

Partial FCC Test Report

(PART 27)

Report No.: RF160401C24

FCC ID: NKR-CB1GSKV2C

Test Model: UMC-SKV2C

Received Date: Apr. 01, 2016

Test Date: Apr. 13, 2016

Issued Date: Apr. 21, 2016

Applicant: Wistron Neweb Corporation

Address: 20 Park Avenue II, Hsinchu Science Park

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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(R.O.C)

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Preface

To whom it may concern,

We hereby declare that the integrated module-end product (FCC ID NKR-CB1GSKV2C) is identical to the LTE module (FCC ID: NKR-IMG01) in the LTE layout of the circuit, components and transmit power levels. The difference is only to add a WLAN chipset into the integrated module-end product.

Based on the similarity between both modules, we hereby request to leverage the partial test data of FCC ID: NKR-IMG01 described as below to demonstrate the compliance of FCC ID NKR-CB1GSKV2C for part 27.

The list of reference details:

Equipment Class	Reference FCC ID	Report Section	
PCE	NKR-IMG01	3.6	Occupied Bandwidth
		3.7	Conducted Band Edge Measurement
		3.8	Conducted Spurious Emission
		3.9	Frequency Stability Temperature & Voltage

The spot check verification data:

FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	1. Meet the requirement of limit. 2. The test data of conducted output power is very similar to the reference module (FCC ID: NKR-IMG01).
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit.



A D T

Release Control Record

Issue No.	Description	Date Issued
RF160401C24	Original Release	Apr. 21, 2016

1 Certificate of Conformity

Product: Intergrate with certified module-End product

Brand: WNC

Test Model: UMC-SKV2C

Sample Status: Production Unit

Applicant: Wistron Neweb Corporation

Test Date: Apr. 13, 2016

Standards: FCC Part 27, Subpart C, L

The above equipment 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 : Gina Liu, **Date:** Apr. 21, 2016
Gina Liu / Specialist

Approved by : Stanley Wu, **Date:** Apr. 21, 2016
Stanley Wu / Assistant Manager

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -20.41 dB at 3465 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -18.87 dB at 30 MHz.

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	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Jan. 21, 2016	Jan. 20, 2017
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep. 03, 2015	Sep. 02, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Jan. 07, 2016	Jan. 06, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 18, 2016	Jan. 17, 2017
Double Ridge Guide Horn Antenna EMCO	3115	5619	Jan. 04, 2016	Jan. 03, 2017
Loop Antenna	EM-6879	269	Jul. 31, 2015	Jul. 30, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 184045	980116	Dec. 21, 2015	Dec. 20, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2015	Dec. 27, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor Anritsu	MA2411B	1207325	Sep. 21, 2015	Sep. 20, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 12, 2015	Oct. 11, 2016
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 12, 2015	Oct. 11, 2016
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 12, 2015	Oct. 11, 2016
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201300640	Aug. 10, 2015	Aug. 09, 2017

- Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The FCC Site Registration No. is 690701.
5. The IC Site Registration No. is IC7450F-10.

3 General Information

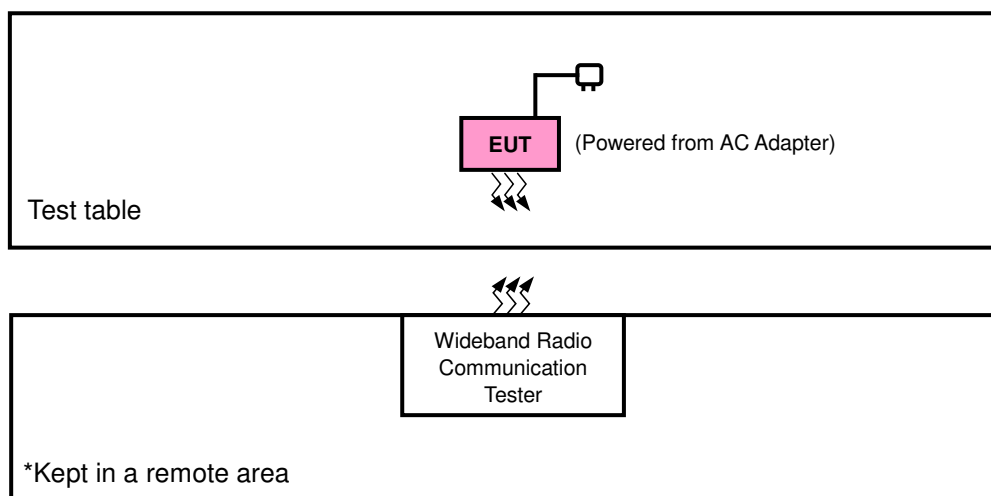
3.1 General Description of EUT

Product	Intergrate with certified module-End product	
Brand	WNC	
Test Model	UMC-SKV2C	
Status of EUT	Production Unit	
Power Supply Rating	5.0 Vdc (adapter)	
Modulation Type	LTE	QPSK, 16QAM
Frequency Range	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
Max. ERP Power	LTE Band 13 (Channel Bandwidth: 5 MHz)	228.03mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	246.04mW
Max. EIRP Power	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	219.79mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	229.09mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	288.40mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	221.26mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	252.76mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	254.10mW
Antenna Type	Fixed Internal Antenna	
Accessory Device	N/A	
Data Cable Supplied	N/A	

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Wideband Radio Communication Tester	R&S	CMW500	101802	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 acted as communication partners to transfer data.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP / EIRP	Radiated Emission
LTE Band 4	Z-plane	Z-axis
LTE Band 13	Z-plane	Z-axis

LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 14 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 74 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 99 RB Offset
-	Radiated Emission	20050 to 20300	20175	20 MHz	QPSK	1 RB / 99 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Radiated Emission	23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
						1 RB / 50 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v02r02

ANSI/TIA/EIA-603-D 2010

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 777-787 MHz band are limited to 3 watts ERP

4.1.2 Test Procedures

EIRP / ERP Measurement:

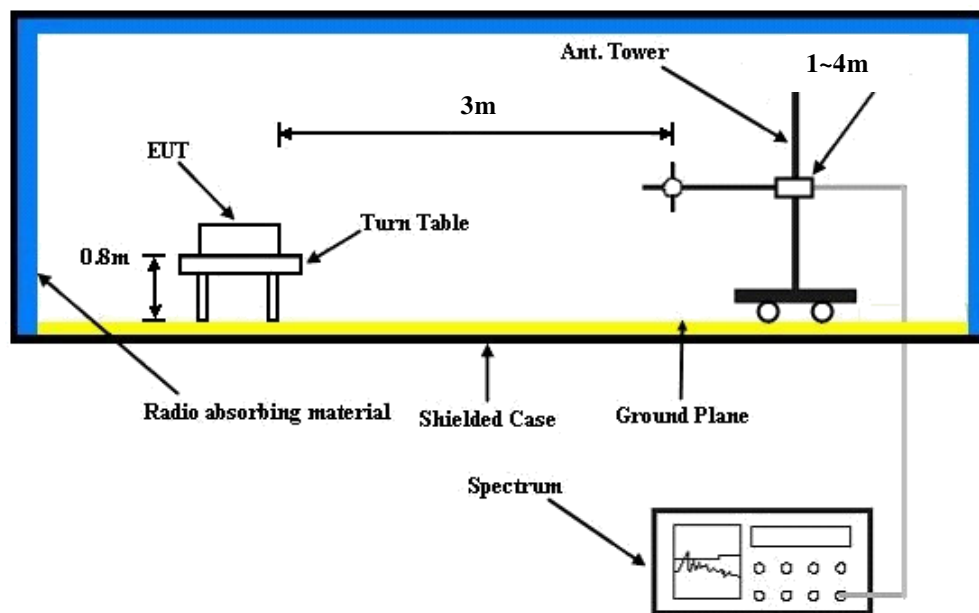
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step b. Record the power level of S.G.
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

Conducted Power Measurement:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19957	Mid Ch 20175	High Ch 20393		Low Ch 19957	Mid Ch 20175	High Ch 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
4 / 1.4M	1	0	22.87	22.93	22.86	0	21.89	21.94	21.87	1
	1	2	22.84	22.91	22.81	0	21.82	21.89	21.81	1
	1	5	22.78	22.85	22.75	0	21.78	21.83	21.73	1
	3	0	22.31	22.39	22.23	0	21.37	21.41	21.28	1
	3	1	22.24	22.32	22.18	0	21.23	21.34	21.21	1
	3	3	22.18	22.26	22.11	0	21.17	21.28	21.15	1
	6	0	22.17	22.22	22.09	1	21.11	21.21	21.09	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19965	Mid Ch 20175	High Ch 20385		Low Ch 19965	Mid Ch 20175	High Ch 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
4 / 3M	1	0	22.95	23.04	22.91	0	21.94	22.03	21.94	1
	1	7	22.91	22.97	22.87	0	21.91	21.96	21.86	1
	1	14	22.86	22.91	22.81	0	21.87	21.91	21.81	1
	8	0	22.37	22.43	22.31	1	21.42	21.44	21.34	2
	8	3	22.31	22.38	22.23	1	21.29	21.38	21.29	2
	8	7	22.28	22.31	22.19	1	21.21	21.31	21.21	2
	15	0	22.22	22.27	22.16	1	21.17	21.22	21.18	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19975	Mid Ch 20175	High Ch 20375		Low Ch 19975	Mid Ch 20175	High Ch 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
4 / 5M	1	0	23.04	23.13	23.02	0	22.04	22.11	21.99	1
	1	12	23.01	23.07	22.96	0	22.01	22.07	21.93	1
	1	24	22.95	23.04	22.94	0	21.94	22.01	21.87	1
	12	0	22.43	22.53	22.38	1	21.47	21.51	21.41	2
	12	6	22.41	22.47	22.31	1	21.33	21.42	21.35	2
	12	13	22.35	22.43	22.28	1	21.27	21.37	21.26	2
	25	0	22.32	22.38	22.25	1	21.22	21.28	21.21	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20000	Mid Ch 20175	High Ch 20350		Low Ch 20000	Mid Ch 20175	High Ch 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
4 / 10M	1	0	23.12	23.21	23.14	0	22.11	22.17	22.07	1
	1	24	23.08	23.17	23.09	0	22.05	22.11	22.01	1
	1	49	23.03	23.13	22.94	0	21.98	22.05	21.97	1
	25	0	22.51	22.59	22.43	1	21.51	21.55	21.44	2
	25	12	22.45	22.52	22.41	1	21.39	21.47	21.38	2
	25	25	22.41	22.47	22.38	1	21.36	21.42	21.31	2
	50	0	22.37	22.43	22.34	1	21.28	21.33	21.27	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20025	Mid Ch 20175	High Ch 20325		Low Ch 20025	Mid Ch 20175	High Ch 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	23.18	23.26	23.17	0	22.17	22.24	22.13	1
	1	37	23.15	23.21	23.13	0	22.13	22.17	22.08	1
	1	74	23.08	23.17	23.04	0	22.05	22.11	22.01	1
	36	0	22.55	22.63	22.53	1	21.54	21.62	21.55	2
	36	19	22.53	22.56	22.51	1	21.45	21.52	21.42	2
	36	39	22.46	22.52	22.45	1	21.41	21.46	21.35	2
	75	0	22.44	22.49	22.41	1	21.33	21.39	21.31	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20050	Mid Ch 20175	High Ch 20300		Low Ch 20050	Mid Ch 20175	High Ch 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	23.21	23.34	23.22	0	22.22	22.29	22.23	1
	1	50	23.19	23.26	23.17	0	22.17	22.23	22.15	1
	1	99	23.13	23.21	23.14	0	22.13	22.18	22.09	1
	50	0	22.67	22.76	22.59	1	21.61	21.67	21.56	2
	50	25	22.63	22.68	22.55	1	21.52	21.59	21.49	2
	50	50	22.57	22.61	22.53	1	21.46	21.51	21.44	2
	100	0	22.51	22.56	22.49	1	21.38	21.44	21.41	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23205	Mid Ch 23230	High Ch 23255		Low Ch 23205	Mid Ch 23230	High Ch 23255	
			779.5 MHz	782.0 MHz	784.5 MHz		779.5 MHz	782.0 MHz	784.5 MHz	
13 / 5M	1	0	22.13	22.17	22.07	0	21.17	21.21	21.09	1
	1	12	21.98	22.04	22.01	0	21.11	21.18	21.01	1
	1	24	21.89	21.94	21.91	0	21.03	21.11	20.98	1
	12	0	21.23	21.31	21.24	1	20.31	20.37	20.27	2
	12	6	21.16	21.23	21.13	1	20.23	20.31	20.19	2
	12	13	21.09	21.18	21.03	1	20.21	20.27	20.16	2
	25	0	21.02	21.11	21.01	1	20.11	20.18	20.09	2

Band / BW	RB Size	RB Offset	QPSK	3GPP MPR (dB)	16QAM	3GPP MPR (dB)
			Mid Ch 23230		Mid Ch 23230	
			782.0 MHz		782.0 MHz	
13 / 10M	1	0	22.21	0	21.27	1
	1	24	22.12	0	21.22	1
	1	49	22.03	0	21.15	1
	25	0	21.34	1	20.42	2
	25	12	21.27	1	20.37	2
	25	25	21.22	1	20.31	2
	50	0	21.16	1	20.25	2

ERP Power (dBm)

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23205	779.5	-9.68	32.24	20.41	109.90	H
	23230	782.0	-9.19	32.17	20.83	121.06	
	23255	784.5	-9.35	32.11	20.61	115.08	
	23205	779.5	-6.95	32.43	23.33	215.28	V
	23230	782.0	-6.69	32.42	23.58	228.03	
	23255	784.5	-7.15	32.46	23.16	207.01	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23205	779.5	-10.21	32.24	19.88	97.27	H
	23230	782.0	-10.03	32.17	19.99	99.77	
	23255	784.5	-10.12	32.11	19.84	96.38	
	23205	779.5	-8.08	32.43	22.20	165.96	V
	23230	782.0	-7.68	32.42	22.59	181.55	
	23255	784.5	-8.26	32.46	22.05	160.32	

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23230	782.0	-9.68	32.17	20.34	108.14	H
	23230	782.0	-6.36	32.42	23.91	246.04	V
Channel Bandwidth: 10 MHz / 16QAM							
Z	23230	782.0	-10.26	32.17	19.76	94.62	H
	23230	782.0	-7.68	32.42	22.59	181.55	V

EIRP Power (dBm)

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	19957	1710.7	-16.35	36.45	20.10	102.33	H
	20175	1732.5	-16.12	36.80	20.68	116.92	
	20393	1754.3	-16.92	36.94	20.02	100.53	
	19957	1710.7	-14.38	37.28	22.90	194.85	V
	20175	1732.5	-14.21	37.63	23.42	219.79	
	20393	1754.3	-14.58	37.64	23.06	202.30	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	19957	1710.7	-17.54	36.45	18.91	77.80	H
	20175	1732.5	-17.33	36.80	19.47	88.49	
	20393	1754.3	-17.92	36.94	19.02	79.85	
	19957	1710.7	-15.06	37.28	22.22	166.61	V
	20175	1732.5	-14.86	37.63	22.77	189.23	
	20393	1754.3	-15.32	37.64	22.32	170.61	

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	19965	1711.5	-16.22	36.45	20.23	105.44	H
	20175	1732.5	-16.29	36.80	20.51	112.43	
	20385	1753.5	-16.65	36.94	20.29	106.98	
	19965	1711.5	-14.36	37.28	22.92	195.75	V
	20175	1732.5	-14.03	37.63	23.60	229.09	
	20385	1753.5	-14.54	37.64	23.10	204.17	
Channel Bandwidth: 3 MHz / 16QAM							
Z	19965	1711.5	-17.36	36.45	19.09	81.10	H
	20175	1732.5	-17.26	36.80	19.54	89.93	
	20385	1753.5	-17.67	36.94	19.27	84.59	
	19965	1711.5	-15.27	37.28	22.01	158.74	V
	20175	1732.5	-15.16	37.63	22.47	176.60	
	20385	1753.5	-15.38	37.64	22.26	168.27	

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	19975	1712.5	-15.69	36.45	20.76	119.12	H
	20175	1732.5	-15.79	36.80	21.01	126.15	
	20375	1752.5	-16.06	36.94	20.88	122.55	
	19975	1712.5	-13.35	37.28	23.93	247.00	V
	20175	1732.5	-13.03	37.63	24.60	288.40	
	20375	1752.5	-13.34	37.64	24.30	269.15	
Channel Bandwidth: 5 MHz / 16QAM							
Z	19975	1712.5	-17.42	36.45	19.03	79.98	H
	20175	1732.5	-17.69	36.80	19.11	81.45	
	20375	1752.5	-17.87	36.94	19.07	80.78	
	19975	1712.5	-15.26	37.28	22.02	159.11	V
	20175	1732.5	-15.33	37.63	22.30	169.82	
	20375	1752.5	-15.54	37.64	22.10	162.18	

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	20000	1715.0	-16.25	36.64	20.39	109.40	H
	20175	1732.5	-16.37	36.80	20.43	110.28	
	20350	1750.0	-16.66	36.80	20.14	103.28	
	20000	1715.0	-14.36	37.44	23.08	203.19	V
	20175	1732.5	-14.18	37.63	23.45	221.26	
	20350	1750.0	-14.38	37.64	23.26	211.59	
Channel Bandwidth: 10 MHz / 16QAM							
Z	20000	1715.0	-17.32	36.64	19.32	85.51	H
	20175	1732.5	-17.25	36.80	19.55	90.05	
	20350	1750.0	-17.72	36.80	19.08	80.91	
	20000	1715.0	-15.24	37.44	22.20	165.92	V
	20175	1732.5	-15.05	37.63	22.58	181.09	
	20350	1750.0	-15.22	37.64	22.42	174.38	

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	20025	1717.5	-16.28	36.45	20.17	103.99	H
	20175	1732.5	-16.11	36.80	20.69	117.19	
	20325	1747.5	-16.67	36.94	20.27	106.49	
	20025	1717.5	-13.25	37.28	24.03	252.76	V
	20175	1732.5	-13.98	37.63	23.65	231.74	
	20325	1747.5	-14.09	37.64	23.55	226.46	
Channel Bandwidth: 15 MHz / 16QAM							
Z	20025	1717.5	-17.03	36.45	19.42	87.50	H
	20175	1732.5	-17.15	36.80	19.65	92.24	
	20325	1747.5	-17.34	36.94	19.60	91.26	
	20025	1717.5	-15.25	37.28	22.03	159.48	V
	20175	1732.5	-15.21	37.63	22.42	174.58	
	20325	1747.5	-15.68	37.64	21.96	157.04	

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
Z	20050	1720.0	-15.26	36.45	21.19	131.52	H
	20175	1732.5	-15.31	36.80	21.49	140.90	
	20300	1745.0	-15.50	36.94	21.44	139.41	
	20050	1720.0	-13.77	37.28	23.51	224.23	V
	20175	1732.5	-13.58	37.63	24.05	254.10	
	20300	1745.0	-13.92	37.64	23.72	235.50	
Channel Bandwidth: 20 MHz / 16QAM							
Z	20050	1720.0	-16.20	36.45	20.25	105.93	H
	20175	1732.5	-16.16	36.80	20.64	115.85	
	20300	1745.0	-16.47	36.94	20.47	111.51	
	20050	1720.0	-15.16	37.28	22.12	162.82	V
	20175	1732.5	-15.12	37.63	22.51	178.24	
	20300	1745.0	-15.36	37.64	22.28	169.04	

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.

4.2.2 Test Procedure

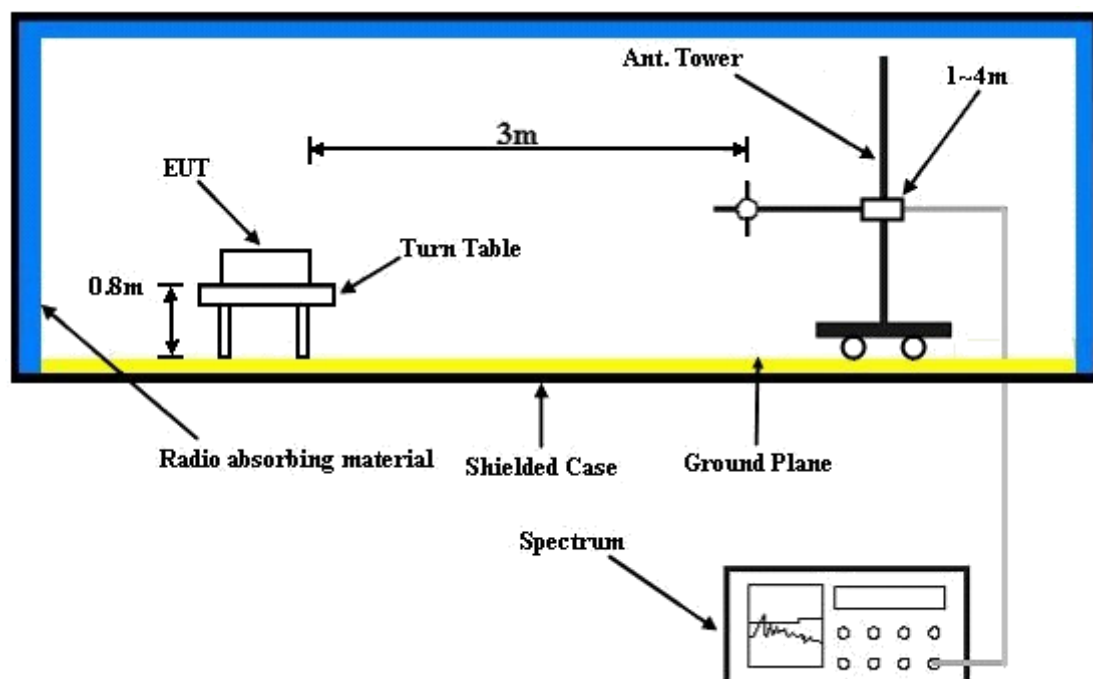
- Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15 dBi.

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.2.3 Deviation from Test Standard

No deviation.

4.2.4 Test Setup



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

4.2.5 Test Results

LTE Band 4

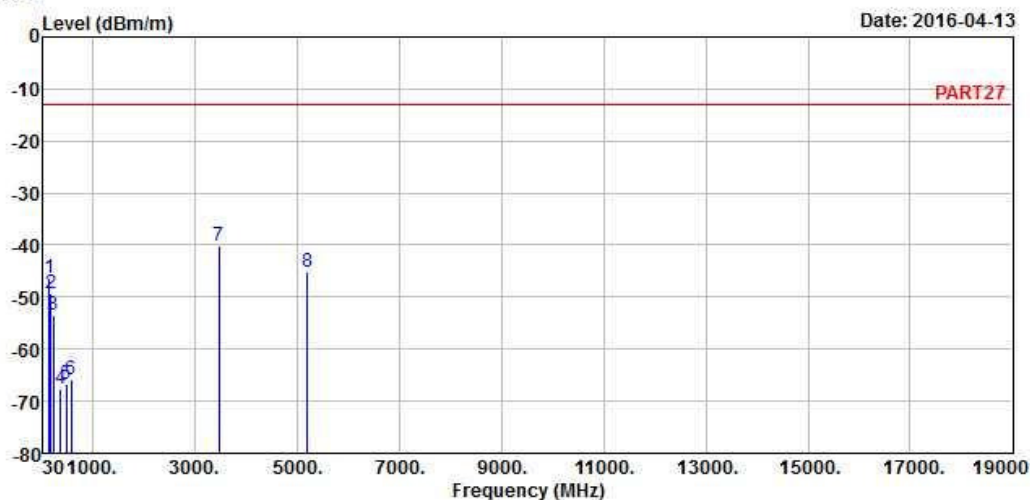
Channel Bandwidth: 20 MHz / QPSK



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Data: 7



Site : 966 Chamber 5
Condition: PART27 3m HORIZONTAL
Remak : LTE Band 4_QPSK_20M
Tested by: Gavin Wu

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	142.52	-46.21	-37.85	-13.00	-33.21	-8.36	Peak
2	175.50	-49.17	-42.62	-13.00	-36.17	-6.55	Peak
3	226.91	-53.40	-46.47	-13.00	-40.40	-6.93	Peak
4	372.41	-67.51	-61.40	-13.00	-54.51	-6.11	Peak
5	483.96	-66.67	-61.75	-13.00	-53.67	-4.92	Peak
6	580.96	-65.95	-64.39	-13.00	-52.95	-1.56	Peak
7 pp	3465.00	-40.17	-31.26	-13.00	-27.17	-8.91	Peak
8	5197.50	-45.12	-42.26	-13.00	-32.12	-2.86	Peak

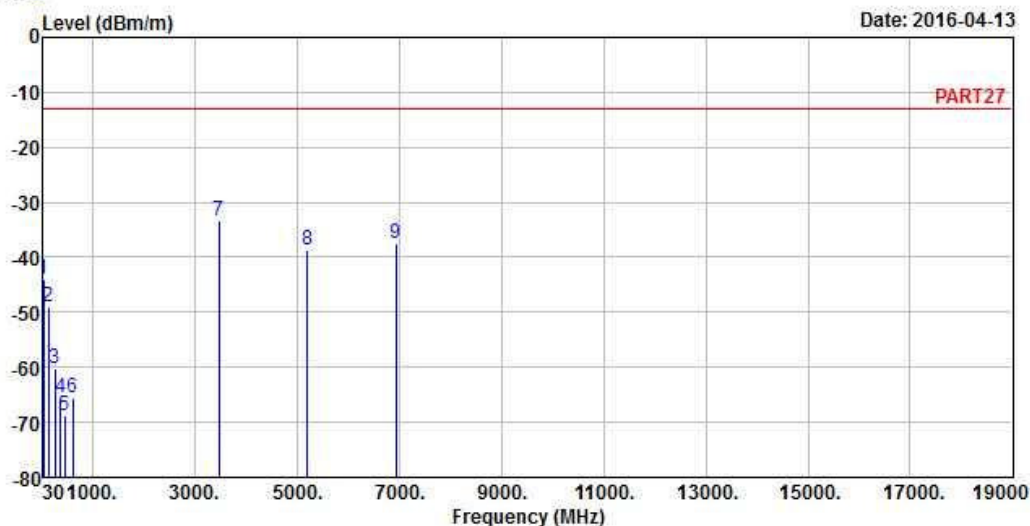


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Data: 8

Date: 2016-04-13



Site : 966 Chamber 5

Condition: PART27 3m VERTICAL

Remak : LTE Band 4_QPSK_20M

Tested by: Gavin Wu

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	41.64	-43.94	-43.53	-13.00	-30.94	-0.41	Peak
2	134.76	-49.11	-40.44	-13.00	-36.11	-8.67	Peak
3	255.04	-60.11	-54.02	-13.00	-47.11	-6.09	Peak
4	374.35	-65.48	-59.38	-13.00	-52.48	-6.10	Peak
5	452.92	-68.80	-63.30	-13.00	-55.80	-5.50	Peak
6	606.18	-65.42	-64.65	-13.00	-52.42	-0.77	Peak
7 pp	3465.00	-33.41	-24.50	-13.00	-20.41	-8.91	Peak
8	5197.50	-38.73	-35.87	-13.00	-25.73	-2.86	Peak
9	6930.00	-37.51	-41.80	-13.00	-24.51	4.29	Peak

LTE Band 13

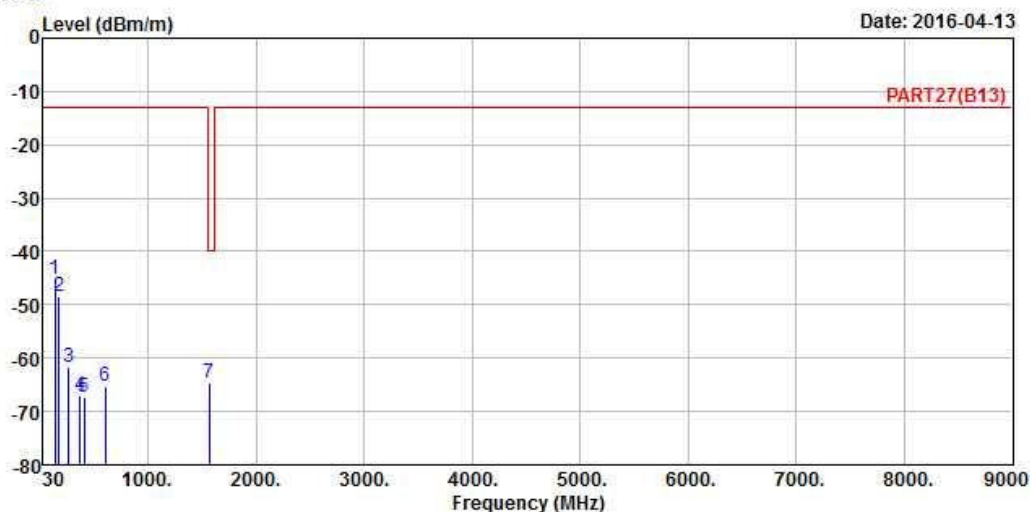
Channel Bandwidth: 10 MHz / QPSK



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Data: 5



Site : 966 Chamber 5

Condition: PART27(B13) 3m HORIZONTAL

Remak : LTE Band 13_QPSK_10M

Tested by: Gavin Wu

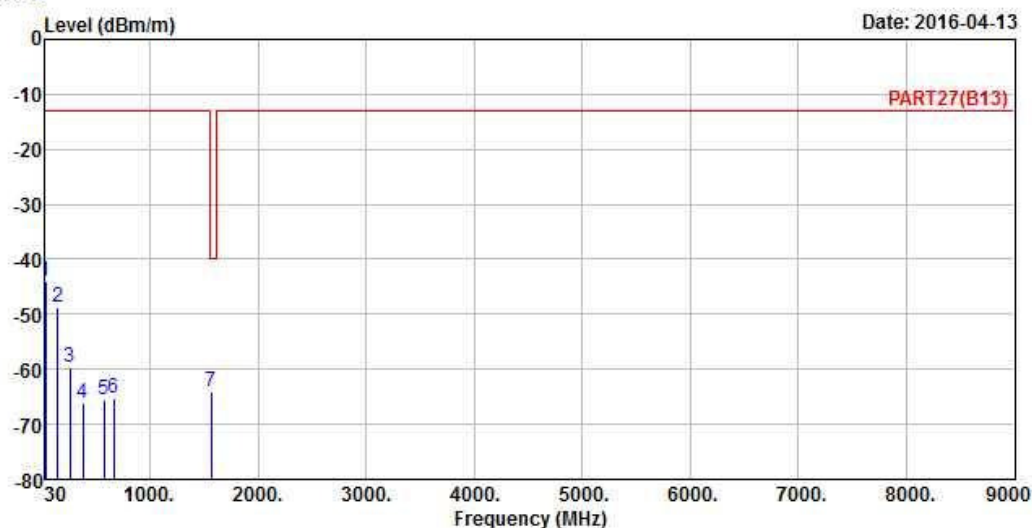
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	135.73	-45.26	-36.59	-25.00	-20.26	-8.67	Peak
2	176.47	-48.43	-41.71	-25.00	-23.43	-6.72	Peak
3	264.74	-61.81	-55.52	-25.00	-36.81	-6.29	Peak
4	372.41	-67.16	-61.05	-25.00	-42.16	-6.11	Peak
5	411.21	-67.43	-61.57	-25.00	-42.43	-5.86	Peak
6	603.27	-65.33	-64.57	-25.00	-40.33	-0.76	Peak
7	1564.00	-64.74	-49.72	-40.00	-24.74	-15.02	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 6



Site : 966 Chamber 5
Condition: PART27(B13) 3m VERTICAL
Remak : LTE Band 13_QPSK_10M
Tested by: Gavin Wu

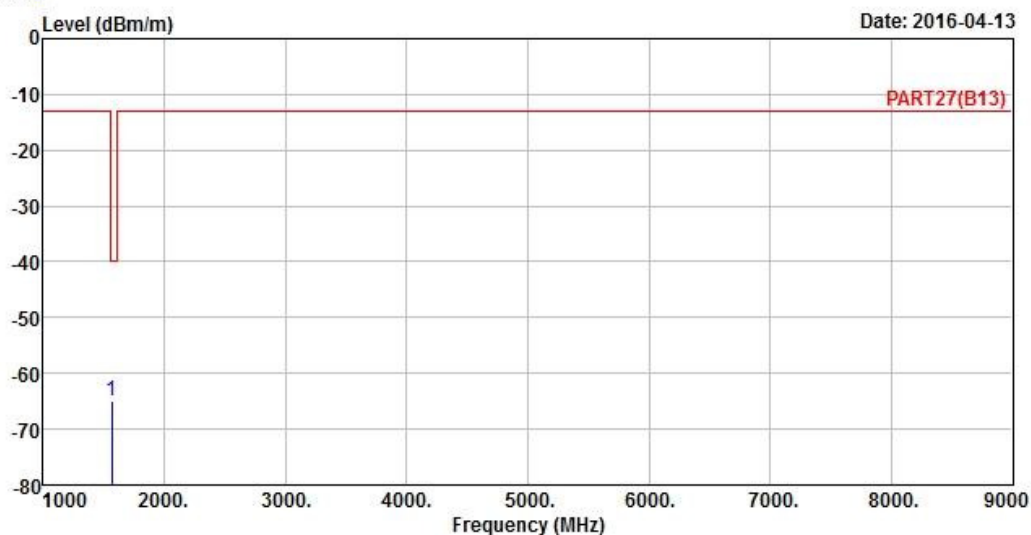
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	30.00	-43.87	-44.25	-25.00	-18.87	0.38	Peak
2	142.52	-48.70	-40.34	-25.00	-23.70	-8.36	Peak
3	255.04	-59.63	-53.54	-25.00	-34.63	-6.09	Peak
4	375.32	-66.16	-60.07	-25.00	-41.16	-6.09	Peak
5	577.08	-65.61	-63.89	-25.00	-40.61	-1.72	Peak
6	660.50	-65.09	-64.37	-25.00	-40.09	-0.72	Peak
7	1564.00	-64.12	-49.10	-40.00	-24.12	-15.02	Peak



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Data: 3



Site : 966 Chamber 5
Condition: PART27(B13) 3m HORIZONTAL
Remak : LTE Band 13_QPSK_10M(50,0) Link
Tested by: Gavin Wu

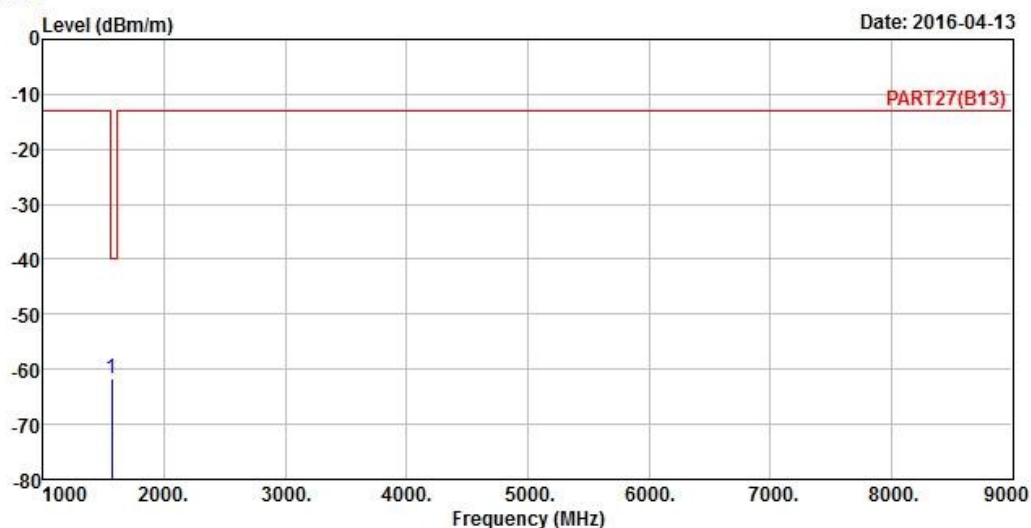
		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp 1564.00	-64.92	-49.90	-40.00	-24.92	-15.02	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 4



Site : 966 Chamber 5
Condition: PART27(B13) 3m VERTICAL
Remak : LTE Band 13_QPSK_10M(50,0) Link
Tested by: Gavin Wu

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp 1564.00	-61.60	-46.58	-40.00	-21.60	-15.02	Peak

5 Pictures of Test Arrangements

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

Appendix – 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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

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.

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