

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.

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

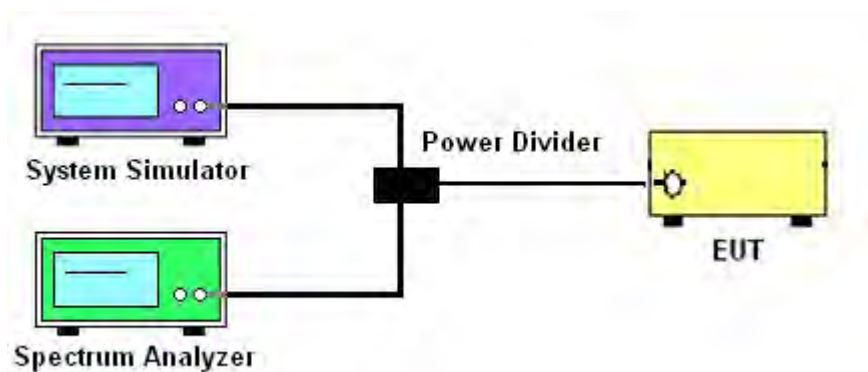
3.6.2 Measuring Instruments

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)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.6.4 Test Setup

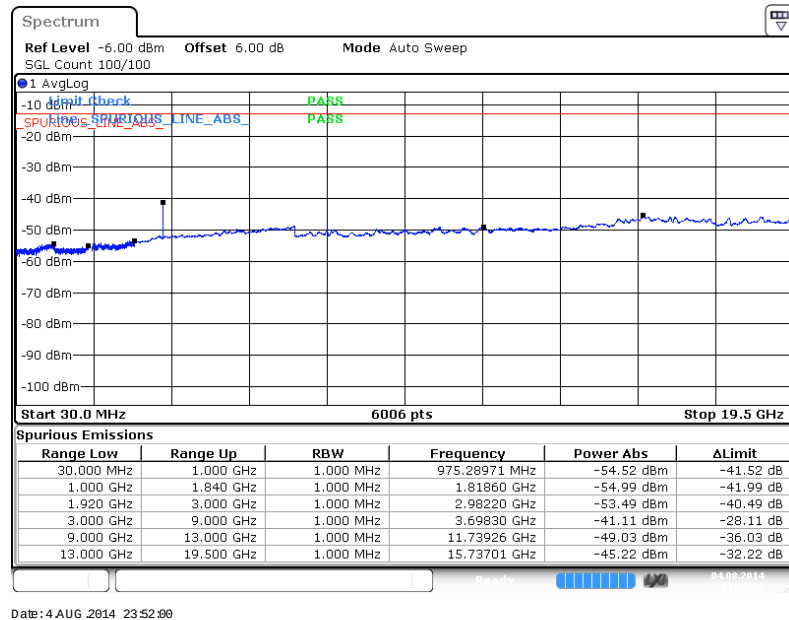




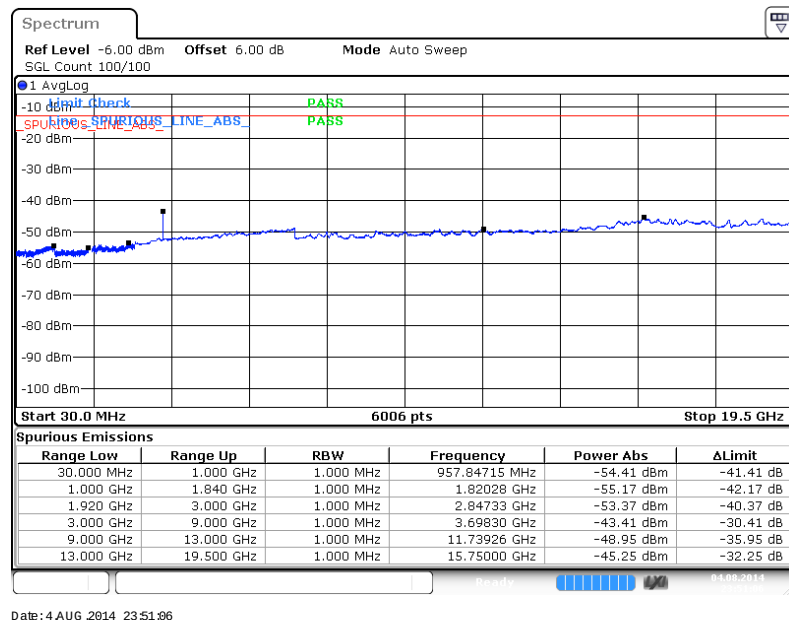
3.6.5 Test Result (Plots) of Conducted Spurious Emission

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

QPSK (RB Size 1, RB Offset 5)



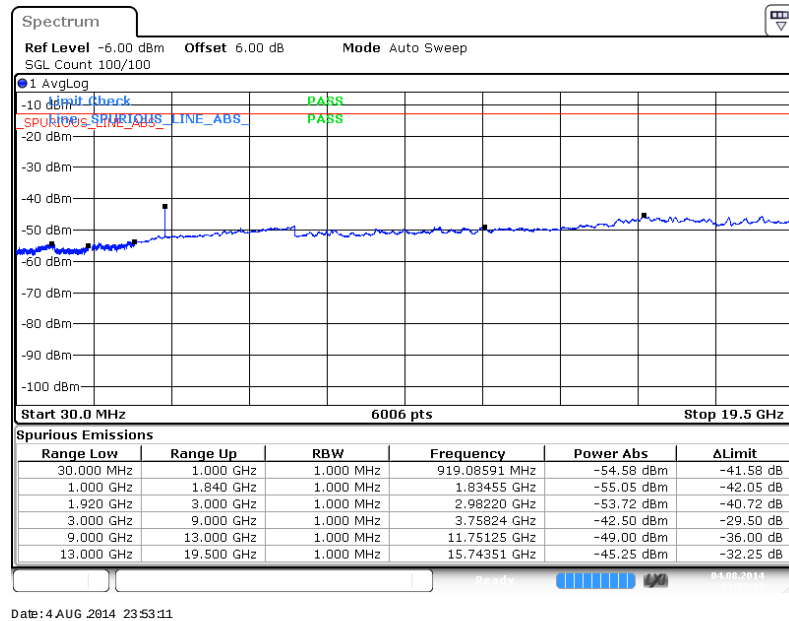
16QAM (RB Size 3, RB Offset 0)



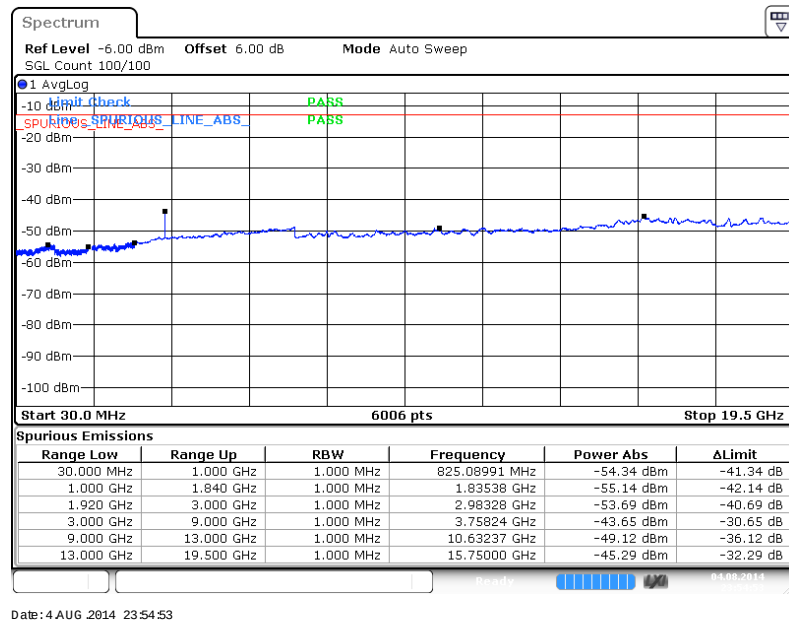


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)



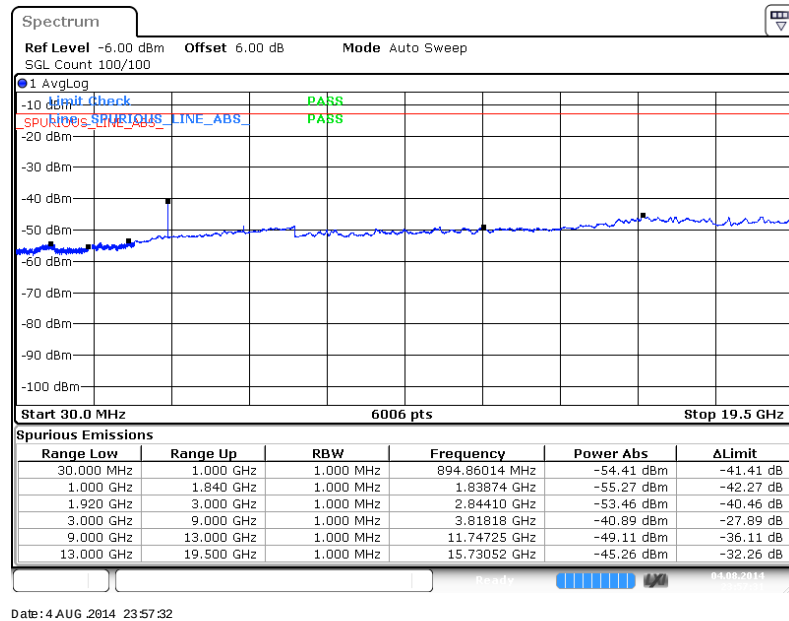
16QAM (RB Size 3, RB Offset 0)



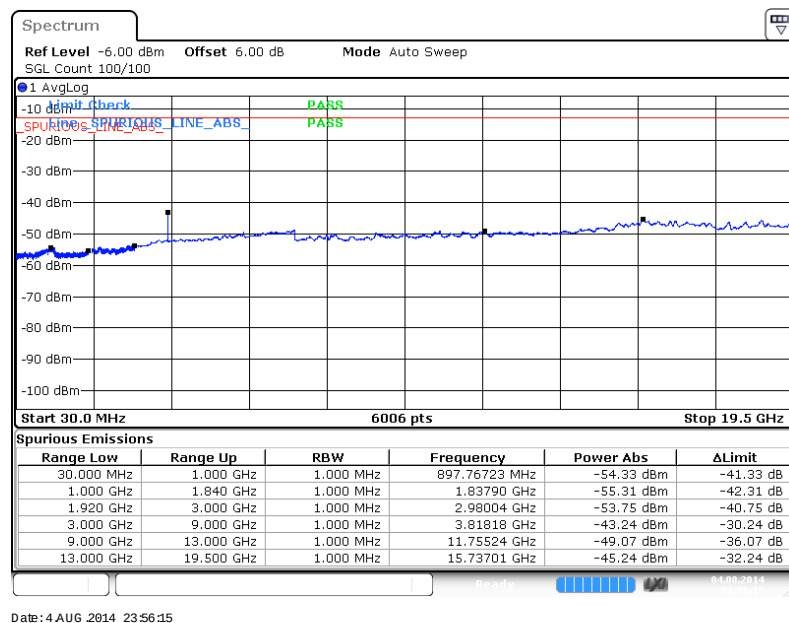


Band :	LTE Band 2	Channel :	CH19193 (High)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)



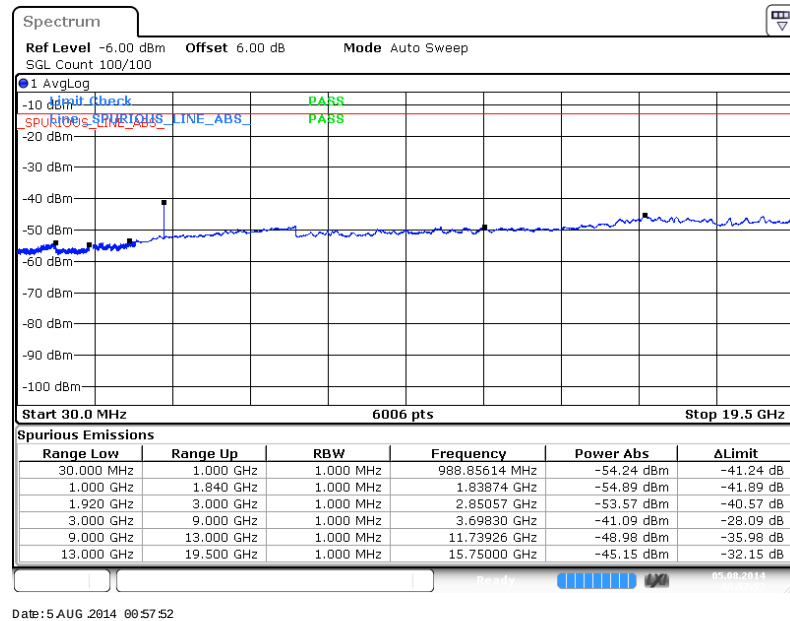
16QAM (RB Size 3, RB Offset 0)



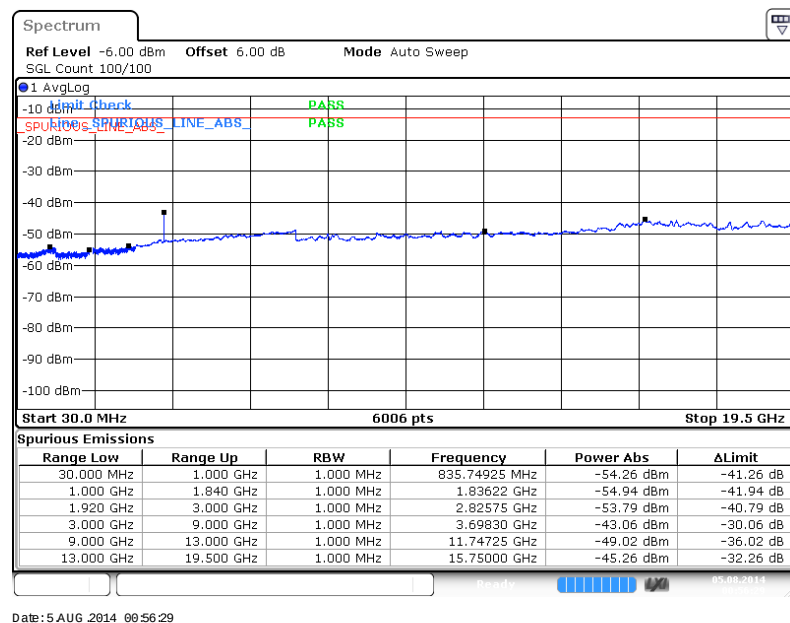


Band :	LTE Band 2	Channel :	CH18615 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



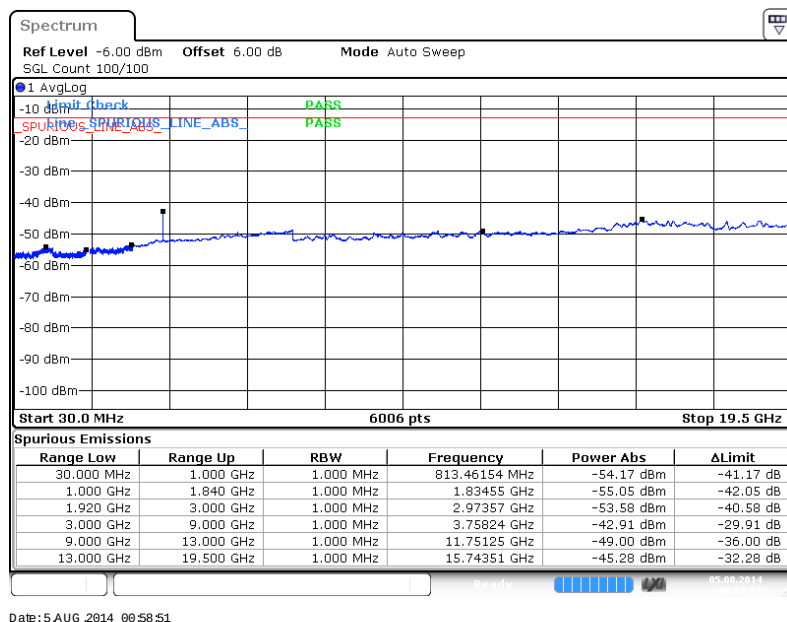
16QAM (RB Size 1, RB Offset 14)



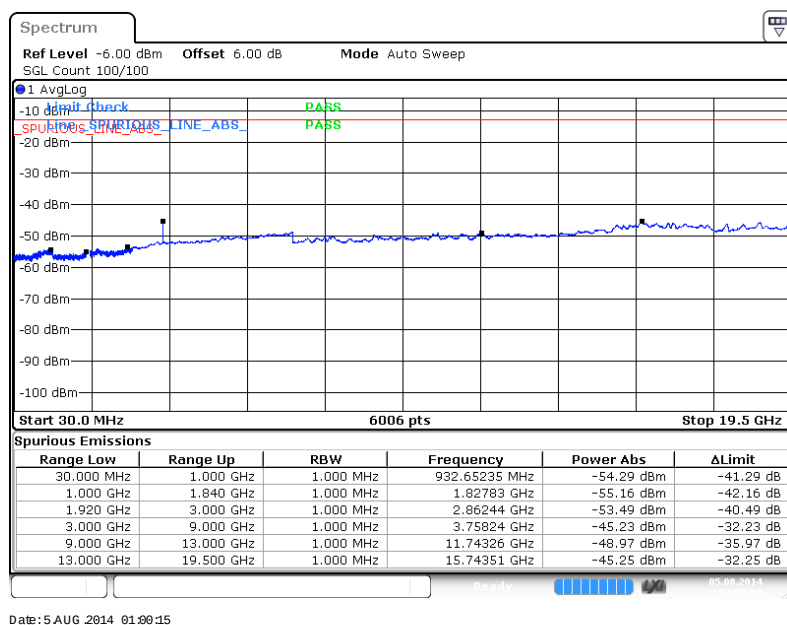


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



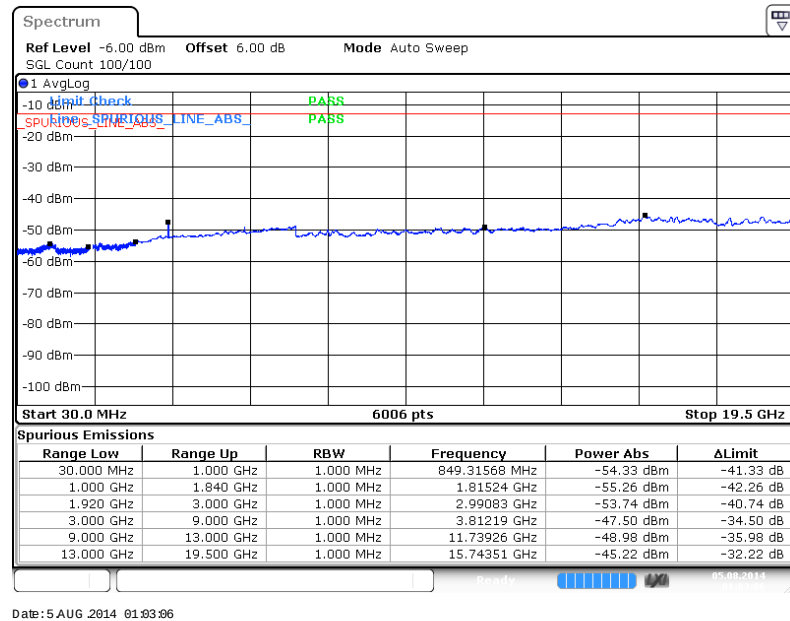
16QAM (RB Size 1, RB Offset 14)



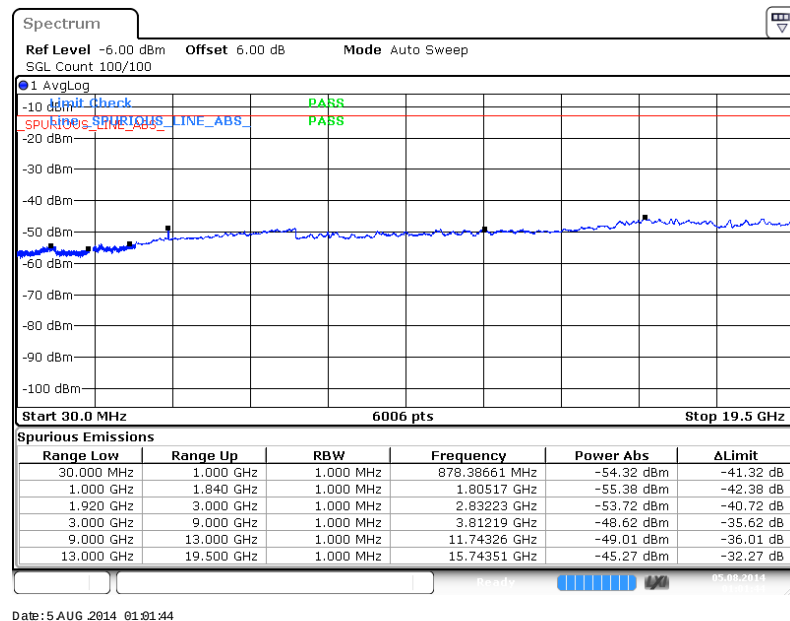


Band :	LTE Band 2	Channel :	CH19185 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



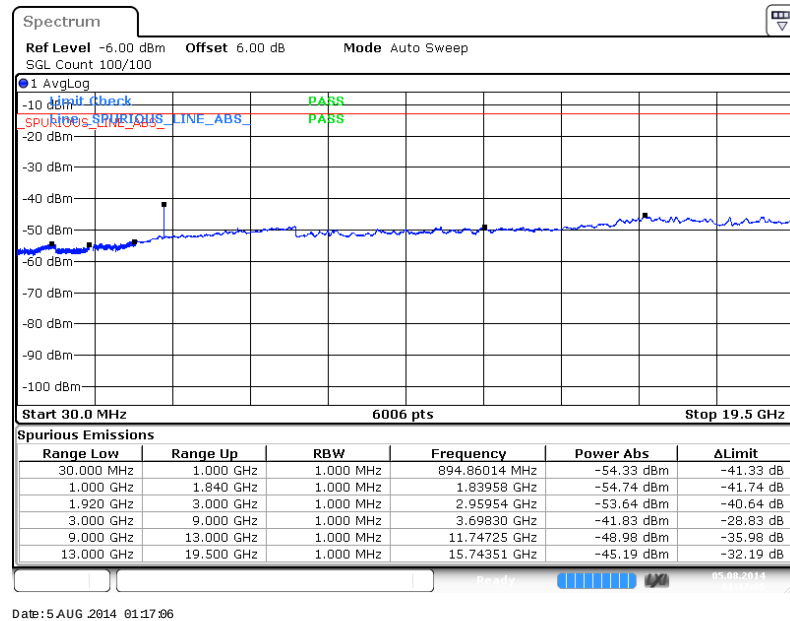
16QAM (RB Size 1, RB Offset 14)



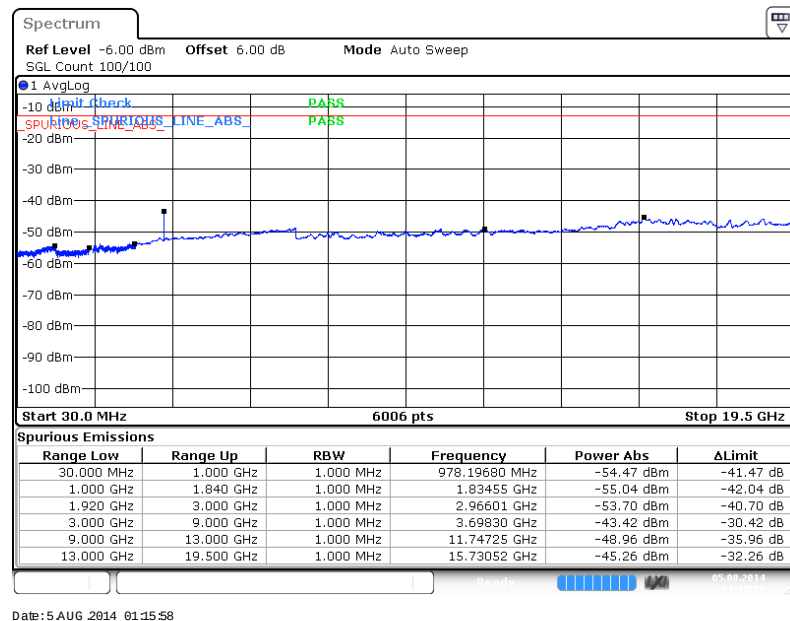


Band :	LTE Band 2	Channel :	CH18625 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



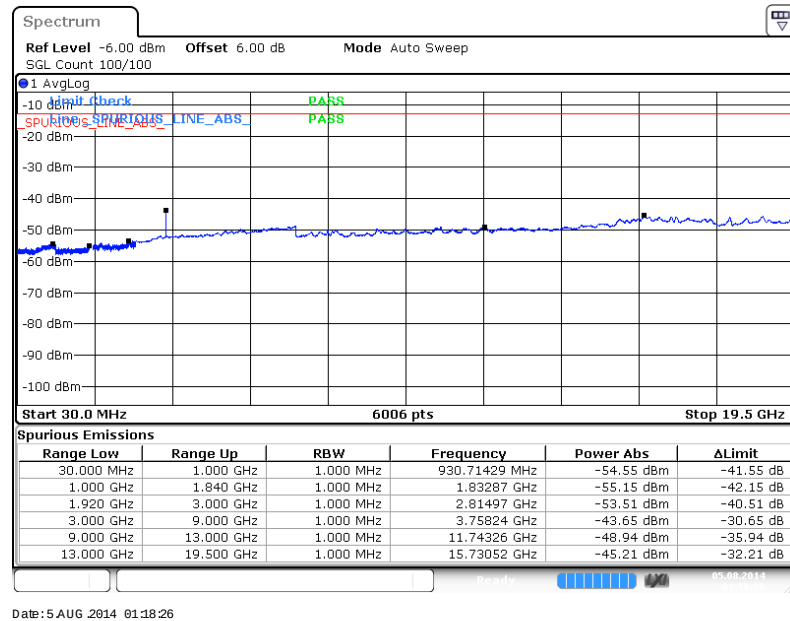
16QAM (RB Size 1, RB Offset 24)



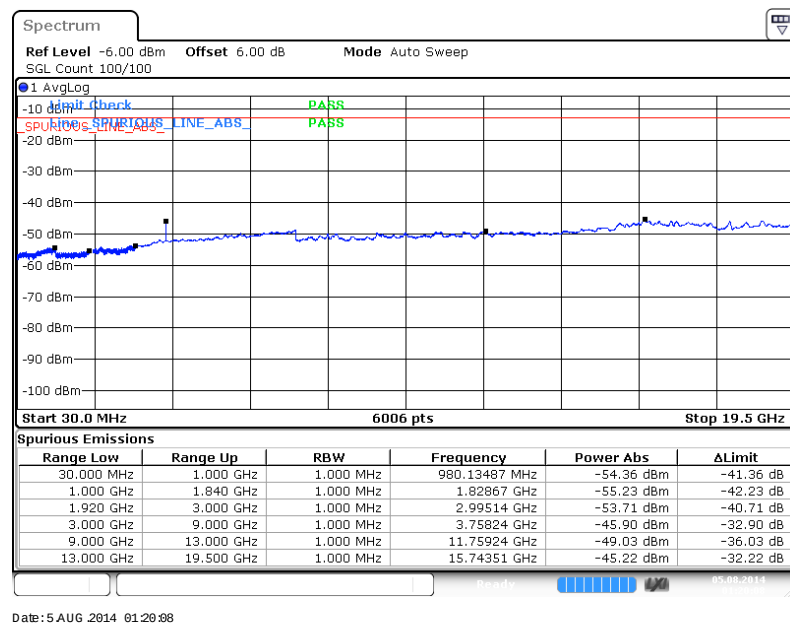


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



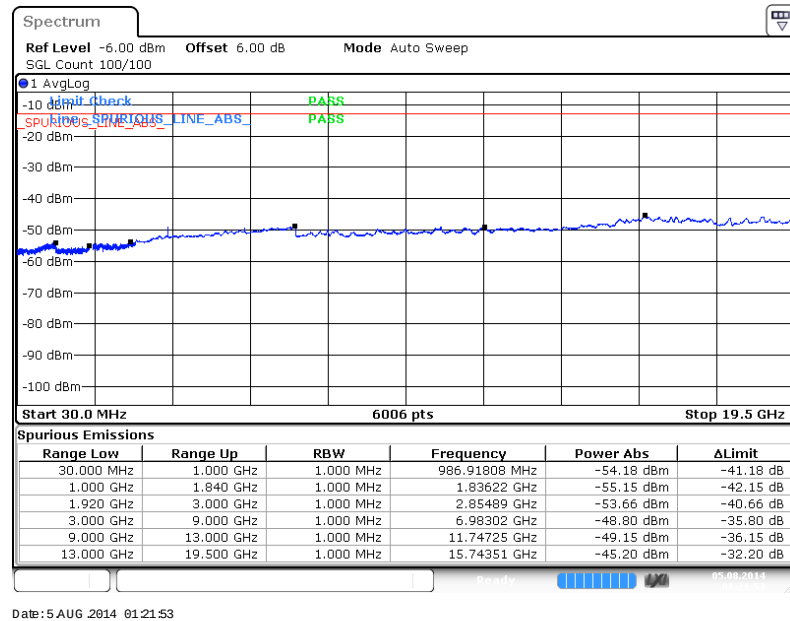
16QAM (RB Size 1, RB Offset 24)



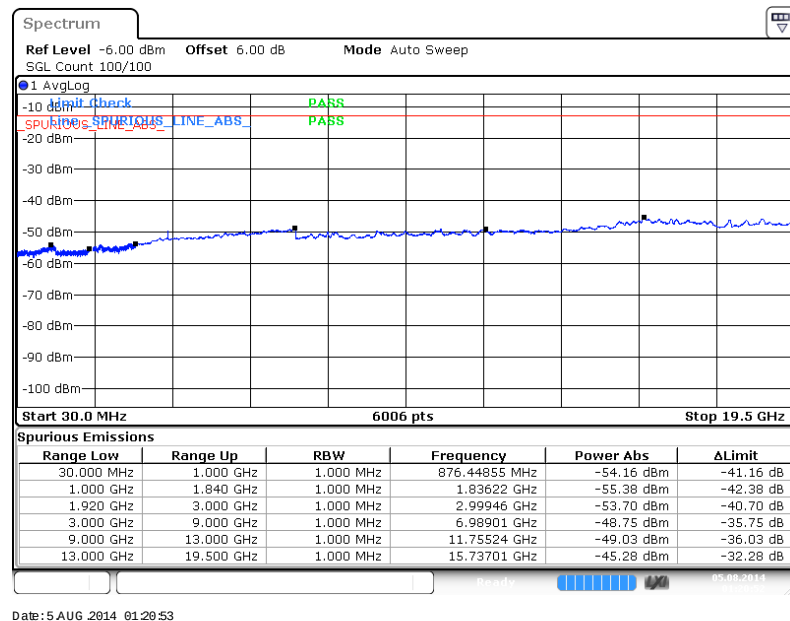


Band :	LTE Band 2	Channel :	CH19175 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



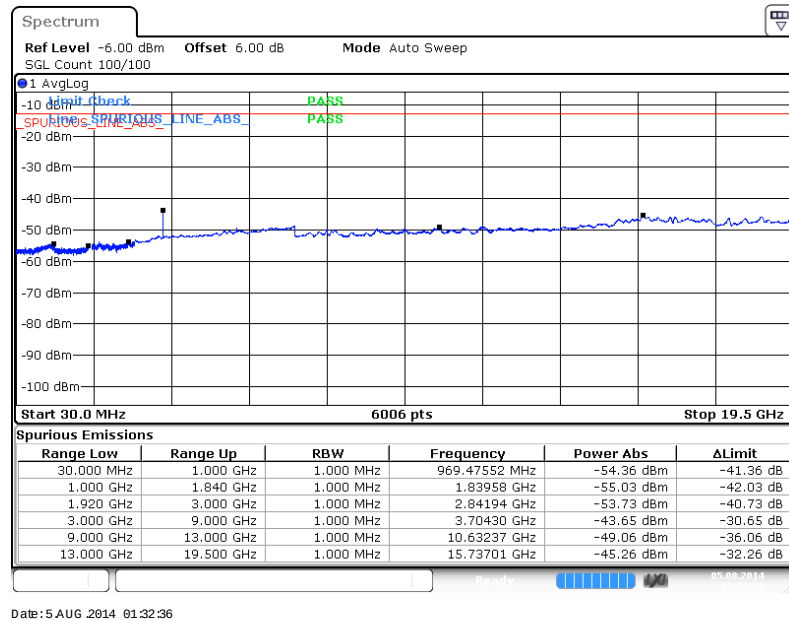
16QAM (RB Size 1, RB Offset 24)



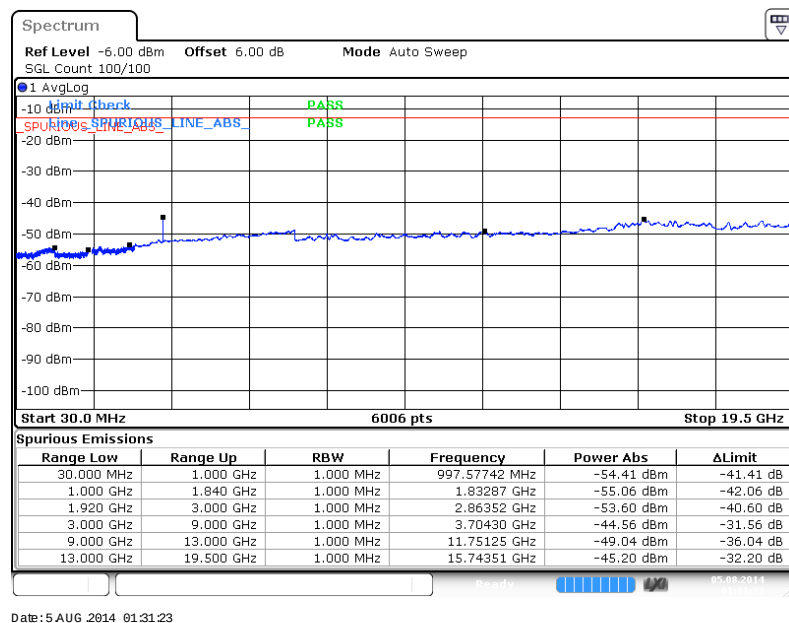


Band :	LTE Band 2	Channel :	CH18650 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



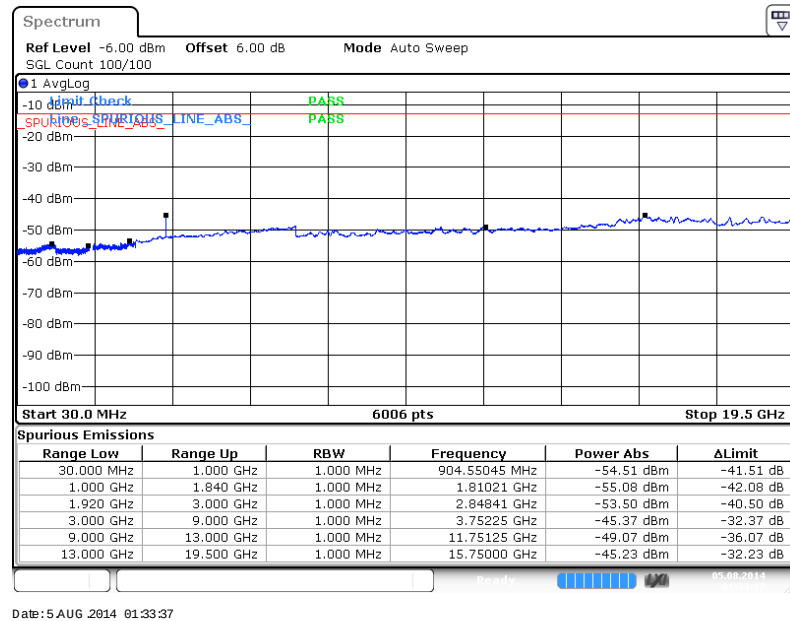
16QAM (RB Size 1, RB Offset 24)



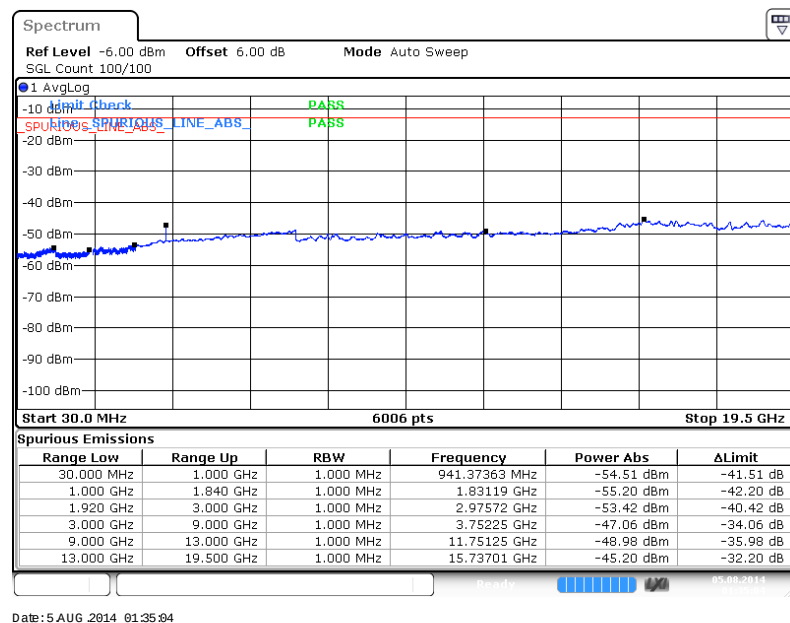


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



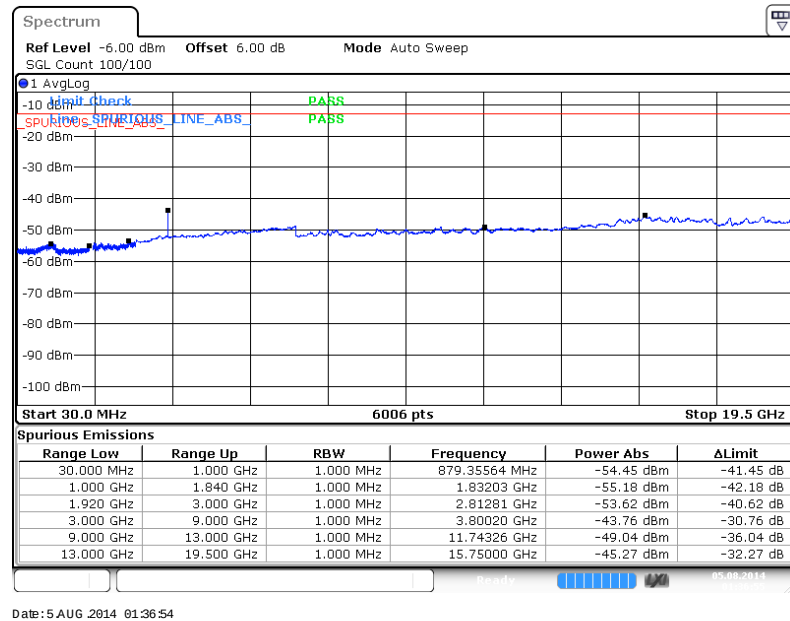
16QAM (RB Size 1, RB Offset 24)



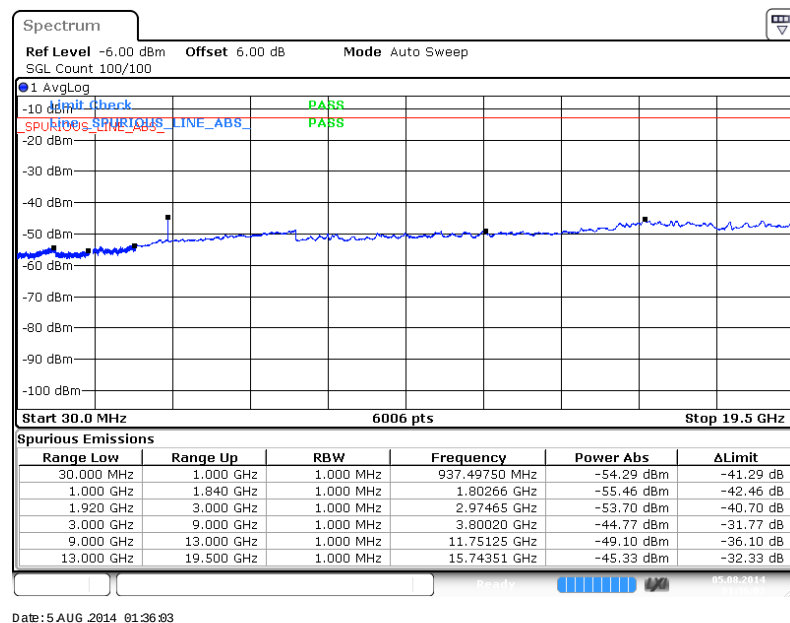


Band :	LTE Band 2	Channel :	CH19150 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



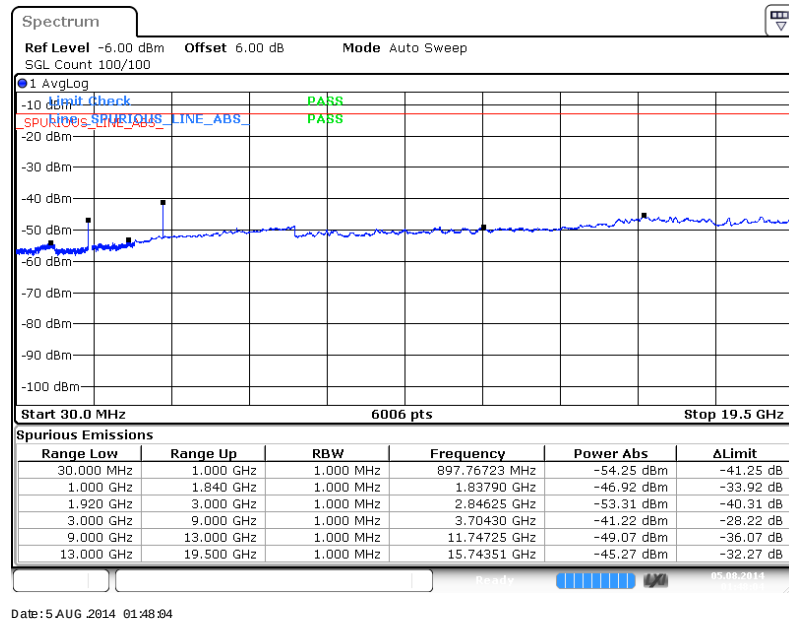
16QAM (RB Size 1, RB Offset 24)



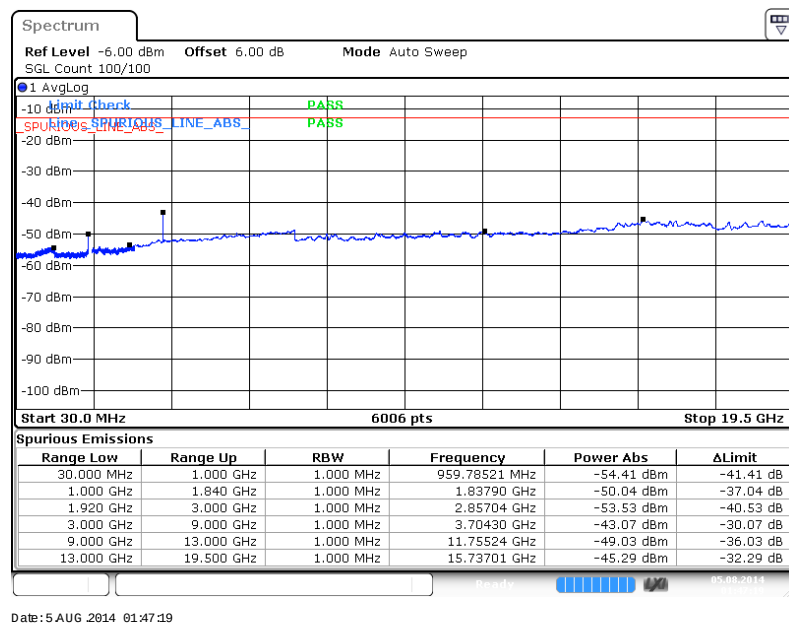


Band :	LTE Band 2	Channel :	CH18675 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)



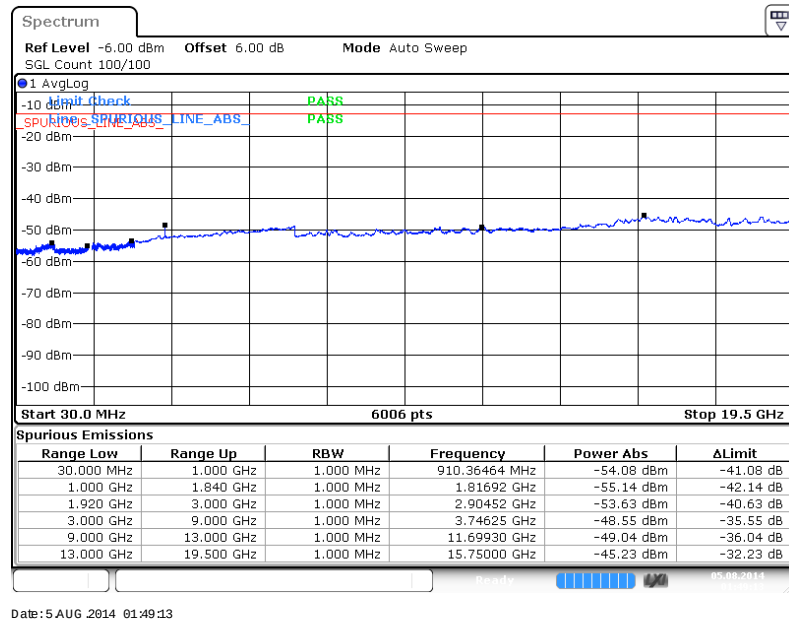
16QAM (RB Size 1, RB Offset 37)



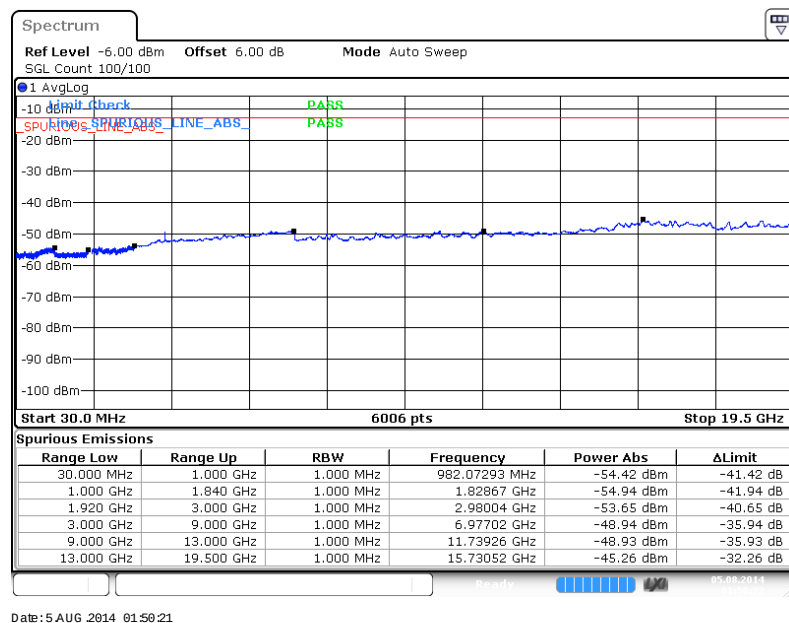


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)



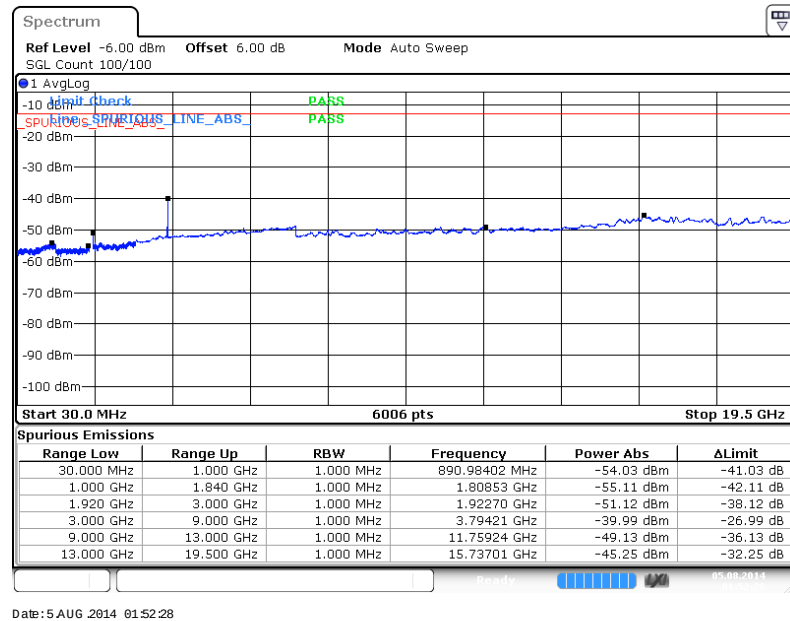
16QAM (RB Size 1, RB Offset 37)



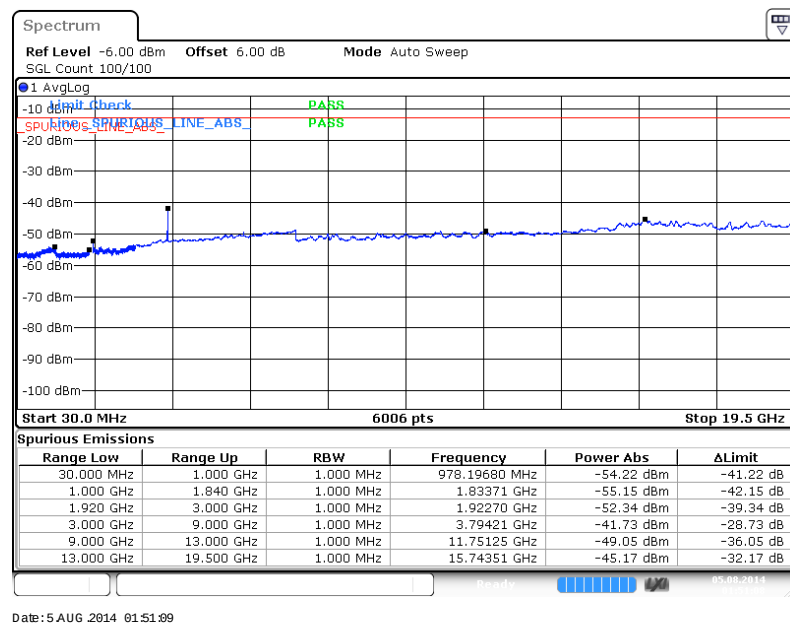


Band :	LTE Band 2	Channel :	CH19125 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)



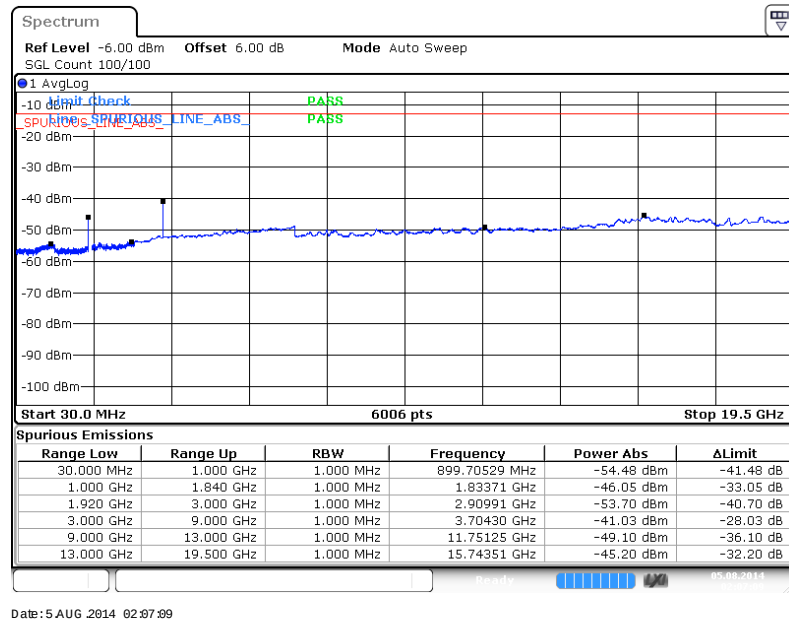
16QAM (RB Size 1, RB Offset 37)



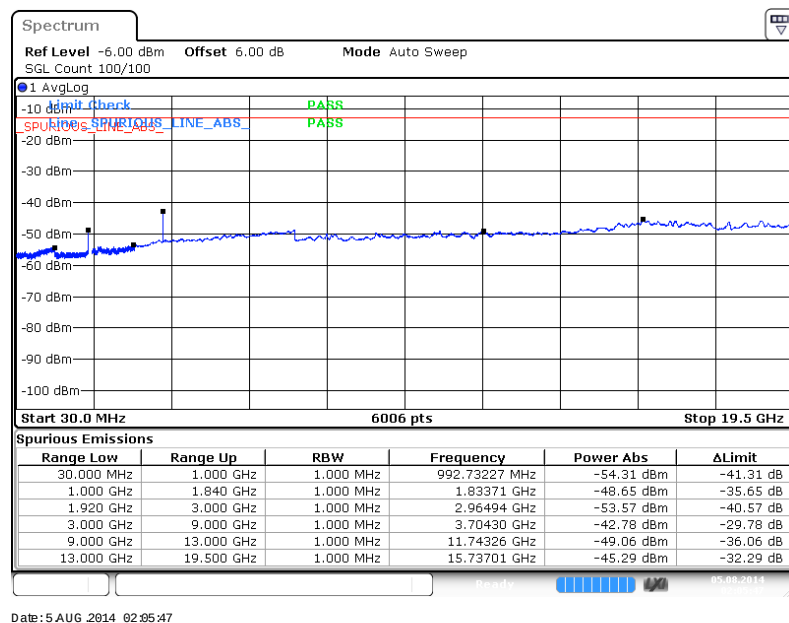


Band :	LTE Band 2	Channel :	CH18700 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



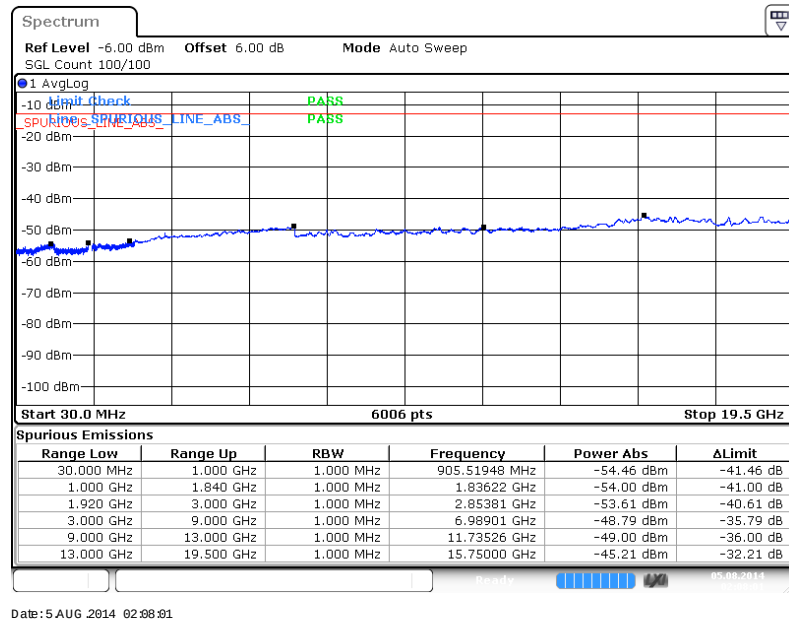
16QAM (RB Size 1, RB Offset 49)



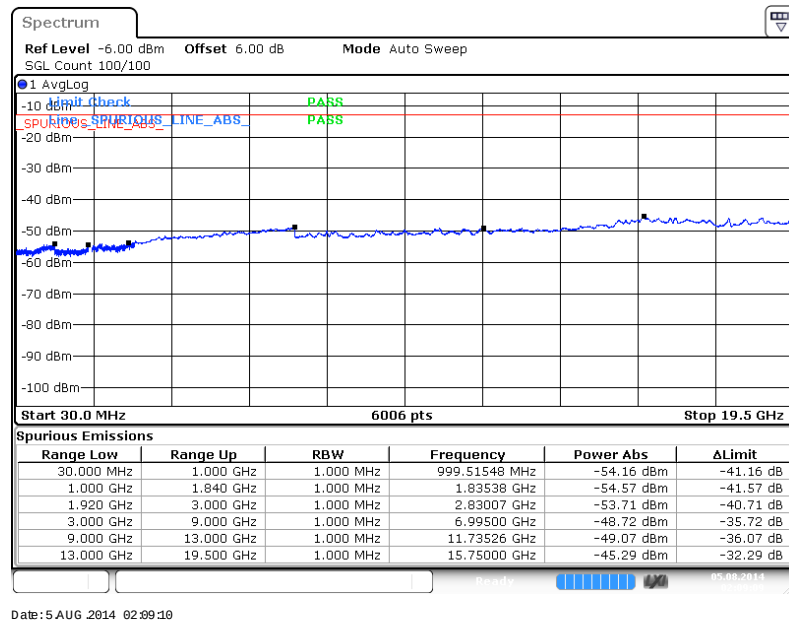


Band :	LTE Band 2	Channel :	CH18900 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



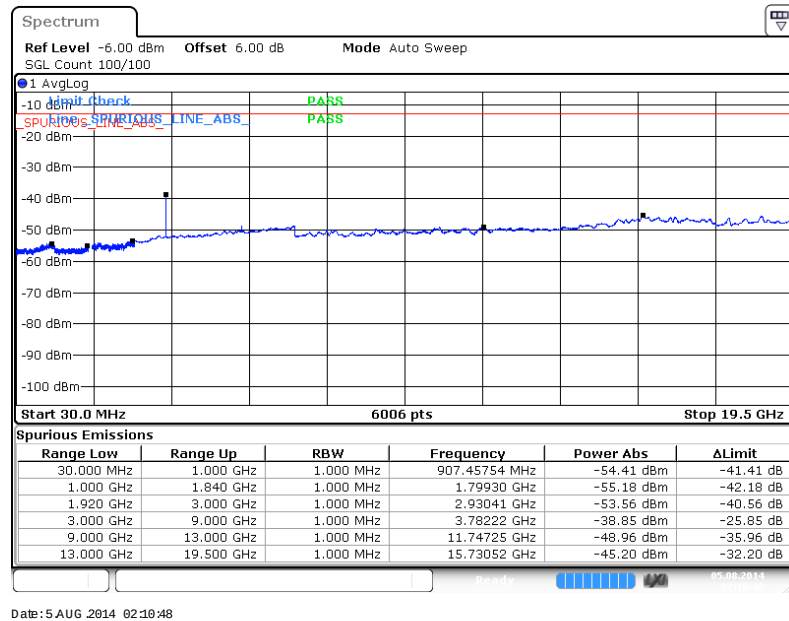
16QAM (RB Size 1, RB Offset 0)



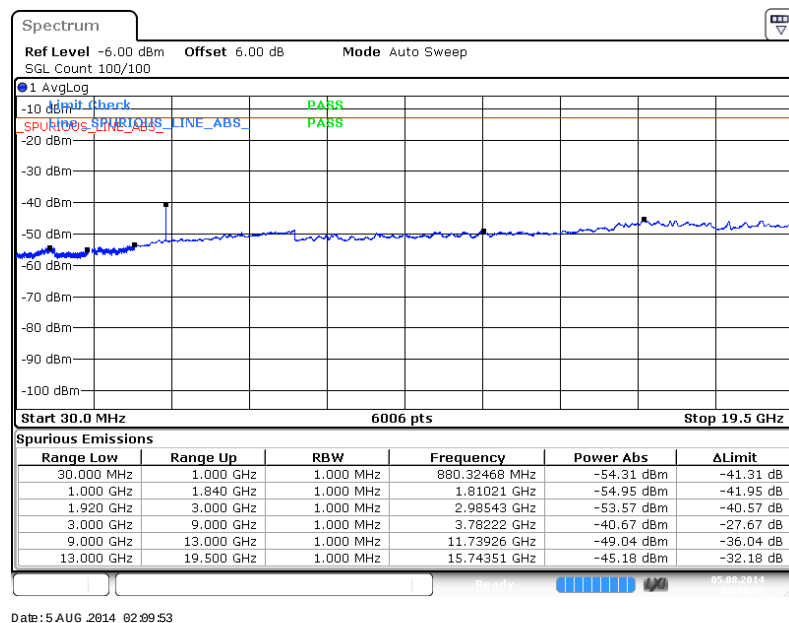


Band :	LTE Band 2	Channel :	CH19100 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



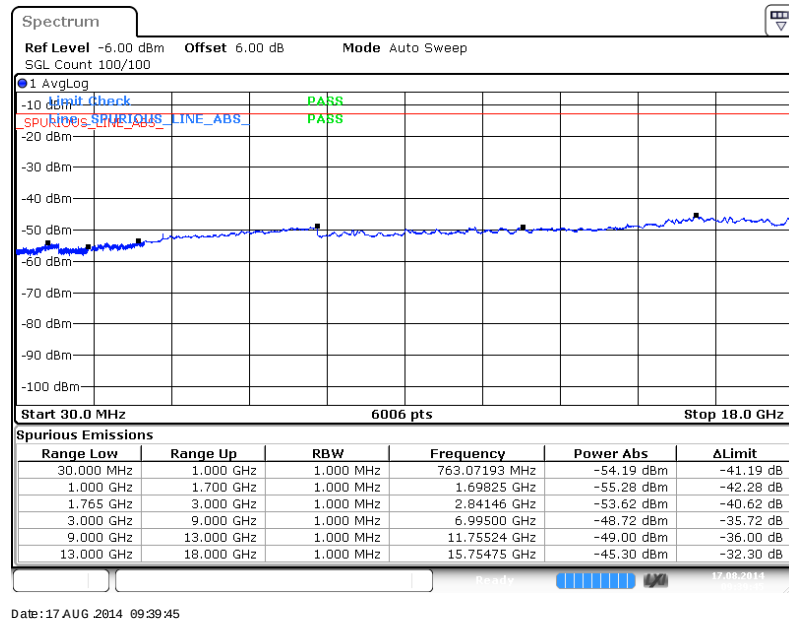
16QAM (RB Size 1, RB Offset 0)



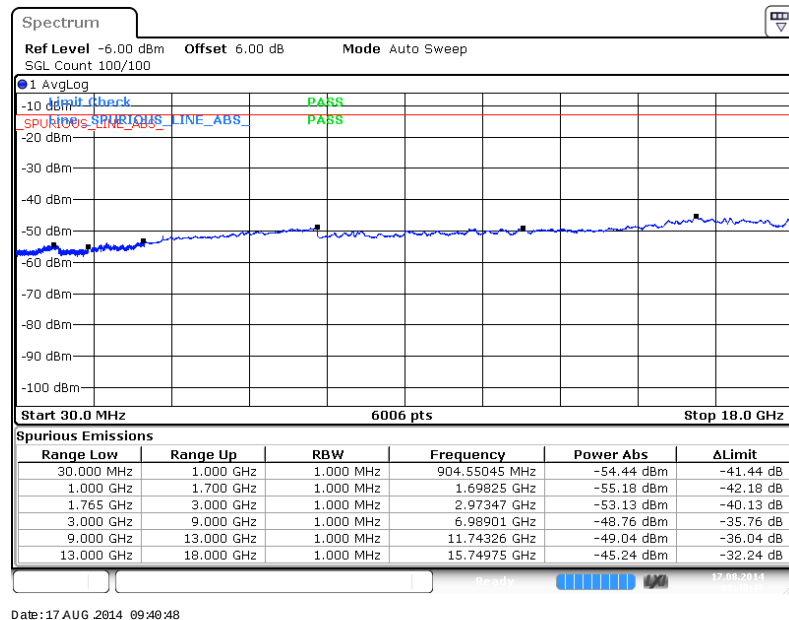


Band :	LTE Band 4	Channel :	CH19957 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 0)



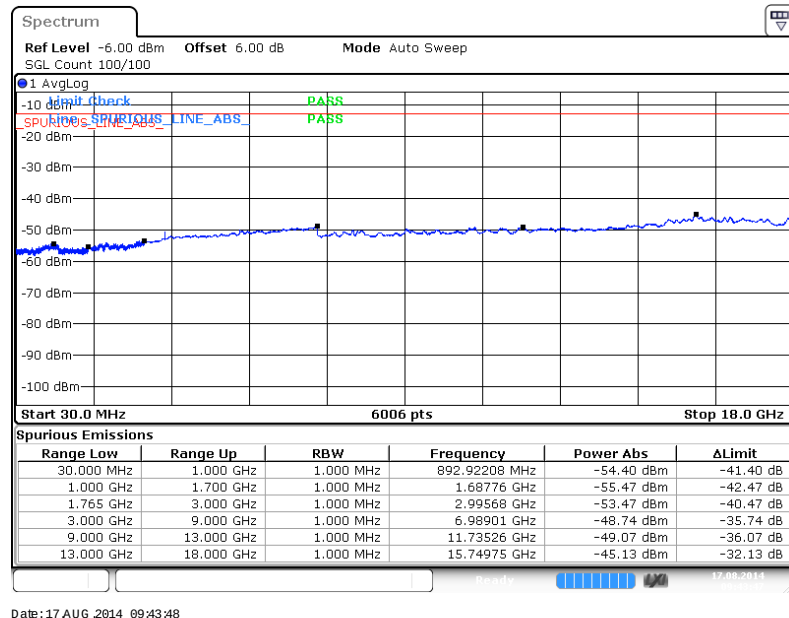
16QAM (RB Size 1, RB Offset 0)



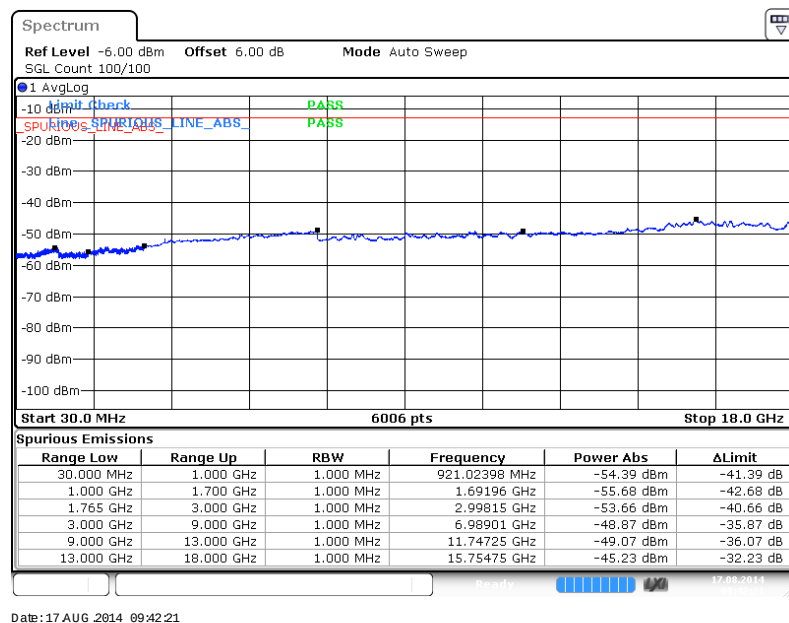


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 3, RB Offset 0)



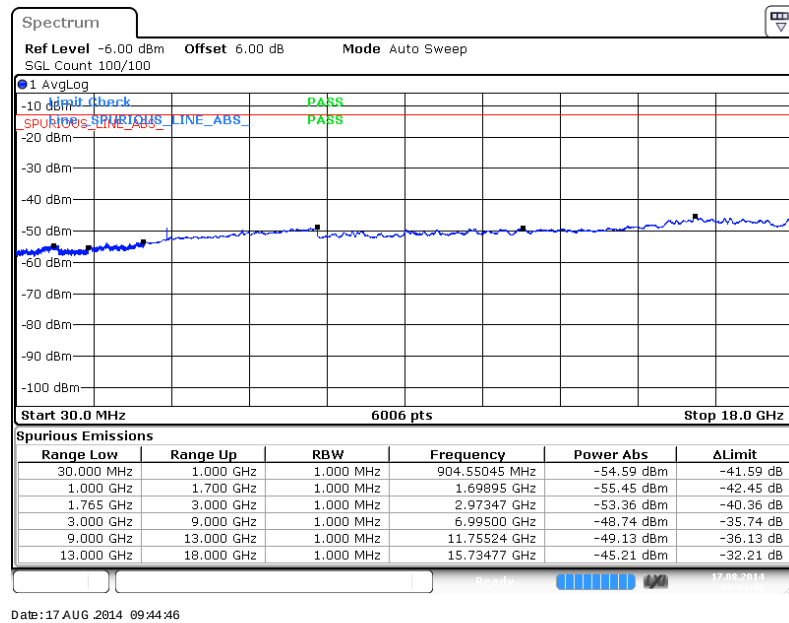
16QAM (RB Size 1, RB Offset 2)



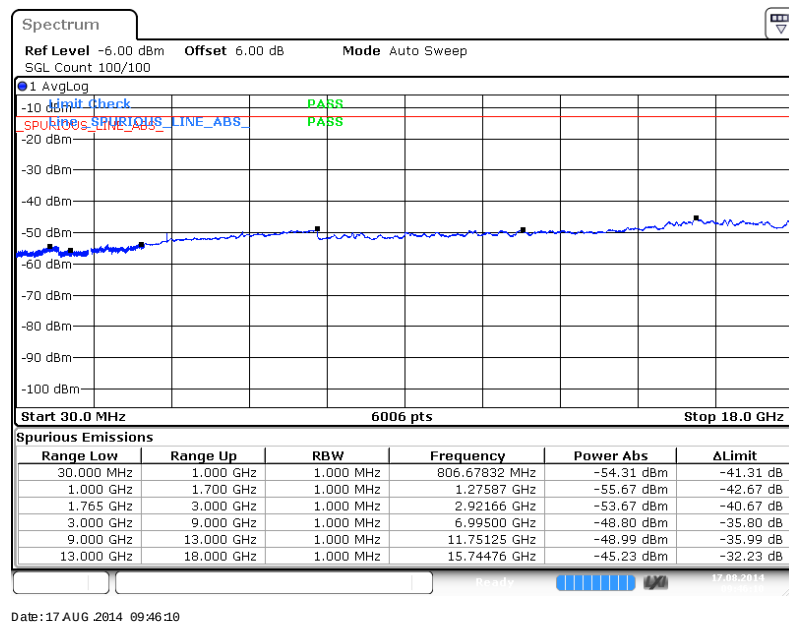


Band :	LTE Band 4	Channel :	CH20393 (High)
Band Width :	1.4MHz		

QPSK (RB Size 3, RB Offset 0)



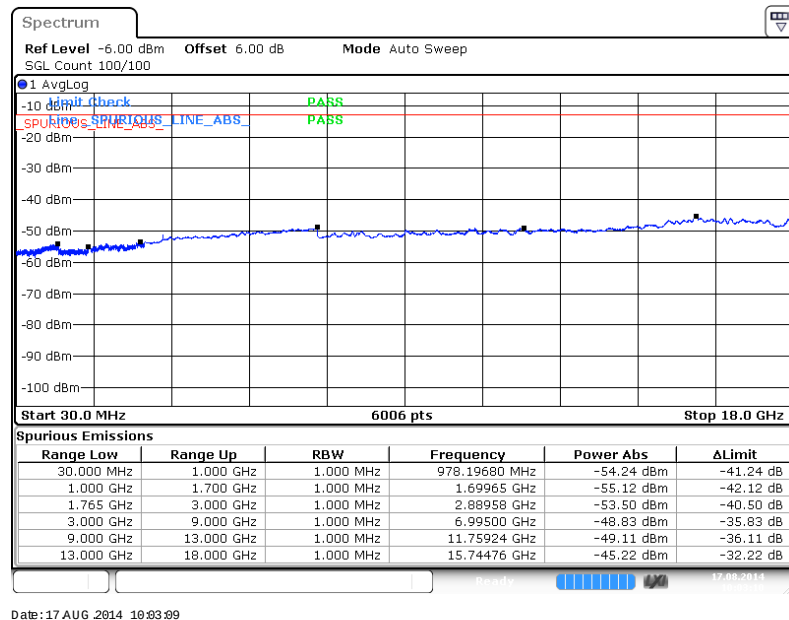
16QAM (RB Size 1, RB Offset 2)



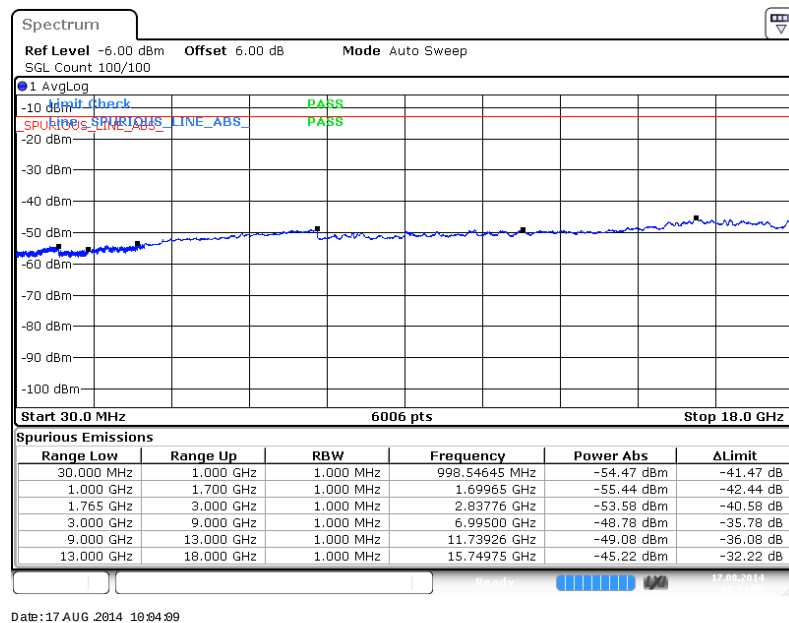


Band :	LTE Band 4	Channel :	CH19965 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)



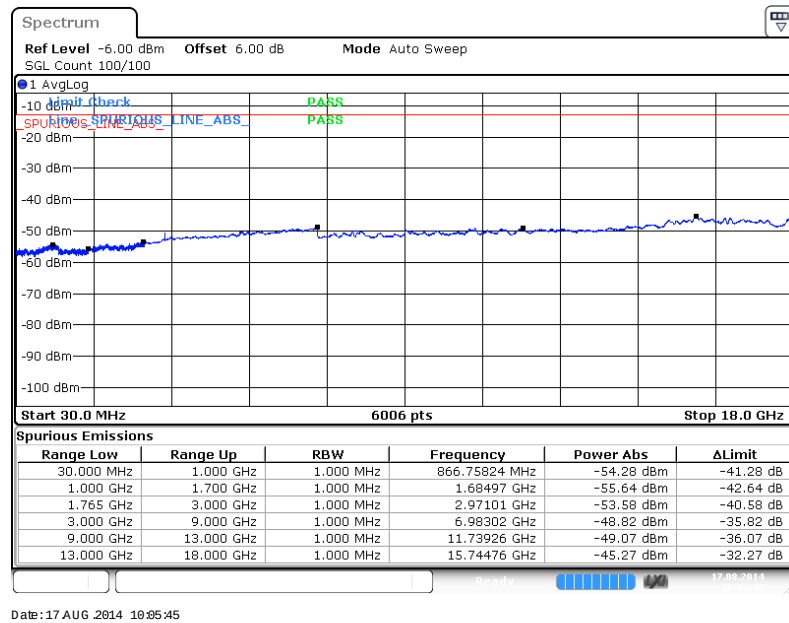
16QAM (RB Size 1, RB Offset 7)



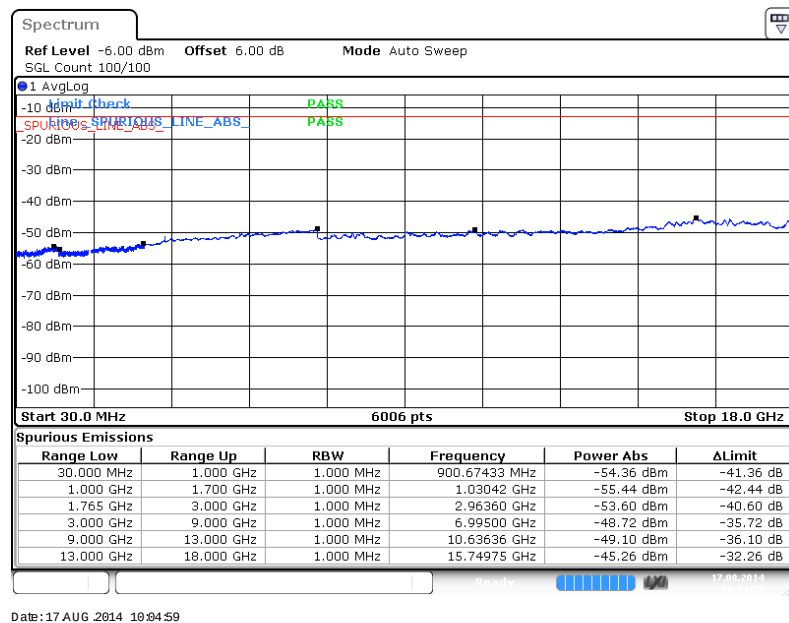


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)



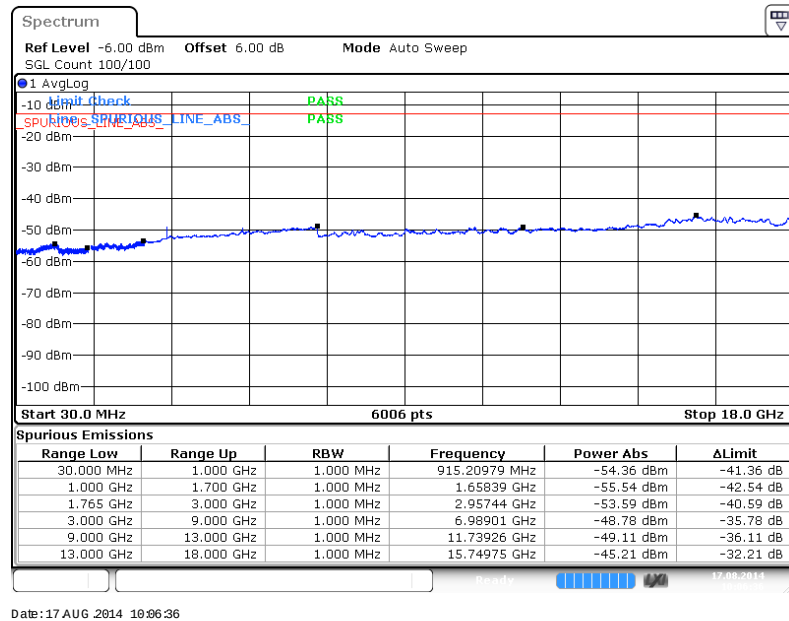
16QAM (RB Size 1, RB Offset 7)



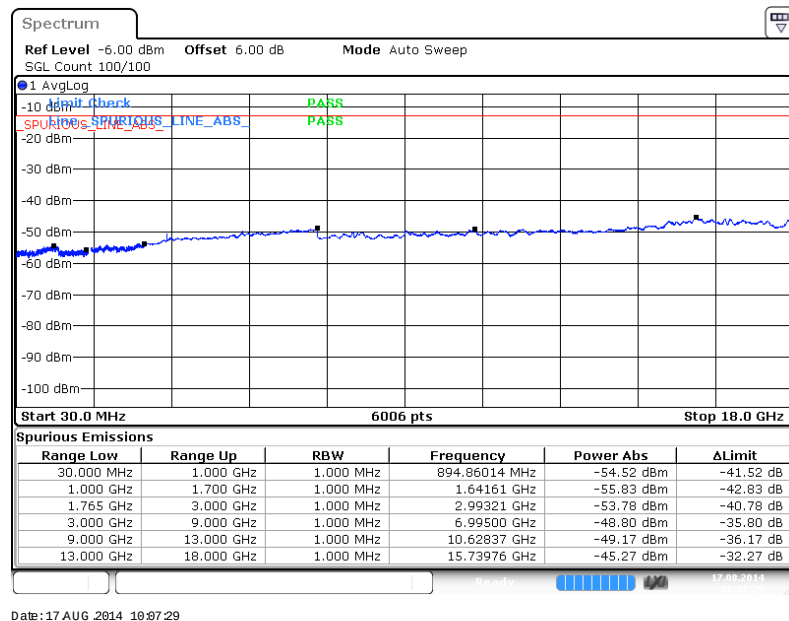


Band :	LTE Band 4	Channel :	CH20385 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 0)



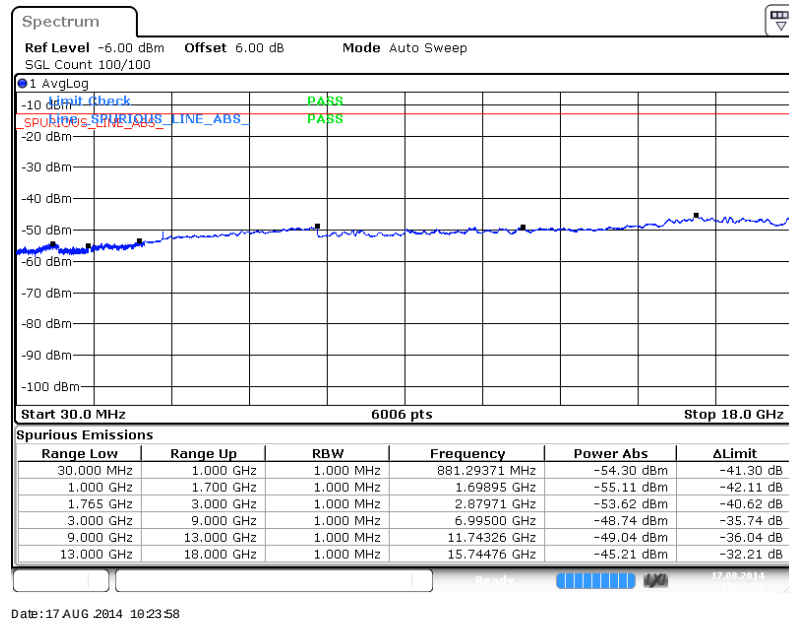
16QAM (RB Size 1, RB Offset 7)



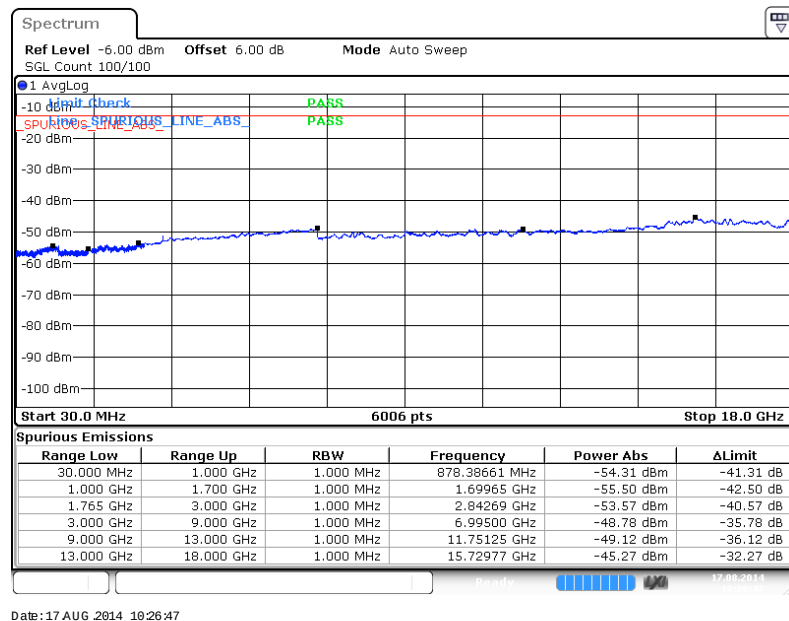


Band :	LTE Band 4	Channel :	CH19975 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



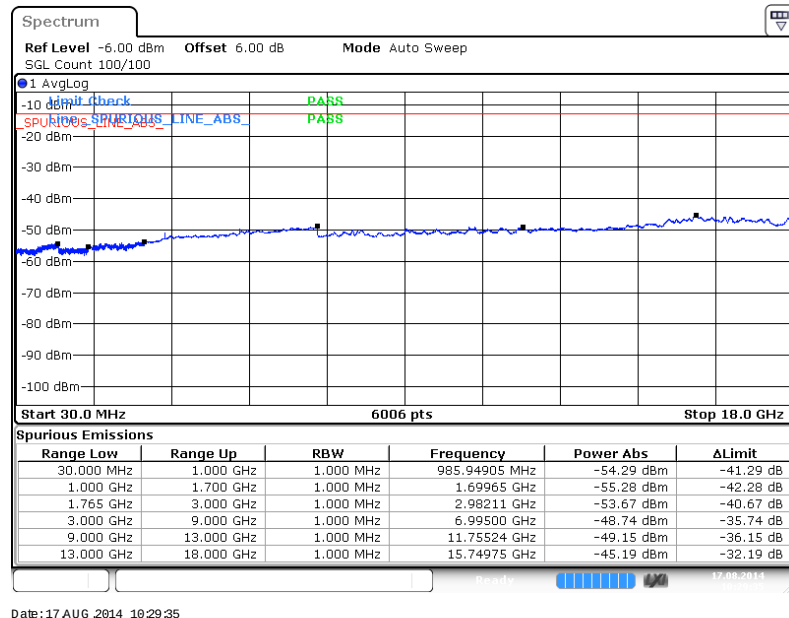
16QAM (RB Size 1, RB Offset 0)



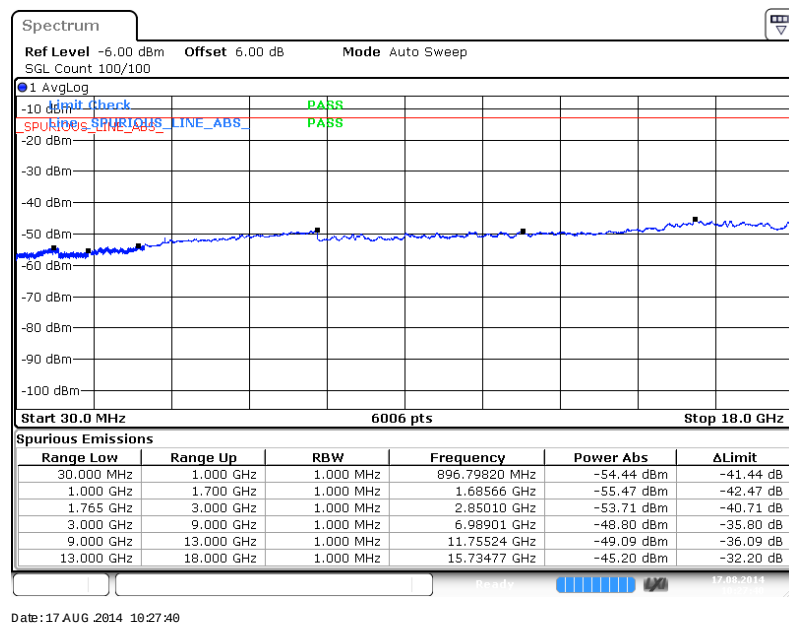


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



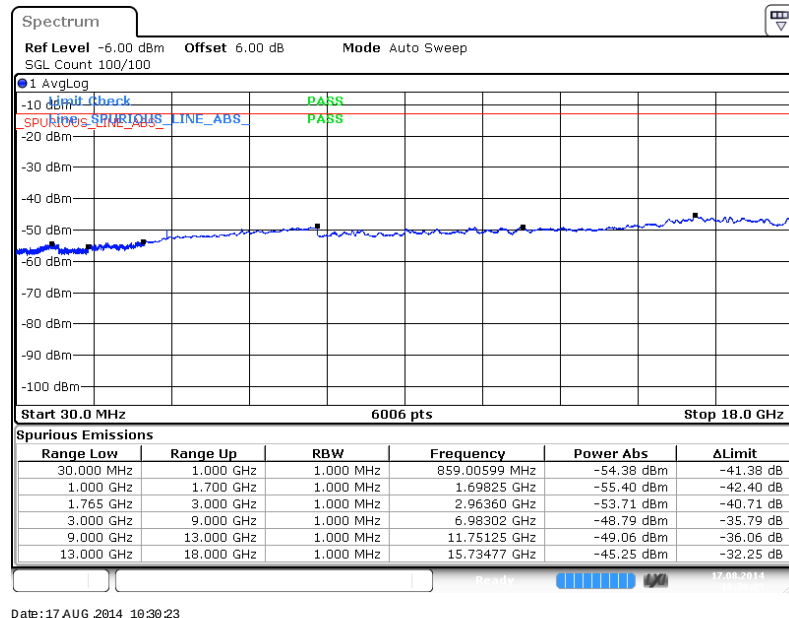
16QAM (RB Size 1, RB Offset 0)



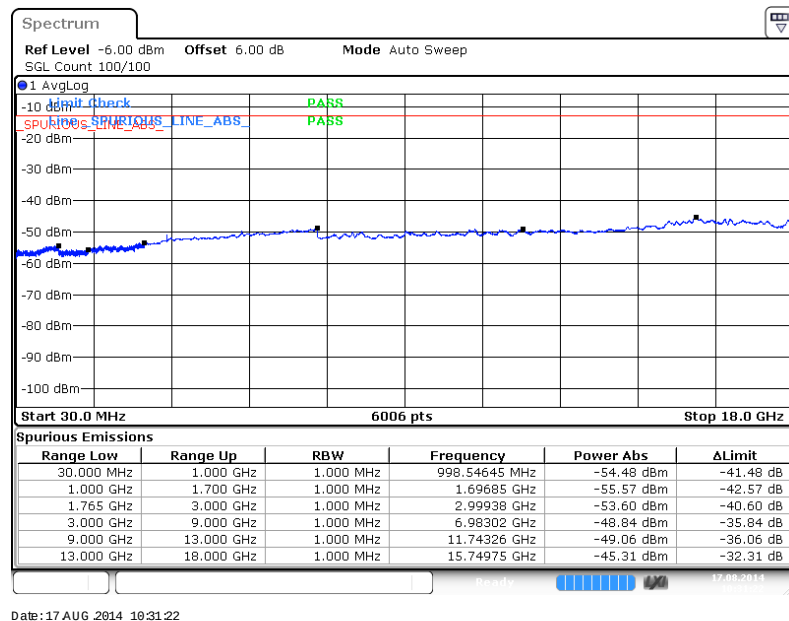


Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 0)



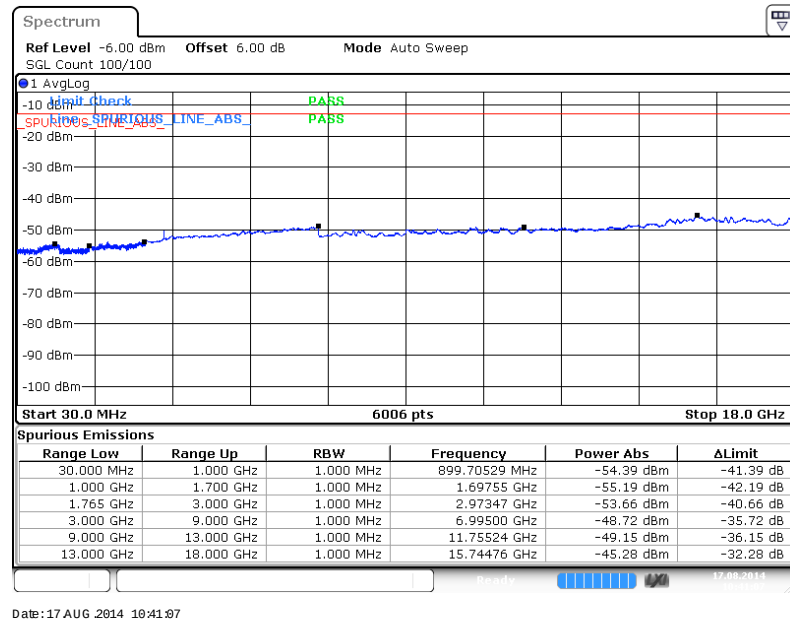
16QAM (RB Size 1, RB Offset 0)



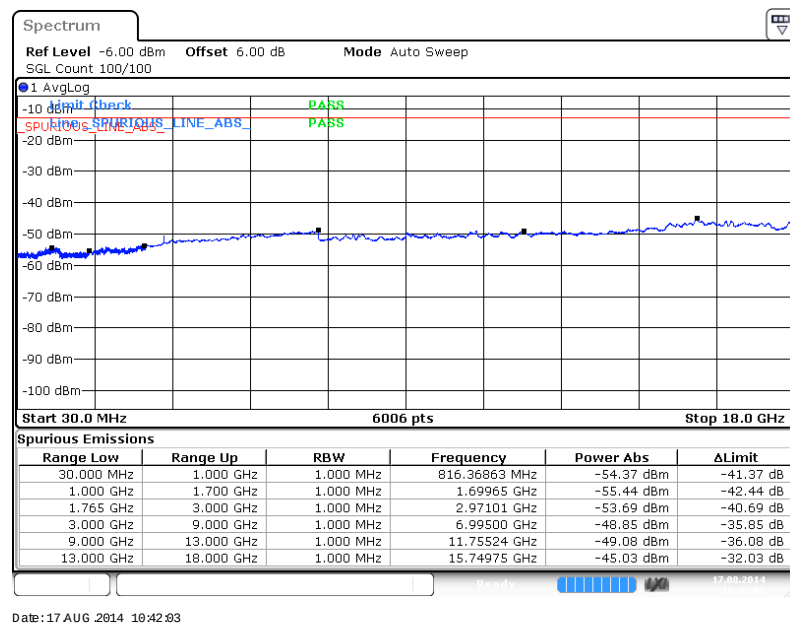


Band :	LTE Band 4	Channel :	CH20000 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



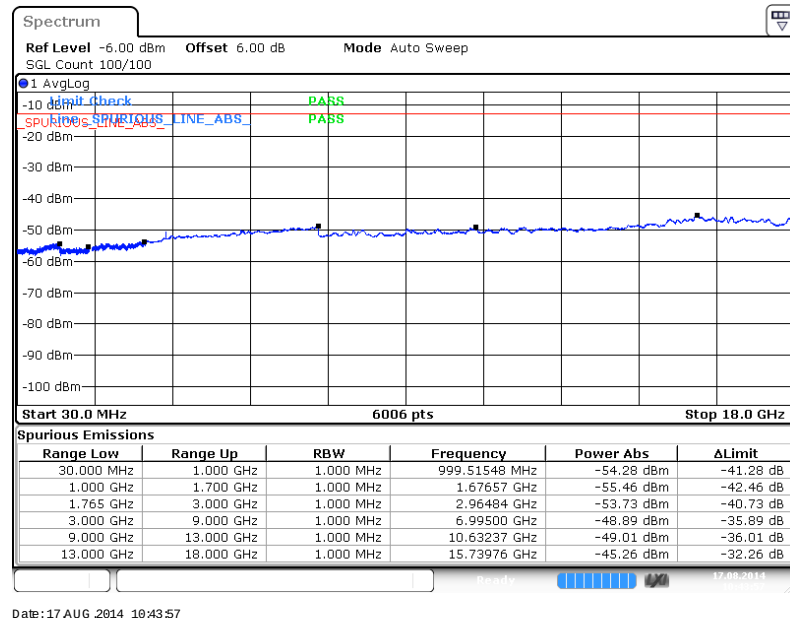
16QAM (RB Size 1, RB Offset 0)



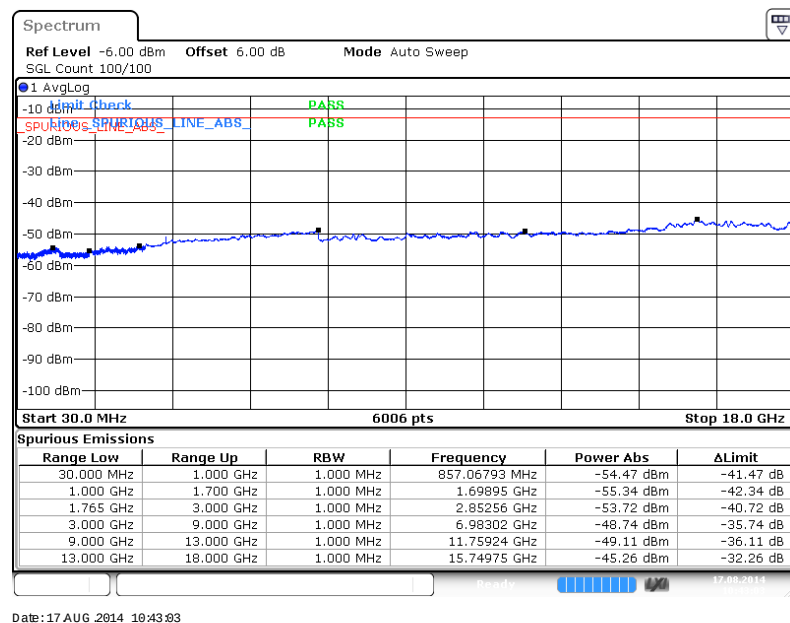


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



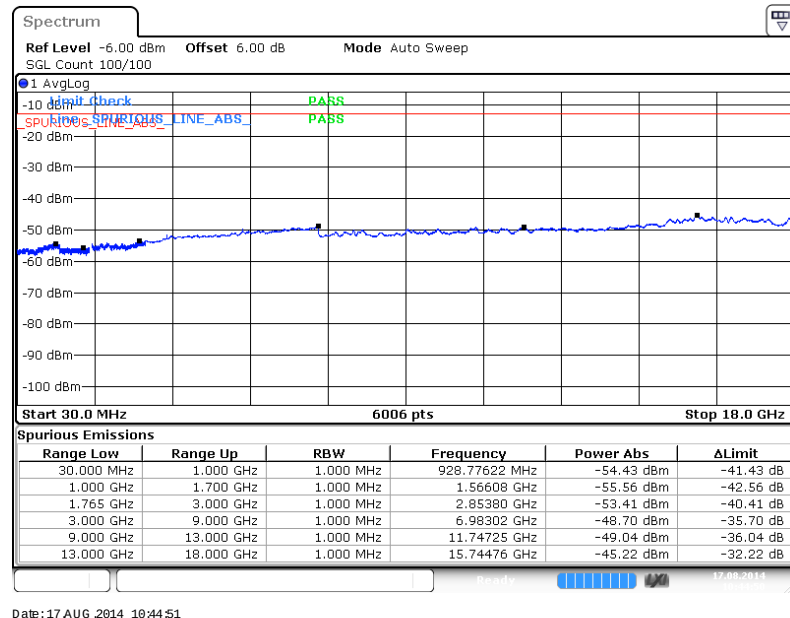
16QAM (RB Size 1, RB Offset 0)



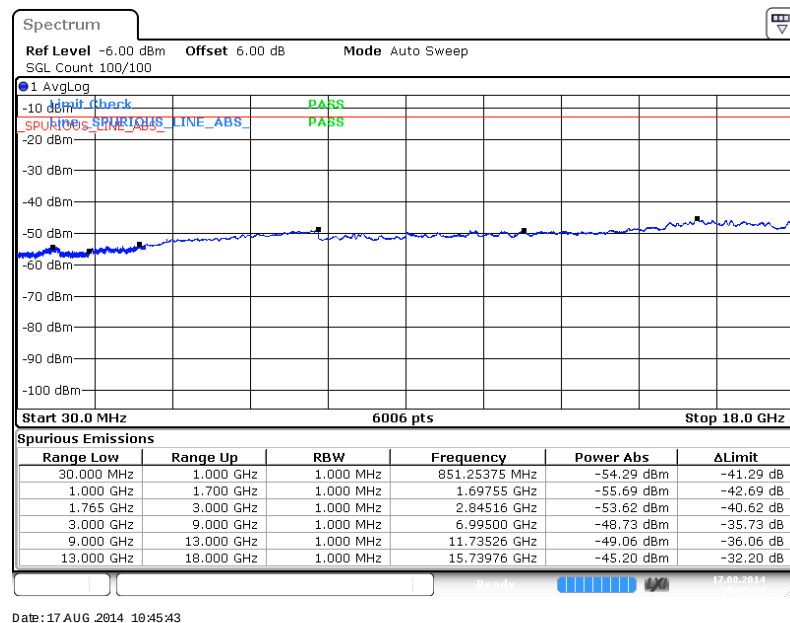


Band :	LTE Band 4	Channel :	CH20350 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



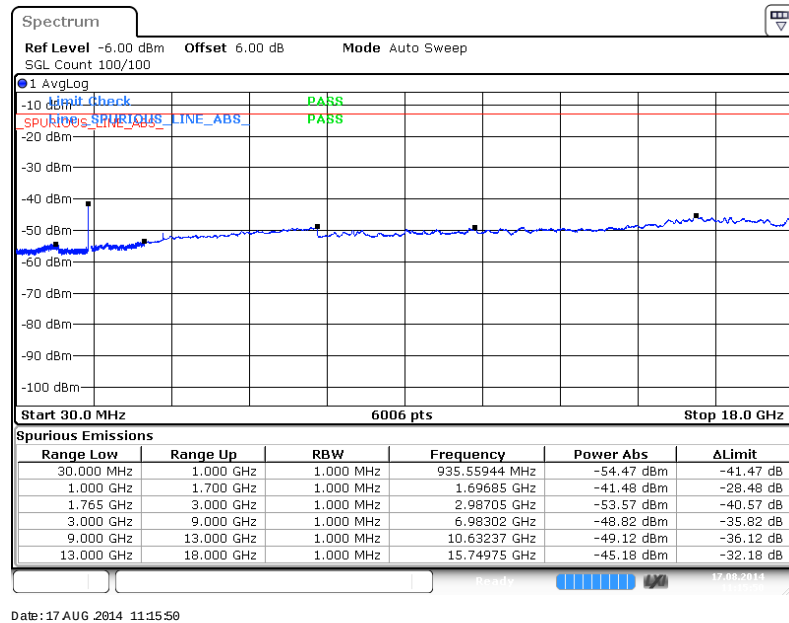
16QAM (RB Size 1, RB Offset 0)



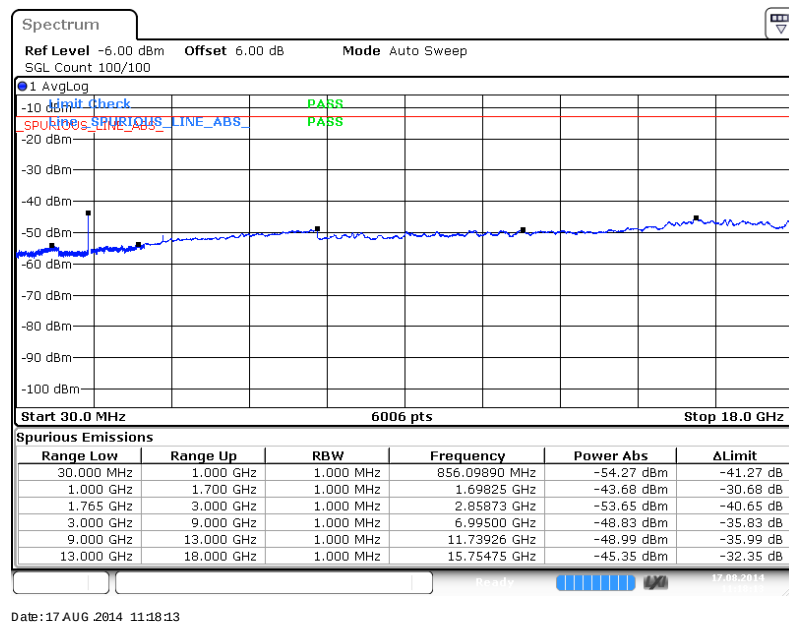


Band :	LTE Band 4	Channel :	CH20025 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)



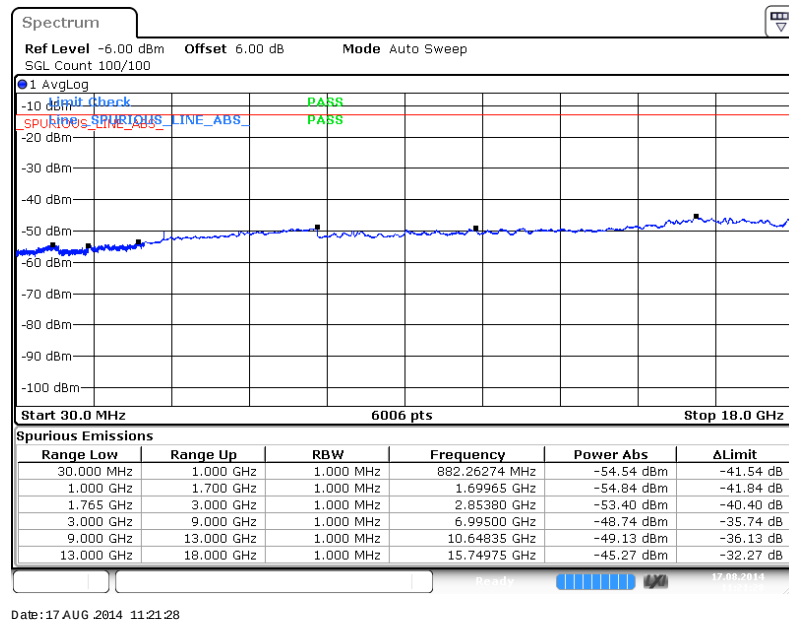
16QAM (RB Size 1, RB Offset 0)



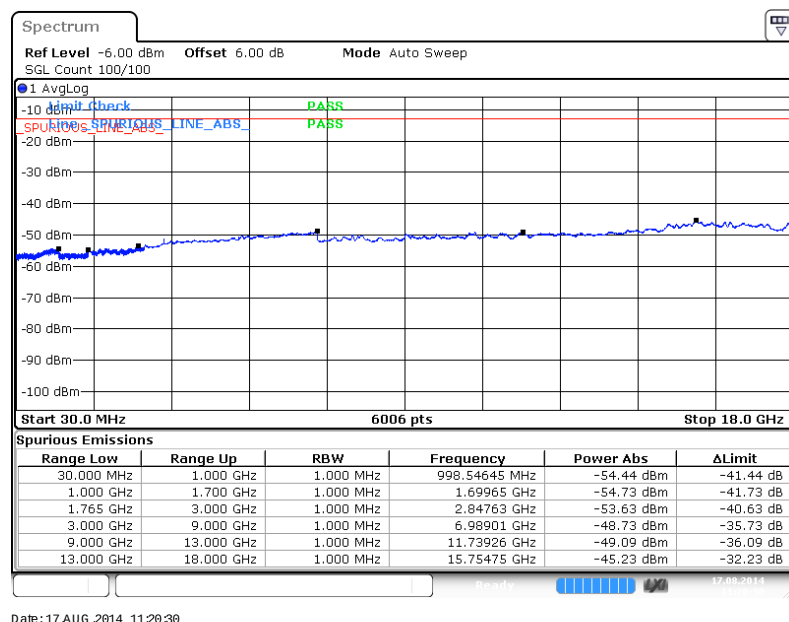


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)



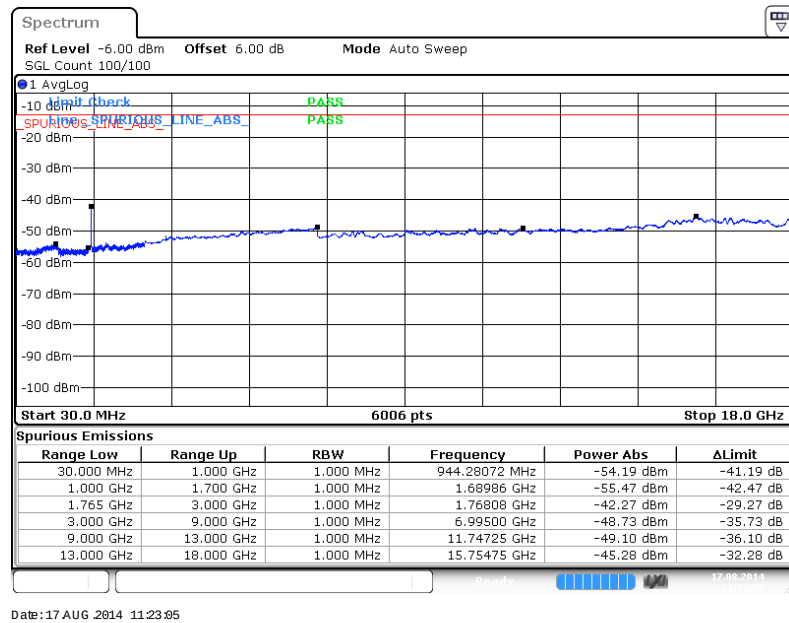
16QAM (RB Size 1, RB Offset 0)



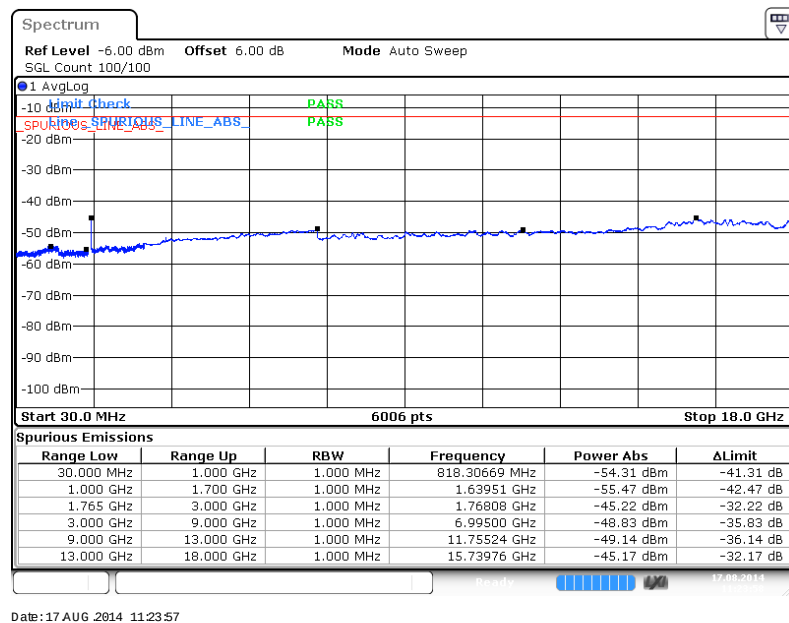


Band :	LTE Band 4	Channel :	CH20325 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 37)



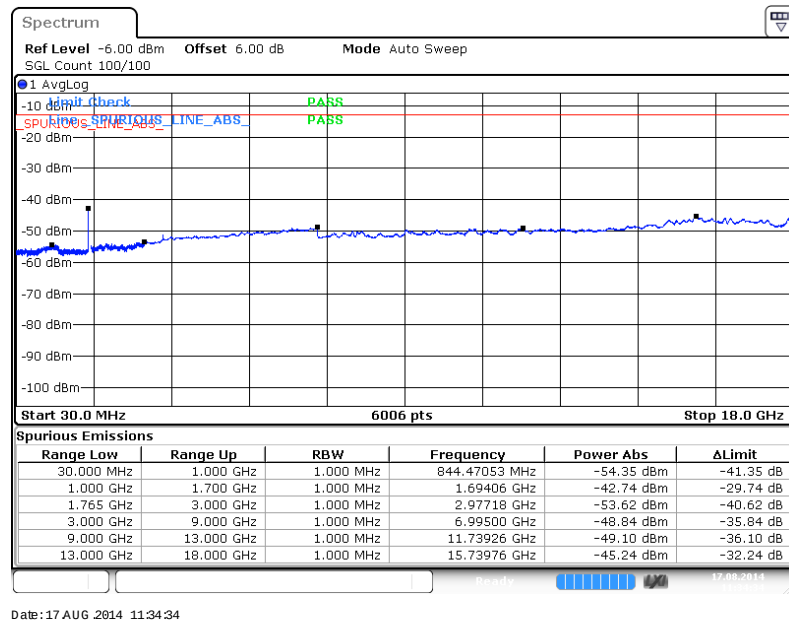
16QAM (RB Size 1, RB Offset 0)



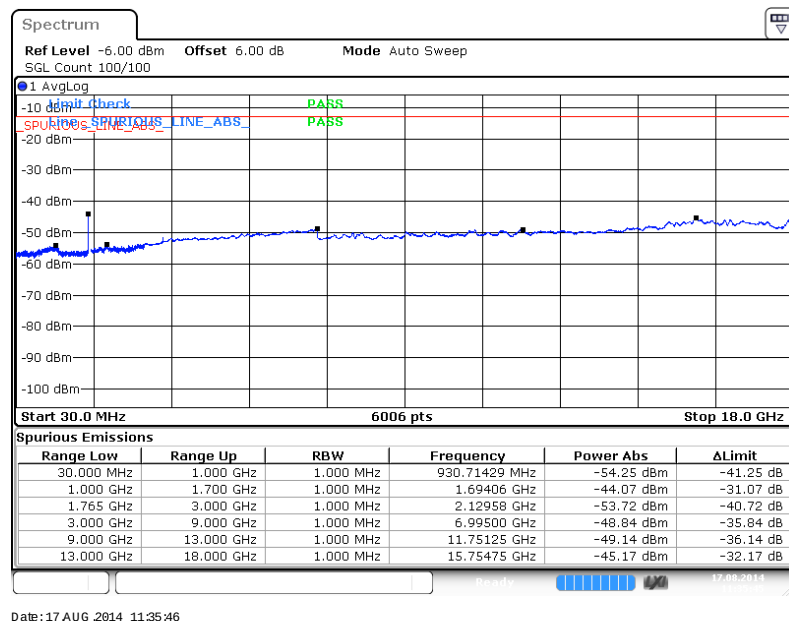


Band :	LTE Band 4	Channel :	CH20050 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



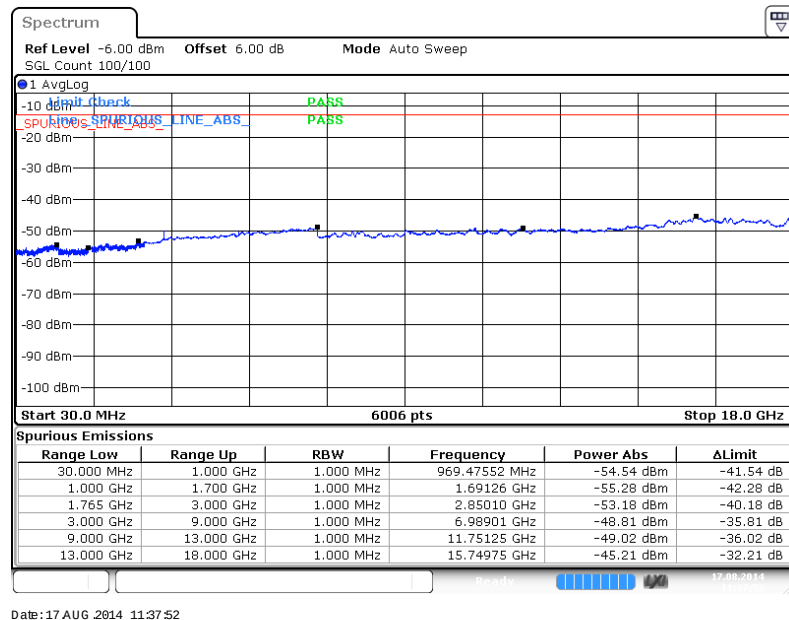
16QAM (RB Size 1, RB Offset 0)



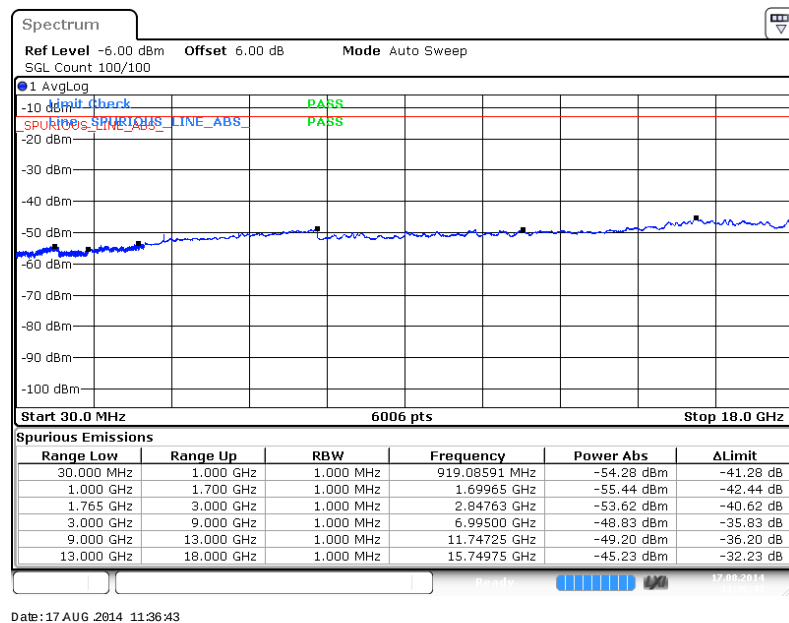


Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



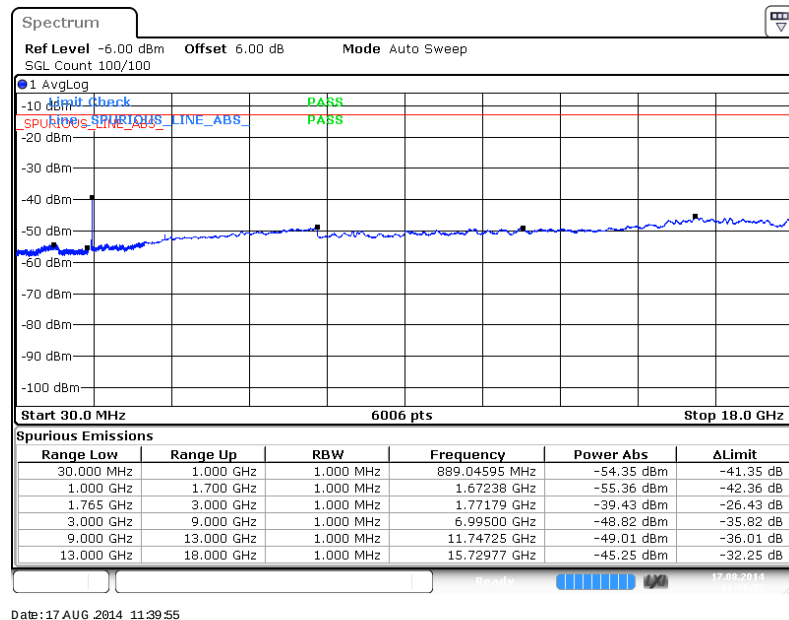
16QAM (RB Size 1, RB Offset 0)



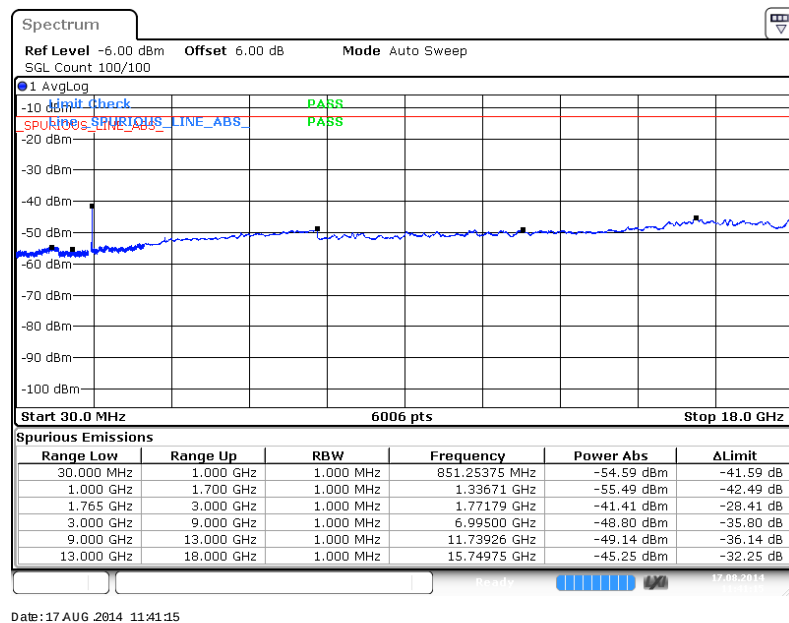


Band :	LTE Band 4	Channel :	CH20300 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 0)



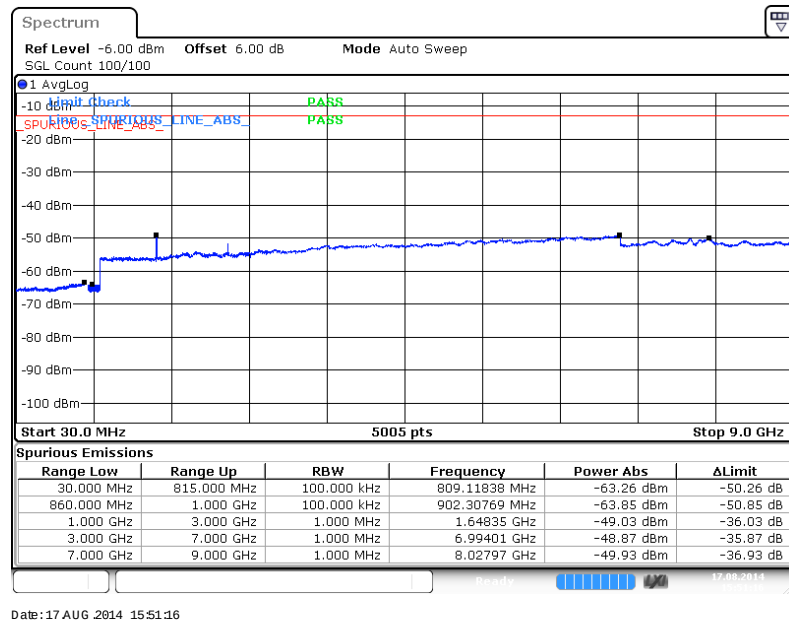
16QAM (RB Size 1, RB Offset 0)



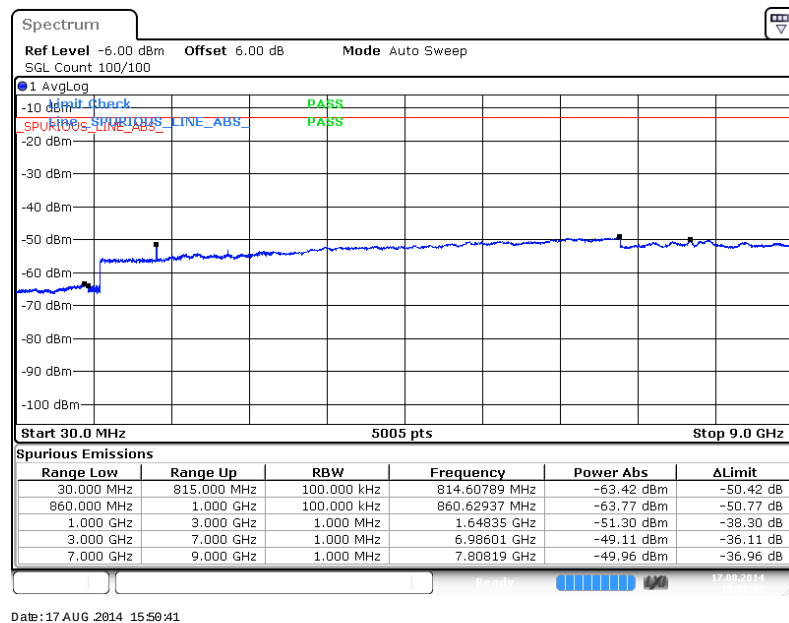


Band :	LTE Band 5	Channel :	CH20407 (Low)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)



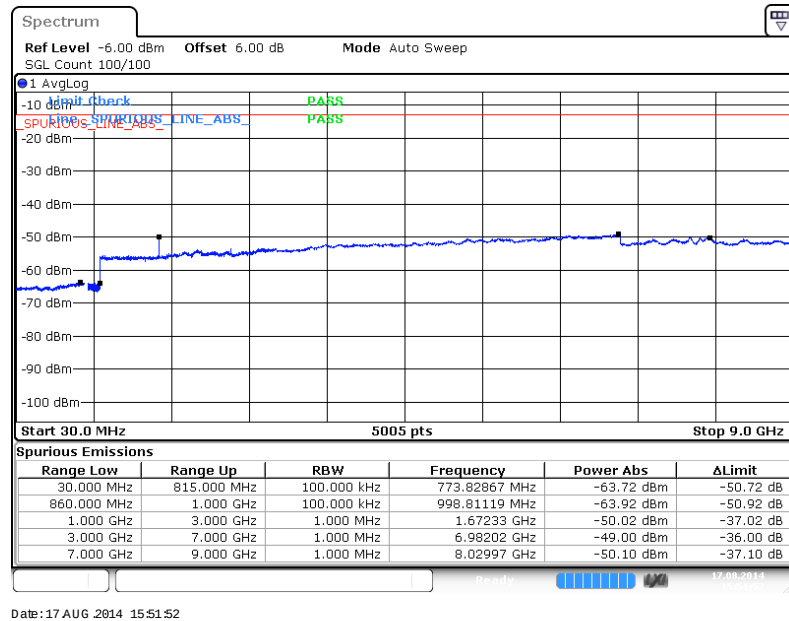
16QAM (RB Size 1, RB Offset 0)



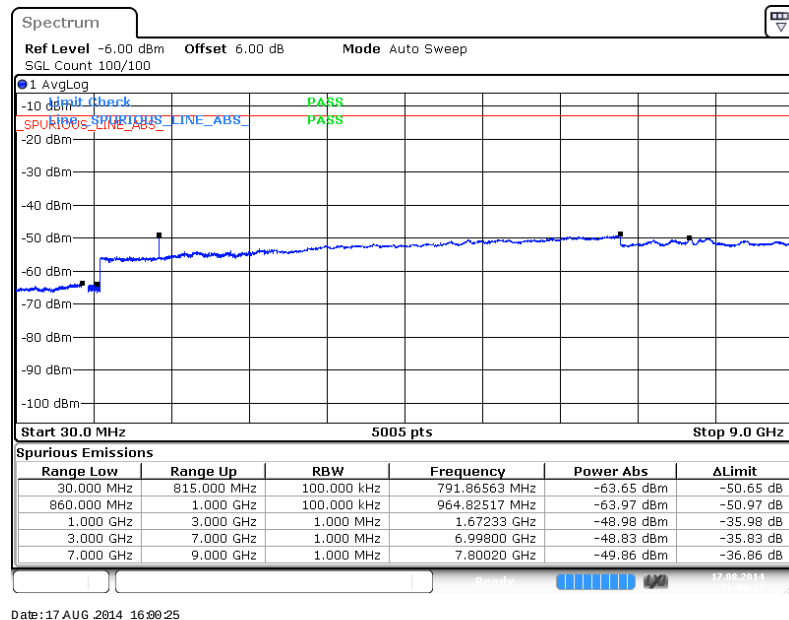


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)



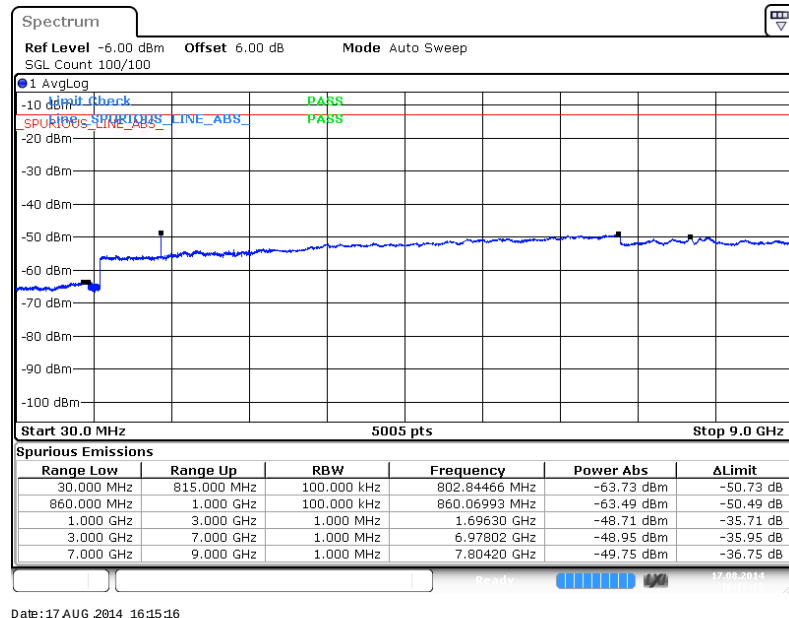
16QAM (RB Size 1, RB Offset 0)



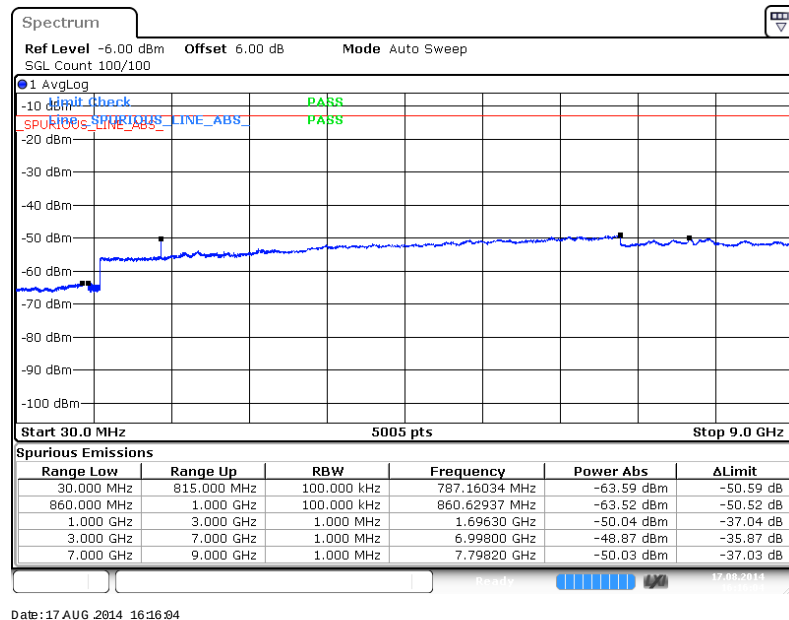


Band :	LTE Band 5	Channel :	CH20643 (High)
Band Width :	1.4MHz		

QPSK (RB Size 1, RB Offset 5)



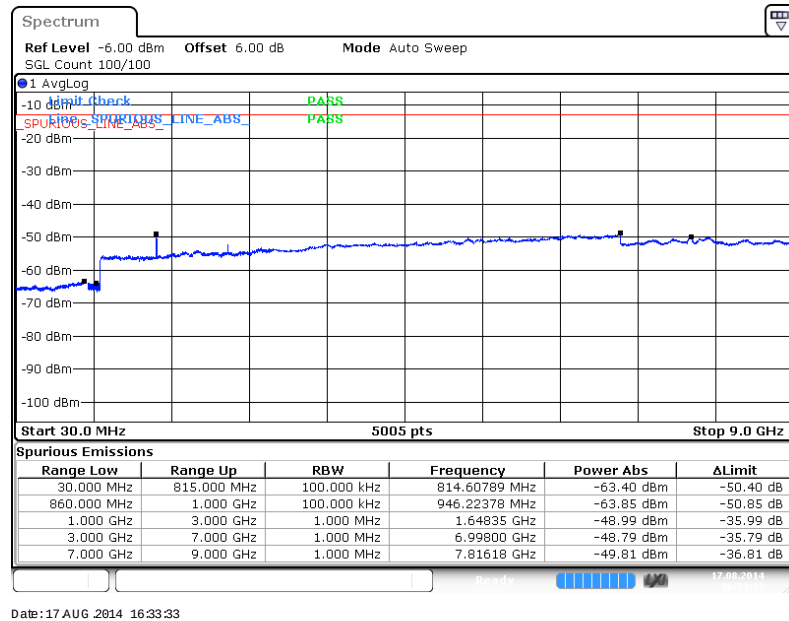
16QAM (RB Size 1, RB Offset 0)



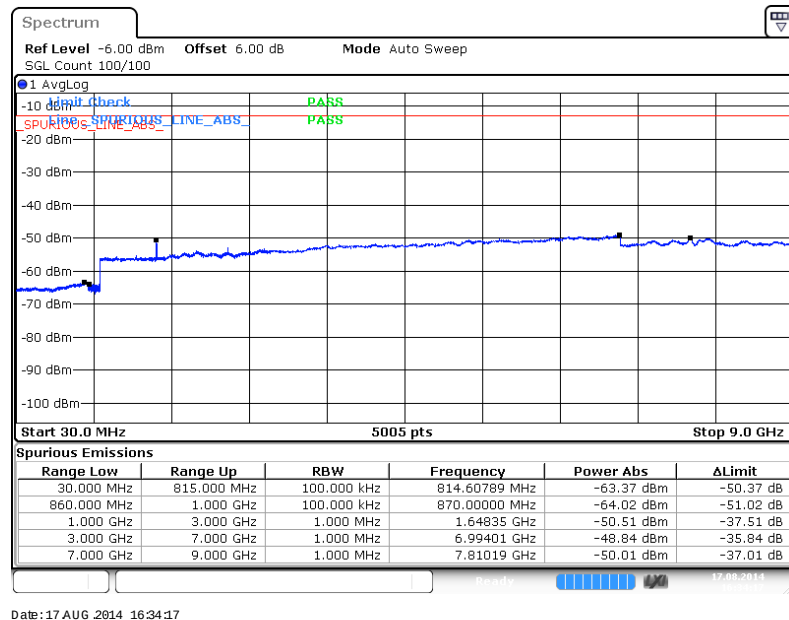


Band :	LTE Band 5	Channel :	CH20415 (Low)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



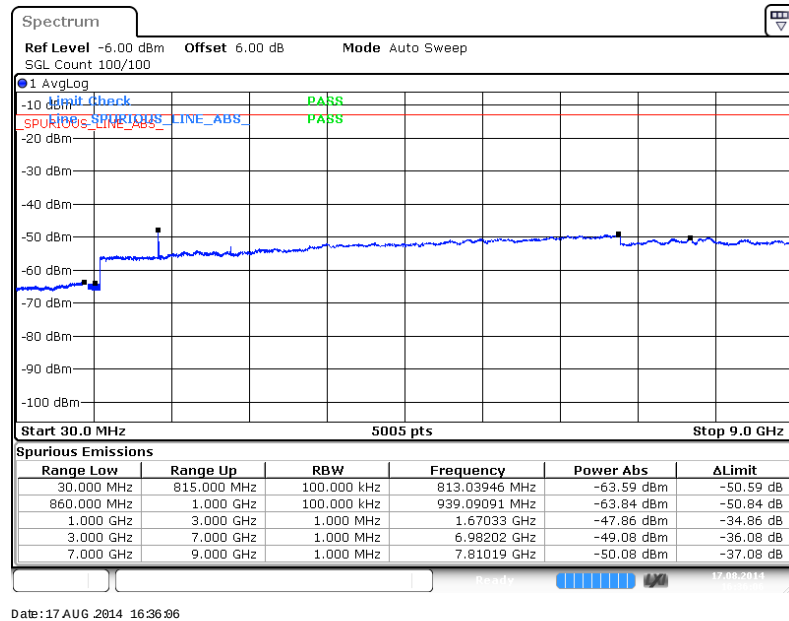
16QAM (RB Size 1, RB Offset 14)



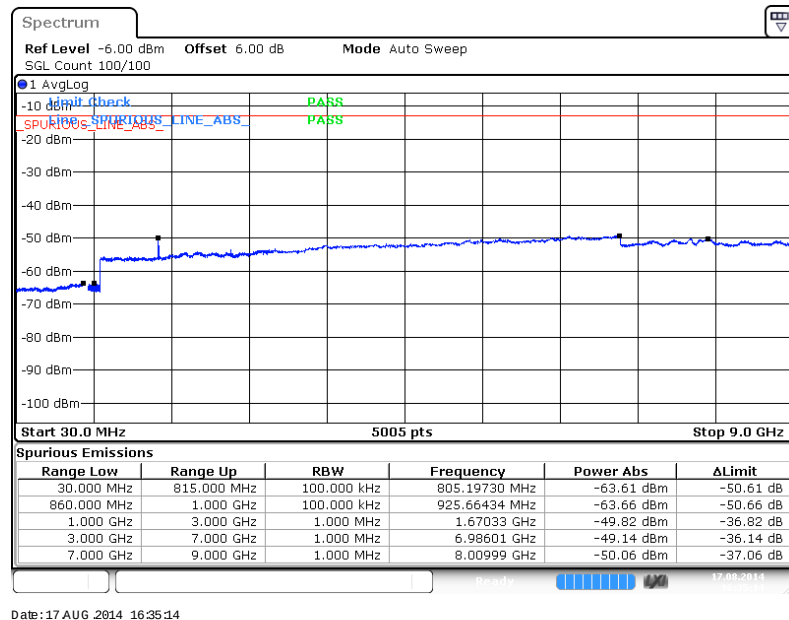


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



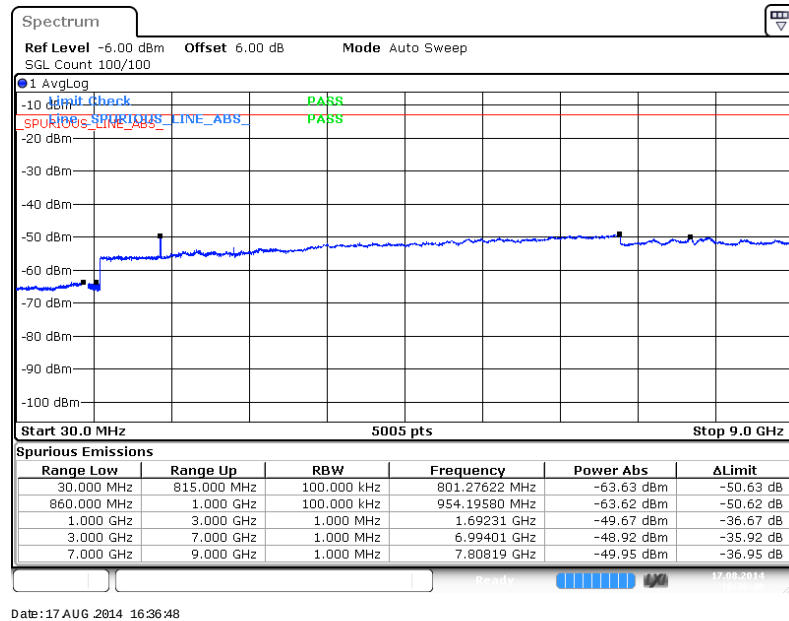
16QAM (RB Size 1, RB Offset 14)



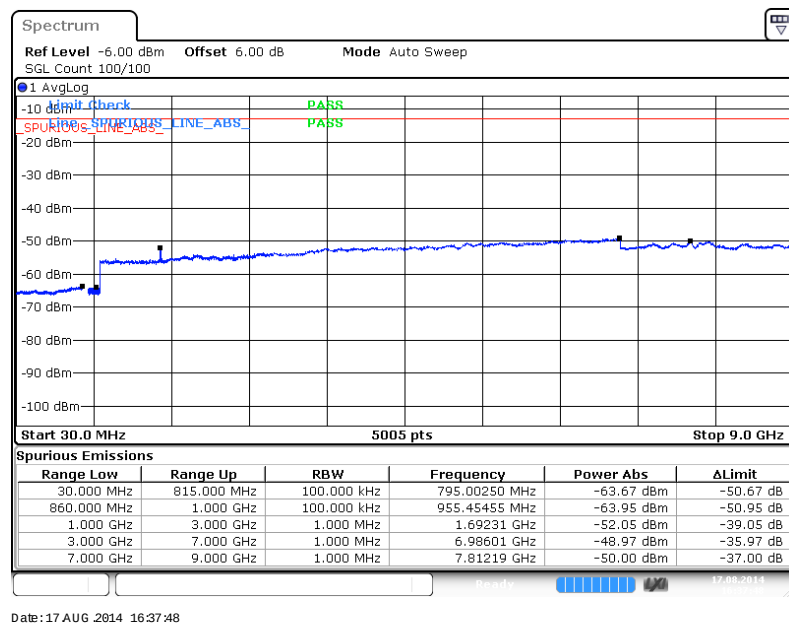


Band :	LTE Band 5	Channel :	CH20635 (High)
Band Width :	3MHz		

QPSK (RB Size 1, RB Offset 14)



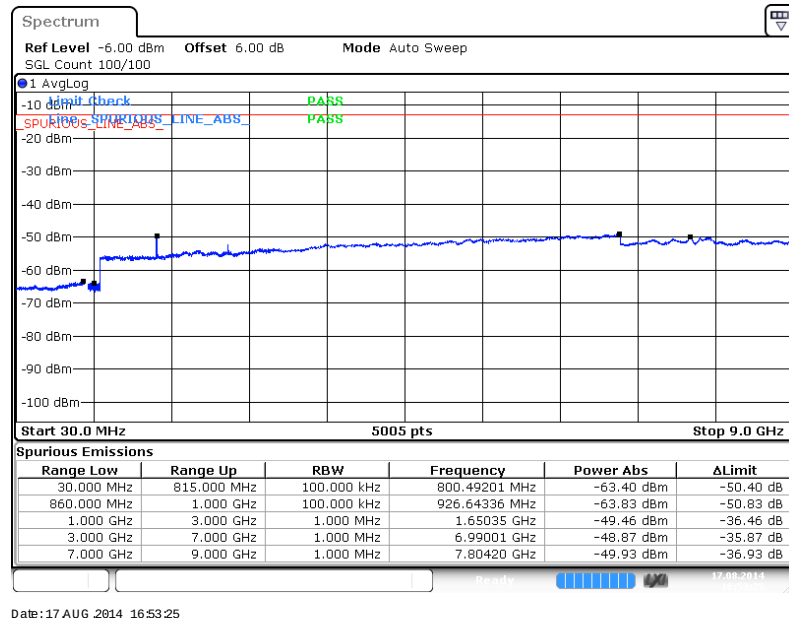
16QAM (RB Size 1, RB Offset 14)



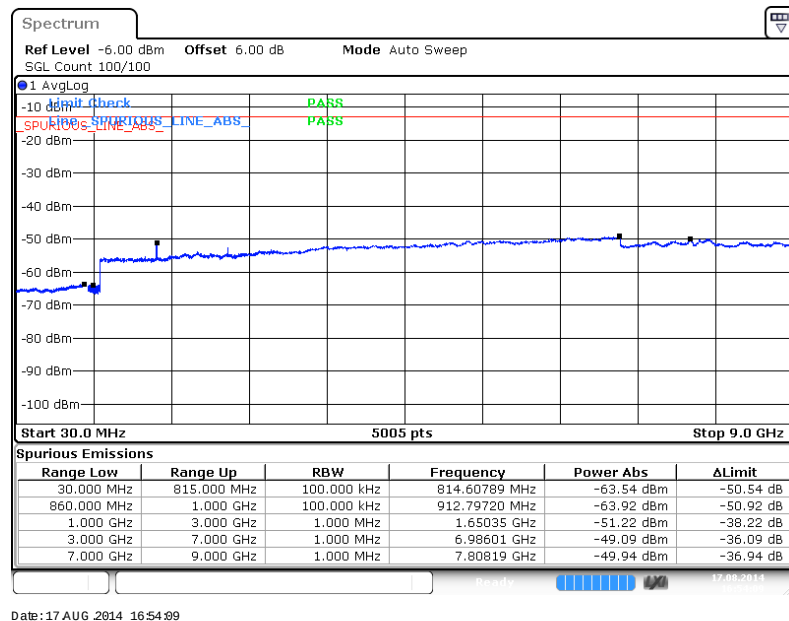


Band :	LTE Band 5	Channel :	CH20425 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



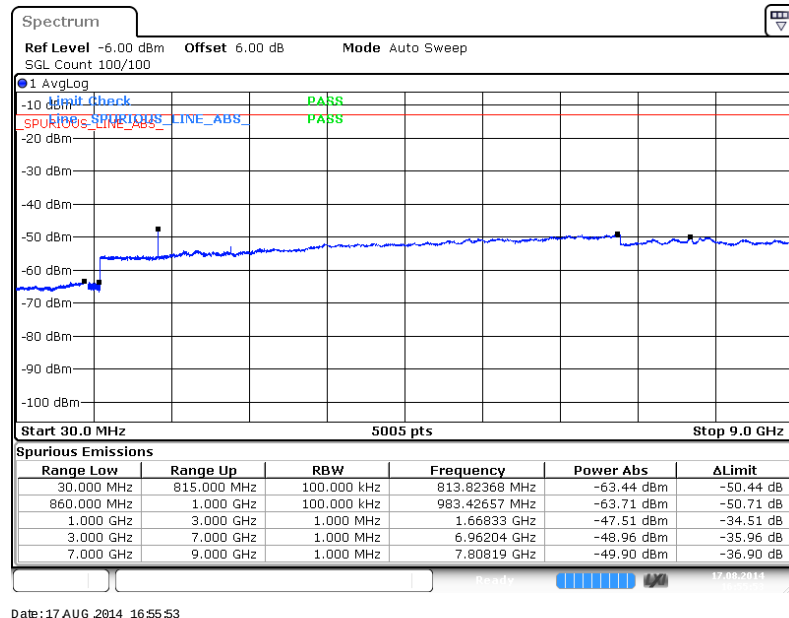
16QAM (RB Size 1, RB Offset 12)



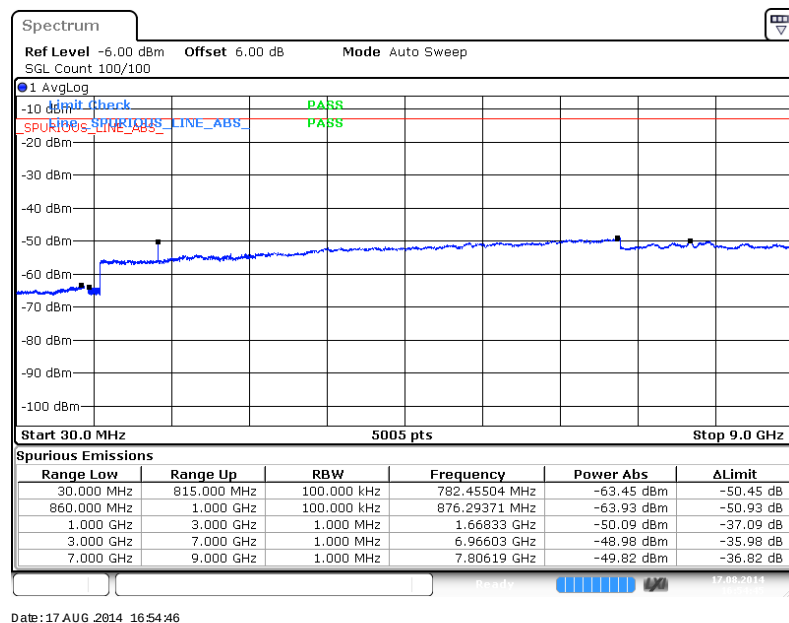


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

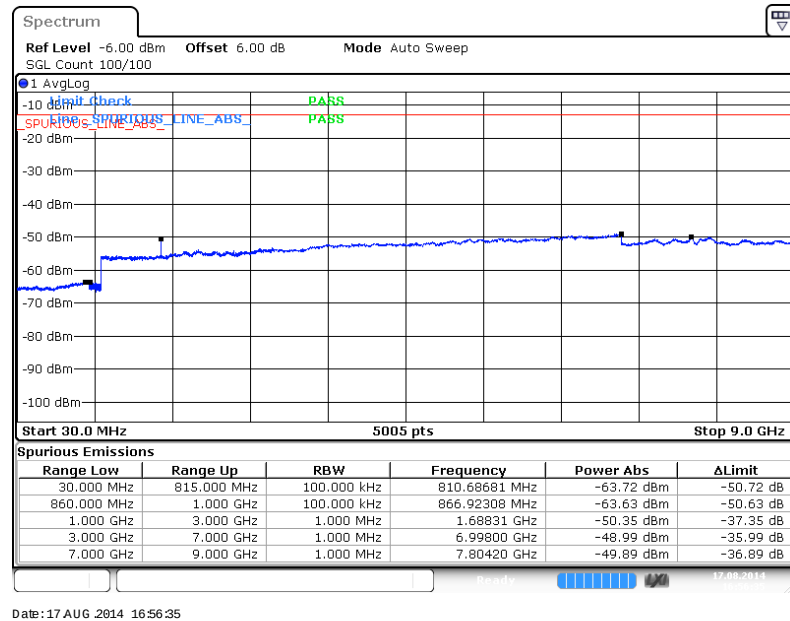
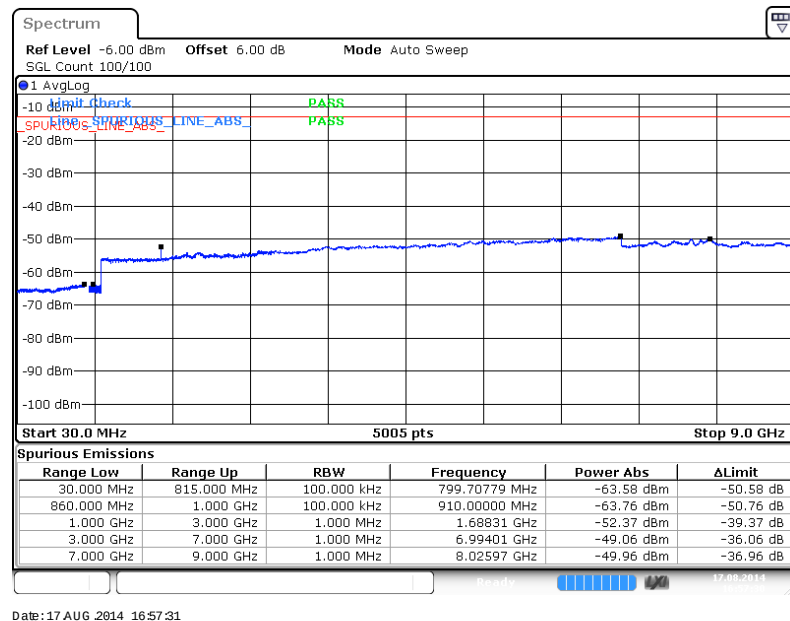


16QAM (RB Size 1, RB Offset 12)





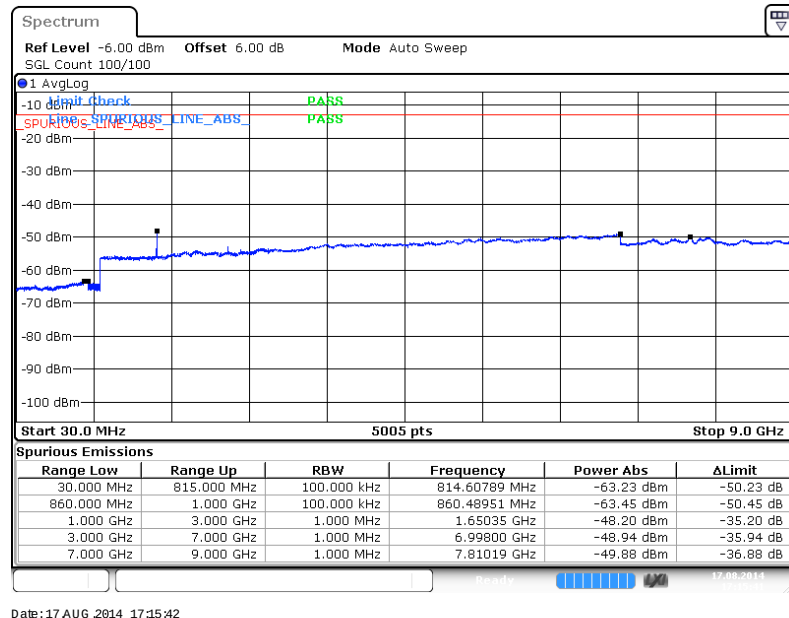
Band :	LTE Band 5	Channel :	CH20625 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)**16QAM (RB Size 1, RB Offset 12)**

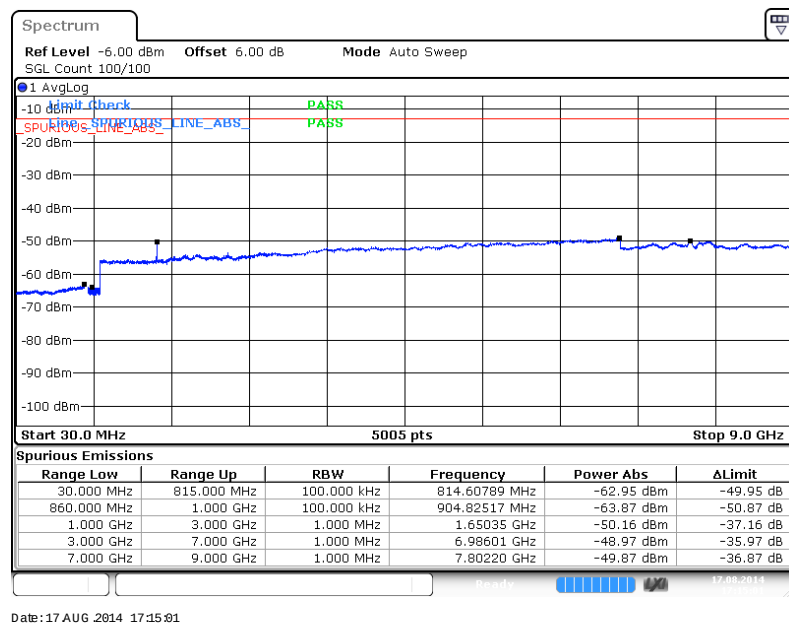


Band :	LTE Band 5	Channel :	CH20450 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)



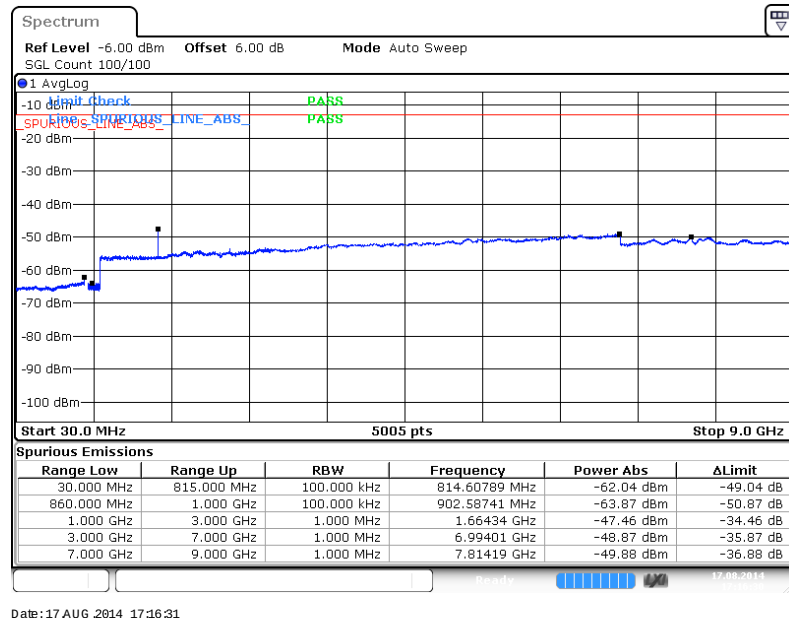
16QAM (RB Size 1, RB Offset 49)



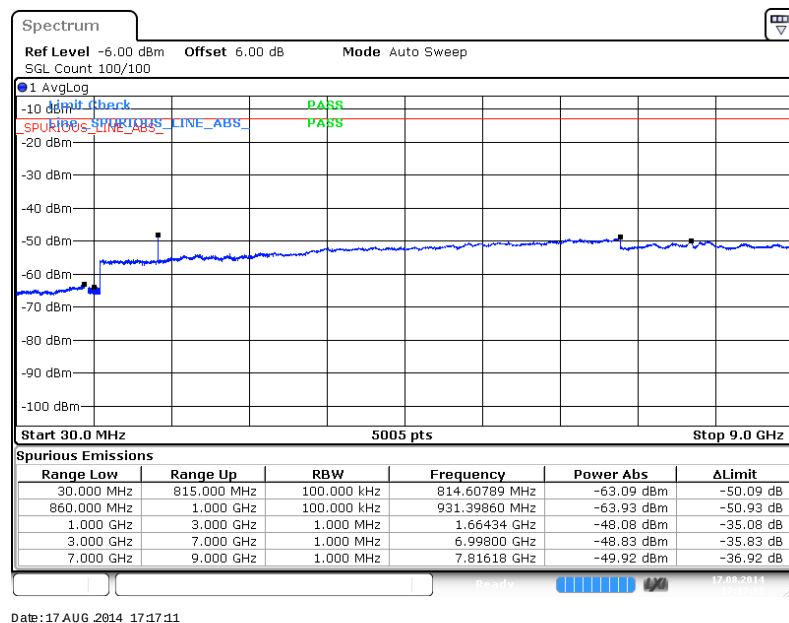


Band :	LTE Band 5	Channel :	CH20525 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)



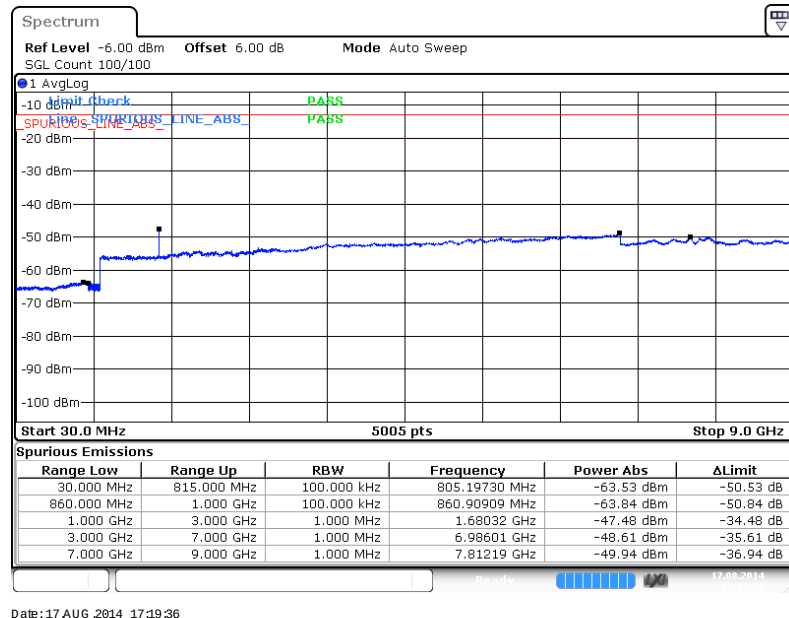
16QAM (RB Size 1, RB Offset 49)



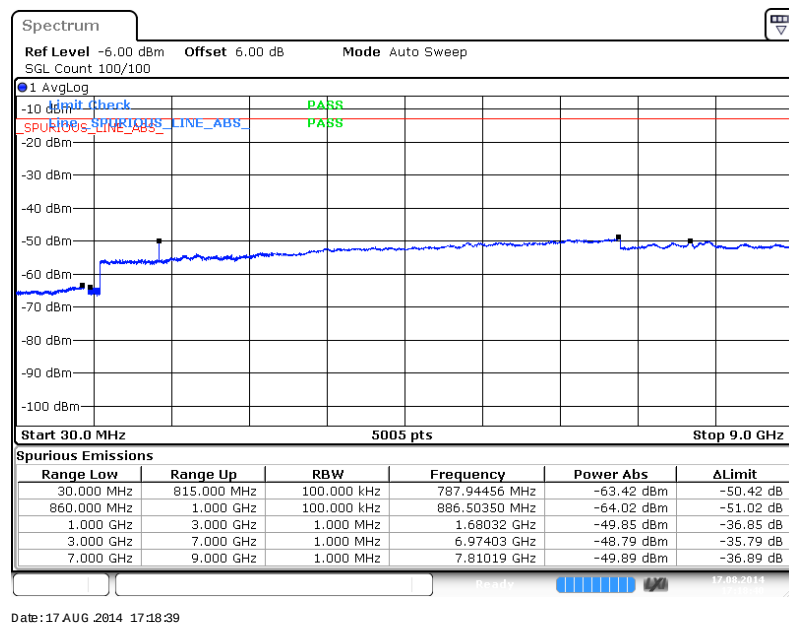


Band :	LTE Band 5	Channel :	CH20600 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 0)

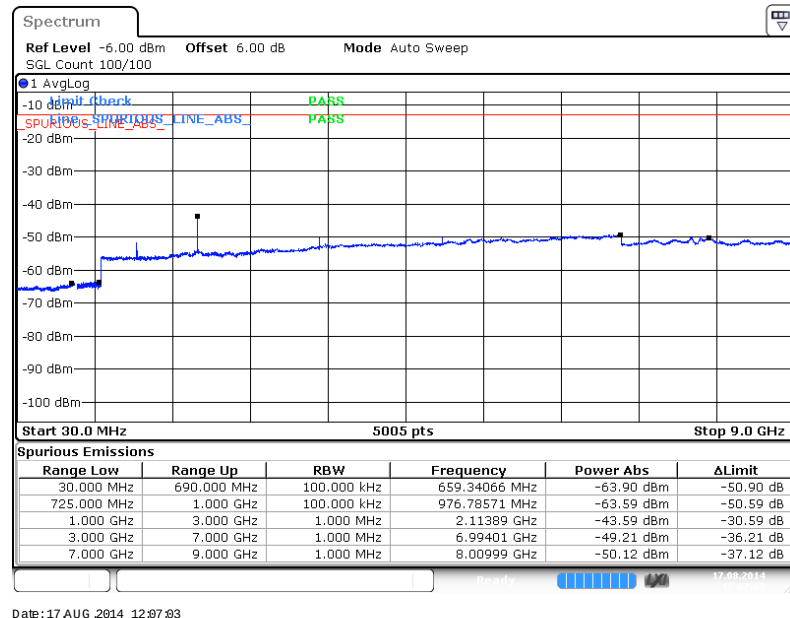
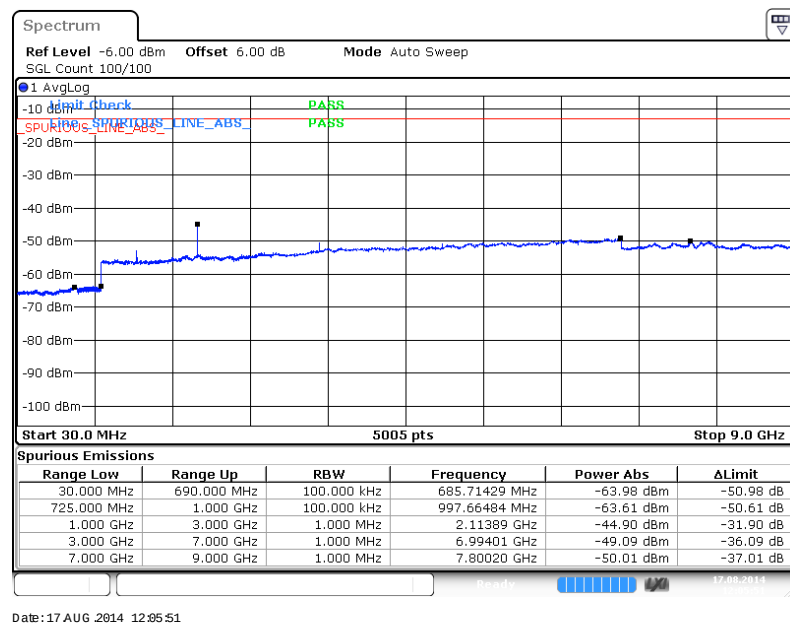


16QAM (RB Size 1, RB Offset 49)



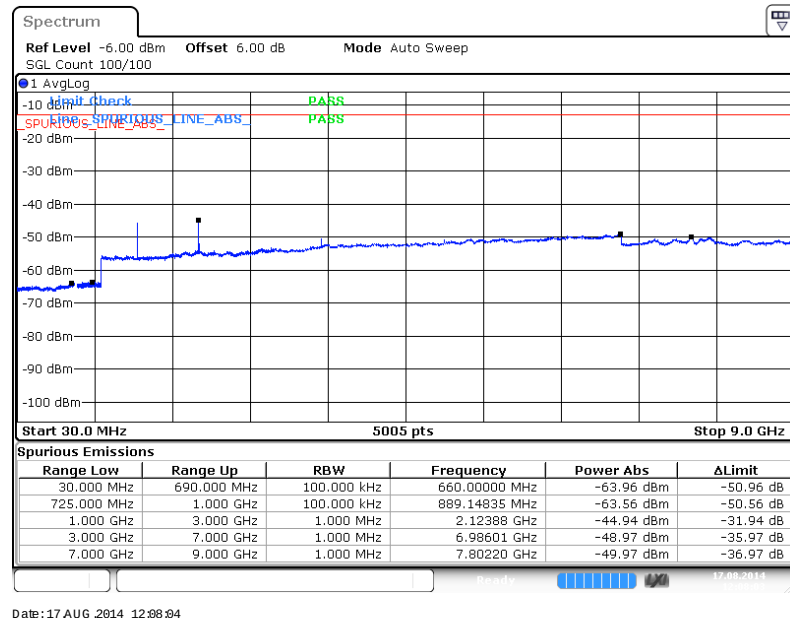
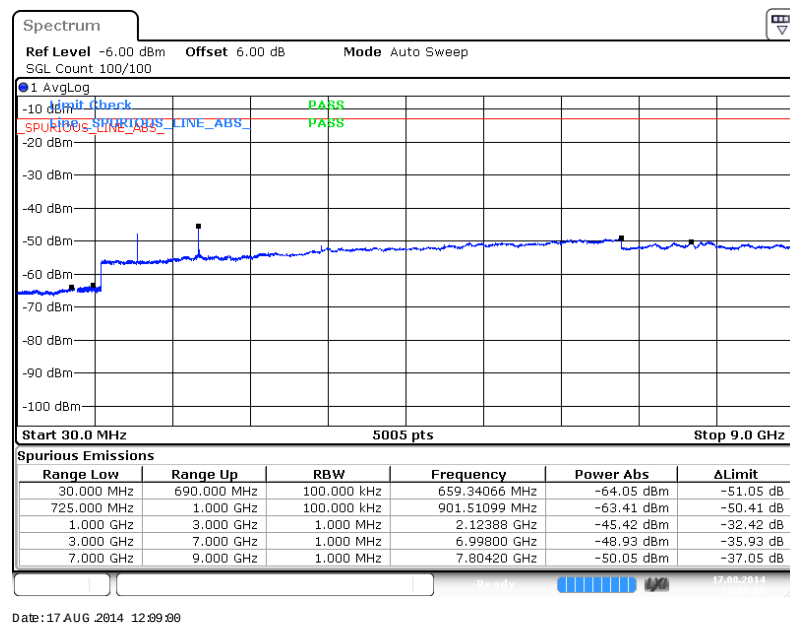


Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width :	5MHz		

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



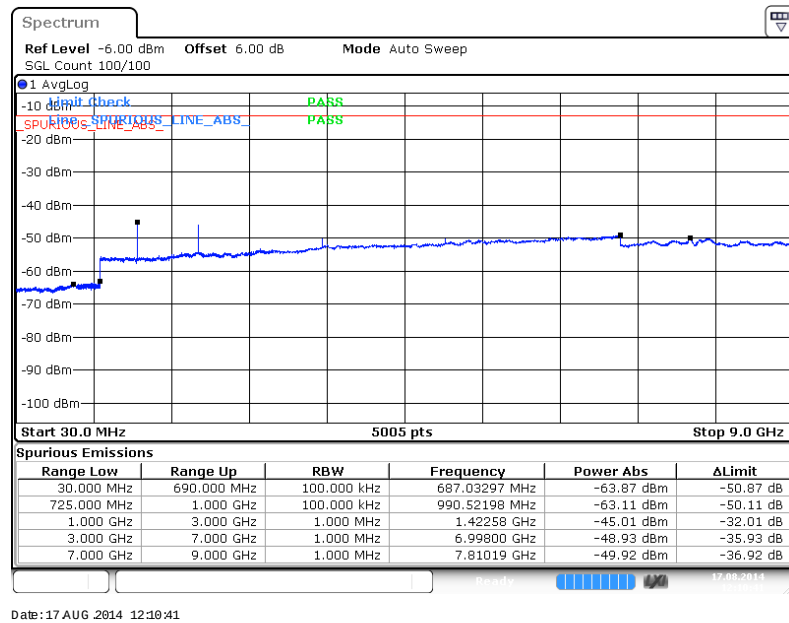
Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	5MHz		

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

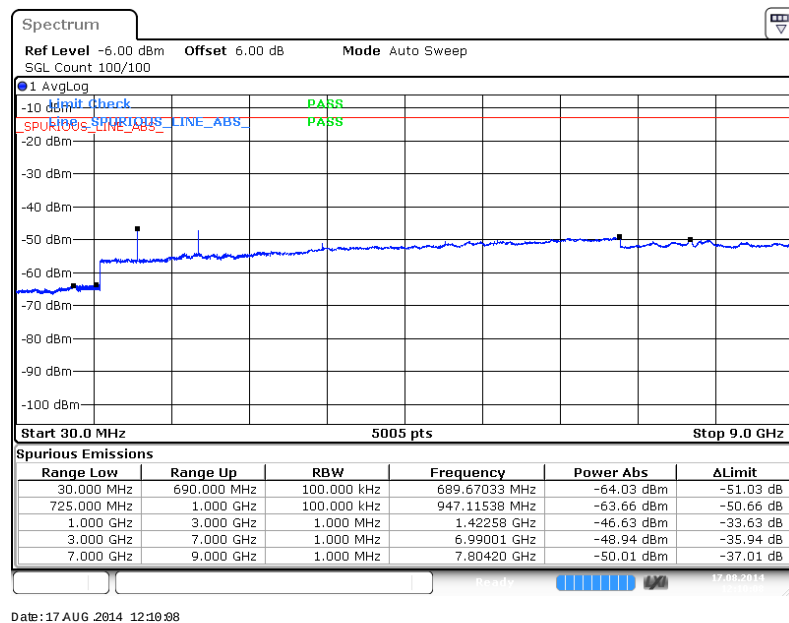


Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)



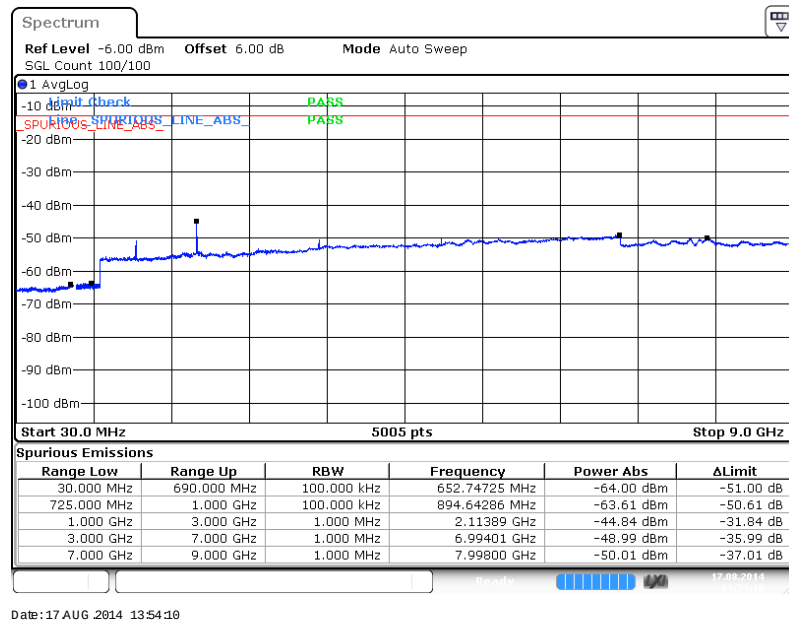
16QAM (RB Size 1, RB Offset 24)



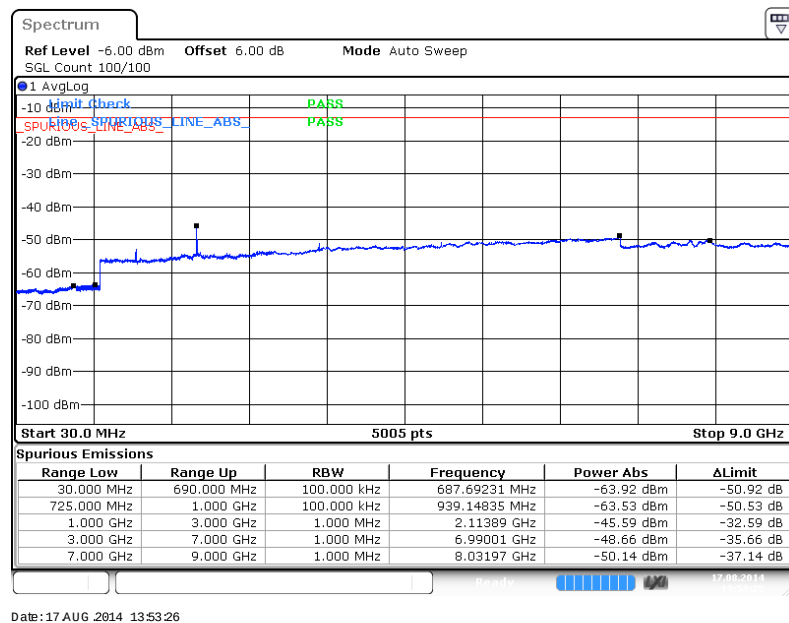


Band :	LTE Band 17	Channel :	CH23780 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)



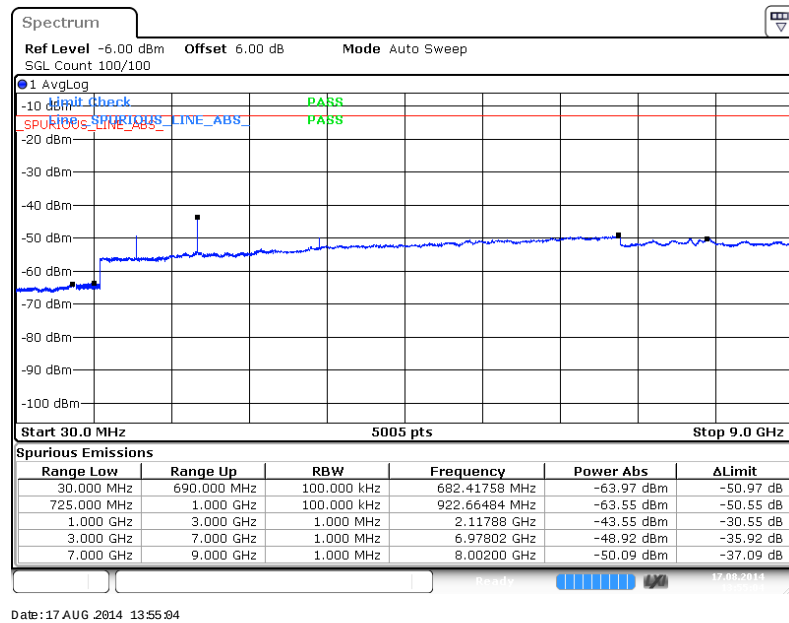
16QAM (RB Size 1, RB Offset 49)



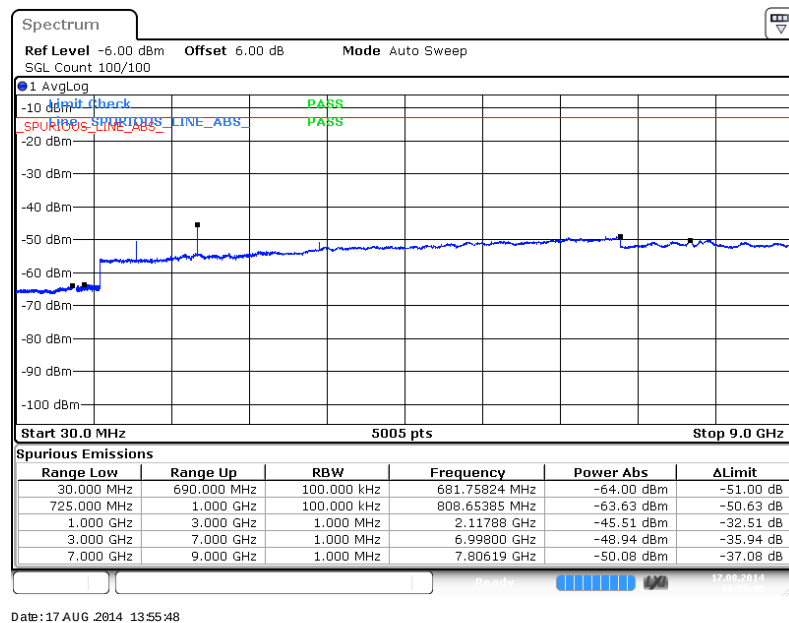


Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

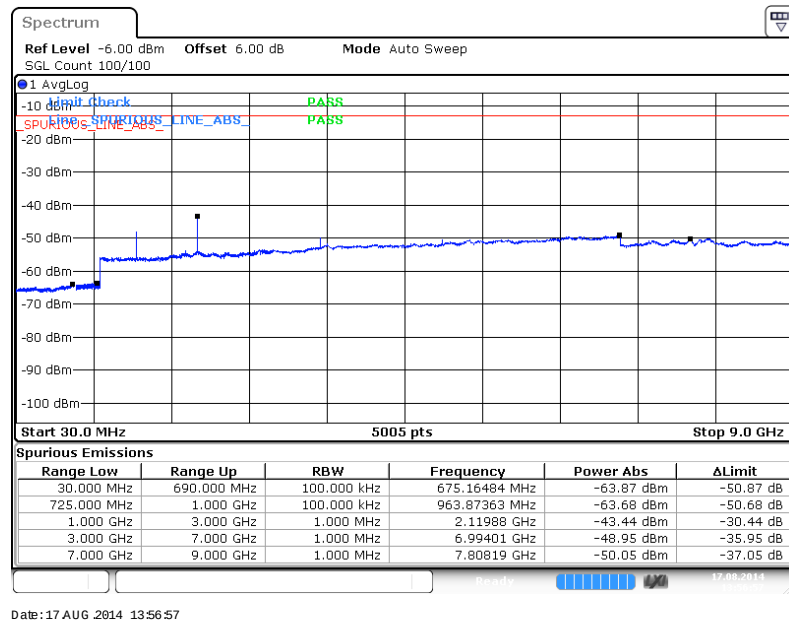
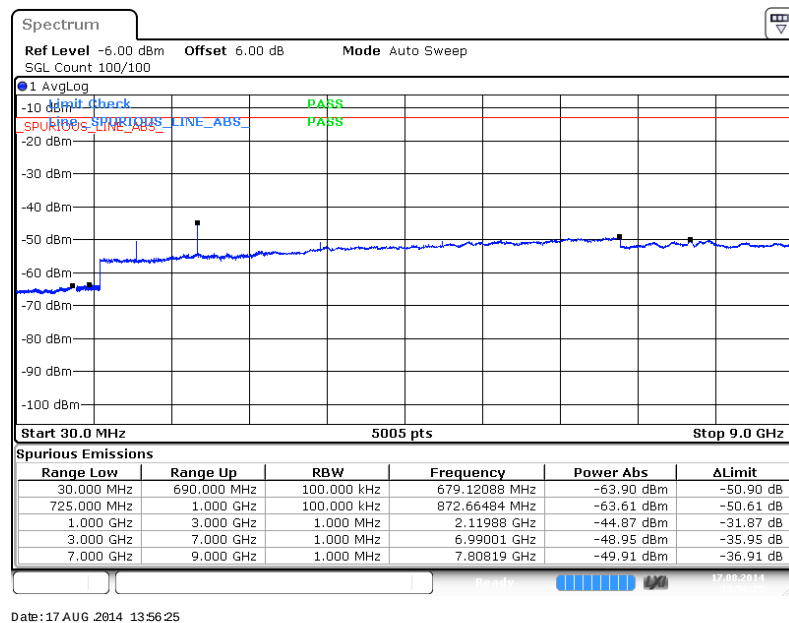


16QAM (RB Size 1, RB Offset 49)





Band :	LTE Band 17	Channel :	CH23800 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)**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.

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)

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

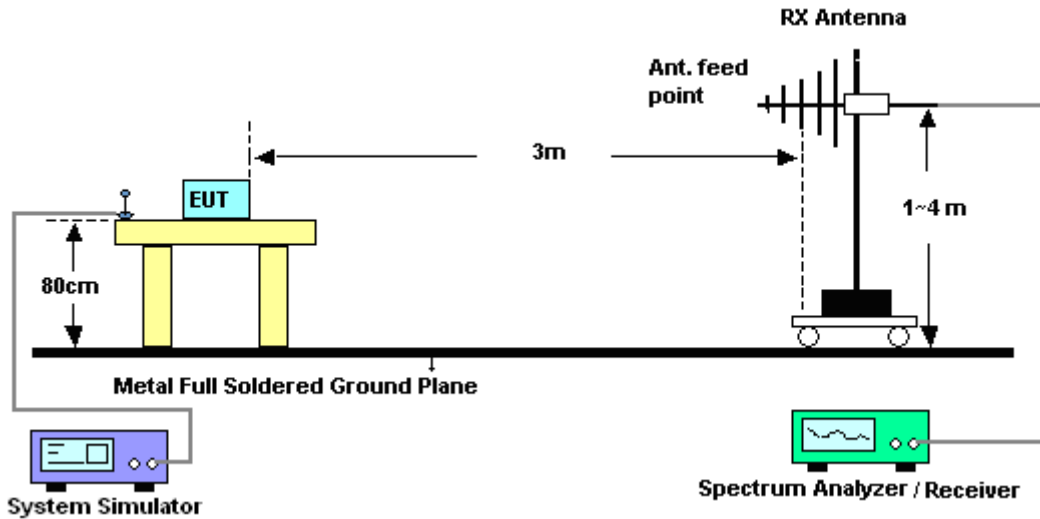
$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

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

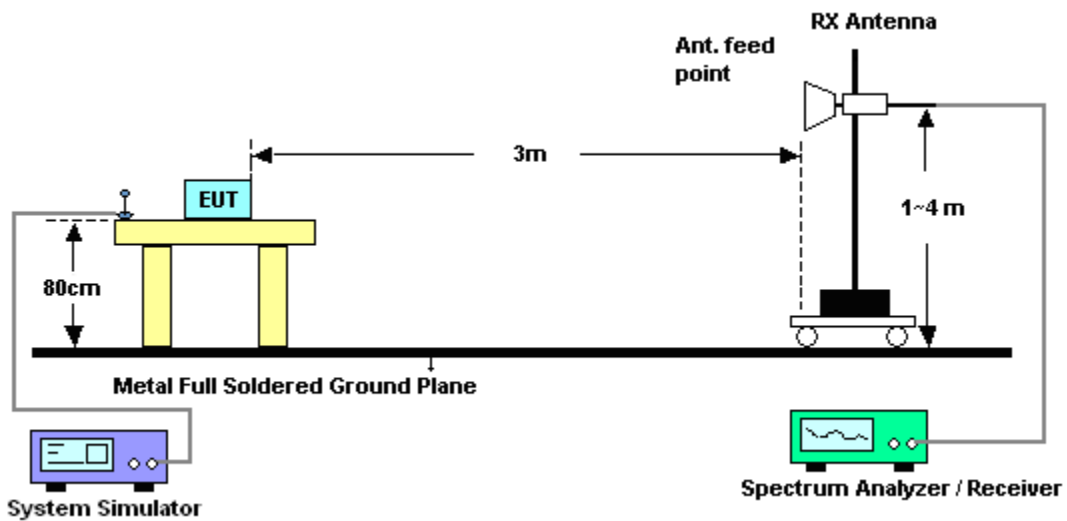
11. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
12. $\text{ERP (dBm)} = \text{EIRP} - 2.15$

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℃			
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic 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	-43.78	-13	-30.78	-52.97	-50.16	0.78	7.16	H	Pass
5640	-48.30	-13	-35.30	-59.86	-56.84	1.04	9.58	H	Pass
7518	-35.11	-13	-22.11	-52.49	-45.22	1.35	11.46	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 :	Star Wei				Polarization :		Vertical		
Remark :	Spurious emissions within 30-10th harmonic 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)	Reading	Power	loss	Gain	(H/V)	
				(dBm)	(dBm)	(dB)	(dBi)		
3759	-41.80	-13	-28.80	-52.94	-48.18	0.78	7.16	V	Pass
5638	-54.45	-13	-41.45	-67.1	-62.99	1.04	9.58	V	Pass
7518	-45.39	-13	-32.39	-60.31	-55.50	1.35	11.46	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 :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3756	-44.34	-13	-31.34	-53.41	-50.72	0.78	7.16	H	Pass
5636	-55.69	-13	-42.69	-65.75	-64.23	1.04	9.58	H	Pass
7515	-41.14	-13	-28.14	-56.95	-51.25	1.35	11.46	H	Pass

Band :	LTE Band 2				Temperature :	22~23℃			
Test Mode :	3MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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	-42.59	-13	-29.59	-53.61	-48.97	0.78	7.16	V	Pass
5637	-50.85	-13	-37.85	-63.5	-59.39	1.04	9.58	V	Pass
7515	-49.20	-13	-36.20	-63.29	-59.31	1.35	11.46	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 :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3756	-43.26	-13	-30.26	-52.49	-49.64	0.78	7.16	H	Pass
5634	-54.47	-13	-41.47	-64.53	-63.01	1.04	9.58	H	Pass
7512	-40.79	-13	-27.79	-56.73	-50.90	1.35	11.46	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 :	Star Wei	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic 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	-42.11	-13	-29.11	-53.18	-48.49	0.78	7.16	V	Pass
5634	-47.77	-13	-34.77	-61.58	-56.31	1.04	9.58	V	Pass
7512	-49.15	-13	-36.15	-63.24	-59.26	1.35	11.46	V	Pass



Band :	LTE Band 2				Temperature :	22~23℃			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic 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	-38.71	-13	-25.71	-48.71	-45.09	0.78	7.16	H	Pass
5628	-51.71	-13	-38.71	-61.84	-60.25	1.04	9.58	H	Pass
7503	-40.52	-13	-27.52	-56.51	-50.63	1.35	11.46	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 :	Star Wei	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic 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)	
3750	-40.59	-13	-27.59	-52.05	-46.97	0.78	7.16	V	Pass
5628	-52.42	-13	-39.42	-65.07	-60.96	1.04	9.58	V	Pass
7503	-48.57	-13	-35.57	-62.66	-58.68	1.35	11.46	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 :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3747	-41.29	-13	-28.29	-50.87	-47.67	0.78	7.16	H	Pass
5622	-45.87	-13	-32.87	-58.51	-54.41	1.04	9.58	H	Pass
7494	-39.52	-13	-26.52	-55.68	-49.63	1.35	11.46	H	Pass

Band :	LTE Band 2				Temperature :	22~23℃			
Test Mode :	15MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3747	-38.87	-13	-25.87	-50.64	-45.25	0.78	7.16	V	Pass
5622	-44.42	-13	-31.42	-59.19	-52.96	1.04	9.58	V	Pass
7494	-47.95	-13	-34.95	-62.04	-58.06	1.35	11.46	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 :	Star Wei					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic 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)	
3741	-39.52	-13	-26.52	-49.38	-45.90	0.78	7.16	H	Pass
5610	-57.36	-13	-44.36	-67.42	-65.90	1.04	9.58	H	Pass
7485	-37.95	-13	-24.95	-54.59	-48.06	1.35	11.46	H	Pass

Band :	LTE Band 2				Temperature :	22~23℃			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3741	-40.97	-13	-27.97	-52.34	-47.35	0.78	7.16	V	Pass
5610	-55.32	-13	-42.32	-67.97	-63.86	1.04	9.58	V	Pass
7485	-44.67	-13	-31.67	-59.91	-54.78	1.35	11.46	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 :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic 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)	
3464	-62.12	-13	-49.12	-64.35	-67.52	2.2	7.60	H	Pass
5196	-45.94	-13	-32.94	-59.96	-52.72	3.12	9.90	H	Pass
6930	-55.61	-13	-42.61	-63.90	-63.50	2.98	10.87	H	Pass
8661	-51.88	-13	-38.88	-62.83	-61.37	2.97	12.46	H	Pass

Band :	LTE Band 4				Temperature :	22~23℃			
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3464	-64.20	-13	-51.20	-65.22	-69.60	2.2	7.6	V	Pass
5196	-46.00	-13	-33.00	-58.25	-52.78	3.12	9.9	V	Pass
6930	-52.17	-13	-39.17	-62.69	-60.06	2.98	10.87	V	Pass
8661	-43.20	-13	-30.20	-57.5	-52.69	2.97	12.46	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 :	Star Wei					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic 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)	(dBm)	(dB)	(dBm)	(dBm)	(dBm)	(dB)	(dBi)		
3462	-60.71	-13	-47.71	-62.94	-66.11	2.2	7.60	H	Pass
5196	-43.24	-13	-30.24	-58.42	-50.02	3.12	9.90	H	Pass
6924	-54.90	-13	-41.90	-63.19	-62.79	2.98	10.87	H	Pass
8658	-51.27	-13	-38.27	-62.22	-60.76	2.97	12.46	H	Pass

Band :	LTE Band 4				Temperature :	22~23℃			
Test Mode :	3MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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	-63.59	-13	-50.59	-64.61	-68.99	2.2	7.6	V	Pass
5196	-46.13	-13	-33.13	-58.32	-52.91	3.12	9.9	V	Pass
6924	-52.97	-13	-39.97	-63.49	-60.86	2.98	10.87	V	Pass
8658	-45.00	-13	-32.00	-58.51	-54.49	2.97	12.46	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 :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic 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)	Reading	Power	loss	Gain	(H/V)	
3640	-65.33	-13	-52.33	-67.56	-70.73	2.2	7.60	H	Pass
5193	-47.11	-13	-34.11	-60.64	-53.89	3.12	9.90	H	Pass
6921	-53.47	-13	-40.47	-62.01	-61.36	2.98	10.87	H	Pass
8655	-52.86	-13	-39.86	-63.81	-62.35	2.97	12.46	H	Pass

Band :	LTE Band 4				Temperature :	22~23℃			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3460	-63.24	-13	-50.24	-64.26	-68.64	2.2	7.6	V	Pass
5193	-47.17	-13	-34.17	-58.92	-53.95	3.12	9.9	V	Pass
6921	-52.93	-13	-39.93	-63.45	-60.82	2.98	10.87	V	Pass
8655	-47.97	-13	-34.97	-60.12	-57.46	2.97	12.46	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 :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic 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)	Reading	Power	loss	Gain	(H/V)	
3456	-62.61	-13	-49.61	-64.84	-68.01	2.2	7.60	H	Pass
5184	-34.23	-13	-21.23	-51.13	-41.01	3.12	9.90	H	Pass
6912	-54.79	-13	-41.79	-63.08	-62.68	2.98	10.87	H	Pass
8652	-55.03	-13	-42.03	-65.98	-64.52	2.97	12.46	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 :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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	-64.28	-13	-51.28	-65.3	-69.68	2.2	7.6	V	Pass
5184	-36.35	-13	-23.35	-51.15	-43.13	3.12	9.9	V	Pass
6912	-52.98	-13	-39.98	-63.5	-60.87	2.98	10.87	V	Pass
8643	-47.62	-13	-34.62	-59.87	-57.11	2.97	12.46	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 :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic 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)	Reading	Power	loss	Gain	(H/V)	
3450	-61.43	-13	-48.43	-63.66	-66.83	2.2	7.60	H	Pass
5178	-45.58	-13	-32.58	-59.76	-52.36	3.12	9.90	H	Pass
6903	-56.85	-13	-43.85	-65.14	-64.74	2.98	10.87	H	Pass
8631	-53.80	-13	-40.80	-64.75	-63.29	2.97	12.46	H	Pass

Band :	LTE Band 4	Temperature :	22~23℃						
Test Mode :	15MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Star Wei	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic 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	-64.66	-13	-51.66	-65.68	-70.06	2.2	7.6	V	Pass
5178	-47.00	-13	-34.00	-58.77	-53.78	3.12	9.9	V	Pass
6900	-56.01	-13	-43.01	-66.53	-63.90	2.98	10.87	V	Pass
8631	-50.83	-13	-37.83	-61.98	-60.32	2.97	12.46	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 :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic 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)	Reading	Power	loss	Gain	(H/V)	
3447	-62.39	-13	-49.39	-64.62	-67.79	2.2	7.60	H	Pass
5172	-43.79	-13	-30.79	-58.76	-50.57	3.12	9.90	H	Pass
6891	-58.95	-13	-45.95	-67.24	-66.84	2.98	10.87	H	Pass
8612	-54.88	-13	-41.88	-65.83	-64.37	2.97	12.46	H	Pass

Band :	LTE Band 4				Temperature :	22~23℃			
Test Mode :	20MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic 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)	
3445	-65.17	-13	-52.17	-66.19	-70.57	2.2	7.6	V	Pass
5172	-46.11	-13	-33.11	-58.31	-52.89	3.12	9.9	V	Pass
6890	-56.66	-13	-43.66	-67.18	-64.55	2.98	10.87	V	Pass
8619	-50.92	-13	-37.92	-62.07	-60.41	2.97	12.46	V	Pass



Band :	LTE Band 5	Temperature :	22~23°C						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Star Wei	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1672	-75.71	-13	-62.71	-66.83	-76.36	0.57	3.37	H	Pass
2510	-57.81	-13	-44.81	-58.01	-60.04	0.78	5.16	H	Pass
3344	-66.49	-13	-53.49	-66.12	-70.13	0.87	6.66	H	Pass

Band :	LTE Band 5	Temperature :	22~23°C						
Test Mode :	1.4MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Star Wei	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)		
1671	-68.96	-13	-55.96	-65.16	-69.61	0.57	3.37	V	Pass
2510	-42.55	-13	-29.55	-51.26	-44.78	0.78	5.16	V	Pass
3344	-65.27	-13	-52.27	-66.33	-68.91	0.87	6.66	V	Pass



Band :	LTE Band 5					Temperature :	22~23℃		
Test Mode :	3MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Star Wei					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1670	-75.59	-13	-62.59	-66.71	-76.24	0.57	3.37	H	Pass
2506	-63.31	-13	-50.31	-61.98	-65.54	0.78	5.16	H	Pass
3340	-66.77	-13	-53.77	-66.40	-70.41	0.87	6.66	H	Pass

Band :	LTE Band 5					Temperature :	22~23°C		
Test Mode :	3MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Star Wei					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1670	-69.64	-13	-56.64	-65.84	-70.29	0.57	3.37	V	Pass
2506	-39.91	-13	-26.91	-49.02	-42.14	0.78	5.16	V	Pass
3340	-64.06	-13	-51.06	-65.12	-67.70	0.87	6.66	V	Pass



Band :	LTE Band 5				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1668	-75.22	-13	-62.22	-66.34	-75.87	0.57	3.37	H	Pass
2504	-63.96	-13	-50.96	-62.63	-66.19	0.78	5.16	H	Pass
3336	-66.17	-13	-53.17	-65.80	-69.81	0.87	6.66	H	Pass

Band :	LTE Band 5				Temperature :	22~23℃			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1668	-69.76	-13	-56.76	-65.96	-70.41	0.57	3.37	V	Pass
2504	-52.75	-13	-39.75	-58.76	-54.98	0.78	5.16	V	Pass
3336	-64.97	-13	-51.97	-66.03	-68.61	0.87	6.66	V	Pass



Band :	LTE Band 5				Temperature :	22~23℃			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1663	-74.48	-13	-61.48	-65.60	-75.13	0.57	3.37	H	Pass
2498	-60.04	-13	-47.04	-58.87	-62.27	0.78	5.16	H	Pass
3326	-66.75	-13	-53.75	-66.38	-70.39	0.87	6.66	H	Pass

Band :	LTE Band 5	Temperature :	22~23°C						
Test Mode :	10MHz QPSK RB Size 1 Offset 0	Relative Humidity :	42~43%						
Test Engineer :	Star Wei	Polarization :	Vertical						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1663	-69.10	-13	-56.10	-65.30	-69.75	0.57	3.37	V	Pass
2498	-44.42	-13	-31.42	-52.84	-46.65	0.78	5.16	V	Pass
3326	-65.36	-13	-52.36	-66.42	-69.00	0.87	6.66	V	Pass



Band :	LTE Band 17				Temperature :	22~23°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	42~43%			
Test Engineer :	Star Wei				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1416	-67.26	-13	-54.26	-59.11	-67.91	0.57	3.37	H	Pass
2124	-44.16	-13	-31.16	-47.89	-46.39	0.78	5.16	H	Pass
2820	-67.79	-13	-54.79	-67.42	-71.43	0.87	6.66	H	Pass

Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	5MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Star Wei					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1410	-70.61	-13	-57.61	-66.81	-71.26	0.57	3.37	V	Pass
2124	-50.05	-13	-37.05	-56.88	-52.28	0.78	5.16	V	Pass
2820	-66.30	-13	-53.30	-67.36	-69.94	0.87	6.66	V	Pass



Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Star Wei					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1410	-70.02	-13	-57.02	-61.14	-70.67	0.57	3.37	H	Pass
2118	-44.50	-13	-31.50	-48.15	-46.73	0.78	5.16	H	Pass
2820	-66.66	-13	-53.66	-66.29	-70.30	0.87	6.66	H	Pass

Band :	LTE Band 17					Temperature :	22~23°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	42~43%		
Test Engineer :	Star Wei					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	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)	
1474	-68.20	-13	-55.20	-64.40	-68.85	0.57	3.37	V	Pass
2118	-52.35	-13	-39.35	-58.42	-54.58	0.78	5.16	V	Pass
2820	-66.69	-13	-53.69	-67.75	-70.33	0.87	6.66	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.

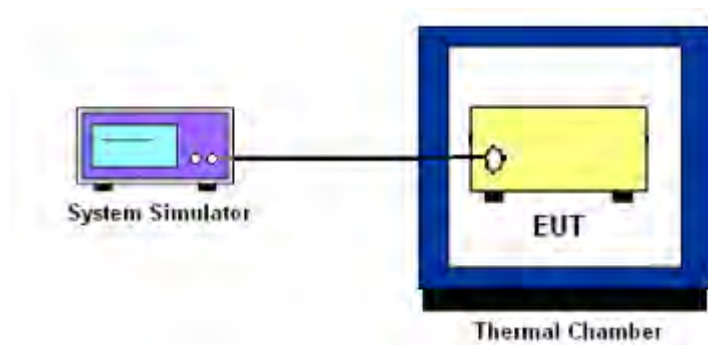
3.8.3 Test Procedures for Temperature Variation

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°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°C step up to 50°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)

Band :	LTE Band 2 (QPSK)	Limit (ppm) :	2.5
Temperature (°C)	BW 10MHz	Deviation (ppm)	Result
50		+0.0010	PASS
40		+0.0051	
30		+0.0103	
20(Ref.)		+0.0001	
10		+0.0033	
0		+0.0093	
-10		+0.0010	
-20		+0.0011	
-30		+0.0072	

Band :	LTE Band 4 (QPSK)	Limit (ppm) :	2.5
Temperature (°C)	BW 10MHz	Deviation (ppm)	Result
50		+0.0013	PASS
40		+0.0054	
30		+0.0026	
20(Ref.)		+0.0001	
10		+0.0125	
0		+0.0085	
-10		+0.0081	
-20		+0.0066	
-30		+0.0056	



Band :	LTE Band 5 (QPSK)	Limit (ppm) :	2.5
Temperature (°C)	BW 10MHz	Result	
	Deviation (ppm)		
50	+0.0225	PASS	
40	+0.0196		
30	+0.0013		
20(Ref.)	+0.0001		
10	+0.0176		
0	+0.0093		
-10	+0.0227		
-20	+0.0139		
-30	+0.0047		

Band :	LTE Band 17 (QPSK)	Limit (ppm) :	2.5
Temperature (°C)	BW 10MHz	Result	
	Deviation (ppm)		
50	+0.0056	PASS	
40	+0.0289		
30	+0.0273		
20(Ref.)	+0.0001		
10	+0.0052		
0	+0.0025		
-10	+0.0055		
-20	+0.0301		
-30	+0.0231		

3.8.7 Test Result of Voltage Variation (FCC)

Band	Bandwidth	Voltage (Volt)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 2	10M	4.35	+0.0075	2.5	PASS
		Normal	+0.0026		
		3.5	+0.0010		
LTE Band 4	10M	4.35	+0.0033		
		Normal	+0.0020		
		3.5	+0.0040		
LTE Band 5	10M	4.35	+0.0219		
		Normal	+0.0161		
		3.5	+0.0243		
LTE Band 17	10M	4.35	+0.0249		
		Normal	+0.0263		
		3.5	+0.0161		

Remark:

1. Normal Voltage = 3.8V.
2. The manufacturer declared that the EUT could work properly between voltage 3.5V ~ 4.35V.



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	Aug. 04, 2014~ Aug. 17, 2014	May 03, 2015	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Dec. 10, 2013	Aug. 04, 2014~ Aug. 17, 2014	Dec. 09, 2014	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	Aug. 10, 2014~ Aug. 18, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Aug. 10, 2014~ Aug. 18, 2014	May 03, 2015	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	Aug. 10, 2014~ Aug. 18, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 08, 2014	Aug. 10, 2014~ Aug. 18, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	Aug. 10, 2014~ Aug. 18, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 10, 2014	Aug. 10, 2014~ Aug. 18, 2014	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	Aug. 10, 2014~ Aug. 18, 2014	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Dec. 10, 2013	Aug. 10, 2014~ Aug. 18, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 10, 2014~ Aug. 18, 2014	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 10, 2014~ Aug. 18, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 10, 2014~ Aug. 18, 2014	NCR	Radiation (03CH01-KS)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 04, 2014	Aug. 14, 2014	May 03, 2015	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY42005452	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY42000841	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002573	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002586	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10MHz~2.5GHz	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	Aug. 14, 2014	N/A	ERP/EIRP (OTA01-KS)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.9
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