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TEST REPORT

Report No.: 17070431HKG-001

Application For Original Grant of 47 CFR Part 15 Certification

Cisco IP Conference Phone (Bluetooth 3.0 portion)

FCC ID: LDK88321516

PREPARED AND CHECKED BY:	APPROVED BY:
Signed On File Yao Xin Lu, Josie Engineer	Digitally signed by Jess Tang Location: Intertek Testing Services Hong Kong Ltd. Jess Tang Lead Engineer Date: August 17, 2017

TEST REPORT

GENERAL INFORMATION

Grantee:	Cisco Systems Inc.
Grantee Address:	125 West Tasman Drive, San Jose, CA 95134-1706.
FCC Specification Standard:	FCC Part 15, October 1, 2015 Edition
FCC ID:	LDK88321516
FCC Model(s):	CP-8832
Type of EUT:	Transceiver
Description of EUT:	Cisco IP Conference Phone
Serial Number:	N/A
Sample Receipt Date:	July 07, 2017
Date of Test:	July 07, 2017 to August 11, 2017
Report Date:	August 17, 2017
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.0 Test Results Summary & Statement of Compliance

1.1 Summary of Test Results

TEST ITEMS	FCC PART 15 SECTION	RESULTS	DETAILS SEE SECTION
Antenna Requirement	15.203	Pass	2.1
Radiated Emission	15.249, 15.209	Pass	4.2
Radiated Emission on the Bandedge		Pass	4.3
Radiated Emission in Restricted Bands	15.205	Pass	4.2
AC Power Line Conducted Emission	15.207 & 15.107	Pass	4.4

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

1.2 Statement of Compliance

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

FCC Part 15, October 1, 2015 Edition

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EXHIBIT 2 GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The CP-8832 is a Cisco IP Conference Phone. It is the next generation IP Conference Phone with Wireless Wi-Fi (802.11a/ac/b/g/n) connectivity as well as Wired RJ45 POE Ethernet support, Bluetooth connectivity, and DECT wireless microphone, as well as 3.5mm wired extension microphone support. The EUT was powered by 120AC adaptor or POE.

The EUT can support Bluetooth 3.0 mode, Bluetooth 4.0 BLE mode, 2.4GHz WiFi mode, 5.8GHz WiFi mode and 1.9GHz DECT mode.

For the Bluetooth module:
For Bluetooth 3.0 mode, it occupies a frequency range from 2402MHz to 2480MHz (79 channels with channel spacing of 1MHz). It transmits via GFSK modulation.

The antenna(s) used in the EUT is internal, integral. And the test sample is a prototype.

The circuit description is saved with filename: descri.pdf.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in Radiated Emission Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The radiated emission test sites and conducted measurement facility used to collect the radiated data and conducted data are at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 3 SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

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

The EUT was powered by 120AC adaptor or POE.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable which is four feet in diameter and approximately 0.8m in height above the ground plane for emission measurement at or below 1GHz and 1.5m in height above the ground plane for emission measurement above 1GHz. If the base unit attached to peripherals, they were connected and operational to simulate typical use. The handset was remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base was wired to transmit full power.

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

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

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 3 MHz for frequencies above 1000 MHz.

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

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

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3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.2.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was 625µs. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

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

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

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

3.2 EUT Exercising Software

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

3.3 Radiated Emission Test Setup

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

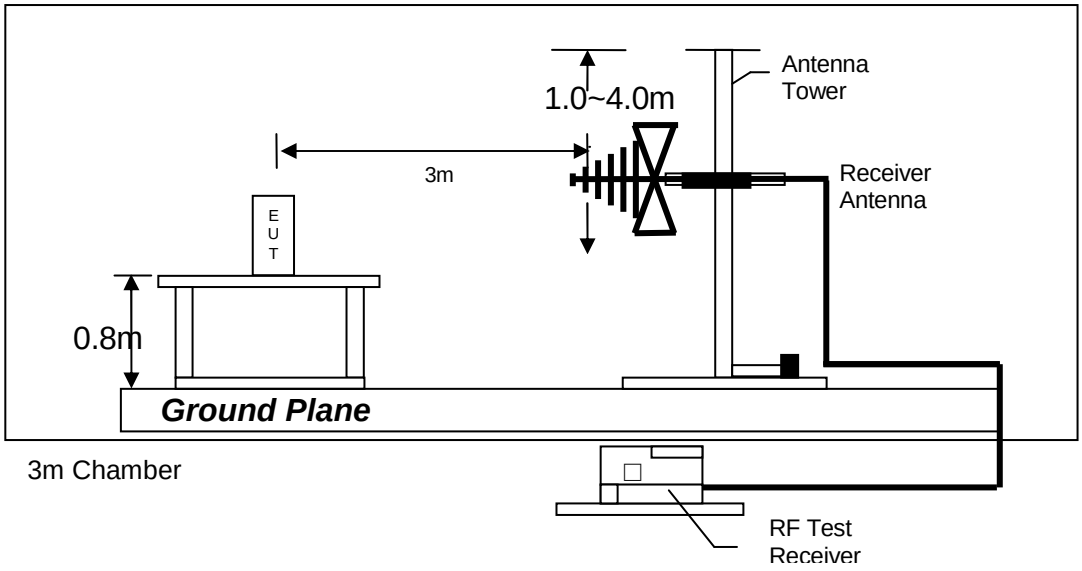

Figure 3.3.1 Test setup of radiated emissions up to 1GHz

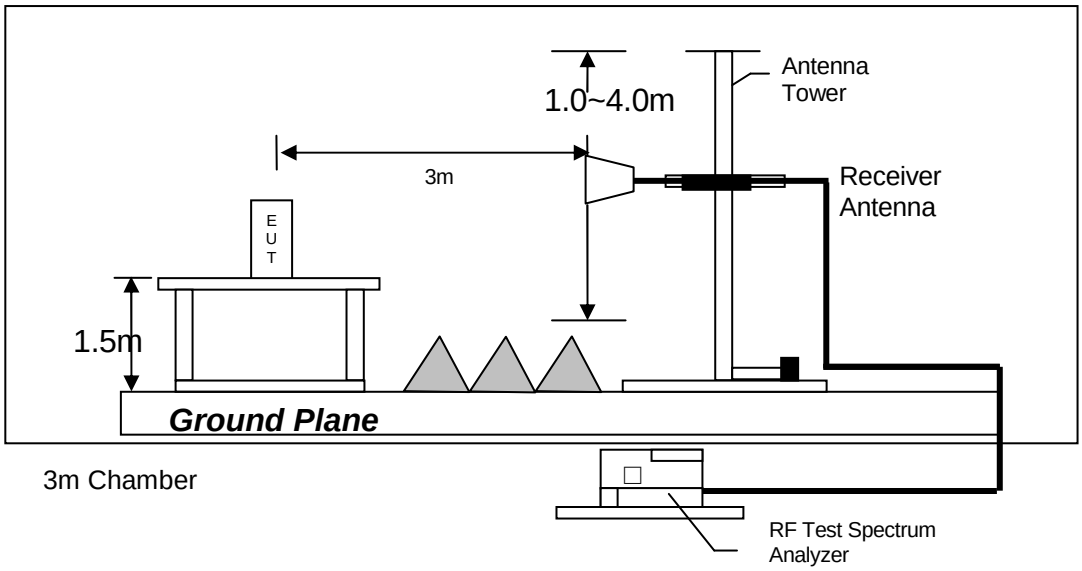

Figure 3.3.2 Test setup of radiated emissions above 1GHz

3.4 Conducted Emission Test Setup

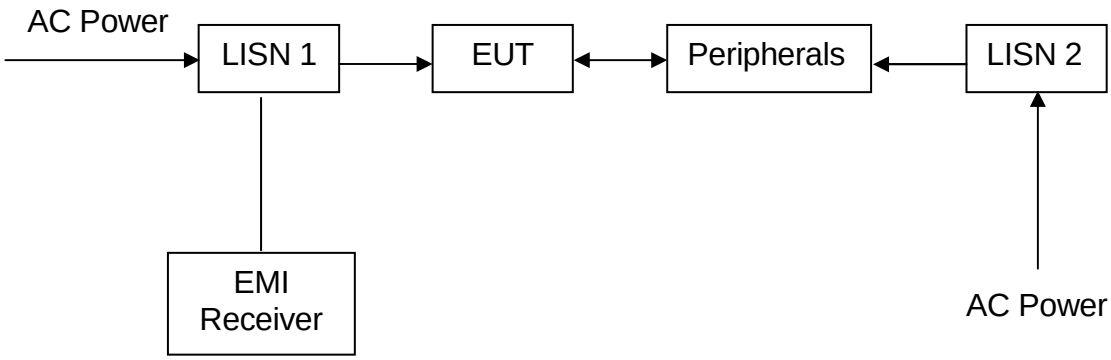

Figure 3.4.1

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3.5 Details of EUT and Description of Accessories

Details of EUT:

An adaptor (provided with the unit) was used to power the device. Its description is listed below.

(1) Adaptor with cable in length of 1.8m, S/N: FCH2119D6L9 (Supplied by Client)

Description of Accessories:

(1) AC Power Adaptor (Input: 100-240V, 50/60Hz, 0.5A; Output: 5V, 3A/ 9V, 2A/ 12V, 1.5A/ 15V, 1.2A), Model: AQ18A-59CFAC-H (Supplied by Client)
(2) Bluetooth Headset, Model: BTE6, Brand: Jabra (Supplied by Client)
(3) Wired Microphone x 2, Brand: Cisco, with cable length of 2.1m (Supplied by Client)
(4) DECT handset, Model: Speedphone 51, Brand: Deutsche Telekom (Supplied by Client)
(5) PoE (Power over Ethernet), Brand: TP-LINK, Model: TL-POE150S with Adaptor (Model: MU24-1480050-B2, Input: 100-240V, 50/60Hz, 1.0A; Output: 48V, 0.5A) (Supplied by Intertek)
(6) LAN cable(s) with 2m in length (Supplied by Intertek)

3.6 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered. The values of the Measurement uncertainty for radiated emission test, AC line conducted emission test and RF conducted test, frequency stability and timing jitter are ± 5.3dB, ± 4.2dB, ±1dB, ±23Hz, 0.1µs respectively.

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

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EXHIBIT 4 TEST RESULTS

4.0 Test Results

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

4.1 Field Strength Calculation

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

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

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

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

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

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

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

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

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4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

62.743 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1-8 list the significant emission frequencies, the limit and the margin of compliance. Test setup is shown in section 3.3 Figure 3.3.1 and 3.3.2.

Judgement -

Passed by 1.2 dB margin

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RADIATED EMISSION DATA

Lowest Channel

Table 1

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	107.6	33	29.4	104.0	24	80.0	94.0	-14.0
H	***4804.000***	***42.5***	***33***	***34.9***	***44.4***	***24***	***20.4***	***54.0***	***-33.6***
H	7206.000	38.8	33	37.9	43.7	24	19.7	54.0	-34.3
H	9608.000	37.4	33	40.4	44.8	24	20.8	54.0	-33.2
H	***12010.000***	***40.8***	***33***	***40.5***	***48.3***	***24***	***24.3***	***54.0***	***-29.7***
V	14412.000	42.4	33	40.0	49.4	24	25.4	54.0	-28.6

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	107.6	33	29.4	104.0	114.0	-10.0
H	***4804.000***	***42.5***	***33***	***34.9***	***44.4***	***74.0***	***-29.6***
H	7206.000	38.8	33	37.9	43.7	74.0	-30.3
H	9608.000	37.4	33	40.4	44.8	74.0	-29.2
H	***12010.000***	***40.8***	***33***	***40.5***	***48.3***	***74.0***	***-25.7***
V	14412.000	42.4	33	40.0	49.4	74.0	-24.6

NOTES:

1. Peak detector is used for the emission measurement.

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

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

4. Horn antenna is used for the emission over 1000MHz.

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

6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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Middle Channel:

Table 2

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2441.000	108.1	33	29.4	104.5	24	80.5	94.0	-13.5
H	***4882.000***	***41.4***	***33***	***34.9***	***43.3***	***24***	***19.3***	***54.0***	***-34.7***
H	***7323.000***	***38.8***	***33***	***37.9***	***43.7***	***24***	***19.7***	***54.0***	***-34.3***
H	9764.000	37.2	33	40.4	44.6	24	20.6	54.0	-33.4
H	***12205.000***	***41.2***	***33***	***40.5***	***48.7***	***24***	***24.7***	***54.0***	***-29.3***
V	14646.000	44.2	33	38.4	49.6	24	25.6	54.0	-28.4

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2441.000	108.1	33	29.4	104.5	114.0	-9.5
H	***4882.000***	***41.4***	***33***	***34.9***	***43.3***	***74.0***	***-30.7***
H	***7323.000***	***38.8***	***33***	***37.9***	***43.7***	***74.0***	***-30.3***
H	9764.000	37.2	33	40.4	44.6	74.0	-29.4
H	***12205.000***	***41.2***	***33***	***40.5***	***48.7***	***74.0***	***-25.3***
V	14646.000	44.2	33	38.4	49.6	74.0	-24.4

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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Highest Channel

Table 3

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	107.2	33	29.4	103.6	24	79.6	94.0	-14.4
H	***4960.000***	***42.0***	***33***	***34.9***	***43.9***	***24***	***19.9***	***54.0***	***-34.1***
H	***7440.000***	***38.3***	***33***	***37.9***	***43.2***	***24***	***19.2***	***54.0***	***-34.8***
H	9920.000	37.5	33	40.4	44.9	24	20.9	54.0	-33.1
H	***12400.000***	***41.0***	***33***	***40.5***	***48.5***	***24***	***24.5***	***54.0***	***-29.5***
V	14880.000	43.7	33	38.4	49.1	24	25.1	54.0	-28.9

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	107.2	33	29.4	103.6	114.0	-10.4
H	***4960.000***	***42.0***	***33***	***34.9***	***43.9***	***74.0***	***-30.1***
H	***7440.000***	***38.3***	***33***	***37.9***	***43.2***	***74.0***	***-30.8***
H	9920.000	37.5	33	40.4	44.9	74.0	-29.1
H	***12400.000***	***41.0***	***33***	***40.5***	***48.5***	***74.0***	***-25.5***
V	14880.000	43.7	33	38.4	49.1	74.0	-24.9

NOTES:

1. Peak detector is used for the emission measurement.

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

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

4. Horn antenna is used for the emission over 1000MHz.

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

6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

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Mode: Bluetooth on with LAN transmission and powered by POE

Table 4

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	56.435	43.2	16	11.0	38.2	40.0	-1.8
V	58.612	43.6	16	11.0	38.6	40.0	-1.4
V	62.743	44.8	16	10.0	38.8	40.0	-1.2
V	***73.168***	***48.4***	***16***	***6.0***	***38.4***	***40.0***	***-1.6***
V	***115.489***	***43.7***	***16***	***14.0***	***41.7***	***43.5***	***-1.8***
V	159.613	40.9	16	16.0	40.9	43.5	-2.6
V	185.446	39.3	16	16.0	39.3	43.5	-4.2
V	202.902	37.5	16	16.0	37.5	43.5	-6.0
V	319.416	33.3	16	23.0	40.3	46.0	-5.7
H	663.533	27.1	16	29.0	40.1	46.0	-5.9
V	761.865	27.8	16	30.0	41.8	46.0	-4.2
H	850.019	26.4	16	31.0	41.4	46.0	-4.6
H	958.413	24.2	16	33.0	41.2	46.0	-4.8

NOTES:

1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Specification Version 3.0, the transmitter ON time for each timeslot of Bluetooth is 625µs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625µs = 3.75ms. For one period for a pseudo-random hopping through at least 20 RF channels in adaptive mode (worst case), it take: 20 x 3.75ms = 75ms.

The dwell time for DH5 is 5 x 625us = 3.125ms

For the worst case calculation, there are two transmissions might occur in 100ms.

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms x 2 /100ms
= 0.0625

Average Factor (AF) of Bluetooth in dB = $20 \log_{10} (0.0625)$
= -24.0dB

4.3 Radiated Emission on the Bandedge

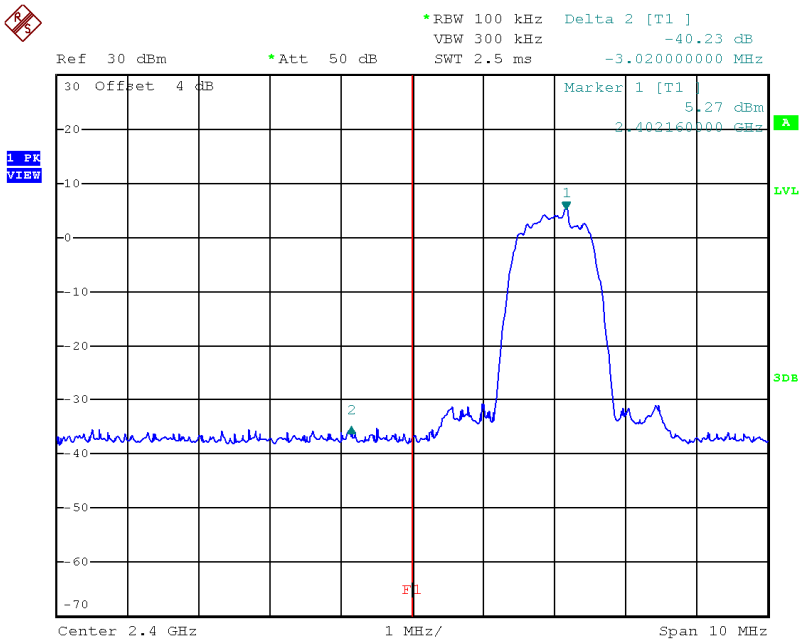
From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of emissions up to two standard bandwidths away from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.10 (2013) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d).

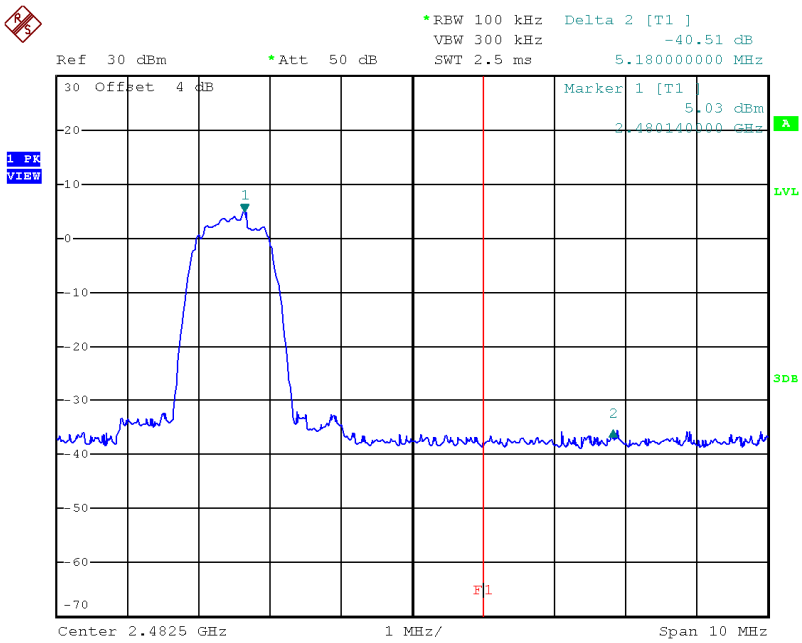
The plots of radiated emission on the bandedge are saved as below.

TEST REPORT

LOWEST CHANNEL



HIGHEST CHANNEL



Peak Measurement (Bluetooth 3.0)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=104.0 dBµV/m – 40.23 dB
=63.77 dBµV/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=80.0 dBµV/m – 40.23 dB
=39.77 dBµV/m

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=103.6 dBµV/m – 40.51 dB
=63.09 dBµV/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=79.6 dBµV/m – 40.51 dB
=39.09 dBµV/m

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dBµV/m (Peak Limit) and 54 dBµV/m (Average Limit).

4.4 AC Power Line Conducted Emission

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

[×] EUT connects to AC power line. Emission Data is listed in following pages.

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

Test setup is shown in section 3.4 Figure 3.4.1.

4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

685.5 kHz

The worst case line conducted configuration photographs are saved with filename: config photos.pdf.

4.4.2 AC Power Line Conducted Emission Data

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

Passed by 4.61 dB margin compared with CISPR average limit

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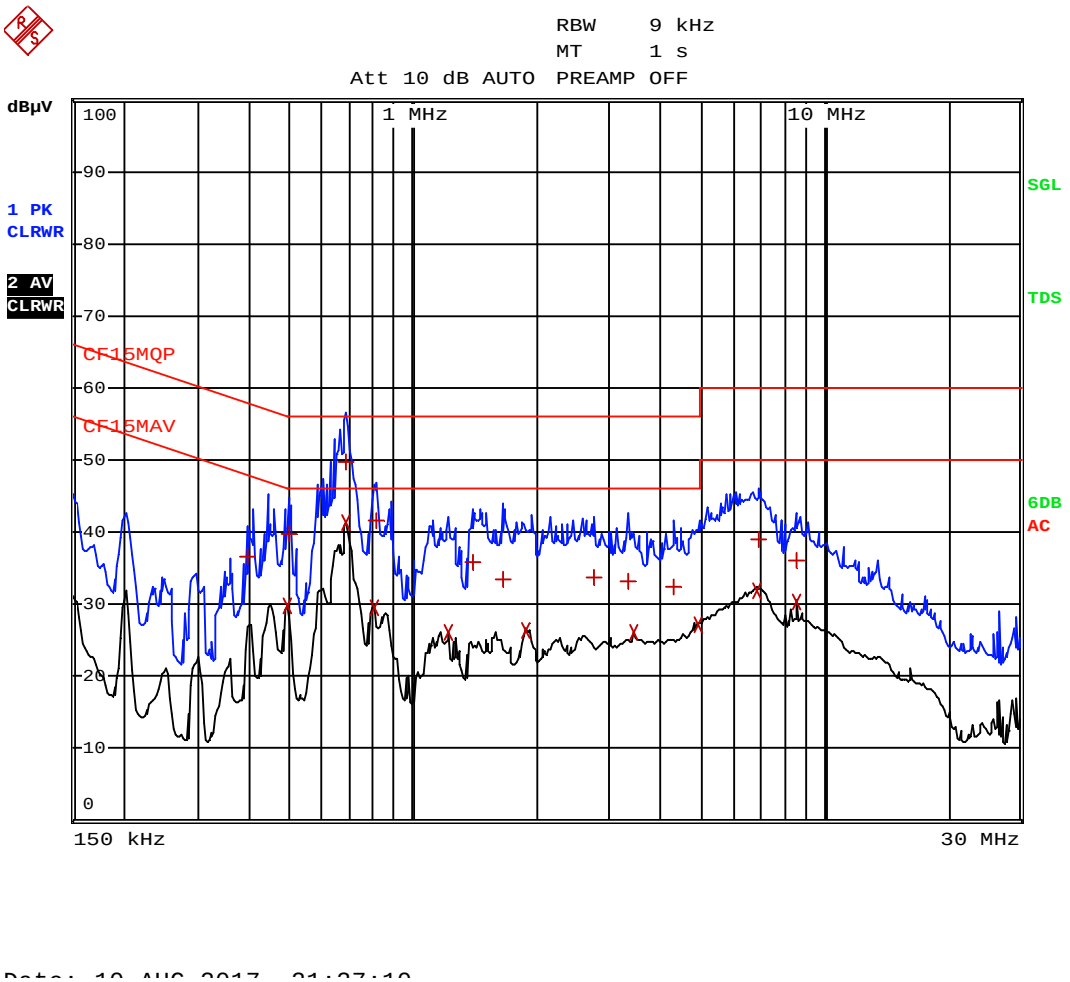
CONDUCTED EMISSION DATA

Worst Case: Bluetooth on with LAN transmission and powered by AC Adaptor



TEST REPORT

Worst Case: Bluetooth on with LAN transmission and powered by AC Adaptor

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	393 kHz	36.73	L1	-21.26
2	CISPR Average	492 kHz	29.83	L1	-16.30
1	Quasi Peak	496.5 kHz	39.79	L1	-16.26
1	Quasi Peak	685.5 kHz	49.76	N	-6.23
2	CISPR Average	685.5 kHz	41.39	L1	-4.61
2	CISPR Average	802.5 kHz	29.62	L1	-16.37
1	Quasi Peak	811.5 kHz	41.48	L1	-14.51
2	CISPR Average	1.221 MHz	26.09	N	-19.90
1	Quasi Peak	1.4055 MHz	35.89	L1	-20.11
1	Quasi Peak	1.6575 MHz	33.34	N	-22.65
2	CISPR Average	1.887 MHz	26.38	L1	-19.61
1	Quasi Peak	2.751 MHz	33.83	N	-22.17
1	Quasi Peak	3.3495 MHz	33.08	L1	-22.91
2	CISPR Average	3.4485 MHz	26.09	N	-19.90
1	Quasi Peak	4.2945 MHz	32.30	L1	-23.69
2	CISPR Average	4.965 MHz	27.11	N	-18.88
2	CISPR Average	6.8955 MHz	31.87	L1	-18.12
1	Quasi Peak	6.9765 MHz	38.95	N	-21.05
2	CISPR Average	8.619 MHz	30.33	N	-19.67
1	Quasi Peak	8.6235 MHz	35.97	L1	-24.02

TEST REPORT

EXHIBIT 5 EQUIPMENT LIST

5.0 Equipment List

1) Radiated Emissions Test

Equipment	Biconical Antenna	EMI Test Receiver (9kHz to 26.5GHz)	Double Ridged Guide Antenna
Registration No.	EW-0571	EW-3156	EW-0194
Manufacturer	EMCO	ROHDESCHWARZ	EMCO
Model No.	3104C	ESR26	3115
Calibration Date	May. 18, 2016	Dec. 06. 2016	Aug. 10, 2016
Calibration Due Date	Nov. 18, 2017	Dec. 06, 2017	Feb. 10, 2018

Equipment	Log Periodic Antenna	Pyramidal Horn Antenna	Spectrum Analyzer
Registration No.	EW-0447	EW-0905	EW-2249
Manufacturer	EMCO	EMCO	R&S
Model No.	3146	3160-09	FSP30
Calibration Date	May. 18, 2016	Feb. 12, 2016	Dec. 23, 2016
Calibration Due Date	Nov. 18, 2017	Aug. 12, 2017	Nov, 27. 2017

Equipment	Active Loop H-field (9kHz to 30MHz)	RF Cable 9kHz to 1000MHz	RF Cable (up to 40GHz)
Registration No.	EW-2313	EW-3170	EW-3155
Manufacturer	ELECTROMETRI	N/A	N/A
Model No.	EM-6876	9kHz to 1000MHz	1-40 GHz
Calibration Date	May. 18, 2016	Mar. 20, 2017	Dec. 05, 2016
Calibration Due Date	Nov. 18, 2017	Mar. 20, 2018	Dec. 05, 2017

Equipment	Solid State Low Noise Preamplifier Assembly (1 - 18)GHz	RF Pre-amplifier 3 pcs (9kHz to 40GHz)	Notch Filter (cutoff frequency 2.4GHz to 2.5GHz)
Registration No.	EW-3229	EW-3006	EW-3155
Manufacturer	BONN ELEKTRO	SCHWARZBECK	MICROTRONICS
Model No.	BLMA 0118-5G	BBV 9744	BRM50701-02
Calibration Date	Oct. 24, 2016	Mar. 23, 2017	May. 26, 2017
Calibration Due Date	Oct. 24, 2017	Mar. 23, 2018	May. 26, 2018

2) Conducted Emissions Test

Equipment	EMI Test Receiver	RF Cable 9kHz to 1000MHz	LISN
Registration No.	EW-3156	EW-3170	EW-2874
Manufacturer	ROHDESCHWARZ	N/A	R&S
Model No.	ESR26	9kHz to 1000MHz	ENV-216
Calibration Date	Dec. 06. 2016	Mar. 20, 2017	Mar. 16, 2017
Calibration Due Date	Dec. 06, 2017	Mar. 20, 2018	Mar. 16, 2018

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3) Bandedge Measurement Test

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Dec. 23, 2016
Calibration Due Date	Nov. 27, 2017

END OF TEST REPORT