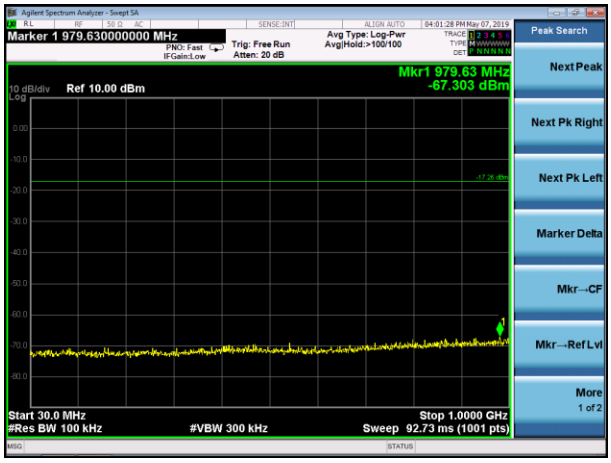
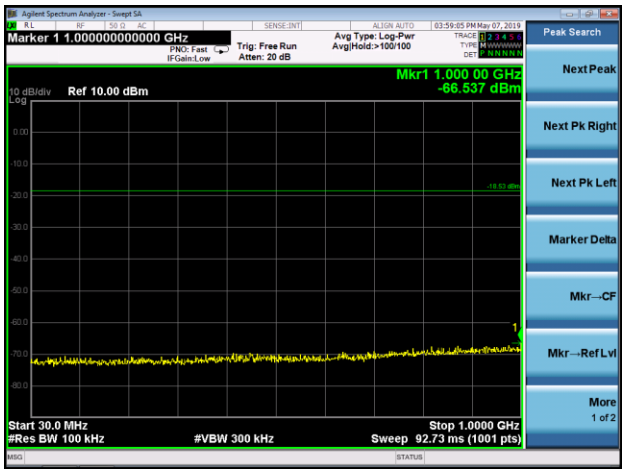
Test Plot

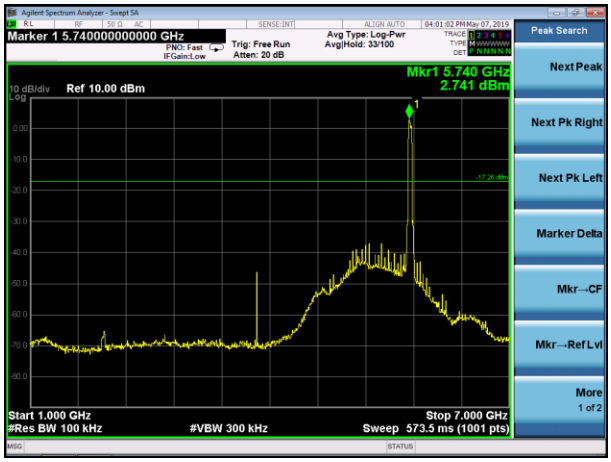
802.11n40 on channel 151



802.11n40 on channel 159



802.11n40 on channel 151



802.11n40 on channel 159

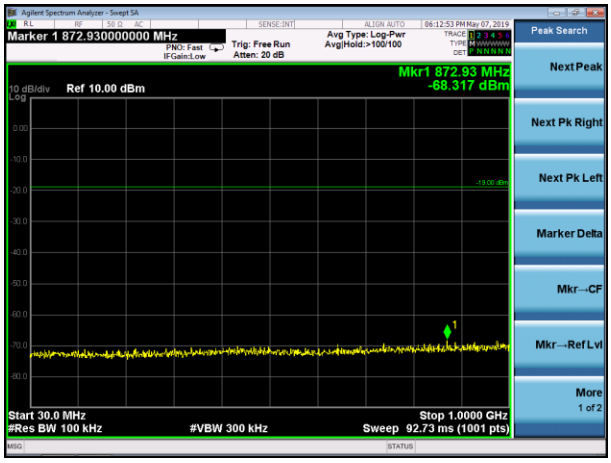
802.11n40 on channel 151

802.11n40 on channel 159

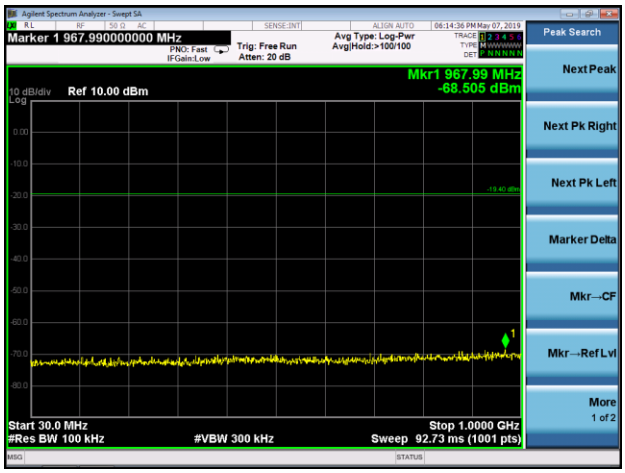
5.2G

Test Plot

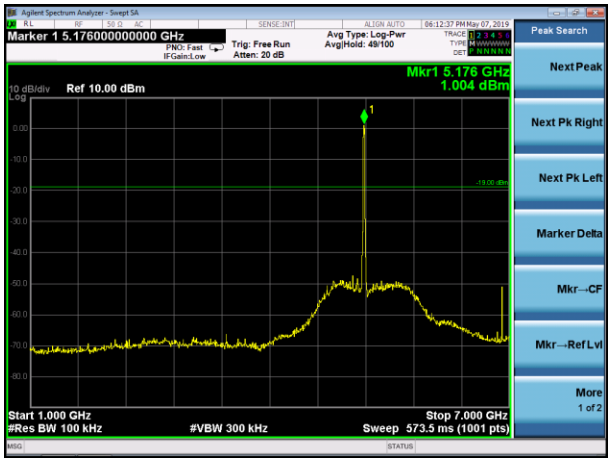
802.11a on channel 36



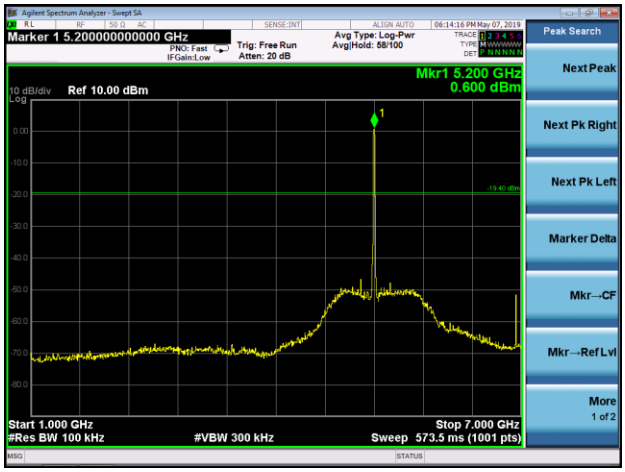
802.11a on channel 40



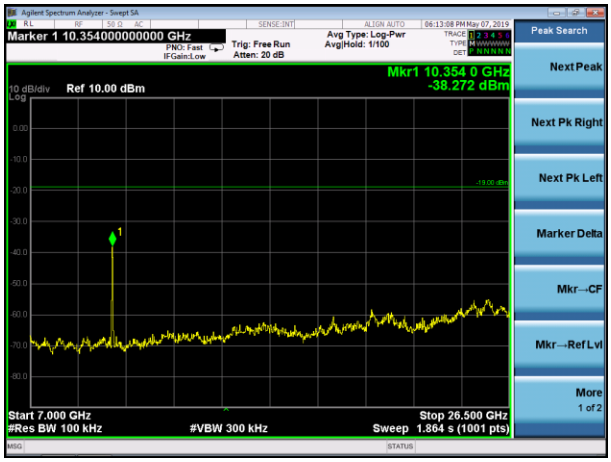
802.11a on channel 36



802.11a on channel 40



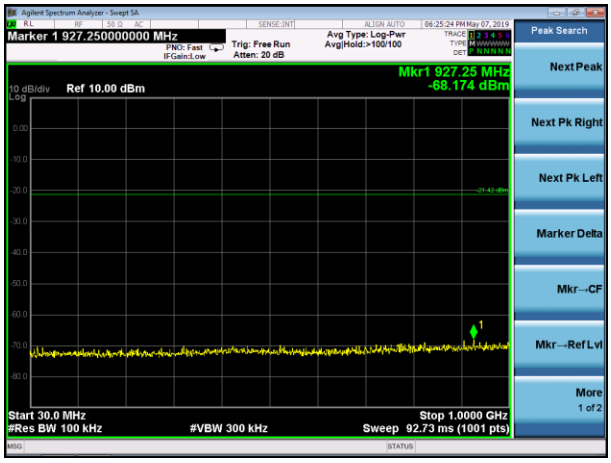
802.11a on channel 36



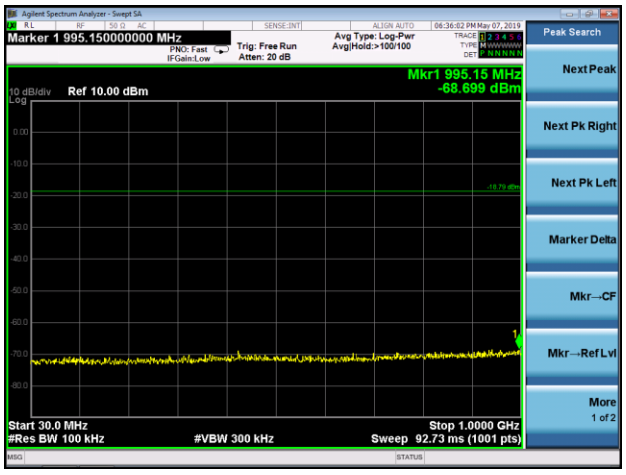
802.11a on channel 40

Test Plot

802.11a on channel 48

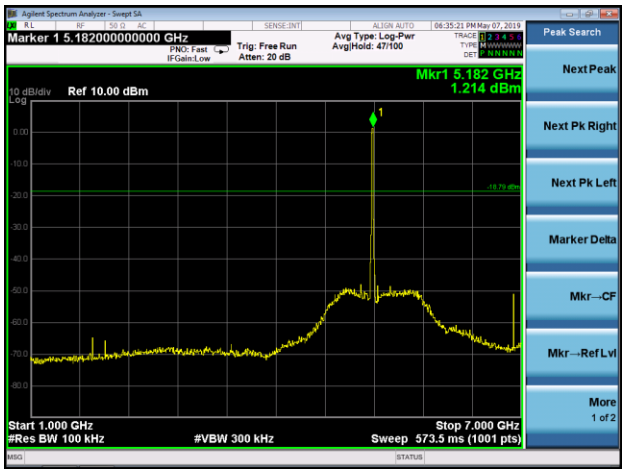


802.11n20 on channel 36



802.11a on channel 48

802.11n20 on channel 36

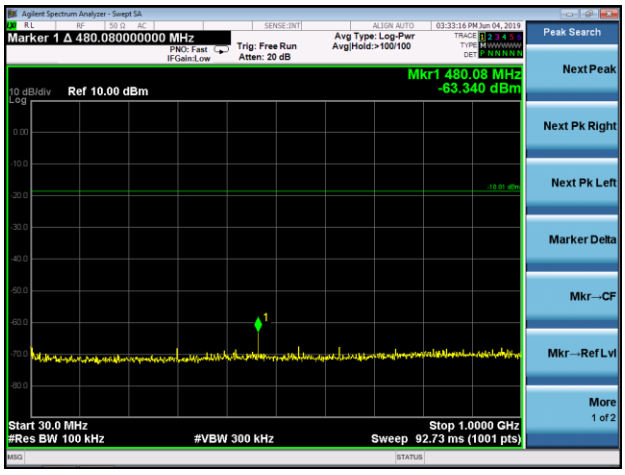


802.11a on channel 48

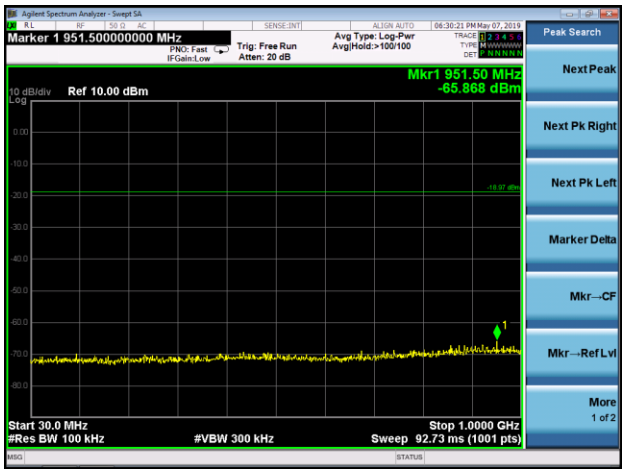
802.11n20 on channel 36

Test Plot

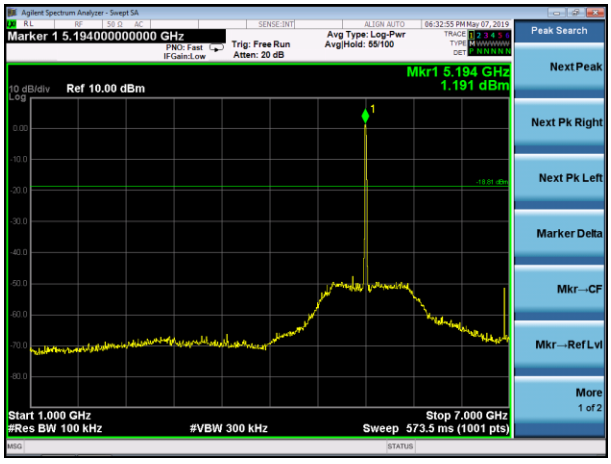
802.11n20 on channel 40



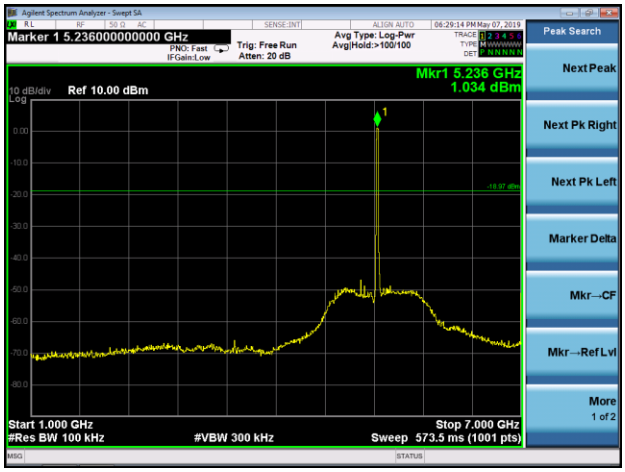
802.11n20 on channel 48



802.11n20 on channel 40



802.11n20 on channel 48

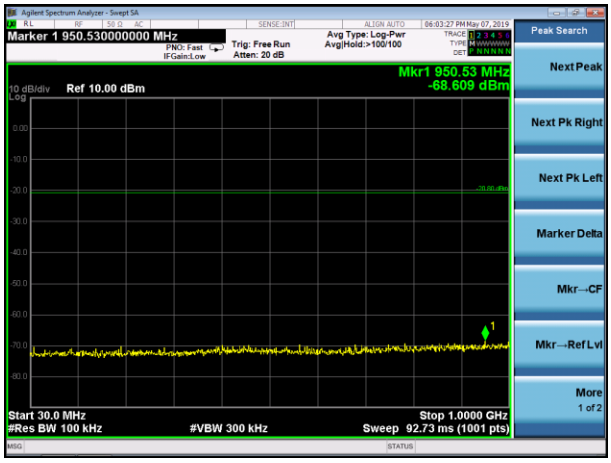


802.11n20 on channel 40

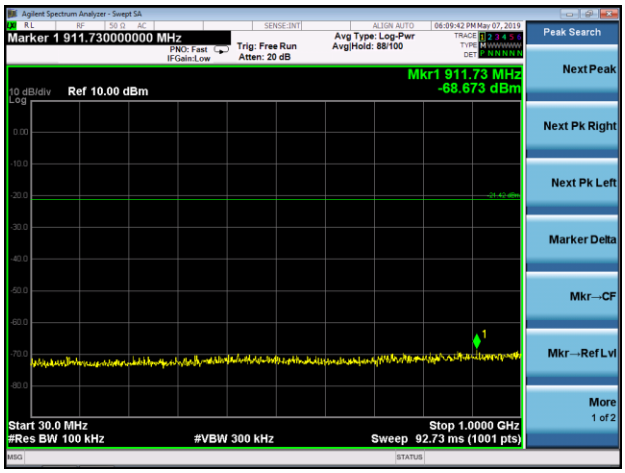
802.11n20 on channel 48

Test Plot

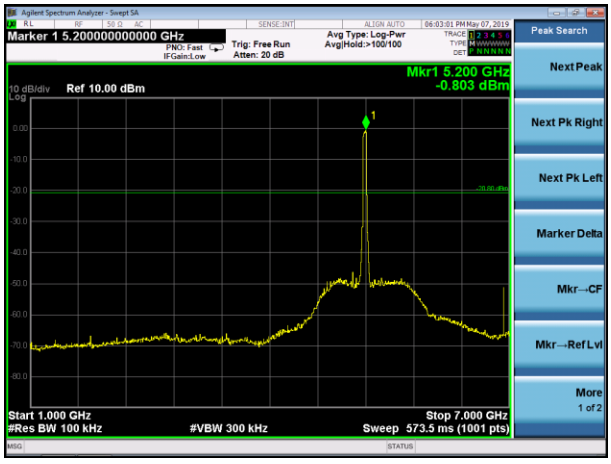
802.11n40 on channel 38



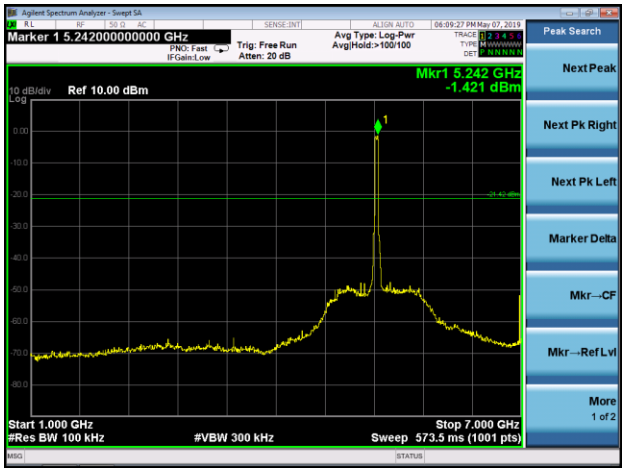
802.11n40 on channel 46



802.11n40 on channel 38



802.11n40 on channel 46



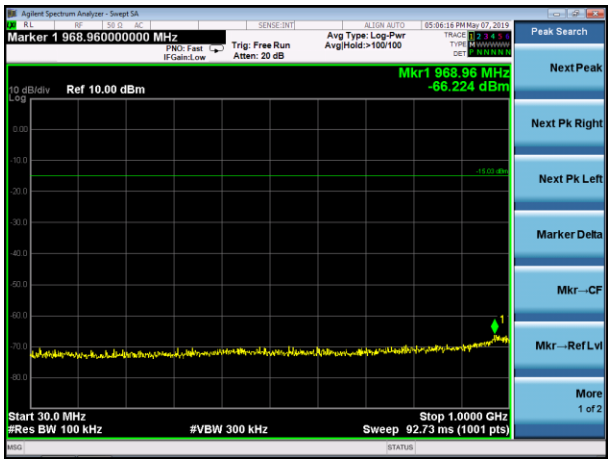
802.11n40 on channel 38

802.11n40 on channel 46

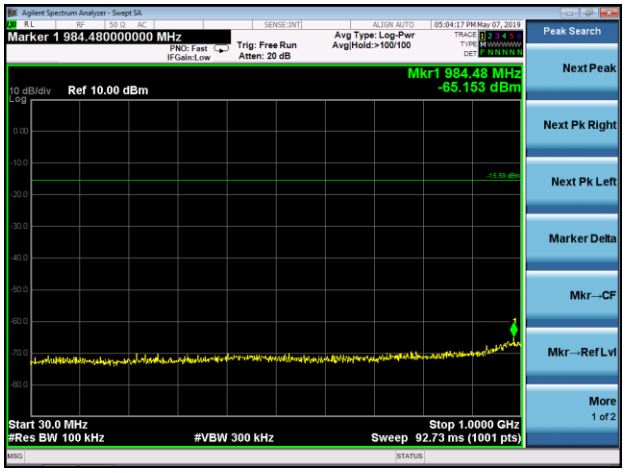
5.8G

Test Plot

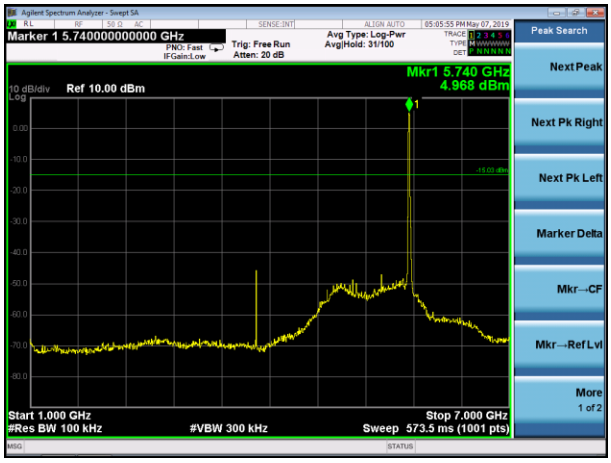
802.11a on channel 149



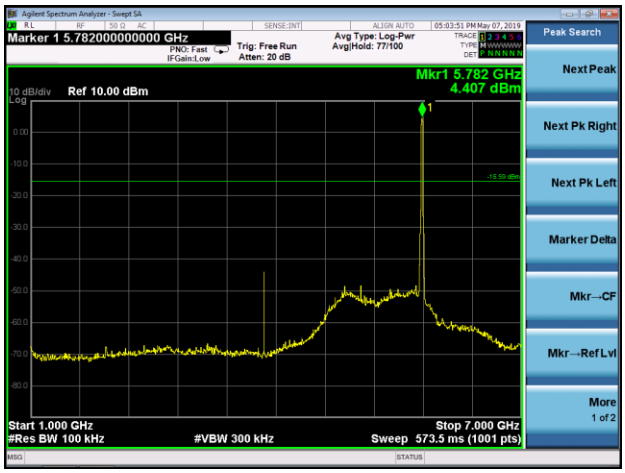
802.11a on channel 157



802.11a on channel 149



802.11a on channel 157

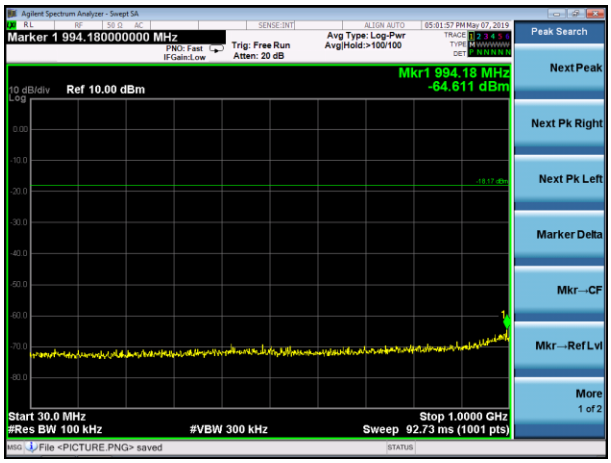


802.11a on channel 149

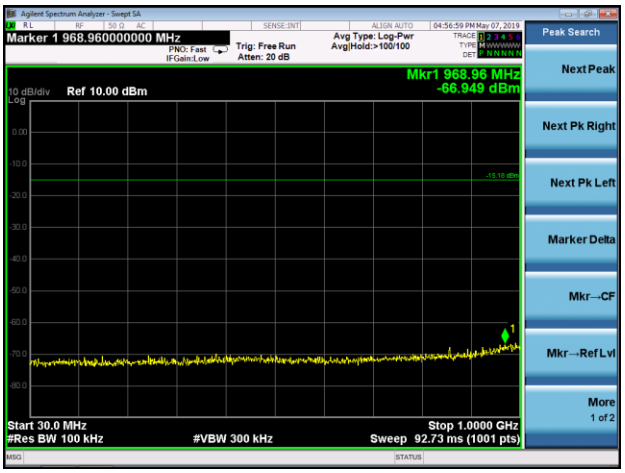
802.11a on channel 157

Test Plot

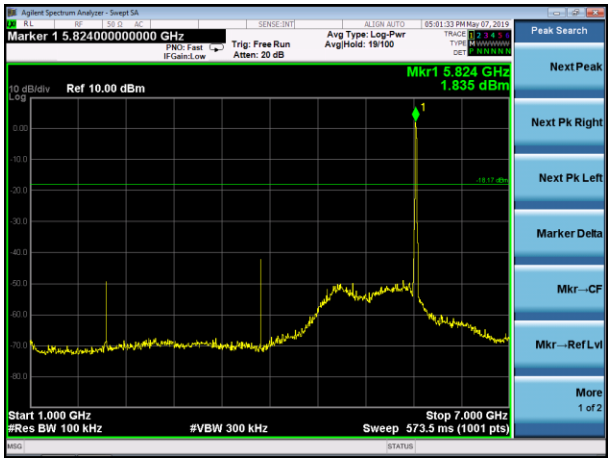
802.11a on channel 165



802.11n20 on channel 149



802.11a on channel 165



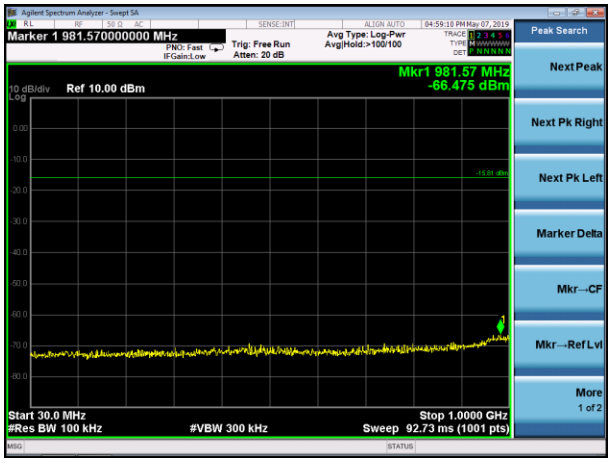
802.11n20 on channel 149

802.11a on channel 165

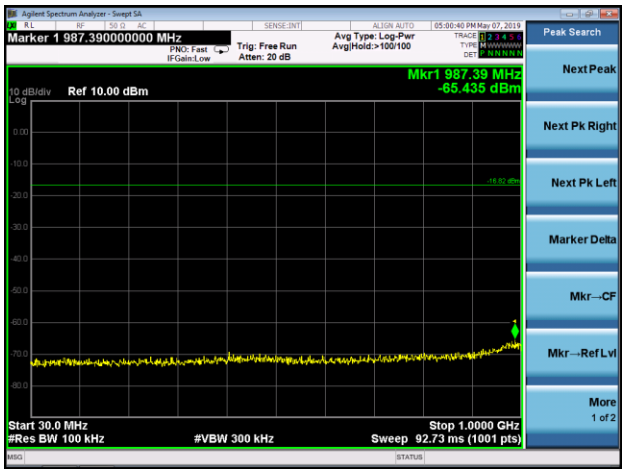
802.11n20 on channel 149

Test Plot

802.11n20 on channel 157



802.11n20 on channel 165



802.11n20 on channel 157

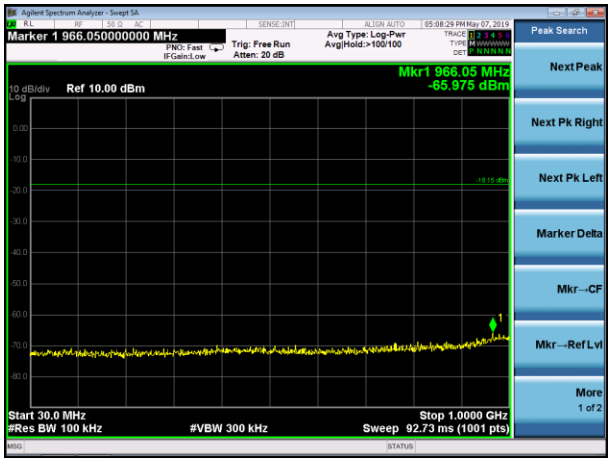
802.11n20 on channel 165

802.11n20 on channel 157

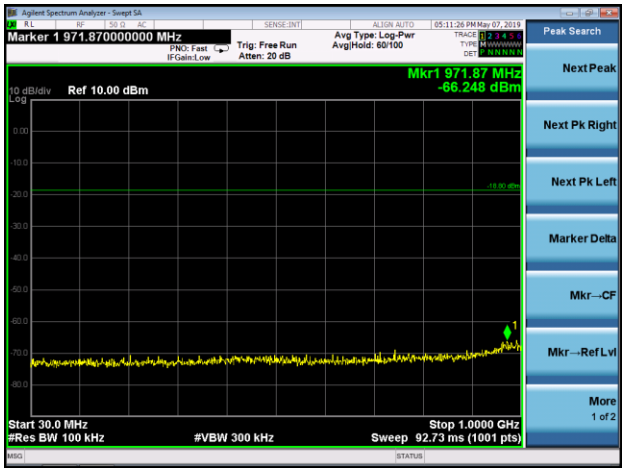
802.11n20 on channel 165

Test Plot

802.11n40 on channel 151



802.11n40 on channel 159



802.11n40 on channel 151

802.11n40 on channel 159

802.11n40 on channel 151

802.11n40 on channel 159

9. Frequency Stability Measurement

9.1 LIMIT

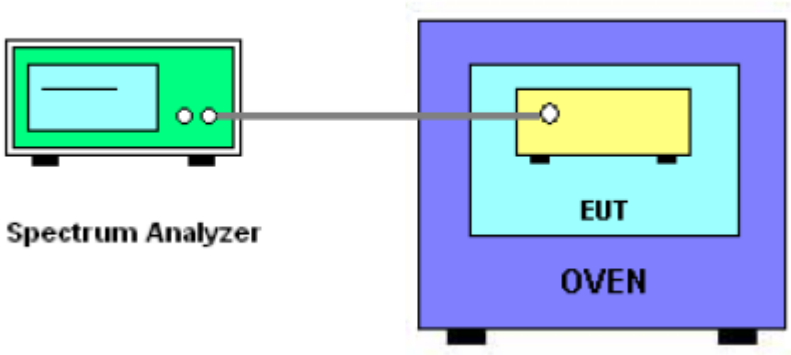
Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

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

9.2 TEST PROCEDURES

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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10_6 ppm and the limit is less than ±20ppm (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°C~70°C.

9.3 TEST SETUP LAYOUT



9.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

9.5 TEST RESULTS

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	DC 24V form power supply
Test Mode ：	TX Frequency Band I (5150-5250MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	24.00	5180.0521	5180	0.0521	-10.0579
		V max (V)	27.60	5180.0326	5180	0.0326	-6.2934
		V min (V)	20.40	5180.0241	5180	0.0241	-4.6525
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5180.0059	5180	0.0059	-1.1390
		T (°C)	-10	5180.0107	5180	0.0107	-2.0656
		T (°C)	0	5180.0325	5180	0.0325	-6.2741
		T (°C)	10	5180.0385	5180	0.0385	-7.4324
		T (°C)	20	5180.0298	5180	0.0298	-5.7529
		T (°C)	30	5180.0213	5180	0.0213	-4.1120
		T (°C)	40	5180.0123	5180	0.0123	-2.3745
		T (°C)	50	5180.0097	5180	0.0097	-1.8726
		T (°C)	60	5180.0417	5180	0.0417	-8.0502
		T (°C)	70	5180.0695	5180	0.0695	-13.4170
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	24.00	5200.0251	5200	0.0251	-4.8269
		V max (V)	27.60	5200.0425	5200	0.0425	-8.1731
		V min (V)	20.40	5200.0694	5200	0.0694	-13.3462
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5200.0632	5200	0.0632	-12.1538
		T (°C)	-10	5200.0529	5200	0.0529	-10.1731
		T (°C)	0	5200.0437	5200	0.0437	-8.4038
		T (°C)	10	5200.0923	5200	0.0923	-17.7500
		T (°C)	20	5200.0633	5200	0.0633	-12.1731
		T (°C)	30	5200.0124	5200	0.0124	-2.3846
		T (°C)	40	5200.0739	5200	0.0739	-14.2115
		T (°C)	50	5200.0418	5200	0.0418	-8.0385
		T (°C)	60	5200.0326	5200	0.0326	-6.2692
		T (°C)	70	5200.0421	5200	0.0421	-8.0962
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	24.00	5240.0132	5240	0.0132	-2.5191
		V max (V)	27.60	5240.0417	5240	0.0417	-7.9580
		V min (V)	20.40	5240.0095	5240	0.0095	-1.8130
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5240.0092	5240	0.0092	-1.7557
		T (°C)	-10	5240.0034	5240	0.0034	-0.6489
		T (°C)	0	5240.0147	5240	0.0147	-2.8053
		T (°C)	10	5240.0852	5240	0.0852	-16.2595
		T (°C)	20	5240.0111	5240	0.0111	-2.1183
		T (°C)	30	5240.0126	5240	0.0126	-2.4046
		T (°C)	40	5240.0069	5240	0.0069	-1.3168
		T (°C)	50	5240.0074	5240	0.0074	-1.4122
		T (°C)	60	5240.0058	5240	0.0058	-1.1069
		T (°C)	70	5240.0100	5240	0.0100	-1.9084
Limits				± 20 ppm			
Result				Complies			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101 kPa	Test Voltage ：	DC 24V form power supply
Test Mode ：	TX Frequency(5745-5850MHz)		

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	24.00	5745.00408	5745	0.00408	-0.7105
		V max (V)	27.60	5745.00778	5745	0.00778	-1.3535
		V min (V)	20.40	5745.00862	5745	0.00862	-1.5000
Limits				± 20 ppm			
Result				Complies			

Voltage vs. Frequency Stability

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5745.01071	5745	0.01071	-1.8638
		T (°C)	-10	5745.00657	5745	0.00657	-1.1438
		T (°C)	0	5745.01002	5745	0.01002	-1.7443
		T (°C)	10	5745.00087	5745	0.00087	-0.1517
		T (°C)	20	5745.00981	5745	0.00981	-1.7067
		T (°C)	30	5745.00057	5745	0.00057	-0.0988
		T (°C)	40	5745.00827	5745	0.00827	-1.4399
		T (°C)	50	5745.00637	5745	0.00637	-1.1086
		T (°C)	60	5745.01215	5745	0.01215	-2.1145
		T (°C)	70	5745.00023	5745	0.00023	-0.0407
Limits				± 20 ppm			
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)	24.00	5785.01017	5785	0.01017	-1.7584
		V max (V)	27.60	5785.00449	5785	0.00449	-0.7765
		V min (V)	20.40	5785.00769	5785	0.00769	-1.3285
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5785.01205	5785	0.01205	-2.0835
		T (°C)	-10	5785.00195	5785	0.00195	-0.3373
		T (°C)	0	5785.00827	5785	0.00827	-1.4290
		T (°C)	10	5785.00509	5785	0.00509	-0.8804
		T (°C)	20	5785.00330	5785	0.00330	-0.5708
		T (°C)	30	5785.00339	5785	0.00339	-0.5852
		T (°C)	40	5785.01120	5785	0.01120	-1.9368
		T (°C)	50	5785.00921	5785	0.00921	-1.5917
		T (°C)	60	5785.01151	5785	0.01151	-1.9895
		T (°C)	70	5785.00343	5785	0.00343	-0.5929
Limits				± 20 ppm			
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)	24.00	5825.00710	5825	0.00710	-1.2197
		V max (V)	27.60	5825.00404	5825	0.00404	-0.6930
		V min (V)	20.40	5825.00080	5825	0.00080	-0.1380
Limits				± 20 ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	24	T (°C)	-20	5825.01272	5825	0.01272	-2.1844
		T (°C)	-10	5825.01084	5825	0.01084	-1.8614
		T (°C)	0	5825.00826	5825	0.00826	-1.4185
		T (°C)	10	5825.00950	5825	0.00950	-1.6301
		T (°C)	20	5825.01042	5825	0.01042	-1.7886
		T (°C)	30	5825.00159	5825	0.00159	-0.2728
		T (°C)	40	5825.00418	5825	0.00418	-0.7172
		T (°C)	50	5825.00141	5825	0.00141	-0.2415
		T (°C)	60	5825.00455	5825	0.00455	-0.7814
		T (°C)	70	5825.00298	5825	0.00298	-0.5111
Limits				± 20 ppm			
Result				Complies			

10. DUTY CYCLE OF TEST SIGNAL

10.1 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.

10.2 FORMULA:

Duty Cycle = Ton / (Ton+Toff)

Measurement Procedure:

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

Duty Cycle:

	Duty Cycle	Duty Fator (dB)
802.11a	1	0
802.11n(HT20)	1	0
802.11n(HT40)	1	0

11. ANTENNA REQUIREMENT

11.1 STANDARD REQUIREMENT

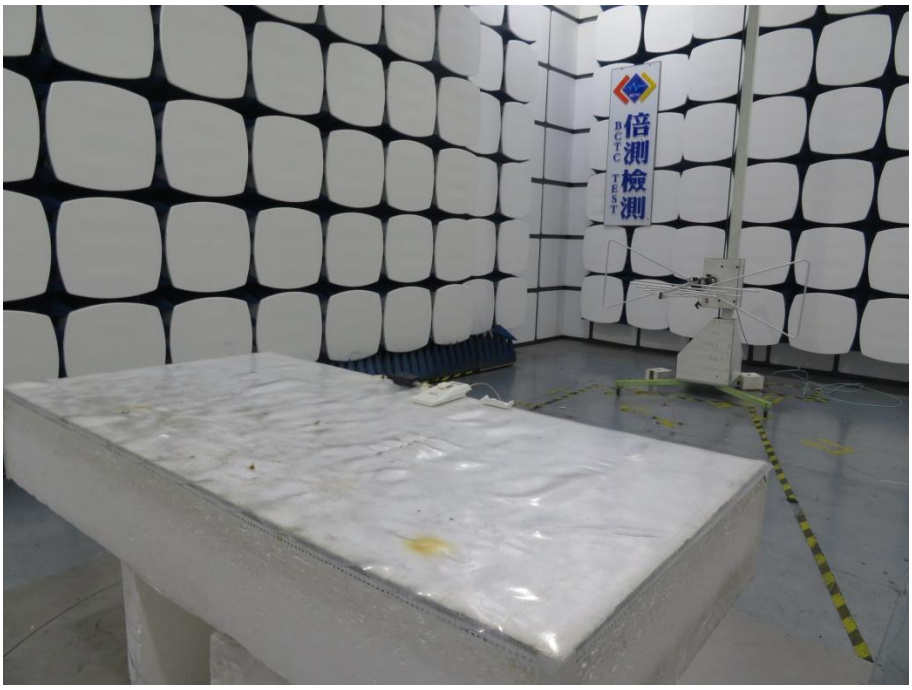
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

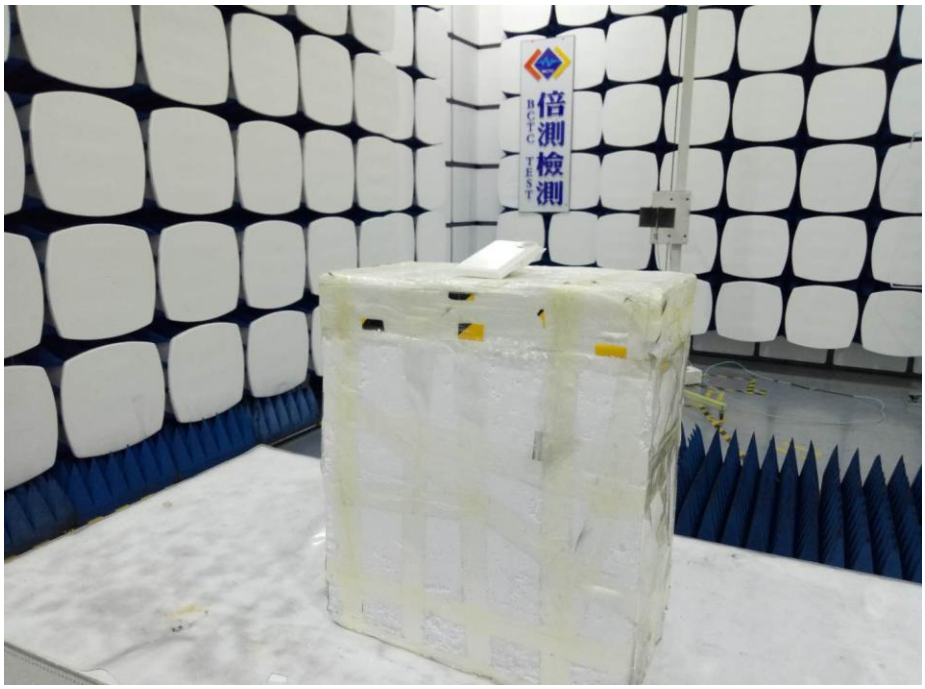
11.2 EUT ANTENNA

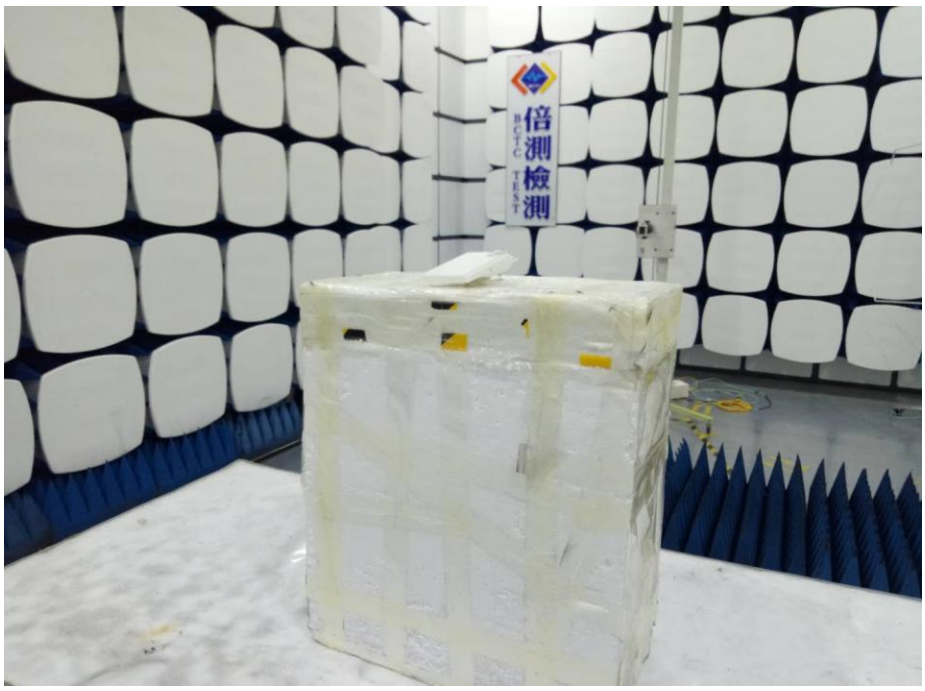
The EUT antenna is permanent attached PCB antenna(antenna gain:10dBi). It comply with the standard requirement.

12. EUT TEST PHOTO

Radiated Measurement Photos

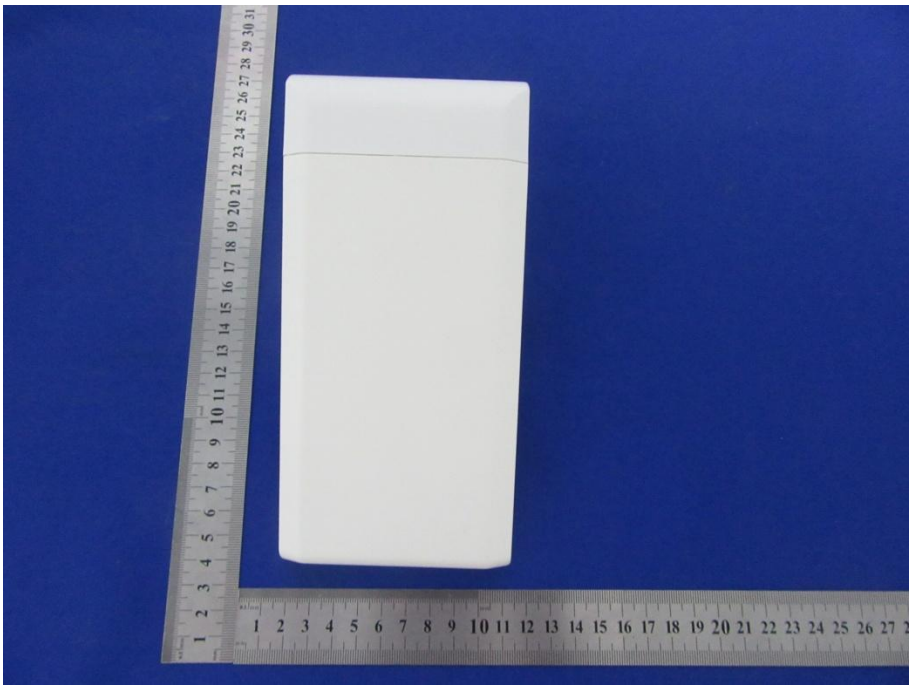






CONDUCTED Measurement Photos

13. EUT PHOTO



******* END OF REPORT*******