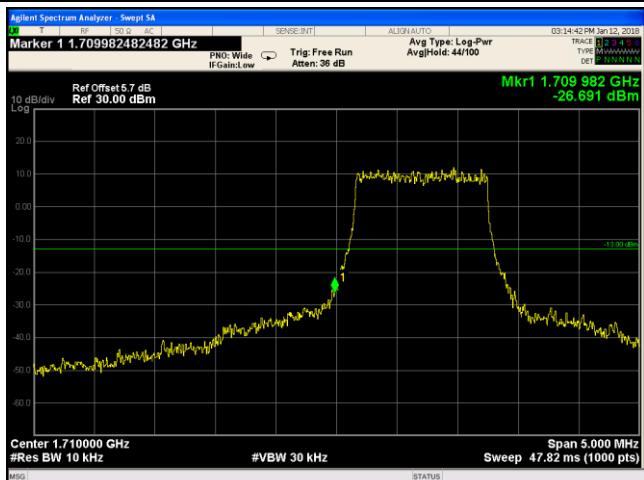


## LTE Band IV (Part 27)

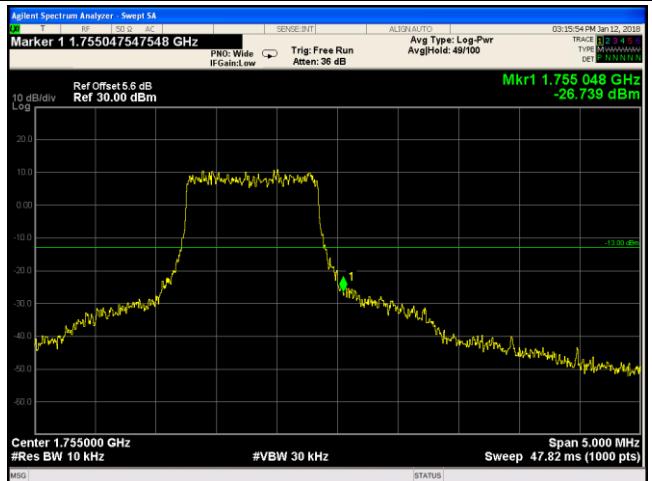
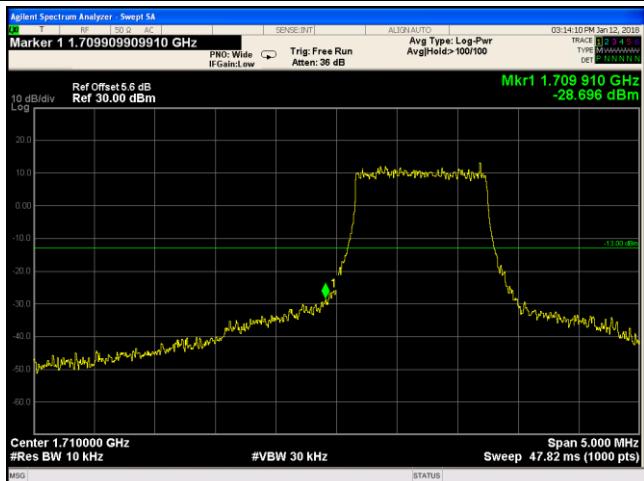


LTE Band IV - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.18/10)=4.5+1.2=5.7 dB

LTE Band IV - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.90/10)=4.5+1.1=5.6 dB

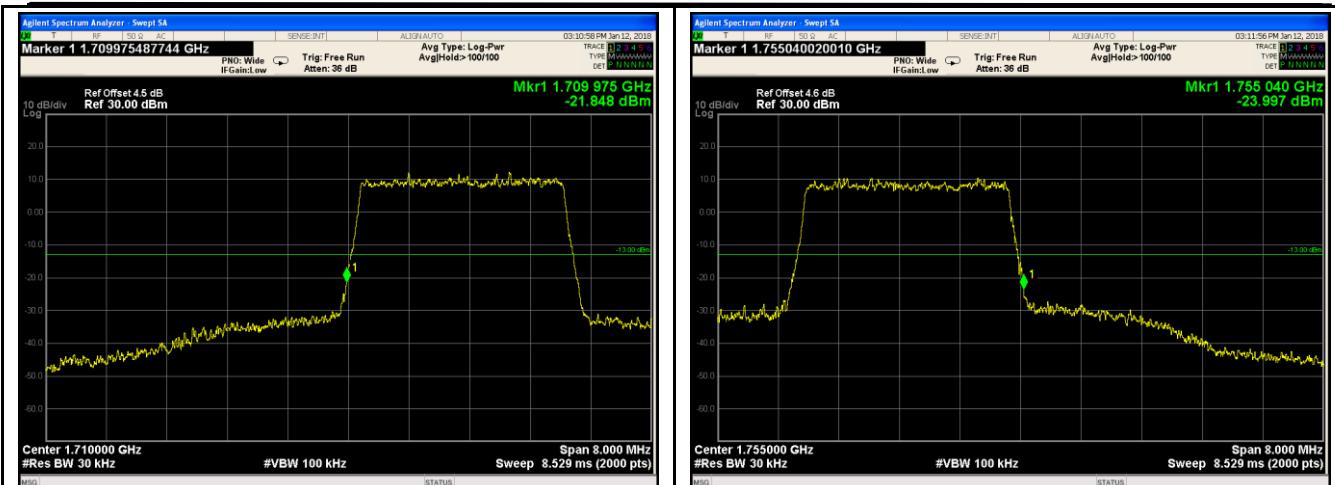


LTE Band IV - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.02/10)=4.5+1.1=5.6 dB

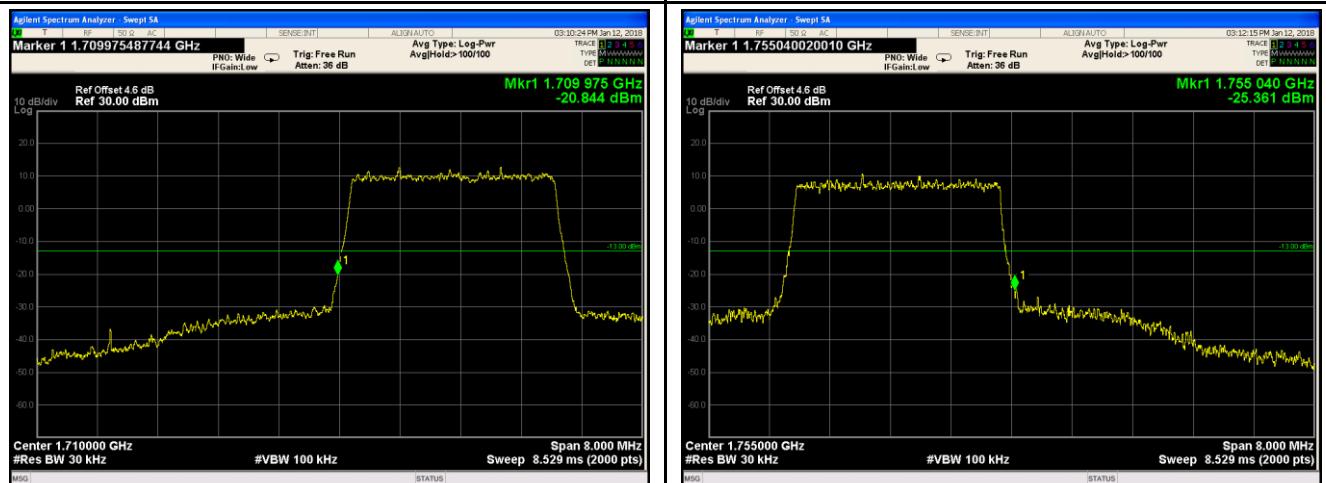
LTE Band IV - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.95/10)=4.5+1.1=5.6 dB



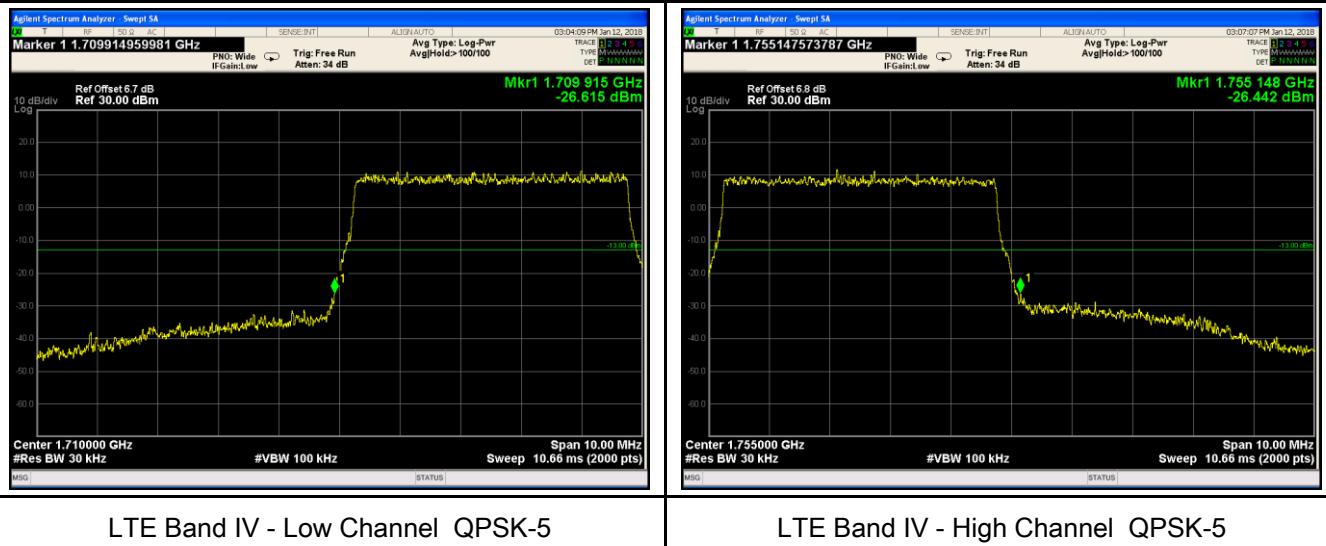
#### LTE Band IV - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
(30.21/30)=4.5+0.0=4.5 dB



#### LTE Band IV - Low Channel 16QAM-3

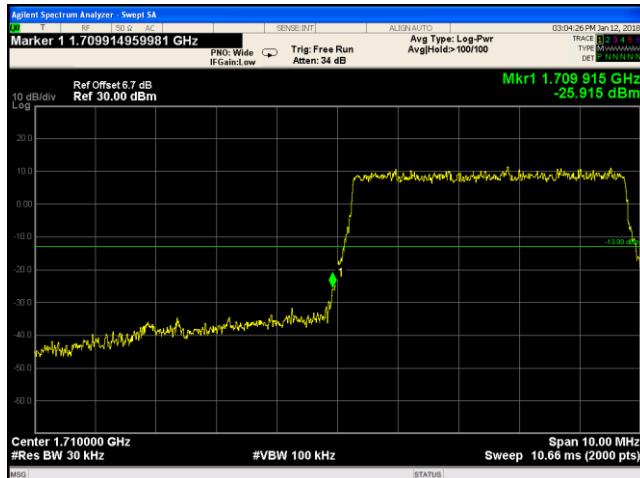
Note: Offset=Cable loss (4.5) + 10log  
(30.58/30)=4.5+0.1=4.6 dB



#### LTE Band IV - Low Channel QPSK-5

#### LTE Band IV - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log  
 $(49.62/30)=4.5+2.2=6.7$  dB



Note: Offset=Cable loss (4.5) + 10log  
 $(50.40/30)=4.5+2.2=6.7$  dB



#### LTE Band IV - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log  
 $(50.35/30)=4.5+2.2=6.7$  dB



#### LTE Band IV - High Channel 16QAM-5

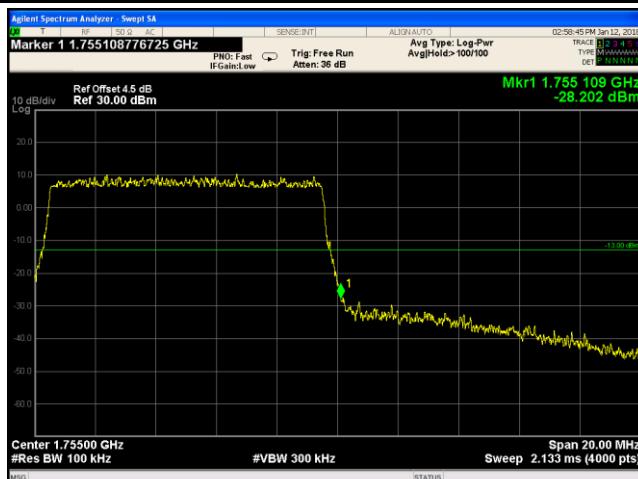
Note: Offset=Cable loss (4.5) + 10log  
 $(50.05/30)=4.5+2.2=6.7$  dB



#### LTE Band IV - Low Channel QPSK-10

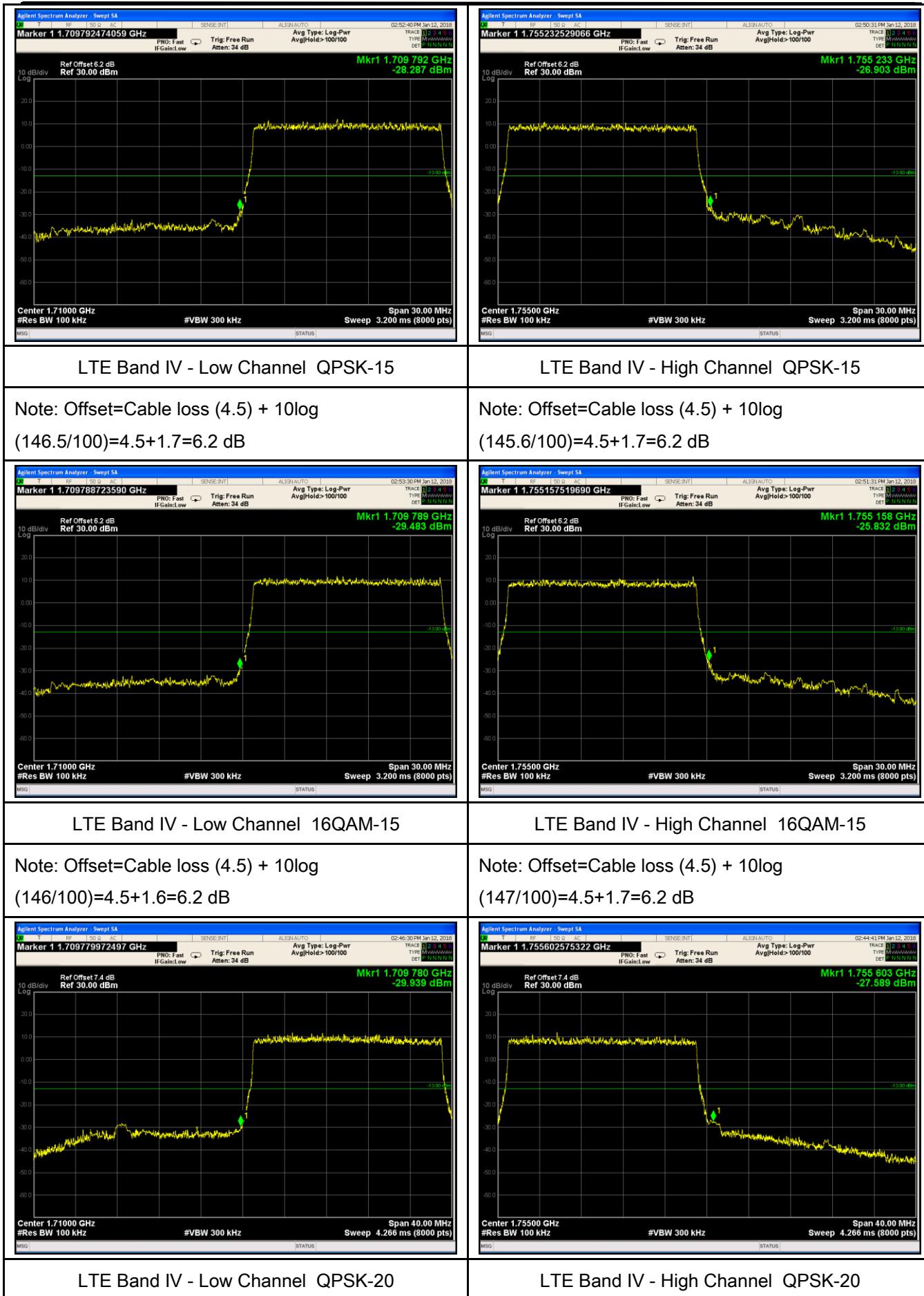


#### LTE Band IV - High Channel QPSK-10



#### LTE Band IV - Low Channel 16QAM-10

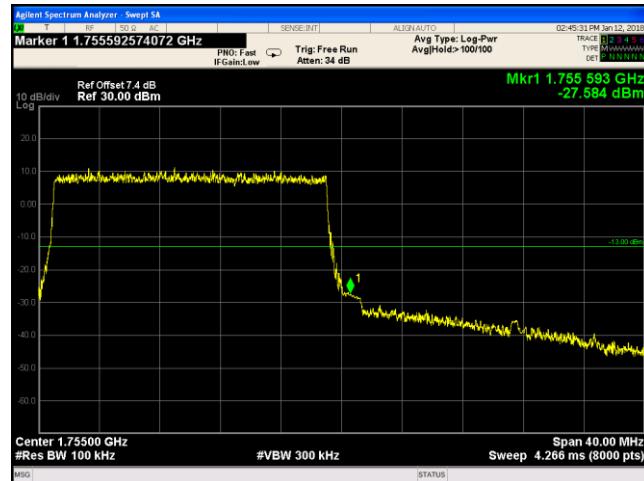
#### LTE Band IV - High Channel 16QAM-10



Note: Offset=Cable loss (4.5) + 10log  
 $(192/100)=4.5+2.9=7.4$  dB



Note: Offset=Cable loss (4.5) + 10log  
 $(193/100)=4.5+2.9=7.4$  dB



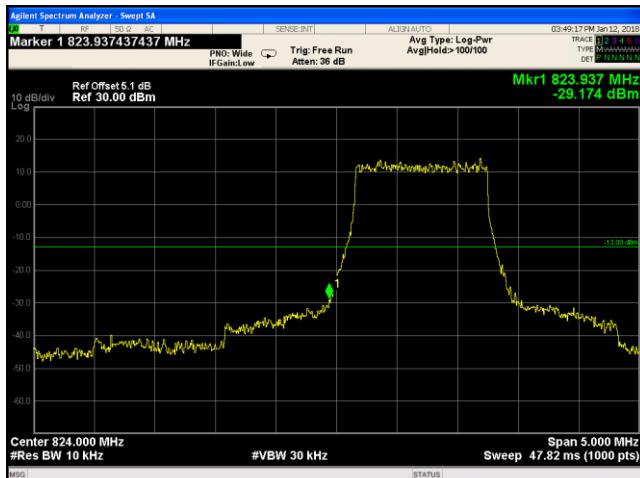
LTE Band IV - Low Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log  
 $(173/100)=4.5+2.9=7.4$  dB

LTE Band IV - High Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log  
 $(193/100)=4.5+2.9=7.4$  dB

## LTE Band V (Part 22H)

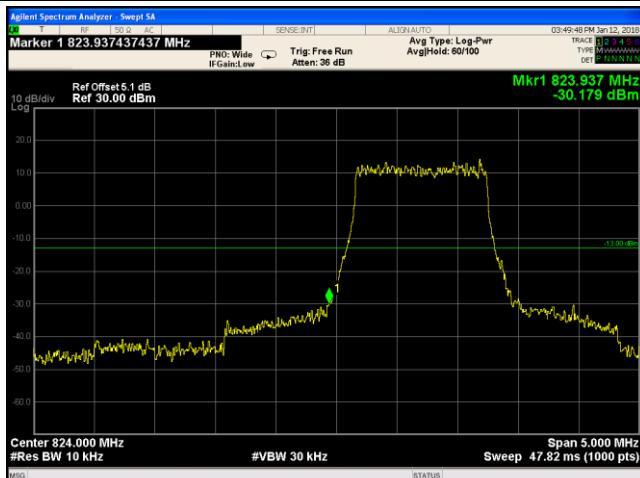


LTE Band V - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.31/10)=4.5+0.6=5.1 dB

LTE Band V - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.01/10)=4.5+0.6=5.1 dB

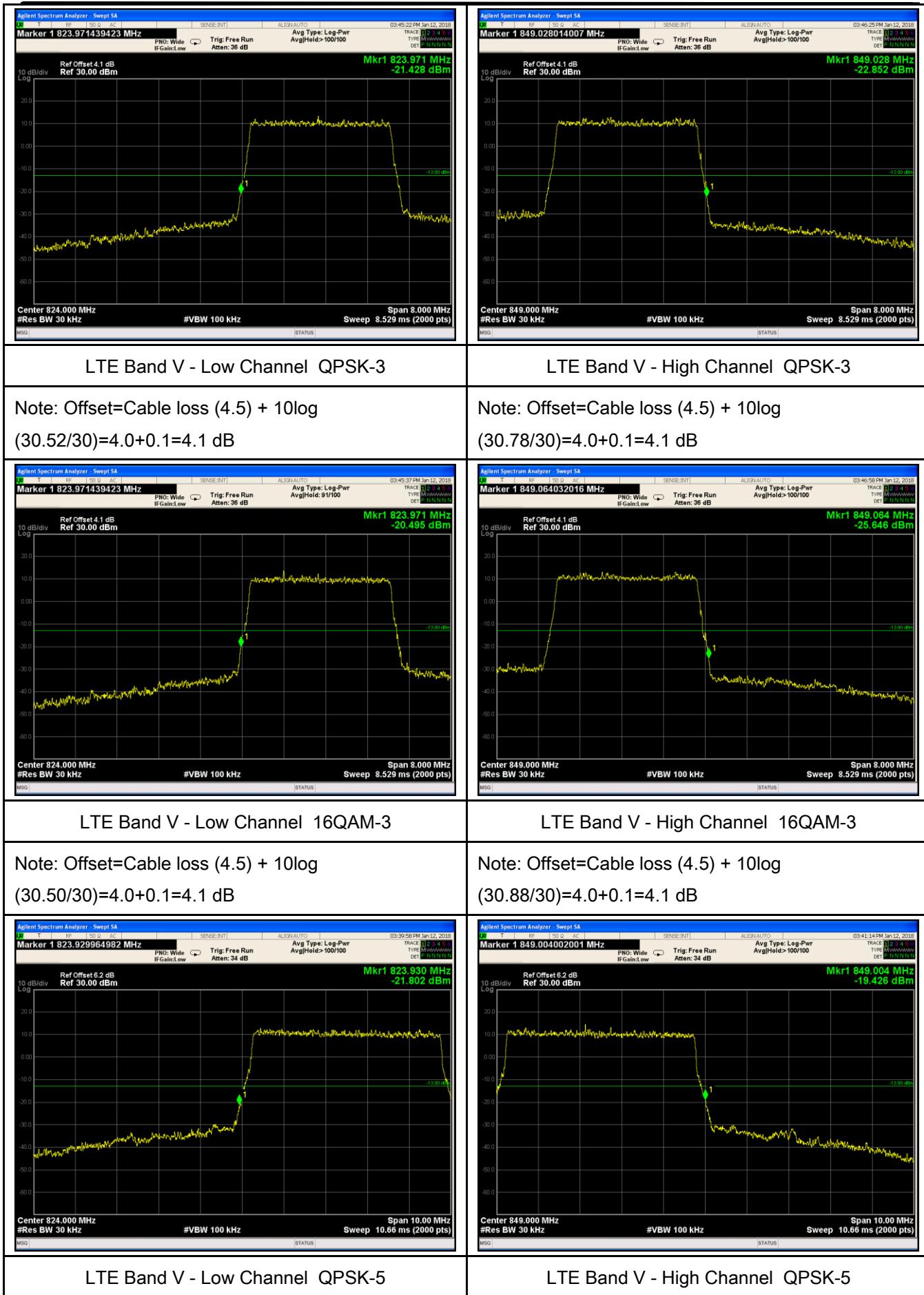


LTE Band V - Low Channel 16QAM-1.4

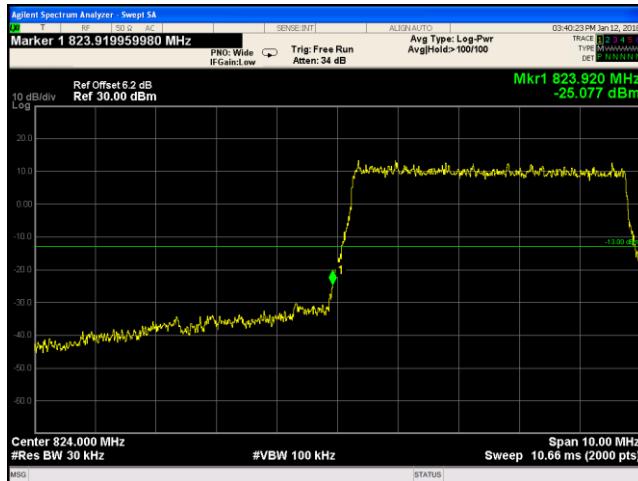
Note: Offset=Cable loss (4.5) + 10log  
(13.16/10)=4.5+0.6=5.1dB

LTE Band V - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.08/10)=4.5+0.6=5.1 dB



Note: Offset=Cable loss (4.5) + 10log  
 $(49.60/30)=4.0+2.2=6.2 \text{ dB}$

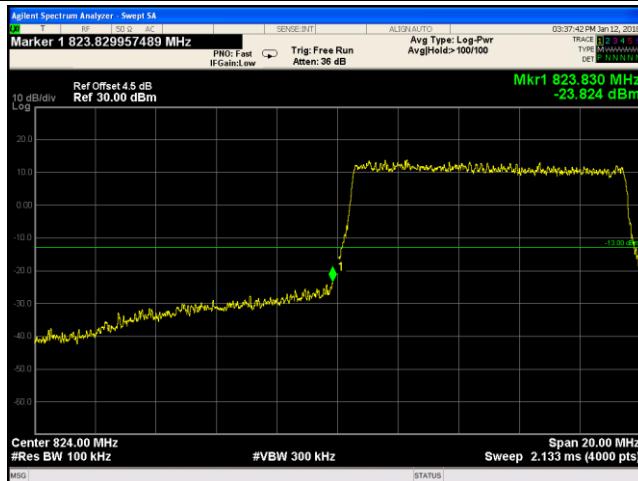


Note: Offset=Cable loss (4.5) + 10log  
 $(50.40/30)=4.0+2.2=6.2 \text{ dB}$



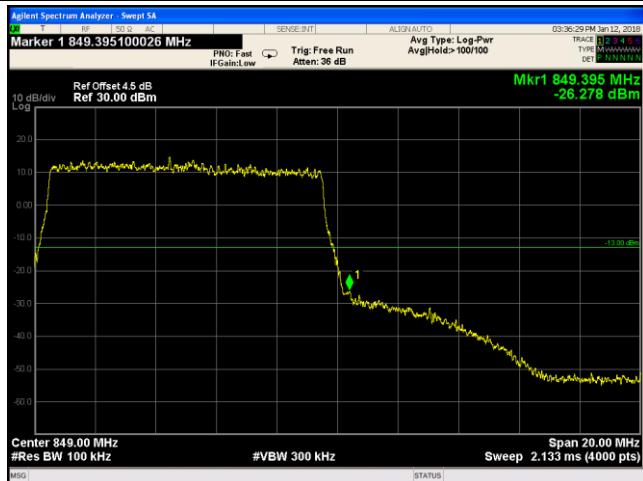
#### LTE Band V - Low Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log  
 $(49.86/30)=4.0+2.2=6.2 \text{ dB}$

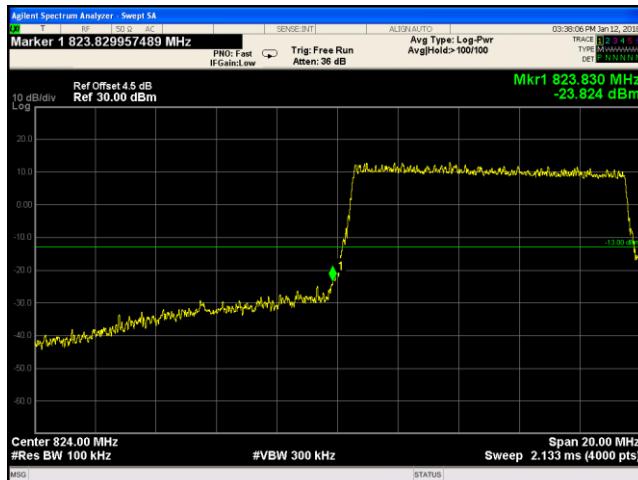


#### LTE Band V - High Channel 16QAM-5

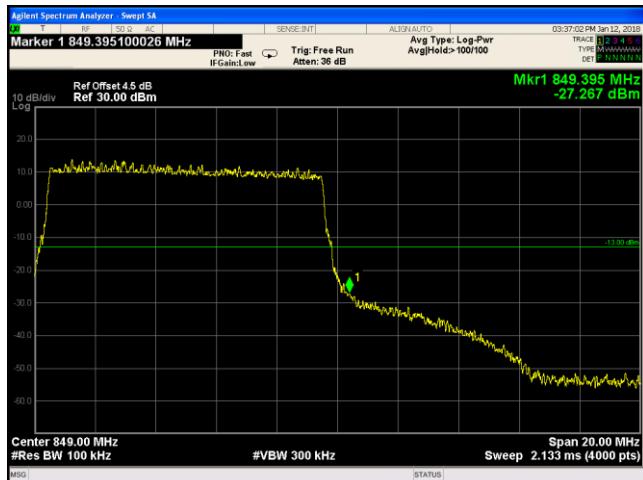
Note: Offset=Cable loss (4.5) + 10log  
 $(50.31/30)=4.0+2.2=6.2 \text{ dB}$



#### LTE Band V - Low Channel QPSK-10



#### LTE Band V - High Channel QPSK-10



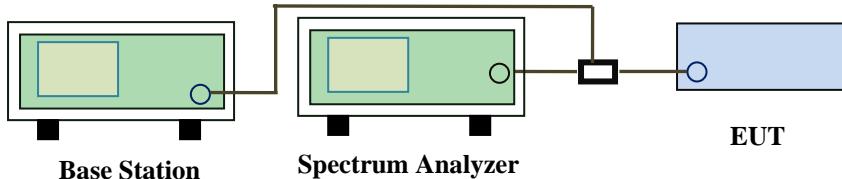
#### LTE Band V - Low Channel 16QAM-10

#### LTE Band V - High Channel 16QAM-10

## 6.8 Band Edge 27.53(m)

Temperature	---
Relative Humidity	---
Atmospheric Pressure	---
Test date :	---
Tested By :	---

### Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than $43+10\log(P)$ dB at the channel edge, the limit of emission equal to -13dBm. And $55+10\log(P)$ dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz 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.	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;"><b>Base Station</b>      <b>Spectrum Analyzer</b>      <b>EUT</b></p>	
Test Procedure	<ul style="list-style-type: none"> <li>The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.</li> </ul>	
Remark		
Result	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A	

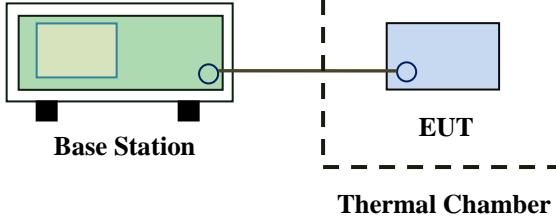
**Test Data**     Yes     N/A  
**Test Plot**     Yes (See below)     N/A

## 6.9 Frequency Stability

Temperature	25°C
Relative Humidity	57%
Atmospheric Pressure	1023mbar
Test date :	January 27, 2018
Tested By :	Aaron Liang

### Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54	a)	<p>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th> <th>Base, fixed (ppm)</th> <th>Mobile ≤ 3 watts (ppm)</th> <th>Mobile ≤ 3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td>25 to 50</td> <td>20.0</td> <td>20.0</td> <td>50.0</td> </tr> <tr> <td>50 to 450</td> <td>5.0</td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>450 to 512</td> <td>2.5</td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>821 to 896</td> <td>1.5</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>928 to 929.</td> <td>5.0</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>929 to 960.</td> <td>1.5</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>2110 to 2220</td> <td>10.0</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p> <p>According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p>	Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)	25 to 50	20.0	20.0	50.0	50 to 450	5.0	5.0	50.0	450 to 512	2.5	5.0	50.0	821 to 896	1.5	2.5	2.5	928 to 929.	5.0	N/A	N/A	929 to 960.	1.5	N/A	N/A	2110 to 2220	10.0	N/A	N/A	<input checked="" type="checkbox"/>
Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)																																
25 to 50	20.0	20.0	50.0																																
50 to 450	5.0	5.0	50.0																																
450 to 512	2.5	5.0	50.0																																
821 to 896	1.5	2.5	2.5																																
928 to 929.	5.0	N/A	N/A																																
929 to 960.	1.5	N/A	N/A																																
2110 to 2220	10.0	N/A	N/A																																

Test setup	 <p>Base Station      EUT</p> <p>Thermal Chamber</p>
Procedure	<p>A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within <math>\pm 0.00025\%</math> (<math>\pm 2.5\text{ppm}</math>) of the center frequency.</p>
Remark	<p>Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of <math>-10^\circ\text{C}</math> to <math>+55^\circ\text{C}</math> at normal supply voltage.</p>
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data     Yes       N/A

Test Plot     Yes (See below)       N/A

### LTE Band II (Part 24E) result

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.85	-12	0.0064	2.5
0		-12	0.0064	2.5
10		-13	0.0069	2.5
20		-14	0.0074	2.5
30		-15	0.0080	2.5
40		-10	0.0053	2.5
50		-17	0.0090	2.5
55		-13	0.0069	2.5
25	4.4	-14	0.0074	2.5
	3.6	-14	0.0074	2.5

### LTE Band IV (Part 27) result

Middle Channel, $f_0 = 1732.5$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	7.4	-12	0.0069	2.5
0		-8	0.0046	2.5
10		-12	0.0069	2.5
20		-14	0.0081	2.5
30		-10	0.0058	2.5
40		-16	0.0092	2.5
50		-15	0.0087	2.5
55		-17	0.0098	2.5
25	7.9	-15	0.0087	2.5
	6.9	-10	0.0058	2.5

### LTE Band V (Part 22H) result

Middle Channel, $f_0 = 836.5$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	7.4	-11	0.0043	2.5
0		-9	0.0036	2.5
10		-9	0.0036	2.5
20		-8	0.0032	2.5
30		-11	0.0043	2.5
40		-9	0.0036	2.5
50		-10	0.0039	2.5
55		-6	0.0024	2.5
25	7.9	-10	0.0039	2.5
	6.9	-12	0.0047	2.5

## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>RF Conducted Test</b>					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/14/2017	09/13/2018	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/07/2017	10/06/2018	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
Power Amplifier	SMC150D	R1553-0313	03/08/2017	03/07/2018	<input checked="" type="checkbox"/>
Power Amplifier	S61-25	R1553-0516	05/26/2017	05/25/2018	<input checked="" type="checkbox"/>
Power Amplifier	S41-25D	R1553-0314	05/26/2017	05/25/2018	<input checked="" type="checkbox"/>



Test Report	17071218-FCC-R5
Page	93 of 109

Tunable Notch Filter	3NF-800/1000-S	AA4	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
----------------------	----------------	-----	------------	------------	-------------------------------------

## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo

Whole Package View



Adapter - Lable View



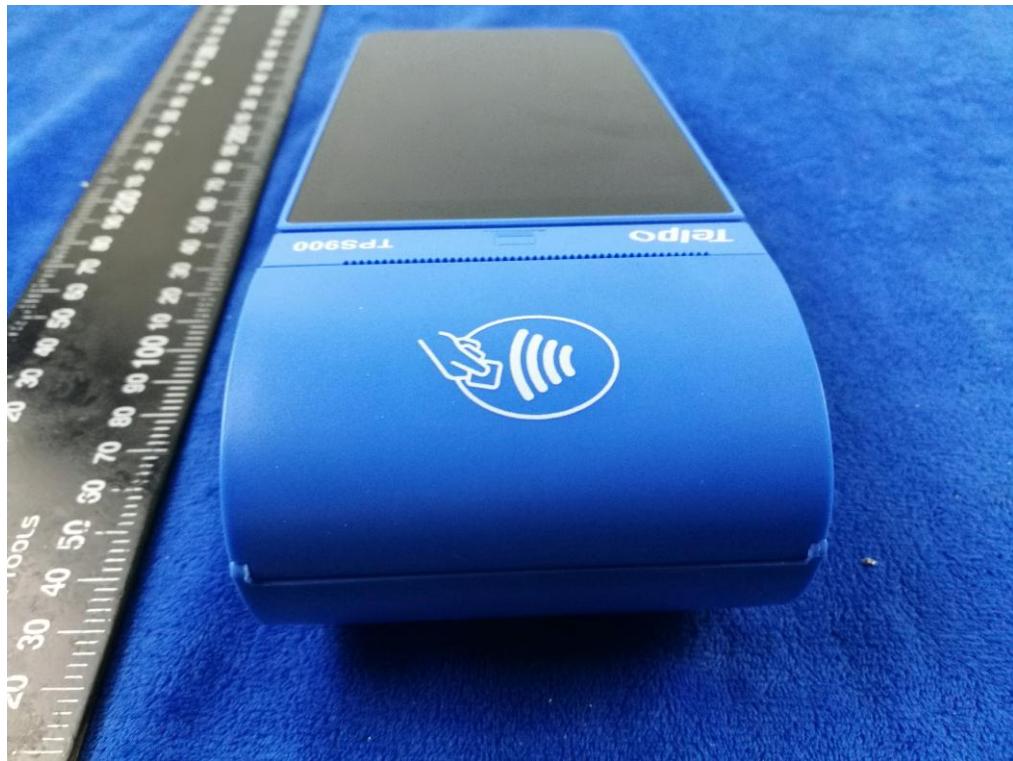
EUT - Front View



EUT - Rear View



EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View



### Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1



Cover Off - Top View 2



Battery - Front View



Battery - Rear View



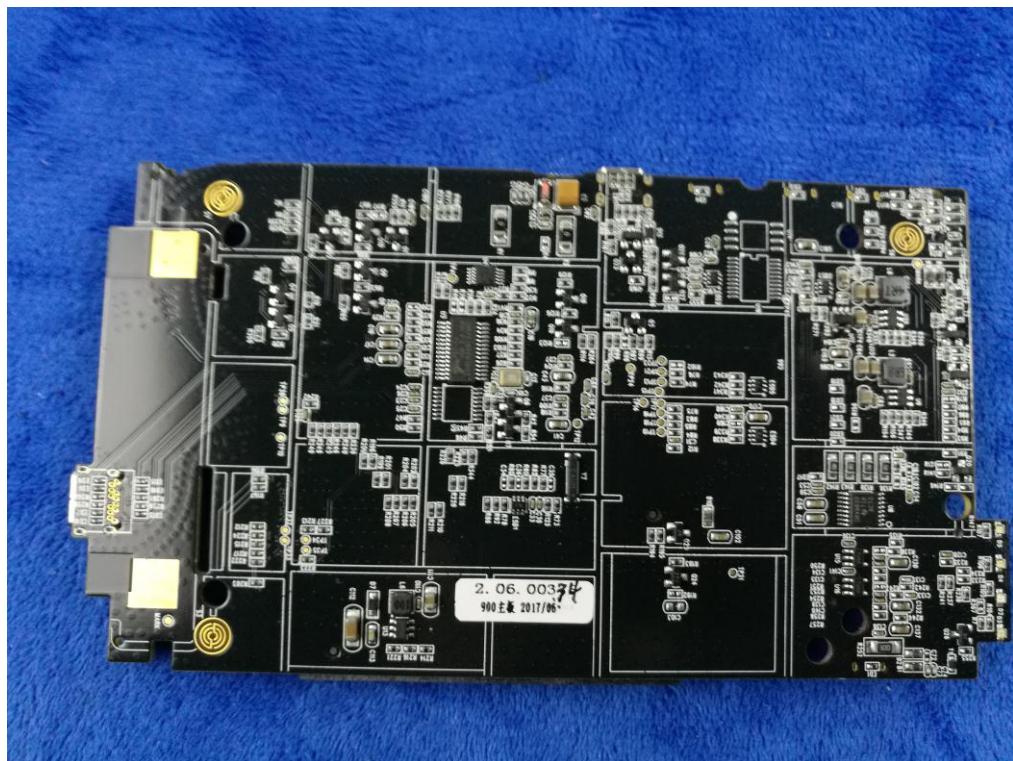
Mainboard with Shielding - Front View



Mainboard without Shielding - Front View



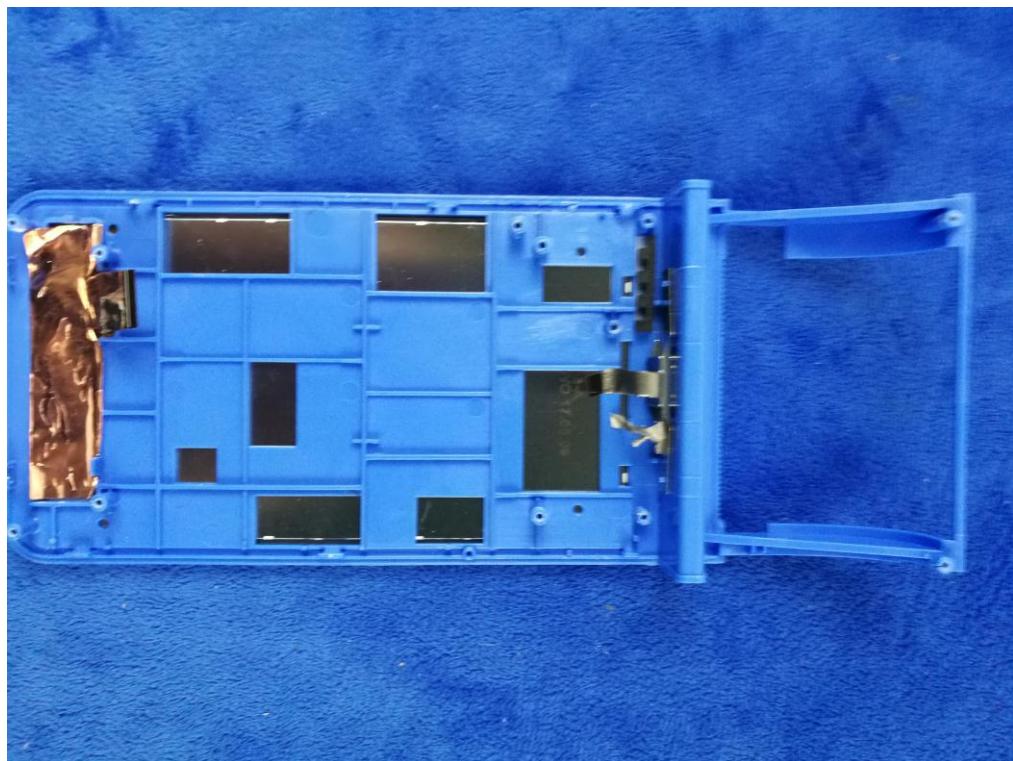
Mainboard – Rear View



LCD – Front View



LCD – Rear View



GSM/PCS/UMTS-FDD/LTE Antenna View



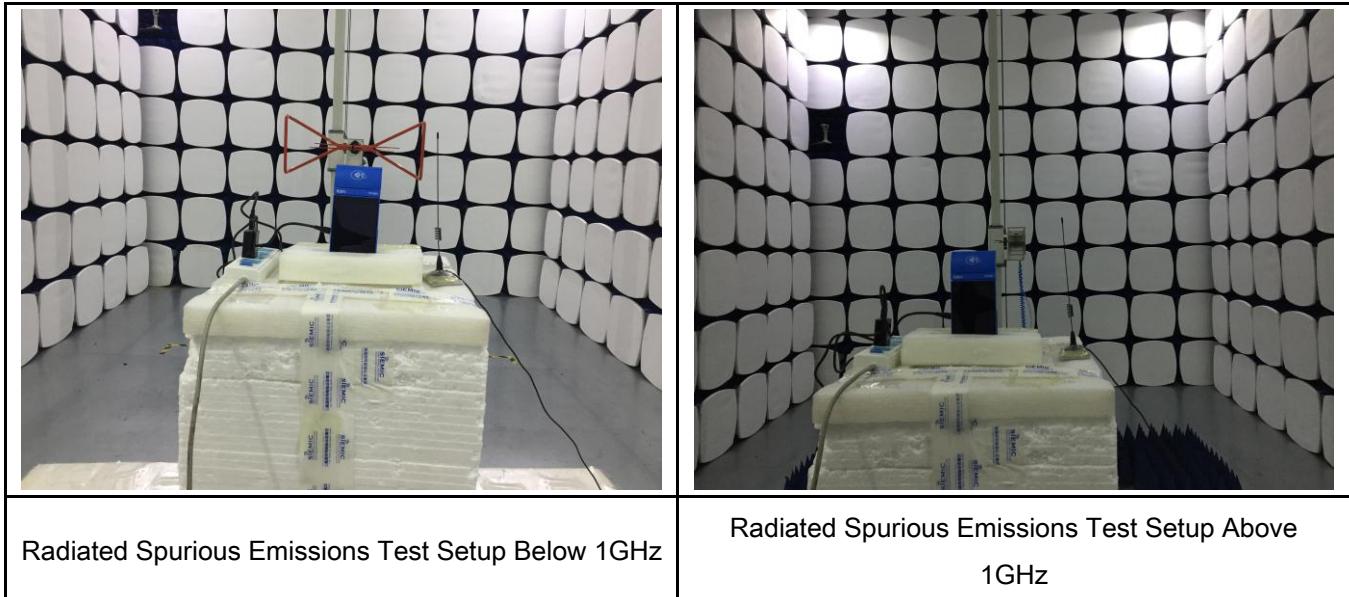
WIFI/BT/BLE - Antenna View



GPS - Antenna View



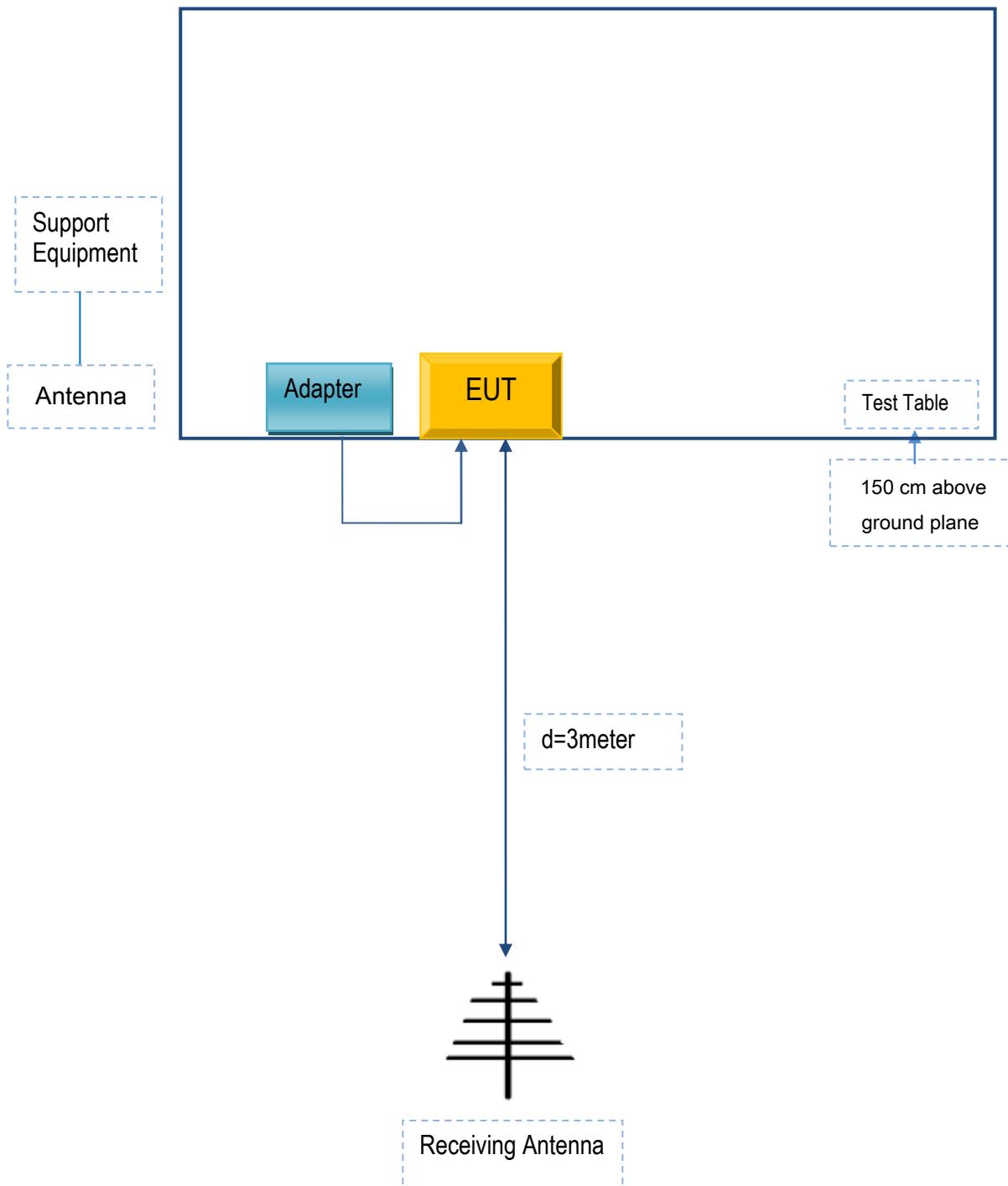
**Annex B.iii. Photograph: Test Setup Photo**



## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



## Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

### Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Telepower Communication Co., Ltd	Adapter	SC/10WA050200US	N/A

### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	N/A

## Annex C.ii. EUT OPERATING CONDITIONS

N/A

## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

## Annex E. DECLARATION OF SIMILARITY

N/A