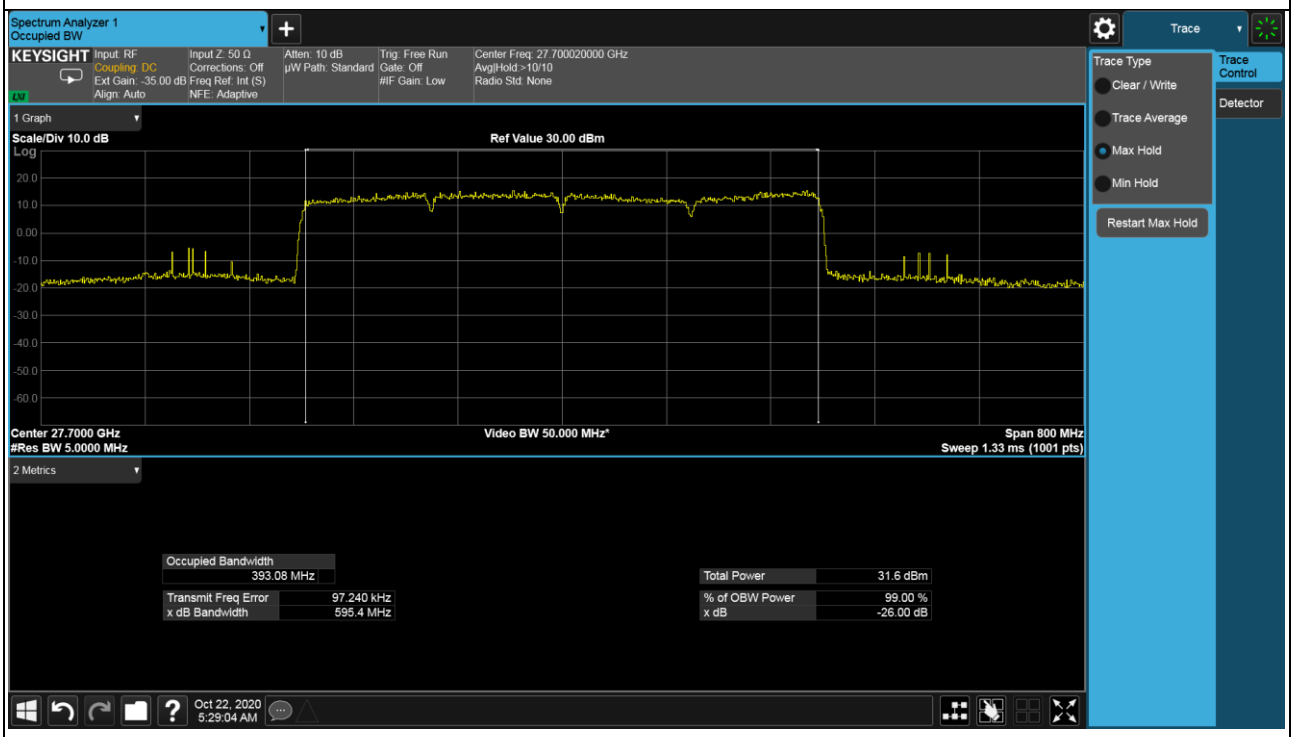
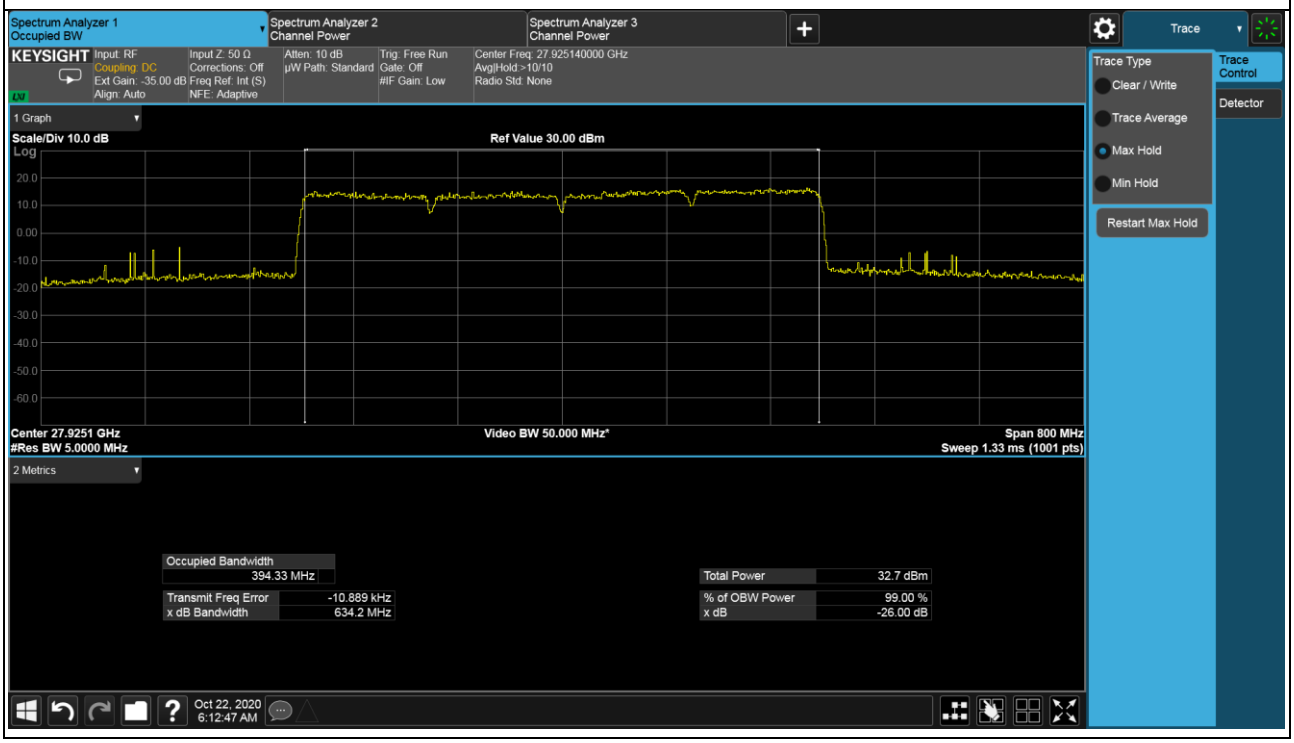
Beam ID: 11 4CC QPSK

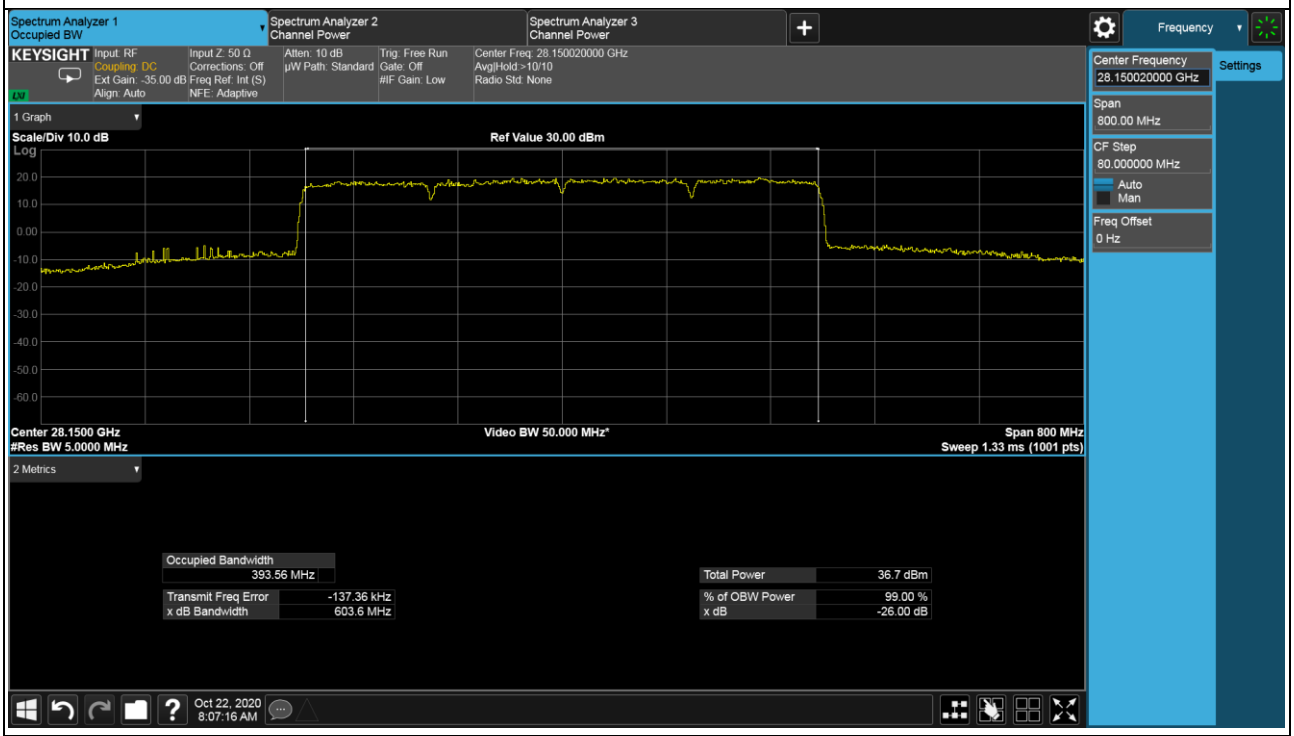
Low



Middle

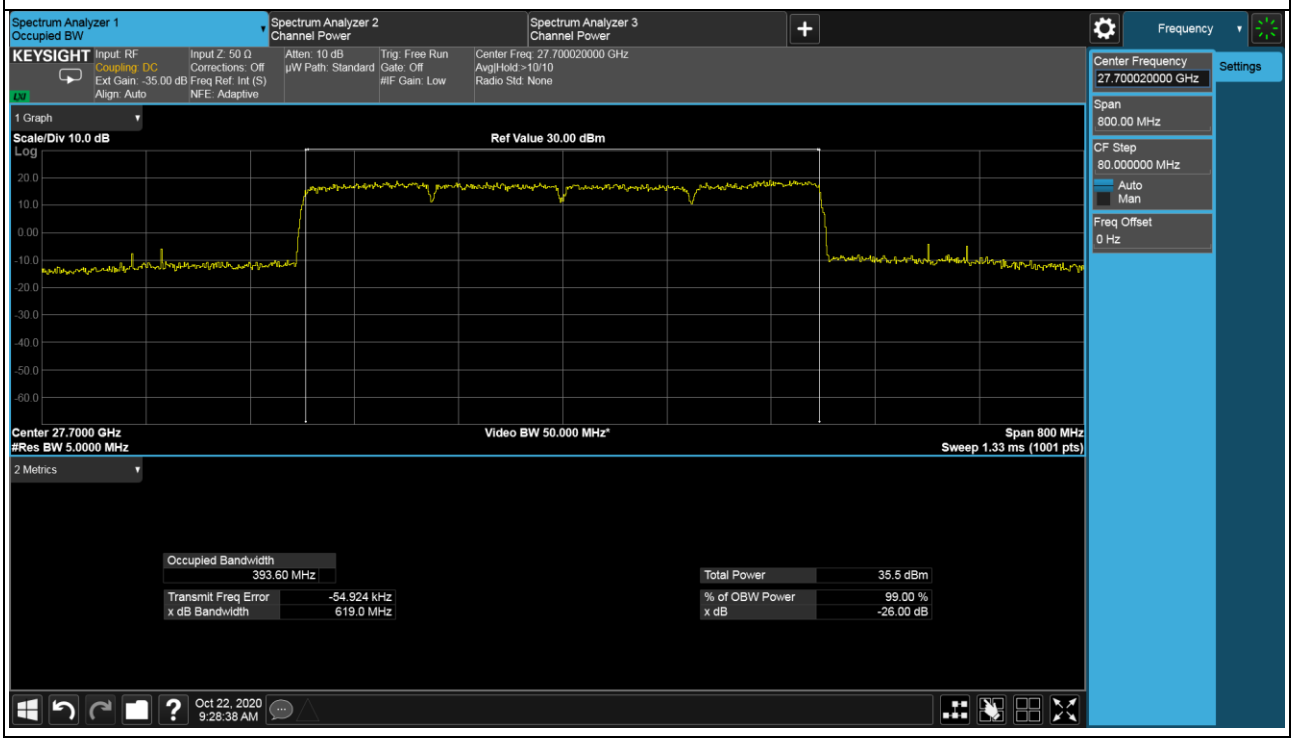


High

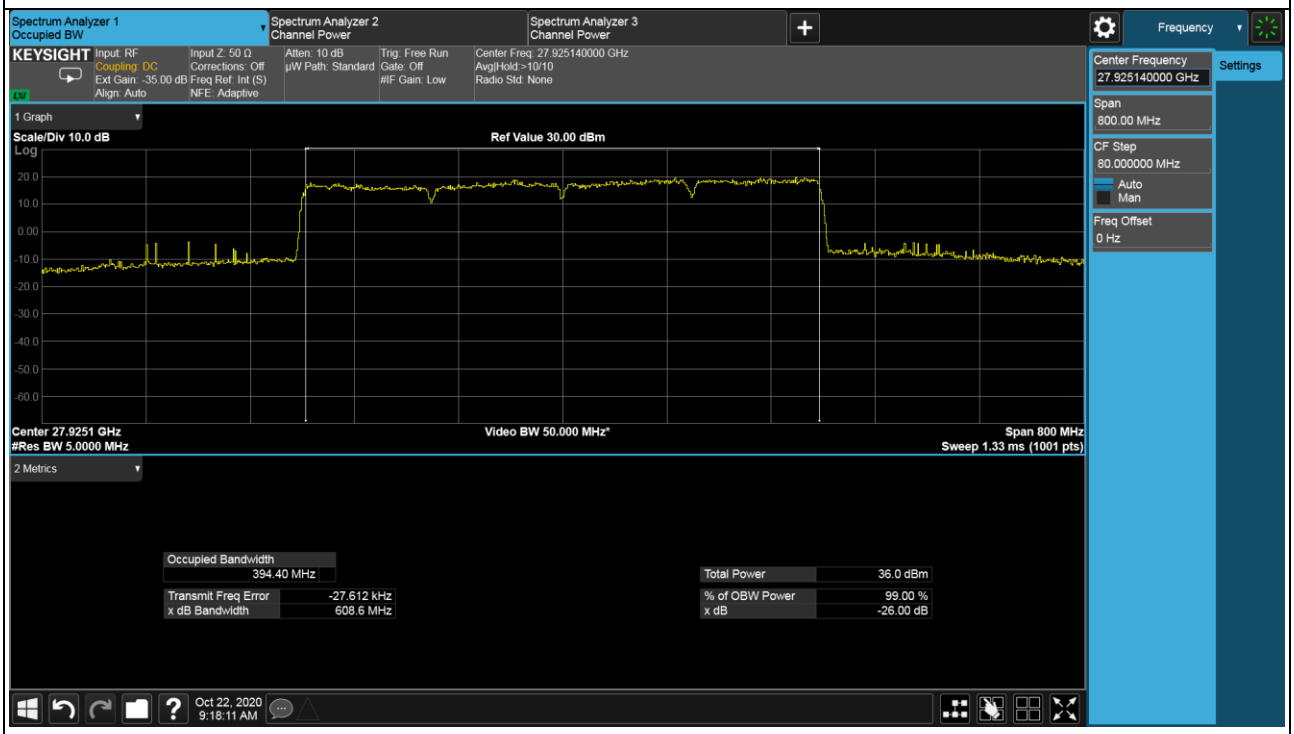


Beam ID: 11 4CC 64QAM

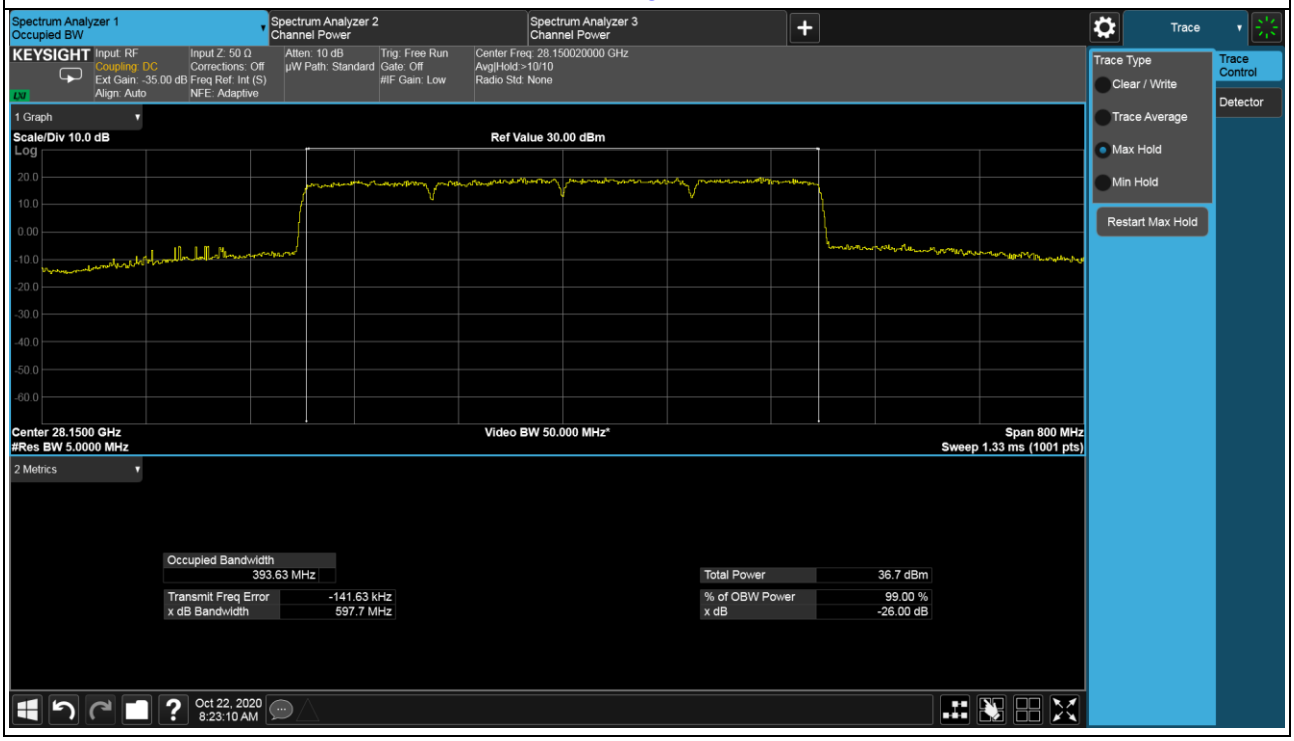
Low



Middle

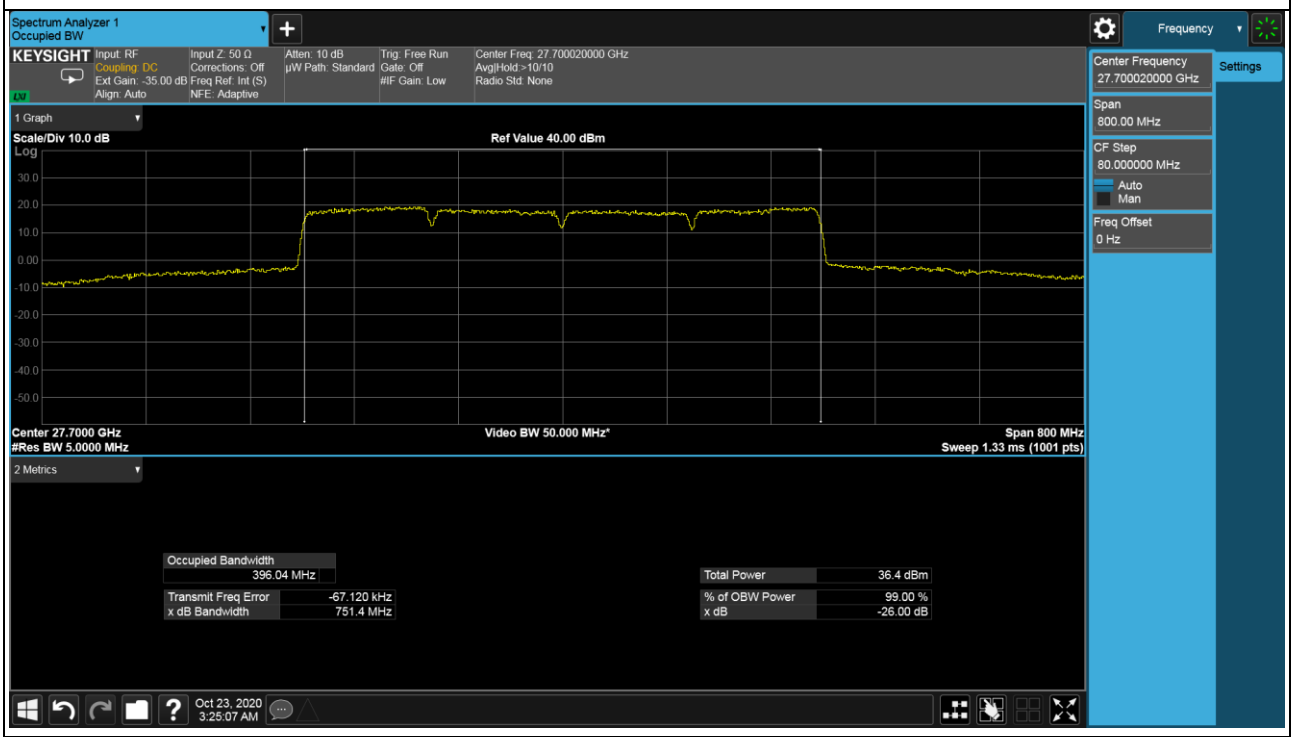

Spectrum Analyzer 1
Occupied BW
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Input: RF
Coupling: DC
Ext Gain: -35.00 dB
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
µW Path: Standard
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 27.925140000 GHz
Avg|Hold:>10/10
Radio Std: None
Frequency
Center Frequency
27.925140000 GHz
Settings
Span
800.00 MHz
CF Step
80.000000 MHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Ref Value 30.00 dBm
Log
Center 27.9251 GHz
#Res BW 5.0000 MHz
Video BW 50.000 MHz*
Span 800 MHz
Sweep 1.33 ms (1001 pts)
2 Metrics
Occupied Bandwidth
394.40 MHz
Transmit Freq Error
-27.612 kHz
x dB Bandwidth
608.6 MHz
Total Power
36.0 dBm
% of OBW Power
99.00 %
x dB
-26.00 dB
Oct 22, 2020
9:18:11 AM

High

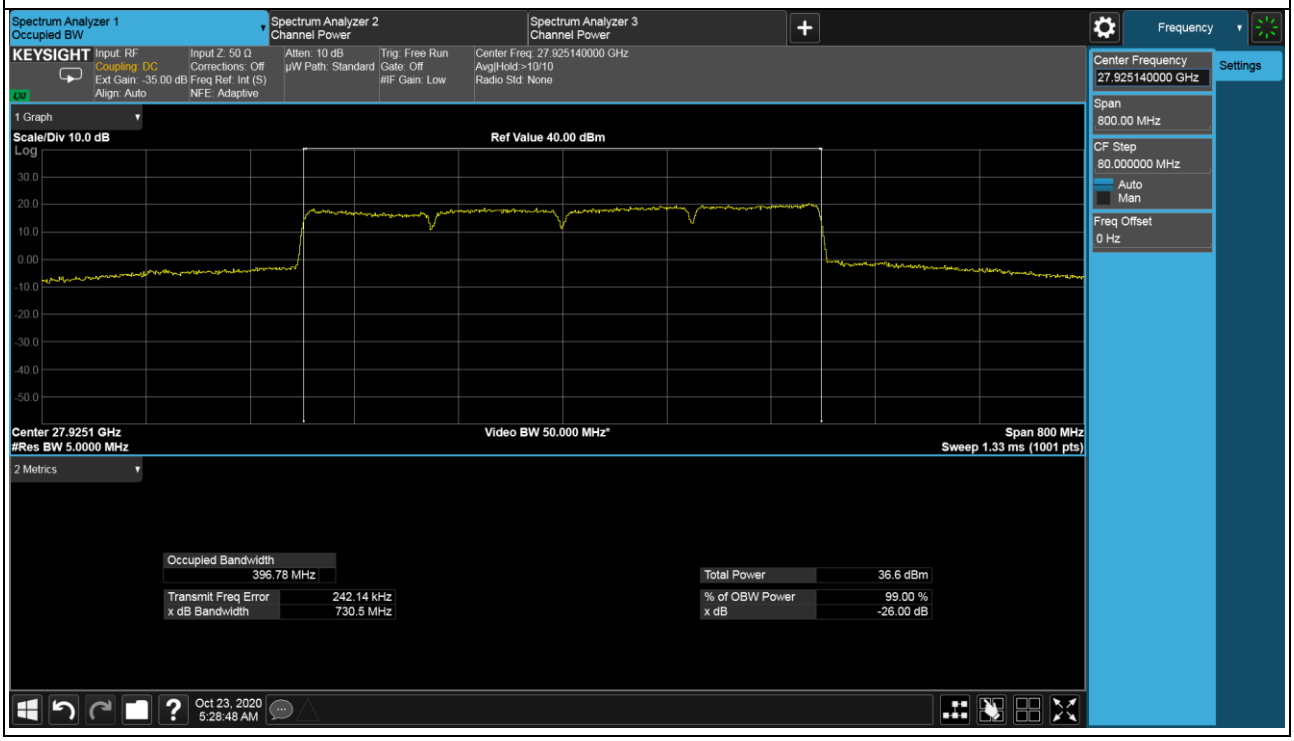

Spectrum Analyzer 1
Occupied BW
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Input: RF
Coupling: DC
Ext Gain: -35.00 dB
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
µW Path: Standard
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 28.150020000 GHz
Avg|Hold:>10/10
Radio Std: None
Trace
Trace Type
Clear / Write
Trace Average
Max Hold
Min Hold
Restart Max Hold
Trace Control
Detector
1 Graph
Scale/Div 10.0 dB
Ref Value 30.00 dBm
Log
Center 28.1500 GHz
#Res BW 5.0000 MHz
Video BW 50.000 MHz*
Span 800 MHz
Sweep 1.33 ms (1001 pts)
2 Metrics
Occupied Bandwidth
393.63 MHz
Transmit Freq Error
-141.63 kHz
x dB Bandwidth
597.7 MHz
Total Power
36.7 dBm
% of OBW Power
99.00 %
x dB
-26.00 dB
Oct 22, 2020
8:23:10 AM

Beam ID: 139 4CC QPSK

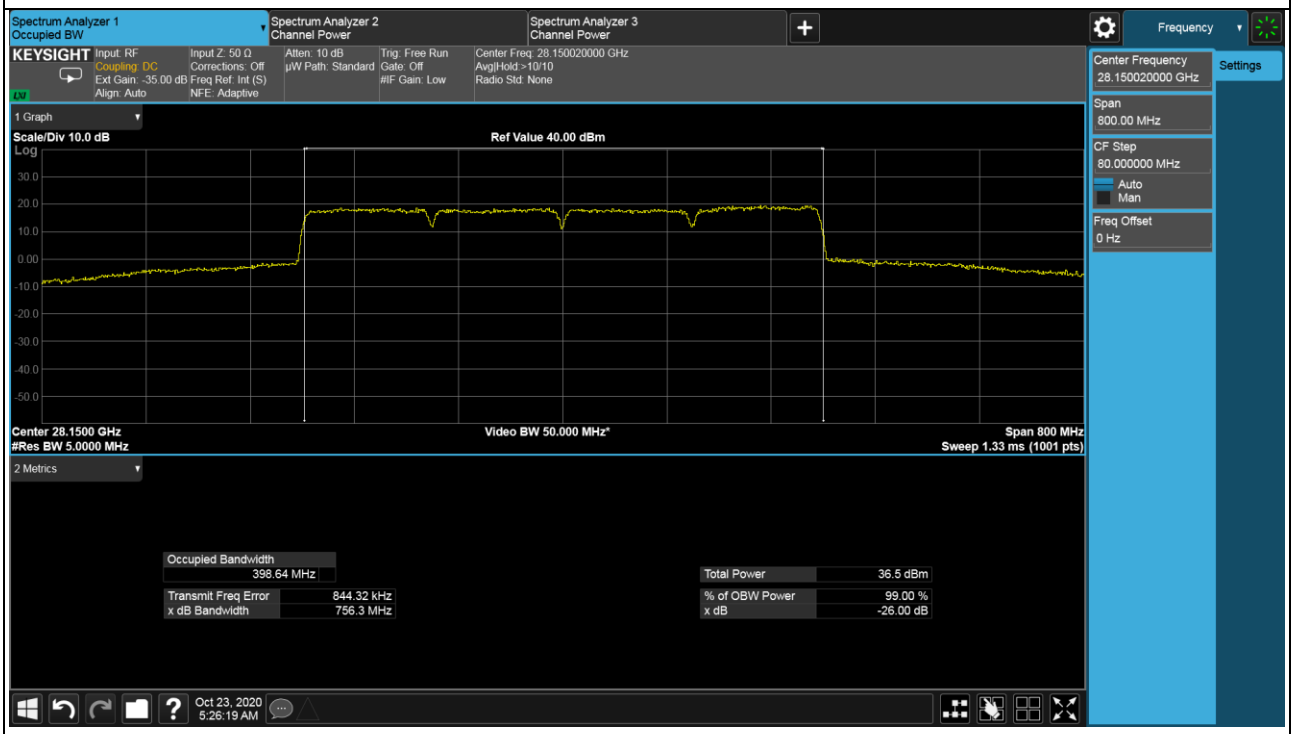
Low



Middle



High



Beam ID: 139 4CC 64QAM

Low

Middle

Spectrum Analyzer 1
Occupied BW
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Input: RF
Coupling: DC
Ext Gain: -35.00 dB
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
µW Path: Standard
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 27.925140000 GHz
Avg|Hold:>10/10
Radio Std: None
Frequency
Center Frequency
27.925140000 GHz
Settings
Span
800.00 MHz
CF Step
80.000000 MHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Ref Value 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 27.9251 GHz
#Res BW 5.0000 MHz
Video BW 50.000 MHz*
Span 800 MHz
Sweep 1.33 ms (1001 pts)
2 Metrics
Occupied Bandwidth
396.10 MHz
Transmit Freq Error
-401.37 kHz
x dB Bandwidth
761.6 MHz
Total Power
36.7 dBm
% of OBW Power
99.00 %
x dB
-26.00 dB
Oct 23, 2020
6:01:18 AM

High

Spectrum Analyzer 1
Occupied BW
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Input: RF
Coupling: DC
Ext Gain: -35.00 dB
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
µW Path: Standard
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 28.150020000 GHz
Avg|Hold:>10/10
Radio Std: None
Frequency
Center Frequency
28.150020000 GHz
Settings
Span
800.00 MHz
CF Step
80.000000 MHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Ref Value 40.00 dBm
Log
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
Center 28.1500 GHz
#Res BW 5.0000 MHz
Video BW 50.000 MHz*
Span 800 MHz
Sweep 1.33 ms (1001 pts)
2 Metrics
Occupied Bandwidth
398.33 MHz
Transmit Freq Error
434.39 kHz
x dB Bandwidth
752.8 MHz
Total Power
36.3 dBm
% of OBW Power
99.00 %
x dB
-26.00 dB
Oct 23, 2020
6:22:53 AM

4.4 Radiated Spurious Emission Measurement

4.4.1 Limits of Radiated Spurious Emission 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.

4.4.2 Test Setup

Refer to section 4.2.2

4.4.3 Test Instruments

Refer to section 4.2.3 to get information of above instrument.

4.4.4 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.

Note:
1. The resolution bandwidth of spectrum analyzer is 100 kHz and the video bandwidth is 300 kHz for below 1GHz.
2. The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for above 1GHz.
3. When test frequency below 1GHz the test-receiver detector function was use peak mode during the testing.
4. When test frequency above 1GHz the detector function was use RMS (average) mode during the testing.
5. Measurements were taken in the far field of the mm-Wave test signal based on the formula:
R ≥ (2D^2) / wavelength.

Measurement Distance

EUT antenna of far field distance		
Measureent Frequency range	Far Field calculation distance	Measurement Distance (Far field)
Below 18GHz	0.4135m	3m
18GHz to 40GHz	0.9189m 2m	2m
40GHz to 50GHz	0.9189m to 1.1486m	2m
50GHz to 100GHz	1.1486m to 2.2971m	3m
Note: EUT Antenna Dimension 42mm length, 41mm thick.		
Measurement antenna of far field distance		
Measureent Frequency range	Far Field calculation distance	Measurement Distance (Far field)
18GHz-40GHz	0.65m to 1.445	2m
40GHz-50GHz	0.240m to 0.3m	2m
50GHz-75GHz	0.208m to 0.313m	3m
75GHz-110GHz	0.162m to 0.238m	3m
18GHz-40GHz: Antenna Dimension 59mm length, 44mm thick.		
40GHz-50GHz: Antenna diameter 30mm length.		
50GHz-75GHz: Antenna diameter 25mm length.		
75GHz-100GHz: Antenna diameter 18mm length.		

NOTE:

Test Instruments for above 18 GHz emission test

1. 18 GHz - 40 GHz: HORN Antenna (SAS-574) + Pre-Ammlifier (RAMP00M50GA)
2. 40 GHz - 50 GHz: HORN Antenna (QWH-UCRR00) + Ammlifier (RAMP00M50GA)
3. 50 GHz - 75 GHz: HORN Antenna (WR15CH-Conical) + VDI Standard Downconverter
4. 75 GHz - 100 GHz: HORN Antenna (WR10CH-Conical) + VDI Standard Downconverter

The emission test results as above listed are performed by different frequency bands respectively because the test instruments, that will make the emission trace non-continuously for these bands.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

Below 1GHz Data:

Band	n261	Beam ID	11
Frequency Range	Below 1000MHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.39	-32.51	269	152	V	33.39	-27.48	0.9	0.23	-26.81	-13	-13.81
67.63	-38.42	147	200	H	67.63	-32.45	0.6	0.25	-32.1	-13	-19.1
45.2	-40.9	118	105	V	45.2	-35.24	0.9	0.25	-34.59	-13	-21.59
45.12	-42.58	288	180	H	45.12	-38.59	0.9	0.25	-37.94	-13	-24.94
67.41	-39.41	128	129	V	67.41	-34.2	0.6	0.25	-33.85	-13	-20.85
34.22	-45.68	233	156	H	34.22	-40.15	0.9	0.25	-39.5	-13	-26.5

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11
Frequency Range	Below 1000MHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.59	-31.61	148	110	V	33.59	-26.38	0.9	0.23	-25.71	-13	-12.71
33.92	-41.09	119	201	H	33.92	-35.26	0.9	0.23	-34.59	-13	-21.59
45.67	-35.24	146	122	V	45.67	-29.48	0.9	0.25	-28.83	-13	-15.83
65.28	-42.88	287	189	H	65.28	-37.47	0.6	0.25	-37.12	-13	-24.12
66.23	-38.28	166	161	V	66.23	-32.82	0.6	0.25	-32.47	-13	-19.47
45.98	-45.18	251	202	H	45.98	-39.71	0.9	0.25	-39.06	-13	-26.06

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11
Frequency Range	Below 1000MHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.45	-34.52	102	145	V	33.45	-29.41	0.9	0.23	-28.74	-13	-15.74
34.02	-36.02	222	192	H	34.02	-30.24	0.9	0.23	-29.57	-13	-16.57
45.91	-39.47	194	182	V	45.91	-33.56	0.9	0.25	-32.91	-13	-19.91
65.22	-41.31	292	200	H	65.22	-35.21	0.6	0.25	-34.86	-13	-21.86
45.89	-41.92	272	163	V	45.89	-35.17	0.9	0.25	-34.52	-13	-21.52
67.25	-43.42	253	211	H	67.25	-38.74	0.6	0.25	-38.39	-13	-25.39

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	Below 1000MHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.27	-31.42	99	104	V	33.27	-26.45	0.9	0.23	-25.78	-13	-12.78
45.34	-39.47	132	212	H	45.34	-34.24	0.9	0.25	-33.59	-13	-20.59
67.52	-39.02	298	145	V	67.52	-32.15	0.6	0.25	-31.8	-13	-18.8
32.6	-36.25	184	280	H	32.6	-30.52	0.8	0.23	-29.95	-13	-16.95
85.24	-42.12	334	196	V	85.24	-36.35	2.1	0.23	-34.48	-13	-21.48
67.5	-43.48	318	215	H	67.5	-38.91	0.6	0.23	-38.54	-13	-25.54

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	Below 1000MHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
34.24	-30.57	209	184	V	34.24	-25.78	0.9	0.23	-25.11	-13	-12.11
33.64	-37.72	301	289	H	33.64	-32.52	0.9	0.23	-31.85	-13	-18.85
65.61	-36.28	174	190	V	65.61	-31.52	0.6	0.25	-31.17	-13	-18.17
45.67	-41.57	3	292	H	45.67	-36.36	0.9	0.25	-35.71	-13	-22.71
46.21	-38.91	193	180	V	46.21	-33.54	0.9	0.25	-32.89	-13	-19.89
66.89	-42.48	338	206	H	66.89	-38.28	0.6	0.25	-37.93	-13	-24.93

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	Below 1000MHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.52	-33.52	33	147	V	33.52	-28.57	0.9	0.23	-27.9	-13	-14.9
34.25	-37.25	98	294	H	34.25	-31.52	0.9	0.23	-30.85	-13	-17.85
67.21	-40.18	284	156	V	67.21	-34.52	0.6	0.25	-34.17	-13	-21.17
45.61	-41.52	202	199	H	45.61	-35.19	0.9	0.25	-34.54	-13	-21.54
45.65	-41.28	338	206	V	45.65	-35.8	0.9	0.25	-35.15	-13	-22.15
67.25	-44.21	226	156	H	67.25	-39.28	0.6	0.25	-38.93	-13	-25.93

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11+139
Frequency Range	Below 1000MHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.27	-32.51	90	142	V	33.27	-25.52	0.9	0.23	-24.85	-13	-11.85
33.23	-38.42	102	209	H	33.23	-29.42	0.9	0.23	-28.75	-13	-15.75
45.58	-40.9	331	187	V	45.58	-32.42	0.9	0.25	-31.77	-13	-18.77
67.68	-42.58	284	199	H	67.68	-36.23	0.6	0.25	-35.88	-13	-22.88
66.91	-40.91	104	209	V	66.91	-34.18	0.6	0.25	-33.83	-13	-20.83
45.22	-44.29	351	201	H	45.22	-39.81	0.9	0.25	-39.16	-13	-26.16

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11+139
Frequency Range	Below 1000MHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.45	-31.61	294	104	V	33.45	-27.5	0.9	0.23	-26.83	-13	-13.83
32.58	-41.09	132	231	H	32.58	-28.42	0.8	0.23	-27.85	-13	-14.85
67.27	-35.24	155	189	V	67.27	-31.72	0.6	0.25	-31.37	-13	-18.37
84.58	-42.88	0	194	H	84.58	-35.25	2.1	0.25	-33.4	-13	-20.4
45.51	-39.41	295	196	V	45.51	-33.51	0.9	0.25	-32.86	-13	-19.86
46.29	-41.29	206	152	H	46.29	-36.27	0.9	0.25	-35.62	-13	-22.62

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11+139
Frequency Range	Below 1000MHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
33.45	-34.52	24	156	V	33.45	-26.25	0.9	0.23	-25.58	-13	-12.58
33.5	-36.02	175	281	H	33.5	-28.56	0.9	0.23	-27.89	-13	-14.89
45.62	-39.47	39	184	V	45.62	-32.51	0.9	0.25	-31.86	-13	-18.86
67.22	-41.31	244	198	H	67.22	-35.83	0.6	0.25	-35.48	-13	-22.48
67.28	-39.82	176	218	V	67.28	-34.18	0.6	0.25	-33.83	-13	-20.83
44.53	-42.57	89	188	H	44.53	-37.47	0.9	0.25	-36.82	-13	-23.82

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-26.48	-28.65	-24.42	-13	-11.42	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Above 1GHz Data:
1GHz-18GHz:

Band	n261	Beam ID	11
Frequency Range	1GHz ~18 GHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
5557.65	-63.09	186	122	V	5557.65	-53.19	10.73	2.72	-45.18	-13	-32.18
5557.65	-66.79	324	198	H	5557.65	-57.09	10.73	2.72	-49.08	-13	-36.08
6332	-64.12	182	194	V	6332	-55.23	10.53	2.64	-47.34	-13	-34.34
6332	-63.3	304	201	H	6332	-54.12	10.53	2.64	-46.23	-13	-33.23
13014	-57.28	268	186	V	13014	-52.89	14.17	3.92	-42.64	-13	-29.64
13014	-55.17	54	161	H	13014	-50.78	14.17	3.92	-40.53	-13	-27.53

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11
Frequency Range	1GHz ~18 GHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
5638	-55.43	143	120	V	5638	-46.13	10.6	2.72	-38.25	-13	-25.25
5638	-57.23	44	210	H	5638	-47.83	10.6	2.72	-39.95	-13	-26.95
6954	-54.52	249	163	V	6954	-48.51	10.55	2.85	-40.81	-13	-27.81
6954	-59.57	174	220	H	6954	-52.32	10.55	2.85	-44.62	-13	-31.62
13124	-63.51	256	181	V	13124	-59.15	14.35	3.95	-48.75	-13	-35.75
13124	-58.27	358	193	H	13124	-53.91	14.35	3.95	-43.51	-13	-30.51

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11
Frequency Range	1GHz ~18 GHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
5722.65	-54.57	22	113	V	5722.65	-45.37	10.91	2.83	-37.29	-13	-24.29
5722.65	-59.89	312	200	H	5722.65	-50.79	10.91	2.83	-42.71	-13	-29.71
6564	-54.7	184	152	V	6564	-48.28	10.62	2.72	-40.38	-13	-27.38
6564	-58.24	12	205	H	6564	-51.24	10.62	2.72	-43.34	-13	-30.34
13263	-58.94	155	152	V	13263	-54.62	14.5	3.99	-44.11	-13	-31.11
13263	-54.3	290	201	H	13263	-49.98	14.5	3.99	-39.47	-13	-26.47

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	1GHz ~18 GHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
2476.95	-60.68	135	108	V	2476.95	-51.18	9.14	1.56	-43.6	-13	-30.6
2476.95	-65.59	299	202	H	2476.95	-55.99	9.14	1.56	-48.41	-13	-35.41
3624.5	-61.2	133	178	V	3624.5	-53.12	10.18	1.82	-44.76	-13	-31.76
3624.5	-64.12	299	200	H	3624.5	-58.77	10.18	1.82	-50.41	-13	-37.41
13214	-58.27	187	174	V	13214	-53.93	14.48	3.97	-43.42	-13	-30.42
13214	-66.21	28	151	H	13214	-61.87	14.48	3.97	-51.36	-13	-38.36

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	1GHz ~18 GHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1658.58	-59.28	208	173	V	1658.58	-53.24	9.42	1.27	-45.09	-13	-32.09
1658.58	-62.72	144	183	H	1658.58	-56.57	9.42	1.27	-48.42	-13	-35.42
6254	-63.22	12	211	V	6254	-58.21	10.41	3.03	-50.83	-13	-37.83
6254	-61.87	127	187	H	6254	-56.86	10.41	3.03	-49.48	-13	-36.48
13012	-57.06	233	186	V	13012	-52.67	14.17	3.92	-42.42	-13	-29.42
13012	-63.38	237	154	H	13012	-58.99	14.17	3.92	-48.74	-13	-35.74

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	139
Frequency Range	1GHz ~18 GHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
6193	-64.15	128	129	V	6193	-59.21	10.31	3.02	-51.92	-13	-38.92
6193	-65.2	23	156	H	6193	-60.06	10.31	3.02	-52.77	-13	-39.77
6563	-67.64	29	156	V	6563	-62.92	10.62	2.72	-55.02	-13	-42.02
6563	-66.89	199	183	H	6563	-61.89	10.62	2.72	-53.99	-13	-40.99
13265	-59.66	167	178	V	13265	-55.34	14.5	3.99	-44.83	-13	-31.83
13265	-54.4	183	156	H	13265	-50.08	14.5	3.99	-39.57	-13	-26.57

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Band	n261	Beam ID	11 + 139
Frequency Range	1GHz ~18 GHz	Channel	Low
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
6193	-58.11	128	129	V	6193	-52.51	10.31	2.6	-44.8	-13	-31.8
6193	-53.25	233	156	H	6193	-48.25	10.31	2.6	-40.54	-13	-27.54
10422	-60.28	193	176	V	10422	-55.22	11.98	3.23	-46.47	-13	-33.47
10422	-54.71	154	211	H	10422	-49.65	11.98	3.23	-40.9	-13	-27.9
13817	-60.5	306	186	V	13817	-56.32	14.23	4.13	-46.22	-13	-33.22
13817	-65.04	173	171	H	13817	-60.86	14.23	4.13	-50.76	-13	-37.76

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-46.22	-40.9	-39.78	-13	-26.78	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Band	n261	Beam ID	11 + 139
Frequency Range	1GHz ~18 GHz	Channel	Middle
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
6254	-56.28	12	211	V	6254	-51.38	10.41	2.62	-43.59	-13	-30.59
6254	-58.42	127	187	H	6254	-52.52	10.41	2.62	-44.73	-13	-31.73
11339	-61.84	301	167	V	11339	-57.02	13.08	3.48	-47.42	-13	-34.42
11339	-61.46	342	170	H	11339	-56.64	13.08	3.48	-47.04	-13	-34.04
13449	-57.54	206	152	V	13449	-53.26	14.49	4.03	-42.8	-13	-29.8
13449	-57.77	207	170	H	13449	-53.49	14.49	4.03	-43.03	-13	-30.03

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-42.8	-43.03	-39.90	-13	-26.90	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Band	n261	Beam ID	11 + 139
Frequency Range	1GHz ~18 GHz	Channel	High
Polarity	Horizontal + Vertical		

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBm)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
5733	-54.23	208	173	V	5733	-48.17	10.91	2.83	-40.09	-13	-27.09
5733	-59.48	144	183	H	5733	-52.22	10.91	2.83	-44.14	-13	-31.14
11004	-54.4	49	193	V	11004	-49.48	12.52	3.38	-40.34	-13	-27.34
11004	-61.09	352	152	H	11004	-56.17	12.52	3.38	-47.03	-13	-34.03
13931	-61.27	272	163	V	13931	-57.12	13.7	4.16	-47.58	-13	-34.58
13931	-59.81	253	211	H	13931	-55.66	13.7	4.16	-46.12	-13	-33.12

REMARKS:

1. Absolute level (dBm) = Level (dBm) + Ant Gain (dBi) – Cable Loss (dB)
2. Margin value = Absolute level – Limit value.

Summary of MIMO Beam Out-of Band Emission:

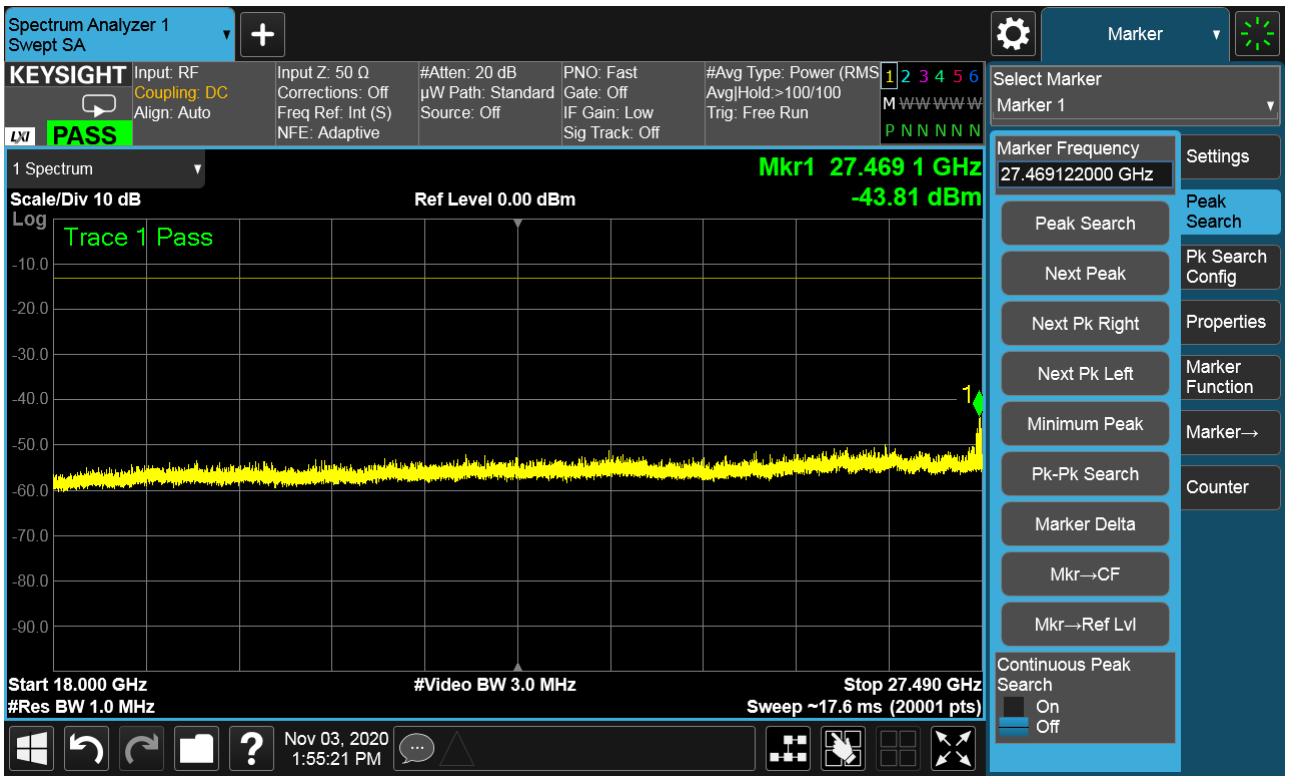
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst-case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-40.34	-46.12	-39.32	-13	-26.32	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

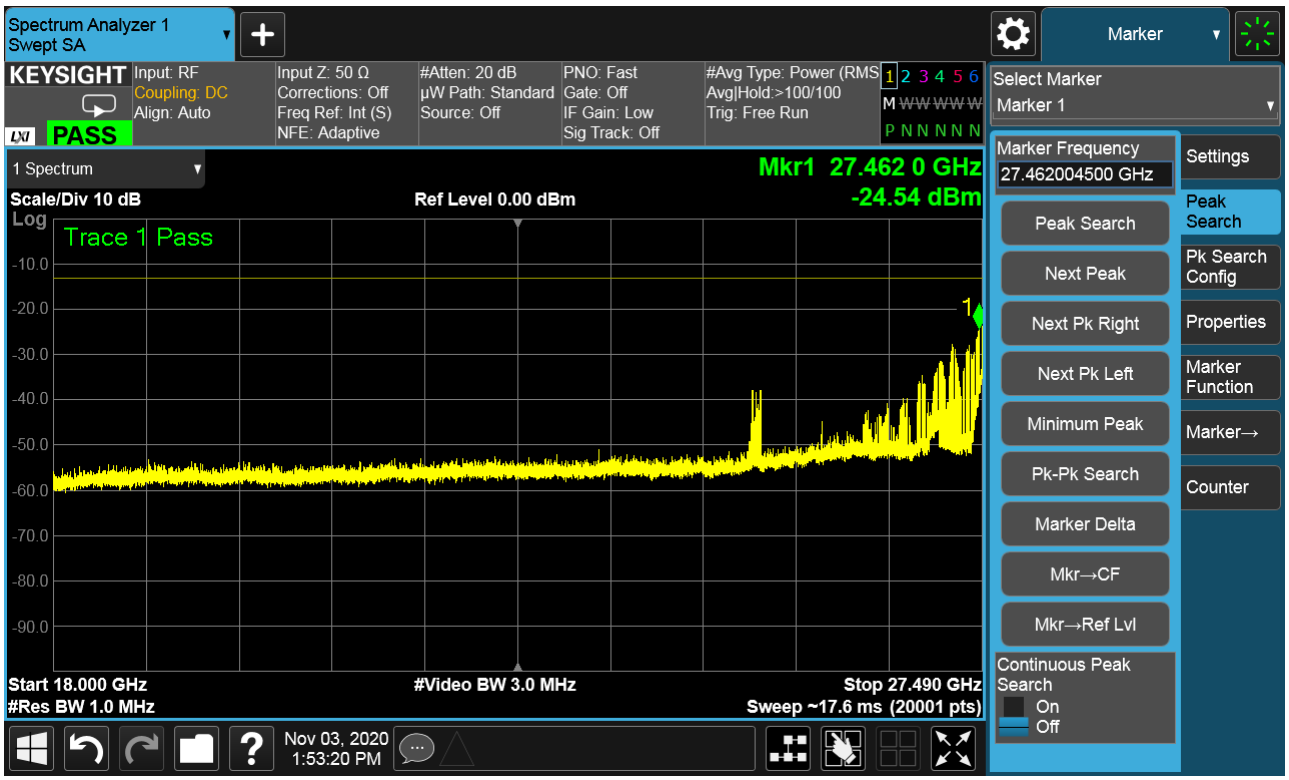
Above 18GHz Data (n261): 18GHz-27.490GHz:

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



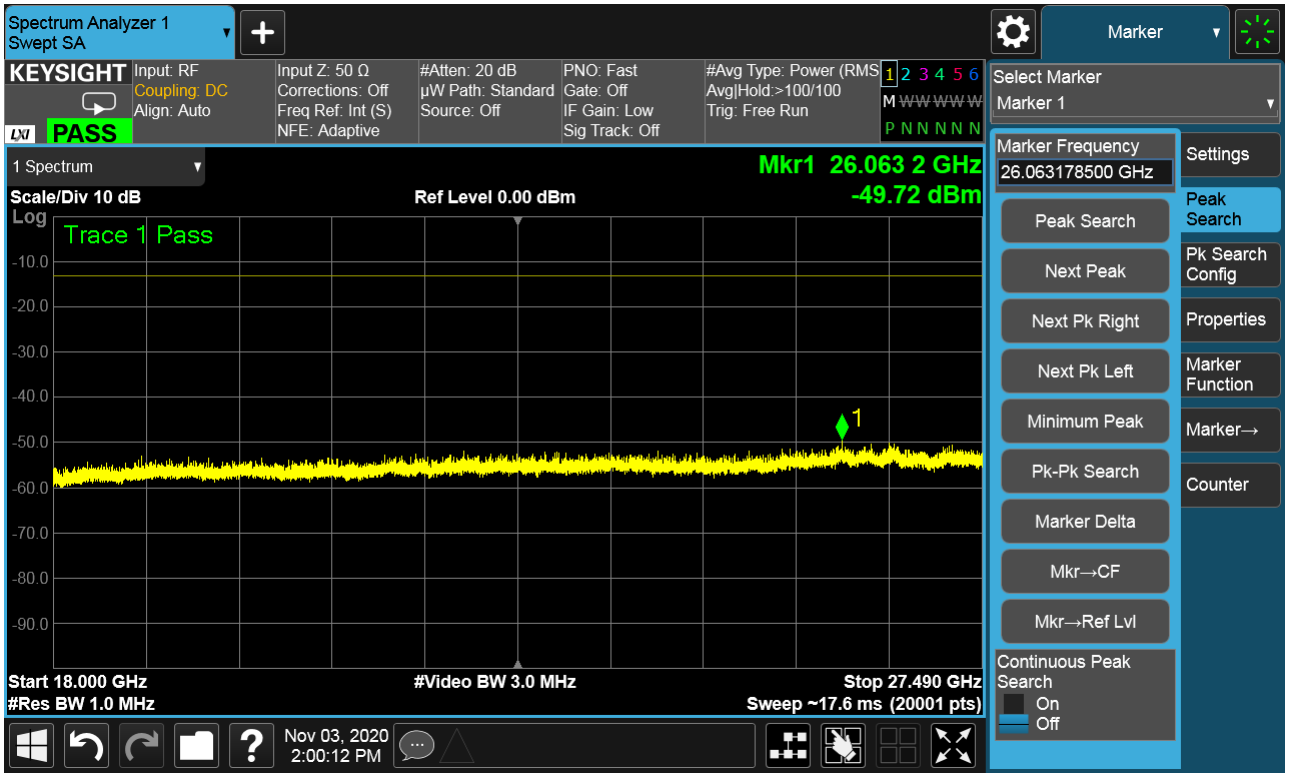
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Vertical	Test distance	2m



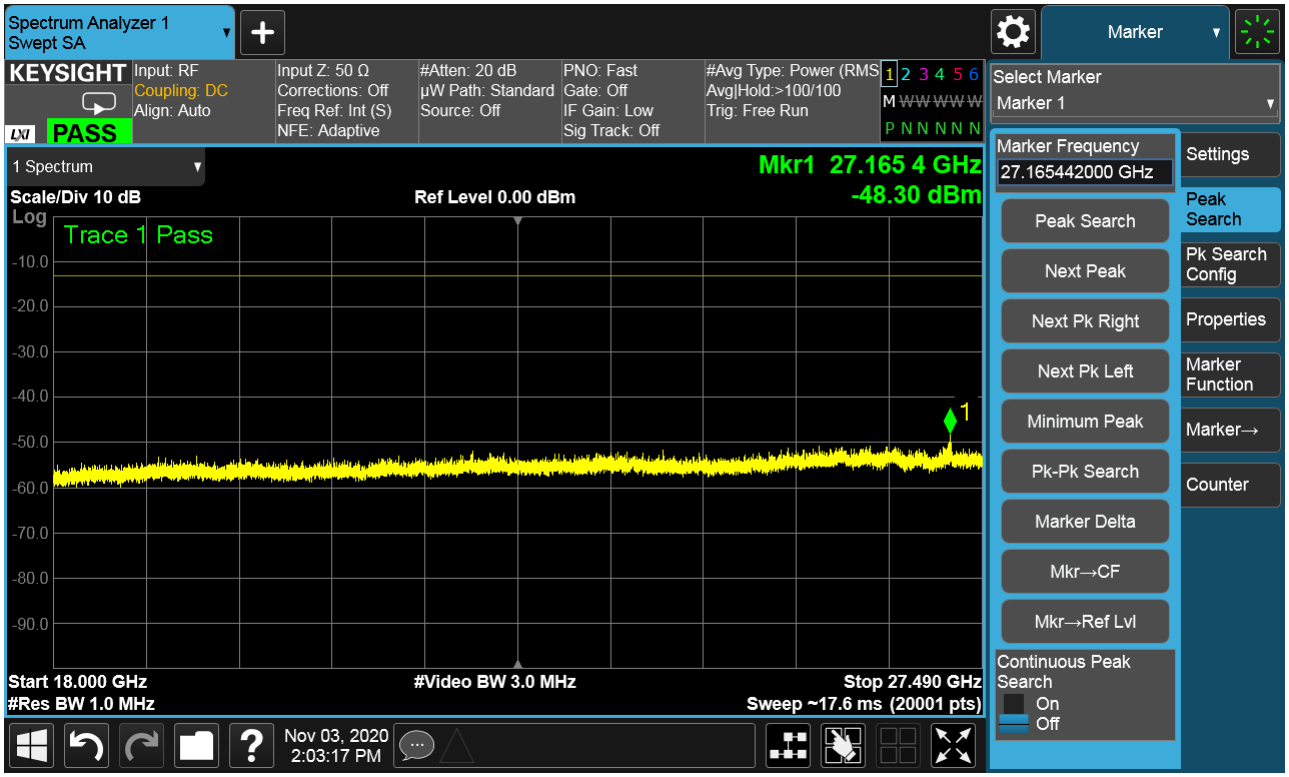
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



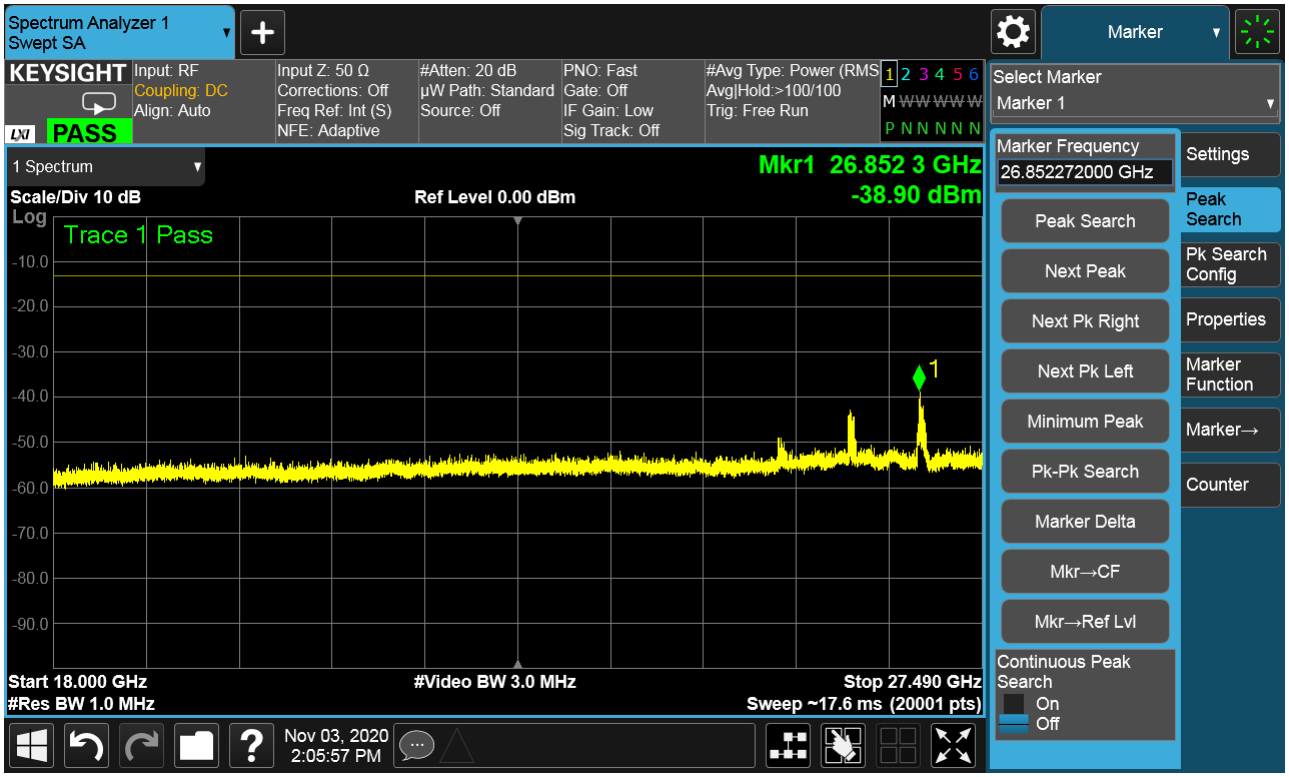
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



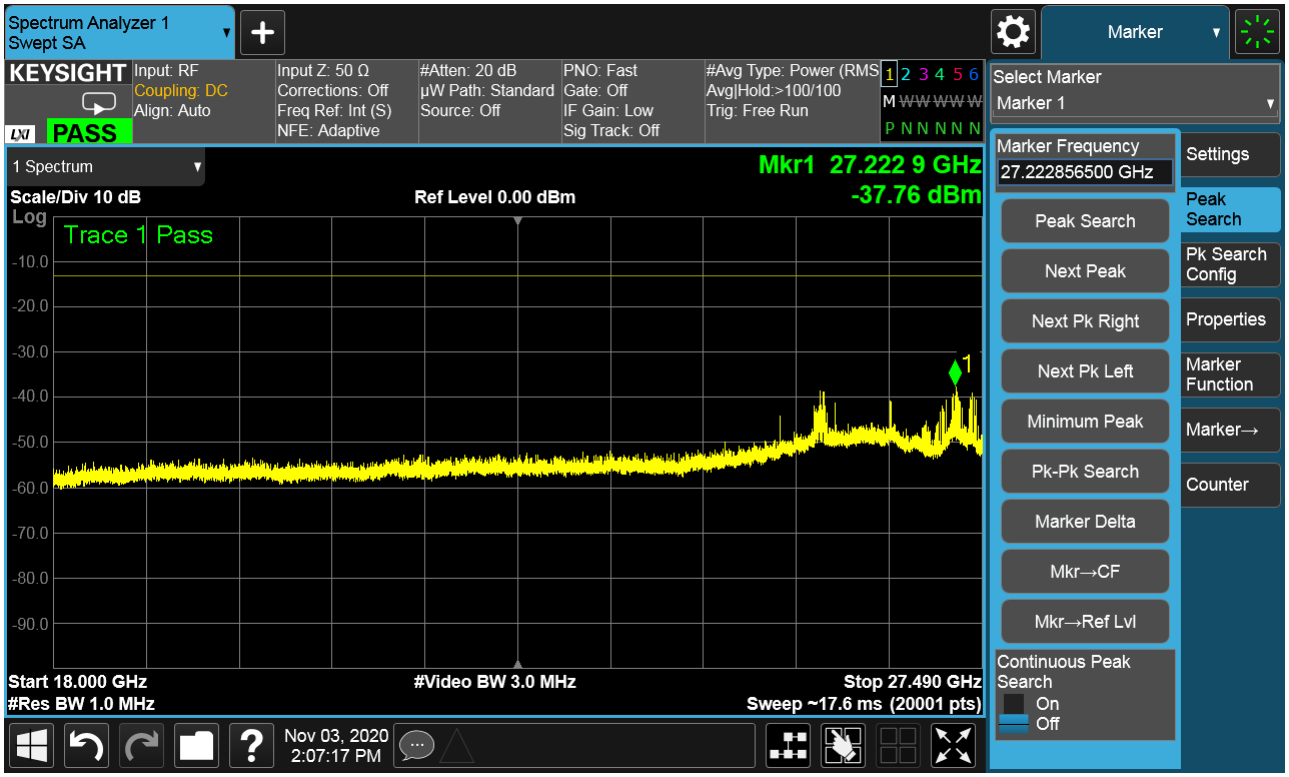
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	High
Polarity	Horizontal	Test distance	2m



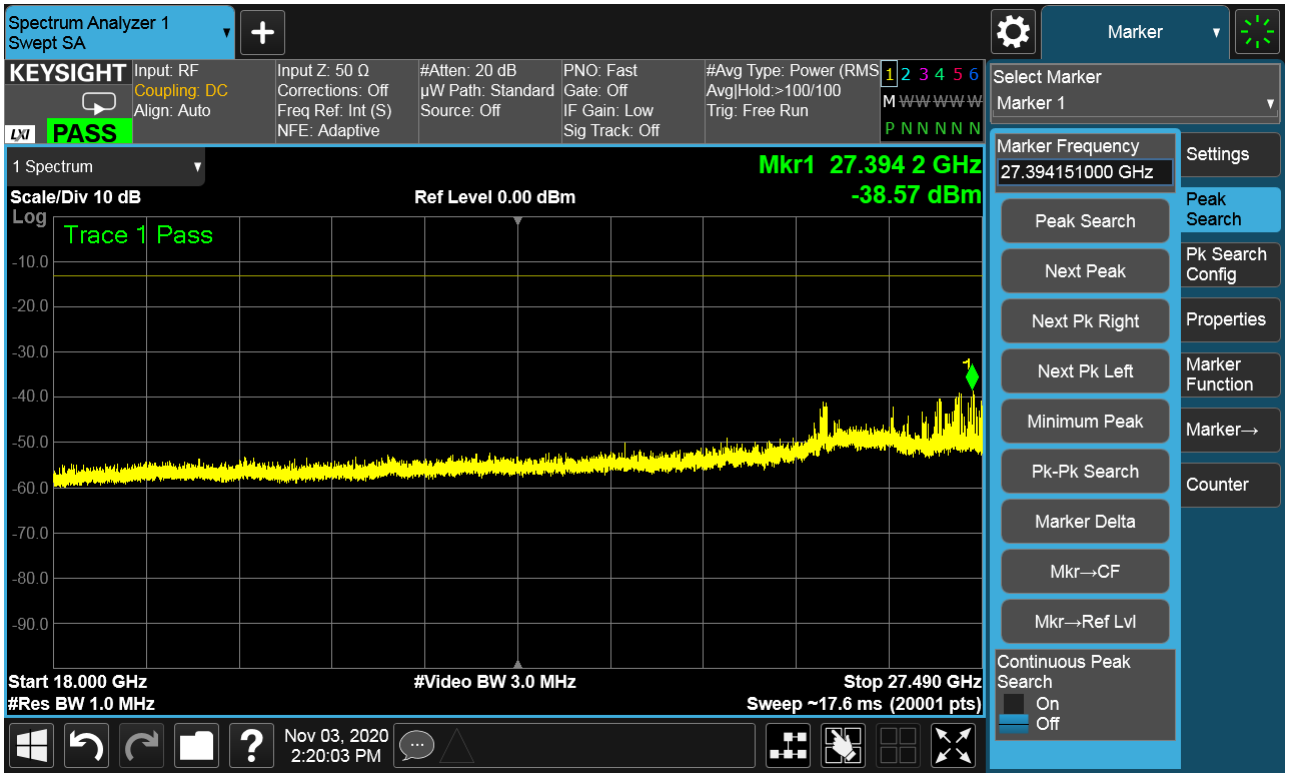
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	18GHz-27.490GHz	Channel	High
Polarity	Vertical	Test distance	2m



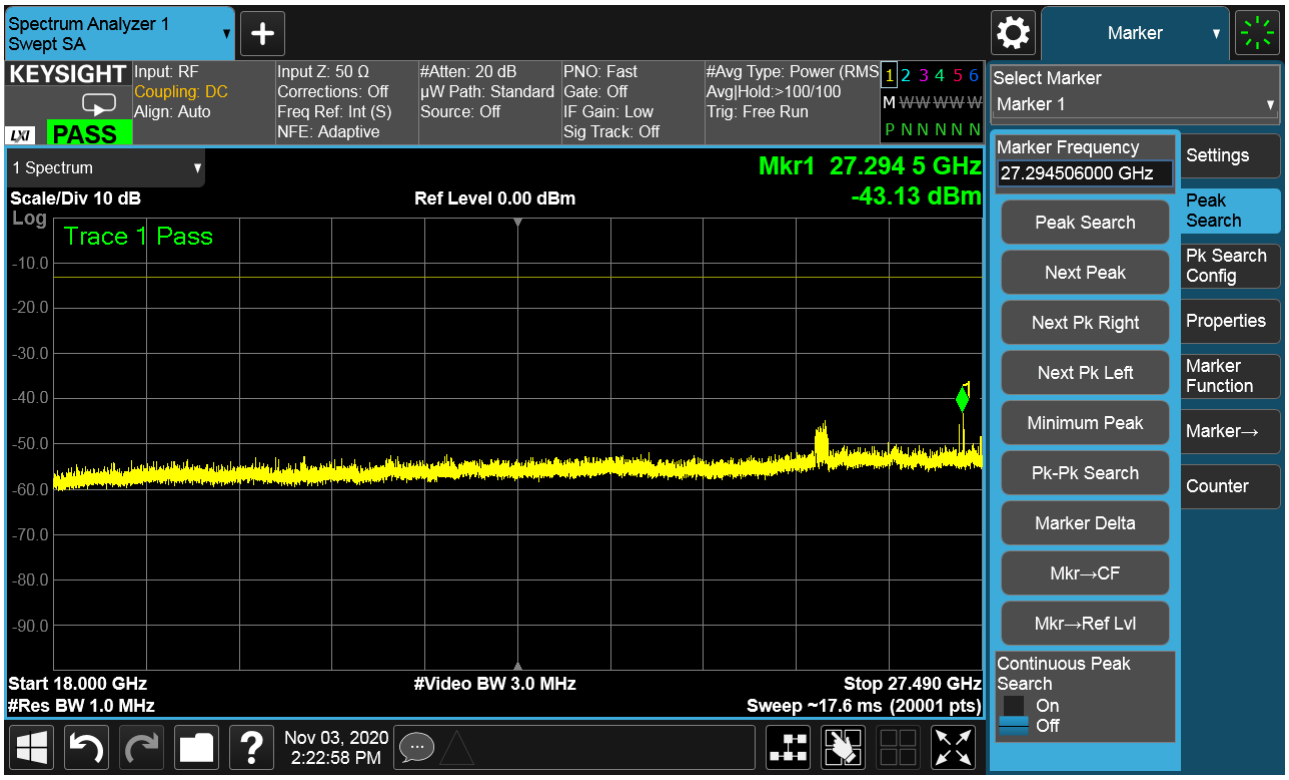
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



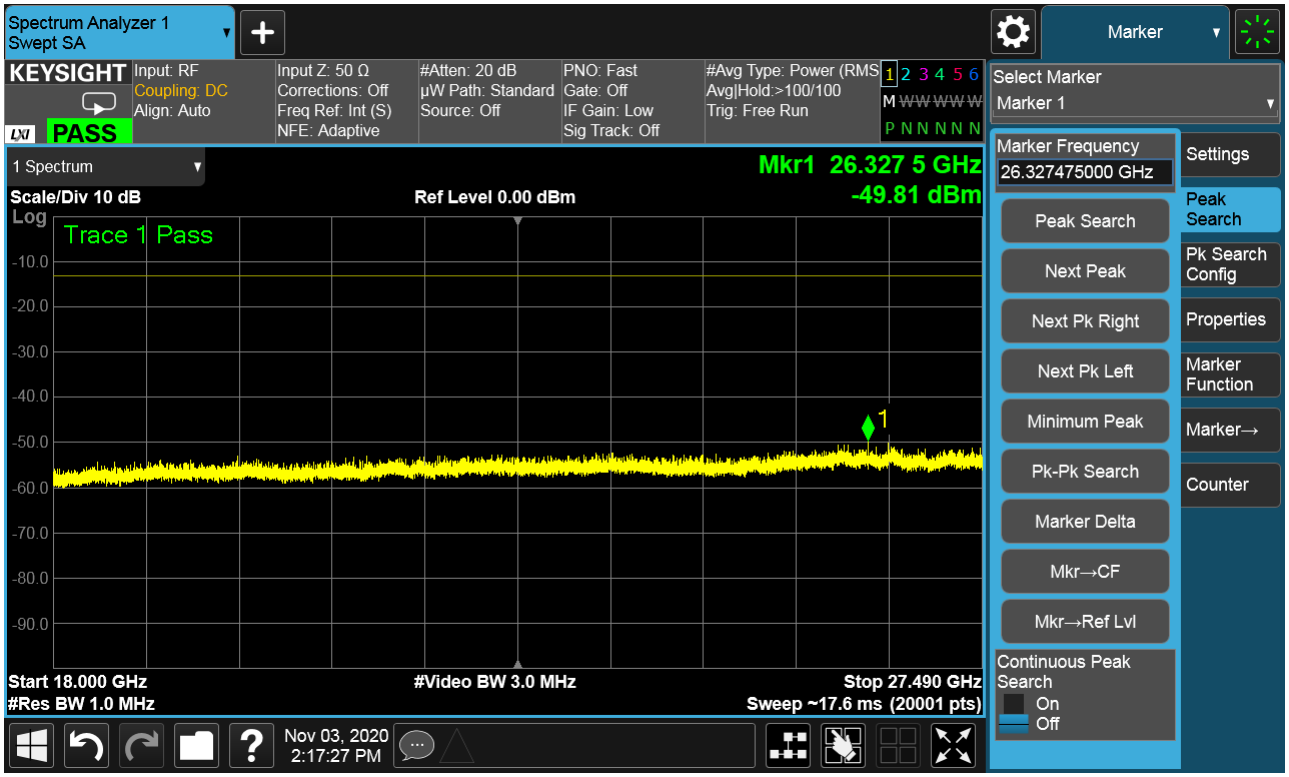
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Vertical	Test distance	2m



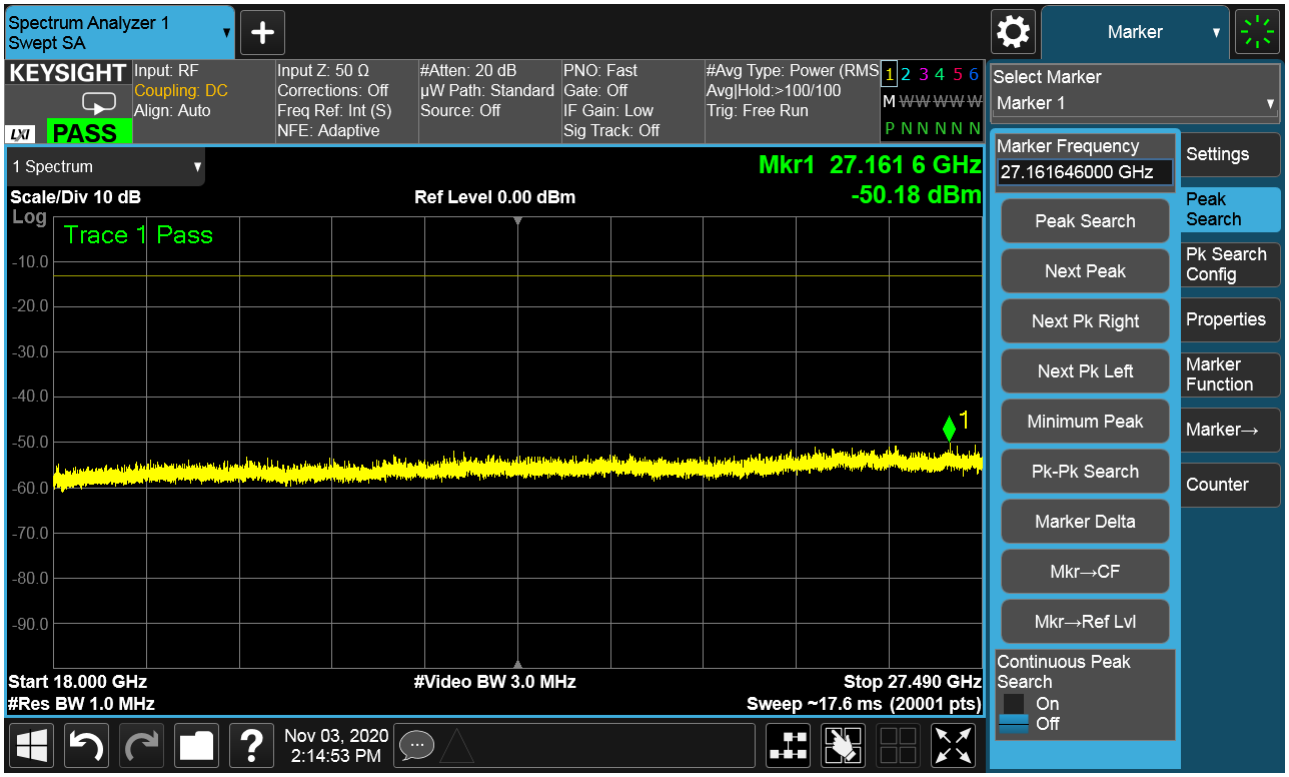
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



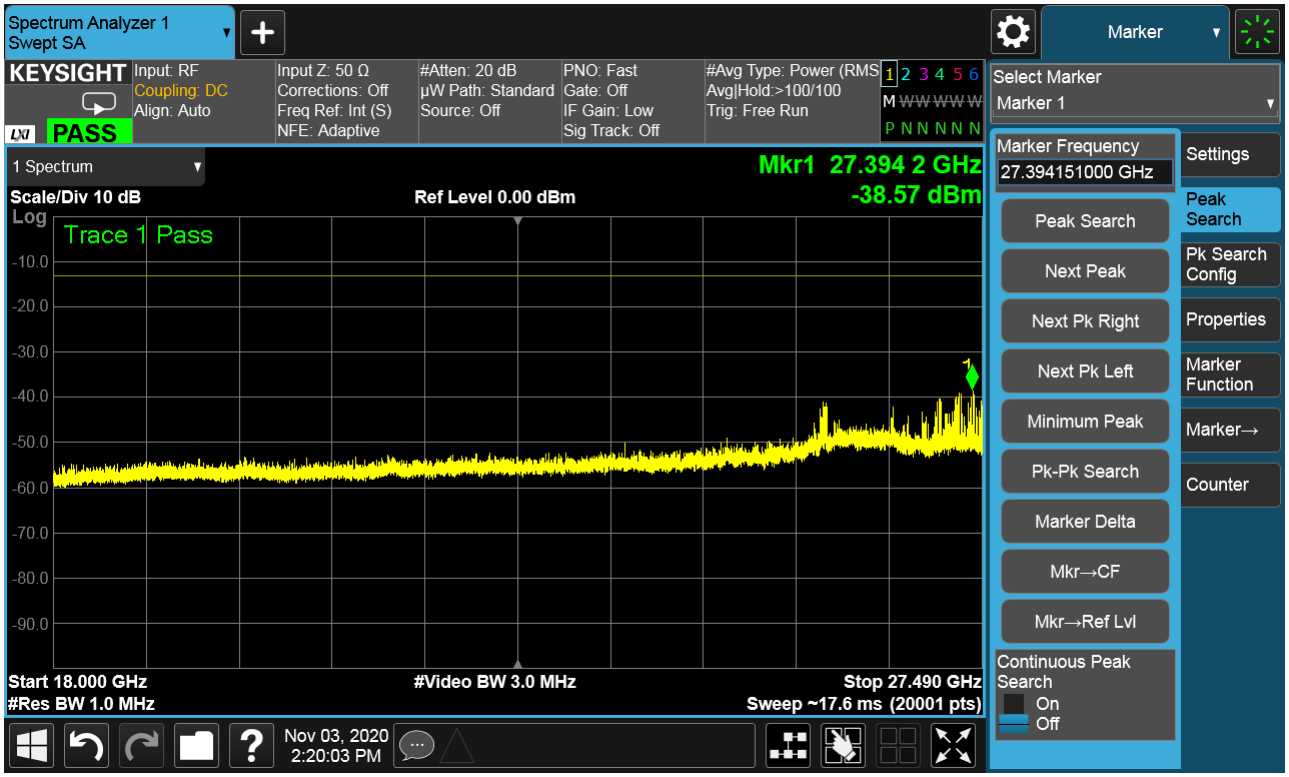
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



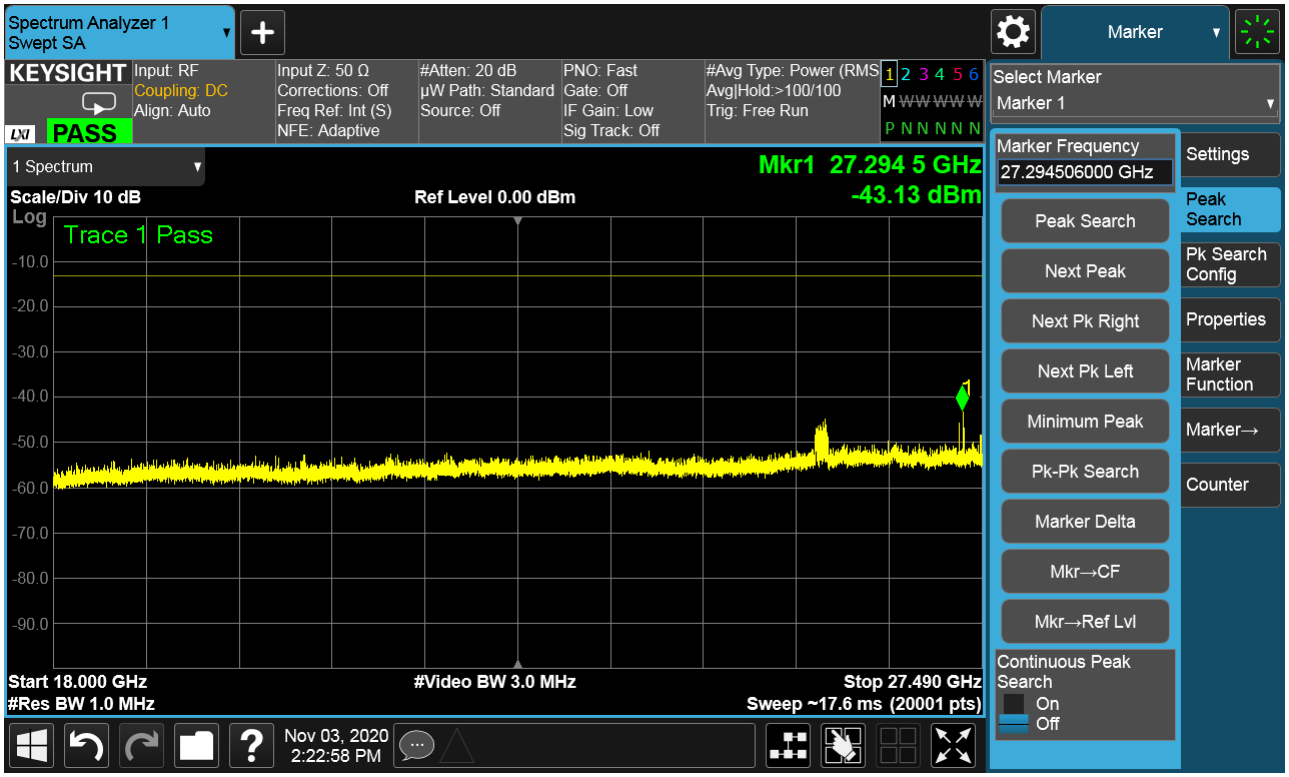
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	High
Polarity	Horizontal	Test distance	2m



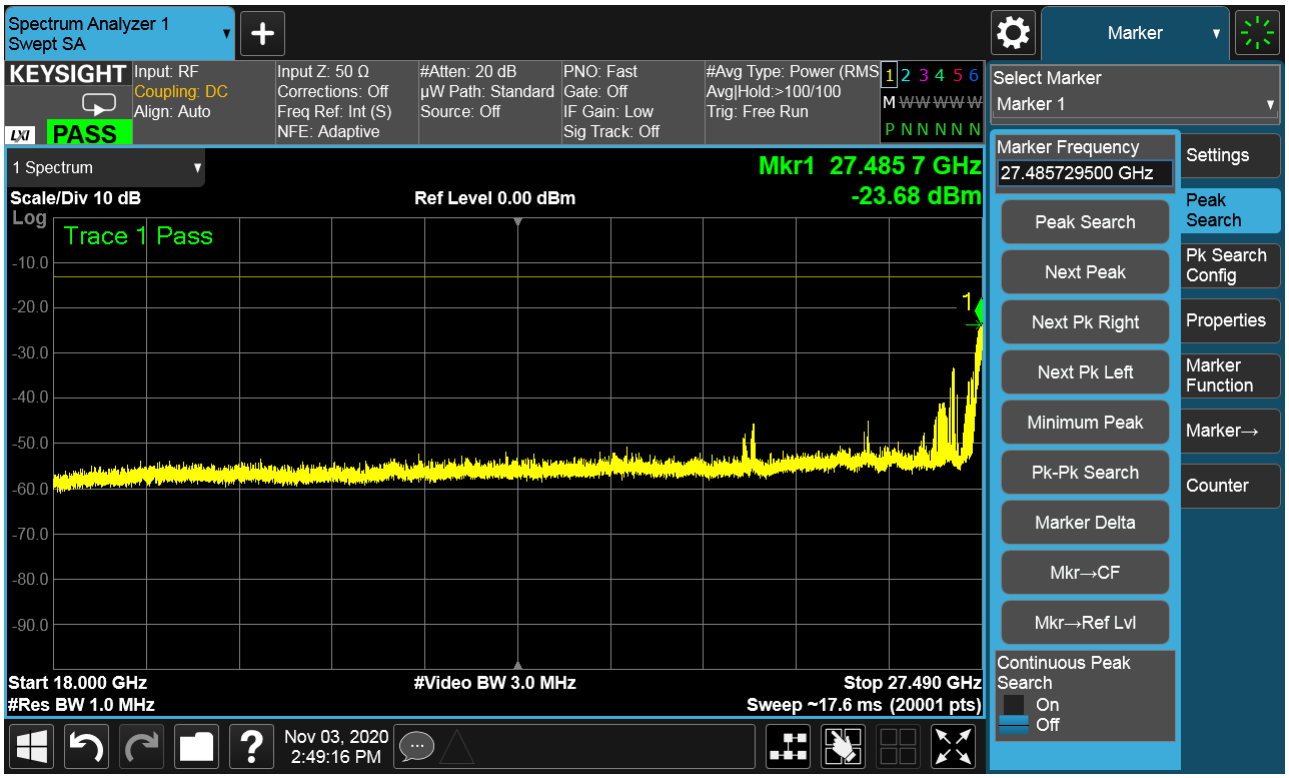
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	18GHz-27.490GHz	Channel	High
Polarity	Vertical	Test distance	2m



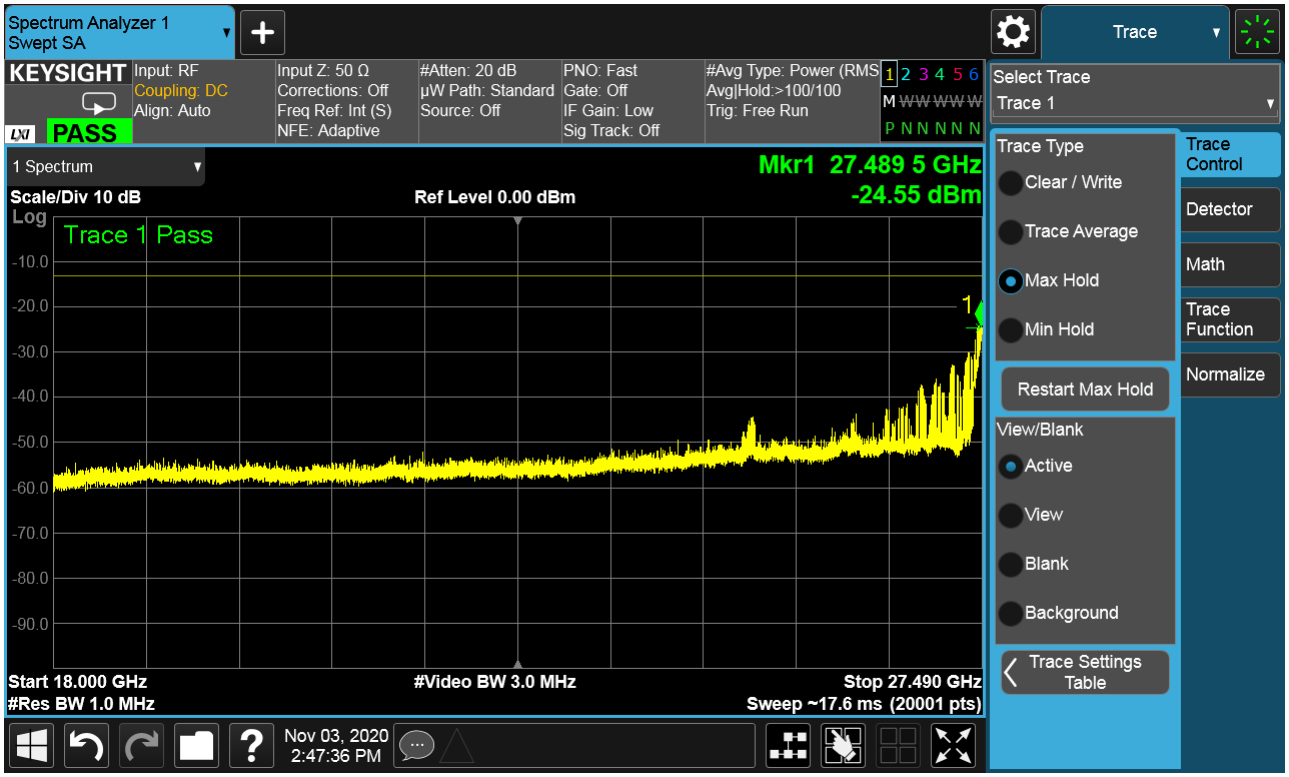
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



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

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Low
Polarity	Vertical	Test distance	2m



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

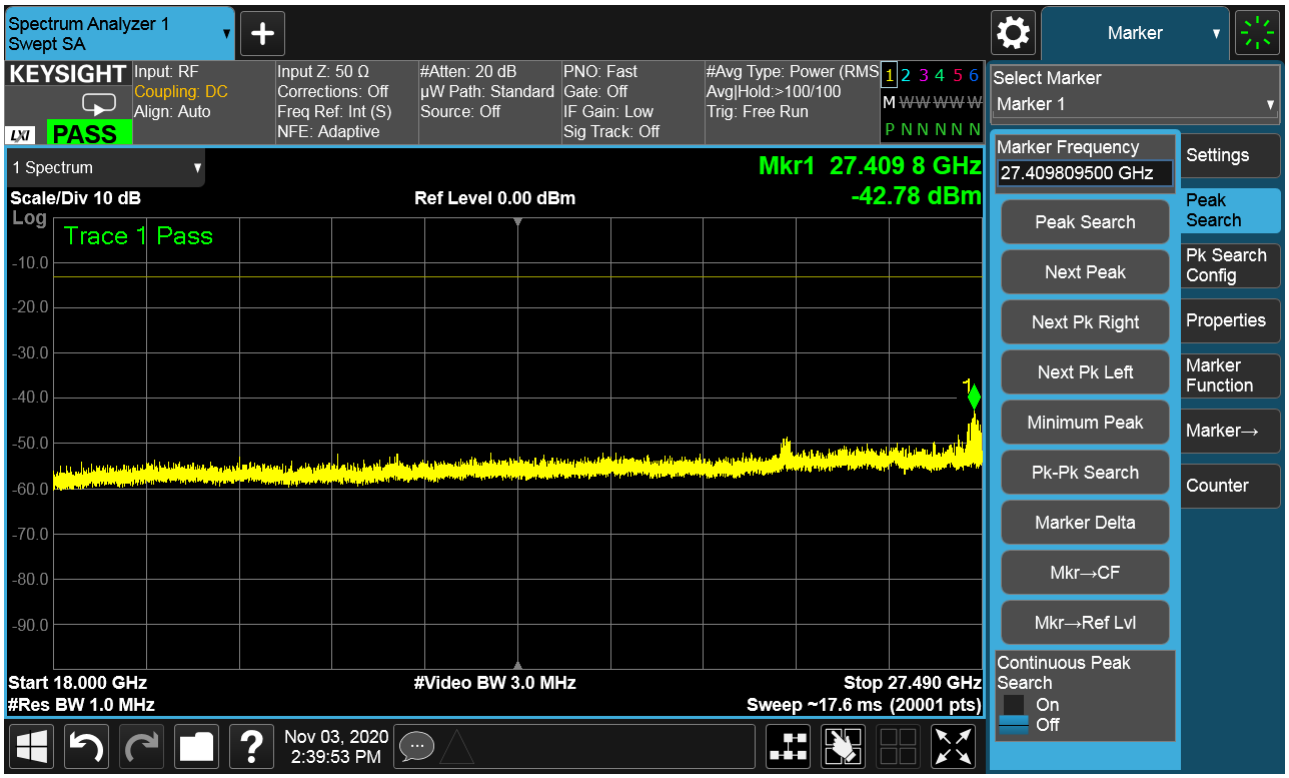
Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-24.55	-23.68	-21.08	-13	-8.08	Pass

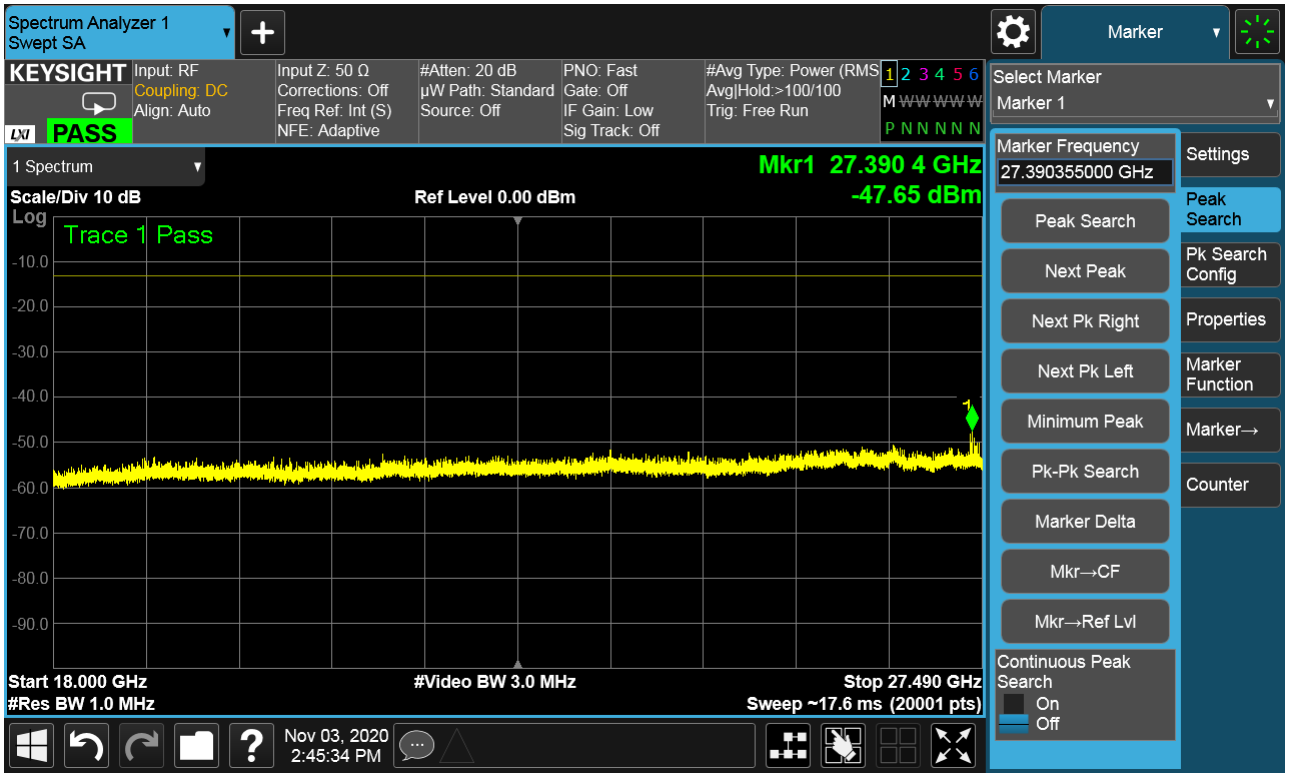
Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



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

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



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

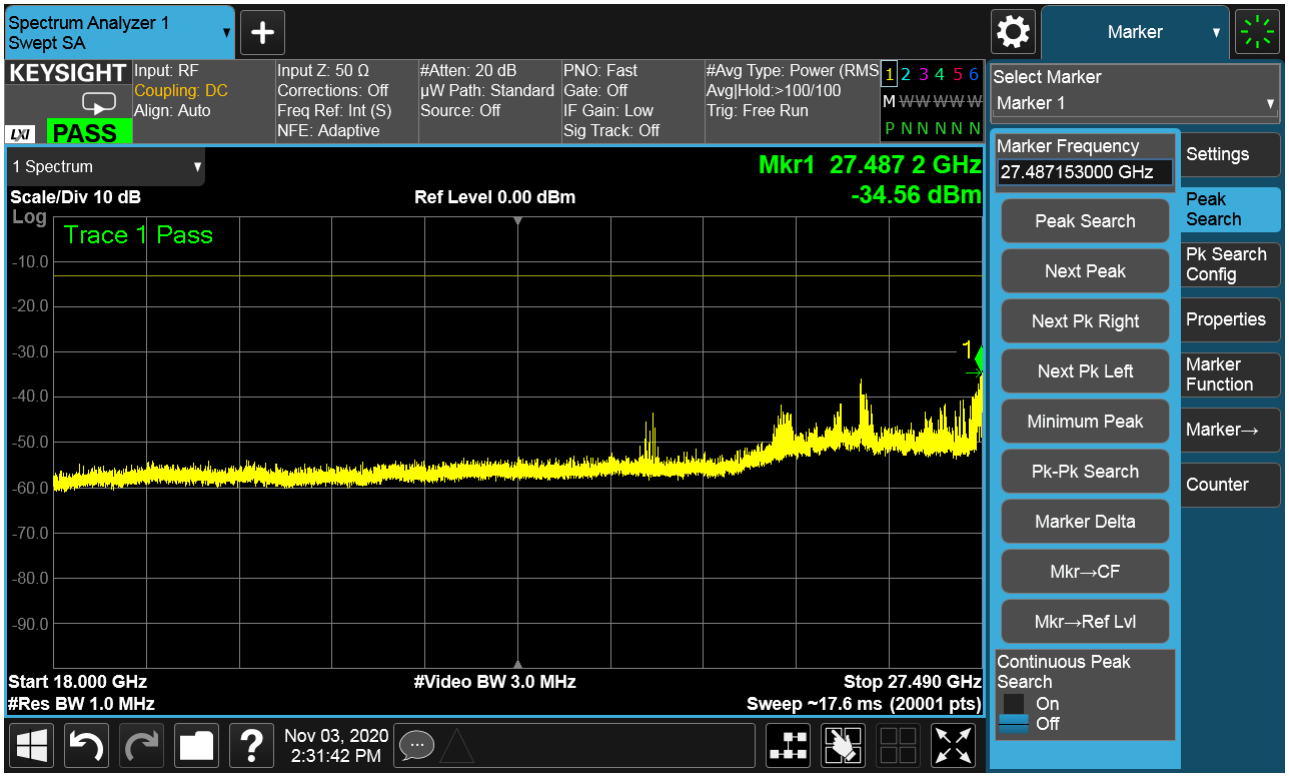
Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-47.65	-42.78	-41.56	-13	-28.56	Pass

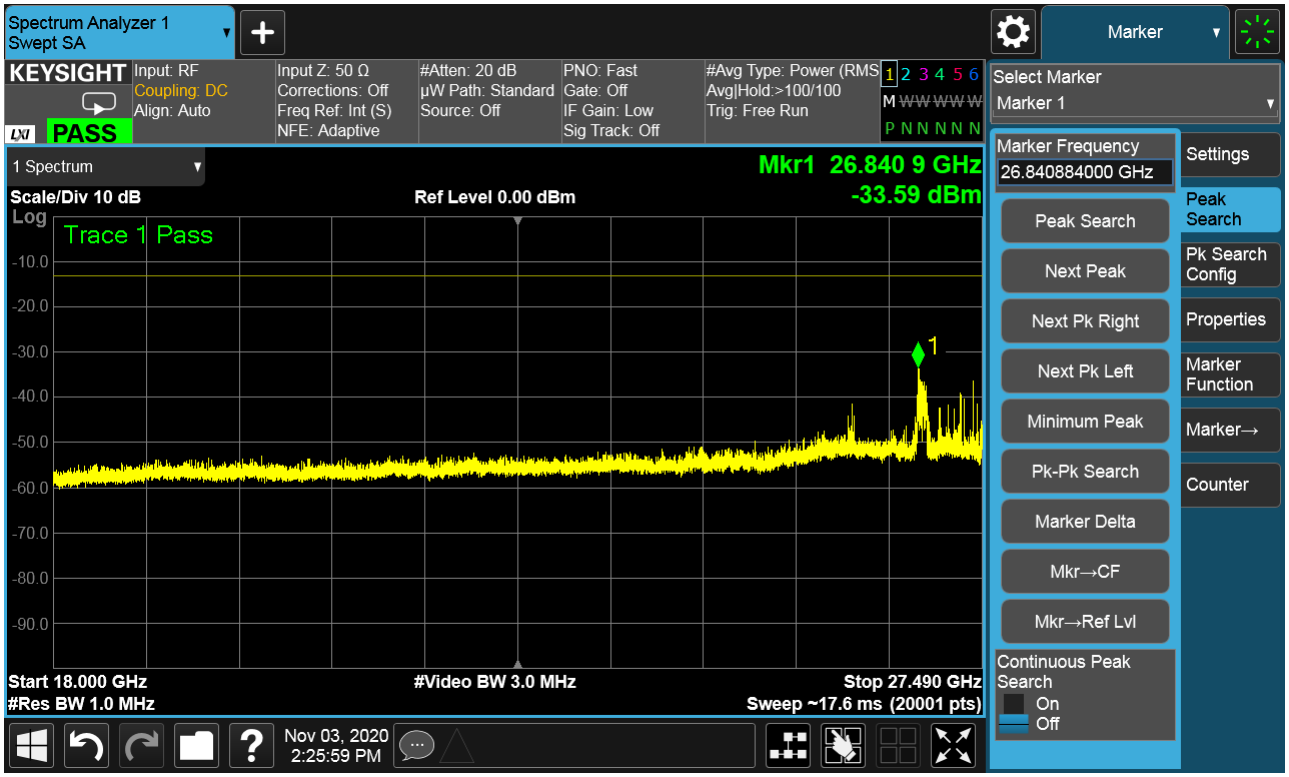
Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



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

Band	n261	Beam ID	11 + 139
Frequency Range	18GHz-27.490GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



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

Summary of MIMO Beam Out-of Band Emission:

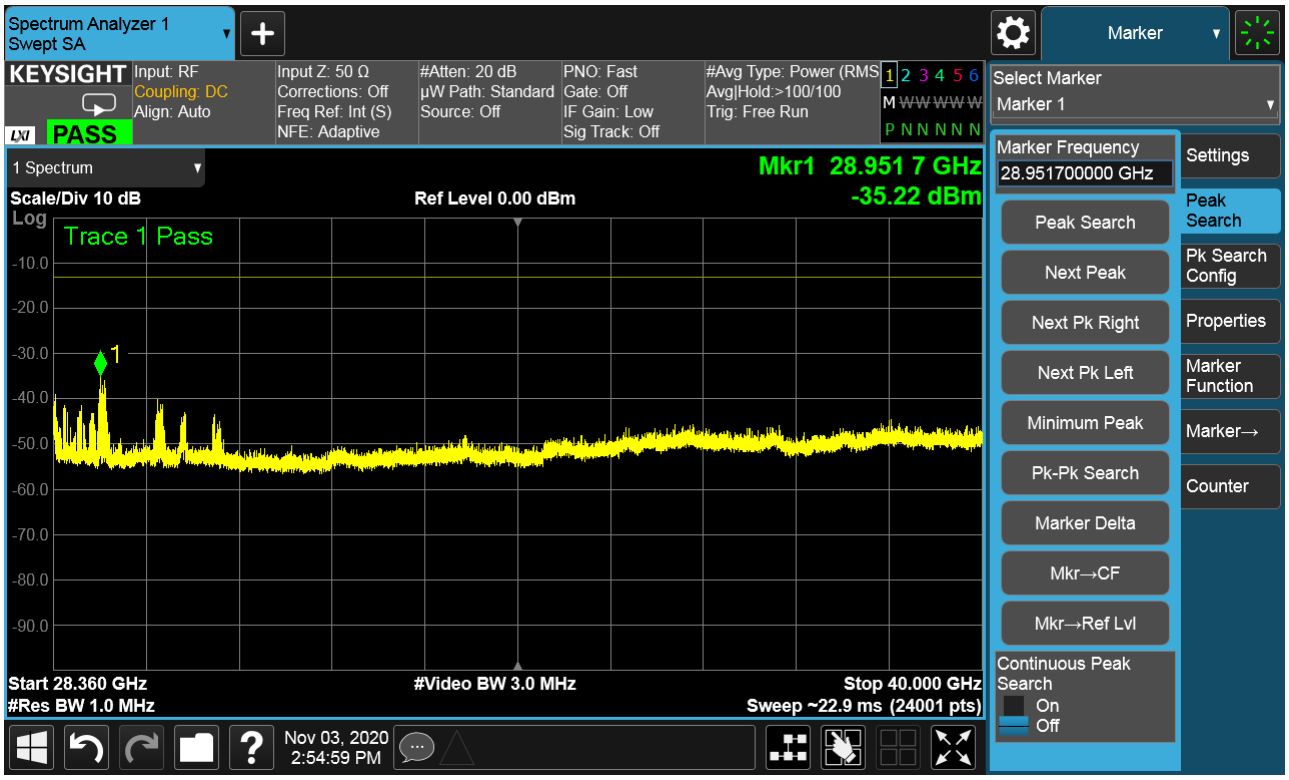
To address compliance of MIMO Out-of Band emission per KDB 662911 D01, the MIMO Out-of Band emission EIRP is calculated by summing the worst-case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm.

Beam ID	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-33.59	-34.56	-31.04	-13	-18.04	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

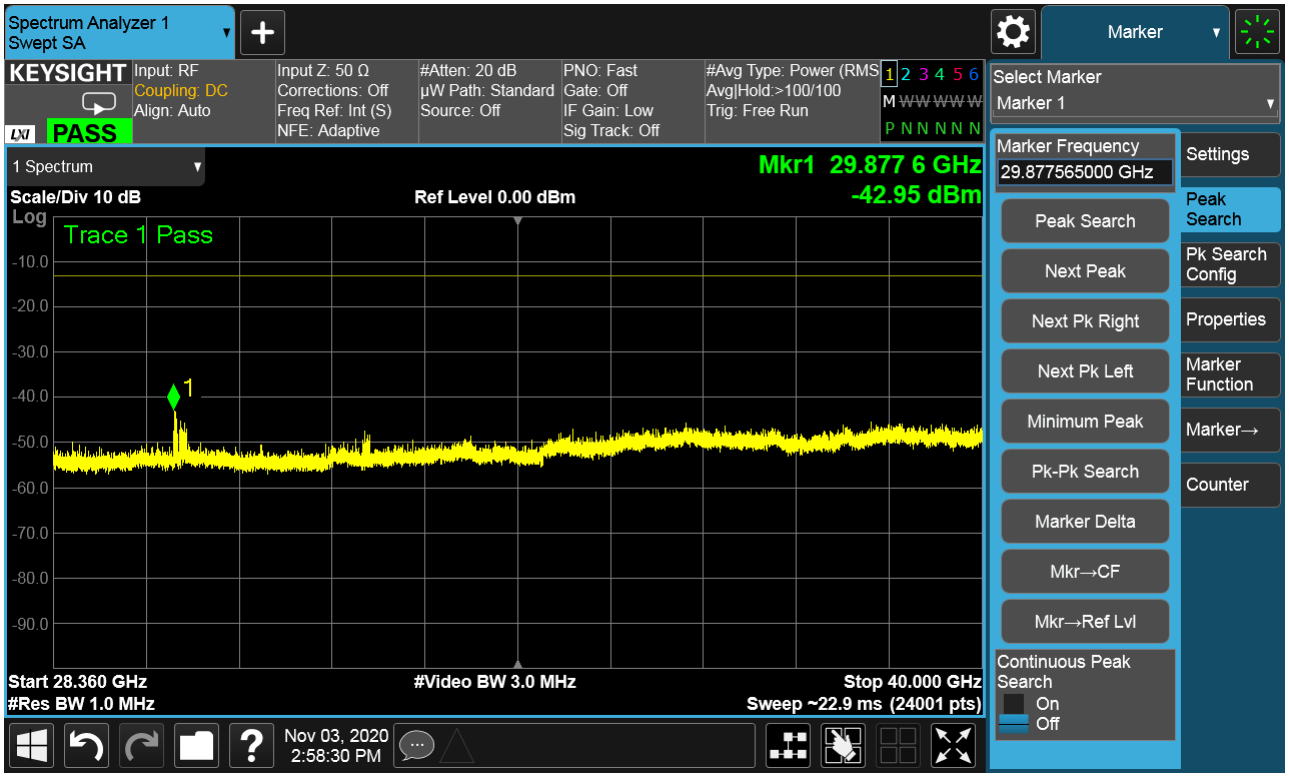
28.360GHz-40GHz (n261):

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



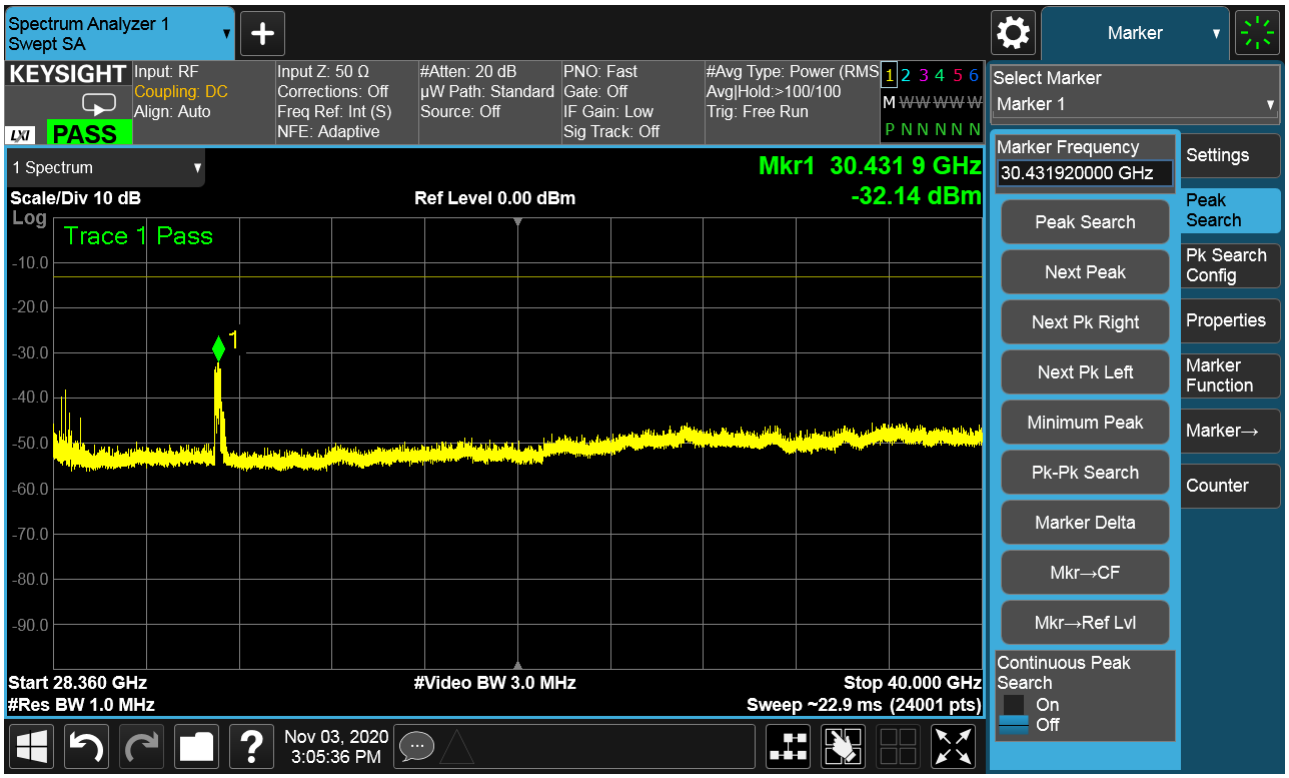
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Vertical	Test distance	2m



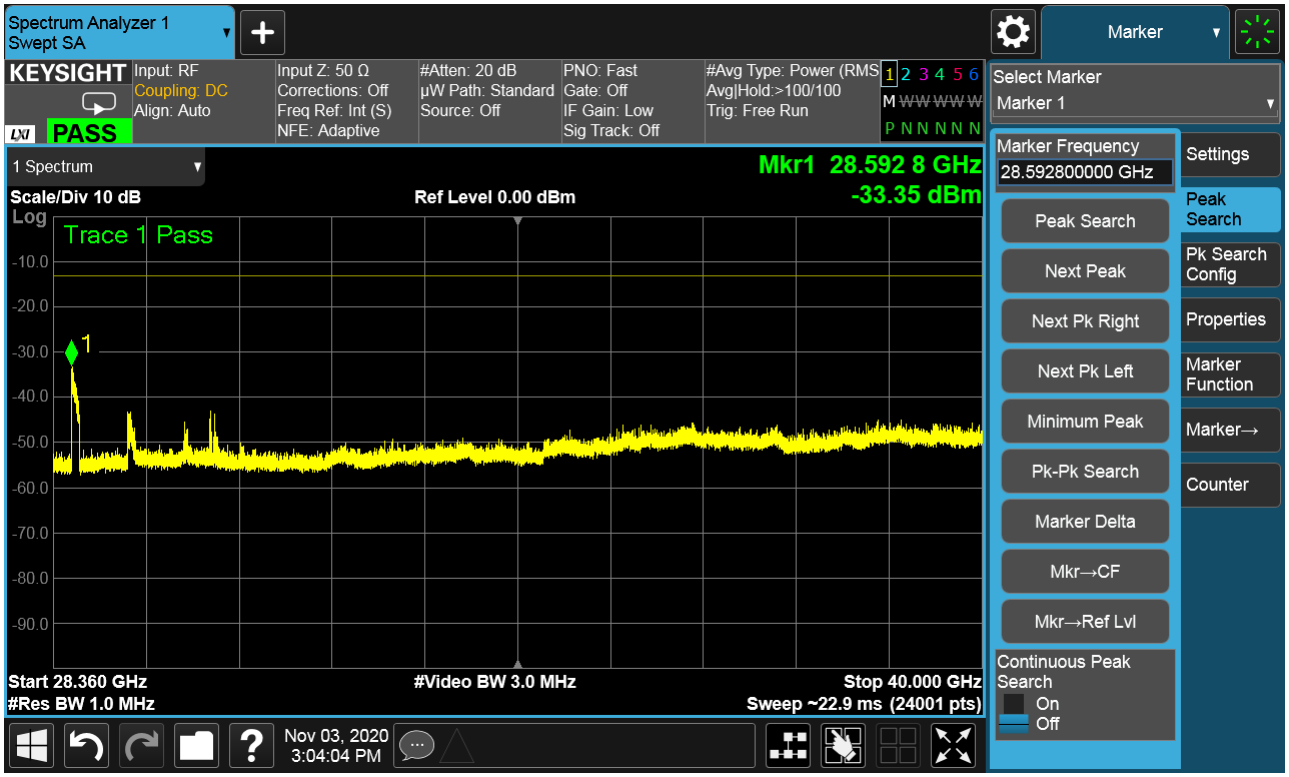
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



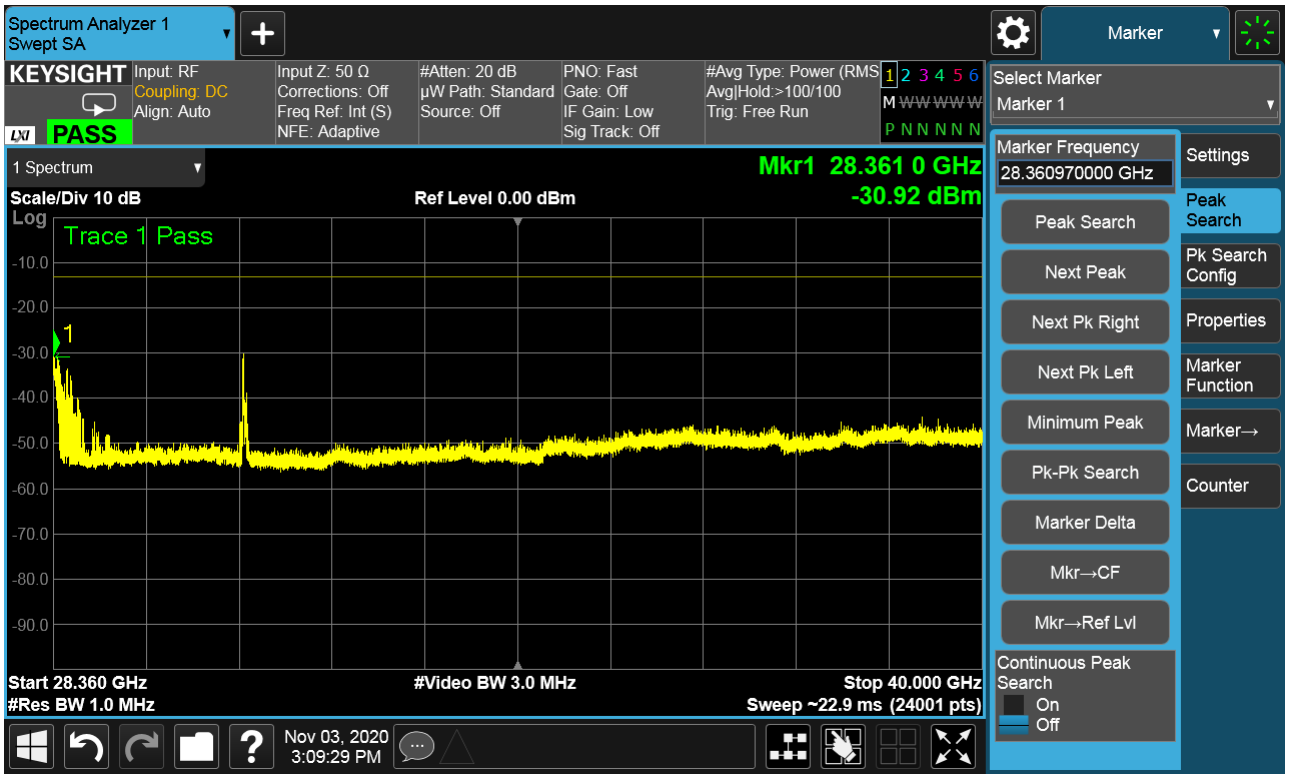
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



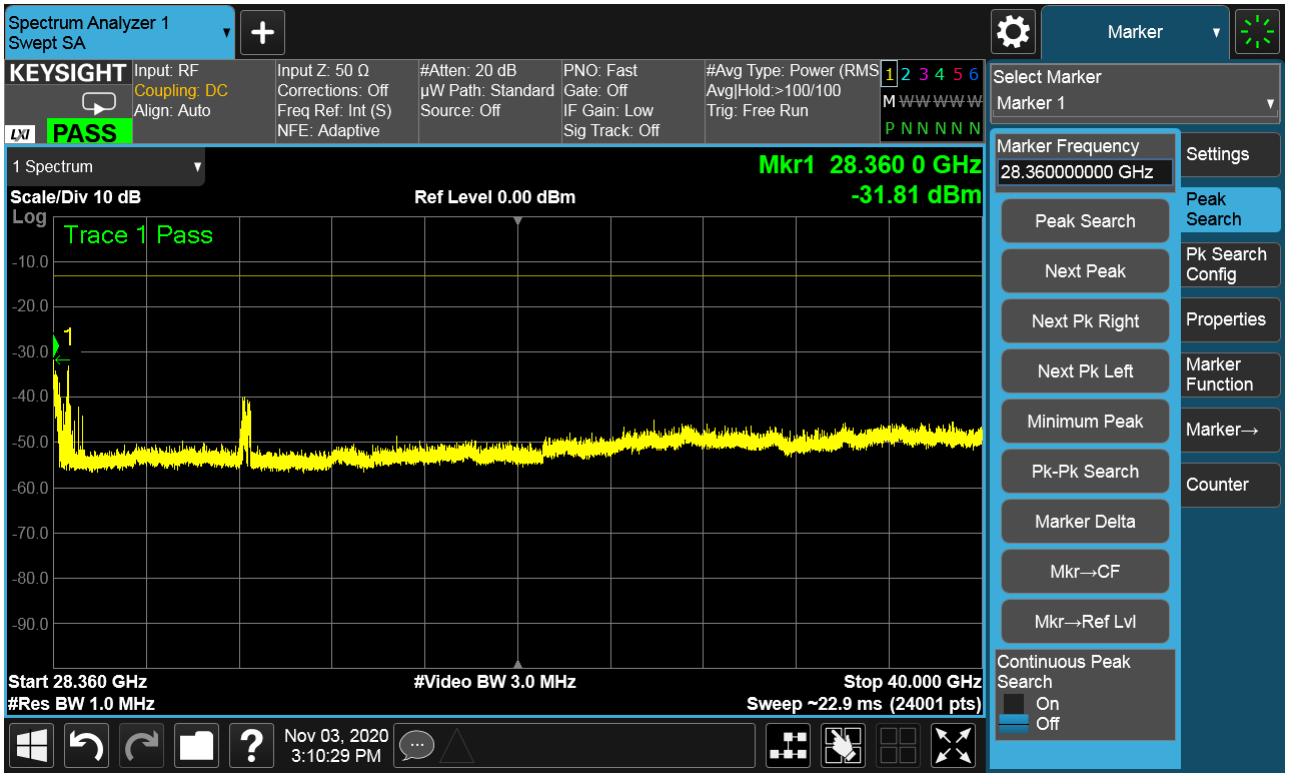
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	High
Polarity	Horizontal	Test distance	2m



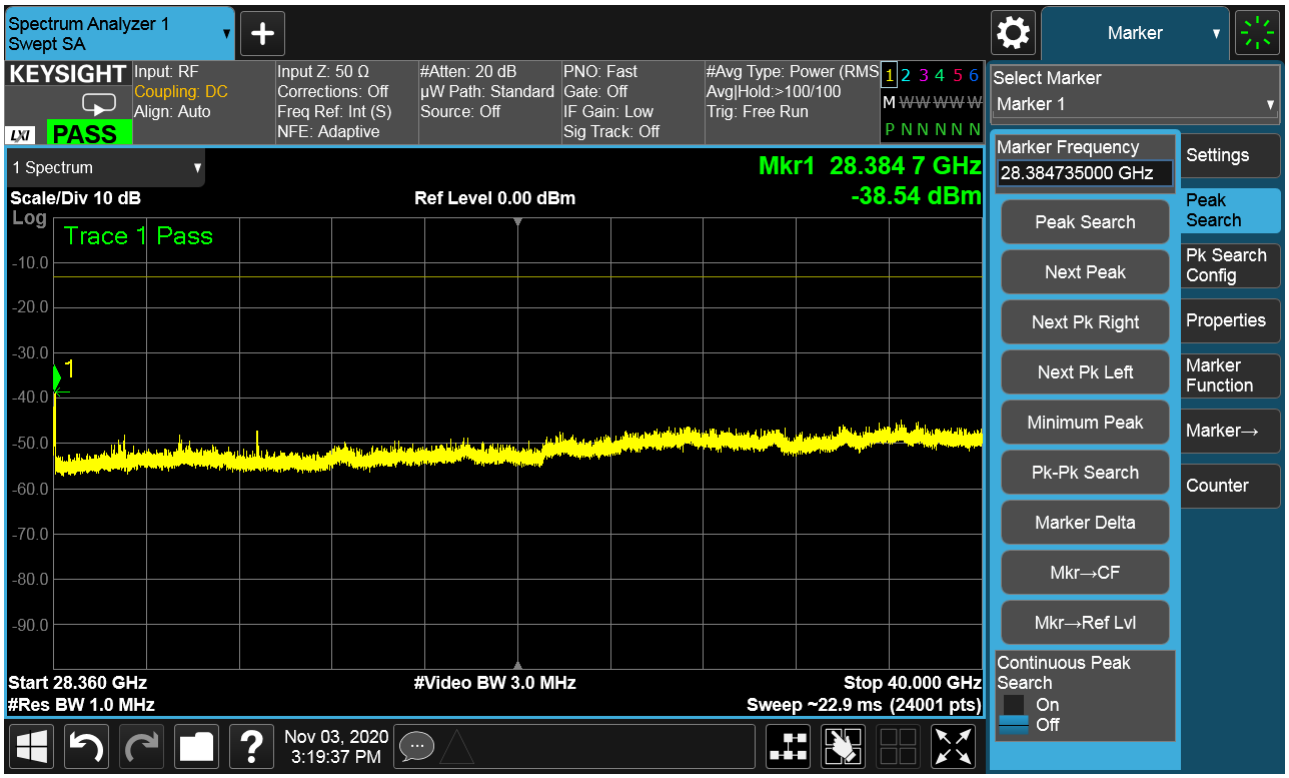
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11
Frequency Range	28.360GHz-40GHz	Channel	High
Polarity	Vertical	Test distance	2m



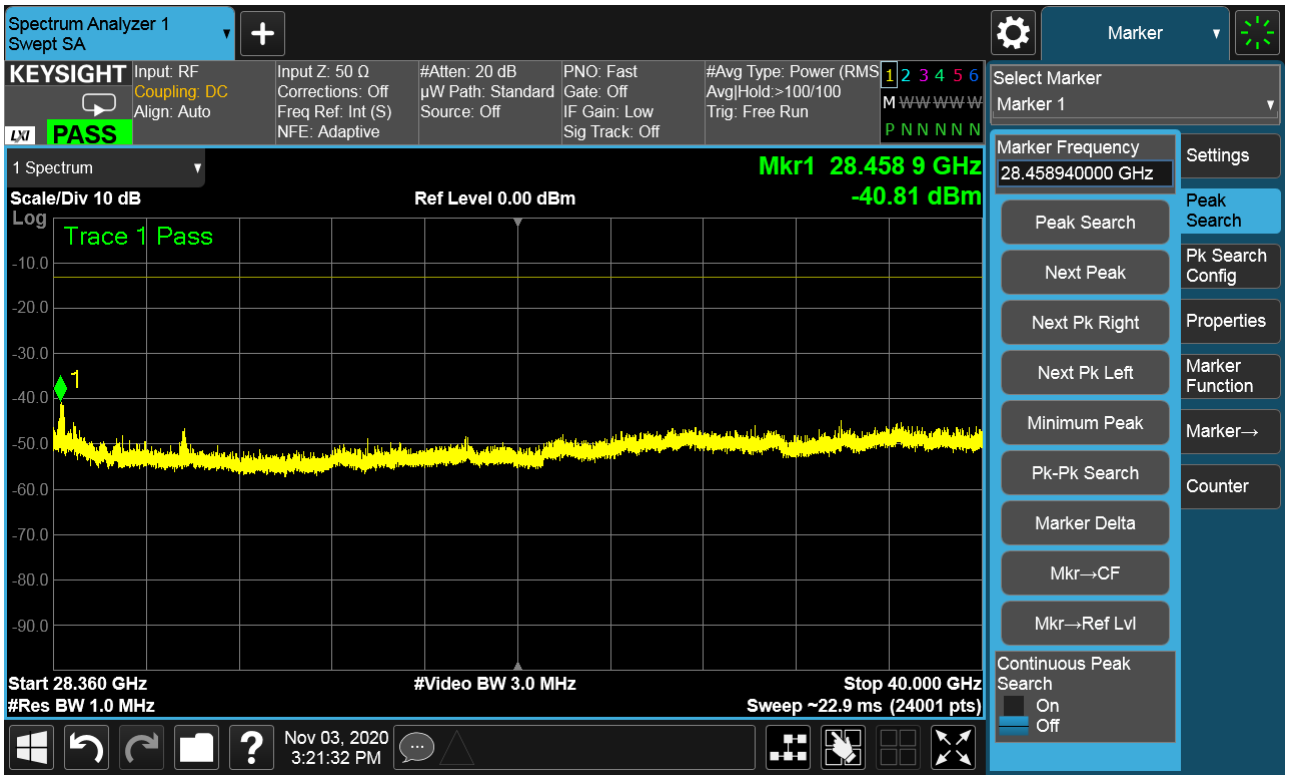
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



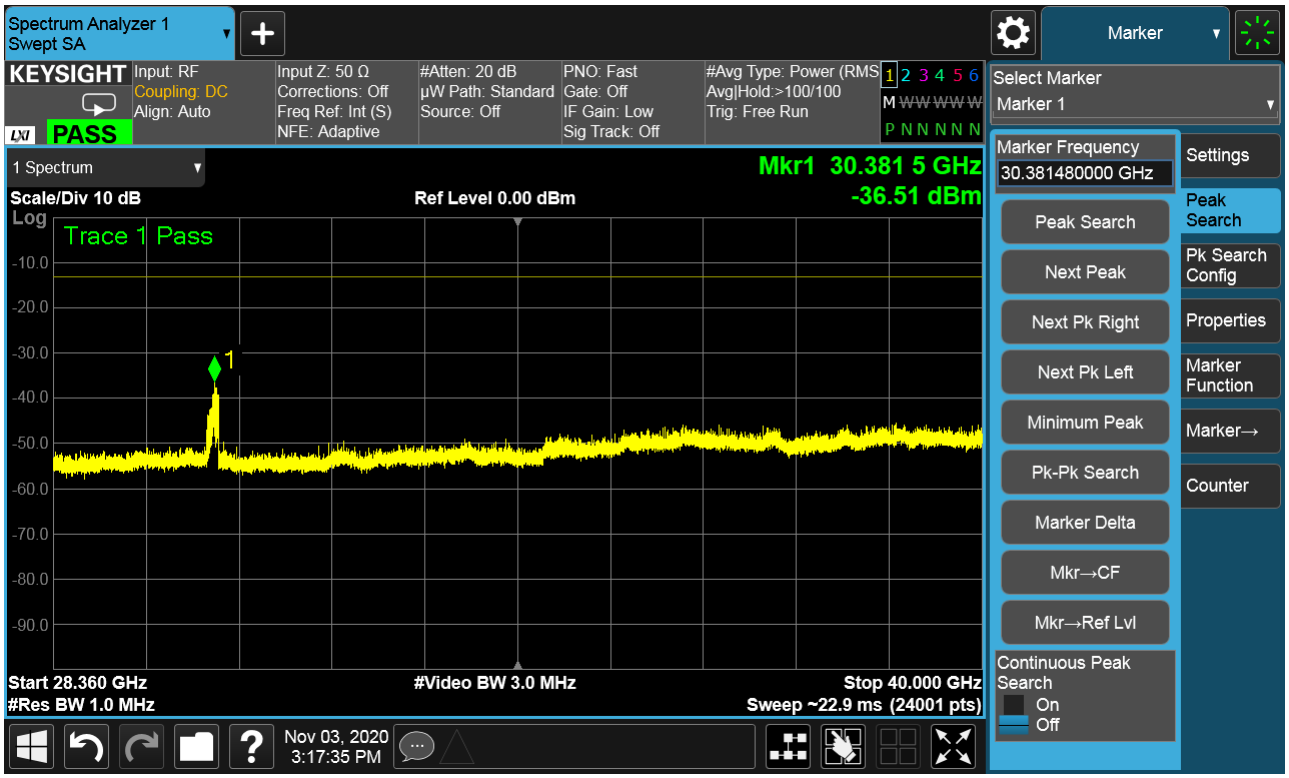
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Vertical	Test distance	2m



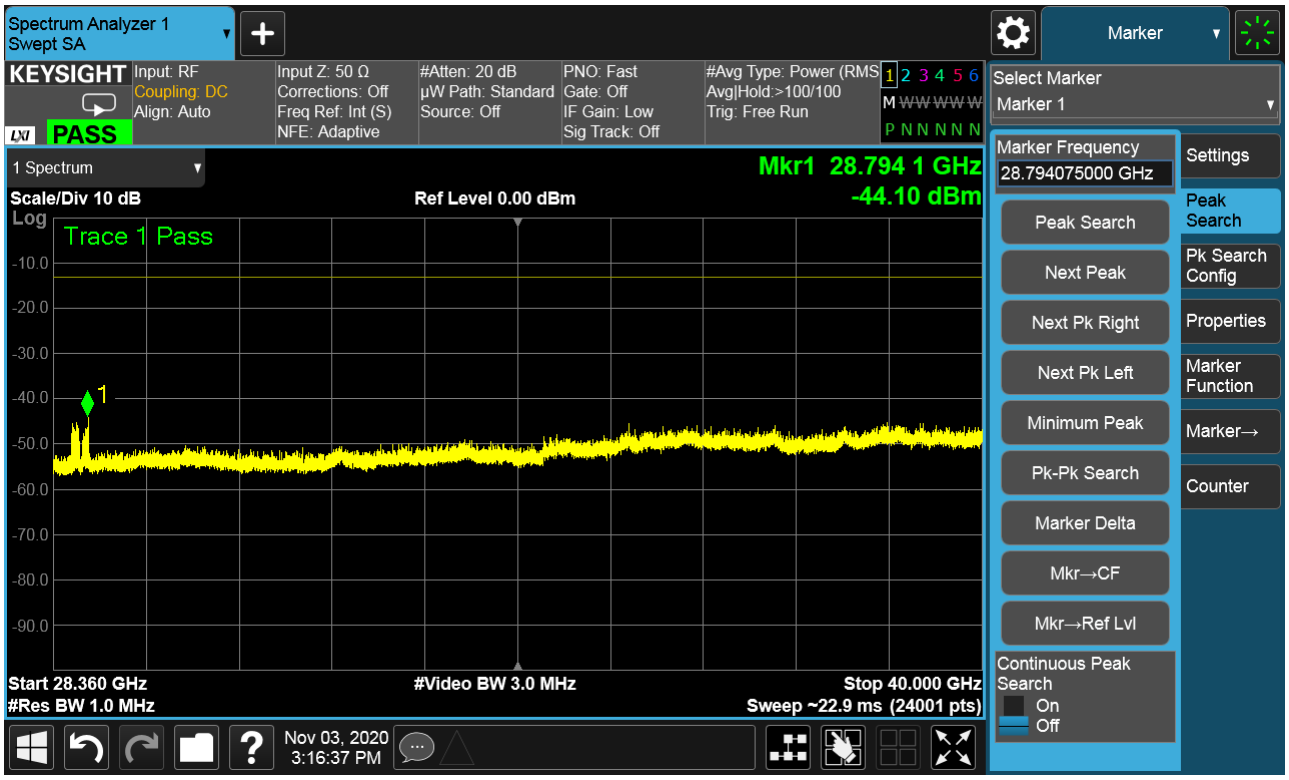
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



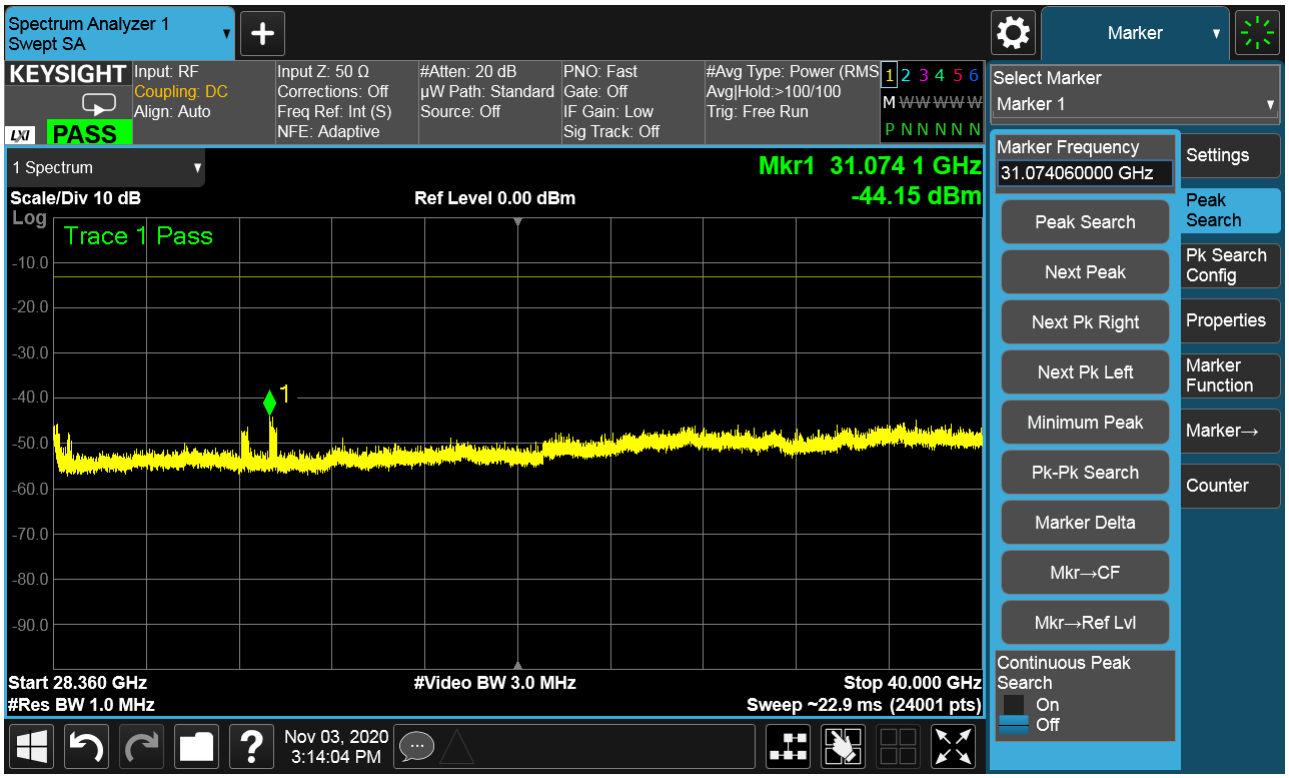
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



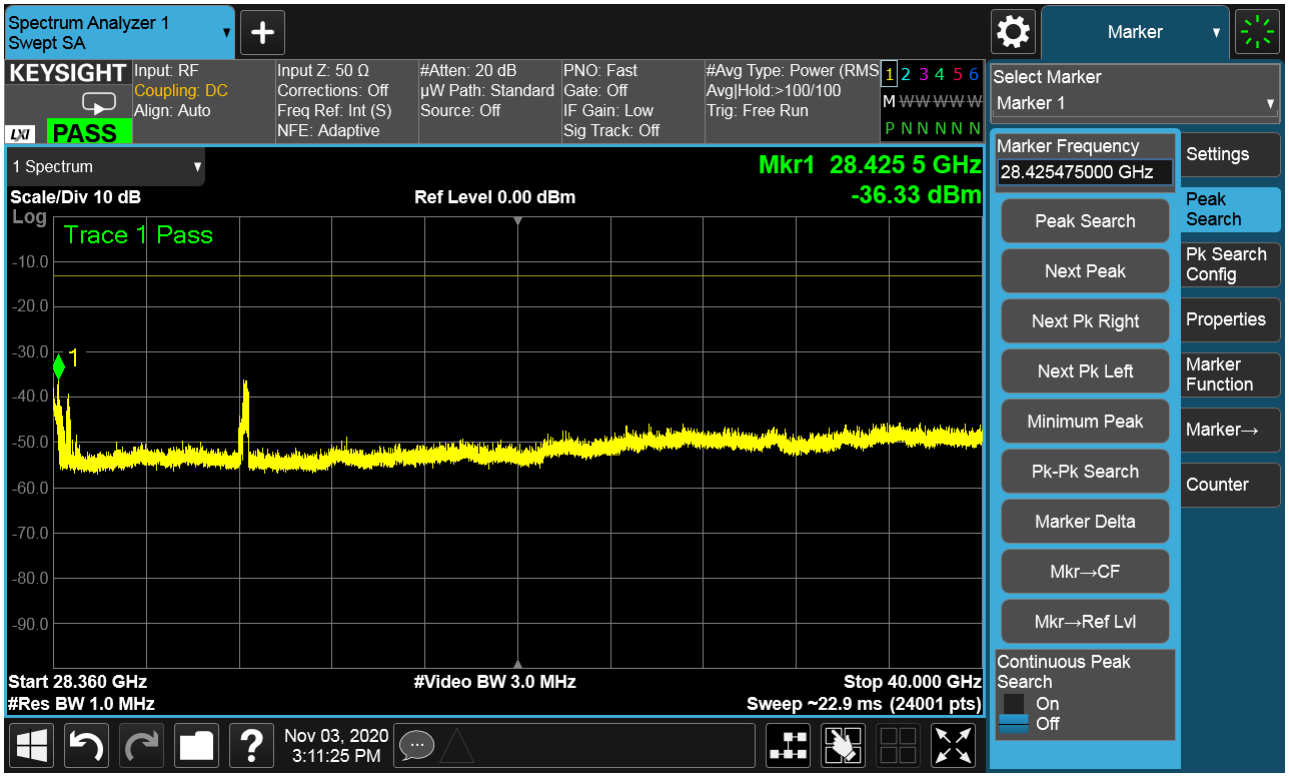
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	High
Polarity	Horizontal	Test distance	2m



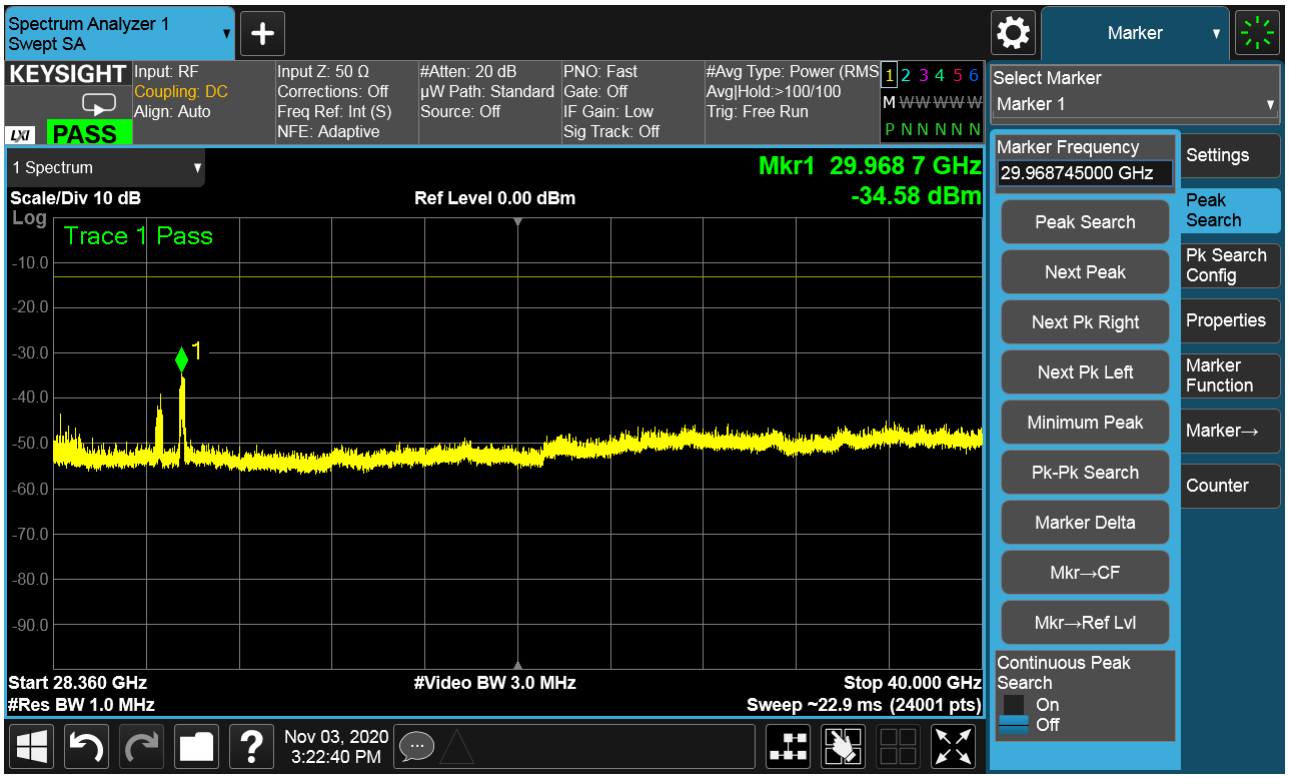
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	139
Frequency Range	28.360GHz-40GHz	Channel	High
Polarity	Vertical	Test distance	2m



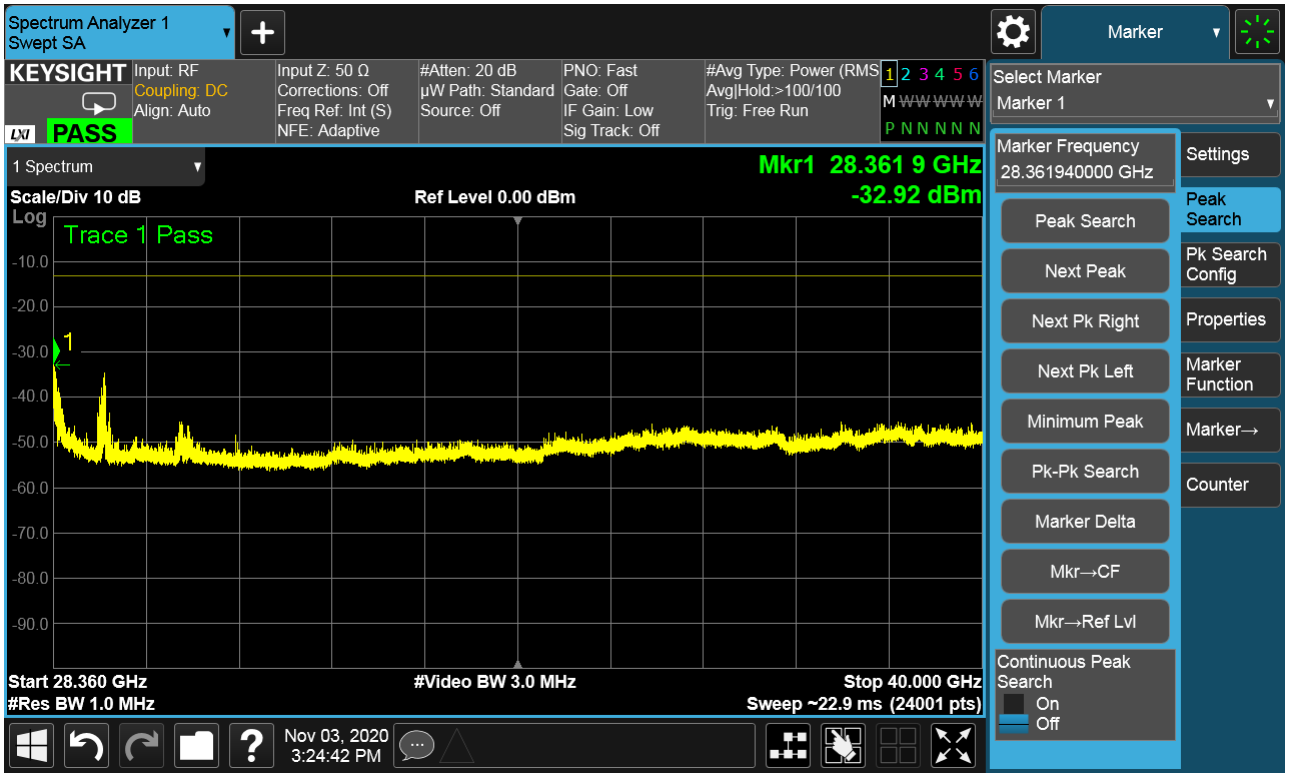
Note: The test results already include the correction factor (corrections: On).

Band	n261	Beam ID	11 + 139
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Horizontal	Test distance	2m



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

Band	n261	Beam ID	11 + 139
Frequency Range	28.360GHz-40GHz	Channel	Low
Polarity	Vertical	Test distance	2m



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

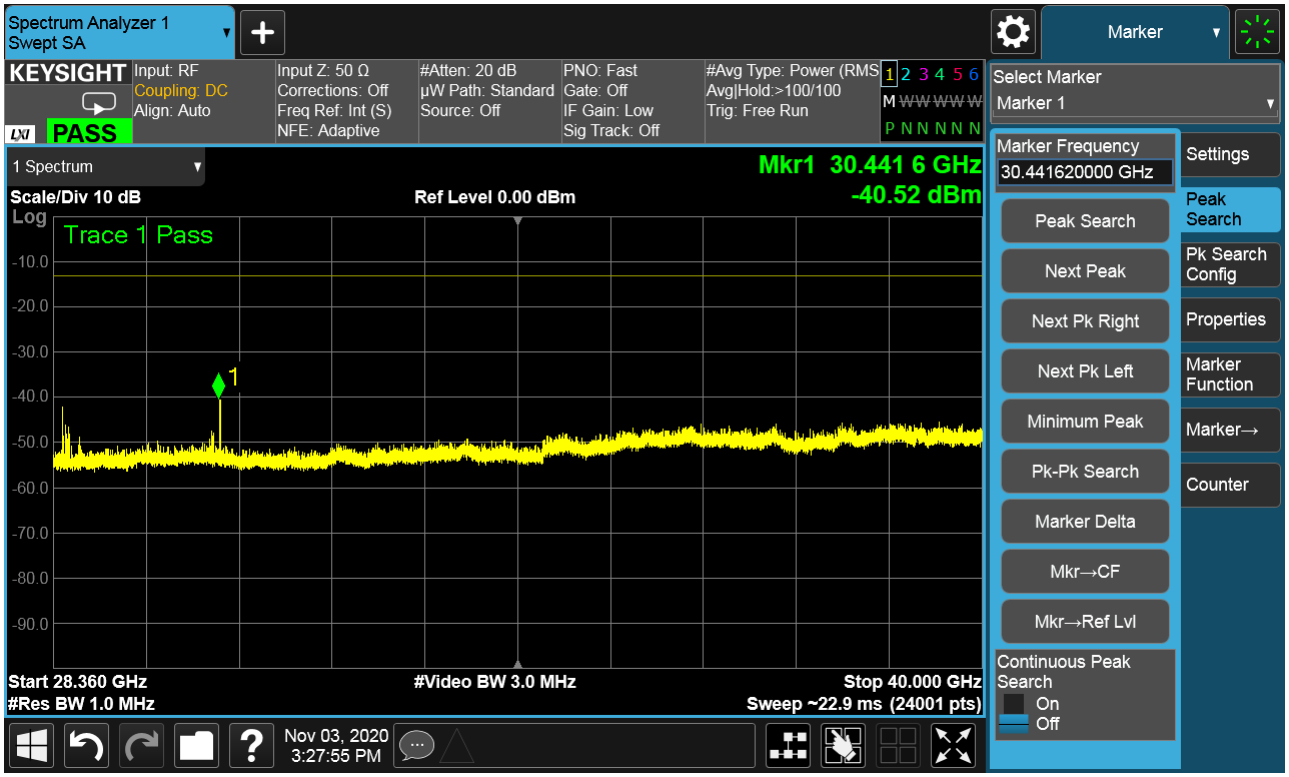
Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-32.92	-34.58	-30.66	-13	-17.66	Pass

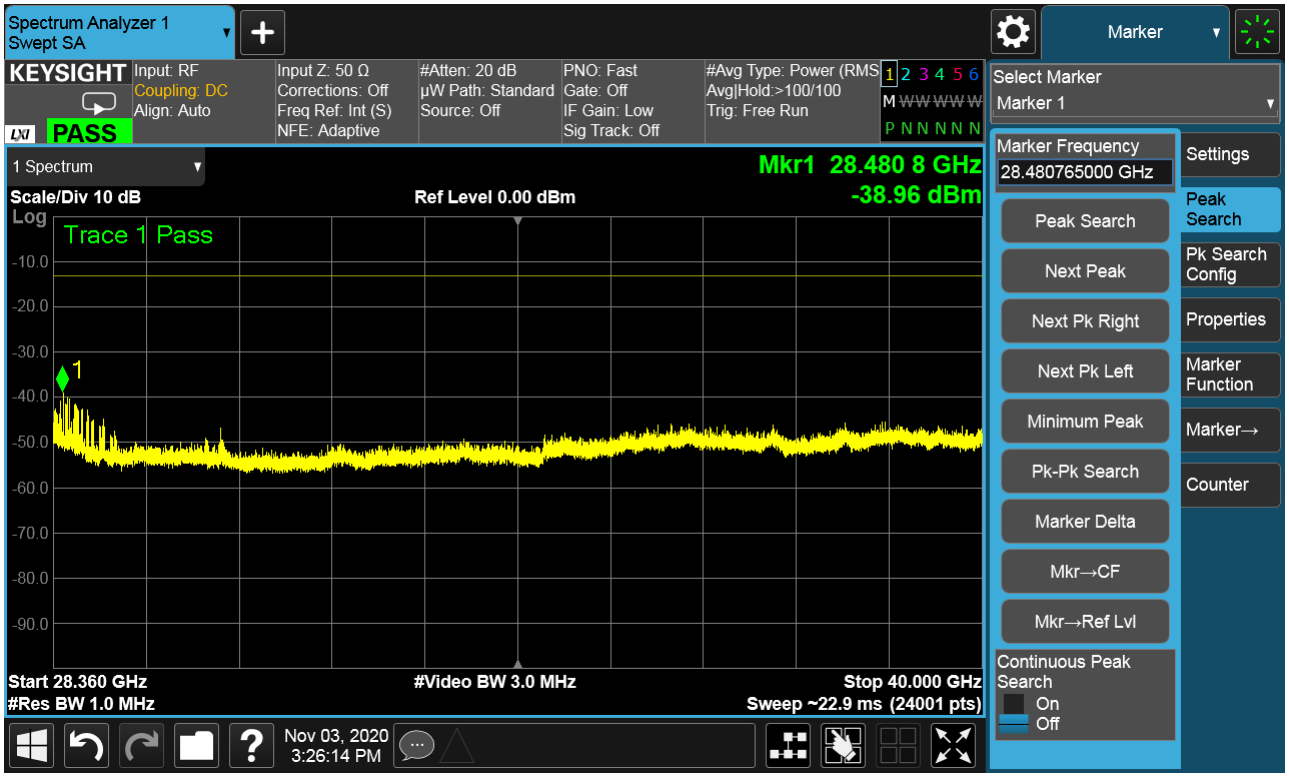
Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.

Band	n261	Beam ID	11 + 139
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Horizontal	Test distance	2m



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

Band	n261	Beam ID	11 + 139
Frequency Range	28.360GHz-40GHz	Channel	Middle
Polarity	Vertical	Test distance	2m



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

Summary of MIMO Beam Out-of Band Emission:

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	EIRP for V Beam (dBm)	EIRP for H Beam (dBm)	EIRP for V+H Beam (dBm)	Limit(dBm)	Margin(dB)	Result
11 + 139	-38.96	-40.52	-36.66	-13	-23.66	Pass

Note: EIRP (V+H) = EIRP (V) + EIRP (H) = 10*Log10 (10^ (V_{dBm}) + 10^ (H_{dBm}))
Margin (dB) = EIRP (V+H) – Limit.