

FCC Partial Test Report

FCC ID : VQK-M02
Equipment : Mobile Phone
Model No. : M02
Brand Name : FUJITSU
Applicant : FUJITSU LIMITED
Address : 1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki 211-8588, Japan
Standard : 47 CFR FCC Part 24 Subpart E
Received Date : Nov. 24, 2015
Tested Date : Nov. 26, 2015

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. The test results contained in this report refer exclusively to the product. 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:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FG560301-02P24	Rev. 01	Initial issue	Dec. 17, 2015

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 24.232(c)	Equivalent Isotropically Radiated Power	Power[dBm]: 24.36	Pass
2.1053 / 24.238(a)	Radiated Emissions	Meet the requirement of limit	Pass

1 General Description

1.1 Information

This report is issued as a supplementary report to original ICC report no. FG560301P24. PCB/trace layouts, product form factor and antenna are identical except following items:

✧ Wi-Fi:

5GHz function is removed by software setting and hardware modification. Hardware modification-Remove components of 5GHz transmission path to cancel 5GHz function that will not affect 2.4GHz function since 2.4GHz and 5GHz transmission path is separately.

✧ LTE: B26 814 ~849 MHz: Activated by software.

✧ Without Fingerprint: Remove components.

✧ Change AC adapter.

✧ Same cradle as original report, change model name from F-51 to FAR-CR105.

In this report, radiated emission and conducted power had been re-tested and only its data was presented in the following sections.

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	M02
IMEI Code	353546071500032
H/W Version	v3.0.0
S/W Version	R021.3

1.1.2 Specification of the Equipment under Test (EUT)

Operating band(MHz)	GSM: 1850.2-1909.8
Modulation	GSM / GPRS: GMSK
Multislot class	33 :GPRS 11: DTM

1.1.3 Antenna Details

Type	Gain (dBi)	Connector	Remark
$\lambda/4$ Monopole	-1.61	No	---

1.1.4 EUT Operational Condition

Supply Voltage	5.0Vdc from AC adapter 3.8Vdc from Battery
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1.1.5 Accessories

No.	Equipment	Description
1	Adapter	Brand Name: Fujitsu Limited Model Name: FMV-AC346 Input rating: 100-240Vac, 50/60Hz, 0.3A Output rating: 5.0Vdc, 2A 1.1m USB shielded cable without core (for charging use)
2	Cradle	Brand Name: Fujitsu Limited Model Name: FAR-CR105 Input rating: 5Vdc, 1.5A Output rating: 5.0Vdc, 1.5A
3	Battery (Unremovable)	Brand Name: Fujitsu Limited Model Name: CA54310-0064 Power Rating: 3.8Vdc, 2330mAh, 8.9Wh

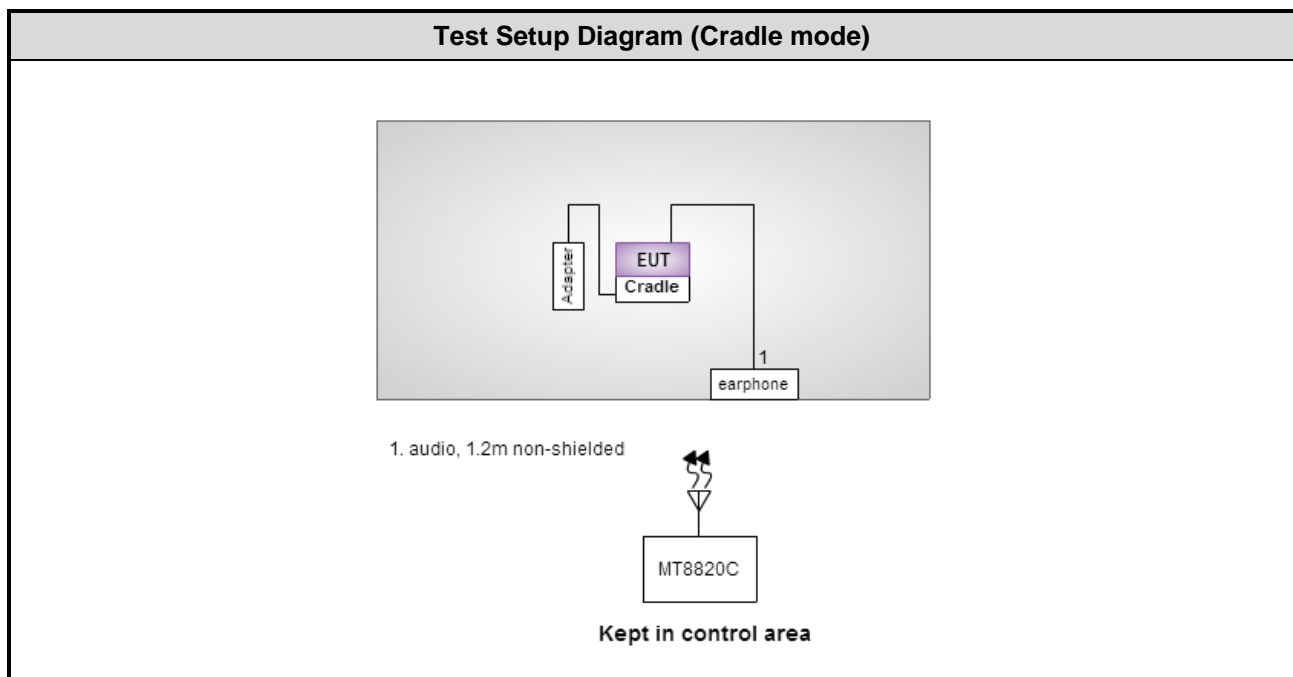
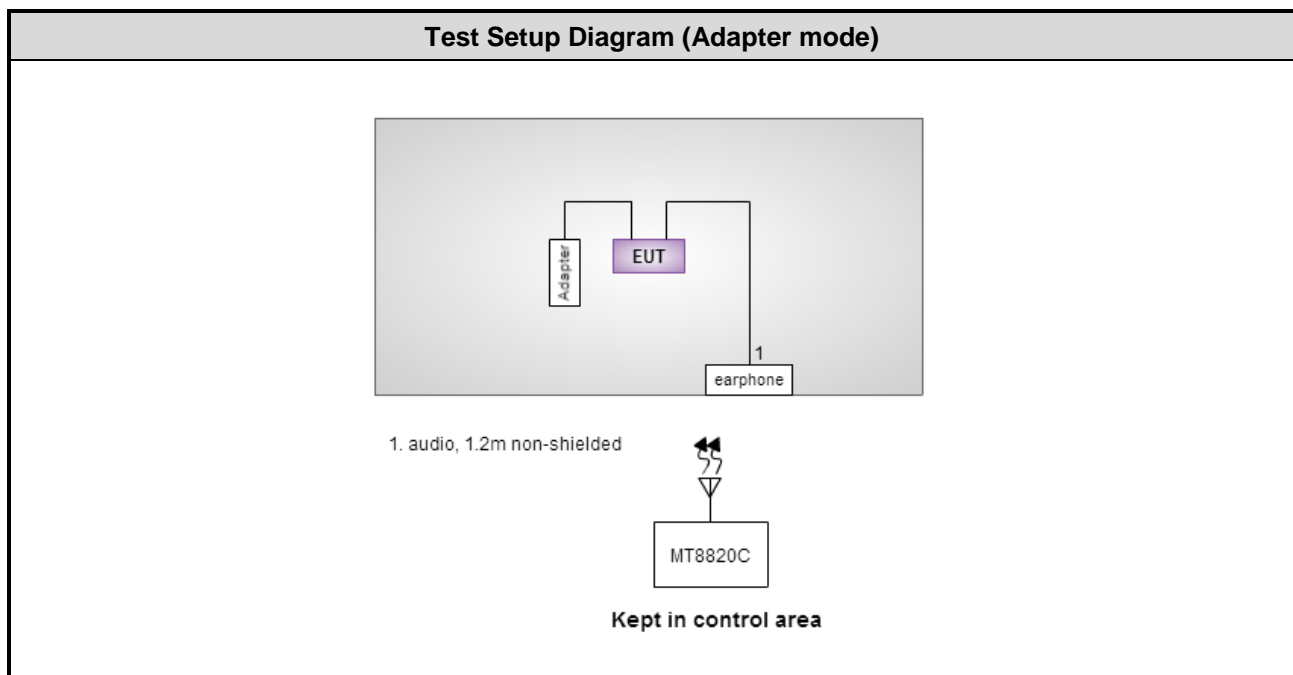
1.1.6 Operating Channel List

GSM & GPRS		
	Channel	Frequency (MHz)
Low	512	1850.2
Middle	661	1880.0
High	810	1909.8

1.2 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.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber 3 / (03CH03-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 14, 2015	Sep. 13, 2016
Receiver	Agilent	N9038A	MY53290044	Oct. 14, 2015	Oct. 13, 2016
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-563	Dec. 30, 2014	Dec. 29, 2015
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 03, 2015	Feb. 02, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Loop Antenna	R&S	HFH2-Z2	11900	Nov. 16, 2015	Nov. 15, 2016
Preamplifier	EMC	EMC02325	980187	Sep. 21, 2015	Sep. 20, 2016
Preamplifier	Agilent	83017A	MY53270014	Sep. 07, 2015	Sep. 06, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 09, 2015	Feb. 08, 2016
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22601/4	Feb. 09, 2015	Feb. 08, 2016
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 09, 2015	Feb. 08, 2016
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 09, 2015	Feb. 08, 2016
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 09, 2015	Feb. 08, 2016
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 09, 2015	Feb. 08, 2016
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 09, 2015	Feb. 08, 2016
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 19, 2015	Mar. 18, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA

Note: Calibration Interval of instruments listed above is one year.

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Feb. 03, 2015	Feb. 02, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 26, 2015	Oct. 25, 2016
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 19, 2015	Mar. 18, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA

Note: Calibration Interval of instruments listed above is one year.

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 24 Subpart E

ANSI C63.4-2003

ANSI / TIA / EIA-603-C -2010

FCC KDB 971168 D01 Power Meas License Digital Systems v02r02

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 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	
Parameters	Uncertainty
Conducted power	± 0.808 dB
Radiated emission ≤ 1 GHz	± 3.99 dB
Radiated emission > 1 GHz	± 5.52 dB

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
RF conducted	TH01-WS	23°C / 65%	Felix Sung
Radiated Emissions	03CH03-WS	22°C / 61%	Anderson Hung

➤ FCC site registration No.: 390588

➤ IC site registration No.: 10807C-1

2.2 The Worst Test Modes and Channel Details

The tests reported herein were performed according to the original worst case conditions in original report no. FG560301P24.

Test item	Mode	Test Channel
E.I.R.P	GSM	661
Radiated Emissions ≤ 1GHz	GSM	810
Radiated Emissions > 1GHz	GSM	810

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. The EUT had been tested by following test configurations for spurious emission below 1GHz.
 - 1) Configuration 1 : Adapter mode
 - 2) Configuration 2 : Cradle mode

3 Test Results

3.1 Equivalent Isotropically Radiated Power

3.1.1 Limit of Equivalent Isotropically Radiated Power

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 Test Procedures

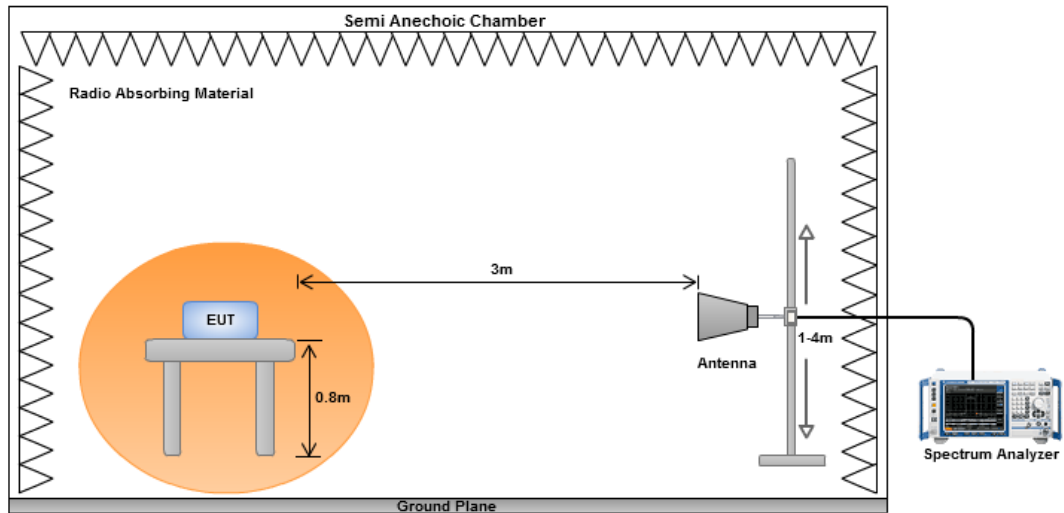
1. The EUT links up with simulator and is set to maximum output power level at low / middel / high channel. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site 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.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable.

For Conducted power measurement

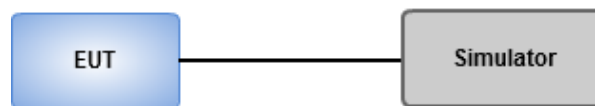
1. The EUT links up with simulator and is set to maximum output power level at low / middel / high channel.
2. Measure the output power of low / middle / high channel of the EUT

3.1.3 Test Setup

Equivalent Isotropically Radiated Power Measurement



Conducted Power Measurement



3.1.4 Test Result of Conducted Power (dBm)

Band		GSM1900		
Channel		512	661	810
Frequency (MHz)		1850.2	1880.0	1909.8
GSM		29.05	28.97	29.03
GPRS 8 (GMSK, 1 slot)		29.07	28.99	29.06
GPRS 10 (GMSK, 2 slots)		26.21	26.29	26.27
GPRS 11 (GMSK, 3 slots)		24.32	24.35	24.36
GPRS 12 (GMSK, 4 slots)		22.94	22.97	23.05
DTM5 (2Tx slots)	GSM (GMSK,1 Tx slot)	26.19	26.28	26.23
	GPRS (GMSK,1 Tx slot)	26.22	26.31	26.26
DTM9 (2Tx slots)	GSM (GMSK,1 Tx slot)	25.90	25.98	26.22
	GPRS (GMSK,1 Tx slot)	25.92	26.00	26.25
DTM11 (3Tx slots)	GSM (GMSK,1 Tx slot)	23.97	23.95	23.95
	GPRS (GMSK,2 Tx slotS)	24.02	24.00	24.00

3.1.5 Test Result of Equivalent Isotropically Radiated Power (dBm)

Mode	GSM						
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
661	1880.0	24.36	33	-8.64	-14.75	18.51	5.85

Note: EIRP = S.G Power value + Correction factor.

3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

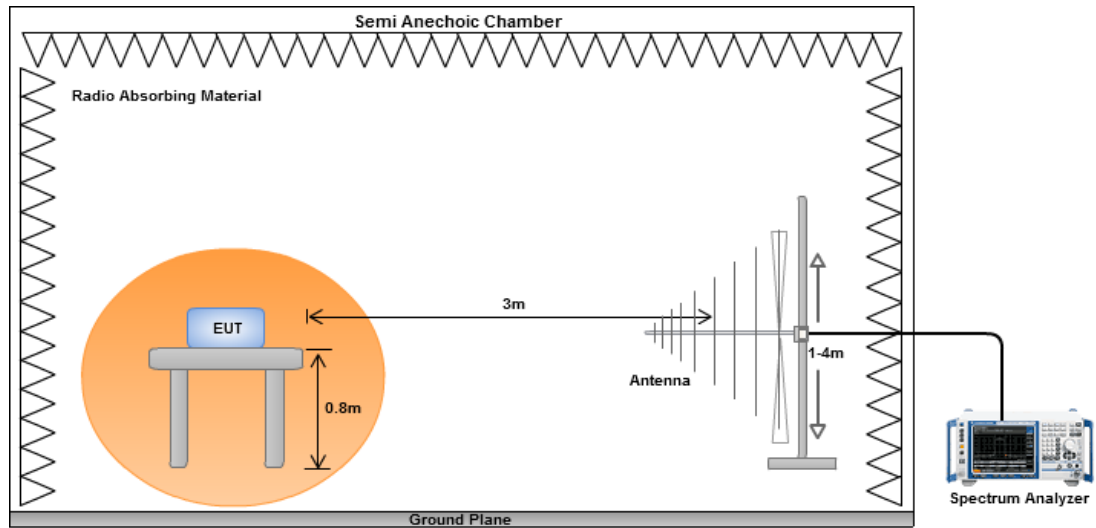
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB equal to -13dBm.

3.2.2 Test Procedures

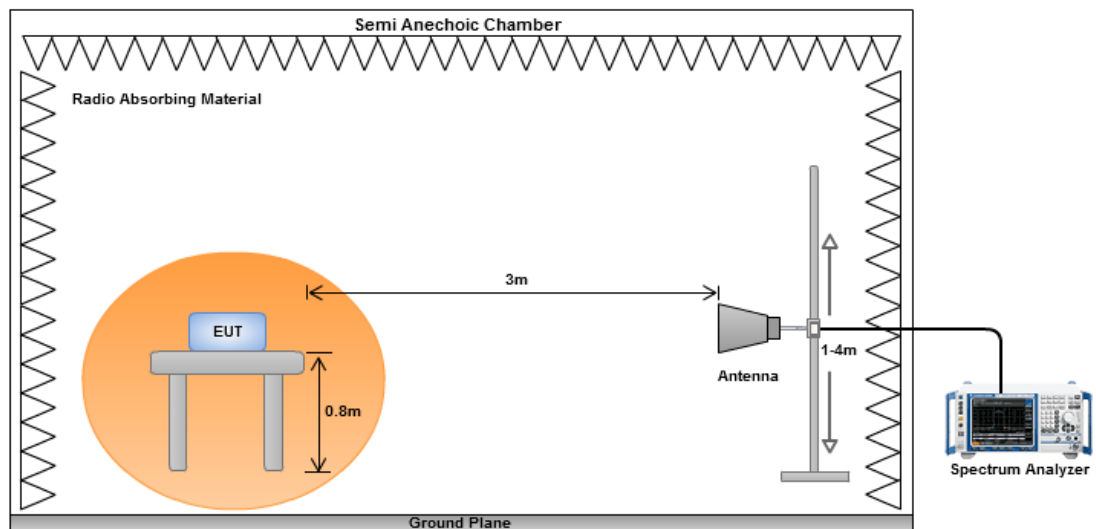
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable.

3.2.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.2.4 Test Result of Radiated Emissions below 1GHz_Adapter mode

Mode	GSM, Channel: 810						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
38.73	H	-59.00	-13.00	-46.00	-61.27	-46.52	-12.48
113.42	H	-56.28	-13.00	-43.28	-48.93	-55.89	-0.39
140.58	H	-50.38	-13.00	-37.38	-44.15	-49.04	-1.34
209.45	H	-58.54	-13.00	-45.54	-49.26	-62.93	4.39
255.04	H	-61.37	-13.00	-48.37	-53.01	-65.72	4.35
341.37	H	-63.52	-13.00	-50.52	-59.13	-67.90	4.38
42.61	V	-54.83	-13.00	-41.83	-47.74	-42.91	-11.92
99.84	V	-57.55	-13.00	-44.55	-51.66	-57.82	0.27
157.07	V	-58.16	-13.00	-45.16	-54.38	-57.23	-0.93
198.78	V	-55.96	-13.00	-42.96	-51.20	-60.21	4.25
215.27	V	-57.75	-13.00	-44.75	-53.49	-62.13	4.38
302.57	V	-61.48	-13.00	-48.48	-57.99	-65.69	4.21

Note: EIRP = S.G Power value + Correction factor.

3.2.5 Test Result of Radiated Emissions below 1GHz_Cradle mode

Mode	GSM, Channel: 810						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
39.70	H	-59.27	-13.00	-46.27	-61.52	-46.93	-12.34
128.94	H	-59.20	-13.00	-46.20	-52.28	-58.20	-1.00
179.38	H	-55.69	-13.00	-42.69	-48.07	-57.72	2.03
210.42	H	-59.73	-13.00	-46.73	-50.46	-64.12	4.39
340.40	H	-65.32	-13.00	-52.32	-60.87	-69.70	4.38
720.64	H	-59.66	-13.00	-46.66	-61.99	-63.28	3.62
45.52	V	-55.22	-13.00	-42.22	-48.59	-43.71	-11.51
66.86	V	-47.88	-13.00	-34.88	-40.11	-41.42	-6.46
142.52	V	-59.01	-13.00	-46.01	-56.33	-57.72	-1.29
211.39	V	-57.31	-13.00	-44.31	-52.91	-61.70	4.39
290.93	V	-63.73	-13.00	-50.73	-60.29	-67.96	4.23
575.14	V	-61.80	-13.00	-48.80	-64.46	-65.76	3.96

Note: EIRP = S.G Power value + Correction factor.

3.2.6 Test Result of Radiated Emissions above 1GHz

Mode	GSM, Channel: 810						
Frequency (MHz)	Antenna Polarity.	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
3819.60	H	-37.83	-13.00	-24.83	-52.13	-44.39	6.56
5729.40	H	-43.63	-13.00	-30.63	-62.39	-49.44	5.81
7639.20	H	-43.59	-13.00	-30.59	-66.22	-46.46	2.87
3819.60	V	-42.26	-13.00	-29.26	-56.41	-48.82	6.56
5729.40	V	-37.47	-13.00	-24.47	-56.53	-43.28	5.81
7639.20	V	-44.43	-13.00	-31.43	-66.05	-47.30	2.87

Note: EIRP = S.G Power value + Correction factor.

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

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Yuan Hsien 333, Taiwan, R.O.C.

Kwei Shan Site II

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