TEST REPORT

Report No.: 15100471HKG-002

ConvenientPower HK Limited

Application
For
Certification
(Original Grant)
(FCC ID: 2AGPD-ZETC03)

Transmitter

Prepared and Checked by:

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Chow Chi Ming, Billy
Manager
Date: December 01, 2015

GENERAL INFORMATION

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Manufacturer:	Huiyang CCT Telecommunications Products Co. Ltd.
Manufacturer Address:	CCT Technology Park, San He Economic Developmental Zone, Huiyang District, Huizhou City, Guangdong Province, The PRC. Postal Code: 516213
Brand Name:	ZENS
Model:	ZETC03N/00
Type of EUT:	Transmitter
Description of EUT:	Wireless Charger For Furniture
Serial Number:	N/A
FCC ID:	2AGPD-ZETC03
Date of Sample Submitted:	October 14, 2015
Date of Test:	October 14, 2015 to November 23, 2015
Report No.:	15100471HKG-002
Report Date:	December 01, 2015
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Field Strength	15.209	Pass
Transmitter Power Line Conducted Emissions	15.207	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2014 Edition

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB 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 excepted variations in temperature and supply voltage were considered.

Table of Contents

1.0 General Description

1.1 Product Description

The model ZETC03N/00 is an induction wireless charger to charging Qi compatible device with the unit. The power transfer frequency of the model is 111-130kHz. Also a RF exposure report with report number 15100471HKG-003 is submitted as well.

Antenna Type: Induction coil

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is a single application for certification of a induction wireless charger transmitter.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The 3m Chamber and conducted measurement facility used to collect data are located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T. Hong Kong and Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong respectively. This test facility and site measurement data have been placed on file with the FCC.

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The device was rated at 12Vdc 1.0A and powered by an AC/DC adaptor (model: S012BEU1200100, input: 100-240VAC 50/60Hz., output: 12Vdc 1000mA).

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.5 Support Equipment List and Description

1) AC/DC Adaptor
   Model: S012BEU1200100
   Input: 100-240VAC 50/60Hz
   Output: 12VDC 1000mA
   (Provided by Applicant)
2) Induction charging receiver with 5 ohm resistive load
   Model: CP/18R/1/XX/B (Provided by Applicant)

3.0 **Emission 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.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - 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
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 37.024 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 11.3 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 21.0435 MHz

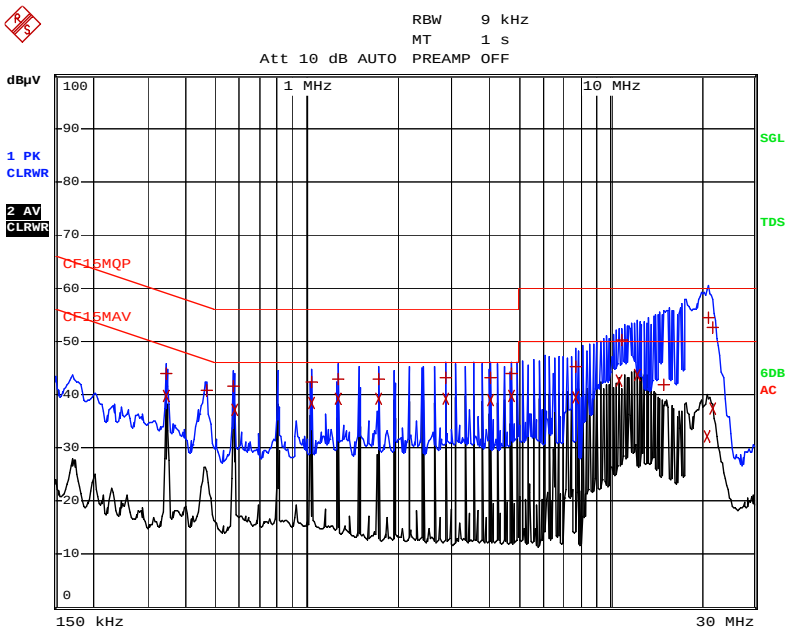
For electronic filing, the worst case line-conducted configuration photographs are saved with filename: conducted photo.pdf.

3.5 Conducted Emission Data

The graph and data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Pass by 5.56 dB

Worst-Case Operating Mode: On Load



EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	343.5 kHz	39.89	L1	-9.22
1	Quasi Peak	343.5 kHz	43.86	L1	-15.25
1	Quasi Peak	465 kHz	40.74	N	-15.85
1	Quasi Peak	573 kHz	41.72	L1	-14.27
2	CISPR Average	577.5 kHz	37.07	L1	-8.92
2	CISPR Average	1.0365 MHz	38.34	L1	-7.65
1	Quasi Peak	1.0365 MHz	42.44	L1	-13.55
2	CISPR Average	1.266 MHz	39.32	L1	-6.67
1	Quasi Peak	1.266 MHz	42.84	L1	-13.15
2	CISPR Average	1.725 MHz	39.29	L1	-6.70
1	Quasi Peak	1.725 MHz	43.03	L1	-12.96
2	CISPR Average	2.877 MHz	39.27	L1	-6.72
1	Quasi Peak	2.877 MHz	43.20	L1	-12.79
2	CISPR Average	4.0245 MHz	39.06	L1	-6.93
1	Quasi Peak	4.0245 MHz	43.13	L1	-12.86
2	CISPR Average	4.7175 MHz	39.75	L1	-6.24
1	Quasi Peak	4.7175 MHz	43.85	L1	-12.14
2	CISPR Average	7.7055 MHz	39.45	N	-10.54
1	Quasi Peak	7.7055 MHz	45.31	L1	-14.68
2	CISPR Average	10.698 MHz	42.54	L1	-7.46

Note: Measurement Uncertainty is ±4.2dB at a level of confidence of 95%.

Worst-Case Operating Mode: On Load

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	10.9275 MHz	50.37	L1	-9.62
2	CISPR Average	12.309 MHz	43.80	L1	-6.19
1	Quasi Peak	15.0585 MHz	41.89	L1	-18.10
2	CISPR Average	20.814 MHz	32.08	N	-17.91
1	Quasi Peak	21.0435 MHz	54.43	L1	-5.56
1	Quasi Peak	21.7365 MHz	52.50	L1	-7.49
2	CISPR Average	21.7365 MHz	37.31	L1	-12.68

Note: Measurement Uncertainty is ±4.2dB at a level of confidence of 95%.

Applicant: ConvenientPower HK Limited Date of Test: November 23, 2015
Model: ZETC03N/00
Worst-Case Operating Mode: Tx

Table 1
Radiated Emissions
Pursuant to FCC Part 15 Section 15.209 Requirement

Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Distance (-dB)	Calculated at 300 (dBµV/m)	Limit at 300m (dBµV/m)	Margin (dB)
0.115	83.1	16	11.8	78.9	-80	-1.1	26.3	-27.4
0.230	55.7	16	11.7	51.4	-80	-28.6	20.3	-48.9
0.345	61.4	16	11.6	57.0	-80	-23.0	16.8	-39.8
0.460	50.7	16	11.5	46.2	-80	-33.8	14.3	-48.1

Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Distance (-dB)	Calculated at 30 (dBµV/m)	Limit at 30m (dBµV/m)	Margin (dB)
0.575	50.7	16	11.6	46.3	-40	6.3	32.4	-26.1
0.690	48.6	16	11.5	44.1	-40	4.1	30.8	-26.7
0.805	48.2	16	11.3	43.5	-40	3.5	29.4	-25.9
0.920	47.2	16	11.2	42.4	-40	2.4	28.3	-25.9
1.151	45.9	16	11.3	41.2	-40	1.2	26.3	-25.1
2.301	45.3	16	10.8	40.1	-40	0.1	29.5	-29.4
3.797	43.5	16	10.5	38.0	-40	-2.0	29.5	-31.5

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. Loop antenna is used for the emission below 30MHz.

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

Applicant: ConvenientPower HK Limited Date of Test: November 23, 2015
Model: ZETC03N/00
Worst-Case Operating Mode: Tx

Table 2
Radiated Emissions
Pursuant to FCC Part 15 Section 15.209 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	31.954	30.2	16	10.0	24.2	40.0	-15.8
V	37.024	34.7	16	10.0	28.7	40.0	-11.3
V	46.340	29.6	16	11.0	24.6	40.0	-15.4
V	103.080	30.0	16	13.0	27.0	43.5	-16.5
V	124.569	33.7	16	14.0	31.7	43.5	-11.8
V	203.522	26.5	16	16.0	26.5	43.5	-17.0
V	237.800	19.7	16	19.0	22.7	46.0	-23.3

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. BiConiLog antenna is used for the emission below 1000MHz.

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

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

8.0 Miscellaneous Information

The miscellaneous information includes details of the test procedure.

8.1 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.2 Calculation of Average Factor

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a 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. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

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 Exhibit 8.3.

The frequency range scanned is 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 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

8.3 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

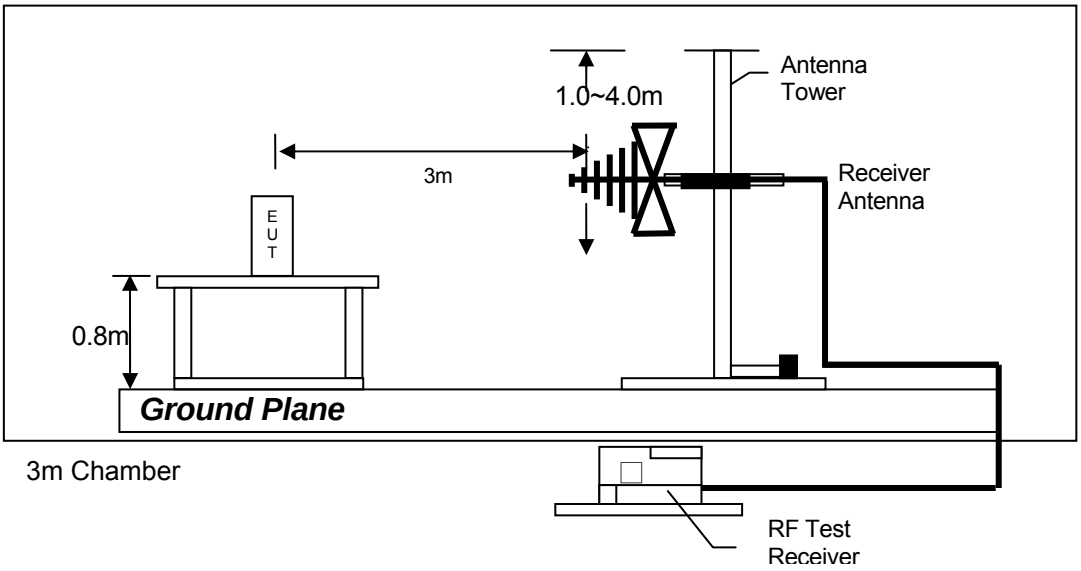
Conducted measurements were made as described in ANSI C63.10 (2013).

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

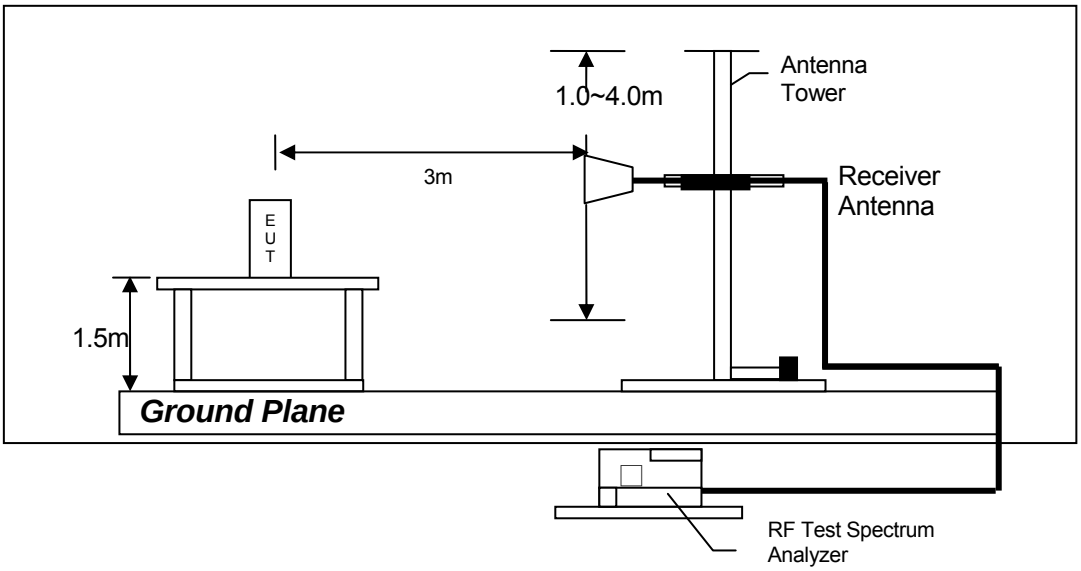
Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

8.3.1 Radiated Emission Test Setup

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



Test setup of radiated emissions up to 1GHz



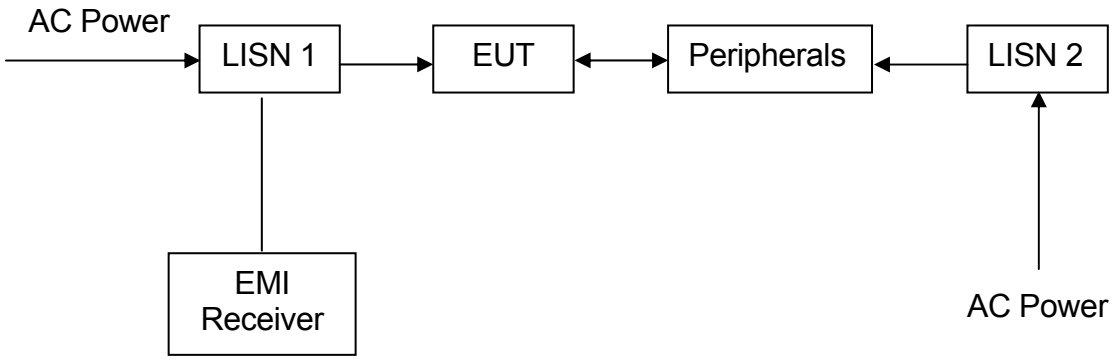
Test setup of radiated emissions above 1GHz

8.3.2 Conducted Emission Test Procedures

For tabletop equipment, the EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table. For floor-standing equipment, the EUT and all cables were insulated, if required, from the ground plane by up to 12 mm of insulating material. The EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

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

8.3.3 Conducted Emission Test Setup



9.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Spectrum Analyzer	EMI Test Receiver
Registration No.	EW-2253	EW-2251
Manufacturer	R&S	R&S
Model No.	FSP40	ESCI
Calibration Date	May 27, 2015	Dec. 04, 2014
Calibration Due Date	May 27, 2016	Dec. 04, 2015

Equipment	BiConiLog Antenna	Double Ridged Guide Antenna
Registration No.	EW-3061	EW-0194
Manufacturer	EMCO	EMCO
Model No.	3412E	3115
Calibration Date	Jul. 22, 2015	Jan. 29, 2015
Calibration Due Date	Jul. 22, 2016	Jul. 29, 2016

2) Conducted Emissions Test

Equipment	LISN	EMI Test Receiver
Registration No.	EW-2874	EW-2500
Manufacturer	R&S	R&S
Model No.	ENV-216	ESCI
Calibration Date	Dec. 08, 2014	Nov. 06, 2014
Calibration Due Date	Dec. 08, 2015	Nov. 06, 2015

END OF TEST REPORT