

August 11, 2009

Guangzhou Grandview Crystal Screen Co., Ltd.  
Federal Industry Zone, No. 363, Yushan West Road,  
Shiqiao, PanYu District, Guangzhou,  
Guangdong, China.

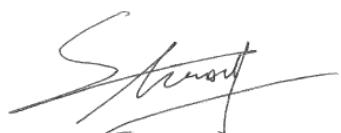
Dear Xiang Yao:

Enclosed you will find your file copy of a Part 15 report (FCC ID: XH8ES2W2).

For your reference, TCB will normally take another 15-20 days for reviewing the report.  
Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,



Shawn Xing  
Assistant Manager

Enclosure

**Guangzhou Grandview Crystal Screen Co., Ltd.**

Application  
For  
Certification  
**(FCC ID: XH8ES2W2)**

868MHz Transmitter

*Billy Li*

SZ09050370-2

Billy Li

August 11, 2009

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

**Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch**  
6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: [www.china.intertek-etlsemko.com](http://www.china.intertek-etlsemko.com)

# INTERTEK TESTING SERVICES

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## LIST OF EXHIBITS

### *INTRODUCTION*

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# INTERTEK TESTING SERVICES

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## MEASUREMENT/TECHNICAL REPORT

**Guangzhou Grandview Crystal Screen Co., Ltd.**  
**MODEL: ES-2W2**

**FCC ID: XH8ES2W2**

**August 11, 2009**

This report concerns (check one):      Original Grant  Class II Change

Equipment Type: DSC-Part 15 Security/Remote Control Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes       No

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes       No

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-01-08 Edition] provision.

Report prepared by:



Shawn Xing  
Intertek Testing Services Shenzhen Ltd.  
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6F, Block D, Huahan Building, Langshan Road,  
Nanshan District, Shenzhen, P. R. China  
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# INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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### List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Report	20dB BW Plot	bw.pdf
Test Report	Average Factor	af.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	agency.pdf
Cover Letter	Confidentiality Request	confidentiality.pdf
Equipment List	Test Equipment List	equipment list.pdf

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 1**

#### **GENERAL DESCRIPTION**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

# INTERTEK TESTING SERVICES

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## 1.0 General Description

### 1.1 Product Description

The Equipment Under Test (EUT) is a synchro power relay transmitter operating at 868MHz. The EUT is powered by 120V AC.

When the EUT is powered on it will sent a trigger signal to the receiver (which controls the Grandview Integrated Motorized Screen), and the Integrated Motorized Screen will be controlled down. And when it is powered off, it will also send a signal to the receiver, and the Integrated Motorized Screen will be controlled up. It will cease transmission within 5 seconds after activation.

Antenna Type: Integral Antenna

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

### 1.2 Related Submittal(s) Grants

This is an application for Certification of a transmitter. The receiver, associated with this transmitter, has FCC ID: XH868MIR and has been filed at the same time.

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### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Radiated emission measurement was performed in Semi-Anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the Semi-Anechoic chamber only to determine the 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 Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data is **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC.

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 2**

### **SYSTEM TEST CONFIGURATION**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

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### 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 C63.4 (2003).

The EUT was powered by 120V AC during test.

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 placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

For simplicity of testing, the unit was wired to transmit continuously

#### 2.2 EUT Exercising Software

There was no special software to exercise the device.

#### 2.3 Special Accessories

No special accessories used.

#### 2.4 Equipment Modification

Any modifications installed previous to testing by Guangzhou Grandview Crystal Screen Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

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### 2.5 Measurement Uncertainty

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

### 2.6 Support Equipment List and Description

This product was tested in the following configuration:

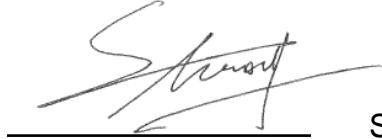
Refer List:

Description	Manufacturer	Model No.
Projector	Viewsonic	VS10729

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Shawn Xing*  
*Assistant Manager*  
*Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch*  
*Agent for Guangzhou Grandview Crystal Screen Co., Ltd.*



Signature

August 11, 2009

Date

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## **INTERTEK TESTING SERVICES**

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### **EXHIBIT 3**

### **EMISSION RESULTS**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

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### 3.0 Emission Results

Data is included 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.

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### 3.1 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 dB $\mu$ V/m  
RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V  
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 reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

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

Assume a receiver reading of 62.0 dB $\mu$ V 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 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
at  
868.000 MHz

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

## INTERTEK TESTING SERVICES

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### 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.

Judgement: Passed by 0.9 dB

#### ***TEST PERSONNEL:***



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*Signature*

Billy Li, Compliance Engineer  
*Typed/Printed Name*

August 11, 2009

*Date*

## INTERTEK TESTING SERVICES

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Company: Guangzhou Grandview Crystal Screen Co., Ltd.

Date of Test: June 18, 2009

Model: ES-2W2

Worst Case Operating Mode: Transmit

Table 1

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Vertical	868.000	83.9	20.0	22.8	5.7	81.0	81.9	-0.9
Vertical	1736.000	73.1	36.8	27.0	5.7	57.6	61.9	-4.3
Vertical	2604.000	66.9	36.7	28.8	5.7	53.3	61.9	-8.6
Horizontal	868.000	83.4	20.0	22.8	5.7	80.5	81.9	-1.4
Horizontal	1736.000	73.5	36.8	27.0	5.7	58.0	61.9	-3.9
Horizontal	2604.000	61.1	36.7	28.8	5.7	47.5	61.9	-14.4
Horizontal	*4340.000	60.4	36.5	28.8	5.7	47.0	54.0	-7.0

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic 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 harmonic 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.

- \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Billy Li

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TRF no.: FCC 15C\_TXa

FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 3.4 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration  
at  
0.346 MHz

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

## INTERTEK TESTING SERVICES

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### 3.5 Conducted Emission Data

Judgement: Passed by 17.5 dB margin

**TEST PERSONNEL:**



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**Signature**

Billy Li, Compliance Engineer  
*Typed/Printed Name*

August 11, 2009

*Date*

## INTERTEK TESTING SERVICES

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Company: Guangzhou Grandview Crystal Screen Co., Ltd.

Model: ES-2W2

Worst Case Operating Mode: Transmit

**Table 2**  
**Conducted Emissions**

### Live Line Data

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(µV)	Permitted limit dB(µV)	Disturbance level dB(µV)	Permitted limit dB(µV)
0.174	20.4	64.8	16.9	54.8
0.342	40.6	59.2	13.4	49.2
3.294	17.3	56.0	11.4	46.0
6.500	20.3	60.0	10.5	50.0
15.200	25.6	60.0	16.3	50.0
28.400	28.5	60.0	17.1	50.0

### Neutral Line Data

Frequency (MHz)	Quasi-Peak		Average	
	Disturbance level dB(µV)	Permitted limit dB(µV)	Disturbance level dB(µV)	Permitted limit dB(µV)
0.174	19.7	64.8	16.4	54.8
0.346	41.6	59.1	13.7	49.1
3.370	14.6	56.0	9.7	46.0
6.535	19.4	60.0	11.0	50.0
14.780	26.0	60.0	16.4	50.0
27.480	29.2	60.0	17.9	50.0

Test Engineer: Billy Li

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TRF no.: FCC 15C\_TXa

FCC ID: XH8ES2W2

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**EXHIBIT 4**

**EQUIPMENT PHOTOGRAPHS**

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### 4.0 Equipment Photographs

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 5**

**PRODUCT LABELLING**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 5.0 Product Labelling

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

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 6.0 Technical Specifications

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

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 7**

**INSTRUCTION MANUAL**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 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.

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure and calculation of factors such as pulse desensitization and averaging factor.

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### 8.1 Measured Bandwidth

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: bw.pdf. From the plot, the bandwidth is observed to be 1.236MHz, at 20dBc where the bandwidth limit is 2.17MHz.

Therefore, the unit meets the requirement of section 15.231 (c).

Figure 8.1 Bandwidth

## INTERTEK TESTING SERVICES

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### 8.2 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

The effective period ( $T_{\text{eff}}$ ) was approximately 52.1 ms for a digital "1" bit, as shown in the plots of Exhibit 8.3. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitivity factor was 0 dB.

## INTERTEK TESTING SERVICES

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### 8.3 Calculation of Average Factor

Averaging factor in dB =  $20 \log (\text{duty cycle})$

The specification for output field strengths in accordance with the FCC rules specifies measurements with an average detector. During testing, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.

The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation. The duty cycle is measured by placing the spectrum analyzer in zero scan (receiver mode) and linear mode at maximum bandwidth (3 MHz at 3 dB down) and viewing the resulting time domain signal output from the analyzer on a Tektronix oscilloscope. The oscilloscope is used because of its superior time base and triggering facilities.

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 100ms

Effective period of the cycle = 52.1ms

$$DC = 52.1\text{ms} / 100\text{ms} = 0.521$$

Therefore, the averaging factor is found by  $20 \log_{10} 0.521 = -5.7 \text{ dB}$

For electronic filing, the plot shows the transmission timing is saved with filename: timing.pdf.

## INTERTEK TESTING SERVICES

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### 8.4 Emissions Test Procedures

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

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2003.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. 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 adjust through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

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.

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.

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### 8.4 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 are made as described in ANSI C63.4 - 2003.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 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. 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 restricted 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, but those measurements taken at a closer distance are so marked.

**INTERTEK TESTING SERVICES**

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**EXHIBIT 9**

**CONFIDENTIALITY REQUEST**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: confidentiality.pdf.

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 10**

**TEST EQUIPMENT LIST**

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TRF no.: FCC 15C\_TXa  
FCC ID: XH8ES2W2

## INTERTEK TESTING SERVICES

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### 10.0 Test Equipment List

For electronic filing, the test equipment list of the tested EUT is saved with filename: equipment list.pdf.