November 19, 2010

STL International Ltd.
Tung Kong Industrial Zone,
Liu Mei Village, Yuen Zhou,
Bolou, China.
Tel.: 2499 8911
Fax: 3018 0754

Dear Esa Chiau:

Enclosed you will find your file copy of an Original Grant of Part 15 Certification report (FCC ID: RF7POM0001). Model: 2.4G Transceiver Module.

For your reference, TCB will normally take another 2 weeks for reviewing the report. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

Nip Ming Fung, Melvin
Supervisor

Enclosure

List of Exhibits

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Operational Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission Test Configuration	config photos.pdf
Test Setup Photo	AC Line Conducted Emission Test Configuration	
Test Report	Bandedge Plot	be.pdf
External Photos	External Photo	external photos.pdf
Internal Photos	Internal Photo	internal photos.pdf
ID Label/Location Info	Label Artwork and Location	label.pdf
Block Diagrams	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	letter of agency.pdf
Cover Letter	Confidentiality Request	request.pdf
Cover Letter	Modular Approval Request	modular.pdf
Cover Letter	Instruction	instruction.pdf

TEST REPORT

Report Number: HK10080998-1

Application
for
Original Grant of 47 CFR Part 15 Certification

2.4GHz Transceiver Module

FCC ID: RF7POM0001

Prepared and Checked by:	Approved by:
	
Koo Wai Ip	Nip Ming Fung, Melvin
Lead Engineer	Supervisor
November 19, 2010	November 19, 2010

Intertek Testing Services Hong Kong Ltd.
2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2785 5487 Website: www.hk.intertek-etlsemko.com

GENERAL INFORMATION

Applicant Name:	STL International Ltd.
Applicant Address:	Tung Kong Industrial Zone, Liu Mei Village, Yuen Zhou, Bolou, China.
FCC Specification Standard:	FCC Part 15, October 1, 2009 Edition
FCC ID:	RF7POM0001
FCC Model(s):	2.4G Transceiver Module
Type of EUT:	Transceiver
Description of EUT:	2.4GHz Transceiver Module
Serial Number:	N/A
Sample Receipt Date:	August 20, 2010
Date of Test:	September 08-November 17, 2010
Report Date:	November 19, 2010
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

Table of Contents

EXHIBIT 1
TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.0 **Test Results Summary & Statement of Compliance**

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	Results	Details see section
Antenna Requirement	15.203	Pass	2.1
Radiated Emission Radiated Emission on the Bandedge	15.249(a), 209 15.249(d)	Pass Pass	4.2 4.3
AC Power Line Conducted Emission	15.207	Pass	4.4
Radiated Emission in Restricted Bands	15.205	Pass	4.2

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 standard:

FCC Part 15, October 1, 2009 Edition

EXHIBIT 2
GENERAL DESCRIPTION

2.0 **General Description**

2.1 Product Description

The Equipment Under Test (EUT) is a 2.4G Transceiver Module based on IEEE 802.15.4 standard (ZigBee) operating at 2.420GHz. It is intended for use as a short range radio module for embedded applications. It is powered by host.

The antenna used EUT is integral, and the test sample is a prototype.

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

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 2nd 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.

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 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 EUT was powered by a an adaptor: 110-120VAC to 3V-15VDC 700mA.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable.

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.

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.

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 2.13ms. 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.

3.3 Details of EUT and Description of Accessories

Details of EUT:

N/A

Description of Peripherals:

An adaptor was used to power the device. Their description are listed below:

(1) An adaptor: 110-120VAC to 3V-15VDC, 700mA, Model: NA-7 (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 STL International Ltd. will be incorporated in each production model sold/leased in the United States.

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

2420.000 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 1-2 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 5.8 dB margin

4.2.3 Transmitter Duty Cycle Calculation

The average factor is not applicable for the device because the peak detector measured data is substituted for the average detector data to show compliance.

Mode: TX

Table 1

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2420.000	91.8	33	29.4	88.2	94.0	-5.8
V	***4840.000***	***43.7***	***33***	***34.9***	***45.6***	***54.0***	***-8.4***
V	***7260.000***	***41.0***	***33***	***37.9***	***45.9***	***54.0***	***-8.1***
V	9680.000	39.0	33	40.4	46.4	54.0	-7.6
V	***12100.000***	***38.7***	***33***	***40.5***	***46.2***	***54.0***	***-7.8***
V	14520.000	39.6	33	38.4	45.0	54.0	-9.0

NOTES:
1. Peak detector is used for the emission measurement. The above peak detector measured data is substituted for the average detector data to show compliance.

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.

Mode: TX

Table 2

Radiated Emission 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	38.454	39.6	16	10.0	33.6	40.0	-6.4
V	45.375	39.2	16	10.0	33.2	40.0	-6.8
V	54.694	39.1	16	11.0	34.1	40.0	-5.9
H	***108.706***	***36.3***	***16***	***14.0***	***34.3***	***43.5***	***-9.2***
H	***132.456***	***35.2***	***16***	***14.0***	***33.2***	***43.5***	***-10.3***
H	***165.363***	***31.8***	***16***	***17.0***	***32.8***	***43.5***	***-10.7***

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.

4.3 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, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d).

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

4.4 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.

4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration

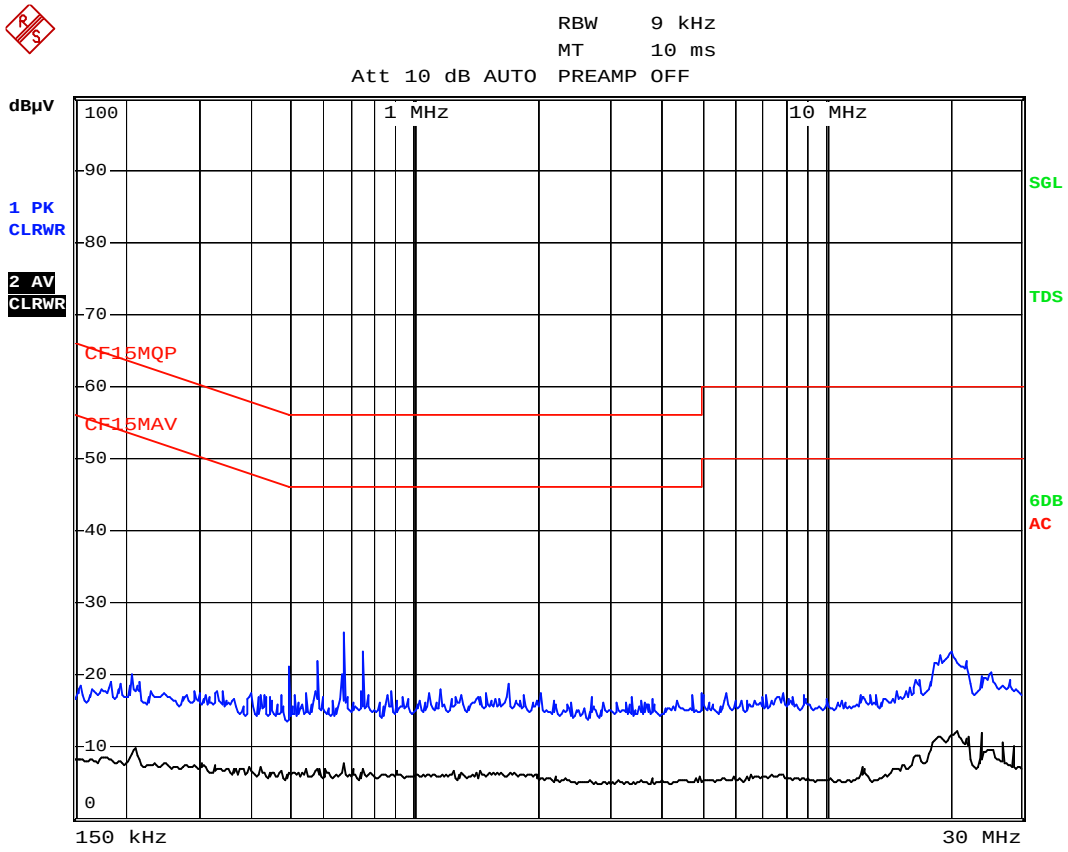
The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.4.2 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

Passed by more than 20 dB margin

Worst Case: Tx



Date: 17.NOV.2010 19:19:11

EXHIBIT 5
EQUIPMENT LIST

5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Biconical Antenna
Registration No.	EW-2251	EW-2188	EW-0954
Manufacturer	R&S	AGILENTTECH	EMCO
Model No.	ESCI	E4407B	3104C
Calibration Date	Oct. 22, 2009	Dec. 25, 2009	Apr. 14, 2010
Calibration Due Date	Jan. 22, 2011	Dec. 31, 2010	Oct. 14, 2011

Equipment	Log Periodic Antenna	Double Ridged Guide Antenna	Spectrum Analyzer
Registration No.	EW-0446	EW-1015	EW-2253
Manufacturer	EMCO	EMCO	R&S
Model No.	3146	3115	FSP40
Calibration Date	Apr. 26, 2010	Feb. 09, 2010	Jun. 10, 2010
Calibration Due Date	Oct. 26, 2011	Aug. 09, 2011	Jun. 10, 2011

Equipment	Digital Multimeter	Broad-Band Horn Antenna
Registration No.	EW-1237	EW-1679
Manufacturer	FLUKE	SCHWARZBECK
Model No.	179	BBHA9170
Calibration Date	Sep. 01, 2010	Feb. 17 , 2010
Calibration Due Date	Oct. 01, 2011	Feb. 17, 2011

2) Conducted Emissions Test

Equipment	LISN	EMI Test Receiver	Pulse Limiter
Registration No.	EW-0090	EW-2500	EW-0700
Manufacturer	R&S	ROHDESCHWARZ	R&S
Model No.	ESH3-Z5	ESCI	ESH3-Z2
Calibration Date	Feb. 05, 2010	Sep. 20, 2009	Jun. 08, 2009
Calibration Due Date	Feb. 05, 2011	Dec. 20, 2010	Dec. 08, 2010

END OF TEST REPORT

APPENDIX
EXHIBITS OF APPLICATION FOR CERTIFICATION