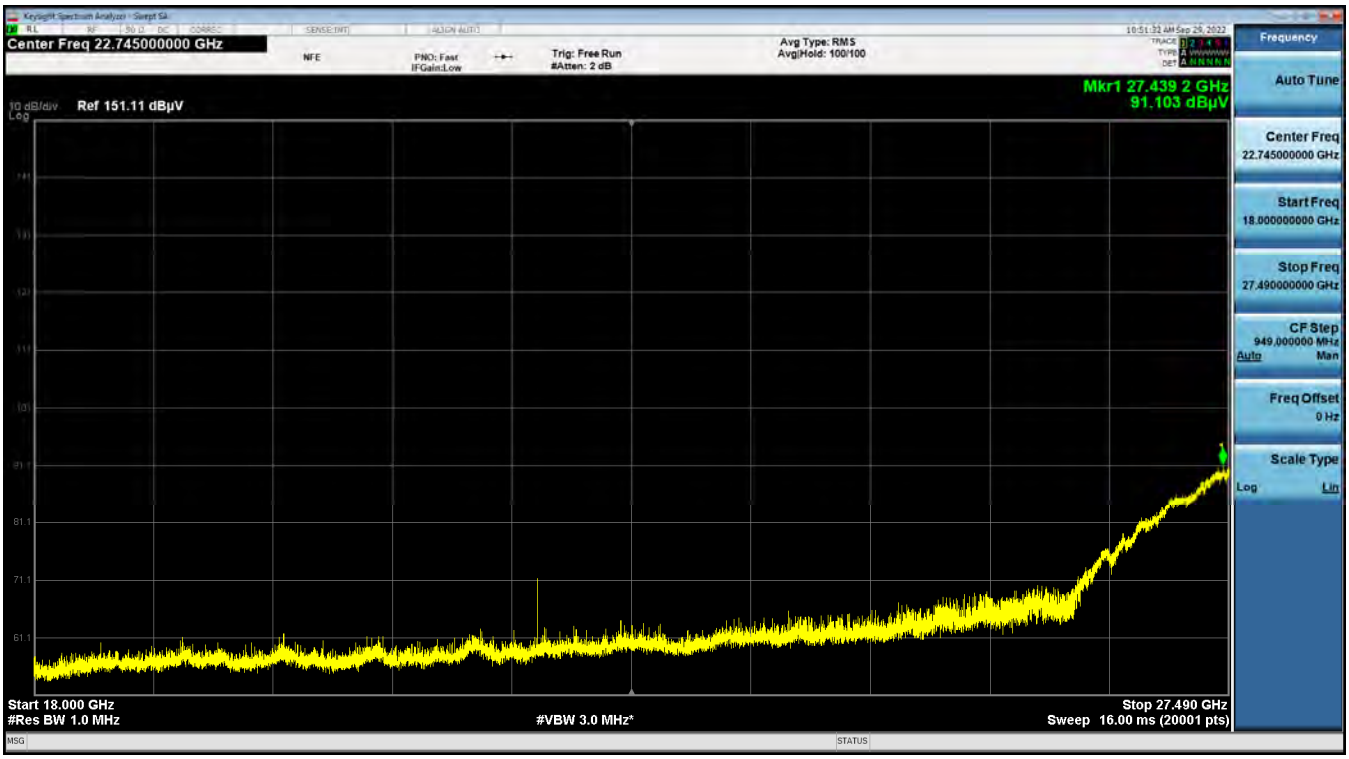
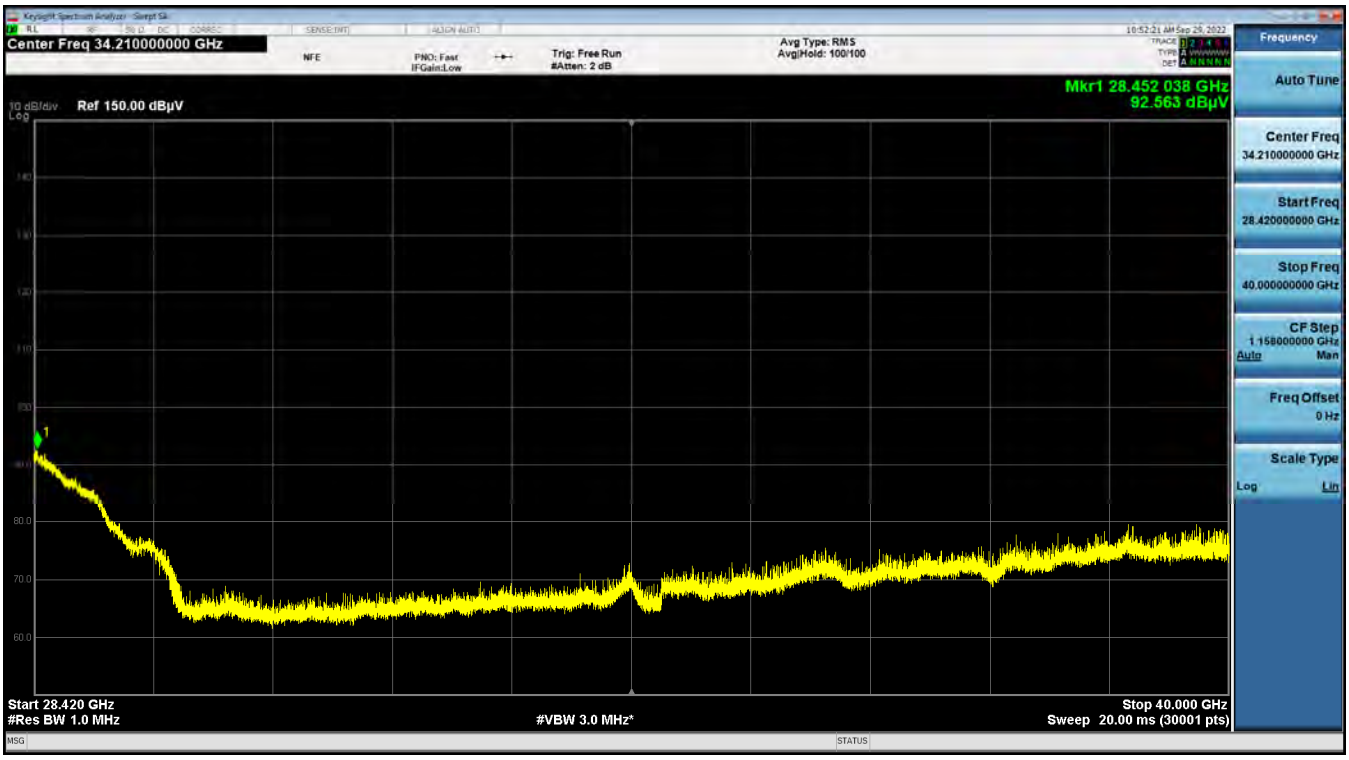
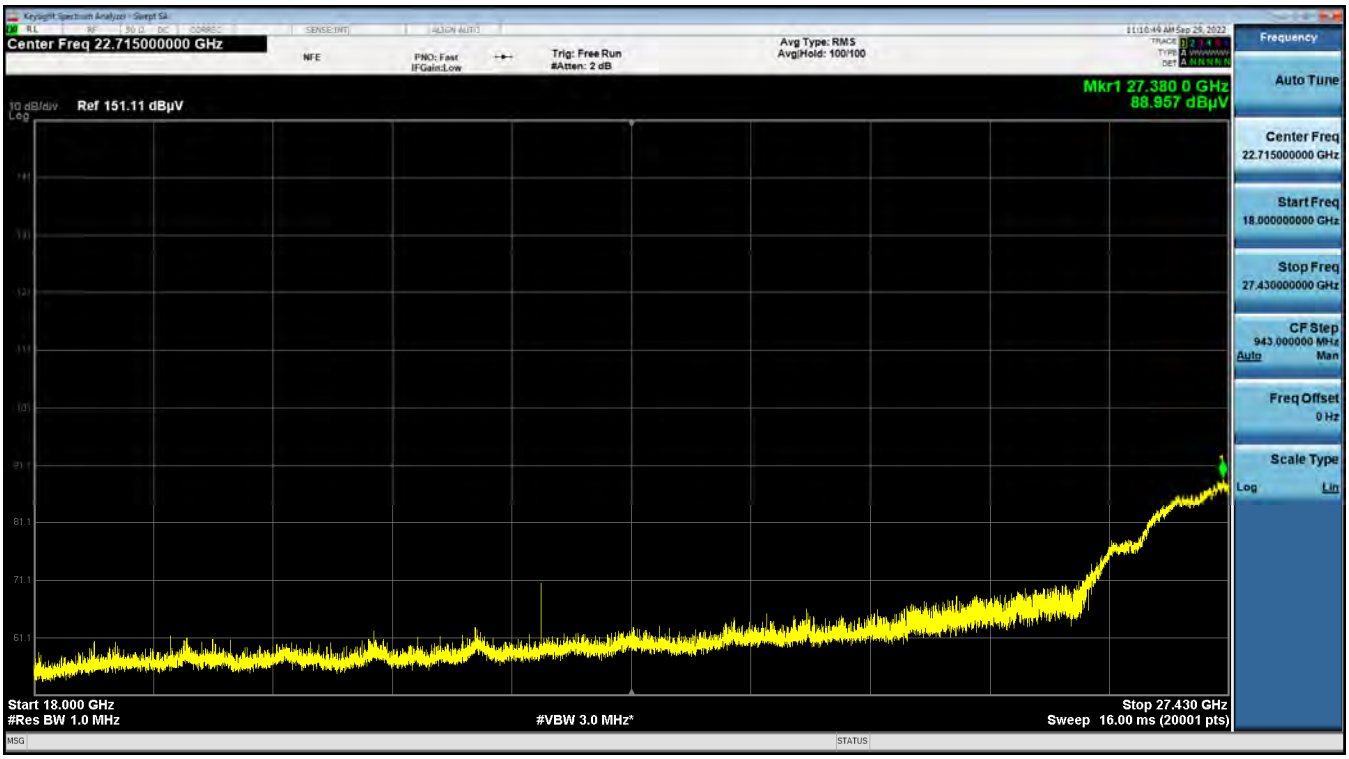
18 GHz ~ Low Edge / 28 GHz 1+7 CC / 256QAM



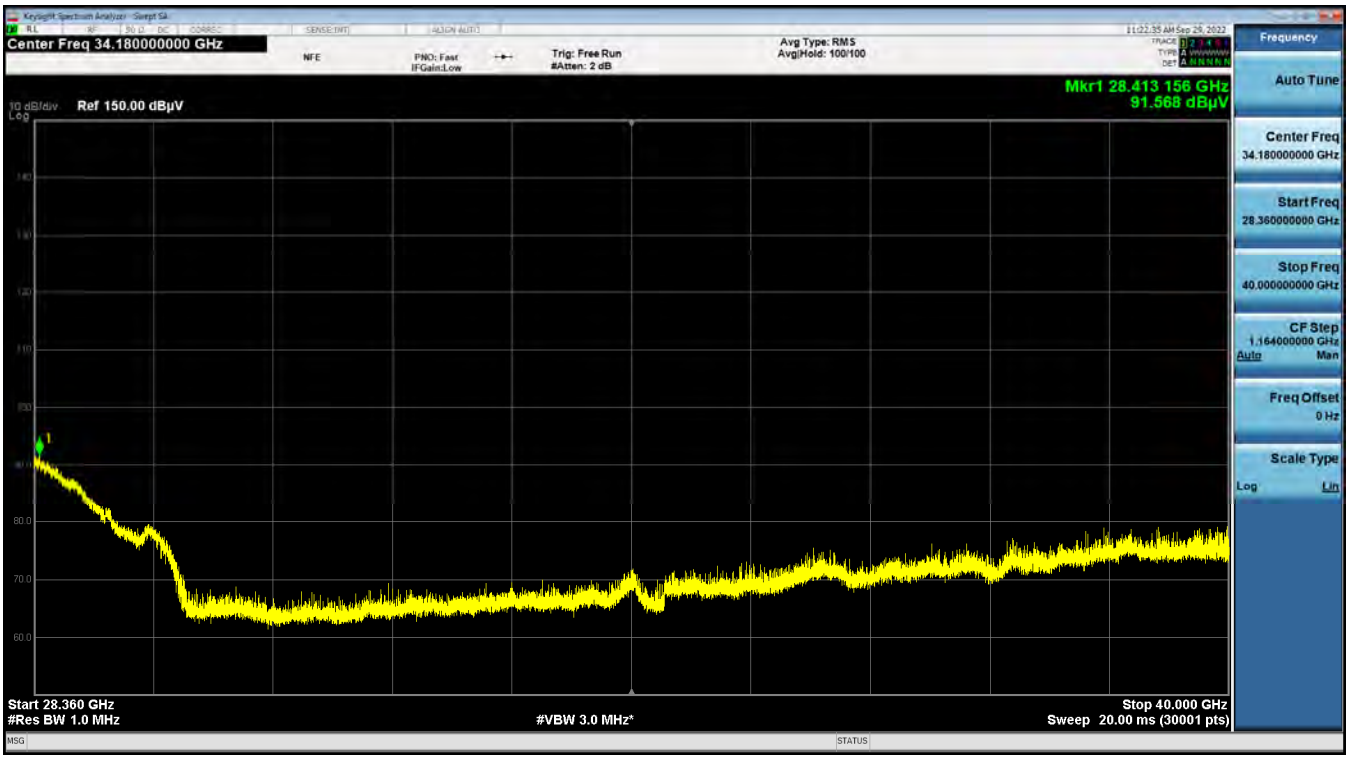
High Edge ~ 40 GHz / 28 GHz 1+7 CC / 256QAM



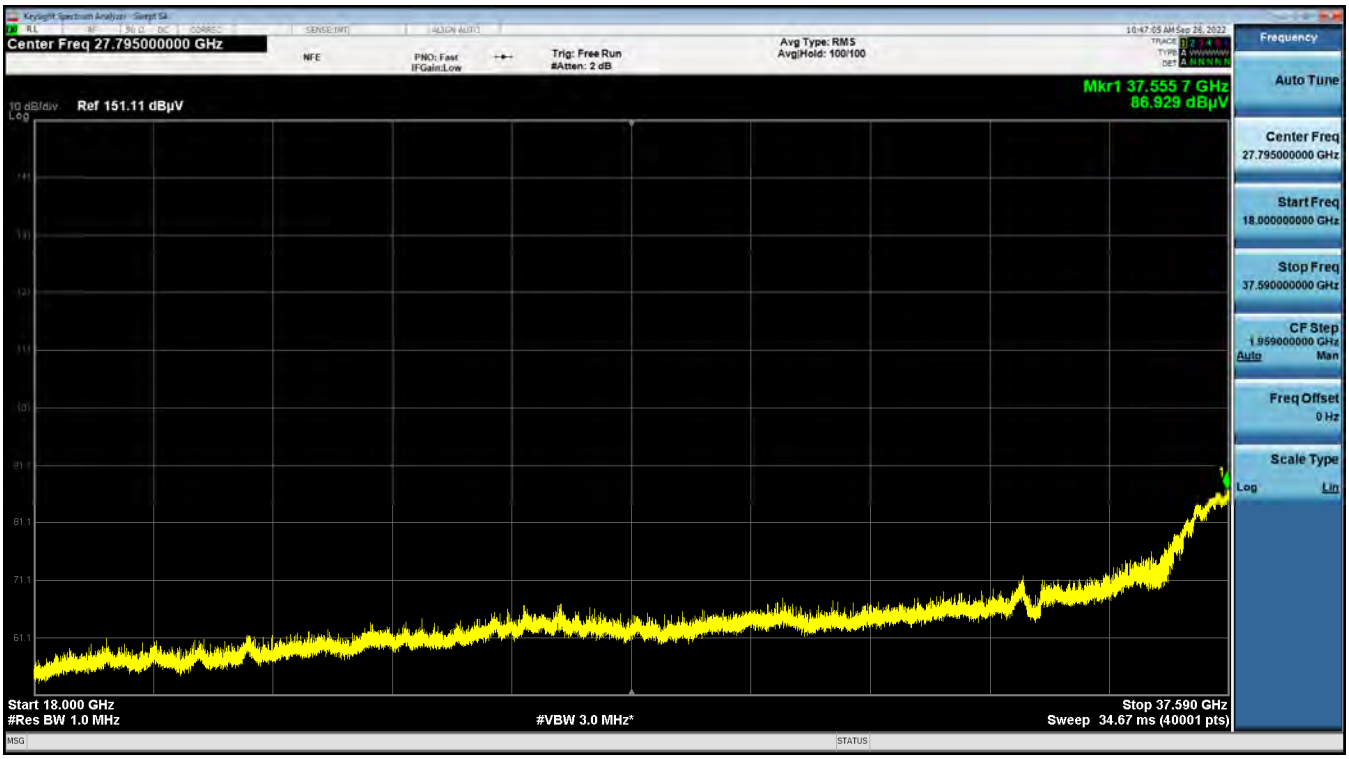
18 GHz ~ Low Edge / 28 GHz 7+1 CC / 16QAM



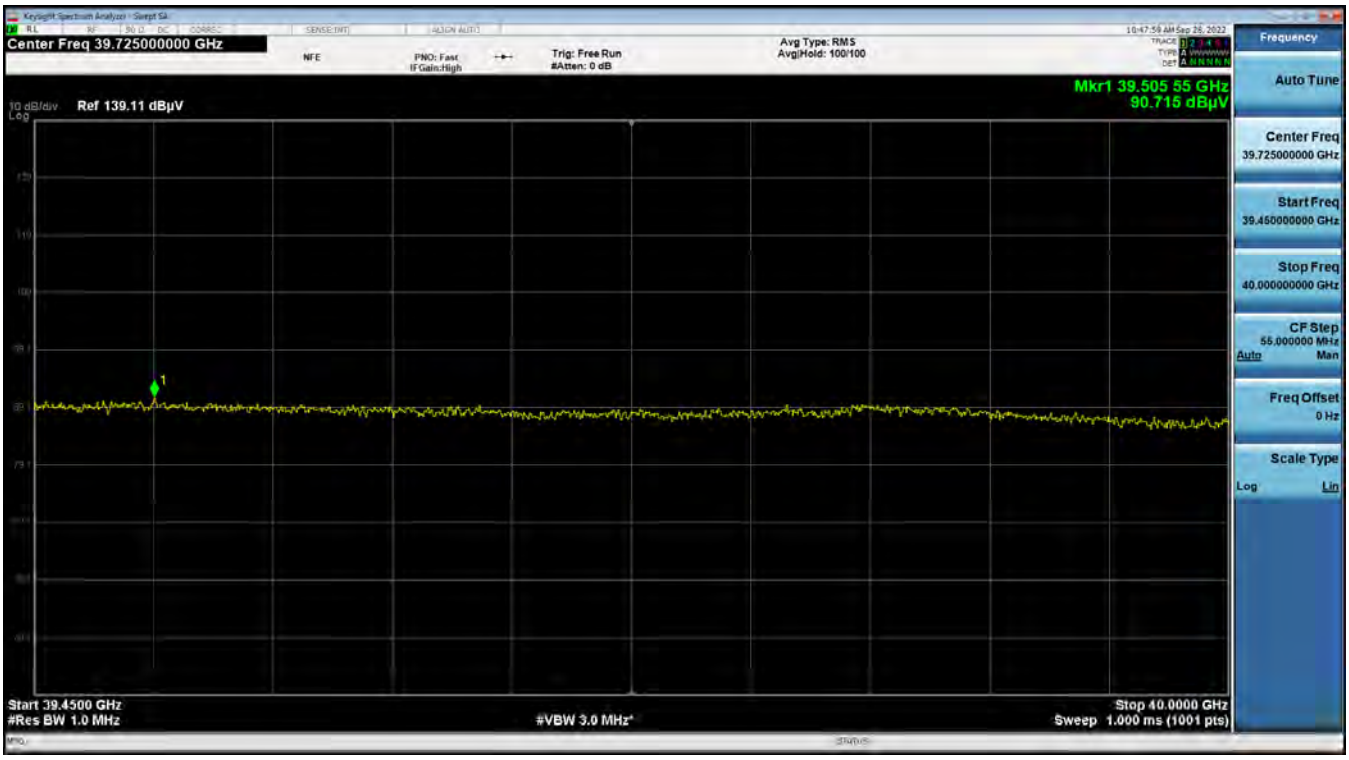
High Edge ~ 40 GHz / 28 GHz 7+1 CC / 256QAM



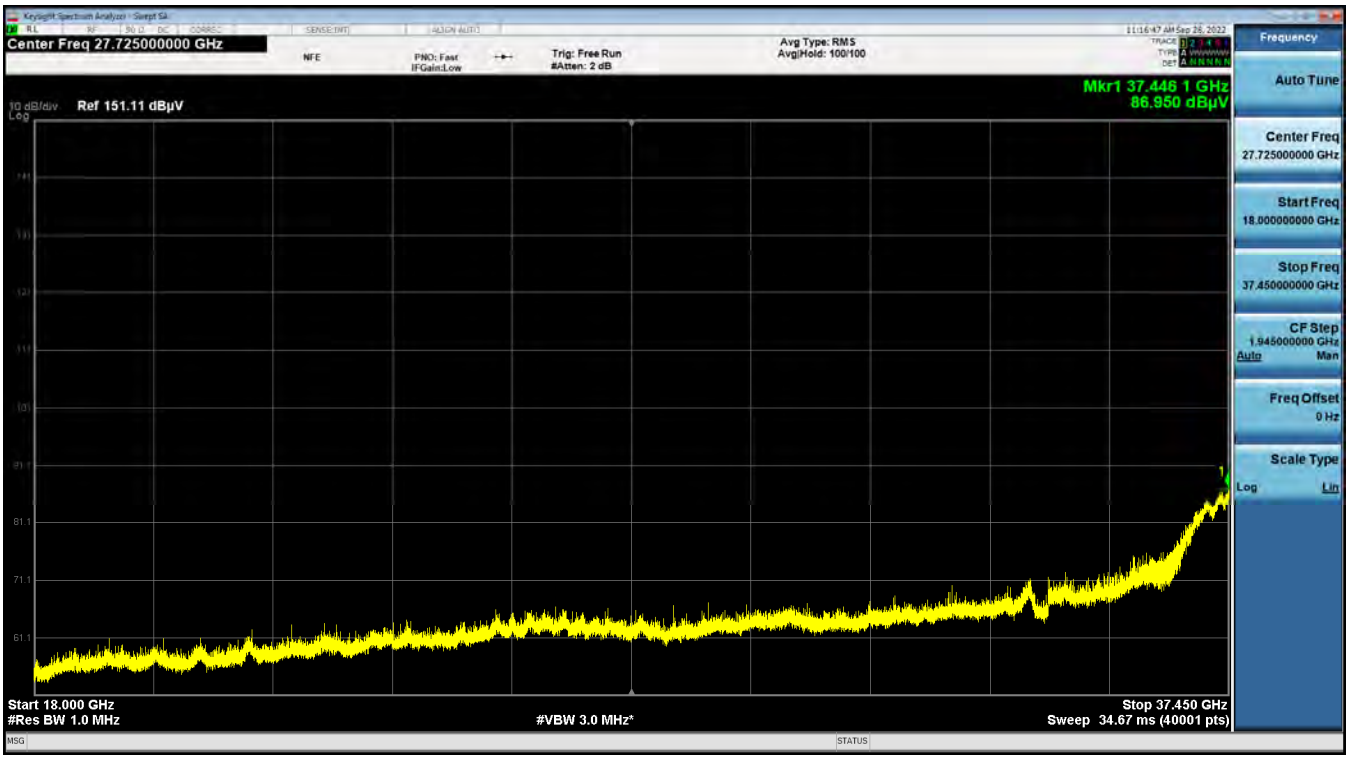
18 GHz ~ Low Edge / 39 GHz 1+15 CC / 256QAM



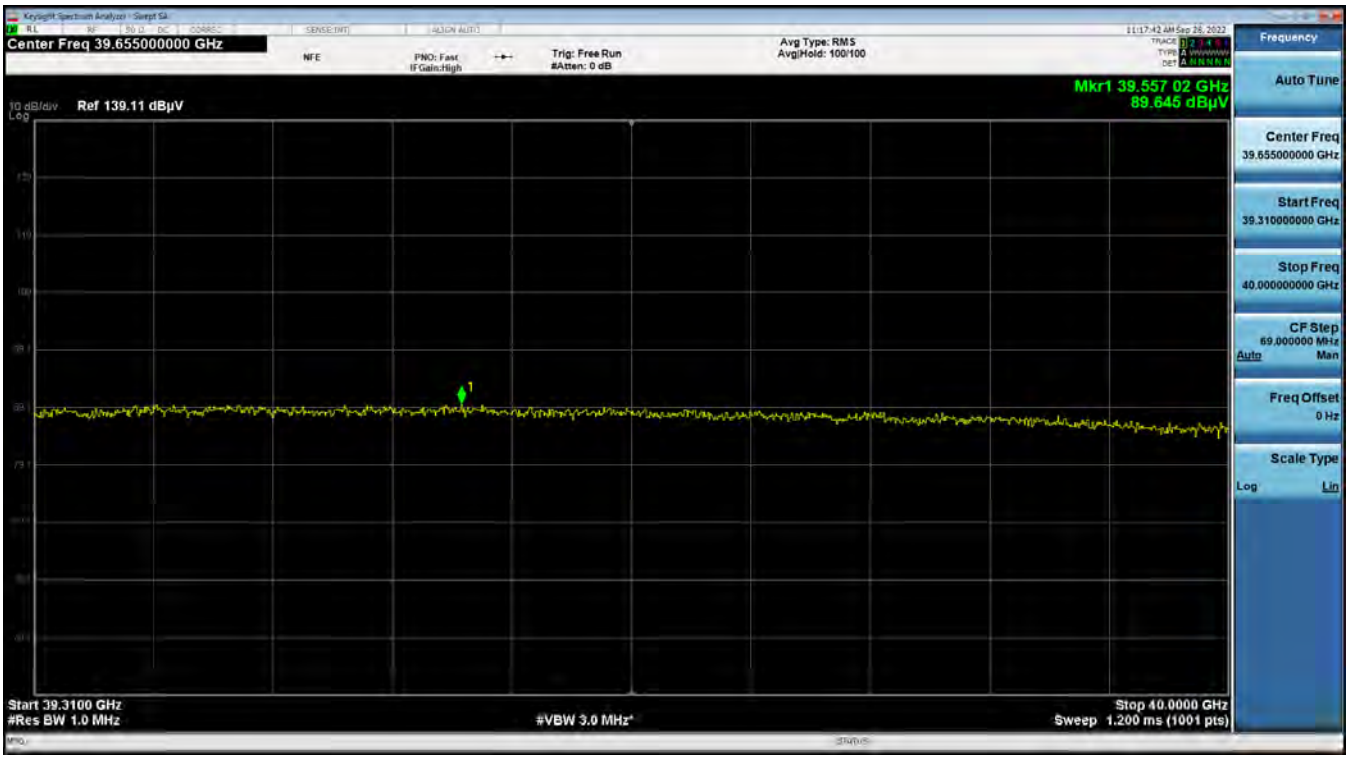
High Edge ~ 40 GHz / 39 GHz 1+15 CC / 256QAM



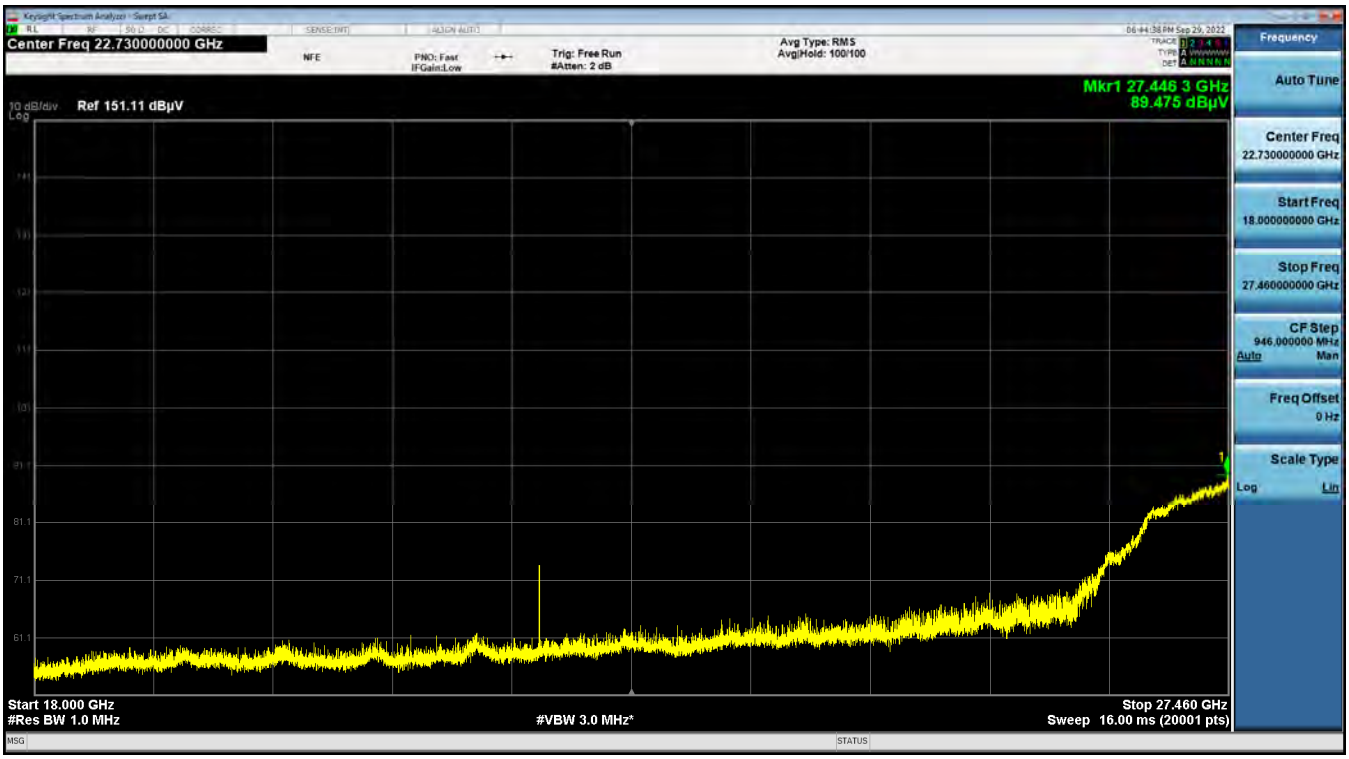
18 GHz ~ Low Edge / 39 GHz 15+1 CC / 64QAM



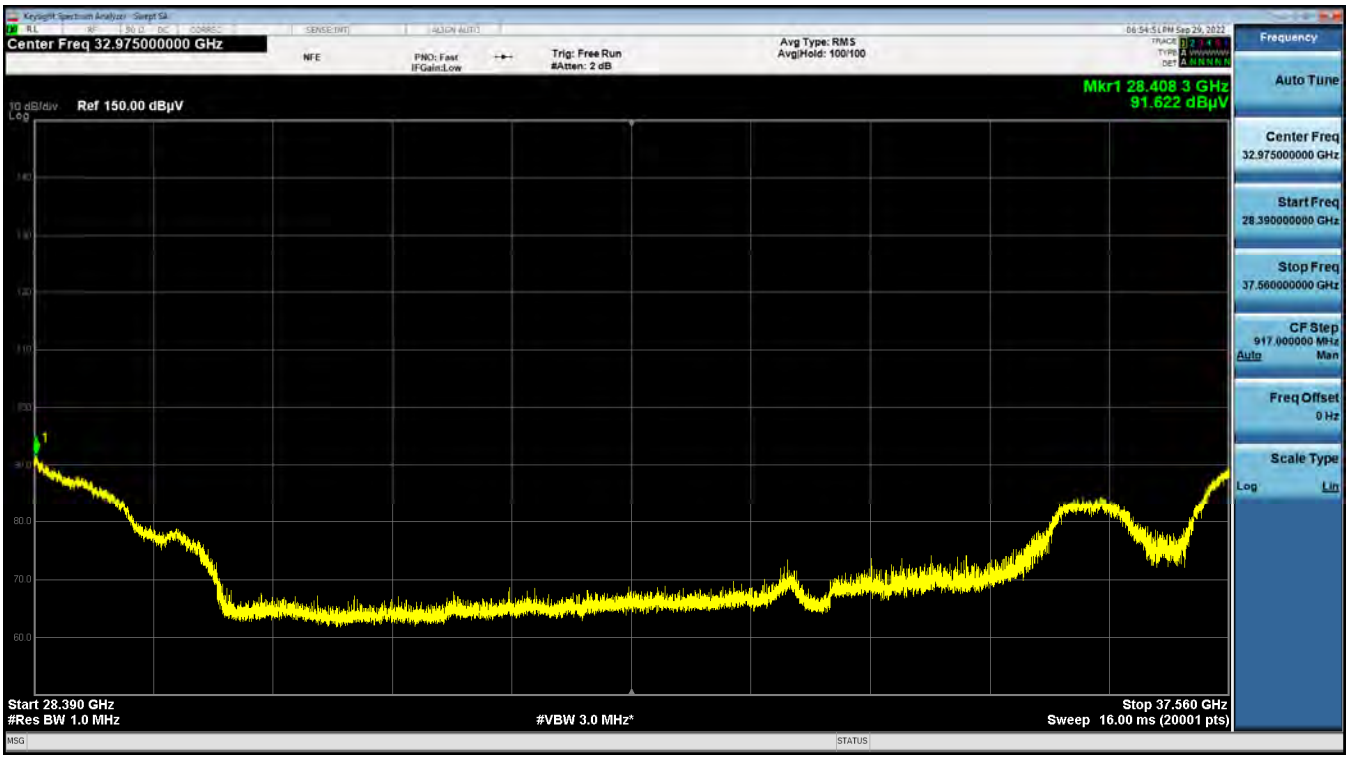
High Edge ~ 40 GHz / 39 GHz 15+1 CC / 64QAM



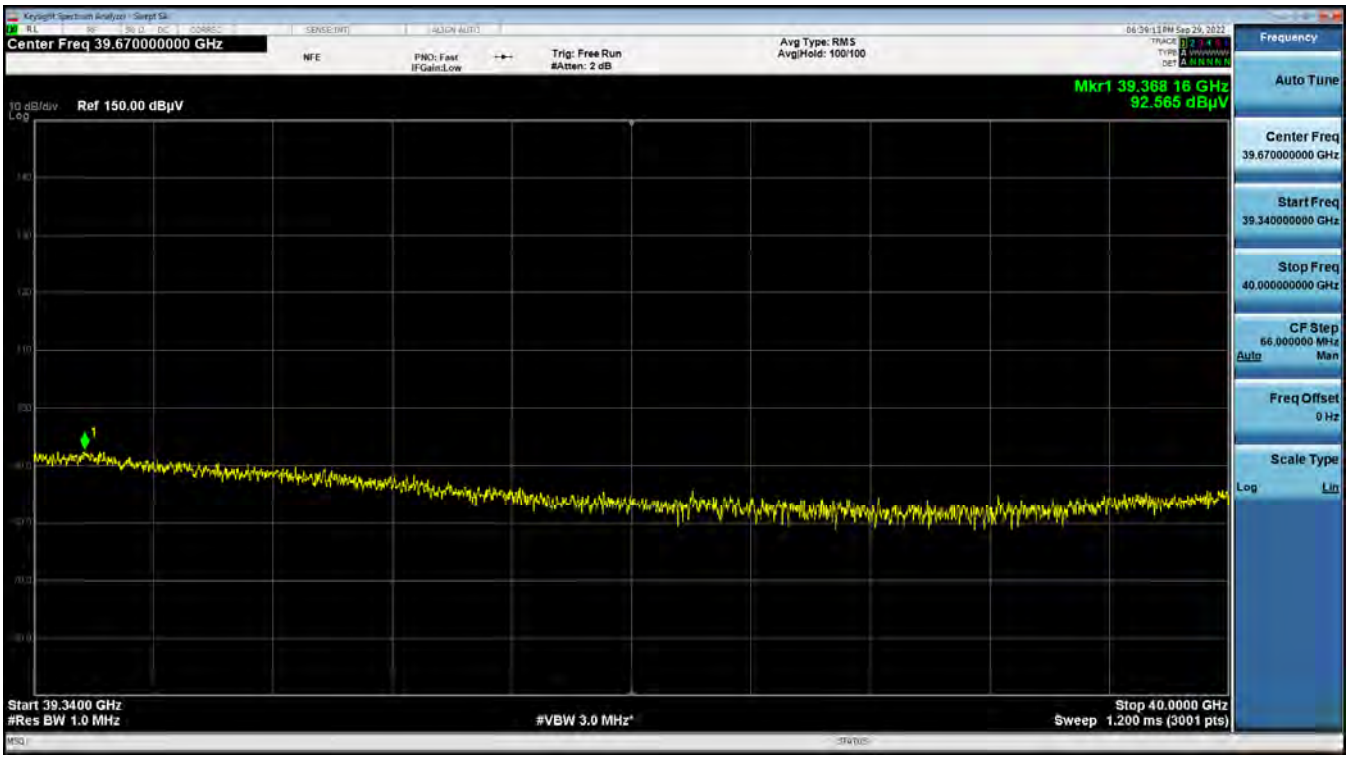
18 GHz ~ Low Edge / InterBand / 28GHz / 16QAM



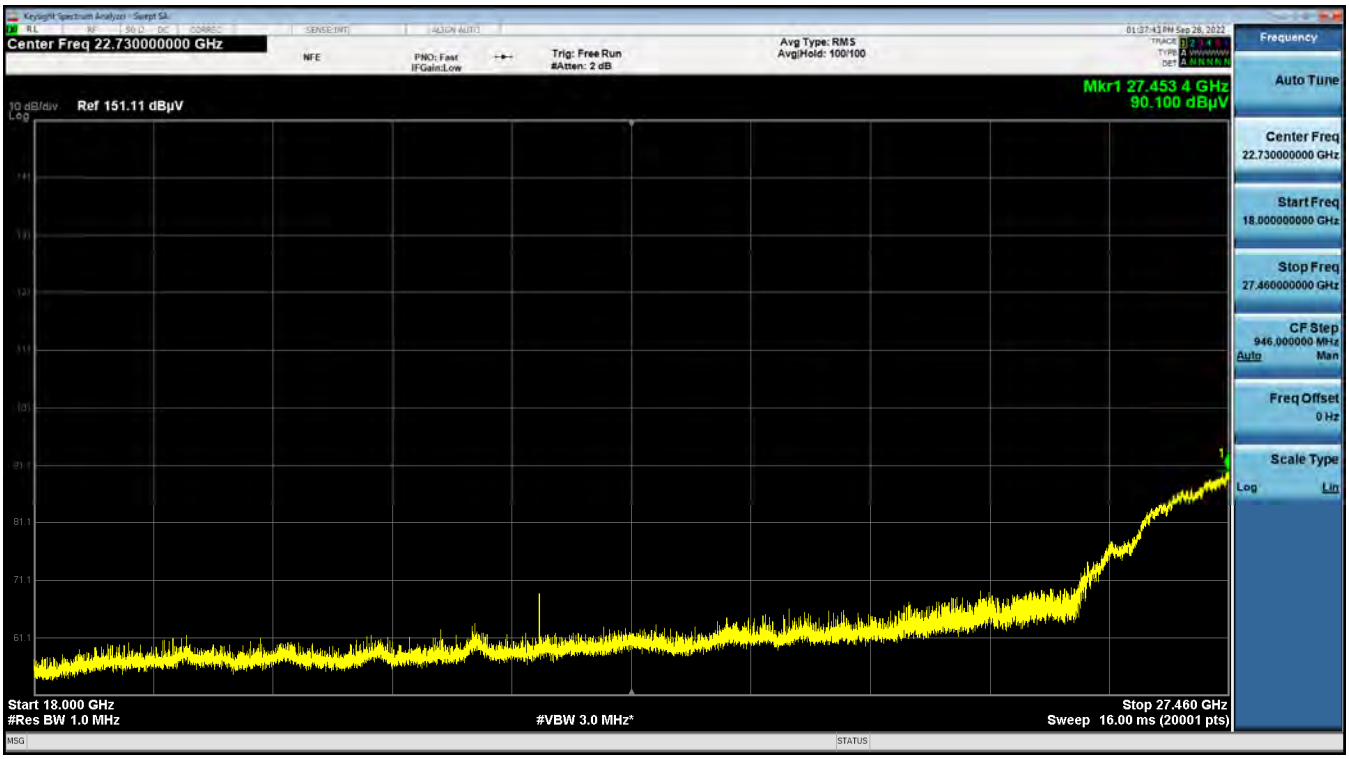
28 GHz High Edge ~ 39 GHz Low Edge / InterBand / 28GHz / 256QAM



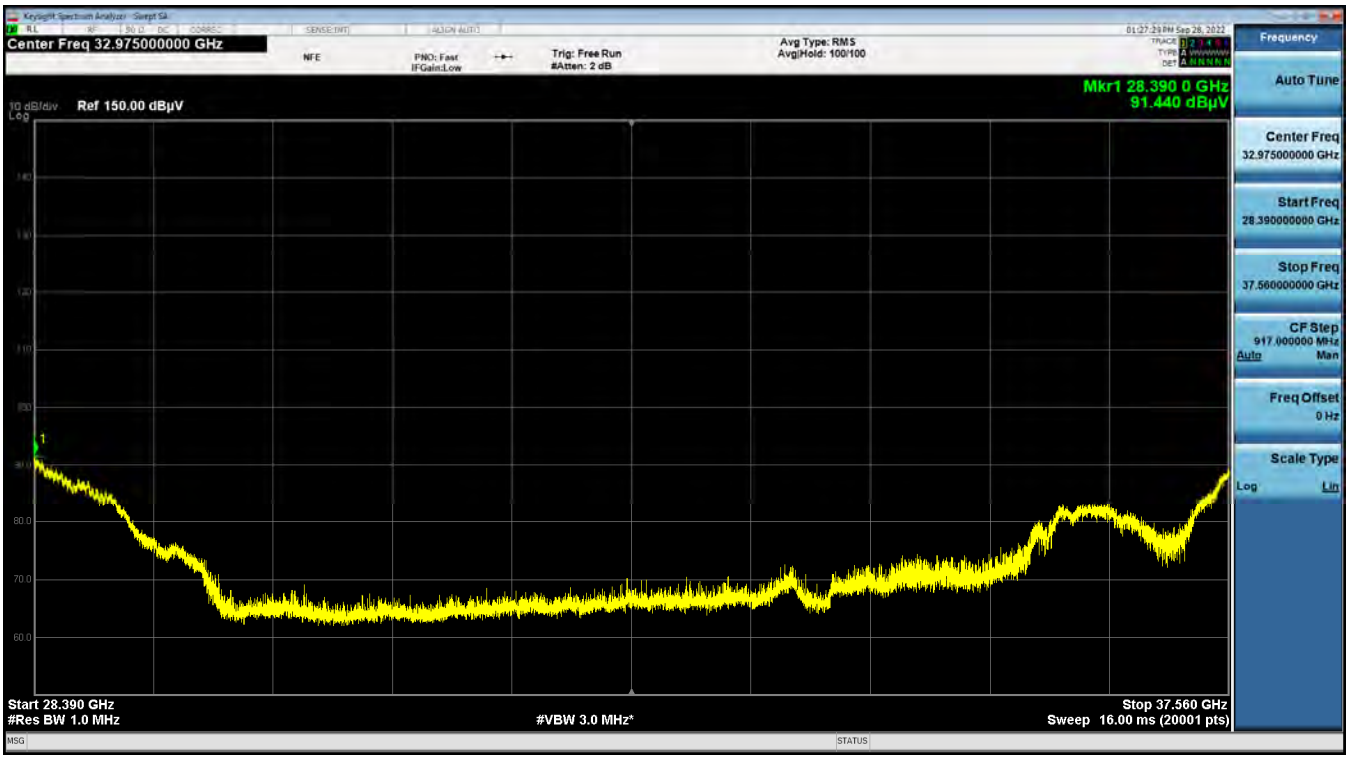
High Edge ~ 40 GHz / InterBand / 28GHz / 16QAM



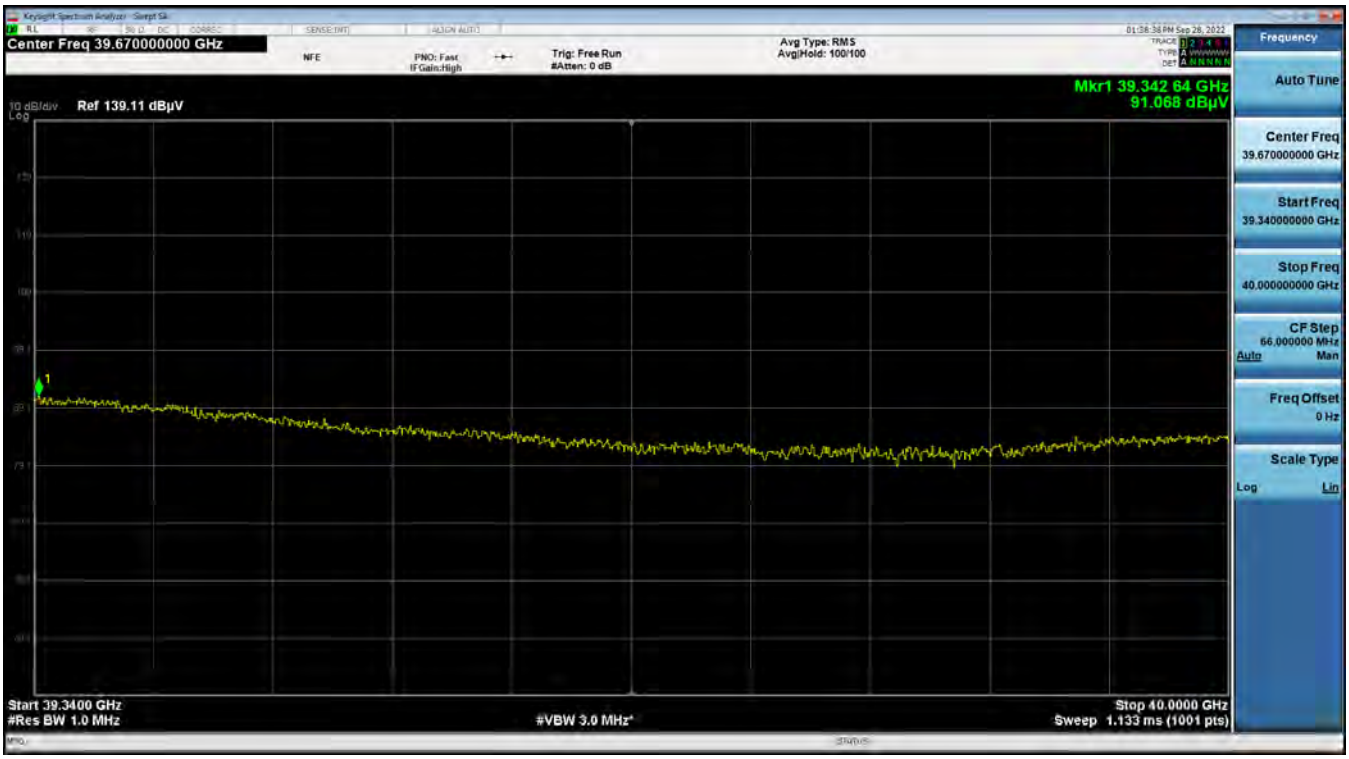
18 GHz ~ Low Edge / InterBand / 38GHz / 64QAM



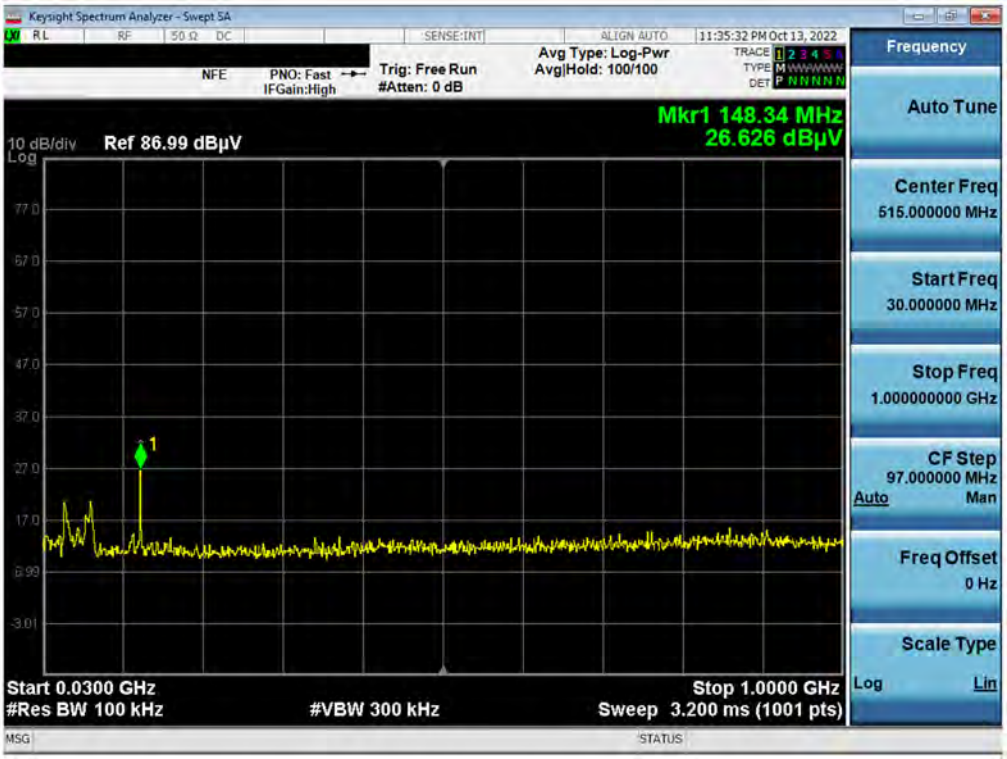
28 GHz High Edge ~ 39 GHz Low Edge / InterBand / 38GHz / QPSK



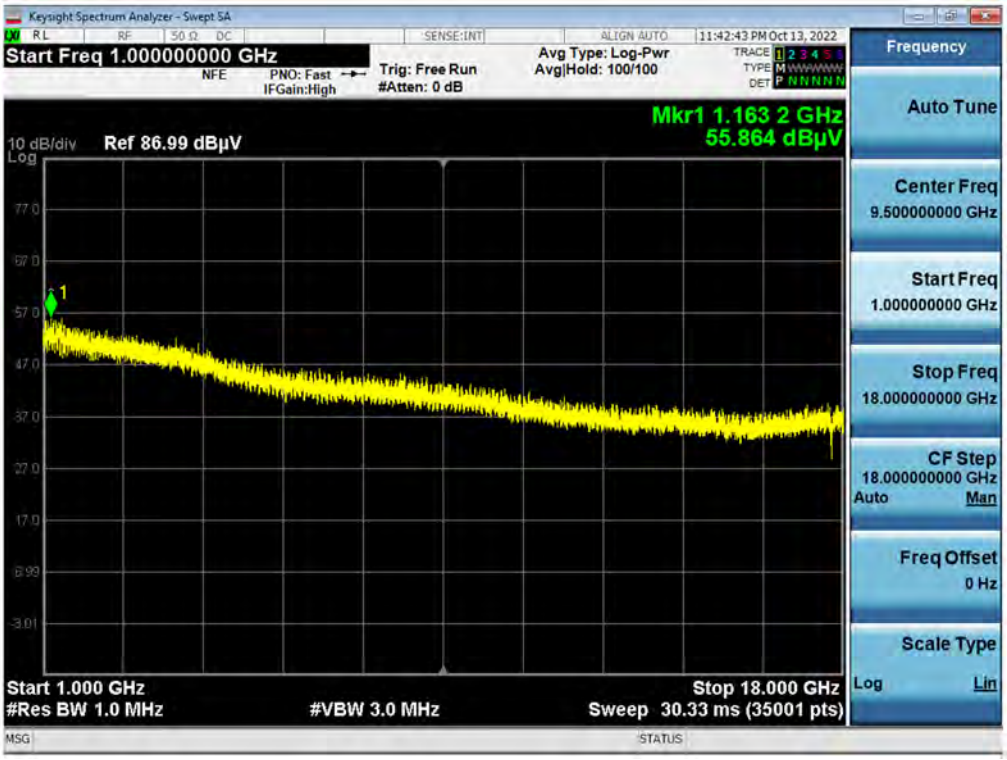
High Edge ~ 40 GHz / InterBand / 38GHz / 64QAM



30 MHz ~ 1 GHz

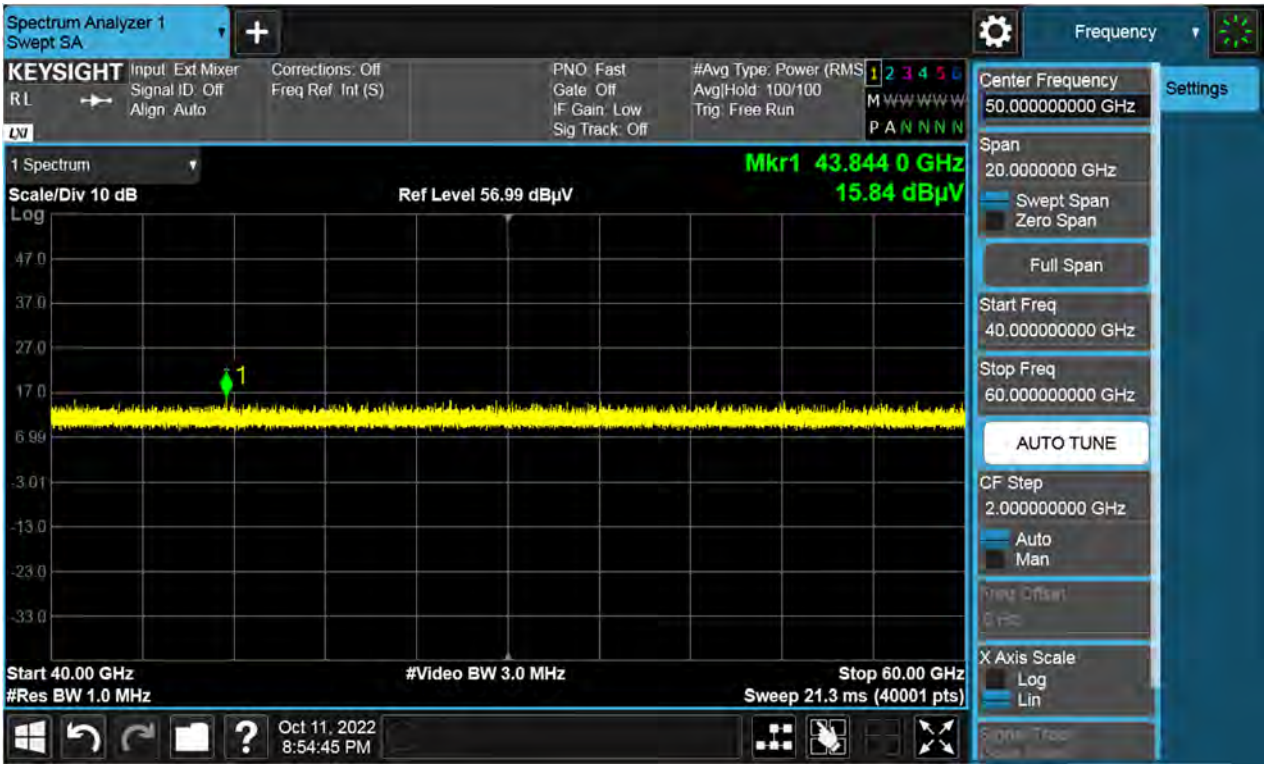


1 GHz ~ 18 GHz

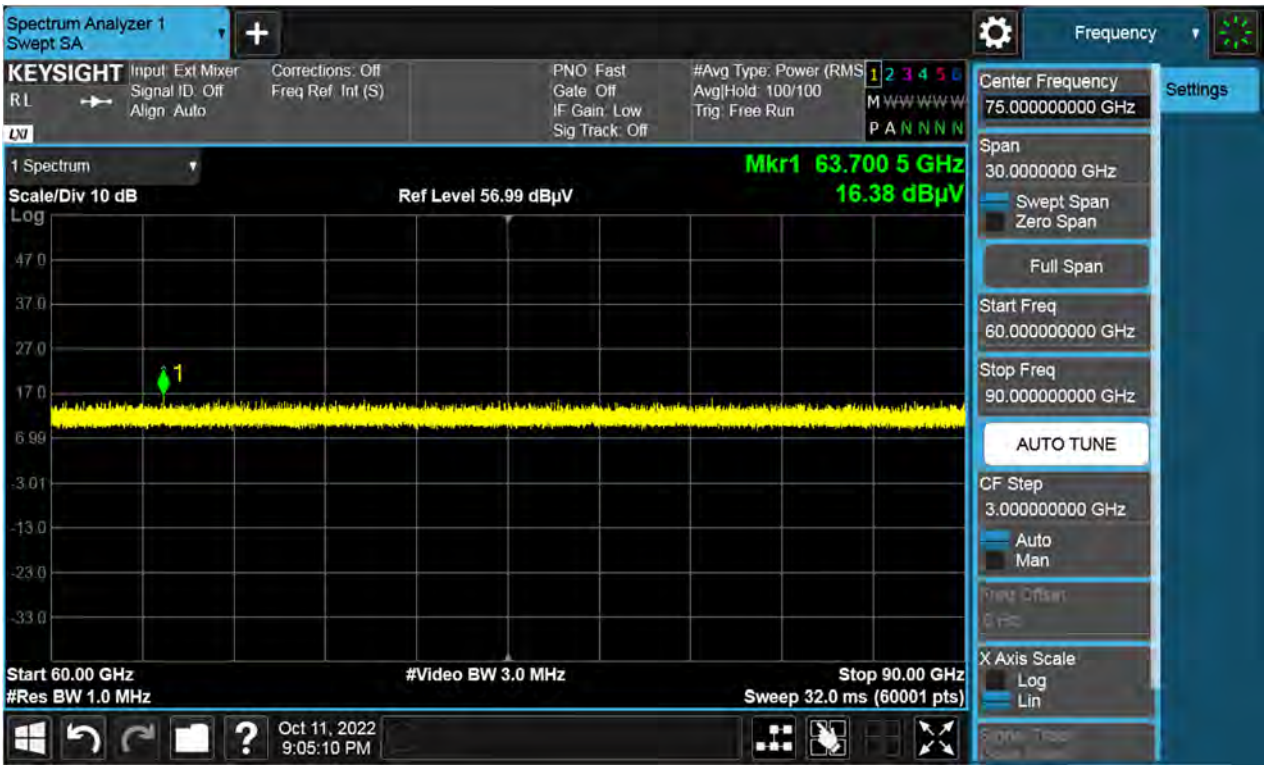


*In case of 9 kHz to 18 GHz and 40 GHz to 200 GHz, the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured so we are attached only the worst case plots.

40 GHz ~ 60 GHz

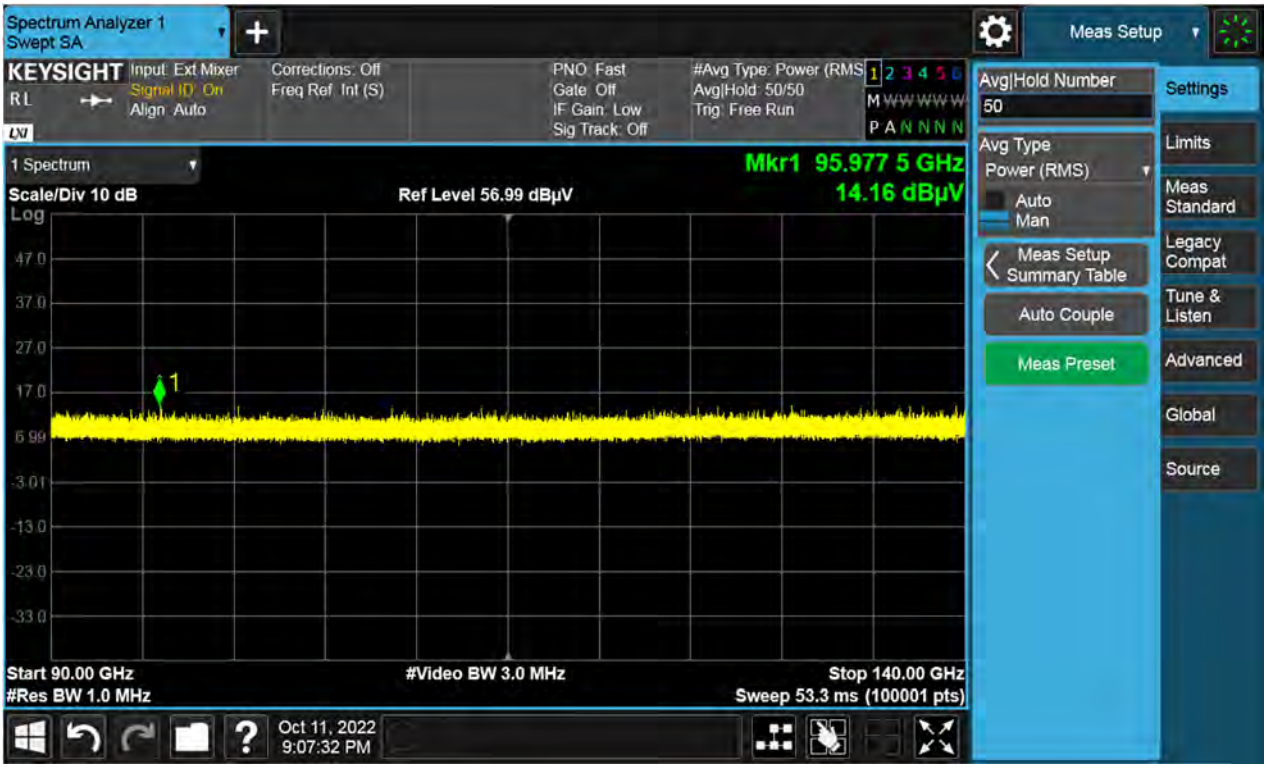


60 GHz ~ 90 GHz

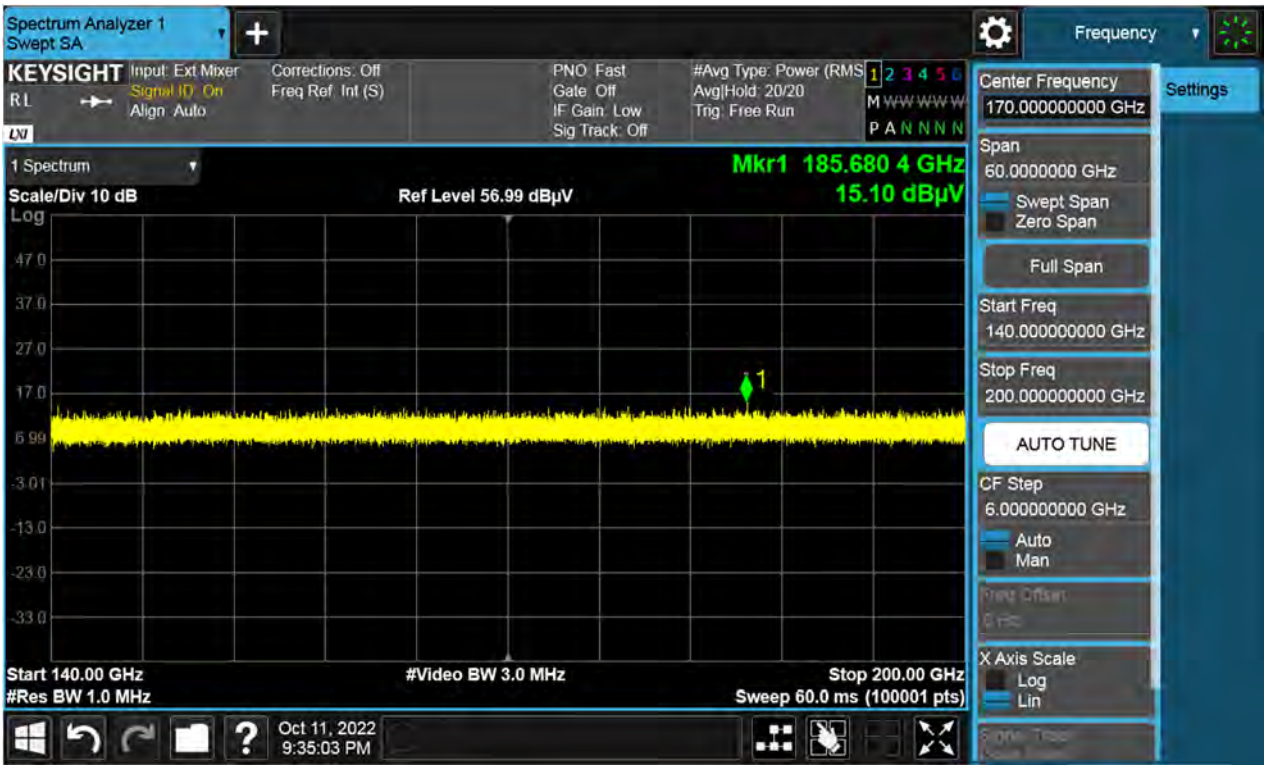


*In case of 9 kHz to 18 GHz and 40 GHz to 200 GHz, the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured so we are attached only the worst case plots.

90 GHz ~ 140 GHz



140 GHz ~ 200 GHz



*In case of 9 kHz to 18 GHz and 40 GHz to 200 GHz, the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured so we are attached only the worst case plots.

5.6. FREQUENCY STABILITY

FCC Rules

Test Requirements:

§ 2.1055 Measurements required: Frequency stability.

(a) The frequency stability shall be measured with variation of ambient temperature as follows:

(1) From −30° to + 50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.

Test Procedures:

The measurement is performed in accordance with Section 5.6.4 and 5.6.5 of ANSI C63.26.

5.6.4 Frequency stability over variations in temperature

a) Supply the EUT with a nominal 60 Hz ac voltage, dc voltage, or install a new or fully charged battery in the EUT.

b) If possible a dummy load should be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, the EUT should be placed in the center of the chamber with the antenna adjusted to the shortest length possible.

c) Turn on the EUT, and tune it to the center frequency of the operating band.

d) Couple the transmitter output to the measuring instrument through a suitable attenuator and coaxial cable. If connection to the EUT output is not possible, make the measurement by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away).

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory authority is the recommended measuring instrument.

e) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument, but is strong enough to allow measurement of the operating or fundamental frequency of the EUT). Adjust the detector bandwidth and span settings to achieve a resolution capable of accurate frequency measurements over the applicable frequency stability limits.

f) Turn the EUT off, and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

g) Set the temperature control on the chamber to the highest temperature specified in the regulatory requirements for the type of device, and allow the oscillator heater and the chamber temperature to stabilize. Unless otherwise instructed by the regulatory authority, this temperature should be 50 °C.

h) While maintaining a constant temperature inside the environmental chamber, turn on the EUT and allow sufficient time for the EUT temperature to stabilize.

i) Measure the frequency.

j) Switch off the EUT, but do not switch off the oscillator heater.

k) Lower the chamber temperature to the next level that is required by the standard and allow the temperature inside the chamber to stabilize. Unless otherwise instructed by the regulators, this temperature step should be 10 °C.

l) Repeat step h) through step k) down to the lowest specified temperature. Unless otherwise instructed by the regulators, this temperature should be −30 °C. When the frequency stability limit is stated as being sufficient such that the

fundamental emissions stay within the authorized bands of operation, a reference point shall be established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as f_L and f_H respectively. The worst-case frequency offset determined in the above methods shall be added or subtracted from the values of f_L and f_H and the resulting frequencies must remain within the band.

m) Omitted

5.6.5 Frequency stability when varying supply voltage

a) Couple the transmitter output to the measuring instrument through a suitable attenuator and coaxial cable. If connection to the EUT output is not possible make the measurement by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away)

b) Supply the EUT with nominal ac or dc voltage. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

c) Turn on the EUT, and couple its output to a frequency counter or other frequency-measuring instrument.

d) Tune the EUT to the center frequency of the operating band. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument, but is strong enough to allow measurement of the operating or fundamental frequency of the EUT). Adjust the detector bandwidth and span settings to achieve a resolution capable of accurate frequency measurements over the applicable frequency stability limits.

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory authority is the recommended measuring instrument.

e) Measure the frequency.

f) Unless otherwise specified, vary primary supply voltage from 85% to 115% of the nominal value for other than hand carried battery equipment.

g) For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

h) Repeat the frequency measurement.

NOTE—For band-edge compliance, it can be required to make these measurements at the low and high channel of the operating band.

Note:

1. The results of the frequency stability test shown above the frequency deviation measured values are very small and similar trend for each path, so we are attached only the worst case data.
2. Test signal is CW signal for frequency stability.

Test Results:

Reference: Voltage = AC 100 ~ 240 V at 20°C, Frequency = 27.925 GHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	27925 000 002	2.063	0.000	0.00000
	-30	27925 000 009	6.489	4.426	0.00016
	-20	27925 000 011	8.664	6.601	0.00024
	-10	27925 000 005	3.148	1.086	0.00004
	0	27925 000 012	9.570	7.507	0.00027
	+10	27925 000 007	5.274	3.212	0.00012
	+30	27925 000 006	4.397	2.334	0.00008
	+40	27925 000 011	8.997	6.935	0.00025
	+50	27925 000 003	0.677	-1.386	-0.00005
115%	+20	27925 000 004	2.301	0.238	0.00001
85%	+20	27925 000 010	7.914	5.852	0.00021

Reference: Voltage = AC 100 ~ 240 V at 20°C, Frequency = 38.45 GHz

Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(°C)	(Hz)	Error (Hz)	(Hz)	
100%	+20(Ref)	38450 000 007	6.722	0.000	0.00000
	-30	38450 000 013	6.751	4.688	0.00017
	-20	38450 000 010	2.849	0.786	0.00003
	-10	38450 000 014	7.346	5.284	0.00019
	0	38450 000 007	0.566	-1.497	-0.00005
	+10	38450 000 007	0.309	-1.754	-0.00006
	+30	38450 000 012	5.653	3.590	0.00013
	+40	38450 000 014	6.910	4.847	0.00017
	+50	38450 000 014	7.551	5.488	0.00020
115%	+20	38450 000 011	3.878	1.815	0.00007
85%	+20	38450 000 011	4.240	2.177	0.00008

6. Annex A_Test Equipment CERTIFIED DOCUMENTS

Please refer to test equipment certified documents.

7. Annex B_EUT AND TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2210-FC004-P