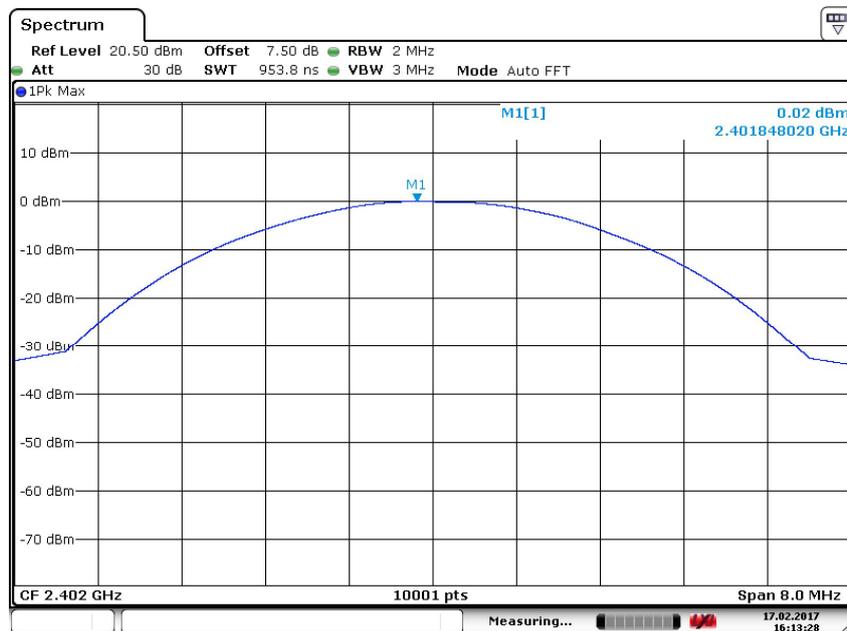


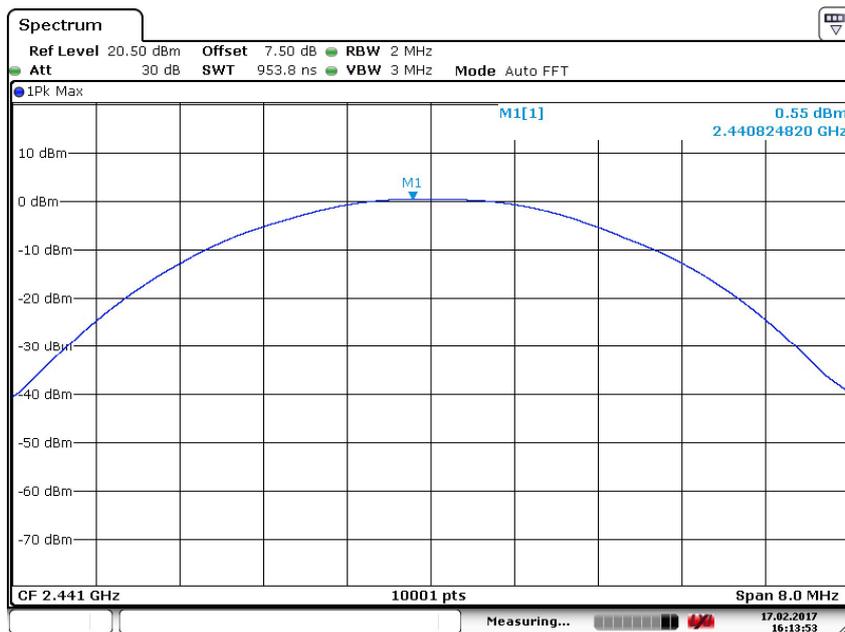
Date: 17.FEB.2017 16:12:20

Carrier frequency (MHz): 2480  
 Channel No.:78  
 Modulation type: GFSK



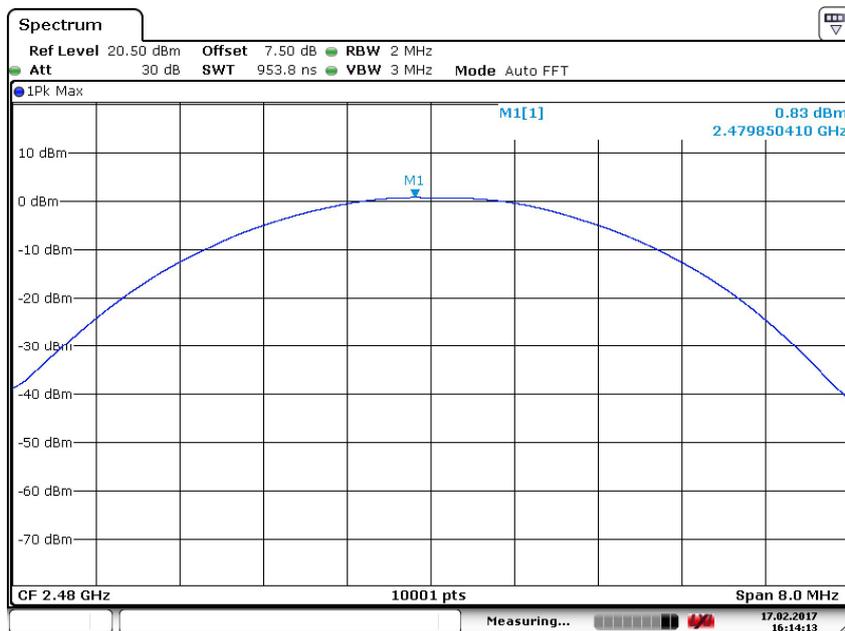
Date: 17.FEB.2017 16:13:28

Carrier frequency (MHz): 2402  
 Channel No.:0  
 Modulation type:  $\pi/4$ DQPSK



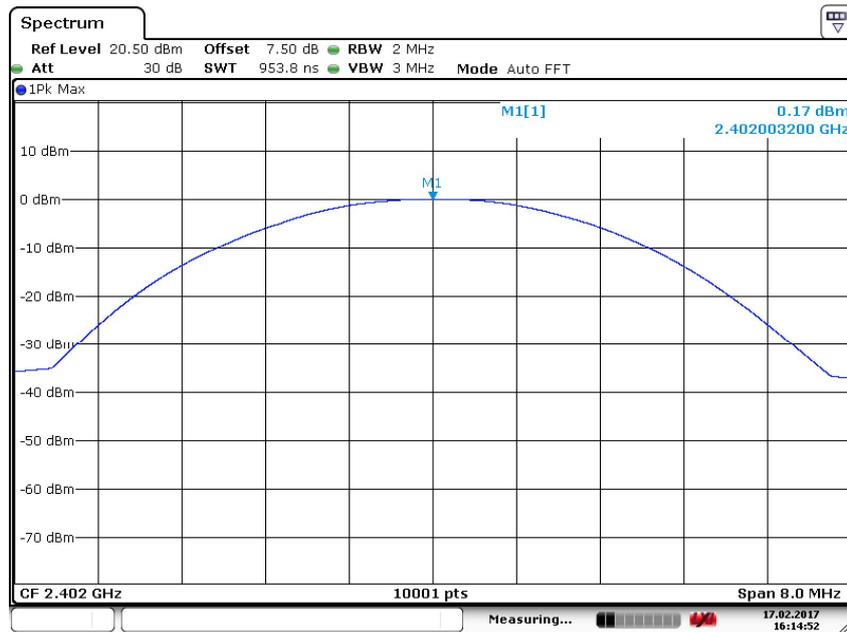
Date: 17.FEB.2017 16:13:53

Carrier frequency (MHz): 2441  
Channel No.:39  
Modulation type:  $\pi/4$ DQPSK



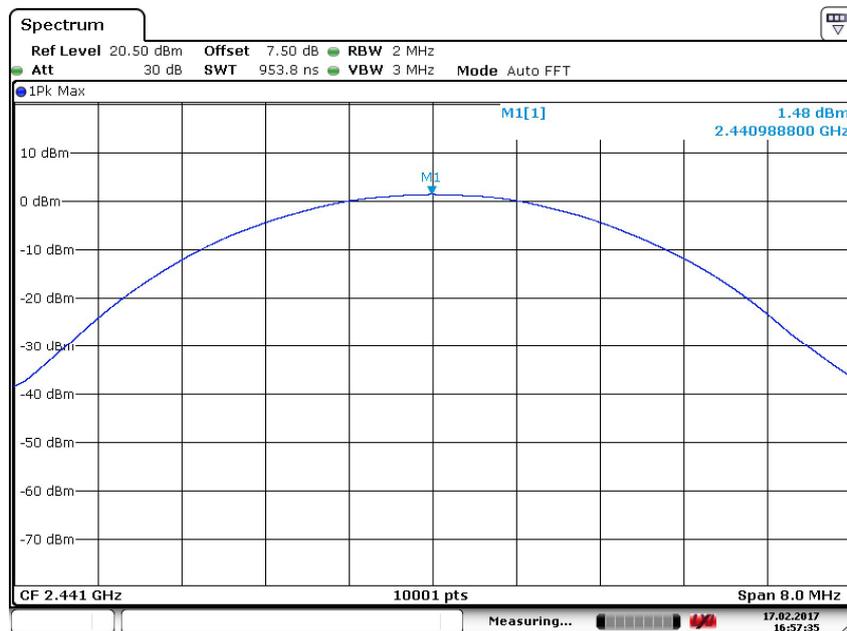
Date: 17.FEB.2017 16:14:13

Carrier frequency (MHz): 2480  
Channel No.:78  
Modulation type:  $\pi/4$ DQPSK



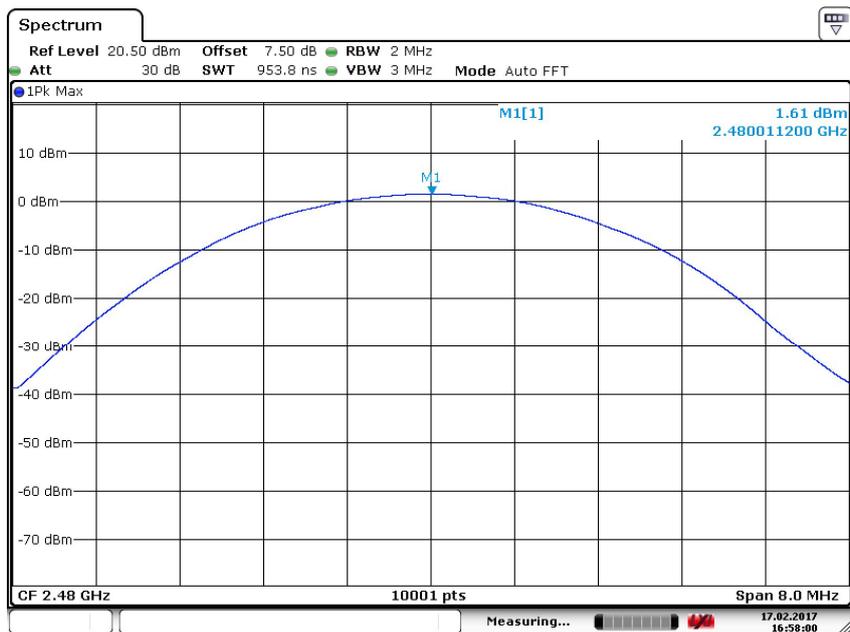
Date: 17.FEB.2017 16:14:52

Carrier frequency (MHz): 2402  
Channel No.:0  
Modulation type: 8DPSK



Date: 17.FEB.2017 16:57:35

Carrier frequency (MHz): 2441  
Channel No.:39  
Modulation type: 8DPSK



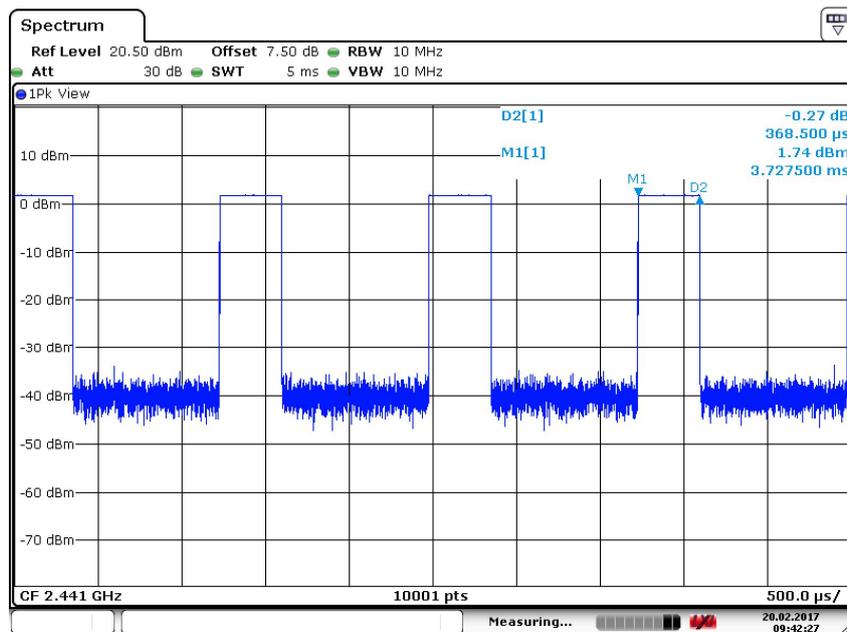
Date: 17.FEB.2017 16:58:00

Carrier frequency (MHz): 2480  
Channel No.:78  
Modulation type: 8DPSK

## Dwell Time

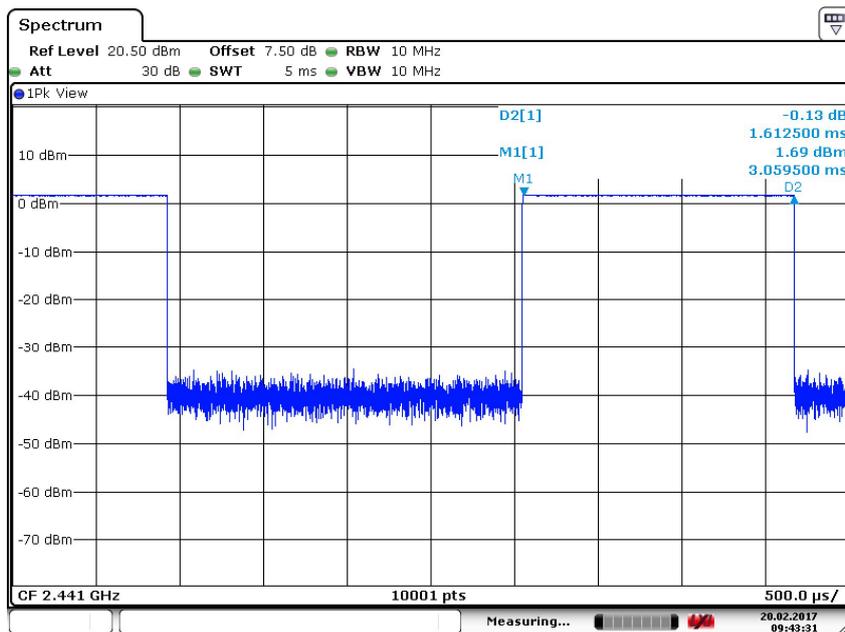
Modulation type: GFSK

Packet type	Time slot length μs	Dwell time	Dwell time ms
DH1	369	time slot length *31.6 *1600/2 /79	118
DH3	1613	time slot length * 31.6 *1600/4 /79	258
DH5	2864	time slot length * 31.6 *1600/6 /79	305



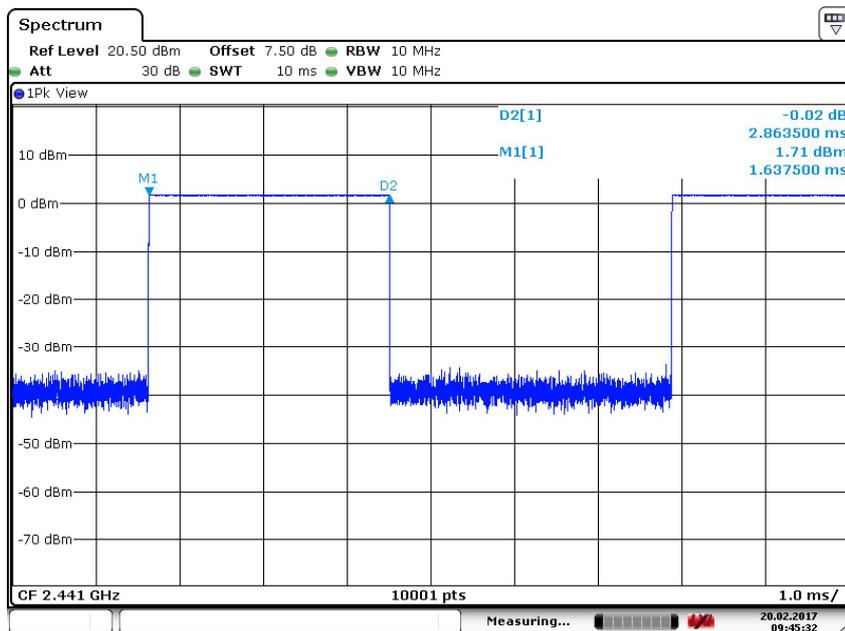
Date: 20.FEB.2017 09:42:27

Carrier frequency (MHz): 2441  
Packet type: DH1  
Modulation type: GFSK



Date: 20.FEB.2017 09:43:30

Carrier frequency (MHz): 2441  
Packet type: DH3  
Modulation type: GFSK

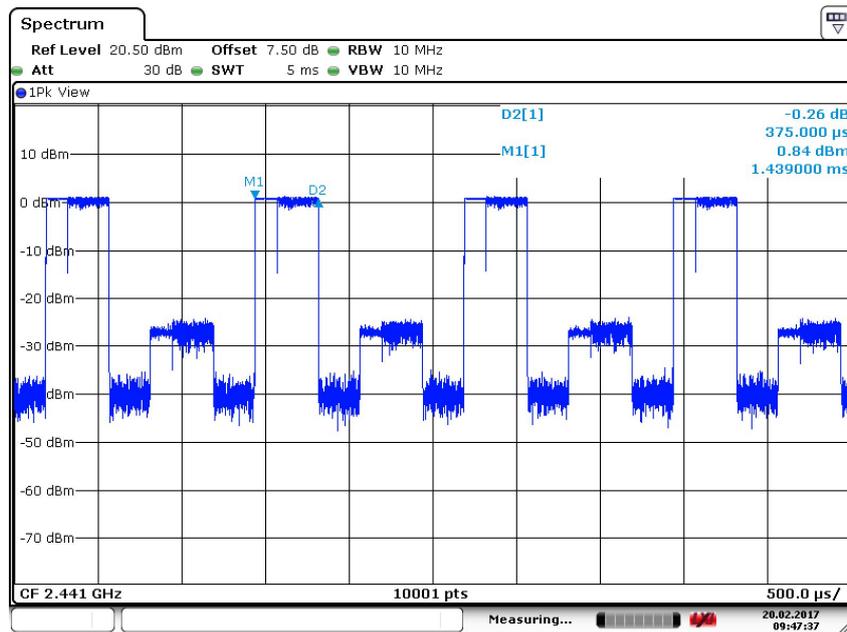


Date: 20.FEB.2017 09:45:32

Carrier frequency (MHz): 2441  
Packet type: DH5  
Modulation type: GFSK

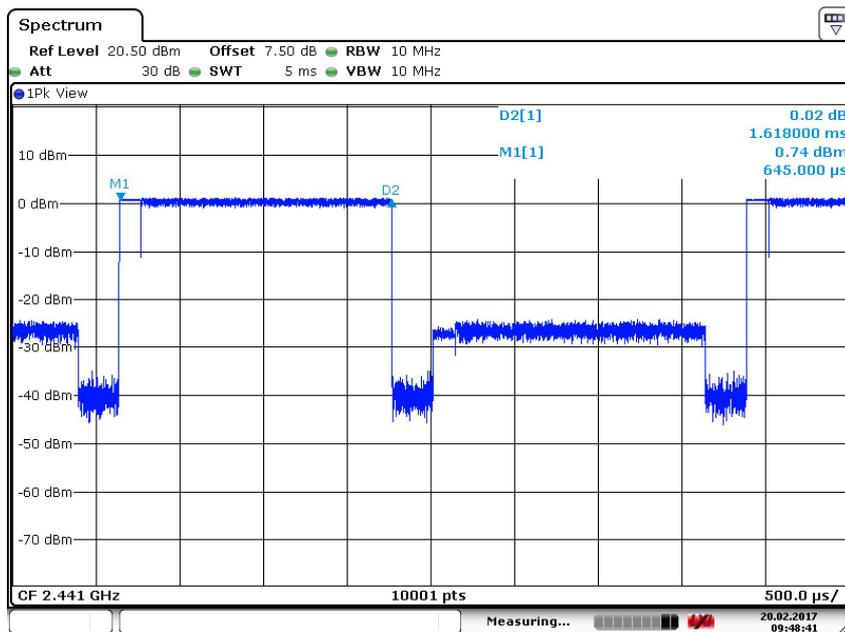
Modulation type:  $\pi/4$ DQPSK

Packet type	Time slot length $\mu$ s	Dwell time	Dwell time ms
DH1	375	time slot length *31.6 *1600/2 /79	120
DH3	1618	time slot length * 31.6 *1600/4 /79	259
DH5	2856	time slot length * 31.6 *1600/6 /79	305



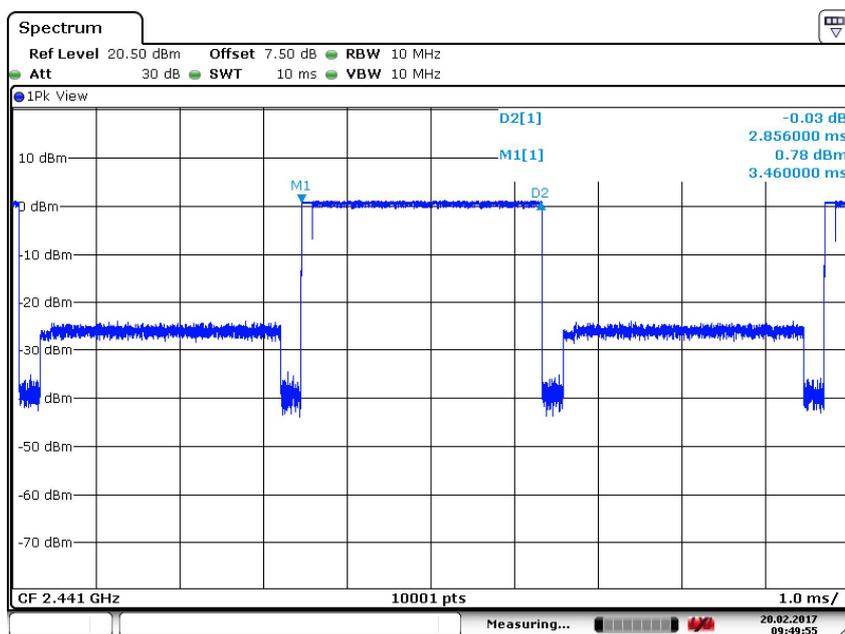
Date: 20.FEB.2017 09:47:37

Carrier frequency (MHz): 2441  
Packet type: DH1  
Modulation type:  $\pi/4$ DQPSK



Date: 20.FEB.2017 09:48:41

Carrier frequency (MHz): 2441  
Packet type: DH3  
Modulation type:  $\pi/4$ DQPSK

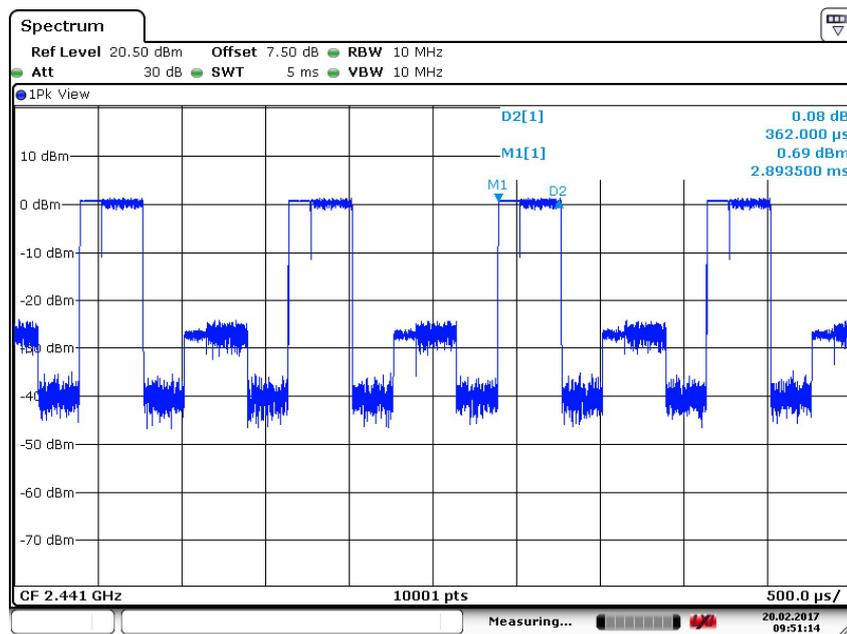


Date: 20.FEB.2017 09:49:55

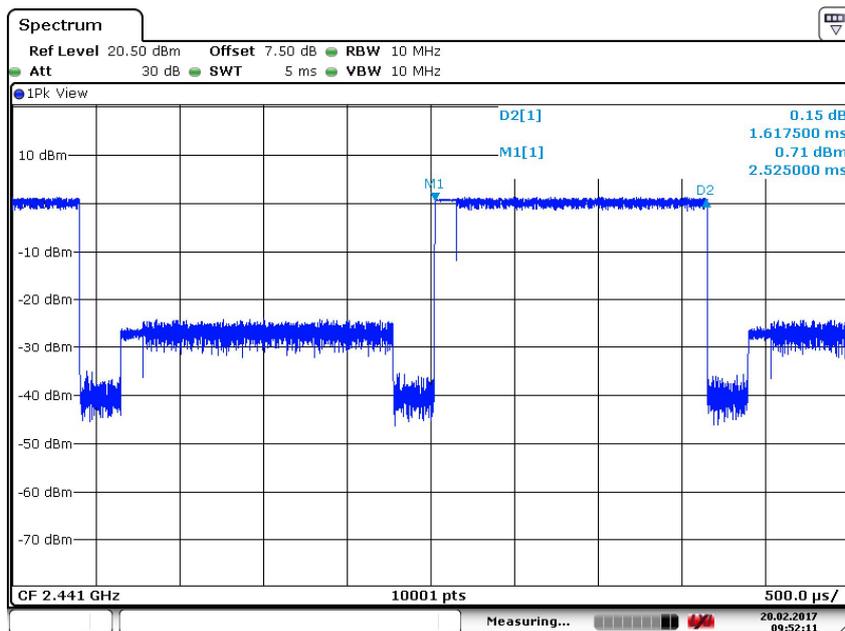
Carrier frequency (MHz): 2441  
Packet type: DH5  
Modulation type:  $\pi/4$ DQPSK

Modulation type: 8DPSK

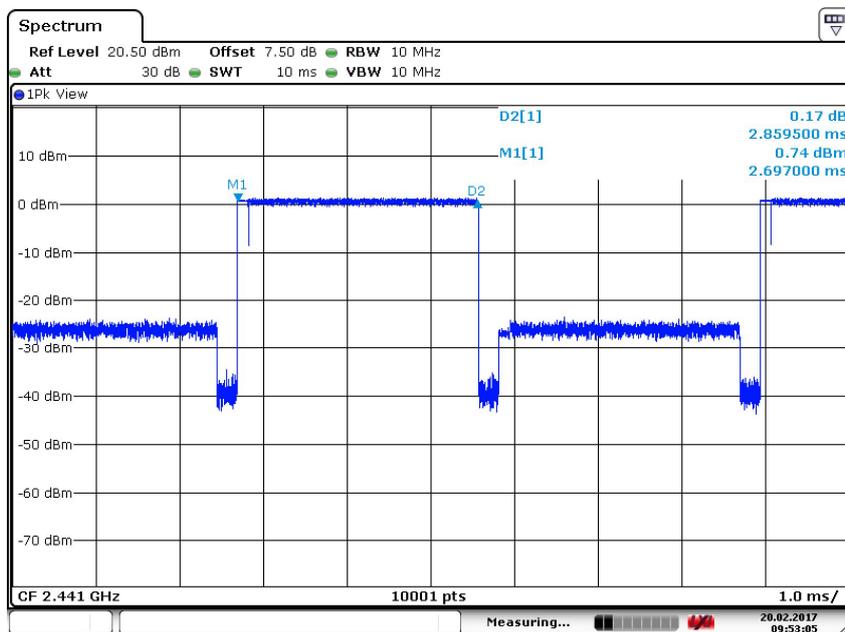
Packet type	Time slot length $\mu$ s	Dwell time	Dwell time ms
DH1	362	time slot length *31.6 *1600/2 /79	116
DH3	1618	time slot length * 31.6 *1600/4 /79	259
DH5	2860	time slot length * 31.6 *1600/6 /79	305



Carrier frequency (MHz): 2441  
Packet type:DH1  
Modulation type: 8DPSK



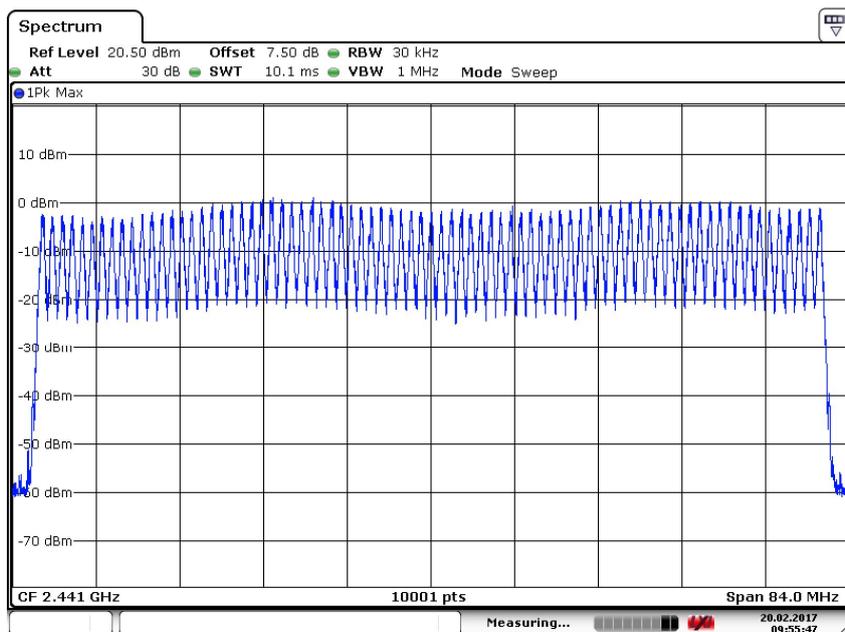
Carrier frequency (MHz): 2441  
 Packet type:DH3  
 Modulation type: 8DPSK



Carrier frequency (MHz): 2441  
 Packet type:DH5  
 Modulation type: 8DPSK

## Number of Hopping Frequencies

Op-mode	Result
Hopping mode	79



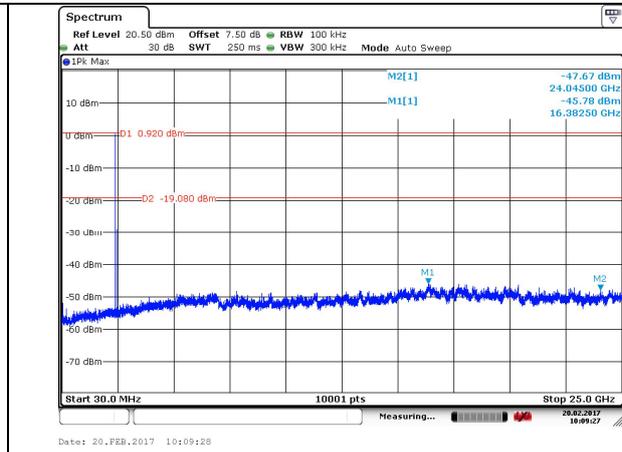
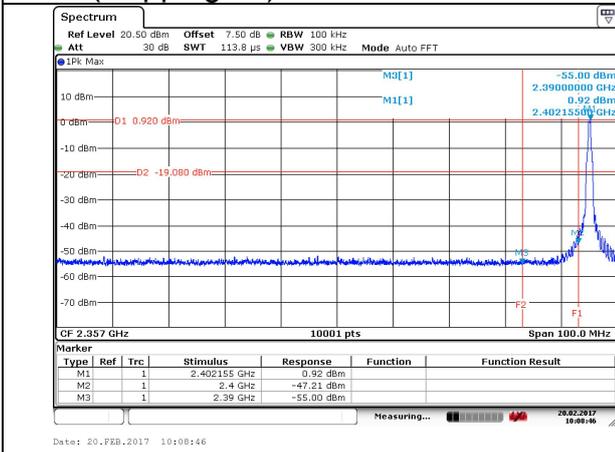
Date: 20.FEB.2017 09:55:48

Op-mode: Hopping mode

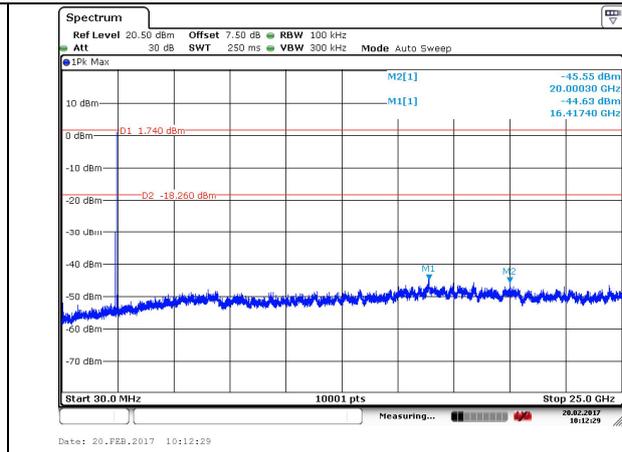
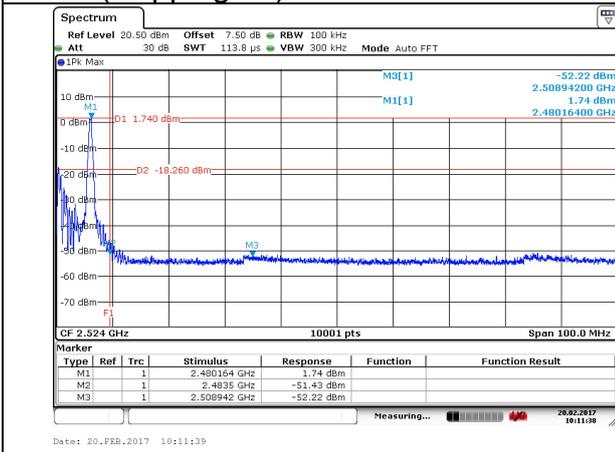
## Conducted out of band emission measurement

### GFSK

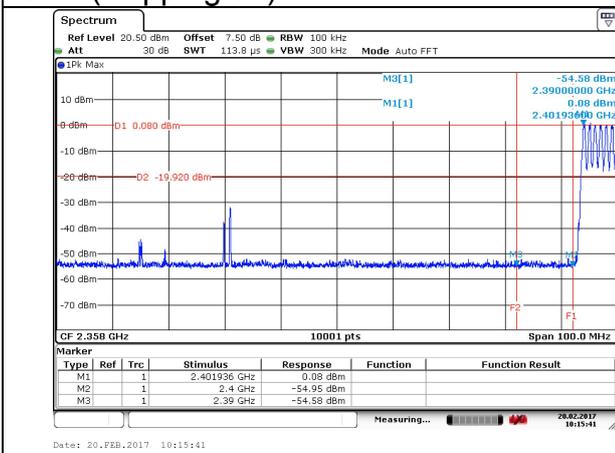
#### CH0 (Hopping off)



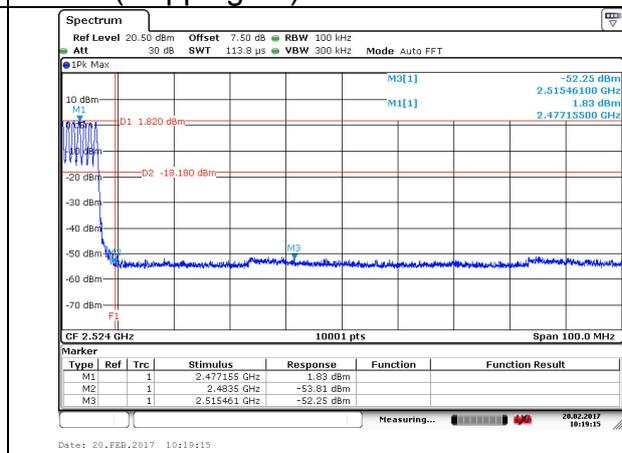
#### CH78(Hopping off)



#### CH0 (Hopping on)

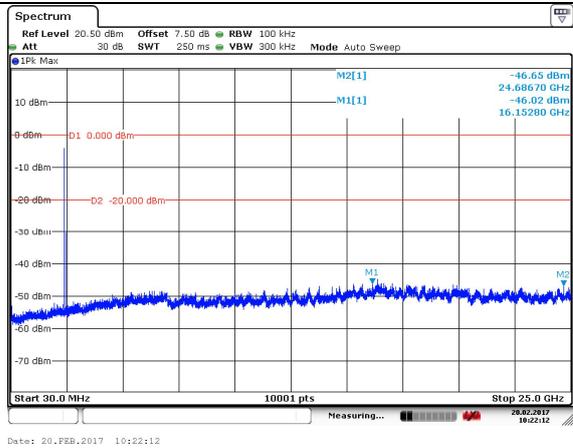
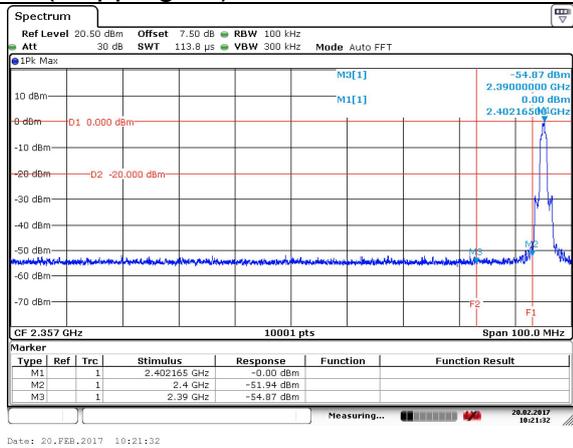


#### CH78 (Hopping on)

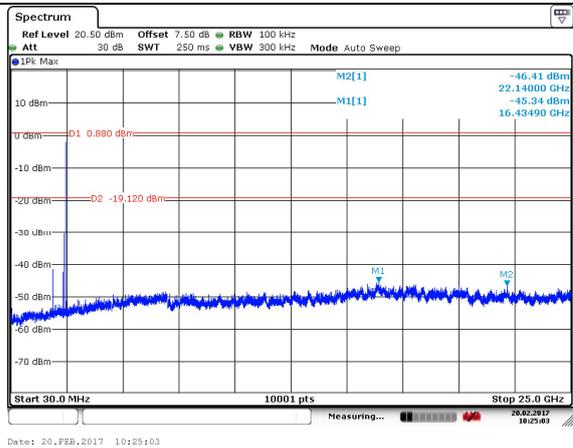
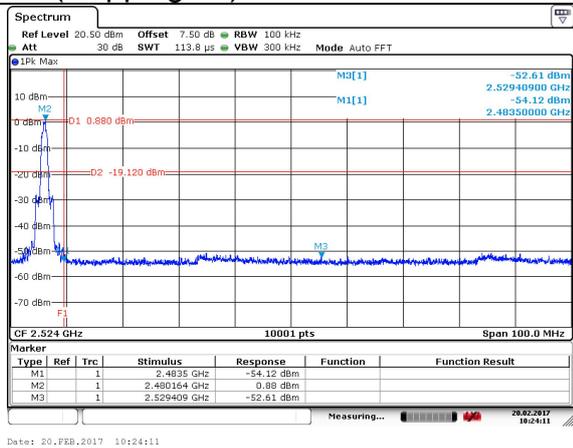


**$\pi/4$ DQPSK**

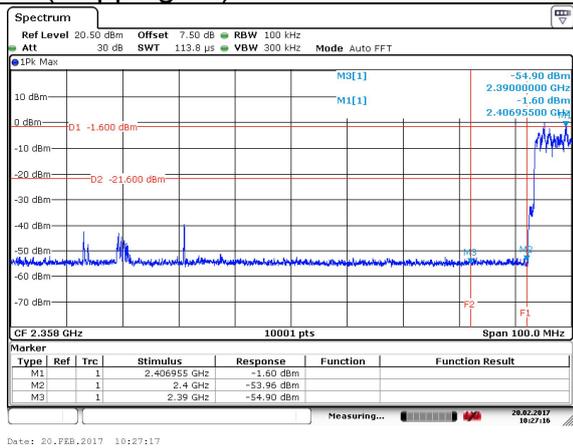
**CH0 (Hopping off)**



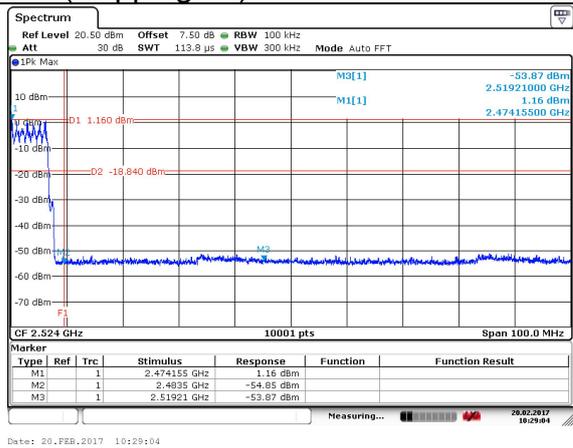
**CH78 (Hopping off)**



**CH0 (Hopping on)**

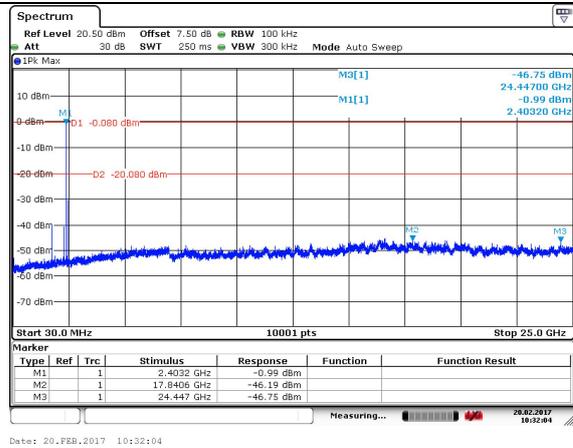
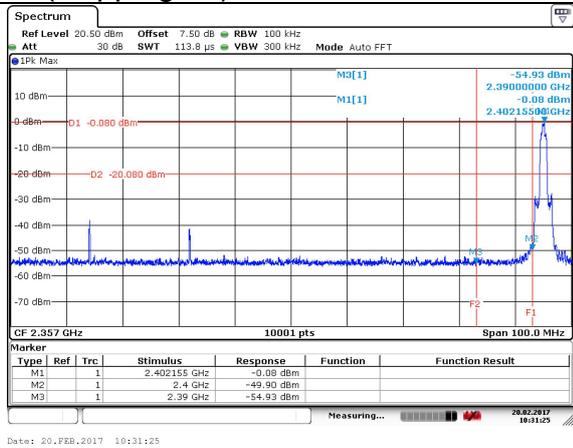


**CH78 (Hopping on)**

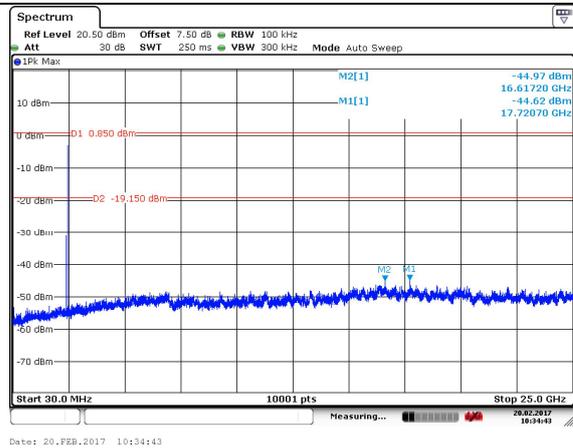
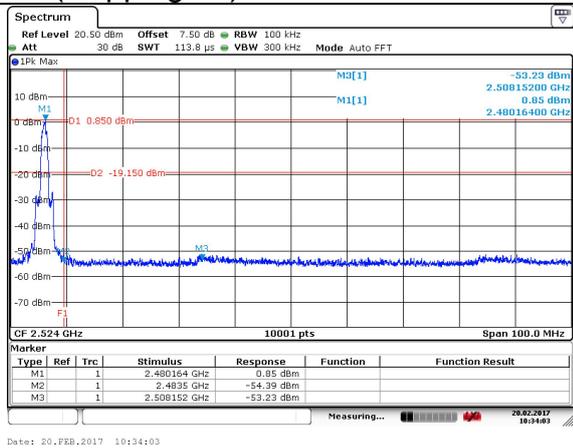


### 8DPSK

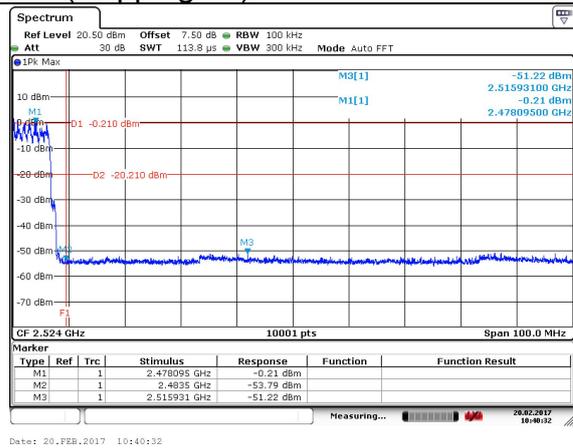
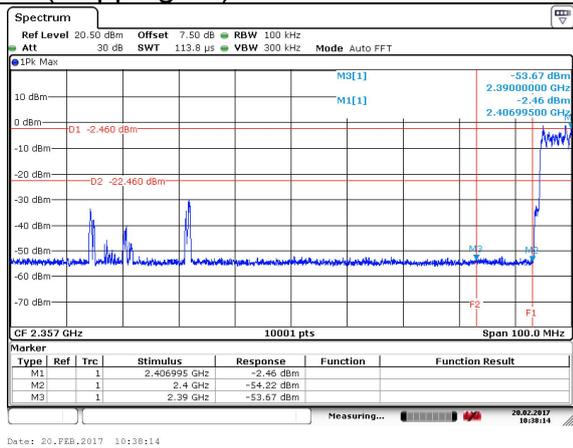
#### CH0 (Hopping off)



#### CH78 (Hopping off)



#### CH0 (Hopping on)



## APPENDIX B – TEST DATA OF RADIATED EMISSION

### Spurious Radiated Emissions

The worst case attitude: The mobile lay down.

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	96.67	62.67	N/A	N/A	8.90	25.10
2	2390	51.27	17.27	-22.73	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	93.32	59.32	N/A	N/A	8.90	25.10
2	2390	45.47	11.47	-28.53	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	86.18	52.18	N/A	N/A	8.90	25.10
2	2390	42.31	8.31	-11.69	54.0	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	80.82	46.82	N/A	N/A	8.90	25.10
2	2390	40.21	6.21	-13.79	54.0	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	97.88	63.88	N/A	N/A	8.90	25.10
2	2483.5	53.21	19.21	-20.79	74.0	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	91.13	57.13	N/A	N/A	8.90	25.10
2	2483.5	45.59	11.59	-28.41	74.0	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	88.44	54.44	N/A	N/A	8.90	25.10
2	2483.5	43.07	9.07	-10.93	54.0	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	81.21	47.21	N/A	N/A	8.90	25.10
2	2483.5	40.11	6.11	-13.89	54.0	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode:  $\pi/4$ DQPSK  
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	97.20	63.20	N/A	N/A	8.90	25.10
2	2390	52.08	18.08	-21.92	74.0	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode:  $\pi/4$ DQPSK  
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	92.28	58.28	N/A	N/A	8.90	25.10
2	2390	46.58	12.58	-27.42	74.0	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode:  $\pi/4$ DQPSK  
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	88.02	54.02	N/A	N/A	8.90	25.10
2	2390	42.13	8.13	-11.87	54.0	8.90	25.10

Carrier frequency (MHz): 2402  
Channel No.:0  
Test Mode:  $\pi/4$ DQPSK  
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	79.77	45.77	N/A	N/A	8.90	25.10
2	2390	40.79	6.79	-13.21	54.0	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:78  
Test Mode:  $\pi/4$ DQPSK  
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	95.81	61.81	N/A	N/A	8.90	25.10
2	2483.5	49.86	15.86	-24.14	74.0	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:78  
Test Mode:  $\pi/4$ DQPSK  
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	91.19	57.19	N/A	N/A	8.90	25.10
2	2483.5	48.59	14.59	-25.41	74.0	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:78  
Test Mode:  $\pi/4$ DQPSK  
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	85.35	51.35	N/A	N/A	8.90	25.10
2	2483.5	41.79	7.79	-12.21	54.0	8.90	25.10

Carrier frequency (MHz): 2480  
Channel No.:78  
Test Mode:  $\pi/4$ DQPSK  
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	78.74	44.74	N/A	N/A	8.90	25.10
2	2483.5	41.93	7.93	-12.07	54.0	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	97.32	63.32	N/A	N/A	8.90	25.10
2	2390	52.03	18.03	-21.97	74.0	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	93.58	59.58	N/A	N/A	8.90	25.10
2	2390	47.71	13.71	-26.29	74.0	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	88.05	54.05	N/A	N/A	8.90	25.10
2	2390	42.82	8.82	-11.18	54.0	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	79.95	45.95	N/A	N/A	8.90	25.10
2	2390	40.72	6.72	-13.28	54.0	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	97.35	63.35	N/A	N/A	8.90	25.10
2	2483.5	50.40	16.40	-23.60	74.0	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	93.30	59.30	N/A	N/A	8.90	25.10
2	2483.5	46.03	12.03	-27.97	74.0	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	87.43	53.43	N/A	N/A	8.90	25.10
2	2483.5	43.57	9.57	-10.43	54.0	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	80.96	46.96	N/A	N/A	8.90	25.10
2	2483.5	42.53	8.53	-11.47	54.0	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:

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

Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
321.98	37.60	16.10	21.50	Horizontal	46.0
514.03	39.10	21.40	17.70	Vertical	46.0
519.04	37.00	21.60	15.40	Horizontal	46.0
523.05	40.20	21.70	18.50	Vertical	46.0
526.05	39.80	21.80	18.00	Horizontal	46.0
529.06	39.30	21.80	17.50	Horizontal	46.0

For  $\pi/4$ DQPSK

Channel No.:39

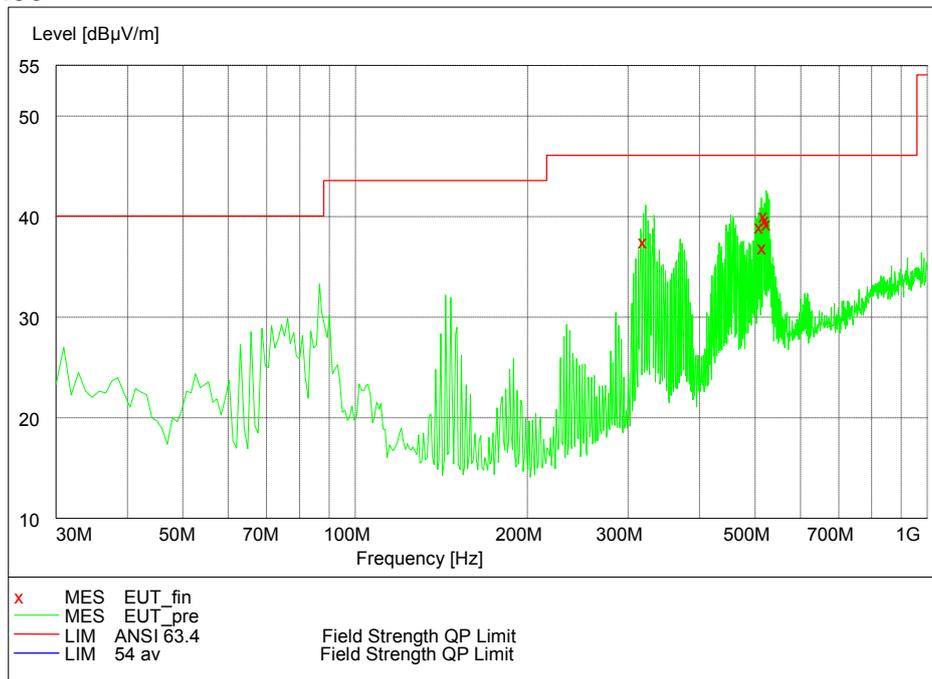
Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
321.98	33.90	16.10	17.80	Vertical	46.0
324.81	39.50	16.10	23.40	Horizontal	46.0
327.64	30.30	16.20	14.10	Vertical	46.0
331.40	33.10	16.40	16.70	Vertical	46.0
500.00	36.20	21.10	15.10	Horizontal	46.0
529.06	37.80	21.80	16.00	Vertical	46.0

For 8DPSK

Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
321.98	36.40	16.10	20.30	Vertical	46.0
331.40	33.40	16.40	17.00	Vertical	46.0
514.03	39.80	21.40	18.40	Vertical	46.0
517.03	37.00	21.50	15.50	Horizontal	46.0
520.04	32.80	21.60	11.20	Vertical	46.0
529.06	34.20	21.80	12.40	Vertical	46.0

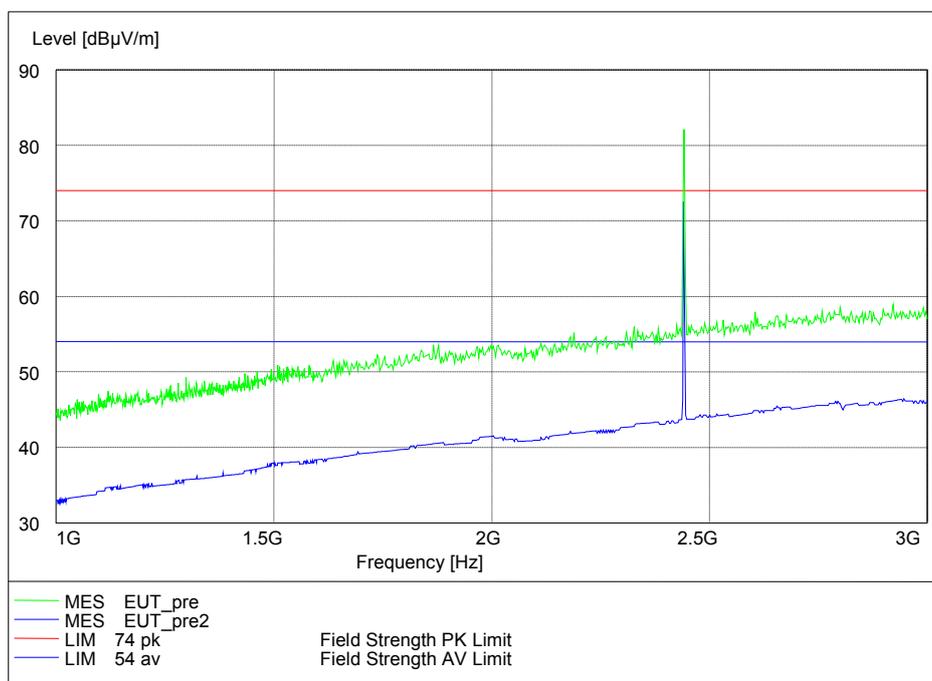
Carrier frequency (MHz): 2441  
Channel No.:39



Frequency Range: 30MHz-1000MHz

Detector: QP mode

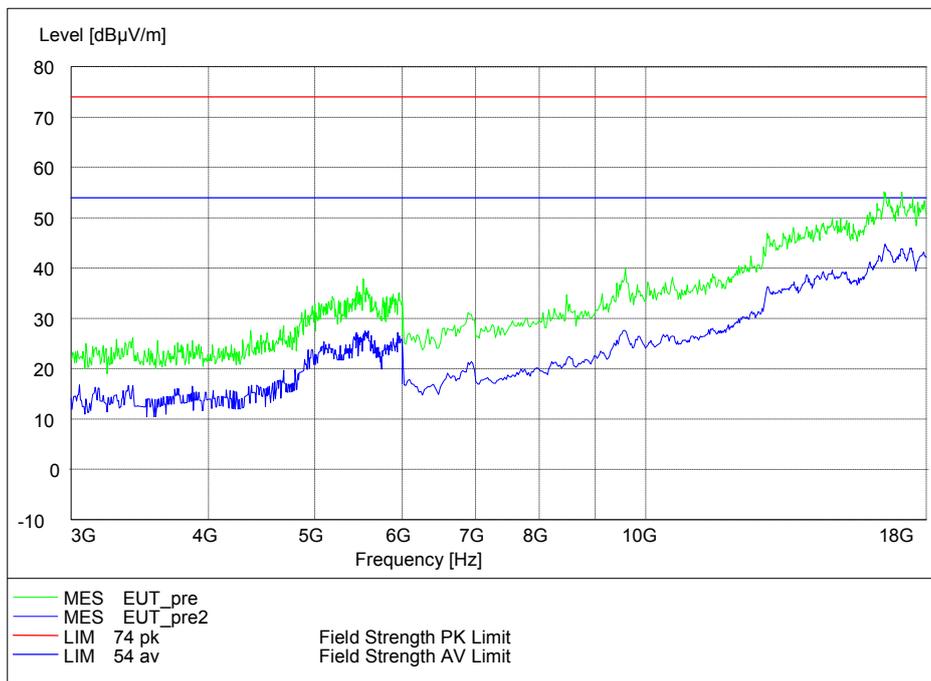
Modulation type: GFSK



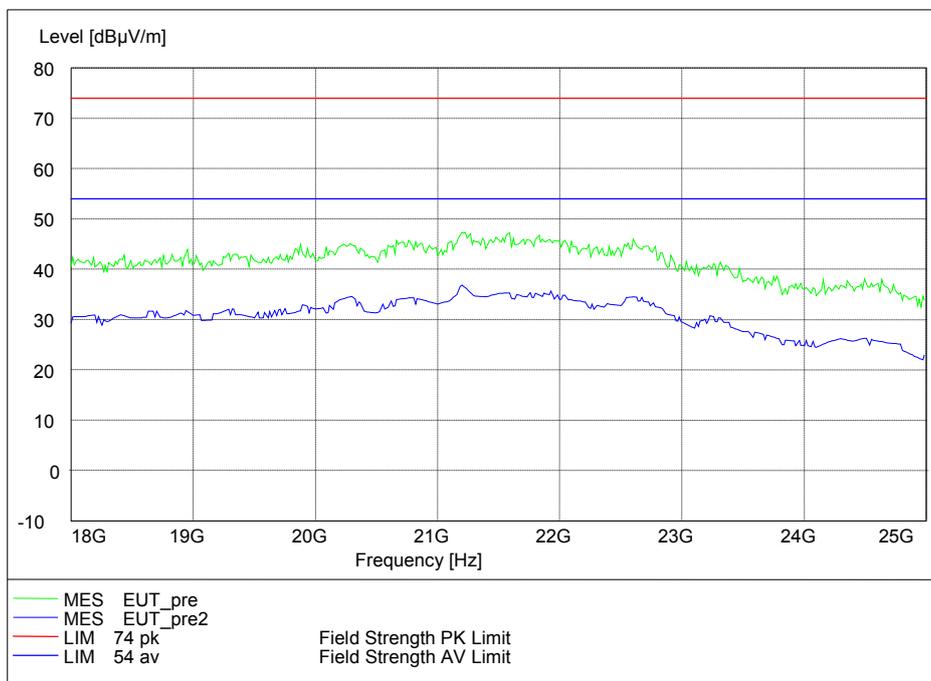
Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

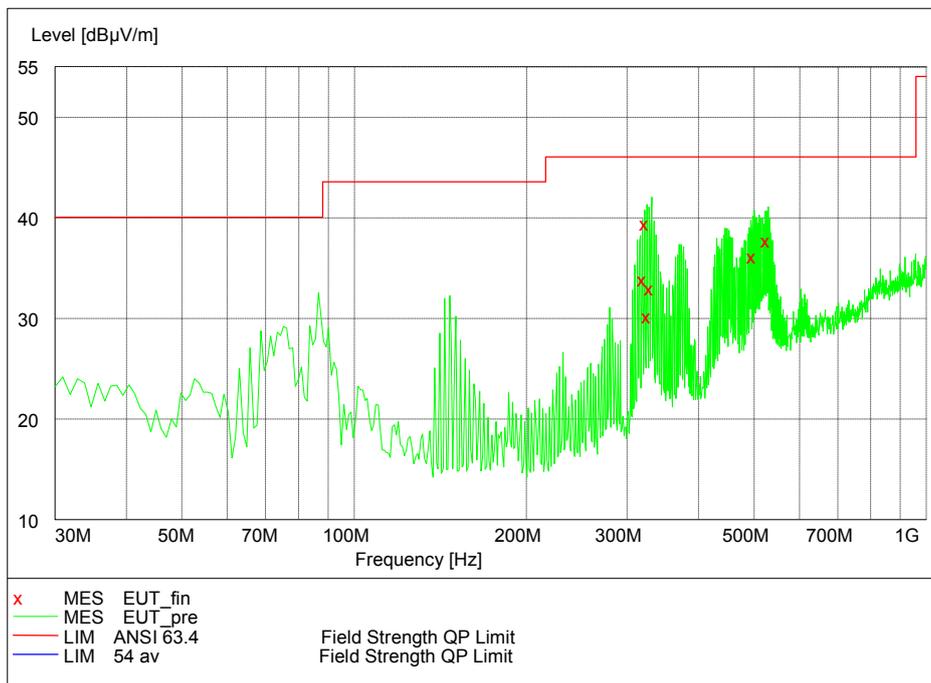
Modulation type: GFSK



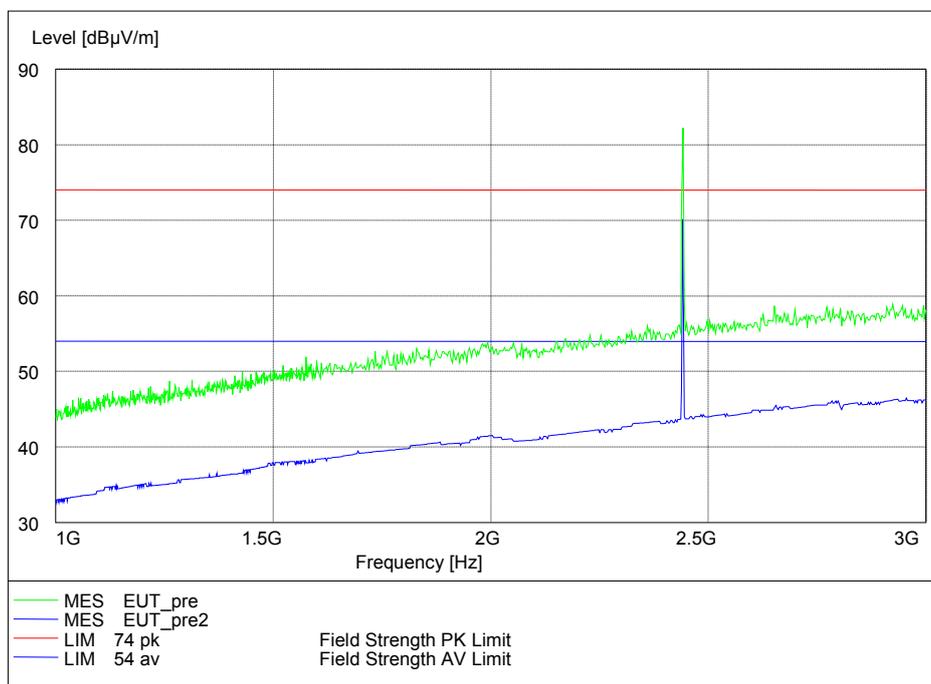
Frequency Range: 3GHz-18GHz  
Detector: Av mode and PK mode  
Modulation type: GFSK



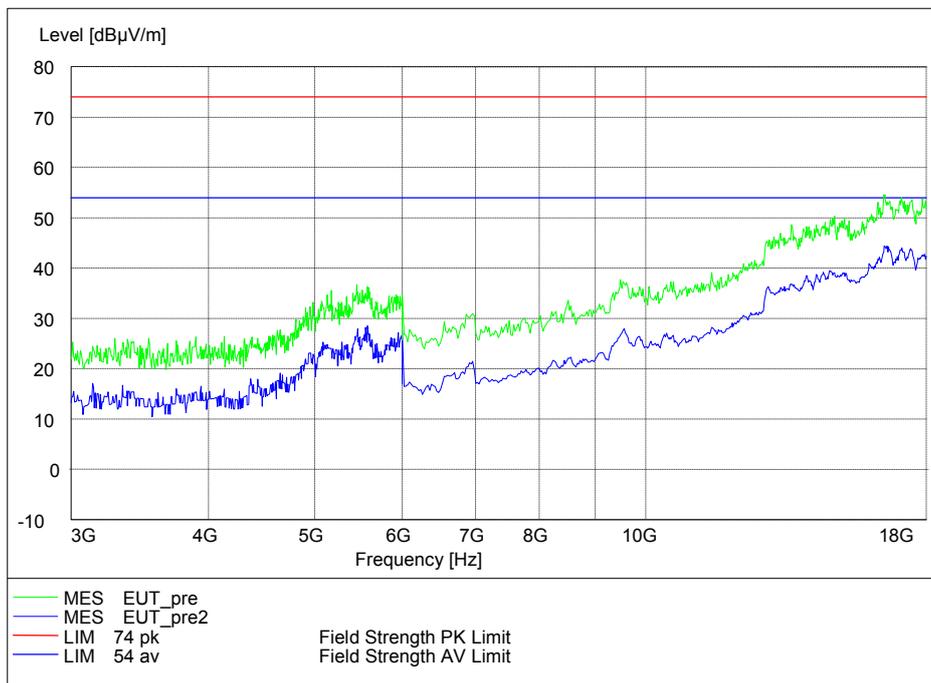
Frequency Range: 18GHz-25GHz  
Detector: Av mode and PK mode  
Modulation type: GFSK



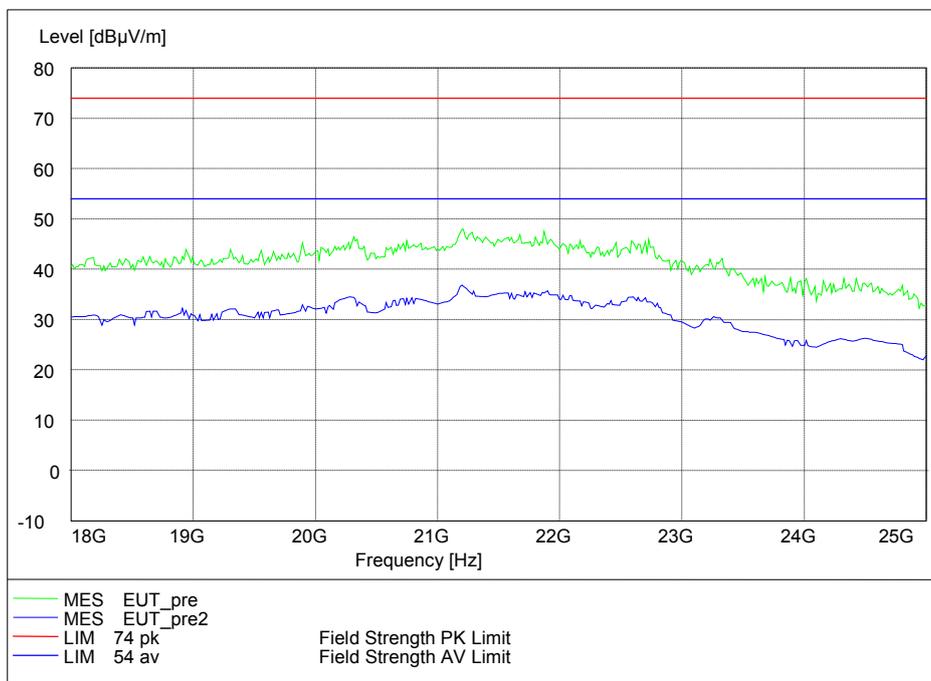
Frequency Range: 30MHz-1000 MHz  
Detector: QP mode  
Modulation type:  $\pi/4$ DQPSK



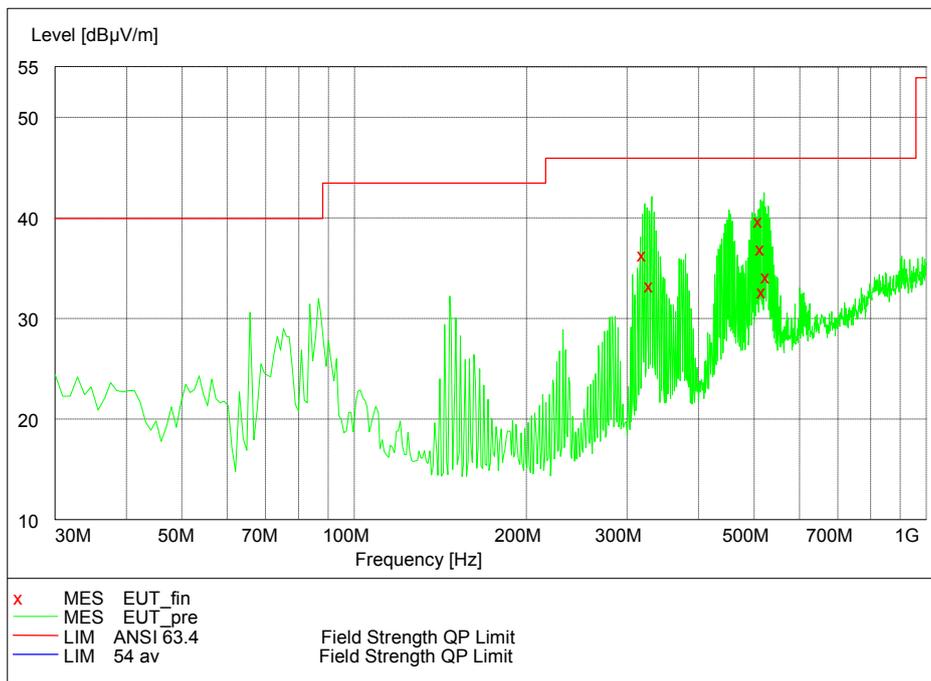
Frequency Range: 1GHz-3GHz  
Detector: Av mode and PK mode  
Modulation type:  $\pi/4$ DQPSK



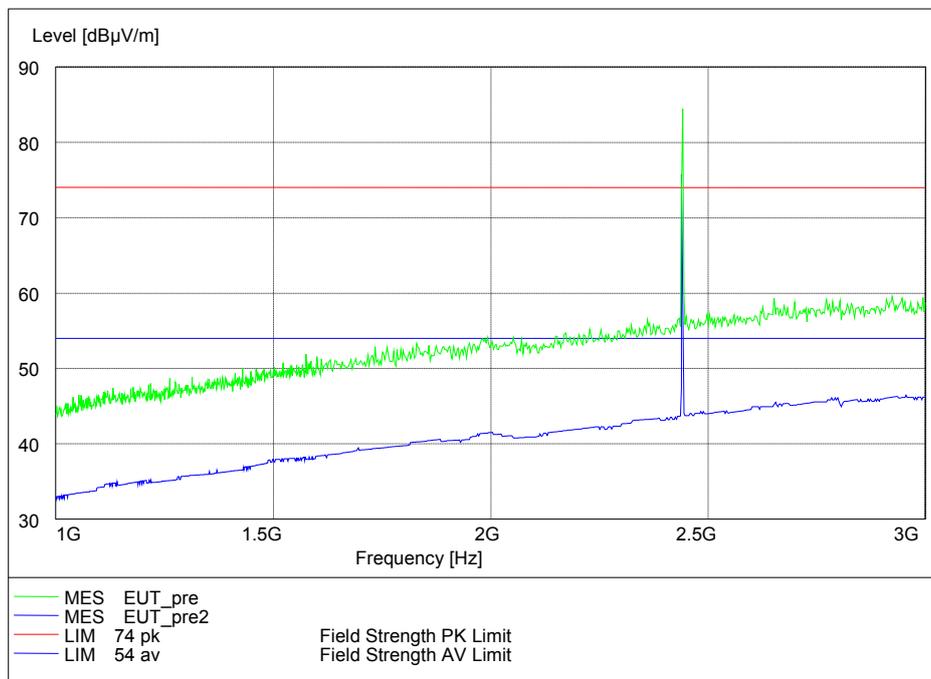
Frequency Range: 3GHz-18GHz  
Detector: Av mode and PK mode  
Modulation type:  $\pi/4$ DQPSK



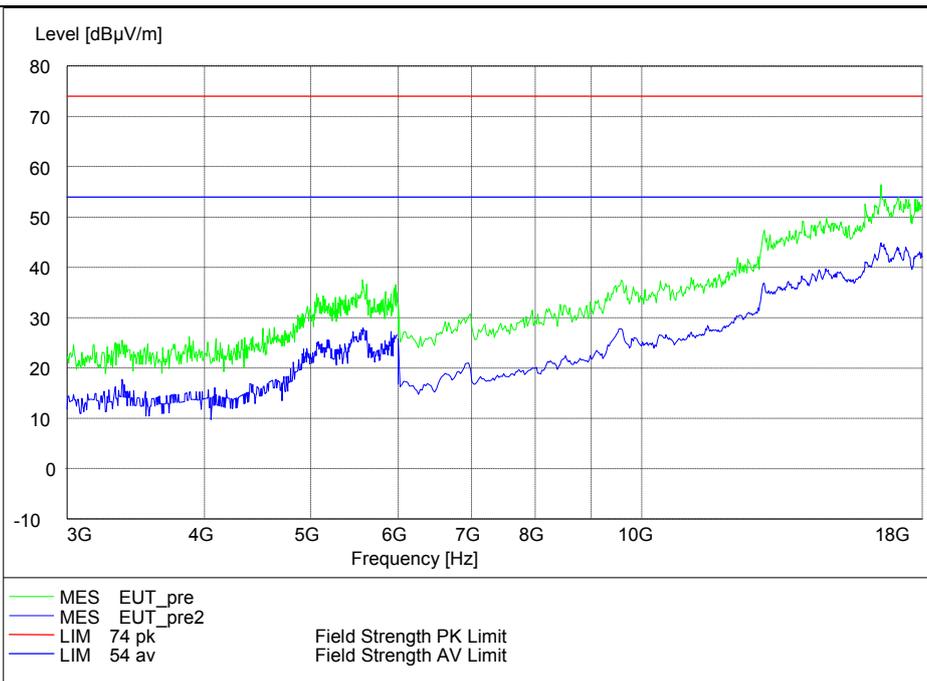
Frequency Range: 18GHz-25GHz  
Detector: Av mode and PK mode  
Modulation type:  $\pi/4$ DQPSK



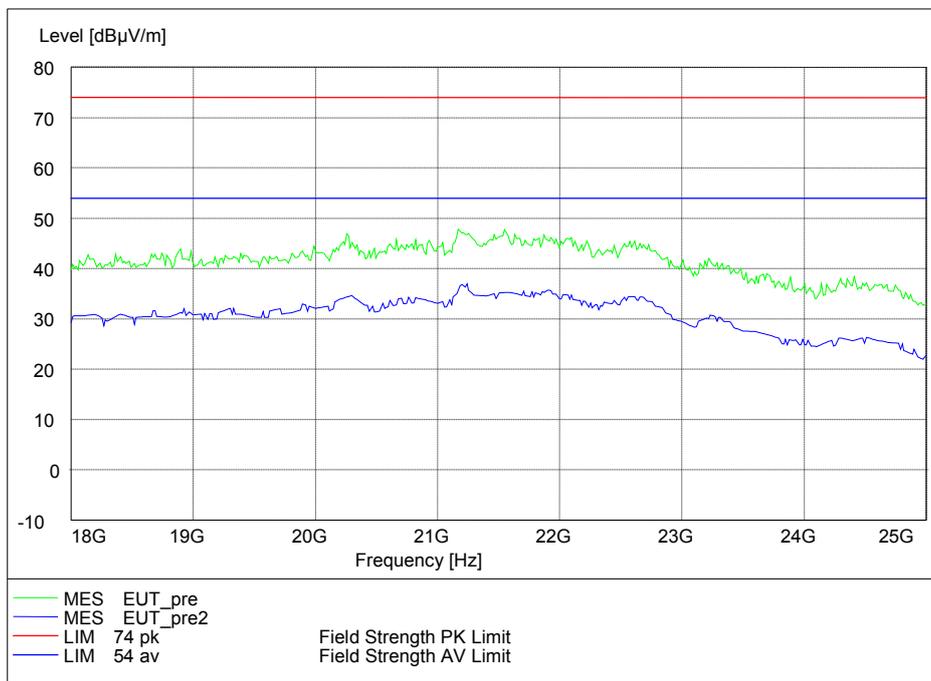
Frequency Range: 30MHz-1000 MHz  
Detector: QP mode  
Modulation type: 8DPSK



Frequency Range: 1GHz-3GHz  
Detector: Av mode and PK mode  
Modulation type: 8DPSK



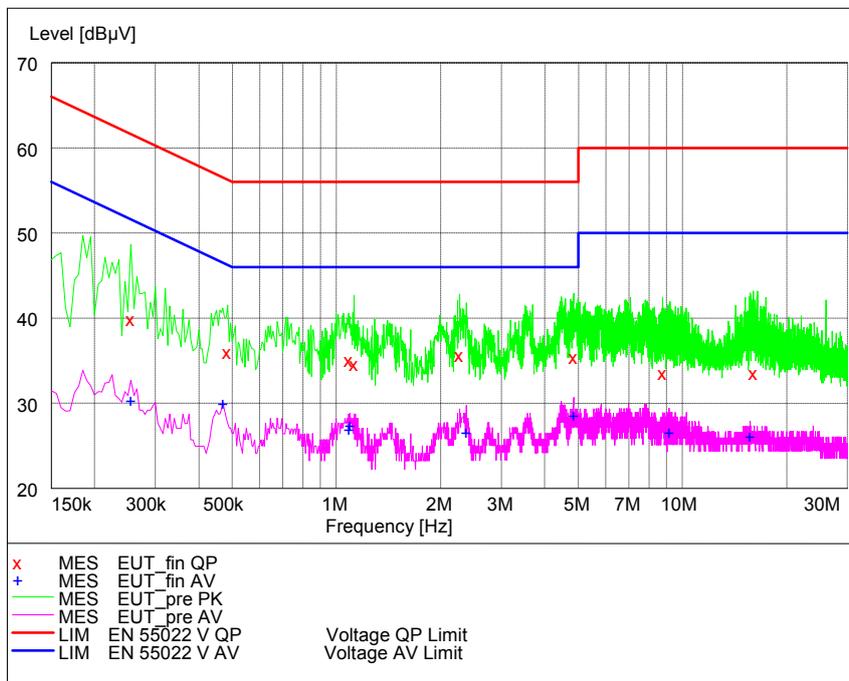
Frequency Range: 3GHz-18GHz  
Detector: Av mode and PK mode  
Modulation type: 8DPSK



Frequency Range: 18GHz-25GHz  
Detector: Av mode and PK mode  
Modulation type: 8DPSK

## AC Power line Conducted Emission

### Noise Level of the Measuring Instrument



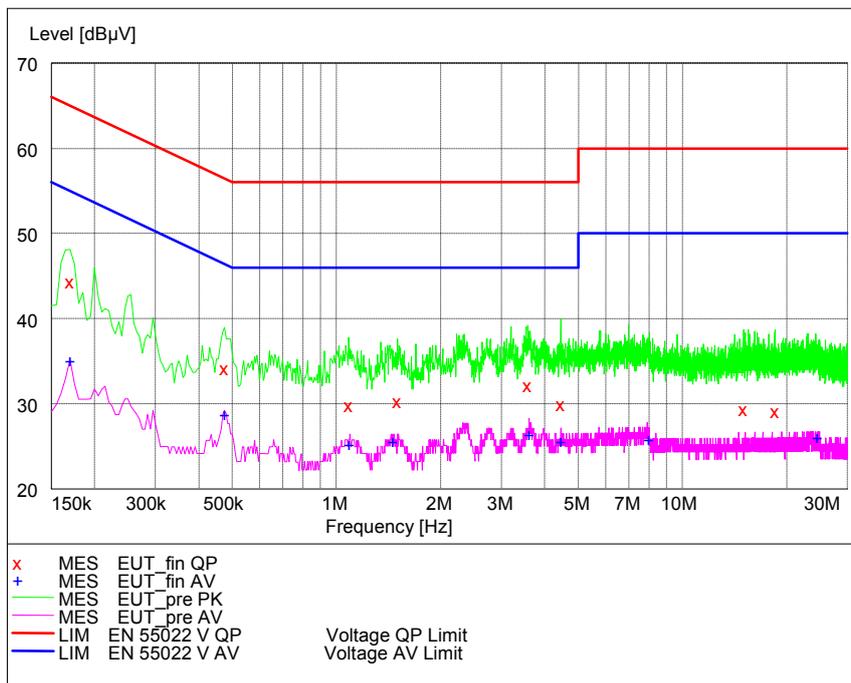
L Line

### MEASUREMENT RESULT: "EUT\_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.255000	40.10	29.6	62	21.5	---	---
0.485000	36.20	29.5	56	20.0	---	---
1.085000	35.30	29.5	56	20.7	---	---
1.125000	34.80	29.5	56	21.2	---	---
2.270000	35.80	29.6	56	20.2	---	---
4.845000	35.60	29.6	56	20.4	---	---
8.770000	33.70	29.7	60	26.3	---	---
16.050000	33.80	30.1	60	26.2	---	---

### MEASUREMENT RESULT: "EUT\_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.255000	30.40	29.6	52	21.2	---	---
0.470000	30.10	29.5	47	16.4	---	---
1.085000	27.10	29.5	46	18.9	---	---
1.095000	27.50	29.5	46	18.5	---	---
2.375000	26.70	29.5	46	19.3	---	---
4.845000	28.70	29.6	46	17.3	---	---
9.140000	26.70	29.8	50	23.3	---	---
15.665000	26.30	30.1	50	23.7	---	---



N Line

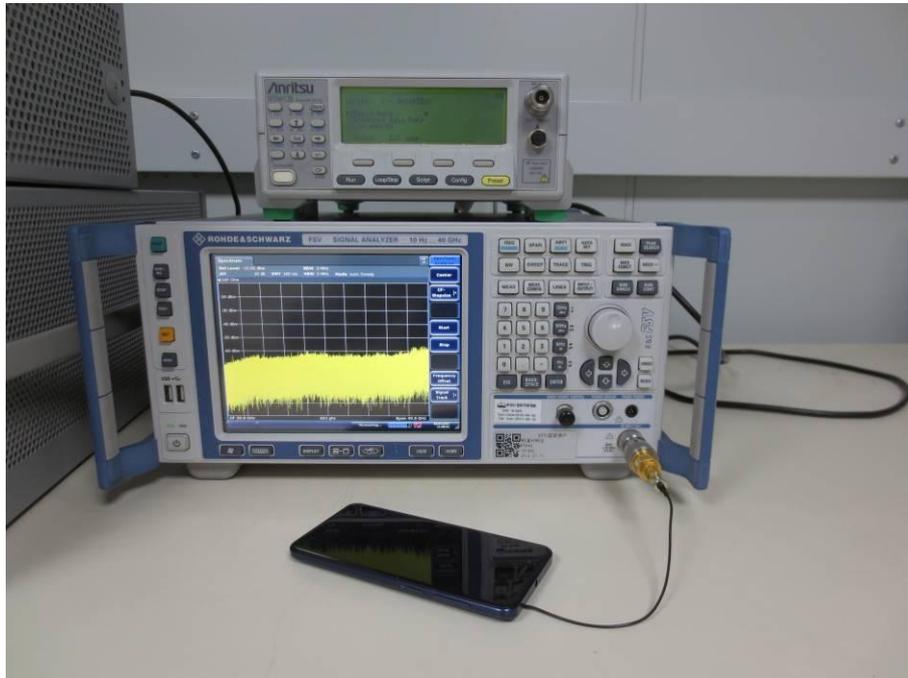
**MEASUREMENT RESULT: "EUT\_fin QP"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.170000	44.50	29.7	65	20.5	---	---
0.475000	34.30	29.5	56	22.1	---	---
1.085000	30.00	29.5	56	26.0	---	---
1.500000	30.40	29.5	56	25.6	---	---
3.580000	32.30	29.6	56	23.7	---	---
4.450000	30.10	29.6	56	25.9	---	---
15.040000	29.50	30.0	60	30.5	---	---
18.535000	29.30	30.3	60	30.7	---	---

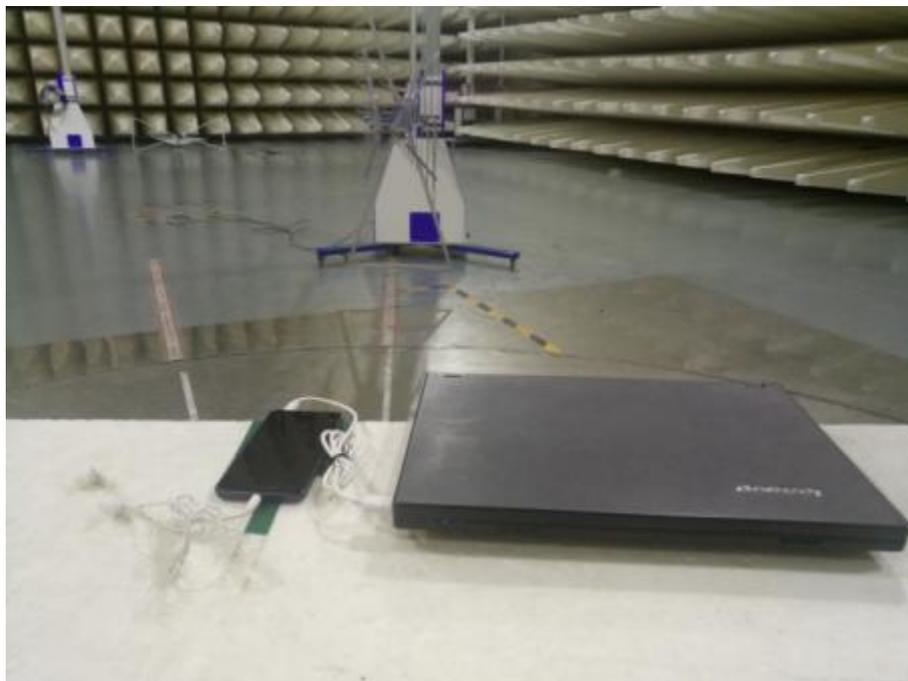
**MEASUREMENT RESULT: "EUT\_fin AV"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.170000	35.10	29.7	55	19.9	---	---
0.475000	28.80	29.5	46	17.7	---	---
1.090000	25.30	29.5	46	20.7	---	---
1.455000	25.70	29.5	46	20.3	---	---
3.605000	26.50	29.6	46	19.5	---	---
4.450000	25.70	29.6	46	20.3	---	---
7.980000	25.90	29.7	50	24.1	---	---
24.500000	26.20	31.1	50	23.8	---	---

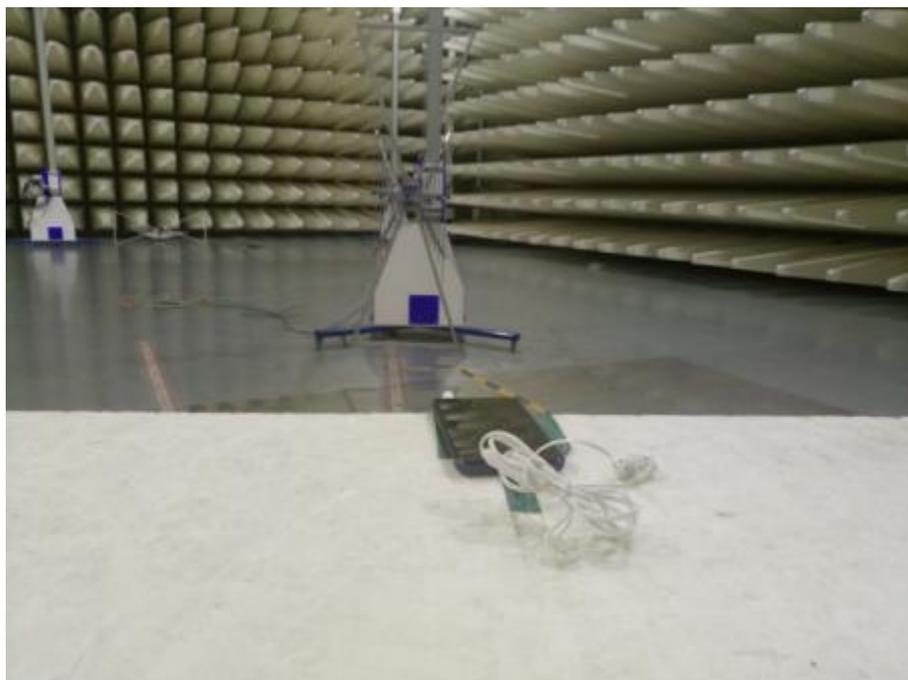
## APPENDIX C – TEST SETUP



Spurious RF Conducted Emissions Test setup



Spurious Radiated Emissions Test setup (30MHz~1GHz)



Spurious Radiated Emissions Test setup (1GHz~25GHz)

---End of Test Report---