FCC TEST REPORT

for

47 CFR, Part 15, Subpart E

Equipment	:	802.11A Carrie-Grade Weatherproof Wireless Outdoor Bridge System
Model No.	:	BR5811E1
FCC ID	:	MAD-BR5811E1
Filing Type	:	Certification
Applicant	:	**MICROELECTRONICS TECHNOLOGY INC.** No.1, Innovation Rd II, Hsinchu science-Based Industrial Park, Hsinchu 30077, Taiwan, R.O.C.

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Nov. 24, 2003

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : F392904-1

CERTIFICATE OF COMPLIANCE

For

47 CFR, Part 15, Subpart E

Equipment	:	802.11A Carrie-Grade Weatherproof Wireless Outdoor Bridge System
Model No.	:	BR5811E1
FCC ID	:	MAD-BR5811E1
Filing Type	:	Certification
Applicant	:	**MICROELECTRONICS TECHNOLOGY INC.** No.1, Innovation Rd II, Hsinchu Science-Based Industrial Park, Hsinchu 30077, Taiwan, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2001** and the equipment under test was ***passed*** all test items required in FCC Part 15 subpart E, relative to the equipment under test. Testing was carried out on Nov. 24, 2003 at **SPORTON International Inc.** LAB.

Joe Yang

Director

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

MICROELECTRONICS TECHNOLOGY INC.

No.1, Innovation Rd II, Hsinchu Science-Based Industrial Park, Hsinchu 30077, Taiwan, R.O.C.

1.2. Manufacturer

Same as 1.1

1.3 Basic Description of Equipment under Test

Equipment	: 802.11A Carrie-Grade Weatherproof Wireless Outdoor Bridge System
Model No.	: BR5811E1
FCC ID	: MAD-BR5811E1
Trade Name	: MICROELECTRONICS
Power Supply Type	: Switching
AC Power Cord	: AC 110V / 60Hz
Data Cable	: power over Ethernet (POE)

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. Host/Radio Interface	**IEEE 802.3 10Base-T / 802.3u 100Base-TX / 802.3x Flow Control 802.11A**			
2. Type of Modulation	**BPSK, QPSK, 16-QAM, 64-QAM**			
3. Number of Channels	**4**			
4. Frequency Band	**5.725 ~ 5.825GHz**			
5. Bandwidth of each channel	**20MHz (Normal mode) 40MHz (Turbo mode)**			
6. Maximum Output Power to Antenna	**14.80 dBm (normal), 13.09 dBm (turbo mode)**			
7. IF & L.O. frequency	**N/A**			
Type of Antenna Connector :	**N-type connector**			
8. Antenna Type / Class and Gain	**Grid Parabolic / 26 dBi**			
9. Function Type	**Transmitter**		**Transceiver**	**yes**
10. Power Rating (DC/AC , Voltage)	**90 ~ 264 Vac, 47~63 Hz (POE 48V) 30W max**			
11. Duty Cycle	**N/A**			
12. Basic function of product	**MTI 802.11a wireless outdoor turbo bridge, BR5811 is a wireless building-to-building bridge solution, BR5811 provide the data rate up to 108 Mbps that is best suited for enterprises, campus or off-site locations that require LAN or Internet access without the availability of wired networks to extend the network coverage. BR5811 provides the point to point and point to multi-point connection**			

13. Temperature Range (Operating)	**–33°C to 55°C**
14. Humidity	**0~95% non-condensing**
15. Remark	**N/A**

1 Test Configuration of Equipment under Test

2.1 Test Manner

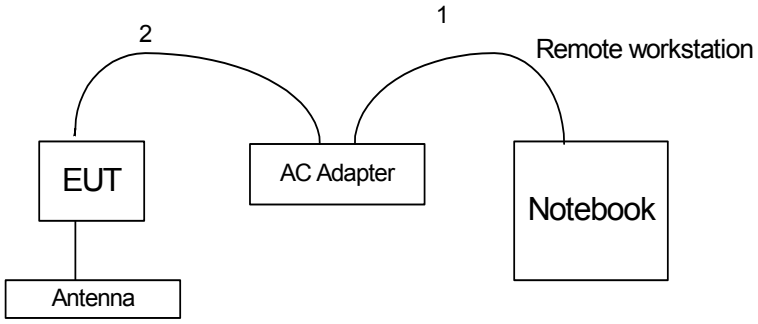
a. The EUT has been associated with notebook and peripherals pursuant to ANSI C63.4-2001 and configuration operated in a manner, which tended to maximize its emission characteristics in a typical application.
b. The complete test system included DELL NOTEBOOK and EUT for EMI test.
c. The EUT can operate on 5745MHz to 5805Hz. (normal mode: data rate 54Mbps), 5760MHz to 5800MHz (Turbo mode: data rate 108Mbps) (as listed in section 1.4).
   According to 15.407(b)(7), four test channels (upper and lower frequency) were performed as following:
d. The following test modes were pretested for conduction test:
   Mode 1: 802. 11a（5745MHz）
   Mode 2: 802. 11a（5805MHz）
   Mode 3: 802. 11a（5760MHz）
   Mode 4: 802. 11a（5800MHz）
e. The following test modes were pretested for radiation test:
   Mode 1: 802. 11a（5745MHz）
   Mode 2: 802. 11a（5805MHz）
   Mode 3: 802. 11a（5760MHz）
   Mode 4: 802. 11a（5800MHz）
f. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 40000MHz

2.2 Description of Test System

Support Unit 1. – Notebook (Dell)

FCC ID	: QD5-BRCM1005-D
Model No.	: PP05L
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0037

2.3 Connection Diagram of Test System



1. The RJ45 cable is connected from EUT to the support unit 1.
2. POE is connected from EUT to the AC adapter

3 Operation of Equipment under Test

An executive program, ART 2.4 under WIN 2000.

At the same time, the following programs was executed:

Keep sending transmit output power.

4 General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO01-HY, 03CH03-HY

4.1 Test Voltage

110V/ 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2001 for conducted power line test and radiated emission test,

4.3 Test in Compliance with

FCC Part 15, Subpart E

4.4 Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation: from 30 MHz to 40000MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 M.

5 Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.407(b)(5)	Conducted Emission	Pass
15.403	Emission Bandwidth	Pass
15.407(a)(3)	Maximum Peak Output Power	Pass
15.407(b)(3)(5)	Radiated Emission	Pass
15.407(a)	Power Spectral Density	Pass
15.407(b)(3)	Band Edges Measurement	Pass
15.407(a)(3)	Antenna Requirement	Pass
15.407(a)(6)	Peak Excursion	Pass
15.407(c)	Automatically Discontinue Transmission	Pass
15.407(g)	Frequency Stability	Pass

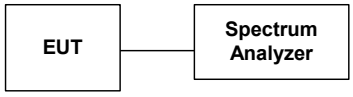
5.2 Emission Bandwidth

5.2.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.2.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to approximately 1% of the emission bandwidth. For these tests, the resolution bandwidth is 300 kHz, and peak detection is used. The 26 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26 dB. Test Setup Layout：



5.2.3 Test Result：The spectrum analyzer plots are attached as below

- Temperature : 23 °C
- Relative Humidity : 52%
-

Frequency (MHz)	26dB Emission bandwidth (MHz)	Plot Ref. No.
5745	22.1	1
5805	22.1	2
5760	40.0	3
5800	36.2	4

5.3 Peak Output Power

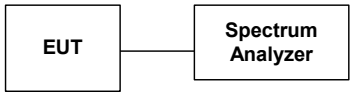
5.3.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.3.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, peak detection is used, and the peak power is determined by channel integration over the previously measured emissions bandwidth..

5.3.3 Test Setup Layout：



5.3.4 Test Result：See spectrum analyzer plots below

- Temperature : 23°C
- Relative Humidity : 52 %
- Antenna Gain: 26 dBi
-

Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)	Plot Ref. No.
5745	12.55	1W/30 dBm	5
5805	14.80	1W/30 dBm	6
5760	13.09	1W/30 dBm	7
5800	13.01	1W/30 dBm	8

- Comments：Maximum Peak Output Power < 30dBm (1Watt)

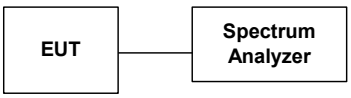
5.4 Peak Power Spectral Density

5.4.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.4.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, sample detection is used, and the analyzer is set for video averaging over.



5.4.3 Test Result：See spectrum analyzer plots below

- . Temperature : 23°C,
- Relative Humidity : 52%
-

Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)	Plot Ref. No.
5745	-3.8	17	17
5805	-2.94	17	18
5760	-7.64	17	19
5800	-6.82	17	20

5.5 Test of Conducted Emission

Conducted Emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz and return leads of the EUT according to the methods defined in ANSI C63.4-2001 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

5.5.1 Major Measuring Instruments：

● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

5.5.2 Test Procedures：

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 KHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.5.3 Test Result of Conducted Emission：

Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz

- Test Mode : Mode 1 (5745MHz)
- Temperature : 24.5°C
- Relative Humidity : 53 %

■ The test was passed at the minimum margin that marked by the frame in the following table

Site : C001-HY
Condition : CNS/VCCI/CISPR-B LINE
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : Tx 5745MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.203	43.87	-19.62	63.49	43.69	0.00	0.18	QP
2	0.203	39.34	-14.15	53.49	39.16	0.00	0.18	Average
3	0.272	47.08	-13.98	61.06	46.94	0.00	0.14	QP
4	0.272	42.00	-9.06	51.06	41.86	0.00	0.14	Average
5	0.339	43.14	-6.09	49.23	43.02	0.00	0.12	Average
6	0.339	48.22	-11.01	59.23	48.10	0.00	0.12	QP
7	0.408	32.86	-14.83	47.69	32.76	0.00	0.10	Average
8	0.408	38.97	-18.72	57.69	38.87	0.00	0.10	QP
9	0.474	41.85	-14.59	56.44	41.76	0.00	0.09	QP
10	0.474	35.17	-11.27	46.44	35.08	0.00	0.09	Average
11	14.140	22.22	-37.78	60.00	21.87	0.00	0.35	QP
12	14.140	17.31	-32.69	50.00	16.96	0.00	0.35	Average

Site : C001-HY
Condition : CNS/VCCI/CISPR-B NEUTRAL
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : Tx 5745MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.203	45.31	-18.18	63.49	45.13	0.00	0.18	QP
2	0.203	34.10	-19.39	53.49	33.92	0.00	0.18	Average
3	0.272	36.92	-14.14	51.06	36.78	0.00	0.14	Average
4	0.272	42.16	-18.90	61.06	42.02	0.00	0.14	QP
5	0.337	41.18	-18.10	59.28	41.06	0.00	0.12	QP
6	0.337	37.64	-11.64	49.28	37.52	0.00	0.12	Average
7	0.474	40.20	-16.24	56.44	40.11	0.00	0.09	QP
8	0.474	34.68	-11.76	46.44	34.59	0.00	0.09	Average
9	0.679	31.59	-14.41	46.00	31.54	0.00	0.05	Average
10	0.679	38.01	-17.99	56.00	37.96	0.00	0.05	QP
11	14.140	17.54	-32.46	50.00	17.19	0.00	0.35	Average
12	14.140	22.48	-37.52	60.00	22.13	0.00	0.35	QP

Test Engineer : Jones Tsai Jones Tsai

5.5.4 Test Result of Conducted Emission：

- Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz
- Test Mode : Mode 2 (5805MHz)
- Temperature : 24.5°C
- Relative Humidity :53 %

■ The test was passed at the minimum margin that marked by the frame in the following table

```
Site      : CO01-HY
Condition : CNS/VCCI/CISPR-B  LINE
EUT       : 5GHz Wireless bridge
Power     : 110V/60Hz
Model     : BR5811
Memo      : Tx 5805MHz
```

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.202	43.87	-19.66	63.53	43.69	0.00	0.18	QP
2	0.202	39.34	-14.19	53.53	39.16	0.00	0.18	Average
3	0.270	42.38	-8.74	51.12	42.23	0.00	0.15	Average
4	0.270	47.45	-13.67	61.12	47.30	0.00	0.15	QP
5	0.337	48.43	-10.85	59.28	48.31	0.00	0.12	QP
6	0.337	43.33	-5.95	49.28	43.21	0.00	0.12	Average
7	0.474	41.76	-14.68	56.44	41.67	0.00	0.09	QP
8	0.474	35.17	-11.27	46.44	35.08	0.00	0.09	Average
9	0.675	32.11	-13.89	46.00	32.06	0.00	0.05	Average
10	0.675	39.03	-16.97	56.00	38.98	0.00	0.05	QP
11	13.840	15.73	-34.27	50.00	15.39	0.00	0.34	Average
12	13.840	21.00	-39.00	60.00	20.66	0.00	0.34	QP

```
Site      : CO01-HY
Condition : CNS/VCCI/CISPR-B  NEUTRAL
EUT       : 5GHz Wireless bridge
Power     : 110V/60Hz
Model     : BR5811
Memo      : Tx 5805MHz
```

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.202	45.35	-18.18	63.53	45.17	0.00	0.18	QP
2	0.202	34.19	-19.34	53.53	34.01	0.00	0.18	Average
3	0.270	42.60	-18.52	61.12	42.45	0.00	0.15	QP
4	0.270	37.37	-13.75	51.12	37.22	0.00	0.15	Average
5	0.339	40.95	-18.28	59.23	40.83	0.00	0.12	QP
6	0.339	37.46	-11.77	49.23	37.34	0.00	0.12	Average
7	0.474	40.26	-16.18	56.44	40.17	0.00	0.09	QP
8	0.474	34.76	-11.68	46.44	34.67	0.00	0.09	Average
9	0.675	32.95	-13.05	46.00	32.90	0.00	0.05	Average
10	0.675	39.38	-16.62	56.00	39.33	0.00	0.05	QP
11	14.140	17.08	-32.92	50.00	16.73	0.00	0.35	Average
12	14.140	21.97	-38.03	60.00	21.62	0.00	0.35	QP

Test Engineer :  Jones Tsai

Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz

- Test Mode : Mode 3 (5760MHZ)
- Temperature : 24.5°C
- Relative Humidity : 53 %

■ The test was passed at the minimum margin that marked by the frame in the following table

Site : C001-HY
Condition : CNS/VCCI/CISPR-B LINE
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : TX 5760MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.202	43.66	-19.87	63.53	43.48	0.00	0.18	QP
2	0.202	39.09	-14.44	53.53	38.91	0.00	0.18	Average
3	0.270	42.65	-8.47	51.12	42.50	0.00	0.15	Average
4	0.270	47.72	-13.40	61.12	47.57	0.00	0.15	QP
5	0.341	47.44	-11.74	59.18	47.32	0.00	0.12	QP
6	0.341	42.40	-6.78	49.18	42.28	0.00	0.12	Average
7	0.406	41.08	-16.65	57.73	40.98	0.00	0.10	QP
8	0.406	34.88	-12.85	47.73	34.78	0.00	0.10	Average
9	0.474	42.03	-14.41	56.44	41.94	0.00	0.09	QP
10	0.474	35.40	-11.04	46.44	35.31	0.00	0.09	Average
11	14.140	35.09	-14.91	50.00	34.74	0.00	0.35	Average
12	14.140	37.13	-22.87	60.00	36.78	0.00	0.35	QP

Site : C001-HY
Condition : CNS/VCCI/CISPR-B NEUTRAL
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : TX 5760MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.203	45.17	-18.32	63.49	44.99	0.00	0.18	QP
2	0.203	33.63	-19.86	53.49	33.45	0.00	0.18	Average
3	0.272	42.69	-18.37	61.06	42.55	0.00	0.14	QP
4	0.272	36.99	-14.07	51.06	36.85	0.00	0.14	Average
5	0.337	40.75	-18.53	59.28	40.63	0.00	0.12	QP
6	0.337	37.58	-11.70	49.28	37.46	0.00	0.12	Average
7	0.675	34.31	-11.69	46.00	34.26	0.00	0.05	Average
8	0.675	40.94	-15.06	56.00	40.89	0.00	0.05	QP
9	0.743	39.87	-16.13	56.00	39.82	0.00	0.05	QP
10	0.743	33.96	-12.04	46.00	33.91	0.00	0.05	Average
11	14.140	39.65	-20.35	60.00	39.30	0.00	0.35	QP
12	14.140	39.08	-10.92	50.00	38.73	0.00	0.35	Average

Test Engineer : Jones Tsai Jones Tsai

5.5.5 Test Result of Conducted Emission：

- Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz
- Test Mode : Mode 4 (5800MHz)
- Temperature : 24.5°C
- Relative Humidity :53 %

■ The test was passed at the minimum margin that marked by the frame in the following table

Site : C001-HY
Condition : CNS/VCCI/CISPR-B LINE
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : TX 5800MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.200	43.83	-19.78	63.61	43.65	0.00	0.18	QP
2	0.200	38.15	-15.46	53.61	37.97	0.00	0.18	Average
3	0.267	40.49	-10.72	51.21	40.34	0.00	0.15	Average
4	0.267	45.04	-16.17	61.21	44.89	0.00	0.15	QP
5	0.334	41.55	-7.80	49.35	41.43	0.00	0.12	Average
6	0.334	46.77	-12.58	59.35	46.65	0.00	0.12	QP
7	14.140	29.29	-30.71	60.00	28.94	0.00	0.35	QP
8	14.140	24.31	-25.69	50.00	23.96	0.00	0.35	Average
9	16.570	34.11	-15.89	50.00	33.73	0.00	0.38	Average
10	16.570	36.80	-23.20	60.00	36.42	0.00	0.38	QP
11	19.740	17.25	-32.75	50.00	16.84	0.00	0.41	Average
12	19.740	19.71	-40.29	60.00	19.30	0.00	0.41	QP

Site : C001-HY
Condition : CNS/VCCI/CISPR-B NEUTRAL
EUT : 5GHz Wireless bridge
Power : 110V/60Hz
Model : BR5811
Memo : TX 5800MHz

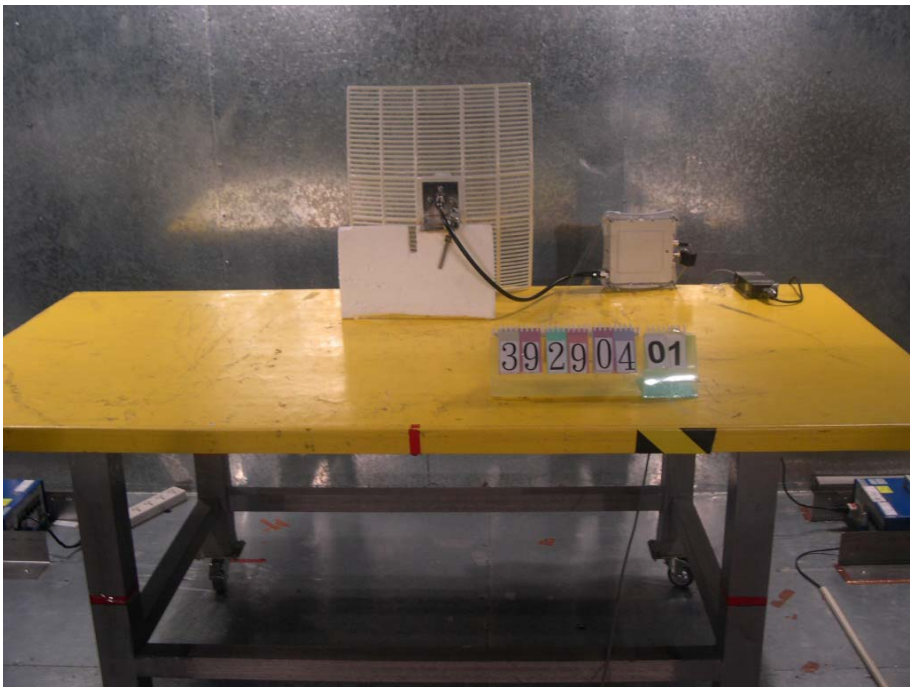
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.200	45.47	-18.14	63.61	45.29	0.00	0.18	QP
2	0.200	35.62	-17.99	53.61	35.44	0.00	0.18	Average
3	0.336	37.29	-12.01	49.30	37.17	0.00	0.12	Average
4	0.336	41.60	-17.70	59.30	41.48	0.00	0.12	QP
5	0.469	35.11	-11.42	46.53	35.02	0.00	0.09	Average
6	0.469	40.95	-15.58	56.53	40.86	0.00	0.09	QP
7	14.140	24.75	-25.25	50.00	24.40	0.00	0.35	Average
8	14.140	29.61	-30.39	60.00	29.26	0.00	0.35	QP
9	16.570	36.32	-23.68	60.00	35.94	0.00	0.38	QP
10	16.570	34.66	-15.34	50.00	34.28	0.00	0.38	Average
11	17.750	25.60	-34.40	60.00	25.21	0.00	0.39	QP
12	17.750	25.25	-24.75	50.00	24.86	0.00	0.39	Average

Test Engineer : Jones Tsai Jones Tsai

5.5.5 Photographs of Conducted Emission Test Configuration

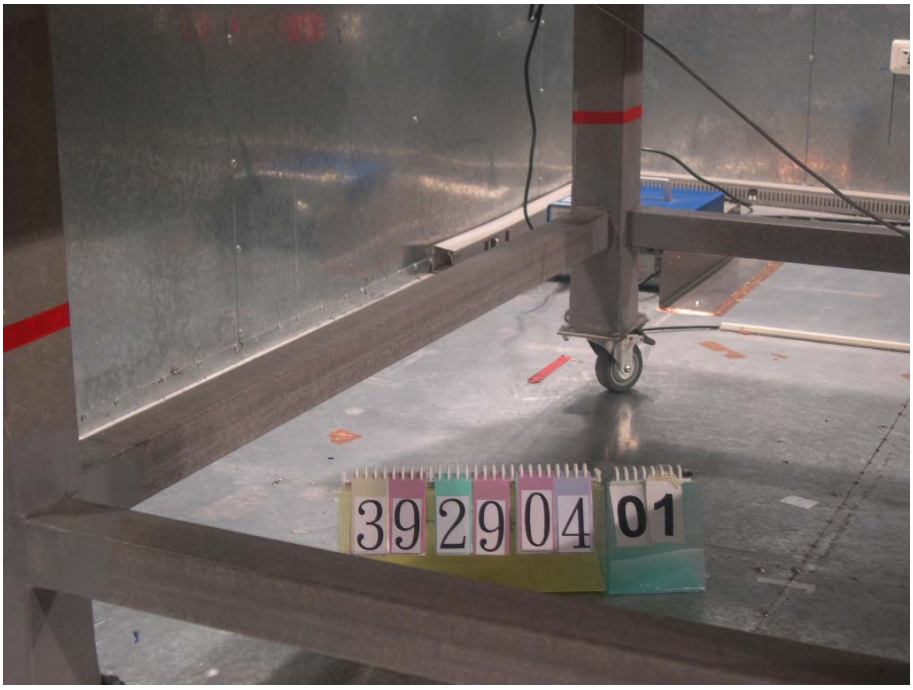
- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW

SIDE VIEW



5.6 Test of Radiated Emission

Radiated emissions from 30 MHz to 40GHz were measured according to the methods defines in ANSI C63.4-2001. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

5.6.1 Major Measuring Instruments

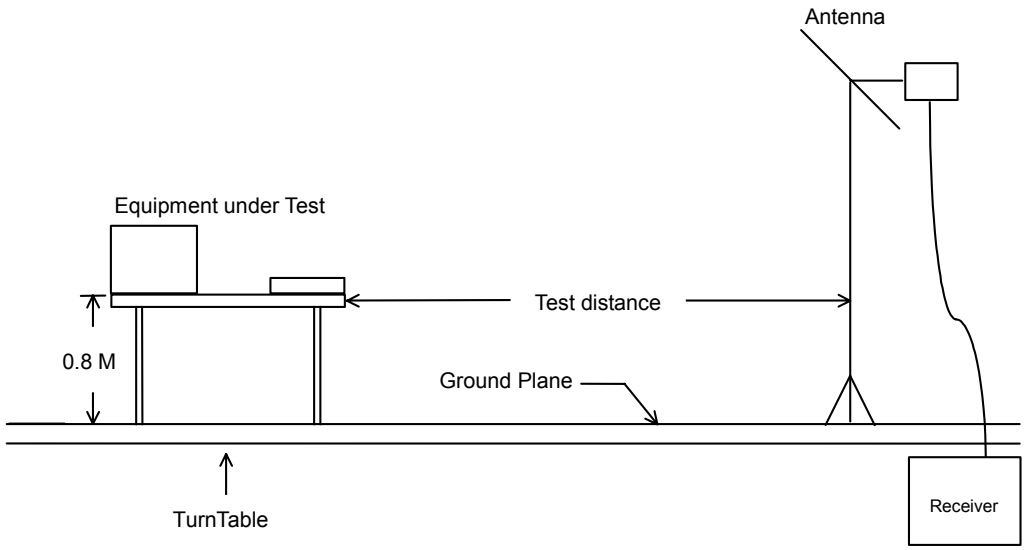
● Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz

● Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	25 GHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 40 GHz

5.6.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
5. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.6.3 Typical Test Setup Layout of Radiated Emission



5.6.4 Test Result of Radiated Emission

- Test Mode: Mode 1 (5745MHz)
- Test Distance : 3 M
- Temperature : 24°C
- Relative Humidity :53 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following table

■ Spurious Emission

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5745

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	34.050	35.94	-4.06	40.00	49.62	13.34	1.02	28.04	Peak	105	358
2 !	43.500	36.34	-3.66	40.00	54.09	9.28	0.98	28.01	Peak	105	357
3 !	55.650	36.61	-3.39	40.00	57.37	5.73	1.50	27.99	Peak	105	356
4 !	85.890	35.62	-4.38	40.00	53.98	7.80	1.77	27.93	Peak	105	354

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5745

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	200.100	36.31	-7.19	43.50	54.26	7.28	2.47	27.70	Peak	105	354
2	212.250	35.48	-8.02	43.50	52.13	8.42	2.58	27.65	Peak	105	352
3	220.890	36.02	-9.98	46.00	51.83	9.23	2.58	27.62	Peak	105	352

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5745

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	396.600	35.88	-10.12	46.00	45.70	14.52	3.44	27.78	Peak	105	354
2	449.800	35.59	-10.41	46.00	44.81	15.33	3.69	28.24	Peak	105	352
3	500.200	39.92	-6.08	46.00	48.66	16.03	3.93	28.70	Peak	---	---

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5745

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	399.400	33.32	-12.68	46.00	43.05	14.60	3.47	27.80	Peak	105	353
2	449.800	36.27	-9.73	46.00	45.49	15.33	3.69	28.24	Peak	105	352
3 !	500.200	40.48	-5.52	46.00	49.22	16.03	3.93	28.70	Peak	105	352

- For 501MHz ~ 40GHz

  Remark: Frequency from 501MHz to 40000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission Level		Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
5752.100	V	34.10	10.14	71.22	-	-	115.46	592925.32		Peak
5752.100	V	34.10	10.14	58.19	-	-	102.43	132281.77		AV
5747.300	H	34.10	10.14	45.19	-	-	89.43	29614.20		AV
5747.300	H	34.10	10.14	60.86	-	-	105.10	179887.09		Peak
11490.000	V/H						-			AV/Peak
17235.000	V/H						-			AV/Peak
22980.000	V/H						-			AV/Peak
28725.000	V/H						-			AV/Peak
34470.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Jones Tsai

Jones Tsai

5.6.5 Test Result of Radiated Emission

- Test Mode: Mode 2 (5805 MHz)
- Test Distance : 3 M
- Temperature : 24 °C
- Relative Humidity : 53%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following table

■ Spurious Emission

```
Site      : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT       : 5GHz Wireless Bridge
Power     : 110V/60Hz
MODEL     : BR5811
MEMO      : Tx 5805
```

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	30.810	35.23	-4.77	40.00	47.93	14.78	0.57	28.05	Peak	105	358
2 !	34.050	35.40	-4.60	40.00	49.08	13.34	1.02	28.04	Peak	105	354
3 !	43.500	35.70	-4.30	40.00	53.45	9.28	0.98	28.01	Peak	105	354
4 !	56.460	36.01	-3.99	40.00	57.01	5.63	1.36	27.99	Peak	105	354
5 !	85.620	36.01	-3.99	40.00	54.59	7.70	1.65	27.93	Peak	105	352

```
Site      : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT       : 5GHz Wireless Bridge
Power     : 110V/60Hz
MODEL     : BR5811
MEMO      : Tx 5805
```

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	200.100	35.87	-7.63	43.50	53.82	7.28	2.47	27.70	Peak	105	354
2	212.250	35.26	-8.24	43.50	51.91	8.42	2.58	27.65	Peak	105	352
3	220.890	35.24	-10.76	46.00	51.05	9.23	2.58	27.62	Peak	105	353

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5805

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	449.800	35.84	-10.16	46.00	45.06	15.33	3.69	28.24	Peak	105	352
2	500.200	39.99	-6.01	46.00	48.73	16.03	3.93	28.70	Peak	105	352
3	512.100	32.23	-13.77	46.00	40.87	16.17	3.90	28.71	Peak	105	354

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5805

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	399.400	33.63	-12.37	46.00	43.36	14.60	3.47	27.80	Peak	105	353
2	449.800	35.60	-10.40	46.00	44.82	15.33	3.69	28.24	Peak	105	352
3 !	500.200	40.04	-5.96	46.00	48.78	16.03	3.93	28.70	Peak	105	352

- For 501MHz ~ 40GHz

  Remark: Frequency from 501MHz to 40000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission Level		Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
5806.400	V	34.13	10.17	72.64	-	-	116.94	703072.32	-	Peak
5806.400	V	34.13	10.17	60.41	-	-	104.71	171988.73	-	AV
5806.100	H	34.13	10.17	58.38	-	-	102.68	136144.47	-	Peak
5806.100	H	34.13	10.17	46.16	-	-	90.46	33342.64	-	AV
1160.000	V/H						-			AV/Peak
17415.000	V/H						-			AV/Peak
23220.000	V/H						-			AV/Peak
29025.000	V/H						-			AV/Peak
34830.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Jones Tsai

Jones Tsai

5.6.6 Test Result of Radiated Emission

- Test Mode: Mode3 (5760MHz)
- Test Distance : 3 M
- Temperature : 24 °C
- Relative Humidity :53%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following table

■ Spurious Emission

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5760 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	30.810	34.89	-5.11	40.00	47.59	14.78	0.57	28.05	Peak	105	354
2 !	34.050	36.59	-3.41	40.00	50.27	13.34	1.02	28.04	Peak	105	354
3 !	41.610	34.87	-5.13	40.00	51.96	10.06	0.87	28.02	Peak	105	356
4	56.460	29.36	-10.64	40.00	50.36	5.63	1.36	27.99	Peak	105	354

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5760 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	486.900	31.73	-14.27	46.00	40.53	15.85	3.93	28.58	Peak	105	355
2	500.200	36.49	-9.51	46.00	45.23	16.03	3.93	28.70	Peak	105	352
3	598.900	32.20	-13.80	46.00	39.21	17.28	4.51	28.80	Peak	105	355

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5760 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	66.180	30.13	-9.87	40.00	51.79	4.69	1.62	27.97	Peak	105	354
2	200.100	28.14	-15.36	43.50	46.09	7.28	2.47	27.70	Peak	105	354
3	227.100	28.03	-17.97	46.00	43.20	9.79	2.63	27.59	Peak	105	358

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5760 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	399.400	29.04	-16.96	46.00	38.77	14.60	3.47	27.80	Peak	105	356
2	449.800	32.82	-13.18	46.00	42.04	15.33	3.69	28.24	Peak	105	354
3	500.200	33.10	-12.90	46.00	41.84	16.03	3.93	28.70	Peak	105	355

For 501MHz ~ 40GHz

Remark: Frequency from 501MHz to 40000MHz, the emission emitted by the EUT is too low to be

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission	Level	Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
5764.500	V	34.11	10.14	52.68	-	-	96.93	70226.33		AV
5764.500	V	34.11	10.14	63.91	-	-	108.16	255858.59		Peak
5732.400	H	34.11	10.14	35.58	-	-	79.83	9806.18		AV
5762.400	H	34.11	10.14	55.12	-	-	99.37	93003.65		Peak
11520.000	V/H						-			AV/Peak
17280.000	V/H						-			AV/Peak
23040.000	V/H						-			AV/Peak
28800.000	V/H						-			AV/Peak
34560.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Jones Tsai

Jones Tsai

5.6.7 Test Result of Radiated Emission

- Test Mode: Mode 4 (5800 MHz)
- Test Distance : 3 M
- Temperature : 24 °C
- Relative Humidity : 53 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following table

■ Spurious Emission

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5800 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	34.050	35.82	-4.18	40.00	49.50	13.34	1.02	28.04	QP	105	356
2 !	36.210	35.67	-4.33	40.00	50.27	12.38	1.05	28.03	Peak	105	356
3 !	45.660	35.49	-4.51	40.00	53.97	8.37	1.16	28.01	Peak	105	356

Site : 03CH03-HY
Condition : 3m 03CH03-MAT VERTICAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5800 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	486.900	32.01	-13.99	46.00	40.81	15.85	3.93	28.58	Peak	105	352
2	500.200	35.05	-10.95	46.00	43.79	16.03	3.93	28.70	Peak	105	354
3	598.900	32.26	-13.74	46.00	39.27	17.28	4.51	28.80	Peak	105	352

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5800 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	66.180	30.98	-9.02	40.00	52.64	4.69	1.62	27.97	Peak	105	355
2	124.770	24.67	-18.83	43.50	40.33	10.25	1.94	27.85	Peak	105	352
3	200.100	28.14	-15.36	43.50	46.09	7.28	2.47	27.70	Peak	105	352

Site : 03CH03-HY
Condition : 3m 03CH03-MAT HORIZONTAL
EUT : 5GHz Wireless Bridge
Power : 110V/60Hz
MODEL : BR5811
MEMO : Tx 5800 (Turbo Mode)

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	399.400	28.15	-17.85	46.00	37.88	14.60	3.47	27.80	Peak	105	356
2	449.800	32.53	-13.47	46.00	41.75	15.33	3.69	28.24	Peak	105	354
3	500.200	31.93	-14.07	46.00	40.67	16.03	3.93	28.70	Peak	105	354

- For 599MHz ~ 40GHz

  Remark: Frequency from 599MHz to 40000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Limits (uV/m)	Emission Level (dBuV/m)	Emission Level (uV/m)	Margin (dB)	Detect Mode
5790.800	V	34.12	10.17	69.53	-	-	113.82	490907.88	-	Peak
5790.800	V	34.12	10.17	53.17	-	-	97.46	74644.88	-	AV
5787.900	H	34.12	10.17	50.64	-	-	94.93	55782.76	-	Peak
5797.900	H	34.12	10.17	40.18	-	-	84.47	16730.16	-	AV
11600.000	V/H						-			AV/Peak
17400.000	V/H						-			AV/Peak
23200.000	V/H						-			AV/Peak
29000.000	V/H						-			AV/Peak
34800.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

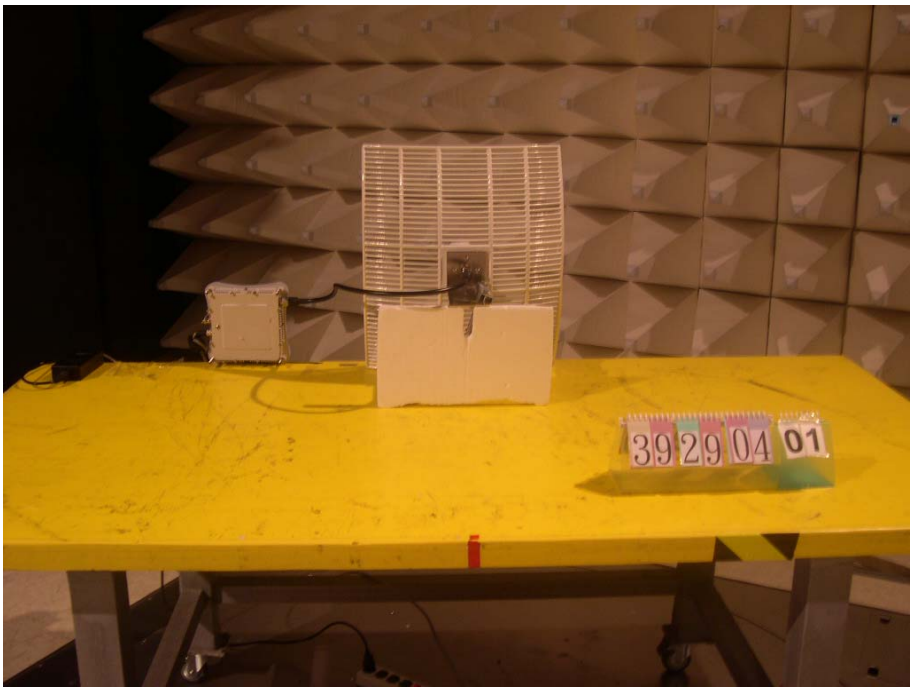
Test Engineer : Jones Tsai

Jones Tsai

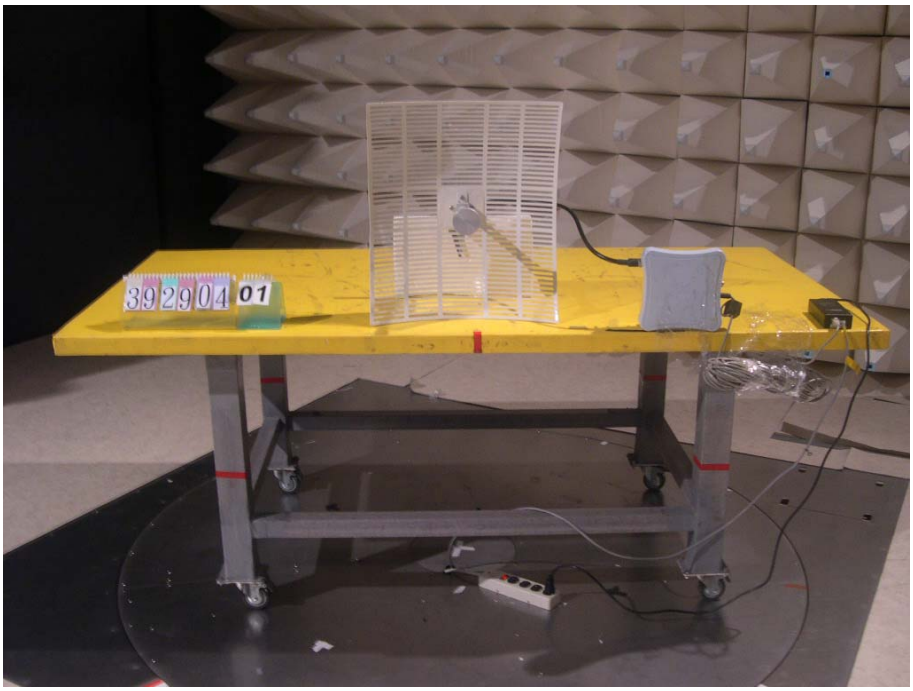
5.6.8 Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



5.7 Band Edges Measurement

5.7.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.7.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.7.3 Test Result：

Test Result in lower band (5745MHz) ：	PASS
Test Result in higher band(5805MHz)：	PASS
Test Result in lower band (5760MHz) ：	PASS
Test Result in higher band(5800MHz)：	PASS

5.7.4 Note on Band edge Radiation Emission

Base mode: 54 Mbps

Channel Frequency	Band edge Frequency	Polarity	The emission of band edge power strength	Limit	Margin	Result
(MHz)	(MHz)		(dB μ V/m)	(dB μ V/m)	(dB)	
5745	5715	V	67.07	68.3	-1.23	Pass
	5715	H	61.32	68.3	-6.98	Pass
	5725	V	66.88	78.3	-11.42	Pass
	5725	H	60.99	78.3	-17.31	Pass
5805	5825	V	75.14	78.3	-3.16	Pass
	5825	H	60.56	78.3	-17.74	Pass
	5835	V	60.77	68.3	-7.53	Pass
	5835	H	60.00	68.3	-8.3	Pass

Turbo Mode: 108 (Mbps)

Channel Frequency	Band edge Frequency	Polarity	The emission of band edge power strength	Limit	Margin	Result
(MHz)	(MHz)		(dB μ V/m)	(dB μ V/m)	(dB)	
5760	5715	V	60.06	68.3	-8.24	Pass
	5715	H	57.73	68.3	-10.57	Pass
	5725	V	59.74	78.3	-18.56	Pass
	5725	H	57.66	78.3	-20.64	Pass
5800	5825	V	72.15	78.3	-6.15	Pass
	5825	H	58.66	78.3	-19.64	Pass
	5835	V	67.14	68.3	-1.16	Pass
	5835	H	58.77	68.3	-9.53	Pass

1. The EIRP Limit for frequencies 10MHz or greater above or below the band edge is 68.3 dBuV/m (-27dBm)
2. The EIRP Limit within the frequency range from the band edge to 10MHz above or below the band edge is 78.3 dBuV/m (-17dBm)
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (E*d)^2 = 30*P

   E = Field Strength in Volts/meter

   P = Effective Isotropic Radiated Power

   D = distance in meters

5.8 Peak Excursion

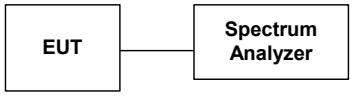
5.8.1 Measuring Instruments：As described in chapter 7 of this test report.

5.8.2 Test Procedure：

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to and maintained at 1 MHz. First the video bandwidth is set to 1 MHz, Trace A is set to Max Hold, then to View. Then the video bandwidth is readjusted to 300 KHz, and the signal under this measurement condition is captured in Trace B.

The difference between the traces is investigated. The marker is placed at the frequency which shows the largest difference. The amplitude delta between the traces at this frequency is the peak excursion.

5.8.3 Test Setup Layout：



5.8.4 Test Result：See spectrum analyzer plots below

Frequency (MHz)	Peak Excursion (dB)	Limits (dB)	Plot Ref. No.
5745	5.54	13	21
5805	5.64	13	22
5760	8.19	13	23
5800	6.03	13	24

5.9 Frequency Stability

Referring to the theory of operation, the crystal used to set the frequency has a temperature coefficient of +/- 20 ppm. For a transmitter fundamental frequency of 5.805 GHz, this corresponds to +/- 116 kHz.

During band edge testing, it was determined that the smallest margin (along the frequency axis) to the band edge occurred at the upper band (5805MHz) edge in the base mode, using peak detection, with the antenna vertically polarized. In this configuration, with the transmitter set to the highest channel, the envelope of the modulation sideband intercepted the 78.3 dBuV/m limit at 5822.5 MHz. Adding the maximum peak -to-peak deviation due to the crystal (0.214 MHz) yields 5822.71MHz, which remains within the authorized band of 5725 to 5825 MHz.

At the lower band (5745MHz)edge, the smallest margin (along the frequency axis) occurred in the base mode, using peak detection, with the antenna vertically polarized. In this configuration, with the transmitter set to the lowest channel, the envelope of the modulation sideband intercepted the 78.3 dBuV/m limit at 5728.2MHz. Subtracting the maximum peak-to-peak deviation due to the crystal (0.214 MHz) yields 5727.9MHz, which remains within the authorized band of 5725 to 5825 MHz.

Frequency(MHz)	Polarity	Intercepted Point frequency (MHz)	maximum peak-to-peak deviation due to the crystal(MHz)	Deviation Frequency (MHz)	Result
5745	V	5728.2	0.214	5727.98	Pass
5805	V	5822.5	0.214	5822.71	Pass
5760	V	5731.6	0.214	5731.38	Pass
5800	V	5820.7	0.214	5820.91	Pass

5.10 Automatically discontinue transmission

During no any information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving .The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission .

5.11 Antenna Requirements

5.11.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(3), for fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23dBi, a 1dB reduction in peak transmitter power and peak power spectral density for each 1dB of antenna gain in excess of 23 dBi would be required.

However, the power reduction is needed only as output power is larger than 30 dBm. And the ouput power of this device is only 14.08 dBm, so no power reduction is needed though its antenna is larger than 23 dBi.

5.11.2 Antenna Connected Construction

The antenna is grid parabolic and its connector is N type connector. The antenna of EUT can be professionally installed only as described in the attached file, BR5811E1 user's manual Chapter 2 hardware installation, in the perimeter protection environment at which person can not easily reach. It is considered to meet the antenna requirements .

6 EMI Suppression Component List

1. 1. Added a EMI rectangle core on Ethernet cable.
   (as shown in appendix A, page 25)
2. Added a EMI rectangle core on Ethernet cable inside the EUT
   (as shown in appendix A, page 5)

7 Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	15.35	1.01	1000	24.10	3.92
35	13.63	1.04	2000	27.40	5.66
40	11.11	1.09	3000	30.00	7.20
45	10.59	1.24	4000	32.60	9.36
50	6.47	1.43	5000	33.40	9.16
55	5.83	1.39	6000	34.20	10.70
60	5.18	1.59	7000	35.30	12.16
65	4.81	1.41	8000	36.90	13.12
70	4.43	1.43	9000	38.10	13.81
75	5.10	1.55	10000	39.00	14.83
80	5.91	1.56	11000	38.60	15.83
85	7.33	1.62	12000	39.50	17.11
90	8.74	1.41	13000	39.30	17.62
95	9.05	1.81	14000	41.60	18.37
100	9.36	1.68	15000	40.60	19.10
110	9.65	1.73	16000	37.20	19.72
120	9.97	1.79	17000	40.20	21.98
130	10.51	1.93	18000	48.90	21.22
140	10.32	2.06	19000	37.60	23.90
150	9.42	2.09	20000	37.30	24.07
160	8.09	2.12	21000	37.00	25.49
170	7.43	2.12	22000	38.00	24.92
180	7.60	2.12	23000	38.70	25.60
190	7.43	2.21	24000	38.60	25.70
200	7.26	2.29	25000	24.10	3.92
220	9.11	2.42	14000	27.40	5.66
240	10.88	2.54	15000	30.00	7.20
260	11.75	2.66	16000	32.60	9.36
280	11.55	2.76	17000	33.40	9.16
300	11.36	2.85	18000	34.20	10.70
320	12.03	3.10	19000	35.30	12.16
340	12.69	3.36	20000	36.90	13.12
360	13.33	3.49	21000	38.10	13.81
380	14.00	3.50	22000	39.00	14.83
400	14.63	3.51	23000	38.60	15.83
450	15.33	3.55	24000	39.50	17.11
500	16.03	3.81	25000	39.30	17.62
550	16.65	4.05	26000	38.80	19.57
600	17.29	4.23	28000	39.40	19.54
650	17.64	4.63	30000	38.80	25.00
700	18.00	4.74	32000	41.00	25.61
750	18.39	4.95	34000	41.30	26.23
800	18.79	5.06	36000	41.30	26.95
850	19.10	5.18	38000	42.80	27.80
900	19.42	5.40	40000	45.10	28.67
950	19.58	5.91			
1000	19.75	5.58			

8 List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 12, 2003	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001-008	9 KHz – 30 MHz	Apr. 29, 2003	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001-009	9 KHz – 30 MHz	Apr. 29, 2003	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Jan. 07, 2003	Conduction (CO01-HY)
50 ohm BNC type Terminal	NOBLE	50ohm	TM009	50 ohm	Apr. 24, 2003	Conduction (CO01-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 07, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	COM-POWER	AH-118	10094	1GHz – 18GHz	Apr. 10, 2003	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Mar. 14, 2003	Radiation (03CH03-HY)
Power Amplifier	MITEG	AMF-GF-2604 00-33-BP	923364	26-40G	Jan,17, 2003	Radiation (03CH03-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA9170	BBHA9170154	15-40GHz	Jun,02,2003	Radiation (03CH03HY)

※ Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.

9 Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch Receiver VSWR Γ1=0.09 Antenna VSWR Γ2=0.67 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.4

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+0.5^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.2$ for 10m test distance

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+3^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.7$ for 3m test distance

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch Receiver VSWR Γ1=0.09 LISN VSWR Γ2=0.33 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	0.2
combined standard uncertainty Ue(y)	normal	±1.66
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.32

$U=\sqrt{\{(0.3/2)^2+(2^2+1.5^2+0.2^2)/3+(0.2)^2/2\}}=1.66$