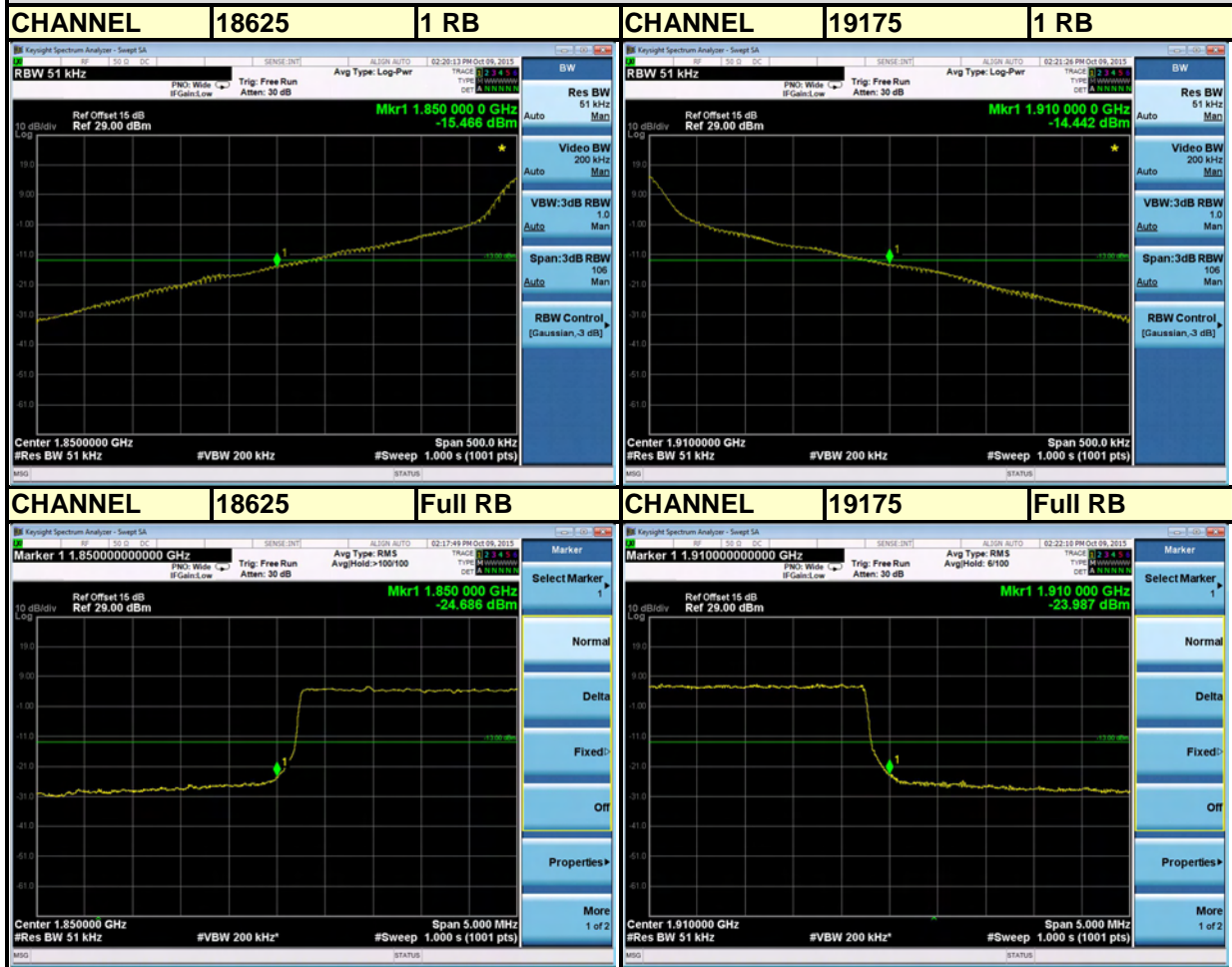


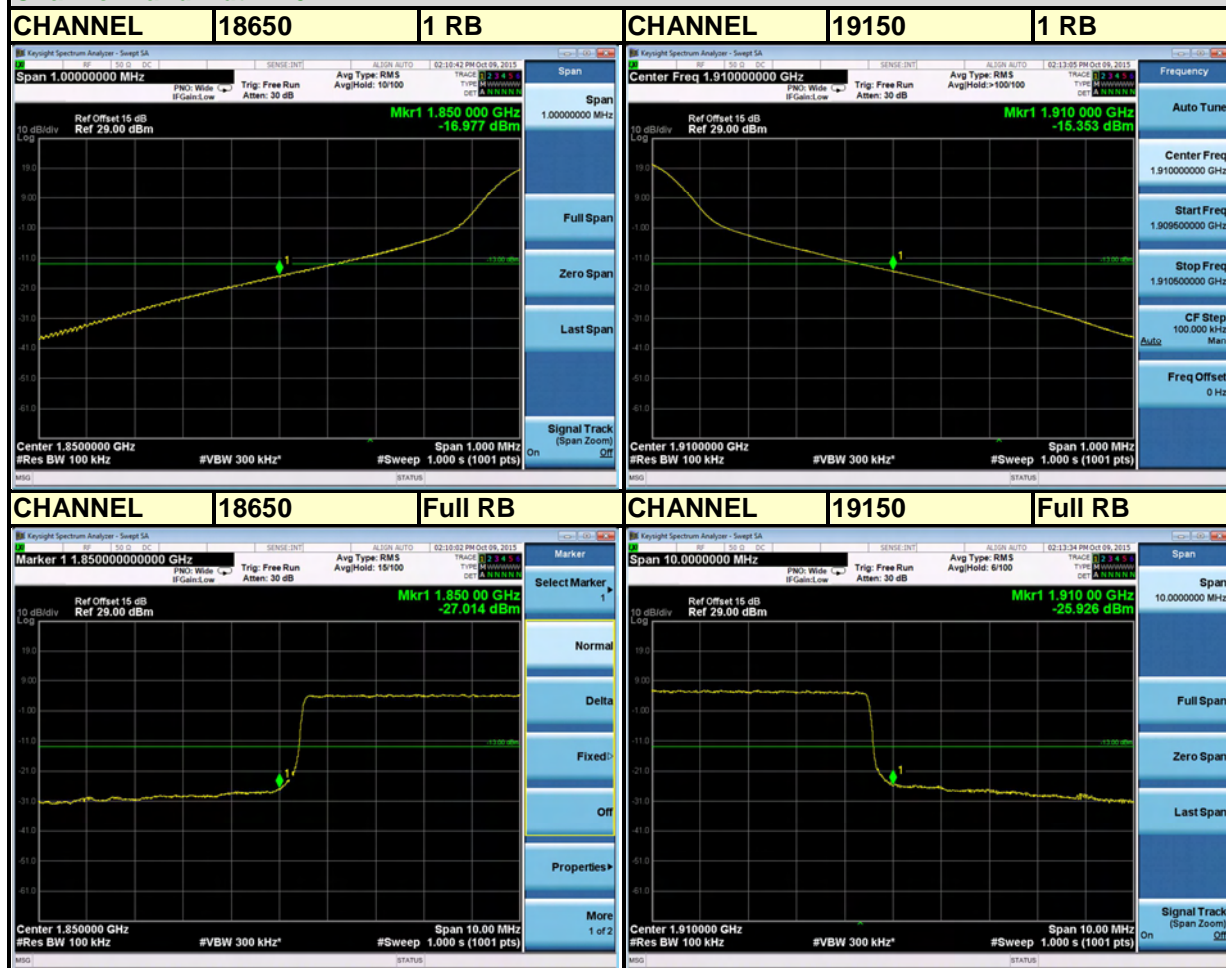
## LTE BAND 2

### Channel Bandwidth: 5MHz



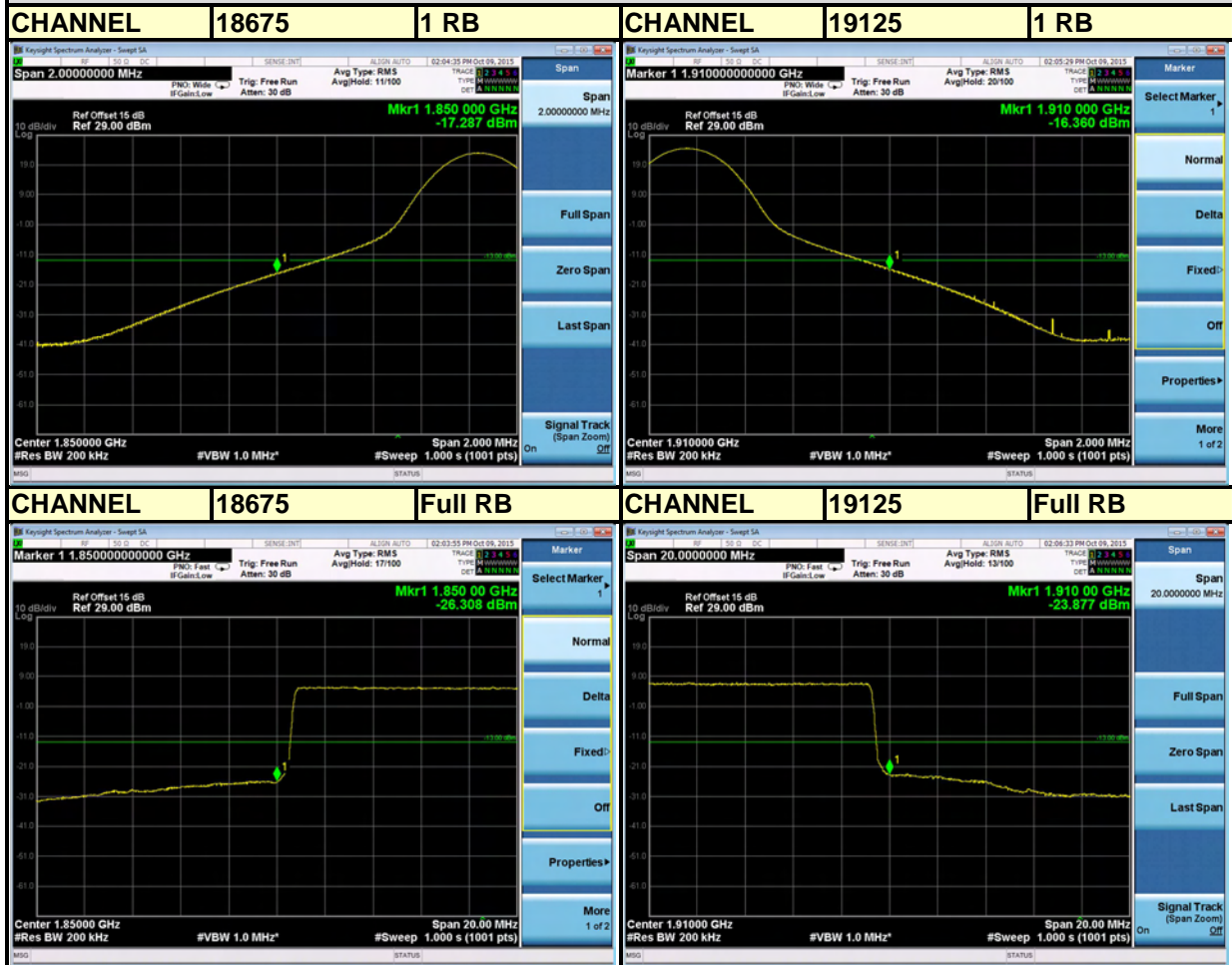
## LTE BAND 2

### Channel Bandwidth: 10MHz



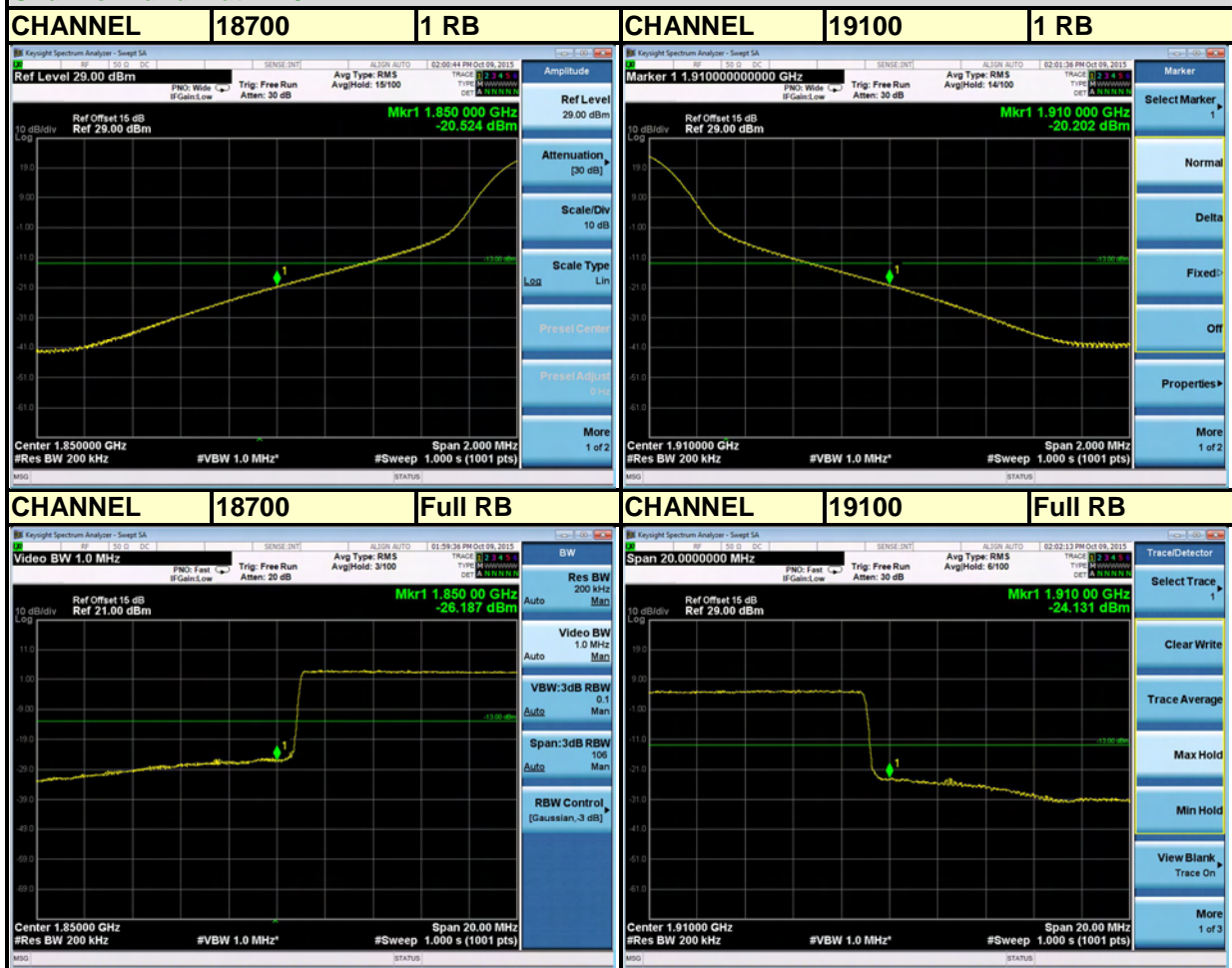
## LTE BAND 2

### Channel Bandwidth: 15MHz



## LTE BAND 2

### Channel Bandwidth: 20MHz

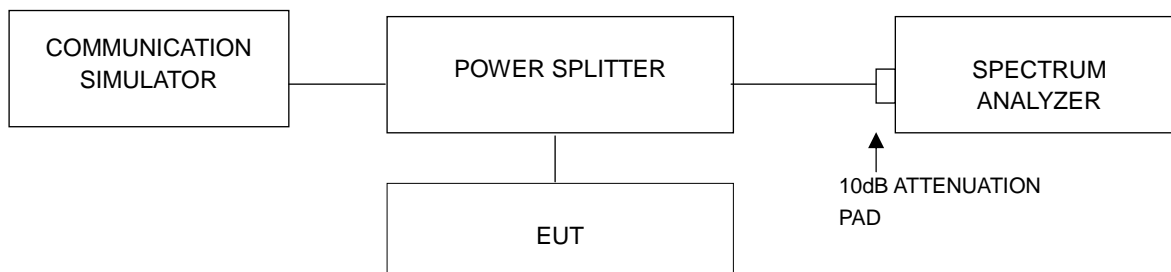


## 4.5 Peak To Average Ratio

### 4.5.1 Limits of Peak To Average Ratio Measurement

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

### 4.5.2 Test Setup

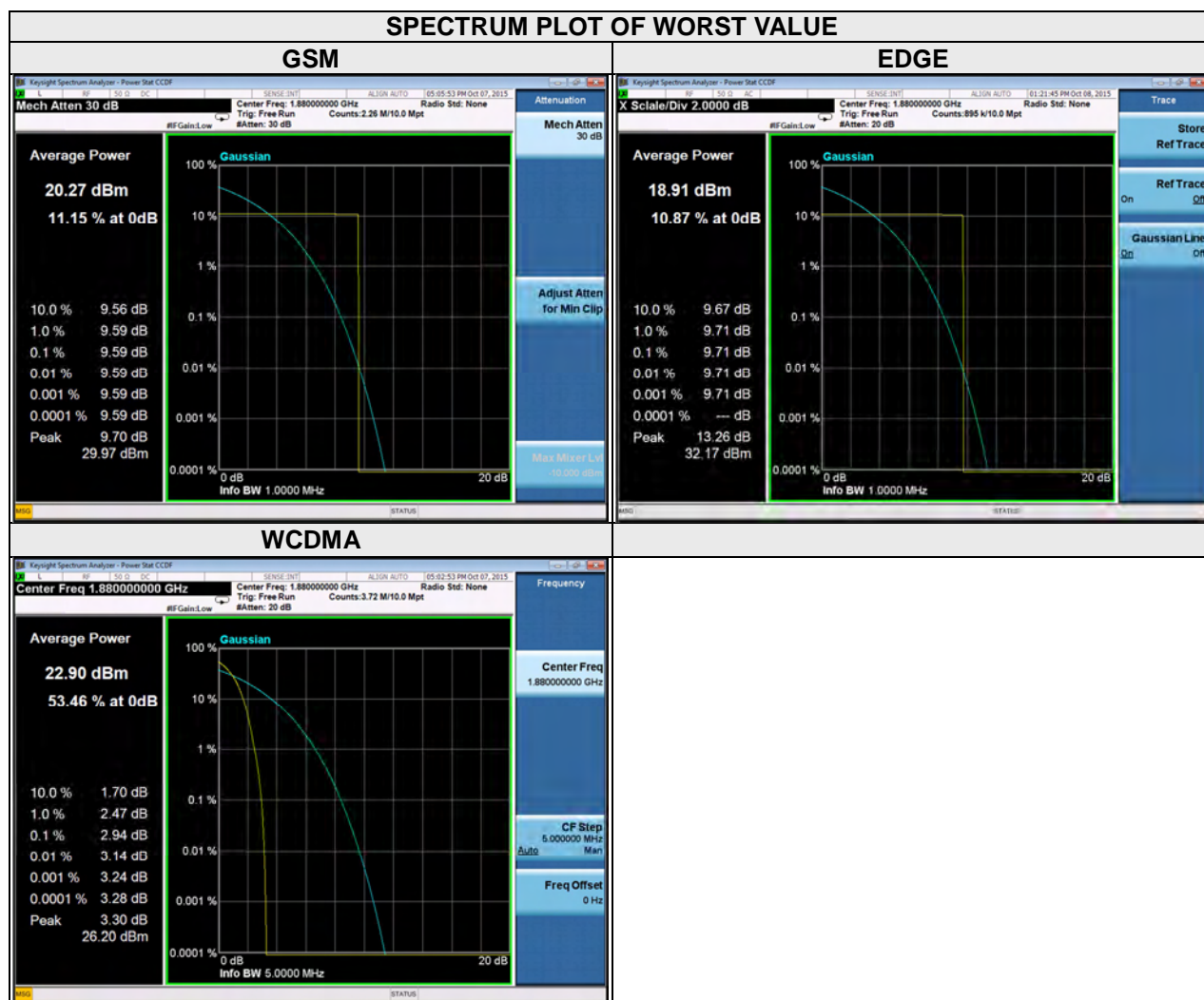


### 4.5.3 Test Procedures

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

#### 4.5.4 Test Results

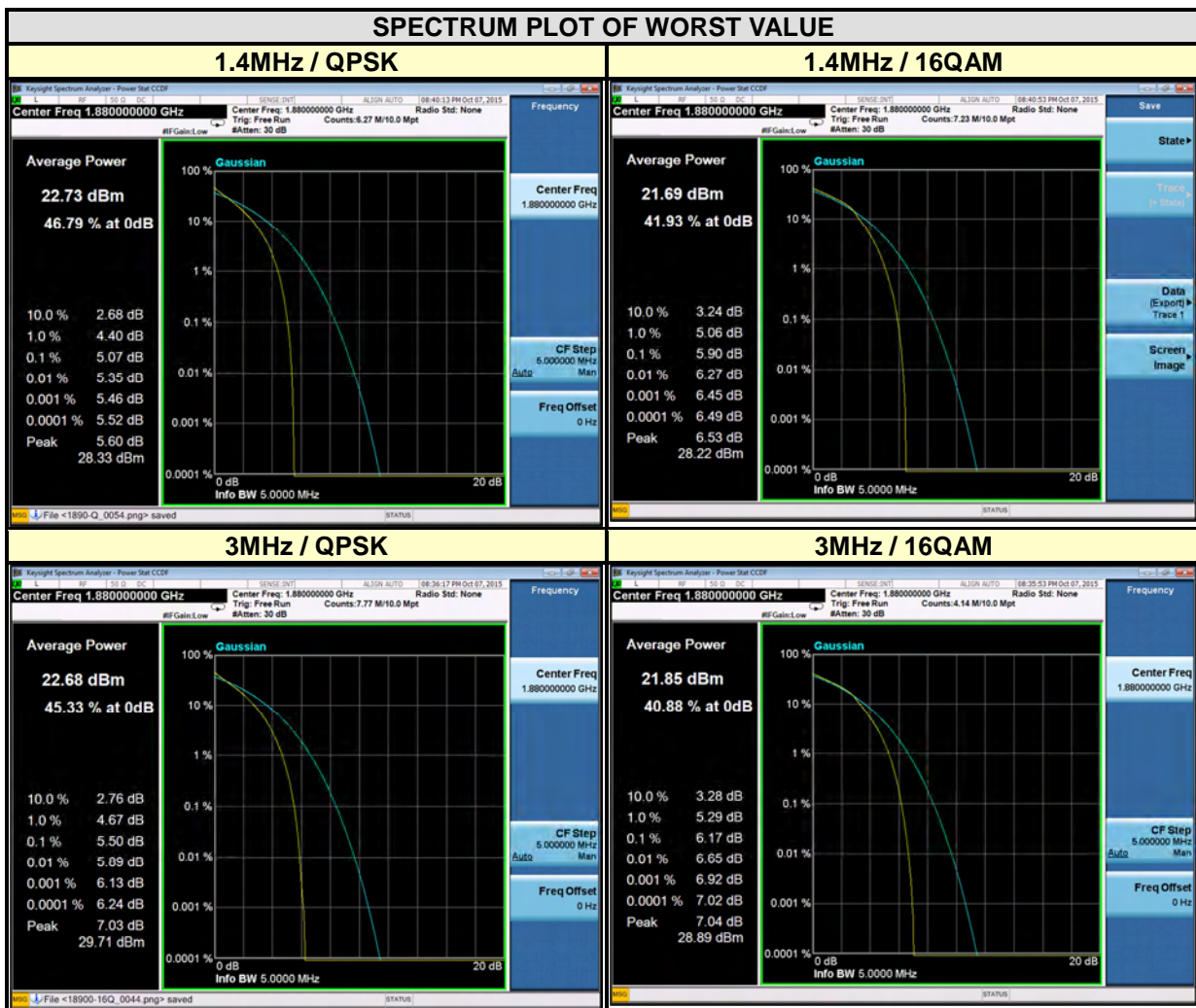
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Channel	Frequency (MHz)	Peak To Average Ratio (dB)
		GSM	EDGE			WCDMA
661	1880.0	9.59	9.71	9400	1880.0	2.94



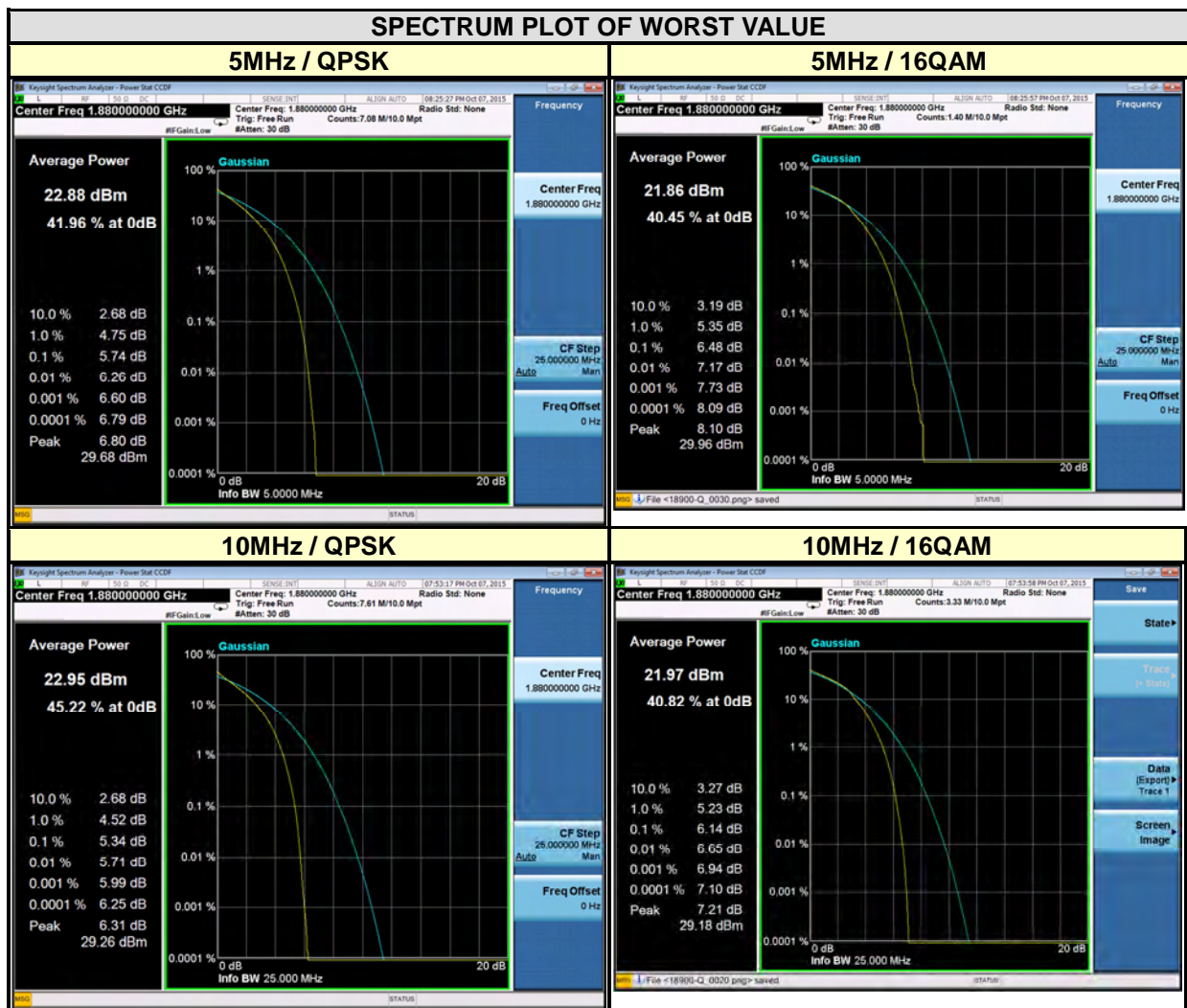


## LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	4.21	5.07	18615	1851.5	4.55	5.37
18900	1880	5.07	5.90	18900	1880	5.50	6.17
19193	1909.3	4.61	5.47	19185	1908.5	5.03	5.86

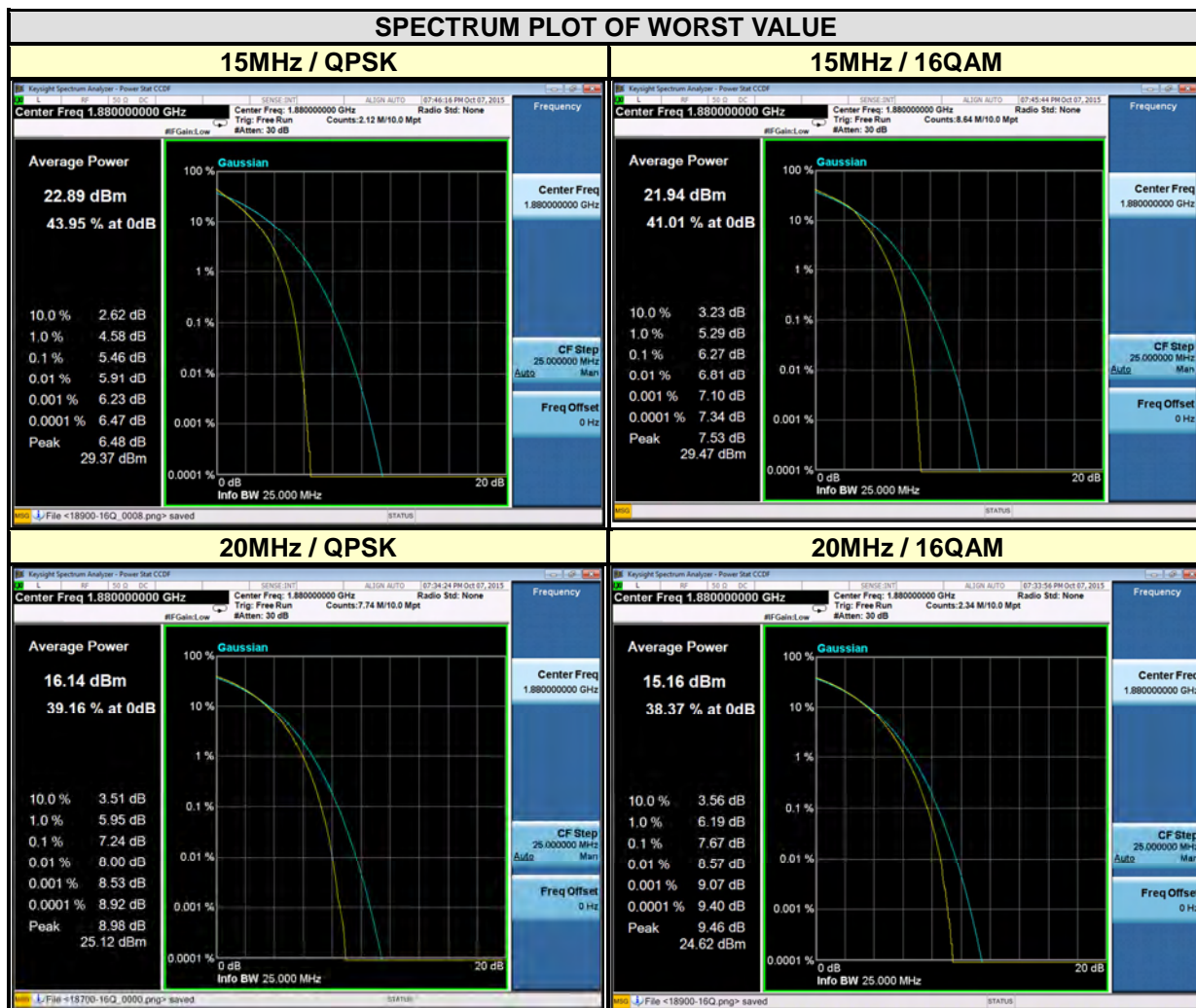


CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	5.08	5.83	18650	1855	4.82	5.64
18900	1880	5.74	6.48	18900	1880	5.34	6.14
19175	1907.5	5.51	6.33	19150	1905	5.03	5.94





CHANNEL BANDWIDTH: 15MHz				CHANNEL BANDWIDTH: 20MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	5.19	5.98	18700	1860	7.24	7.67
18900	1880	5.46	6.27	18900	1880	5.53	6.36
19125	1902.5	5.34	6.22	19100	1900	5.45	6.30

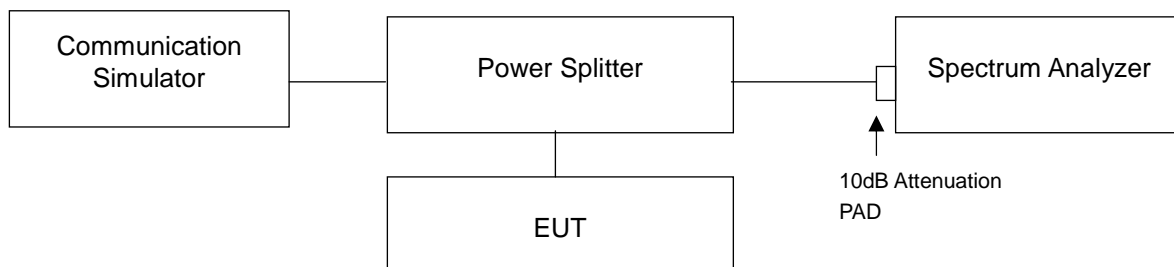


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

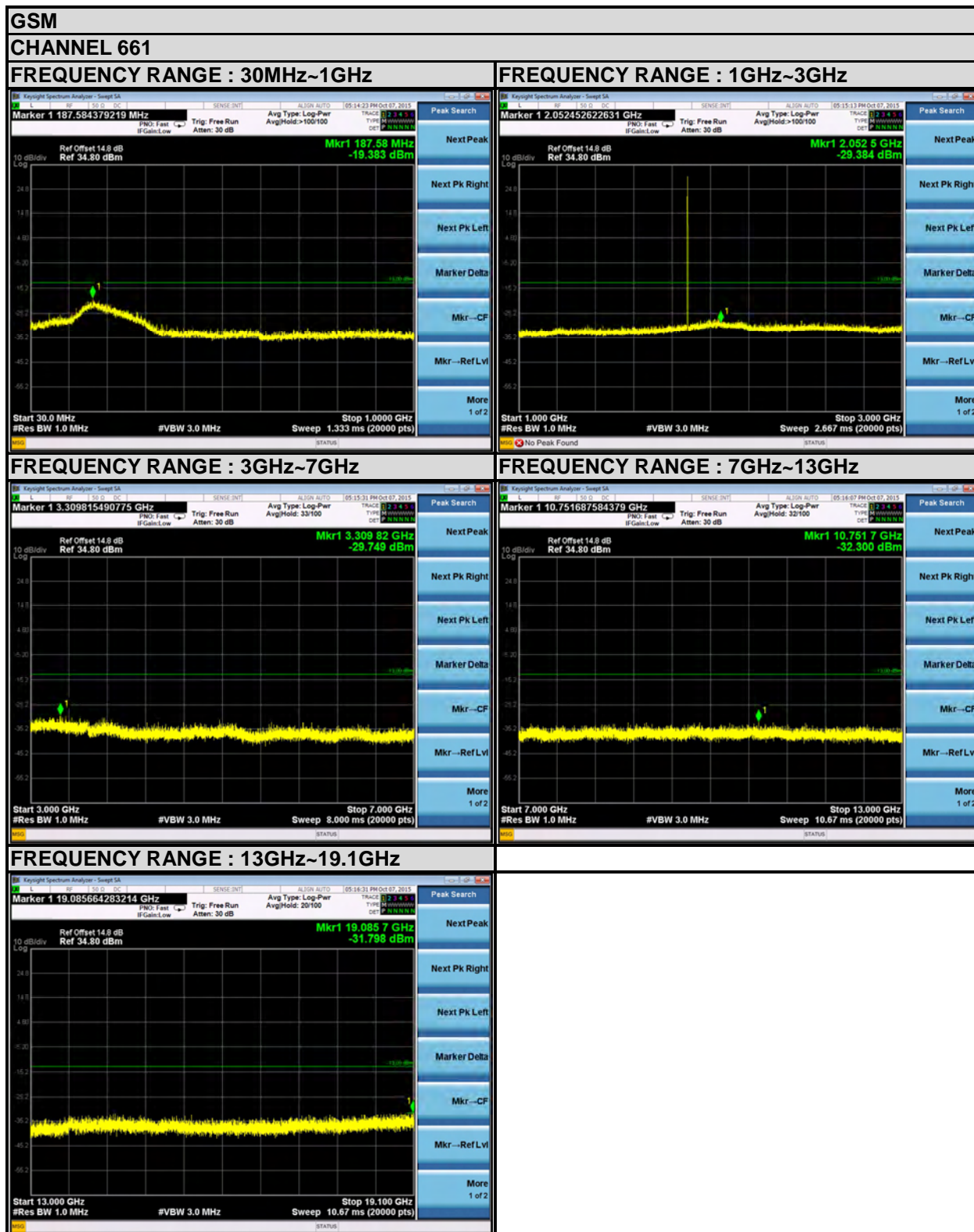
### 4.6.2 Test Setup



### 4.6.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

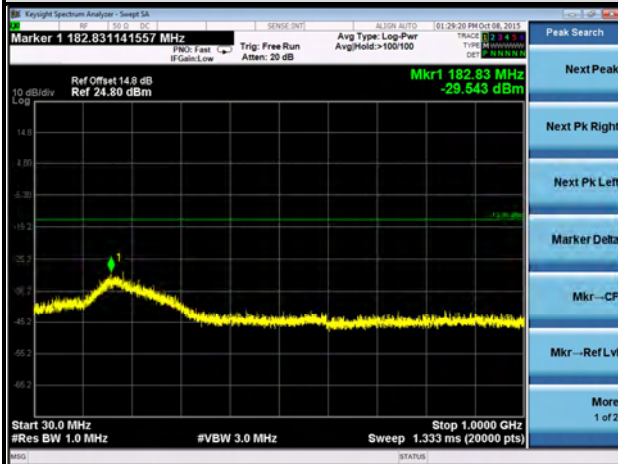
#### 4.6.4 Test Results



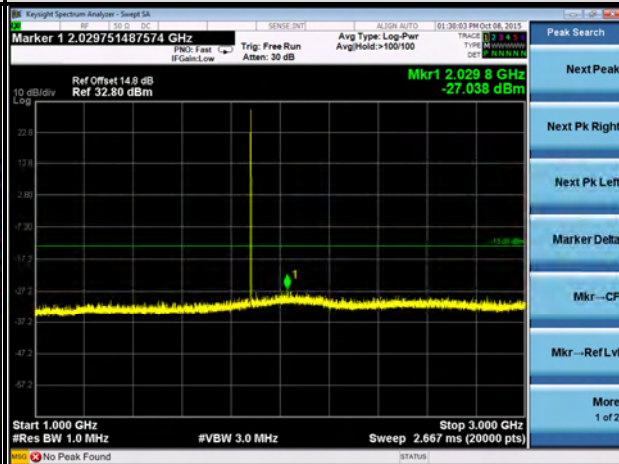
# EDGE

## CHANNEL 512

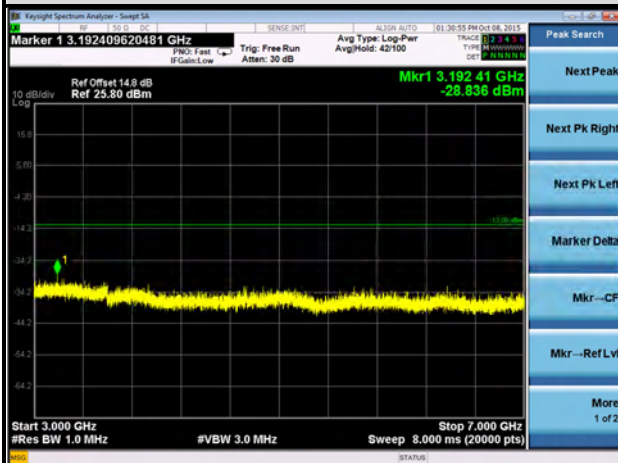
### FREQUENCY RANGE : 30MHz~1GHz



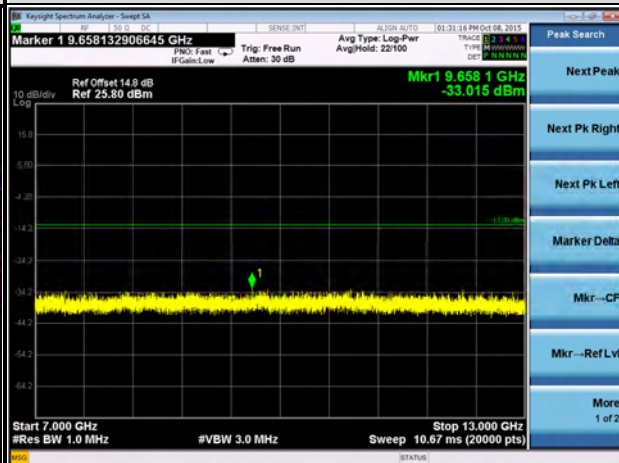
### FREQUENCY RANGE : 1GHz~3GHz



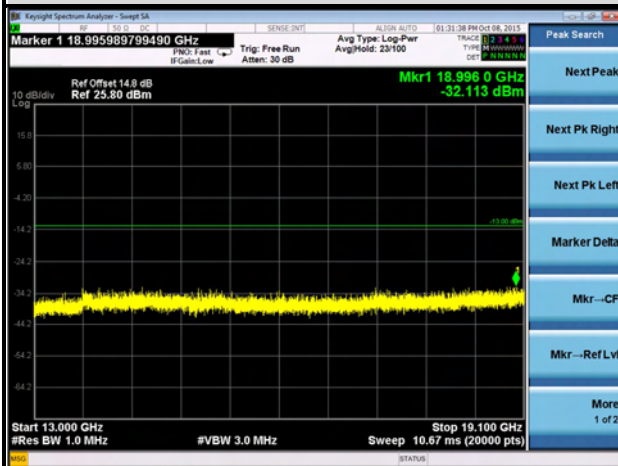
### FREQUENCY RANGE : 3GHz~7GHz



### FREQUENCY RANGE : 7GHz~13GHz



### FREQUENCY RANGE : 13GHz~19.1GHz

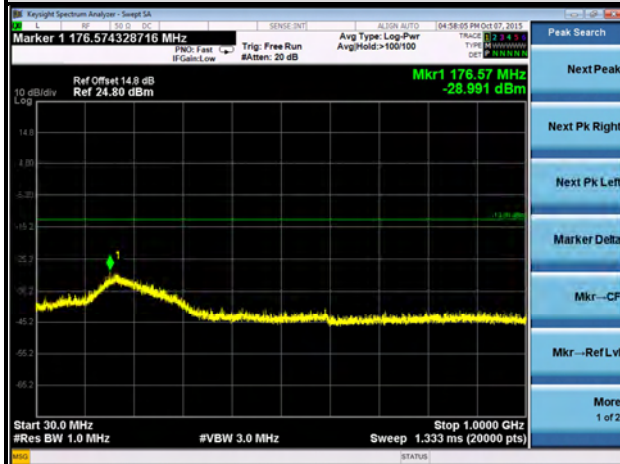




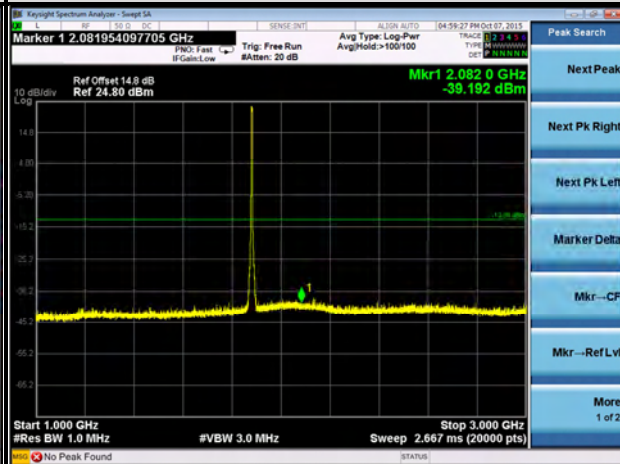
# WCDMA

## CHANNEL 9400

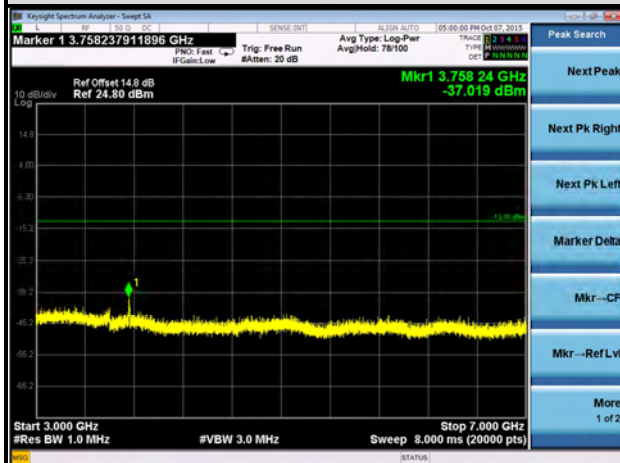
### FREQUENCY RANGE : 30MHz~1GHz



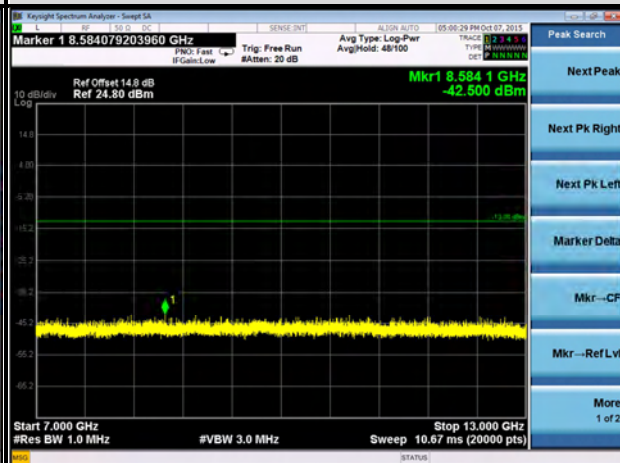
### FREQUENCY RANGE : 1GHz~3GHz



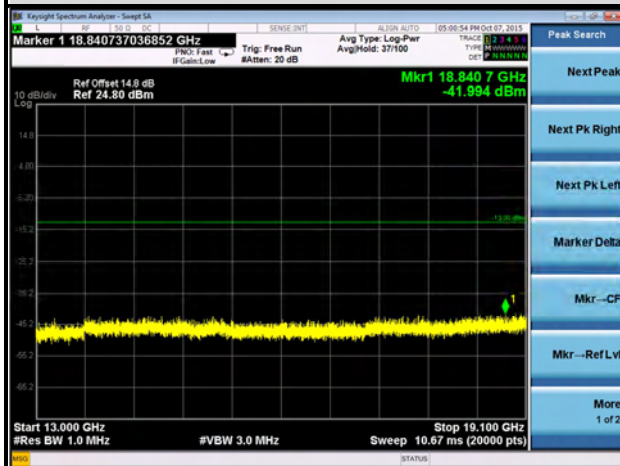
### FREQUENCY RANGE : 3GHz~7GHz



### FREQUENCY RANGE : 7GHz~13GHz

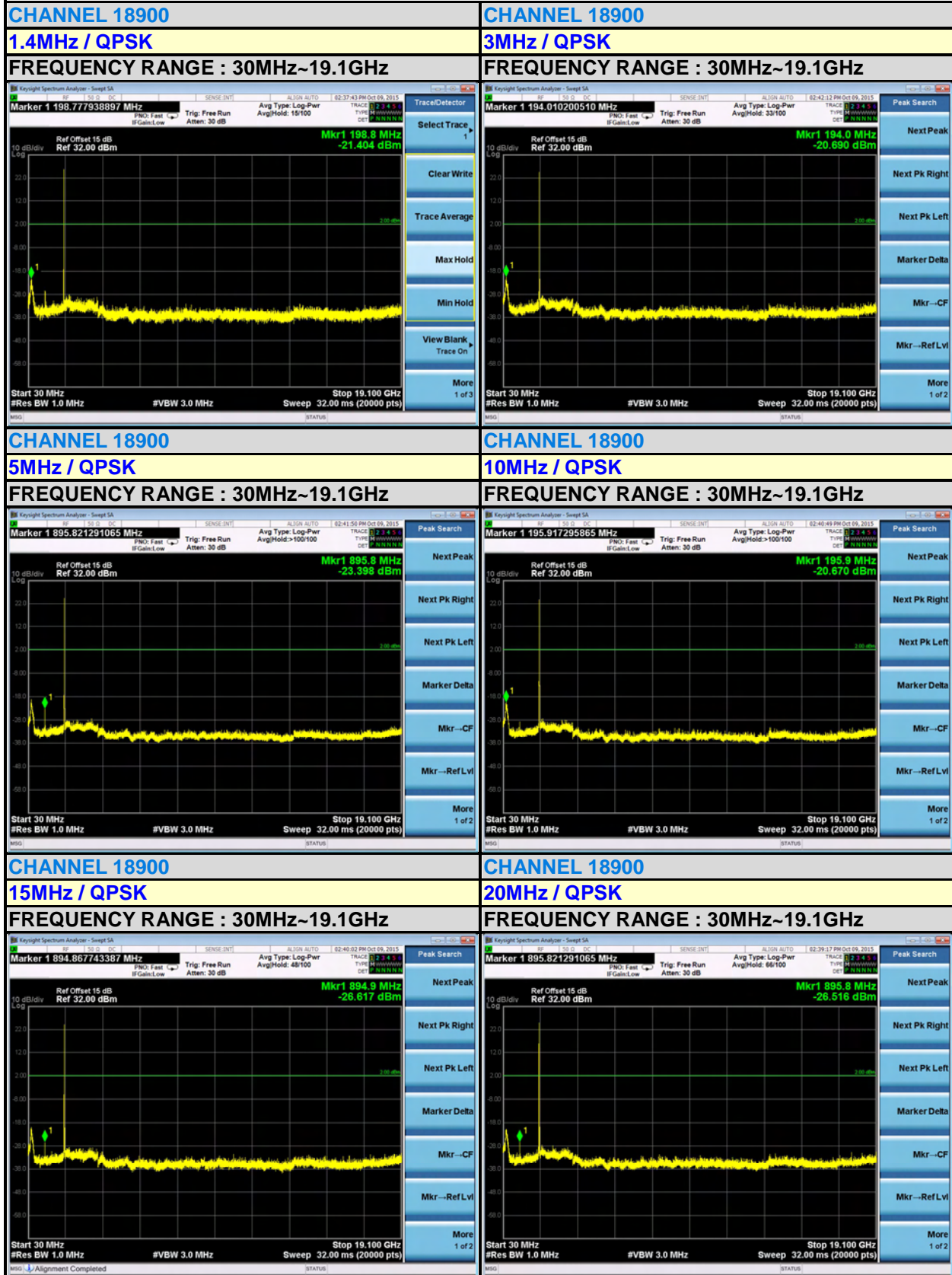


### FREQUENCY RANGE : 13GHz~19.1GHz





## LTE BAND 2



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

### 4.7.2 Test Procedure

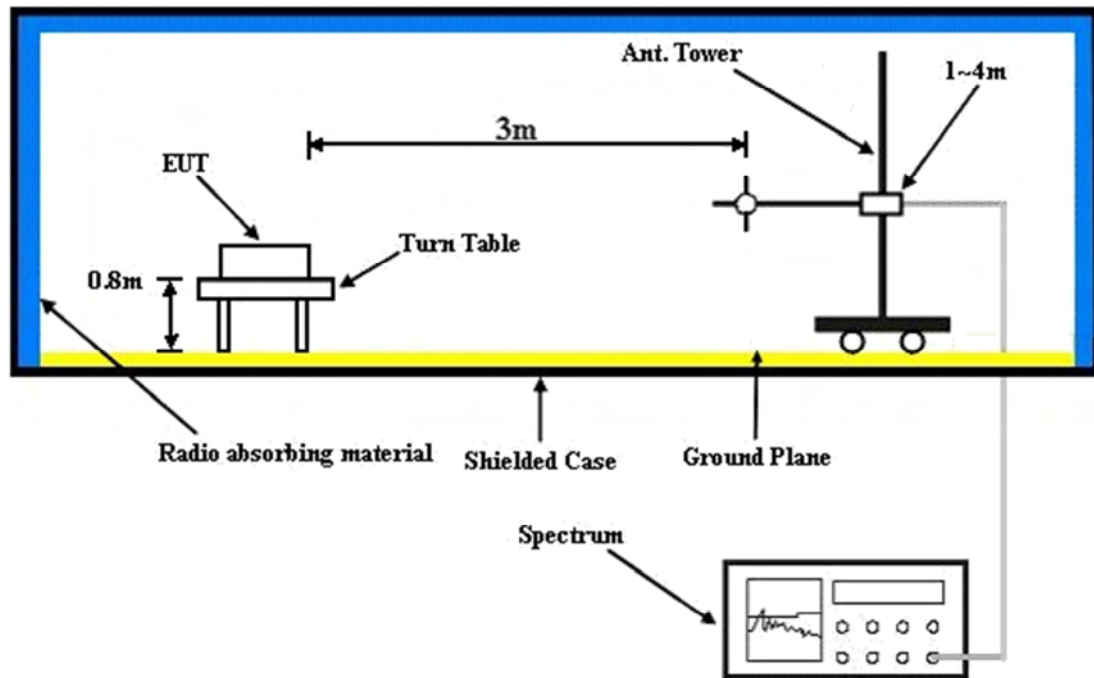
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from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

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.7.3 Deviation from Test Standard

No deviation.

#### 4.7.4 Test Setup



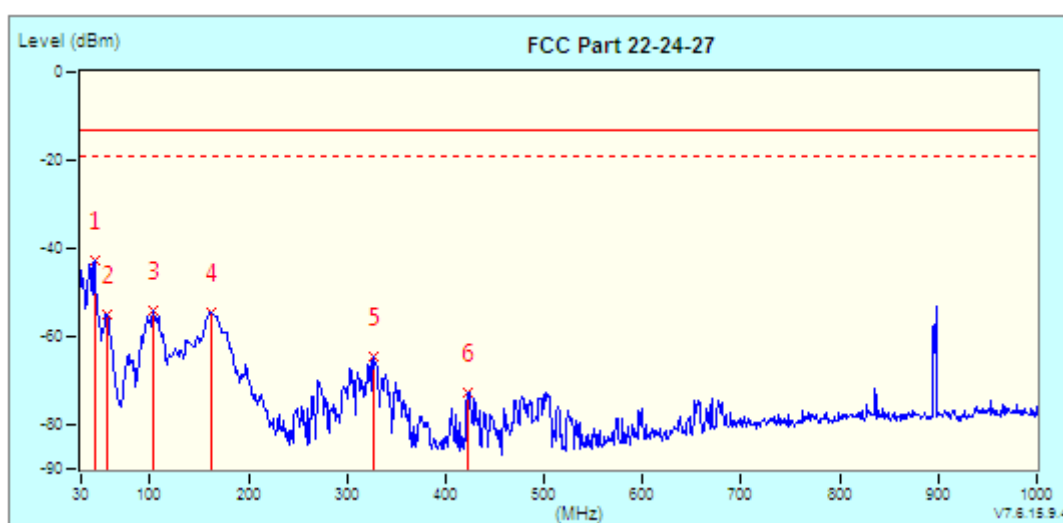
For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.7.5 Test Results

##### BELOW 1GHz WORST-CASE DATA

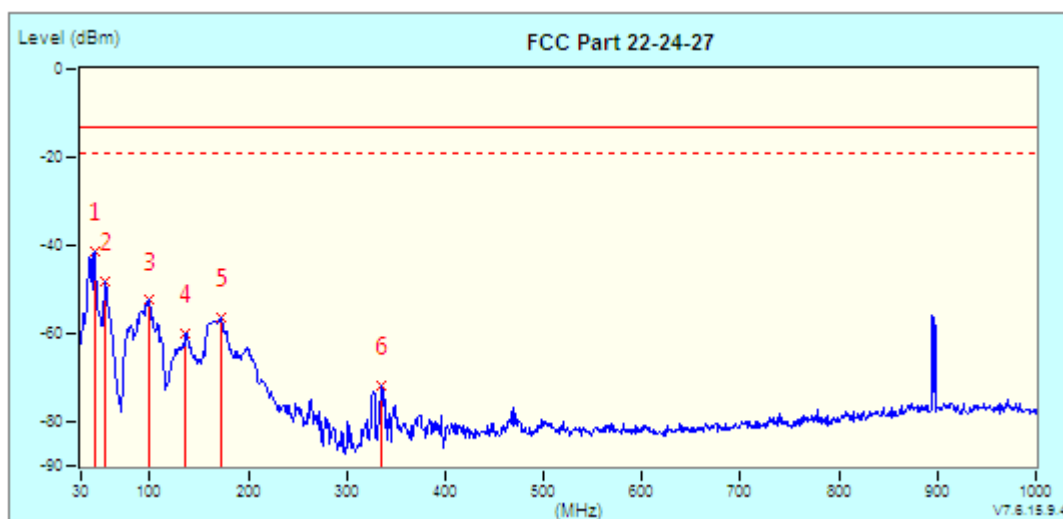
##### PCS1900

MODE	TX channel 512	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
*	1						cm	deg
1	43.58	8.94	-51.87	-42.93	-13.00	-29.93	--	--
2	56.19	-3.25	-51.68	-54.93	-13.00	-41.93	100	20
3	102.75	-11.73	-42.44	-54.17	-13.00	-41.17	--	--
4	161.92	-18.40	-36.35	-54.75	-13.00	-41.75	--	--
5	326.82	-12.91	-51.80	-64.71	-13.00	-51.71	--	--
6	422.85	-10.44	-62.10	-72.54	-13.00	-59.54	--	--

MODE	TX channel 512	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



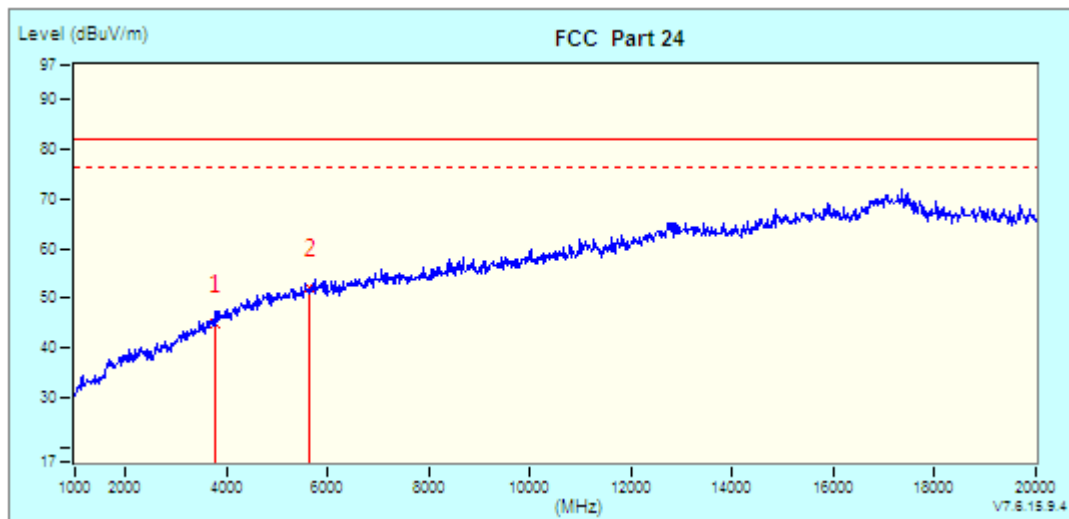
No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
*	1	-2.64	-38.53	-41.17	-13.00	-28.17	--	--
	2	-8.71	-39.42	-48.13	-13.00	-35.13	100	0
	3	-10.66	-41.84	-52.50	-13.00	-39.50	--	--
	4	-14.36	-45.68	-60.04	-13.00	-47.04	--	--
	5	-14.05	-42.34	-56.39	-13.00	-43.39	--	--
	6	-11.17	-60.81	-71.98	-13.00	-58.98	--	--



## ABOVE 1GHz DATA

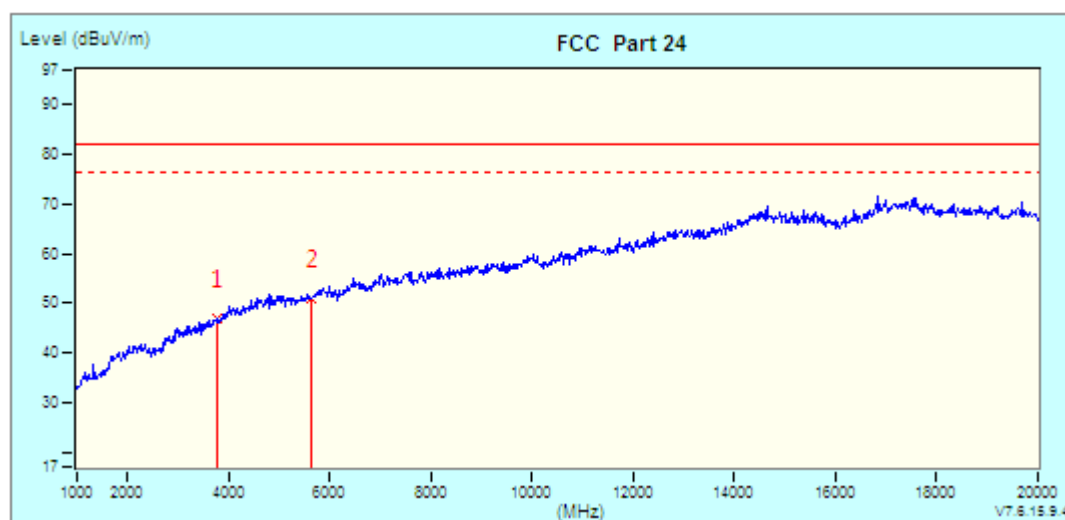
### PCS 1900:

MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	41.29	44.70	82.22	-37.52	100	0
* 2	5640.00 (PK)	9.12	42.92	52.04	82.22	-30.18	100	0

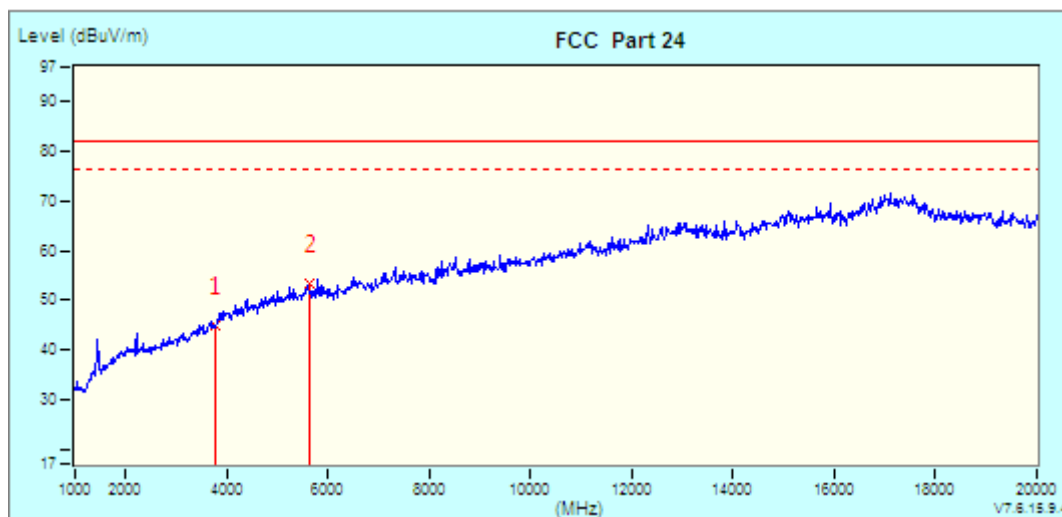
MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	42.89	46.77	82.22	-35.45	100	0
* 2	5640.00 (PK)	8.26	42.70	50.96	82.22	-31.26	100	0

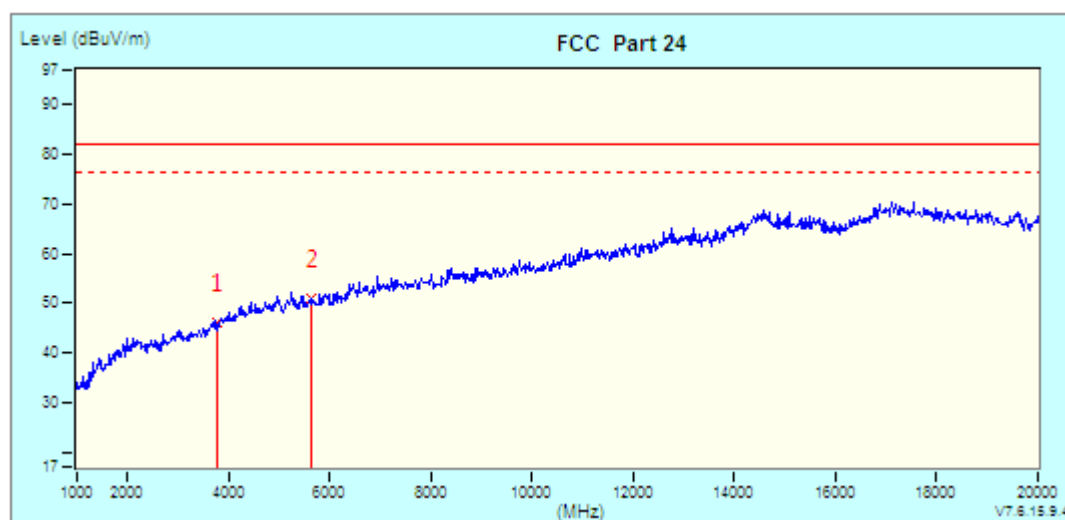
# EDGE 1900:

MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	41.64	45.05	82.22	-37.17	100	0
* 2	5640.00 (PK)	9.12	44.14	53.26	82.22	-28.96	100	0

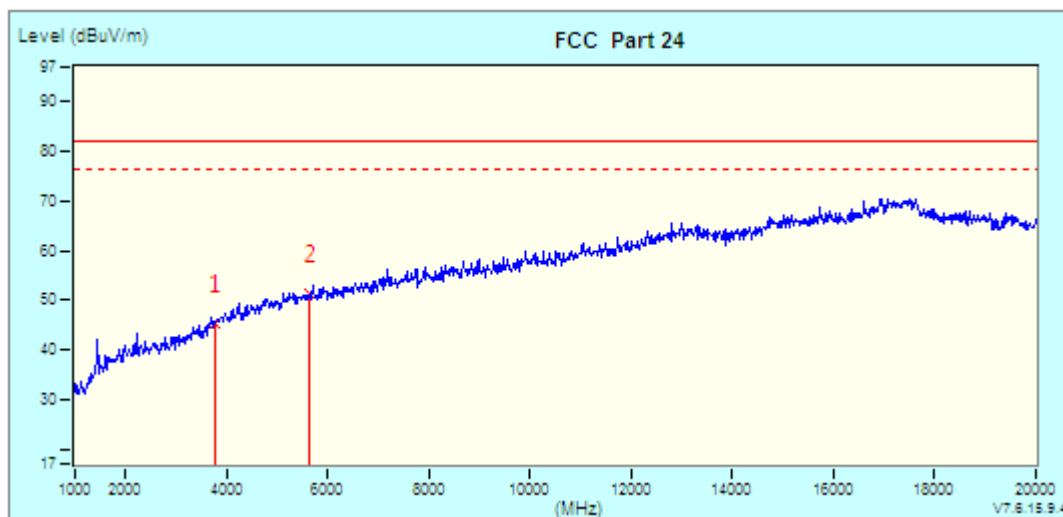
MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	42.10	45.98	82.22	-36.24	100	0
* 2	5640.00 (PK)	8.26	42.82	51.08	82.22	-31.14	100	0

# WCDMA Band II:

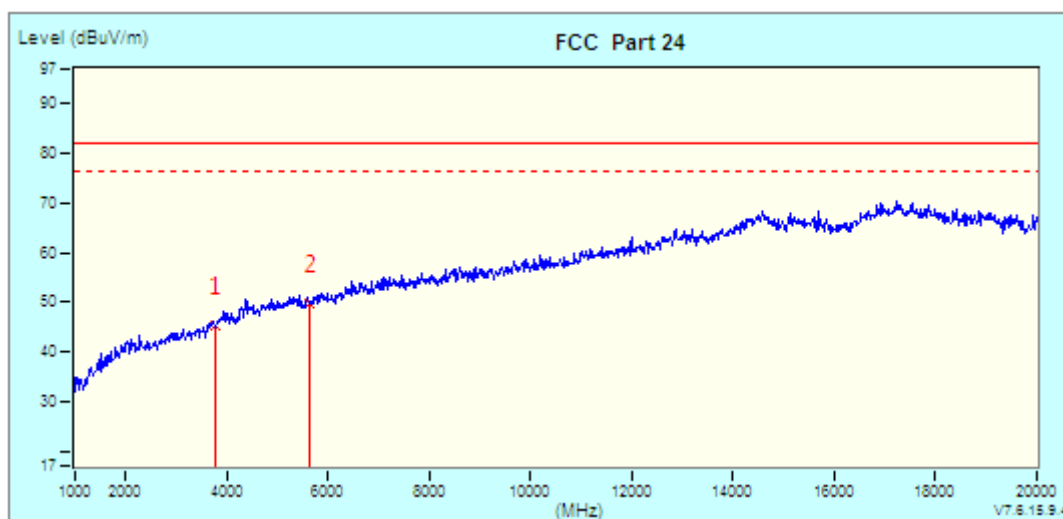
MODE	TX channel 9262	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	41.97	45.38	82.22	-36.84	100	0
* 2	5640.00 (PK)	9.12	42.06	51.18	82.22	-31.04	100	0



MODE	TX channel 9262	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

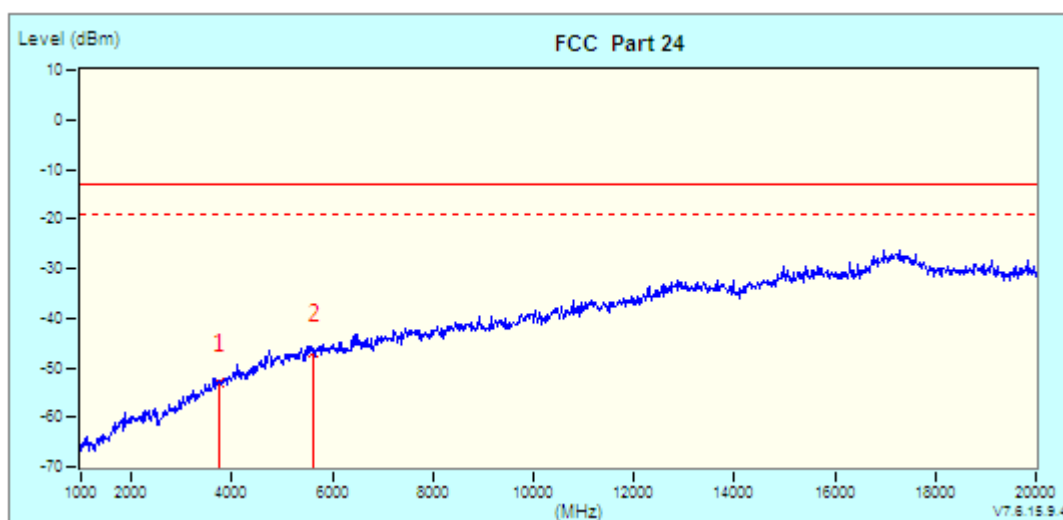


No.	Frequency MHz	Factor dB/m	Reading dBuV	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	41.46	45.34	82.22	-36.88	100	0
* 2	5640.00 (PK)	8.26	41.45	49.71	82.22	-32.51	100	0

## LTE Band 2

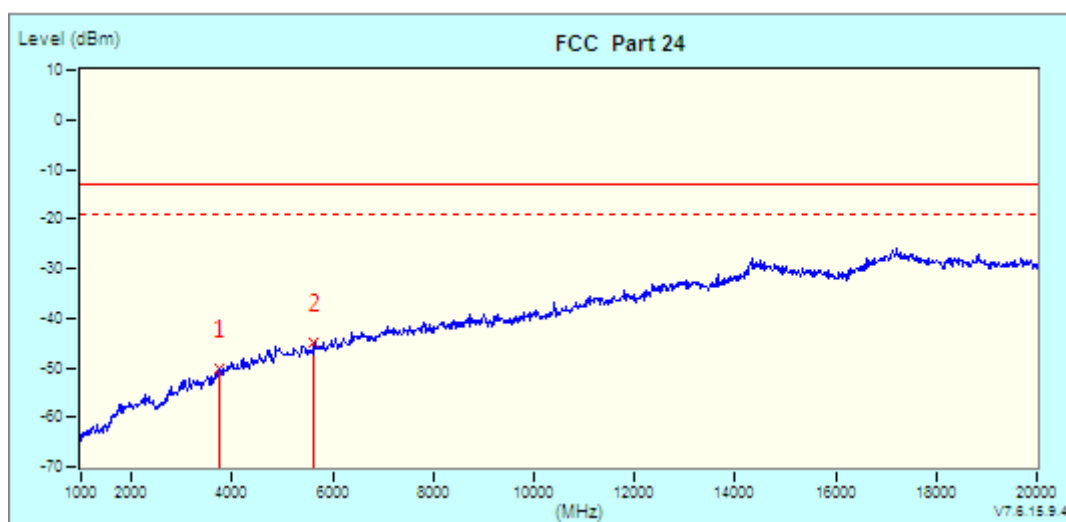
### CHANNEL BANDWIDTH: 1.4MHz / QPSK

MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-56.25	-52.84	-13.00	-39.84	100	360
* 2	5640.00 (PK)	9.12	-55.93	-46.81	-13.00	-33.81	100	360

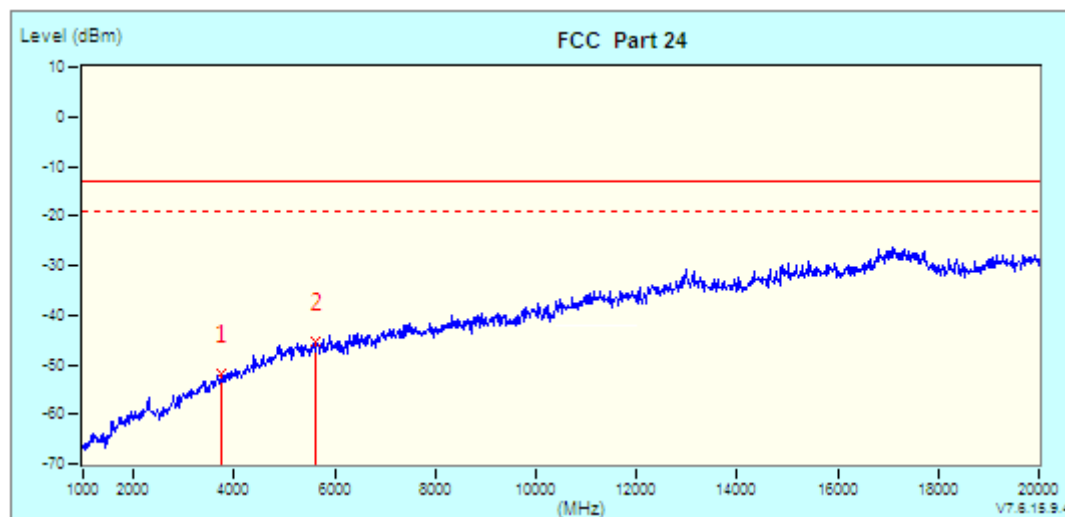
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	-53.99	-50.11	-13.00	-37.11	100	360
* 2	5640.00 (PK)	8.26	-53.39	-45.13	-13.00	-32.13	100	360

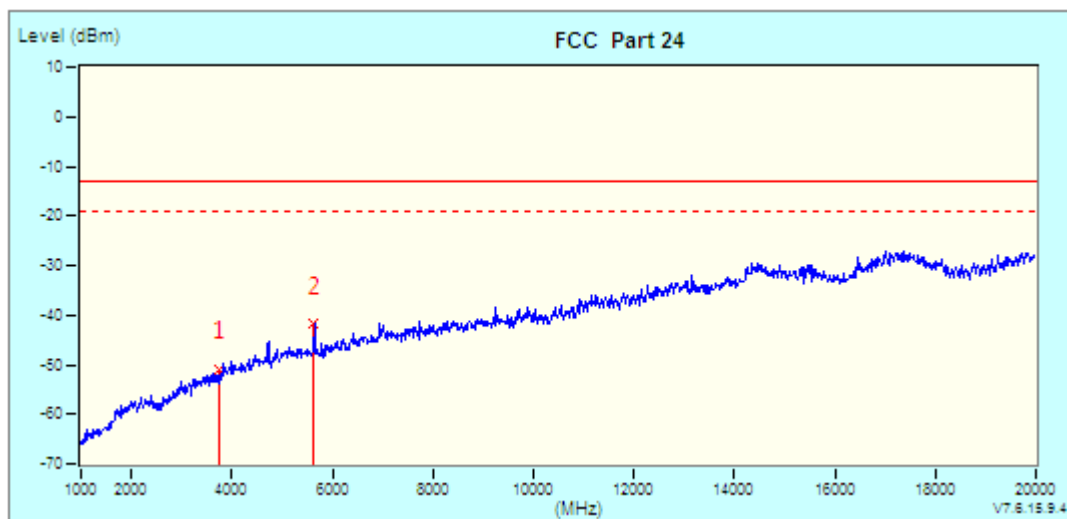
# CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-55.04	-51.63	-13.00	-38.63	100	0
* 2	5640.00 (PK)	9.12	-54.63	-45.51	-13.00	-32.51	100	0

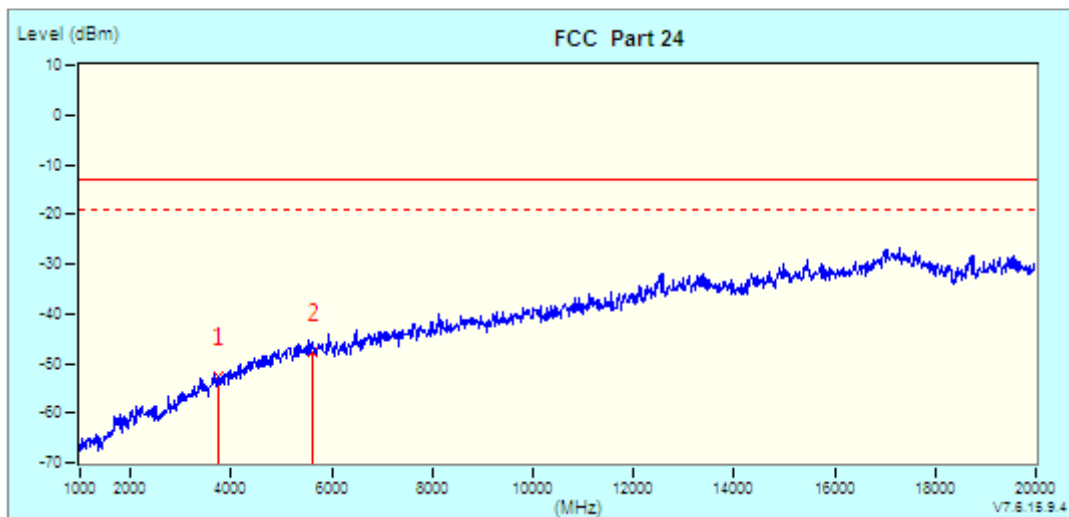
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	-55.07	-51.19	-13.00	-38.19	100	0
* 2	5640.00 (PK)	8.26	-50.18	-41.92	-13.00	-28.92	100	0

# CHANNEL BANDWIDTH: 5MHz / QPSK

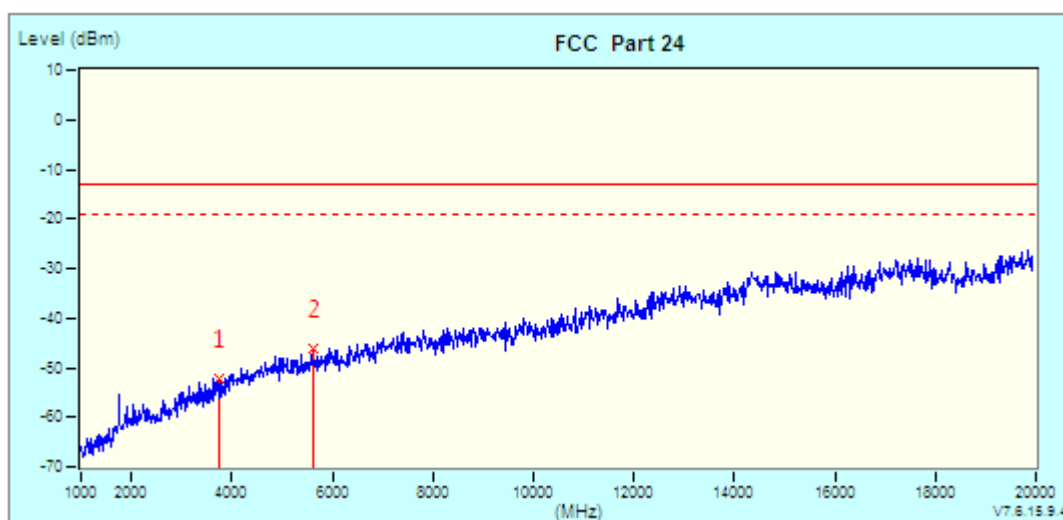
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-55.86	-52.45	-13.00	-39.45	100	0
* 2	5640.00 (PK)	9.12	-56.80	-47.68	-13.00	-34.68	100	0



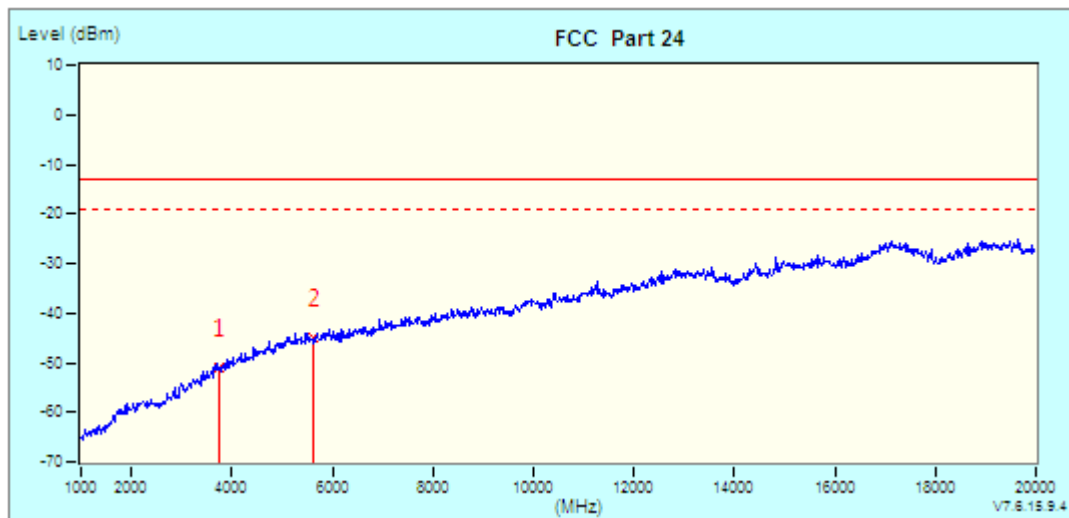
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	-56.16	-52.28	-13.00	-39.28	100	0
* 2	5640.00 (PK)	8.26	-54.53	-46.27	-13.00	-33.27	100	0

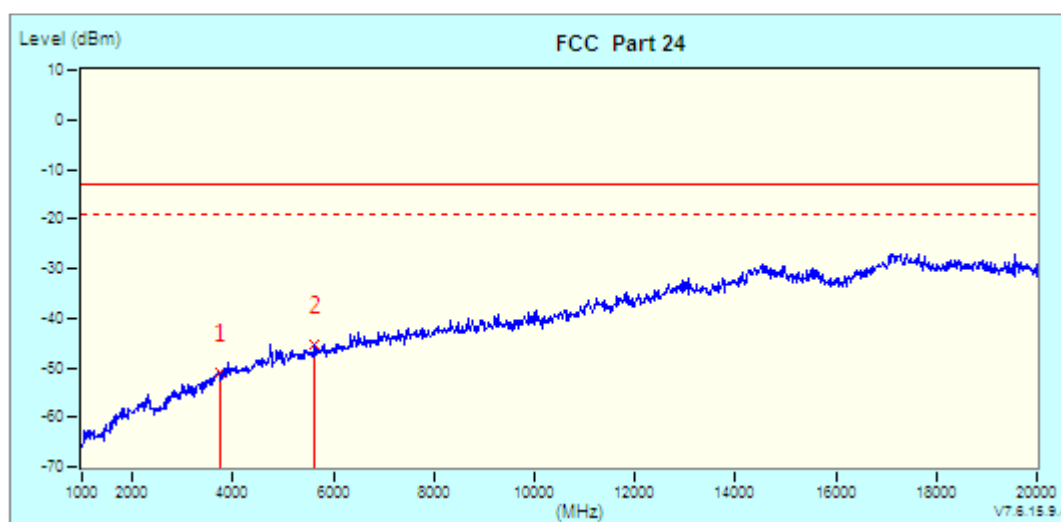
# CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-54.51	-51.10	-13.00	-38.10	100	186
* 2	5640.00 (PK)	9.12	-54.08	-44.96	-13.00	-31.96	100	142

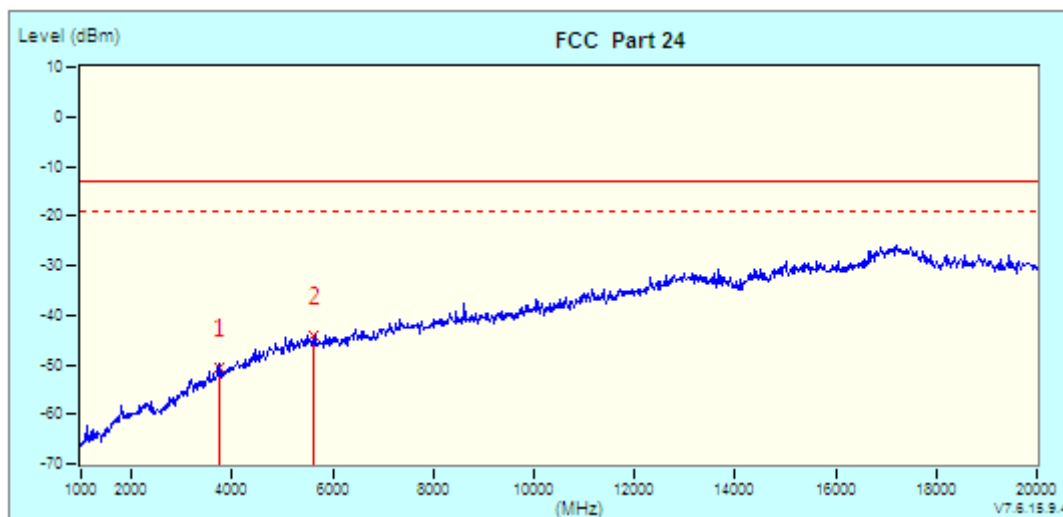
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	-54.79	-50.91	-13.00	-37.91	100	0
* 2	5640.00 (PK)	8.26	-53.74	-45.48	-13.00	-32.48	100	0

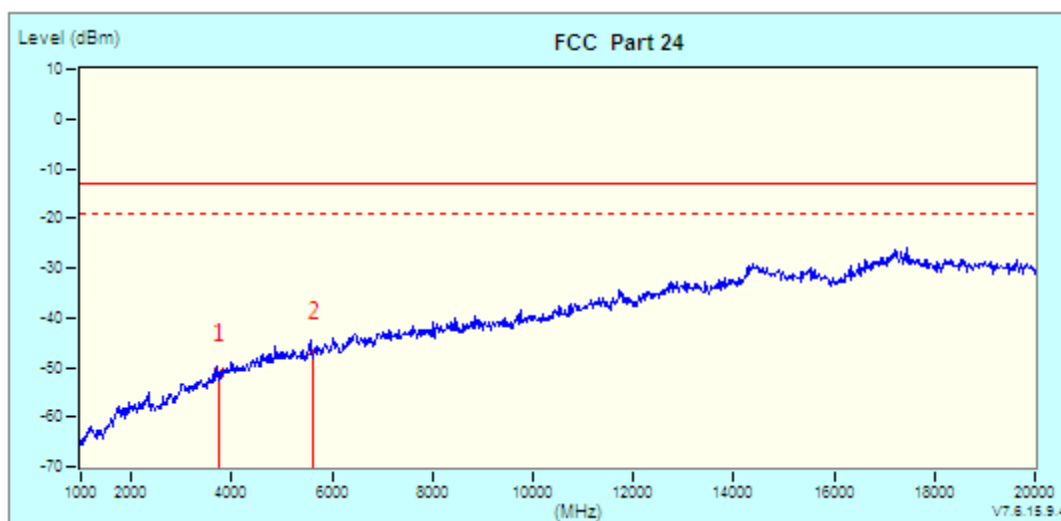
CHANNEL BANDWIDTH: 15MHz / QPSK

MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-53.90	-50.49	-13.00	-37.49	100	0
* 2	5640.00 (PK)	9.12	-53.26	-44.14	-13.00	-31.14	100	0

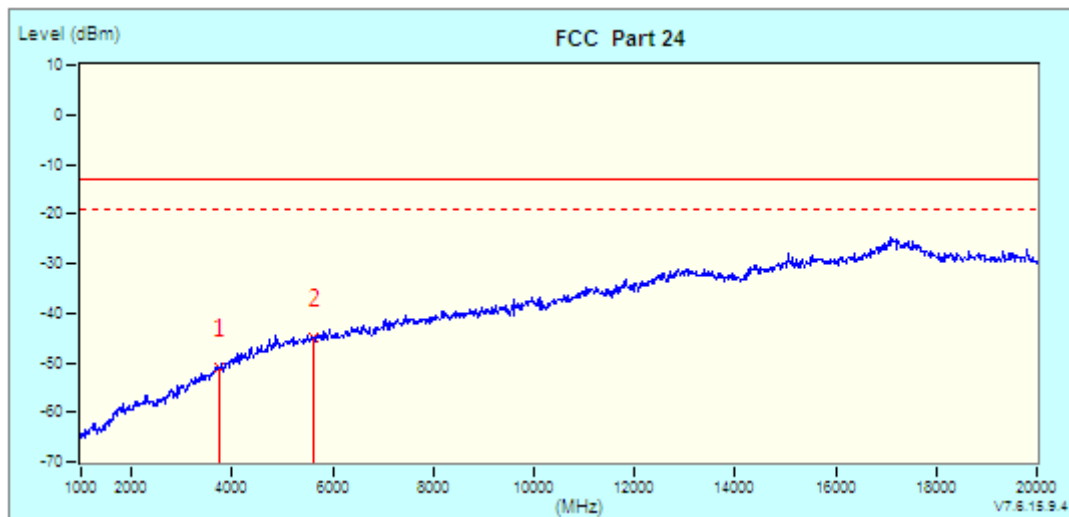
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
1	3760.00 (PK)	3.88	-54.99	-51.11	-13.00	-38.11	100	360
* 2	5640.00 (PK)	8.26	-54.91	-46.65	-13.00	-33.65	100	360

# CHANNEL BANDWIDTH: 20MHz / QPSK

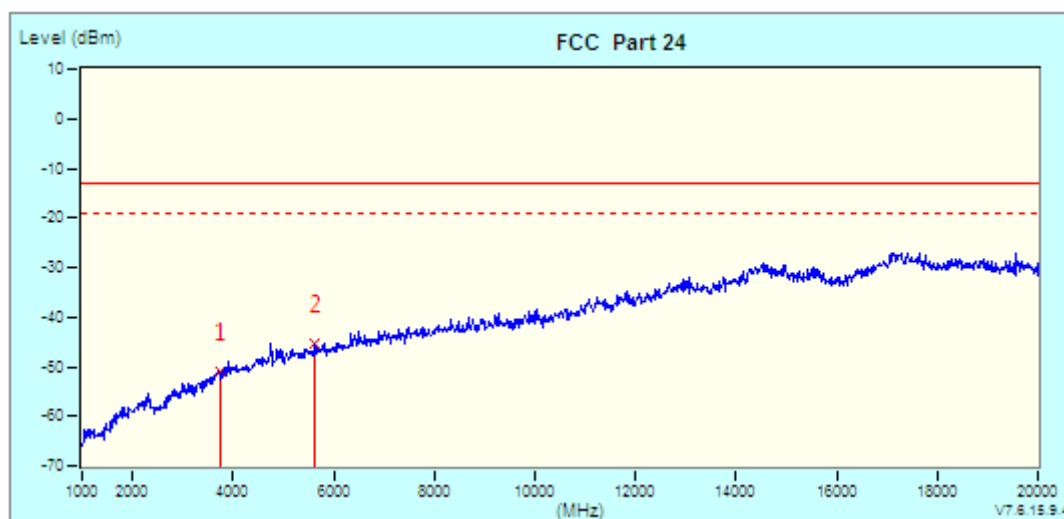
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.41	-54.45	-51.04	-13.00	-38.04	100	360
* 2	5640.00 (PK)	9.12	-53.87	-44.75	-13.00	-31.75	100	360



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Green		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency MHz	Factor dB	Reading dBm	Emission dBm	Limit dBm	Margin dB	Tower / Table	
							cm	deg
1	3760.00 (PK)	3.88	-54.79	-50.91	-13.00	-37.91	100	0
* 2	5640.00 (PK)	8.26	-53.74	-45.48	-13.00	-32.48	100	0

## 5 Pictures of Test Arrangements

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

## Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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