

FCC RF Test Report

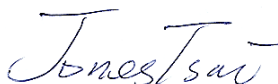
APPLICANT : Foxconn International Holdings Ltd.
EQUIPMENT : Data Card
BRAND NAME : AMBIT
MODEL NAME : NF2
MARKETIG NAME : M.2 module
FCC ID : RYQ-NF2
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Aug. 07, 2013 and testing was completed on Oct. 31, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : RYQ-NF2

Page Number : 1 of 34

Report Issued Date : Nov. 01, 2013

Report Version : Rev. 01



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	6
1.5 Modification of EUT	6
1.6 Testing Site	7
1.7 Applied Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Test Mode	8
2.2 Connection Diagram of Test System	9
2.3 Support Unit used in test configuration and system	9
3 TEST RESULT	10
3.1 Conducted Output Power Measurement	10
3.2 Radiated Spurious Emission Measurement	23
4 LIST OF MEASURING EQUIPMENT	33
5 UNCERTAINTY OF EVALUATION	34
APPENDIX A. SETUP PHOTOGRAPHS	
APPENDIX B. ORIGINAL REPORT	

[illegible]

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-132 (5.4) RSS-133 (6.4) RSS-139(6.4)	Conducted Output Power	Reporting Only	PASS	-
3.2	§2.1053 §22.917(a) §24.238(a) §27.53(c)(g)(h)	RSS-132 (5.5) RSS-133 (6.5.1) RSS-139 (6.5)	Radiated Spurious Emission (Band 4) (Band 13) (Band 17)	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 5.34 dB at 5012.000 MHz
3.2	§2.1053 §27.53(m)	-	Radiated Spurious Emission (Band 7)	$< 55 + 10\log_{10}(P[\text{Watts}])$		

1 General Description

1.1 Applicant

Foxconn International Holdings Ltd.

No. 4, Mingsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan

1.2 Manufacturer

Foxconn International Holdings Ltd.

No. 4, Mingsheng St., Tu-Cheng Dist., New Taipei City 23679, Taiwan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Data Card
Brand Name	AMBIT
Model Name	NF2
Marketing Name	M.2 module
FCC ID	RYQ-NF2
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE
HW Version	PR4.5
SW Version	FIH7160_MODEM_01.1338.03
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 7 : 2506.5 MHz ~ 2534.5 MHz and 2556 MHz ~ 2567.5 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 7 : 2626.5MHz ~ 2654.5 MHz and 2676 MHz ~ 2687.5 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	1.4MHz / 3MHz / 5MHz/ 10MHz (Band 5) 1.4MHz / 3MHz / 5MHz/ 10MHz / 15MHz / 20MHz (Band 2) 1.4MHz / 3MHz / 5MHz/ 10MHz / 15MHz / 20MHz (Band 4) 5MHz/ 10MHz / 15MHz / 20MHz (Band 7) 5MHz / 10MHz (Band 13) 5MHz / 10MHz (Band 17)
Maximum Output Power to Antenna	LTE Band 5 : 23.22 dBm LTE Band 2 : 22.81 dBm LTE Band 4 : 23.45 dBm LTE Band 7 : 23.30 dBm LTE Band 13 : 23.11 dBm LTE Band 17 : 23.27 dBm
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH07-HY	722060/4086B-1

1.7 Applied Standards

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

- ♦ 47 CFR Part 2, 22(H), 24(E), 27
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

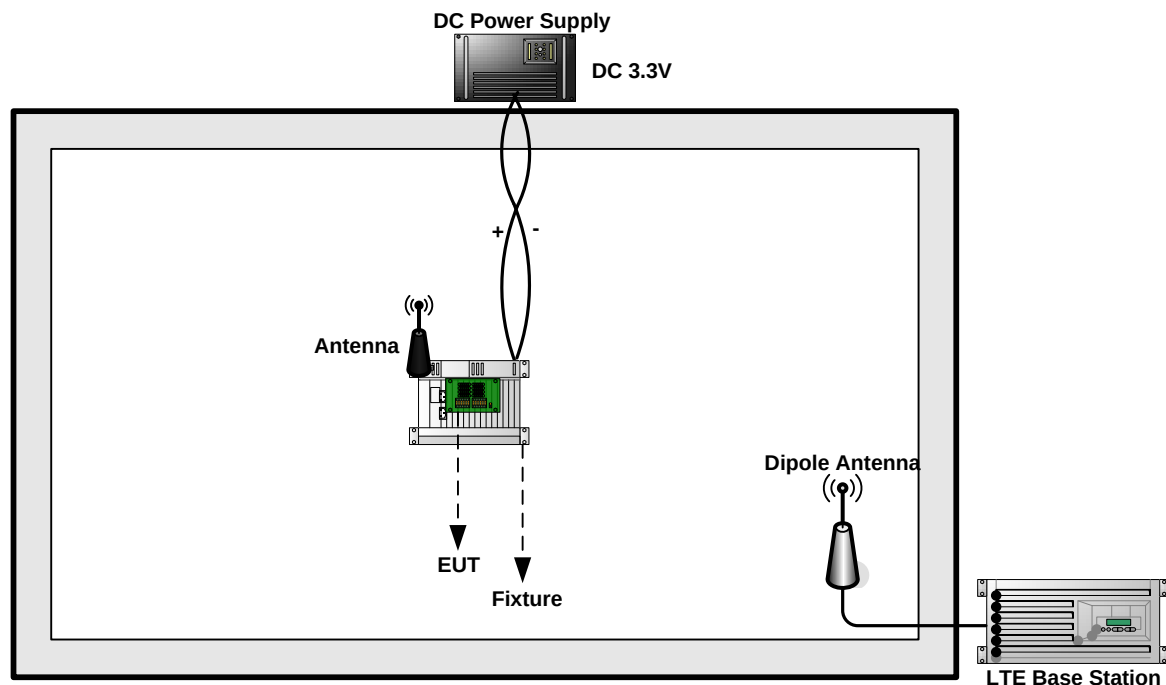
2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission: 30MHz to 10th harmonic.

Test Modes		
Band		Radiated TCs
LTE Band 4	BW 3MHz	■ LTE (RB Size 1) Link
LTE Band 7	BW 5MHz	■ LTE (RB Size 1) Link
LTE Band 13	BW 10MHz	■ LTE (RB Size 1) Link
LTE Band 17	BW 10MHz	■ LTE (RB Size 1) Link

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	Fixture	INTEL	NGFF Card Carrier	N/A	N/A	N/A

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

<LTE Band 5 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20450	20525	20600
Frequency (MHz)				829	836.5	844
10	QPSK	1	0	22.74	23.22	22.78
10	QPSK	1	24	22.49	22.74	22.31
10	QPSK	1	49	23.11	22.76	22.76
10	QPSK	25	0	22.59	22.94	22.45
10	QPSK	25	12	22.56	22.71	22.33
10	QPSK	25	24	22.90	22.76	22.71
10	QPSK	50	0	22.61	23.11	22.70
10	16QAM	1	0	22.11	22.47	22.19
10	16QAM	1	24	21.98	22.17	21.67
10	16QAM	1	49	22.47	22.15	22.19
10	16QAM	25	0	21.65	22.19	21.77
10	16QAM	25	12	21.44	21.74	21.60
10	16QAM	25	24	21.99	21.76	22.03
10	16QAM	50	0	21.76	22.03	22.04
Channel				20425	20525	20625
Frequency (MHz)				826.5	836.5	846.5
5	QPSK	1	0	22.48	22.79	22.61
5	QPSK	1	12	22.01	23.11	23.04
5	QPSK	1	24	22.76	22.58	22.47
5	QPSK	12	0	22.77	23.02	22.74
5	QPSK	12	6	22.80	23.09	22.83
5	QPSK	12	11	22.91	22.88	22.74
5	QPSK	25	0	22.83	22.91	22.65
5	16QAM	1	0	21.69	22.09	21.80
5	16QAM	1	12	22.14	22.40	22.36
5	16QAM	1	24	22.06	21.81	21.79
5	16QAM	12	0	21.79	22.34	22.00
5	16QAM	12	6	21.77	22.31	22.13
5	16QAM	12	11	22.04	22.01	22.11
5	16QAM	25	0	21.86	22.06	22.12



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20415	20525	20635
Frequency (MHz)				825.5	836.5	847.5
3	QPSK	1	0	22.47	23.11	22.48
3	QPSK	1	7	23.01	23.20	22.66
3	QPSK	1	14	22.49	22.57	22.13
3	QPSK	8	0	22.76	22.99	22.59
3	QPSK	8	4	22.68	22.97	22.71
3	QPSK	8	7	22.70	22.76	22.64
3	QPSK	15	0	22.64	22.91	22.59
3	16QAM	1	0	21.73	22.21	21.92
3	16QAM	1	7	22.13	22.40	22.16
3	16QAM	1	14	21.74	21.73	21.60
3	16QAM	8	0	21.65	22.14	21.96
3	16QAM	8	4	21.66	22.16	21.99
3	16QAM	8	7	21.70	21.85	21.86
3	16QAM	15	0	21.64	22.00	21.82
Channel				20407	20525	20643
Frequency (MHz)				824.7	836.5	848.3
1.4	QPSK	1	0	22.31	22.74	22.57
1.4	QPSK	1	2	22.44	22.84	22.62
1.4	QPSK	1	5	22.14	22.49	22.13
1.4	QPSK	3	0	22.29	22.70	22.40
1.4	QPSK	3	1	22.41	22.73	22.51
1.4	QPSK	3	2	22.51	22.61	22.17
1.4	QPSK	6	0	22.39	22.58	22.16
1.4	16QAM	1	0	21.80	22.13	21.98
1.4	16QAM	1	2	22.13	22.29	22.04
1.4	16QAM	1	5	21.80	21.85	21.49
1.4	16QAM	3	0	21.66	21.99	21.83
1.4	16QAM	3	1	21.74	22.14	21.77
1.4	16QAM	3	2	21.69	22.10	21.68
1.4	16QAM	6	0	21.72	22.06	21.65

<LTE Band 2 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18700	18900	19100
Frequency (MHz)				1860	1880	1900
20	QPSK	1	0	22.46	22.19	22.03
20	QPSK	1	49	22.54	22.27	22.15
20	QPSK	1	99	21.88	22.08	21.73
20	QPSK	50	0	22.30	22.19	21.89
20	QPSK	50	24	22.19	22.23	21.99
20	QPSK	50	49	22.31	22.04	21.58
20	QPSK	100	0	22.06	22.11	21.66
20	16QAM	1	0	21.66	21.03	20.64
20	16QAM	1	49	21.90	21.49	21.23
20	16QAM	1	99	20.81	20.62	20.44
20	16QAM	50	0	21.32	20.74	20.95
20	16QAM	50	24	21.44	21.14	20.92
20	16QAM	50	49	21.29	21.03	20.76
20	16QAM	100	0	21.20	21.00	20.79
Channel				18675	18900	19125
Frequency (MHz)				1857.5	1880	1902.5
15	QPSK	1	0	21.59	20.79	20.43
15	QPSK	1	37	21.28	21.03	21.05
15	QPSK	1	74	21.00	20.94	20.49
15	QPSK	36	0	21.48	20.89	20.87
15	QPSK	36	18	21.44	21.03	21.02
15	QPSK	36	37	21.22	20.78	20.70
15	QPSK	75	0	21.31	20.99	20.74
15	16QAM	1	0	21.04	20.54	19.98
15	16QAM	1	37	21.00	20.66	20.45
15	16QAM	1	74	20.71	20.11	19.72
15	16QAM	36	0	20.52	20.43	20.15
15	16QAM	36	18	20.58	20.35	20.31
15	16QAM	36	37	20.49	20.11	20.05
15	16QAM	75	0	20.39	20.15	20.13



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18650	18900	19150
Frequency (MHz)				1855	1880	1905
10	QPSK	1	0	22.81	22.11	21.79
10	QPSK	1	24	22.47	21.49	21.30
10	QPSK	1	49	22.38	21.79	21.74
10	QPSK	25	0	22.59	22.06	21.66
10	QPSK	25	12	22.41	21.74	21.14
10	QPSK	25	24	22.50	21.89	21.42
10	QPSK	50	0	22.61	21.88	21.60
10	16QAM	1	0	22.31	21.29	21.13
10	16QAM	1	24	22.30	20.79	20.33
10	16QAM	1	49	21.70	21.14	21.30
10	16QAM	25	0	21.64	20.99	20.64
10	16QAM	25	12	21.37	20.68	20.20
10	16QAM	25	24	21.66	20.82	20.71
10	16QAM	50	0	22.01	21.01	20.81
Channel				18625	18900	19175
Frequency (MHz)				1852.5	1880	1907.5
5	QPSK	1	0	22.52	21.26	20.99
5	QPSK	1	12	22.31	21.65	21.19
5	QPSK	1	24	21.99	21.15	20.71
5	QPSK	12	0	22.48	21.49	21.13
5	QPSK	12	6	22.34	21.58	21.22
5	QPSK	12	11	22.11	21.60	21.06
5	QPSK	25	0	22.13	21.43	21.11
5	16QAM	1	0	21.58	20.44	20.24
5	16QAM	1	12	21.55	20.80	20.59
5	16QAM	1	24	21.14	20.29	20.14
5	16QAM	12	0	21.41	20.45	20.33
5	16QAM	12	6	21.28	20.51	20.41
5	16QAM	12	11	21.05	20.39	20.32
5	16QAM	25	0	21.12	20.44	20.09



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				18615	18900	19185
Frequency (MHz)				1851.5	1880	1908.5
3	QPSK	1	0	22.41	20.72	20.49
3	QPSK	1	7	22.30	21.13	20.77
3	QPSK	1	14	21.77	20.58	20.31
3	QPSK	8	0	22.24	20.85	20.70
3	QPSK	8	4	22.12	20.97	20.58
3	QPSK	8	7	21.58	20.80	20.52
3	QPSK	15	0	21.63	20.91	20.61
3	16QAM	1	0	21.27	20.17	20.07
3	16QAM	1	7	21.30	20.64	20.39
3	16QAM	1	14	20.84	20.15	19.90
3	16QAM	8	0	21.22	20.16	20.11
3	16QAM	8	4	21.05	20.23	20.03
3	16QAM	8	7	21.01	20.17	19.97
3	16QAM	15	0	20.99	20.13	19.99
Channel				18607	18900	19193
Frequency (MHz)				1850.7	1880	1909.3
1.4	QPSK	1	0	21.84	20.62	20.04
1.4	QPSK	1	2	22.00	20.89	20.39
1.4	QPSK	1	5	21.42	20.49	20.04
1.4	QPSK	3	0	21.76	20.72	20.23
1.4	QPSK	3	1	21.77	20.81	20.35
1.4	QPSK	3	2	21.77	20.88	20.34
1.4	QPSK	6	0	21.62	20.80	20.11
1.4	16QAM	1	0	21.10	20.07	19.68
1.4	16QAM	1	2	21.27	20.39	20.13
1.4	16QAM	1	5	20.77	20.05	19.85
1.4	16QAM	3	0	20.86	20.00	19.76
1.4	16QAM	3	1	20.97	19.98	19.82
1.4	16QAM	3	2	21.03	20.02	20.01
1.4	16QAM	6	0	21.07	19.99	19.84

<LTE Band 4 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20050	20175	20300
Frequency (MHz)				1720	1732.5	1745
20	QPSK	1	0	22.04	22.44	22.01
20	QPSK	1	49	22.49	22.79	22.55
20	QPSK	1	99	21.94	22.18	22.00
20	QPSK	50	0	22.28	22.44	22.47
20	QPSK	50	24	22.48	22.60	22.50
20	QPSK	50	49	22.51	22.43	22.13
20	QPSK	100	0	22.41	22.38	22.47
20	16QAM	1	0	21.30	21.79	21.40
20	16QAM	1	49	21.67	21.95	21.75
20	16QAM	1	99	21.44	21.70	21.31
20	16QAM	50	0	21.30	21.44	21.66
20	16QAM	50	24	21.41	21.73	21.50
20	16QAM	50	49	21.47	21.64	21.28
20	16QAM	100	0	21.40	21.62	21.44
Channel				20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	22.17	22.11	23.45
15	QPSK	1	37	22.30	22.49	22.42
15	QPSK	1	74	22.01	22.00	23.08
15	QPSK	36	0	22.28	22.38	22.10
15	QPSK	36	18	22.31	22.44	21.71
15	QPSK	36	37	22.21	22.47	21.86
15	QPSK	75	0	22.19	22.41	22.02
15	16QAM	1	0	21.38	21.60	21.76
15	16QAM	1	37	21.59	22.23	21.61
15	16QAM	1	74	21.30	21.70	21.13
15	16QAM	36	0	21.33	21.90	21.51
15	16QAM	36	18	21.47	21.88	21.44
15	16QAM	36	37	21.40	21.79	21.19
15	16QAM	75	0	21.44	21.83	21.50



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20000	20175	20350
Frequency (MHz)				1715	1732.5	1750
10	QPSK	1	0	22.51	22.31	22.29
10	QPSK	1	24	22.03	21.91	21.97
10	QPSK	1	49	22.09	22.37	22.17
10	QPSK	25	0	22.10	21.96	22.13
10	QPSK	25	12	21.98	21.88	21.96
10	QPSK	25	24	21.90	22.21	22.11
10	QPSK	50	0	21.99	22.17	22.10
10	16QAM	1	0	21.88	21.77	21.59
10	16QAM	1	24	20.97	21.30	21.03
10	16QAM	1	49	21.75	21.89	21.54
10	16QAM	25	0	21.44	21.55	21.22
10	16QAM	25	12	21.09	21.40	21.06
10	16QAM	25	24	21.38	21.63	21.22
10	16QAM	50	0	21.40	21.65	21.24
Channel				19975	20175	20375
Frequency (MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	22.21	22.13	22.04
5	QPSK	1	12	22.31	22.34	22.26
5	QPSK	1	24	21.97	22.03	22.00
5	QPSK	12	0	22.28	22.19	22.21
5	QPSK	12	6	22.19	22.40	22.19
5	QPSK	12	11	22.13	22.41	22.16
5	QPSK	25	0	22.09	22.13	22.11
5	16QAM	1	0	21.44	21.44	21.18
5	16QAM	1	12	21.49	21.96	21.49
5	16QAM	1	24	21.08	21.44	21.11
5	16QAM	12	0	21.29	21.59	21.26
5	16QAM	12	6	21.28	21.66	21.23
5	16QAM	12	11	21.20	21.67	21.18
5	16QAM	25	0	21.27	21.70	21.25



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				19965	20175	20385
Frequency (MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	22.41	22.14	22.07
3	QPSK	1	7	22.60	22.41	22.27
3	QPSK	1	14	22.01	22.14	22.06
3	QPSK	8	0	22.33	22.34	22.07
3	QPSK	8	4	22.18	22.39	22.14
3	QPSK	8	7	22.16	22.26	22.03
3	QPSK	15	0	22.19	22.17	22.00
3	16QAM	1	0	21.40	21.44	21.09
3	16QAM	1	7	21.66	21.87	21.44
3	16QAM	1	14	21.23	21.59	21.16
3	16QAM	8	0	21.44	21.50	21.27
3	16QAM	8	4	21.48	21.58	21.31
3	16QAM	8	7	21.33	21.63	21.09
3	16QAM	15	0	21.40	21.55	21.14
Channel				19957	20175	20393
Frequency (MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	22.21	22.17	22.03
1.4	QPSK	1	2	22.43	22.47	22.14
1.4	QPSK	1	5	22.11	22.14	21.99
1.4	QPSK	3	0	22.19	22.16	21.97
1.4	QPSK	3	1	22.29	22.19	22.02
1.4	QPSK	3	2	22.25	22.33	22.11
1.4	QPSK	6	0	22.25	22.15	22.04
1.4	16QAM	1	0	21.52	21.51	21.13
1.4	16QAM	1	2	21.77	21.79	21.44
1.4	16QAM	1	5	21.38	21.70	21.20
1.4	16QAM	3	0	21.42	21.55	21.15
1.4	16QAM	3	1	21.50	21.63	21.17
1.4	16QAM	3	2	21.44	21.70	21.20
1.4	16QAM	6	0	21.39	21.64	21.29

<LTE Band 7 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20890	21020	
Frequency (MHz)				2514	2527	
20	QPSK	1	0	22.49	22.04	
20	QPSK	1	49	23.11	22.61	
20	QPSK	1	99	22.47	22.00	
20	QPSK	50	0	22.76	22.43	
20	QPSK	50	24	22.81	22.51	
20	QPSK	50	49	22.90	22.33	
20	QPSK	100	0	22.73	22.21	
20	16QAM	1	0	21.44	21.13	
20	16QAM	1	49	22.08	22.16	
20	16QAM	1	99	21.60	21.42	
20	16QAM	50	0	21.72	21.46	
20	16QAM	50	24	21.77	21.80	
20	16QAM	50	49	21.68	21.49	
20	16QAM	100	0	21.75	21.66	
Channel				20865	21045	21375
Frequency (MHz)				2511.5	2529.5	2562.5
15	QPSK	1	0	22.17	22.21	22.07
15	QPSK	1	37	22.95	22.47	22.39
15	QPSK	1	74	22.16	22.00	22.01
15	QPSK	36	0	22.60	22.46	22.44
15	QPSK	36	18	22.71	22.39	22.41
15	QPSK	36	37	22.52	22.41	22.07
15	QPSK	75	0	22.51	22.33	22.26
15	16QAM	1	0	21.46	21.03	21.50
15	16QAM	1	37	22.08	21.88	21.91
15	16QAM	1	74	21.36	21.25	21.13
15	16QAM	36	0	21.49	21.50	21.60
15	16QAM	36	18	21.75	21.51	21.49
15	16QAM	36	37	21.56	21.36	21.44
15	16QAM	75	0	21.43	21.27	21.56



BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				20840	21070	21400
Frequency (MHz)				2509	2532	2565
10	QPSK	1	0	22.44	22.47	22.48
10	QPSK	1	24	22.17	22.04	21.96
10	QPSK	1	49	22.48	22.28	22.01
10	QPSK	25	0	22.40	22.17	22.26
10	QPSK	25	12	22.17	22.00	22.00
10	QPSK	25	24	22.33	22.01	21.96
10	QPSK	50	0	22.49	21.99	22.02
10	16QAM	1	0	21.46	21.56	21.77
10	16QAM	1	24	21.00	21.17	21.30
10	16QAM	1	49	21.56	21.66	21.40
10	16QAM	25	0	21.43	21.43	21.44
10	16QAM	25	12	21.11	21.00	21.20
10	16QAM	25	24	21.30	21.35	21.33
10	16QAM	50	0	21.28	21.32	21.45
Channel				20815	21095	21425
Frequency (MHz)				2506.5	2534.5	2567.5
5	QPSK	1	0	23.30	22.19	22.46
5	QPSK	1	12	22.87	22.40	22.70
5	QPSK	1	24	22.51	22.06	22.10
5	QPSK	12	0	22.59	22.19	22.44
5	QPSK	12	6	22.74	22.33	22.43
5	QPSK	12	11	22.63	22.30	22.30
5	QPSK	25	0	22.46	22.28	22.19
5	16QAM	1	0	21.45	21.47	21.84
5	16QAM	1	12	21.77	21.81	22.06
5	16QAM	1	24	21.50	21.33	21.70
5	16QAM	12	0	21.66	21.40	21.77
5	16QAM	12	6	21.83	21.50	21.96
5	16QAM	12	11	21.80	21.43	21.76
5	16QAM	25	0	21.61	21.36	21.76

<LTE Band 13 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel					23230	
Frequency (MHz)					782	
10	QPSK	1	0		22.94	
10	QPSK	1	24		22.60	
10	QPSK	1	49		23.11	
10	QPSK	25	0		22.96	
10	QPSK	25	12		22.57	
10	QPSK	25	24		22.54	
10	QPSK	50	0		22.70	
10	16QAM	1	0		22.50	
10	16QAM	1	24		21.63	
10	16QAM	1	49		22.70	
10	16QAM	25	0		21.88	
10	16QAM	25	12		21.58	
10	16QAM	25	24		21.66	
10	16QAM	50	0		21.76	
Channel				23205	23230	23255
Frequency (MHz)				779.5	782	784.5
5	QPSK	1	0	22.90	22.71	22.49
5	QPSK	1	12	22.79	22.60	22.65
5	QPSK	1	24	22.68	22.28	22.71
5	QPSK	12	0	22.83	22.48	22.44
5	QPSK	12	6	22.77	22.40	22.46
5	QPSK	12	11	22.80	22.41	22.56
5	QPSK	25	0	22.84	22.56	22.40
5	16QAM	1	0	22.20	22.08	21.79
5	16QAM	1	12	22.54	22.00	22.03
5	16QAM	1	24	22.16	21.91	22.17
5	16QAM	12	0	22.37	22.00	21.95
5	16QAM	12	6	22.16	21.86	21.79
5	16QAM	12	11	22.00	21.79	22.03
5	16QAM	25	0	22.12	21.55	21.90

<LTE Band 17 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				23780	23790	23800
Frequency (MHz)				709	710	711
10	QPSK	1	0	22.96	22.98	23.01
10	QPSK	1	24	22.19	22.44	22.58
10	QPSK	1	49	23.00	23.10	23.27
10	QPSK	25	0	22.94	22.99	23.00
10	QPSK	25	12	22.65	22.80	22.74
10	QPSK	25	24	22.99	22.97	23.15
10	QPSK	50	0	22.83	23.01	23.11
10	16QAM	1	0	22.16	22.30	22.19
10	16QAM	1	24	21.66	21.81	21.80
10	16QAM	1	49	22.49	22.70	22.76
10	16QAM	25	0	21.93	22.01	22.00
10	16QAM	25	12	21.68	21.72	21.83
10	16QAM	25	24	22.00	22.07	22.24
10	16QAM	50	0	21.99	22.13	22.20
Channel				23755	23790	23825
Frequency (MHz)				706.5	710	713.5
5	QPSK	1	0	22.88	22.73	22.77
5	QPSK	1	12	23.27	23.16	23.25
5	QPSK	1	24	22.71	22.76	23.14
5	QPSK	12	0	23.11	22.89	23.00
5	QPSK	12	6	23.16	23.13	23.08
5	QPSK	12	11	23.14	23.04	23.14
5	QPSK	25	0	23.00	23.07	23.00
5	16QAM	1	0	22.20	21.88	22.01
5	16QAM	1	12	22.61	22.57	22.60
5	16QAM	1	24	22.11	22.16	22.43
5	16QAM	12	0	22.21	22.10	22.04
5	16QAM	12	6	22.27	22.29	22.35
5	16QAM	12	11	22.15	22.17	22.58
5	16QAM	25	0	22.19	22.20	22.40

Note: maximum average power for LTE.

3.2 Radiated Spurious Emission Measurement

3.2.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004.

For Band 2, 4, 5, 13, 17

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

For Band 7

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

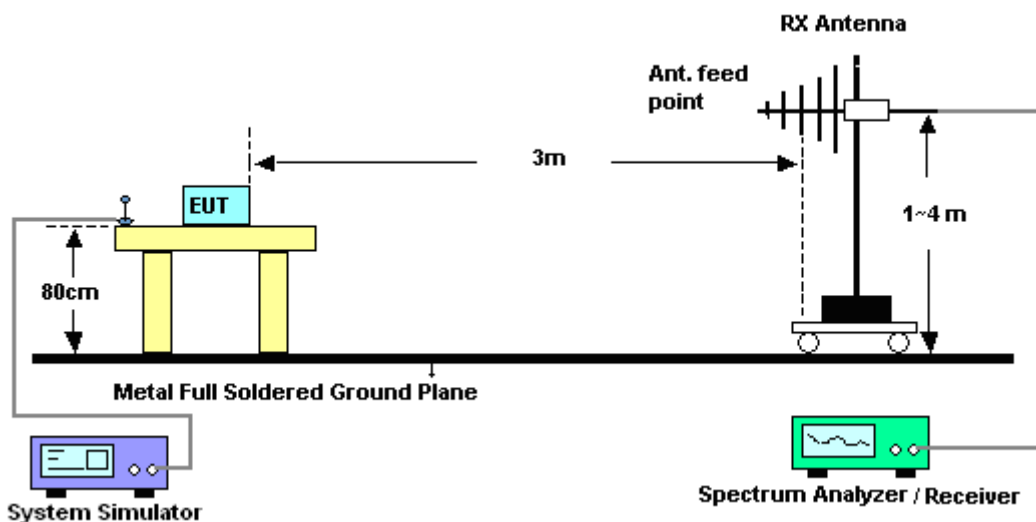
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
= -13dBm.

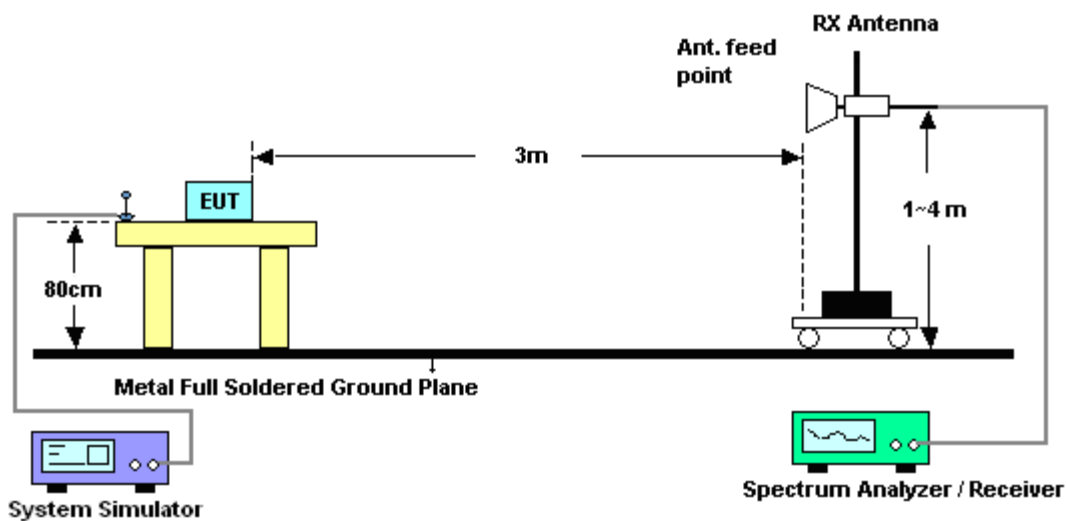
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.2.4 Test Setup

For radiated emissions from 30MHz to 1GHz

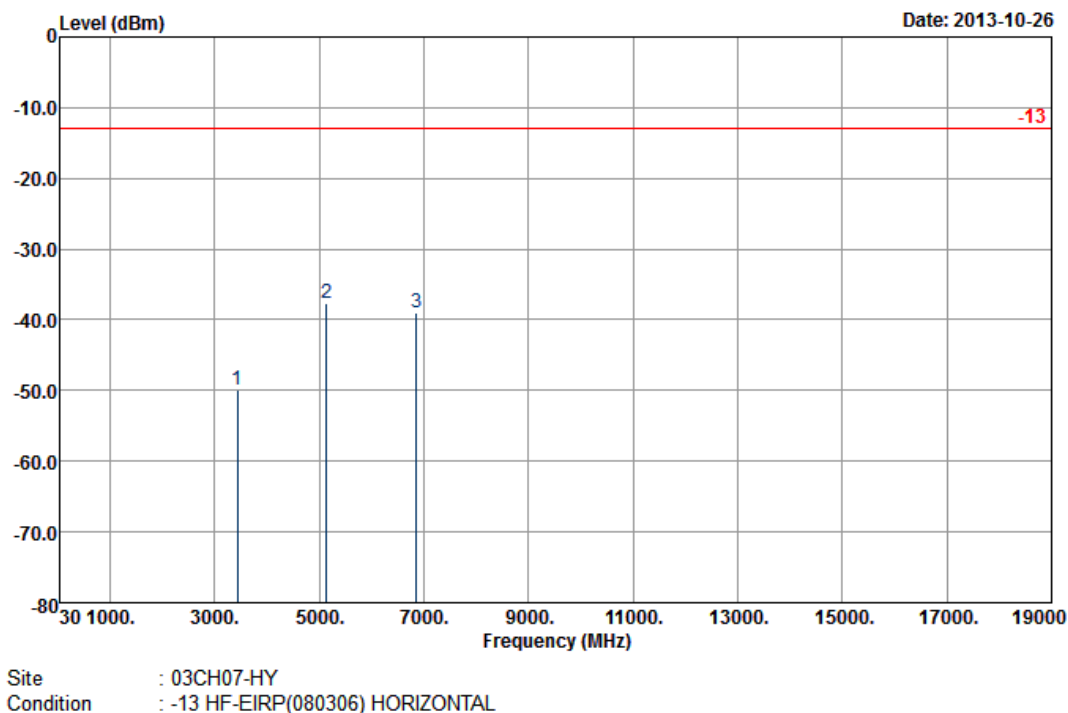


For radiated emissions above 1GHz



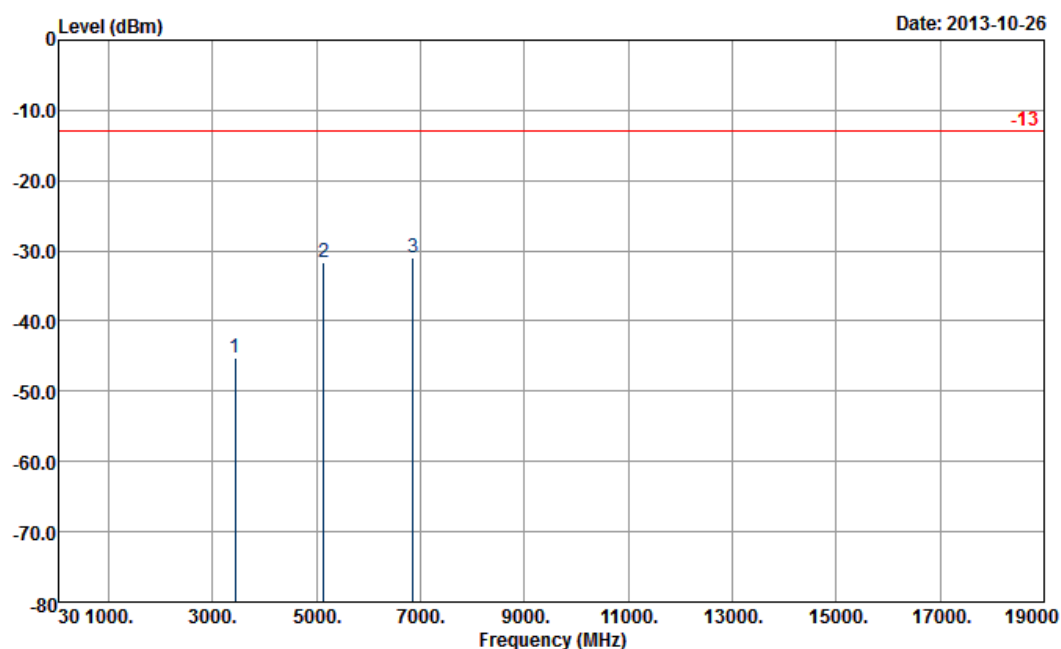
3.2.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 4	Temperature :	22~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 7	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3424	-50.02	-13	-37.02	-64.43	-51.7	4.48	8.31	H	Pass
5136	-37.61	-13	-24.61	-56.09	-40.1	5.332	9.98	H	Pass
6848	-39.01	-13	-26.01	-64.81	-42.1	6.1	11.34	H	Pass

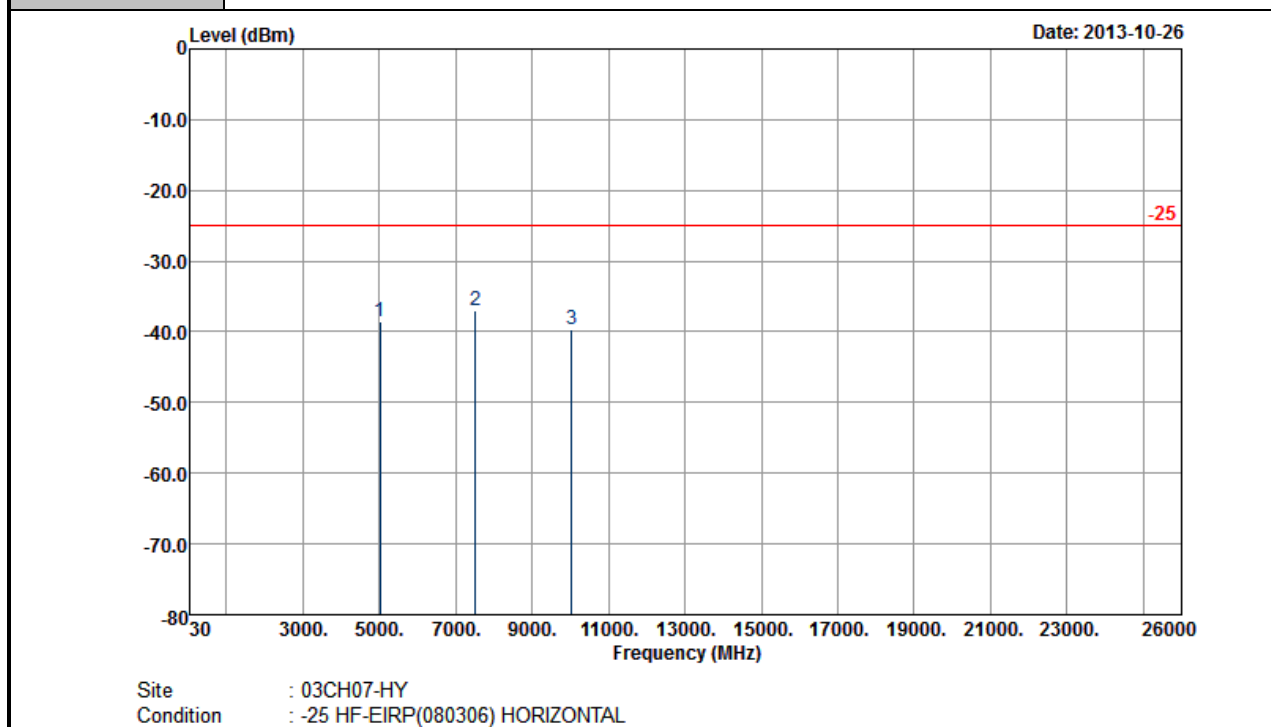
Band :	LTE Band 4	Temperature :	22~25°C
Test Mode :	3MHz QPSK RB Size 1 Offset 7	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) VERTICAL

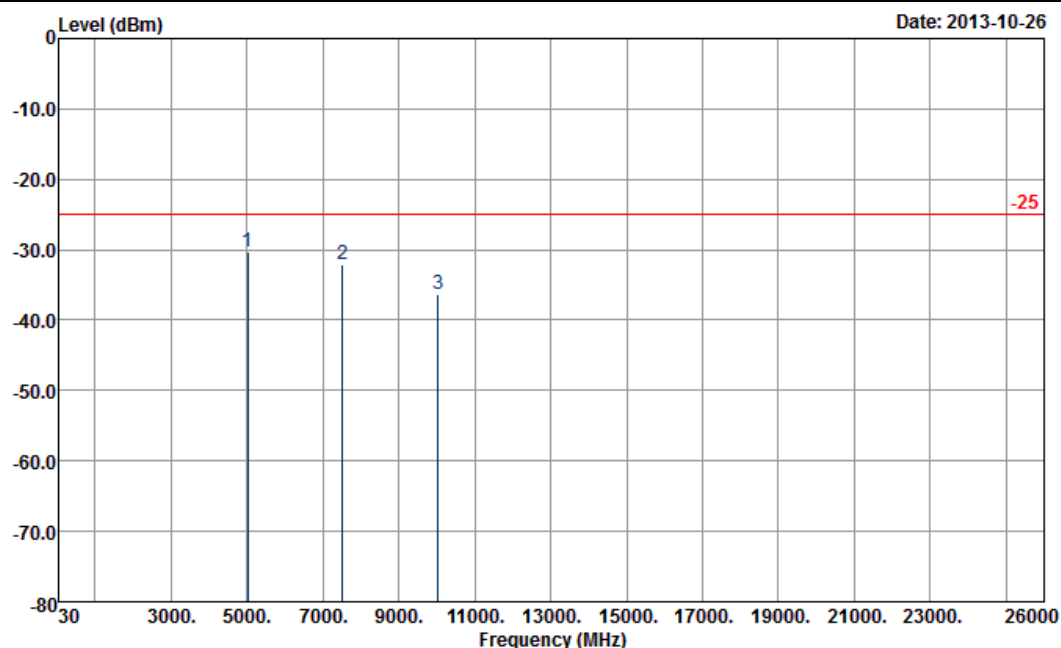
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3424	-45.22	-13	-32.22	-60.9	-46.9	4.48	8.31	V	Pass
5136	-31.61	-13	-18.61	-50.18	-34.1	5.332	9.98	V	Pass
6848	-31.01	-13	-18.01	-56.32	-34.1	6.1	11.34	V	Pass

Band :	LTE Band 7	Temperature :	22~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 12	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



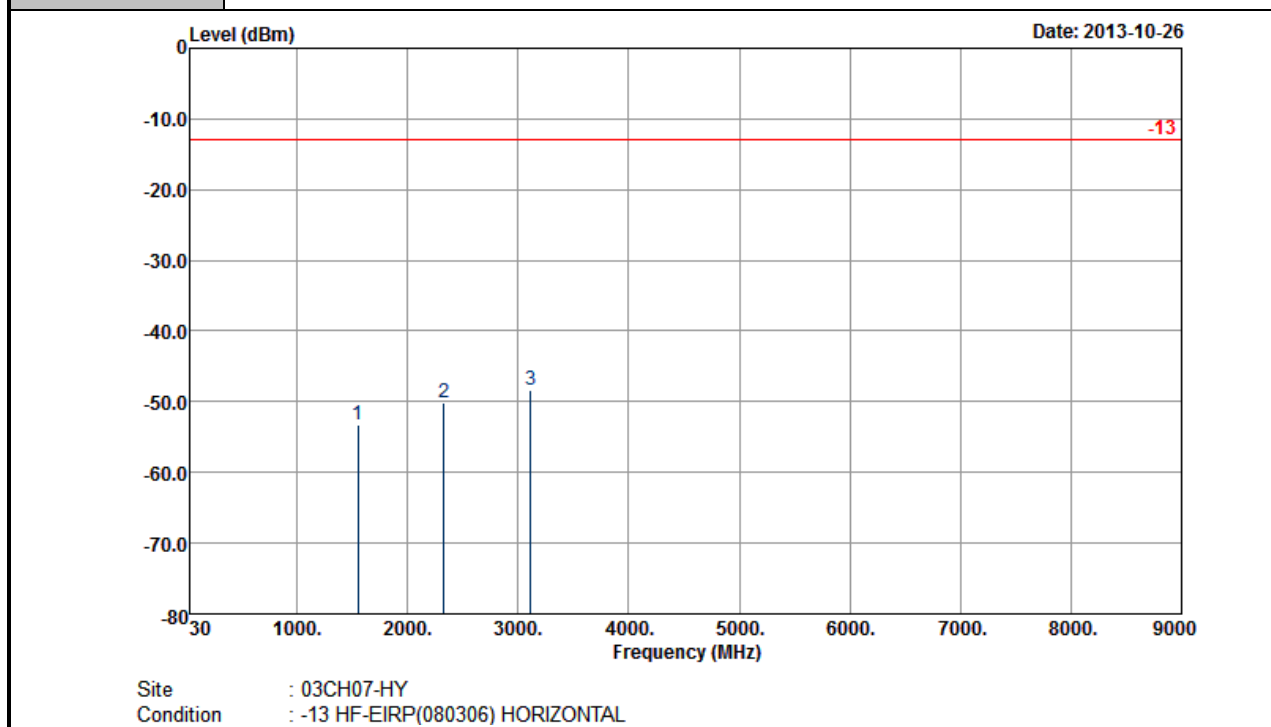
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5012	-38.54	-25	-13.54	-56.53	-42.1	6.78	10.34	H	Pass
7516	-37.06	-25	-12.06	-64.43	-40.1	9.22	12.26	H	Pass
10028	-39.56	-25	-14.56	-68.69	-43.9	8.51	12.85	H	Pass

Band :	LTE Band 7	Temperature :	22~25°C
Test Mode :	5MHz QPSK RB Size 1 Offset 12	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



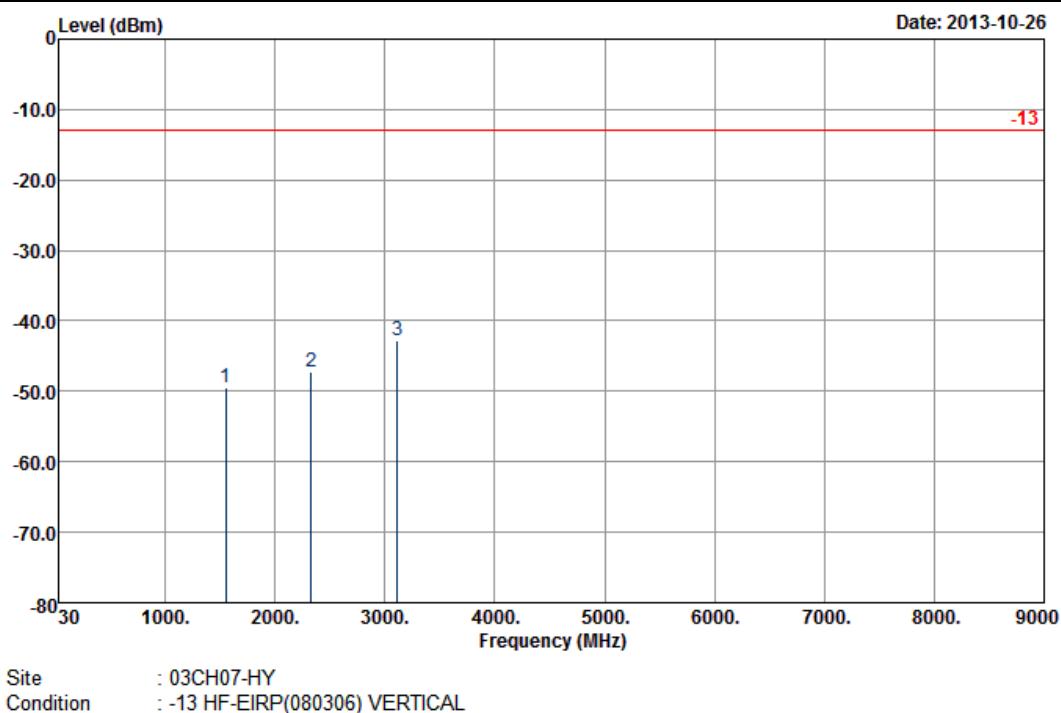
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5012	-30.34	-25	-5.34	-48.69	-33.9	6.78	10.34	V	Pass
7516	-32.16	-25	-7.16	-58.68	-35.2	9.22	12.26	V	Pass
10028	-36.36	-25	-11.36	-64.3	-40.7	8.51	12.85	V	Pass

Band :	LTE Band 13	Temperature :	22~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



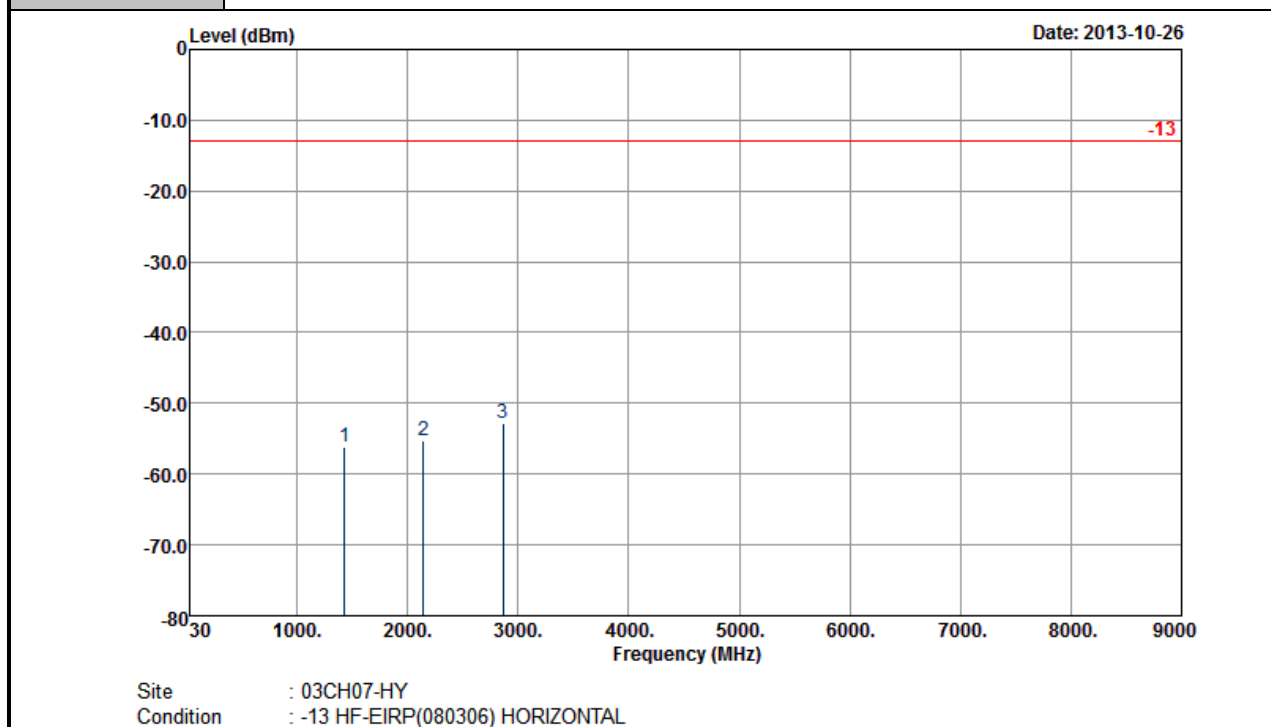
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1555	-53.37	-13	-40.37	-61.9	-55.2	1.51	5.49	H	Pass
2332	-50.08	-13	-37.08	-62.41	-52	1.98	6.05	H	Pass
3112	-48.28	-13	-35.28	-62.13	-51.3	2.39	7.56	H	Pass

Band :	LTE Band 13	Temperature :	22~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



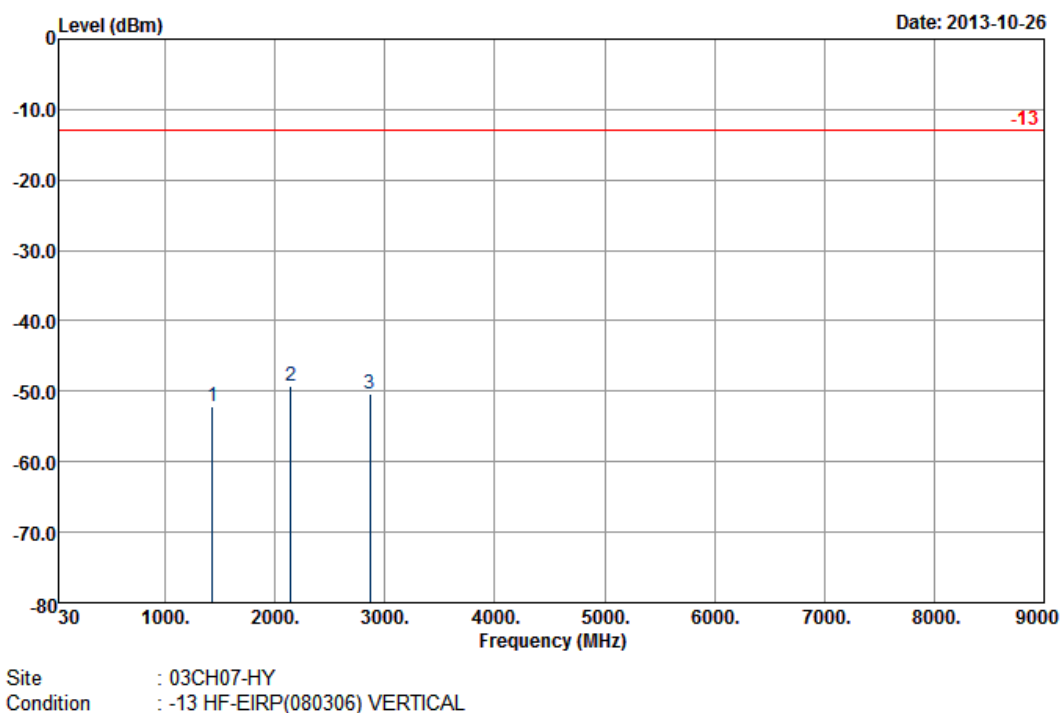
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1555	-49.57	-13	-36.57	-60.25	-51.4	1.51	5.49	V	Pass
2332	-47.18	-13	-34.18	-60.75	-49.1	1.98	6.05	V	Pass
3112	-42.68	-13	-29.68	-58.42	-45.7	2.39	7.56	V	Pass

Band :	LTE Band 17	Temperature :	22~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 49	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1429	-56.05	-13	-43.05	-64.19	-58	1.53	5.63	H	Pass
2146	-55.35	-13	-42.35	-66.77	-57.4	1.88	6.08	H	Pass
2863	-52.81	-13	-39.81	-66.48	-55.5	2.27	7.11	H	Pass

Band :	LTE Band 17	Temperature :	22~25°C
Test Mode :	10MHz QPSK RB Size 1 Offset 49	Relative Humidity :	51~54%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1429	-52.15	-13	-39.15	-62.62	-54.1	1.53	5.63	V	Pass
2146	-49.15	-13	-36.15	-62.52	-51.2	1.88	6.08	V	Pass
2863	-50.41	-13	-37.41	-65.73	-53.1	2.27	7.11	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201026480	30MHz~2.7GHz SISO(FDD Band	Jan. 04, 2013	Oct. 31, 2013	Jan. 03, 2014	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz~30GHz	Nov. 30, 2012	Oct. 26, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 10, 2013	Oct. 26, 2013	Oct. 09, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 22, 2013	Oct. 26, 2013	Aug. 21, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30MHz~1GHz	Feb. 26, 2013	Oct. 26, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Dec. 01, 2012	Oct. 26, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18G~40G	Sep. 28, 2012	Oct. 26, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Oct. 26, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Oct. 26, 2013	N/A	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
---	------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
---	------



Appendix B. Original Report

Please refer to Sporton report number FG352141B as below.