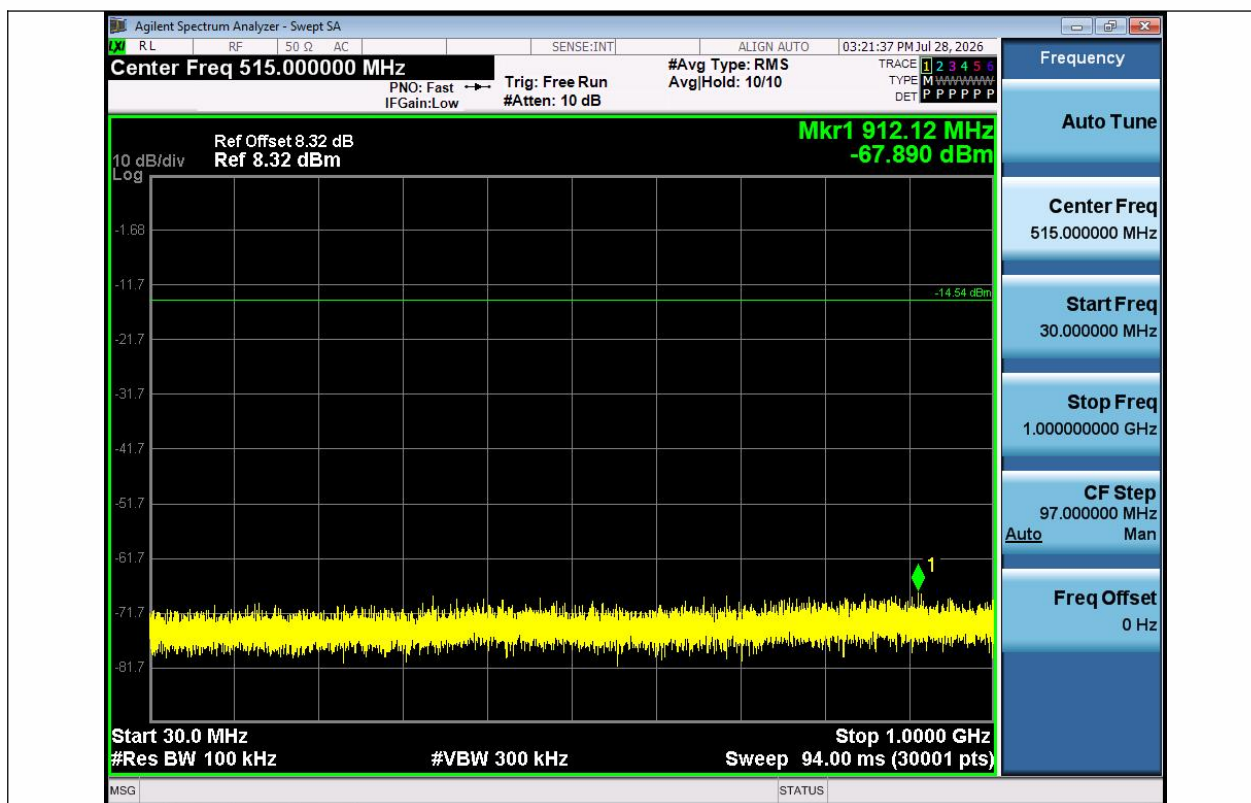
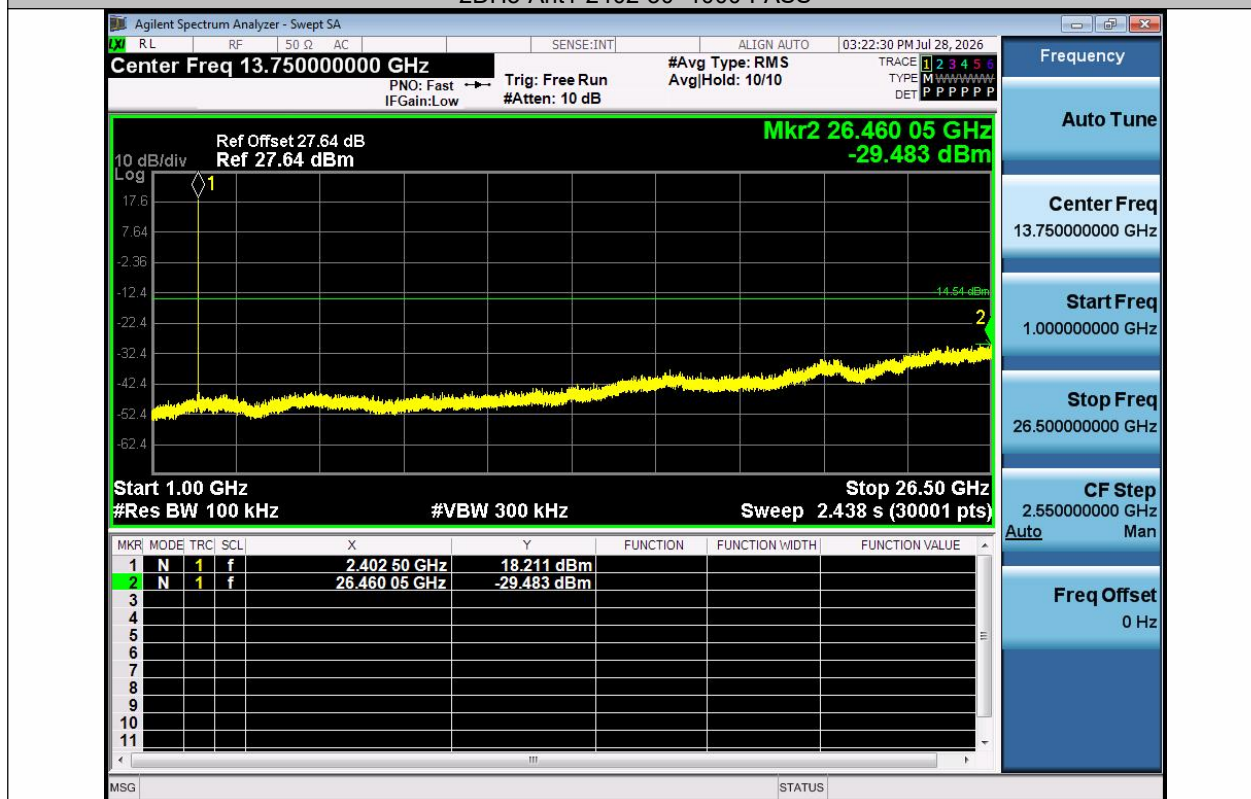




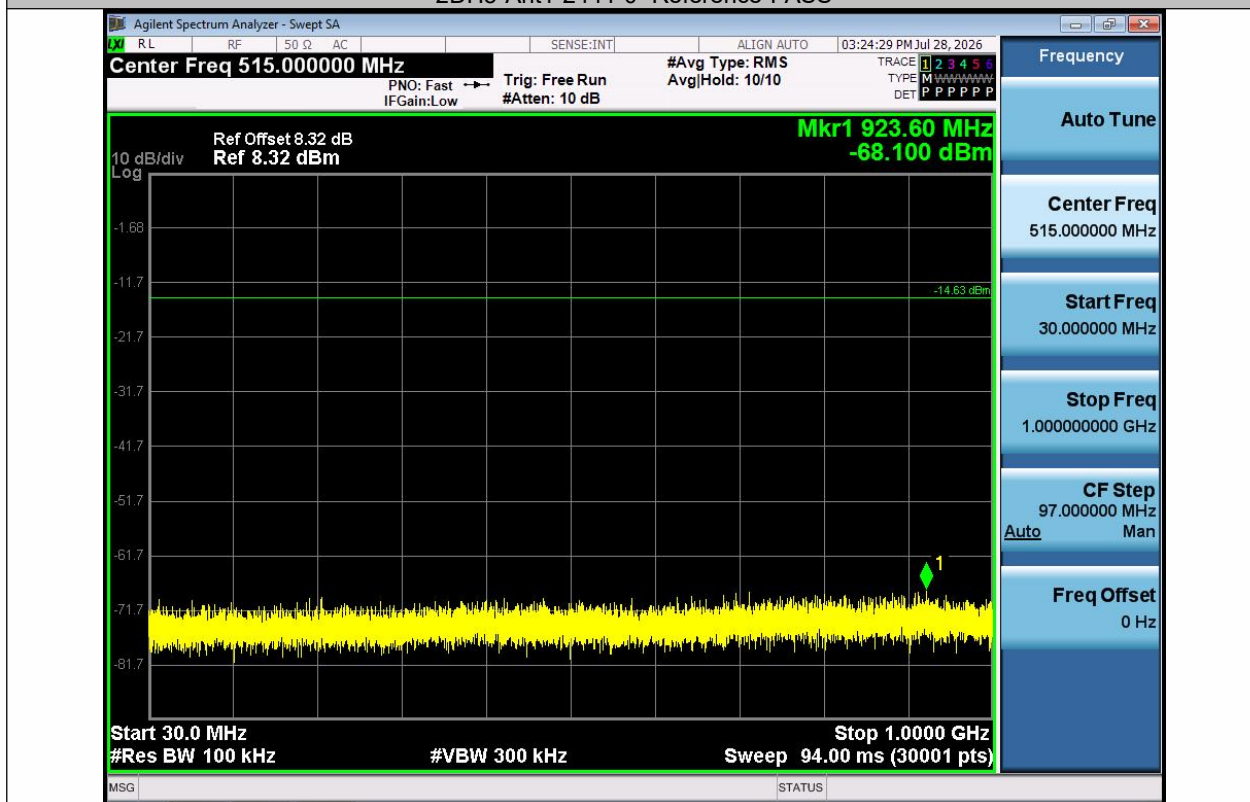
2DH5-Ant1-2402-30~1000-PASS



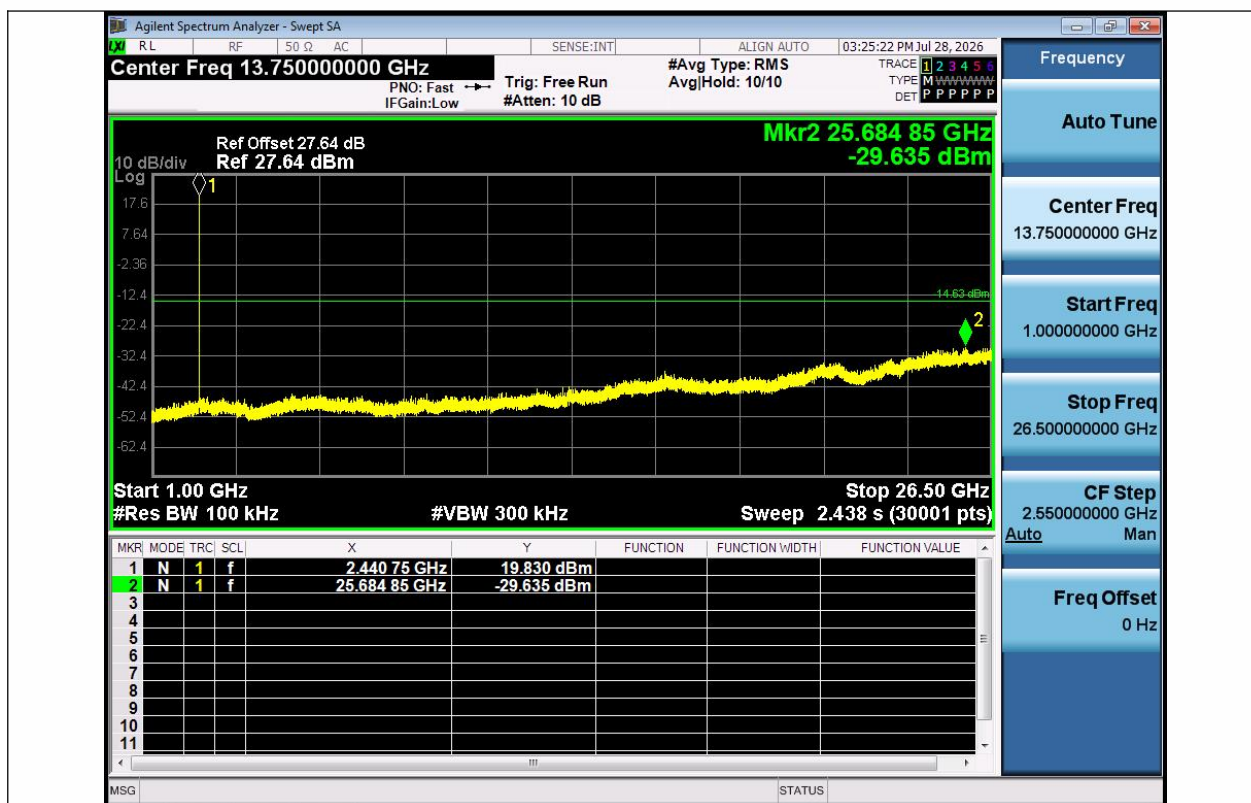
2DH5-Ant1-2402-1000~26500-PASS



2DH5-Ant1-2441-0~Reference-PASS



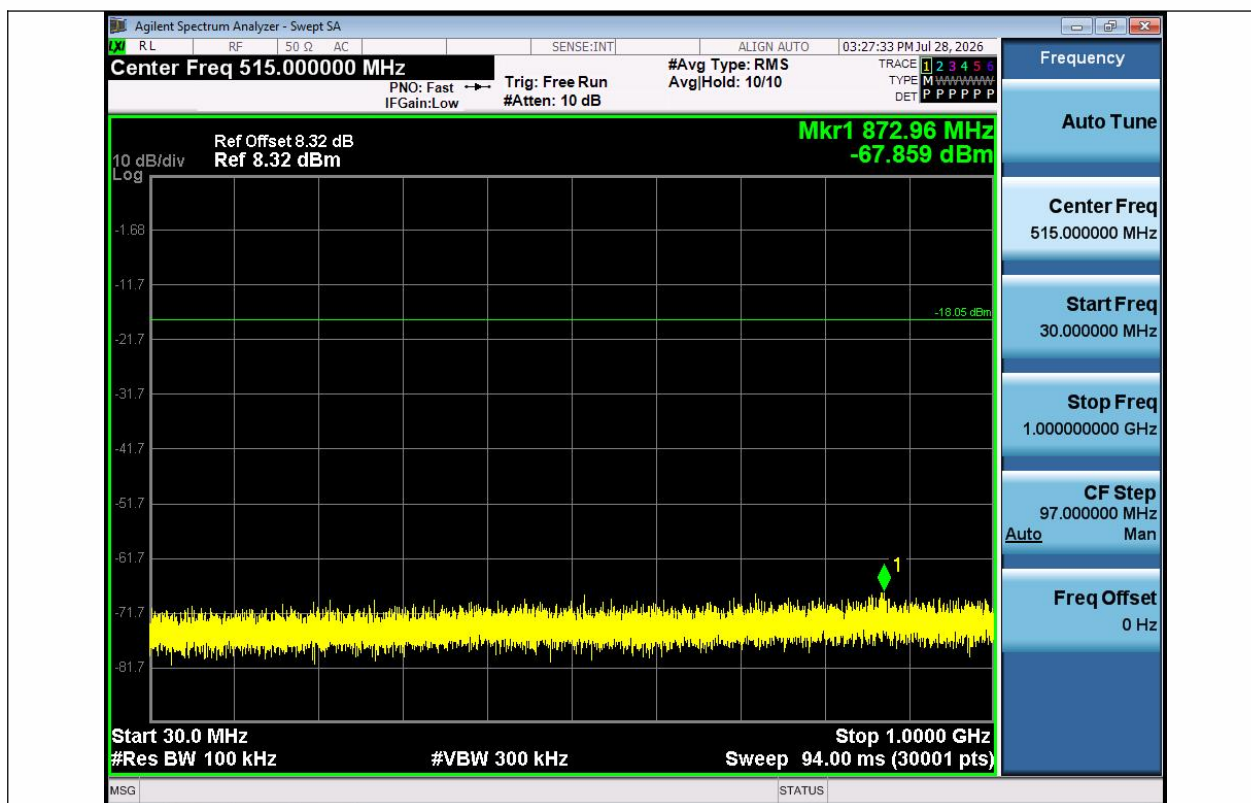
2DH5-Ant1-2441-30~1000-PASS



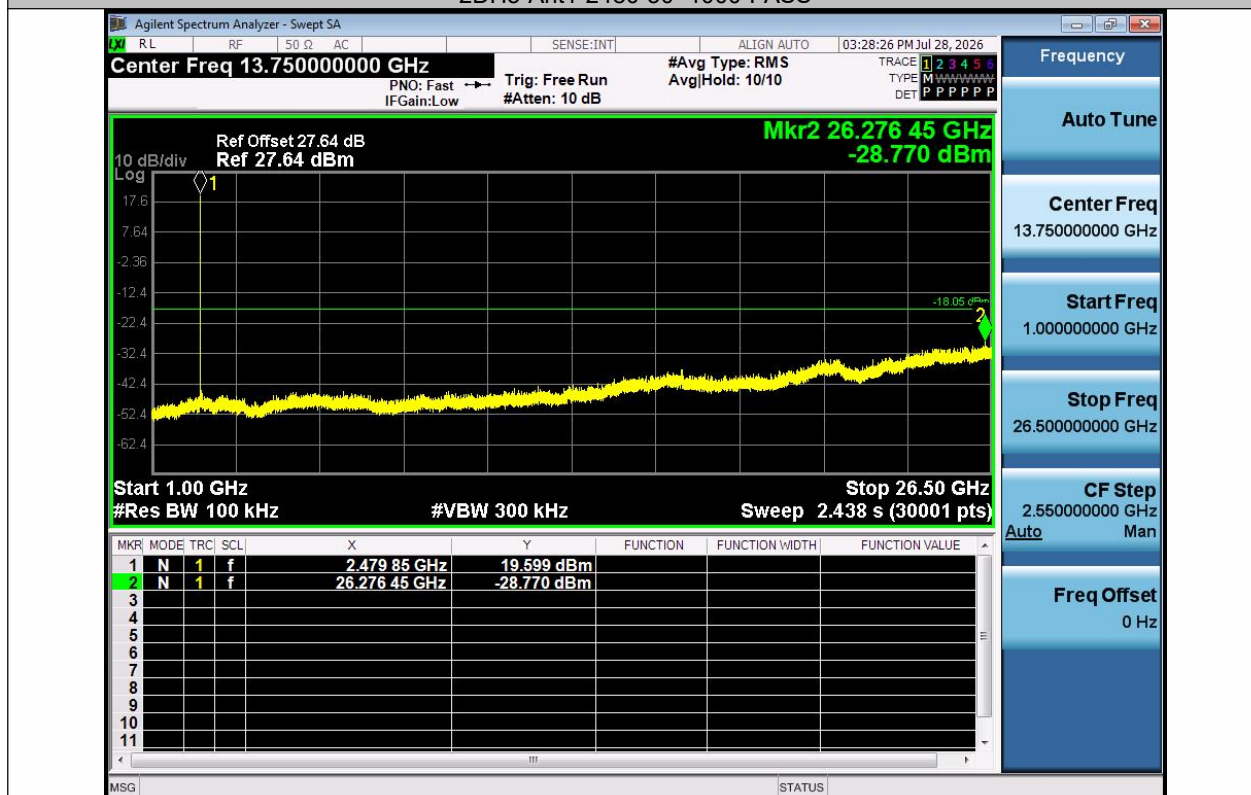
2DH5-Ant1-2441-1000~26500-PASS



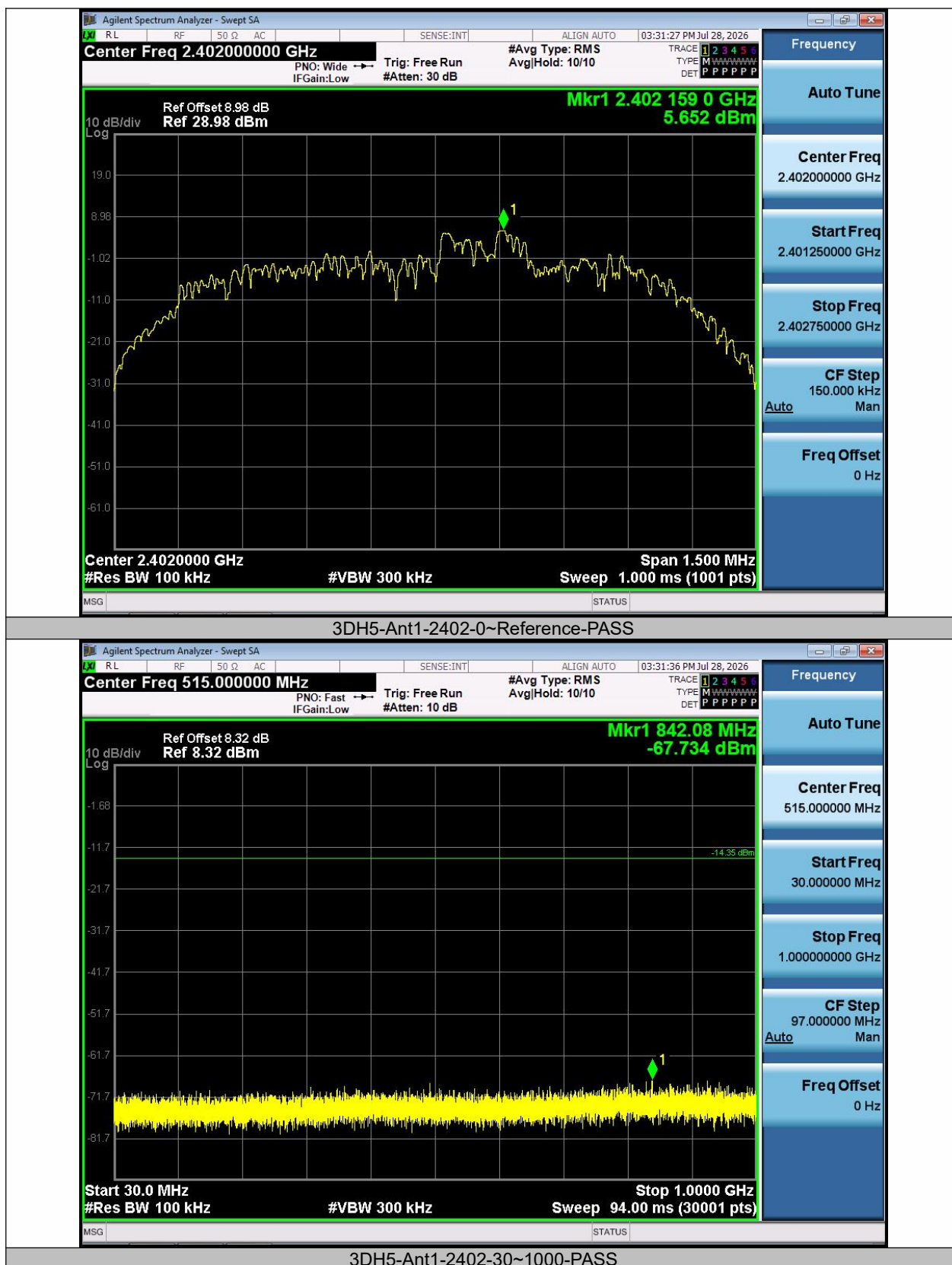
2DH5-Ant1-2480-0~Reference-PASS

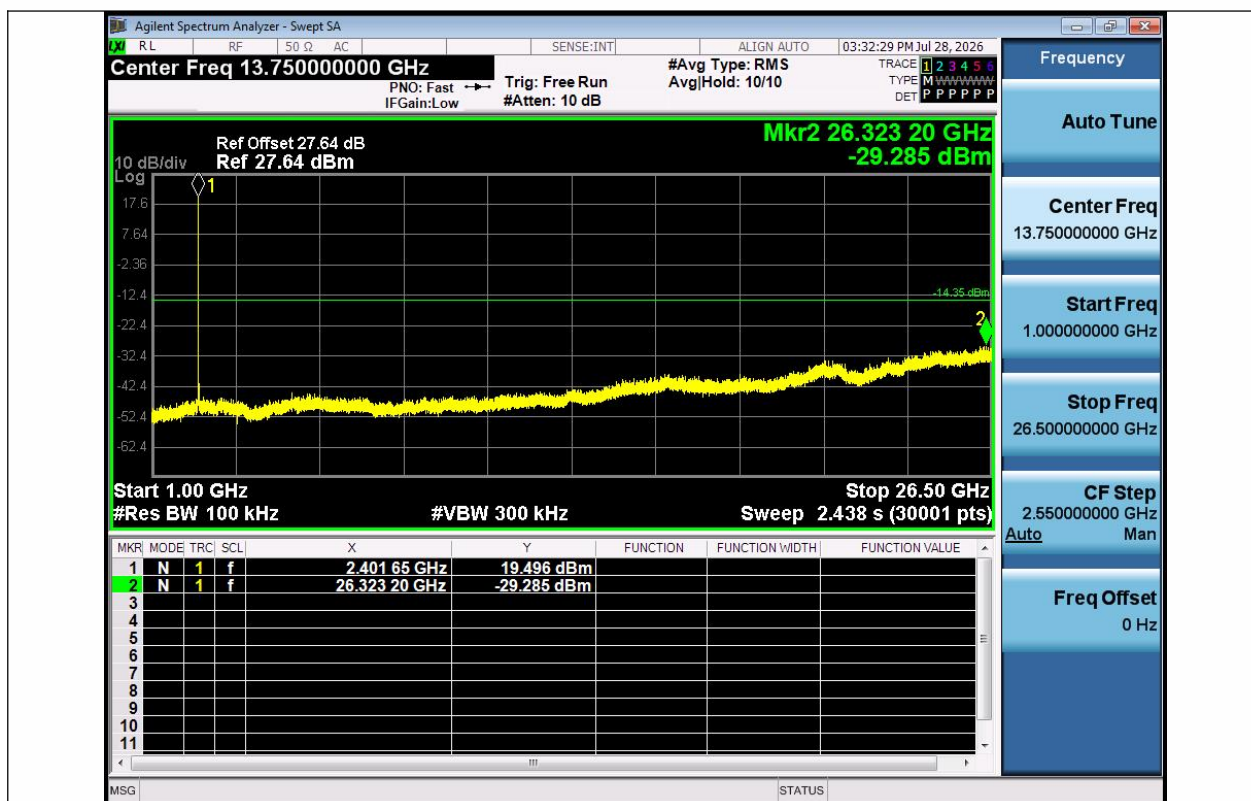


2DH5-Ant1-2480-30~1000-PASS



2DH5-Ant1-2480-1000~26500-PASS

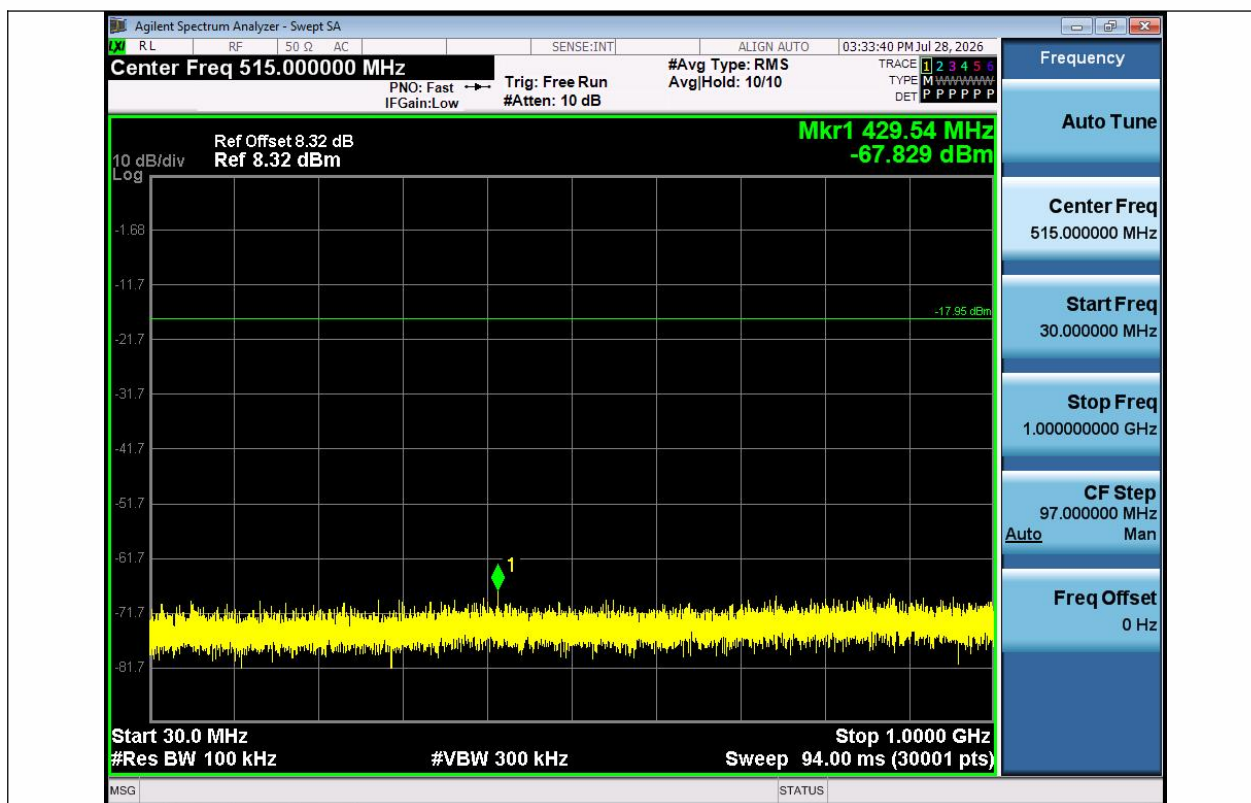




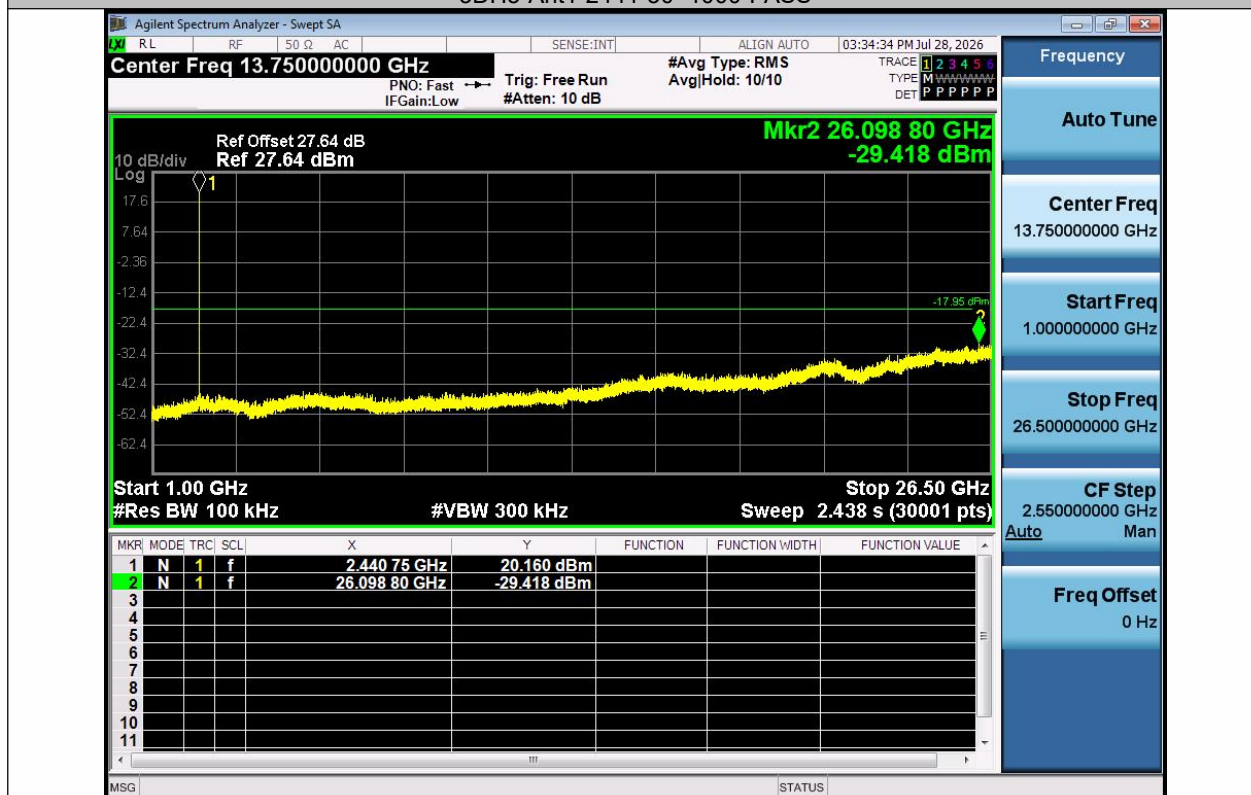
3DH5-Ant1-2402-1000~26500-PASS



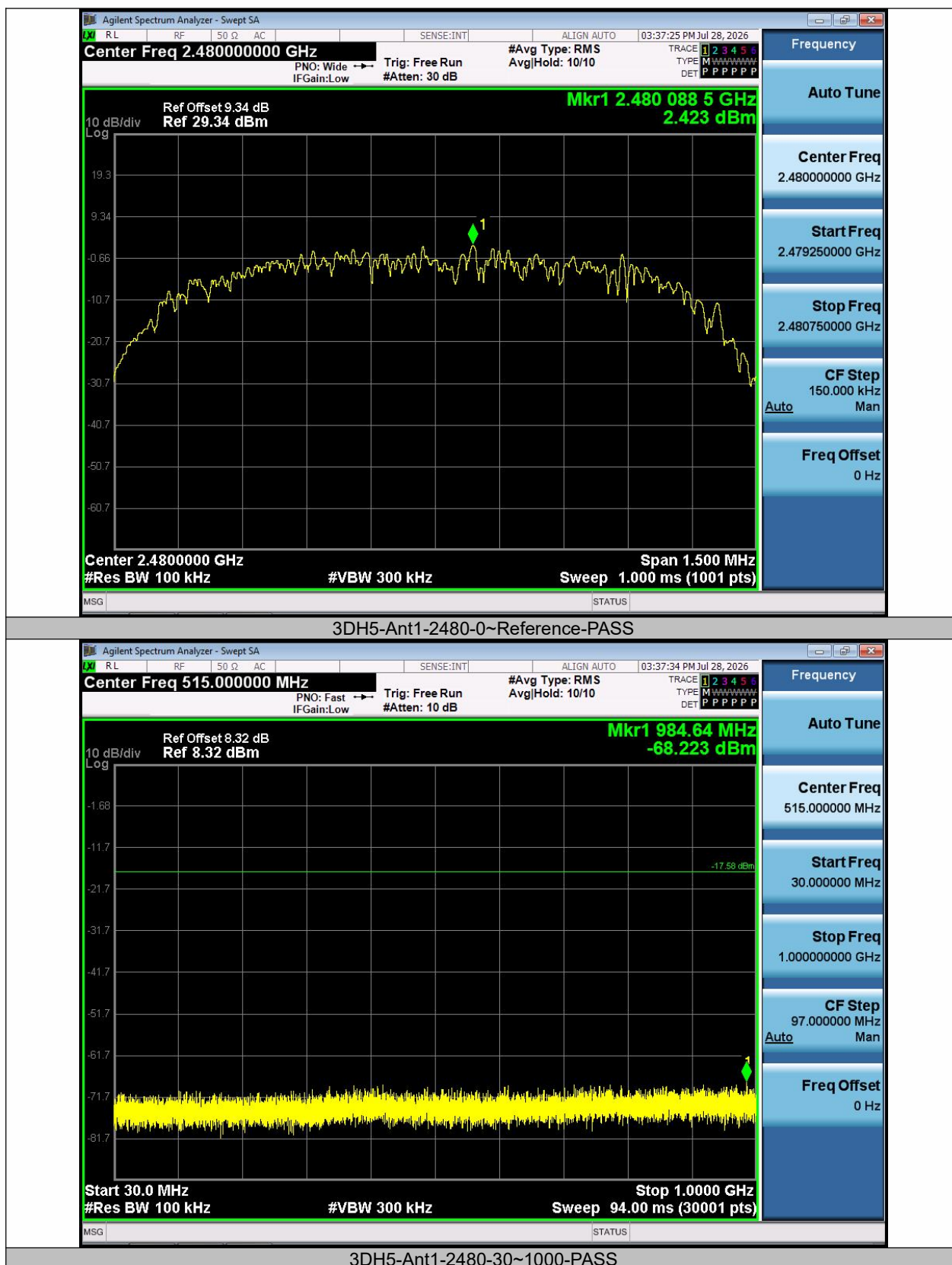
3DH5-Ant1-2441-0~Reference-PASS

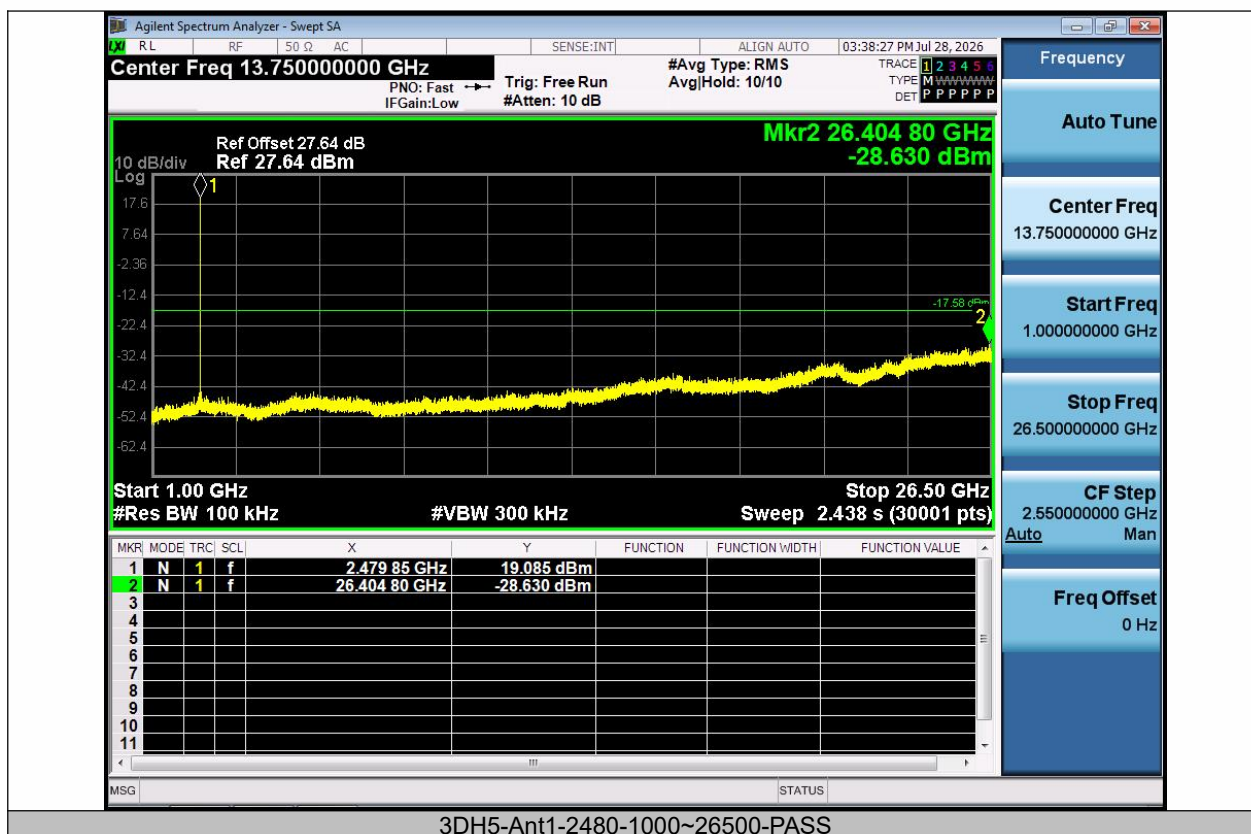


3DH5-Ant1-2441-30~1000-PASS

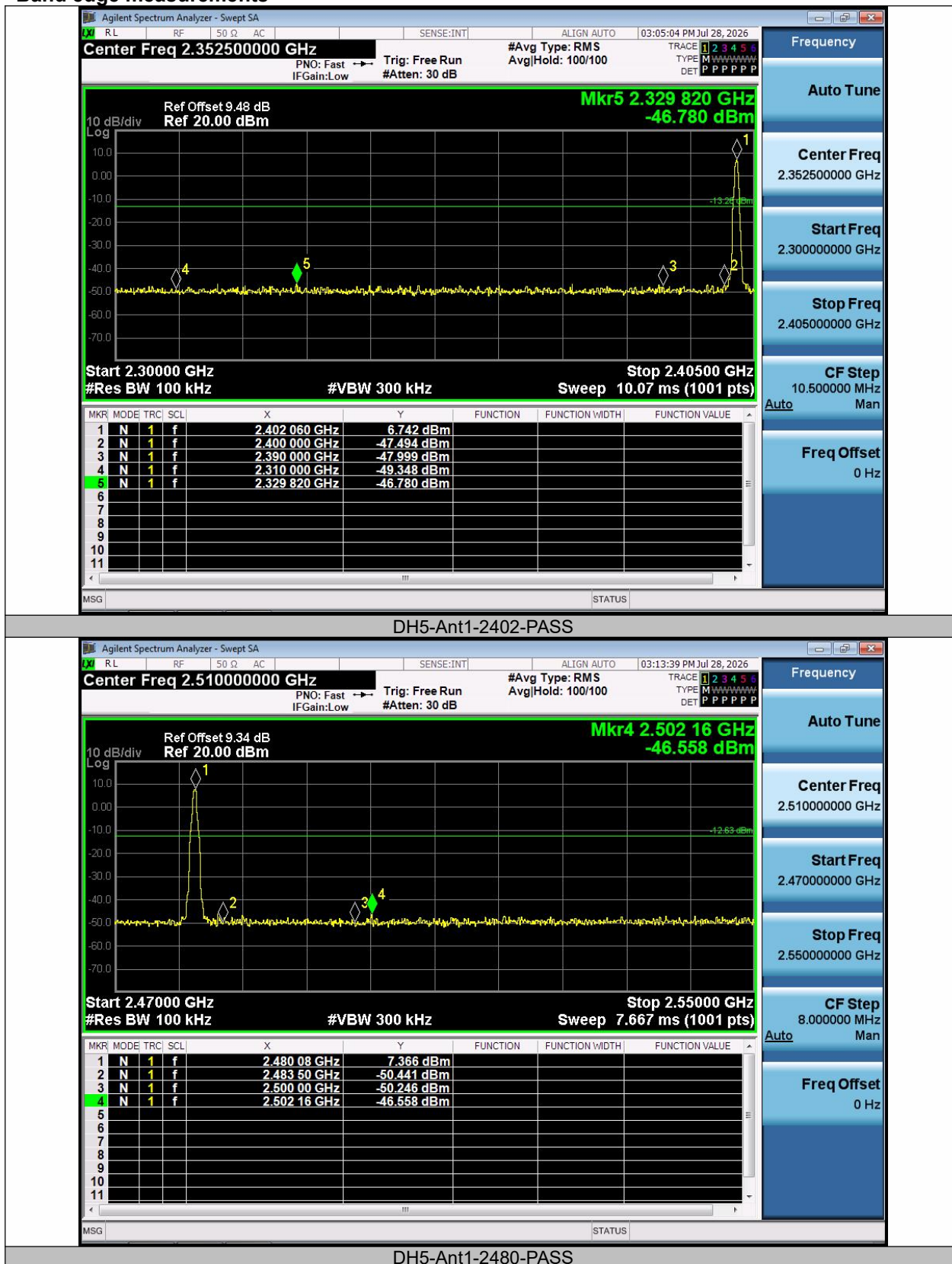


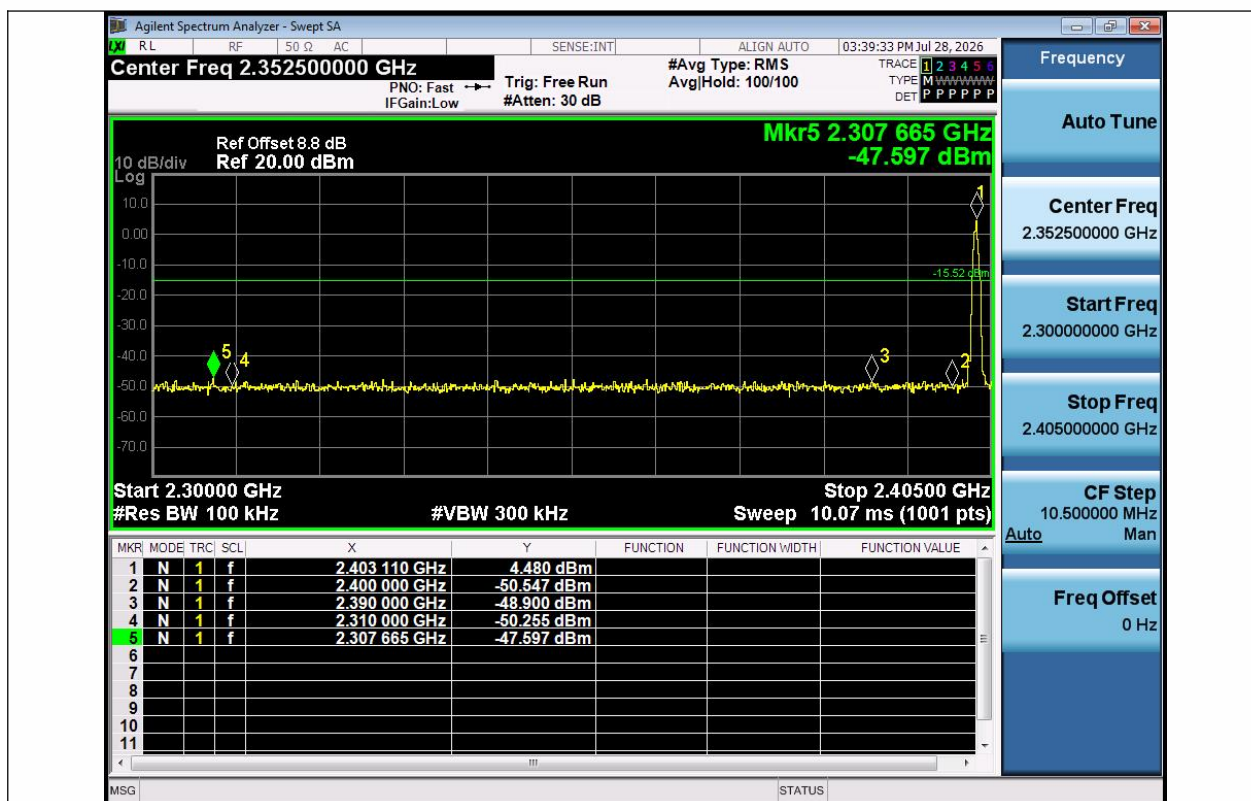
3DH5-Ant1-2441-1000~26500-PASS



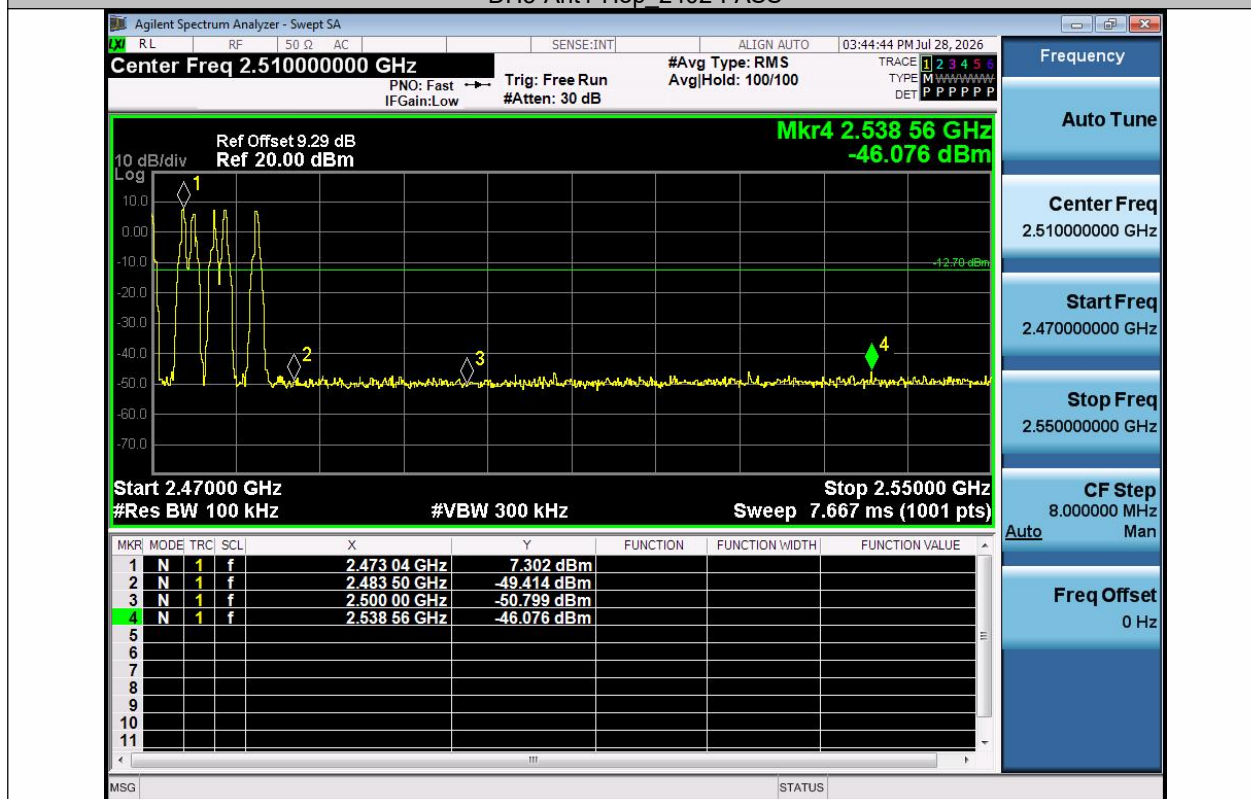


Band edge measurements

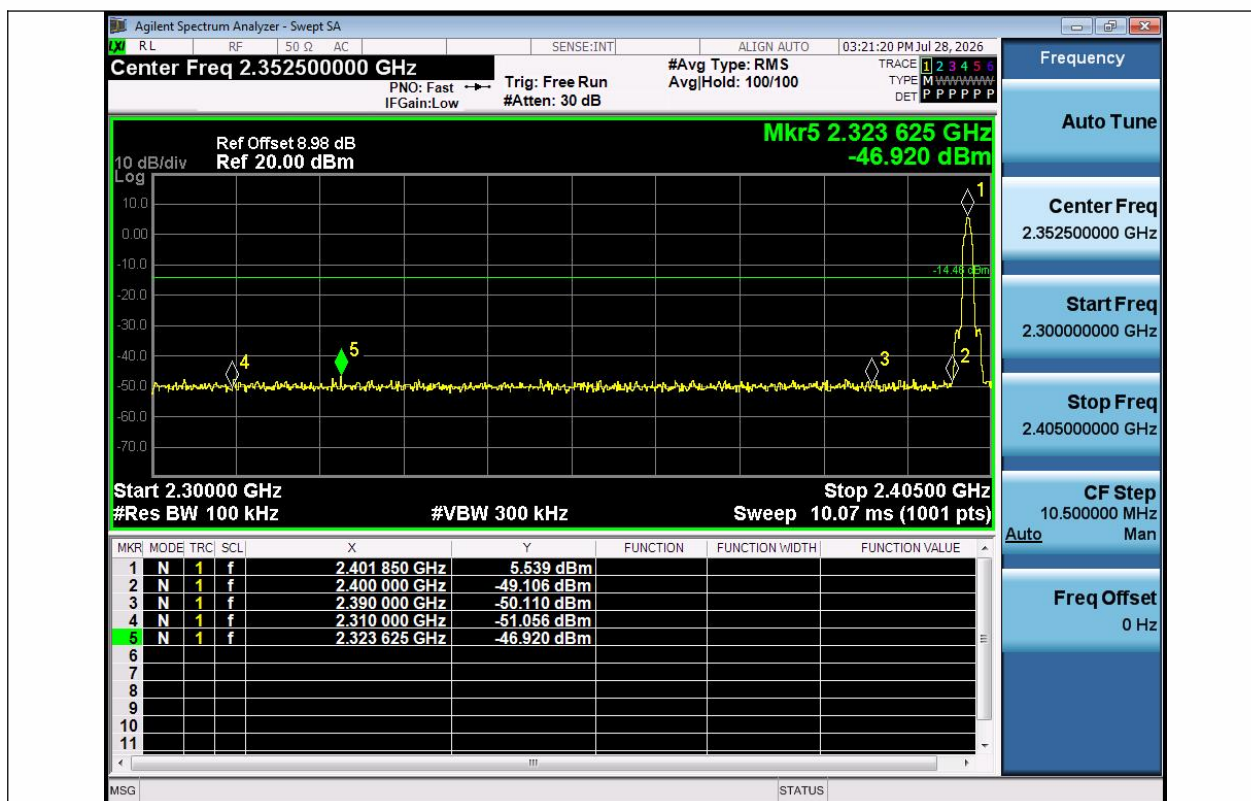




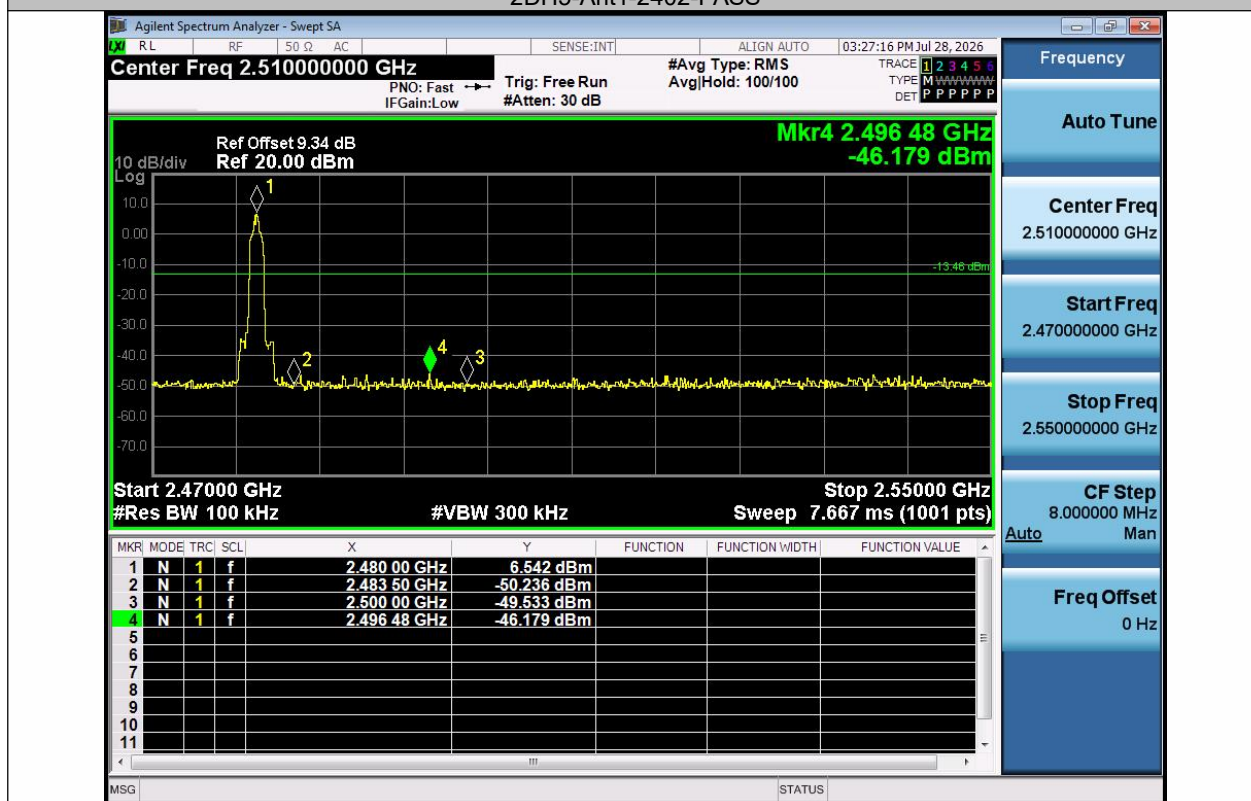
DH5-Ant1-Hop_2402-PASS



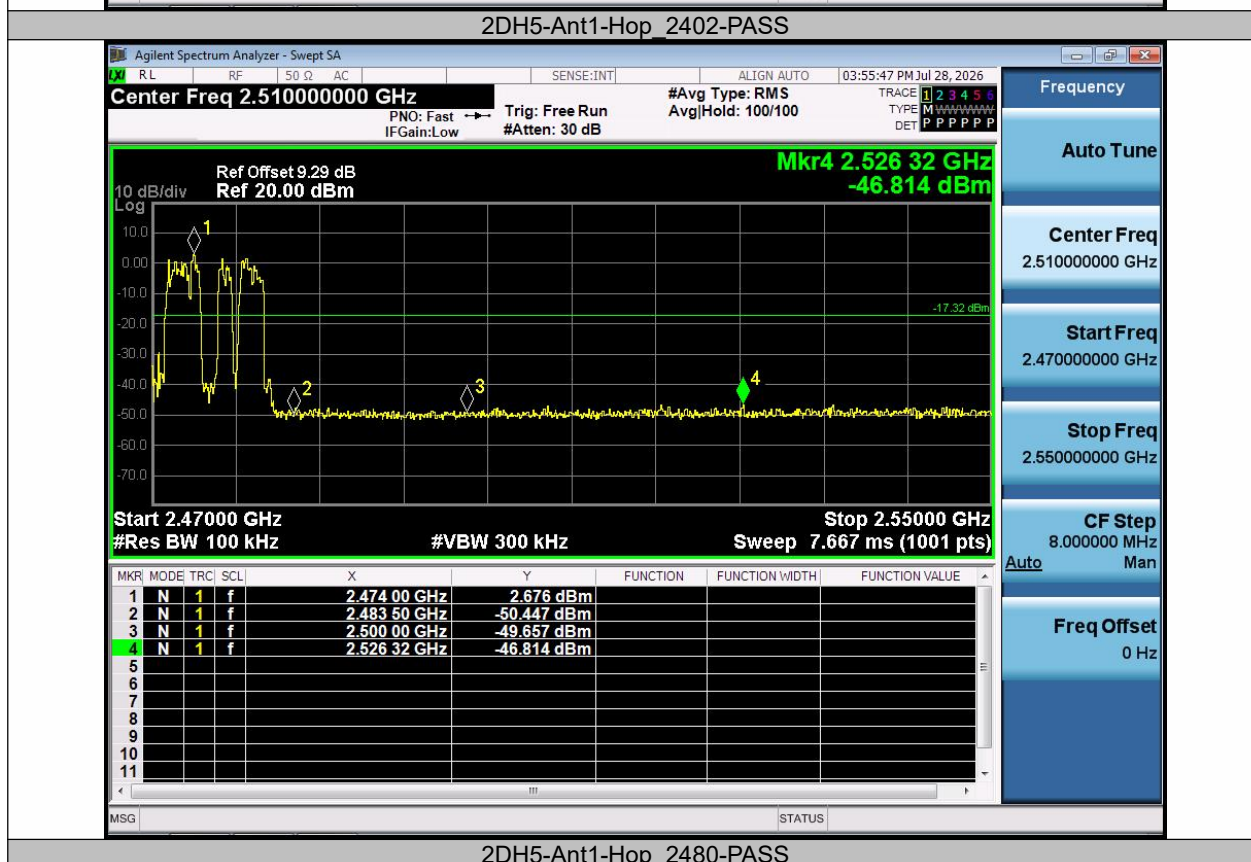
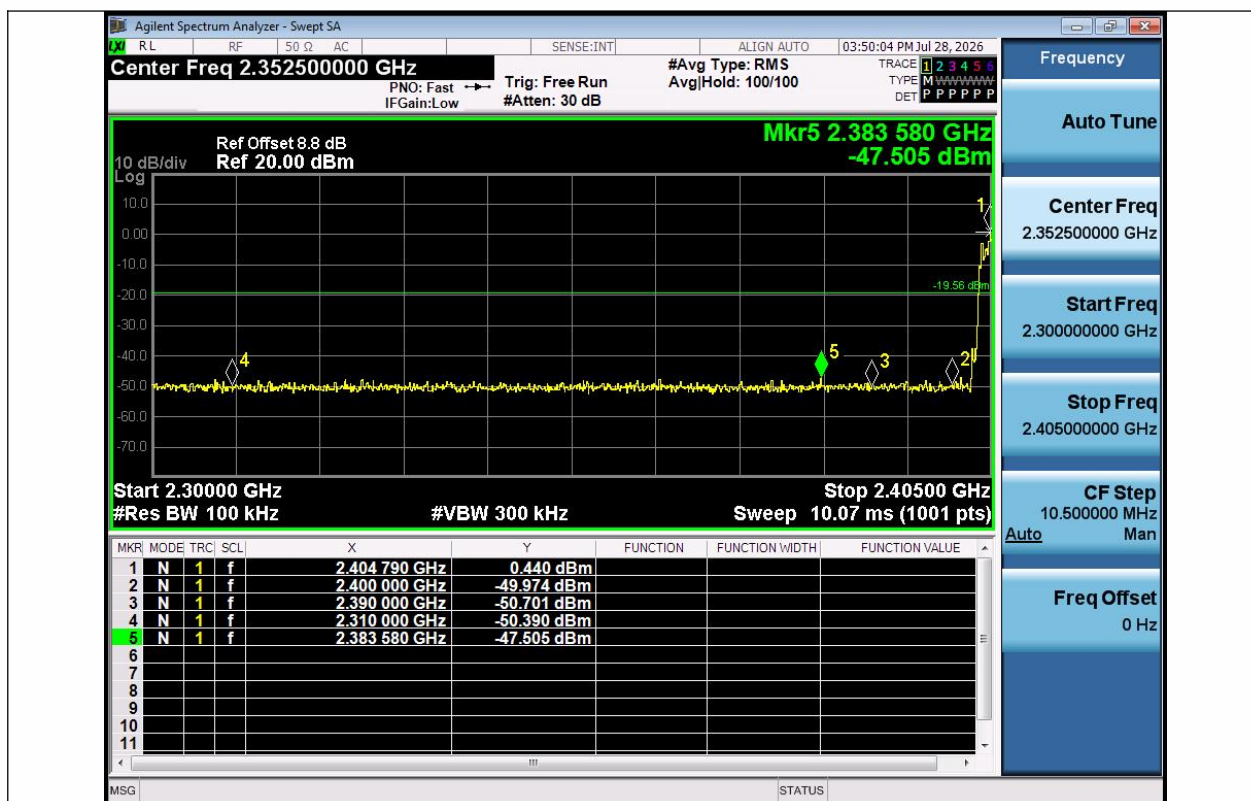
DH5-Ant1-Hop_2480-PASS

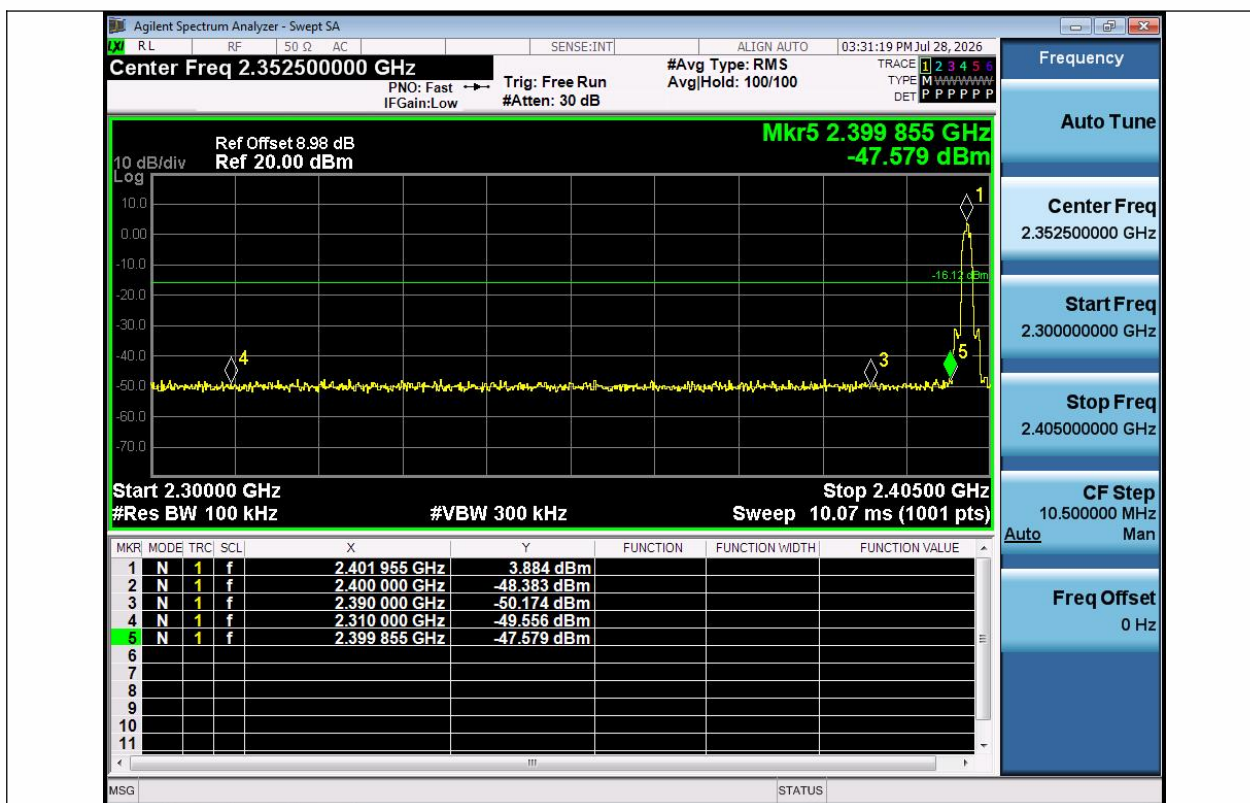


2DH5-Ant1-2402-PASS

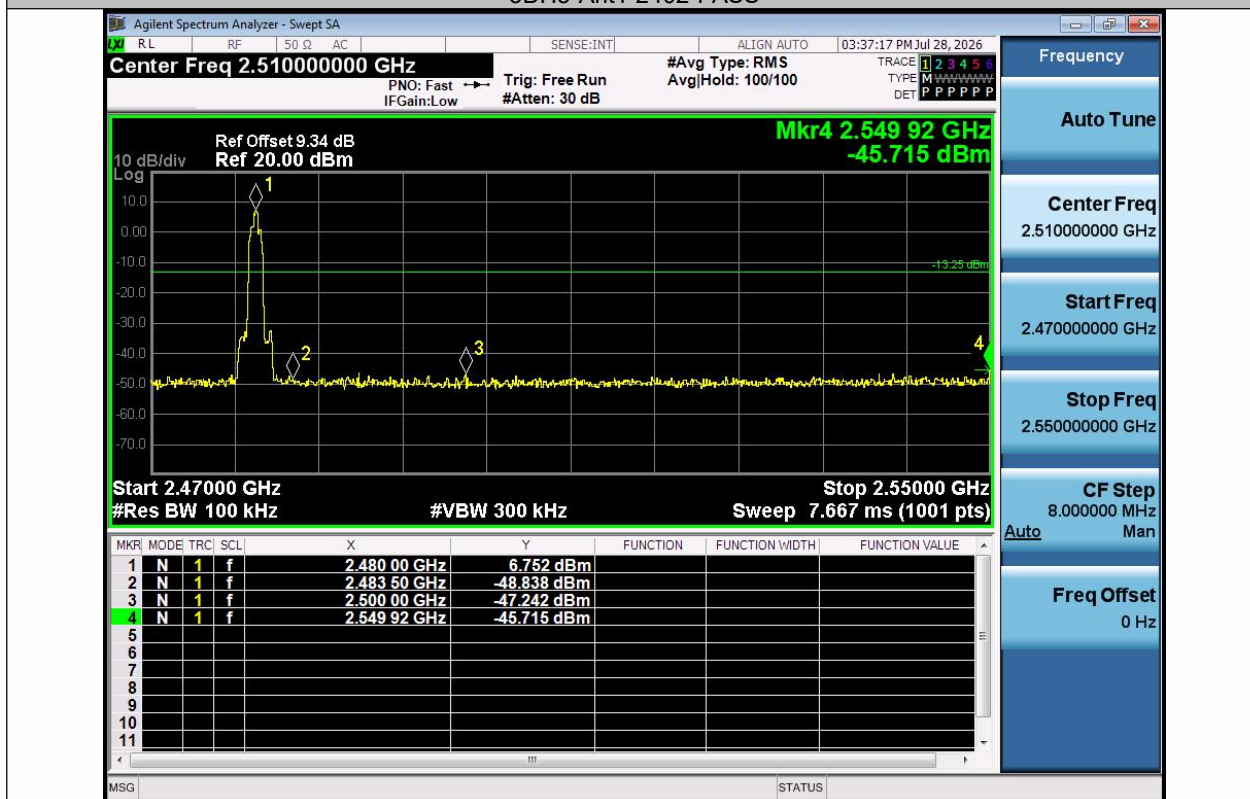


2DH5-Ant1-2480-PASS

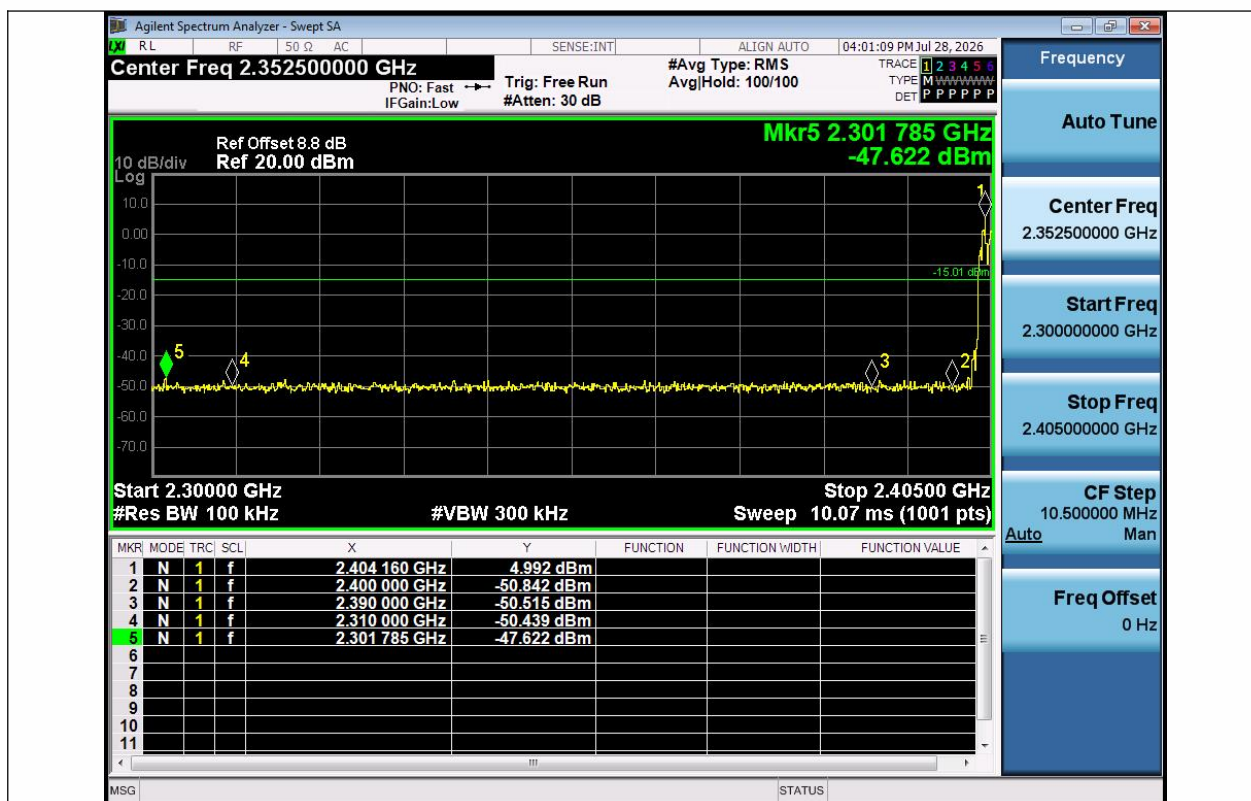




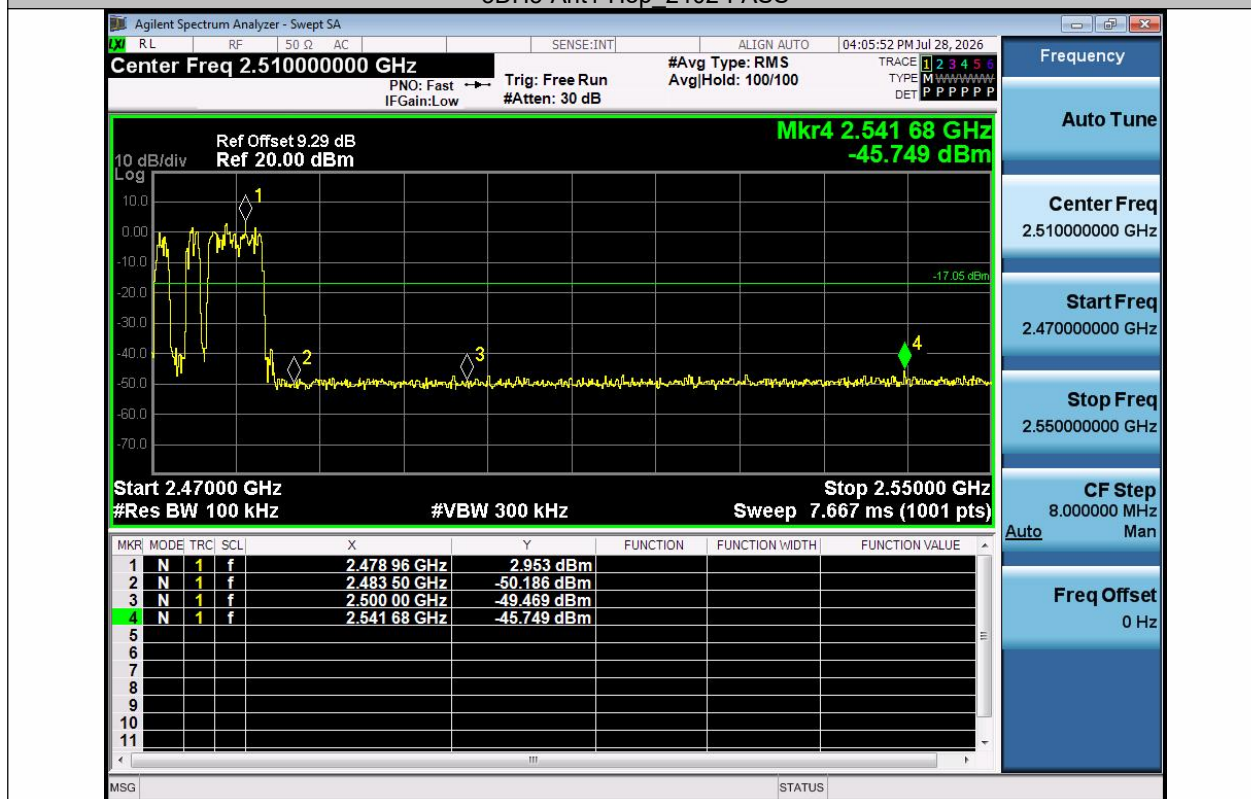
3DH5-Ant1-2402-PASS



3DH5-Ant1-2480-PASS



3DH5-Ant1-Hop_2402-PASS



3DH5-Ant1-Hop_2480-PASS

9.7 RADIATED SPURIOUS EMISSION

9.7.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 MEAS GUIDANCE v05r02.

9.7.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands.

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

9.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2.

9.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured.

RBW = 1 MHz.

VBW $\geq$ RBW.

Sweep = auto.

Detector function = peak.

Trace = max hold.

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured.

RBW = 100 kHz.

VBW $\geq$ RBW.

Sweep = auto.

Detector function = peak.

Trace = max hold.

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured.

RBW = 9kHz.

VBW $\geq$ RBW.

Sweep = auto.

Detector function = peak.

Trace = max hold.

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured.

RBW = 200Hz.

VBW $\geq$ RBW.

Sweep = auto.

Detector function = peak.

Trace = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Repeat above procedures until all frequency measured was complete.

9.7.5 Test Results

Pass

Temperature : 25°C ATM Pressure: 1011 mbar
Humidity : 45 % Test Engineer: YXP

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission Above 1GHz (1GHz to 25GHz)

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
10475.63	V	58.71	-45.58	-27	18.58
13166.25	V	62.21	-42.08	-27	15.08
17634.38	V	65.64	-38.65	-27	11.65
9868.13	H	58.47	-45.82	-27	18.82
13140.00	H	62.23	-42.06	-27	15.06
17008.13	H	64.97	-39.32	-27	12.32

Test mode: GFSK Frequency: Channel 39: 2441MHz

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
9853.13	V	58.11	-46.18	-27	19.18
13147.50	V	61.84	-42.45	-27	15.45
17581.88	V	66.52	-37.77	-27	10.77
10231.88	H	58.46	-45.83	-27	18.83
13149.38	H	61.55	-42.74	-27	15.74
16983.75	H	65.04	-39.25	-27	12.25

Test mode: GFSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
9896.25	V	58.82	-45.47	-27	18.47
13132.50	V	61.87	-42.42	-27	15.42
17621.25	V	65.34	-38.95	-27	11.95
9907.50	H	58.64	-45.65	-27	18.65
13164.38	H	62.4	-41.89	-27	14.89
17602.50	H	66.11	-38.18	-27	11.18

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

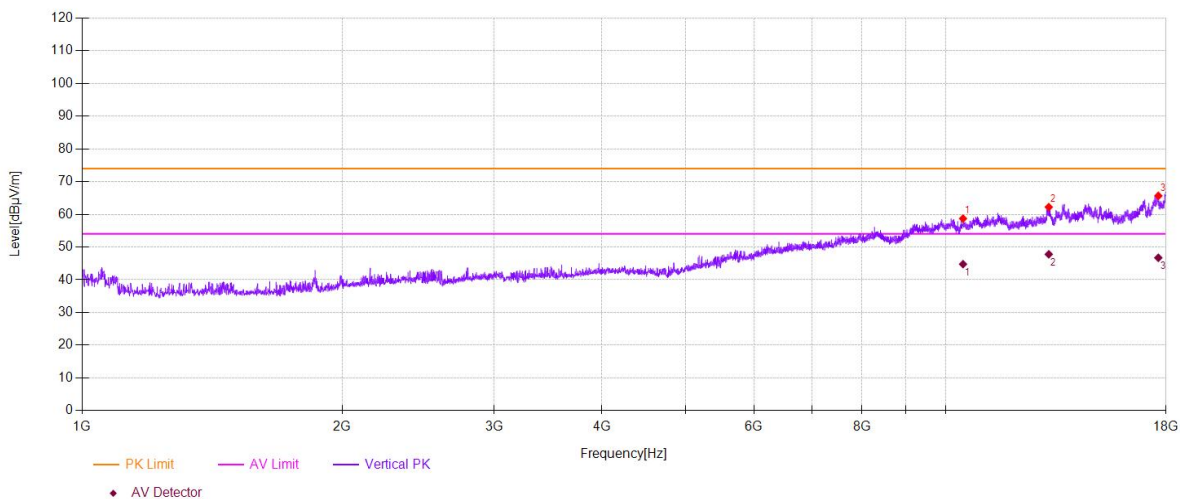


Test Graph

Channel 0: 2402MHz

GFSK

Vertical

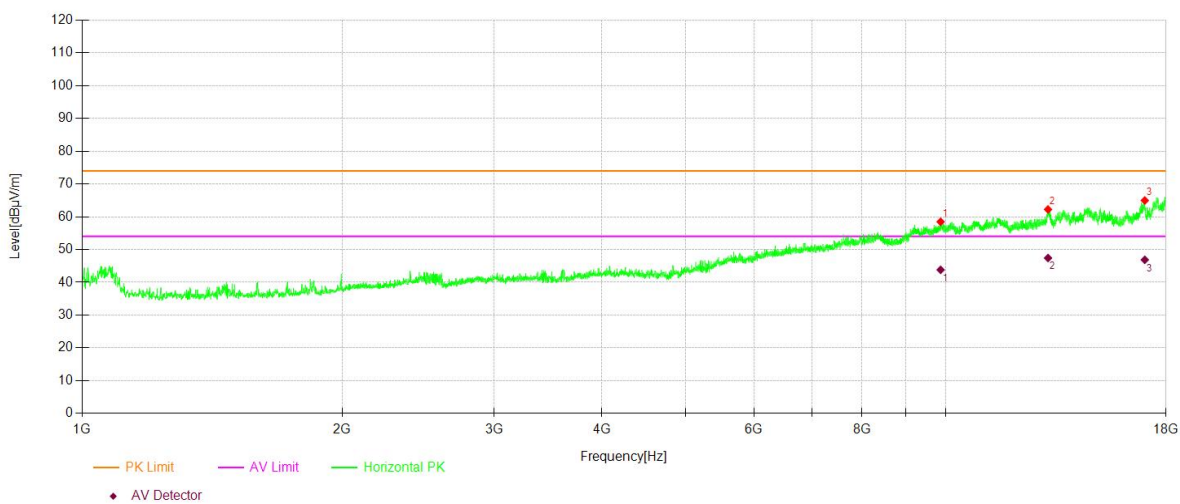


Test Graph

Channel 0: 2402MHz

GFSK

Horizontal

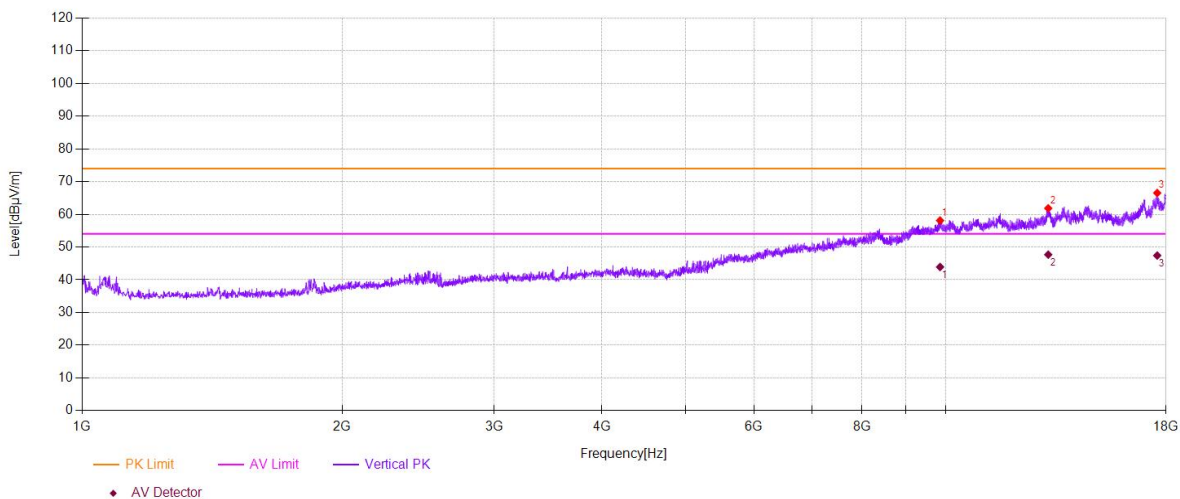


Test Graph

Channel 39: 2441MHz

GFSK

Vertical

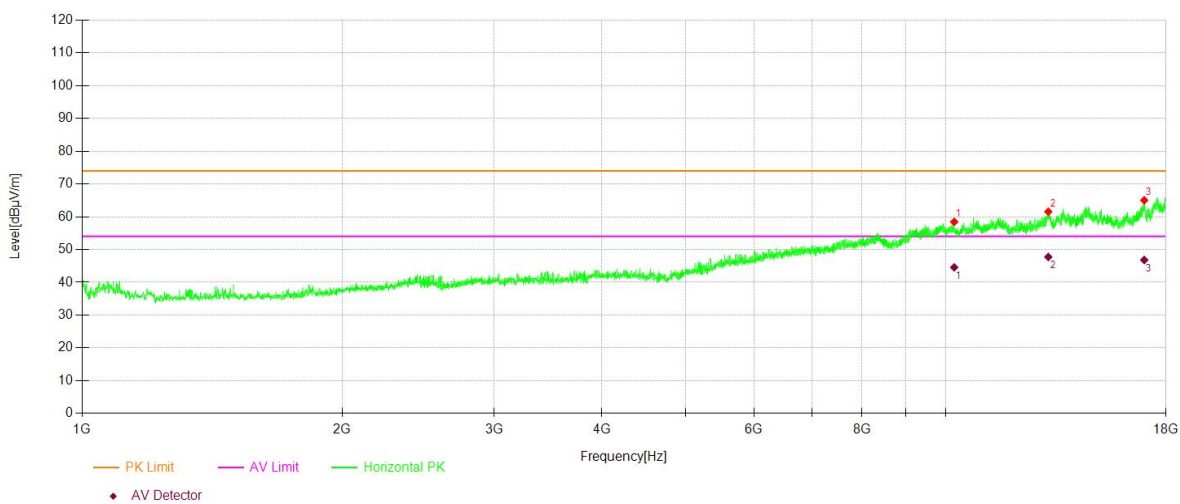


Test Graph

Channel 39: 2441MHz

GFSK

Horizontal

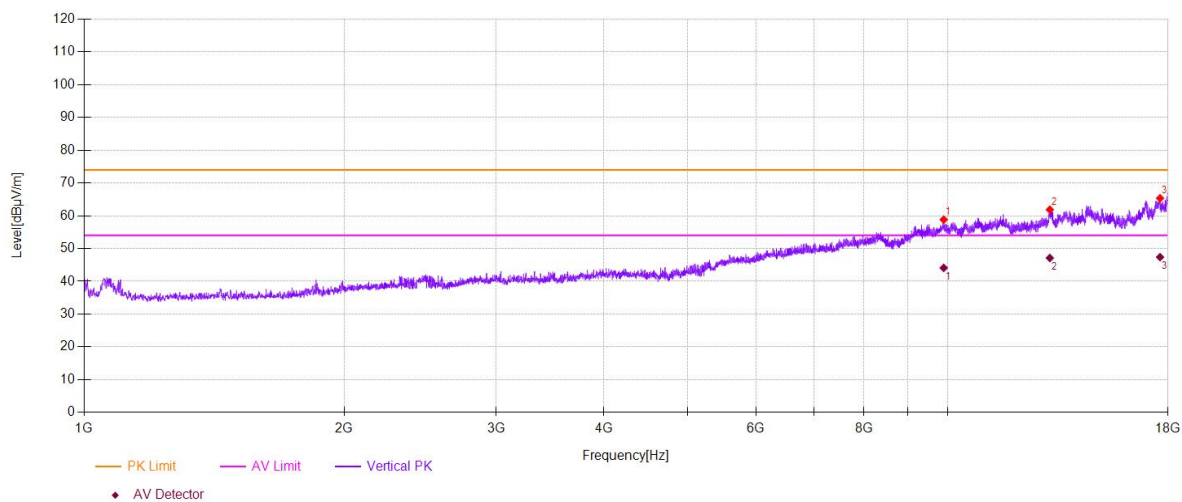


Test Graph

Channel 78: 2480MHz

GFSK

Vertical

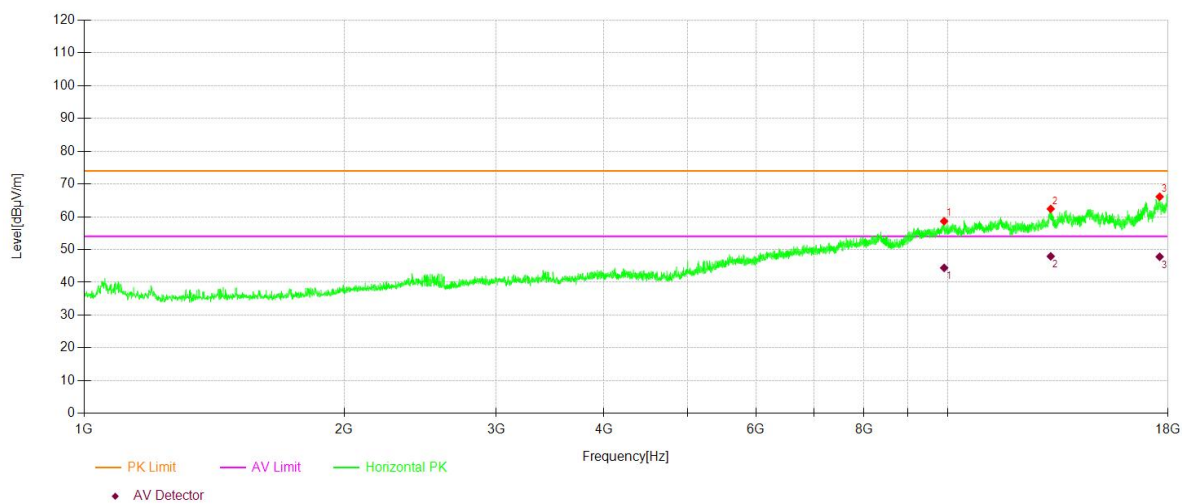


Test Graph

Channel 78: 2480MHz

GFSK

Horizontal



■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK, Hopping) mode have been tested, and the worst result(GFSK, Hopping) was report as below:

Test mode: GFSK Frequency: Channel 0: 2402MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2384.79	V	44.55	74.00	29.45	peak
2384.79	V	36.52	54.00	17.48	AVG
2384.10	H	44.59	74.00	29.41	peak
2384.10	H	36.50	54.00	17.50	AVG

Test mode: GFSK Frequency: Channel 78: 2480MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2484.18	V	47.71	74.00	26.29	peak
2484.18	V	36.90	54.00	17.10	AVG
2485.72	H	44.79	74.00	29.21	peak
2485.72	H	36.34	54.00	17.66	AVG

Test mode: GFSK Frequency: Hopping

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2389.95	V	43.38	74.00	30.62	peak
2485.87	V	44.42	74.00	29.58	AVG
2389.95	V	36.6	54.00	17.4	peak
2485.87	V	36.39	54.00	17.61	AVG
2389.07	H	43.93	74.00	30.07	peak
2484.29	H	44.3	74.00	29.7	AVG
2389.07	H	36.42	54.00	17.58	peak
2484.29	H	36.43	54.00	17.57	AVG

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Test Model

Spurious Emission in Restricted Band 2310-2390MHz

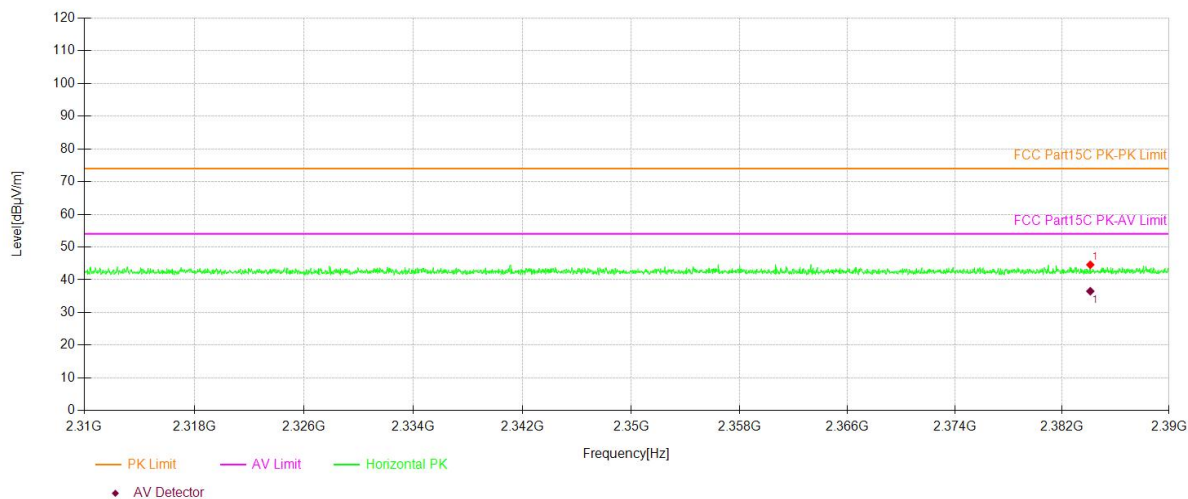
BT

Channel 0: 2402MHz

GFSK

H

Test By: CZF



Test Model

Spurious Emission in Restricted Band 2310-2390MHz

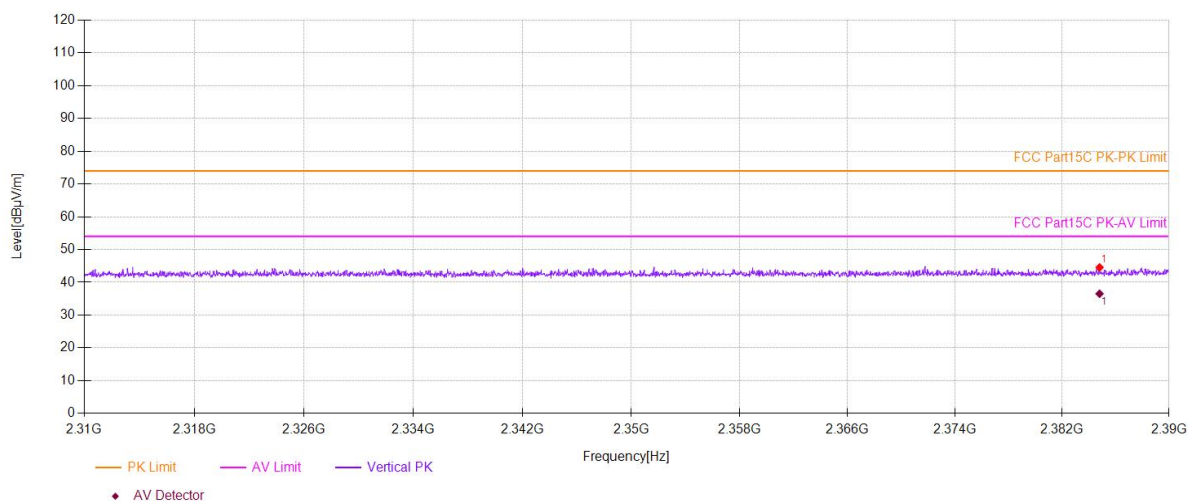
BT

Channel 0: 2402MHz

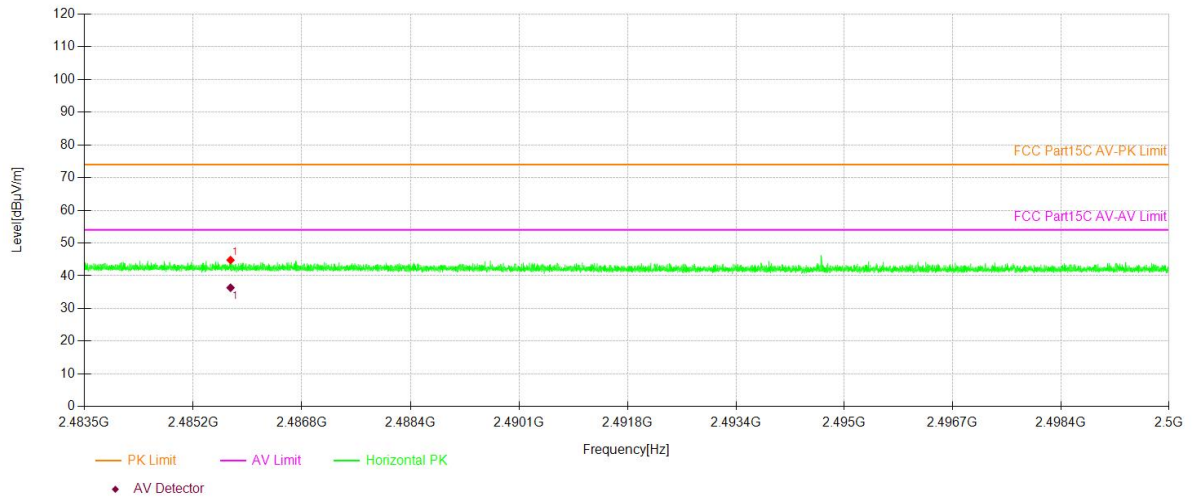
GFSK

V

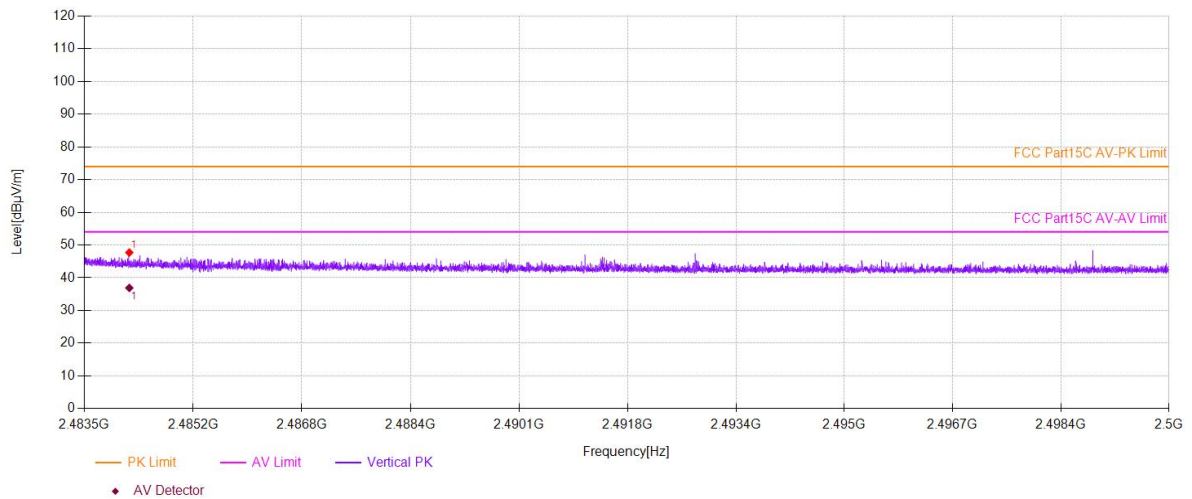
Test By: CZF



Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz		
	BT		
	Channel 78: 2480MHz	GFSK	H
		Test By: CZF	



Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz		
	BT		
	Channel 78: 2480MHz	GFSK	V
		Test By: CZF	

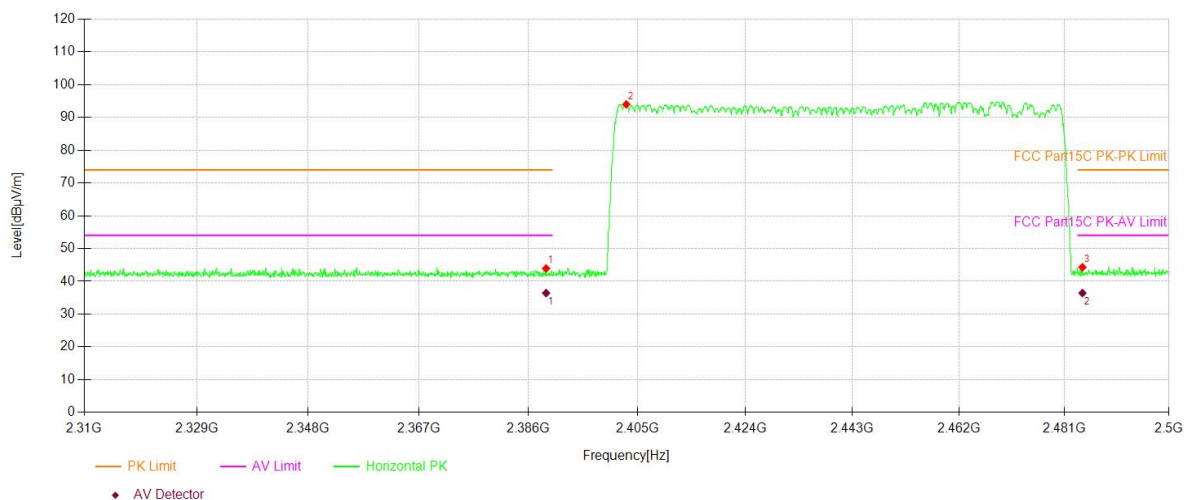


Test Model

Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz
BT
Hopping

GFSK
Test By: CZF

H



Test Model

Spurious Emission in Restricted Band 2310-2390MHz and 2400-2483.5MHz
BT
Hopping

GFSK
Test By: CZF

V

