

## Transmitter Power Spectral Density

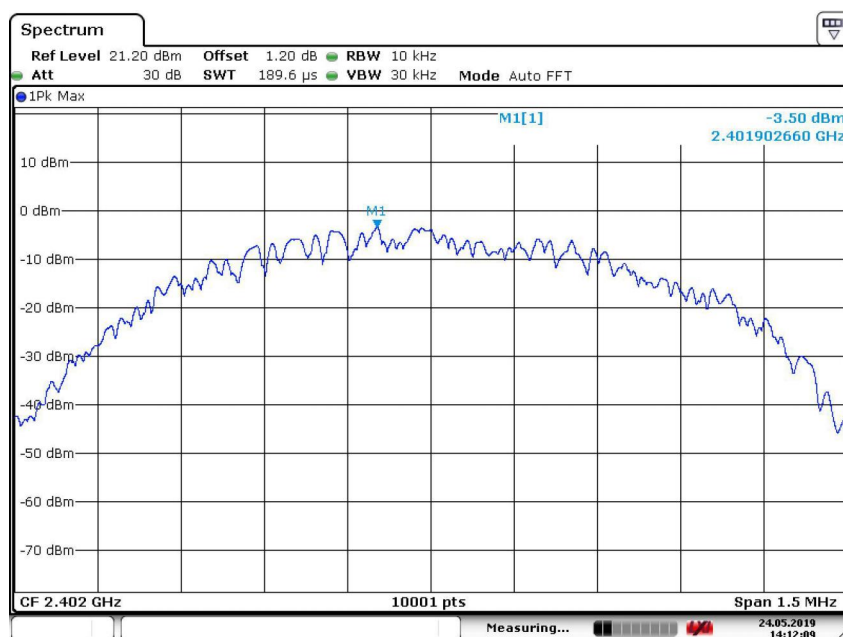
Offset 1.2dB = Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

Modulation type: GFSK (LE 1Mbps)

Carrier frequency (MHz)	Channel No	Power Density( dBm/10kHz)
2402	0	-3.50
2440	19	-3.18
2480	39	-5.84

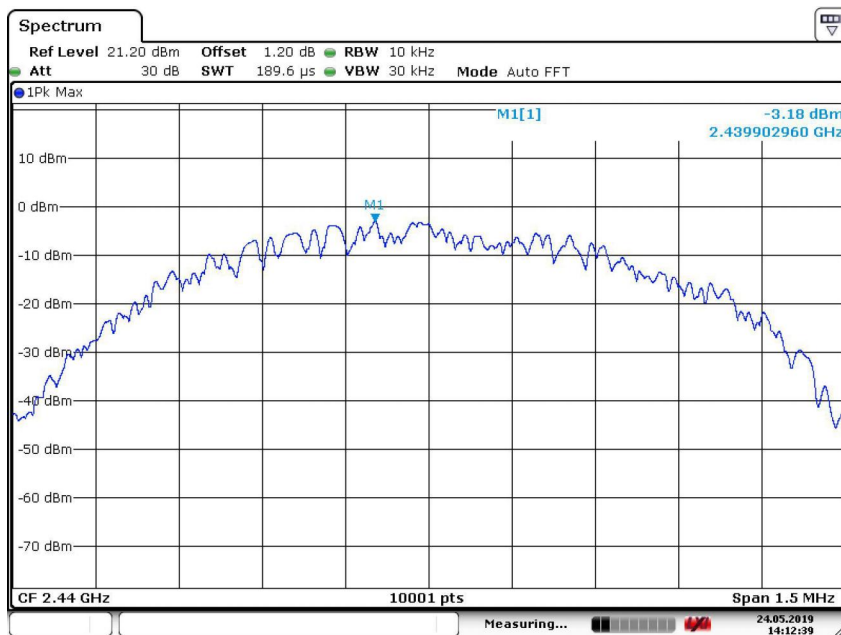
Modulation type: GFSK (LE 2Mbps)

Carrier frequency (MHz)	Channel No	Power Density( dBm/10kHz)
2402	0	-4.90
2440	19	-4.50
2480	39	-7.09

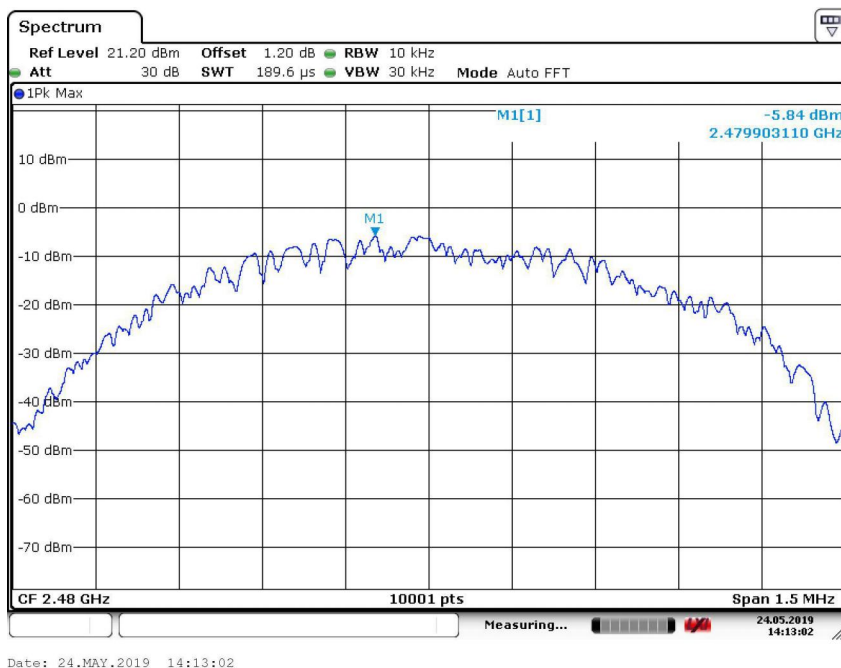


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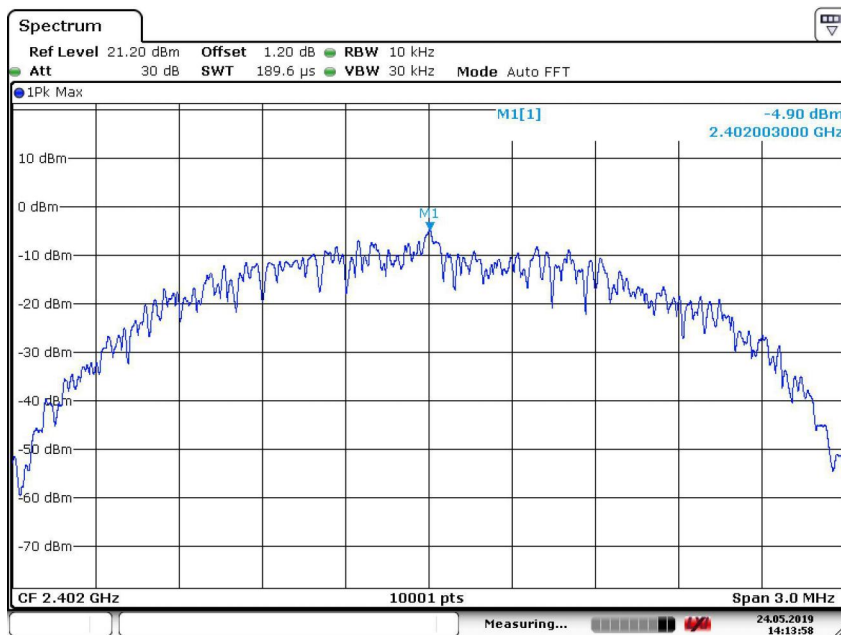
Carrier frequency (MHz): 2402  
Channel No.:0  
Modulation type: GFSK (LE 1Mbps)



Carrier frequency (MHz): 2440  
 Channel No.:19  
 Modulation type: GFSK (LE 1Mbps)

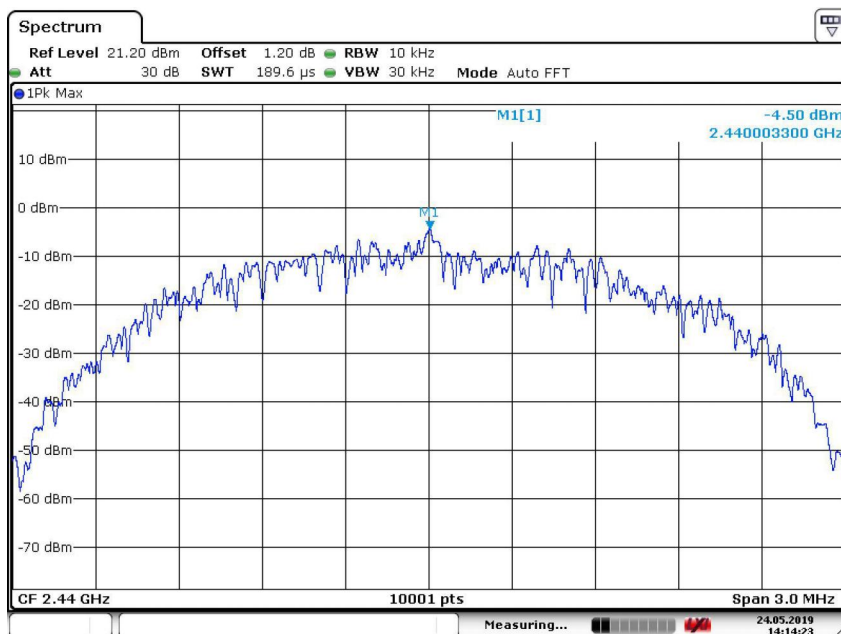


Carrier frequency (MHz): 2480  
 Channel No.:39  
 Modulation type: GFSK (LE 1Mbps)



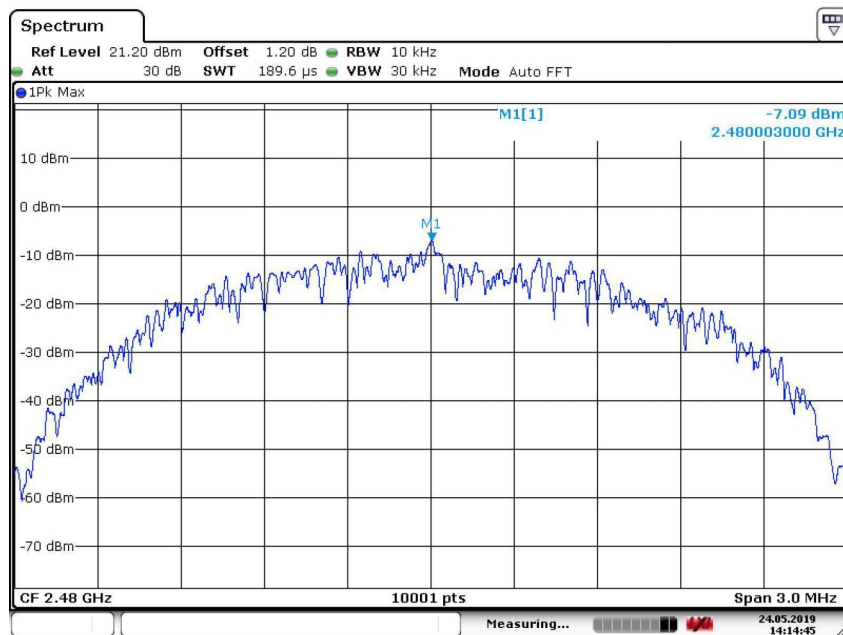
Date: 24.MAY.2019 14:13:57

Carrier frequency (MHz): 2402  
 Channel No.:0  
 Modulation type: GFSK (LE 2Mbps)



Date: 24.MAY.2019 14:14:22

Carrier frequency (MHz): 2440  
 Channel No.:19  
 Modulation type: GFSK (LE 2Mbps)



Date: 24.MAY.2019 14:14:45

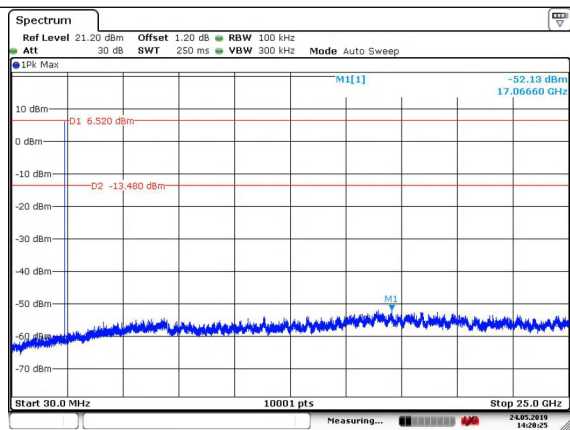
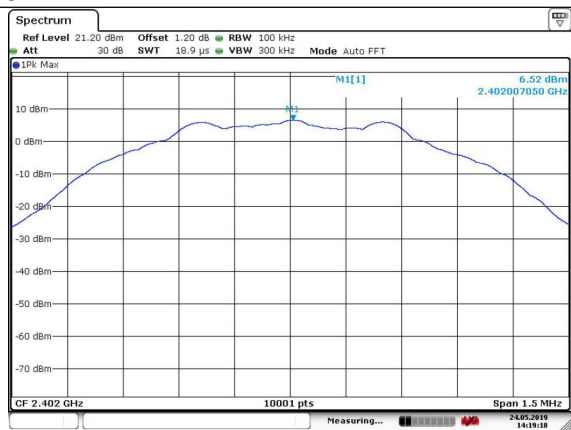
Carrier frequency (MHz): 2480  
Channel No.:39  
Modulation type: GFSK (LE 2Mbps)

### Conducted Out of band emission measurement

Offset 1.2dB = Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

Modulation type: GFSK (LE 1Mbps)

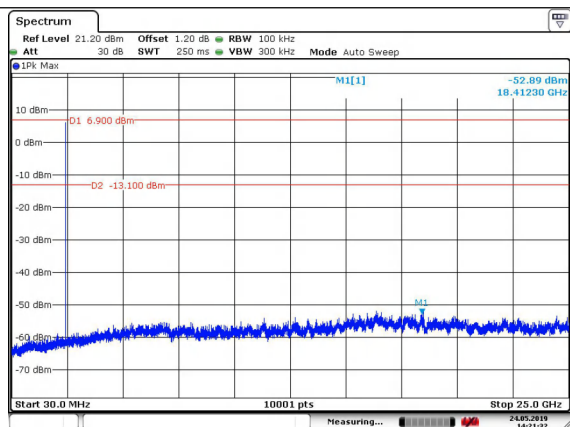
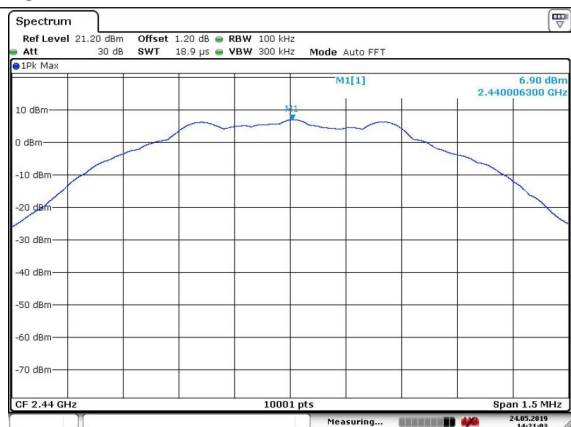
#### CH0



Date: 24.MAY.2019 14:19:18

Date: 24.MAY.2019 14:20:25

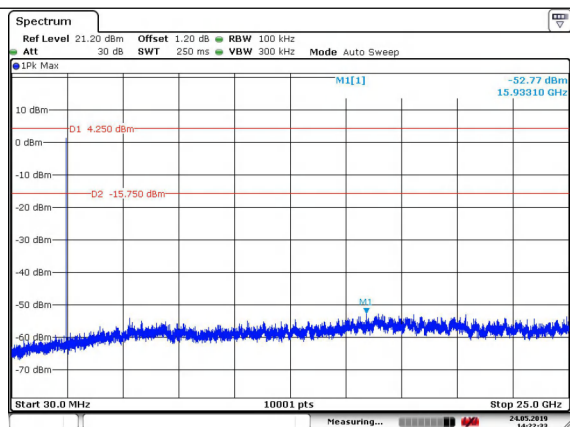
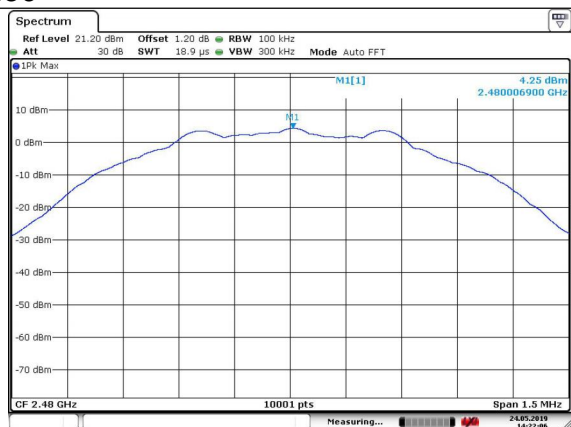
#### CH19



Date: 24.MAY.2019 14:21:03

Date: 24.MAY.2019 14:21:32

#### CH39

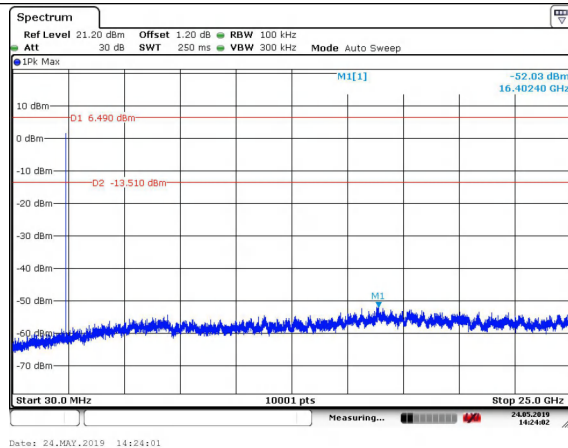
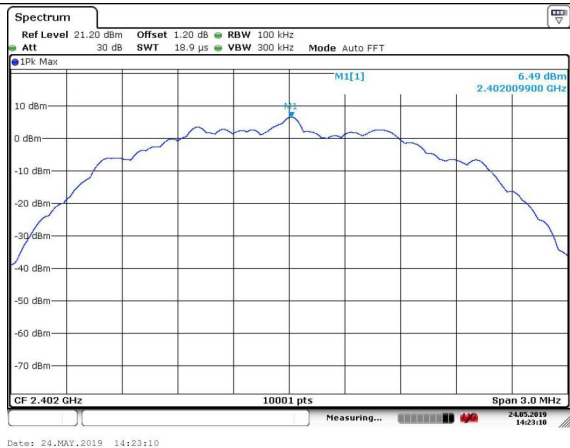


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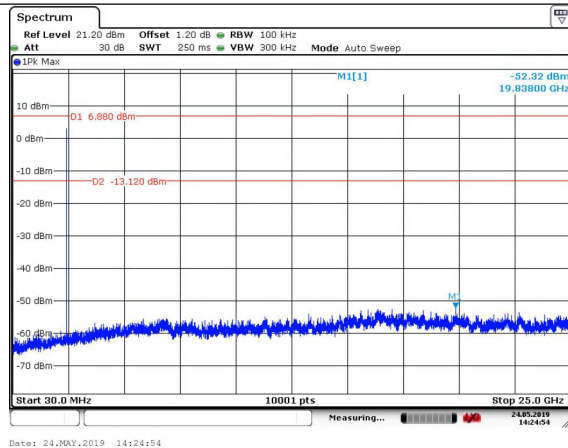
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Modulation type: GFSK (LE 2Mbps)

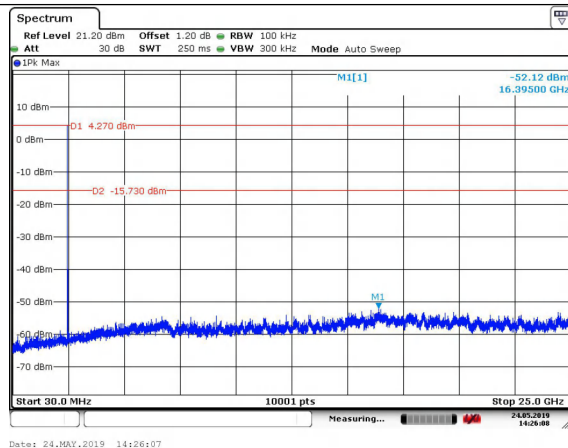
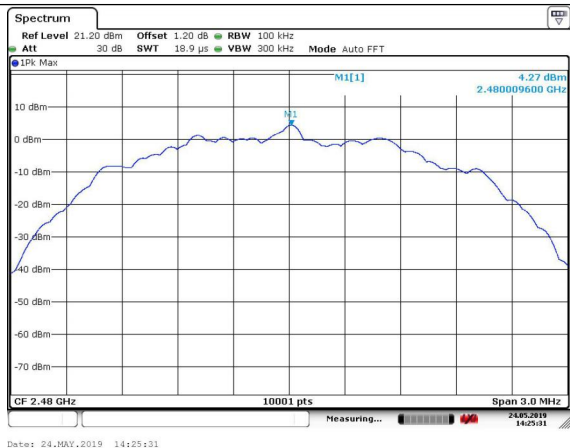
CH0



CH19



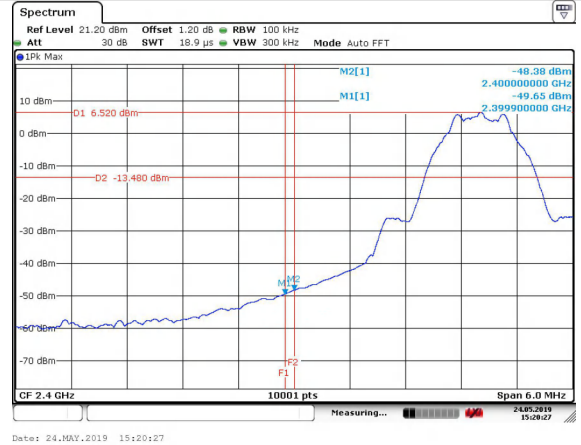
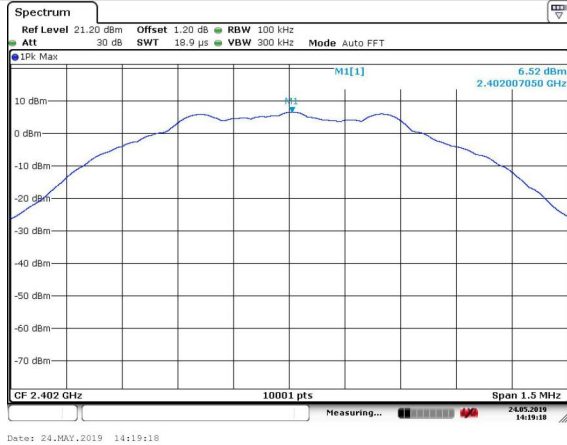
CH39



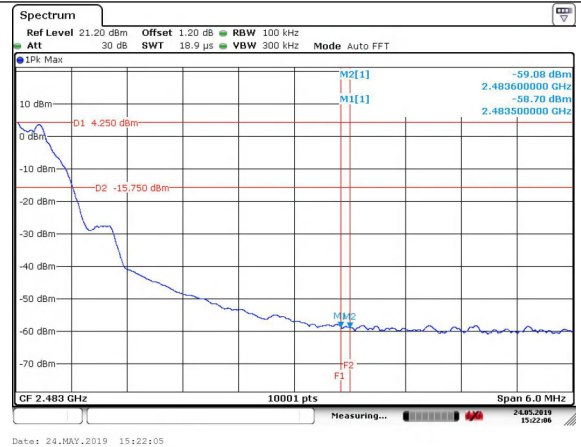
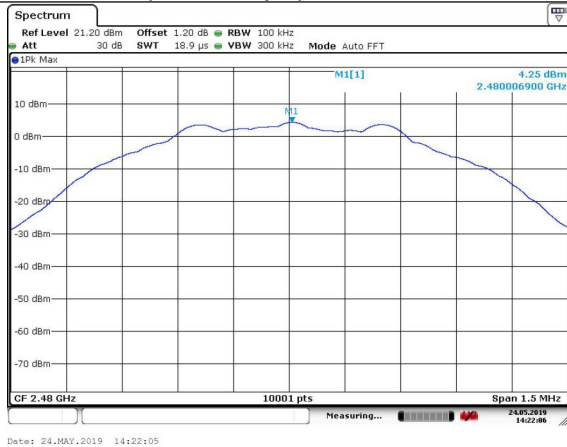
### Band edge measurement (RF Conducted measurement)

Offset 1.2dB = Temporary antenna connector loss 0.2dB+ Cable loss 1.0dB

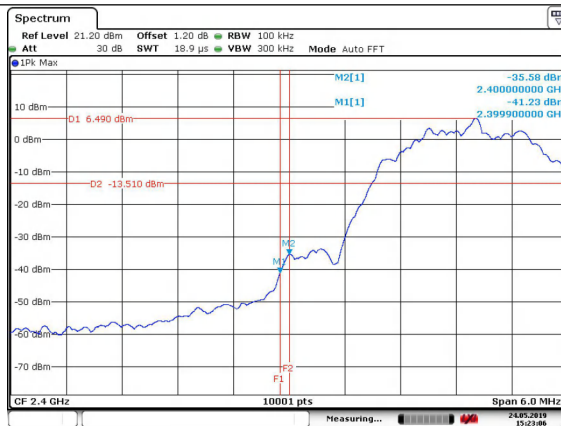
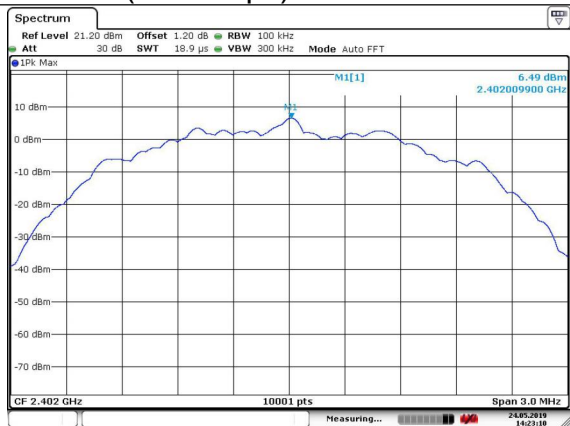
#### CH0 GFSK (LE 1Mbps)



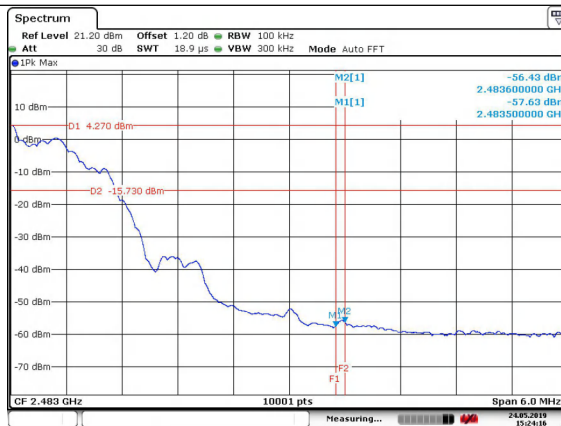
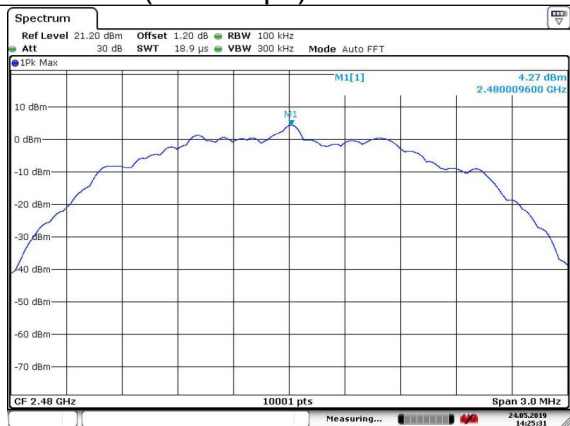
#### CH39 GFSK (LE 1Mbps)



### CH0 GFSK (LE 2Mbps)



### CH39 GFSK (LE 2Mbps)





## **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: (98.32 dBuV/m) = (64.32 dBμV) + (8.90 dB) + (25.10 dB), the corresponding frequency is 2402MHz.

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 1MHz)

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	99.71	65.71	N/A	N/A	8.90	25.10
2	2390	57.10	23.10	-16.90	74.00	8.90	25.10

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 1MHz)

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	96.40	62.40	N/A	N/A	8.90	25.10
2	2390	55.38	21.38	-18.62	74.00	8.90	25.10

Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 1MHz)

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	88.41	54.41	N/A	N/A	8.90	25.10
2	2390	37.44	3.44	-16.56	54.00	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE 1MHz)  
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	85.62	51.62	N/A	N/A	8.90	25.10
2	2390	40.36	6.36	-13.64	54.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 1MHz)  
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	98.39	64.39	N/A	N/A	8.90	25.10
2	2483.5	57.23	23.23	-16.77	74.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 1MHz)  
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	97.02	63.02	N/A	N/A	8.90	25.10
2	2483.5	55.25	21.25	-18.75	74.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 1MHz)  
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	88.17	54.17	N/A	N/A	8.90	25.10
2	2483.5	39.48	5.48	-14.52	54.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 1MHz)  
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	86.70	52.70	N/A	N/A	8.90	25.10
2	2483.5	40.02	6.02	-13.98	54.00	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE 2MHz)  
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	102.53	68.53	N/A	N/A	8.90	25.10
2	2390	54.36	20.36	-19.64	74.00	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE 2MHz)  
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	96.50	62.50	N/A	N/A	8.90	25.10
2	2390	57.39	23.39	-16.61	74.00	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE 2MHz)  
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	88.92	54.92	N/A	N/A	8.90	25.10
2	2390	40.42	6.42	-13.58	54.00	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode: GFSK (LE 2MHz)  
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	88.77	54.77	N/A	N/A	8.90	25.10
2	2390	40.31	6.31	-13.69	54.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 2MHz)  
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	101.70	67.70	N/A	N/A	8.90	25.10
2	2483.5	55.98	21.98	-18.02	74.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 2MHz)  
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	98.21	64.21	N/A	N/A	8.90	25.10
2	2483.5	56.99	22.99	-17.01	74.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 2MHz)  
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	89.66	55.66	N/A	N/A	8.90	25.10
2	2483.5	37.80	3.80	-16.20	54.00	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:39  
Test Mode: GFSK (LE 2MHz)  
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	88.10	54.10	N/A	N/A	8.90	25.10
2	2483.5	41.72	7.72	-12.28	54.00	8.90	25.10

### 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:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation:  $(24.13 \text{ dB}\mu\text{V/m}) = (37.93 \text{ dBuV}) + (-13.8 \text{ dB/m})$ , the corresponding frequency is 30.121250MHz.

The worst case attitude: The eut lay down.

For GFSK (LE 1MHz)  
Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30	25.51	-21.7	47.21	Vertical	40.00
42.044167	30.41	-18.1	48.51	Vertical	40.00
45.075417	33.67	-17.6	51.27	Vertical	40.00
69.810417	20.1	-21.8	41.9	Vertical	40.00
83.95625	17.84	-23.5	41.34	Vertical	40.00
86.057917	16.02	-22.8	38.82	Vertical	40.00

Channel No.:19

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.080833	25.16	-21.7	46.86	Vertical	40.00
41.720833	30.25	-18.2	48.45	Vertical	40.00
45.317917	33.61	-17.5	51.11	Vertical	40.00
70.335833	20.14	-22	42.14	Vertical	40.00
78.338333	18.17	-24.4	42.57	Vertical	40.00
84.158333	18.03	-23.4	41.43	Vertical	40.00

Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.202083	24.81	-21.7	46.51	Vertical	40.00
30.889167	24.39	-21.5	45.89	Vertical	40.00
42.3675	30.63	-18.1	48.73	Vertical	40.00
44.954167	33.64	-17.6	51.24	Vertical	40.00
70.214583	20.19	-22	42.19	Vertical	40.00
84.158333	18.04	-23.4	41.44	Vertical	40.00

For GFSK (LE 2MHz)

Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
42.569583	31.12	-18	49.12	Vertical	40.00
43.58	32.14	-17.8	49.94	Vertical	40.00
53.926667	23.58	-17.8	41.38	Vertical	40.00
55.09875	23.82	-17.9	41.72	Vertical	40.00
55.300833	23.84	-18	41.84	Vertical	40.00
55.58375	23.78	-18	41.78	Vertical	40.00

Channel No.:19

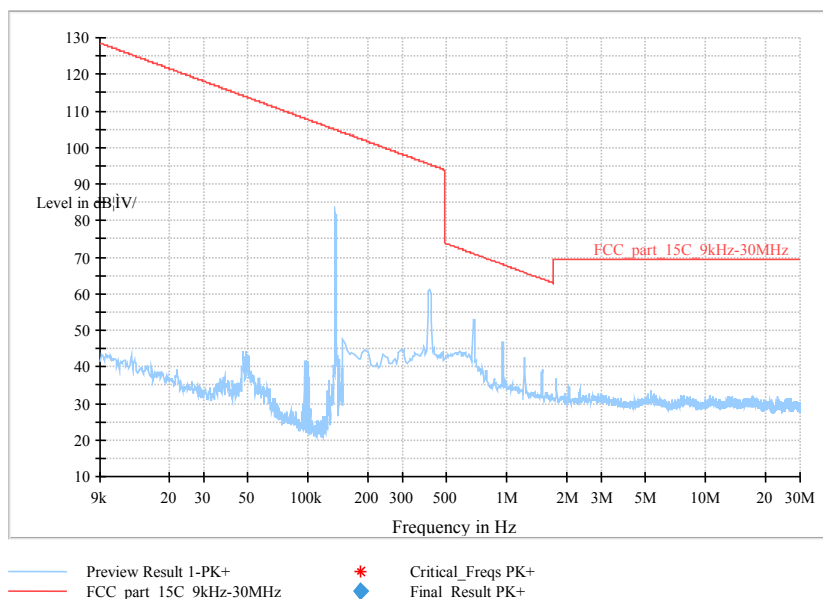
Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.161667	25.26	-21.7	46.96	Vertical	40.00
41.720833	30.09	-18.2	48.29	Vertical	40.00
44.873333	33.33	-17.6	50.93	Vertical	40.00
70.4975	20.25	-22.1	42.35	Vertical	40.00
84.239167	18.19	-23.4	41.59	Vertical	40.00
86.219583	15.5	-22.7	38.2	Vertical	40.00

Channel No.:39

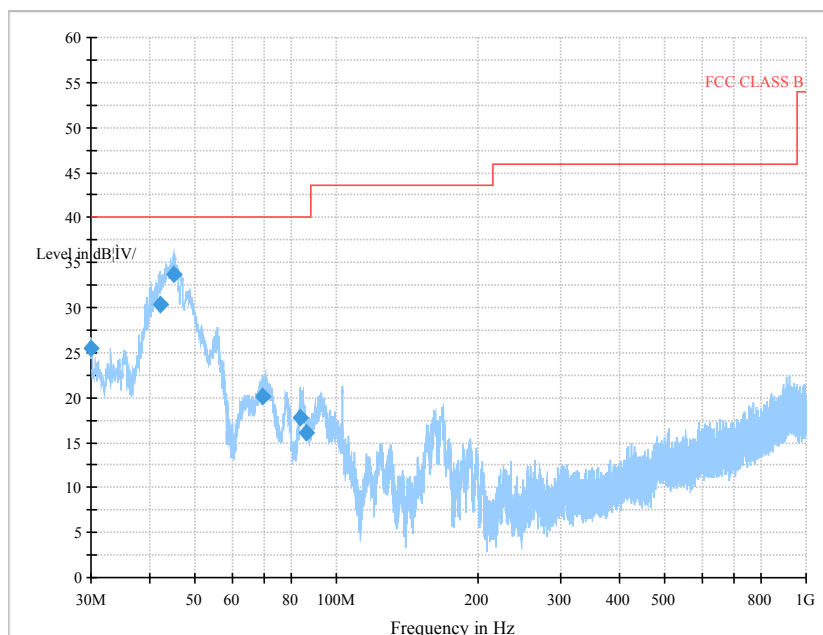
Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.202083	25.15	-21.7	46.85	Vertical	40.00
42.205833	30.74	-18.1	48.84	Vertical	40.00
45.035	33.7	-17.6	51.3	Vertical	40.00
57.483333	20.03	-18.4	38.43	Vertical	40.00
70.052917	20.41	-21.9	42.31	Vertical	40.00
78.37875	18.18	-24.4	42.58	Vertical	40.00

Channel No.:0

Full Spectrum

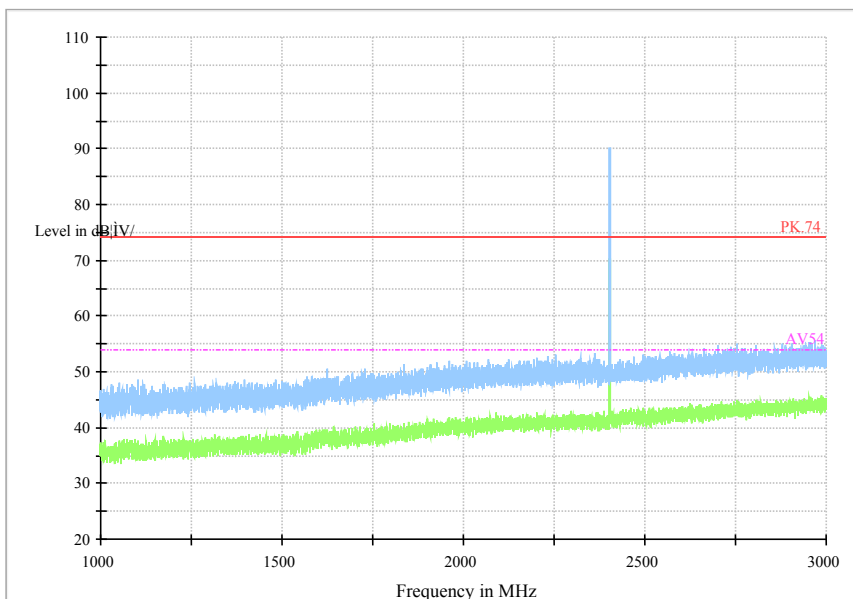


Frequency Range: 9kHz-30MHz  
Detector: PK mode  
Modulation type: GFSK (LE 1MHz)



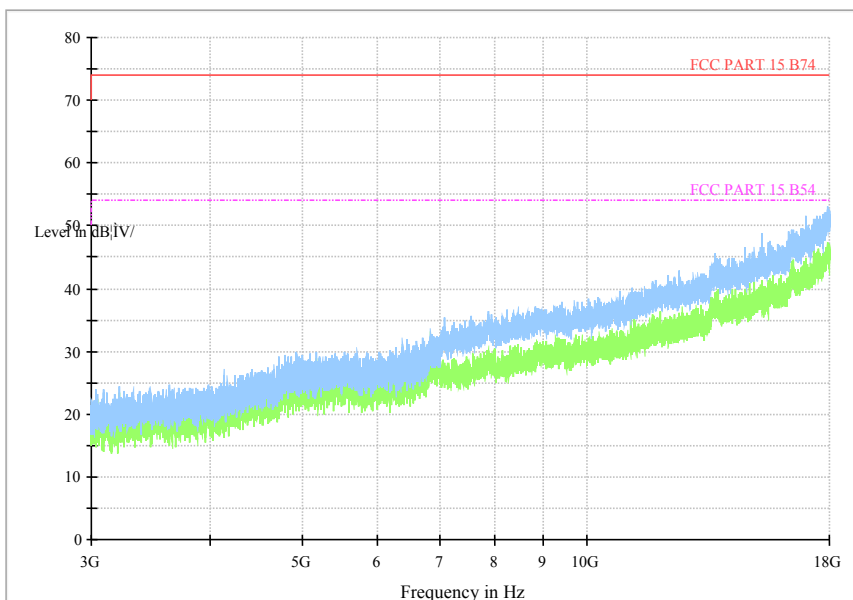
Frequency Range: 30MHz-1000 MHz  
Detector: QP mode  
Modulation type: GFSK (LE 1MHz)

Full Spectrum



Frequency Range: 1GHz-3GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

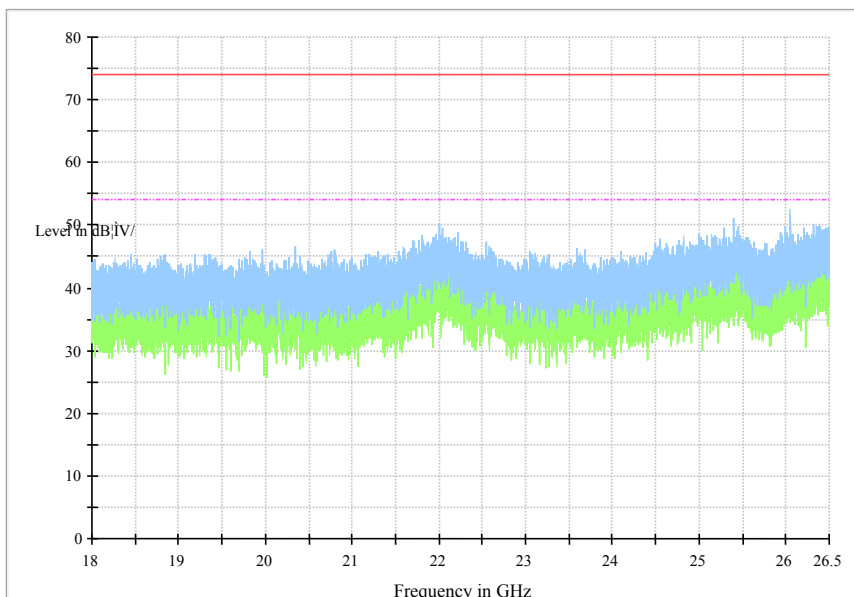
Full Spectrum



Frequency Range: 3GHz-18GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)



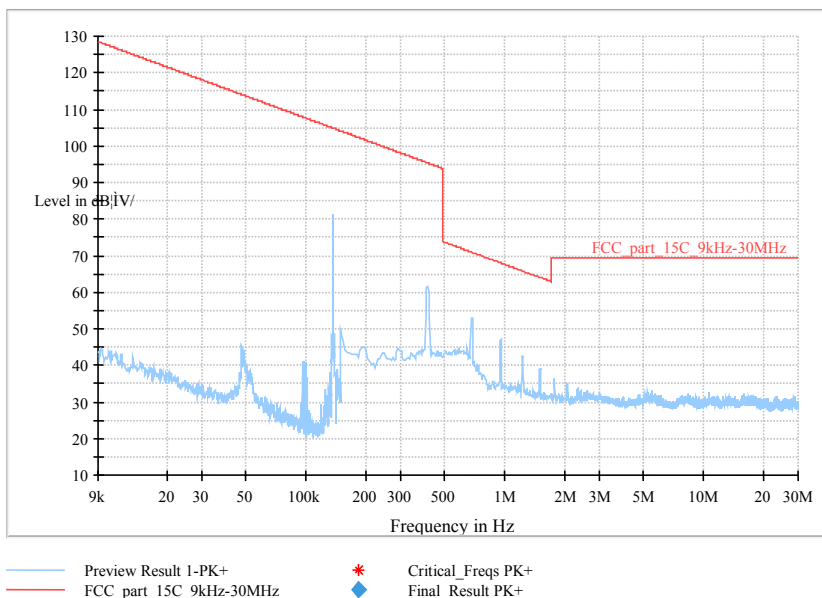
Full Spectrum



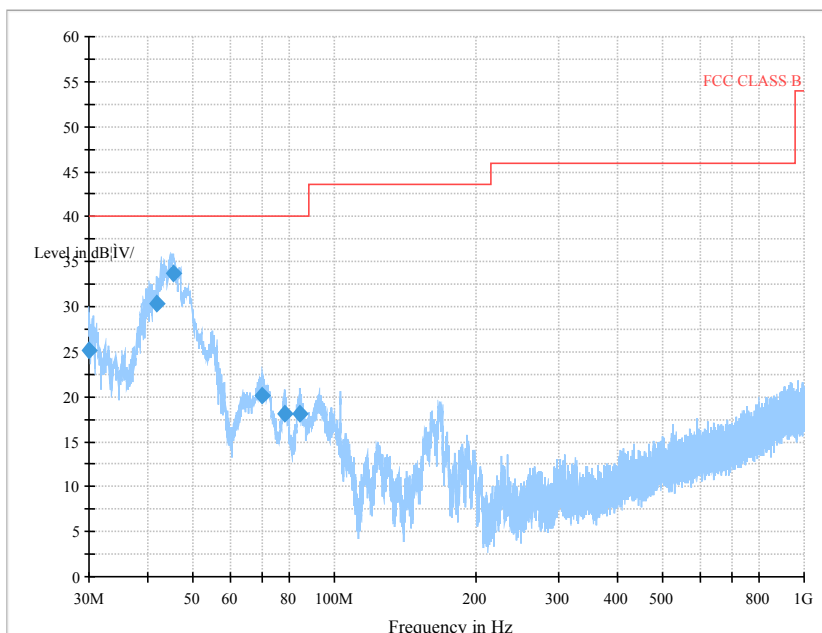
Frequency Range: 18GHz-25GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

Channel No.:19

Full Spectrum

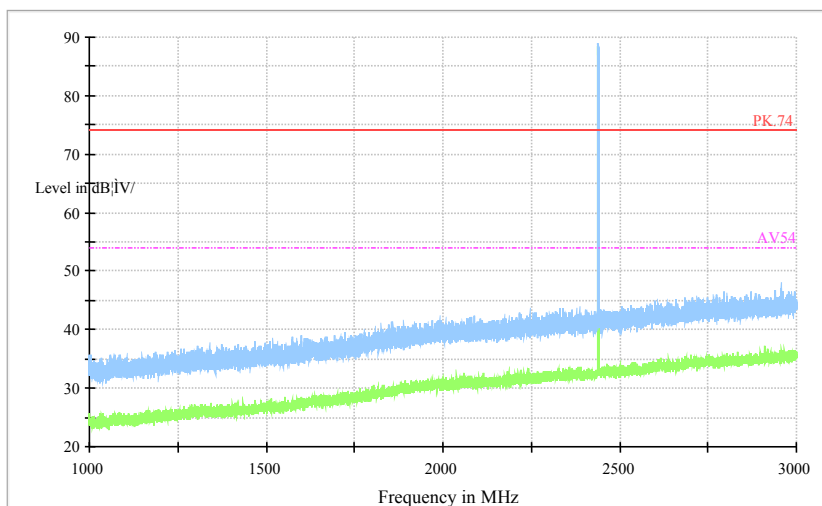


Frequency Range: 9kHz-30MHz  
 Detector: PK mode  
 Modulation type: GFSK (LE 1MHz)



Frequency Range: 30MHz-1000 MHz  
 Detector: QP mode  
 Modulation type: GFSK (LE 1MHz)

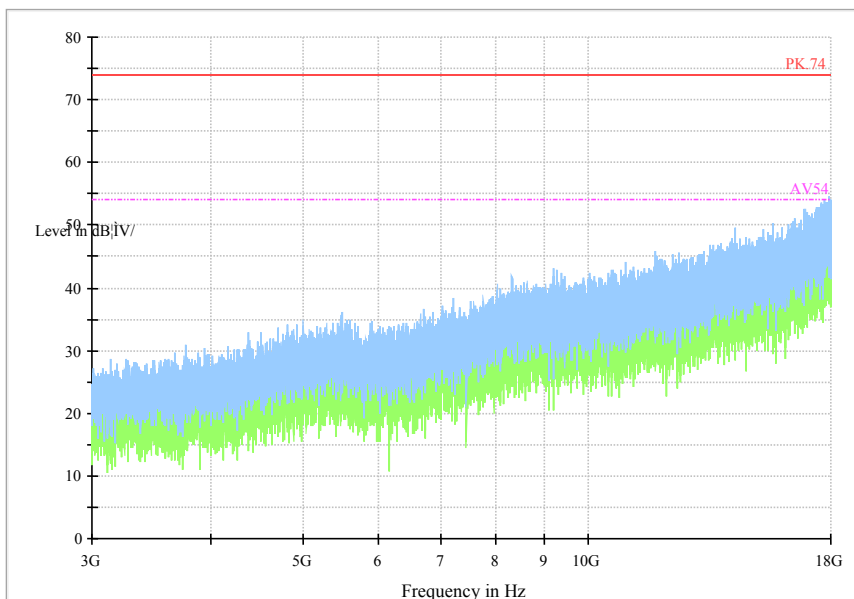
Full Spectrum



Comment

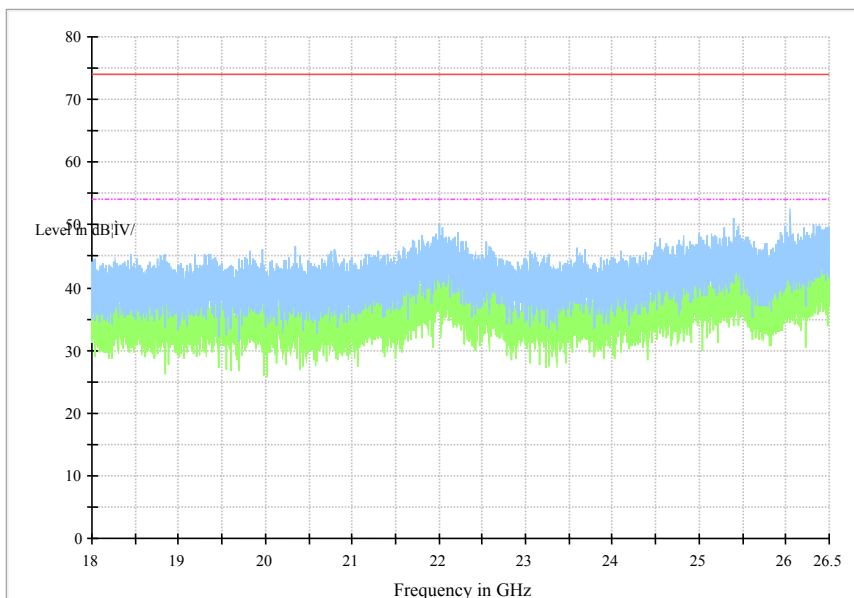
Frequency Range: 1GHz-3GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

Full Spectrum



Frequency Range: 3GHz-18GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

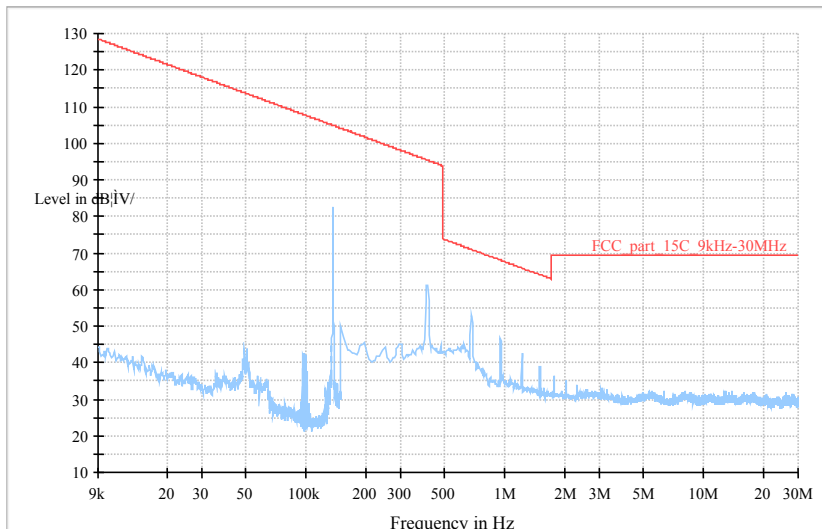
Full Spectrum



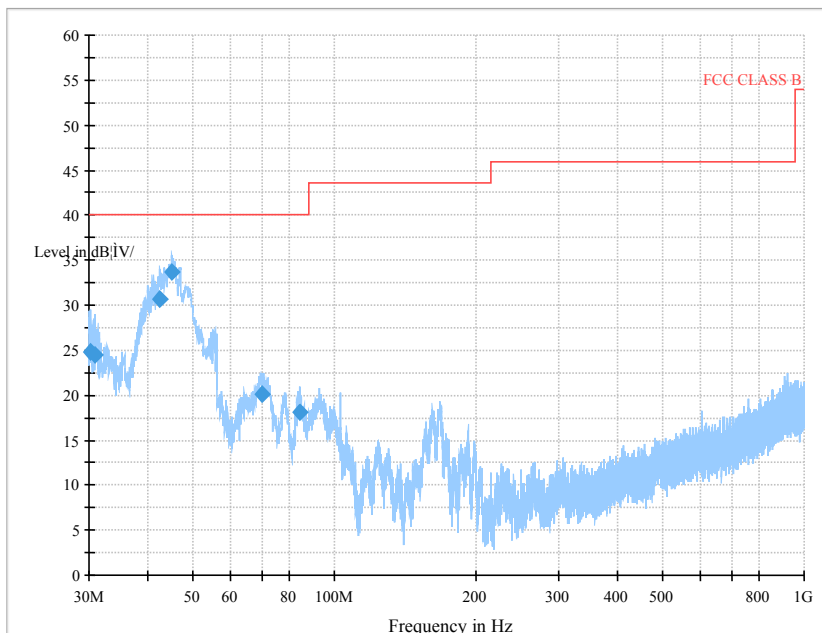
Frequency Range: 18GHz-25GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

Channel No.:39

Full Spectrum

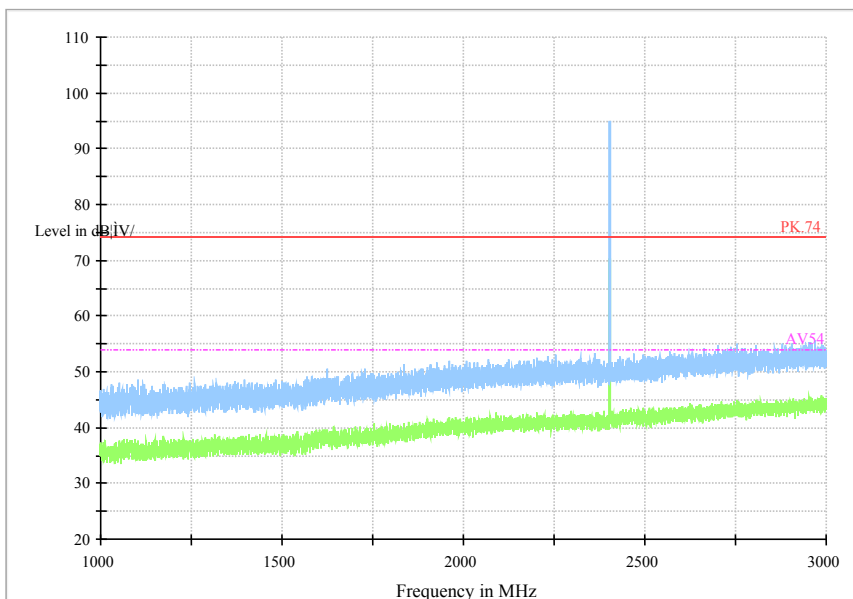


Frequency Range: 9kHz-30MHz  
 Detector: PK mode  
 Modulation type: GFSK (LE 1MHz)



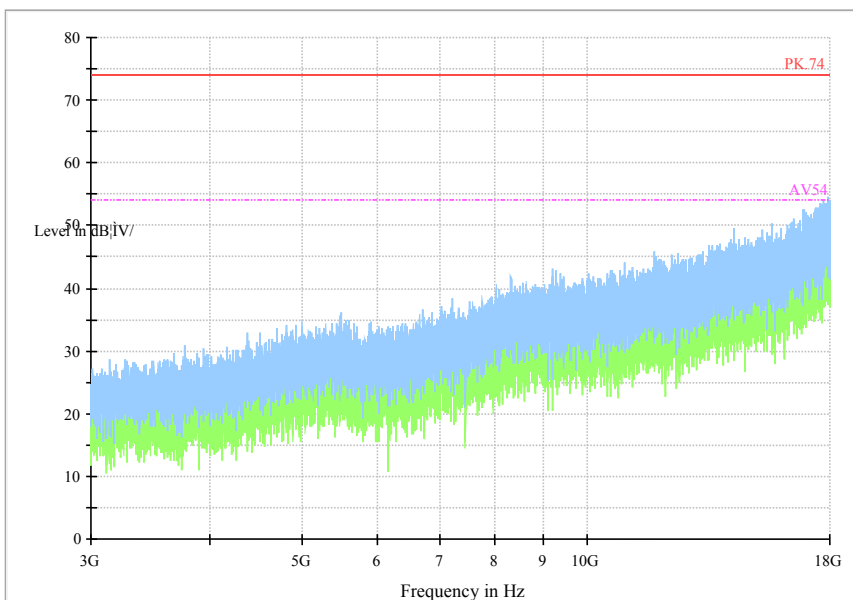
Frequency Range: 30MHz-1000 MHz  
 Detector: QP mode  
 Modulation type: GFSK (LE 1MHz)

Full Spectrum



Frequency Range: 1GHz-3GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)

Full Spectrum



Frequency Range: 3GHz-18GHz  
 Detector: Av mode and PK mode  
 Modulation type: GFSK (LE 1MHz)