Fig.82.   20dB Bandwidth: GFSK, Channel 0
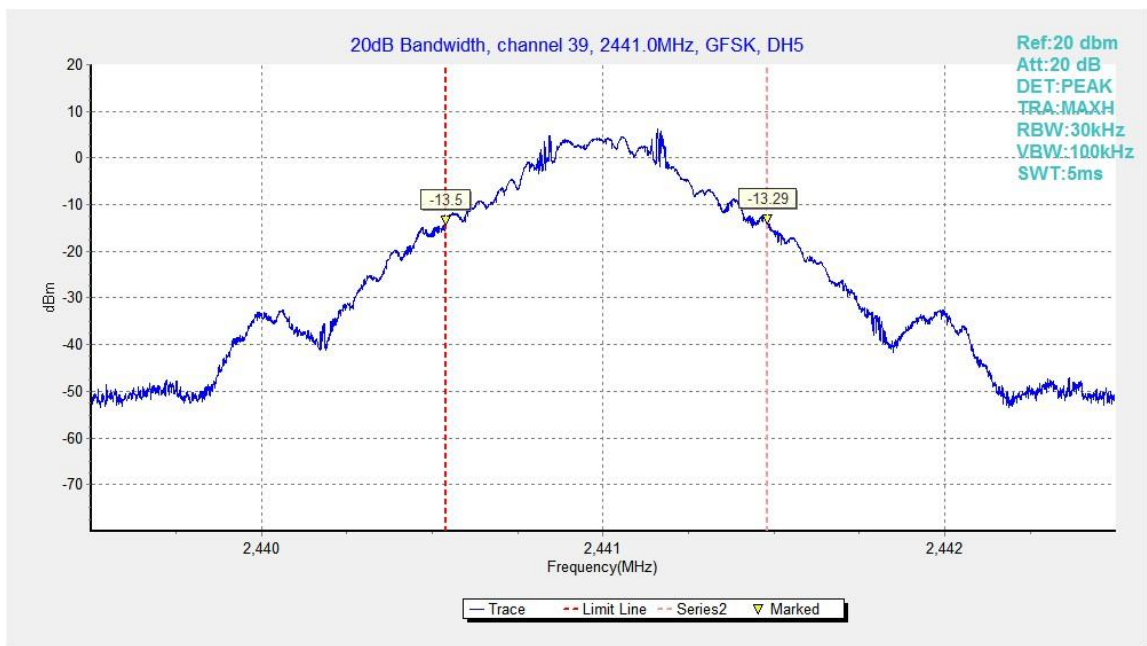

Fig.83.   20dB Bandwidth: GFSK, Channel 39
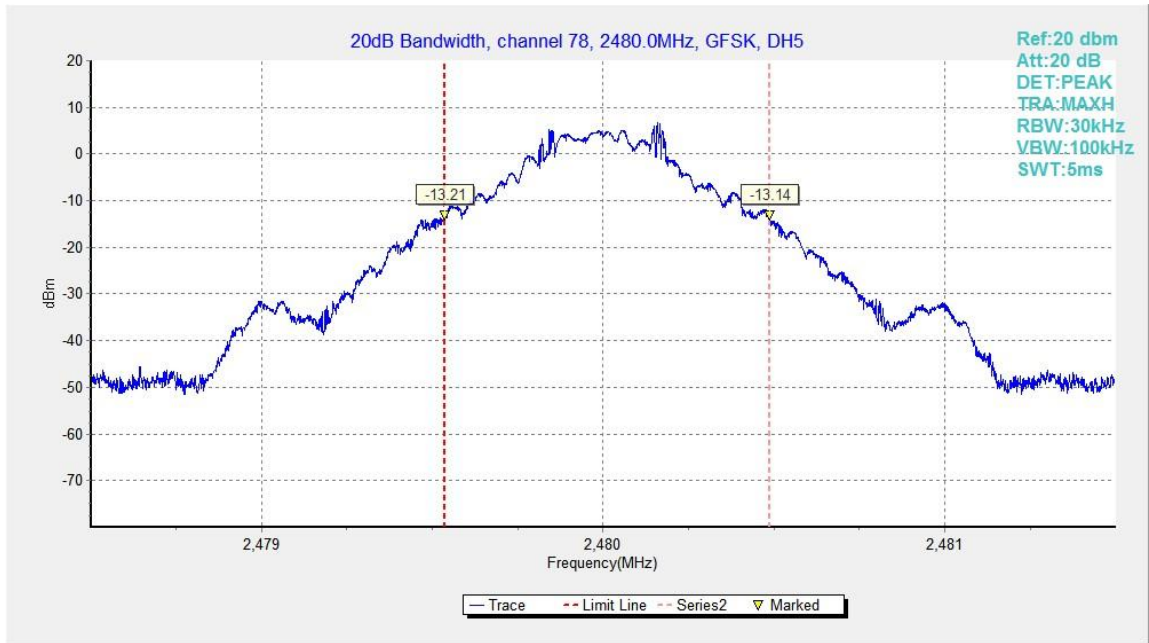
Fig.84.   20dB Bandwidth: GFSK, Channel 78
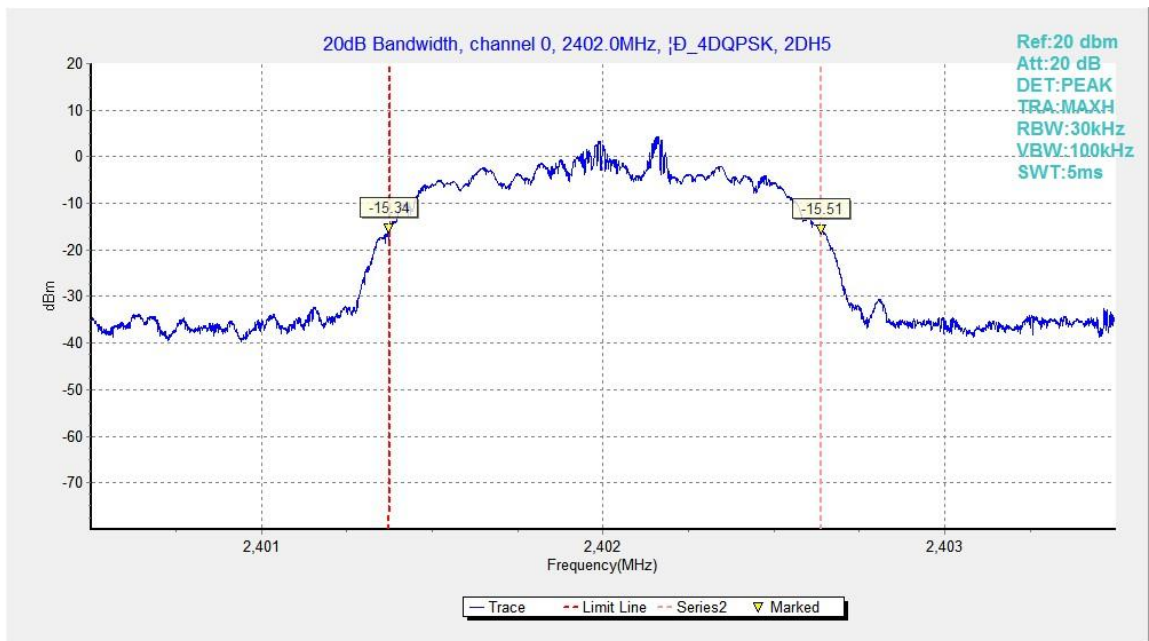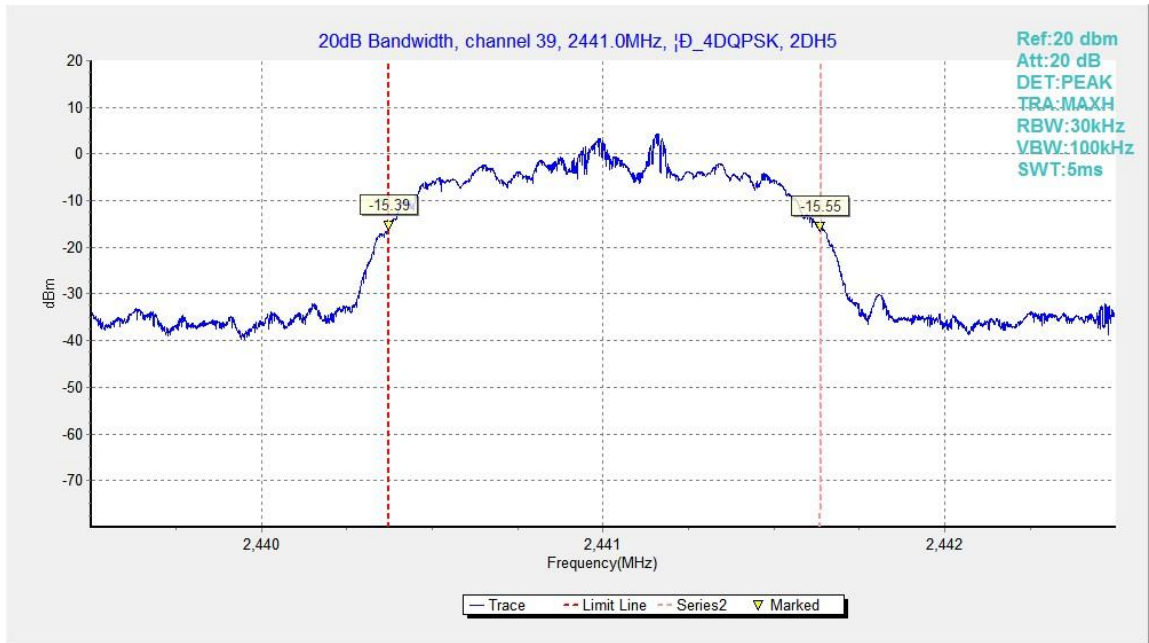

Fig.85.   20dB Bandwidth: π/4 DQPSK, Channel 0
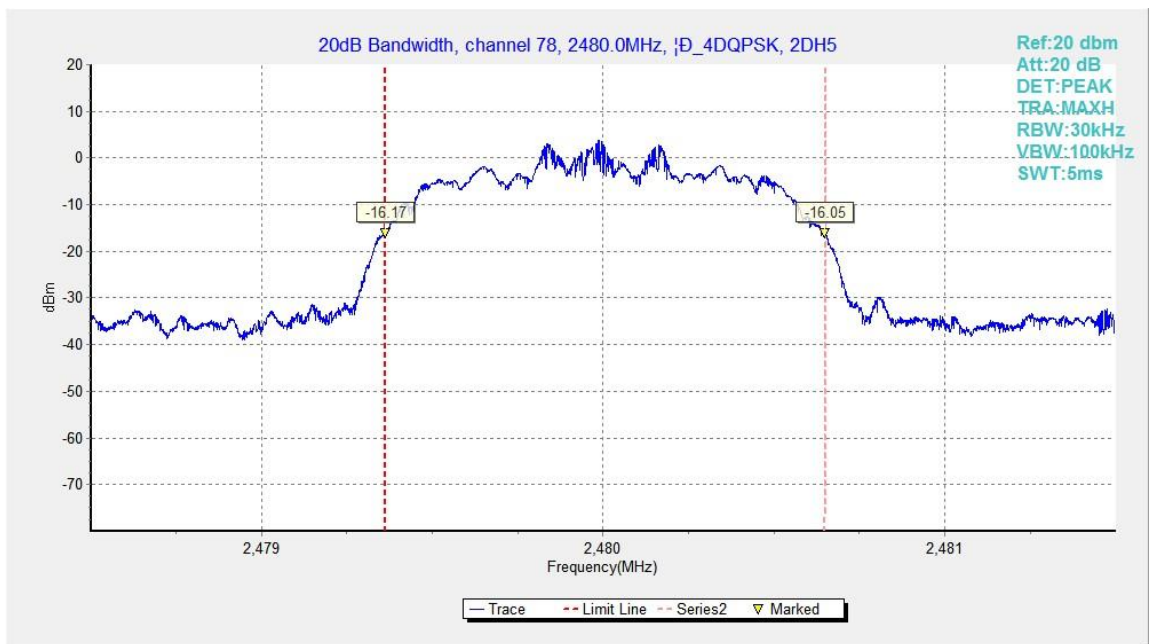
Fig.86.　20dB Bandwidth: π/4 DQPSK, Channel 39

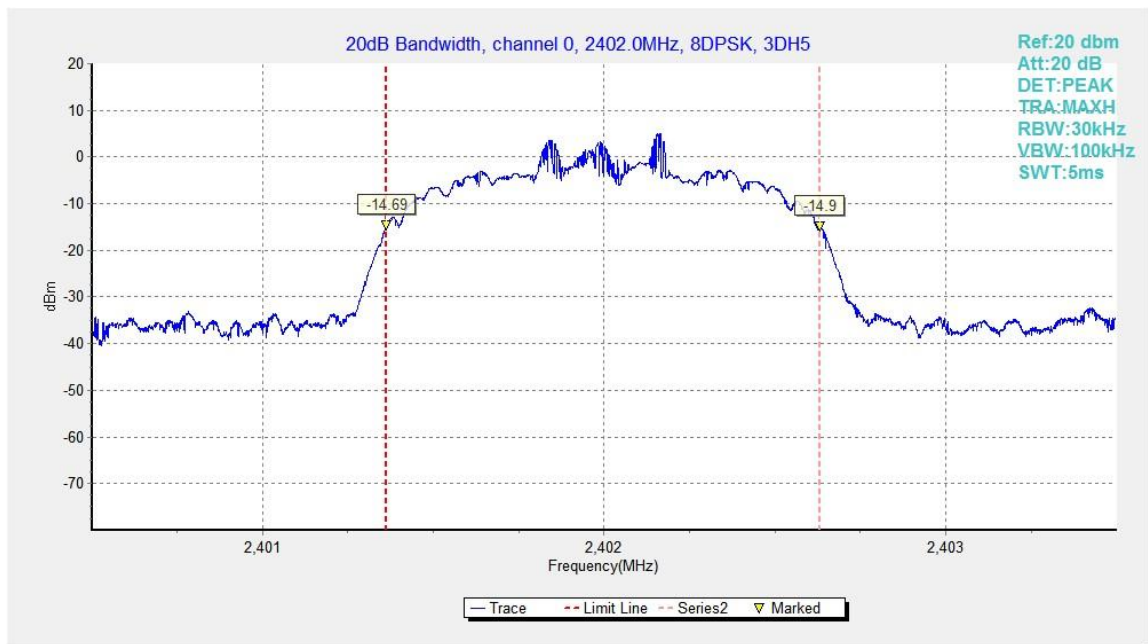Fig.87.　20dB Bandwidth: π/4 DQPSK, Channel 78

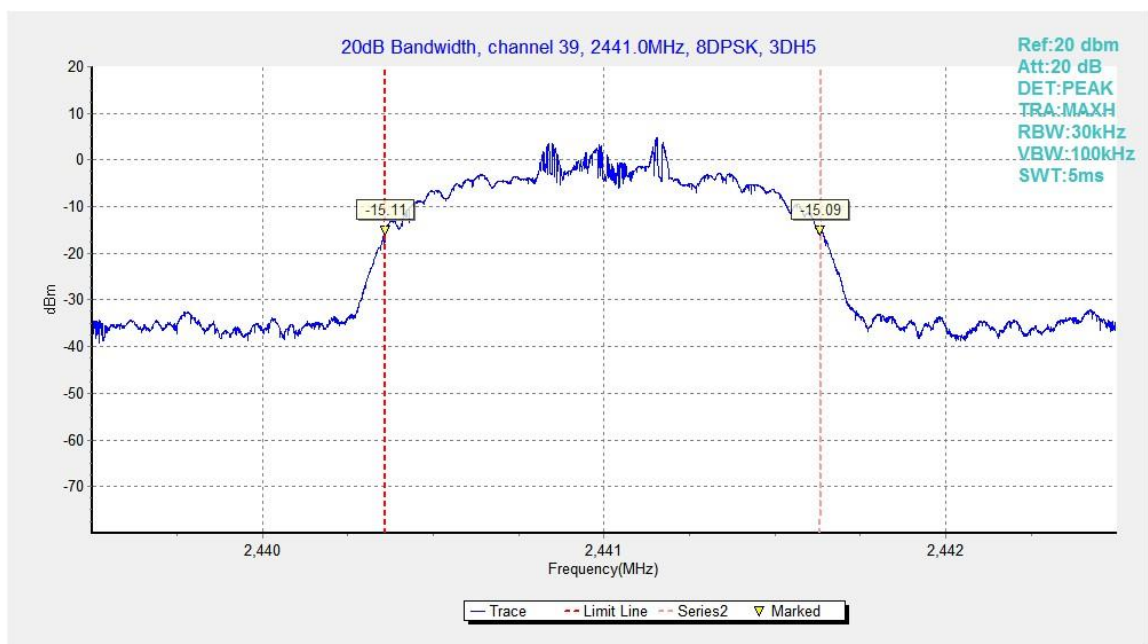Fig.88.　20dB Bandwidth: 8DPSK, Channel 0
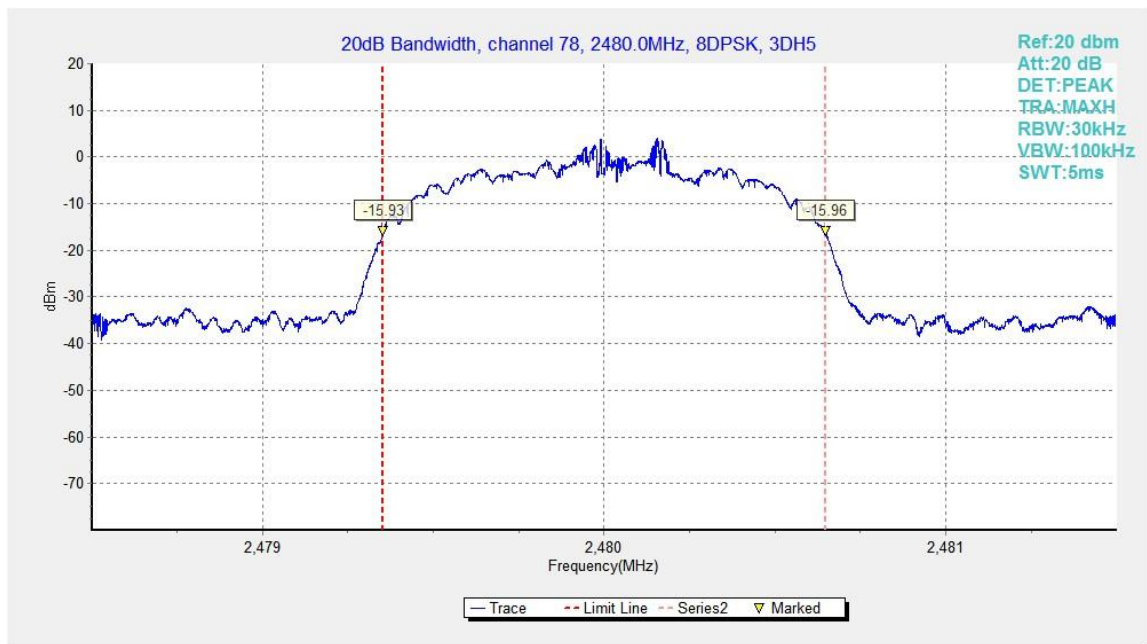

Fig.89.　20dB Bandwidth: 8DPSK, Channel 39

Fig.90.   20dB Bandwidth: 8DPSK, Channel 78

B.9. Carrier Frequency Separation

Method of Measurement: See ANSI C63.10-clause 7.8.2

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = 3MHz

- RBW=300kHz

- VBW=300kHz

- Sweep = auto

- Detector function = peak

- Trace = max hold

- Allow the trace to stabilize

Search the peak marks of the middle frequency and adjacent channel, then record the separation between them.

 ＊Comment: This limit should be over 25 kHz or (2/3) * 20dB bandwidth, whichever is greater.

Measurement Limit:

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

Measurement Result:
For GFSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.91	832.50	P

For π/4 DQPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.92	969.75	P

For 8DPSK

Channel	Carrier frequency separation (kHz)		Conclusion
39	Fig.93	1129.50	P

Conclusion: PASS

Test graphs as below:
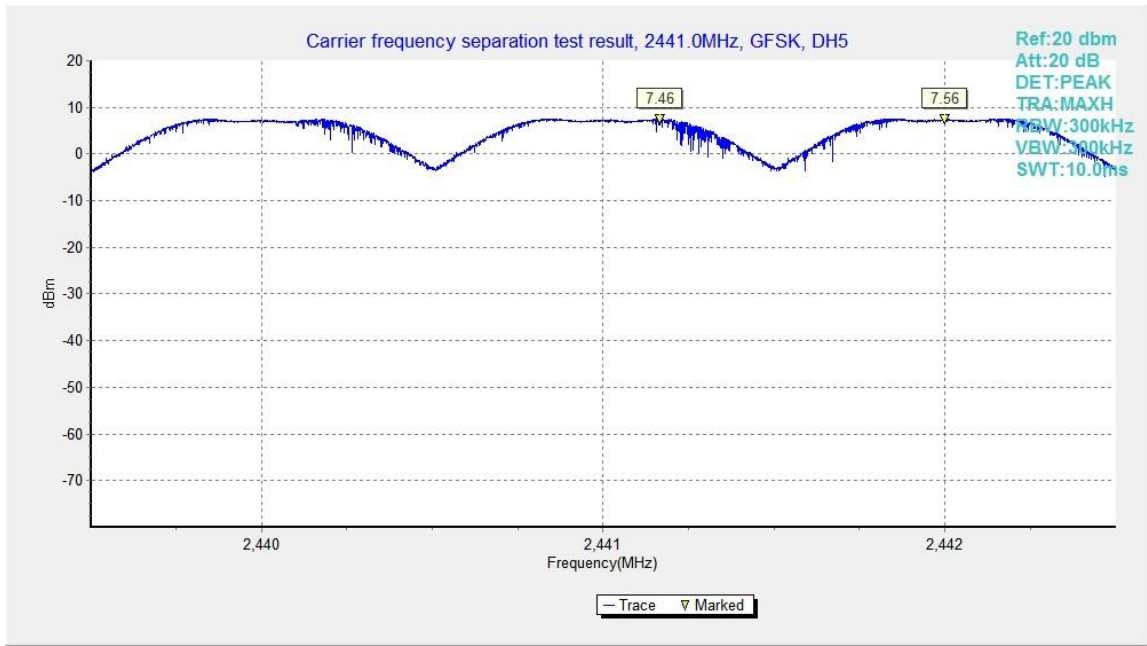
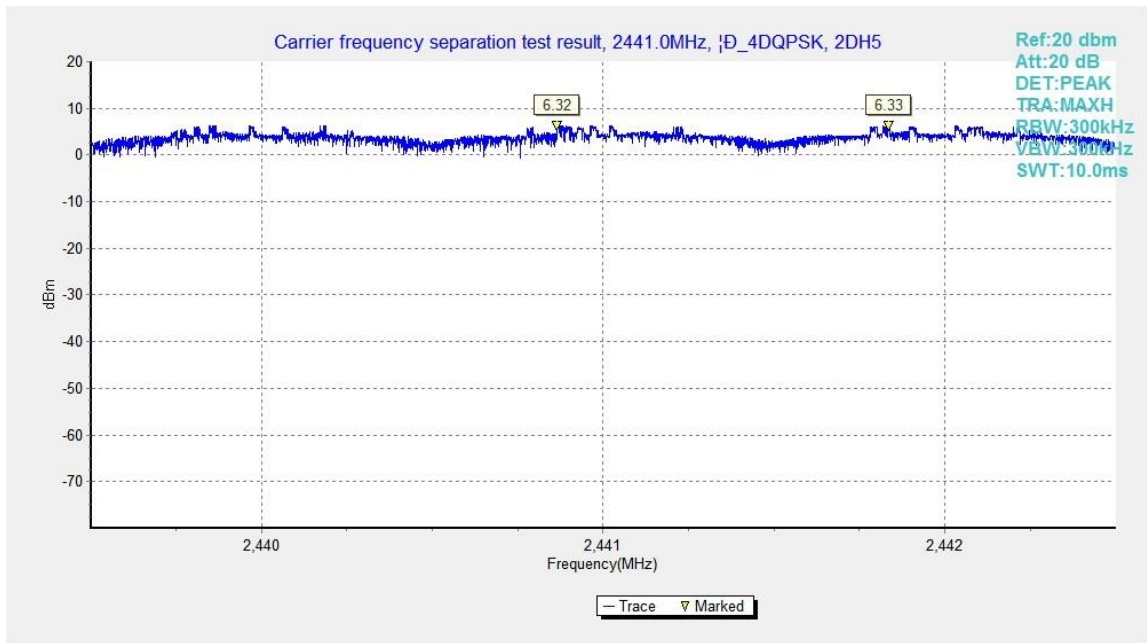Fig.91.   Carrier frequency separation measurement: GFSK, Channel 39

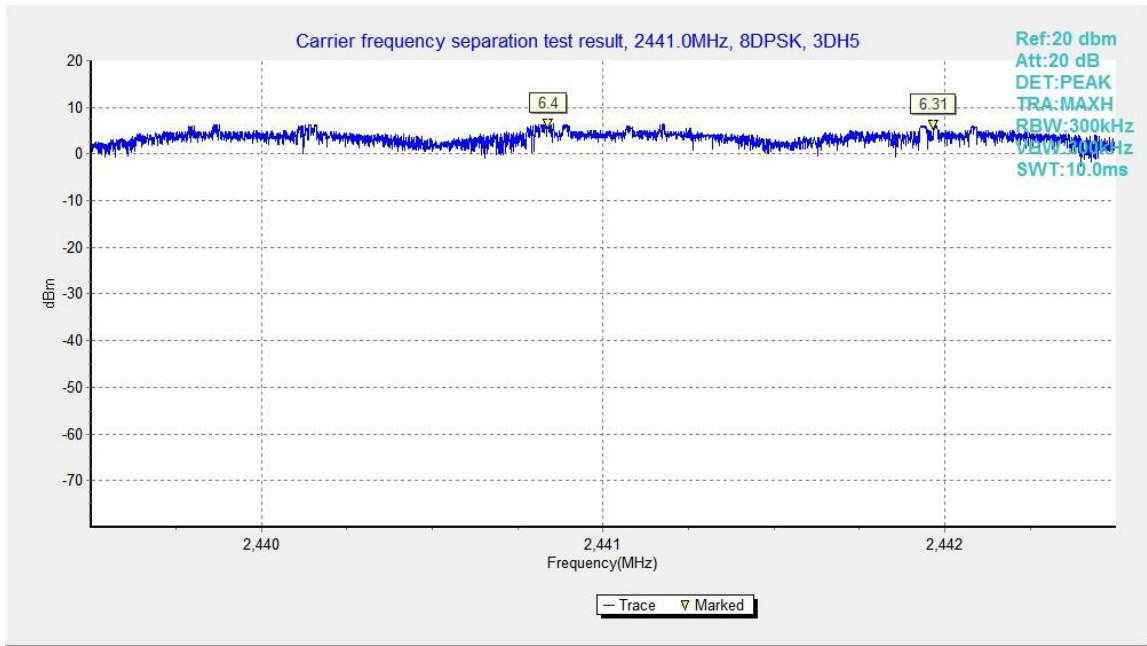Fig.92.   Carrier frequency separation measurement: π/4 DQPSK, Channel 39

Fig.93.   Carrier frequency separation measurement: 8DPSK, Channel 39

B.10. Number of Hopping Channels

Method of Measurement: See ANSI C63.10-clause 7.8.3

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = the frequency band of operation

- RBW = 500kHz

- VBW = 500kHz

- Sweep = auto

- Detector function = peak

- Trace = max hold

- Allow the trace to stabilize

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

Measurement Limit:

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

Measurement Result:

For GFSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.94	79	P
40~78	Fig.95		

Forπ/4 DQPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.96	79	P
40~78	Fig.97		

For 8DPSK

Channel	Number of hopping channels		Conclusion
0~39	Fig.98	79	P
40~78	Fig.99		

Conclusion: PASS

Test graphs as below:
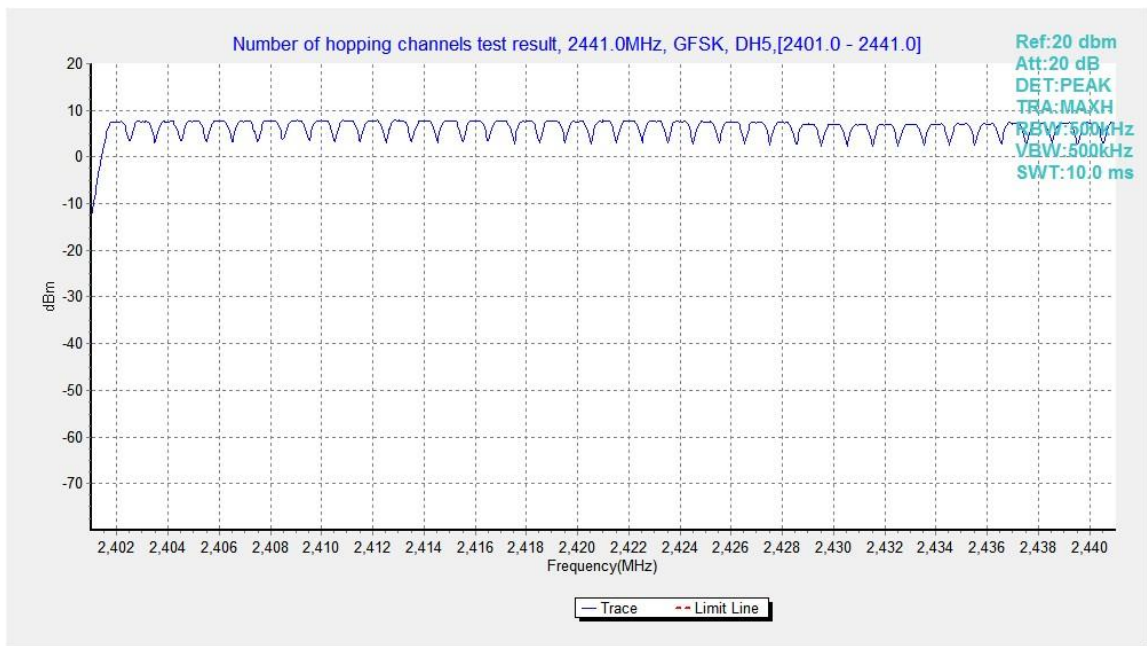
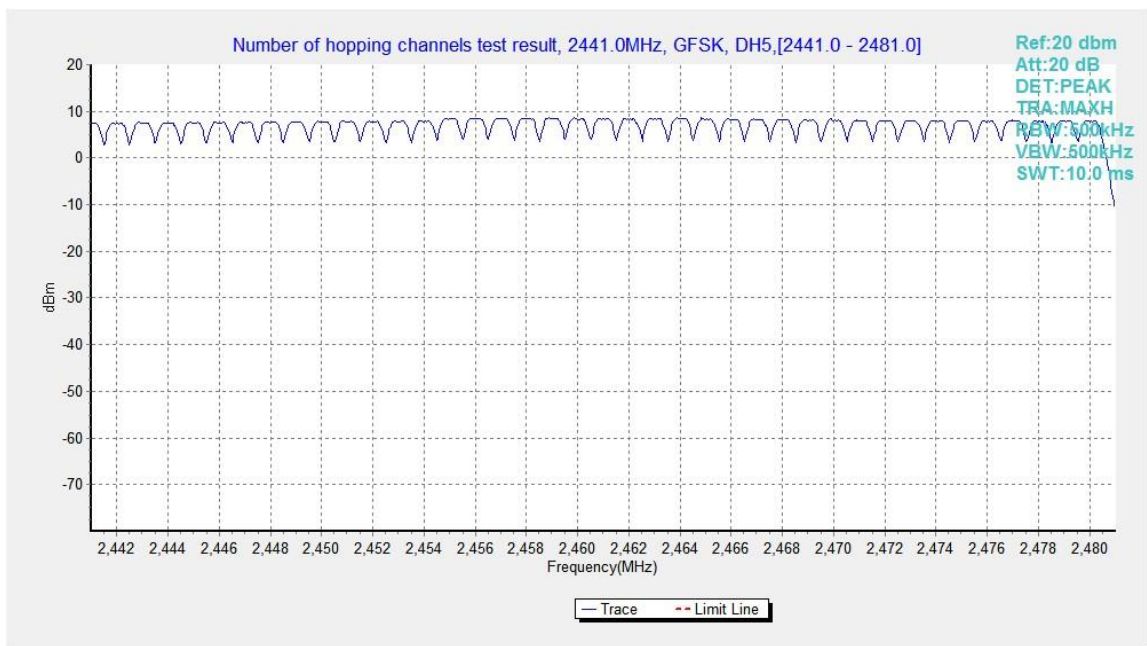Fig.94.　Number of hopping frequencies: GFSK, Channel 0 - 39

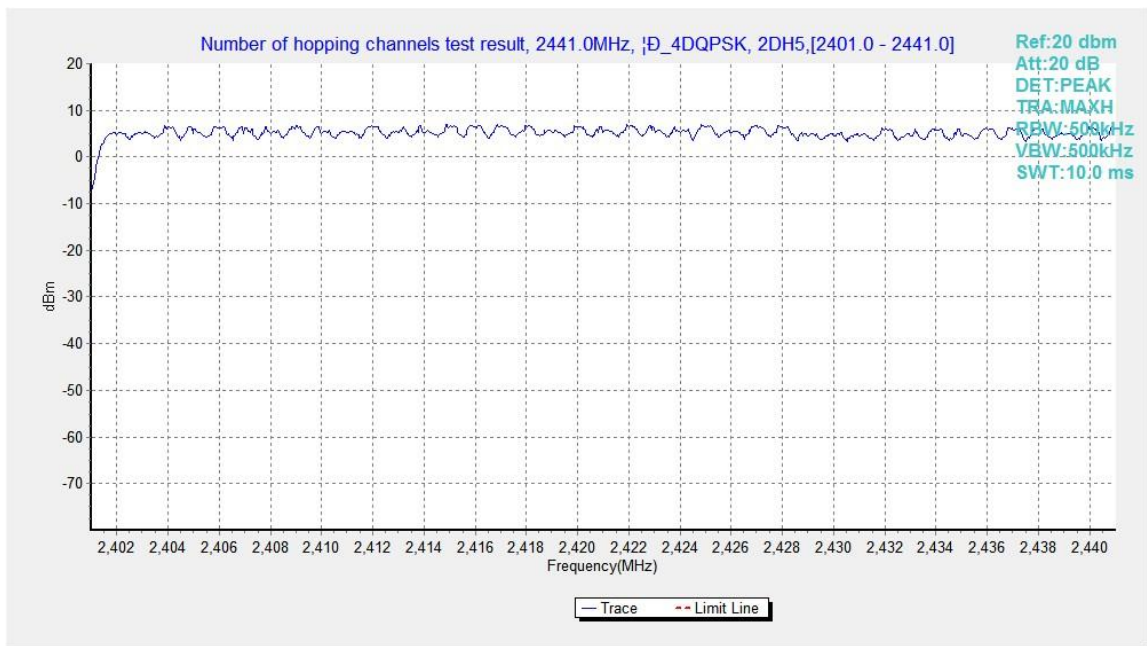
Fig.95.　Number of hopping frequencies: GFSK, Channel 40 - 78

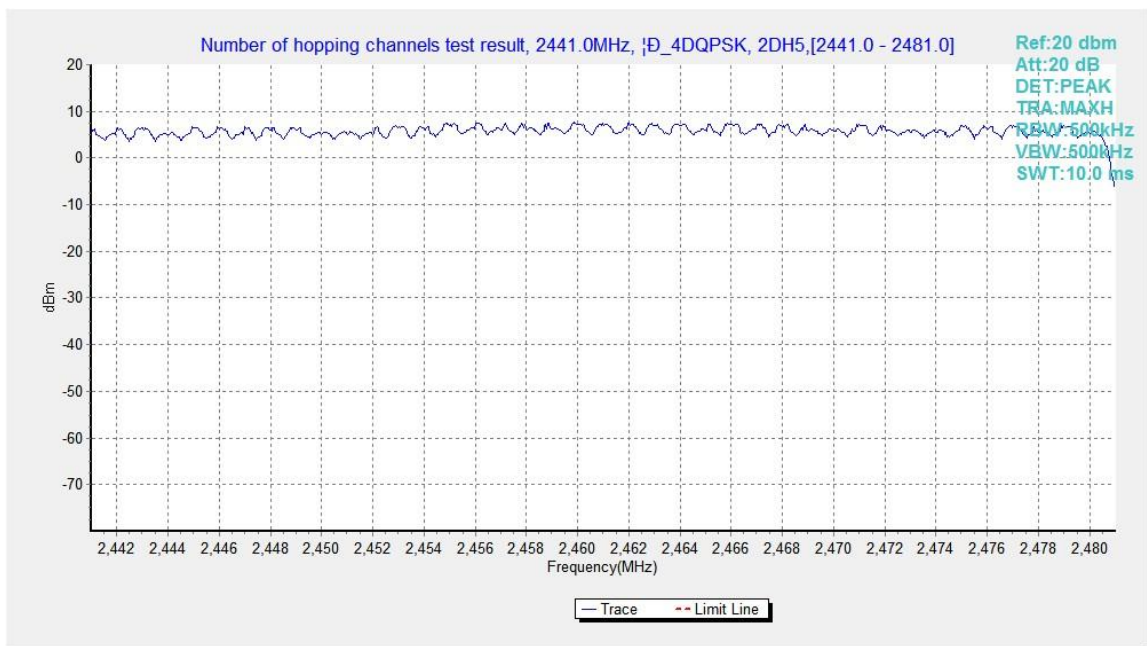Fig.96.　Number of hopping frequencies: π/4 DQPSK, Channel 0 - 39

Fig.97.　Number of hopping frequencies: π/4 DQPSK, Channel 40 - 78
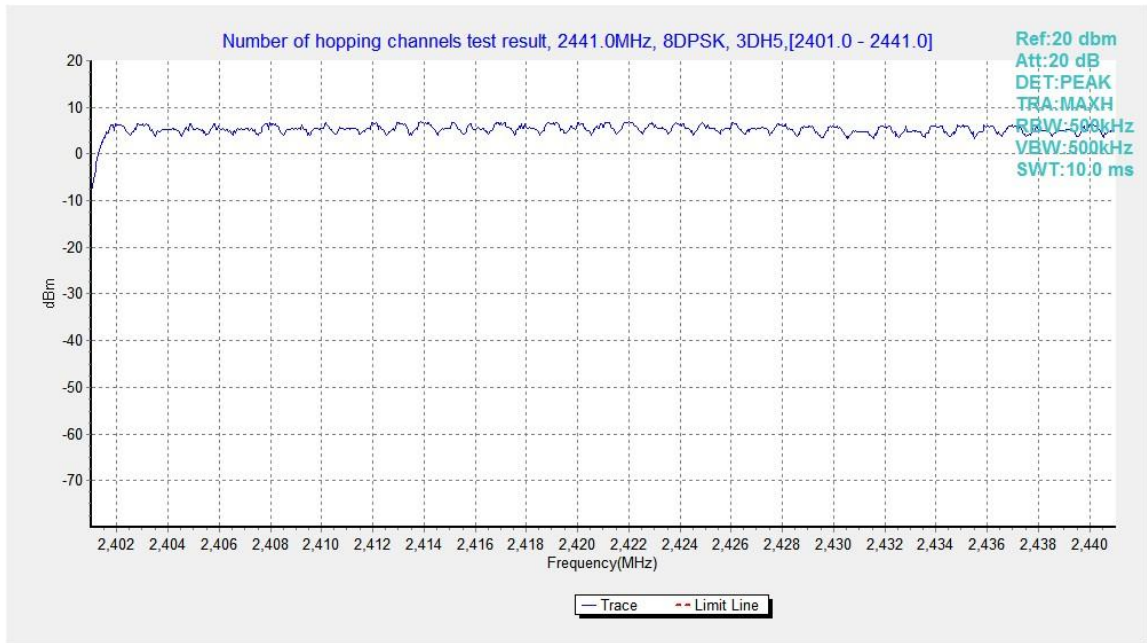
Fig.98.　Number of hopping frequencies: 8DPSK, Channel 0 - 39
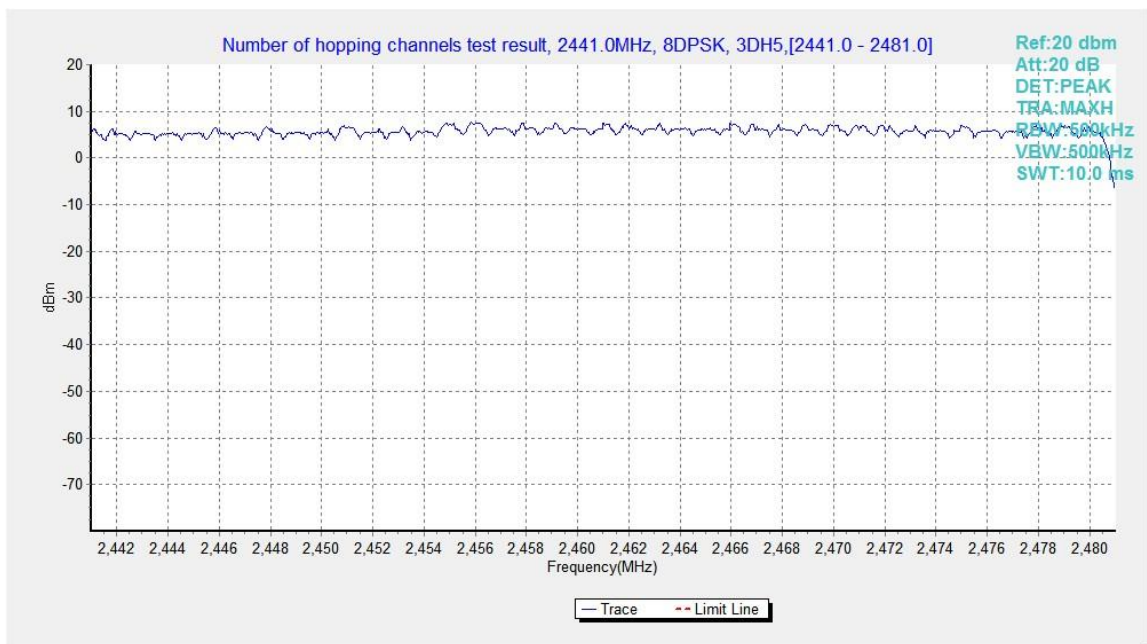

Fig.99.　Number of hopping frequencies: 8DPSK, Channel 40 - 78

B.11. AC Powerline Conducted Emission
Method of Measurement: See ANSI C63.10-clause 6.2

Setup:
A stand-alone EUT shall be placed in the center along the back edge of the tabletop. For multiunit tabletop systems, the EUT shall be centered laterally (left to right facing the tabletop) on the tabletop and its rear shall be flush with the rear of the table.

Accessories that are part of an EUT system tested on a tabletop shall be placed in a test arrangement on one or both sides of the host with a 10 cm separation between the nearest points of the cabinets. The rear of the host and accessories shall be flush with the back of the supporting tabletop unless that would not be typical of normal use. If more than two accessories are present, then an equipment test arrangement shall be chosen that maintains 10 cm spacing between cabinets unless the equipment is normally located closer together.
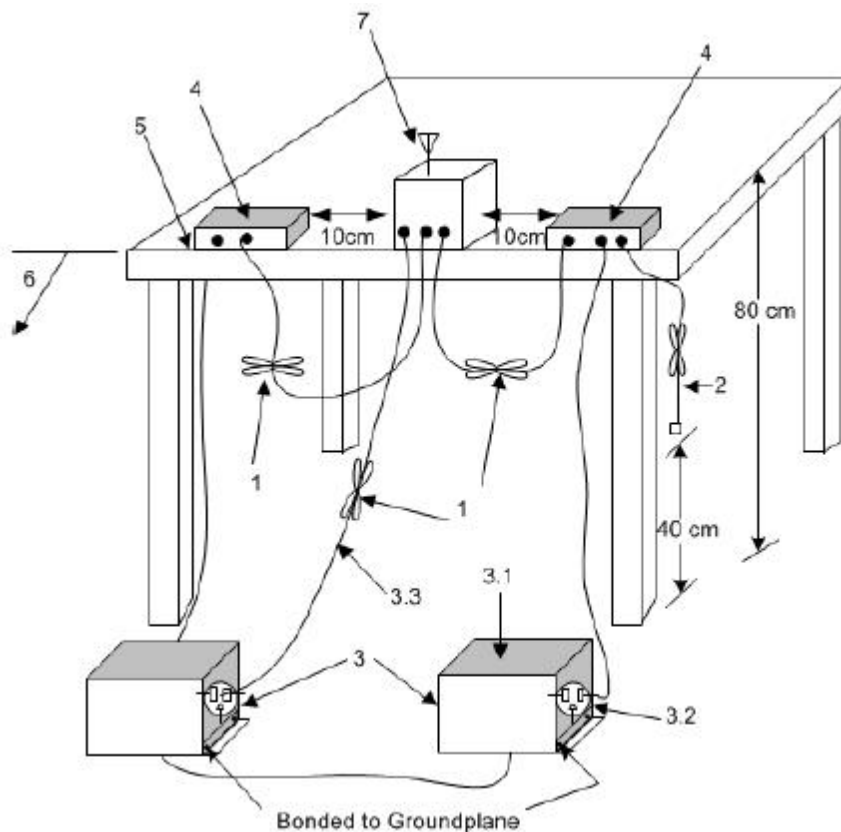
Exploratory ac power-line conducted emission measurements

Exploratory measurements shall be used to identify the frequency of the emission that has the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable positions, and with a typical system equipment configuration and arrangement. For each mode of operation and for each ac power current-carrying conductor, cable manipulation shall be performed within the range of likely configurations. For this measurement or series of measurements, the frequency spectrum of interest shall be monitored looking for the emission that has the highest amplitude relative to the limit. Once that emission is found for each current-carrying conductor of each power cord associated with the EUT (but not the cords associated with non-EUT equipment in the overall system), the one configuration and

arrangement and mode of operation that produces the emission closest to the limit over all of the measured conductors shall be recorded.

Final ac power-line conducted emission measurements

Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that produced the emission with the highest amplitude relative to the limit is selected for the final measurement, while applying the appropriate modulating signal to the EUT. If the EUT is relocated from an exploratory test site to a final test site, the highest emissions shall be remaximized at the final test location before final ac power-line conducted emission measurements are performed. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment in the system) is then performed for the full frequency range for which the EUT is being tested for compliance without further variation of the EUT arrangement, cable positions, or EUT mode of operation. If the EUT is composed of equipment units that have their own separate ac power connections (e.g., floor-standing equipment with independent power cords for each shelf that are able to connect directly to the ac power network), then each current-carrying conductor of one unit is measured while the other units are connected to a second (or more) LISN(s). All units shall be measured separately. If a power strip is provided by the manufacturer, to supply all of the units making up the EUT, only the conductors in the power cord of the power strip shall be measured.

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement Result and limit:

EUT ID: UT35a

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		Bluetooth EDR	**Idle**	
0.15 to 0.5	66 to 56			
0.5 to 5	56	Fig.B.11.1	Fig.B.11.2	**P**
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		Bluetooth EDR	**Idle**	
0.15 to 0.5	56 to 46			
0.5 to 5	46	Fig.B.11.1	Fig.B.11.2	**P**
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

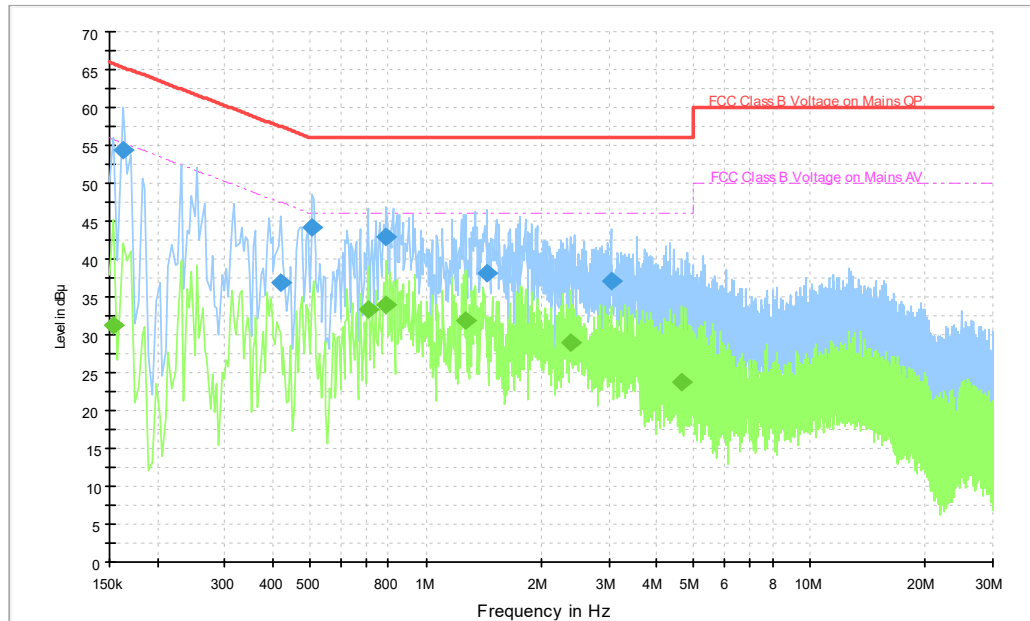**Conclusion: Pass**
Test graphs as below:

Fig.B.11.1   AC Powerline Conducted Emission- bluetooth

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162000	54.4	L1	20.0	10.9	65.4
0.418000	36.8	N	19.9	20.7	57.5
0.506000	44.1	L1	19.9	11.9	56.0
0.790000	42.9	L1	19.7	13.1	56.0
1.442000	38.1	L1	19.5	17.9	56.0
3.030000	37.0	L1	19.5	19.0	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154000	31.2	N	19.8	24.6	55.8
0.706000	33.3	L1	19.7	12.7	46.0
0.790000	34.1	L1	19.7	11.9	46.0
1.270000	31.8	L1	19.5	14.2	46.0

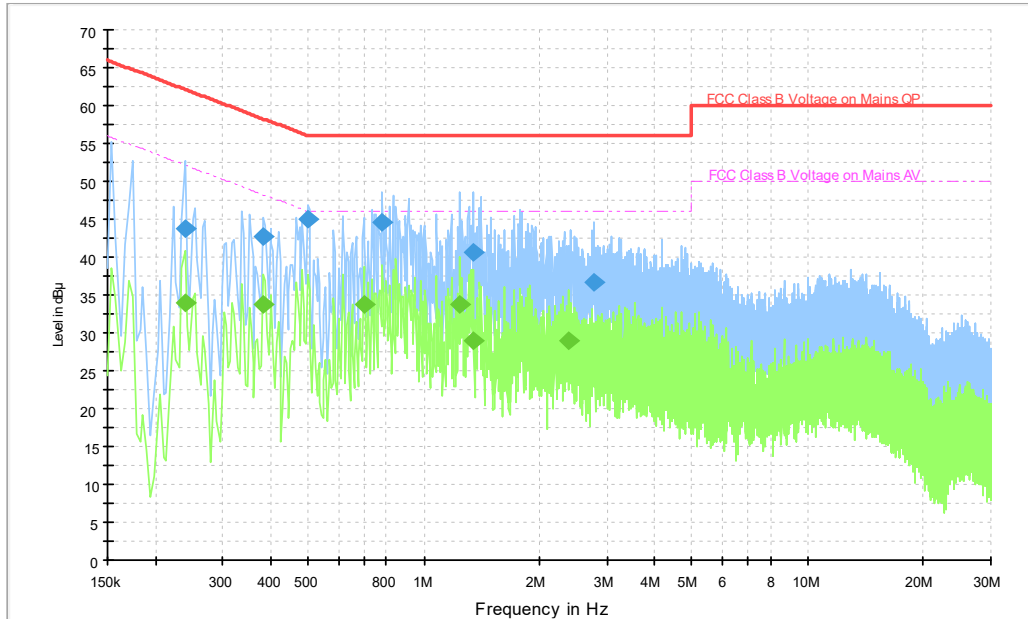| 2.374000	28.9	L1	19.5	17.1	46.0
4.654000	23.8	L1	19.6	22.2	46.0

Fig.B.11.2   AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.238000	43.9	N	19.8	18.3	62.2
0.382000	42.7	L1	20.0	15.5	58.2
0.498000	45.0	L1	19.9	11.0	56.0
0.778000	44.6	L1	19.7	11.4	56.0
1.342000	40.7	L1	19.5	15.3	56.0
2.770000	36.6	L1	19.5	19.4	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.238000	34.0	L1	20.0	18.2	52.2
0.382000	33.8	L1	20.0	14.4	48.2
0.698000	33.8	L1	19.7	12.2	46.0
1.242000	33.8	L1	19.5	12.2	46.0
1.342000	28.9	L1	19.5	17.1	46.0
2.378000	28.9	L1	19.5	17.1	46.0

ANNEX C: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2021-09-29 through 2022-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

END OF REPORT