| *802.11ac*(VHT40) | *802.11ac*(VHT80) |
|---|---|
|  |  |
| *CH38* | *CH42* |
|  | |
| *CH46* | |

## 4.7 Minimum Emission Bandwidth (6dB Bandwidth)

**TEST CONFIGURATION**


**TEST PROCEDURE**

According to KDB789033 D02 General UNII Test Procedures New Rules v01 for one of the following procedures may be used for section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a. Set RBW = 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 × RBW
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize
g. 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.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

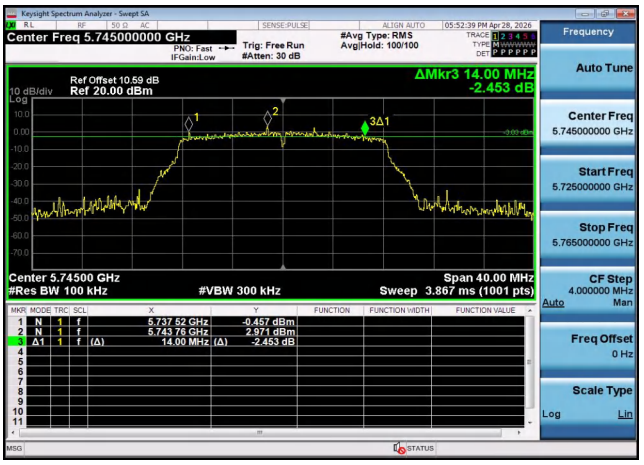
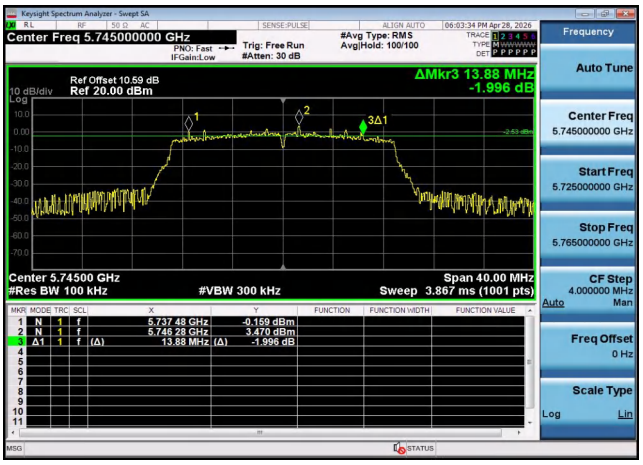
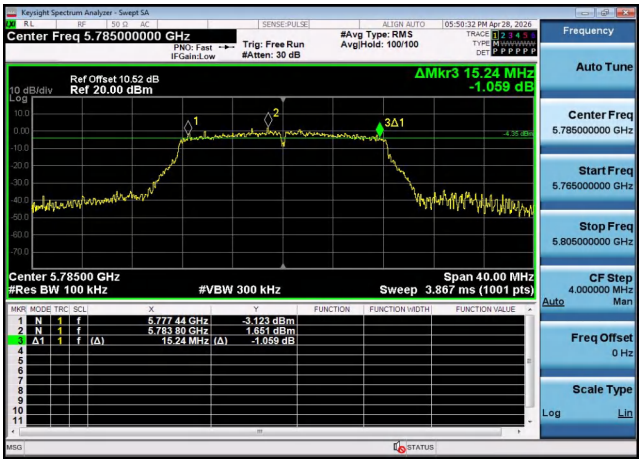
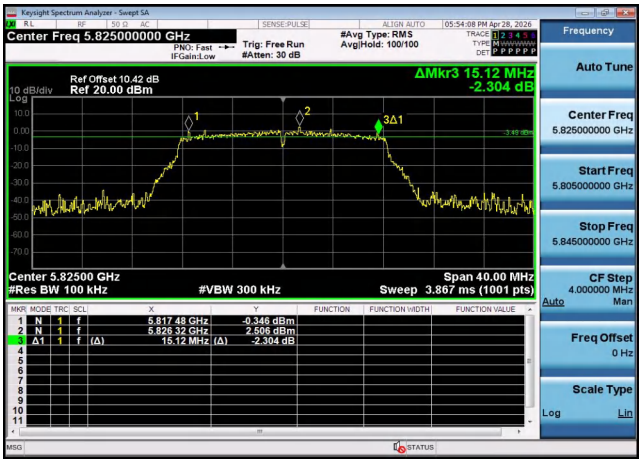
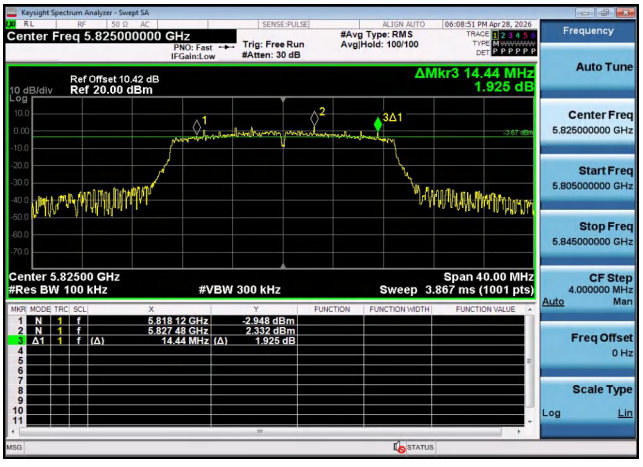
**LIMIT**

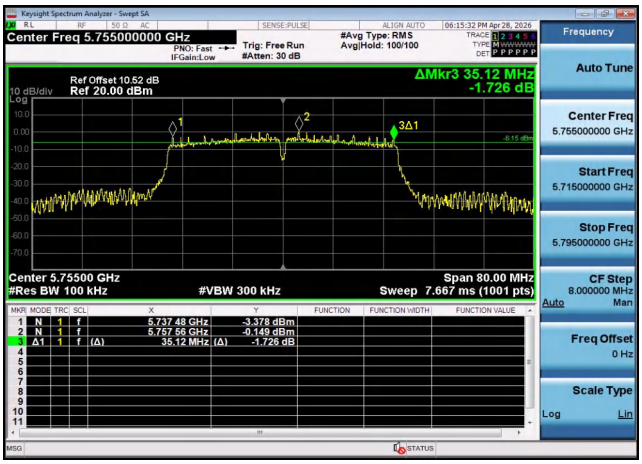
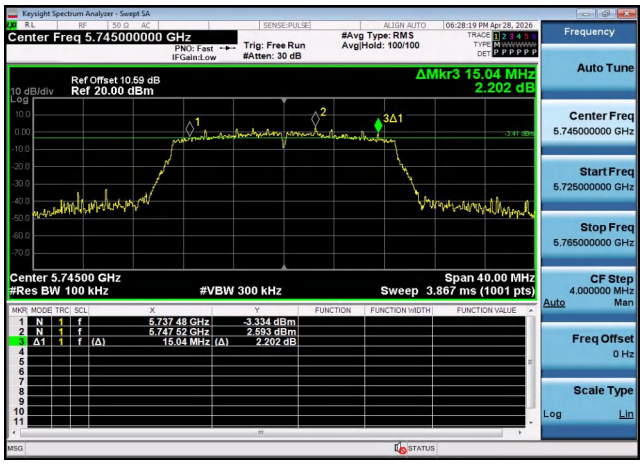
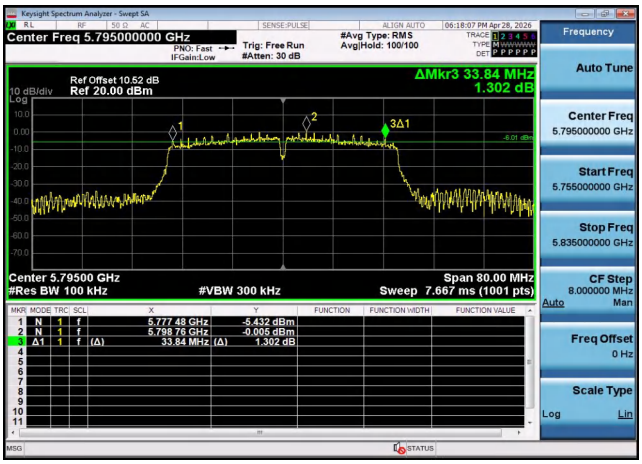
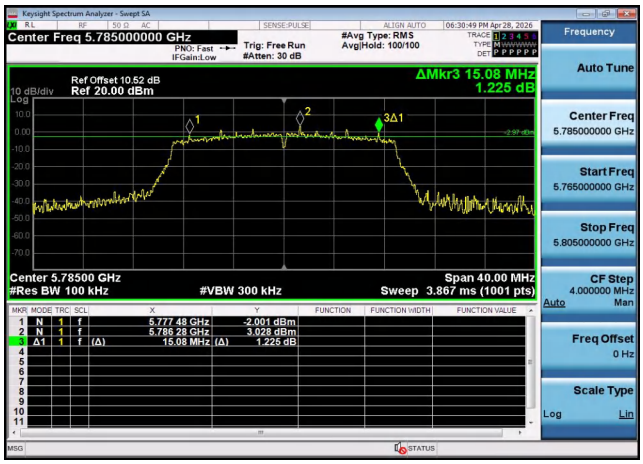
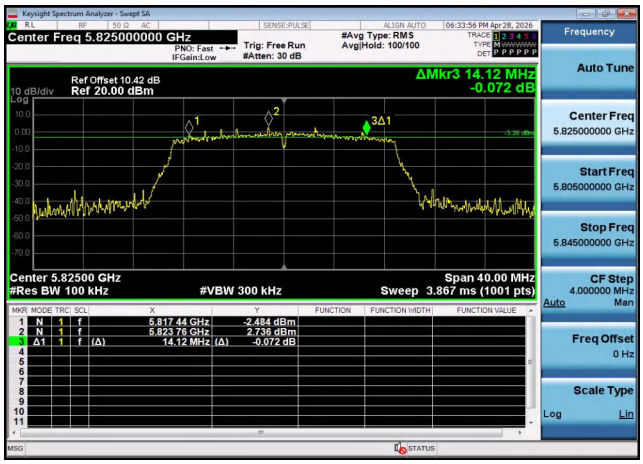
For Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz

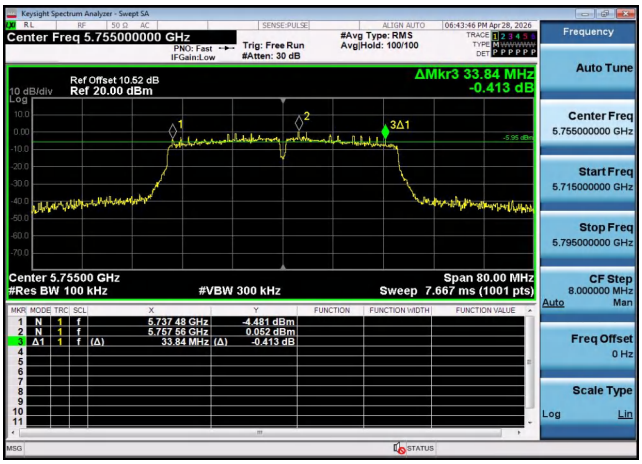
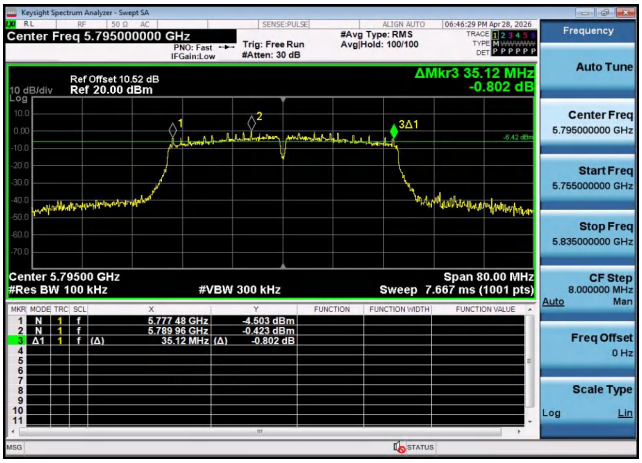
**Test Results**

| Type | Bands | Channel | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|---|---|---|---|---|---|
| 802.11a | U-NII 3 | 149 | 14.000 | ≥500KHz | Pass |
| | | 157 | 15.240 | | |
| | | 165 | 15.120 | | |
| 802.11n(HT20) | U-NII 3 | 149 | 13.880 | | |
| | | 157 | 16.040 | | |
| | | 165 | 14.440 | | |
| 802.11n(HT40) | U-NII 3 | 151 | 35.120 | | |
| | | 159 | 33.840 | | |
| 802.11ac(VHT20) | U-NII 3 | 149 | 15.040 | | |
| | | 157 | 15.080 | | |
| | | 165 | 14.120 | | |
| 802.11ac(VHT40) | U-NII 3 | 151 | 33.840 | | |
| | | 159 | 35.120 | | |
| 802.11ac(VHT80) | U-NII 3 | 155 | 75.200 | | |

Test plot as follows:

| 802.11a | 802.11n(HT20) |
|---|---|
|  |  |
| CH149 | CH149 |
|  |  |
| CH157 | CH157 |
|  |  |
| CH165 | CH165 |

| 802.11n(HT40) | 802.11ac(VHT20) |
|---|---|
|  |  |
| CH151 | CH149 |
|  |  |
| CH159 | CH157 |
| |  |
| | CH165 |

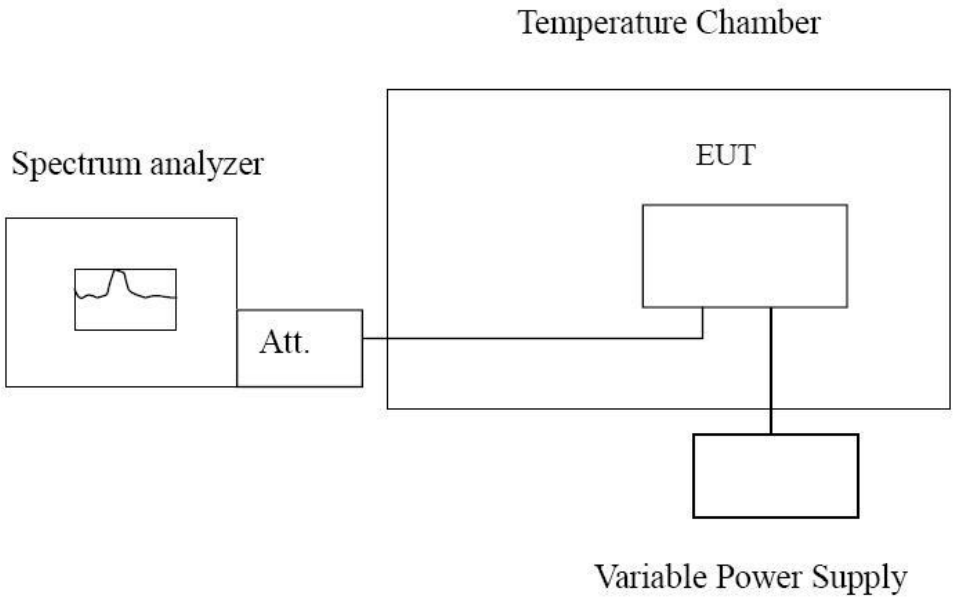
| 802.11ac(VHT40) | 802.11ac(VHT80) |
| --- | --- |
|  |  |
| CH151 | CH155 |
|  | |
| CH159 | |

## 4.8 Frequency Stability

**LIMIT**

Manufacturers 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 users manual.

**TEST CONFIGURATION**




**TEST PROCEDURE**

**Frequency Stability under Temperature Variations:**
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20℃ operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

**Frequency Stability under Voltage Variations:**
Set chamber temperature to 20℃. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.
Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

**TEST RESULTS**

Record worst case as below:

| Reference Frequency: 802.11ac channel=36 frequency=5180MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 9.0 | -30 | 131.702 | 0.02543 | Within the band of operation | Pass |
| | -20 | 163.963 | 0.03165 | | |
| | -10 | 169.238 | 0.03267 | | |
| | 0 | 128.207 | 0.02475 | | |
| | 10 | 167.601 | 0.03236 | | |
| | 20 | 114.779 | 0.02216 | | |
| | 30 | 111.173 | 0.02146 | | |
| | 40 | 112.550 | 0.02173 | | |
| | 50 | 134.272 | 0.02592 | | |
| 9.9 | 20 | 174.658 | 0.03372 | | |
| 8.1 | 20 | 137.538 | 0.02655 | | |

| Reference Frequency: 802.11ac channel=149 frequency=5745MHz | | | | | |
|---|---|---|---|---|---|
| Voltage ( V ) | Temperature (℃) | Frequency error | | Limit (ppm) | Result |
| | | Hz | ppm | | |
| 9.0 | -30 | 142.938 | 0.02488 | Within the band of operation | Pass |
| | -20 | 145.214 | 0.02528 | | |
| | -10 | 163.219 | 0.02841 | | |
| | 0 | 129.292 | 0.02251 | | |
| | 10 | 178.849 | 0.03113 | | |
| | 20 | 153.596 | 0.02674 | | |
| | 30 | 122.993 | 0.02141 | | |
| | 40 | 179.086 | 0.03117 | | |
| | 50 | 123.135 | 0.02143 | | |
| 9.9 | 20 | 164.215 | 0.02858 | | |
| 8.1 | 20 | 151.199 | 0.02632 | | |

## 4.9 Automatically Discontinue Transmission

**Standard Applicable**

**FCC CFR Title 47 Part 15 Subpart C Section 15.407(c):**

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.

**Test Result:**

Declared by applicants that the device will automatically discontinue transmission in case of either absence of information to transmit or operational failure.

## 4.10 Band edge for RF Conducted Emissions

**Limit**

1) For transmitters operating in the 5.15 – 5.25 GHz band: All emissions outside of the 5.15 – 5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

2) For transmitters operating solely in the 5.725 – 5.850 GHz band.

All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

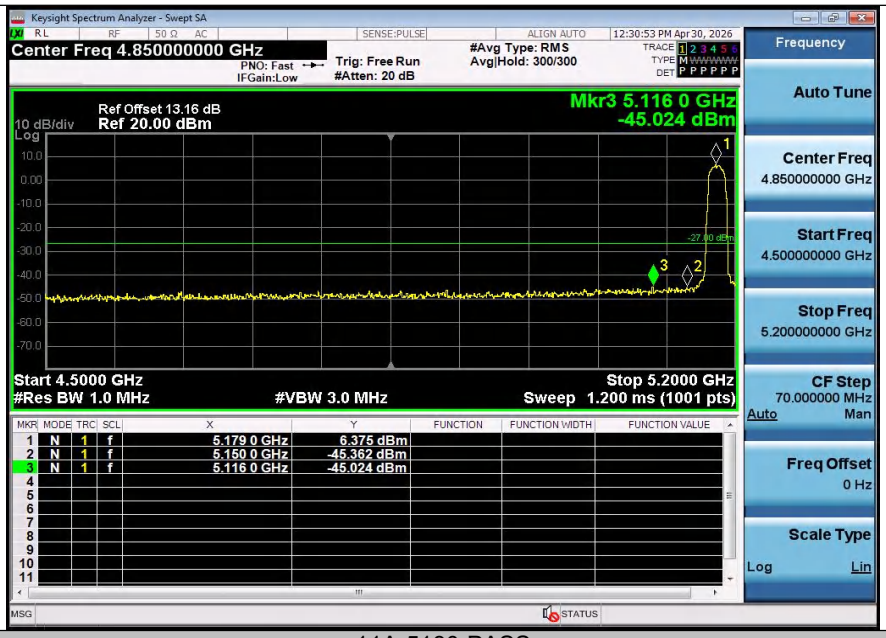
**Test Procedure**

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=1MHz, VBW= 1MHz, peak detector , and max hold.

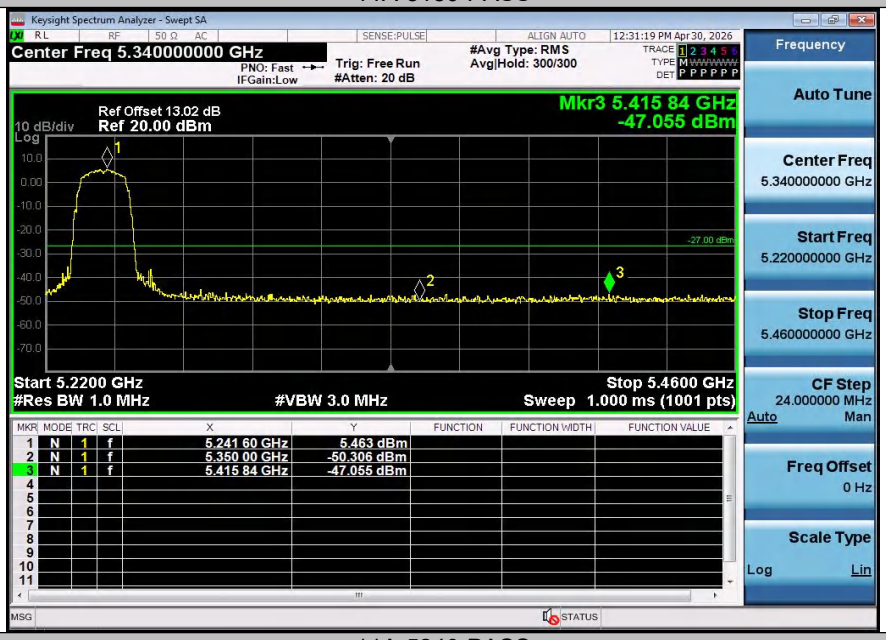
**Test Configuration**


**Test Results**

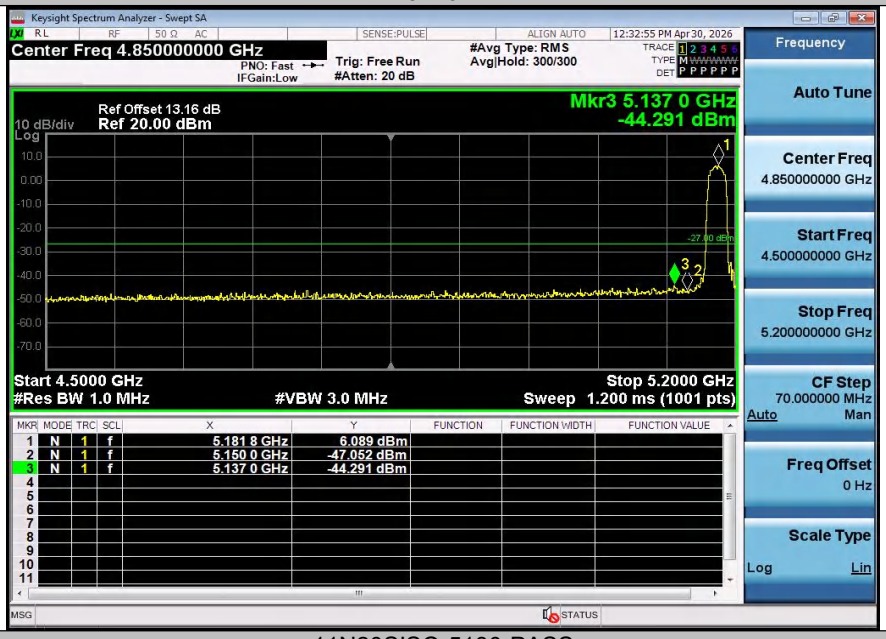
Test plot as follows:



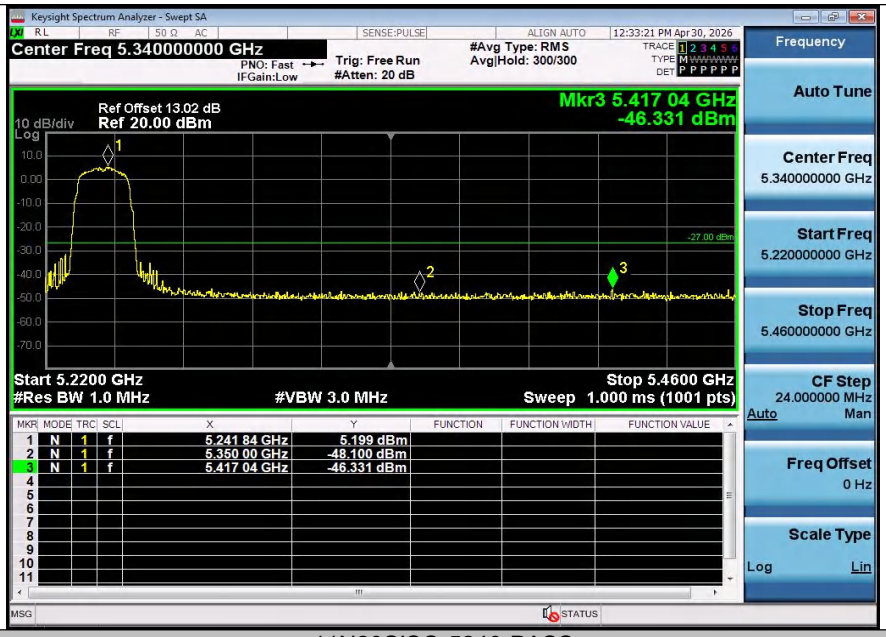

11A-5180-PASS



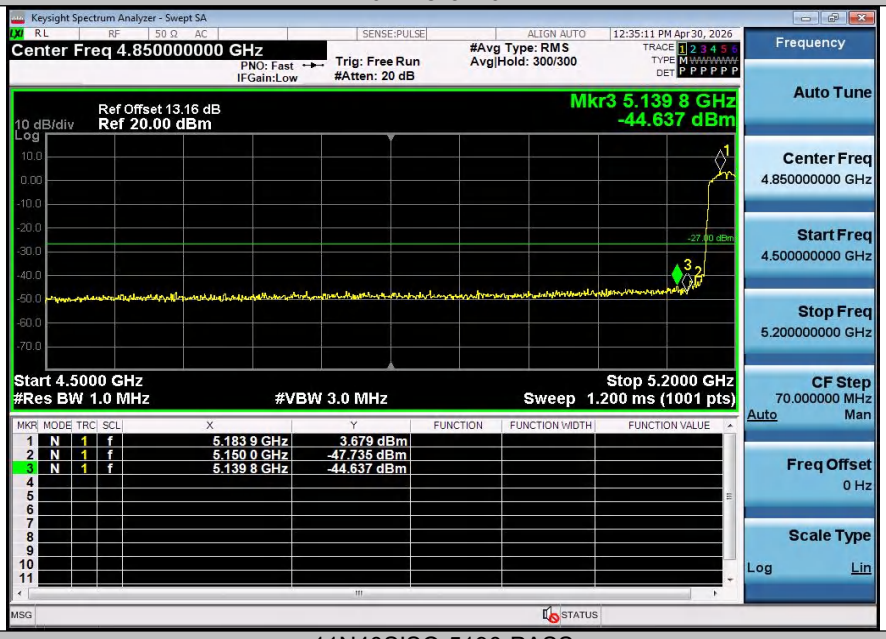

11A-5240-PASS



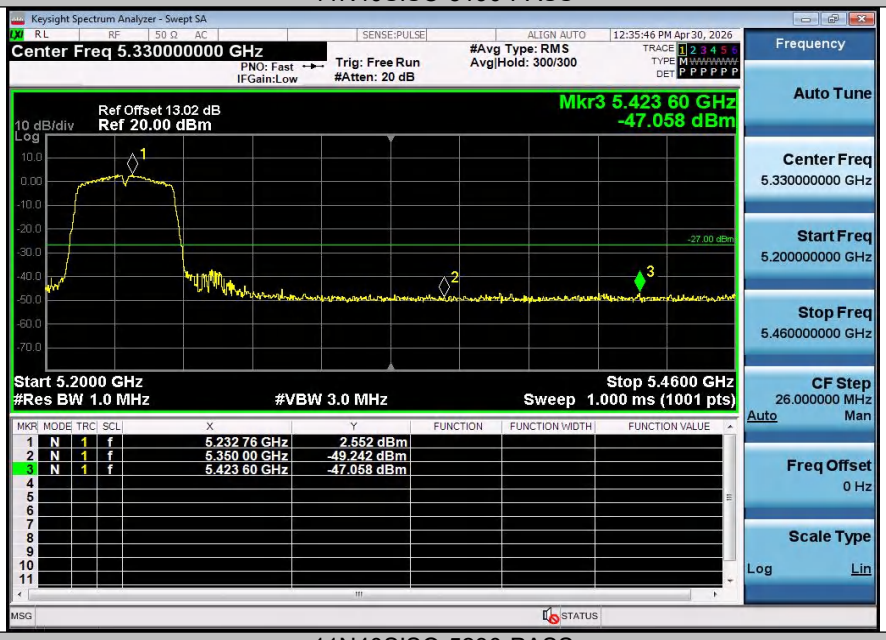

11N20SISO-5180-PASS



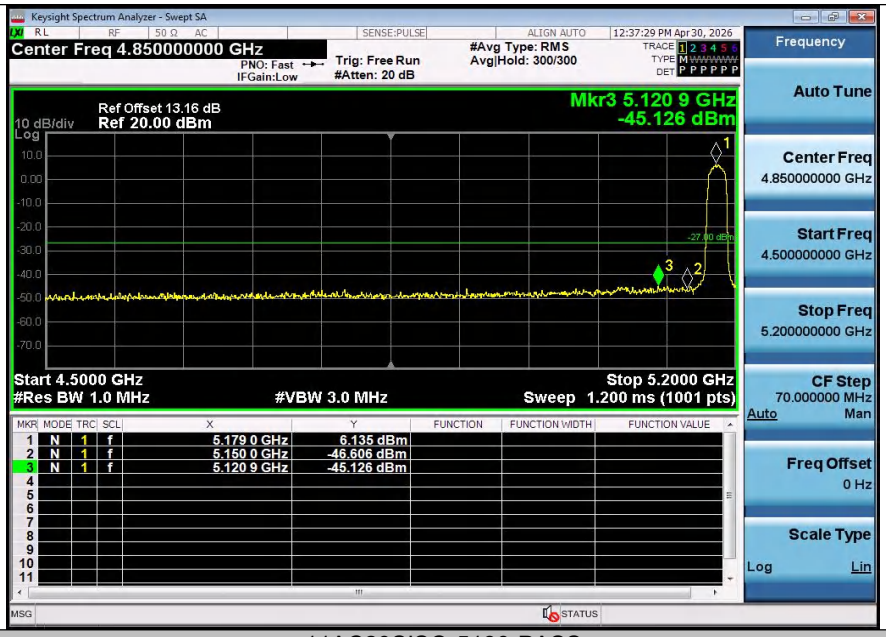

11N20SISO-5240-PASS



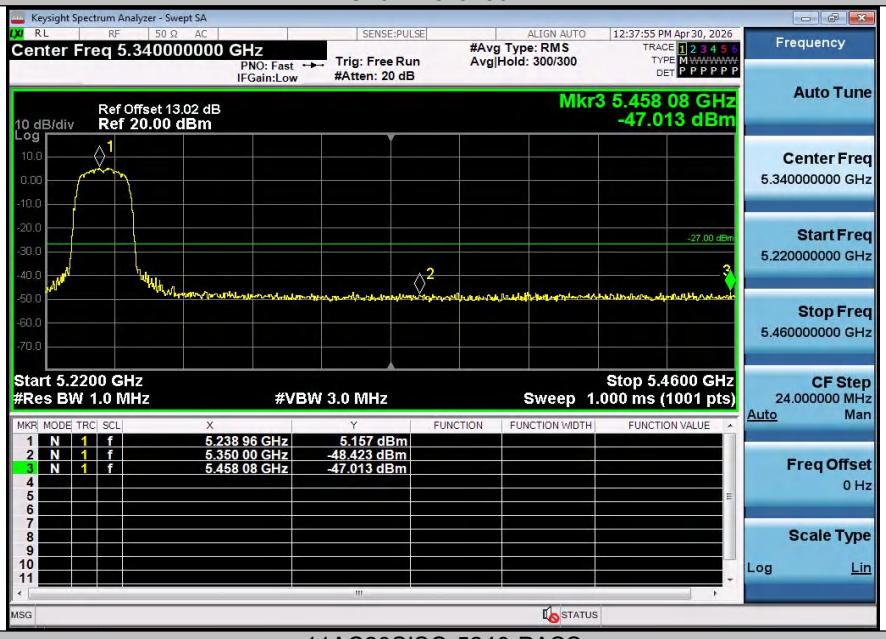

11N40SISO-5190-PASS



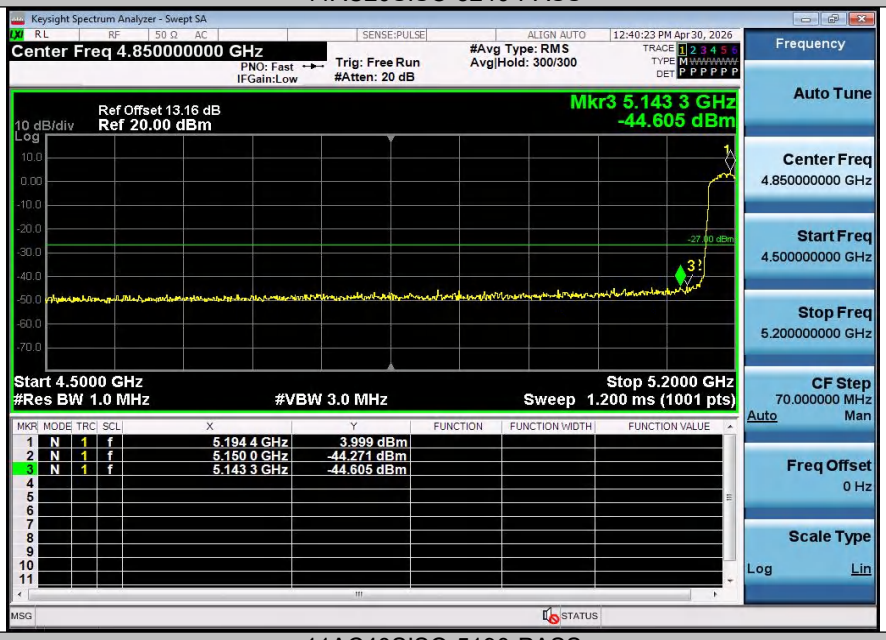

11N40SISO-5230-PASS



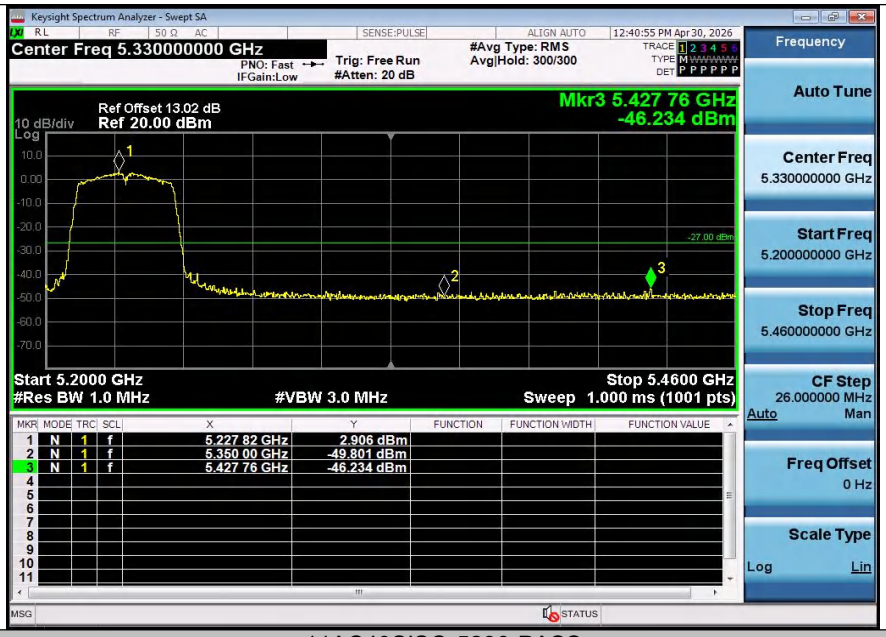

11AC20SISO-5180-PASS



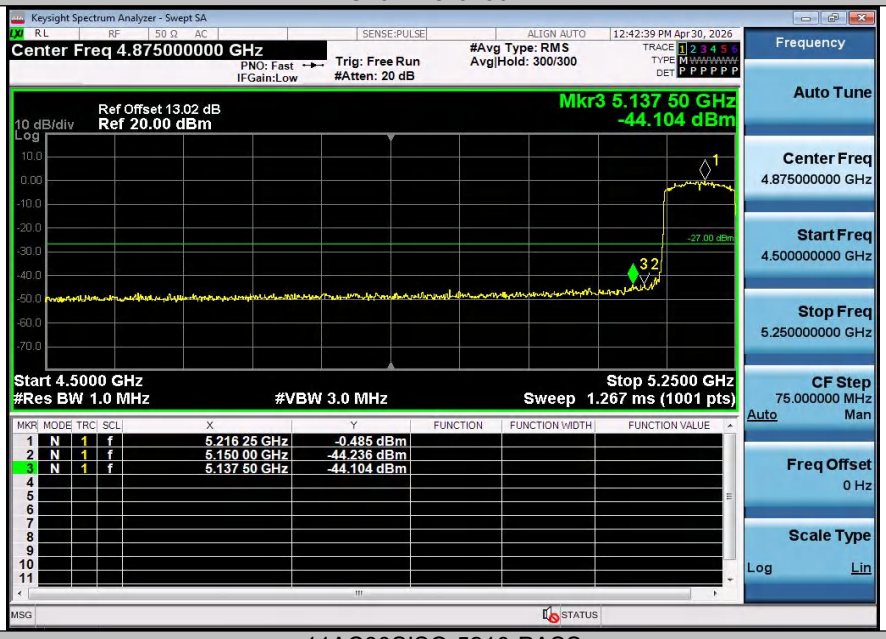

11AC20SISO-5240-PASS



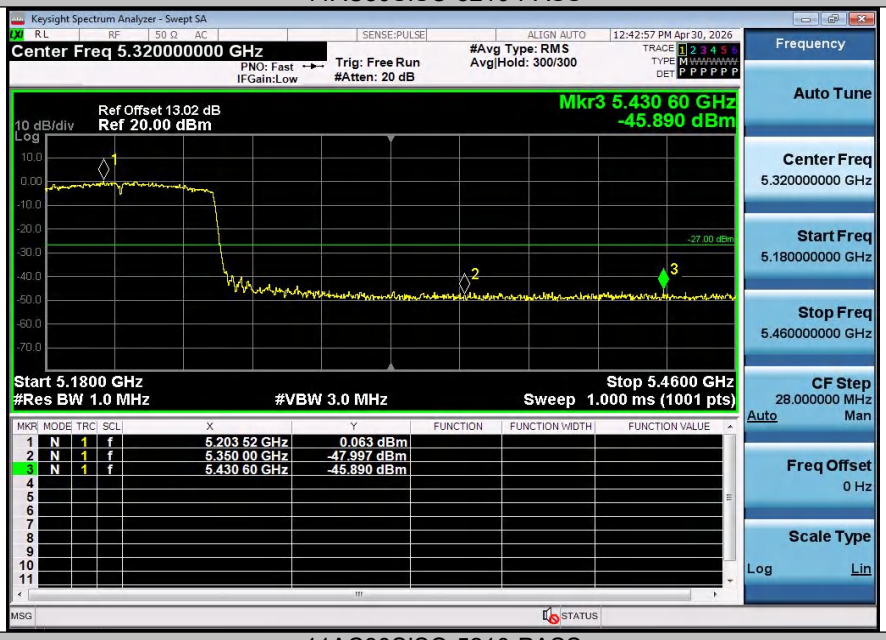

11AC40SISO-5190-PASS



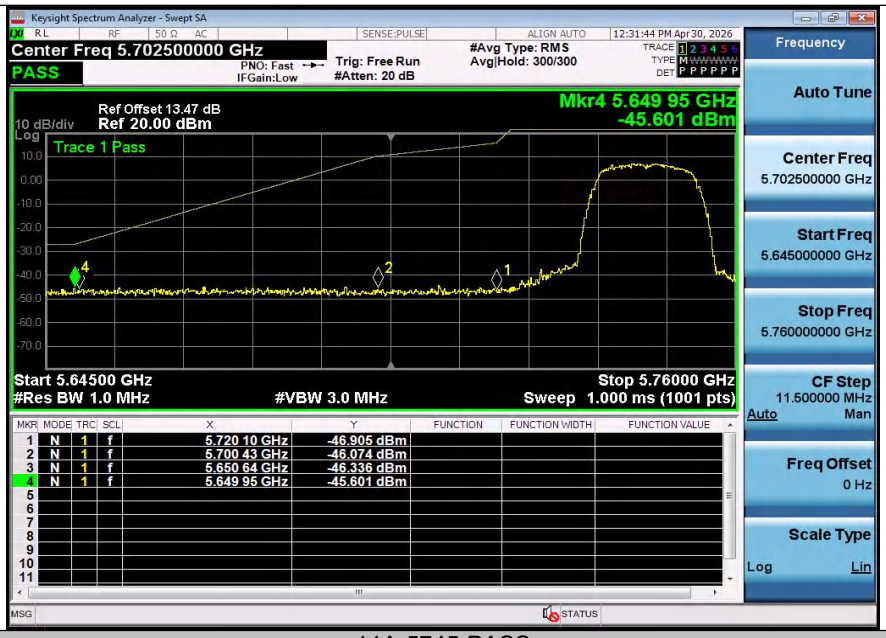

11AC40SISO-5230-PASS



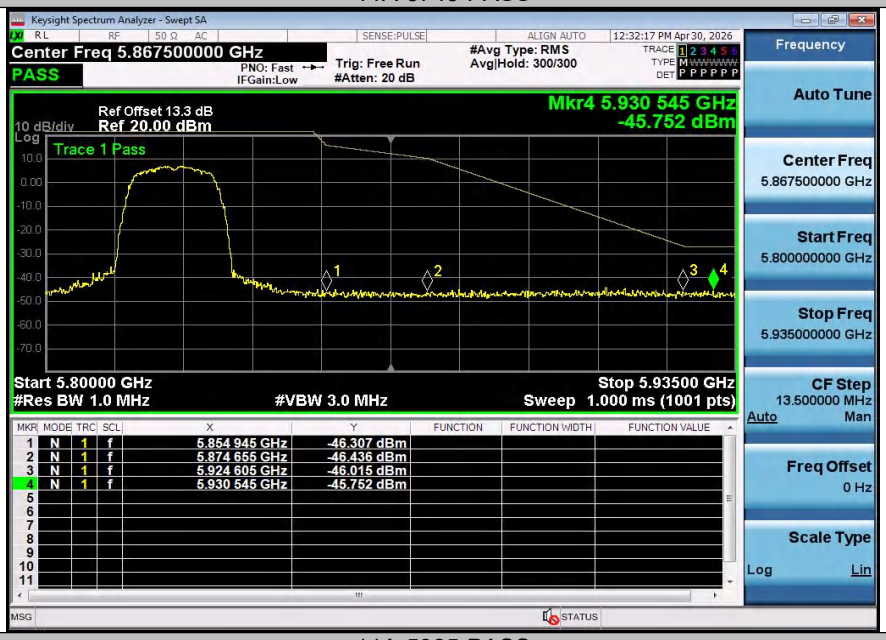

11AC80SISO-5210-PASS



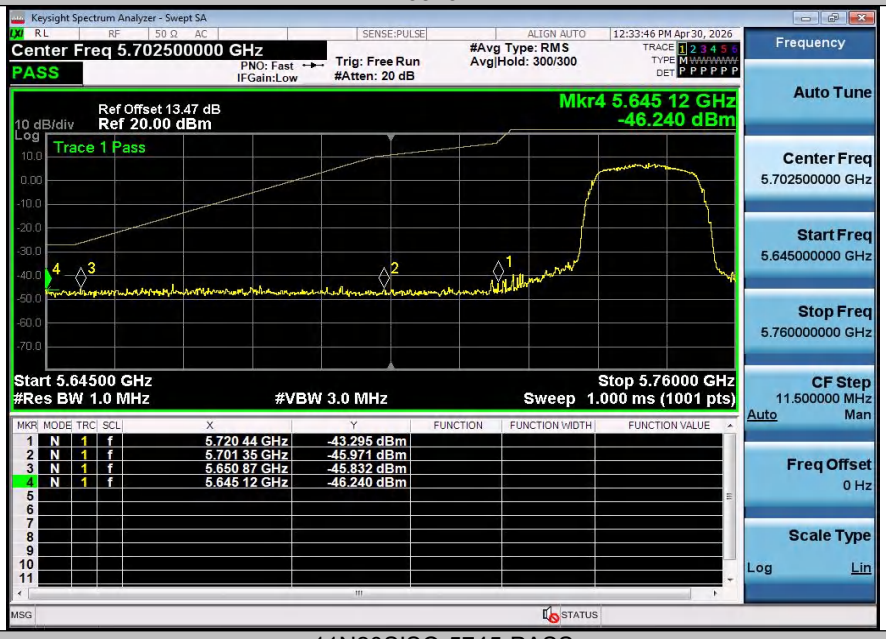

11AC80SISO-5210-PASS



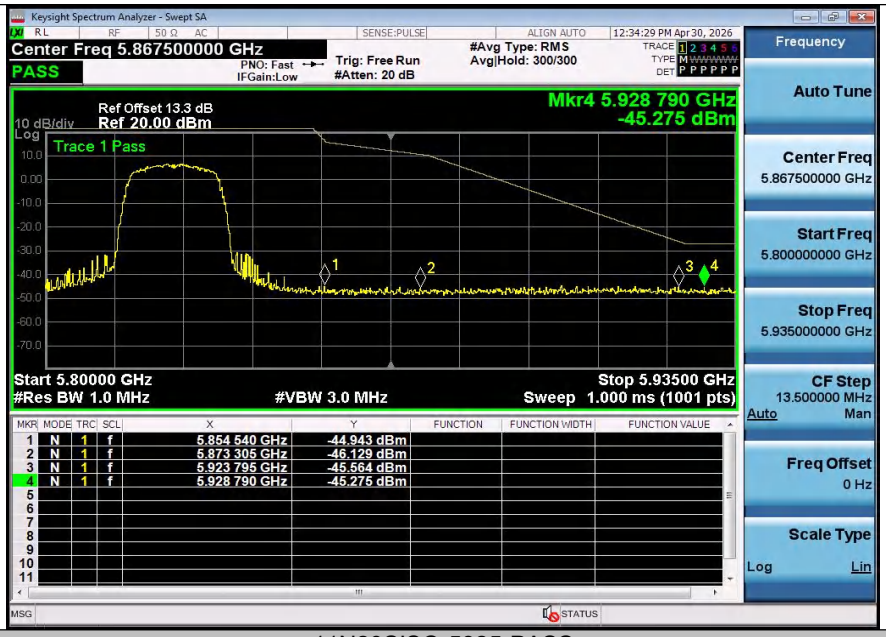

11A-5745-PASS




11A-5825-PASS




11N20SISO-5745-PASS

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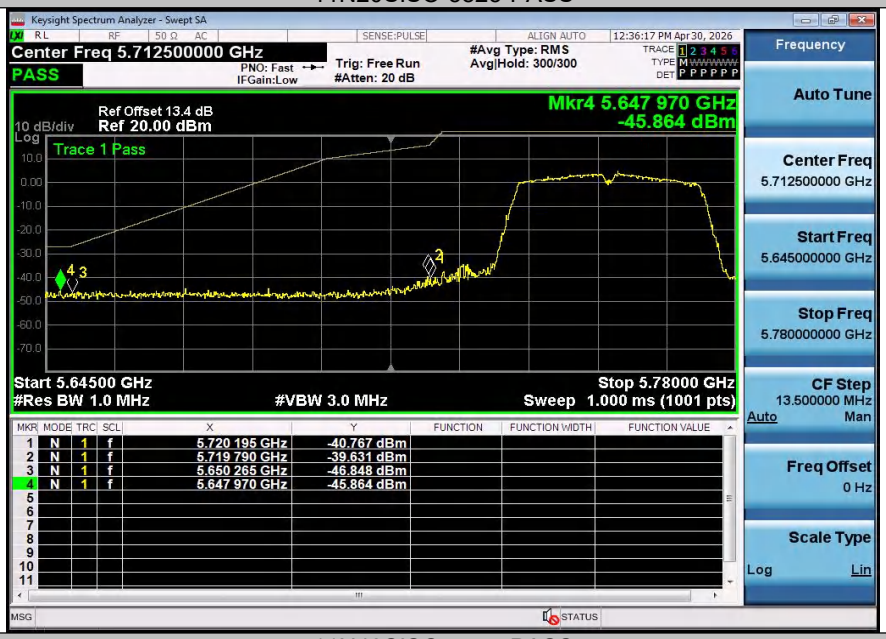
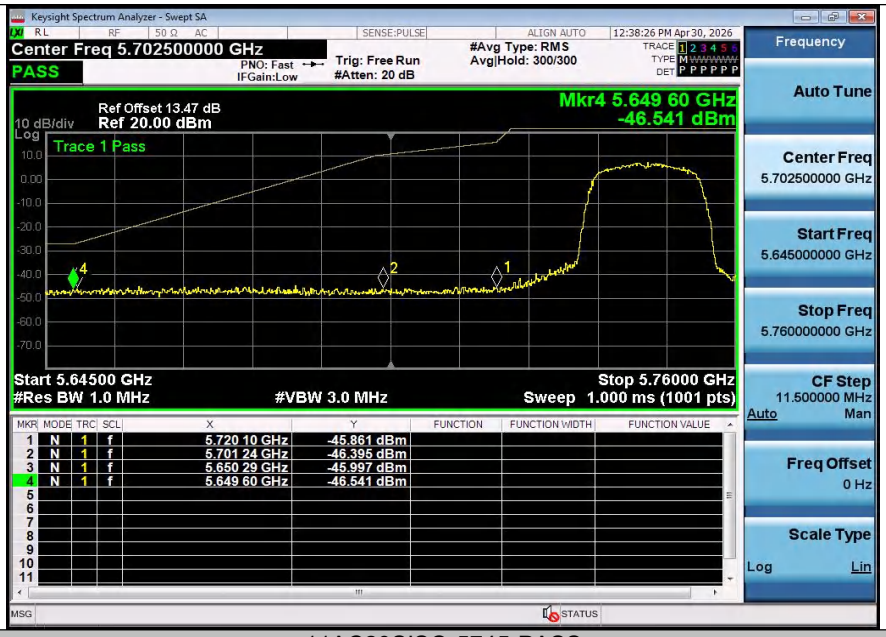
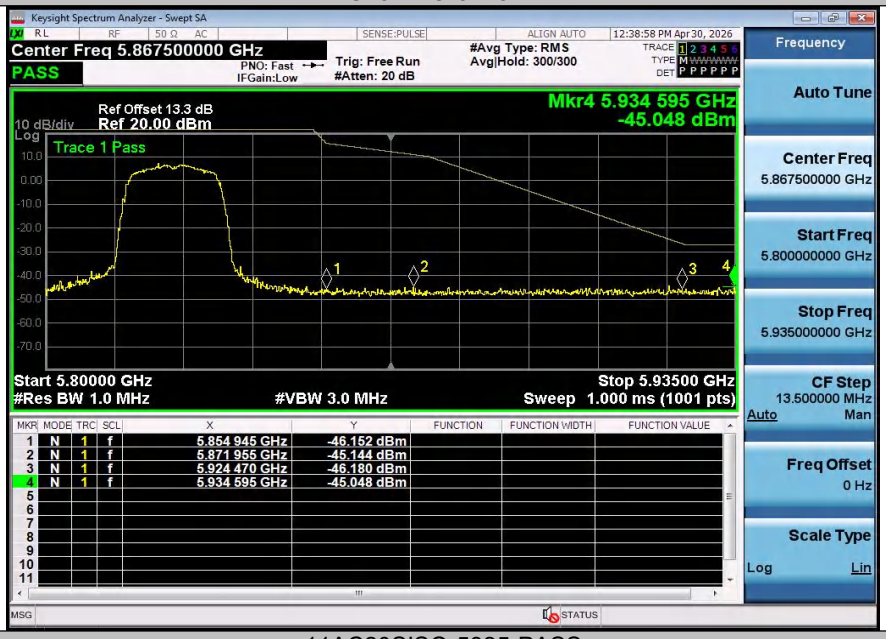



11N40SISO-5755-PASS

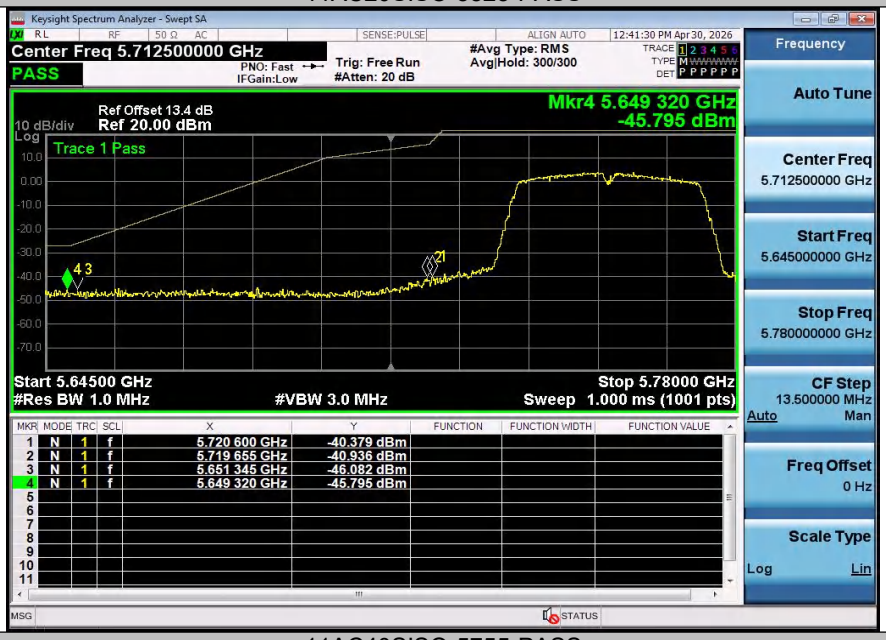

11N40SISO-5795-PASS



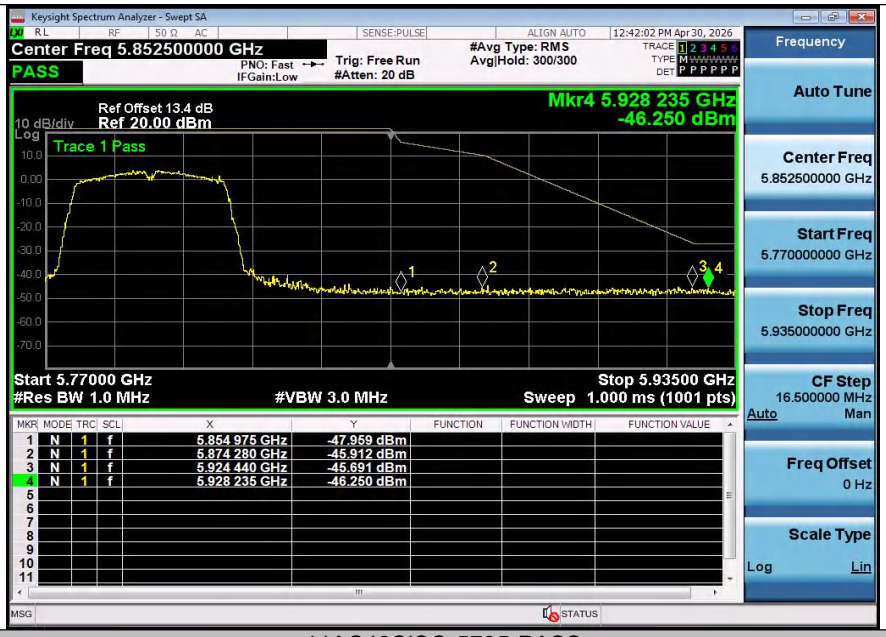

11AC20SISO-5745-PASS



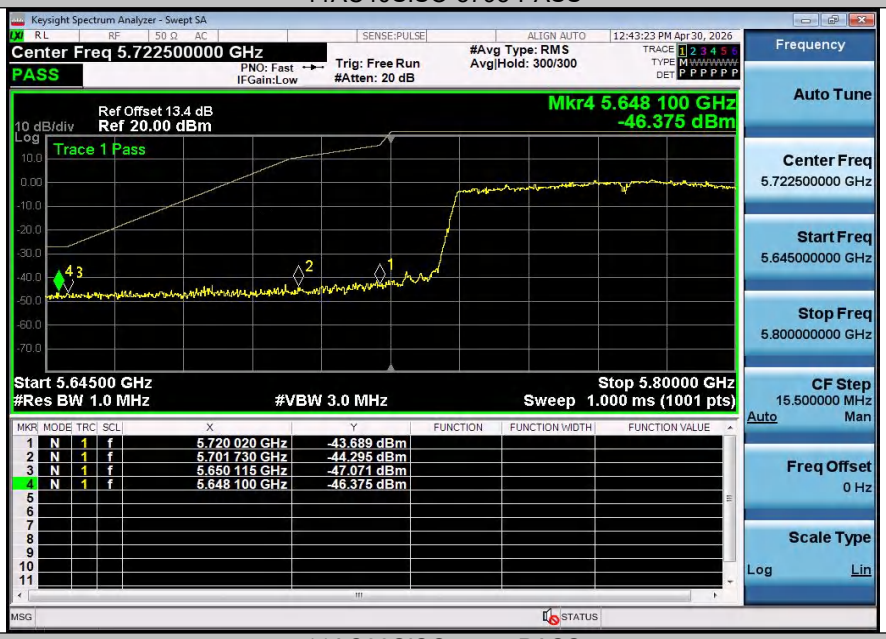

11AC20SISO-5825-PASS




11AC40SISO-5755-PASS



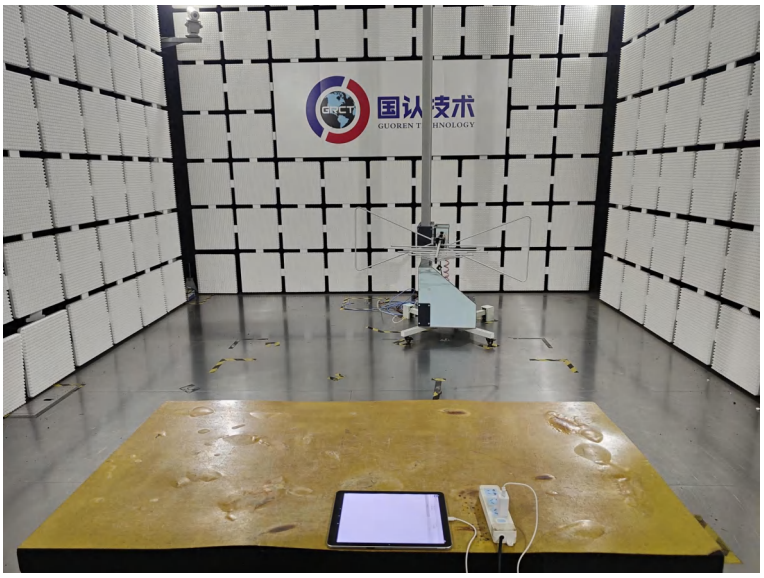

11AC40SISO-5795-PASS

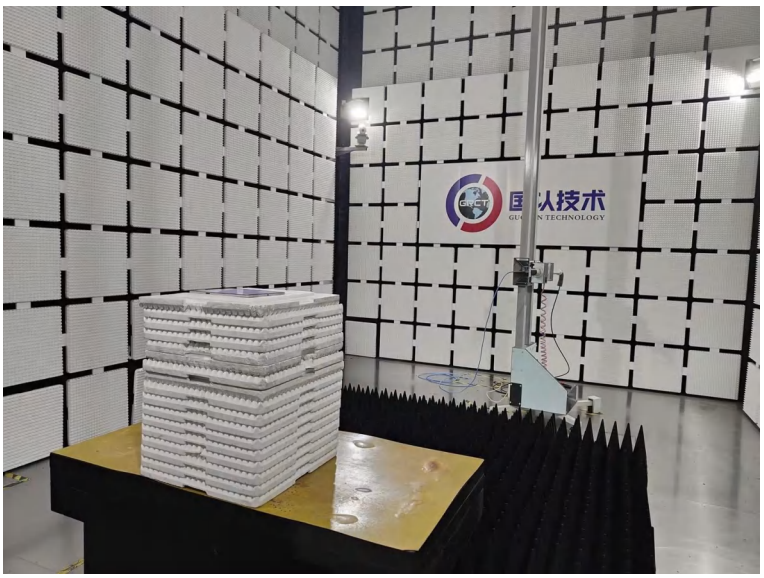


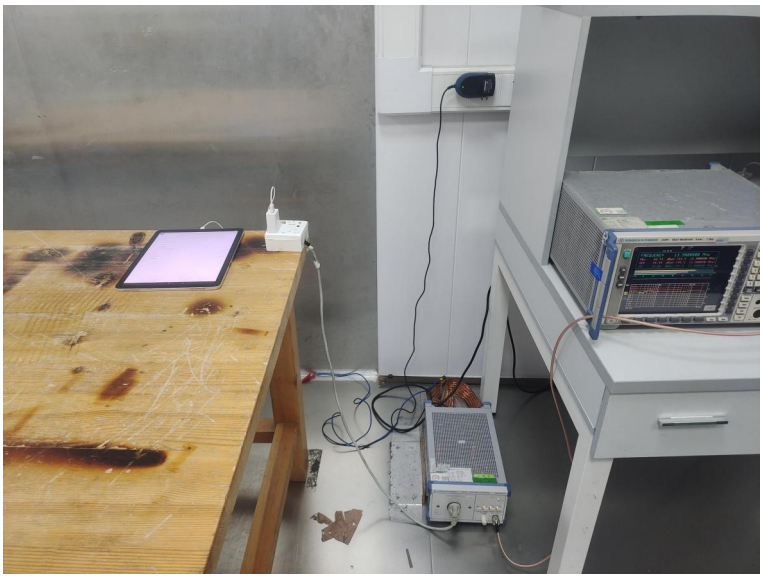

11AC80SISO-5775-PASS

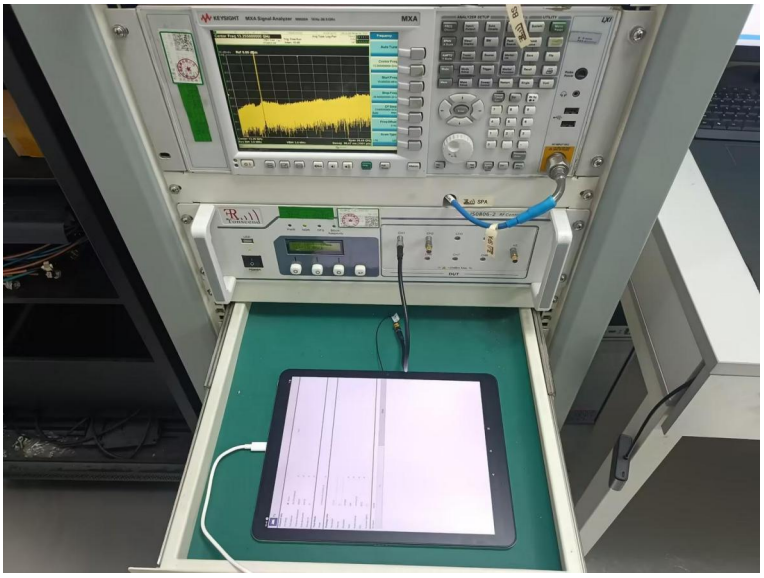

11AC80SISO-5775-PASS

# 5 Test Setup Photos of the EUT









# 6 Photos of the EUT

Reference to the test report No. **GRCTR260402007-01.**

********** End of Report **********