

FCC Test Report

Report No.: RFBHQZ-WTW-P26040456-1

Model No.: SPACES-CT-UB

Received Date: 2026/4/21

Test Date: 2026/5/15 ~ 2026/6/18

Issued Date: 2026/6/18

Applicant: Cisco Systems, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RFBHQZ-WTW-P26040456-1	Original release.	2026/6/18

1. Certificate of Conformity

Product: Asset Tag

Brand: Cisco

Test Model: SPACES-CT-UB

Sample Status: Engineering sample

Applicant: Cisco Systems, Inc.

Test Date: 2026/5/15 ~ 2026/6/18

Standards: 47 CFR FCC Part 15, Subpart F (Section 15.519)
ANSI C63.10-2020

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Gina Liu, **Date:** 2026/6/18
Gina Liu / Specialist

Approved by : Jeremy Lin, **Date:** 2026/6/18
Jeremy Lin / Project Engineer

2. Summary of Test Results

47 CFR FCC Part 15, Subpart F (Section 15.519)			
Standard Section	Test Item	Result	Remarks
15.519	Peak and Average Power Emission Levels	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emission	N/A	Power supply is from battery.
-	Occupied Bandwidth	-	Reference only.
15.209	Radiated Emissions at or Below 960 MHz	Pass	Meet the requirement of limit. Minimum passing margin is -10.78 dB at 947.99 MHz.
15.519	Radiated emissions above 960 MHz	Pass	Meet the requirement of limit. Minimum passing margin is -0.25 dB at 7987.20 MHz.
15.519	UWB Bandwidth	Pass	Meet the requirement of limit.
15.519	Transmission Time	Pass	Meet the requirement of limit.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.90 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.59 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3. General Information

3.1 General Description of EUT

Product	Asset Tag
Brand	Cisco
Test Model	SPACES-CT-UB
Sample Status	Engineering sample
Power Supply Rating	3 Vdc from Battery
Modulation Type	BPM-BPSK
Number of Channel	1
Operating Frequency	7.9872 GHz
Output Power	-1.87 dBm (PK)
Antenna Type	Refer to Note for more details
Antenna Connector	Refer to Note for more details
Accessory Device	NA
Cable Supplied	NA
Device category	Handheld UWB systems(15.519)

Note:

1. The EUT uses following accessories.

Item	Brand	Model	Specification
Battery	Panasonic	CR2477 Coin Cell (User Replaceable)	Power Rating: 3V, 1000mAh
Mounting bracket	Cisco	N/A	-

2. The antenna information is listed as below.

Antenna	Antenna Type	Brand/ Manufacturer	Model	Antenna Connector	Freq.	Gain (dBi)
UWB	Patch	Cisco	NA	none(like solder)	7.737~8.5GHz	1.7

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Frequency (MHz)
9	7987.2

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to						Description
	EL	BW	RE<1G	RE≥1G	TT	PLC	
-	√	√	√A	√	√	-	-

Where EL: Peak and Average Power Emission Levels

BW: Occupied Bandwidth and UWB Bandwidth

RE<1G: Radiated Emission below 960 MHz

RE≥1G: Radiated Emission above 960 MHz & Bandedge Measurement

TT: Transmission Time

PLC: Power Line Conducted Emission

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-axis.

Peak and Average Power Emission Levels:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	1	9	BPM-BPSK

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	1	9	BPM-BPSK

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	1	9	BPM-BPSK

UBW Bandwidth Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	1	9	BPM-BPSK

Transmission Time Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

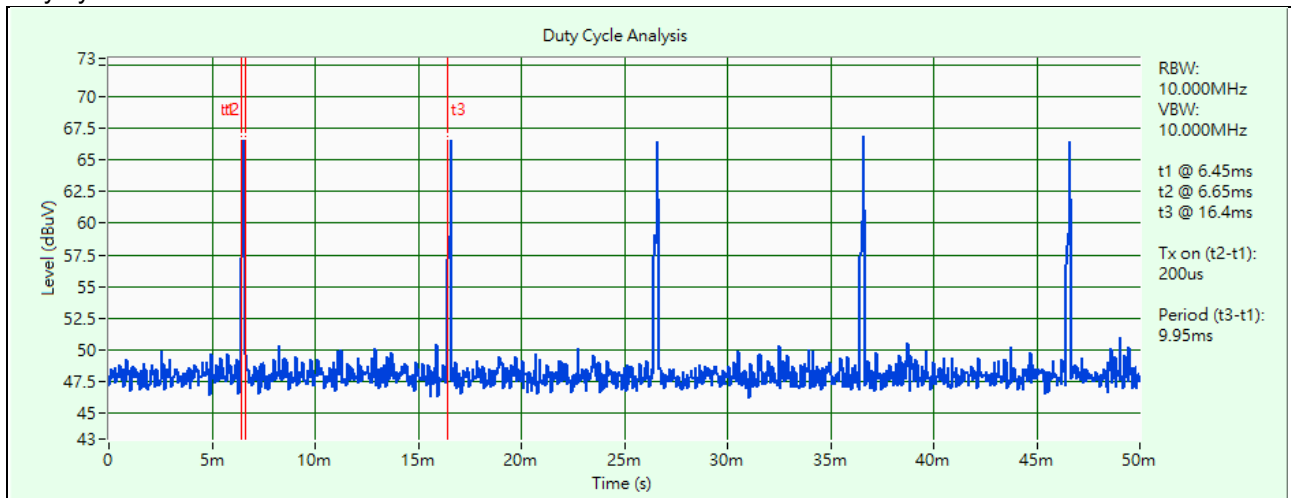
EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	1	9	BPM-BPSK

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	22 deg. C, 67% RH	3 Vdc	Luis Lee
RE<1G	22 deg. C, 67% RH	3 Vdc	Luis Lee
BW	23 deg. C, 68% RH	3 Vdc	Luis Lee
EL	23 deg. C, 68% RH	3 Vdc	Luis Lee
TT	23 deg. C, 68% RH	3 Vdc	Luis Lee

3.3 Duty cycle of test signal.

Duty cycle = $0.2 \text{ ms} / 9.95 \text{ ms} \times 100 \% = 5 \%$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.4.1 Configuration of System under Test



Under Table

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR FCC Part 15, Subpart F

ANSI C63.10-2020

All test items have been performed and recorded as per the above standards.

4. Test Types and Results

4.1 Peak and Average Power Emission Levels

4.1.1 Limits of Peak Power

For UWB devices where the frequency at which the highest radiated emission occurs, f_M , is above 960 MHz, there is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on f_M . That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

4.1.2 Limits of Average Power

Frequency (MHz)	EIRP (dBm) / RBW = 1 MHz
3100-10600	-41.3

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver R&S	ESR3+	102782	2025/12/8	2026/12/7
Spectrum Analyzer R&S	FSW43	101582	2026/5/2	2027/5/1
Loop Antenna TESEQ	HLA 6121	63620	2025/10/20	2026/10/19
Pre-amplifier EMCI	EMC001340	980201	2025/9/21	2026/9/20
RF Coaxial Cable EMCI	5D-NM-BM	140901	2025/9/21	2026/9/20
Pre_Amplifier Agilent	8447D	2944A10631	2026/4/18	2027/4/17
Bi_Log Antenna Schwarzbeck	VULB9168	9168-155	2025/9/16	2026/9/15
RF Coaxial Cable WOKEN	8D-FB	Cable-CH4-01	2025/6/30	2026/6/29
Horn Antenna Schwarzbeck	9120D	9120D-408	2025/11/9	2026/11/8
Pre_Amplifier KEYSIGHT	83017A	MY53270295	2026/4/18	2027/4/17
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	2026/4/18	2027/4/17
Pre-Amplifier EMCI	EMC 184045	980116	2025/9/21	2026/9/20
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170241	2025/10/28	2026/10/27
Horn Antenna Schwarzbeck	BBHA 9170	9170-480	2025/11/9	2026/11/8
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170243	2025/11/9	2026/11/8
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	2025/6/30	2026/6/29
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	2025/6/30	2026/6/29
Pre-Amplifier EMCI	EMC 184045	980116	2025/9/21	2026/9/20
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight antenna tower fixture BV	BAF-02	5	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HY - 966 chamber 3.

4.1.4 Test Procedures

For Peak Power:

Based on the measurement procedure in ANSI C63.10 clause 10.3.5 for peak power measurement, perform the test using a peak detector with maximum hold function, setting the resolution bandwidth (RBW) to 50 MHz and the video bandwidth (VBW) to 50 MHz.

The procedures for radiated emissions were performed in accordance with the steps outlined below:

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- Determination of EIRP, field strength converted to EIRP at 3m, $EIRP(dBm) = E(dBuV/m) - 95.2$.
- The correction factor has already been compensated by the instrument.

For Average Power:

The procedures for radiated emissions were performed in accordance with the steps outlined below:

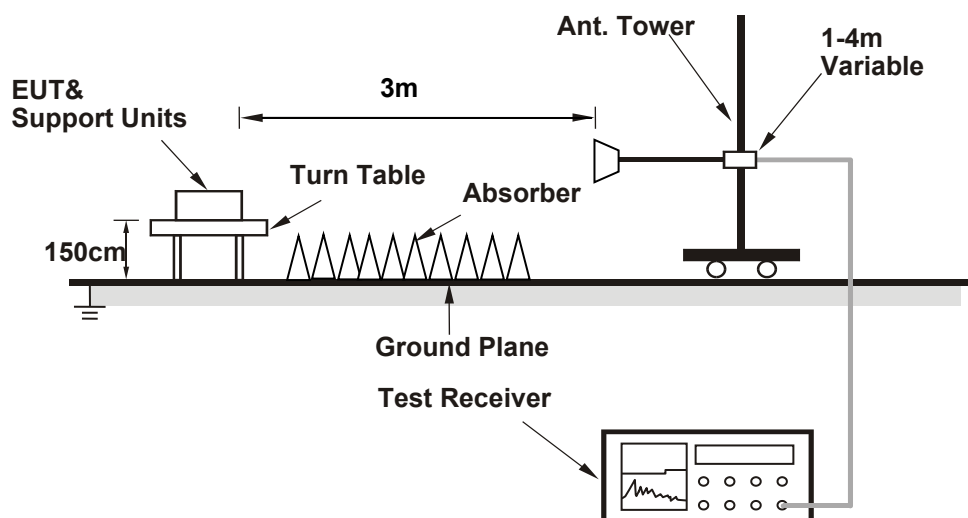
- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The radiated emissions above 960 MHz were performed in accordance with the measurement procedure for RMS-average power spectral density specified in ANSI C63.10 Clause 10.3.7, using a power averaging (RMS) detector. The frequency span is set to examine a convenient frequency segment, and the sweep time is configured so that there is no more than a 1 ms integration period over each measurement bin.
- Determination of EIRP, field strength converted to EIRP at 3m, $EIRP(dBm) = E(dBuV/m) - 95.2$.
- The correction factor has already been compensated by the instrument.

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 Test Setup

For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.7 EUT Operating Conditions

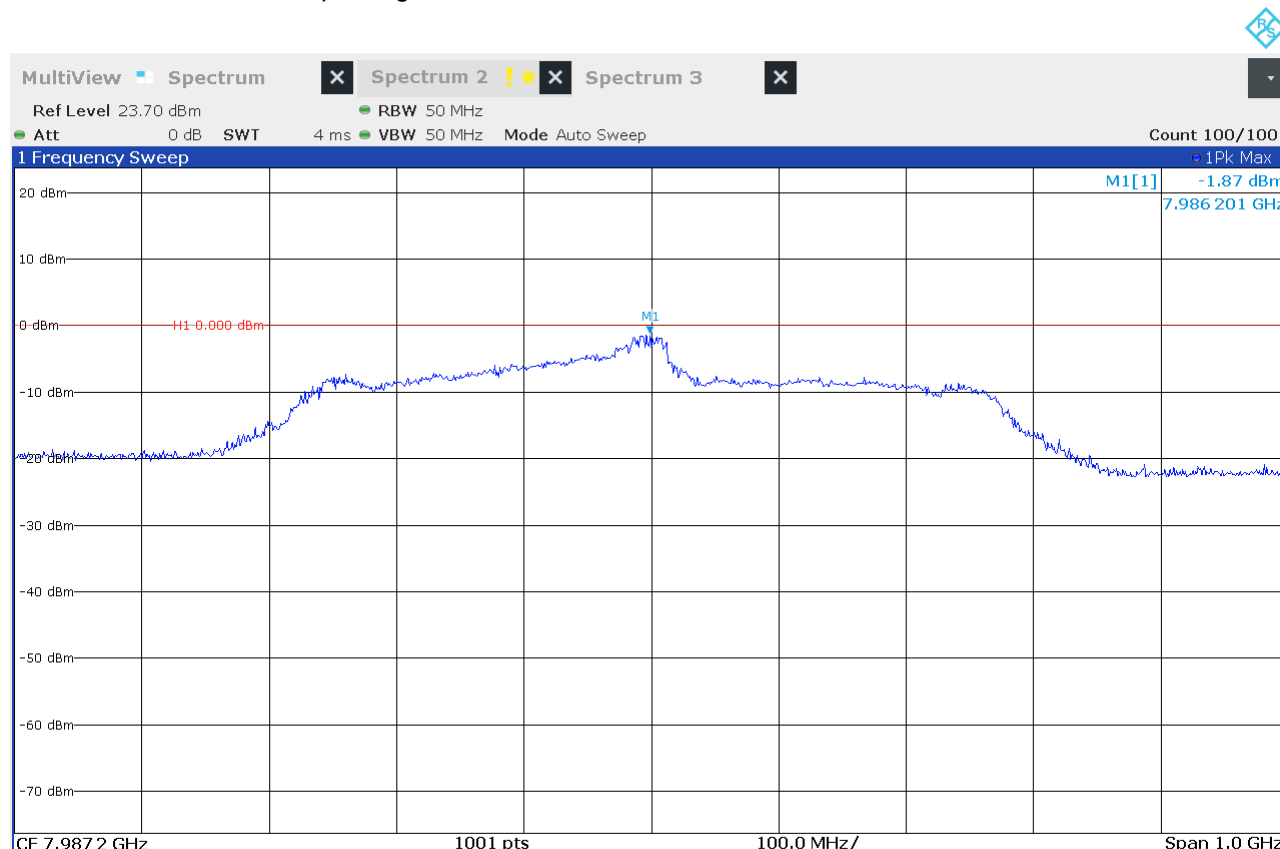
Set the EUT under transmission condition continuously at specific channel frequency.

4.1.8 Test Results

For Peak Power:

Antenna Polarity & Test Distance: Horizontal at 3 m			
Frequency (MHz)	EIRP Level (dBm)	Limit (dBm)	Detector Function & Bandwidth
7987.2	-1.87	0	(PK), RB = 50 MHz, VB = 50 MHz

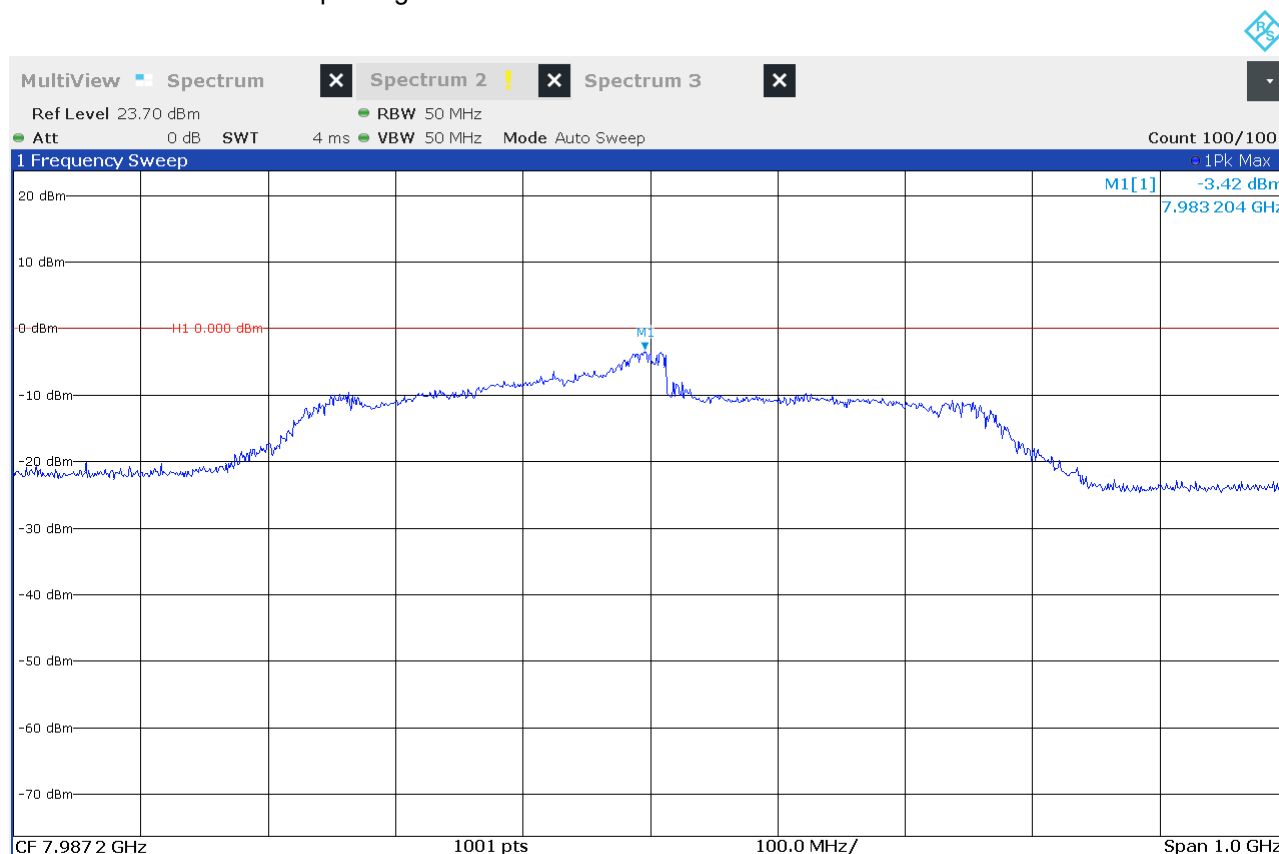
The detailed data for the spectrogram is shown below.



18:51:51 09.06.2026

Antenna Polarity & Test Distance: Vertical at 3 m			
Frequency (MHz)	EIRP Level (dBm)	Limit (dBm)	Detector Function & Bandwidth
7987.2	-3.42	0	(PK), RB = 50 MHz, VB = 50 MHz

The detailed data for the spectrogram is shown below.

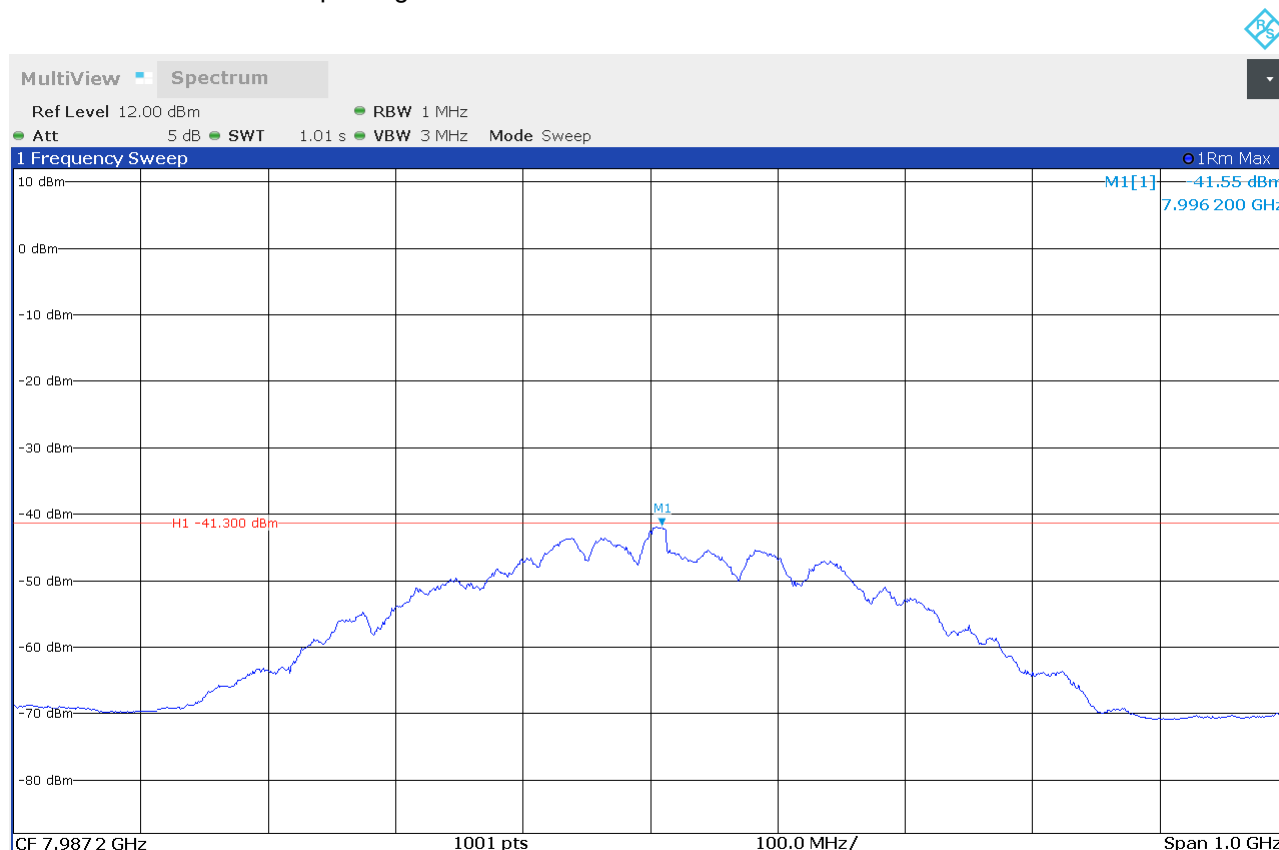


19:00:28 09.06.2026

For Average Power:

Antenna Polarity & Test Distance: Horizontal at 3 m			
Frequency (MHz)	EIRP Level (dBm)	Limit (dBm)	Detector Function & Bandwidth
7987.2	-41.55	-41.3	(AV), RB = 1 MHz, VB = 3 MHz Sweep time = 1 s

The detailed data for the spectrogram is shown below.

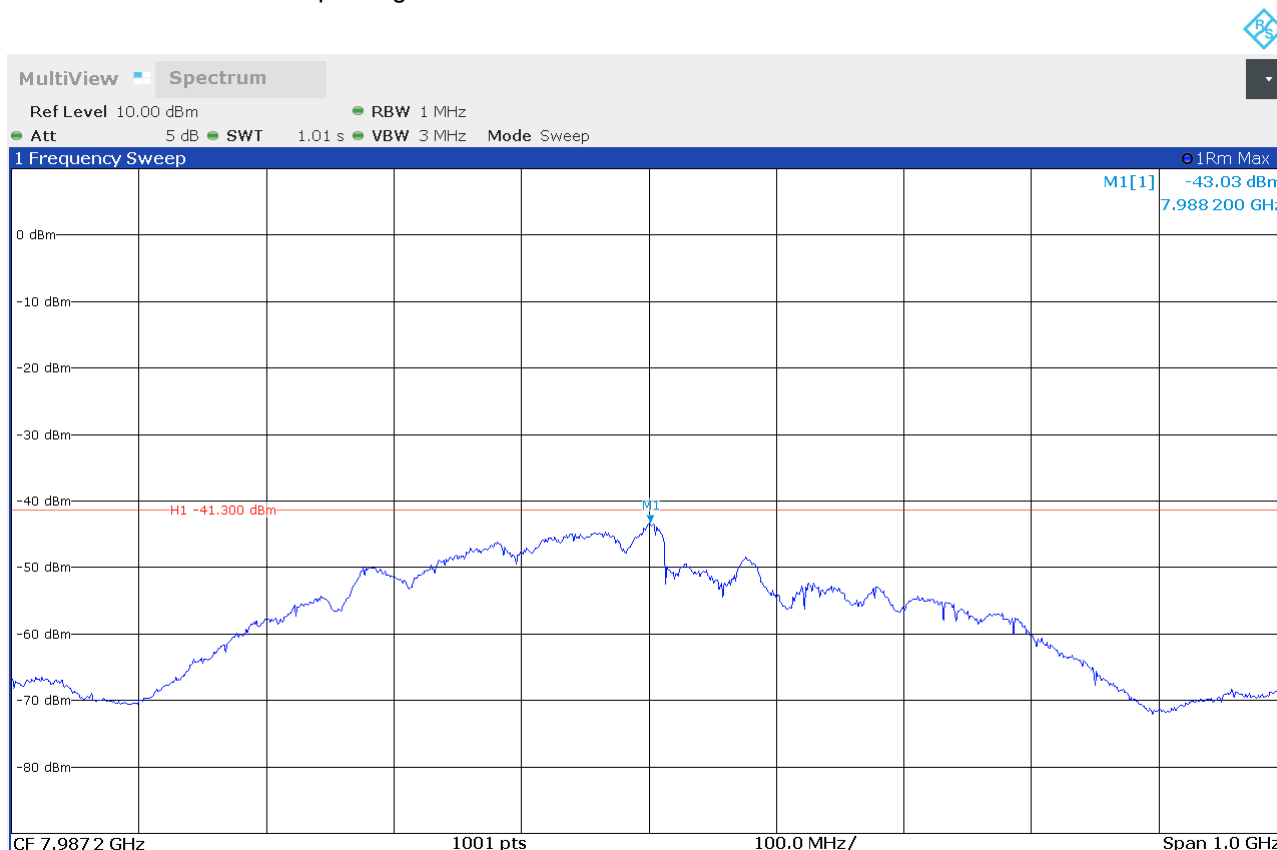


12:45:59 18.06.2026

Antenna Polarity & Test Distance: Vertical at 3 m

Frequency (MHz)	EIRP Level (dBm)	Limit (dBm)	Detector Function & Bandwidth
7987.2	-43.03	-41.3	(AV), RB = 1 MHz, VB = 3 MHz Sweep time = 1 s

The detailed data for the spectrogram is shown below.



12:27:33 18.06.2026

4.2 Radiated Emissions

4.2.1 Limits of Radiated Emission Measurement - at or Below 960 MHz

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average emissions detector.
2. The lower limit shall apply at the transition frequencies.
3. Emission level (dBuV/m) = 20 log Emission level (uV/m).
4. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.2.2 Limits of Radiated Emission Measurement - Above 960 MHz

Hand held UWB systems

Frequency (MHz)	EIRP (dBm) / RBW = 1 MHz
960-1610	-75.3
1610-1990	-63.3
1990-3100	-61.3
3100-10600	-41.3
Above 10600	-61.3
Frequency (MHz)	EIRP (dBm) / RBW $\geq$ 1 kHz
1164-1240	-85.3
1559-1610	-85.3

4.2.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.2.4 Test Procedures

The procedures for radiated emissions below 30MHz were performed in accordance with the steps outlined below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. The correction factor has already been compensated by the instrument.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

The procedures for radiated emissions above 30MHz were performed in accordance with the steps outlined below:

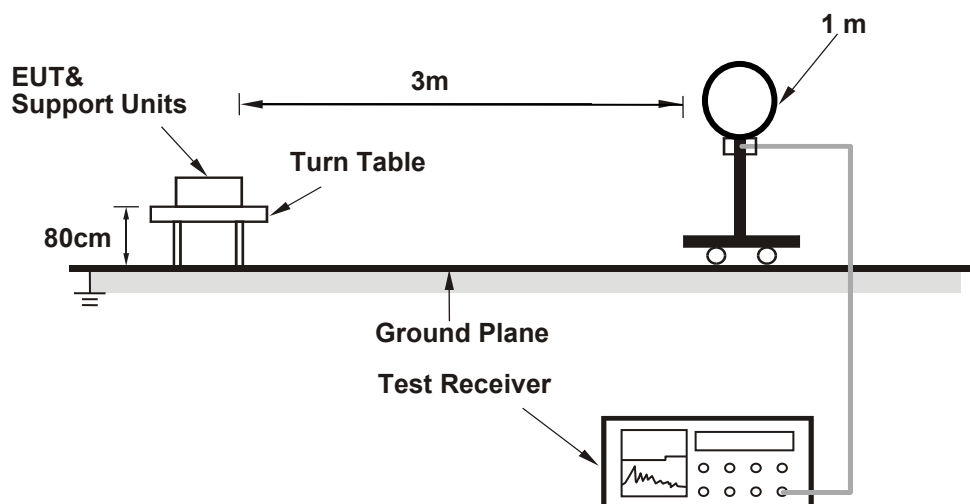
- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 960MHz) / 1.5 meters (for above 960MHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The radiated emissions above 960 MHz were performed in accordance with the measurement procedure for RMS-average power spectral density specified in ANSI C63.10 Clause 10.3.7, using a power averaging (RMS) detector. The frequency span is set to examine a convenient frequency segment, and the sweep time is configured so that there is no more than a 1 ms integration period over each measurement bin.
- g. Determination of EIRP, field strength converted to EIRP at 3m, $EIRP(dBm) = E(dBuV/m) - 95.2$.
- h. The correction factor has already been compensated by the instrument.

4.2.5 Deviation from Test Standard

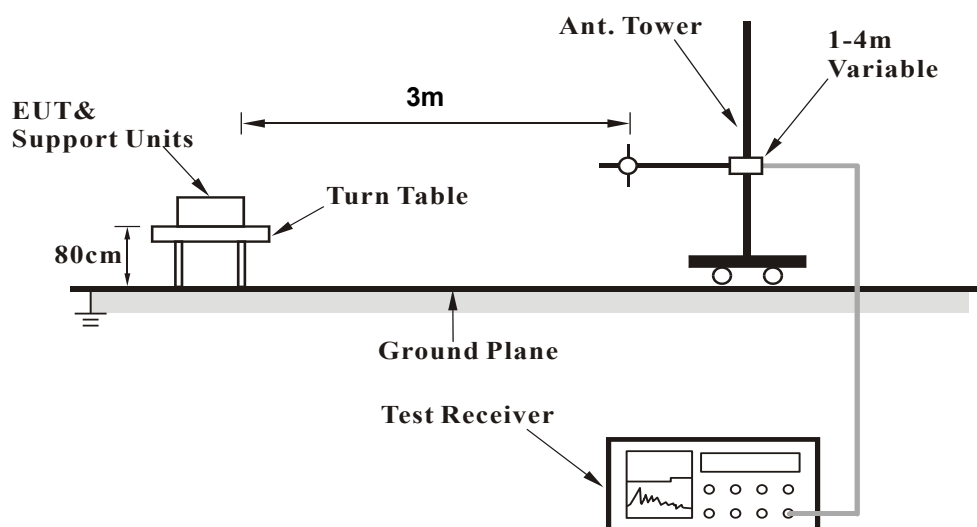
No deviation.

4.2.6 Test Setup

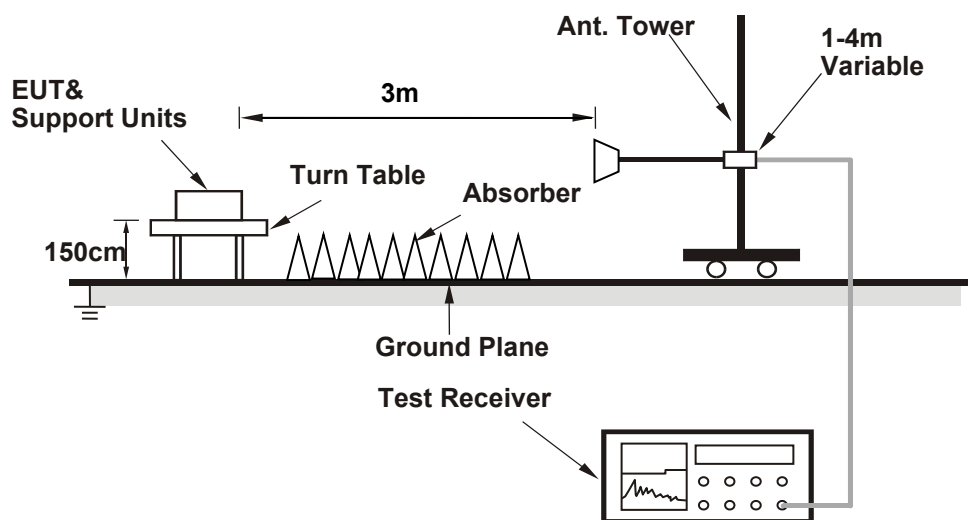
For Radiated emission below 30MHz



For Radiated emission 30MHz to 960MHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.7 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.2.8 Test Results

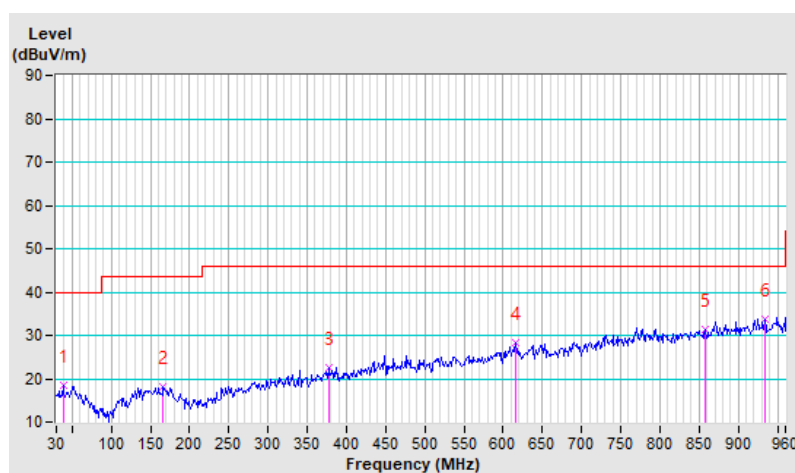
<960MHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	30 MHz ~ 960 MHz	Detector Function & Bandwidth	(QP), RB = VB = 120 kHz Sweep time = Auto

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	38.43	18.53 QP	40.00	-21.47	1.50 H	244	28.00	-9.47
2	166.36	18.15 QP	43.50	-25.35	1.00 H	174	26.73	-8.58
3	377.23	22.45 QP	46.00	-23.55	1.00 H	210	28.20	-5.75
4	616.22	28.24 QP	46.00	-17.76	1.00 H	152	28.58	-0.34
5	858.01	31.24 QP	46.00	-14.76	1.00 H	82	26.83	4.41
6	933.93	33.70 QP	46.00	-12.30	1.50 H	326	27.69	6.01

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9kHz ~ 30MHz: all emissions are more than 20dB below the limit, therefore do not be recorded in this report.

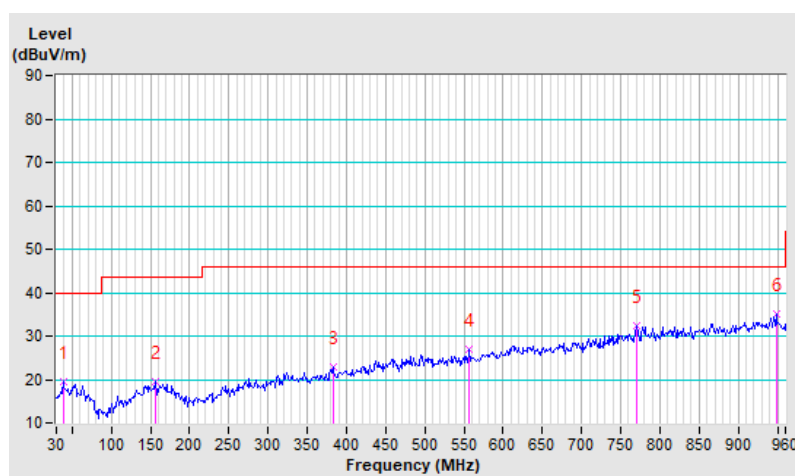


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	30 MHz ~ 960 MHz	Detector Function & Bandwidth	(QP), RB = VB = 120 kHz Sweep time = Auto

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	38.43	19.42 QP	40.00	-20.58	1.00 V	150	28.89	-9.47
2	156.52	19.34 QP	43.50	-24.16	1.50 V	78	27.71	-8.37
3	382.86	23.03 QP	46.00	-22.97	1.00 V	174	28.66	-5.63
4	557.17	26.95 QP	46.00	-19.05	1.00 V	226	29.32	-2.37
5	769.45	32.36 QP	46.00	-13.64	1.50 V	23	29.35	3.01
6	947.99	35.22 QP	46.00	-10.78	1.00 V	192	29.20	6.02

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9kHz ~ 30MHz: all emissions are more than 20dB below the limit, therefore do not be recorded in this report.



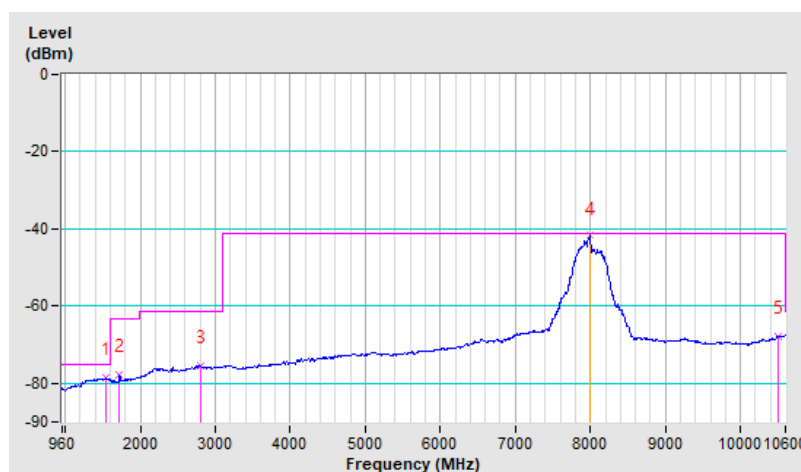
960 MHz – 10.6 GHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	960 MHz ~ 10600 MHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time = 1 s

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1538.40	-78.65AV	-75.30	-3.35	1.55 H	28	30.46	-109.11
2	1721.56	-77.82AV	-63.30	-14.52	1.64 H	33	31.62	-109.44
3	2801.24	-75.42AV	-61.30	-14.12	1.51 H	34	29.17	-104.59
4	*7987.20	-41.55AV	-41.30	-0.25	1.58 H	30	53.86	-95.41
5	10503.60	-67.71AV	-41.30	-26.41	1.59 H	32	24.86	-92.57

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.
4. " * " : Fundamental frequency.

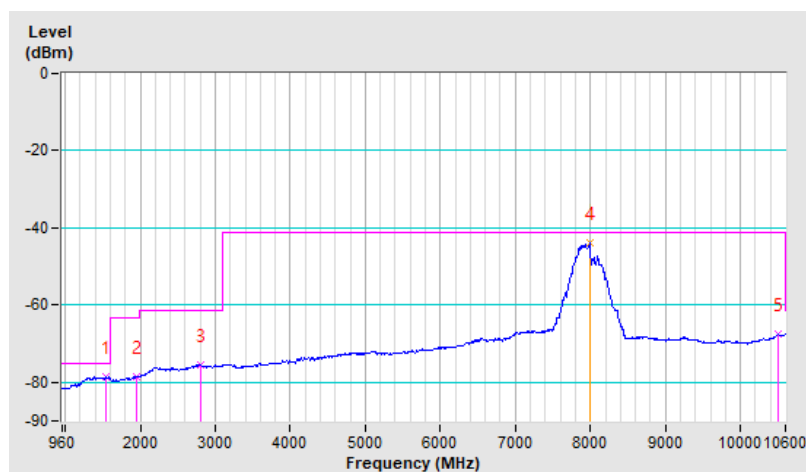


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	960 MHz ~ 10600 MHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time = 1 s

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1538.40	-78.64AV	-75.30	-3.34	2.47 V	244	30.47	-109.11
2	1952.92	-78.50AV	-63.30	-15.20	2.43 V	256	29.69	-108.19
3	2801.24	-75.44AV	-61.30	-14.14	2.41 V	268	29.15	-104.59
4	*7987.20	-43.03AV	-41.30	-1.73	2.45 V	250	52.38	-95.41
5	10493.96	-67.63AV	-41.30	-26.33	2.40 V	252	24.98	-92.61

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.
4. " * " : Fundamental frequency.



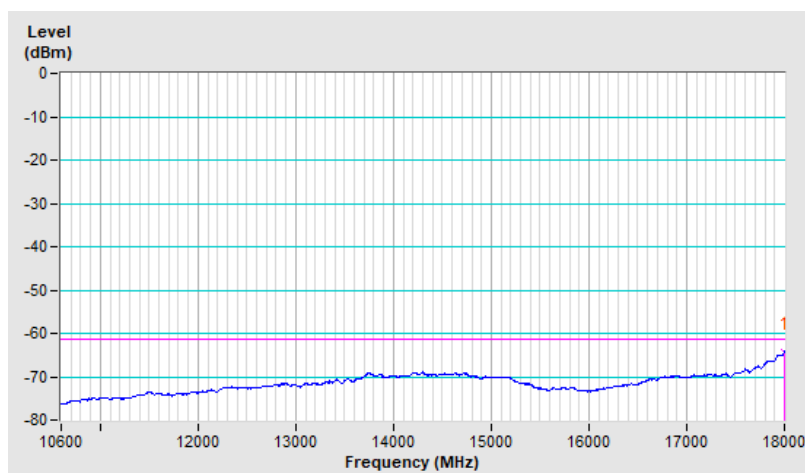
10.6 GHz - 18 GHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	10600 MHz ~ 18 GHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time = 1 s

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	17992.60	-64.37 AV	-61.30	-3.07	1.52 H	226	19.71	-84.08

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.

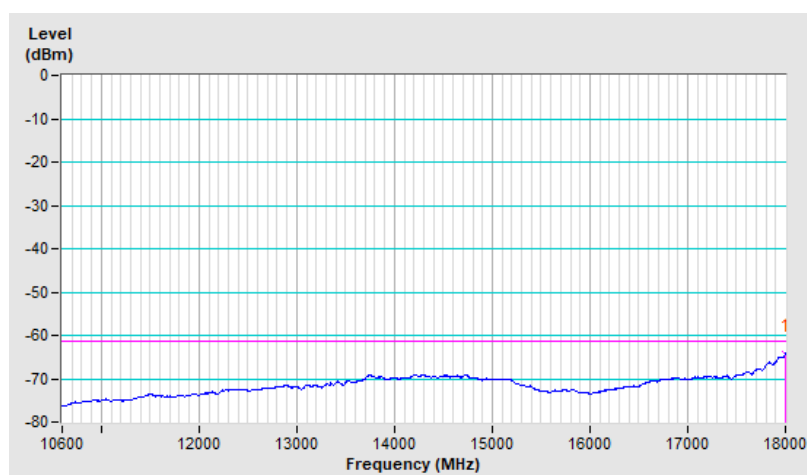


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	10600 MHz ~ 18 GHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time = 1 s

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	17992.60	-64.42 AV	-61.30	-3.12	1.94 V	87	19.66	-84.08

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.



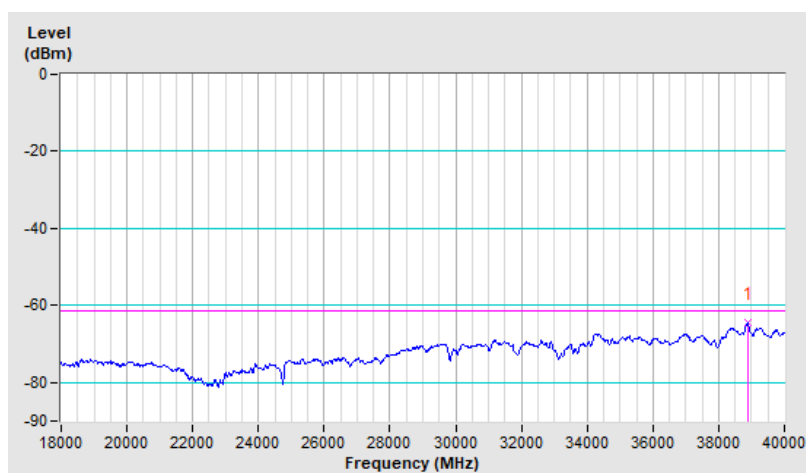
18 GHz – 40 GHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	18 GHz ~ 40 GHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time = 1 s

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	38878.00	-64.62 AV	-61.30	-3.32	1.84 H	230	37.98	-102.60

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.

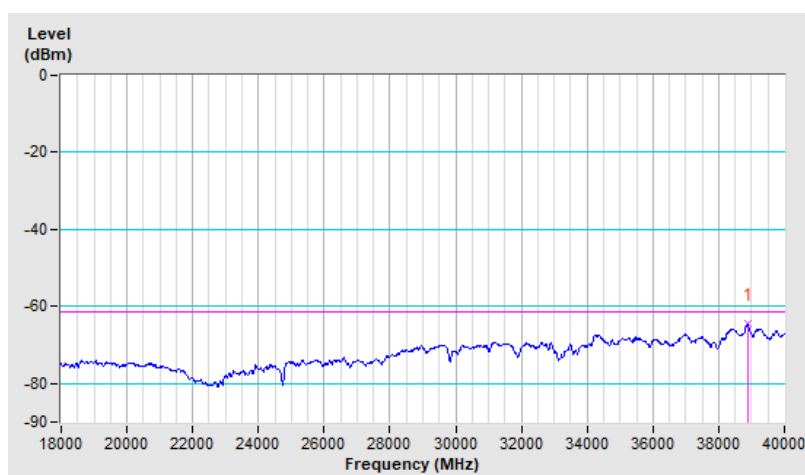


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	18 GHz ~ 40 GHz	Detector Function & Bandwidth	(AV), RB = 1 MHz, VB = 3 MHz (RMS) Sweep time =1 s

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	38878.00	-64.45 AV	-61.30	-3.15	2.00 V	141	38.15	-102.60

Remarks:

1. EIRP Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor.
2. Correction Factor = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.



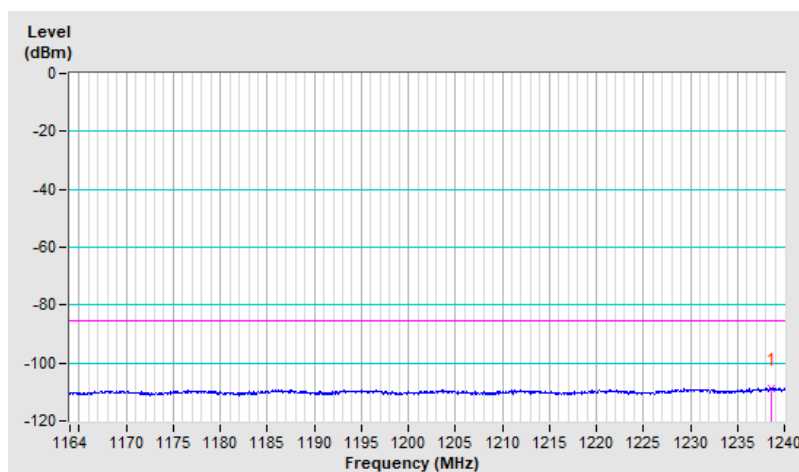
1.164 GHz – 1.24 GHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	1.164 GHz ~ 1.24 GHz	Detector Function & Bandwidth	(AV), RB = 1 kHz, VB = 3 kHz Sweep time = 1 s

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1238.56	-108.57 AV	-85.30	-23.27	1.85 H	223	2.24	-110.81

Remarks:

1. Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.

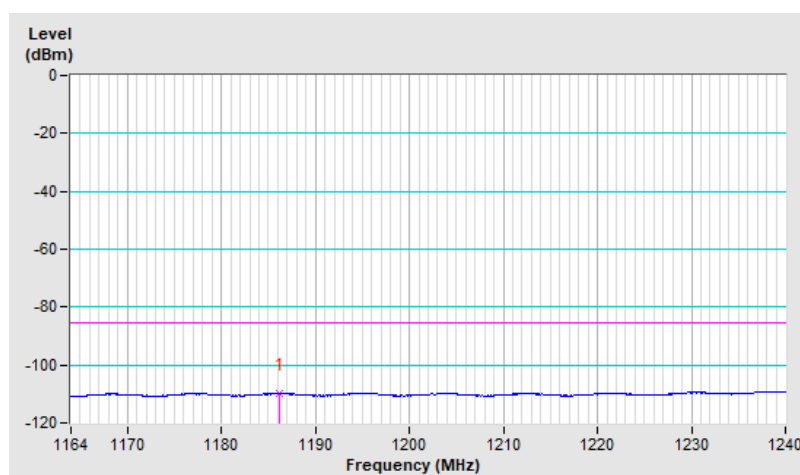


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	1.164 GHz ~ 1.24 GHz	Detector Function & Bandwidth	(AV), RB = 1 kHz, VB = 3 kHz Sweep time = 1 s

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1186.12	-109.72 AV	-85.30	-24.42	2.01 V	120	1.87	-111.59

Remarks:

1. Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.



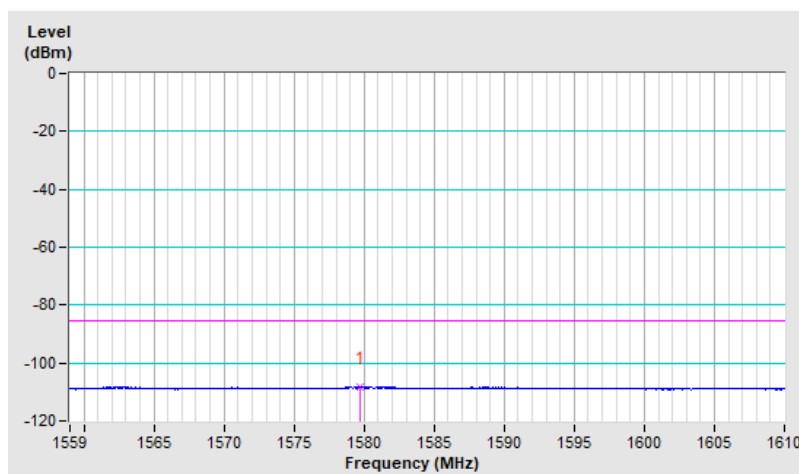
1.559 GHz – 1.61 GHz

RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	1.559 GHz ~ 1.61 GHz	Detector Function & Bandwidth	(AV), RB = 1 kHz, VB = 3 kHz Sweep time = 1 s

Antenna Polarity & Test Distance: Horizontal at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1579.71	-108.39 AV	-85.30	-23.09	1.40 H	98	0.83	-109.22

Remarks:

1. Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.

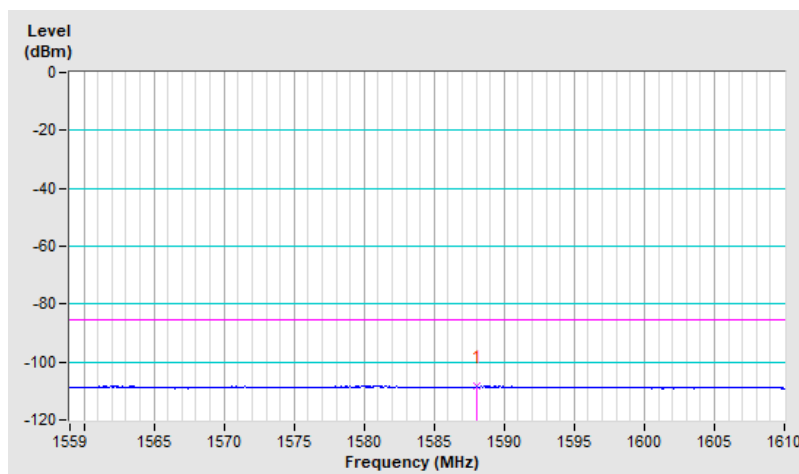


RF Mode	UWB	Operating Frequency	7987.2 MHz
Frequency Range	1.559 GHz ~ 1.61 GHz	Detector Function & Bandwidth	(AV), RB = 1 kHz, VB = 3 kHz Sweep time = 1 s

Antenna Polarity & Test Distance: Vertical at 3 m								
No.	Freq. (MHz)	EIRP Emission Level (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor
1	1588.02	-108.45 AV	-85.30	-23.15	2.39 V	202	0.82	-109.27

Remarks:

1. Emission Level(dBm) = Raw Value(dBuV/m) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) – 95.2 (field strength converted to EIRP at 3m).
3. Margin value = Emission Level – Limit value.



4.3 Occupied Bandwidth Measurement

4.3.1 Limits of Occupied Bandwidth Measurement

The results are for reference only.

4.3.2 Test Setup

Same as 4.1.6.

4.3.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.3.4 Test Procedure

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

1. The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
2. The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be at least three times the RBW, unless otherwise specified by the applicable requirement.
3. Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level.
4. Step a) through step c) might require iteration to adjust within the specified range.
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max-hold mode (until the trace stabilizes) shall be used.
6. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.
7. The correction factor has already been compensated by the instrument.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as 4.1.7.

4.3.7 Test Results

Frequency (MHz)	Occupied Bandwidth (MHz)
7987.2	601.832813285



4.4 UWB Bandwidth Measurement

4.4.1 Limits of Transmitter Power and Power Spectral Density Measurement

EUT Description	Limit
Hand held UWB systems	Must be contained between 3100 MHz and 10,600 MHz

4.4.2 Test Setup

Same as 4.1.6.

4.4.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.4.4 Test Procedure

The frequency at which the maximum power level is measured with the peak detector is designated f_M . The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below f_M , where the peak power falls by 10 dB relative to the level at f_M , are designated as f_H and f_L , respectively:

- For the lowest frequency bound f_L , the emission is searched from a frequency lower than f_M that has, by inspection, a peak power much lower than 10 dB less than the power at f_M and increased toward f_M until the peak power indicates 10 dB less than the power at f_M . The frequency of that segment is recorded.
- This process is repeated for the highest frequency bound f_H , beginning at a frequency higher than f_M that has, by inspection, a peak power much lower than 10 dB below the power at f_M . The frequency of that segment is recorded.
- The two recorded frequencies represent the highest f_H and lowest f_L bounds of the UWB transmission, and the -10 dB bandwidth ($B - 10$) is defined as $(f_H - f_L)$. The center frequency (f_c) is mathematically determined from $(f_H + f_L) / 2$.
- The fractional bandwidth is defined as $2(f_H - f_L) / (f_H + f_L)$.
- Determine whether the -10 dB bandwidth $(f_H - f_L)$ is ≥ 500 MHz, or whether the fractional bandwidth $2(f_H - f_L) / (f_H + f_L)$ is ≥ 0.2 .
- The correction factor has already been compensated by the instrument.

4.4.5 Deviation from Test Standard

No deviation.

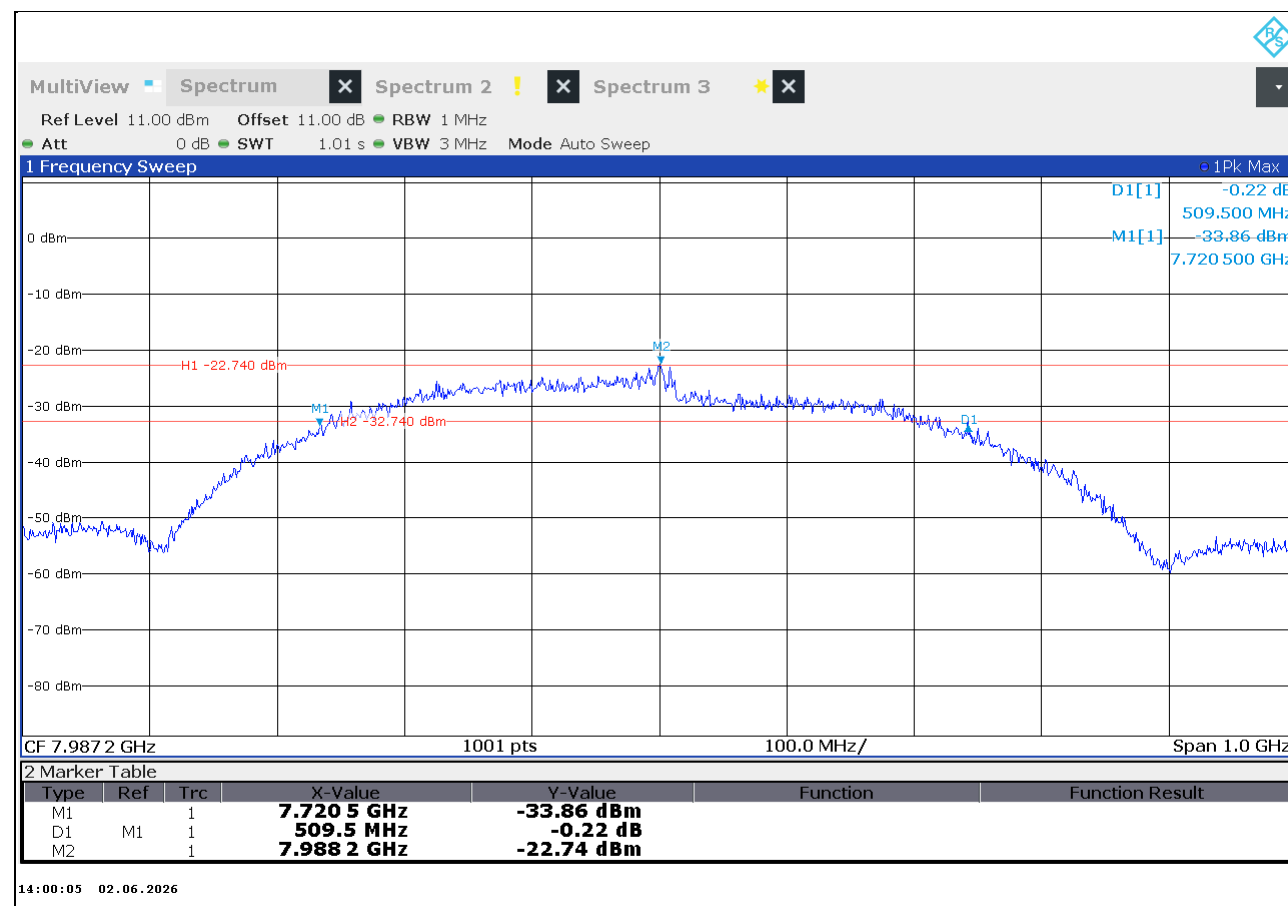
4.4.6 EUT Operating Conditions

Same as 4.1.7

4.4.7 Test Results

10 dB Bandwidth

F _M (MHz)	F _L (MHz)	F _C (MHz)	F _H (MHz)	10dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
7988.2	7720.5	7975.25	8230	509.5	500	Pass

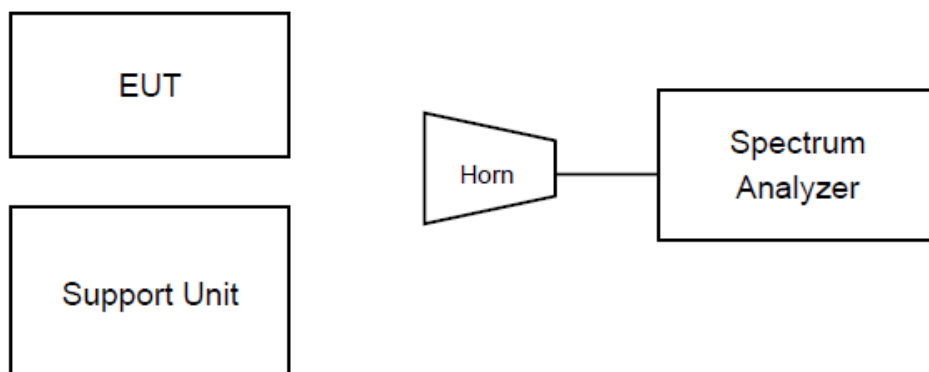


4.5 Transmission Time Measurement

4.5.1 Limits of Transmitter Emission Measurement

EUT Description	Limit
Hand held UWB systems	Shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

4.5.2 Test Setup



Use control software to configure the EUT to transmit or stop transmitting at a specific frequency.

4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedure

1. Set the device under test (DUT) and test companion to transmission mode.
2. Configure the spectrum analyzer with a resolution bandwidth of 10MHz, video bandwidth of 10MHz, span of 0Hz, and sweep time of 20 seconds.
3. Observe whether the transmission stops within 10 seconds after the test companion stop.

4.5.5 Deviation from Test Standard

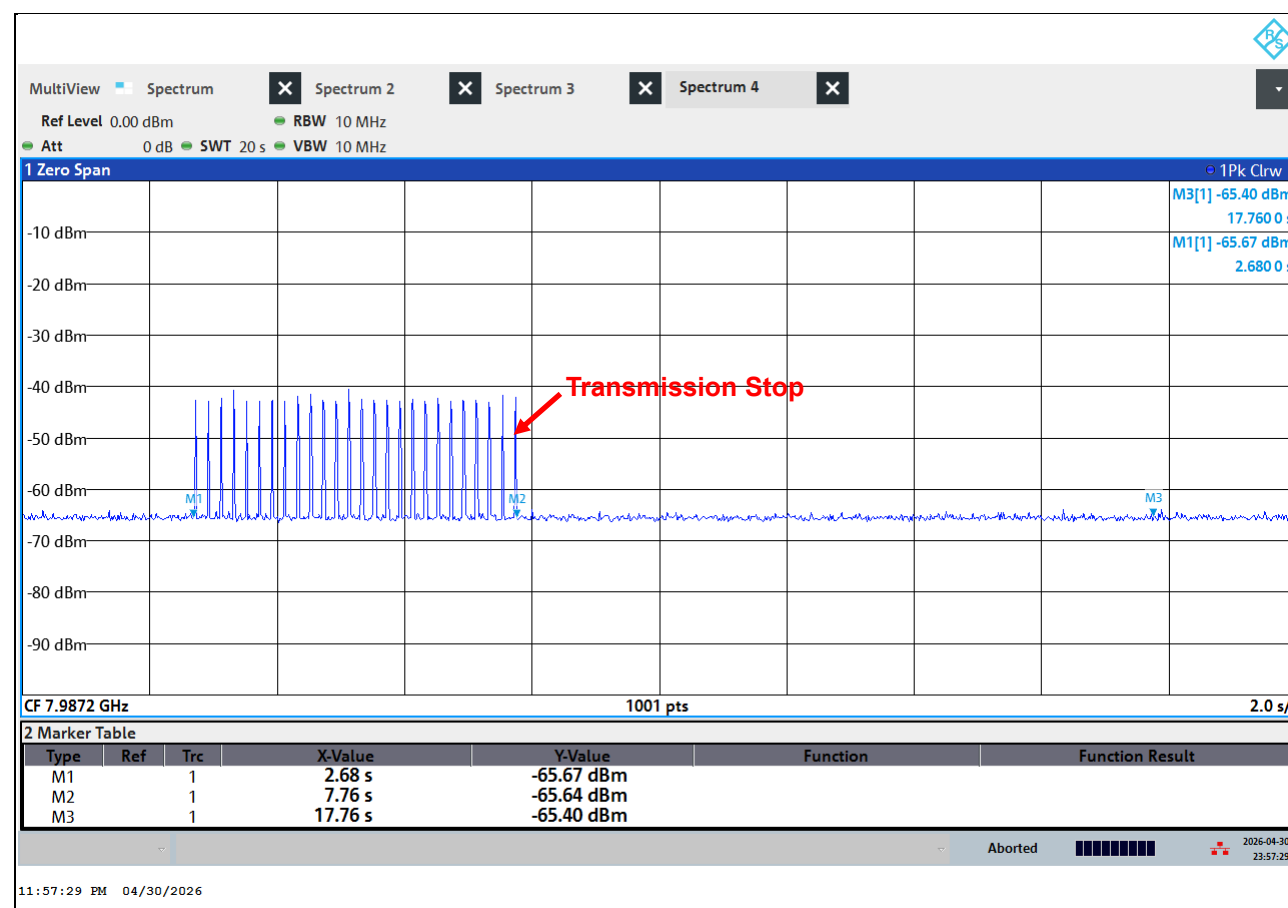
No deviation

4.5.6 EUT Operating Condition

Same as 4.1.7.

4.5.7 Test Results

Operating Frequency (MHz)	Transmission Time (s)	Limit (s)	Pass / Fail
7987.2	5.08	10	Pass



Note:

- M1 = The EUT begins transmitting information to companion receiver.
M2 = Companion receiver disconnected.
M3 = Point at which EUT stops transmission, within 10 seconds.

5. Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: <http://ee.bureauveritas.com.tw>

The address and road map of all our labs can be found in our web site also.

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