

# FCC TEST REPORT (BLUETOOTH LE4.0)

**REPORT NO.:** RF120405C14-7

**MODEL NO.:** FJI13

**FCC ID:** YUW-FJI13

**RECEIVED:** Apr. 05, 2012

**TESTED:** May 08 ~ May 15, 2012

**ISSUED:** Jun. 01, 2012

**APPLICANT:** Fujitsu Mobile Communications Ltd.

**ADDRESS:** 1-1, Kamikodanaka 4-chome, Nakahara-ku,  
Kawasaki 211-8588, Japan

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New  
Taipei City, Taiwan ( R.O.C )

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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## Table of Contents

RELEASE CONTROL RECORD .....	4
1. CERTIFICATION.....	5
2. SUMMARY OF TEST RESULTS.....	6
2.1 MEASUREMENT UNCERTAINTY .....	6
3. GENERAL INFORMATION .....	7
3.1 GENERAL DESCRIPTION OF EUT.....	7
3.2 DESCRIPTION OF TEST MODES.....	8
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	9
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	10
3.4 DESCRIPTION OF SUPPORT UNITS .....	11
3.4.1 CONFIGURATION OF SYSTEM UNDER TEST .....	11
4. TEST TYPES AND RESULTS.....	12
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	12
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	12
4.1.2 TEST INSTRUMENTS.....	12
4.1.3 TEST PROCEDURES .....	12
4.1.4 DEVIATION FROM TEST STANDARD .....	12
4.1.5 TEST SETUP.....	12
4.1.6 EUT OPERATING CONDITIONS.....	12
4.1.7 TEST RESULTS .....	13
4.2 CONDUCTED EMISSION MEASUREMENT .....	21
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	21
4.2.2 TEST INSTRUMENTS.....	21
4.2.3 TEST PROCEDURES .....	21
4.2.4 DEVIATION FROM TEST STANDARD .....	21
4.2.5 TEST SETUP.....	21
4.2.6 EUT OPERATING CONDITIONS.....	21
4.2.7 TEST RESULTS .....	22
4.3 6DB BANDWIDTH MEASUREMENT.....	24
4.3.1 LIMITS OF 6DB BANDWIDTH MEASUREMENT .....	24
4.3.2 TEST SETUP.....	24
4.3.3 TEST INSTRUMENTS.....	24
4.3.4 TEST PROCEDURE .....	24
4.3.5 DEVIATION FROM TEST STANDARD .....	24
4.3.6 EUT OPERATING CONDITIONS.....	24
4.3.7 TEST RESULTS .....	25
4.4 CONDUCTED OUTPUT POWER .....	26
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT .....	26
4.4.2 TEST SETUP.....	26



A D T

4.4.3	TEST INSTRUMENTS .....	26
4.4.4	TEST PROCEDURES .....	26
4.4.5	DEVIATION FROM TEST STANDARD .....	26
4.4.6	EUT OPERATING CONDITIONS.....	26
4.4.7	TEST RESULTS .....	26
4.5	POWER SPECTRAL DENSITY MEASUREMENT .....	27
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT.....	27
4.5.2	TEST SETUP.....	27
4.5.3	TEST INSTRUMENTS.....	27
4.5.4	TEST PROCEDURE .....	27
4.5.5	DEVIATION FROM TEST STANDARD .....	27
4.5.6	EUT OPERATING CONDITION .....	27
4.5.7	TEST RESULTS .....	27
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT .....	28
4.6.1	LIMITS OF OUT OF BAND EMISSION MEASUREMENT .....	28
4.6.2	TEST SETUP.....	28
4.6.3	TEST INSTRUMENTS.....	28
4.6.4	TEST PROCEDURE .....	28
4.6.5	DEVIATION FROM TEST STANDARD .....	29
4.6.6	EUT OPERATING CONDITION .....	29
4.6.7	TEST RESULTS .....	29
4.6.8	TEST RESULTS .....	30
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION .....	31
6.	INFORMATION ON THE TESTING LABORATORIES .....	32
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	33



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120405C14-7	Original release	Jun. 01, 2012

## 1. CERTIFICATION

**PRODUCT:** CDMA FJI13

**MODEL:** FJI13

**BRAND:** Fujitsu Mobile Communications Ltd.

**APPLICANT:** Fujitsu Mobile Communications Ltd.

**TESTED:** May 08 ~ May 15, 2012

**TEST SAMPLE:** Production Unit

**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10-2009

The above equipment (Model: FJI13) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** : Ivonne Wu , **DATE** : Jun. 01, 2012  
Ivonne Wu / Senior Specialist

**APPROVED BY** : Gary Chang , **DATE** : Jun. 01, 2012  
Gary Chang / Technical Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) (Bluetooth LE 4.0)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.63dB at 1.38672MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.06dB at 7440.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	CDMA FJI13	
<b>MODEL NO.</b>	FJI13	
<b>POWER SUPPLY</b>	5.0Vdc (adapter) 3.7Vdc (Li-ion battery)	
<b>MODULATION TYPE</b>	Bluetooth LE 4.0	GFSK
<b>TRANSFER RATE</b>	Bluetooth LE 4.0	1Mbps
<b>OPERATING FREQUENCY</b>	2402 ~ 2480MHz	
<b>NUMBER OF CHANNEL</b>	Bluetooth LE 4.0	40
<b>CHANNEL SPACING</b>	Bluetooth LE 4.0	2MHz
<b>OUTPUT POWER</b>	Bluetooth LE 4.0	0.007W
<b>ANTENNA TYPE</b>	Dipole antenna with -3.2dBi gain	
<b>ANTENNA CONNECTOR</b>	NA	
<b>DATA CABLE</b>	NA	
<b>I/O PORTS</b>	Refer to user's manual	
<b>ACCESSORY DEVICES</b>	Refer to Note as below	

#### NOTE:

1. The EUT contains following accessory and components.

ITEM	BRAND	MODEL	SPECIFICATION
Battery	Panasonic	FJI13UAA	Rating: 3.7Vdc, 1800mAh Type: Li-ion
LCD Panel	TMD	LT046MDY0000	--
Camera 1	SONY	IU091F-Z	--
Camera 2	SAMSUNG	S5K6AAFX13	--
WLAN/BT Module	TI	WL1283	--
WiMAX Module	Broadcom	BCSM350	--

2. The following accessory is for support unit only.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter	HOSHIDEN	0204PTA	Input: 100-240Vac, 220mA Output: 5Vdc, 600mA

3. The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

#### For Bluetooth LE 4.0:

40 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

#### FOR Bluetooth LE 4.0:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

**NOTE:** 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.  
2. “-” means no effect.

#### RADIATED EMISSION TEST (ABOVE 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
-	0 to 39	0, 19, 39	GFSK	1.0

#### RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
-	0 to 39	19	GFSK	1.0

#### POWER LINE CONDUCTED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
-	0 to 39	19	GFSK	1.0

#### **ANTENNA PORT CONDUCTED MEASUREMENT:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
-	0 to 39	0, 19, 39	GFSK	1.0

#### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Kay Wu
PLC	22deg. C, 56%RH	120Vac, 60Hz	Skys Huang
APCM	25deg. C, 65%RH	120Vac, 60Hz	Phoenix Chen

### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.247)**

**ANSI C63.10-2009**

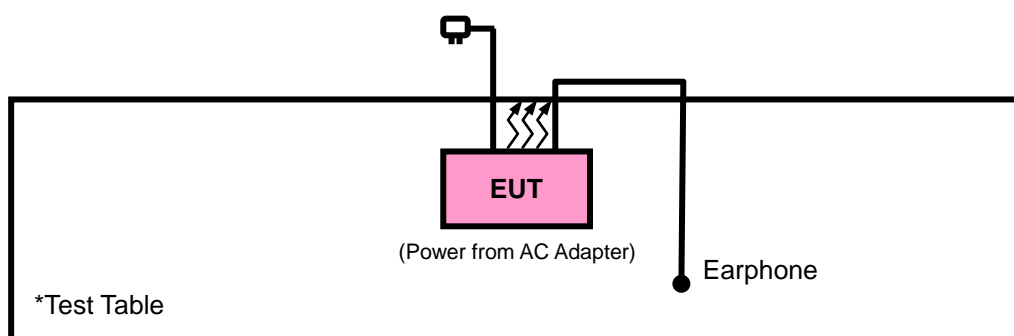
**558074 D01 DTS Meas Guidance v01**

All test items have been performed and recorded as per the above standards.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units.

#### 3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



## **4. TEST TYPES AND RESULTS**

### **4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT**

#### **4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT**

Same as 4.1.1.

#### **4.1.2 TEST INSTRUMENTS**

Same as 4.1.2.

#### **4.1.3 TEST PROCEDURES**

Same as 4.1.3.

#### **4.1.4 DEVIATION FROM TEST STANDARD**

No deviation.

#### **4.1.5 TEST SETUP**

Same as 4.1.5.

#### **4.1.6 EUT OPERATING CONDITIONS**

Same as 4.1.6.



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## 4.1.7 TEST RESULTS

### ABOVE 1GHz DATA

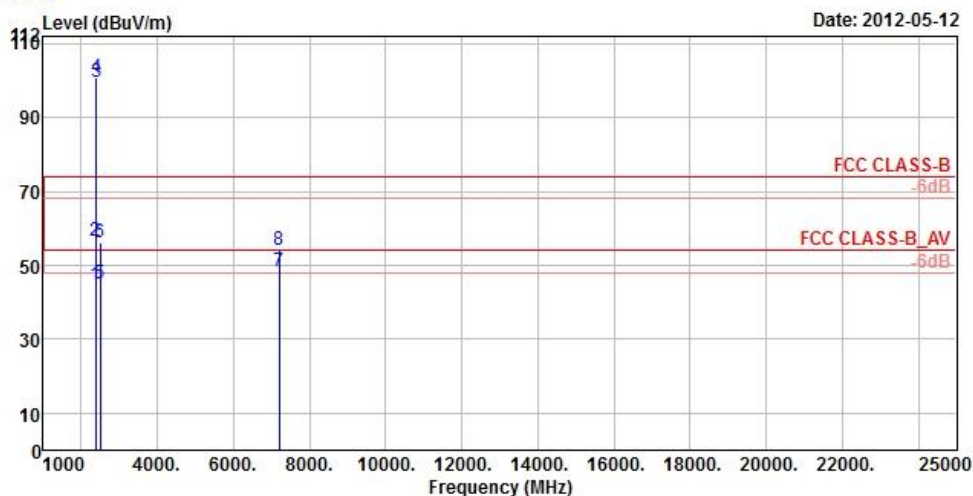


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Data: 19

Date: 2012-05-12



Site : 966 Chamber 5  
Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF HORIZONTAL  
Brand/Model: FJI13  
Remark : BT4.0 TX CH00  
Tested by : Kay Wu  
Temperature : 25°C  
Humidity : 65%  
Plane : X

	Freq	Level	Read	Limit	OverAntenna	Cable	Preamp	A/Pos	T/Pos	Remark
	MHz	dBuV/m	Level	Line	Limit	Factor	Loss	Factor	cm	deg
1	2368.00	44.51	50.00	54.00	-9.49	27.16	4.85	37.50	129	60 Average
2	2368.00	56.53	62.02	74.00	-17.47	27.16	4.85	37.50	129	60 Peak
3 pp	2402.00	99.42	104.81			27.26	4.87	37.52	129	60 Average
4 pk	2402.00	100.80	106.19			27.26	4.87	37.52	129	60 Peak
5	2486.00	45.03	49.93	54.00	-8.97	27.50	4.92	37.32	129	60 Average
6	2486.00	56.24	61.14	74.00	-17.76	27.50	4.92	37.32	129	60 Peak
7 !	7206.00	48.20	54.83	54.00	-5.80	35.97	9.57	52.17	127	14 Average
8	7206.00	54.05	60.68	74.00	-19.95	35.97	9.57	52.17	127	14 Peak



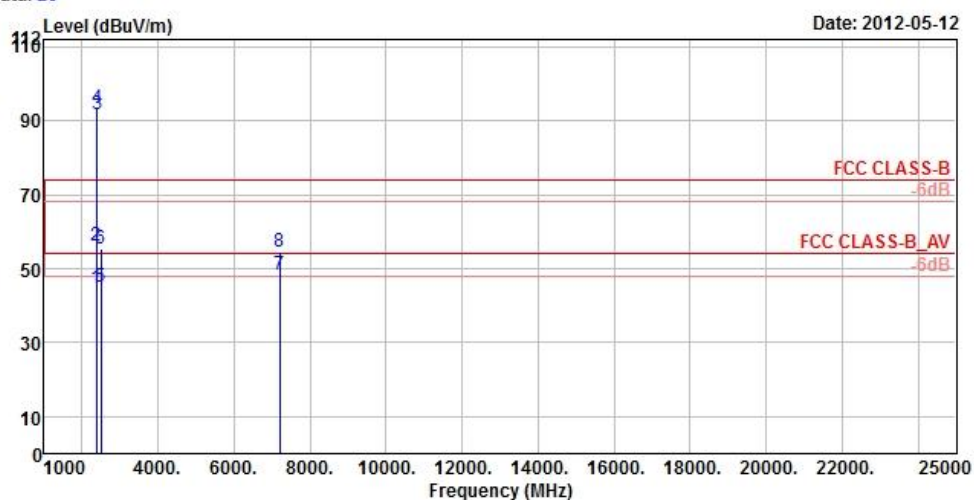
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Data: 20



Site : 966 Chamber 5  
Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF VERTICAL  
Brand/Model: FJI13  
Remark : BT4.0 TX CH00  
Tested by : Kay Wu  
Temperature : 25°C  
Humidity : 65%  
Plane : X

		Read	Limit	OverAntenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Level	Limit	Factor	Loss	Factor		Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm deg
1	2380.00	44.48	49.92	54.00	-9.52	27.21	4.85	37.50	100 194 Average
2	2380.00	56.30	61.74	74.00	-17.70	27.21	4.85	37.50	100 194 Peak
3 pp	2402.00	91.85	97.24			27.26	4.87	37.52	100 194 Average
4 pk	2402.00	93.42	98.81			27.26	4.87	37.52	100 194 Peak
5	2500.00	45.20	49.96	54.00	-8.80	27.55	4.94	37.25	100 194 Average
6	2500.00	55.49	60.25	74.00	-18.51	27.55	4.94	37.25	100 194 Peak
7 !	7206.00	48.19	54.82	54.00	-5.81	35.97	9.57	52.17	130 306 Average
8	7206.00	54.35	60.98	74.00	-19.65	35.97	9.57	52.17	130 306 Peak



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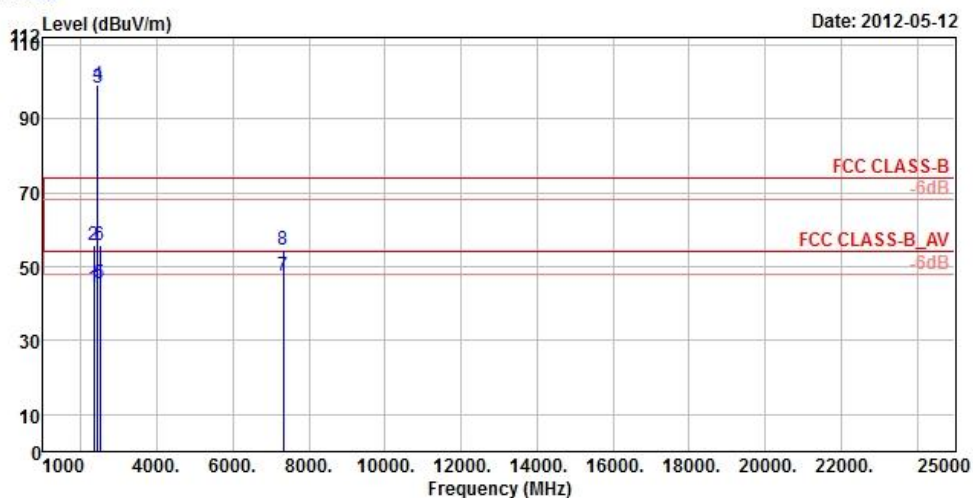


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Data: 19

Date: 2012-05-12



Site : 966 Chamber 5  
Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF HORIZONTAL  
Brand/Model: FJI13  
Remark : BT4.0 TX CH19  
Tested by : Kay Wu  
Temperature : 25°C  
Humidity : 65%  
Plane : X

		Read	Limit	OverAntenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Level	Line	Limit	Factor	Loss	Factor	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm deg
1	2332.00	44.38	50.00	54.00	-9.62	27.06	4.79	37.47	125 62 Average
2	2332.00	55.88	61.50	74.00	-18.12	27.06	4.79	37.47	125 62 Peak
3 pp	2440.00	98.17	103.34			27.40	4.89	37.46	125 62 Average
4 pk	2440.00	99.36	104.53			27.40	4.89	37.46	125 62 Peak
5	2488.00	45.27	50.12	54.00	-8.73	27.55	4.92	37.32	125 62 Average
6	2488.00	55.96	60.81	74.00	-18.04	27.55	4.92	37.32	125 62 Peak
7	7320.00	47.46	53.34	54.00	-6.54	36.26	9.63	51.77	131 13 Average
8	7320.00	54.70	60.58	74.00	-19.30	36.26	9.63	51.77	131 13 Peak





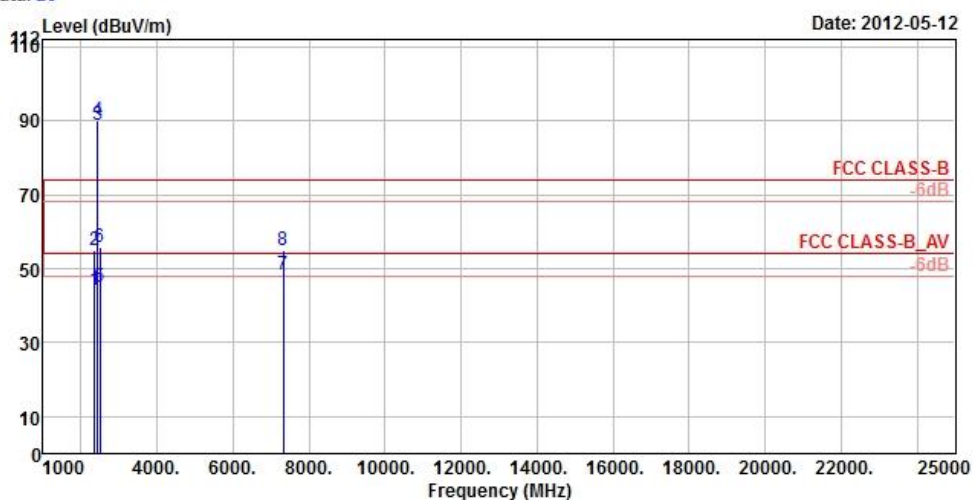
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Data: 20



Site : 966 Chamber 5  
Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF VERTICAL  
Brand/Model: FJI13  
Remark : BT4.0 TX CH19  
Tested by : Kay Wu  
Temperature : 25°C  
Humidity : 65%  
Plane : X

		Read	Limit	OverAntenna	Cable	Preamp	A/Pos	T/Pos	
	Freq	Level	Level	Line	Limit	Factor	Loss	Factor	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm deg
1	2360.00	44.39	49.90	54.00	-9.61	27.16	4.82	37.49	119 195 Average
2	2360.00	55.06	60.57	74.00	-18.94	27.16	4.82	37.49	119 195 Peak
3 pp	2440.00	88.66	93.83			27.40	4.89	37.46	119 195 Average
4 pk	2440.00	90.11	95.28			27.40	4.89	37.46	119 195 Peak
5	2494.00	45.17	49.93	54.00	-8.83	27.55	4.94	37.25	119 195 Average
6	2494.00	55.75	60.51	74.00	-18.25	27.55	4.94	37.25	119 195 Peak
7 !	7320.00	48.25	54.13	54.00	-5.75	36.26	9.63	51.77	100 383 Average
8	7320.00	54.97	60.85	74.00	-19.03	36.26	9.63	51.77	100 383 Peak





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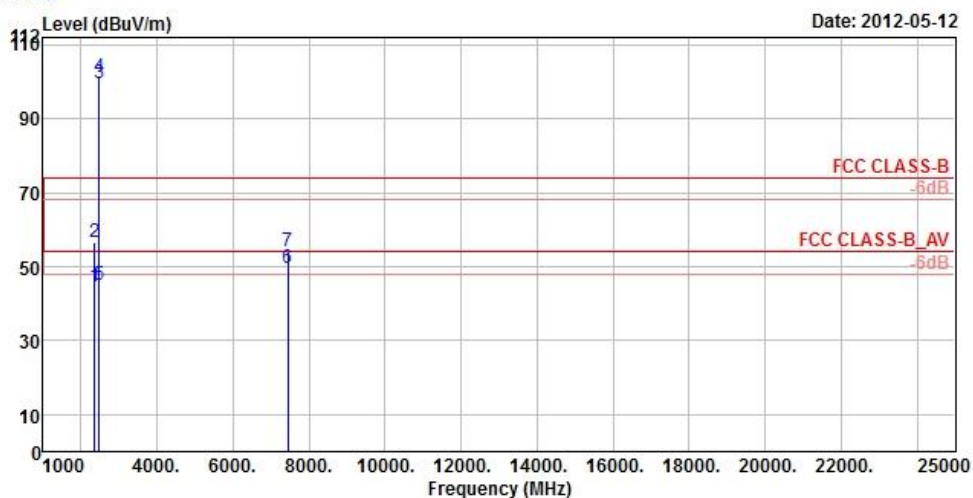


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Data: 19

Date: 2012-05-12



Site : 966 Chamber 5  
 Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF HORIZONTAL  
 Brand/Model: FJI13  
 Remark : BT4.0 TX CH39  
 Tested by : Kay Wu  
 Temperature : 25°C  
 Humidity : 65%  
 Plane : X

	Freq	Level	Read Level	Limit Line	OverAntenna Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2358.00	44.59	50.10	54.00	-9.41	27.16	4.82	37.49	123	58	Average
2	2358.00	56.81	62.32	74.00	-17.19	27.16	4.82	37.49	123	58	Peak
3 pp	2480.00	99.77	104.67			27.50	4.92	37.32	123	58	Average
4 pk	2480.00	101.46	106.36			27.50	4.92	37.32	123	58	Peak
5	2484.00	45.23	50.13	54.00	-8.77	27.50	4.92	37.32	123	58	Average
6 !	7440.00	49.77	54.89	54.00	-4.23	36.55	9.71	51.38	106	29	Average
7	7440.00	54.16	59.28	74.00	-19.84	36.55	9.71	51.38	106	29	Peak



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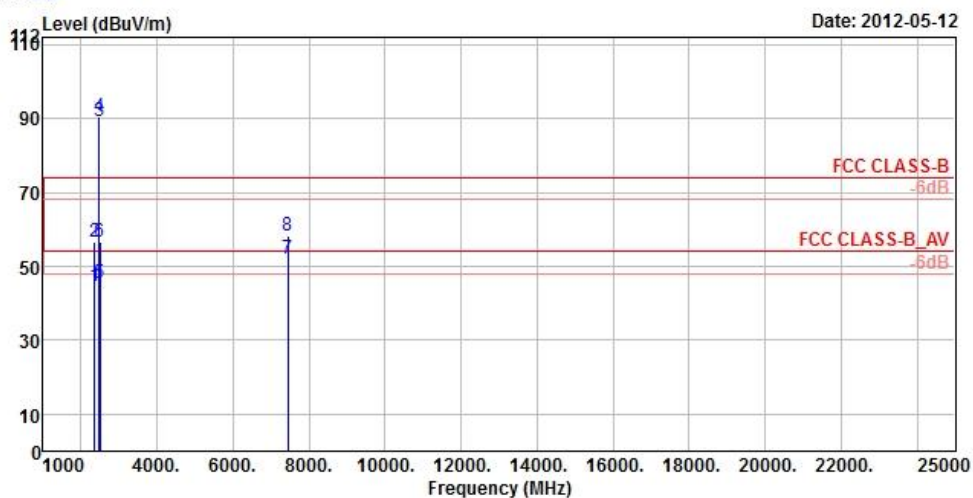


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Data: 20

Date: 2012-05-12



Site : 966 Chamber 5  
 Condition : FCC CLASS-B 3m ANT\_18G~40G\_HF VERTICAL  
 Brand/Model: FJI13  
 Remark : BT4.0 TX CH39  
 Tested by : Kay Wu  
 Temperature : 25°C  
 Humidity : 65%  
 Plane : X

	Freq	Level	Read Level	Limit Line	OverAntenna Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	2350.00	44.61	50.17	54.00	-9.39	27.11	4.82	37.49	100	357	Average
2	2350.00	56.80	62.36	74.00	-17.20	27.11	4.82	37.49	100	357	Peak
3 pp	2480.00	89.41	94.31			27.50	4.92	37.32	100	357	Average
4 pk	2480.00	90.64	95.54			27.50	4.92	37.32	100	357	Peak
5	2500.00	45.44	50.20	54.00	-8.56	27.55	4.94	37.25	100	357	Average
6	2500.00	56.52	61.28	74.00	-17.48	27.55	4.94	37.25	100	357	Peak
7 !	7440.00	51.94	57.06	54.00	-2.06	36.55	9.71	51.38	101	343	Average
8	7440.00	58.40	63.52	74.00	-15.60	36.55	9.71	51.38	101	343	Peak



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## BELOW 1GHz WORST-CASE DATA

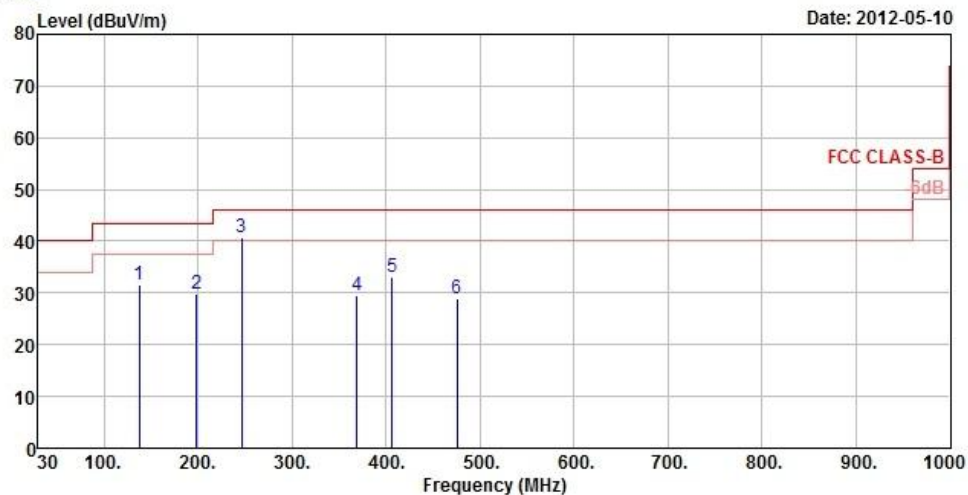


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2012-05-10



Site : 966 Chamber 5  
 Condition : FCC CLASS-B 3m ANT\_30M~1G\_LF HORIZONTAL  
 Brand/Model: FJI13  
 Remark : BT4.0 TX LF  
 Tested by : Kay Wu  
 Temperature : 25°C  
 Humidity : 65%  
 Plane : X

	Freq	Level	Read Level	Limit Line	OverAntenna Limit	Cable Factor	Preamp Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1	137.73	31.58	49.78	43.50	-11.92	12.21	1.28	31.69	100	212	Peak
2	198.48	29.87	50.61	43.50	-13.63	9.43	1.59	31.76	100	258	Peak
3 pp	246.54	40.81	59.55	46.00	-5.19	11.32	1.82	31.88	100	221	Peak
4	369.30	29.52	44.53	46.00	-16.48	14.61	2.30	31.92	100	266	Peak
5	406.40	32.96	47.09	46.00	-13.04	15.46	2.45	32.04	100	41	Peak
6	475.70	29.05	41.39	46.00	-16.95	16.83	2.70	31.87	100	199	Peak



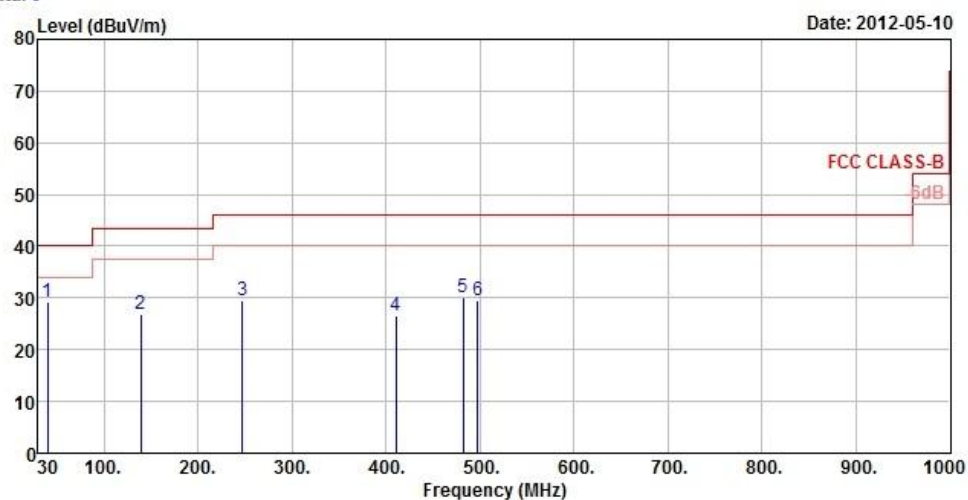
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Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6



Site : 966 Chamber 5  
Condition : FCC CLASS-B 3m ANT\_30M~1G\_LF VERTICAL  
Brand/Model: FJI13  
Remark : BT4.0 TX LF  
Tested by : Kay Wu  
Temperature : 25°C  
Humidity : 65%  
Plane : X

	Freq	Level	Read Level	Limit Line	OverAntenna Limit	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m	dB	dB	cm	deg	
1 pp	39.72	29.29	46.09	40.00	-10.71	13.54	0.65	30.99	100	174	Peak
2	138.81	26.96	45.06	43.50	-16.54	12.27	1.29	31.66	100	132	Peak
3	247.08	29.42	48.14	46.00	-16.58	11.36	1.82	31.90	100	227	Peak
4	410.60	26.64	40.63	46.00	-19.36	15.54	2.46	31.99	212	221	Peak
5	482.00	30.13	42.28	46.00	-15.87	16.96	2.72	31.83	123	21	Peak
6	497.40	29.59	41.21	46.00	-16.41	17.27	2.77	31.66	102	285	Peak

## **4.2 CONDUCTED EMISSION MEASUREMENT**

### **4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT**

Same as 4.2.1.

### **4.2.2 TEST INSTRUMENTS**

Same as 4.2.2.

### **4.2.3 TEST PROCEDURES**

Same as 4.2.3.

### **4.2.4 DEVIATION FROM TEST STANDARD**

No deviation.

### **4.2.5 TEST SETUP**

Same as 4.2.5.

### **4.2.6 EUT OPERATING CONDITIONS**

Same as 4.2.6.

## 4.2.7 TEST RESULTS

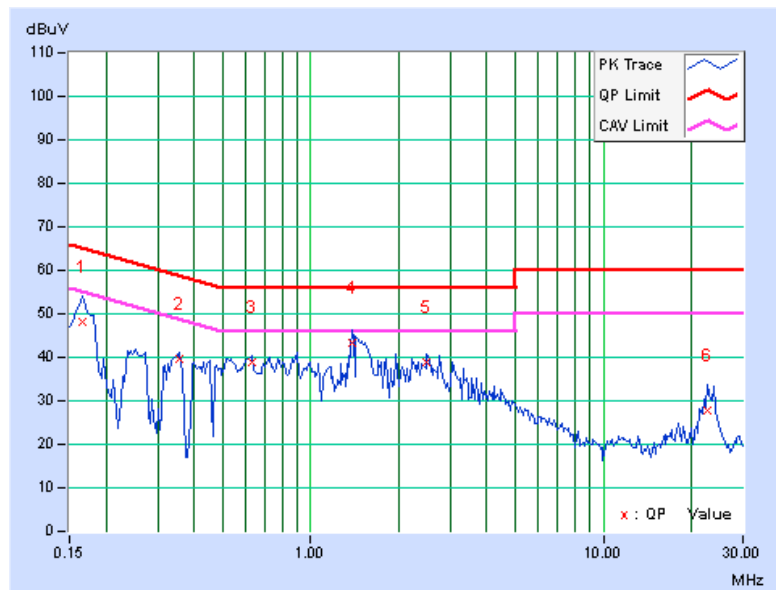
### CONDUCTED WORST CASE DATA:

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.27	47.90	29.03	48.17	29.30	65.18	55.18	-17.01	-25.88
2	0.35703	0.29	39.43	27.68	39.72	27.97	58.80	48.80	-19.08	-20.83
3	0.62656	0.30	38.46	24.71	38.76	25.01	56.00	46.00	-17.24	-20.99
4	1.38672	0.33	43.04	23.76	43.37	24.09	56.00	46.00	-12.63	-21.91
5	2.49219	0.39	38.51	22.36	38.90	22.75	56.00	46.00	-17.10	-23.25
6	22.68359	0.70	27.04	11.61	27.74	12.31	60.00	50.00	-32.26	-37.69

### REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

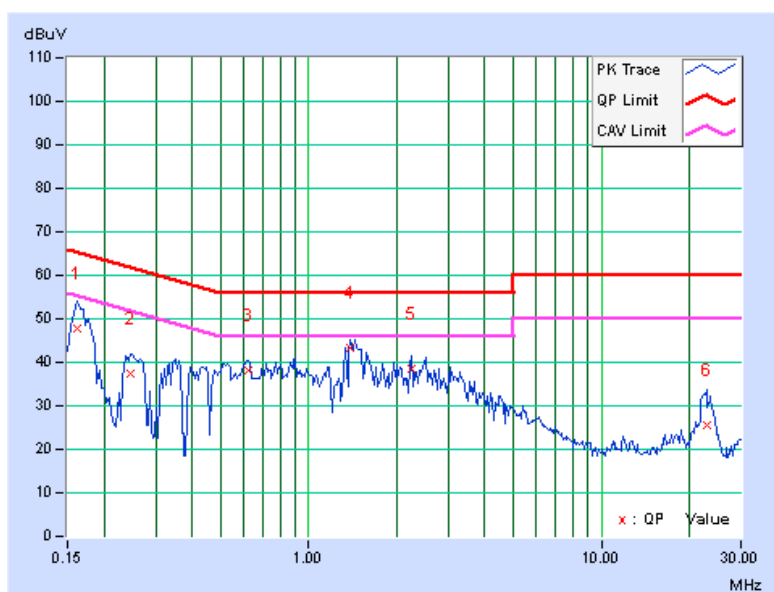


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.29	47.42	27.38	47.71	27.67	65.38	55.38	-17.67	-27.71
2	0.24766	0.29	37.16	25.41	37.45	25.70	61.84	51.84	-24.38	-26.13
3	0.62266	0.31	38.01	24.78	38.32	25.09	56.00	46.00	-17.68	-20.91
4	1.39453	0.35	42.94	23.48	43.29	23.83	56.00	46.00	-12.71	-22.17
5	2.24219	0.40	38.03	22.52	38.43	22.92	56.00	46.00	-17.57	-23.08
6	22.92969	0.83	24.84	14.98	25.67	15.81	60.00	50.00	-34.33	-34.19

# REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



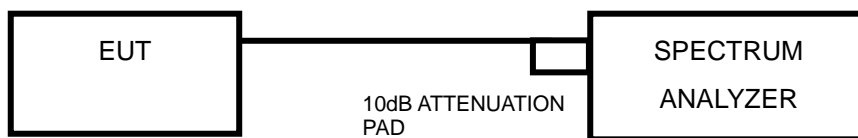


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST SETUP



#### 4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



#### 4.3.7 TEST RESULTS

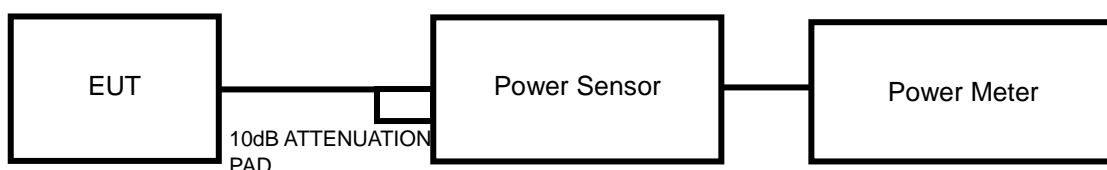
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.668	0.5	PASS
19	2440	0.664	0.5	PASS
39	2480	0.668	0.5	PASS

## 4.4 CONDUCTED OUTPUT POWER

### 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz: 1 Watt (30dBm)

### 4.4.2 TEST SETUP



### 4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the peak power level.

### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

### 4.4.7 TEST RESULTS

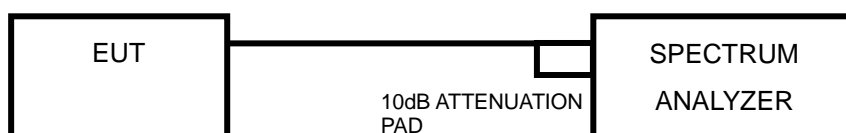
CHANNEL	FREQUENCY (MHz)	PEAK POWER (W)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
0	2402	0.006	7.65	30	PASS
19	2440	0.007	8.22	30	PASS
39	2480	0.006	7.58	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST SETUP



### 4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 TEST PROCEDURE

- Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

### 4.5.7 TEST RESULTS

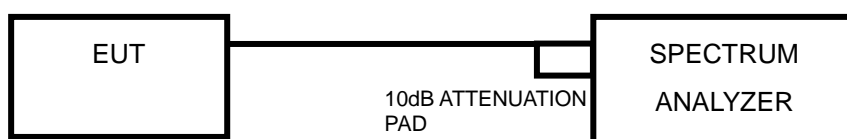
Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	6.45	-8.75	8	PASS
19	2440	7.17	-8.03	8	PASS
39	2480	6.48	-8.72	8	PASS

## 4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

### 4.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST SETUP



### 4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 TEST PROCEDURE

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

## MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

### 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

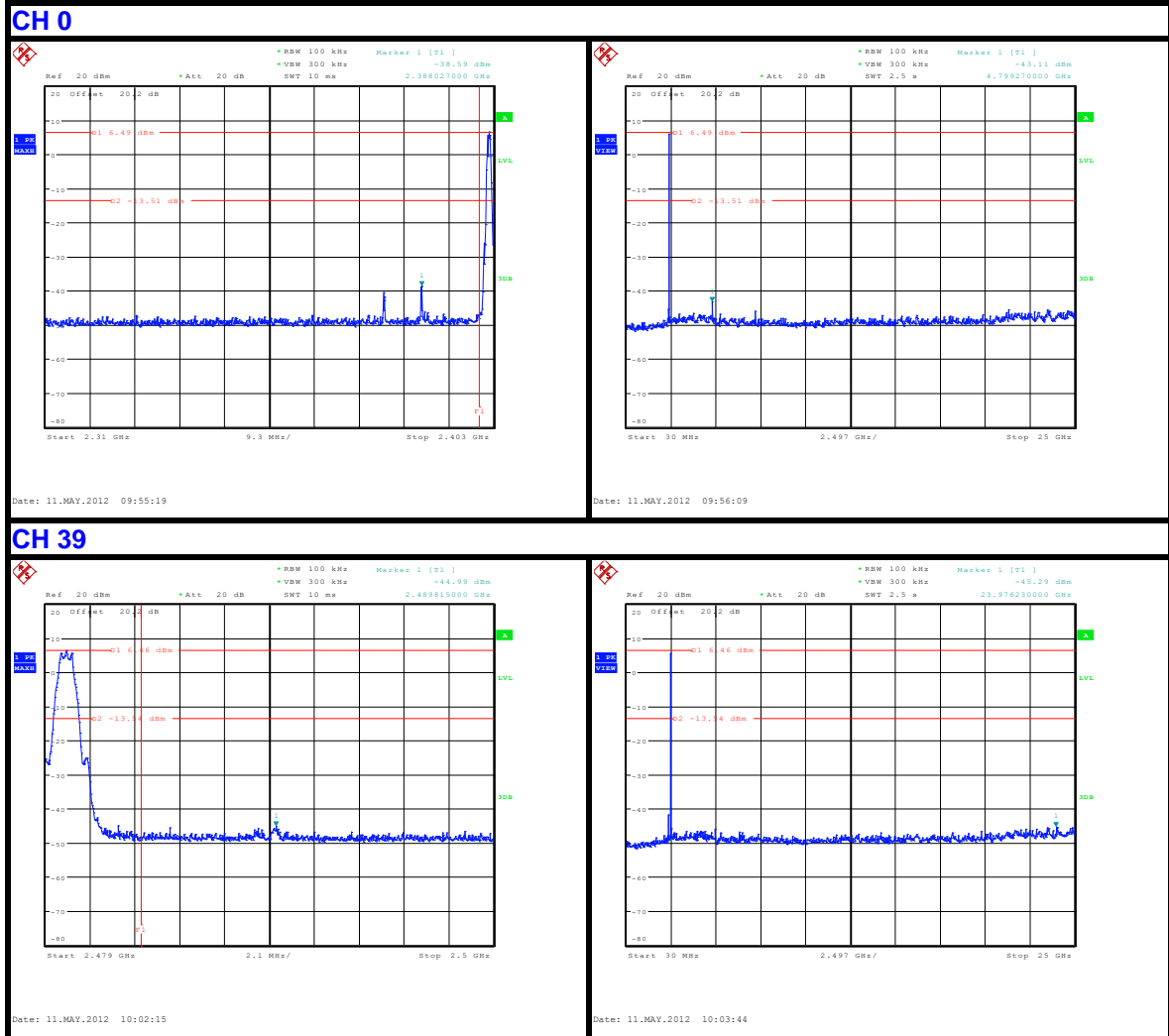
### 4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

### 4.6.7 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

## 4.6.8 TEST RESULTS



## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

## 6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site also.



## **7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No modifications were made to the EUT by the lab during the test.

**--- END ---**