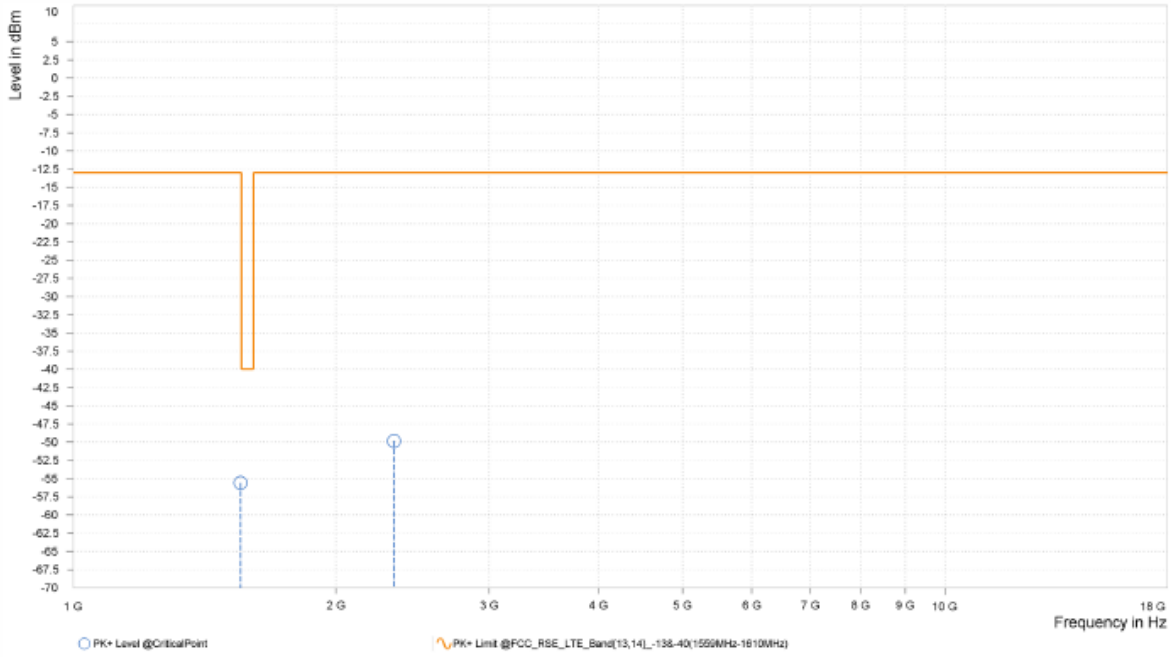
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

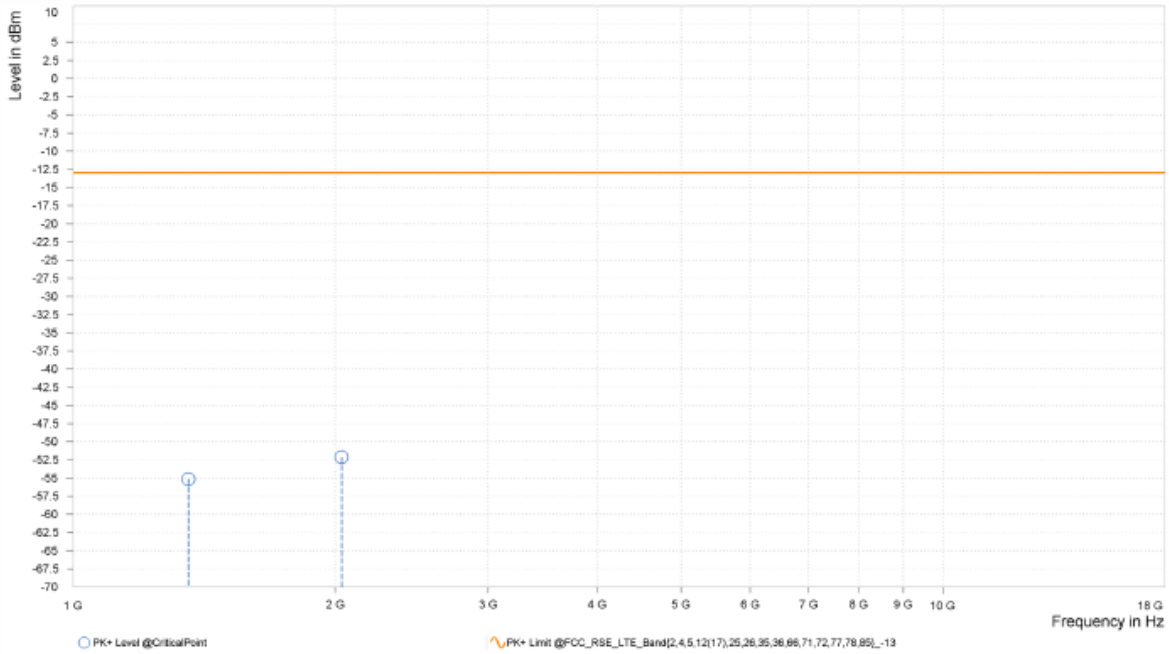
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,555.000	-55.57	-13.00	42.57	4.95	V	49.6	2.00
1	2,332.500	-49.84	-13.00	36.84	12.58	V	226.7	1.00



LTE Band 71
CHANNEL BANDWIDTH: 5MHz / QPSK

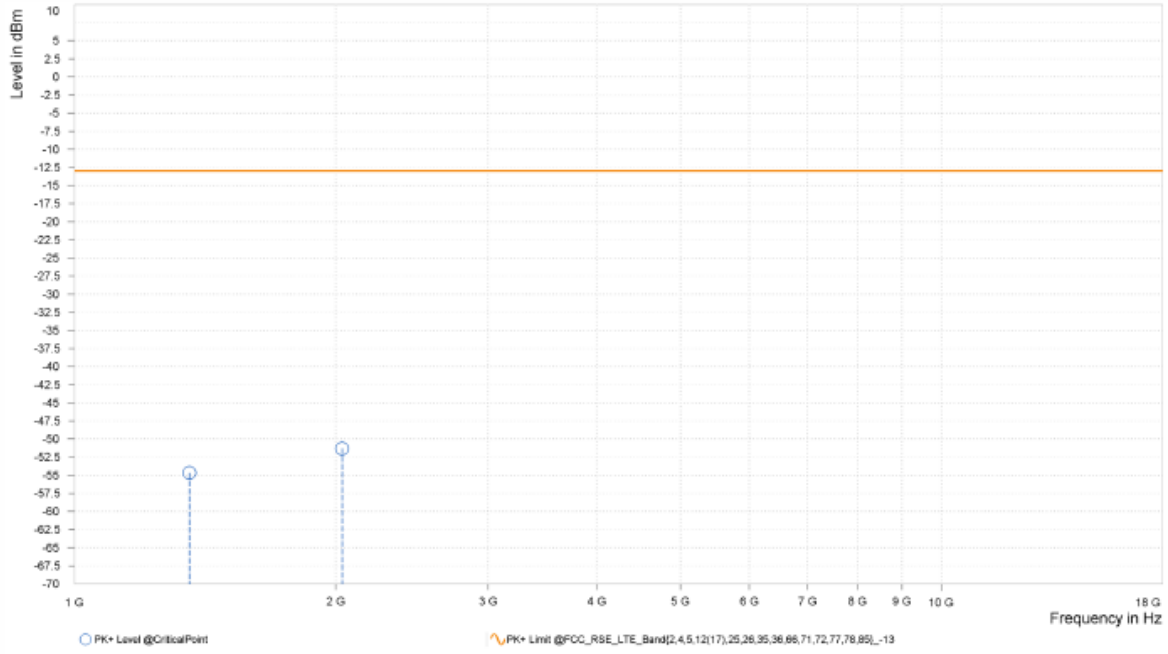
MODE	TX channel 133297	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,356.500	-55.14	-13.00	42.14	6.95	H	354.9	2.00
1	2,034.750	-52.15	-13.00	39.15	11.39	H	2.1	2.00



MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,356.500	-54.67	-13.00	41.67	7.03	V	358.8	1.00
1	2,034.750	-51.31	-13.00	38.31	11.93	V	1	1.00

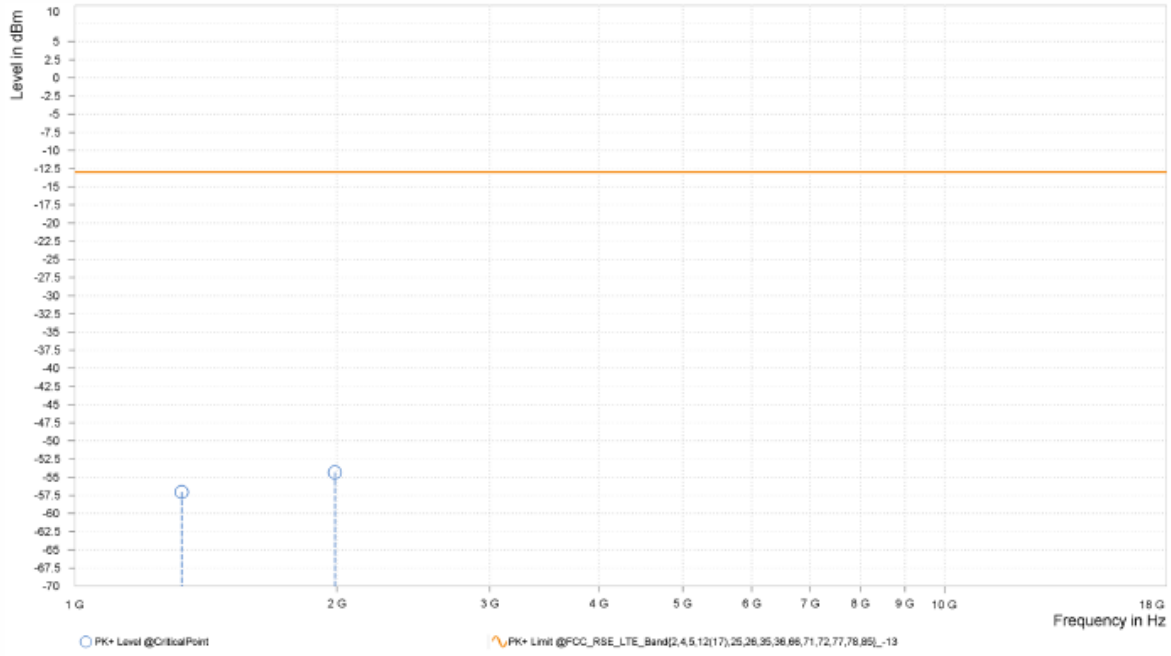


CHANNEL BANDWIDTH: 10MHz / QPSK

CH:133172

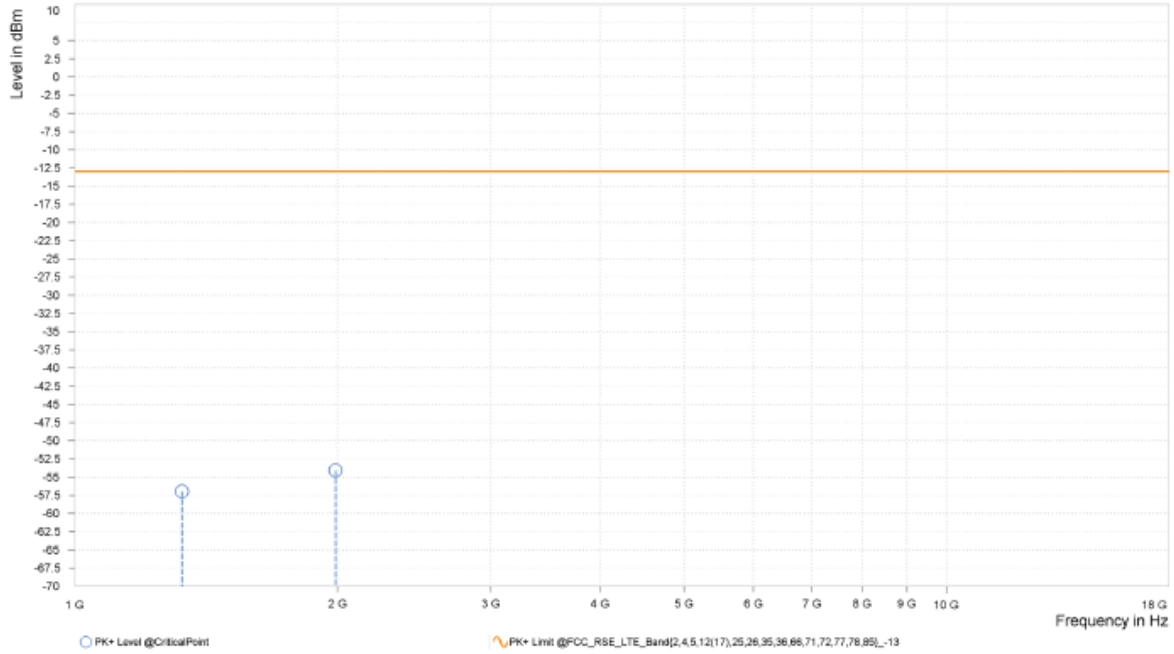
MODE	TX channel 133172	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,327.000	-57.05	-13.00	44.05	4.45	H	4.5	1.00
1	1,990.500	-54.34	-13.00	41.34	9.58	H	1.2	2.00



MODE	TX channel 133172	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

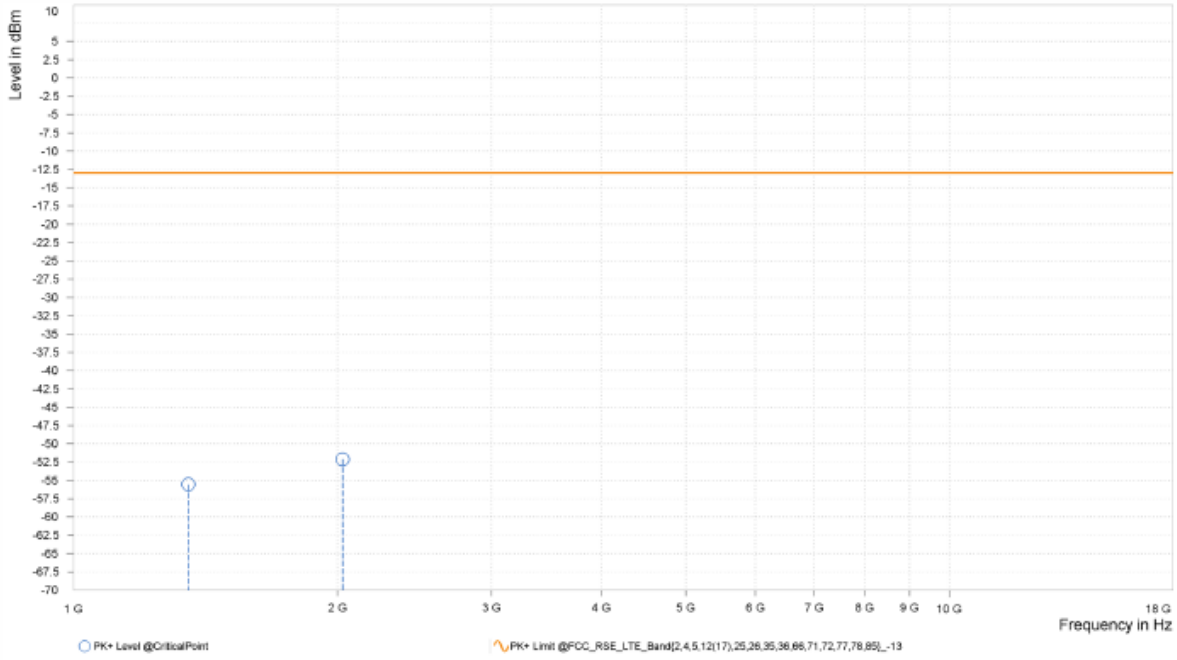
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,327.000	-56.97	-13.00	43.97	4.51	V	359	2.00
1	1,990.500	-54.08	-13.00	41.08	9.54	V	359	1.00



CH133297

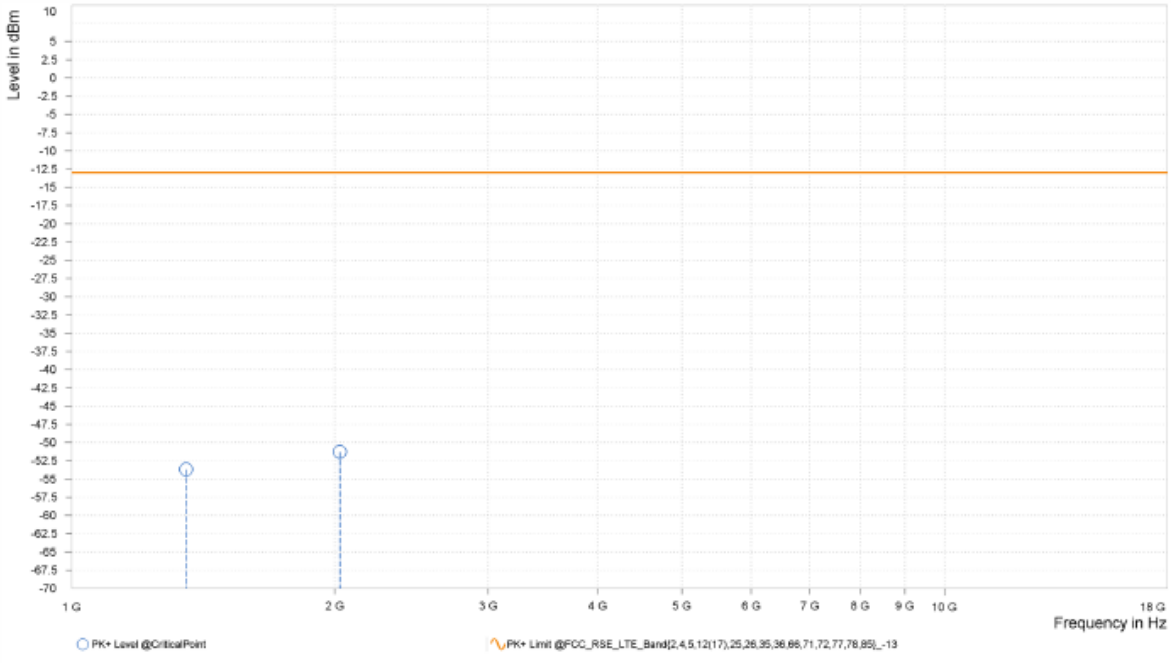
MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,352.000	-55.55	-13.00	42.55	6.90	H	1	1.00
1	2,028.000	-52.11	-13.00	39.11	11.48	H	355.6	2.00



MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

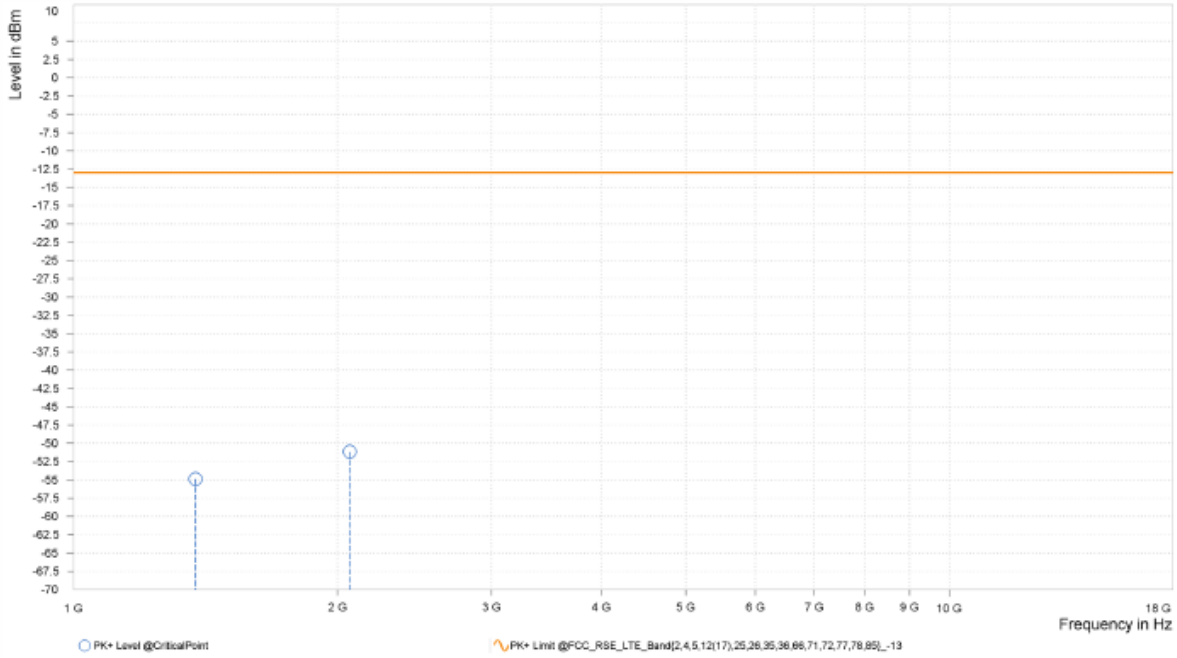
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,352.000	-53.69	-13.00	40.69	6.97	V	2.2	2.00
1	2,028.000	-51.29	-13.00	38.29	12.05	V	4.6	1.00



CH:133422

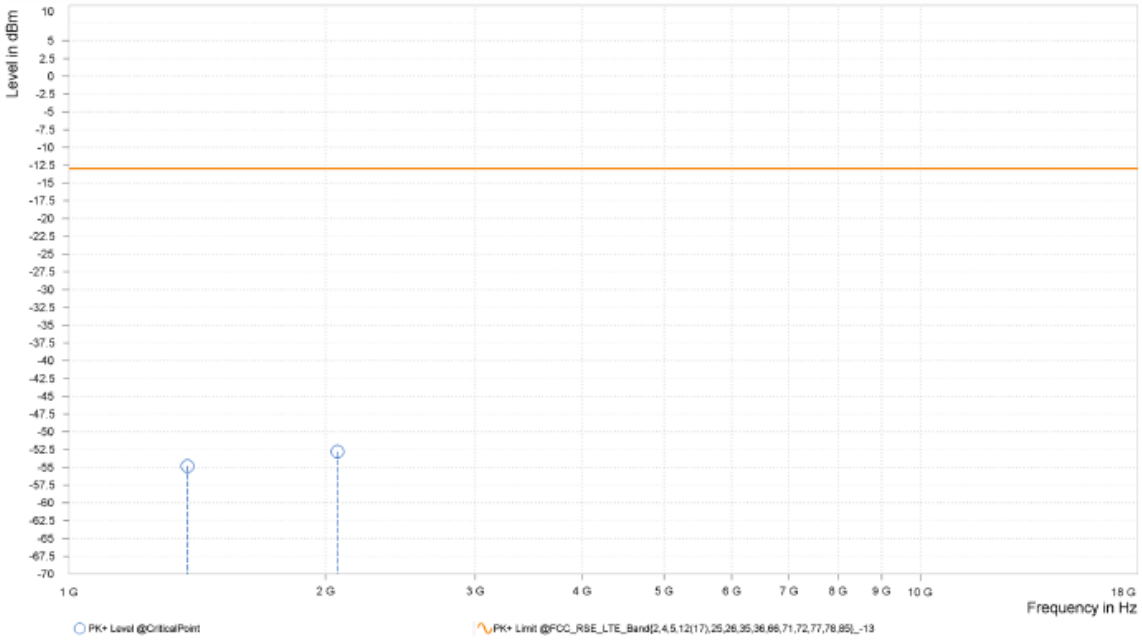
MODE	TX channel 133422	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,377.000	-54.88	-13.00	41.88	7.20	H	1	1.00
1	2,065.500	-51.16	-13.00	38.16	10.31	H	243.5	1.00



MODE	TX channel 133422	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

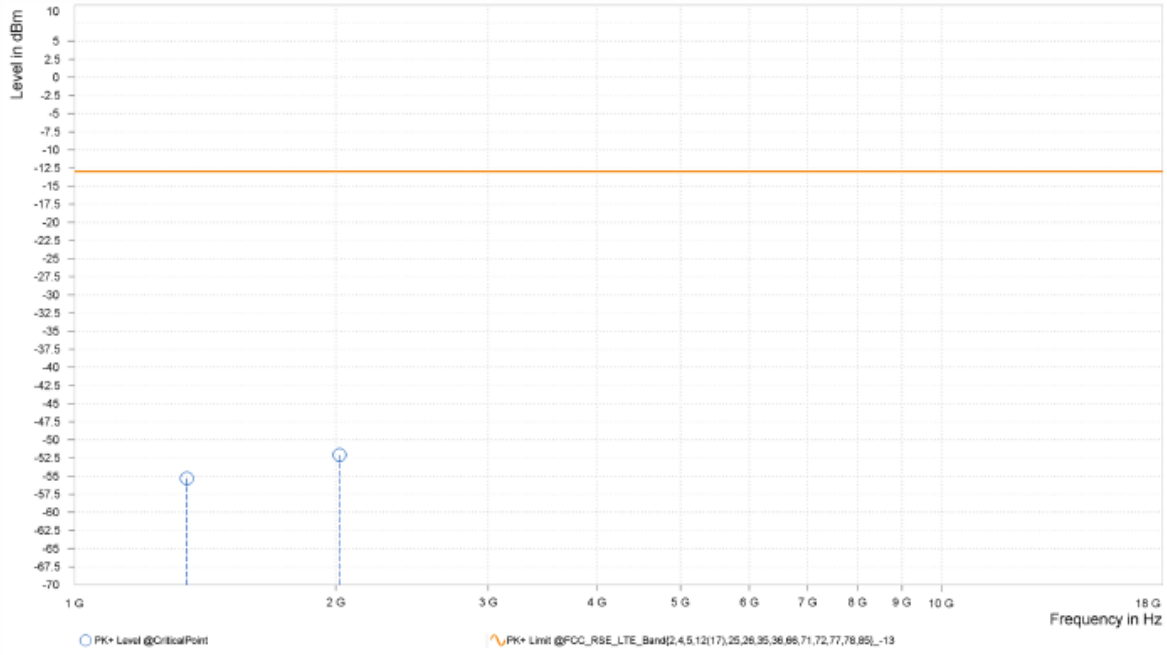
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,377.000	-54.83	-13.00	41.83	7.29	V	354.9	2.00
1	2,065.500	-52.80	-13.00	39.80	10.55	V	121.4	2.00



CHANNEL BANDWIDTH: 15MHz / QPSK

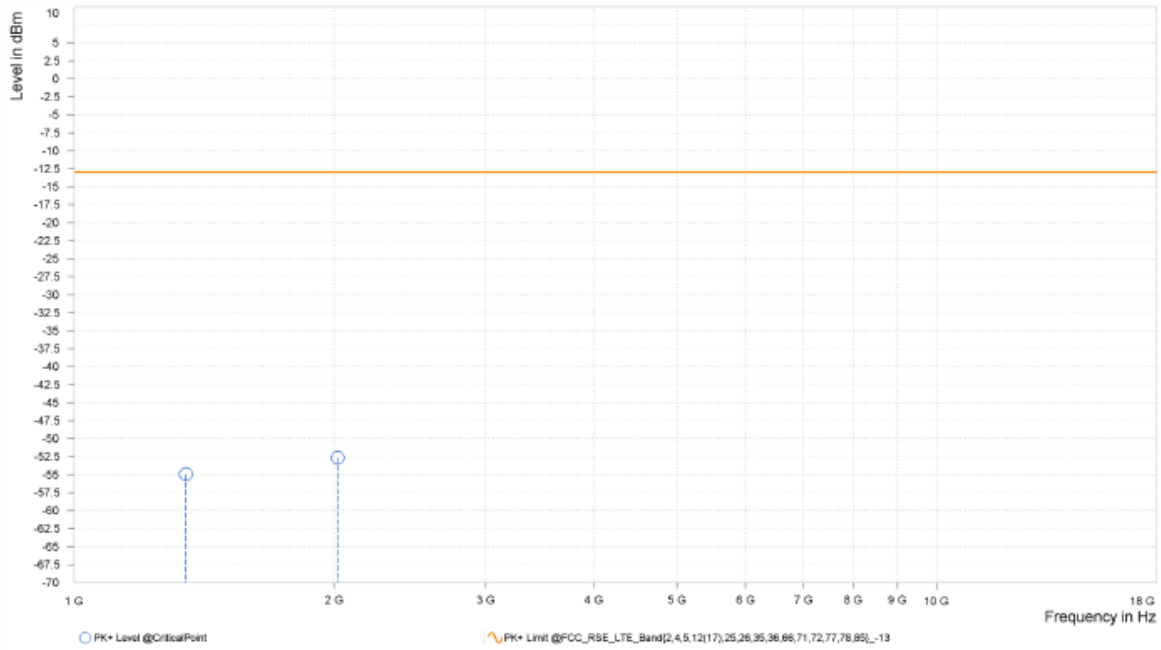
MODE	TX channel 133297	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,347.500	-55.34	-13.00	42.34	6.85	H	1	1.00
1	2,021.250	-52.10	-13.00	39.10	11.13	H	129.8	2.00



MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,347.500	-54.93	-13.00	41.93	6.91	V	354.9	2.00
1	2,021.250	-52.64	-13.00	39.64	11.58	V	262.5	1.00

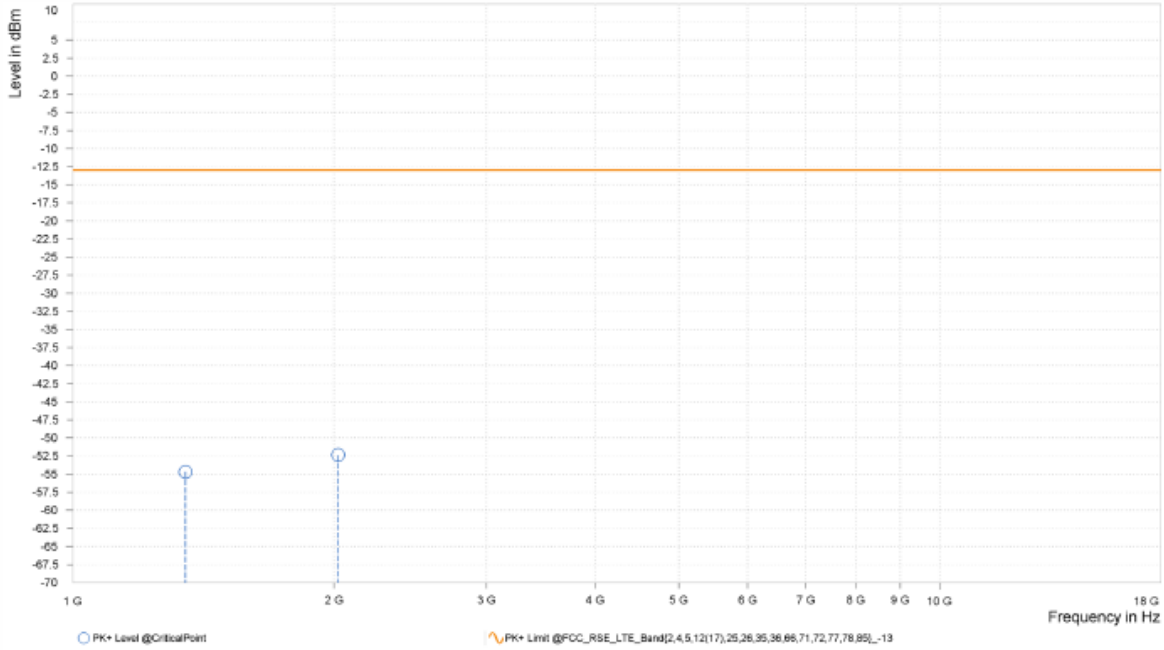


CHANNEL BANDWIDTH: 20MHz / QPSK

CH:133297

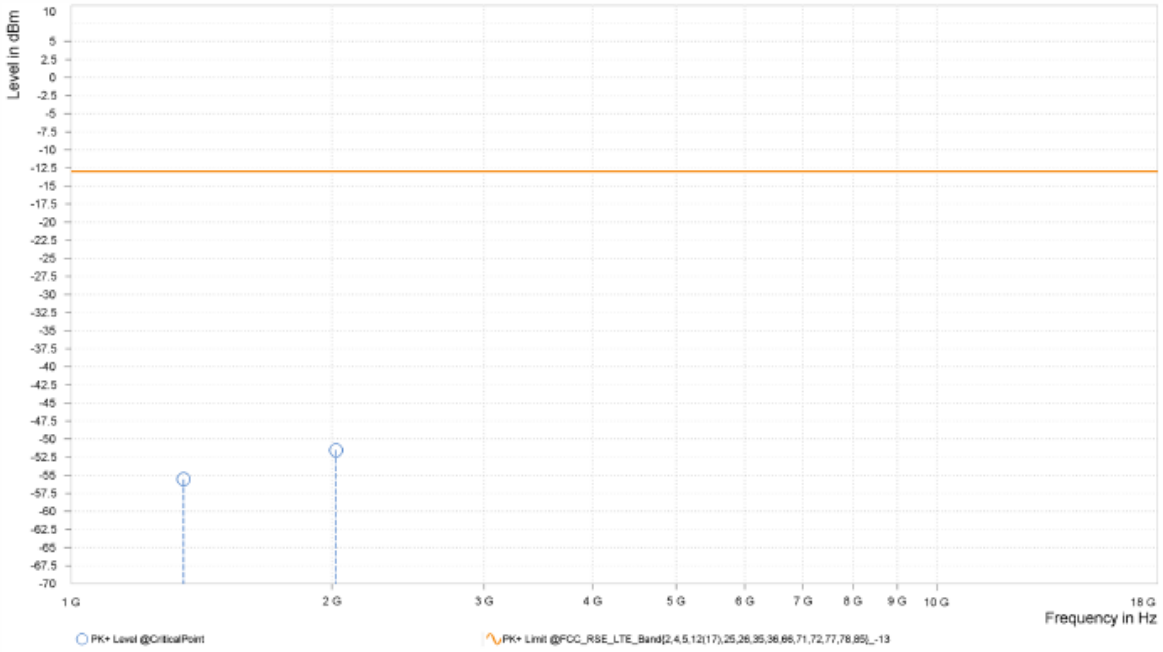
MODE	TX channel 133297	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,348.000	-54.69	-13.00	41.69	6.85	H	117.8	2.00
1	2,022.000	-52.35	-13.00	39.35	11.18	H	117.8	2.00



MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

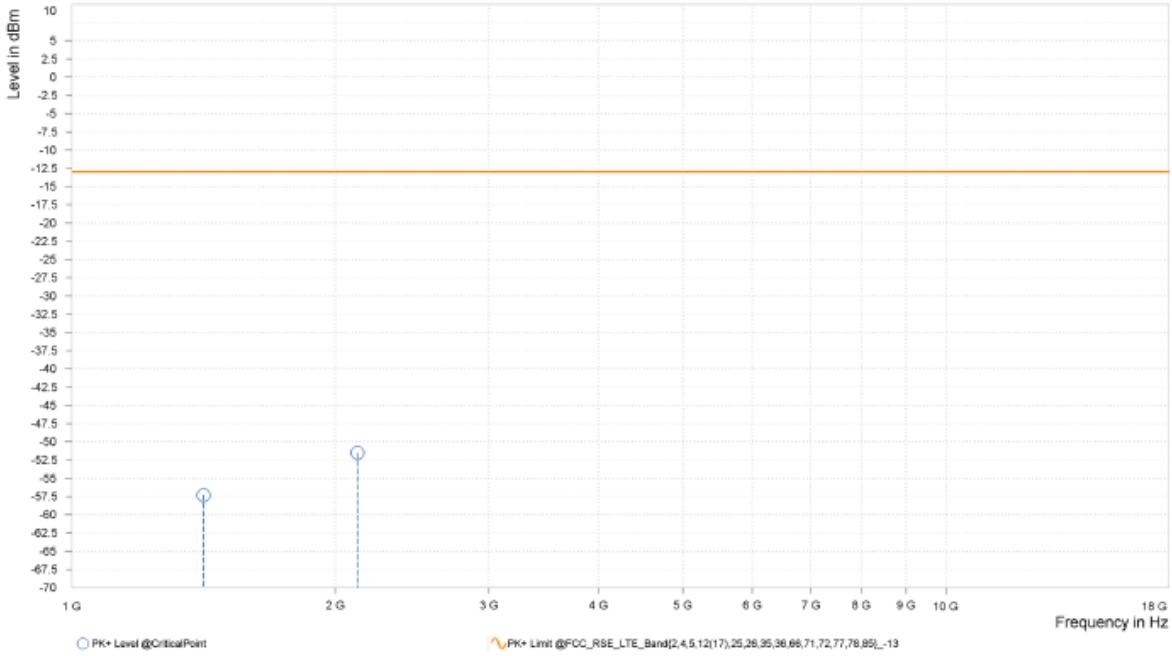
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,348.000	-55.55	-13.00	42.55	6.91	V	0.9	2.00
1	2,022.000	-51.54	-13.00	38.54	11.65	V	350.2	2.00



LTE Band 85
CHANNEL BANDWIDTH: 5MHz / QPSK

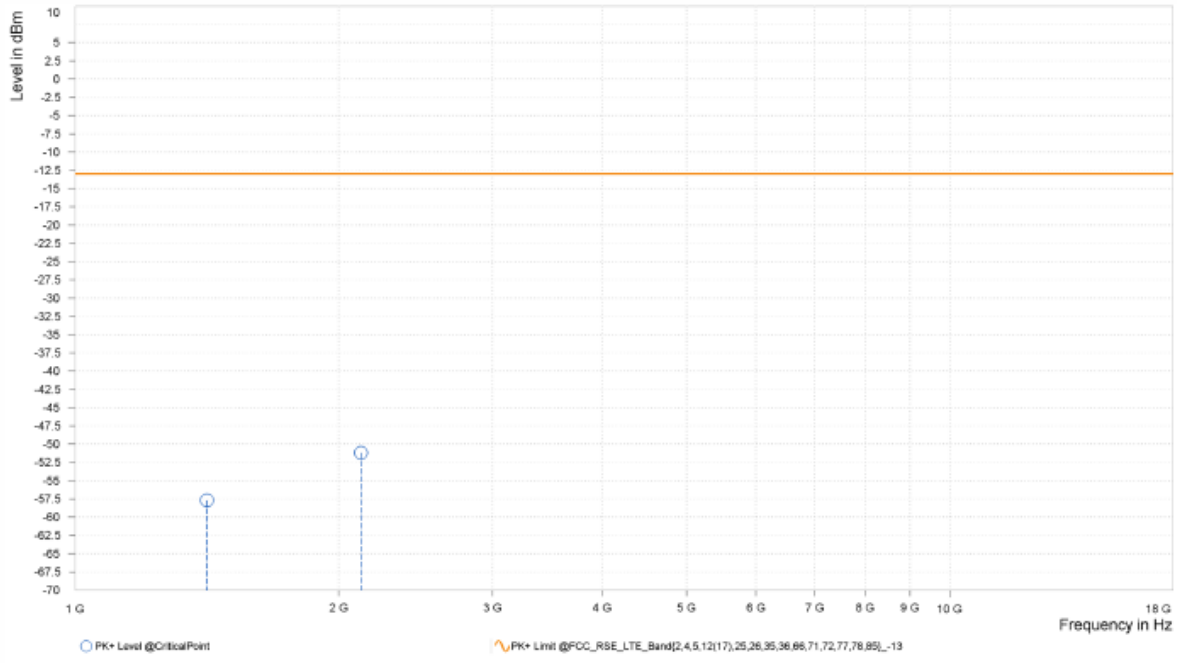
MODE	TX channel 134092	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-57.31	-13.00	44.31	2.84	H	121.4	2.00
1	2,121.000	-51.51	-13.00	38.51	10.91	H	355.5	2.00



MODE	TX channel 134092	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-57.70	-13.00	44.70	2.74	V	1	1.00
1	2,121.000	-51.17	-13.00	38.17	10.55	V	119	2.00

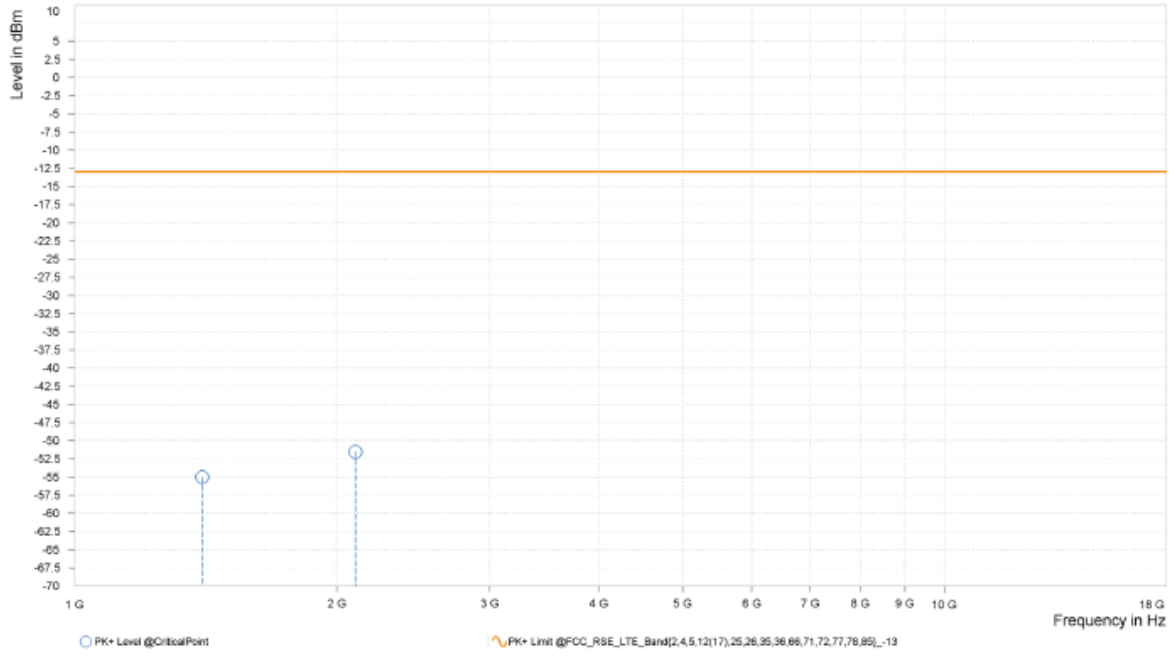


CHANNEL BANDWIDTH: 10MHz / QPSK

CH:134052

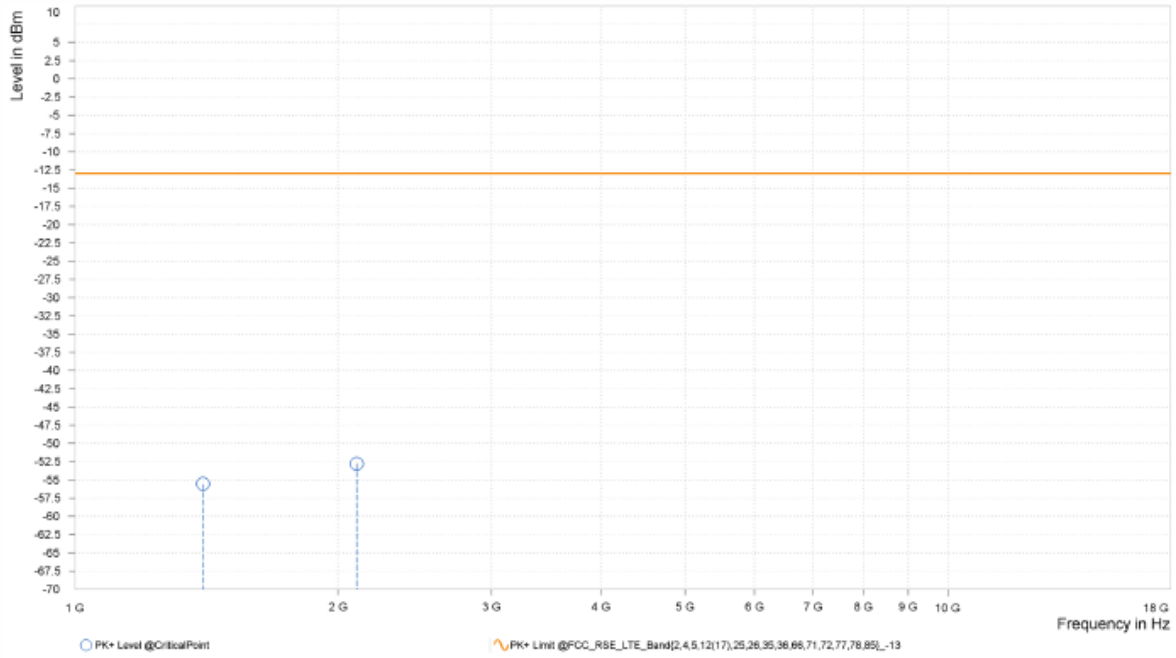
MODE	TX channel 134052	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,401.000	-55.02	-13.00	42.02	4.68	H	359	2.00
1	2,101.500	-51.54	-13.00	38.54	10.08	H	1	2.00



MODE	TX channel 134052	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

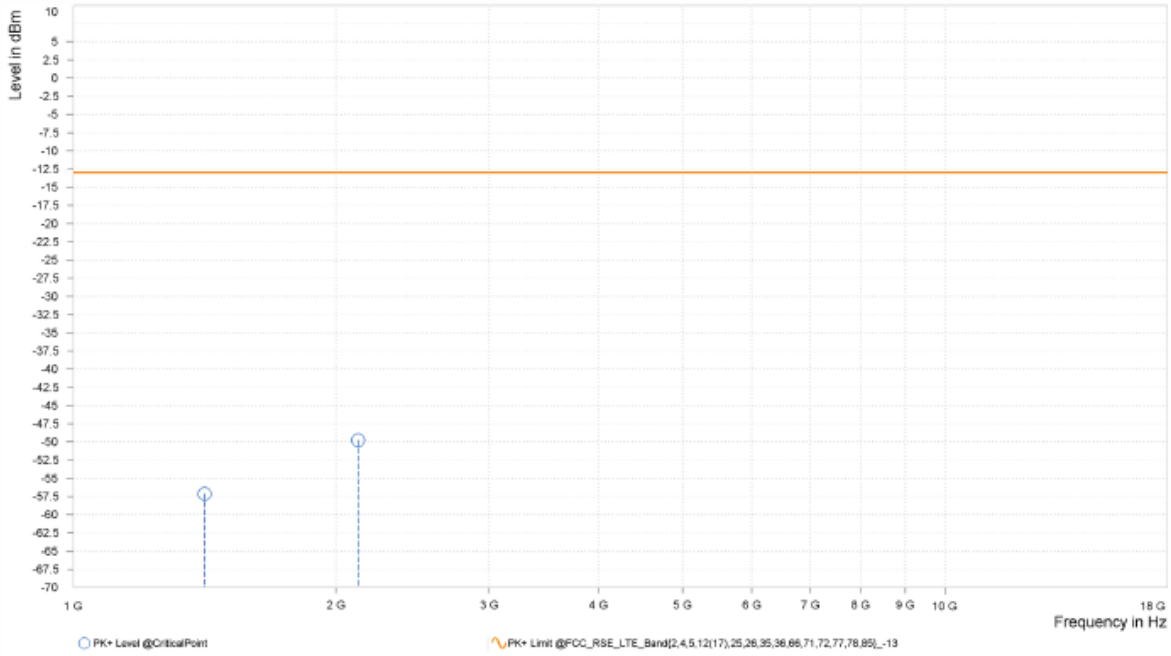
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,401.000	-55.55	-13.00	42.55	4.66	V	114.3	2.00
1	2,101.500	-52.79	-13.00	39.79	9.94	V	359	2.00



CH134092

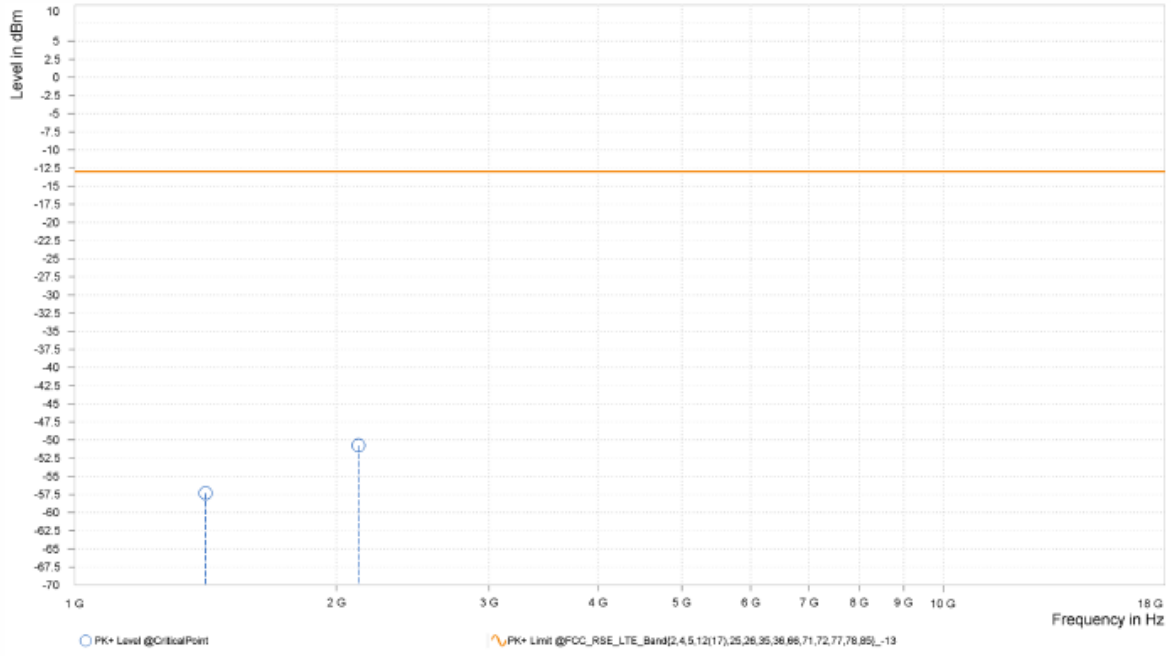
MODE	TX channel 134092	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-57.14	-13.00	44.14	2.84	H	242.2	1.00
1	2,121.000	-49.75	-13.00	36.75	10.91	H	0.9	2.00



MODE	TX channel 134092	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

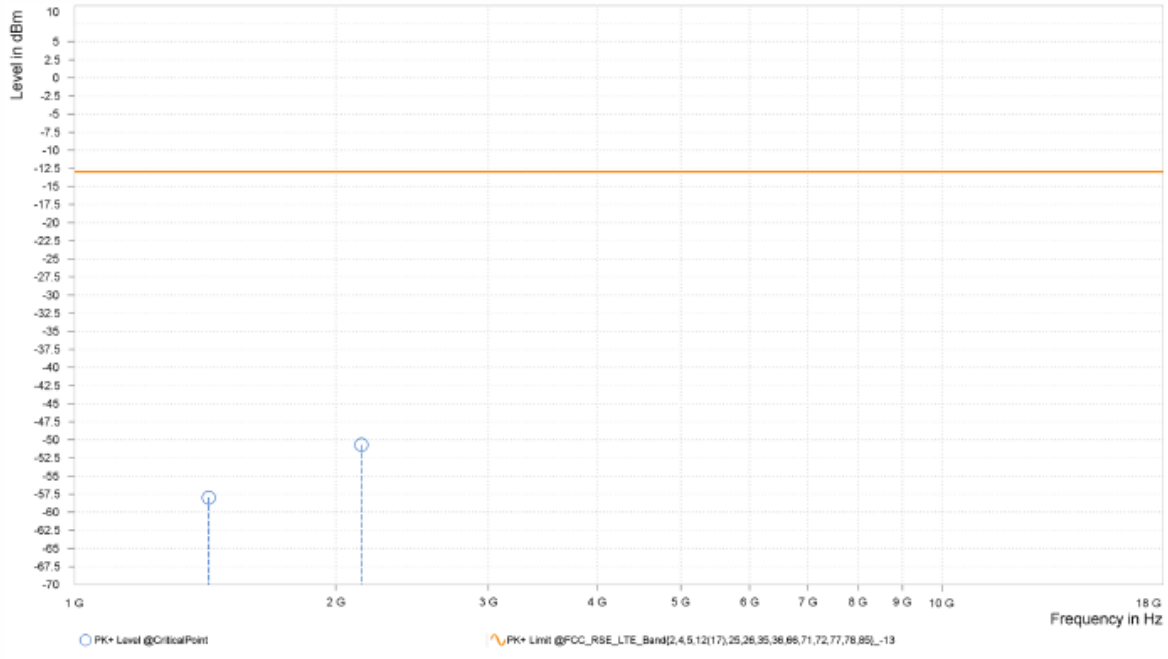
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-57.33	-13.00	44.33	2.74	V	1	2.00
1	2,121.000	-50.76	-13.00	37.76	10.55	V	354.8	2.00



CH:134132

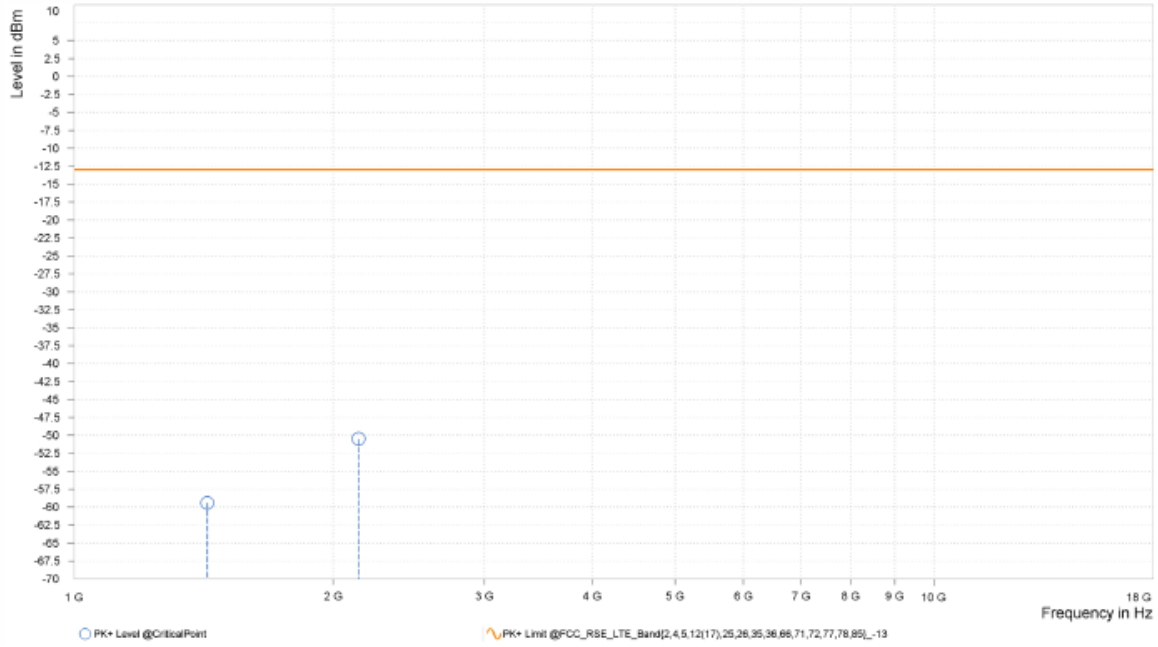
MODE	TX channel 134132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,427.000	-57.99	-13.00	44.99	1.64	H	354.2	2.00
1	2,140.500	-50.69	-13.00	37.69	11.73	H	290	1.00



MODE	TX channel 134132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,427.000	-59.42	-13.00	46.42	1.48	V	359	1.00
1	2,140.500	-50.50	-13.00	37.50	11.15	V	359	2.00



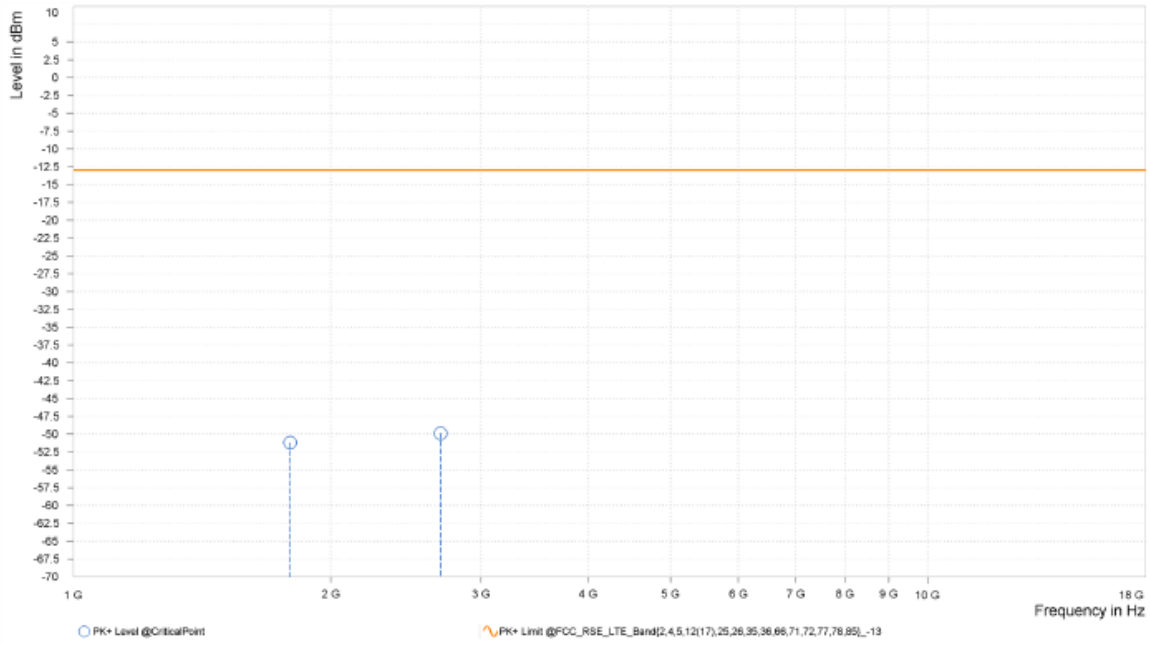
LTE BAND 8

CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH 21640

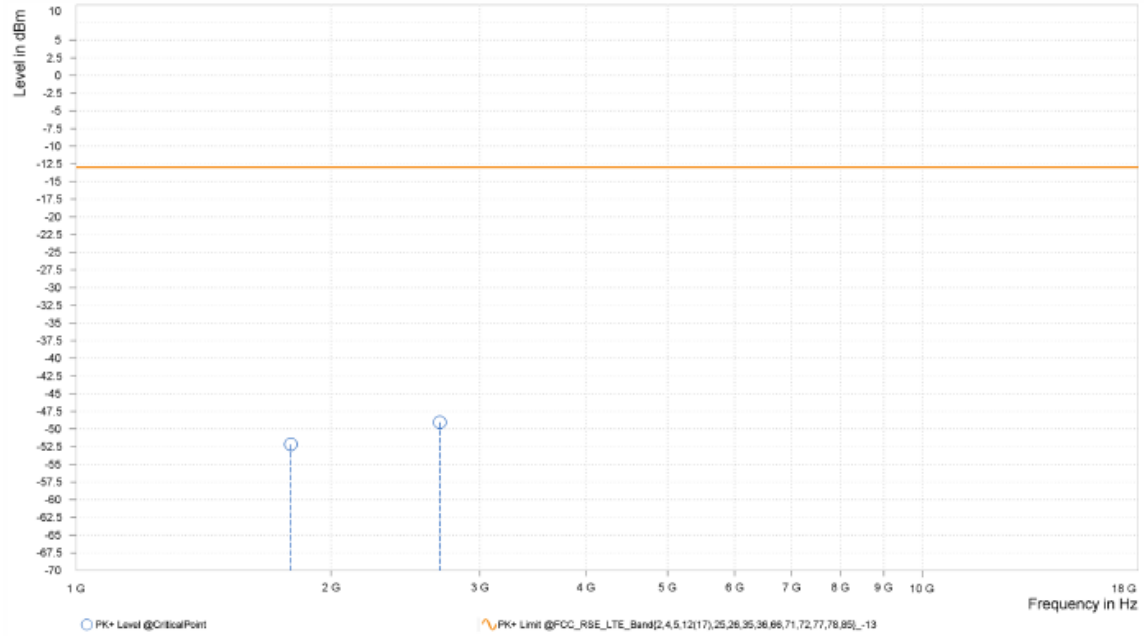
MODE	TX channel 21640	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,797.000	-51.17	-13.00	38.17	9.16	H	125	2.00
1	2,695.000	-49.89	-13.00	36.89	13.32	H	355.5	2.00



MODE	TX channel 21640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

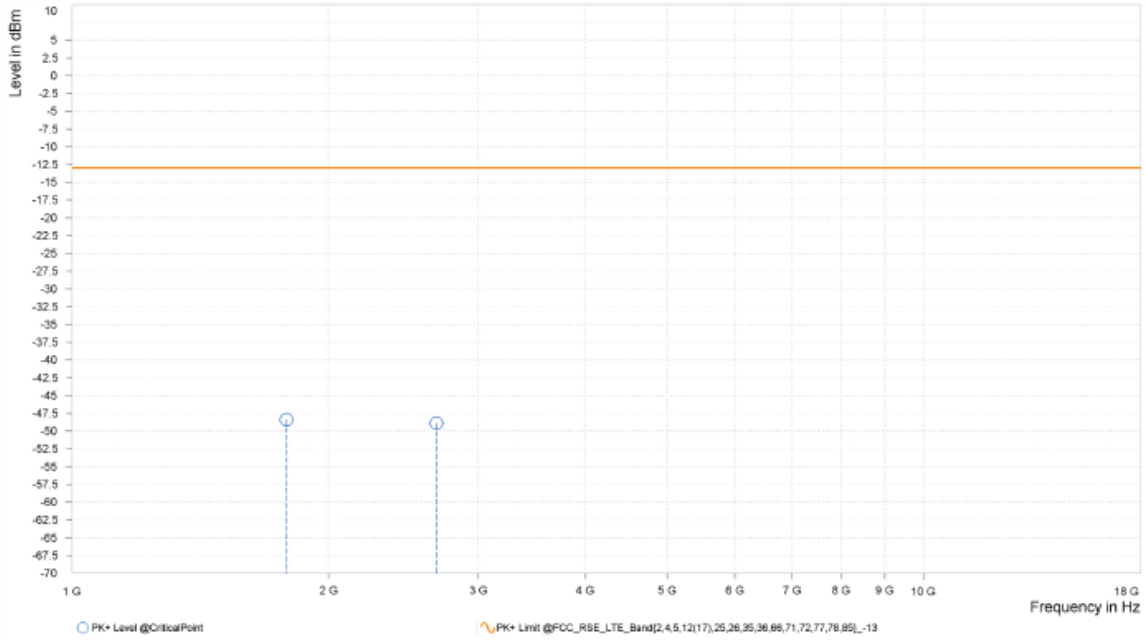
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,797.000	-52.17	-13.00	39.17	9.19	V	1.9	2.00
1	2,695.000	-49.07	-13.00	36.07	13.13	V	359	2.00



CHANNEL BANDWIDTH: 3MHz / QPSK
CH21640

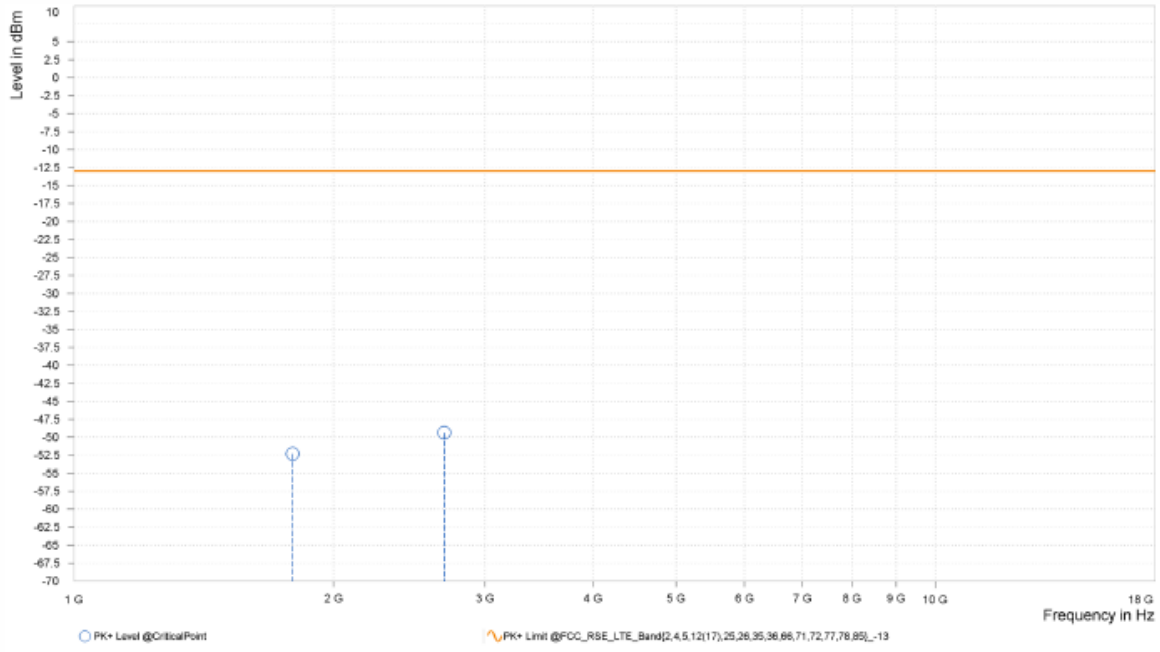
MODE	TX channel 21640	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,795.000	-48.38	-13.00	35.38	9.19	H	5.2	1.00
1	2,693.000	-48.89	-13.00	35.89	13.54	H	123.8	2.00



MODE	TX channel 21640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

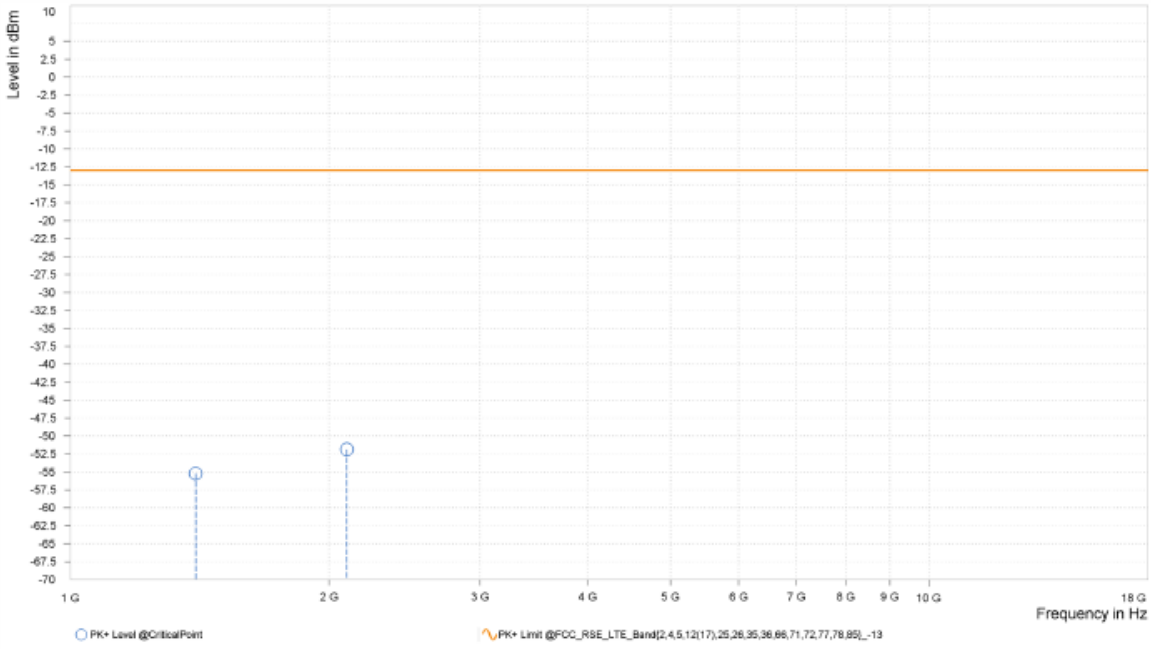
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,795.000	-52.30	-13.00	39.30	9.17	V	359	2.00
1	2,693.000	-49.38	-13.00	36.38	13.17	V	359	1.00



NB-IOT LTE Band 12
CHANNEL BANDWIDTH: QPSK

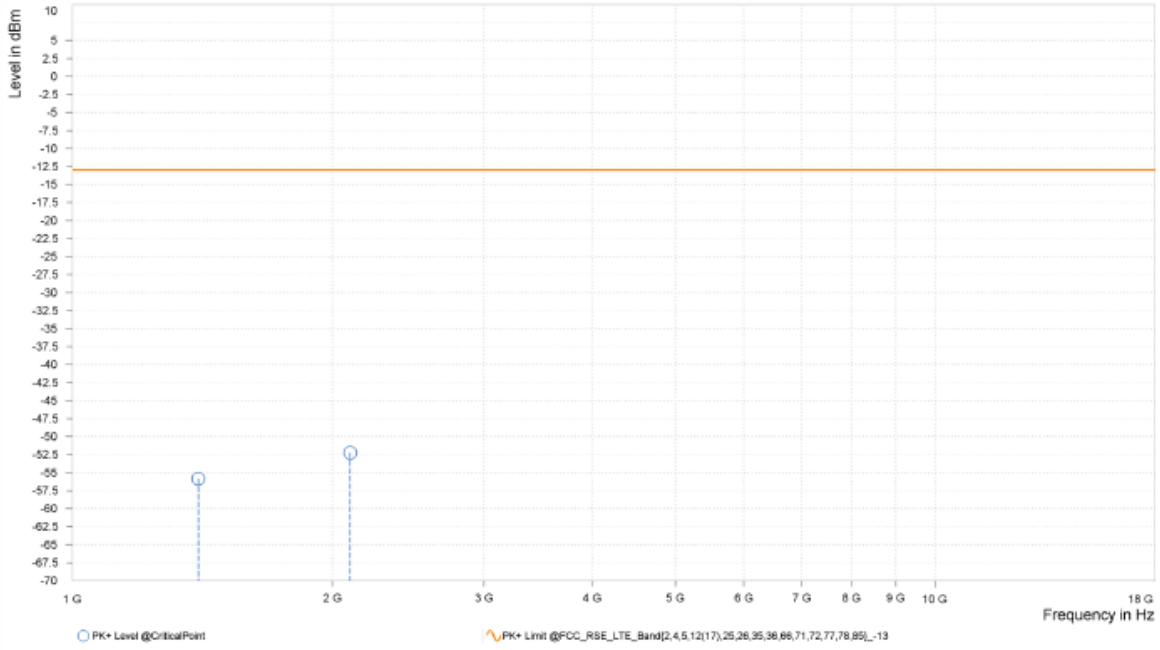
MODE	TX channel 23012	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,398.200	-55.24	-13.00	42.24	5.11	H	354.9	2.00
1	2,097.300	-51.87	-13.00	38.87	9.91	H	1	1.00



MODE	TX channel 23012	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

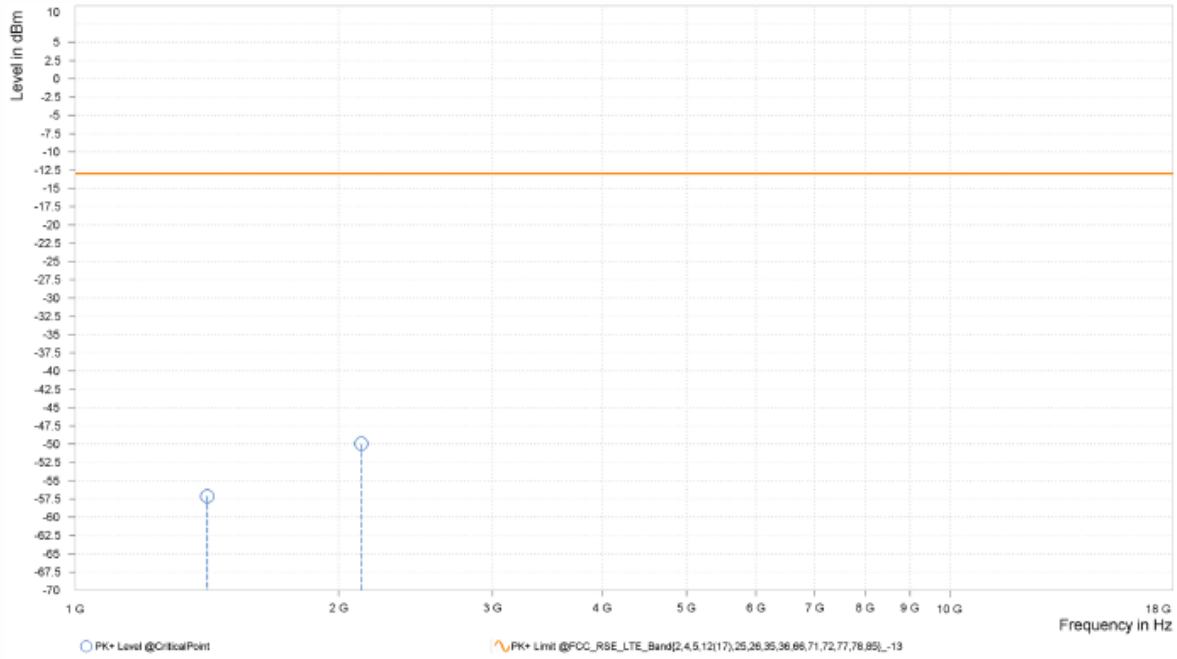
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,398.200	-55.85	-13.00	42.85	5.11	V	9	1.00
1	2,097.300	-52.26	-13.00	39.26	9.81	V	1	1.00



CH 23095

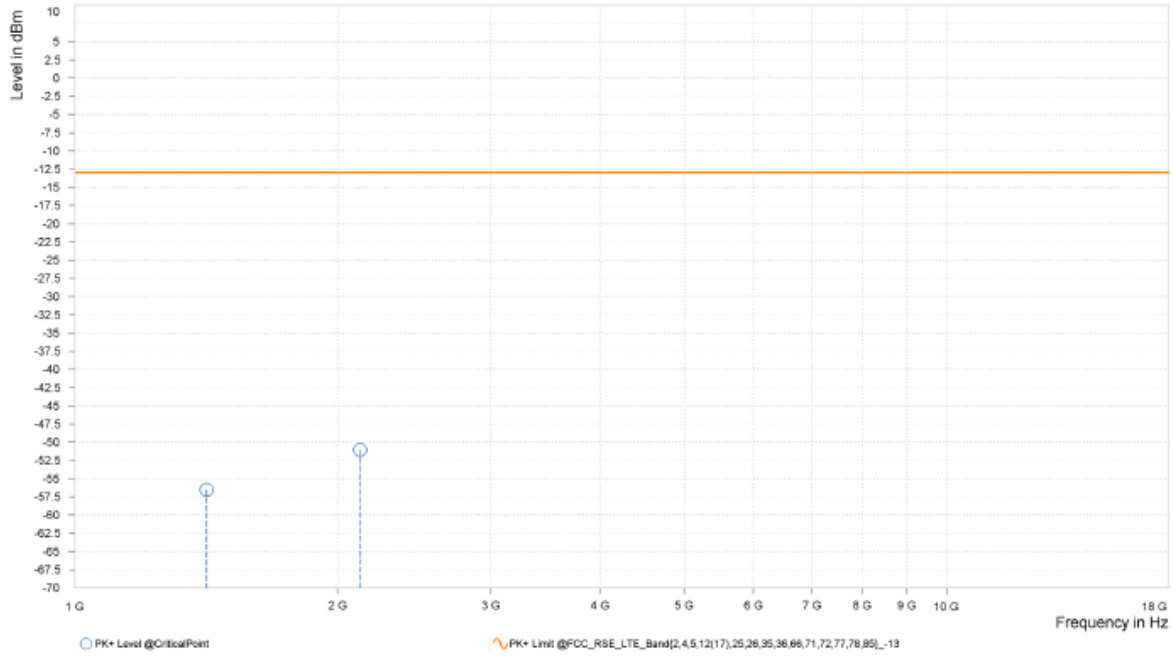
MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,415.000	-57.13	-13.00	44.13	2.70	H	5	1.00
1	2,122.500	-49.96	-13.00	36.96	10.97	H	5	1.00



MODE	TX channel 23095	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

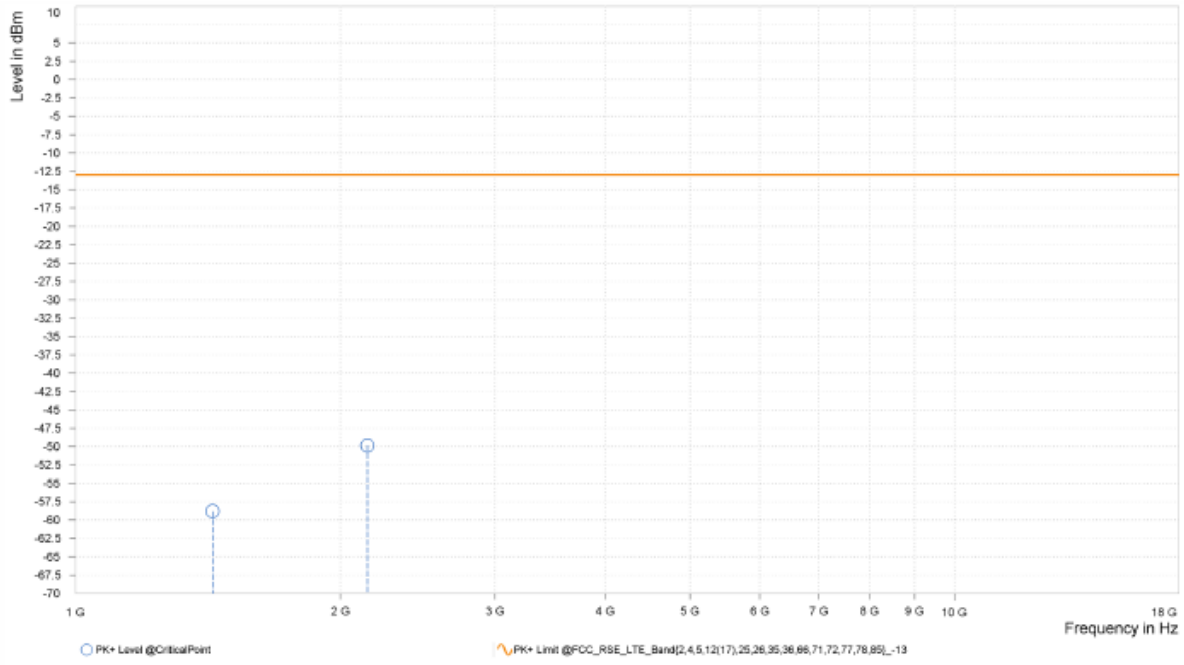
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,415.000	-56.52	-13.00	43.52	2.59	V	359	2.00
1	2,122.500	-51.07	-13.00	38.07	10.59	V	358.2	1.00



CH23178

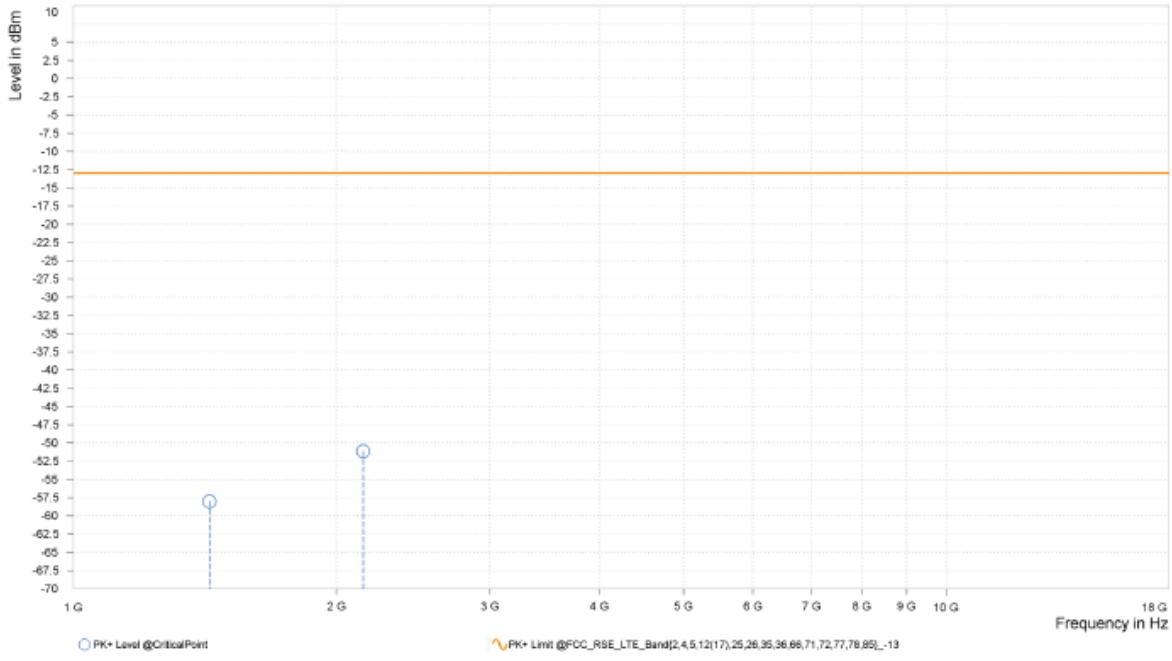
MODE	TX channel 23178	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,431.800	-58.81	-13.00	45.81	2.28	H	2.6	2.00
1	2,147.700	-49.84	-13.00	36.84	12.02	H	359	2.00



MODE	TX channel 23178	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

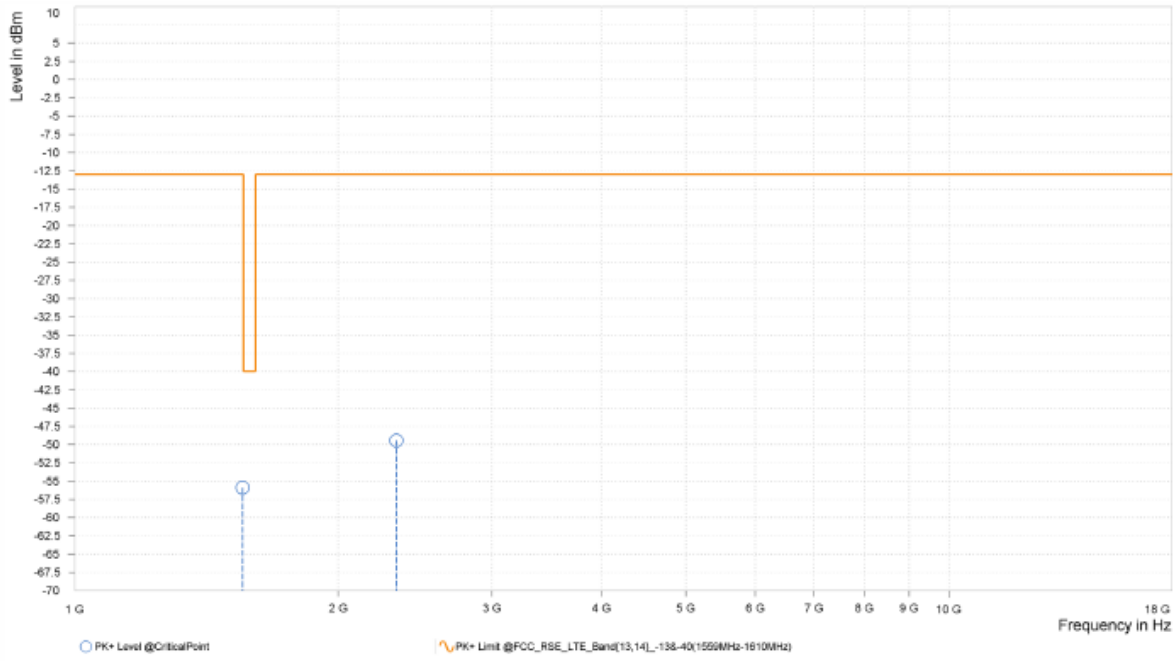
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,431.800	-58.04	-13.00	45.04	2.15	V	255.3	1.00
1	2,147.700	-51.13	-13.00	38.13	11.36	V	359	1.00



NB-IOT LTE Band 13
CHANNEL BANDWIDTH: QPSK

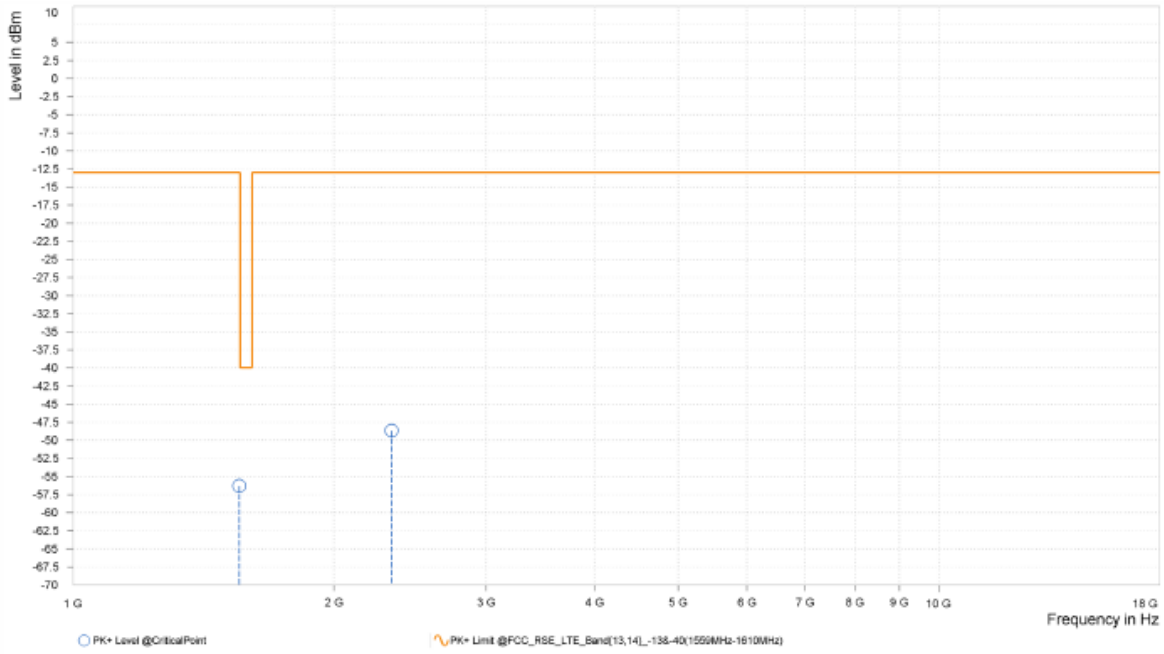
MODE	TX channel 23182	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,554.200	-55.92	-13.00	42.92	5.28	H	357.4	1.00
1	2,331.300	-49.45	-13.00	36.45	13.06	H	354.9	2.00



MODE	TX channel 23182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

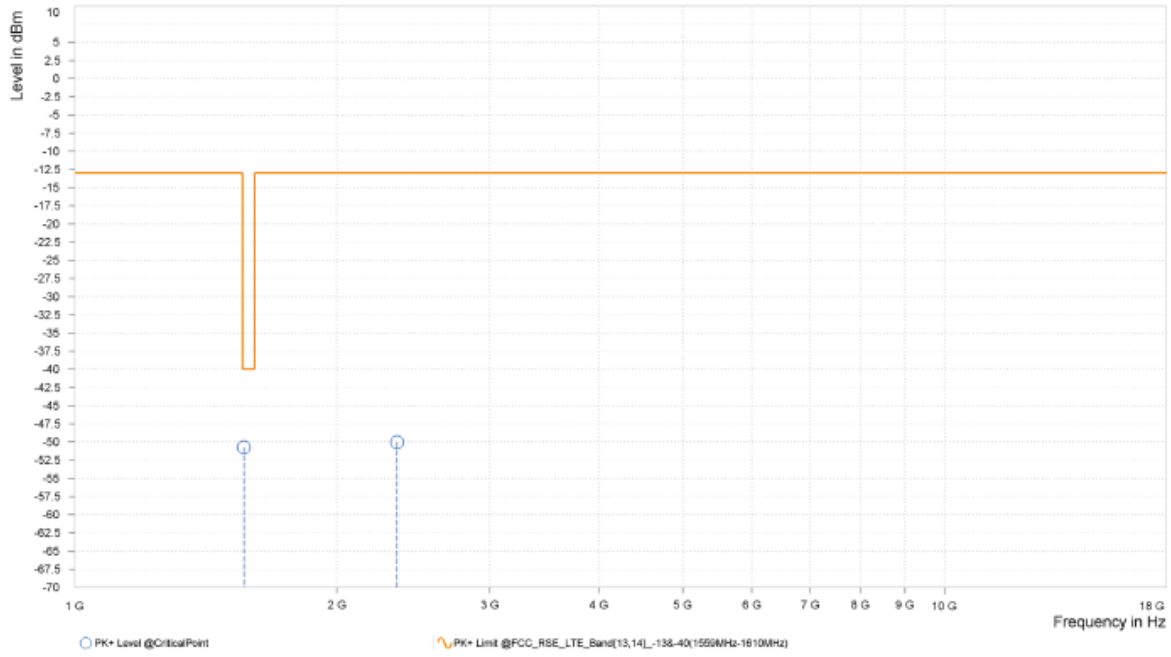
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,554.200	-56.32	-13.00	43.32	4.91	V	1	1.00
1	2,331.300	-48.67	-13.00	35.67	12.57	V	243.4	1.00



CH 23230

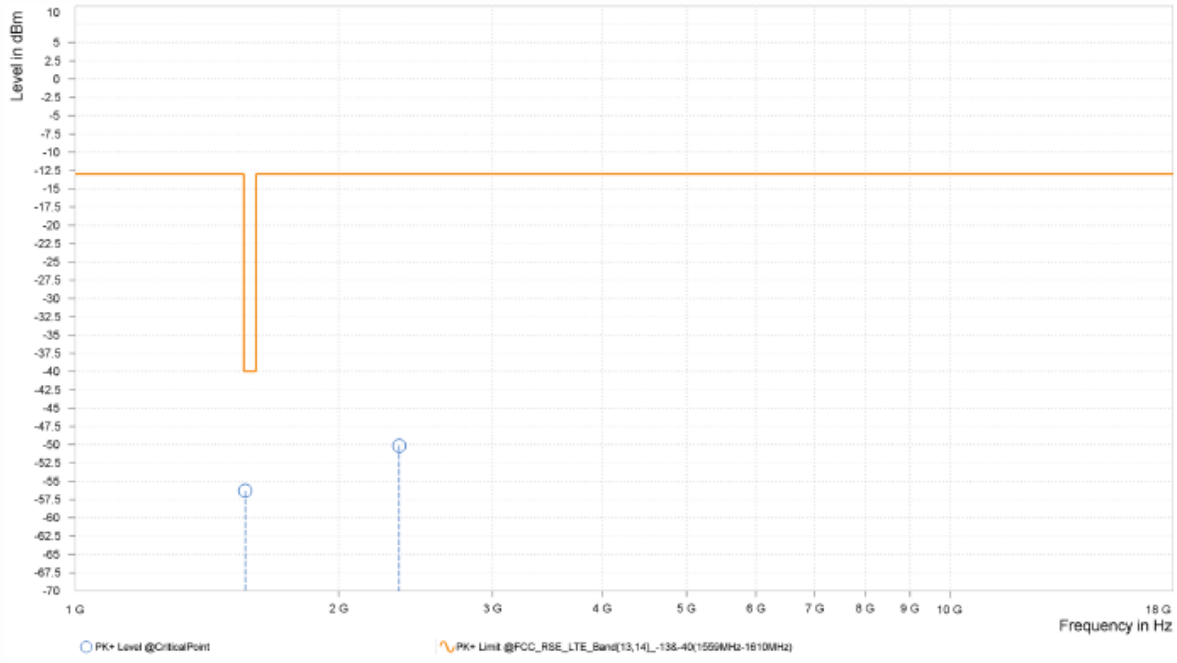
MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,564.000	-50.74	-40.00	10.74	5.33	H	359	2.00
1	2,346.000	-50.02	-13.00	37.02	13.06	H	134.6	2.00



MODE	TX channel 23230	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

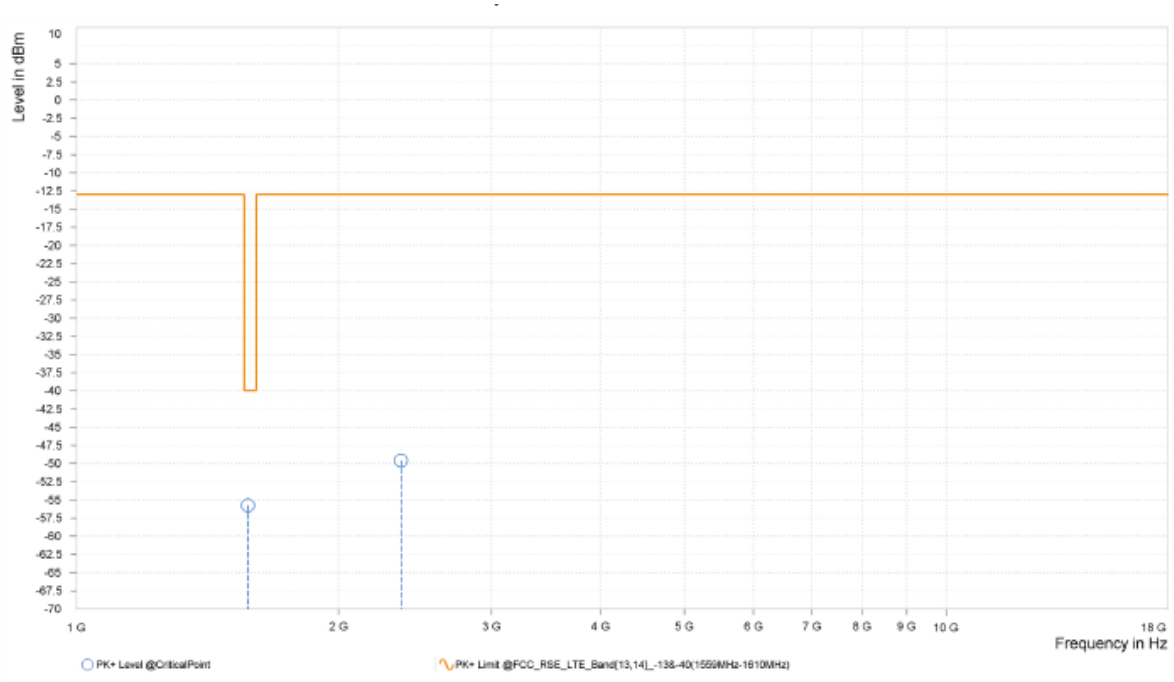
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,564.000	-56.32	-40.00	16.32	5.04	V	359	2.00
1	2,346.000	-50.16	-13.00	37.16	12.66	V	12.9	1.00



CH23178

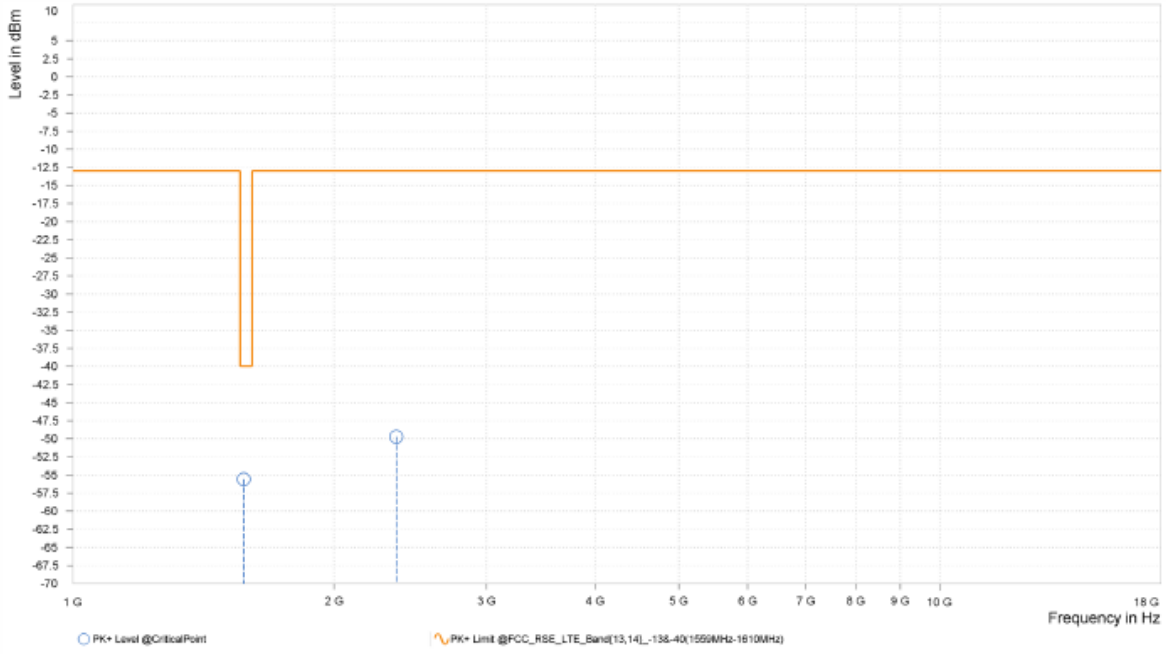
MODE	TX channel 23278	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,573.800	-55.77	-40.00	15.77	5.30	H	134.6	2.00
1	2,360.700	-49.58	-13.00	36.58	12.98	H	354.9	2.00



MODE	TX channel 23278	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

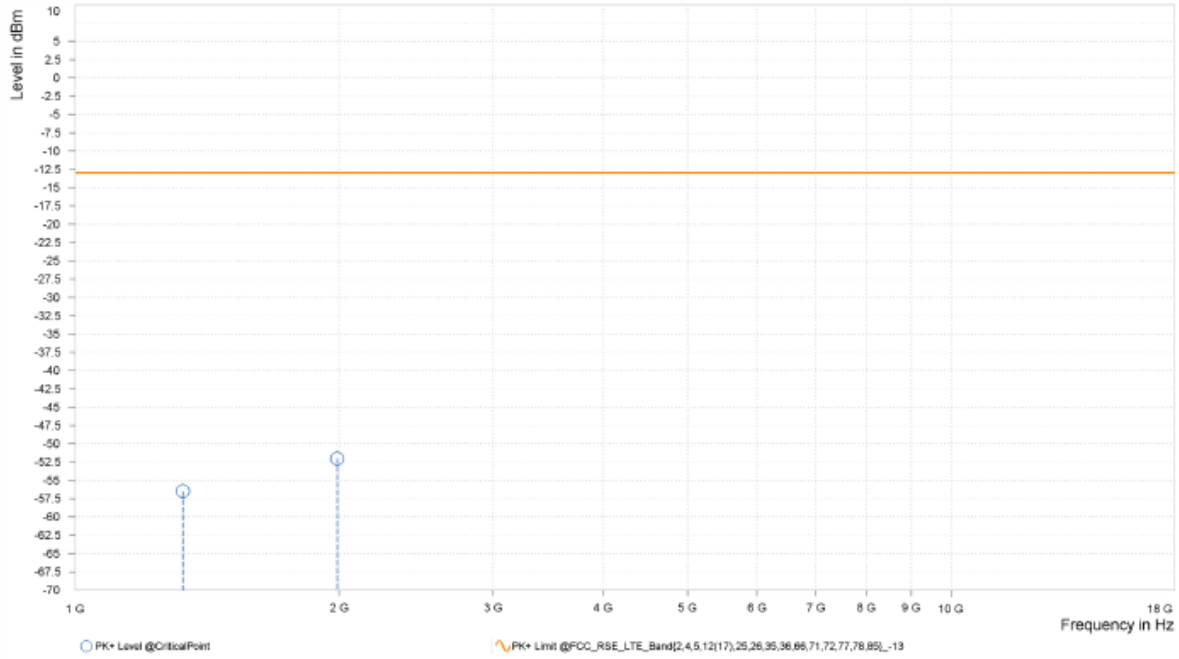
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,573.800	-55.58	-40.00	15.58	5.09	V	2.3	2.00
1	2,360.700	-49.73	-13.00	36.73	12.65	V	2.3	2.00



NB-IOT LTE Band 71
CHANNEL BANDWIDTH: QPSK
CH 133124

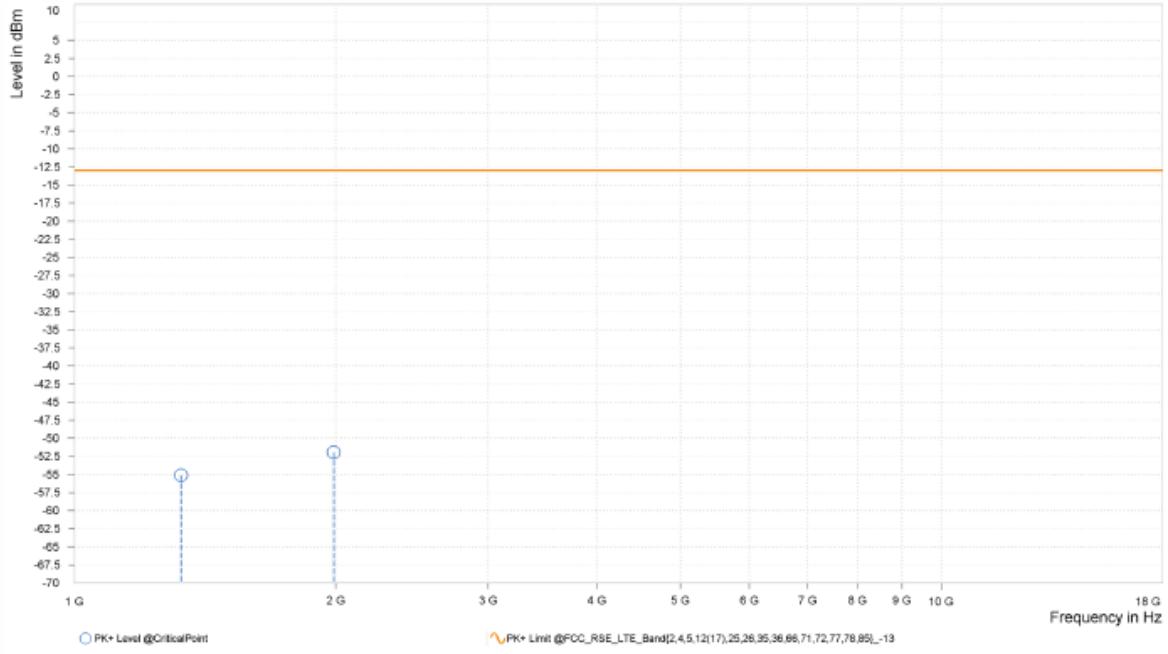
MODE	TX channel 133124	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,326.200	-56.50	-13.00	43.50	4.30	H	1	1.00
1	1,989.300	-52.02	-13.00	39.02	9.53	H	1.4	2.00



MODE	TX channel 133124	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

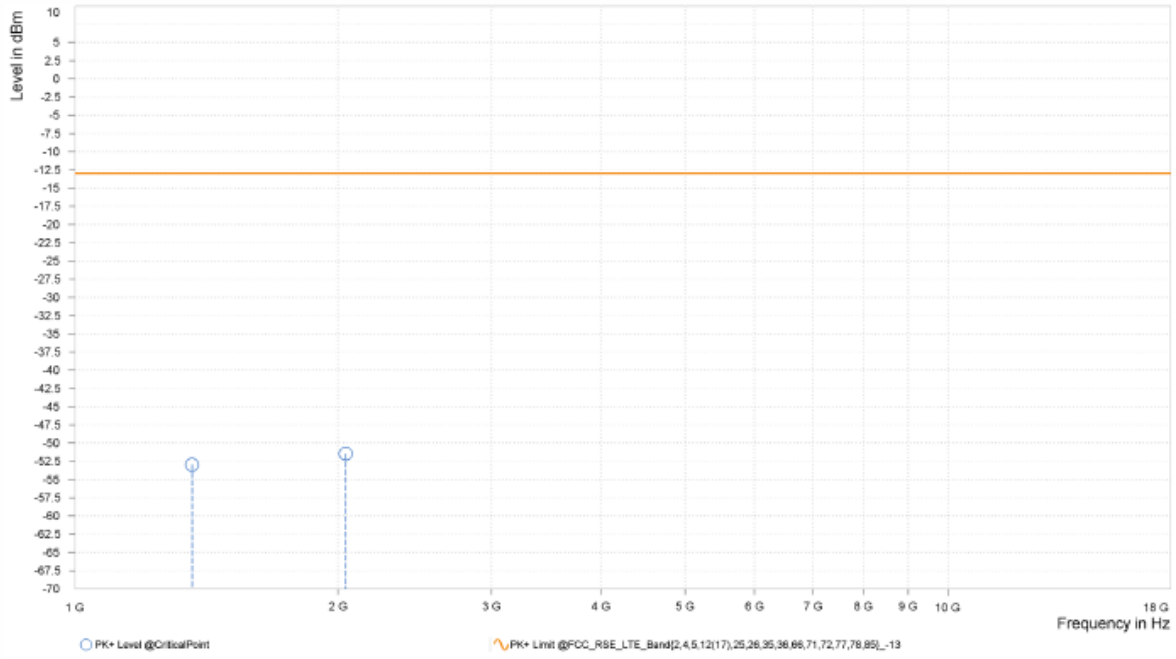
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,326.200	-55.11	-13.00	42.11	4.37	V	3.6	1.00
1	1,989.500	-51.97	-13.00	38.97	9.47	V	357.5	1.00



CH 133297

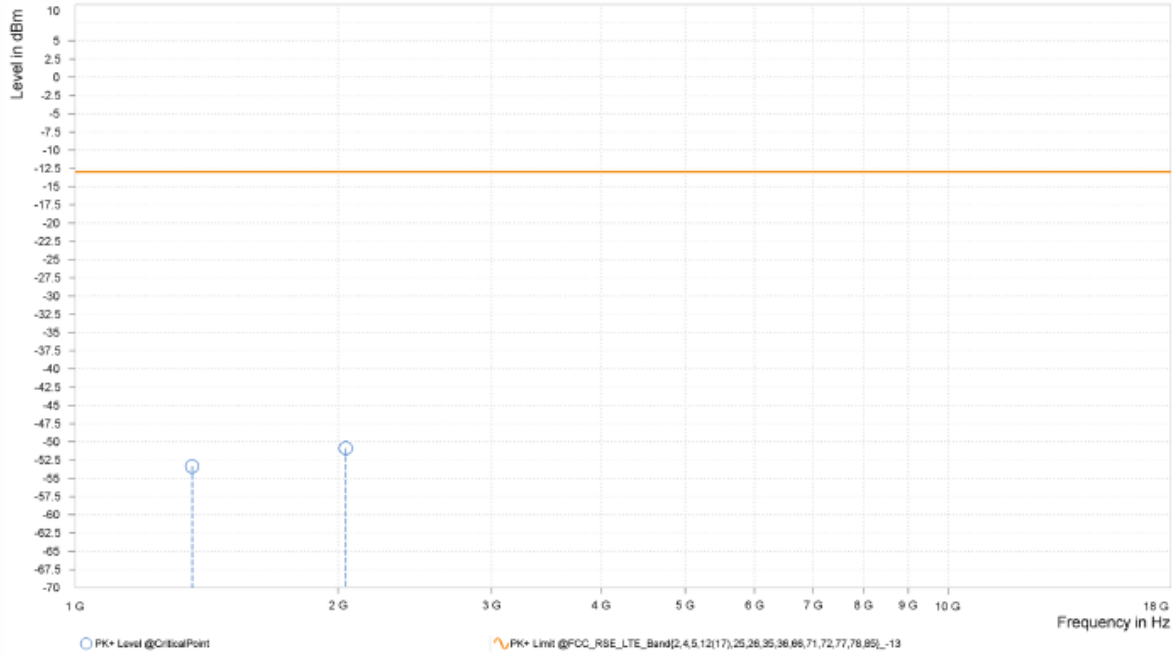
MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,361.000	-52.97	-13.00	39.97	7.01	H	354.9	2.00
1	2,041.500	-51.46	-13.00	38.46	11.14	H	134.6	2.00



MODE	TX channel 133297	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

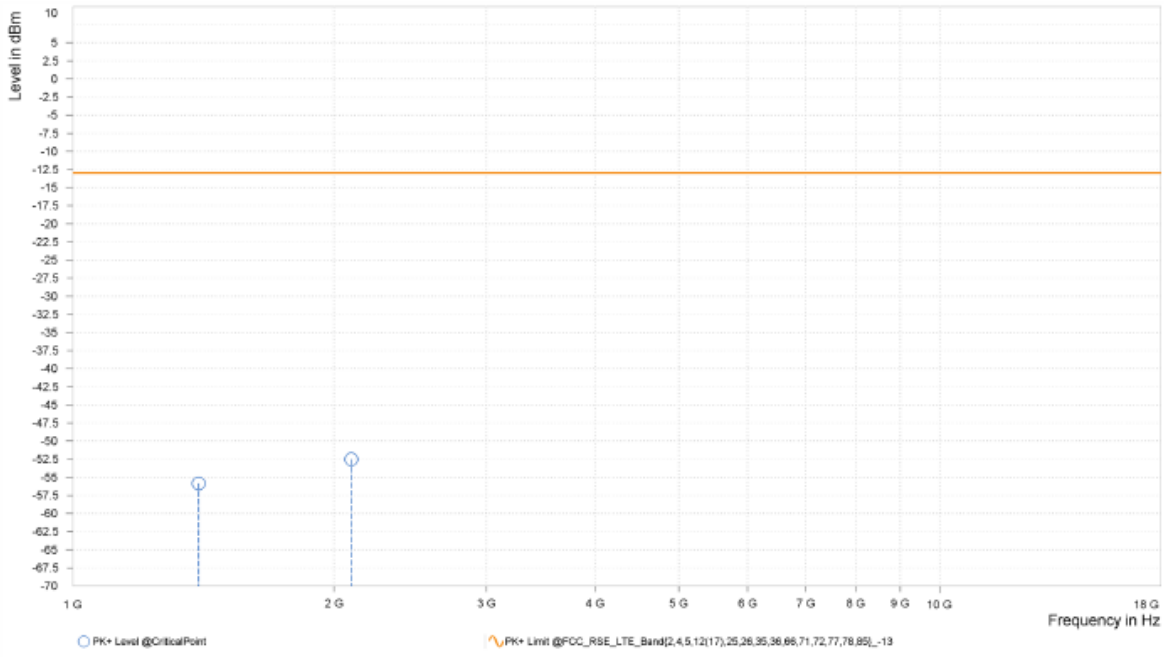
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,361.000	-53.36	-13.00	40.36	7.09	V	2.5	2.00
1	2,041.500	-50.88	-13.00	37.88	11.62	V	1	1.00



CH 133470

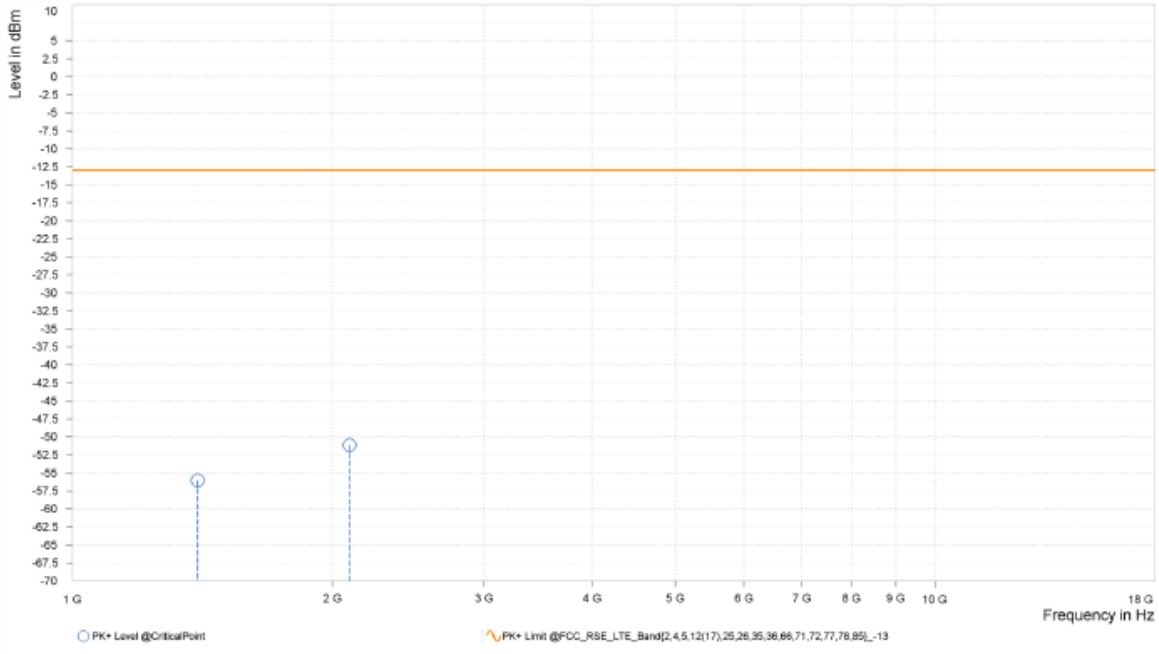
MODE	TX channel 133470	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,395.800	-55.84	-13.00	42.84	5.39	H	5.1	1.00
1	2,093.700	-52.50	-13.00	39.50	9.74	H	354.9	2.00



MODE	TX channel 133470	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

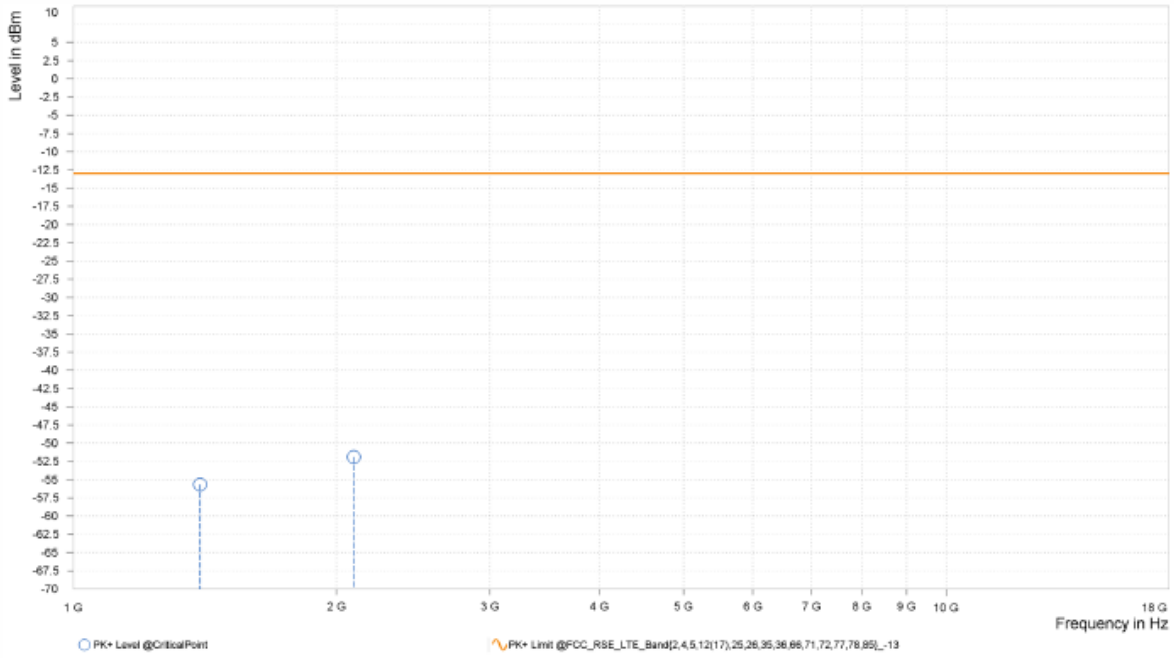
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,395.800	-56.04	-13.00	43.04	5.41	V	133.4	2.00
1	2,093.700	-51.12	-13.00	38.12	9.69	V	359	2.00



NB-IOT LTE Band 85
CHANNEL BANDWIDTH: QPSK
CH 134004

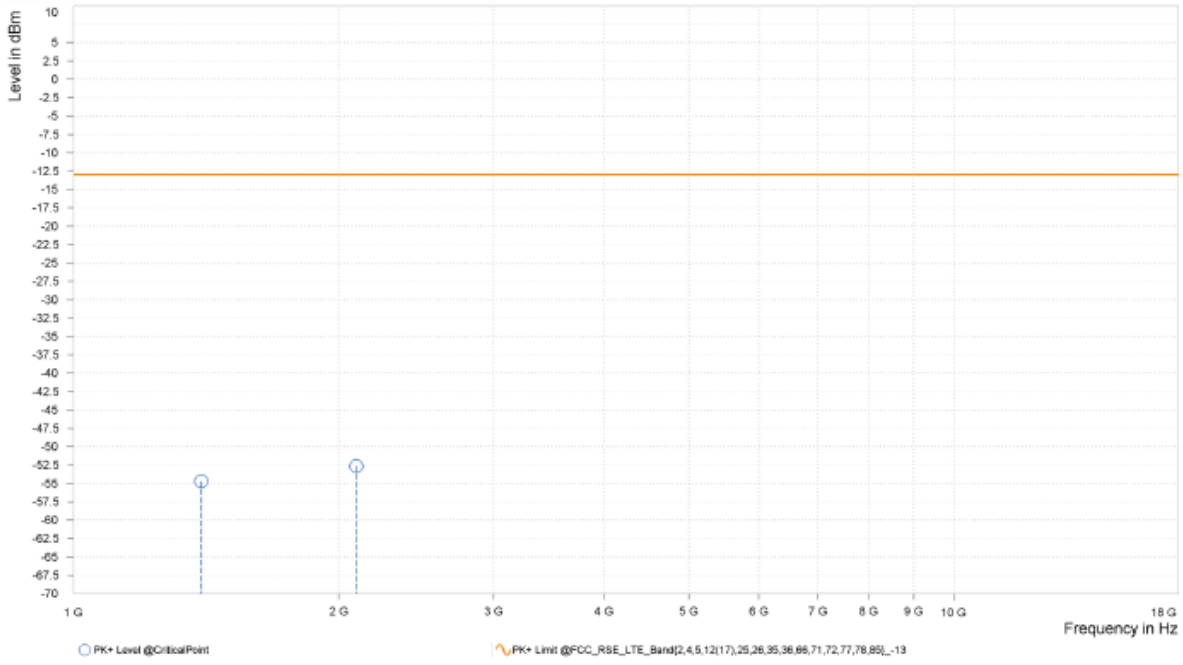
MODE	TX channel 134004	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,396.400	-55.66	-13.00	42.66	5.32	H	126.2	2.00
1	2,094.600	-51.89	-13.00	38.89	9.78	H	4.5	1.00



MODE	TX channel 134004	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

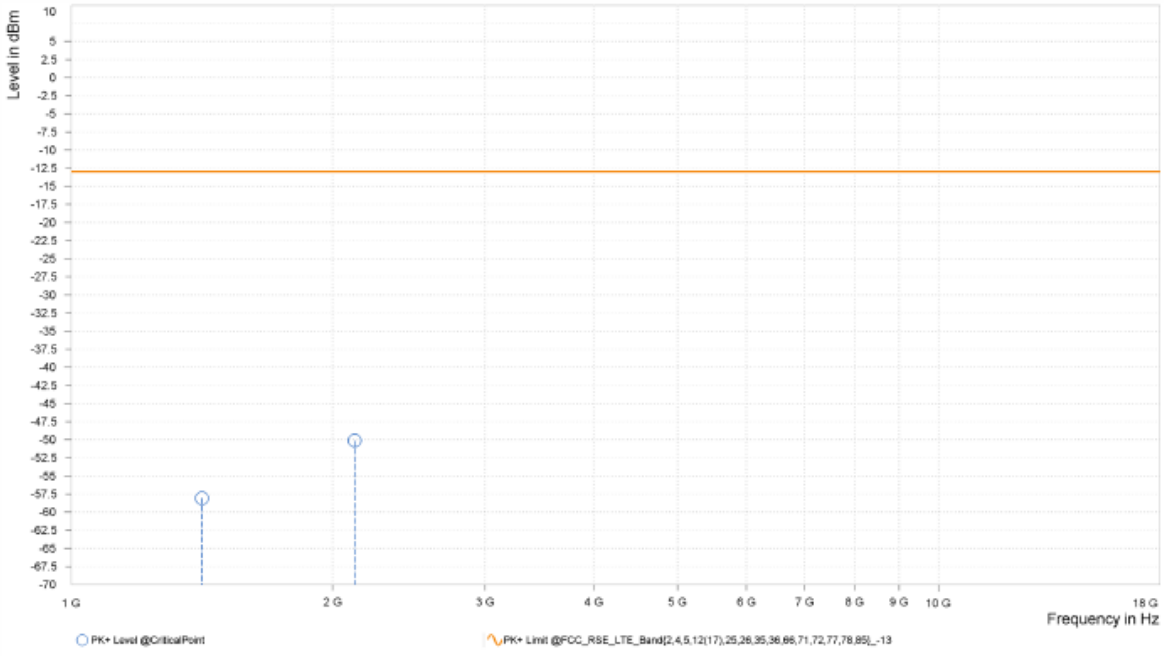
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,396.400	-54.72	-13.00	41.72	5.33	V	1	1.00
1	2,094.600	-52.65	-13.00	39.65	9.72	V	359.1	1.00



CH 134092

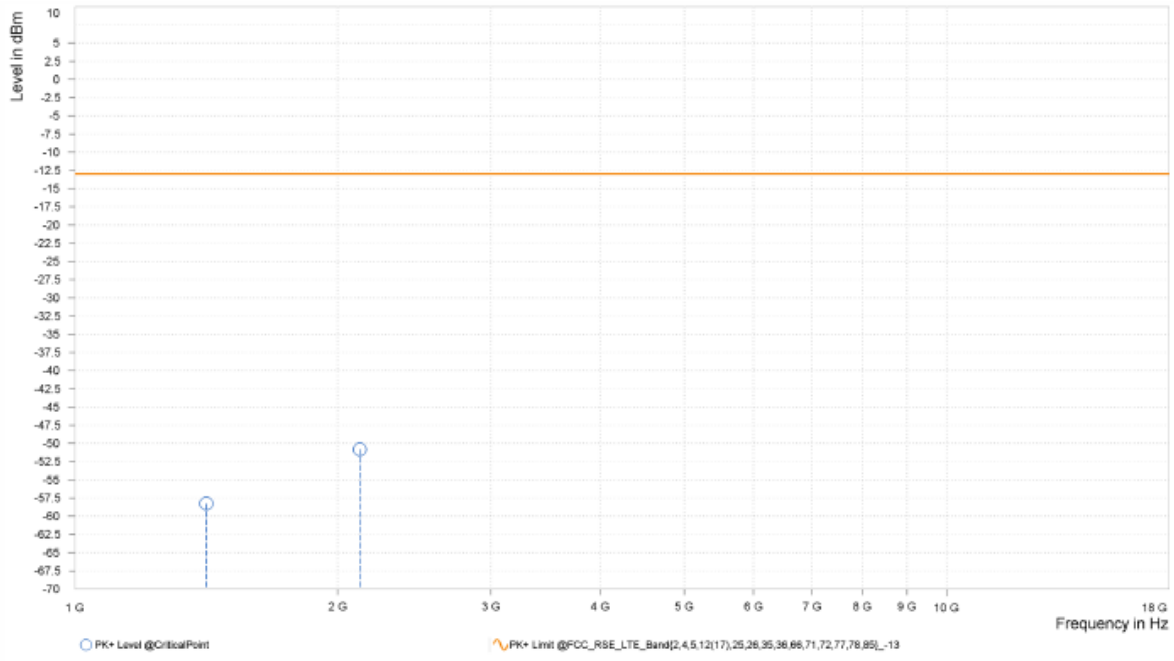
MODE	TX channel 134092	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-58.07	-13.00	45.07	2.84	H	128.6	2.00
1	2,121.000	-50.13	-13.00	37.13	10.91	H	354.8	2.00



MODE	TX channel 134092	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

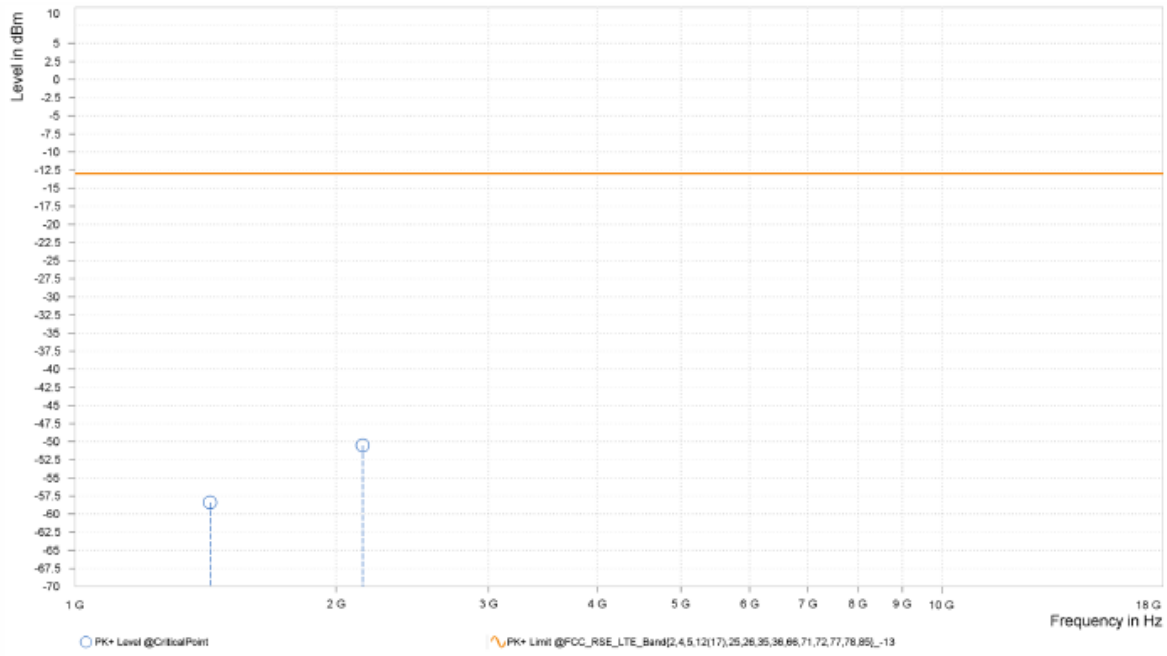
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,414.000	-58.27	-13.00	45.27	2.74	V	10.9	1.00
1	2,121.000	-50.83	-13.00	37.83	10.55	V	129.8	2.00



CH 134180

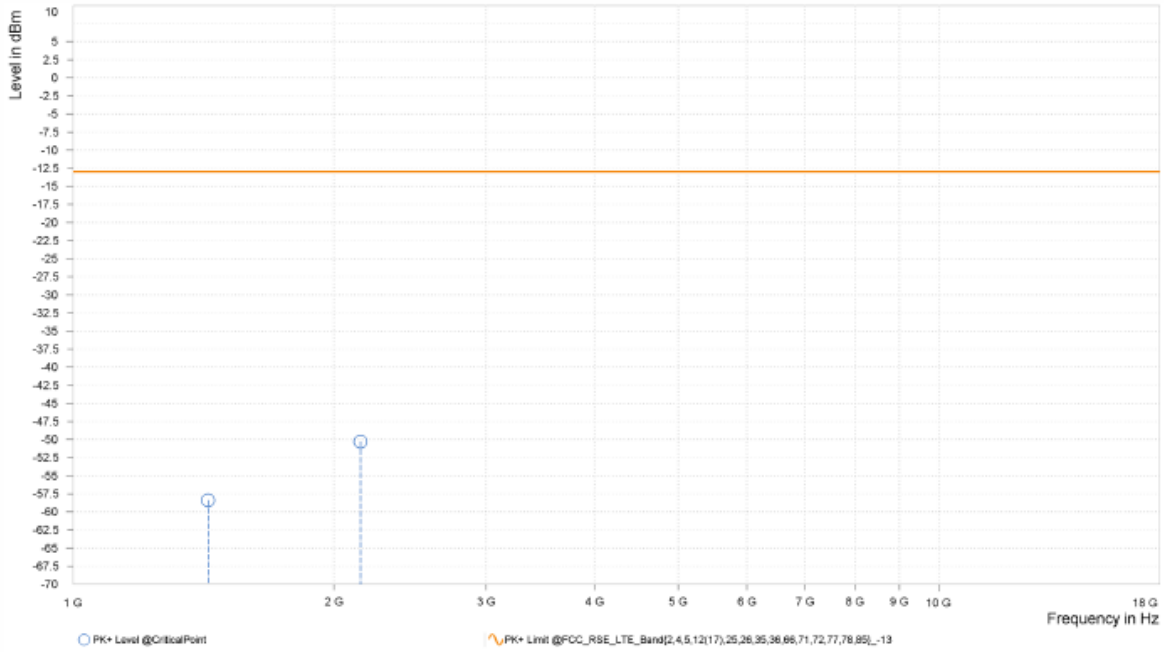
MODE	TX channel 134180	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,431.600	-58.40	-13.00	45.40	2.22	H	358.2	1.00
1	2,147.400	-50.51	-13.00	37.51	12.02	H	1.8	2.00



MODE	TX channel 134180	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

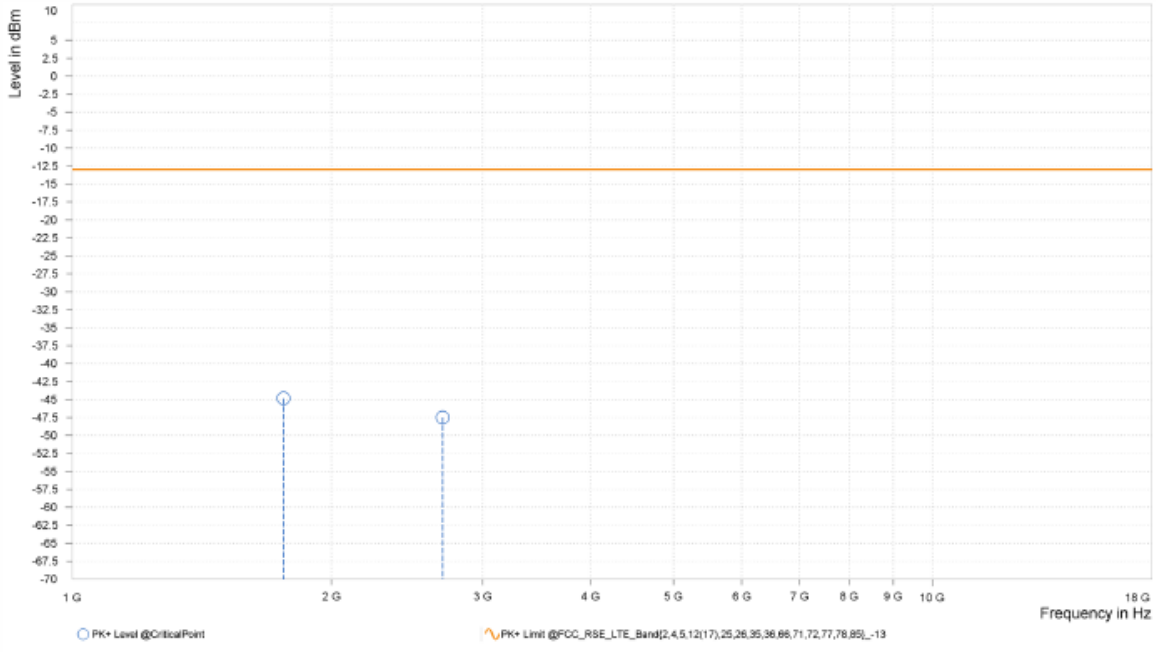
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,431.600	-58.38	-13.00	45.38	2.09	V	359	2.00
1	2,147.400	-50.30	-13.00	37.30	11.36	V	126.2	2.00



NB-IOT LTE Band 8
CHANNEL BANDWIDTH: QPSK

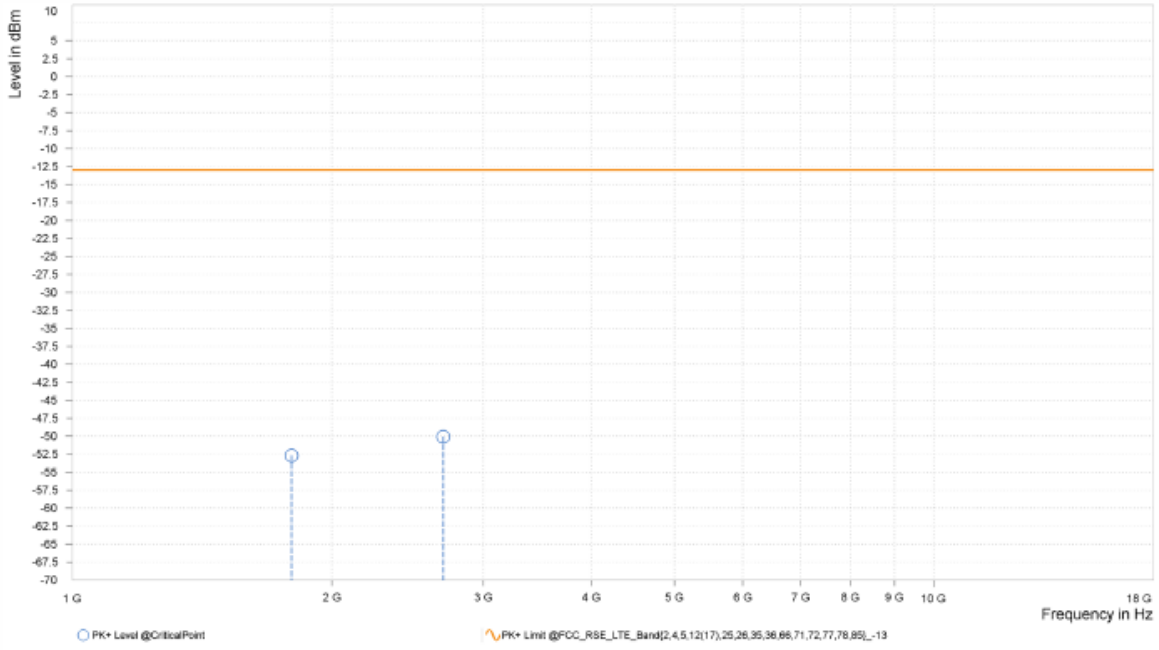
MODE	TX channel 21627	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,795.500	-44.84	-13.00	31.84	9.30	H	357.5	1.00
1	2,693.100	-47.49	-13.00	34.49	13.27	H	355.5	2.00



MODE	TX channel 21627	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

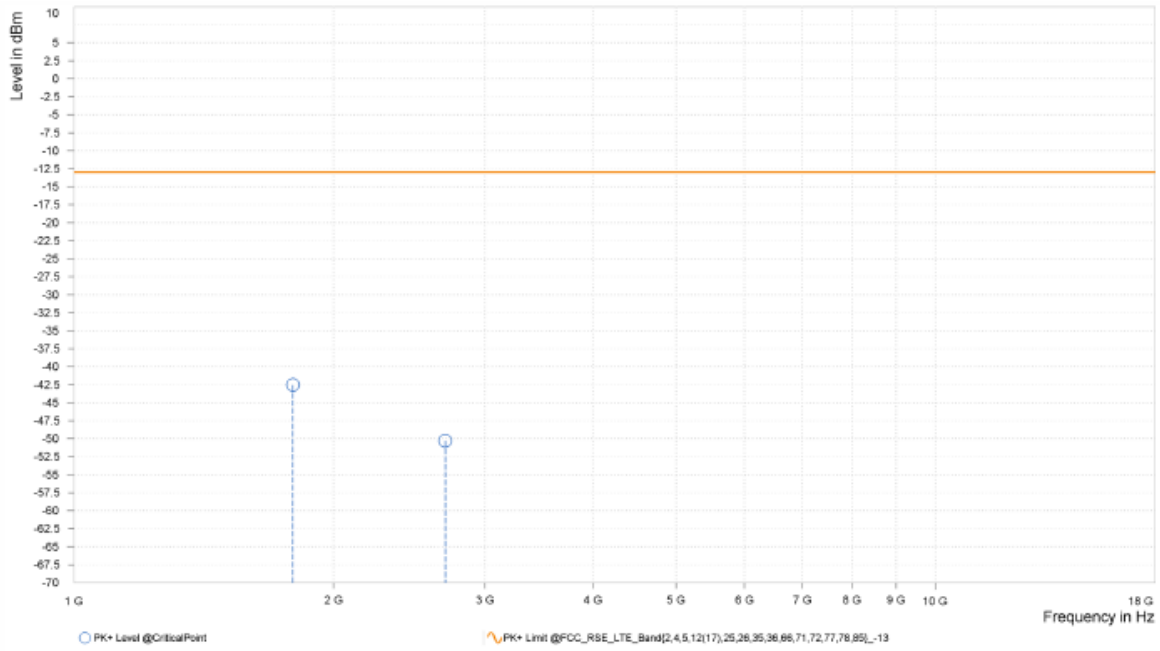
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,795.400	-52.69	-13.00	39.69	9.21	V	359	2.00
1	2,693.100	-50.07	-13.00	37.07	13.08	V	356.1	2.00



CH 21640

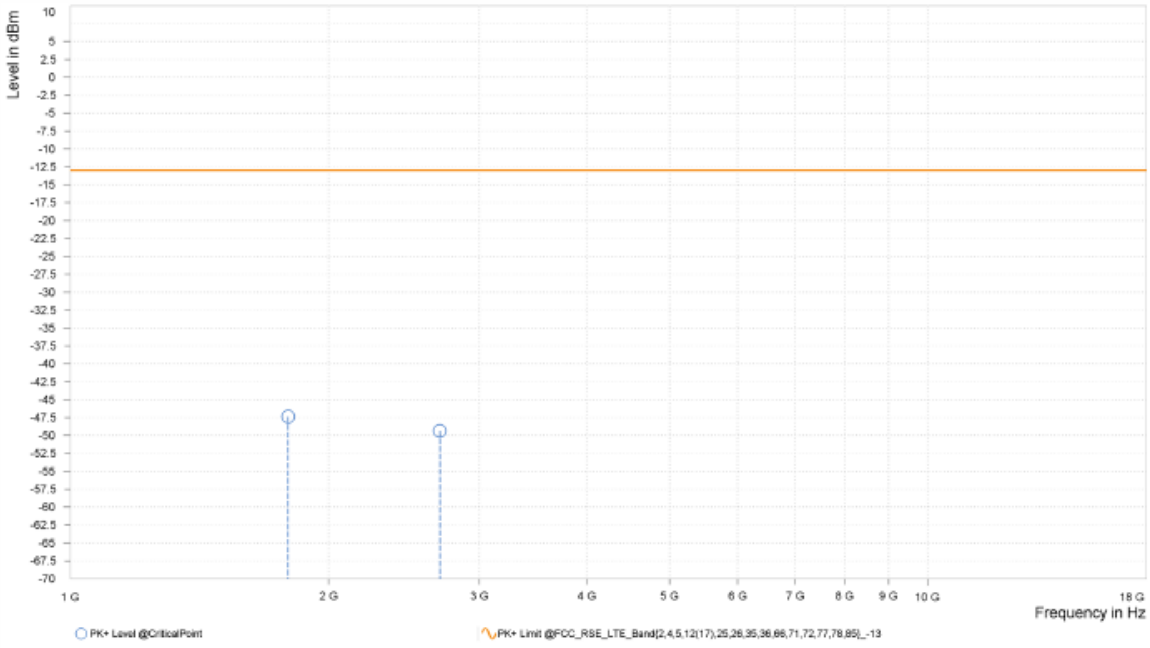
MODE	TX channel 21640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,794.500	-42.52	-13.00	29.52	9.16	H	230.2	1.00
1	2,697.000	-50.31	-13.00	37.31	13.19	H	2.2	2.00



MODE	TX channel 21640	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

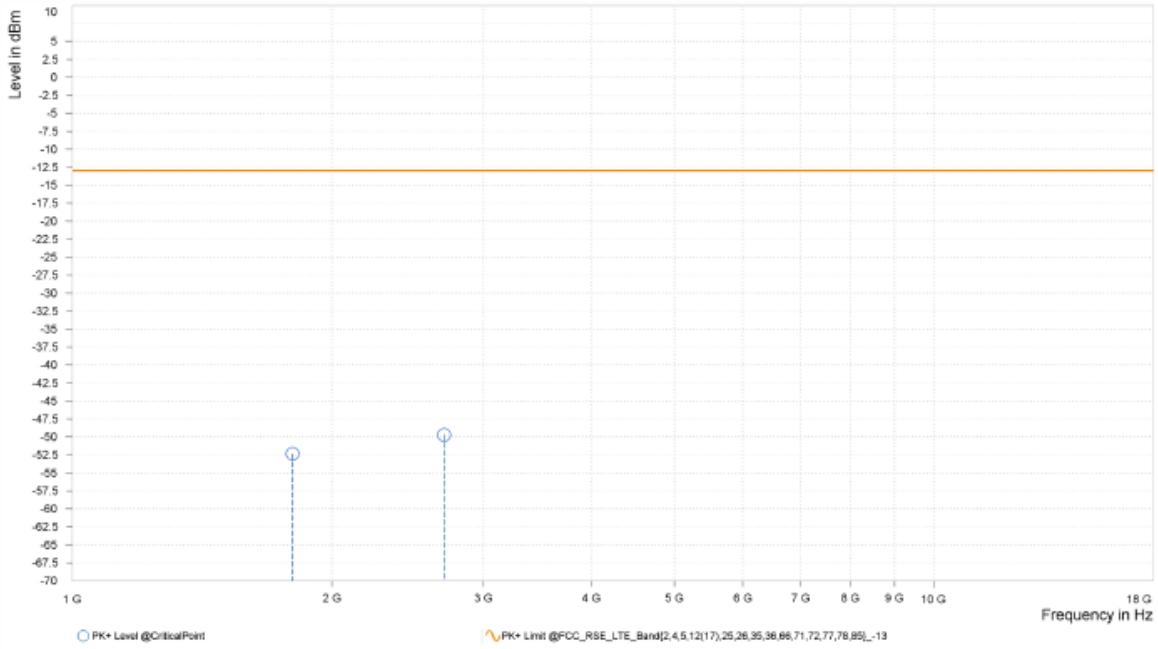
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,795.000	-47.37	-13.00	34.37	9.21	V	355.5	2.00
1	2,697.000	-49.37	-13.00	36.37	12.99	V	4.4	1.00



CH21653

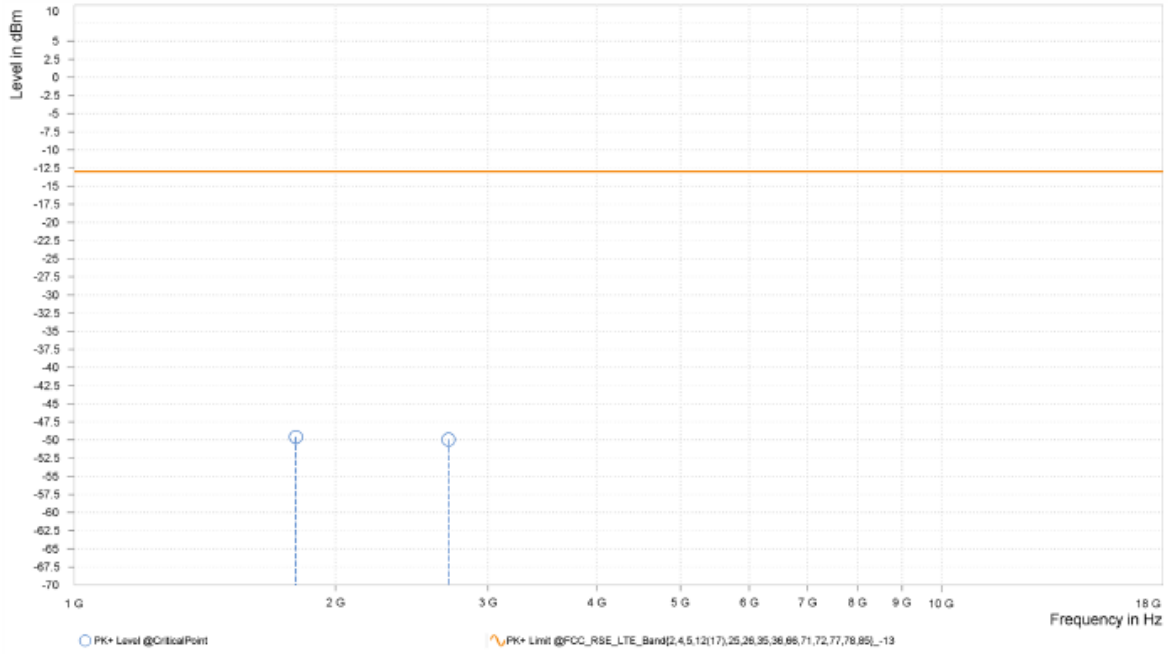
MODE	TX channel 21653	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,800.600	-52.34	-13.00	39.34	9.13	H	355	2.00
1	2,700.900	-49.71	-13.00	36.71	13.11	H	355	2.00



MODE	TX channel 21653	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	1,800.600	-49.58	-13.00	36.58	9.27	V	355.6	2.00
1	2,700.900	-49.93	-13.00	36.93	12.91	V	5	1.00

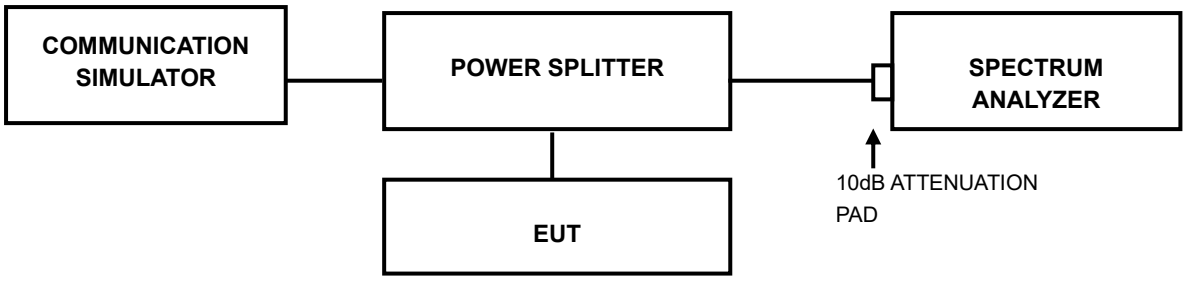


3.7 PEAK TO AVERAGE RATIO

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, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 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:

Suzhou EMC/RF Lab:
Tel: +86 (0557) 368 1008

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

CAT-M: LTE BAND12

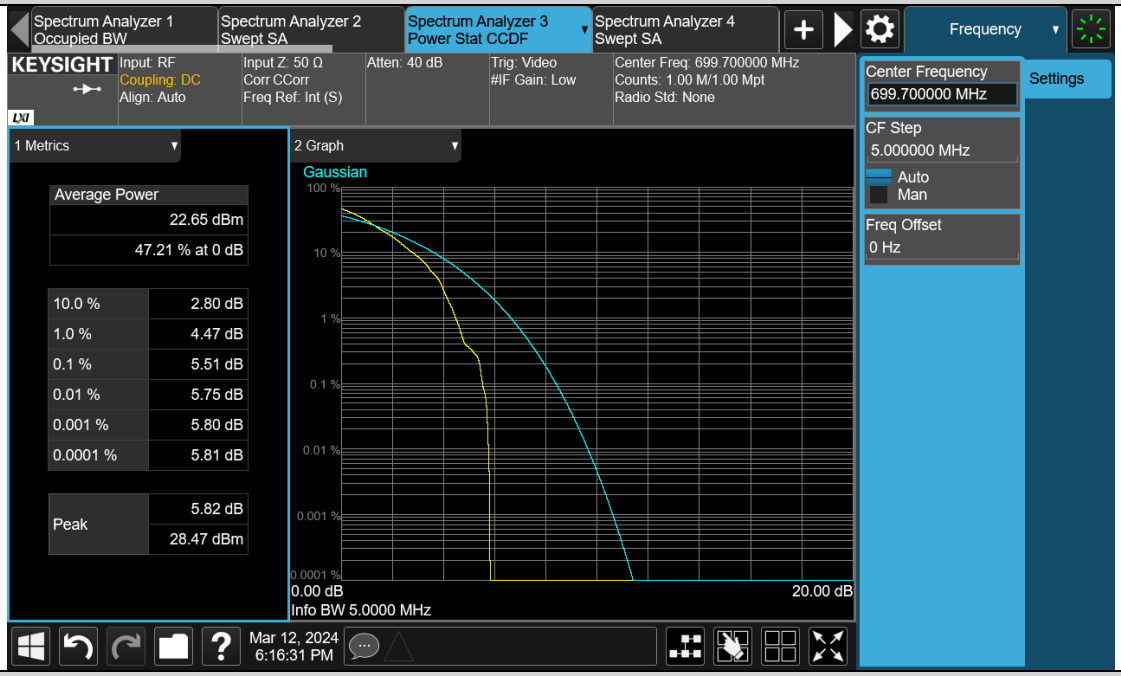
PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

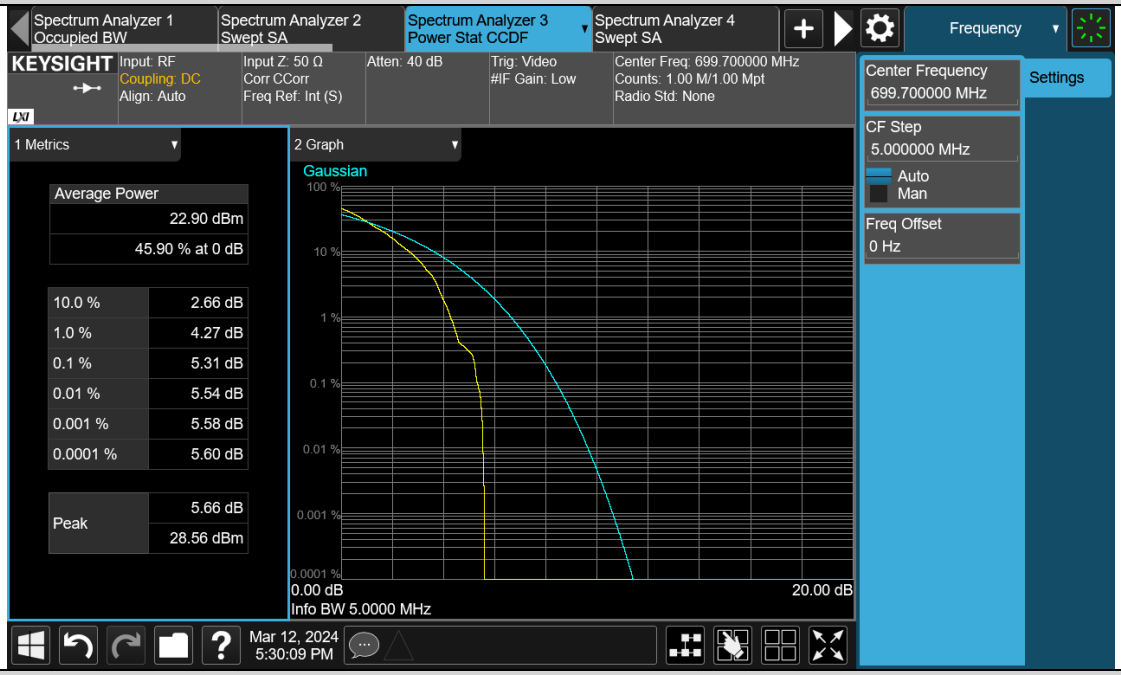
Band	Bandwidth	Modulation	Channel	Result(dB)	Limit(dB)	Verdict
Band12	1.4MHz	QPSK	23095	5.51	13	PASS
Band12	1.4MHz	QPSK	23017	5.31	13	PASS
Band12	1.4MHz	QPSK	23173	5.50	13	PASS
Band12	1.4MHz	16QAM	23095	6.88	13	PASS
Band12	1.4MHz	16QAM	23017	6.90	13	PASS
Band12	1.4MHz	16QAM	23173	6.84	13	PASS
Band12	3MHz	QPSK	23025	6.06	13	PASS
Band12	3MHz	QPSK	23095	6.69	13	PASS
Band12	3MHz	QPSK	23165	6.29	13	PASS
Band12	3MHz	16QAM	23025	6.81	13	PASS
Band12	3MHz	16QAM	23095	7.42	13	PASS
Band12	3MHz	16QAM	23165	7.10	13	PASS
Band12	5MHz	QPSK	23035	6.64	13	PASS
Band12	5MHz	QPSK	23095	6.75	13	PASS
Band12	5MHz	QPSK	23155	7.06	13	PASS
Band12	5MHz	16QAM	23035	7.48	13	PASS
Band12	5MHz	16QAM	23095	6.98	13	PASS
Band12	5MHz	16QAM	23155	7.63	13	PASS
Band12	10MHz	QPSK	23060	7.27	13	PASS
Band12	10MHz	QPSK	23095	6.56	13	PASS
Band12	10MHz	QPSK	23130	6.81	13	PASS
Band12	10MHz	16QAM	23060	7.68	13	PASS
Band12	10MHz	16QAM	23095	7.19	13	PASS
Band12	10MHz	16QAM	23130	6.72	13	PASS

Test Graphs

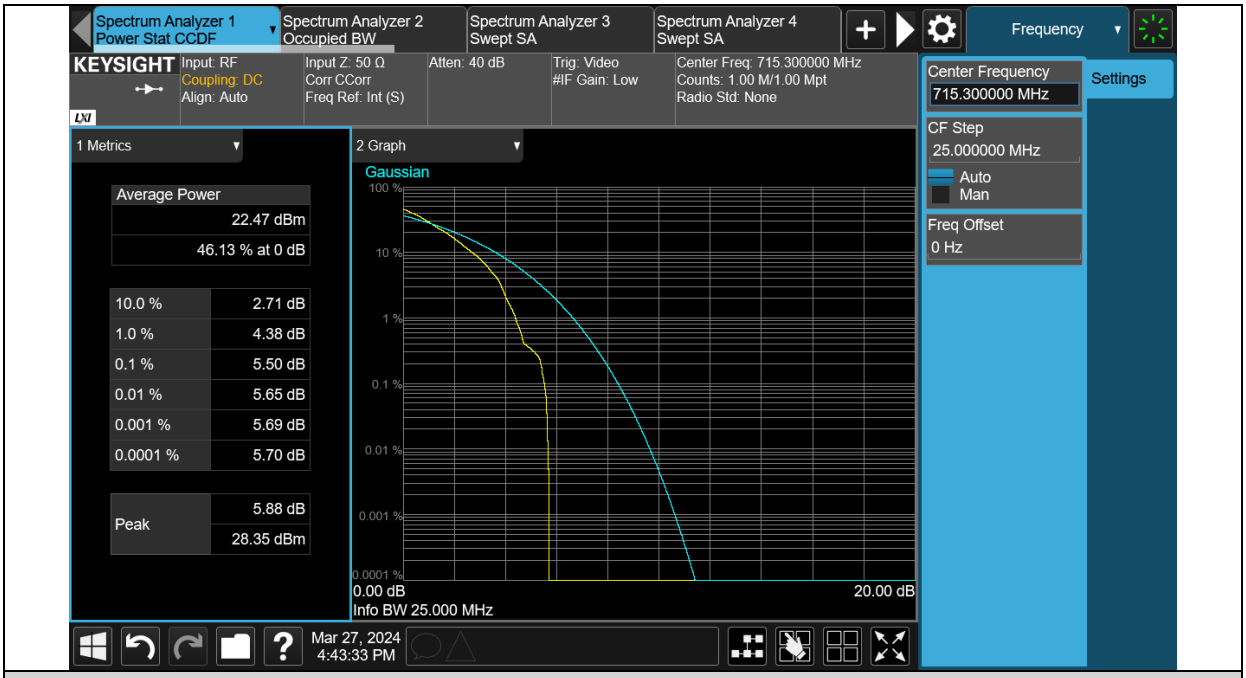
Band12-1.4MHz-QPSK-23017



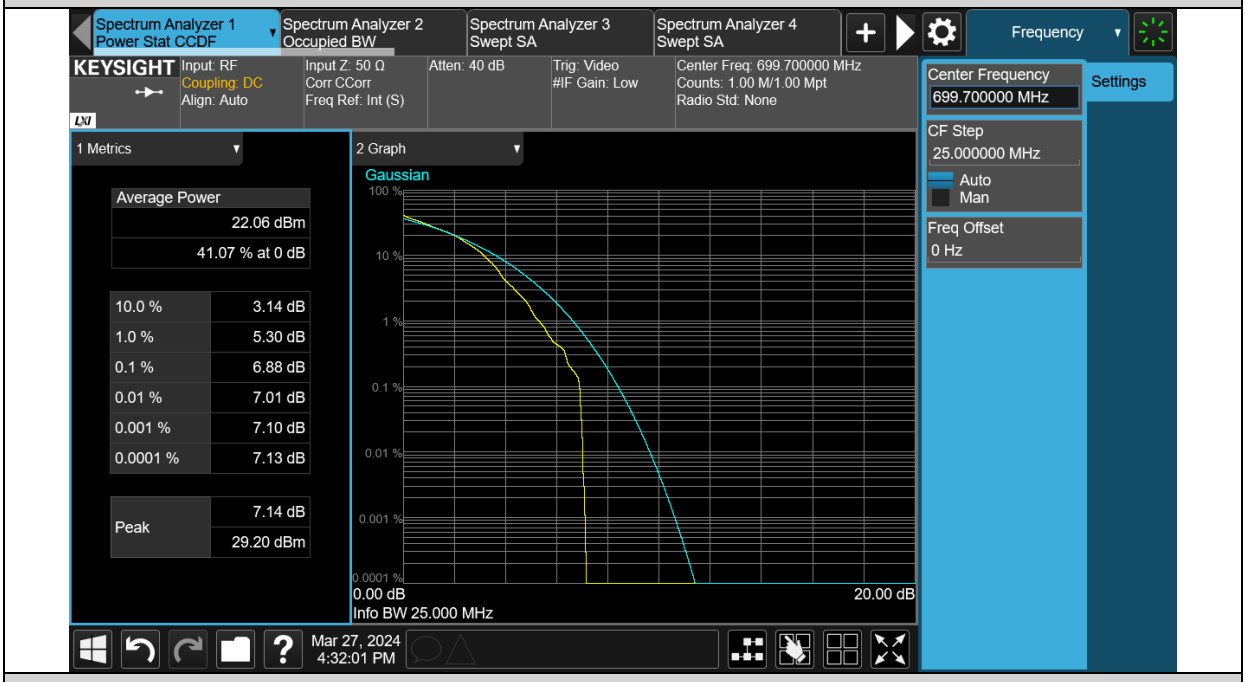
Band12-1.4MHz-QPSK-23095



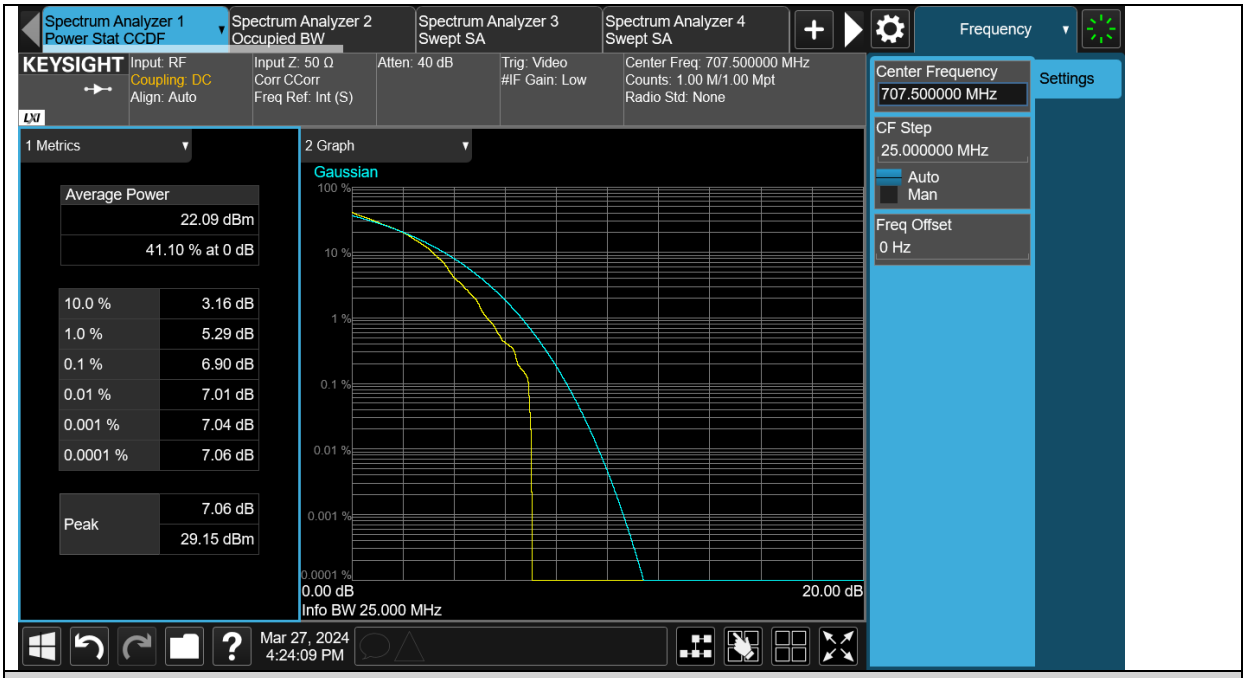
Band12-1.4MHz-QPSK-23173



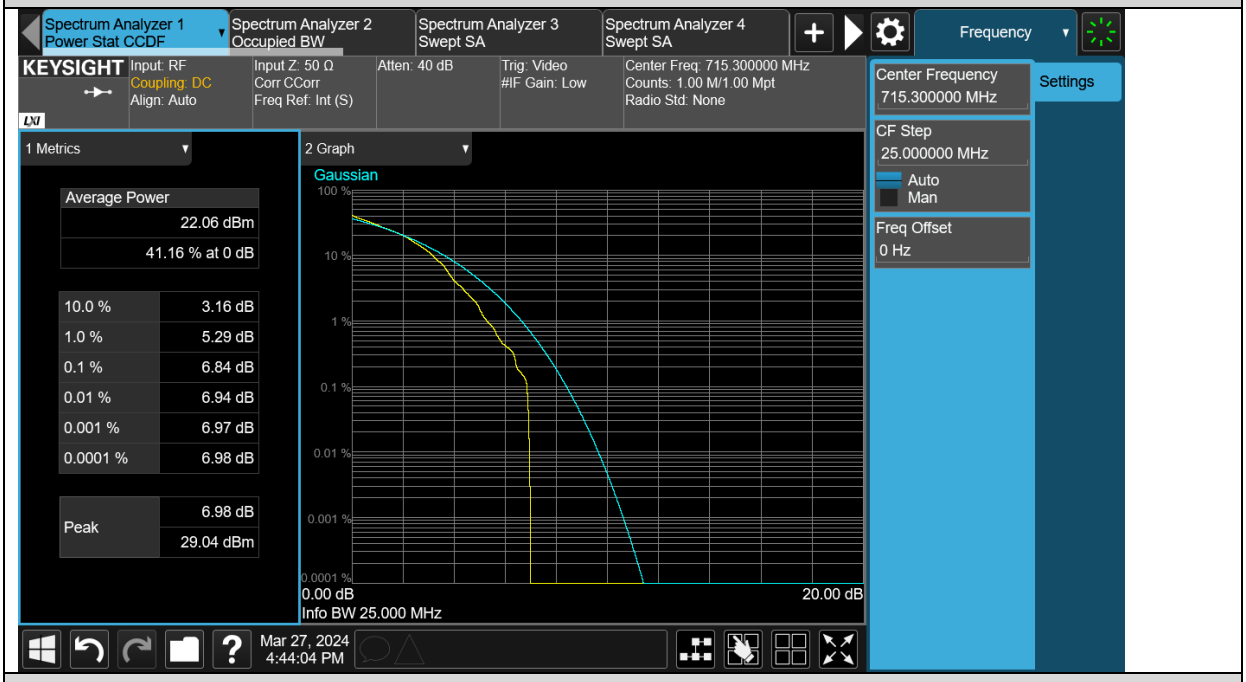
Band12-1.4MHz-16QAM-23017



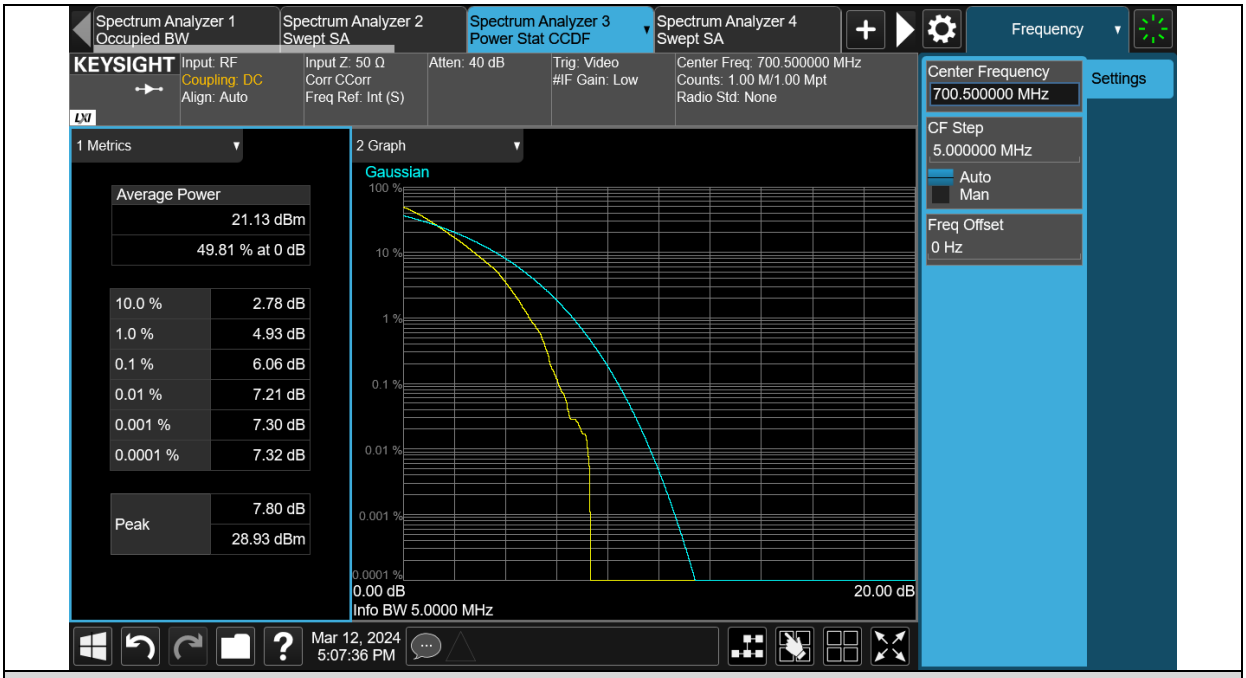
Band12-1.4MHz-16QAM-23095



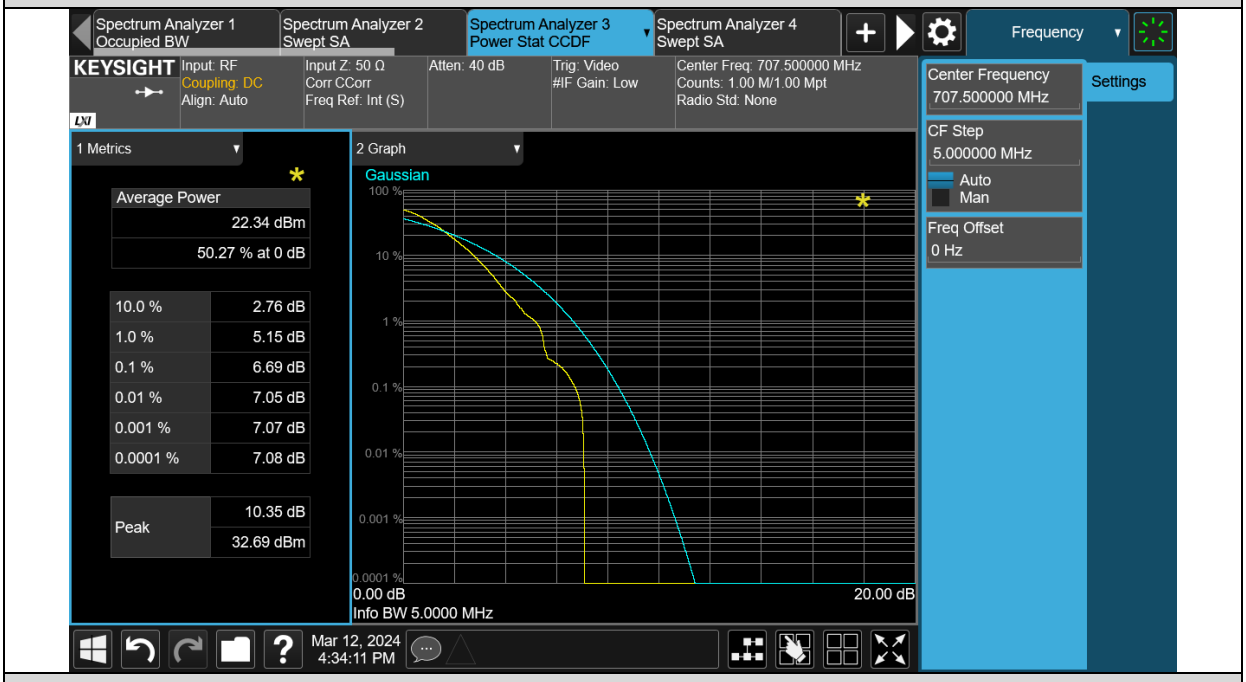
Band12-1.4MHz-16QAM-23173



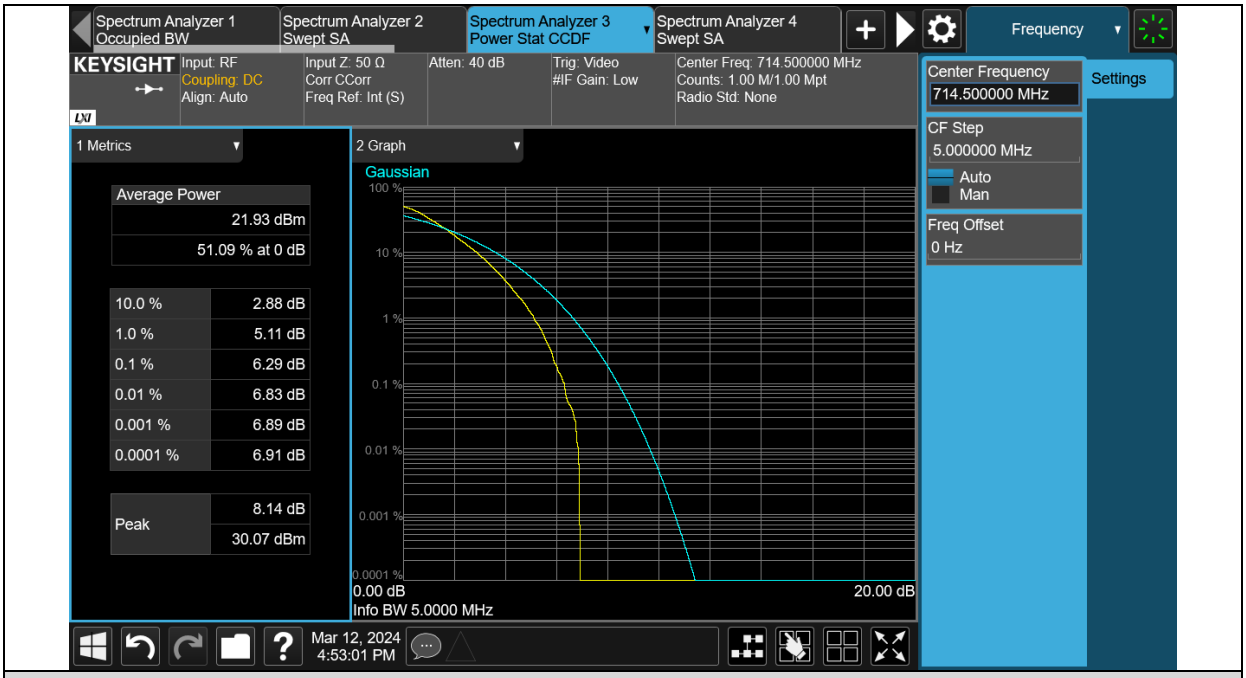
Band12-3MHz-QPSK-23025



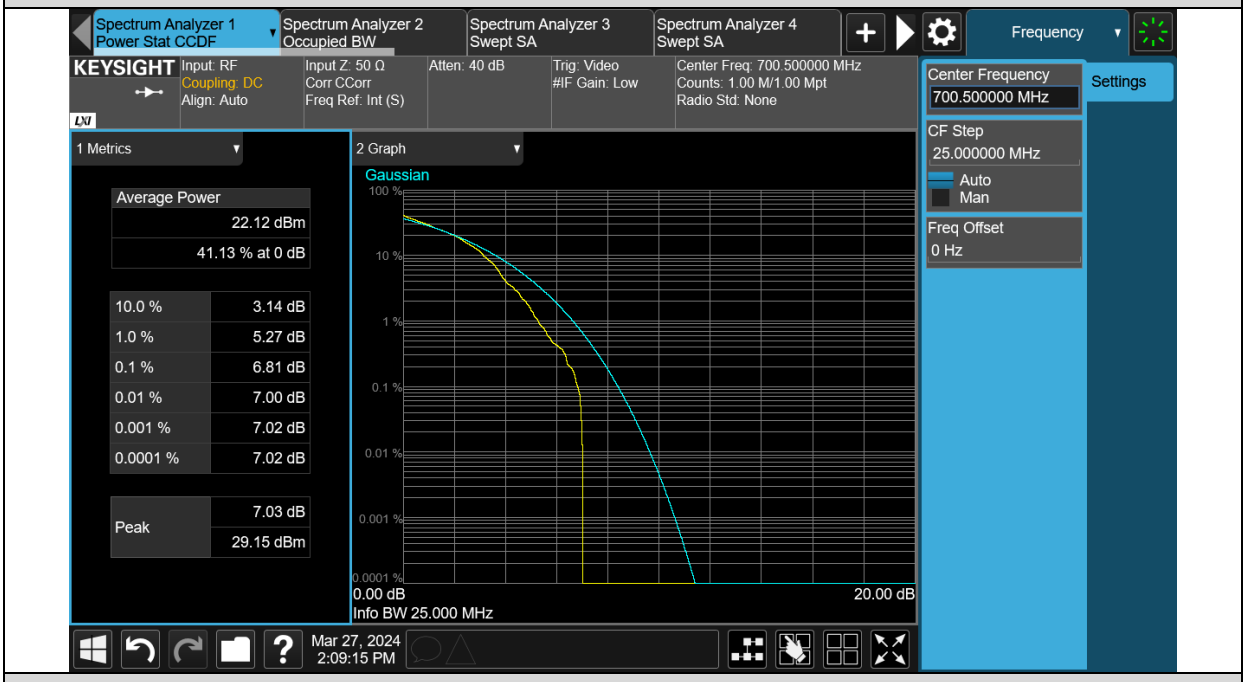
Band12-3MHz-QPSK-23095



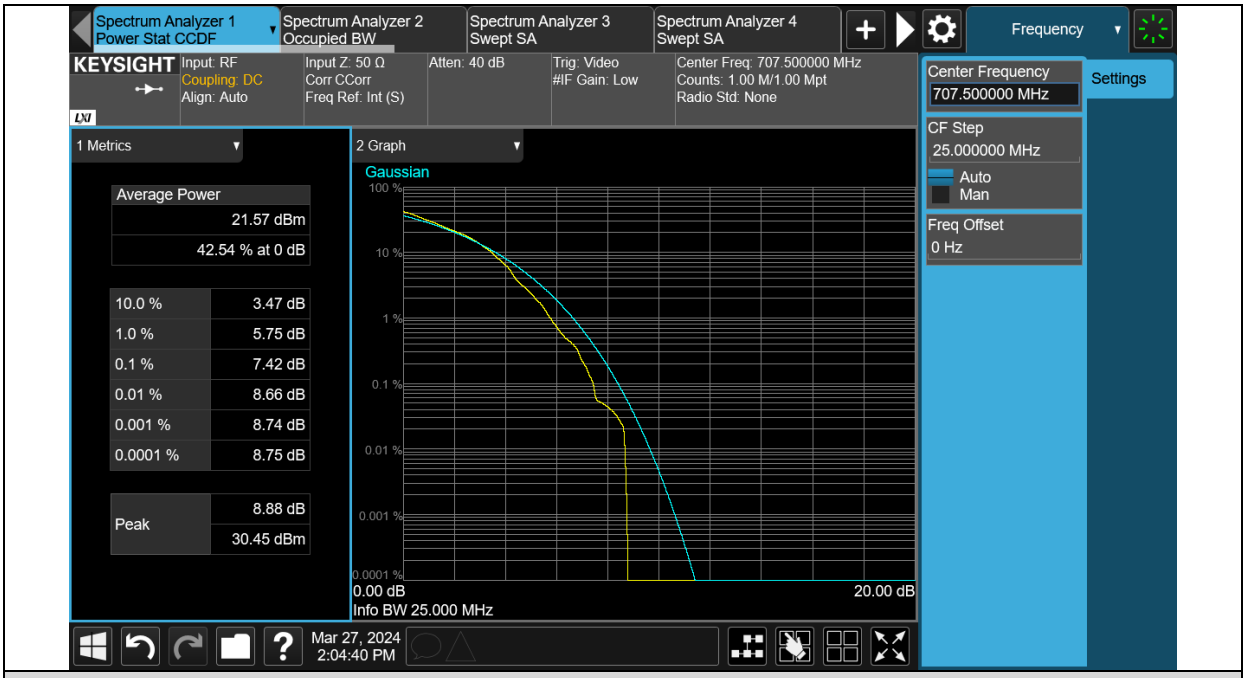
Band12-3MHz-QPSK-23165



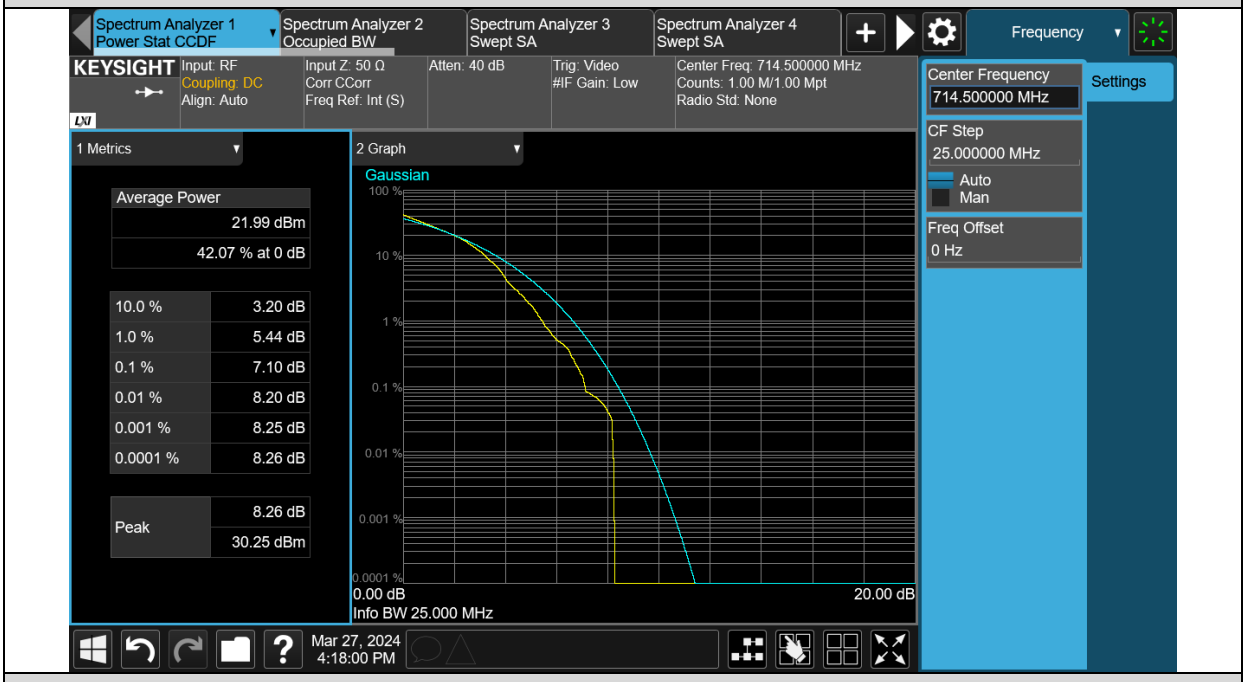
Band12-3MHz-16QAM-23025



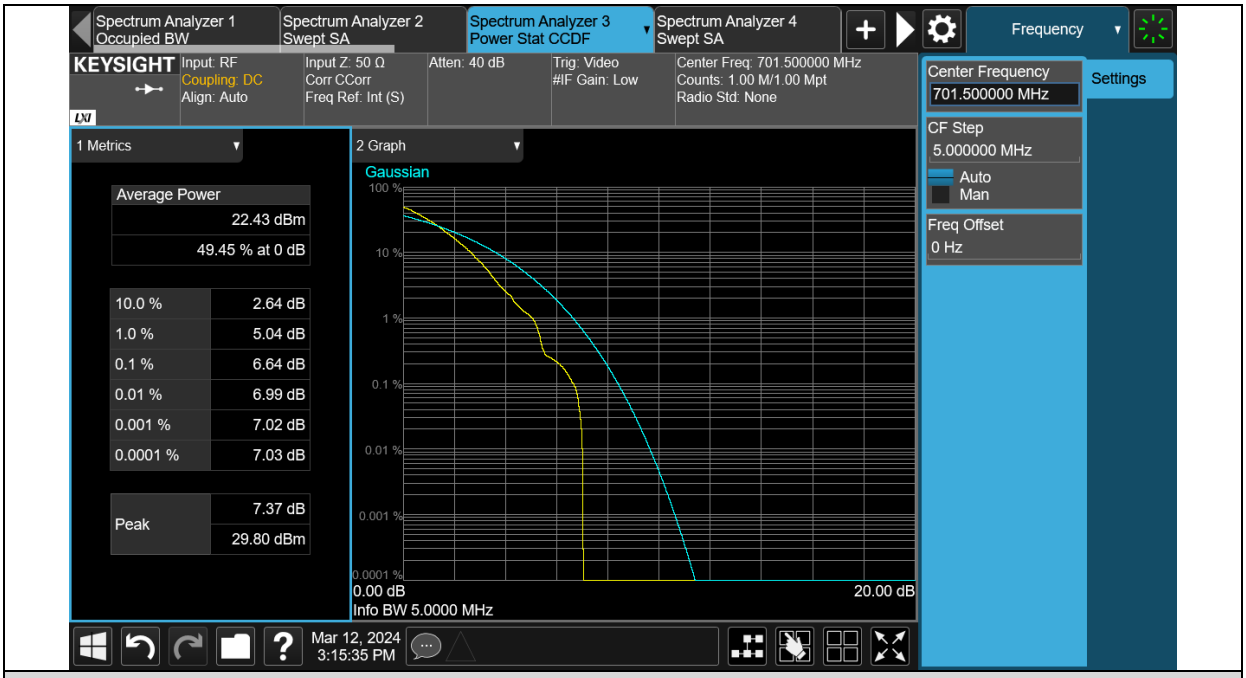
Band12-3MHz-16QAM-23095



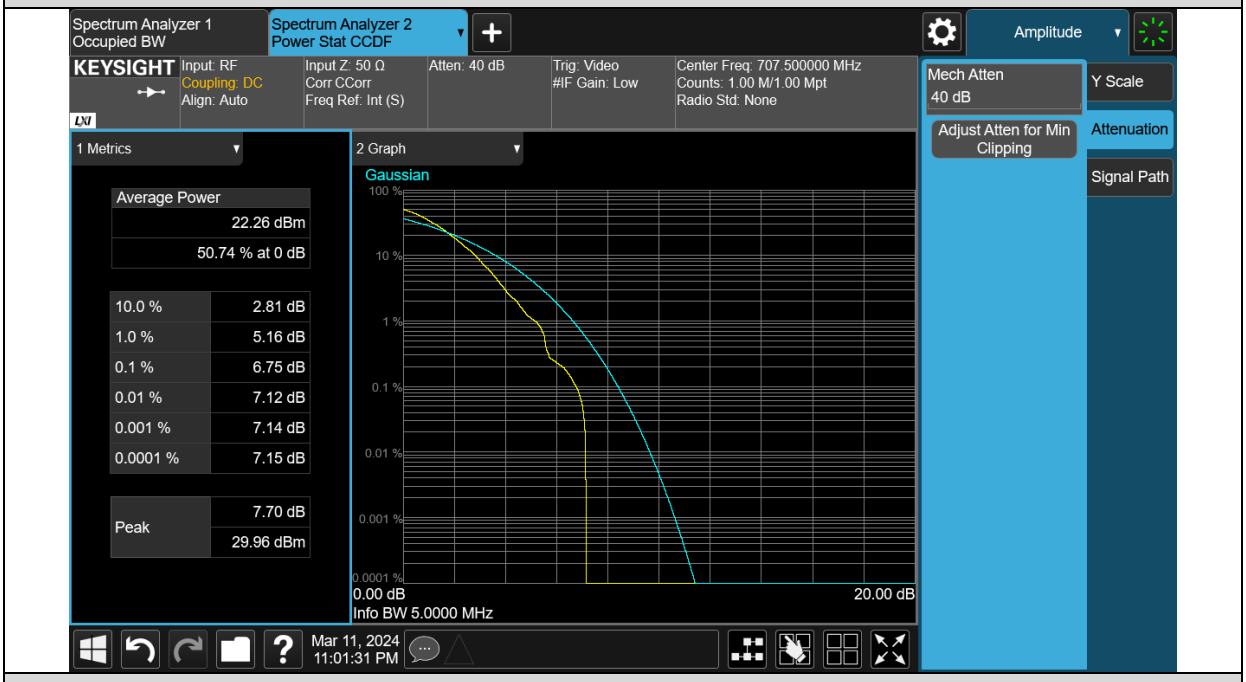
Band12-3MHz-16QAM-23165



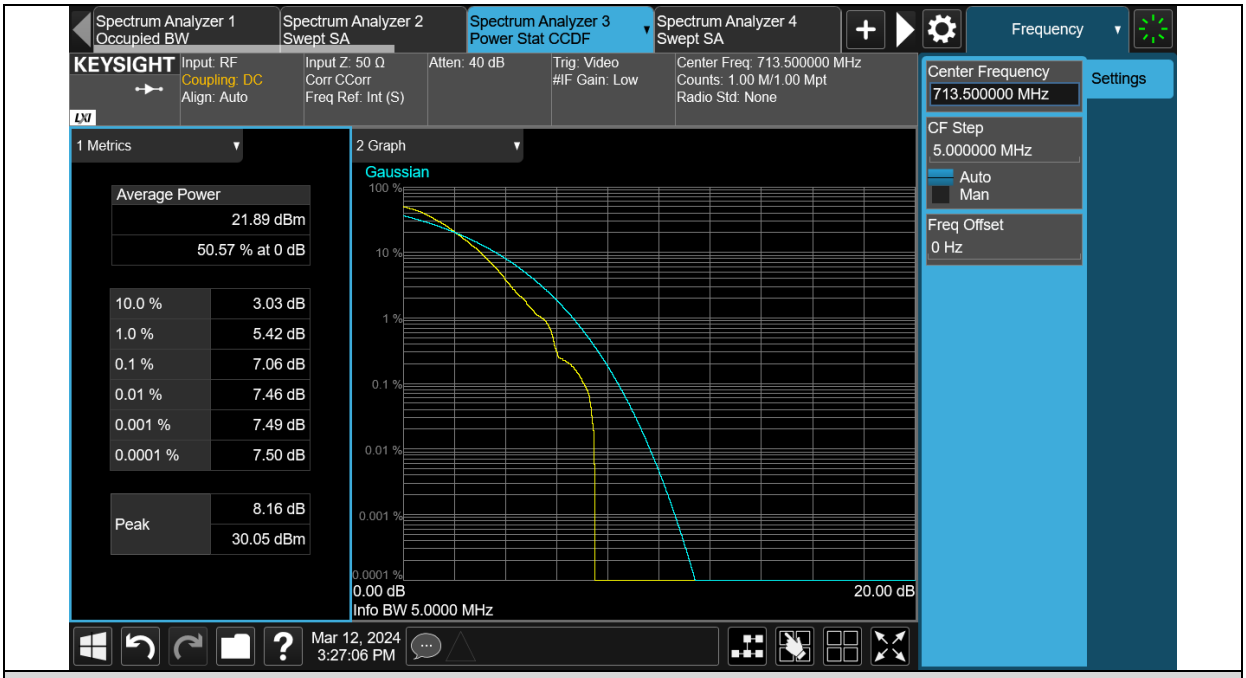
Band12-5MHz-QPSK-23035



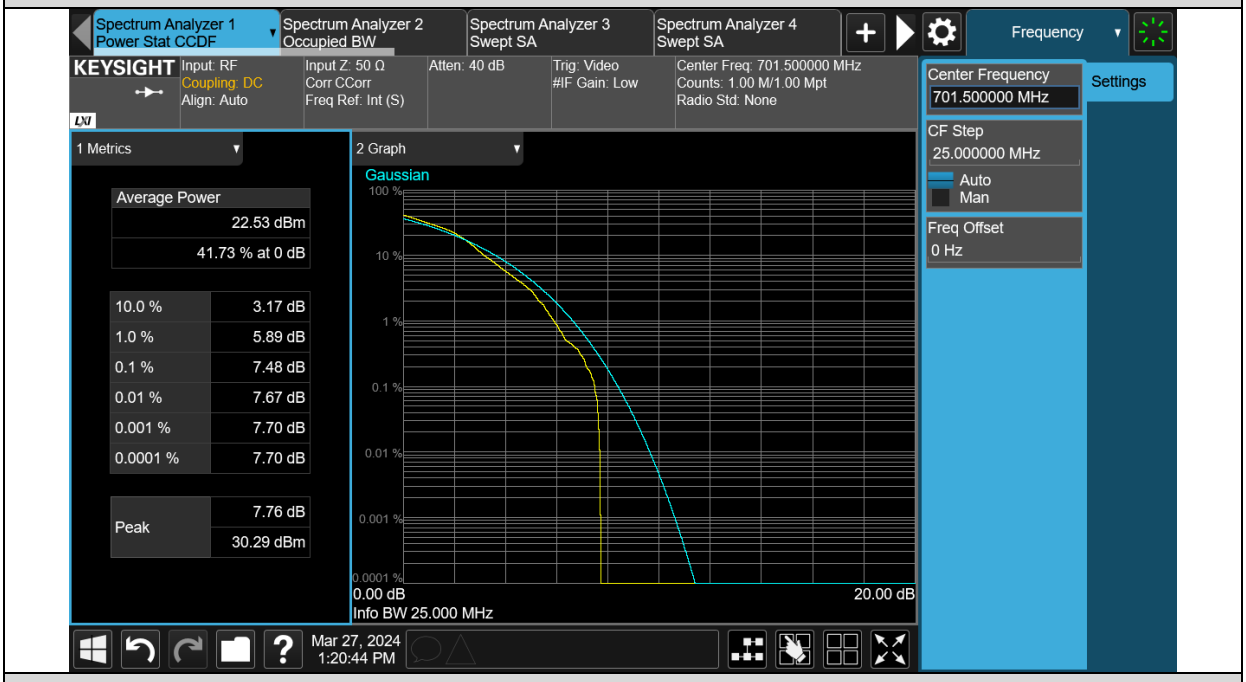
Band12-5MHz-QPSK-23095



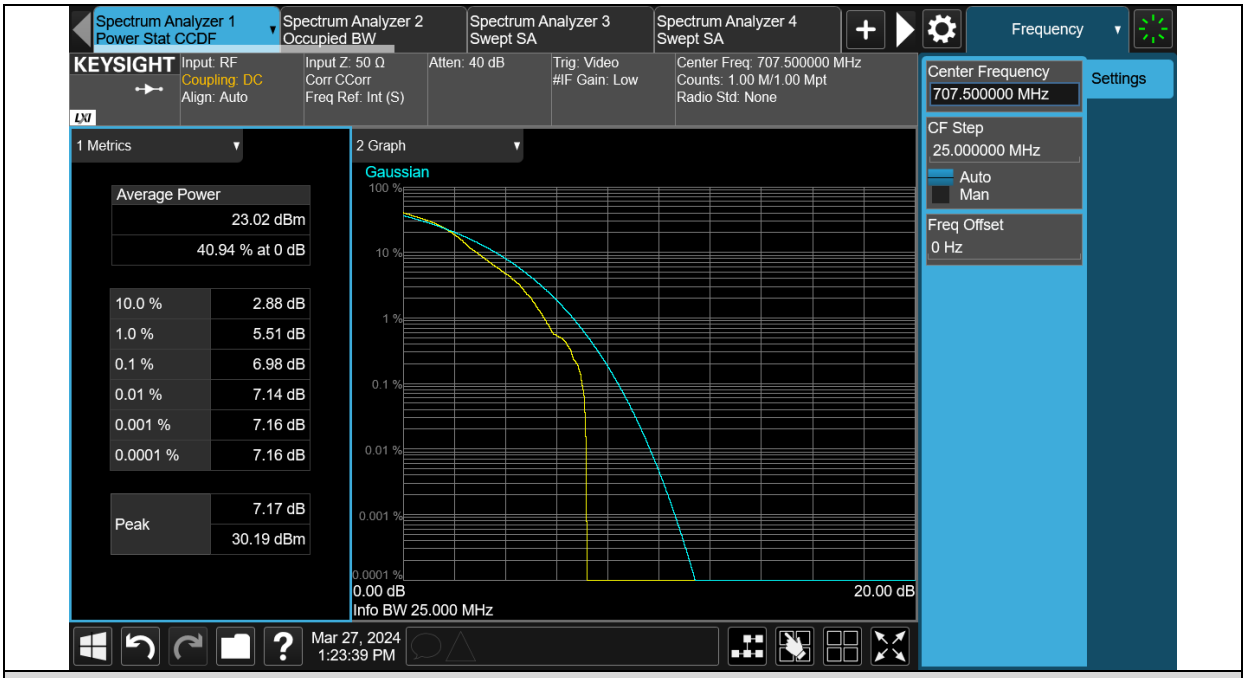
Band12-5MHz-QPSK-23155



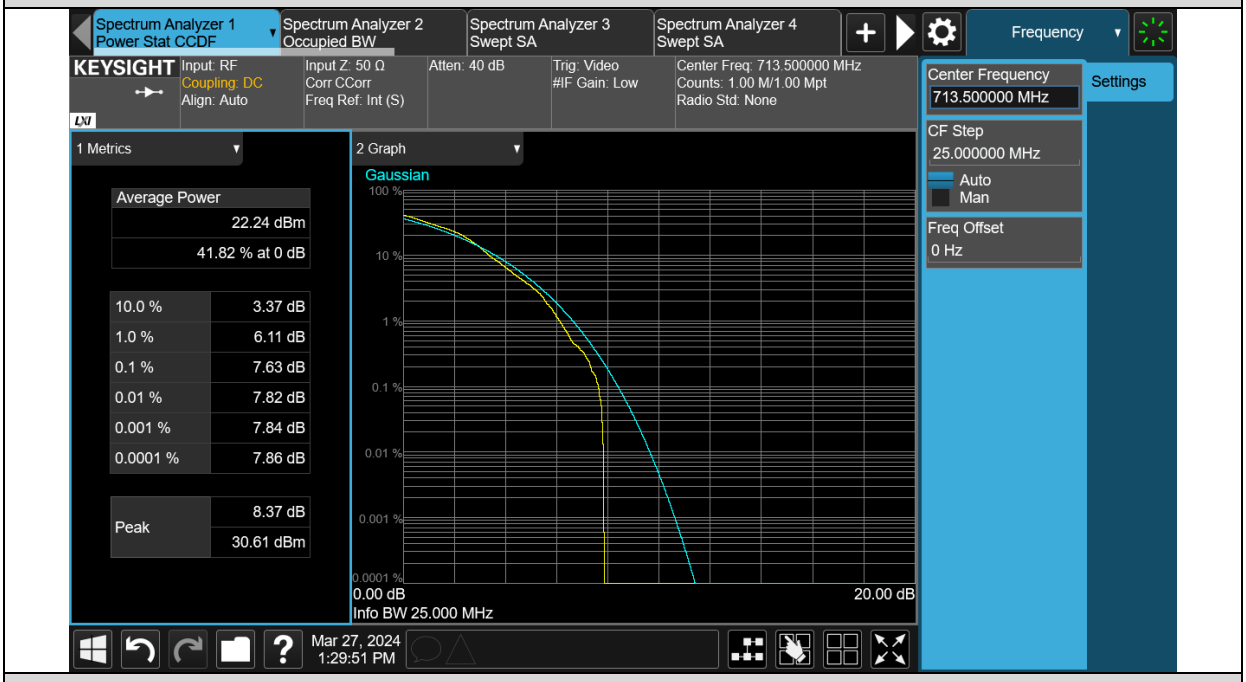
Band12-5MHz-16QAM-23035



Band12-5MHz-16QAM-23095

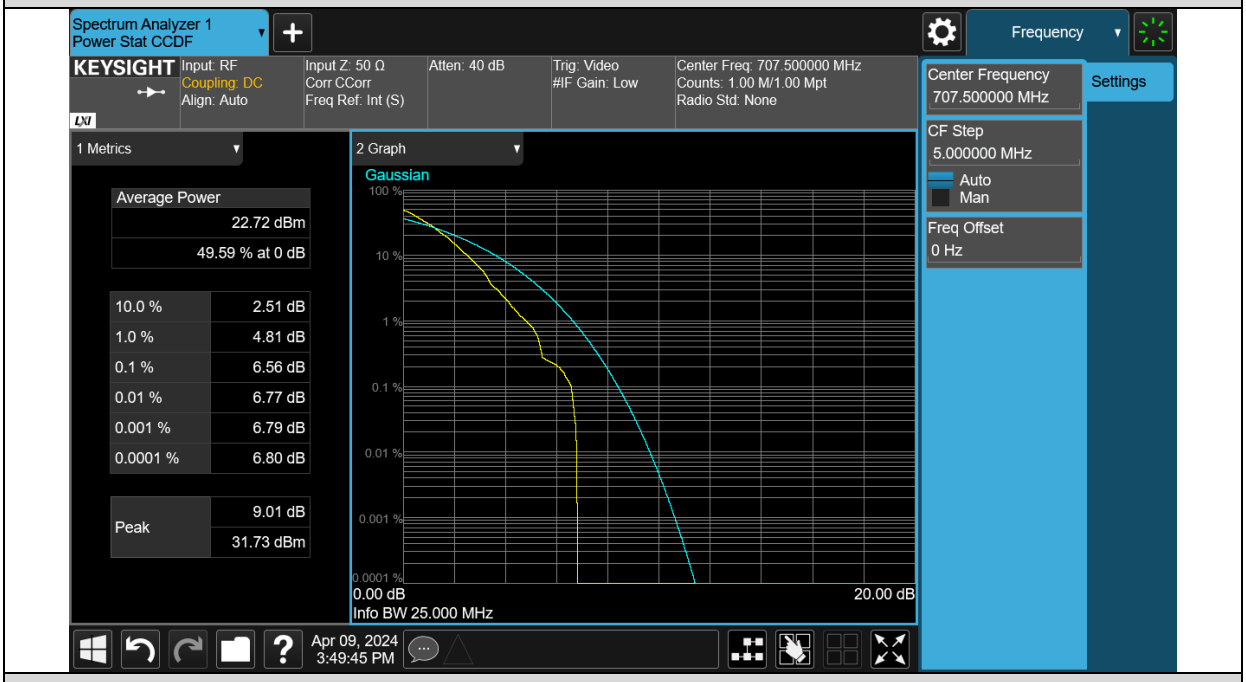


Band12-5MHz-16QAM-23155



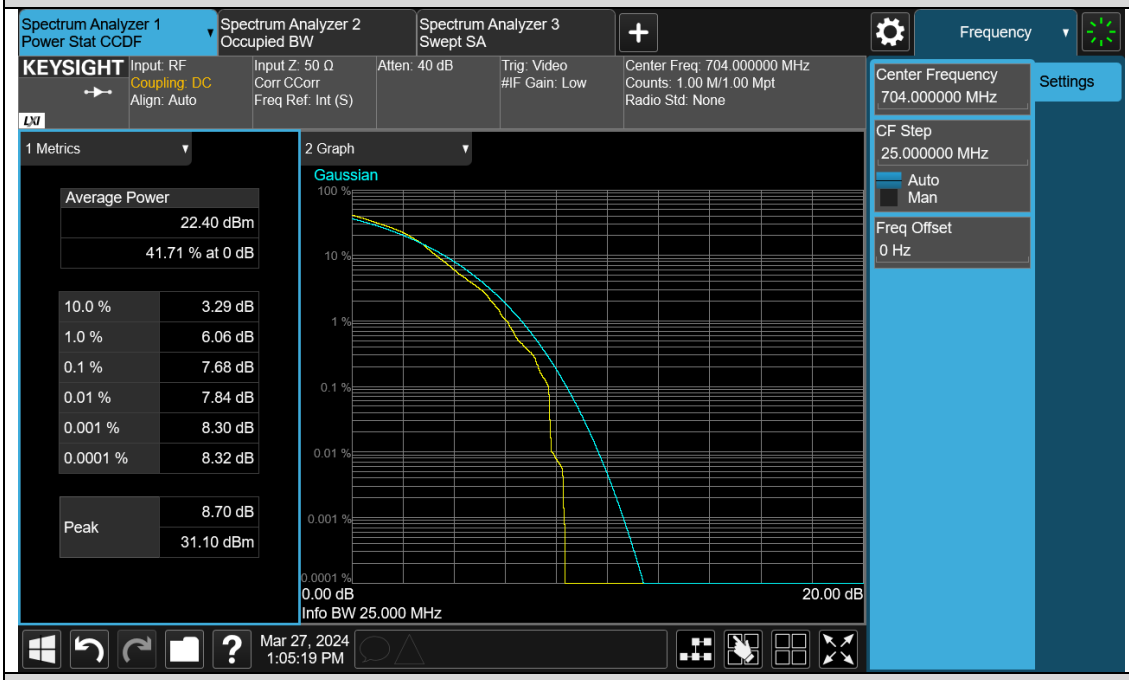
Band12-10MHz-QPSK-23060

Band12-10MHz-QPSK-23095

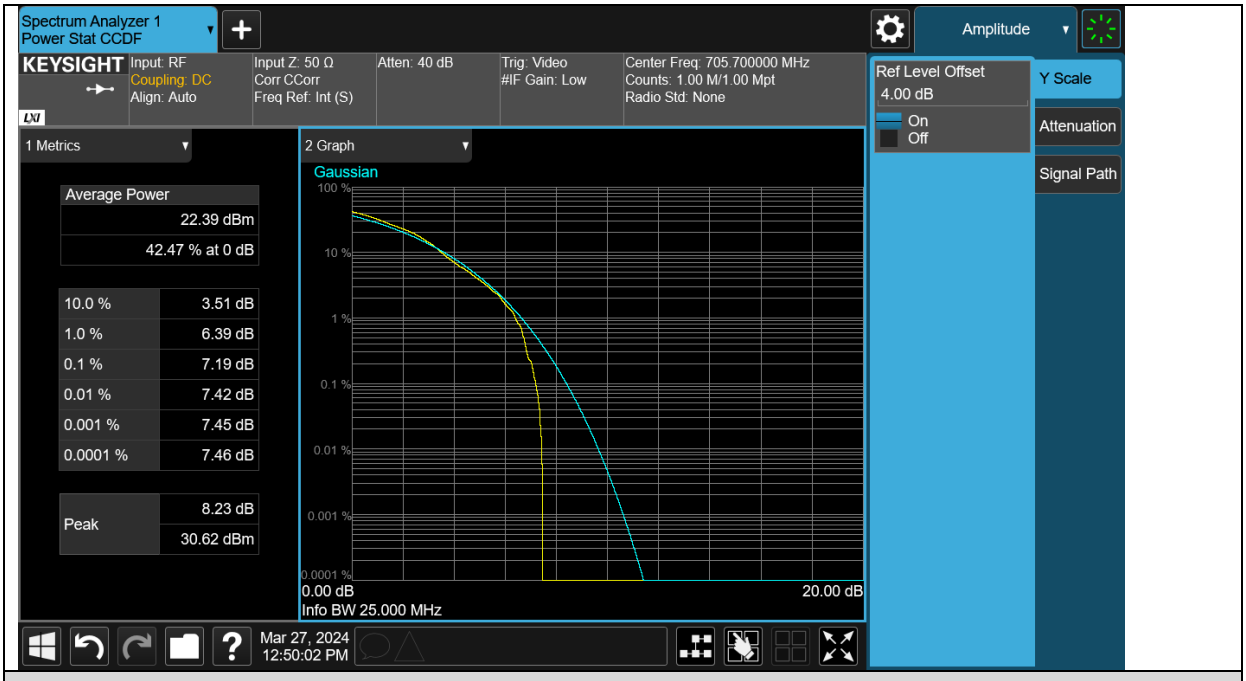


Band12-10MHz-QPSK-23130

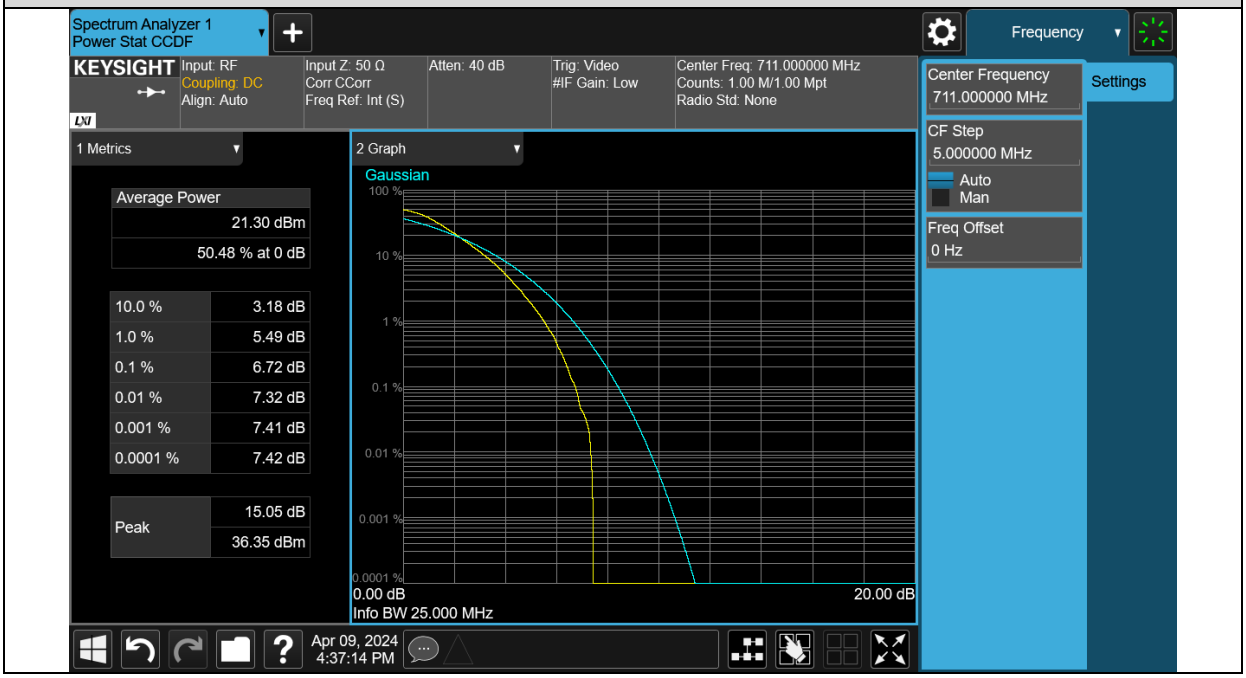
Band12-10MHz-16QAM-23060



Band12-10MHz-16QAM-23095



Band12-10MHz-16QAM-23130



26DB BANDWIDTH AND OCCUPIED BANDWIDTH

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band12	1.4MHz	QPSK	23017	6RB#0	1.0689	1.271	PASS
Band12	1.4MHz	QPSK	23095	6RB#0	1.0802	1.260	PASS
Band12	1.4MHz	QPSK	23173	6RB#0	1.0806	1.248	PASS
Band12	1.4MHz	16QAM	23017	6RB#0	1.0755	1.271	PASS
Band12	1.4MHz	16QAM	23095	6RB#0	1.0721	1.256	PASS
Band12	1.4MHz	16QAM	23173	6RB#0	1.0736	1.263	PASS
Band12	3MHz	QPSK	23025	6RB#0	1.0785	1.263	PASS
Band12	3MHz	QPSK	23095	6RB#0	1.0692	1.273	PASS
Band12	3MHz	QPSK	23165	6RB#0	1.0815	1.263	PASS
Band12	3MHz	16QAM	23025	6RB#0	1.0705	1.265	PASS
Band12	3MHz	16QAM	23095	6RB#0	1.0583	1.262	PASS
Band12	3MHz	16QAM	23165	6RB#0	1.0735	1.259	PASS
Band12	5MHz	QPSK	23035	6RB#0	1.0818	1.264	PASS
Band12	5MHz	QPSK	23095	6RB#0	1.0809	1.263	PASS
Band12	5MHz	QPSK	23155	6RB#0	1.0787	1.260	PASS
Band12	5MHz	16QAM	23035	6RB#0	1.0752	1.287	PASS
Band12	5MHz	16QAM	23095	6RB#0	1.0804	1.291	PASS
Band12	5MHz	16QAM	23155	6RB#0	1.0756	1.279	PASS
Band12	10MHz	QPSK	23060	6RB#0	1.0617	1.161	PASS
Band12	10MHz	QPSK	23095	6RB#0	1.0746	1.252	PASS
Band12	10MHz	QPSK	23130	6RB#0	1.0551	1.200	PASS
Band12	10MHz	16QAM	23060	6RB#0	1.0742	1.278	PASS
Band12	10MHz	16QAM	23095	6RB#0	1.0713	1.280	PASS
Band12	10MHz	16QAM	23130	6RB#0	1.0717	1.271	PASS