

## TEST REPORT

**Report Number: HK11020003-1**

Application  
for  
Original Grant of 47 CFR Part 15 Certification  
New Family of RSS-210 Issue 8 Equipment Certification

1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone,  
Digital Answering Machine, and Bluetooth - Base Unit Bluetooth Portion

**FCC ID: EW780-8213-00**

**IC: 1135B-80821300**

Prepared and Checked by:



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Koo Wai Ip  
Lead Engineer  
March 10, 2011

Approved by:



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Nip Ming Fung, Melvin  
Supervisor  
March 10, 2011

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### GENERAL INFORMATION

<b>Applicant Name:</b>	VTech Telecommunications Limited
<b>Applicant Address:</b>	23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
<b>FCC Specification Standard:</b>	FCC Part 15, October 1, 2009 Edition
<b>FCC ID:</b>	EW780-8213-00
<b>FCC Model(s):</b>	TL96XY1
<b>IC Specification Standard:</b>	RSS-210 Issue 8, December 2010 RSS-Gen Issue 3, December 2010 RSS-102 Issue 4, March 2010 RSS-310 Issue 3, December 2010
<b>IC:</b>	1135B-80821300
<b>IC Model(s):</b>	TL96271, TL96371, TL96471
<b>Type of EUT:</b>	Transceiver
<b>Description of EUT:</b>	1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone, Digital Answering Machine, and Bluetooth - Base Unit Bluetooth Portion
<b>Serial Number:</b>	N/A
<b>Sample Receipt Date:</b>	February 01, 2011
<b>Date of Test:</b>	Radiated Emission Test : March 3, 2011 AC Conducted Emission Test: January 28, 2011 Bandedge Test: January 28, 2011
<b>Report Date:</b>	March 10, 2011
<b>Environmental Conditions:</b>	Temperature: +10 to 40°C Humidity: 10 to 90%

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## Appendix – Exhibits for Application of Certification

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**EXHIBIT 1  
TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE**

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## 1.0 Test Results Summary & Statement of Compliance

### 1.1 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen <sup>#</sup> / RSS-310 <sup>^</sup> Section	Results	Details see section
Antenna Requirement	15.203	7.1.2 <sup>#</sup>	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	3.1 <sup>^</sup>	Pass	4.3
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4 <sup>#</sup>	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.

### 1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2009 Edition  
RSS-210 Issue 8, December 2010  
RSS-Gen Issue 3, December 2010  
RSS-102 Issue 4, March 2010  
RSS-310 Issue 3, December 2010

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**EXHIBIT 2  
GENERAL DESCRIPTION**

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### **2.0 General Description**

#### **2.1 Product Description**

The TL96271 is a 1.9GHz Digital Modulation Cordless Phone with Caller ID, Speakerphone, Digital Answering Machine, and Bluetooth - Base Unit Bluetooth Portion. Only base unit has Bluetooth feature, and it operates at frequency range of 2402MHz to 2480MHz with 79 channels. The Base Unit is powered by an adaptor 100-120VAC to 6VDC 600mA with either Ten Pao brand, (Model: S005IU0600060), or Sunstrong brand, (Model: SSA-5AP-09 US 060060L). With Bluetooth and 1.9GHz wireless communications enabled, the base unit allows users to use a cordless handset to dial out or receive Bluetooth-equipped cellular phone calls via the cellular network, or use a corresponding Bluetooth-equipped headset instead of the cordless headset. Only one cellular phone or headset can be on a call at a time.

The Bluetooth antennas used in base unit is integral, and the test sample is a prototype.

For FCC, The Model(s): TL96XY1 is the same as the Model: TL96271 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are model number, color, package configuration and material to be sold for marketing purpose. Suffix (X) indicates different number of handset and extra charger. Suffix (Y) indicates different color of base and handset and packages materials.

For IC, The Model(s): TL96371 and TL96471 are the same as the Model: TL96271 in electronics/electrical designs including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are model number, package configuration and material to be sold for marketing purpose.

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 in the 2-wire loop calling central office line.

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### 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 at Roof Top and 2<sup>nd</sup> Floor respectively of Intertek Testing Services Hong Kong Ltd., which is located at 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.



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**EXHIBIT 3  
SYSTEM TEST CONFIGURATION**

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### 3.0 System Test Configuration

#### 3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously / receive continuously / normal mode 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 was attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attached to peripherals, they were connected and operational to simulate typical use. The handset was remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base was wired to transmit full power.

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

For any intentional radiator powered by AC power line, 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 was 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 were measured, and the limit are according to FCC Part 15 Section 15.109.

The DECT module was put into transmission mode when taking radiated emission data for determining worst-case spurious emission.

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### 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 625 $\mu$ s. 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 and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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### 3.3 Details of EUT and Description of Accessories

#### Details of EUT:

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

- (1) Base Unit: An AC adaptor (100-120VAC to 6VDC, 600mA, Model: S005IU0600060, Brand: Ten Pao) (Supplied by Client)
- (2) Base Unit: An AC adaptor (100-120VAC to 6VDC, 600mA, Model: SSA-5AP-09 US 060060L, Brand: Sunstrong) (Supplied by Client)

#### Description of Accessories:

- (1) Telephone Line Simulator, Model: TLS-5D-01, S/N: 151101 (Supplied by Intertek)
- (2) Nokia Mobile Phone, Model: 5300, FCC ID: PPIRM-146 (Supplied by Intertek)
- (3) Handset; Model: TL96271, FCC ID: EW780-7764-00 (Supplied by Client)
- (4) 3m Telephone Line (Supplied by Intertek)
- (5) 1m Telephone Line with Termination (Supplied by Intertek)

### 3.4 Measurement Uncertainty

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

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**EXHIBIT 4  
TEST RESULTS**

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### 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 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:

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

#### Example

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 dB $\mu$ V  
AF = 7.4 dB  
CF = 1.6 dB  
AG = 29 dB  
PD = 0 dB  
AV = -10 dB  
FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dB $\mu$ V/m

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

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### 4.2 Radiated Emissions

#### 4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
at

Base Unit with adaptor "Sunstrong": 64.000 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 1-8 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Base Unit with adaptor "Sunstrong" - Passed by 6.1 dB margin

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### 4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Specification Version 2.0 / 2.1 + EDR, the transmitter ON time for each timeslot of Bluetooth is 625 $\mu$ s. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625 $\mu$ s = 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 625 $\mu$ s = 3.125ms.

Therefore,

$$\begin{aligned}\text{Duty Cycle (DC)} &= \text{Maximum On time in 100ms}/100\text{ms} \\ &= 3.125\text{ms}/100\text{ms} \\ &= 0.03125\end{aligned}$$

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



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Mode: TX-Channel 00 with adaptor "Ten Pao"

Table 1

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	2402.000	95.7	33	29.4	30.1	62.0	94.0	-32.0
<b>V</b>	<b>4804.000</b>	<b>60.4</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.2</b>	<b>54.0</b>	<b>-21.8</b>
H	7206.000	49.4	33	37.9	30.1	24.2	54.0	-29.8
H	9608.000	47.1	33	40.4	30.1	24.4	54.0	-29.6
<b>H</b>	<b>12010.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.1</b>	<b>54.0</b>	<b>-29.9</b>

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	2402.000	95.7	33	29.4	92.1	114.0	-21.9
<b>V</b>	<b>4804.000</b>	<b>60.4</b>	<b>33</b>	<b>34.9</b>	<b>62.3</b>	<b>74.0</b>	<b>-11.7</b>
H	7206.000	49.4	33	37.9	54.3	74.0	-19.7
H	9608.000	47.1	33	40.4	54.5	74.0	-19.5
<b>H</b>	<b>12010.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.8</b>

- 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.

## INTERTEK TESTING SERVICES

Mode: TX-Channel 39 with adaptor "Ten Pao"

Table 2

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	2441.000	95.8	33	29.4	30.1	62.1	94.0	-31.9
<b>V</b>	<b>4882.000</b>	<b>60.3</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.1</b>	<b>54.0</b>	<b>-21.9</b>
<b>H</b>	<b>7323.000</b>	<b>49.5</b>	<b>33</b>	<b>37.9</b>	<b>30.1</b>	<b>24.3</b>	<b>54.0</b>	<b>-29.7</b>
H	9764.000	47.2	33	40.4	30.1	24.5	54.0	-29.5
<b>H</b>	<b>12205.000</b>	<b>46.8</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.2</b>	<b>54.0</b>	<b>-29.8</b>

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	2441.000	95.8	33	29.4	92.2	114.0	-21.8
<b>V</b>	<b>4882.000</b>	<b>60.3</b>	<b>33</b>	<b>34.9</b>	<b>62.2</b>	<b>74.0</b>	<b>-11.8</b>
<b>H</b>	<b>7323.000</b>	<b>49.5</b>	<b>33</b>	<b>37.9</b>	<b>54.4</b>	<b>74.0</b>	<b>-19.6</b>
H	9764.000	47.2	33	40.4	54.6	74.0	-19.4
<b>H</b>	<b>12205.000</b>	<b>46.8</b>	<b>33</b>	<b>40.5</b>	<b>54.3</b>	<b>74.0</b>	<b>-19.7</b>

- 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.

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Mode: TX-Channel 78 with adaptor "Ten Pao"

Table 3

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	2480.000	95.9	33	29.4	30.1	62.2	94.0	-31.8
<b>V</b>	<b>4960.000</b>	<b>60.5</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.3</b>	<b>54.0</b>	<b>-21.7</b>
<b>H</b>	<b>7440.000</b>	<b>49.3</b>	<b>33</b>	<b>37.9</b>	<b>30.1</b>	<b>24.1</b>	<b>54.0</b>	<b>-29.9</b>
H	9920.000	46.9	33	40.4	30.1	24.2	54.0	-29.8
<b>H</b>	<b>12400.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.1</b>	<b>54.0</b>	<b>-29.9</b>

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	2480.000	95.9	33	29.4	92.3	114.0	-21.7
<b>V</b>	<b>4960.000</b>	<b>60.5</b>	<b>33</b>	<b>34.9</b>	<b>62.4</b>	<b>74.0</b>	<b>-11.6</b>
<b>H</b>	<b>7440.000</b>	<b>49.3</b>	<b>33</b>	<b>37.9</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.8</b>
H	9920.000	46.9	33	40.4	54.3	74.0	-19.7
<b>H</b>	<b>12400.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.8</b>

- 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.

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Mode: TX-Channel 00 with adaptor "Sunstrong"

Table 4

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBuV/m)	Average Limit at 3m (dBuV/m)	Margin (dB)
H	2402.000	95.8	33	29.4	30.1	62.1	94.0	-31.9
<b>V</b>	<b>4804.000</b>	<b>60.5</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.3</b>	<b>54.0</b>	<b>-21.7</b>
H	7206.000	49.7	33	37.9	30.1	24.5	54.0	-29.5
H	9608.000	46.9	33	40.4	30.1	24.2	54.0	-29.8
<b>H</b>	<b>12010.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.1</b>	<b>54.0</b>	<b>-29.9</b>

Polarization	Frequency (MHz)	Reading (dBuV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBuV/m)	Peak Limit at 3m (dBuV/m)	Margin (dB)
H	2402.000	95.8	33	29.4	92.2	114.0	-21.8
<b>V</b>	<b>4804.000</b>	<b>60.5</b>	<b>33</b>	<b>34.9</b>	<b>62.4</b>	<b>74.0</b>	<b>-11.6</b>
H	7206.000	49.7	33	37.9	54.6	74.0	-19.4
H	9608.000	46.9	33	40.4	54.3	74.0	-19.7
<b>H</b>	<b>12010.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.8</b>

- 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.

## INTERTEK TESTING SERVICES

Mode: TX-Channel 39 with adaptor "Sunstrong"

Table 5

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBUV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBUV/m)	Average Limit at 3m (dBUV/m)	Margin (dB)
H	2441.000	95.9	33	29.4	30.1	62.2	94.0	-31.8
<b>V</b>	<b>4882.000</b>	<b>60.4</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.2</b>	<b>54.0</b>	<b>-21.8</b>
<b>H</b>	<b>7323.000</b>	<b>49.4</b>	<b>33</b>	<b>37.9</b>	<b>30.1</b>	<b>24.2</b>	<b>54.0</b>	<b>-29.8</b>
H	9764.000	47.1	33	40.4	30.1	24.4	54.0	-29.6
<b>H</b>	<b>12205.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.1</b>	<b>54.0</b>	<b>-29.9</b>

Polarization	Frequency (MHz)	Reading (dBUV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBUV/m)	Peak Limit at 3m (dBUV/m)	Margin (dB)
H	2441.000	95.9	33	29.4	92.3	114.0	-21.7
<b>V</b>	<b>4882.000</b>	<b>60.4</b>	<b>33</b>	<b>34.9</b>	<b>62.3</b>	<b>74.0</b>	<b>-11.7</b>
<b>H</b>	<b>7323.000</b>	<b>49.4</b>	<b>33</b>	<b>37.9</b>	<b>54.3</b>	<b>74.0</b>	<b>-19.7</b>
H	9764.000	47.1	33	40.4	54.5	74.0	-19.5
<b>H</b>	<b>12205.000</b>	<b>46.7</b>	<b>33</b>	<b>40.5</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.8</b>

- 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.

## INTERTEK TESTING SERVICES

Mode: TX-Channel 78 with adaptor "Sunstrong"

Table 6

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBUV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (dB)	Calculated at 3m (dBUV/m)	Average Limit at 3m (dBUV/m)	Margin (dB)
H	2480.000	95.9	33	29.4	30.1	62.2	94.0	-31.8
<b>V</b>	<b>4960.000</b>	<b>60.2</b>	<b>33</b>	<b>34.9</b>	<b>30.1</b>	<b>32.0</b>	<b>54.0</b>	<b>-22.0</b>
<b>H</b>	<b>7440.000</b>	<b>49.6</b>	<b>33</b>	<b>37.9</b>	<b>30.1</b>	<b>24.4</b>	<b>54.0</b>	<b>-29.6</b>
H	9920.000	47.2	33	40.4	30.1	24.5	54.0	-29.5
<b>H</b>	<b>12400.000</b>	<b>46.8</b>	<b>33</b>	<b>40.5</b>	<b>30.1</b>	<b>24.2</b>	<b>54.0</b>	<b>-29.8</b>

Polarization	Frequency (MHz)	Reading (dBUV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBUV/m)	Peak Limit at 3m (dBUV/m)	Margin (dB)
H	2480.000	95.9	33	29.4	92.3	114.0	-21.7
<b>V</b>	<b>4960.000</b>	<b>60.2</b>	<b>33</b>	<b>34.9</b>	<b>62.1</b>	<b>74.0</b>	<b>-11.9</b>
<b>H</b>	<b>7440.000</b>	<b>49.6</b>	<b>33</b>	<b>37.9</b>	<b>54.5</b>	<b>74.0</b>	<b>-19.5</b>
H	9920.000	47.2	33	40.4	54.6	74.0	-19.4
<b>H</b>	<b>12400.000</b>	<b>46.8</b>	<b>33</b>	<b>40.5</b>	<b>54.2</b>	<b>74.0</b>	<b>-19.7</b>

- 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.

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## INTERTEK TESTING SERVICES

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Mode: Talk (3 way conference) with adaptor "Ten Pao"

Table 7

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	32.000	39.6	16	10.0	33.6	40.0	-6.4
V	64.000	40.8	16	9.0	33.8	40.0	-6.2
H	96.000	37.6	16	12.0	33.6	43.5	-9.9
<b>H</b>	<b>128.000</b>	<b>36.2</b>	<b>16</b>	<b>14.0</b>	<b>34.2</b>	<b>43.5</b>	<b>-9.3</b>
H	160.000	34.8	16	16.0	34.8	43.5	-8.7
H	192.000	33.6	16	16.0	33.6	43.5	-9.9
H	224.000	30.8	16	18.0	32.8	46.0	-13.2

- 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.

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## INTERTEK TESTING SERVICES

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Mode: Talk (3 way conference) with adaptor "Sunstrong"

Table 8

### Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	32.000	39.6	16	10.0	33.6	40.0	-6.4
V	64.000	40.9	16	9.0	33.9	40.0	-6.1
H	96.000	37.8	16	12.0	33.8	43.5	-9.7
<b>H</b>	<b>128.000</b>	<b>36.1</b>	<b>16</b>	<b>14.0</b>	<b>34.1</b>	<b>43.5</b>	<b>-9.4</b>
H	160.000	34.6	16	16.0	34.6	43.5	-8.9
H	192.000	33.2	16	16.0	33.2	43.5	-10.3
H	224.000	30.6	16	18.0	32.6	46.0	-13.4

- 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. 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.



## INTERTEK TESTING SERVICES

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### 4.3 Radiated Emissions from Receiver

#### 4.3.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission  
at

Base Unit with adaptor "Ten Pao": 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 9-10 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Base Unit with adaptor "Ten Pao" - Passed by 13.1 dB margin

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## INTERTEK TESTING SERVICES

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Mode: Receiving (Bluetooth) with adaptor “Ten Pao” – Middle Channel

Table 9

### Radiated Emissions Data

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	2439.500	44.5	33	29.4	40.9	54.0	-13.1
V	4879.000	38.7	33	34.9	40.6	54.0	-13.4
V	7318.500	35.3	33	37.9	40.2	54.0	-13.8
V	9758.000	32.2	33	40.4	39.6	54.0	-14.4
V	12197.500	31.9	33	40.5	39.4	54.0	-14.6

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. Horn antenna is used for the emission over 1000MHz.

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## INTERTEK TESTING SERVICES

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Mode: Receiving (Bluetooth) with adaptor "Sunstrong" – Middle Channel

Table 10

### Radiated Emissions Data

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
V	2439.500	44.2	33	29.4	40.6	54.0	-13.4
V	4879.000	38.6	33	34.9	40.5	54.0	-13.5
V	7318.500	35.3	33	37.9	40.2	54.0	-13.8
V	9758.000	32.5	33	40.4	39.9	54.0	-14.1
V	12197.500	32.1	33	40.5	39.6	54.0	-14.4

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.

## INTERTEK TESTING SERVICES

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### 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 emissions up to two standard bandwidths away 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 5 of RSS-Gen, 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:

Model	Adaptor	Channel	Fundamental Emission (dB $\mu$ V/m)	Delta from the plot (dB)	Resultant Field Strength (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)
TL96271	"Ten Pao"	Lowest	62.0	28.44	33.56	54	-20.44
TL96271	"Ten Pao"	Highest	62.2	48.76	13.44	54	-40.56
TL96271	"Sunstrong"	Lowest	62.1	28.44	33.66	54	-20.34
TL96271	"Sunstrong"	Highest	62.2	48.76	13.44	54	-40.56

Model	Adaptor	Channel	Fundamental Emission (dB $\mu$ V/m)	Delta from the plot (dB)	Resultant Field Strength (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)
TL96271	"Ten Pao"	Lowest	92.1	28.44	63.66	74	-10.34
TL96271	"Ten Pao"	Highest	92.3	48.76	43.54	74	-30.46
TL96271	"Sunstrong"	Lowest	92.2	28.44	63.76	74	-10.24
TL96271	"Sunstrong"	Highest	92.3	48.76	43.54	74	-30.46

The resultant field strength meets the general radiated emission limit in FCC Part 15 Section 15.209 / Table 5 of RSS-Gen, which does not exceed 74dB $\mu$ V/m for peak limit and also 54dB $\mu$ V/m for average limit.

## INTERTEK TESTING SERVICES

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### 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

Base Unit with adaptor “Ten Pao”: 0.5595 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 plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

Base Unit with adaptor “Ten Pao” - Passed by 10.72 dB margin compare with quasi-peak limit.

# INTERTEK TESTING SERVICES

Worst Case: Talk (3 way conference)

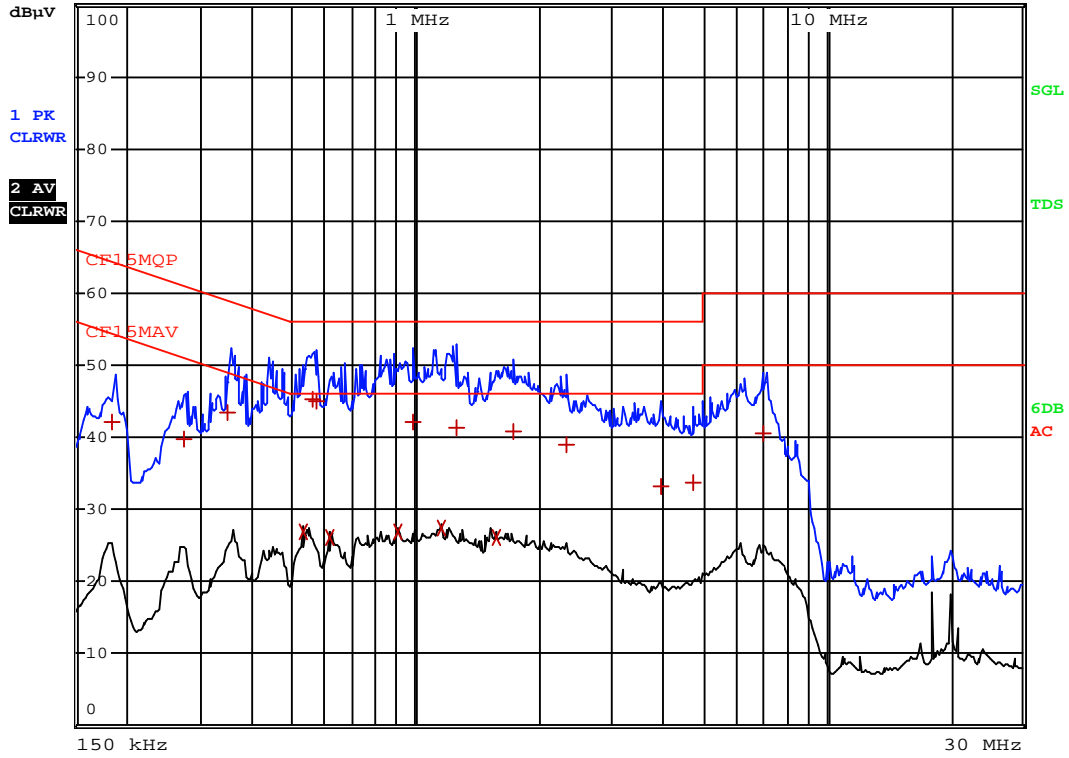
Adaptor: Ten Pao



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Date: 28.JAN.2011 19:37:58

# INTERTEK TESTING SERVICES

Worst Case: Talk (3 way conference)

Adaptor: Ten Pao

## EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP

Trace2: CF15MAV

Trace3: ---

	TRACE	FREQUENCY	LEVEL		DELTA LIMIT
1	Quasi Peak	186 kHz	42.20	L1 gnd	-22.01
1	Quasi Peak	276 kHz	39.85	L1 gnd	-21.08
1	Quasi Peak	352.5 kHz	43.32	L1 gnd	-15.57
2	CISPR Average	532.5 kHz	26.79	L1 gnd	-19.20
1	Quasi Peak	559.5 kHz	45.27	L1 gnd	-10.72
1	Quasi Peak	573 kHz	44.99	L1 gnd	-11.00
2	CISPR Average	618 kHz	26.22	L1 gnd	-19.77
2	CISPR Average	901.5 kHz	26.98	L1 gnd	-19.01
1	Quasi Peak	982.5 kHz	42.25	L1 gnd	-13.74
2	CISPR Average	1.149 MHz	27.43	L1 gnd	-18.56
1	Quasi Peak	1.257 MHz	41.37	L1 gnd	-14.62
2	CISPR Average	1.5765 MHz	26.10	L1 gnd	-19.89
1	Quasi Peak	1.7295 MHz	40.93	L1 gnd	-15.06
1	Quasi Peak	2.328 MHz	38.97	L1 gnd	-17.02
1	Quasi Peak	3.9705 MHz	33.33	L1 gnd	-22.66
1	Quasi Peak	4.731 MHz	33.70	L1 gnd	-22.29
1	Quasi Peak	6.9855 MHz	40.49	L1 gnd	-19.50

Date: 28.JAN.2011 19:37:46

# INTERTEK TESTING SERVICES

Worst Case: Talk (3 way conference)

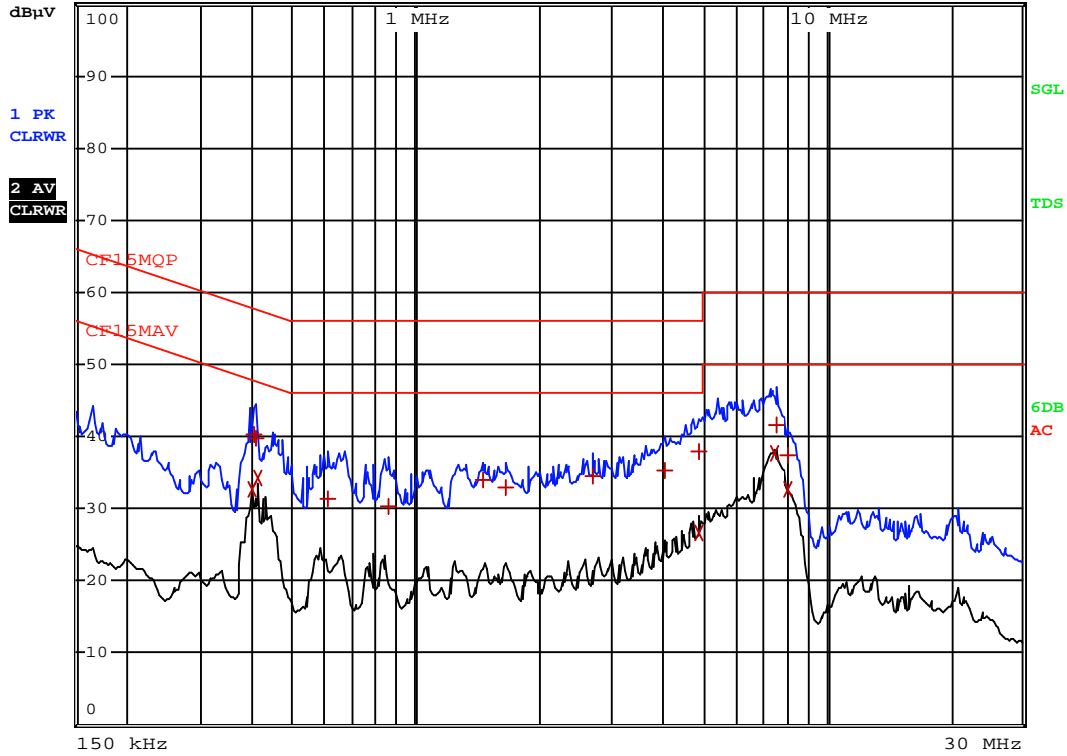
Adaptor: Sunstrong



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Date: 28.JAN.2011 18:42:39



# INTERTEK TESTING SERVICES

Worst Case: Talk (3 way conference)  
Adaptor: Sunstrong

## EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP  
Trace2: CF15MAV  
Trace3: ---

	TRACE	FREQUENCY	LEVEL dB $\mu$ V		DELTA LIMIT dB
2	CISPR Average	397.5 kHz	32.66	L1 gnd	-15.24
1	Quasi Peak	402 kHz	40.36	N gnd	-17.45
1	Quasi Peak	406.5 kHz	39.84	N gnd	-17.87
2	CISPR Average	411 kHz	34.29	L1 gnd	-13.33
1	Quasi Peak	609 kHz	31.24	N gnd	-24.75
1	Quasi Peak	861 kHz	30.37	N gnd	-25.62
1	Quasi Peak	1.464 MHz	33.86	N gnd	-22.13
1	Quasi Peak	1.6665 MHz	32.91	N gnd	-23.08
1	Quasi Peak	2.7105 MHz	34.49	L1 gnd	-21.50
1	Quasi Peak	4.065 MHz	35.23	N gnd	-20.76
1	Quasi Peak	4.911 MHz	37.82	N gnd	-18.17
2	CISPR Average	4.911 MHz	26.74	N gnd	-19.25
2	CISPR Average	7.4895 MHz	37.71	L1 gnd	-12.28
1	Quasi Peak	7.5615 MHz	41.69	L1 gnd	-18.30
2	CISPR Average	8.016 MHz	32.71	L1 gnd	-17.28
1	Quasi Peak	8.016 MHz	37.29	L1 gnd	-22.70

Date: 28.JAN.2011 18:41:54

## INTERTEK TESTING SERVICES

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### 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

**INTERTEK TESTING SERVICES**

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**EXHIBIT 5  
EQUIPMENT LIST**

## INTERTEK TESTING SERVICES

### 5.0 Equipment List

#### 1) Radiated Emissions Test

Equipment	EMI Test Receiver	Log Periodic Antenna	Biconical Antenna
Registration No.	EW-2251	EW-0446	EW-0954
Manufacturer	R&S	EMCO	EMCO
Model No.	ESCI	3146	3104C
Calibration Date	Oct. 22, 2009	Apr. 26, 2010	Apr. 14, 2010
Calibration Due Date	Apr. 22, 2011	Oct. 26, 2011	Oct. 14, 2011

Equipment	Double Ridged Guide Antenna	Spectrum Analyzer	Broad-Band Horn Antenna with frequency
Registration No.	EW-1015	EW-2188	EW-1679
Manufacturer	EMCO	AGILENTTECH	SCHWARZBECK
Model No.	3115	E4407B	BBHA9170
Calibration Date	Feb 09, 2010	Dec. 27, 2010	Mar. 03, 2011
Calibration Due Date	Aug 09, 2011	Dec. 31, 2011	Sep. 03, 2012

Equipment	Digital Multimeter
Registration No.	EW-1237
Manufacturer	FLUKE
Model No.	179
Calibration Date	Sep 01, 2010
Calibration Due Date	Oct 01, 2011

#### 2) Conducted Emissions Test

Equipment	EMI Test Receiver	Artificial Mains	Pulse Limiter
Registration No.	EW-2666	EW-0090	EW-0699
Manufacturer	R&S	R&S	R&S
Model No.	ESCI7	ESH3-Z5	ESH3-Z2
Calibration Date	Oct. 12, 2010	Feb. 05, 2010	Dec. 24, 2009
Calibration Due Date	Oct. 12, 2011	May 05, 2011	Jun. 24, 2011

**END OF TEST REPORT**