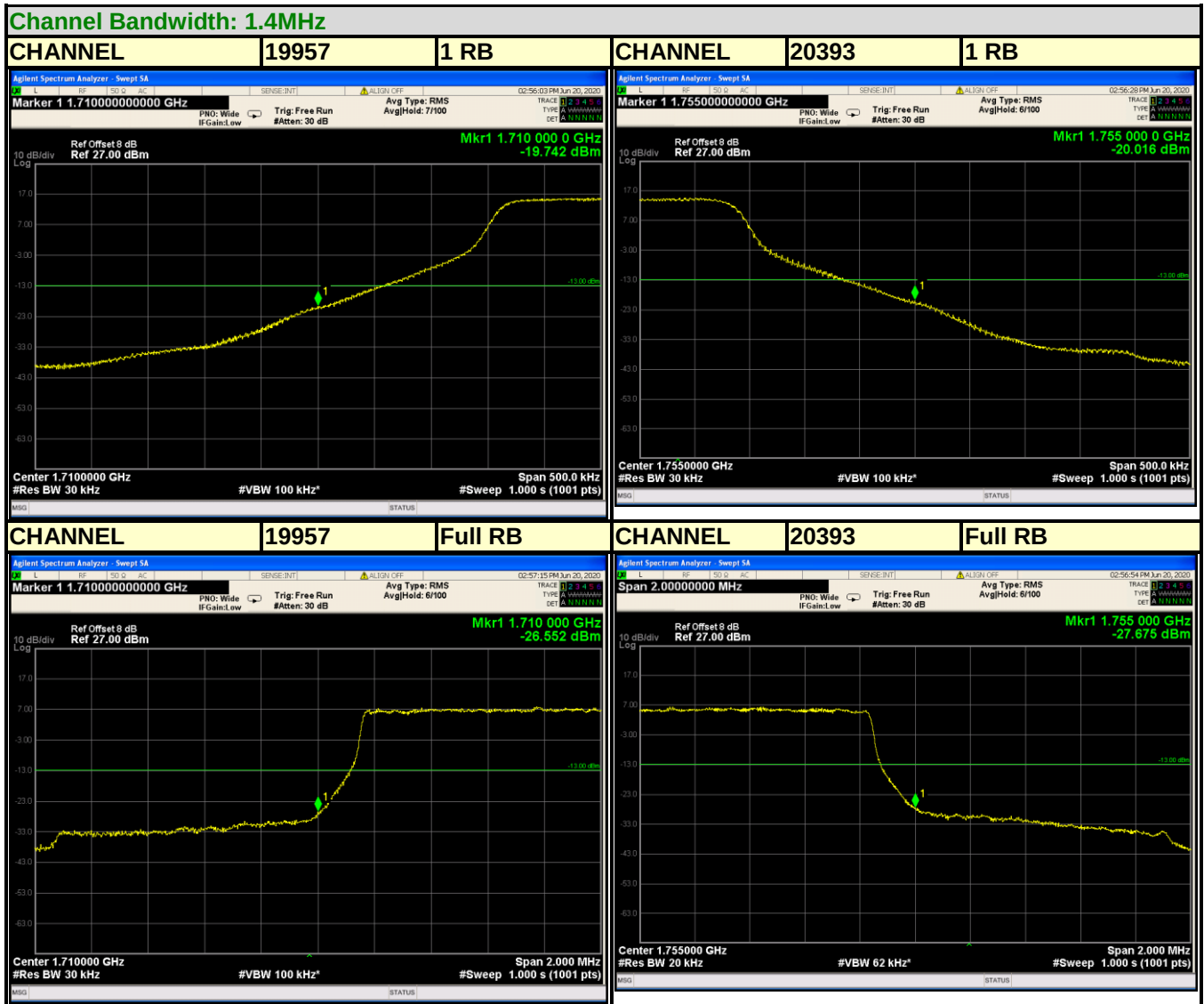




Test Report No.: RF200327S003-3

3.5.4 TEST RESULTS

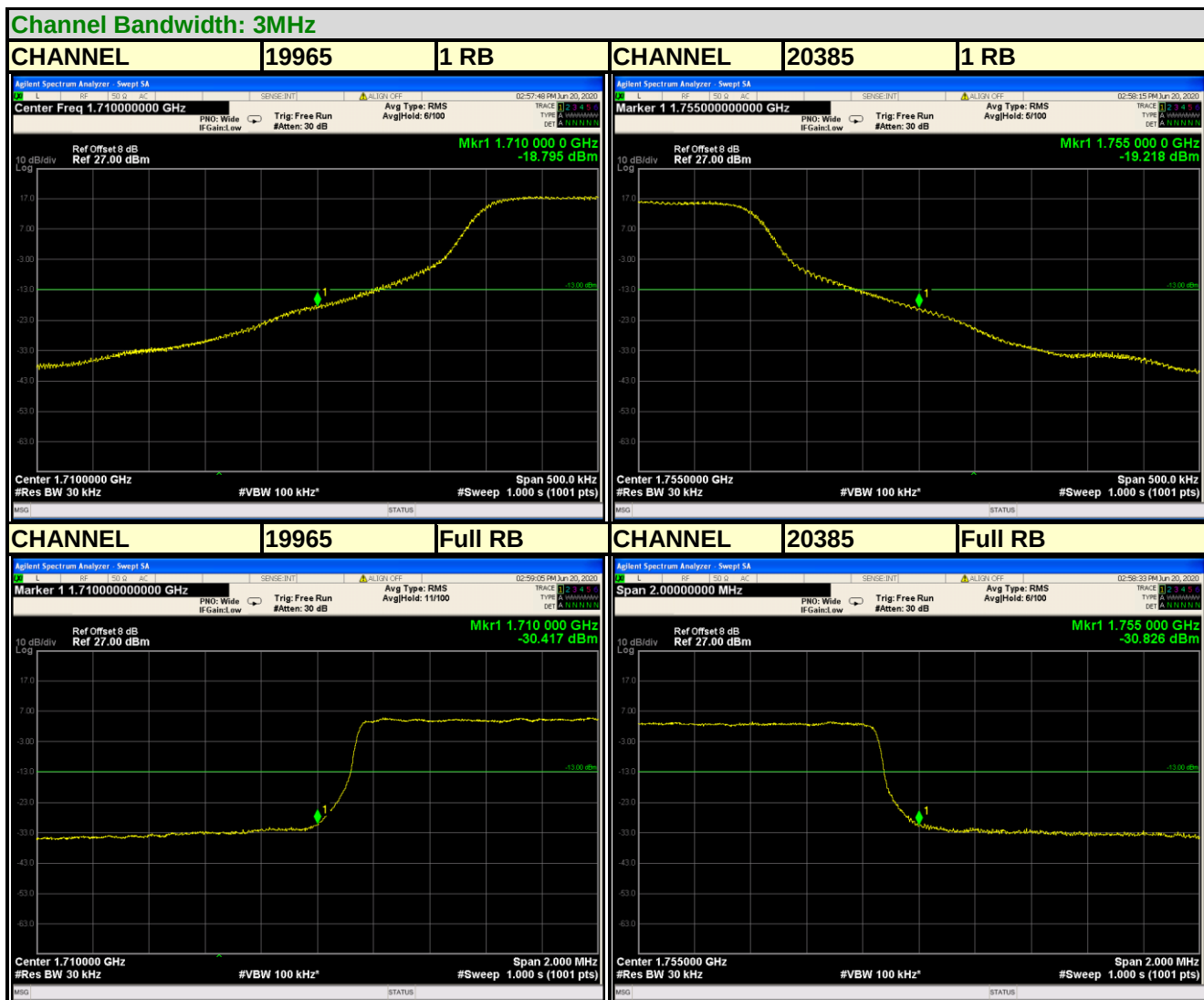
LTE BAND 4





Test Report No.: RF200327S003-3

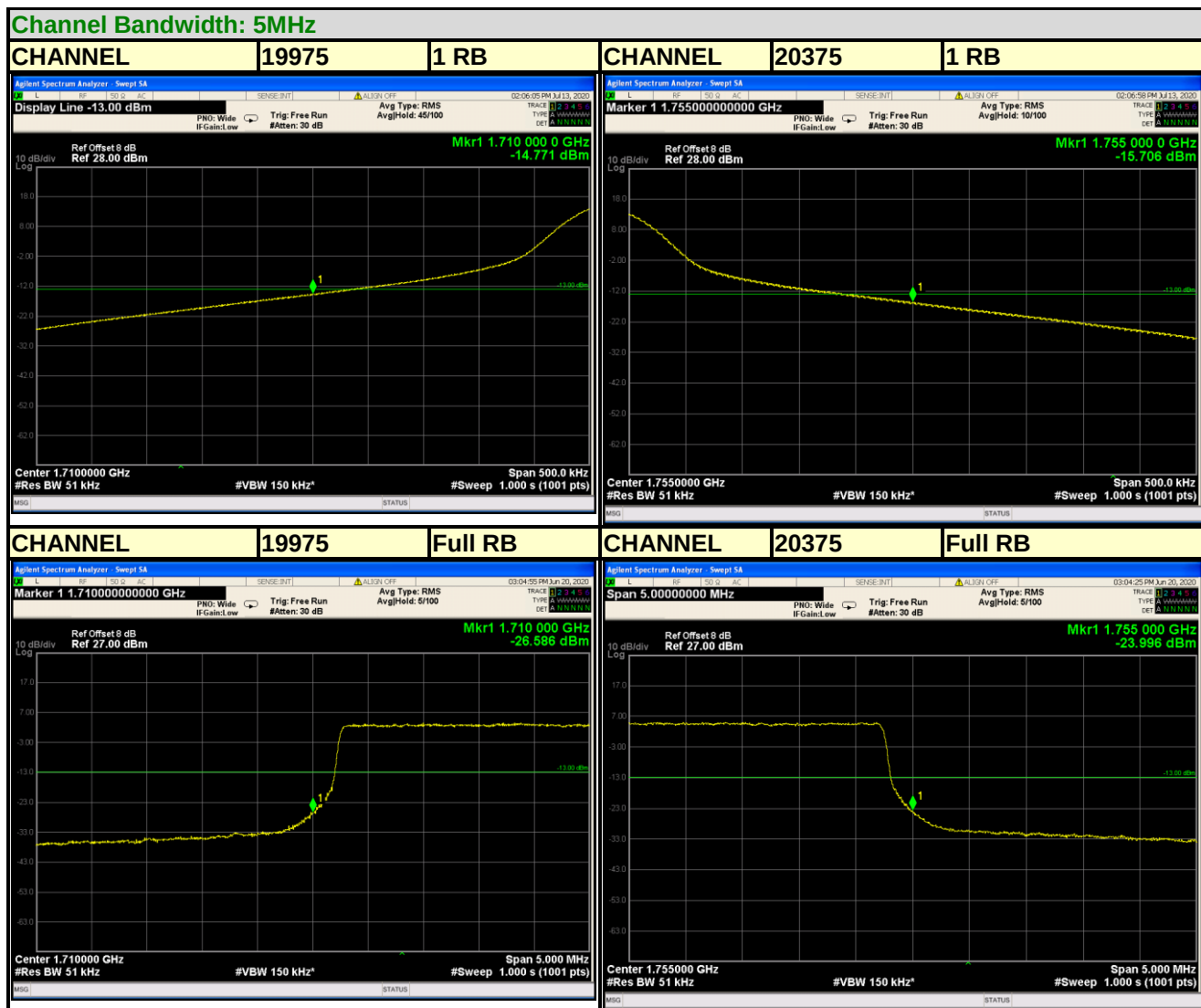
LTE BAND 4





Test Report No.: RF200327S003-3

LTE BAND 4

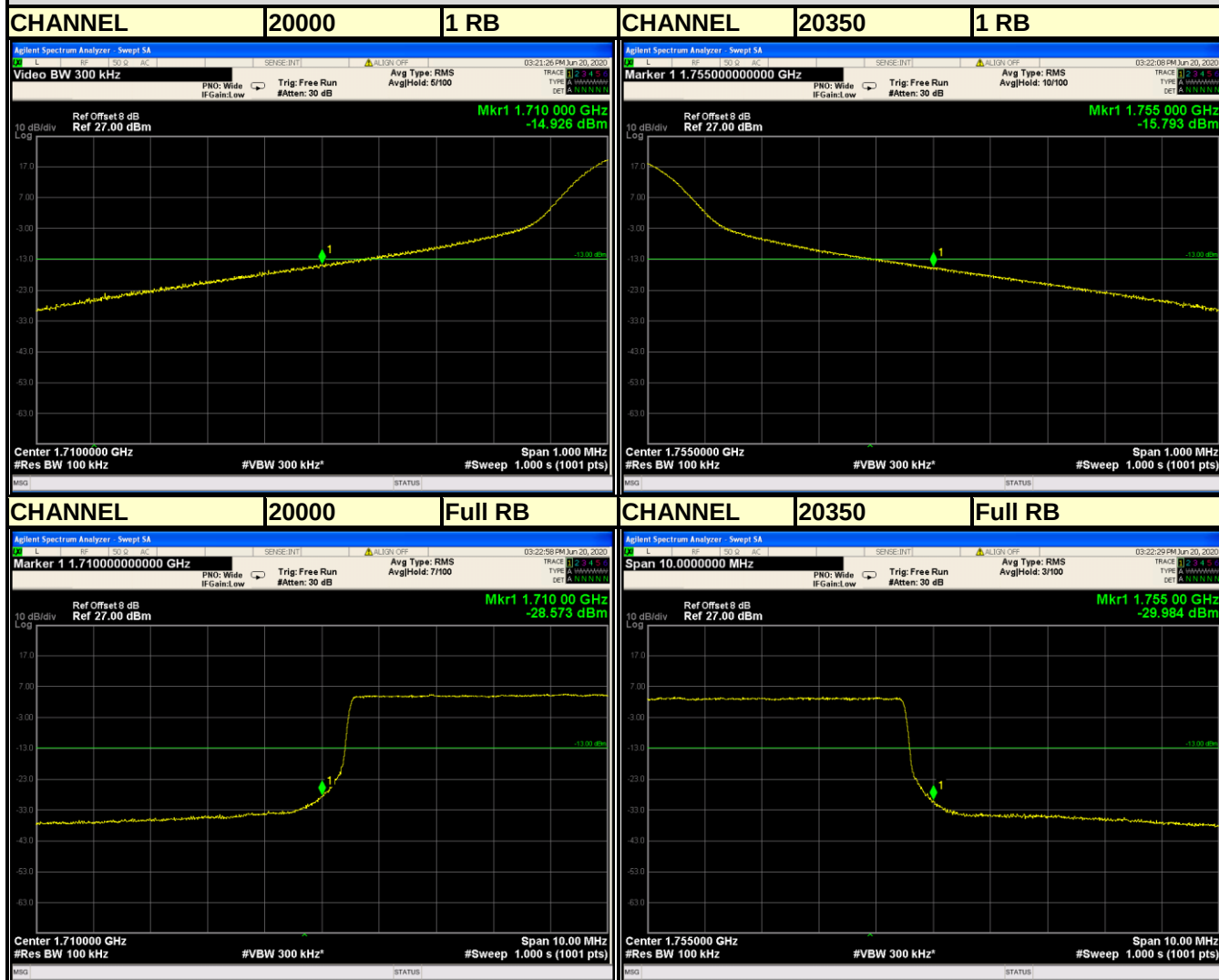




Test Report No.: RF200327S003-3

LTE BAND 4

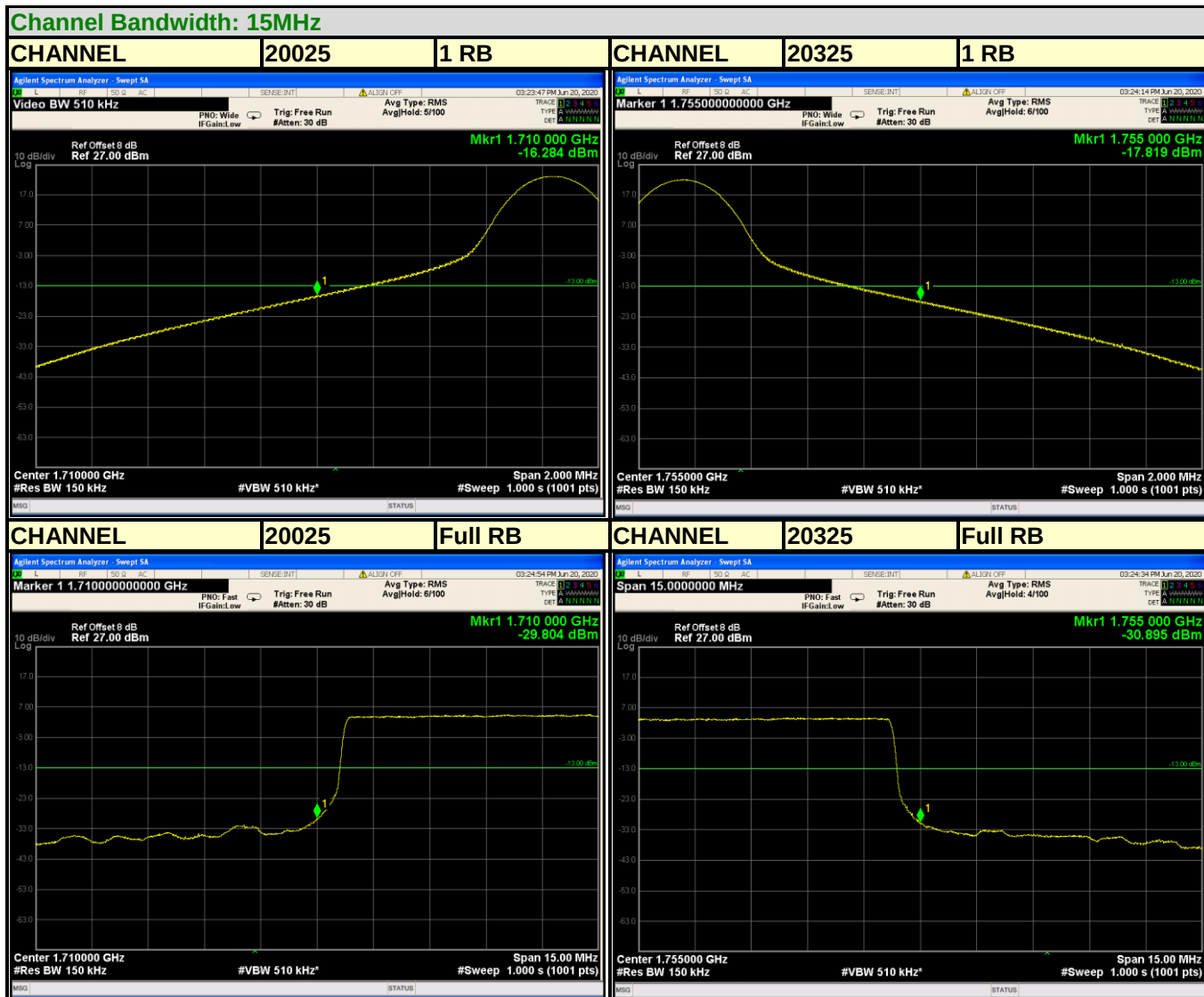
Channel Bandwidth: 10MHz





Test Report No.: RF200327S003-3

LTE BAND 4

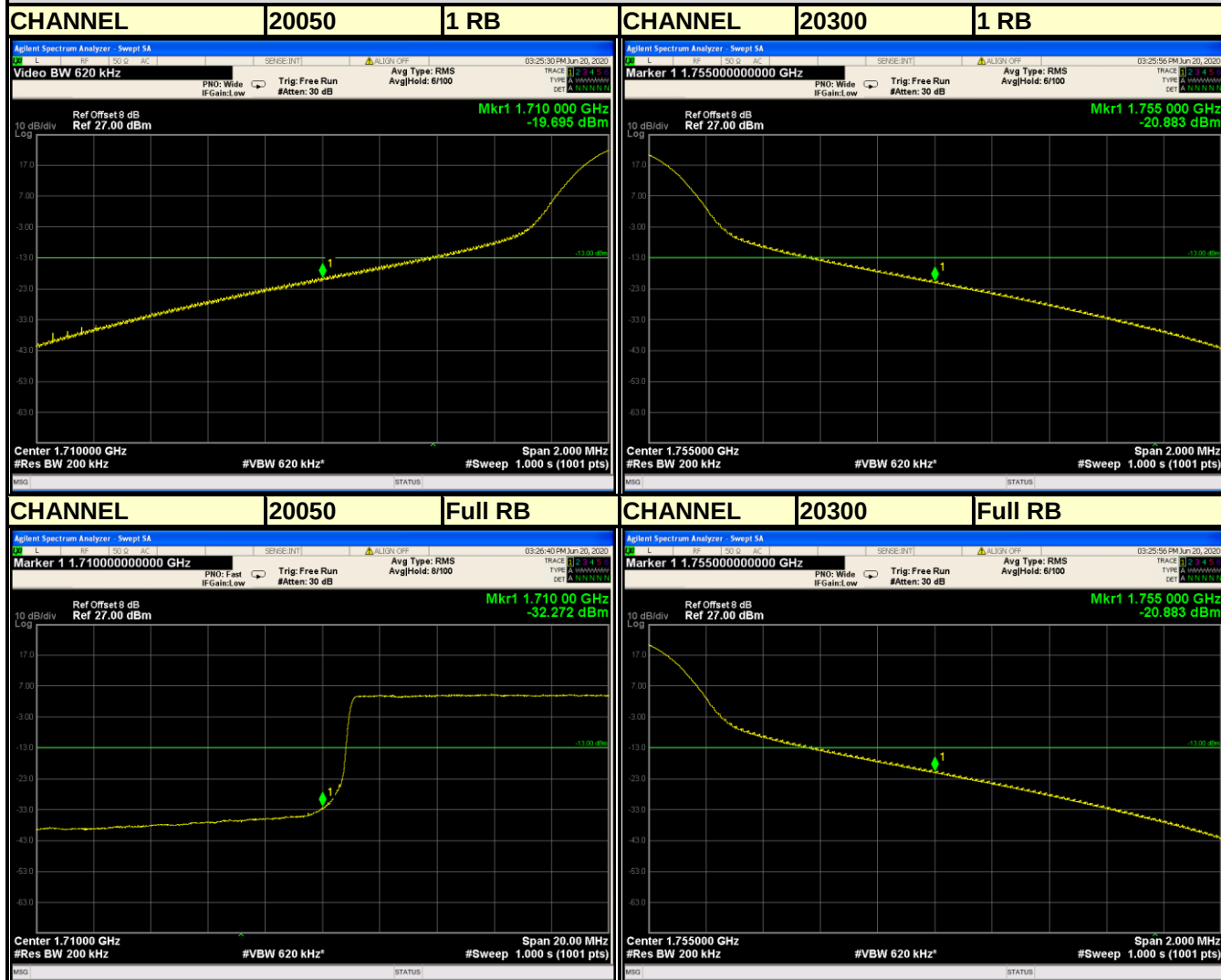




Test Report No.: RF200327S003-3

LTE BAND 4

Channel Bandwidth: 20MHz

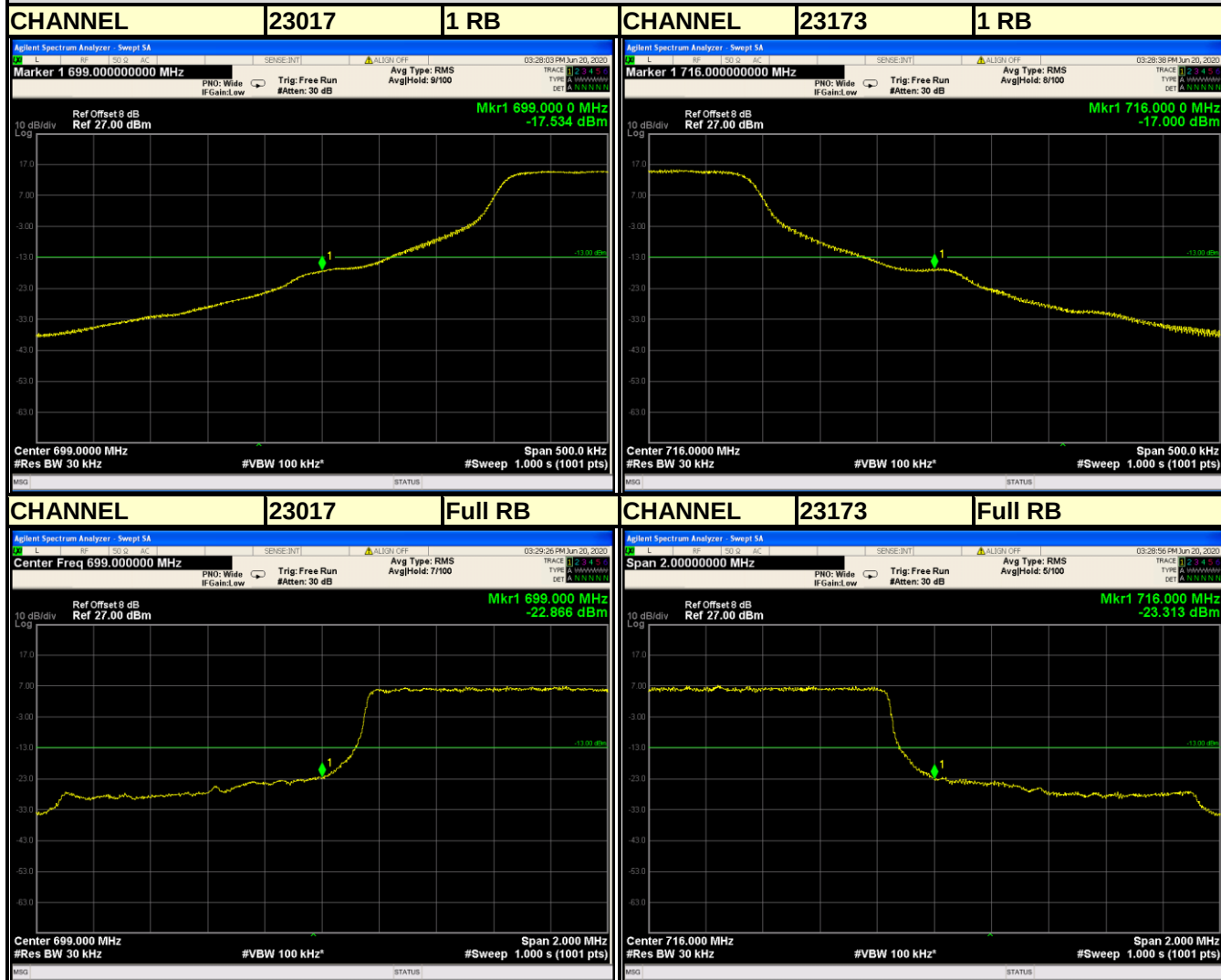




Test Report No.: RF200327S003-3

LTE BAND 12

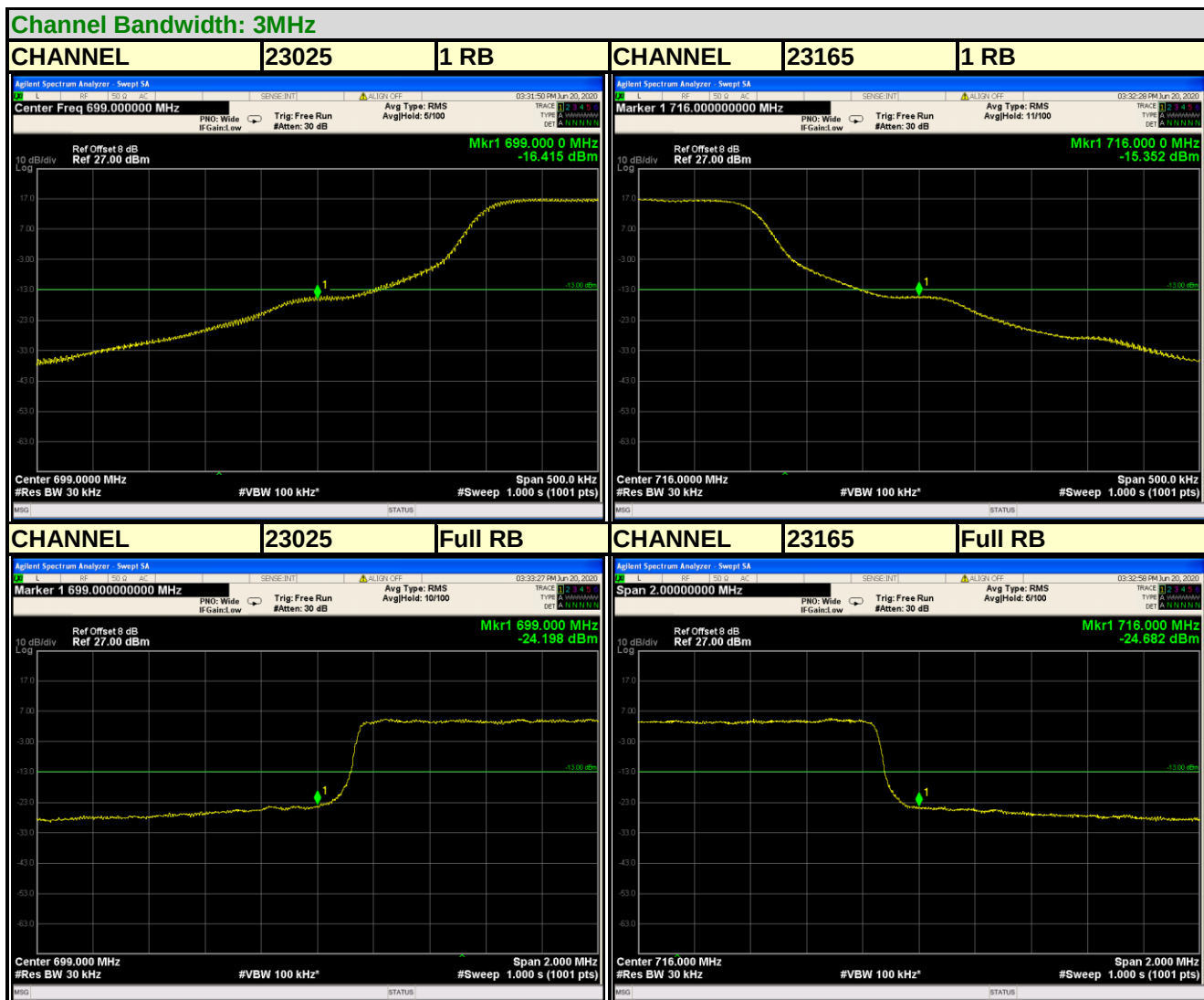
Channel Bandwidth: 1.4MHz





Test Report No.: RF200327S003-3

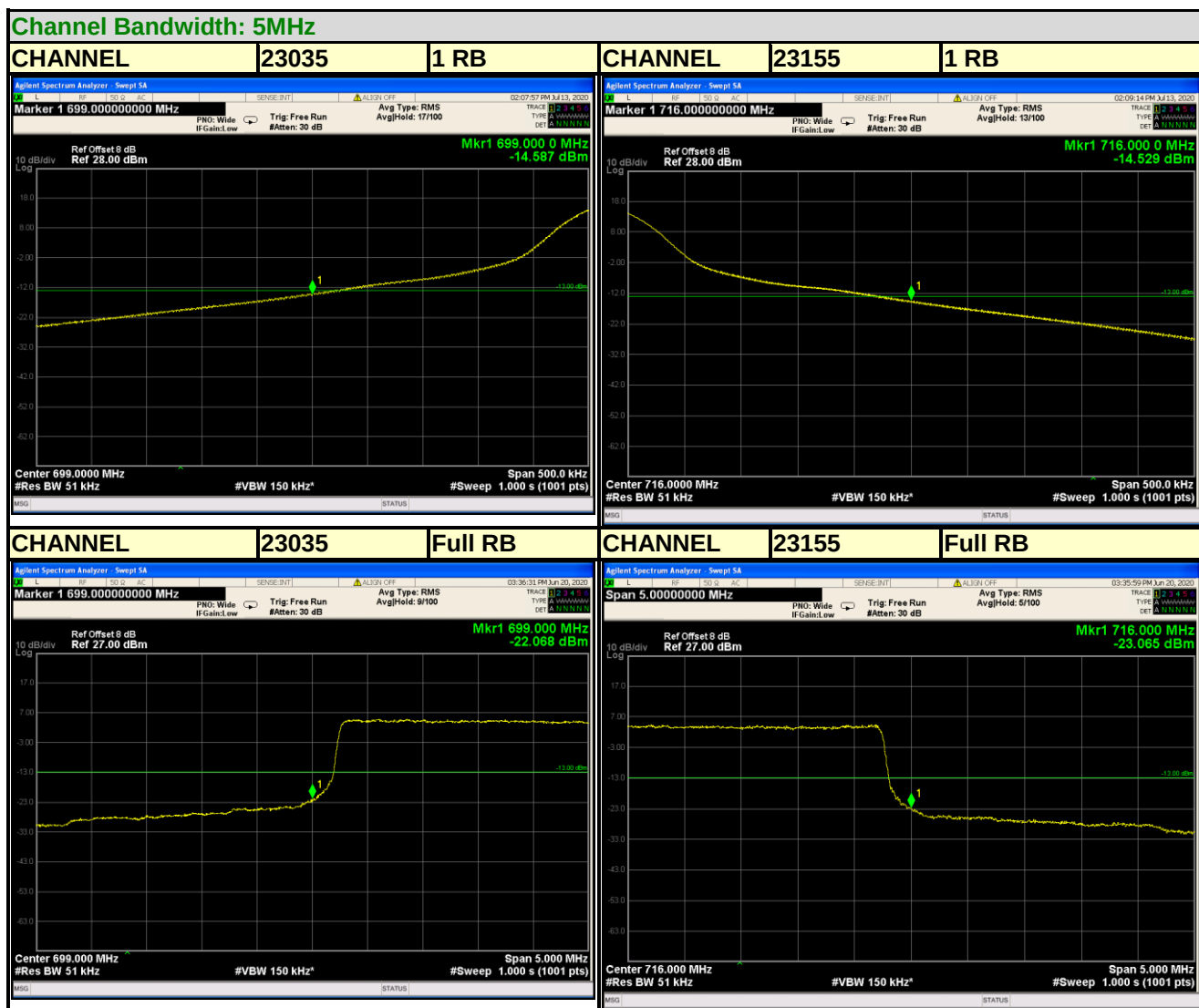
LTE BAND 12



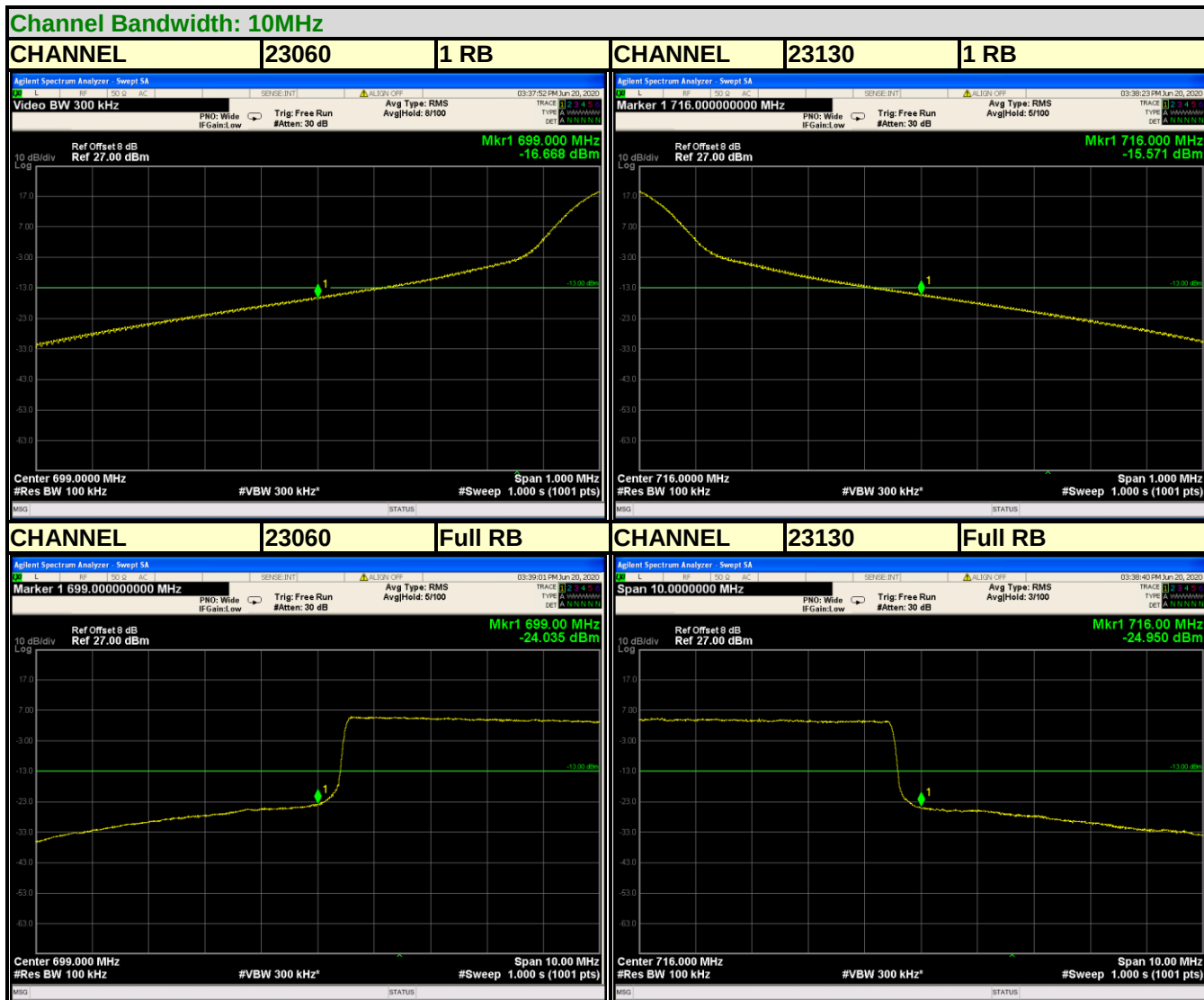


Test Report No.: RF200327S003-3

LTE BAND 12



LTE BAND 12



3.6 CONDUCTED SPURIOUS EMISSIONS

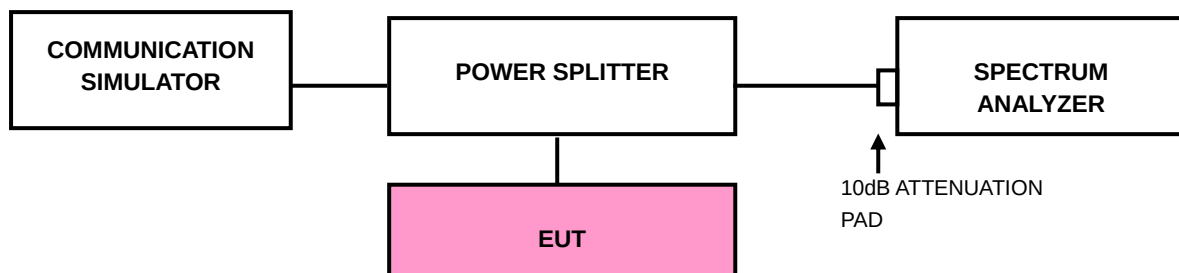
3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

3.6.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.
- b. Measuring frequency range is from 30 MHz to 17.55GHz for LTE Band 4 and 30 MHz to 7.16GHz for LTE Band 12. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

3.6.3 TEST SETUP



3.6.4 TEST RESULTS

LTE BAND 4

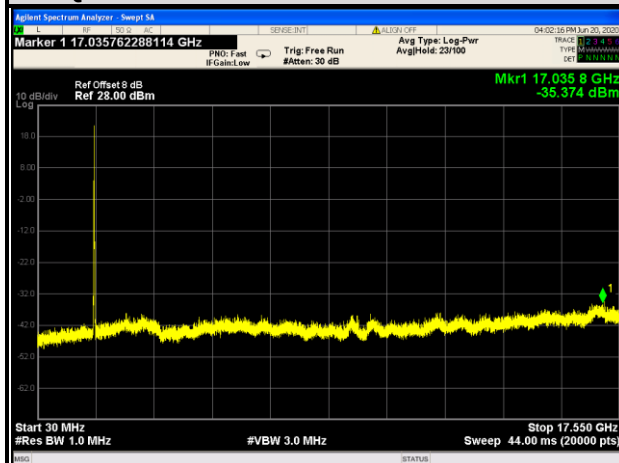




5MHz / QPSK

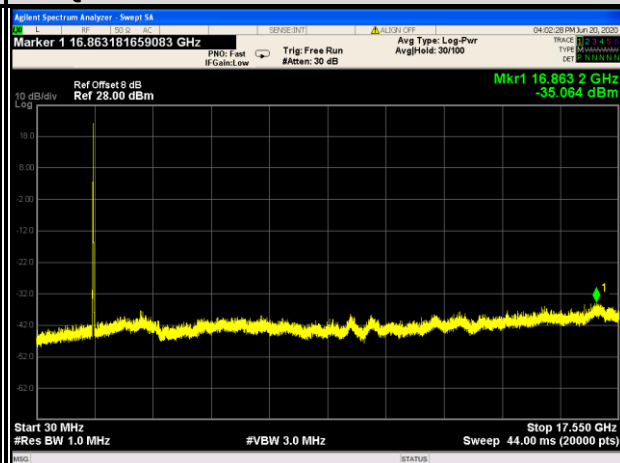
CHANNEL 19975

FREQUENCY RANGE : 30MHz~17.55GHz



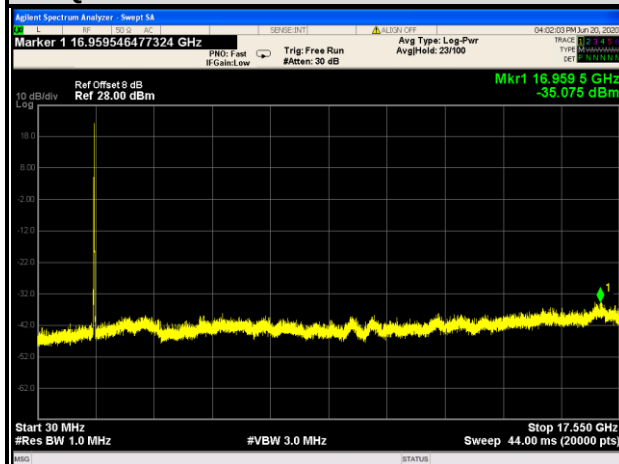
CHANNEL 20175

FREQUENCY RANGE : 30MHz~17.55GHz



CHANNEL 20375

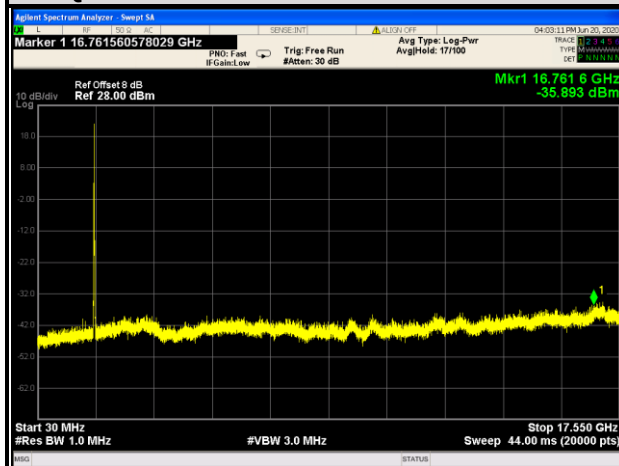
FREQUENCY RANGE : 30MHz~17.55GHz



10MHz / QPSK

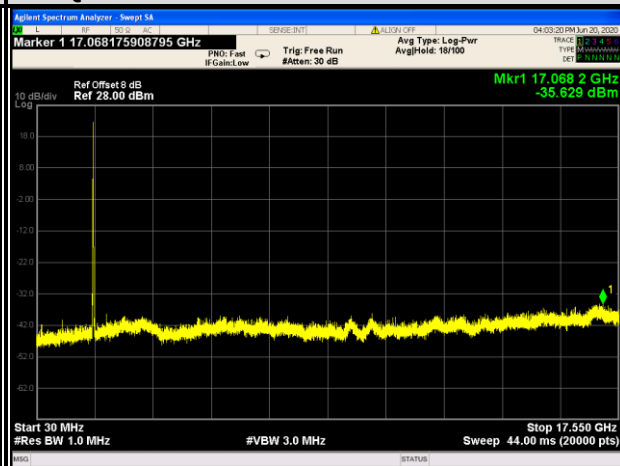
CHANNEL 20000

FREQUENCY RANGE : 30MHz~17.55GHz



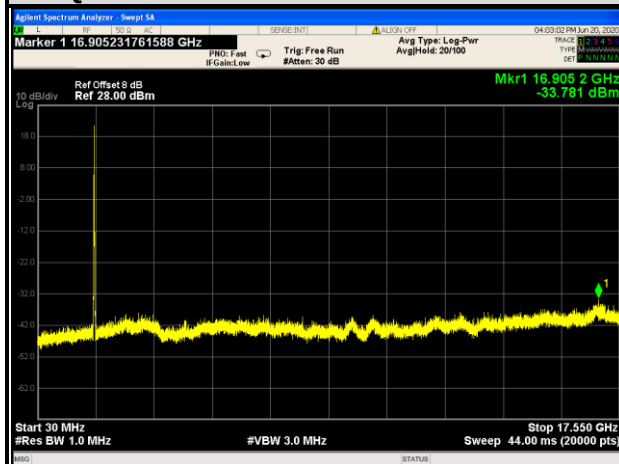
CHANNEL 20175

FREQUENCY RANGE : 30MHz~17.55GHz



CHANNEL 20350

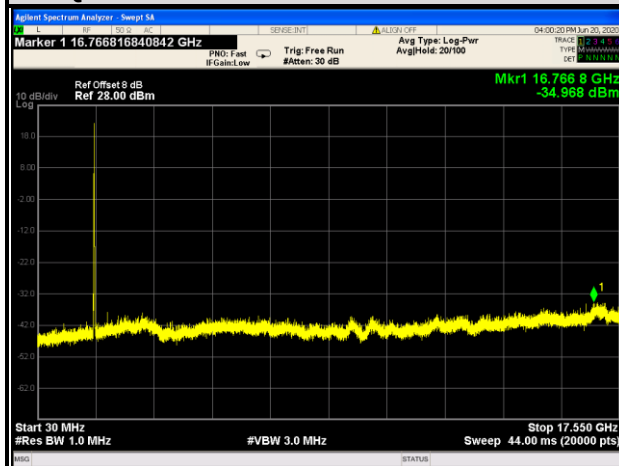
FREQUENCY RANGE : 30MHz~17.55GHz



15MHz / QPSK

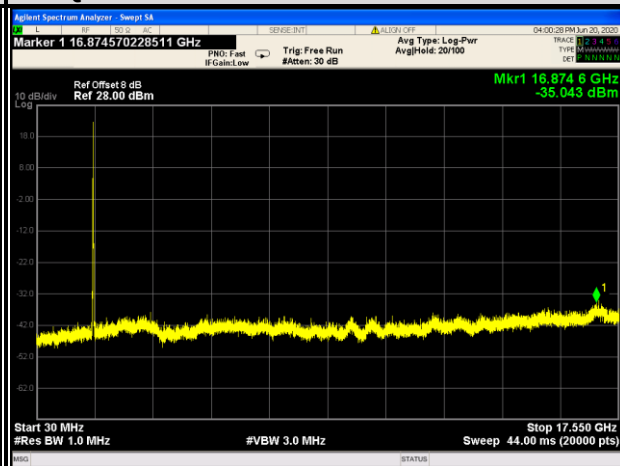
CHANNEL 20025

FREQUENCY RANGE : 30MHz~17.55GHz



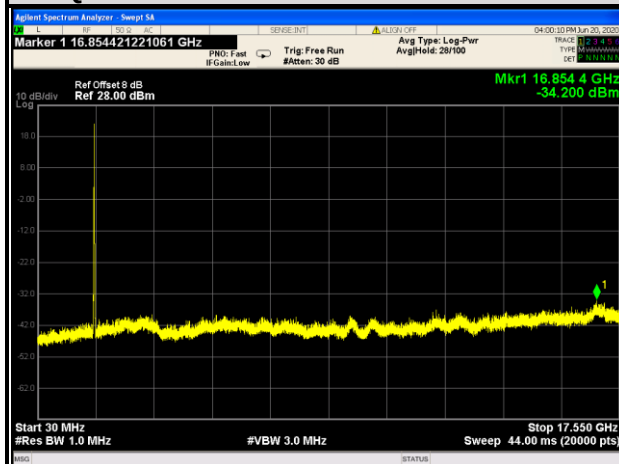
CHANNEL 20175

FREQUENCY RANGE : 30MHz~17.55GHz



CHANNEL 20325

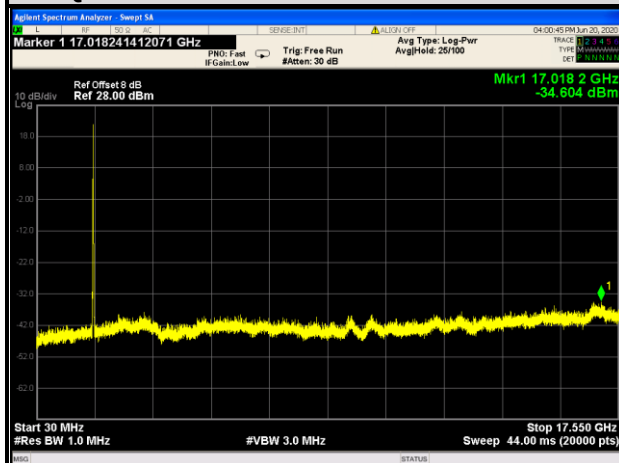
FREQUENCY RANGE : 30MHz~17.55GHz



20MHz / QPSK

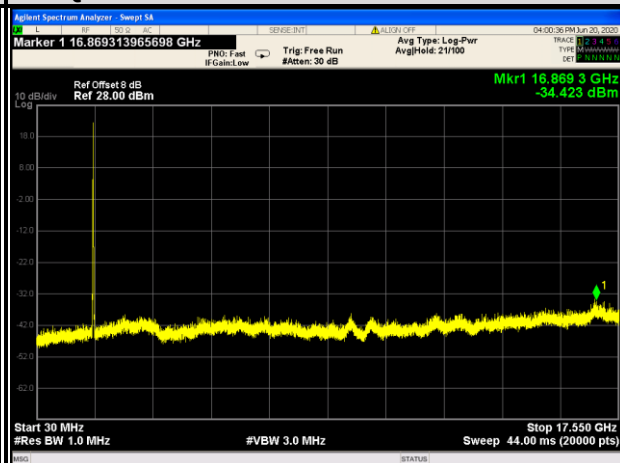
CHANNEL 20050

FREQUENCY RANGE : 30MHz~17.55GHz



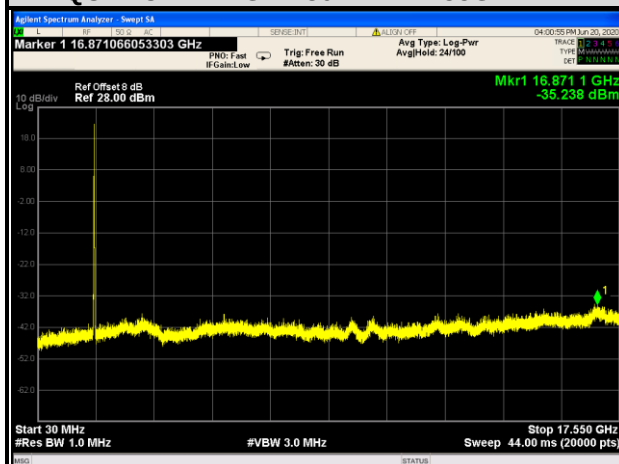
CHANNEL 20175

FREQUENCY RANGE : 30MHz~17.55GHz



CHANNEL 20300

FREQUENCY RANGE : 30MHz~17.55GHz

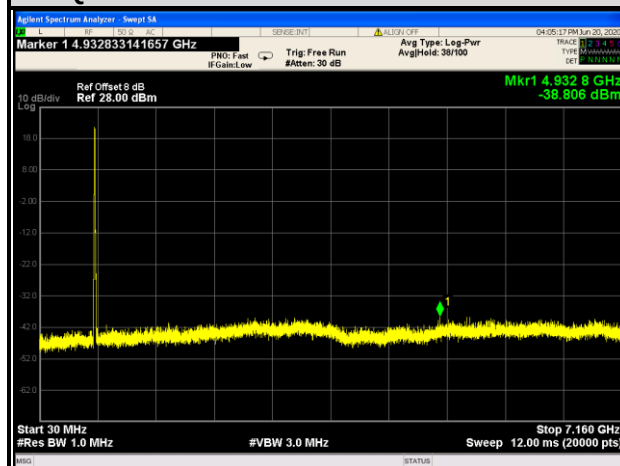


LTE BAND 12

1.4MHz / QPSK

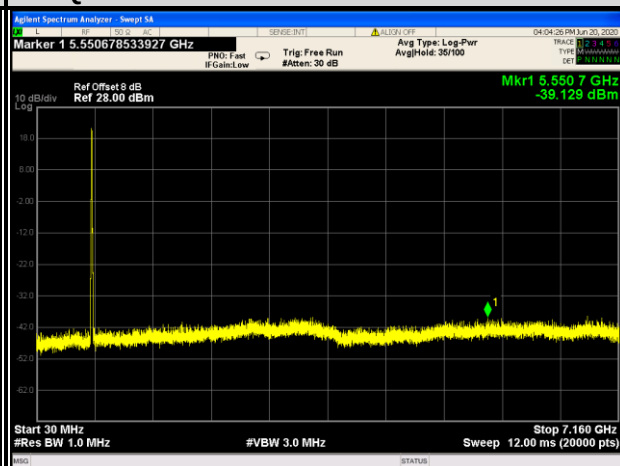
CHANNEL 23017

FREQUENCY RANGE : 30MHz~7.16GHz



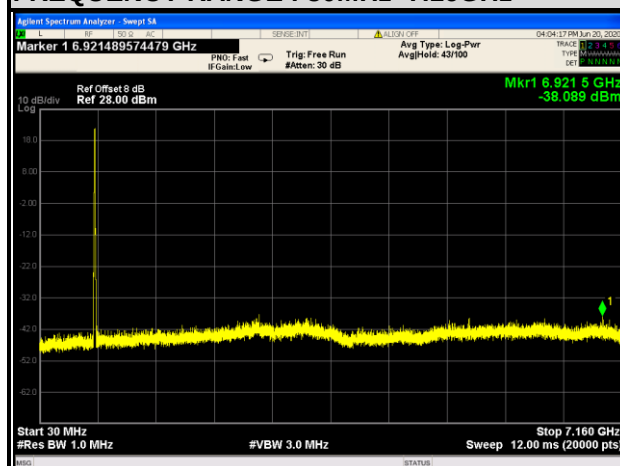
CHANNEL 23095

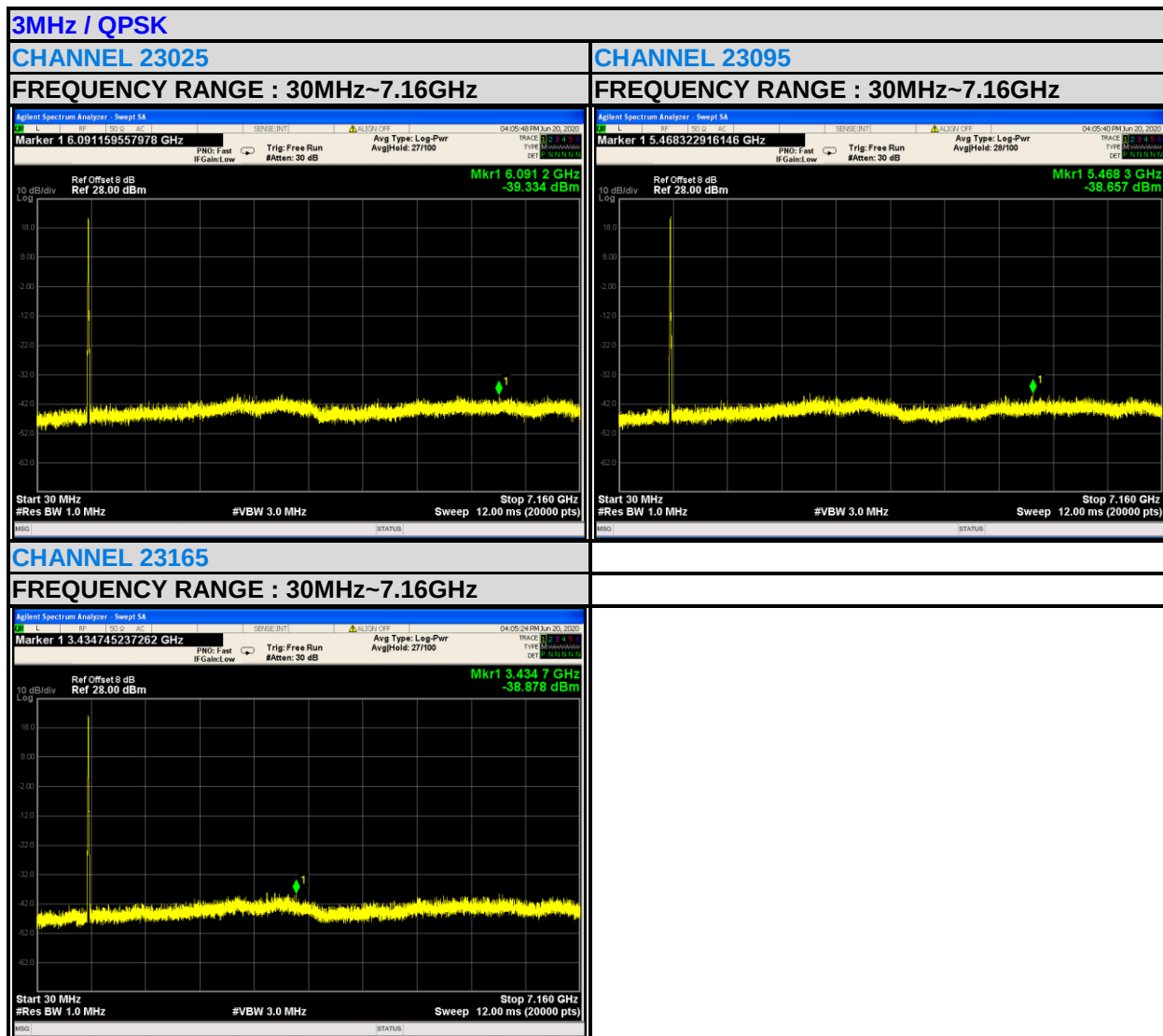
FREQUENCY RANGE : 30MHz~7.16GHz



CHANNEL 23173

FREQUENCY RANGE : 30MHz~7.16GHz

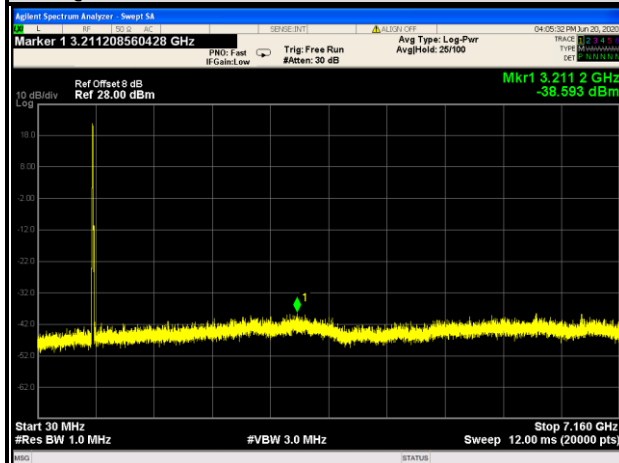




5MHz / QPSK

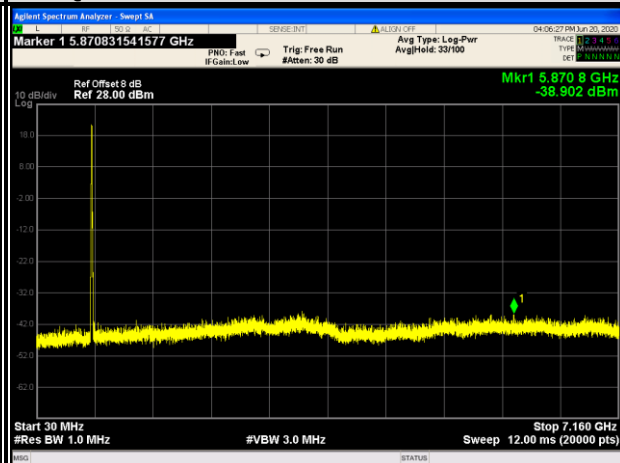
CHANNEL 23035

FREQUENCY RANGE : 30MHz~7.16GHz



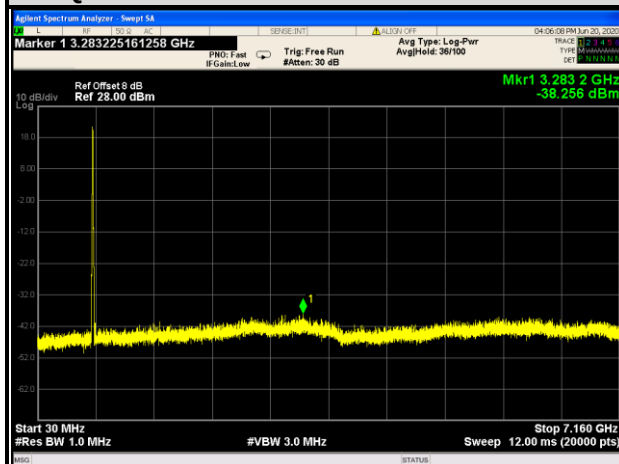
CHANNEL 23095

FREQUENCY RANGE : 30MHz~7.16GHz



CHANNEL 23155

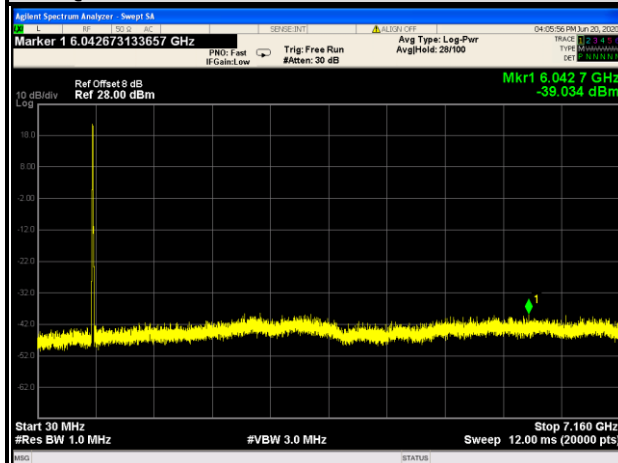
FREQUENCY RANGE : 30MHz~7.16GHz



10MHz / QPSK

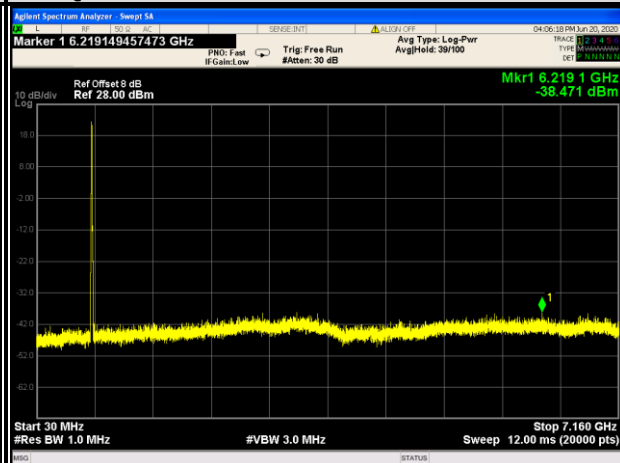
CHANNEL 23060

FREQUENCY RANGE : 30MHz~7.16GHz



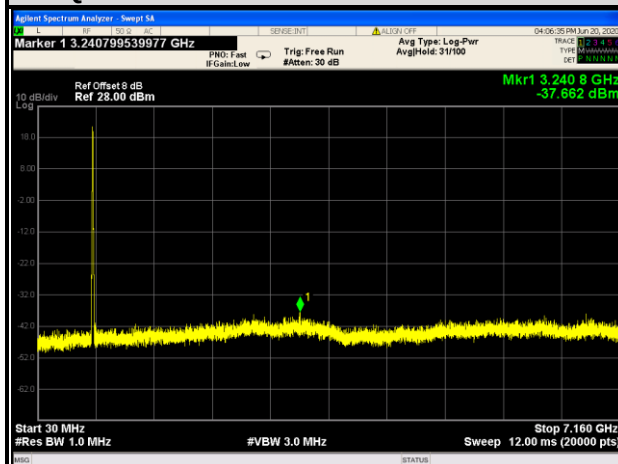
CHANNEL 23095

FREQUENCY RANGE : 30MHz~7.16GHz



CHANNEL 23130

FREQUENCY RANGE : 30MHz~7.16GHz



3.7 RADIATED EMISSION MEASUREMENT

3.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

3.7.2 TEST PROCEDURES

- 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, $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$

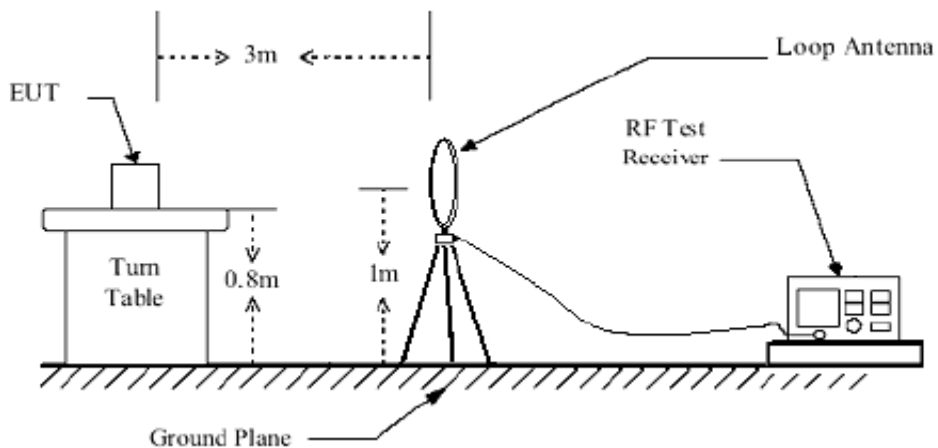
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.7.3 DEVIATION FROM TEST STANDARD

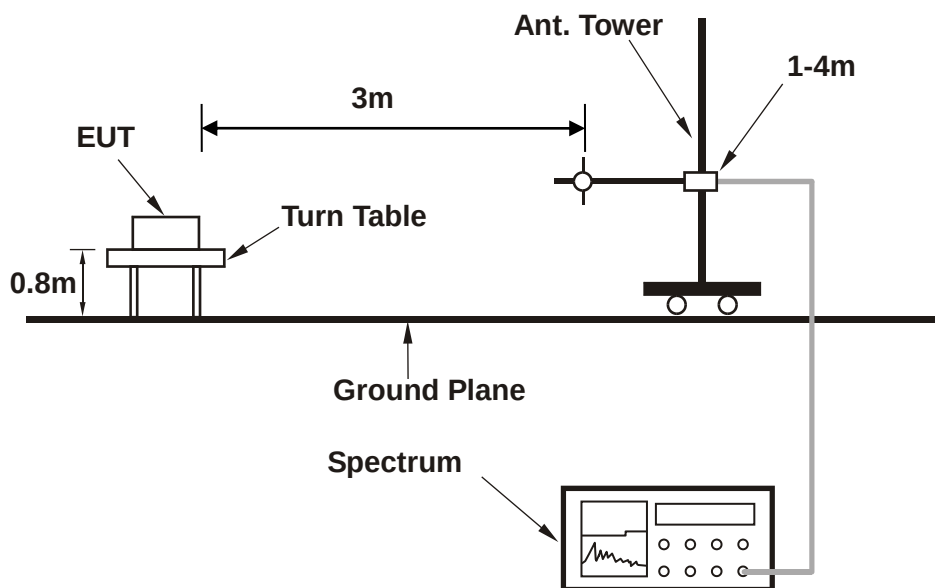
No deviation

3.7.4 TEST SETUP

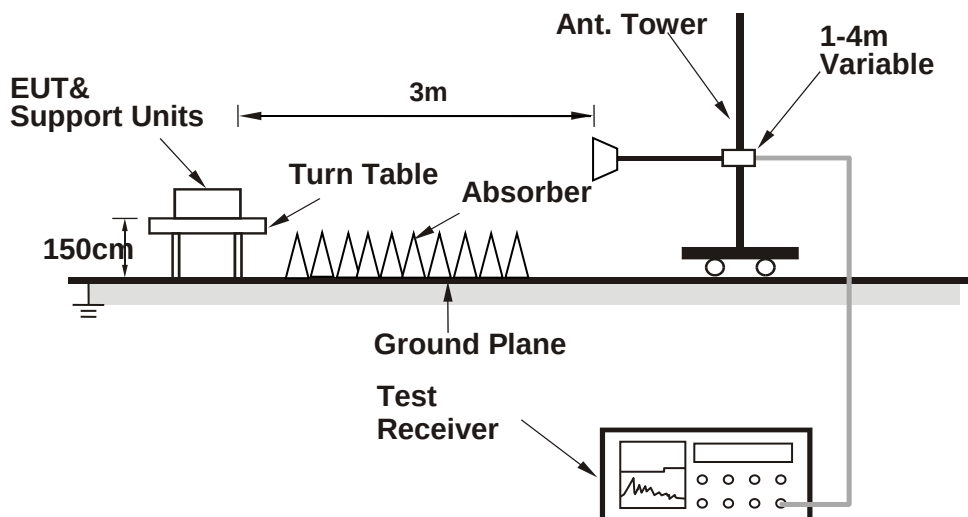
<Below 30MHz>



< Frequency Range 30MHz~1GHz >



< Frequency Range above 1GHz >



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

3.7.5 TEST RESULTS

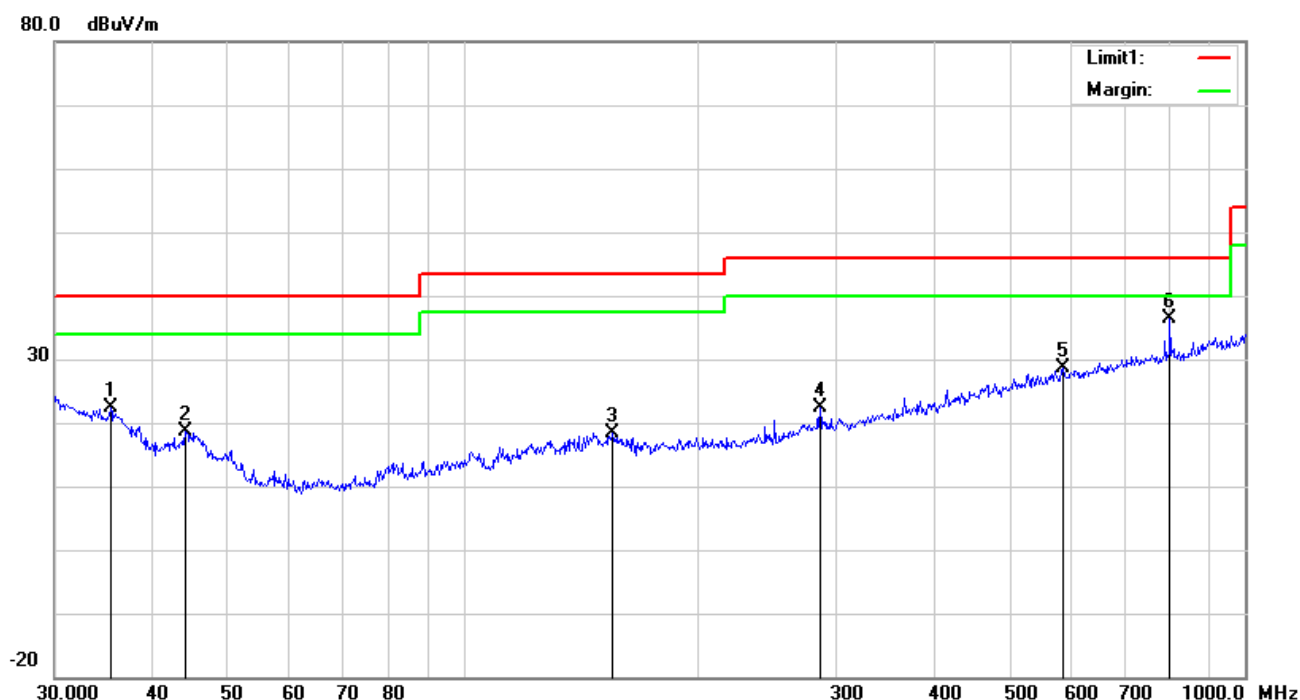
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 4

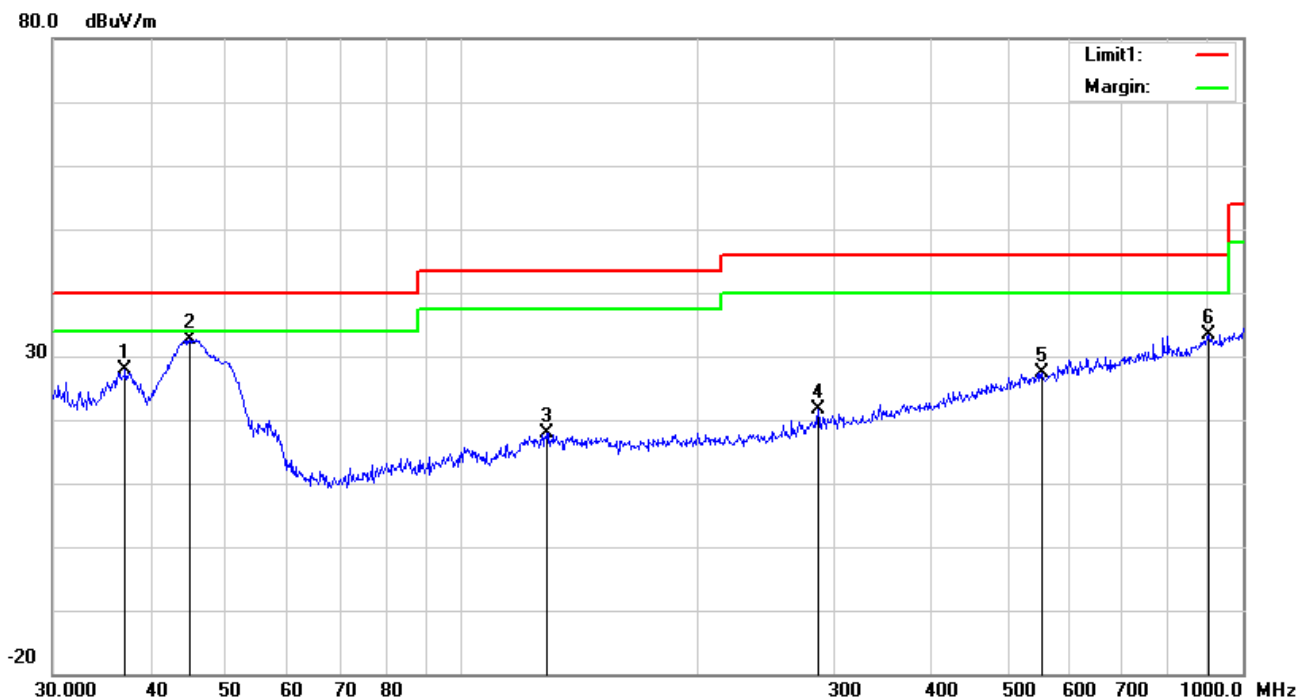
MODE	TX channel 20175	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 60%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Aaron Liang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	35.3750	27.82	16.58	22.25	0.16	22.31	40.00	-17.69	151	282
2	44.1202	30.52	10.15	22.29	0.20	18.58	40.00	-21.42	151	282
3	155.3644	28.54	10.96	22.30	1.29	18.49	43.50	-25.01	132	114
4	285.9778	29.64	13.36	22.29	1.69	22.40	46.00	-23.60	132	114
5	584.7895	27.67	20.18	21.61	2.30	28.54	46.00	-17.46	130	88
6	801.7863	32.71	22.29	21.15	2.56	36.41	46.00	-9.59	130	88



MODE	TX channel 20175	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 60%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Aaron Liang		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	37.1550	35.00	15.09	22.26	0.17	28.00	40.00	-12.00	140	240
2	44.9006	45.16	9.66	22.29	0.21	32.74	40.00	-7.26	140	240
3	128.5630	27.69	11.59	22.38	1.06	17.96	43.50	-25.54	137	169
4	285.9778	28.93	13.36	22.29	1.69	21.69	46.00	-24.31	137	169
5	552.8833	27.51	19.39	21.69	2.27	27.48	46.00	-18.52	144	170
6	903.3094	27.83	23.83	20.87	2.65	33.44	46.00	-12.56	144	170





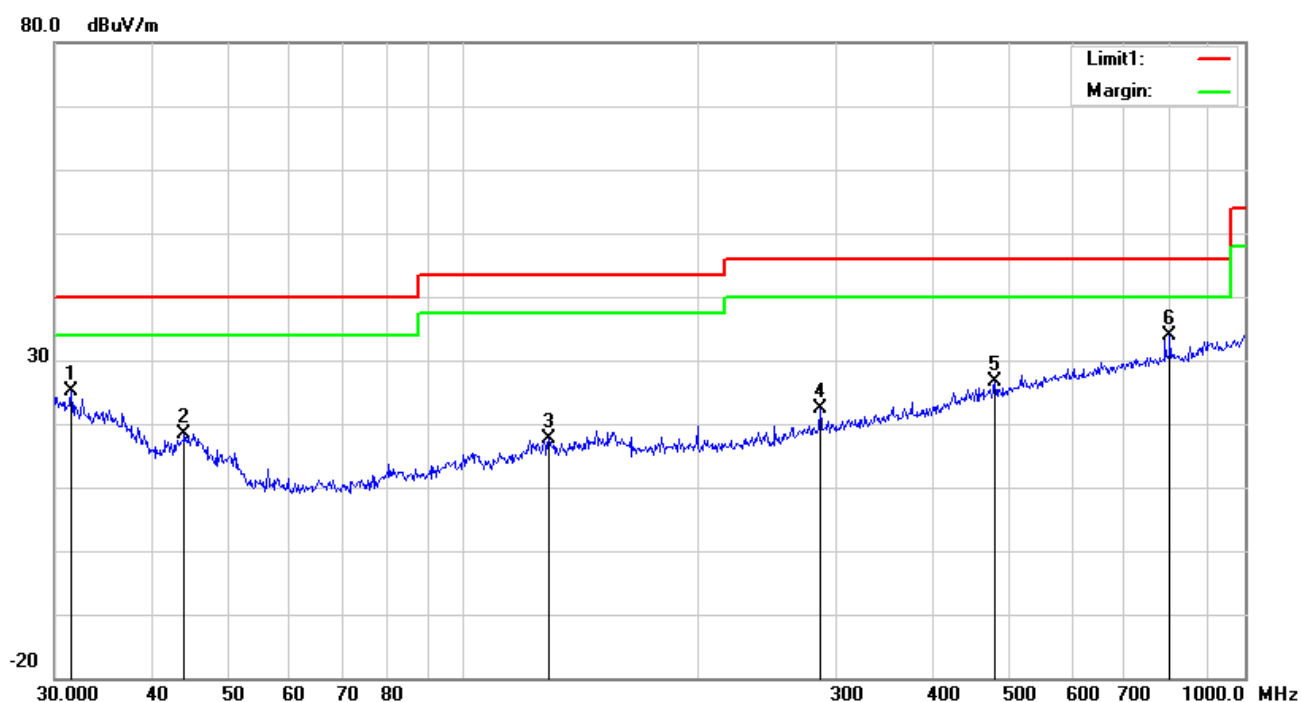
**BUREAU
VERITAS**

Test Report No.: RF200327S003-3

LTE Band 12

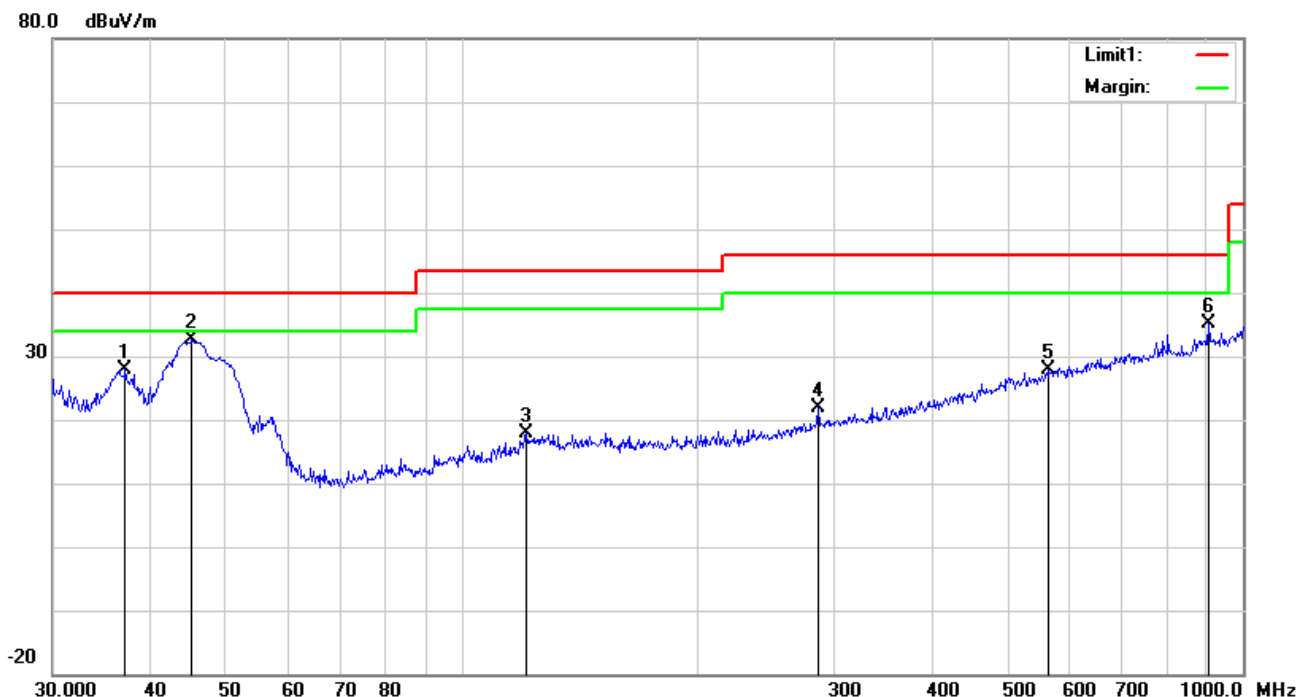
MODE	TX channel 23060	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 60%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Aaron Liang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	31.5095	28.05	19.13	22.27	0.14	25.05	40.00	-14.95	150	262
2	43.9658	30.23	10.24	22.29	0.20	18.38	40.00	-21.62	150	262
3	128.5630	27.30	11.59	22.38	1.06	17.57	43.50	-25.93	151	1
4	285.9778	29.51	13.36	22.29	1.69	22.27	46.00	-23.73	151	1
5	478.8456	27.98	18.45	21.85	2.08	26.66	46.00	-19.34	166	87
6	801.7863	30.22	22.29	21.15	2.56	33.92	46.00	-12.08	166	87



MODE	TX channel 23060	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	24deg. C, 60%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Aaron Liang		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m										
No.	Frequency (MHz)	Reading (dBuV/m)	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	37.1550	34.95	15.09	22.26	0.17	27.95	40.00	-12.05	144	232
2	45.2166	45.27	9.52	22.29	0.21	32.71	40.00	-7.29	144	232
3	121.1231	28.12	11.23	22.36	0.96	17.95	43.50	-25.55	144	278
4	285.9778	29.19	13.36	22.29	1.69	21.95	46.00	-24.05	144	278
5	564.6389	27.57	19.77	21.66	2.28	27.96	46.00	-18.04	134	111
6	903.3094	29.59	23.83	20.87	2.65	35.20	46.00	-10.80	134	111





**BUREAU
VERITAS**

Test Report No.: RF200327S003-3

ABOVE 1GHz

Note: For higher frequency, the emission is too low to be detected.

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3424.4	V	-32.59	-13	-19.59
3423.4	H	-31.67	-13	-18.67
5161.6	V	-40.1	-13	-27.1
5292.7	H	-40.54	-13	-27.54

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3467.66	V	-33.51	-13	-20.51
3467.66	H	-32.8	-13	-19.8
5292.7	V	-40.55	-13	-27.55
5198.7	H	-39.92	-13	-26.92

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3511.4	V	-33.32	-13	-20.32
3511.4	H	-31.52	-13	-18.52
5106.4	V	-40.55	-13	-27.55
5292.7	H	-40.24	-13	-27.24

Note:

- 1, The testing has been conformed to $10 \times 1754.3 \text{ MHz} = 17,543 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 4

CHANNEL BANDWIDTH: 3MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3424.4	V	-36.45	-13	-23.45
3424.4	H	-36.44	-13	-23.44
5254.9	V	-40.36	-13	-27.36
5264.3	H	-40.72	-13	-27.72

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3467.66	V	-36.97	-13	-23.97
3467.66	H	-36.81	-13	-23.81
5161.6	V	-40.46	-13	-27.46
5273.8	H	-40.61	-13	-27.61

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.1	V	-37.41	-13	-24.41
3505.1	H	-34.81	-13	-21.81
5124.76	V	-40.81	-13	-27.81
5264.36	H	-40.78	-13	-27.78

Note:

- 1, The testing has been conformed to $10 \times 1753.5 \text{ MHz} = 17,535 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 4

CHANNEL BANDWIDTH: 5MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3430.58	V	-38.02	-13	-25.02
3430.58	H	37.39	-13	50.39
5283.26	V	-40.27	-13	-27.27
5264.36	H	-40.82	-13	-27.82

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3461.45	V	-38.3	-13	-25.3
3467.66	H	-37.56	-13	-24.56
5340.37	V	-39.7	-13	-26.7
5226.77	H	-40.68	-13	-27.68

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.1	V	-28.2	-13	-15.2
3505.1	H	-36.46	-13	-23.46
5161.6	V	-40.15	-13	-27.15
5124.76	H	-40.49	-13	-27.49

Note:

- 1, The testing has been conformed to $10 \times 1752.5 \text{ MHz} = 17,525 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 4

CHANNEL BANDWIDTH: 10MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3436.7	V	-39.19	-13	-26.19
3434.7	H	-40.03	-13	-27.03
5208.07	V	-34.15	-13	-21.15
5575.02	H	-40.16	-13	-27.16

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3461.45	V	-40.08	-13	-27.08
3461.45	H	-39.61	-13	-26.61
5161.62	V	-40.05	-13	-27.05
5311.7	H	-40.43	-13	-27.43

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.1	V	-39.84	-13	-26.84
3498.86	H	-39.21	-13	-26.21
5152.38	V	-39.78	-13	-26.78
5180.15	H	-40.26	-13	-27.26

Note:

- 1, The testing has been conformed to $10 \times 1750 \text{ MHz} = 17,500 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 4

CHANNEL BANDWIDTH: 15MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3436.7	V	-41.46	-13	-28.46
3436.7	H	-38.88	-13	-25.88
5115.59	V	-40.33	-13	-27.33
5311.7	H	-40.86	-13	-27.86

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3461.45	V	-41.82	-13	-28.82
3455.2	H	-40.94	-13	-27.94
5106.4	V	-39.87	-13	-26.87
5115.59	H	-40.38	-13	-27.38

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3498.86	V	-40.75	-13	-27.75
3498.86	H	-40.09	-13	-27.09
5133.95	V	-40.03	-13	-27.03
5292.7	H	-40.24	-13	-27.24

Note:

- 1, The testing has been conformed to $10 \times 1747.5 \text{ MHz} = 17,475 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 4

CHANNEL BANDWIDTH: 20MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3442.9	V	-38.86	-13	-25.86
3436.7	H	-39.83	-13	-26.83
5124.76	V	-39.89	-13	-26.89
5152.38	H	-40.74	-13	-27.74

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3467.66	V	-41.02	-13	-28.02
3467.66	H	-41.48	-13	-28.48
5115.59	V	-44.91	-13	-31.91
5161.6	H	-41.04	-13	-28.04

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3480.1	V	-42.32	-13	-29.32
3498.86	H	-41.11	-13	-28.11
5236.1	V	-40.47	-13	-27.47
5273.8	H	-40.43	-13	-27.43

Note:

- 1, The testing has been conformed to $10 \times 1745 \text{ MHz} = 17,450 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.



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LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1398	V	-47.87	-13	-34.87
1398	H	-52.12	-13	-39.12
2099.68	V	-42.96	-13	-29.96
2099.68	H	-42.37	-13	-29.37

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1413.1	V	-51.35	-13	-38.35
1413.1	H	-50.2	-13	-37.2
2122.38	V	-44.53	-13	-31.53
2122.38	H	-44.04	-13	-31.04

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1430.96	V	-49.45	-13	-36.45
1430.96	H	-50.91	-13	-37.91
2145.3	V	-41.11	-13	-28.11
2145.3	H	-42.41	-13	-29.41

Note:

- 1, The testing has been conformed to $10 \times 715.3 \text{ MHz} = 7,153 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

LTE BAND 12

CHANNEL BANDWIDTH: 3MHz / QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1400.5	V	-49.41	-13	-36.41
1400.5	H	-52.77	-13	-39.77
2099.68	V	-43.41	-13	-30.41
2103.45	H	-42.66	-13	-29.66

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1415.66	V	-51.75	-13	-38.75
1370.7	H	-54.5	-13	-41.5
2118.58	V	-43.91	-13	-30.91
2122.38	H	-45.16	-13	-32.16