







### ISO/IEC17025Accredited Lab.

Report No: FCC 1003346-02 File reference No: 2010-07-12

Applicant: Shenzhen Sinchun Electronic Co., Ltd

Product: NOTE BOOK

Model No: UMPC891

Trademark: saycool

Test Standards: FCC Part 15 Subpart C, Paragraph 15.247

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.247 regulations and RSS-210 for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung Manager

Dated: July 12, 2010

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

### SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

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Date: 2010-07-12



# **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

#### CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

# FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

# IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-01.

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#### 1.0 General Details

#### 1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District,

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Shenzhen, CHINA.

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

#### 1.2 Applicant Details

Applicant: Shenzhen Sinchun Electronic Co., Ltd

Address: Shenzhen Sinchun Electronic Co., Ltd/3/F,Unit5,Cuihai Industrial Zone,Fengtang

Road, Fuyong Town, Baoan District, Shenzhen, China

Telephone: 755 83957777
Fax: 755 83956777

### 1.3 Description of EUT

Product: NOTE BOOK

Manufacturer: Shenzhen Sinchun Electronic Co., Ltd

Brand Name: saycool Model Number: UMPC891

Additional Model Name N/A
Additional Trade Name N/A

Rating: Input: 100-240V~1.5A 60/50Hz

Power Supply Model: K-8828B1853500 Input: 100-240V~1.5A 60/50Hz

Output: 18.5V-3.5A

Type of Modulation FHSS

Frequency range 2402-2480MHz

Number of Channel 79

Frequency Selection By software

Antenna type PIFA antenna, the antenna gain is 2.5dBi maximum

1.4 Submitted Sample: 2 Sample

1.5 Test Duration

2010-04-22-2010-07-12

1.6 Test Uncertainty

The report refers only to the sample tested and does not apply to the bulk.

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Conducted Emissions Uncertainty = 3.6dB Radiated Emissions Uncertainty = 4.7dB

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

6.0	Test Equipments						
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date		
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2009-12-05	2010-12-04		
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2009-12-05	2010-12-04		
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2009-12-05	2010-12-04		
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2009-12-05	2010-12-04		
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2009-12-05	2010-12-04		
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2010-03-29	2011-03-28		
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2010-02-17	2011-02-16		
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2010-02-17	2011-02-16		
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2010-02-17	2011-02-16		
System Controller	CT	SC100	-	2010-02-17	2011-02-16		
Printer	EPSON	РНОТО ЕХЗ	CFNH234850	2010-02-17	2011-02-16		
FM-AM Signal Generator	JUNG.JIN	SG-150M	389911177	2010-02-17	2011-02-16		
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2010-02-17	2011-02-16		
Computer	IBM	8434	1S8434KCE99 BLXLO*	-	-		
Oscillator	KENWOOD	AG-203D	3070002	2010-02-17	2011-02-16		
Spectrum Analyzer	HAMEG	HM5012	-	-	-		
Power Supply	LW	APS1502	-	-	-		

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	\				
5K VA AC Power Source	California Instruments	5001iX	56060	2010-02-17	2011-02-16
CDN	EM TEST	CDN M2/M3	-	2010-02-17	2011-02-16
Attenuation	EM TEST	ATT6/75	-	2010-02-17	2011-02-16
Resistance	EM TEST	R100	-	2010-02-17	2011-02-16
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2010-02-17	2011-02-16
Inductive Components	EM TEST	MC2630	-	2010-02-17	2011-02-16
Antenna	EM TEST	MS100	-	2010-02-17	2011-02-16
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2010-02-17	2011-02-16
Power Amplifier	AR	150W1000	300999	2010-02-17	2011-02-16
Field probe	Holaday	HI-6005	105152	2010-02-17	2011-02-16
Bilog Antenna	Chase	CBL6111C	2576	2010-02-17	2011-02-16
Loop Antenna	EMCO	6502	00042960	2010-02-17	2011-02-16
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2010-02-17	2011-02-16
3m OATS			N/A	2010-02-17	2011-02-16
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2009-08-15	2010-08-14
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2010-07-03	2011-07-02
Power meter	Anritsu	ML2487A	6K00003613	2010-02-17	2011-02-16
Power sensor	Anritsu	MA2491A	32263	2010-02-17	2011-02-16
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2010-05-14	2011-05-13
LISN	AFJ	LS16C	10010947251	2010-5-14	2011-05-13
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2010-5-14	2011-05-13
9*6*6 Anechoic			N/A	2010-5-14	2011-05-13

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#### 3.0 Technical Details

### 3.1 Summary of test results

# The EUT has been tested according to the following specifications:

Requirement	CFR 47 Section	Result	Notes
Antenna Requirement	15.203, 15.247(b)(4)	PASS	Complies
Maximum Peak Out Power	15.247 (b)(1), (4)	PASS	Complies
Carrier Frequency Separation	15.247(a)(1)	PASS	Complies
20dB Channel Bandwidth	15.247 (a)(1)	PASS	Complies
Number of Hopping Channels	15.247(a)(iii), 15.247(b)(1)	PASS	Complies
Time of Occupancy (Dwell Time)	15.247(a)(iii)	PASS	Complies
Spurious Emission, Band Edge, and	15.247(d),15.205(a),	PASS	Complies
Restricted bands	15.209 (a),15.109		
Peak Power Spectral Density	15.247(e)	PASS	Complies
Conducted Emissions	15.207(a), 15.107	PASS	Complies
RF Exposure	15.247(i), 1.1307(b)(1)	PASS	Complies

#### 3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

#### 4.0 EUT Modification

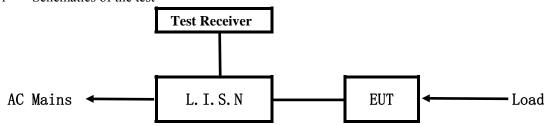
No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

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# 5. Power Line Conducted Emission Test

#### 5.1 Schematics of the test

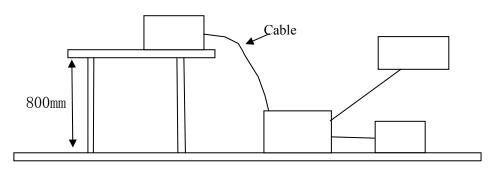


**EUT: Equipment Under Test** 

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

#### Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

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#### A. EUT

Device	Manufacturer	Model	FCC ID
NOTE BOOK	Shenzhen Sinchun Electronic Co., Ltd	UMPC891	YG6SINCHUN

#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

### C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

### 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

### 5.5 Power line conducted Emission Limit according to Paragraph 15.107, 15.207 and RSS-210

Frequency	Class A Lim	its (dB µ V)	Class B Limits (dB $\mu$ V)		
(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
$5.00 \sim 30.00$	73.0	60.0	60.0	50.0	

Notes:

- 1. \*Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

#### 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Note: the worse cases was selected to conducted the test

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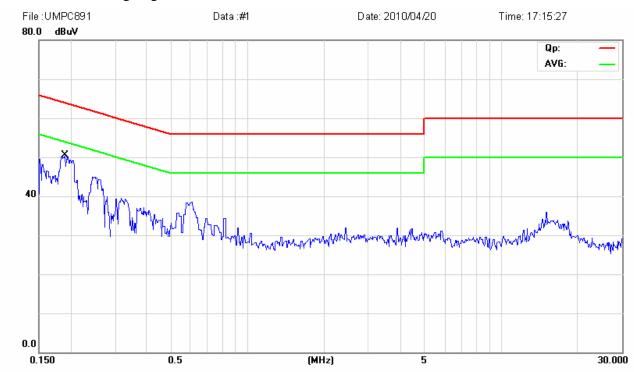
Date: 2010-07-12

# A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Read USB,SD card and Running EMC test software and Ping

wireless network

**Results:** Pass



Fraguanay		Reading	Limi	t		
Frequency (MHz)	Line		Neutral		(dB µ V)	
(MHZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1873	48.24	14.94			64.16	54.16

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### B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Read USB,SD card and Running EMC test software and Ping

wireless network

Results: Pass



Eraguanav		Reading	Limi	t		
Frequency (MHz)	Live	Live		Neutral		V)
(MITZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1922			47.34	17.74	63.94	53.94

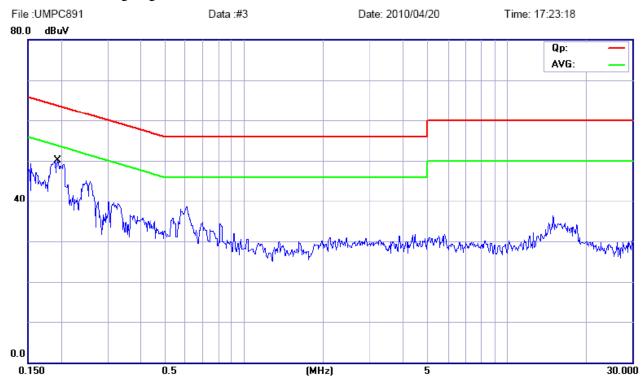
Date: 2010-07-12

### C Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Running notebook test program, Ping network and Keep Bluetooth

Transmitting

**Results:** Pass



Eraguanav		Reading	Limi	t		
Frequency (MHz)	Line	Neutra		al	(dB µ V)	
(IVIIIZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1941	50.06	20.12			63.86	53.86

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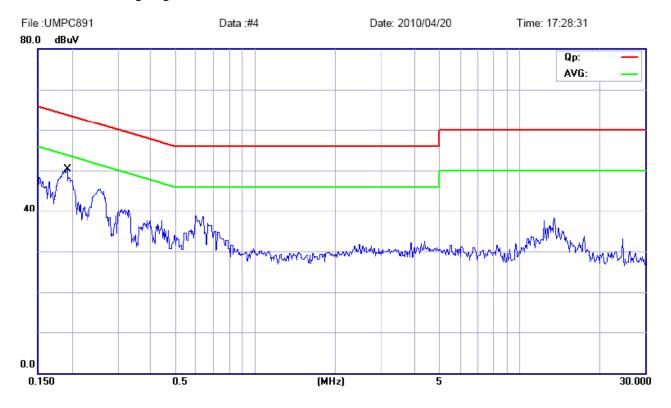
Date: 2010-07-12

### D Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Running notebook test program, Ping network and Keep Bluetooth

Transmitting

**Results:** Pass



Eraguanav	Reading(dB $\mu$ V)				Limit	
Frequency (MHz)	Live	;	Neutral		$(dB \mu V)$	
(IVII IZ)	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1927			50.32	22.37	63.92	53.92

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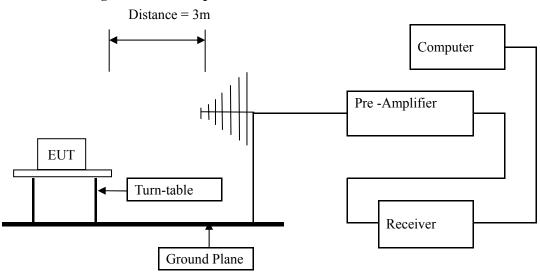
Date: 2010-07-12



#### 6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

### **Block diagram of Test setup**



- 6.2 Configuration of The EUT

  Same as section 5.3 of this report
- 6.3 EUT Operating Condition
  Same as section 5.4 of this report.

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#### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

#### Frequencies in restricted band are complied to limit on Paragraph 15.109. 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. Two antennas used in the EUT. RF Module Control Unit can check the signal strength of the two antennas, and decide use which one through control the RF switch unit. In the same time just One Antenna is working. Pre-scanning tests for the both antennas and the worse case data is recorded

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#### Test result

### General Radiated Emission Data and Harmonics Radiated Emission Data

### Radiated Emission In Horizontal (30MHz----1000MHz)

Read USB, SD card and Running EMC test software and Ping **EUT set Condition:** 

wireless network

**Results: Pass** 

Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
141.552	29.68	Н	43.50
243.406	35.21	Н	46.00
665.351	37.46	Н	46.00
718.706	36.47	Н	46.00
961.213	40.25	Н	54.00
66.616	32.32	V	40.00
122.152	35.06	V	43.50
483.475	38.72	V	46.00
963.618	41.86	V	54.00
135.993	36.82	V	43.50

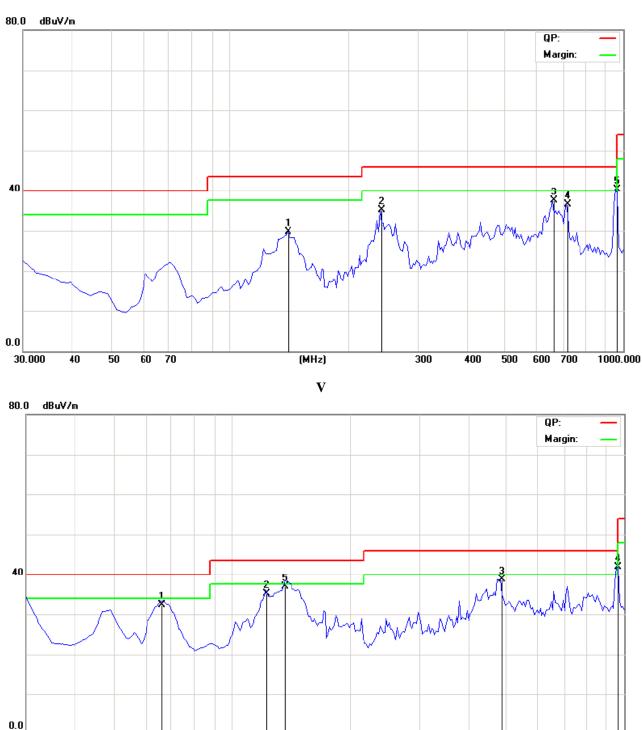
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Test Figure:



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60 70

30.000

40

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(MHz)

300

400

500

600 700

1000.000

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#### Test result

### General Radiated Emission Data and Harmonics Radiated Emission Data

### Radiated Emission In Horizontal (30MHz----1000MHz)

**EUT set Condition:** Running notebook test program, Ping network and Keep Bluetooth

Transmitting

**Results: Pass** 

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
143.975	31.85	Н	43.50
248.250	32.87	Н	46.00
662.925	38.95	Н	46.00
716.275	36.98	Н	46.00
963.625	40.89	Н	54.00
30.000	34.48	V	40.00
67.794	33.03	V	40.00
106.013	34.52	V	43.50
418.000	37.12	V	46.00
808.425	38.30	V	46.00
963.625	41.19	V	54.00

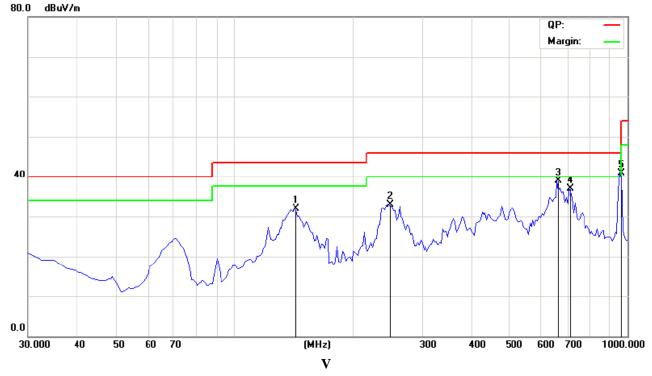
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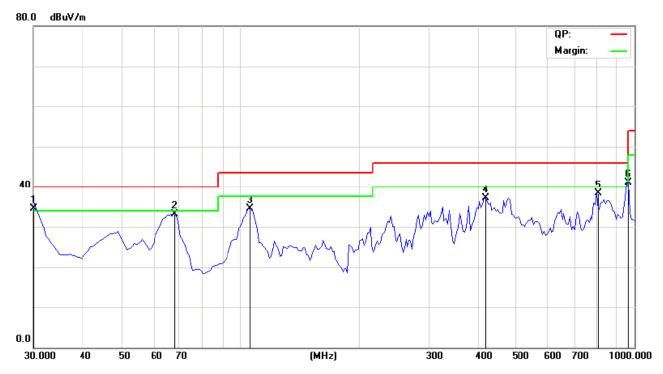
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Test Figure:





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### **Operation Mode: Transmitting under Low Channel (2402MHz)**

	<u> </u>		
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
2402	86.2 (PK) /79.2 (AV)	V	Fundamental Frequency
2402	81.6 (PK) /75.1 (AV)	Н	rundamental Frequency
4804		H/V	74(Peak)/ 54(AV)
7206		H/V	74(Peak)/ 54(AV)
9608		H/V	74(Peak)/ 54(AV)
12010		H/V	74(Peak)/ 54(AV)
14412		H/V	74(Peak)/ 54(AV)
16814		H/V	74(Peak)/ 54(AV)
19216		H/V	74(Peak)/ 54(AV)
21618		H/V	74(Peak)/ 54(AV)
24020		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

### **Operation Mode: Transmitting g under Middle Channel (2442MHz)**

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
2442	85.3 (PK) /77.3 (AV)	Н	Fundamental Frequency
2442	81.2 (PK) /75.1 (AV)	V	Fundamental Frequency
4884		H/V	74(Peak)/ 54(AV)
7326		H/V	74(Peak)/ 54(AV)
9768		H/V	74(Peak)/ 54(AV)
12210		H/V	74(Peak)/ 54(AV)
14652		H/V	74(Peak)/ 54(AV)
17094		H/V	74(Peak)/ 54(AV)
19536		H/V	74(Peak)/ 54(AV)
21978		H/V	74(Peak)/ 54(AV)
24420		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

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### **Operation Mode: Transmitting under High Channel**

Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
84.2 (PK) /76.1 (AV)	Н	Even do mo antal Erra avan av
80.2 (PK) /74.3 (AV)	V	Fundamental Frequency
	H/V	74(Peak)/ 54(AV)
	84.2 (PK) /76.1 (AV)	84.2 (PK) /76.1 (AV)  80.2 (PK) /74.3 (AV)   H/V   H/V

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

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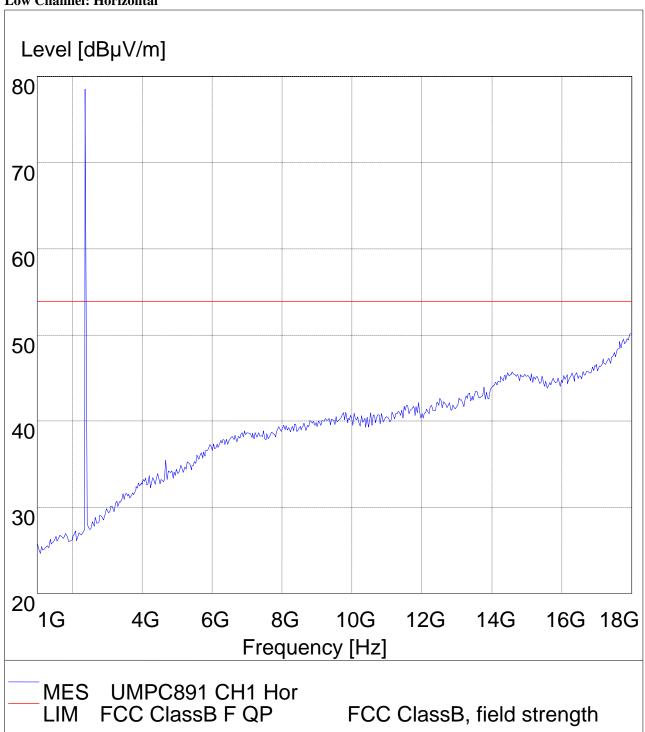
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Please refer to the following test plots for details:

Low Channel: Horizontal



The report refers only to the sample tested and does not apply to the bulk.

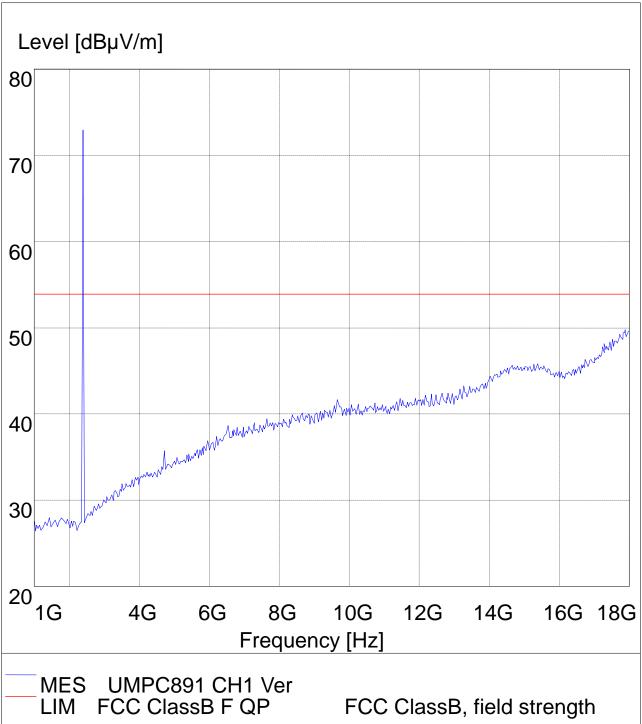
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**Low Channel: Vertical** 



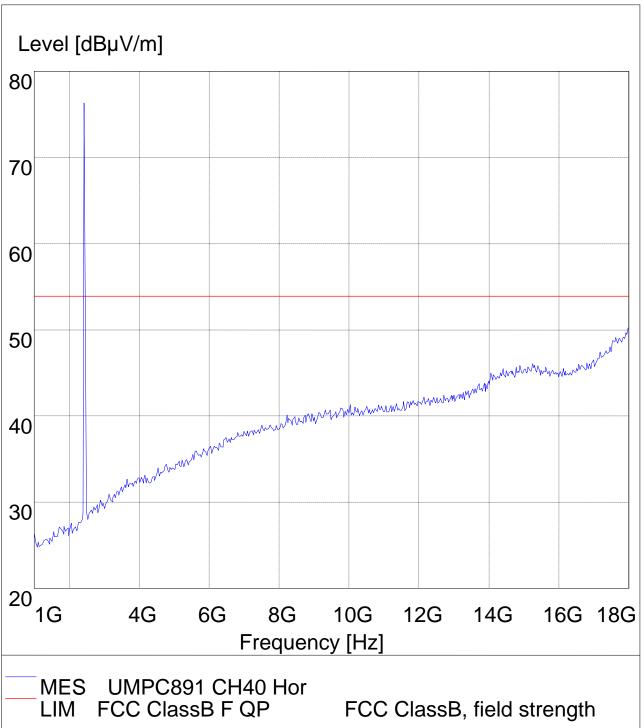
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**Middle Channel: Horizontal** 



The report refers only to the sample tested and does not apply to the bulk.

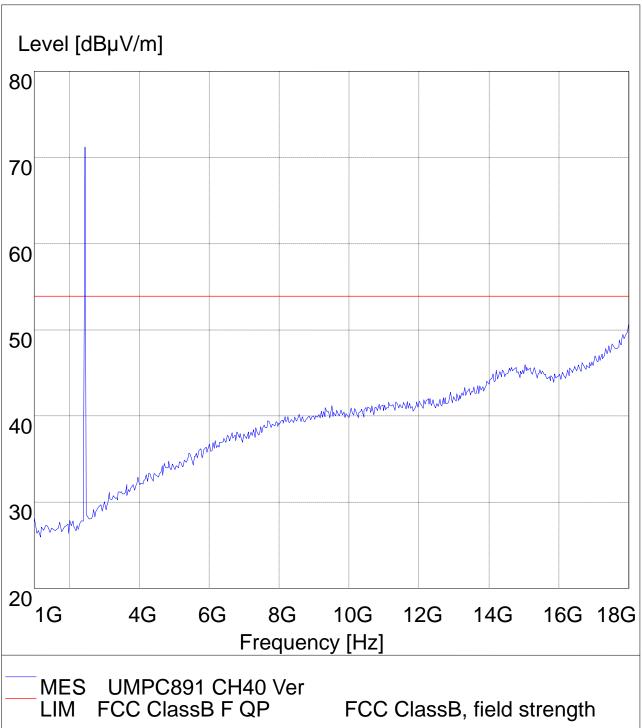
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Middle Channel :: Vertical



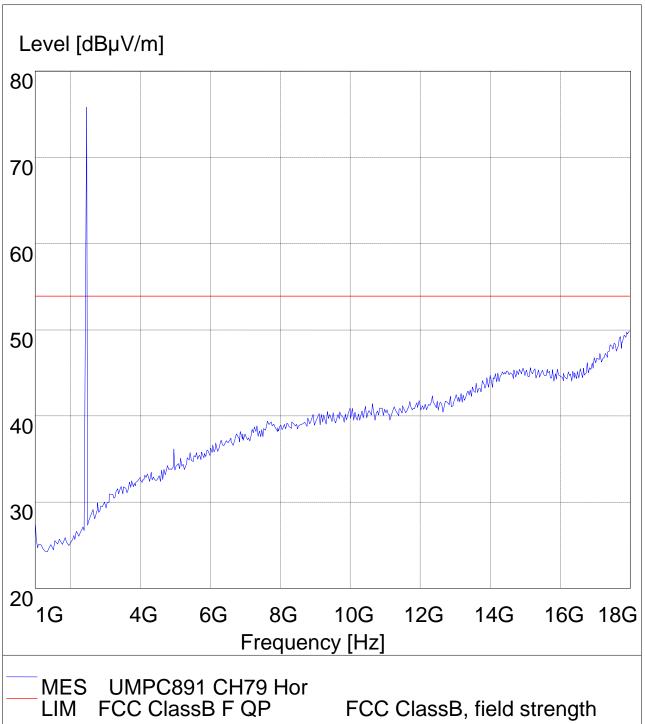
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**High Channel: Horizontal** 



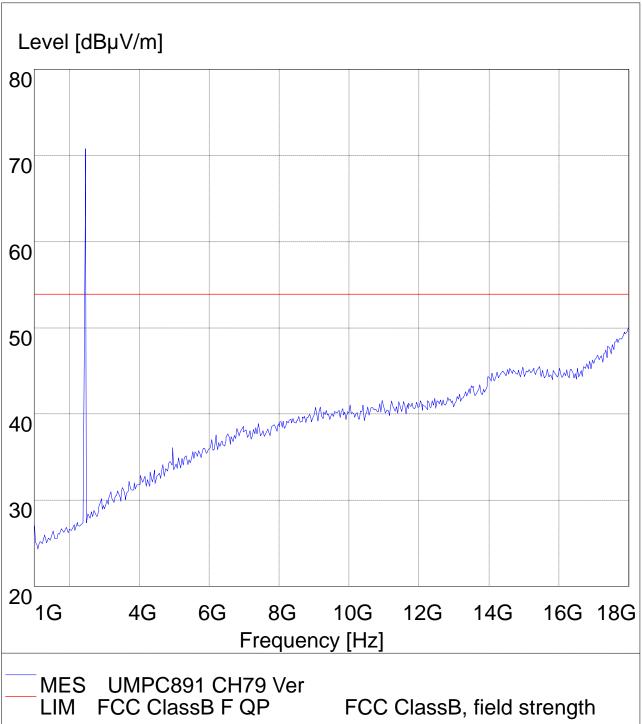
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**High Channel: Vertical** 



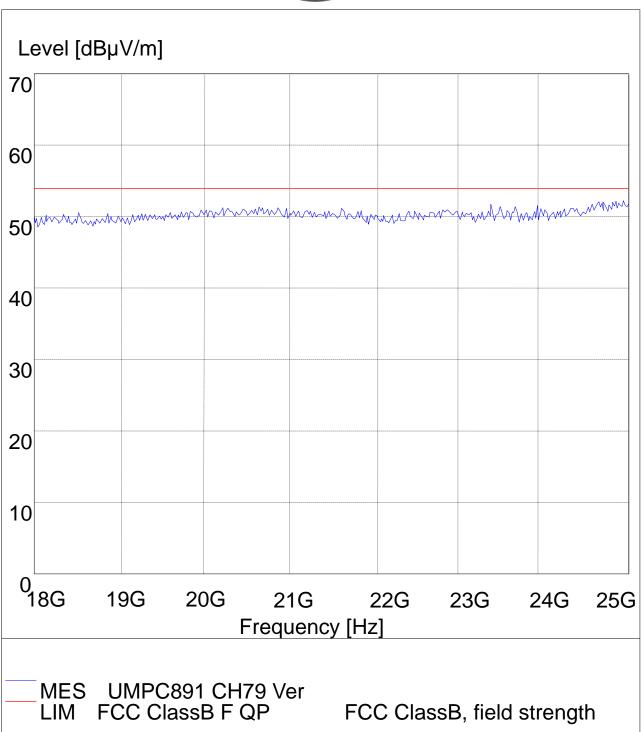
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### 18-25G Horizontal



The report refers only to the sample tested and does not apply to the bulk.

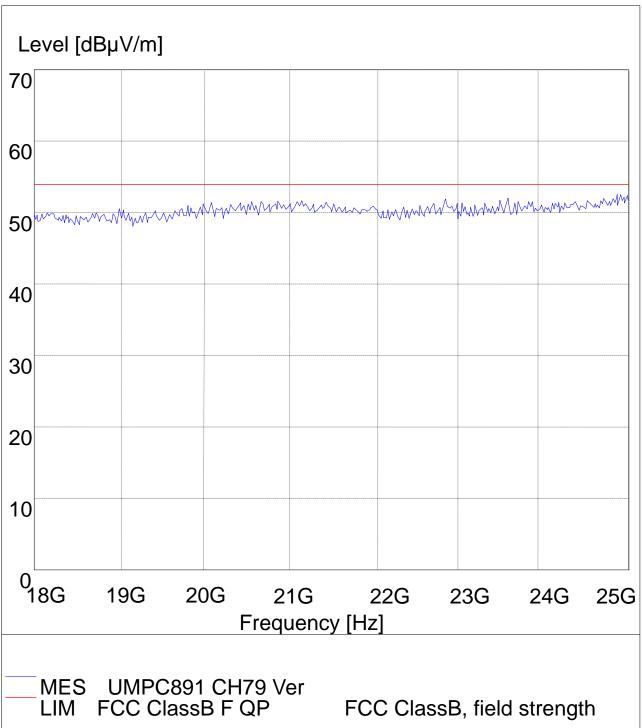
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#### 18-25G Vertical



The report refers only to the sample tested and does not apply to the bulk.

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#### 7.0 20dB Bandwidth Measurement

### 7.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.2 Limits of 20dB Bandwidth Measurement

N/A

#### 7.3 Test Procedure.

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel RBW > the 20 dB bandwidth of the emission being measured VBW  $\geq$  RBW Sweep = auto Detector function = peak Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

### 7.4 Test Result

EU'	Т	NOTE BOOK		Model		UMPC	891		
Mod	de	Keep	Keep Transmitting		Input Voltage		<i>I</i> ~		
Temper	ature	24	4 deg. C, Humidity 56%		24 deg. C, Humidity 56		Humidity		RH
Channel		el Frequency (MHz)	20 dB Bandwidth (kHz)		Maximum Limit (kHz)		Pass/ Fail		
Low		2402	1102.2				Pass		
Middle		2442	1102.2				Pass		
High		2480	1122.2						

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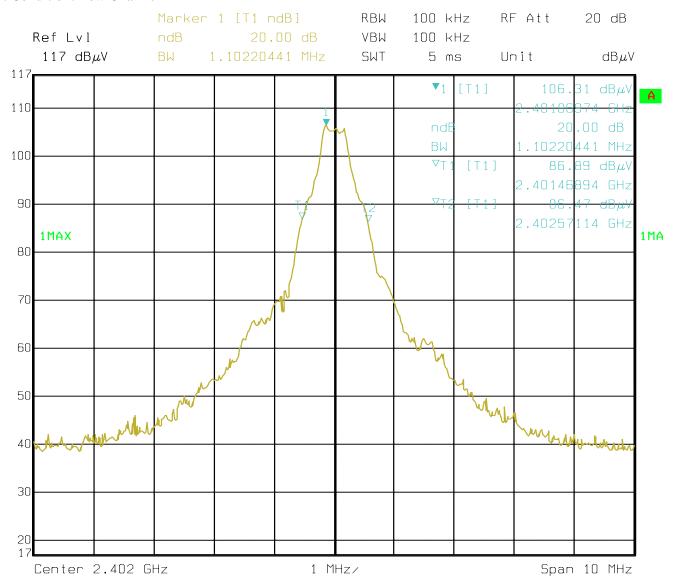
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# Test Figure:

#### 1. Condition: Low Channel



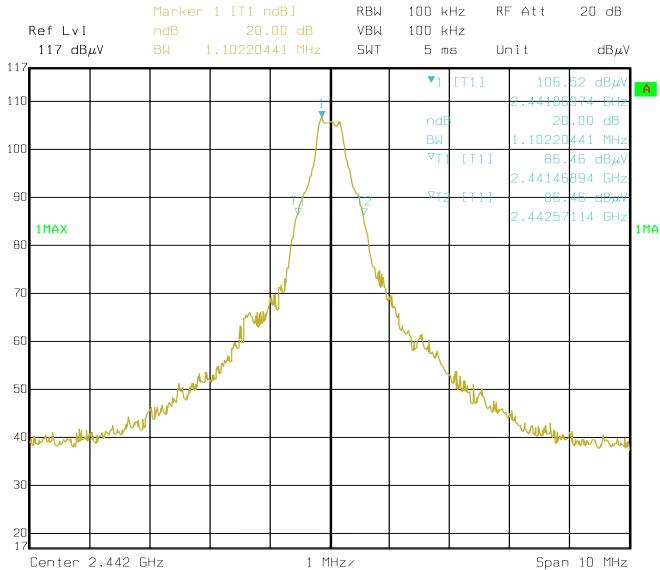
Date: 13.MAY 2010 19:07:08

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#### 2. Condition: Middle Channel



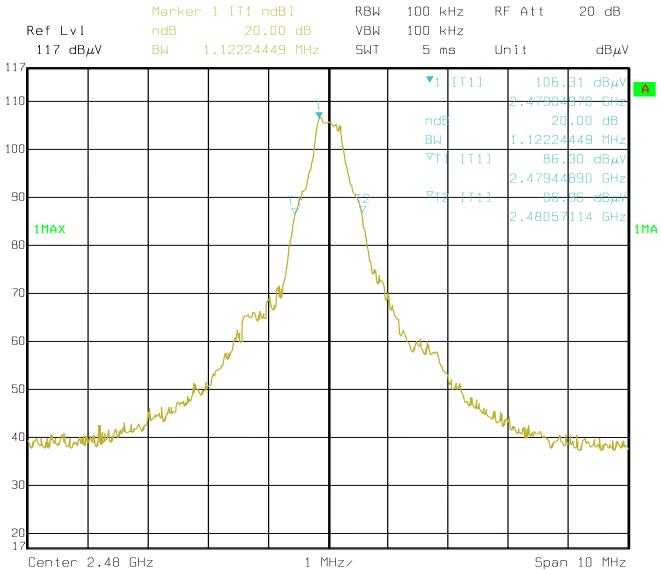
Date: 13.MAY 2010 19:07:51

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### 3. High Channel



Date: 13.MAY 2010 19:08:40

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# 8. Maximum Peak Output Power

#### 8.1 Regulation

According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

#### **8.3 Test Procedure**

- 1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel; RBW > the 20 dB bandwidth of the emission being measured; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
- 4. Repeat above procedures until all frequencies measured were complete.

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#### **8.4Test Results**

EUT		NOTE BOOK		Model		UMPC891		
Mode	Keep Transmitting		Input Voltage		1	.20V~		
Temperature	e	24 deg	C, Humidity		24 deg. C, Humidity		56%	
Channel	Cha	annel Frequency (MHz)	Peak Power Output (dBm)		Peak Power Limit (dBm)		Pass/ Fail	
Low		2402	-0.26		30		Pass	
Middle		2442	-0.35		30		Pass	
High		2480	-0.42		30		Pass	

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

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# 9. Carrier Frequency Separation

## 9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

### 9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

#### 9.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span; Video (or Average) Bandwidth (VBW)  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.

#### 9.4Test Result

EUT	NOTE BO		BOOK	Model		UN	<b>ЛРС891</b>
Mode		Keep Tran	smitting	Input Voltage		1	20V~
Temperature	e	24 deg	g. C,	Humidity		Iumidity 56% R	
Channel	Ch	annel Frequency (MHz)	Carrier Frequ Separatio	-	Limit		Pass/ Fail
Middle		2442	1.02MHz		≥ 25 kHz or 20		Pass
					dB band	dwidth	

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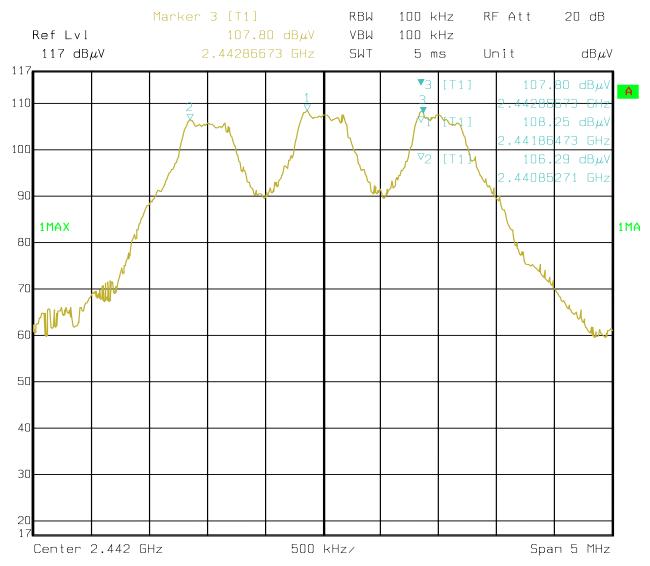
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## **Test Plots**

Middle Channel



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# 10. Number of Hopping Channels

### 10.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

#### 10.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

#### **10.3 Test Procedure**

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW  $\geq$  1% of the span; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold
- 3. Record the number of hopping channels.

#### 10.4Test Result

EUT	NOTE BOOK		Model		UMPC891	
Mode	Keep Transmitting		Input Voltage		120V~	
Temperature	24 deg. C,		Humidity		56% RH	
Operating Frequency		Number of hopping channels		Limit		Pass/ Fail
2402-2480MHz		79		≥ 15		Pass

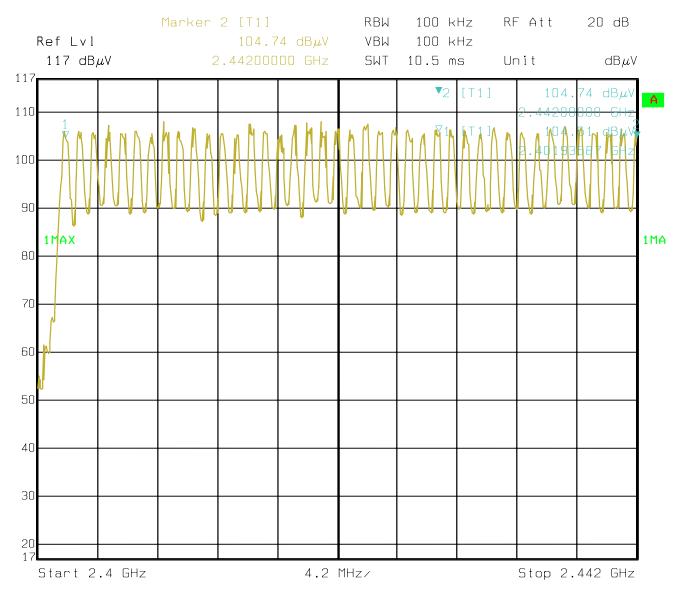
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### **Test Plot**

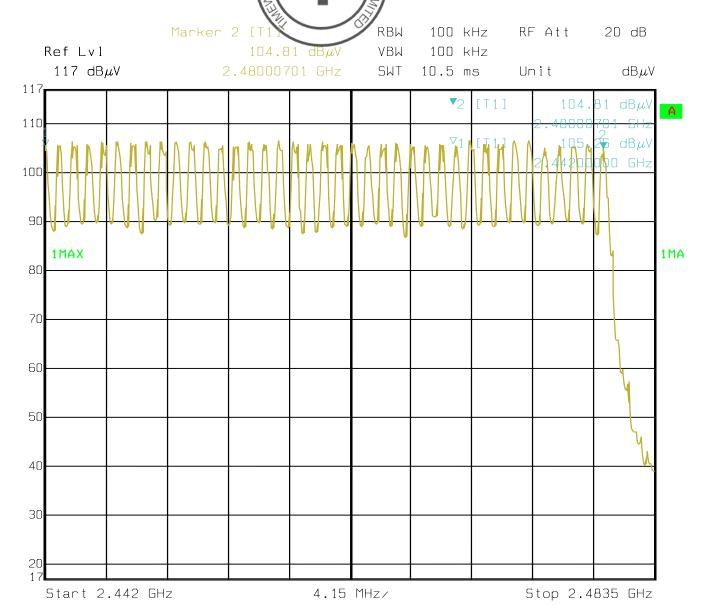


Date: 13.MAY 2010 19:16:14

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Date: 14.MAY 2010 09:58:04

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### 11. Time of Occupancy (Dewell Time)

### 11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

#### 11.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

#### 11.3 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold
- 3. Measure the dwell time using the marker-delta function.
- 4. Repeat above procedures until all frequencies measured were complete.
- 5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

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#### 11.4 Test Result

EUT		NOTE I	BOOK	Model		UMPC891	
Mode		Keep Tran	smitting	Input Voltage		120V~	
Temperature	e	24 deg	g. C,	Humidity		56% RH	
Channel		Reading	Hoping Rate		Actual		Limit
Low		2.9519	266.667 hop/s		0.3	15	0.4s
Middle		2.9499	266.667 hop/s		0.315		0.4s
High		2.9499	266.667 hop/s		0.315		0.4s

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels. And the DH5 is the worst case.

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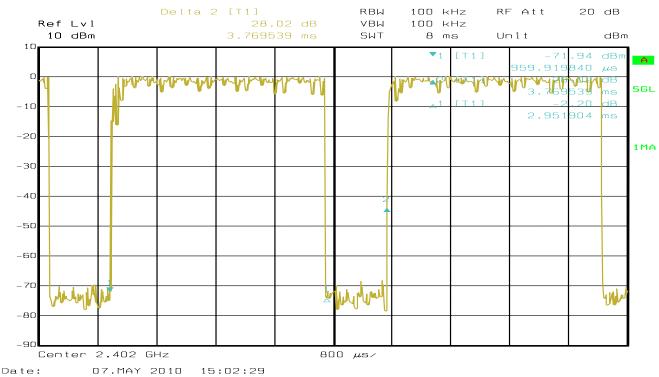
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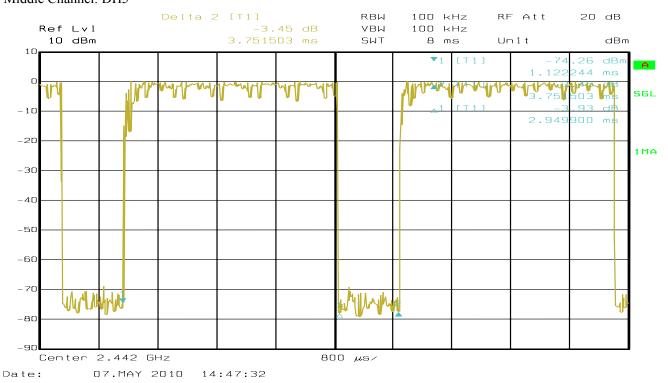


Test Plots:

Low Channel: DH5



# Middle Channel: DH5



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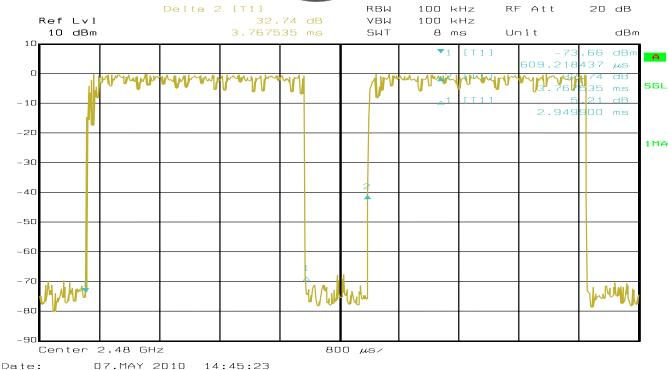
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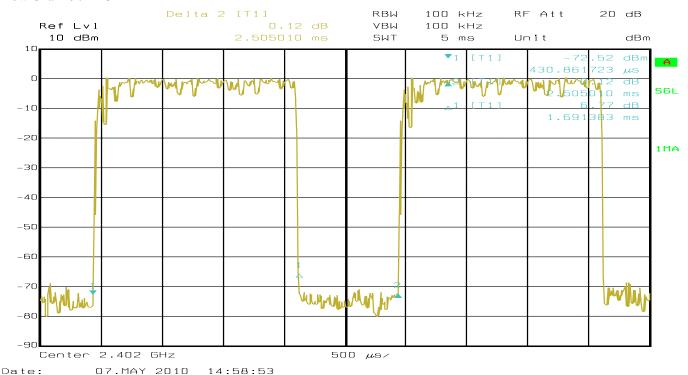
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High Channel: DH5



#### Low Channel: DH3



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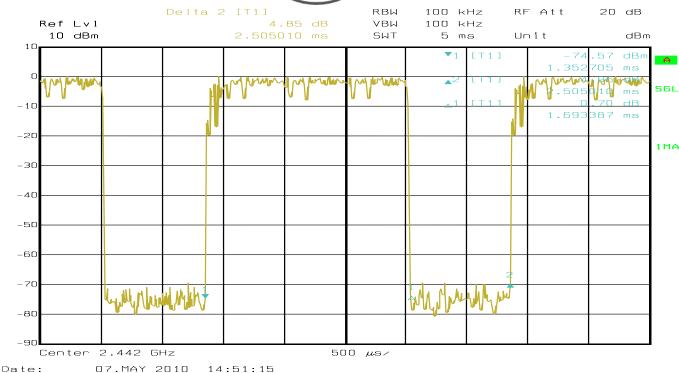
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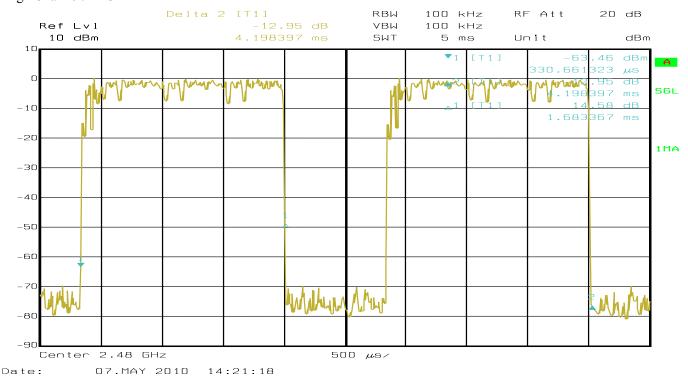
Date: 2010-07-12



Middle Channel: DH3



#### High Channel: DH3



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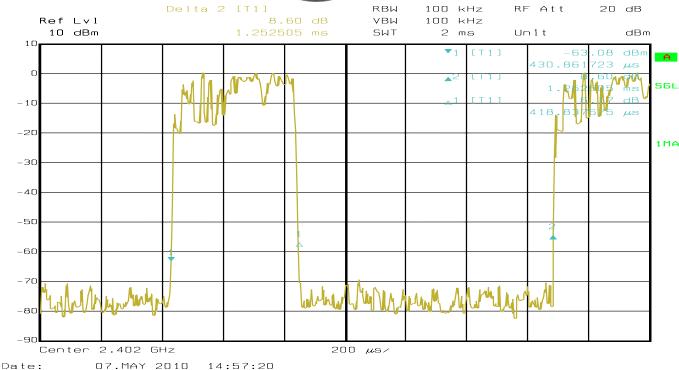
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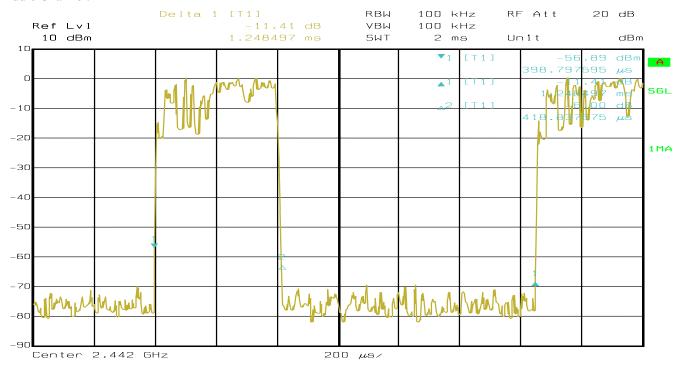
Date: 2010-07-12



Low Channel: DH1



#### Middle Channel: DH1



Date: 07.MAY 2010 14:53:24

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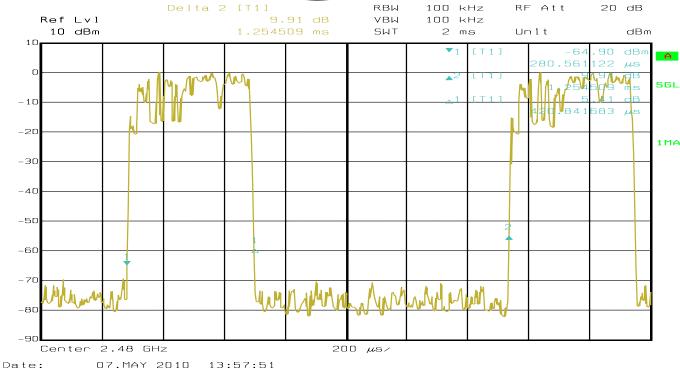
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High Channel: DH1:



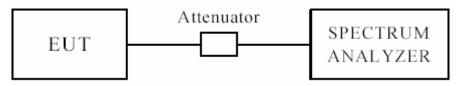
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# 12 Out of Band Measurement

# 12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

#### 12.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

#### 12.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test. (Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measurement used

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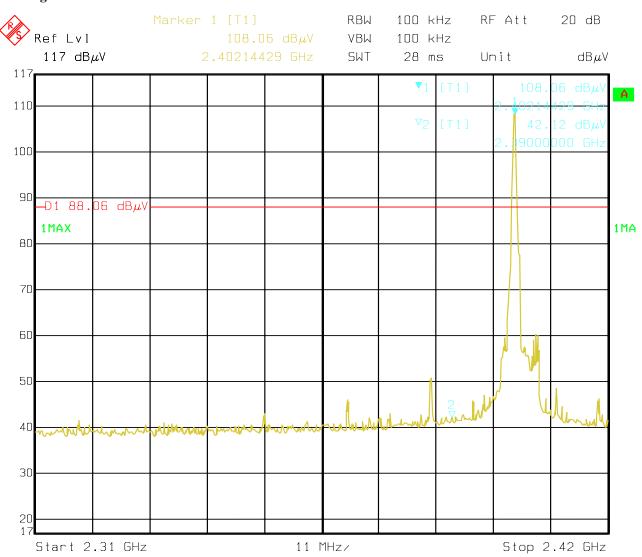
Date: 2010-07-12



#### 12.4 Out of Band Test Result

Product:	NOTE I	BOOK	Test Mode:	Low Channel		
Mode	Keeping Tra	ansmitting	Input Voltage	120V∼		
Temperature	24 de	g. C	Humidity	56% RH		
Test Result:	Pas	SS	Detector	PK		
The Max. FS in	PK (dBµV/m)	54.2		74(dBμV/m)		
Restrict Band	AV(dBμV/m) 38.9		Limit	54(dBμV/m)		
2385.9MHz						

# **Test Figure:**



Date: 13.MAY 2010 19:22:26

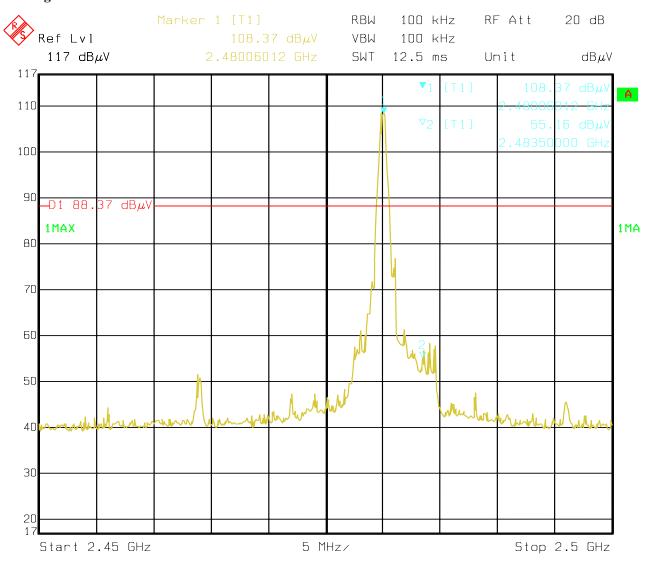
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#### 12.4 Out of Band Test Result

Product:	NOTE	E BOOK	Test Mode:	High Channel
Mode		Transmitting	Input Voltage	120V~
Temperature	24 d	leg. C,	Humidity	56% RH
Test Result:	P	ass	Detector	PK
The Max. FS in	PK (dBμV/m) 60.2			74(dBμV/m)
Restrict Band	AV( $dB\mu V/m$ ) 45.8		Limit	54(dBμV/m)
2485.6MHz				

# **Test Figure:**



Date: 13.MAY 2010 19:24:13

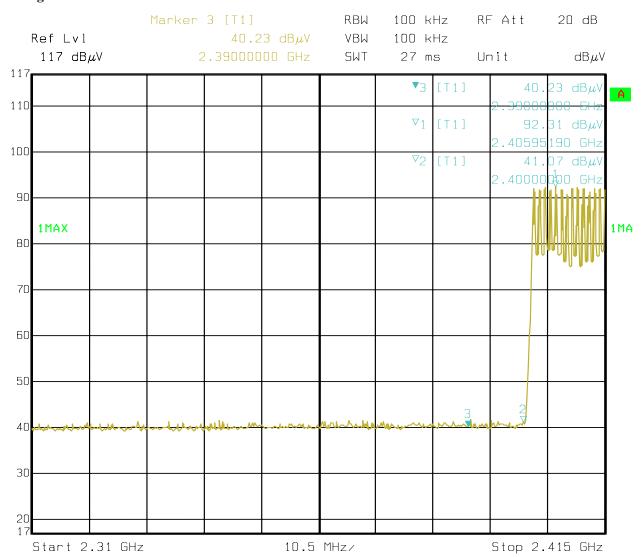
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### 12.4 Out of Band Test Result

Product:	NOTI	E BOOK	Test Mode:	High Channel		
Mode	Keeping	g Hopping	Input Voltage	120V~		
Temperature	24 0	leg. C,	Humidity	56% RH		
Test Result:	Pass		Detector	PK		
The Max. FS in	PK (dBμV/m) 43.8			74(dBμV/m)		
Restrict Band	AV(dBμV/m)		Limit	54(dBμV/m)		
2390MHz						

### **Test Figure:**



Date: 04.JUL.2010 14:46:22

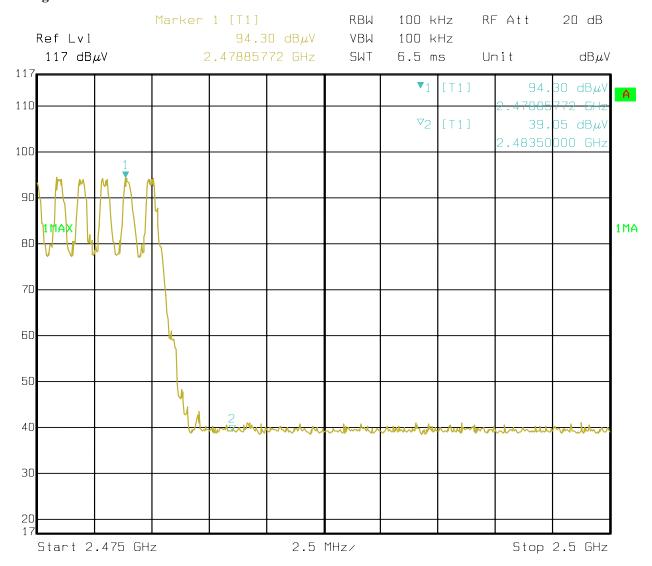
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# 12.4 Out of Band Test Result

Product:	NOTI	E BOOK	Test Mode:	High Channel		
Mode	Keeping	g Hopping	Input Voltage	120V~		
Temperature	24 0	leg. C,	Humidity	56% RH		
Test Result:	Pass		Detector	PK		
The Max. FS in	PK (dBμV/m) 44.6			$74(dB\mu V/m)$		
Restrict Band	AV(dBμV/m)		Limit	$54(dB\mu V/m)$		
2483.5MHz						

### **Test Figure:**



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# 13.0 Antenna Requirement

# 13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi

are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 13.2 Antenna Connected construction

There are two antennas used in the device. An RF cable connected the IPX connector with the PIFA antenna. The maximum Gain of both antennas is 2.5dBi.

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# 14.0 Maximum Permissible Exposure

#### **Applicable Standard**

According to §1.1307(b)(5), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Portable device. KDB616217 was used as the guidance.

According to §1.1310 and §2.1093 RF exposure is calculated.

#### **Measurement Result**

This is a laptop and the conducted output power is -0.26dBm (0.942mW), which is lower than low threshold 60/fGHz mW (60/2.462GHz = 24.37 mW), and the antenna is 2.5dBi which is less than 6dBi.

The SAR measurement is not necessary.

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**FCC ID Label** 

15.0

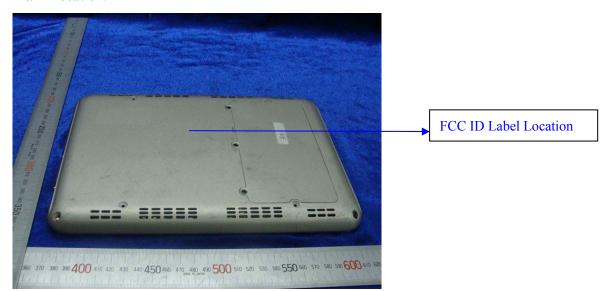


# FCC ID: YG6SINCHUN

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

#### **Mark Location:**



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# 16.0 Photo of testing

### 16.1 Conducted test View



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#### 16.2 Emission Radiated test View





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#### 16.3 Photo for the EUT



Top of the EUT



Top of the PC

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Bottom of the PC



Top of the Adapter

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Ports of the PC



Ports of the PC

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Inside View



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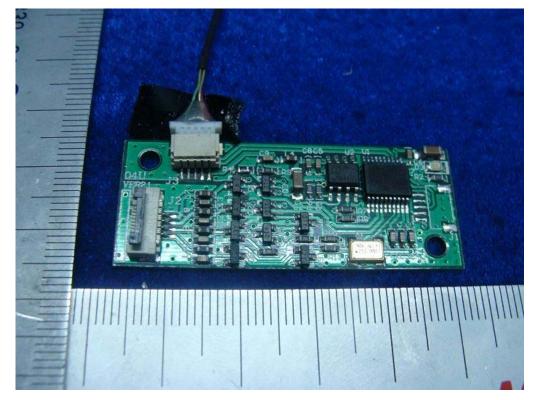
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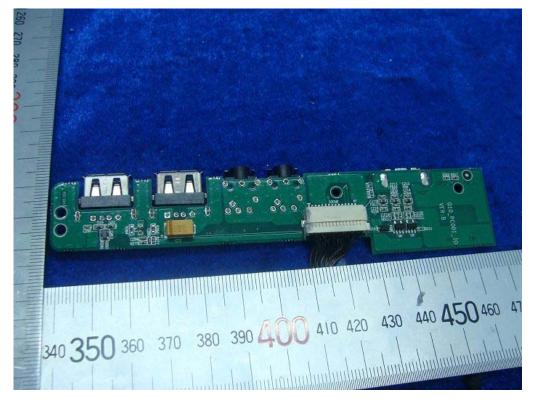
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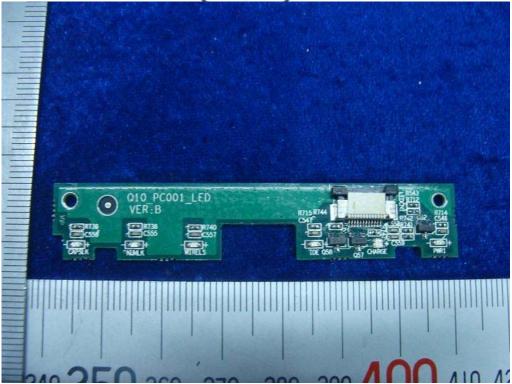
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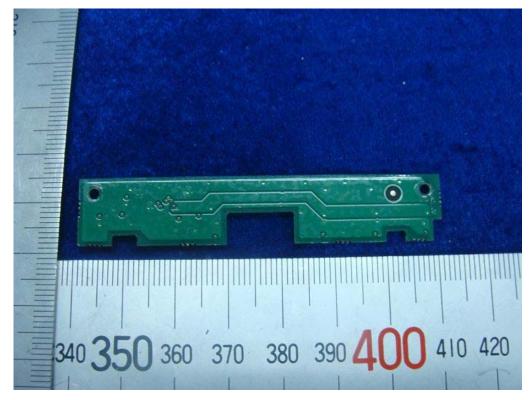
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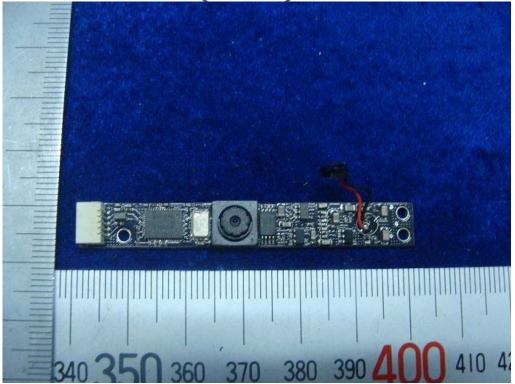
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Model No. of the LCD

# End of the report