



FCC TEST REPORT (15.225_NFC)

REPORT NO.: RF130823C23-6
MODEL NO.: F-02F
FCC ID: VQK-F02F
RECEIVED: Aug. 23, 2013
TESTED: Aug. 27 ~ Aug. 28, 2013
ISSUED: Oct. 07, 2013

APPLICANT: FUJITSU LIMITED

ADDRESS: 1-1, Kamikodanaka 4-chome, Nakahara-ku,
Kawasaki 211-8588, Japan

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,
New Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



Table of Contents

RELEASE CONTROL RECORD.....	3
1. CERTIFICATION	4
2. SUMMARY OF TEST RESULTS	5
2.1 MEASUREMENT UNCERTAINTY	5
3. GENERAL INFORMATION.....	6
3.1 GENERAL DESCRIPTION OF EUT.....	6
3.2 DESCRIPTION OF TEST MODES.....	7
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	7
3.3 DESCRIPTION OF SUPPORT UNITS	8
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	8
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	9
4. TEST TYPES AND RESULTS	10
4.1 RADIATED EMISSION MEASUREMENT	10
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT.....	10
4.1.2 TEST INSTRUMENTS	11
4.1.3 TEST PROCEDURES	12
4.1.4 DEVIATION FROM TEST STANDARD	12
4.1.5 TEST SETUP	13
4.1.6 EUT OPERATING CONDITIONS.....	13
4.1.7 TEST RESULTS	14
4.2 FREQUENCY STABILITY	18
4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT	18
4.2.2 TEST INSTRUMENTS	18
4.2.3 TEST PROCEDURE	18
4.2.4 DEVIATION FROM TEST STANDARD	19
4.2.5 TEST SETUP	19
4.2.6 EUT OPERATING CONDITION	19
4.2.7 TEST RESULTS	20
4.3 20dB BANDWIDTH	21
4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT	21
4.3.2 TEST INSTRUMENTS	21
4.3.3 TEST PROCEDURE	21
4.3.4 DEVIATION FROM TEST STANDARD	21
4.3.5 TEST SETUP	21
4.3.6 EUT OPERATING CONDITION	21
4.3.7 TEST RESULTS	22
5. PHOTOGRAPHS OF THE TEST CONFIGURATION.....	23
6. INFORMATION ON THE TESTING LABORATORIES.....	24
7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	25



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130823C23-6	Original release	Oct. 07, 2013



1. CERTIFICATION

PRODUCT: Tablet PC
MODEL: F-02F
BRAND: FUJITSU
APPLICANT: FUJITSU LIMITED
TESTED: Aug. 27 ~ Aug. 28, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.225)**
FCC Part 15, Subpart C (Section 15.215)
ANSI C63.10-2009

The above equipment (model: F-02F) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Ivy Lin , **DATE** : Oct. 07, 2013
Ivy Lin / Specialist

APPROVED BY : Ken Liu , **DATE** : Oct. 07, 2013
Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.225, 15.215)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	Conducted emission test	NA	Power supply is 3.8Vdc from battery
15.225 (a)	The field strength of any emissions within the band 13.553-13.567 MHz	PASS	Meet the requirement of limit. Minimum passing margin is -68.20dB at 13.56MHz.
15.225 (d)	The field strength of any emissions appearing outside of the 13.110-14.010 MHz band	PASS	Meet the requirement of limit. Minimum passing margin is -11.50dB at 379.17MHz.
15.225 (e)	The frequency tolerance	PASS	Meet the requirement of limit.
15.215 (c)	20dB Bandwidth	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Tablet PC
MODEL NO.	F-02F
POWER SUPPLY	3.8Vdc (battery) 12.0Vdc (cradle) 5Vdc (adapter or host equipment)
MODULATION TYPE	ASK
OPERATING FREQUENCY	13.56MHz
ANTENNA TYPE	loop antenna
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Refer to Note as below

NOTE:

- The EUT contains the following accessories.

No.	Product	Brand	Model	Description
1	Adapter (For cradle)	NTT docomo	TA08017-B222	Input : 100-240Vac, 1000mA Output: 12.0Vdc, 3000mA 1m shielded AC cable without core 1.8m shielded DC cable with 1 core
2	Cradle	NTT docomo	CA50601-1841	Input : 12.0V, 2000mA Output: 12.0V, 2000mA
3	Battery	Fujitsu Limited	CA54310-0048	3.8Vdc, 9600mA

- The EUT uses following support unit.

No.	Product	Brand	Model	Description
1	Adapter	NTT docomo	AC Adaptor 04	Input: 100-240Vac, 0.22A, 50-60Hz Output: 5.0V, 1.8A 1.05m DC cable with 2 cores

- SW version is R23.5e.
- HW version is V2.0.0.
- IMEI Code: 357614050009510
- The above EUT information is declared by manufacturer and for more detailed feature description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE	PLC	FS	BW	
-	√	NOTE 2	√	√	-

Where **RE:** Radiated Emission **PLC:** Power Line Conducted Emission
FS: Frequency Stability **BW:** 20dB Bandwidth

NOTE 1: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

NOTE 2: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1	1	ASK

FREQUENCY STABILITY:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1	1	ASK

20dB BANDWIDTH:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1	1	ASK

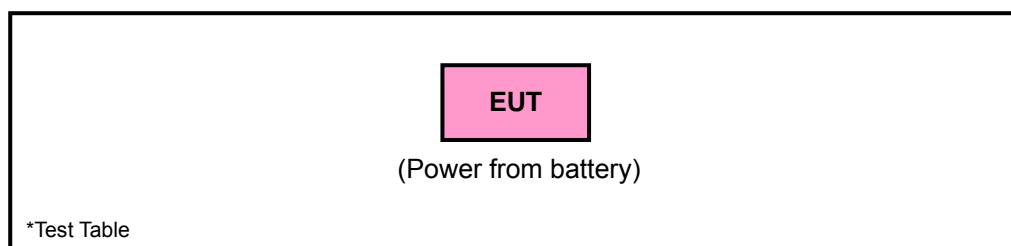
TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	24deg. C, 73%RH	3.8Vdc	Martin Lee
FS	24deg. C, 73%RH	3.8Vdc	Martin Lee
BW	25deg. C, 60%RH	3.8Vdc	Martin Lee

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RFID Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.225)

FCC Part 15, Subpart C (15.215)

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B. The test report has been issued separately.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Sep. 09, 2013	Sep. 08, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU 43	100115	Oct. 25, 2012	Oct. 24, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10738	Oct. 23, 2012	Oct. 22, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309222/4	Aug. 22, 2013	Aug. 21, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4	Aug. 22, 2013	Aug. 21, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274392/4	Aug. 22, 2013	Aug. 21, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table BV ADT	TT100.	TT93021704	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021704	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. The test was performed in HwaYa Chamber 4.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 460141.
 6. The IC Site Registration No. is IC7450F-4.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

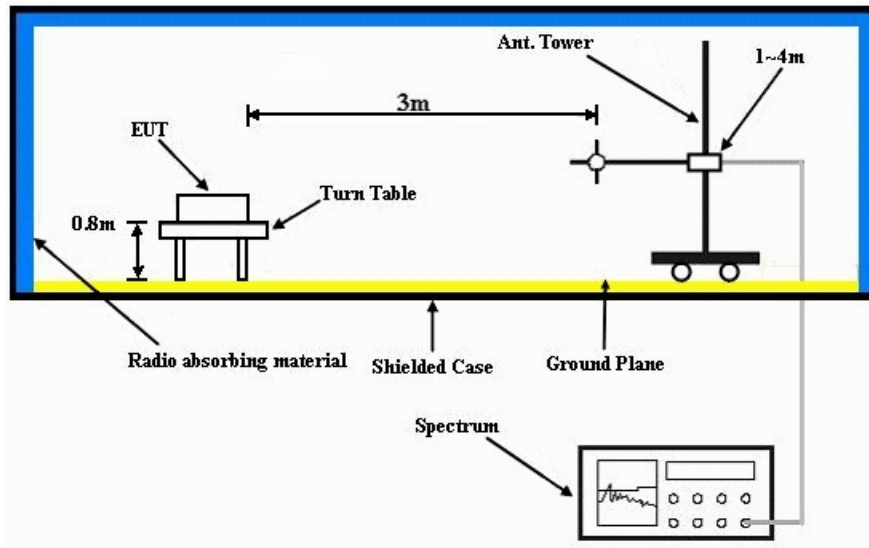
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

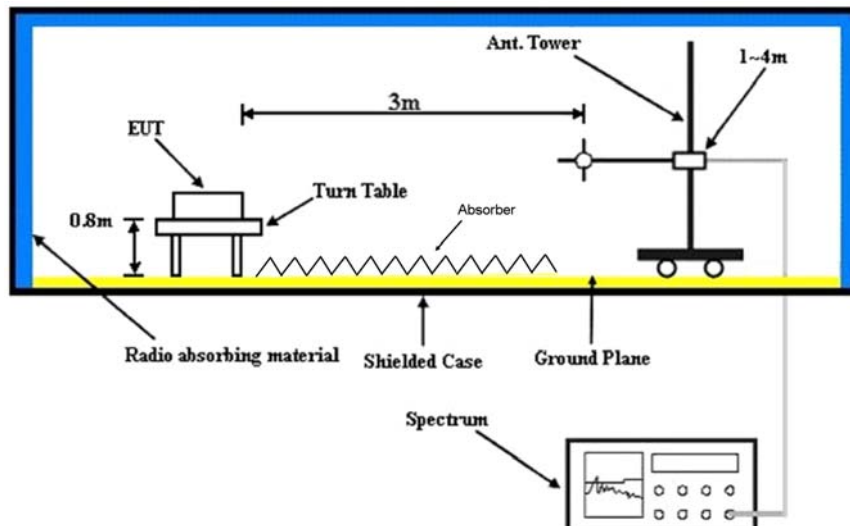
No deviation.

4.1.5 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	13.553 ~ 13.567MHz
INPUT POWER	3.8Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 73%RH	TESTED BY	Martin Lee

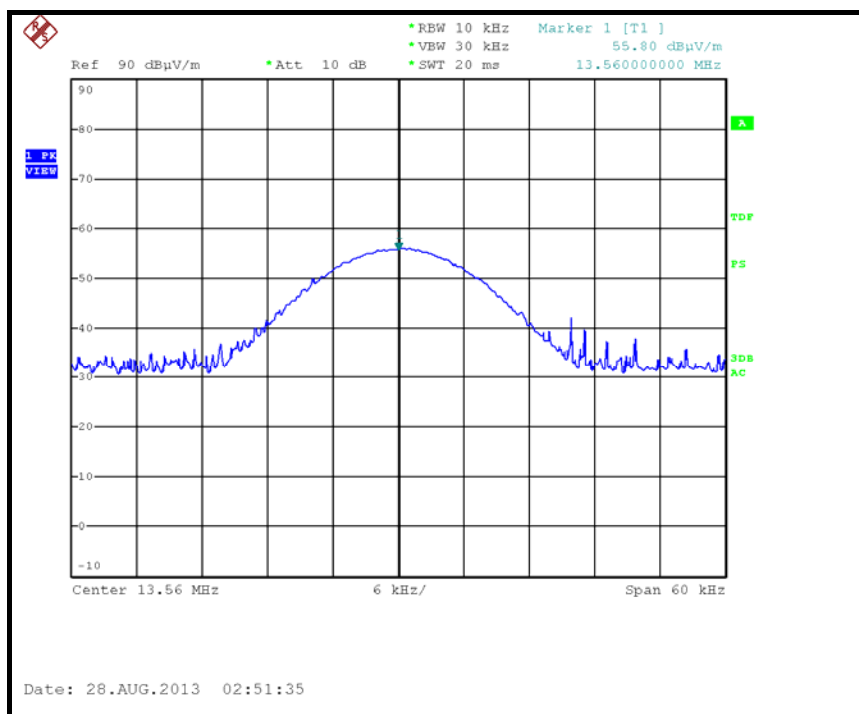
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	13.56	55.80	124.00	-68.20	1.00	225	35.90	19.90

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84+20\log(30/3)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	13.553 ~ 13.567MHz
INPUT POWER	3.8Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 73%RH	TESTED BY	Martin Lee

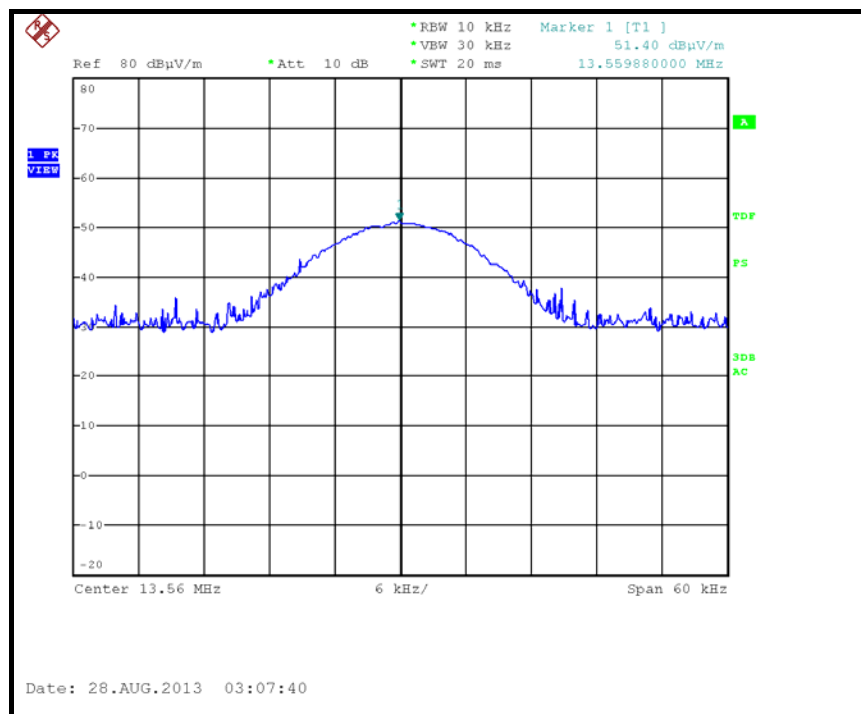
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	13.56	51.40	124.00	-72.60	1.00	114	31.50	19.90

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. Above limits have been translated by the formula

The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\mu\text{V/m} && 30\text{m} \\
 &= 84\text{dBuV/m} && 30\text{m} \\
 &= 84+20\log(30/3)^2 && 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 30MHz
INPUT POWER	3.8Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 73%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	27.12	35.90 QP	69.50	-33.60	1.00 H	145	15.90	20.00
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	27.12	35.80 QP	69.50	-33.70	1.00 V	332	15.80	20.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3.8Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 73%RH	TESTED BY	Martin Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	216.18	24.50 QP	46.00	-21.50	1.00 H	194	41.10	-16.60
2	379.17	34.50 QP	46.00	-11.50	2.25 H	17	45.60	-11.10
3	406.34	34.30 QP	46.00	-11.70	1.75 H	17	45.10	-10.80
4	433.50	30.30 QP	46.00	-15.70	1.49 H	159	40.30	-10.00
5	460.67	30.30 QP	46.00	-15.70	1.49 H	159	40.00	-9.70
6	569.33	31.70 QP	46.00	-14.30	2.00 H	171	39.70	-8.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	103.64	17.40 QP	43.50	-26.10	1.00 V	319	35.50	-18.10
2	134.68	17.60 QP	43.50	-25.90	1.25 V	307	32.40	-14.80
3	379.17	22.30 QP	46.00	-23.70	1.78 V	108	33.40	-11.10
4	406.34	23.30 QP	46.00	-22.70	1.00 V	258	34.10	-10.80
5	433.50	23.20 QP	46.00	-22.80	2.24 V	324	33.20	-10.00
6	487.83	21.90 QP	46.00	-24.10	1.00 V	248	31.20	-9.30

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 FREQUENCY STABILITY

4.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100040	Jul. 19, 2013	Jul. 18, 2014
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 10, 2013	Jun. 09, 2014

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

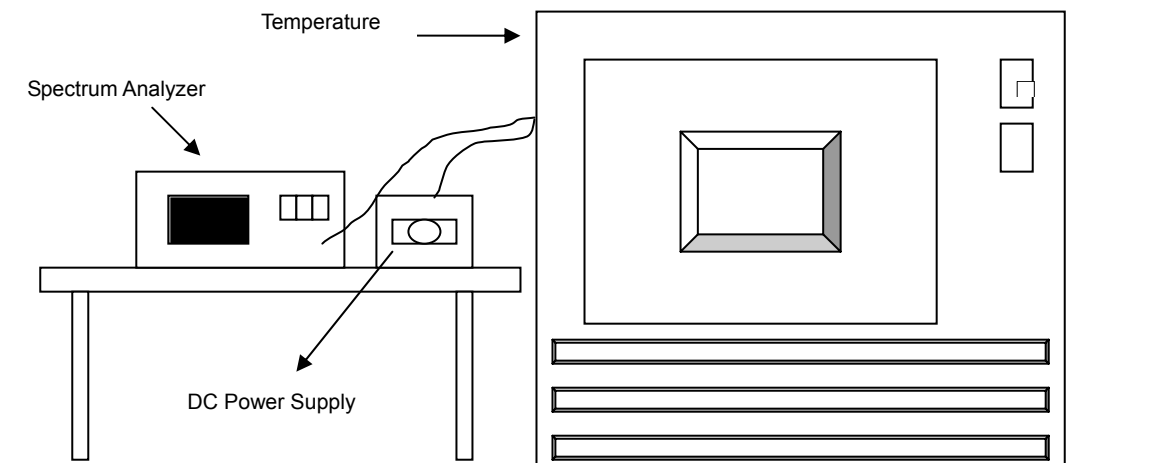
4.2.3 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITION

Same as Item 4.1.6.

4.2.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	3.9	13.559946	-0.00040	13.559955	-0.00033	13.559952	-0.00035	13.559961	-0.00029
40	3.9	13.559971	-0.00021	13.559976	-0.00018	13.559976	-0.00018	13.559967	-0.00024
30	3.9	13.56001	0.00007	13.559987	-0.00010	13.559999	-0.00001	13.559991	-0.00007
20	3.9	13.559992	-0.00006	13.560003	0.00002	13.559984	-0.00012	13.559987	-0.00010
10	3.9	13.560079	0.00058	13.56006	0.00044	13.560066	0.00049	13.560058	0.00043
0	3.9	13.559996	-0.00003	13.559989	-0.00008	13.559992	-0.00006	13.559977	-0.00017
-10	3.9	13.559997	-0.00022	13.559997	-0.00022	13.559954	-0.00034	13.559964	-0.00027
-20	3.9	13.559969	-0.00023	13.559972	-0.00021	13.559974	-0.00019	13.559973	-0.00020

FREQUENCY STABILITY VERSUS VOLTAGE									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	4.29	13.559995	-0.00004	13.560003	0.00002	13.559983	-0.00013	13.559986	-0.00010
	3.9	13.559992	-0.00006	13.560003	0.00002	13.559984	-0.00012	13.559987	-0.00010
	3.51	13.559994	-0.00004	13.560003	0.00002	13.559985	-0.00011	13.559989	-0.00008

4.3 20dB BANDWIDTH

4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

The 20dB bandwidth shall be specified in operating frequency band.

4.3.2 TEST INSTRUMENTS

Same as Item 4.1.2.

4.3.3 TEST PROCEDURE

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 1kHz RBW and 3kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP

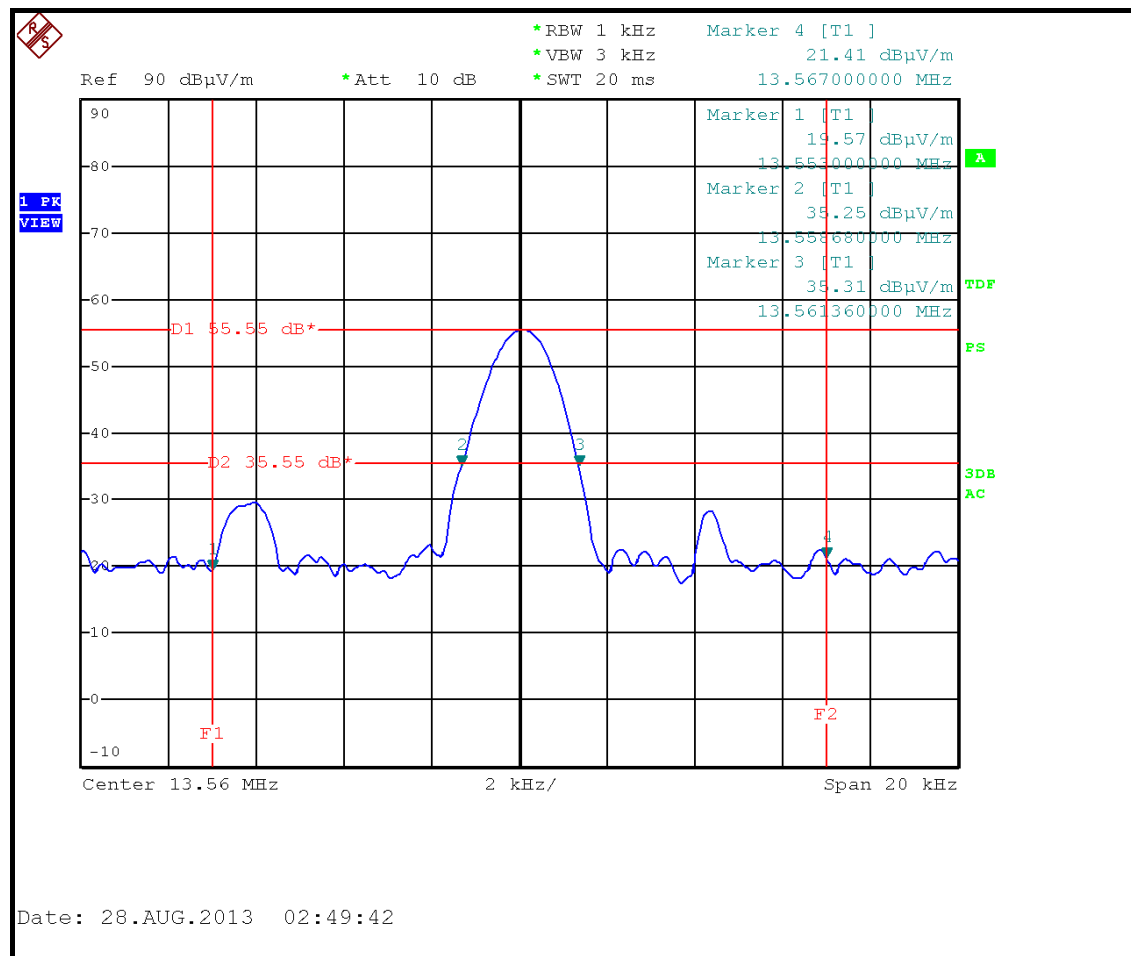
Same as Item 4.1.5.

4.3.6 EUT OPERATING CONDITION

Same as Item 4.1.6.

4.3.7 TEST RESULTS

20dBc point (Low)	20dBc point (High)	Operating frequency band (MHz)	PASS/FAIL
13.55868 MHz	13.56136 MHz	13.553~13.567	PASS



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

--- END ---