FCC 15B Test Report

Equipment	:	**Mobile Phone**
Model No.	:	**F-03F**
Brand Name	:	**FUJITSU**
Applicant	:	**FUJITSU LIMITED**
Address	:	**1-1, Kamikodanaka 4-chome, Nakahara-ku, Kawasaki 211-8588, Japan**
Standard	:	**FCC Part 15, Subpart B, Class B ANSI C63.4:2009**
Received Date	:	**Sep. 13, 2013**
Tested Date	:	**Oct. 05 ~ Oct. 08, 2013**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Kent Chen / Assistant Manager

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FD391304	Rev. 01	Initial issue	Oct. 25, 2013

Summary of Test Results

FCC Part 15, Subpart B Emission Tests				
Ref. Std. Clause	**Test Standard**	**Test Items**	**Measured**	**Result**
15.107	FCC Part 15, Subpart B, Class B	Conducted Emissions	-8.87dB AV@ 3.985MHz.	Pass
15.109	FCC Part 15, Subpart B, Class B	Radiated Emissions	-4.09dB PK@ 30.00MHz.	Pass

1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	F-03F
IMEI Code	353704050012905
H/W Version	V2.1.0
S/W Version	R17.1e

1.1.2 Specification of the Equipment under Test (EUT)

WLAN	
Operating Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz
Antenna Type	λ/4 Monopole Antenna
Modulaton Type	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac: OFDM (BPSK / QPSK / 16QAM / 64QAM)
Bluetooth	
Operating Frequency	2402 MHz ~ 2480 MHz
Antenna Type	λ/4 Monopole Antenna
Modulaton Type	Bluetooth 4.0 LE: GFSK Bluetooth BR(1Mbps): GFSK Bluetooth EDR (2Mbps): π/4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK
WWAN	
Operating Frequency	TX: GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz RX: GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz
Antenna Type	λ/4 Monopole Antenna
Modulaton Type	GSM: GMSK GPRS: GMSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

RFID/NFC	
Operating Frequency	13.56 MHz
Antenna Type	Loop Antenna
Modulaton Type	ASK
GPS	
Operating Frequency	1.57542 GHz
Modulaton Type	BPSK
Note: IEEE 11ac standard is still Draft version.	

1.1.3 EUT Operational Condition

Supply Voltage	☒ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☒ External DC adapter	☒ Battery

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Battery	Brand Name: Fujitsu limited Model Name: CA54310-0045 Power Rating: O/P: 3.8Vdc, 2600mA
2	Cradle	Brand Name: Fujitsu limited Model Name: F44 Power Rating: O/P: 5.0Vdc, 1.5A

1.2 The Equipment and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
EMC Receiver	R&S	ESCS 30	100358	May 17, 2013	May 16, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013
ISN	TESEQ	ISN T800	34406	Apr. 08, 2013	Apr. 07, 2014
ISN	TESEQ	ISN T200A	30494	Apr. 09, 2013	Apr. 08, 2014
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013
ESH3-Z6 V-Network(+)	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013
ESH3-Z6 V-Network(-)	R&S	ESH3-Z6	100951	Jan. 30, 2013	Jan. 29, 2014
Two-Line V-Network	R&S	ENV216	101579	Jan. 07, 2013	Jan. 06, 2014
50 ohm terminal	NA	50	01	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	02	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	03	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	R&S	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100219	Nov. 28, 2012	Nov. 27, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC Part 15, Subpart B, Class B
ANSI C63.4:2009

1.4 Measurement Uncertainty

CISPR 16-4-2 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty		
Test Item	**Frequency**	**Uncertainty**
Conducted Emissions	150kHz ~ 30MHz	2.8 dB
Radiated Emissions	30MHz ~ 1GHz	3.9 dB
	Above 1GHz	4.2 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 53%	Skys Huang
Radiated Emissions	03CH02-WS	24°C / 69%	Peter Lin

2.2 The Worst Case Measurement Configuration

Conduction Pretest Mode	
Pretest Mode	**Operating Description**
1	GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + Adapter
2	PCS1900 Idle + Bluetooth Idle + WLAN (5G) Idle + Camera + Earphone + Battery + USB Cable + Adapter
3	WCDMA850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4 + Earphone + Battery + USB Cable + Adapter
4	GSM850 Idle + Bluetooth Idle + WLAN (5G) Idle + SD Card R/W + Earphone + Battery + USB Cable (Data Link with Notebook)
5	GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + charger (with cradle)
For **Pretest mode 5** is the worst case and only its data was record in this test report.	

Radiation Pretest Mode	
Pretest Mode	**Operating Description**
1	GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + Adapter
2	PCS1900 Idle + Bluetooth Idle + WLAN (5G) Idle + Camera + Earphone + Battery + USB Cable + Adapter
3	WCDMA850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + MPEG4 + Earphone + Battery + USB Cable + Adapter
4	PCS1900 Idle + Bluetooth Idle + WLAN (5G) Idle + SD Card R/W + Earphone + Battery + USB Cable (Data Link with Notebook)
5	PCS1900 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + charger (with cradle)
For **Pretest mode 5** is the worst case and only its data was record in this test report.	

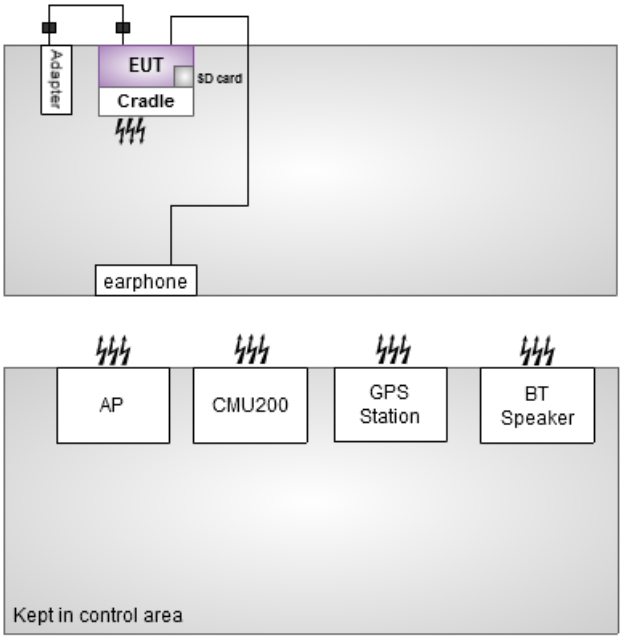
The Determined Worst Case Configurations	
Conducted Emissions	
Test Mode	**Operating Description**
1	GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + charger (with cradle)
Radiated Emissions	
Test Mode ≤1GHz	**Operating Description**
1	PCS1900 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + charger (with cradle)
Test Mode >1GHz	**Operating Description**
1	PCS1900 Idle + Bluetooth Idle + WLAN (2.4G) Idle + GPS Rx + Earphone + Battery + USB Cable + charger (with cradle)

2.3 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**S/N**	**Signal cable / Length (m)**
1	Adapter	NTT docomo	AC Adaptor 04	54	1.0m non-shielded with 2 core
2	Radio Communication Analyzer	R&S	CMU200	108087	---
3	Earphone	APPLE	MD827FE/A	6	1.2m non-shielded w/o core
4	AP	D-LINK	DIR-815	3000228	---
5	BT speaker	Nokia	HF-34W	---	---
6	GPS Station (MXG)	Agilent	N5182B	MY53050081	---
7	Micro SD card	SanDisk	8GB	---	---

Note: Item 1 was provided by client.

2.4 Test Setup Chart

Test Setup Diagram


2.5 Test Software and Operating Condition

a. The EUT was in GSM idle mode during the testing. The EUT was synchronized to the BCCH.
b. Linked with BT speaker (support unit) in idle mode.
c. Linked with Wireless AP (support unit) in idle mode.
d. Executed “GPS Test” to make the EUT receive continuous signals from GPS station.

3 Emission Tests Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

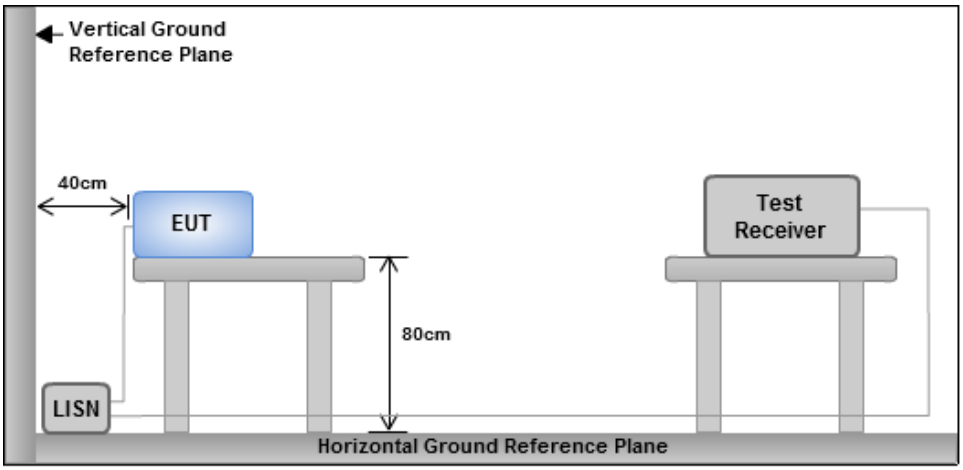
3.1.2 Test Procedures

a. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.

b. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.

c. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.

3.1.3 Test Setup

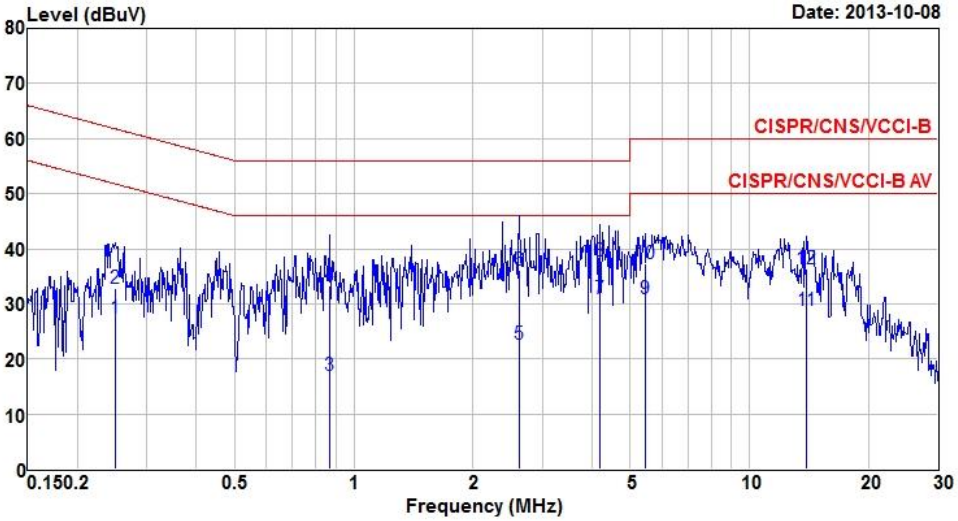


Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

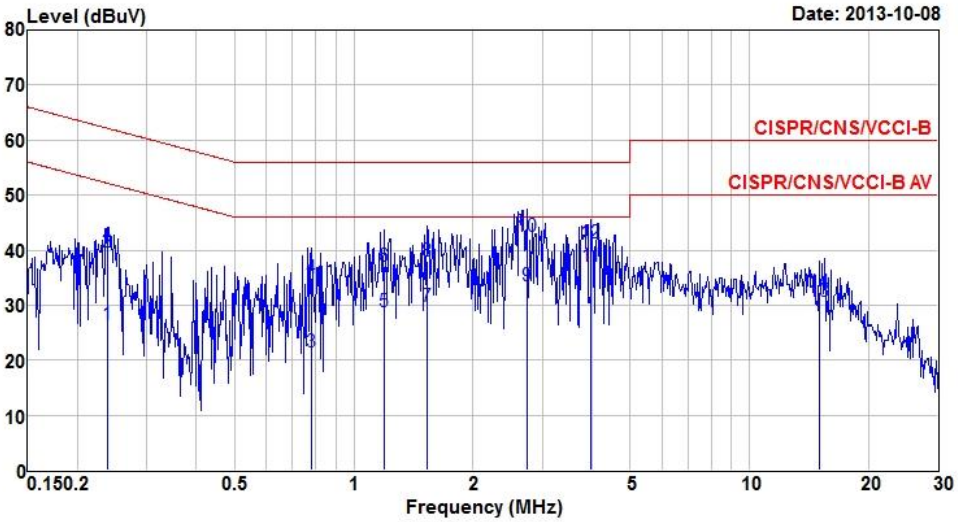
Power Phase	Line	Test Mode	1



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.249	27.39	51.78	-24.39	27.20	0.05	0.14	Average
2	0.249	32.86	61.78	-28.92	32.67	0.05	0.14	QP
3	0.866	16.90	46.00	-29.10	16.73	0.13	0.04	Average
4	0.866	33.23	56.00	-22.77	33.06	0.13	0.04	QP
5	2.622	22.58	46.00	-23.42	22.19	0.20	0.19	Average
6	2.622	36.01	56.00	-19.99	35.62	0.20	0.19	QP
7	4.180	30.86	46.00	-15.14	30.46	0.17	0.23	Average
8	4.180	37.79	56.00	-18.21	37.39	0.17	0.23	QP
9	5.447	30.88	50.00	-19.12	30.44	0.24	0.20	Average
10	5.447	37.20	60.00	-22.80	36.76	0.24	0.20	QP
11	13.989	28.79	50.00	-21.21	27.78	0.88	0.13	Average
12	13.989	36.38	60.00	-23.62	35.37	0.88	0.13	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

Power Phase	Neutral	Test Mode	1



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.239	26.42	52.13	-25.71	26.23	0.04	0.15	Average
2	0.239	39.63	62.13	-22.50	39.44	0.04	0.15	QP
3	0.783	21.48	46.00	-24.52	21.32	0.12	0.04	Average
4	0.783	34.96	56.00	-21.04	34.80	0.12	0.04	QP
5	1.191	28.77	46.00	-17.23	28.55	0.15	0.07	Average
6	1.191	37.12	56.00	-18.88	36.90	0.15	0.07	QP
7	1.527	29.70	46.00	-16.30	29.42	0.17	0.11	Average
8	1.527	38.04	56.00	-17.96	37.76	0.17	0.11	QP
9	2.736	33.63	46.00	-12.37	33.26	0.17	0.20	Average
10	2.736	42.44	56.00	-13.56	42.07	0.17	0.20	QP
11	3.985	37.13	46.00	-8.87	36.75	0.14	0.24	Average
12	3.985	41.34	56.00	-14.66	40.96	0.14	0.24	QP
13	14.986	30.59	50.00	-19.41	29.52	0.94	0.13	Average
14	14.986	32.27	60.00	-27.73	31.20	0.94	0.13	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

According to FCC Part 15, Subpart B §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Note: According to FCC Part 15, Subpart B §15.33: For an unintentional radiator is shown in the table above.

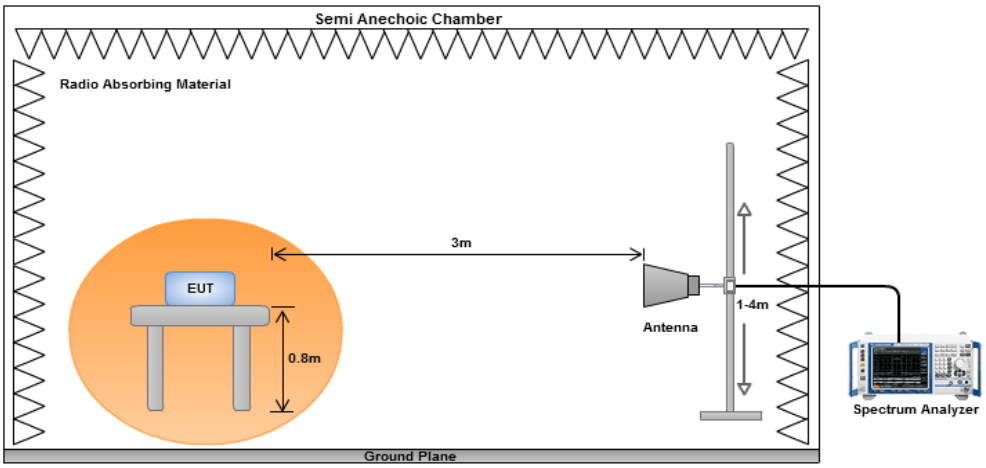
3.2.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

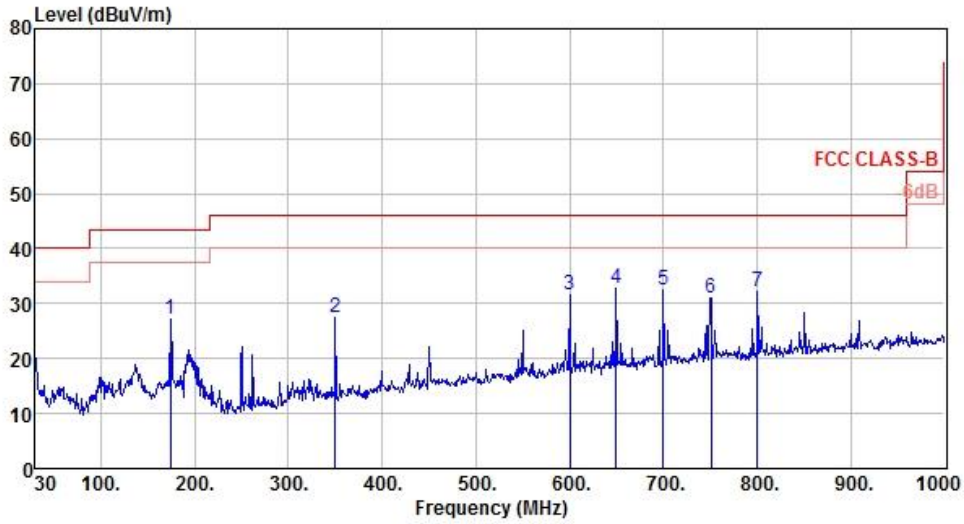
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=3MHz and RMS detector is for average measured value of radiated emission above 1GHz.

3.2.3 Test Setup



3.2.4 Radiated Emissions (Below 1GHz)

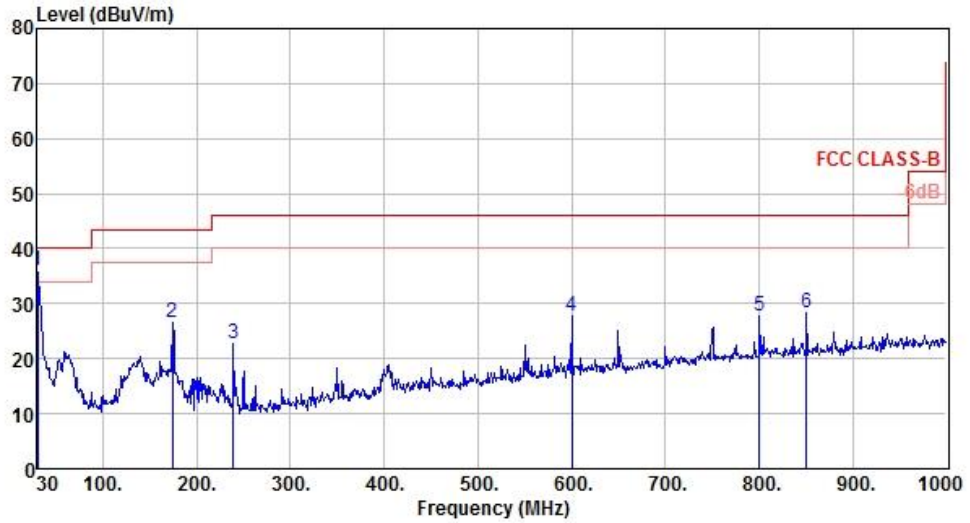
Polarization	Horizontal	Test Mode	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	174.53	27.29	43.50	-16.21	44.99	-17.70	Peak	---	---
2	350.10	27.47	46.00	-18.53	42.37	-14.90	Peak	---	---
3	600.36	31.60	46.00	-14.40	41.34	-9.74	Peak	---	---
4	649.83	32.68	46.00	-13.32	41.71	-9.03	Peak	178	189
5	700.27	32.36	46.00	-13.64	40.60	-8.24	Peak	---	---
6	750.71	31.13	46.00	-14.87	38.34	-7.21	Peak	---	---
7	800.18	32.05	46.00	-13.95	38.81	-6.76	Peak	---	---

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

Polarization	Vertical	Test Mode	1

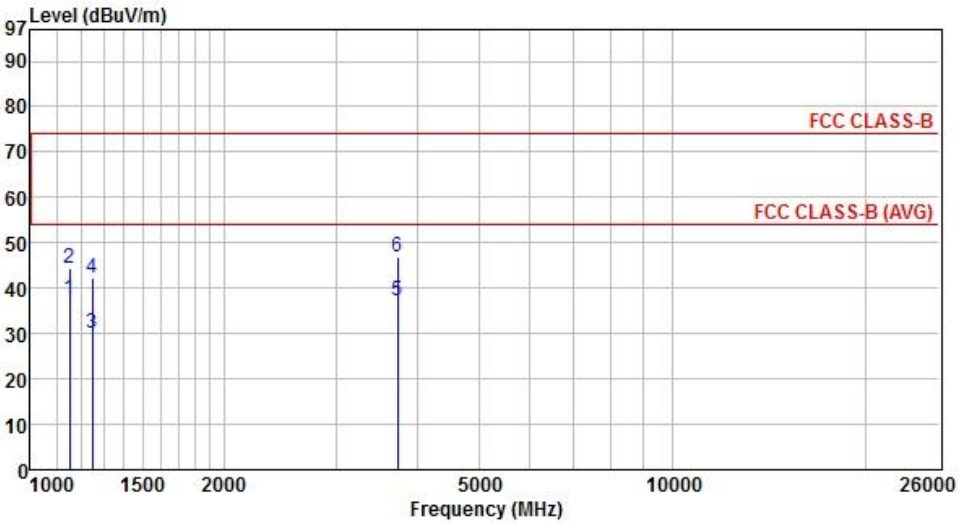


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.00	35.91	40.00	-4.09	53.64	-17.73	Peak	100	79
2	174.53	26.64	43.50	-16.86	44.34	-17.70	Peak	---	---
3	239.52	22.77	46.00	-23.23	40.91	-18.14	Peak	---	---
4	600.36	27.65	46.00	-18.35	37.39	-9.74	Peak	---	---
5	800.18	27.86	46.00	-18.14	34.62	-6.76	Peak	---	---
6	850.62	28.22	46.00	-17.78	34.34	-6.12	Peak	---	---

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

3.2.5 Radiated Emissions (Above 1GHz)

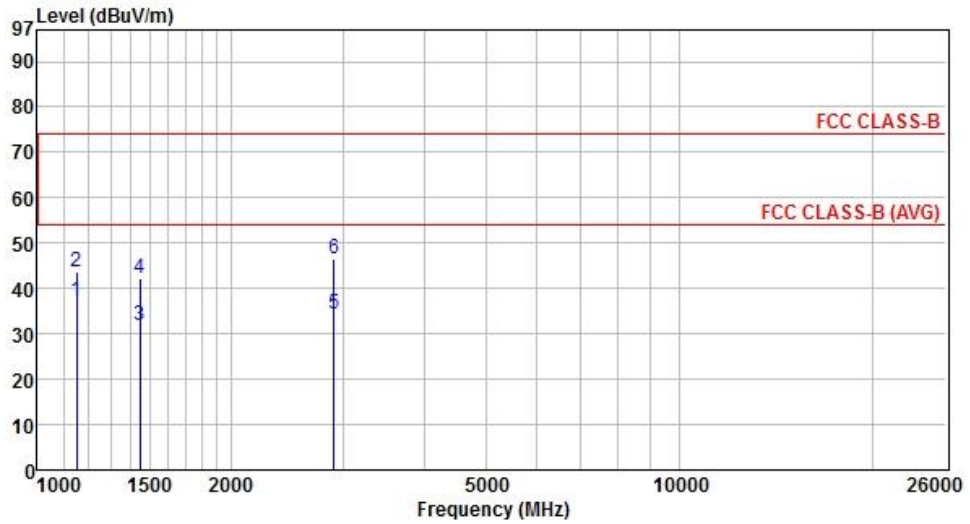
Polarization	Horizontal	Test Mode	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1150.30	37.45	54.00	-16.55	46.06	-8.61	Average	100	22
2	1150.30	44.27	74.00	-29.73	52.88	-8.61	Peak	100	22
3	1249.60	30.24	54.00	-23.76	38.26	-8.02	Average	121	49
4	1249.60	42.17	74.00	-31.83	50.19	-8.02	Peak	121	49
5	3724.30	37.31	54.00	-16.69	36.44	0.87	Average	100	356
6	3724.30	46.84	74.00	-27.16	45.97	0.87	Peak	100	356

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

Polarization	Vertical	Test Mode	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1150.10	37.09	54.00	-16.91	45.70	-8.61	Average	106	24
2	1150.10	43.73	74.00	-30.27	52.34	-8.61	Peak	106	24
3	1445.70	31.72	54.00	-22.28	38.58	-6.86	Average	100	133
4	1445.70	42.10	74.00	-31.90	48.96	-6.86	Peak	100	133
5	2892.20	34.22	54.00	-19.78	35.48	-1.26	Average	100	159
6	2892.20	46.36	74.00	-27.64	47.62	-1.26	Peak	100	159

Note 1: Level (dBuV/m) = Read Level (dBuV/m) + Antenna Factor (dB) + Cable Loss (dB) - Preamp Factor (dB).
2: Over Limit (dBuV/m) = Limit Line (dBuV/m) – Level (dBuV/m).

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

Tel: 886-2-2601-1640

No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.

Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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