RF Test Report

For

Project No.:	ZKT-240801L9141E-6
Model:	EF6-2
Client:	Autel Robotics Co., Ltd.
Manufacturer:	Autel Robotics Co., Ltd.
Product Description:	Autel Smart Controller SE V2
Test Engineer:	Jim Liu
Test Date:	2024-05-28

Test Summary

Item	**Result**
Duty Cycle	Pass
Bandwidth	Pass
Maximum Conducted Output Power	Pass
Maximum Power Spectral Density	Pass
Frequency Stability	Pass
Form731	Pass

1. Duty Cycle

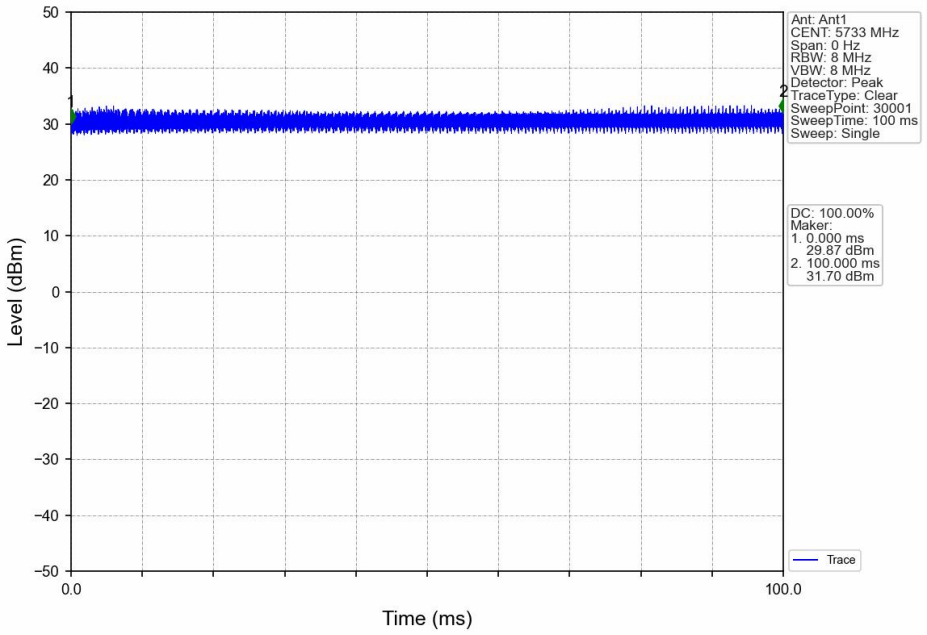
1.1 Ant1

1.1.1 Test Result

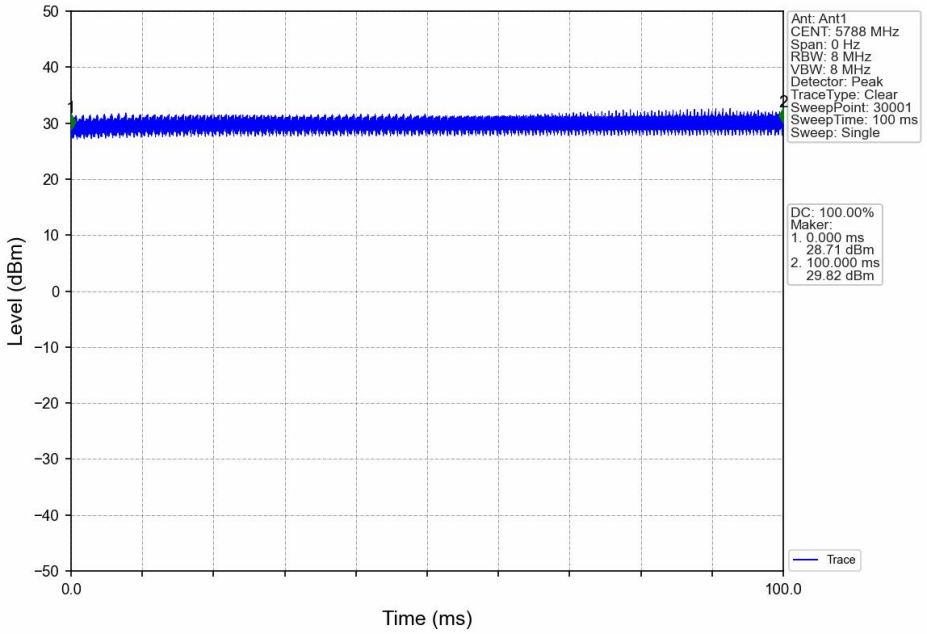
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
QPSK	MIMO	5733	100.000	100.000	100.00	0.00	0.00
		5788	100.000	100.000	100.00	0.00	0.00
		5842	100.000	100.000	100.00	0.00	0.00
16QAM	MIMO	5733	100.000	100.000	100.00	0.00	0.00
		5788	100.000	100.000	100.00	0.00	0.00
		5842	100.000	100.000	100.00	0.00	0.00

1.1.2 Test Graph

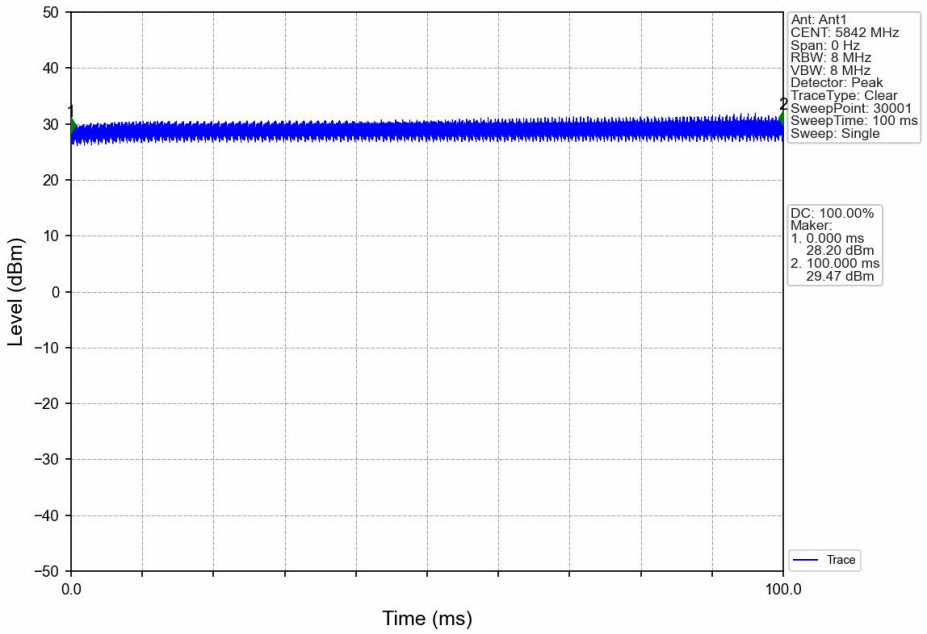
QPSK_LCH_5733MHz_Ant1_NTNV



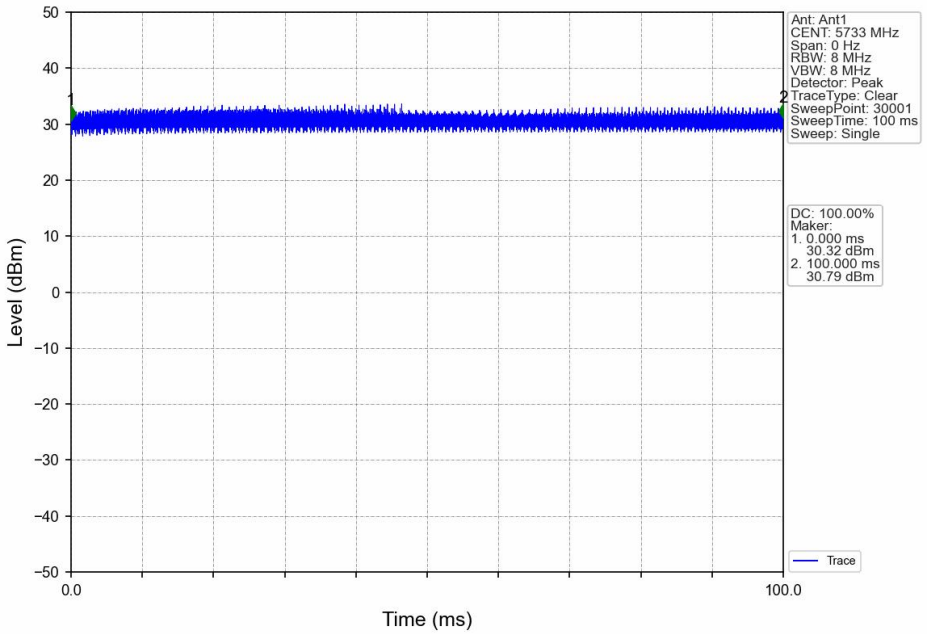
QPSK_MCH_5788MHz_Ant1_NTNV



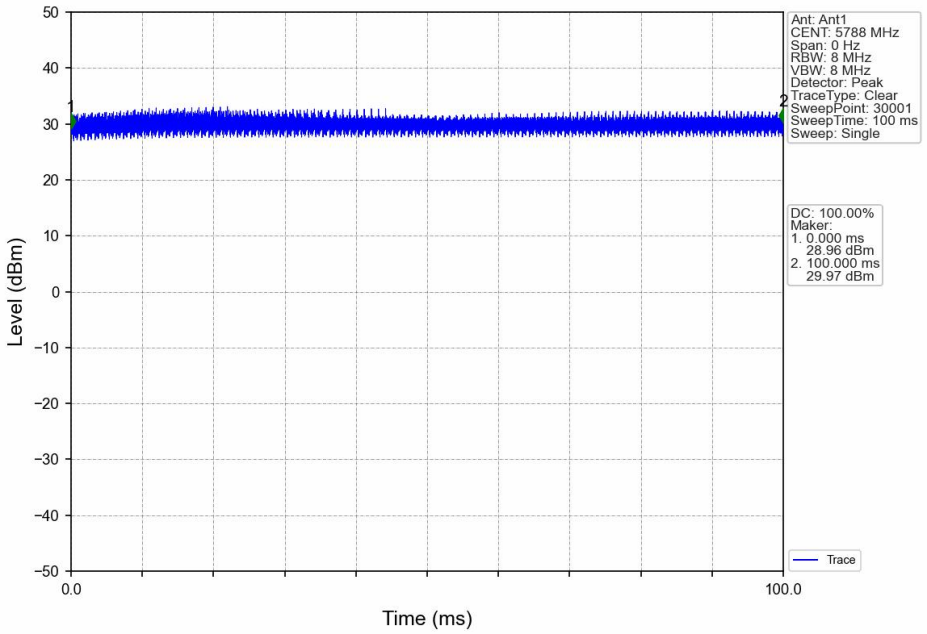
QPSK_HCH_5842MHz_Ant1_NTNV



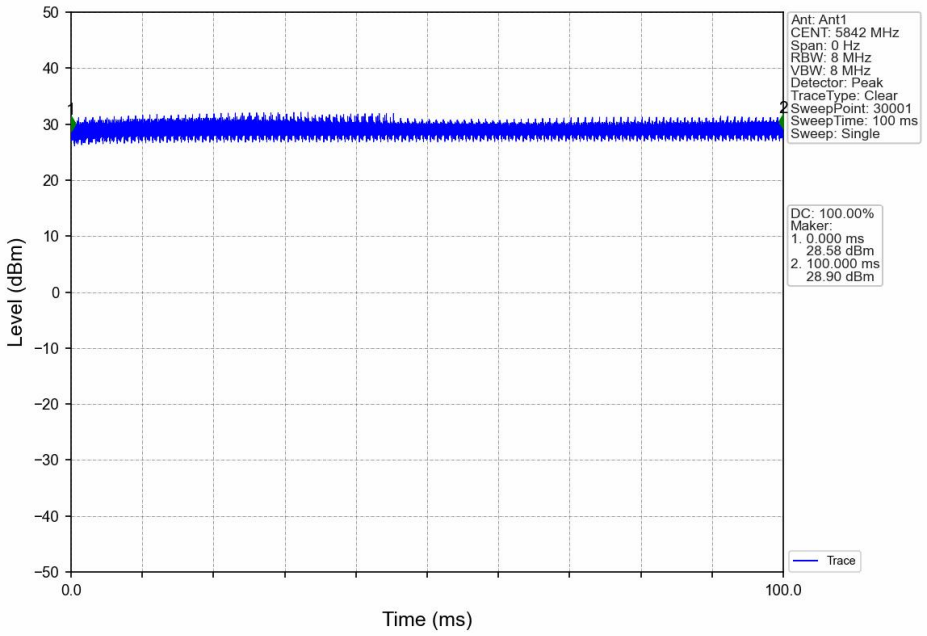
16QAM_LCH_5733MHz_Ant1_NTNV



16QAM_MCH_5788MHz_Ant1_NTNV



16QAM_HCH_5842MHz_Ant1_NTNV



2. Bandwidth

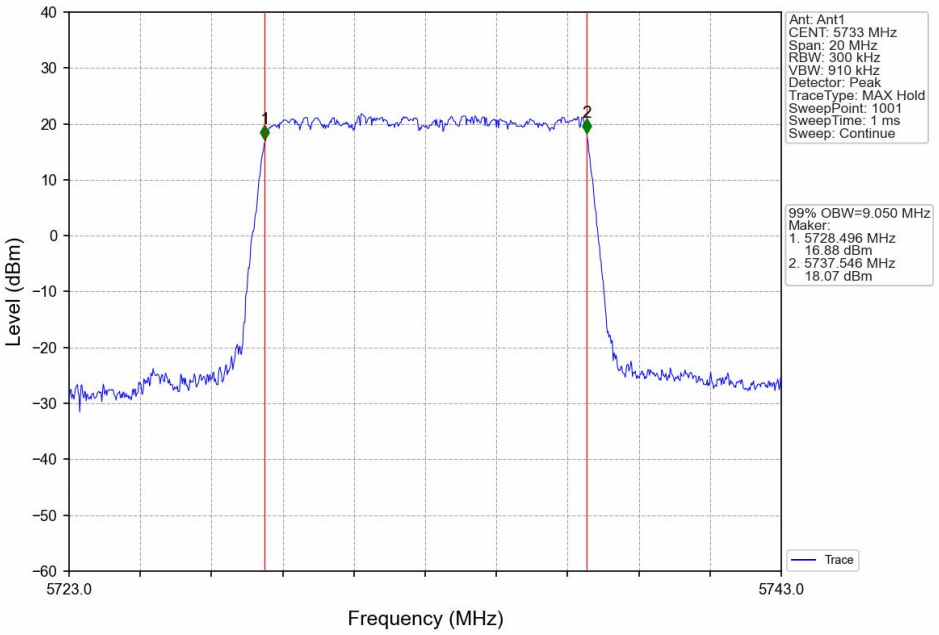
2.1 OBW

2.1.1 Test Result

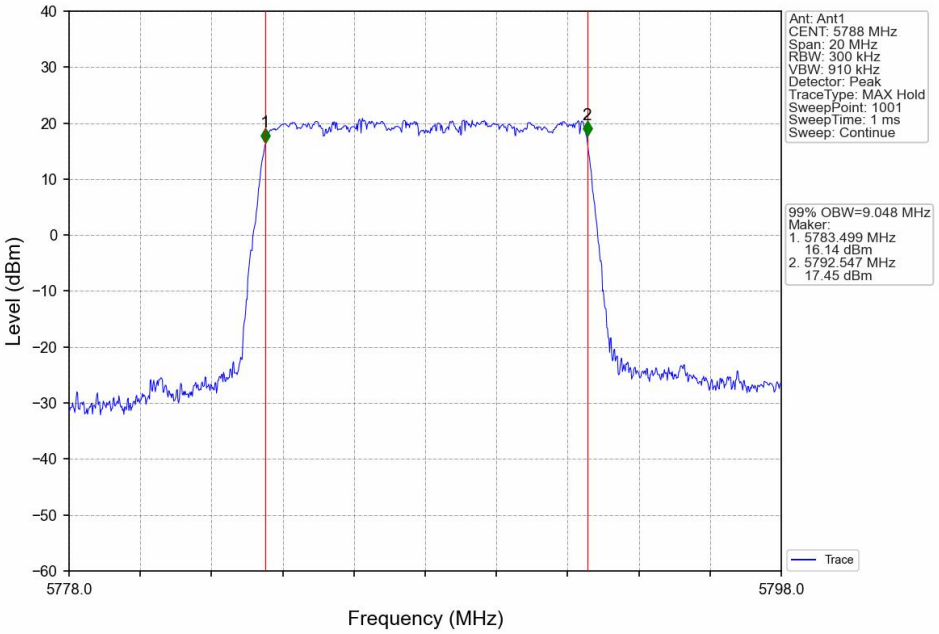
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
QPSK	MIMO	5733	MIMO	9.050	/	Pass
		5788	MIMO	9.048	/	Pass
		5842	MIMO	9.050	/	Pass
16QAM	MIMO	5733	MIMO	9.054	/	Pass
		5788	MIMO	9.041	/	Pass
		5842	MIMO	9.060	/	Pass

2.1.2 Test Graph

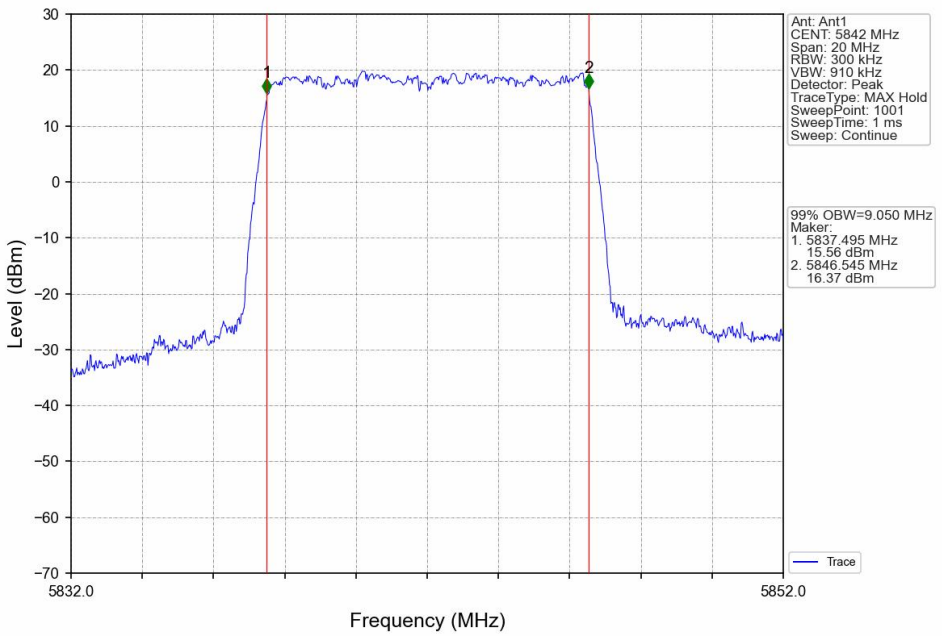
QPSK_LCH_5733MHz_MIMO_NTNV



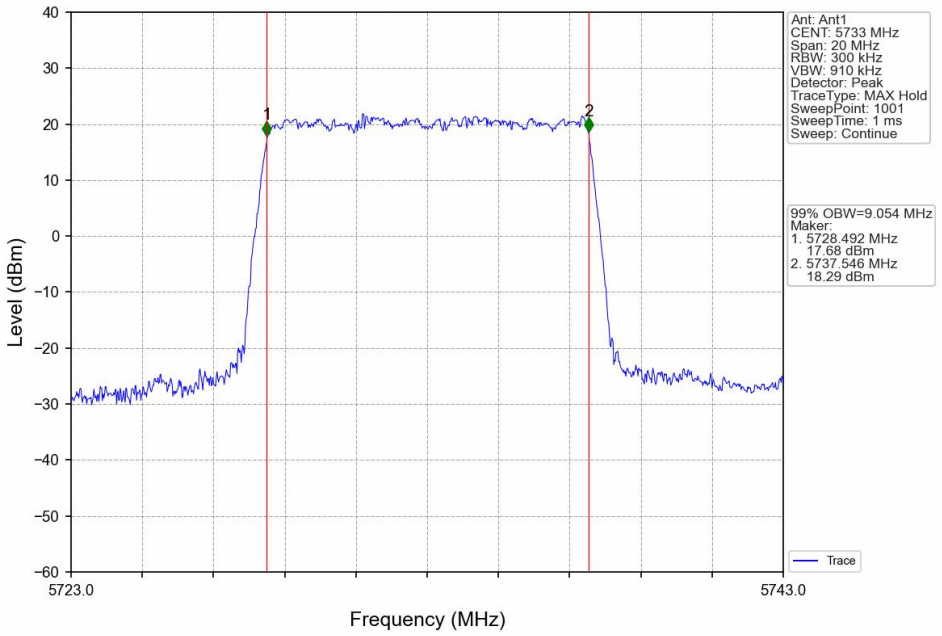
QPSK_MCH_5788MHz_MIMO_NTNV



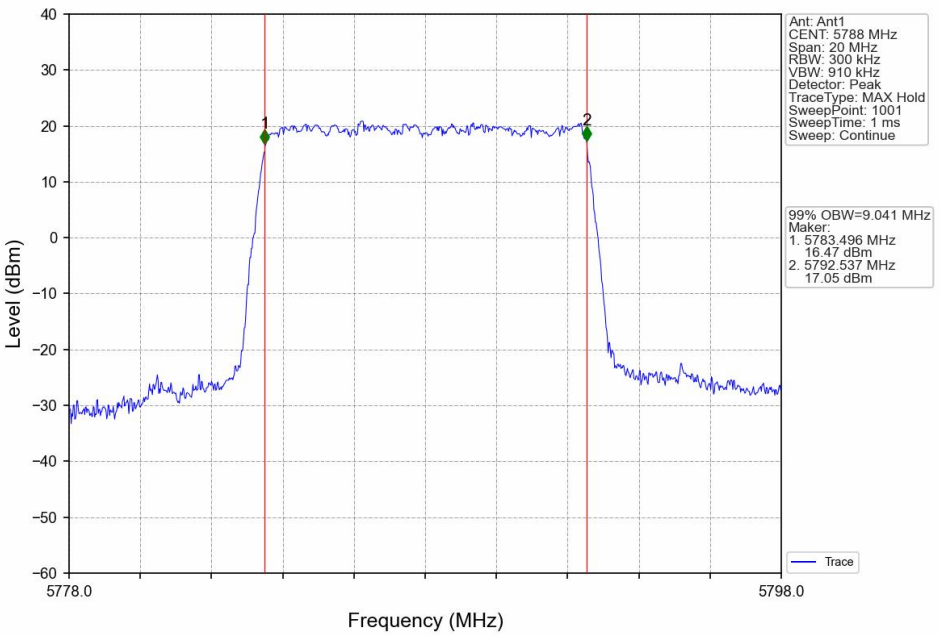
QPSK_HCH_5842MHz_MIMO_NTNV



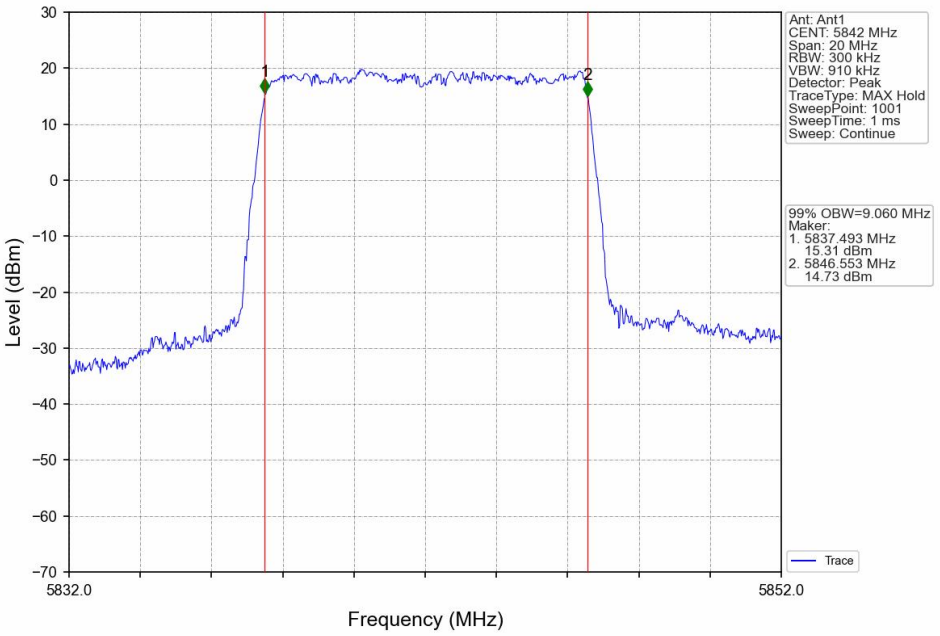
16QAM_LCH_5733MHz_MIMO_NTNV



16QAM_MCH_5788MHz_MIMO_NTNV



16QAM_HCH_5842MHz_MIMO_NTNV



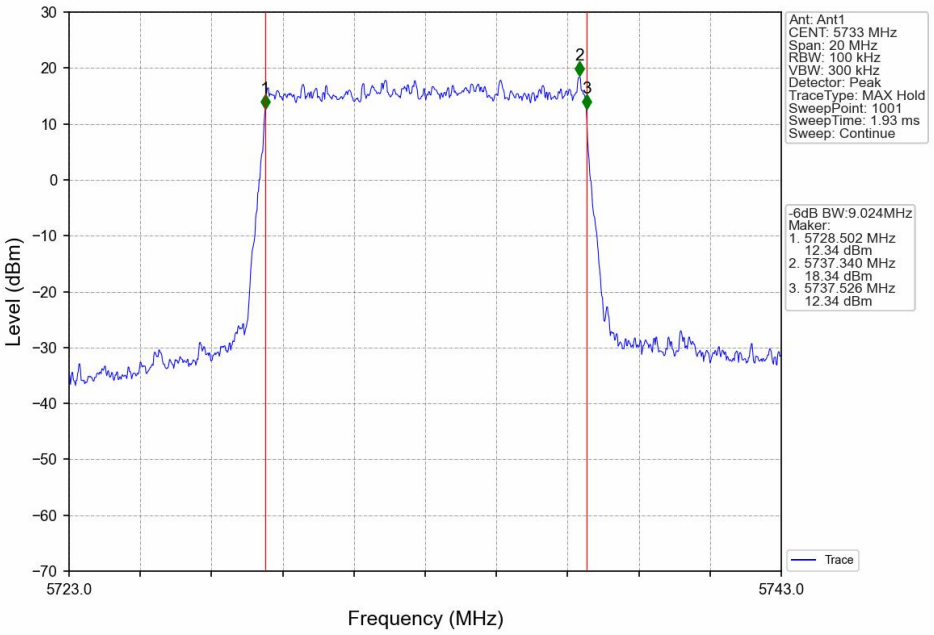
2.2 6dB BW

2.2.1 Test Result

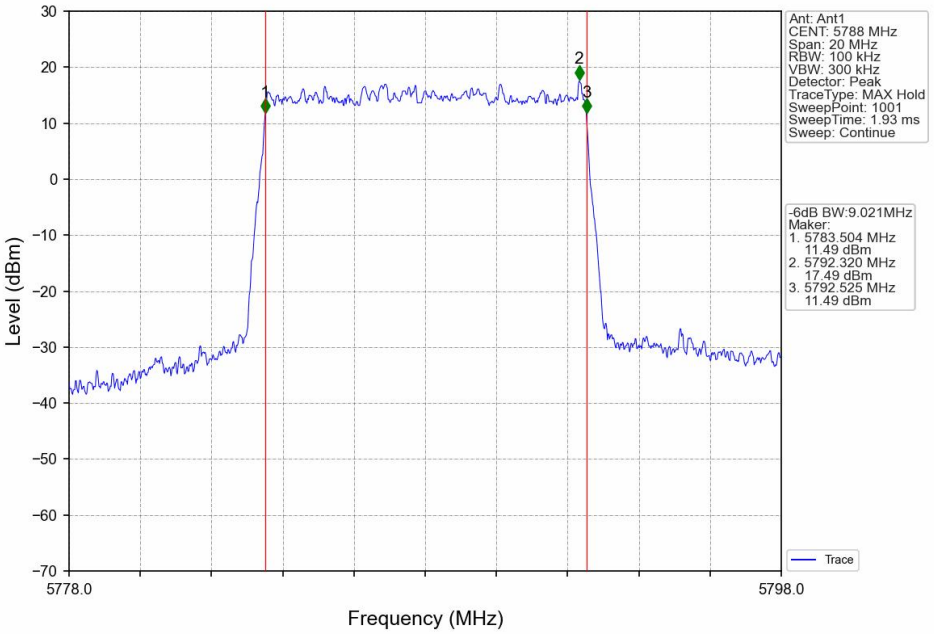
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
QPSK	MIMO	5733	MIMO	9.024	>=0.5	Pass
		5788	MIMO	9.021	>=0.5	Pass
		5842	MIMO	9.009	>=0.5	Pass
16QAM	MIMO	5733	MIMO	9.017	>=0.5	Pass
		5788	MIMO	9.018	>=0.5	Pass
		5842	MIMO	9.007	>=0.5	Pass

2.2.2 Test Graph

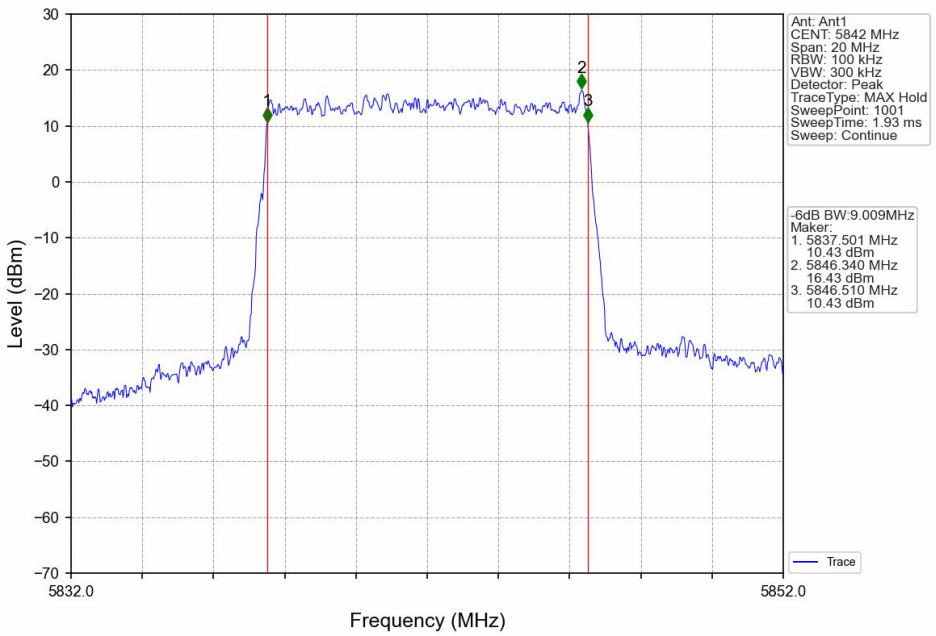
QPSK_LCH_5733MHz_MIMO_NTNV



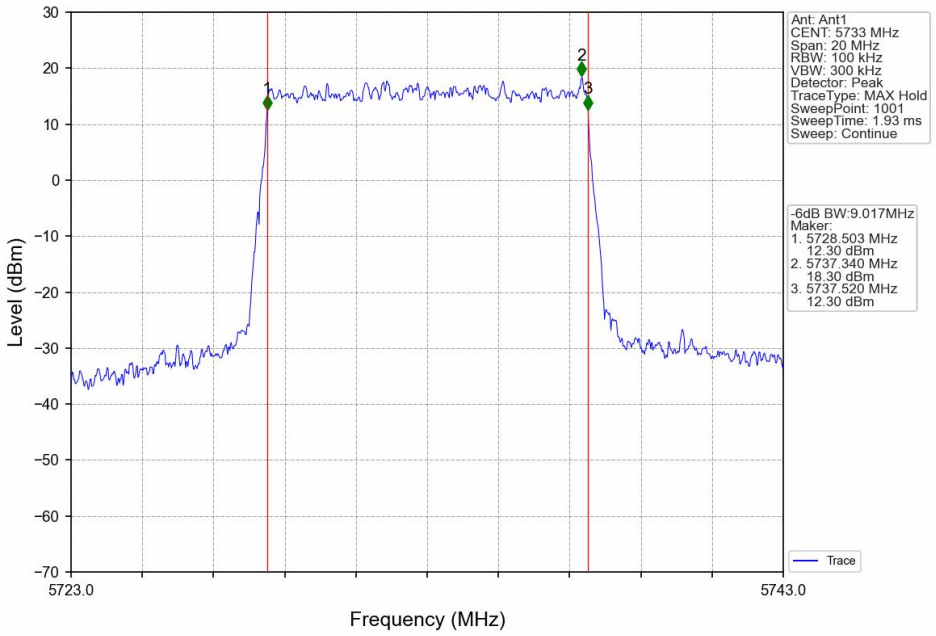
QPSK_MCH_5788MHz_MIMO_NTNV



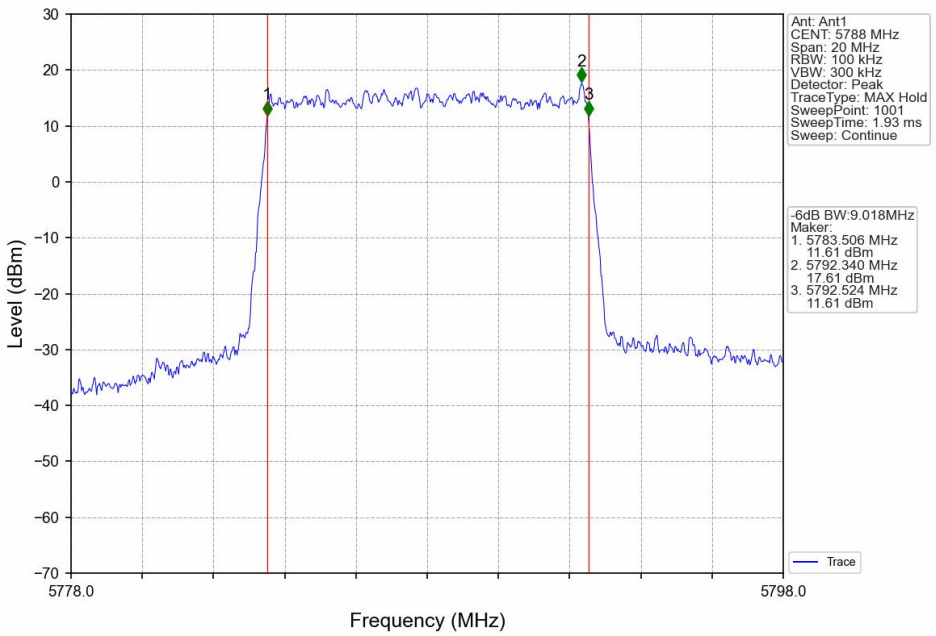
QPSK_HCH_5842MHz_MIMO_NTNV



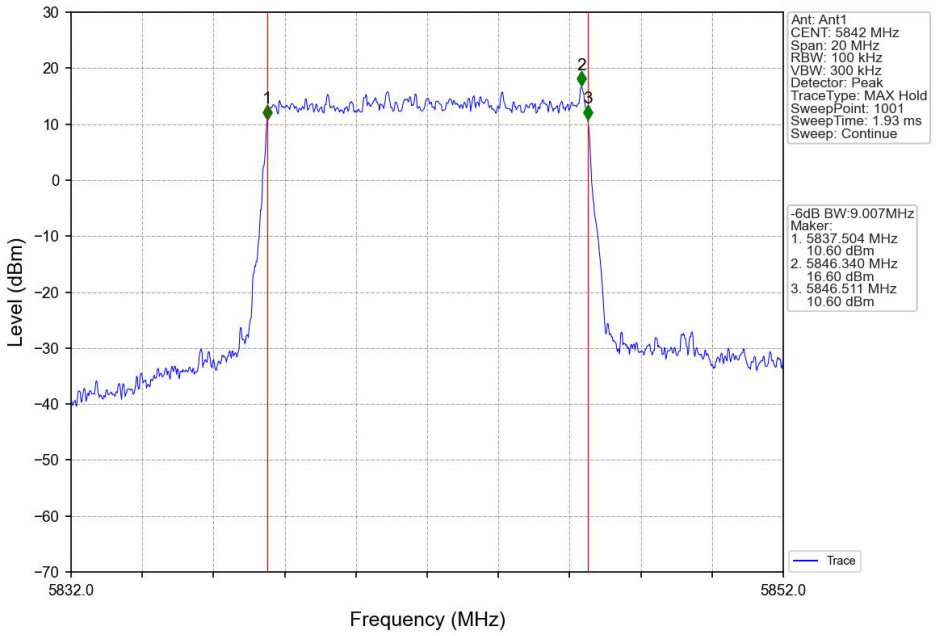
16QAM_LCH_5733MHz_MIMO_NTNV



16QAM_MCH_5788MHz_MIMO_NTNV



16QAM_HCH_5842MHz_MIMO_NTNV



3. Maximum Conducted Output Power

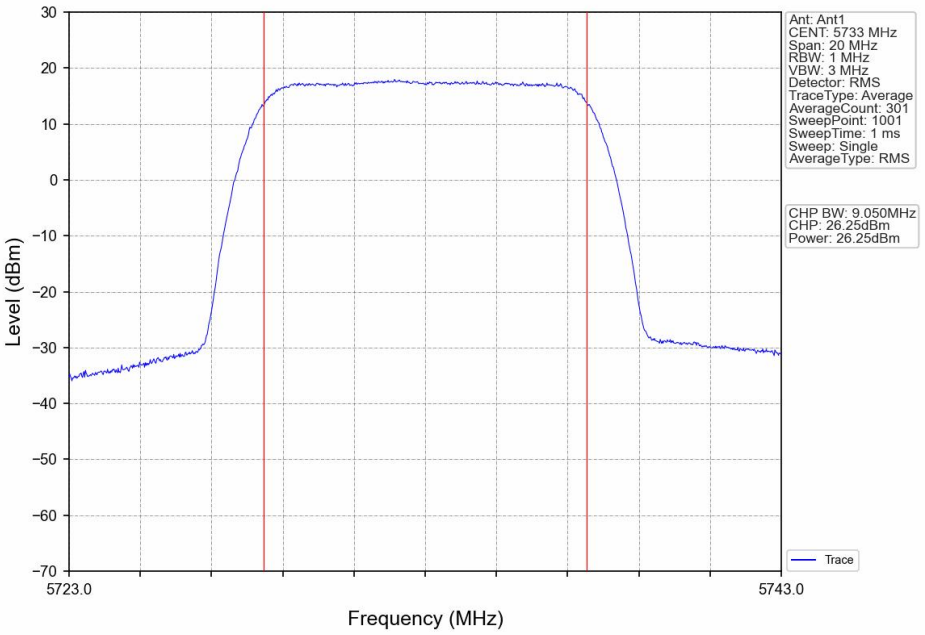
3.1 Power

3.1.1 Test Result

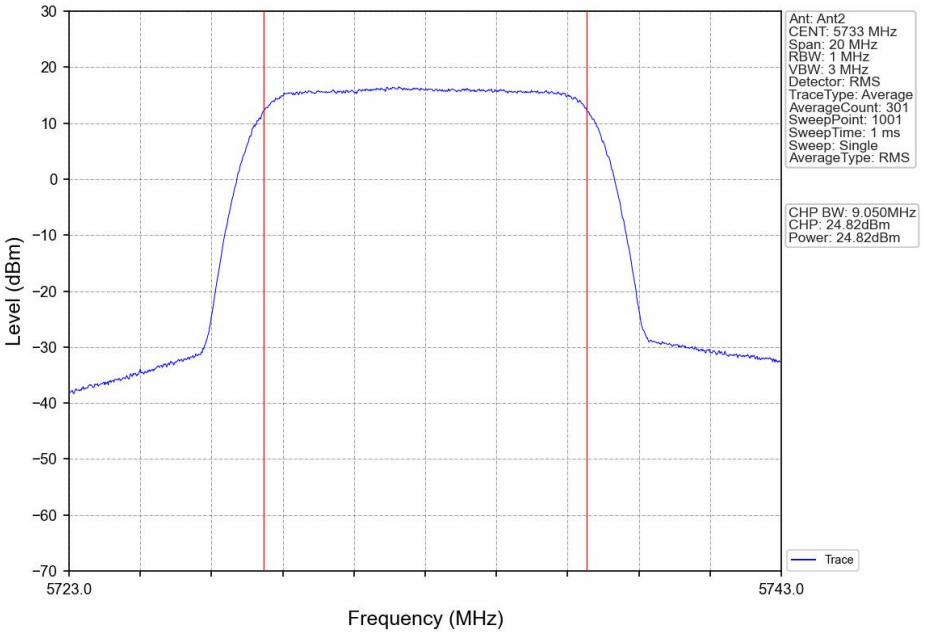
Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)				Verdict
			ANT1	ANT2	MIMO	Limit	
QPSK	MIMO	5733	26.25	24.82	28.60	<=30	Pass
		5788	25.40	24.23	27.86	<=30	Pass
		5842	24.30	23.50	26.93	<=30	Pass
16QAM	MIMO	5733	26.21	24.78	28.56	<=30	Pass
		5788	25.35	24.17	27.81	<=30	Pass
		5842	24.28	23.49	26.91	<=30	Pass
Note1: Antenna Gain: Ant1: 3.50dBi; Ant2: 3.10dBi; Note2: Directional Gain: Uncorrelated(Directional Gain = Ant Gain)							

3.1.2 Test Graph

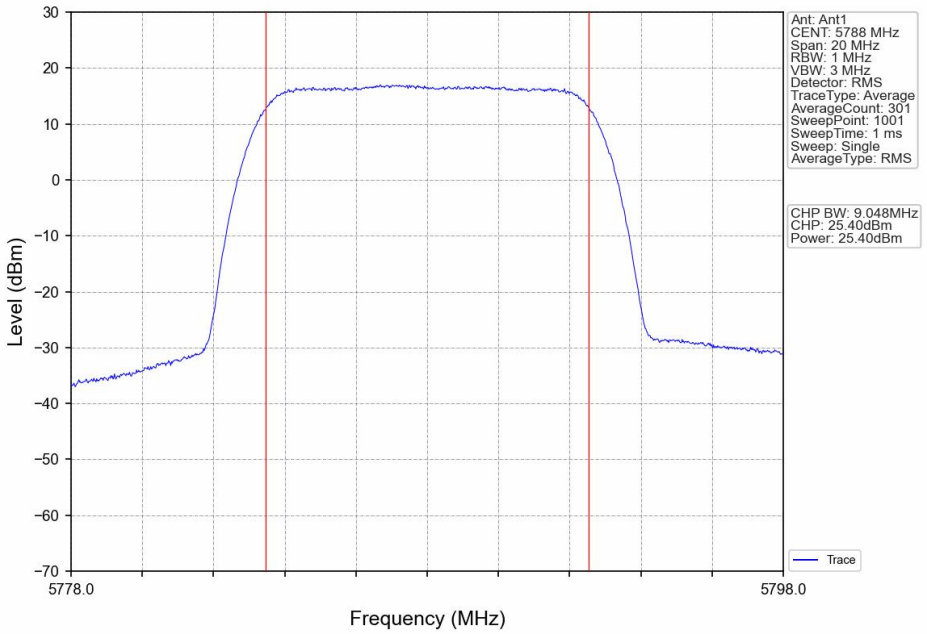
QPSK_LCH_5733MHz_Ant1_NTNV



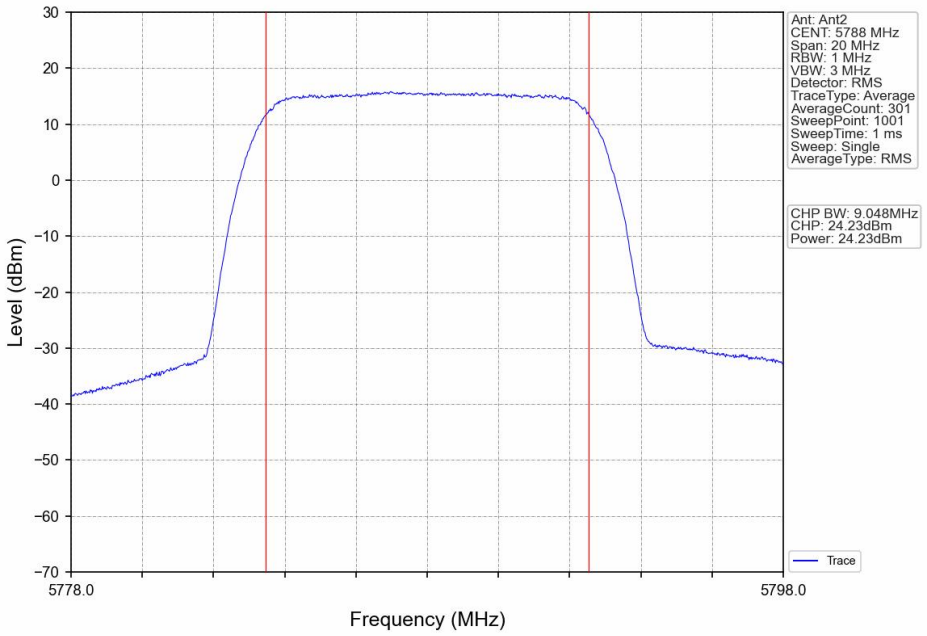
QPSK_LCH_5733MHz_Ant2_NTNV



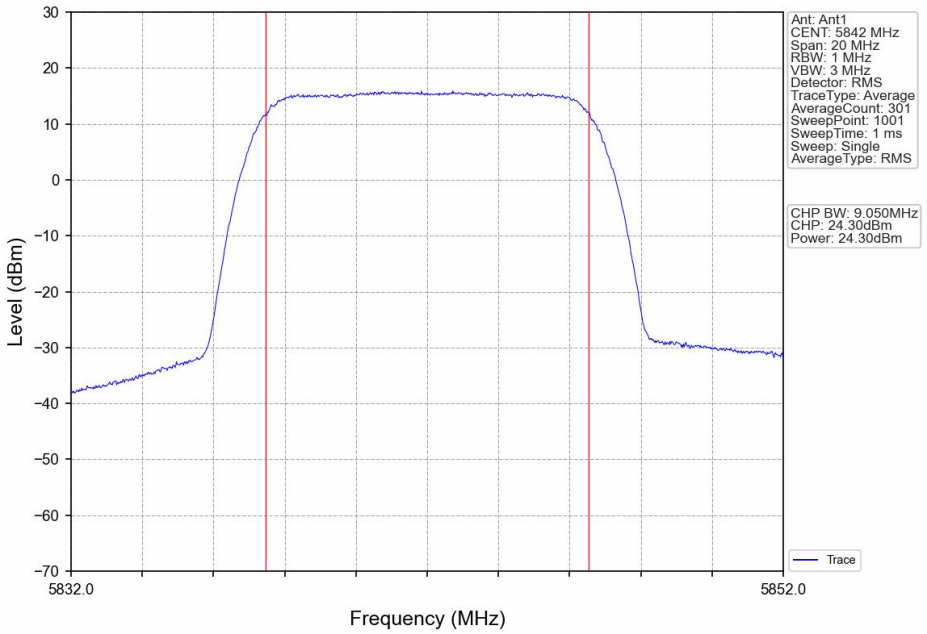
QPSK_MCH_5788MHz_Ant1_NTNV



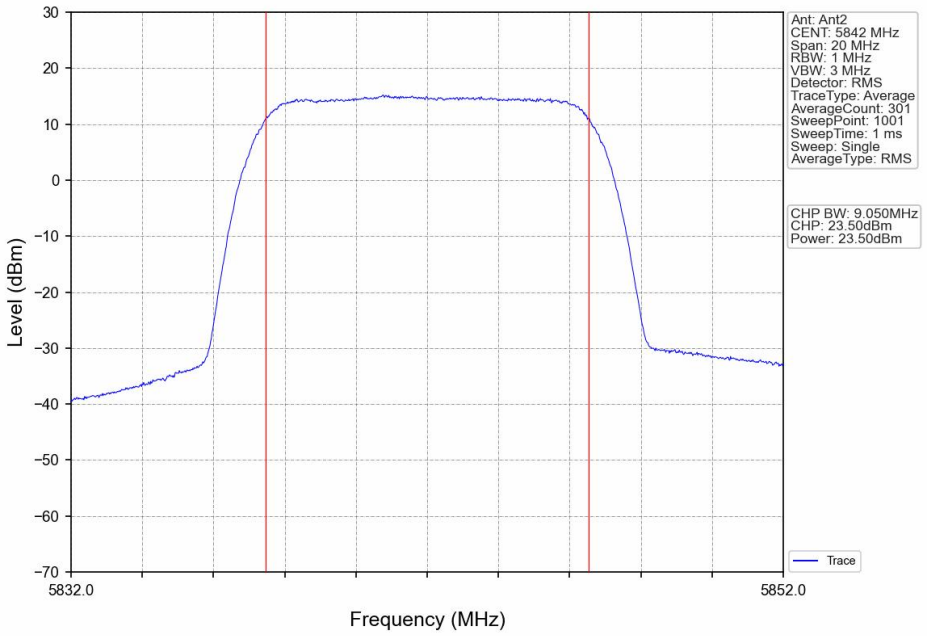
QPSK_MCH_5788MHz_Ant2_NTNV



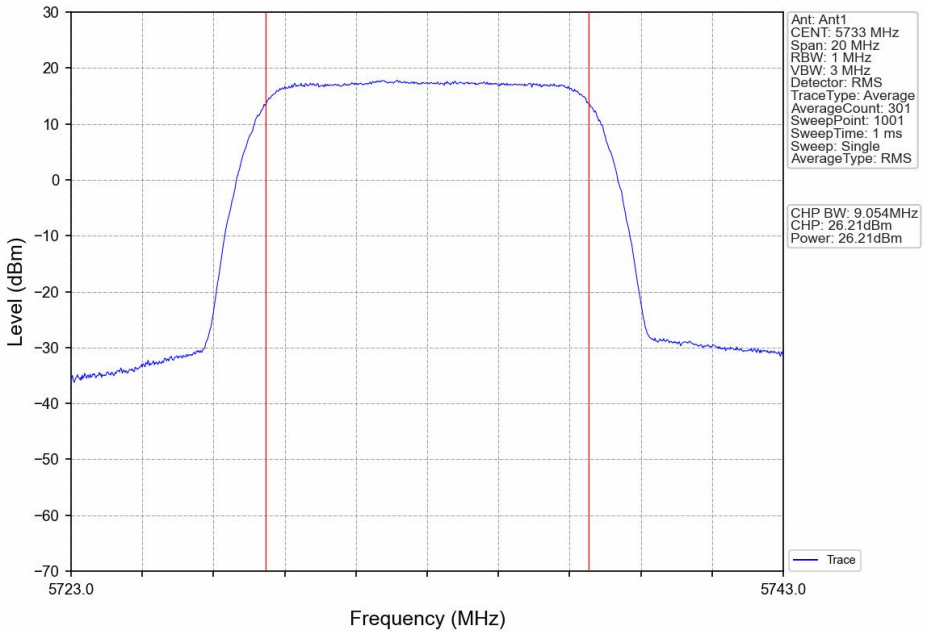
QPSK_HCH_5842MHz_Ant1_NTNV



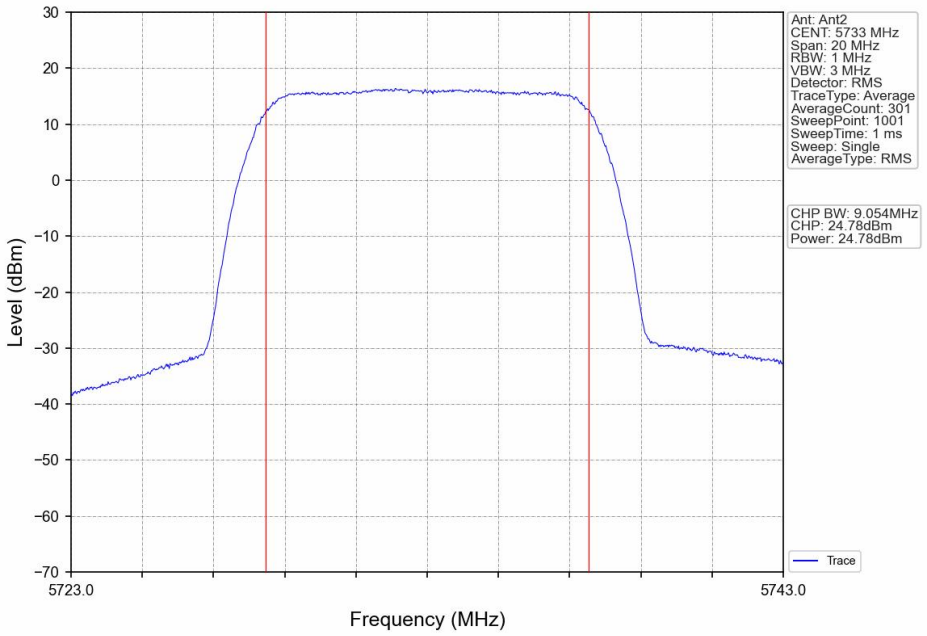
QPSK_HCH_5842MHz_Ant2_NTNV



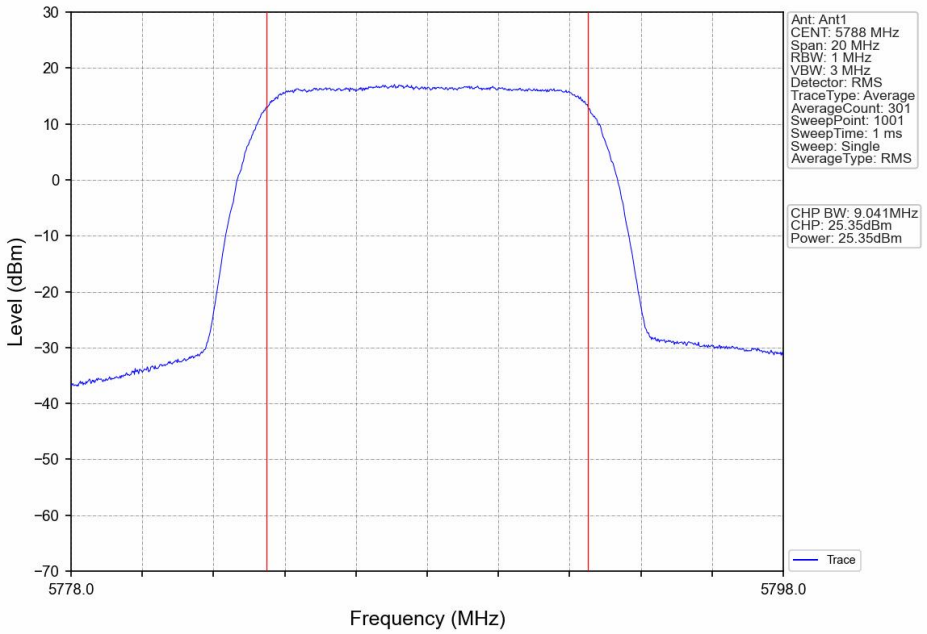
16QAM_LCH_5733MHz_Ant1_NTNV



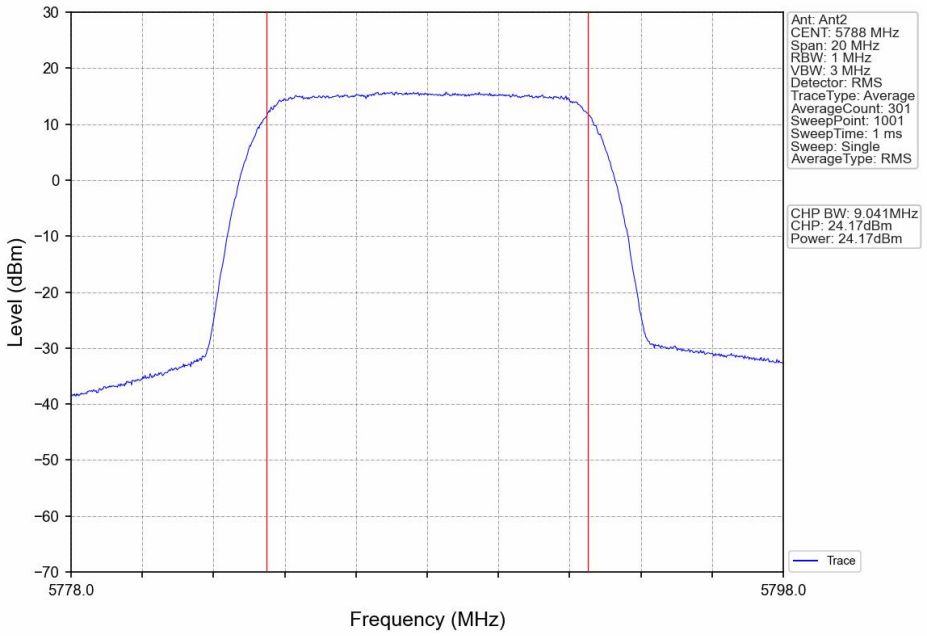
16QAM_LCH_5733MHz_Ant2_NTNV



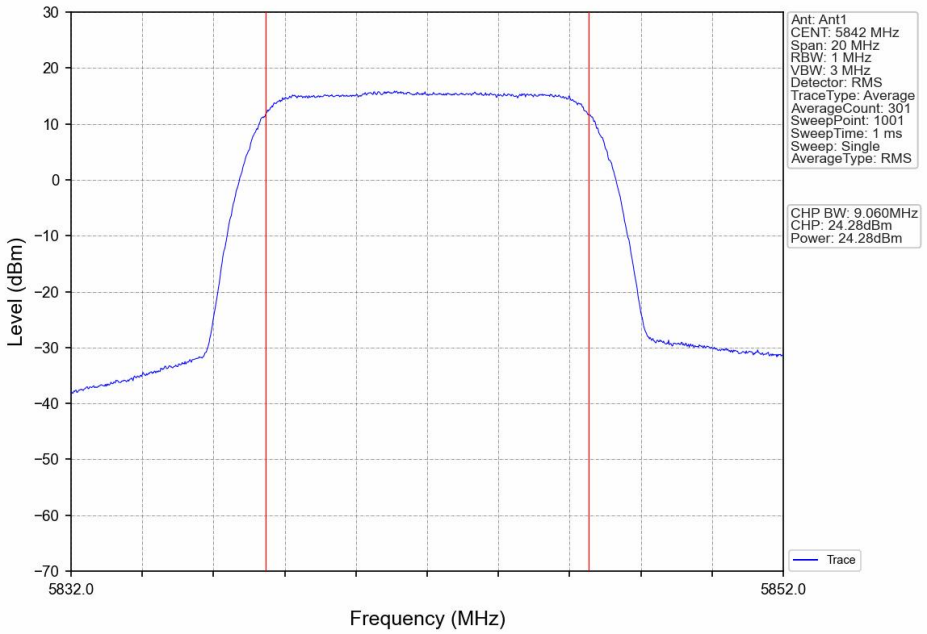
16QAM_MCH_5788MHz_Ant1_NTNV



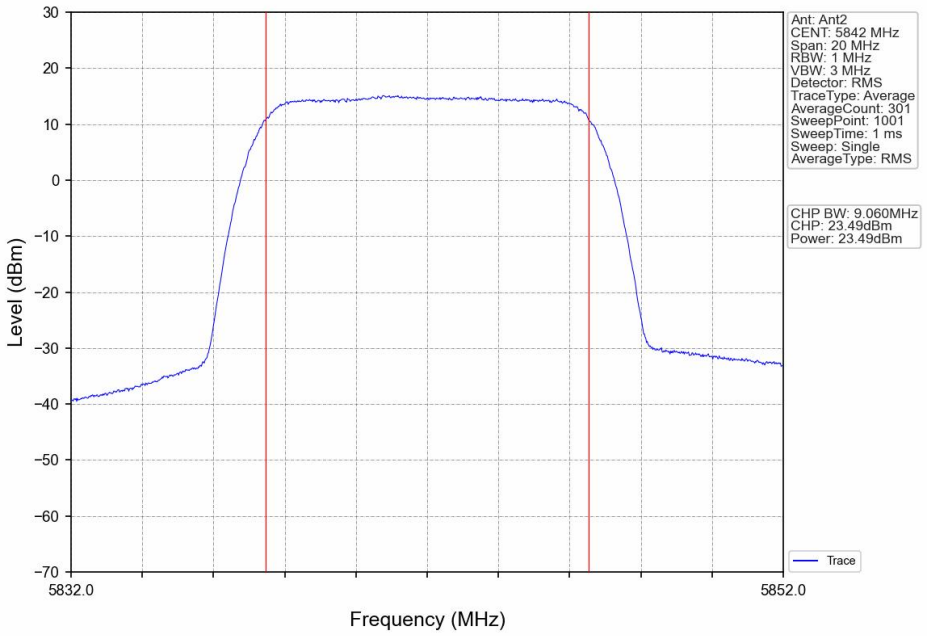
16QAM_MCH_5788MHz_Ant2_NTNV



16QAM_HCH_5842MHz_Ant1_NTNV



16QAM_HCH_5842MHz_Ant2_NTNV



4. Maximum Power Spectral Density

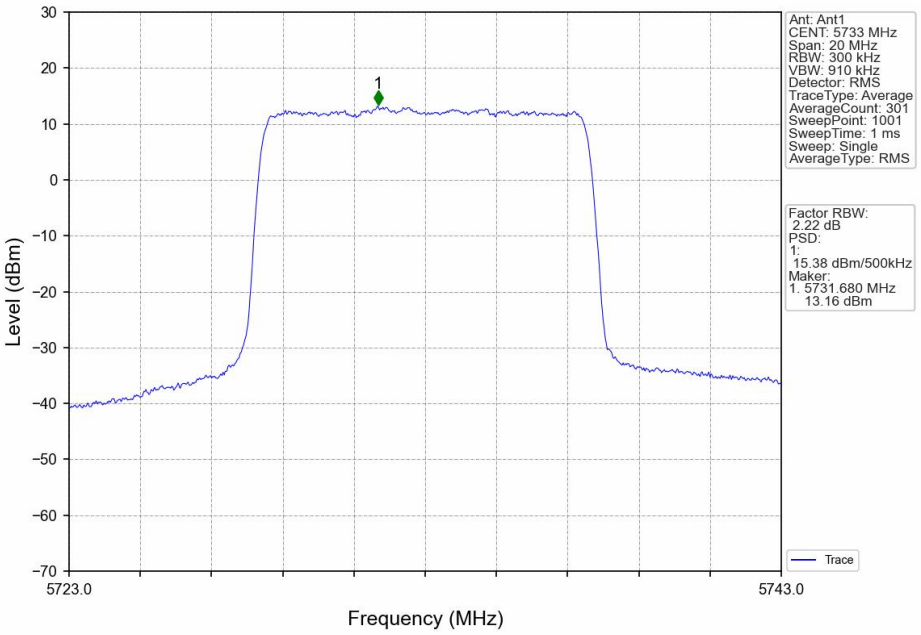
4.1 PSD-Band3

4.1.1 Test Result

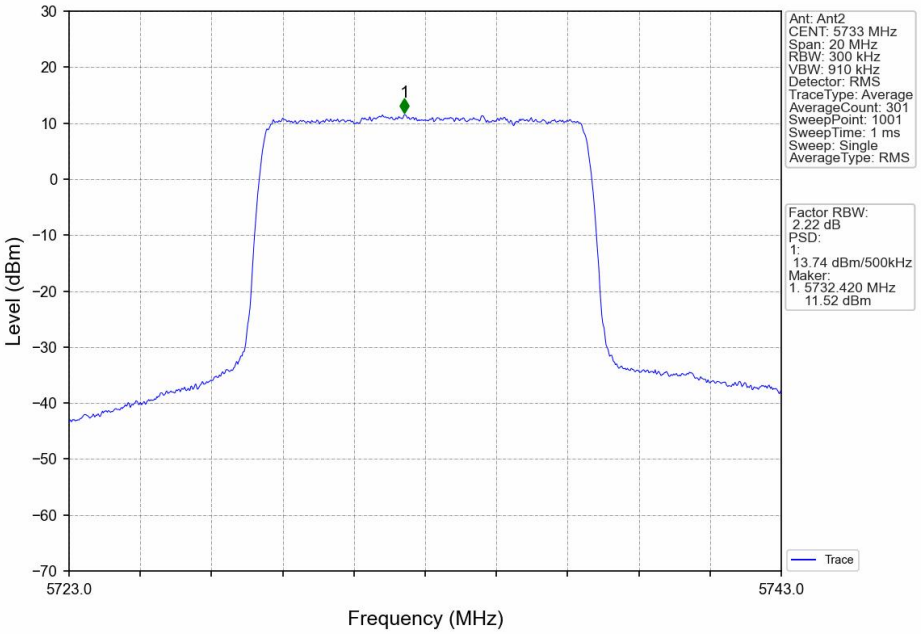
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/500kHz)				Verdict
			ANT1	ANT2	MIMO	Limit	
QPSK	MIMO	5733	15.38	13.74	17.46	<=30	Pass
		5788	14.32	13.30	16.82	<=30	Pass
		5842	13.02	12.55	15.76	<=30	Pass
16QAM	MIMO	5733	15.26	13.67	17.52	<=30	Pass
		5788	14.36	13.29	16.70	<=30	Pass
		5842	13.06	12.56	15.75	<=30	Pass
Note1: Antenna Gain: Ant1: 3.50dBi; Ant2: 3.10dBi; Note2: Directional Gain: Uncorrelated(Directional Gain = Ant Gain)							

4.1.2 Test Graph

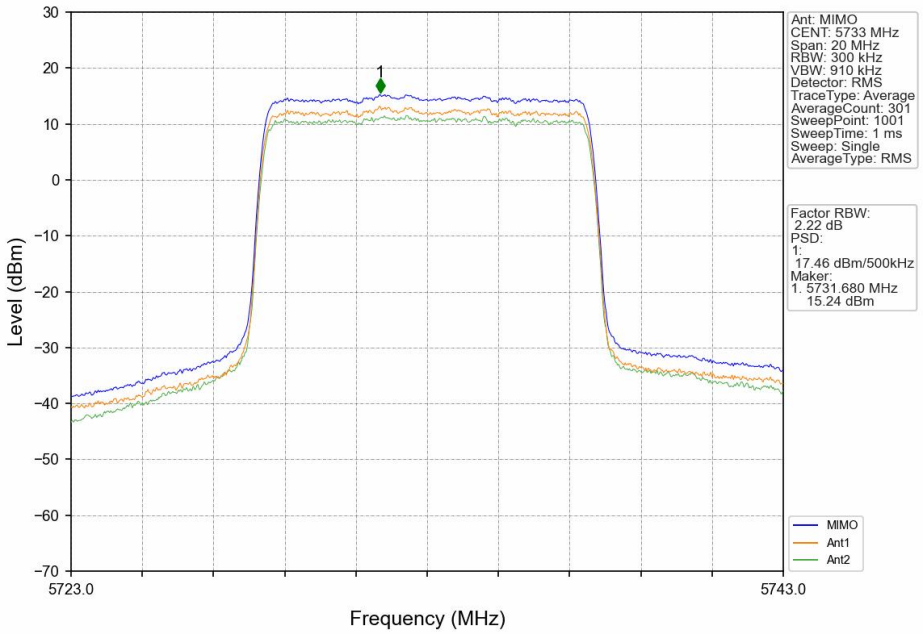
QPSK_LCH_5733MHz_Ant1_NTNV



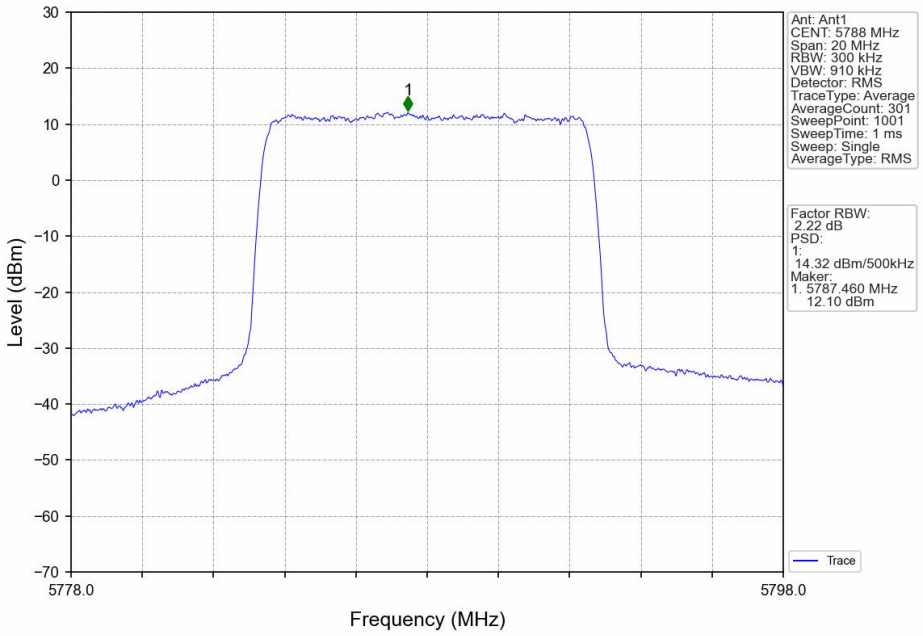
QPSK_LCH_5733MHz_Ant2_NTNV



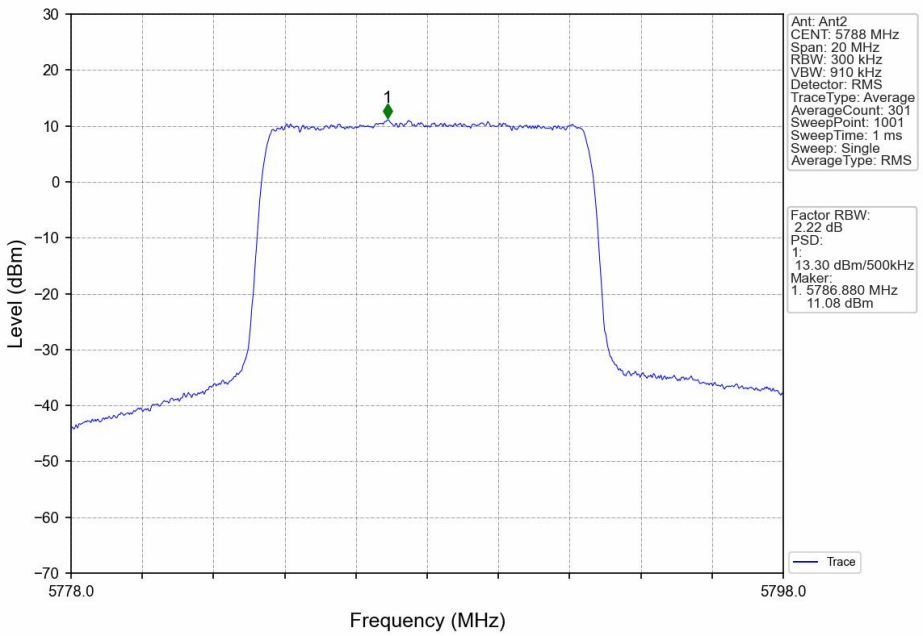
QPSK_LCH_5733MHz_MIMO_NTNV



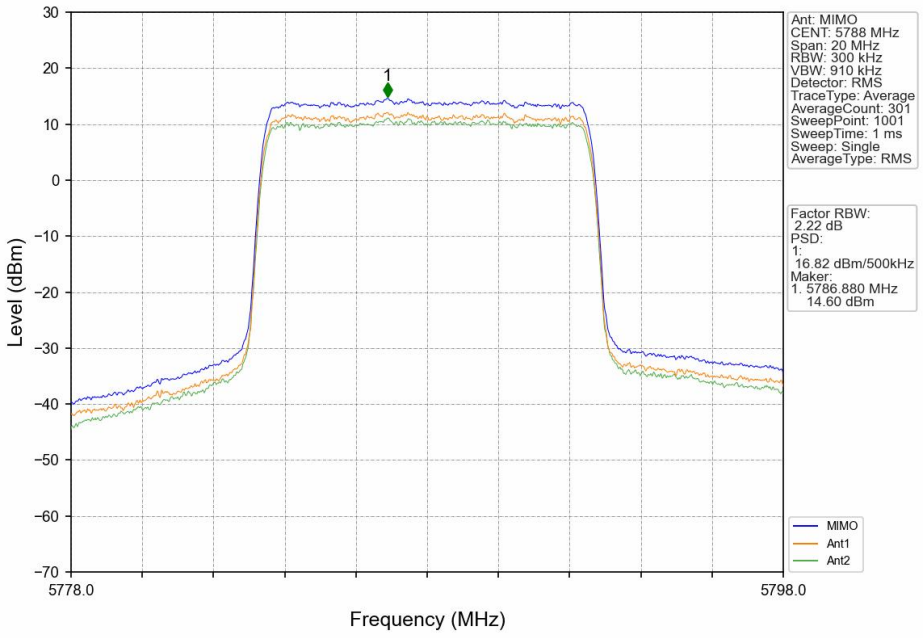
QPSK_MCH_5788MHz_Ant1_NTNV



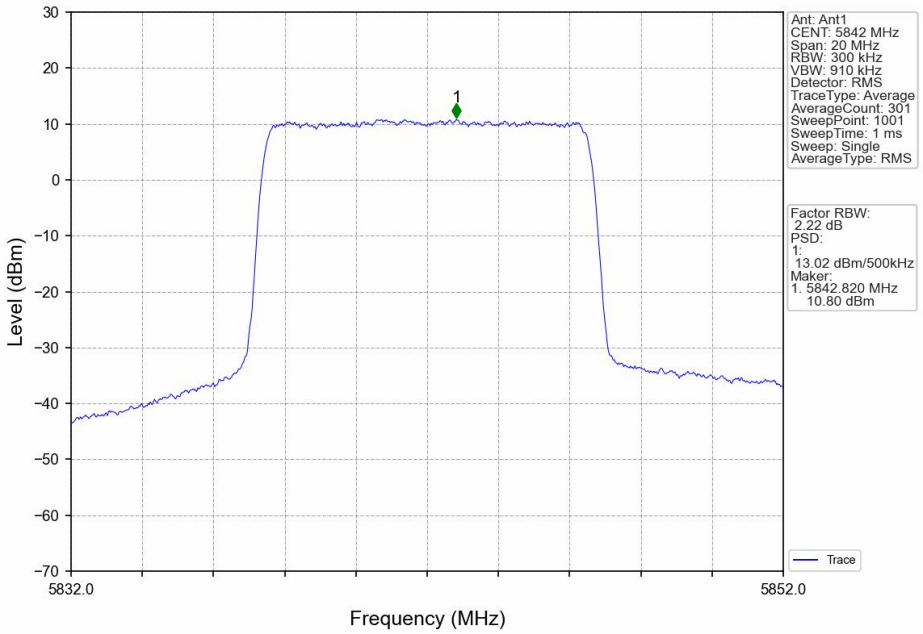
QPSK_MCH_5788MHz_Ant2_NTNV



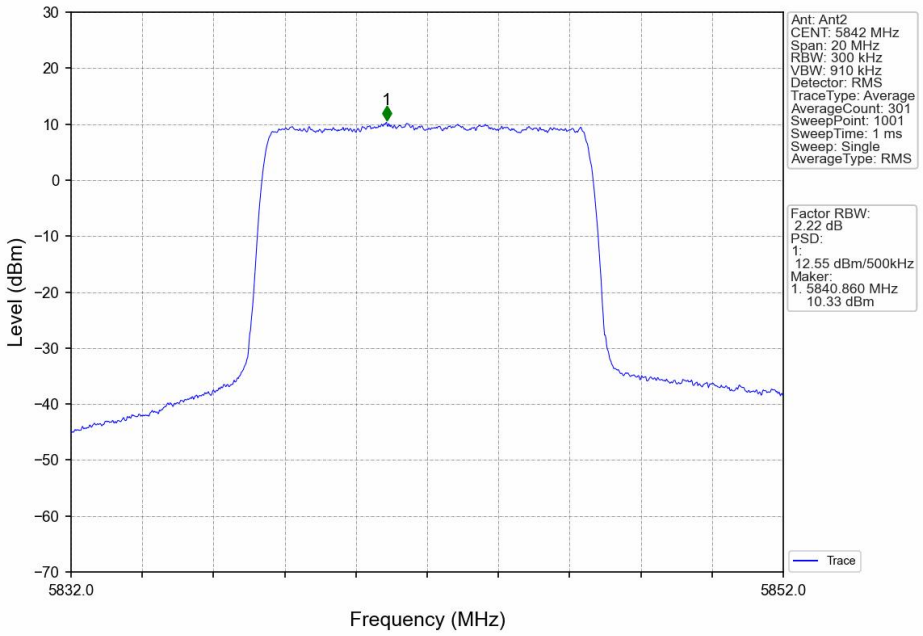
QPSK_MCH_5788MHz_MIMO_NTNV



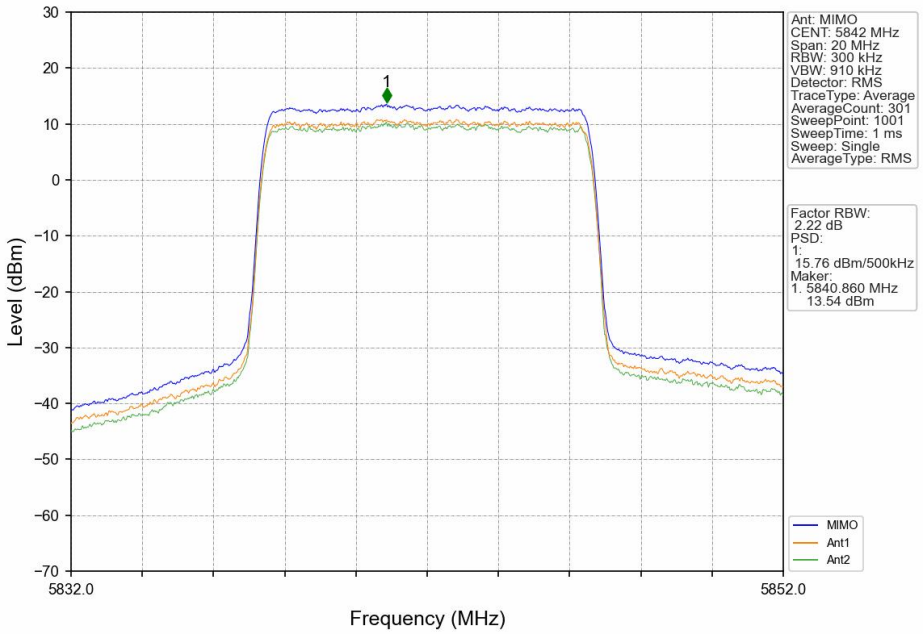
QPSK_HCH_5842MHz_Ant1_NTNV



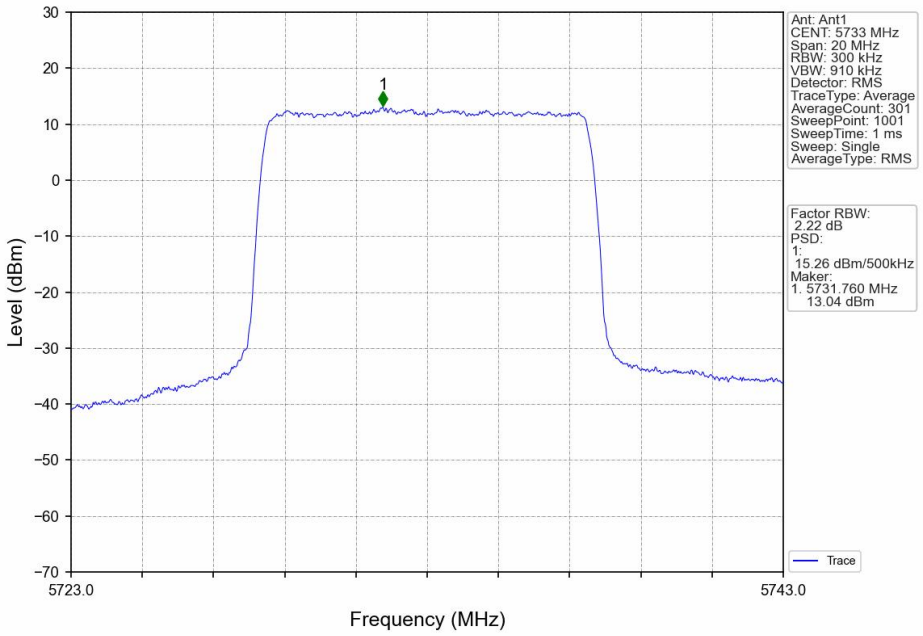
QPSK_HCH_5842MHz_Ant2_NTNV



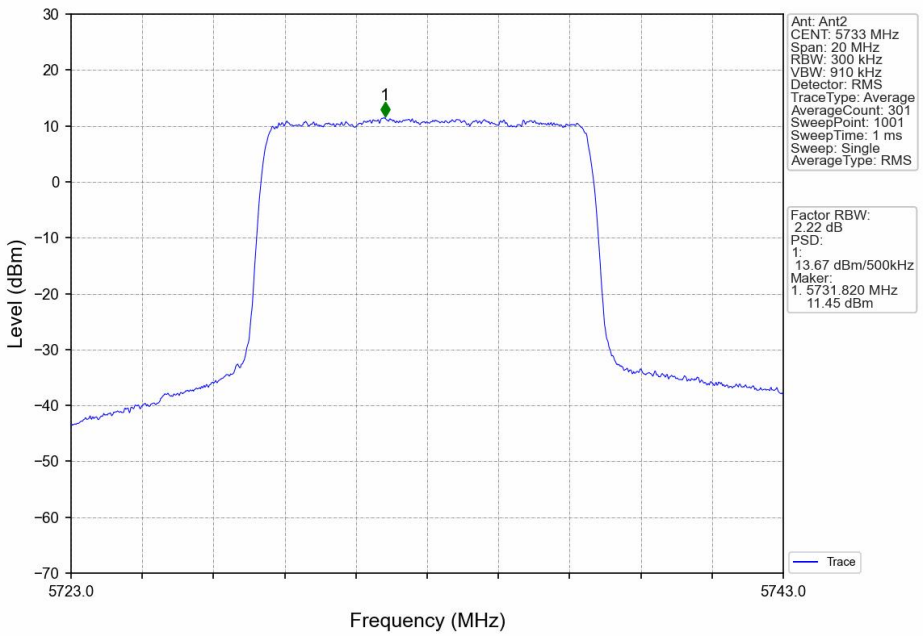
QPSK_HCH_5842MHz_MIMO_NTNV



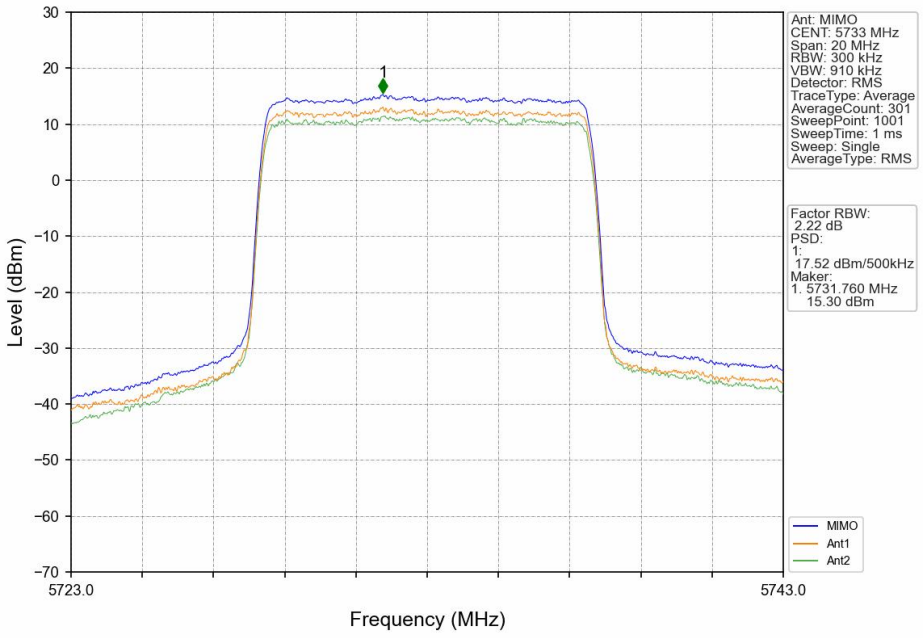
16QAM_LCH_5733MHz_Ant1_NTNV



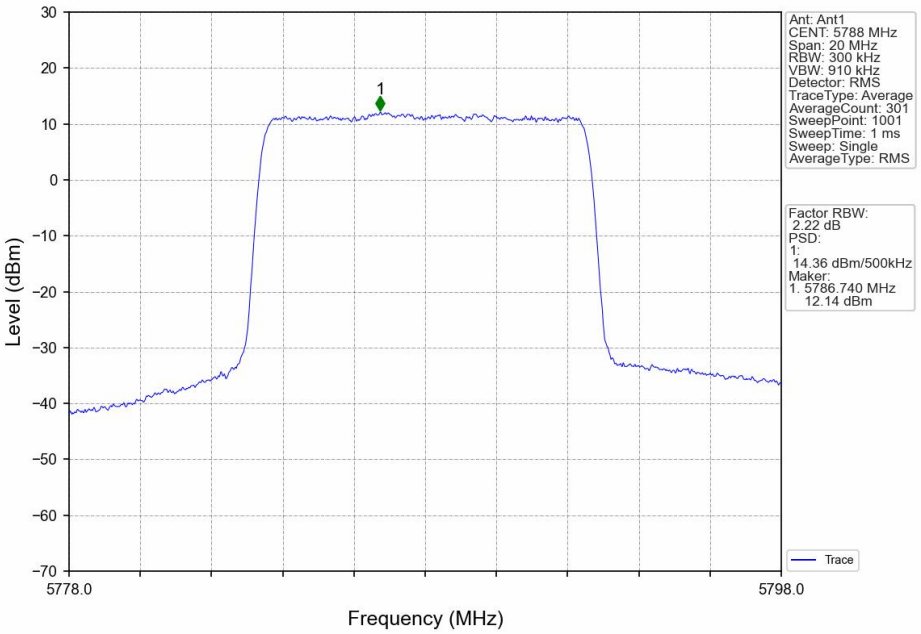
16QAM_LCH_5733MHz_Ant2_NTNV



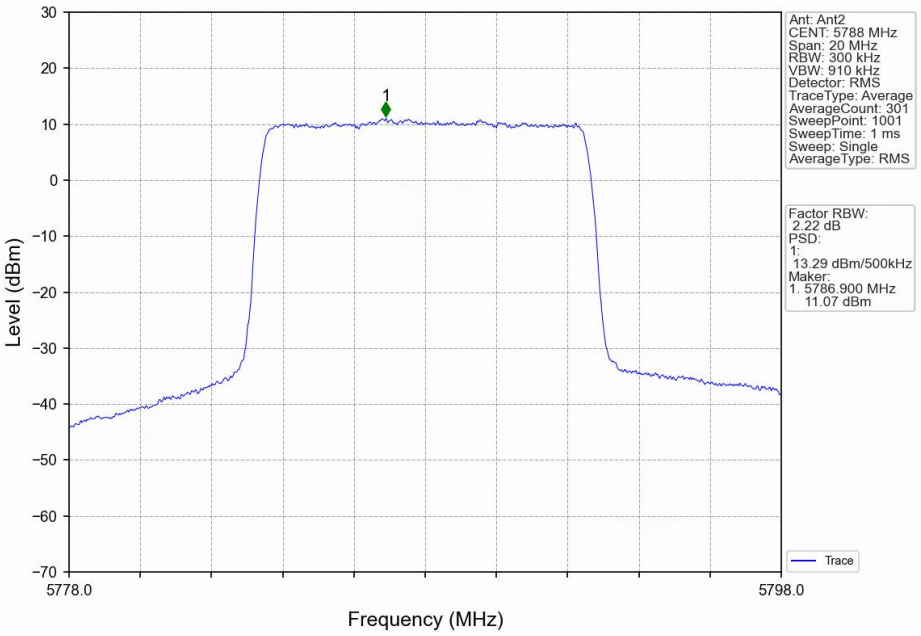
16QAM_LCH_5733MHz_MIMO_NTNV



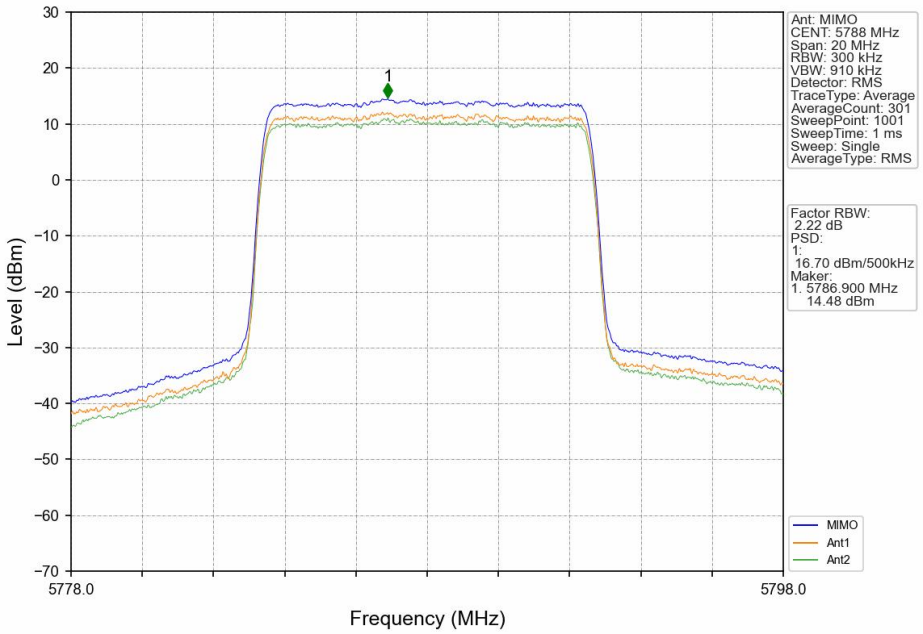
16QAM_MCH_5788MHz_Ant1_NTNV



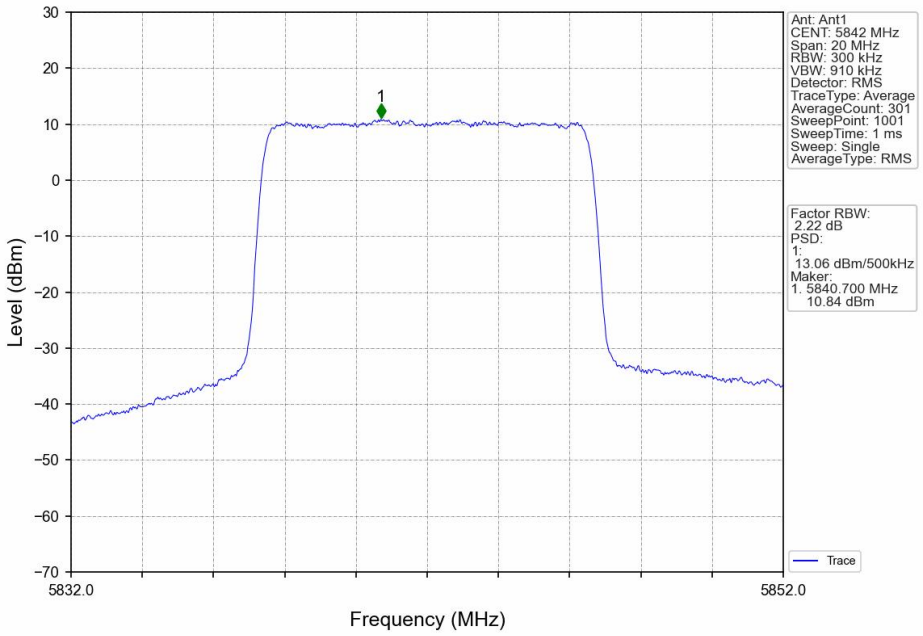
16QAM_MCH_5788MHz_Ant2_NTNV



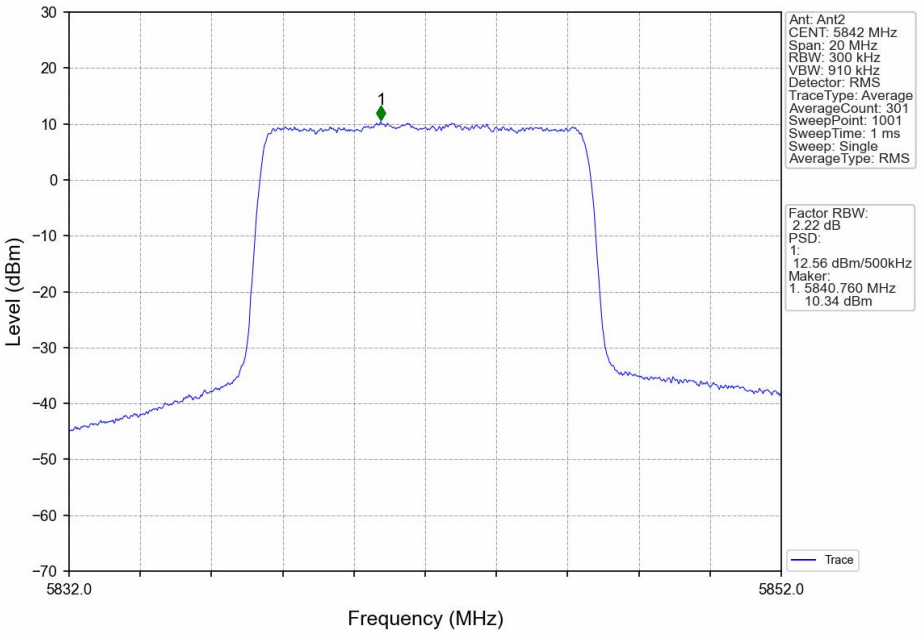
16QAM_MCH_5788MHz_MIMO_NTNV



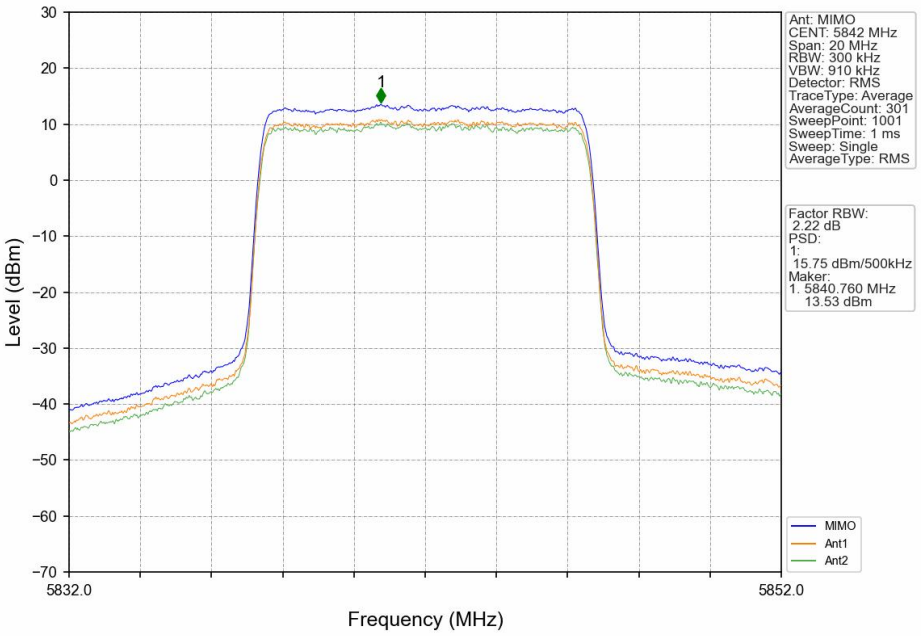
16QAM_HCH_5842MHz_Ant1_NTNV



16QAM_HCH_5842MHz_Ant2_NTNV



16QAM_HCH_5842MHz_MIMO_NTNV



5. Frequency Stability

5.1 Ant1

5.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
QPSK	MIMO	5733	20	102	5733.020	5725 to 5850	Pass
				120	5733.030	5725 to 5850	Pass
				138	5733.020	5725 to 5850	Pass
			-30	120	5733.010	5725 to 5850	Pass
			-20	120	5733.020	5725 to 5850	Pass
			-10	120	5733.030	5725 to 5850	Pass
			0	120	5733.020	5725 to 5850	Pass
			10	120	5733.020	5725 to 5850	Pass
			30	120	5733.020	5725 to 5850	Pass
			40	120	5733.020	5725 to 5850	Pass
			50	120	5733.020	5725 to 5850	Pass
		5788	20	102	5787.990	5725 to 5850	Pass
				120	5788.020	5725 to 5850	Pass
				138	5788.010	5725 to 5850	Pass
			-30	120	5788.010	5725 to 5850	Pass
			-20	120	5788.010	5725 to 5850	Pass
			-10	120	5788.000	5725 to 5850	Pass
			0	120	5788.010	5725 to 5850	Pass
			10	120	5788.010	5725 to 5850	Pass
			30	120	5788.030	5725 to 5850	Pass
			40	120	5788.020	5725 to 5850	Pass
			50	120	5788.020	5725 to 5850	Pass
		5842	20	102	5842.020	5725 to 5850	Pass
				120	5842.020	5725 to 5850	Pass
				138	5842.020	5725 to 5850	Pass
			-30	120	5842.020	5725 to 5850	Pass
			-20	120	5842.020	5725 to 5850	Pass
			-10	120	5842.010	5725 to 5850	Pass
			0	120	5842.020	5725 to 5850	Pass
			10	120	5842.020	5725 to 5850	Pass
			30	120	5842.020	5725 to 5850	Pass
			40	120	5842.020	5725 to 5850	Pass
			50	120	5842.000	5725 to 5850	Pass
16QAM	MIMO	5733	20	102	5733.000	5725 to 5850	Pass
				120	5733.020	5725 to 5850	Pass
				138	5733.020	5725 to 5850	Pass
			-30	120	5733.000	5725 to 5850	Pass
			-20	120	5733.000	5725 to 5850	Pass
			-10	120	5733.020	5725 to 5850	Pass
			0	120	5733.020	5725 to 5850	Pass
			10	120	5733.010	5725 to 5850	Pass
			30	120	5733.020	5725 to 5850	Pass
			40	120	5733.010	5725 to 5850	Pass
			50	120	5733.020	5725 to 5850	Pass
		5788	20	102	5788.010	5725 to 5850	Pass
				120	5788.020	5725 to 5850	Pass

				138	5788.020	5725 to 5850	Pass
			-30	120	5788.010	5725 to 5850	Pass
			-20	120	5788.010	5725 to 5850	Pass
			-10	120	5788.020	5725 to 5850	Pass
			0	120	5788.020	5725 to 5850	Pass
			10	120	5788.010	5725 to 5850	Pass
			30	120	5787.990	5725 to 5850	Pass
			40	120	5788.020	5725 to 5850	Pass
			50	120	5788.000	5725 to 5850	Pass
		5842	20	102	5842.020	5725 to 5850	Pass
				120	5842.010	5725 to 5850	Pass
				138	5842.020	5725 to 5850	Pass
			-30	120	5842.020	5725 to 5850	Pass
			-20	120	5842.030	5725 to 5850	Pass
			-10	120	5842.020	5725 to 5850	Pass
			0	120	5842.000	5725 to 5850	Pass
			10	120	5842.020	5725 to 5850	Pass
			30	120	5842.020	5725 to 5850	Pass
			40	120	5842.010	5725 to 5850	Pass
			50	120	5842.020	5725 to 5850	Pass

6. Form731

6.1 Form731

6.1.1 Test Result

Lower Freq (MHz)	High Freq (MHz)	MAX Power (W)	MAX Power (dBm)
5733	5842	0.7244	28.60