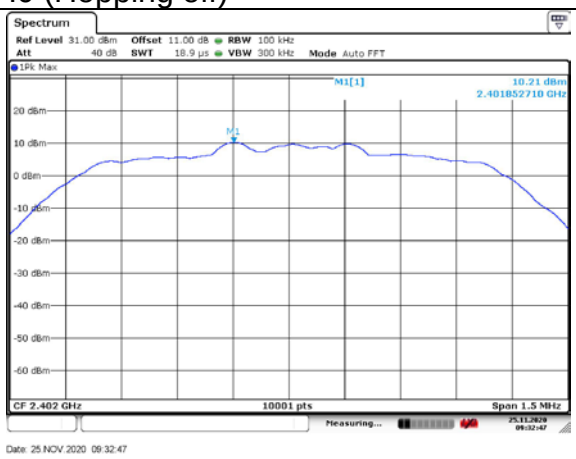
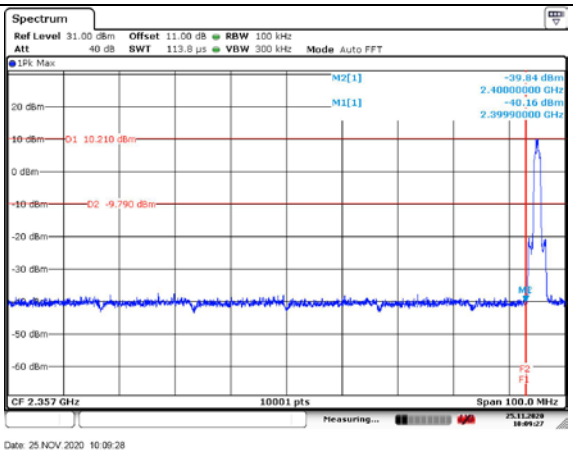
π/4DQPSK

CH0 (Hopping off)





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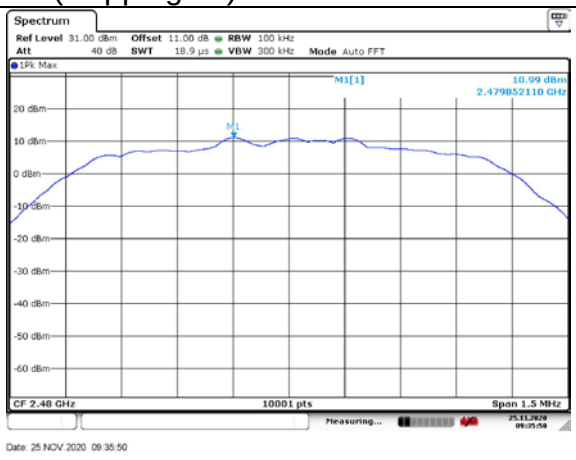

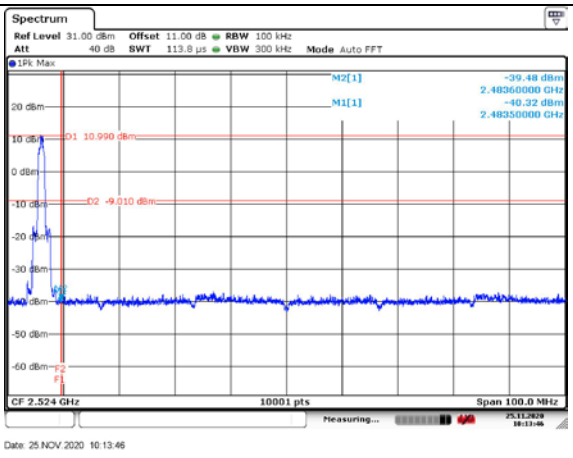

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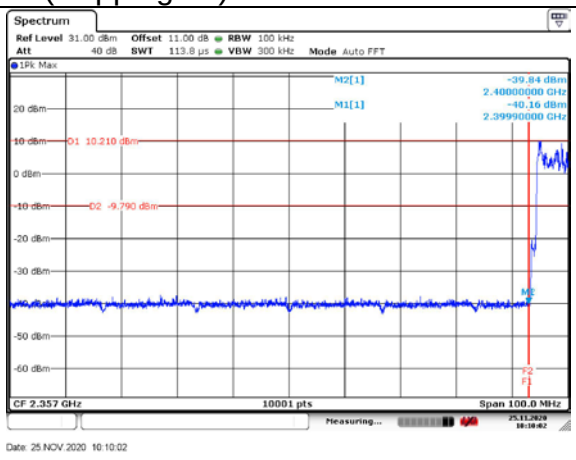

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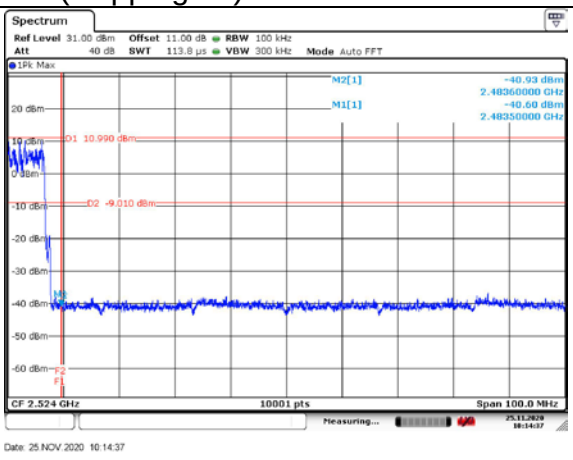
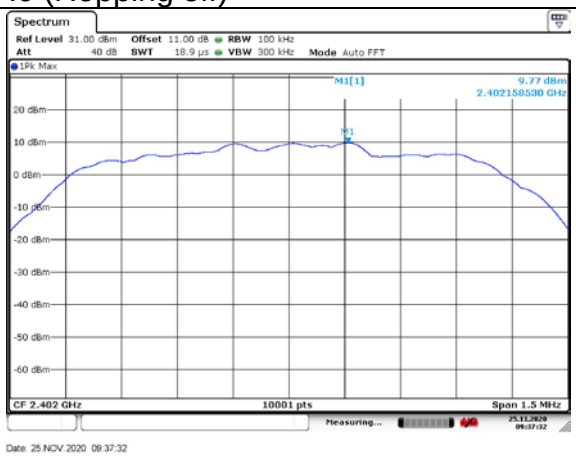
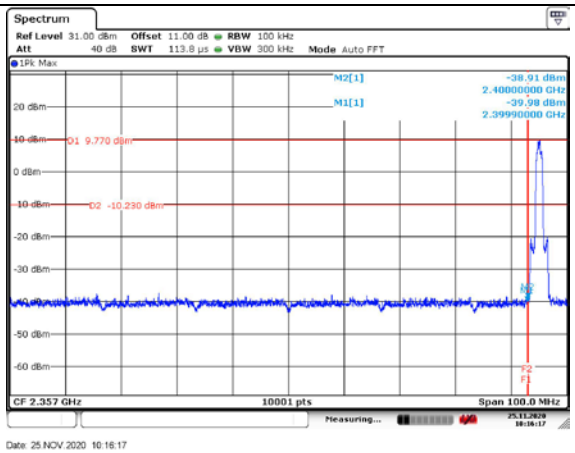


8DPSK

CH0 (Hopping off)





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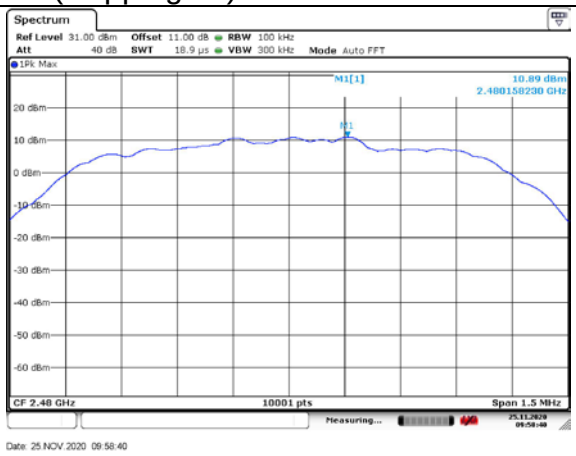
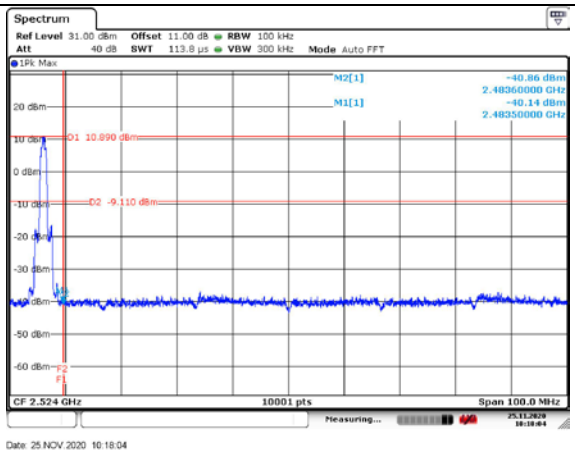
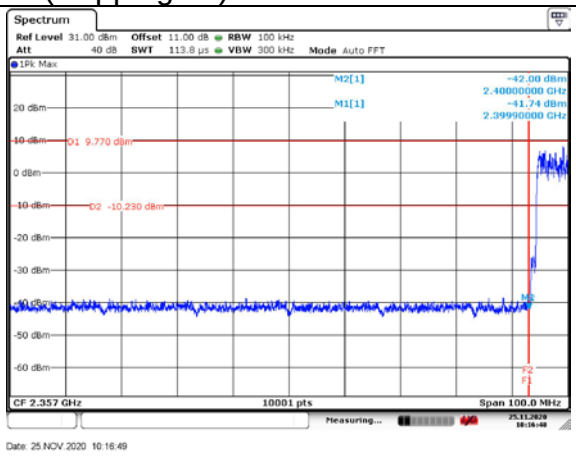
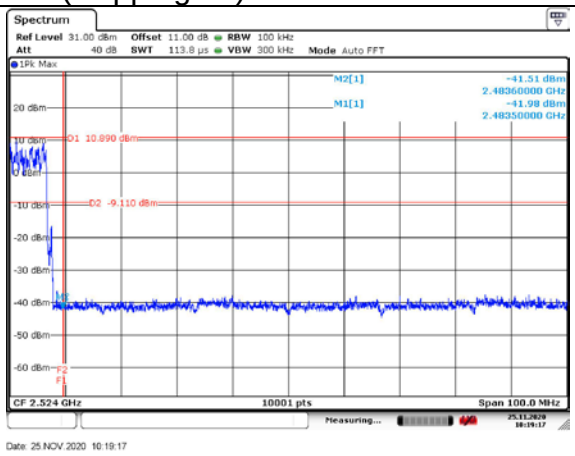




CH0 (Hopping on)



CH78 (Hopping on)



APPENDIX B – TEST DATA OF RADIATED EMISSION

Radiated Emission Band Edge

The worst case attitude: The mobile lay down.
The measurement results are obtained as described below:
Measure Level = Reading Level + cable loss + antenna factor
Sample calculation: (90.12 dBuV/m) = (56.12 dBμV) + (8.90 dB) + (25.10 dB), the corresponding frequency is 2402MHz.

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: GFSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	96.57	62.57	N/A	N/A	8.90	25.10
2	2390	39.16	5.16	-34.84	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: GFSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	92.84	58.84	N/A	N/A	8.90	25.10
2	2390	37.39	3.39	-36.61	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: GFSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	93.87	59.87	N/A	N/A	8.90	25.10
2	2390	31.89	-2.11	-22.11	54.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: GFSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	90.42	56.42	N/A	N/A	8.90	25.10
2	2390	31.18	-2.82	-22.82	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: GFSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	96.17	62.17	N/A	N/A	8.90	25.10
2	2483.5	40.44	6.44	-33.56	74.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: GFSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	92.17	58.17	N/A	N/A	8.90	25.10
2	2483.5	39.47	5.47	-34.53	74.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: GFSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	94.04	60.04	N/A	N/A	8.90	25.10
2	2483.5	31.37	-2.63	-22.63	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: GFSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	91.07	57.07	N/A	N/A	8.90	25.10
2	2483.5	30.74	-3.26	-23.26	54.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: π/4DQPSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	97.34	63.34	N/A	N/A	8.90	25.10
2	2390	40.71	6.71	-33.29	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: π/4DQPSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	93.55	59.55	N/A	N/A	8.90	25.10
2	2390	38.86	4.86	-35.14	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: π/4DQPSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	93.07	59.07	N/A	N/A	8.90	25.10
2	2390	31.49	-2.51	-22.51	54.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: π/4DQPSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	89.71	55.71	N/A	N/A	8.90	25.10
2	2390	30.21	-3.79	-23.79	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: π/4DQPSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	96.34	62.34	N/A	N/A	8.90	25.10
2	2483.5	39.15	5.15	-34.85	74.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: π/4DQPSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	92.75	58.75	N/A	N/A	8.90	25.10
2	2483.5	37.97	3.97	-36.03	74.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: π/4DQPSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	93.93	59.93	N/A	N/A	8.90	25.10
2	2483.5	30.60	-3.40	-23.40	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: π/4DQPSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	90.64	56.64	N/A	N/A	8.90	25.10
2	2483.5	29.54	-4.46	-24.46	54.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: 8DPSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	96.59	62.59	N/A	N/A	8.90	25.10
2	2390	39.85	5.85	-34.15	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: 8DPSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	92.48	58.48	N/A	N/A	8.90	25.10
2	2390	39.17	5.17	-34.83	74.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: 8DPSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	94.22	60.22	N/A	N/A	8.90	25.10
2	2390	31.99	-2.01	-22.01	54.00	8.90	25.10

Carrier frequency (MHz): 2402
Channel No.:0
Test Mode: 8DPSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2402	91.15	57.15	N/A	N/A	8.90	25.10
2	2390	31.55	-2.45	-22.45	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: 8DPSK
Polarity: Vertical
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	96.52	62.52	N/A	N/A	8.90	25.10
2	2483.5	40.12	6.12	-33.88	74.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: 8DPSK
Polarity: Horizontal
Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	92.68	58.68	N/A	N/A	8.90	25.10
2	2483.5	39.04	5.04	-34.96	74.00	8.90	25.10

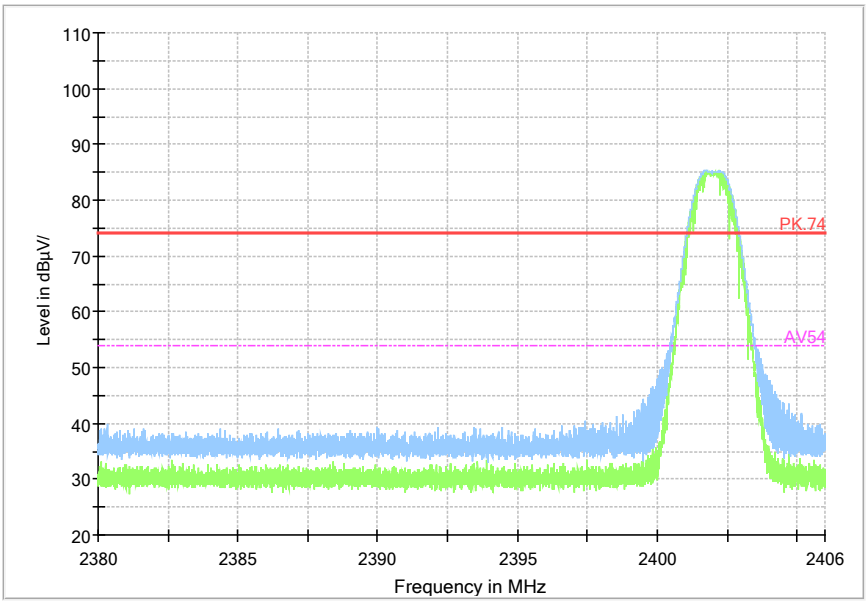
Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: 8DPSK
Polarity: Vertical
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	93.03	59.03	N/A	N/A	8.90	25.10
2	2483.5	31.50	-2.50	-22.50	54.00	8.90	25.10

Carrier frequency (MHz): 2480
Channel No.:78
Test Mode: 8DPSK
Polarity: Horizontal
Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2480	89.52	55.52	N/A	N/A	8.90	25.10
2	2483.5	29.62	-4.38	-24.38	54.00	8.90	25.10

Full Spectrum



Carrier frequency (MHz): 2402
Channel No.:0
Frequency Range: 2380MHz-2406MHz
Detector: Av mode and PK mode
Modulation type: GFSK

Sample Calculations

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.
The measurement results are obtained as described below:
Result= $P_{mea} + A_{Rpl}$
Sample calculation: (28.52 dBμV/m) = (48.92 dBμV/m) + (-20.4 dB), the corresponding frequency is 65.933MHz.
The worst case attitude: The mobile lay down.

For GFSK
Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
34.365000	19.71	-19.9	39.61	Vertical	40.00
87.181500	12.38	-21.5	33.88	Vertical	40.00
158.913000	20.18	-21.2	41.38	Vertical	43.50
175.160500	18.81	-20.4	39.21	Vertical	43.50
555.449000	12.50	-7.8	20.30	Vertical	46.00
955.913500	17.32	-0.8	18.12	Vertical	46.00

For π/4DQPSK
Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
34.025500	20.39	-20.0	40.39	Vertical	40.00
53.862000	14.87	-17.6	32.47	Vertical	40.00
158.622000	19.97	-21.3	41.27	Vertical	43.50
174.190500	18.58	-20.4	38.98	Vertical	43.50
551.084000	12.29	-7.9	20.19	Vertical	46.00
959.502500	17.30	-0.7	18.00	Vertical	46.00

For 8DPSK
Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
33.346500	22.09	-20.2	42.29	Vertical	40.00
53.910500	14.63	-17.6	32.23	Vertical	40.00
161.192500	18.93	-21.1	40.03	Vertical	43.50
175.742500	19.28	-20.4	39.68	Vertical	43.50
525.718500	11.88	-8.6	20.48	Vertical	46.00
935.446500	17.20	-1.0	18.20	Vertical	46.00

For GFSK
Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
33.104000	22.61	-20.3	42.91	Vertical	40.00
54.347000	13.38	-17.7	31.08	Vertical	40.00
161.435000	19.10	-21.1	40.20	Vertical	43.50
174.918000	19.20	-20.4	39.60	Vertical	43.50
552.151000	12.26	-7.9	20.16	Vertical	46.00
914.155000	16.99	-1.3	18.29	Vertical	46.00

For π/4DQPSK
Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
31.940000	23.70	-20.6	44.30	Vertical	40.00
87.909000	14.29	-21.3	35.59	Vertical	40.00
161.095500	18.96	-21.1	40.06	Vertical	43.50
175.112000	19.45	-20.4	39.85	Vertical	43.50
544.779000	12.38	-8.1	20.48	Vertical	46.00
933.506500	17.15	-1.0	18.15	Vertical	46.00

For 8DPSK
Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
32.522000	23.15	-20.4	43.55	Vertical	40.00
86.551000	14.30	-21.7	36.00	Vertical	40.00
157.264000	18.56	-21.3	39.86	Vertical	43.50
173.414500	18.39	-20.5	38.89	Vertical	43.50
538.959000	12.17	-8.2	20.37	Vertical	46.00
933.312500	17.14	-1.0	18.14	Vertical	46.00

For GFSK
Channel No.:78

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
46.829500	19.06	-17.4	36.46	Vertical	40.00
86.551000	14.11	-21.7	35.81	Vertical	40.00
172.881000	17.71	-20.5	38.21	Vertical	43.50
173.511500	18.51	-20.4	38.91	Vertical	43.50
554.915500	12.10	-7.8	19.90	Vertical	46.00
943.303500	17.17	-0.9	18.07	Vertical	46.00

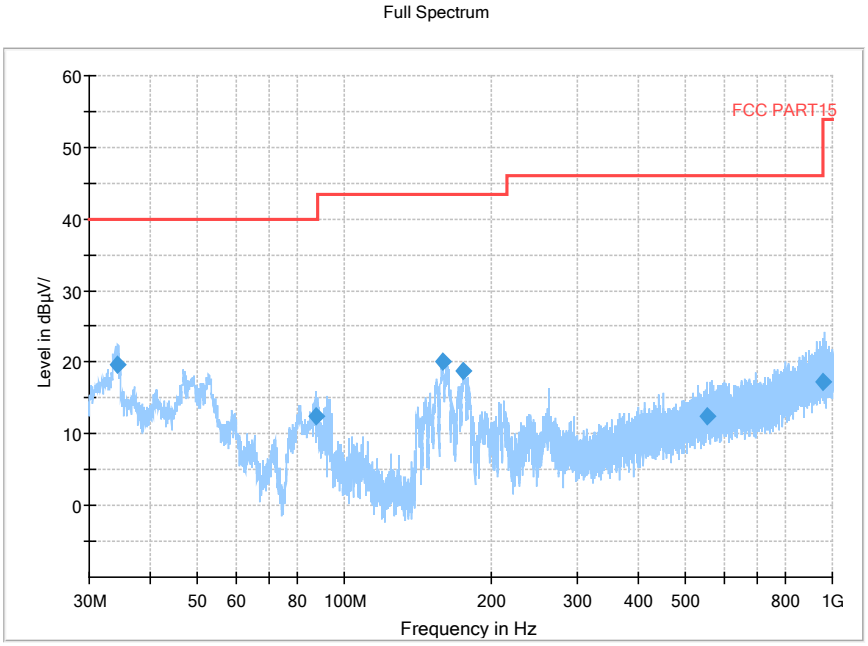
For π/4DQPSK
Channel No.:78

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
34.510500	19.23	-19.8	39.03	Vertical	40.00
86.551000	14.04	-21.7	35.74	Vertical	40.00
160.416500	18.49	-21.2	39.69	Vertical	43.50
173.657000	18.54	-20.4	38.94	Vertical	43.50
523.681500	11.43	-8.7	20.13	Vertical	46.00
926.571000	17.15	-1.1	18.25	Vertical	46.00

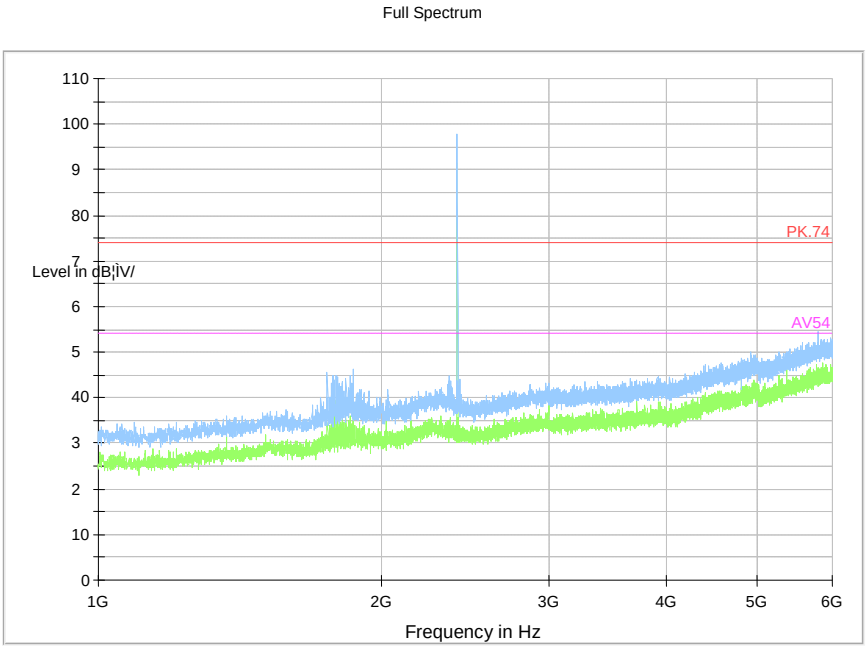
For 8DPSK
Channel No.:78

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
31.746000	23.75	-20.6	44.35	Vertical	40.00
85.872000	12.95	-21.9	34.85	Vertical	40.00
173.172000	18.27	-20.5	38.77	Vertical	43.50
177.052000	18.68	-20.3	38.98	Vertical	43.50
535.564000	11.90	-8.3	20.20	Vertical	46.00
855.373000	16.29	-2.3	18.59	Vertical	46.00

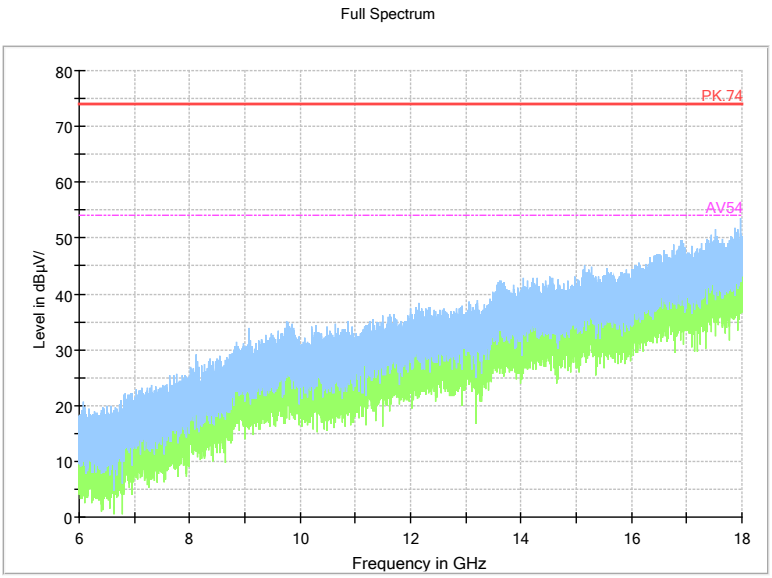
Carrier frequency (MHz): 2402
Channel No.:0



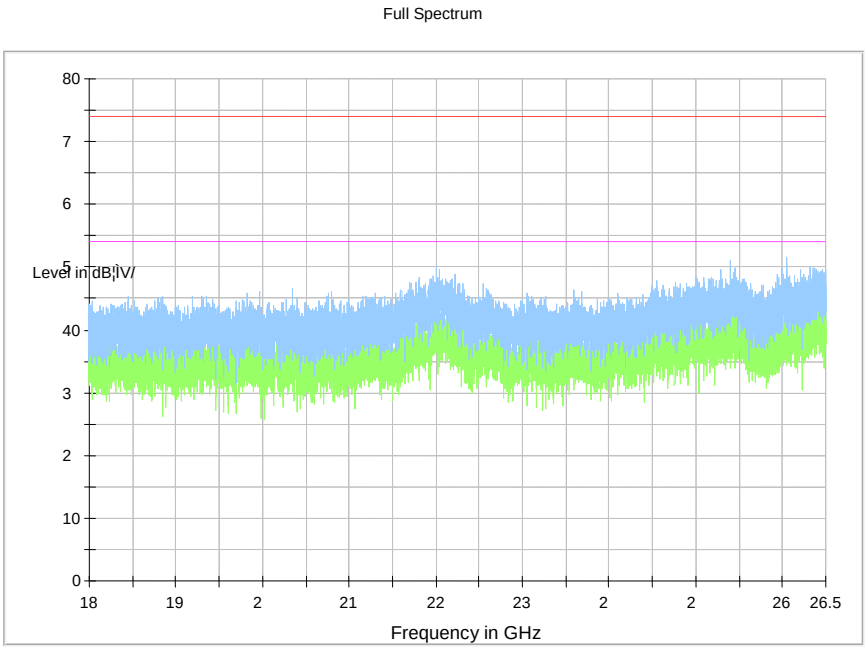
Frequency Range: 30MHz-1000MHz
Detector: QP mode
Modulation type: GFSK



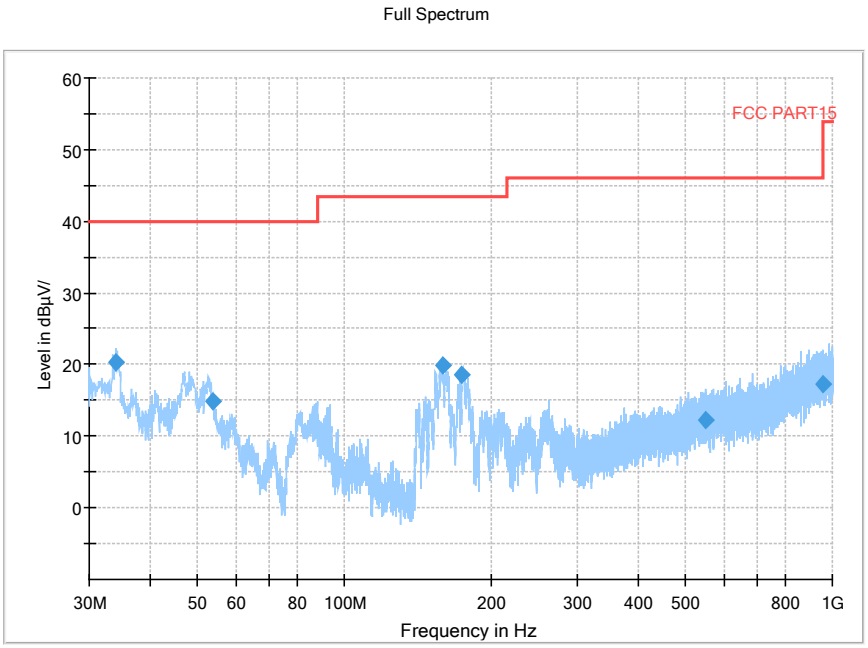
Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: GFSK



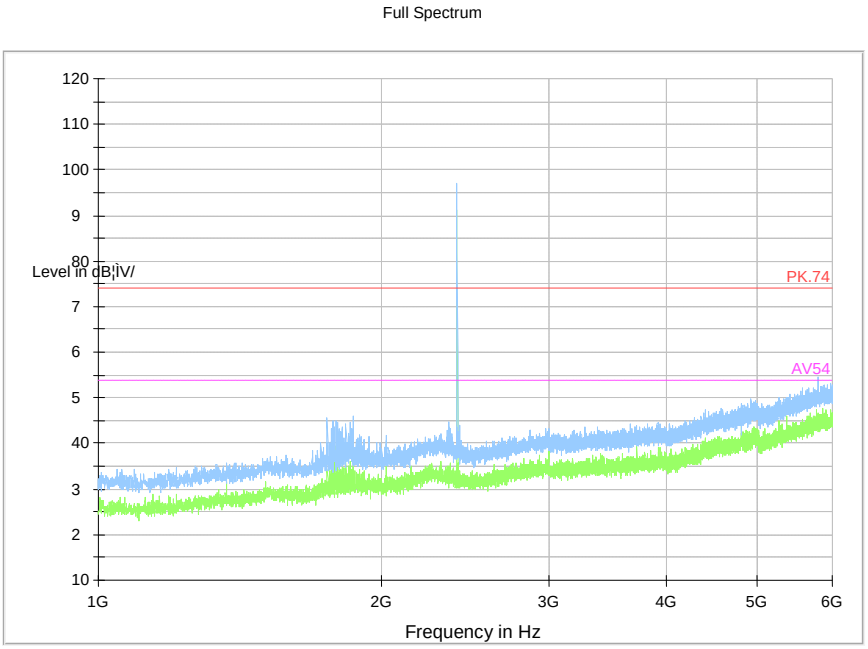
Frequency Range: 6GHz- 18GHz
Detector: Av mode and PK mode
Modulation type: GFSK



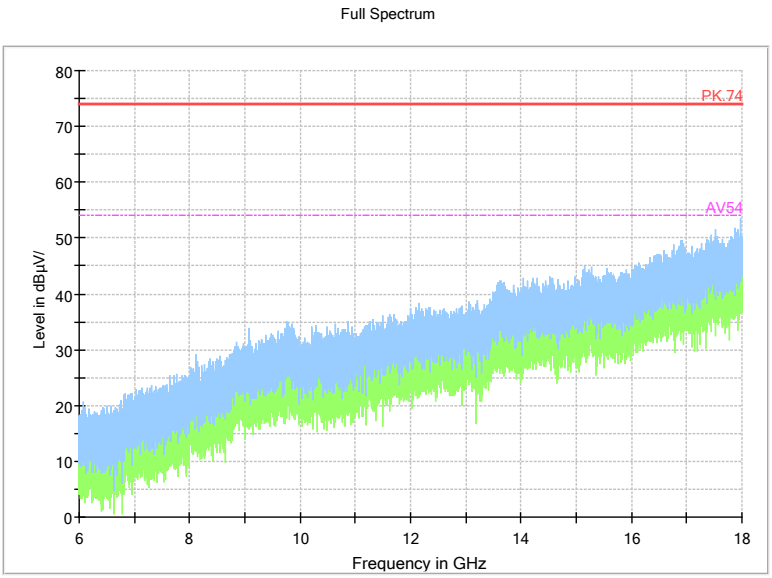
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK



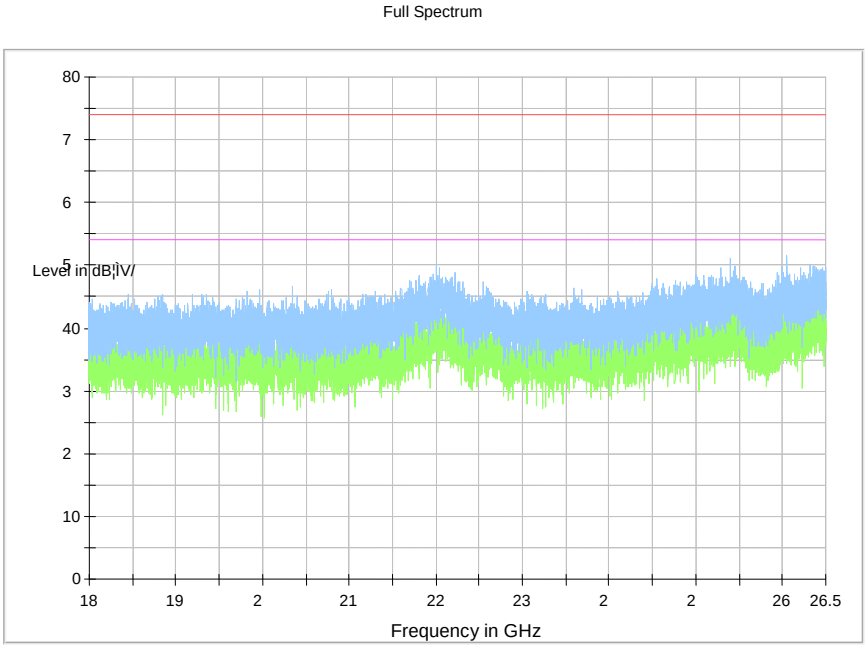
Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: π/4DQPSK



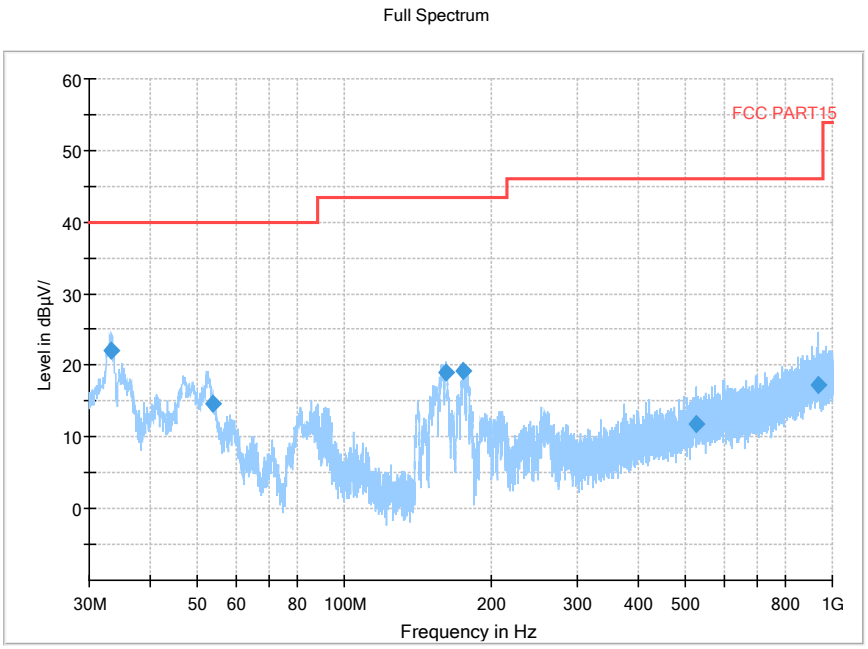
Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



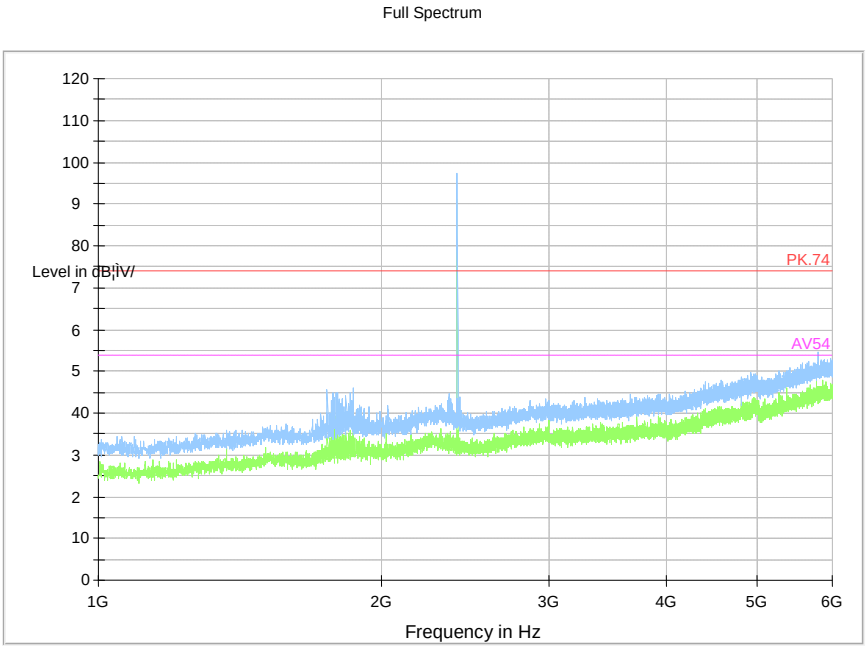
Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



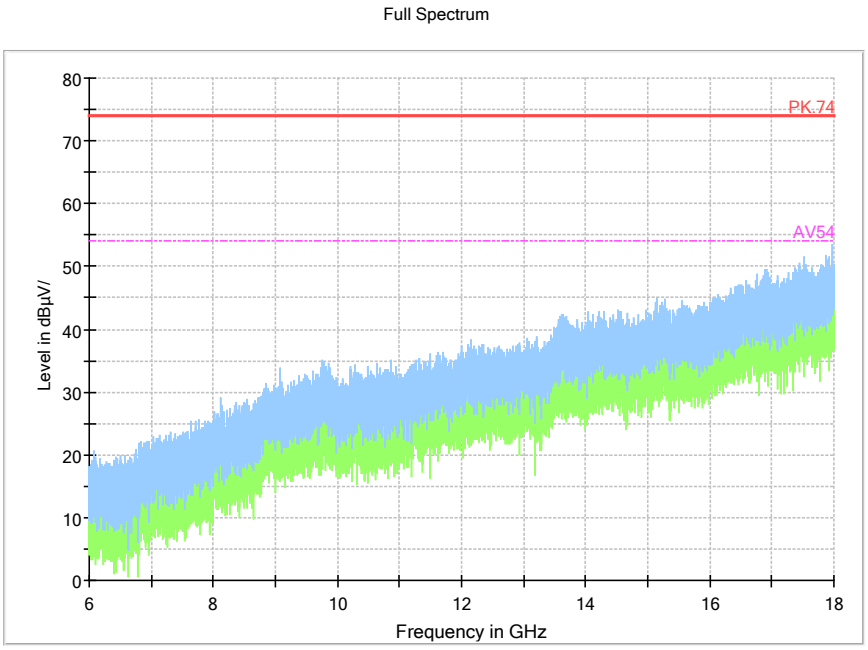
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



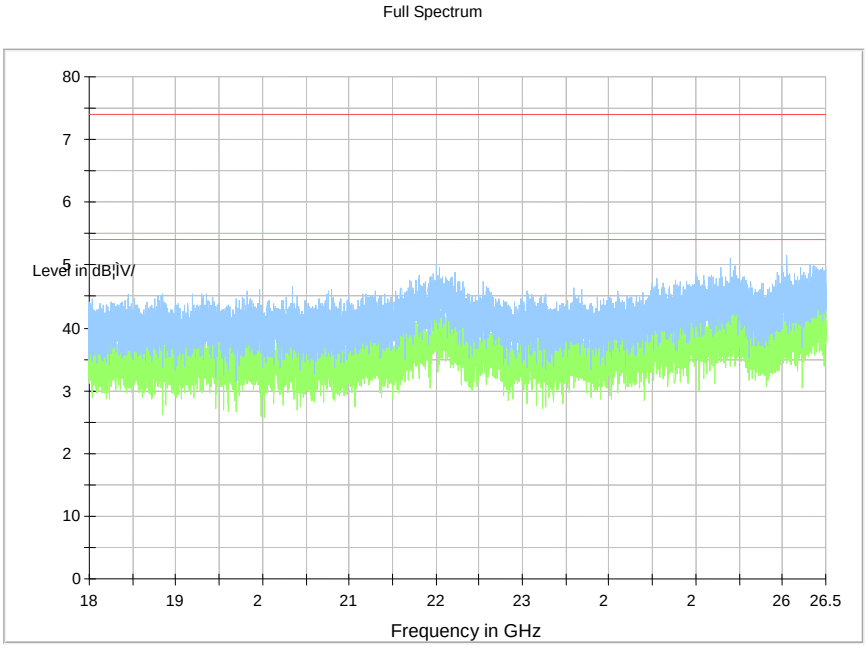
Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: 8DPSK



Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

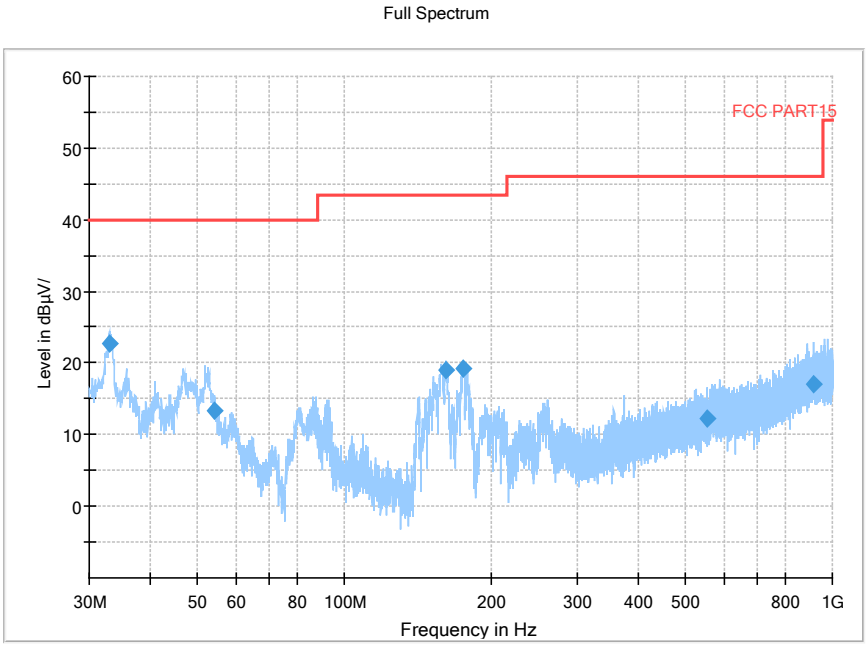


Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

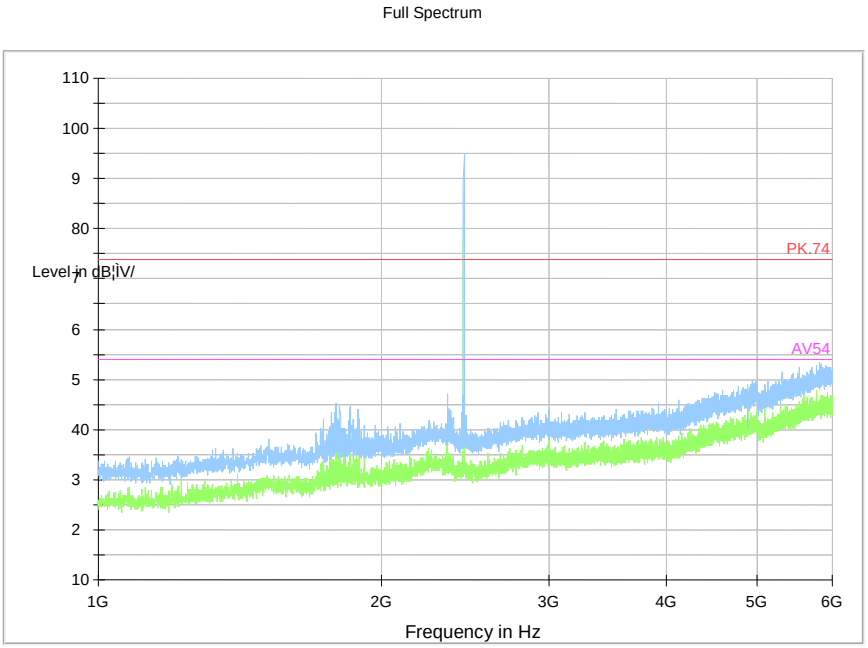


Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

Carrier frequency (MHz): 2441
Channel No.:39

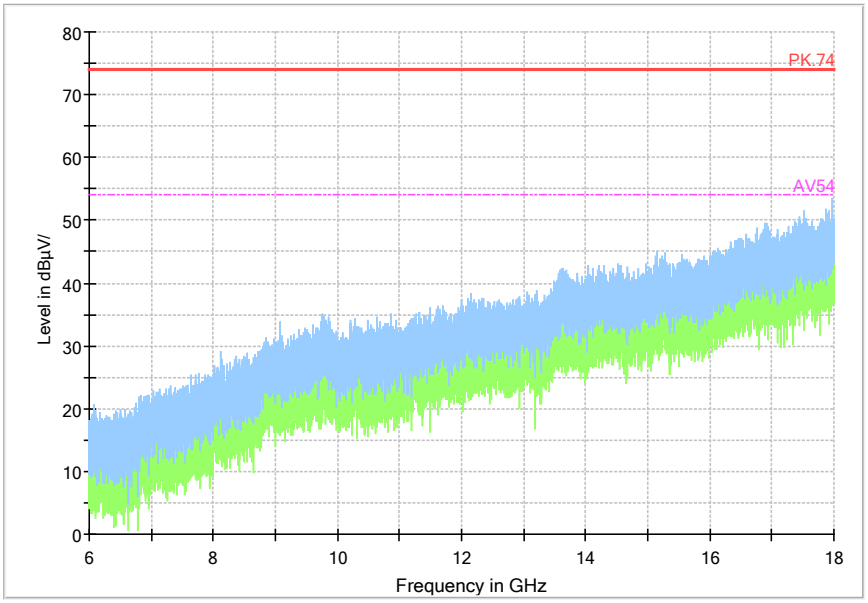


Frequency Range: 30MHz-1000MHz
Detector: QP mode
Modulation type: GFSK



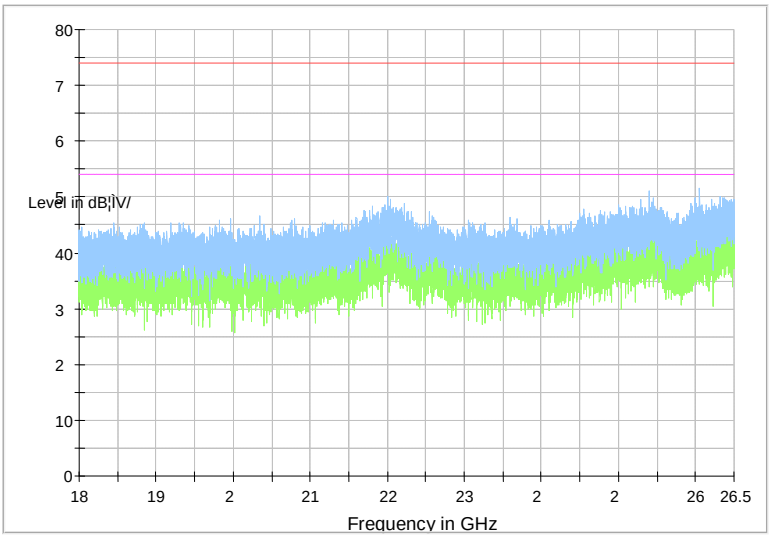
Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: GFSK

Full Spectrum

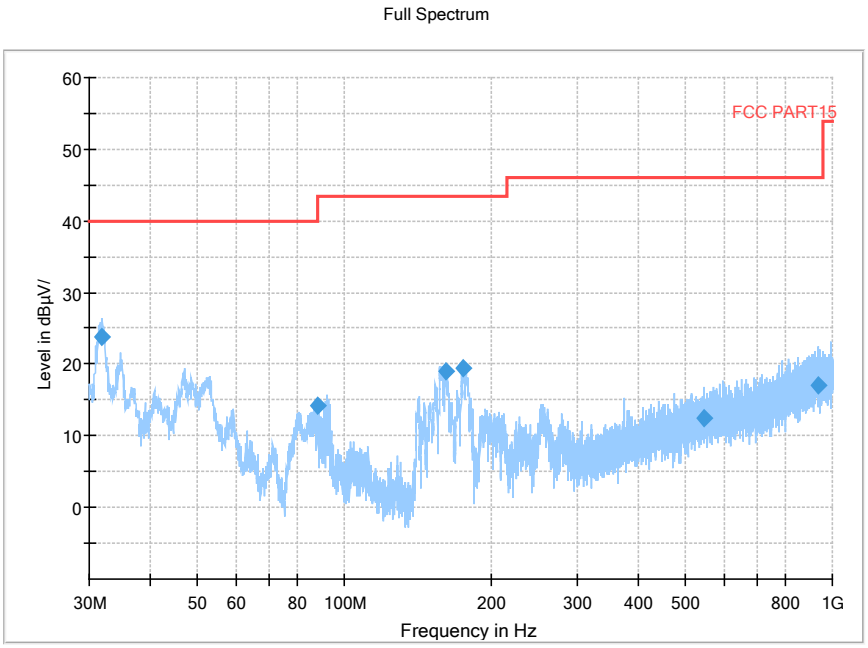


Frequency Range: 6GHz- 18GHz
Detector: Av mode and PK mode
Modulation type: GFSK

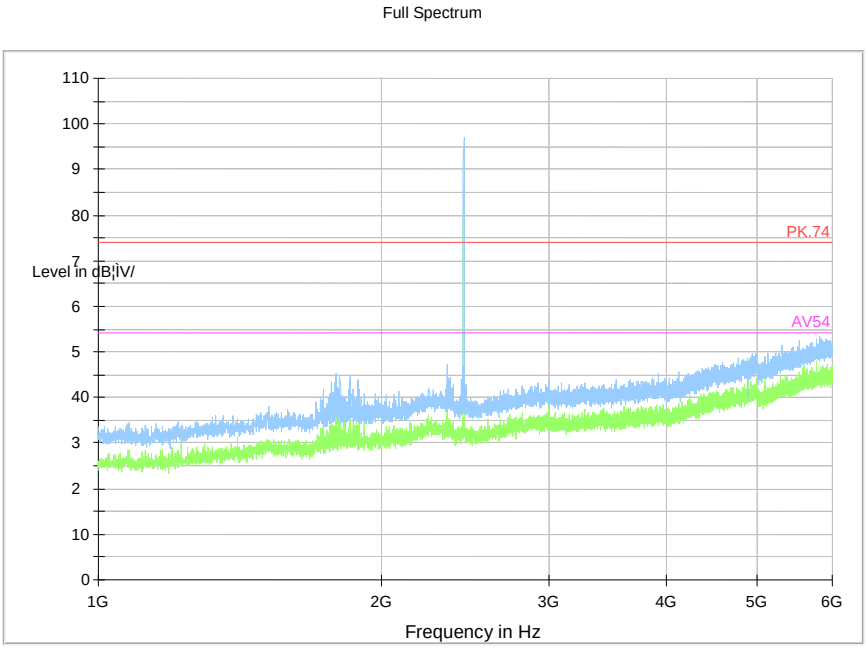
Full Spectrum



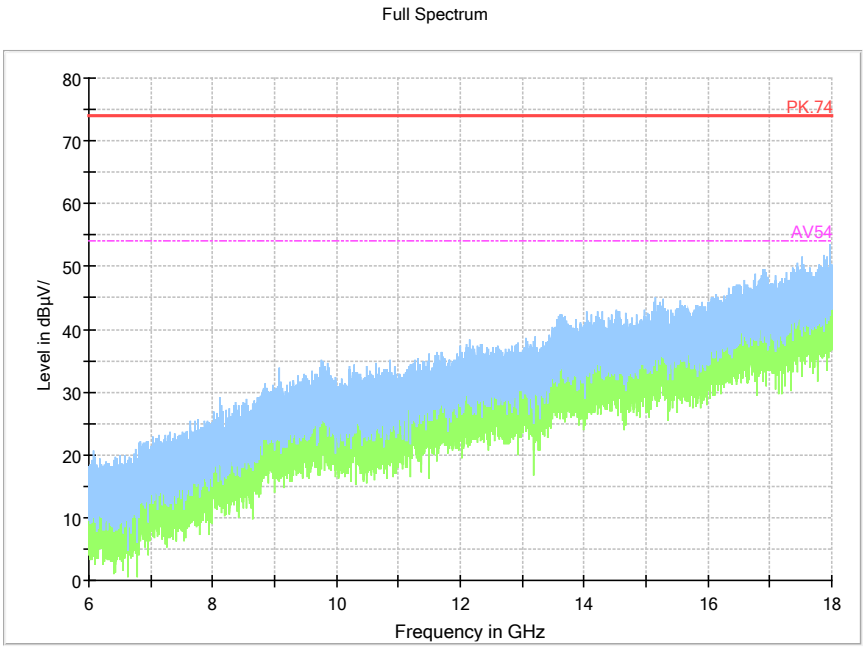
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK



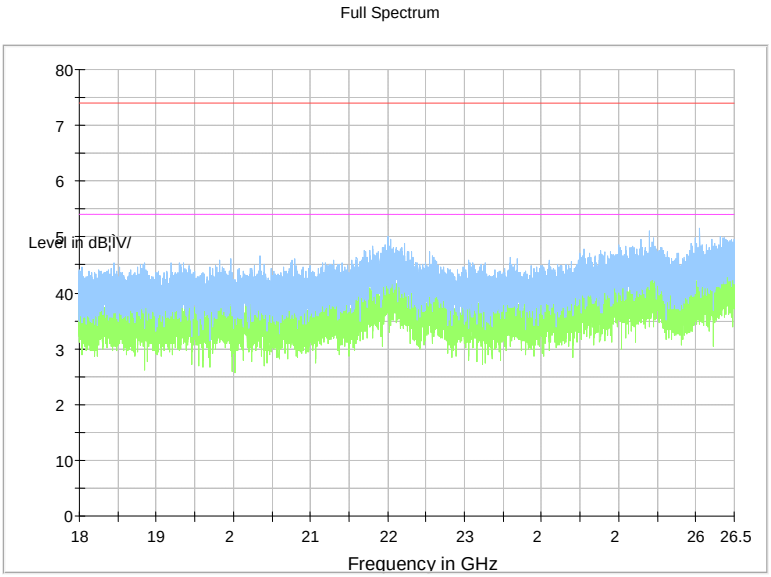
Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: π/4DQPSK



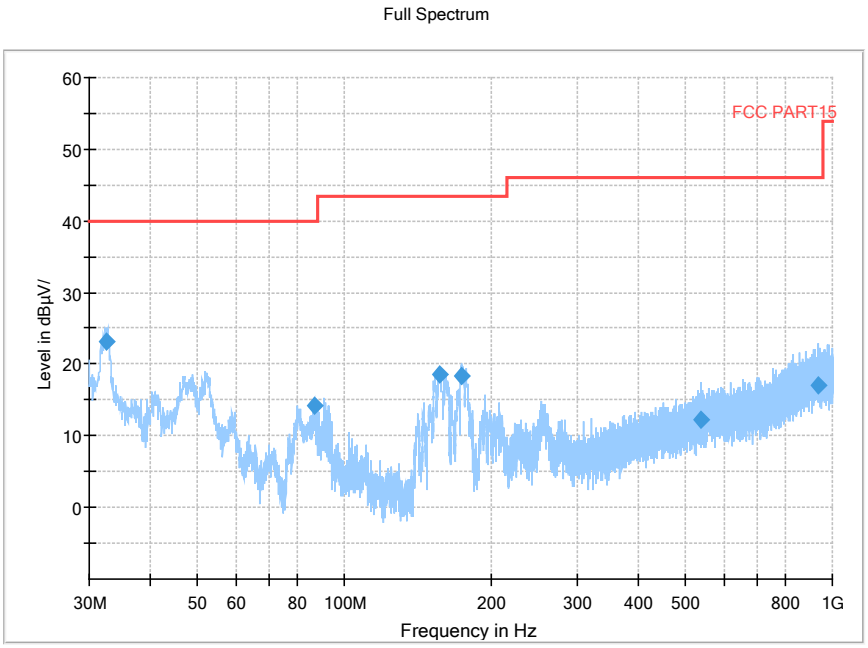
Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



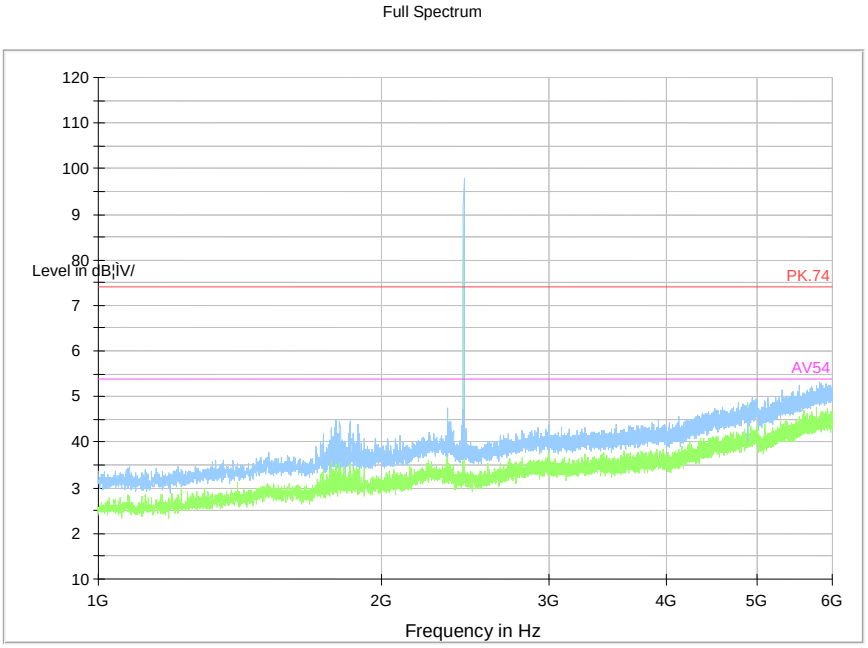
Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



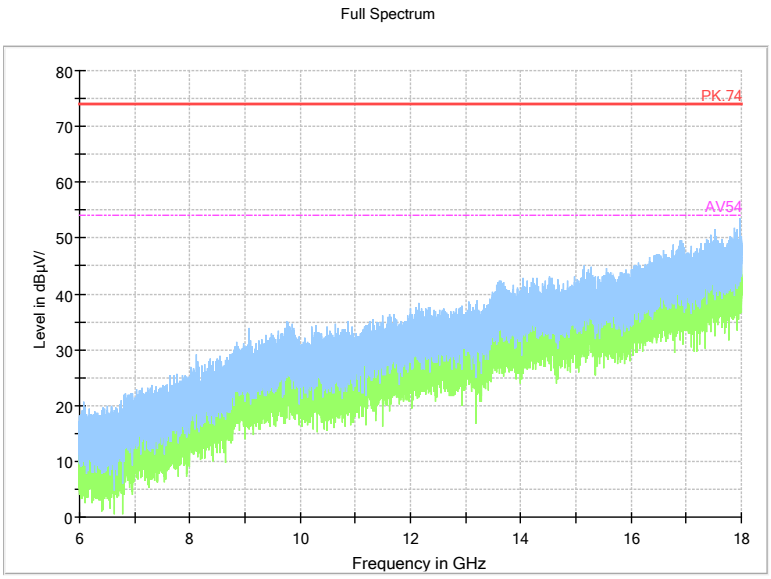
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



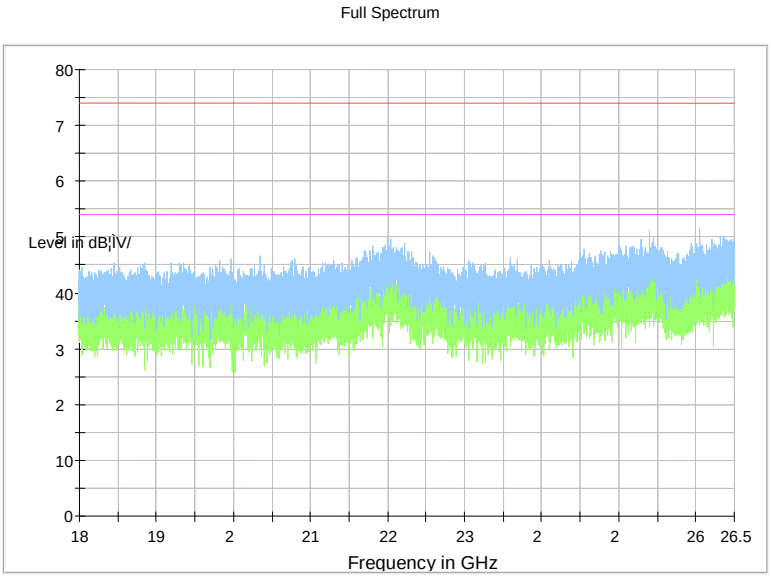
Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: 8DPSK



Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

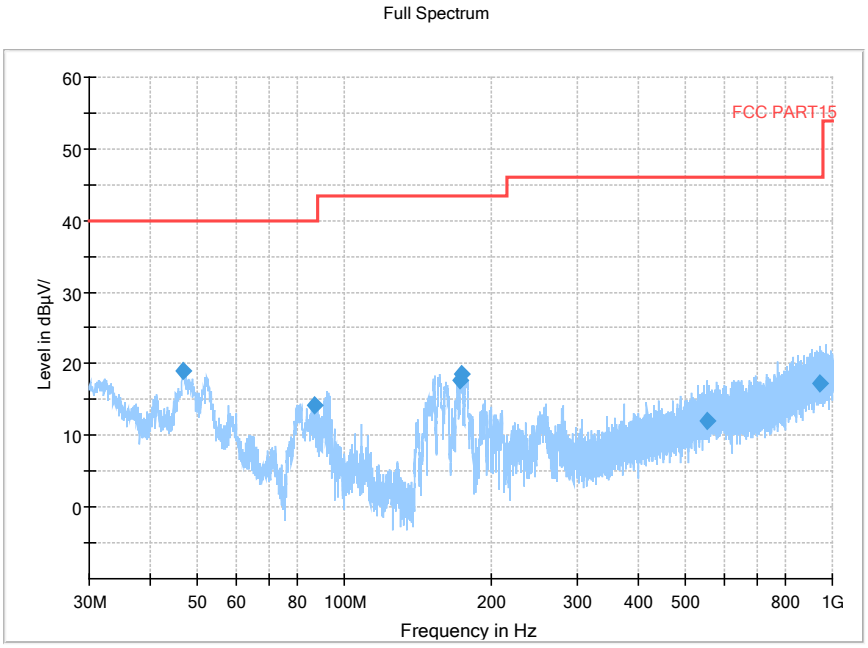


Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

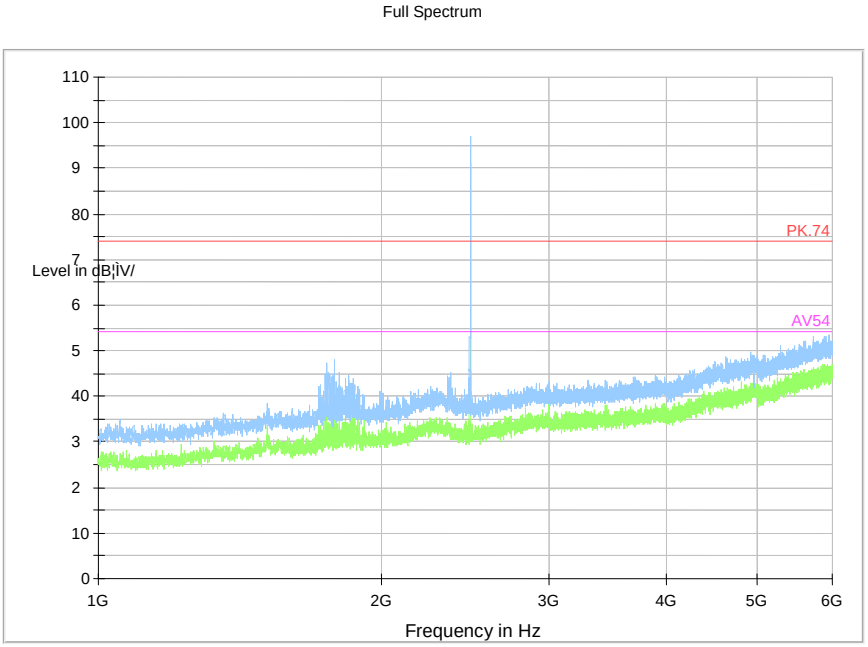


Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

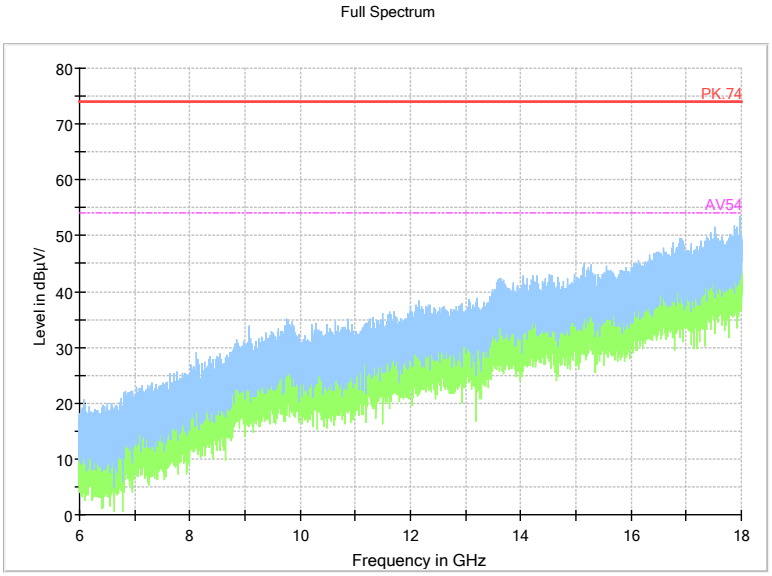
Carrier frequency (MHz): 2480
Channel No.:78



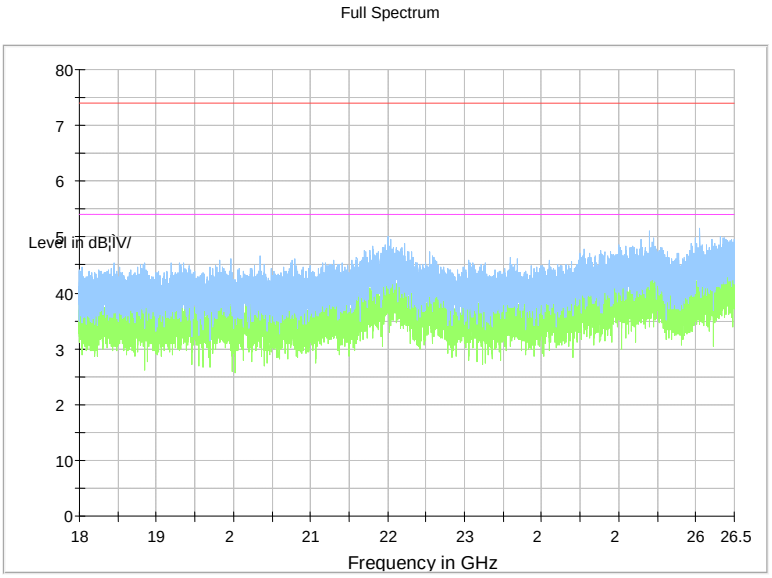
Frequency Range: 30MHz-1000MHz
Detector: QP mode
Modulation type: GFSK



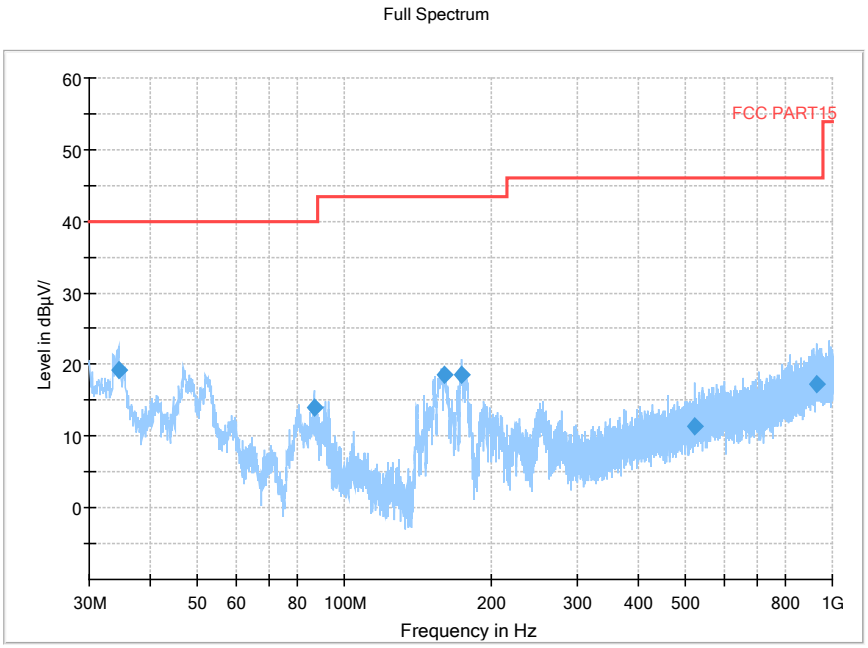
Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: GFSK



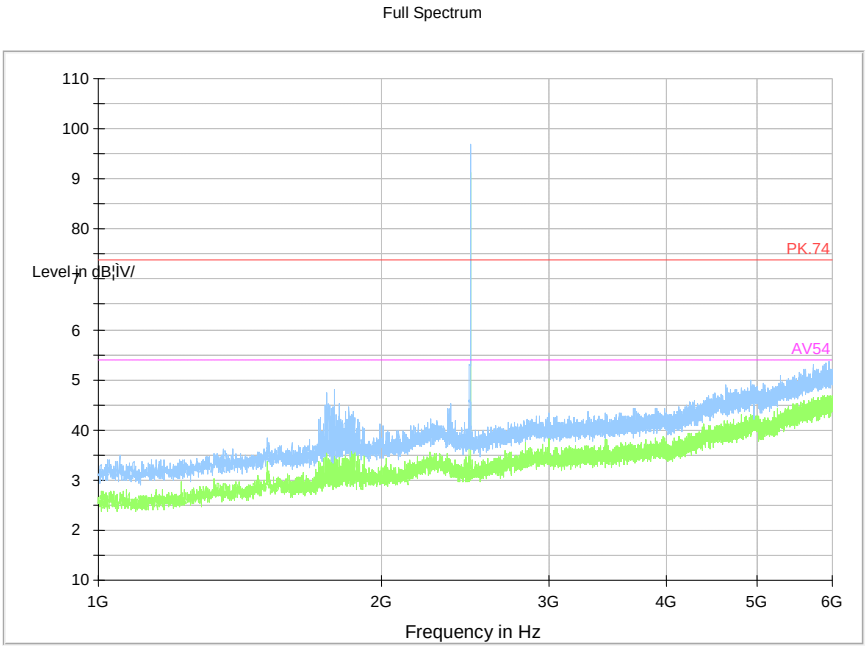
Frequency Range: 6GHz- 18GHz
Detector: Av mode and PK mode
Modulation type: GFSK



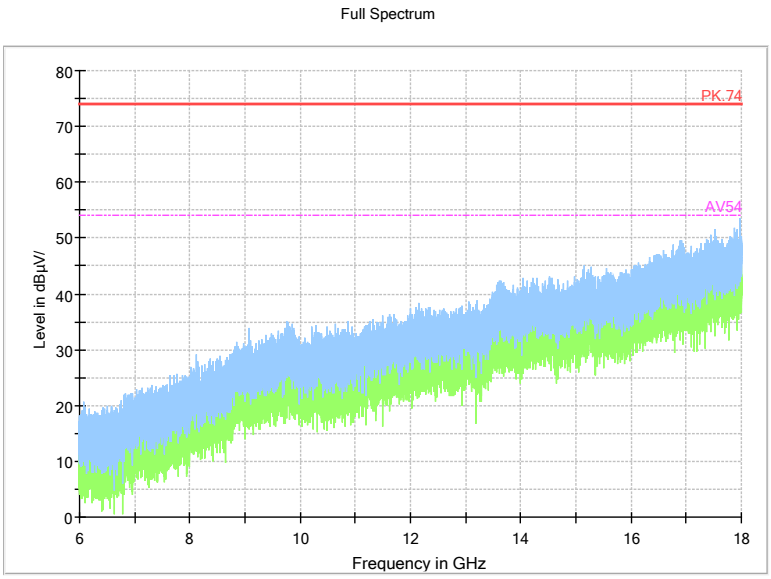
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK



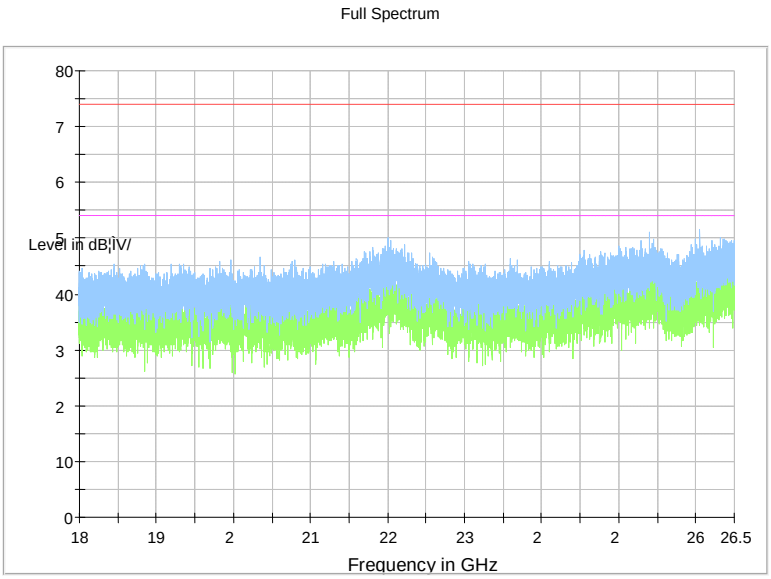
Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: π/4DQPSK



Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK

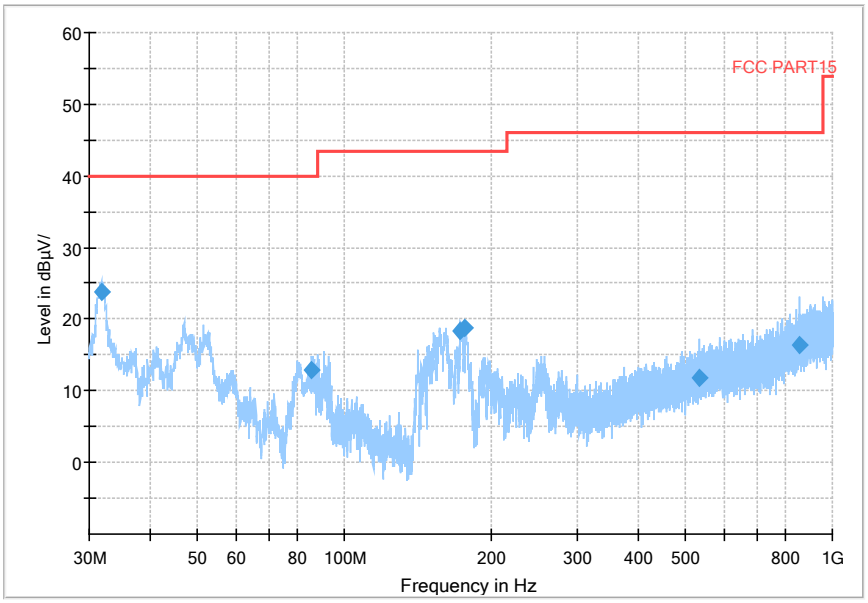


Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK



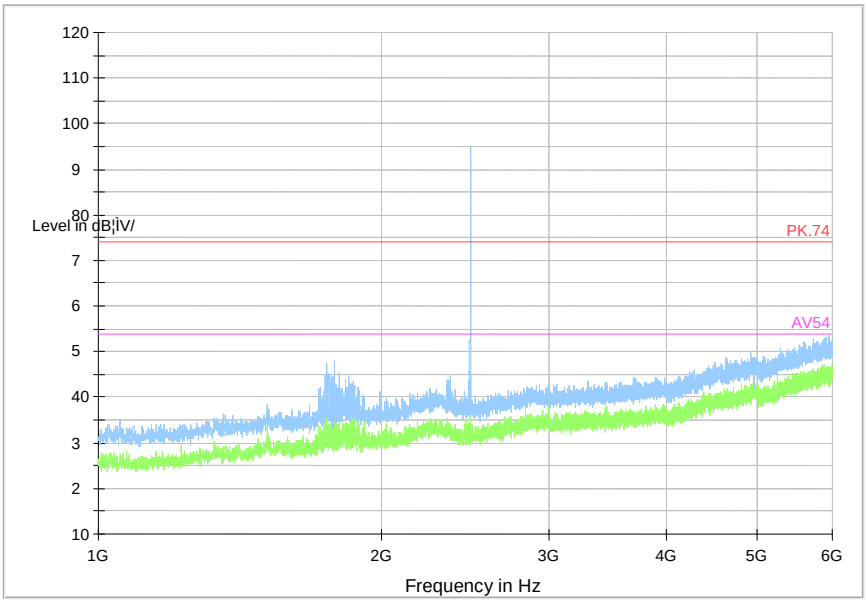
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: π/4DQPSK

Full Spectrum

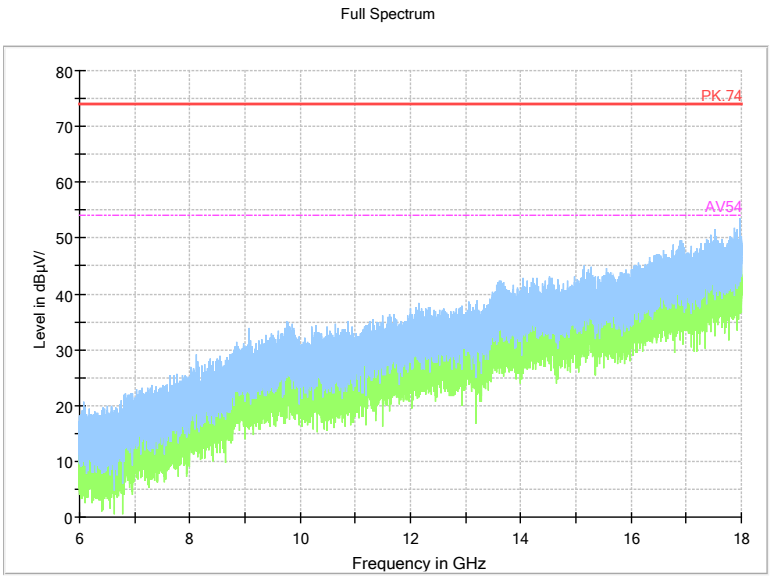


Frequency Range: 30MHz-1000 MHz
Detector: QP mode
Modulation type: 8DPSK

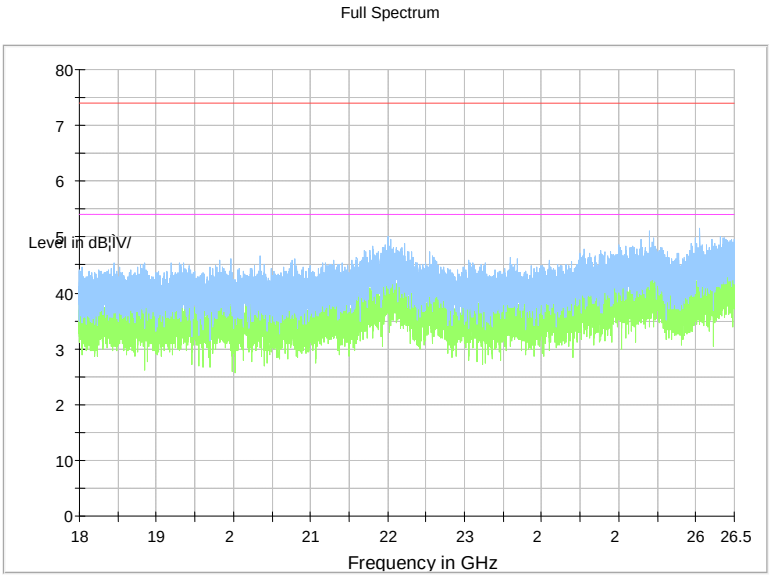
Full Spectrum



Frequency Range: 1GHz-6GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK



Frequency Range: 6GHz-18GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK



Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: 8DPSK

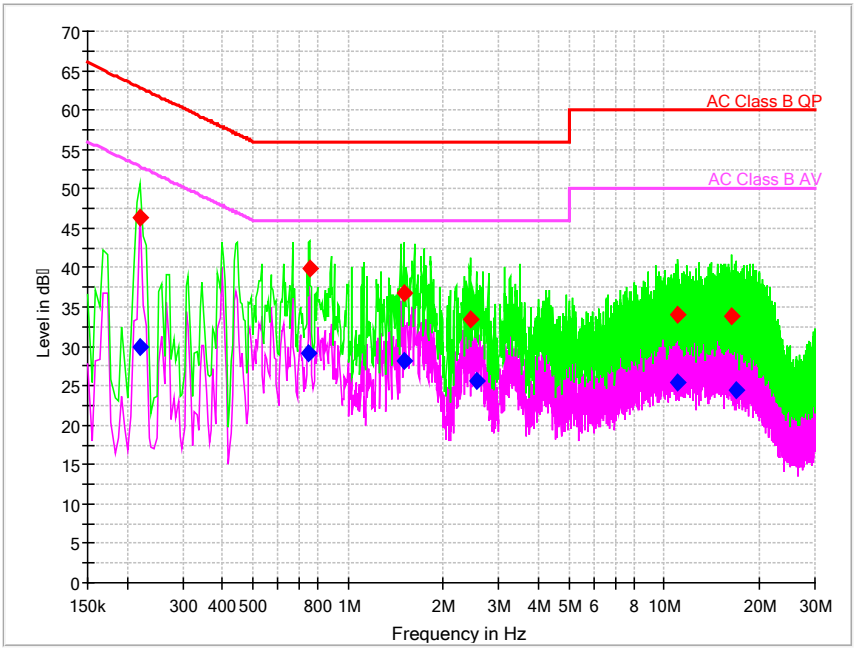
AC Power line Conducted Emission

A “reference path loss” Corr.(dB) is established and the L_{cable}+ATT+VDF is the attenuation of ” reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$P_{result}=P_{mea}$+ Corr.(dB)

Sample calculation: (35.95 dBμV) = (6.25 dBμV) + (29.7 dB), the corresponding frequency is 0.725679MHz.



L+N Line

MEASUREMENT RESULT:

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Pmea QuasiPeak	Pmea Average (dBμV)
0.219961	---	29.92	52.82	22.90	L1	29.6	---	0.32
0.219961	46.37	---	62.82	16.45	L1	29.6	16.77	---
0.751664	---	29.22	46.00	16.78	L1	29.6	---	-0.38
0.756328	39.95	---	56.00	16.05	L1	29.6	10.35	---
1.502578	---	28.09	46.00	17.91	L1	29.7	---	-1.61
1.502578	36.74	---	56.00	19.26	L1	29.7	7.04	---
2.435391	33.43	---	56.00	22.57	L1	29.7	3.73	---
2.542664	---	25.67	46.00	20.33	L1	29.7	---	-4.03
11.082562	34.06	---	60.00	25.94	L1	29.8	4.26	---
11.082562	---	25.37	50.00	24.63	L1	29.8	---	-4.43
16.427578	33.77	---	60.00	26.23	N	29.8	3.97	---
16.856672	---	24.51	50.00	25.49	N	29.8	---	-5.29

---End of Test Report---