π/4 DQPSK Ch0 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1134.47	29.65	1.7	27.95	H
1210.10	30.57	2.6	27.97	H
1298.63	30.37	3.6	26.77	V
1747.79	33.79	8.3	25.49	V
2576.87	41.93	16.9	25.03	H
2762.80	41.87	17.5	24.37	H

π/4 DQPSK Ch0 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3016.4	50.71	-7.4	58.11	H
3393.3	45.49	-6.8	52.29	V
3829.3	47.34	-6.2	53.54	V
4284.7	45.02	-5.3	50.32	V
5399.7	49.09	-3.3	52.39	H
8099.5	47.44	-1.5	48.94	H

π/4 DQPSK Ch0 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3016.4	28.58	-7.4	35.98	H
3393.3	27.04	-6.8	33.84	V
3829.3	28.50	-6.2	34.7	V
4284.7	28.56	-5.3	33.86	V
5399.7	43.75	-3.3	47.05	H
8099.5	40.07	-1.5	41.57	H

π /4 DQPSK Ch78 30MHz-1GHz

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
50.67	31.35	-15.30	46.65	V
55.75	30.75	-15.90	46.65	V
62.78	29.51	-17.10	46.61	V
229.64	32.62	-14.20	46.82	H
271.71	32.25	-12.90	45.15	V
305.37	33.39	-12.40	45.79	V

π/4 DQPSK Ch78 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1137.08	51.83	1.70	50.13	H
1298.10	49.08	3.60	45.48	V
1975.19	49.26	9.80	39.46	V
2632.29	54.62	17.30	37.32	V
2790.62	55.32	17.60	37.72	V
2978.54	55.82	19.10	36.72	H

π/4 DQPSK Ch78 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1137.08	29.76	1.7	28.06	H
1298.10	30.44	3.6	26.84	V
1975.19	35.34	9.8	25.54	V
2632.29	42.29	17.3	24.99	V
2790.62	42.33	17.6	24.73	V
2978.54	43.47	19.1	24.37	H

π/4 DQPSK Ch78 3GHz-18GHz(Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3029.8	44.94	-7.40	52.34	H
3401.2	45.20	-6.70	51.90	V
3791.1	41.07	-6.20	47.27	H
4270.4	40.89	-5.30	46.19	H
5399.6	48.24	-3.30	51.54	H
8100.3	42.92	-1.50	44.42	H

π/4 DQPSK Ch78 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3029.8	27.24	-7.40	34.64	H
3401.2	27.05	-6.70	33.75	V
3791.1	27.53	-6.20	33.73	H
4270.4	28.15	-5.30	33.45	H
5399.6	42.54	-3.30	45.84	H
8100.3	31.43	-1.50	32.93	H

8DPSK Ch0 30MHz-1GHz

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
50.84	28.07	-15.3	43.37	V
55.63	29.41	-15.9	45.31	V
305.99	34.36	-12.4	46.76	V
377.67	32.56	-10.2	42.76	H
612.54	32.71	-4.2	36.91	V
829.72	35.24	-1.7	36.94	V

8DPSK Ch0 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1135.83	52.41	1.7	50.71	H
1296.34	50.19	3.5	46.69	V
1710.69	45.52	7.9	37.62	H
2621.36	53.82	17.3	36.52	H
2789.22	54.54	17.6	36.94	V
2992.84	55.14	19.3	35.84	H

8DPSK Ch0 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1135.83	29.75	1.7	28.05	H
1296.34	30.64	3.5	27.14	V
1710.69	32.98	7.9	25.08	H
2621.36	41.86	17.3	24.56	H
2789.22	42.34	17.6	24.74	V
2992.84	43.68	19.3	24.38	H

8DPSK Ch0 3GHz-18GHz(Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3050.9	49.22	-7.40	56.62	H
3405.2	43.86	-6.70	50.56	V
3798.4	44.43	-6.20	50.63	V
4267.6	45.40	-5.30	50.70	V
5399.7	48.68	-3.30	51.98	H
8100.2	47.00	-1.50	48.50	V

8DPSK Ch0 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3050.9	28.6	-7.4	36.00	H
3405.2	26.88	-6.7	33.58	V
3798.4	27.88	-6.2	34.08	V
4267.6	28.52	-5.3	33.82	V
5399.7	43.54	-3.3	46.84	H
8100.2	38.53	-1.5	40.03	V

8DPSK Ch78 30MHz-1GHz

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
50.94	32.71	-15.3	48.01	V
229.64	30.70	-14.2	44.90	H
302.02	37.88	-12.5	50.38	V
377.72	28.15	-10.2	38.35	H
612.44	32.33	-4.2	36.53	V
829.69	34.39	-1.7	36.09	H

8DPSK Ch78 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1146.05	51.69	1.8	49.89	H
1218.83	48.78	2.7	46.08	H
1298.15	49.90	3.6	46.30	V
2184.01	49.62	12.3	37.32	V
2704.60	53.58	17.3	36.28	H
2874.25	54.31	18.1	36.21	V

8DPSK Ch78 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1146.05	29.11	1.8	27.31	H
1218.83	30.24	2.7	27.54	H
1298.15	30.52	3.6	26.92	V
2184.01	37.23	12.3	24.93	V
2704.60	41.76	17.3	24.46	H
2874.25	42.25	18.1	24.15	V

8DPSK Ch78 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3063.4	50.28	-7.5	57.78	H
3415	43.67	-6.7	50.37	V
3800.7	45.02	-6.2	51.22	V
5400.4	47.53	-3.3	50.83	H
8099.9	47.05	-1.5	48.55	H
9697.6	42.52	-0.6	43.12	H

8DPSK Ch78 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3063.4	28.57	-7.5	36.07	H
3415	26.84	-6.7	33.54	V
3800.7	27.86	-6.2	34.06	V
5400.4	38.72	-3.3	42.02	H
8099.9	40.62	-1.5	42.12	H
9697.6	29.6	-0.6	30.2	H

Secondary Supply

GFSK Ch0 30MHz-1GHz (Peak）

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
42.78	29.15	-16.1	45.25	V
47.55	31.54	-15.5	47.04	V
50.89	32.08	-15.3	47.38	V
124.97	17.47	-18.3	35.77	V
165.23	18.37	-17.8	36.17	V
181.34	16.83	-16.7	33.53	V

GFSK Ch0 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1,991.54	50.49	10	40.49	H
2,577.47	53.35	17	36.35	V
2,617.78	54.62	17.3	37.32	H
2,677.78	54.48	17.3	37.18	V
2,770.56	54.32	17.5	36.82	V
2,840.08	54.09	17.8	36.29	V

GFSK Ch0 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1,991.54	35.01	10	25.01	H
2,577.47	41.78	17	24.78	V
2,617.78	41.78	17.3	24.48	H
2,677.78	41.98	17.3	24.68	V
2,770.56	41.8	17.5	24.3	V
2,840.08	42.36	17.8	24.56	V

GFSK Ch0 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3424.0	45.81	87	-41.19	H
4279.7	48.57	56	-7.43	H
5399.7	44.98	143	-98.02	H
6209.3	46.55	55	-8.45	V
8100.0	46.98	81	-34.02	H
10799.3	46.62	50	-3.38	V

GFSK Ch0 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3424.0	40.85	87	-46.15	H
4279.7	41.14	56	-14.86	H
5399.7	37.15	143	-105.85	H
6209.3	37.13	55	-17.87	V
8100.0	39.98	81	-41.02	H
10799.3	36.22	50	-13.78	V

GFSK Ch78 30MHz-1GHz (Peak）

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
47.09	31.65	-15.5	47.15	V
51.08	33.61	-15.4	49.01	V
54.94	30.33	-15.8	46.13	V
124.69	16.89	-18.3	35.19	V
168.95	18.54	-17.4	35.94	V
180.85	16.94	-16.7	33.64	V

GFSK Ch78 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1,995.30	53.08	10.1	42.98	H
2,602.50	54.42	17.3	37.12	H
2,667.85	53.62	17.3	36.32	V
2,740.56	54.65	17.4	37.25	V
2,792.21	54.16	17.6	36.56	V
2,836.12	54.29	17.8	36.49	V

GFSK Ch78 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1,995.30	35.11	10.10	25.01	H
2,602.50	41.71	17.30	24.41	H
2,667.85	41.87	17.30	24.57	V
2,740.56	42.13	17.40	24.73	V
2,792.21	42.25	17.60	24.65	V
2,836.12	42.31	17.80	24.51	V

GFSK Ch78 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3424.0	46.02	84	-37.98	H
4279.9	48.14	57	-8.86	V
5989.2	44.54	-40	84.54	H
6209.9	47.35	54	-6.65	H
8099.5	47.41	80	-32.59	H
11205.0	43.48	129	-85.52	H

GFSK Ch78 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
3424.0	40.66	84	-43.34	H
4279.9	42.1	57	-14.90	V
5989.2	29.26	-40	69.26	H
6209.9	41.81	54	-12.19	H
8099.5	39.12	80	-40.88	H
11205.0	31.24	129	-97.76	H

GFSK Ch0 30MHz-1GHz (Peak）

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
31.92	31.89	-14.3	46.19	V
40.69	27.16	-12.8	39.96	V
48.48	30.55	-12	42.55	V
59.39	30.31	-12.3	42.61	V
124.99	25.83	-15.6	41.43	H
149.23	20.28	-17.1	37.38	V

GFSK Ch0 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1197.72	44.87	2.8	42.07	H
1374.81	42.19	4.1	38.09	H
1574.78	43.75	6.6	37.15	V
1714.22	44.62	7.8	36.82	H
1994.54	55.08	9.2	45.88	H
2159.49	49.74	12.1	37.64	V

GFSK Ch0 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1197.72	27.94	2.8	25.14	H
1374.81	30.6	4.1	26.5	H
1574.78	31.54	6.6	24.94	V
1714.22	32.81	7.8	25.01	H
1994.54	34.35	9.2	25.15	H
2159.49	36.79	12.1	24.69	V

GFSK Ch0 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
4803.9	43.73	-4.9	48.63	H
4998.6	44.45	-3.7	48.15	H
5399.9	49.55	-3.3	52.85	V
7222.1	41.89	-2.1	43.99	V
8099.7	48.51	-1.5	50.01	V
13132	44.89	3.7	41.19	V
14316.3	46.62	5.4	41.22	H

GFSK Ch0 3GHz-18GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
4803.9	34.3	-4.9	39.2	H
4998.6	23.77	-3.7	27.47	H
5399.9	45.34	-3.3	48.64	V
7222.1	29.12	-2.1	31.22	V
8099.7	42.51	-1.5	44.01	V
13132	31.96	3.7	28.26	V
14316.3	33.1	5.4	27.7	H

GFSK Ch78 30MHz-1GHz (Peak）

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
32.02	31.85	-14.3	46.15	V
48.15	30.60	-12.1	42.70	V
59.50	31.35	-12.3	43.65	V
125.01	27.15	-15.6	42.75	V
152.21	22.57	-16.9	39.47	H
624.99	30.37	-3.1	33.47	V

GFSK Ch78 1GHz-3GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1195.48	44.92	2.7	42.22	H
1375.09	43.63	4.1	39.53	V
1711.77	48.19	7.8	40.39	H
1907.29	46.71	9.2	37.51	H
1995.06	51.65	9.2	42.45	H
2192.86	49.35	12.4	36.95	H

GFSK Ch78 1GHz-3GHz (Average)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
1195.48	27.89	2.7	25.19	H
1375.09	33.48	4.1	29.38	V
1711.77	32.92	7.8	25.12	H
1907.29	33.84	9.2	24.64	H
1995.06	34.30	9.2	25.1	H
2192.86	37.36	12.4	24.96	H

GFSK Ch78 3GHz-18GHz (Peak)

Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
5400.0	50.23	190	-139.77	V
7570.2	41.10	314	-272.90	V
8099.9	48.77	185	-136.23	V
9183.4	42.18	175	-132.82	V
11620.8	44.11	-27	71.11	V
14143.3	45.13	1	44.13	H

GFSK Ch78 3GHz-18GHz (Average)

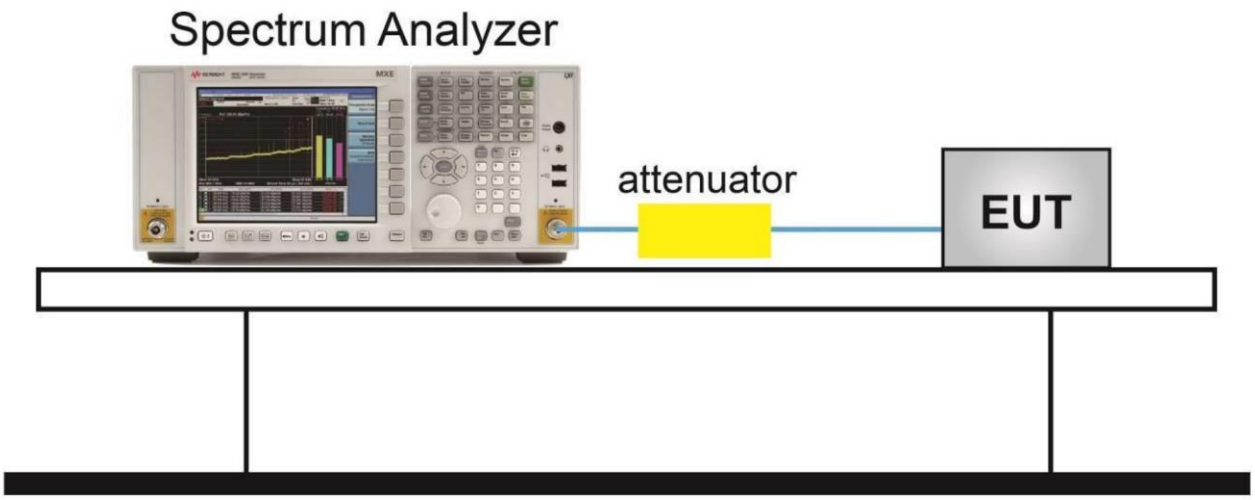
Frequency (MHz)	Result(dBuV/m)	ARpl(dB)	PMea(dBuV/m)	Polarity
5400.0	46.52	190	-143.48	V
7570.2	29.11	314	-284.89	V
8099.9	42.42	185	-142.58	V
9183.4	30.35	175	-144.65	V
11620.8	31.66	-27	58.66	V
14143.3	32.76	1	31.76	H

6.5. Time Of Occupancy (Dwell Time)

6.5.1. Measurement Limit

Standard	Limit (ms)
FCC 47 Part 15.247 (a) (1) (iii)	< 400
RSS-247 5.5	< 400

6.5.2. Test Setup



6.5.3. Test procedures

The measurement is according to ANSI C63.10 clause 7.8.4

1. Connect the EUT through cable and divide with CBT32 and spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 8.
4. Span: Zero span, centered on a hopping channel.
5. RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
6. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to showtwo successive hops on a channel.
7. Detector function: Peak.
8. Trace: Max hold.
9. Use the marker-delta function, and record it.

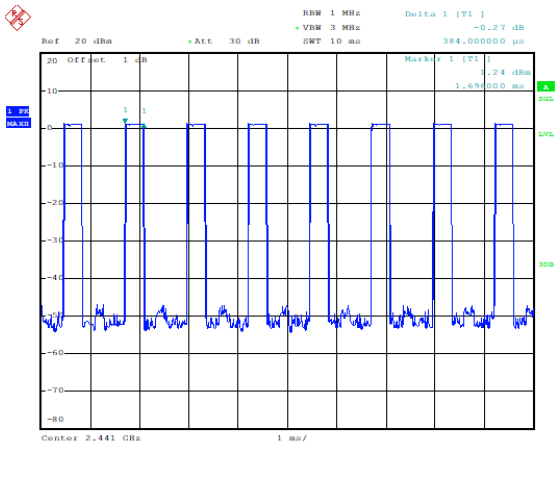
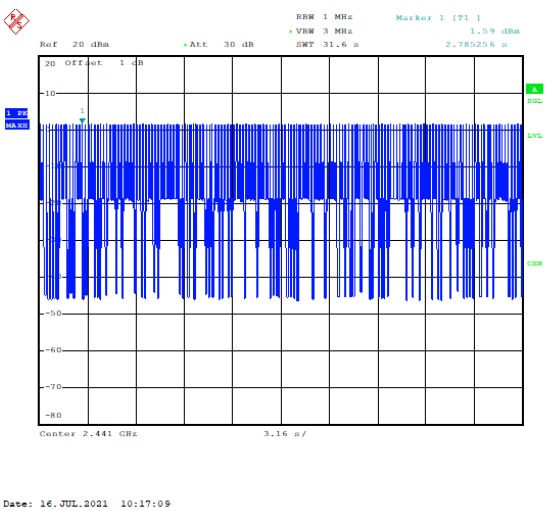
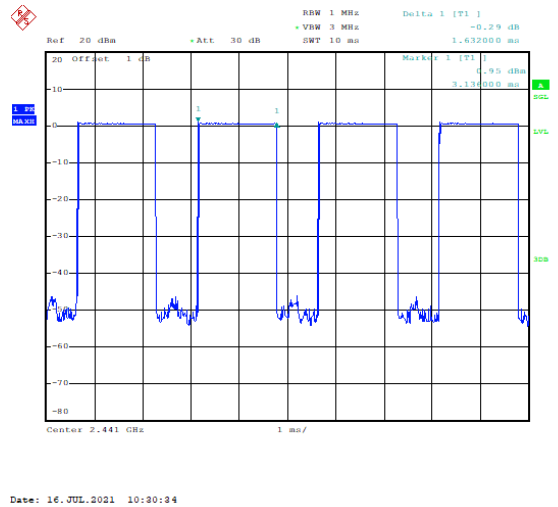
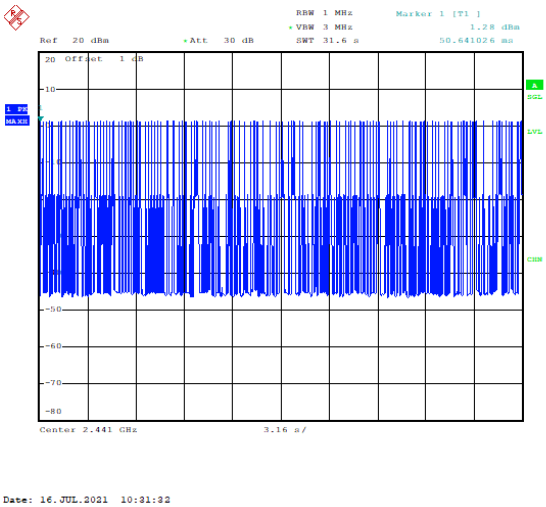
Note： For AFH mode, Test Period = 0.4 (second/ channel) x 20 Channel = 8 sec,

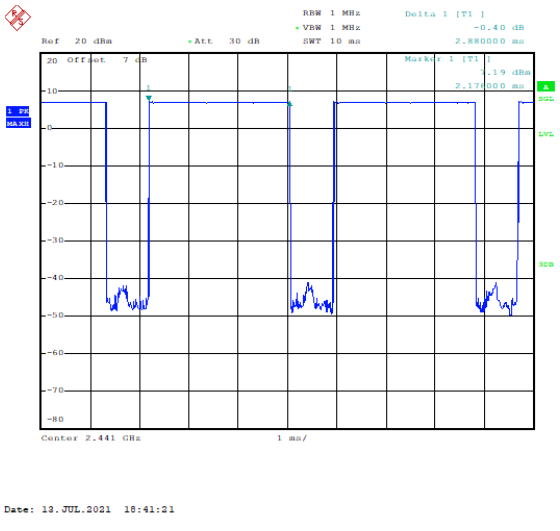
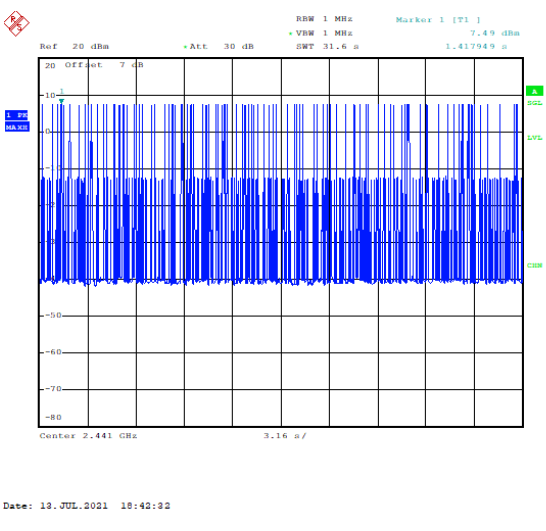
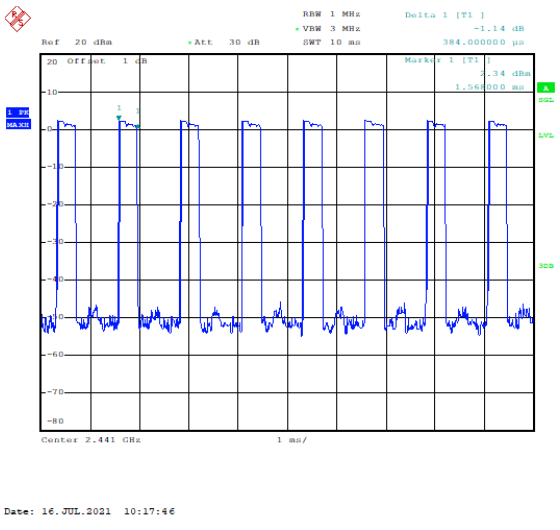
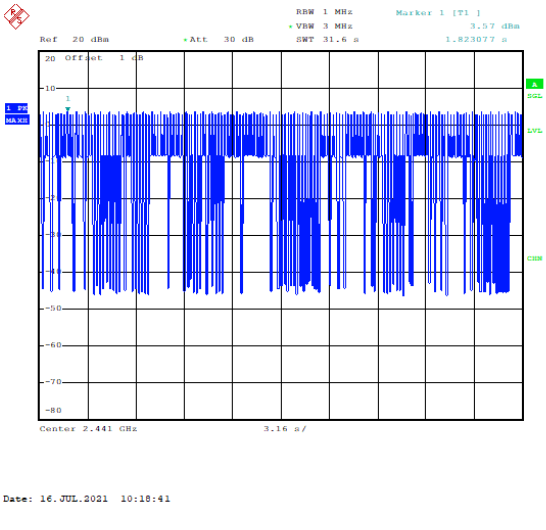
For FHSS mode, Test Period = 0.4 (second/ channel) x 79 Channel = 31.6 sec,
So the Time of Occupancy (Dwell Time) of AFH mode= Time of Occupancy (Dwell Time) of FHSS mode / 79 Channel x 20 Channel

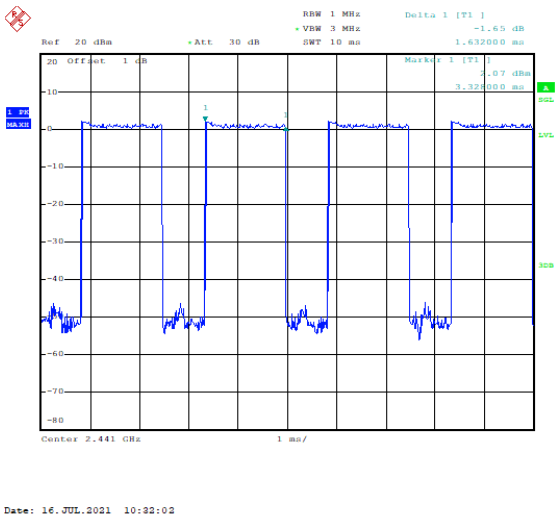
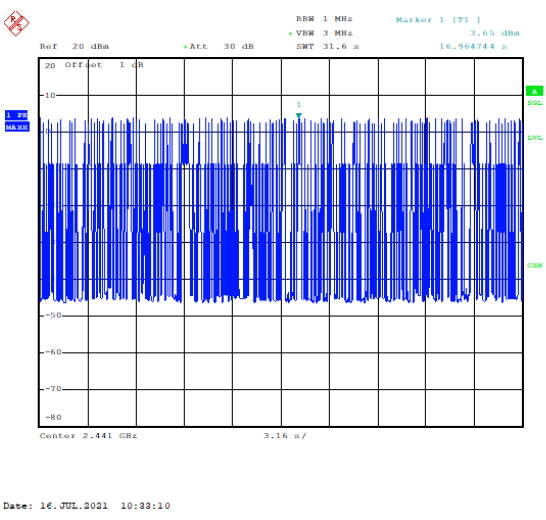
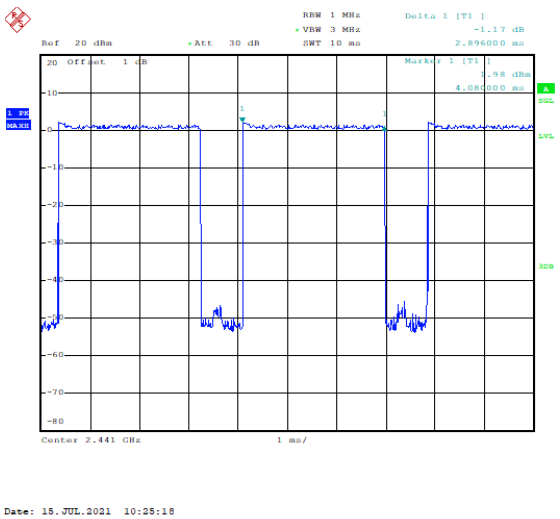
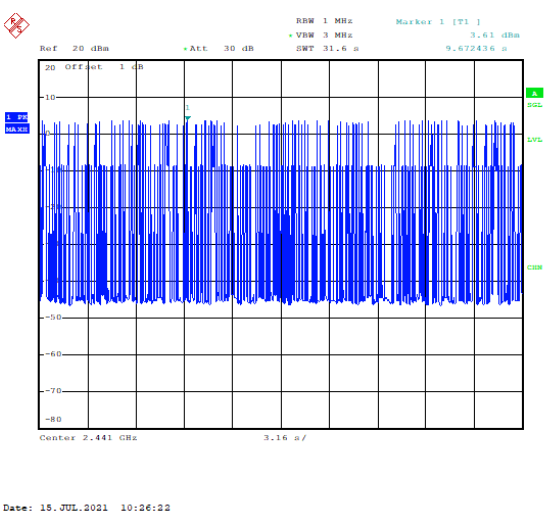
Modulation type	Frequency (MHz)	Time slot length (ms)	Hop rate(s)	Dwell Time (ms)	Limit (ms)	Conclusion
GFSK DH5	2402-2480	2.88	91	262.08	400	P
π/4 DQPSK 2DH5	2402-2480	2.90	93	269.33	400	P
8DPSK 3DH5	2402-2480	2.90	88	254.85	400	P

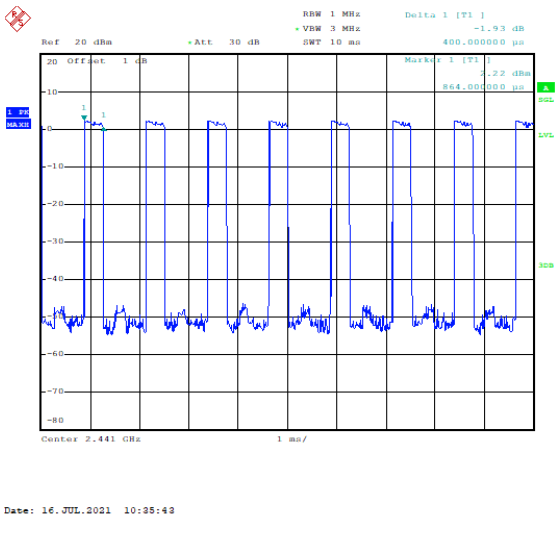
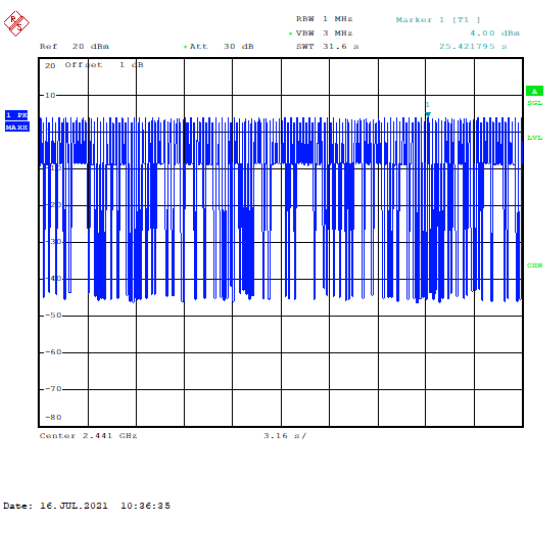
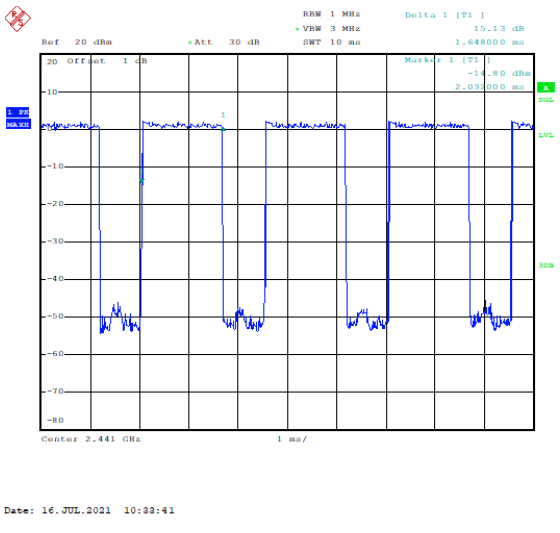
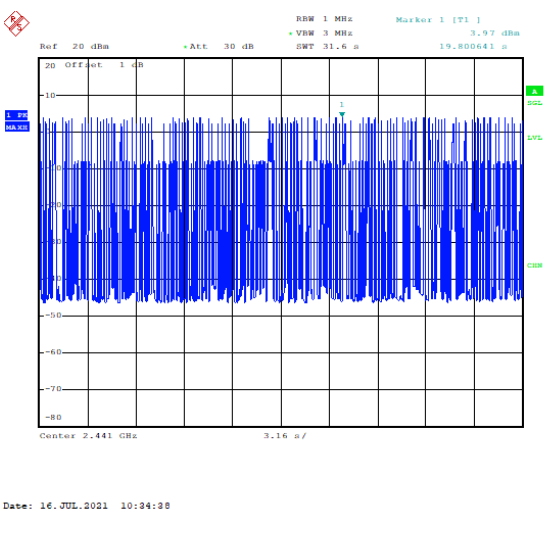
Note: Dwell time = time slot length * hop rate

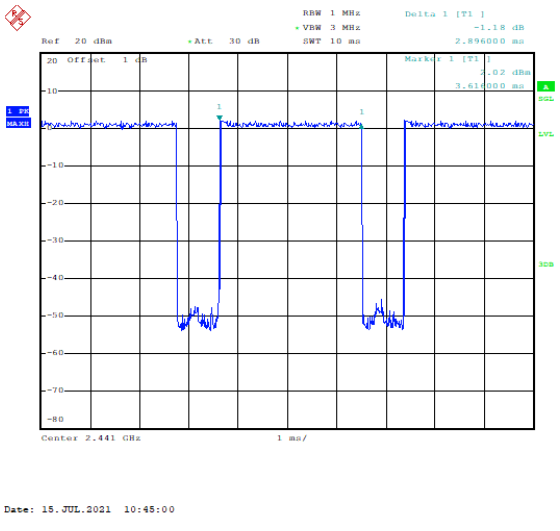
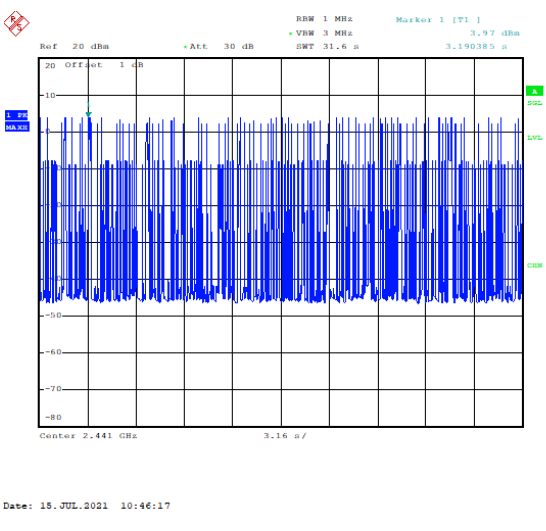
Measurement Result

For GFSK, Ch39,Packet DH1 Time of occupancy (Dwell Time):0.38ms	For GFSK, Ch39,Packet DH1 Number of Transmissions Measurement
	
For GFSK, Ch39,Packet DH3 Time of occupancy (Dwell Time):1.63ms	For GFSK, Ch39,Packet DH3 Number of Transmissions Measurement
	

For GFSK, Ch39,Packet DH5 Time of occupancy (Dwell Time): 2.88ms	For GFSK, Ch39,Packet DH5 Number of Transmissions Measurement
 	
For π/4 DQPSK, Ch39,Packet 2DH1 Time of occupancy (Dwell Time):0.38ms	For π/4 DQPSK, Ch39,Packet 2DH1 Number of Transmissions Measurement
 	

For π/4 DQPSK, Ch39,Packet 2DH3 Time of occupancy (Dwell Time):1.63 ms	For π/4 DQPSK, Ch39,Packet 2DH3 Number of Transmissions Measurement
	
For π/4 DQPSK, Ch39,Packet 2DH5 Time of occupancy (Dwell Time):2.9 ms	For π/4 DQPSK, Ch39,Packet 2DH5 Number of Transmissions Measurement
	

For 8DPSK, Ch39,Packet 3DH1 Time of occupancy (Dwell Time):0.40ms	For 8DPSK, Ch39,Packet 3DH1 Number of Transmissions Measurement
	
For 8DPSK, Ch39,Packet 3DH3 Time of occupancy (Dwell Time):1.65ms	For 8DPSK, Ch39,Packet 3DH3 Number of Transmissions Measurement
	

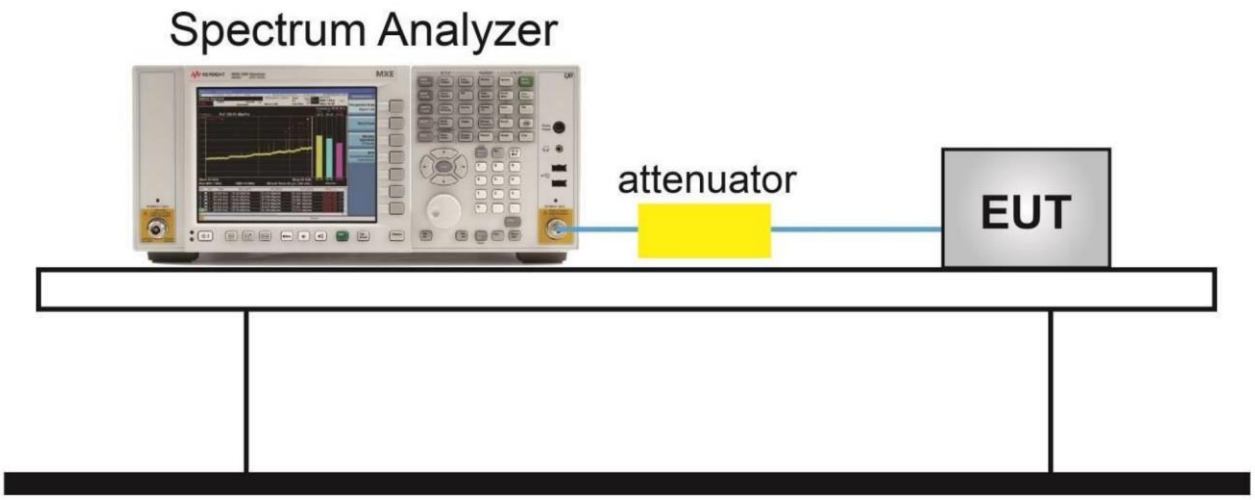
For 8DPSK, Ch39,Packet 3DH5 Time of occupancy (Dwell Time):2.90ms	For 8DPSK, Ch39,Packet 3DH5 Number of Transmissions Measurement
	

6.6. 20dB Bandwidth

6.6.1. Measurement Limit

Standard	Limit
FCC 47 Part 15.247 (a) (1)	N/A
RSS-247 5.1(b)	N/A

6.6.2. Test Setup



6.6.3. Test procedures

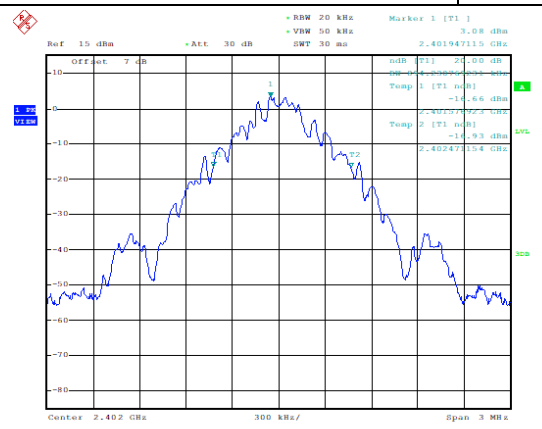
The measurement is according to ANSI C63.10 clause 7.8.7

1. Connect the EUT through cable and divide with CBT32 and spectrum analyzer.
2. Enable the EUT transmit maximum power.
3. Set the spectrum analyzer as step 4 to step 7.
4. Span: two or five times of OBW
5. RBW= 1% to 5% of the OBW; VBW is approximately three times of RBW; Max Hold.
6. Select the max peak, and N DB DOWN=20dB.
7. Record the results.

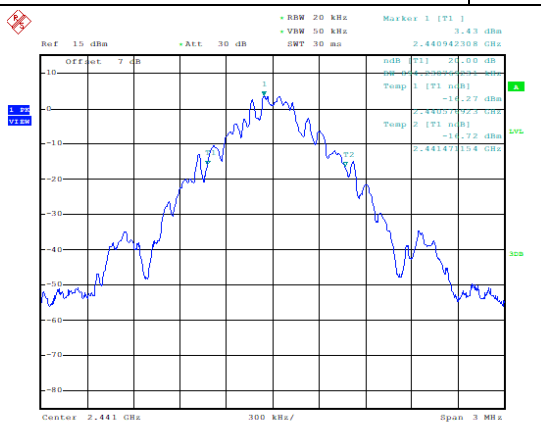
Measurement Result

Note: Bold font is the maximum Value

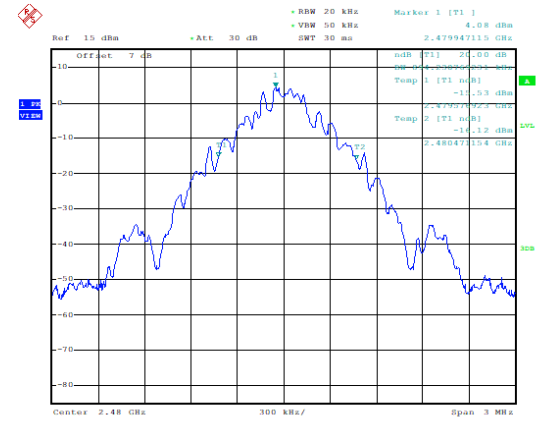
20dB Bandwidth: GFSK, Ch0(MHz)	**0.894**



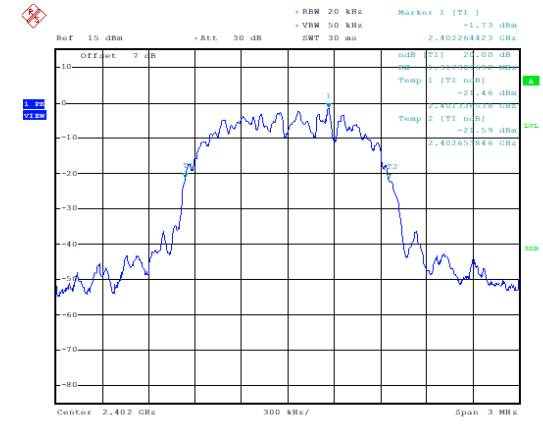
20dB Bandwidth: GFSK, Ch39(MHz)	0.894



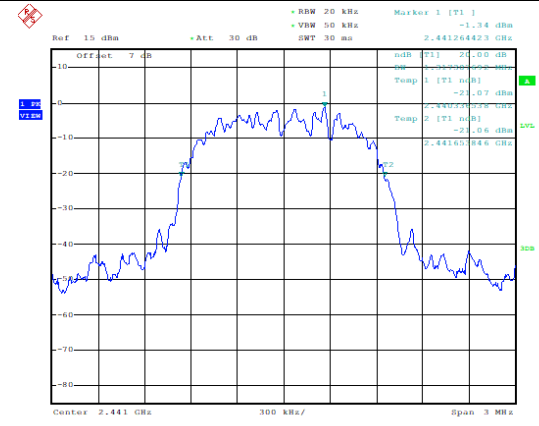
20dB Bandwidth: GFSK, Ch78(MHz)	0.894



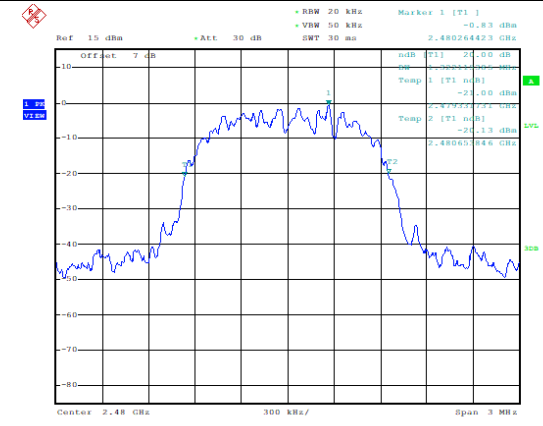
20dB Bandwidth: π/4 DQPSK, Ch0(MHz)	1.317

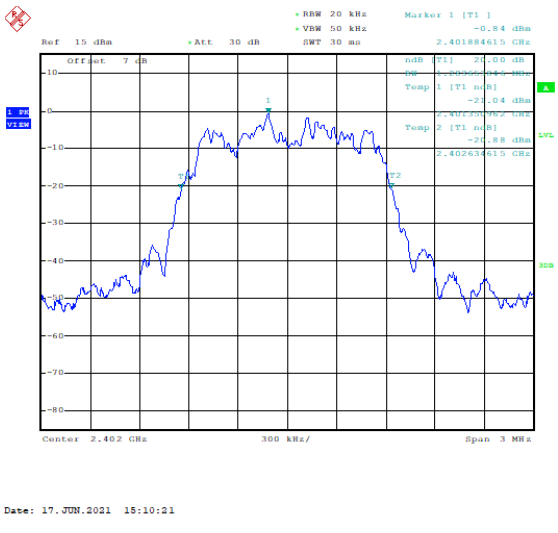
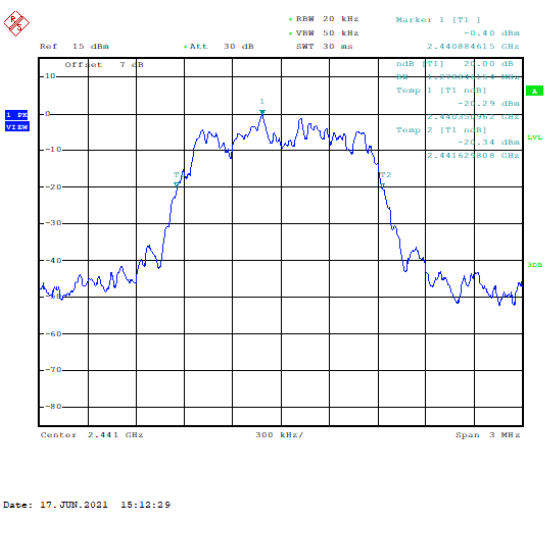
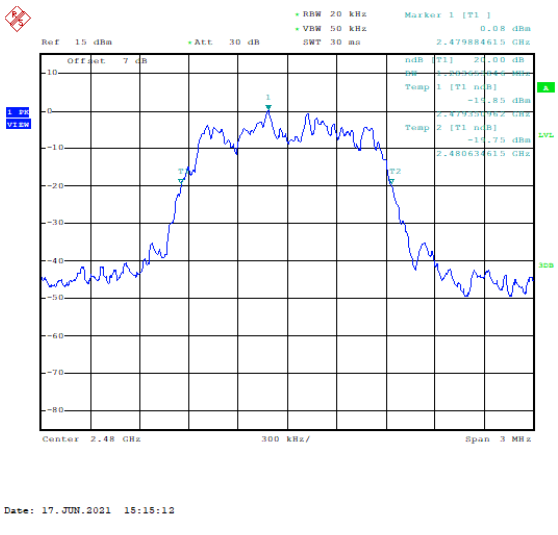


20dB Bandwidth: π/4 DQPSK, Ch39(MHz)	1.317



20dB Bandwidth: π/4 DQPSK, Ch78(MHz)	**1.322**



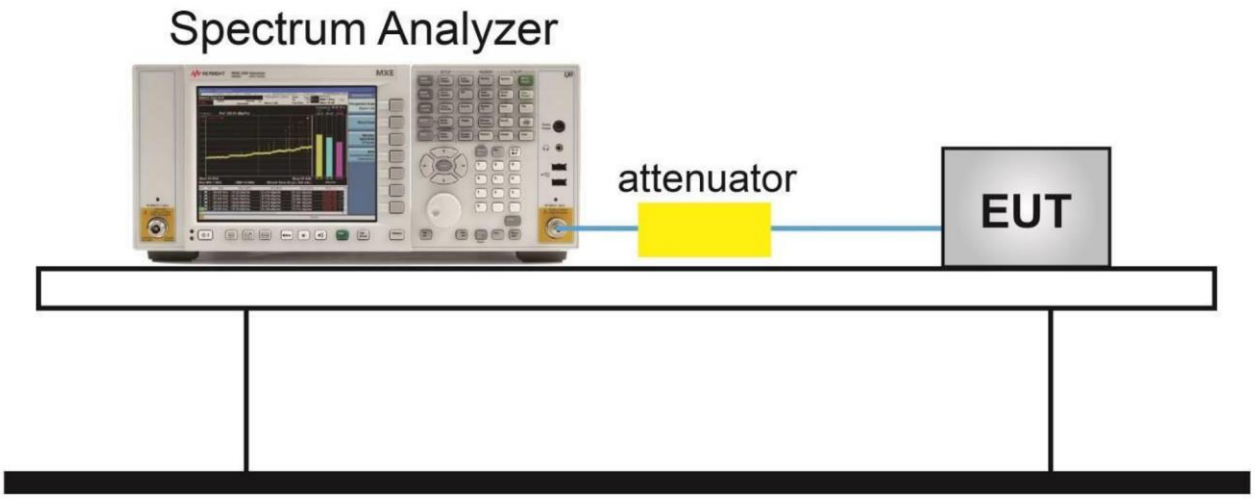
20dB Bandwidth: 8DPSK, Ch0(MHz)	**1.284**	20dB Bandwidth: 8DPSK, Ch39(MHz)	1.279
			
20dB Bandwidth: 8DPSK, Ch78(MHz)	1.284	/	
		/	

6.7. 99% Occupied Bandwidth

6.7.1. Measurement Limit

Standard	Limit
RSS-Gen 6.7	N/A

6.7.2. Test Setup



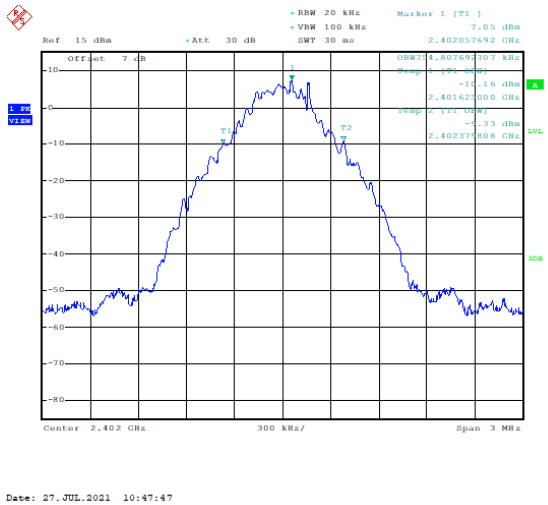
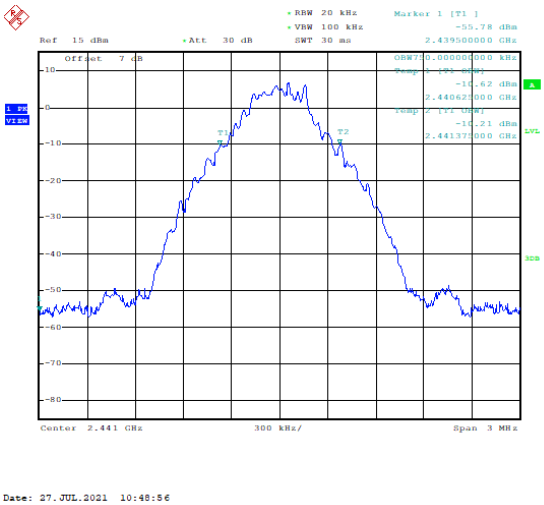
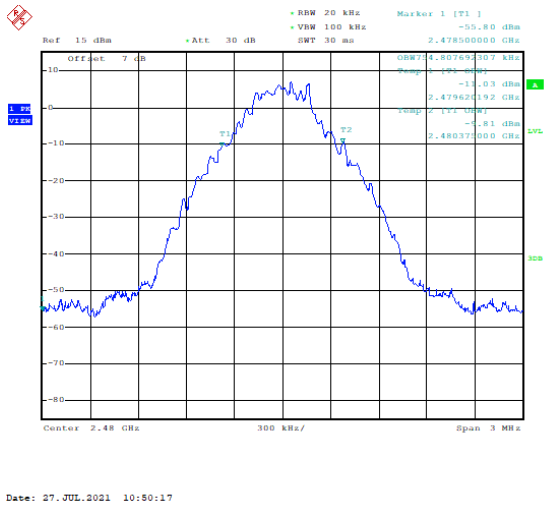
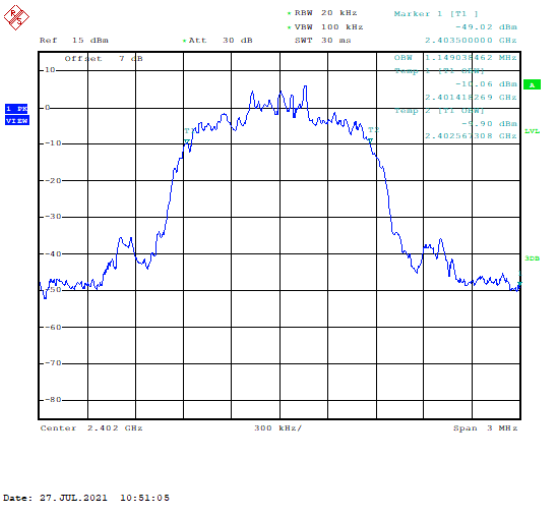
6.7.3. Test procedures

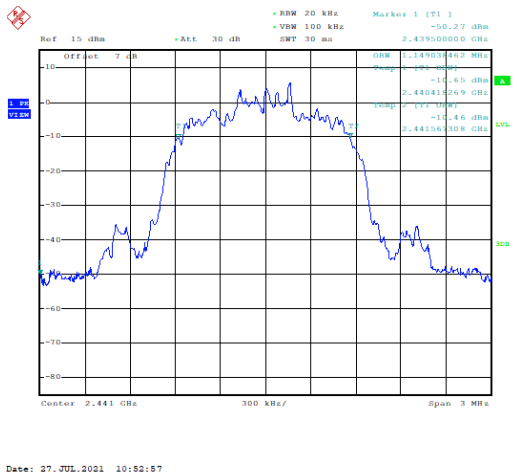
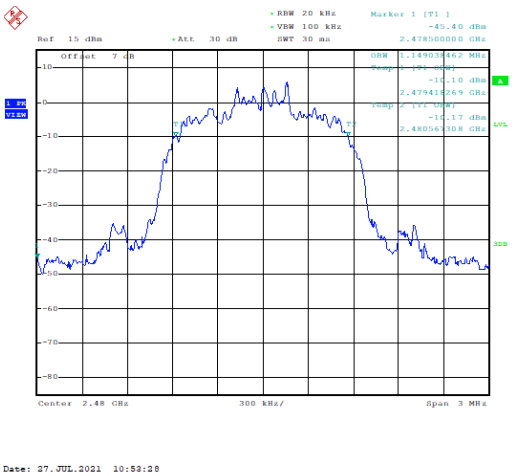
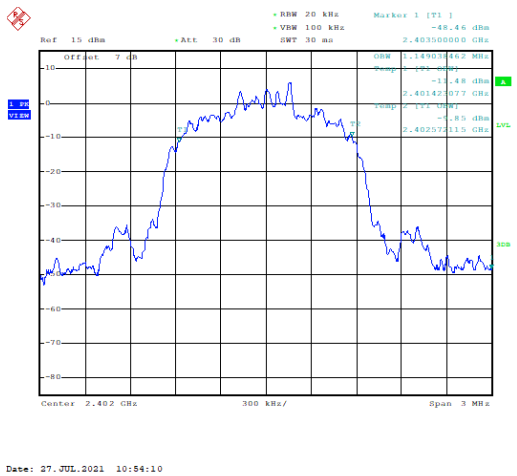
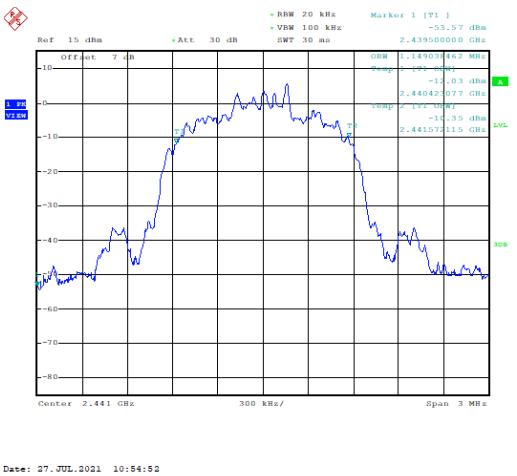
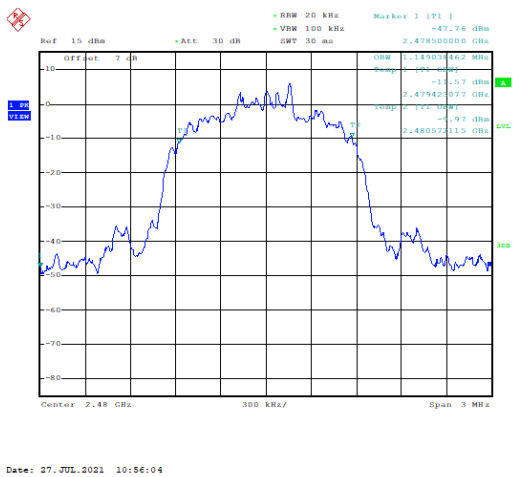
The measurement is according to ANSI C63.10 clause 6.9.3.

1. The output power of EUT was connected to the spectrum analyzer. The path loss was compensated to the results for each measurement.
2. Enable EUT transmitter maximum power continuously.
3. Set RBW shall be in the range of 1% to 5% of the OBW.
4. Set the VBW ≥ [3 × RBW].
5. Detector = peak.
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

Measurement Result

Note: Bold font is the maximum Value

99% Bandwidth: GFSK, Ch0 (KHz)	754.808	99% Bandwidth: GFSK, Ch39 (KHz)	750
			
99% Bandwidth: GFSK, Ch78 (KHz)	754.808	99% Bandwidth: DQPSK, Ch0 (KHz)	**1149.038**
			

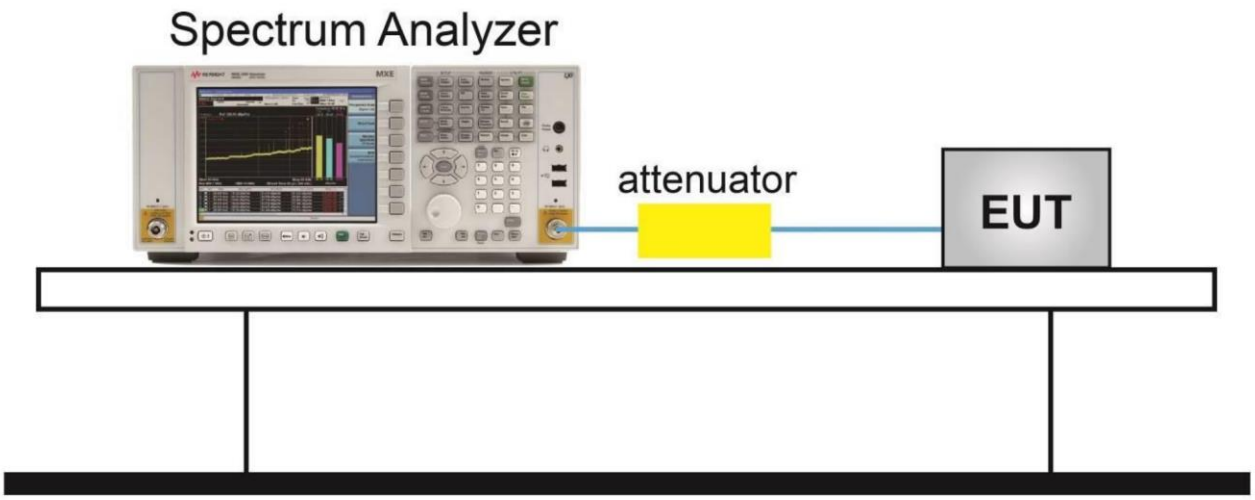
99% Bandwidth: DQPSK, Ch39(KHz)	1149.038	99% Bandwidth: DQPSK, Ch78(KHz)	1149.038
			
99% Bandwidth: 8DPSK, Ch0 (KHz)	1149.038	99% Bandwidth: 8DPSK, Ch39 (KHz)	1149.038
			
99% Bandwidth: 8DPSK, Ch78(KHz)	1149.038	/	/
		/	

6.8. Carrier Frequency Separation

6.8.1. Measurement Limit

Standard	Limit (KHz)
FCC 47 Part 15.247 (a) (1)	Over 25KHz or (2/3)*20dB bandwidth
RSS-247 5.1	Over 25KHz or (2/3)*20dB bandwidth

6.8.2 Test Setup



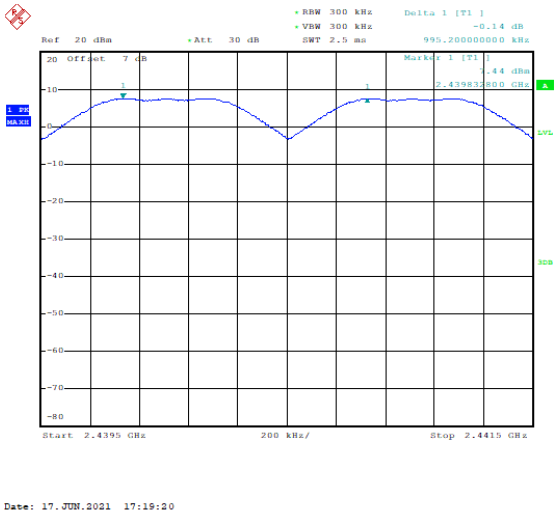
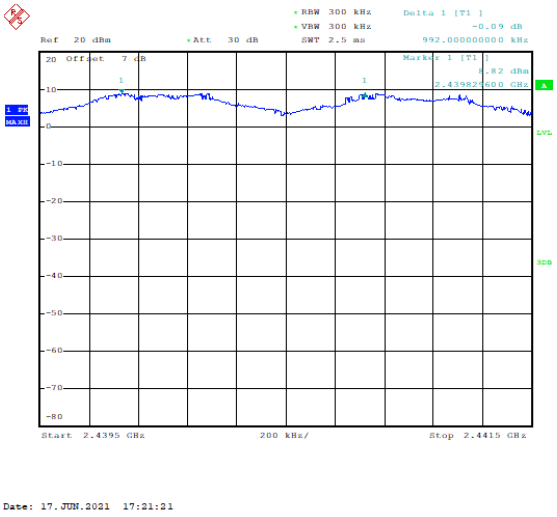
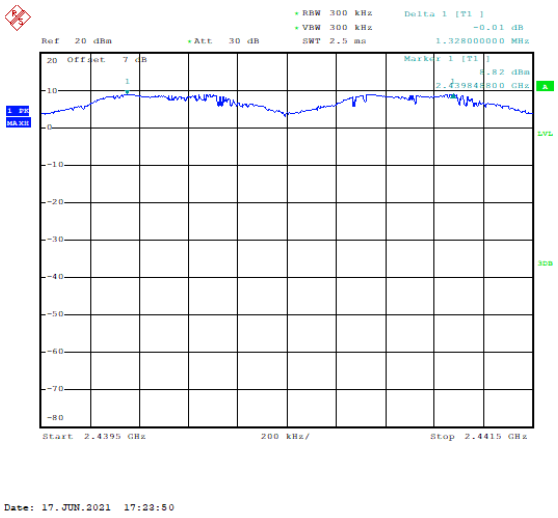
6.8.3. Test procedures

The measurement is according to ANSI C63.10 clause 7.8.2.

1. Connect the EUT through cable and divide with CBT32 and spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: Wide enough to capture the peaks of two adjacent channels.
4. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
5. Video (or average) bandwidth (VBW) ≥ RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.

Measurement Result

Note: Bold font is the maximum Value

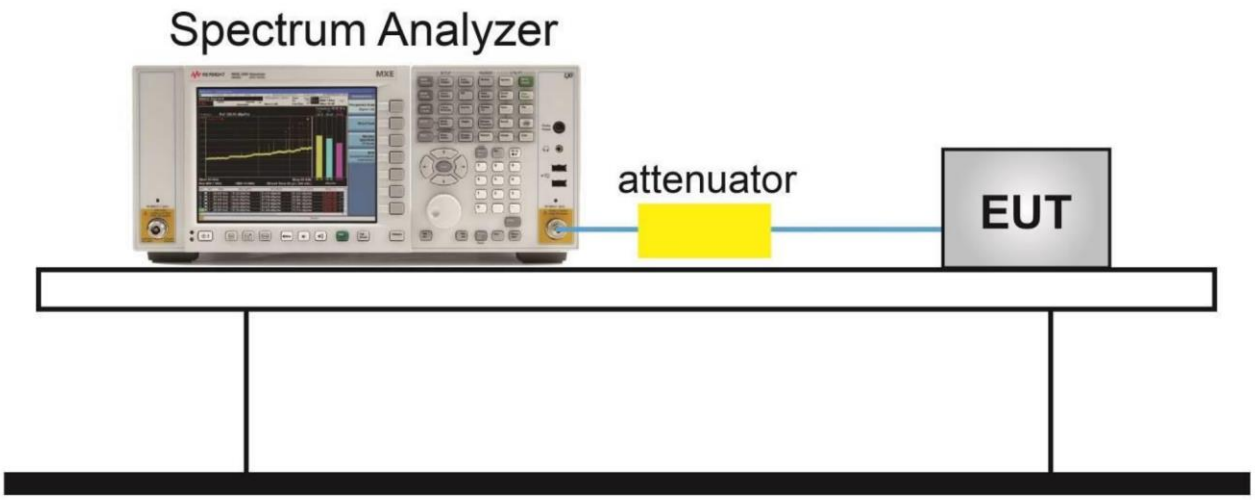
Carrier separation measurement: GFSK, Ch0 (kHz)	995.2	Carrier separation measurement: π/4 DQPSK, Ch39(kHz)	992
			
Carrier separation measurement: 8DPSK, Ch39(kHz)	**1328**	/	
		/	

6.9. Number Of Hopping Channels

6.9.1. Measurement Limit

Standard	Limit
FCC 47 CFR Part 15.247 (a)(1)(iii)	At least 15 non-overlapping channels
RSS-247 5.1	At least 15 non-overlapping channels

6.9.2. Test Setup

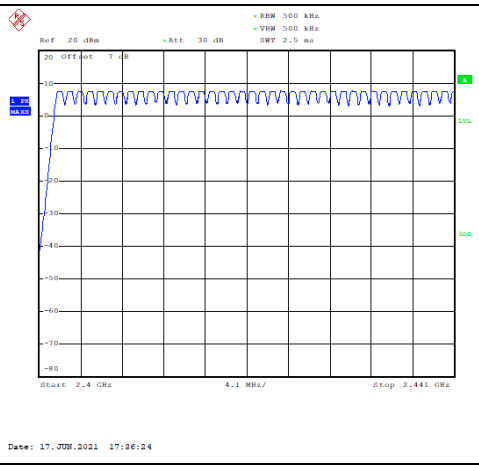
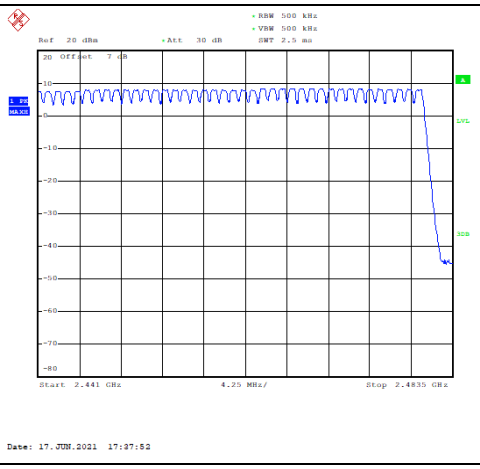
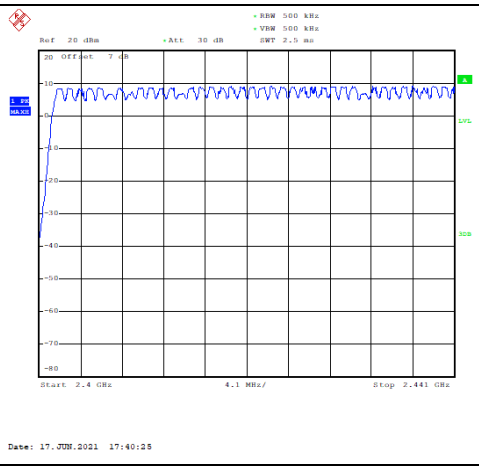
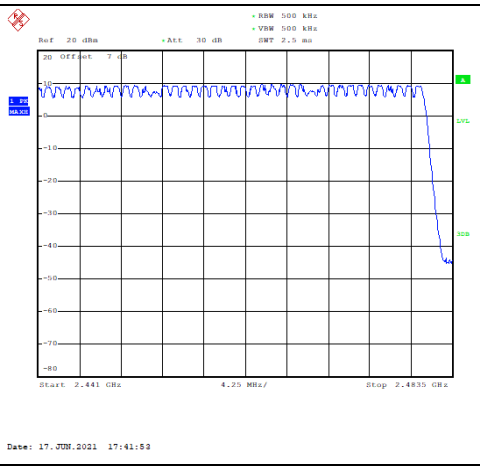
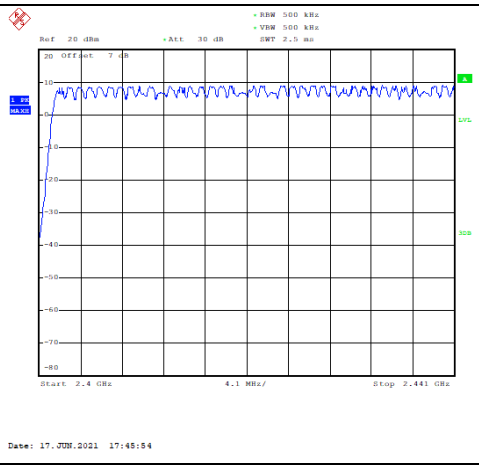
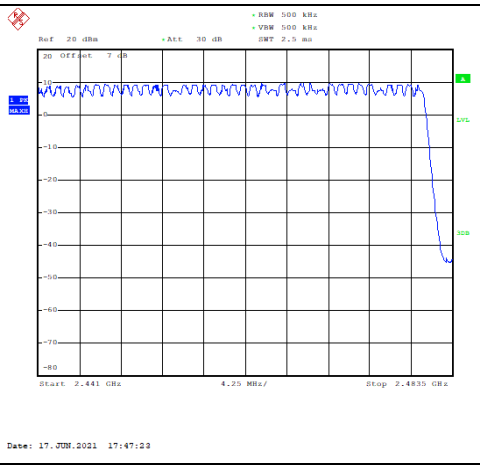


6.9.3. Test procedure

The measurement is according to ANSI C63.10 clause 7.8.3.

1. Connect the EUT through cable and divide with CBT32 and spectrum analyzer.
2. Enable the EUT transmit in hopping mode.
3. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
4. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
5. VBW ≥ RBW.
6. Sweep: Auto.
7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.
10. Record the test results.

Measurement Result:

Number of hopping frequency GFSK Ch0~78:79	
	
Number of hopping frequency π/4 DQPSK Ch0~78:79	
	
Number of hopping frequency 8PSK Ch0~78:79	
	

6.10. AC Powerline Conducted Emission

6.10.1. Method of Measurement: ANSI C63.10-2013-clause 6.2

1 The one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT.

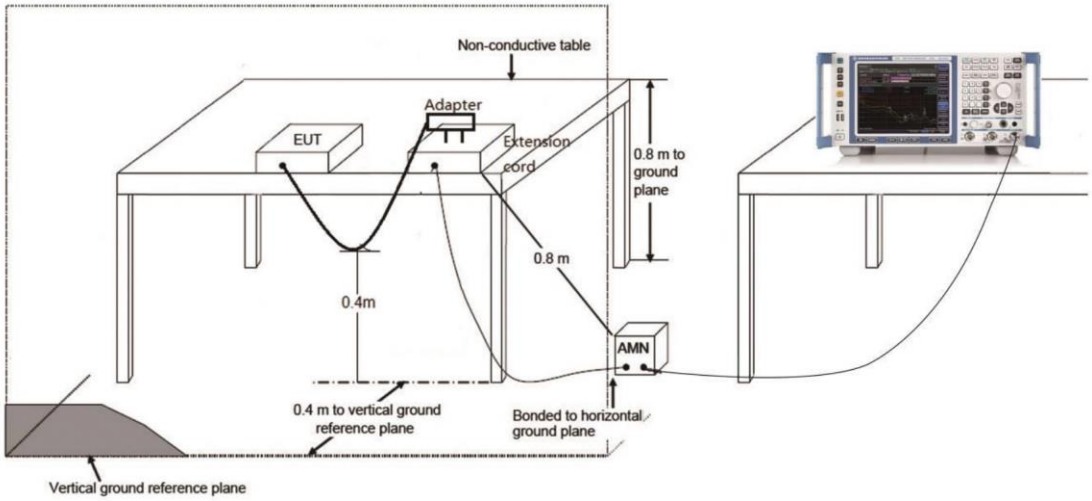
2 If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed.

3 The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation.

4 If the EUT is comprised of equipment units that have their own separate ac power connections, e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network, each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be separately measured. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

If the EUT uses a detachable antenna, these measurements shall be made with a suitable dummy load connected to the antenna output terminals; otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended. When measuring the ac conducted emissions from a device that operates between 150 kHz and 30 MHz a non-detachable antenna may be replaced with a dummy load for the measurements within the fundamental emission band of the transmitter, but only for those measurements.36 Record the six highest EUT emissions relative to the limit of each of the current-carrying conductors of the power cords of the equipment that comprises the EUT over the frequency range specified by the procuring or regulatory agency. Diagram or photograph the test setup that was used. See Clause 8 for full reporting requirements.

6.10.2. Test Setup



6.10.3. Test Condition

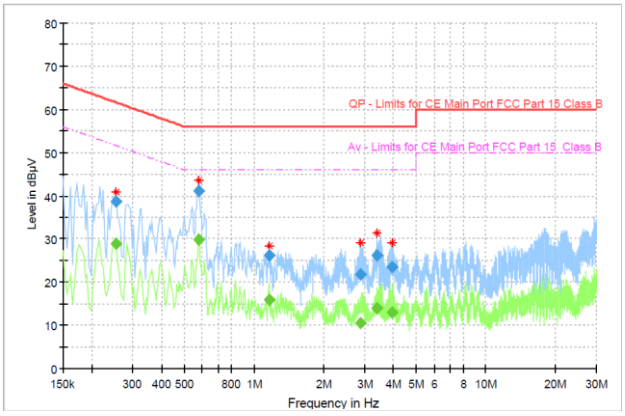
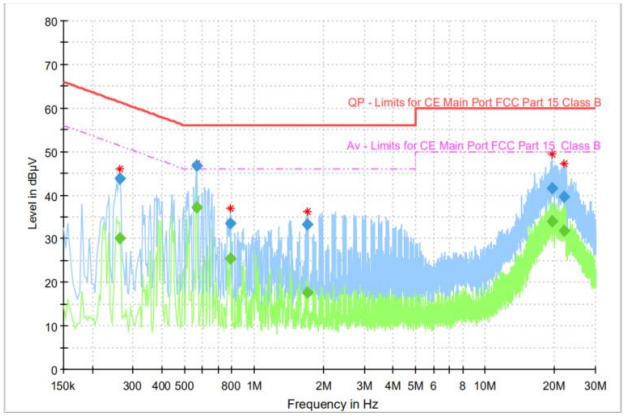
Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit

(Quasi-peak-average Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)	Conclusion
0.15 to 0.5	66 to 56	56 to 46	P
0.5 to 5	56	46	
5 to 30	60	50	
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.			

Mainly Supply

CA01	CB02
	

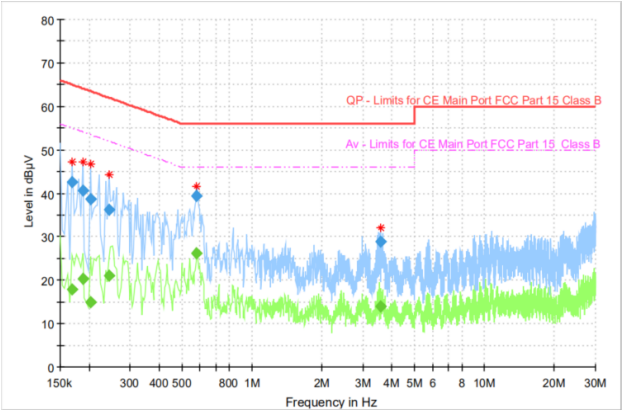
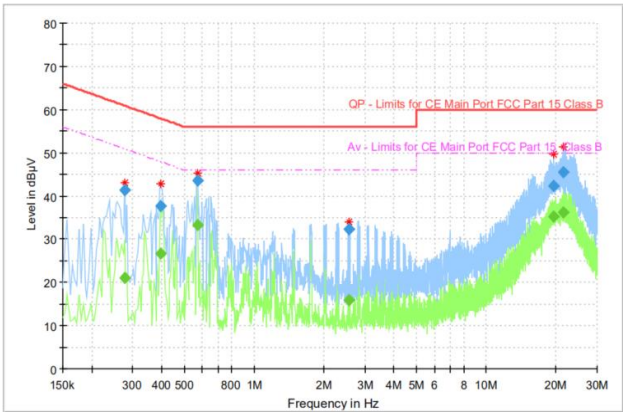
CA01

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.254475	---	28.79	51.61	22.82	15000	9	N	ON	9.7
0.254475	38.66	---	61.61	22.95	15000	9	N	ON	9.7
0.579094	41.21	---	56	14.79	15000	9	N	ON	9.8
0.579094	---	29.82	46	16.18	15000	9	N	ON	9.8
1.1649	26.23	---	56	29.77	15000	9	L1	ON	10.1
1.1649	---	15.85	46	30.15	15000	9	L1	ON	10.1
2.870081	---	10.55	46	35.45	15000	9	L1	ON	10.4
2.870081	21.67	---	56	34.33	15000	9	L1	ON	10.4
3.381263	26.18	---	56	29.82	15000	9	L1	ON	10.4
3.381263	---	13.93	46	32.07	15000	9	L1	ON	10.4
3.933488	23.53	---	56	32.47	15000	9	L1	ON	10.5
3.933488	---	13.02	46	32.98	15000	9	L1	ON	10.5

CB02

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.261938	---	30.11	51.37	21.26	15000	9	L1	ON	9.8
0.261938	43.8	---	61.37	17.57	15000	9	L1	ON	9.8
0.5679	---	37.13	46	8.87	15000	9	N	ON	9.8
0.5679	46.77	---	56	9.23	15000	9	N	ON	9.8
0.791775	33.53	---	56	22.47	15000	9	N	ON	9.8
0.791775	---	25.51	46	20.49	15000	9	N	ON	9.8
1.698469	33.35	---	56	22.65	15000	9	L1	ON	10.2
1.698469	---	17.68	46	28.32	15000	9	L1	ON	10.2
19.455488	---	33.94	50	16.06	15000	9	L1	ON	11.1
19.455488	41.71	---	60	18.29	15000	9	L1	ON	11.1
21.929306	---	31.79	50	18.21	15000	9	L1	ON	11
21.929306	39.7	---	60	20.3	15000	9	L1	ON	11

Secondary Supply

CA01	CB02
	

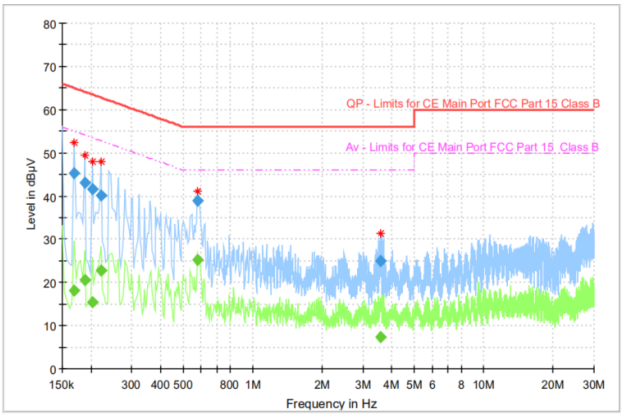
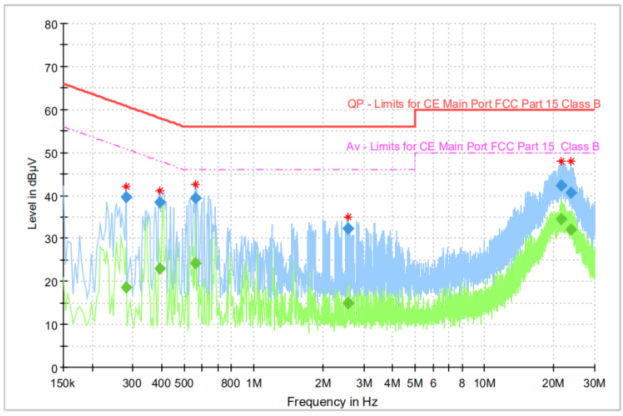
CA01

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.168656	42.62	---	65.03	22.4	15000	9	N	ON	9.7
0.168656	---	17.86	55.03	37.17	15000	9	N	ON	9.7
0.187313	---	20.29	54.16	33.86	15000	9	N	ON	9.7
0.187313	40.7	---	64.16	23.46	15000	9	N	ON	9.7
0.202238	38.65	---	63.52	24.87	15000	9	N	ON	9.7
0.202238	---	14.87	53.52	38.65	15000	9	N	ON	9.7
0.243281	36.33	---	61.98	25.65	15000	9	N	ON	9.7
0.243281	---	21.08	51.98	30.9	15000	9	N	ON	9.7
0.579094	39.37	---	56	16.63	15000	9	N	ON	9.8
0.579094	---	26.08	46	19.92	15000	9	N	ON	9.8
3.567825	---	14.01	46	31.99	15000	9	L1	ON	10.4
3.567825	28.82	---	56	27.18	15000	9	L1	ON	10.4

CB02

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.276863	---	21.07	50.91	29.84	15000	9	L1	ON	9.8
0.276863	41.4	---	60.91	19.51	15000	9	L1	ON	9.8
0.396263	---	26.77	47.93	21.16	15000	9	N	ON	9.7
0.396263	37.73	---	57.93	20.2	15000	9	N	ON	9.7
0.571631	43.55	---	56	12.45	15000	9	N	ON	9.8
0.571631	---	33.29	46	12.71	15000	9	N	ON	9.8
2.552925	32.18	---	56	23.82	15000	9	L1	ON	10.4
2.552925	---	16	46	30	15000	9	L1	ON	10.4
19.563694	---	35.2	50	14.8	15000	9	L1	ON	11.1
19.563694	42.37	---	60	17.63	15000	9	L1	ON	11.1
21.548719	---	36.09	50	13.91	15000	9	L1	ON	11.1
21.548719	45.49	---	60	14.51	15000	9	L1	ON	11.1

Thirdly Supply

CA01	CB02
	

CA01

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.168656	---	18.04	55.03	36.98	15000	9	L1	ON	9.7
0.168656	45.16	---	65.03	19.86	15000	9	L1	ON	9.7
0.187313	43.01	---	64.16	21.15	15000	9	N	ON	9.7
0.187313	---	20.58	54.16	33.57	15000	9	N	ON	9.7
0.202238	---	15.32	53.52	38.2	15000	9	L1	ON	9.8
0.202238	41.7	---	63.52	21.82	15000	9	L1	ON	9.8
0.220894	---	22.63	52.79	30.15	15000	9	N	ON	9.7
0.220894	40.09	---	62.79	22.69	15000	9	N	ON	9.7
0.579094	---	25.2	46	20.8	15000	9	N	ON	9.8
0.579094	38.85	---	56	17.15	15000	9	N	ON	9.8
3.597675	24.94	---	56	31.06	15000	9	L1	ON	10.4
3.597675	---	7.32	46	38.68	15000	9	L1	ON	10.4

CB02

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.280594	---	18.52	50.8	32.28	15000	9	N	ON	9.7
0.280594	39.68	---	60.8	21.11	15000	9	N	ON	9.7
0.392531	---	22.92	48.01	25.09	15000	9	N	ON	9.7
0.392531	38.3	---	58.01	19.71	15000	9	N	ON	9.7
0.556706	39.46	---	56	16.54	15000	9	N	ON	9.8
0.556706	---	24.29	46	21.71	15000	9	N	ON	9.8
2.552925	---	15	46	31	15000	9	L1	ON	10.4
2.552925	32.3	---	56	23.7	15000	9	L1	ON	10.4
21.429319	---	34.53	50	15.47	15000	9	L1	ON	11.1
21.429319	42.36	---	60	17.64	15000	9	L1	ON	11.1
23.757619	40.7	---	60	19.3	15000	9	L1	ON	11
23.757619	---	31.94	50	18.06	15000	9	L1	ON	11

7. Test Equipment List

7.1. Conducted Test System

Item	Equipment Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Vector Signal Analyzer	FSQ26	101091	R&S	2021-05-10	1 year
2	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2021-05-10	1 year
3	Eagle Test Software	Eagle V3.1 FCC BT/WIFI	N/A	ECIT	N/A	N/A

7.2. Radiated Emission Test System

Item	Equipment Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2021-05-10	1 year
2	EMI Test Receiver	ESU40	100307	R&S	2021-03-03	1 year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2021-02-03	2 years
4	Double- ridged Waveguide Antenna	ETS-3117	00135890	ETS	2020-02-28	3 years
5	Universal Radio Communication Tester	CMW500	104178	R&S	2021-05-10	1 year
6	EMI Test Software	EMC32 V 9.15.00	N/A	R&S	N/A	N/A

Anechoic chamber

Fully anechoic chamber by ETS.

Annex A: Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in 3IN documents. The detailed measurement uncertainty is defined in 3IN documents.

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Peak Output Power-Conducted	2402MHz-2480MHz	95%	0.544dB
Frequency Band Edges-Conducted	2402MHz-2480MHz	95%	0.544dB
Conducted Emission	30MHz-2GHz	95%	0.90dB
Conducted Emission	2GHz-3.6GHz	95%	0.88dB
Conducted Emission	3.6GHz-8GHz	95%	0.96dB
Conducted Emission	8GHz-20GHz	95%	0.94dB
Conducted Emission	20GHz-22GHz	95%	0.88dB
Conducted Emission	22GHz-26GHz	95%	0.86dB
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	5.66dB
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	4.98dB
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	5.06dB
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	5.20dB
Dwell Time	2402MHz-2480MHz	95%	0.218ms
20dB Bandwidth	2402MHz-2480MHz	95%	62.04Hz
AC Power line Conducted Emission	0.15MHz-30MHz	95%	3.66 dB

Annex B: Accreditation Certificate

Accredited Laboratory

A2LA has accredited

INDUSTRIAL INTERNET INNOVATION CENTER (SHANGHAI) CO., LTD.

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 12th day of April 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2023

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

************END OF REPORT************