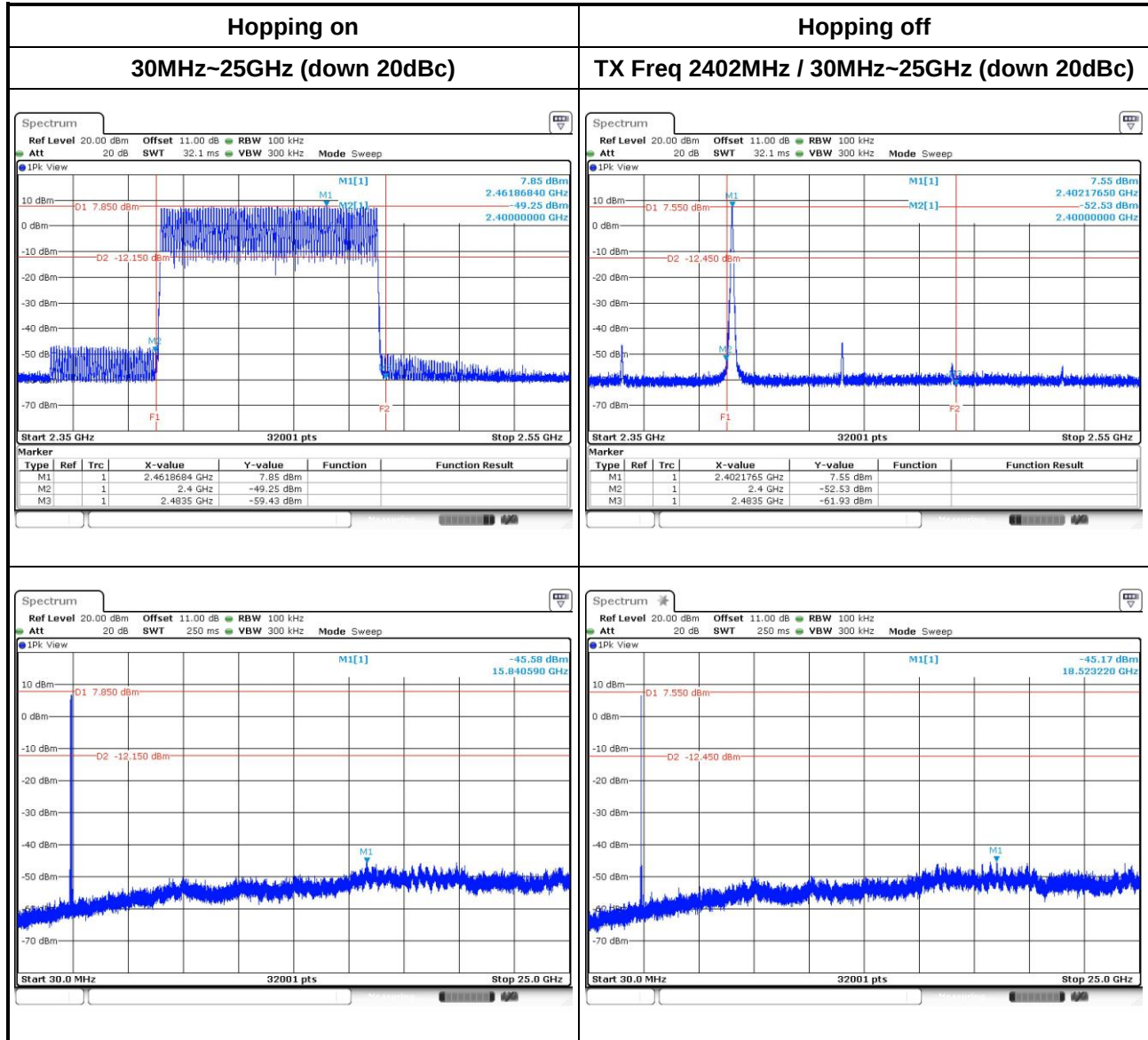


3.3.4 Unwanted Emissions into Non-Restricted Frequency Bands

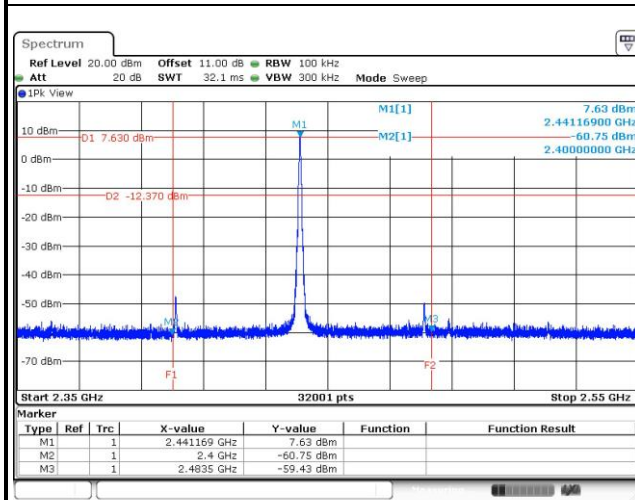
Configuration 2 : BT850-ST

GFSK



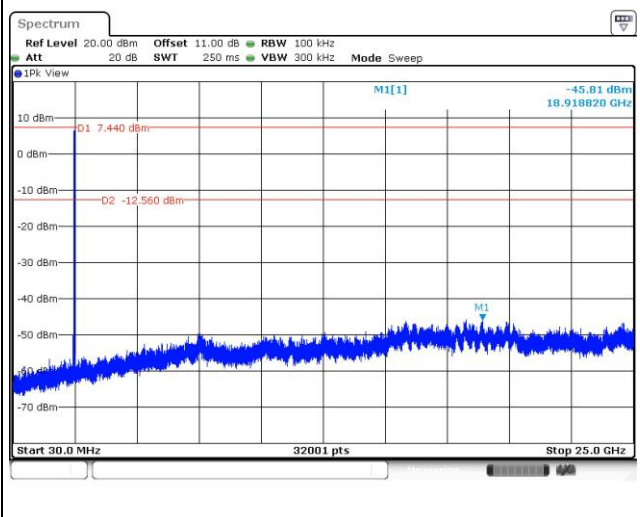
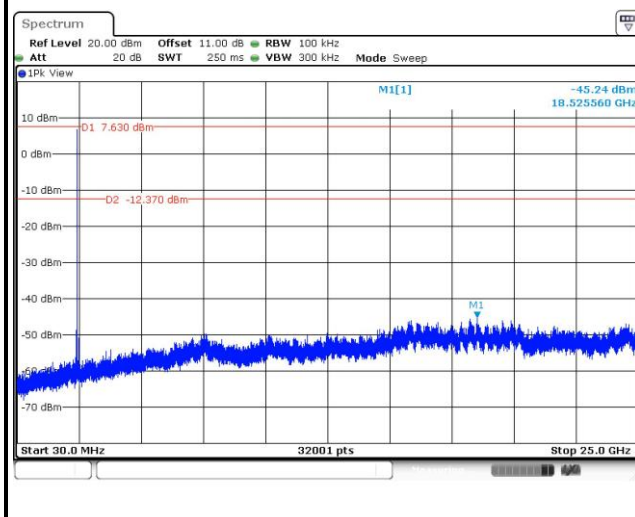
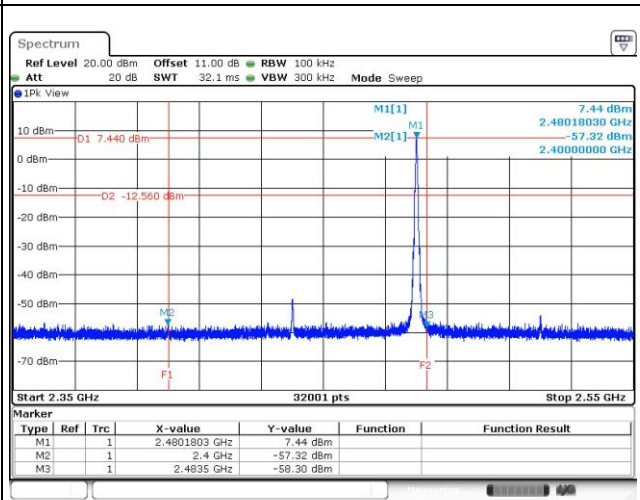
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)

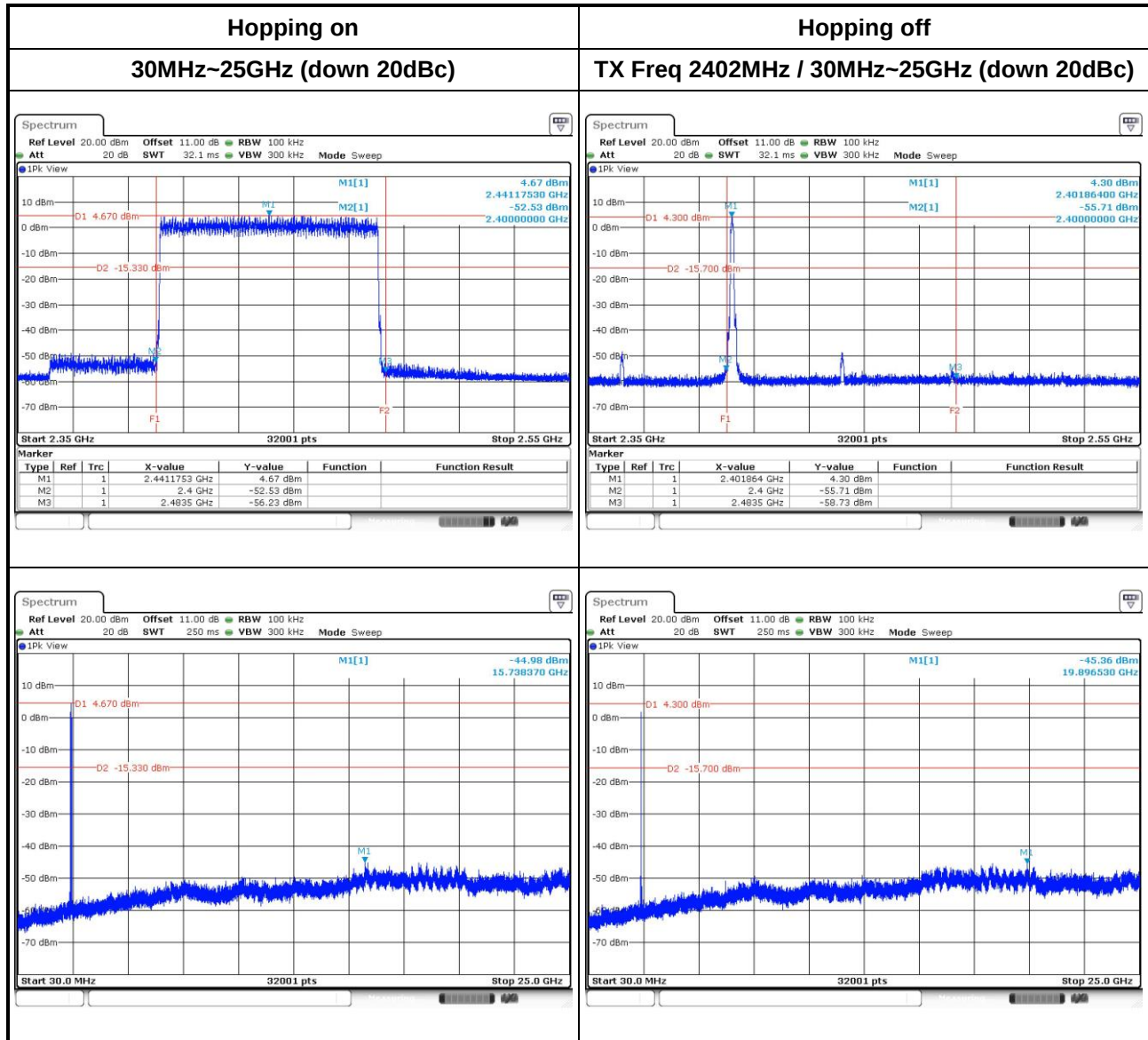


Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)

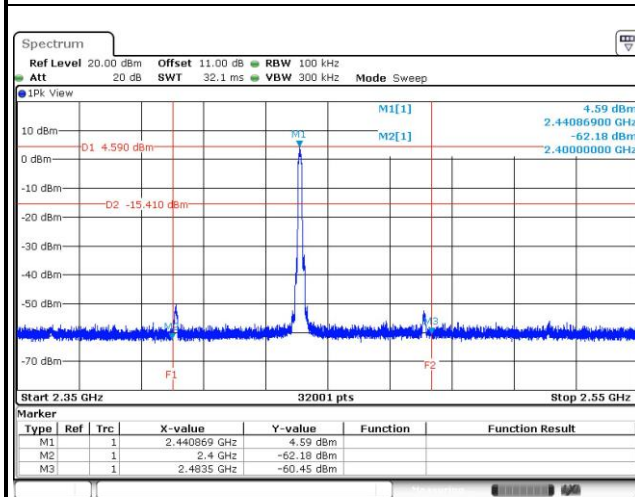


8DPSK



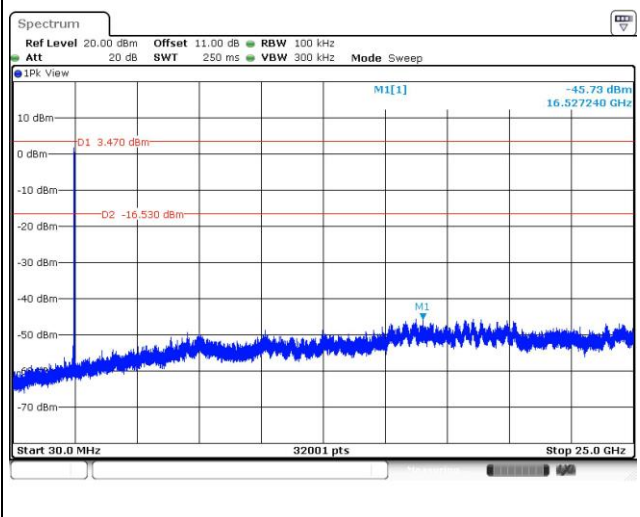
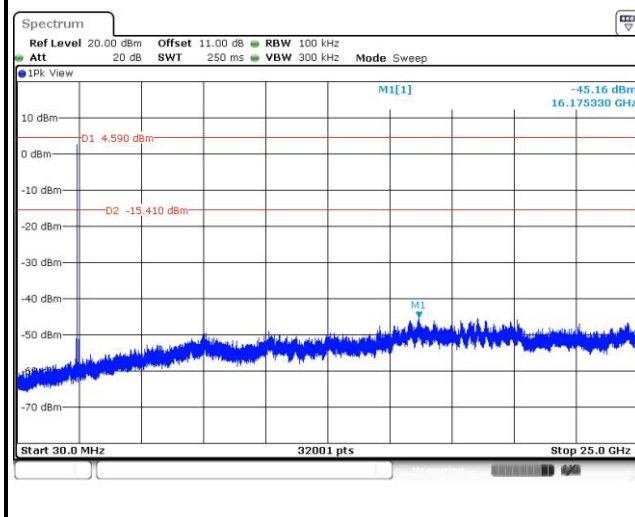
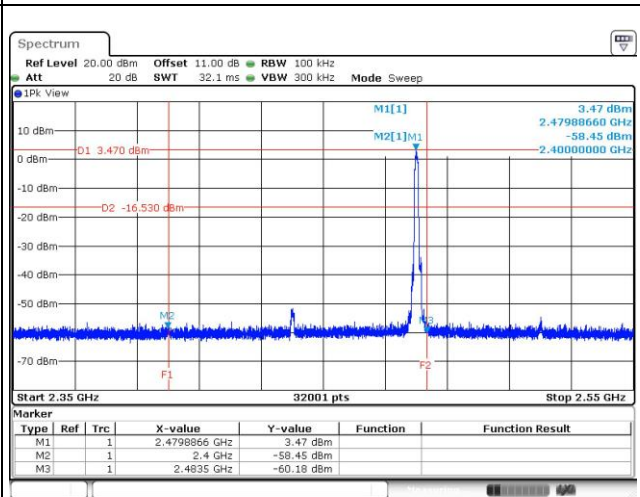
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)

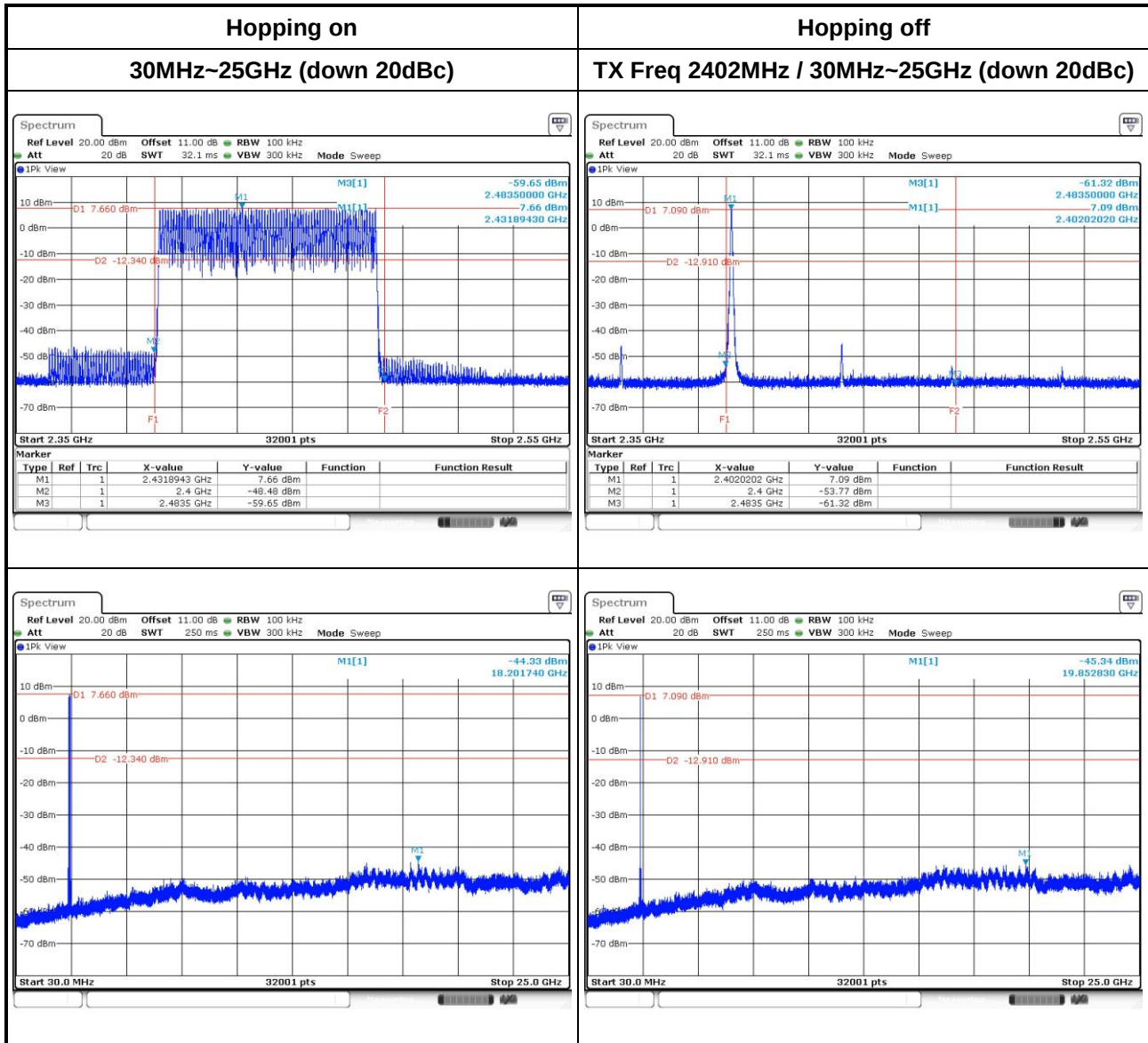


Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)

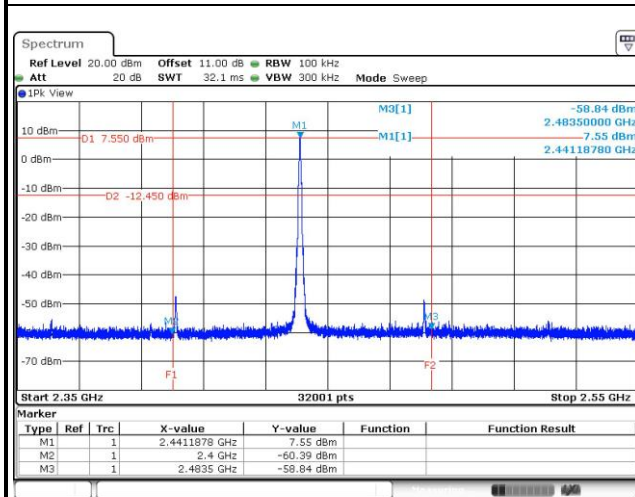


Configuration 4 : BT860-ST GFSK



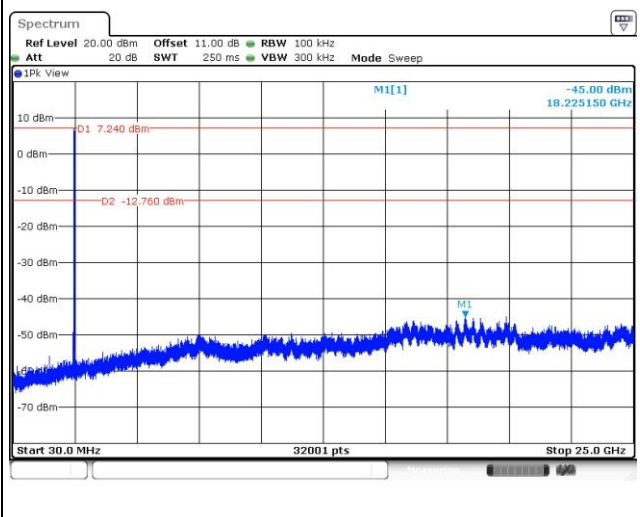
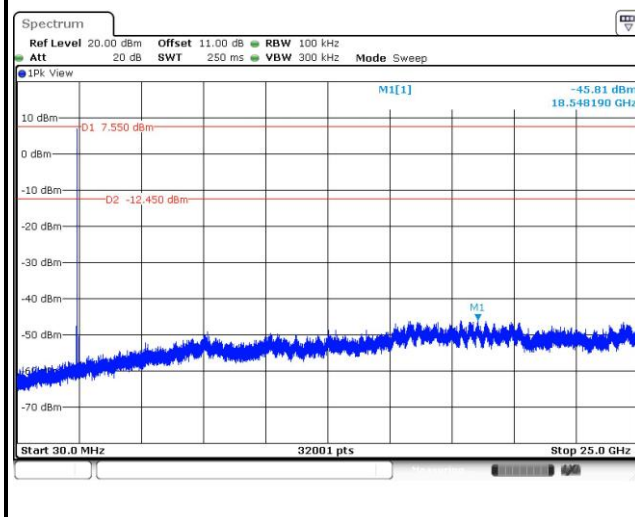
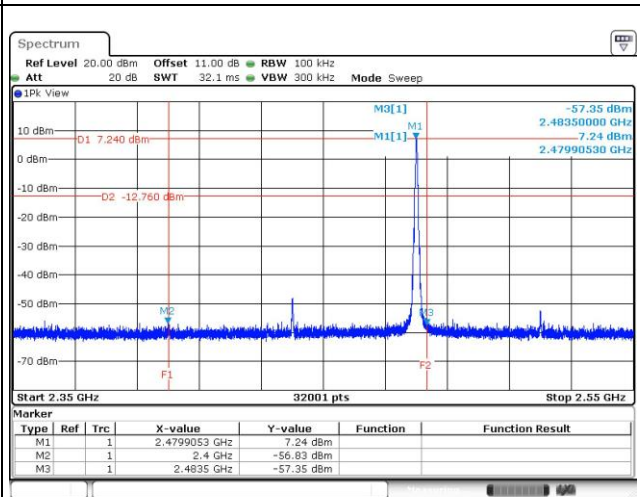
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)

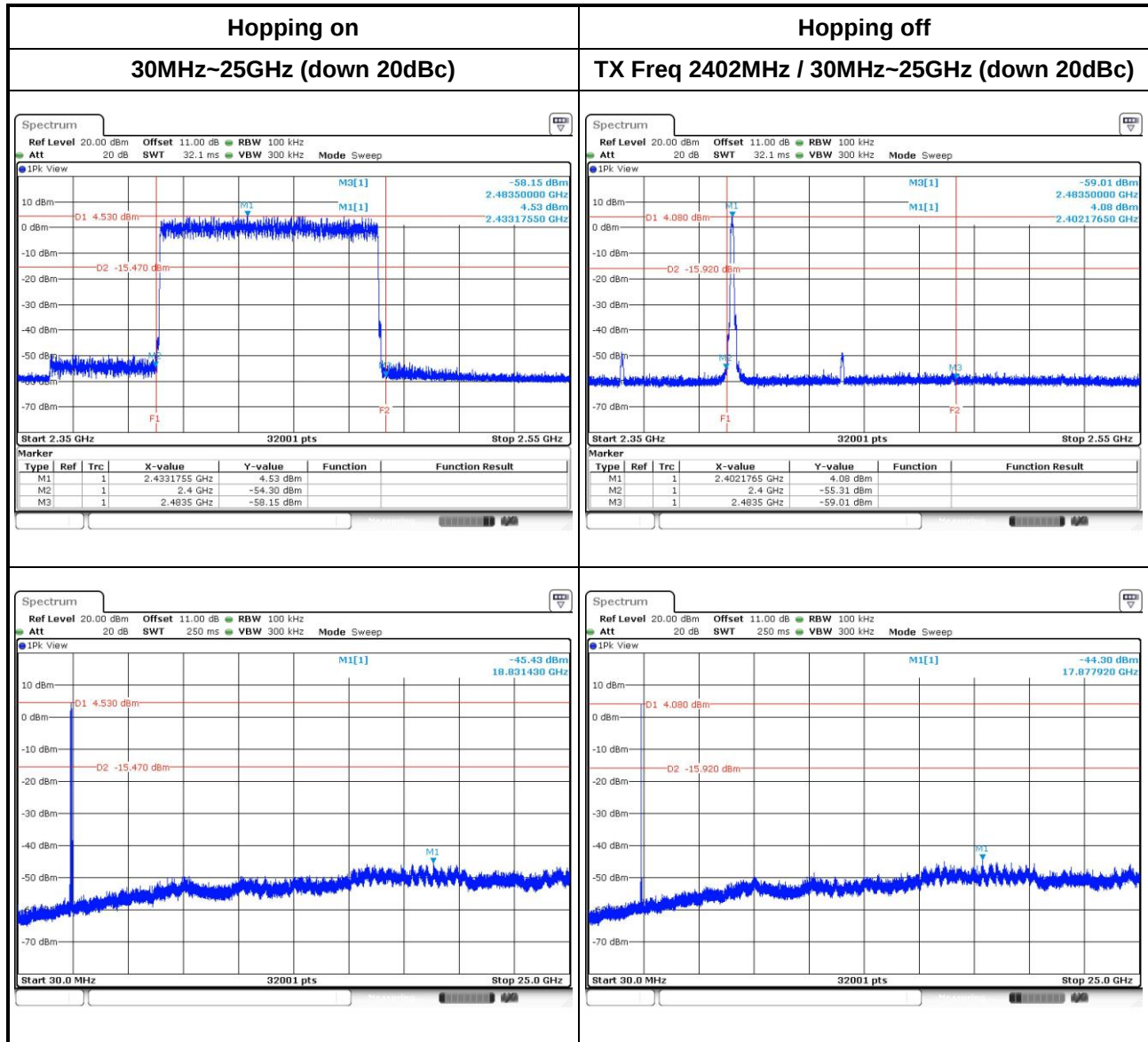


Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)

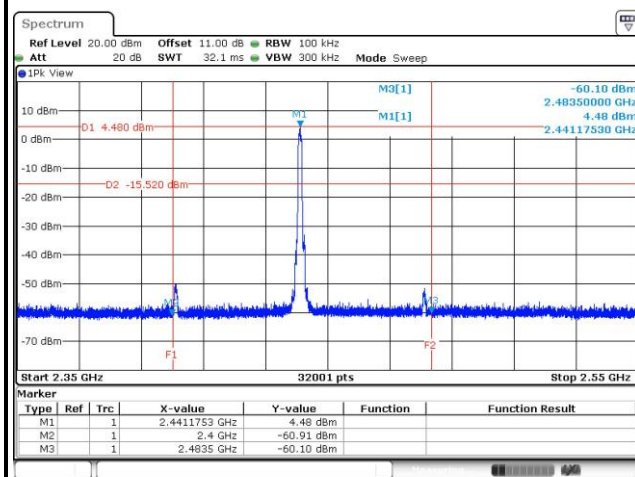


8DPSK



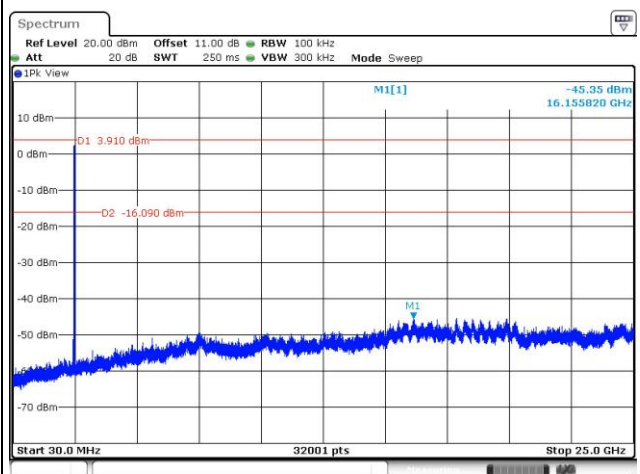
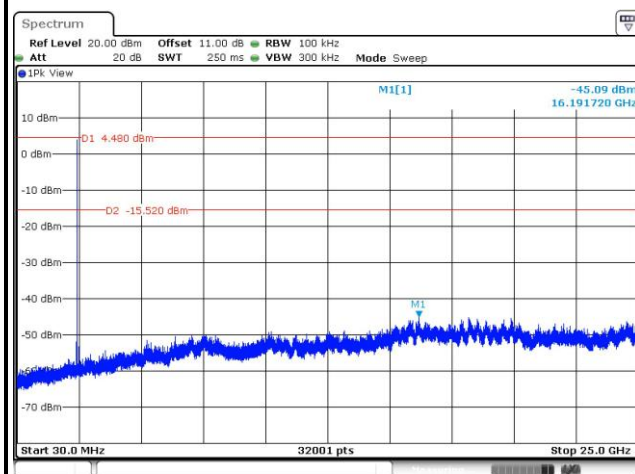
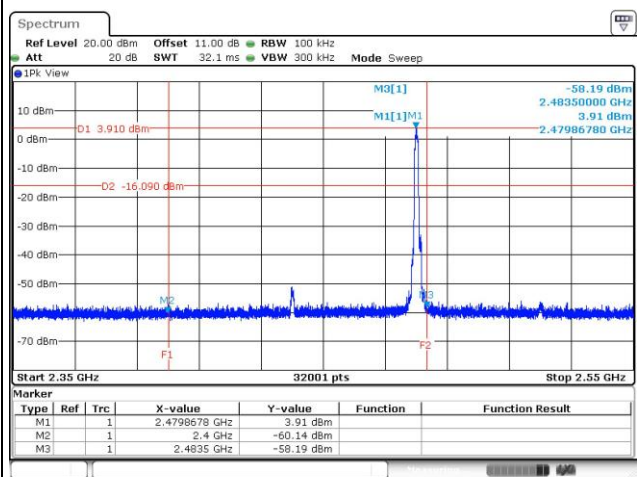
Hopping off

TX Freq 2441MHz / 30MHz~25GHz (down 20dBc)



Hopping off

TX Freq 2480MHz / 30MHz~25GHz (down 20dBc)



3.4 Conducted Output Power

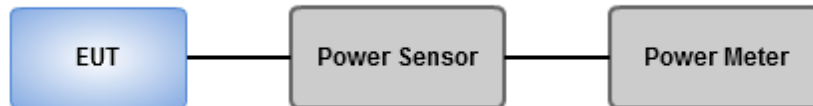
3.4.1 Limit of Conducted Output Power

- ☐ 1 Watt
For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band.
- ☒ 0.125 Watt
For all other frequency hopping systems in the 2400–2483.5 MHz band.
- ☐ 0.125 Watt
For Frequency hopping systems operating in the 2400–2483.5 MHz band have hopping channel carrier frequencies that are separated by two-thirds of the 20 dB bandwidth of the hopping channel.

3.4.2 Test Procedures

1. A wideband power meter is used for power measurement. Bandwidth of power sensor and meter is 50MHz
2. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power

3.4.3 Test Setup



3.4.4 Test Result of Conducted Output Power

Configuration 2 : BT850-ST

Modulation Mode	Freq. (MHz)	Output Power (mW)	Output Power (dBm)	Limit (mW)
GFSK	2402	5.53	7.43	125
GFSK	2441	6.07	7.83	125
GFSK	2480	5.48	7.39	125
π/4 DQPSK	2402	4.69	6.71	125
π/4 DQPSK	2441	5.24	7.19	125
π/4 DQPSK	2480	4.51	6.54	125
8DPSK	2402	5.05	7.03	125
8DPSK	2441	5.52	7.42	125
8DPSK	2480	4.68	6.70	125

Modulation Mode	Freq. (MHz)	AV Output Power (mW)	AV Output Power (dBm)
GFSK	2402	5.36	7.29
GFSK	2441	5.86	7.68
GFSK	2480	5.24	7.19
π/4 DQPSK	2402	2.63	4.20
π/4 DQPSK	2441	2.92	4.65
π/4 DQPSK	2480	2.54	4.04
8DPSK	2402	2.64	4.22
8DPSK	2441	2.94	4.68
8DPSK	2480	2.56	4.09

Note: Average power is for reference only.

Configuration 4 : BT860-ST

Modulation Mode	Freq. (MHz)	Output Power (mW)	Output Power (dBm)	Limit (mW)
GFSK	2402	5.61	7.49	125
GFSK	2441	6.15	7.89	125
GFSK	2480	5.53	7.43	125
π/4 DQPSK	2402	4.81	6.82	125
π/4 DQPSK	2441	5.27	7.22	125
π/4 DQPSK	2480	4.59	6.62	125
8DPSK	2402	5.14	7.11	125
8DPSK	2441	5.66	7.53	125
8DPSK	2480	4.82	6.83	125

Modulation Mode	Freq. (MHz)	AV Output Power (mW)	AV Output Power (dBm)
GFSK	2402	5.46	7.37
GFSK	2441	5.97	7.76
GFSK	2480	5.35	7.28
π/4 DQPSK	2402	2.72	4.35
π/4 DQPSK	2441	2.97	4.73
π/4 DQPSK	2480	2.58	4.12
8DPSK	2402	2.72	4.35
8DPSK	2441	2.98	4.74
8DPSK	2480	2.58	4.11

Note: Average power is for reference only.

3.5 Number of Hopping Frequency

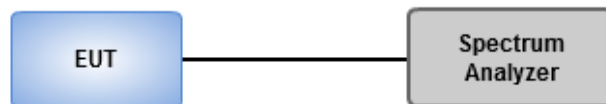
3.5.1 Limit of Number of Hopping Frequency

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

3.5.2 Test Procedures

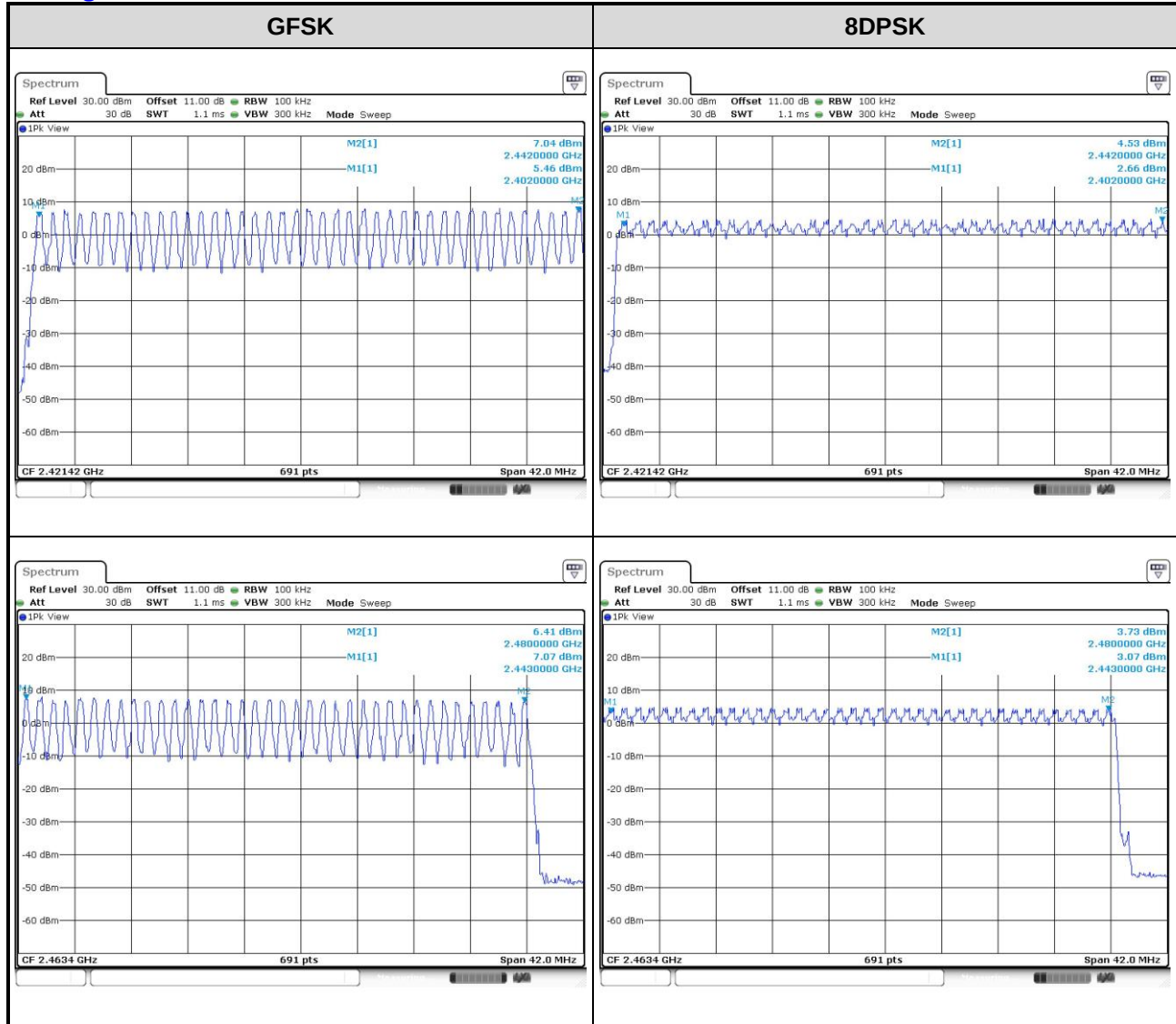
1. Set RBW = 100kHz, VBW = 300kHz, Sweep time = Auto, Detector = Peak Trace max hold.
2. Allow trace to stabilize.

3.5.3 Test Setup

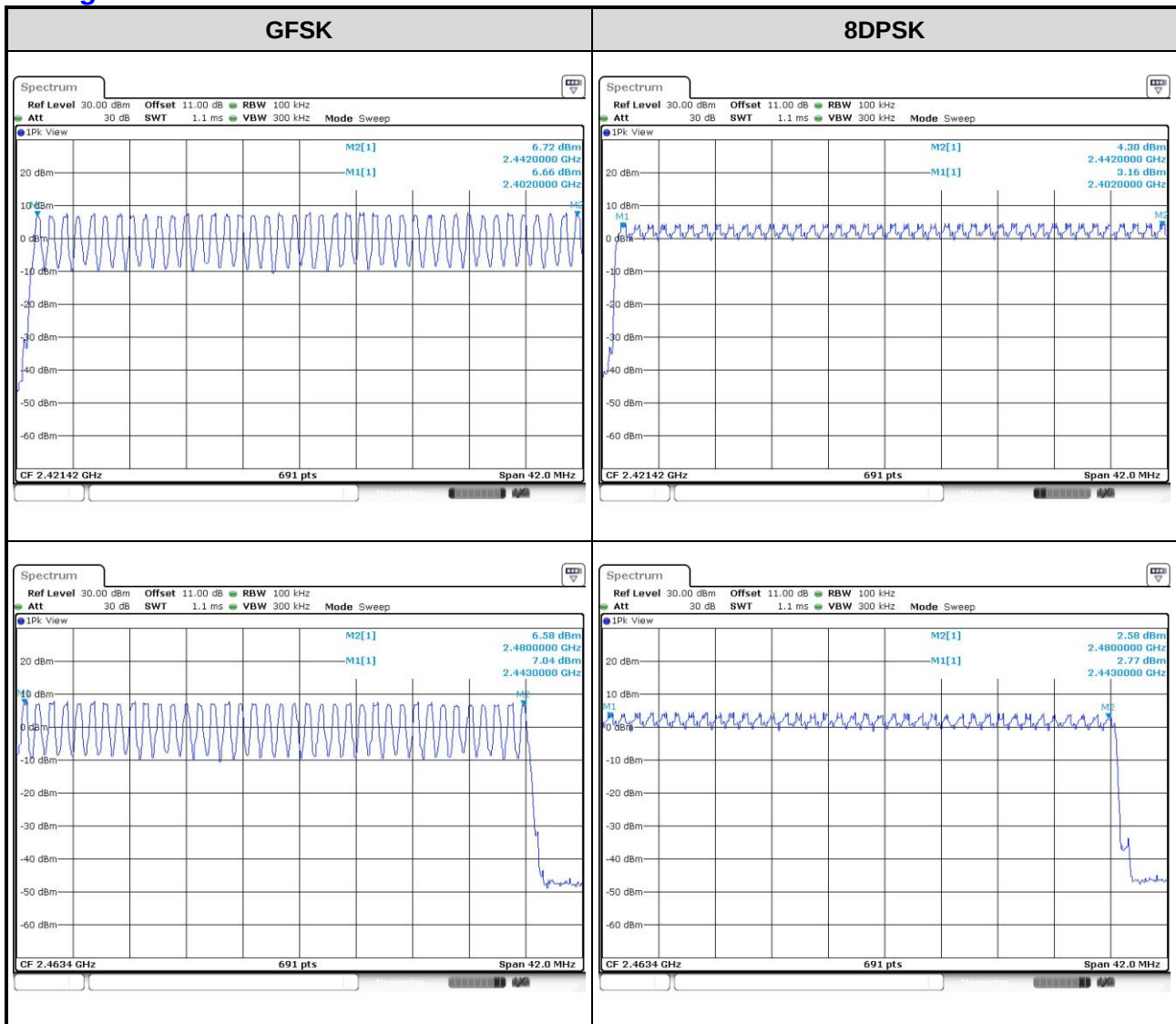


3.5.4 Test Result of Number of Hopping Frequency

Configuration 2 : BT850-ST



Configuration 4 : BT860-ST



3.6 20dB and Occupied Bandwidth

3.6.1 Test Procedures

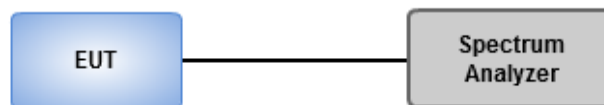
20dB Bandwidth

1. Set RBW=30kHz, VBW=100kHz, Sweep time = Auto, Detector=Peak, Trace max hold
2. Allow trace to stabilize
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set RBW=30kHz, VBW=100kHz, Sweep time = Auto, Detector=Sample, Trace max hold
2. Allow trace to stabilize
3. Use Occupied bandwidth function of spectrum analyzer to measuring 99% occupied bandwidth

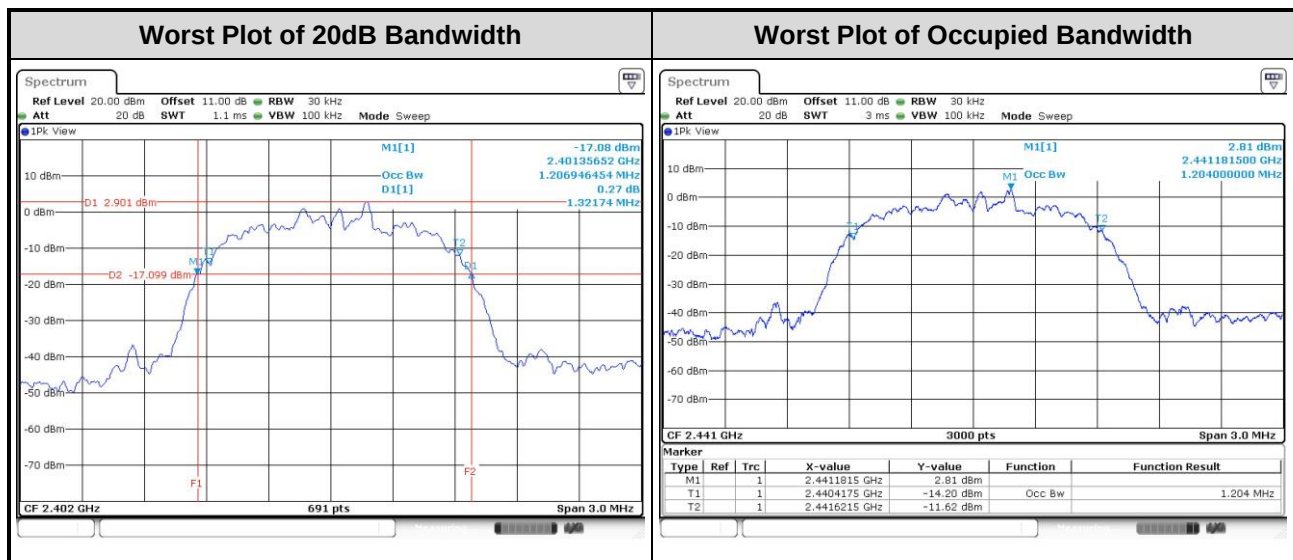
3.6.2 Test Setup



3.6.3 Test result of 20dB and Occupied Bandwidth

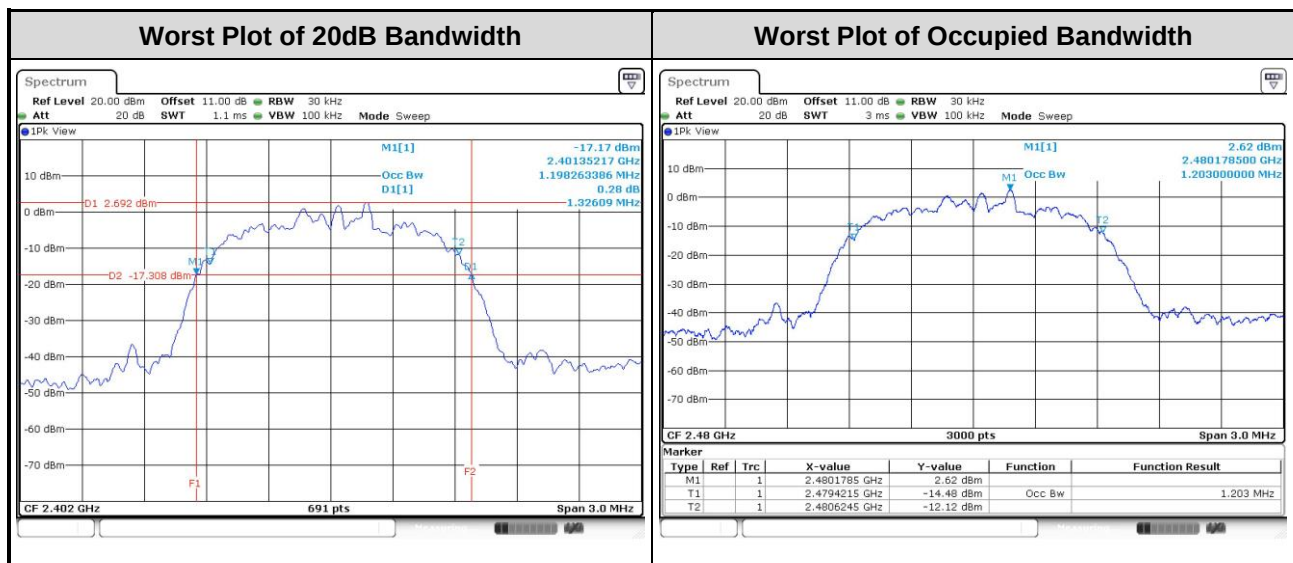
Configuration 2 : BT850-ST

Modulation Mode	Freq. (MHz)	20dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
GFSK	2402	0.970	0.891
GFSK	2441	0.991	0.887
GFSK	2480	0.970	0.913
8DPSK	2402	1.322	1.203
8DPSK	2441	1.317	1.204
8DPSK	2480	1.322	1.203



Configuration 4 : BT860-ST

Modulation Mode	Freq. (MHz)	20dB Bandwidth (MHz)	Occupied Bandwidth (MHz)
GFSK	2402	0.970	0.896
GFSK	2441	0.987	0.898
GFSK	2480	1.013	0.900
8DPSK	2402	1.326	1.201
8DPSK	2441	1.309	1.202
8DPSK	2480	1.317	1.203



3.7 Channel Separation

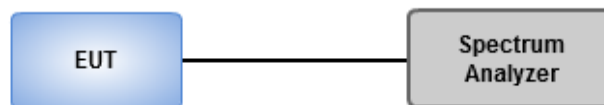
3.7.1 Limit of Channel Separation

- ☐ Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
- ☒ Frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

3.7.2 Test Procedures

1. Set RBW=100kHz, VBW=300kHz, Sweep time = Auto, Detector=Peak Trace max hold
2. Allow trace to stabilize
3. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The EUT shall show compliance with the appropriate regulatory limit

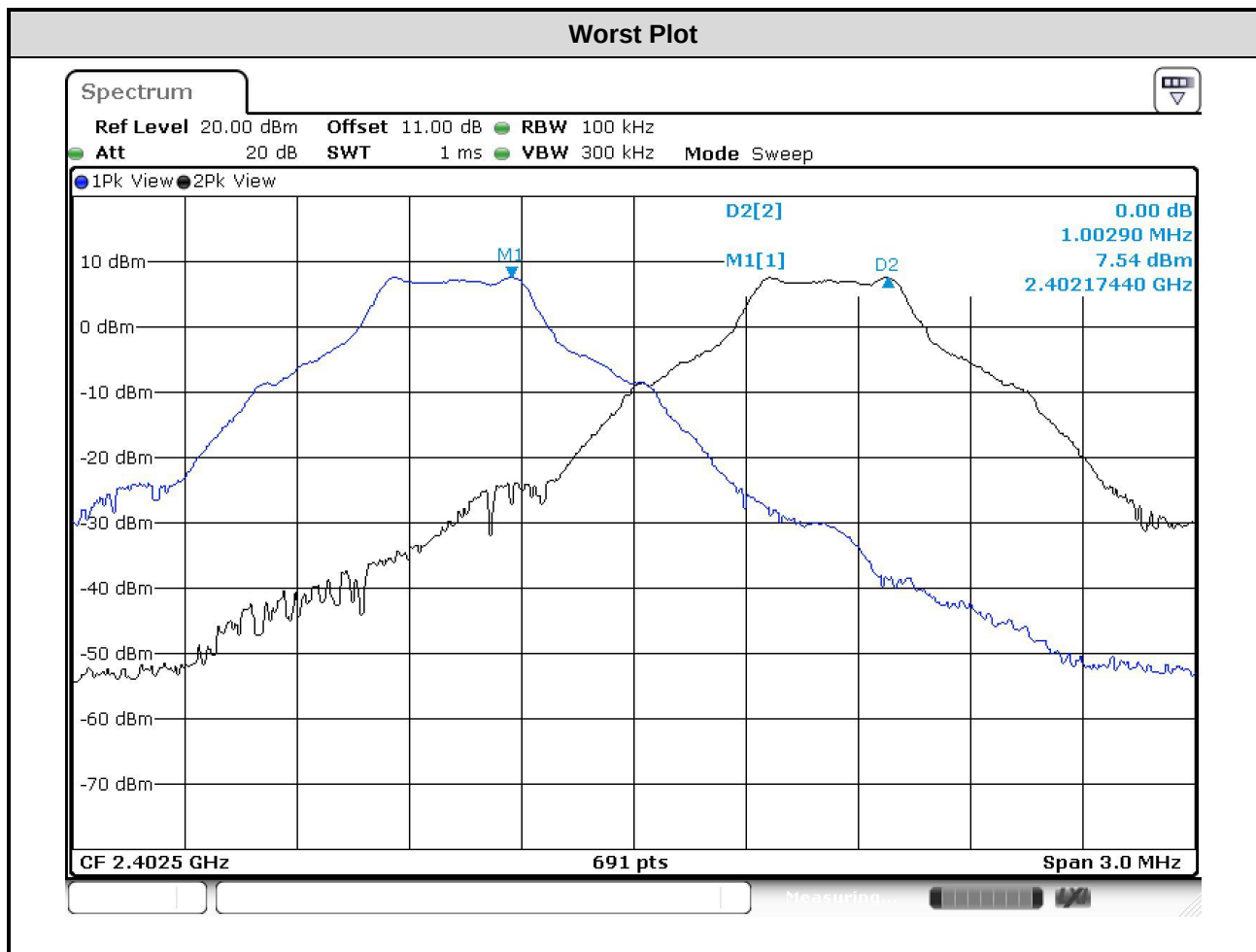
3.7.3 Test Setup



3.7.4 Test result of Channel Separation

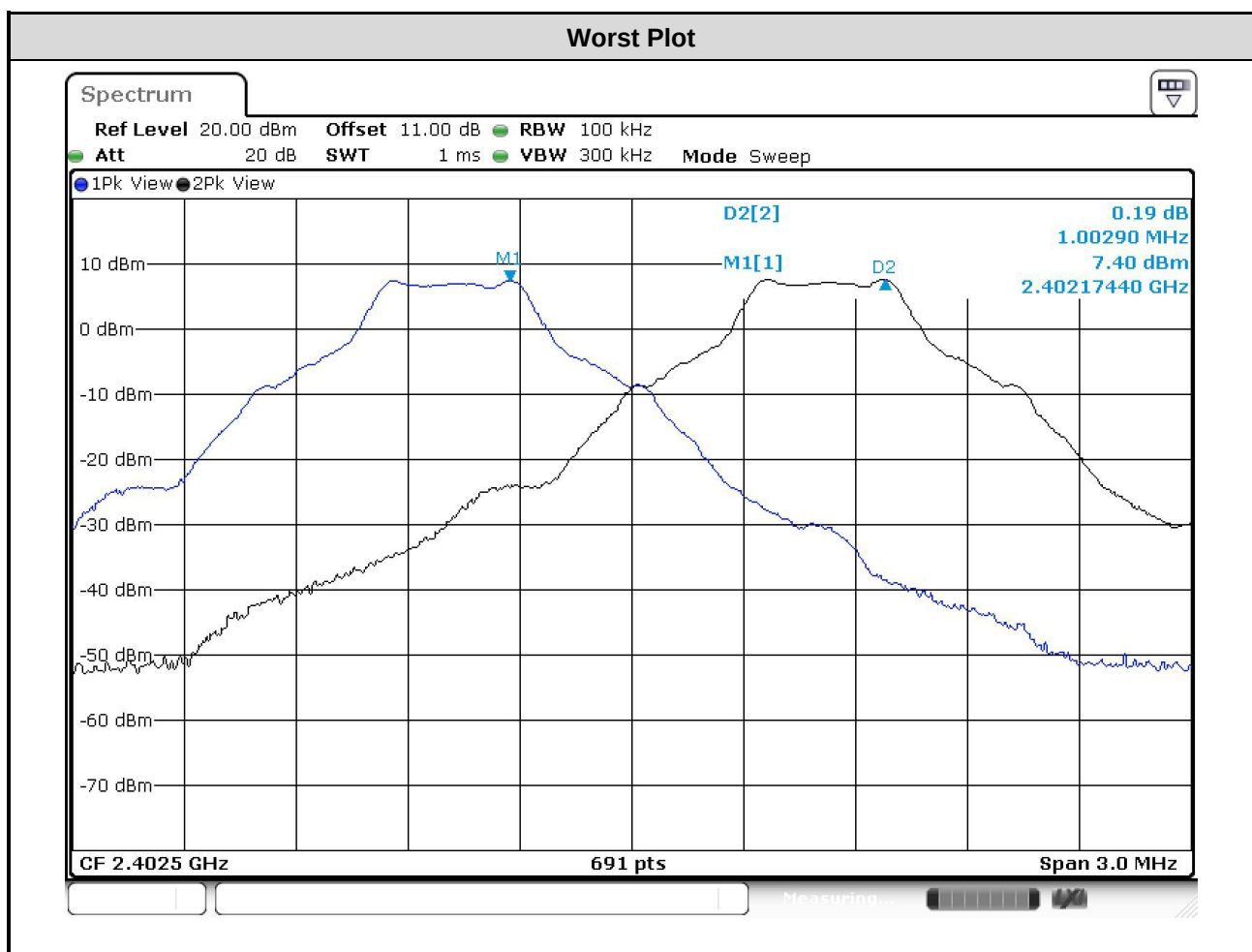
Configuration 2 : BT850-ST

Modulation Mode	Freq. (MHz)	Channel Separation (MHz)	20dB Bandwidth (MHz)	Minimum Limit (MHz)
GFSK	2402	1.003	0.970	0.647
GFSK	2441	1.003	0.991	0.661
GFSK	2480	1.003	0.970	0.647
8DPSK	2402	1.003	1.322	0.881
8DPSK	2441	1.003	1.317	0.878
8DPSK	2480	1.003	1.322	0.881



Configuration 4 : BT860-ST

Modulation Mode	Freq. (MHz)	Channel Separation (MHz)	20dB Bandwidth (MHz)	Minimum Limit (MHz)
GFSK	2402	1.003	0.970	0.647
GFSK	2441	1.003	0.987	0.658
GFSK	2480	1.003	1.013	0.675
8DPSK	2402	1.003	1.326	0.884
8DPSK	2441	1.003	1.309	0.873
8DPSK	2480	1.003	1.317	0.878



3.8 Number of Dwell Time

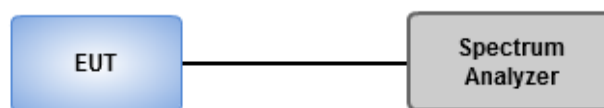
3.8.1 Limit of Dwell time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

3.8.2 Test Procedures

1. Set RBW=100kHz,VBW=300kHz,Sweep time = 500us(DH1),2ms(DH3),4ms(DH5), Detector=Peak, Span=0Hz,Trace max hold
2. Enable gating and trigger function of spectrum analyzer to measure burst on time.
3. The DH1 packet can cover a single time slot. A maximum length packet has duration of 1 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 1/1600 seconds, or 0.625ms. DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.
4. The DH3 packet can cover up to 3 time slots. A maximum length packet has duration of 3 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 3/1600 seconds, or 1.875ms. DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
5. The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds

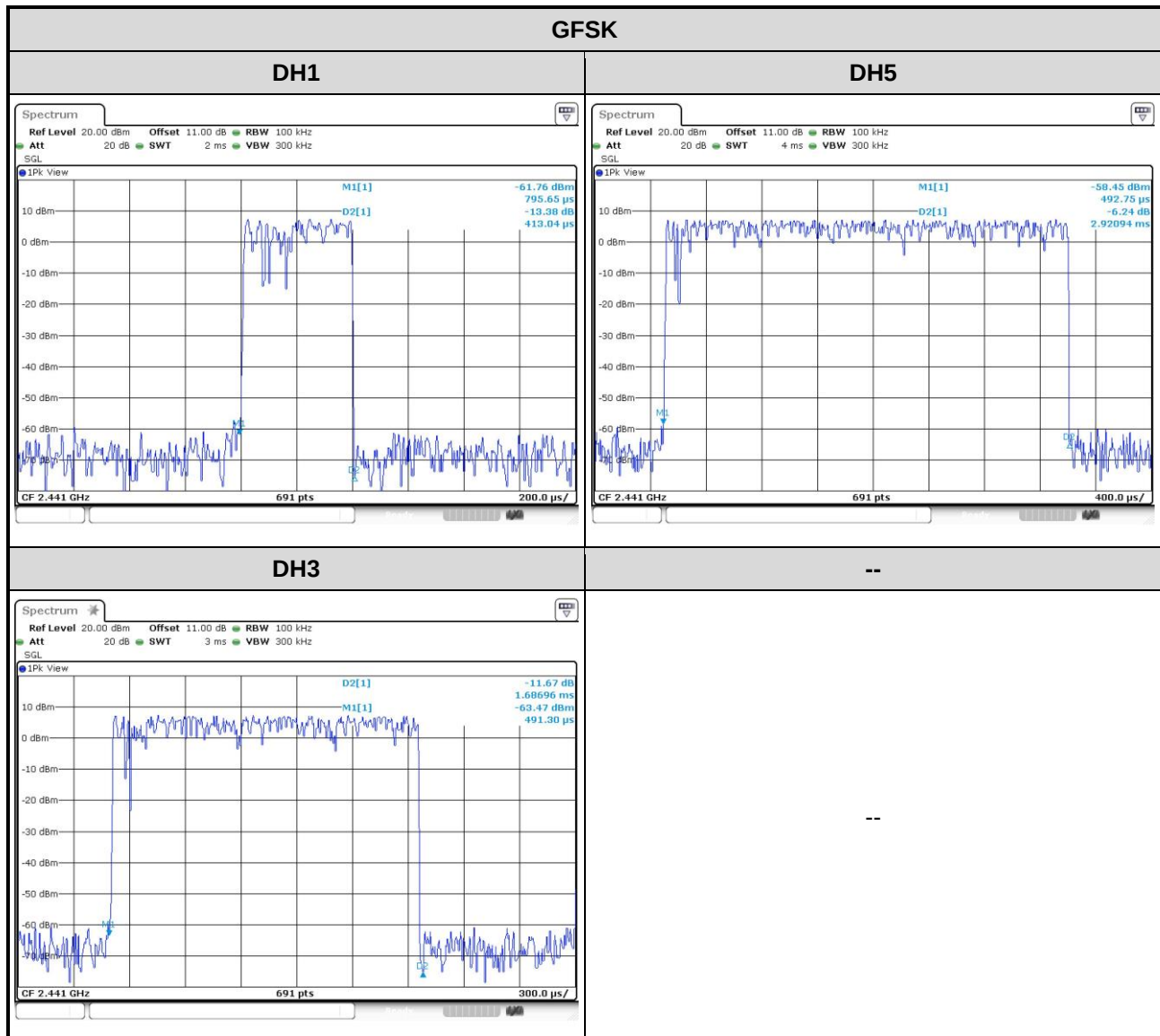
3.8.3 Test Setup

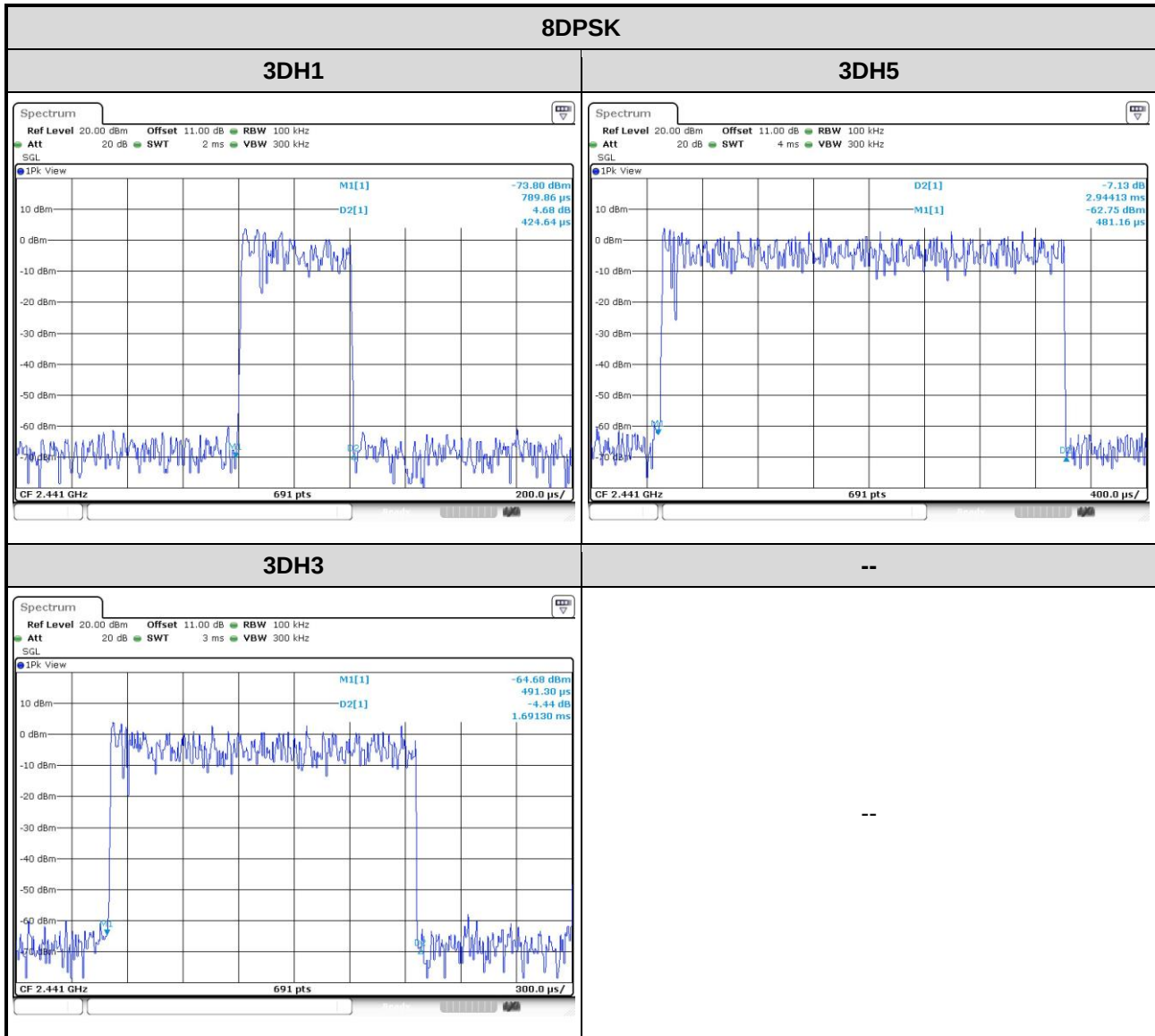


3.8.4 Test Result of Dwell Time

Configuration 2 : BT850-ST

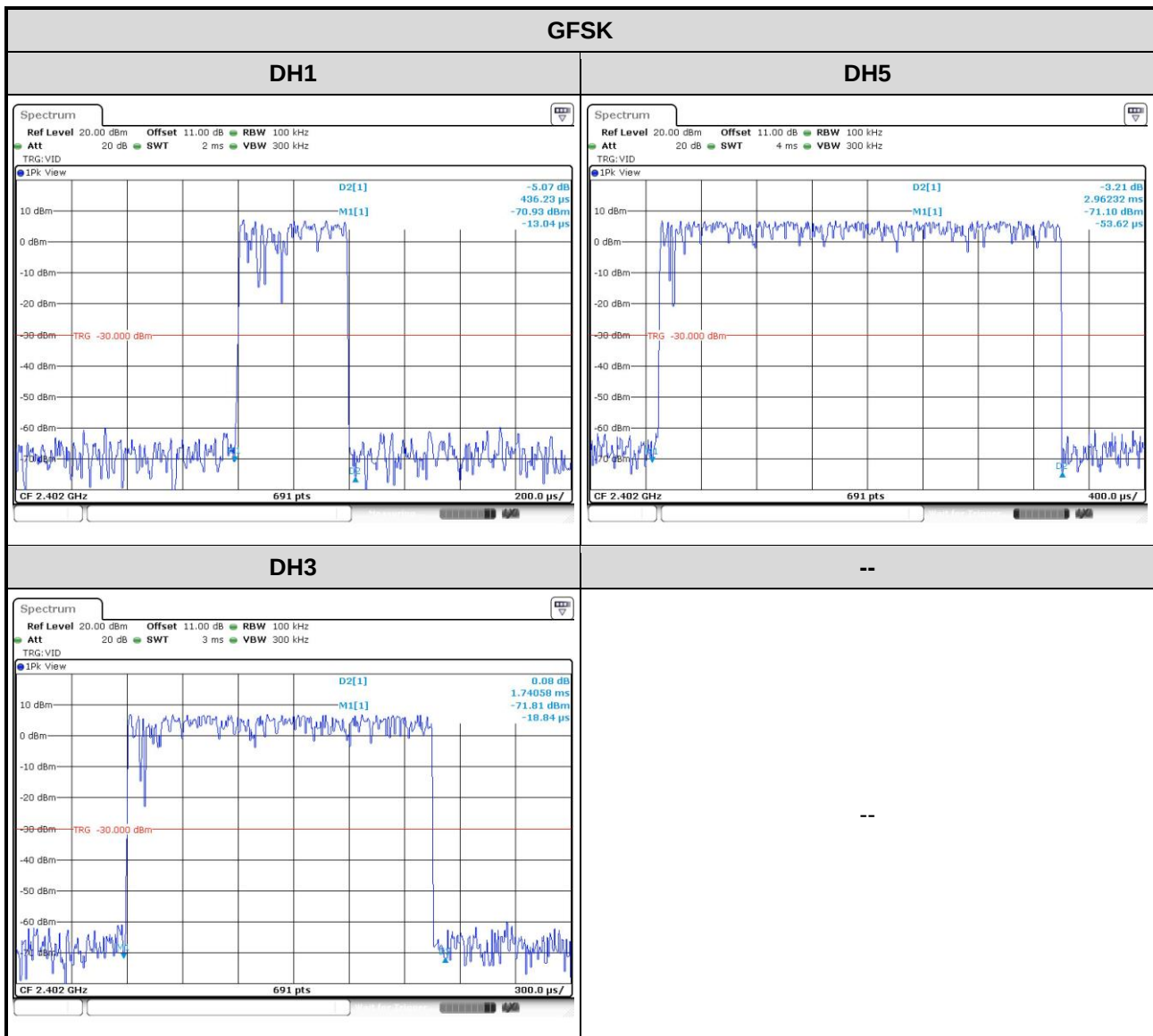
Modulation Mode	Freq. (MHz)	Length of Transmission Time (msec)	Number of Transmission in a 31.6 (79 Hopping*0.4)	Result (s)	Limit (s)
GFSK-DH1	2441	0.41304	320	0.132	0.4
GFSK-DH3	2441	1.68696	160	0.270	0.4
GFSK-DH5	2441	2.92094	106.6	0.311	0.4
8DPSK-DH1	2441	0.42464	320	0.136	0.4
8DPSK-DH3	2441	1.69130	160	0.271	0.4
8DPSK-DH5	2441	2.94413	106.6	0.314	0.4

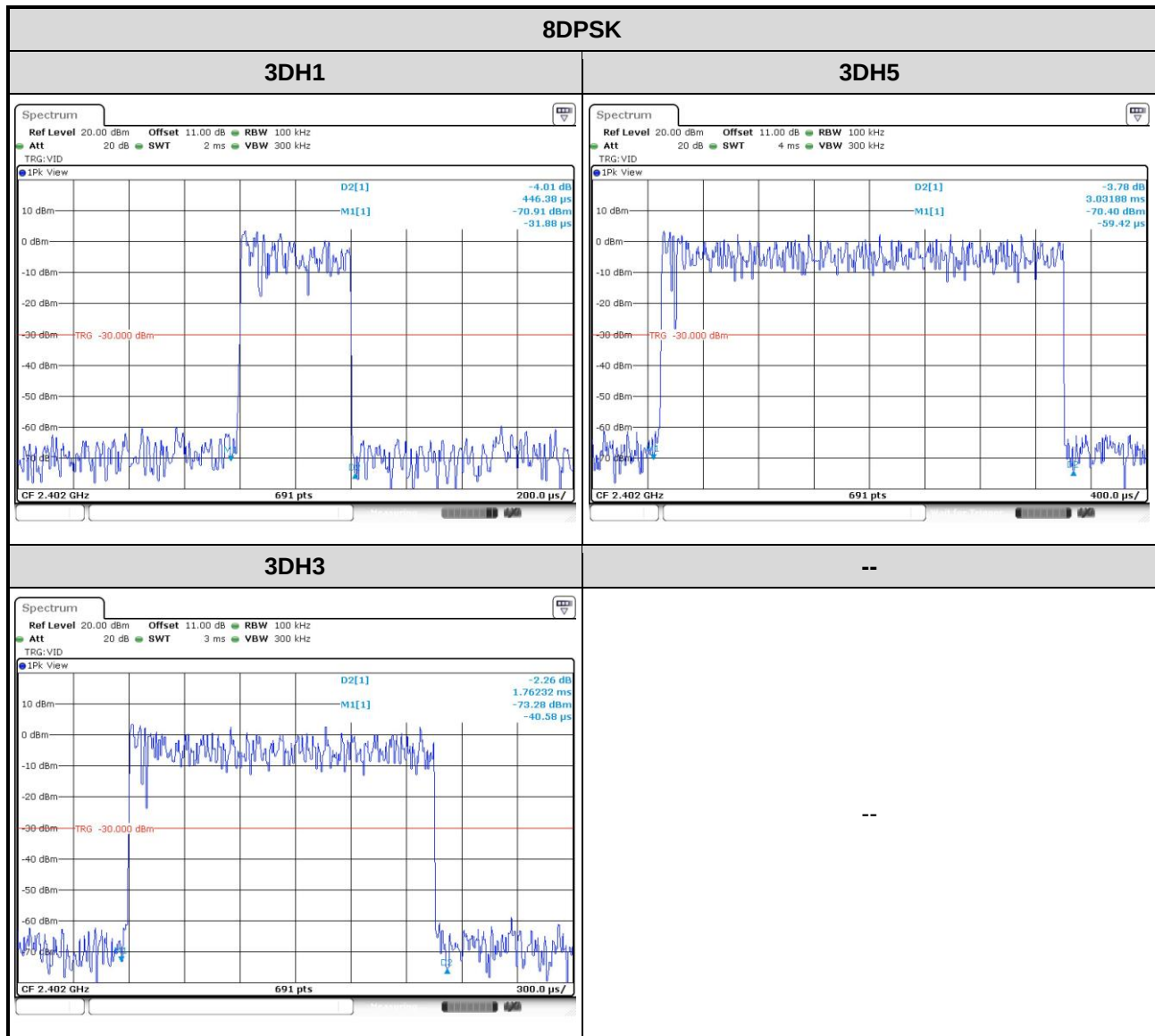




Configuration 4 : BT860-ST

Modulation Mode	Freq. (MHz)	Length of Transmission Time (msec)	Number of Transmission in a 31.6 (79 Hopping*0.4)	Result (s)	Limit (s)
GFSK-DH1	2402	0.43623	320	0.140	0.4
GFSK-DH3	2402	1.74058	160	0.278	0.4
GFSK-DH5	2402	2.96232	106.6	0.316	0.4
8DPSK-DH1	2402	0.44638	320	0.143	0.4
8DPSK-DH3	2402	1.76232	160	0.282	0.4
8DPSK-DH5	2402	3.03188	106.6	0.323	0.4





4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

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If you have any suggestion, please feel free to contact us as below information.

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