

FCC 15B Test Report

FCC ID : VQK-F02J

Equipment: Mobile Phone

Model No. : F-02J

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 C63.4:2014

Received Date : May 25, 2016

Tested Date : Jun. 14 ~ Jun. 15, 2016

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





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Release Record

Report No.	Version	Description	Issued Date
FD652501	Rev. 01	Initial issue	Jul. 12, 2016

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Summary of Test Results

	FCC Part 15, Subpart B Emission Tests						
Ref. Std. Clause	Test Standard	est Standard Test Items		Result			
15.107	FCC Part 15, Subpart B, Class B	Conducted Emissions	-7.65dB AV @ 16.193MHz.	Pass			
15.109	FCC Part 15, Subpart B, Class B	Radiated Emissions	-4.63dB PK@ 232.73MHz.	Pass			

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1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	F-02J
IMEI Code	358094070022026
H/W Version	v2.1.0
S/W Version	R015.1

1.1.2 Specification of the Equipment under Test (EUT)

WLAN	VLAN			
Operating Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz			
Antenna Type	λ/4 Monopole antenna			
Modulaton Type	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)			
Bluetooth				
Operating Frequency	2402 MHz ~ 2480 MHz			
Antenna Type	λ /4 Monopole antenna			
Modulaton Type	Bluetooth 4.1 LE: GFSK Bluetooth BR(1Mbps): GFSK Bluetooth EDR (2Mbps): π/4-DQPSK Bluetooth EDR (3Mbps): 8-DPSK			
WWAN				
Operating Frequency	WCDMA Band V: 826.4 MHz ~ 846.6 MHz			
Antenna Type	λ /4 Monopole antenna			
Modulaton Type	WCDMA / HSDPA / HSUPA: QPSK (Uplink)			
GPS				
Operating Frequency	1.57542 GHz			
Modulaton Type	BPSK			

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type 5.0Vdc from AC adapter 3.8Vdc from Battery	
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1.1.4 Accessories

No.	Equipment	Description
1	Battery	Brand Name: NTT docomo Model Name: F33 Power Rating: 3.8Vdc, 1500mAh, 5.7Wh
2	Brand Name: NTT docomo Cradle Model Name: F49 Input/Output Rating: 5Vdc, 1.5A	

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1.2 Test Equipment and Calibration Data

Test Item	Conducted Emission	Conducted Emission			
Test Site	Conduction room 1 /	Conduction room 1 / (CO01-WS)			
Tested Date	Jun. 15, 2016	Jun. 15, 2016			
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 28, 2016	Mar. 27, 2017
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Jun. 14, 2016				
Instrument	Manufacturer Model No. Serial No. Calibration Date Calibration Ur			Calibration Until	
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 28, 2016	Mar. 27, 2017
Spectrum Analyzer	R&S	FSV40	101498	Dec. 13, 2015	Dec. 12, 2016
Receiver	R&S	ESR3	101658	Nov. 04, 2015	Nov. 03, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 20, 2015	Aug. 19, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 16, 2015	Dec. 15, 2016
Preamplifier	Burgeon	BPA-530	SN:100219	Sep. 10, 2015	Sep. 09, 2016
Preamplifier	Agilent	83017A	MY39501308	Oct. 02, 2015	Oct. 01, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 10, 2015	Dec. 09, 2016
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 10, 2015	Dec. 09, 2016
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 10, 2015	Dec. 09, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

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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 C63.4:2014

1.4 Measurement Uncertainty

ISO/IEC 17025 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	±2.90 dB	
Radiated Emissions	30MHz ~ 1GHz	±3.66 dB	
Radiated Emissions	Above 1GHz	±5.63 dB	

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2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 63%	Howard Huang
Radiated Emissions	03CH01-WS	23°C / 60%	Howard Huang

FCC site registration No.: 933633IC site registration No.: 10807A-1

2.2 The Worst Case Measurement Configuration

The Determined Test Configurations					
Conducted Emis	Conducted Emissions				
Test Mode	Operating Description				
1	WCDMA Band V link, BT/Wifi 2.4G link, GPS Rx, with earphone, Battery 80%, with Adapter				
2	WCDMA Band V idle, BT/Wifi 2.4G link, Camera, with earphone, Battery 20%, with Adapter				
WCDMA Band V link, BT/Wifi 2.4G link, MPEG4 play, with earphone, Battery 20 with Cradle+Adapter					
WCDMA Band V idle, BT/Wifi 2.4G link, SD R/W, with earphone, Battery 20%, with USB cable link to NB					
Note: The worst case was marked in boldface, therefore, only its data was recorded in this report.					

The Determined Test Configurations			
Radiated Emissions			
Test Mode	Operating Description		
1	WCDMA Band V link, BT/Wifi 2.4G link, GPS Rx, Battery 20%, with Adapter		
2	WCDMA Band V idle, BT/Wifi 2.4G link, Camera, with earphone, Battery 80%		
3	WCDMA Band V link, BT/Wifi 2.4G link, MPEG4 play, with earphone, Battery 20%, with Cradle+Adapter		
4	WCDMA Band V idle, BT/Wifi 2.4G link, SD R/W, with earphone, Battery 20%, with USB cable link to NB		
Note: The worst case was marked in boldface, therefore, only its data was recorded in this report.			

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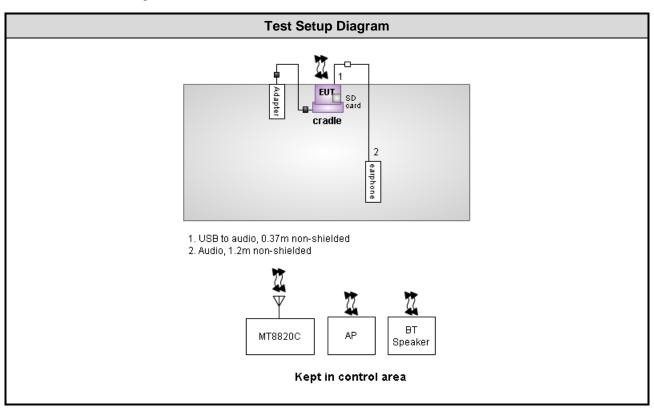


2.3 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	S/N	Signal cable / Length (m)
1	Earphone	APPLE	MD827FE/A	6	1.2m non-shielded w/o core
2	Wireless AP	D-LINK	DIR-815	3000228	
3	Radio Communication Analyzer	Anritsu	MT8820C	6201240341	
4	BT Speaker	Nokia	HF-34W		
5	SD Card	SanDisk	Micro SDHC 8GB		
6	Adapter	NTT docomo	AC Adaptor 04		Remarks: I/P: 100-240Vac, 0.22A, 50-60Hz, 0.4A O/P: 5.0Vdc, 1.8A Power line: 1m, non-shielded with 2 cores
7	Earphone adapter	NTT docomo	Earphone adapter 02		0.37m non-shielded w/o core

Note: No.6 & No. 7 are provided by applicant.

2.4 Test Setup Chart



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2.5 Test Software and Operating Condition

- a. The EUT was charged with cradle during the testing.
- b. The EUT was in WCDMA link mode during the testing.
- c. The EUT was attached to the support BT speaker and WLAN AP in link mode.
- d. The EUT play MPEG4 file from SD card.

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3 Emission Tests Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

Applicable Standard: FCC Part 15, Subpart B §15.107, ICES-003 §6.1					
	Class A (dBµV)		Class B (dBµV)		
Frequency Range (MHz)	Limits				
	Quasi-peak	Average	Quasi-peak	Average	
0.15 to 0.50	79	66	66 to 56	56 to 46	
0.50 to 5	73	60	56	46	
5 to 30	73	60	60	50	

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

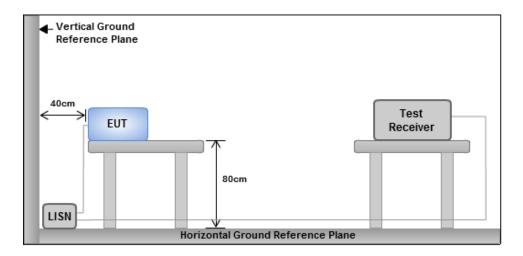
3.1.2 Test Procedures

- a. The EUT was placed on a table with a height of 0.8 meters from the metal ground plane and 0.4 meters from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
- b. The test equipment EUT installed received DC power through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- c. All the support units were connected to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The CISPR 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 measurement frequency range extends from 150 kHz to 30 MHz.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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3.1.3 Test Setup



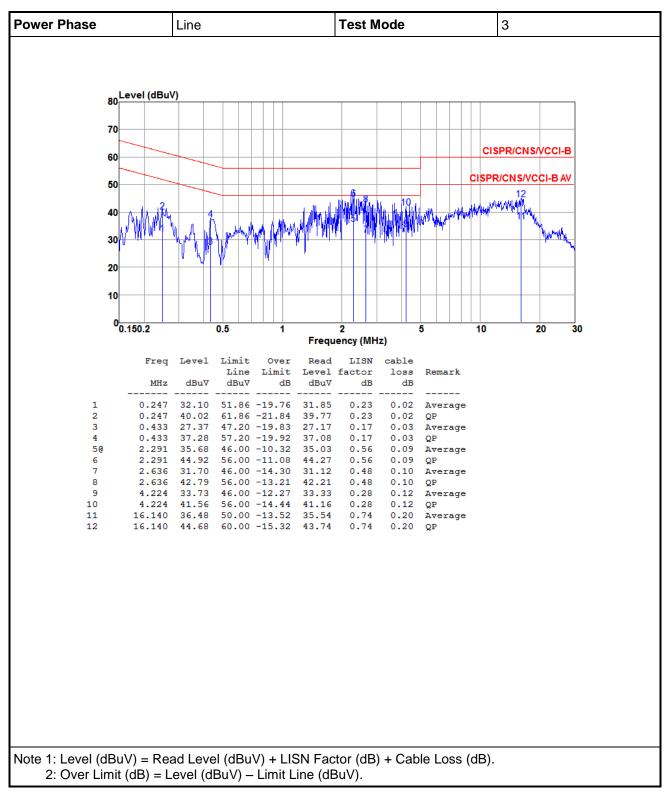
Note: 1. Support units were connected to second LISN.

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

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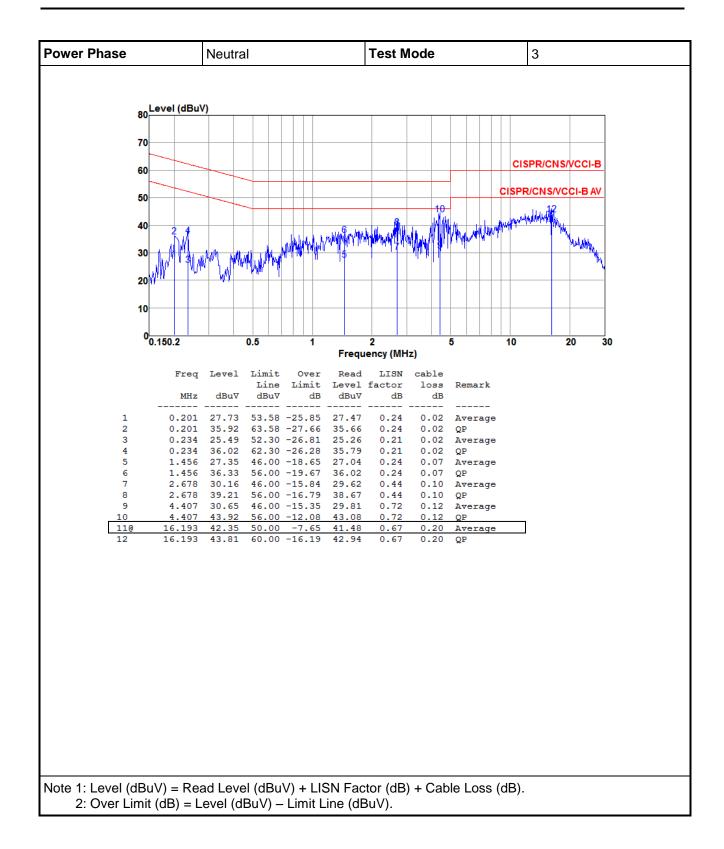


3.1.4 Test Result of Conducted Emissions



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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.

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3.2.2 Test Procedures

Measuring below 1 GHz:

- a. 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.
- b. 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.
- c. 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.

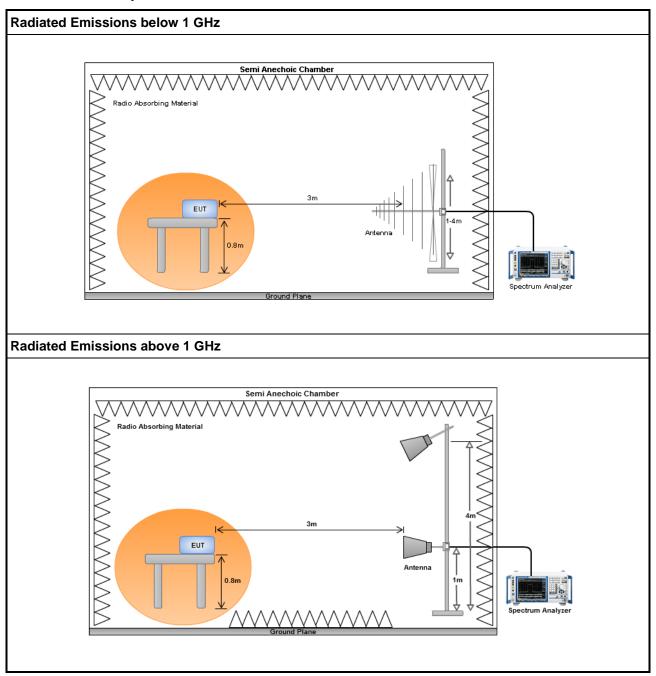
Measuring above 1 GHz:

- Same test set up as below 1GHz radiated testing.
- b. The EUT was set 3 meters from the interference-receiving antenna which was mounted on the top of a variable height antenna tower.
- c. There should be absorber placed between the EUT and Antenna and its located size should let the test site meet CISPR16-1-4 requirement.
- d. The table was rotated 360 degrees to determine the position of the highest radiation.
- e. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- f. Set the Horn Antenna at 1m height, then run the turn table to get the maximum noise reading from Horizontal and Vertical polarity separately.
- g. When EUT locating on the turn-table, the Horn Antenna must be raised up and descended down, then turning around the turn-table to get the maximum noise reading of the Horizontal and Vertical polarity separately. Note the maximum raise up height is same as the top of EUT.
- h. If 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.

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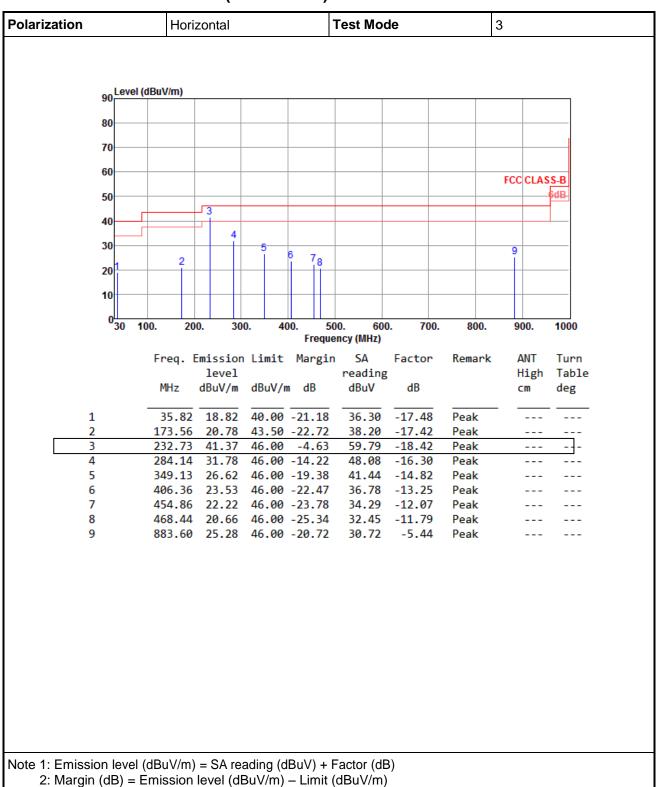
3.2.3 Test Setup



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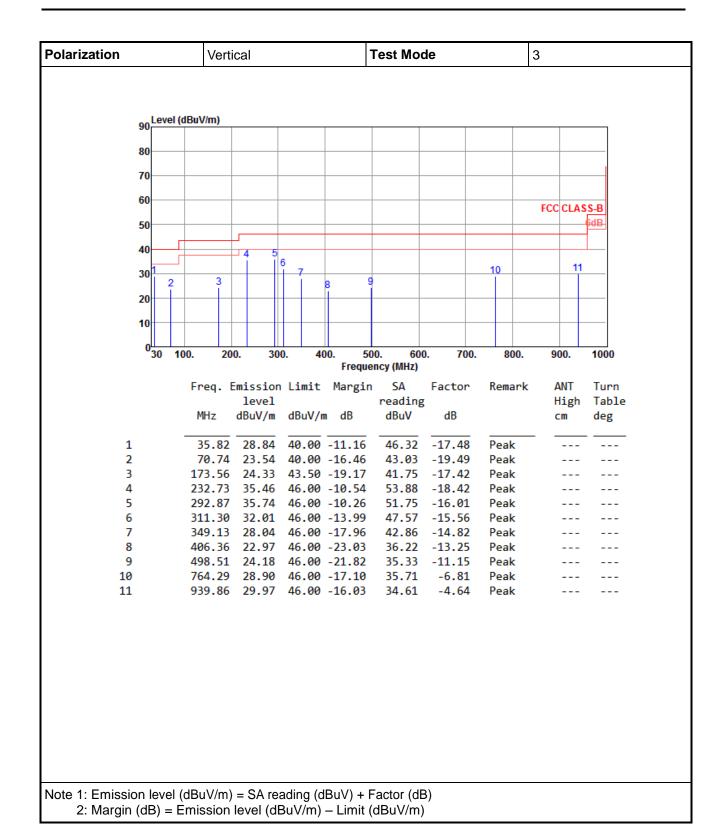


3.2.4 Radiated Emissions (Below 1GHz)



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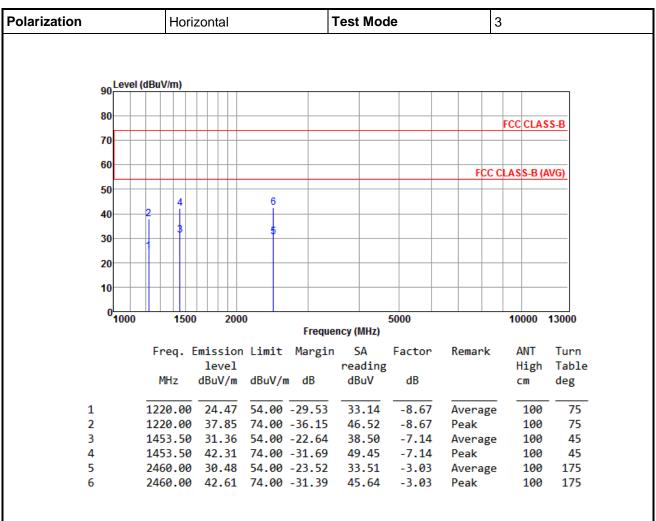




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3.2.5 Radiated Emissions (Above 1GHz)

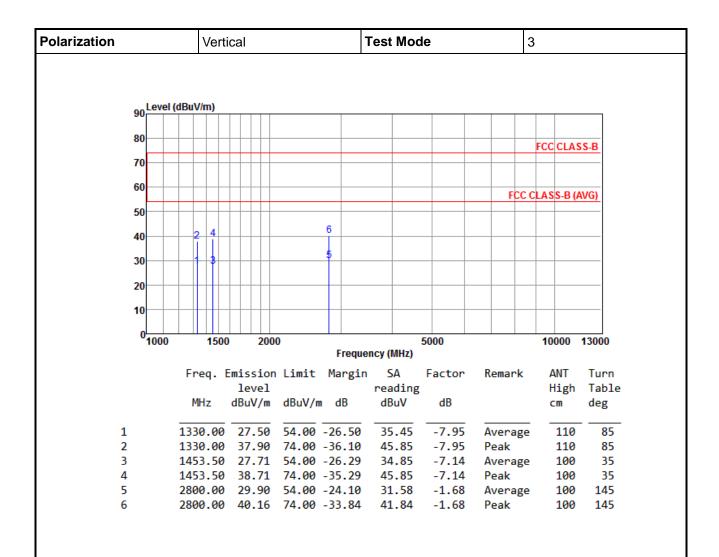


Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)

2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

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Note 1: Emission level (dBuV/m) = SA reading (dBuV) + Factor (dB)

2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m)

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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 (EMC and Wireless Communication Laboratory), 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

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Kwei Shan

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Kwei Shan Site II

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No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C..

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

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Email: ICC_Service@icertifi.com.tw

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