

FCC RF Test Report

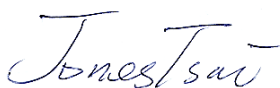
APPLICANT : Wistron NeWeb Corporation
EQUIPMENT : LGA Module
BRAND NAME : Wistron Neweb Corporation
MODEL NAME : M14Q2FG, M14Q2F
FCC ID : NKRM18Q2
STANDARD : 47 CFR Part 2, 22(H), 24(E), 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)

This is a variant report which is only valid together with the original test report. The product was received on Jun. 25, 2016 and completely tested on Jun. 30, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 and the testing has shown the tested sample to be in 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 District, Tao Yuan City, Taiwan, R.O.C.



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APPENDIX A. TEST RESULTS OF CONDUCTED TEST	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION					ISSUED DATE
FG622607-03B	Rev. 01	This is a variant report. The original report which can be referred to Sporton Report No. FG622607					Jul. 07, 2016
		Detail changes list as below :					
		Project no.	Device	Type	Current Spec		
						GPS	
		622607	M18Q2F	Parent	CAT 4 LTE(B2/4/5/12) + UMTS(B2/5)	No	
		622607-03	M14Q2F	Variant	CAT 1 LTE(B2/4/5/12) + UMTS(B2/5)	No	
622607-03	M14Q2FG	Variant	CAT 1 LTE(B2/4/5/12) + UMTS(B2/5) + GPS	Yes			
For the changes, the conducted output power case was verified.							

**SUMMARY OF TEST RESULT**

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-

1 General Description

1.1 Applicant

Wistron NeWeb Corporation

20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C

1.2 Manufacturer

Wistron NeWeb Corporation

20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	LGA Module
Brand Name	Wistron Neweb Corporation
Model Name	M14Q2FG, M14Q2F
FCC ID	NKRM18Q2
EUT supports Radios application	WCDMA/HSPA/LTE
HW Version	v1.0
SW Version	M14Q2_v12.04
EUT Stage	Production Unit

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz
Rx Frequency	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz
Bandwidth	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 2 : 22.96 dBm LTE Band 4 : 23.25 dBm LTE Band 5 : 22.96 dBm LTE Band 12 : 23.08 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 Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH02-HY

1.7 Applicable 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-D-2010
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	5	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
	12	✓	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
Note	- The mark "✓" means that this configuration is chosen for testing - The mark "-" means that this bandwidth is not supported.														



2.2 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3



LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

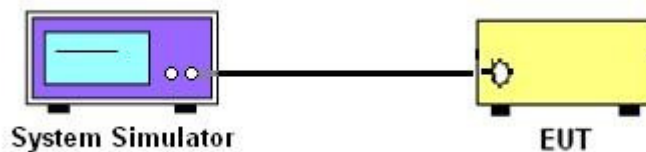
3 Conducted Test Items

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 Conducted Output Power



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power

3.4.1 Description of the Conducted Output Power Measurement

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

3.4.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Radio Communication	Anritsu	MT8820C	6201341950	N/A	Dec. 18, 2015	Jun. 30, 2016	Dec. 17, 2016	Conducted (TH02-HY)



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	22.10	22.20	22.21
20	1	49		22.57	22.56	22.77
20	1	99		22.00	22.25	22.23
20	50	0		21.49	21.42	21.64
20	50	24		21.51	21.56	21.68
20	50	50		21.32	21.54	21.46
20	100	0		21.33	21.49	21.44
20	1	0	16-QAM	22.43	22.46	22.54
20	1	49		21.39	22.08	21.57
20	1	99		21.03	21.32	21.30
20	50	0		20.46	20.51	20.33
20	50	24		20.38	20.45	20.37
20	50	50		20.33	20.48	20.22
20	100	0		20.25	20.33	20.26
15	1	0	QPSK	22.23	22.13	22.32
15	1	37		22.58	22.87	22.64
15	1	74		22.20	22.31	22.43
15	36	0		21.42	21.50	21.63
15	36	20		21.58	21.64	21.77
15	36	39		21.45	21.48	21.44
15	75	0		21.36	21.41	21.35
15	1	0	16-QAM	22.41	22.37	21.62
15	1	37		21.35	21.84	21.57
15	1	74		21.34	21.58	21.25
15	36	0		20.36	20.48	20.29
15	36	20		20.28	20.43	20.27
15	36	39		20.26	20.35	20.26
15	75	0		20.17	20.24	20.15



LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.16	22.44	22.34
10	1	25		22.72	22.96	22.81
10	1	49		22.00	22.35	22.25
10	25	0		21.32	21.58	21.60
10	25	12		21.43	21.63	21.55
10	25	25		21.47	21.57	21.52
10	50	0		21.57	21.54	21.54
10	1	0	16-QAM	21.03	21.08	21.06
10	1	25		21.76	21.33	21.33
10	1	49		21.01	21.12	21.03
10	25	0		20.61	20.57	20.70
10	25	12		20.46	20.64	20.67
10	25	25		20.41	20.59	20.54
10	50	0		20.27	20.44	20.39
5	1	0	QPSK	22.20	22.41	22.45
5	1	12		22.52	22.49	22.46
5	1	24		22.32	22.21	22.06
5	12	0		21.32	21.43	21.60
5	12	7		21.41	21.54	21.55
5	12	13		21.44	21.50	21.49
5	25	0		21.46	21.50	21.50
5	1	0	16-QAM	21.04	21.18	21.34
5	1	12		21.55	21.53	21.30
5	1	24		21.14	21.24	21.21
5	12	0		20.38	20.60	20.40
5	12	7		20.56	20.70	20.60
5	12	13		20.58	20.46	20.48
5	25	0		20.43	20.57	20.34



LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.23	22.47	22.39
3	1	8		22.40	22.51	22.37
3	1	14		22.30	22.24	22.06
3	8	0		21.32	21.43	21.53
3	8	4		21.31	21.50	21.44
3	8	7		21.32	21.46	21.37
3	15	0		21.28	21.47	21.42
3	1	0	16-QAM	21.13	21.32	21.42
3	1	8		21.17	21.20	21.28
3	1	14		21.16	21.27	21.30
3	8	0		20.36	20.60	20.30
3	8	4		20.33	20.61	20.47
3	8	7		20.43	20.48	20.53
3	15	0		20.27	20.46	20.52
1.4	1	0	QPSK	22.27	22.52	22.34
1.4	1	3		22.22	22.58	22.52
1.4	1	5		22.45	22.51	22.47
1.4	3	0		22.43	22.53	22.53
1.4	3	1		22.47	22.57	22.54
1.4	3	3		22.48	22.57	22.51
1.4	6	0		21.40	21.51	21.50
1.4	1	0	16-QAM	21.25	21.33	21.43
1.4	1	3		21.86	21.33	21.37
1.4	1	5		21.19	21.29	21.28
1.4	3	0		21.67	21.48	21.45
1.4	3	1		21.66	21.66	21.55
1.4	3	3		21.69	21.77	21.58
1.4	6	0		20.44	20.56	20.40



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
20	1	0	QPSK	22.53	22.97	22.70
20	1	49		22.86	23.13	22.72
20	1	99		22.77	22.48	22.54
20	50	0		21.94	22.10	22.06
20	50	24		21.89	21.87	21.97
20	50	50		21.85	22.03	21.94
20	100	0		21.86	21.93	21.89
20	1	0	16-QAM	22.78	22.85	22.79
20	1	49		21.59	21.79	21.74
20	1	99		21.59	21.52	21.64
20	50	0		21.43	21.49	21.53
20	50	24		21.72	21.86	21.52
20	50	50		21.29	21.28	21.33
20	100	0		21.13	21.18	21.20
15	1	0	QPSK	22.71	22.77	22.68
15	1	37		23.08	23.11	23.13
15	1	74		22.81	22.82	22.71
15	36	0		21.91	21.97	22.02
15	36	20		21.81	21.98	22.00
15	36	39		21.96	21.96	21.94
15	75	0		21.86	21.94	21.89
15	1	0	16-QAM	22.72	22.99	22.82
15	1	37		21.44	21.58	21.33
15	1	74		21.52	21.39	21.30
15	36	0		21.12	21.03	21.22
15	36	20		20.72	20.99	21.10
15	36	39		20.93	21.03	20.99
15	75	0		20.84	20.92	21.06



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.60	22.68	22.60
10	1	25		23.16	23.22	23.25
10	1	49		22.43	22.70	22.89
10	25	0		21.85	21.92	21.98
10	25	12		21.90	21.93	22.03
10	25	25		21.80	22.03	21.97
10	50	0		21.82	21.96	21.95
10	1	0	16-QAM	21.56	21.47	21.74
10	1	25		21.52	21.78	21.79
10	1	49		21.63	21.37	21.74
10	25	0		21.00	20.93	21.15
10	25	12		20.69	20.95	20.98
10	25	25		20.80	20.97	20.90
10	50	0		20.78	20.89	20.93
5	1	0	QPSK	22.57	22.77	22.57
5	1	12		22.64	22.93	23.11
5	1	24		22.61	22.80	22.97
5	12	0		21.78	21.91	21.93
5	12	7		21.75	21.98	21.95
5	12	13		21.76	21.98	22.03
5	25	0		21.80	21.95	21.99
5	1	0	16-QAM	21.55	21.59	21.66
5	1	12		21.48	21.75	21.79
5	1	24		21.59	21.80	21.83
5	12	0		20.59	21.06	20.90
5	12	7		20.58	21.02	20.86
5	12	13		20.88	21.08	21.01
5	25	0		20.86	20.99	20.91



LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.92	22.73	22.89
3	1	8		22.81	22.90	22.95
3	1	14		22.56	22.88	22.96
3	8	0		21.94	21.99	21.92
3	8	4		21.89	21.92	21.98
3	8	7		21.89	21.89	21.93
3	15	0		21.86	21.89	21.90
3	1	0	16-QAM	21.65	21.73	21.71
3	1	8		21.60	21.82	21.73
3	1	14		21.68	21.92	21.91
3	8	0		20.63	20.79	20.69
3	8	4		20.90	21.01	20.79
3	8	7		20.91	20.98	20.67
3	15	0		20.85	20.94	20.83
1.4	1	0	QPSK	22.85	22.93	22.90
1.4	1	3		22.87	22.99	22.95
1.4	1	5		22.78	22.90	22.96
1.4	3	0		22.84	23.03	23.00
1.4	3	1		22.99	22.97	23.13
1.4	3	3		22.95	22.97	23.02
1.4	6	0		21.98	21.93	21.97
1.4	1	0	16-QAM	22.02	22.18	21.68
1.4	1	3		21.90	22.13	21.69
1.4	1	5		22.33	22.20	21.83
1.4	3	0		22.03	22.01	21.79
1.4	3	1		22.08	22.06	21.81
1.4	3	3		21.92	22.16	21.82
1.4	6	0		20.80	20.90	20.86



LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.49	22.45	22.25
10	1	25		22.74	22.96	22.58
10	1	49		22.59	22.51	22.31
10	25	0		21.77	21.72	21.67
10	25	12		21.70	21.69	21.65
10	25	25		21.65	21.72	21.60
10	50	0		21.78	21.69	21.70
10	1	0	16-QAM	21.52	21.42	21.30
10	1	25		21.76	21.49	21.53
10	1	49		21.59	21.38	21.13
10	25	0		20.71	20.60	20.50
10	25	12		20.65	20.58	20.56
10	25	25		20.60	20.61	20.53
10	50	0		20.52	20.46	20.41
5	1	0	QPSK	22.32	22.19	22.53
5	1	12		22.61	22.59	22.92
5	1	24		22.27	22.33	22.32
5	12	0		21.68	21.62	21.58
5	12	7		21.77	21.75	21.75
5	12	13		21.80	21.73	21.59
5	25	0		21.76	21.73	21.65
5	1	0	16-QAM	21.45	21.38	21.43
5	1	12		21.75	21.50	21.42
5	1	24		21.42	21.35	21.22
5	12	0		20.57	20.44	20.54
5	12	7		20.52	20.62	20.80
5	12	13		20.85	20.55	20.75
5	25	0		20.78	20.67	20.49



LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.53	22.61	22.53
3	1	8		22.66	22.58	22.62
3	1	14		22.32	22.45	22.32
3	8	0		21.77	21.56	21.67
3	8	4		21.77	21.66	21.65
3	8	7		21.74	21.69	21.68
3	15	0		21.70	21.63	21.53
3	1	0	16-QAM	21.78	21.48	21.37
3	1	8		21.48	21.44	21.68
3	1	14		21.41	21.34	21.30
3	8	0		20.65	20.64	20.51
3	8	4		20.83	20.74	20.45
3	8	7		20.70	20.80	20.79
3	15	0		20.53	20.55	20.51
1.4	1	0	QPSK	22.62	22.54	22.62
1.4	1	3		22.68	22.61	22.62
1.4	1	5		22.59	22.52	22.47
1.4	3	0		22.64	22.57	22.53
1.4	3	1		22.70	22.74	22.63
1.4	3	3		22.72	22.59	22.50
1.4	6	0		21.65	21.72	21.62
1.4	1	0	16-QAM	21.57	21.47	21.54
1.4	1	3		21.07	21.46	21.47
1.4	1	5		21.61	21.46	21.40
1.4	3	0		21.63	21.59	21.51
1.4	3	1		21.67	21.65	21.60
1.4	3	3		21.80	21.64	21.56
1.4	6	0		20.58	20.50	20.39



LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
10	1	0	QPSK	22.39	22.53	22.44
10	1	25		22.97	22.75	22.79
10	1	49		22.38	22.48	22.65
10	25	0		21.90	21.91	21.79
10	25	12		21.80	21.90	21.75
10	25	25		21.86	21.81	21.78
10	50	0		21.80	21.88	21.92
10	1	0	16-QAM	21.25	21.50	21.50
10	1	25		21.83	21.73	21.69
10	1	49		21.67	21.55	21.65
10	25	0		20.65	21.01	20.53
10	25	12		20.87	20.83	20.78
10	25	25		20.83	20.53	21.00
10	50	0		20.77	20.66	20.96
5	1	0	QPSK	22.41	22.83	22.49
5	1	12		22.76	23.03	22.63
5	1	24		22.60	22.44	22.62
5	12	0		21.83	21.92	21.77
5	12	7		21.83	21.83	21.91
5	12	13		21.78	21.81	21.96
5	25	0		21.76	21.88	21.85
5	1	0	16-QAM	21.39	21.58	21.59
5	1	12		21.67	21.68	21.74
5	1	24		21.69	21.51	21.63
5	12	0		20.71	21.07	20.72
5	12	7		20.67	20.67	20.85
5	12	13		20.78	20.76	20.78
5	25	0		20.73	20.84	20.80



LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
3	1	0	QPSK	22.55	22.74	22.81
3	1	8		22.68	22.86	23.08
3	1	14		22.61	22.36	23.00
3	8	0		21.76	21.83	22.02
3	8	4		21.83	21.79	21.98
3	8	7		21.79	21.79	21.97
3	15	0		21.77	21.77	21.90
3	1	0	16-QAM	21.48	21.59	21.72
3	1	8		21.56	21.60	22.15
3	1	14		21.79	21.66	21.83
3	8	0		20.47	20.56	20.68
3	8	4		20.97	20.62	20.74
3	8	7		20.97	20.90	20.65
3	15	0		20.70	20.74	20.75
1.4	1	0	QPSK	22.57	22.72	22.73
1.4	1	3		22.66	22.85	22.80
1.4	1	5		22.67	22.49	22.65
1.4	3	0		22.74	22.81	22.94
1.4	3	1		22.91	22.83	23.04
1.4	3	3		22.78	22.63	22.95
1.4	6	0		21.78	21.71	21.94
1.4	1	0	16-QAM	21.59	21.65	21.89
1.4	1	3		21.59	21.77	21.80
1.4	1	5		22.09	21.71	21.86
1.4	3	0		21.69	21.52	21.80
1.4	3	1		21.74	21.63	22.11
1.4	3	3		21.81	21.83	22.19
1.4	6	0		20.74	20.74	20.95