（**peak**）
Fig.56 Radiated emission (Power): 8DPSK, high channel
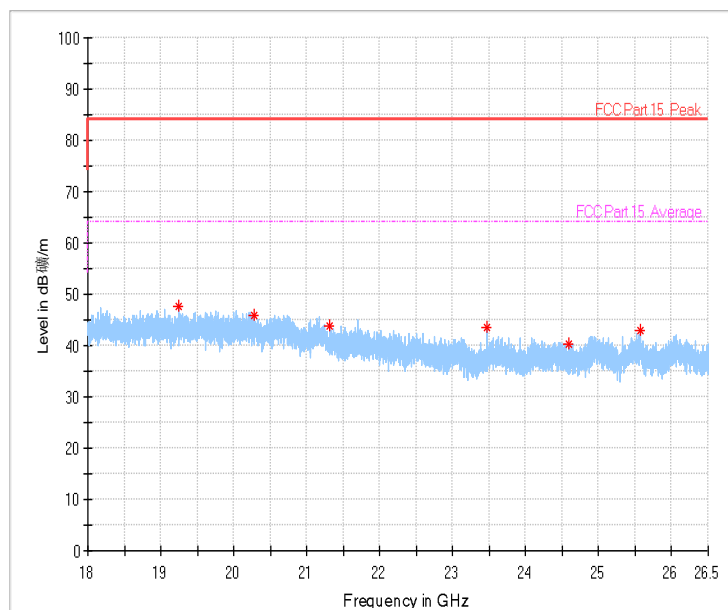

Fig.57 Radiated emission: 8DPSK, 18 GHz - 26 GHz

6.5. Time Of Occupancy (Dwell Time)

6.5.1 Measurement Limit:

Standard	Limit (ms)
FCC 47CFR Part 15.247 (a) (1) (iii)	< 400

6.5.2 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.

6.5.3 Measurement Result

For GFSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	DH1	Fig.58	161.600	P
		Fig.59		
	DH3	Fig.60	282.080	P
		Fig.61		
	DH5	Fig.62	319.519	P
		Fig.63		

For π/4 DQPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	2DH1	Fig.64	164.160	P
		Fig.65		
	2DH3	Fig.66	282.080	P
		Fig.67		
	2DH5	Fig.68	321.386	P
		Fig.69		

For 8DPSK

Channel	Packet	Dwell Time (ms)		Conclusion
39	3DH1	Fig.70	166.400	P
		Fig.71		
	3DH3	Fig.72	282.080	P
		Fig.73		
	3DH5	Fig.74	311.146	P
		Fig.75		

Note: the dwell time is Calculated of the sum of test time about 31.5 seconds.

Equation: dwell time = pulsetime *(1600/N)/79*T . N is the number of timeslot; T is the time about 31.5s.

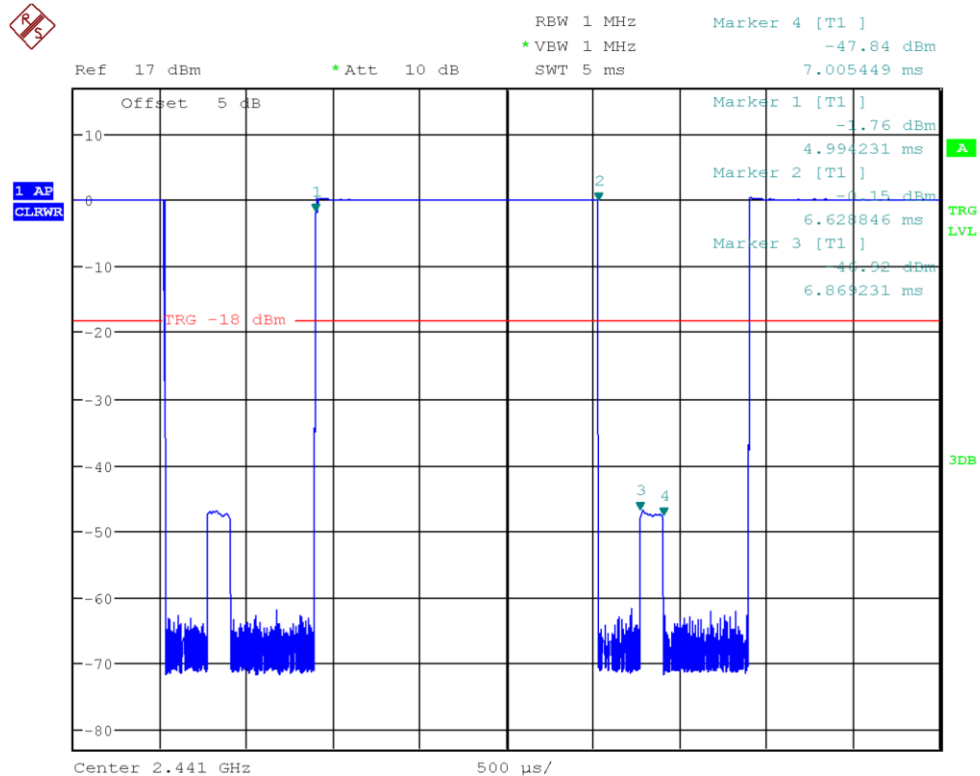**The time of DH5=3.005*(1600/6)/79*31.6=319.519ms.**

Conclusion: PASS

Test graphs as below:
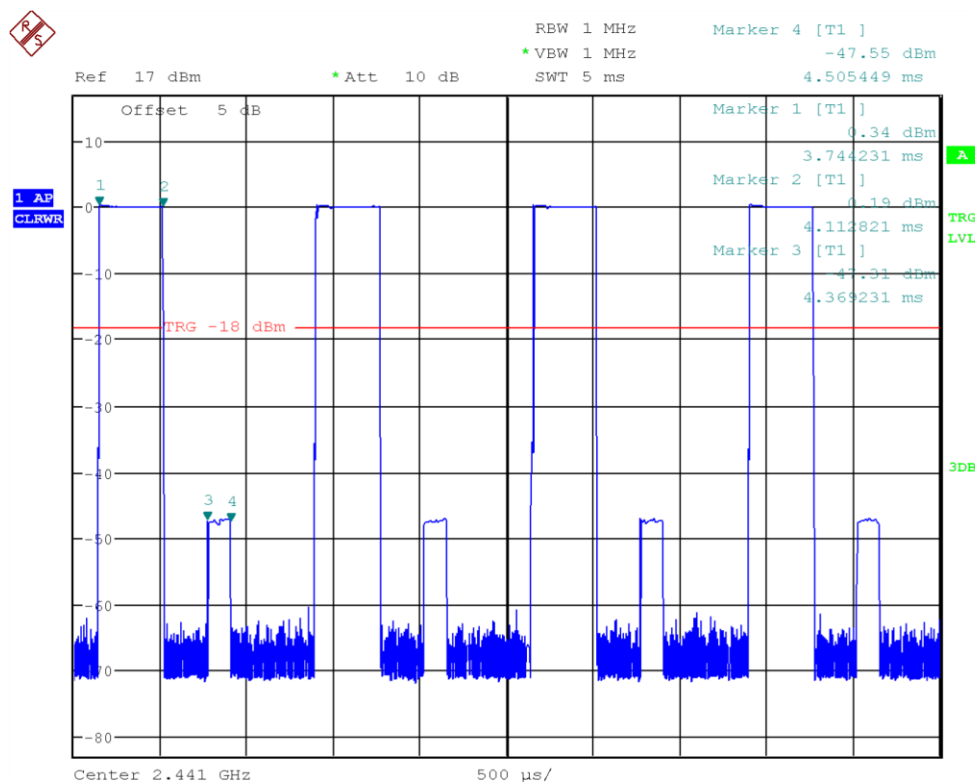
Date: 9.APR.2016 11:05:41

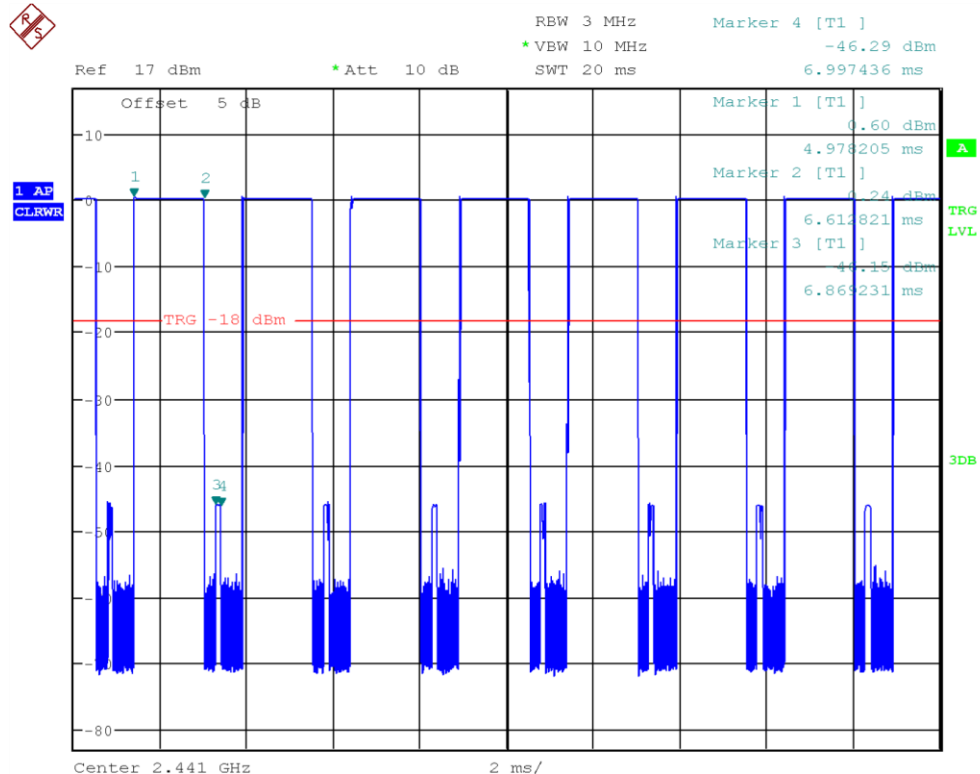Fig.58 Time of occupancy (Dwell Time): Ch39, Packet DH1

Fig.59 Number of Transmissions Measurement: Ch39, Packet DH1

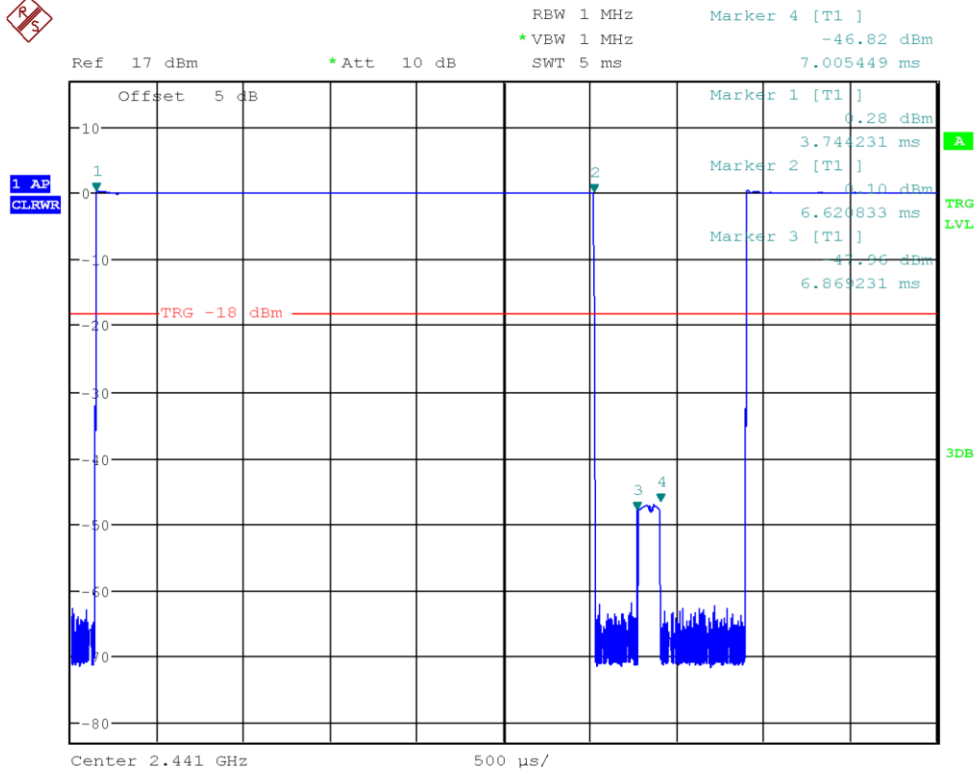Fig.60 Time of occupancy (Dwell Time): Ch39, Packet DH3

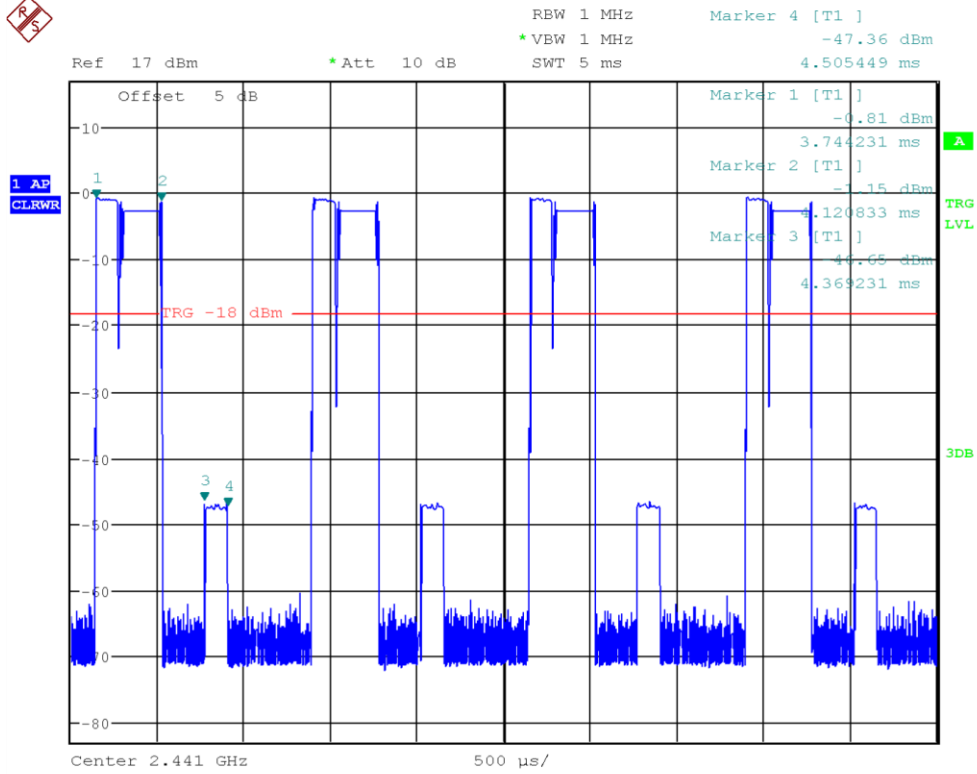Fig.61 Number of Transmissions Measurement: Ch39, Packet DH3

```
                                    RBW   1 MHz      Marker 4 [T1 ]
                                  * VBW   1 MHz             -46.82 dBm
   Ref  17 dBm          * Att  10 dB    SWT  5 ms          7.005449 ms
      Offset  5 dB                             Marker 1 [T1 ]
   -10                                                0.28 dBm
                                                    3.744231 ms     A
 1   AP    1                               2         Marker 2 [T1 ]
 CLRWR    0                                            0.10 dBm     TRG
                                                    6.620833 ms     LVL
   -10                                              Marker 3 [T1 ]
                                                       47.96 dBm
                                                    6.869231 ms
   -20   TRG -18 dBm

   -30

   -40                                                             3DB

   -50                                      3  4

   -60

   -70

   -80
   Center 2.441 GHz              500 µs/
```

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Fig.62 Time of occupancy (Dwell Time): Ch39,Packet DH5

Fig.63 Number of Transmissions Measurement: Ch39, Packet DH5

```
                              RBW  1 MHz        Marker 4 [T1 ]
                            * VBW  1 MHz               -47.36 dBm
  Ref  17 dBm        * Att  10 dB   SWT 5 ms           4.505449 ms
     Offset  5 dB                              Marker 1 [T1 ]
  -10                                                 -0.81 dBm
                                                       3.744231 ms      A
  1 AP
  CLRWR                                        Marker 2 [T1 ]
                                                      -1.15 dBm        TRG
   -10                                                 4.120833 ms     LVL
       TRG -18 dBm                             Marker 3 [T1 ]
   -20                                                 46.65 dBm
                                                       4.369231 ms
   -30
   -40                                                                  3DB
       3  4
   -50
   -60
   -70
   -80
  Center 2.441 GHz              500 µs/
```
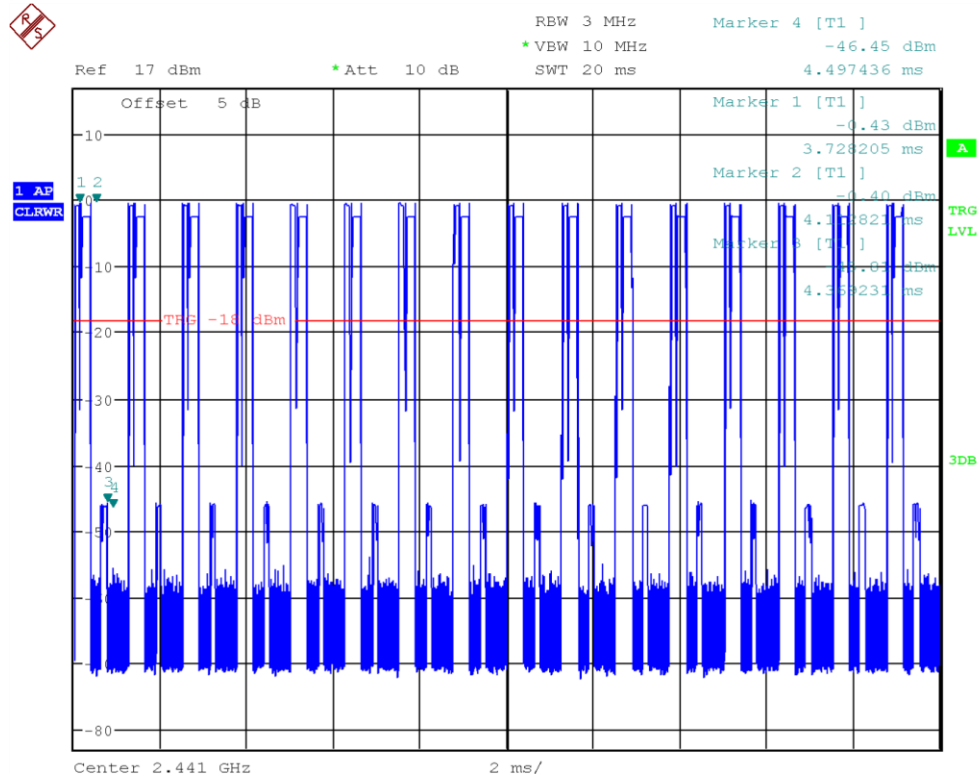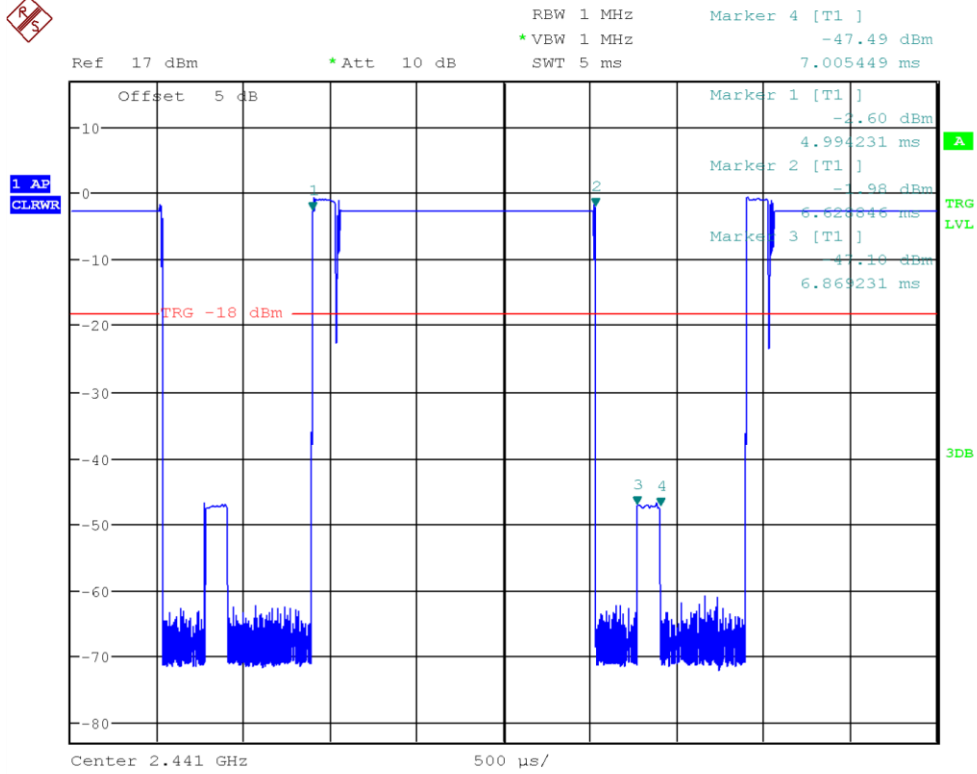
Date: 9.APR.2016 11:06:33

Fig.64 Time of occupancy (Dwell Time): Ch39,Packet 2-DH1
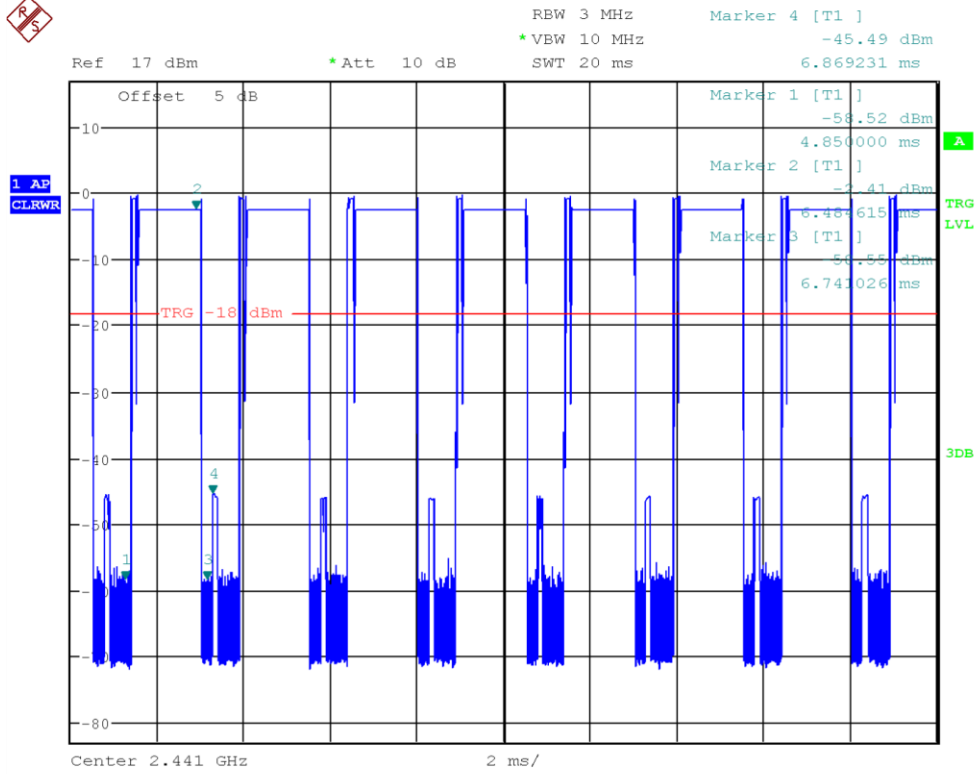
Date: 9.APR.2016 11:06:42

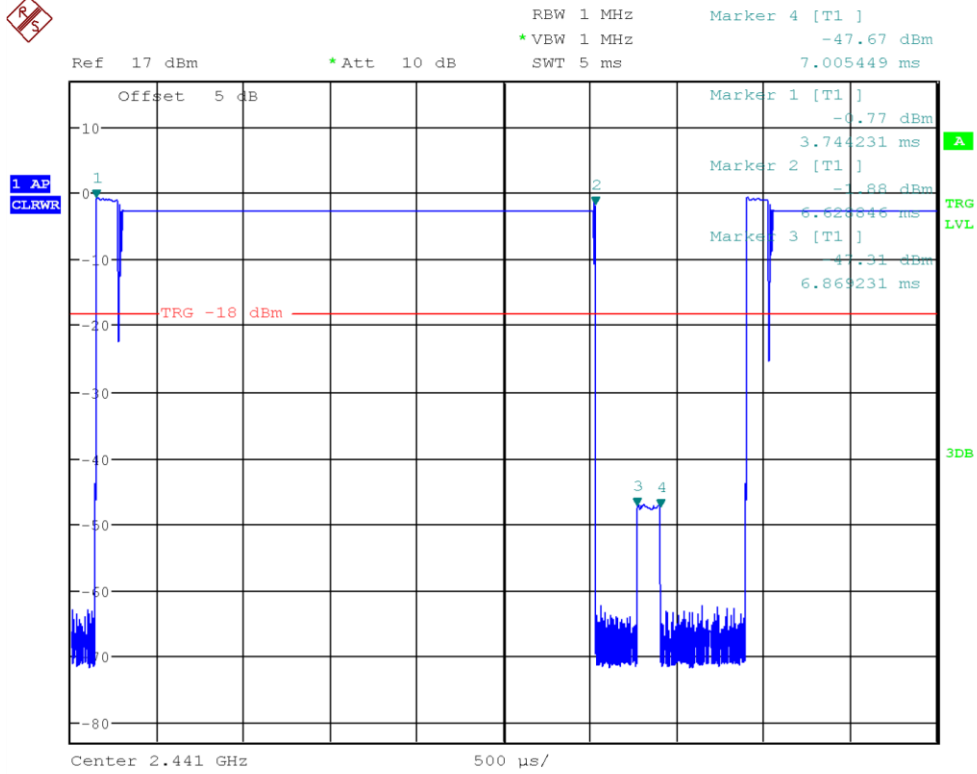Fig.65 Number of Transmissions Measurement: Ch39, Packet 2-DH1

Fig.66 Time of occupancy (Dwell Time): Ch39,Packet 2-DH3

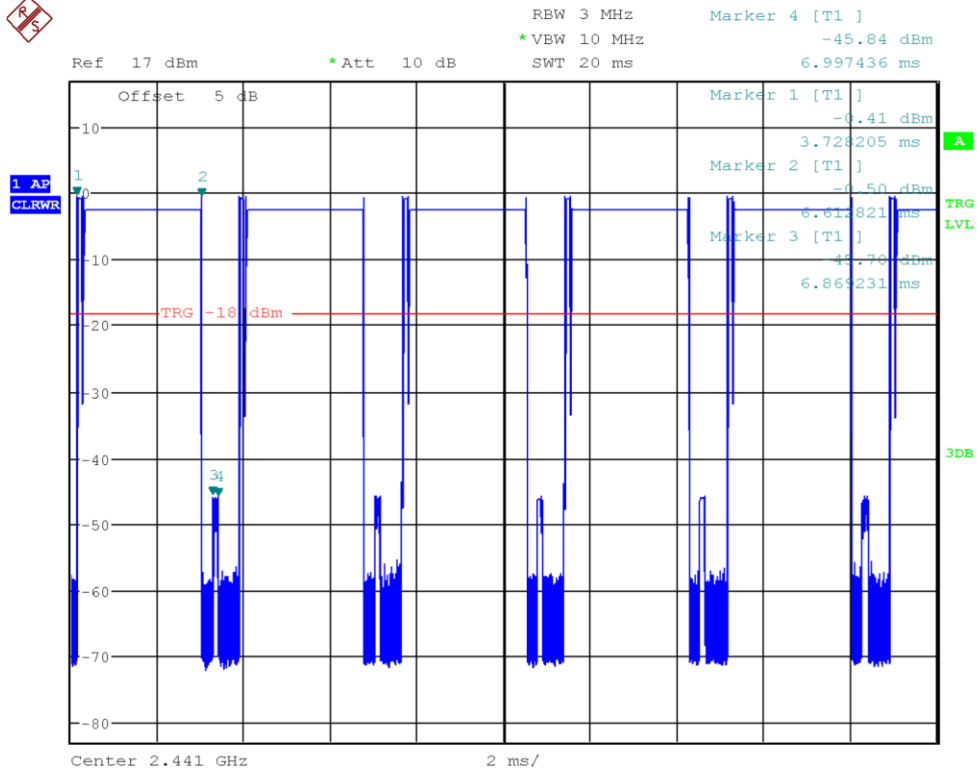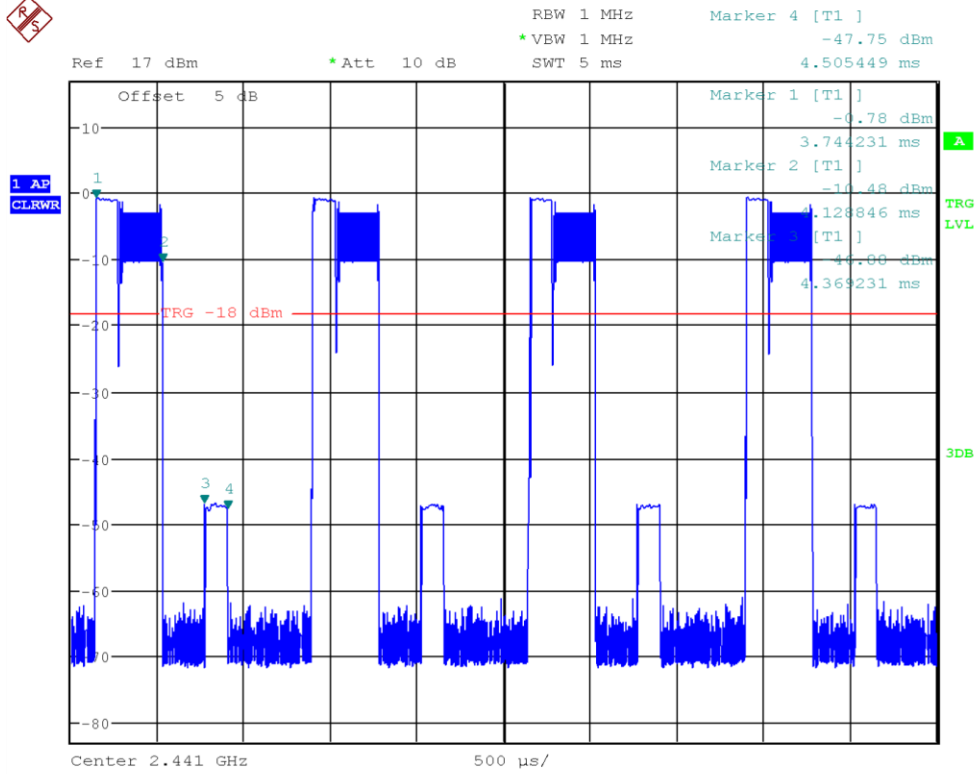Fig.67 Number of Transmissions Measurement: Ch39, Packet 2-DH3

```
                                    RBW  1 MHz        Marker 4 [T1 ]
                                  * VBW  1 MHz                -47.67 dBm
     Ref   17 dBm        * Att  10 dB    SWT 5 ms          7.005449 ms

        Offset   5 dB                          Marker 1 [T1 ]
   -10                                                -0.77 dBm
                                                    3.744231 ms
   1 AP    1                            2          Marker 2 [T1 ]
   CLRWR                                                -1.88 dBm
                                                    6.626846 ms
   -10                                            Marker 3 [T1 ]
                                                      47.31 dBm
                                                    6.869231 ms
   -20   TRG -18 dBm

   -30

   -40

   -50                           3  4

   -60

   -70

   -80
       Center 2.441 GHz              500 µs/
```

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Fig.68 Time of occupancy (Dwell Time): Ch39,Packet 2-DH5

Fig.69 Number of Transmissions Measurement: Ch39, Packet 2-DH5

Date: 9.APR.2016 11:07:25
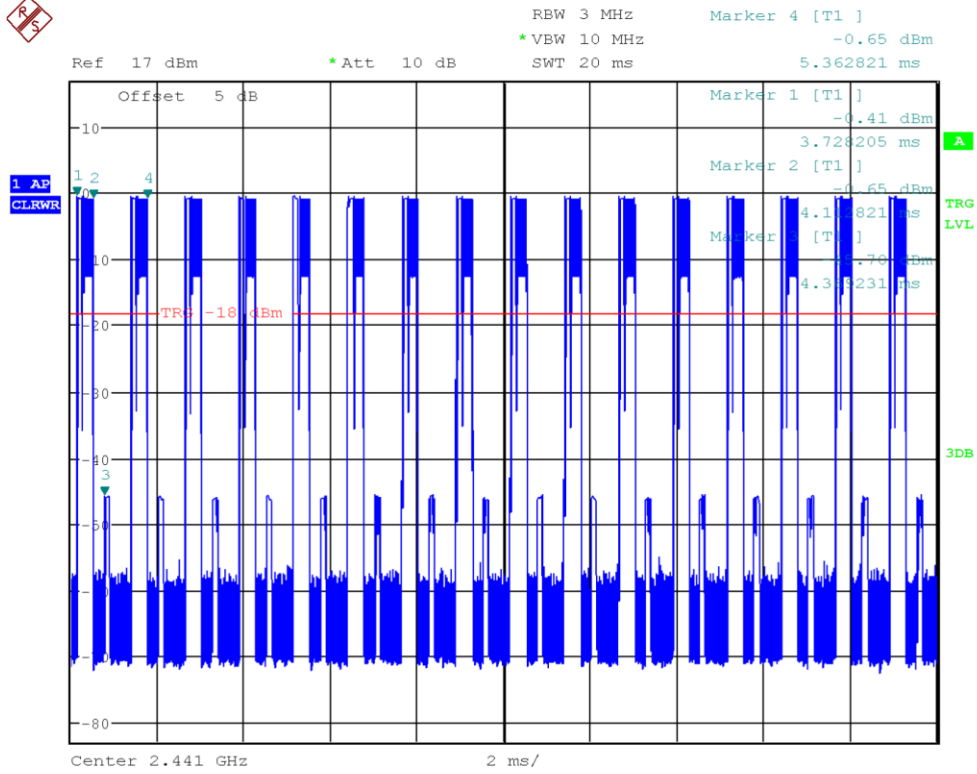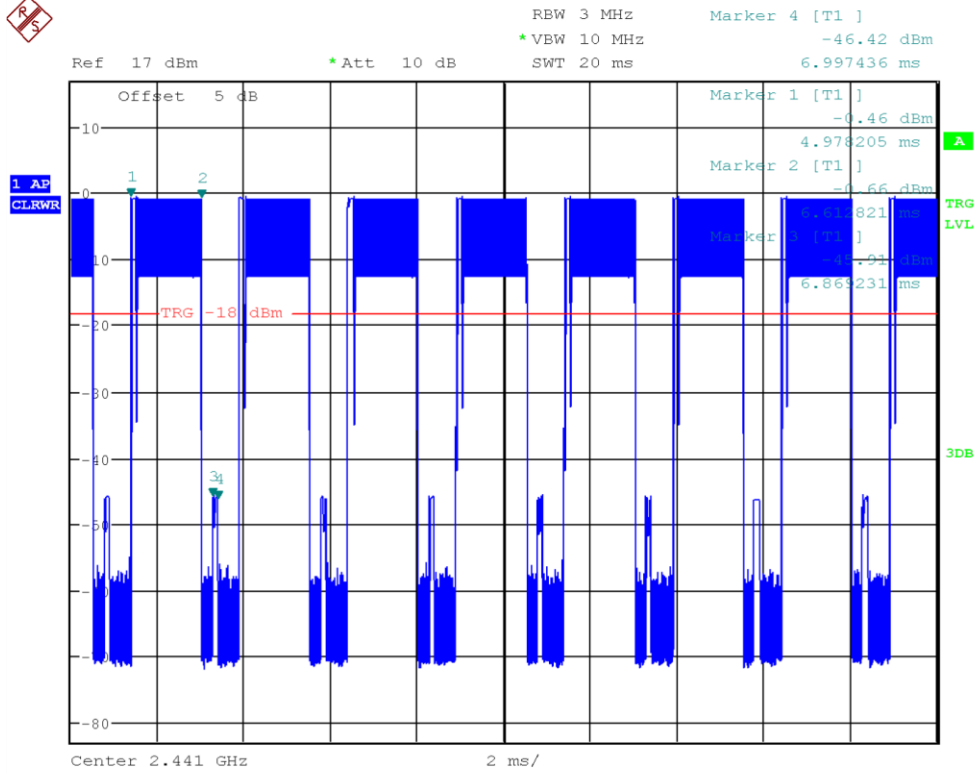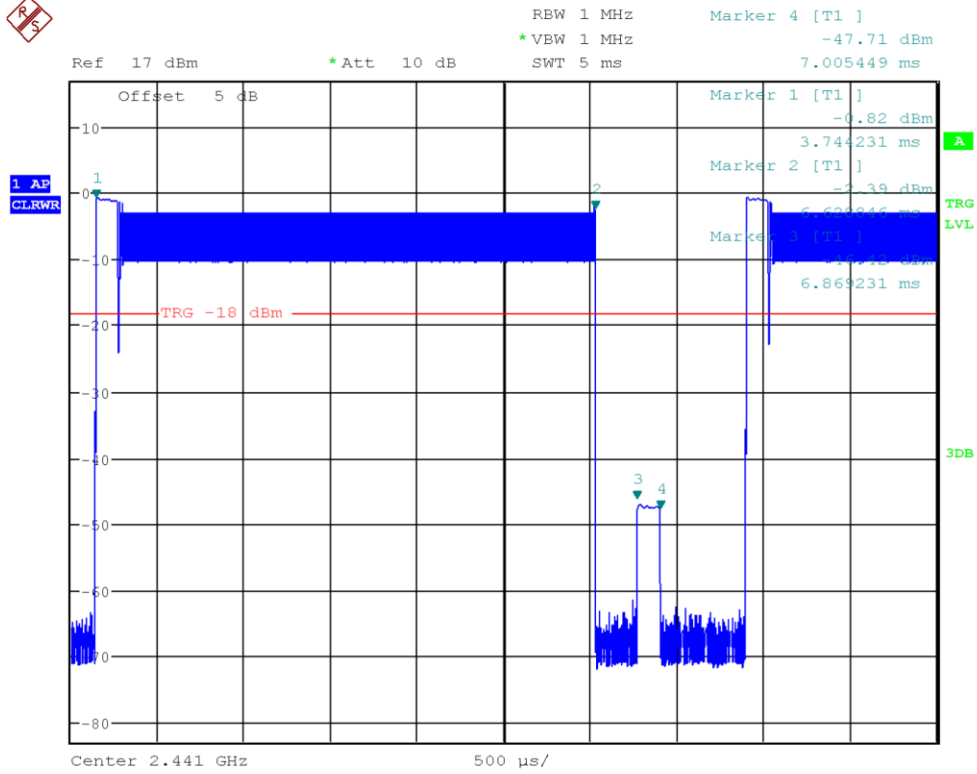
Fig.70 Time of occupancy (Dwell Time): Ch39,Packet 3-DH1

Date: 9.APR.2016 11:07:34

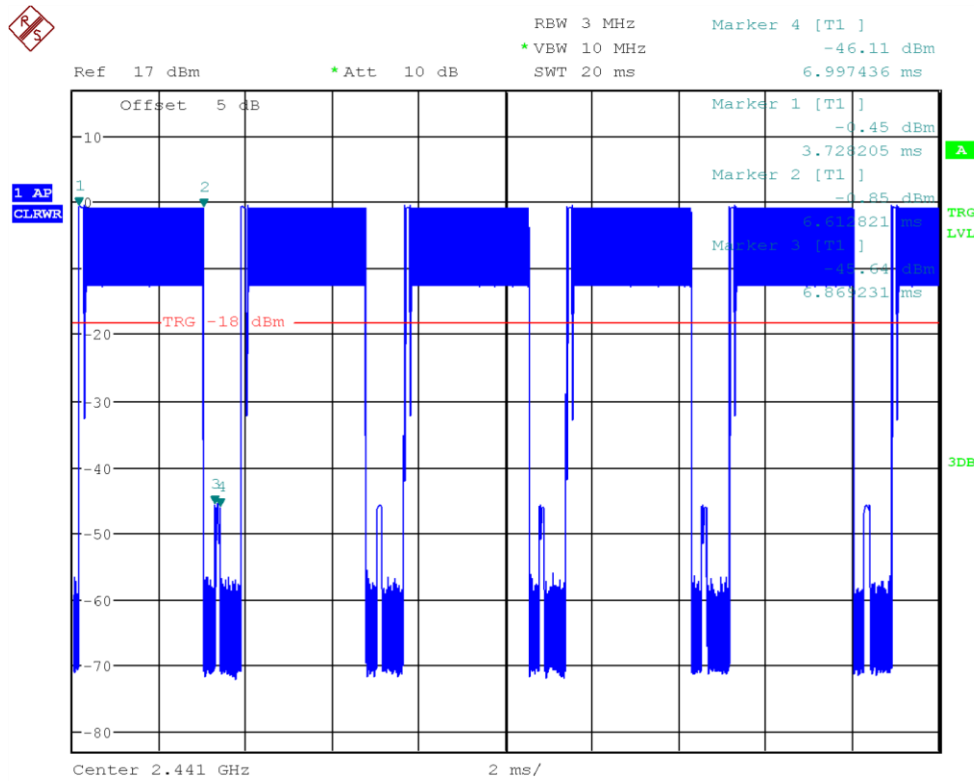Fig.71 Number of Transmissions Measurement: Ch39, Packet 3-DH1

Fig.72 Time of occupancy (Dwell Time): Ch39,Packet 3-DH3

```
                                    RBW   3 MHz          Marker 4 [T1 ]
                                  * VBW  10 MHz                   -46.42 dBm
     Ref   17 dBm          * Att  10 dB   SWT  20 ms            6.997436 ms

          Offset  5 dB                          Marker 1 [T1 ]
    -10                                                  -0.46 dBm
                                                      4.978205 ms        A
                                                Marker 2 [T1 ]
      0                                                 -0.66 dBm
                                                      6.615821 ms     TRG
    -10                                                              LVL
                                                Marker 3 [T1 ]
                                                       -45.91 dBm
                                                      6.869231 ms
    -20     TRG  -18 dBm

    -30                                                             3DB

    -40      34

    -50

    -80
        Center 2.441 GHz                     2 ms/
```

Date: 9.APR.2016 11:07:51

Fig.73 Number of Transmissions Measurement: Ch39, Packet 3-DH3

Fig.74 Time of occupancy (Dwell Time): Ch39,Packet 3-DH5

Date: 9.APR.2016 11:08:09

Fig.75 Number of Transmissions Measurement: Ch39, Packet 3-DH5

6.6. 20dB Bandwidth

6.6.1 Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (a) (1)	N/A

6.6.2 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
4. Span: two or five times of OBW
5. RBW= 1% to 5% of the OBW; VBW≥3RBW; Max Hold.
6. Select the max peak, and N DB DOWN=20dB.
7. Record the results.

Measurement Result:

For GFSK

Channel	20dB Bandwidth (MHz)		Conclusion
0	Fig.76	1.034	P
39	Fig.77	1.029	P
78	Fig.78	1.029	P

For π/4 DQPSK

Channel	20dB Bandwidth (MHz)		Conclusion
0	Fig.79	1.091	P
39	Fig.80	1.091	P
78	Fig.81	1.091	P

For 8DPSK

Channel	20dB Bandwidth (MHz)		Conclusion
0	Fig.82	1.188	P
39	Fig.83	1.188	P
78	Fig.84	1.188	P

Conclusion: PASS

Test graphs as below:
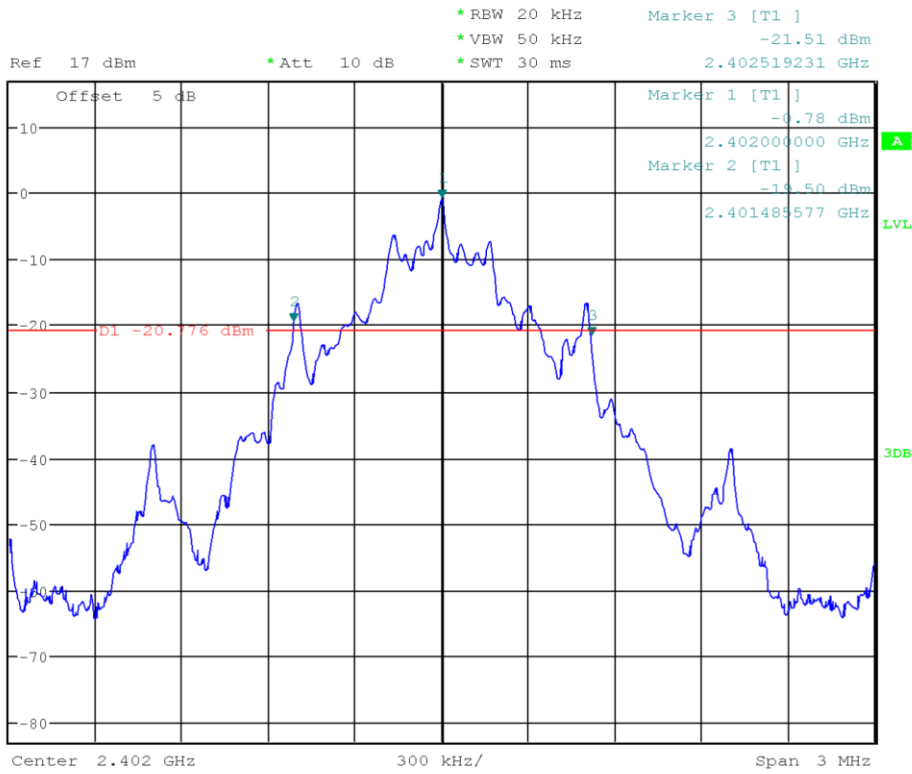
Fig.76 20dB Bandwidth: GFSK, Ch0
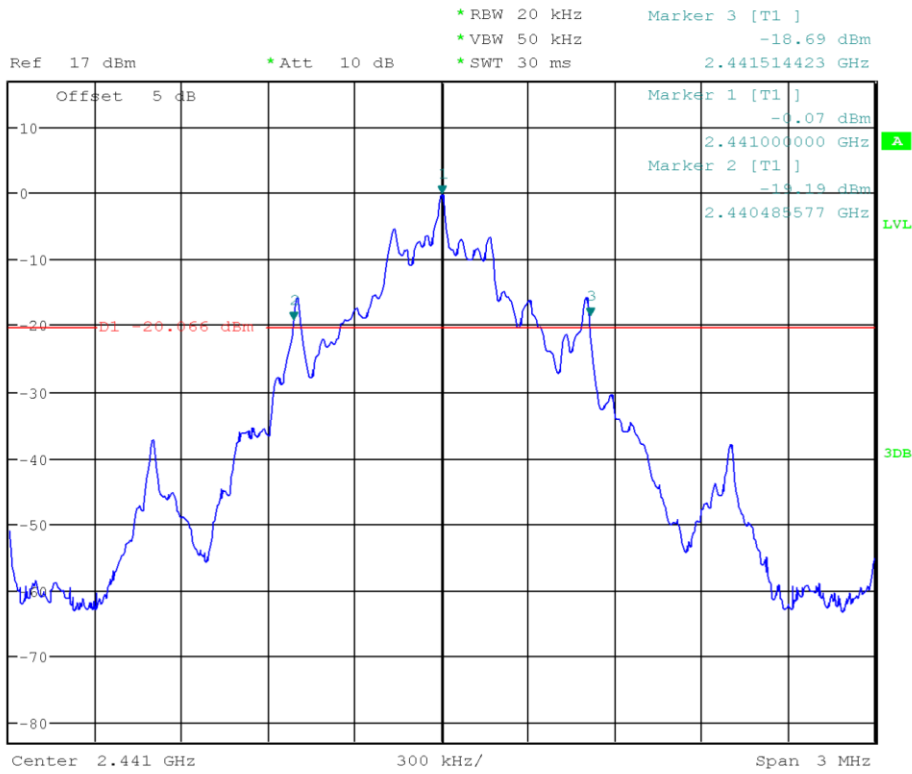
Fig.77 20dB Bandwidth: GFSK, Ch39
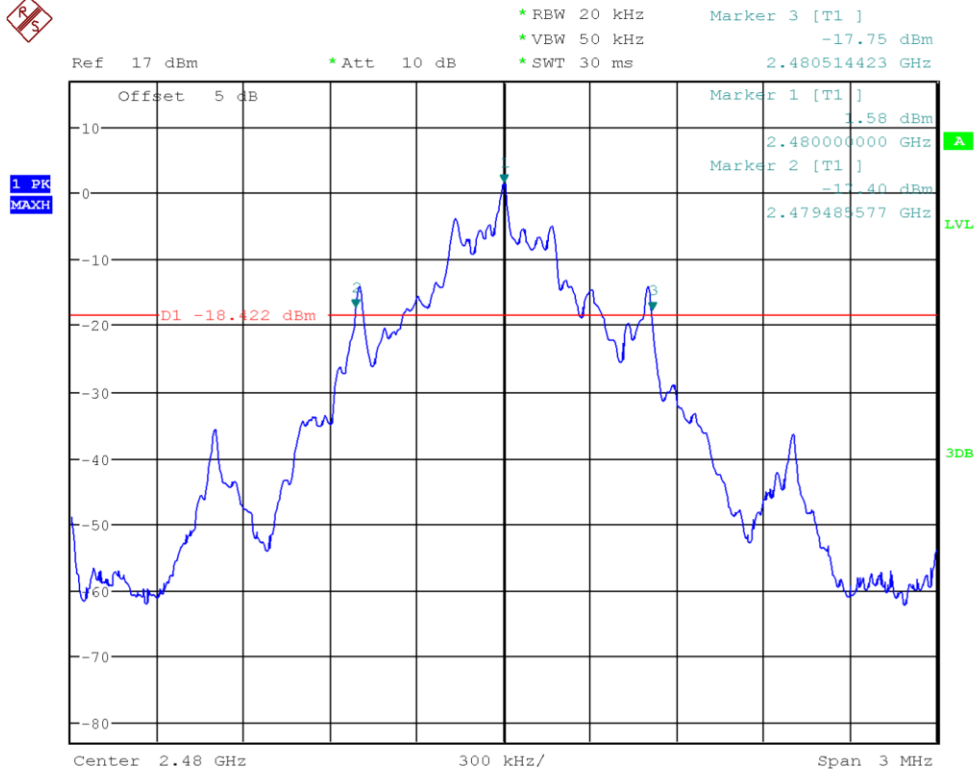
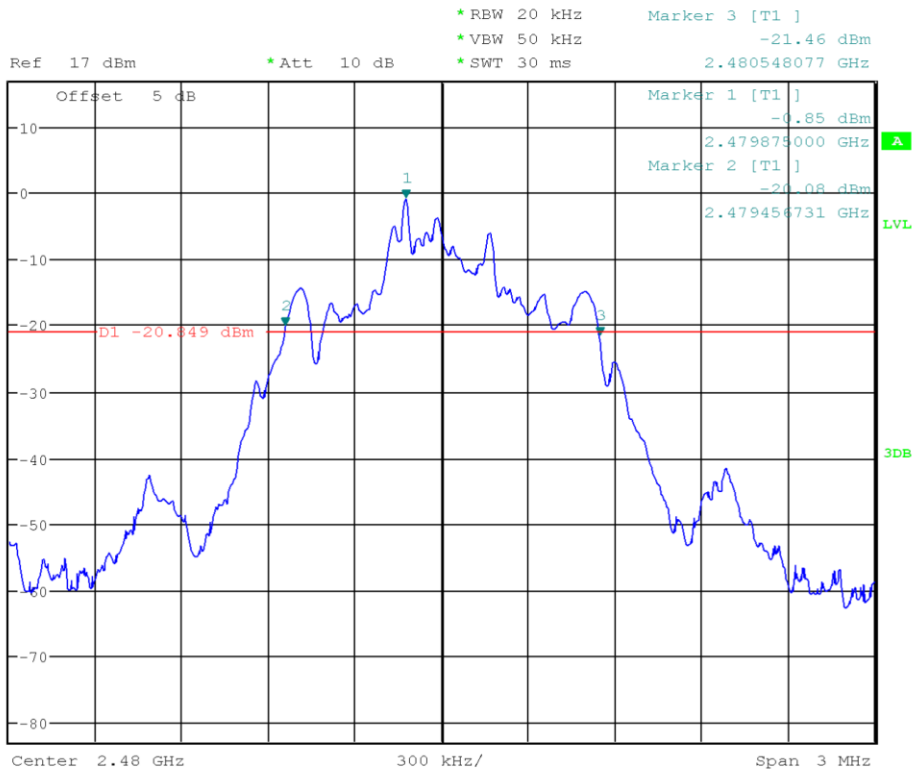Date: 9.APR.2016 11:09:23

Fig.78 20dB Bandwidth: GFSK, Ch78
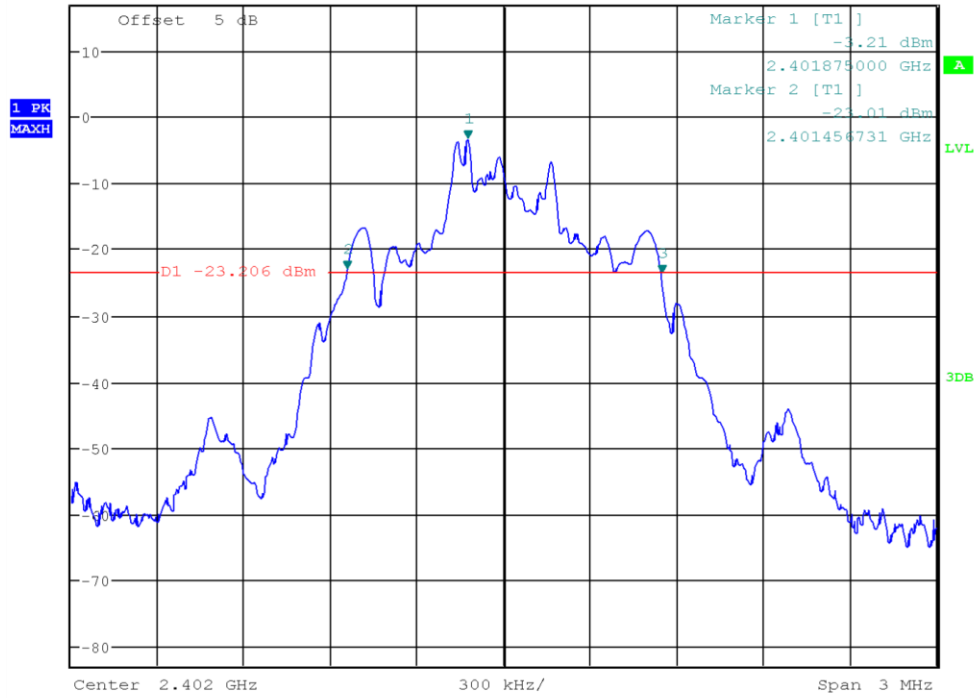
Fig.79 20dB Bandwidth: π/4 DQPSK, Ch0

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Fig.80 20dB Bandwidth: π/4 DQPSK, Ch39

Fig.81 20dB Bandwidth: π/4 DQPSK, Ch78
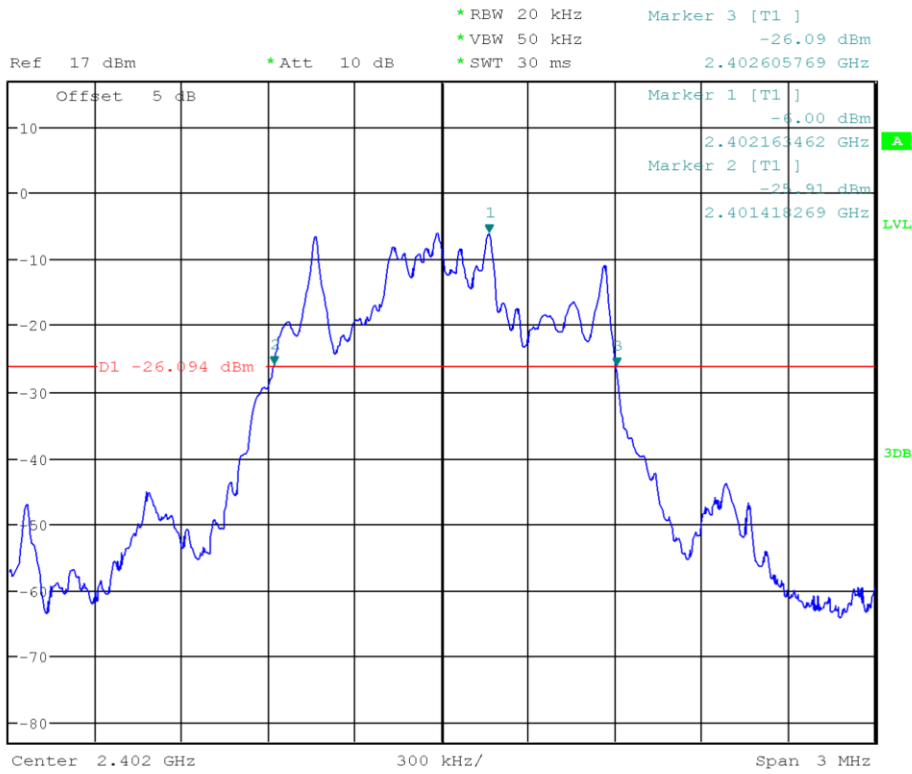
Fig.82 20dB Bandwidth: 8DPSK, Ch0
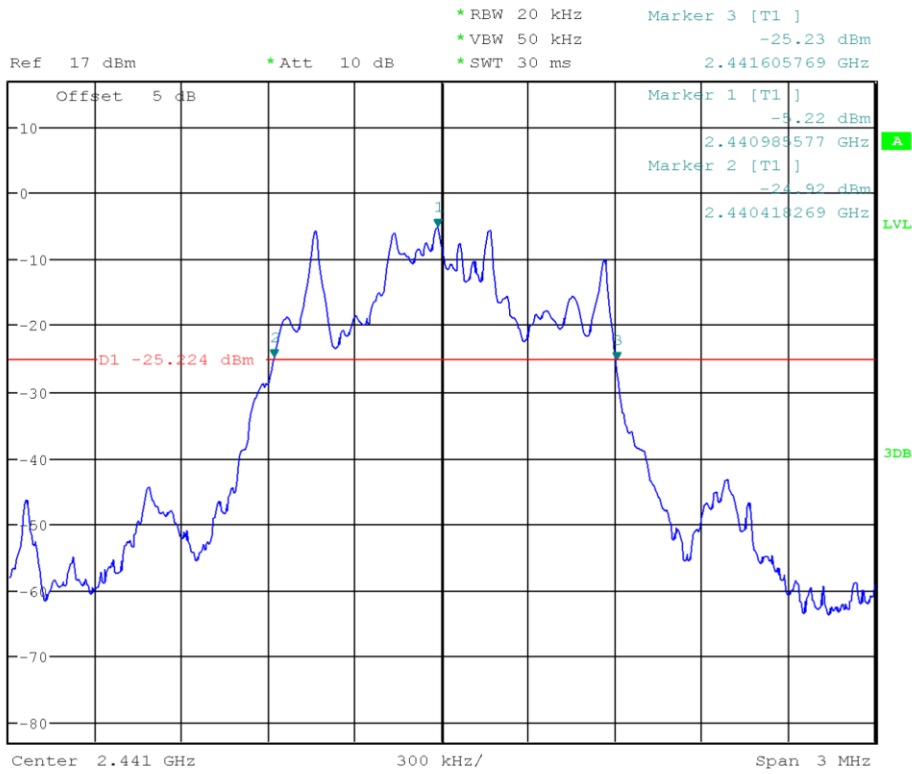
Fig.83 20dB Bandwidth: 8DPSK, Ch39
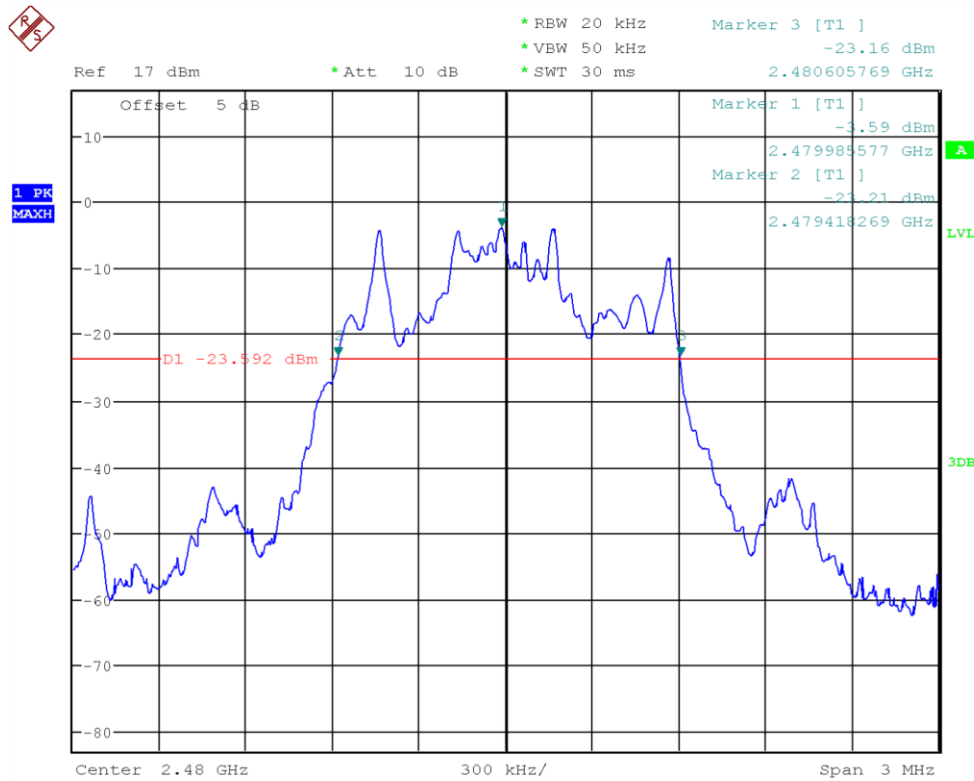
Fig.84 20dB Bandwidth: 8DPSK, Ch78

6.7. Carrier Frequency Separation

6.7.1 Measurement Limit:

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

6.7.2 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.

6.7.3 Measurement Result:

For GFSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.85	995.1923	P

For π/4 DQPSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.86	985.5769	P

For 8DPSK

Channel	Carrier separation (KHz)		Conclusion
39	Fig.87	1038.4615	P

Conclusion: PASS

Test graphs as below:
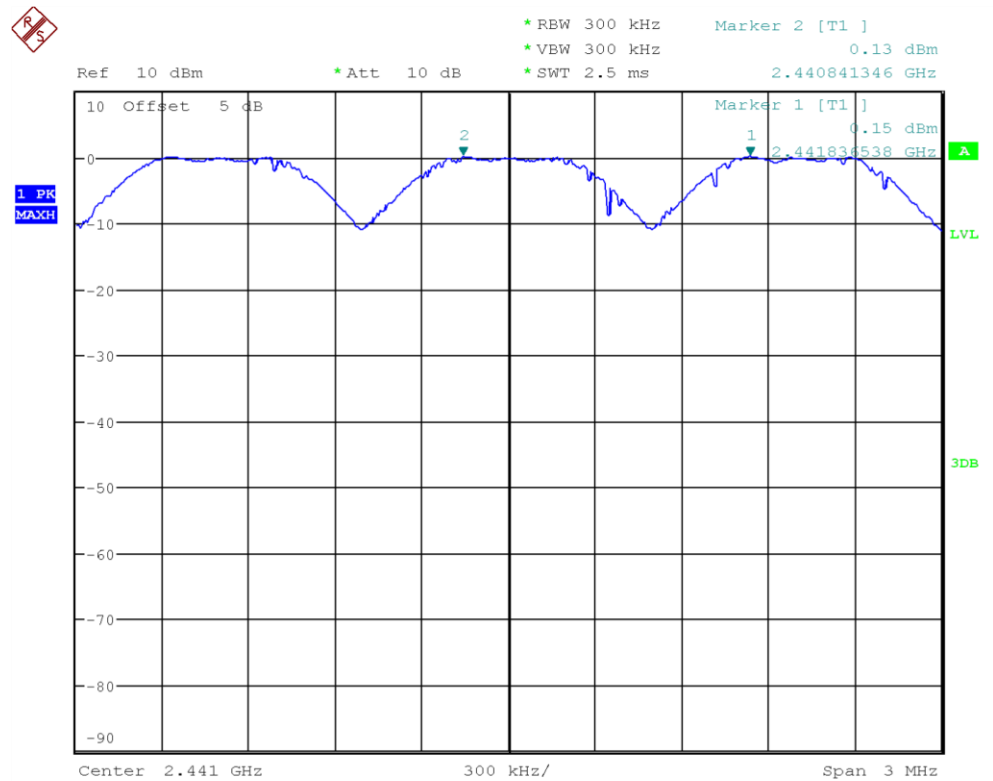
Date: 9.APR.2016 12:06:34

Fig.85 Carrier separation measurement: GFSK, Ch39

Date: 9.APR.2016 12:07:45

Fig.86 Carrier separation measurement: π/4 DQPSK, Ch39

Fig.87 Carrier separation measurement: 8DPSK, Ch39

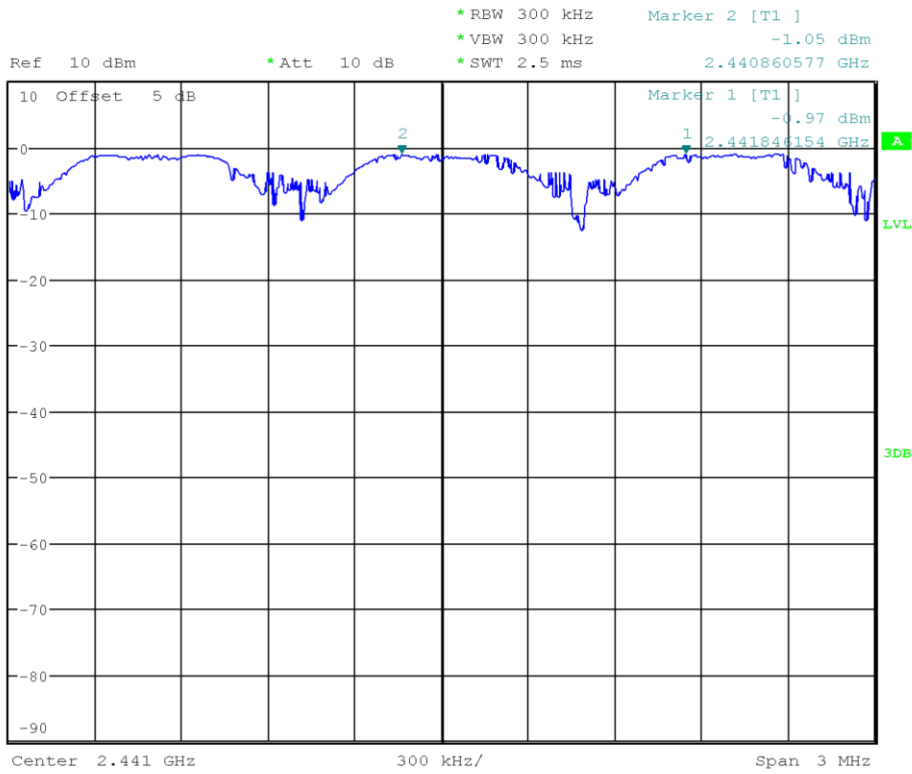## 6.8. Number Of Hopping Channels

6.8.1 Measurement Limit:

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

6.8.2 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 $\geqslant$ RBW.
6. Sweep: Auto.

7. Detector function: Peak.
8. Trace: Max hold.
9. Allow the trace to stabilize.
10. Record the test rsults.

6.8.3 Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.88	79	P
40~78	Fig.89		P

For π/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.90	79	P
40~78	Fig.91		P

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.92	79	P
40~78	Fig.93		P

Conclusion: PASS

Test graphs as below:

```
                                          * RBW  500 kHz
                                          * VBW  500 kHz
        Ref   10 dBm          * Att  10 dB    SWT  2.5 ms
        10  Offset   3 dB
```
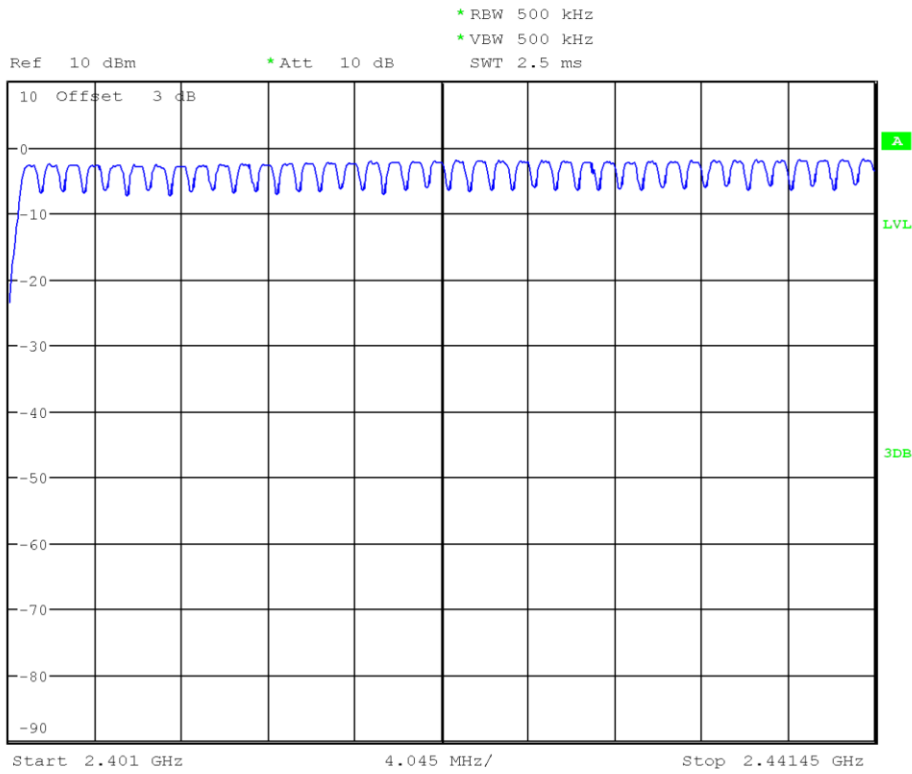
Date: 9.APR.2016 12:11:36

Fig.88 Number of hopping frequency: GFSK, Ch0~39
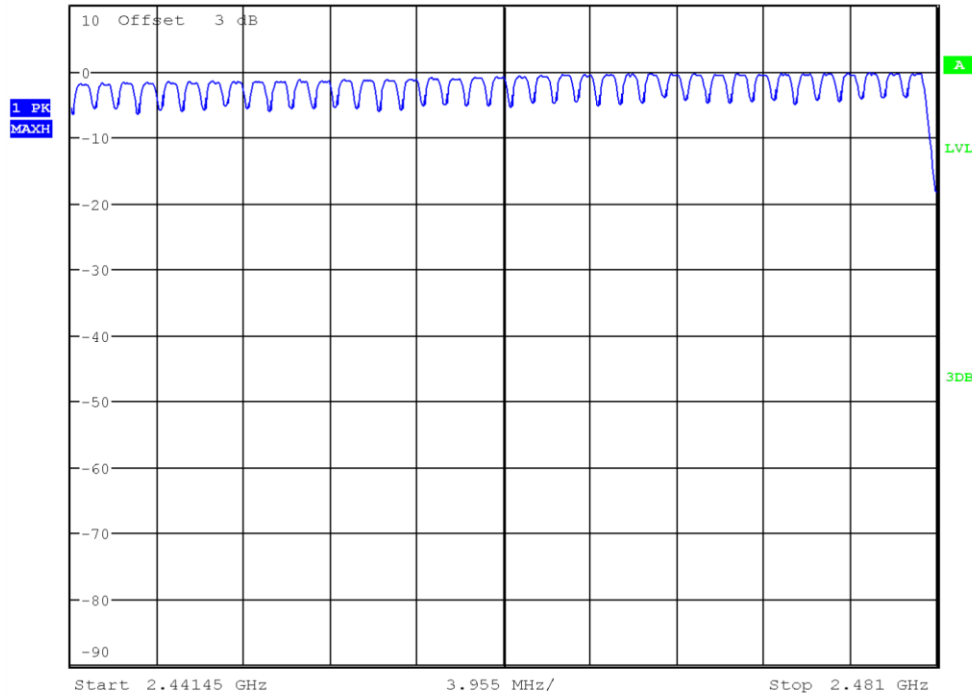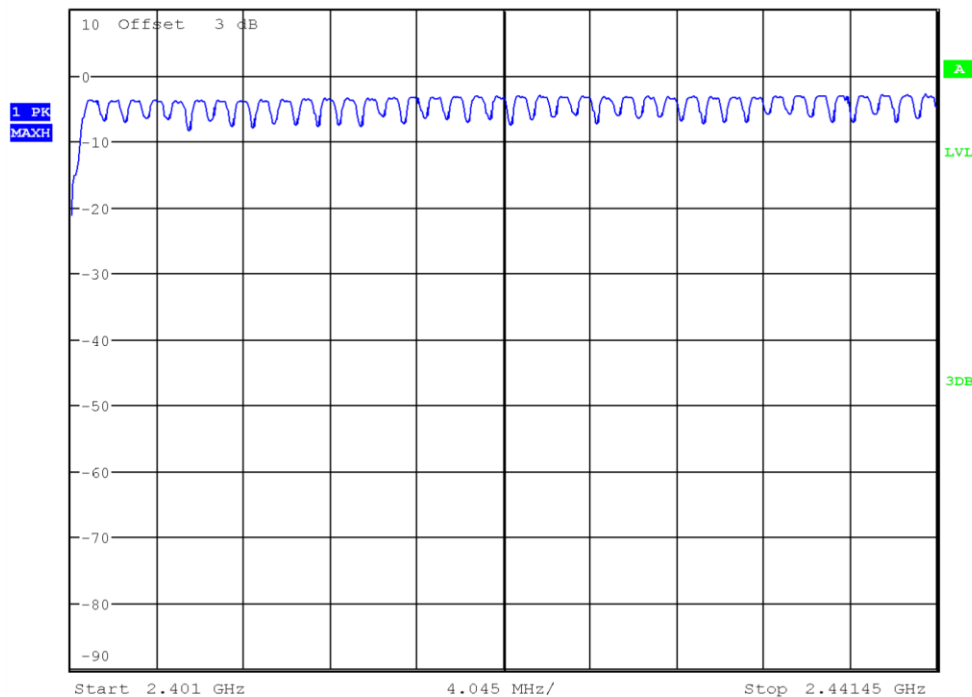
Fig.89 Number of hopping frequency: GFSK, Ch40~78

```
                                        * RBW  500 kHz
                                        * VBW  500 kHz
        Ref   10 dBm          * Att  10 dB    SWT  2.5 ms
        10  Offset   3 dB
```

Date: 9.APR.2016 12:15:46

Fig.90 Number of hopping frequency: π/4 DQPSK, Ch0~39

```
                                          * RBW  500 kHz
                                          * VBW  500 kHz
   Ref   10 dBm           * Att  10 dB     SWT  2.5 ms
```
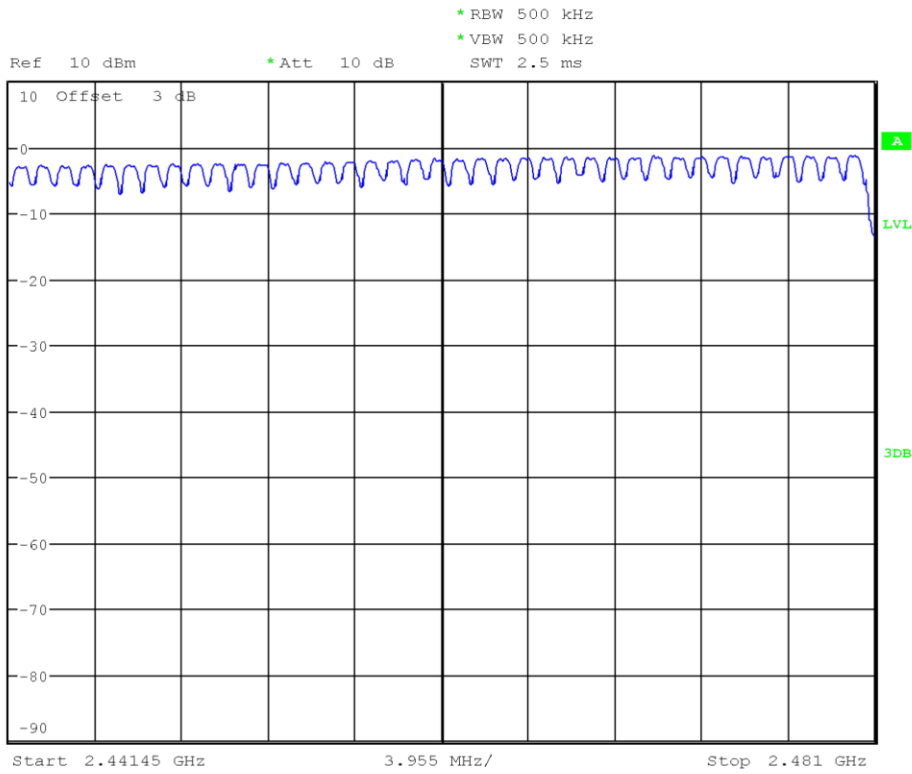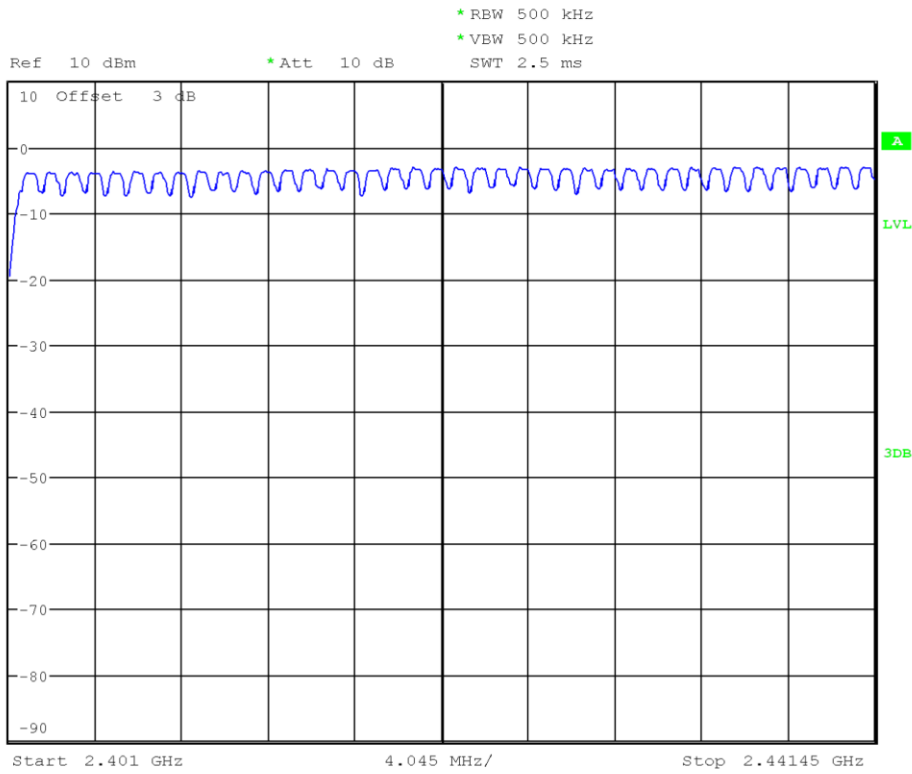
Date: 9.APR.2016 12:17:52

Fig.91 Number of hopping frequency: π/4 DQPSK, Ch40~78

Date: 9.APR.2016 12:19:57

Fig.92 Number of hopping frequency: 8DPSK, Ch0~39

* RBW 500 kHz
* VBW 500 kHz
Ref 10 dBm   * Att 10 dB   SWT 2.5 ms

Start 2.44145 GHz   3.955 MHz/   Stop 2.481 GHz
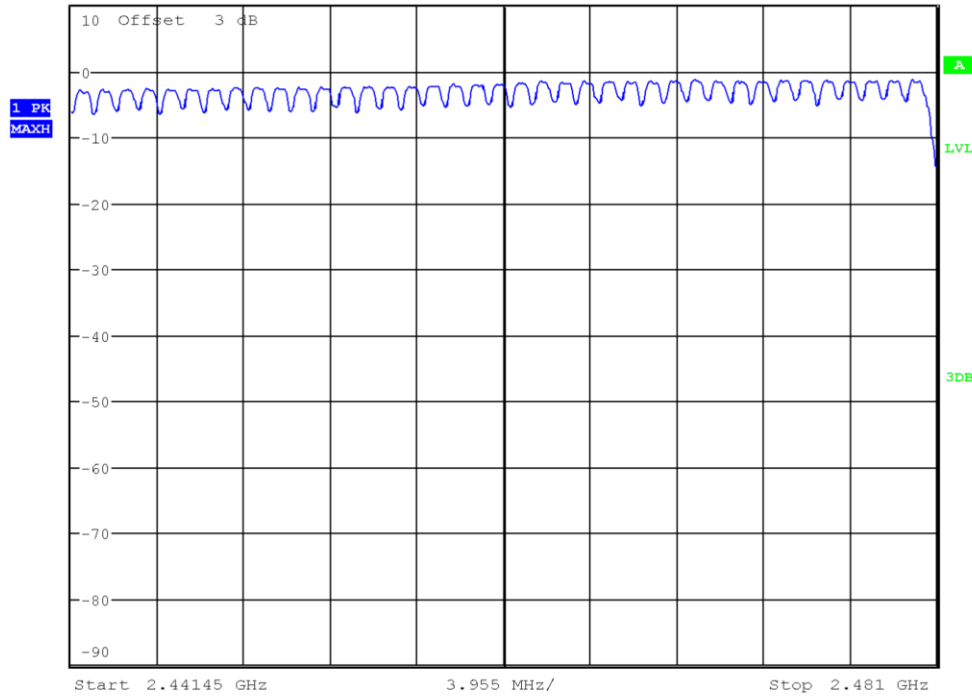
Date: 9.APR.2016 12:22:02

Fig.93 Number of hopping frequency: 8DPSK, Ch40~78

7. Test Equipments and Ancillaries Used For Tests

The test equipments and ancillaries used are as follows.

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Cal.interval
1	Vector Signal Analyser	FSQ26	101096	Rohde&Schwarz	2015-05-13	1
2	Bluetooth Tester	CBT32	100785	Rohde&Schwarz	2015-05-13	1
3	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2015-05-13	1

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Date	Cal.interval
1	Universal Radio Communicati	CMU200	123126	R&S	2015-05-13	1
2	Test Receiver	ESU40	100307	R&S	2015-05-13	1
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2014-11-05	3
4	Double Ridged Guide Antenna	ETS-3117	00135885	ETS	2014-05-06	3
5	2-Line V-Network	ENV216	101380	R&S	2015-05-13	1

Anechoic chamber

Fully anechoic chamber by Frankonia German.

8. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.8 meters×3.08 meters×3.53 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

Fully-anechoic chamber2 (Tapered Section: 8.75 meters×3.66 meters×3.66 meters, Rectangular Section: 7.32 meters×3.97 meters×3.66 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %

Shielding effectiveness	> 110 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
Uniformity of field strength	Between 0 and 6 dB, from 30MHz to 40000MHz

ANNEX A.   Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

**********End The Report**********