

SCT DIGITAL TECHNOLOGY CO., LTD.

Application
For
Certification

FCC ID: 2ACFJIWB-PC02

Product description: PC

Model: IWB-PC02
Additional Model: LB-PC02, SCT-PC02

Class B Personal Computer

Report No.: 140626006SZN-001

Prepared and Checked by:

Approved by:

Sign on file

Robert Li
Project Engineer

Andy Yan
Project Engineer
Date: August 1, 2014

- 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.
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TRF No.: FCC 15C_PC_b

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INTERTEK TESTING SERVICES

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MEASUREMENT / TECHNICAL REPORT

SCT DIGITAL TECHNOLOGY CO., LTD.

MODEL: IWB-PC02

Additional Model: LB-PC02, SCT-PC02

FCC ID: 2ACFJIWB-PC02

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

Equipment Type: JBC- Part 15 Class B Computing Device/Personal Computer

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 B for unintentional radiator – the new 47 CFR [10-01-13 Edition] provision.

Report prepared by:

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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 Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a PC, The EUT was powered by Adapter with input of AC 120V, 60Hz. For more detailed features description, please refer to the user's manual.

The Model: LB-PC02 and SCT-PC02 are same as the Model: IWB-PC02 in hardware aspect, they are different in appearance, model number and brand name for trading purpose.

1.2 Related Submittal(s) Grants

This is an application for certification of a computer.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). 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 shielding room used to collect the radiated data and conducted data are **Intertek Test 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 (Registration Number: 242492).

EXHIBIT 2
SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for Test in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by AC/DC adapter with Input AC 120V/60Hz during the testing. All test modes have been performed; the worst case data was reported in this report.

Worst case operating Mode: Normal Operating with Full load (PC download through USB disk & displayed through the VGA and HDMI & Ping with Notebook through router)

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 Test 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 6GHz (EUT highest frequency is 1.1GHz, so according to 15.33, the test range is update to 5.5GHz) 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

The EUT exercise program (provided by client) used during radiated and conducted Test was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified Test.

2.3 Special Accessories

Shielded HDMI Cable and shielded VGA Cable with two ferrite cores were used during the test.

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2.4 Equipment Modification

Any modifications installed previous to Test by SCT DIGITAL TECHNOLOGY CO., LTD. Will be incorporated in each production model sold / leased in the United States.

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

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.
Display 1	HP	634347-701
Display 2	DELL	23.058D0.017G
Mouse	HP	SM-2020
Keyboard	HP	SK-2885
Earphone	N/A	N/A
USB disk 1	TOSHIBA	4GB
USB disk 2	SanDisk	4GB
Router	TP-LINK	TL-MR11U
Notebook	LENOVO	T420
150cm shielded HDMI Cable	HP	N/A
150cm shielded VGA Cable with two ferrite core	DELL	N/A
Adapter	SCT DIGITAL TECHNOLOGY CO., LTD.	Input: AC 100-240V; 50/60Hzx Output: DC 19V
Converted board	SCT DIGITAL TECHNOLOGY CO., LTD.	N/A

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EXHIBIT 3

EMISSION RESULTS

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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.

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

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization 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:

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

Example

Assume a receiver reading of 62.0dB μ 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 42dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

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

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

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

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

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

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(42\text{dB}\mu\text{V/m})/20] = 125.9\mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
At
276.572MHz (Normal Operating with Full load)

For electronic filing, the worst case radiated emission configuration photograph is 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.

Judgement: Passed by 2.5dB margin

TEST PERSONNEL:

Sign on file

Robert Li Project Engineer
Typed/Printed Name

28 June 2014
Date

INTERTEK TESTING SERVICES

Applicant: SCT DIGITAL TECHNOLOGY CO., LTD.

Model: IWB-PC02

Worst case operating Mode: Normal Operating with Full load

Radiated Emissions (30MHz~1GHz)

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	170.650	48.8	20.0	10.5	39.3	43.5	-4.2
Horizontal	196.840	46.3	20.0	10.5	36.8	43.5	-6.7
Horizontal	276.572	50.6	20.0	12.9	43.5	46.0	-2.5
Vertical	30.970	45.8	20.0	10.5	36.3	40.0	-3.7
Vertical	117.780	45.1	20.0	10.5	35.6	43.5	-7.9
Vertical	166.285	45.4	20.0	10.5	35.9	43.5	-7.6

NOTES:

1. Quasi-Peak detector is used for frequency up to 1GHz.
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 value in the margin column shows emission below limit.
4. All emissions up to 1GHz are below the QP limit.

INTERTEK TESTING SERVICES

Applicant: SCT DIGITAL TECHNOLOGY CO., LTD.

Model: IWB-PC02

Worst Case Operating Mode: Normal Operating with Full load

Radiated Emissions(1GHz~6GHz)

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	1331.250	52.0	36.1	34.1	50.0	74.0	-24.0
Horizontal	1665.000	50.8	36.1	34.3	49.0	74.0	-25.0
Horizontal	1757.500	50.9	36.1	34.3	49.1	74.0	-24.9
Vertical	1211.250	50.4	36.0	34.1	48.5	74.0	-25.5
Vertical	1846.250	51.9	36.1	34.3	50.1	74.0	-23.9
Vertical	2453.750	46.0	36.3	34.5	44.2	74.0	-29.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	1331.250	36.2	36.1	34.1	34.2	54.0	-19.8
Horizontal	1665.000	37.5	36.1	34.3	35.7	54.0	-18.3
Horizontal	1757.500	38.0	36.1	34.3	36.2	54.0	-17.8
Vertical	1211.250	37.1	36.0	34.1	35.2	54.0	-18.8
Vertical	1846.250	38.9	36.1	34.3	37.1	54.0	-16.9
Vertical	2453.750	38.9	36.3	34.5	37.1	54.0	-16.9

- NOTES: 1. Peak detector is used for Peak Value and Average detector is used for average Value.
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 used for the emission over 1000MHz.

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3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration
at
0.530 MHz (Normal Operating with Full load Mode)

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

3.5 Conducted Emission Data

Judgement: Passed by 16.2 dB margin

TEST PERSONNEL:

Sign on file

Robert Li Project Engineer
Typed/Printed Name

28 June 2014
Date

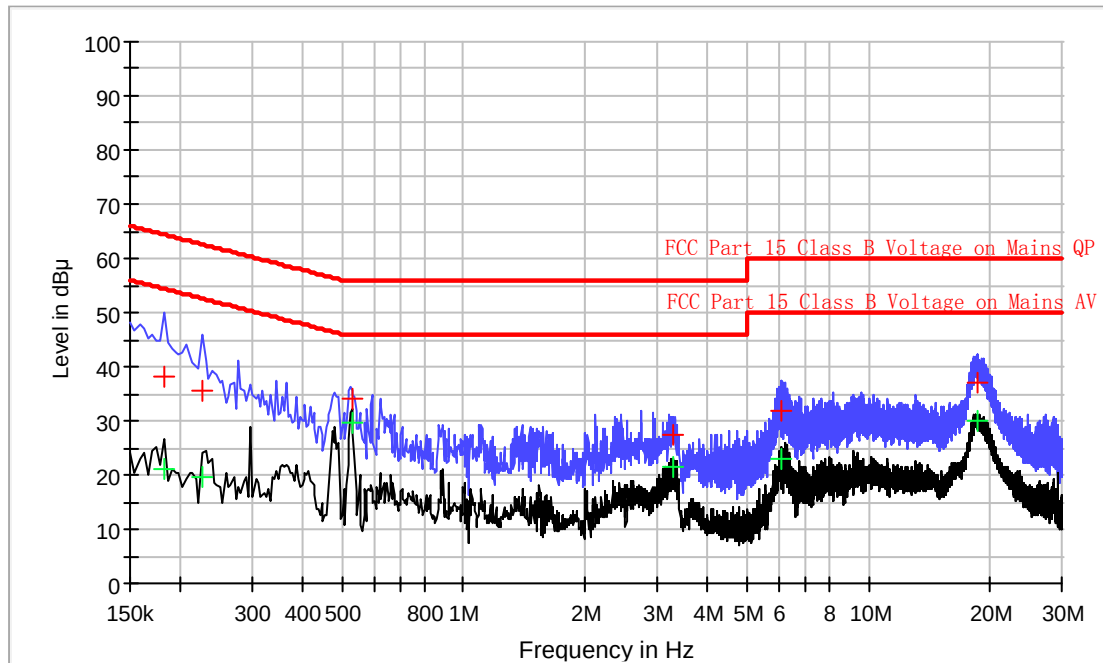
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Applicant: SCT DIGITAL TECHNOLOGY CO., LTD.

Model: IWB-PC02

Worst case operating Mode: Normal Operating with Full load

Conducted Emission Test FCC Part 15



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.182000	38.1	9.000	L1	9.8	26.3	64.4
0.226000	35.6	9.000	L1	9.8	27.0	62.6
0.530000	34.0	9.000	L1	9.8	22.0	56.0
3.294000	27.3	9.000	L1	10.0	28.7	56.0
6.118000	32.0	9.000	L1	10.0	28.0	60.0
18.506000	37.0	9.000	L1	10.4	23.0	60.0

Result Table AV

Frequency (MHz)	CAverage (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.182000	21.1	9.000	L1	9.8	33.3	54.4
0.226000	19.5	9.000	L1	9.8	33.1	52.6
0.530000	29.8	9.000	L1	9.8	16.2	46.0
3.294000	21.3	9.000	L1	10.0	24.7	46.0
6.118000	23.0	9.000	L1	10.0	27.0	50.0
18.506000	29.8	9.000	L1	10.4	20.2	50.0

TRF No.: FCC 15C_PC_b

FCC ID: 2ACFJIWB-PC02

Report No.: 140626006SZN-001

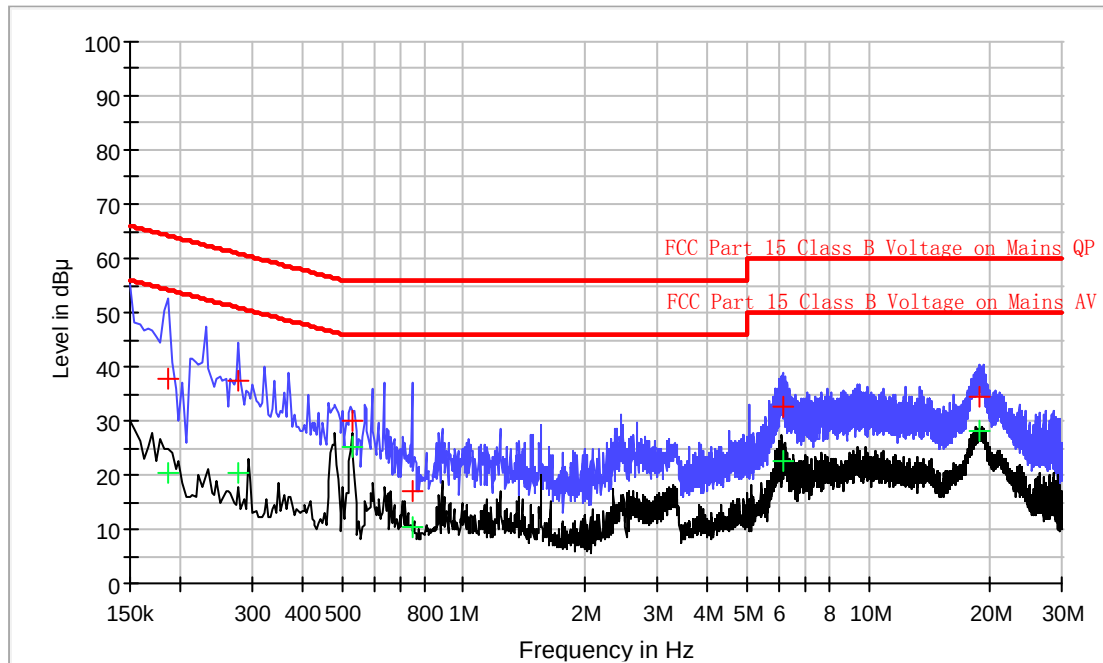
INTERTEK TESTING SERVICES

Applicant: SCT DIGITAL TECHNOLOGY CO., LTD.

Model: IWB-PC02

Worst case operating Mode: Normal Operating with Full load

Conducted Emission Test FCC Part 15



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.186000	37.8	9.000	N	10.1	26.4	64.2
0.278000	37.6	9.000	N	10.1	23.3	60.9
0.530000	29.9	9.000	N	10.2	26.1	56.0
0.746000	16.9	9.000	N	10.2	39.1	56.0
6.122000	32.4	9.000	N	10.3	27.6	60.0
18.870000	34.3	9.000	N	10.6	25.7	60.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.186000	20.5	9.000	N	10.1	33.7	54.2
0.278000	20.5	9.000	N	10.1	30.4	50.9
0.530000	25.2	9.000	N	10.2	20.8	46.0
0.746000	10.3	9.000	N	10.2	35.7	46.0
6.122000	22.7	9.000	N	10.3	27.3	50.0
18.870000	28.0	9.000	N	10.6	22.0	50.0

TRF No.: FCC 15C_PC_b

FCC ID: 2ACFJIWB-PC02

Report No.: 140626006SZN-001

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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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

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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.

EXHIBIT 6
TECHNICAL SPECIFICATIONS

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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

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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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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 **Miscellaneous Information**

This miscellaneous information includes emission measuring procedure.

8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Test 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 - 2009.

The computer 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 Test to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz. Detector function for radiated emissions are in PK&AV mode from the frequency band above 1GHz with RBW setting 1MHz. 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 6GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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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 - 2009.

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EXHIBIT 9

CONFIDENTIALITY REQUEST

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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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EXHIBIT 10

TEST EQUIPMENT LIST

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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	29-Jun-13	29-Jun-14
SZ185-01	EMI Receiver	R&S	ESCI	100547	12-Mar-14	12-Mar-15
SZ061-09	Horn Antenna	ETS	3115	00092346	29-Jun-13	29-Jun-14
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	12-Mar-14	12-Mar-15
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	12-Mar-14	12-Mar-15
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2-Mar-14	2-Mar-15
SZ062-02	RF Cable	RADIAL	RG 213U	--	20-Jul-13	20-Jul-14
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	--	20-Jul-13	20-Jul-14
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	20-Jul-13	20-Jul-14
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	9-Nov-13	9-Nov-14
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	9-Nov-13	9-Nov-14
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	9-Nov-13	9-Nov-14
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-13	23-Aug-14