FCC Test Report

FCC ID	:	**VQK-F03H**
Equipment	:	**Mobile Phone**
Model No.	:	**F-03H**
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	:	**Feb. 26, 2016**
Tested Date	:	**Apr. 10 ~ Apr. 14, 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. 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

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FG622602P24	Rev. 01	Initial issue	May 10, 2016

Summary of Test Results

FCC Rules	Test Items	Measured	Result
2.1046 / 24.232(c)	Equivalent Isotropically Radiated Power	Power[dBm]: 29.02	Pass
2.1053 / 24.238(a)	Radiated Emissions	Meet the requirement of limit	Pass
2.1051 / 24.238(a)	Conducted Emissions	Meet the requirement of limit	Pass
2.1051 / 24.238(a)	Band Edge	Meet the requirement of limit	Pass
2.1049	Occupied Bandwidth	Meet the requirement of limit	Pass
24.232(d)	Peak to average ratio	Meet the requirement of limit	Pass
2.1055 / 24.235	Frequency Stability	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Product Details

Product Name	Mobile Phone
Brand Name	FUJITSU
Model Name	F-03H
IMEI Code	356398070028442
H/W Version	V2.1.0
S/W Version	R012.2

1.1.2 Specification of the Equipment under Test (EUT)

Operating Band	1850.2 ~ 1909.8 MHz
Modulation	GSM / GPRS: GMSK
Multislot Class	33 for GPRS 11 for DTM

1.1.3 Maximum EIRP, Frequency Tolerance and Emission Designator

System	Modulation	Maximum EIRP(W)	Frequency Tolerance (ppm)	Emission Designator
GSM 1900	GMSK	0.798	0.010	250KGXW

1.1.4 Antenna Details

Type	Gain (dBi)	Connector	Remark
λ/4 Monopole	-0.8	No	---

1.1.5 EUT Operational Condition

Supply Voltage	5.0Vdc from AC adapter 3.8Vdc from Battery		
Operational Voltage	☒ Vnom (3.9 V)	☒ Vmax (4.29 V)	☒ Vmin (3.51 V)
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (55°C)	☒ Tmin (-30°C)

1.1.6 Accessories

No.	Equipment	Description
1	Battery	Brand Name: FUJITSU CONNECTED TECHNOLOGIES LIMITED Model Name: CA54310-0067 Power Rating: 3.8Vdc, 2,580mAh, 9.9Wh

1.1.7 Operating Channel List

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

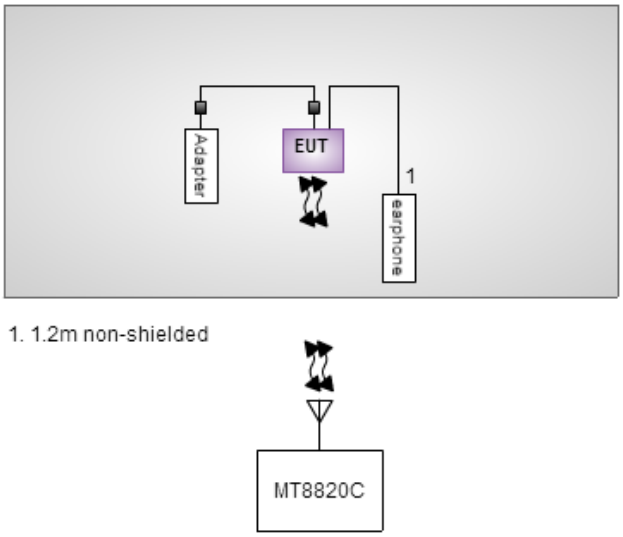
1.2 Local Support Equipment List

Support Equipment List						
No.	**Equipment**	**Brand**	**Model**	**S/N**	**FCC ID**	**Signal cable / Length (m)**
1	Earphone	APPLE	MD827FE/A	6	---	1.2m non-shielded w/o core
2	Adapter	NTT docomo	AC Adapter 04	---	---	---

Note: Adapter is provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**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
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Preamplifier	Burgeon	BPA-530	SN:100219	Sep. 10, 2015	Sep. 09, 2016
Preamplifier	Agilent	83017A	MY39501308	Oct. 02, 2015	Oct. 01, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 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.					

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. 17, 2016	Feb. 16, 2017
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 27, 2015	Nov. 26, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 28, 2016	Mar. 27, 2017
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 C63.4-2014
ANSI/TIA-603-D 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**
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Frequency error	±34.134 Hz
Conducted emission	±2.670 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.63 dB
Temperature	±0.6 °C

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	23°C / 65%	Felix Sung
RF Conducted	TH01-WS	22°C / 61%	Anderson Hung

- FCC site registration No.: 181692
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test channel
E.I.R.P	GSM	512, 661, 810
Radiated Emission ≤ 1GHz	GSM	810
Radiated Emission > 1GHz	GSM	512, 661, 810
Conducted Emissions	GSM	512, 661, 810
Band Edge	GSM	512, 810
Occupied Bandwidth	GSM	512, 661, 810
Peak to average ratio	GSM	512, 661, 810
Frequency Stability	GSM	661

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.

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

For E.I.R.P measurement

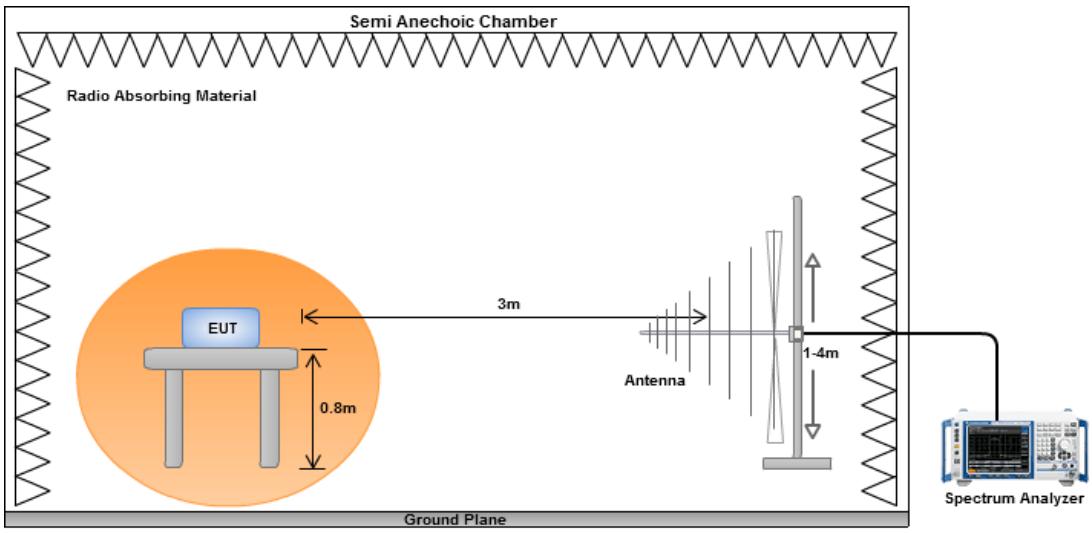
1. The EUT links up with simulator and is set to maximum output power level at low / middel / high channel.Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site 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

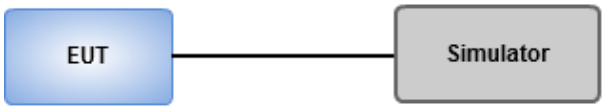
1. The EUT links up with simulator and is set to maximum output power level at low / middel / high channel.
2. Measure the output power of low / middle / high channel of the EUT

3.1.3 Test Setup

Equivalent Isotropically Radiated Power Measurement



Conducted Power Measurement



3.1.4 Test Result of Conducted power (dBm)

Band		GSM 1900		
Channel		512	661	810
Frequency (MHz)		1850.2	1880.0	1909.8
GSM 1 Tx slot		28.87	28.94	28.98
GPRS 1 Tx slot		28.88	28.95	**29.00**
GPRS 2 Tx slots		26.15	26.25	26.37
GPRS 3 Tx slots		25.09	25.20	24.20
GPRS 4 Tx slots		23.80	23.91	23.02
DTM 5 (2Tx slots)	GSM 1 Tx slot	26.13	26.25	26.38
	GPRS 1 Tx slot	26.10	26.21	26.32
DTM 9 (2Tx slots)	GSM 1 Tx slot	26.14	26.24	26.36
	GPRS 1 Tx slot	26.11	26.20	26.31
DTM 11 (3Tx slots)	GSM 1 Tx slot	25.06	25.17	24.17
	GPRS 2 Tx slots	25.00	25.10	24.12

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 Value (dBm)	Correction Factor (dB)
512	1850.2	27.20	33	-5.80	-12.88	21.54	5.66
661	1880.0	27.94	33	-5.06	-12.52	22.20	5.74
810	1909.8	**29.02**	33	-3.98	-11.81	23.20	5.82

3.2 Radiated Emissions

3.2.1 Limit of Radiated Emissions

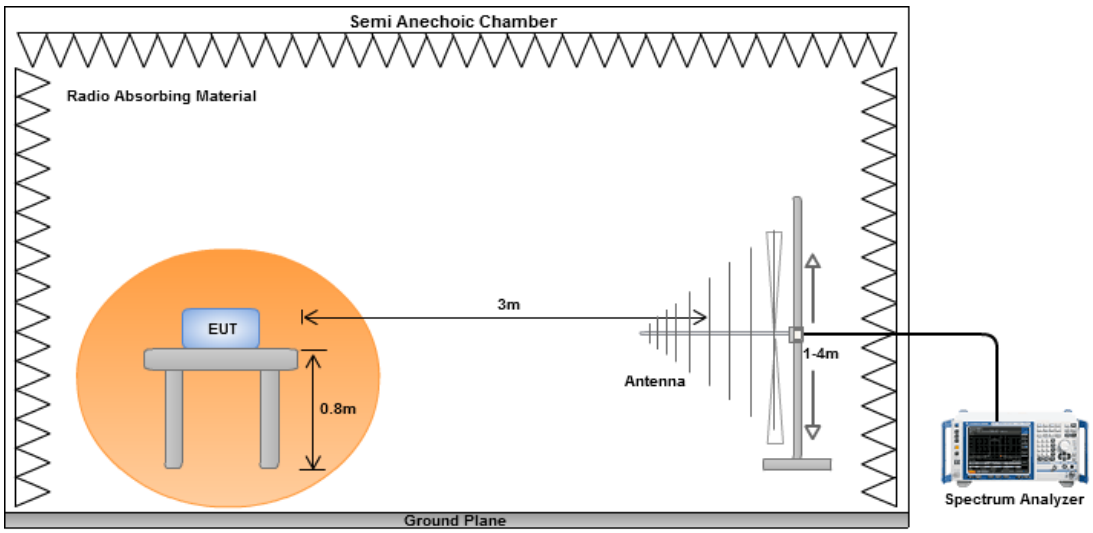
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB equal to -13dBm.

3.2.2 Test Procedures

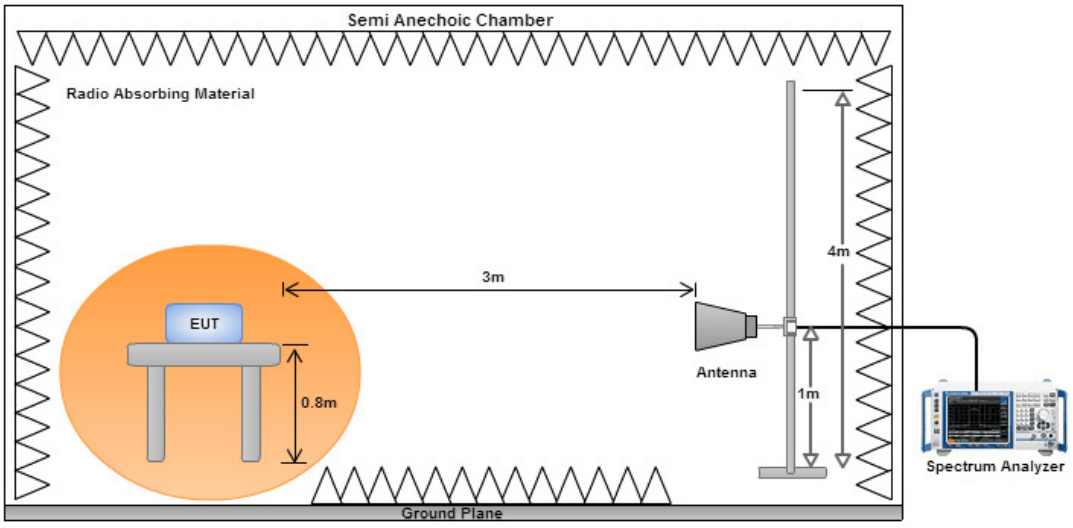
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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 and4 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

Mode	GSM, Channel : 810						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
43.58	H	-68.72	-13.00	-55.72	-67.33	-56.79	-11.93
90.14	H	-70.38	-13.00	-57.38	-59.84	-71.04	0.66
148.34	H	-79.04	-13.00	-66.04	-70.26	-77.90	-1.14
439.34	H	-75.73	-13.00	-62.73	-70.30	-79.76	4.03
761.38	H	-69.02	-13.00	-56.02	-69.02	-72.45	3.43
935.01	H	-73.65	-13.00	-60.65	-75.03	-76.39	2.74
43.58	V	-61.26	-13.00	-48.26	-51.80	-49.33	-11.93
90.14	V	-62.10	-13.00	-49.10	-52.54	-62.76	0.66
101.78	V	-68.77	-13.00	-55.77	-59.71	-68.99	0.22
523.73	V	-73.83	-13.00	-60.83	-71.17	-78.01	4.18
761.38	V	-69.50	-13.00	-56.50	-70.18	-72.93	3.43
935.01	V	-68.04	-13.00	-55.04	-70.92	-70.78	2.74

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

3.2.5 Test Result of Radiated Emissions above 1GHz

Mode	GSM, Channel: 512						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
3700.40	H	-50.14	-13.00	-37.14	-63.20	-57.10	6.96
5550.60	H	-34.69	-13.00	-21.69	-52.32	-41.27	6.58
7400.80	H	-53.21	-13.00	-40.21	-75.29	-56.77	3.56
3700.40	V	-46.80	-13.00	-33.80	-59.36	-53.76	6.96
5550.60	V	-43.18	-13.00	-30.18	-59.31	-49.76	6.58
7400.80	V	-54.06	-13.00	-41.06	-74.28	-57.62	3.56

Mode	GSM, Channel: 661						
Frequency (MHz)	Antenna Polarity	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
3760.00	H	-50.61	-13.00	-37.61	-63.89	-57.57	6.96
5640.00	H	-35.66	-13.00	-22.66	-53.50	-42.19	6.53
7520.00	H	-53.92	-13.00	-40.92	-75.66	-57.31	3.39
3760.00	V	-46.19	-13.00	-33.19	-58.72	-53.15	6.96
5640.00	V	-44.16	-13.00	-31.16	-60.57	-50.69	6.53
7520.00	V	-55.19	-13.00	-42.19	-75.81	-58.58	3.39

Mode	GSM, Channel: 810						
Frequency (MHz)	Antenna Polarity.	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)
3819.60	H	-50.83	-13.00	-37.83	-64.31	-57.78	6.95
5729.40	H	-35.41	-13.00	-22.41	-53.32	-41.89	6.48
7639.20	H	-53.95	-13.00	-40.95	-75.35	-57.20	3.25
3819.60	V	-46.95	-13.00	-33.95	-59.55	-53.90	6.95
5729.40	V	-46.98	-13.00	-33.98	-63.87	-53.46	6.48
7639.20	V	-54.90	-13.00	-41.90	-75.63	-58.15	3.25

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

3.3 Conducted Emissions

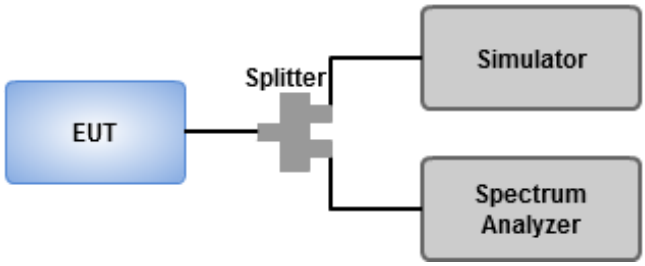
3.3.1 Limit of Conducted Emissions

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

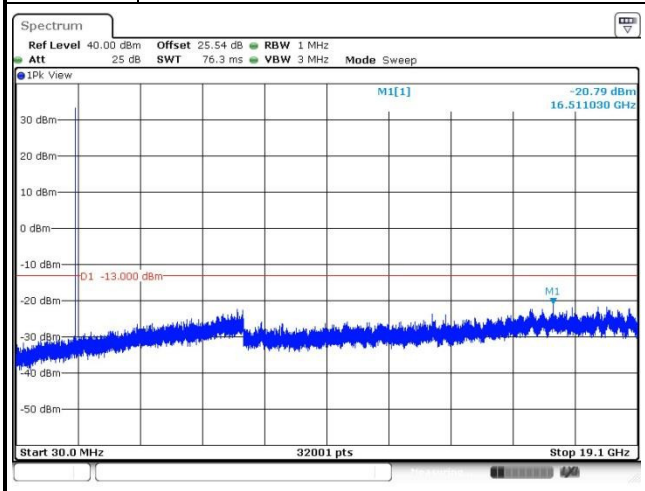
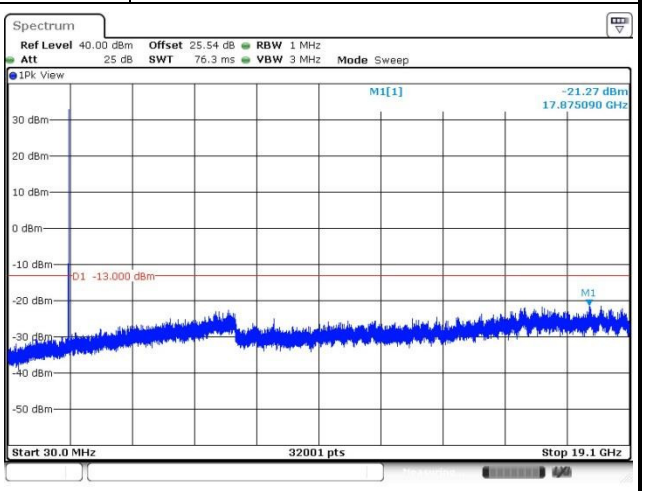
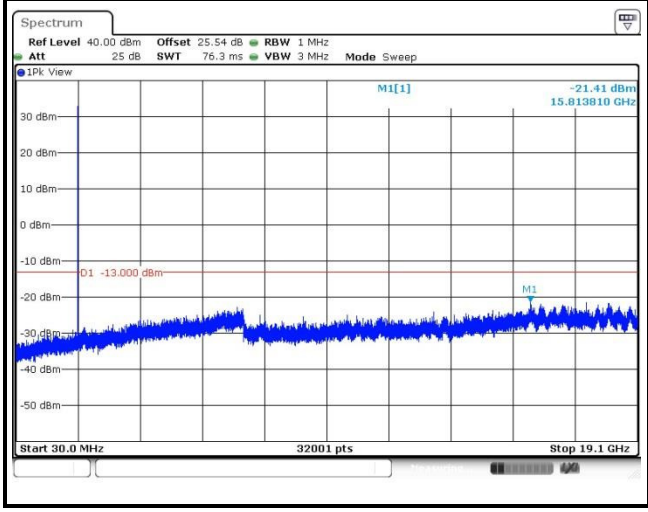
3.3.2 Test Procedures

1. Lowest, middle and highest operating channels are tested for this item.
2. Scan frequency range is from 30MHz~19.1GHz.
3. Set RBW = 1MHz, VBW = 3MHz, detector = Peak, sweep time = auto.
4. Record the max trace value and capture the test plot of each sub frequency band.

3.3.3 Test Setup



3.3.4 Test Result of Conducted Emissions

Mode	GSM		
Channel	512	Channel	661
			
Channel	810		---
		---	

3.4 Band Edge

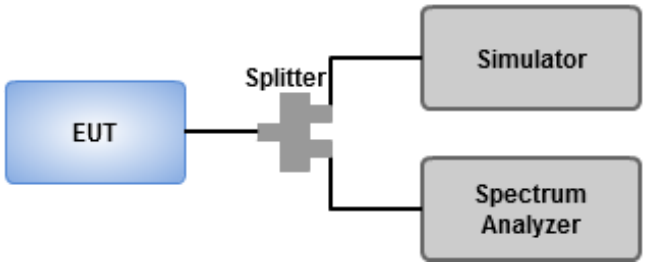
3.4.1 Limit of Band Edge

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

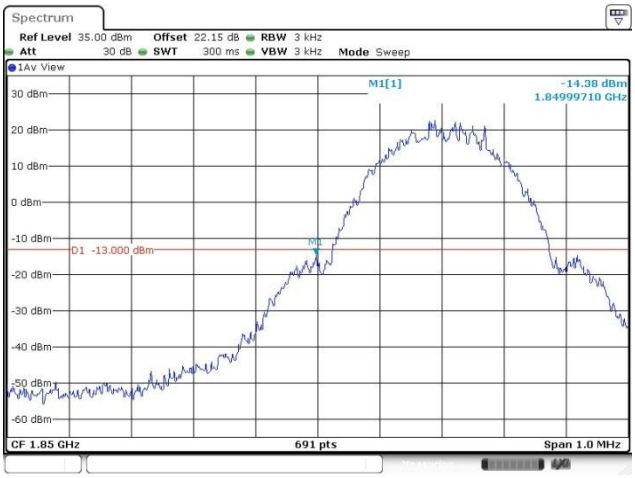
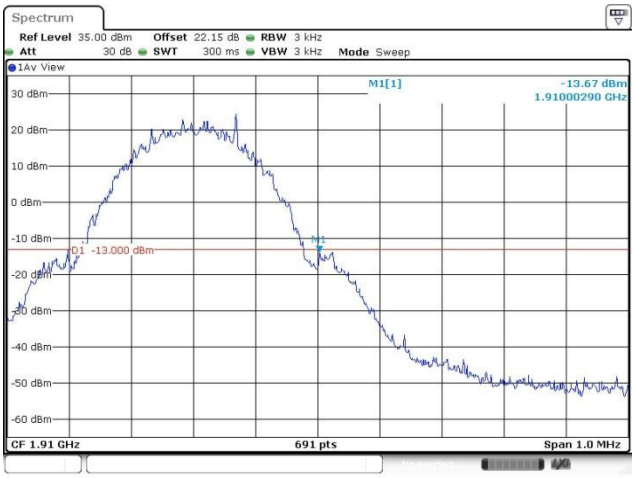
3.4.2 Test Procedures

1. Lowest and highest operating channels are tested for this item.
2. The center frequency of spectrum analyzer will be set to 1850 and 1910 MHz.
3. Set RBW = VBW=3kHz, span = 1 MHz, detector = RMS, sweep time = auto
4. Record the max trace value and capture the test plot.

3.4.3 Test Setup



3.4.4 Test Result of Band Edge

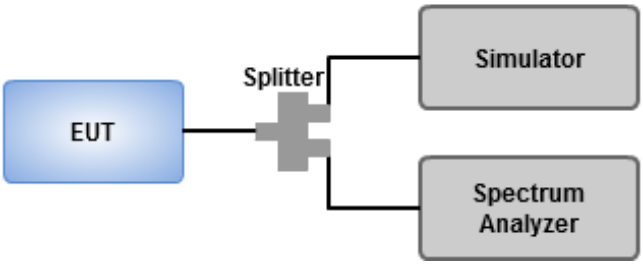
Mode	GSM		
Channel	512	Channel	810
			

3.5 Occupied Bandwidth

3.5.1 Test Procedures

1. Set resolution bandwidth (RBW) = 10 kHz, Video bandwidth = 30 kHz
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Using occupied bandwidth measurement function of spectrum analyzer to measure occupied bandwidth.

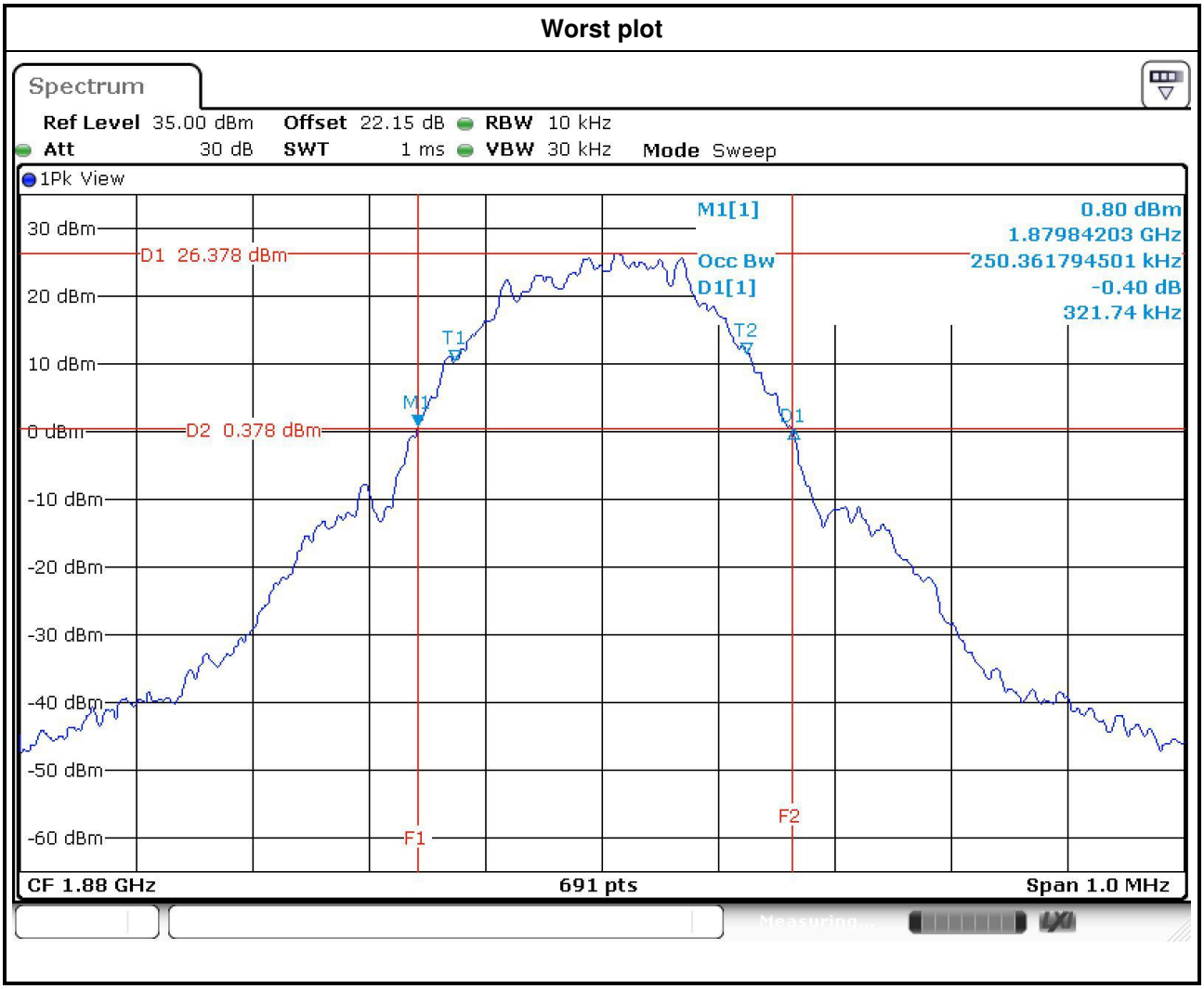
3.5.2 Test Setup



3.5.3 Test Result of Occupied Bandwidth

MODE	Channel	Frequency (MHz)	26dB BW (kHz)	99% OBW (kHz)
GSM	512	1850.2	317.39	243.13
GSM	661	1880.0	321.74	250.36
GSM	810	1909.8	311.59	238.78

Worst plot



3.6 Peak to Average Ratio

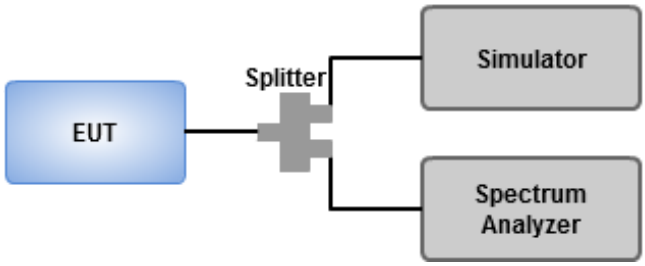
3.6.1 Limit of Peak to Average Ratio

Peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 Test Procedures

1. Set RBW=1MHz, RBW=3MHz, Peak detector in Trace 1.
2. Set RBW=1MHz, RBW=3MHz, RMs detector in Trace 2.
3. Trigger function is enabled for measuring singal at burst on time. Measure the difference between trace1 and trace 2.

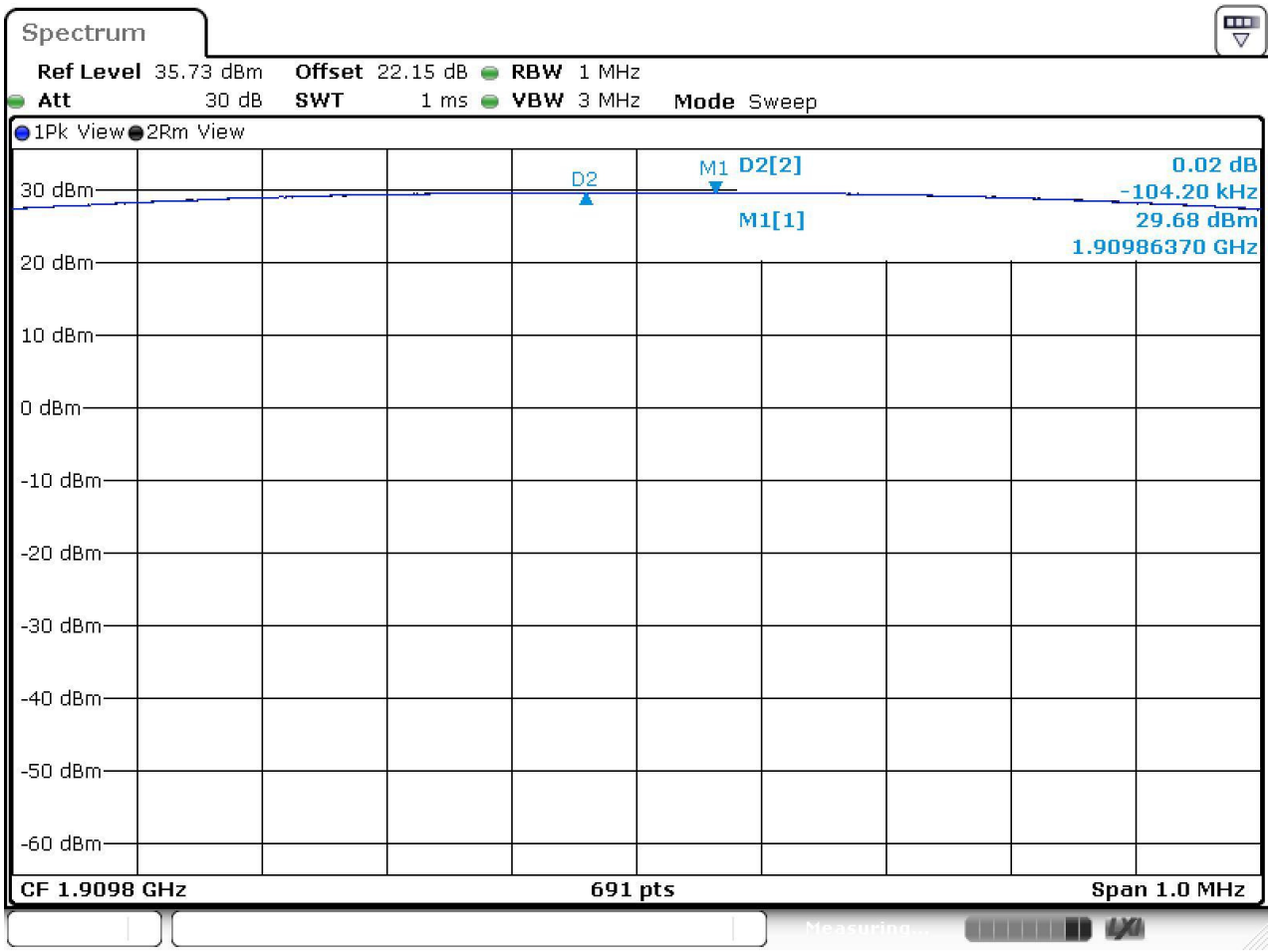
3.6.3 Test Setup



3.6.4 Test Result of Peak to Average ratio

MODE	Channel	Frequency (MHz)	Peak to Average ratio (dB)
GSM	512	1850.2	0.01
GSM	661	1880.0	0.02
GSM	810	1909.8	0.02

Worst plots



3.7 Frequency Stability

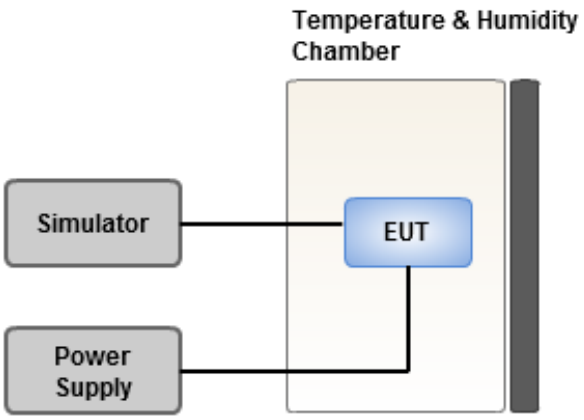
3.7.1 Limit of Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures

1. EUT was placed at temperature chamber and connected to an external power supply.
2. Temperature and voltage condition shall be tested to confirm frequency stability.
3. Temperature range is from -30~55°C and voltage range is from lowest to highest working voltage.
4. Tem Link up EUT and simulator. Confirm frequency drift value of simulator and record it.

3.7.3 Test Setup



3.7.4 Test Result of Frequency Stability

Temperature (°C)	Voltage (dc)	Frequency Drift (ppm)	Limit (ppm)
20	4.29	0.006	2.5
20	3.51	0.007	2.5
55	3.9	0.003	2.5
50	3.9	0.005	2.5
40	3.9	0.006	2.5
30	3.9	0.006	2.5
20	3.9	0.006	2.5
10	3.9	0.007	2.5
0	3.9	0.007	2.5
-10	3.9	0.009	2.5
-20	3.9	0.010	2.5
-30	3.9	0.010	2.5

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	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.	No. 14-1, Lane 19, 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

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