



12 February 2012

Comat Electronic (Shenzhen) Co., Ltd  
No.2 Lane 1, Xin'an 3rd 28 District Baoan  
Shenzhen, Guangdong, China

Dear Xiaowen Zhang :

Enclosed you will find your file copy of a Part 15 report (FCC ID: RTX-CR707G).

For your reference, TCB will normally take another 5 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,

A handwritten signature in black ink, appearing to read "Shawn Xing", with a long horizontal stroke extending to the right.

Shawn Xing  
Manager

Enclosure



**Comat Electronic (Shenzhen) Co., Ltd**

Application  
For  
Certification  
**(FCC ID: RTX-CR707G)**

2.4G wireless receiver

Model: CM9028G

2.4GHz Transceiver

SZ11120185-3  
Billy Li  
12 February 2012

- 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\_PC\_a  
FCC ID: RTX-CR707G

**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)

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## INTERTEK TESTING SERVICES

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### LIST OF EXHIBITS

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<i>EXHIBIT 2:</i>	System Test Configuration
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# INTERTEK TESTING SERVICES

## MEASUREMENT / TECHNICAL REPORT

Comat Electronic (Shenzhen) Co., Ltd – MODEL: CM9028G

FCC ID: RTX-CR707G

12 February 2012

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

Equipment Type: JBP-Class B Computing Device Peripheral

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 [10-1-10 Edition] provision.

Report prepared by:

Shawn Xing  
Intertek Testing Services Shenzhen Ltd.  
Kejiyuan Branch  
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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
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Request	request.pdf
Cover Letter	Letter of Agency	agency.pdf

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1**

### **GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

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### 1.0 General Description

#### 1.1 Product Description

The Equipment under Test (EUT) is a 2.4G wireless receiver unit, model: CM9028G operating at 2.4GHz band. It is powered by PC USB port.

#### 1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral.



## INTERTEK TESTING SERVICES

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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 conducted measurement facility used to collect the radiated data are **Interterk Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, 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**

**EXHIBIT 2**

**SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

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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 PC USB Port during test.

For maximizing emissions, 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. The step by step procedure for maximizing emissions led to the data reported 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 turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30MHz to 1GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

#### 2.2 EUT Exercising Software

There was no special software to exercise the device.

#### 2.3 Special Accessories

N/A

#### 2.4 Equipment Modification

Any modifications installed previous to testing by Comat Electronic (Shenzhen) 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

#### 2.5 Measurement Uncertainty

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

## INTERTEK TESTING SERVICES

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### 2.6 Support Equipment List and Description

This product was tested in the following configuration:

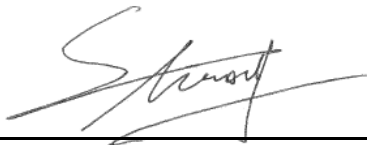
Refer List:

Description	Manufacturer	Model No.
Test PC	HP	2510P
Hard Disk	Smart.drive	HD3-SU2FW
USB Cable	Smart.drive	Length 155cm
1394 Cable	Smart.drive	Length 180cm

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Shawn Xing*  
*Manager*  
*Intertek Testing Services Shenzhen Ltd.*  
*Kejiyuan Branch*  
*Agent for Comat Electronic (Shenzhen) Co., Ltd*



Signature

12 February 2012

Date

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 3**

**EMISSION RESULTS**

## INTERTEK TESTING SERVICES

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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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## INTERTEK TESTING SERVICES

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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:

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

## INTERTEK TESTING SERVICES

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### 3.1 Field Strength Calculation (cont'd)

#### Example

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

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

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

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

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

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

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

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

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



## **INTERTEK TESTING SERVICES**

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### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
At  
37.365 MHz (Data Transfer)

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

## INTERTEK TESTING SERVICES

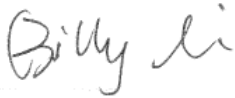
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### 3.3 Radiated Emission Data

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 19.4dB margin (Data Transfer)

#### **TEST PERSONNEL:**



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*Signature*

Billy Li Team Leader  
*Typed / Printed Name*

12 February 2012  
*Date*

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## INTERTEK TESTING SERVICES

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Applicant: Comat Electronic (Shenzhen) Co., Ltd

Date of Test: 12 February 2012

Model: CM9028G

Worst Case Operating Mode: Data Transfer

**Table 1**

**Radiated Emissions**

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	37.365	26.5	20.0	14.1	20.6	40.0	-19.4
Horizontal	42.236	27.6	20.0	12.2	19.8	40.0	-20.2
Horizontal	49.569	28.4	20.0	9.2	17.6	40.0	-22.4
Vertical	32.128	22.1	20.0	17.7	19.8	40.0	-20.2
Vertical	36.695	23.6	20.0	15.3	18.9	40.0	-21.1
Vertical	65.238	32.8	20.0	7.4	20.2	40.0	-19.8

- NOTES:
1. 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.
  2. Negative value in the margin column shows emission below limit.
  3. All emissions are below the QP limit.

Test Engineer: Billy Li

## INTERTEK TESTING SERVICES

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### 3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration  
at  
0.198 MHz

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

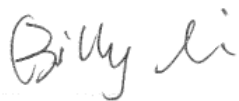
## INTERTEK TESTING SERVICES

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### 3.5 Conducted Emission Data

Judgement: Passed by 12.0 dB margin

#### **TEST PERSONNEL:**



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*Signature*

Billy Li Team Leader  

---

*Typed/Printed Name*

12 February 2012  

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*Date*

## INTERTEK TESTING SERVICES

Applicant: Comat Electronic (Shenzhen) Co., Ltd

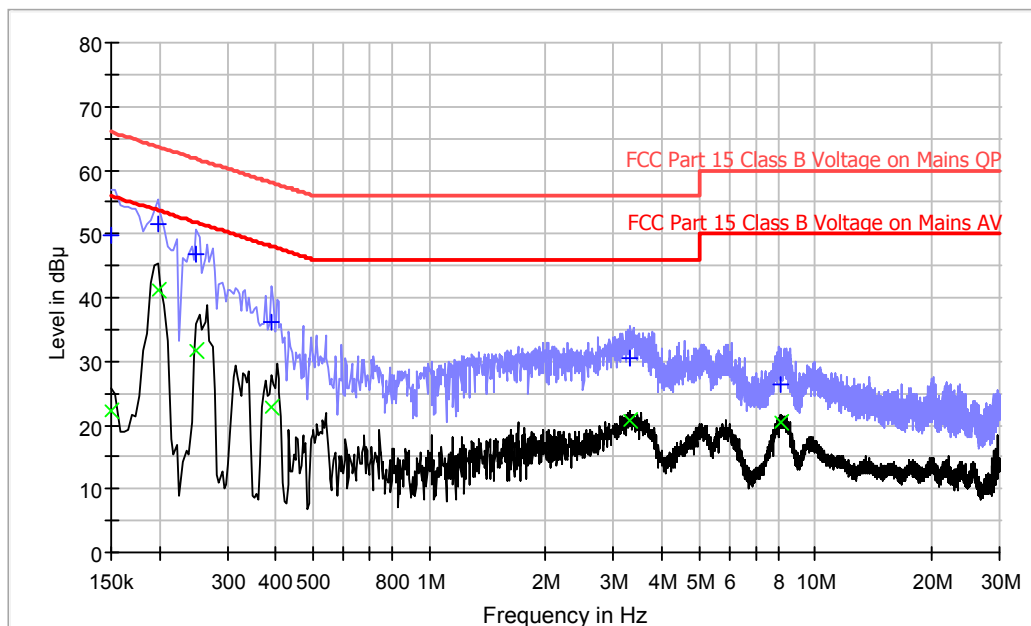
Date of Test: 12 February 2012

Model: CM9028G

Worst Case Operating Mode: Data Transfer

### Conducted Emissions Graph & data

Live Line



Result Table QP

Frequency (MHz)	QuasiPeak (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.150	49.7	L1	9.6	16.4	66.0
0.198	51.7	L1	9.6	12.0	63.7
0.250	46.9	L1	9.6	14.9	61.8
0.390	36.2	L1	9.6	21.9	58.1
3.326	30.4	L1	9.8	25.6	56.0
8.134	26.5	L1	9.9	33.5	60.0

Result Table AV

Frequency (MHz)	Average (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.150	22.3	L1	9.6	33.7	56.0
0.198	41.1	L1	9.6	12.6	53.7
0.250	31.8	L1	9.6	20.0	51.8
0.390	22.8	L1	9.6	25.3	48.1
3.326	20.9	L1	9.8	25.1	46.0
8.134	20.5	L1	9.9	29.5	50.0

## INTERTEK TESTING SERVICES

Applicant: Comat Electronic (Shenzhen) Co., Ltd

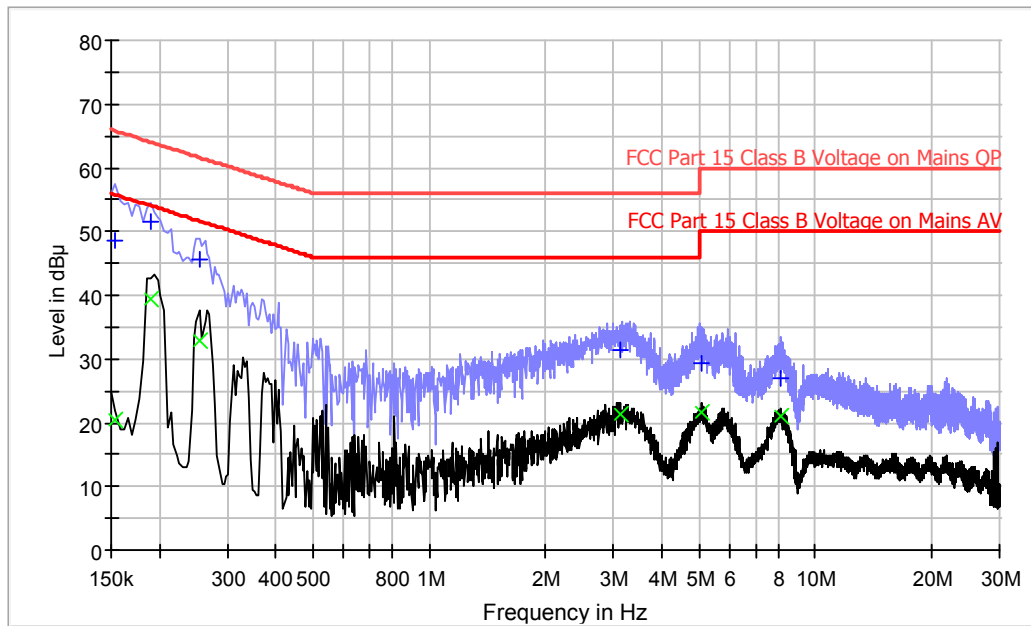
Date of Test: 12 February 2012

Model: CM9028G

Worst Case Operating Mode: Data Transfer

### Conducted Emissions Graph & data

Neutral Line



#### Result Table QP

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.154	48.7	N	9.6	17.1	65.8
0.190	51.5	N	9.6	12.5	64.0
0.254	45.5	N	9.6	16.1	61.6
3.138	31.4	N	9.8	24.6	56.0
5.090	29.3	N	9.9	30.7	60.0
8.114	27.0	N	10.0	33.0	60.0

#### Result Table AV

Frequency (MHz)	Average (dB $\mu$ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.154	20.5	N	9.6	35.3	55.8
0.190	39.4	N	9.6	14.6	54.0
0.254	32.8	N	9.6	18.8	51.6
3.138	21.4	N	9.8	24.6	46.0
5.090	21.6	N	9.9	28.4	50.0
8.114	21.2	N	10.0	28.8	50.0

Test Engineer: Billy Li

TRF No.: FCC 15C\_PC\_a

FCC ID: RTX- CR707G

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**INTERTEK TESTING SERVICES**

**EXHIBIT 4**

**EQUIPMENT PHOTOGRAPHS**



## INTERTEK TESTING SERVICES

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### 4.0 Equipment Photographs

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

**EXHIBIT 5**  
**PRODUCT LABELLING**

## INTERTEK TESTING SERVICES

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### 5.0 Product Labelling

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

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**INTERTEK TESTING SERVICES**

**EXHIBIT 6**

**TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

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### 6.0 Technical Specifications

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

**EXHIBIT 7**  
**INSTRUCTION MANUAL**

## 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**

**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**



## INTERTEK TESTING SERVICES

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### 8.0 Miscellaneous Information

This miscellaneous information includes emission measuring procedure.

## INTERTEK TESTING SERVICES

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### 8.1 Emissions Test Procedures

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

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

The computer peripheral 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 antenna height and polarization are 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 QP mode from the frequency band 30MHz to 1GHz and RBW setting is 120kHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 1GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

## **INTERTEK TESTING SERVICES**

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### 8.1 Emissions Test Procedures (cont'd)

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

Conducted measurements are made as described in ANSI C63.4 – 2003.

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**INTERTEK TESTING SERVICES**

**EXHIBIT 9**

**CONFIDENTIALITY REQUEST**

## 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: request.pdf.

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**INTERTEK TESTING SERVICES**

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**EXHIBIT 10**

**TEST EQUIPMENT LIST**

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## INTERTEK TESTING SERVICES

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### 10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	02-Jul-11	02-Jan-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	08-Mar-11	08-Mar-12
SZ061-08	Horn Antenna	ETS	3115	00092346	06-Jul-11	03-Jul-12
SZ061-06	Active Loop Antenna	Electro-Metrics	6509	00069080	17-May-11	17-May-12
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	08-Mar-11	08-Mar-12
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	08-Mar-11	08-Mar-12
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	06-Mar-11	06-Mar-12
SZ062-02	RF Cable	RADIAL	RG 213U	--	25-Sep-11	25-Mar-12
SZ062-06	RF Cable	RADIAL	0.04-26.5GHz	--	16-Sep-11	16-Sep-12
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	16-Sep-11	16-Sep-12
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	05-Nov-11	05-Nov-12
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	05-Nov-11	05-Nov-12
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	05-Nov-11	05-Nov-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	10-Sep-11	10-Sep-12