

## FCC 47 CFR PART 27 SUBPART L

Product Type : PCI-E Embedded Module

Applicant : HON HAI Precision IND. CO., LTD.

Address : 5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park  
Taiwan, R.O.C

Trade Name : N/A

Model Number : TangoP1001

Test Specification : FCC 47 CFR PART 27 SUBPART L: Oct. 2011  
ANSI C63.4: 2009  
ANSI/TIA-603-C-2004

Application Purpose : Original

Receive Date : Jul. 17, 2012

Issue Date : Aug. 22, 2012

### Issue by

A Test Lab Techno Corp.  
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Taiwan Accreditation Foundation accreditation number: 1330



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**Revision History**

Rev.	Issue Date	Revisions	Revised By
00	Aug. 15, 2012	Initial Issue	
01	Aug. 22, 2012	Revise Model Number	Queenie Yang


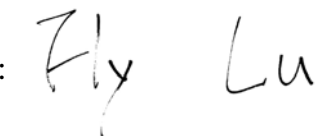
## Verification of Compliance

Issued Date: 08/22/2012

Product Type : PCI-E Embedded Module  
Applicant : HON HAI Precision IND. CO., LTD.  
Address : 5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park  
Taiwan, R.O.C  
Trade Name : N/A  
Model Number : TangoP1001  
FCC ID : MCLT77Z29500  
EUT Rated Voltage : DC 3.3V  
Test Voltage : 120 Vac / 60 Hz  
Applicable Standard : FCC 47 CFR PART 27 SUBPART L: Oct. 2011  
ANSI C63.4: 2009  
ANSI/TIA-603-C-2004  
Test Result : Complied  
Application Purpose : Original  
Performing Lab. : A Test Lab Techno Corp.  
No. 140-1, Changan Street, Bade City,  
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Taiwan Accreditation Foundation accreditation number: 1330  
<http://www.atl-lab.com.tw/e-index.htm>

The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 27L.

The test results of this report relate only to the tested sample identified in this report.

Approved By :  Reviewed By :   
(Manager) (Murphy Wang) (Testing Engineer) (Fly Lu)

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# 1 General Information

## 1.1. EUT Description

Applicant		HON HAI Precision IND. CO., LTD.			
Applicant Address		5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C			
Manufacturer		HON HAI Precision IND. CO., LTD.			
Manufacturer Address		5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C			
Product Type		PCI-E Embedded Module			
Trade Name		N/A			
Model Number		TangoP1001			
FCC ID		MCLT77Z29500			
Hardware Version		Rev.F			
Software Version		P1001.3.03_0.1			
Mode	LTE	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
		4	1710.0 ~ 1754.9	2110.0 ~ 2154.9	QPSK, 16QAM
		17	704.0 ~ 715.9	734.0 ~ 745.9	QPSK, 16QAM
Channel Bandwidth		5MHz / 10MHz			
Antenna for test		Tel Cab, T-AT314			
Type of Antenna		External Antenna			
Antenna Gain (dBi)		LTE Band 4: 2.14 dBi LTE Band 17: 2.14 dBi			
Max. Conducted Output Average Power		LTE Band 4 (Channel Bandwidth 5MHz):	0.201	W	
		LTE Band 4 (Channel Bandwidth 10MHz):	0.187	W	
		LTE Band 17 (Channel Bandwidth 5MHz):	0.208	W	
		LTE Band 17 (Channel Bandwidth 10MHz):	0.184	W	
Max. E.R.P. / E.I.R.P.		LTE Band 4 (Channel Bandwidth 5MHz):	0.182	W (E.I.R.P.)	
		LTE Band 4 (Channel Bandwidth 10MHz):	0.165	W (E.I.R.P.)	
		LTE Band 17 (Channel Bandwidth 5MHz):	0.195	W (E.R.P.)	
		LTE Band 17 (Channel Bandwidth 10MHz):	0.117	W (E.R.P.)	
Emission Designator		LTE Band 4 (Channel Bandwidth 5MHz):	4M49G7D		
		LTE Band 4 (Channel Bandwidth 10MHz):	8M93D7W		
		LTE Band 17 (Channel Bandwidth 5MHz):	4M47G7D		
		LTE Band 17 (Channel Bandwidth 10MHz):	8M91D7W		

## 1.2. Mode of Operation

Three channels had been tested for each channel bandwidth.

LTE Band 4				
Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	19975	1712.5	20000	1715.0
Middle CH	20175	1732.5	20175	1732.5
High CH	20375	1752.5	20350	1750.0

LTE Band 17				
Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	23755	706.5	23780	709.0
Middle CH	23790	710.0	23790	710.0
High CH	23825	713.5	23800	711.0

Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

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, and EUT is rotated on three test planes to find out the worst emission.

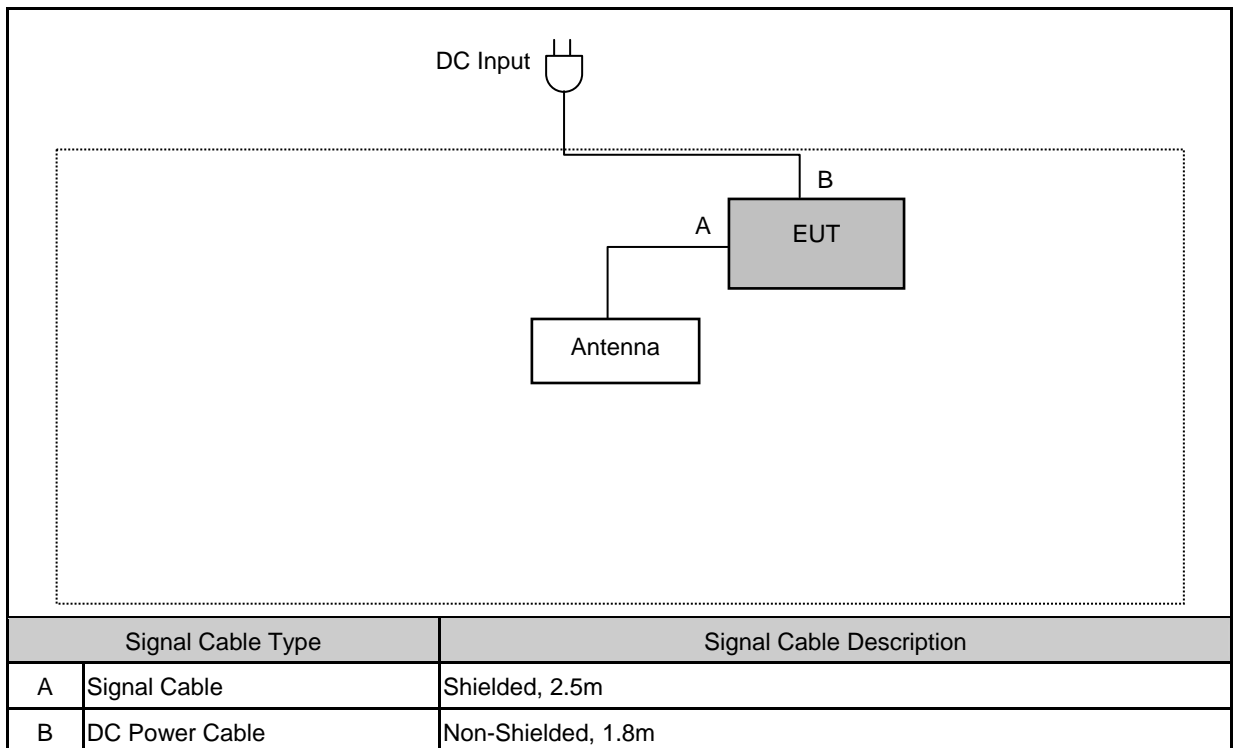
Frequency range investigated for radiated emission: 30MHz to 19000 MHz.

Band	Channel Bandwidth	Test Modes		
LTE Band 4	5MHz	Conducted TCs	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 24) Link <input type="checkbox"/> LTE(RB Size 12, RB Offset 6) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 0) Link	QPSK
		Radiated TCs		QPSK
	10MHz	Conducted TCs	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 49) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 13) Link <input type="checkbox"/> LTE(RB Size 50, RB Offset 0) Link	QPSK
		Radiated TCs		QPSK
LTE Band 17	5MHz	Conducted TCs	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 24) Link <input type="checkbox"/> LTE(RB Size 12, RB Offset 6) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 0) Link	QPSK
		Radiated TCs		QPSK
	10MHz	Conducted TCs	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 49) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 13) Link <input type="checkbox"/> LTE(RB Size 50, RB Offset 0) Link	QPSK
		Radiated TCs		QPSK

### 1.3. EUT Exercise Software

1	Setup the EUT and Base Station (CMW500) as shown on 1.4.
2	Turn on the power of all equipment.
3	EUT run test program test.

### 1.4. Configuration of Test System Details



### 1.5. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950



**1.6. Summary of Test Result**

LTE Band 4			
FCC Rule	Description	Limit	Result
§2.1046	Conducted Output Average Power	N/A	Pass
§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 W (E.I.R.P.)	Pass
§2.1055 §27.54	Frequency Stability	< ± 2.5 ppm	Pass
§2.1049 §27.53(h)	Occupied Bandwidth	N/A	Pass
§27.50(d)(5)	Peak to average ratio	< 13 dB	Pass
§2.1051 §27.53(h)	Band Edge	< 43+10log <sub>10</sub> (P) dB	Pass
§2.1051 §27.53(h)	Conducted Spurious Emissions	< 43+10log <sub>10</sub> (P) dB Under 13.0 dB	Pass
§2.1053 §27.53(h)	Radiated Spurious Emissions	< 43+10log <sub>10</sub> (P) dB Under 13.0 dB	Pass

LTE Band 17			
FCC Rule	Description	Limit	Result
§2.1046	Conducted Output Average Power	N/A	Pass
§27.50(C)(10)	Equivalent Radiated Power	< 3 W (E.R.P.)	Pass
§2.1055 §27.54	Frequency Stability	< ± 2.5 ppm	Pass
§2.1049 §27.53(g)	Occupied Bandwidth	N/A	Pass
§27.50(d)(5)	Peak to average ratio	< 13 dB	Pass
§2.1051 §27.53(g)	Band Edge	< 43+10log(P) dB	Pass
§2.1051 §27.53(g)	Conducted Spurious Emissions	< 43+10log(P) dB Under 13.0 dB	Pass
§2.1053 §27.53(g)	Radiated Spurious Emissions	< 43+10log(P) dB Under 13.0 dB	Pass

## 2 Conducted Output Average Power Test

### 2.1. Limit

N/A

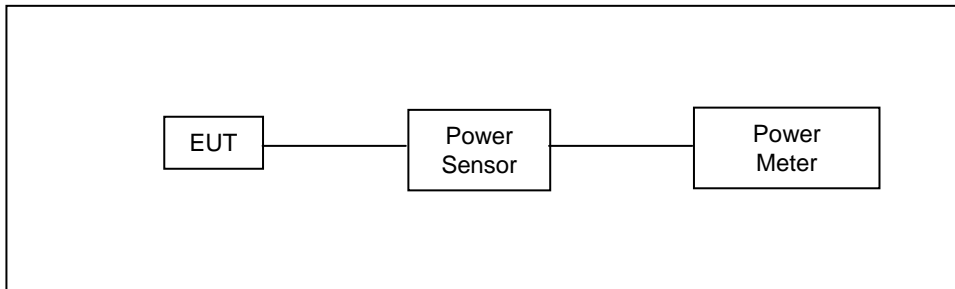
### 2.2. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Wideband Power Sensor	Agilent	N1921A	MY45241957	12/15/2011	(1)
Single Channel PK Power Meter	Agilent	N1911A	MY45101619	12/15/2011	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 2.3. Test Setup



### 2.4. Test Procedure

- 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.

### 2.5. Uncertainty

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

**2.6. Test Result**

Model Number	TangoP1001		
Test Item	Conducted Output Average Power		
Date of Test	07/27/2012	Test Site	TE05

Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power		
					Size	Offset	(dBm)	(W)	
LTE Band 4	5MHz	QPSK	19975	1712.5	1	0	21.63	0.146	
					1	24	21.37	0.137	
					12	6	21.57	0.144	
					25	0	21.51	0.142	
			1	0	<b>23.03</b>	<b>0.201</b>			
			1	24	23.01	0.200			
			12	6	22.53	0.179			
			25	0	22.51	0.178			
			1	0	21.51	0.142			
			1	24	21.47	0.140			
			12	6	21.54	0.143			
			25	0	21.48	0.141			
		1	0	22.01	0.159				
		1	24	21.71	0.148				
		12	6	21.64	0.146				
		25	0	21.52	0.142				
		16QAM	19975	1712.5	1	0	22.62	0.183	
					1	24	22.54	0.179	
					12	6	21.67	0.147	
					25	0	21.53	0.142	
			1	0	21.66	0.147			
			1	24	21.52	0.142			
			12	6	21.53	0.142			
			25	0	21.43	0.139			
LTE Band 4	10MHz		QPSK	20000	1715.0	1	0	21.34	0.136
						1	49	21.33	0.136
						25	12	21.85	0.153
						50	0	21.68	0.147
		1		0	<b>22.71</b>	<b>0.187</b>			
		1		49	22.48	0.177			
		25		12	22.69	0.186			
		50		0	22.44	0.175			
		1		0	21.94	0.156			
		1		49	21.62	0.145			
		25		12	21.96	0.157			
		50		0	21.75	0.150			
16QAM	20000	1715.0	1	0	21.83	0.152			
			1	49	21.62	0.145			
			25	12	21.77	0.150			
			50	0	21.62	0.145			
	1	0	21.67	0.147					
	1	49	21.79	0.151					
	25	12	21.73	0.149					
	50	0	21.51	0.142					
	1	0	21.67	0.147					
	1	49	21.52	0.142					
	25	12	21.65	0.146					
	50	0	21.62	0.145					

Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power		
					Size	Offset	(dBm)	(W)	
LTE Band 17	5MHz	QPSK	23755	706.5	1	0	22.10	0.162	
					1	24	22.63	0.183	
					12	6	21.93	0.156	
			25	0	21.86	0.153			
			23790	710.0	1	0	22.46	0.176	
					1	24	22.92	0.196	
		12			6	22.41	0.174		
		23825	713.5	25	0	22.16	0.164		
				1	0	<b>23.18</b>	<b>0.208</b>		
				1	24	21.83	0.152		
		23755	706.5	12	6	22.37	0.173		
				25	0	22.19	0.166		
	1			0	21.69	0.148			
	16QAM	23755	706.5	1	24	22.06	0.161		
				12	6	21.47	0.140		
				25	0	20.90	0.123		
		23790	710.0	1	0	22.02	0.159		
				1	24	22.19	0.166		
				12	6	21.54	0.143		
	23825	713.5	25	0	21.25	0.133			
			1	0	22.51	0.178			
			1	24	21.35	0.136			
	LTE Band 17	10MHz	QPSK	23780	709.0	12	6	21.47	0.140
						25	0	21.19	0.132
1						0	21.84	0.153	
23790				710.0	1	49	<b>22.65</b>	<b>0.184</b>	
					25	12	22.62	0.183	
					50	0	22.41	0.174	
23800			711.0	1	0	21.84	0.153		
				1	49	21.74	0.149		
				25	12	22.38	0.173		
16QAM			23780	709.0	50	0	22.00	0.158	
					1	0	21.35	0.136	
					1	49	21.23	0.133	
		23790	710.0	25	12	22.44	0.175		
				50	0	21.99	0.158		
				1	0	21.35	0.136		
23800		711.0	1	49	21.78	0.151			
			25	12	21.76	0.150			
			50	0	21.48	0.141			
QPSK		23780	709.0	1	0	21.14	0.130		
				1	49	21.04	0.127		
				25	12	21.57	0.144		
		23790	710.0	50	0	21.18	0.131		
				1	0	21.28	0.134		
				1	49	20.92	0.124		
23800	711.0	25	12	21.47	0.140				
		50	0	20.94	0.124				
		1	0	21.84	0.153				

### 3 Effective Radiated Power / Equivalent Isotropic Radiated Power Test

#### 3.1. Limit

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt E.I.R.P..  
 Portable stations (hand-held devices) operating in the 698–746 MHz band are limited to 3 watts E.R.P..

#### 3.2. Test Instruments

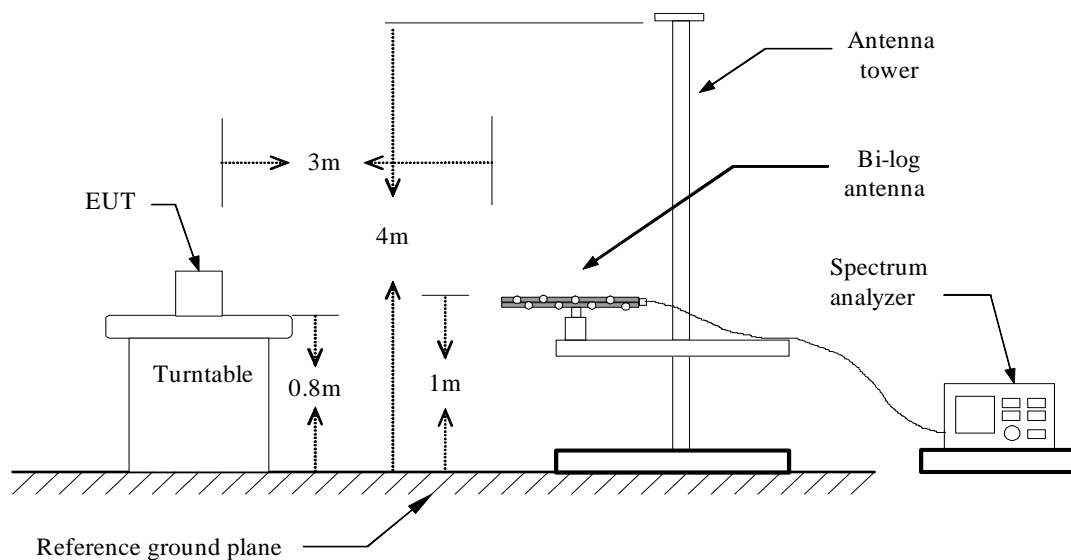
3 Meter Chamber					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	06/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	12/20/2011	(1)

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

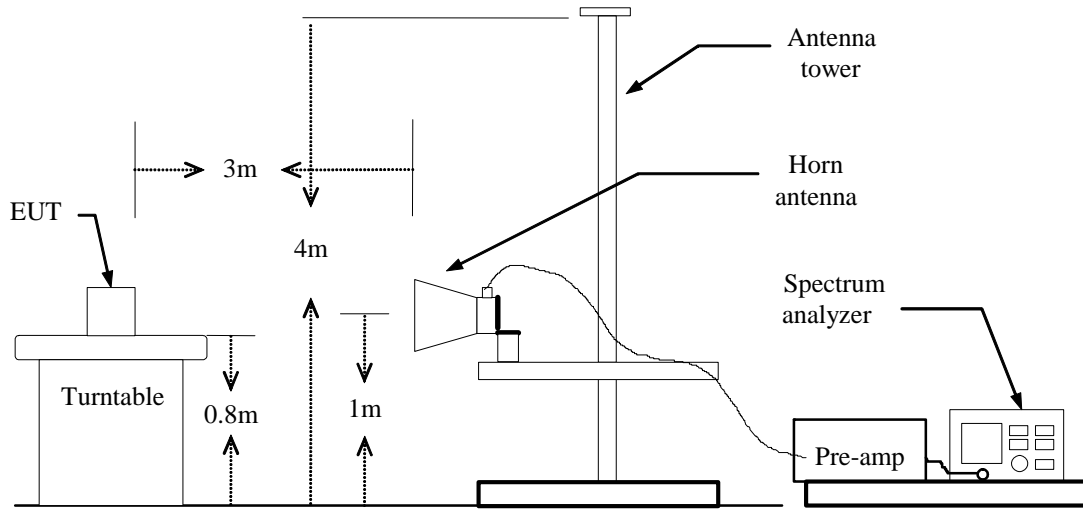
Note: N.C.R. = No Calibration Request.

#### 3.3. Test Setup

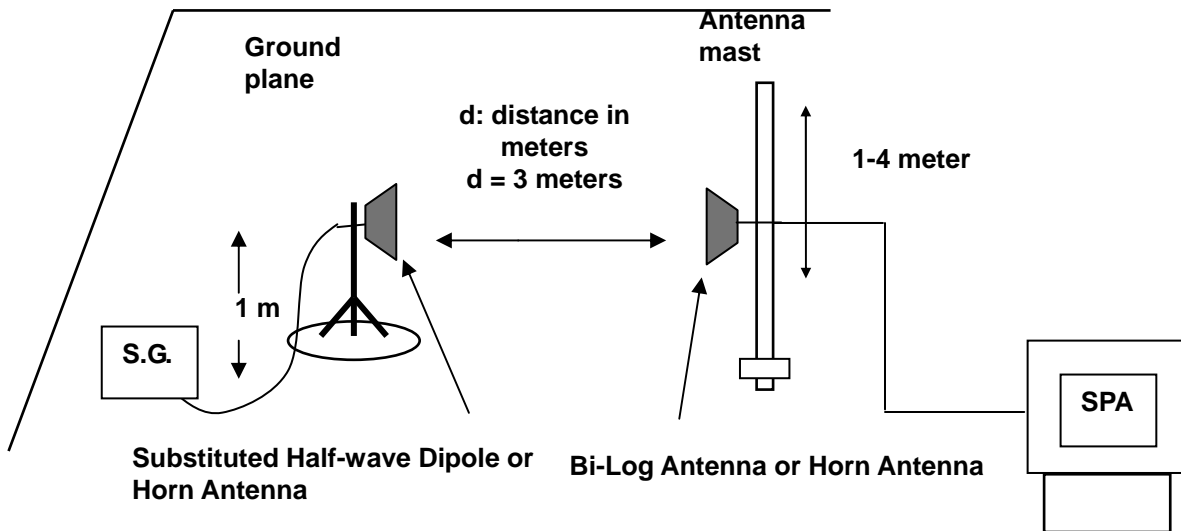
Below 1 GHz



**Above 1 GHz**



**For Substituted Method Test Set-UP**



### 3.4. Test Procedure

- a. The EUT was set up for the maximum power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range). RWB and VBW is 10MHz for LTE and 5MHz for WCDMA mode.
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 1m to 4m 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 a. Record the power level of S.G.
- d.  $E.I.R.P. = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- e.  $E.R.P. = E.I.R.P. - 2.15 \text{ dB}$

### 3.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is  $\pm 3.072 \text{ dB}$ .

**3.6. Test Result**

Model Number	TangoP1001		
Test Item	E.I.R.P. / E.R.P.		
Date of Test	07/30/2012	Test Site	TC03

LTE Band 4								
Channel Bandwidth	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
5MHz	QPSK	1712.5	H	8.69	10.44	19.13	0.082	< 1
			V	15.39	7.22	<b>22.61</b>	<b>0.182</b>	< 1
		1732.5	H	8.05	10.45	18.50	0.071	< 1
			V	14.73	7.39	22.12	0.163	< 1
		1752.5	H	10.29	10.46	20.75	0.119	< 1
			V	13.73	7.54	21.27	0.134	< 1
10MHz	QPSK	1715.0	H	9.12	10.44	19.56	0.090	< 1
			V	14.95	7.23	<b>22.18</b>	<b>0.165</b>	< 1
		1732.5	H	6.95	10.45	17.40	0.055	< 1
			V	14.23	7.36	21.59	0.144	< 1
		1750.0	H	8.21	10.45	18.66	0.073	< 1
			V	13.40	7.51	20.91	0.123	< 1

LTE Band 17								
Channel Bandwidth	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
5MHz	QPSK	706.5	H	8.15	4.93	15.23	0.033	< 3
			V	12.18	8.20	22.53	0.179	< 3
		710.0	H	8.41	5.02	15.58	0.036	< 3
			V	12.46	8.30	<b>22.91</b>	<b>0.195</b>	< 3
		713.5	H	8.76	5.12	16.03	0.040	< 3
			V	12.33	8.43	22.91	0.195	< 3
10MHz	QPSK	709.0	H	8.00	5.05	15.20	0.033	< 3
			V	9.98	8.34	20.47	0.111	< 3
		710.0	H	7.43	5.08	14.66	0.029	< 3
			V	9.88	8.39	20.42	0.110	< 3
		711.0	H	7.77	5.11	15.03	0.032	< 3
			V	10.10	8.43	<b>20.68</b>	<b>0.117</b>	< 3



## 4 Frequency Stability Test

### 4.1. Limit

According to the FCC part 27.54 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 2.1055(a)(1) -30°C ~ 50°C.

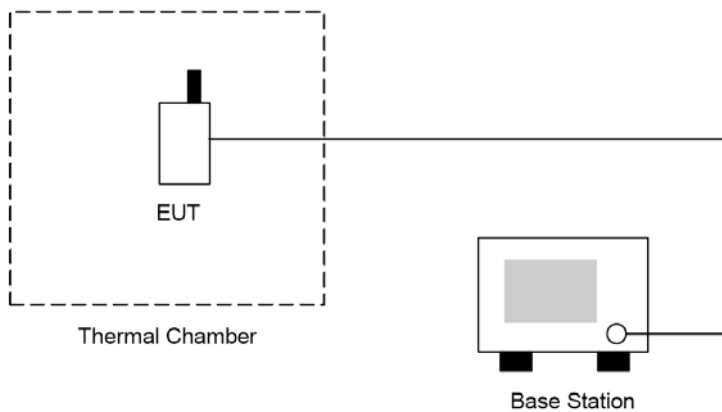
### 4.2. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	08/24/2011	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 4.3. Setup



#### 4.4. Test Procedure

The measurement is made according to FCC rules part 27:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at  $25 \pm 5^{\circ}\text{C}$  and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

#### 4.5. Uncertainty

The measurement uncertainty is defined as for Frequency Stability measurement is  $\pm 10\text{Hz}$ .

**4.6. Test Result**

Model Number	TangoP1001		
Test Item	Frequency Stability		
Date of Test	07/30/2012	Test Site	TE05

LTE Band 4 _ QPSK					
Voltage					
Channel Bandwidth	Frequency (MHz)	Voltage (Vac)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)
5MHz	1732.5	3.6	-21	-0.012	± 2.5
		3.3	-8	-0.005	± 2.5
		3.0	16	0.009	± 2.5
10MHz	1732.5	3.6	-10	-0.006	± 2.5
		3.3	-12	-0.007	± 2.5
		3.0	15	0.009	± 2.5
Temperature					
Channel Bandwidth	Frequency (MHz)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)
5MHz	1732.5	-30	-22	-0.013	± 2.5
		-20	-17	-0.010	± 2.5
		-10	-13	-0.008	± 2.5
		0	21	0.012	± 2.5
		10	18	0.010	± 2.5
		20	14	0.008	± 2.5
		30	23	0.013	± 2.5
		40	16	0.009	± 2.5
10MHz	1732.5	50	15	0.009	± 2.5
		-30	-23	-0.013	± 2.5
		-20	21	0.012	± 2.5
		-10	18	0.010	± 2.5
		0	17	0.010	± 2.5
		10	-16	-0.009	± 2.5
		20	-7	-0.004	± 2.5
		30	18	0.010	± 2.5
40	15	0.009	± 2.5		
		50	11	0.006	± 2.5

LTE Band 17 _ QPSK					
Voltage					
Channel Bandwidth	Frequency (MHz)	Voltage (Vdc)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)
5MHz	710.0	3.6	-16	-0.023	± 2.5
		3.3	8	0.011	± 2.5
		3.0	-6	-0.008	± 2.5
10MHz	710.0	3.6	-6	-0.008	± 2.5
		3.3	-19	-0.027	± 2.5
		3.0	8	0.011	± 2.5
Temperature					
Channel Bandwidth	Frequency (MHz)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)
5MHz	710.0	-30	17	0.024	± 2.5
		-20	12	0.017	± 2.5
		-10	-7	-0.010	± 2.5
		0	-11	-0.015	± 2.5
		10	-1	-0.001	± 2.5
		20	9	0.013	± 2.5
		30	6	0.008	± 2.5
		40	10	0.014	± 2.5
		50	13	0.018	± 2.5
10MHz	710.0	-30	-18	-0.025	± 2.5
		-20	-16	-0.023	± 2.5
		-10	-4	-0.006	± 2.5
		0	6	0.008	± 2.5
		10	9	0.013	± 2.5
		20	7	0.010	± 2.5
		30	-10	-0.014	± 2.5
		40	-3	-0.004	± 2.5
		50	2	0.003	± 2.5

## 5 26dB Bandwidth and Occupied Bandwidth Test

### 5.1. Limit

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

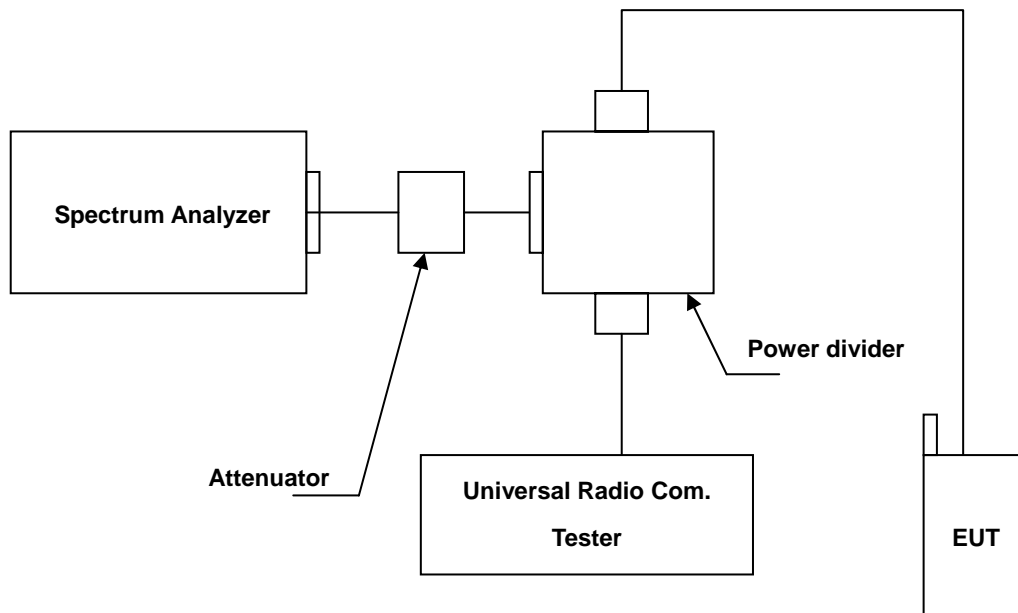
### 5.2. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 5.3. Setup



#### **5.4. Test Procedure**

The measurement is made according to FCC rules part 27:

- a. The EUT makes a phone call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels. (low, middle and high operational frequency range.)
- b. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### **5.5. Uncertainty**

The measurement uncertainty is defined as  $\pm 10\text{Hz}$

**5.6. Test Result**

Model Number	TangoP1001		
Test Item	26dB Bandwidth and Occupied Bandwidth		
Date of Test	07/27/2012	Test Site	TE05

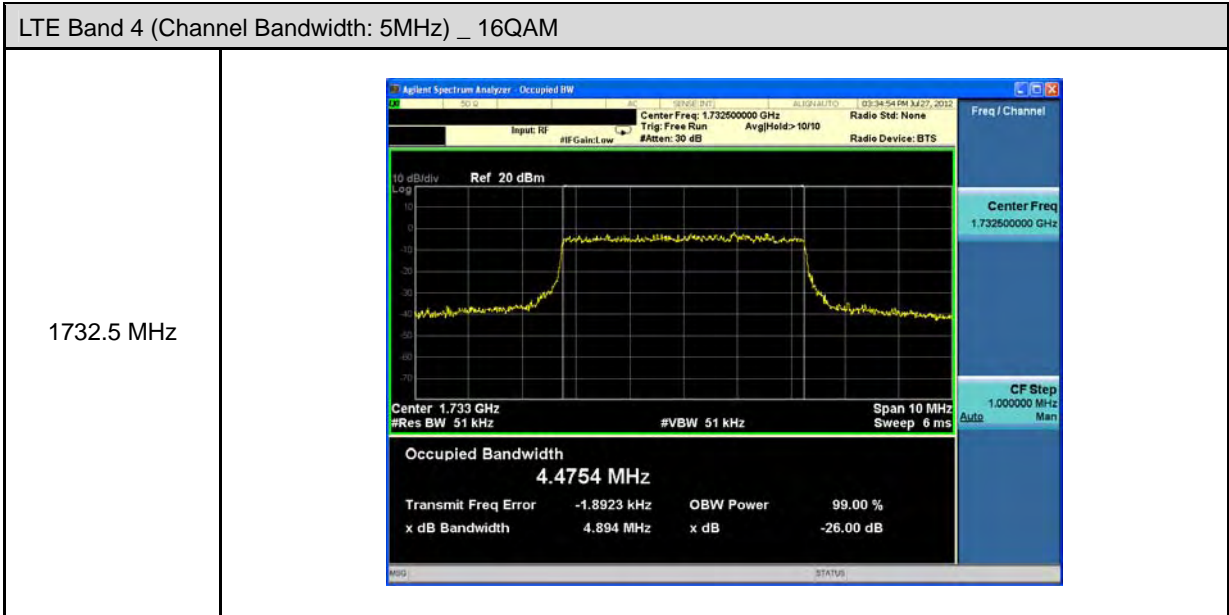
LTE Band 4				
Channel Bandwidth	Modulation	Frequency (MHz)	26dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
5MHz	QPSK	1712.5	4.993	4.467
		1732.5	4.969	4.469
		1752.5	4.949	4.470
	16QAM	1732.5	4.894	4.475
10MHz	QPSK	1715.0	9.596	8.913
		1732.5	9.606	8.912
		1750.0	9.642	8.929
	16QAM	1732.5	9.738	8.915

LTE Band 17				
Channel Bandwidth	Modulation	Frequency (MHz)	26dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
5MHz	QPSK	706.5	4.914	4.466
		710.0	4.958	4.464
		713.5	4.929	4.461
	16QAM	710.0	4.923	4.455
10MHz	QPSK	709.0	9.501	8.912
		710.0	9.467	8.901
		711.0	9.655	8.894
	16QAM	710.0	9.587	8.895

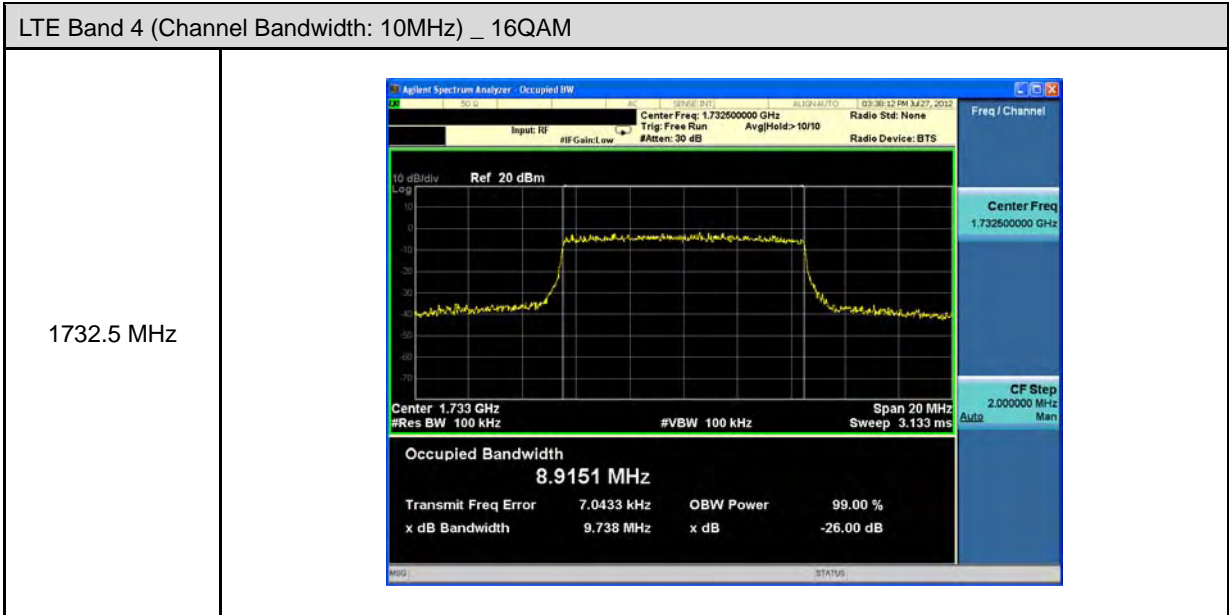
**5.7. Test Graphs**

LTE Band 4 (Channel Bandwidth: 5MHz) _ QPSK	
1712.5 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.712500000 GHz          Trig: Free Run          #Attenu: 30 dB          Avg/Hold: &gt;10/10          Radio Std: None          Radio Device: BTS</p> <p>Ref 20 dBm</p> <p>Center 1.713 GHz          #Res BW 51 kHz          #VBW 51 kHz          Span 10 MHz          Sweep 6 ms</p> <p>Occupied Bandwidth  <b>4.4672 MHz</b></p> <p>Transmit Freq Error 888.5310 Hz          x dB Bandwidth 4.993 MHz</p> <p>OBW Power 99.00 %          x dB -26.00 dB</p>
1732.5 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.732500000 GHz          Trig: Free Run          #Attenu: 30 dB          Avg/Hold: &gt;10/10          Radio Std: None          Radio Device: BTS</p> <p>Ref 20 dBm</p> <p>Center 1.733 GHz          #Res BW 51 kHz          #VBW 51 kHz          Span 10 MHz          Sweep 6 ms</p> <p>Occupied Bandwidth  <b>4.4685 MHz</b></p> <p>Transmit Freq Error -750.2220 Hz          x dB Bandwidth 4.969 MHz</p> <p>OBW Power 99.00 %          x dB -26.00 dB</p>
1750.0 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 1.752500000 GHz          Trig: Free Run          #Attenu: 30 dB          Avg/Hold: &gt;10/10          Radio Std: None          Radio Device: BTS</p> <p>Ref 20 dBm</p> <p>Center 1.753 GHz          #Res BW 51 kHz          #VBW 51 kHz          Span 10 MHz          Sweep 6 ms</p> <p>Occupied Bandwidth  <b>4.4697 MHz</b></p> <p>Transmit Freq Error -2.9084 kHz          x dB Bandwidth 4.949 MHz</p> <p>OBW Power 99.00 %          x dB -26.00 dB</p>

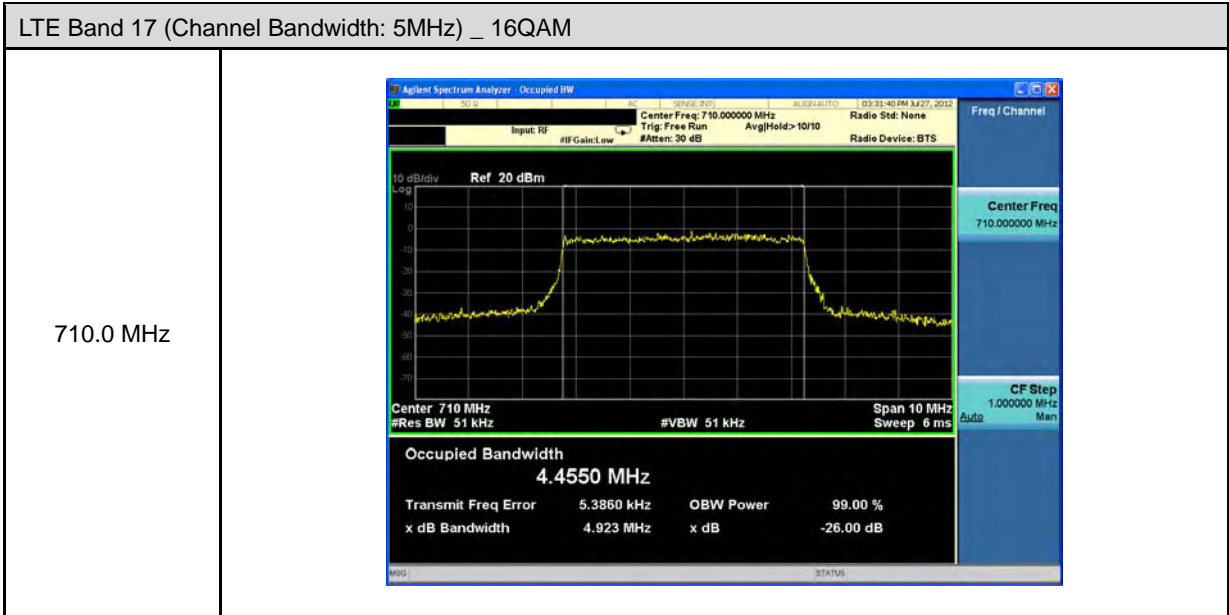




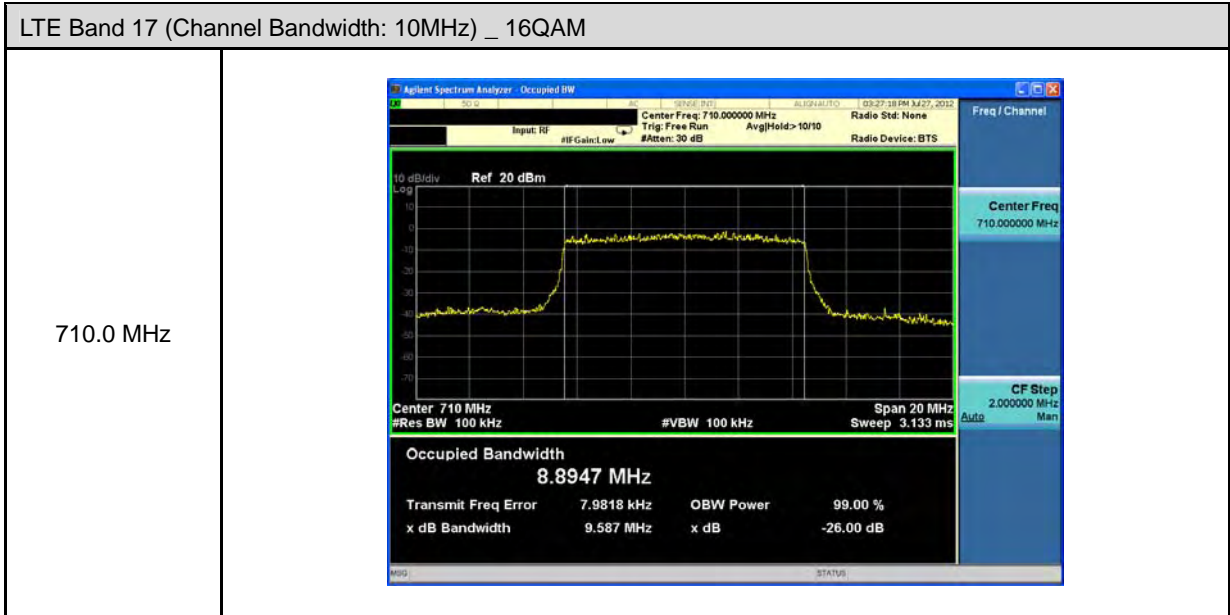
LTE Band 4 (Channel Bandwidth: 10MHz) _ QPSK									
1715.0 MHz	<p>Center 1.715 GHz #Res BW 100 kHz #VBW 100 kHz Span 20 MHz Sweep 3.133 ms</p> <p><b>Occupied Bandwidth</b> <b>8.9129 MHz</b></p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>11.7586 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>9.596 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> </table>	Transmit Freq Error	11.7586 kHz	OBW Power	99.00 %	x dB Bandwidth	9.596 MHz	x dB	-26.00 dB
Transmit Freq Error	11.7586 kHz	OBW Power	99.00 %						
x dB Bandwidth	9.596 MHz	x dB	-26.00 dB						
1732.5 MHz	<p>Center 1.733 GHz #Res BW 100 kHz #VBW 100 kHz Span 20 MHz Sweep 3.133 ms</p> <p><b>Occupied Bandwidth</b> <b>8.9117 MHz</b></p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>664.4946 Hz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>9.606 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> </table>	Transmit Freq Error	664.4946 Hz	OBW Power	99.00 %	x dB Bandwidth	9.606 MHz	x dB	-26.00 dB
Transmit Freq Error	664.4946 Hz	OBW Power	99.00 %						
x dB Bandwidth	9.606 MHz	x dB	-26.00 dB						
1752.5 MHz	<p>Center 1.75 GHz #Res BW 100 kHz #VBW 100 kHz Span 20 MHz Sweep 3.133 ms</p> <p><b>Occupied Bandwidth</b> <b>8.9286 MHz</b></p> <table border="1"> <tr> <td>Transmit Freq Error</td> <td>2.8517 kHz</td> <td>OBW Power</td> <td>99.00 %</td> </tr> <tr> <td>x dB Bandwidth</td> <td>9.642 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> </table>	Transmit Freq Error	2.8517 kHz	OBW Power	99.00 %	x dB Bandwidth	9.642 MHz	x dB	-26.00 dB
Transmit Freq Error	2.8517 kHz	OBW Power	99.00 %						
x dB Bandwidth	9.642 MHz	x dB	-26.00 dB						



LTE Band 17 (Channel Bandwidth: 5MHz) _ QPSK	
706.5 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 706.500000 MHz          Res BW: 51 kHz          Span: 10 MHz</p> <p>Occupied Bandwidth: <b>4.4658 MHz</b></p> <p>Transmit Freq Error: 3.1153 kHz          x dB Bandwidth: 4.914 MHz</p> <p>OBW Power: 99.00 %          x dB: -26.00 dB</p>
710.0 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 710.000000 MHz          Res BW: 51 kHz          Span: 10 MHz</p> <p>Occupied Bandwidth: <b>4.4641 MHz</b></p> <p>Transmit Freq Error: 2.5858 kHz          x dB Bandwidth: 4.958 MHz</p> <p>OBW Power: 99.00 %          x dB: -26.00 dB</p>
713.5 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 713.500000 MHz          Res BW: 51 kHz          Span: 10 MHz</p> <p>Occupied Bandwidth: <b>4.4611 MHz</b></p> <p>Transmit Freq Error: -7.7829 kHz          x dB Bandwidth: 4.929 MHz</p> <p>OBW Power: 99.00 %          x dB: -26.00 dB</p>



LTE Band 17 (Channel Bandwidth: 10MHz) _ QPSK	
709.0 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 709.000000 MHz</p> <p>Ref 20 dBm</p> <p>Center 709 MHz</p> <p>Span 20 MHz</p> <p>Occupied Bandwidth</p> <p><b>8.9121 MHz</b></p> <p>Transmit Freq Error 13.4801 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 9.501 MHz</p> <p>x dB -26.00 dB</p>
710.0 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 710.000000 MHz</p> <p>Ref 20 dBm</p> <p>Center 710 MHz</p> <p>Span 20 MHz</p> <p>Occupied Bandwidth</p> <p><b>8.9014 MHz</b></p> <p>Transmit Freq Error 3.2566 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 9.467 MHz</p> <p>x dB -26.00 dB</p>
711.0 MHz	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq: 711.000000 MHz</p> <p>Ref 20 dBm</p> <p>Center 711 MHz</p> <p>Span 20 MHz</p> <p>Occupied Bandwidth</p> <p><b>8.8938 MHz</b></p> <p>Transmit Freq Error 4.6214 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 9.655 MHz</p> <p>x dB -26.00 dB</p>



## 6 Peak to Average Ratio Test

### 6.1. Limit

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

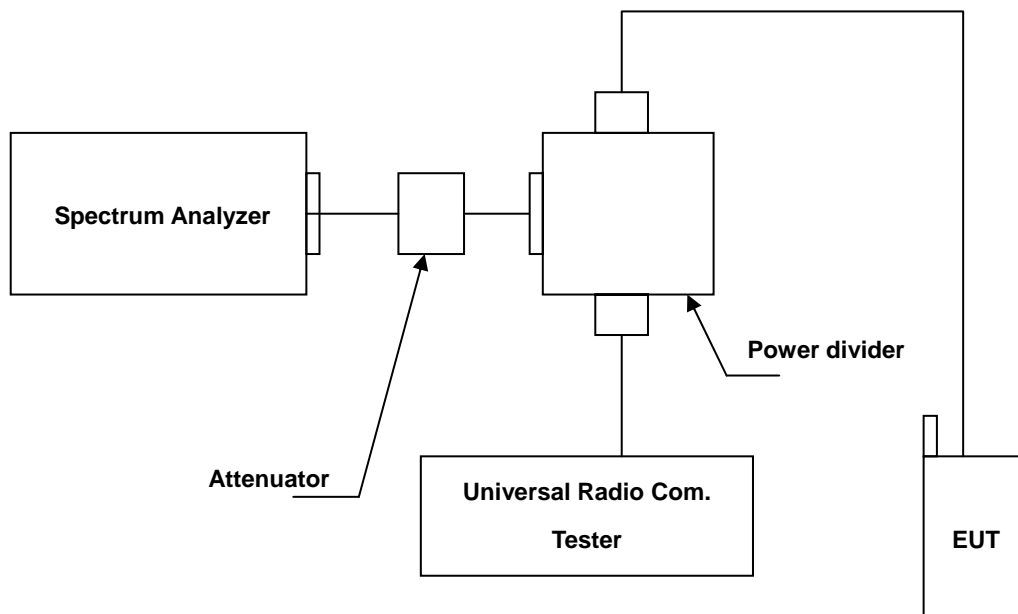
### 6.2. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 6.3. Setup





#### **6.4. Test Procedure**

The measurement is made according to FCC rules part 27:

- a. Set resolution/measurement bandwidth signal's occupied bandwidth;
- b. Set the number of counts to a value that stabilizes the measured CCDF curve;
- c. Record the maximum PAPR level associated with a probability of 0.1%.

#### **6.5. Uncertainty**

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

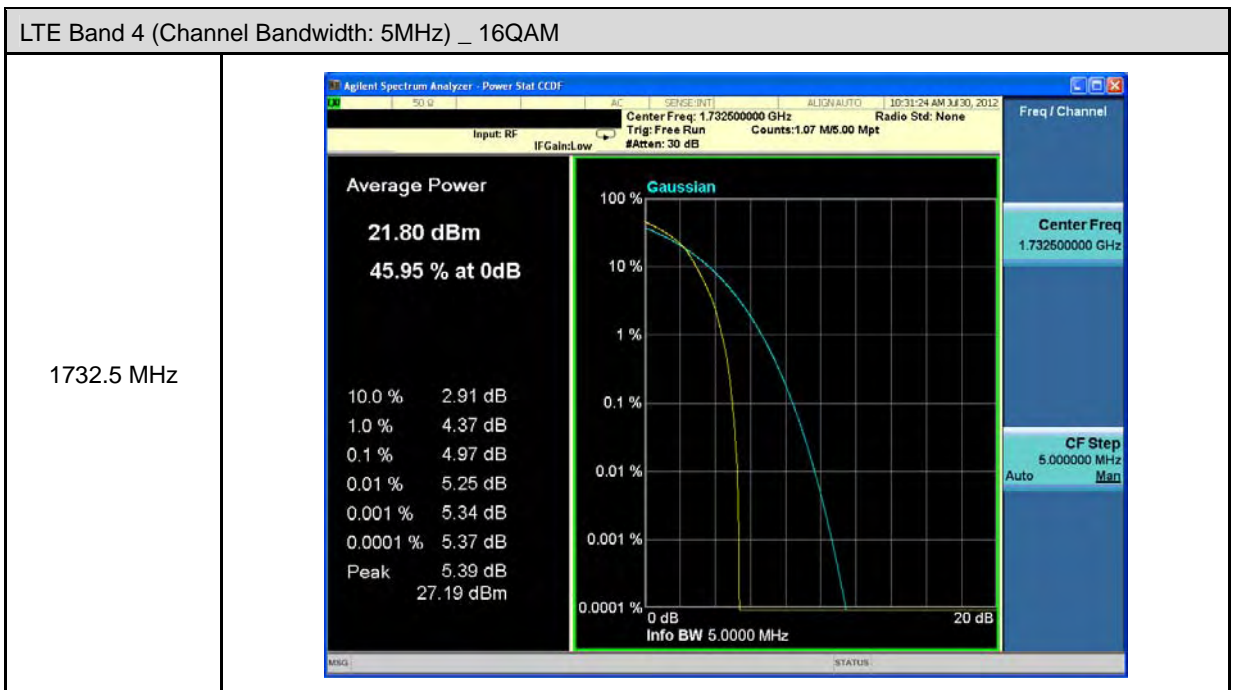
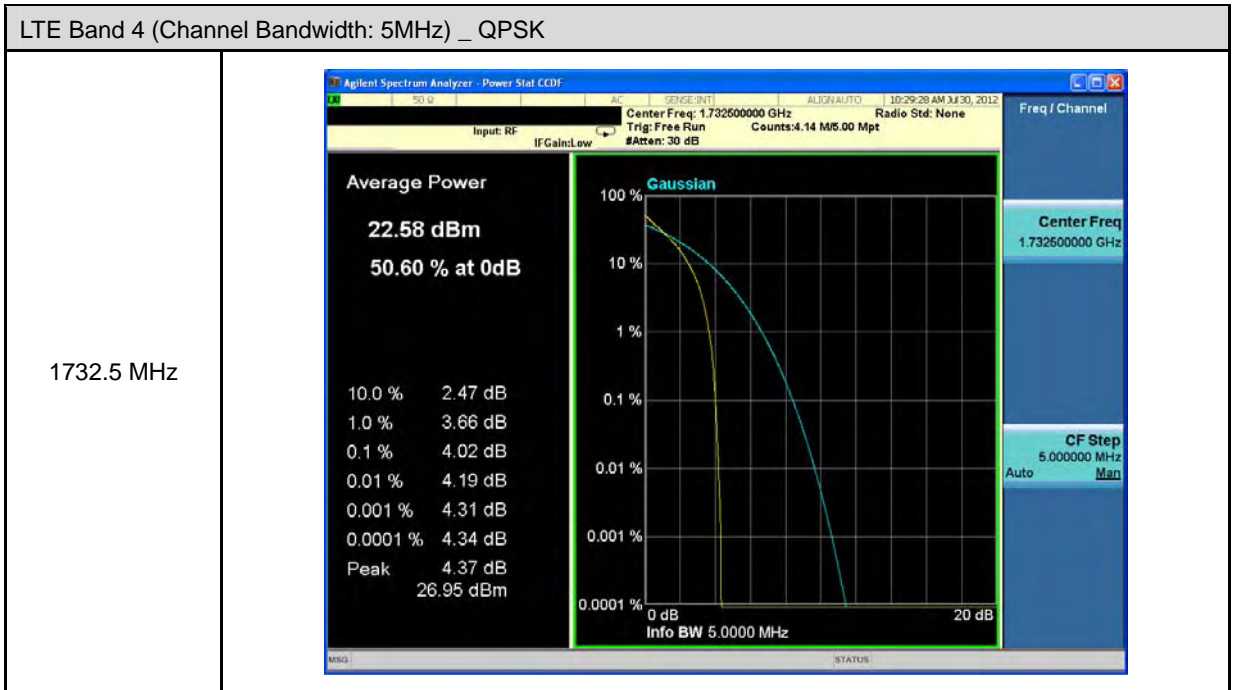
**6.6. Test Result**

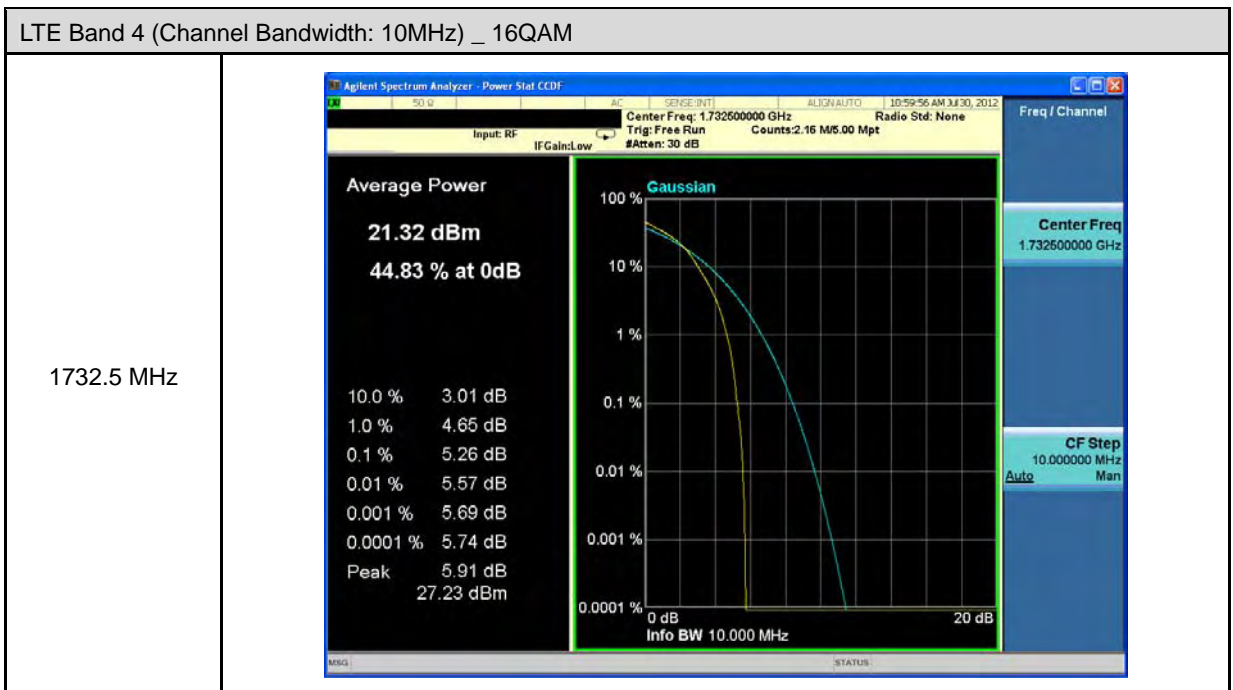
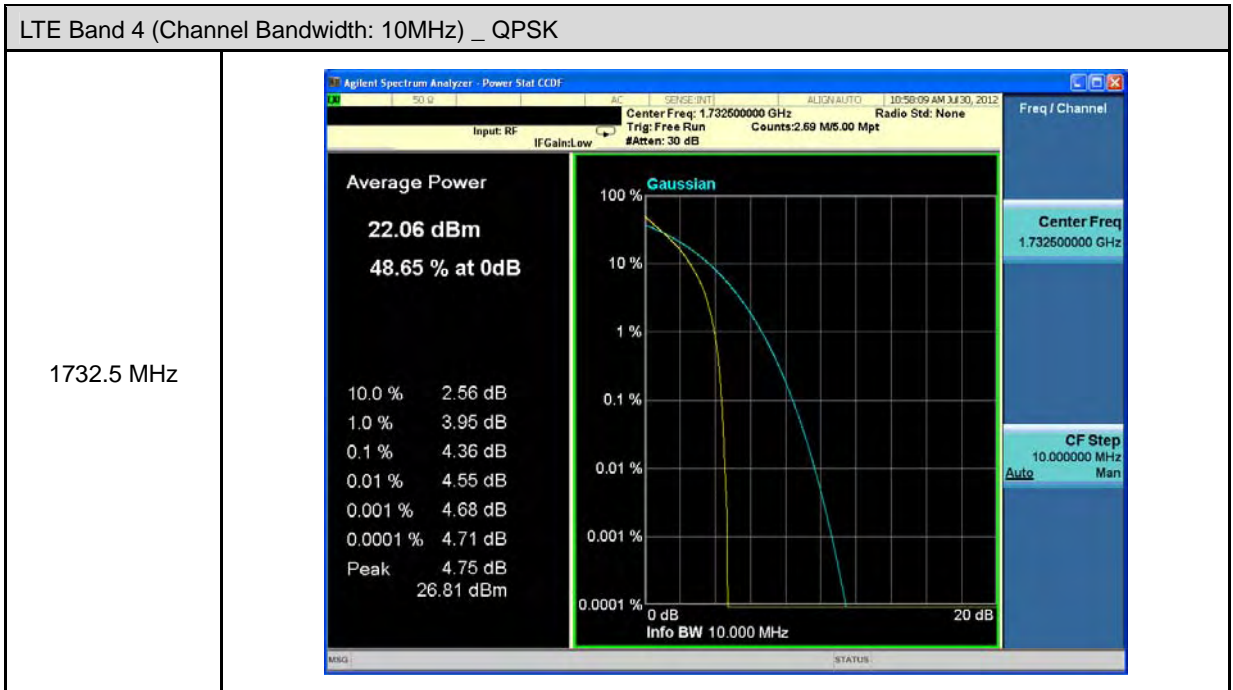
Model Number	TangoP1001		
Test Item	Peak to Average Ratio		
Date of Test	07/30/2012	Test Site	TE05

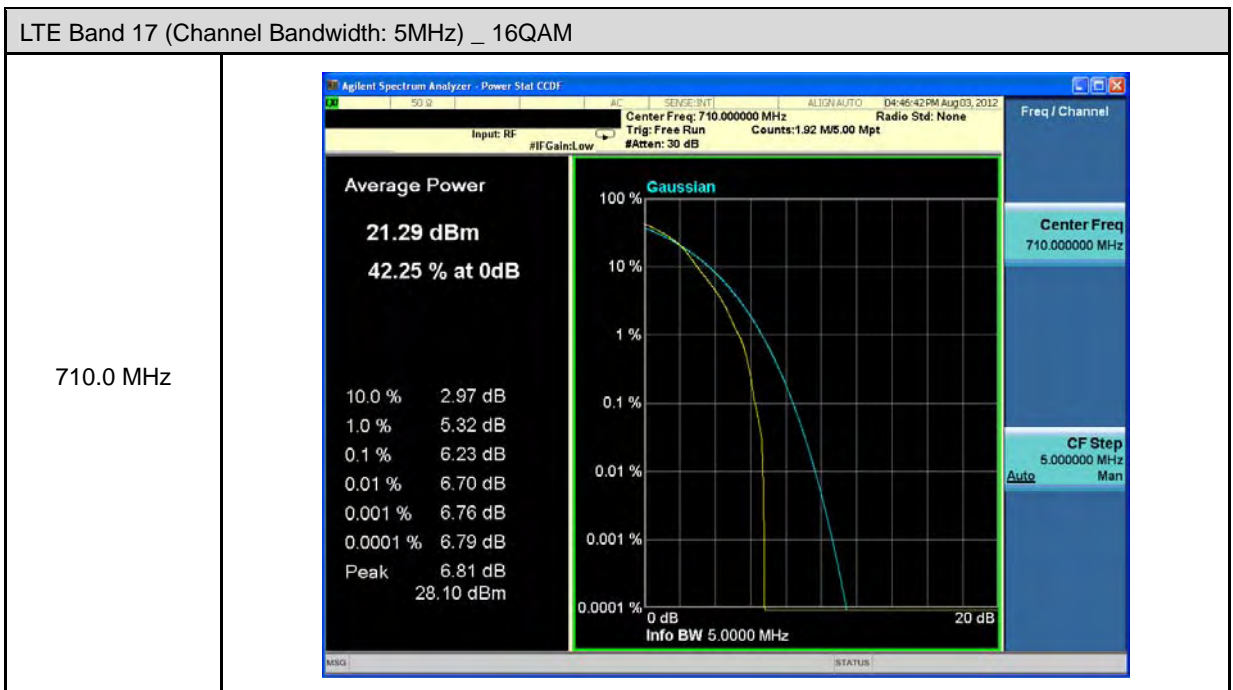
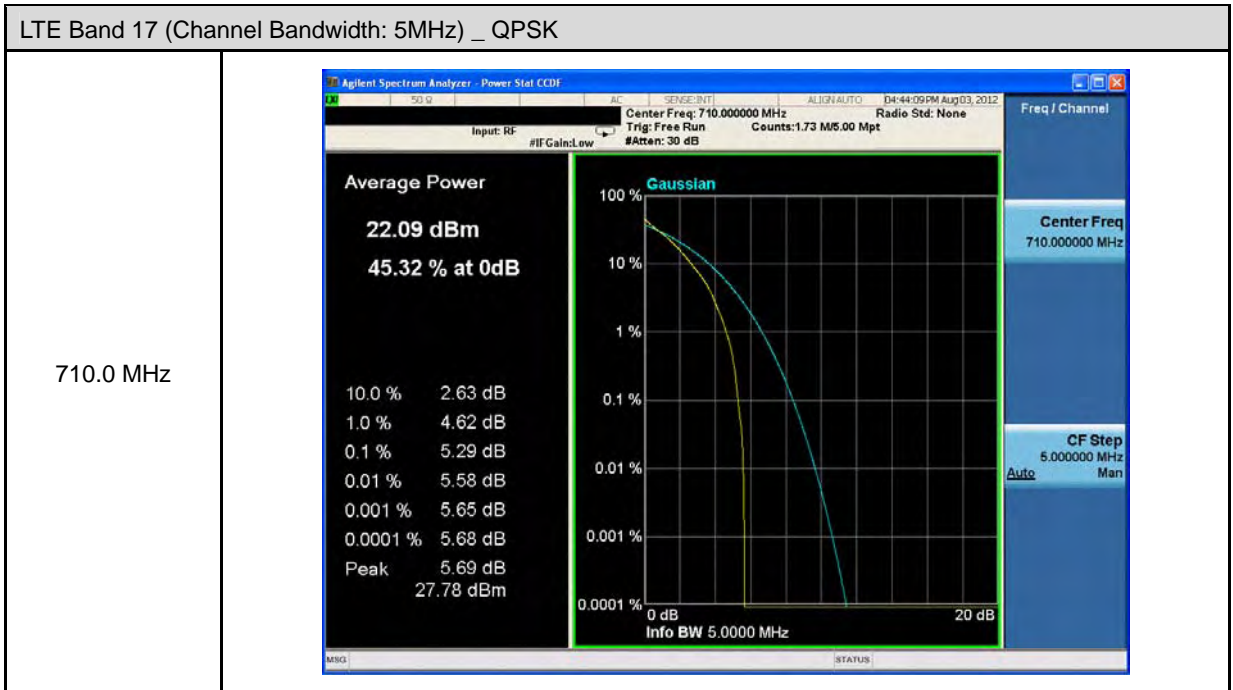
LTE Band 4				
Channel Bandwidth	Modulation	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
5MHz	QPSK	1732.5	4.02	< 13
	16QAM	1732.5	4.97	< 13
10MHz	QPSK	1732.5	4.36	< 13
	16QAM	1732.5	5.26	< 13

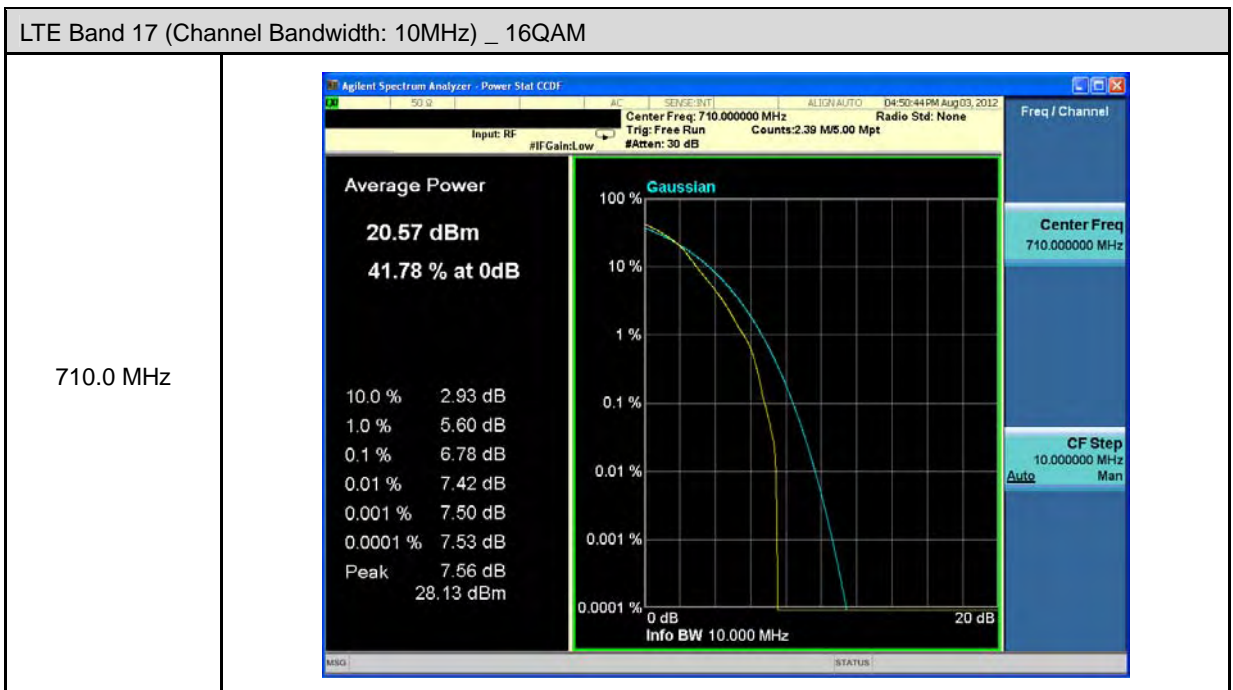
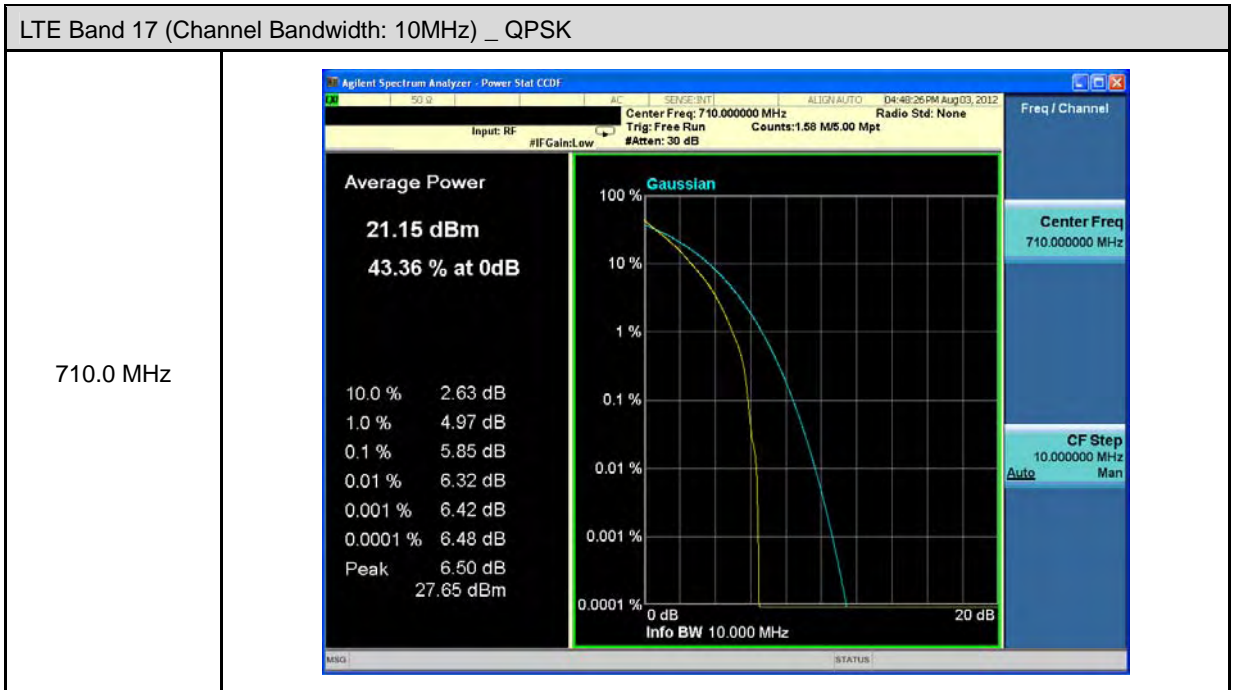
LTE Band 17				
Channel Bandwidth	Modulation	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
5MHz	QPSK	710.0	5.29	< 13
	16QAM	710.0	6.23	< 13
10MHz	QPSK	710.0	5.85	< 13
	16QAM	710.0	6.78	< 13

**6.7. Test Graphs**









## 7 Band Edge Test

### 7.1. Limit

For operations in the 698 ~ 746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710 ~ 1755 MHz and 2110 ~ 2155 MHz bands, 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 equal to -13dBm. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

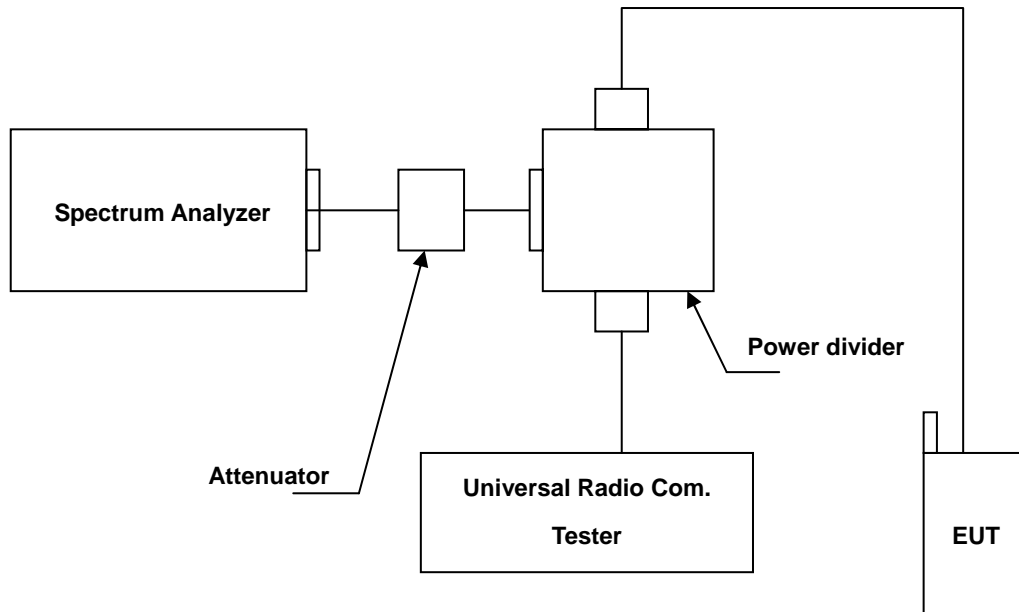
### 7.2. Test Instruments

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 7.3. Setup



### 7.4. Test Procedure

The measurement is made according to FCC rules part 27:

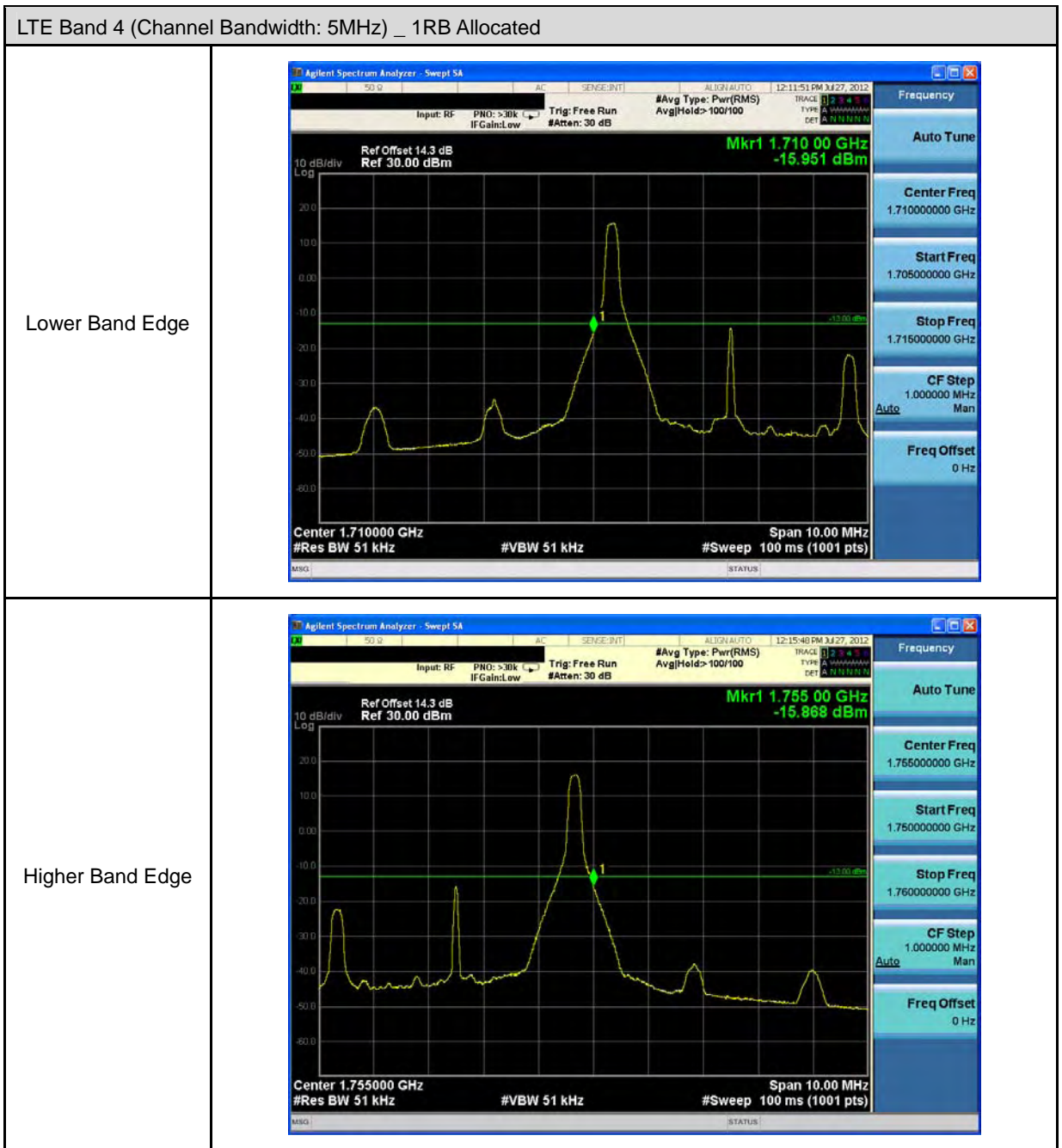
- The EUT was set up for the maximum peak power with LTE/WCDMA link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.)
- The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 7.2 dB in the transmitted path track.
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz.
- Record the max trace plot into the test report.

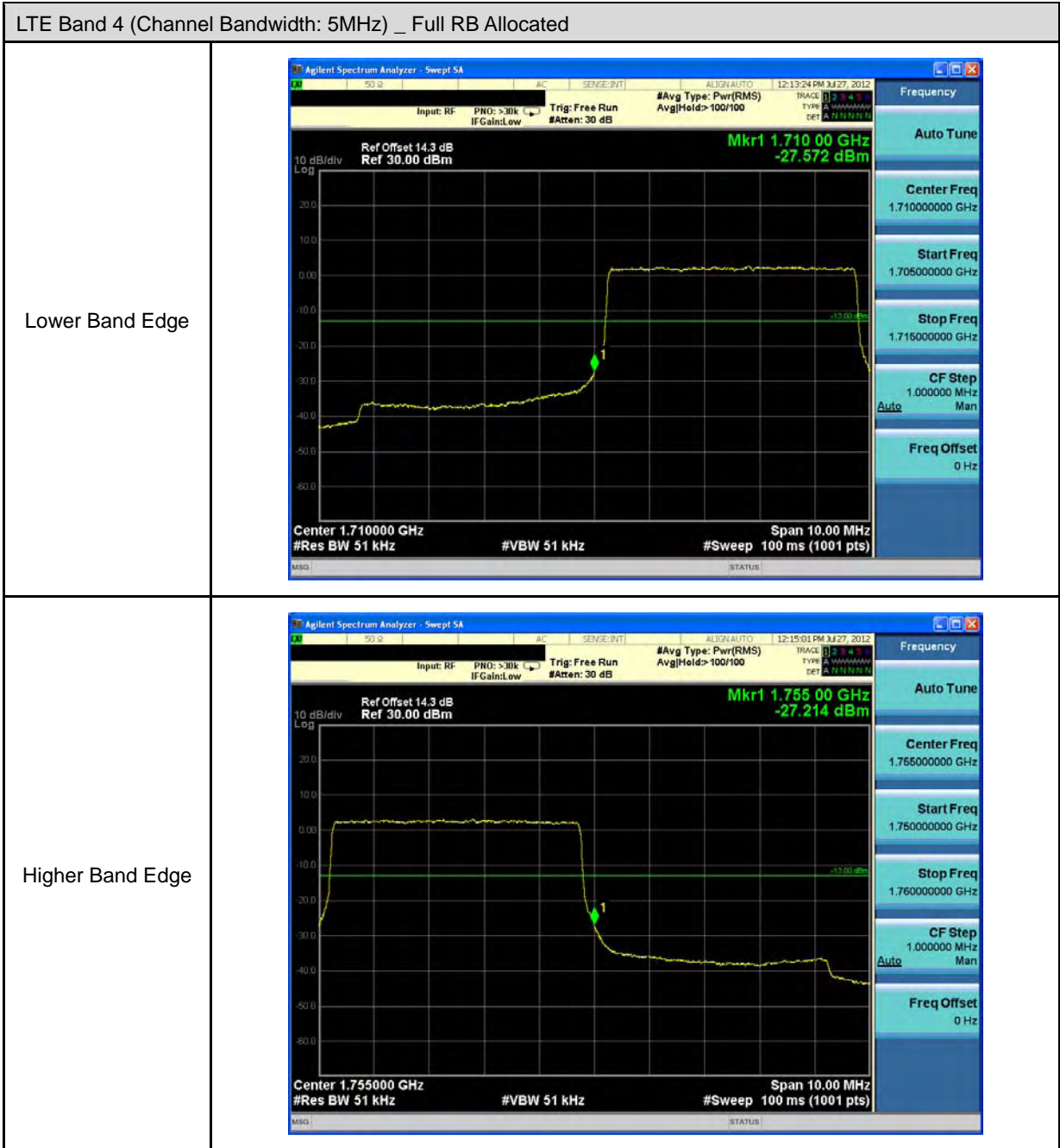
### 7.5. Uncertainty

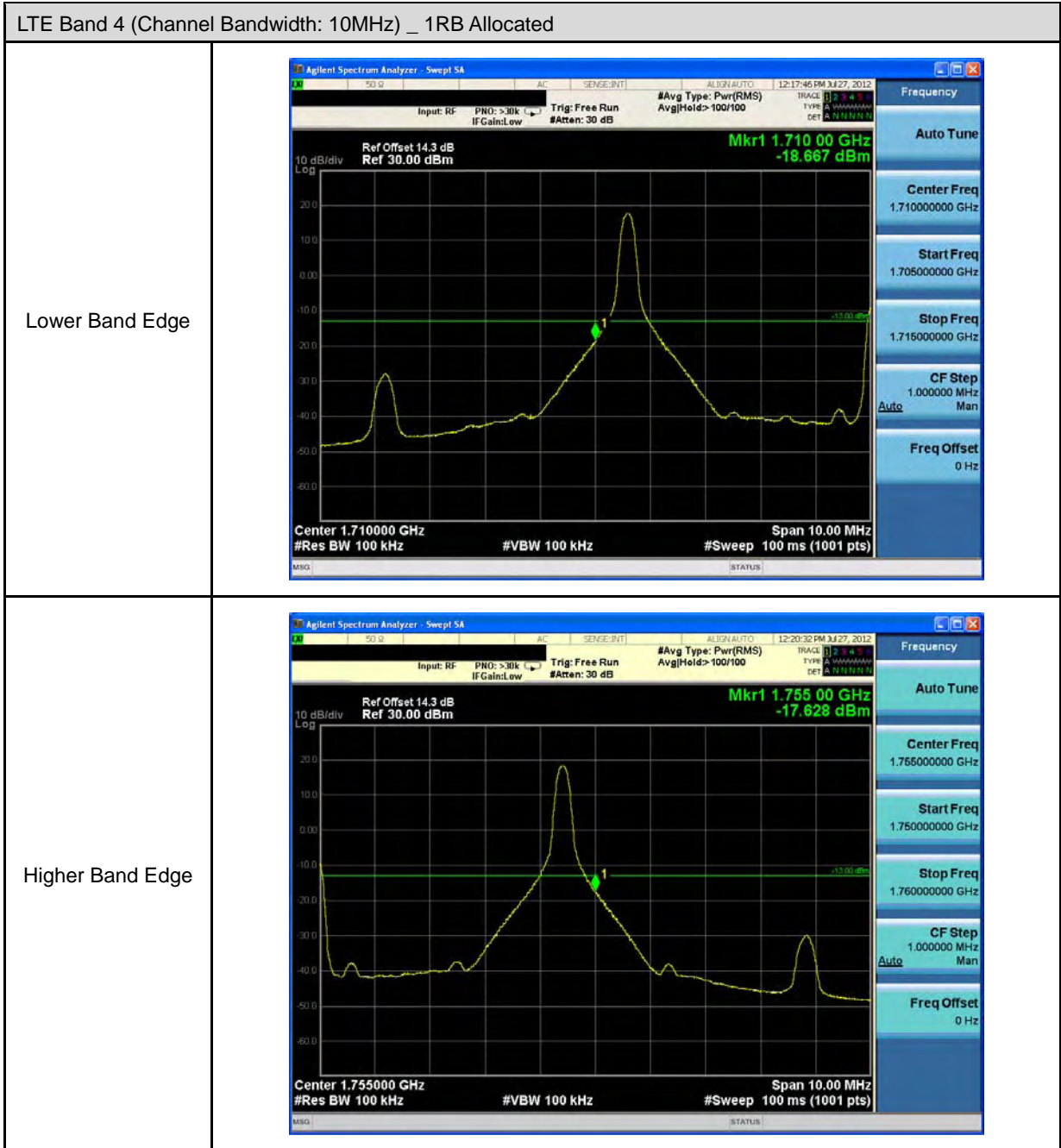
The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

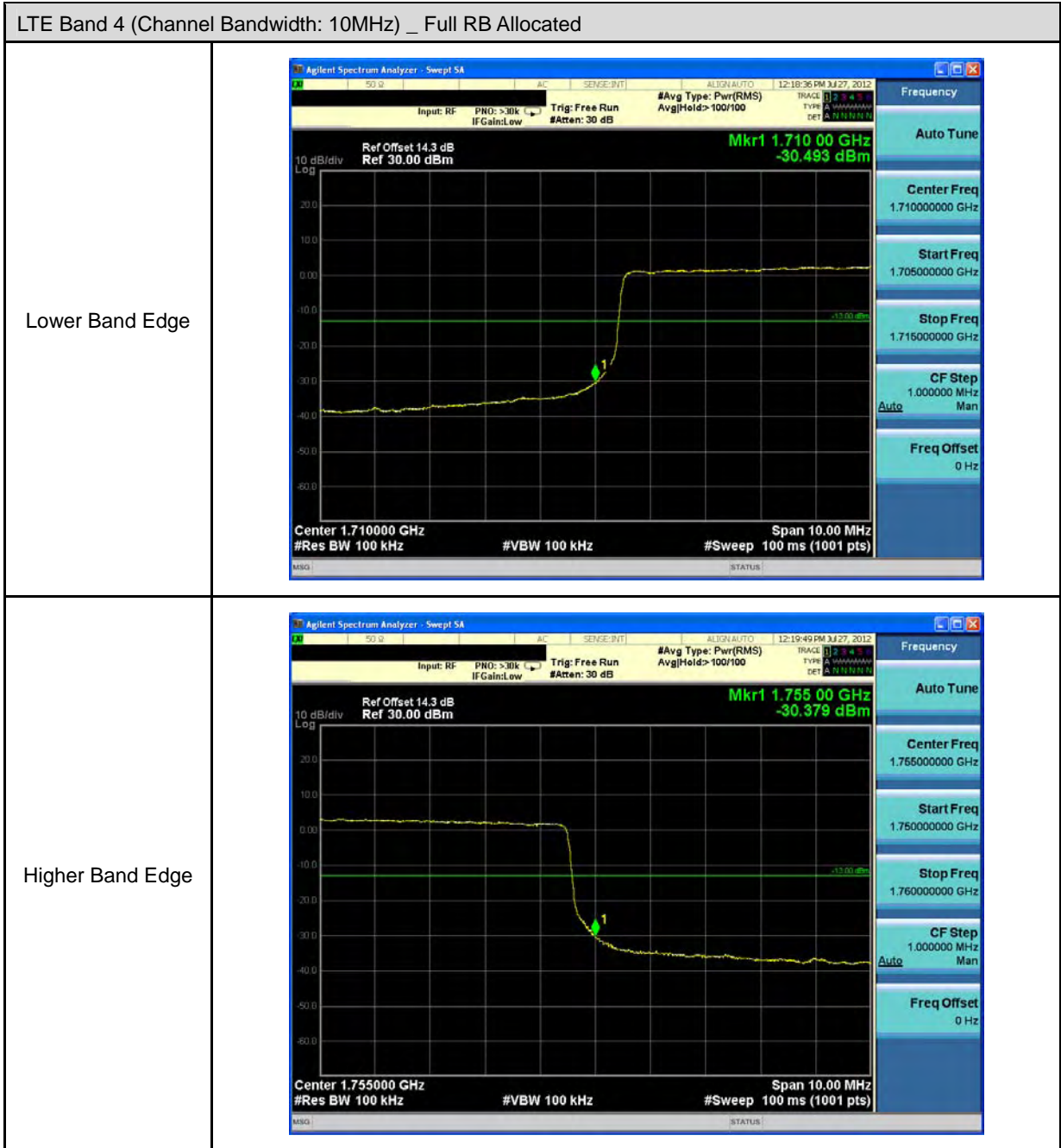


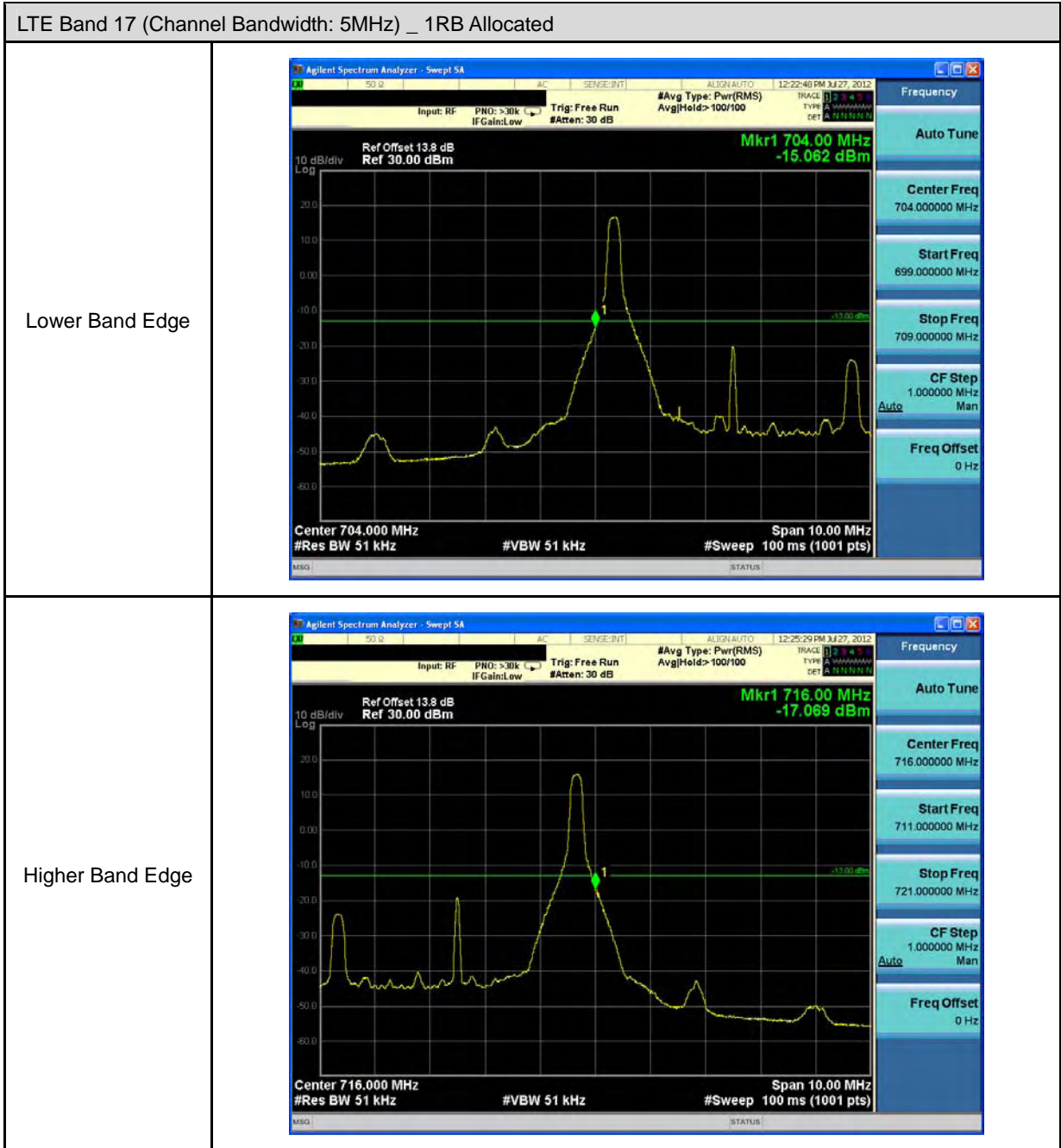
**7.6. Test Result**

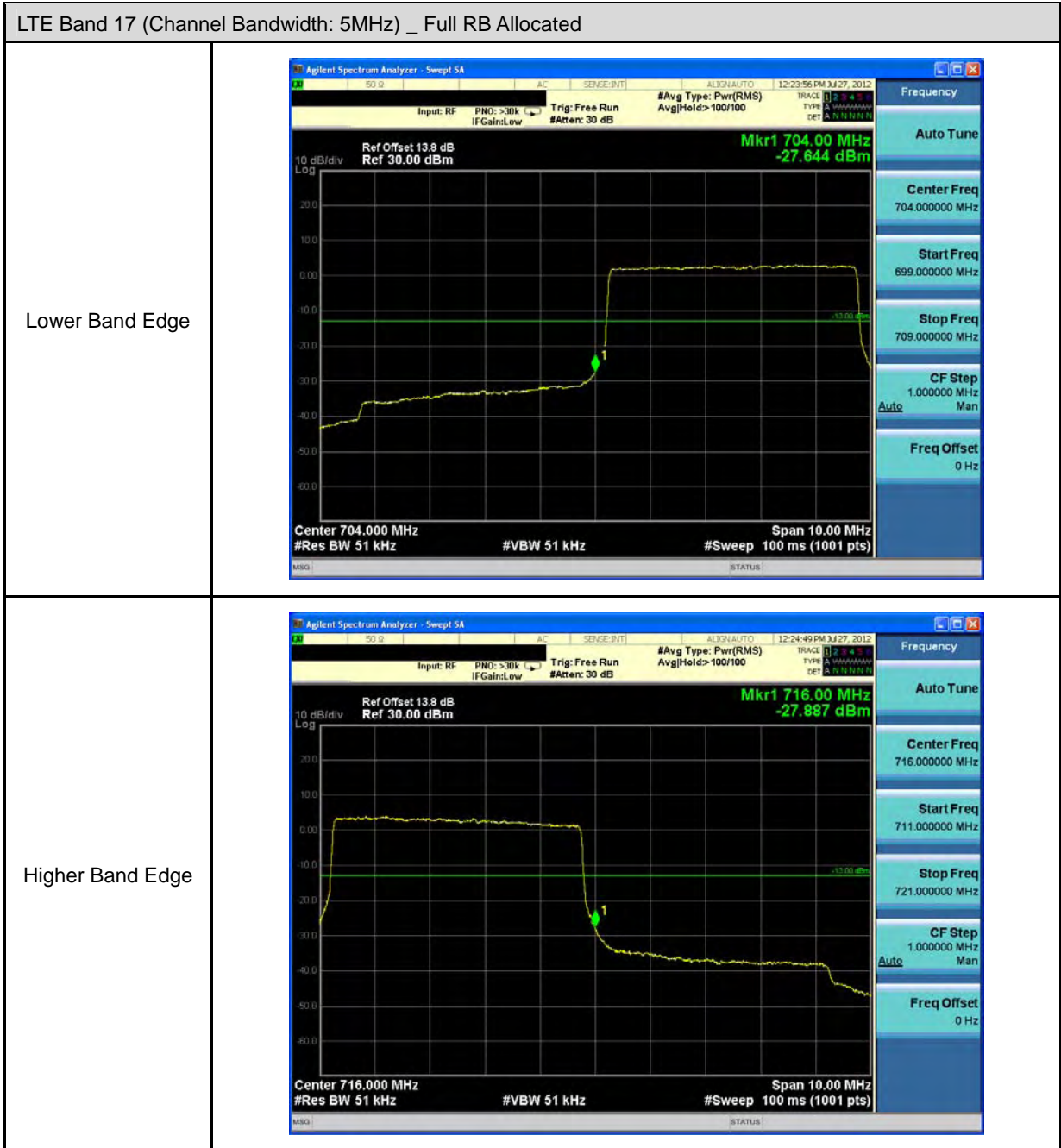


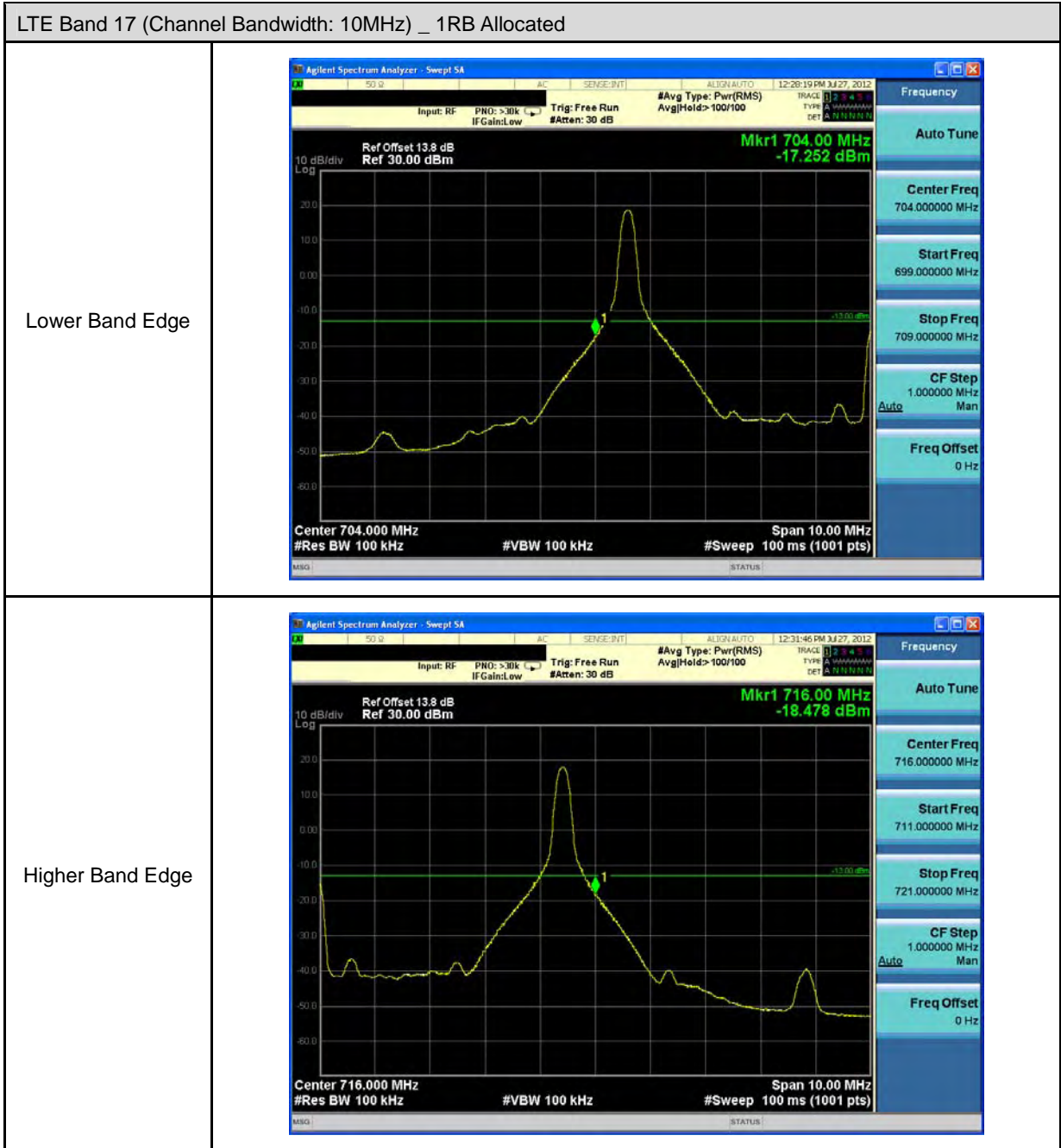


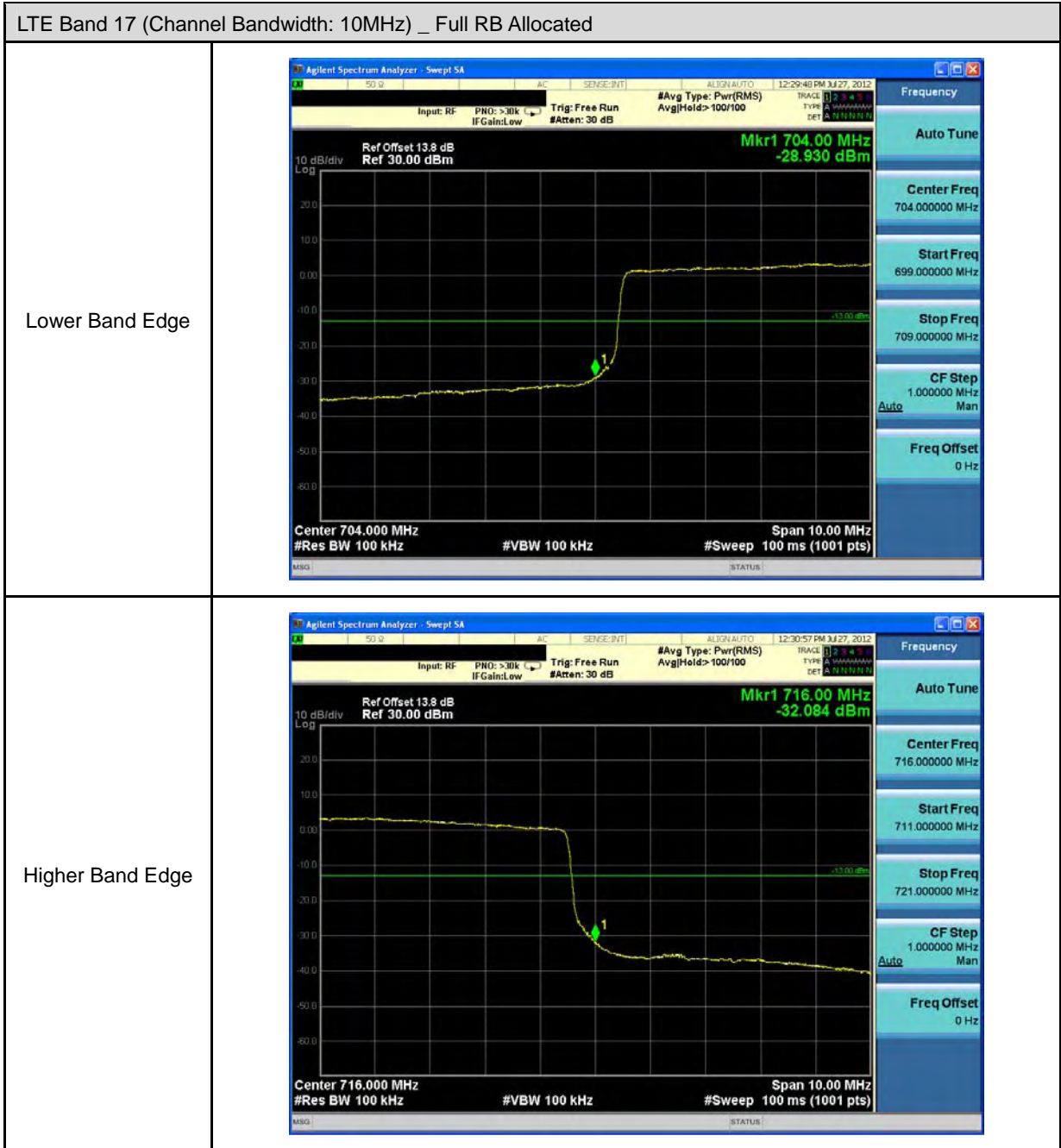














## 8 Conducted Spurious Emission Test

### 8.1. Limit

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 equal to -13dBm

### 8.2. Test Instruments

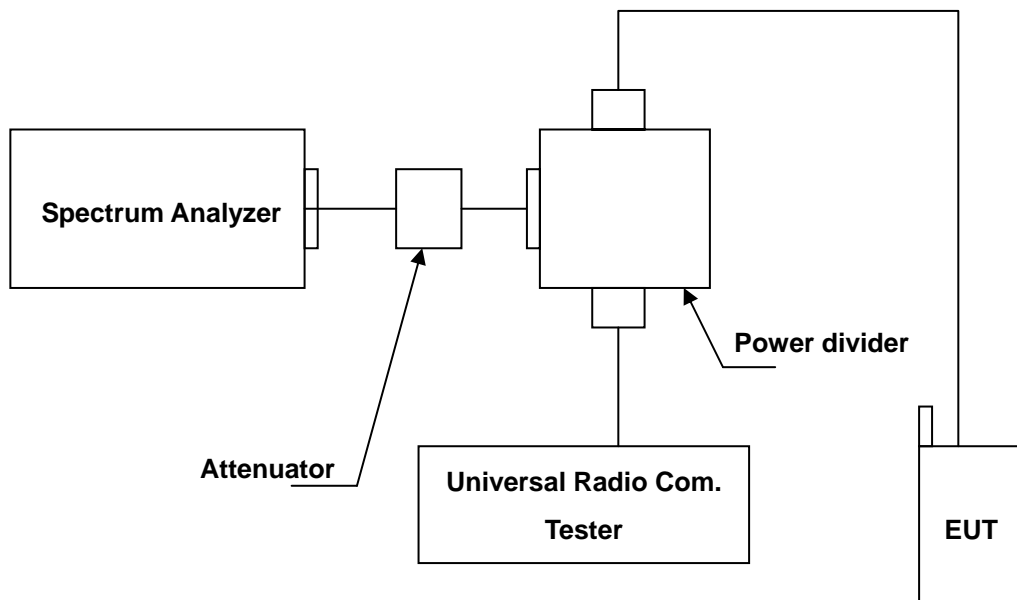
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/10/2012	(1)
Wideband Radio Communication Test	R & S	CMW500	103168	12/01/2011	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power divider	Agilent	87302C	3239A00760	N.C.R.	-----
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

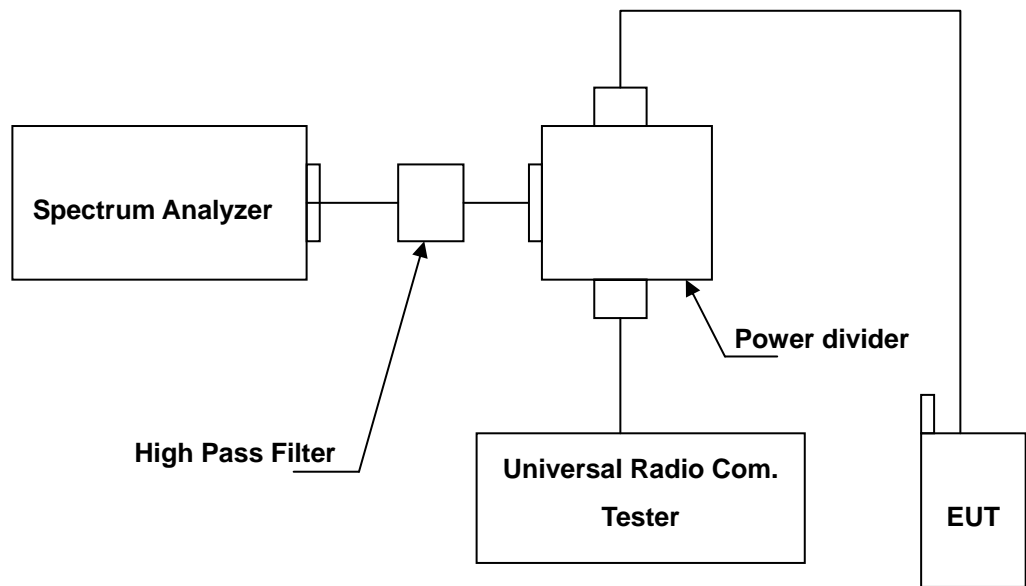
Note: N.C.R. = No Calibration Request.

### 8.3. Setup

Below 2.8GHz



Above 2.8GHz



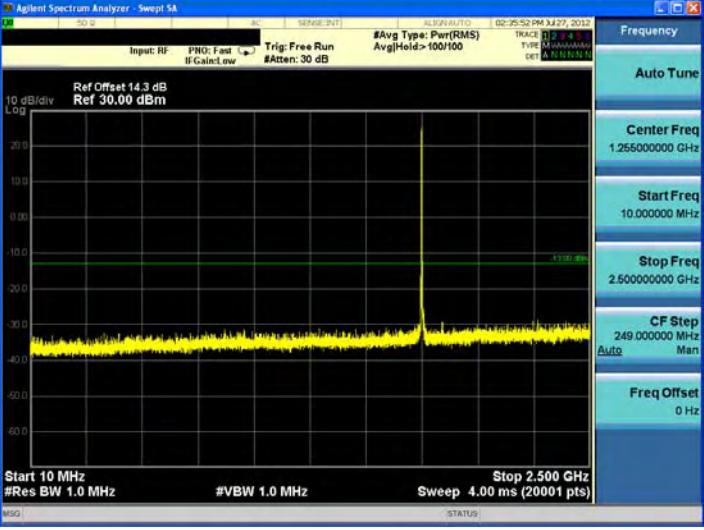
#### 8.4. Test Procedure

- The EUT was set up for the maximum peak power with LTE / WCDMA link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range.).
- The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=1MHz.
- When the spectrum scanned from 3GHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=1MHz.

#### 8.5. Uncertainty

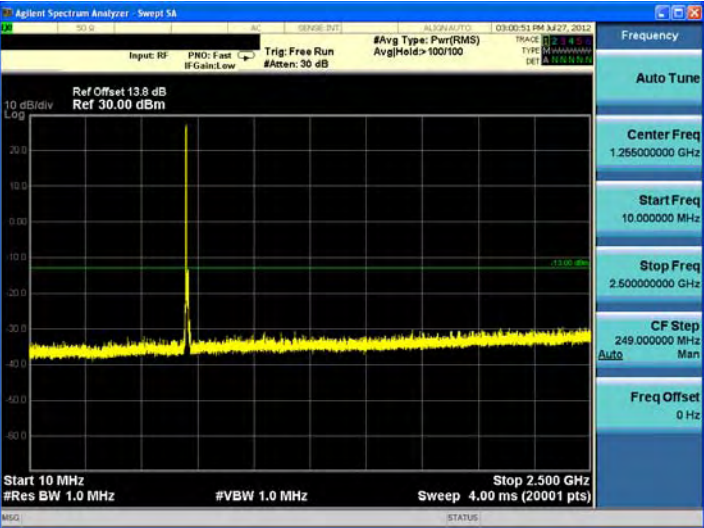
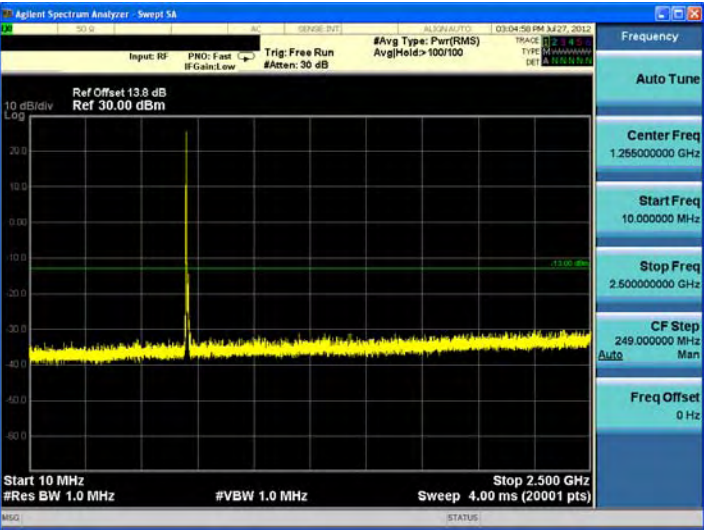
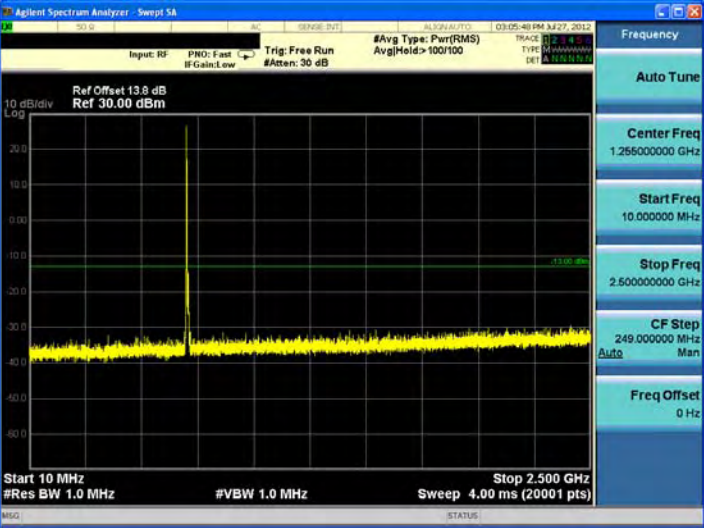
The measurement uncertainty is evaluated as  $\pm 2.24$  dB.

**8.6. Test Graphs**

LTE Band 4 (Channel Bandwidth: 5MHz) _ QPSK	
1712.5 MHz	
1732.5 MHz	
1750.0 MHz	

LTE Band 4 (Channel Bandwidth: 10MHz) _ QPSK	
1715.0 MHz	
1732.5 MHz	
1752.5 MHz	

LTE Band 17 (Channel Bandwidth: 5MHz) _ QPSK	
706.5 MHz	
710.0 MHz	
713.5 MHz	

LTE Band 17 (Channel Bandwidth: 10MHz) _ QPSK	
709.0 MHz	
710.0 MHz	
711.0 MHz	

## 9 Radiated Emission Test

### 9.1. Limit

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 equal to -13dBm

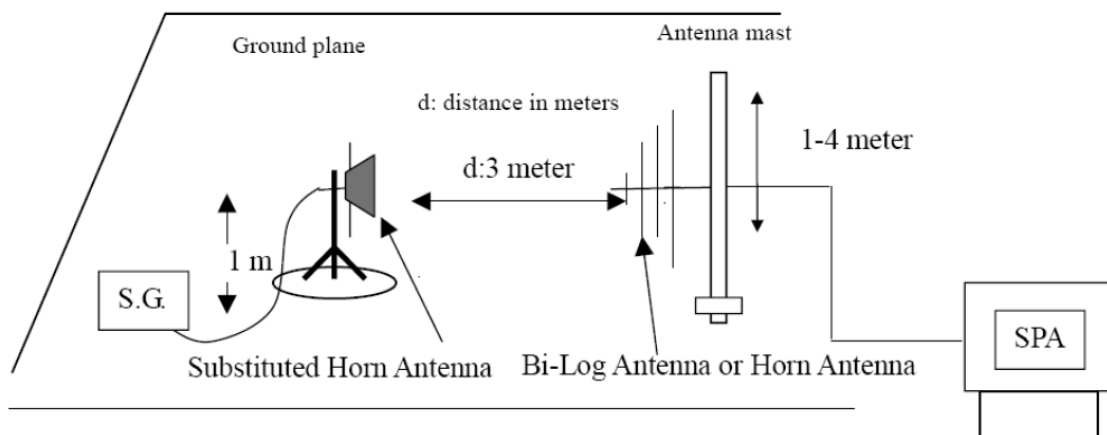
### 9.2. Test Instruments

3 Meter Chamber					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	06/29/2012	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/15/2012	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/21/2012	(1)
Test Site	ATL	TE01	888001	12/20/2011	(1)

Remark: <sup>(1)</sup> Calibration period 1 year. <sup>(2)</sup> Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

### 9.3. Setup



#### **9.4. Test Procedure**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
- c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
- d. Repeat step a ~ c for horizontal polarization.

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

#### **9.5. Uncertainty**

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is  $\pm 3.072$  dB.



**9.6. Test Result**

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1712.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	61.0000	-64.58	4.01	-60.57	-13.00	-47.57	peak	H
2	200.5000	-75.39	2.83	-72.56	-13.00	-59.56	peak	H
3	351.5000	-73.62	-0.21	-73.83	-13.00	-60.83	peak	H
4	518.5000	-79.20	7.59	-71.61	-13.00	-58.61	peak	H
5	591.0000	-78.75	7.78	-70.97	-13.00	-57.97	peak	H
6	898.0000	-79.99	13.97	-66.02	-13.00	-53.02	peak	H
7	3652.000	-68.98	15.78	-53.20	-13.00	-40.20	peak	H
8	5992.000	-71.51	23.03	-48.48	-13.00	-35.48	peak	H
9	7888.000	-71.65	29.51	-42.14	-13.00	-29.14	peak	H
1	130.5000	-72.55	14.10	-58.45	-13.00	-45.45	peak	V
2	236.0000	-70.83	1.10	-69.73	-13.00	-56.73	peak	V
3	367.0000	-72.13	2.15	-69.98	-13.00	-56.98	peak	V
4	413.0000	-76.03	1.33	-74.70	-13.00	-61.70	peak	V
5	486.5000	-72.86	2.50	-70.36	-13.00	-57.36	peak	V
6	940.5000	-79.85	12.73	-67.12	-13.00	-54.12	peak	V
7	3280.000	-67.62	18.14	-49.48	-13.00	-36.48	peak	V
8	5152.000	-71.60	23.46	-48.14	-13.00	-35.14	peak	V
9	7420.000	-71.34	26.34	-45.00	-13.00	-32.00	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1732.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	91.5000	-58.56	-0.25	-58.81	-13.00	-45.81	peak	H
2	200.5000	-74.78	2.83	-71.95	-13.00	-58.95	peak	H
3	354.0000	-74.38	-0.13	-74.51	-13.00	-61.51	peak	H
4	498.5000	-78.91	6.87	-72.04	-13.00	-59.04	peak	H
5	667.5000	-80.32	7.11	-73.21	-13.00	-60.21	peak	H
6	874.0000	-79.73	13.16	-66.57	-13.00	-53.57	peak	H
7	3220.000	-68.45	14.62	-53.83	-13.00	-40.83	peak	H
8	5368.000	-72.23	21.27	-50.96	-13.00	-37.96	peak	H
9	7696.000	-71.44	29.37	-42.07	-13.00	-29.07	peak	H
1	131.0000	-72.61	13.83	-58.78	-13.00	-45.78	peak	V
2	234.5000	-74.95	1.38	-73.57	-13.00	-60.57	peak	V
3	366.5000	-73.08	2.18	-70.90	-13.00	-57.90	peak	V
4	489.0000	-72.93	2.54	-70.39	-13.00	-57.39	peak	V
5	633.5000	-79.46	8.71	-70.75	-13.00	-57.75	peak	V
6	823.5000	-80.02	11.29	-68.73	-13.00	-55.73	peak	V
7	3388.000	-68.39	18.82	-49.57	-13.00	-36.57	peak	V
8	5272.000	-71.77	23.47	-48.30	-13.00	-35.30	peak	V
9	7876.000	-71.87	26.39	-45.48	-13.00	-32.48	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1752.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	93.0000	-58.73	-0.52	-59.25	-13.00	-46.25	peak	H
2	200.5000	-78.13	2.83	-75.30	-13.00	-62.30	peak	H
3	353.5000	-75.71	-0.15	-75.86	-13.00	-62.86	peak	H
4	418.0000	-77.14	3.35	-73.79	-13.00	-60.79	peak	H
5	569.0000	-78.08	7.72	-70.36	-13.00	-57.36	peak	H
6	820.5000	-79.15	11.92	-67.23	-13.00	-54.23	peak	H
7	3004.000	-69.38	13.93	-55.45	-13.00	-42.45	peak	H
8	5008.000	-70.58	20.12	-50.46	-13.00	-37.46	peak	H
9	7216.000	-71.09	28.28	-42.81	-13.00	-29.81	peak	H
1	130.5000	-73.19	14.10	-59.09	-13.00	-46.09	peak	V
2	236.0000	-74.49	1.10	-73.39	-13.00	-60.39	peak	V
3	366.5000	-73.41	2.18	-71.23	-13.00	-58.23	peak	V
4	489.0000	-74.34	2.54	-71.80	-13.00	-58.80	peak	V
5	630.0000	-79.89	8.76	-71.13	-13.00	-58.13	peak	V
6	821.0000	-79.71	11.28	-68.43	-13.00	-55.43	peak	V
7	2728.000	-68.38	14.19	-54.19	-13.00	-41.19	peak	V
8	4804.000	-70.67	22.95	-47.72	-13.00	-34.72	peak	V
9	7444.000	-71.18	26.38	-44.80	-13.00	-31.80	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1715.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	91.5000	-59.10	-0.25	-59.35	-13.00	-46.35	peak	H
2	144.0000	-64.66	-3.56	-68.22	-13.00	-55.22	peak	H
3	237.0000	-71.29	-1.74	-73.03	-13.00	-60.03	peak	H
4	352.0000	-74.93	-0.18	-75.11	-13.00	-62.11	peak	H
5	578.5000	-78.45	7.61	-70.84	-13.00	-57.84	peak	H
6	824.5000	-77.83	11.96	-65.87	-13.00	-52.87	peak	H
7	3484.000	-69.09	15.44	-53.65	-13.00	-40.65	peak	H
8	5476.000	-71.58	21.61	-49.97	-13.00	-36.97	peak	H
9	7732.000	-71.50	29.39	-42.11	-13.00	-29.11	peak	H
1	130.0000	-73.63	14.37	-59.26	-13.00	-46.26	peak	V
2	235.0000	-73.35	1.29	-72.06	-13.00	-59.06	peak	V
3	368.5000	-71.81	2.08	-69.73	-13.00	-56.73	peak	V
4	486.5000	-73.21	2.50	-70.71	-13.00	-57.71	peak	V
5	628.5000	-80.29	8.77	-71.52	-13.00	-58.52	peak	V
6	825.0000	-79.16	11.30	-67.86	-13.00	-54.86	peak	V
7	3112.000	-67.85	17.11	-50.74	-13.00	-37.74	peak	V
8	5188.000	-71.43	23.46	-47.97	-13.00	-34.97	peak	V
9	7744.000	-70.84	26.43	-44.41	-13.00	-31.41	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1732.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	91.0000	-58.13	-0.16	-58.29	-13.00	-45.29	peak	H
2	144.0000	-65.37	-3.56	-68.93	-13.00	-55.93	peak	H
3	237.0000	-73.60	-1.74	-75.34	-13.00	-62.34	peak	H
4	353.5000	-74.05	-0.15	-74.20	-13.00	-61.20	peak	H
5	559.0000	-78.94	7.84	-71.10	-13.00	-58.10	peak	H
6	887.5000	-80.80	13.53	-67.27	-13.00	-54.27	peak	H
7	3232.000	-69.22	14.65	-54.57	-13.00	-41.57	peak	H
8	5668.000	-71.84	22.15	-49.69	-13.00	-36.69	peak	H
9	7768.000	-71.26	29.42	-41.84	-13.00	-28.84	peak	H
1	131.5000	-72.48	13.57	-58.91	-13.00	-45.91	peak	V
2	207.0000	-81.15	9.31	-71.84	-13.00	-58.84	peak	V
3	367.0000	-72.14	2.15	-69.99	-13.00	-56.99	peak	V
4	486.5000	-72.37	2.50	-69.87	-13.00	-56.87	peak	V
5	631.0000	-79.28	8.74	-70.54	-13.00	-57.54	peak	V
6	935.5000	-81.01	12.54	-68.47	-13.00	-55.47	peak	V
7	3484.000	-68.41	19.41	-49.00	-13.00	-36.00	peak	V
8	5464.000	-71.87	23.49	-48.38	-13.00	-35.38	peak	V
9	7756.000	-70.79	26.42	-44.37	-13.00	-31.37	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 4	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	1750.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	91.0000	-58.58	-0.16	-58.74	-13.00	-45.74	peak	H
2	144.0000	-64.81	-3.56	-68.37	-13.00	-55.37	peak	H
3	240.0000	-72.90	-2.09	-74.99	-13.00	-61.99	peak	H
4	352.0000	-74.81	-0.18	-74.99	-13.00	-61.99	peak	H
5	573.5000	-77.98	7.66	-70.32	-13.00	-57.32	peak	H
6	837.0000	-76.15	12.08	-64.07	-13.00	-51.07	peak	H
7	3340.000	-68.31	14.99	-53.32	-13.00	-40.32	peak	H
8	5668.000	-71.73	22.15	-49.58	-13.00	-36.58	peak	H
9	7900.000	-72.24	29.53	-42.71	-13.00	-29.71	peak	H
1	130.0000	-72.88	14.37	-58.51	-13.00	-45.51	peak	V
2	238.0000	-72.16	0.75	-71.41	-13.00	-58.41	peak	V
3	361.5000	-74.00	2.38	-71.62	-13.00	-58.62	peak	V
4	489.0000	-71.86	2.54	-69.32	-13.00	-56.32	peak	V
5	630.5000	-80.07	8.76	-71.31	-13.00	-58.31	peak	V
6	802.5000	-79.88	11.79	-68.09	-13.00	-55.09	peak	V
7	3340.000	-67.75	18.52	-49.23	-13.00	-36.23	peak	V
8	5224.000	-71.39	23.47	-47.92	-13.00	-34.92	peak	V
9	7744.000	-71.83	26.43	-45.40	-13.00	-32.40	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	706.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	60.5000	-63.36	4.34	-59.02	-13.00	-46.02	peak	H
2	144.0000	-64.89	-3.56	-68.45	-13.00	-55.45	peak	H
3	244.5000	-69.59	-3.05	-72.64	-13.00	-59.64	peak	H
4	355.0000	-72.58	-0.11	-72.69	-13.00	-59.69	peak	H
5	598.0000	-69.19	7.90	-61.29	-13.00	-48.29	peak	H
6	909.5000	-79.65	14.38	-65.27	-13.00	-52.27	peak	H
7	3292.000	-68.56	14.85	-53.71	-13.00	-40.71	peak	H
8	5392.000	-71.26	21.34	-49.92	-13.00	-36.92	peak	H
9	7780.000	-71.23	29.43	-41.80	-13.00	-28.80	peak	H
1	130.5000	-71.89	14.10	-57.79	-13.00	-44.79	peak	V
2	239.0000	-73.28	0.56	-72.72	-13.00	-59.72	peak	V
3	367.0000	-73.19	2.15	-71.04	-13.00	-58.04	peak	V
4	489.0000	-73.57	2.54	-71.03	-13.00	-58.03	peak	V
5	630.5000	-73.14	8.76	-64.38	-13.00	-51.38	peak	V
6	823.5000	-79.45	11.29	-68.16	-13.00	-55.16	peak	V
7	3664.000	-69.62	19.87	-49.75	-13.00	-36.75	peak	V
8	5728.000	-72.01	23.16	-48.85	-13.00	-35.85	peak	V
9	7876.000	-71.05	26.39	-44.66	-13.00	-31.66	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	710.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	90.5000	-59.03	-0.07	-59.10	-13.00	-46.10	peak	H
2	144.0000	-65.76	-3.56	-69.32	-13.00	-56.32	peak	H
3	350.5000	-73.11	-0.23	-73.34	-13.00	-60.34	peak	H
4	419.0000	-76.96	3.39	-73.57	-13.00	-60.57	peak	H
5	596.5000	-70.35	7.89	-62.46	-13.00	-49.46	peak	H
6	820.5000	-75.49	11.92	-63.57	-13.00	-50.57	peak	H
7	3184.000	-67.92	14.50	-53.42	-13.00	-40.42	peak	H
8	5560.000	-72.21	21.85	-50.36	-13.00	-37.36	peak	H
9	7612.000	-71.84	29.30	-42.54	-13.00	-29.54	peak	H
1	130.5000	-72.48	14.10	-58.38	-13.00	-45.38	peak	V
2	235.5000	-71.36	1.20	-70.16	-13.00	-57.16	peak	V
3	366.5000	-74.07	2.18	-71.89	-13.00	-58.89	peak	V
4	486.5000	-74.28	2.50	-71.78	-13.00	-58.78	peak	V
5	616.5000	-68.23	8.64	-59.59	-13.00	-46.59	peak	V
6	823.5000	-79.82	11.29	-68.53	-13.00	-55.53	peak	V
7	3040.000	-68.96	16.67	-52.29	-13.00	-39.29	peak	V
8	4852.000	-69.73	23.07	-46.66	-13.00	-33.66	peak	V
9	7372.000	-70.74	26.25	-44.49	-13.00	-31.49	peak	V



Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	5MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	713.5 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	92.5000	-58.50	-0.43	-58.93	-13.00	-45.93	peak	H
2	238.0000	-72.36	-1.85	-74.21	-13.00	-61.21	peak	H
3	416.0000	-75.73	3.25	-72.48	-13.00	-59.48	peak	H
4	486.5000	-77.29	6.13	-71.16	-13.00	-58.16	peak	H
5	619.0000	-73.37	7.72	-65.65	-13.00	-52.65	peak	H
6	823.5000	-77.89	11.95	-65.94	-13.00	-52.94	peak	H
7	3796.000	-69.29	16.05	-53.24	-13.00	-40.24	peak	H
8	5932.000	-71.99	22.87	-49.12	-13.00	-36.12	peak	H
9	7684.000	-71.20	29.35	-41.85	-13.00	-28.85	peak	H
1	131.0000	-72.14	13.83	-58.31	-13.00	-45.31	peak	V
2	237.5000	-74.35	0.83	-73.52	-13.00	-60.52	peak	V
3	365.0000	-73.51	2.23	-71.28	-13.00	-58.28	peak	V
4	486.5000	-74.24	2.50	-71.74	-13.00	-58.74	peak	V
5	620.5000	-67.62	8.88	-58.74	-13.00	-45.74	peak	V
6	851.0000	-79.32	11.49	-67.83	-13.00	-54.83	peak	V
7	3664.000	-69.11	19.87	-49.24	-13.00	-36.24	peak	V
8	5740.000	-71.88	23.13	-48.75	-13.00	-35.75	peak	V
9	7696.000	-70.81	26.45	-44.36	-13.00	-31.36	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	709.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	90.5000	-59.01	-0.07	-59.08	-13.00	-46.08	peak	H
2	237.0000	-70.10	-1.74	-71.84	-13.00	-58.84	peak	H
3	353.5000	-74.05	-0.15	-74.20	-13.00	-61.20	peak	H
4	478.0000	-78.23	5.63	-72.60	-13.00	-59.60	peak	H
5	602.0000	-71.74	7.92	-63.82	-13.00	-50.82	peak	H
6	828.5000	-78.33	11.99	-66.34	-13.00	-53.34	peak	H
7	3400.000	-68.42	15.18	-53.24	-13.00	-40.24	peak	H
8	5692.000	-70.17	22.22	-47.95	-13.00	-34.95	peak	H
9	7816.000	-72.14	29.46	-42.68	-13.00	-29.68	peak	H
1	131.0000	-71.99	13.83	-58.16	-13.00	-45.16	peak	V
2	200.5000	-78.96	10.08	-68.88	-13.00	-55.88	peak	V
3	367.0000	-72.77	2.15	-70.62	-13.00	-57.62	peak	V
4	489.0000	-74.08	2.54	-71.54	-13.00	-58.54	peak	V
5	621.5000	-66.90	8.88	-58.02	-13.00	-45.02	peak	V
6	854.0000	-79.87	11.54	-68.33	-13.00	-55.33	peak	V
7	3220.000	-67.92	17.79	-50.13	-13.00	-37.13	peak	V
8	5416.000	-71.36	23.48	-47.88	-13.00	-34.88	peak	V
9	7396.000	-71.90	26.30	-45.60	-13.00	-32.60	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	710.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	91.0000	-58.55	-0.16	-58.71	-13.00	-45.71	peak	H
2	243.5000	-70.81	-2.83	-73.64	-13.00	-60.64	peak	H
3	351.5000	-75.25	-0.21	-75.46	-13.00	-62.46	peak	H
4	413.5000	-77.26	3.15	-74.11	-13.00	-61.11	peak	H
5	605.0000	-70.67	7.88	-62.79	-13.00	-49.79	peak	H
6	836.5000	-75.66	12.07	-63.59	-13.00	-50.59	peak	H
7	3556.000	-68.80	15.61	-53.19	-13.00	-40.19	peak	H
8	5656.000	-71.39	22.11	-49.28	-13.00	-36.28	peak	H
9	7684.000	-72.08	29.35	-42.73	-13.00	-29.73	peak	H
1	91.5000	-58.70	-0.25	-58.95	-13.00	-45.95	peak	V
2	238.0000	-72.72	-1.85	-74.57	-13.00	-61.57	peak	V
3	353.5000	-74.40	-0.15	-74.55	-13.00	-61.55	peak	V
4	489.0000	-78.83	6.28	-72.55	-13.00	-59.55	peak	V
5	600.0000	-71.90	7.94	-63.96	-13.00	-50.96	peak	V
6	826.0000	-78.15	11.97	-66.18	-13.00	-53.18	peak	V
7	2788.000	-68.38	14.68	-53.70	-13.00	-40.70	peak	V
8	4744.000	-70.98	22.80	-48.18	-13.00	-35.18	peak	V
9	7492.000	-71.50	26.48	-45.02	-13.00	-32.02	peak	V

Standard:	FCC Part 27	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TangoP1001	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Band:	LTE Band 17	Date:	07/27/2012
Channel Bandwidth:	10MHz	Test By:	Fly Lu
Modulation Technology:	QPSK		
Frequency:	711.0 MHz		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
1	92.5000	-58.12	-0.43	-58.55	-13.00	-45.55	peak	H
2	234.5000	-71.54	-1.45	-72.99	-13.00	-59.99	peak	H
3	352.5000	-74.99	-0.17	-75.16	-13.00	-62.16	peak	H
4	416.5000	-76.77	3.27	-73.50	-13.00	-60.50	peak	H
5	600.5000	-75.07	7.93	-67.14	-13.00	-54.14	peak	H
6	869.0000	-80.25	13.10	-67.15	-13.00	-54.15	peak	H
7	3448.000	-69.36	15.33	-54.03	-13.00	-41.03	peak	H
8	5596.000	-70.70	21.95	-48.75	-13.00	-35.75	peak	H
9	7504.000	-70.42	29.20	-41.22	-13.00	-28.22	peak	H
1	131.5000	-71.88	13.57	-58.31	-13.00	-45.31	peak	V
2	235.5000	-72.86	1.20	-71.66	-13.00	-58.66	peak	V
3	366.5000	-73.67	2.18	-71.49	-13.00	-58.49	peak	V
4	486.5000	-73.63	2.50	-71.13	-13.00	-58.13	peak	V
5	625.0000	-70.56	8.83	-61.73	-13.00	-48.73	peak	V
6	836.0000	-73.53	11.34	-62.19	-13.00	-49.19	peak	V
7	2860.000	-68.28	15.28	-53.00	-13.00	-40.00	peak	V
8	4828.000	-71.27	23.00	-48.27	-13.00	-35.27	peak	V
9	7552.000	-72.42	26.49	-45.93	-13.00	-32.93	peak	V