TEST REPORT

Report Number: HK09121128-1

Application
for
Original Grant
of 47 CFR Part 15 Certification
Single New of RSS-210 Issue 7 Equipment Certification

A Two Lines Corded Phone and 1.9GHz Digital Modulation Cordless Phone with Bluetooth - Base Unit Bluetooth Portion

FCC ID: EW780-6879-00

IC: 1135B-80687900

Prepared and Checked by:

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GENERAL INFORMATION

Applicant Name:	VTech Telecommunications Ltd.
Applicant Address:	23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
FCC Specification Standard:	FCC Part 15: 2008
FCC ID:	EW780-6879-00
FCC Model(s):	TL86XY9
IC Specification Standard:	RSS-210 Issue 7, June 2007 RSS-Gen Issue 2, June 2007 RSS-102 Issue 3, June 2009
IC:	1135B-80687900
IC Model(s):	TL86109
Type of EUT:	Transceiver
Description of EUT:	A Two Lines Corded Phone and 1.9GHz Digital Modulation Cordless Phone with Bluetooth - Base Unit Bluetooth Portion
Serial Number:	N/A
Sample Receipt Date:	December 30, 2009
Date of Test:	December 31, 2009-January 08, 2010
Report Date:	February 18, 2010
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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1.0 **Summary of Test Results**

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen# / RSS-310^ Section	Results	Details see section
Antenna Requirement	15.203	7.1.4#	Pass	2.1
Radiated Emission Radiated Emission on the Bandedge	15.249(a), 209, & 109 15.249(d)	A2.9(a) A2.9(b)	Pass Pass	4.2 4.4
Radiated Emission in Restricted Bands	15.205	2.2	Pass	4.2
Radiated Emission from Receiver	N/A	2.3	Pass	4.3
AC Power Line Conducted Emission	15.207 & 15.107	7.2.2#	Pass	4.5
Radio Frequency Exposure Compliance	N/A	RSS-102	Pass	4.6

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB 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 expected variations in temperature and supply voltage were considered.

EXHIBIT 2
GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Model: TL86109 is a Two Lines Corded Phone and 1.9GHz Digital Modulation Cordless Phone with Bluetooth - Base Unit Bluetooth Portion. Only Base offers Bluetooth feature, and it operates at frequency range of 2402-2480MHz with 79 channels. Base Unit for TL86209 is powered by an AC adaptor: 100-120VAC to 6VDC 600mA (Model: SSA-5AP-09 US 060060L). Handset unit has a “cellular” button that manages Bluetooth connections to a Bluetooth-equipped cell phone or headset. With Bluetooth and 1.9GHz wireless communications enable, the Base Unit allows user to use the cordless handset to dial out or receive cellular phone calls via the cellular network. Four Bluetooth equipped devices (cell phones and headsets) can be paired with the telephone base, but only one Bluetooth cell phone or a headset can be on a call at a time.

The Bluetooth antenna used in base unit is integral, and the tested sample is a prototype.

For FCC, The Model(s): TL86XY9 is the same as the Model: TL86109 in electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are model number, color, number of cordless handset and extra charger, color and packaging material to be sold for marketing purpose. Suffix (X) indicates different number of cordless handset and extra charger; suffix (Y) indicates different color and packaging material.

The circuit description is attached in the Appendix and saved with filename: descri.pdf.

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C and RJ14C in the 2-wire loop calling central office line.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data and conducted data are located at Roof Top and 2nd Floor respectively of Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC and the Industry Canada.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit / receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The Base Unit was powered by a 100-120VAC to 6VDC 600mA adaptor.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational to simulate typical use. The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

Measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

For receiver radiated measurement, the spectrum analyzer resolution bandwidth was 1MHz for measurement above 1GHz while 100kHz for measurement from 30MHz to 1GHz.

Radiated emission measurement for transmitter were performed 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 to 40 GHz, whichever is lower. Receiver was performed from 30MHz to the fifth harmonic of the highest frequency or 40GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion are measured, and the limit are according to FCC Part 15 Section 15.109.

3.1 Justification - Cont'd

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 4.2.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was 625µs. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and 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 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

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

All relevant operation modes have been tested, and the worst case data is included in this report.

3.2 EUT Exercising Software

The EUT exercise program used during radiated testing was designed to exercise the various system components in a manner similar to a typical use.

3.3 Details of EUT and Description of Peripherals

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

(1) Base Unit: An AC adaptor (100-120VAC to 6VDC 600mA, Model: SSA-5AP-09 US 060060L) (Supplied by Client)

Description of Peripherals:

(1) 3 x Telecommunication cable with RJ11C connectors (1m, unshielded), terminated (Supplied by Intertek)

(2) Handset battery: A "Ni-MH" type rechargeable battery (2.4V, 400, 500, 550, 750mAh) (Supplied by Client)

(3) Telephone Line Simulator, Model: TLS-5C-01, S/N: 059355 (Supplied by Intertek)

(4) Telephone Headset (Supplied by Client)

(5) Handset, Model: TL86109, FCC ID: EW780-6879-00 (Supplied by Client)

(6) Motorola Mobile Phone: Model: V9, FCC ID: IHDT56HN2 (Supplied by Client)

(7) 3 x 3m Telephone Line (Supplied by Intertek)

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

Any modifications installed previous to testing by VTech Telecommunications Ltd. will be incorporated in each production model sold/leased in the United States and Canada.

No modifications were installed by Commercial & Electrical Division, Intertek Testing Services Hong Kong Ltd.

EXHIBIT 4
TEST RESULTS

4.0 **Test 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.

4.1 Field Strength Calculation

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

FS = RA + AF + CF - AG

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

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 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 is added. The amplifier gain of 29 dB is 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
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
FS = RR + LF
FS = 23 + 9 = 32 dBμV/m

RR = 23.0 dBμV
LF = 9.0 dB

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

55.300 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1-4 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 6.6 dB margin

4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Specification Version 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625µs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625µs = 3.75ms. For one period for a pseudo-random hopping through all 79 RF channels, it take: 79 x 3.75ms = 296.25ms.

The dwell time for DH5 is 5 x 625µs = 3.125ms.

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms/100ms
= 0.03125

Average Factor (AF) of Bluetooth in dB = $20 \log_{10} (0.03125)$
= -30.1dB

Mode: TX-Channel 00

Table 1

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	94.6	33	29.4	30.1	60.9	94.0	-33.1
V	***4804.000***	***55.3***	***33***	***34.9***	***30.1***	***27.1***	***54.0***	***-26.9***
H	7206.000	44.9	33	37.9	30.1	19.7	54.0	-34.3
H	9608.000	42.6	33	40.4	30.1	19.9	54.0	-34.1
H	***12010.000***	***41.7***	***33***	***40.5***	***30.1***	***19.1***	***54.0***	***-34.9***
H	14412.000	42.1	33	40.0	30.1	19.0	54.0	-35.0

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	94.6	33	29.4	91.0	114.0	-23.0
V	***4804.000***	***55.3***	***33***	***34.9***	***57.2***	***74.0***	***-16.8***
H	7206.000	44.9	33	37.9	49.8	74.0	-24.2
H	9608.000	42.6	33	40.4	50.0	74.0	-24.0
H	***12010.000***	***41.7***	***33***	***40.5***	***49.2***	***74.0***	***-24.8***
H	14412.000	42.1	33	40.0	49.1	74.0	-24.9

NOTES:
1. Peak detector is used for the emission measurement.
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 is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 39

Table 2

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	94.8	33	29.4	30.1	61.1	94.0	-32.9
V	***4882.000***	***55.5***	***33***	***34.9***	***30.1***	***27.3***	***54.0***	***-26.7***
H	***7323.000***	***45.5***	***33***	***37.9***	***30.1***	***20.3***	***54.0***	***-33.7***
H	9764.000	42.4	33	40.4	30.1	19.7	54.0	-34.3
H	***12205.000***	***41.4***	***33***	***40.5***	***30.1***	***18.8***	***54.0***	***-35.2***
H	14646.000	43.3	33	38.4	30.1	18.6	54.0	-35.4

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2441.000	94.8	33	29.4	91.2	114.0	-22.8
V	***4882.000***	***55.5***	***33***	***34.9***	***57.4***	***74.0***	***-16.6***
H	***7323.000***	***45.5***	***33***	***37.9***	***50.4***	***74.0***	***-23.6***
H	9764.000	42.4	33	40.4	49.8	74.0	-24.2
H	***12205.000***	***41.4***	***33***	***40.5***	***48.9***	***74.0***	***-25.1***
H	14646.000	43.3	33	38.4	48.7	74.0	-25.3

NOTES:
1. Peak detector is used for the emission measurement.
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 is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: TX-Channel 78

Table 3

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	94.9	33	29.4	30.1	61.2	94.0	-32.8
V	***4960.000***	***55.7***	***33***	***34.9***	***30.1***	***27.5***	***54.0***	***-26.5***
H	***7440.000***	***45.3***	***33***	***37.9***	***30.1***	***20.1***	***54.0***	***-33.9***
H	9920.000	42.2	33	40.4	30.1	19.5	54.0	-34.5
H	***12400.000***	***41.7***	***33***	***40.5***	***30.1***	***19.1***	***54.0***	***-34.9***
H	14880.000	43.5	33	38.4	30.1	18.8	54.0	-35.2

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	94.9	33	29.4	91.3	114.0	-22.7
V	***4960.000***	***55.7***	***33***	***34.9***	***57.6***	***74.0***	***-16.4***
H	***7440.000***	***45.3***	***33***	***37.9***	***50.2***	***74.0***	***-23.8***
H	9920.000	42.2	33	40.4	49.6	74.0	-24.4
H	***12400.000***	***41.7***	***33***	***40.5***	***49.2***	***74.0***	***-24.8***
H	14880.000	43.5	33	38.4	48.9	74.0	-25.1

NOTES: 1. Peak detector is used for the emission measurement.

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 is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

Mode: Talk

Table 4

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	55.300	38.4	16	11.0	33.4	40.0	-6.6
V	***110.600***	***35.5***	***16***	***14.0***	***33.5***	***43.5***	***-10.0***
H	***165.900***	***33.0***	***16***	***17.0***	***34.0***	***43.5***	***-9.5***
H	221.200	32.8	16	17.0	33.8	46.0	-12.2
H	***276.500***	***26.6***	***16***	***22.0***	***32.6***	***46.0***	***-13.4***
H	***331.800***	***24.4***	***16***	***24.0***	***32.4***	***46.0***	***-13.6***

NOTES:
1. Peak detector is used for the emission measurement.
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. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

4.3 Radiated Emissions from Receiver

4.3.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

2439.500 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.3.2 Radiated Emission Data

The data in tables 5 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 5.0 dB margin

Mode: Receiving – Middle Channel

Table 5

Radiated Emissions Data

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	2439.500	52.6	33	29.4	49.0	54.0	-5.0
H	4879.000	46.6	33	34.9	48.5	54.0	-5.5
H	7318.500	43.5	33	37.9	48.4	54.0	-5.6
H	9758.000	40.2	33	40.4	47.6	54.0	-6.4

NOTES:

1. Peak detector is used for the emission measurement.

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 is used for the emission over 1000MHz.

4.4 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2003) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209 / Table 2 of RSS-210, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d) / RSS-210 A2.9(b).

Radiated Emission on bandedge plots are attached in the Appendix and saved with filename: be.pdf

Bandedge compliance is determined by applying marker-delta method, i.e.

Resultant Field Strength = Fundamental Emissions - Delta from the plot

Resultant field strength for the lowest and/or highest channel(s), with corresponding average values are calculated as follows:

	Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
Base	Lowest	60.9	30.48	30.42	54	-23.58
	Highest	61.2	47.44	13.76	54	-40.24

	Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
Base	Lowest	91.0	30.48	60.52	74	-13.48
	Highest	91.3	47.44	43.86	74	-30.14

The resultant field strength meets the general radiated emission limit in FCC Part 15 Section 15.209 / Table 2 of RSS-210, which does not exceed 74dBµV/m for peak limit and also 54dBµV/m for average limit.

4.5 AC Power Line Conducted Emission

[ ] Not applicable – EUT is only powered by battery for operation.

[×] EUT connects to AC power line. Emission Data is listed in following pages.

[ ] Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.5.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

0.429 MHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.5.2 AC Power Line Conducted Emission Data

The conducted emission test result is attached in the Appendix and saved with filename: conduct.pdf

Judgement -

Passed by 14.7 dB margin compare with average limit

4.6 Radio Frequency Exposure Compliance

The Routine RF Exposure Evaluation, Routine SAR Evaluation and Declaration of RF Exposure Compliance are saved as filename: RF exposure.pdf

5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Biconical Antenna	Log Periodic Antenna	Double Ridged Guide Antenna
Registration No.	EW-0954	EW-0446	EW-1015
Manufacturer	EMCO	EMCO	EMCO
Model No.	3104C	3146	3115
Calibration Date	Sep. 30, 2008	Oct. 02, 2008	Jul. 28, 2008
Calibration Due Date	Mar. 30, 2010	Apr. 02, 2010	Jan. 28, 2010

Equipment	EMI Test Receiver	Spectrum Analyzer
Registration No.	EW-0014	EW-1792
Manufacturer	R&S	R&S
Model No.	ESVS30	FSP40
Calibration Date	Jun. 01, 2009	Feb. 02, 2009
Calibration Due Date	Jun. 01, 2010	Feb. 02, 2010

Equipment	Broad-Band Horn Antenna with frequency range 14G - 40GHz	Digital Multimeter	Spectrum Analyzer
Registration No.	EW-1679	EW-1237	EW-2188
Manufacturer	SCHWARZBECK	FLUKE	AGILENTTECH
Model No.	BBHA9170	179	E4407B
Calibration Date	Feb. 10, 2009	Sep. 01, 2009	Dec. 25, 2009
Calibration Due Date	Feb. 10, 2010	Oct. 01, 2010	Dec. 31, 2010

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-0015	EW-0090	EW-0700
Manufacturer	R&S	R&S	R&S
Model No.	ESHS30	ESH3-Z5	ESH3-Z2
Calibration Date	Aug. 14, 2009	Jan. 20, 2009	Jun. 08, 2009
Calibration Due Date	Aug. 14, 2010	Jan. 20, 2010	Dec. 08, 2010

END OF TEST REPORT