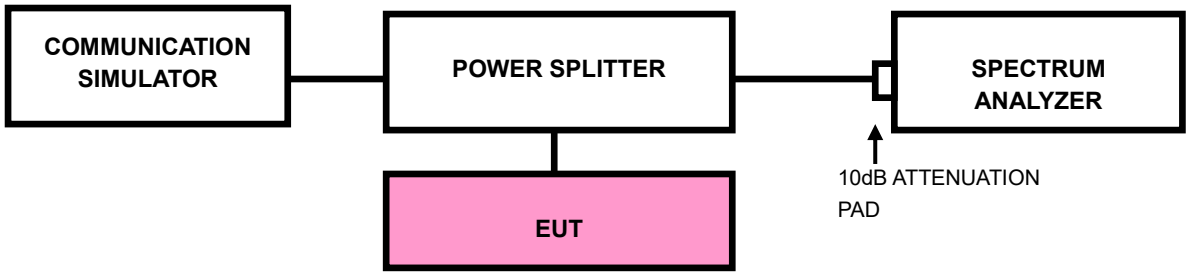
3.4 BAND EDGE MEASUREMENT

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

According to FCC Part 27.53(h) specified that For operations in the 1710-1755 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

According to FCC Part 27.53(m)(4) specified that For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. For mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

a) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.

b) Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).

c) Set the resolution bandwidth (RBW) ≧ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

d) Beyond the 1MHz band from the band edge, RBW=1MHz was used.

e) Set the video bandwidth (VBW) to ≧3 x RBW.

f) Select the average power (RMS) display detector.

g) Set the number of measurement points to ≧ 1001.

h) Use auto-coupled sweep time.

i) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.

j) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 30/100KHz.

k) Record the max trace plot into the test report.

3.4.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 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 –13dBm.

For: Band41

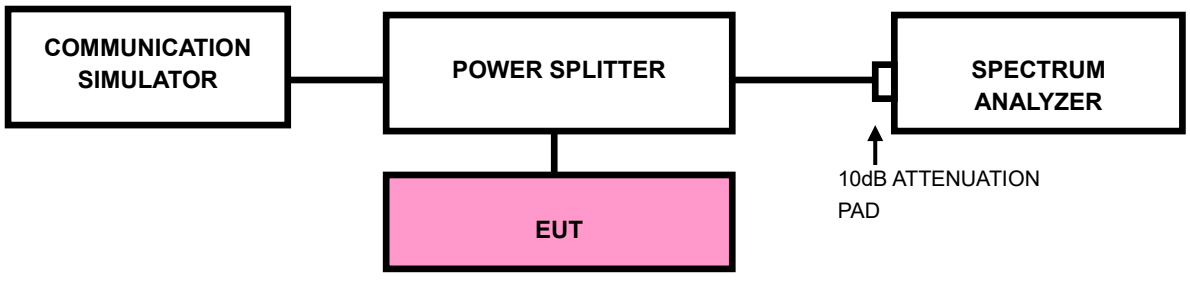
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

3.5.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9kHz up to a frequency including its 10th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

NOTE：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 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 –13dBm.

For: Band41

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

.

3.6.2 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. EIRP = Output power level of S.G – TX cable loss + 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, E.R.P power = E.I.P.R power - 2.15dBi.

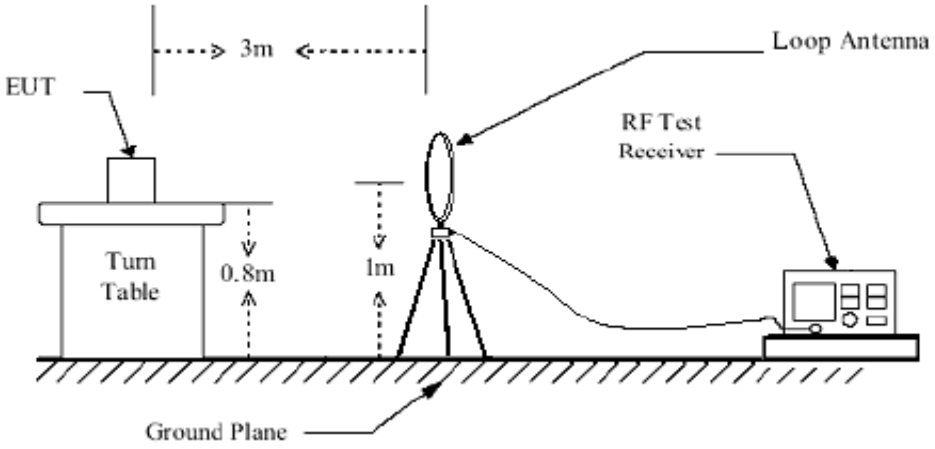
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.6.3 DEVIATION FROM TEST STANDARD

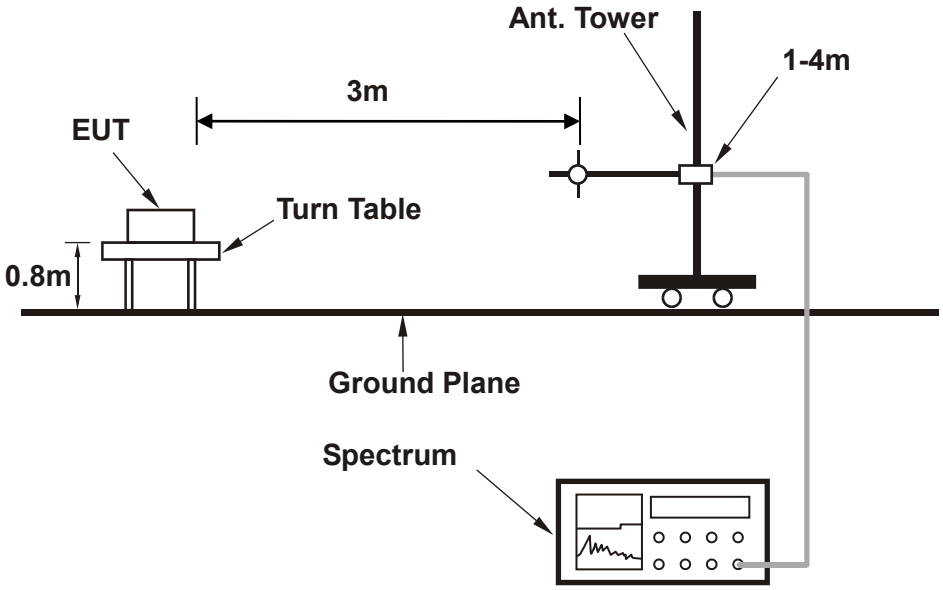
No deviation

3.6.4 TEST SETUP

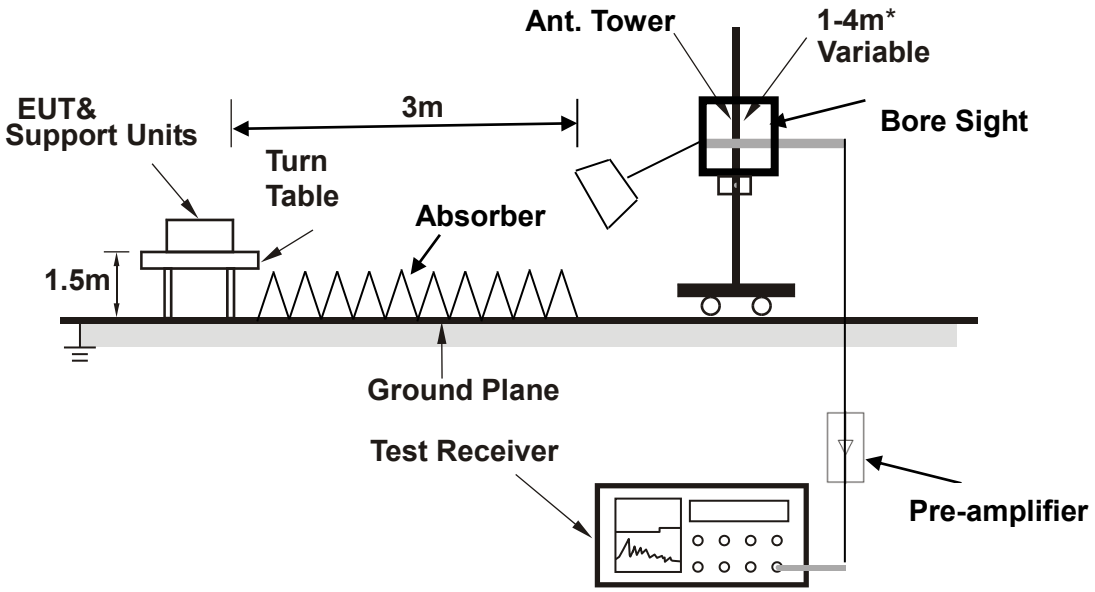
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

3.6.5 TEST RESULTS

NOTE： The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

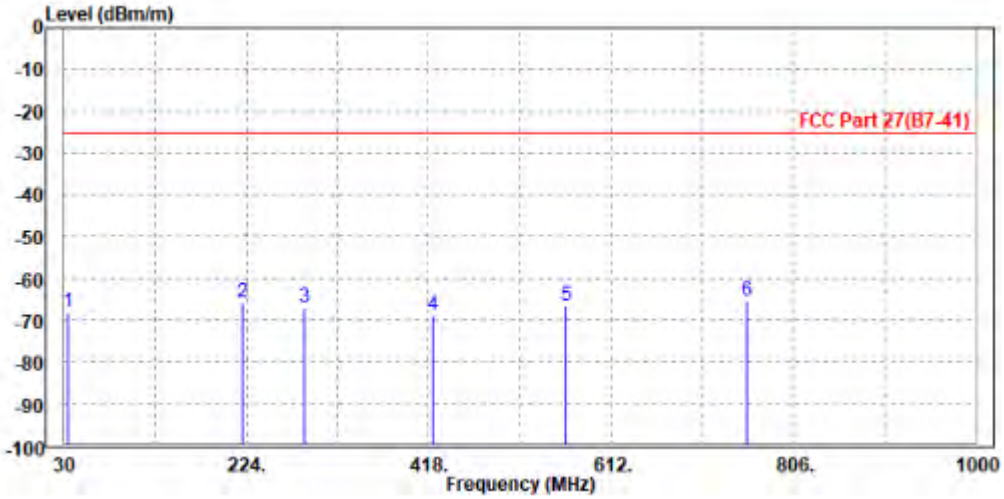
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 41
CHANNEL BANDWIDTH: 10MHz / QPSK

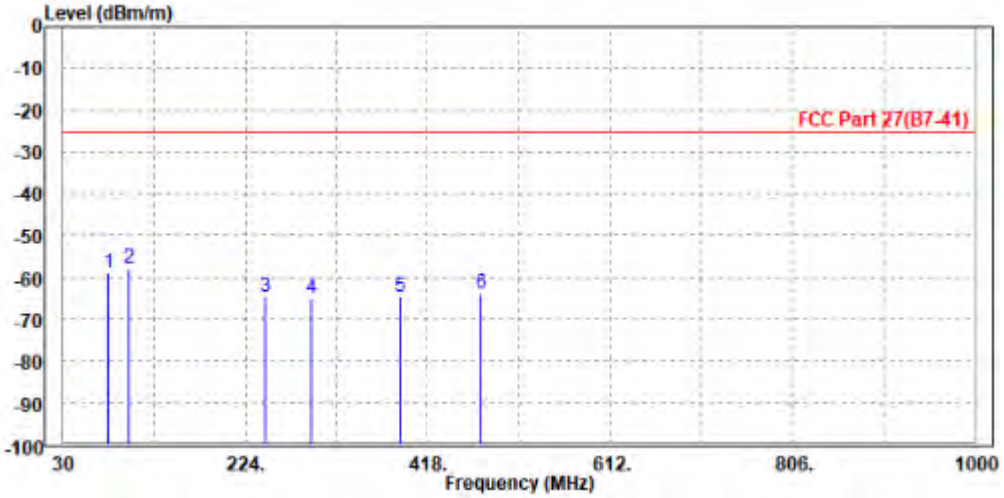
MODE	TX channel 41190	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	34.850	-67.92	-55.88	-25.00	-42.92	-12.04	Peak	Horizontal
2	220.120	-65.88	-50.86	-25.00	-40.88	-15.02	Peak	Horizontal
3	286.080	-67.04	-54.86	-25.00	-42.04	-12.18	Peak	Horizontal
4	422.850	-68.79	-59.17	-25.00	-43.79	-9.62	Peak	Horizontal
5	563.500	-66.53	-60.95	-25.00	-41.53	-5.58	Peak	Horizontal
6 PP	756.530	-65.25	-61.56	-25.00	-40.25	-3.69	Peak	Horizontal



MODE	TX channel 41190	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	78.500	-58.81	-39.14	-25.00	-33.81	-19.67	Peak	Vertical
2 PP	99.840	-57.80	-51.29	-25.00	-32.80	-6.51	Peak	Vertical
3	244.370	-64.81	-50.71	-25.00	-39.81	-14.10	Peak	Vertical
4	294.810	-64.83	-53.73	-25.00	-39.83	-11.10	Peak	Vertical
5	387.930	-64.59	-55.37	-25.00	-39.59	-9.22	Peak	Vertical
6	475.230	-63.70	-55.39	-25.00	-38.70	-8.31	Peak	Vertical



ABOVE 1GHz

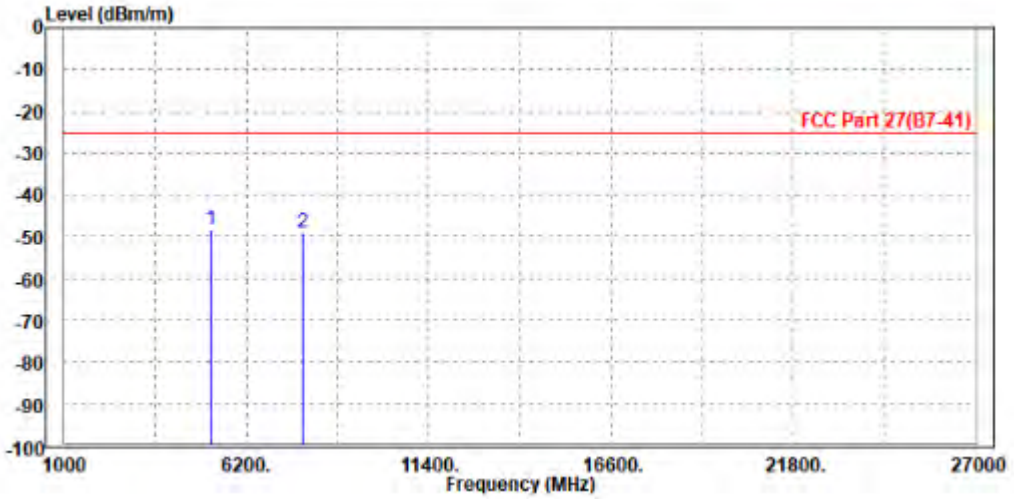
Note: For higher frequency, the emission is too low to be detected.

LTE BAND 41

CHANNEL BANDWIDTH: 5MHz / QPSK

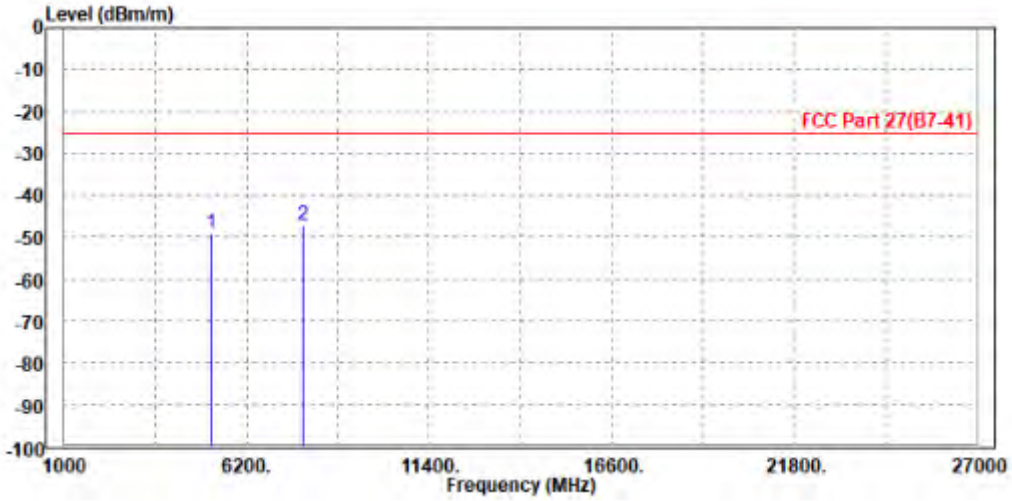
MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	5186.000	-48.43	-58.41	-25.00	-23.43	9.98	Peak	Horizontal
2	7785.000	-49.19	-62.68	-25.00	-24.19	13.49	Peak	Horizontal



MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

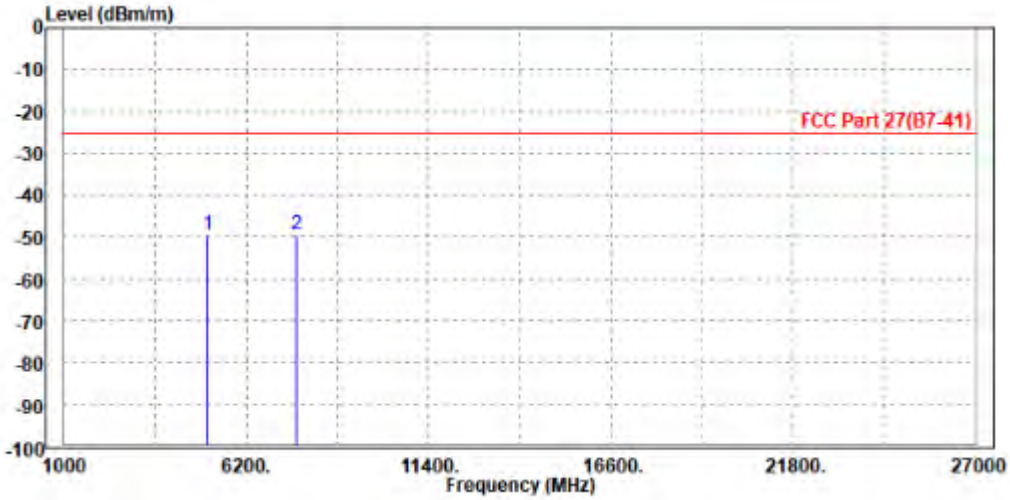
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5190.000	-49.23	-59.67	-25.00	-24.23	10.44	Peak	Vertical
2 PP	7786.000	-47.08	-62.20	-25.00	-22.08	15.12	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK
CH40090

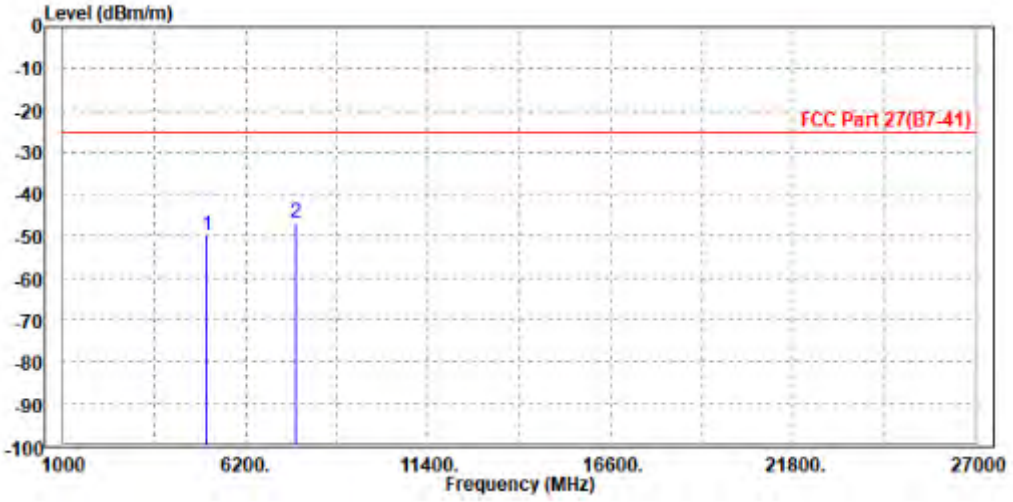
MODE	TX channel 40090	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5082.000	-49.38	-59.20	-25.00	-24.38	9.82	Peak	Horizontal
2 PP	7620.000	-49.35	-61.64	-25.00	-24.35	12.29	Peak	Horizontal



MODE	TX channel 40090	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

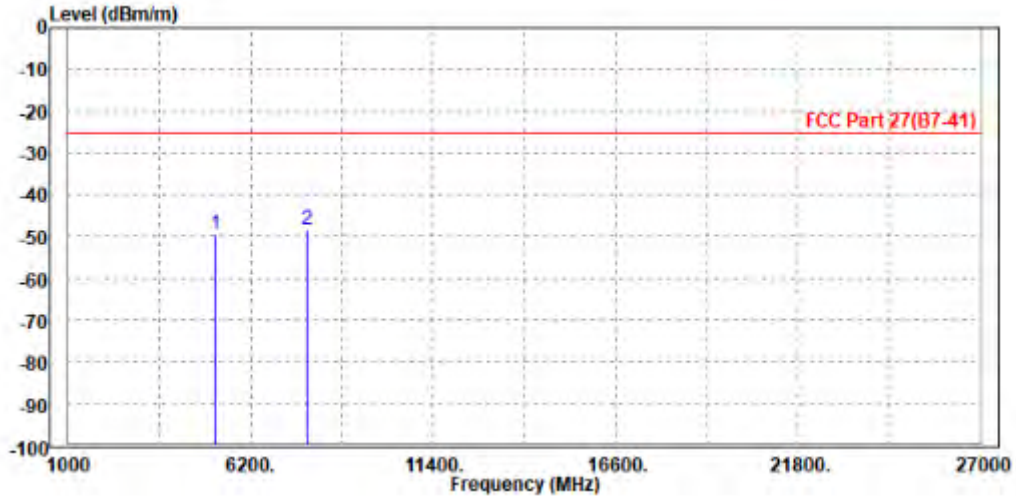
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5080.000	-49.94	-60.28	-25.00	-24.94	10.34	Peak	Vertical
2 PP	7630.000	-46.81	-61.70	-25.00	-21.81	14.89	Peak	Vertical



CH40640

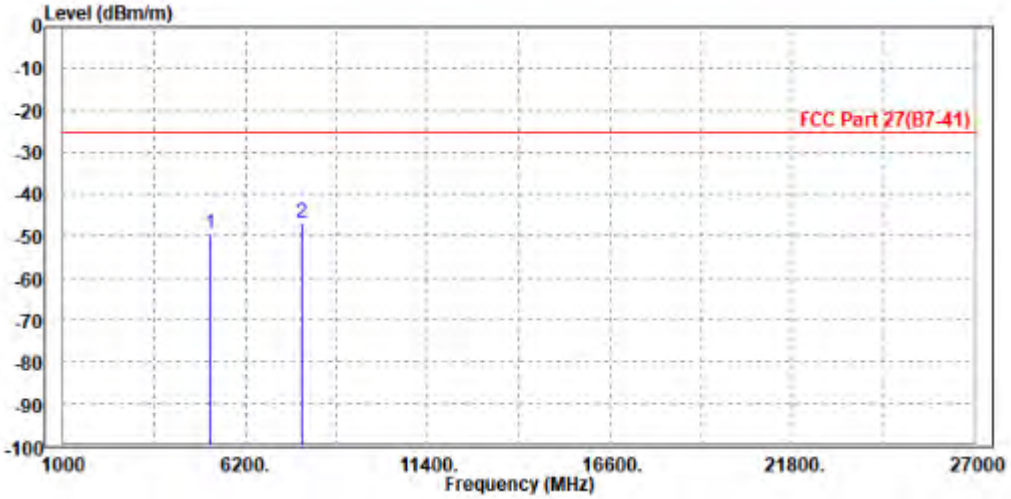
MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5190.000	-49.50	-59.49	-25.00	-24.50	9.99	Peak	Horizontal
2 PP	7786.000	-48.16	-61.65	-25.00	-23.16	13.49	Peak	Horizontal



MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

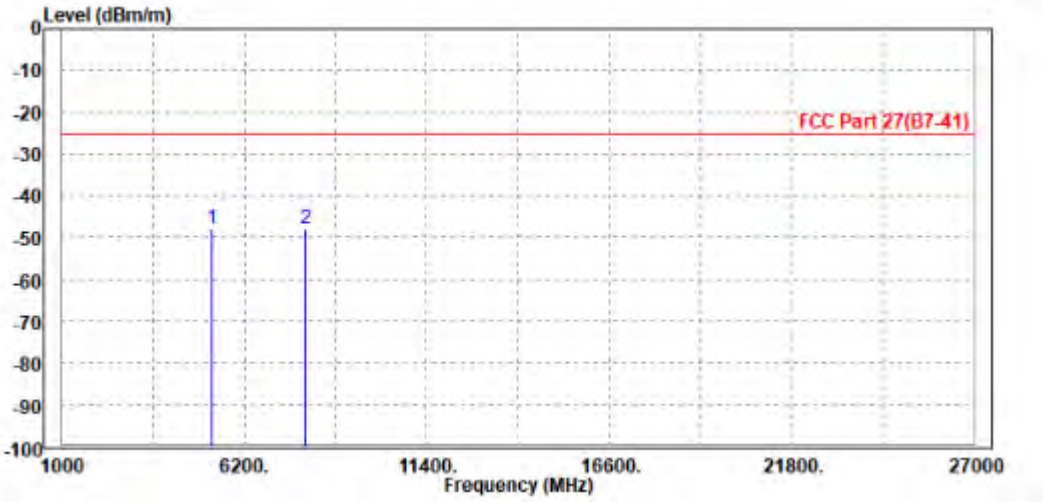
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5186.000	-49.48	-59.92	-25.00	-24.48	10.44	Peak	Vertical
2 PP	7785.000	-46.72	-61.84	-25.00	-21.72	15.12	Peak	Vertical



CH41190

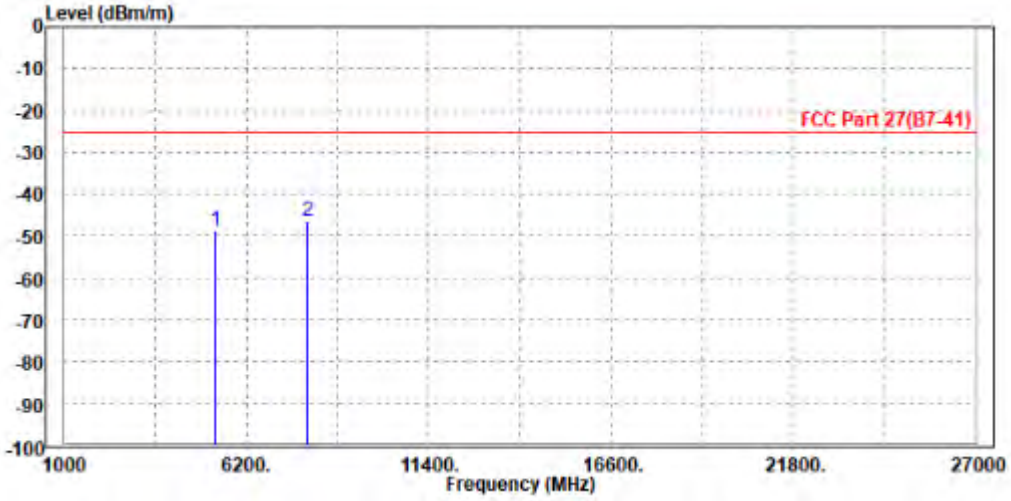
MODE	TX channel 41190	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 5290.000	-47.75	-57.89	-25.00	-22.75	10.14	Peak	Horizontal
2	7950.000	-47.87	-62.56	-25.00	-22.87	14.69	Peak	Horizontal



MODE	TX channel 41190	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

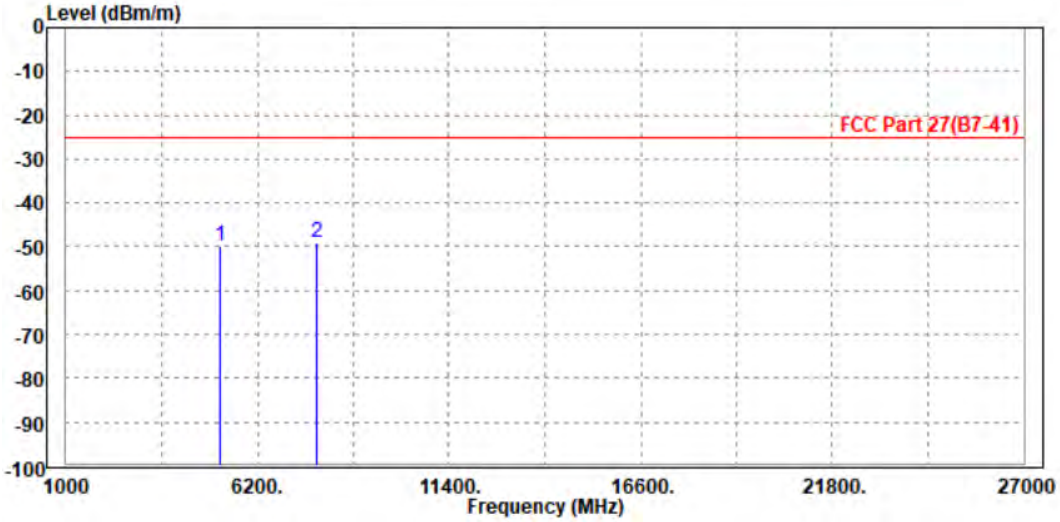
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5300.000	-48.68	-59.22	-25.00	-23.68	10.54	Peak	Vertical
2 PP	7942.000	-46.30	-61.65	-25.00	-21.30	15.35	Peak	Vertical



CHANNEL BANDWIDTH: 15MHz / QPSK

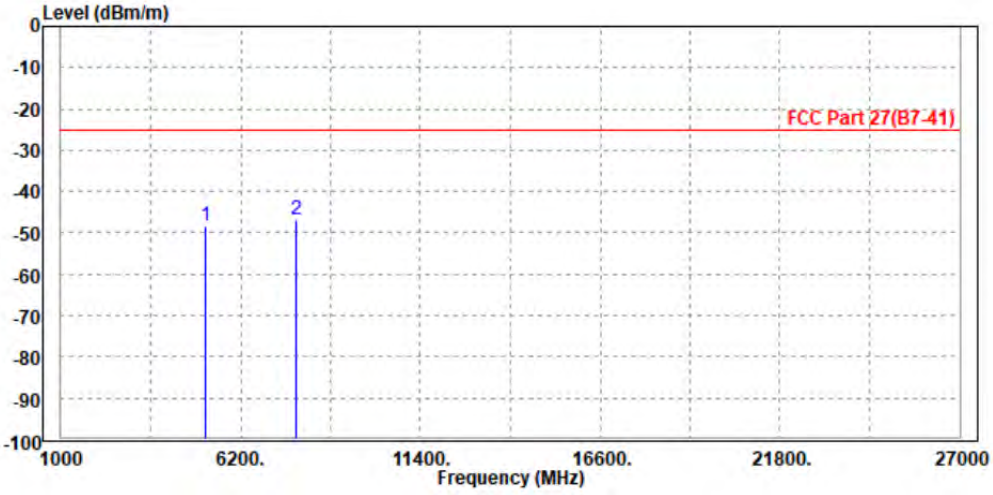
MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5186.000	-49.75	-59.73	-25.00	-24.75	9.98	Peak	Horizontal
2 PP	7785.000	-48.95	-62.44	-25.00	-23.95	13.49	Peak	Horizontal



MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

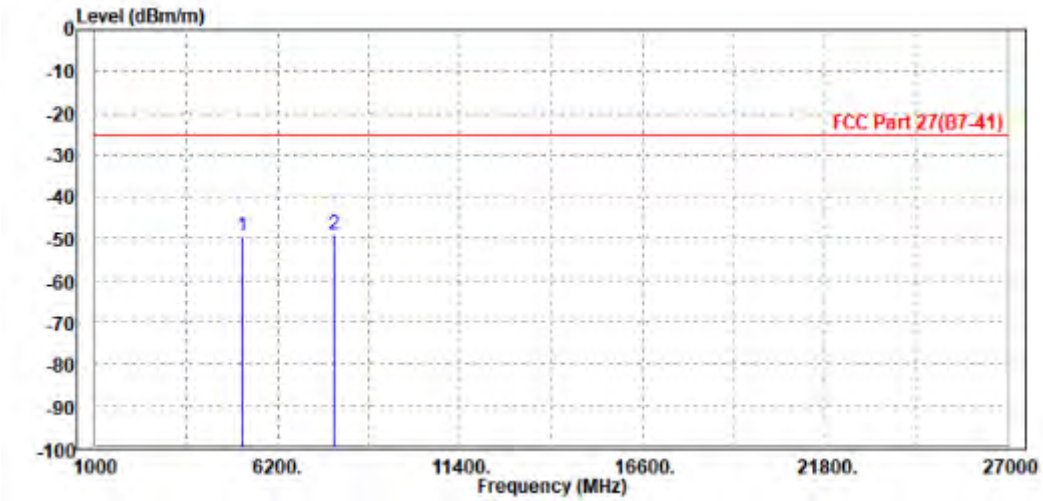
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5190.000	-48.31	-58.75	-25.00	-23.31	10.44	Peak	Vertical
2 PP	7786.000	-46.91	-62.03	-25.00	-21.91	15.12	Peak	Vertical



CHANNEL BANDWIDTH: 20MHz / QPSK

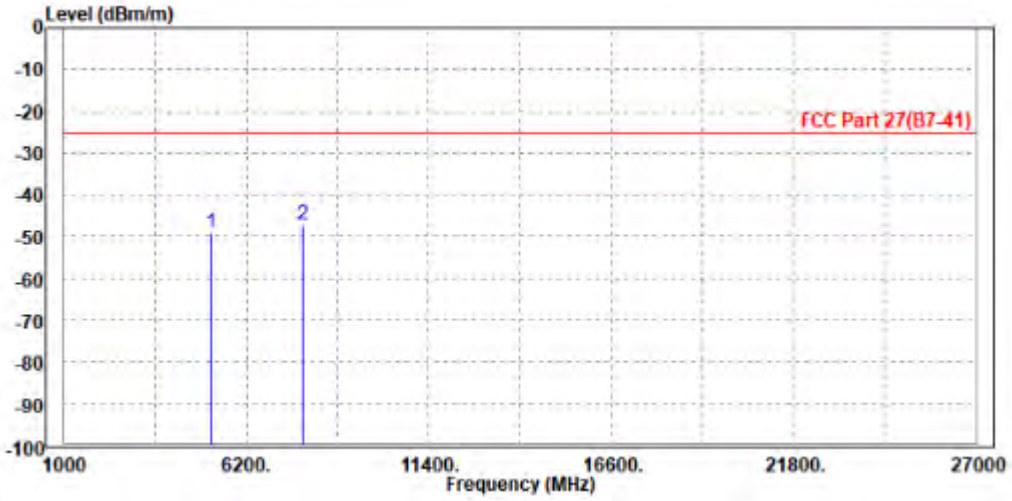
MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5190.000	-49.35	-59.34	-25.00	-24.35	9.99	Peak	Horizontal
2 PP	7786.000	-48.98	-62.47	-25.00	-23.98	13.49	Peak	Horizontal



MODE	TX channel 40640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	5186.000	-49.10	-59.54	-25.00	-24.10	10.44	Peak	Vertical
2 PP	7785.000	-47.23	-62.35	-25.00	-22.23	15.12	Peak	Vertical

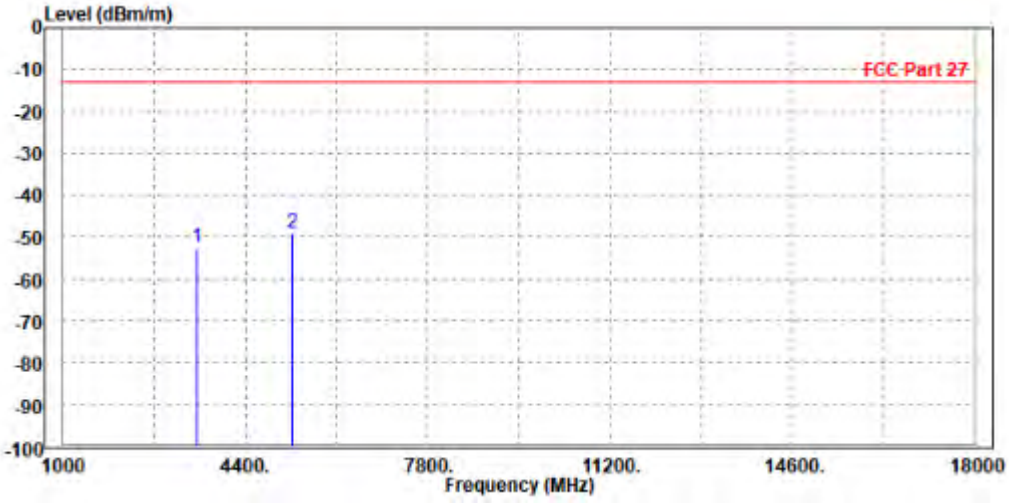


LTE B66

CHANNEL BANDWIDTH: 1.4MHz / QPSK

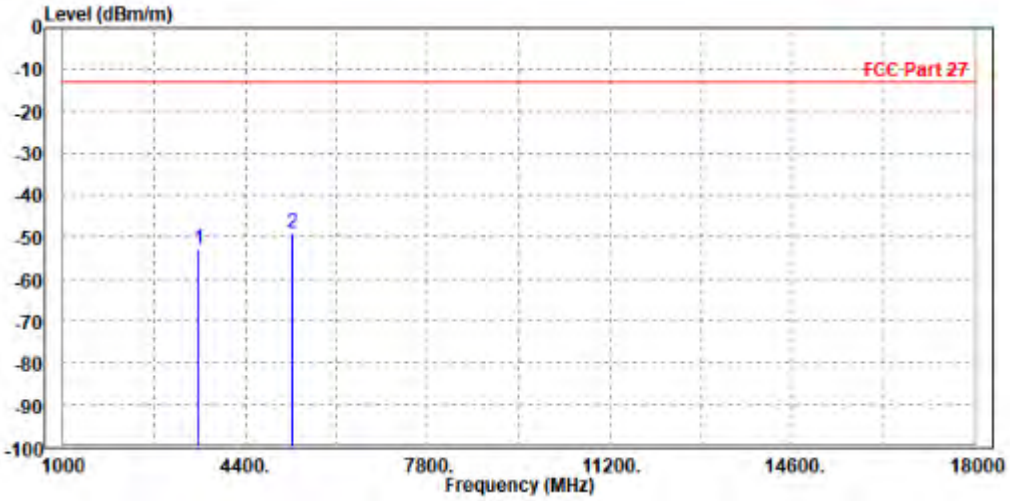
MODE	TX channel 132322	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-52.54	-59.89	-13.00	-39.54	7.35	Peak	Horizontal
2 PP	5267.000	-48.87	-58.98	-13.00	-35.87	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-53.03	-60.37	-13.00	-40.03	7.34	Peak	Vertical
2 PP	5265.000	-49.09	-59.60	-13.00	-36.09	10.51	Peak	Vertical

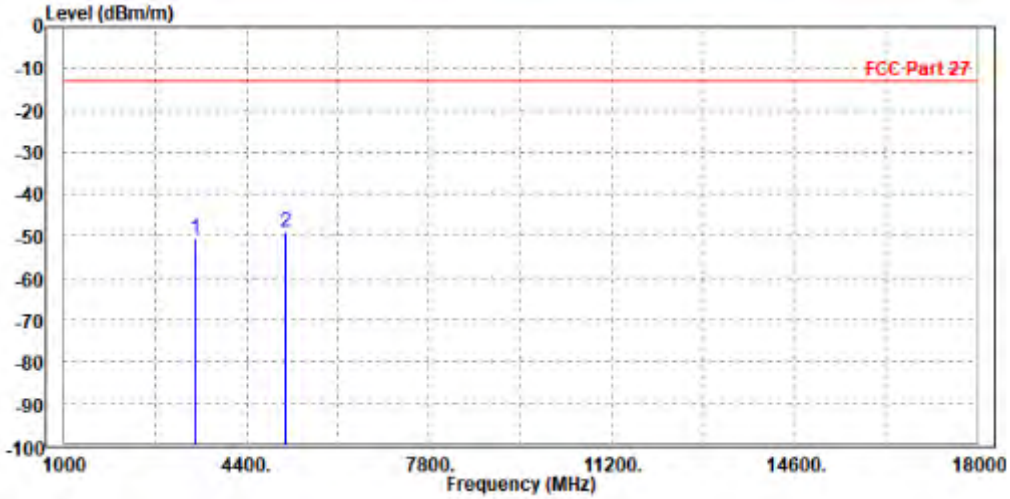


CHANNEL BANDWIDTH: 3MHz / QPSK

CH131987

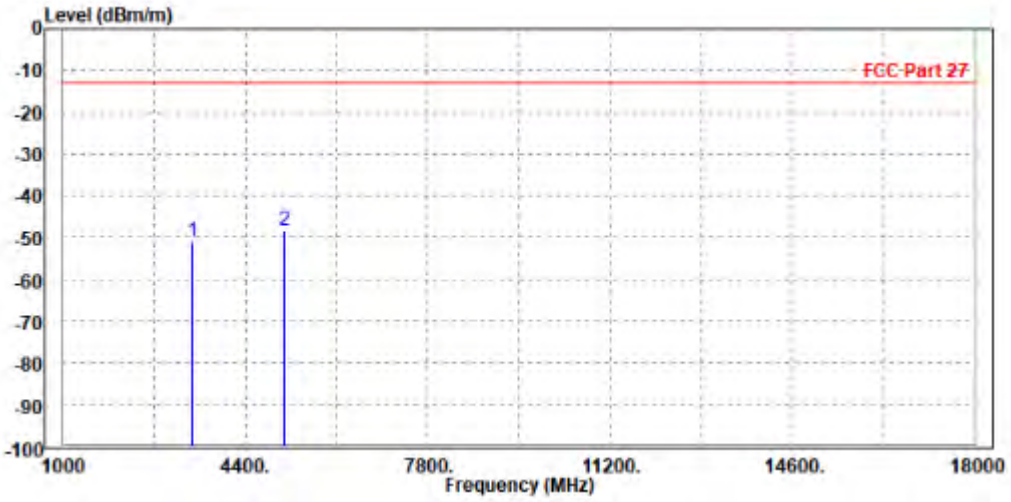
MODE	TX channel 131987	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3431.000	-50.39	-57.62	-13.00	-37.39	7.23	Peak	Horizontal
2 PP	5134.500	-48.87	-58.77	-13.00	-35.87	9.90	Peak	Horizontal



MODE	TX channel 131987	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

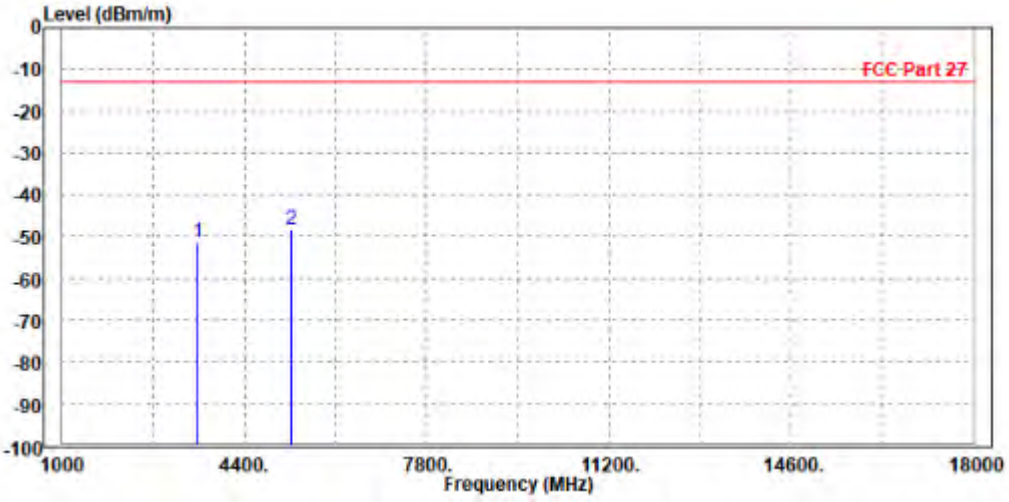
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3423.000	-50.78	-57.98	-13.00	-37.78	7.20	Peak	Vertical
2 PP	5131.000	-48.33	-58.72	-13.00	-35.33	10.39	Peak	Vertical



CH132322

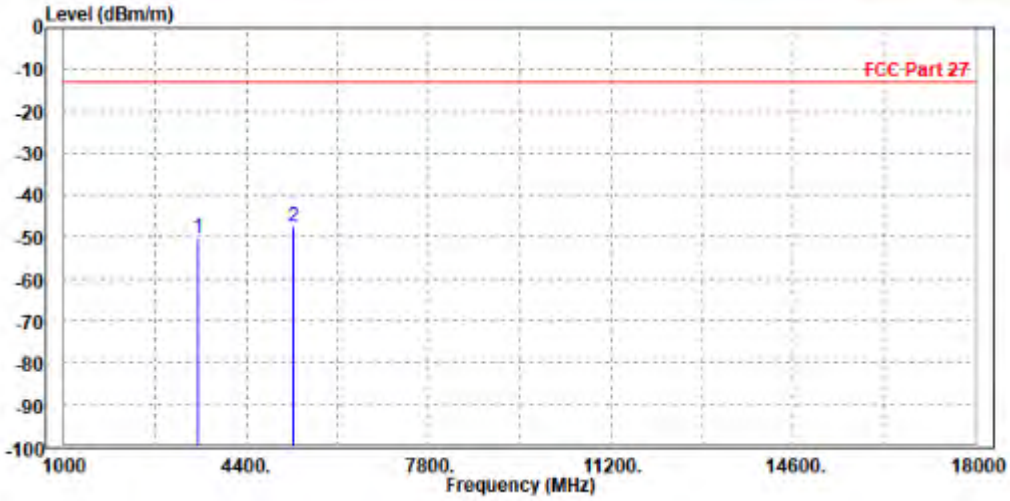
MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-51.18	-58.54	-13.00	-38.18	7.36	Peak	Horizontal
2 PP	5265.000	-48.44	-58.55	-13.00	-35.44	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

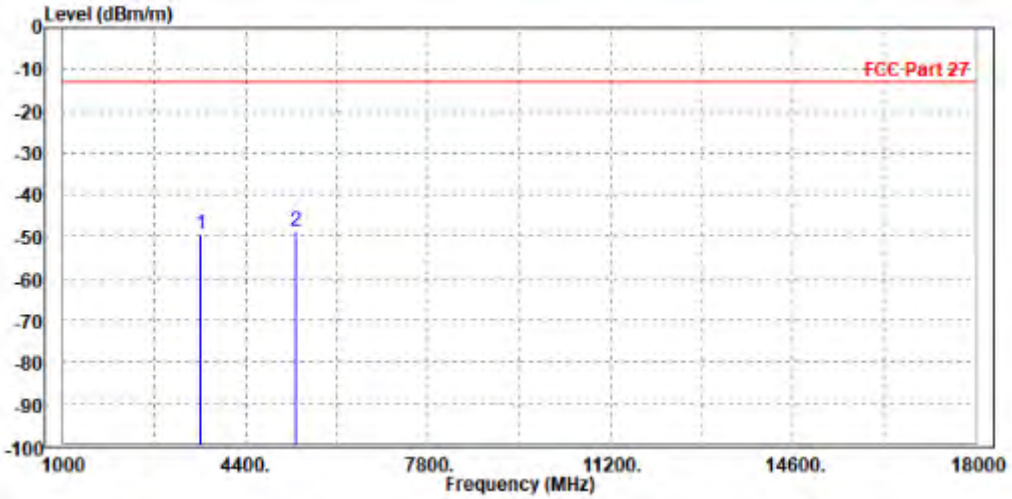
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-50.07	-57.40	-13.00	-37.07	7.33	Peak	Vertical
2 PP	5267.000	-47.39	-57.90	-13.00	-34.39	10.51	Peak	Vertical



CH132657

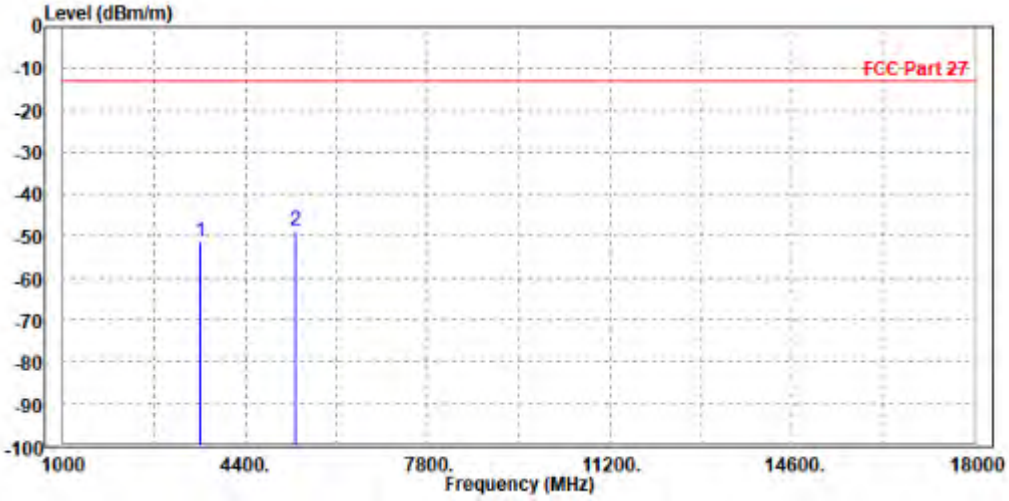
MODE	TX channel 132657	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3550.000	-49.49	-56.94	-13.00	-36.49	7.45	Peak	Horizontal
2 PP	5335.500	-48.68	-58.90	-13.00	-35.68	10.22	Peak	Horizontal



MODE	TX channel 132657	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

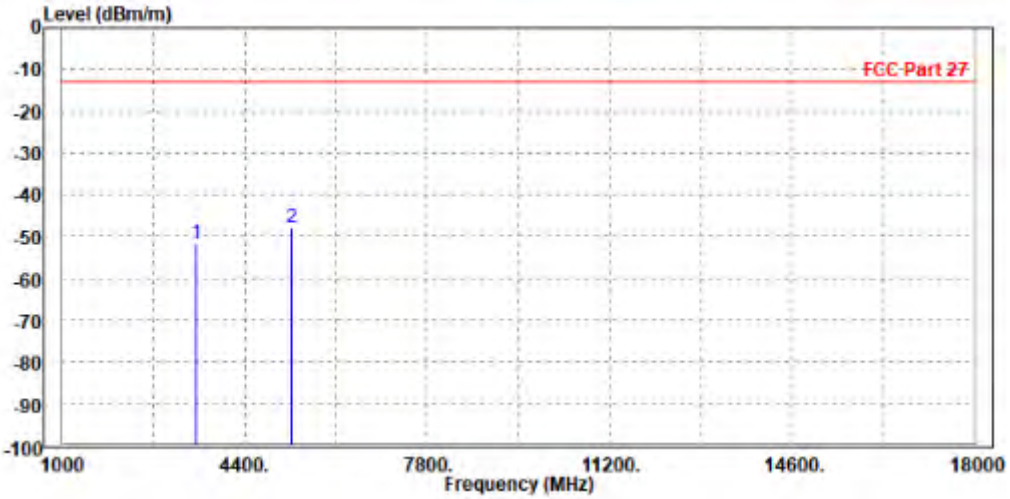
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3557.000	-51.41	-58.81	-13.00	-38.41	7.40	Peak	Vertical
2 PP	5335.000	-48.70	-59.28	-13.00	-35.70	10.58	Peak	Vertical



CHANNEL BANDWIDTH: 5MHz / QPSK

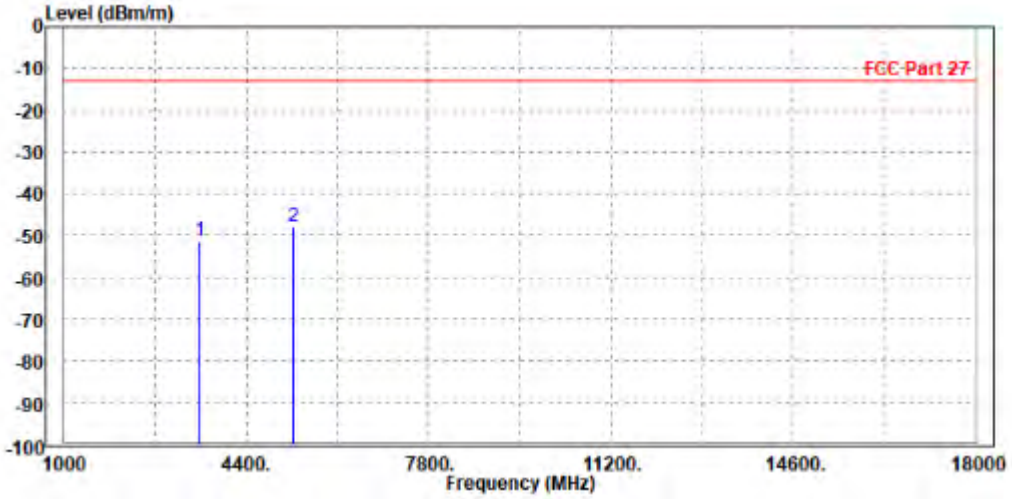
MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-51.54	-58.89	-13.00	-38.54	7.35	Peak	Horizontal
2 PP	5267.000	-48.06	-58.17	-13.00	-35.06	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

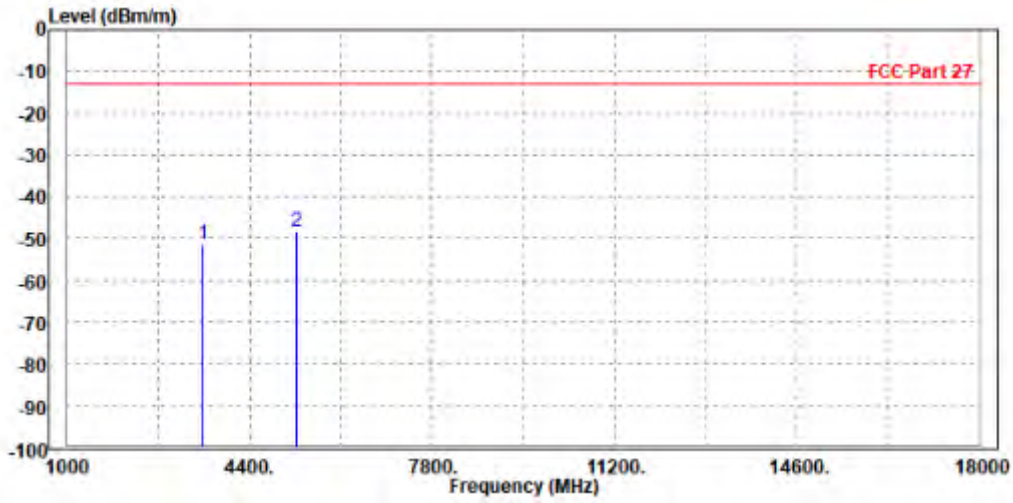
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-51.31	-58.65	-13.00	-38.31	7.34	Peak	Vertical
2 PP	5265.000	-47.87	-58.38	-13.00	-34.87	10.51	Peak	Vertical



CHANNEL BANDWIDTH: 10MHz / QPSK

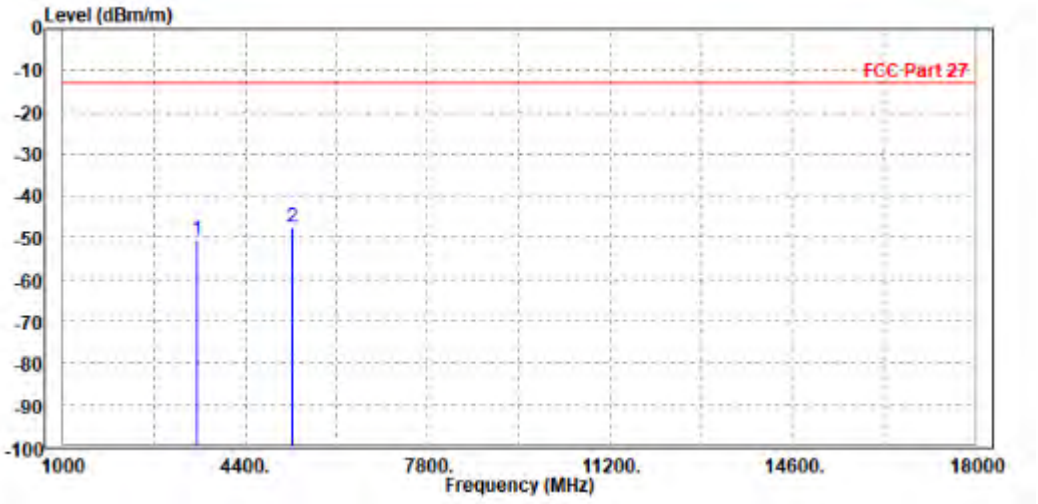
MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-51.49	-58.85	-13.00	-38.49	7.36	Peak	Horizontal
2 PP	5265.000	-48.21	-58.32	-13.00	-35.21	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

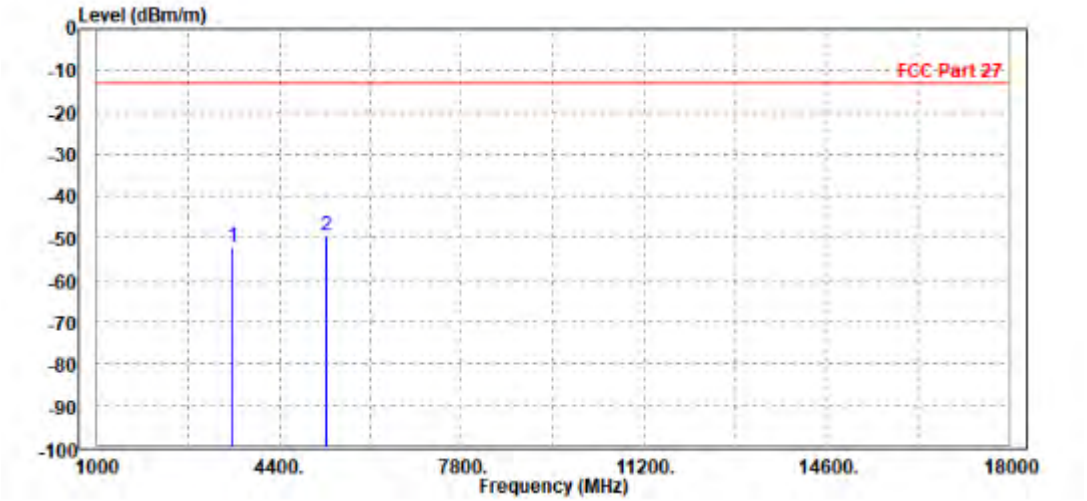
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-50.53	-57.86	-13.00	-37.53	7.33	Peak	Vertical
2 PP	5267.000	-47.54	-58.05	-13.00	-34.54	10.51	Peak	Vertical



CHANNEL BANDWIDTH: 15MHz / QPSK

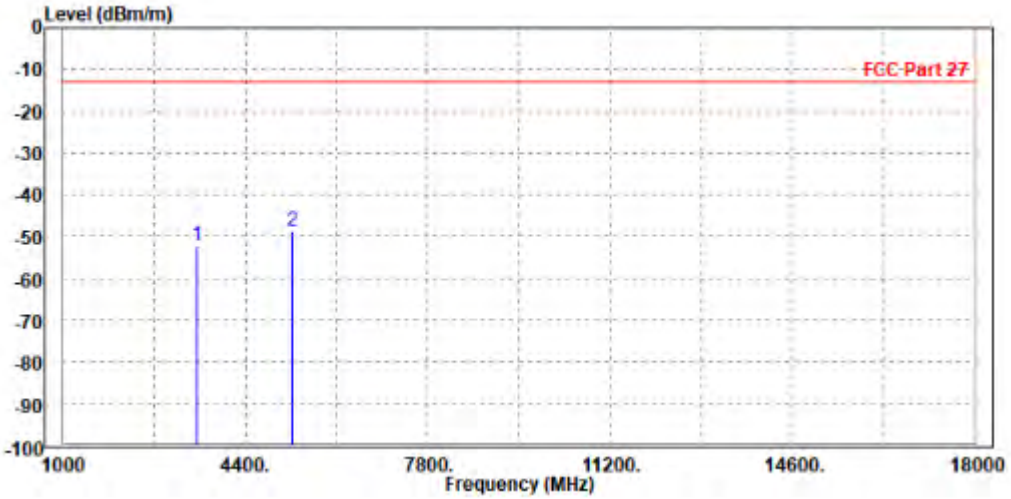
MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-52.14	-59.50	-13.00	-39.14	7.36	Peak	Horizontal
2 PP	5265.000	-49.37	-59.48	-13.00	-36.37	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

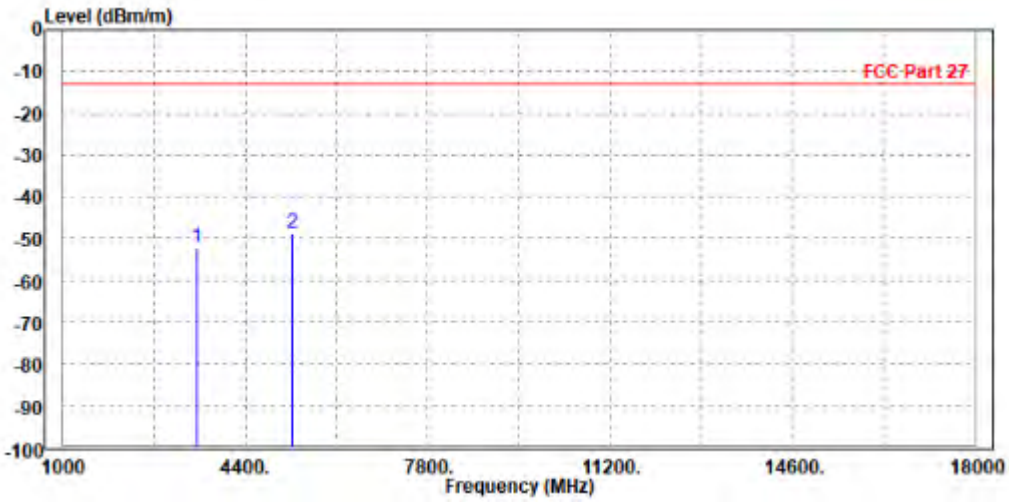
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-51.92	-59.25	-13.00	-38.92	7.33	Peak	Vertical
2 PP	5267.000	-48.50	-59.01	-13.00	-35.50	10.51	Peak	Vertical



CHANNEL BANDWIDTH: 20MHz / QPSK

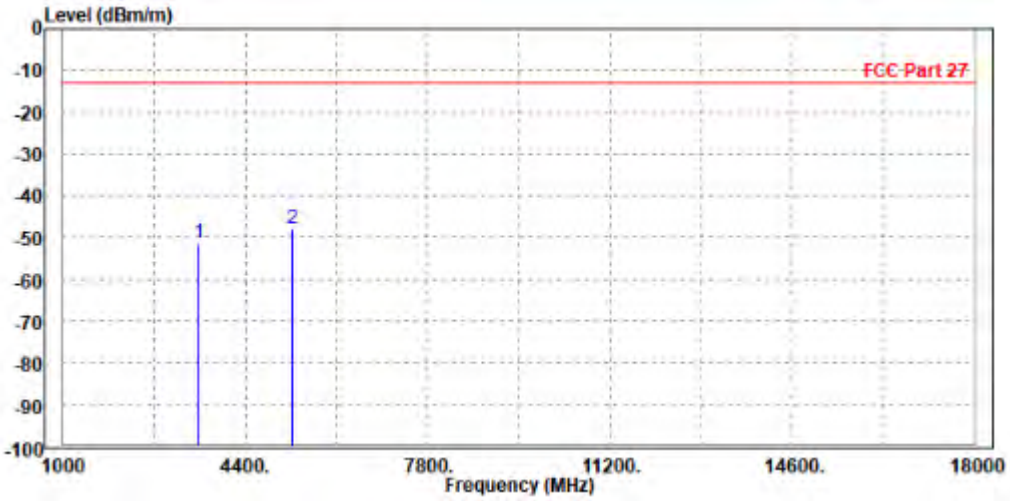
MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3510.000	-52.13	-59.48	-13.00	-39.13	7.35	Peak	Horizontal
2 PP	5267.000	-48.82	-58.93	-13.00	-35.82	10.11	Peak	Horizontal



MODE	TX channel 132322	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3516.000	-51.29	-58.63	-13.00	-38.29	7.34	Peak	Vertical
2 PP	5265.000	-48.08	-58.59	-13.00	-35.08	10.51	Peak	Vertical

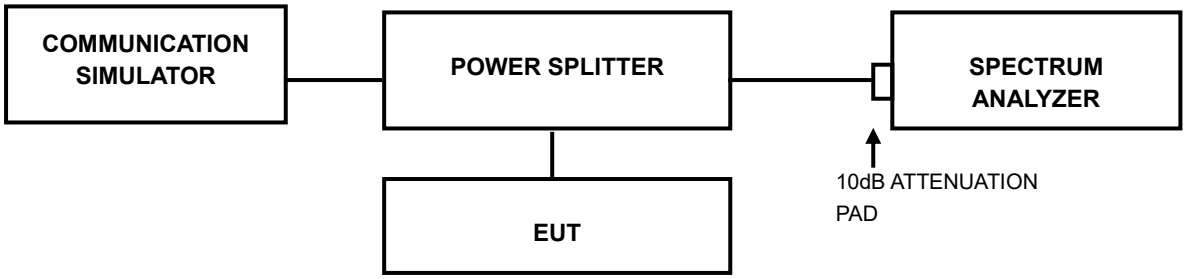


3.7 PEAK TO AVERAGE RATIO

3.7.1 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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ 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%.

3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.

4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 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:

Shenzhen EMC/RF Lab:
Tel: +86-755-88696566
Fax: +86-755-88696577

Email: customerservice.sw@cn.bureauveritas.com
Web Site: www.adt.com.tw

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

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 APPENDIX

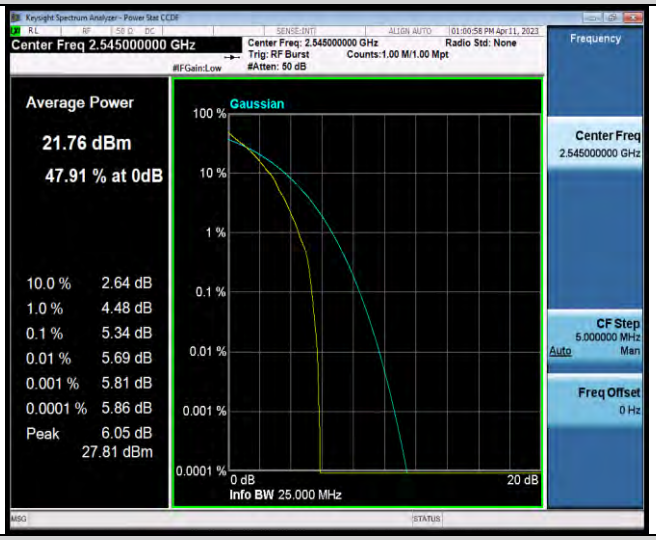
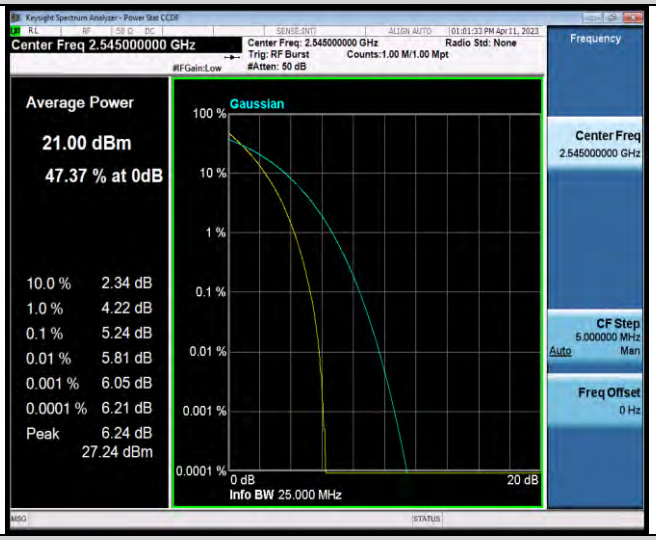
LTE BAND41

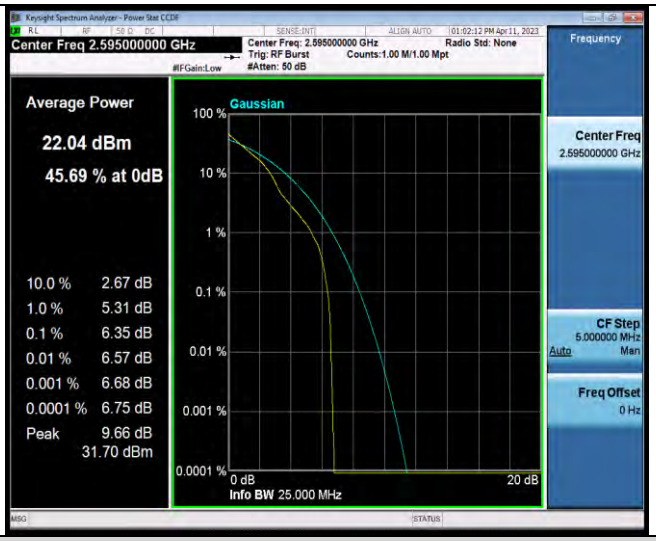
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

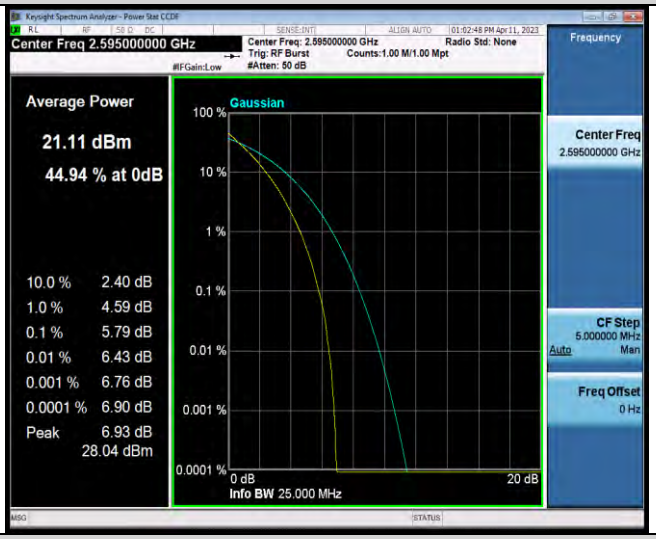
Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band41	20MHz	QPSK	40140	1RB#0	5.34	13	PASS
Band41	20MHz	QPSK	40140	100RB#0	5.24	13	PASS
Band41	20MHz	QPSK	40640	1RB#0	6.35	13	PASS
Band41	20MHz	QPSK	40640	100RB#0	5.79	13	PASS
Band41	20MHz	QPSK	41140	1RB#0	4.32	13	PASS
Band41	20MHz	QPSK	41140	100RB#0	4.81	13	PASS
Band41	20MHz	16QAM	40140	1RB#0	7.05	13	PASS
Band41	20MHz	16QAM	40140	100RB#0	6.05	13	PASS
Band41	20MHz	16QAM	40640	1RB#0	7.23	13	PASS
Band41	20MHz	16QAM	40640	100RB#0	6.57	13	PASS
Band41	20MHz	16QAM	41140	1RB#0	5.22	13	PASS
Band41	20MHz	16QAM	41140	100RB#0	5.51	13	PASS
Band41	20MHz	64QAM	40140	1RB#0	7.01	13	PASS
Band41	20MHz	64QAM	40140	100RB#0	6.47	13	PASS
Band41	20MHz	64QAM	40640	1RB#0	7.11	13	PASS
Band41	20MHz	64QAM	40640	100RB#0	6.91	13	PASS
Band41	20MHz	64QAM	41140	1RB#0	5.52	13	PASS
Band41	20MHz	64QAM	41140	100RB#0	6.11	13	PASS

Test Graphs

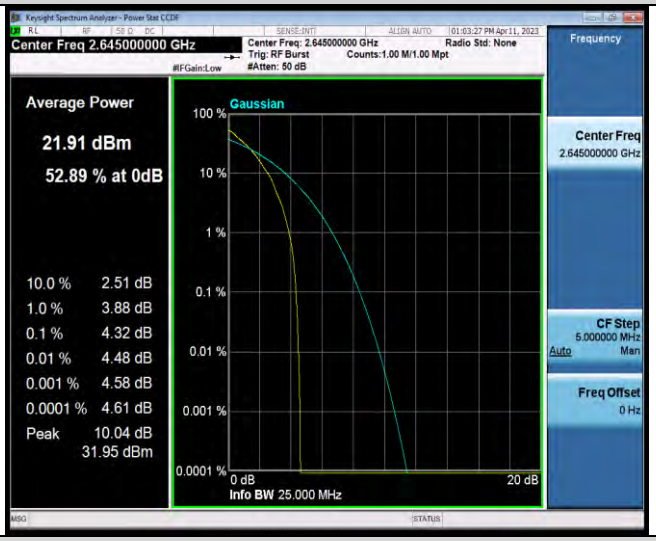
Band41-20MHz-QPSK-40140-1RB#0

Band41-20MHz-QPSK-40140-100RB#0

Band41-20MHz-QPSK-40640-1RB#0



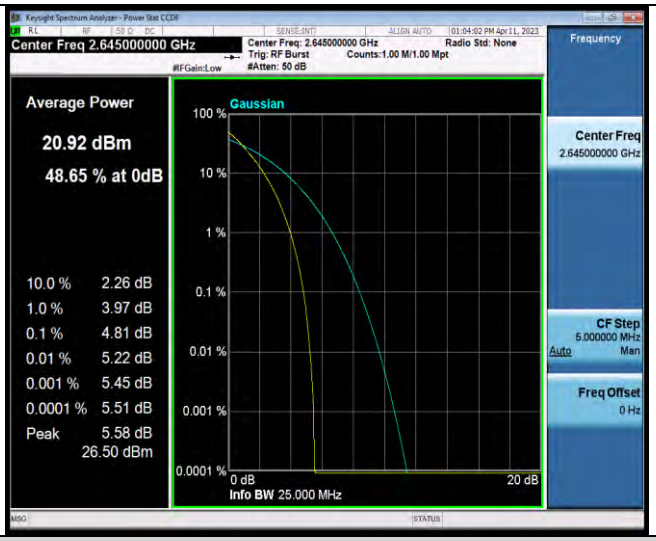
Band41-20MHz-QPSK-40640-100RB#0



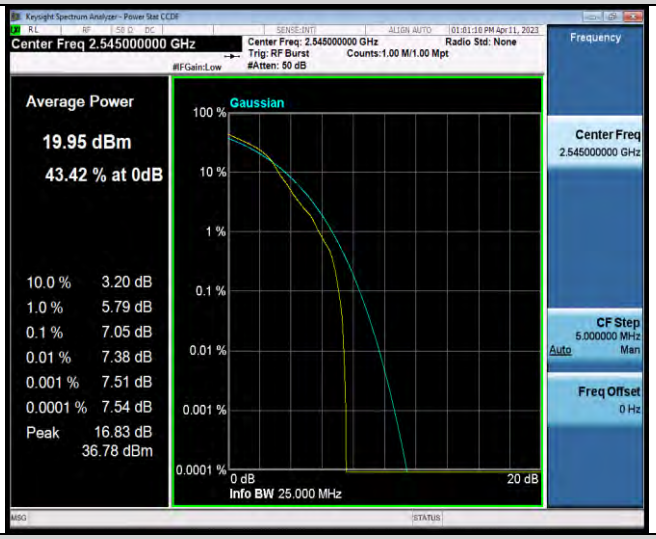
Band41-20MHz-QPSK-41140-1RB#0



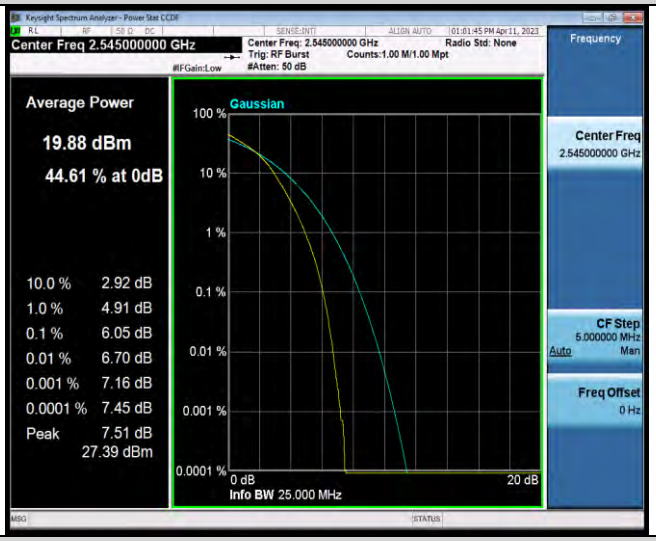
Band41-20MHz-QPSK-41140-100RB#0



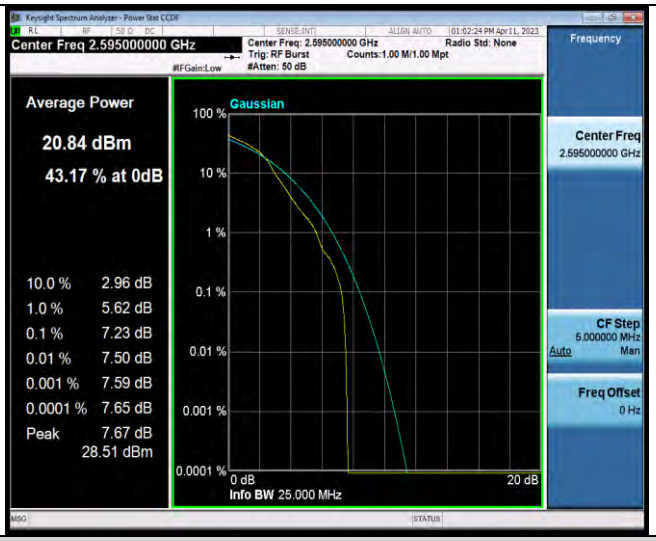
Band41-20MHz-16QAM-40140-1RB#0



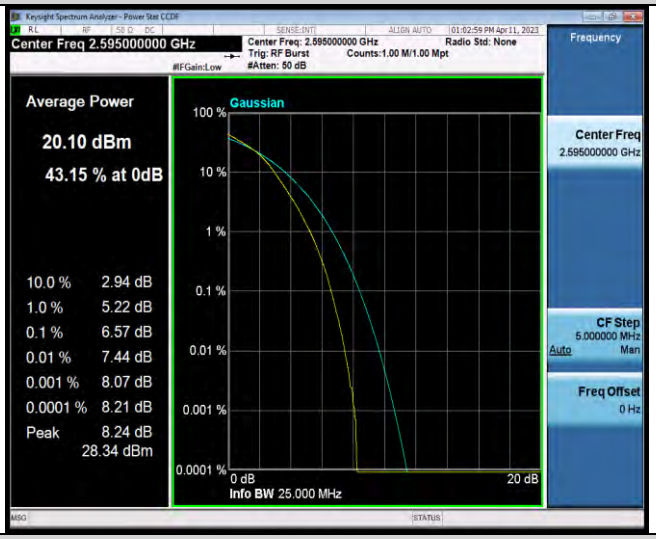
Band41-20MHz-16QAM-40140-100RB#0



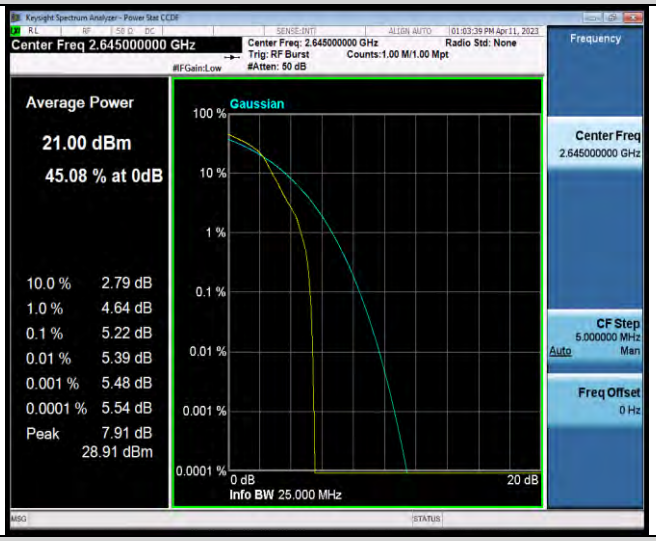
Band41-20MHz-16QAM-40640-1RB#0



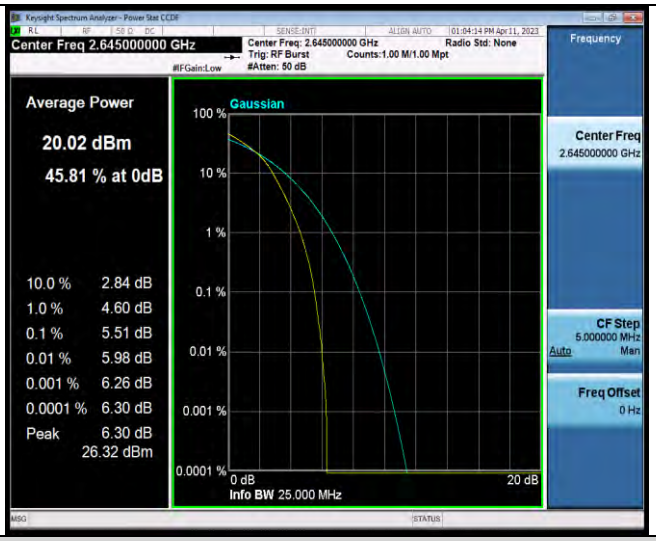
Band41-20MHz-16QAM-40640-100RB#0



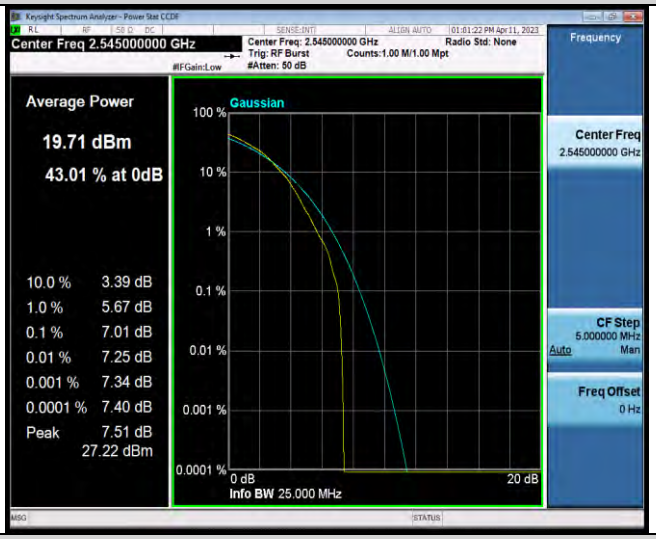
Band41-20MHz-16QAM-41140-1RB#0



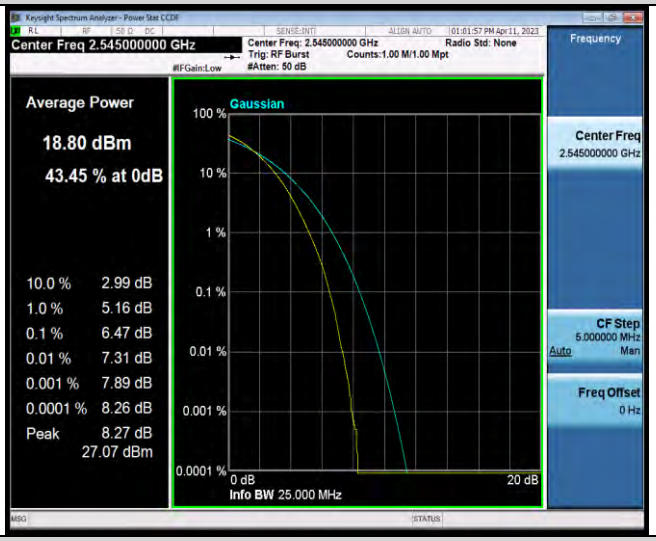
Band41-20MHz-16QAM-41140-100RB#0



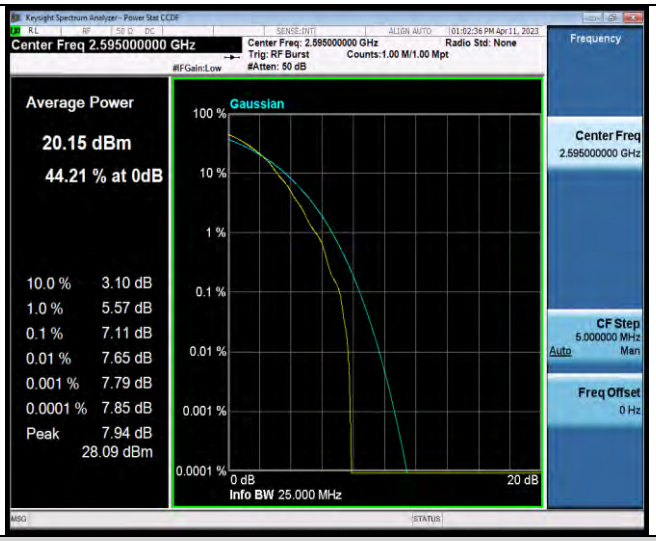
Band41-20MHz-64QAM-40140-1RB#0



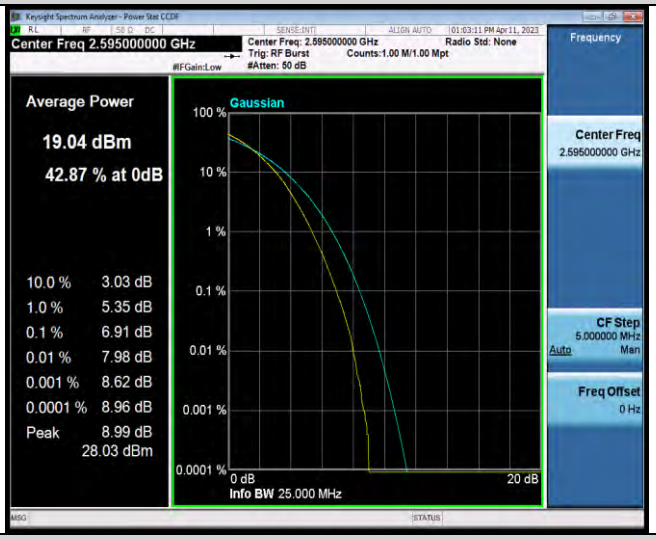
Band41-20MHz-64QAM-40140-100RB#0



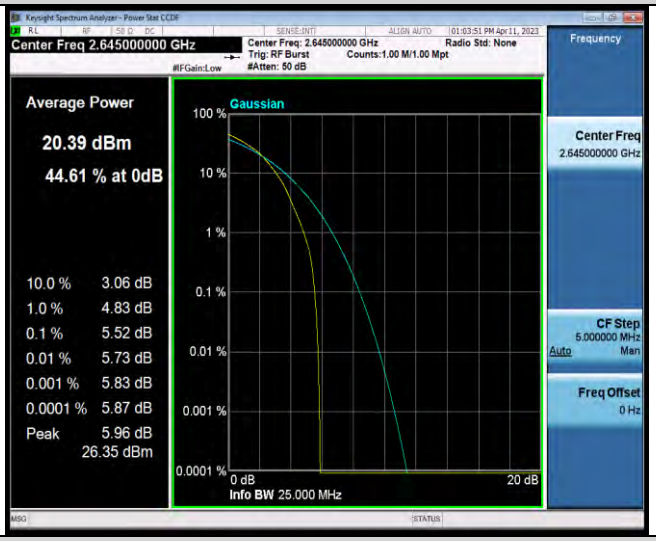
Band41-20MHz-64QAM-40640-1RB#0



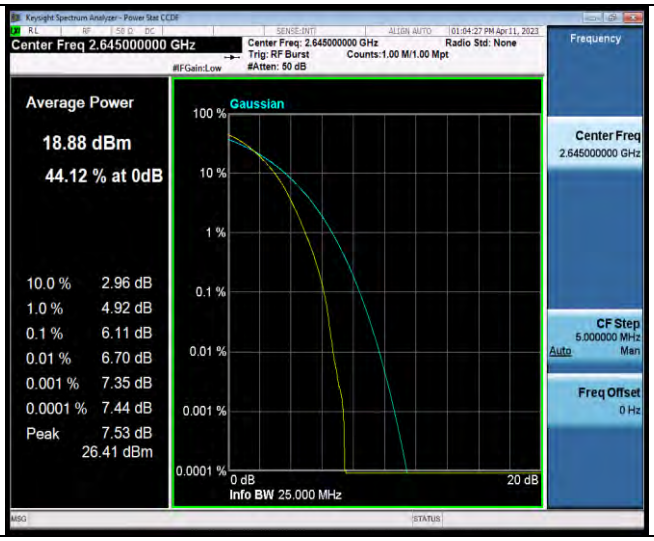
Band41-20MHz-64QAM-40640-100RB#0



Band41-20MHz-64QAM-41140-1RB#0



Band41-20MHz-64QAM-41140-100RB#0


Keysight Spectrum Analyzer - Power Stat CCDF
Center Freq 2.645000000 GHz
Center Freq: 2.645000000 GHz
Trig: RF Burst
#Atten: 50 dB
Counts:1.00 M/1.00 Mpt
Radio Std: None
Frequency
Average Power
18.88 dBm
44.12 % at 0dB
10.0 % 2.96 dB
1.0 % 4.92 dB
0.1 % 6.11 dB
0.01 % 6.70 dB
0.001 % 7.35 dB
0.0001 % 7.44 dB
Peak 7.53 dB
26.41 dBm
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0 dB
20 dB
Info BW 25.000 MHz
Center Freq
2.645000000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

26DB BANDWIDTH AND OCCUPIED BANDWIDTH

Test Result

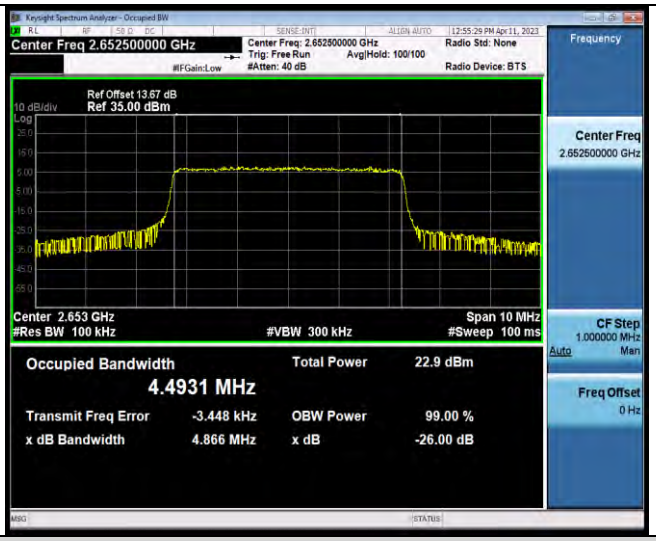
Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band41	5MHz	QPSK	40065	25RB#0	4.4917	4.865	PASS
Band41	5MHz	QPSK	40640	25RB#0	4.4992	4.875	PASS
Band41	5MHz	QPSK	41215	25RB#0	4.4931	4.866	PASS
Band41	5MHz	16QAM	40065	25RB#0	4.4771	4.778	PASS
Band41	5MHz	16QAM	40640	25RB#0	4.4801	4.810	PASS
Band41	5MHz	16QAM	41215	25RB#0	4.4794	4.818	PASS
Band41	5MHz	64QAM	40065	25RB#0	4.4939	4.794	PASS
Band41	5MHz	64QAM	40640	25RB#0	4.4949	4.810	PASS
Band41	5MHz	64QAM	41215	25RB#0	4.4993	4.812	PASS
Band41	10MHz	QPSK	40090	50RB#0	8.9517	9.500	PASS
Band41	10MHz	QPSK	40640	50RB#0	8.9567	9.513	PASS
Band41	10MHz	QPSK	41190	50RB#0	8.9449	9.513	PASS
Band41	10MHz	16QAM	40090	50RB#0	8.9494	9.498	PASS
Band41	10MHz	16QAM	40640	50RB#0	8.9531	9.501	PASS
Band41	10MHz	16QAM	41190	50RB#0	8.9502	9.513	PASS
Band41	10MHz	64QAM	40090	50RB#0	8.9664	9.510	PASS
Band41	10MHz	64QAM	40640	50RB#0	8.9675	9.535	PASS
Band41	10MHz	64QAM	41190	50RB#0	8.9511	9.485	PASS
Band41	15MHz	QPSK	40115	75RB#0	13.428	14.20	PASS
Band41	15MHz	QPSK	40640	75RB#0	13.419	14.22	PASS
Band41	15MHz	QPSK	41165	75RB#0	13.440	14.21	PASS
Band41	15MHz	16QAM	40115	75RB#0	13.411	14.24	PASS
Band41	15MHz	16QAM	40640	75RB#0	13.410	14.24	PASS
Band41	15MHz	16QAM	41165	75RB#0	13.427	14.23	PASS
Band41	15MHz	64QAM	40115	75RB#0	13.402	14.21	PASS
Band41	15MHz	64QAM	40640	75RB#0	13.423	14.27	PASS
Band41	15MHz	64QAM	41165	75RB#0	13.405	14.22	PASS
Band41	20MHz	QPSK	40140	100RB#0	17.850	18.92	PASS
Band41	20MHz	QPSK	40640	100RB#0	17.884	18.94	PASS
Band41	20MHz	QPSK	41140	100RB#0	17.891	18.95	PASS
Band41	20MHz	16QAM	40140	100RB#0	17.861	18.91	PASS
Band41	20MHz	16QAM	40640	100RB#0	17.886	18.95	PASS
Band41	20MHz	16QAM	41140	100RB#0	17.888	18.93	PASS
Band41	20MHz	64QAM	40140	100RB#0	17.864	18.93	PASS
Band41	20MHz	64QAM	40640	100RB#0	17.906	18.95	PASS
Band41	20MHz	64QAM	41140	100RB#0	17.894	18.94	PASS

Test Graphs

Band41-5MHz-QPSK-40065-25RB#0

Band41-5MHz-QPSK-40640-25RB#0

Band41-5MHz-QPSK-41215-25RB#0



Band41-5MHz-16QAM-40065-25RB#0

Band41-5MHz-16QAM-40640-25RB#0

Band41-5MHz-16QAM-41215-25RB#0

Band41-5MHz-64QAM-40065-25RB#0

Band41-5MHz-64QAM-40640-25RB#0

Band41-5MHz-64QAM-41215-25RB#0