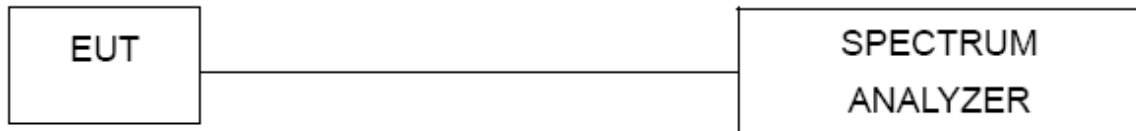


13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and he limit is less than ± 20 ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$.

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 13.2V
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Note: (A)(B) Represent the value of antenna A and B, The worst data is AntennaA, only shown Antenna A .

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	13.20	5745.00491	5745	0.00491	0.8550
		V max (V)	15.18	5745.00021	5745	0.00021	0.0364
		V min (V)	11.22	5745.00125	5745	0.00125	0.2180
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	13.2	T (°C)	-20	5745.00398	5745	0.00398	0.6922
		T (°C)	-10	5745.00378	5745	0.00378	0.6574
		T (°C)	0	5745.00618	5745	0.00618	1.0762
		T (°C)	10	5745.01105	5745	0.01105	1.9235
		T (°C)	20	5745.00354	5745	0.00354	0.6170
		T (°C)	30	5745.00588	5745	0.00588	1.0227
		T (°C)	40	5745.00646	5745	0.00646	1.1245
		T (°C)	50	5745.01181	5745	0.01181	2.0564
		T (°C)	60	5745.00176	5745	0.00176	0.3072
		T (°C)	70	5745.00522	5745	0.00522	0.9095
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	13.20	5785.01212	5785	0.01212	2.0953
		V max (V)	15.18	5785.00378	5785	0.00378	0.6527
		V min (V)	11.22	5785.00039	5785	0.00039	0.0669
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	13.2	T (°C)	-20	5785.00441	5785	0.00441	0.7619
		T (°C)	-10	5785.00978	5785	0.00978	1.6902
		T (°C)	0	5785.00432	5785	0.00432	0.7473
		T (°C)	10	5785.00091	5785	0.00091	0.1570
		T (°C)	20	5785.01309	5785	0.01309	2.2625
		T (°C)	30	5785.00145	5785	0.00145	0.2515
		T (°C)	40	5785.01186	5785	0.01186	2.0507
		T (°C)	50	5785.00166	5785	0.00166	0.2878
		T (°C)	60	5785.00053	5785	0.00053	0.0913
		T (°C)	70	5785.00522	5785	0.00522	0.9030
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	13.20	5825.00625	5825	0.00625	1.0726
		V max (V)	15.18	5825.01119	5825	0.01119	1.9213
		V min (V)	11.22	5825.00475	5825	0.00475	0.8150
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	13.2	T (°C)	-20	5825.00828	5825	0.00828	1.4218
		T (°C)	-10	5825.00397	5825	0.00397	0.6818
		T (°C)	0	5825.00261	5825	0.00261	0.4479
		T (°C)	10	5825.01143	5825	0.01143	1.9615
		T (°C)	20	5825.01138	5825	0.01138	1.9532
		T (°C)	30	5825.00582	5825	0.00582	0.9988
		T (°C)	40	5825.00566	5825	0.00566	0.9710
		T (°C)	50	5825.00614	5825	0.00614	1.0543
		T (°C)	60	5825.00619	5825	0.00619	1.0621
		T (°C)	70	5825.00286	5825	0.00286	0.4905
Limits				5725-5850 MHz			
Result				Complies			

14. Duty Cycle Of Test Signal

14.1 Standard Requirement

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

14.2 Formula

Duty Cycle = $T_{on} / (T_{on} + T_{off})$

14.3 Test Procedure

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

14.4 Test Result

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	AntA	100	0	0
NVNT	a	5785	AntA	100	0	0
NVNT	a	5825	AntA	100	0	0
NVNT	n20	5745	AntA	100	0	0
NVNT	n20	5785	AntA	100	0	0
NVNT	n20	5825	AntA	100	0	0
NVNT	n40	5755	AntA	100	0	0
NVNT	n40	5795	AntA	100	0	0
NVNT	ac20	5745	AntA	100	0	0
NVNT	ac20	5785	AntA	100	0	0
NVNT	ac20	5825	AntA	100	0	0
NVNT	ac40	5755	AntA	100	0	0
NVNT	ac40	5795	AntA	100	0	0
NVNT	ac80	5775	AntA	100	0	0
NVNT	ax20	5745	AntA	100	0	0
NVNT	ax20	5785	AntA	100	0	0
NVNT	ax20	5825	AntA	100	0	0
NVNT	ax40	5755	AntA	100	0	0
NVNT	ax40	5795	AntA	100	0	0
NVNT	ax80	5775	AntA	100	0	0

15. Antenna Requirement

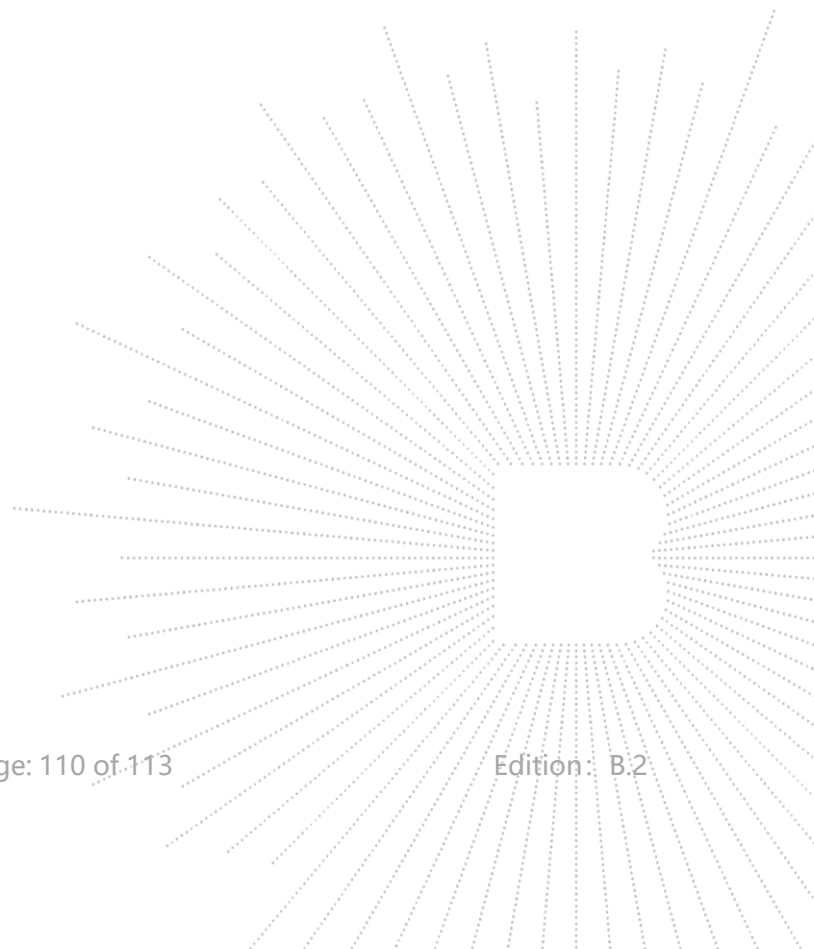
15.1 Limit

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

15.2 Test Result

The EUT antenna is Internal antenna, not using a standard antenna jack or electrical connector for antenna replacement, fulfill the requirement of this section.

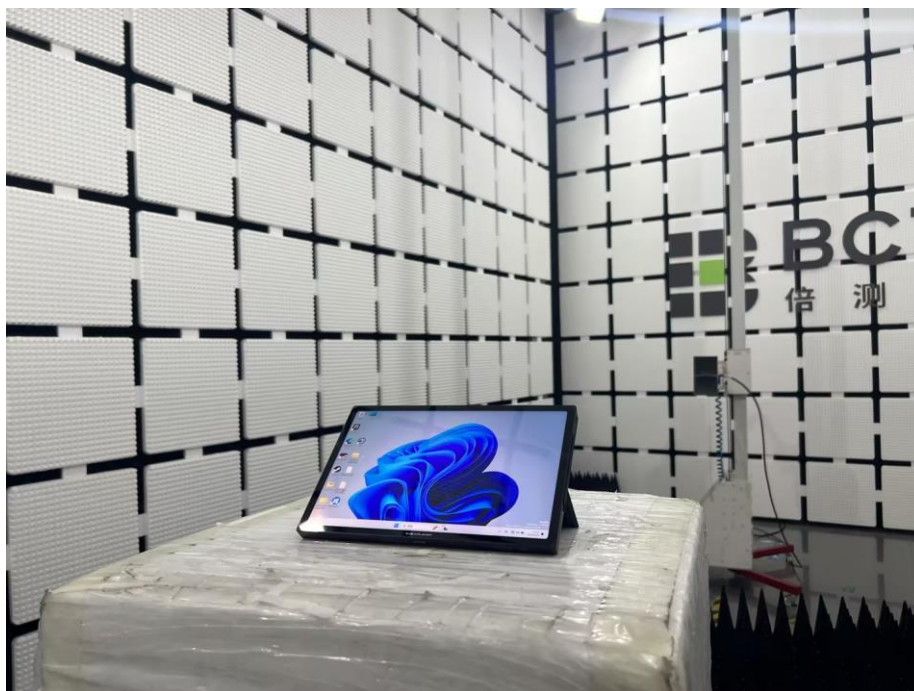
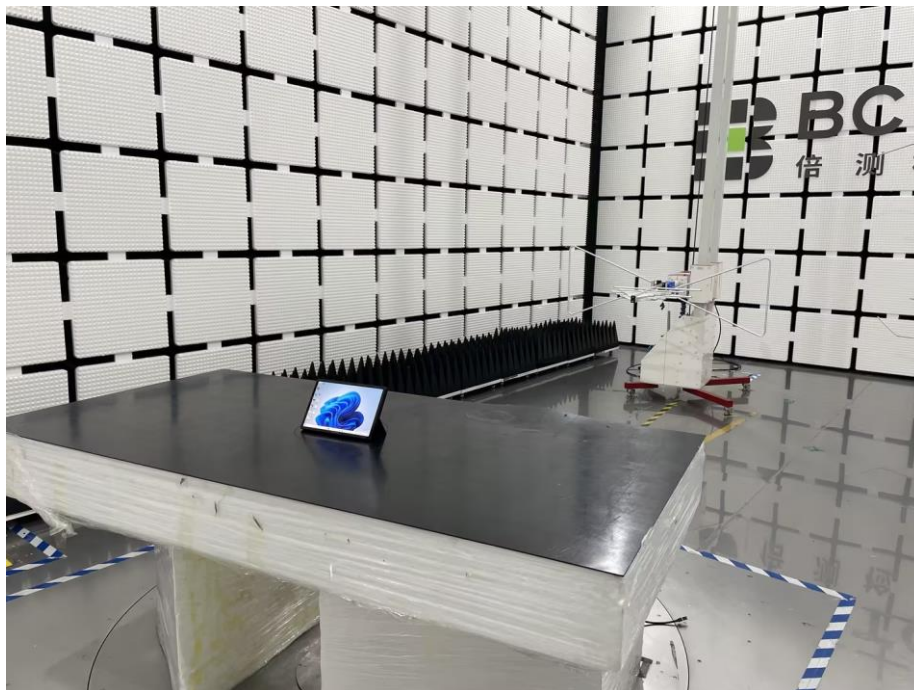


16. EUT Test Setup Photographs

Conducted emissions



Radiated Measurement Photos



STATEMENT

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC17025.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** **END** *****