

## TEST REPORT For FCC

Test Report No. : CTK-2015-00376  
Date of Issue : 2015-03-25  
FCC ID : P4Y365PLUS  
Model/Type No. : 365plus  
Variant Model/Type No. : -  
Kind of Product : Digital door lock  
Applicant : Samsung SDS Co., Ltd.  
Applicant Address : 125, Olympic-ro 35-gil, Songpa-gu, Seoul, Korea  
Manufacturer : Meta Networks Co., Ltd.  
Manufacturer Address : 55, Galmachi-ro 281beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, Korea  
Contact Person : Yu Seungkwan / Advisory Engineer  
Telephone : +82-2-6155-5105  
Received Date : 2015-03-12  
Test period : Start : 2015-03-17 End : 2015-03-25

The test results presented in this report relate only to the object tested.

Tested by



Won-Jae, Hwang  
Test Engineer  
Date: 2015-03-25

Reviewed by



Young-Joon, Park  
Technical Manager  
Date: 2015-03-25

## REPORT REVISION HISTORY

| Date       | Revision                | Page No |
|------------|-------------------------|---------|
| 2015-03-25 | Issued (CTK-2015-00376) | All     |
|            |                         |         |
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## 1.0 General Product Description

|                        |                                                   |
|------------------------|---------------------------------------------------|
| Kind of Product        | Digital door lock                                 |
| Model/Type No.         | 365plus                                           |
| Variant Model/Type No. | -                                                 |
| Serial number          | Prototype                                         |
| EUT condition          | Pre-production, not damaged                       |
| Frequency Range        | 2405 MHz - 2480 MHz                               |
| RF output power        | 11.36 dBm                                         |
| Number of channels     | 16                                                |
| Transfer Rate          | 250 Kbps                                          |
| Type of Modulation     | DSSS                                              |
| Channel Spacing        | 5 MHz                                             |
| Duty cycle TX power    | 1.0                                               |
| Power Source           | 6 Vdc (4 AA Alkaline 1.5 V Batteries (LR6))       |
| Antenna Type           | Wire antenna                      Gain : 3.14 dBi |

## 1.1 Tested Frequency

|                 | CH11 | CH15 | CH19 | CH20 | CH25 | CH26 |
|-----------------|------|------|------|------|------|------|
| Frequency (MHz) | 2405 | 2425 | 2445 | 2450 | 2475 | 2480 |

## 1.2 Model Differences

Not applicable

## 1.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

## 1.4 Peripheral Devices

| Device             | Manufacturer                    | Model No.     | Serial No. |
|--------------------|---------------------------------|---------------|------------|
| Note Computer      | DELL INC.                       | Inspiron 6400 | -          |
| Switching Adapter2 | DDongguang Lite Power 2nd Plant | LA65NS0-00    | -          |

## 1.5 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.6 Test Facility

The measurement facility is located at (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.7 Laboratory Accreditations and Listings

| Country       | Agency | Scope of Accreditation                                                                           | Logo                                                                                                        |
|---------------|--------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| USA           | FCC    | 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements                    | <br>805871               |
| JAPAN         | VCCI   | 3 m & 10 m SAC and Conducted Test Site                                                           | <br>R-948, C-986, T-1843 |
| KOREA         | MSIP   | EMI (Electromagnetic Interference / Emission)<br>EMS (Electromagnetic Susceptibility / Immunity) | <br>No. 51, KR0025       |
| International | KOLAS  | EMC                                                                                              |                        |

## 2 Summary of tests

| FCC Part Section(s) | Parameter                          | Limit           | Test Condition | Status (note 1) |
|---------------------|------------------------------------|-----------------|----------------|-----------------|
| 15.247(a)           | 6 dB Bandwidth                     | > 500 kHz       | Conducted      | C               |
| 15.247(b)           | Maximum Output Power               | < 1 Watt        |                | C               |
| 15.247(d)           | Conducted Spurious emission        | > 20 dBc        |                | C               |
| 15.247(d)           | Band Edge                          | > 20 dBc        |                | C               |
| 15.247(e)           | Transmitter Power Spectral Density | < 8 dBm @ 3 kHz |                | C               |
|                     |                                    |                 |                | C               |
| 15.209              | Field Strength of Harmonics        | 15.209(a)       | Radiated       | C               |
| 15.207              | AC Conducted Emissions             | 15.207(a)       | Line Conducted | NA              |

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

- FCC Part 15.247, ANSI C63.4-2003

The tests were performed according to the method of measurements prescribed in

KDB No.558074

## 2.1 Technical Characteristic Test

### 2.1.1 6dB Bandwidth

#### Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is ( as close as possible to ) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 40 MHz

VBW = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

#### Measurement Data:

| Frequency (MHz) | Channel No. | Test Results        |                          |          |
|-----------------|-------------|---------------------|--------------------------|----------|
|                 |             | 6dB Bandwidth (MHz) | Occupied Bandwidth (MHz) | Result   |
| 2405            | 11          | 1.632               | 2.471                    | Complies |
| 2425            | 15          | 1.626               | 2.474                    | Complies |
| 2445            | 19          | 1.619               | 2.467                    | Complies |
| 2450            | 20          | 1.620               | 2.473                    | Complies |
| 2475            | 25          | 1.624               | 2.456                    | Complies |
| 2480            | 26          | 1.635               | 2.491                    | Complies |

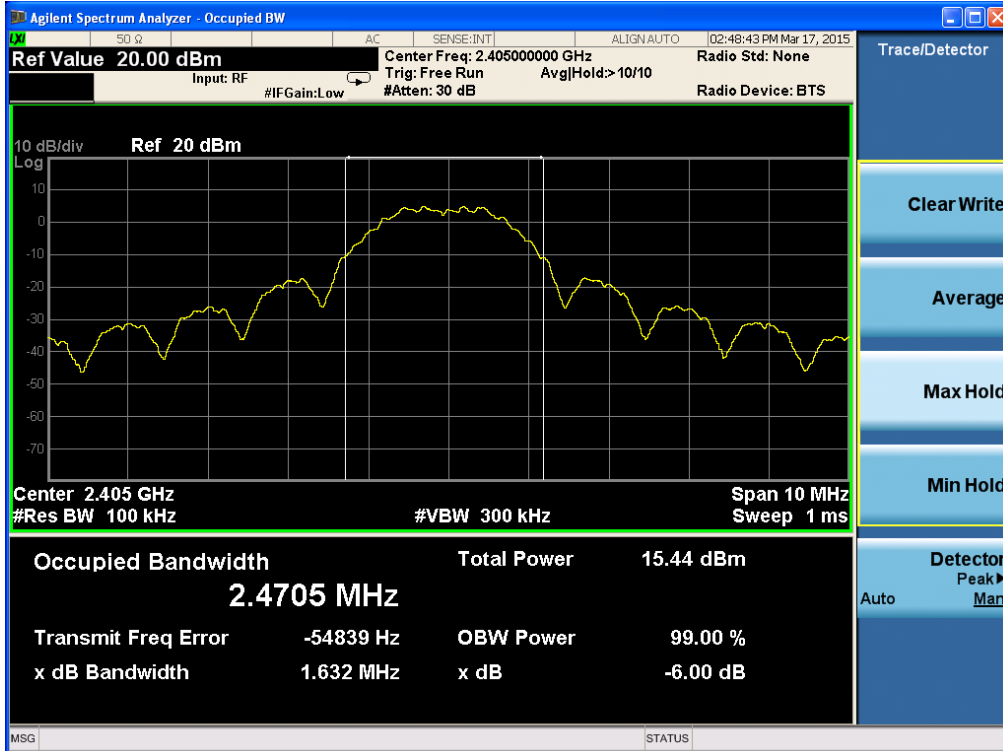
#### Minimum Standard:

6 dB Bandwidth > 500kHz

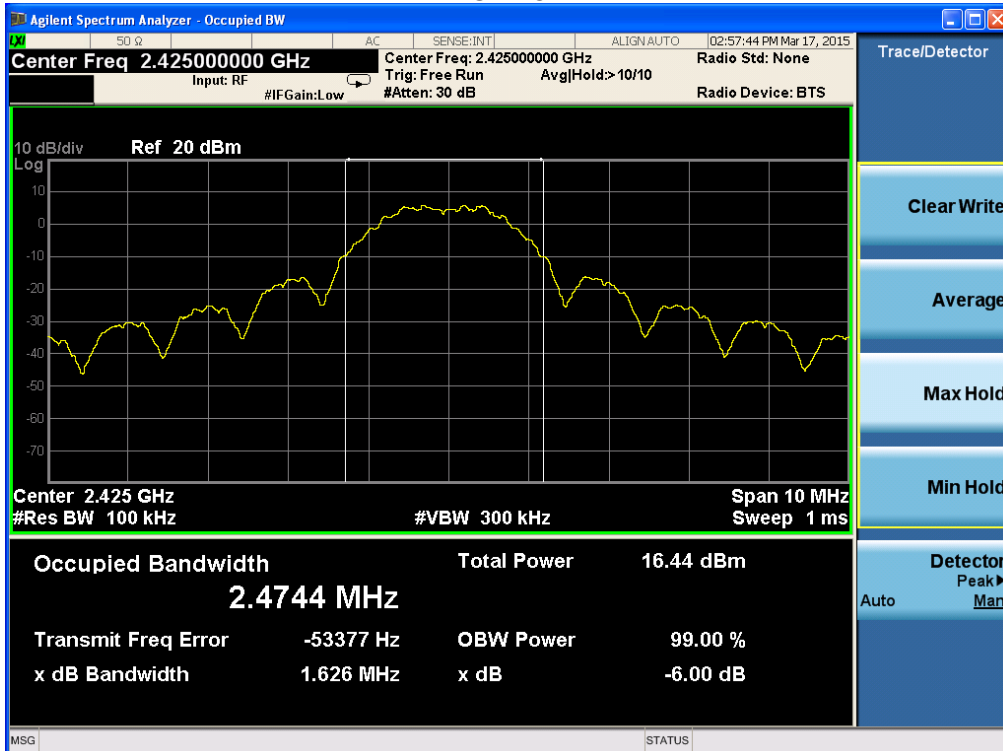
See next pages for actual measured spectrum plots.



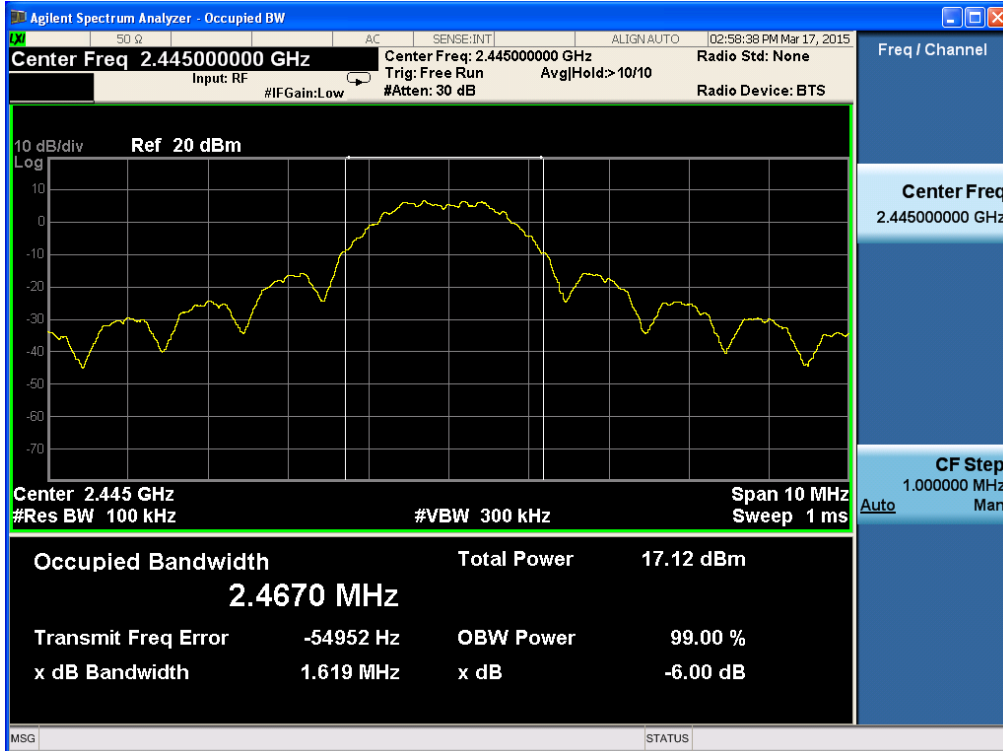
### CH11



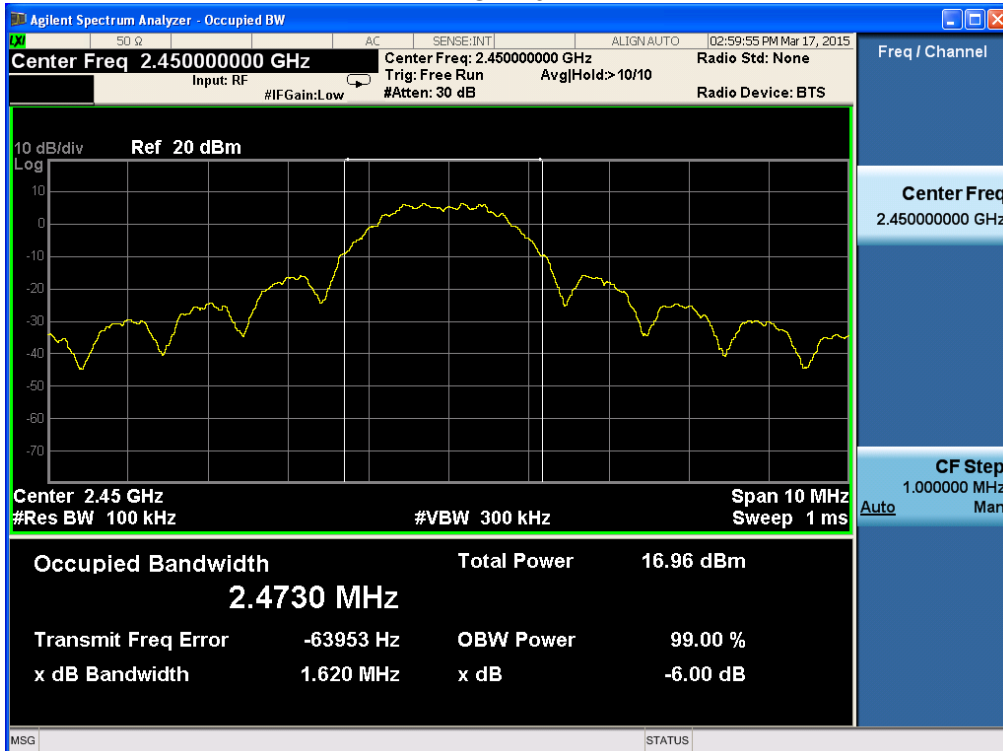
### CH15



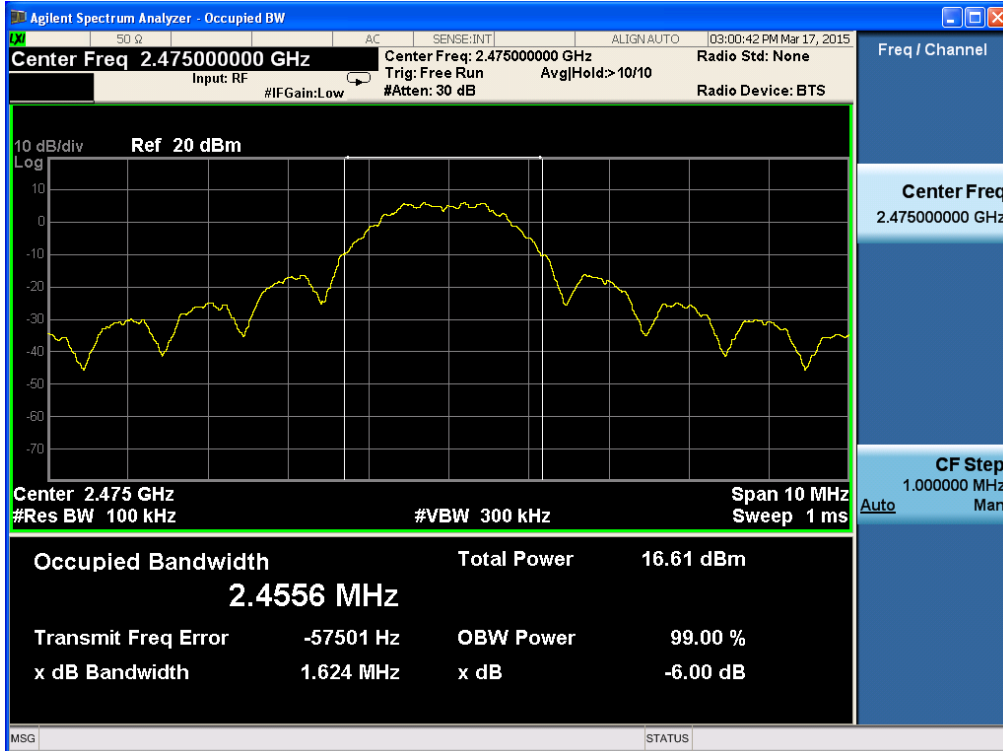
### CH19



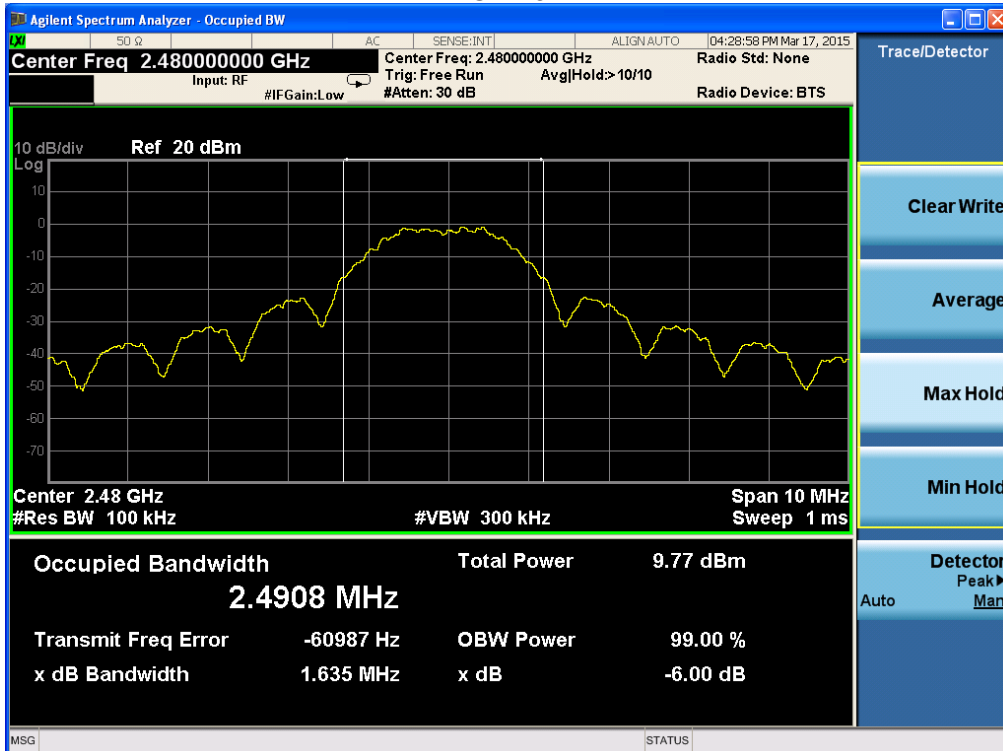
### CH20



### CH25



### CH26



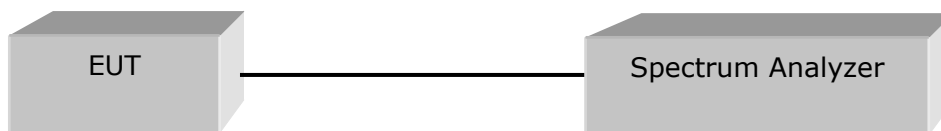
## 2.1.2 Maximum peak Conducted Output Power

### Test Location

RF Test Room

### Test Procedures

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



### Limit

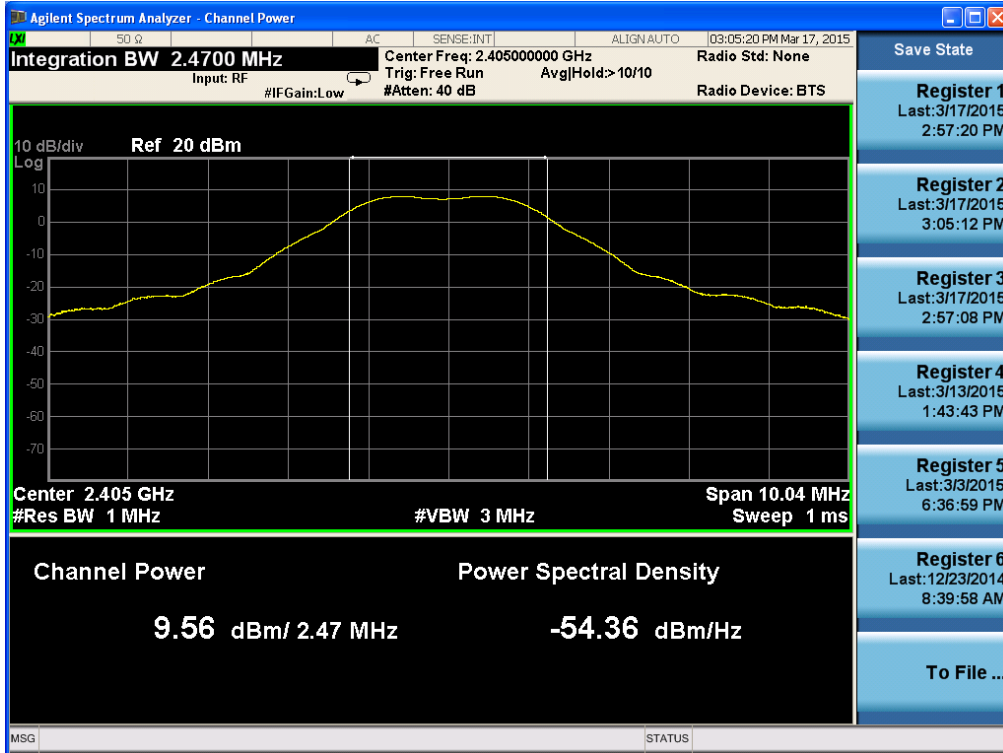
< 1 W

### Test Results

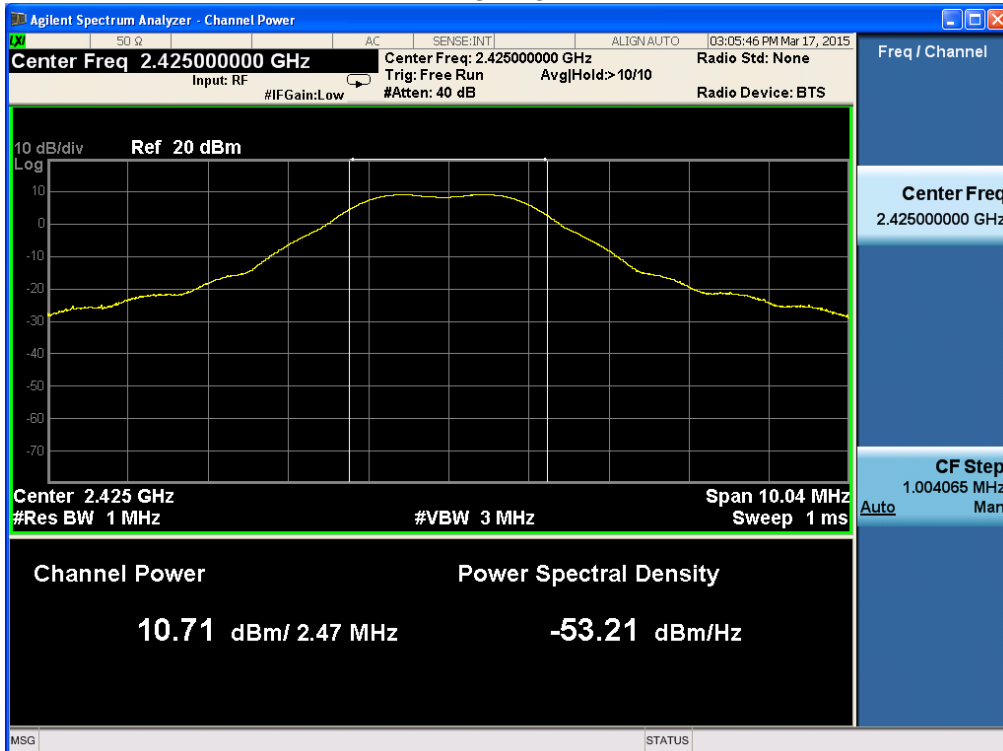
Cable loss : 0.4 dB

| Frequency (MHz) | Channel No. | Mesurement data (dBm) | Total Power (dBm) | Limit | Result   |
|-----------------|-------------|-----------------------|-------------------|-------|----------|
| 2405            | 11          | 9.56                  | 9.96              | 30dBm | Complies |
| 2425            | 15          | 10.71                 | 11.11             |       | Complies |
| 2445            | 19          | 11.36                 | 11.76             |       | Complies |
| 2450            | 20          | 11.30                 | 11.70             |       | Complies |
| 2475            | 25          | 10.82                 | 11.22             |       | Complies |
| 2480            | 26          | 4.09                  | 4.49              |       | Complies |

### CH11



### CH15





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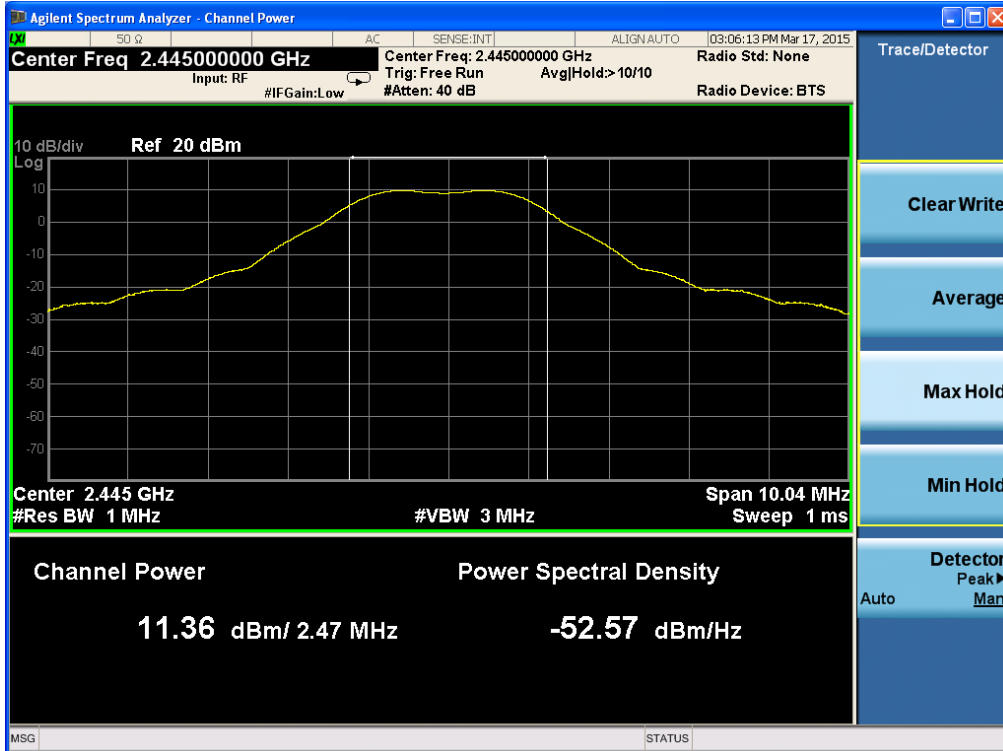
## CTK Co., Ltd.

(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

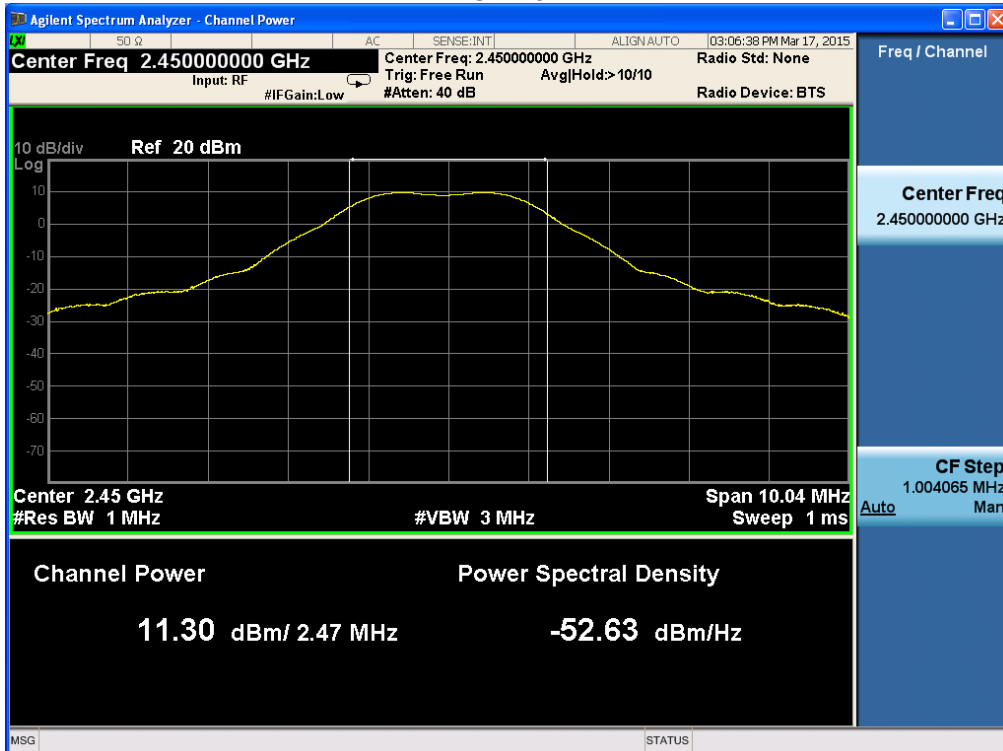
Tel: +82-31-339-9970 Fax: +82-31-624-9501

www.e-ctk.com

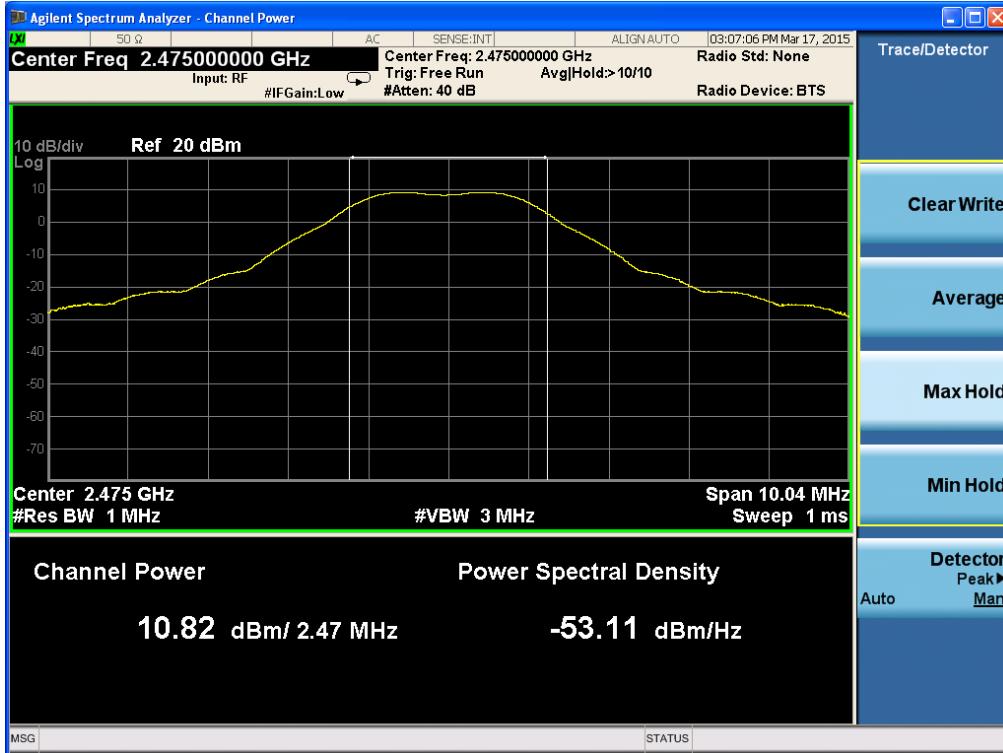
### CH19



### CH20



### CH25



### CH26



### 2.1.3 Power Spectral Density

#### Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = 3 kHz

VBW = (VBW ≥ RBW)

Sweep = Auto

Span = 5 MHz

Detector function = peak

Trace = max hold

#### Test Results

| Frequency (MHz) | Ch. | Test Results |          |
|-----------------|-----|--------------|----------|
|                 |     | dBm          | Result   |
| 2405            | 11  | -6.036       | Complies |
| 2425            | 15  | -5.174       | Complies |
| 2445            | 19  | -4.616       | Complies |
| 2450            | 20  | -5.164       | Complies |
| 2475            | 25  | -5.482       | Complies |
| 2480            | 26  | -12.649      | Complies |

#### Minimum Standard:

|                        |                   |
|------------------------|-------------------|
| Power Spectral Density | < 8dBm @ 3 kHz BW |
|------------------------|-------------------|

See next pages for actual measured spectrum plots.



## Power Density Measurement

CH11



CH15



### CH19



### CH20



### CH25



### CH26



## 2.1.4 Band - edge

### Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

VBW = 100 kHz

Span = 20 MHz

Detector function = peak

Trace = max hold

Sweep = auto

### Measurement Data: Complies

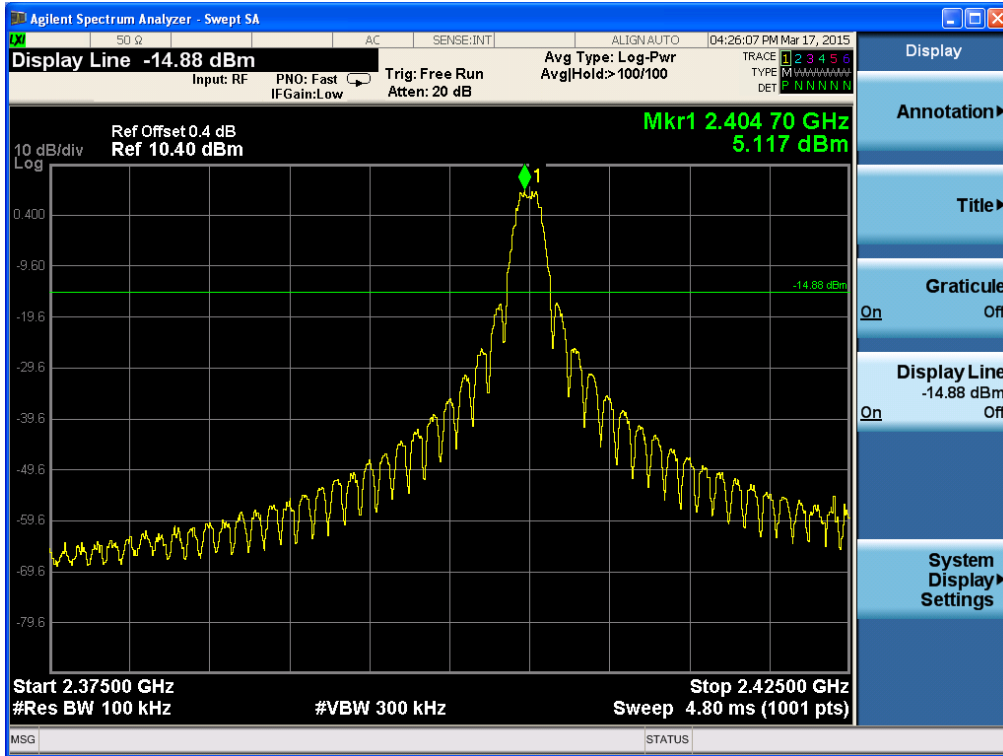
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

|                          |          |
|--------------------------|----------|
| <b>Minimum Standard:</b> | > 20 dBc |
|--------------------------|----------|

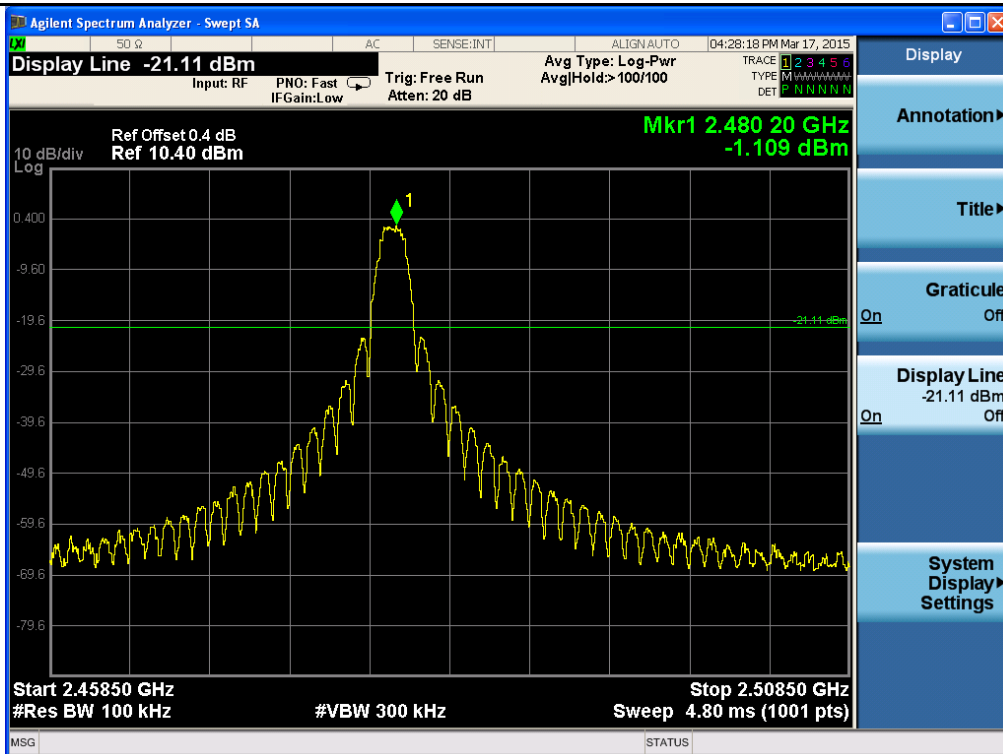
See next pages for actual measured spectrum plots.

## Band-edge Measurements

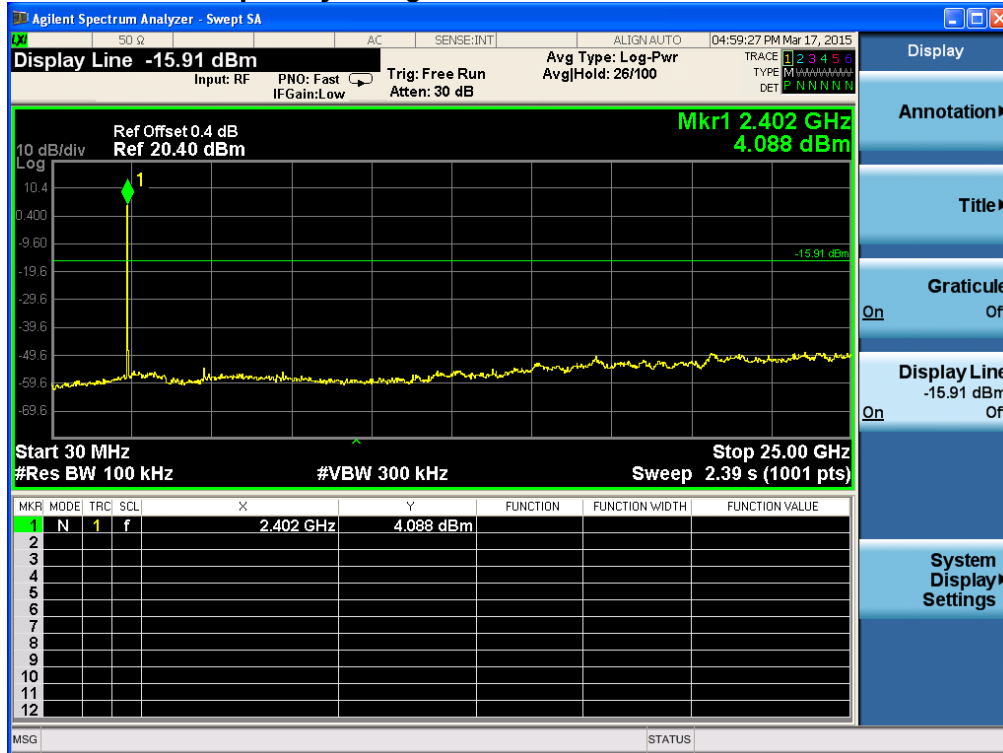
### CH11



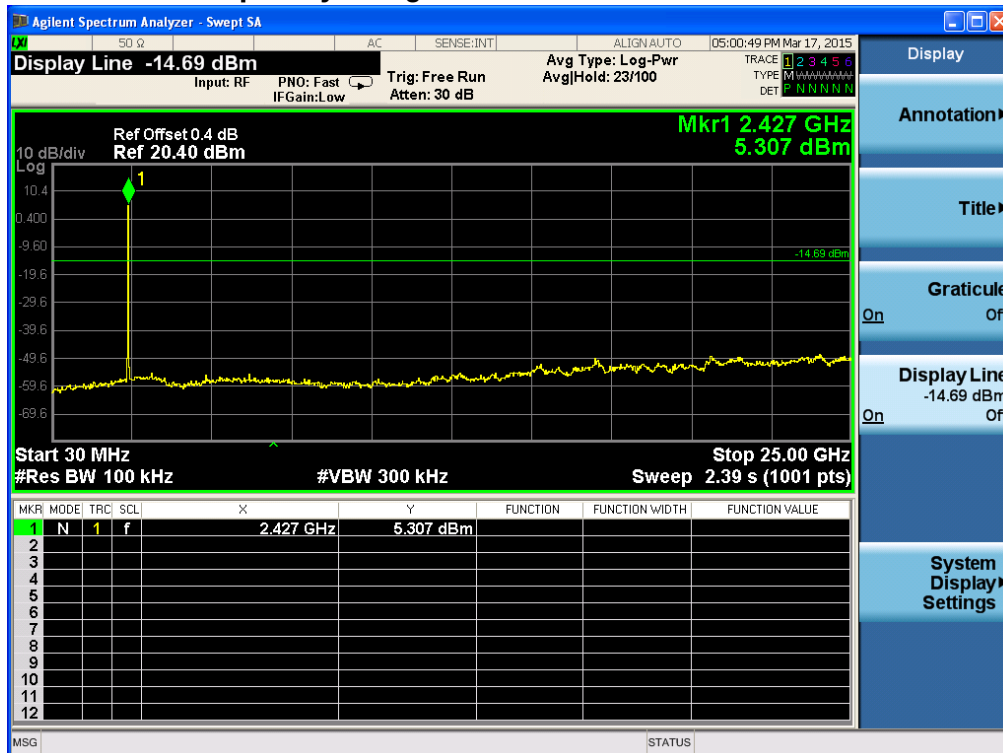
### CH26



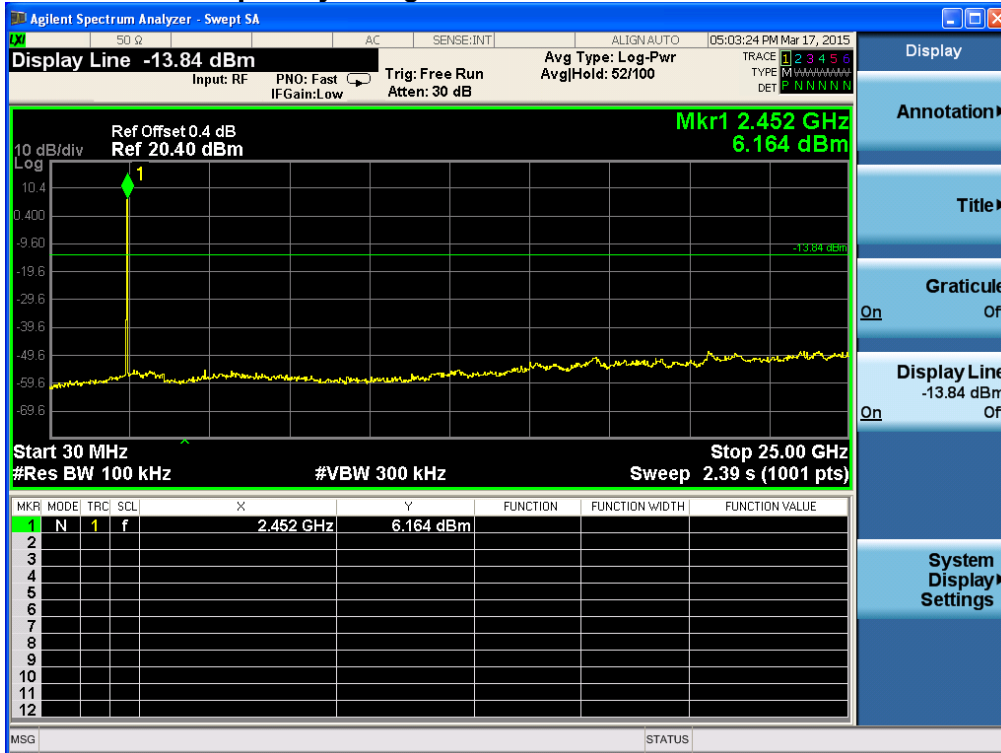
**Band – edge (at 20 dB blow) – CH11**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



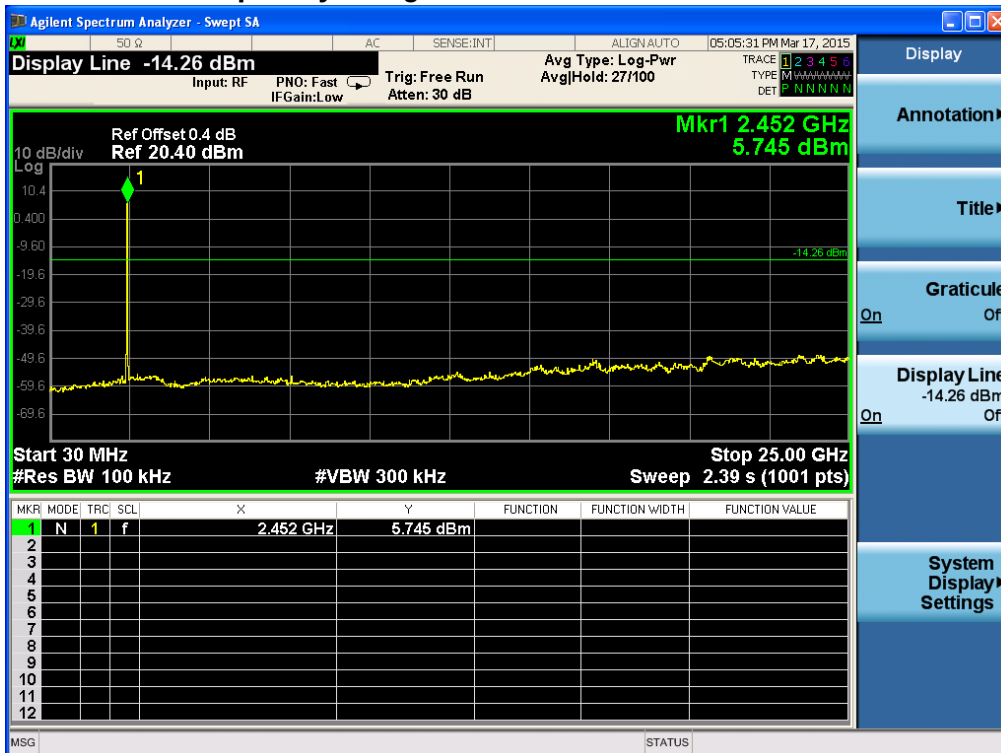
**Band – edge (at 20 dB blow) – CH15**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



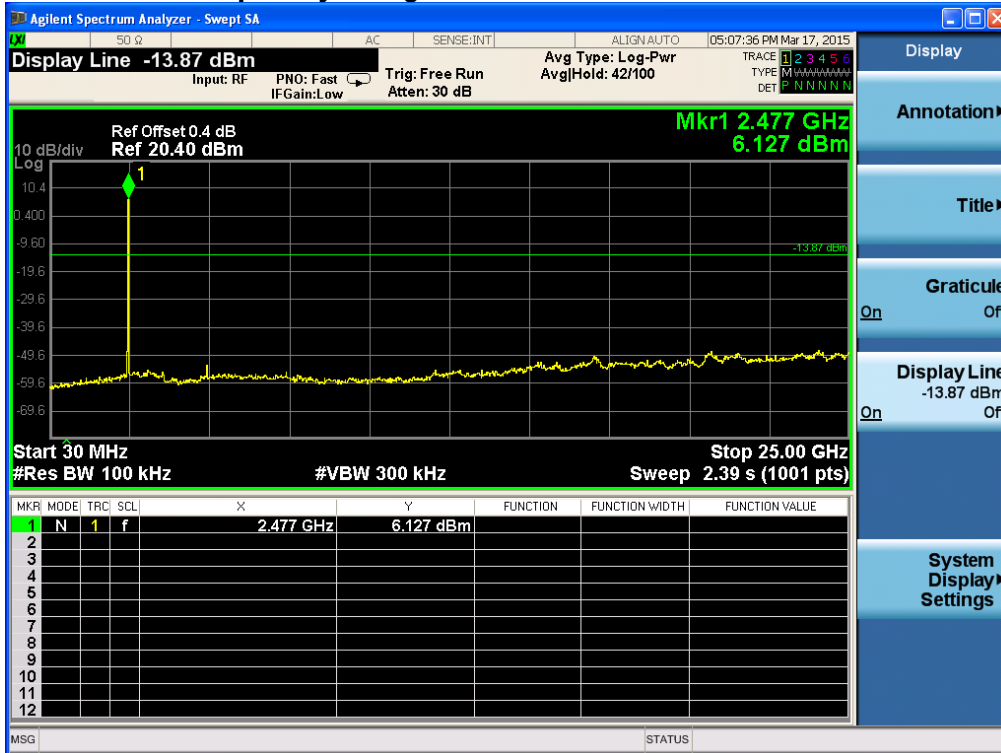
**Band – edge (at 20 dB blow) – CH19**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



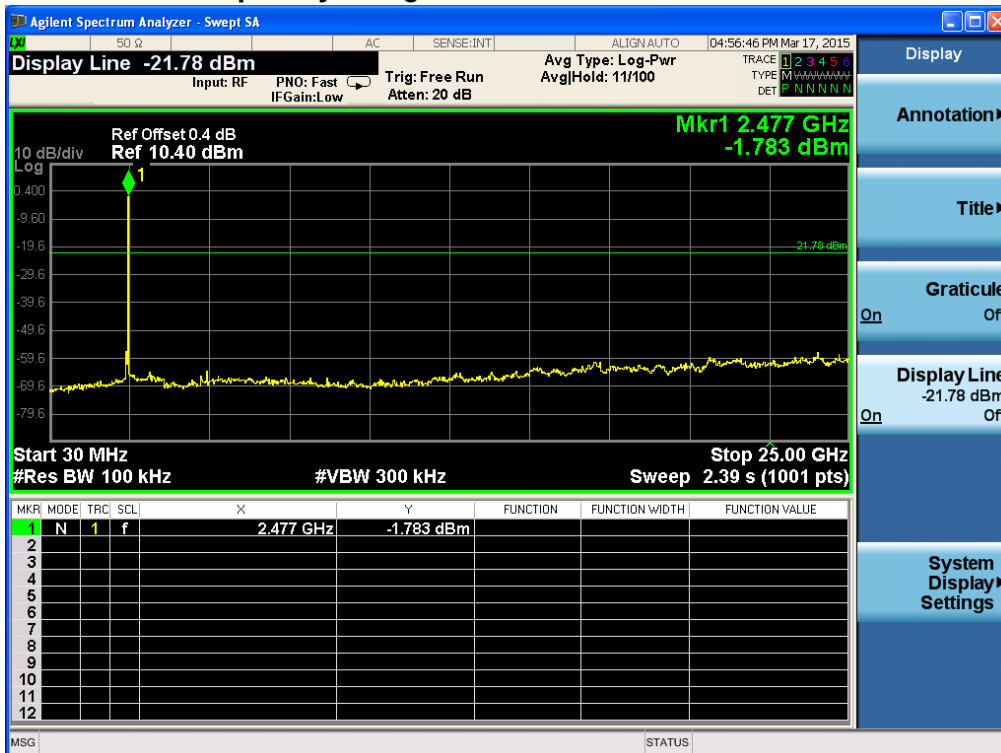
**Band – edge (at 20 dB blow) – CH20**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – CH25**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**



**Band – edge (at 20 dB blow) – CH26**  
**Frequency Range = 30 MHz ~ 10<sup>th</sup> harmonic**





## 2.1.5 Field Strength of Emissions

### Test Location

- ☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)  
☒ 3 m SAC (test distance : 3 m)

### Test Procedures

- 1) In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

The spectrum analyzer is set to:

Frequency Range = 9 kHz ~ 25 GHz (2.4 GHz 10<sup>th</sup> harmonic)  
RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz, 9 kHz for  $f < 30$  MHz  
VBW  $\geq$  RBW  
Sweep = auto

### Limit

#### - 15.209(a)

| Frequency(MHz) | Field Strength<br>uV/m@3m | Field Strength<br>dBuV/m@3m | Measurement<br>Distance (meters) |
|----------------|---------------------------|-----------------------------|----------------------------------|
| 0.009-0.490    | 2400/F(kHz)               | -                           | 300                              |
| 0.490-1.705    | 24000/F(kHz)              | -                           | 30                               |
| 1.705-30       | 30                        | -                           | 30                               |
| 30-88          | 100**                     | 40                          | 3                                |
| 88-216         | 150**                     | 43.5                        | 3                                |
| 216-960        | 200**                     | 46                          | 3                                |
| Above 960      | 500                       | 54                          | 3                                |

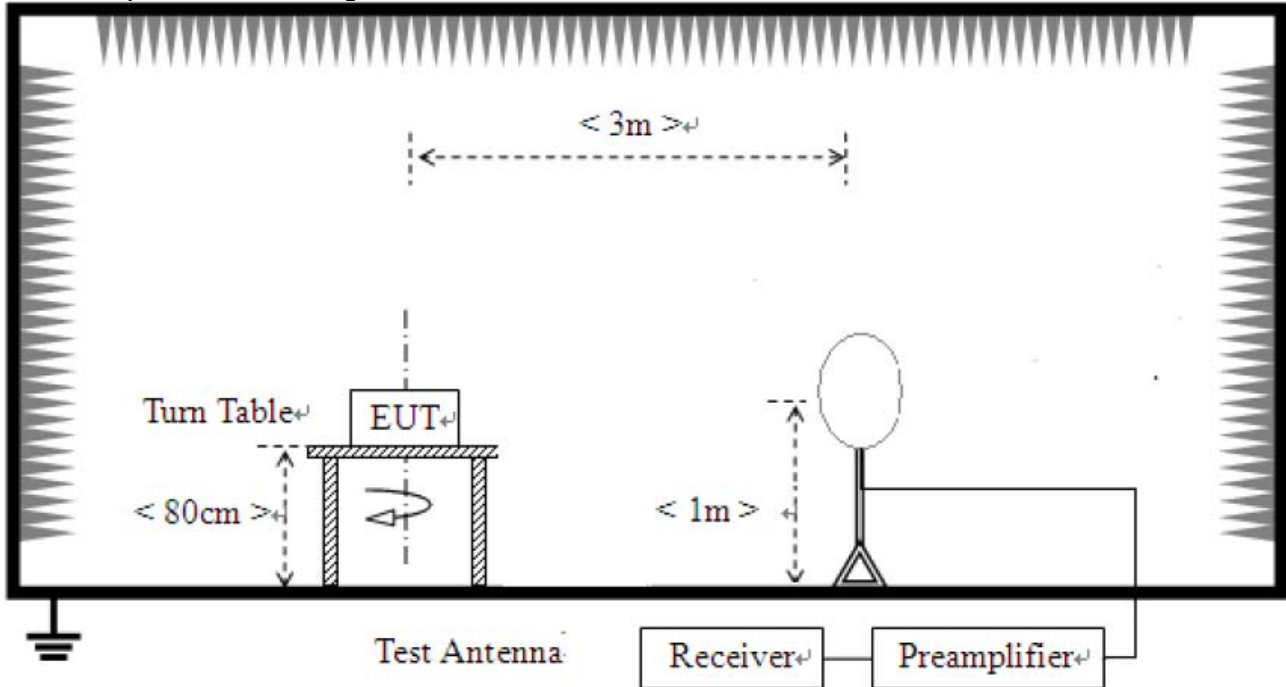
\*\* Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

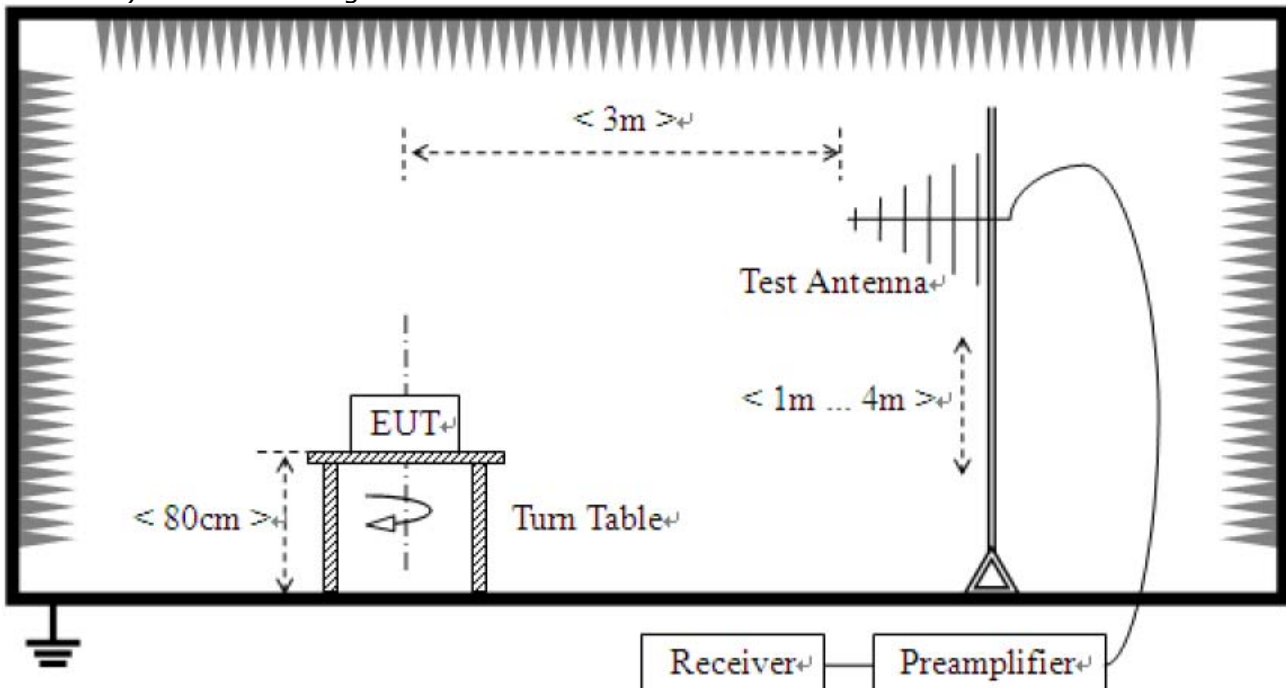
- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

### Test Setup:

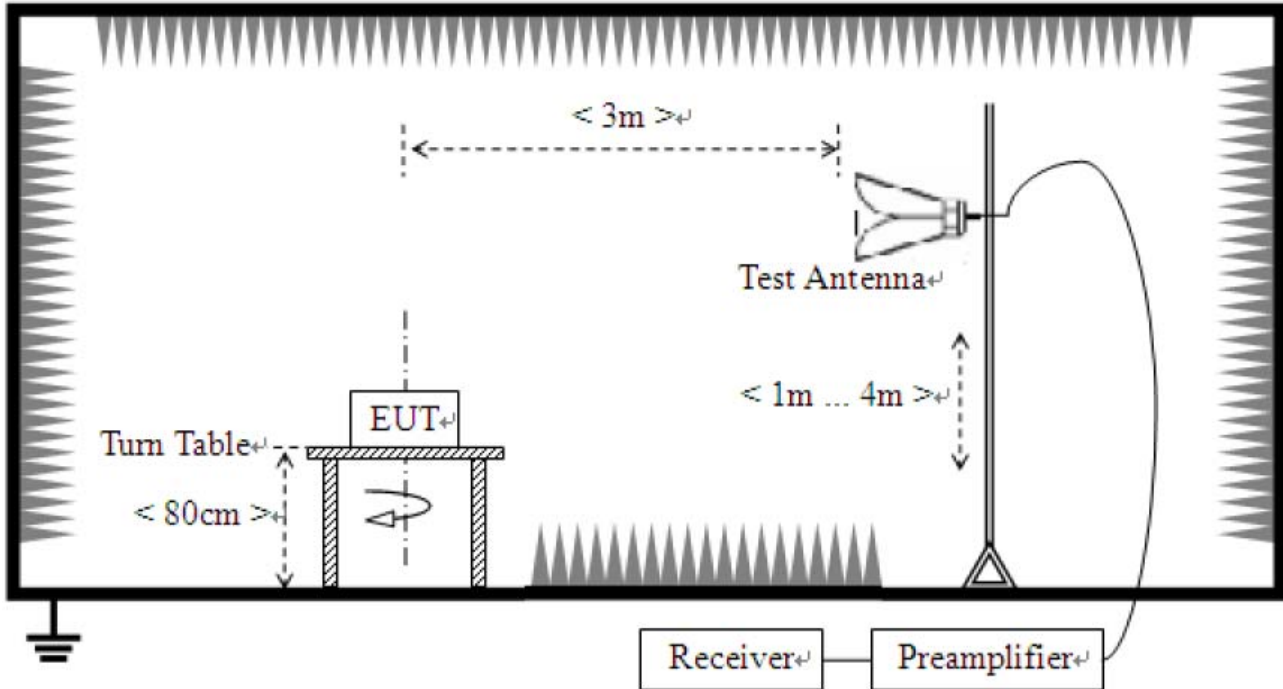
1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz



**Test Results**

**1) 9 kHz to 30 MHz**

|           |                    |                    |                |
|-----------|--------------------|--------------------|----------------|
| EUT       | Digital door lock  | Measurement Detail |                |
| Model     | 365plus            | Frequency Range    | 9 kHz – 30 MHz |
| Test mode | Ch.19 (Worst Case) | Detector function  | Quasi-Peak     |

The requirements are:

☒ Complies

| Frequency (MHz) | Measured Data (dBuV/m) | Margin (dB) | Remark   |
|-----------------|------------------------|-------------|----------|
| -               | -                      | -           | See note |

**Note :**

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

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

## Test Results

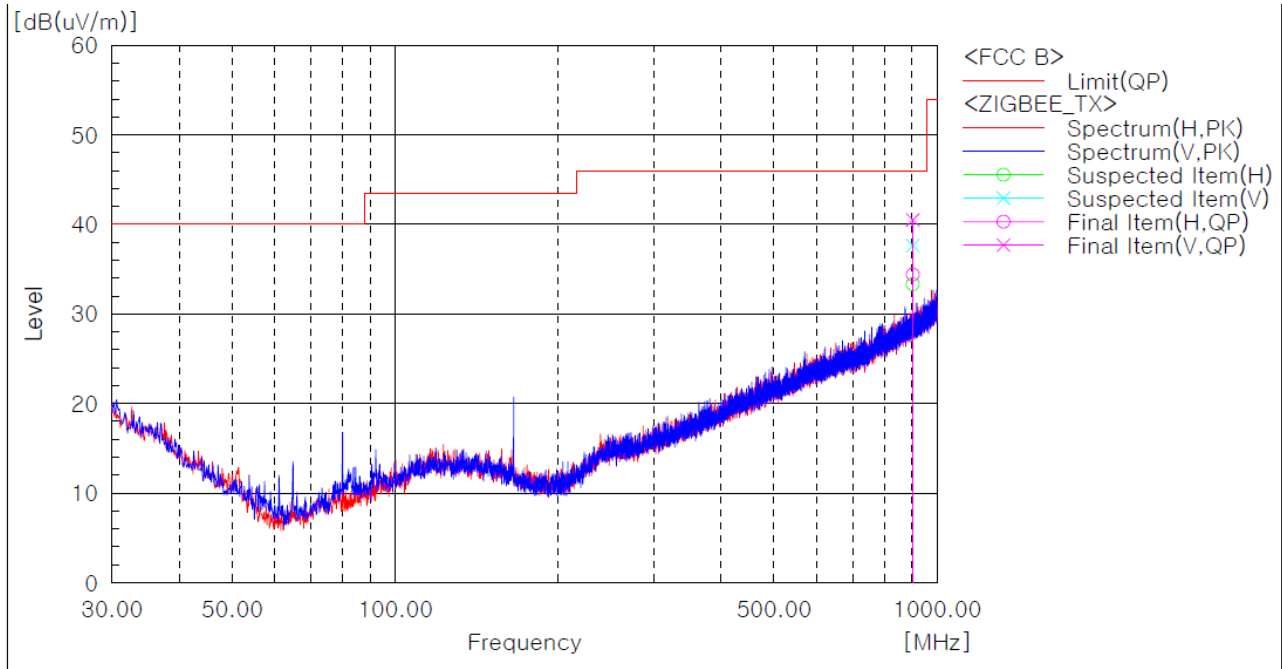
|       |                    |                    |               |
|-------|--------------------|--------------------|---------------|
| EUT   | Digital door lock  | Measurement Detail |               |
| Model | 365plus            | Frequency Range    | Below 1000MHz |
| Mode  | Ch.19 (Worst Case) | Detector function  | Quasi-Peak    |

The requirements are:

☒ Complies

| Frequency (MHz) | Measured Data (dBUV/m) | Margin (dB) | Remark     |
|-----------------|------------------------|-------------|------------|
| 902.394         | 40.5                   | 5.5         | Quasi-peak |

### Test Data



### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|
| 1   | 902.394         | V   | 35.6                | 4.9           | 40.5                 | 46.0                | 5.5            | 100.0       | 0.0         |
| 2   | 902.394         | H   | 29.5                | 4.9           | 34.4                 | 46.0                | 11.6           | 100.0       | 157.0       |

### Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.

## Test Results

|       |                   |                    |                |
|-------|-------------------|--------------------|----------------|
| EUT   | Digital door lock | Measurement Detail |                |
| Model | 365plus           | Frequency Range    | 1-25GHz        |
|       |                   | Detector function  | Average / Peak |

### Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

| Frequency (MHz) | Measured Data (dBUV/m) | Margin (dB) | Remark  |
|-----------------|------------------------|-------------|---------|
| 2483.5          | 52.3                   | 1.7         | Average |

## Test Data

### Ch.11

| Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | Factor [dB(1/m)] | Level AV [dB(uV/m)] | Level PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] |
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|

No emissions were detected at a level greater than 20dB below limit.

### Ch.15

| Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | Factor [dB(1/m)] | Level AV [dB(uV/m)] | Level PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] |
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|

No emissions were detected at a level greater than 20dB below limit.

### Ch.19

| Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | Factor [dB(1/m)] | Level AV [dB(uV/m)] | Level PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] |
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|

No emissions were detected at a level greater than 20dB below limit.

### Ch.20

| Frequency [MHz] | (P) | Reading AV [dB(uV)] | Reading PK [dB(uV)] | Factor [dB(1/m)] | Level AV [dB(uV/m)] | Level PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Limit PK [dB(uV/m)] | Margin AV [dB] | Margin PK [dB] |
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|
|-----------------|-----|---------------------|---------------------|------------------|---------------------|---------------------|---------------------|---------------------|----------------|----------------|

No emissions were detected at a level greater than 20dB below limit.



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## CTK Co., Ltd.

(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea

Tel: +82-31-339-9970 Fax: +82-31-624-9501

www.e-ctk.com

### Ch.25

| Frequency<br>[MHz] | (P) | Reading AV<br>[dB(uV)] | Reading PK<br>[dB(uV)] | Factor<br>[dB(1/m)] | Level AV<br>[dB(uV/m)] | Level PK<br>[dB(uV/m)] | Limit AV<br>[dB(uV/m)] | Limit PK<br>[dB(uV/m)] | Margin AV<br>[dB] | Margin PK<br>[dB] |
|--------------------|-----|------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|-------------------|-------------------|
|--------------------|-----|------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|-------------------|-------------------|

No emissions were detected at a level greater than 20dB below limit.

### Ch.26

| Frequency<br>[MHz] | (P) | Reading AV<br>[dB(uV)] | Reading PK<br>[dB(uV)] | Factor<br>[dB(1/m)] | Level AV<br>[dB(uV/m)] | Level PK<br>[dB(uV/m)] | Limit AV<br>[dB(uV/m)] | Limit PK<br>[dB(uV/m)] | Margin AV<br>[dB] | Margin PK<br>[dB] |
|--------------------|-----|------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|-------------------|-------------------|
|--------------------|-----|------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|-------------------|-------------------|

No emissions were detected at a level greater than 20dB below limit.

### Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

| Frequency<br>[MHz] | (P) | Reading AV<br>[dB(uV)] | Reading PK<br>[dB(uV)] | Factor<br>[dB(1/m)] | Level AV<br>[dB(uV/m)] | Level PK<br>[dB(uV/m)] | Limit AV<br>[dB(uV/m)] | Limit PK<br>[dB(uV/m)] | Margin AV<br>[dB] | Margin PK<br>[dB] |
|--------------------|-----|------------------------|------------------------|---------------------|------------------------|------------------------|------------------------|------------------------|-------------------|-------------------|
| 2483.5             | V   | 37.8                   | 52.1                   | 8.3                 | 46.1                   | 60.4                   | 54.0                   | 74.0                   | 7.9               | 13.6              |
| 2483.5             | H   | 44.0                   | 59.4                   | 8.3                 | 52.3                   | 67.7                   | 54.0                   | 74.0                   | 1.7               | 6.3               |

## 2.1.6 AC Conducted Emissions

### Test Location

Shielded Room

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

### Limit

#### - 15.207(a)

| Frequency (MHz) | Conducted Limit (dBuV) |           |
|-----------------|------------------------|-----------|
|                 | Quasi-peak             | Average   |
| 0.15 ~ 0.5      | 66 to 56*              | 56 to 46* |
| 0.5 ~ 5         | 56                     | 46        |
| 5 ~ 30          | 60                     | 50        |

\* Decreases with the logarithm of the frequency.

### Test Results

The requirements are:

☒ **Not Applicable (Battery Power)**

| Frequency (MHz) | Measured Data (dBuV/m) | Margin (dB) | Remark |
|-----------------|------------------------|-------------|--------|
| -               | -                      | -           | -      |

**Test Data**

[HOT]

Not Applicable

Not Applicable



[NEUTRAL]

Not Applicable

Not Applicable

## APPENDIX A – Test Equipment Used For Tests

|    | Name of Equipment             | Manufacturer          | Model No.   | Serial No.  | Cal Date   | Due Date   |
|----|-------------------------------|-----------------------|-------------|-------------|------------|------------|
| 1  | Signal Analyzer               | Agilent               | N9020A      | MY48011598  | 2014-11-07 | 2015-11-07 |
| 2  | Spectrum Analyzer             | Rohde & Schwarz       | FSP-30      | 100994      | 2014-11-07 | 2015-11-07 |
| 3  | EMI Test Receiver             | Rohde & Schwarz       | ESCI7       | 100814      | 2014-12-05 | 2015-12-05 |
| 4  | EMI Test Receiver             | Rohde & Schwarz       | ESCI7       | 100816      | 2014-12-05 | 2015-12-05 |
| 5  | Active Loop Antenna           | SCHWARZBECK           | FMZB 1513   | 1513-126    | 2014-05-19 | 2016-05-19 |
| 6  | Attenuator                    | HP                    | 8498A       | 1801A06913  | 2014-11-11 | 2015-11-11 |
| 7  | EPM Series Power Meter        | HP                    | E4418A      | GB38272734  | 2014-11-17 | 2015-11-17 |
| 8  | Power Sensor                  | HP                    | 8487A       | 3318A03524  | 2015-02-06 | 2016-02-06 |
| 9  | Audio Analyzer                | HP                    | 8903B       | 2747A03432  | 2014-11-10 | 2015-11-10 |
| 10 | ESG-D Series Signal Generator | Agilent               | E4432B      | US40054094  | 2014-11-12 | 2015-11-12 |
| 11 | SYNTHESIZED SWEEPER           | HP                    | 8341B       | 2819A01563  | 2014-11-14 | 2015-11-14 |
| 12 | Attenuator                    | HP                    | 8494A       | 3308A33351  | 2014-11-07 | 2015-11-07 |
| 13 | Temp&Humi Chamber             | Kunpoong              | JT-TH-556-1 | 9QE5-002    | 2015-01-16 | 2016-01-16 |
| 14 | Temp&Humi Chamber             | Kunpoong              | JT-TH-556-2 | 9QE5-003    | 2015-01-16 | 2016-01-16 |
| 15 | Temp&Humi Chamber             | ESPEC CORP.           | SH-241      | 92000872    | 2014-08-18 | 2015-08-18 |
| 16 | DC POWER SUPPLY               | Agilent               | E3632A      | MY40011638  | 2014-11-07 | 2015-11-07 |
| 17 | Horn Antenna                  | ETS-Lindgren          | 3115        | 00078894    | 2013-05-13 | 2015-05-13 |
| 18 | Horn Antenna                  | ETS-Lindgren          | 3116        | 00062504    | 2013-05-27 | 2015-05-27 |
| 19 | Horn Antenna                  | ETS-Lindgren          | 3117        | 00154525    | 2013-07-03 | 2015-07-03 |
| 20 | OPT H64 AMPLIFIER             | HP                    | 8447F       | 3113A06814  | 2015-02-06 | 2016-02-06 |
| 21 | PREAMPLIFIER                  | Agilent               | 8449B       | 3008A02307  | 2014-10-24 | 2015-10-24 |
| 22 | Radio Communication Tester    | Rohde & Schwarz       | CMU200      | 106765      | 2015-02-02 | 2016-02-02 |
| 23 | LISN                          | Rohde & Schwarz       | ENV216      | 101235      | 2014-07-30 | 2015-07-30 |
| 24 | LISN                          | Rohde & Schwarz       | ENV216      | 101236      | 2014-07-30 | 2015-07-30 |
| 25 | LISN                          | Rohde & Schwarz       | ENV216      | 101151      | 2014-11-07 | 2015-11-07 |
| 26 | DC POWER SUPPLY               | Agilent               | E3632A      | MY40011638  | 2014-11-07 | 2015-11-07 |
| 27 | EMI Test Receiver             | Rohde & Schwarz       | ESCI3       | 100032      | 2015-02-02 | 2016-02-02 |
| 28 | 6dB Attenuator                | R&S                   | DNF         | 272.4110.50 | 2014-11-07 | 2015-11-07 |
| 29 | AMPLIFIER                     | Sonoma Instrument Co. | 310         | 291721      | 2015-02-02 | 2016-02-02 |
| 30 | EMI Test Receiver             | Rohde & Schwarz       | ESU40       | 100336      | 2014-05-15 | 2015-05-15 |
| 31 | Signal Generator              | Rohde & Schwarz       | SMBV100A    | 258008      | 2014-08-21 | 2015-08-21 |
| 32 | Bilog Antenna                 | Schaffner             | CBL6111C    | 2551        | 2014-05-08 | 2016-05-08 |