



## EMC TEST REPORT

Test Report No. : KES-E2-19T0063  
Date of Issue : Jul. 08, 2019  
Product name : SMART NECK  
Model/Type No. : TF100  
Variant Mode : -  
Applicant : Twofive Co.,Ltd.  
Applicant Address : #102, 34, Simin-daero, Manan-gu, Anyang-si, Gyeonggi-do, Korea  
Manufacturer : Twofive Co.,Ltd.  
Manufacturer Address : #102, 34, Simin-daero, Manan-gu, Anyang-si, Gyeonggi-do, Korea  
FCC ID : 2ASZB-TF100  
Date of Receipt : Apr. 11, 2019  
Test date : Jun. 04, 2019 ~ Jun. 07, 2019  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Dae Hyun, Kim  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (2) of (30)

**REPORT REVISION HISTORY**

| Date          | Test Report No. | Revision History |
|---------------|-----------------|------------------|
| Jul. 08, 2019 | KES-E2-19T0063  | Issued           |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |
|               |                 |                  |

***This report shall not be reproduced except in full, without the written approval of KES Co., Ltd. This document may be altered or revised by KES Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by KES Co., Ltd. will constitute fraud and shall nullify the document.***

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## TABLE OF CONTENTS

|                                                       |                                                             |    |
|-------------------------------------------------------|-------------------------------------------------------------|----|
| 1.0                                                   | General Product Description.....                            | 4  |
| 1.1                                                   | Test Voltage & Frequency .....                              | 5  |
| 1.2                                                   | Variant Model Differences .....                             | 5  |
| 1.3                                                   | Device Modifications .....                                  | 5  |
| 1.4                                                   | Equipment Under Test.....                                   | 5  |
| 1.5                                                   | Support Equipments .....                                    | 5  |
| 1.6                                                   | External I/O Cabling .....                                  | 6  |
| 1.7                                                   | EUT Operating Mode(s) .....                                 | 6  |
| 1.8                                                   | Configuration .....                                         | 7  |
| 1.9                                                   | Remarks when standards applied .....                        | 8  |
| 1.10                                                  | Calibration Details of Equipment Used for Measurement ..... | 8  |
| 1.11                                                  | Test Facility .....                                         | 8  |
| 1.12                                                  | Laboratory Accreditations and Listings .....                | 8  |
| 2.0                                                   | Test Regulations.....                                       | 9  |
| 2.1                                                   | Conducted Emissions at Mains Power Ports .....              | 11 |
| 2.2                                                   | Radiated Electric Field Emissions(Below 1 GHz) .....        | 12 |
| 2.3                                                   | Radiated Electric Field Emissions(Above 1 GHz) .....        | 13 |
| APPENDIX A – TEST DATA.....                           |                                                             | 14 |
| Conducted Emissions at Mains Power Ports.....         |                                                             | 14 |
| Radiated Electric Field Emissions(Below 1 GHz) .....  |                                                             | 22 |
| Radiated Electric Field Emissions(Above 1 GHz) .....  |                                                             | 24 |
| APPENDIX B - Test Setup Photos and Configuration..... |                                                             | 28 |
| Conducted Voltage Emissions .....                     |                                                             | 28 |
| Radiated Electric Field Emissions(Below 1 GHz) .....  |                                                             | 29 |
| Radiated Electric Field Emissions(Above 1 GHz) .....  |                                                             | 30 |



## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:  
KES-E2-19T0063  
Page (4) of (30)

## 1.0 General Product Description

### Main Specifications of EUT are:

| Item                | spec                                                                       |
|---------------------|----------------------------------------------------------------------------|
| Operating Frequency | 2.4 GHz (Bluetooth)                                                        |
| Power               | Input Power : AC 120 V / 60 Hz<br>Output Power : DC 24 V (AC / DC Adapter) |
| Size                | ( 800 x 1 315 x 1 000 ) mm                                                 |
| Weight              | 105 kg                                                                     |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage ☐ 230 Vac ☒ 120 Vac ☐ 12 Vdc ☐ 24 Vdc ☐ PoE

Frequency ☐ 50 Hz ☒ 60 Hz ☐ Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

| Description   | Model Number    | Serial Number | Manufacturer      | Remarks |
|---------------|-----------------|---------------|-------------------|---------|
| SMART NECK    | TF100           | -             | Twofive Co., Ltd. | EUT     |
| AC/DC Adapter | BSG-100W2404170 | -             | -                 | -       |

## 1.5 Support Equipments

| Description | Model Number | Serial Number | Manufacturer                  | Remarks |
|-------------|--------------|---------------|-------------------------------|---------|
| Smart Phone | SM-9550G     | R33D713KA3F   | Samsung Electronics Co., Ltd. | -       |



## 1.6 External I/O Cabling

### ■ Bluetooth Mode

| Start            |          | END         |          | Cable Spec. |        |
|------------------|----------|-------------|----------|-------------|--------|
| Description      | I/O Port | Description | I/O Port | Length      | Shield |
| SMART NECK (EUT) | Wireless | Smart Phone | Wireless | -           | -      |

### ■ Operating Mode

| Start            |          | END         |          | Cable Spec. |        |
|------------------|----------|-------------|----------|-------------|--------|
| Description      | I/O Port | Description | I/O Port | Length      | Shield |
| SMART NECK (EUT) | Wireless | Smart Phone | Wireless | -           | -      |

## 1.7 EUT Operating Mode(s)

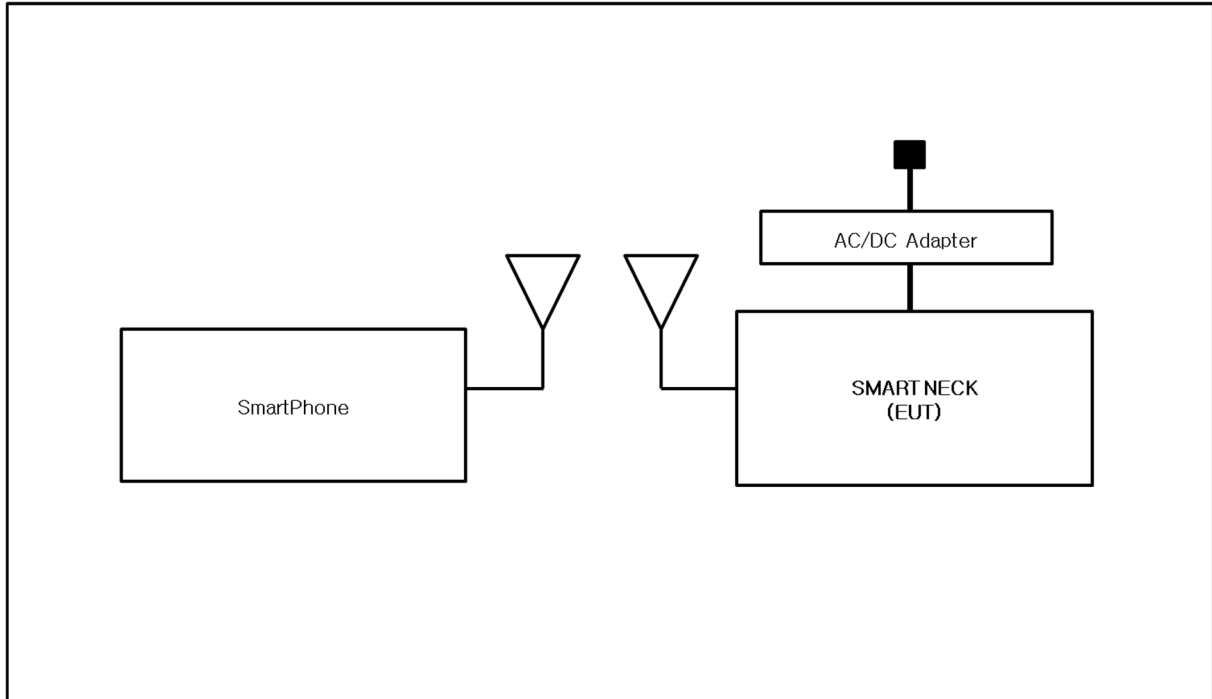
| Test mode | operating                                                                        |
|-----------|----------------------------------------------------------------------------------|
| Bluetooth | Confirmed the operation of EUT through "SmartNeck" application of the SmarPhone. |
| Operating | Confirmed the operation of EUT through Pull Bar Control.                         |

| EUT Test operating S/W |         |                     |
|------------------------|---------|---------------------|
| Name                   | Version | Manufacture Company |
| SmartNeck              | 1.20    | Twofive Co., Ltd.   |

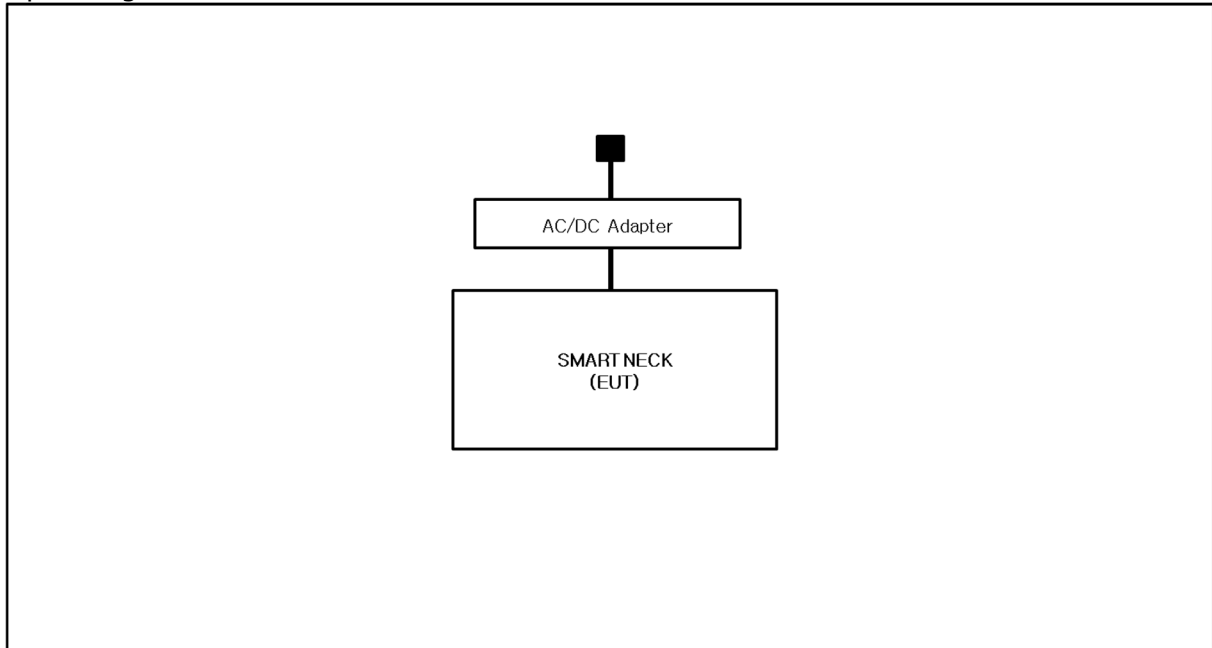
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ Bluetooth Mode



### ■ Operating Mode



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
 The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
 The authenticity of the test report, contact shchoi@kes.co.kr

## 1.9 Remarks when standards applied

N/A

## 1.10 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.

## 1.11 Test Facility

The measurement facility is located at 473-21 Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea. The sites are constructed in conformance with the requirements of ANSI C63.4:2014 and CISPR 16-1-4:2012

## 1.12 Laboratory Accreditations and Listings

| Country       | Agency  | Scope of Accreditation                                                                                                                                                                         | Logo                                                                                                                          |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| KOREA         | RRA     | EMI (3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)                                        | <br>KR0100                                 |
| International | KOLAS   | EMI (3 m & 10 m Semi-Anechoic Chamber, and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)                                                       | <br>KT489                                |
| USA           | FCC     | 3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and Conducted test site to perform FCC Part 15/18 measurements.                                                                               | <br>KR0100                               |
| Canada        | ISED    | 3 m & 10 m Semi-Anechoic Chamber and Conducted test site                                                                                                                                       | <br>23298-1                              |
| JAPAN         | VCCI    | Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz | <br>R-20056, C-20036<br>T-20040, G-20057 |
| Europe        | TÜV SÜD | EMI (3 m & 10 m Semi-Anechoic Chamber, 10 m Open Area and conducted test site)<br>EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)                                        | <br>CARAT 17 07 01633<br>001             |



## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☐ **EMC – Directive 2014/30/EU**

☐ EN 61000-6-3:2011

☐ EN 61000-6-1:2007

☐ EN 61000-6-4:2007 +A1:2011

☐ EN 61000-6-2:2005

☐ EN 55011:2007 +A1:2010

☐ Group 1  
☐ Class A

☐ Group 2  
☐ Class B

☐ EN 55014-1:2006 +A2:2011

☐ EN 55014-2:1997 +A2:2008

☐ EN 55015:2013

☐ EN 55032:2015

☐ Class A

☐ Class B

☐ EN 55024:2010

☐ EN 50130-4:2011 +A1:2014

☐ EN 61000-3-2:2014

☐ EN 61000-3-3:2013

☐ EN 61326-1:2013



**KES Co., Ltd.**

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (10) of (30)

☐ **VCCI V-3 / 2015.04**

☐ Class A

☐ Class B

☐ **AS/NZS:2013**

☐ Class A

☐ Class B

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4-2014

☐ Class A

☒ Class B

☐ **IC Regulation ICES-003 : 2016**

☐ CAN/CSA CISPR 22-10

☐ Class A

☐ Class B

☐ ANSI C63.4-2014

☐ Class A

☐ Class B

☐ **RE- Directive 2014/53/EU**

☐ EN 301 489-1 V1.9.2

☐ Equipment for fixed use

☐ Equipment for vehicular use

☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## 2.1 Conducted Emissions at Mains Power Ports

### Test Date

Jun. 07, 2019

### Test Location

Electro wave Shieldroom #6

### Test Equipment

| Used                                | Description       | Model Number | Manufacturer | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|--------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EMC32        | R & S        | 9.12.00       | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESR3         | R & S        | 101781        | 04, 22, 2020 |
| <input checked="" type="checkbox"/> | LISN              | ENV216       | R & S        | 101787        | 01, 04, 2020 |
| <input type="checkbox"/>            | LISN              | ESH2-Z5      | R & S        | 100450        | 04, 22, 2020 |
| <input checked="" type="checkbox"/> | PULSE LIMITER     | ESH3-Z2      | R & S        | 101915        | 11, 26, 2019 |
| <input type="checkbox"/>            | LISN              | NNBM8124     | SCHWARZBECK  | 8124-1002     | 08, 06, 2019 |
| <input type="checkbox"/>            | LISN              | NNBM8124     | SCHWARZBECK  | 8124-1003     | 08, 06, 2019 |

### Test Conditions

Temperature: 23.2 °C  
Relative Humidity: 46.1 % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.



## 2.2 Radiated Electric Field Emissions(Below 1 GHz)

### Test Date

Jun. 04, 2019

### Test Location

☐ OPEN AREA TEST SITE #2 ☒ SEMI ANECHOIC CHAMBER #4(10 m)

### Test Equipment

| Used                                | Description              | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|--------------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W             | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER        | ESU26        | R & S            | 100551        | 04, 09, 2020 |
| <input checked="" type="checkbox"/> | AMPLIFIER                | SCU 01       | R & S            | 100603        | 11, 26, 2019 |
| <input checked="" type="checkbox"/> | TRILOG-BROADBAND ANTENNA | VULB9163     | Schwarzbeck      | 715           | 11, 29, 2020 |
| <input checked="" type="checkbox"/> | ATTENUATOR               | 8491A        | HP               | 32173         | 03, 11, 2020 |

### Test Conditions

Temperature: 22.8 °C  
Relative Humidity: 43.5 % R.H.

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Settings

IF Band Width: 120 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.



## 2.3 Radiated Electric Field Emissions(Above 1 GHz)

### Test Date

Jun. 06, 2019

### Test Location

SEMI ANECHOIC CHAMBER #4(10 m)

### Test Equipment

| Used                                | Description       | Model Number | Manufacturer     | Serial Number | Cal. Due     |
|-------------------------------------|-------------------|--------------|------------------|---------------|--------------|
| <input checked="" type="checkbox"/> | EMI Test S/W      | EP5/RE       | TOYO Corporation | 6.0.0         | -            |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER | ESU26        | R & S            | 100551        | 04, 09, 2020 |
| <input checked="" type="checkbox"/> | PREAMPLIFIER      | 8449B        | AGILENT          | 3008A01742    | 01, 08, 2020 |
| <input checked="" type="checkbox"/> | ATTENUATOR        | 8491A        | HP               | 35496         | 03, 11, 2020 |
| <input checked="" type="checkbox"/> | HORN ANTENNA      | BBHA 9120D   | SCHWARZBECK      | 9120D-1802    | 03, 12, 2020 |

### Test Conditions

Temperature: 23.0 °C  
Relative Humidity: 43.0 % R.H.

### Frequency Range of Measurement

1 GHz to 12.4 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.

## APPENDIX A – TEST DATA

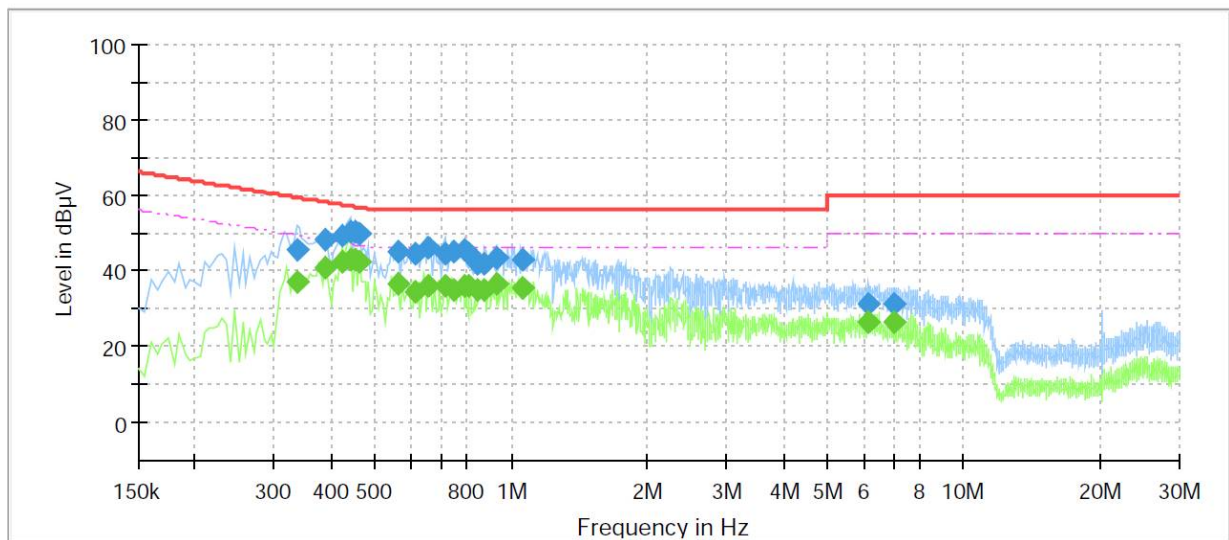
### Conducted Emissions at Mains Power Ports

■ Bluetooth Mode

HOT LINE

### Common Information

|                   |                    |
|-------------------|--------------------|
| Test Description: | Conducted Emission |
| Model No.:        | TF100              |
| Mode              | FCC / Bluetooth    |
| Operator Name:    | KES                |







## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (15) of (30)

## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.335000        | ---              | 36.87           | 49.33        | 12.46       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.335000        | 45.40            | ---             | 59.33        | 13.93       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.390000        | 47.99            | ---             | 58.06        | 10.07       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.390000        | ---              | 40.85           | 48.06        | 7.21        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.425000        | ---              | 42.33           | 47.35        | 5.02        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.425000        | 49.33            | ---             | 57.35        | 8.02        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.440000        | ---              | 42.77           | 47.06        | 4.29        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.440000        | 50.55            | ---             | 57.06        | 6.51        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.450000        | ---              | 42.79           | 46.88        | 4.09        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.450000        | 50.24            | ---             | 56.88        | 6.64        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.460000        | ---              | 42.55           | 46.69        | 4.14        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.460000        | 49.74            | ---             | 56.69        | 6.95        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.565000        | ---              | 36.33           | 46.00        | 9.67        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.565000        | 44.79            | ---             | 56.00        | 11.21       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.615000        | 44.62            | ---             | 56.00        | 11.38       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.615000        | ---              | 34.19           | 46.00        | 11.81       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.655000        | ---              | 35.84           | 46.00        | 10.16       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.655000        | 46.29            | ---             | 56.00        | 9.71        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.715000        | 44.72            | ---             | 56.00        | 11.28       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.715000        | ---              | 35.77           | 46.00        | 10.23       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.745000        | 45.17            | ---             | 56.00        | 10.83       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.745000        | ---              | 35.00           | 46.00        | 11.00       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.785000        | 45.73            | ---             | 56.00        | 10.27       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.785000        | ---              | 36.15           | 46.00        | 9.85        | 1000.0          | 9.000           | L1   | 19.7       |
| 0.810000        | 44.42            | ---             | 56.00        | 11.58       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.810000        | ---              | 35.80           | 46.00        | 10.20       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.845000        | ---              | 34.84           | 46.00        | 11.16       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.845000        | 41.81            | ---             | 56.00        | 14.19       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.875000        | ---              | 34.96           | 46.00        | 11.04       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.875000        | 41.62            | ---             | 56.00        | 14.38       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.925000        | ---              | 36.42           | 46.00        | 9.58        | 1000.0          | 9.000           | L1   | 19.7       |
| 0.925000        | 43.40            | ---             | 56.00        | 12.60       | 1000.0          | 9.000           | L1   | 19.7       |
| 1.065000        | 42.63            | ---             | 56.00        | 13.37       | 1000.0          | 9.000           | L1   | 19.7       |
| 1.065000        | ---              | 35.73           | 46.00        | 10.27       | 1000.0          | 9.000           | L1   | 19.7       |
| 6.185000        | 31.20            | ---             | 60.00        | 28.80       | 1000.0          | 9.000           | L1   | 19.8       |
| 6.185000        | ---              | 26.54           | 50.00        | 23.46       | 1000.0          | 9.000           | L1   | 19.8       |
| 6.985000        | 31.05            | ---             | 60.00        | 28.95       | 1000.0          | 9.000           | L1   | 19.9       |
| 6.985000        | ---              | 26.47           | 50.00        | 23.53       | 1000.0          | 9.000           | L1   | 19.9       |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

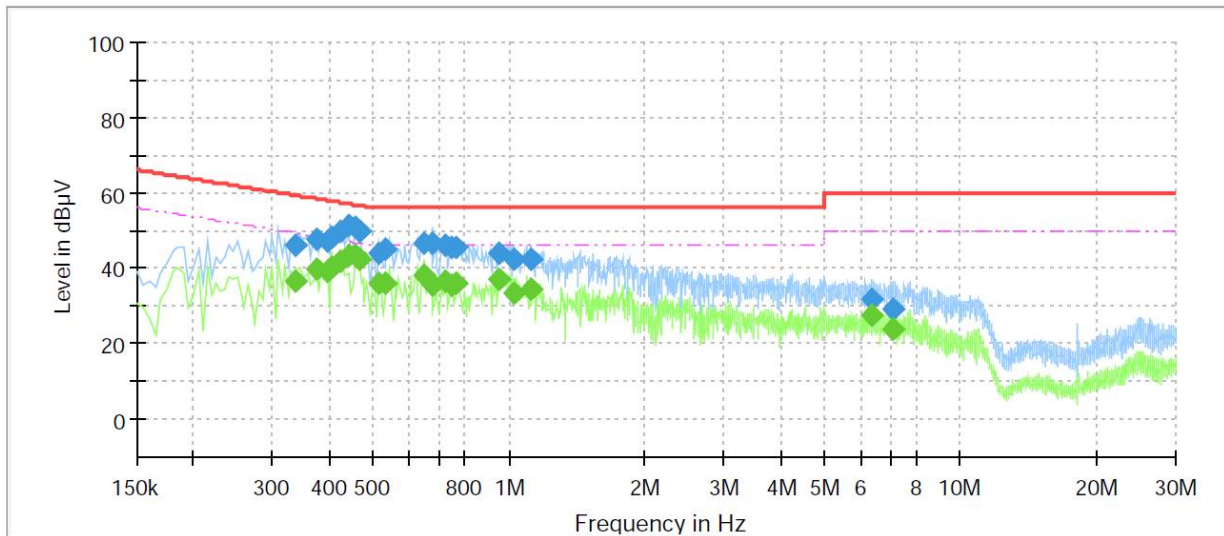
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:  
KES-E2-19T0063  
Page (16) of (30)

### NEUTRAL LINE

## Common Information

|                   |                    |
|-------------------|--------------------|
| Test Description: | Conducted Emission |
| Model No.:        | TF100              |
| Mode              | FCC / Bluetooth    |
| Operator Name:    | KES                |



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr





## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (17) of (30)

## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.335000        | ---              | 36.33           | 49.33        | 13.00       | 1000.0          | 9.000           | N    | 19.6       |
| 0.335000        | 46.02            | ---             | 59.33        | 13.31       | 1000.0          | 9.000           | N    | 19.6       |
| 0.375000        | 47.40            | ---             | 58.39        | 10.99       | 1000.0          | 9.000           | N    | 19.6       |
| 0.375000        | ---              | 39.48           | 48.39        | 8.91        | 1000.0          | 9.000           | N    | 19.6       |
| 0.395000        | ---              | 39.27           | 47.96        | 8.69        | 1000.0          | 9.000           | N    | 19.6       |
| 0.395000        | 47.32            | ---             | 57.96        | 10.64       | 1000.0          | 9.000           | N    | 19.6       |
| 0.405000        | ---              | 40.20           | 47.75        | 7.55        | 1000.0          | 9.000           | N    | 19.6       |
| 0.405000        | 48.22            | ---             | 57.75        | 9.53        | 1000.0          | 9.000           | N    | 19.6       |
| 0.425000        | ---              | 41.80           | 47.35        | 5.55        | 1000.0          | 9.000           | N    | 19.6       |
| 0.425000        | 49.87            | ---             | 57.35        | 7.48        | 1000.0          | 9.000           | N    | 19.6       |
| 0.440000        | ---              | 43.23           | 47.06        | 3.83        | 1000.0          | 9.000           | N    | 19.6       |
| 0.440000        | 51.21            | ---             | 57.06        | 5.85        | 1000.0          | 9.000           | N    | 19.6       |
| 0.455000        | ---              | 43.60           | 46.78        | 3.18        | 1000.0          | 9.000           | N    | 19.6       |
| 0.455000        | 51.01            | ---             | 56.78        | 5.77        | 1000.0          | 9.000           | N    | 19.6       |
| 0.465000        | 49.67            | ---             | 56.60        | 6.93        | 1000.0          | 9.000           | N    | 19.6       |
| 0.465000        | ---              | 42.14           | 46.60        | 4.46        | 1000.0          | 9.000           | N    | 19.6       |
| 0.515000        | ---              | 36.05           | 46.00        | 9.95        | 1000.0          | 9.000           | N    | 19.6       |
| 0.515000        | 43.96            | ---             | 56.00        | 12.04       | 1000.0          | 9.000           | N    | 19.6       |
| 0.535000        | ---              | 36.15           | 46.00        | 9.85        | 1000.0          | 9.000           | N    | 19.6       |
| 0.535000        | 44.74            | ---             | 56.00        | 11.26       | 1000.0          | 9.000           | N    | 19.6       |
| 0.645000        | ---              | 38.07           | 46.00        | 7.93        | 1000.0          | 9.000           | N    | 19.6       |
| 0.645000        | 46.51            | ---             | 56.00        | 9.49        | 1000.0          | 9.000           | N    | 19.6       |
| 0.675000        | 46.47            | ---             | 56.00        | 9.53        | 1000.0          | 9.000           | N    | 19.6       |
| 0.675000        | ---              | 35.54           | 46.00        | 10.46       | 1000.0          | 9.000           | N    | 19.6       |
| 0.725000        | ---              | 36.51           | 46.00        | 9.49        | 1000.0          | 9.000           | N    | 19.6       |
| 0.725000        | 46.20            | ---             | 56.00        | 9.80        | 1000.0          | 9.000           | N    | 19.6       |
| 0.745000        | 45.54            | ---             | 56.00        | 10.46       | 1000.0          | 9.000           | N    | 19.6       |
| 0.745000        | ---              | 35.23           | 46.00        | 10.77       | 1000.0          | 9.000           | N    | 19.6       |
| 0.765000        | 45.56            | ---             | 56.00        | 10.44       | 1000.0          | 9.000           | N    | 19.6       |
| 0.765000        | ---              | 35.78           | 46.00        | 10.22       | 1000.0          | 9.000           | N    | 19.6       |
| 0.955000        | ---              | 37.19           | 46.00        | 8.81        | 1000.0          | 9.000           | N    | 19.7       |
| 0.955000        | 43.99            | ---             | 56.00        | 12.01       | 1000.0          | 9.000           | N    | 19.7       |
| 1.025000        | 42.60            | ---             | 56.00        | 13.40       | 1000.0          | 9.000           | N    | 19.7       |
| 1.025000        | ---              | 33.25           | 46.00        | 12.75       | 1000.0          | 9.000           | N    | 19.7       |
| 1.115000        | 42.32            | ---             | 56.00        | 13.68       | 1000.0          | 9.000           | N    | 19.7       |
| 1.115000        | ---              | 34.40           | 46.00        | 11.60       | 1000.0          | 9.000           | N    | 19.7       |
| 6.375000        | ---              | 27.35           | 50.00        | 22.65       | 1000.0          | 9.000           | N    | 19.8       |
| 6.375000        | 31.62            | ---             | 60.00        | 28.38       | 1000.0          | 9.000           | N    | 19.8       |
| 7.090000        | ---              | 24.02           | 50.00        | 25.98       | 1000.0          | 9.000           | N    | 19.9       |
| 7.090000        | 29.28            | ---             | 60.00        | 30.72       | 1000.0          | 9.000           | N    | 19.9       |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (18) of (30)

### ■ Operating Mode

HOT LINE

## Common Information

Test Description:

Model No.:

Mode

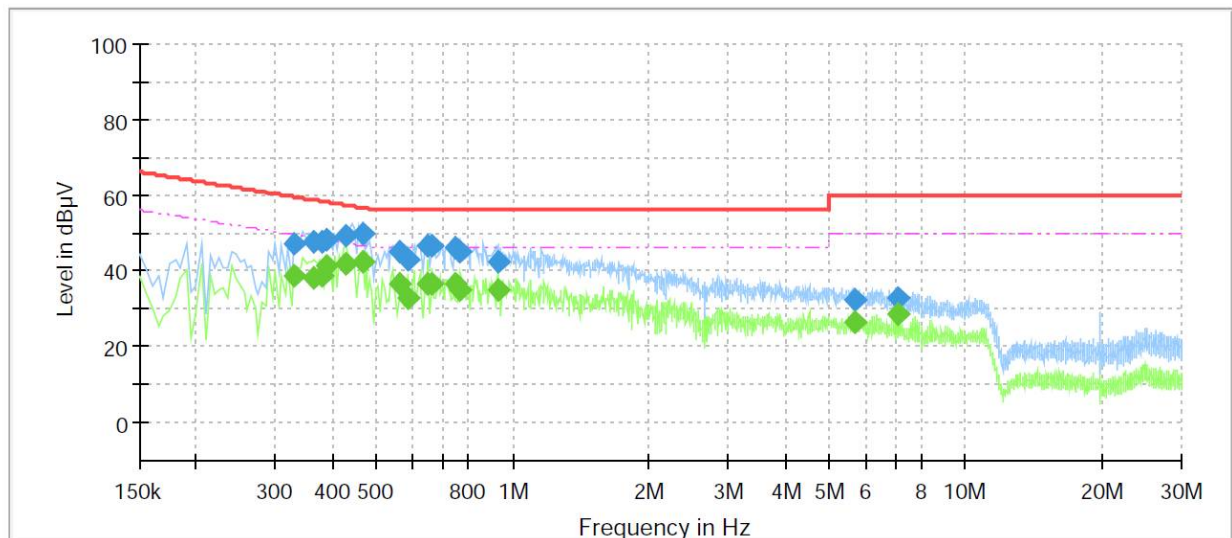
Operator Name:

Conducted Emission

TF100

FCC / Operating

KES



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr





## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (19) of (30)

## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.330000        | ---              | 38.81           | 49.45        | 10.64       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.330000        | 46.87            | ---             | 59.45        | 12.58       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.365000        | 47.55            | ---             | 58.61        | 11.06       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.365000        | ---              | 37.93           | 48.61        | 10.68       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.380000        | ---              | 38.80           | 48.28        | 9.48        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.380000        | 47.86            | ---             | 58.28        | 10.42       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.390000        | 48.24            | ---             | 58.06        | 9.82        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.390000        | ---              | 41.08           | 48.06        | 6.98        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.430000        | ---              | 42.00           | 47.25        | 5.25        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.430000        | 49.27            | ---             | 57.25        | 7.98        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.465000        | 49.74            | ---             | 56.60        | 6.86        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.465000        | ---              | 42.16           | 46.60        | 4.44        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.560000        | 45.05            | ---             | 56.00        | 10.95       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.560000        | ---              | 36.41           | 46.00        | 9.59        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.590000        | 43.11            | ---             | 56.00        | 12.89       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.590000        | ---              | 32.78           | 46.00        | 13.22       | 1000.0          | 9.000           | L1   | 19.6       |
| 0.650000        | 46.64            | ---             | 56.00        | 9.36        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.650000        | ---              | 36.31           | 46.00        | 9.69        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.665000        | ---              | 36.47           | 46.00        | 9.53        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.665000        | 46.38            | ---             | 56.00        | 9.62        | 1000.0          | 9.000           | L1   | 19.6       |
| 0.750000        | ---              | 36.41           | 46.00        | 9.59        | 1000.0          | 9.000           | L1   | 19.7       |
| 0.750000        | 46.07            | ---             | 56.00        | 9.93        | 1000.0          | 9.000           | L1   | 19.7       |
| 0.760000        | 45.19            | ---             | 56.00        | 10.81       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.760000        | ---              | 35.19           | 46.00        | 10.81       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.925000        | 42.27            | ---             | 56.00        | 13.73       | 1000.0          | 9.000           | L1   | 19.7       |
| 0.925000        | ---              | 35.20           | 46.00        | 10.80       | 1000.0          | 9.000           | L1   | 19.7       |
| 5.700000        | ---              | 26.44           | 50.00        | 23.56       | 1000.0          | 9.000           | L1   | 19.8       |
| 5.700000        | 32.41            | ---             | 60.00        | 27.59       | 1000.0          | 9.000           | L1   | 19.8       |
| 7.065000        | 33.02            | ---             | 60.00        | 26.98       | 1000.0          | 9.000           | L1   | 19.9       |
| 7.065000        | ---              | 28.36           | 50.00        | 21.64       | 1000.0          | 9.000           | L1   | 19.9       |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (20) of (30)

### NEUTRAL LINE

## Common Information

Test Description:

Model No.:

Mode

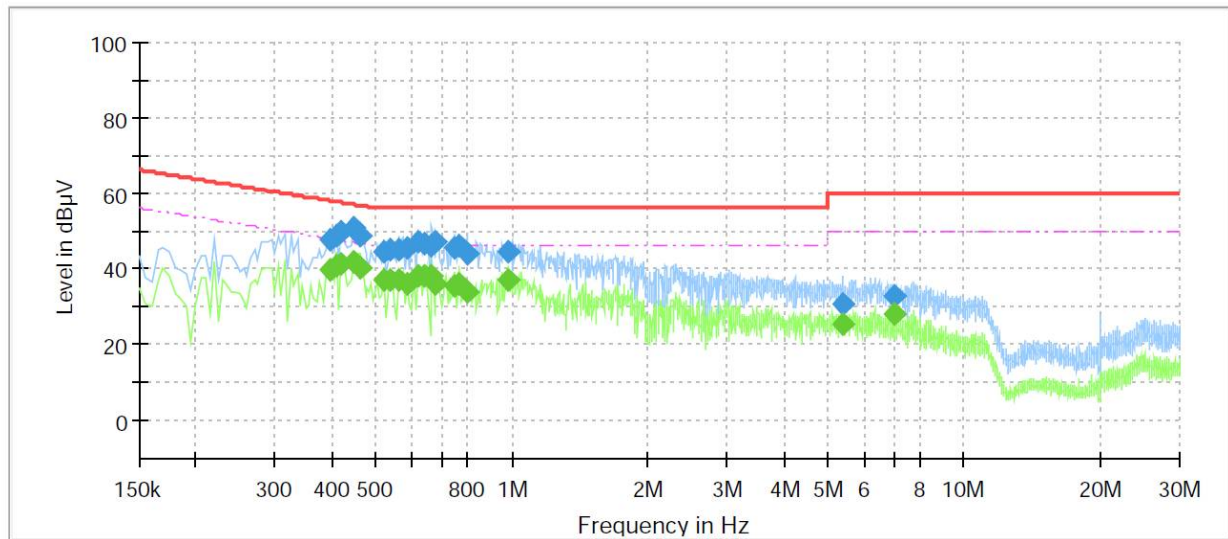
Operator Name:

Conducted Emission

TF100

FCC / Operating

KES



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr





## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (21) of (30)

## Final Result

| Frequency (MHz) | QuasiPeak (dBμV) | CAverage (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|------------------|-----------------|--------------|-------------|-----------------|-----------------|------|------------|
| 0.395000        | ---              | 39.95           | 47.96        | 8.01        | 1000.0          | 9.000           | N    | 19.6       |
| 0.395000        | 47.70            | ---             | 57.96        | 10.26       | 1000.0          | 9.000           | N    | 19.6       |
| 0.410000        | ---              | 40.78           | 47.65        | 6.87        | 1000.0          | 9.000           | N    | 19.6       |
| 0.410000        | 48.78            | ---             | 57.65        | 8.87        | 1000.0          | 9.000           | N    | 19.6       |
| 0.420000        | ---              | 41.39           | 47.45        | 6.06        | 1000.0          | 9.000           | N    | 19.6       |
| 0.420000        | 49.78            | ---             | 57.45        | 7.67        | 1000.0          | 9.000           | N    | 19.6       |
| 0.445000        | ---              | 42.06           | 46.97        | 4.91        | 1000.0          | 9.000           | N    | 19.6       |
| 0.445000        | 50.73            | ---             | 56.97        | 6.24        | 1000.0          | 9.000           | N    | 19.6       |
| 0.460000        | ---              | 40.13           | 46.69        | 6.56        | 1000.0          | 9.000           | N    | 19.6       |
| 0.460000        | 48.89            | ---             | 56.69        | 7.80        | 1000.0          | 9.000           | N    | 19.6       |
| 0.520000        | ---              | 37.16           | 46.00        | 8.84        | 1000.0          | 9.000           | N    | 19.6       |
| 0.520000        | 44.70            | ---             | 56.00        | 11.30       | 1000.0          | 9.000           | N    | 19.6       |
| 0.540000        | ---              | 36.83           | 46.00        | 9.17        | 1000.0          | 9.000           | N    | 19.6       |
| 0.540000        | 45.05            | ---             | 56.00        | 10.95       | 1000.0          | 9.000           | N    | 19.6       |
| 0.560000        | 44.85            | ---             | 56.00        | 11.15       | 1000.0          | 9.000           | N    | 19.6       |
| 0.560000        | ---              | 36.92           | 46.00        | 9.08        | 1000.0          | 9.000           | N    | 19.6       |
| 0.590000        | ---              | 36.17           | 46.00        | 9.83        | 1000.0          | 9.000           | N    | 19.6       |
| 0.590000        | 45.61            | ---             | 56.00        | 10.39       | 1000.0          | 9.000           | N    | 19.6       |
| 0.620000        | 46.90            | ---             | 56.00        | 9.10        | 1000.0          | 9.000           | N    | 19.6       |
| 0.620000        | ---              | 38.12           | 46.00        | 7.88        | 1000.0          | 9.000           | N    | 19.6       |
| 0.640000        | 46.56            | ---             | 56.00        | 9.44        | 1000.0          | 9.000           | N    | 19.6       |
| 0.640000        | ---              | 38.18           | 46.00        | 7.82        | 1000.0          | 9.000           | N    | 19.6       |
| 0.665000        | ---              | 37.97           | 46.00        | 8.03        | 1000.0          | 9.000           | N    | 19.6       |
| 0.665000        | 46.10            | ---             | 56.00        | 9.90        | 1000.0          | 9.000           | N    | 19.6       |
| 0.680000        | ---              | 35.96           | 46.00        | 10.04       | 1000.0          | 9.000           | N    | 19.6       |
| 0.680000        | 46.91            | ---             | 56.00        | 9.09        | 1000.0          | 9.000           | N    | 19.6       |
| 0.745000        | ---              | 35.38           | 46.00        | 10.62       | 1000.0          | 9.000           | N    | 19.6       |
| 0.745000        | 45.78            | ---             | 56.00        | 10.22       | 1000.0          | 9.000           | N    | 19.6       |
| 0.765000        | 45.83            | ---             | 56.00        | 10.17       | 1000.0          | 9.000           | N    | 19.6       |
| 0.765000        | ---              | 35.96           | 46.00        | 10.04       | 1000.0          | 9.000           | N    | 19.6       |
| 0.795000        | 44.02            | ---             | 56.00        | 11.98       | 1000.0          | 9.000           | N    | 19.6       |
| 0.795000        | ---              | 34.09           | 46.00        | 11.91       | 1000.0          | 9.000           | N    | 19.6       |
| 0.985000        | 44.25            | ---             | 56.00        | 11.75       | 1000.0          | 9.000           | N    | 19.7       |
| 0.985000        | ---              | 37.03           | 46.00        | 8.97        | 1000.0          | 9.000           | N    | 19.7       |
| 5.385000        | 30.63            | ---             | 60.00        | 29.37       | 1000.0          | 9.000           | N    | 19.8       |
| 5.385000        | ---              | 25.19           | 50.00        | 24.81       | 1000.0          | 9.000           | N    | 19.8       |
| 7.045000        | 32.86            | ---             | 60.00        | 27.14       | 1000.0          | 9.000           | N    | 19.9       |
| 7.045000        | ---              | 27.98           | 50.00        | 22.02       | 1000.0          | 9.000           | N    | 19.9       |

### ◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

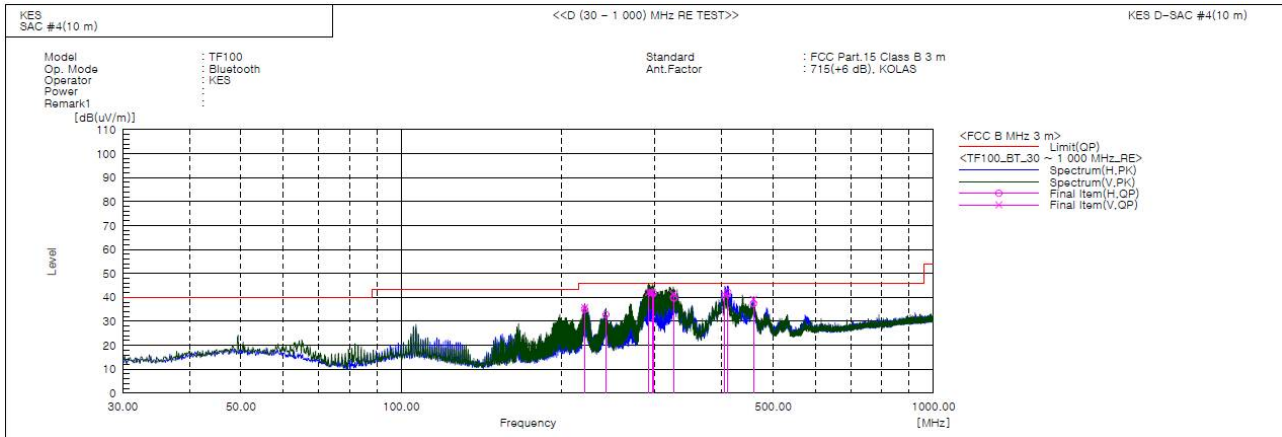
Report No.:

KES-E2-19T0063

Page (22) of (30)

## Radiated Electric Field Emissions(Below 1 GHz)

### Bluetooth Mode



### 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] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 221.128         | H   | 56.7                | -21.6         | 35.1                 | 46.0                | 10.9           | 357.0       | 143.0       |        |
| 2   | 221.241         | V   | 57.3                | -21.6         | 35.7                 | 46.0                | 10.3           | 162.0       | 99.0        |        |
| 3   | 242.543         | H   | 54.0                | -21.2         | 32.8                 | 46.0                | 13.2           | 195.0       | 143.0       |        |
| 4   | 292.036         | V   | 62.4                | -20.2         | 42.2                 | 46.0                | 3.8            | 116.0       | 95.0        |        |
| 5   | 296.253         | V   | 62.0                | -20.0         | 42.0                 | 46.0                | 4.0            | 152.0       | 115.0       |        |
| 6   | 297.582         | H   | 61.7                | -19.9         | 41.8                 | 46.0                | 4.2            | 247.0       | 167.0       |        |
| 7   | 324.626         | V   | 59.9                | -18.5         | 41.4                 | 46.0                | 4.6            | 138.0       | 99.0        |        |
| 8   | 325.612         | H   | 58.2                | -18.4         | 39.8                 | 46.0                | 6.2            | 355.0       | 40.0        |        |
| 9   | 405.519         | V   | 57.5                | -16.5         | 41.0                 | 46.0                | 5.0            | 229.0       | 71.0        |        |
| 10  | 410.979         | H   | 58.6                | -16.5         | 42.1                 | 46.0                | 3.9            | 204.0       | 135.0       |        |
| 11  | 459.220         | H   | 53.1                | -15.7         | 37.4                 | 46.0                | 8.6            | 220.0       | 24.0        |        |
| 12  | 459.354         | V   | 54.9                | -15.7         | 39.2                 | 46.0                | 6.8            | 311.0       | 350.0       |        |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

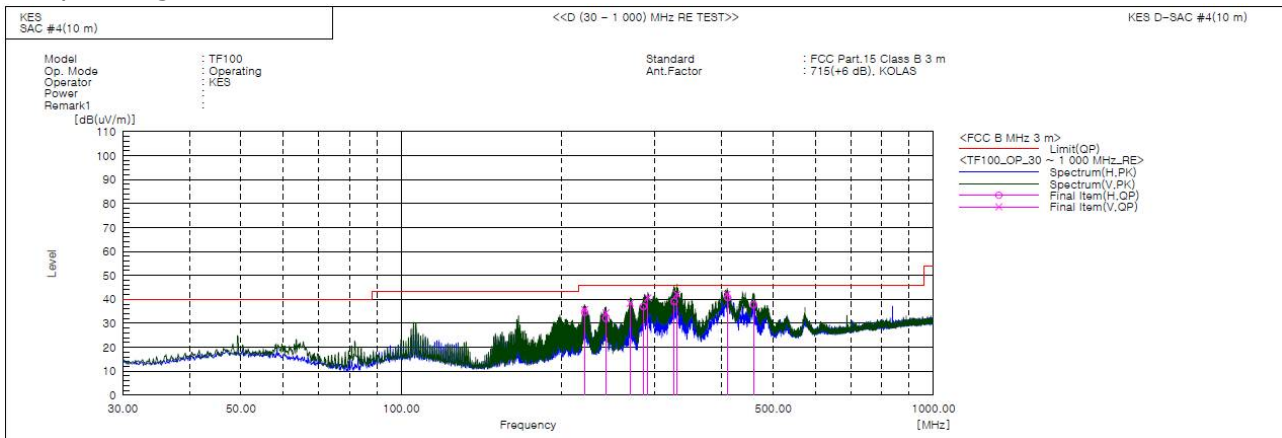
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (23) of (30)

### Operating Mode



### Final Result

| No. | Frequency<br>[MHz] | (P) | Reading<br>QP<br>[dB(uV)] | c.f<br>[dB(1/m)] | Result<br>QP<br>[dB(uV/m)] | Limit<br>QP<br>[dB(uV/m)] | Margin<br>QP<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|-----|--------------------|-----|---------------------------|------------------|----------------------------|---------------------------|----------------------|----------------|----------------|--------|
| 1   | 221.090            | V   | 57.3                      | -21.6            | 35.7                       | 46.0                      | 10.3                 | 195.0          | 87.0           |        |
| 2   | 221.214            | H   | 56.3                      | -21.6            | 34.7                       | 46.0                      | 11.3                 | 328.0          | 135.0          |        |
| 3   | 242.437            | H   | 53.3                      | -21.2            | 32.1                       | 46.0                      | 13.9                 | 216.0          | 135.0          |        |
| 4   | 242.432            | V   | 55.6                      | -21.2            | 34.4                       | 46.0                      | 11.6                 | 115.0          | 83.0           |        |
| 5   | 269.348            | V   | 59.2                      | -20.8            | 38.4                       | 46.0                      | 7.6                  | 242.0          | 43.0           |        |
| 6   | 285.129            | H   | 57.5                      | -20.4            | 37.1                       | 46.0                      | 8.9                  | 384.0          | 139.0          |        |
| 7   | 290.926            | V   | 60.9                      | -20.2            | 40.7                       | 46.0                      | 5.3                  | 139.0          | 230.0          |        |
| 8   | 325.622            | H   | 57.5                      | -18.4            | 39.1                       | 46.0                      | 6.9                  | 200.0          | 43.0           |        |
| 9   | 329.973            | V   | 60.3                      | -18.2            | 42.1                       | 46.0                      | 3.9                  | 107.0          | 190.0          |        |
| 10  | 409.634            | V   | 58.7                      | -16.5            | 42.2                       | 46.0                      | 3.8                  | 129.0          | 111.0          |        |
| 11  | 410.831            | H   | 57.3                      | -16.5            | 40.8                       | 46.0                      | 5.2                  | 260.0          | 131.0          |        |
| 12  | 459.225            | H   | 53.5                      | -15.7            | 37.8                       | 46.0                      | 8.2                  | 320.0          | 35.0           |        |

### ◆ Calculation – SAC #4(10 m)

Result(QP) [dB( $\mu$ V/m)] = (Reading(QP)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB( $\mu$ V/m)] - Result(QP) [dB( $\mu$ V/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value





## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

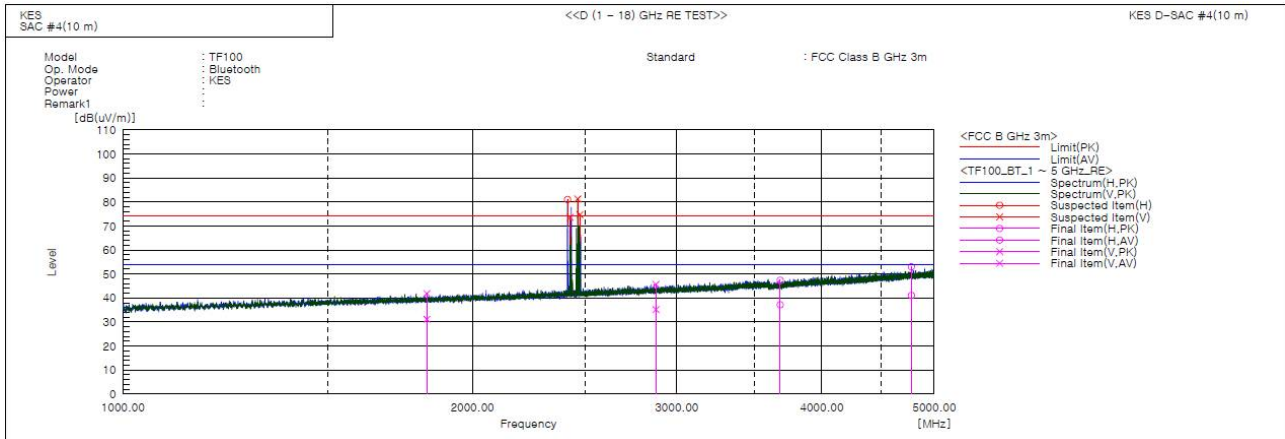
Report No.:

KES-E2-19T0063

Page (24) of (30)

## Radiated Electric Field Emissions(Above 1 GHz)

### Bluetooth Mode - (1 ~ 5) GHz



### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 1827.455        | V   | 43.1                | -1.2          | 41.9                 | 74.0                | 54.0                | 32.1           | 363.0       | 207.0       |        |
| 2   | 2878.885        | V   | 42.3                | 3.4           | 45.7                 | 74.0                | 54.0                | 28.3           | 241.0       | 264.0       |        |
| 3   | 3683.855        | H   | 41.3                | 6.1           | 47.4                 | 74.0                | 54.0                | 26.6           | 123.0       | 144.0       |        |
| 4   | 4778.155        | H   | 42.4                | 10.6          | 53.0                 | 74.0                | 54.0                | 21.0           | 335.0       | 246.0       |        |
| 5   | 2416.000        | H   | -----               | 1.5           | -----                | 74.0                | 54.0                | -----          | 100.0       | 123.0       |        |
| 6   | 2428.000        | V   | -----               | 1.6           | -----                | 74.0                | 54.0                | -----          | 100.0       | 249.0       |        |
| 7   | 2465.500        | V   | -----               | 1.8           | -----                | 74.0                | 54.0                | -----          | 100.0       | 18.0        |        |
| 8   | 2476.000        | V   | -----               | 1.8           | -----                | 74.0                | 54.0                | -----          | 100.0       | 45.0        |        |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



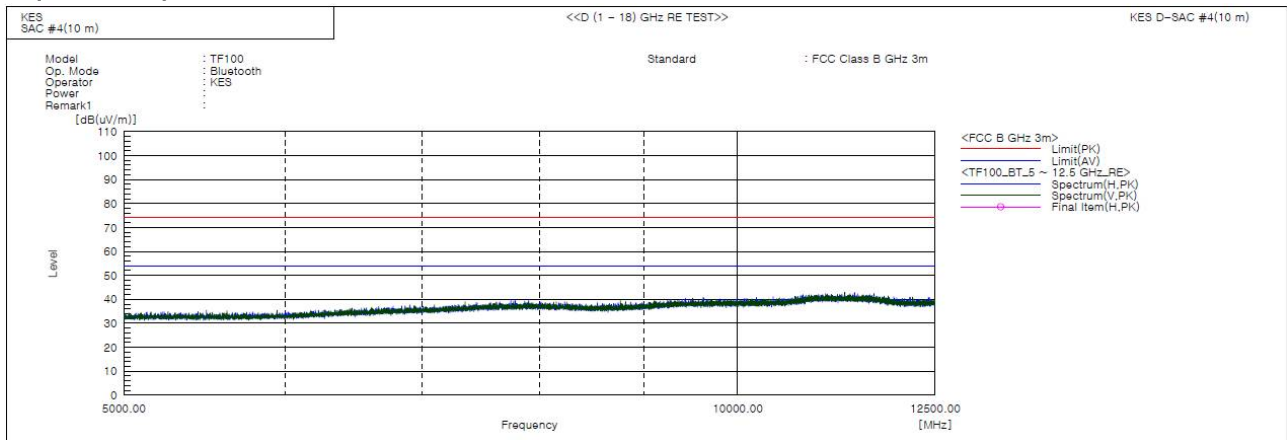


## KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:  
KES-E2-19T0063  
Page (25) of (30)

– (5 ~ 12.5) GHz



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

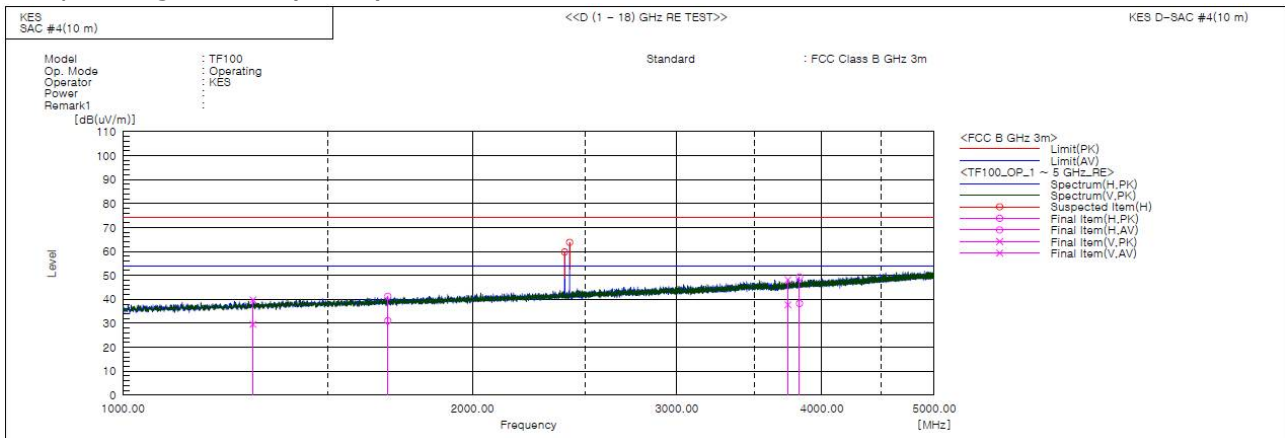
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (26) of (30)

### ■ Operating Mode – (1 ~ 5) GHz



### Final Result

| No. | Frequency [MHz] | (P) | Reading PK [dB(uV)] | c.f [dB(1/m)] | Result PK [dB(uV/m)] | Limit PK [dB(uV/m)] | Limit AV [dB(uV/m)] | Margin PK [dB] | Height [cm] | Angle [deg] | Remark |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|---------------------|----------------|-------------|-------------|--------|
| 1   | 1294.355        | V   | 43.9                | -4.1          | 39.8                 | 74.0                | 54.0                | 34.2           | 251.0       | 106.0       |        |
| 2   | 1691.360        | H   | 43.1                | -1.8          | 41.3                 | 74.0                | 54.0                | 32.7           | 253.0       | 138.0       |        |
| 3   | 3741.075        | V   | 41.7                | 6.5           | 48.2                 | 74.0                | 54.0                | 25.8           | 195.0       | 243.0       |        |
| 4   | 3827.560        | H   | 42.3                | 7.0           | 49.3                 | 74.0                | 54.0                | 24.7           | 119.0       | 359.0       |        |
| 5   | 2402.000        | H   | -----               | 1.5           | -----                | 74.0                | 54.0                | -----          | 100.0       | 48.0        |        |
| 6   | 2426.000        | H   | -----               | 1.6           | -----                | 74.0                | 54.0                | -----          | 100.0       | 297.0       |        |

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr



## KES Co., Ltd.

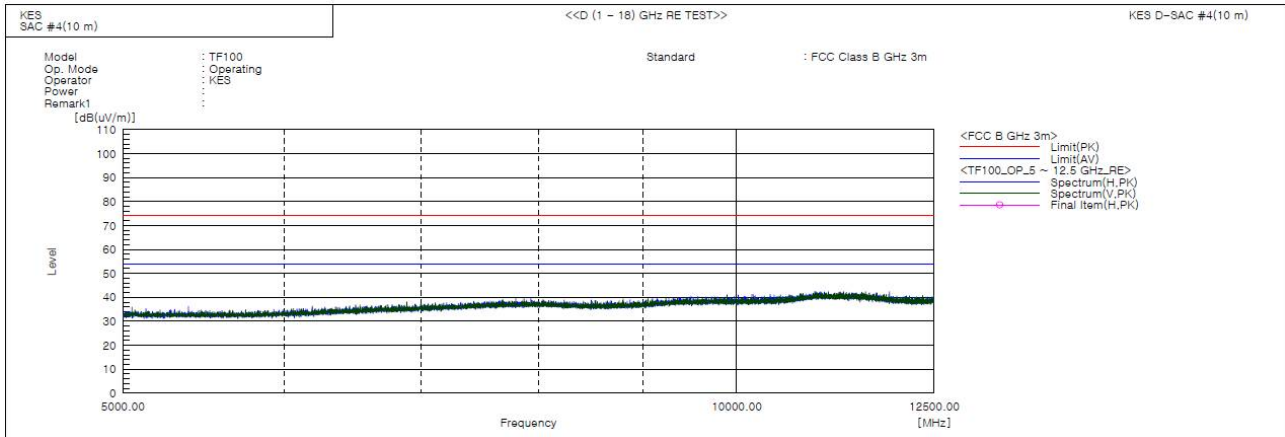
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:

KES-E2-19T0063

Page (27) of (30)

– (5 ~ 12.5) GHz



### ◆ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

\* Exclusion Band : 2.4 GHz

\* No spurious emission were detected above 5 GHz.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.  
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
The authenticity of the test report, contact shchoi@kes.co.kr