

## 3.6 Conducted Spurious Emission Measurement

### 3.6.1 Description of Conducted Spurious Emission Measurement

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

For Band 7

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

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10<sup>th</sup> harmonic.

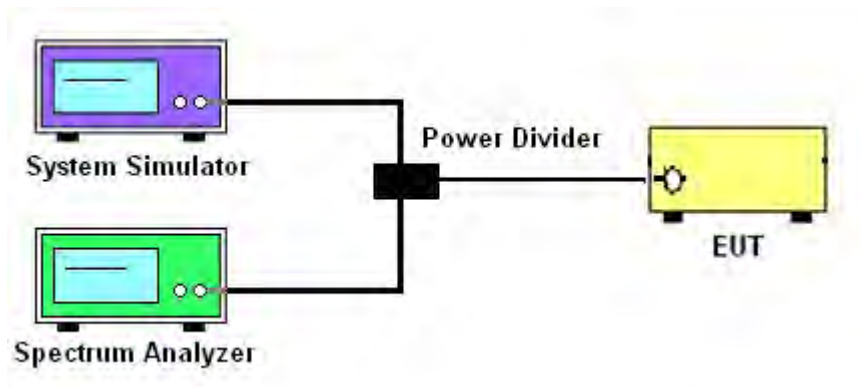
### 3.6.2 Measuring Instruments

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

### 3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.  
The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)]$  (dB)  
 $= [30 + 10\log(P)]$  (dBm) -  $[43 + 10\log(P)]$  (dB)  
 $= -13$ dBm.
8. For Band 7  
The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)  
 $= P(W) - [55 + 10\log(P)]$  (dB)  
 $= [30 + 10\log(P)]$  (dBm) -  $[55 + 10\log(P)]$  (dB)  
 $= -25$ dBm.

### 3.6.4 Test Setup

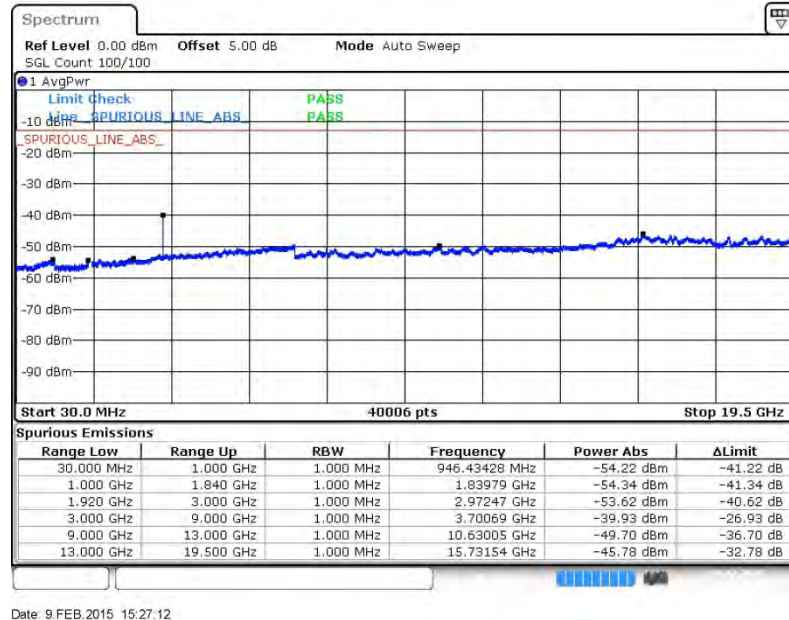




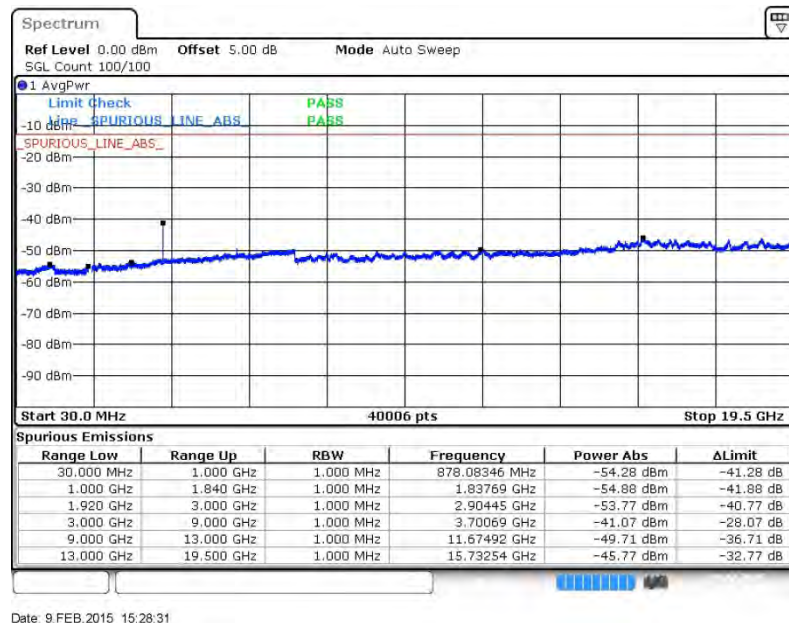
## 3.6.5 Test Result (Plots) of Conducted Spurious Emission

Band :	LTE Band 2	Channel :	CH18607 (Low)
Band Width :	1.4MHz		

## QPSK (RB Size 3, RB Offset 1)



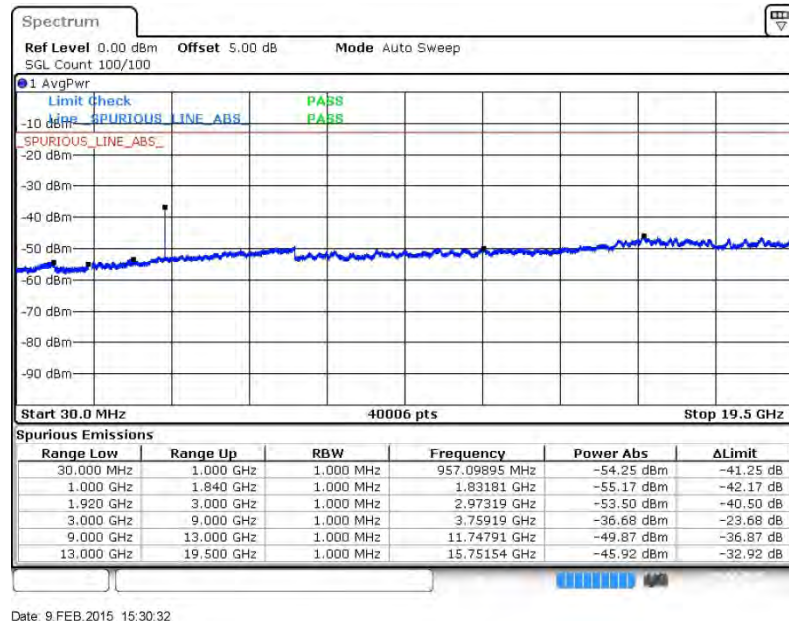
## 16QAM (RB Size 3, RB Offset 1)



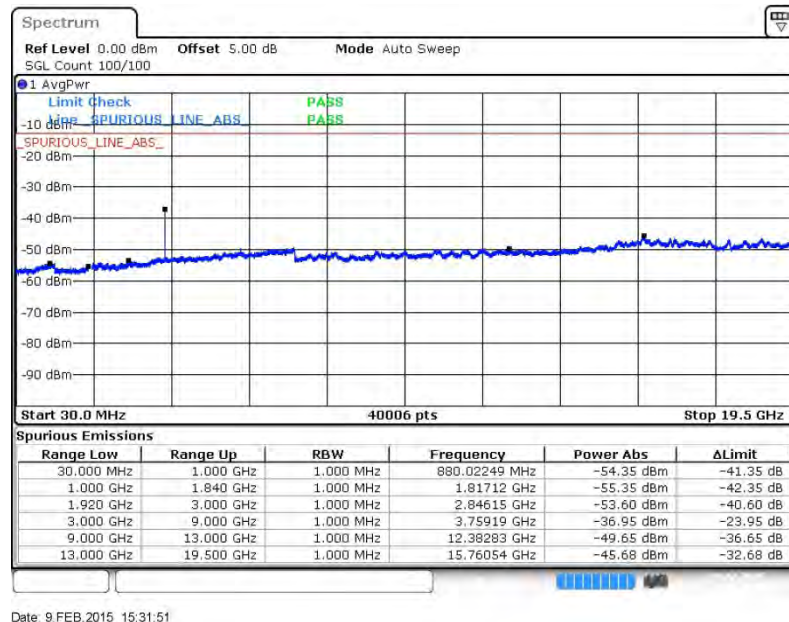


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	1.4MHz		

## QPSK (RB Size 3, RB Offset 1)

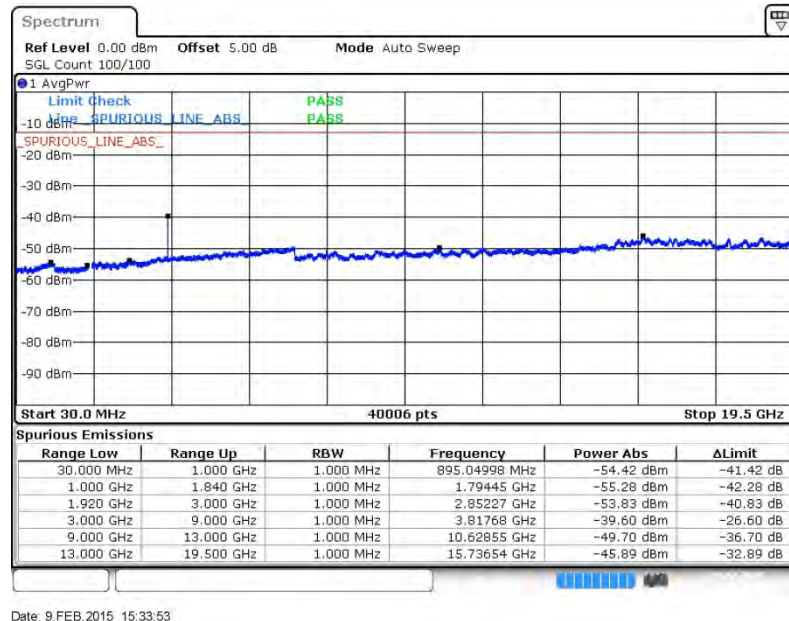
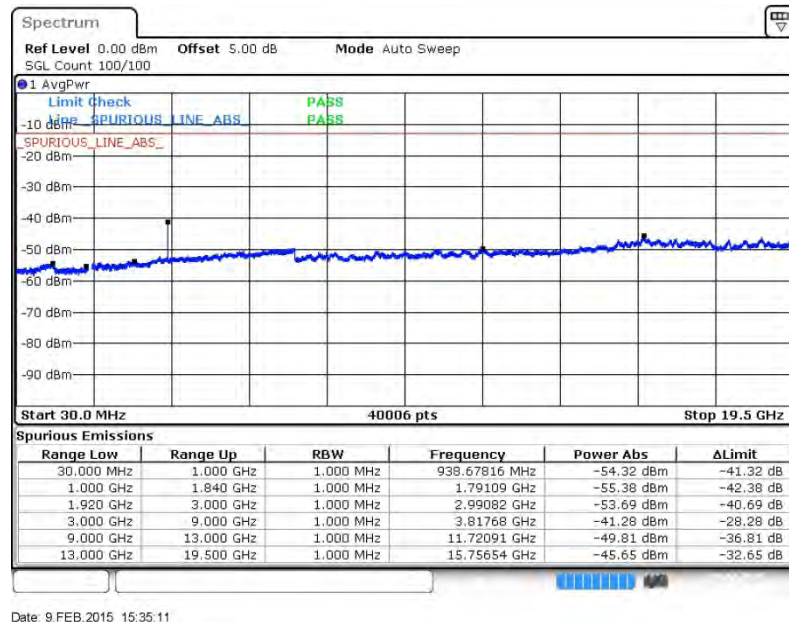


## 16QAM (RB Size 3, RB Offset 2)





<b>Band :</b>	LTE Band 2	<b>Channel :</b>	CH19193 (High)
<b>Band Width :</b>	1.4MHz		

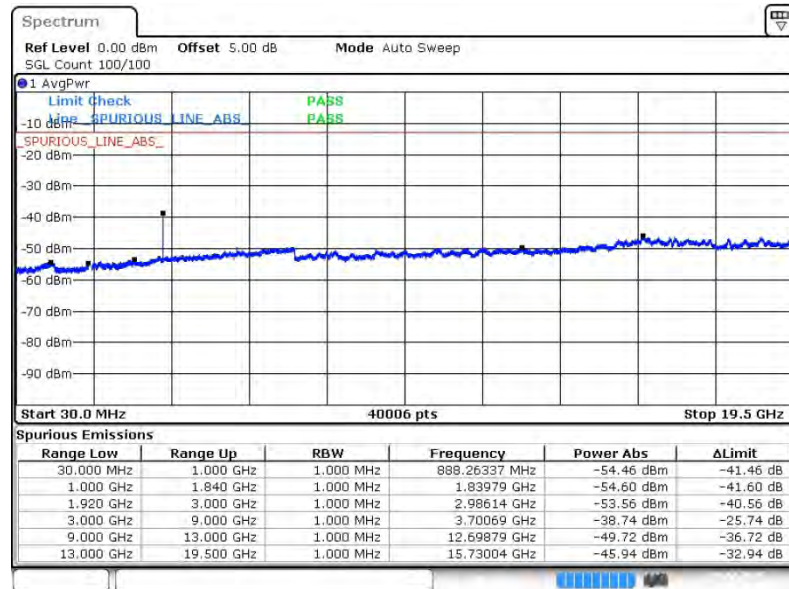
**QPSK (RB Size 3, RB Offset 0)****16QAM (RB Size 1, RB Offset 2)**



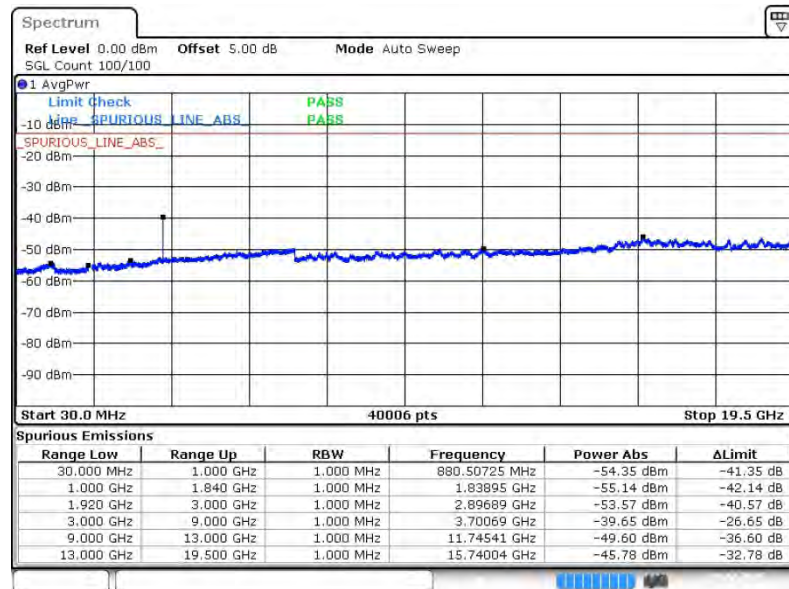


Band :	LTE Band 2	Channel :	CH18615 (Low)
Band Width :	3MHz		

## QPSK (RB Size 1, RB Offset 0)



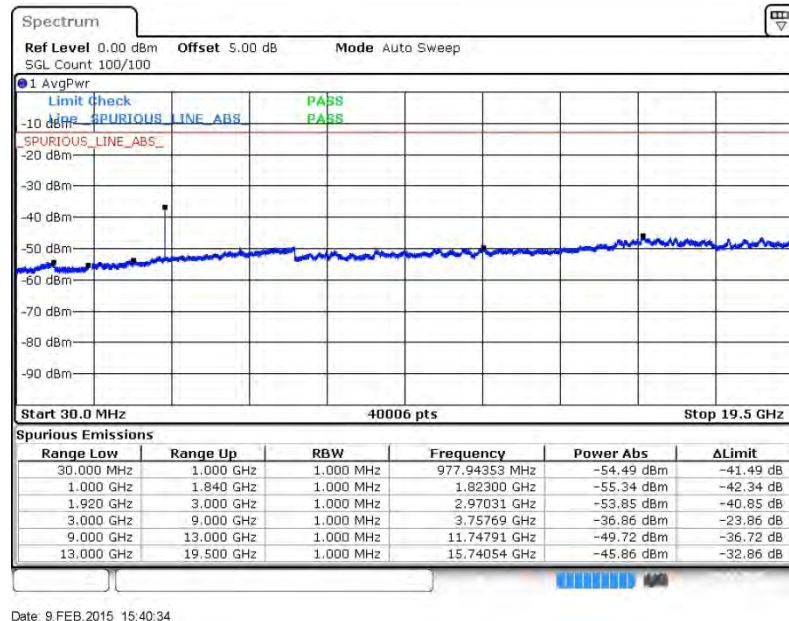
## 16QAM (RB Size 1, RB Offset 7)



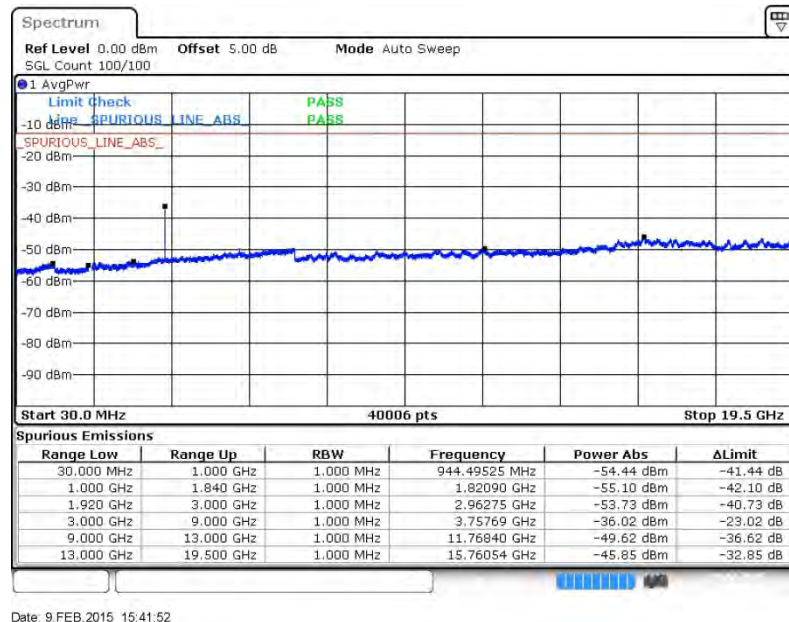


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	3MHz		

## QPSK (RB Size 1, RB Offset 0)



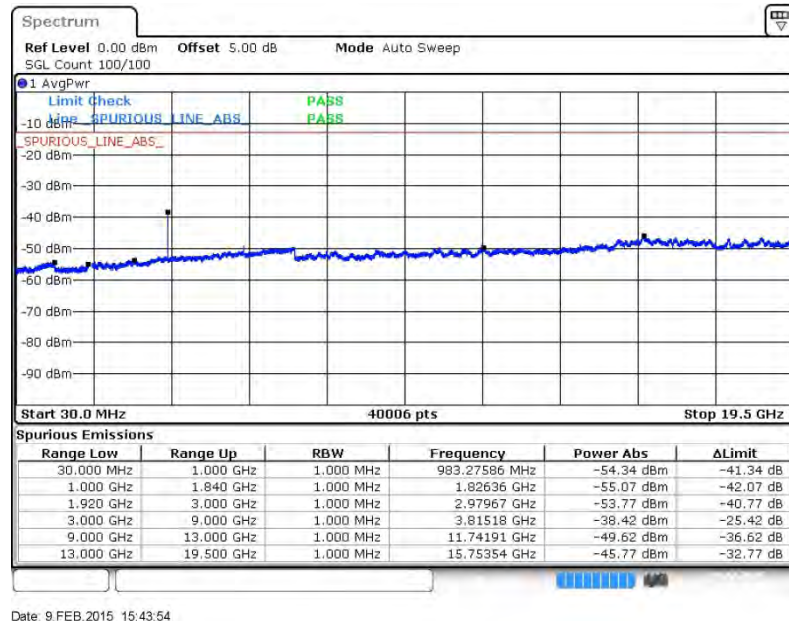
## 16QAM (RB Size 1, RB Offset 14)



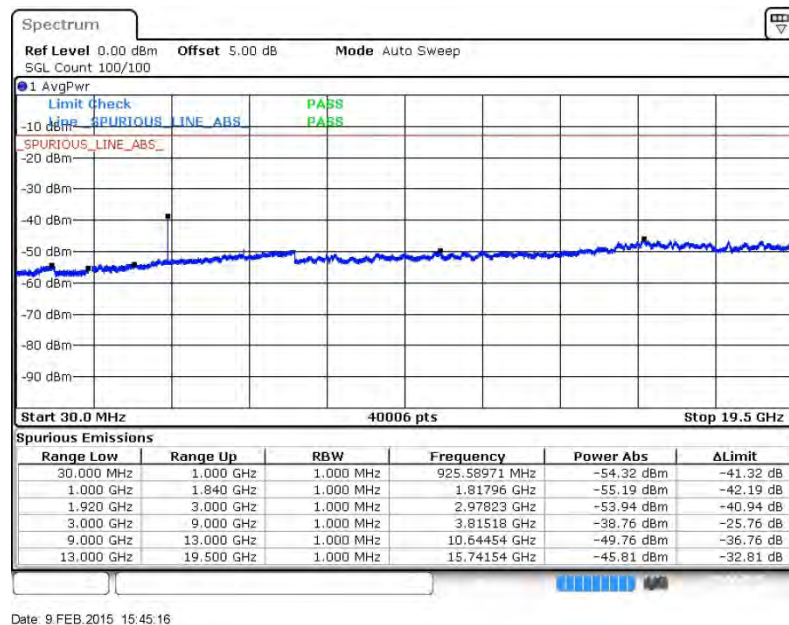


Band :	LTE Band 2	Channel :	CH19185 (High)
Band Width :	3MHz		

## QPSK (RB Size 1, RB Offset 7)



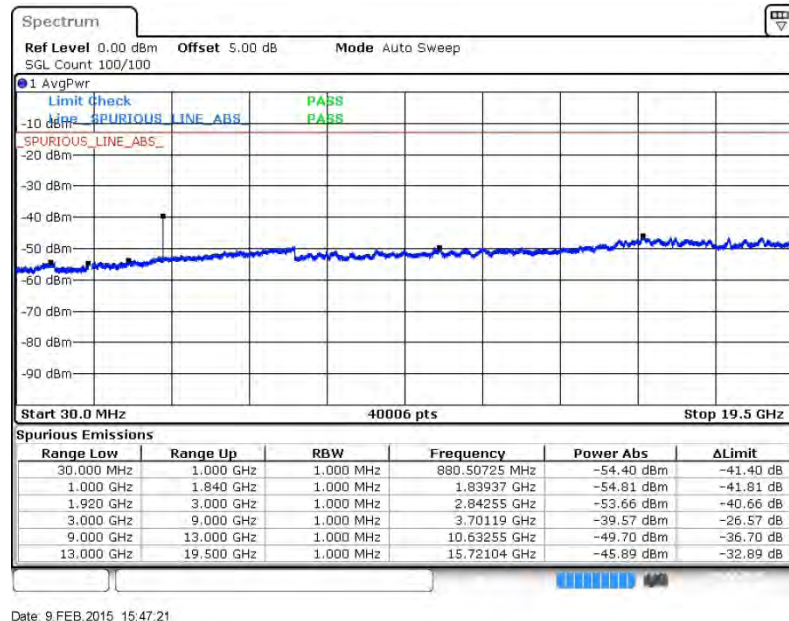
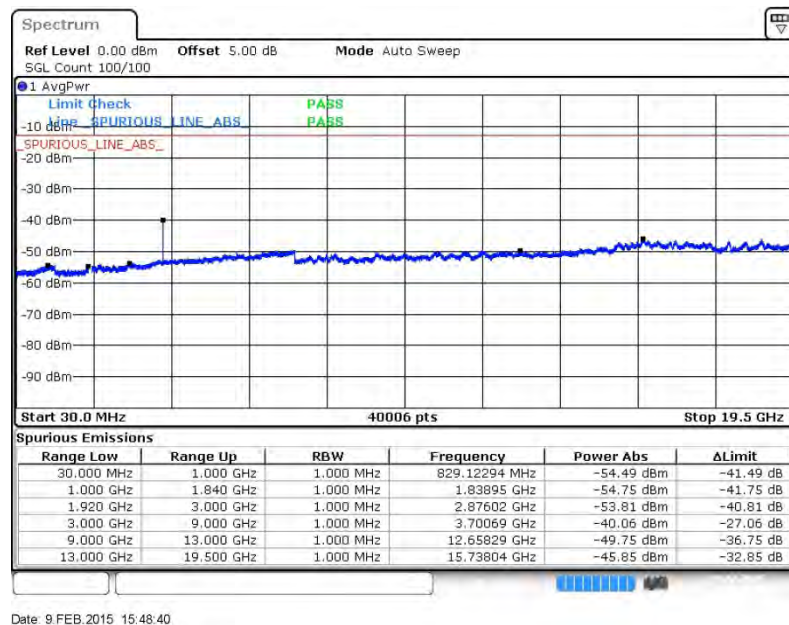
## 16QAM (RB Size 1, RB Offset 0)







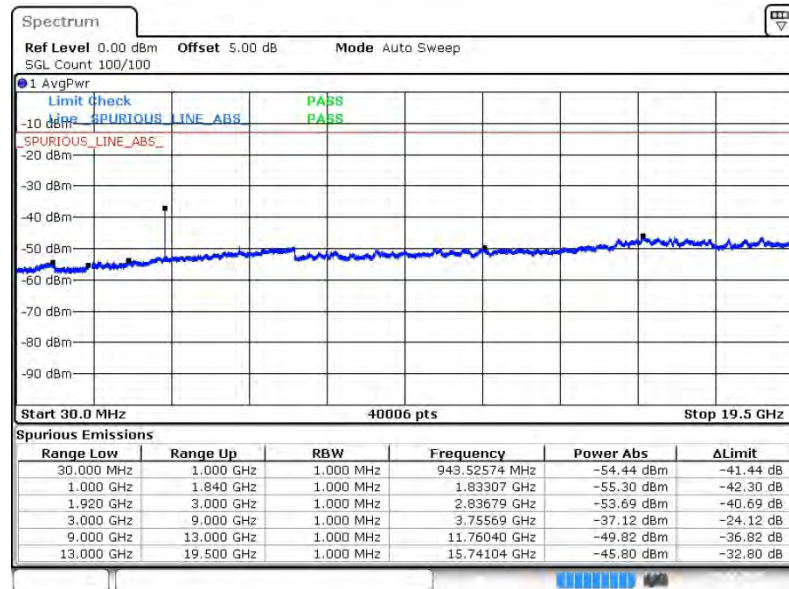
<b>Band :</b>	LTE Band 2	<b>Channel :</b>	CH18625 (Low)
<b>Band Width :</b>	5MHz		

**QPSK (RB Size 1, RB Offset 12)****16QAM (RB Size 1, RB Offset 12)**

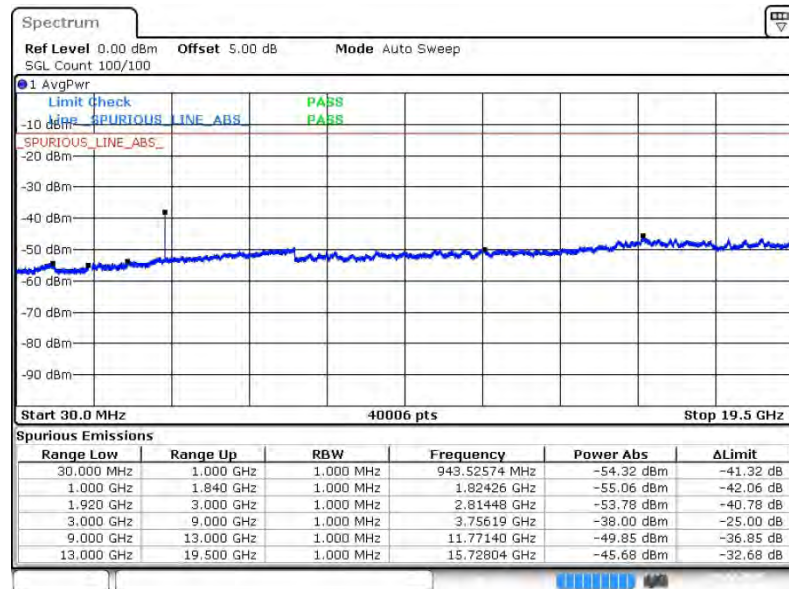


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	5MHz		

## QPSK (RB Size 1, RB Offset 12)



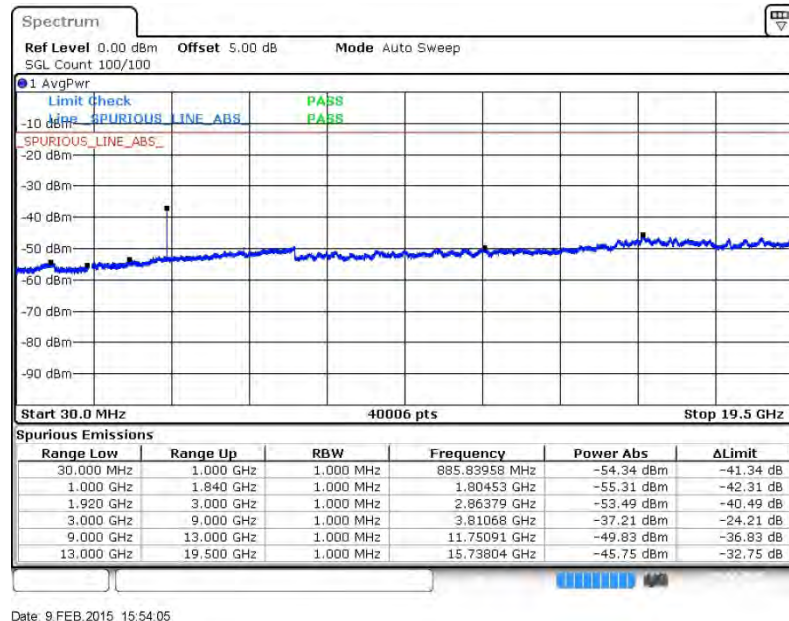
## 16QAM (RB Size 1, RB Offset 12)



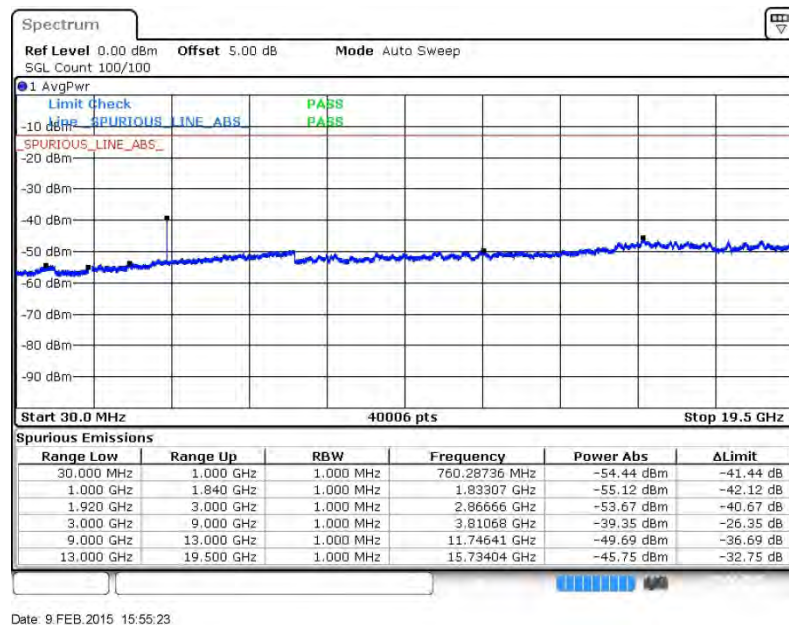


Band :	LTE Band 2	Channel :	CH19175 (High)
Band Width :	5MHz		

## QPSK (RB Size 1, RB Offset 12)



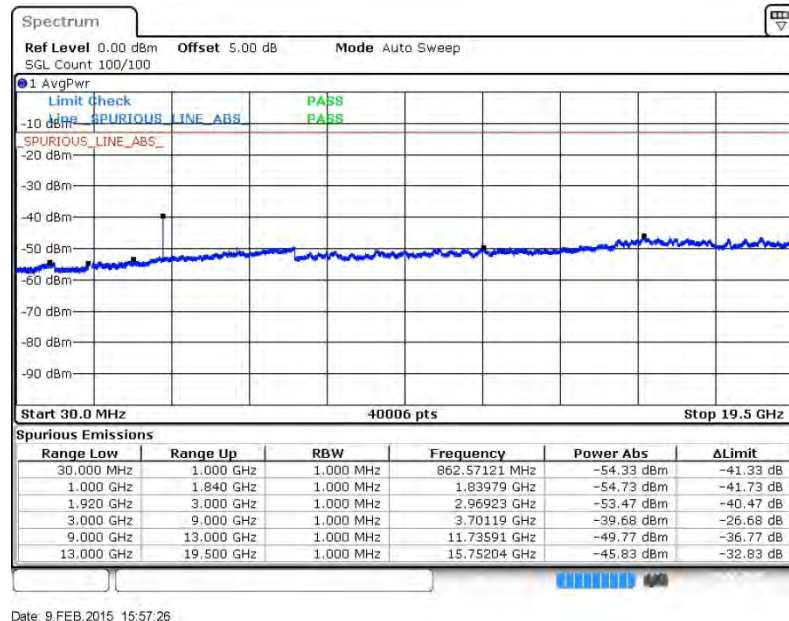
## 16QAM (RB Size 1, RB Offset 12)



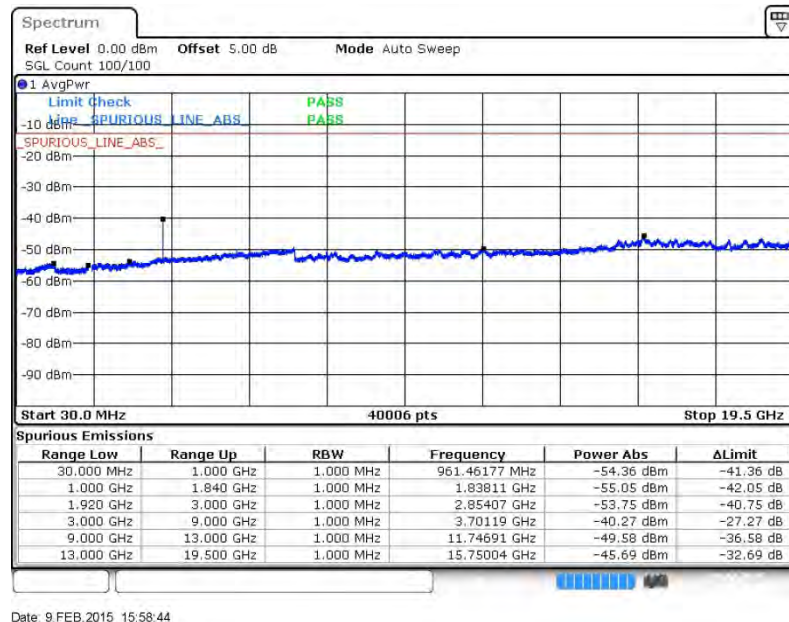


Band :	LTE Band 2	Channel :	CH18650 (Low)
Band Width :	10MHz		

## QPSK (RB Size 1, RB Offset 0)



## 16QAM (RB Size 1, RB Offset 49)

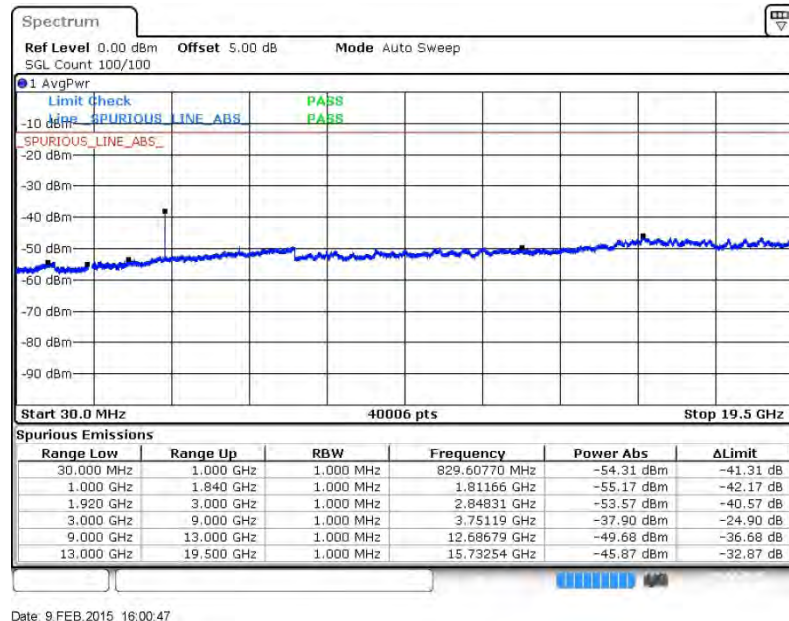




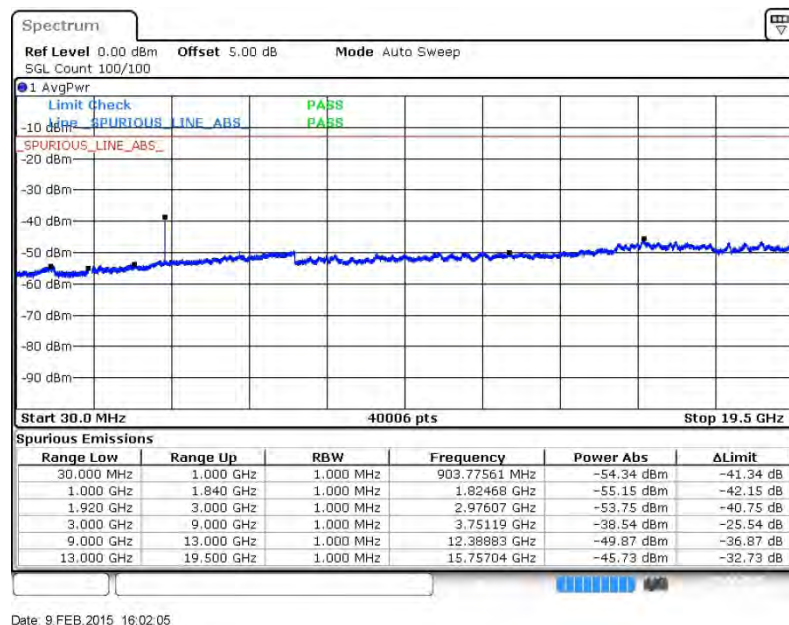


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	10MHz		

## QPSK (RB Size 1, RB Offset 0)



## 16QAM (RB Size 1, RB Offset 0)

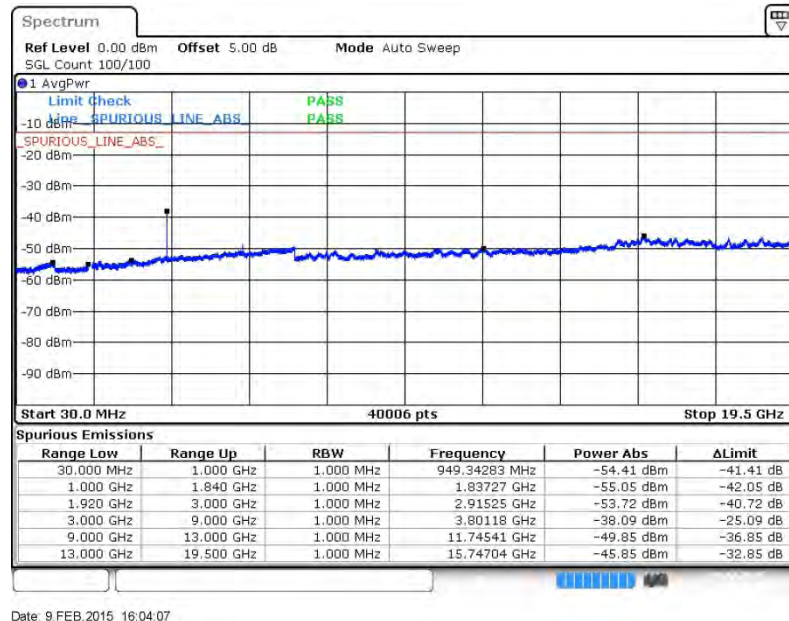




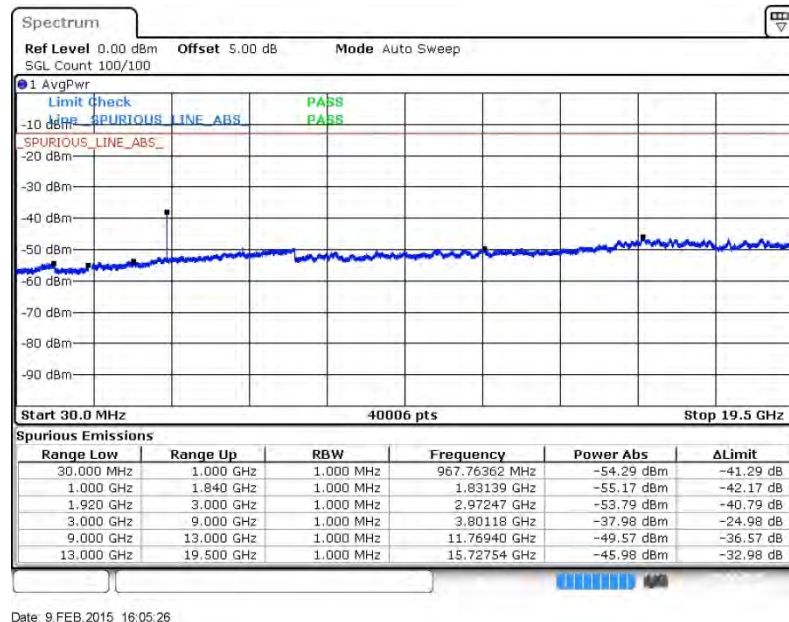


Band :	LTE Band 2	Channel :	CH19150 (High)
Band Width :	10MHz		

## QPSK (RB Size 1, RB Offset 0)



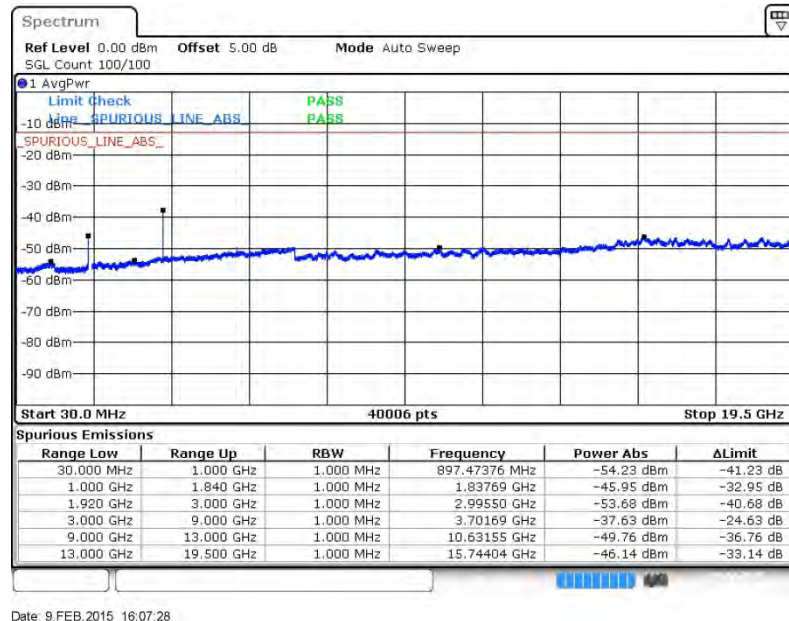
## 16QAM (RB Size 1, RB Offset 0)



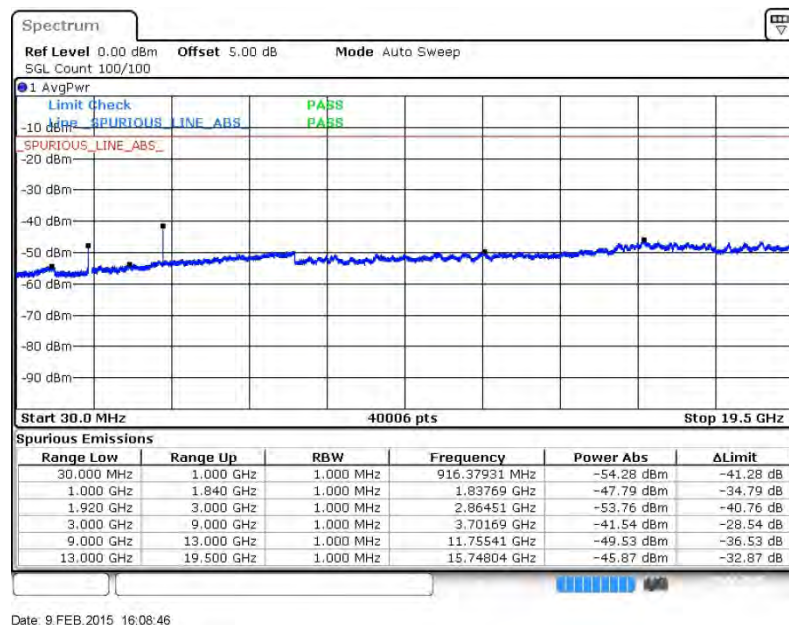


Band :	LTE Band 2	Channel :	CH18675 (Low)
Band Width :	15MHz		

## QPSK (RB Size 1, RB Offset 0)



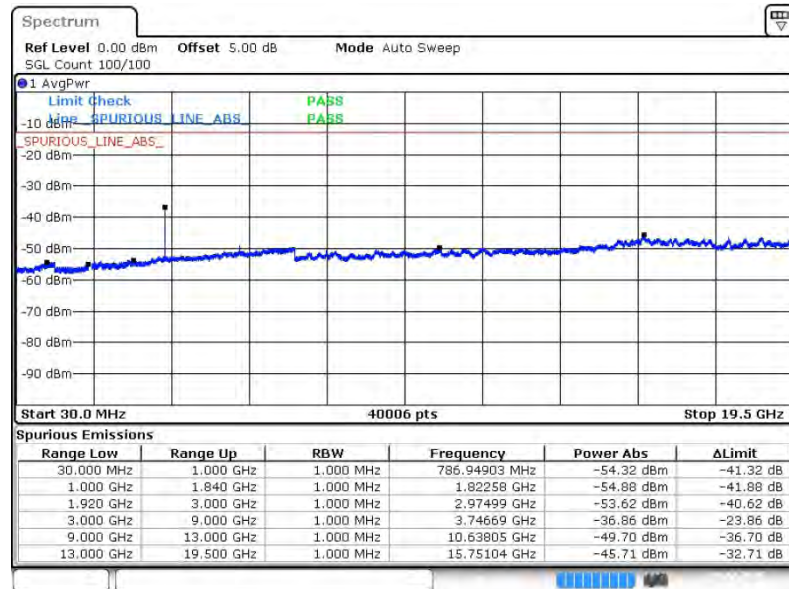
## 16QAM (RB Size 1, RB Offset 0)



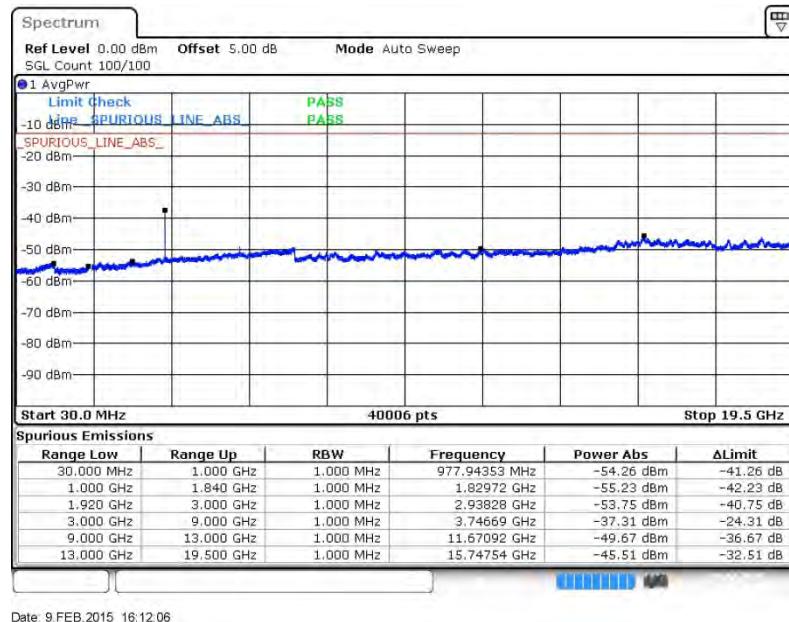


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	15MHz		

## QPSK (RB Size 1, RB Offset 0)



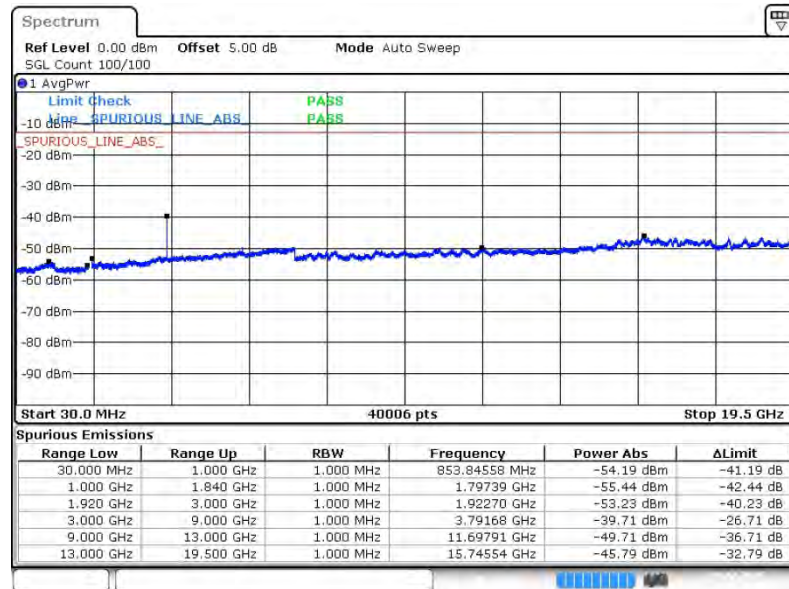
## 16QAM (RB Size 1, RB Offset 0)



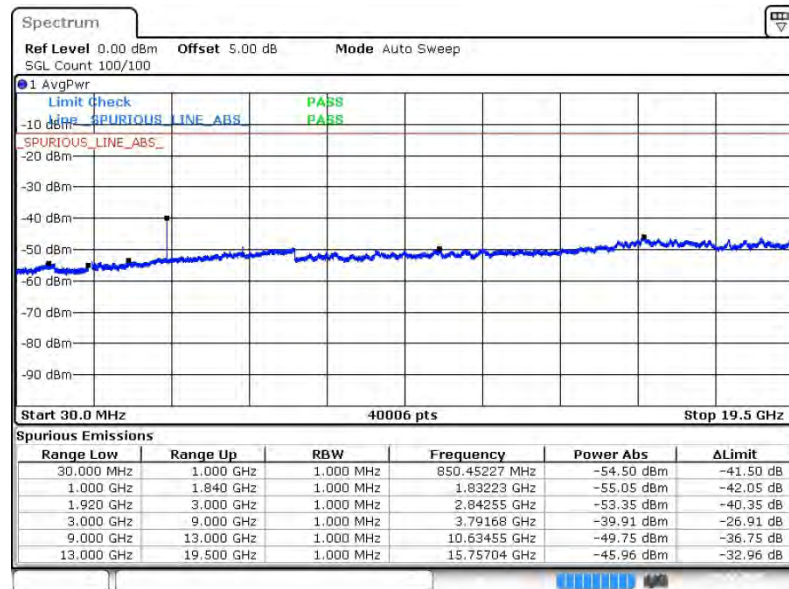


Band :	LTE Band 2	Channel :	CH19125 (High)
Band Width :	15MHz		

## QPSK (RB Size 1, RB Offset 0)



## 16QAM (RB Size 1, RB Offset 0)

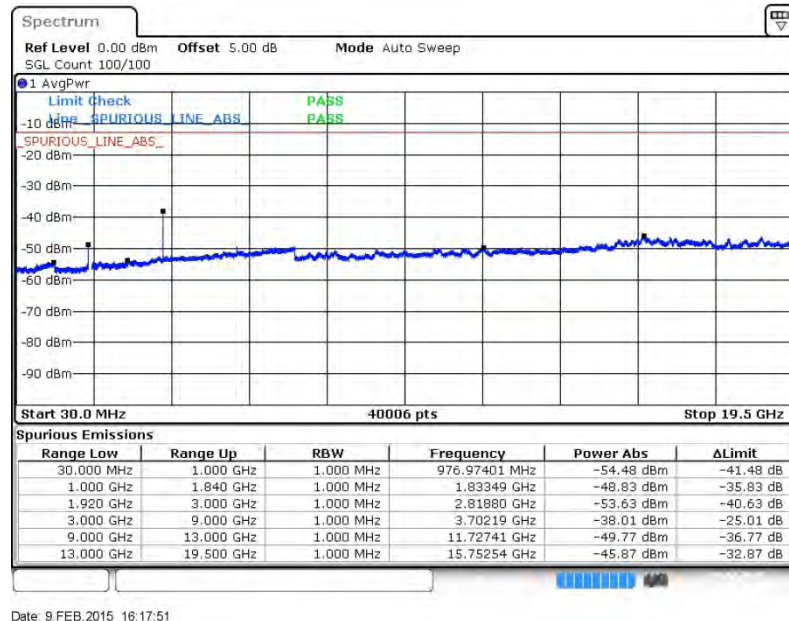




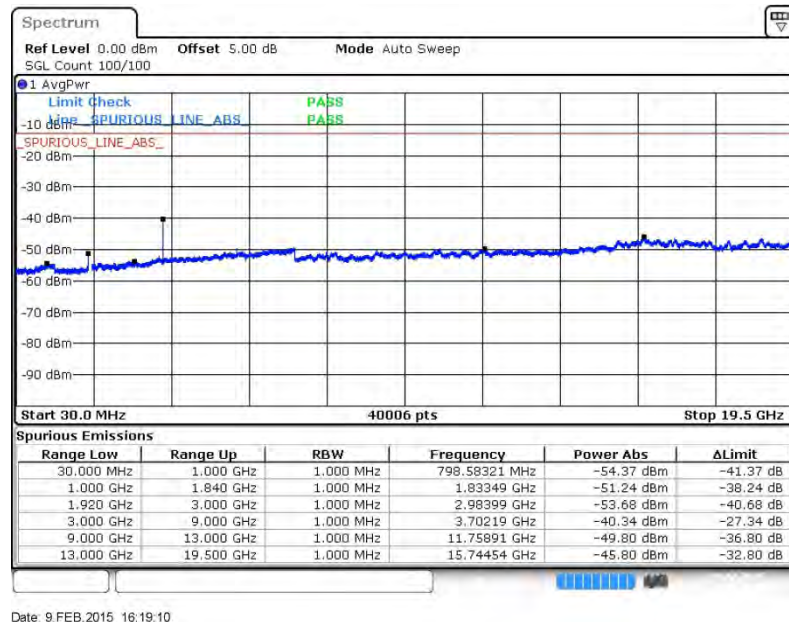


Band :	LTE Band 2	Channel :	CH18700 (Low)
Band Width :	20MHz		

## QPSK (RB Size 1, RB Offset 0)



## 16QAM (RB Size 1, RB Offset 0)

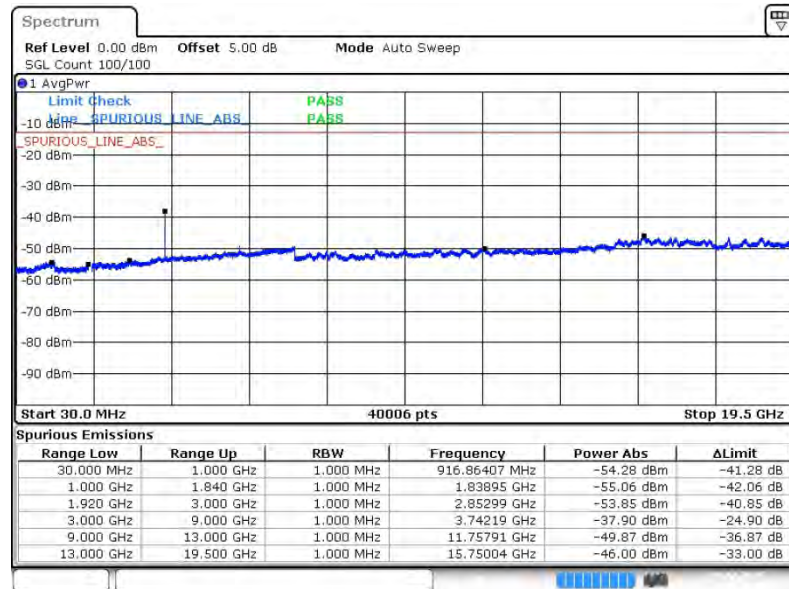




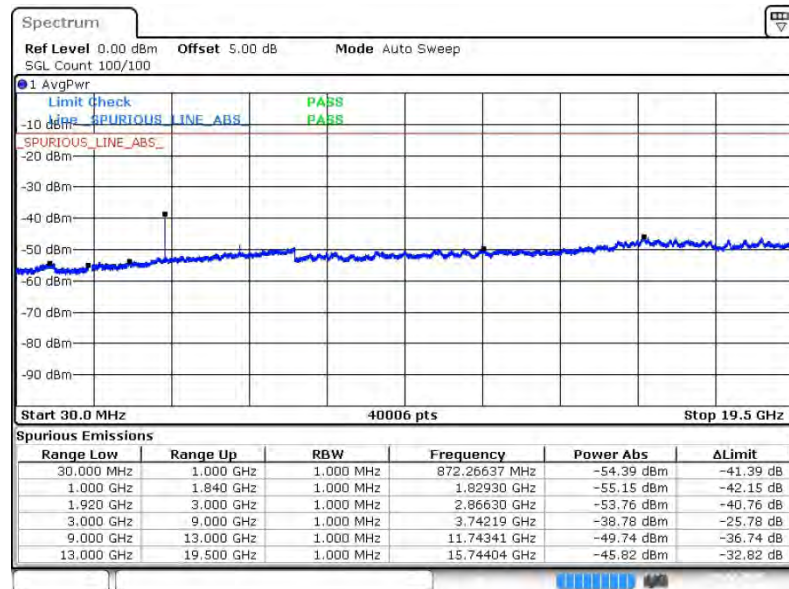


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	20MHz		

## QPSK (RB Size 1, RB Offset 0)

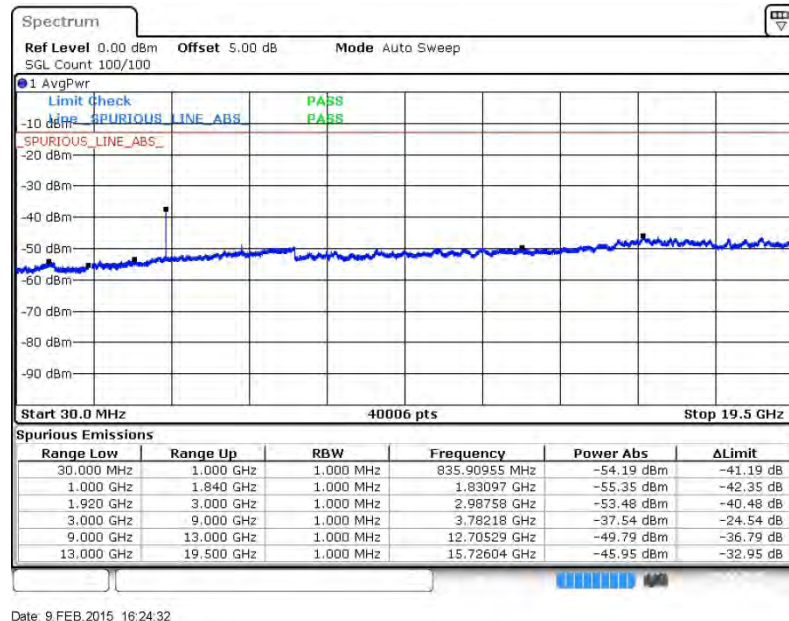
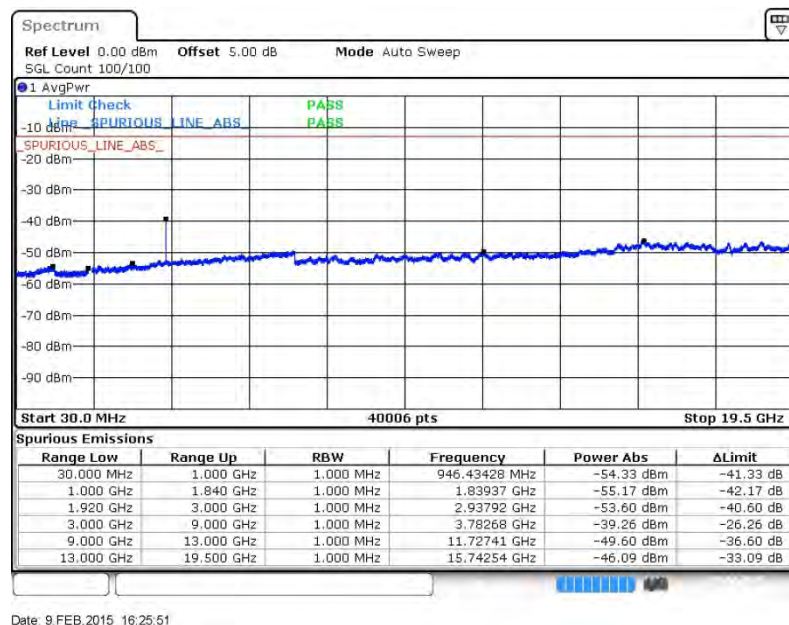


## 16QAM (RB Size 1, RB Offset 49)



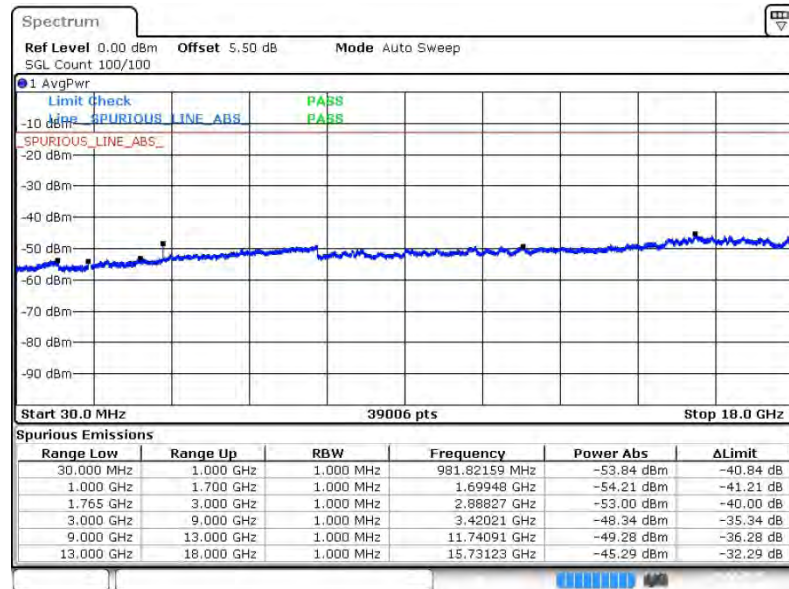


<b>Band :</b>	LTE Band 2	<b>Channel :</b>	CH19100 (High)
<b>Band Width :</b>	20MHz		

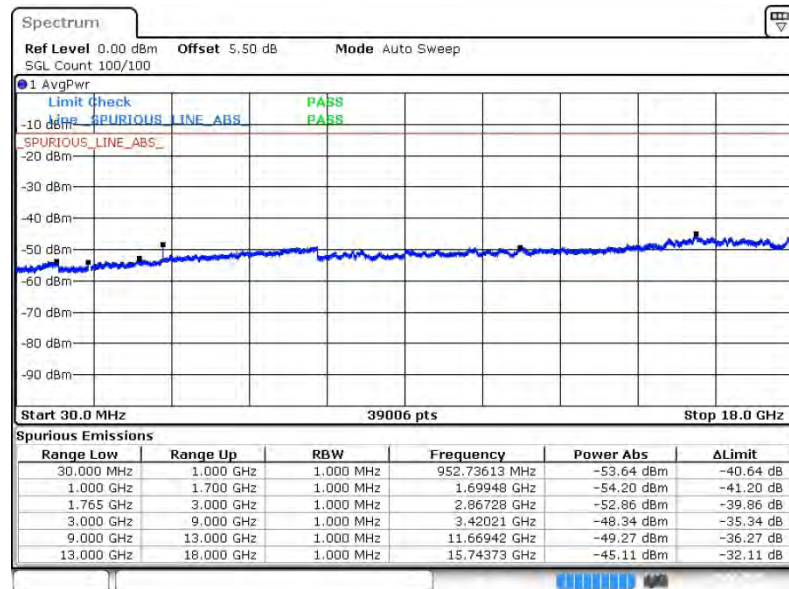
**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 49)**



<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH19957 (Low)
<b>Band Width :</b>	1.4MHz		

**QPSK (RB Size 3, RB Offset 2)**

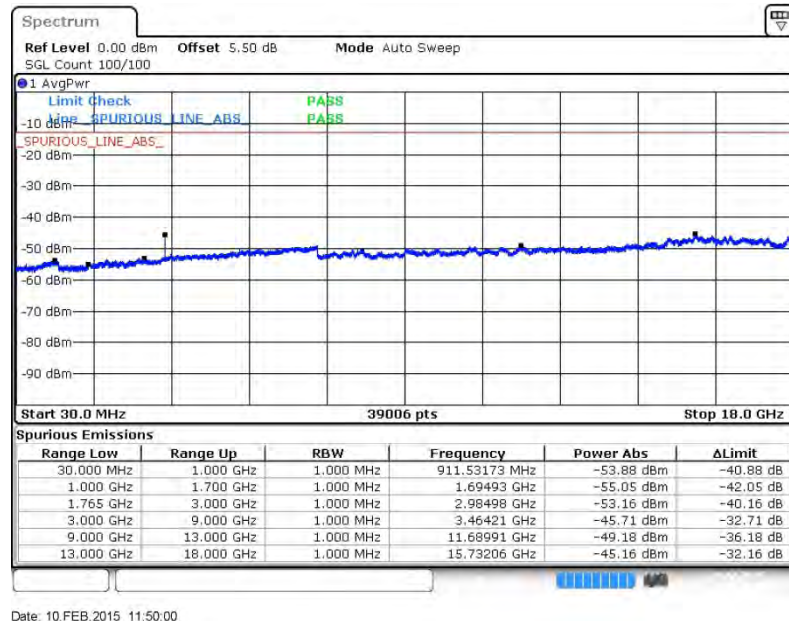
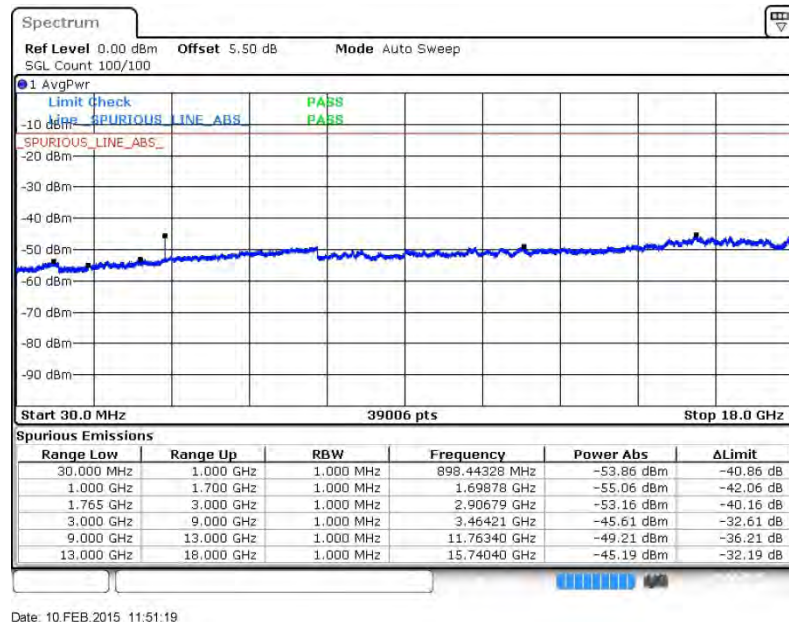
Date: 10.FEB.2015 11:46:37

**16QAM (RB Size 3, RB Offset 2)**

Date: 10.FEB.2015 11:47:58



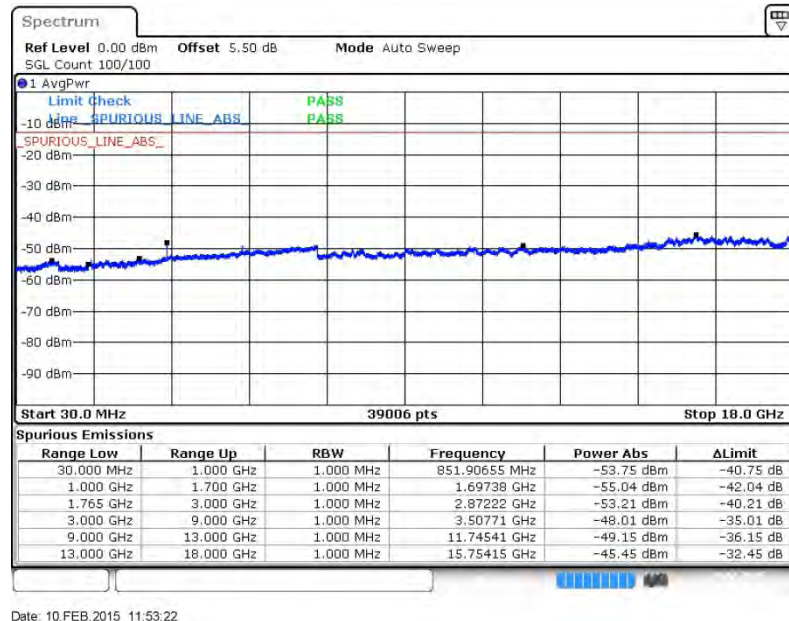
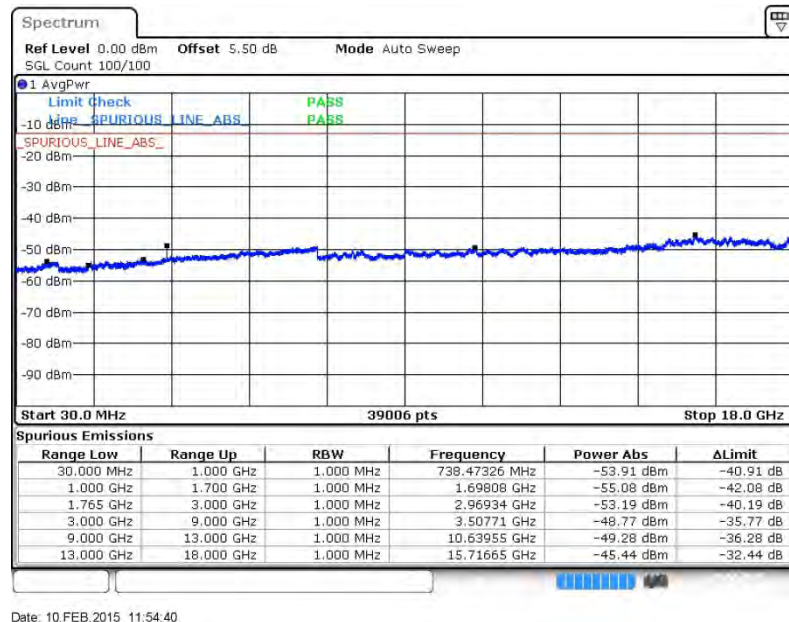
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20175 (Middle)
<b>Band Width :</b>	1.4MHz		

**QPSK (RB Size 3, RB Offset 1)****16QAM (RB Size 1, RB Offset 0)**





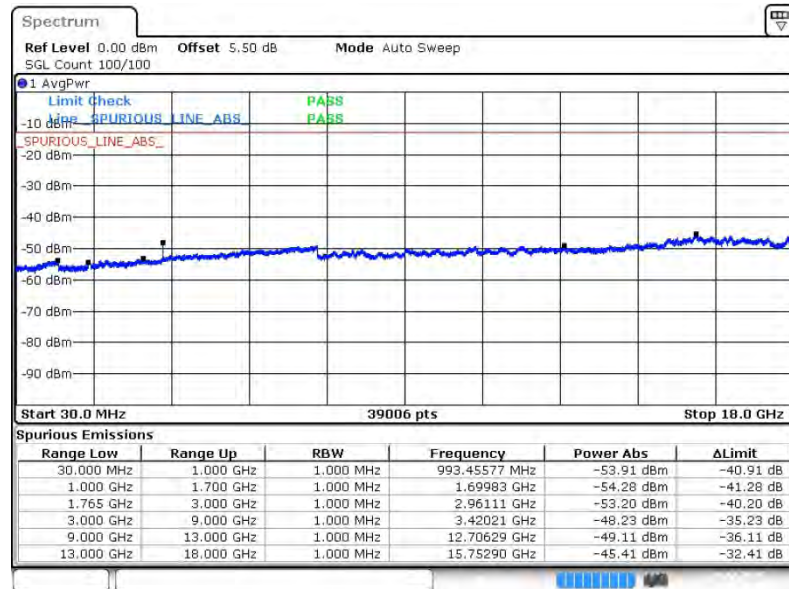
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20393 (High)
<b>Band Width :</b>	1.4MHz		

**QPSK (RB Size 1, RB Offset 2)****16QAM (RB Size 3, RB Offset 2)**





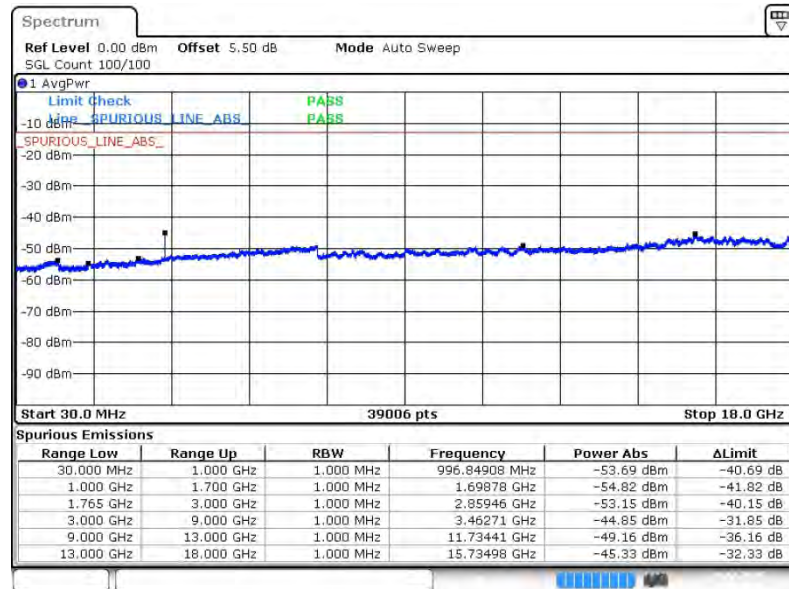
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH19965 (Low)
<b>Band Width :</b>	3MHz		

**QPSK (RB Size 1, RB Offset 7)****16QAM (RB Size 1, RB Offset 7)**

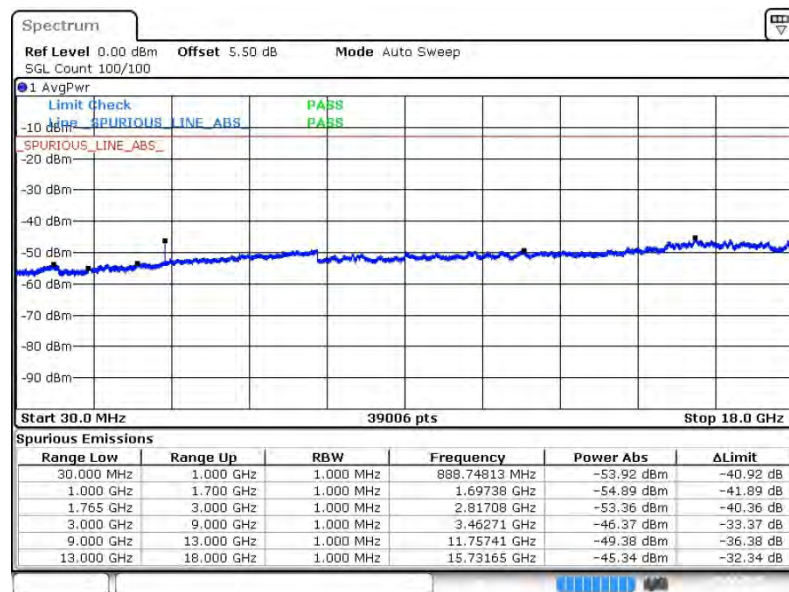


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	3MHz		

## QPSK (RB Size 1, RB Offset 7)



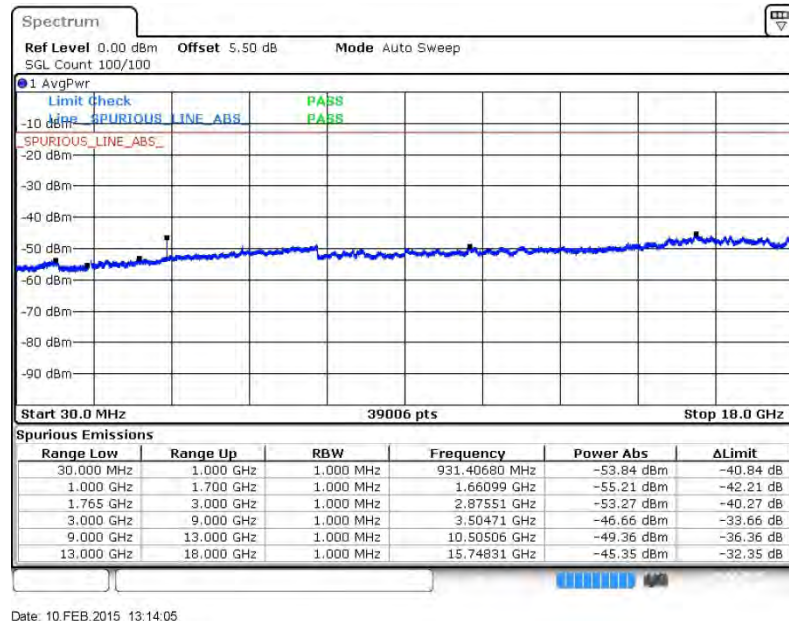
## 16QAM (RB Size 1, RB Offset 0)





Band :	LTE Band 4	Channel :	CH20385 (High)
Band Width :	3MHz		

## QPSK (RB Size 1, RB Offset 7)

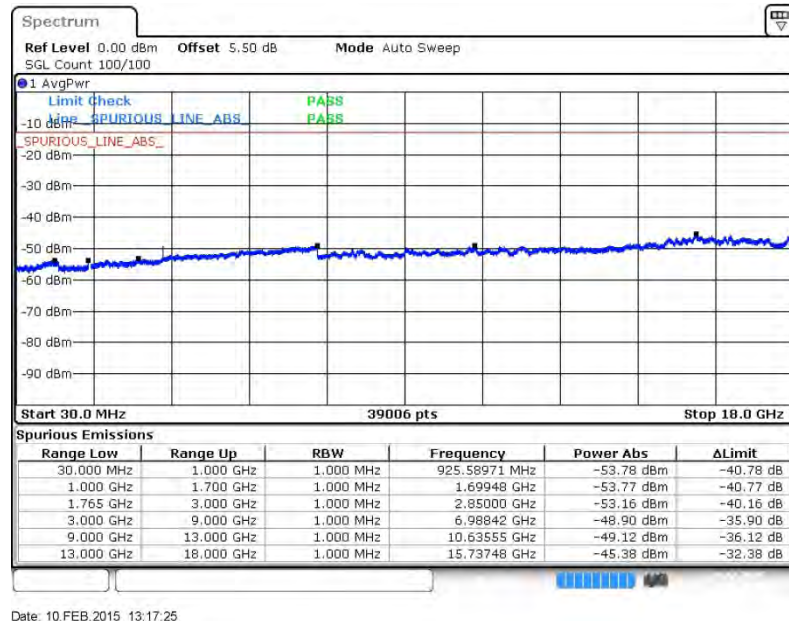
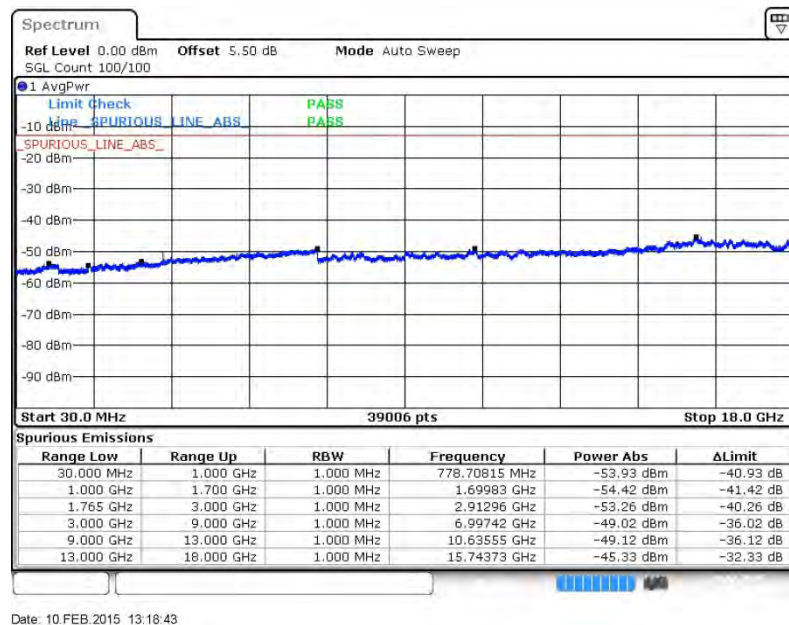


## 16QAM (RB Size 1, RB Offset 7)





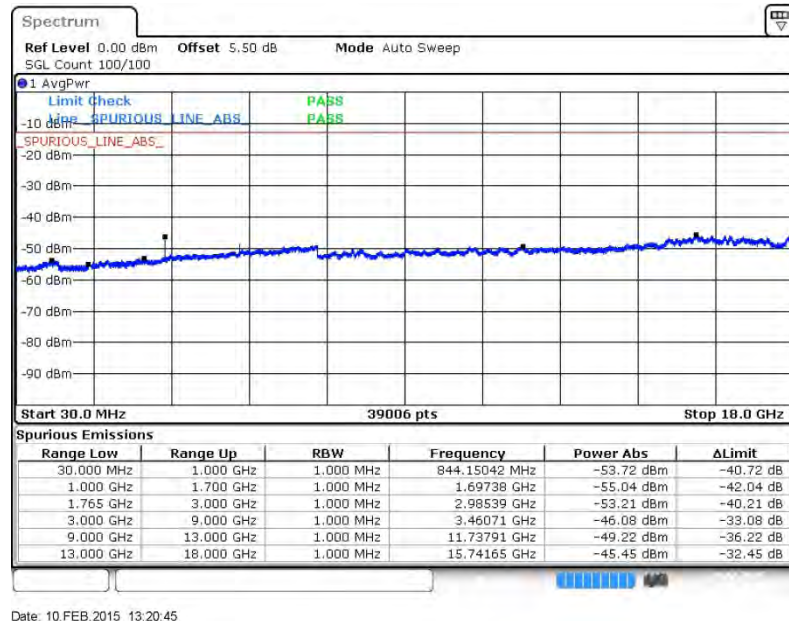
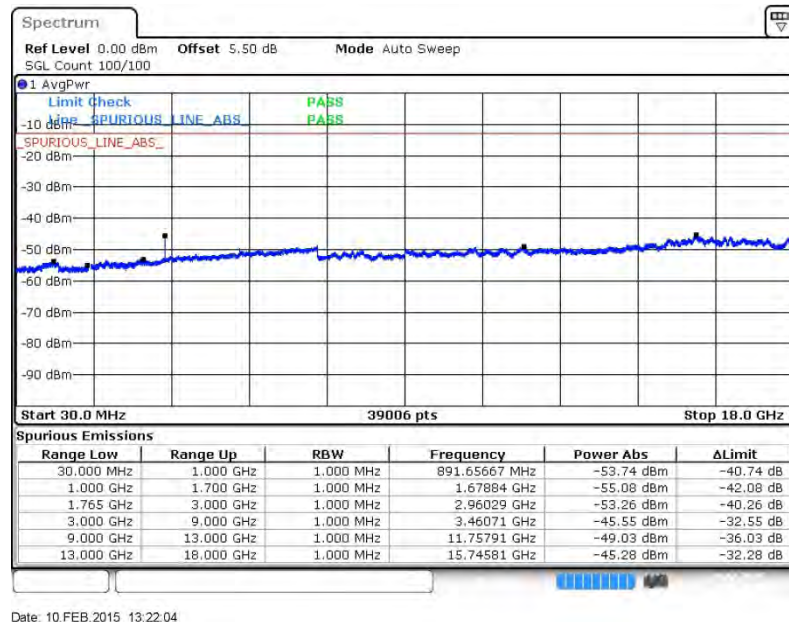
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH19975 (Low)
<b>Band Width :</b>	5MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**





<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20175 (Middle)
<b>Band Width :</b>	5MHz		

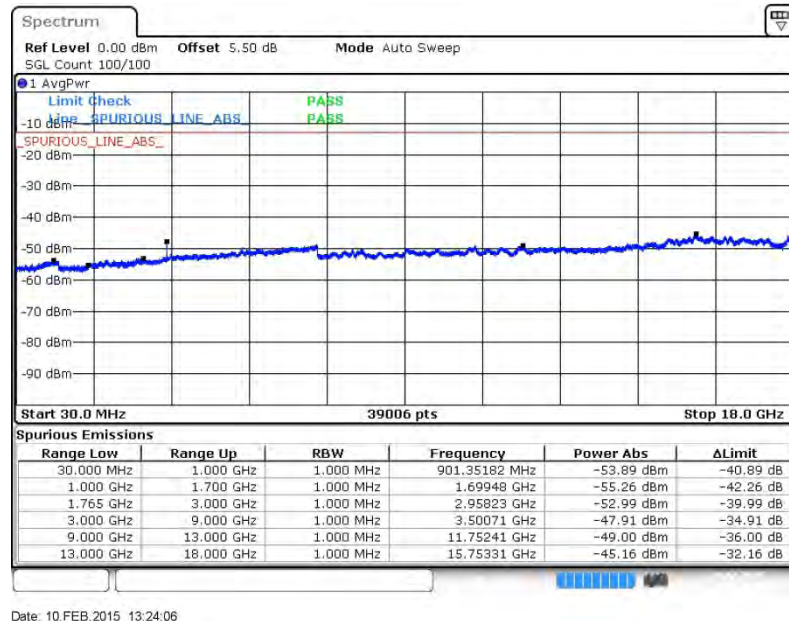
**QPSK (RB Size 1, RB Offset 24)****16QAM (RB Size 1, RB Offset 24)**



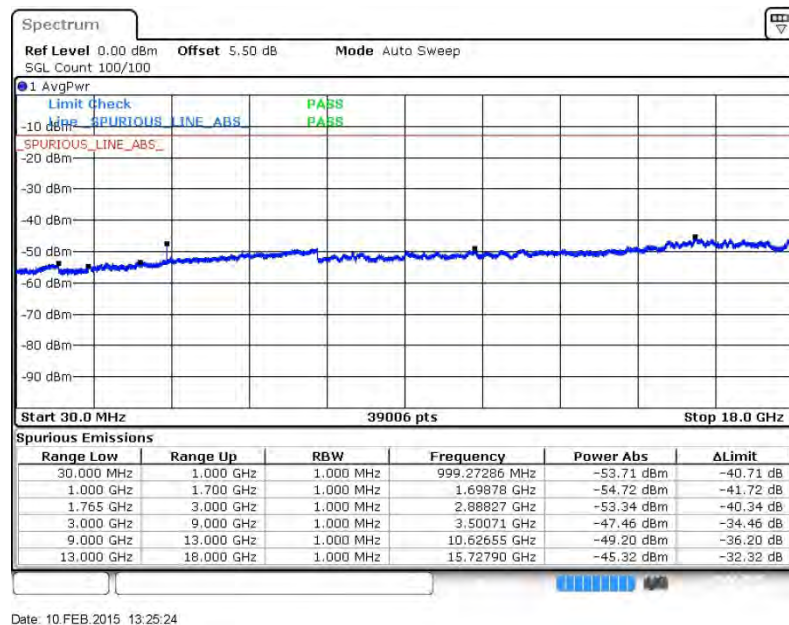


Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width :	5MHz		

## QPSK (RB Size 1, RB Offset 12)

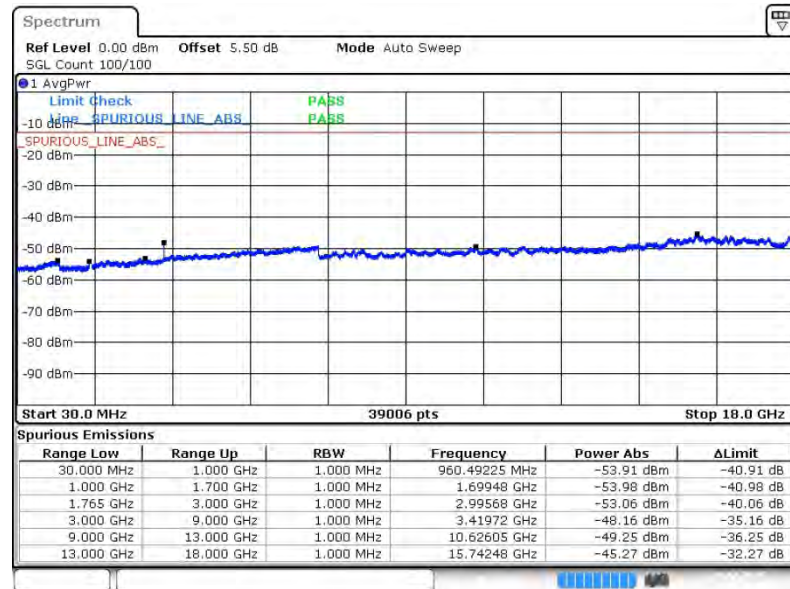
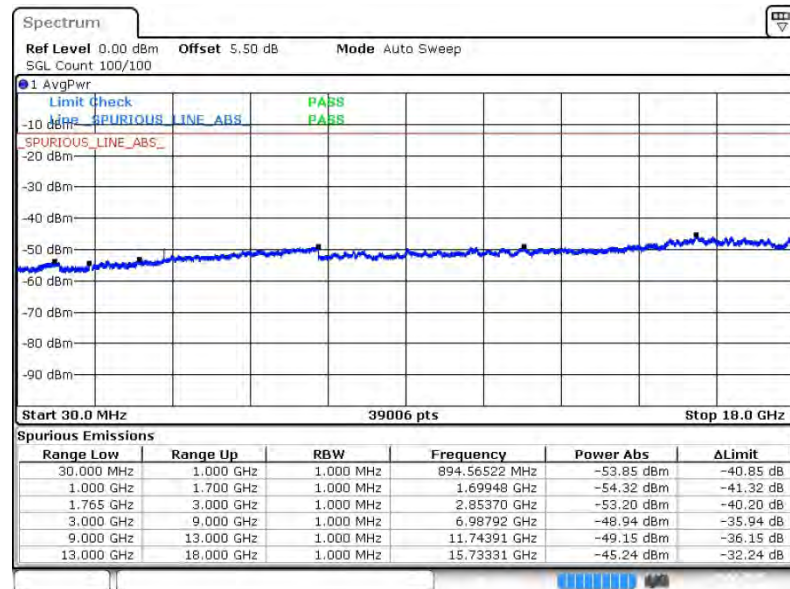


## 16QAM (RB Size 1, RB Offset 12)





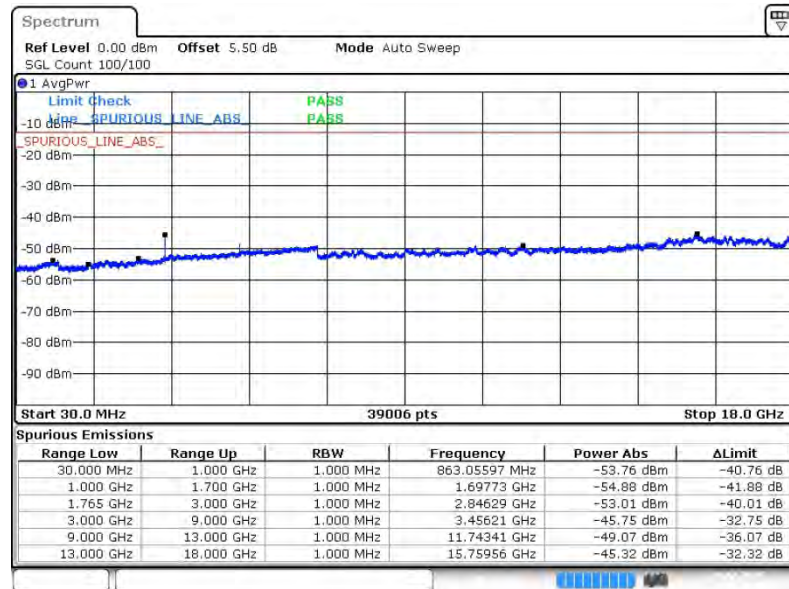
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20000 (Low)
<b>Band Width :</b>	10MHz		

**QPSK (RB Size 1, RB Offset 24)****16QAM (RB Size 1, RB Offset 0)**

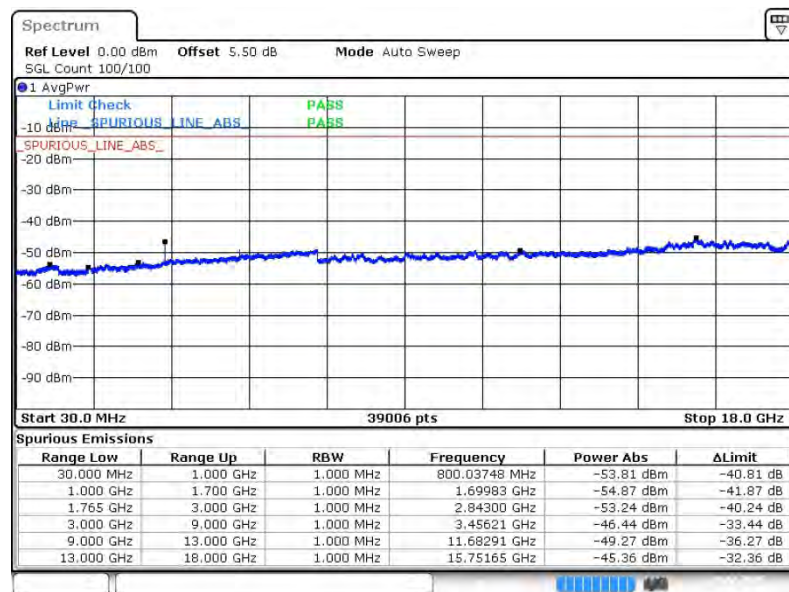


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	10MHz		

## QPSK (RB Size 1, RB Offset 24)

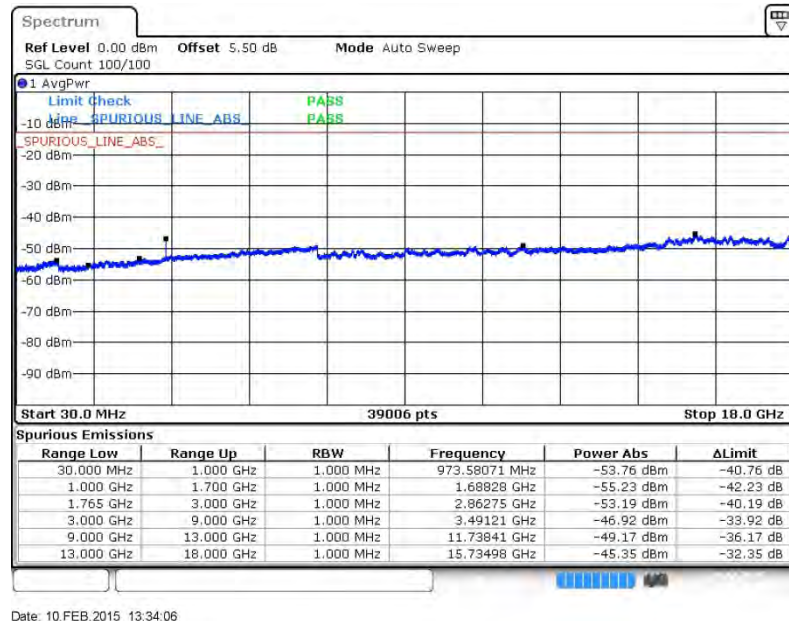
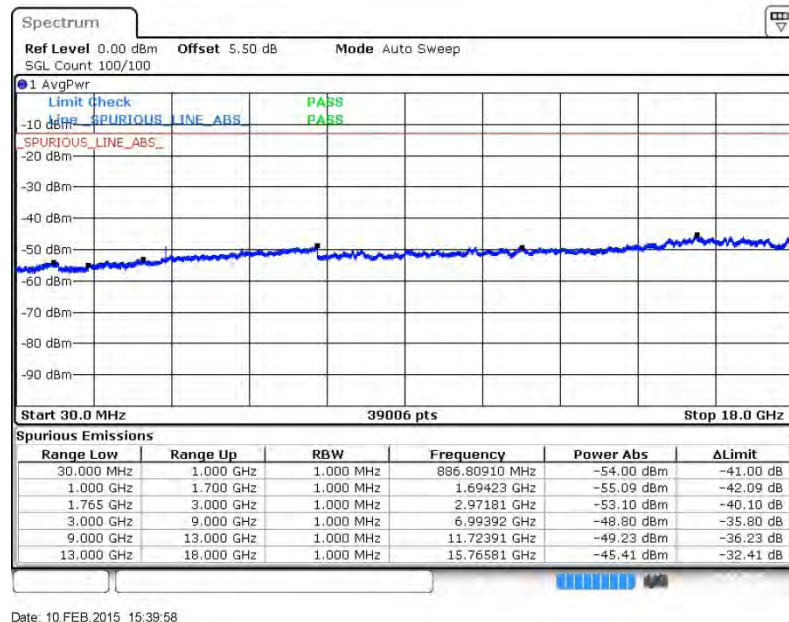


## 16QAM (RB Size 1, RB Offset 49)





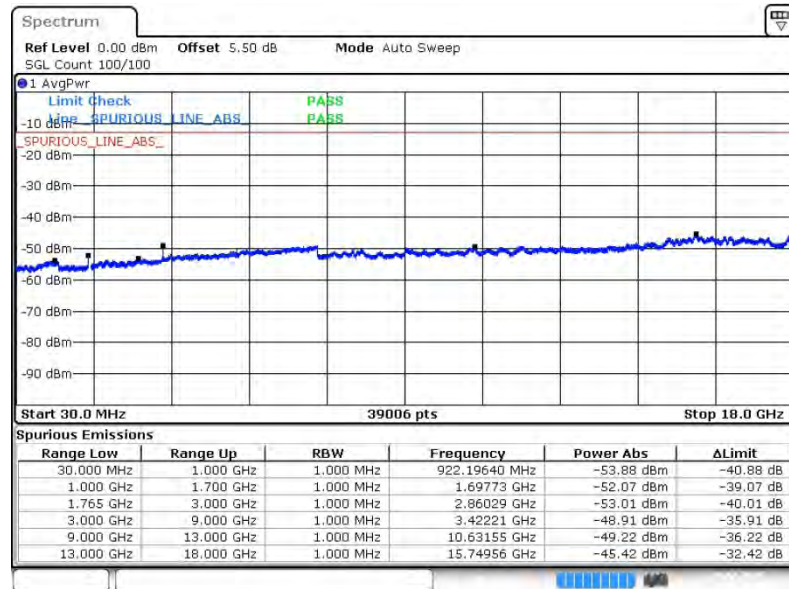
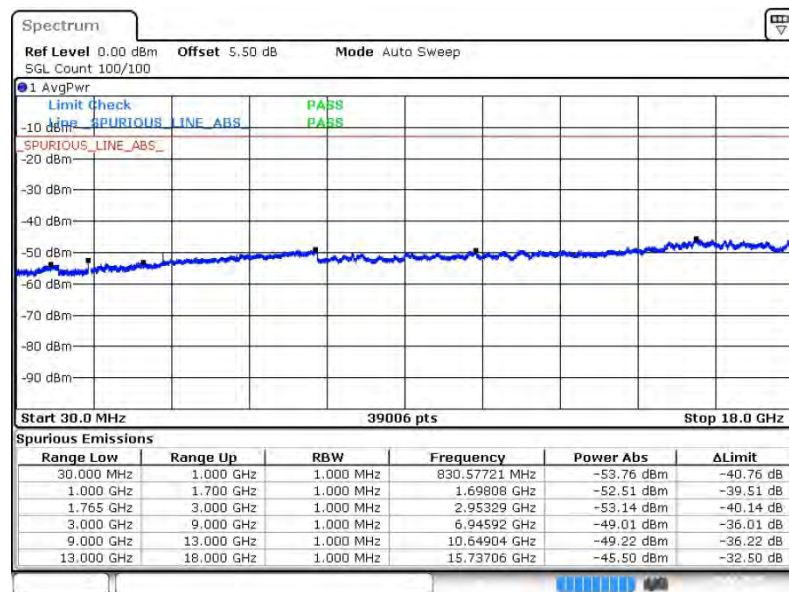
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20350 (High)
<b>Band Width :</b>	10MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**





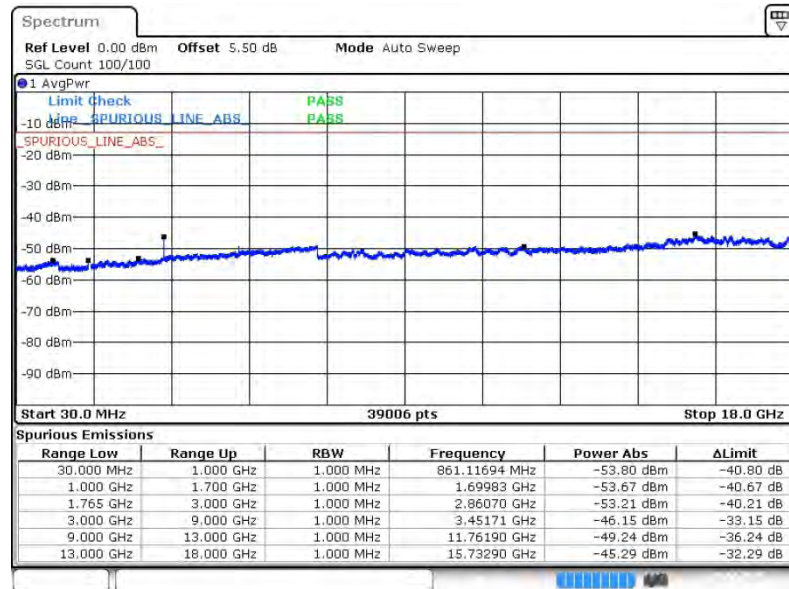
<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20025 (Low)
<b>Band Width :</b>	15MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**

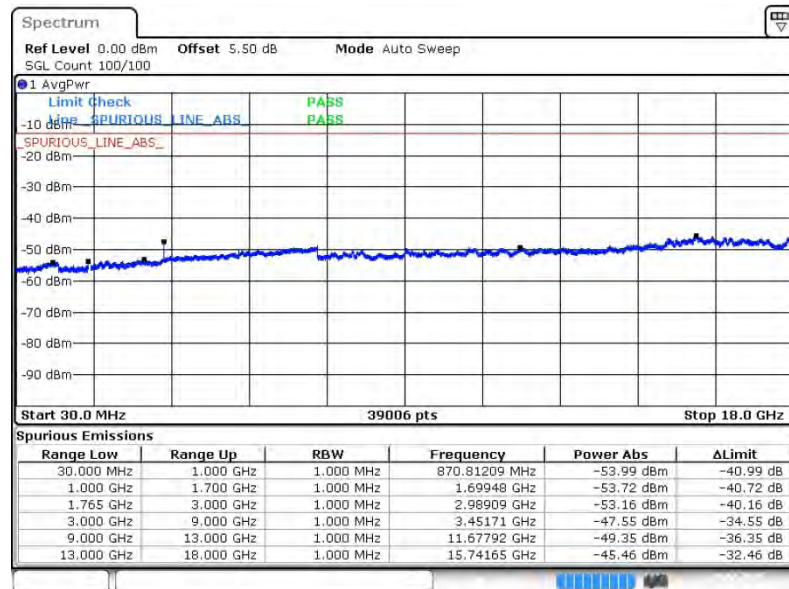


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	15MHz		

## QPSK (RB Size 1, RB Offset 0)



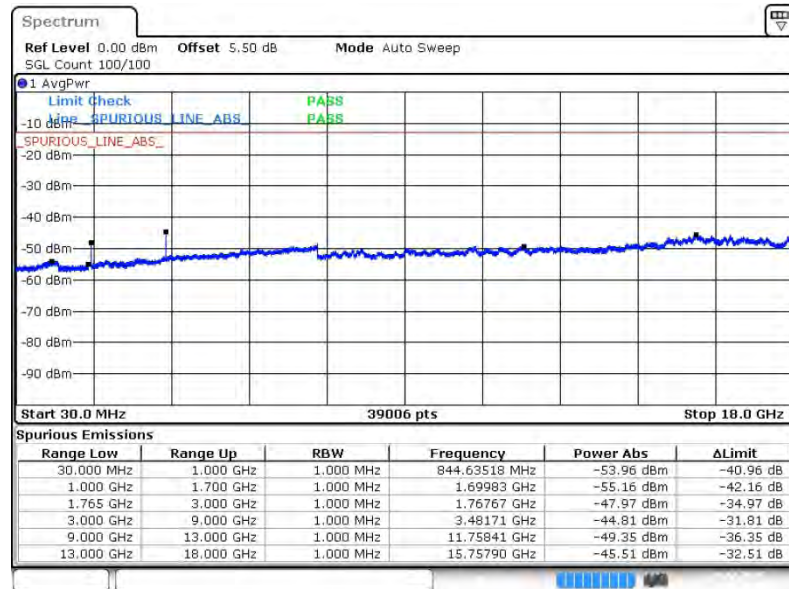
## 16QAM (RB Size 1, RB Offset 0)



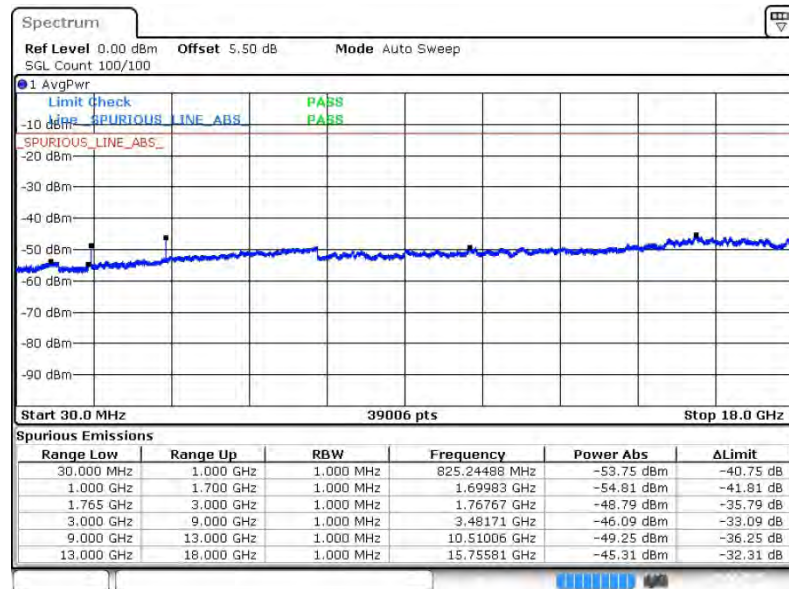


Band :	LTE Band 4	Channel :	CH20325 (High)
Band Width :	15MHz		

## QPSK (RB Size 1, RB Offset 0)



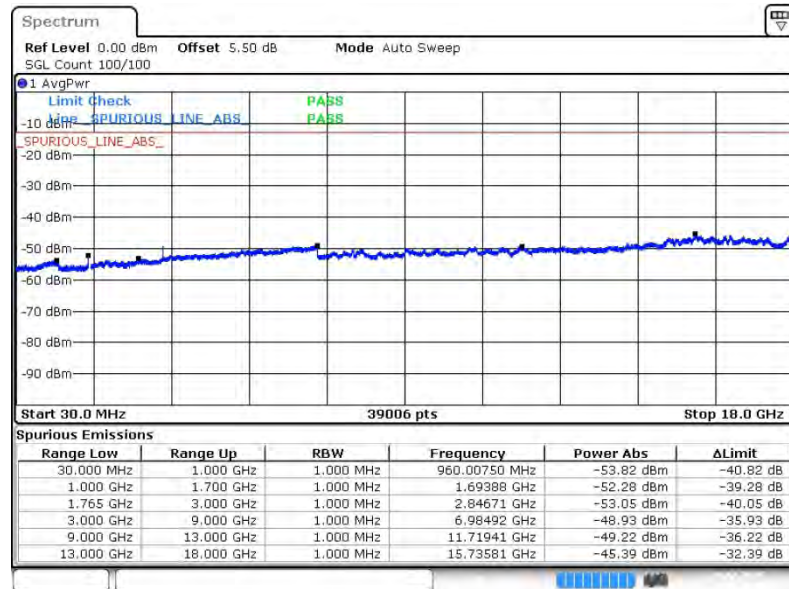
## 16QAM (RB Size 1, RB Offset 0)



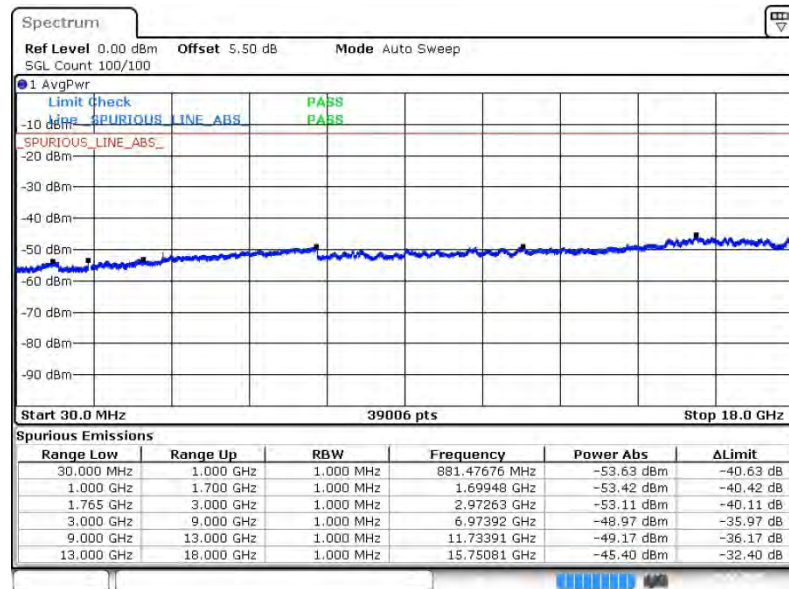


Band :	LTE Band 4	Channel :	CH20050 (Low)
Band Width :	20MHz		

## QPSK (RB Size 1, RB Offset 0)



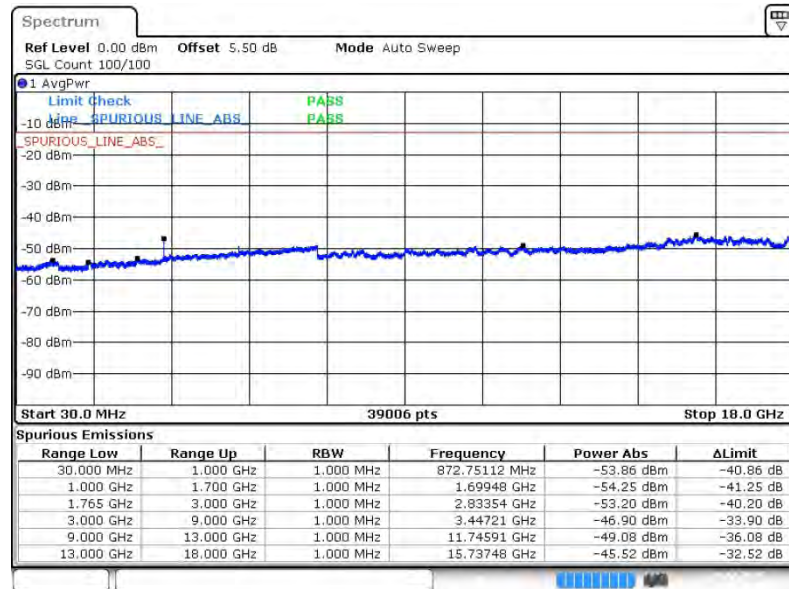
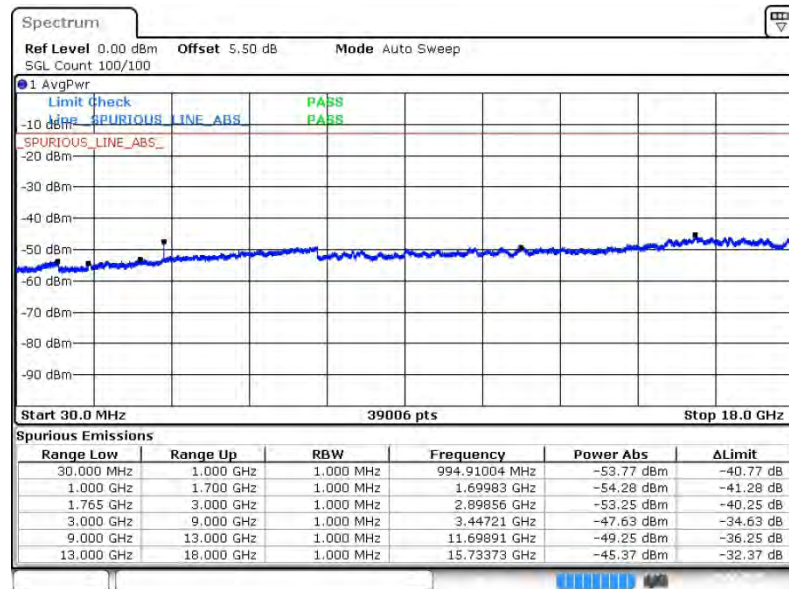
## 16QAM (RB Size 1, RB Offset 0)





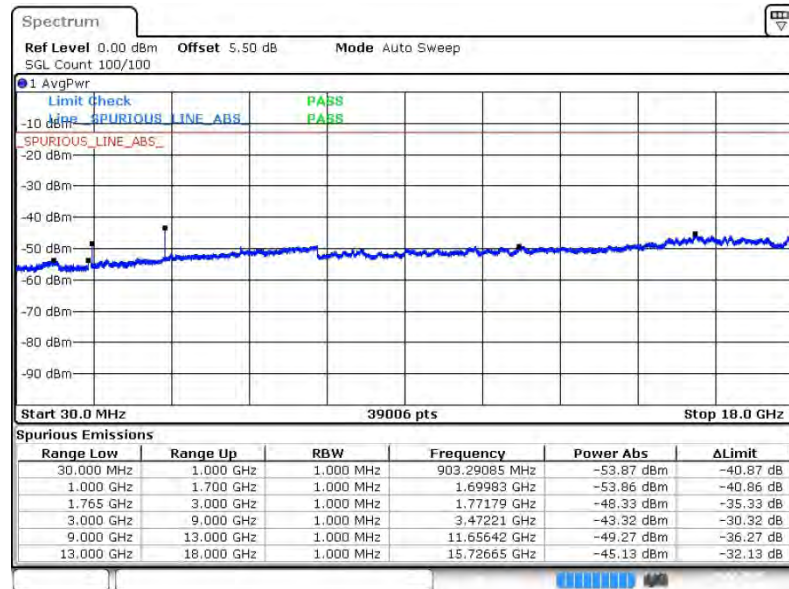
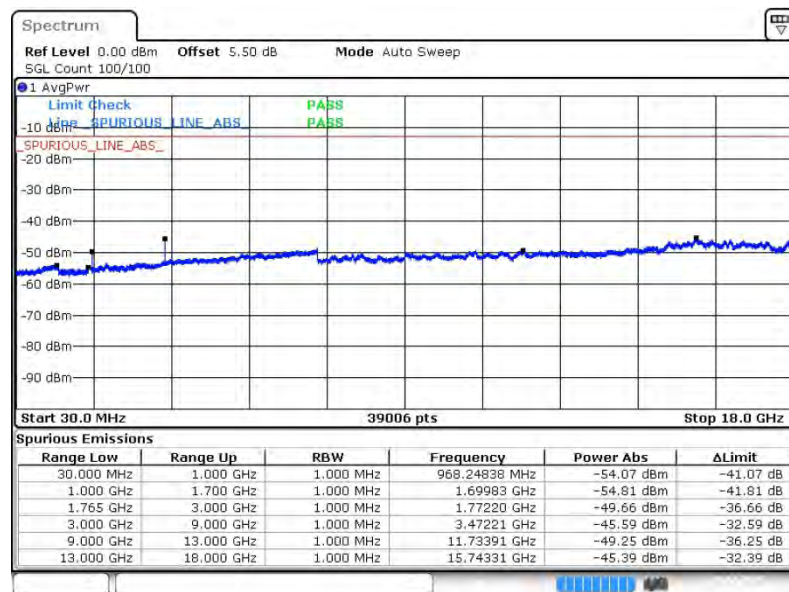


<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20175 (Middle)
<b>Band Width :</b>	20MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**

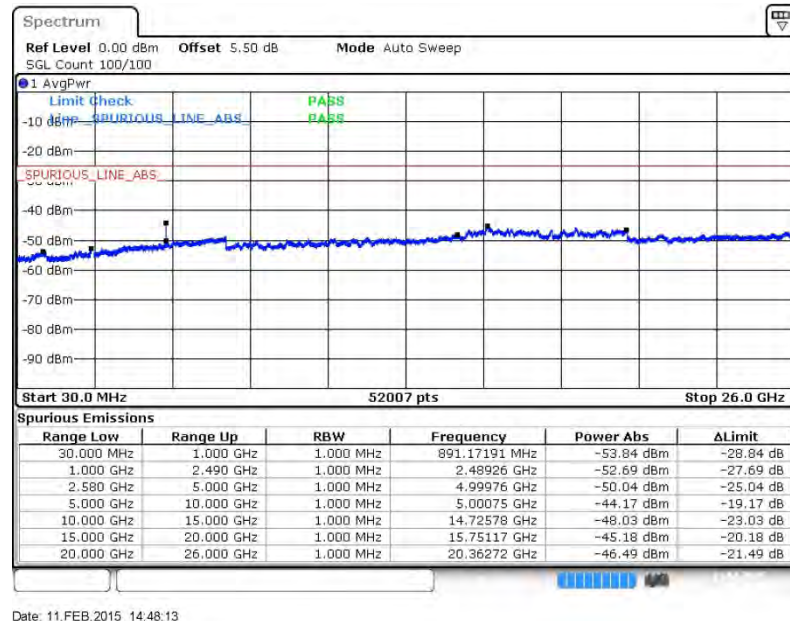
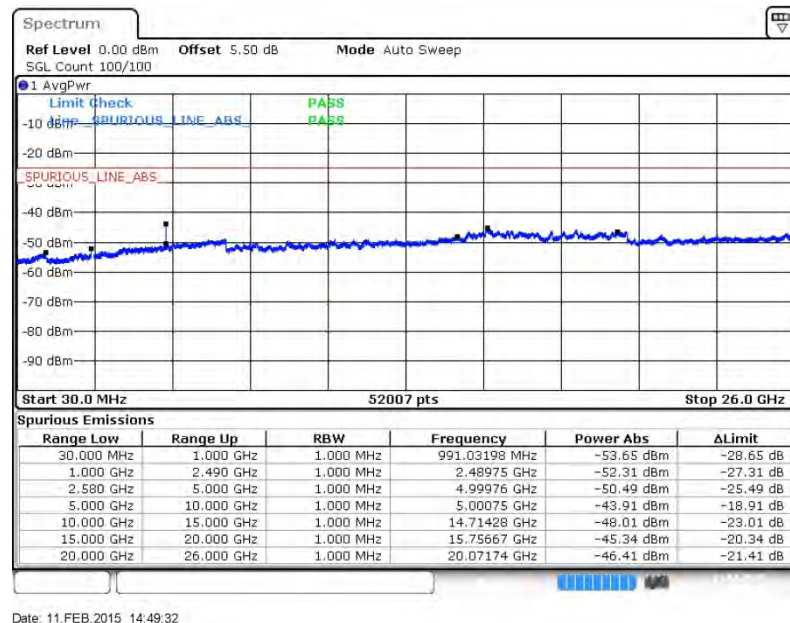


<b>Band :</b>	LTE Band 4	<b>Channel :</b>	CH20300 (High)
<b>Band Width :</b>	20MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 99)**

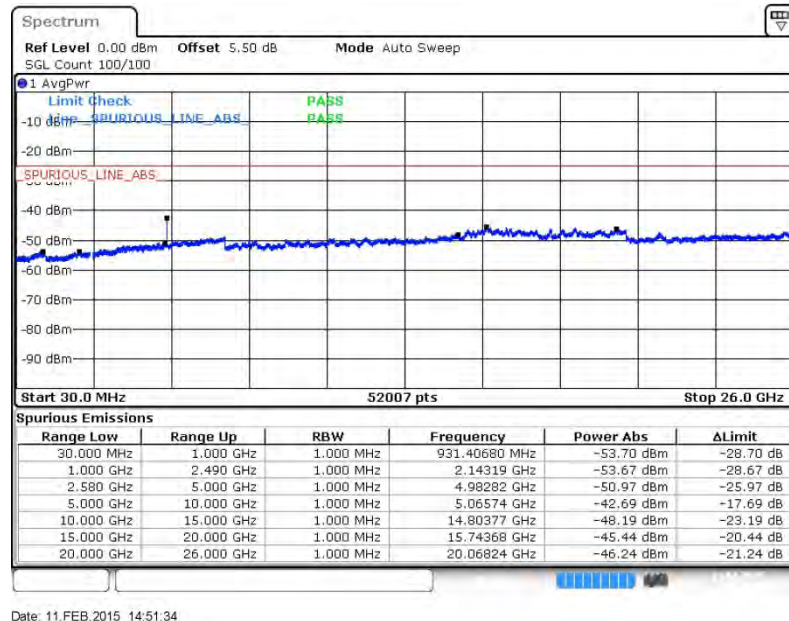
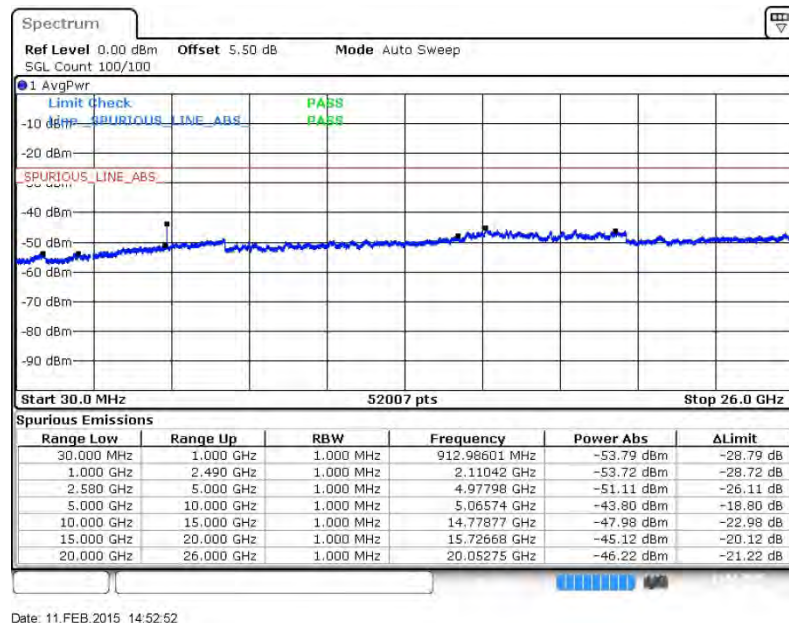


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH20775 (Low)
<b>Band Width :</b>	5MHz		

**QPSK (RB Size 1, RB Offset 12)****16QAM (RB Size 1, RB Offset 12)**



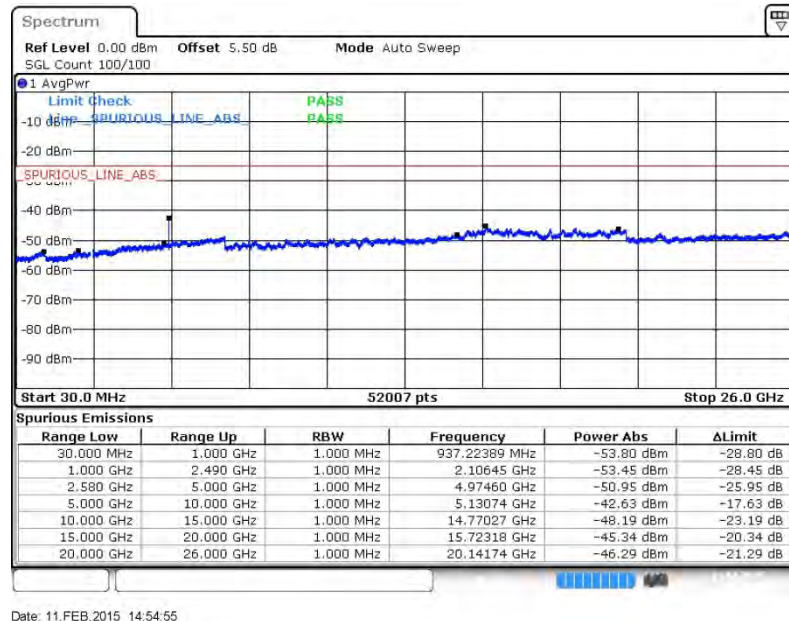
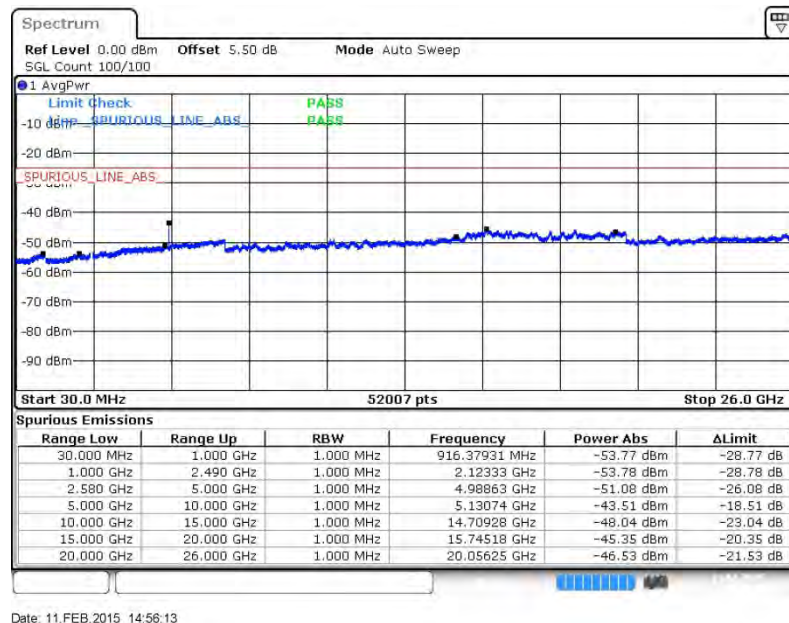
<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21100 (Middle)
<b>Band Width :</b>	5MHz		

**QPSK (RB Size 1, RB Offset 12)****16QAM (RB Size 1, RB Offset 12)**



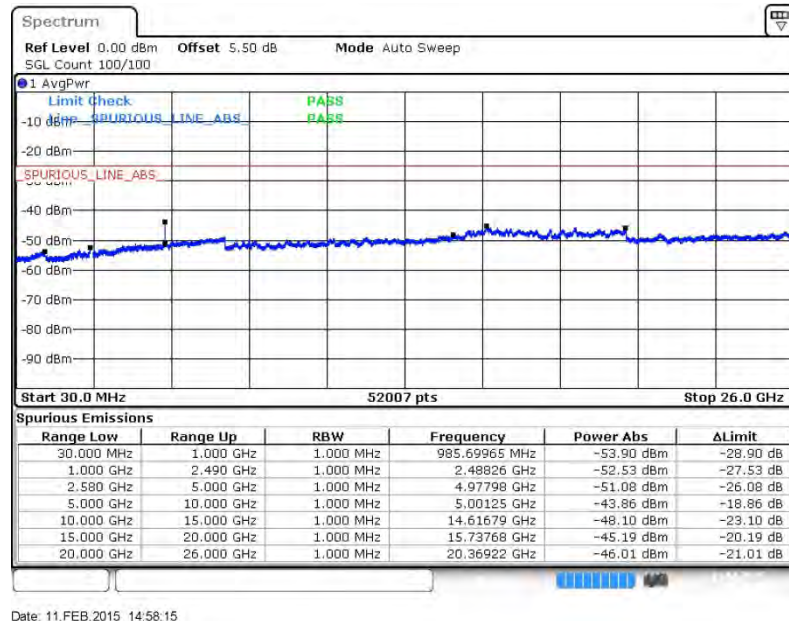
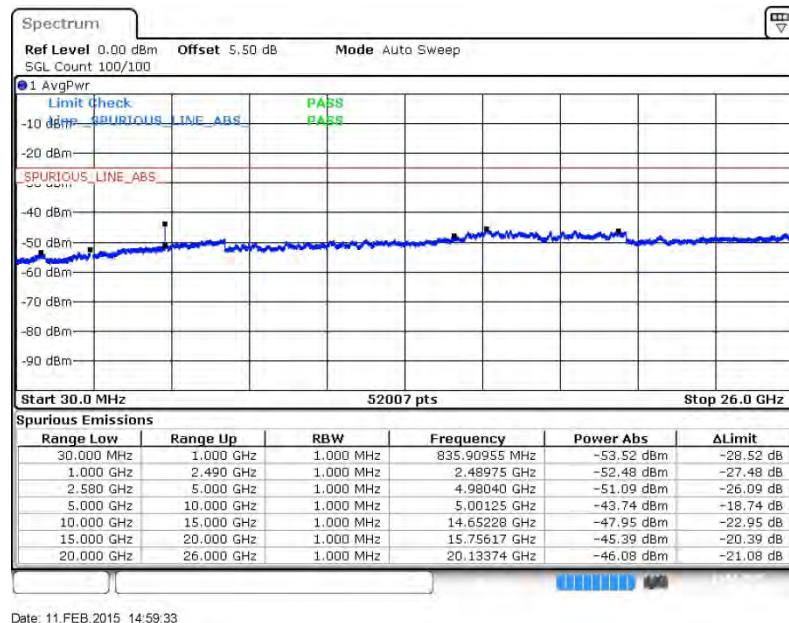


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21425 (High)
<b>Band Width :</b>	5MHz		

**QPSK (RB Size 1, RB Offset 12)****16QAM (RB Size 1, RB Offset 12)**

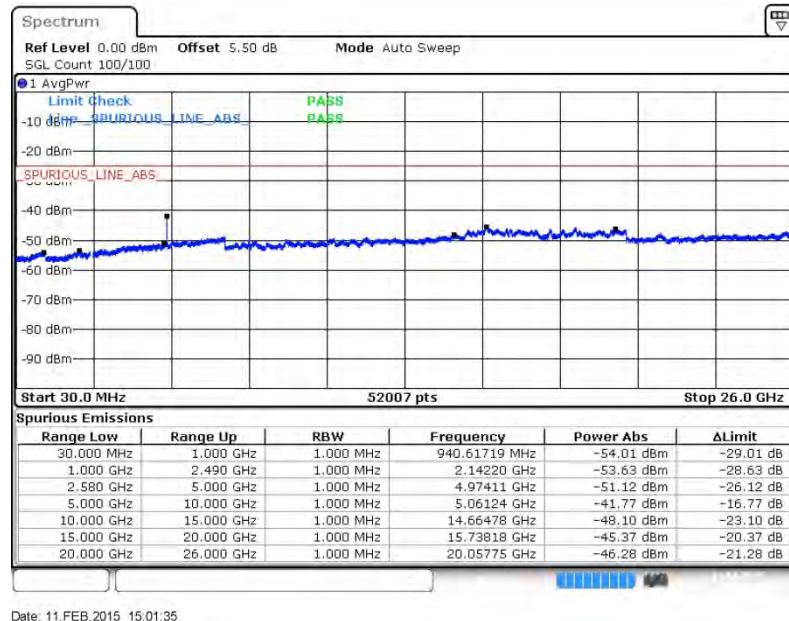
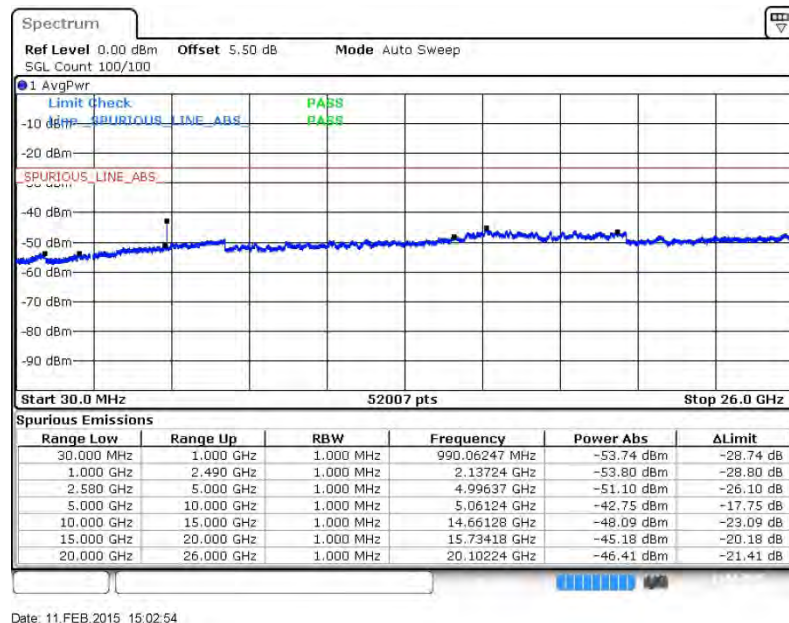


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH20800 (Low)
<b>Band Width :</b>	10MHz		

**QPSK (RB Size 1, RB Offset 24)****16QAM (RB Size 1, RB Offset 0)**

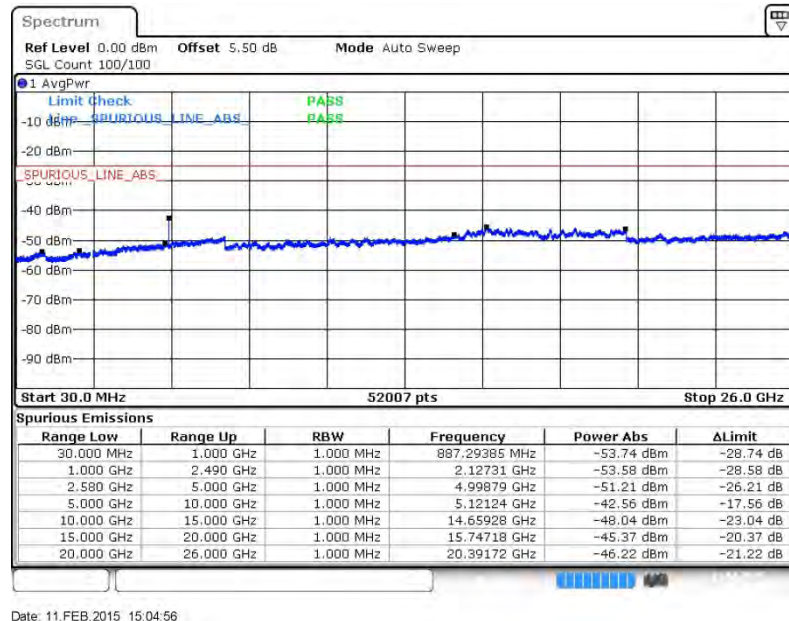
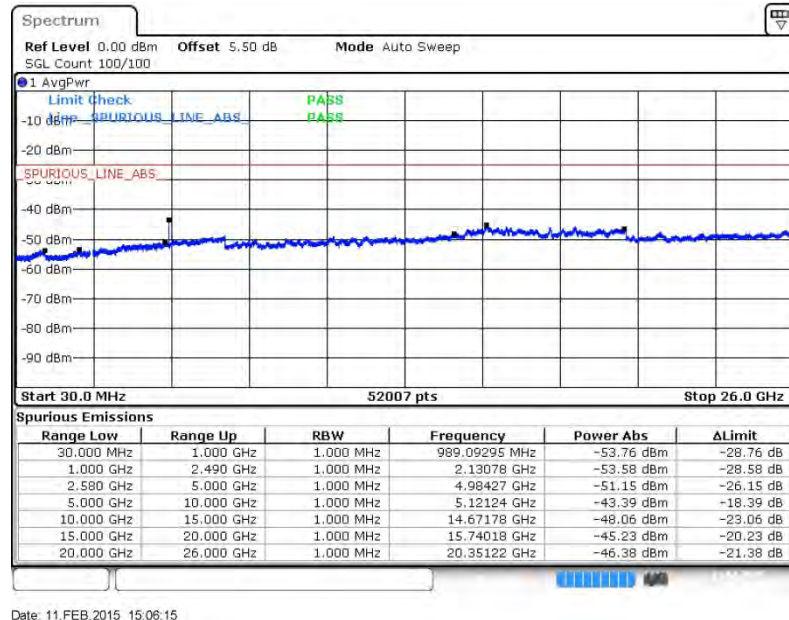


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21100 (Middle)
<b>Band Width :</b>	10MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 24)**



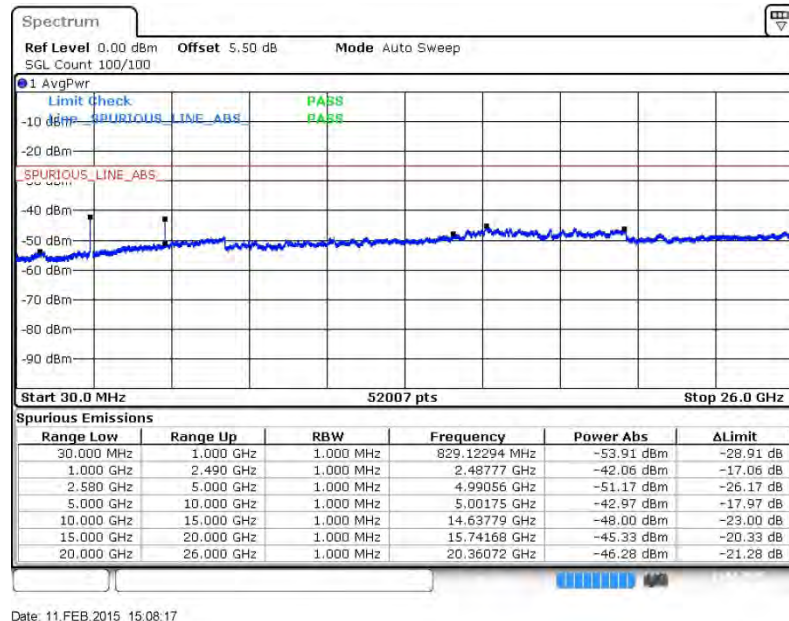
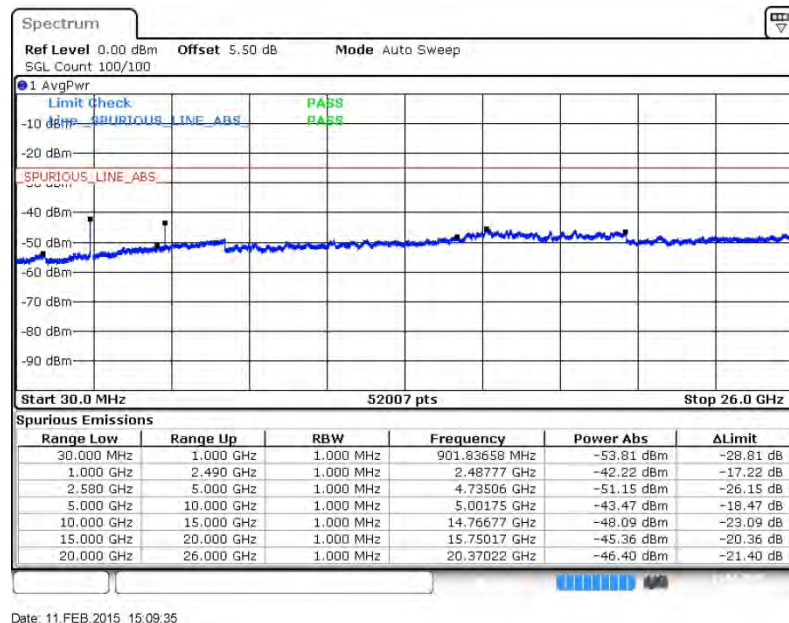
<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21400 (High)
<b>Band Width :</b>	10MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 24)**



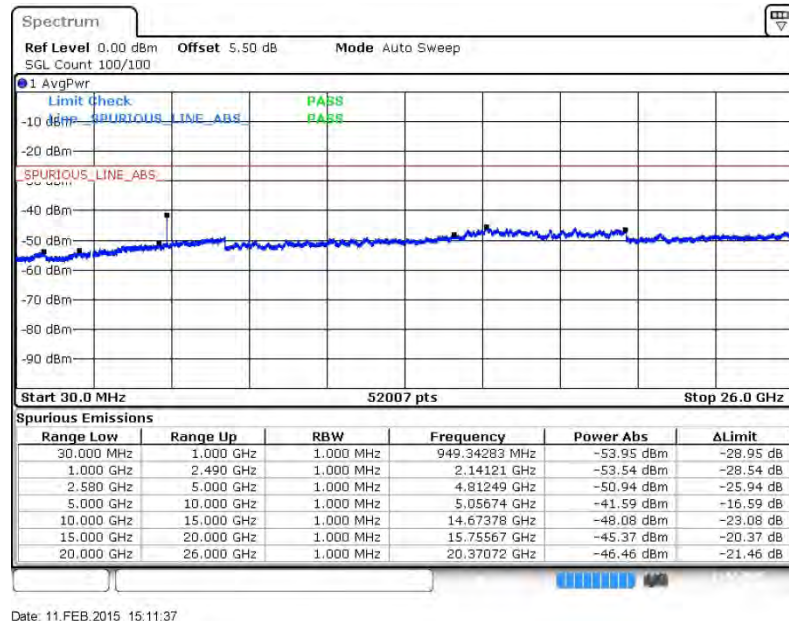
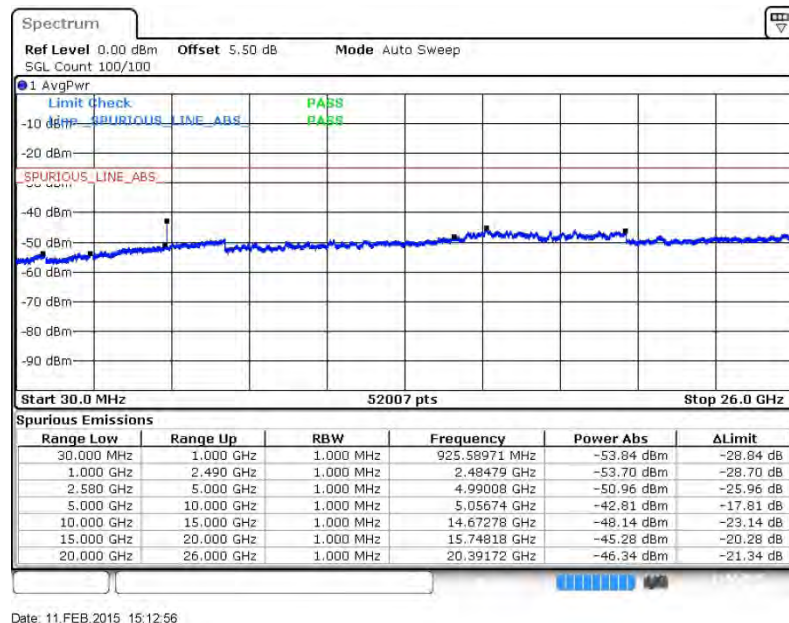


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH20825 (Low)
<b>Band Width :</b>	15MHz		

**QPSK (RB Size 1, RB Offset 37)****16QAM (RB Size 1, RB Offset 0)**

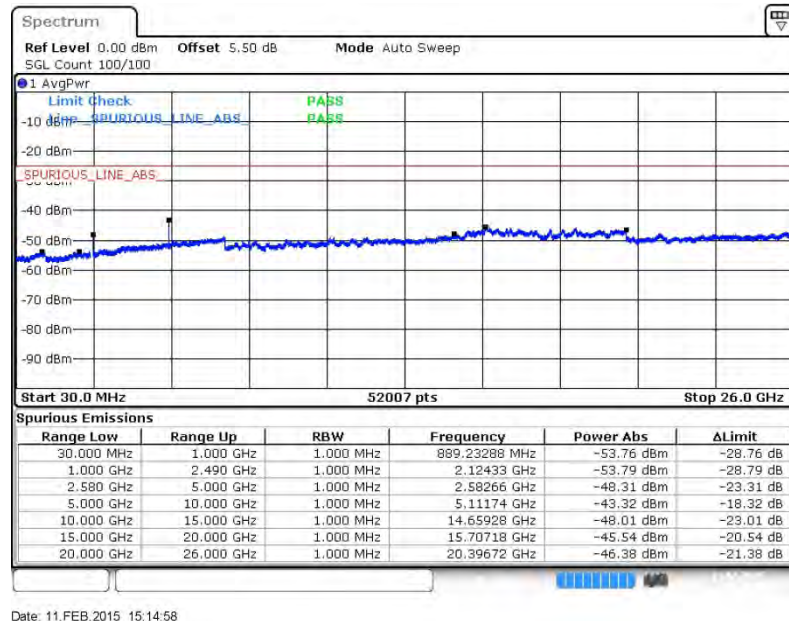
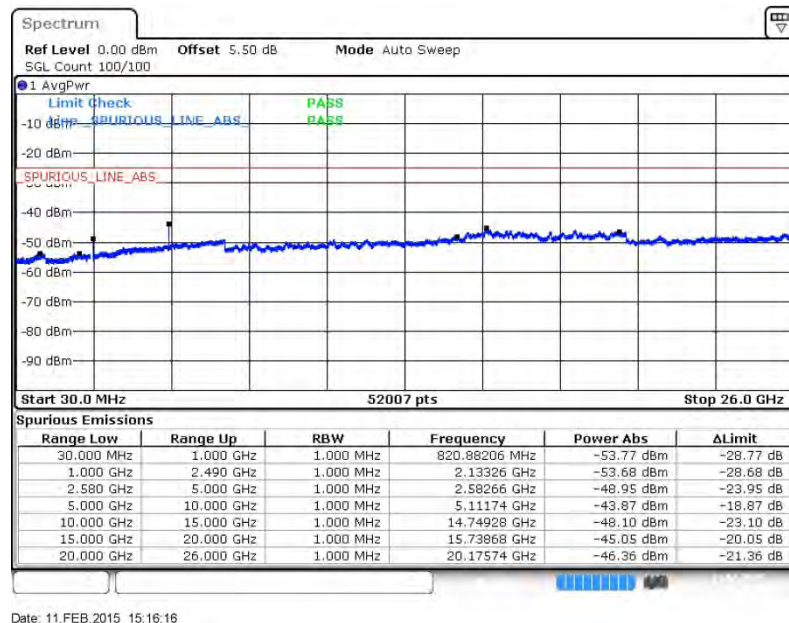


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21100 (Middle)
<b>Band Width :</b>	15MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**



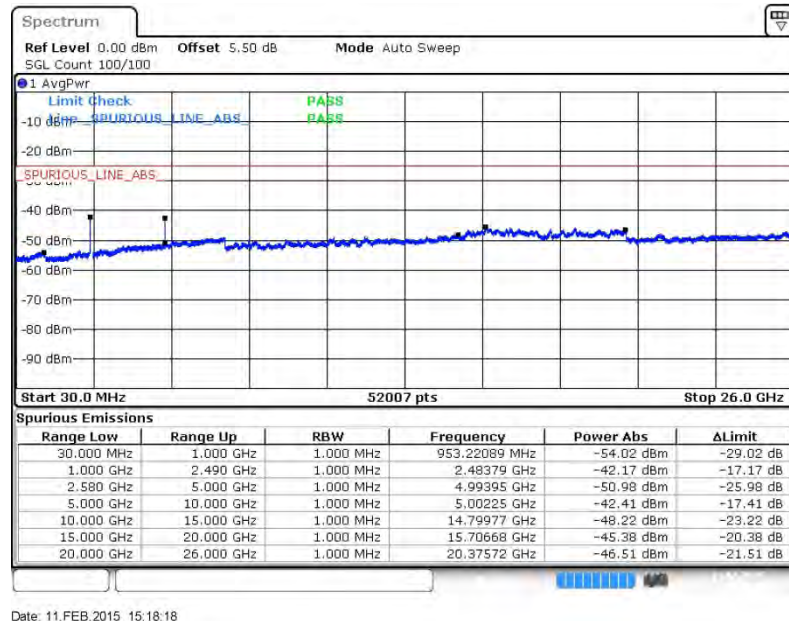
<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21375 (High)
<b>Band Width :</b>	15MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**

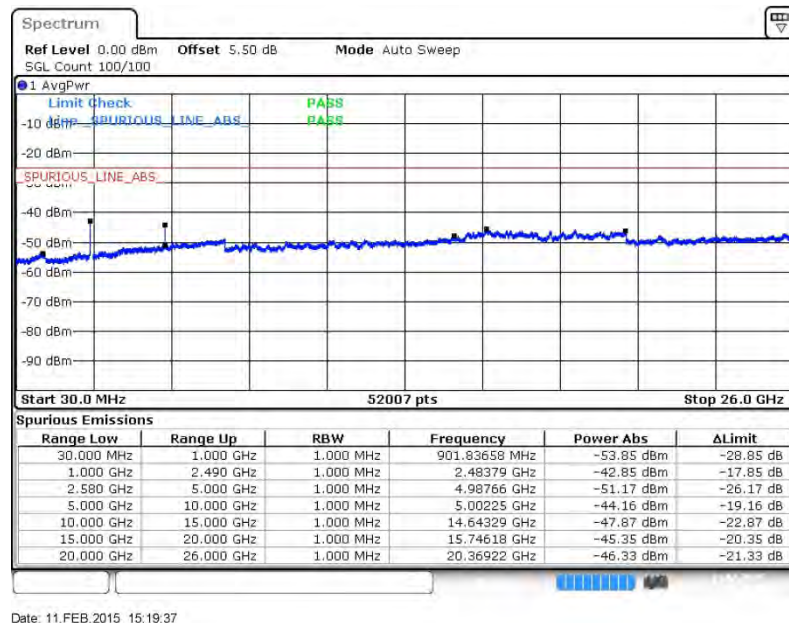


Band :	LTE Band 7	Channel :	CH20850 (Low)
Band Width :	20MHz		

## QPSK (RB Size 1, RB Offset 0)



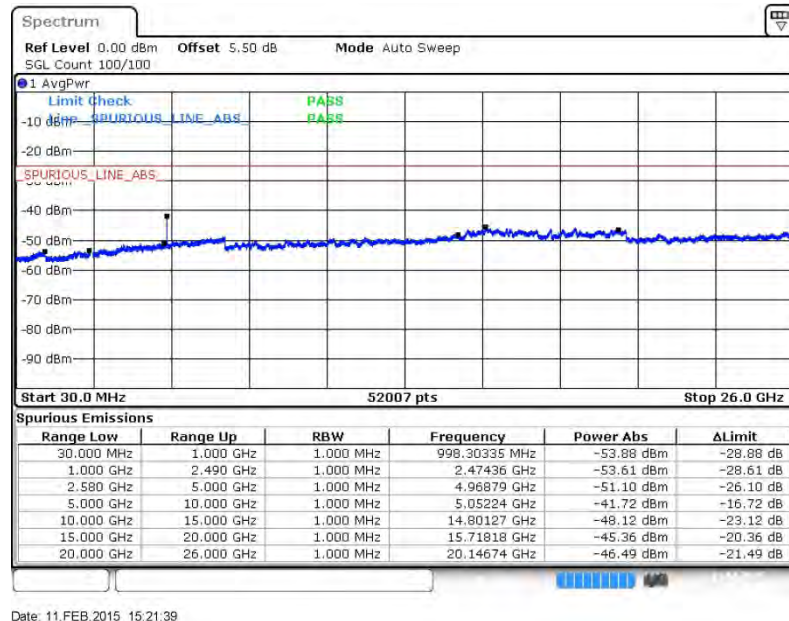
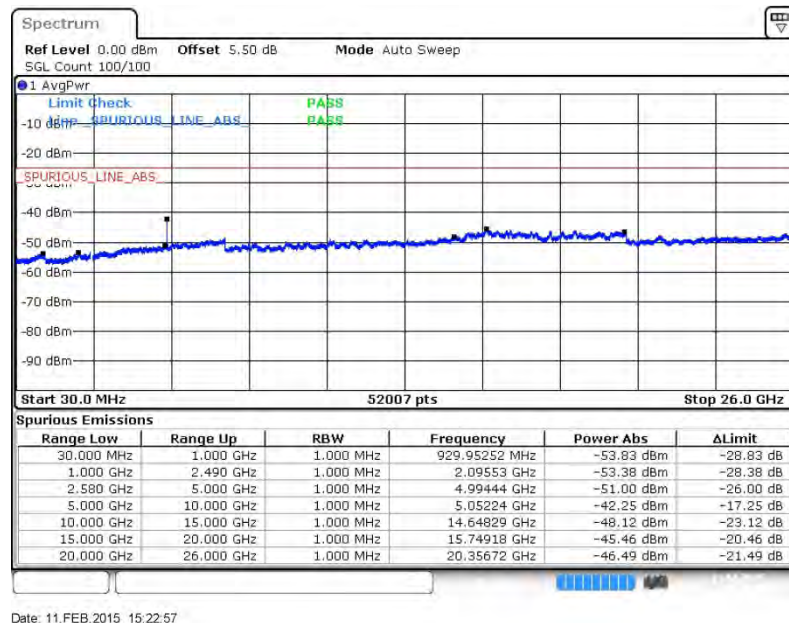
## 16QAM (RB Size 1, RB Offset 99)





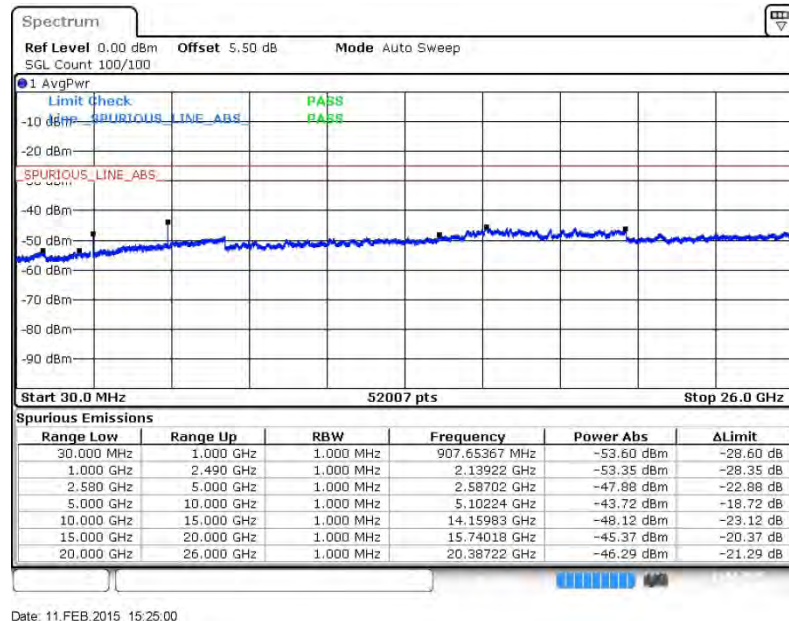
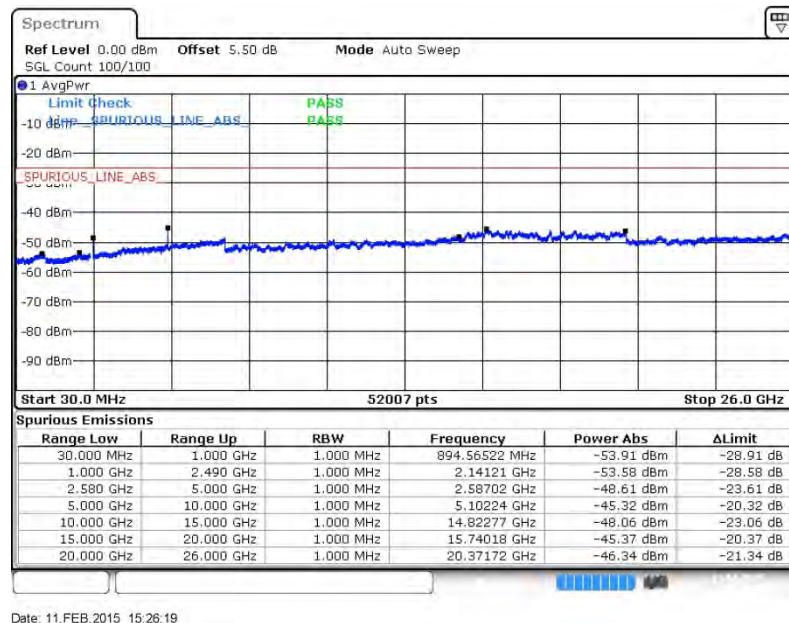


<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21100 (Middle)
<b>Band Width :</b>	20MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 0)**



<b>Band :</b>	LTE Band 7	<b>Channel :</b>	CH21350 (High)
<b>Band Width :</b>	20MHz		

**QPSK (RB Size 1, RB Offset 0)****16QAM (RB Size 1, RB Offset 49)**

### **3.7 Radiated Spurious Emission Measurement**

#### **3.7.1 Description of Radiated Spurious Emission**

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

For Band 7

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

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

#### **3.7.2 Measuring Instruments**

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

### 3.7.3 Test Procedures

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

The limit line is derived from  $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm.}$$

For Band 7

The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [55 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [55 + 10\log(P)] \text{ (dB)}$$

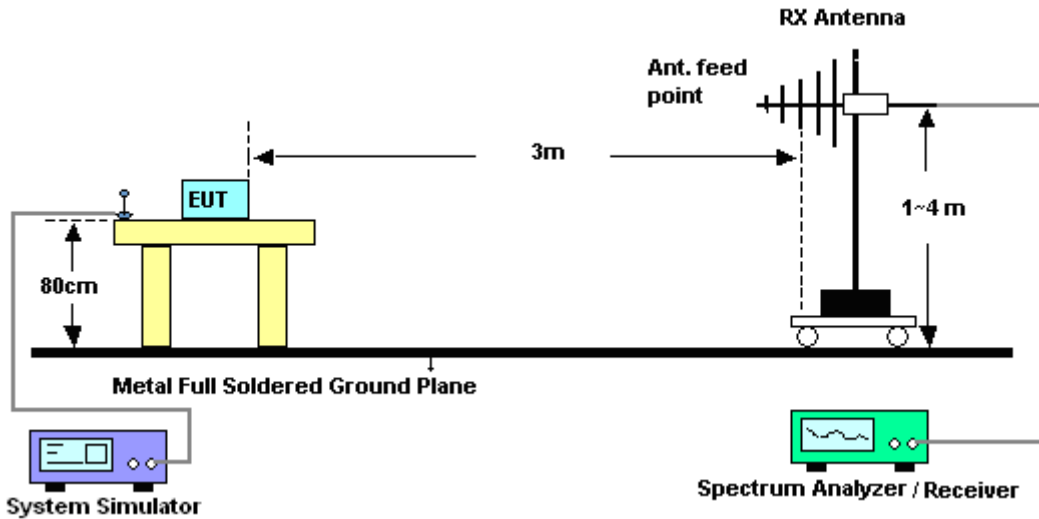
$$= -25\text{dBm.}$$

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

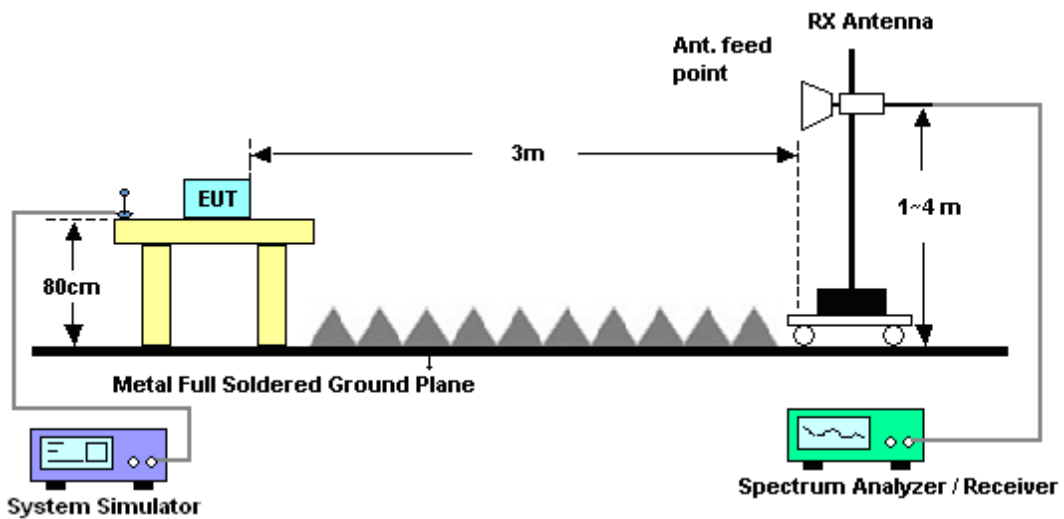


### 3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





## 3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 2					Temperature :	22~23°C		
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Horizontal		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3759	-58.08	-13	-45.08	-65.07	-61.66	3	6.58	H	Pass
5637.9	-55.29	-13	-42.29	-59.91	-60.66	3.84	9.21	H	Pass
7518	-51.16	-13	-38.16	-60.40	-57.83	4.43	11.10	H	Pass

Band :	LTE Band 2					Temperature :	22~23°C		
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Vertical		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3759	-60.85	-13	-47.85	-64.93	-64.43	3	6.58	V	Pass
5637	-54.57	-13	-41.57	-60.8	-59.94	3.84	9.21	V	Pass
7518	-51.94	-13	-38.94	-60.6	-58.61	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3756	-58.63	-13	-45.63	-65.62	-62.21	3	6.58	H	Pass
5635.5	-56.62	-13	-43.62	-60.89	-61.99	3.84	9.21	H	Pass
7515	-51.93	-13	-38.93	-60.87	-58.60	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
			( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3756	-60.91	-13	-47.91	-64.99	-64.49	3	6.58	V	Pass
5635.5	-54.26	-13	-41.26	-60.49	-59.63	3.84	9.21	V	Pass
7515	-54.33	-13	-41.33	-61.49	-61.00	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3756	-58.07	-13	-45.07	-65.06	-61.65	3	6.58	H	Pass
5632.5	-50.08	-13	-37.08	-58.10	-55.44	3.84	9.21	H	Pass
7509	-51.21	-13	-38.21	-60.43	-57.88	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3756	-61.25	-13	-48.25	-65.33	-64.83	3	6.58	V	Pass
5632.5	-52.82	-13	-39.82	-59.58	-58.19	3.84	9.21	V	Pass
7509	-50.55	-13	-37.55	-59.89	-57.22	4.43	11.10	V	Pass





Band :	LTE Band 2					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Horizontal		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3750	-57.49	-13	-44.49	-64.48	-61.07	3	6.58	H	Pass
5625	-56.68	-13	-43.68	-60.95	-62.05	3.84	9.21	H	Pass
7500	-50.45	-13	-37.45	-60.02	-57.12	4.43	11.10	H	Pass

Band :	LTE Band 2					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Vertical		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3750	-60.89	-13	-47.89	-64.97	-64.47	3	6.58	V	Pass
5628	-50.57	-13	-37.57	-58.58	-55.94	3.84	9.21	V	Pass
7500	-54.30	-13	-41.30	-61.46	-60.97	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3744	-58.21	-13	-45.21	-65.20	-61.79	3	6.58	H	Pass
5617.5	-53.80	-13	-40.80	-59.53	-59.16	3.84	9.21	H	Pass
7491	-51.96	-13	-38.96	-60.89	-58.63	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3744	-60.74	-13	-47.74	-64.82	-64.32	3	6.58	V	Pass
5617.5	-54.21	-13	-41.21	-60.44	-59.58	3.84	9.21	V	Pass
7491	-54.25	-13	-41.25	-61.41	-60.92	4.43	11.10	V	Pass



Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3741	-58.15	-13	-45.15	-65.14	-61.73	3	6.58	H	Pass
5610	-48.67	-13	-35.67	-57.38	-54.04	3.84	9.21	H	Pass
7479	-52.71	-13	-39.71	-61.26	-59.38	4.43	11.10	H	Pass

Band :	LTE Band 2	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3741	-60.74	-13	-47.74	-64.82	-64.32	3	6.58	V	Pass
5610	-54.73	-13	-41.73	-60.96	-60.10	3.84	9.21	V	Pass
7479	-52.79	-13	-39.79	-60.82	-59.46	4.43	11.10	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3465	-57.37	-13	-44.37	-64.63	-60.73	3.12	6.49	H	Pass
5196	-54.47	-13	-41.47	-60.39	-59.45	3.65	8.64	H	Pass
6927	-46.81	-13	-33.81	-59.43	-53.38	4.15	10.72	H	Pass

Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3465	-61.70	-13	-48.70	-63.99	-65.06	3.12	6.49	V	Pass
5196	-57.73	-13	-44.73	-61.13	-62.71	3.65	8.64	V	Pass
6927	-49.50	-13	-36.50	-59.26	-56.07	4.15	10.72	V	Pass





Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	3MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain	(H/V)	
3462	-57.27	-13	-44.27	-64.53	-60.63	3.12	6.49	H	Pass
5193	-55.79	-13	-42.79	-61.71	-60.77	3.65	8.64	H	Pass
6924	-49.80	-13	-36.80	-61.44	-56.37	4.15	10.72	H	Pass

Band :	LTE Band 4				Temperature :	22~23°C			
Test Mode :	3MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Vertical			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3462	-62.59	-13	-49.59	-64.67	-65.95	3.12	6.49	V	Pass
5193	-58.14	-13	-45.14	-61.54	-63.12	3.65	8.64	V	Pass
6924	-51.83	-13	-38.83	-61.59	-58.40	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	loss	Gain	(H/V)	
3459	-57.53	-13	-44.53	-64.79	-60.89	3.12	6.49	H	Pass
5190	-55.28	-13	-42.28	-61.20	-60.26	3.65	8.64	H	Pass
6921	-50.01	-13	-37.01	-61.65	-56.58	4.15	10.72	H	Pass

Band :	LTE Band 4				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Vertical			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3459	-63.63	-13	-50.63	-65.71	-66.99	3.12	6.49	V	Pass
5190	-58.33	-13	-45.33	-61.73	-63.31	3.65	8.64	V	Pass
6921	-52.07	-13	-39.07	-61.83	-58.64	4.15	10.72	V	Pass



Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3455	-57.08	-13	-44.08	-64.34	-60.44	3.12	6.49	H	Pass
5184	-51.84	-13	-38.84	-58.53	-56.83	3.65	8.64	H	Pass
6909	-49.50	-13	-36.50	-61.14	-56.07	4.15	10.72	H	Pass

Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3456	-62.05	-13	-49.05	-64.13	-65.41	3.12	6.49	V	Pass
5182.5	-57.79	-13	-44.79	-61.19	-62.77	3.65	8.64	V	Pass
6909	-50.65	-13	-37.65	-60.41	-57.22	4.15	10.72	V	Pass



Band :	LTE Band 4				Temperature :	22~23°C			
Test Mode :	15MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Horizontal			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3450	-57.49	-13	-44.49	-64.75	-60.85	3.12	6.49	H	Pass
5175	-55.97	-13	-42.97	-61.89	-60.95	3.65	8.64	H	Pass
6900	-49.81	-13	-36.81	-61.45	-56.38	4.15	10.72	H	Pass

Band :	LTE Band 4					Temperature :	22~23°C		
Test Mode :	15MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Vertical		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3450	-63.06	-13	-50.06	-65.14	-66.42	3.12	6.49	V	Pass
5175	-57.80	-13	-44.80	-61.2	-62.78	3.65	8.64	V	Pass
6900	-51.85	-13	-38.85	-61.61	-58.42	4.15	10.72	V	Pass





Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
3447	-57.34	-13	-44.34	-64.60	-60.70	3.12	6.49	H	Pass
5166	-55.56	-13	-42.56	-61.48	-60.54	3.65	8.64	H	Pass
6891	-50.49	-13	-37.49	-62.13	-57.06	4.15	10.72	H	Pass

Band :	LTE Band 4	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
3450	-61.70	-13	-48.70	-63.99	-65.06	3.12	6.49	V	Pass
5166	-58.29	-13	-45.29	-61.69	-63.27	3.65	8.64	V	Pass
6891	-51.59	-13	-38.59	-61.35	-58.16	4.15	10.72	V	Pass



Band :	LTE Band 7				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Horizontal			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
5066	-54.08	-25	-29.08	-60.87	-59.07	3.49	8.48	H	Pass
7597.5	-51.20	-25	-26.20	-61.32	-58.06	4.28	11.15	H	Pass
10128	-46.17	-25	-21.17	-63.02	-54.01	5.1	12.94	H	Pass

Band :	LTE Band 7	Temperature :	22~23°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Vertical						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit	Reading	Power	loss	Gain	(H/V)	
( dB )			( dB )	(dBm)	( dBm )	( dB )	(dBi)		
5066	-56.70	-25	-31.70	-61.31	-61.69	3.49	8.48	V	Pass
7597.5	-50.14	-25	-25.14	-61.11	-57.01	4.28	11.15	V	Pass
10128	-46.09	-25	-21.09	-62.72	-53.93	5.1	12.94	V	Pass



Band :	LTE Band 7					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Horizontal		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
5060	-54.50	-25	-29.50	-60.98	-59.49	3.49	8.48	H	Pass
7590	-49.00	-25	-24.00	-60.22	-55.86	4.28	11.15	H	Pass
10120	-45.66	-25	-20.66	-62.64	-53.50	5.1	12.94	H	Pass

Band :	LTE Band 7					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Simon Lu					Polarization :	Vertical		
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
5060	-55.15	-25	-30.15	-60.08	-60.14	3.49	8.48	V	Pass
7592	-41.95	-25	-16.95	-57.35	-48.82	4.28	11.15	V	Pass
10120	-45.96	-25	-20.96	-62.6	-53.81	5.1	12.94	V	Pass



Band :	LTE Band 7				Temperature :	22~23°C			
Test Mode :	15MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Horizontal			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over Limit	SPA Reading	S.G. Power	TX Cable loss	TX Antenna Gain	Polarization	Result
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
5054	-56.20	-25	-31.20	-61.79	-61.19	3.49	8.48	H	Pass
7583	-49.66	-25	-24.66	-60.55	-56.52	4.28	11.15	H	Pass
10112	-44.43	-25	-19.43	-61.76	-52.27	5.1	12.94	H	Pass

Band :	LTE Band 7				Temperature :	22~23°C			
Test Mode :	15MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Vertical			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
5054	-54.96	-25	-29.96	-59.97	-59.95	3.49	8.48	V	Pass
7582.5	-48.14	-25	-23.14	-60.02	-55.01	4.28	11.15	V	Pass
10112	-44.90	-25	-19.90	-61.66	-52.74	5.1	12.94	V	Pass





Band :	LTE Band 7	Temperature :	22~23°C						
Test Mode :	20MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Simon Lu	Polarization :	Horizontal						
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
( MHz )	( dBm )	( dBm )	( dB )	(dBm)	( dBm )	( dB )	(dBi)	(H/V)	
5051	-55.13	-25	-30.13	-61.17	-60.11	3.49	8.48	H	Pass
7575	-50.38	-25	-25.38	-60.93	-57.25	4.28	11.15	H	Pass
10100	-43.88	-25	-18.88	-61.29	-51.72	5.1	12.94	H	Pass

Band :	LTE Band 7				Temperature :	22~23°C			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Simon Lu				Polarization :	Vertical			
Remark :	Spurious emissions below 1GHz were found more than 20dB below limit line.								
Frequency	EIRP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
( MHz )	( dBm )	( dBm )	Limit ( dB )	Reading (dBm)	Power ( dBm )	loss ( dB )	Gain (dBi)	(H/V)	
5051	-56.48	-25	-31.48	-61.09	-61.47	3.49	8.48	V	Pass
7575	-51.03	-25	-26.03	-61.6	-57.89	4.28	11.15	V	Pass
10100	-46.57	-25	-21.57	-63.2	-54.41	5.1	12.94	V	Pass

### 3.8 Frequency Stability Measurement

#### 3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

#### 3.8.2 Measuring Instruments

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

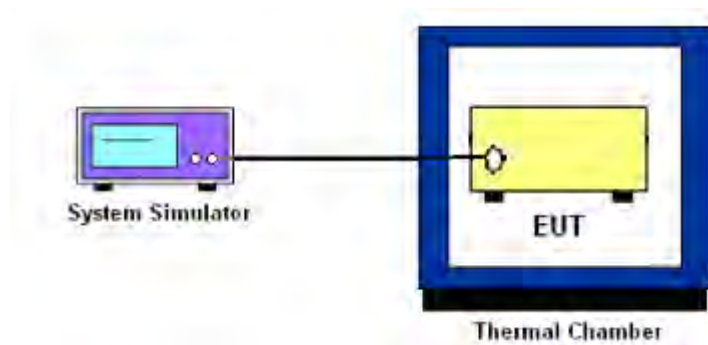
#### 3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to  $-30^{\circ}\text{C}$  and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  step up to  $50^{\circ}\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

#### 3.8.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at  $25\pm 5^{\circ}\text{C}$  and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

#### 3.8.5 Test Setup



**3.8.6 Test Result of Temperature Variation (FCC)**

<b>Band :</b>	LTE Band 2 (QPSK)	<b>Limit (ppm) :</b>	within authorized band
Temperature (°C)	BW 10MHz	Result	
	Deviation (ppm)		
50	0.0008	PASS	
40	0.0037		
30	0.0023		
20(Ref.)	0.0000		
10	0.0016		
0	0.0070		
-10	0.0085		
-20	0.0010		
-30	0.32		

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

<b>Band :</b>	LTE Band 4 (QPSK)	<b>Limit (ppm) :</b>	within authorized band
Temperature (°C)	BW 10MHz	Result	
	Deviation (ppm)		
50	0.0004	PASS	
40	0.0009		
30	0.0026		
20(Ref.)	0.0000		
10	0.0054		
0	0.0009		
-10	0.0044		
-20	0.0003		
-30	0.0024		

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

<b>Band :</b>	LTE Band 7 (QPSK)	<b>Limit (ppm) :</b>	within authorized band
Temperature (°C)	BW 10MHz	Result	
	Deviation (ppm)		
50	0.0004	PASS	
40	0.0007		
30	0.0018		
20(Ref.)	0.0000		
10	0.0009		
0	0.0046		
-10	0.0069		
-20	0.0007		
-30	0.0023		

Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

### 3.8.7 Test Result of Voltage Variation (FCC)

Band	Bandwidth	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 2	10M	4.35	0.0040	(Note 3.)	PASS
		Normal	0.0027		
		3.50	0.0013		
LTE Band 4	10M	4.35	0.0008	(Note 3.)	PASS
		Normal	0.0066		
		3.50	0.0021		
LTE Band 7	10M	4.35	0.0043	(Note 3.)	PASS
		Normal	0.0050		
		3.50	0.0009		

**Remark:**

1. Normal Voltage = 3.80V.
2. The manufacturer declared that the EUT could work properly between voltage 3.50V ~ 4.35V.
3. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.





## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	May 04, 2014	Feb. 09, 2015~ Feb. 11, 2015	May 03, 2015	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 25, 2014	Feb. 09, 2015~ Feb. 11, 2015	Oct. 24, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 25, 2014	Feb. 12, 2015~ Feb. 14, 2015	Oct. 24, 2015	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Feb. 12, 2015~ Feb. 14, 2015	May 03, 2015	Radiation (03CH01-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30Mhz-2Ghz	Sep. 13, 2014	Feb. 12, 2015~ Feb. 14, 2015	Sep. 12, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	Feb. 12, 2015~ Feb. 14, 2015	Nov. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Feb. 12, 2015~ Feb. 14, 2015	Nov. 07, 2015	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA17024 9	15GHz~40GHz	Mar. 10, 2014	Feb. 12, 2015~ Feb. 14, 2015	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	Feb. 12, 2015~ Feb. 14, 2015	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Oct. 28, 2014	Feb. 12, 2015~ Feb. 14, 2015	Oct. 27, 2015	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Feb. 12, 2015~ Feb. 14, 2015	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Feb. 12, 2015~ Feb. 14, 2015	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Feb. 12, 2015~ Feb. 14, 2015	NCR	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP 7	100818	9kHz~7GHz	Jul. 17, 2014	Feb. 13, 2015	Jul. 16, 2015	ERP/EIRP (OTA02-SZ)
Quad-Ridged Horn	ETS-Lindgren	3164-08	00102954	700MHz~10000M Hz	N/A	Feb. 13, 2015	N/A	ERP/EIRP (OTA02-SZ)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00108147	N/A	N/A	Feb. 13, 2015	N/A	ERP/EIRP (OTA02-SZ)
Switch Control Mainframe	Agilent	3499A	MY4200545 1	N/A	N/A	Feb. 13, 2015	N/A	ERP/EIRP (OTA02-SZ)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.5 dB
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