

Shen Zhen MTC Co., LTD

Application  
For  
Certification  
**FCC ID: 2AHVH4835530**

**LED TV**

**Model: MHAV4830Y-35530**  
**Additional Models: MUAV48 followed by 2 characters; followed by**  
**Y-35530, LT-48MA570**

Computer Peripheral

Report No.: 170509133GZU-001

Prepared and Checked by:

Approved by:

Sign on file

Powell Bao  
Engineer

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Kidd Yang  
Senior Project Engineer  
Date: June 6, 2017

- 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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- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF No.: FCC 15C\_PC\_b

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## INTERTEK TESTING SERVICES

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### LIST OF EXHIBITS

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## INTERTEK TESTING SERVICES

### MEASUREMENT / TECHNICAL REPORT

Shen Zhen MTC Co., LTD

**MODEL: MHAV4830Y-35530**

**Additional Models: MUAV48 followed by 2 characters; followed by Y-35530, LT-48MA570**

**FCC ID: 2AHVH4835530**

This report concerns (check one:) Original Grant ☒ Class I 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 B for unintentional radiator – the new 47 CFR [10-01-15 Edition] provision.

Report prepared by:

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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 photos	radiated photos.pdf
Test Setup Photo	Conducted photos	conducted photos.pdf
External Photo	External Photos	external photos.pdf
Internal Photo	Internal Photos	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	Confidential Letter	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 LED TV. The device can be used to connect PC by VGA and HDMI port. The EUT is powered by 120V/60Hz.

The Models: MUAV48 followed by 2 characters; followed by Y-35530, LT-48MA570 are the same as the Model: MHAV4830Y-35530 in hardware and electronic aspect. The difference in packaging and model number serves as marketing strategy.

#### 1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral. Other digital functions were reported in the verification report: 170509133GZU-002.

## 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 (2014). 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 **EMTEK (Shenzhen) Co., Ltd** and located at Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, 518052, China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 406365).



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### **EXHIBIT 2**

### **SYSTEM TEST CONFIGURATION**

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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 (2014).

The device was powered by AC 120V/60Hz during the test. The worst case data was reported in this report.

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 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

N/A

#### 2.3 Special Accessories

VGA cable with ferrite cores

#### 2.4 Equipment Modification

Any modifications installed previous to testing by Shen Zhen MTC 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. Guangzhou Branch.

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## INTERTEK TESTING SERVICES

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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.
Laptop	HP	HP 430G
Hard Disk	Smart.drive	HD-003
USB Cable	Smart.drive	Unshielded, Length 155cm
Vga Cable*1	N/A	Unshielded, Length 150cm
USB Memory	TOSHIBA	UHYBS-004G-BL
Dummy Load	N/A	N/A
HDMI Cable*3	N/A	Unshielded, Length 180cm
AV Cable	N/A	Unshielded, Length 120cm
Audio Cable	N/A	Unshielded, Length 120cm
Tuner Resister	N/A	75ohm
RJ45	N/A	Unshielded, Length 300cm
Optical cable	N/A	Unshielded, Length 200cm
AC Power Cable	N/A	Unshielded, Length 150cm
Remote controller	Shen Zhen MTC 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.

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

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/m

AG = Amplifier Gain 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:

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

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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/m and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The net field strength for comparison to the appropriate emission limit is 42dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

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

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

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

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

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

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

## **INTERTEK TESTING SERVICES**

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### 3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
At  
188.580MHz (VGA Mode)

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 3.2dB margin (VGA Mode)

#### **TEST PERSONNEL:**

*Sign on file*

Powell Bao Engineer  
*Typed/Printed Name*

May 17, 2017  
*Date*

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## INTERTEK TESTING SERVICES

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Company: Shen Zhen MTC Co., LTD

Date of Test: May 17, 2017

Model: MHAV4830Y-35530

Operating Mode: VGA

**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	188.580	44.1	20.0	11.2	35.3	43.5	-8.2
Horizontal	240.480	41.0	20.0	13.6	34.6	46.0	-11.4
Horizontal	598.920	33.6	20.0	22.2	35.8	46.0	-10.2
Horizontal	1117.117	27.8	20.0	26.7	34.5	54.0	-19.5
Horizontal	3432.012	25.2	20.0	32.4	37.6	54.0	-16.4
Horizontal	4951.059	16.0	20.0	45.5	41.5	54.0	-12.5
Vertical	73.680	43.7	20.0	8.3	32.0	40.0	-8.0
Vertical	188.580	49.1	20.0	11.2	40.3	43.5	-3.2
Vertical	239.520	40.2	20.0	13.5	33.7	46.0	-12.3
Vertical	1221.210	34.0	20.0	27.5	41.5	54.0	-12.5
Vertical	3515.022	27.3	20.0	33.5	40.8	54.0	-13.2
Vertical	4951.253	18.9	20.0	45.7	44.6	54.0	-9.4

**NOTES:**

1. Quasi-Peak detector is used for frequency up to 1GHz and Peak detector is used for frequency from 1-5GHz.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. All emissions up to 1GHz are below the QP limit and all emissions between 1-5GHz are below the AV limit.

Test Engineer: Powell Bao

## **INTERTEK TESTING SERVICES**

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3.4 Conducted Emission at Mains Terminal

3.5 Conducted Emission Configuration Photograph

Worst Case Conducted Configuration  
at  
0.474 MHz(VGA Mode)

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

## INTERTEK TESTING SERVICES

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### 3.6 Conducted Emission Data

Judgement: Passed by 11.8 dB margin(VGA Mode)

#### **TEST PERSONNEL:**

*Sign on file*

Powell Bao Engineer  
*Typed/Printed Name*

May 17, 2017  
*Date*

## INTERTEK TESTING SERVICES

Company: Shen Zhen MTC Co., LTD

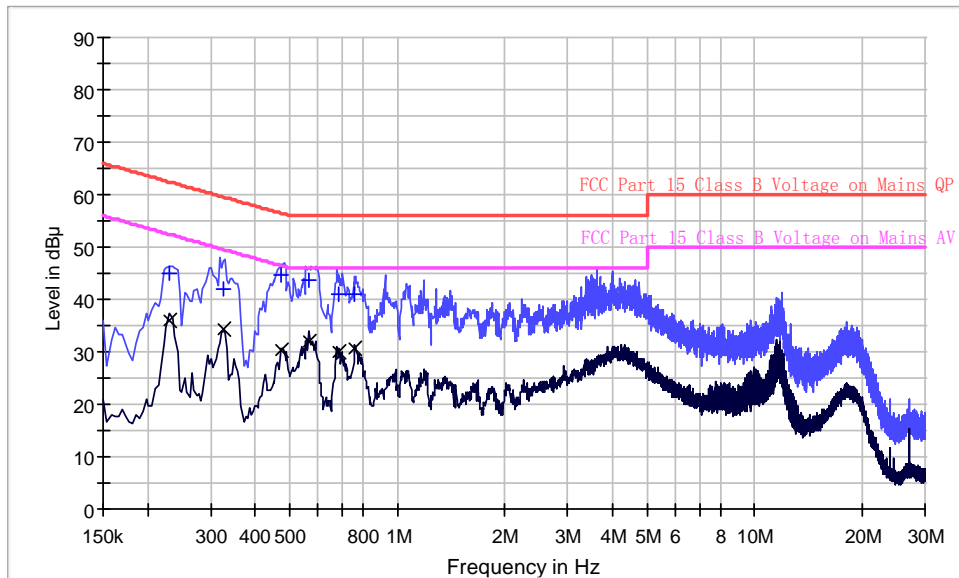
Date of Test: May 17, 2017

Model: MHAV4830Y-35530

Operating Mode: VGA

Phase: Live

### Conducted Emission Test - FCC



### Result Table QP

Frequency (MHz)	QuasiPeak (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.230	44.9	L1	9.7	17.5	62.4
0.326	42.1	L1	9.7	17.5	59.6
0.474	44.6	L1	9.7	11.8	56.4
0.566	43.6	L1	9.7	12.4	56.0
0.686	40.9	L1	9.7	15.1	56.0
0.762	40.9	L1	9.7	15.1	56.0

### Result Table AV

Frequency (MHz)	Average (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.230	36.1	L1	9.7	16.3	52.4
0.326	34.2	L1	9.7	15.4	49.6
0.474	30.4	L1	9.7	16.0	46.4
0.566	32.1	L1	9.7	13.9	46.0
0.686	29.9	L1	9.7	16.1	46.0
0.762	30.6	L1	9.7	15.4	46.0

Test Engineer: Powell Bao

TRF No.: FCC 15C\_PC\_b

FCC ID: 2AHVH4835530

## INTERTEK TESTING SERVICES

Company: Shen Zhen MTC Co., LTD

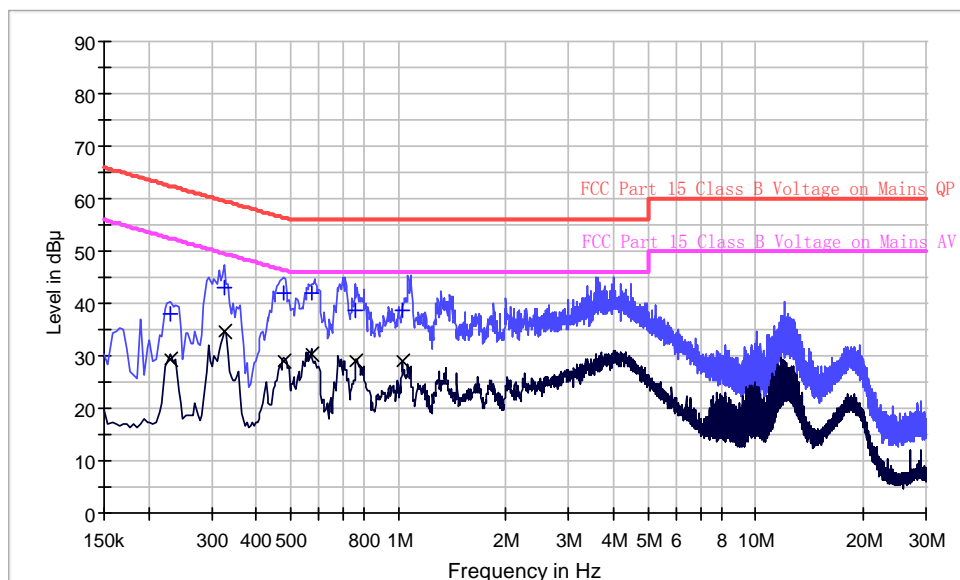
Date of Test: May 17, 2017

Model: MHAV4830Y-35530

Operating Mode: VGA

Phase: Neutral

### Conducted Emission Test - FCC



### Result Table QP

Frequency (MHz)	QuasiPeak (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.230	38.1	N	9.7	24.3	62.4
0.326	43.0	N	9.7	16.6	59.6
0.478	42.0	N	9.7	14.4	56.4
0.570	42.0	N	9.7	14.0	56.0
0.762	38.7	N	9.7	17.3	56.0
1.026	38.7	N	9.7	17.3	56.0

### Result Table AV

Frequency (MHz)	Average (dB μV)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.230	29.5	N	9.7	22.9	52.4
0.326	34.7	N	9.7	14.9	49.6
0.478	29.0	N	9.7	17.4	46.4
0.570	30.4	N	9.7	15.6	46.0
0.762	29.0	N	9.7	17.0	46.0
1.026	29.1	N	9.7	16.9	46.0

Test Engineer: Powell Bao

TRF No.: FCC 15C\_PC\_b

FCC ID: 2AHVH4835530

## **INTERTEK TESTING SERVICES**

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### **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.



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## **INTERTEK TESTING SERVICES**

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### **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**

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### **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.

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## **INTERTEK TESTING SERVICES**

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### **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**

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### **EXHIBIT 8**

### **MISCELLANEOUS INFORMATION**

## INTERTEK TESTING SERVICES

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### 8.0 **Miscellaneous Information**

This miscellaneous information includes emission measuring procedure.



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## 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 – 2014.

The computer peripheral equipment under test (EUT) is placed on a polystyrene turntable which is four feet in diameter and approximately 0.8 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 are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz and in PK & AV mode from frequency band 1GHz to 5GHz 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 5GHz. 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 – 2014.

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### **EXHIBIT 9**

### **TEST EQUIPMENT LIST**

## INTERTEK TESTING SERVICES

### 9.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
EE089	EMI Test Receiver	Rohde & Schwarz	ESU	1302.600 5.26	17-May-2016	17-May-2017
EE040	Pre-Amplifier	HP	8447F	2944A07 999	17-May-2016	17-May-2017
EE043	Bilog Antenna	Schwarzbeck	VULB916 3	142	17-May-2016	17-May-2017
EE147	Cable	Schwarzbeck	AK9513	ACRX1	17-May-2016	17-May-2017
EE169	Cable	Rosenberger	N/A	FP2RX2	17-May-2016	17-May-2017
EE168	Cable	Schwarzbeck	AK9513	CRPX1	29-May-2016	29-May-2017
EE170	Cable	Schwarzbeck	AK9513	CRRX2	29-May-2016	29-May-2017
EE096	Pre-Amplifier	A.H.	PAM-0126	1415261	17-May-2016	17-May-2017
EE343	EMI Test Receiver	Rohde & Schwarz	FSV40	132.1-3008K39-100967-AP	29-May-2016	29-May-2017
EE234	Horn Antenna	AHS/USA	SAS-573	184	17-May-2016	17-May-2017
EE312	Cable	A.H	SAC-40G-1	414	17-May-2016	17-May-2017
EE313	Cable	A.H	SAC-40G-1	413	17-May-2016	17-May-2017
EE023	Test Receiver	Rohde & Schwarz	ESCS30	879	29-May-2016	29-May-2017
EE145	L.I.S.N.	Rohde & Schwarz	ENV216	590	29-May-2016	29-May-2017
EE021	L.I.S.N.	ROHDE & SCHWARZ	ESH2-Z5	236	29-May-2016	29-May-2017