



802.11ac (20MHz)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	98.28	98.81	/	/	35.09	9.88	45.5	200	175	Peak
5745	91.73	92.26	/	/	35.09	9.88	45.5	200	175	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5745	94.8	95.53	/	/	34.89	9.88	45.5	200	40	Peak
5745	87.28	88.01	/	/	34.89	9.88	45.5	200	40	Average

REMARKS:

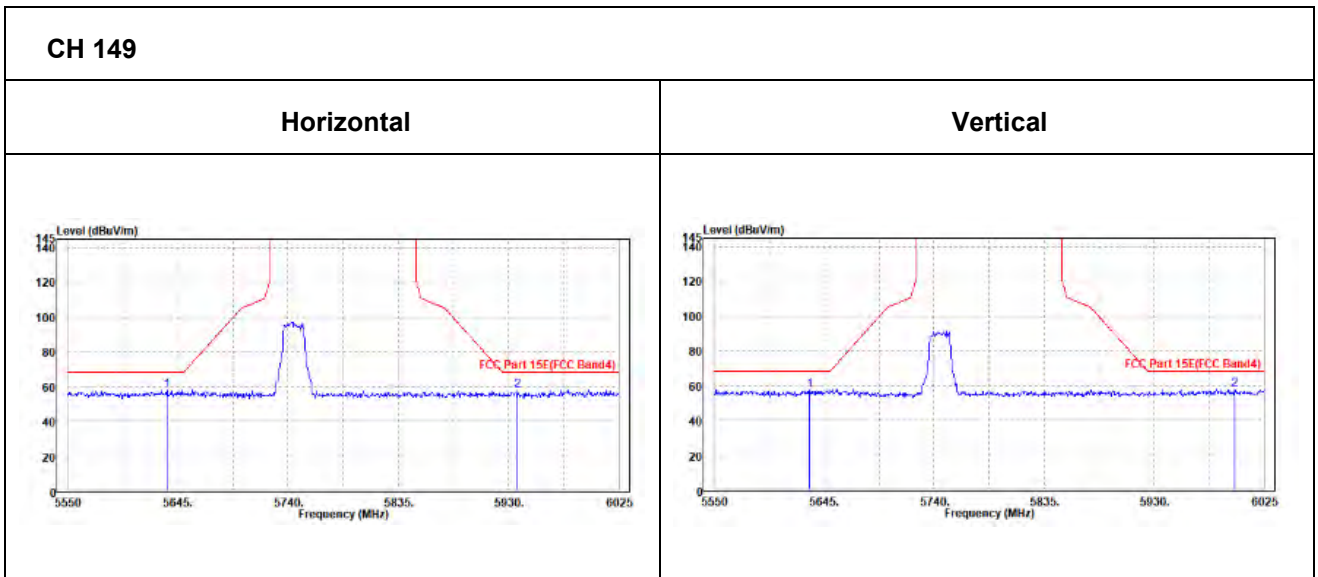
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5745MHz: Fundamental frequency.



**Oobe Data**

**802.11ac (20MHz)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5635.5	57.82	58.51	68.2	-10.38	34.96	9.85	45.5	200	360	Peak
5937.6	57.85	58.07	68.2	-10.35	35.33	9.95	45.5	200	360	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5632.175	57.4	58.3	68.2	-10.8	34.76	9.84	45.5	200	0	Peak
5999.825	58.06	58.39	68.2	-10.14	35.2	9.97	45.5	200	0	Peak





<b>CHANNEL</b>	TX Channel 157	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	98.97	99.43	/	/	35.14	9.9	45.5	200	175	Peak
5785	92.2	92.66	/	/	35.14	9.9	45.5	200	175	Average

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5785	94.19	94.85	/	/	34.94	9.9	45.5	200	40	Peak
5785	87.75	88.41	/	/	34.94	9.9	45.5	200	40	Average

**REMARKS:**

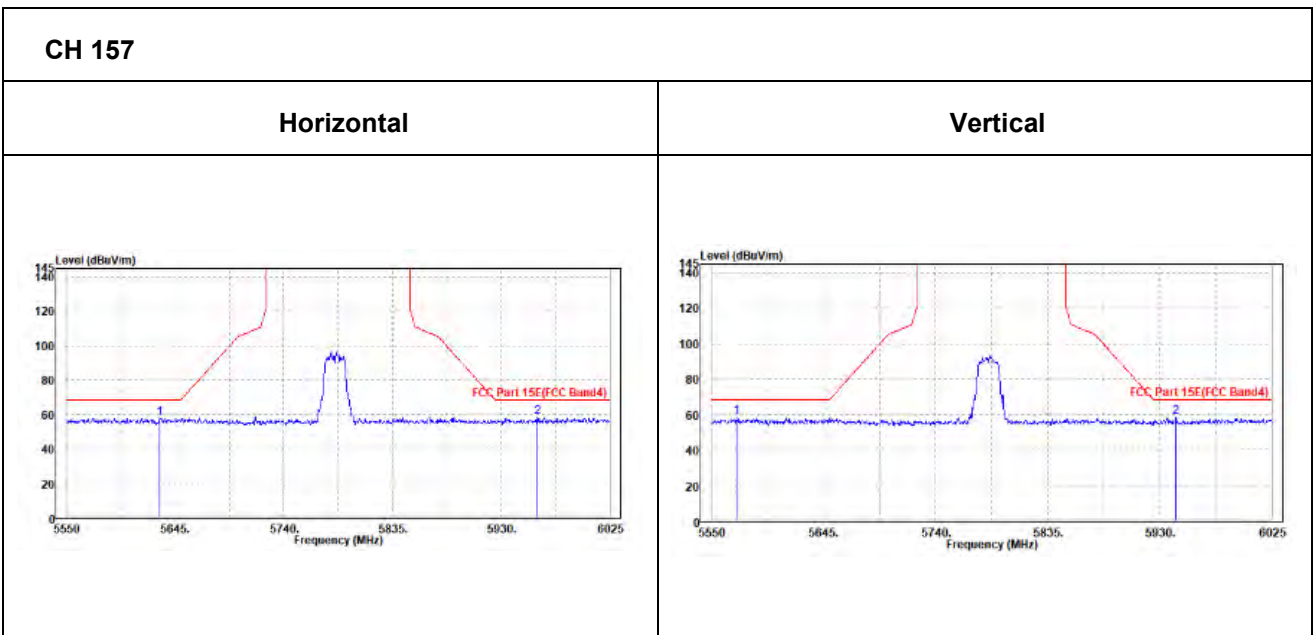
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5785MHz: Fundamental frequency.



**Oobe Data**

**802.11ac (20MHz)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV /m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5631.225	57.7	58.4	68.2	-10.5	34.96	9.84	45.5	200	0	Peak
5961.825	58.22	58.41	68.2	-9.98	35.35	9.96	45.5	200	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV /m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5570.9	58.18	59.17	68.2	-10.02	34.69	9.82	45.5	200	360	Peak
5943.775	58.35	58.77	68.2	-9.85	35.13	9.95	45.5	200	360	Peak





CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	98.5	98.9	/	/	35.19	9.91	45.5	200	175	Peak
5825	91.23	91.63	/	/	35.19	9.91	45.5	200	175	Average

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5825	93.55	94.15	/	/	34.99	9.91	45.5	200	40	Peak
5825	86.38	86.98	/	/	34.99	9.91	45.5	200	40	Average

REMARKS:

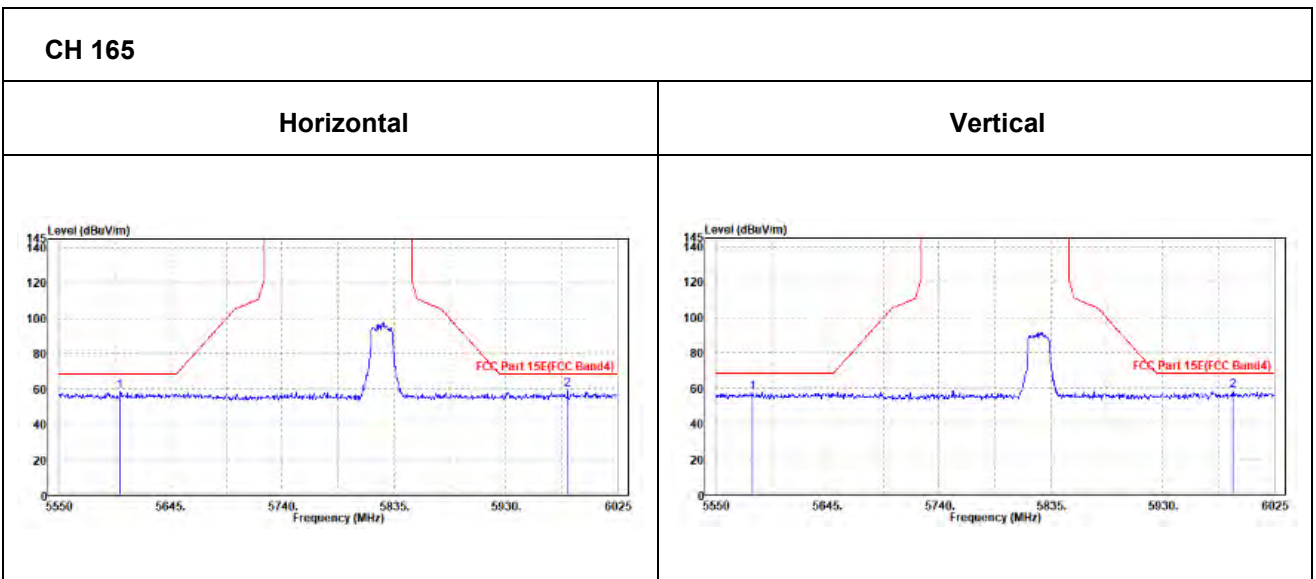
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5825MHz: Fundamental frequency.



**Oobe Data**

**802.11ac (20MHz)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5601.775	58.62	59.37	68.2	-9.58	34.92	9.83	45.5	200	360	Peak
5982.725	59.4	59.56	68.2	-8.8	35.38	9.96	45.5	200	360	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5581.35	57.18	58.15	68.2	-11.02	34.7	9.83	45.5	200	0	Peak
5989.85	58.6	58.94	68.2	-9.6	35.19	9.97	45.5	200	0	Peak





**802.11ac (40MHz)**

<b>CHANNEL</b>	TX Channel 151	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5755	93.94	94.44	/	/	35.11	9.89	45.5	200	175	Peak
5755	89.47	89.97	/	/	35.11	9.89	45.5	200	175	Average

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5755	91.31	92.01	/	/	34.91	9.89	45.5	200	40	Peak
5755	86.09	86.79	/	/	34.91	9.89	45.5	200	40	Average

**REMARKS:**

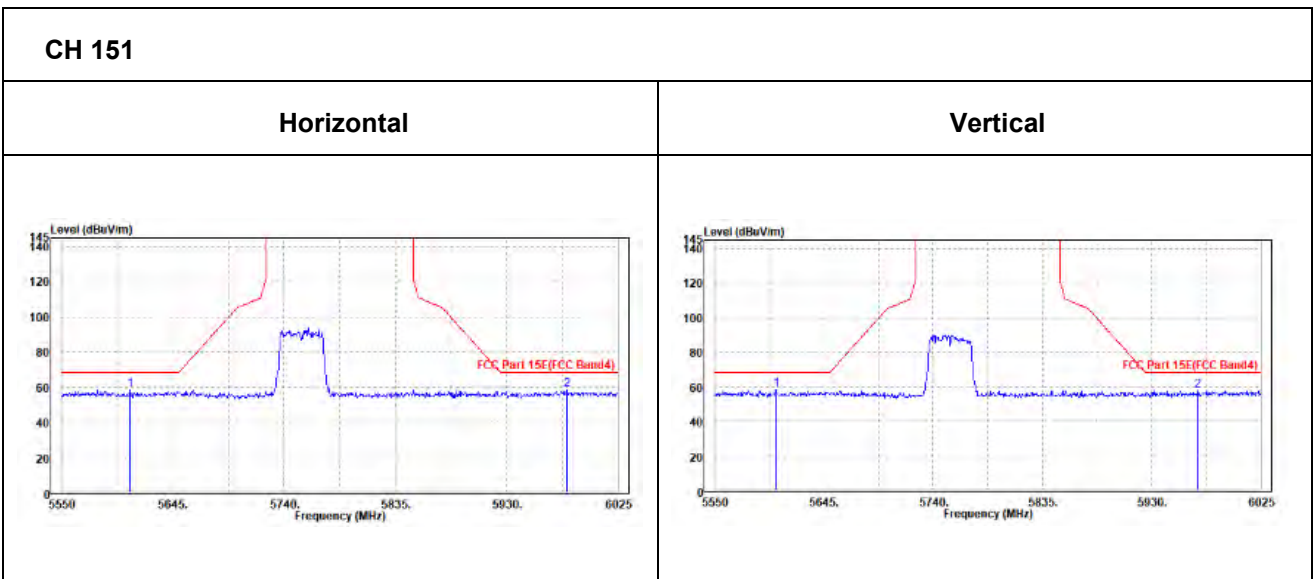
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5755MHz: Fundamental frequency.



**OOBE DATA**

**802.11ac (40MHZ)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5607.95	58.67	59.4	68.2	-9.53	34.93	9.84	45.5	200	0	Peak
5981.775	58.46	58.62	68.2	-9.74	35.38	9.96	45.5	200	0	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5603.2	58.5	59.44	68.2	-9.7	34.72	9.84	45.5	200	360	Peak
5970.375	57.9	58.28	68.2	-10.3	35.16	9.96	45.5	200	360	Peak







<b>CHANNEL</b>	TX Channel 159	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5795	93.28	93.73	/	/	35.15	9.9	45.5	200	175	Peak
5795	88.58	89.03	/	/	35.15	9.9	45.5	200	175	Average

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5795	90.16	90.81	/	/	34.95	9.9	45.5	200	40	Peak
5795	84.66	85.31	/	/	34.95	9.9	45.5	200	40	Average

**REMARKS:**

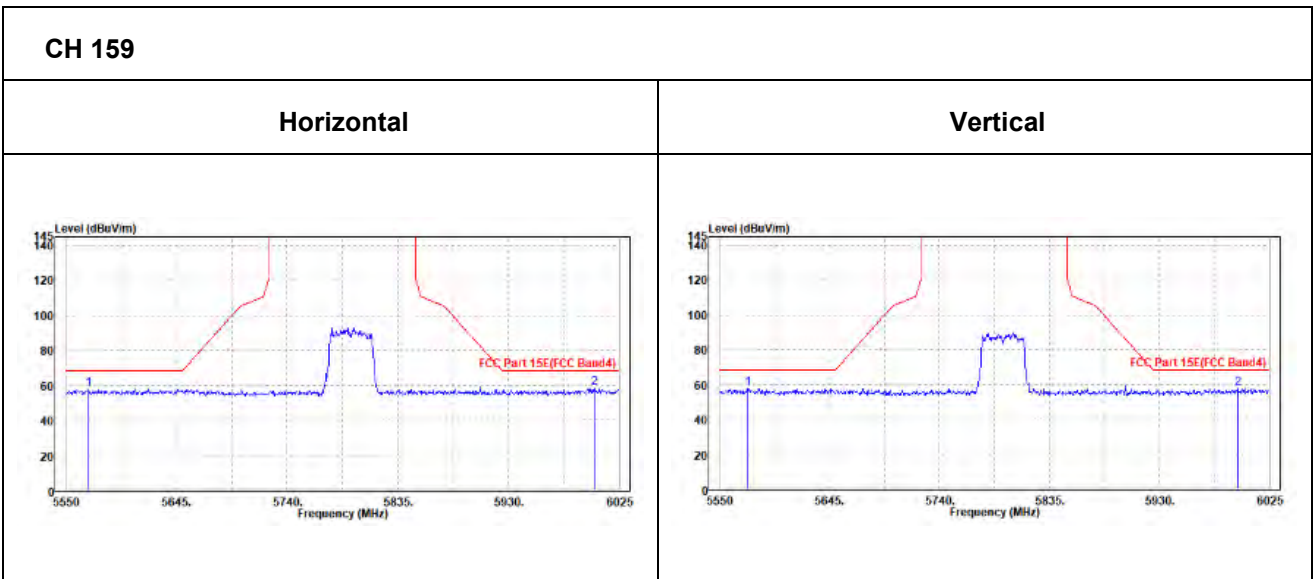
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5795MHz: Fundamental frequency.



**OOBE DATA**

**802.11ac (40MHZ)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5569.475	58.06	58.86	68.2	-10.14	34.88	9.82	45.5	200	360	Peak
6003.625	58.31	58.44	68.2	-9.89	35.4	9.97	45.5	200	360	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5574.7	57.73	58.71	68.2	-10.47	34.69	9.83	45.5	200	0	Peak
5997.925	58.12	58.45	68.2	-10.08	35.2	9.97	45.5	200	0	Peak





**802.11ac (80MHz)**

<b>CHANNEL</b>	TX Channel 155	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5775	90.31	90.79	/	/	35.13	9.89	45.5	200	175	Peak
5775	86.3	86.78	/	/	35.13	9.89	45.5	200	175	Average

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5775	86.82	87.5	/	/	34.93	9.89	45.5	200	40	Peak
5775	81.91	82.59	/	/	34.93	9.89	45.5	200	40	Average

**REMARKS:**

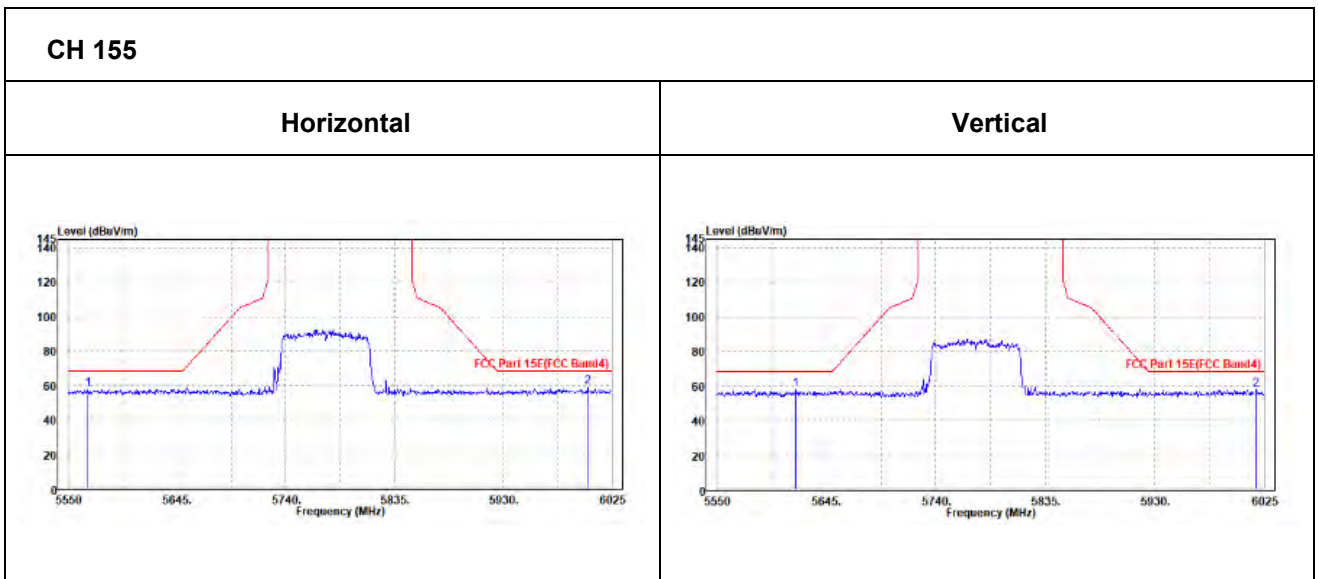
- Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
- 5775MHz: Fundamental frequency.



**Oobe Data**

**802.11ac (80MHz)**

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5567.1	57.8	58.6	68.2	-10.4	34.88	9.82	45.5	200	360	Peak
6004.1	58.76	58.89	68.2	-9.44	35.4	9.97	45.5	200	360	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5618.4	58.01	58.93	68.2	-10.19	34.74	9.84	45.5	200	0	Peak
6018.35	57.84	58.13	68.2	-10.36	35.22	9.98	45.49	200	0	Peak





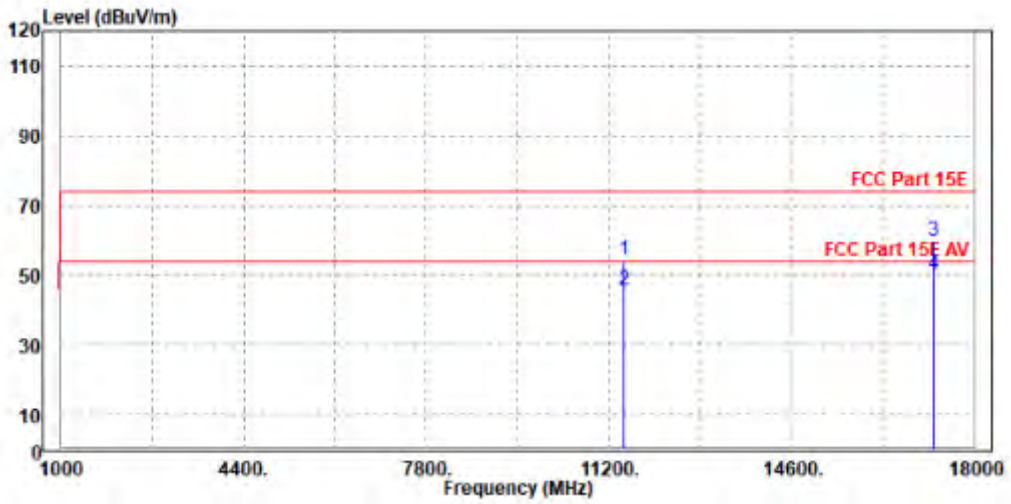
802.11a

Worst case harmonic:

<b>CHANNEL</b>	TX Channel 149	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

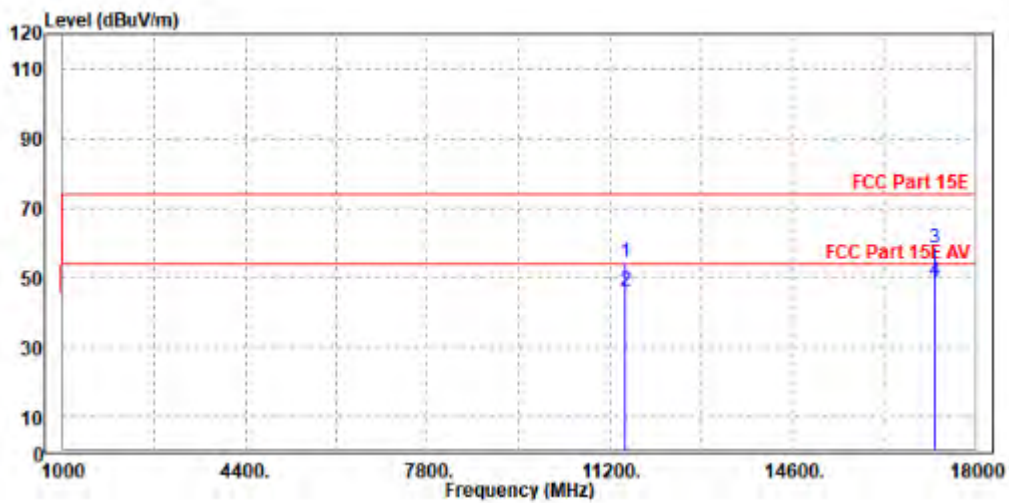
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m		
1	11490.000	54.48	45.46	74.00	-19.52	9.02	Peak	Horizontal
2	11490.000	45.77	36.75	54.00	-8.23	9.02	Average	Horizontal
3	PK17235.000	59.59	41.37	74.00	-14.41	18.22	Peak	Horizontal
4	PP17235.000	50.26	32.04	54.00	-3.74	18.22	Average	Horizontal





ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBuV/m	dBuV	dBuV/m	dB	dB/m		
1	11489.000	54.25	44.64	74.00	-19.75	9.61	Peak	Vertical
2	11489.000	45.93	36.32	54.00	-8.07	9.61	Average	Vertical
3	PK17235.000	58.49	41.69	74.00	-15.51	16.80	Peak	Vertical
4	PP17235.000	49.00	32.20	54.00	-5.00	16.80	Average	Vertical



REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor  
Margin value = Emission level – Limit value.
2. 5745MHz: Fundamental frequency.
3. For frequency above 18GHz, the emission was tested 20db below the limit so the data not recorded in the sheet.



### 3.2 CONDUCTED EMISSION MEASUREMENT

#### 3.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 14,23	Feb. 13,24
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Mar. 03,23	Mar. 02,24

**NOTE:**

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

#### 3.2.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

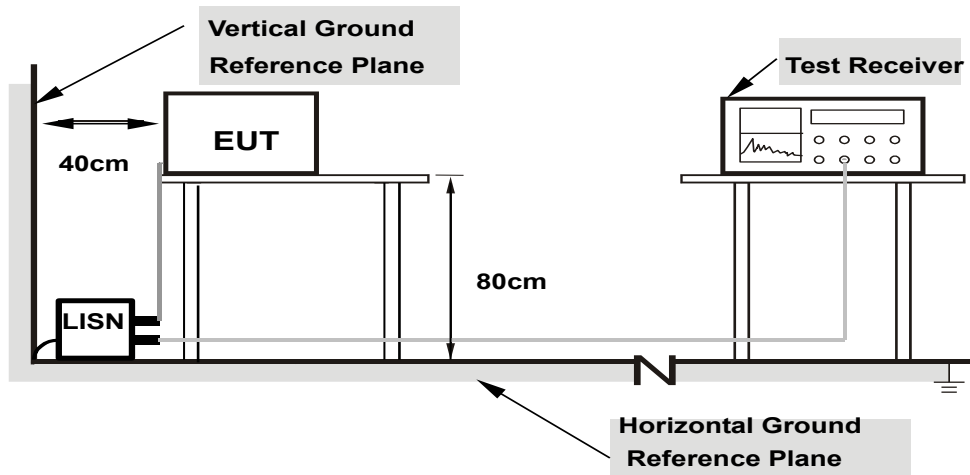
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.



### 3.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 3.2.5 TEST SETUP



- Note: 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80  
from other units and other metal planes**

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

### 3.2.6 EUT OPERATING CONDITIONS

Same as 3.1.7.





### 3.2.7 TEST RESULTS

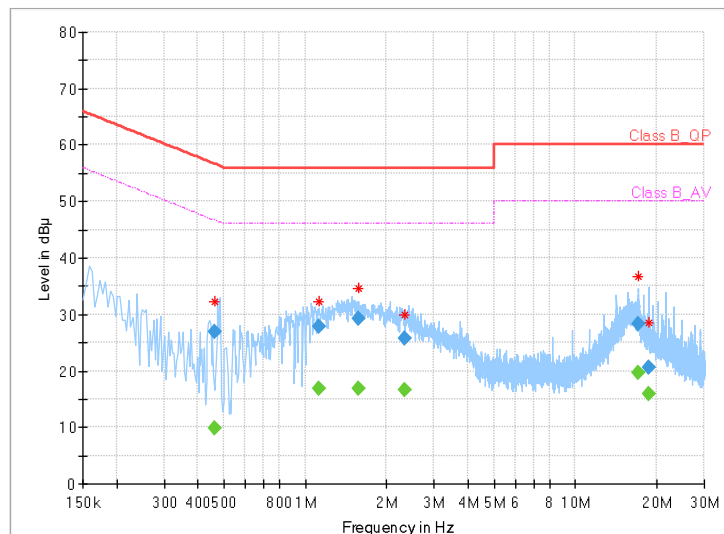
#### CONDUCTED WORST-CASE DATA:

<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	26deg. C, 51%RH
<b>Tested By</b>	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.464000	---	9.84	46.62	36.78	L1	ON	9.7
0.464000	26.94	---	56.62	29.68	L1	ON	9.7
1.124000	---	16.91	46.00	29.09	L1	ON	9.7
1.124000	27.93	---	56.00	28.07	L1	ON	9.7
1.568000	---	16.91	46.00	29.09	L1	ON	9.7
1.568000	29.27	---	56.00	26.73	L1	ON	9.7
2.340000	---	16.57	46.00	29.43	L1	ON	9.7
2.340000	25.64	---	56.00	30.36	L1	ON	9.7
17.180000	---	19.72	50.00	30.28	L1	ON	9.8
17.180000	28.32	---	60.00	31.68	L1	ON	9.8
18.676000	---	15.93	50.00	34.07	L1	ON	9.8
18.676000	20.70	---	60.00	39.30	L1	ON	9.8

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Limit value - Emission level
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum



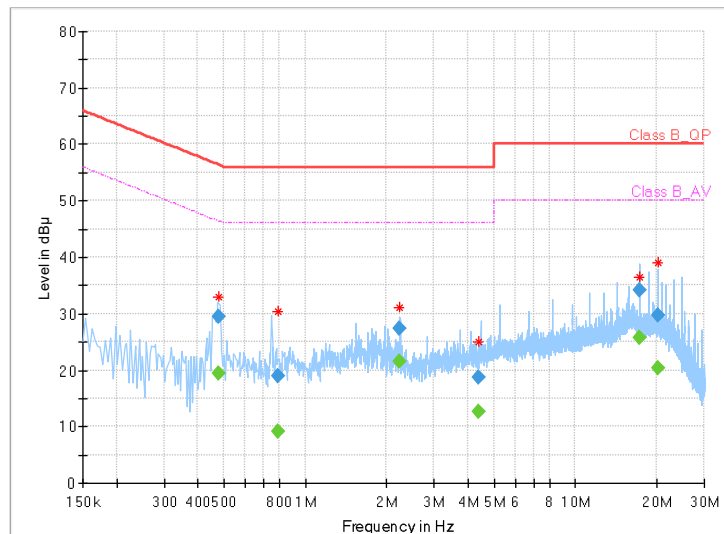


<b>Frequency Range</b>	150KHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	26deg. C, 51%RH
<b>Tested By</b>	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.480000	---	19.34	46.34	27.00	N	ON	9.7
0.480000	29.38	---	56.34	26.96	N	ON	9.7
0.794000	---	9.03	46.00	36.97	N	ON	9.7
0.794000	18.99	---	56.00	37.01	N	ON	9.7
2.244000	---	21.51	46.00	24.49	N	ON	9.8
2.244000	27.26	---	56.00	28.74	N	ON	9.8
4.384000	---	12.59	46.00	33.41	N	ON	9.8
4.384000	18.73	---	56.00	37.27	N	ON	9.8
17.208000	---	25.70	50.00	24.30	N	ON	9.9
17.208000	34.04	---	60.00	25.96	N	ON	9.9
20.208000	---	20.29	50.00	29.71	N	ON	9.9
20.208000	29.69	---	60.00	30.31	N	ON	9.9

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Limit value - Emission level
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.

Full Spectrum





### 3.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

#### 3.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	√	Client devices	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

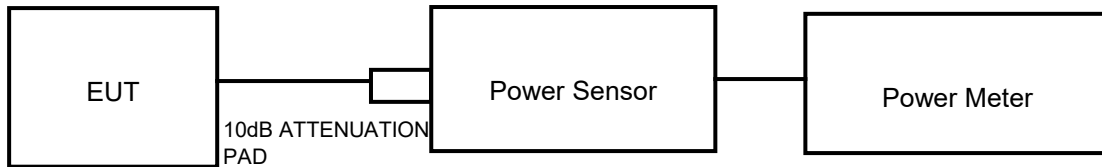
**NOTE:** Where B is the 26dB emission bandwidth in MHz.



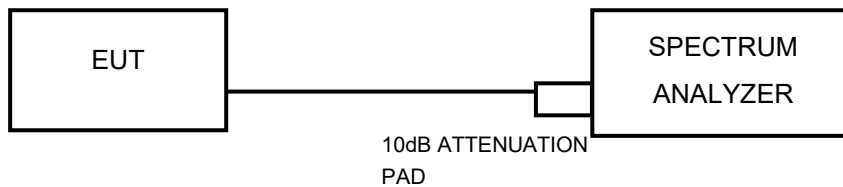
### 3.3.2 TEST SETUP

#### FOR POWER OUTPUT MEASUREMENT

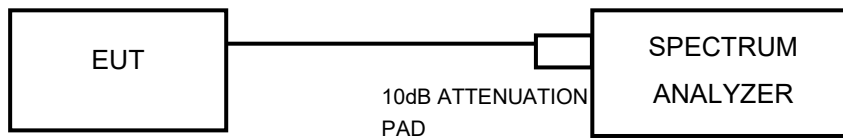
##### 802.11a, 802.11n/ac (20MHz), 802.11 n/ac (40MHz) TEST CONFIGURATION



##### 802.11ac (80MHz) TEST CONFIGURATION



#### FOR 26dB BANDWIDTH



### 3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Meter	ANRITSU	ML2495A	1506002	Feb. 14,23	Feb. 13,24
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 17,23	Feb. 16,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.14,22	May.13,23
Power Sensor	ANRITSU	MA2411B	1339352	Feb. 14,23	Feb. 13,24

#### NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.



### 3.3.4 TEST PROCEDURE

#### FOR POWER MEASUREMENT

##### For 802.11a, 802.11 n/ac (20MHz), 802.11 n/ac (40MHz)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

##### For 802.11ac (80MHz)

1. Measure the duty cycle,  $x$ , of the transmitter output signal as described in II.B.
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
3. Set RBW = 1 MHz.
4. Set VBW  $\geq$  3 MHz.
5. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ . (This ensures that bin-to-bin spacing is  $\leq \text{RBW}/2$ , so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
8. Do not use sweep triggering. Allow the sweep to “free run.”
9. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
10. Add  $10 \log (1/x)$ , where  $x$  is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \log (1/0.25) = 6 \text{ dB}$  if the duty cycle is 25%.



#### **FOR 99 PERCENT OCCUPIED BANDWIDTH**

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot$  RBW
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 (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

#### **FOR 26dB BANDWIDTH**

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### **FOR 6dB BANDWIDTH**

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



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### 3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



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### 3.3.7 TEST RESULTS

Please Refer to Appendix Of this test report.



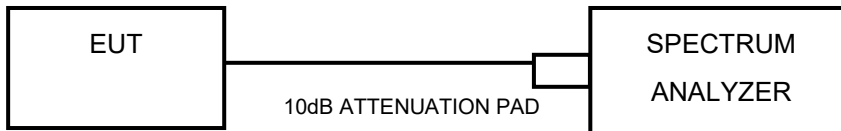


### 3.4 MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

#### 3.4.1 LIMITS OF MAXIMUM POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Client devices	11dBm/ MHz
U-NII-2A	√		11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

#### 3.4.2 TEST SETUP



#### 3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.



### 3.4.4 TEST PROCEDURES

Using method SA-2(Band1/2/3)

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz, Set VBW  $\geq$  3 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Add  $10 \log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).
- 7) Record the max value

Using method SA-2 (Band4)

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 300 KHz, Set VBW  $\geq$  1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to "free run".
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Add  $10 \log(500\text{kHz}/\text{RBW})$  to the test result.  $10 \log(500\text{kHz}/300\text{KHZ}) = 2.22\text{dBm}$
- 7) Add  $10 \log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).
- 8) Record the max value

### 3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 3.4.6 EUT OPERATING CONDITIONS

Same as 3.1.7.



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### 3.4.7 TEST RESULTS

Please Refer to Appendix Of this test report.



### 3.5 AUTOMATICALLY DISCONTINUE TRANSMISSION

#### 3.5.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

#### 3.5.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

#### 3.5.3 TEST RESULT

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission



### 3.6 ANTENNA REQUIREMENTS

#### 3.6.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 3.6.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

#### 3.6.3 ANTENNA GAIN

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit and PSD limit



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## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.



### 6 APPENDIX: RLAN EMISSION BANDWIDTH TEST RESULT

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	23.960	5168.400	5192.360	---	---
		5200	23.480	5188.720	5212.200	---	---
		5240	23.680	5228.040	5251.720	---	---
		5260	23.000	5248.440	5271.440	---	---
		5300	23.400	5288.800	5312.200	---	---
		5320	22.960	5308.800	5331.760	---	---
		5500	22.200	5488.880	5511.080	---	---
		5580	21.760	5568.920	5590.680	---	---
		5700	22.600	5688.760	5711.360	---	---
		5720	22.400	5708.760	5731.160	---	---
		5720_UNII-2C	16.24	5708.760	5725	---	---
		5720_UNII-3	6.16	5725	5731.160	---	---
		5745	21.880	5733.800	5755.680	---	---
		5785	21.920	5774.040	5795.960	---	---
		5825	22.920	5813.920	5836.840	---	---
11N20SISO	Ant1	5180	22.800	5168.680	5191.480	---	---
		5200	23.760	5188.000	5211.760	---	---
		5240	23.040	5228.640	5251.680	---	---
		5260	22.720	5248.680	5271.400	---	---
		5300	23.840	5288.280	5312.120	---	---
		5320	21.720	5309.160	5330.880	---	---
		5500	23.040	5488.640	5511.680	---	---
		5580	22.760	5568.560	5591.320	---	---
		5700	21.920	5688.920	5710.840	---	---
		5720	22.560	5708.480	5731.040	---	---
		5720_UNII-2C	16.52	5708.480	5725	---	---
		5720_UNII-3	6.04	5725	5731.040	---	---
		5745	23.680	5733.160	5756.840	---	---
		5785	22.800	5773.440	5796.240	---	---





11N20SISO	Ant1	5825	21.920	5814.000	5835.920	---	---
11N40SISO	Ant1	5190	42.320	5169.280	5211.600	---	---
		5230	40.960	5209.760	5250.720	---	---
		5270	41.360	5249.120	5290.480	---	---
		5310	41.280	5289.200	5330.480	---	---
		5510	41.120	5489.520	5530.640	---	---
		5550	41.680	5529.040	5570.720	---	---
		5670	41.520	5649.200	5690.720	---	---
		5710	41.760	5688.880	5730.640	---	---
		5710_UNII-2C	36.12	5688.880	5725	---	---
		5710_UNII-3	5.64	5725	5730.640	---	---
		5755	40.960	5734.200	5775.160	---	---
5795	42.640	5773.720	5816.360	---	---		
11AC20SISO	Ant1	5180	23.440	5167.920	5191.360	---	---
		5200	22.840	5188.760	5211.600	---	---
		5240	23.880	5228.160	5252.040	---	---
		5260	24.080	5247.960	5272.040	---	---
		5300	22.160	5289.080	5311.240	---	---
		5320	22.680	5308.840	5331.520	---	---
		5500	23.560	5488.520	5512.080	---	---
		5580	22.760	5568.800	5591.560	---	---
		5700	22.880	5688.280	5711.160	---	---
		5720	22.440	5708.800	5731.240	---	---
		5720_UNII-2C	16.2	5708.800	5725	---	---
		5720_UNII-3	6.24	5725	5731.240	---	---
		5745	22.920	5733.480	5756.400	---	---
		5785	23.120	5773.200	5796.320	---	---
5825	23.320	5813.000	5836.320	---	---		
11AC40SISO	Ant1	5190	40.880	5169.840	5210.720	---	---
		5230	40.640	5209.760	5250.400	---	---
		5270	41.440	5249.280	5290.720	---	---
		5310	42.640	5288.640	5331.280	---	---
		5510	42.960	5488.640	5531.600	---	---
		5550	41.600	5529.440	5571.040	---	---



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11AC40SISO	Ant1	5670	42.480	5648.880	5691.360	---	---
		5710	41.600	5689.120	5730.720	---	---
		5710_UNII-2C	35.88	5689.120	5725	---	---
		5710_UNII-3	5.72	5725	5730.720	---	---
		5755	41.840	5733.800	5775.640	---	---
		5795	41.120	5774.200	5815.320	---	---
11AC80SISO	Ant1	5210	82.720	5169.200	5251.920	---	---
		5290	82.240	5249.360	5331.600	---	---
		5530	81.760	5488.880	5570.640	---	---
		5610	82.080	5568.880	5650.960	---	---
		5690	92.320	5641.360	5733.680	---	---
		5690_UNII-2C	83.64	5641.360	5725	---	---
		5690_UNII-3	8.68	5725	5733.680	---	---
		5775	90.400	5728.440	5818.840	---	---



BUREAU VERITAS

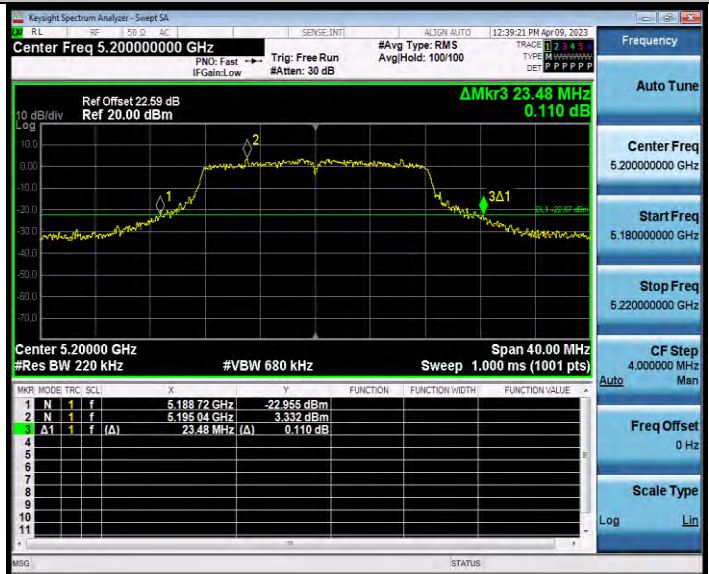
Test Report No.: W7L-P23030025RF03

### TEST GRAPHS

11A\_Ant1\_5180



11A\_Ant1\_5200

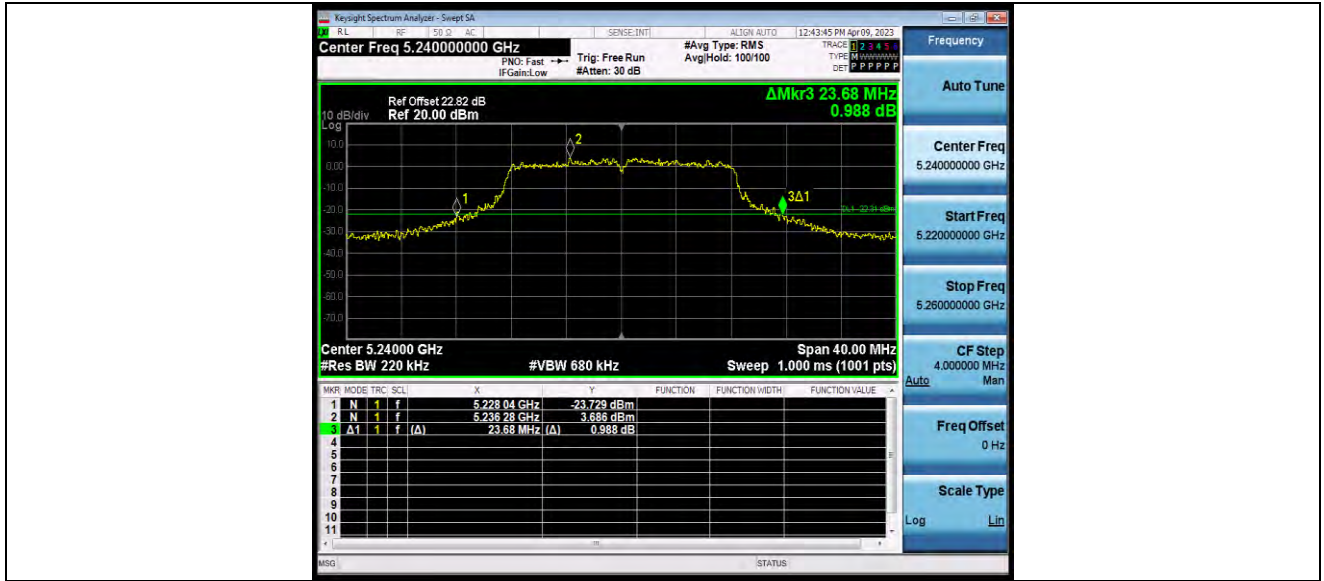


11A\_Ant1\_5240



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11A\_Ant1\_5260

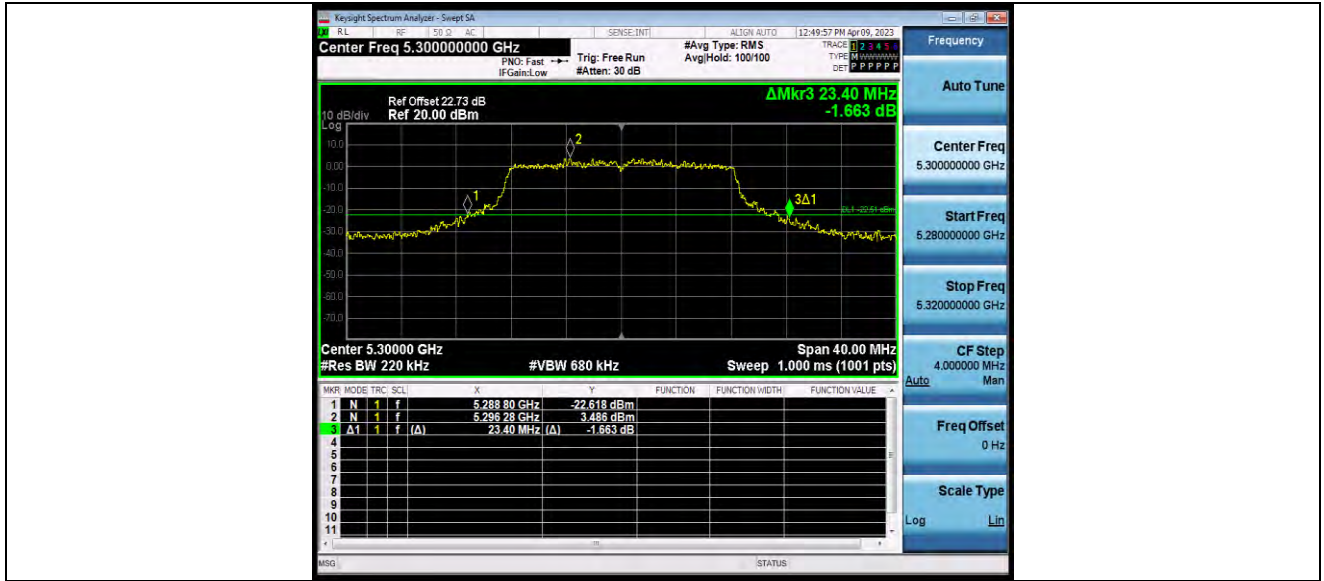


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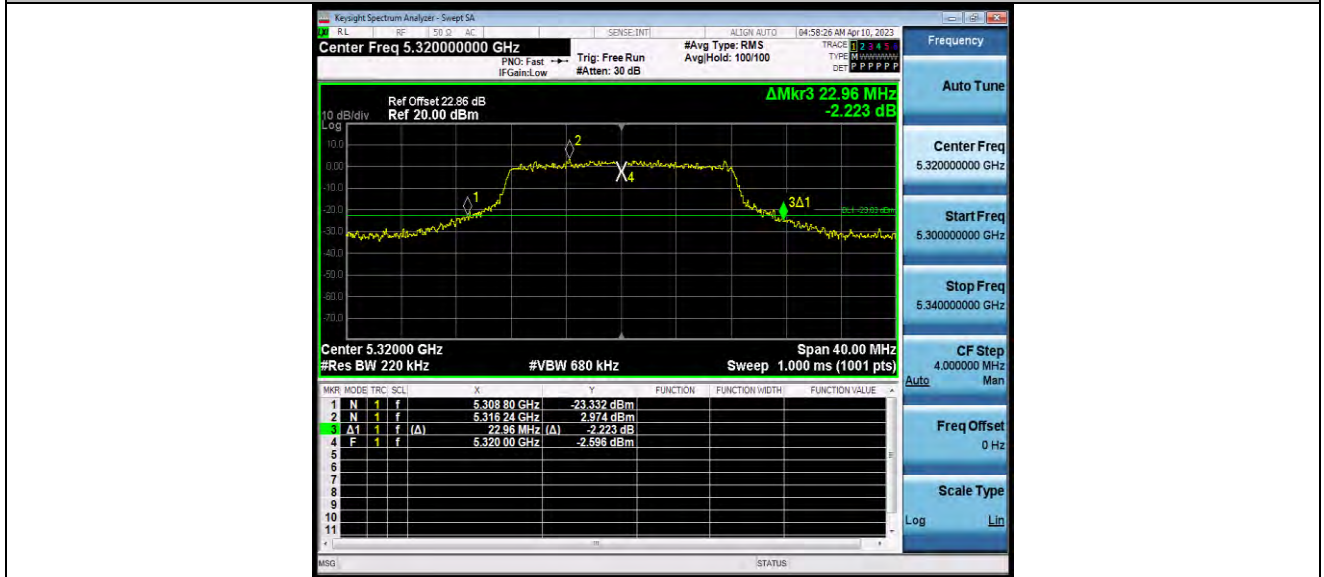


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Test Report No.: W7L-P23030025RF03



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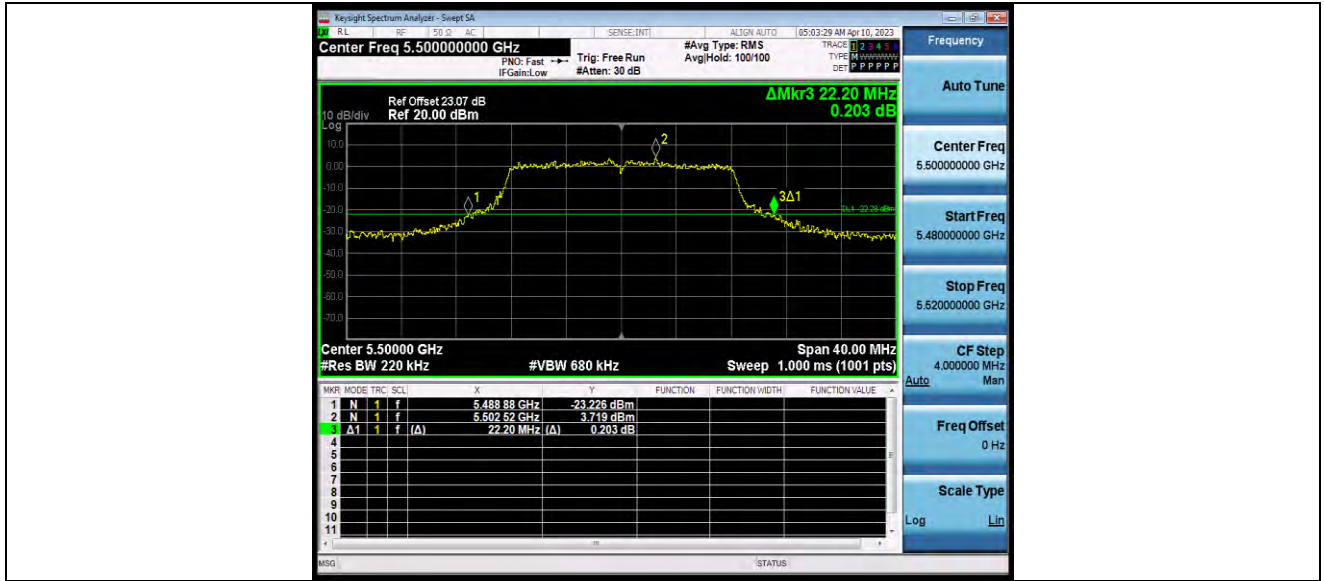


11A\_Ant1\_5500



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Test Report No.: W7L-P23030025RF03



11A\_Ant1\_5580

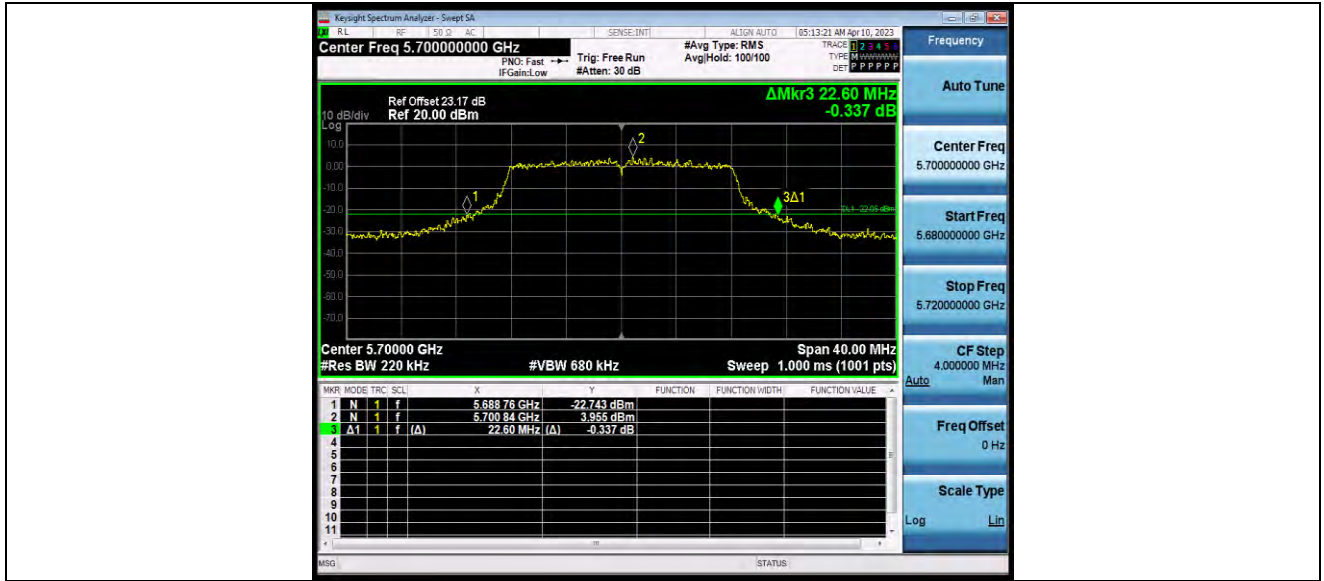


11A\_Ant1\_5700

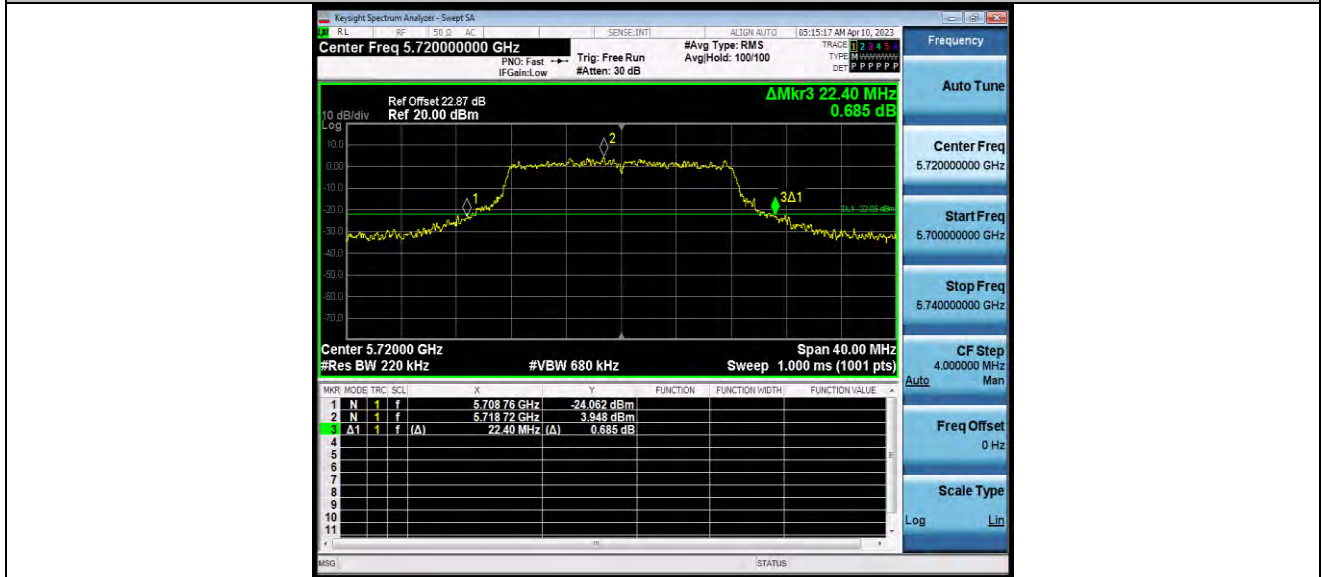


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11A\_Ant1\_5720

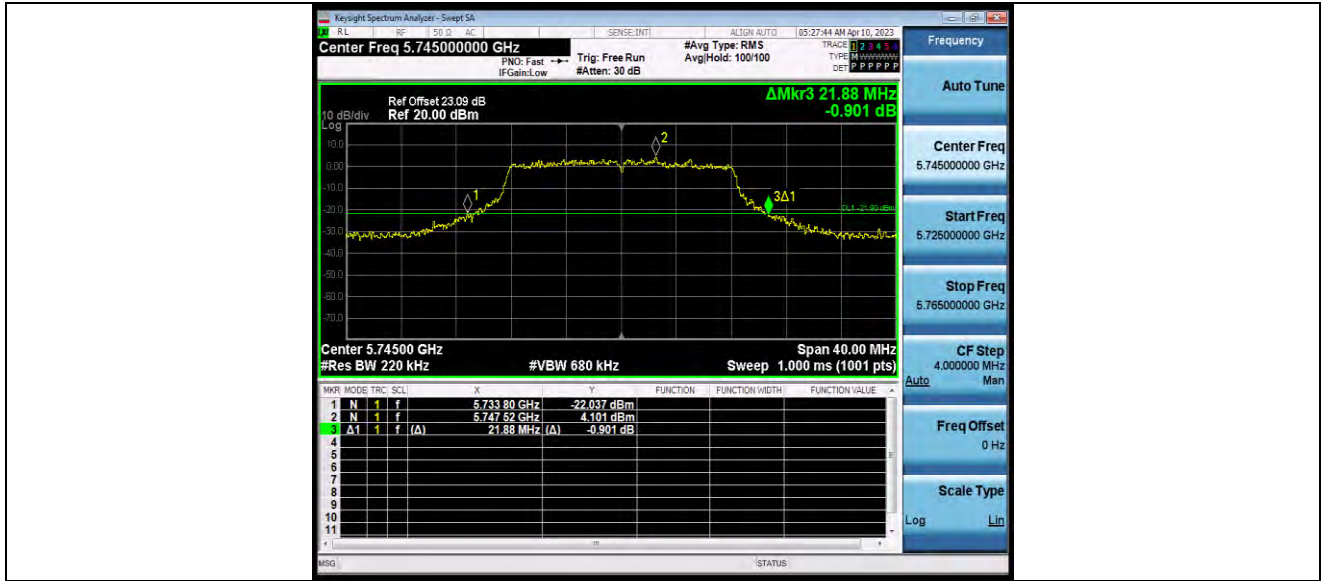


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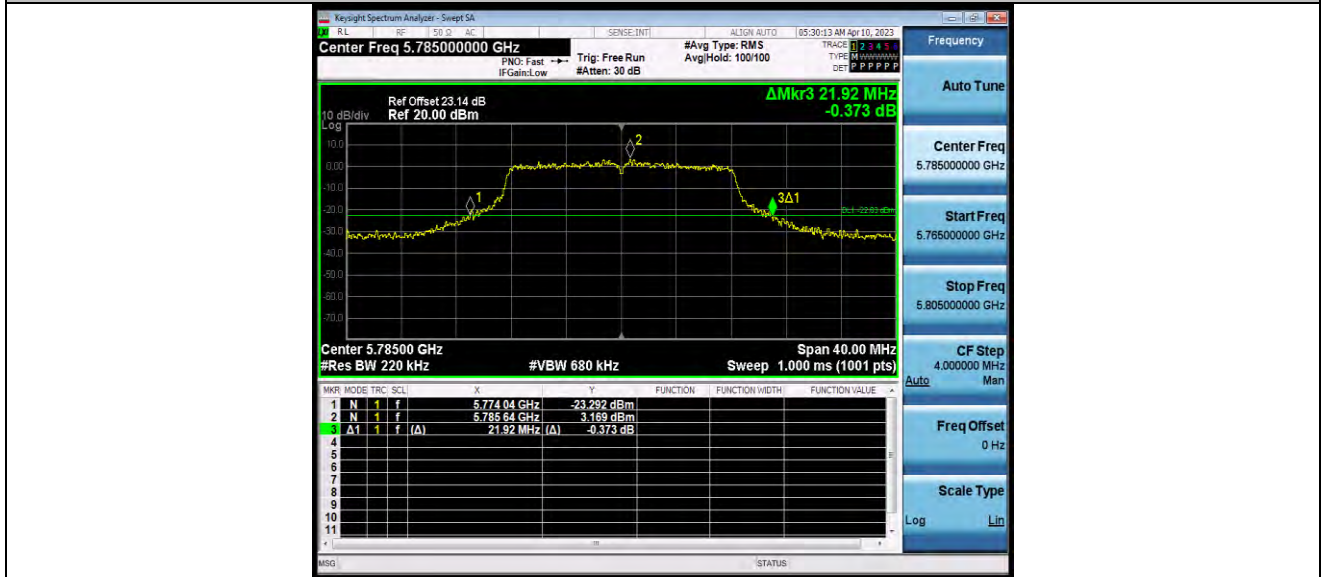


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11A\_Ant1\_5785



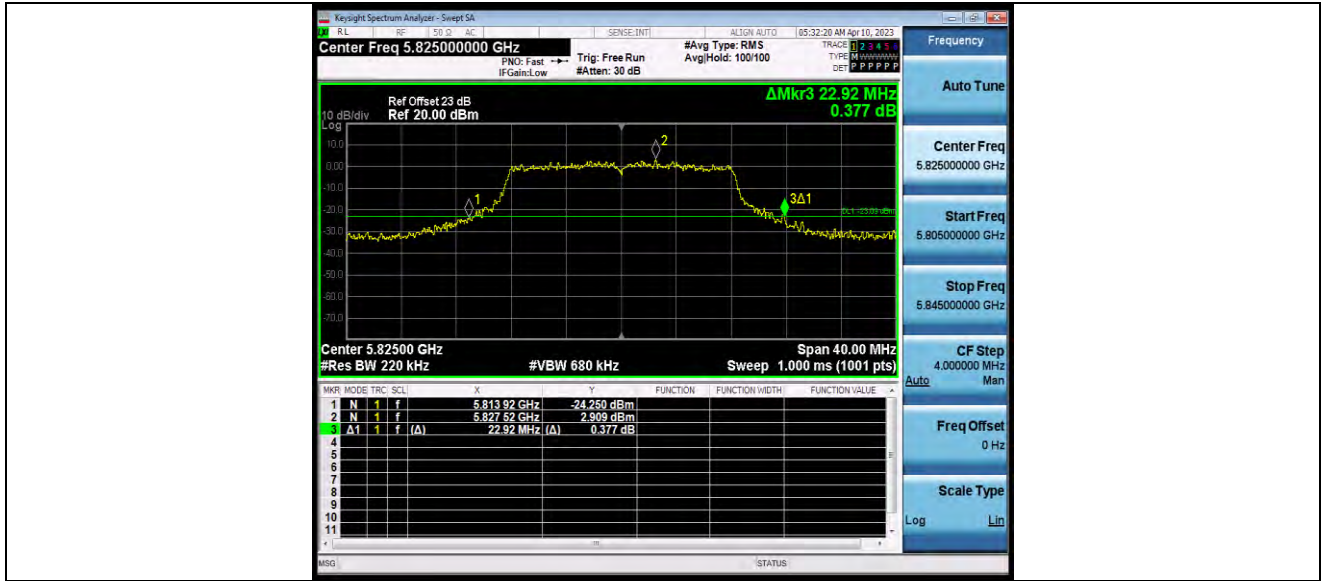
11A\_Ant1\_5825



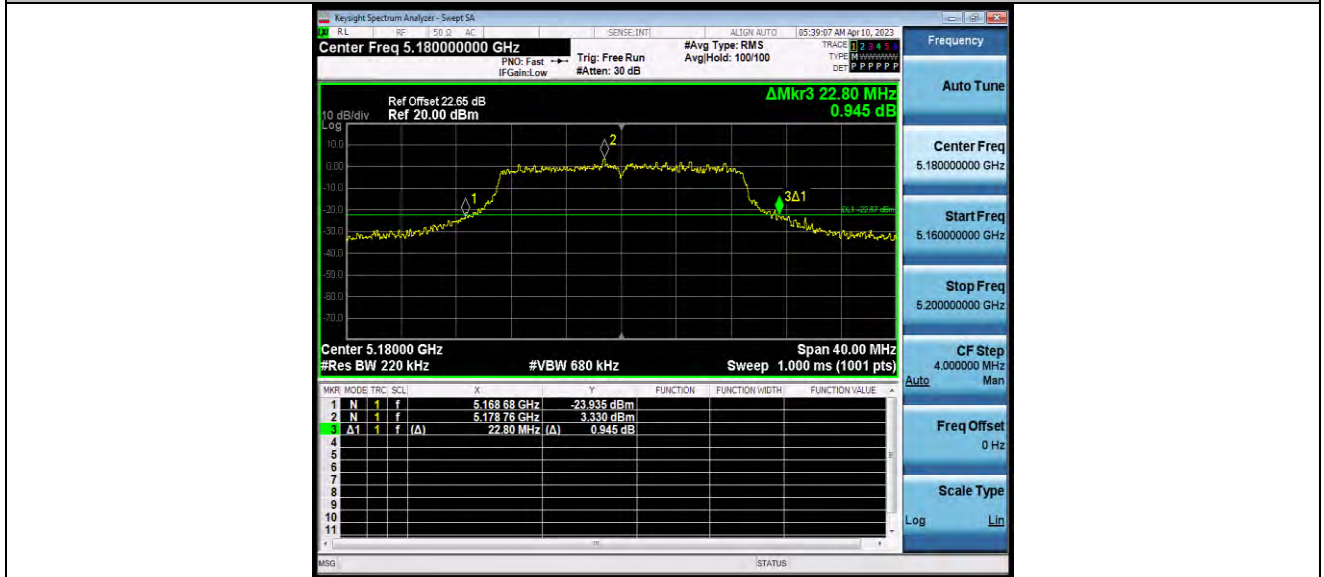


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N20SISO\_Ant1\_5180

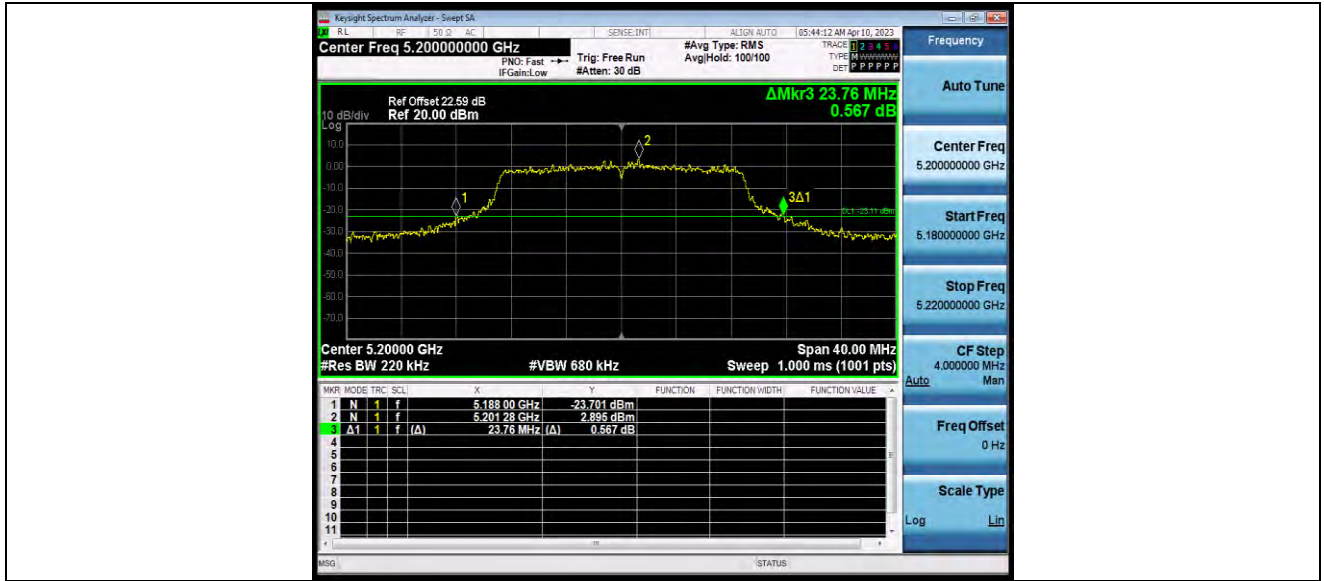


11N20SISO\_Ant1\_5200



BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N20SISO\_Ant1\_5240



11N20SISO\_Ant1\_5260



BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N20SISO\_Ant1\_5300

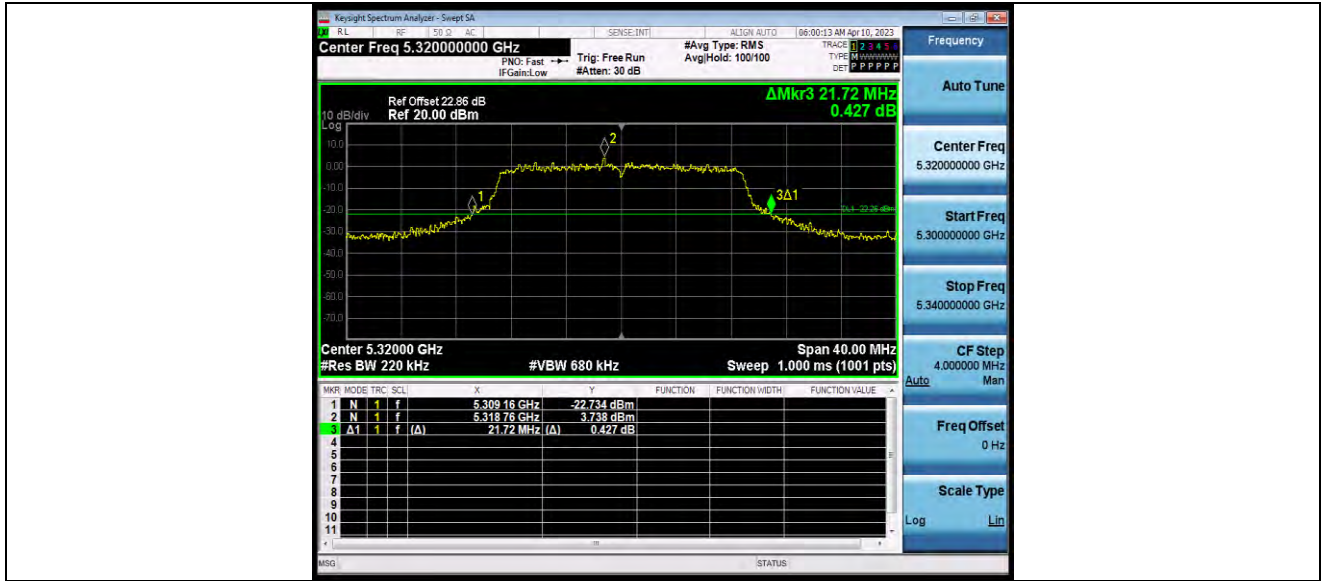


11N20SISO\_Ant1\_5320

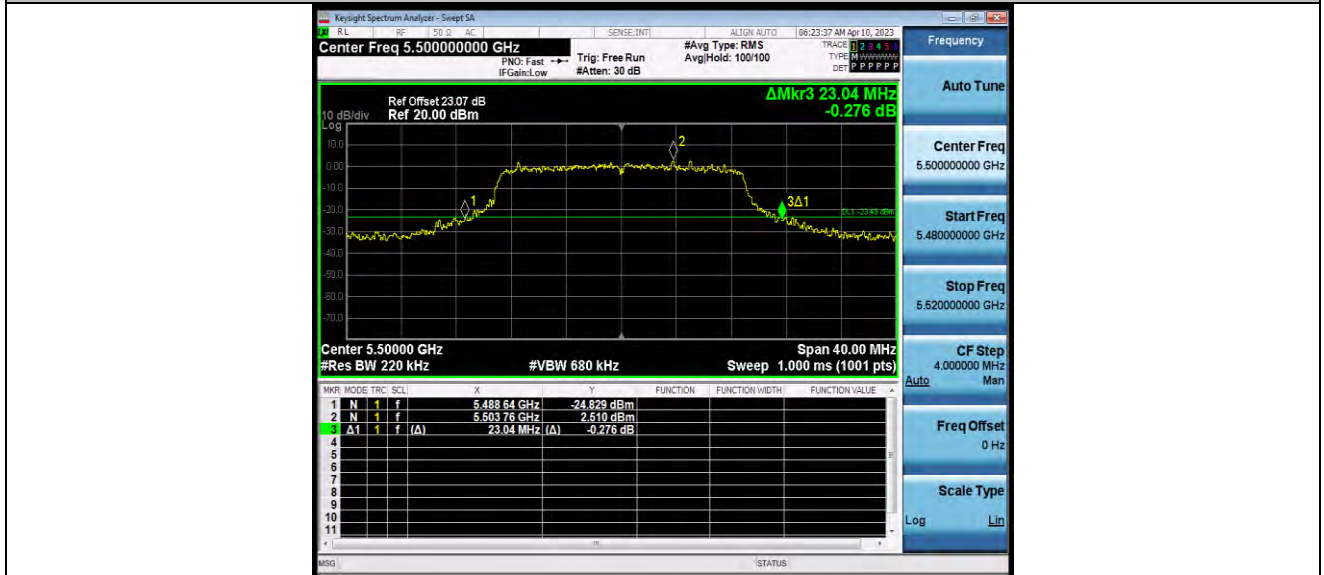


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N20SISO\_Ant1\_5500

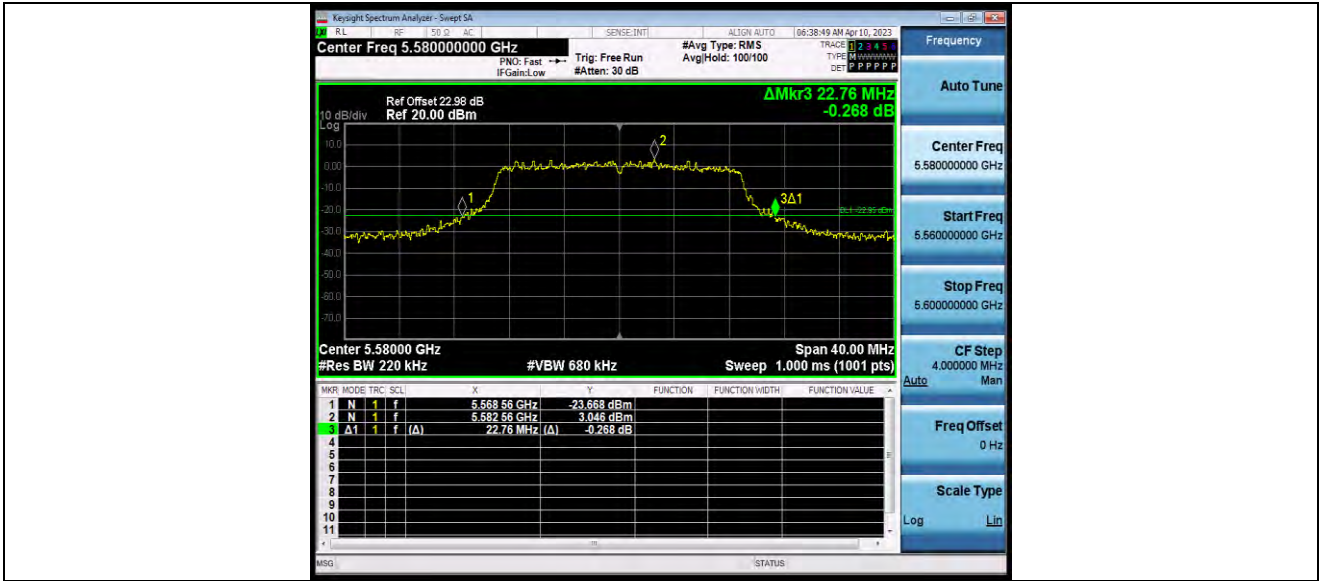


11N20SISO\_Ant1\_5580

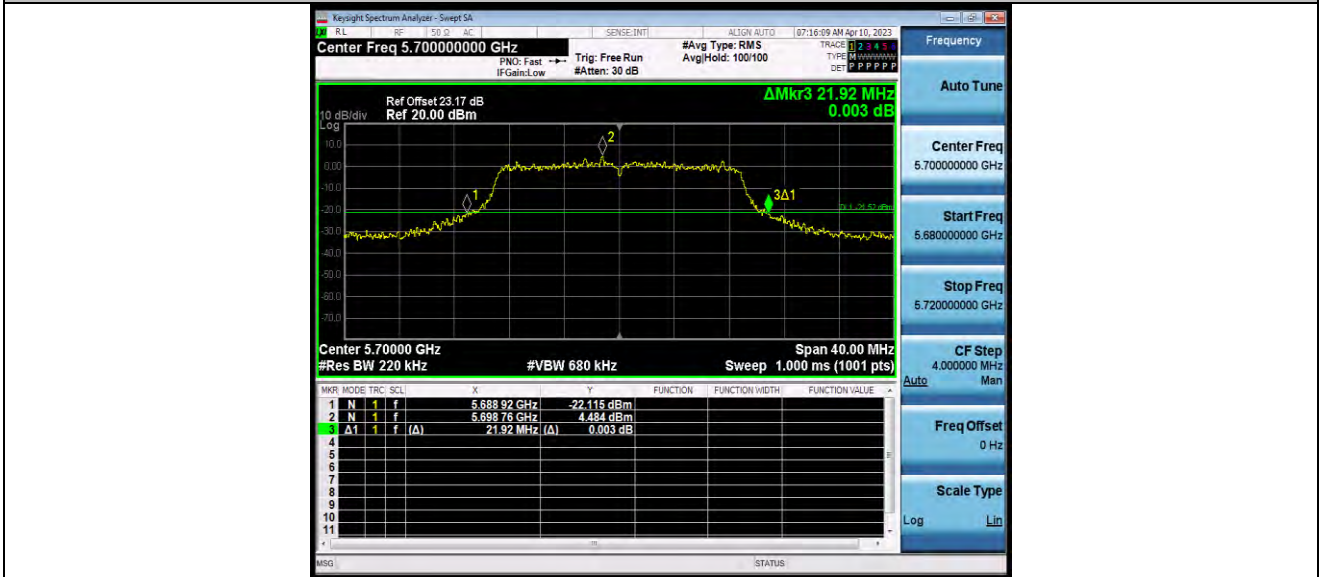


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



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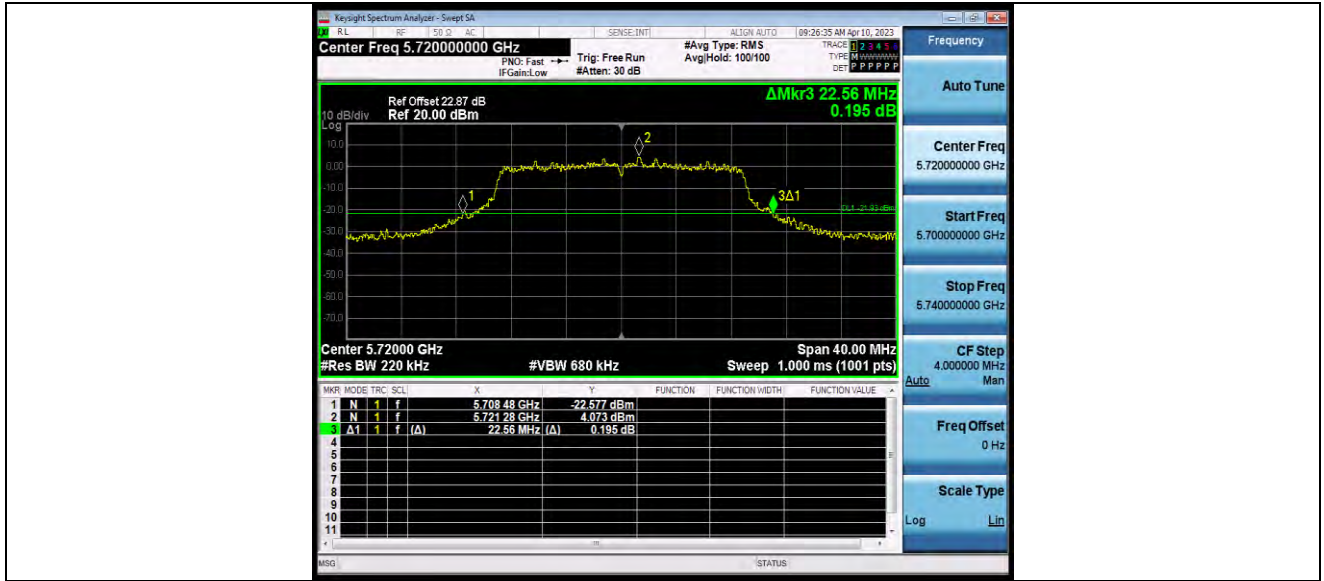


11N20SISO\_Ant1\_5720

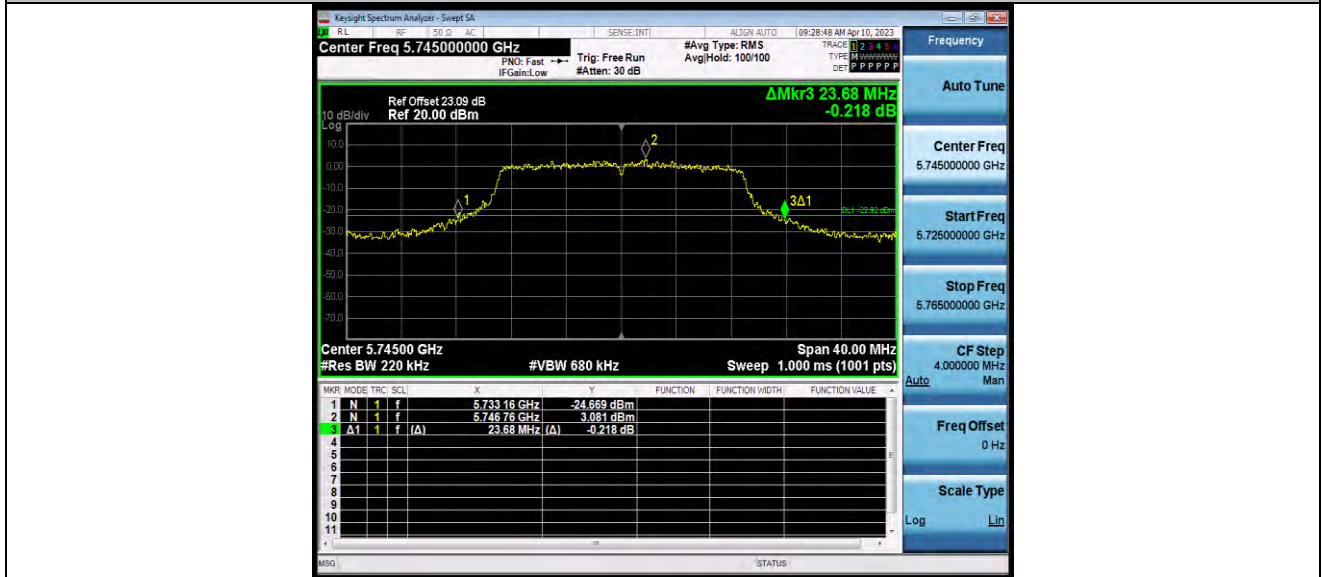


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



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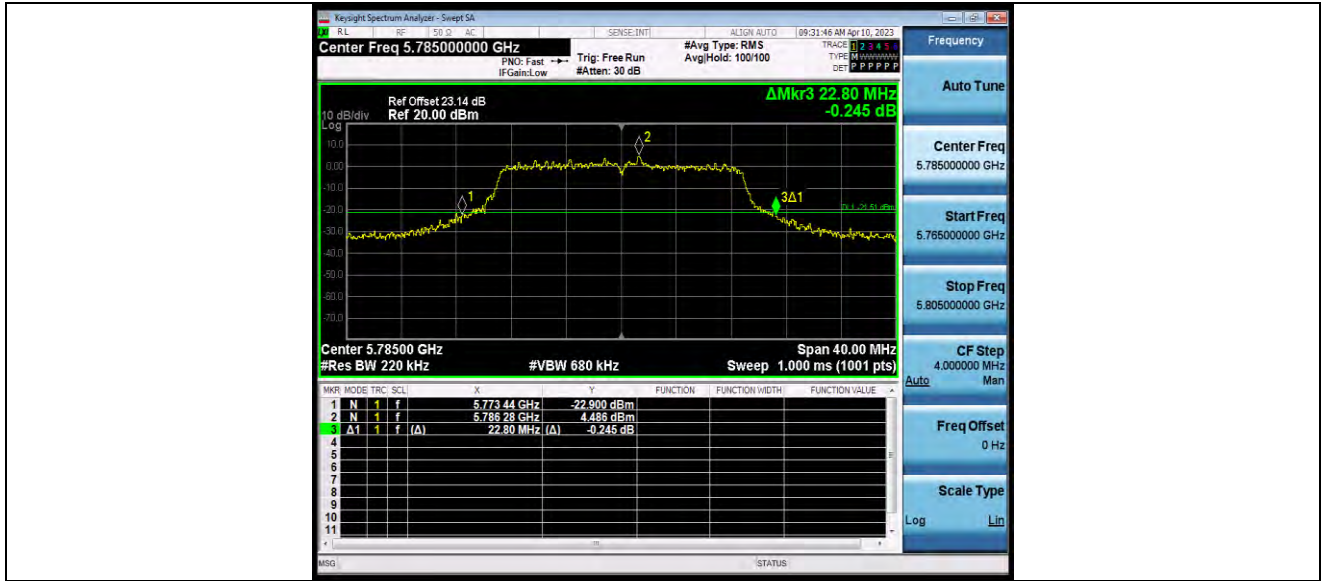


11N20SISO\_Ant1\_5785

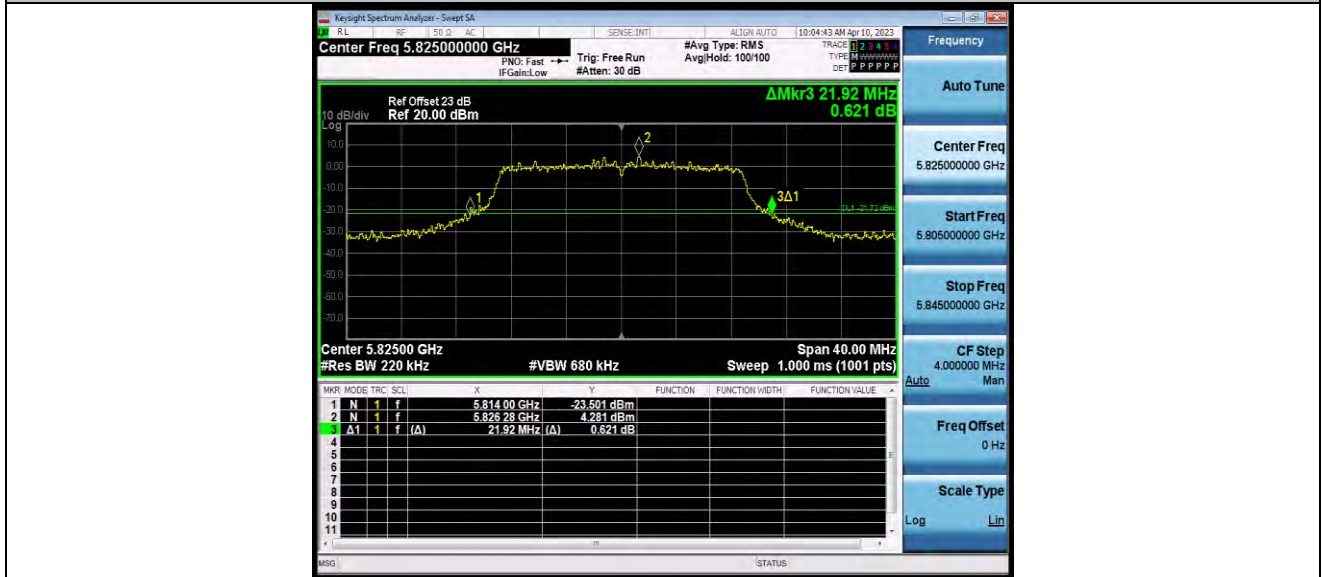


BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N20SISO\_Ant1\_5825

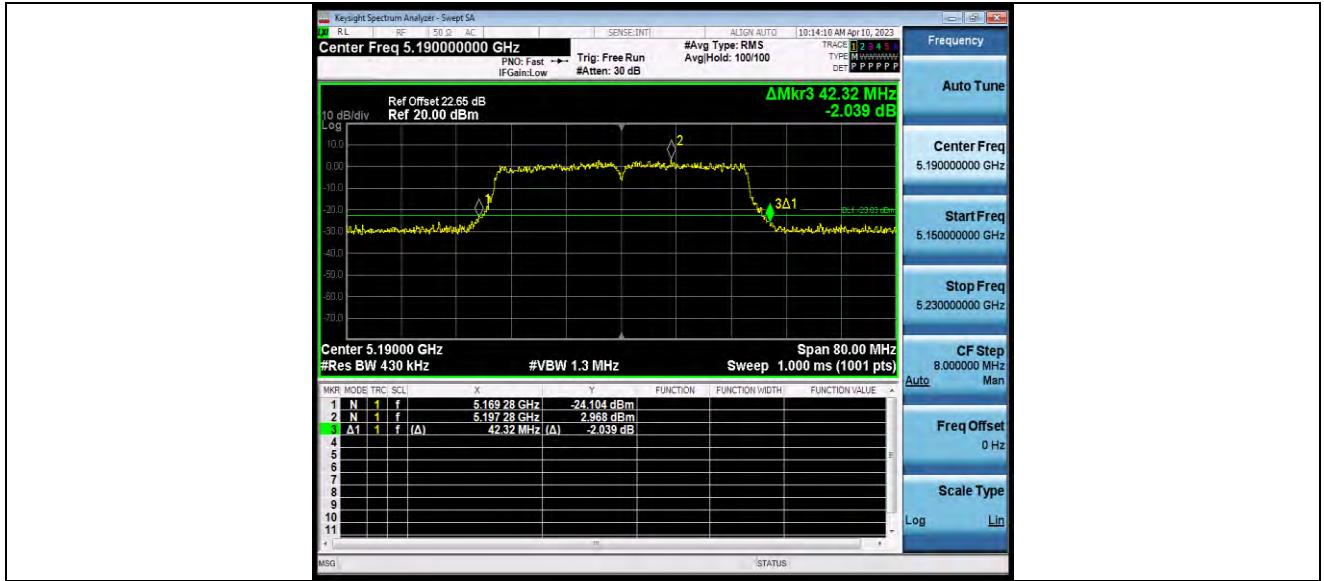


11N40SISO\_Ant1\_5190

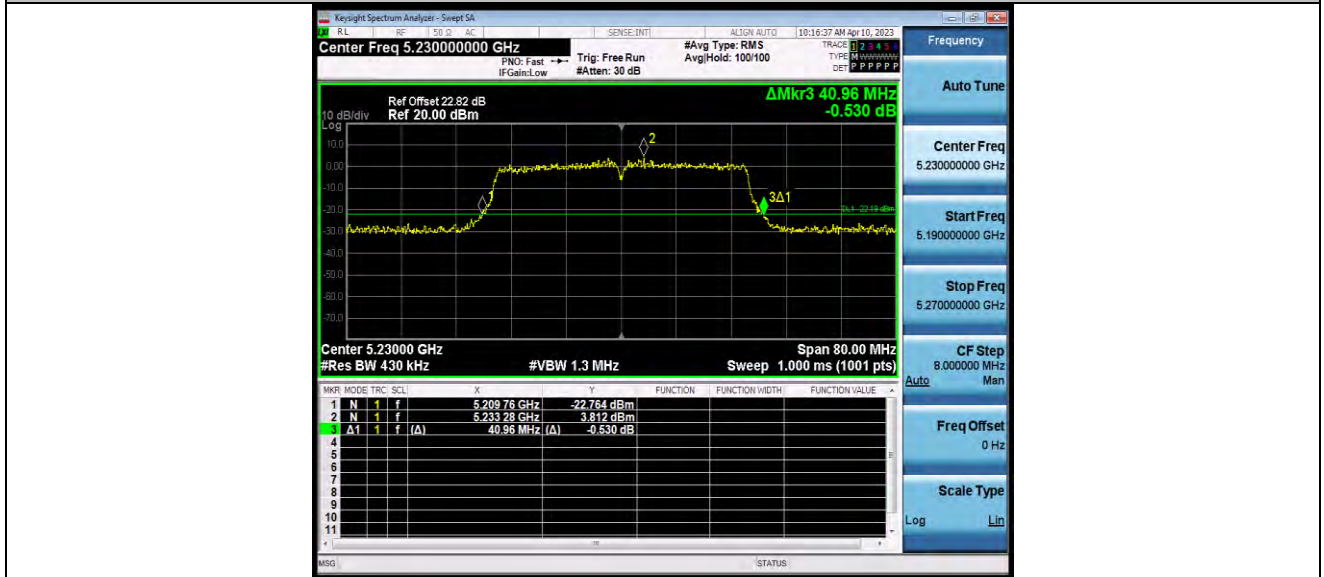


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Test Report No.: W7L-P23030025RF03



11N40SISO\_Ant1\_5230



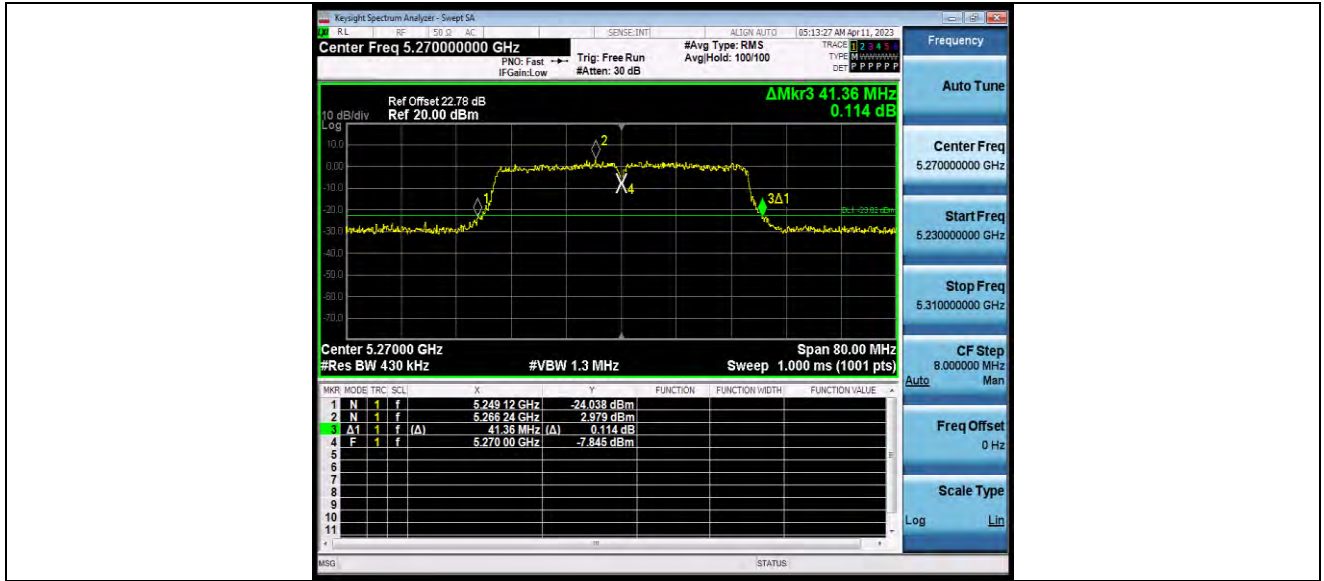
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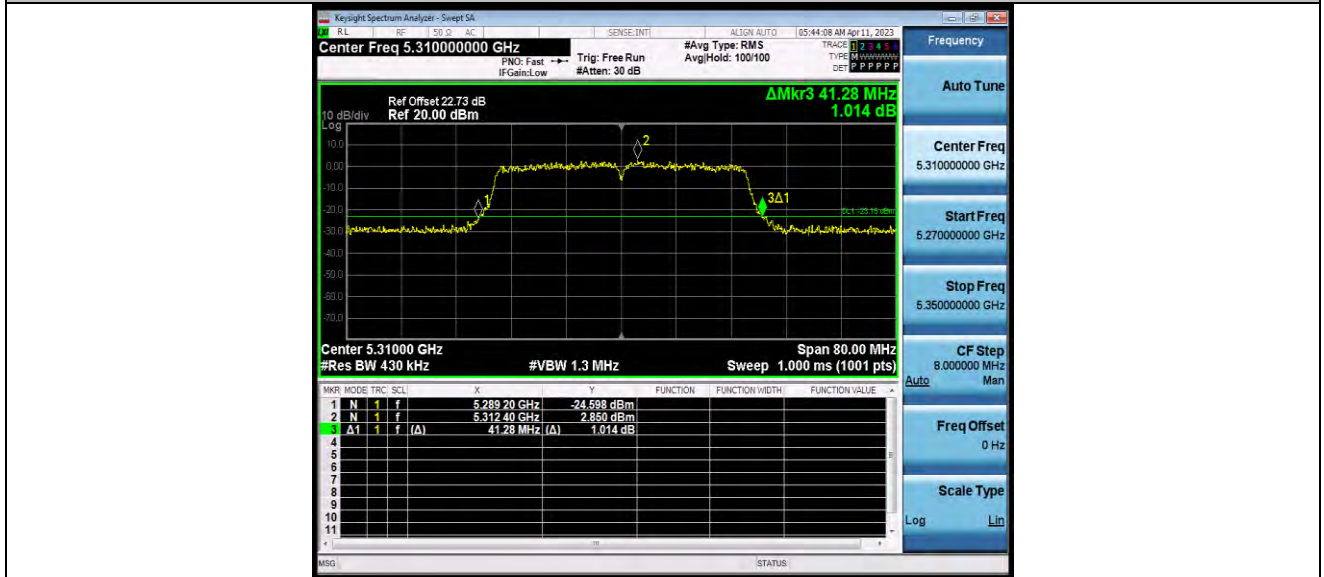


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Test Report No.: W7L-P23030025RF03



11N40SISO\_Ant1\_5310

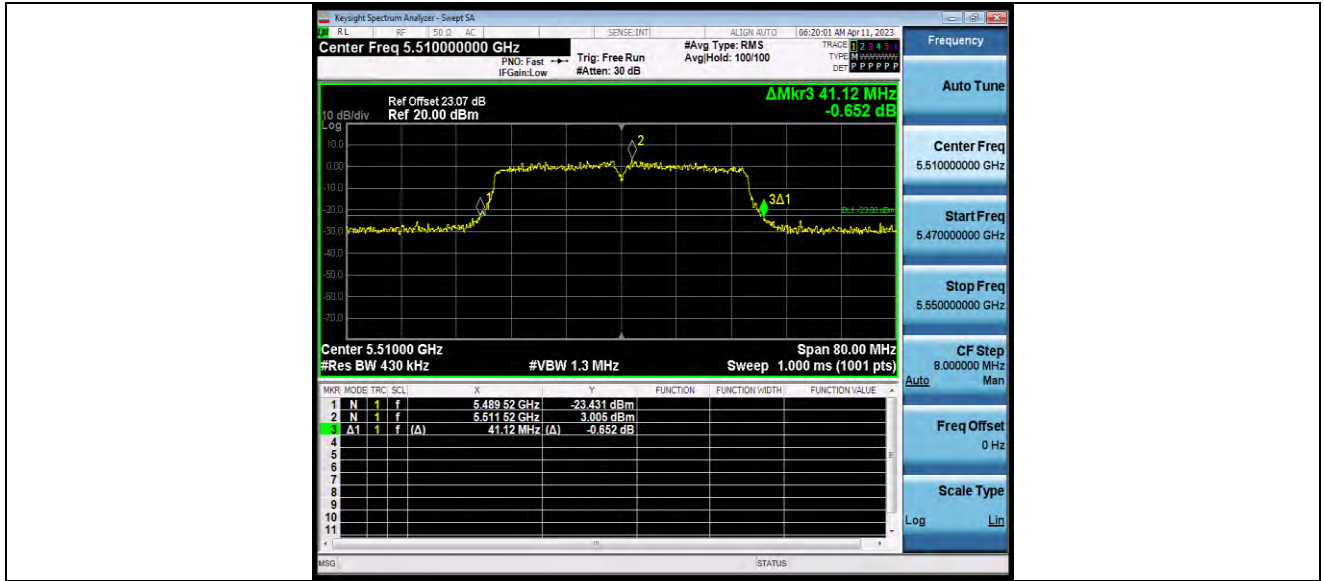


11N40SISO\_Ant1\_5510



BUREAU VERITAS

Test Report No.: W7L-P23030025RF03



11N40SISO\_Ant1\_5550



11N40SISO\_Ant1\_5670