CMA Testing and Certification Laboratories
廠商會檢定中心

TEST REPORT

Report No.	:	AN0000470(0)	Date :	2011-01-04
Application No.	:	LM014880(0)		
Applicant	:	Portable Innovation Technology Limited Unit 601-602, 6/F Park Building, 476 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong		
Sample Description	:	One(1) item of submitted sample stated to be PT20 Mobile Barcode Terminal of Model No. PT20 Radio Frequency : 2402MHz ~ 2480MHz Bluetooth Transceiver : 2412MHz ~ 2472MHz Wi-Fi Transceiver Rating : 1 x 3.7V rechargeable battery AC 100V ~ 240V to DC 5.5V adaptor No. of submitted sample : Three (3) set (s)		
Date Received	:	2010-08-27.		
Test Period	:	2010-08-30 to 2010-12-29.		
Test Requested	:	FCC Part 15 Certification.		
Test Method	:	47 CFR Part 15 (10-1-09 Edition) ANSI C63.4 – 2003		
Test Result	:	See attached sheet(s) from page 2 to 32.		
Conclusion	:	The submitted sample was found to comply with requirement of FCC Part 15 Subpart B and C.		
Remark	:	The sample contains Cino SE380 scanner module or HHP 5X00 Series scanner module. HHP 5100 scanner module was chosen to be the representative of HHP 5X00 Series. Both scanner modules were tested in barcode scanning mode.		

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____ Page 1 of 32

Mr. WONG Lap-pong, Andrew
Assistant Manager
Electrical Division

FCC ID: UYA-PT20

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CMA Industrial Development Foundation Limited
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1 General Information

1.1 General Description

The equipment under test (EUT) is a PT20 Mobile Barcode Terminal. The EUT is powered by 1 x 3.7V rechargeable battery. The operation system of the EUT is WinCE and built-in SDRAM, NAND Flash Memory, Barcode scanner, Bluetooth and Wi-Fi features.

The brief circuit description is saved with filename: OpDes.pdf

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1.2 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
EMI Test Receiver	R&S	ESCI	100152	2010 December 23
Spectrum Analyzer	R&S	FSP30	100628	2011 April 26
Broadband Antenna	Schaffner	CBL6112B	2692	2011 May 31
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531	2012 June 10
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119	2012 June 07
LISN	R&S	ESH3-Z5	100038	2011 June 06
Coaxial Cable	Schaffner	RG 213/U	N/A	2012 August 03
Coaxial Cable	Suhner	RG 214/U	N/A	2012 August 03
Coaxial Cable	Suhner	Sucoflex_102	N/A	2012 June 06

1.4 List of supporting equipment

Computer:

1. Intel CPU P4 2.8GHz / 512k cache / 533MHz bus
   Model: 9426A657
2. Intel Mother Board
   Model: Intel Type: D845EPI/D845GVSR
3. Seagate Hard-Disk
   Model: ST380011A, 80GB
4. Proview LCD Monitor
   Model: 568
5. Logitech Mouse
   Model: M-S34
6. Hewlett Packard Keyboard
   Model: SK-2502C
7. Hewlett Packard LaserJet 2100TN
   Model: C4172A
8. PenPower Handwriting System
   Model: PP403N
9. USB Cable
   (Provided by Applicant)
10. Cradle
    (Provided by Applicant)

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1.5 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Radiated emissions

Frequency	Uncertainty (U_{lab})
30MHz ~ 200MHz (Horizontal)	4.63dB
30MHz ~ 200MHz (Vertical)	4.64dB
200MHz ~1000MHz (Horizontal)	4.65dB
200MHz ~1000MHz (Vertical)	4.64dB

Conducted emissions

Frequency	Uncertainty (U_{lab})
150kHz ~ 30MHz	3.04dB

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2 Description of the radiated emission test

2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement for Radiated Emission measurement.

The antenna output terminal was connected to spectrum analyzer directly for conducted output power measurement.

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2.2 Test Result

Subpart C:

Peak Detector and Average Detector data in radiated emission test was measured unless otherwise stated.

"#" means emissions appear within the restricted bands shall follow the requirement of section 15.205.

The harmonic emissions meet the requirement of section 15.209 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

The maximum peak conducted output power of Terminal J4 and Terminal J5 meet the requirement of section 15.247(b)(3) and below the limit. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

The fundamental and the harmonics were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next page (section 2.3 and 2.4).

It was found that the EUT meet the FCC requirement.

Subpart B:

The emissions meet the requirement of section 15.109 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

The frequencies from 30MHz to 1000MHz were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next page (section 2.3).

It was found that the EUT meet the FCC requirement.

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2.3 Radiated Emission Measurement Data

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	18	° C
Relative humidity:	56	%

Operation Mode: Bluetooth Transmitter

Detector: Peak

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
00	2402.082	V	63.5	31.5	95.0	N/A	N/A
	#4803.983	V	65.4	1.5	66.9	74.0	-7.1
	7205.988	H	40.6	10.6	51.2	74.0	-22.8
	9607.277	H	37.0	13.5	50.5	74.0	-23.5
39	2441.004	V	63.5	31.5	95.0	N/A	N/A
	#4881.968	V	62.0	1.5	63.5	74.0	-10.5
	#7322.464	H	40.2	10.6	50.8	74.0	-23.2
	9763.308	H	37.2	13.5	50.7	74.0	-23.3
78	2480.056	V	61.0	31.5	92.5	N/A	N/A
	#4959.928	H	61.2	1.5	62.7	74.0	-11.3
	#7439.480	H	38.7	10.6	49.3	74.0	-24.7
	9919.668	H	36.5	13.5	50.0	74.0	-24.0

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Bluetooth Transmitter

Detector: Average

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
00	#4803.983	V	51.5	1.5	53.0	54.0	-1.0
	7205.988	H	27.9	10.6	38.5	54.0	-15.5
	9607.277	H	25.0	13.5	38.5	54.0	-15.5
39	#4881.968	V	38.6	1.5	40.1	54.0	-13.9
	#7322.464	H	26.8	10.6	37.4	54.0	-16.6
	9763.308	H	24.9	13.5	38.4	54.0	-15.6
78	#4959.928	H	44.5	1.5	46.0	54.0	-8.0
	#7439.480	H	26.1	10.6	36.7	54.0	-17.3
	9919.668	H	23.8	13.5	37.3	54.0	-16.7

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	18	° C
Relative humidity:	55	%

Operation Mode: Wi-Fi (802.11b) Transmitter

Detector: Peak

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
01	2411.616	H	67.1	31.5	98.6	N/A	N/A
	#4824.004	H	37.6	1.5	39.1	74.0	-34.9
	7236.384	H	34.5	10.6	45.1	74.0	-28.9
	9647.968	H	34.5	13.5	48.0	74.0	-26.0
06	2436.616	H	65.0	31.5	96.5	N/A	N/A
	#4873.992	H	37.7	1.5	39.2	74.0	-34.8
	#7313.428	H	35.5	10.6	46.1	74.0	-27.9
	9747.856	H	34.7	13.5	48.2	74.0	-25.8
11	2461.596	H	63.0	31.5	94.5	N/A	N/A
	#4923.968	H	36.9	1.5	38.4	74.0	-35.6
	#7390.224	H	35.3	10.6	45.9	74.0	-28.1
	9847.986	H	34.2	13.5	47.7	74.0	-26.3

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11b) Transmitter

Detector: Average

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
01	#4824.004	H	21.6	1.5	23.1	54.0	-30.9
	7236.384	H	20.9	10.6	31.5	54.0	-22.5
	9647.968	H	21.8	13.5	35.3	54.0	-18.7
06	#4873.992	H	21.9	1.5	23.4	54.0	-30.6
	#7313.428	H	21.6	10.6	32.2	54.0	-21.8
	9747.856	H	21.4	13.5	34.9	54.0	-19.1
11	#4923.968	H	22.3	1.5	23.8	54.0	-30.2
	#7390.224	H	21.7	10.6	32.3	54.0	-21.7
	9847.986	H	21.6	13.5	35.1	54.0	-18.9

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	18	° C
Relative humidity:	55	%

Operation Mode: Wi-Fi (802.11g) Transmitter

Detector: Peak

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
01	2417.120	H	66.7	31.5	98.2	N/A	N/A
	#4824.296	H	36.0	1.5	39.5	74.0	-34.5
	7230.672	H	35.0	10.6	45.6	74.0	-28.4
	9643.051	H	34.2	13.5	47.7	74.0	-26.3
06	2431.458	H	65.8	31.5	97.3	N/A	N/A
	#4875.000	H	38.1	1.5	39.6	74.0	-34.4
	#7306.068	H	35.2	10.6	45.8	74.0	-28.2
	9748.080	H	34.0	13.5	47.5	74.0	-26.5
11	2467.156	H	65.3	31.5	96.8	N/A	N/A
	#4928.112	H	39.6	1.5	41.1	74.0	-32.9
	#7393.268	H	35.7	10.6	46.3	74.0	-27.7
	9848.024	H	35.8	13.5	49.3	74.0	-24.7

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11g) Transmitter

Detector: Average

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
01	#4824.296	H	21.5	1.5	23.0	54.0	-31.0
	7230.672	H	20.8	10.6	31.4	54.0	-22.6
	9643.051	H	21.7	13.5	35.2	54.0	-18.8
06	#4875.000	H	21.9	1.5	23.4	54.0	-30.6
	#7306.068	H	21.5	10.6	32.1	54.0	-21.9
	9748.080	H	21.3	13.5	34.8	54.0	-19.2
11	#4928.112	H	22.3	1.5	23.8	54.0	-30.2
	#7393.268	H	21.6	10.6	32.2	54.0	-21.8
	9848.024	H	21.6	13.5	35.1	54.0	-18.9

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	22	° C
Relative humidity:	62	%

Operation Mode: PC connected with data transfer and battery charging

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
35.632	V	13.7	15.5	29.2	40.0	-10.8
92.678	V	16.1	9.7	25.8	43.5	-17.7
99.248	H	28.8	9.7	38.5	43.5	-5.0
266.005	H	27.9	14.3	42.2	46.0	-3.8
286.360	H	13.6	14.3	27.9	46.0	-18.1
300.316	H	22.4	15.9	38.3	46.0	-7.7
398.000	H	20.5	15.9	36.4	46.0	-9.6

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Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	22	° C
Relative humidity:	62	%

Operation Mode: Barcode scanning with vibration

Barcode scanner module: Cino SE380

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
264.830	V	7.2	14.3	21.5	46.0	-24.5
274.330	H	13.2	14.3	27.5	46.0	-18.5
332.530	H	18.5	15.9	34.4	46.0	-11.6
399.008	H	19.5	15.9	35.4	46.0	-10.6
467.998	H	15.4	18.9	34.3	46.0	-11.7
731.542	H	16.3	22.4	38.7	46.0	-7.3
857.986	H	11.8	23.6	35.4	46.0	-10.6

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	21	° C
Relative humidity:	56	%

Operation Mode: Barcode scanning with vibration

Barcode scanner module: HHP 5100

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
245.070	H	17.5	10.5	28.0	46.0	-18.0
340.820	H	13.3	15.9	29.2	46.0	-16.8
381.090	H	10.9	15.9	26.8	46.0	-19.2
411.790	H	8.0	18.9	26.9	46.0	-19.1
469.420	H	8.1	18.9	27.0	46.0	-19.0
599.740	H	9.1	20.2	29.3	46.0	-16.7
736.160	H	8.0	22.4	30.4	46.0	-15.6

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	23	° C
Relative humidity:	58	%

Operation Mode: Bluetooth receiver

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
39.725	V	6.0	15.5	21.5	40.0	-18.5
46.228	H	8.5	10.5	19.0	40.0	-21.0
117.487	H	10.2	11.3	21.5	43.5	-22.0
143.412	H	9.5	12.2	21.7	43.5	-21.8
154.731	H	8.7	12.2	20.9	43.5	-22.6
190.929	H	10.4	10.0	20.4	43.5	-23.1
234.668	H	12.3	10.5	22.8	46.0	-23.2
252.482	H	10.6	14.3	24.9	46.0	-21.1
270.840	H	10.3	14.3	24.6	46.0	-21.4
285.427	H	11.0	14.3	25.3	46.0	-20.7

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Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	23	° C
Relative humidity:	58	%

Operation Mode: Wi-Fi (802.11b) receiver

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
44.580	V	6.1	13.0	19.1	40.0	-20.9
101.814	H	10.7	11.3	22.0	43.5	-21.5
129.365	H	9.7	12.6	22.3	43.5	-21.2
148.259	H	8.6	12.2	20.8	43.5	-22.7
160.135	H	10.7	10.9	21.6	43.5	-21.9
194.707	H	8.9	10.0	18.9	43.5	-24.6
219.546	H	10.9	10.5	21.4	46.0	-24.6
238.442	H	12.2	10.5	22.7	46.0	-23.3
270.311	H	10.8	14.3	25.1	46.0	-20.9
275.160	H	11.5	14.3	25.8	46.0	-20.2

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2.3 Radiated Emission Measurement Data (Con't)

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	23	° C
Relative humidity:	58	%

Operation Mode: Wi-Fi (802.11g) receiver

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
32.162	H	8.5	18.2	26.7	40.0	-13.3
72.126	V	9.4	6.0	15.4	40.0	-24.6
79.669	H	11.9	6.0	17.9	40.0	-22.1
123.427	H	9.3	12.6	21.9	43.5	-21.6
152.588	H	8.6	12.2	20.8	43.5	-22.7
182.824	H	9.4	10.0	19.4	43.5	-24.1
217.910	H	10.0	10.5	20.5	46.0	-25.5
231.422	H	11.9	10.5	22.4	46.0	-23.6
251.403	H	9.2	14.3	23.5	46.0	-22.5
270.368	H	10.4	14.3	24.7	46.0	-21.3

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2.4 Conducted Output Power Measurement Data

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Bluetooth

Transmission Power

Channel	Frequency (MHz)	Reading (dBμV)	Reading (mW)	Limit (W)	Margin (W)
00	2401.985	105.0	0.632	1.0	-0.999
39	2440.996	104.9	0.618	1.0	-0.999
78	2479.988	104.8	0.604	1.0	-0.999

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2.4 Conducted Output Power Measurement Data (Con't)

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Bluetooth

Spurious Emissions

Channel	Frequency (MHz)	Reading (dBμV)	Limit -20dBc below carrier (dBμV)	Margin (dB)
00	3202.650	64.3	85.0	-20.7
	4003.310	54.4	85.0	-30.6
	4803.982	74.9	85.0	-10.1
	7205.974	47.2	85.0	-37.8
	9607.960	52.6	85.0	-32.4
39	3254.650	59.9	84.9	-25.0
	4068.308	50.6	84.9	-34.3
	4881.988	68.4	84.9	-16.5
	7322.976	47.3	84.9	-37.6
	9763.932	51.5	84.9	-33.4
78	3306.654	54.7	84.8	-30.1
	4133.304	47.9	84.8	-36.9
	4959.980	68.1	84.8	-16.7
	7439.946	41.9	84.8	-42.9
	9919.946	36.6	84.8	-48.2

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2.4 Conducted Output Power Measurement Data (Con't)

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11b)

Terminal: J4

Transmission Power

Channel	Frequency (MHz)	Reading (dBμV)	Reading (mW)	Limit (W)	Margin (W)
01	2411.850	111.5	2.825	1.0	-0.997
06	2436.840	112.0	3.170	1.0	-0.997
11	2461.840	112.2	3.319	1.0	-0.997

Spurious Emissions

Channel	Frequency (MHz)	Reading (dBμV)	Limit -20dBc below carrier (dBμV)	Margin (dB)
01	4823.960	44.7	91.5	-46.8
	7235.690	36.7	91.5	-54.8
	9647.880	34.5	91.5	-57.0
06	4874.020	37.4	92.0	-54.6
	7310.420	36.5	92.0	-55.5
	9747.980	34.3	92.0	-57.7
11	4923.960	38.8	92.2	-53.4
	7384.540	36.7	92.2	-55.5
	9847.960	35.6	92.2	-56.6

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2.4 Conducted Output Power Measurement Data (Con't)

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11b)

Terminal: J5

Transmission Power

Channel	Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
01	2411.864	82.8	3.811	1.0	-0.999
06	2436.844	83.3	4.276	1.0	-0.999
11	2461.804	84.0	5.024	1.0	-0.999

Spurious Emissions

Channel	Frequency (MHz)	Reading (dBμV)	Limit -20dBc below carrier (dBμV)	Margin (dB)
01	4823.888	34.3	62.8	-28.5
	7235.812	32.1	62.8	-30.7
	9647.896	33.9	62.8	-28.9
06	4874.008	33.5	63.3	-29.8
	7310.892	32.8	63.3	-30.5
	9747.956	33.5	63.3	-29.8
11	4923.988	34.6	64.0	-29.4
	7385.832	32.5	64.0	-31.5
	9847.926	34.1	64.0	-29.9

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2.4 Conducted Output Power Measurement Data (Con't)

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11g)

Terminal: J4

Transmission Power

Channel	Frequency (MHz)	Reading (dBμV)	Reading (mW)	Limit (W)	Margin (W)
01	2417.170	111.4	2.761	1.0	-0.997
06	2429.580	112.3	3.397	1.0	-0.997
11	2467.176	113.1	4.083	1.0	-0.996

Spurious Emissions

Channel	Frequency (MHz)	Reading (dBμV)	Limit -20dBc below carrier (dBμV)	Margin (dB)
01	4817.780	43.4	91.4	-48.0
	7236.230	43.6	91.4	-47.8
	9649.470	34.6	91.4	-56.8
06	4867.660	38.7	92.3	-53.6
	7305.800	47.0	92.3	-45.3
	9735.240	32.4	92.3	-59.9
11	4924.110	40.1	93.1	-53.0
	7376.438	44.4	93.1	-48.7
	9843.634	33.6	93.1	-59.5

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2.4 Conducted Output Power Measurement Data (Con't)

Conducted Output Power

pursuant to

the requirement of FCC Part 15 subpart C

Operation Mode: Wi-Fi (802.11g)

Terminal: J5

Transmission Power

Channel	Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
01	2417.170	82.1	3.244	1.0	-0.999
06	2442.200	84.8	6.040	1.0	-0.999
11	2467.180	84.7	5.902	1.0	-0.999

Spurious Emissions

Channel	Frequency (MHz)	Reading (dBμV)	Limit -20dBc below carrier (dBμV)	Margin (dB)
01	4825.200	32.1	62.1	-30.0
	7231.120	34.6	62.1	-27.5
	9647.960	34.0	62.1	-28.1
06	4873.920	33.9	64.8	-30.9
	7307.480	33.6	64.8	-31.2
	9747.960	34.3	64.8	-30.5
11	4924.020	34.4	64.7	-30.3
	7306.980	31.6	64.7	-33.1
	9847.964	34.0	64.7	-30.7

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3 Description of the Line-conducted Test

3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. The EUT was setup as described in the procedures, and both lines were measured.

3.2 Test Result

The EUT was tested under PC connected with data transfer situation with battery charging.

It was found that the EUT met the FCC requirement.

3.3 Graph and Table of Conducted Emission Measurement Data

For electronic filling, the document is saved with filename TestRpt2.pdf.

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4 Photograph

4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission

For electronic filing, the photos are saved with filename TSup1.jpg to TSup7.jpg.

4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho8.jpg and InPho1.jpg to InPho12.jpg.

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5 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

5.1 Bandwidth

Bluetooth:

The plot saved in TestRpt3.pdf shows the channel spacing has minimum 25 kHz.

The plot saved in TestRpt4.pdf shows the frequency hopping channel over 75 hopping frequency.

The plot saved in TestRpt5.pdf shows the fundamental emission is confined in the specified band. It shows the 20dB bandwidth and band edge meet the 15.247(d) and 15.205 requirement for frequency band 2400 MHz to 2483.5 MHz.

Wi-Fi 802.11b/g:

The plot saved in TestRpt7.pdf shows the 6dB bandwidth has minimum 500 kHz for frequency band 2400 MHz to 2483.5 MHz. it fulfils the section 15.247(a)(2) requirement.

The plot saved in TestRpt8.pdf shows the fundamental emission is confined in the specified band. It shows that the band edge meet the 15.247(d) and 15.205 requirement at 2400 MHz and 2483.5 MHz.

5.2 Duty cycle

Not Applicable

5.3 Transmission time

Not Applicable

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5.4 Power Spectral Density

The plot saved in TestRpt9.pdf shows the frequency channel 2412 MHz, 2437 MHz and 2462 MHz were not excess 8dBm for 3 kHz bandwidth. It fulfils 15.247(e) requirement.

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5.5 Average on time

The plot saved in TestRpt6.pdf shows the average on time for frequency hopping channel is within 0.4 seconds.

The calculation for average on time as below:

Average hopping channel = Number of transmitted carrier / Sweep time

Average on time = Packet on time x Average hopping channel

Dwell time = Average on time x Total frequency hopping channel x 0.4

Test result:

Frequency Channel (MHz)	Packet	Dwell Time (Seconds)	Limit (Seconds)	Margin (Seconds)
2402	DH1	0.125	0.4	-0.275
2402	DH3	0.262	0.4	-0.138
2402	DH5	0.306	0.4	-0.094
2441	DH1	0.125	0.4	-0.275
2441	DH3	0.262	0.4	-0.138
2441	DH5	0.306	0.4	-0.094
2480	DH1	0.125	0.4	-0.275
2480	DH3	0.262	0.4	-0.138
2480	DH5	0.306	0.4	-0.094

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6 Appendices

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A2	Photos of the set-up of Conducted Emissions	2	pages
A3	Photos of External Configurations	4	pages
A4	Photos of Internal Configurations	6	pages
A5	ID Label/Location	1	page
A6	Conducted Emission Measurement Data	2	pages
A7	Bluetooth Channel Spacing	2	pages
A8	Bluetooth Hopping Channel	1	page
A9	Bluetooth Band Edge	3	pages
A10	Bluetooth Average on time	3	pages
A11	Wi-Fi Bandwidth	8	pages
A12	Wi-Fi Band Edge	8	pages
A13	Wi-Fi Power Spectral Density	8	pages
A14	Block Diagram	1	page
A15	Schematics	17	pages
A16	User Manual	14	pages
A17	Operation Description	2	pages

***** End of Report *****

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