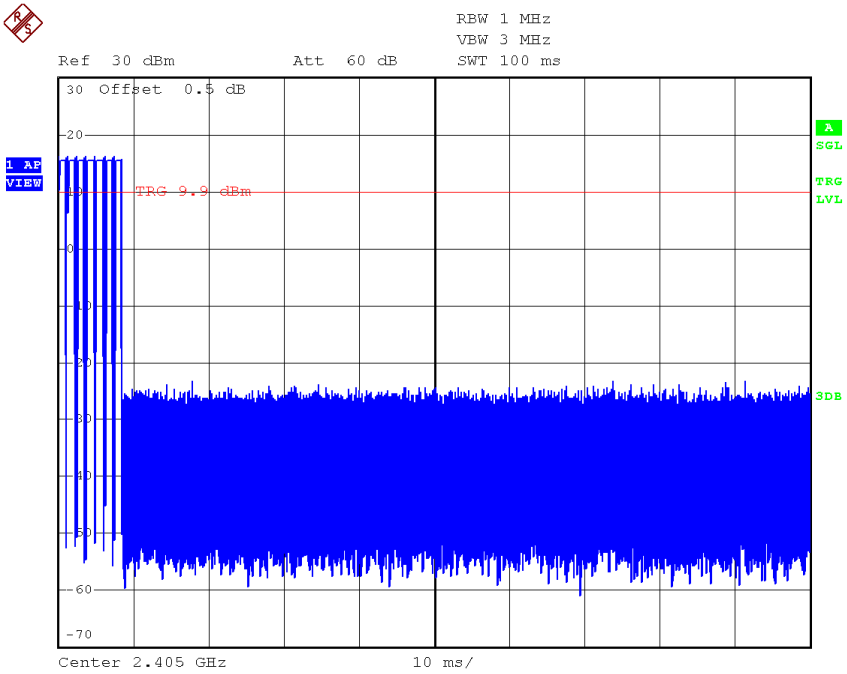

Plot B



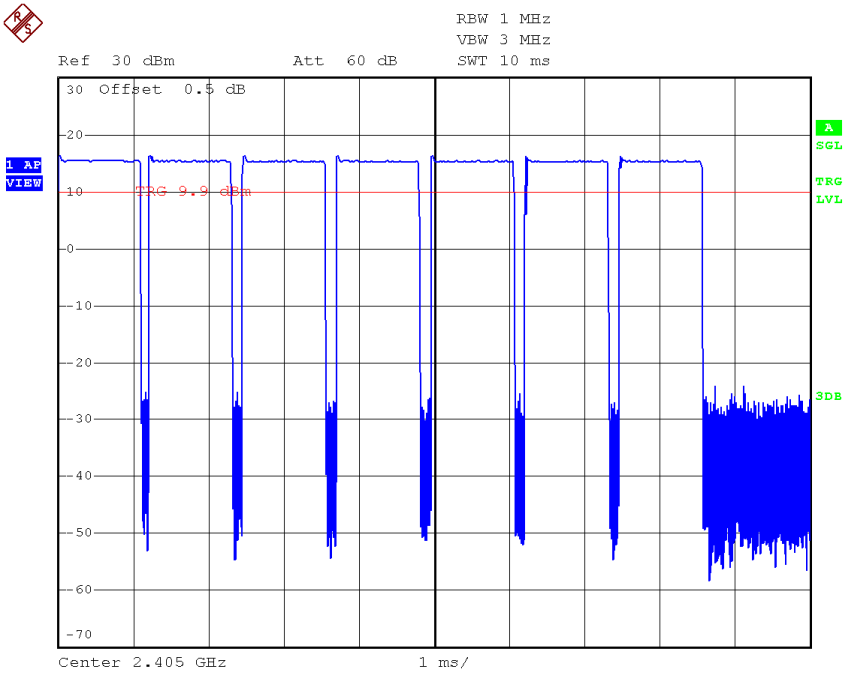
## TEST REPORT

# PLOTS AVERAGE CHANNEL OCCUPANCY TIME

Plot C



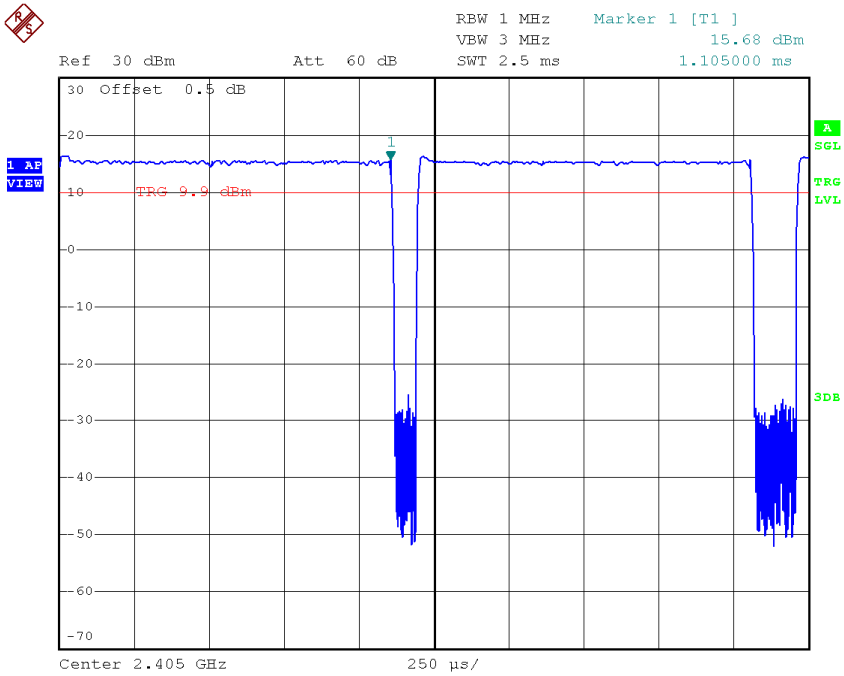

Plot D



## TEST REPORT

# PLOTS AVERAGE CHANNEL OCCUPANCY TIME

Plot E



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## 4.6 Out of Band Conducted Emissions

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

The plot(s) of bandedge compliance is shown the worst-case which has been already considered between enable and disable the hopping function of the EUT.

Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

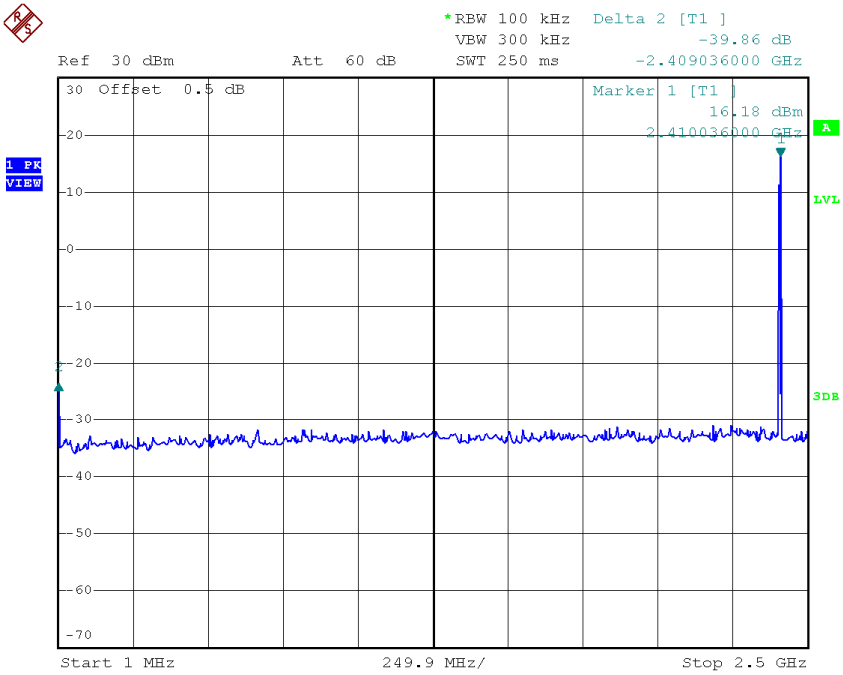
Limits:
All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The plots of out of band conducted emissions are saved as below.

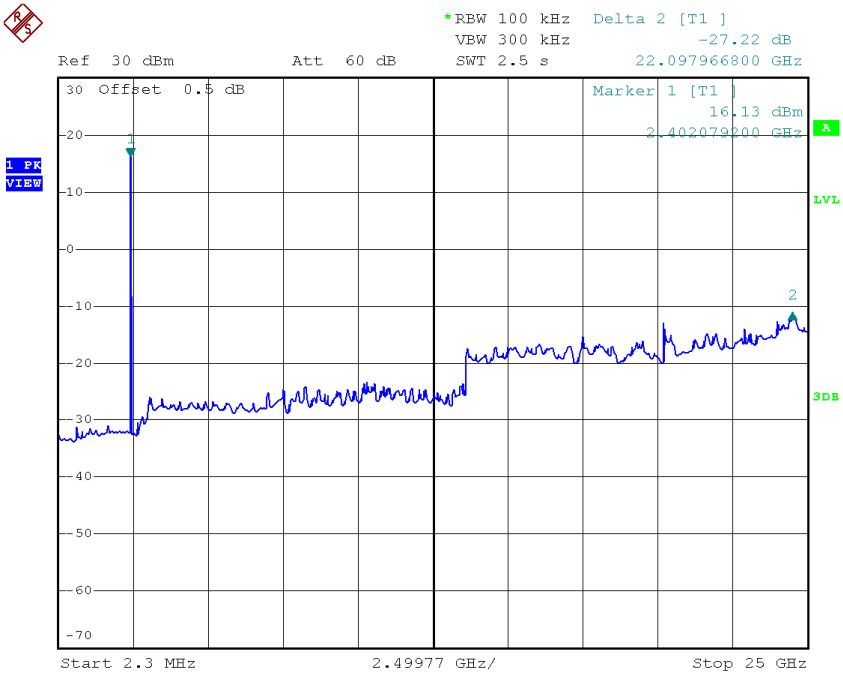
## TEST REPORT

# PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Lowest Channel, Plot 1



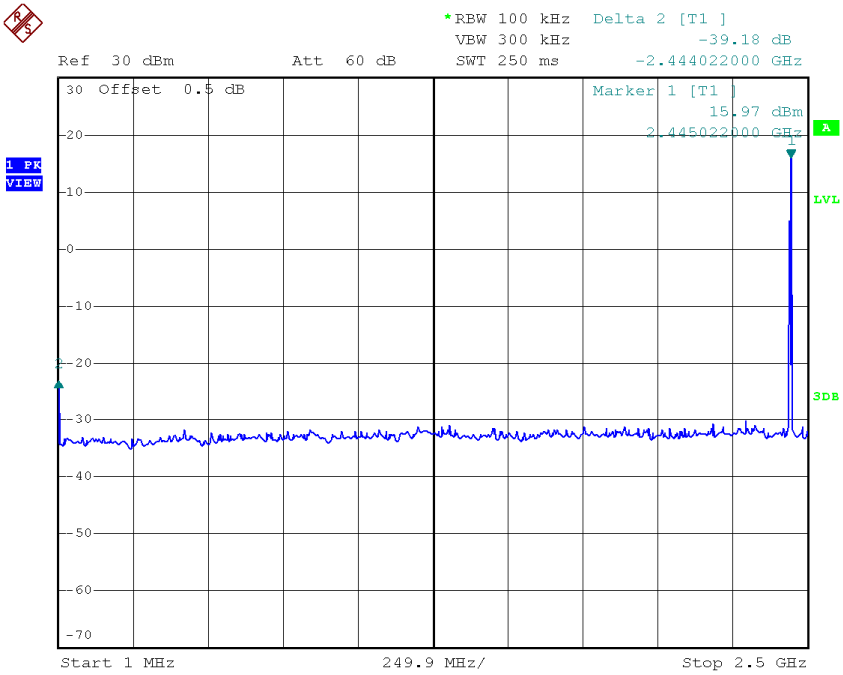

Lowest Channel, Plot 2



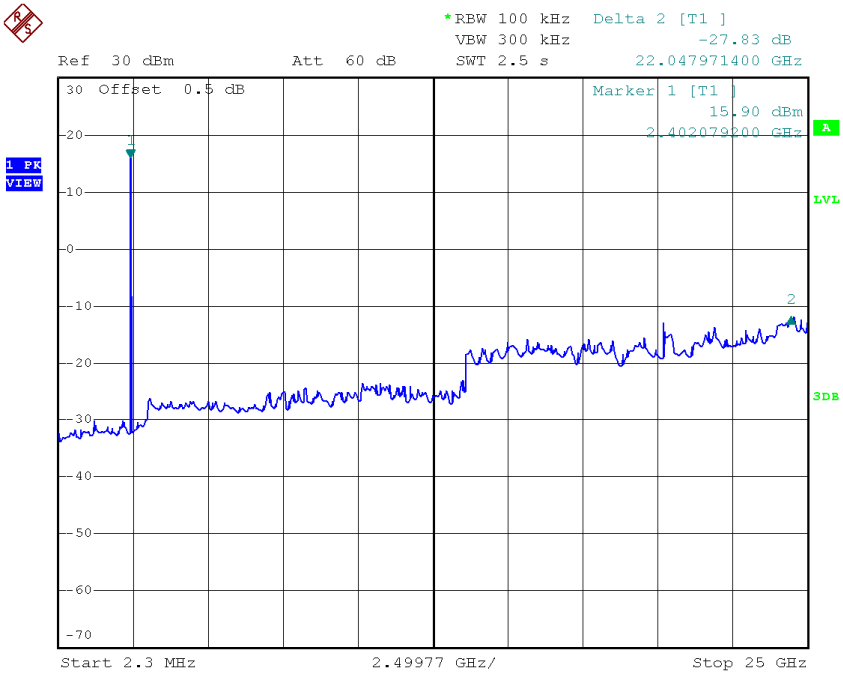
**TEST REPORT**

## PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Middle Channel, Plot 1



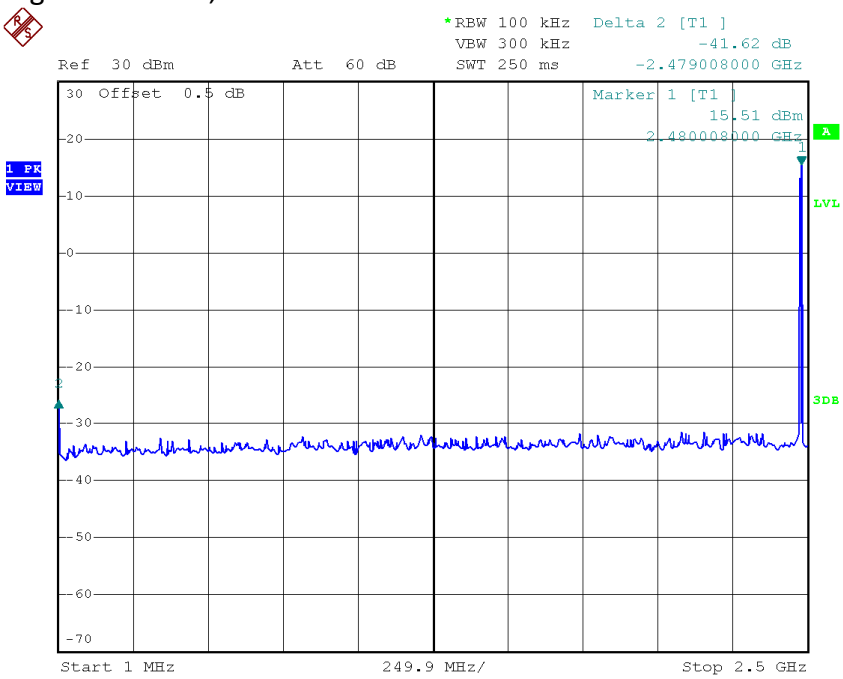

Middle Channel, Plot 2



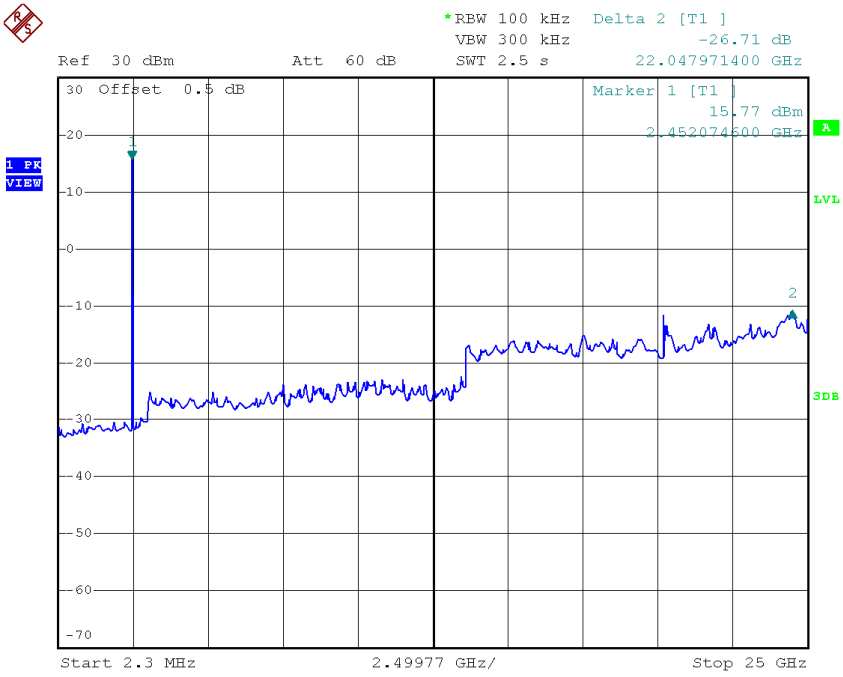
**TEST REPORT**

# PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Highest Channel, Plot 1



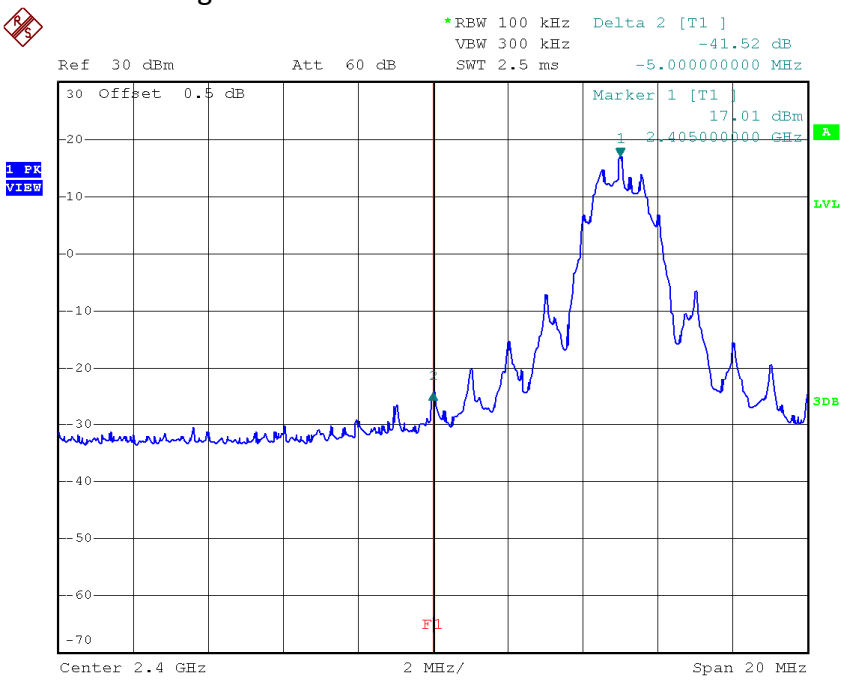

Highest Channel, Plot 2



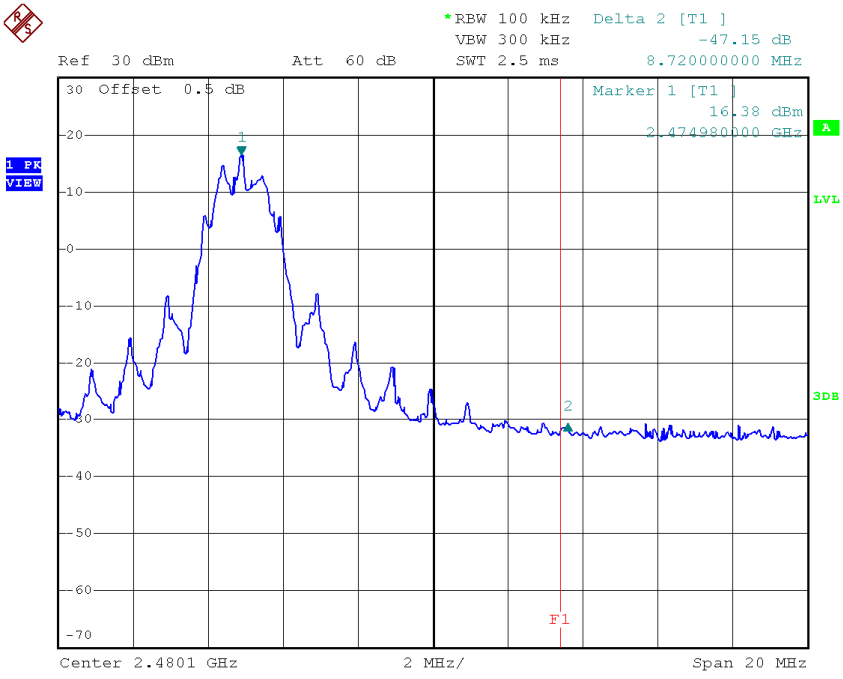
**TEST REPORT**

# PLOTS OF BANDEDGE

## Lowest Bandedge




## Highest Bandedge



## 4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflects the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD +AV

Example

Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 +1.6 -29 +0 + (-10) = 32 dBµV/m

Level in µV/m = Common Antilogarithm [(32 dBµV/m)/20] = 39.8 µV/m

**TEST REPORT**

## 4.8 Transmitter Radiated Emissions in Restricted Bands and Spurious Emissions

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

**TEST REPORT**

### 4.8.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

Baby Unit: 215.994 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

### 4.8.2 Radiated Emission Data

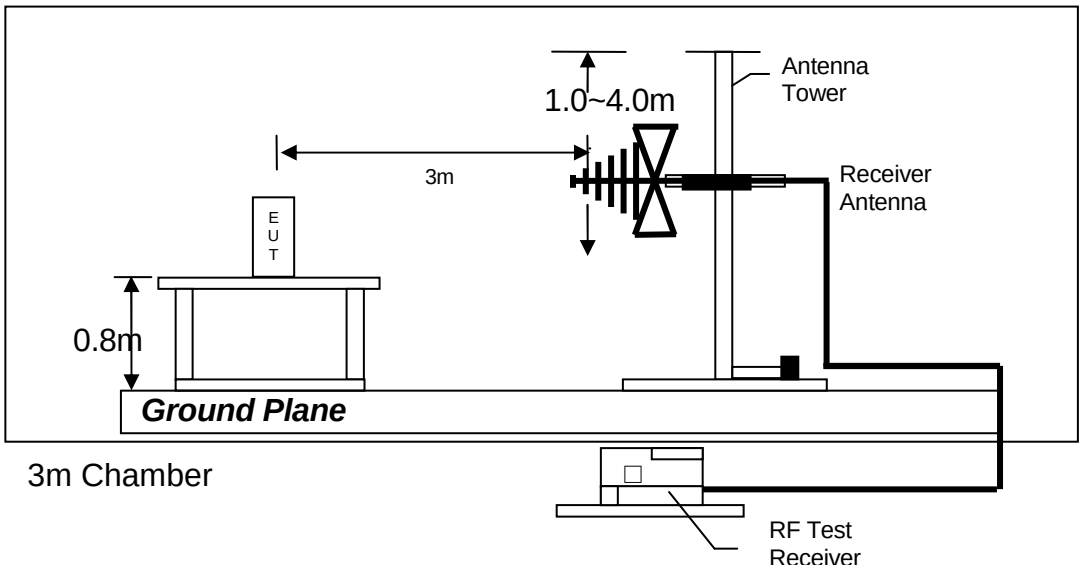
The data in tables 1-8 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

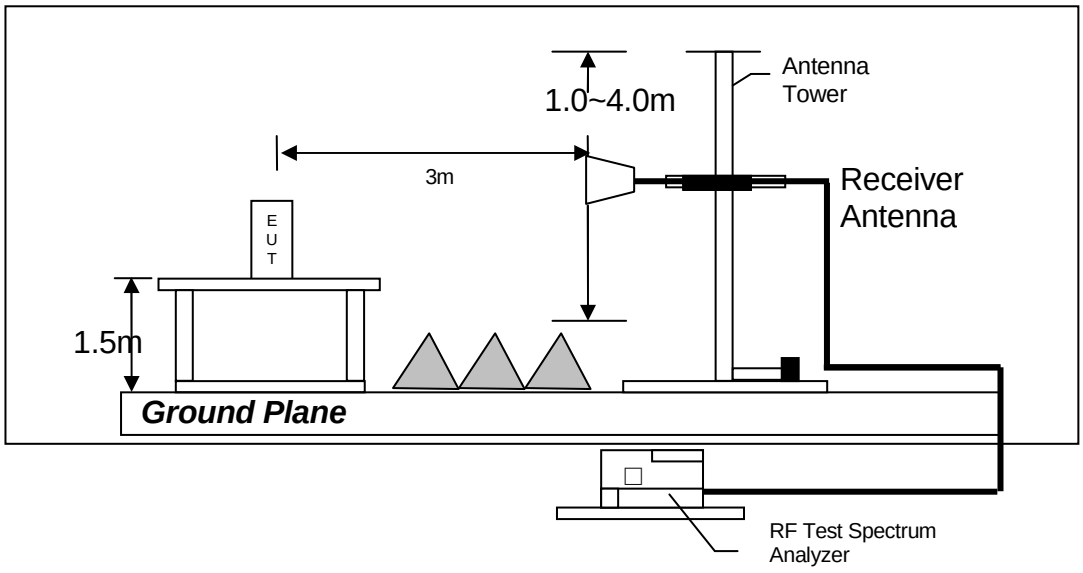
Baby Unit: Passed by 1.0 dB margin compare with peak limit

4.8.3 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.




Test setup of radiated emissions up to 1GHz




Test setup of radiated emissions above 1GHz

**TEST REPORT**

## RADIATED EMISSION DATA

Mode: TX-Channel 1 (Sunstrong Adaptor)

Table 1, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1195.825*** | ***55.7*** | ***33*** | ***26.1*** | ***48.8*** | ***22.23*** | ***26.6*** | ***54.0*** | ***-27.4*** |
| ***H*** | ***2390.000*** | ***58.4*** | ***33*** | ***29.4*** | ***54.8*** | ***22.23*** | ***32.6*** | ***54.0*** | ***-21.4*** |
| ***H*** | ***4810.000*** | ***51.9*** | ***33*** | ***34.9*** | ***53.8*** | ***22.23*** | ***31.6*** | ***54.0*** | ***-22.4*** |
| ***H*** | ***12025.000*** | ***43.9*** | ***33*** | ***40.5*** | ***51.4*** | ***22.23*** | ***29.2*** | ***54.0*** | ***-24.8*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1195.825*** | ***55.7*** | ***33*** | ***26.1*** | ***48.8*** | ***74.0*** | ***-25.2*** |
| ***H*** | ***2390.000*** | ***58.4*** | ***33*** | ***29.4*** | ***54.8*** | ***74.0*** | ***-19.2*** |
| ***H*** | ***4810.000*** | ***51.9*** | ***33*** | ***34.9*** | ***53.8*** | ***74.0*** | ***-20.2*** |
| ***H*** | ***12025.000*** | ***43.9*** | ***33*** | ***40.5*** | ***51.4*** | ***74.0*** | ***-22.6*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: TX-Channel 18 (Sunstrong Adaptor)

Table 2, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1196.443*** | ***54.0*** | ***33*** | ***26.1*** | ***47.1*** | ***22.23*** | ***24.9*** | ***54.0*** | ***-29.1*** |
| ***H*** | ***4882.000*** | ***51.5*** | ***33*** | ***34.9*** | ***53.4*** | ***22.23*** | ***31.2*** | ***54.0*** | ***-22.8*** |
| ***H*** | ***7323.000*** | ***39.2*** | ***33*** | ***37.9*** | ***44.1*** | ***22.23*** | ***21.9*** | ***54.0*** | ***-32.1*** |
| ***H*** | ***12205.000*** | ***43.7*** | ***33*** | ***40.5*** | ***51.2*** | ***22.23*** | ***29.0*** | ***54.0*** | ***-25.0*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1196.443*** | ***54.0*** | ***33*** | ***26.1*** | ***47.1*** | ***74.0*** | ***-26.9*** |
| ***H*** | ***4882.000*** | ***51.5*** | ***33*** | ***34.9*** | ***53.4*** | ***74.0*** | ***-20.6*** |
| ***H*** | ***7323.000*** | ***39.2*** | ***33*** | ***37.9*** | ***44.1*** | ***74.0*** | ***-29.9*** |
| ***H*** | ***12205.000*** | ***43.7*** | ***33*** | ***40.5*** | ***51.2*** | ***74.0*** | ***-22.8*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: TX-Channel 32 (Sunstrong Adaptor)

Table 3, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1198.100*** | ***55.1*** | ***33*** | ***26.1*** | ***48.2*** | ***22.23*** | ***26.0*** | ***54.0*** | ***-28.0*** |
| ***H*** | ***2483.500*** | ***64.8*** | ***33*** | ***29.4*** | ***61.2*** | ***22.23*** | ***39.0*** | ***54.0*** | ***-15.0*** |
| ***H*** | ***4950.000*** | ***51.7*** | ***33*** | ***34.9*** | ***53.6*** | ***22.23*** | ***31.4*** | ***54.0*** | ***-22.6*** |
| ***H*** | ***7425.000*** | ***39.6*** | ***33*** | ***37.9*** | ***44.5*** | ***22.23*** | ***22.3*** | ***54.0*** | ***-31.7*** |
| ***H*** | ***12375.000*** | ***43.8*** | ***33*** | ***40.5*** | ***51.3*** | ***22.23*** | ***29.1*** | ***54.0*** | ***-24.9*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1198.100*** | ***55.1*** | ***33*** | ***26.1*** | ***48.2*** | ***74.0*** | ***-25.8*** |
| ***H*** | ***2483.500*** | ***64.8*** | ***33*** | ***29.4*** | ***61.2*** | ***74.0*** | ***-12.8*** |
| ***H*** | ***4950.000*** | ***51.7*** | ***33*** | ***34.9*** | ***53.6*** | ***74.0*** | ***-20.4*** |
| ***H*** | ***7425.000*** | ***39.6*** | ***33*** | ***37.9*** | ***44.5*** | ***74.0*** | ***-29.5*** |
| ***H*** | ***12375.000*** | ***43.8*** | ***33*** | ***40.5*** | ***51.3*** | ***74.0*** | ***-22.7*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: Talkback with Sunstrong Adaptor

Table 4, Baby Unit

| Polarization | Frequency (MHz) | Reading (dBµV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| V | 47.945 | 36.1 | 16 | 11.0 | 31.1 | 40.0 | -8.9 |
| V | 71.952 | 42.5 | 16 | 7.0 | 33.5 | 40.0 | -6.5 |
| ***V*** | ***119.967*** | ***41.1*** | ***16*** | ***14.0*** | ***39.1*** | ***43.5*** | ***-4.4*** |
| ***V*** | ***167.982*** | ***39.5*** | ***16*** | ***18.0*** | ***41.5*** | ***43.5*** | ***-2.0*** |
| V | 215.997 | 41.4 | 16 | 17.0 | 42.4 | 43.5 | -1.1 |
| H | 288.020 | 36.5 | 16 | 22.0 | 42.5 | 46.0 | -3.5 |
| H | 360.042 | 32.6 | 16 | 24.0 | 40.6 | 46.0 | -5.4 |
| ***V*** | ***408.057*** | ***35.0*** | ***16*** | ***24.0*** | ***43.0*** | ***46.0*** | ***-3.0*** |
| H | 456.072 | 31.4 | 16 | 26.0 | 41.4 | 46.0 | -4.6 |
| V | 576.110 | 32.9 | 16 | 28.0 | 44.9 | 46.0 | -1.1 |
| V | 588.235 | 29.9 | 16 | 29.0 | 42.9 | 46.0 | -3.1 |
| H | 696.147 | 30.8 | 16 | 30.0 | 44.8 | 46.0 | -1.2 |
| V | 888.207 | 23.9 | 16 | 32.0 | 39.9 | 46.0 | -6.1 |
| V | 960.230 | 26.4 | 16 | 33.0 | 43.4 | 54.0 | -10.6 |

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: TX-Channel 1 (TenPao Adaptor)

Table 5, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1195.825*** | ***54.6*** | ***33*** | ***26.1*** | ***47.7*** | ***22.23*** | ***25.5*** | ***54.0*** | ***-28.5*** |
| ***H*** | ***2390.000*** | ***57.8*** | ***33*** | ***29.4*** | ***54.2*** | ***22.23*** | ***32.0*** | ***54.0*** | ***-22.0*** |
| ***H*** | ***4810.000*** | ***51.2*** | ***33*** | ***34.9*** | ***53.1*** | ***22.23*** | ***30.9*** | ***54.0*** | ***-23.1*** |
| ***H*** | ***12025.000*** | ***43.5*** | ***33*** | ***40.5*** | ***51.0*** | ***22.23*** | ***28.8*** | ***54.0*** | ***-25.2*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1195.825*** | ***54.6*** | ***33*** | ***26.1*** | ***47.7*** | ***74.0*** | ***-26.3*** |
| ***H*** | ***2390.000*** | ***57.8*** | ***33*** | ***29.4*** | ***54.2*** | ***74.0*** | ***-19.8*** |
| ***H*** | ***4810.000*** | ***51.2*** | ***33*** | ***34.9*** | ***53.1*** | ***74.0*** | ***-20.9*** |
| ***H*** | ***12025.000*** | ***43.5*** | ***33*** | ***40.5*** | ***51.0*** | ***74.0*** | ***-23.0*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: TX-Channel 18 (TenPao Adaptor)

Table 6, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1196.443*** | ***54.9*** | ***33*** | ***26.1*** | ***48.0*** | ***22.23*** | ***25.8*** | ***54.0*** | ***-28.2*** |
| ***H*** | ***4882.000*** | ***51.6*** | ***33*** | ***34.9*** | ***53.5*** | ***22.23*** | ***31.3*** | ***54.0*** | ***-22.7*** |
| ***H*** | ***7323.000*** | ***40.0*** | ***33*** | ***37.9*** | ***44.9*** | ***22.23*** | ***22.7*** | ***54.0*** | ***-31.3*** |
| ***H*** | ***12205.000*** | ***43.6*** | ***33*** | ***40.5*** | ***51.1*** | ***22.23*** | ***28.9*** | ***54.0*** | ***-25.1*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1196.443*** | ***54.9*** | ***33*** | ***26.1*** | ***48.0*** | ***74.0*** | ***-26.0*** |
| ***H*** | ***4882.000*** | ***51.6*** | ***33*** | ***34.9*** | ***53.5*** | ***74.0*** | ***-20.5*** |
| ***H*** | ***7323.000*** | ***40.0*** | ***33*** | ***37.9*** | ***44.9*** | ***74.0*** | ***-29.1*** |
| ***H*** | ***12205.000*** | ***43.6*** | ***33*** | ***40.5*** | ***51.1*** | ***74.0*** | ***-22.9*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: TX-Channel 32 (TenPao Adaptor)

Table 7, Baby Unit

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Average Factor (dB) | Calculated at 3m (dBµV/m) | Average Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| ***H*** | ***1198.100*** | ***54.2*** | ***33*** | ***26.1*** | ***47.3*** | ***22.23*** | ***25.1*** | ***54.0*** | ***-28.9*** |
| ***H*** | ***2483.500*** | ***64.8*** | ***33*** | ***29.4*** | ***61.2*** | ***22.23*** | ***39.0*** | ***54.0*** | ***-15.0*** |
| ***H*** | ***4950.000*** | ***51.3*** | ***33*** | ***34.9*** | ***53.2*** | ***22.23*** | ***31.0*** | ***54.0*** | ***-23.0*** |
| ***H*** | ***7425.000*** | ***39.5*** | ***33*** | ***37.9*** | ***44.4*** | ***22.23*** | ***22.2*** | ***54.0*** | ***-31.8*** |
| ***H*** | ***12375.000*** | ***44.0*** | ***33*** | ***40.5*** | ***51.5*** | ***22.23*** | ***29.3*** | ***54.0*** | ***-24.7*** |

| Polari-zation | Frequency (MHz) | Reading (dBµV) | Pre-Amp Gain (dB) | Antenna Factor (dB) | Net at 3m - Peak (dBµV/m) | Peak Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| ***H*** | ***1198.100*** | ***54.2*** | ***33*** | ***26.1*** | ***47.3*** | ***74.0*** | ***-26.7*** |
| ***H*** | ***2483.500*** | ***64.8*** | ***33*** | ***29.4*** | ***61.2*** | ***74.0*** | ***-12.8*** |
| ***H*** | ***4950.000*** | ***51.3*** | ***33*** | ***34.9*** | ***53.2*** | ***74.0*** | ***-20.8*** |
| ***H*** | ***7425.000*** | ***39.5*** | ***33*** | ***37.9*** | ***44.4*** | ***74.0*** | ***-29.6*** |
| ***H*** | ***12375.000*** | ***44.0*** | ***33*** | ***40.5*** | ***51.5*** | ***74.0*** | ***-22.5*** |

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

Mode: Voice Receiving mode with TenPao Adaptor

Table 8, Baby Unit

| Polarization | Frequency (MHz) | Reading (dBµV) | Pre-amp (dB) | Antenna Factor (dB) | Net at 3m (dBµV/m) | Limit at 3m (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| V | 47.942 | 36.8 | 16 | 11.0 | 31.8 | 40.0 | -8.2 |
| V | 71.953 | 42.4 | 16 | 7.0 | 33.4 | 40.0 | -6.6 |
| ***V*** | ***119.962*** | ***41.2*** | ***16*** | ***14.0*** | ***39.2*** | ***43.5*** | ***-4.3*** |
| ***V*** | ***167.980*** | ***39.9*** | ***16*** | ***18.0*** | ***41.9*** | ***43.5*** | ***-1.6*** |
| V | 215.994 | 41.5 | 16 | 17.0 | 42.5 | 43.5 | -1.0 |
| H | 288.025 | 36.3 | 16 | 22.0 | 42.3 | 46.0 | -3.7 |
| H | 360.043 | 32.2 | 16 | 24.0 | 40.2 | 46.0 | -5.8 |
| ***V*** | ***408.057*** | ***35.1*** | ***16*** | ***24.0*** | ***43.1*** | ***46.0*** | ***-2.9*** |
| H | 456.070 | 31.5 | 16 | 26.0 | 41.5 | 46.0 | -4.5 |
| V | 576.118 | 32.3 | 16 | 28.0 | 44.3 | 46.0 | -1.7 |
| V | 588.232 | 29.6 | 16 | 29.0 | 42.6 | 46.0 | -3.4 |
| H | 696.148 | 30.2 | 16 | 30.0 | 44.2 | 46.0 | -1.8 |
| V | 888.201 | 24.9 | 16 | 32.0 | 40.9 | 46.0 | -5.1 |
| V | 960.234 | 26.1 | 16 | 33.0 | 43.1 | 54.0 | -10.9 |

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

**TEST REPORT**

4.8.4 Transmitter Duty Cycle Calculation

Duty Cycle (DC) = (Maximum ON time in 100 ms) / (100 ms)
= 1.105 ms x 7 / 100 ms

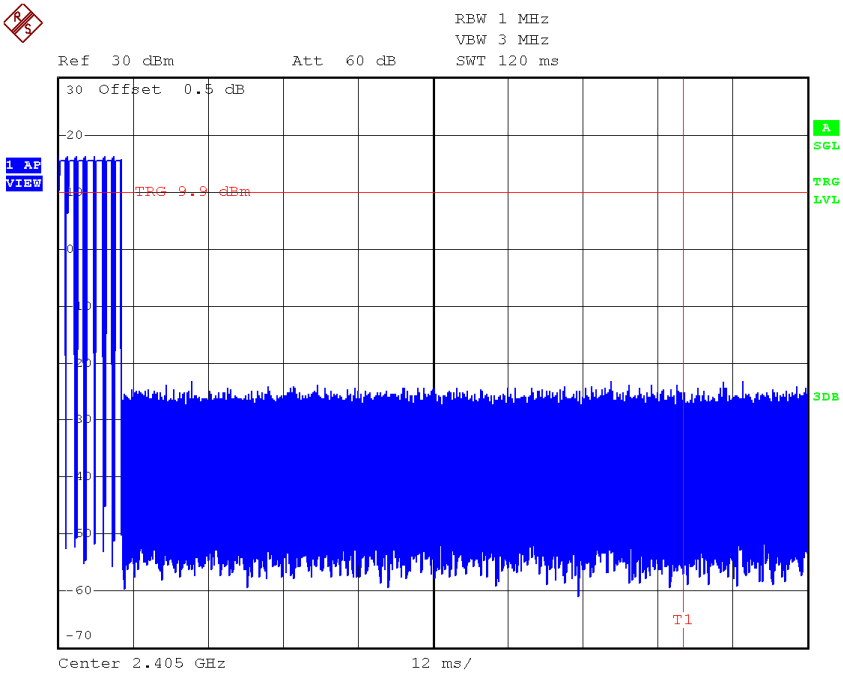
Average Factor (AF) = 20 log(DC)
= 20* log (0.07735)
= -22.23 dB

The plot(s) shows the bit timing is saved as below.

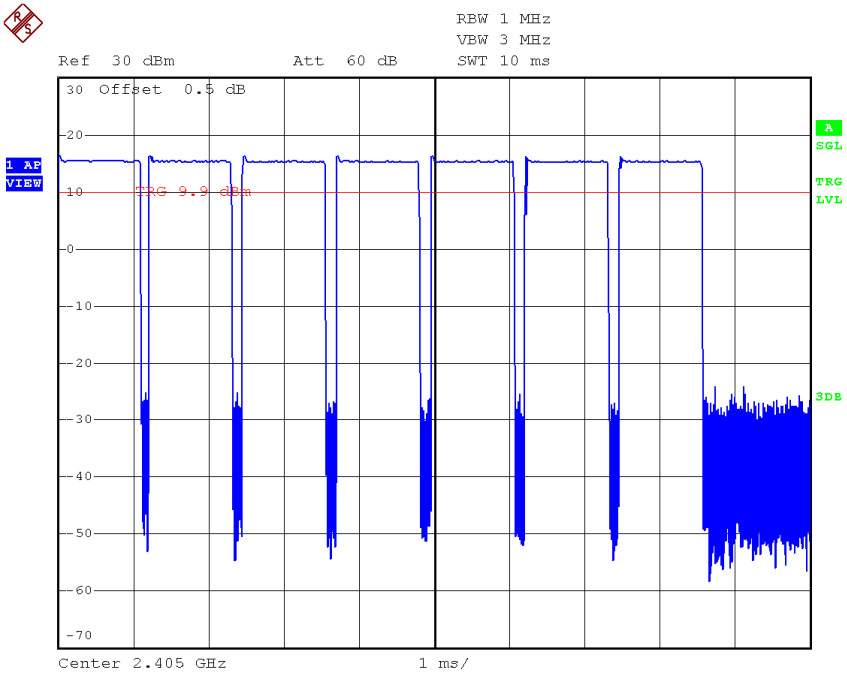
## TEST REPORT

# PLOTS OF TRANSMITTER DUTY CYCLE

Plot A



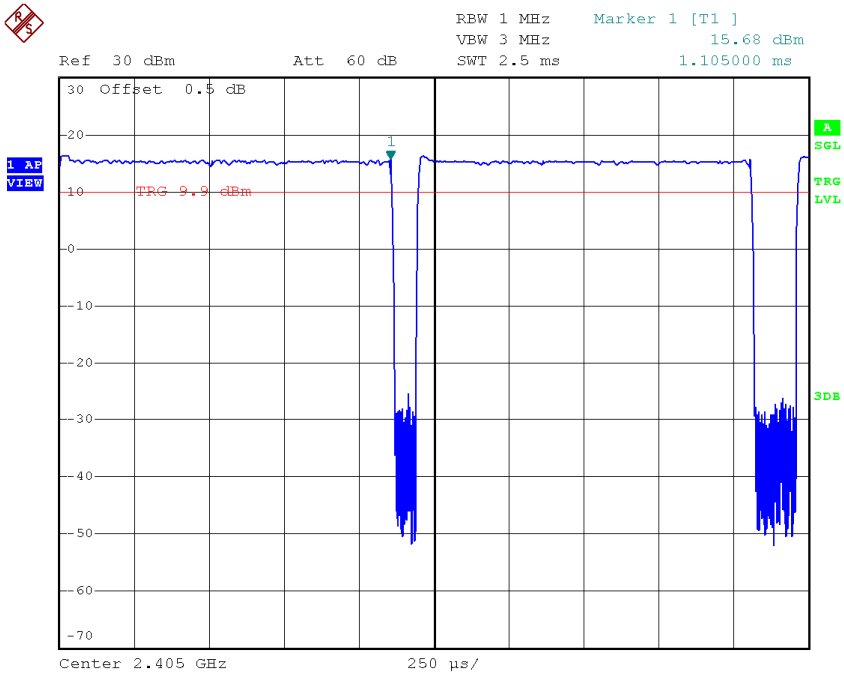

Plot B



## TEST REPORT

# PLOTS OF TRANSMITTER DUTY CYCLE

Plot C



**TEST REPORT**

## 4.9 AC Power Line Conducted Emission

☐ Not applicable – EUT is only powered by battery for operation.

☒ EUT connects to AC power line. Emission Data is listed in following pages.

☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

### 4.9.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

343.5 kHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

### 4.9.2 AC Power Line Conducted Emission Data

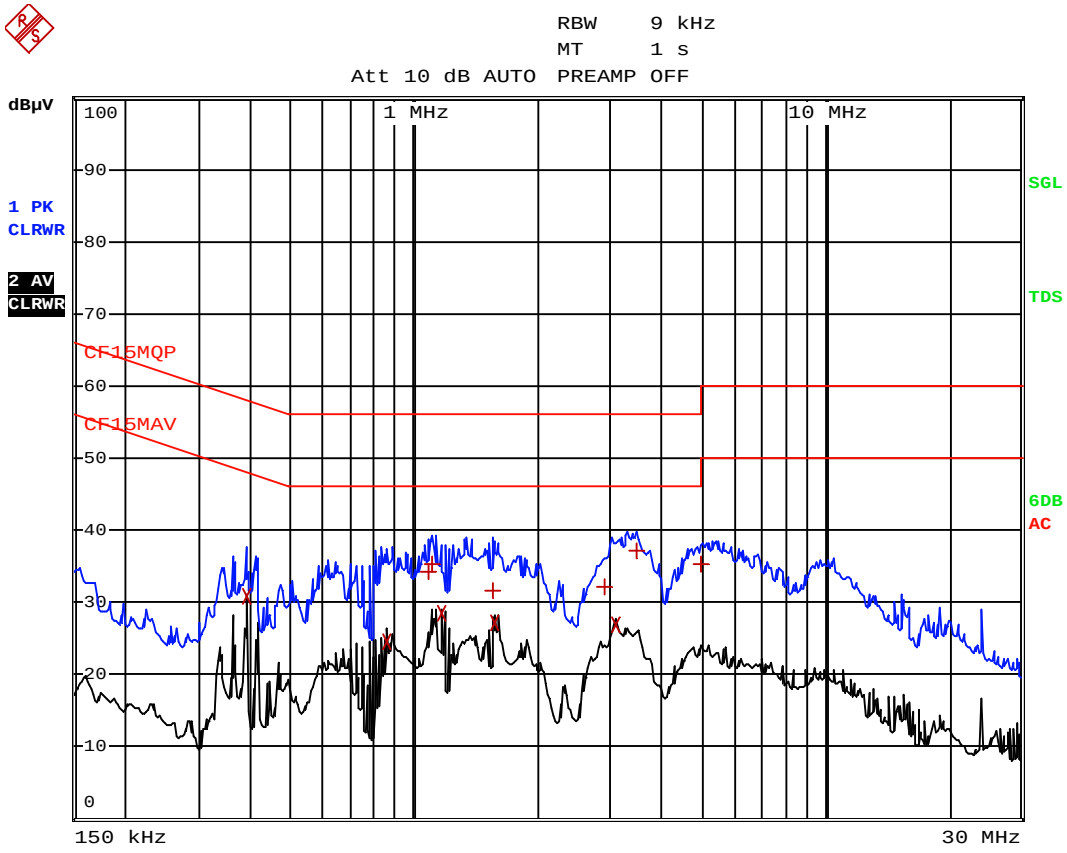
The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

Passed by 16.08 dB margin compare with CISPR average limit

**TEST REPORT**

## AC POWER LINE CONDUCTED EMISSION

Worst Case: Voice Receiving mode with Sunstrong Adaptor



**TEST REPORT**

Worst Case: Voice Receiving mode with Sunstrong Adaptor

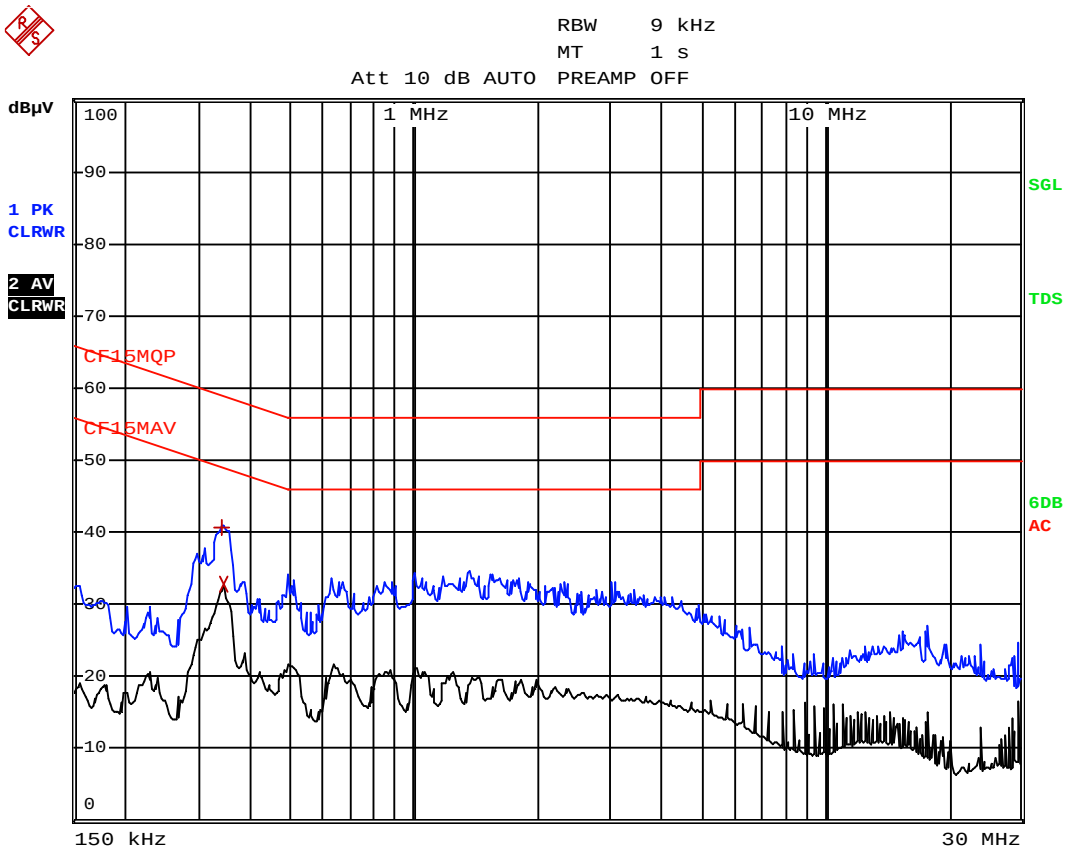
EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

| TRACE | | FREQUENCY | LEVEL dBµV | | DELTA LIMIT dB |
|---|---|---|---|---|---|
| 2 | CISPR Average | 388.5 kHz | 30.91 | L1 | -17.18 |
| 2 | CISPR Average | 856.5 kHz | 24.66 | L1 | -21.33 |
| 1 | Quasi Peak | 1.0815 MHz | 34.23 | L1 | -21.76 |
| 1 | Quasi Peak | 1.1085 MHz | 35.37 | L1 | -20.62 |
| 2 | CISPR Average | 1.1625 MHz | 28.42 | L1 | -17.57 |
| 1 | Quasi Peak | 1.5495 MHz | 31.60 | N | -24.39 |
| 2 | CISPR Average | 1.5765 MHz | 27.25 | L1 | -18.74 |
| 1 | Quasi Peak | 2.9175 MHz | 32.20 | L1 | -23.80 |
| 2 | CISPR Average | 3.102 MHz | 26.78 | L1 | -19.21 |
| 1 | Quasi Peak | 3.489 MHz | 37.11 | L1 | -18.88 |
| 1 | Quasi Peak | 4.9875 MHz | 35.25 | L1 | -20.74 |

## TEST REPORT

Worst Case: Voice Receiving mode with TenPao Adaptor



**TEST REPORT**

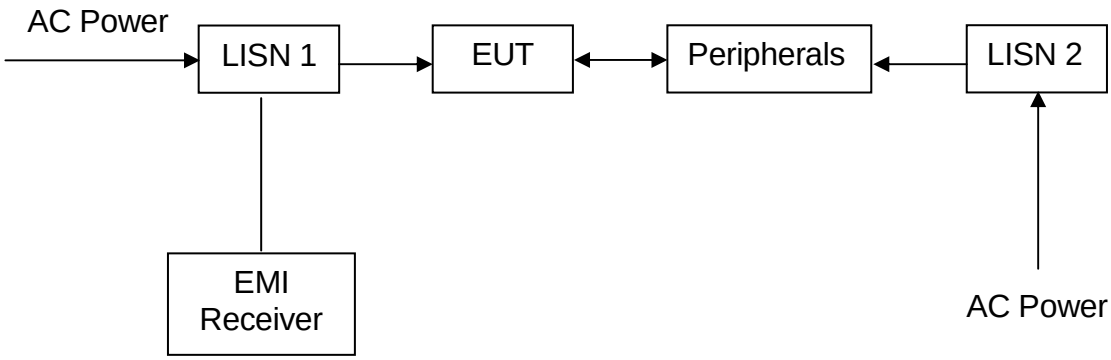
Worst Case: Voice Receiving mode with TenPao Adaptor

EDIT PEAK LIST (Final Measurement Results)

| | |
|---|---|
| Trace1: | CF15MQP |
| Trace2: | CF15MAV |
| Trace3: | --- |

| TRACE | FREQUENCY | LEVEL dBµV | | DELTA LIMIT dB |
|---|---|---|---|---|
| 1 Quasi Peak | 339 kHz | 40.73 | N | -18.49 |
| 2 CISPR Average | 343.5 kHz | 33.03 | N | -16.08 |

4.9.3 AC Line Conducted Emission Test Setup




The EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were moved to find the maximum emission.

**TEST REPORT**

# EXHIBIT 5 EQUIPMENT LIST

## 5.0 EQUIPMENT LIST

1) Radiated Emissions Test

| Equipment | EMI Test Receiver | Spectrum Analyzer | Biconical Antenna |
|---|---|---|---|
| Registration No. | EW-3156 | EW-2253 | EW-0571 |
| Manufacturer | R&S | R&S | EMCO |
| Model No. | ESR26 | FSP30 | 3104C |
| Calibration Date | Dec. 06, 2016 | Oct. 03, 2016 | May 18, 2016 |
| Calibration Due Date | Dec. 06, 2017 | Aug. 20, 2017 | Nov. 18, 2017 |

| Equipment | Log Periodic Antenna | Double Ridged Guide Antenna | Broad-Band Horn Antenna |
|---|---|---|---|
| Registration No. | EW-0447 | EW-0194 | EW-1679 |
| Manufacturer | EMCO | EMCO | SCHWARZBECK |
| Model No. | 3146 | 3115 | BBHA9170 |
| Calibration Date | May 18, 2016 | Aug. 10, 2016 | Aug. 10, 2016 |
| Calibration Due Date | Nov. 18, 2017 | Feb. 10, 2018 | Feb. 10, 2018 |

2) Conducted Emissions Test

| Equipment | EMI Test Receiver | LISN |
|---|---|---|
| Registration No. | EW-2500 | EW-2501 |
| Manufacturer | R&S | R&S |
| Model No. | ESCI | ENV-216 |
| Calibration Date | Nov. 17, 2016 | Feb. 21, 2017 |
| Calibration Due Date | Nov. 15, 2017 | Jan. 05, 2018 |

3) Conductive Measurement Test

| Equipment | Spectrum Analyzer |
|---|---|
| Registration No. | EW-2466 |
| Manufacturer | R&S |
| Model No. | FSP30 |
| Calibration Date | Oct. 03, 2016 |
| Calibration Due Date | Aug. 20, 2017 |