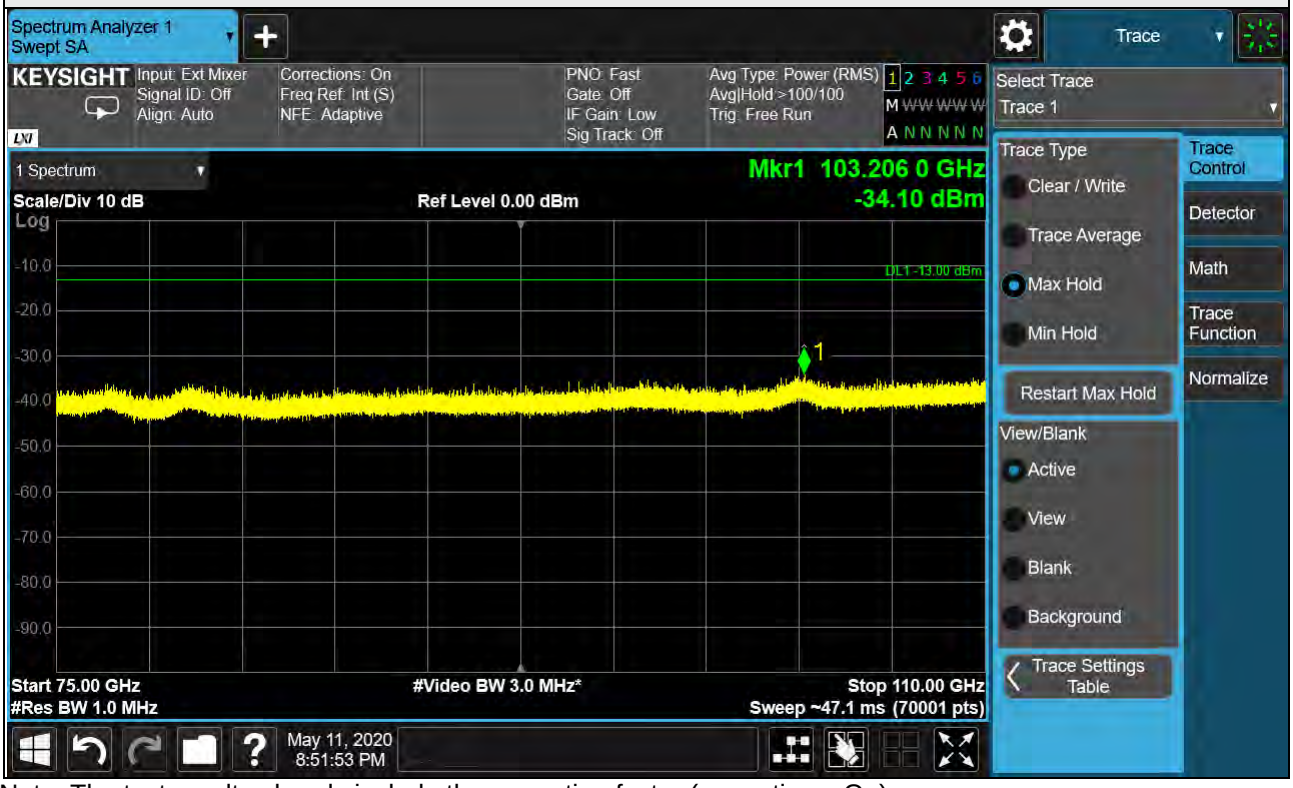
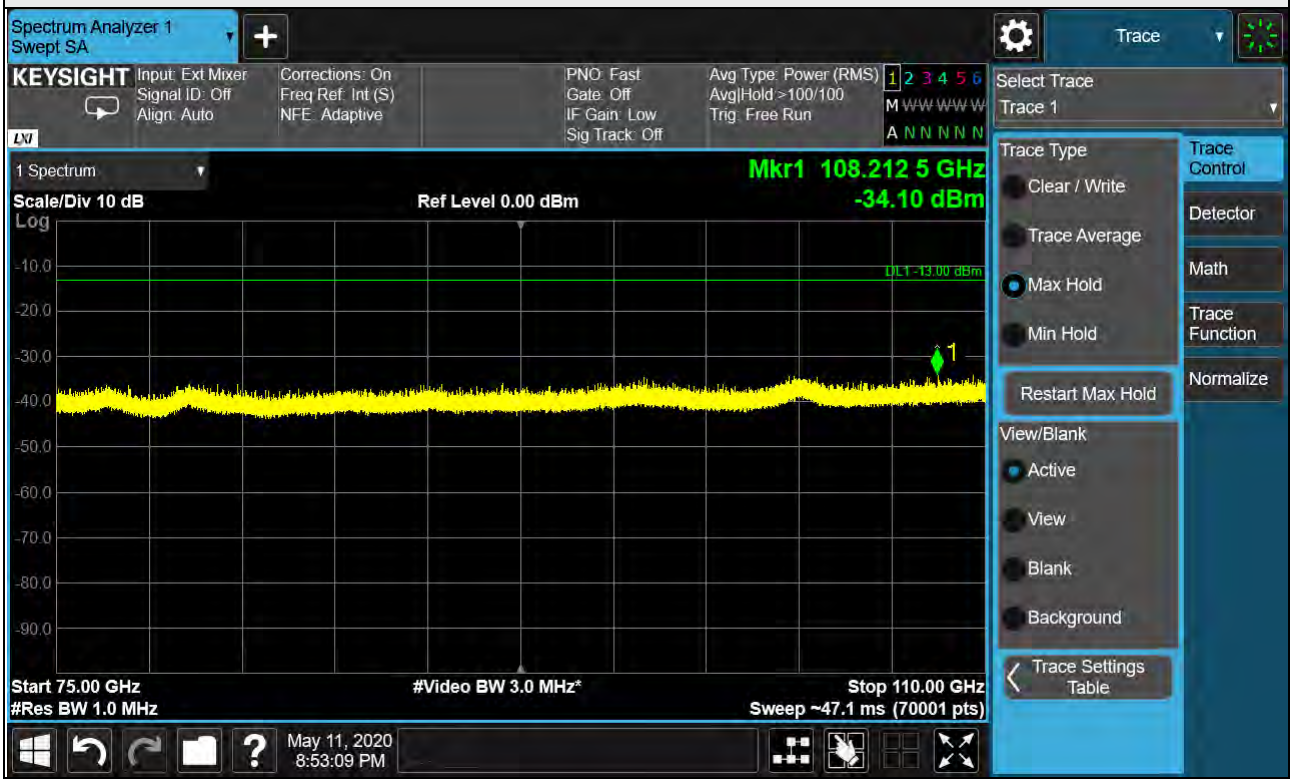
Beam ID	30	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



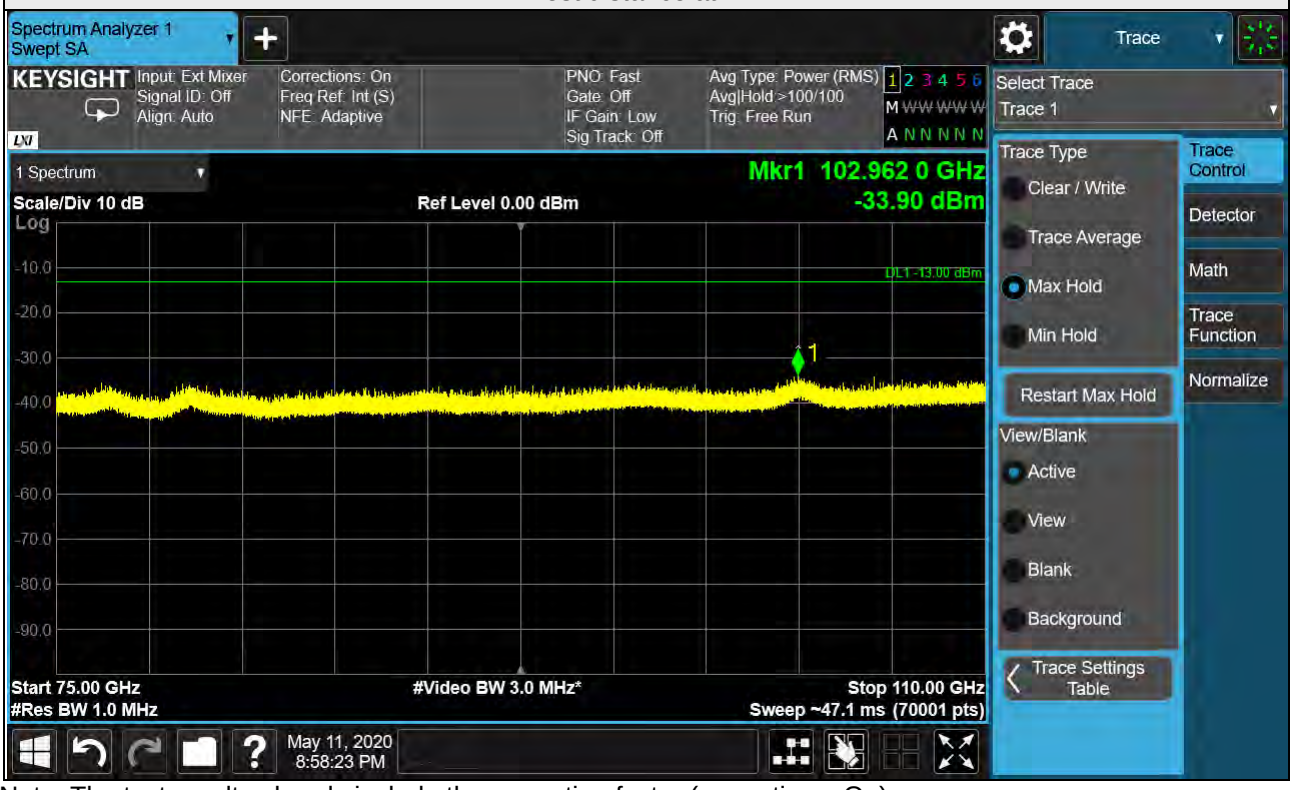
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



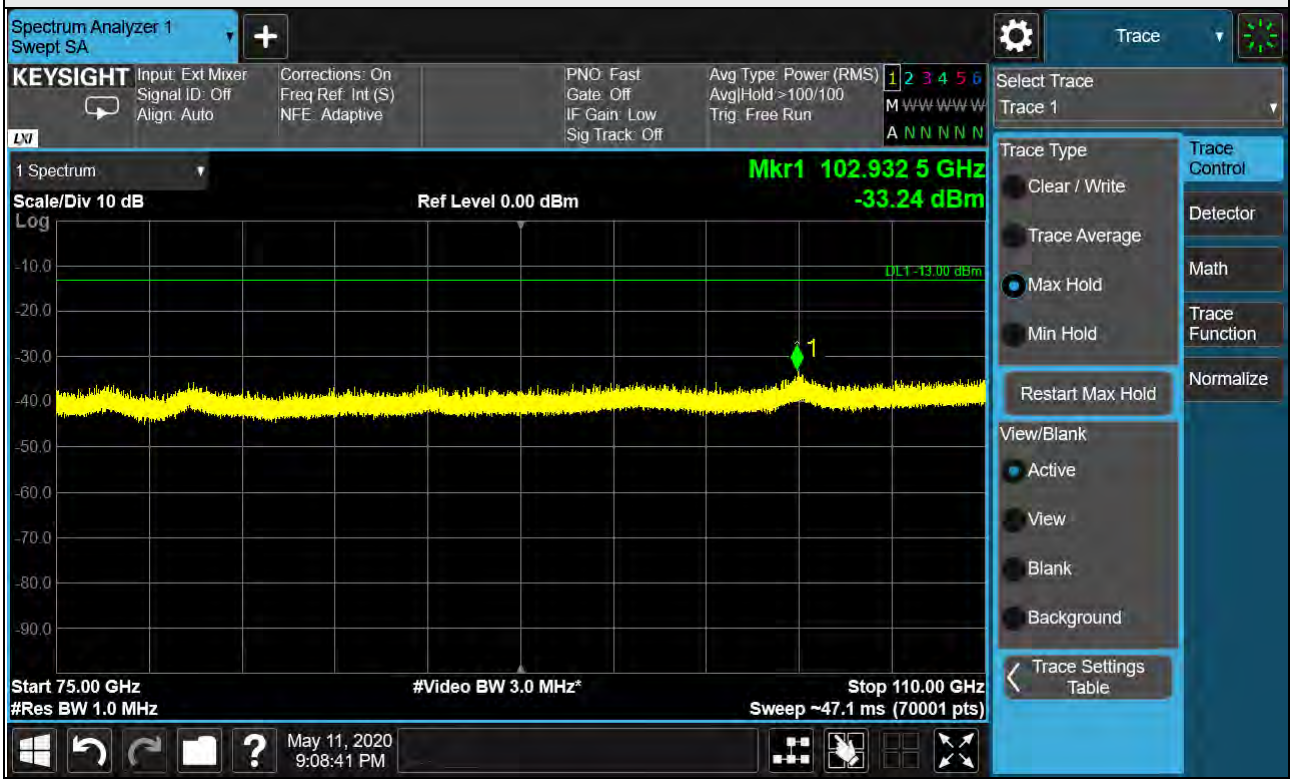
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



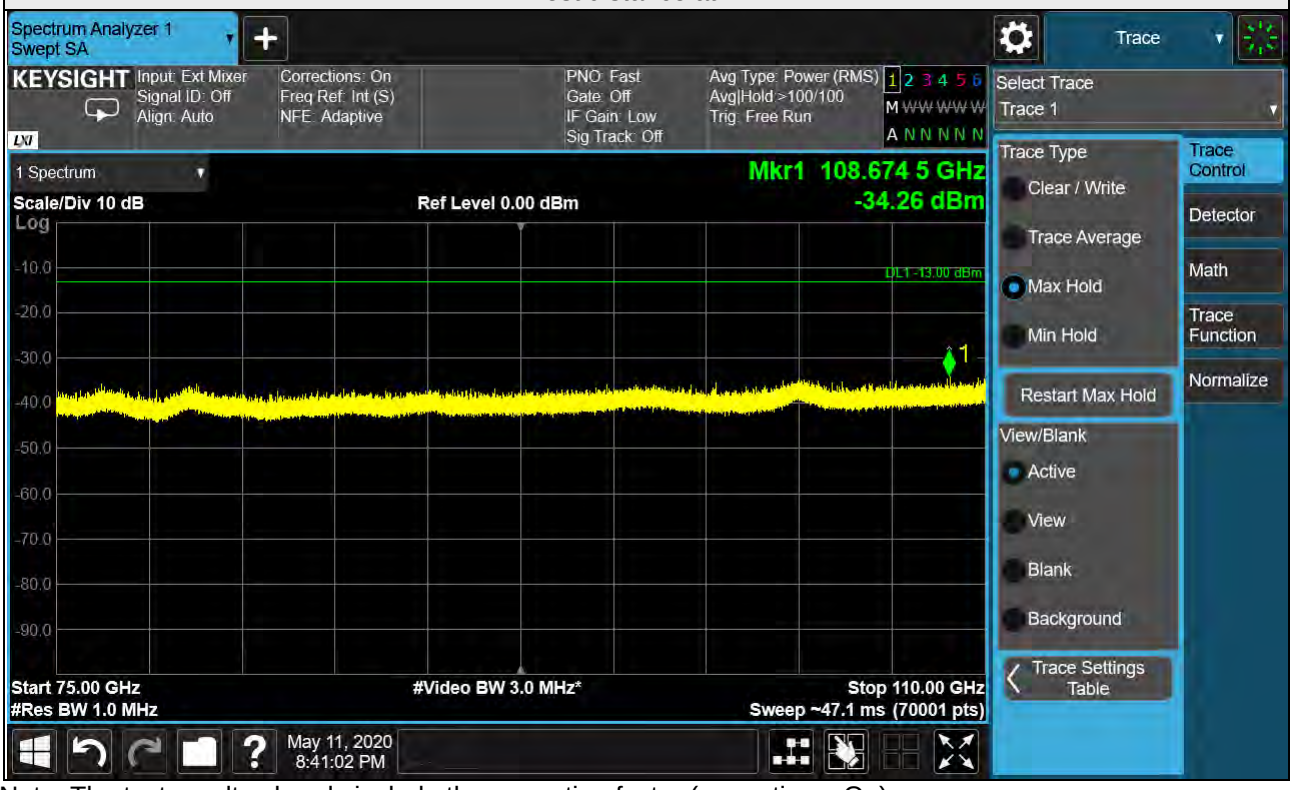
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



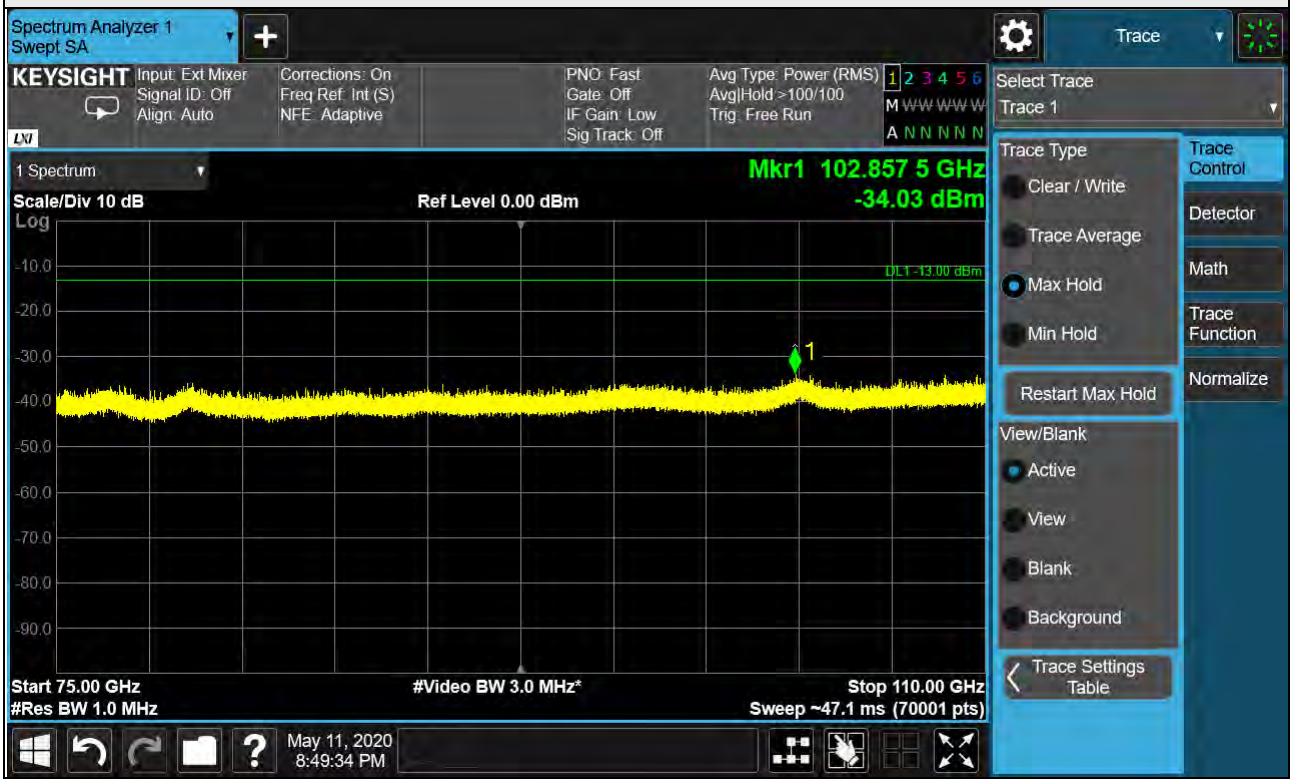
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



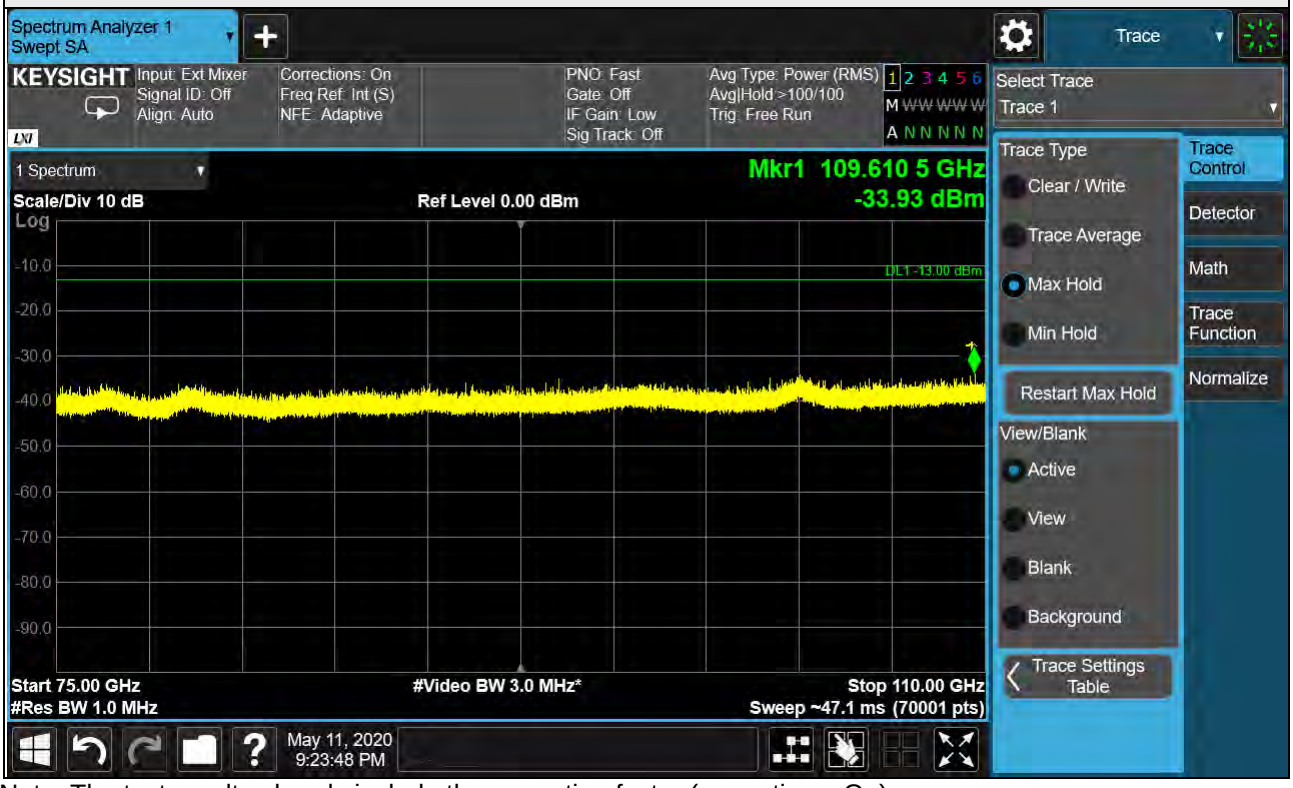
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



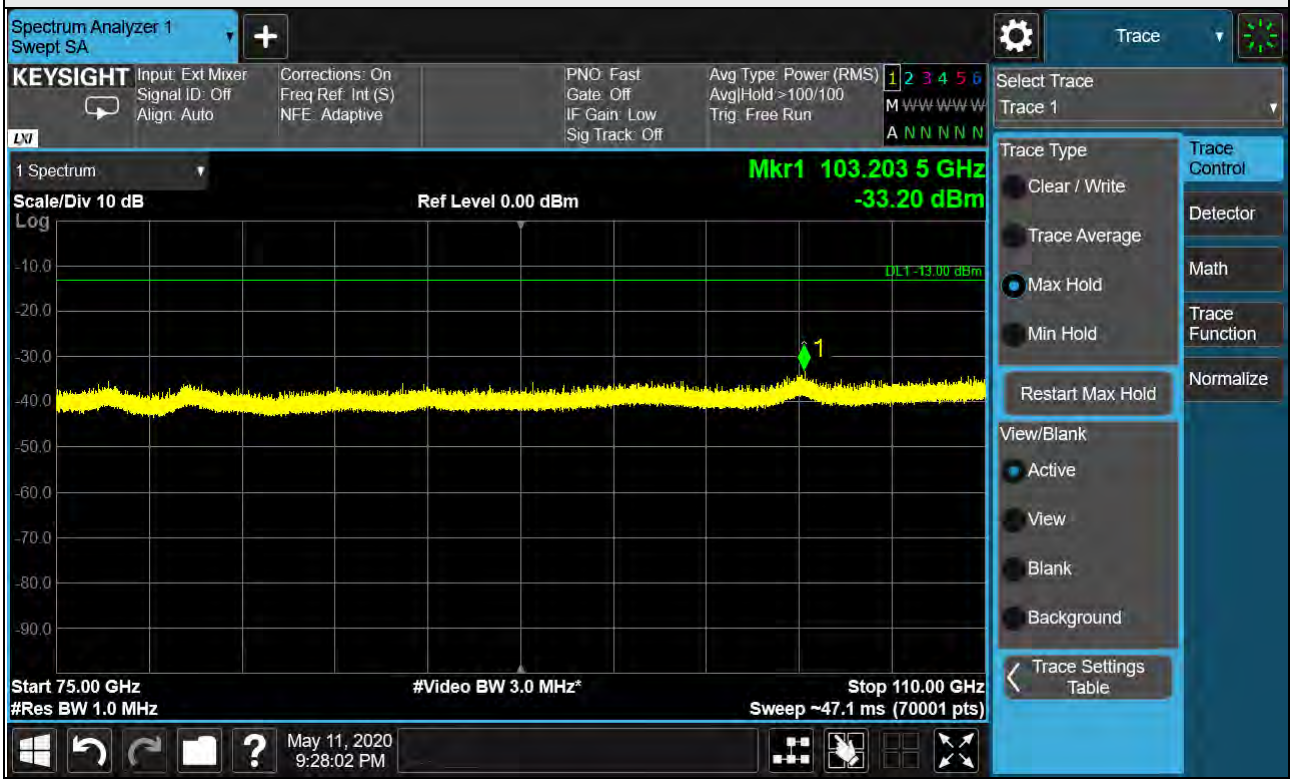
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



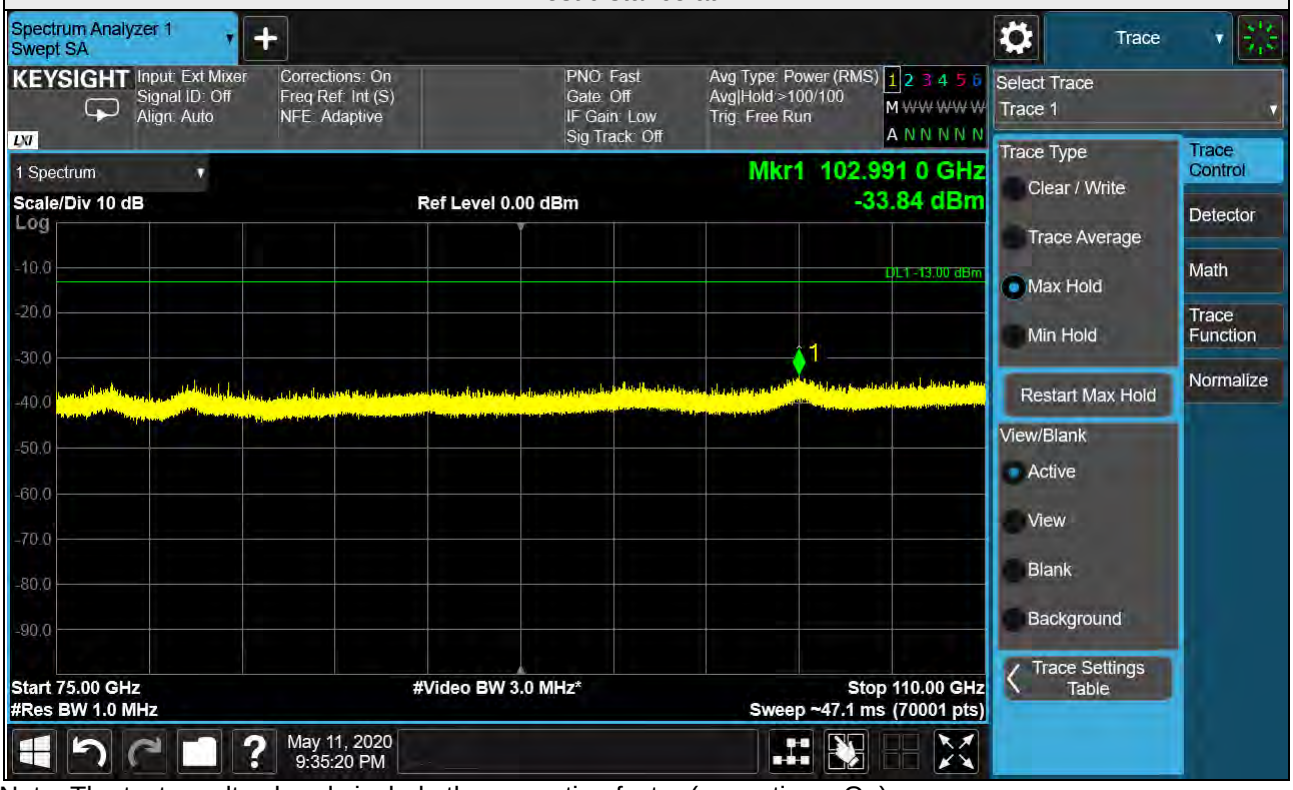
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



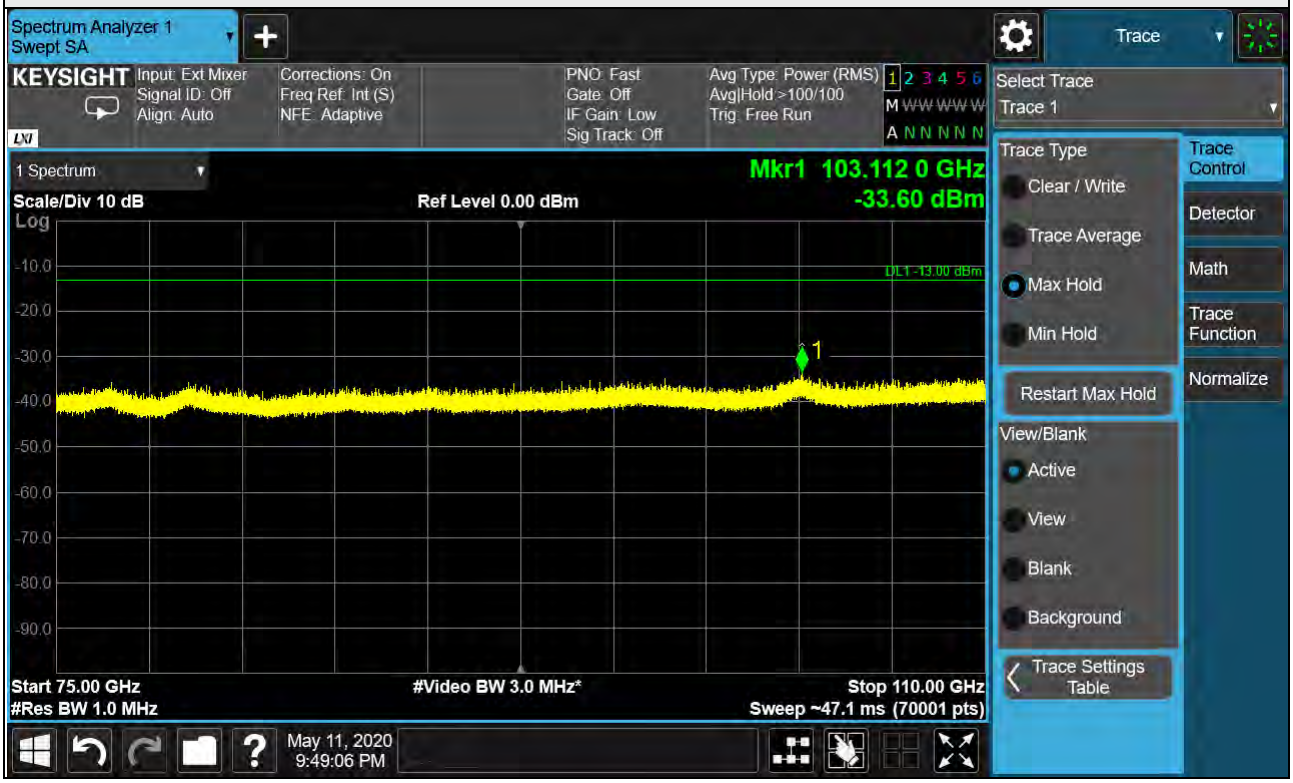
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



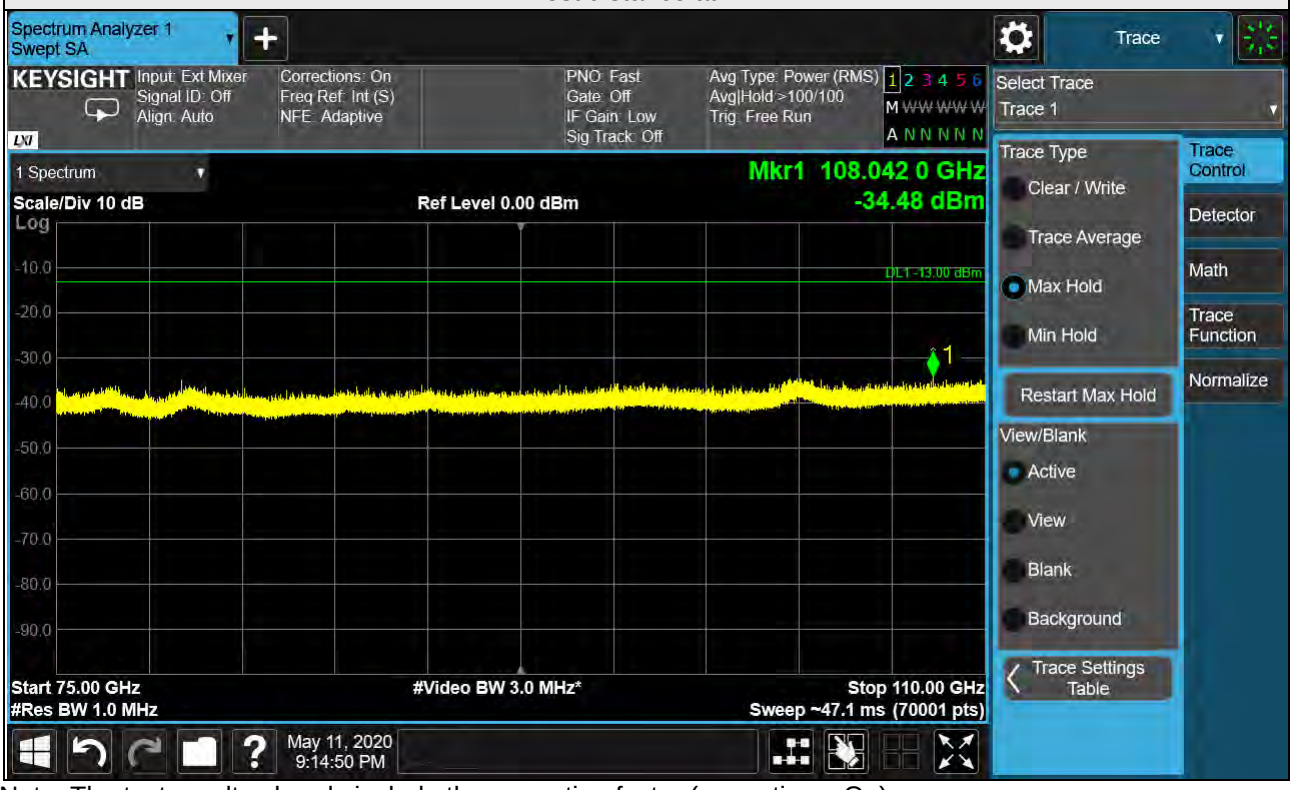
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



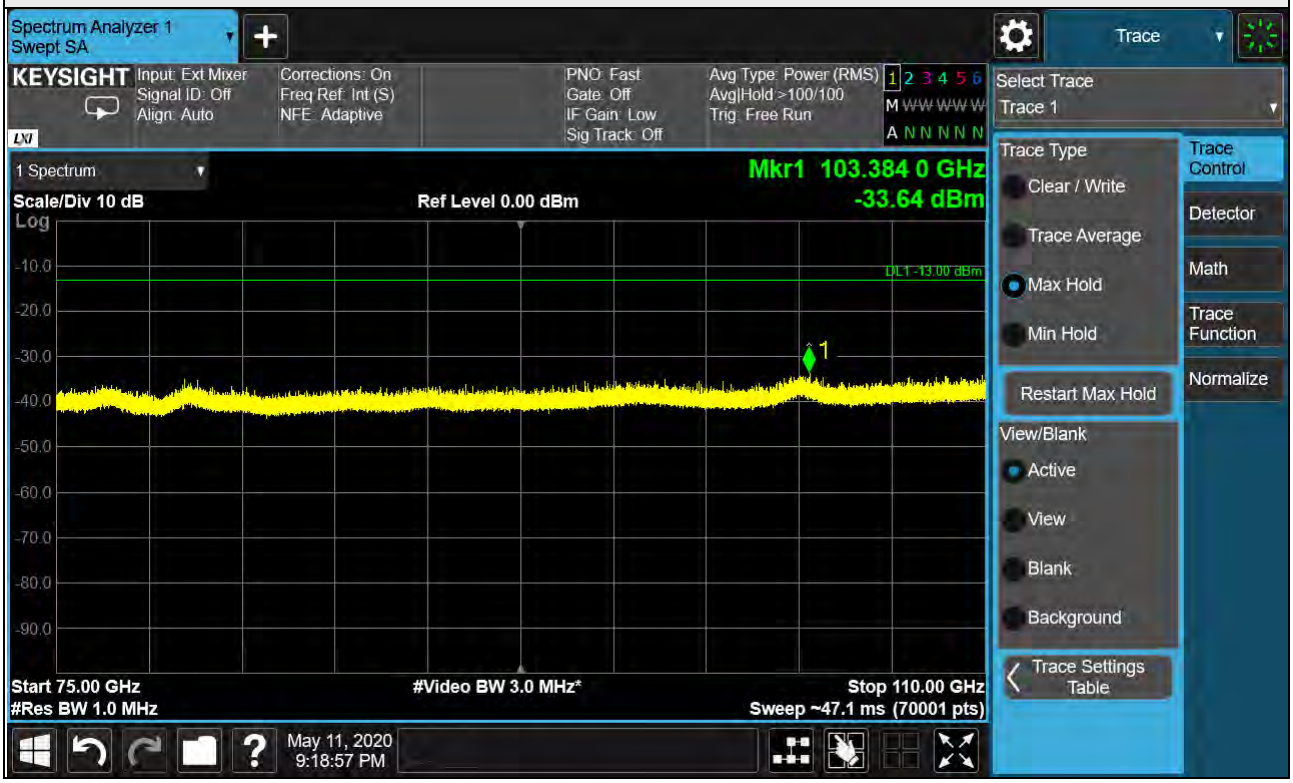
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



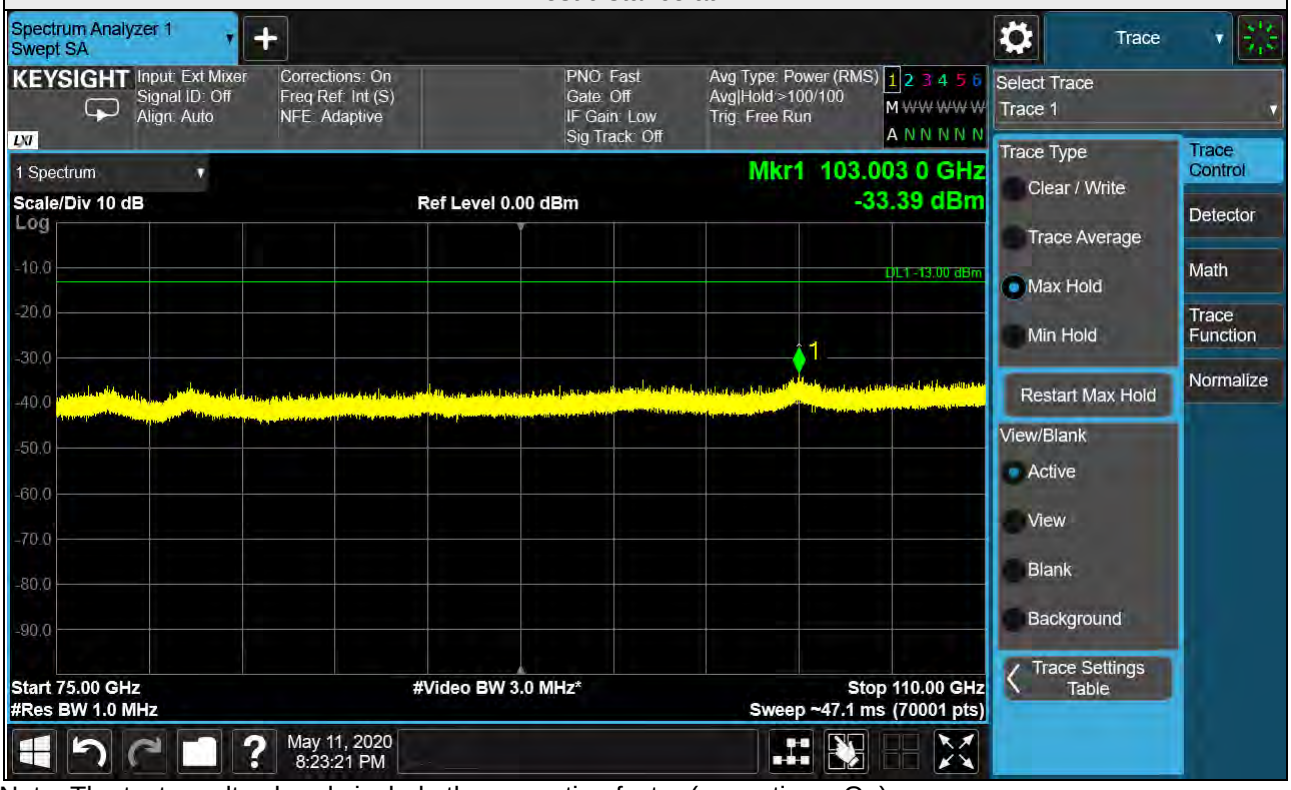
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



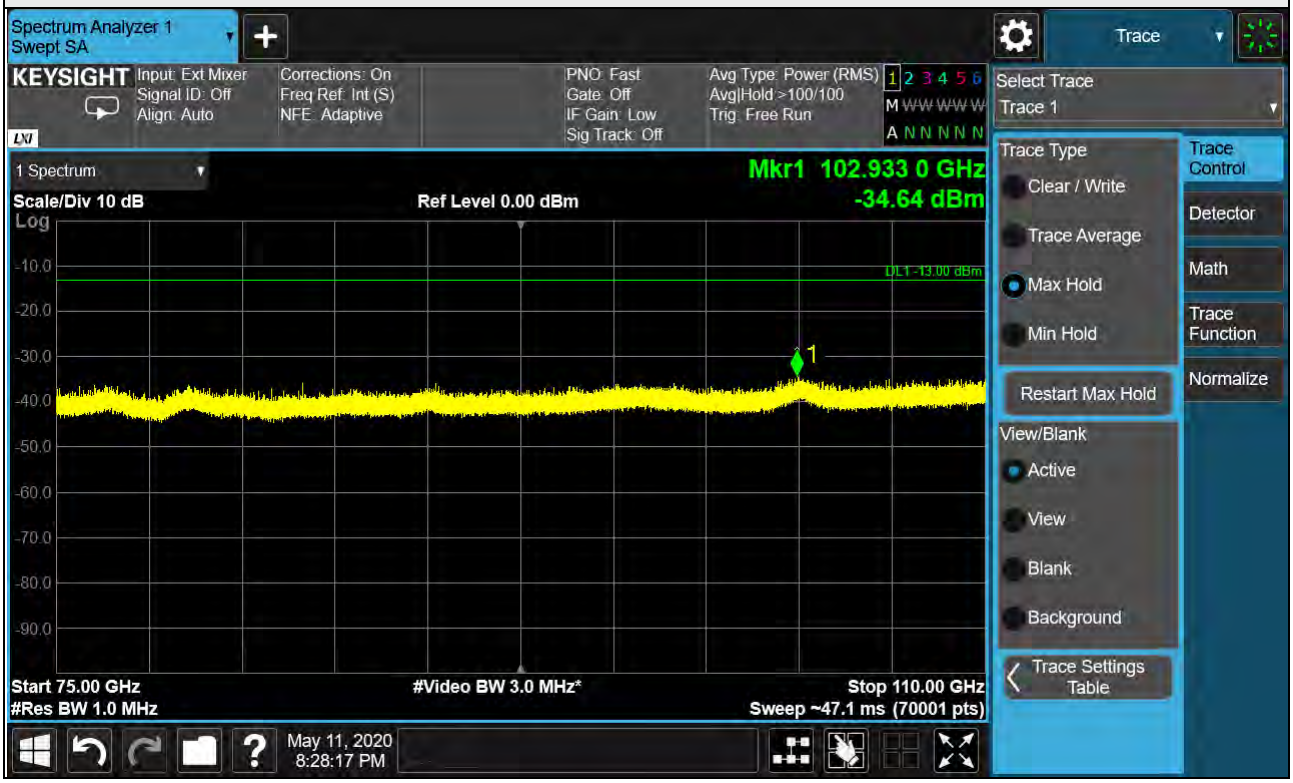
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



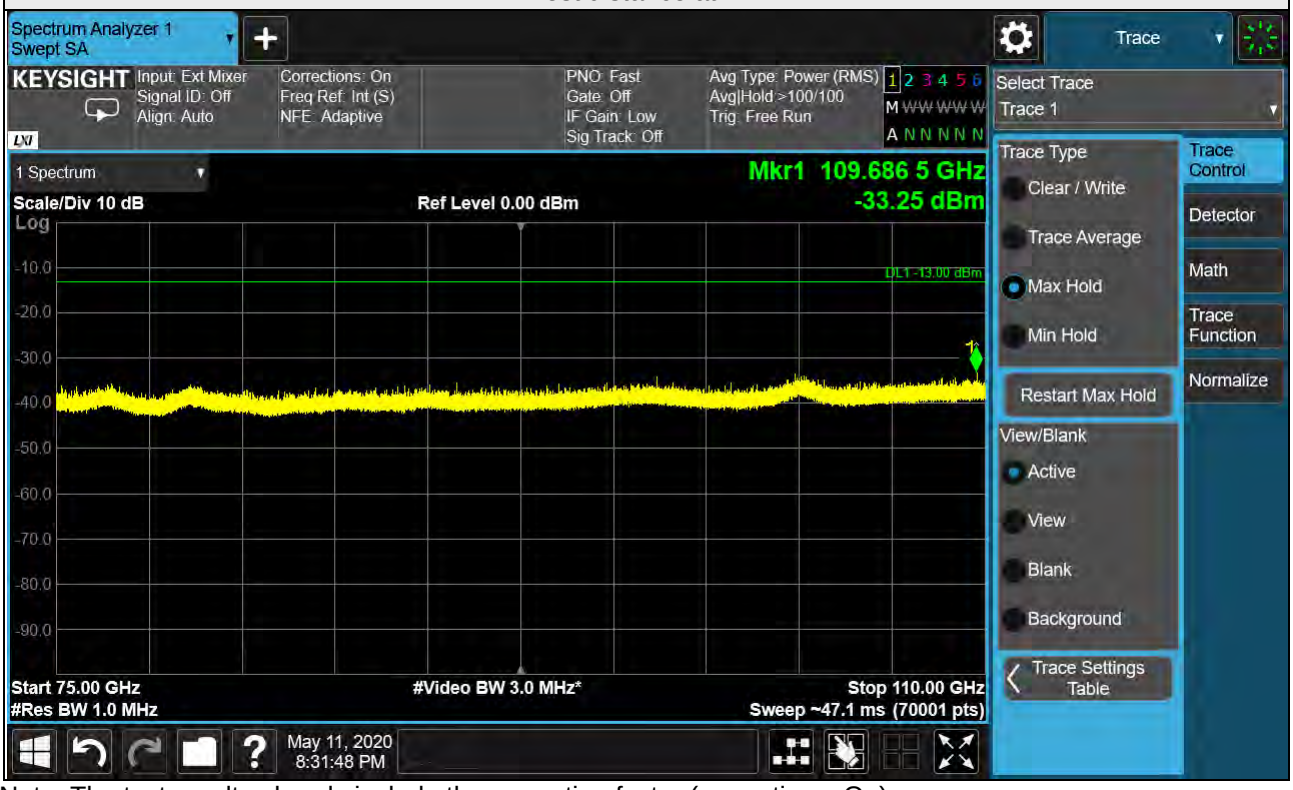
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



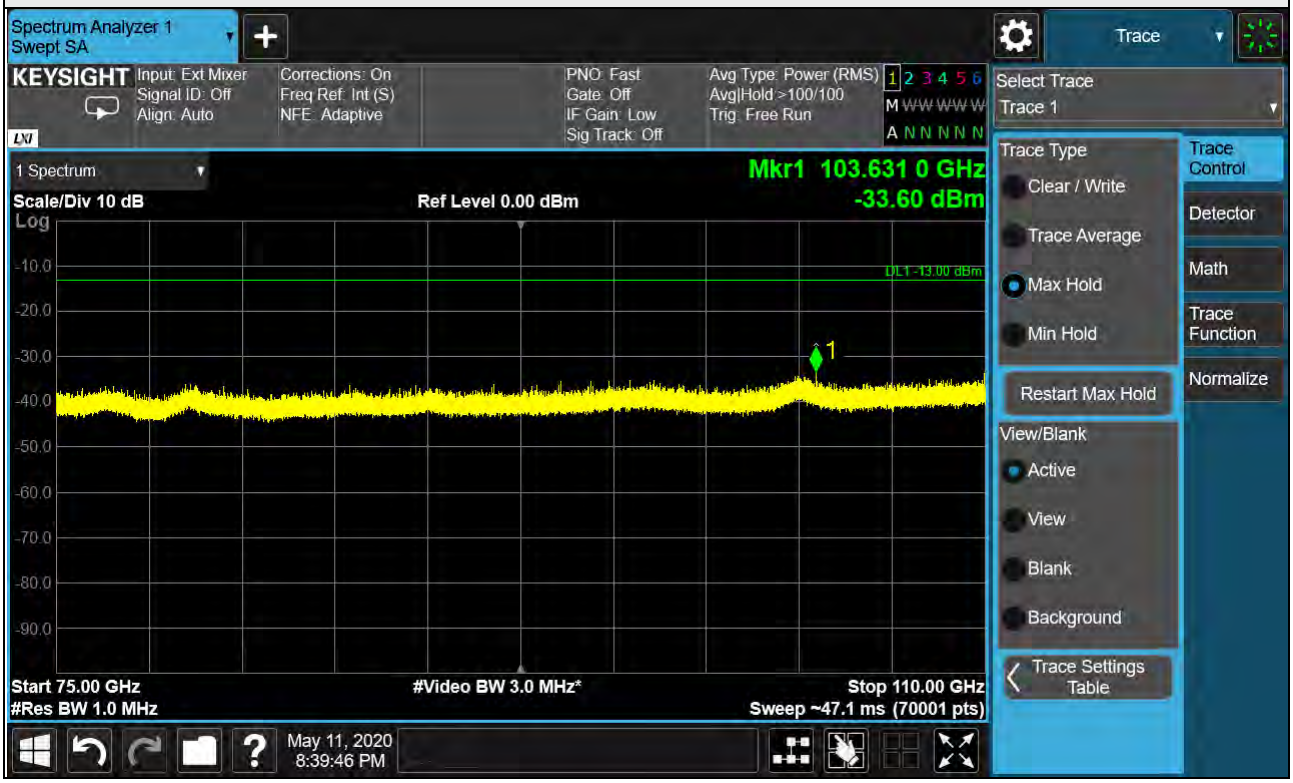
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



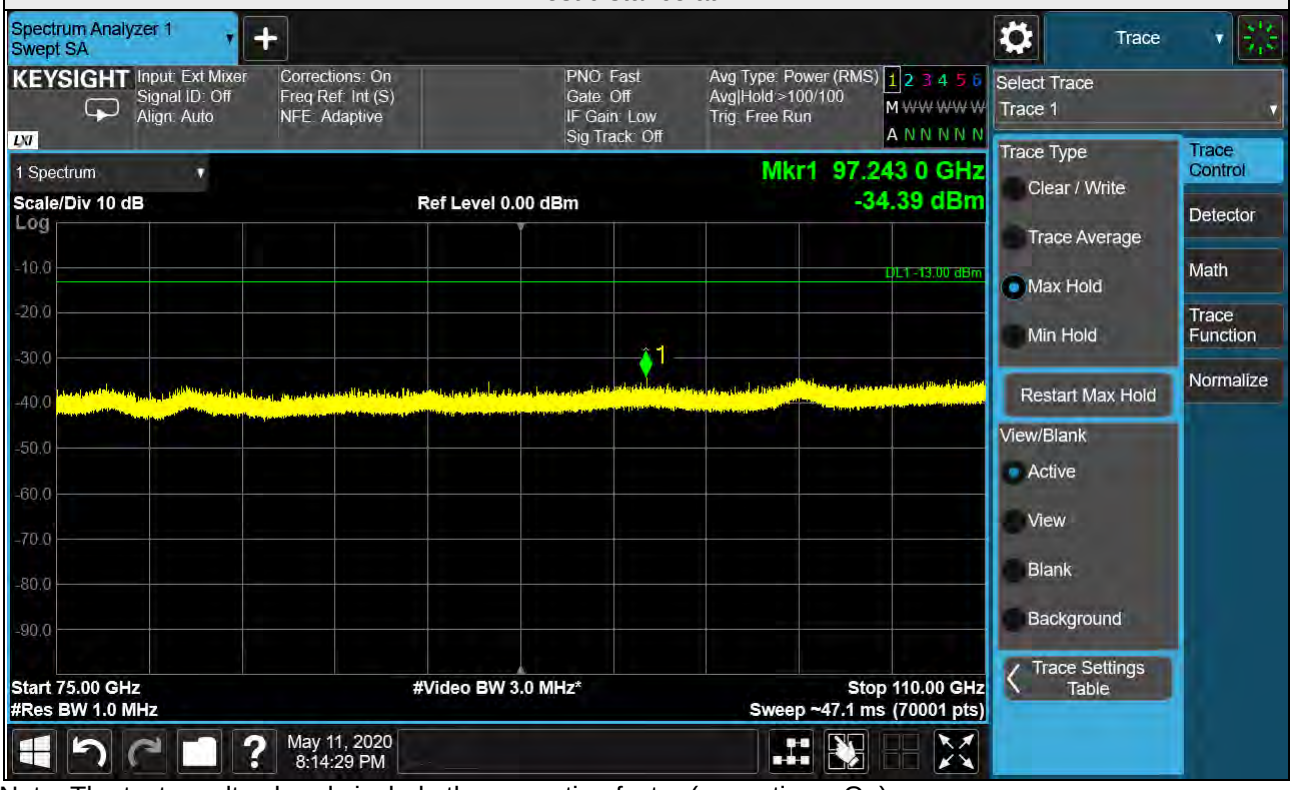
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



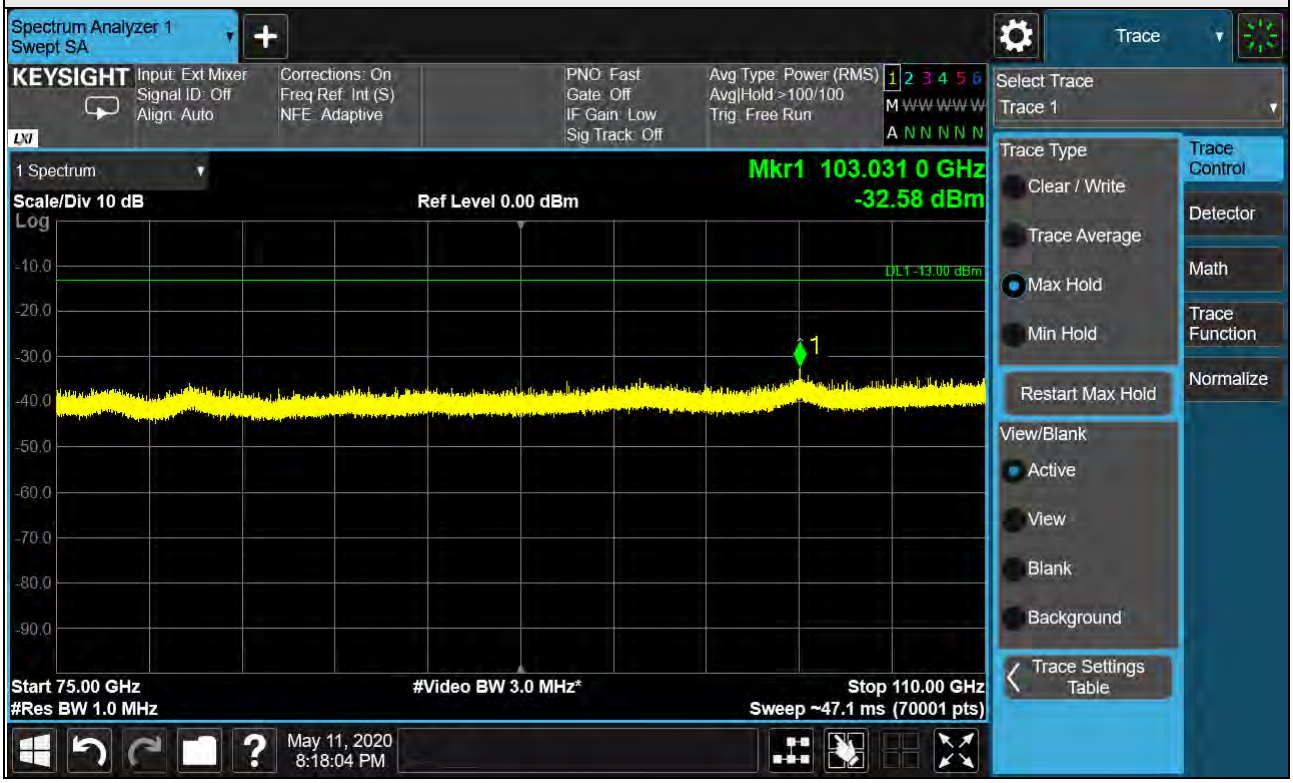
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



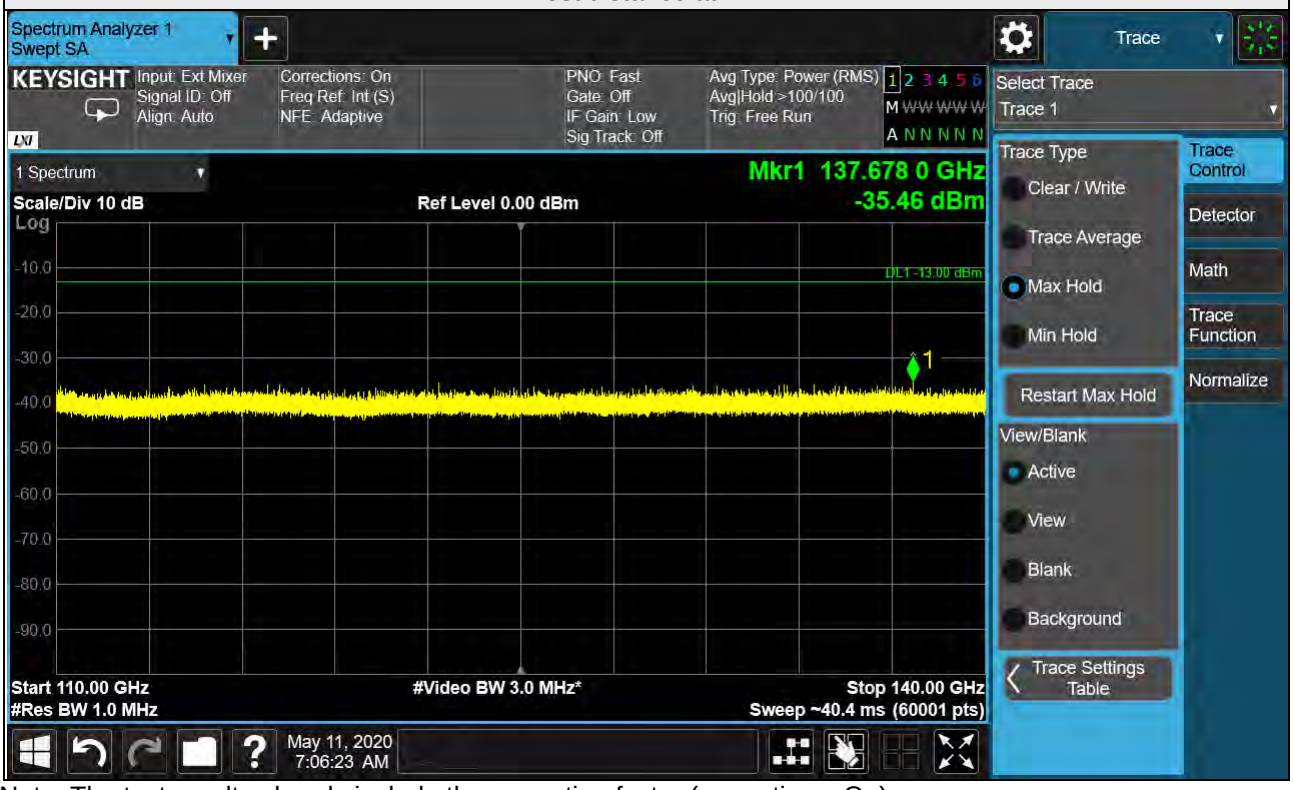
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	75GHz-110GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



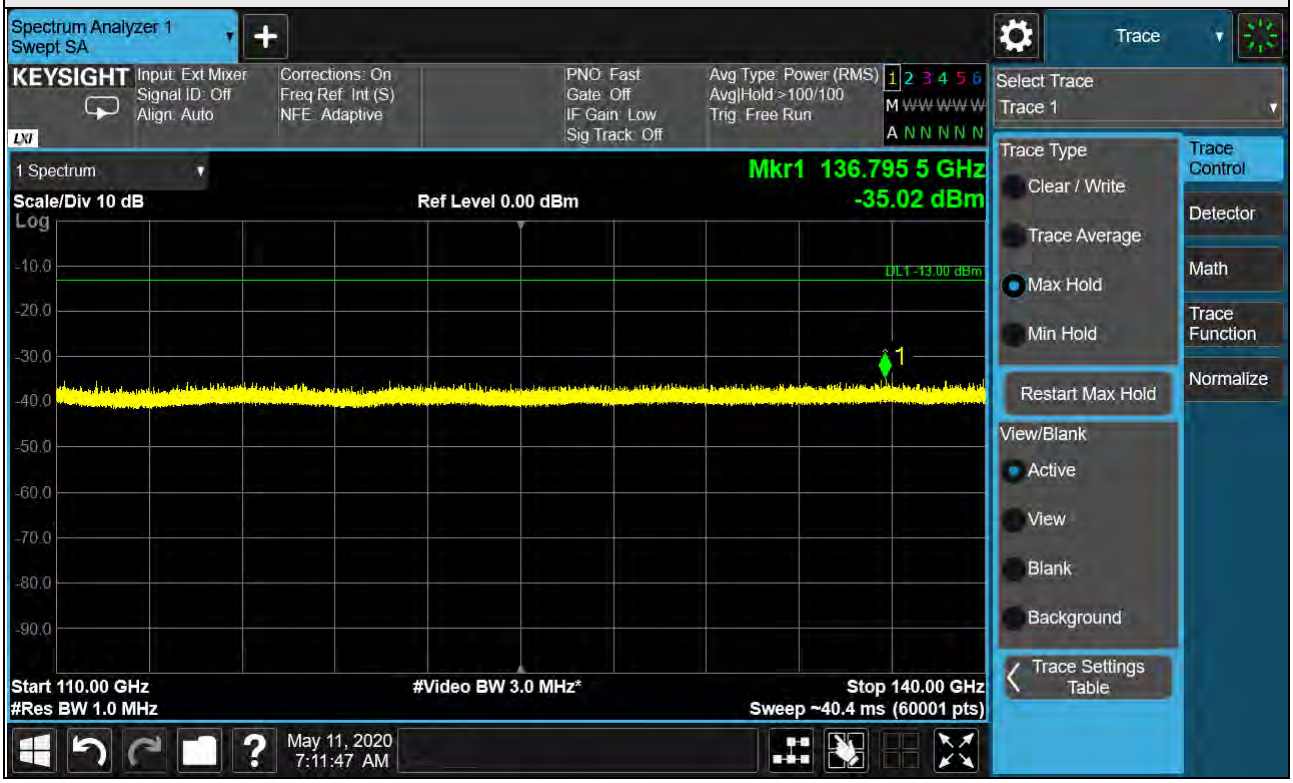
Note: The test results already include the correction factor (corrections: On).

eam ID	20	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



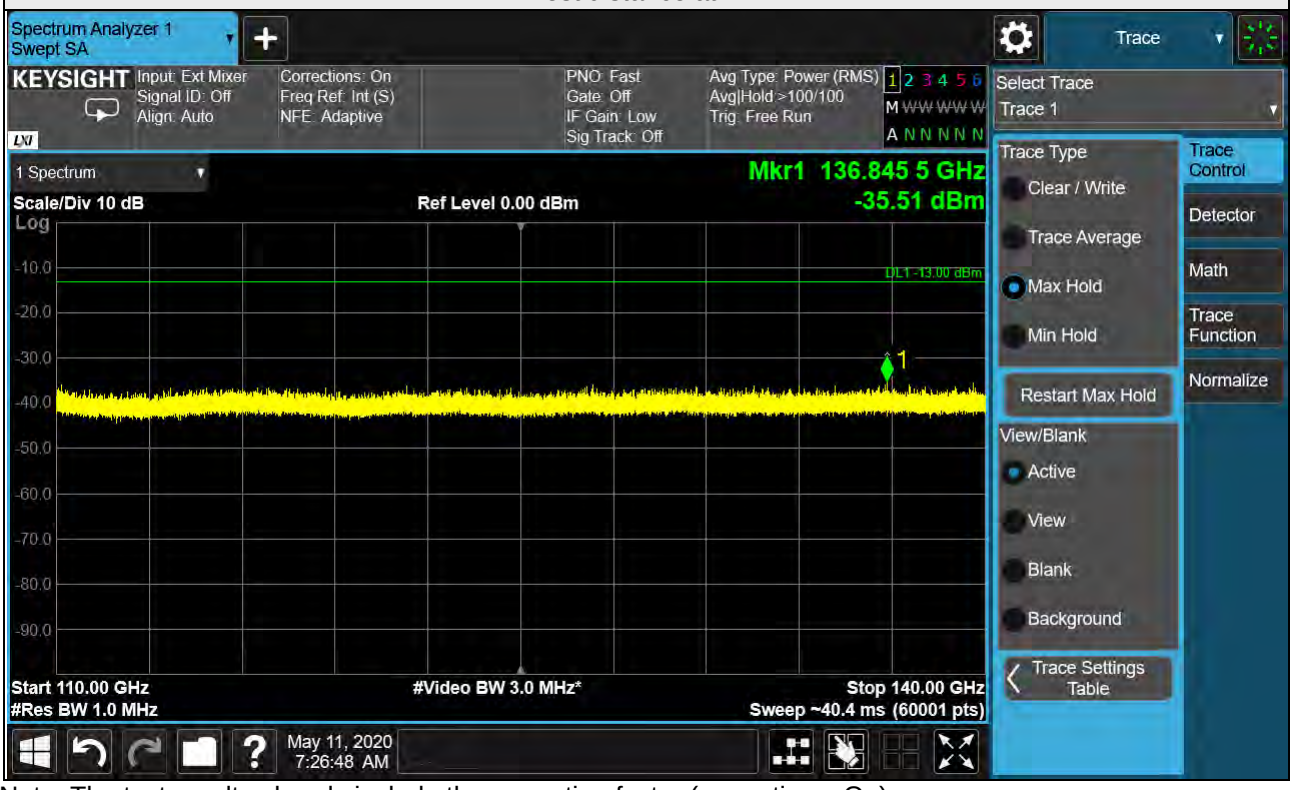
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



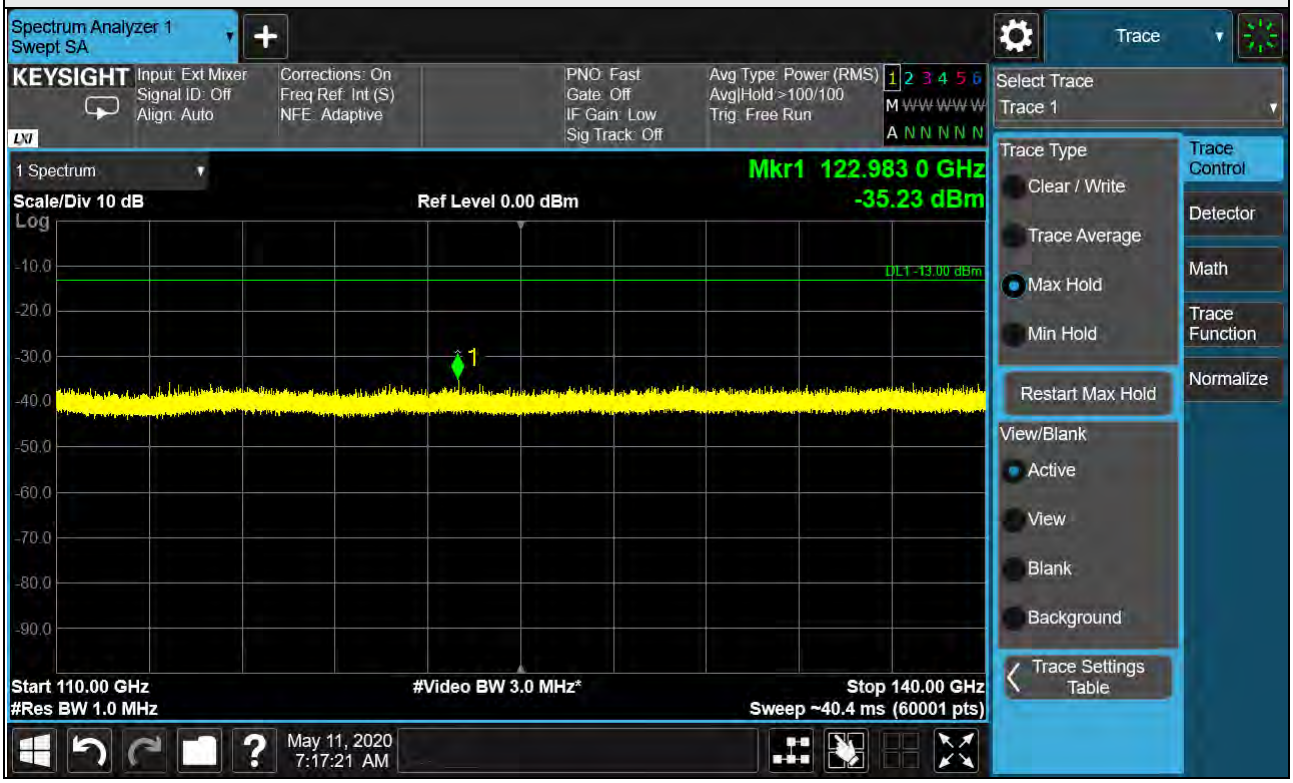
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



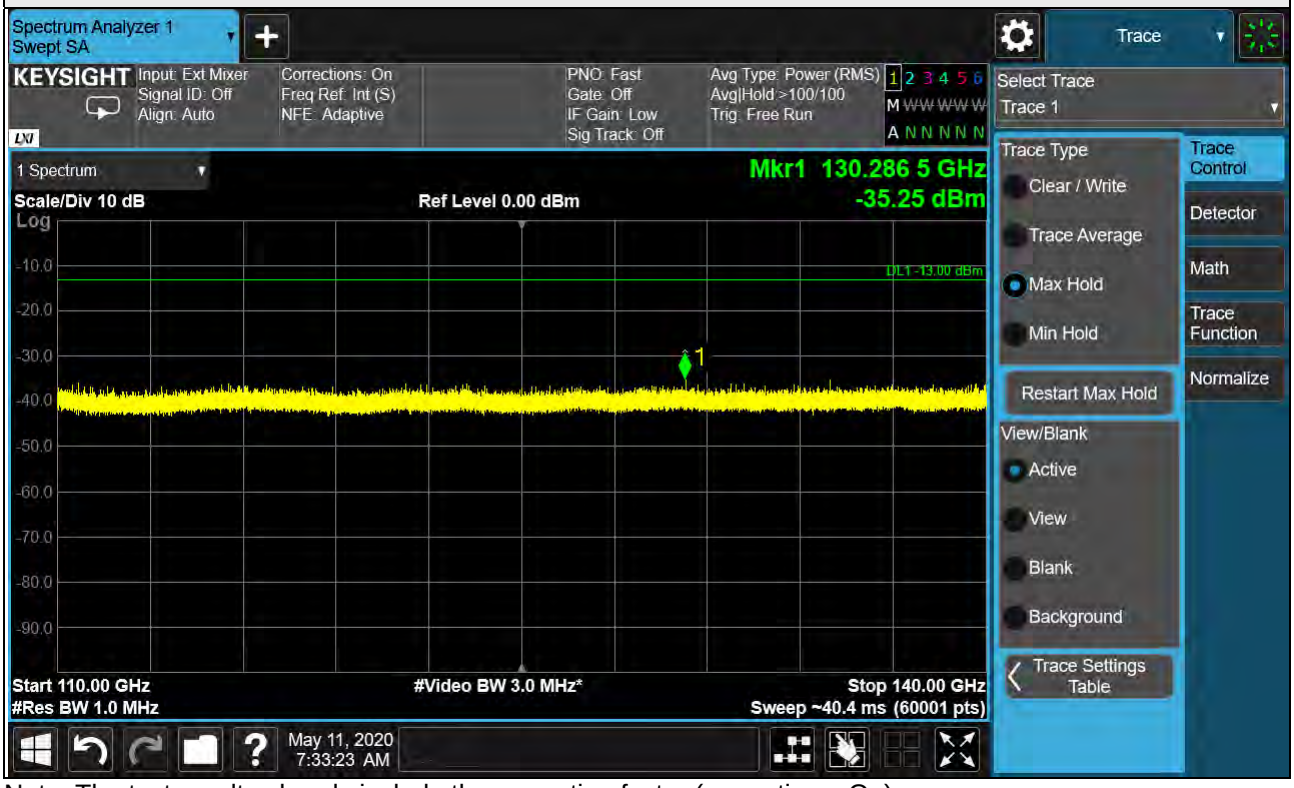
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



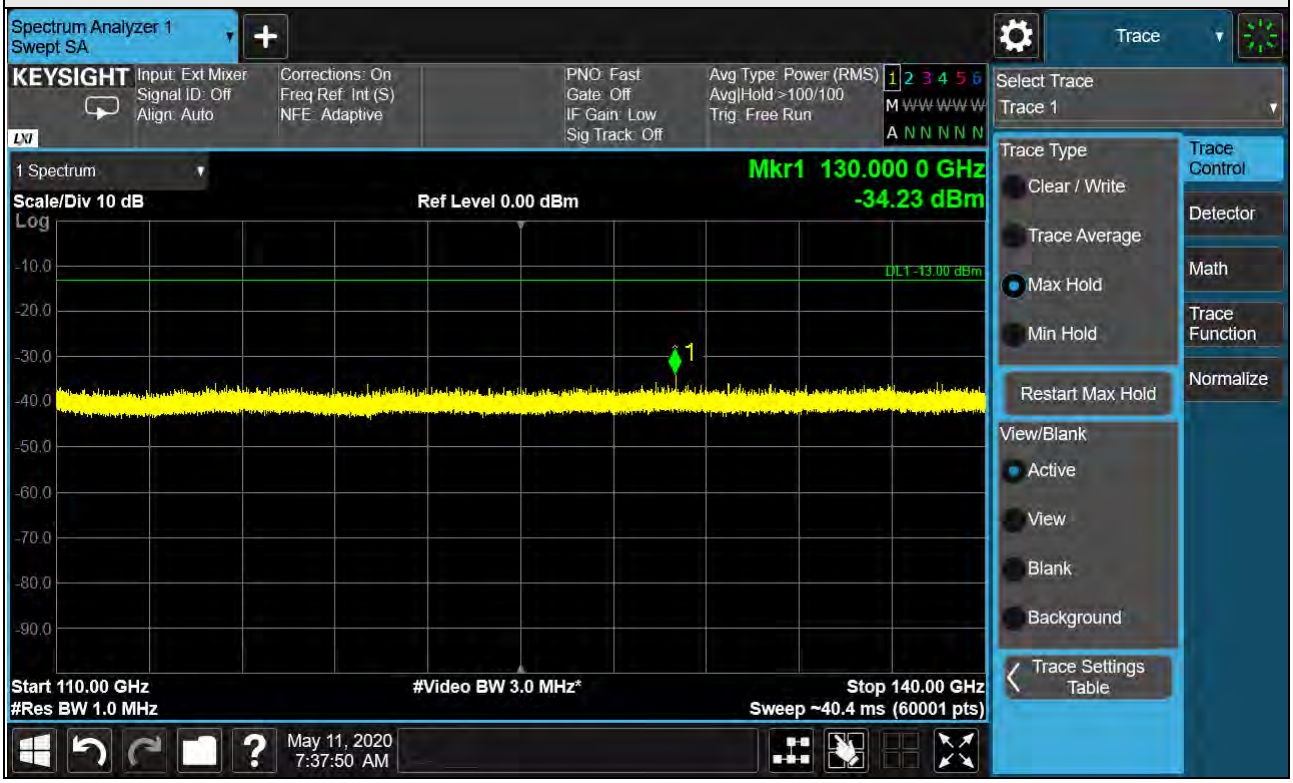
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



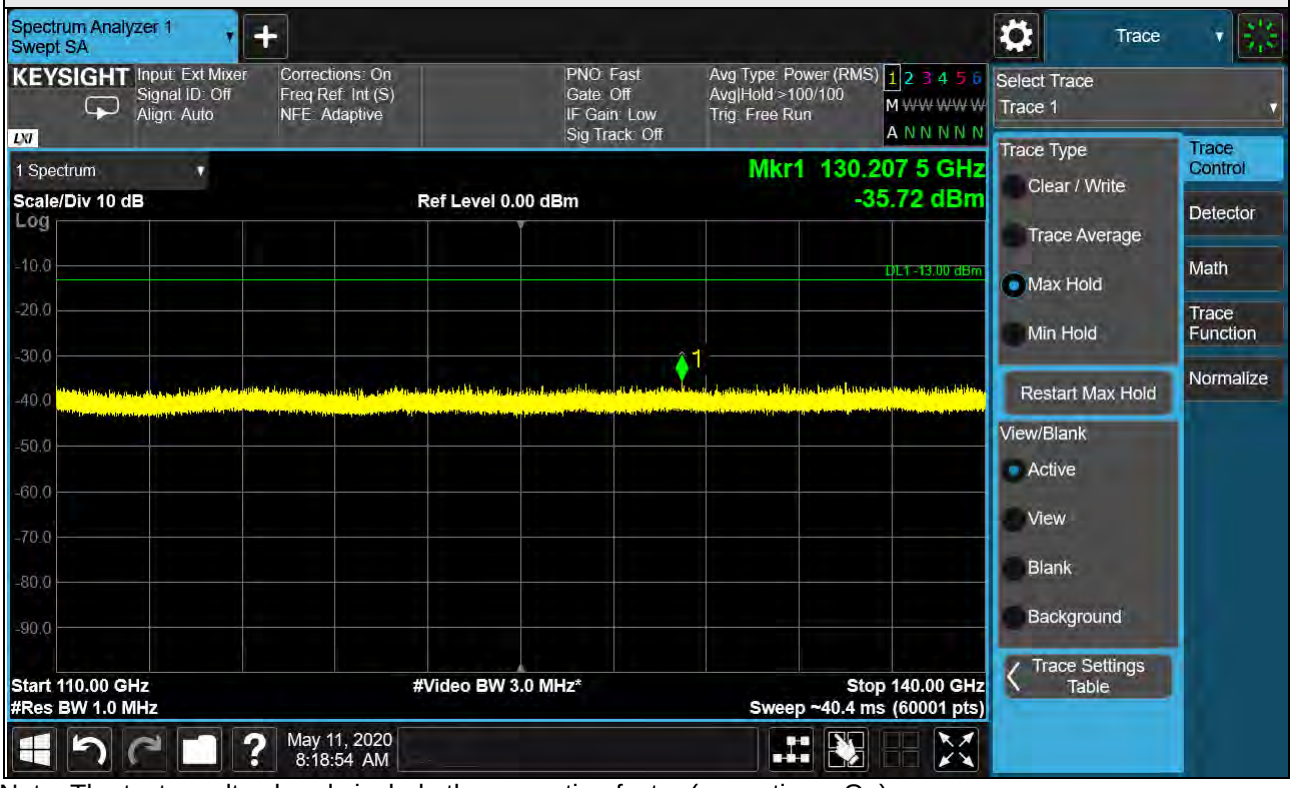
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



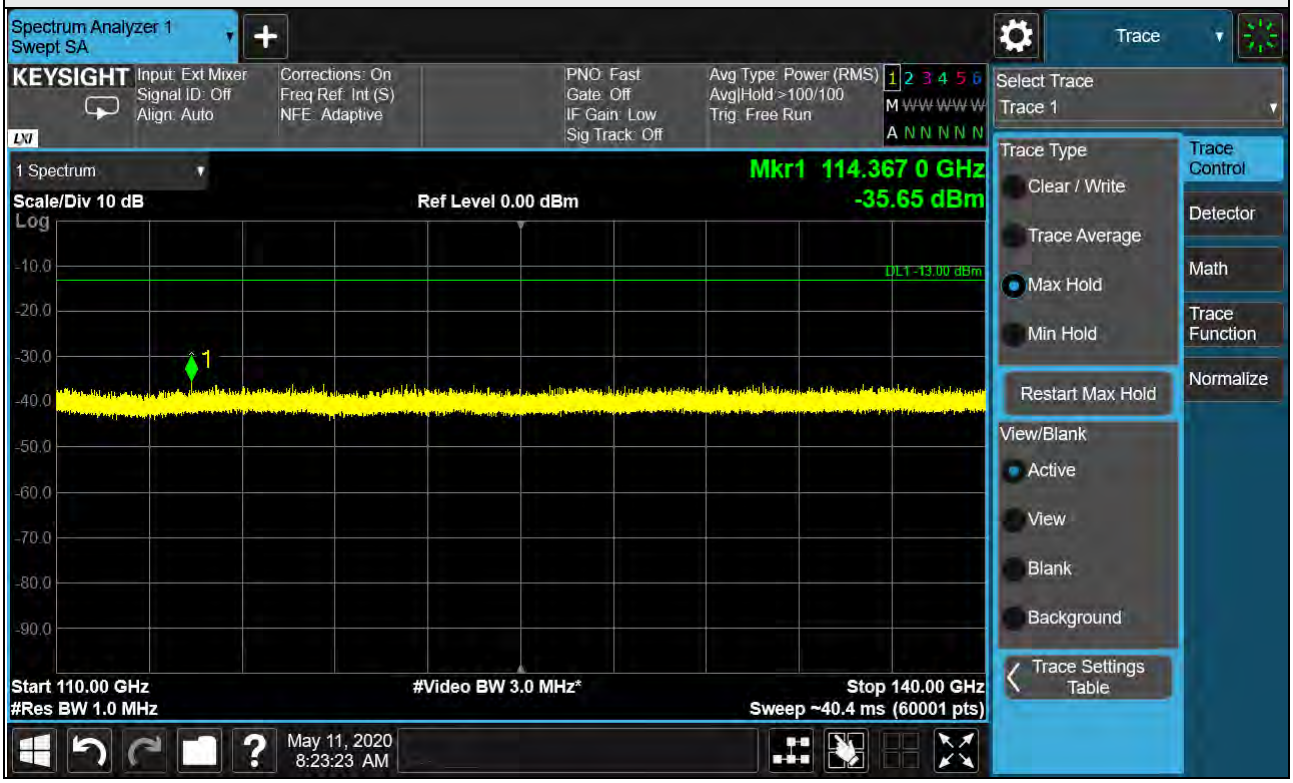
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



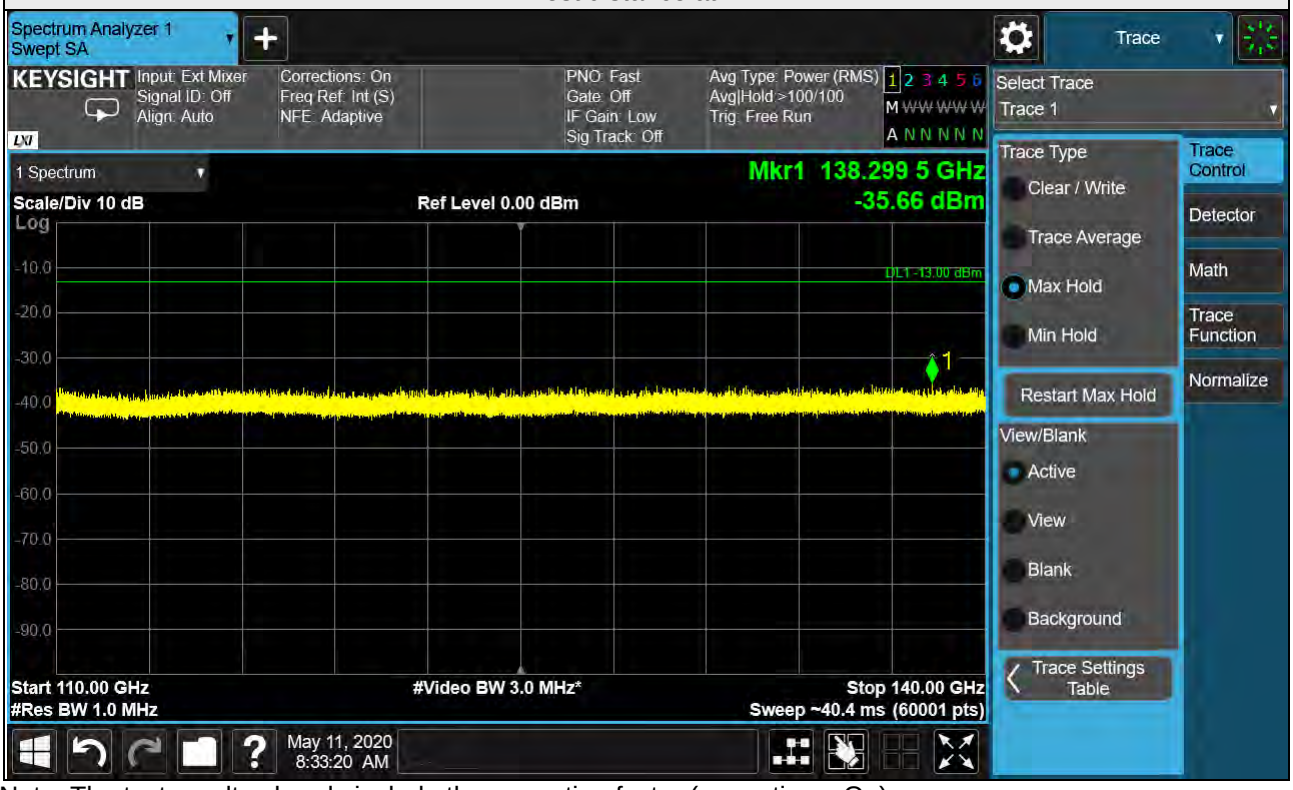
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



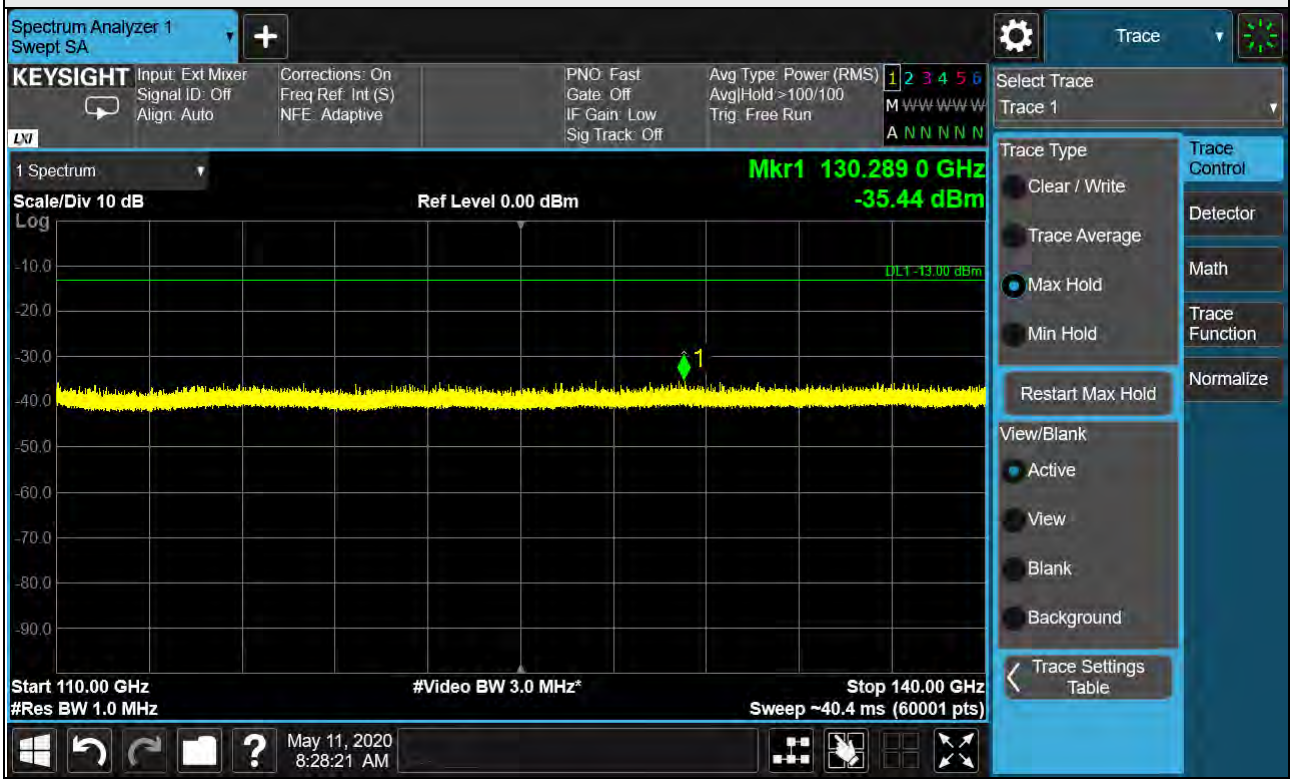
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



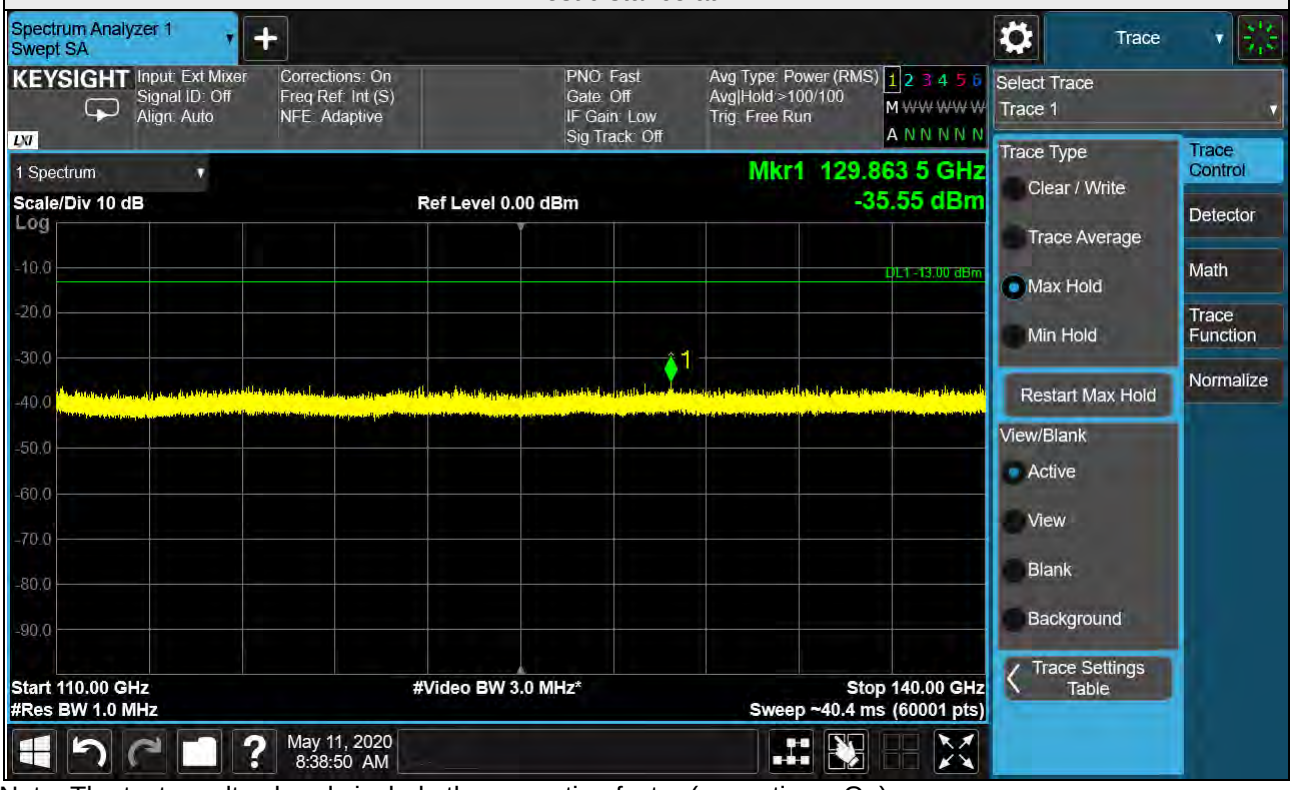
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



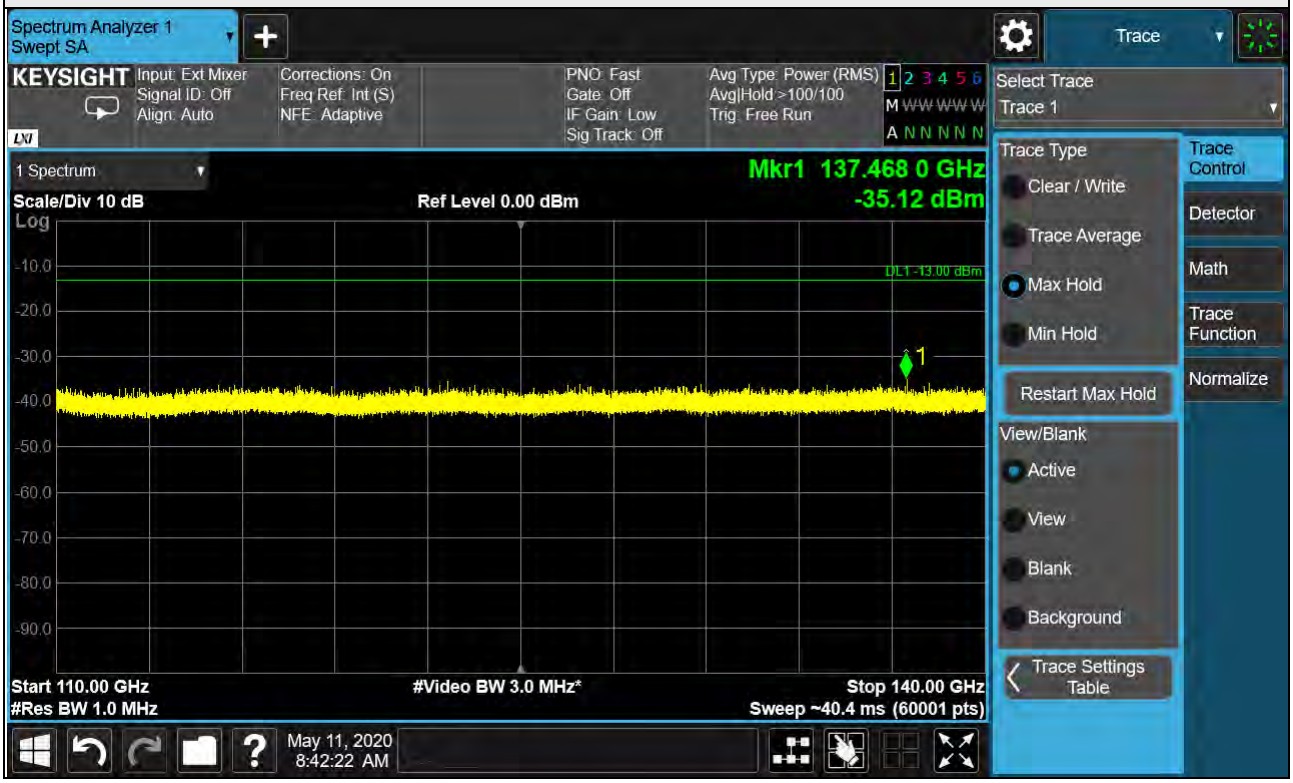
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



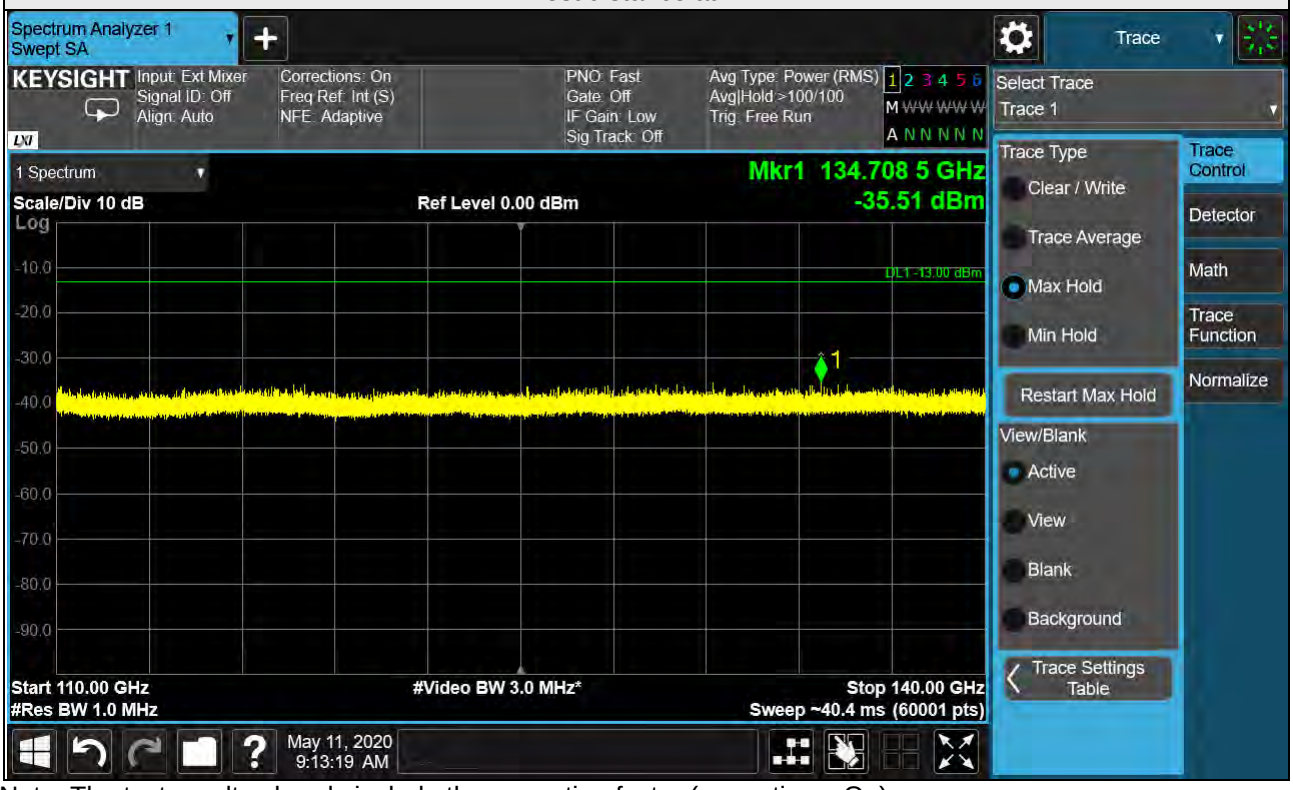
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



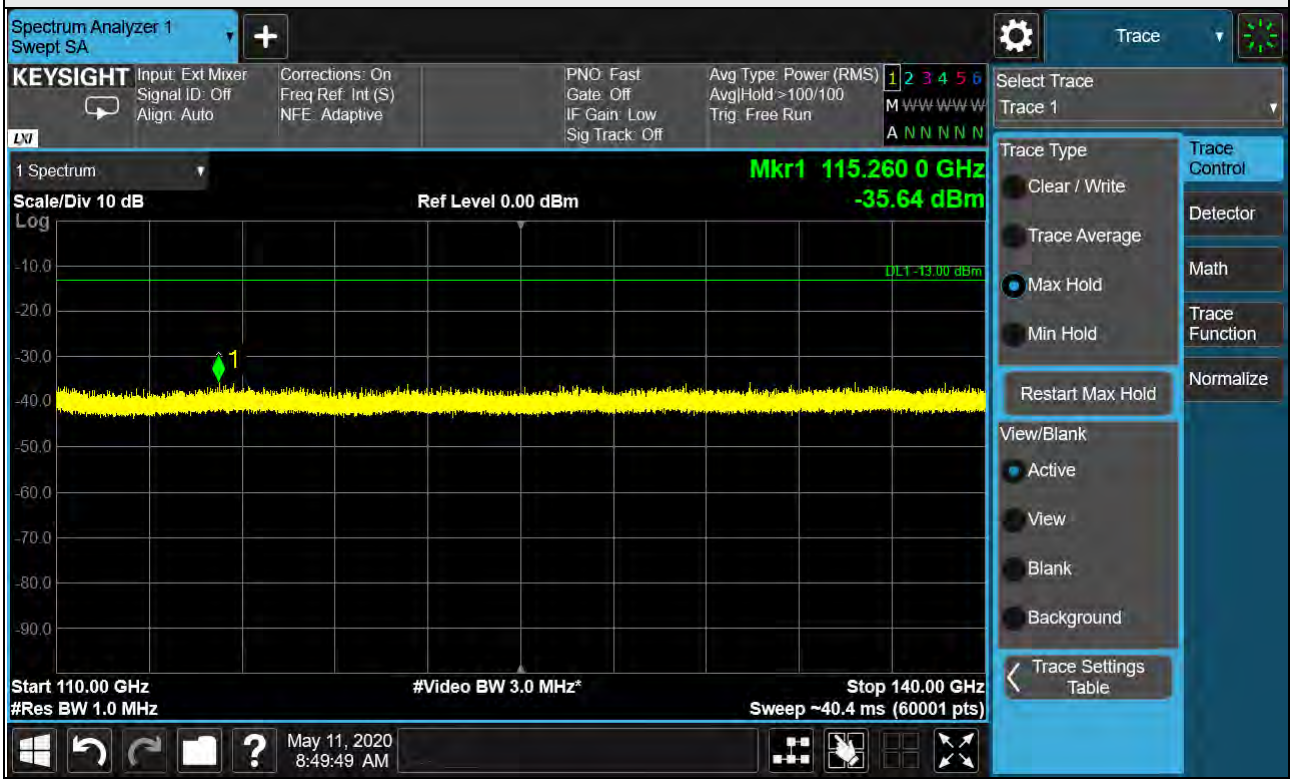
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



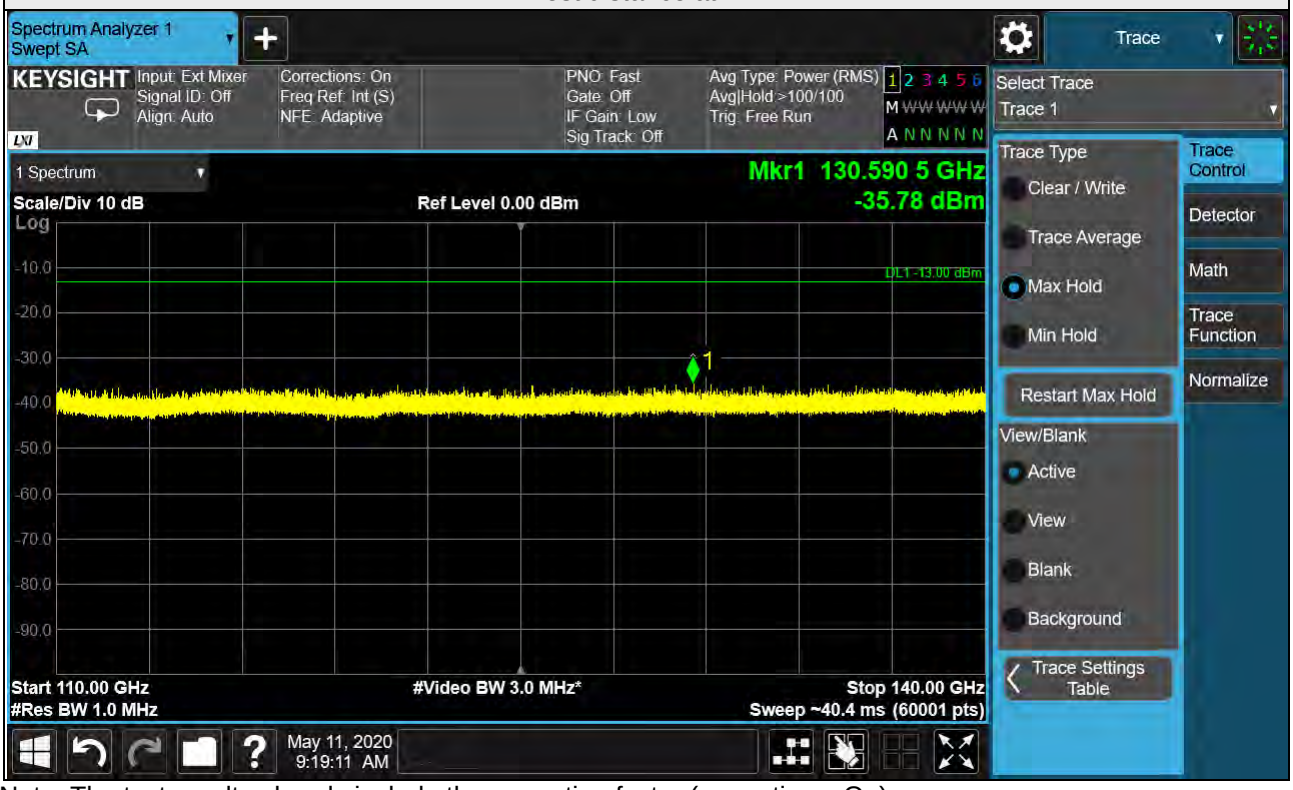
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



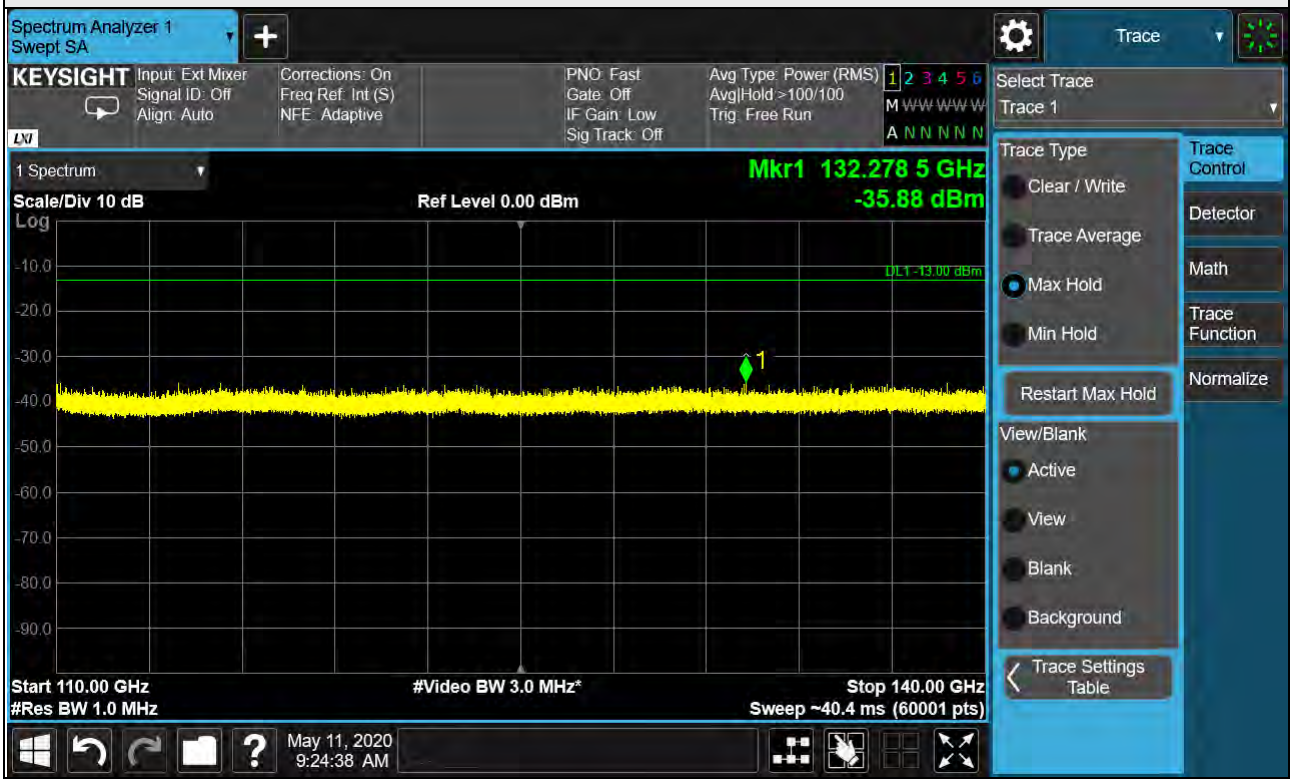
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



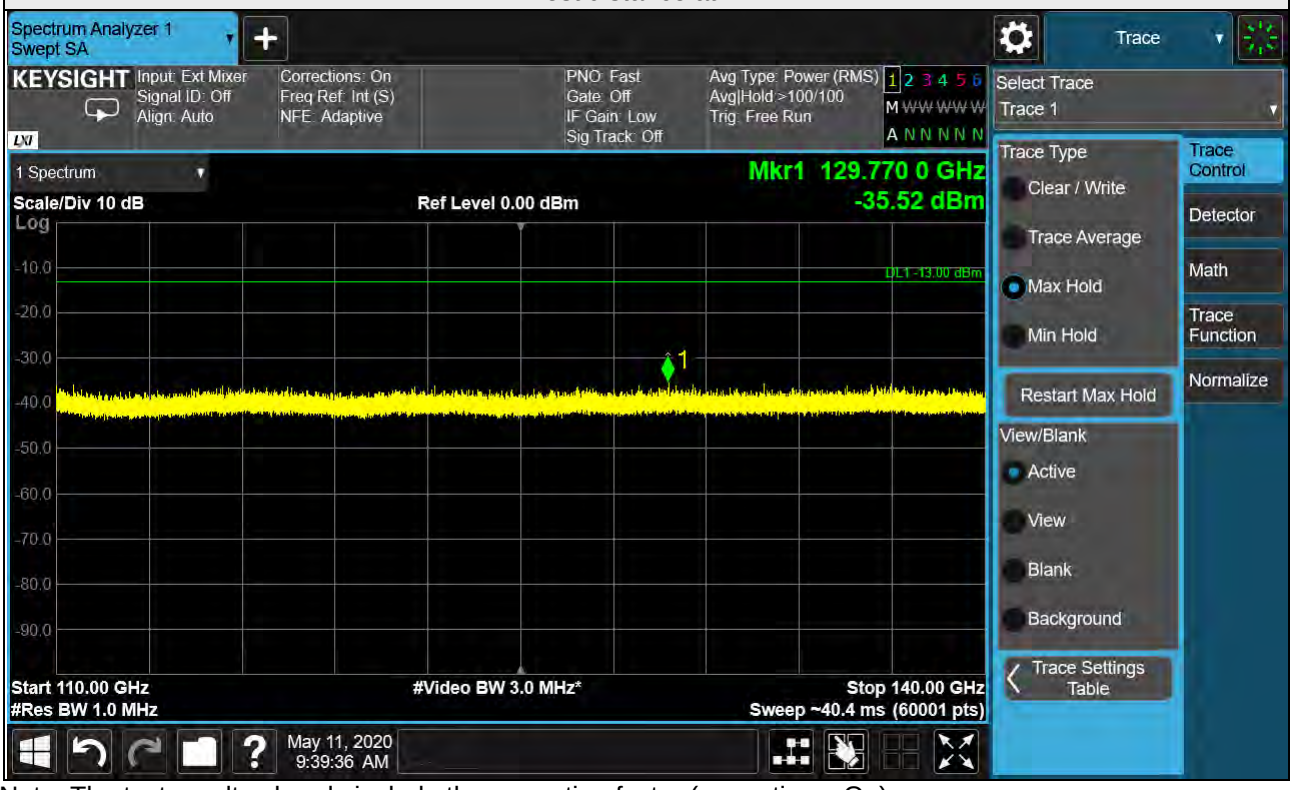
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



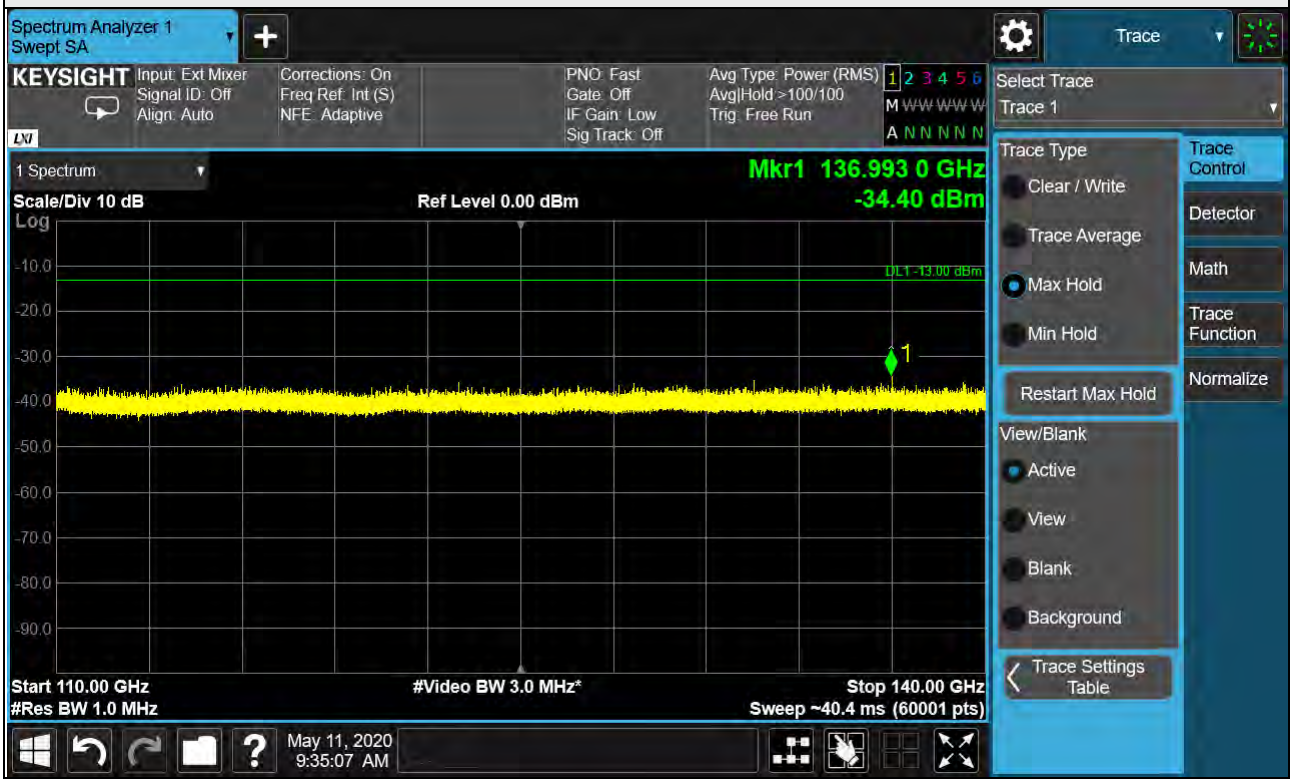
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



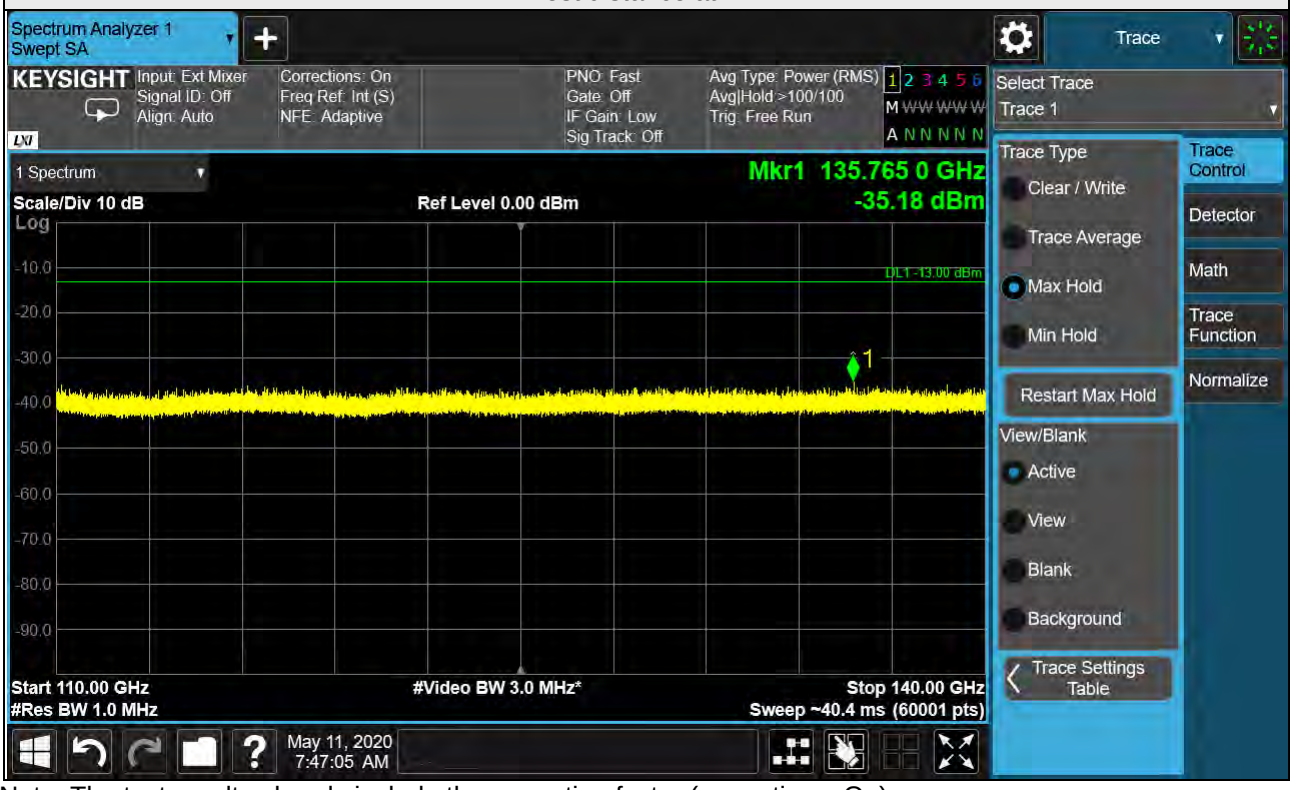
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



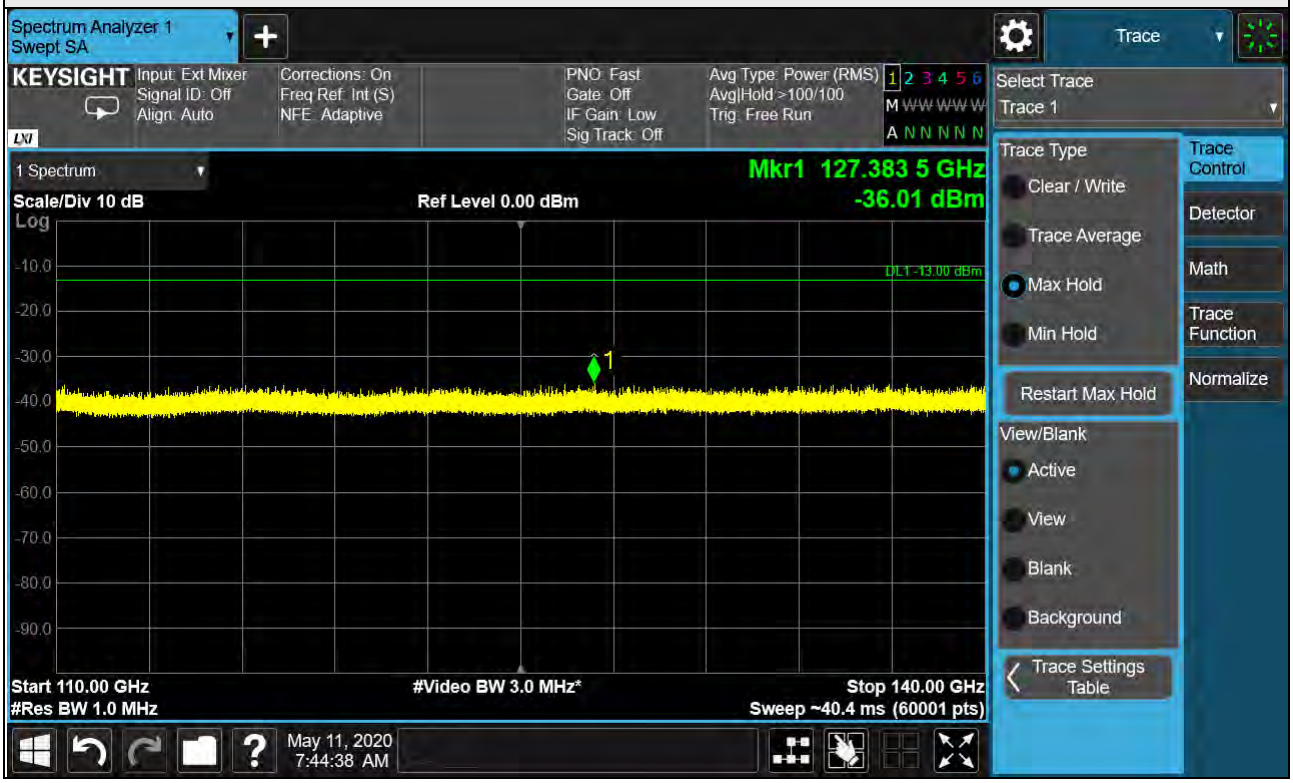
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



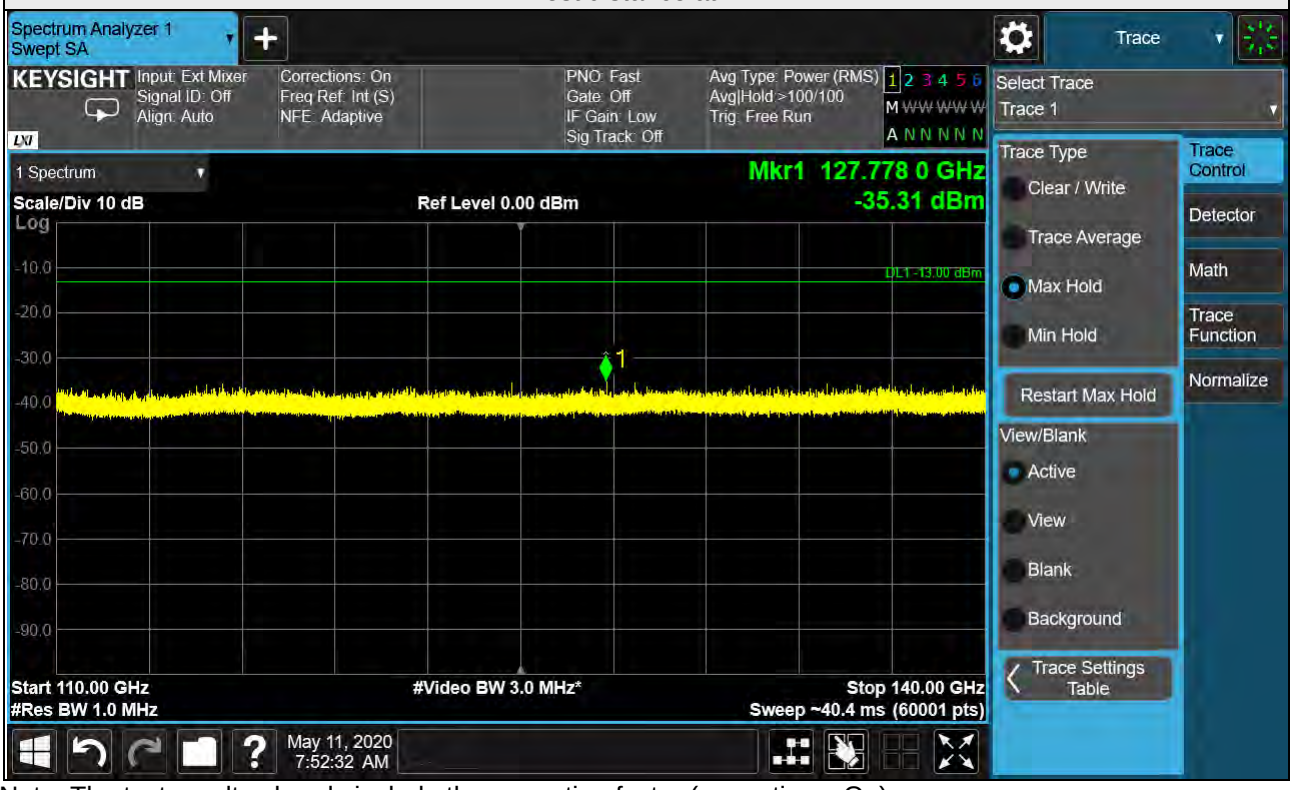
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



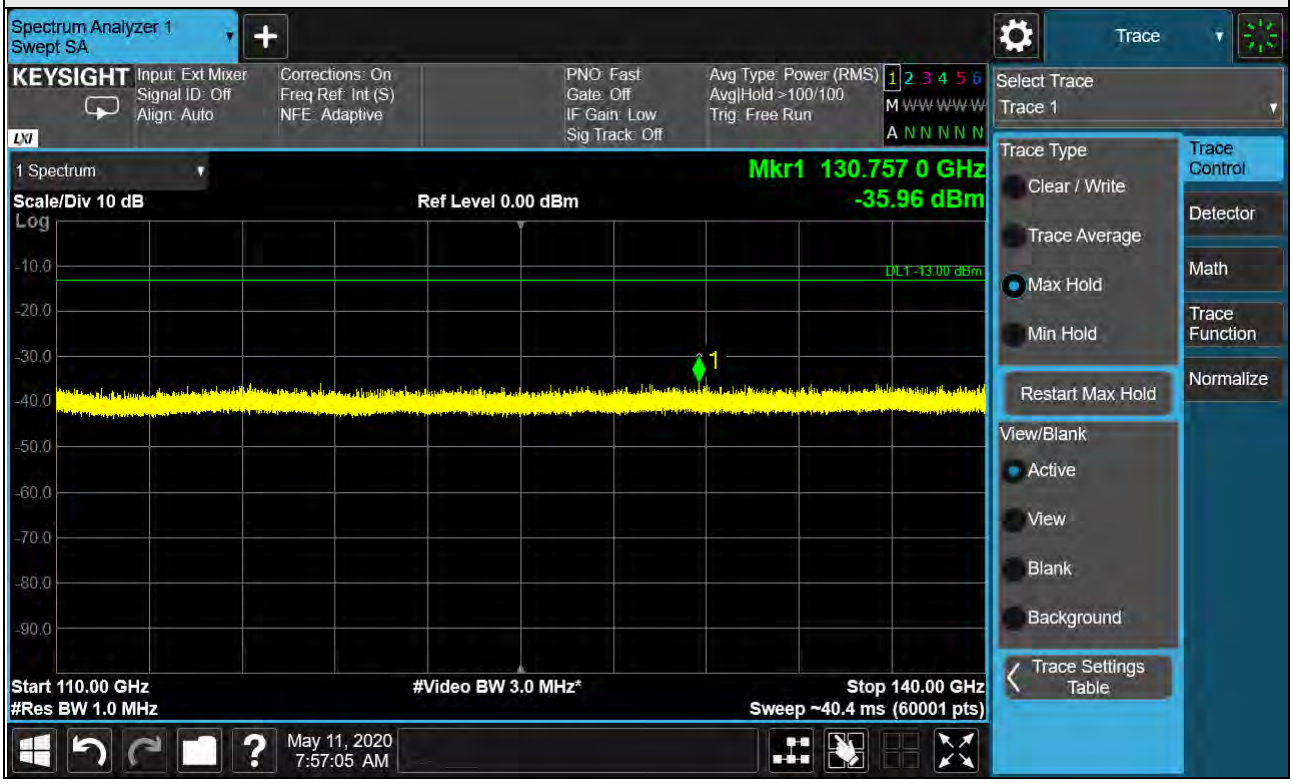
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



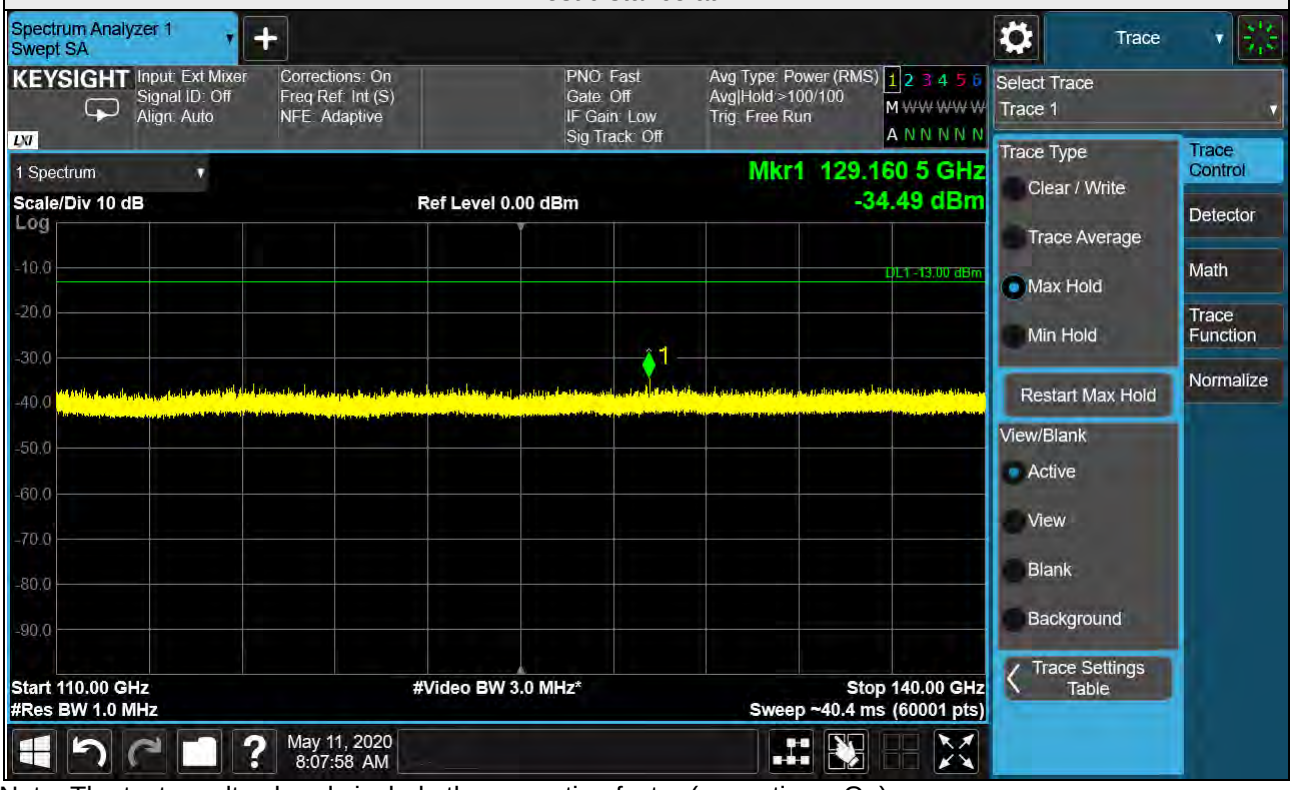
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



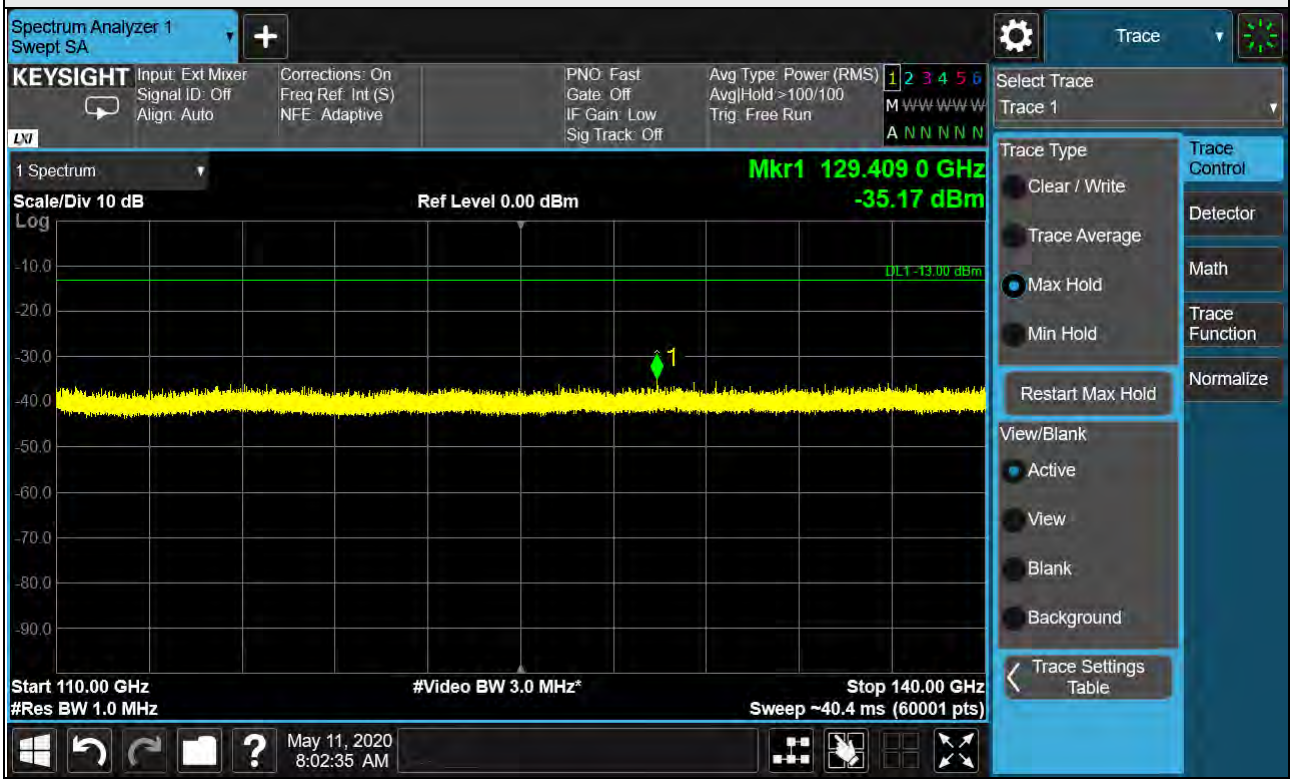
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



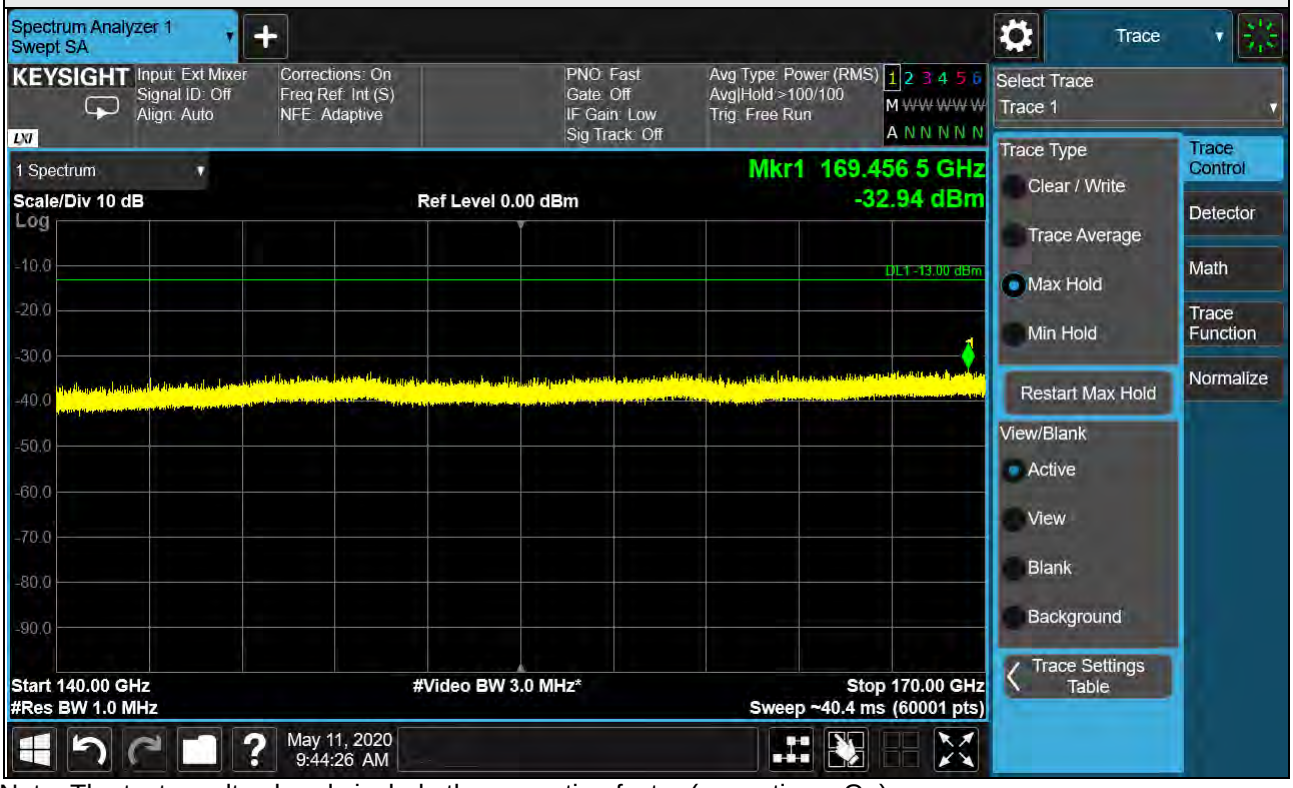
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	110GHz-140GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



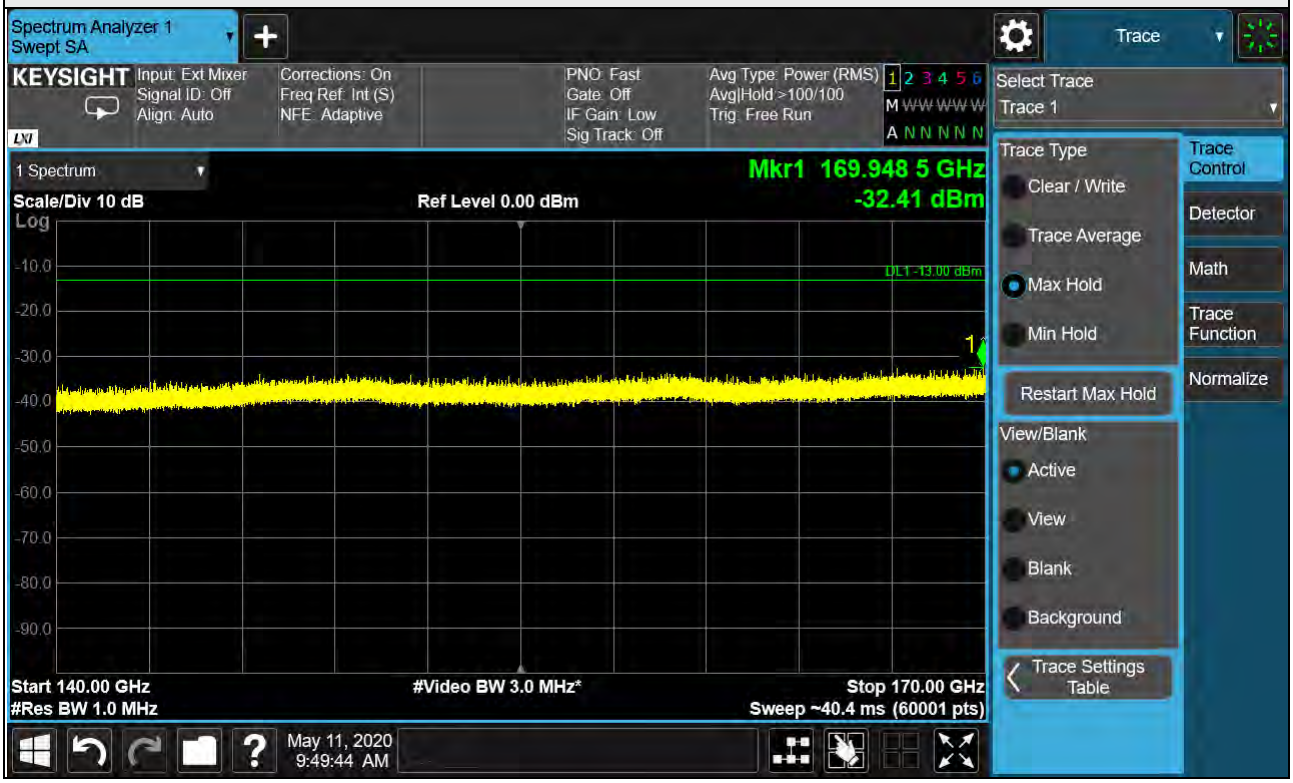
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



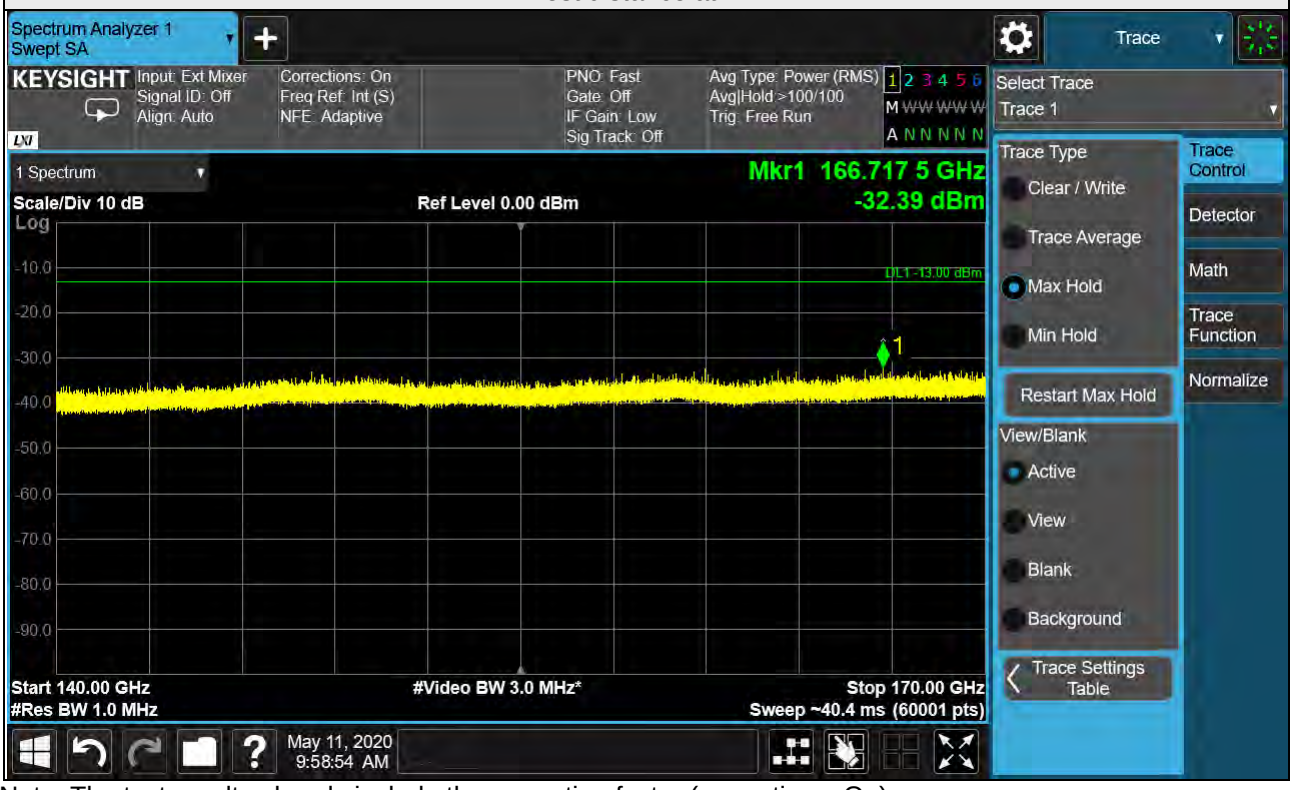
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



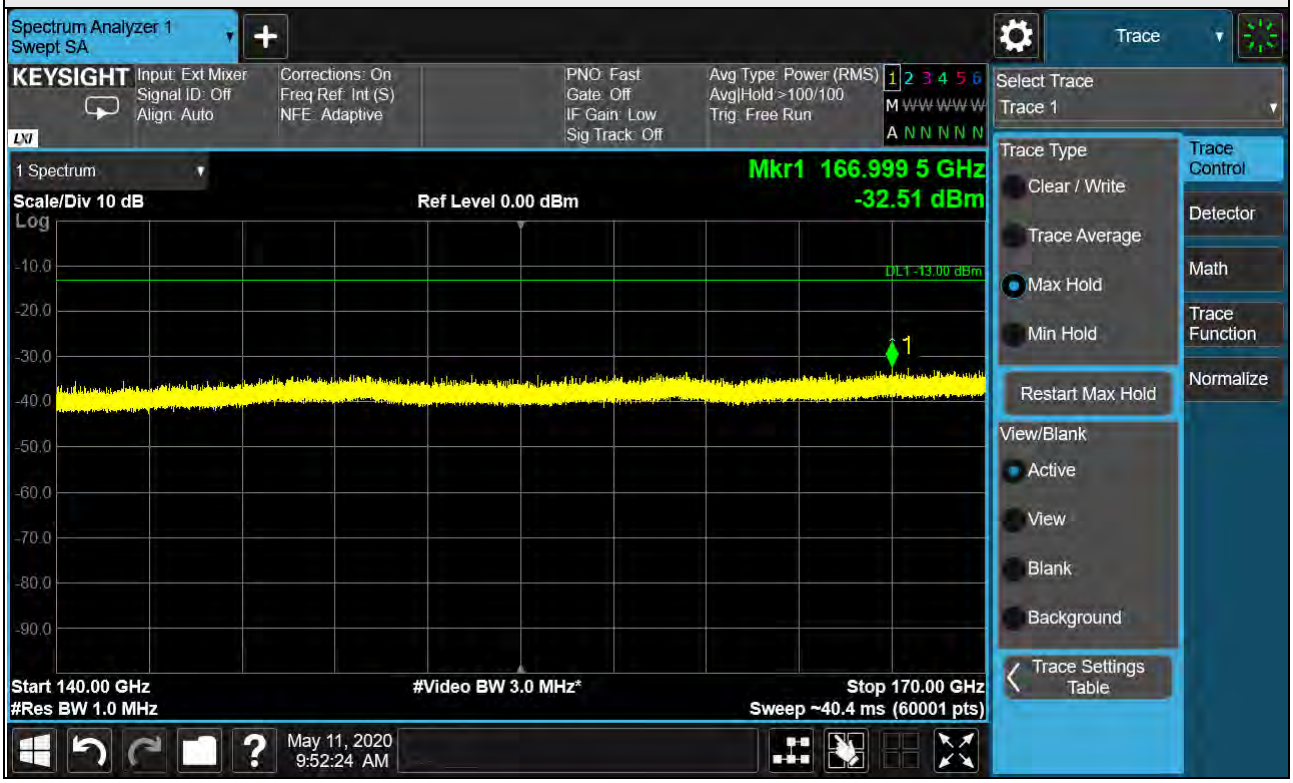
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



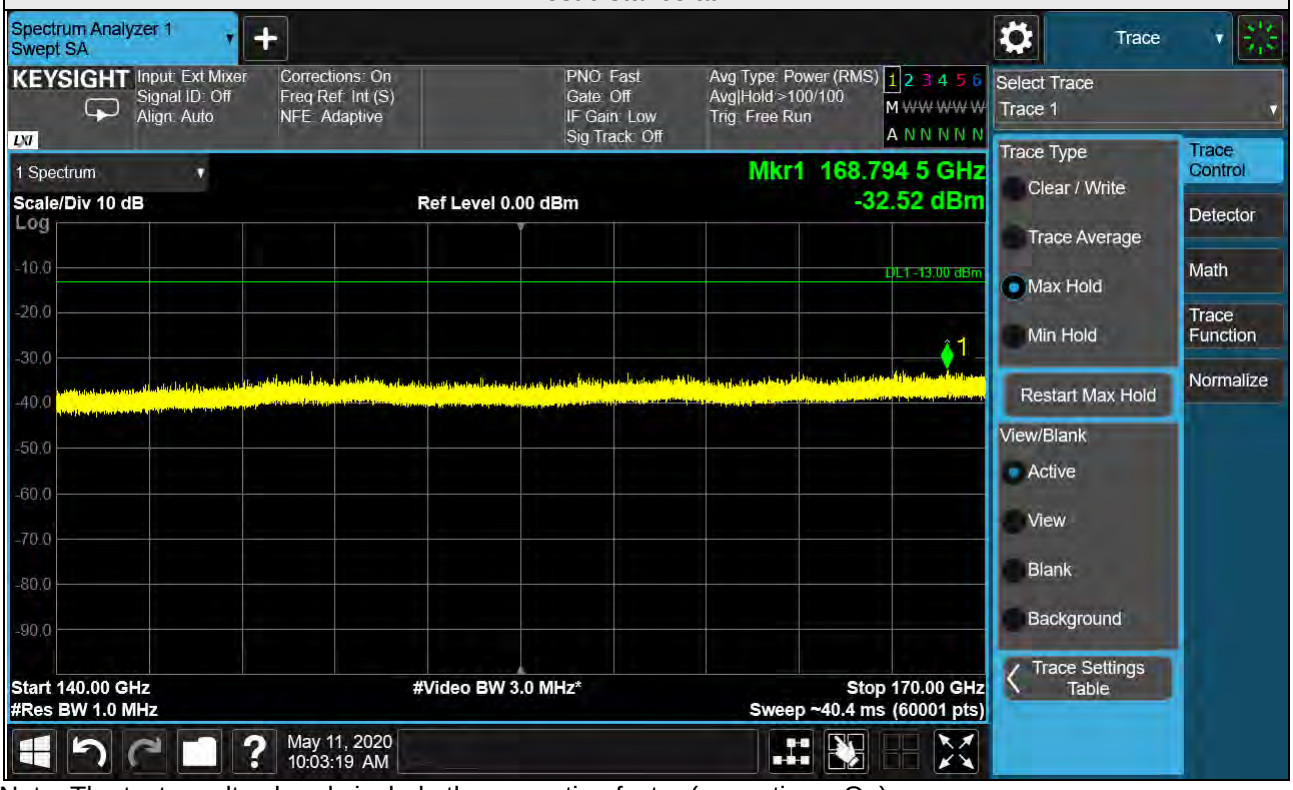
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



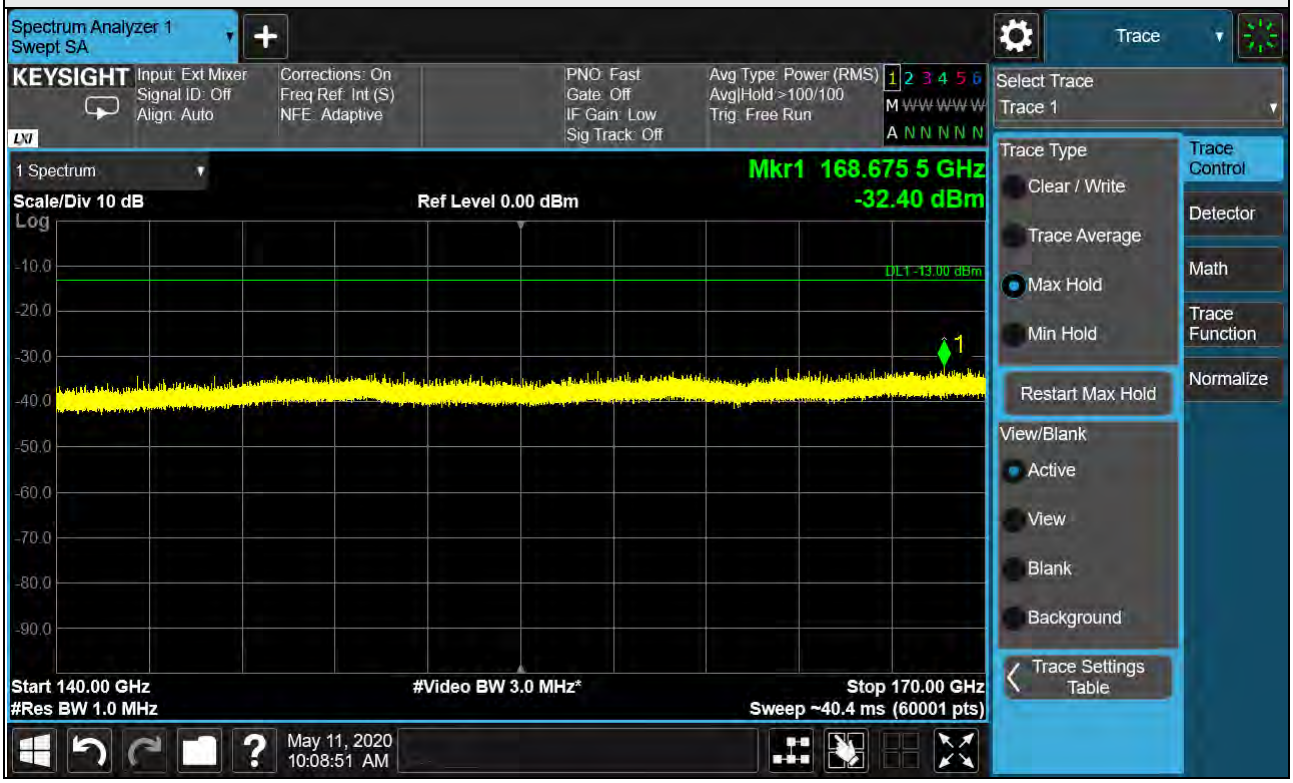
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



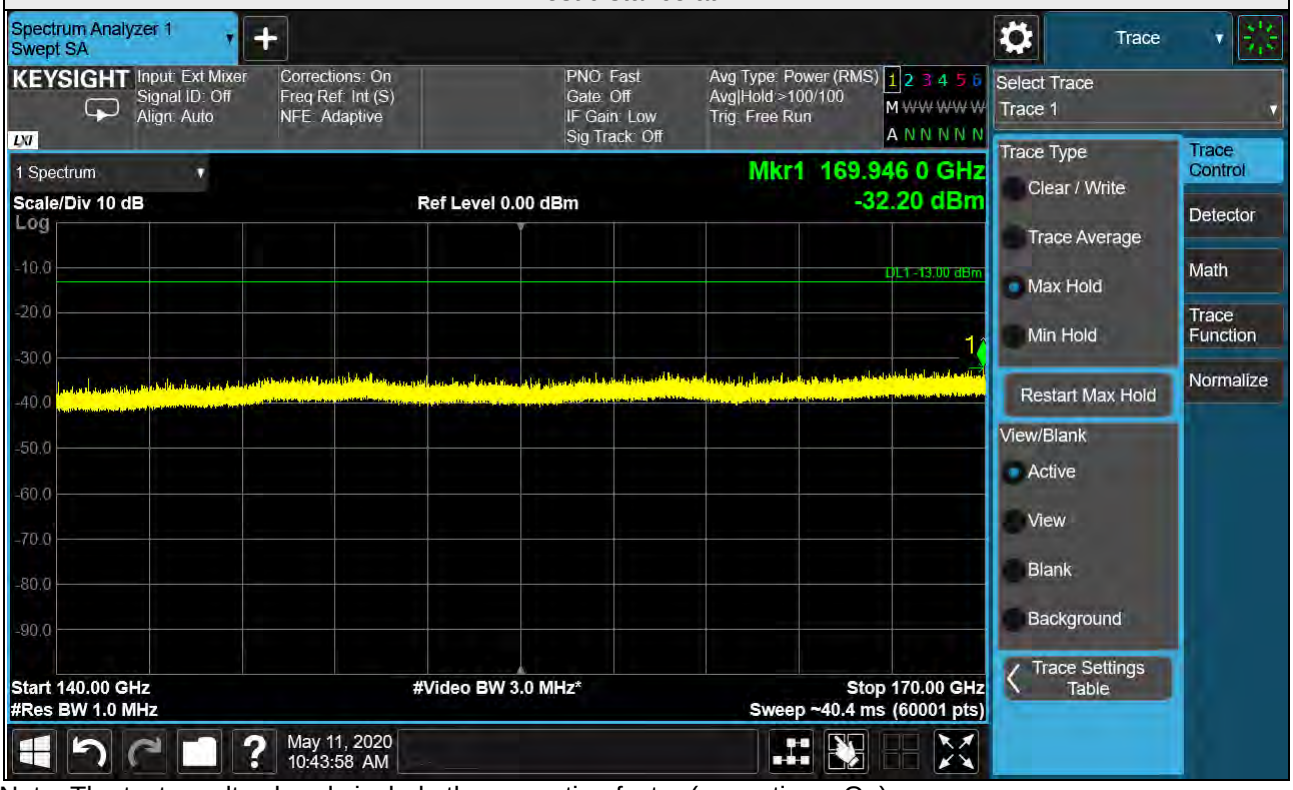
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



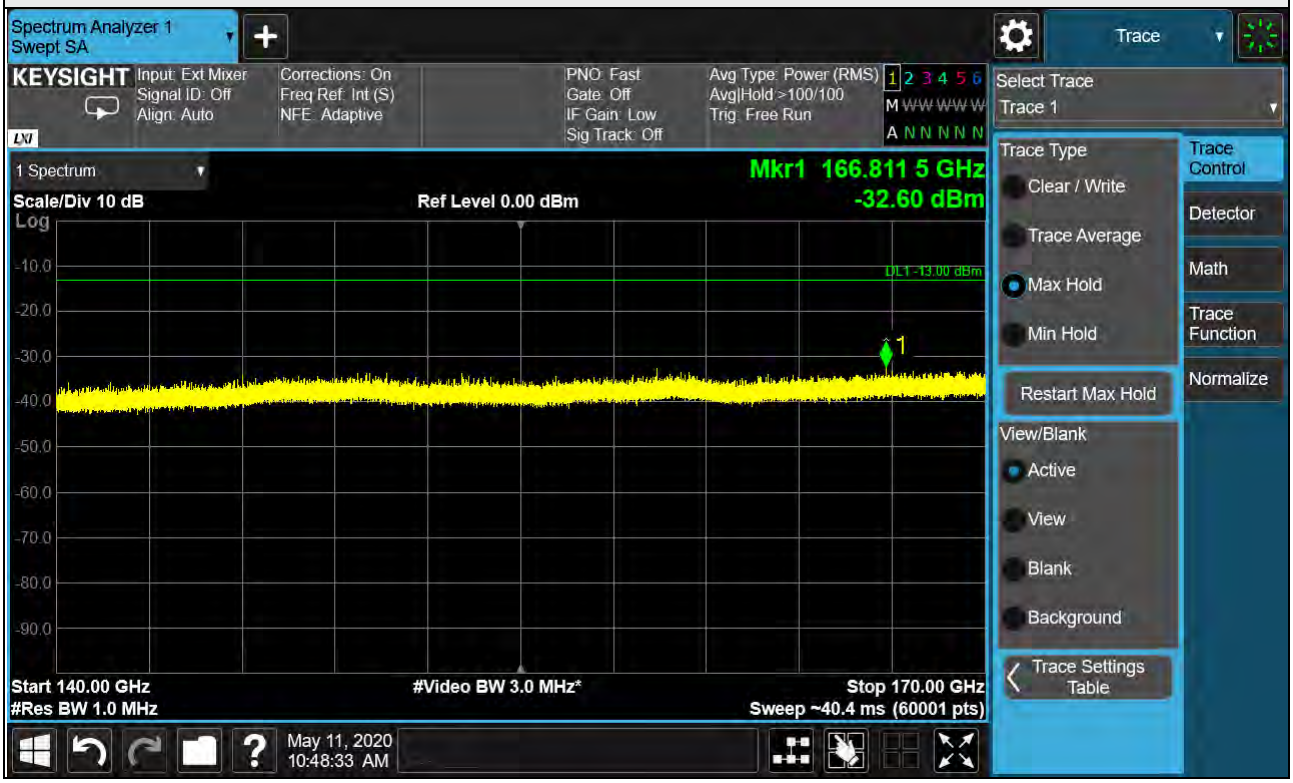
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



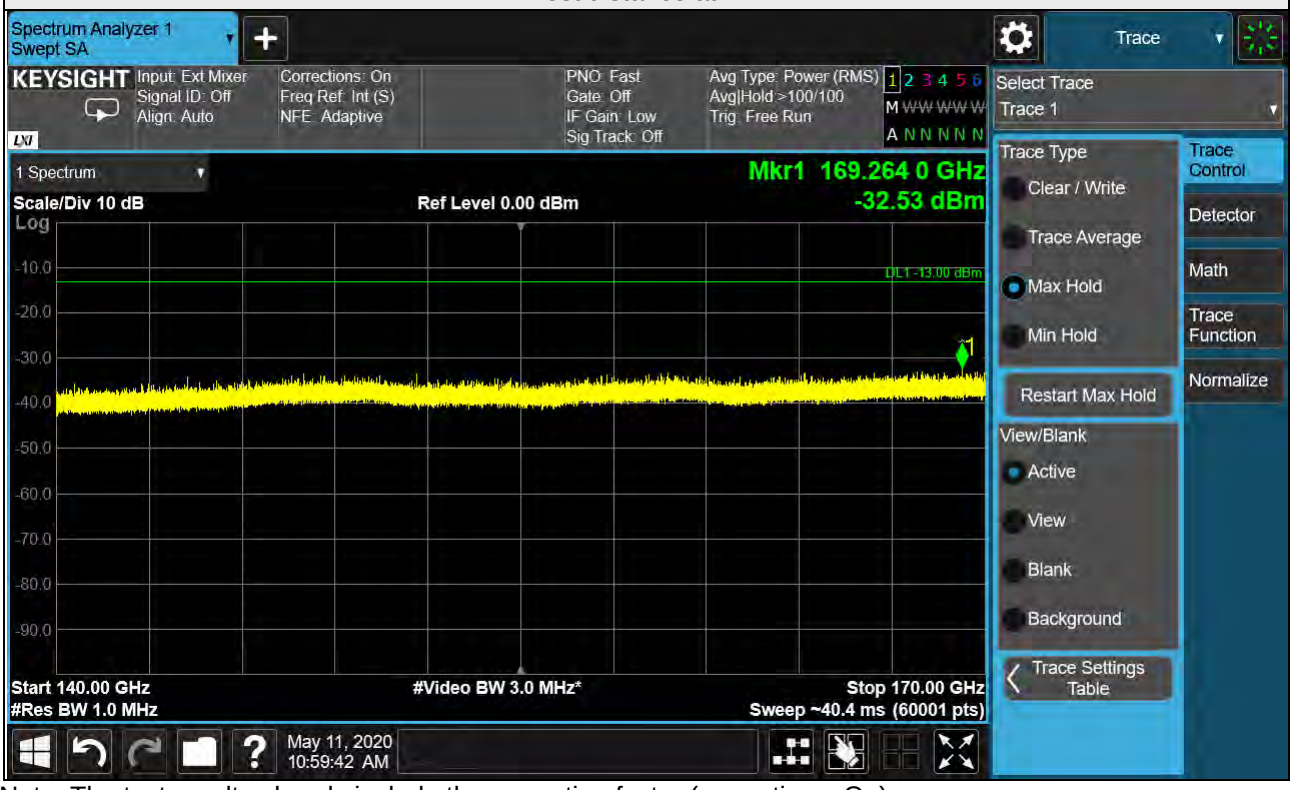
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



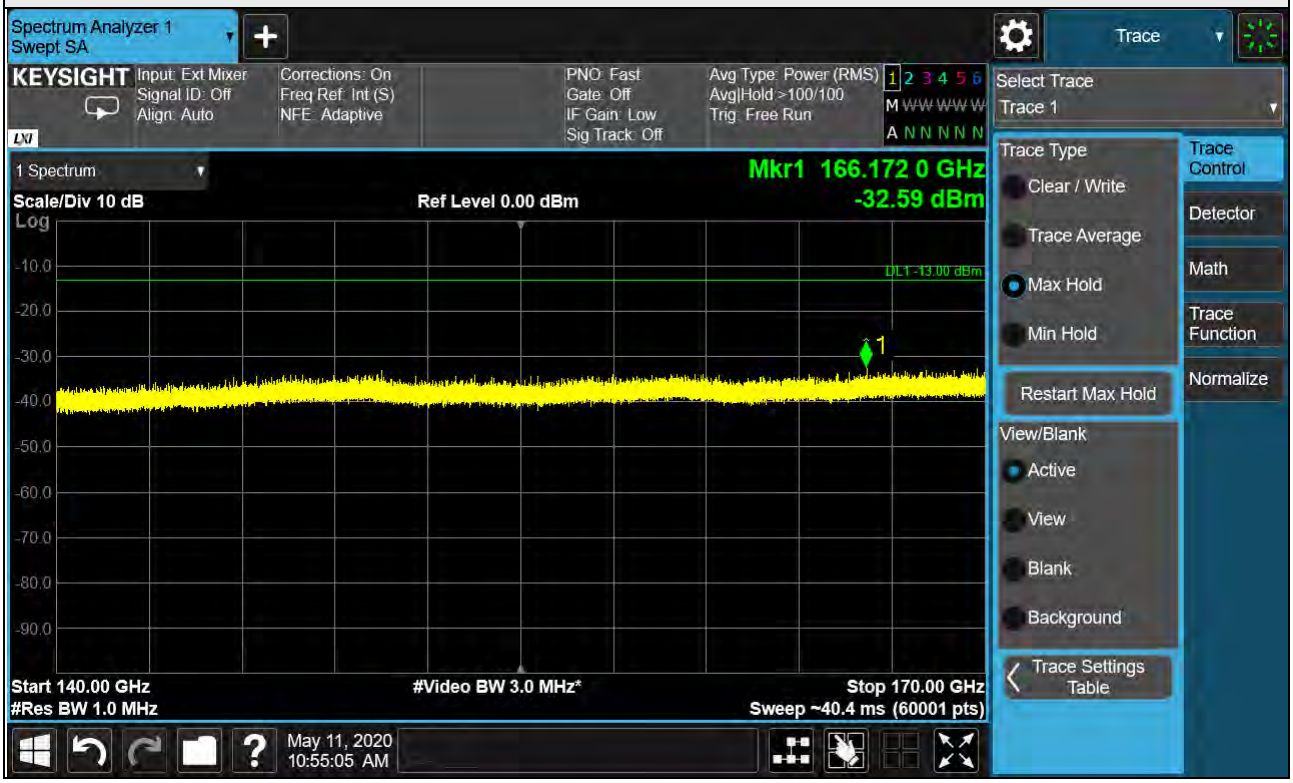
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



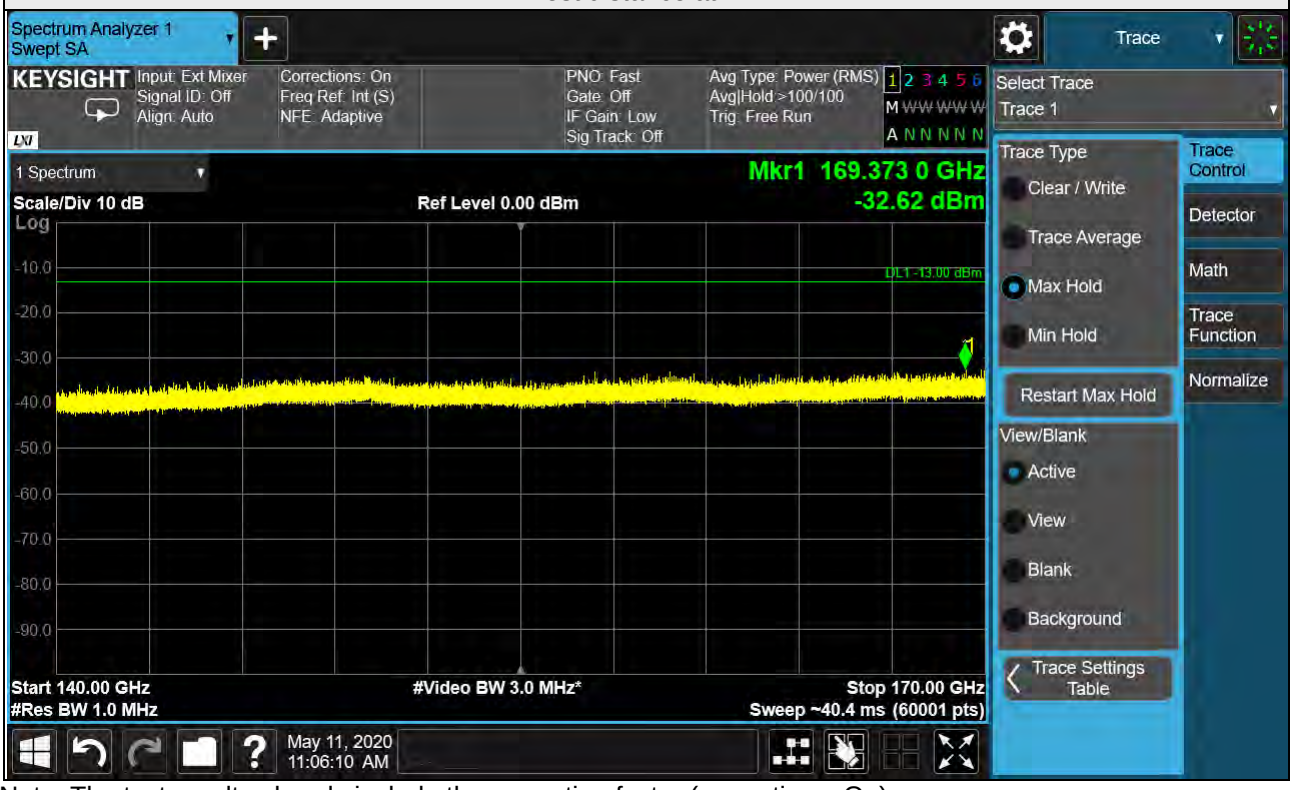
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



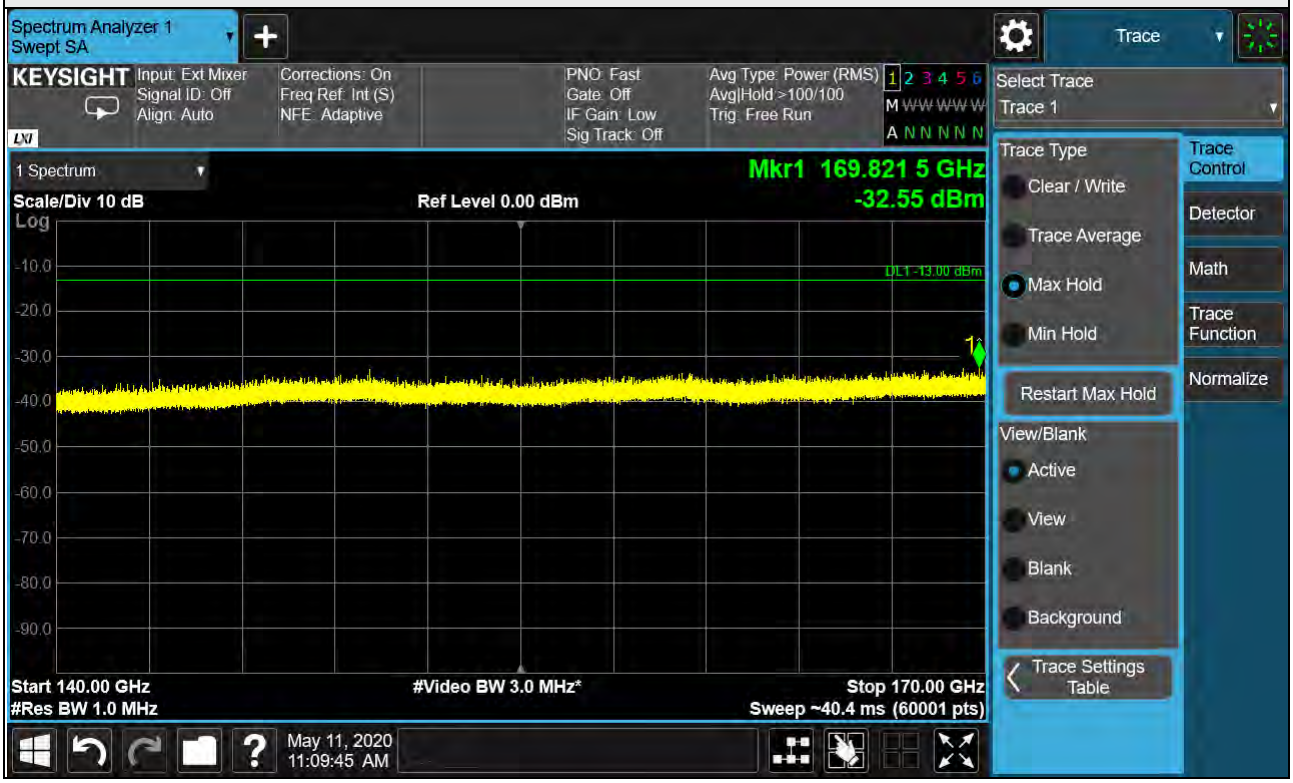
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



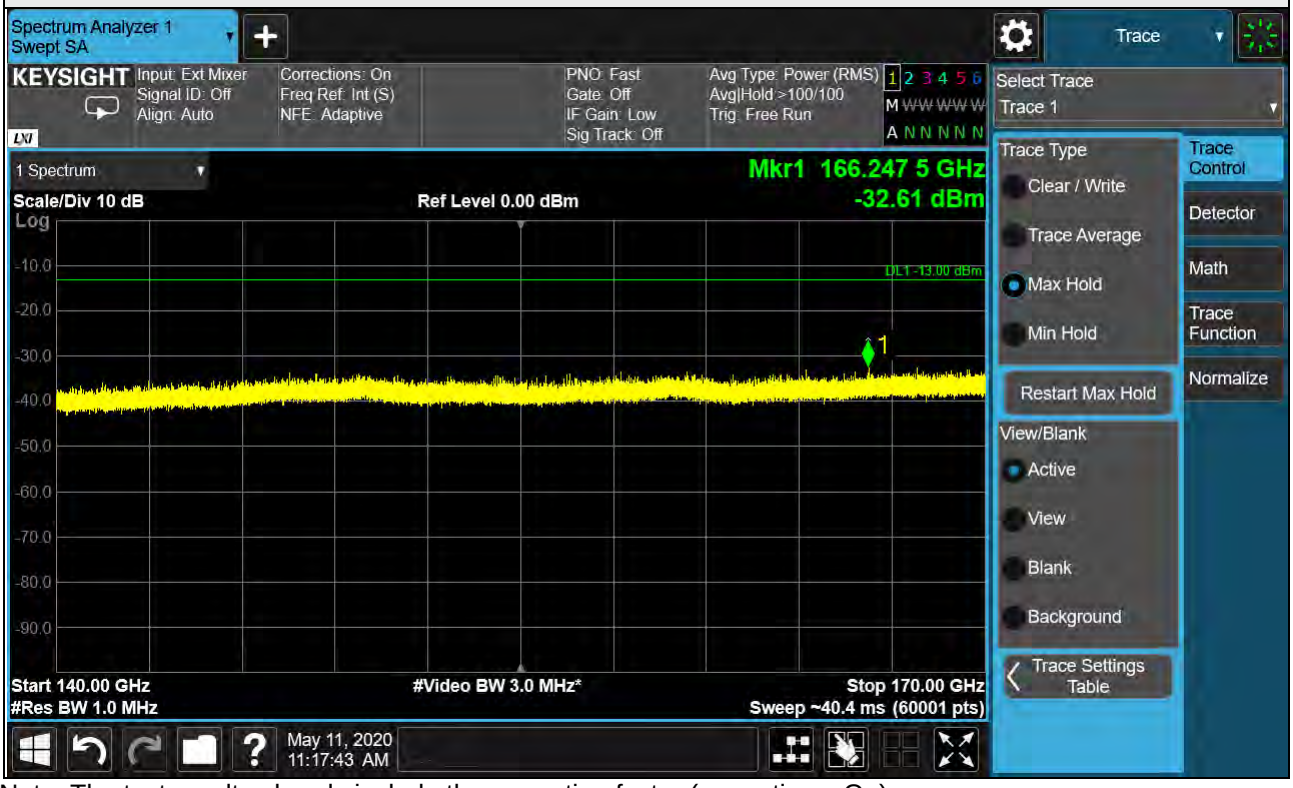
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



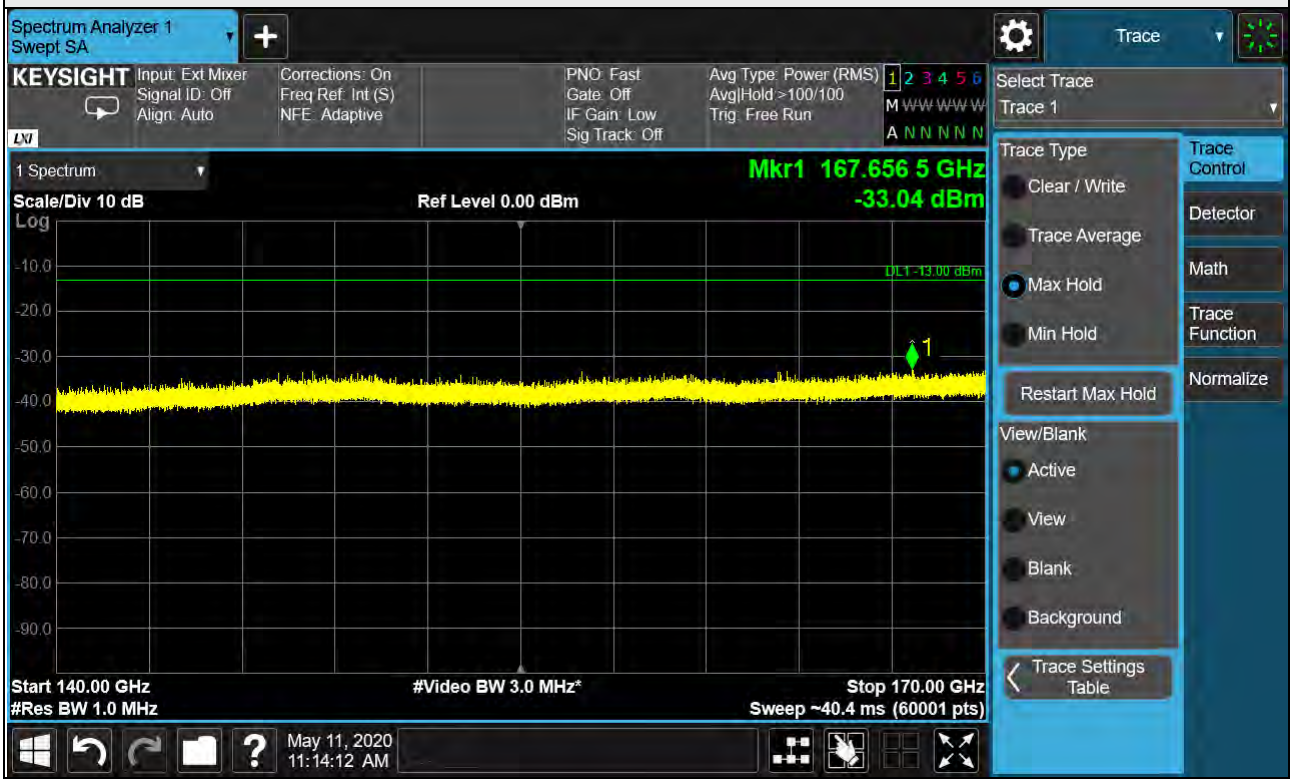
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



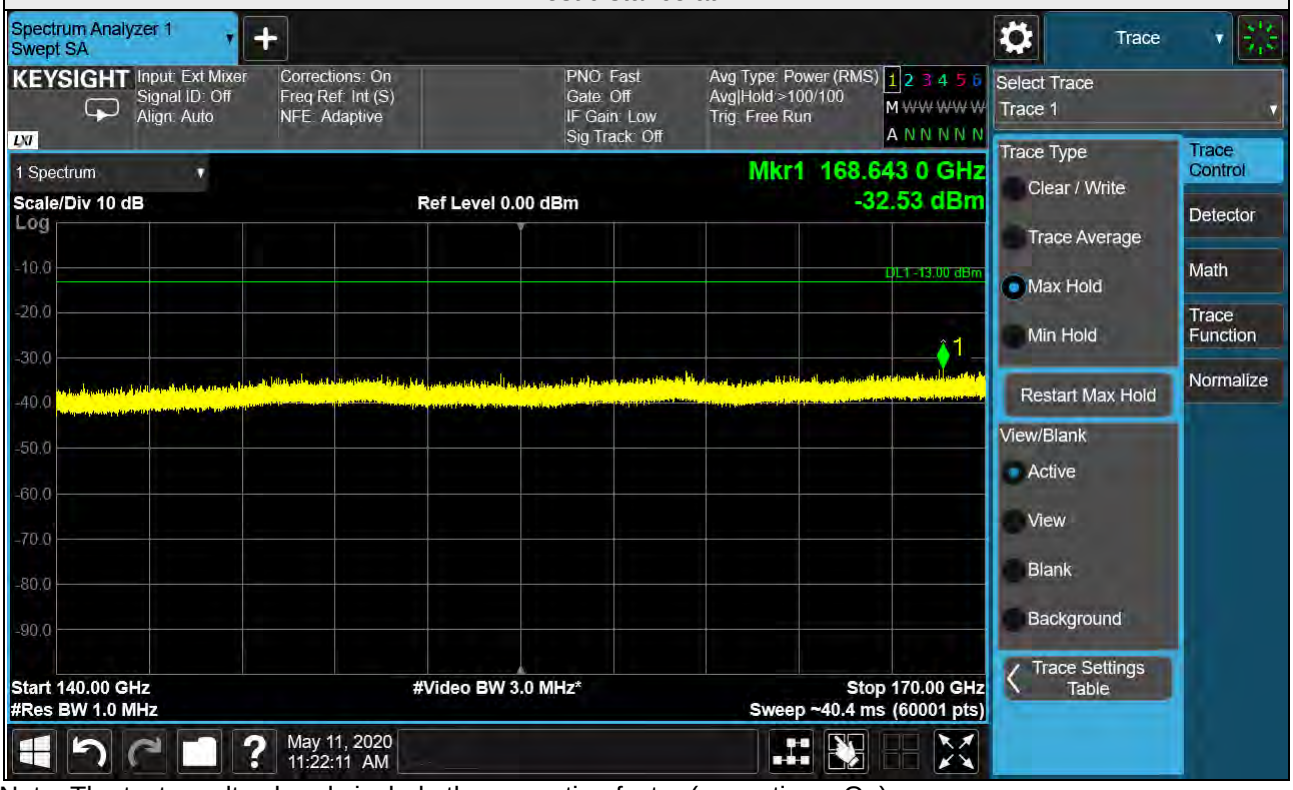
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



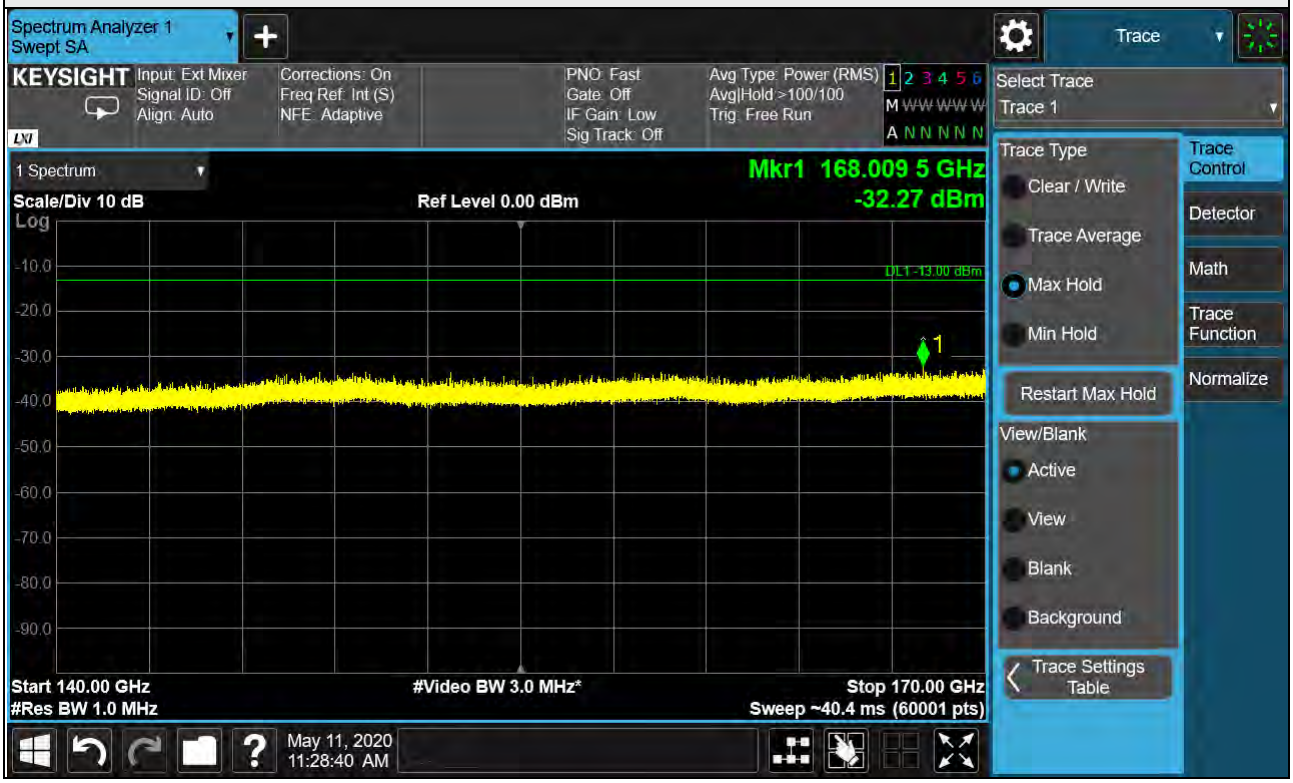
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



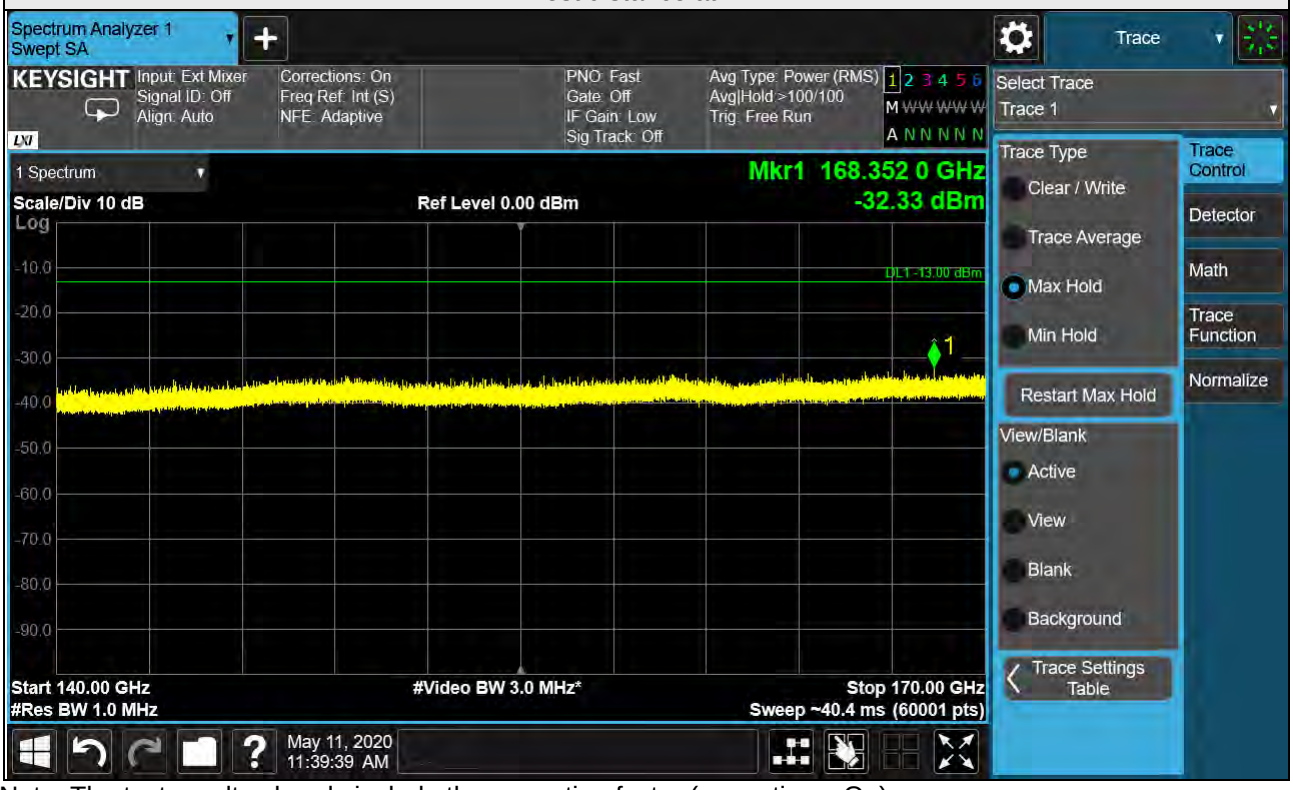
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



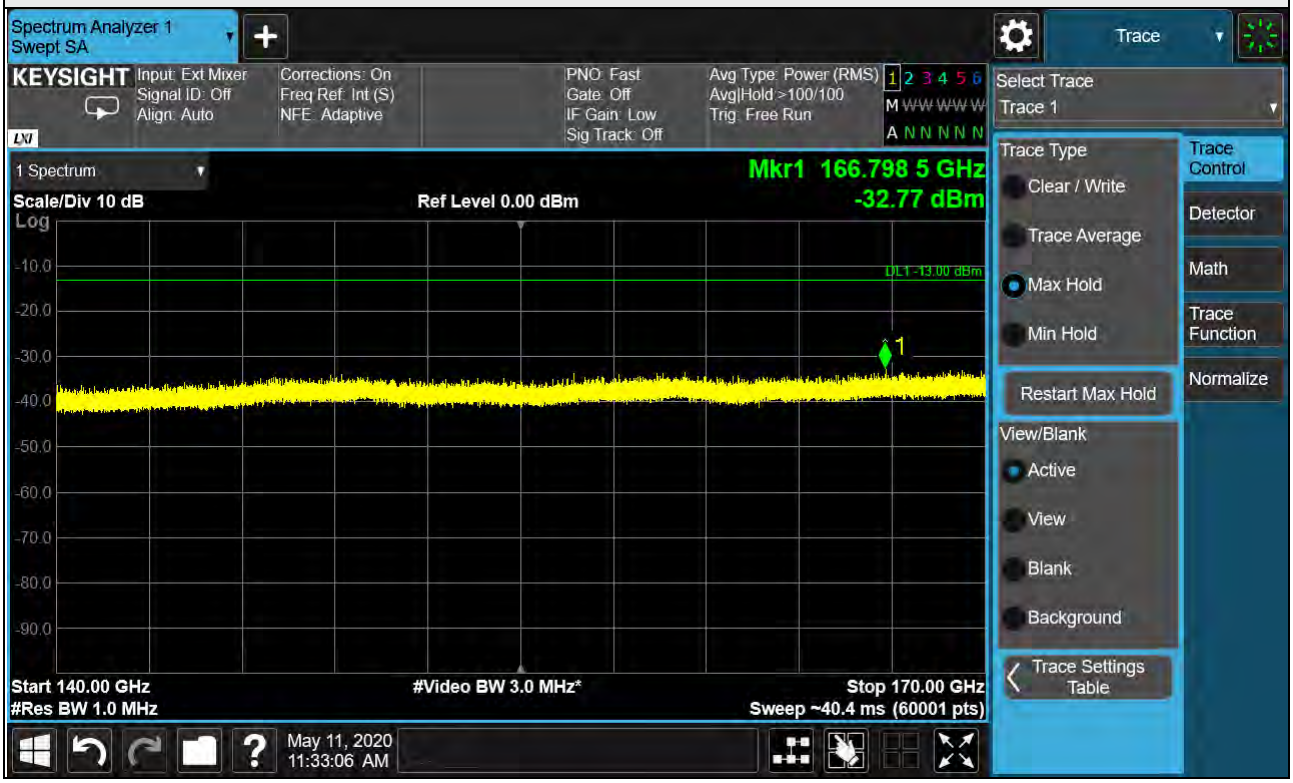
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



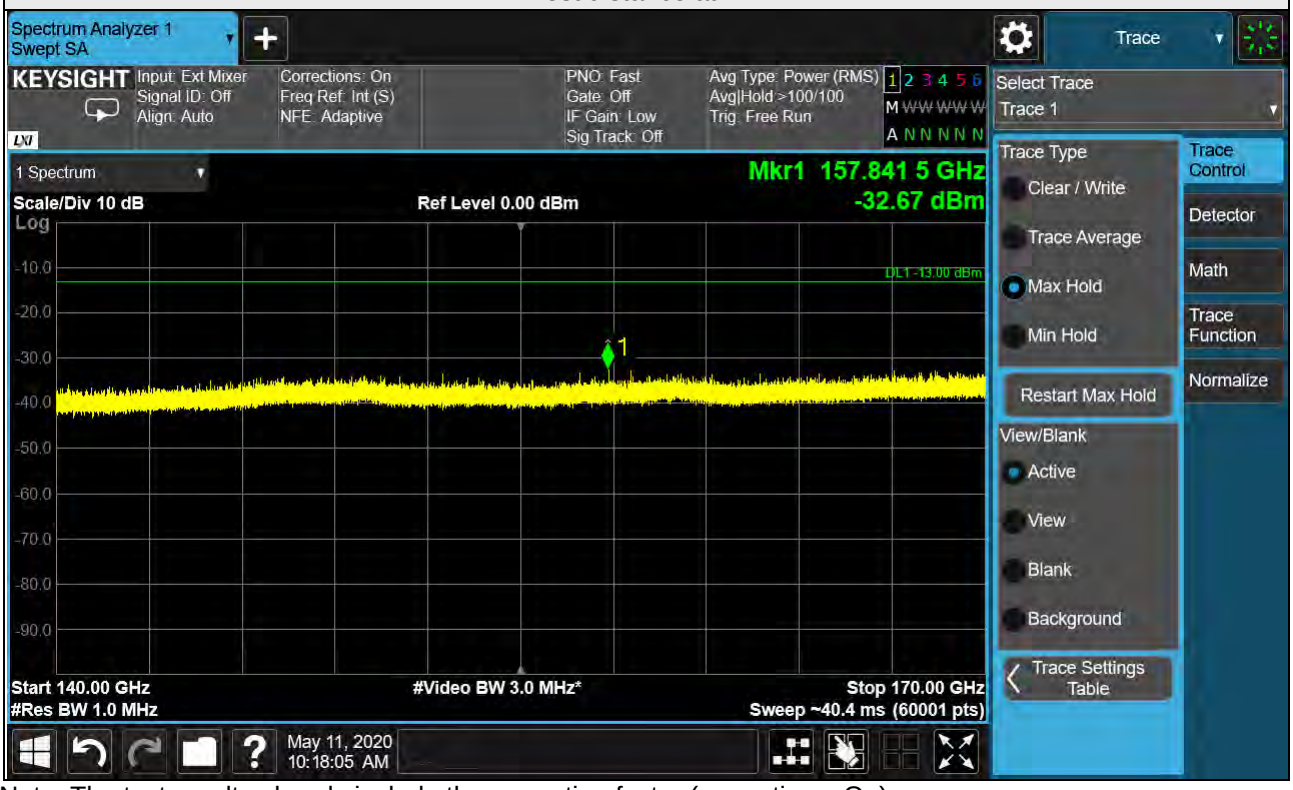
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



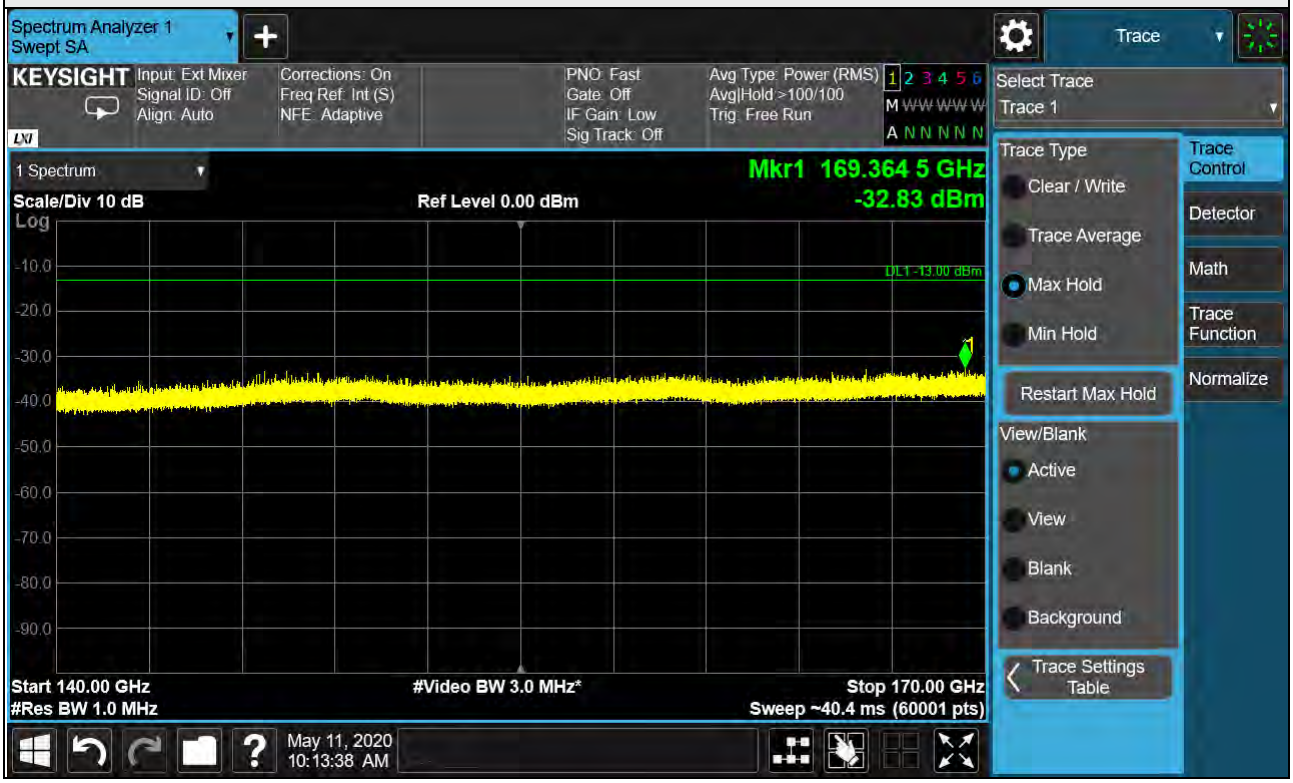
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



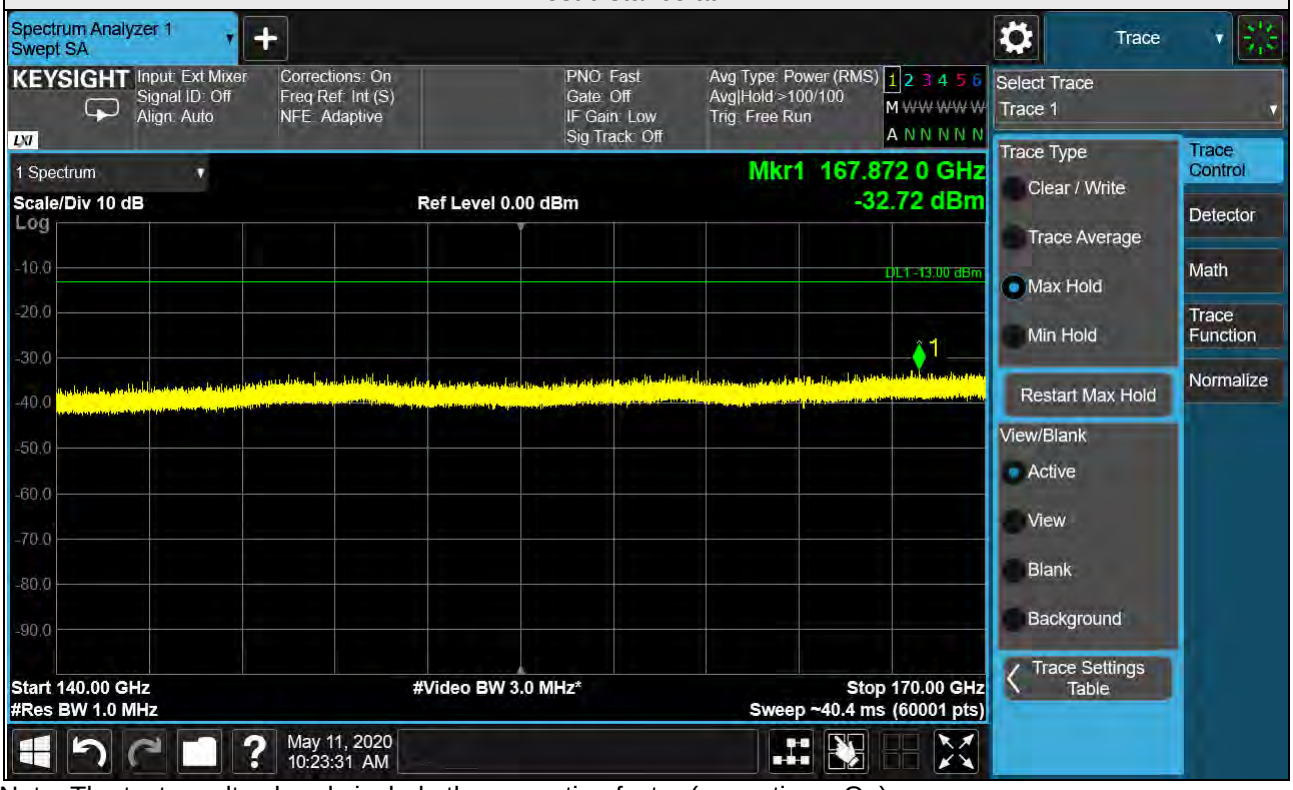
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



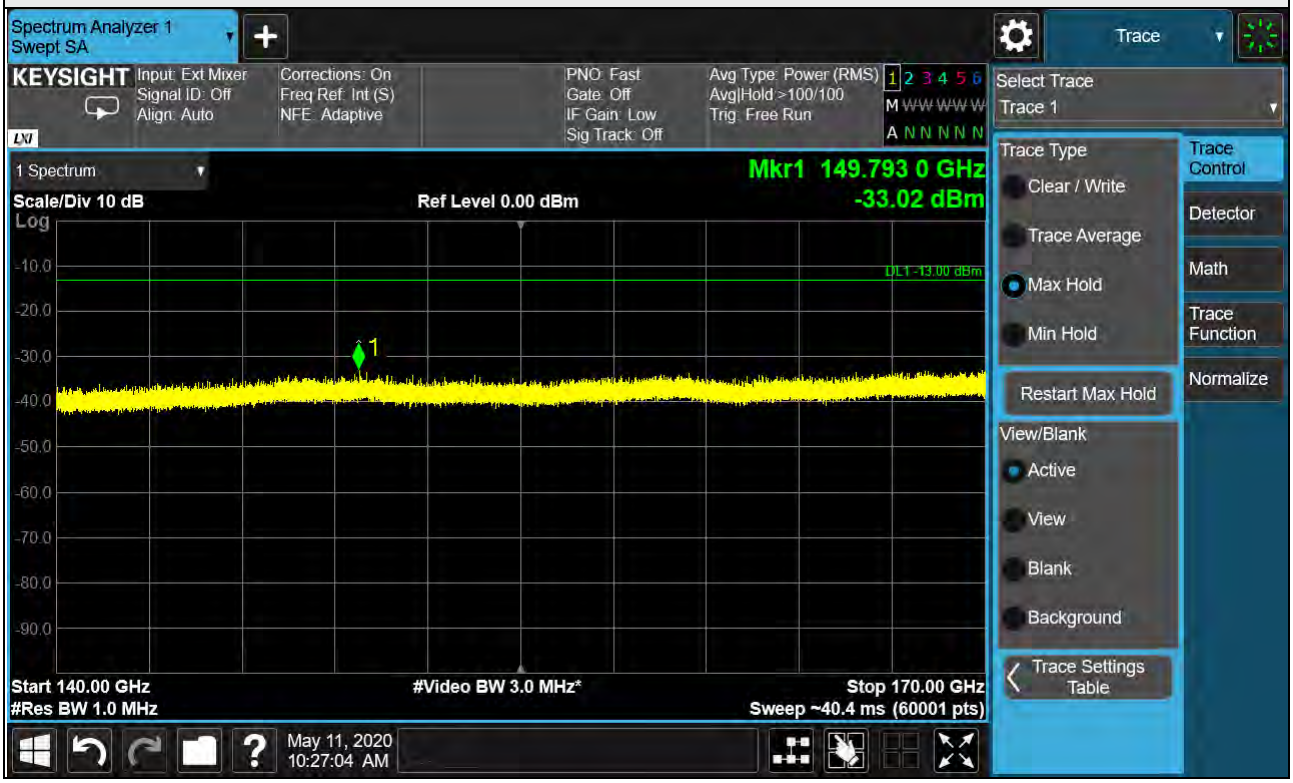
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



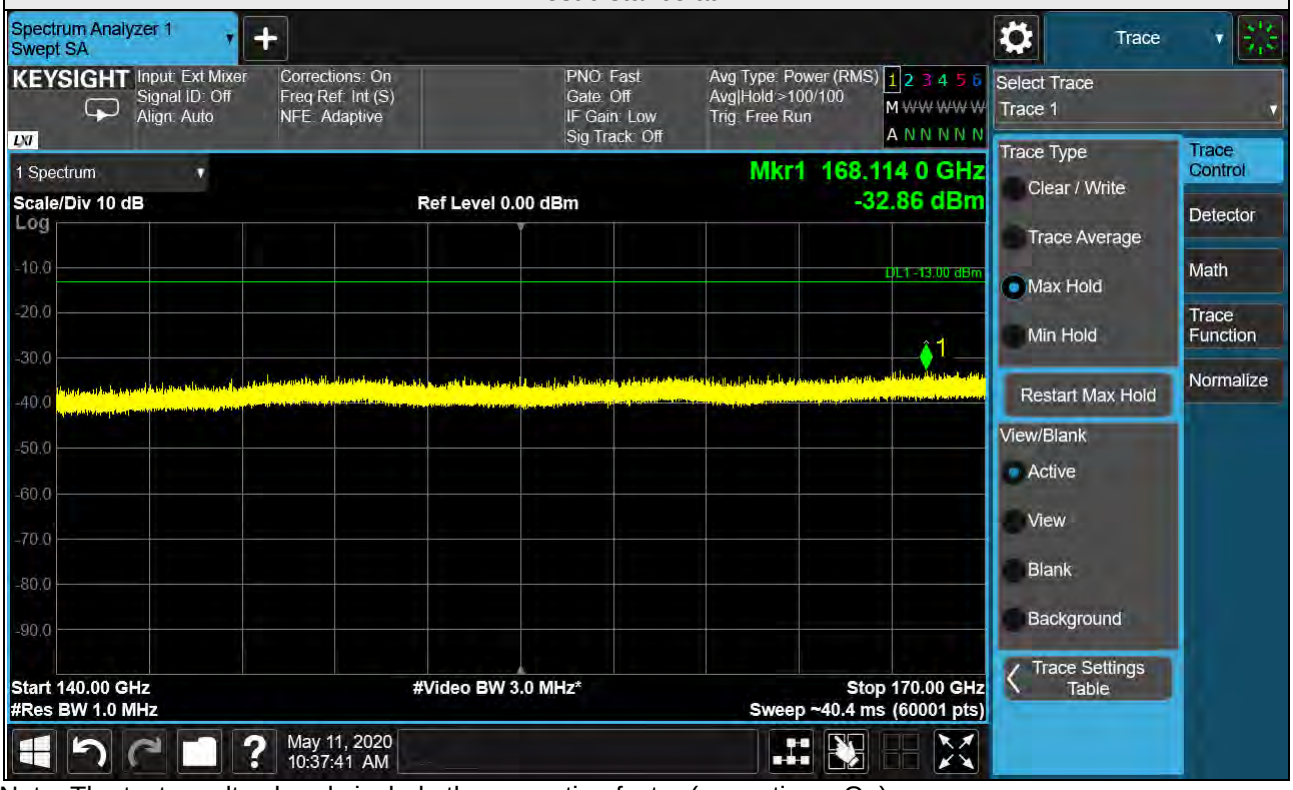
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



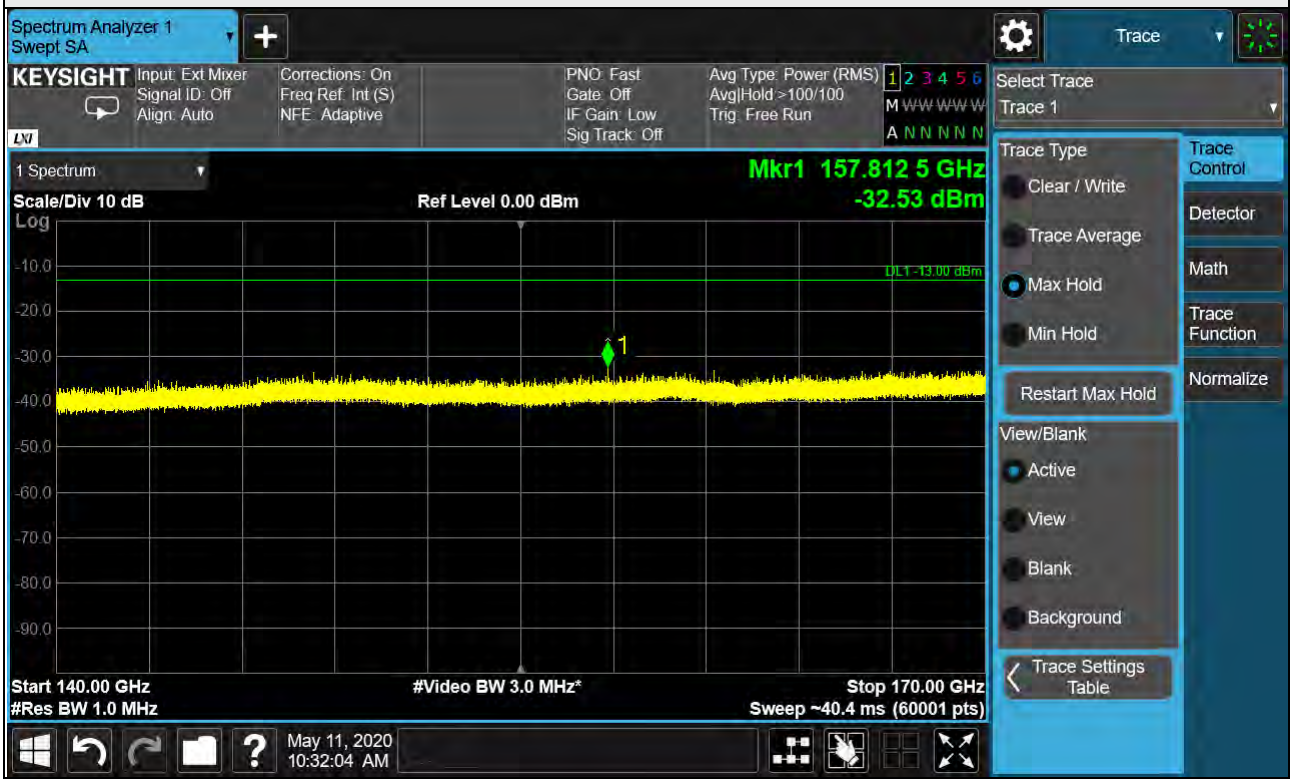
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



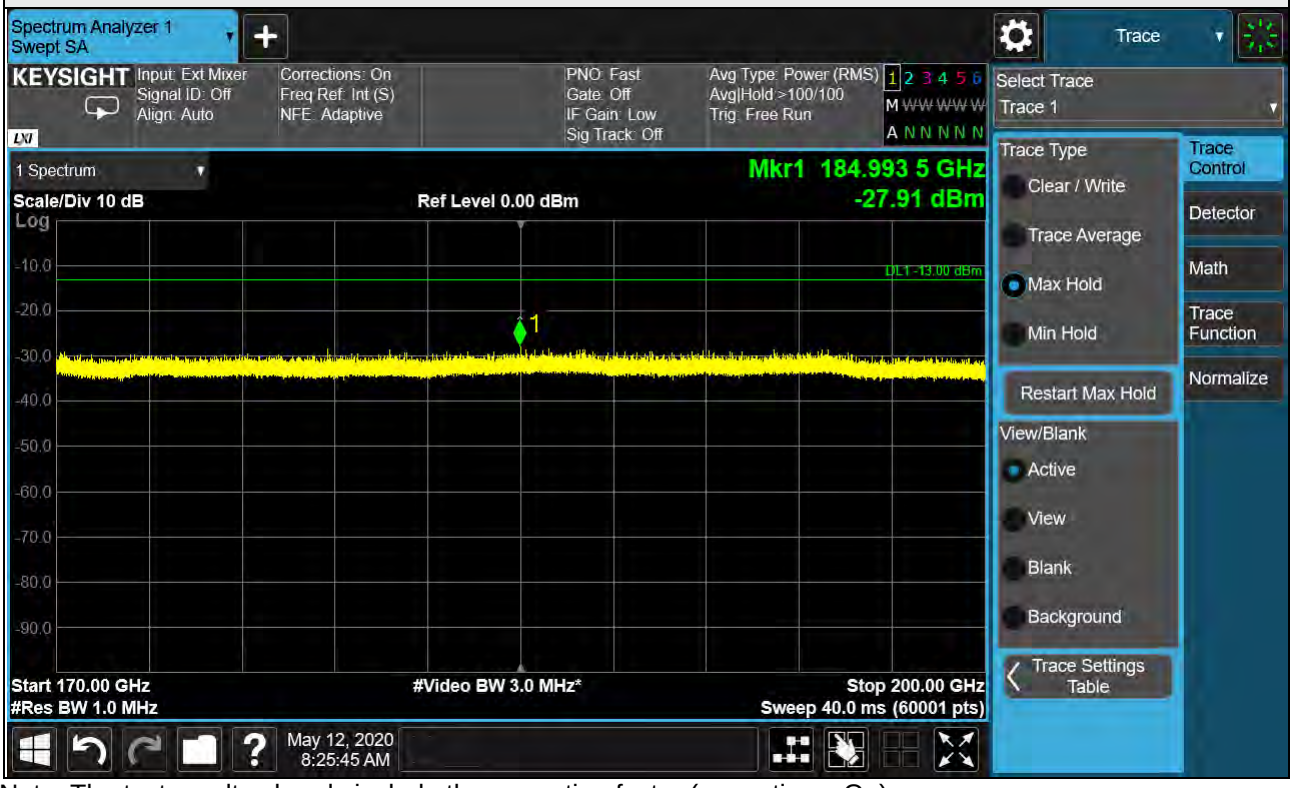
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	140GHz-170GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



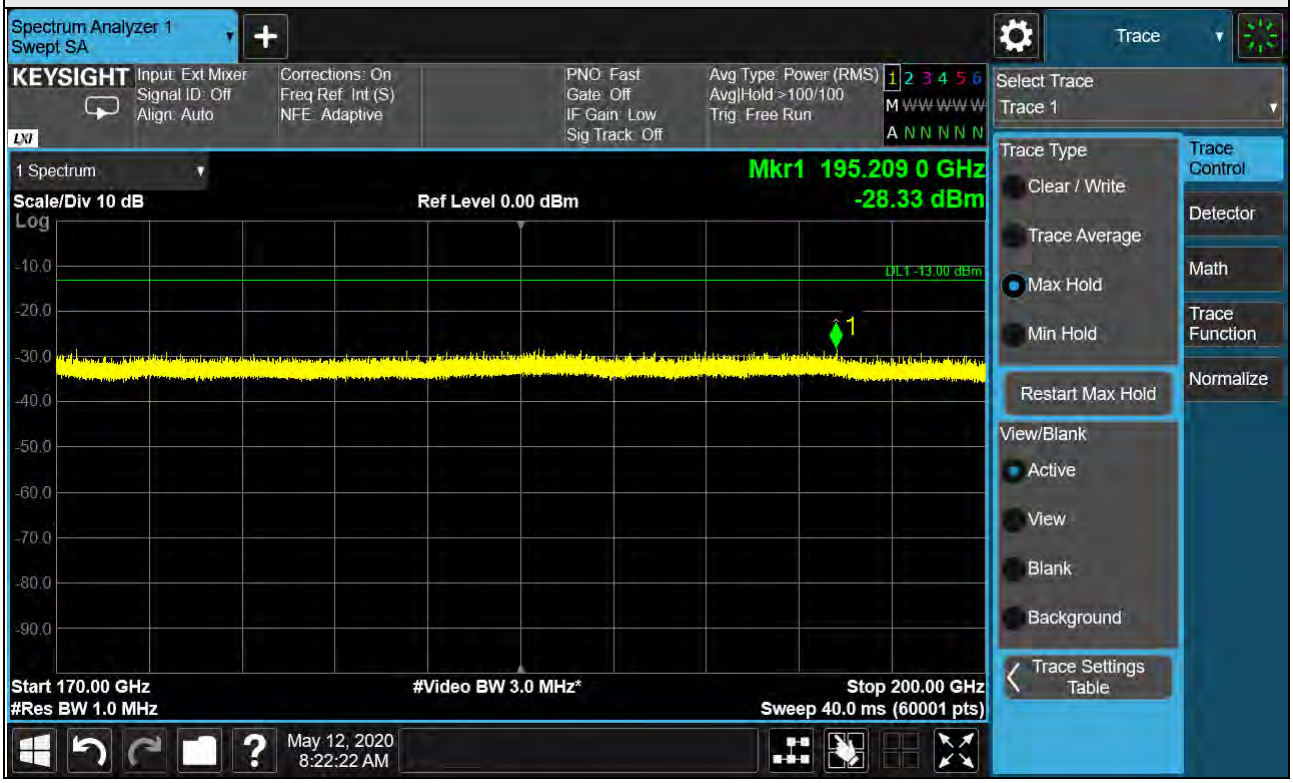
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



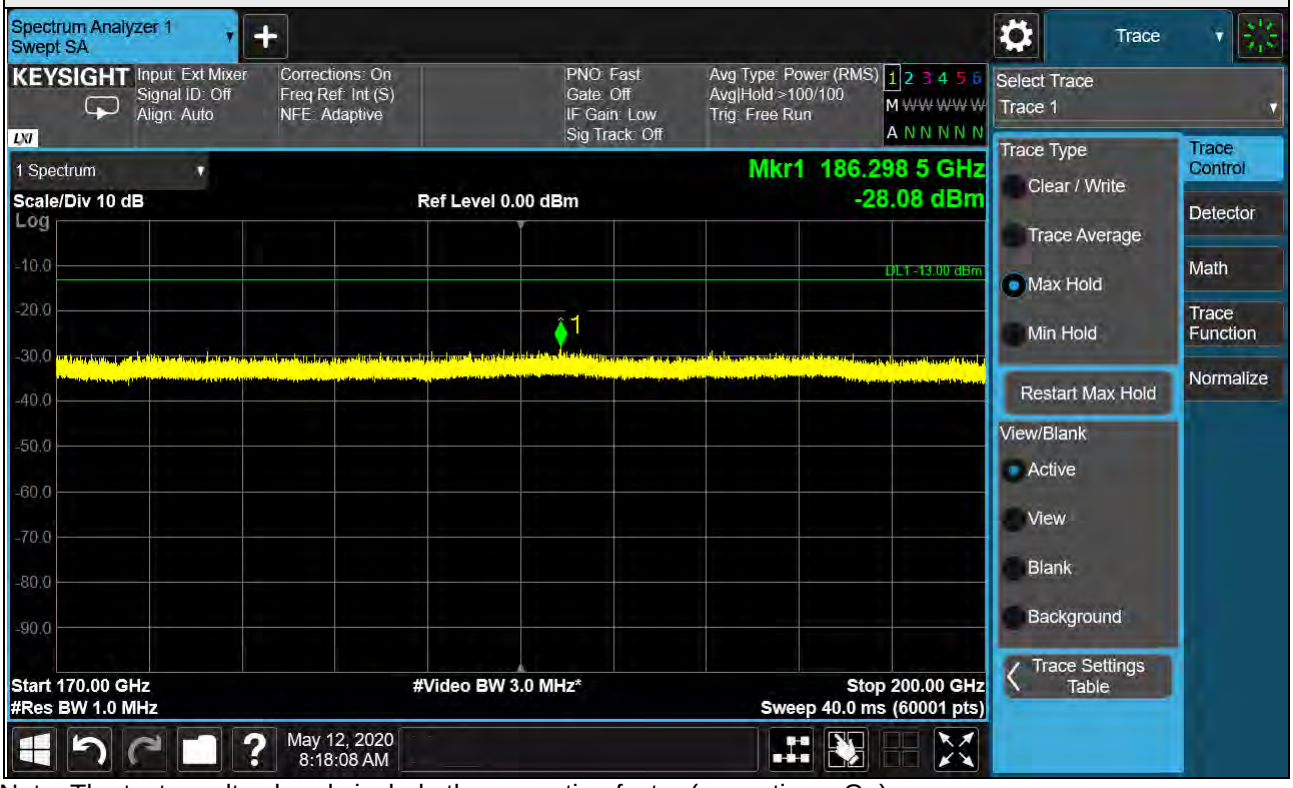
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



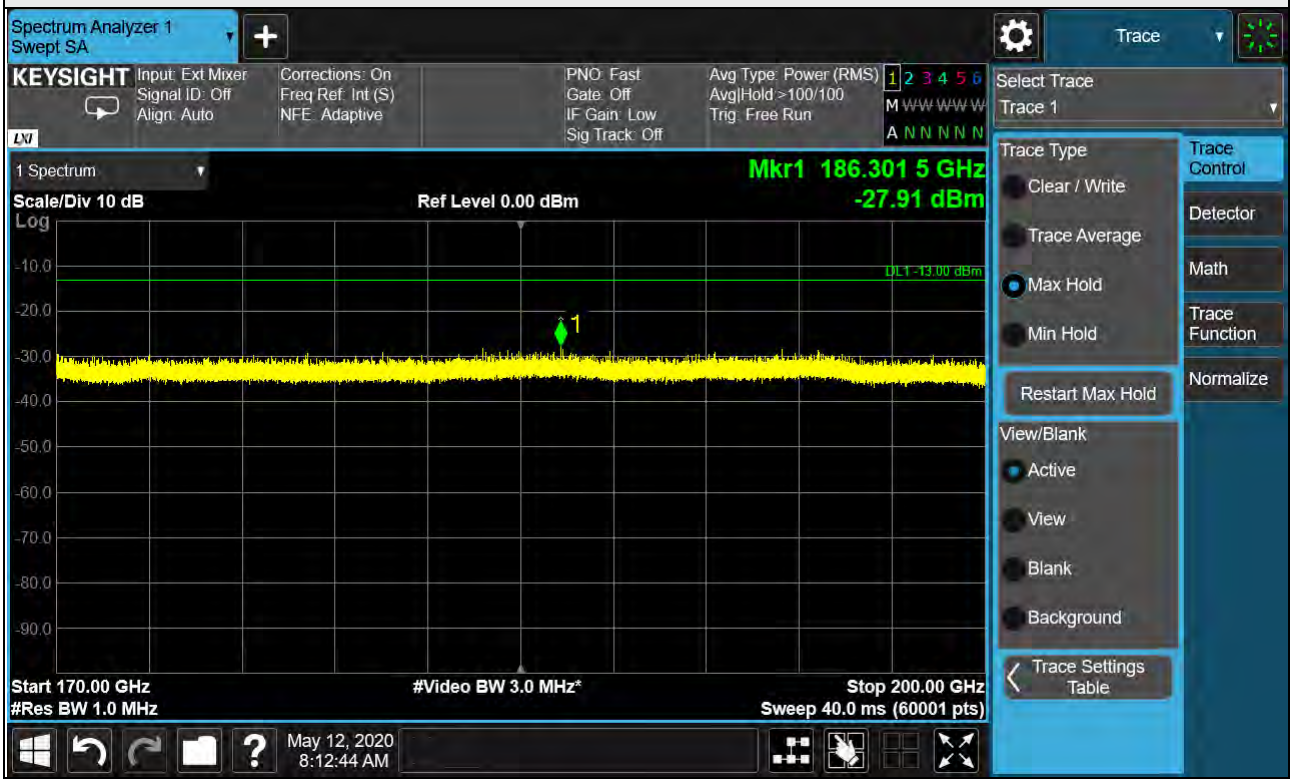
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



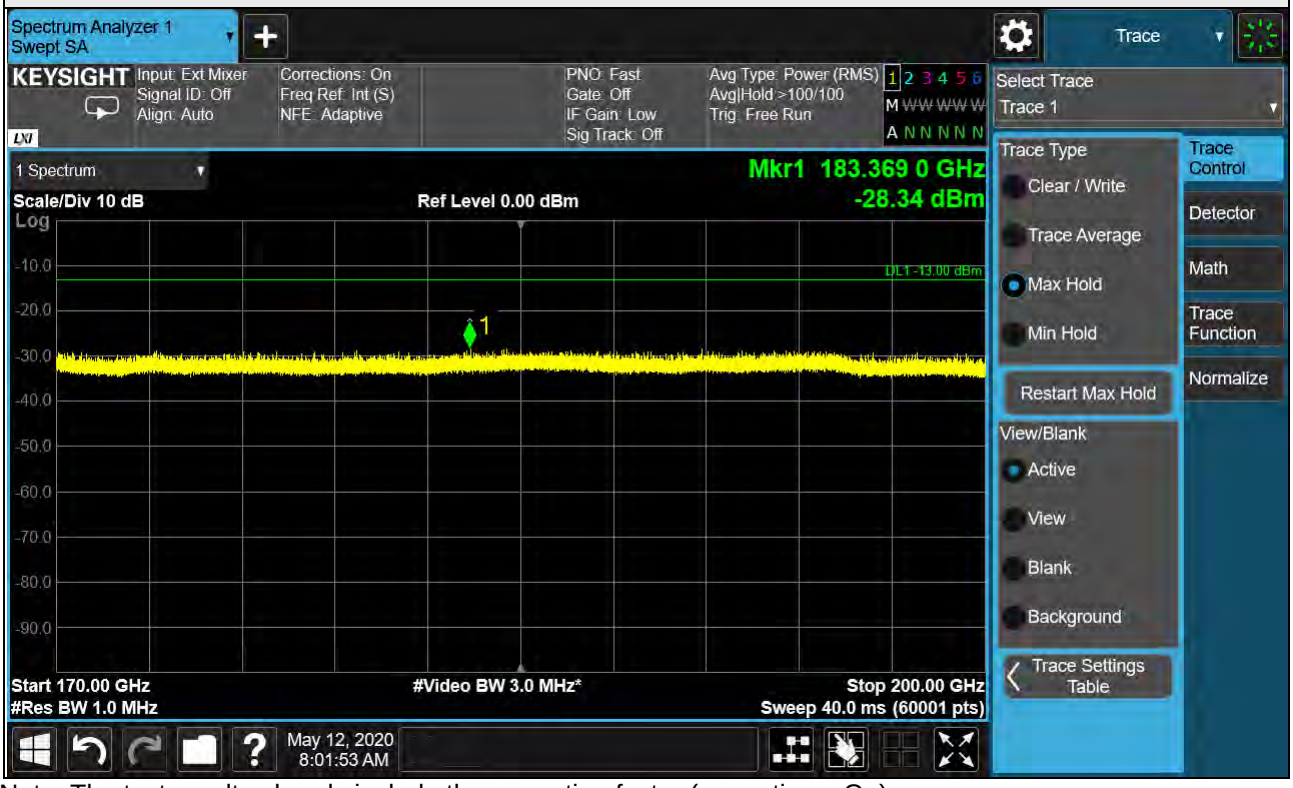
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



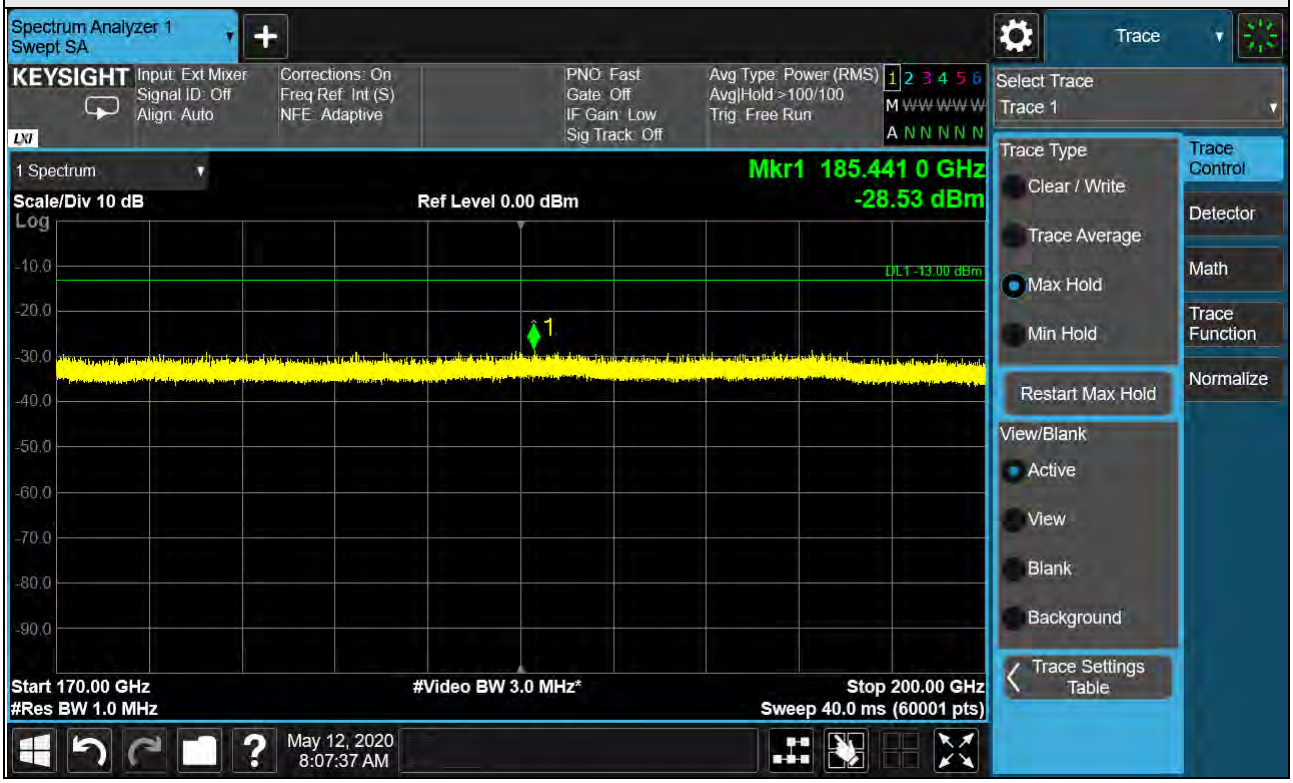
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



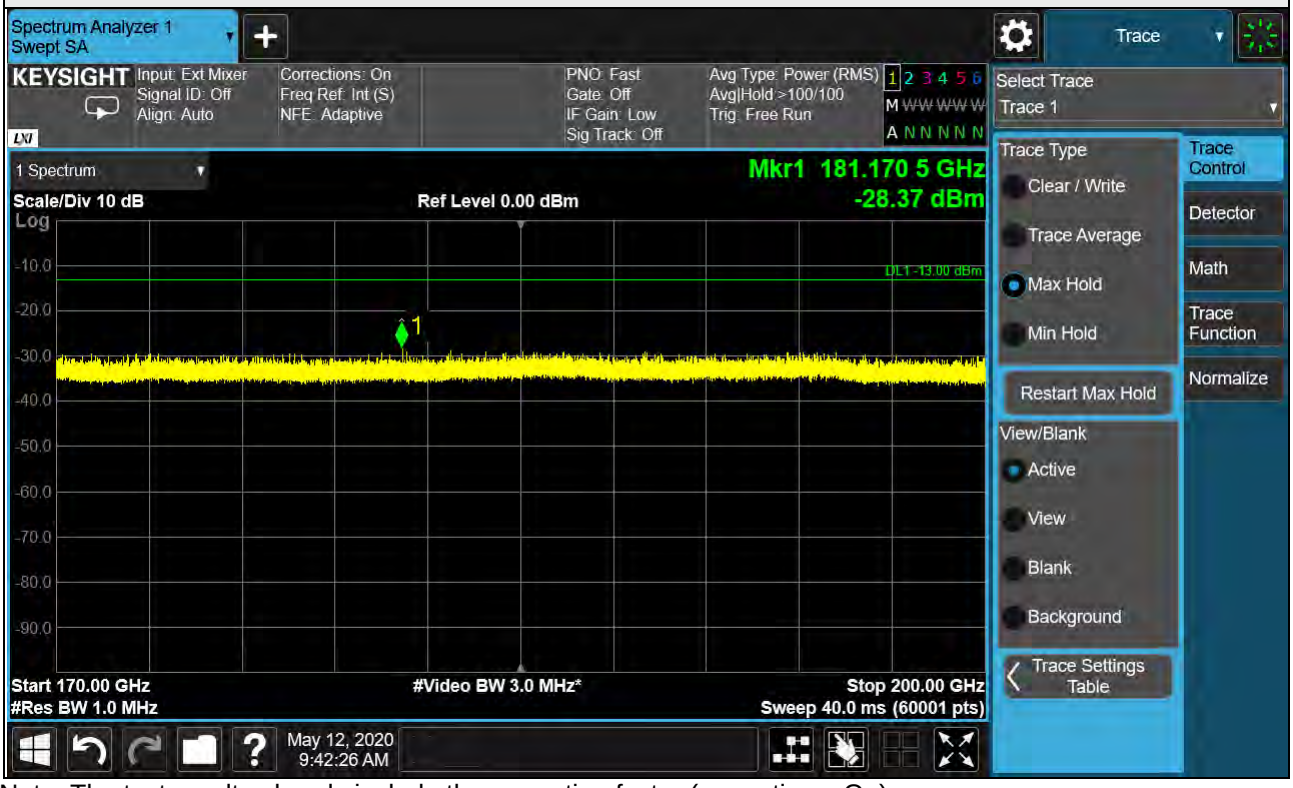
Note: The test results already include the correction factor (corrections: On).

Beam ID	20	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



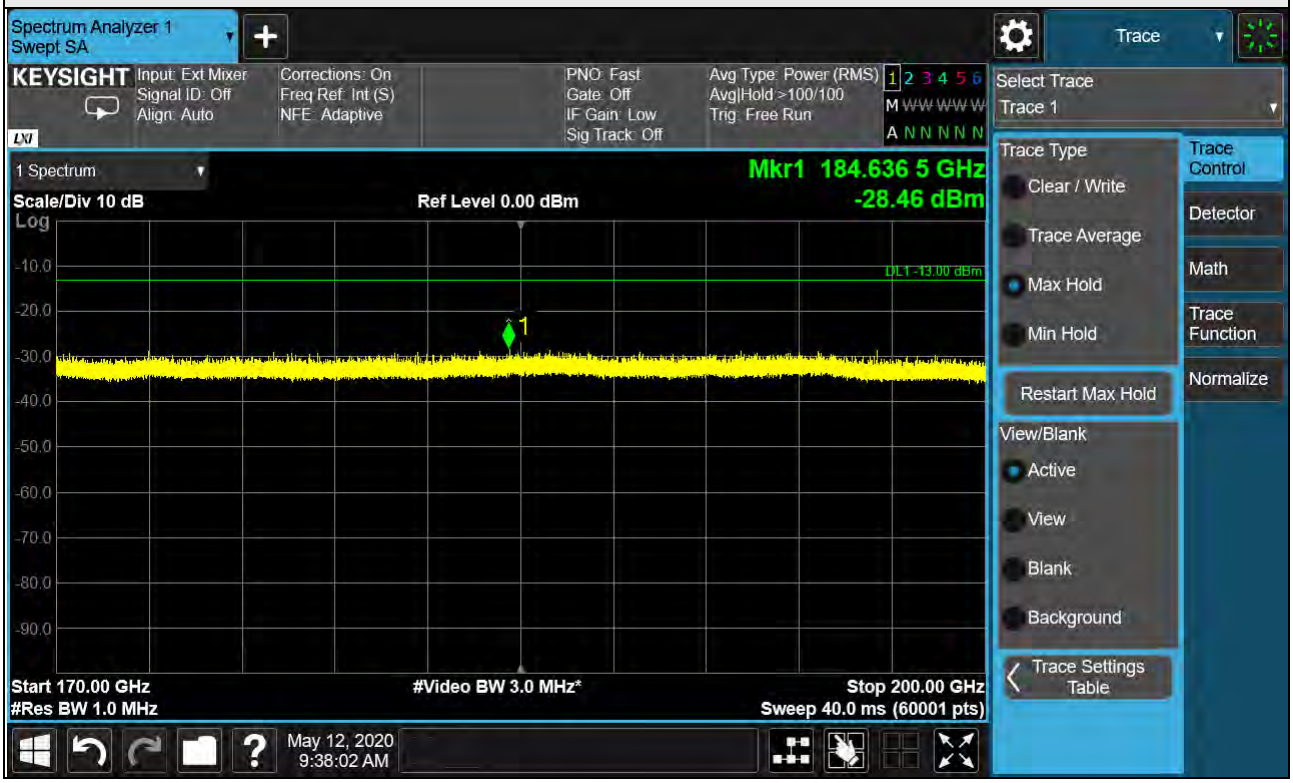
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



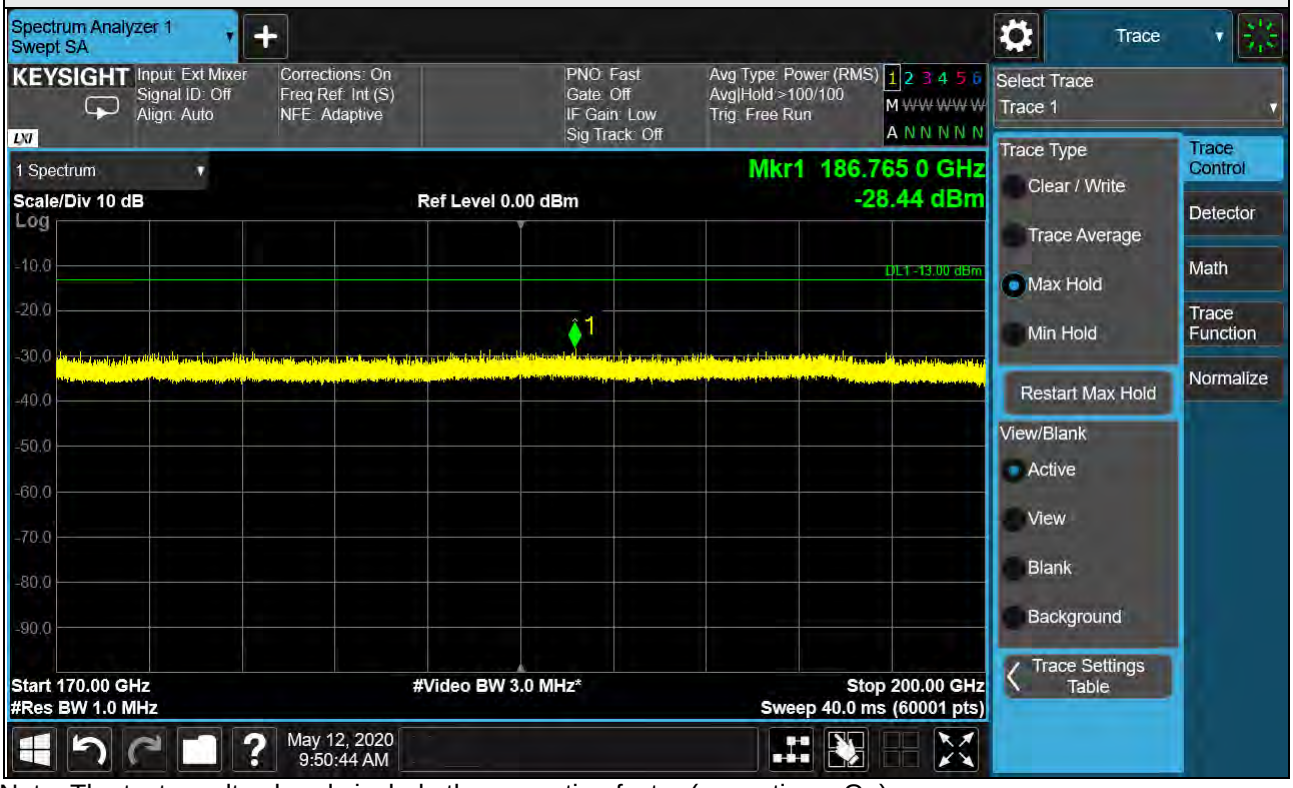
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



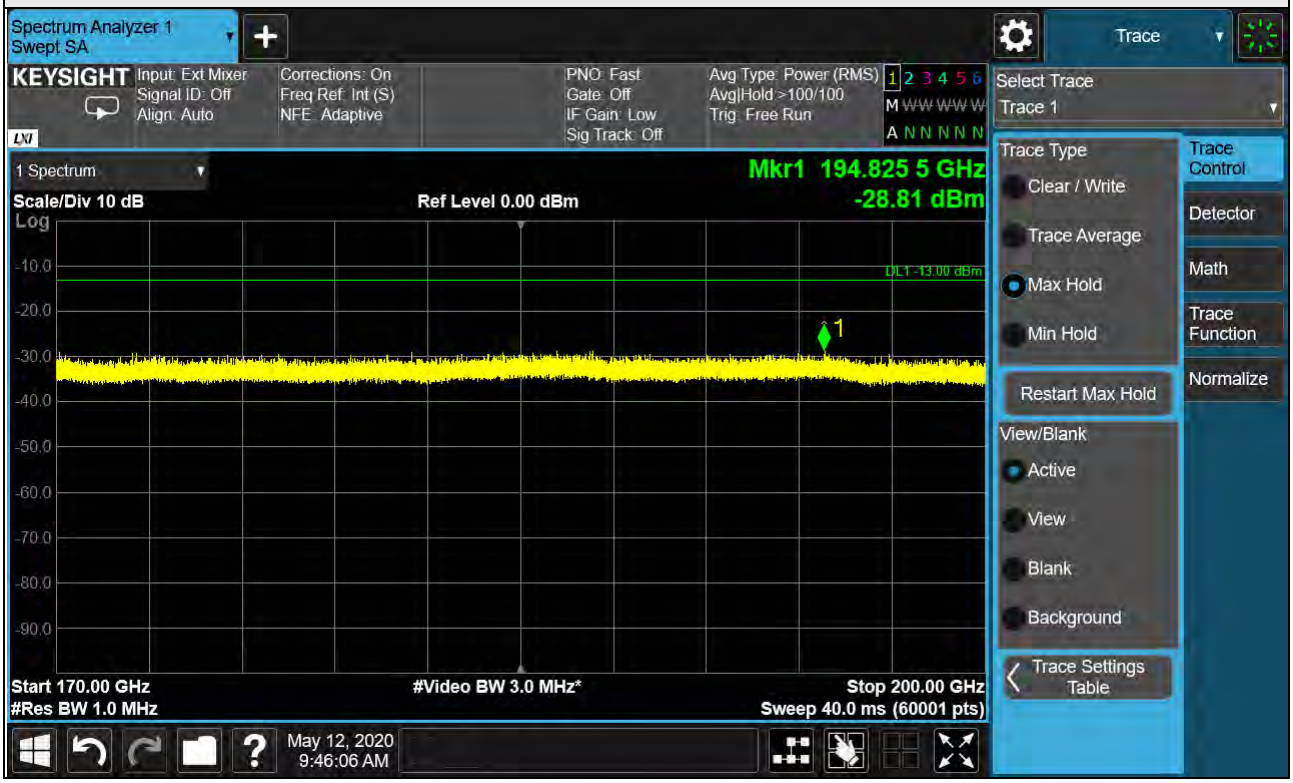
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



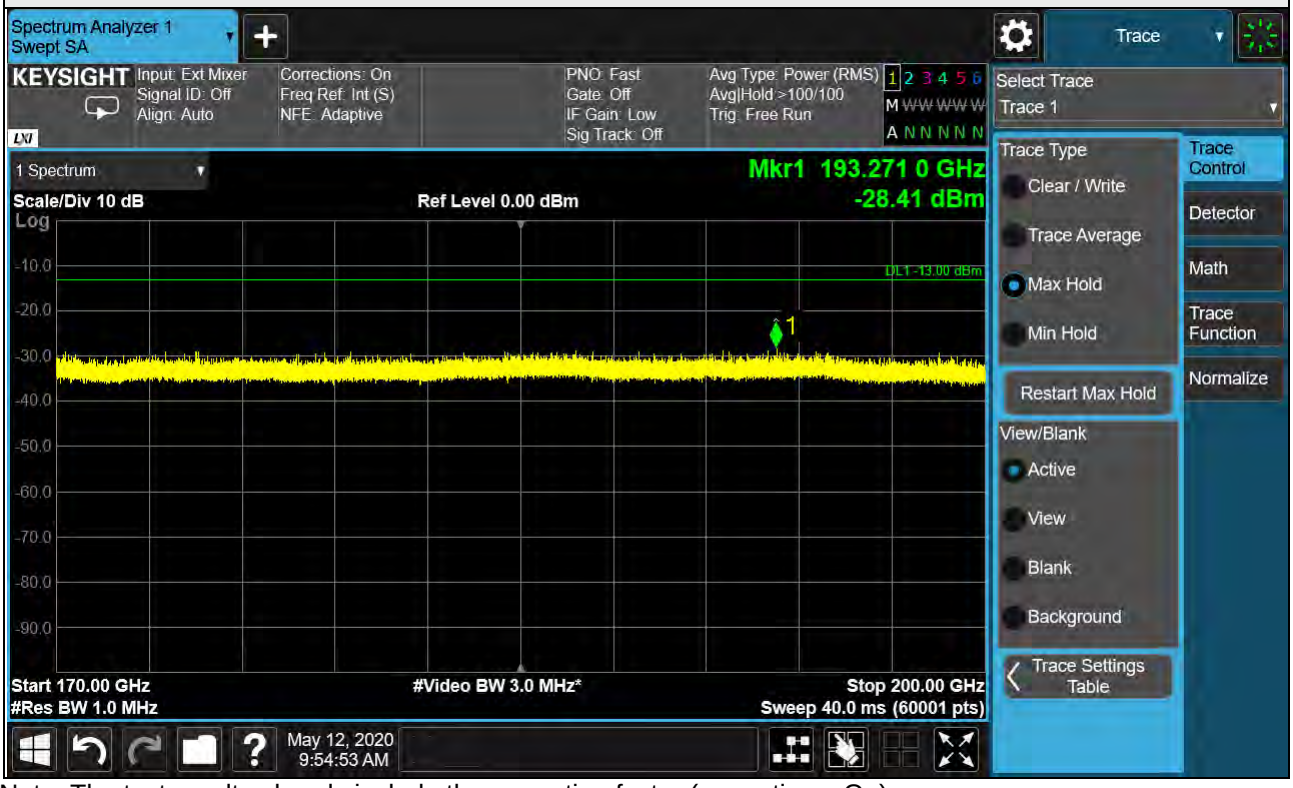
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



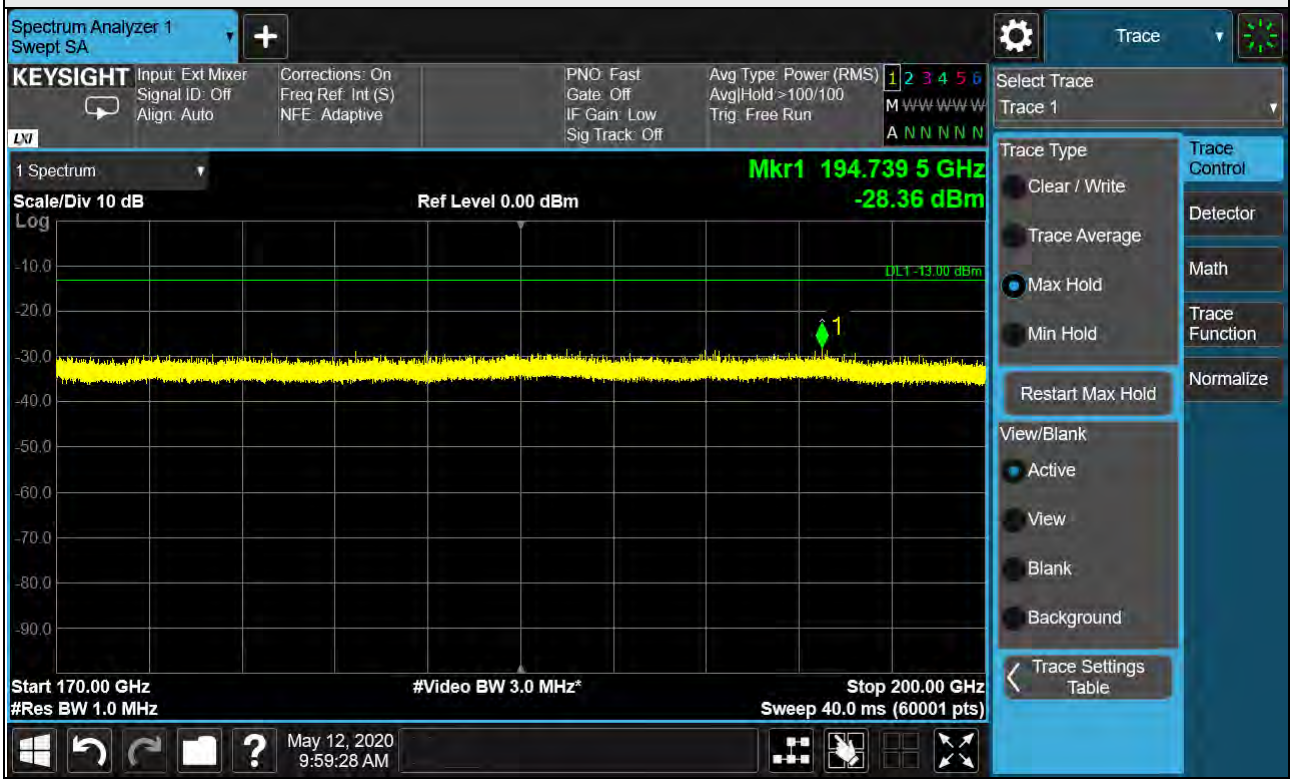
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



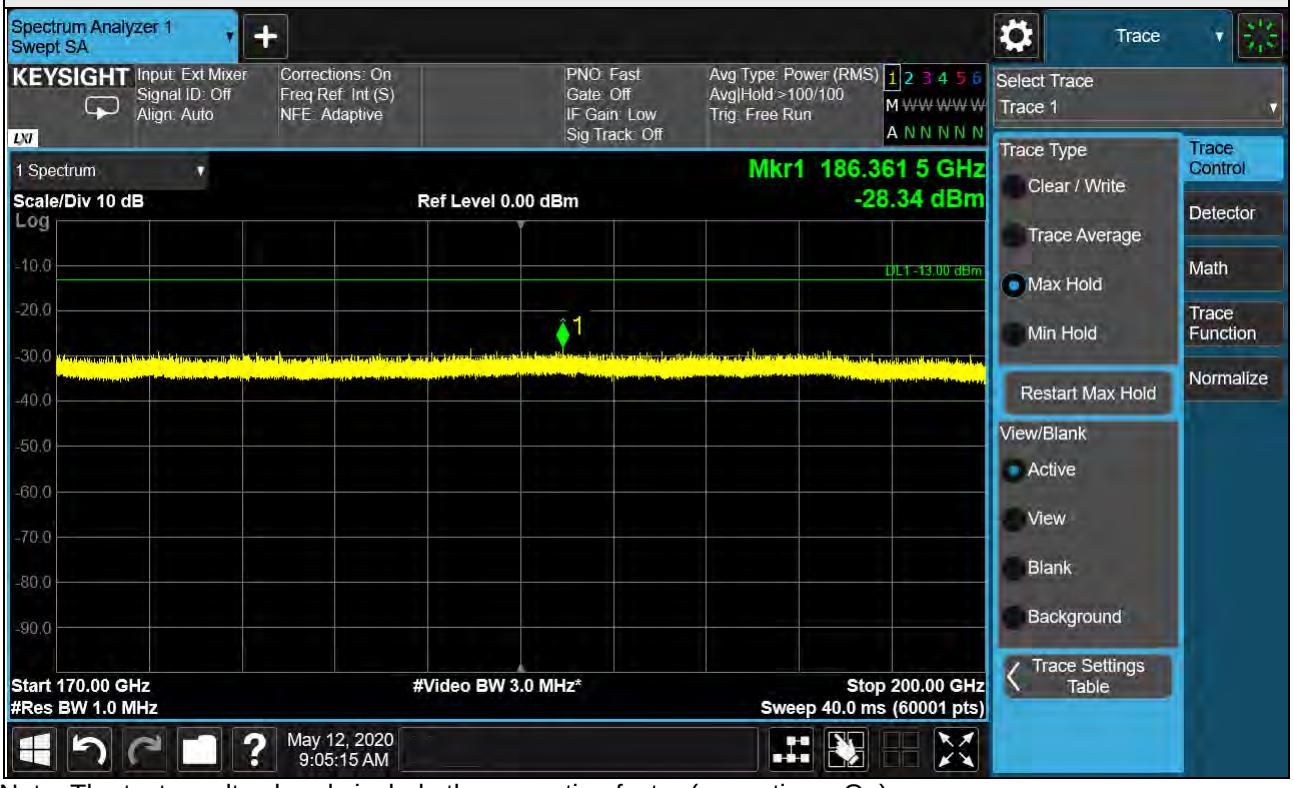
Note: The test results already include the correction factor (corrections: On).

Beam ID	30	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



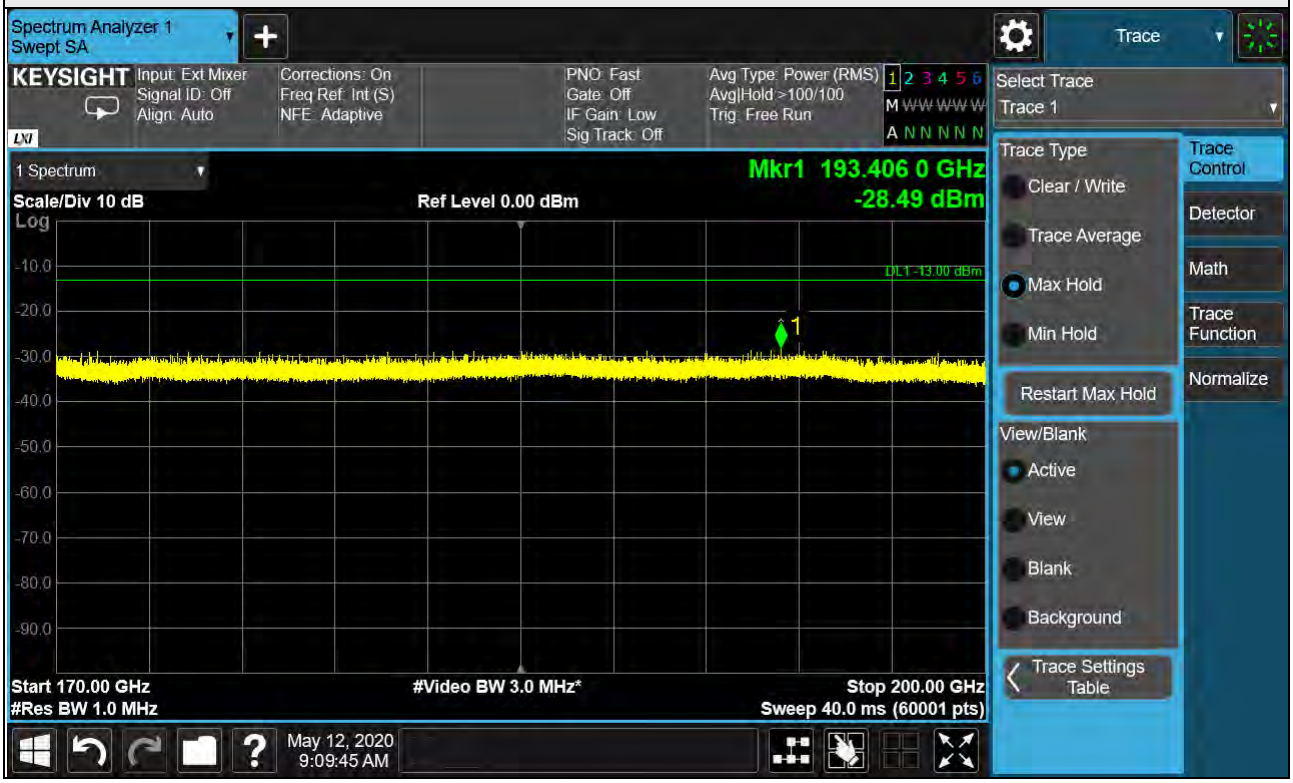
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



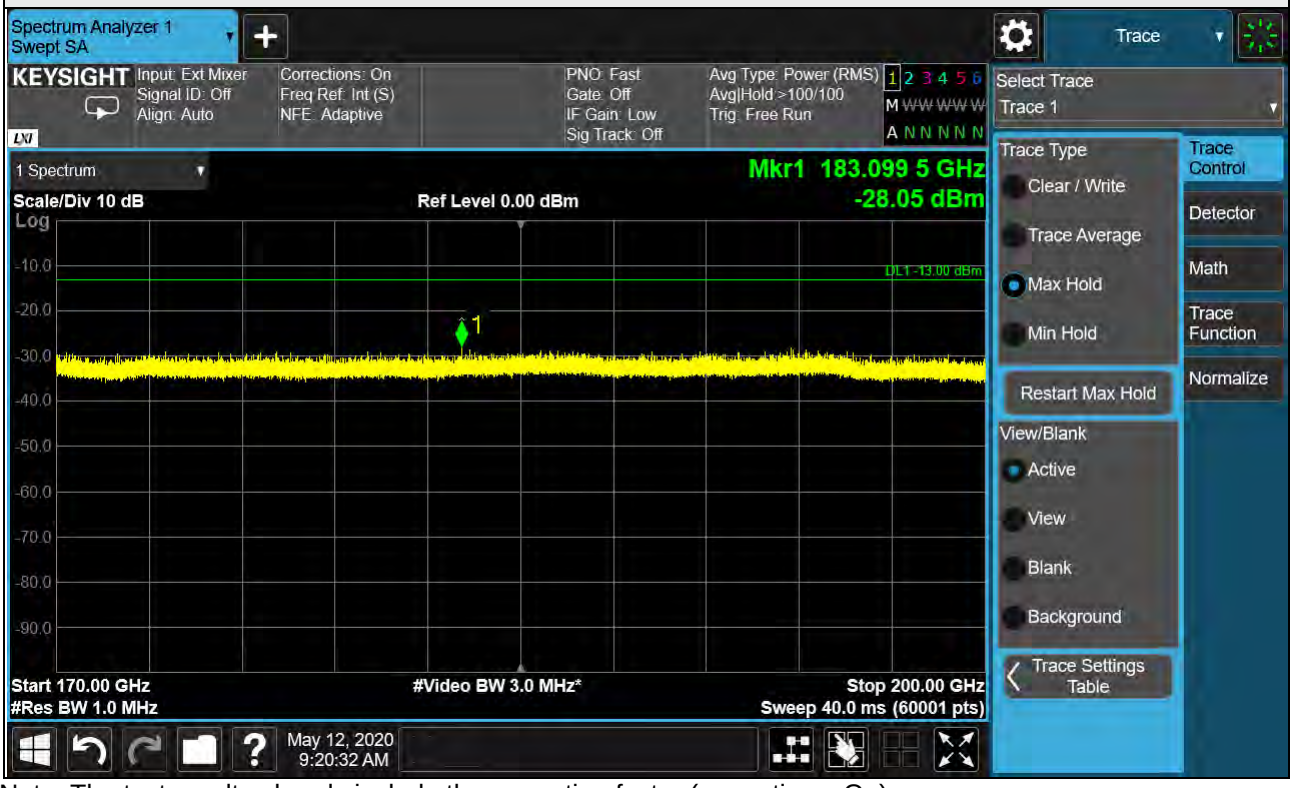
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



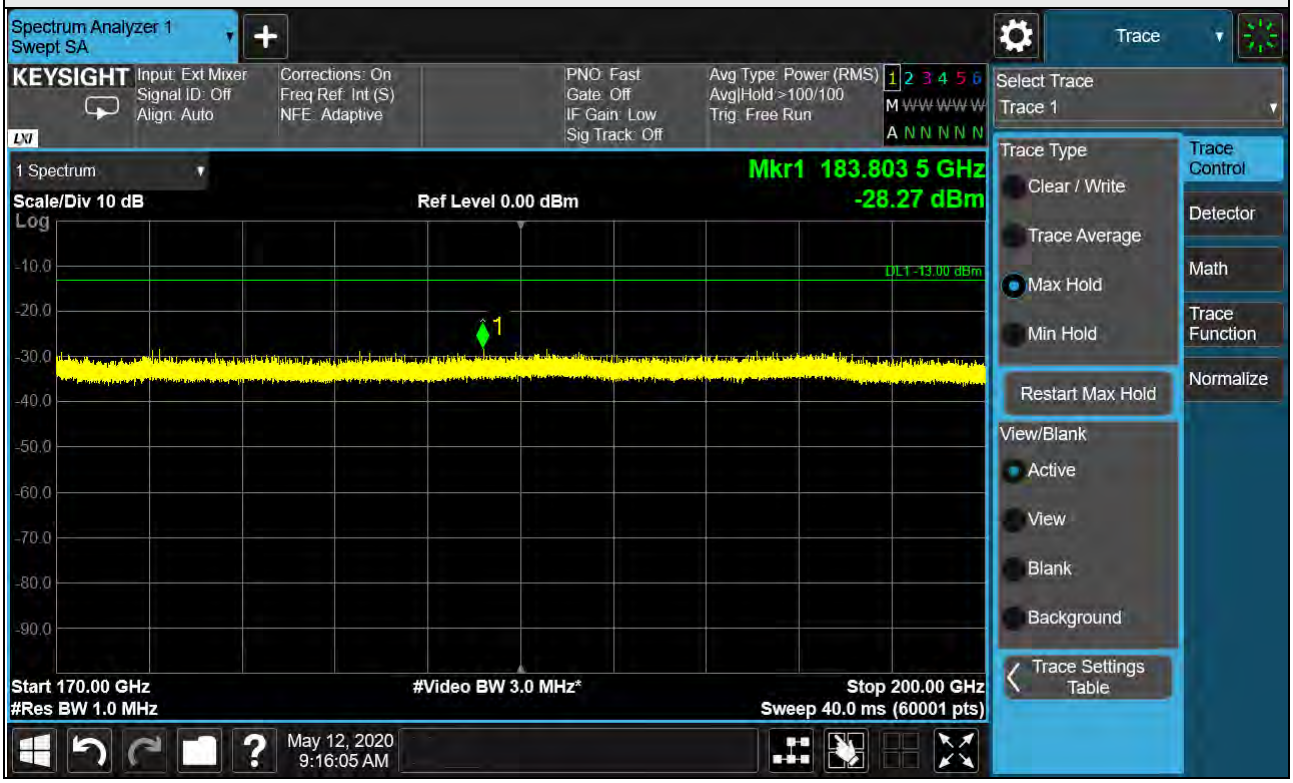
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



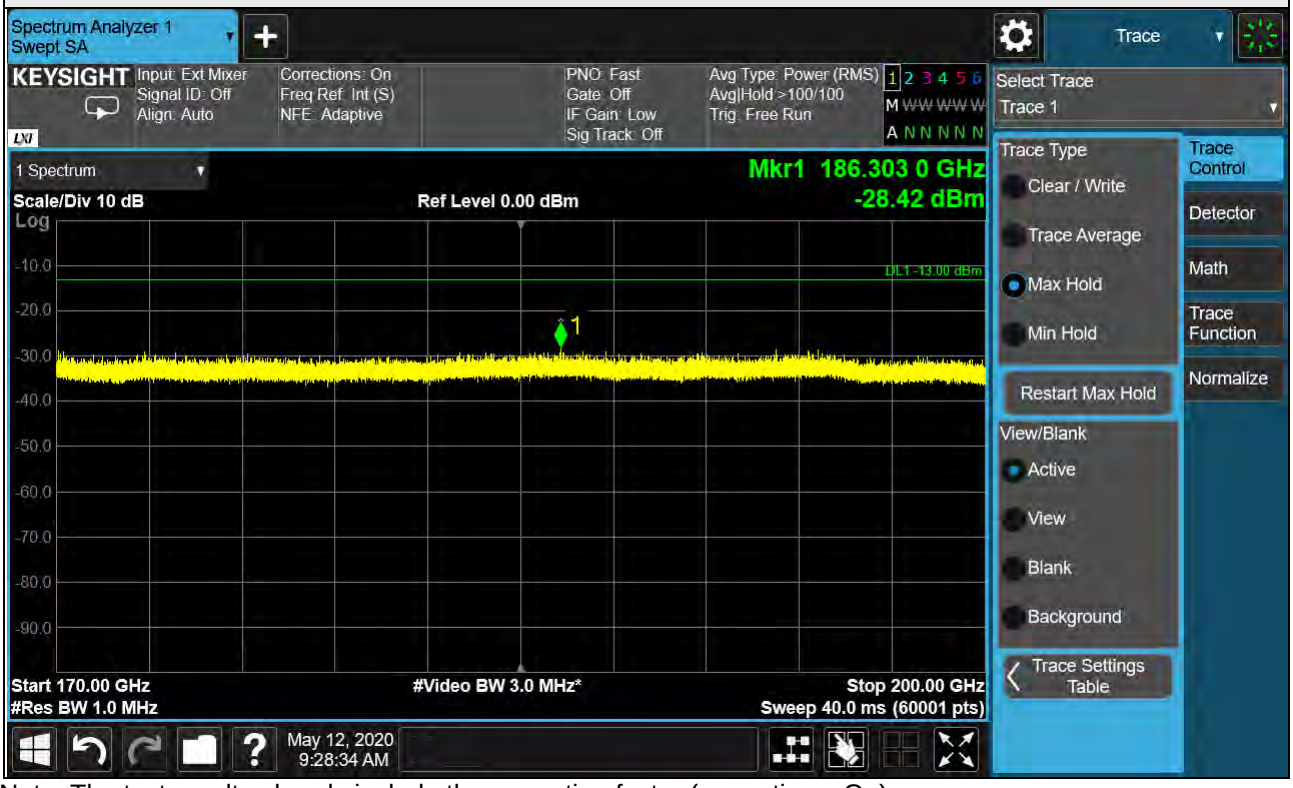
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



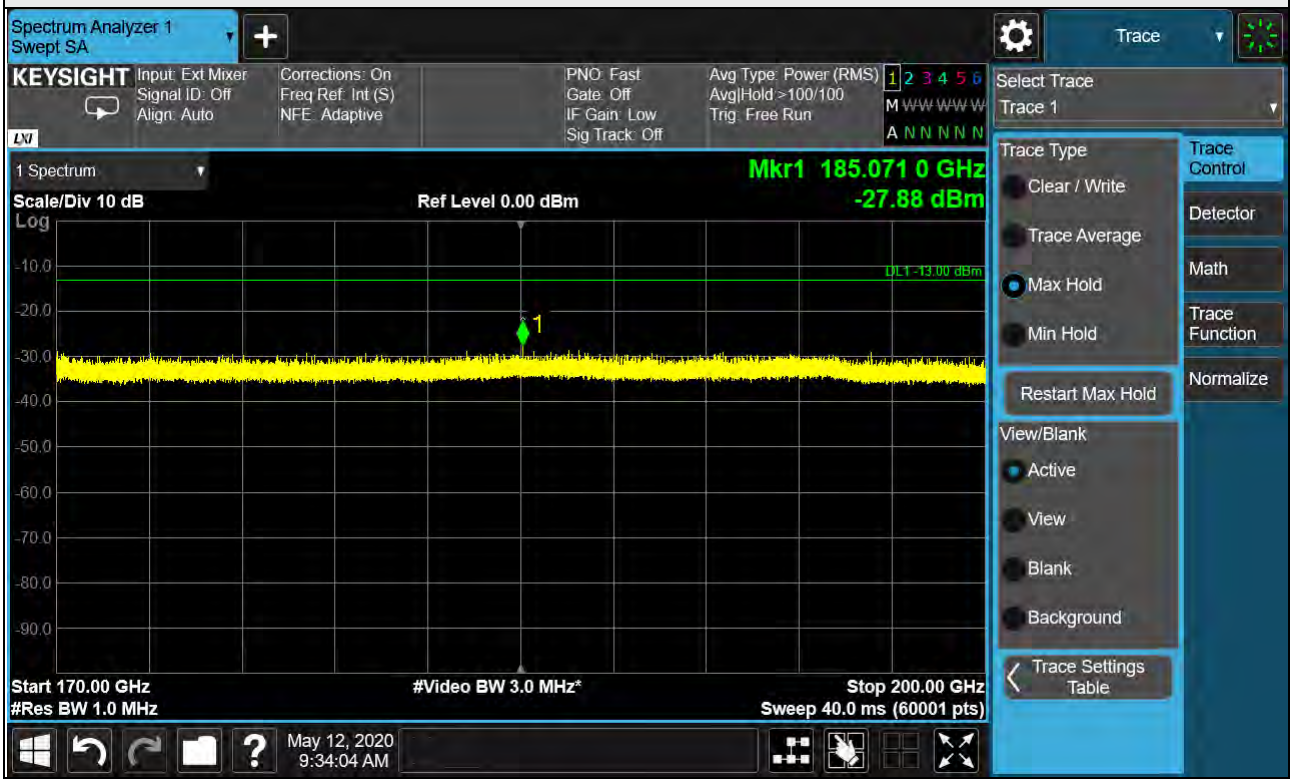
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



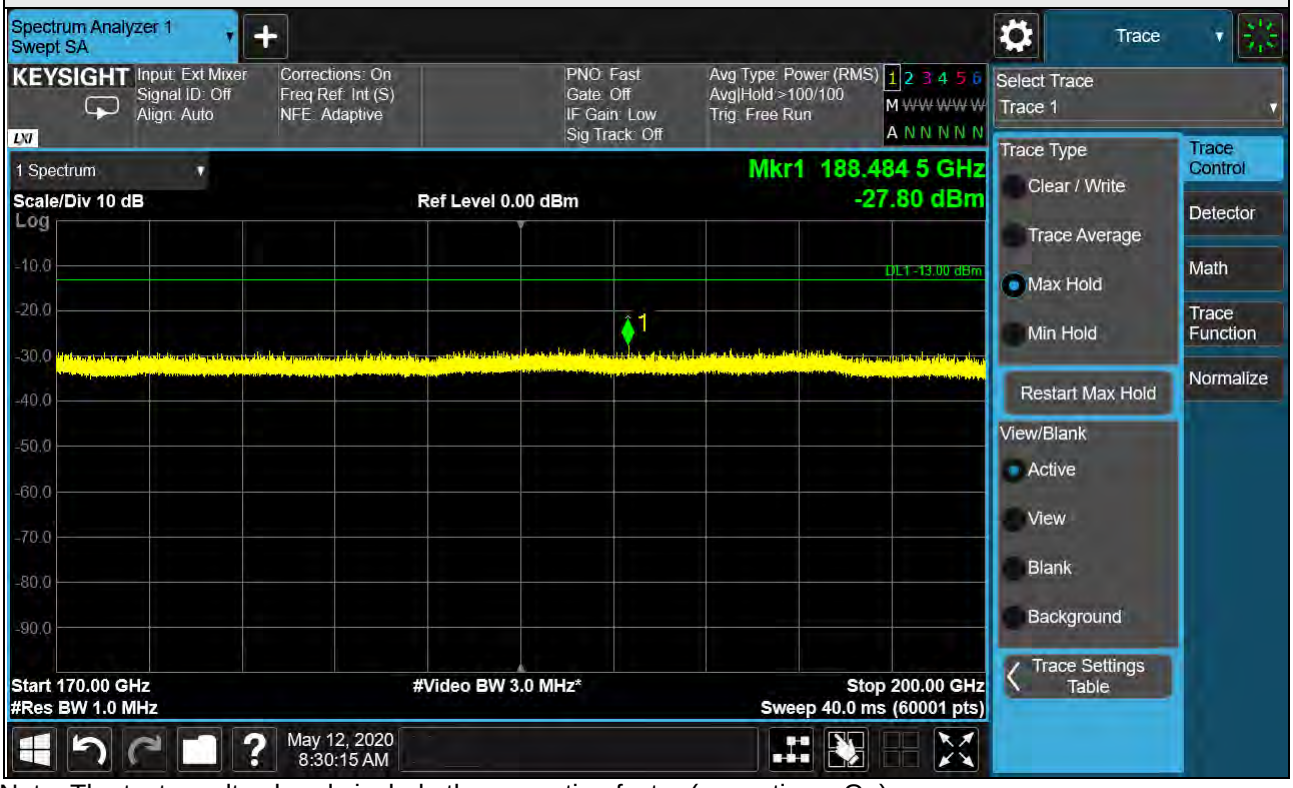
Note: The test results already include the correction factor (corrections: On).

Beam ID	39	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



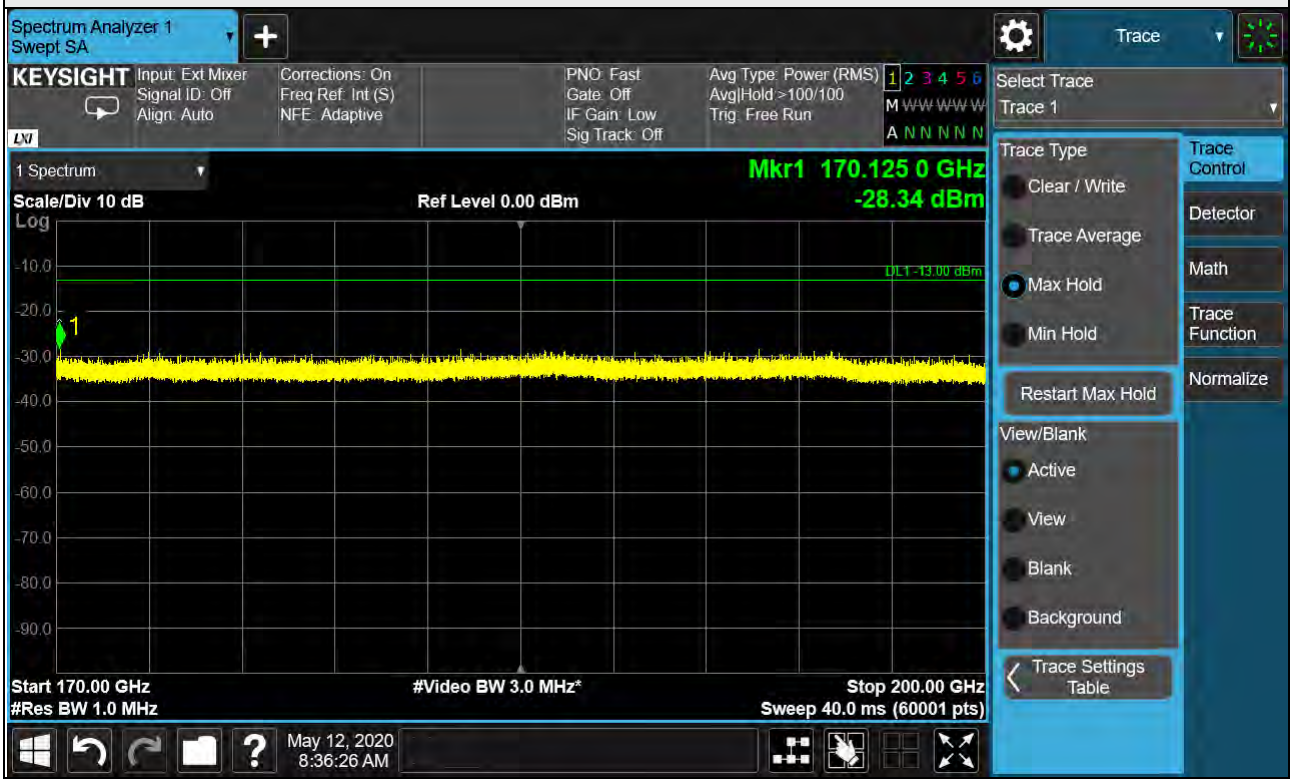
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Horizontal
Test distance at 1m			



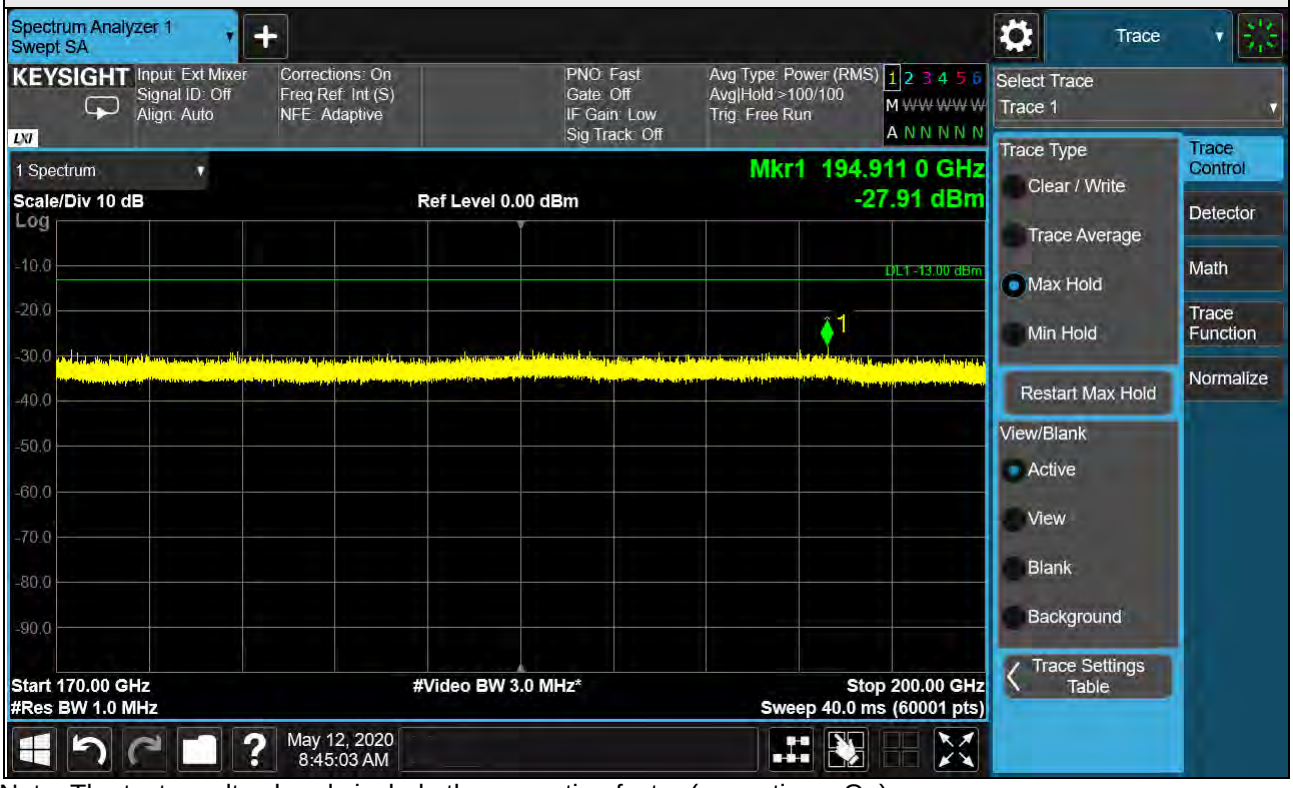
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	Low	Antenna polarity	Vertical
Test distance at 1m			



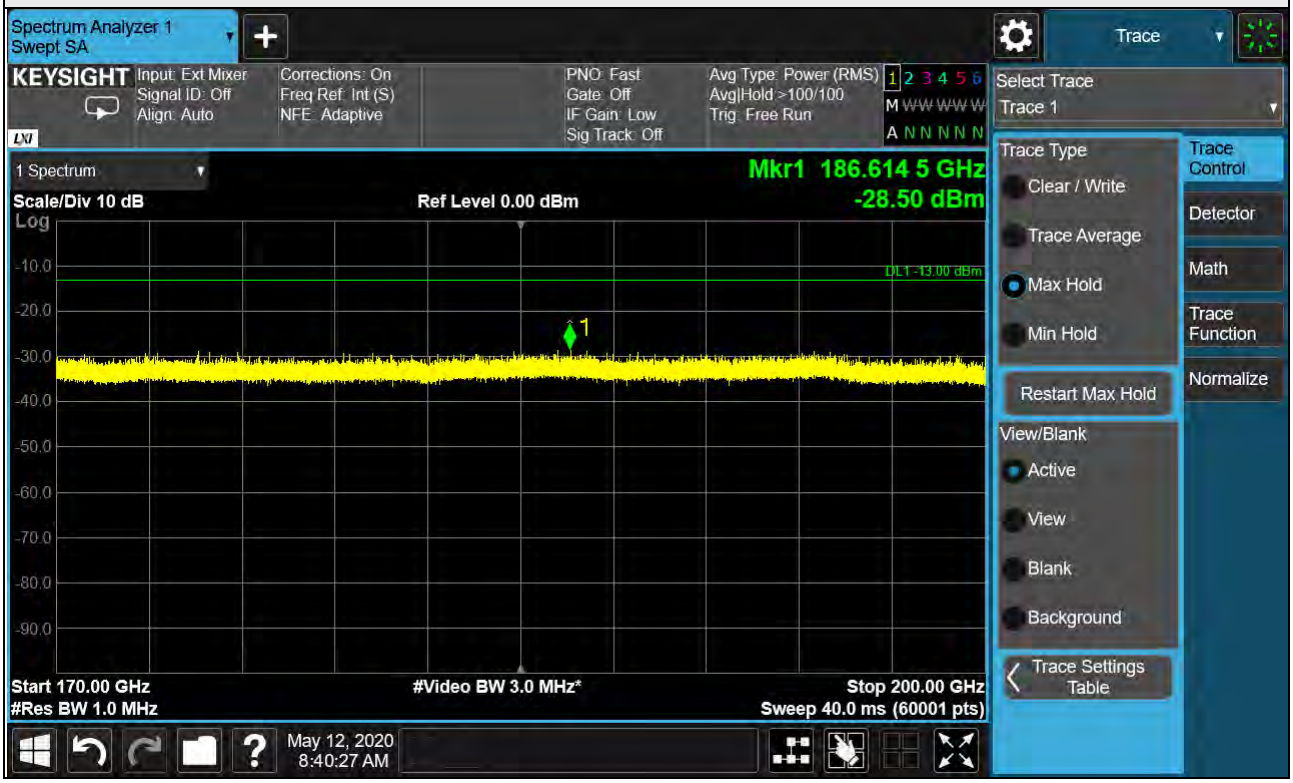
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Horizontal
Test distance at 1m			



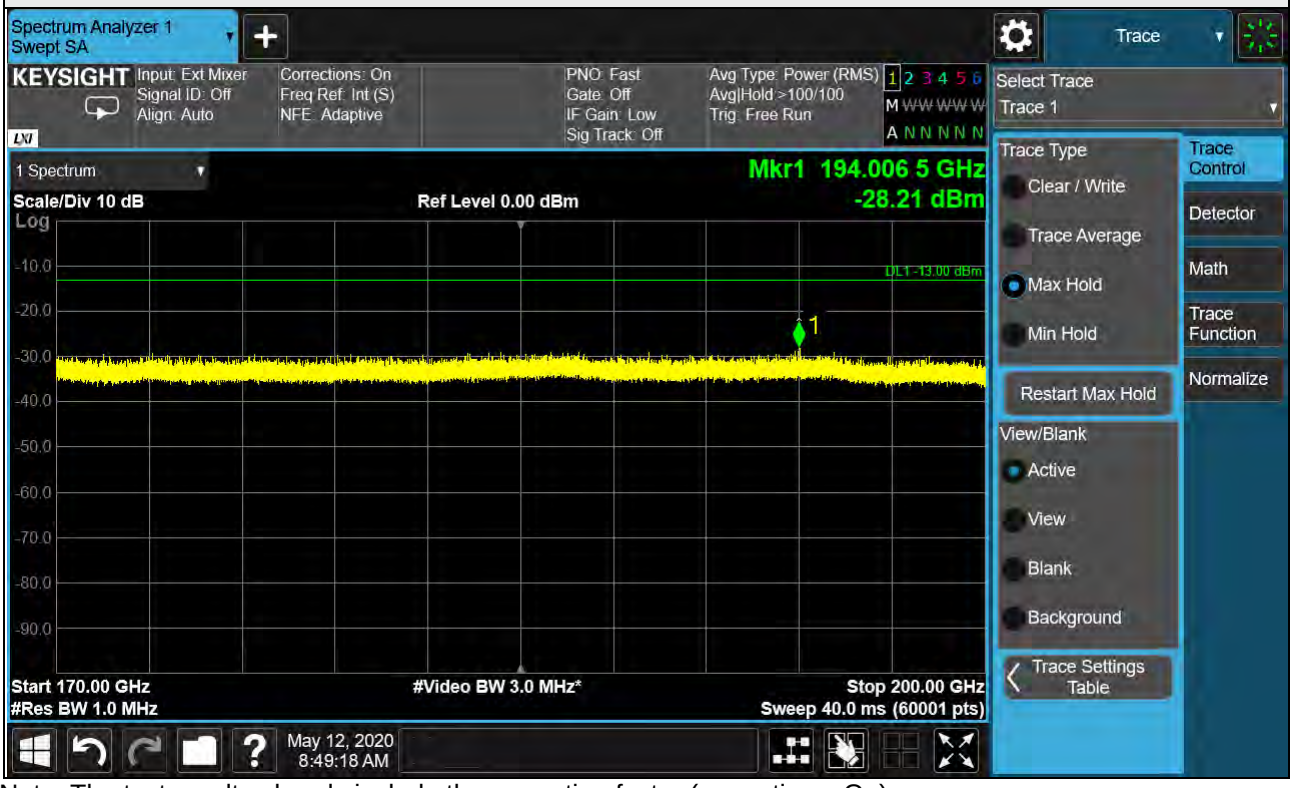
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	Mid	Antenna polarity	Vertical
Test distance at 1m			



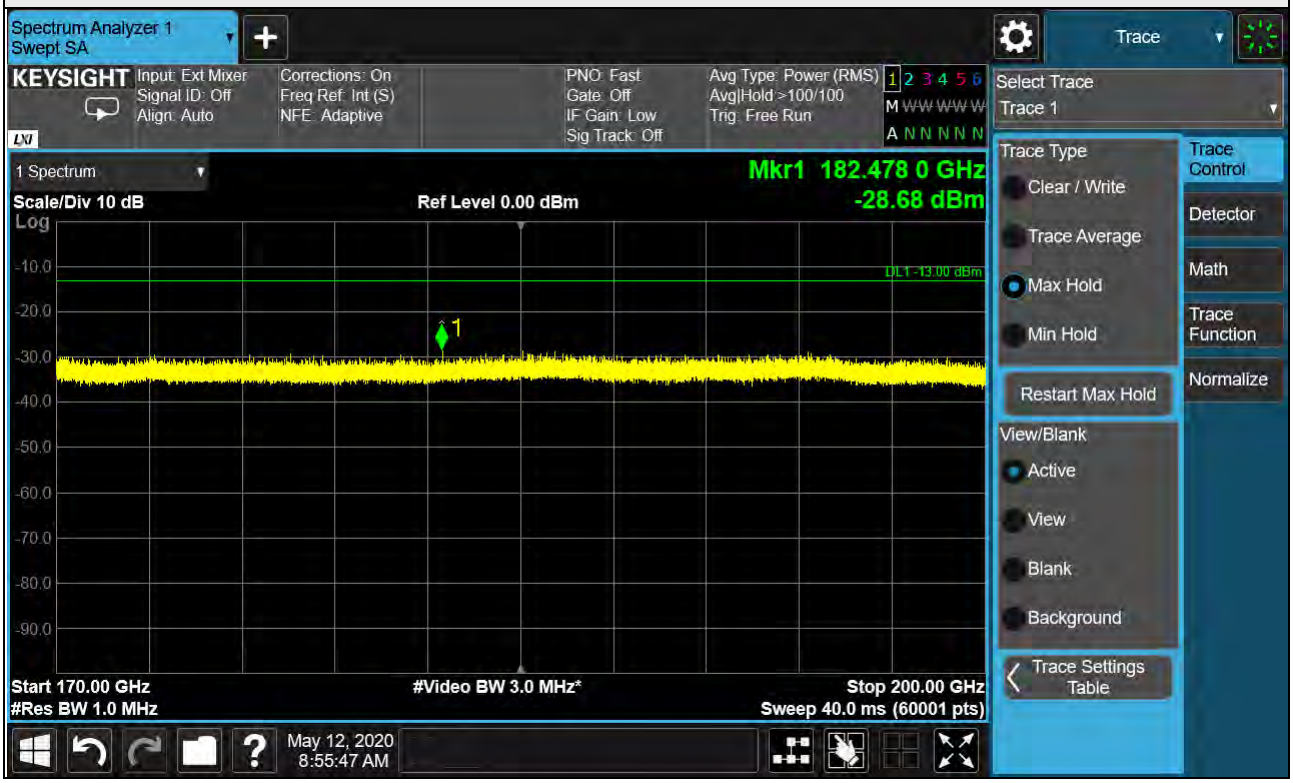
Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Horizontal
Test distance at 1m			



Note: The test results already include the correction factor (corrections: On).

Beam ID	20+148	Frequency Range	170GHz-200GHz
Channel	High	Antenna polarity	Vertical
Test distance at 1m			



Note: The test results already include the correction factor (corrections: On).

Summary of MIMO Out-of-Band Spurious Emission EIRP:

To address compliance of MIMO spurious emission per KDB 662911 D01, the MIMO spurious emission EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)						
Test Frequency Range	Channel	EIRP (H Beam)	EIRP (V Beam)	EIRP (MIMO)	Limit (dBm)	Margin (dB)
Below 1GHz	2239997	-41.90	-39.40	-37.46	-13	-24.46
	2259997	-43.50	-39.20	-37.83	-13	-24.83
	2278331	-43.80	-35.90	-35.25	-13	-22.25
IGHz to 18GHz	2239997	-30.20	-27.90	-25.89	-13	-12.89
	2259997	-29.30	-28.00	-25.59	-13	-12.59
	2278331	-29.30	-27.60	-25.36	-13	-12.36
I8GHz to 37.575GHz	2239997	-34.95	-35.59	-32.25	-13	-19.25
	2259997	-45.96	-45.58	-42.76	-13	-29.76
	2278331	-44.55	-45.39	-41.94	-13	-28.94
40.025GHz to 50GHz	2239997	-23.46	-23.26	-20.35	-13	-7.35
	2259997	-22.52	-21.77	-19.12	-13	-6.12
	2278331	-23.19	-23.48	-20.32	-13	-7.32
50GHz to 75GHz	2239997	-36.75	-37.28	-34.00	-13	-21.00
	2259997	-37.08	-37.17	-34.11	-13	-21.11
	2278331	-37.29	-37.27	-34.27	-13	-21.27
75GHz to 110GHz	2239997	-33.39	-34.64	-30.96	-13	-17.96
	2259997	-33.25	-33.60	-30.41	-13	-17.41
	2278331	-34.39	-32.58	-30.38	-13	-17.38
110GHz to 140GHz	2239997	-35.18	-36.01	-32.56	-13	-19.56
	2259997	-35.31	-35.96	-32.61	-13	-19.61
	2278331	-34.49	-35.17	-31.81	-13	-18.81
140GHz to 170GHz	2239997	-32.67	-32.83	-29.74	-13	-16.74
	2259997	-32.72	-33.02	-29.86	-13	-16.86
	2278331	-32.86	-32.53	-29.68	-13	-16.68
170GHz to 200GHz	2239997	-27.80	-28.34	-25.05	-13	-12.05
	2259997	-27.91	-28.50	-25.18	-13	-12.18
	2278331	-28.21	-28.68	-25.43	-13	-12.43

4.5 Out-of-Band Emission at the Band Edge Measurement

4.5.1 Limits of Out-of Band Emission at the Band Edge Measurement

The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

4.5.2 Test Instruments

Refer to section 4.2.3.

4.5.3 Test Procedures

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
b. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.
e. The requirements in 30.203 are expressed in terms of conductive power, and then conducted power will be calculated by EIRP-Array Gain.
f. Antenna Gain Information at the Band Edge :

   The following antenna gain information is provided to demonstrate the antenna performance of the 37~40 GHz band. These antenna gains were subtracted from the measured E.I.R.P levels at lower and upper band edge frequencies to determine an equivalent conductive power that was compared directly with the part 30.203 limits.

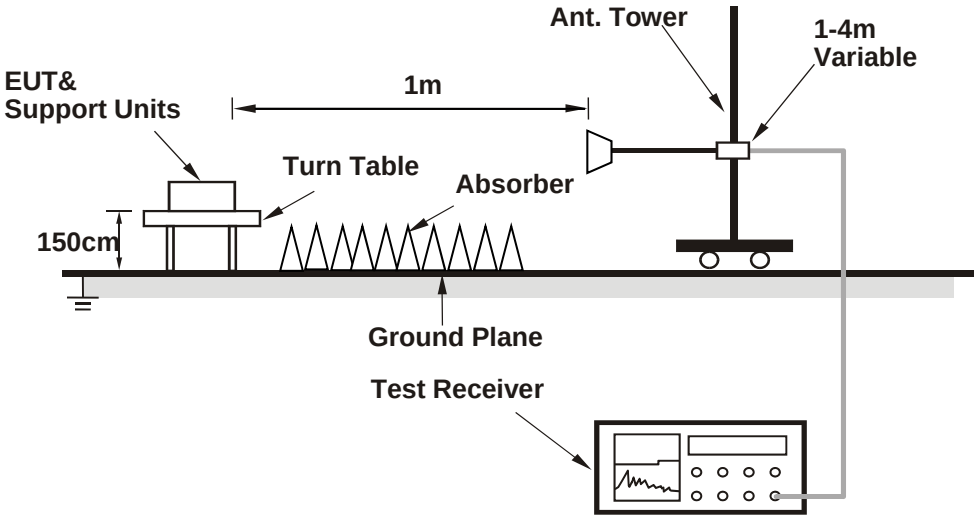
	Module 0		Module 1		Module 2	
n260	Beam 39	Beam 166	Beam 20	Beam 148	Beam 30	Beam 158
low	8.3dBi	7.4dBi	10.2dBi	9.7dBi	9.2dBi	9.9dBi
mid	9.1dBi	9.0dBi	9.3dBi	9.0dBi	10.0dBi	9.1dBi
high	8.5dBi	8.6dBi	9.0dBi	9.1dBi	8.4dBi	9.8dBi

Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.5.4 Deviation from Test Standard

No deviation.

4.5.5 Test Set Up



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

4.5.6 EUT Operating Conditions

a. Connected the Adapter to EUT.
b. Prepared notebook to act as communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.5.7 Test Result

Channel 2239997							
QPSK / 1RB 0RB							
Beam ID	Frequency (GHz)	EIRP Value (dBm)	Array Gain (dBi)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
20	37.5999	-11.47	10.2	-21.67	-5	-16.67	Pass
	37.5869	-25.11	10.2	-35.31	-13	-22.31	Pass
30	37.5999	-10.23	9.2	-19.43	-5	-14.43	Pass
	37.5855	-24.49	9.2	-33.69	-13	-20.69	Pass
39	37.5997	-7.914	8.3	-16.214	-5	-11.214	Pass
	37.5825	-23.11	8.3	-31.41	-13	-18.41	Pass
20+148(Ver)	37.59985	-11.03	9.7	-20.73	-5	-15.73	Pass
	37.58745	-25.07	9.7	-34.77	-13	-21.77	Pass
20+148(Hor)	37.59955	-12.9	9.7	-22.6	-5	-17.6	Pass
	37.58206	-31.63	9.7	-41.33	-13	-28.33	Pass

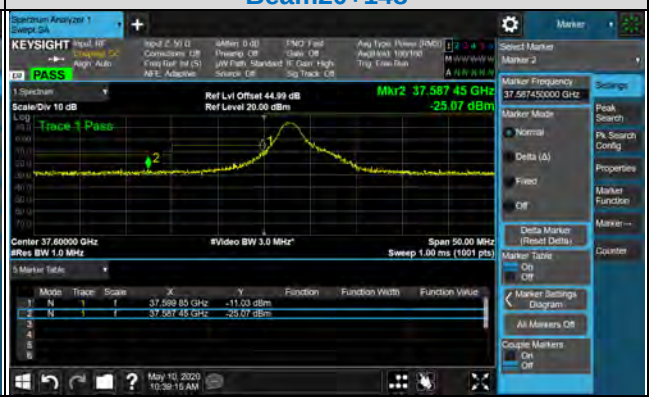
Note: The Conducted Power = EIRP-Array Gain

Beam 20

Beam 30

Beam 39

Beam20+148



Summary of MIMO Beam Out-of Band Emission at the Band Edge:
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	Conducted Power for V Beam (dBm)	Conducted Power for H Beam (dBm)	Conducted Power for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
20+148	-20.73	-22.6	-18.55	-5	-13.55	Pass
	-34.77	-41.33	-33.90	-13	-20.90	Pass

Channel 2239997							
QPSK / Full RB							
Beam ID	Frequency (GHz)	EIRP Value (dBm)	Array Gain (dBi)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
20	37.59425	-24.05	10.2	-34.25	-5	-29.25	Pass
	37.5832	-24.52	10.2	-34.72	-13	-21.72	Pass
30	37.5985	-22.25	9.2	-31.45	-5	-26.45	Pass
	37.58735	-24.06	9.2	-33.26	-13	-20.26	Pass
39	37.5965	-21.81	8.3	-30.11	-5	-25.11	Pass
	37.58785	-23.19	8.3	-31.49	-13	-18.49	Pass
20+148(Ver)	37.5961	-24.56	9.7	-34.26	-5	-29.26	Pass
	37.58665	-24.49	9.7	-34.19	-13	-21.19	Pass
20+148(Hor)	37.59379	-30.21	9.7	-39.91	-5	-34.91	Pass
	37.58502	-28.35	9.7	-38.05	-13	-25.05	Pass

Note: The Conducted Power = EIRP-Array Gain

Beam 20

Beam 30

Beam 39

Beam20+148

Summary of MIMO Beam Out-of Band Emission at the Band Edge:
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	Conducted Power for V Beam (dBm)	Conducted Power for H Beam (dBm)	Conducted Power for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
20+148	-34.26	-39.91	-33.21	-5	-28.21	Pass
	-34.19	-38.05	-32.69	-13	-19.69	Pass

Channel 2278331							
QPSK / 1RB 65RB							
Beam ID	Frequency (GHz)	EIRP Value (dBm)	Array Gain (dBi)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
20	40.0002	-12.35	10.2	-22.55	-5	-17.55	Pass
	40.0123	-22.46	10.2	-32.66	-13	-19.66	Pass
30	40.0003	-14.48	9.2	-23.68	-5	-18.68	Pass
	40.01475	-22.05	9.2	-31.25	-13	-18.25	Pass
39	40.00035	-17.24	8.3	-25.54	-5	-20.54	Pass
	40.01655	-21.6	8.3	-29.9	-13	-16.9	Pass
20+148(Ver)	40.0002	-12.59	9.7	-22.29	-5	-17.29	Pass
	40.01695	-22.64	9.7	-32.34	-13	-19.34	Pass
20+148(Hor)	40.0002	-14.48	9.7	-24.18	-5	-19.18	Pass
	40.02305	-27.83	9.7	-37.53	-13	-24.53	Pass

Note: The Conducted Power = EIRP-Array Gain

Beam 20

Beam 30

Beam 39

Beam20+148

Summary of MIMO Beam Out-of Band Emission at the Band Edge:
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	Conducted Power for V Beam (dBm)	Conducted Power for H Beam (dBm)	Conducted Power for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
20+148	-22.29	-24.18	-20.12	-5	-15.12	Pass
	-32.34	-37.53	-31.19	-13	-18.19	Pass

Channel 2278331							
QPSK / Full RB							
Beam ID	Frequency (GHz)	EIRP Value (dBm)	Array Gain (dBi)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
20	40.0008	-23.3	10.2	-33.5	-5	-28.5	Pass
	40.0136	-23.23	10.2	-33.43	-13	-20.43	Pass
30	40.00325	-21	9.2	-30.2	-5	-25.2	Pass
	40.0165	-21.26	9.2	-30.46	-13	-17.46	Pass
39	40.0087	-21.99	8.3	-30.29	-5	-25.29	Pass
	40.0126	-22.76	8.3	-31.06	-13	-18.06	Pass
20+148(Ver)	40.003	-21.28	9.7	-30.98	-5	-25.98	Pass
	40.0178	-22.65	9.7	-32.35	-13	-19.35	Pass
20+148(Hor)	40.00666	-26.79	9.7	-36.49	-5	-31.49	Pass
	40.01237	-27.85	9.7	-37.55	-13	-24.55	Pass

Note: The Conducted Power = EIRP-Array Gain

Beam 20

Beam 30

Beam 39

Beam20+148

Summary of MIMO Beam Out-of Band Emission at the Band Edge:
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	Conducted Power for V Beam (dBm)	Conducted Power for H Beam (dBm)	Conducted Power for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
20+148	-30.98	-36.49	-29.90	-5	-24.90	Pass
	-32.35	-37.55	-31.20	-13	-18.20	Pass

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.6.2 Test Procedure

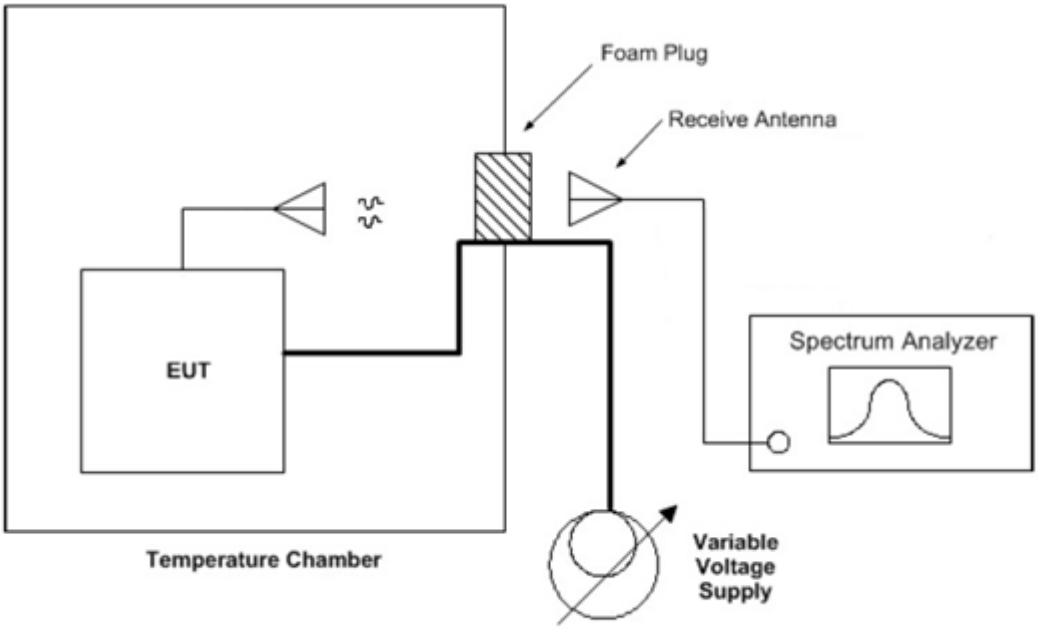
b. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

c. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

d. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded from the communication simulator.

4.6.3 Test Setup



4.6.4 Test Result

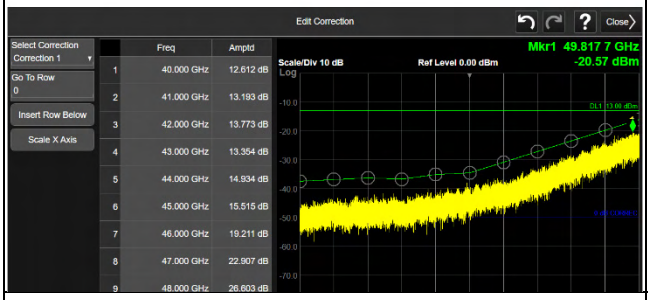
Frequency Stability Versus Temp.				
TEMP. (℃)	**Power Supply (Vdc)**	**Measured Frequency (MHz)**	**FT, ppm**	**Pass/Fail**
-30	3.85	38860.101000	0.0003	Pass
-20	3.85	38860.090140	0.0003	Pass
-10	3.85	38860.074300	0.0003	Pass
0	3.85	38860.063200	0.0003	Pass
10	3.85	38860.082300	0.0003	Pass
20	3.85	38860.080000	0.0003	Pass
30	3.85	38859.930200	0.0003	Pass
40	3.85	38859.702300	0.0003	Pass
50	3.85	38859.714860	0.0003	Pass

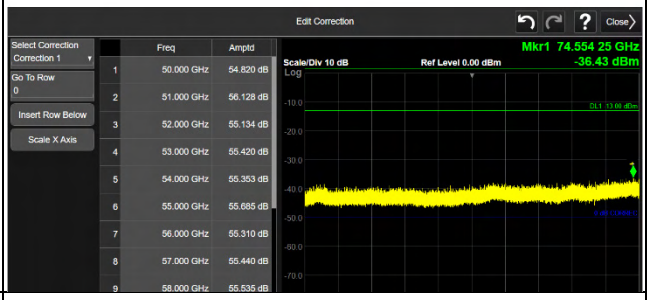
Frequency Stability Versus Voltage				
TEMP. (℃)	**Power Supply (Vdc)**	**Measured Frequency (MHz)**	**FT, ppm**	**Pass/Fail**
20	4.4	38860.340000	0.0003	Pass
	3.85	38860.080000	0.0003	Pass
	3.4	38860.083200	0.0003	Pass

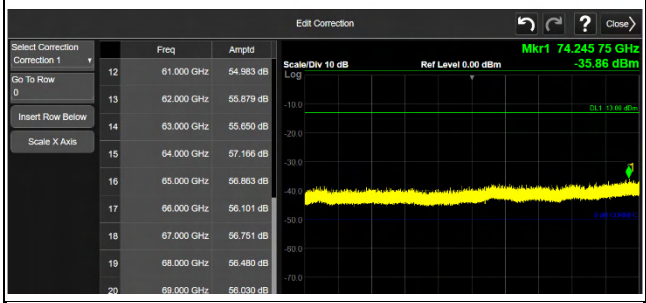
5 Pictures of Test Arrangements

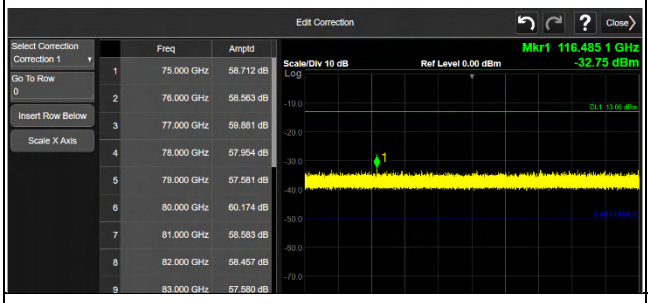
Please refer to the attached file (Test Setup Photo).

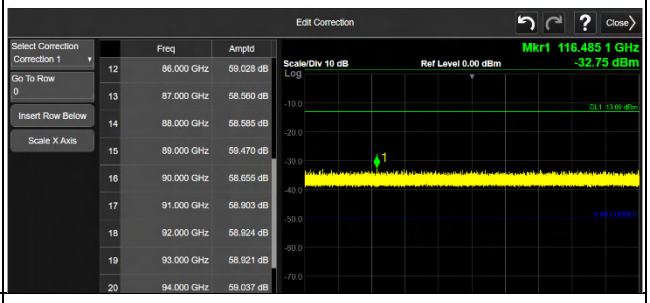
Annex A- Factor to 200GHz

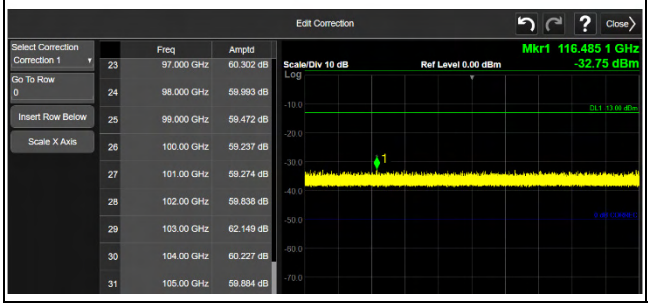


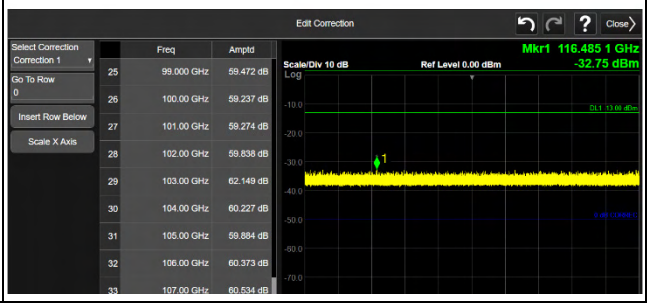


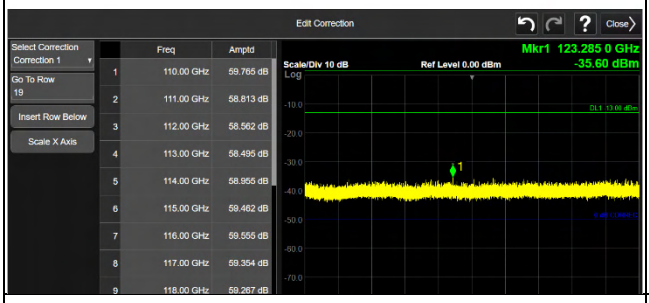








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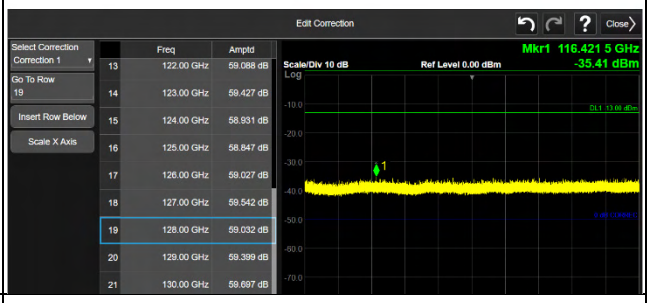
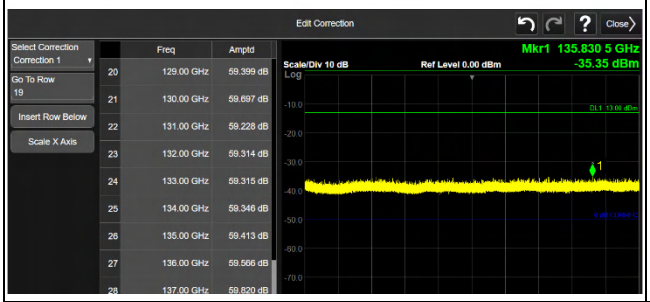
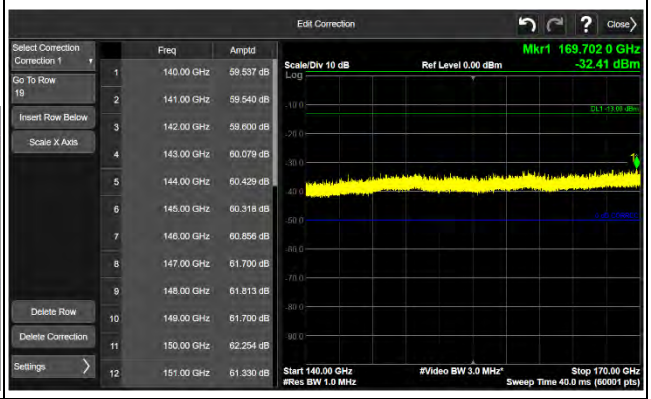
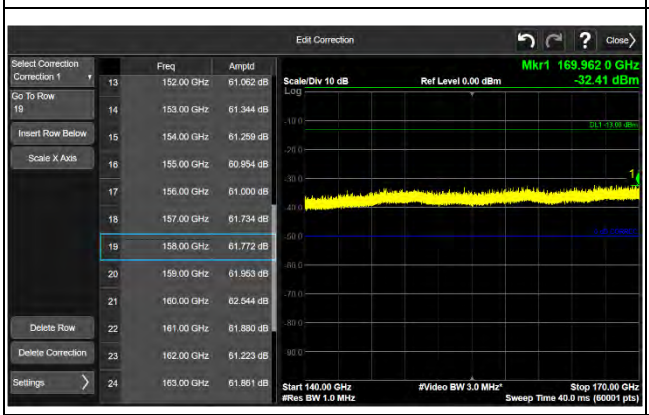
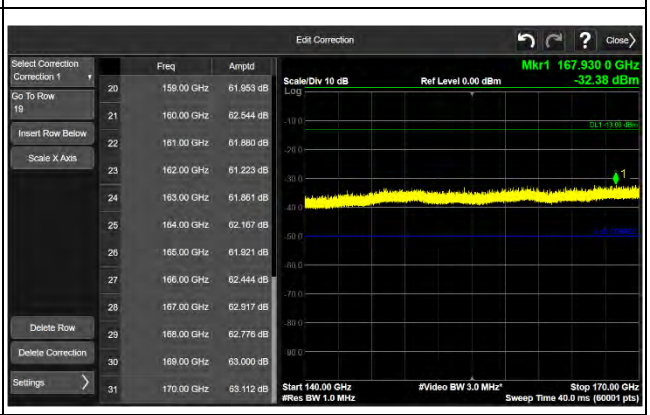
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Freq
Amptd
1 110.00 GHz 59.765 dB
2 111.00 GHz 58.813 dB
3 112.00 GHz 58.562 dB
4 113.00 GHz 58.495 dB
5 114.00 GHz 58.955 dB
6 115.00 GHz 59.462 dB
7 116.00 GHz 59.555 dB
8 117.00 GHz 59.354 dB
9 118.00 GHz 59.267 dB
Mkr1 123.285 0 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-35.60 dBm
Log

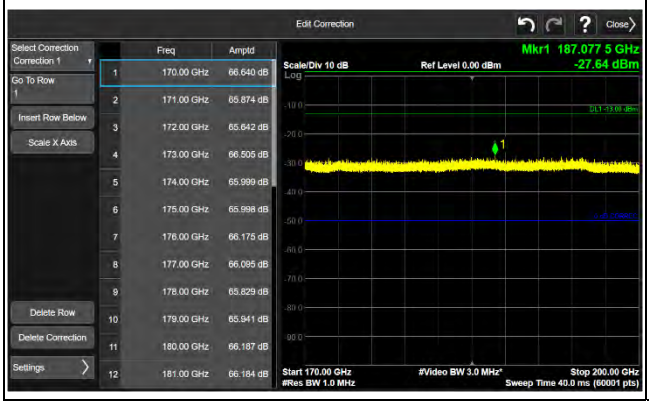

Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Freq
Amptd
13 122.00 GHz 59.088 dB
14 123.00 GHz 59.427 dB
15 124.00 GHz 58.931 dB
16 125.00 GHz 58.847 dB
17 126.00 GHz 59.027 dB
18 127.00 GHz 59.542 dB
19 128.00 GHz 59.032 dB
20 129.00 GHz 59.399 dB
21 130.00 GHz 59.697 dB
Mkr1 116.421 5 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-35.41 dBm
Log

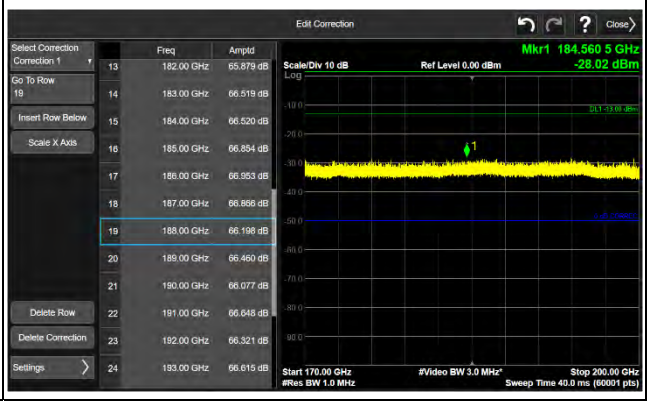

Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Freq
Amptd
20 129.00 GHz 59.399 dB
21 130.00 GHz 59.697 dB
22 131.00 GHz 59.228 dB
23 132.00 GHz 59.314 dB
24 133.00 GHz 59.315 dB
25 134.00 GHz 59.346 dB
26 135.00 GHz 59.413 dB
27 136.00 GHz 59.566 dB
28 137.00 GHz 59.820 dB
Mkr1 135.830 5 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-35.35 dBm
Log

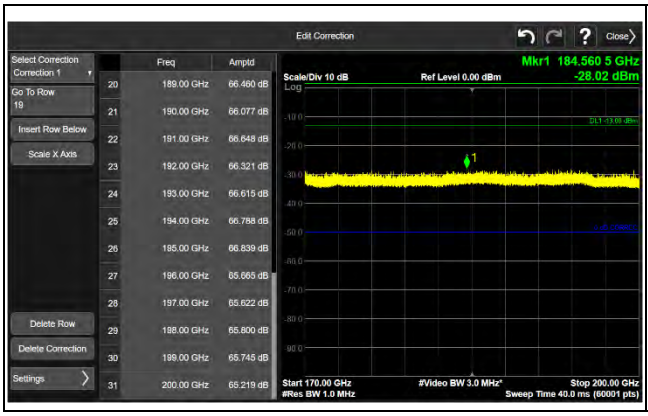

Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
1 140.00 GHz 59.537 dB
2 141.00 GHz 59.540 dB
3 142.00 GHz 59.600 dB
4 143.00 GHz 60.079 dB
5 144.00 GHz 60.429 dB
6 145.00 GHz 60.318 dB
7 146.00 GHz 60.856 dB
8 147.00 GHz 61.700 dB
9 148.00 GHz 61.813 dB
10 149.00 GHz 61.700 dB
11 150.00 GHz 62.254 dB
12 151.00 GHz 61.330 dB
Mkr1 169.702 0 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-32.41 dBm
Log
Start 140.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 170.00 GHz
Sweep Time 40.0 ms (60001 pts)


Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
13 152.00 GHz 61.062 dB
14 153.00 GHz 61.344 dB
15 154.00 GHz 61.259 dB
16 155.00 GHz 60.954 dB
17 156.00 GHz 61.000 dB
18 157.00 GHz 61.734 dB
19 158.00 GHz 61.772 dB
20 159.00 GHz 61.953 dB
21 160.00 GHz 62.544 dB
22 161.00 GHz 61.880 dB
23 162.00 GHz 61.223 dB
24 163.00 GHz 61.861 dB
Mkr1 169.962 0 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-32.41 dBm
Log
Start 140.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 170.00 GHz
Sweep Time 40.0 ms (60001 pts)


Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
20 159.00 GHz 61.953 dB
21 160.00 GHz 62.544 dB
22 161.00 GHz 61.880 dB
23 162.00 GHz 61.223 dB
24 163.00 GHz 61.861 dB
25 164.00 GHz 62.167 dB
26 165.00 GHz 61.921 dB
27 166.00 GHz 62.444 dB
28 167.00 GHz 62.917 dB
29 168.00 GHz 62.776 dB
30 169.00 GHz 63.000 dB
31 170.00 GHz 63.112 dB
Mkr1 167.930 0 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-32.38 dBm
Log
Start 140.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 170.00 GHz
Sweep Time 40.0 ms (60001 pts)


Edit Correction
Close
Select Correction
Correction 1
Go To Row
1
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
1 170.00 GHz 66.640 dB
2 171.00 GHz 65.874 dB
3 172.00 GHz 65.642 dB
4 173.00 GHz 66.505 dB
5 174.00 GHz 65.999 dB
6 175.00 GHz 65.998 dB
7 176.00 GHz 66.175 dB
8 177.00 GHz 66.095 dB
9 178.00 GHz 65.829 dB
10 179.00 GHz 65.941 dB
11 180.00 GHz 66.187 dB
12 181.00 GHz 66.184 dB
Mkr1 187.077 5 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-27.64 dBm
Log
Start 170.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 200.00 GHz
Sweep Time 40.0 ms (60001 pts)


Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
13 182.00 GHz 65.879 dB
14 183.00 GHz 66.519 dB
15 184.00 GHz 66.520 dB
16 185.00 GHz 66.884 dB
17 186.00 GHz 66.953 dB
18 187.00 GHz 66.866 dB
19 188.00 GHz 66.198 dB
20 189.00 GHz 66.460 dB
21 190.00 GHz 66.077 dB
22 191.00 GHz 66.648 dB
23 192.00 GHz 66.321 dB
24 193.00 GHz 66.615 dB
Mkr1 184.560 5 GHz
Scale/Div 10 dB
Ref Level 0.00 dBm
-28.02 dBm
Log
Start 170.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 200.00 GHz
Sweep Time 40.0 ms (60001 pts)


Edit Correction
Close
Select Correction
Correction 1
Go To Row
19
Insert Row Below
Scale X Axis
Delete Row
Delete Correction
Settings
Freq
Amptd
20 189.00 GHz 66.460 dB
21 190.00 GHz 66.077 dB
22 191.00 GHz 66.648 dB
23 192.00 GHz 66.321 dB
24 193.00 GHz 66.615 dB
25 194.00 GHz 66.788 dB
26 195.00 GHz 66.839 dB
27 196.00 GHz 65.665 dB
28 197.00 GHz 65.622 dB
29 198.00 GHz 65.800 dB
30 199.00 GHz 65.745 dB
31 200.00 GHz 65.219 dB
Mkr1 184.560 5 GHz
-28.02 dBm
Scale/Div 10 dB
Ref Level 0.00 dBm
Log
Start 170.00 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Stop 200.00 GHz
Sweep Time 40.0 ms (60001 pts)

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

FCC accreditation scope:

Web Site:
https://apps.fcc.gov/oetcf/eas/reports/ViewTestFirmAccredScopes.cfm?calledFromFrame=N&RequestTimeout=500&regnum_specified=N&test_firm_id=7635

Scope	FCC Rule Parts	Maximum Assessed Frequency in Mhz	Status	Expiration Date	Recognition Date
Intentional Radiators	FCC Part 15 Subpart C	300000.00	Approved	08-06-2020	07-06-2017
U-NII without DFS Intentional Radiators	FCC Part 15, Subpart E	300000.00	Approved	08-06-2020	07-06-2017
U-NII with DFS Intentional Radiators	FCC Part 15, Subpart E	300000.00	Approved	08-06-2020	07-06-2017
UWB Intentional Radiators	FCC Part 15, Subpart F	300000.00	Approved	08-06-2020	07-06-2017
BPL Intentional Radiators	FCC Part 15, Subpart G	300000.00	Approved	08-06-2020	07-06-2017
White Space Device Intentional Radiators	FCC Part 15, Subpart H	300000.00	Approved	08-06-2020	07-06-2017
Commercial Mobile Services	Part 22 (cellular), Part 24, Part 25 (below 3 GHz), Part 27	300000.00	Approved	08-06-2020	07-06-2017
General Mobile Radio Services	Part 22 (non-cellular), Part 90 (below 3 GHz), Part 95 (below 3 GHz), Part 97 (below 3 GHz),Part 101 (below 3 GHz)	300000.00	Approved	08-06-2020	07-06-2017
Citizens Broadband Radio Services	Part 96	300000.00	Approved	08-06-2020	07-06-2017
Maritime and Aviation Radio Services	Part 80, Part 87	300000.00	Approved	08-06-2020	07-06-2017
Microwave and Millimeter Bands Radio Services	Part 25 (above 3 GHz), Part 30, Part 74, Part 90 (above 3 GHz), Part 95 (above 3 GHz), Part 97 (above 3 GHz) Part 101	300000.00	Approved	08-06-2020	07-06-2017
RF Exposure		6000.00	Approved	08-06-2020	07-06-2017
Hearing Aid Compatibility	Part 20	6000.00	Approved	08-06-2020	07-06-2017
Signal Boosters	Part 20, Part 90.219	300000.00	Approved	08-06-2020	07-06-2017

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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