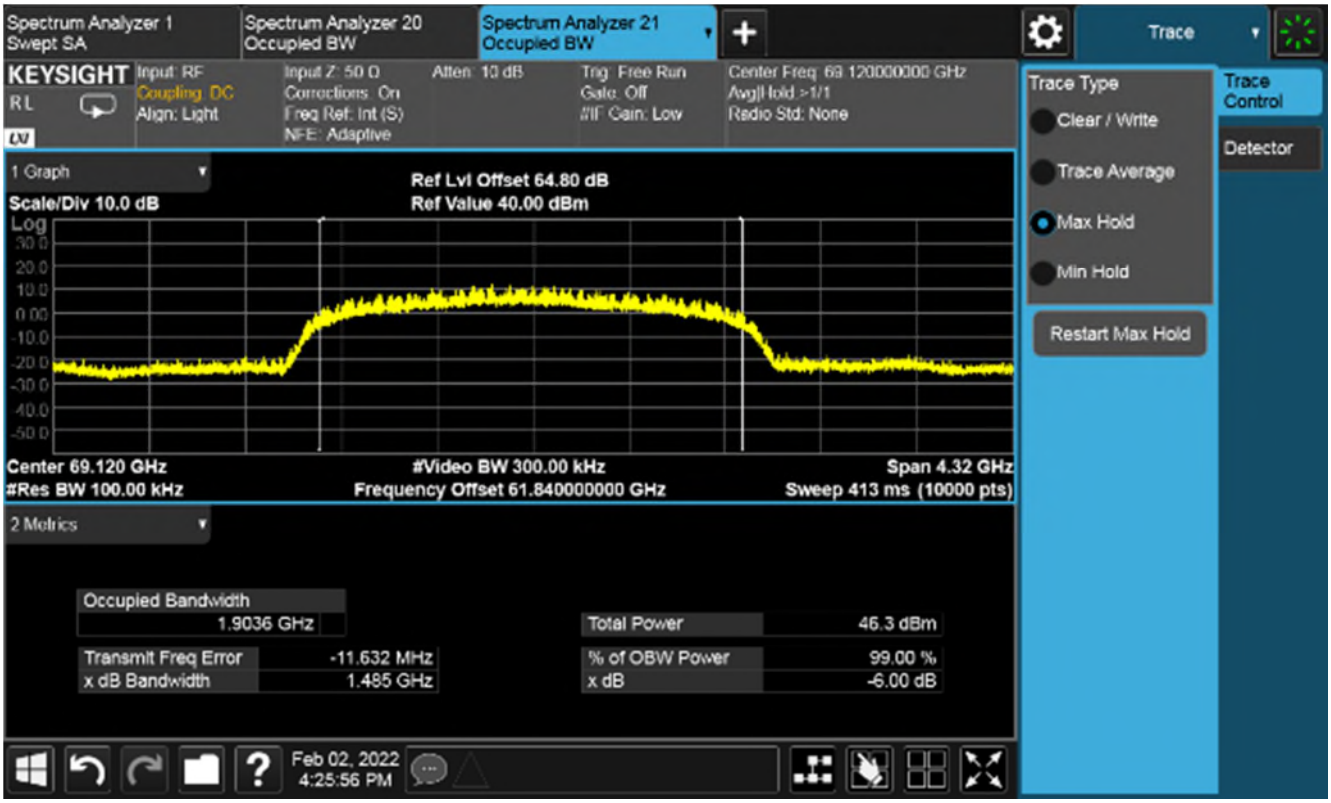
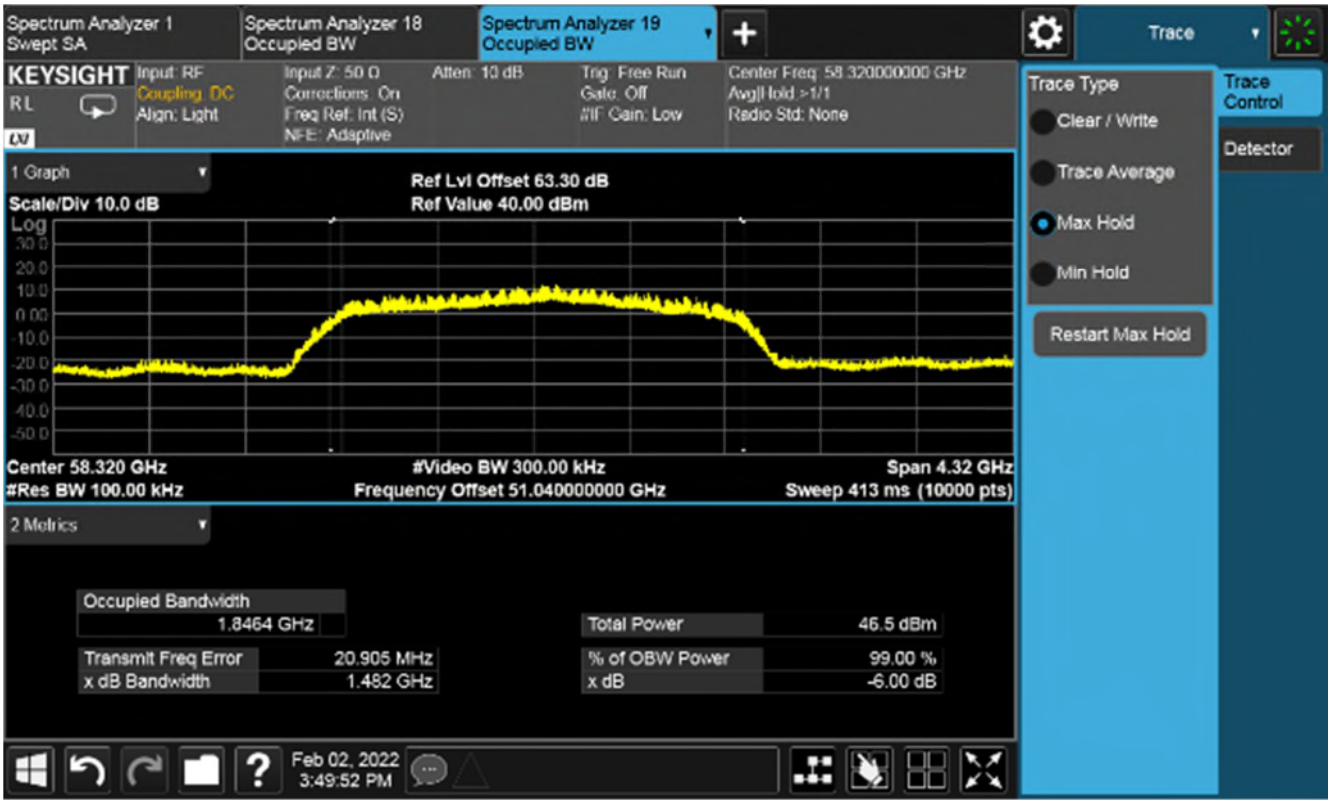
RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS2, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS2, Channel 58.32 GHz

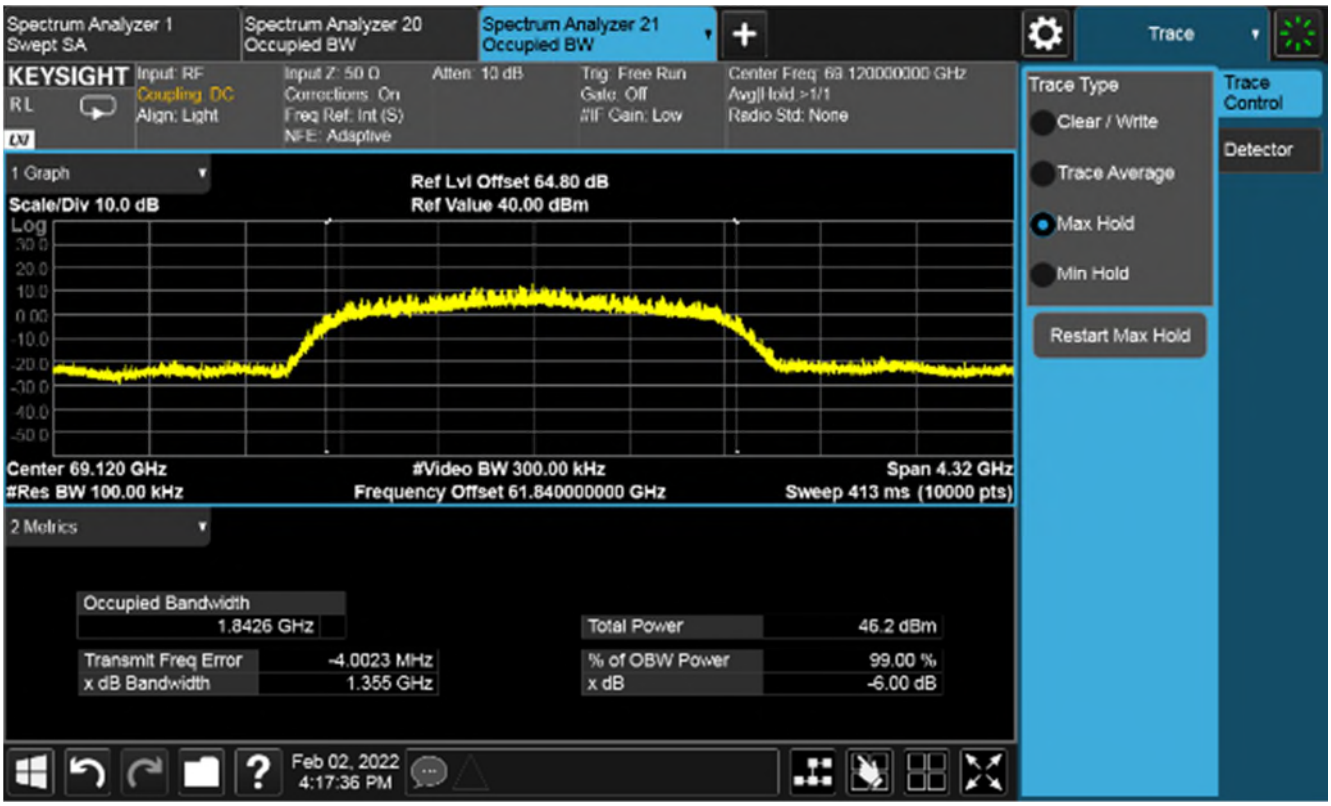


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS2, Channel 64.8 GHz

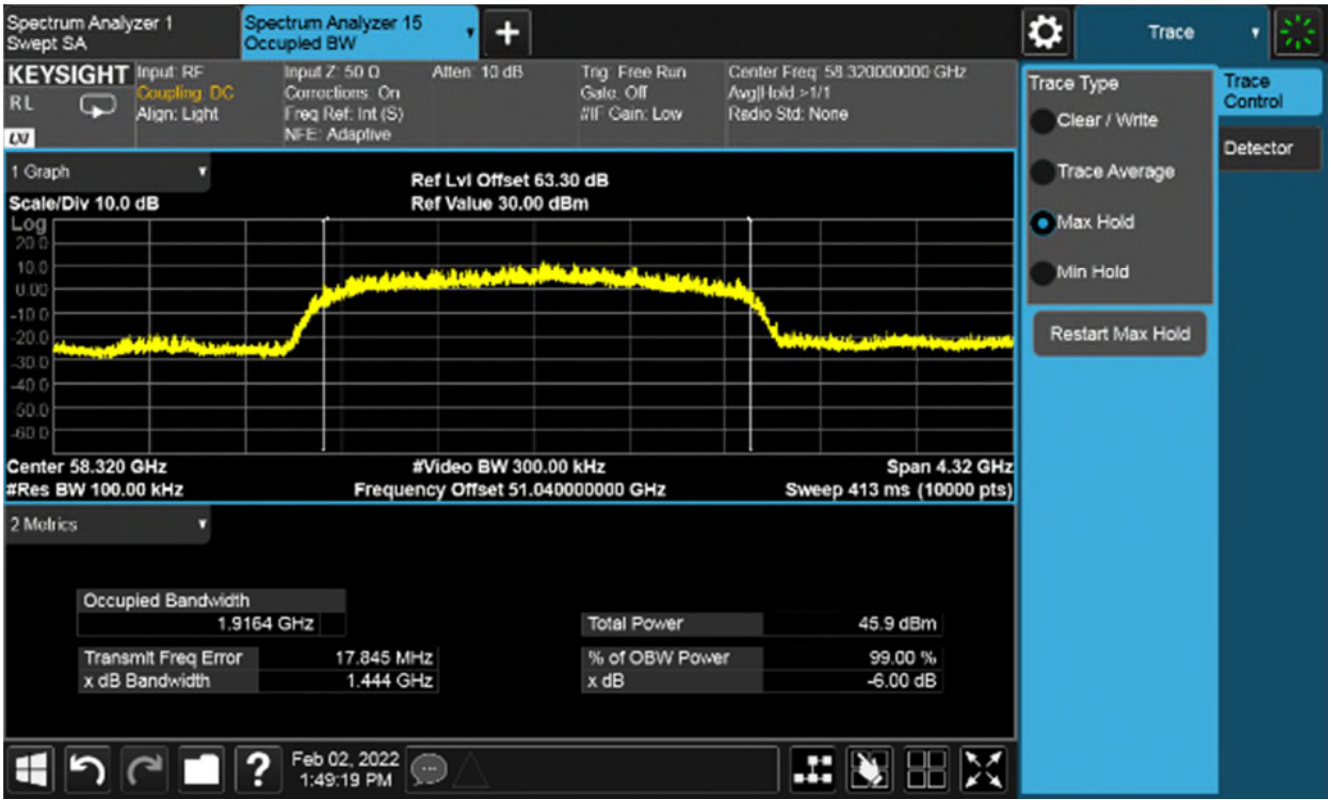
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS2, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 58.32 GHz

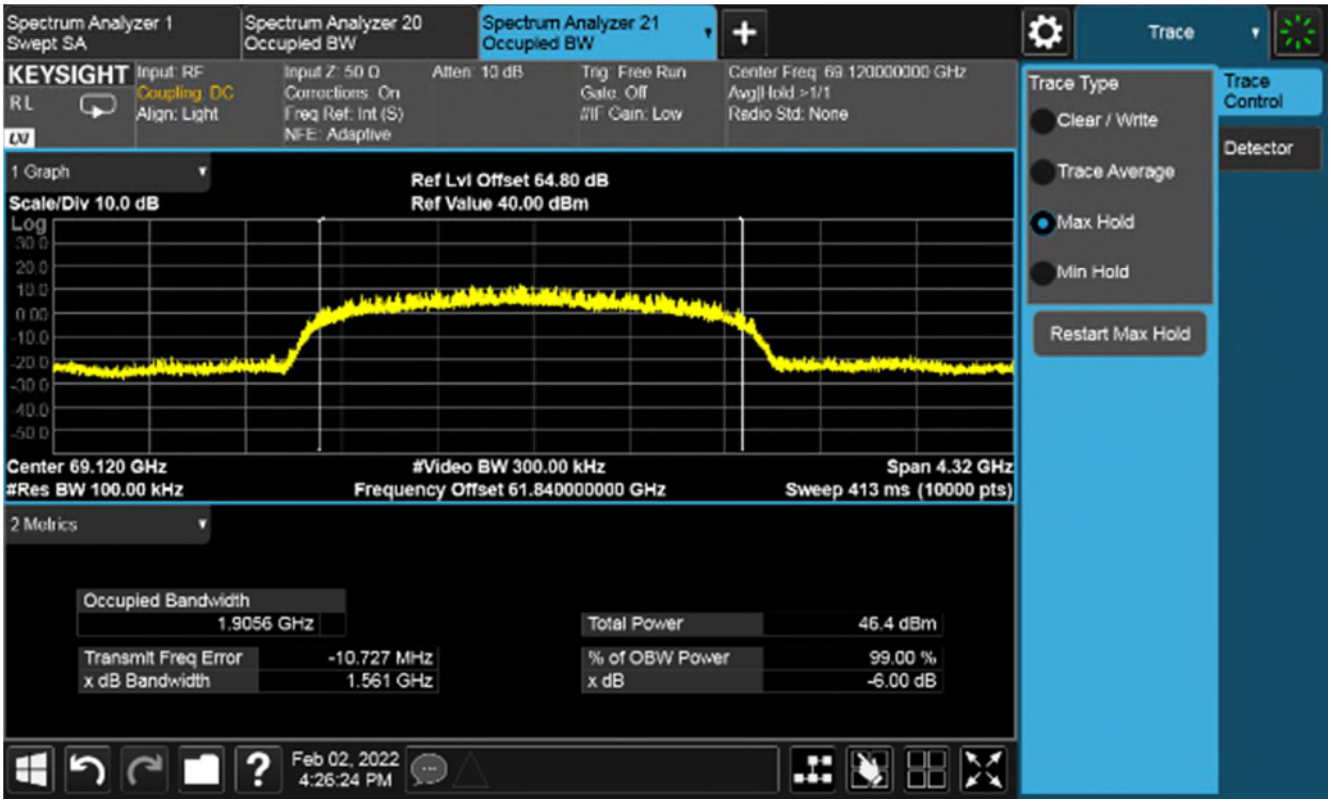


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 64.8 GHz

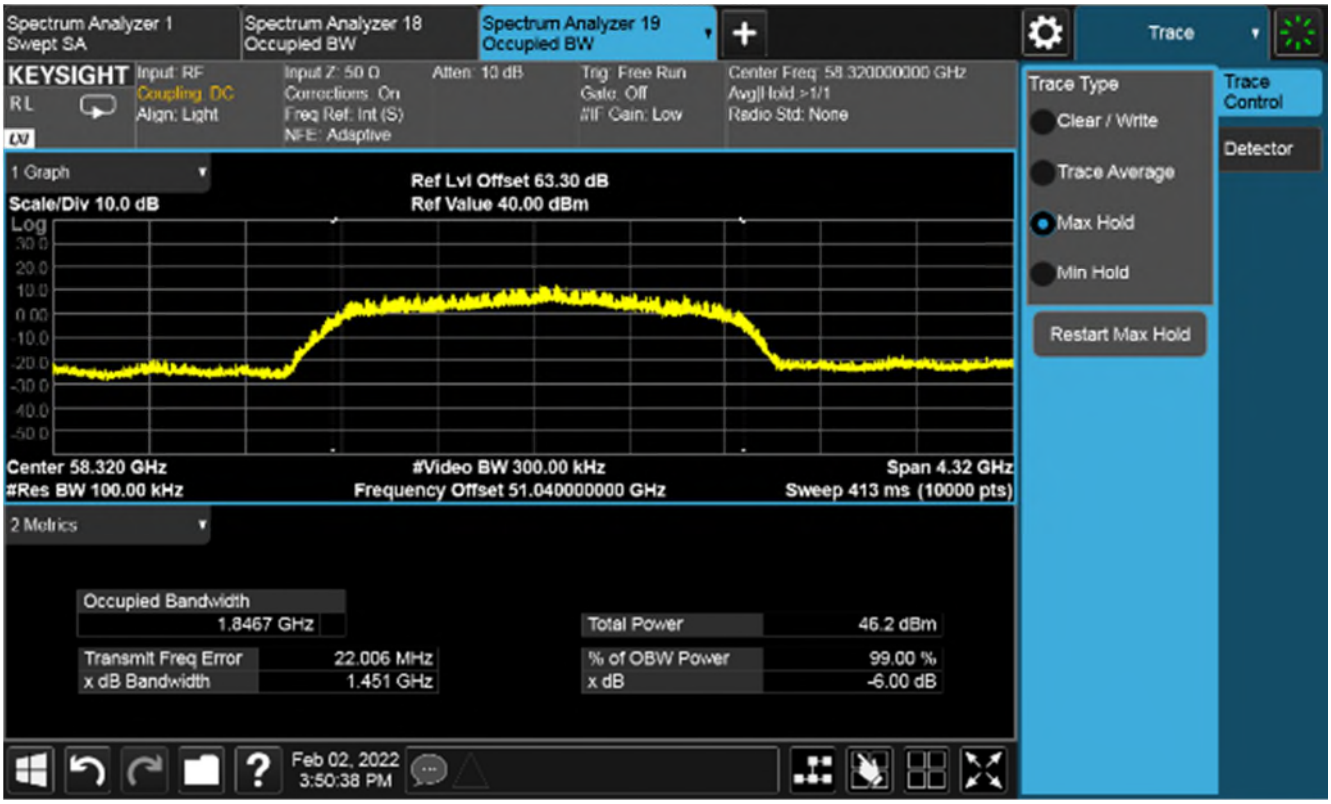
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 58.32 GHz

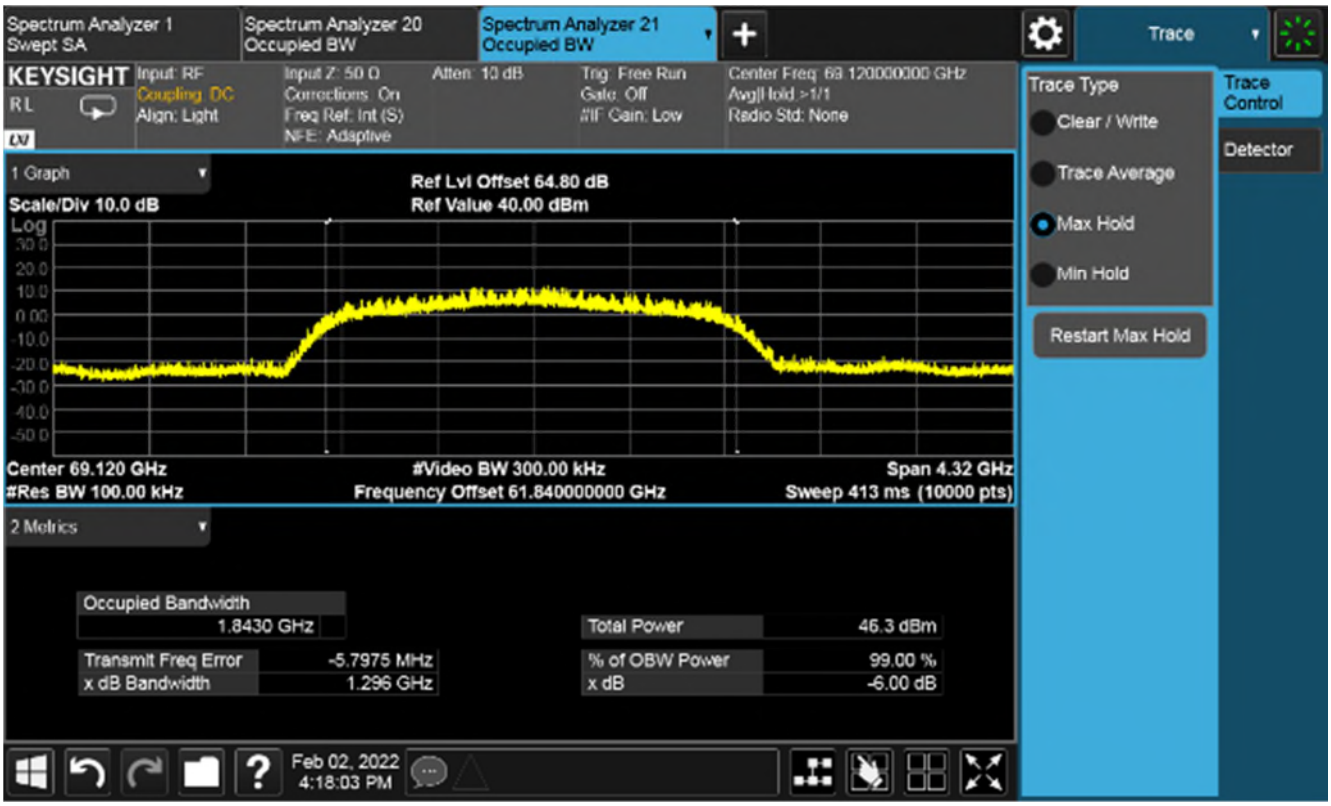


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 64.8 GHz

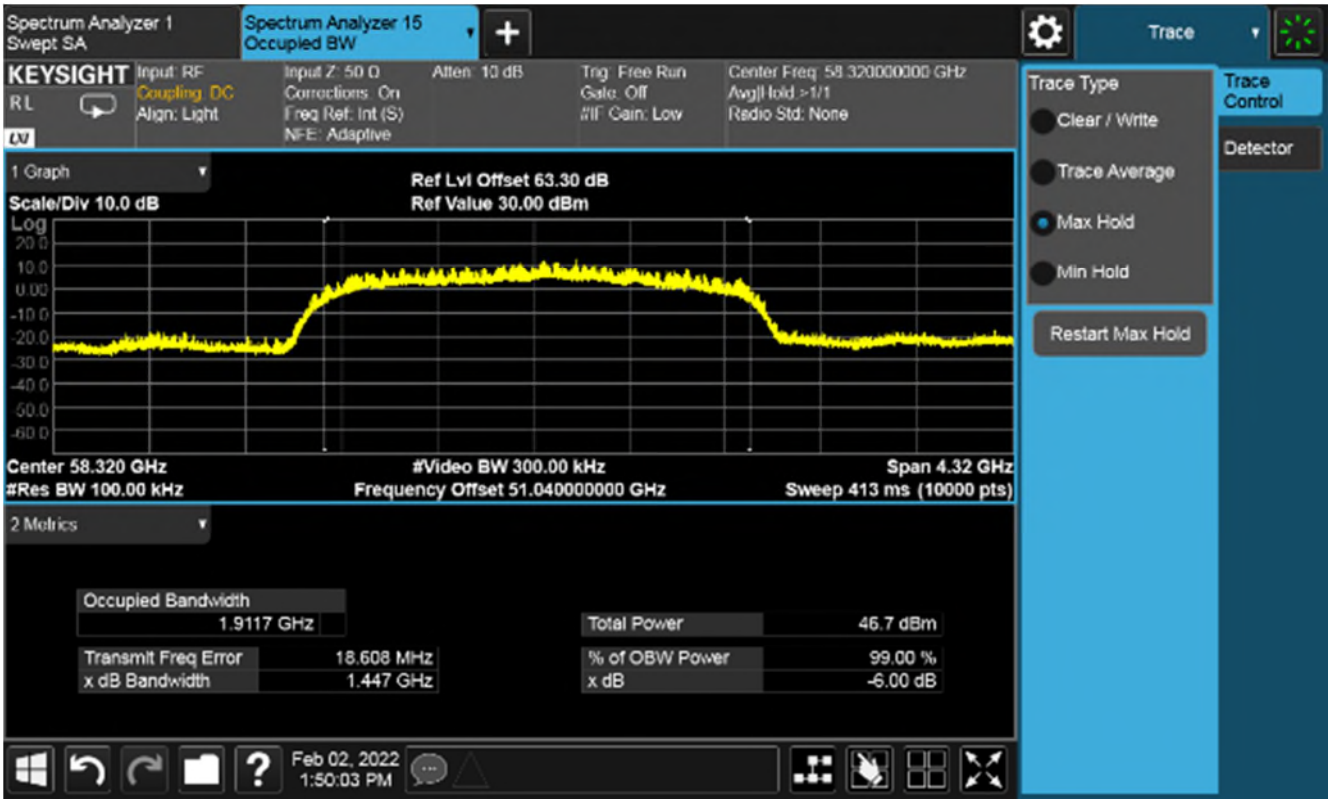
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS3, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 58.32 GHz

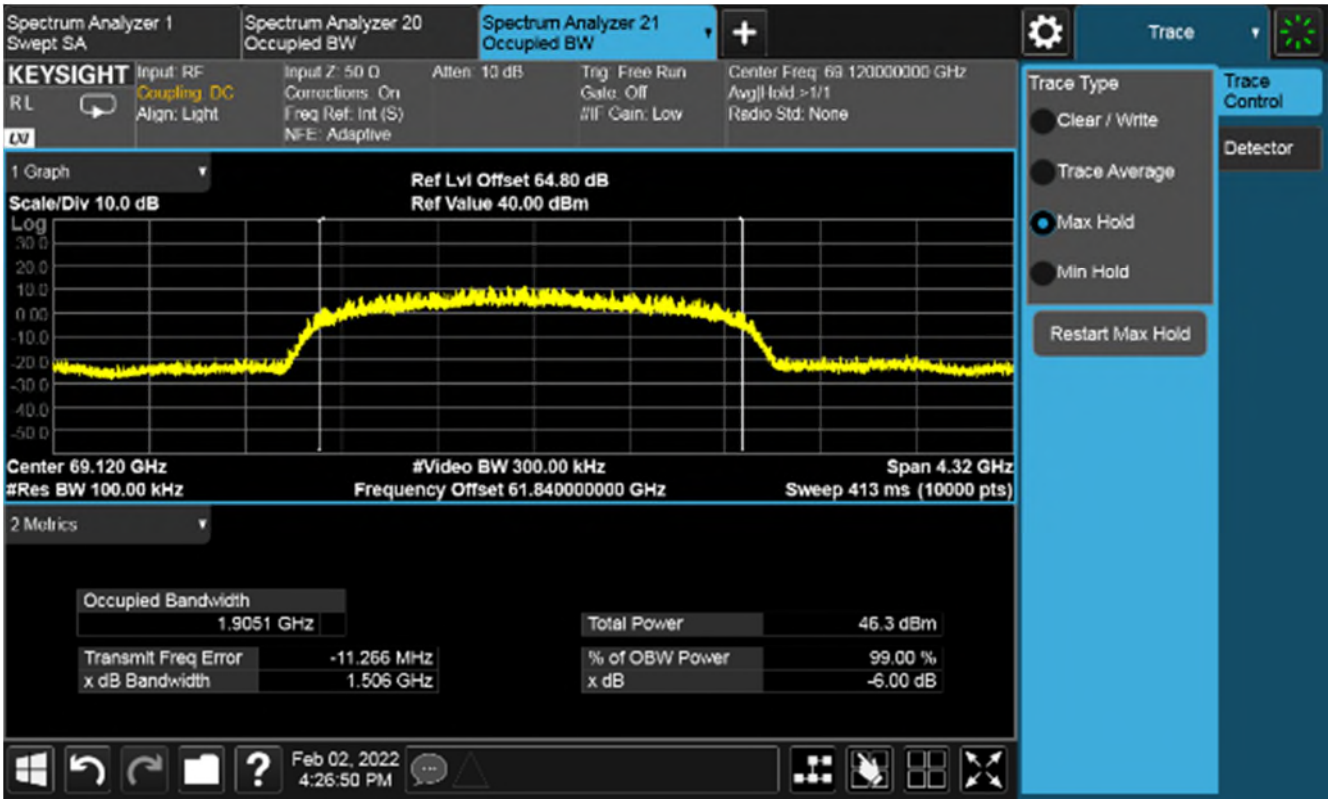


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 64.8 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

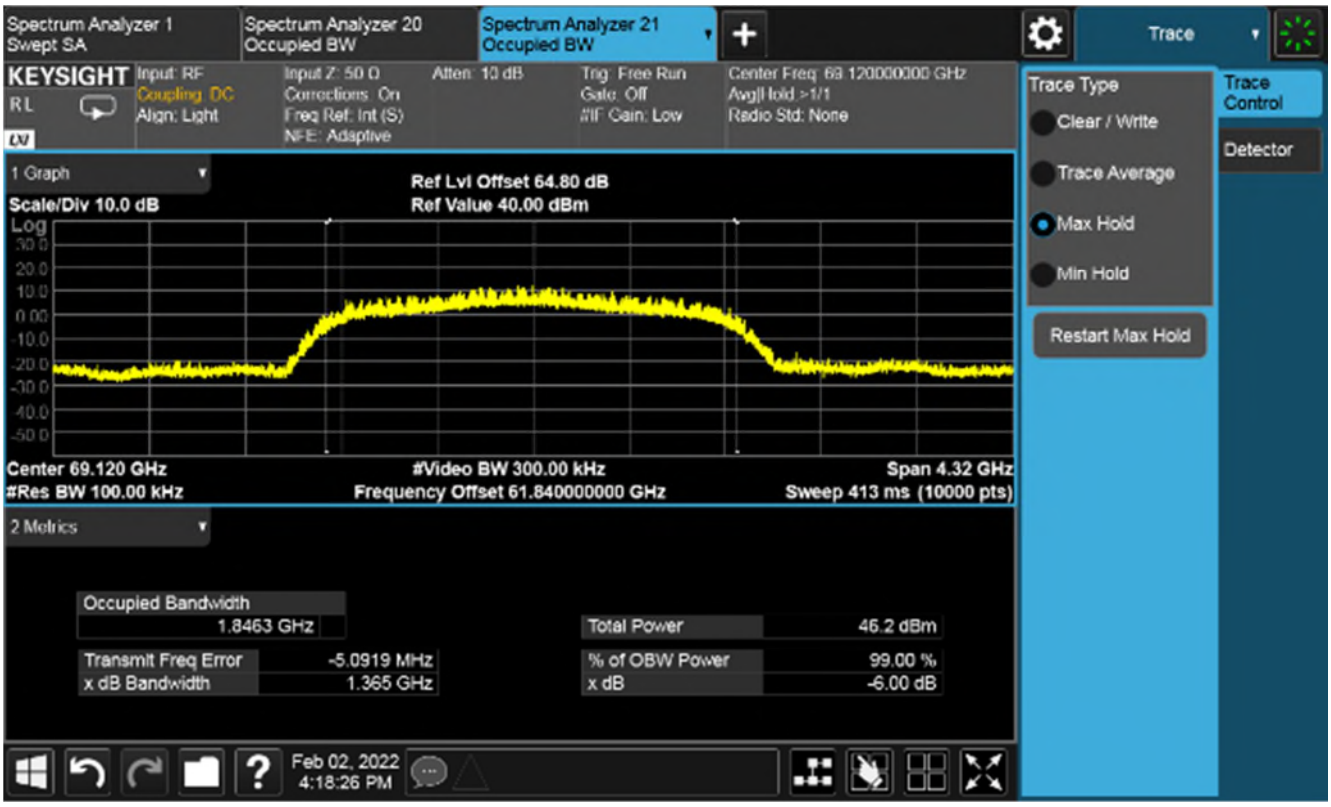
RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 58.32 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 64.8 GHz

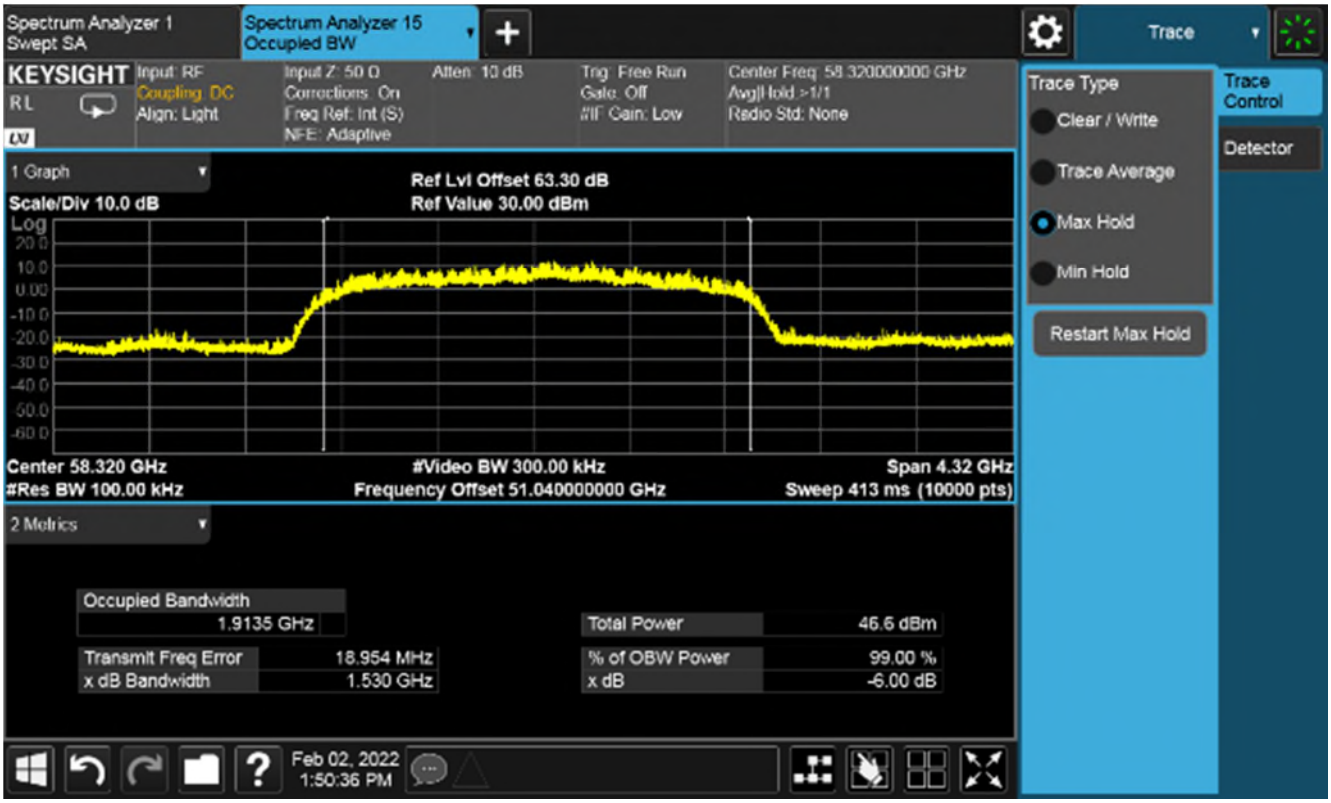
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS4, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 58.32 GHz

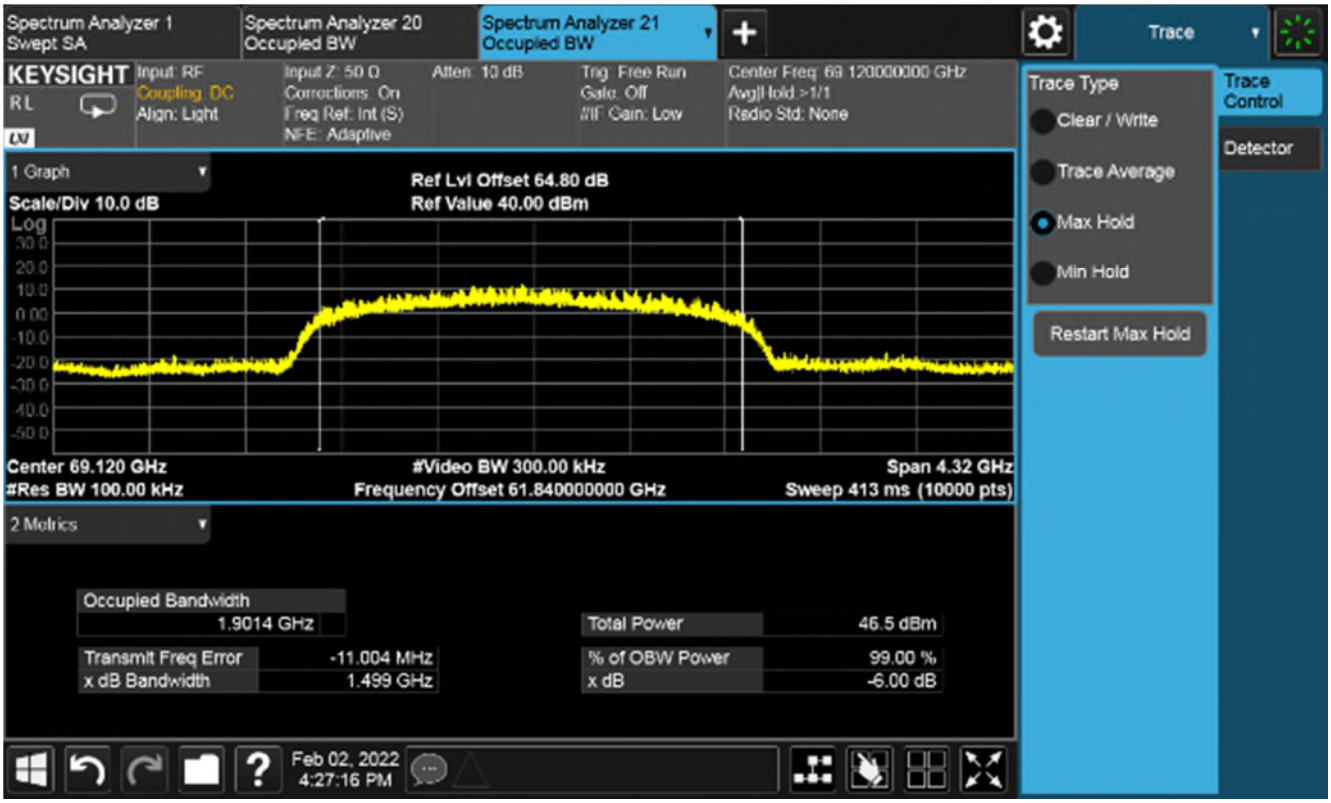


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 64.8 GHz

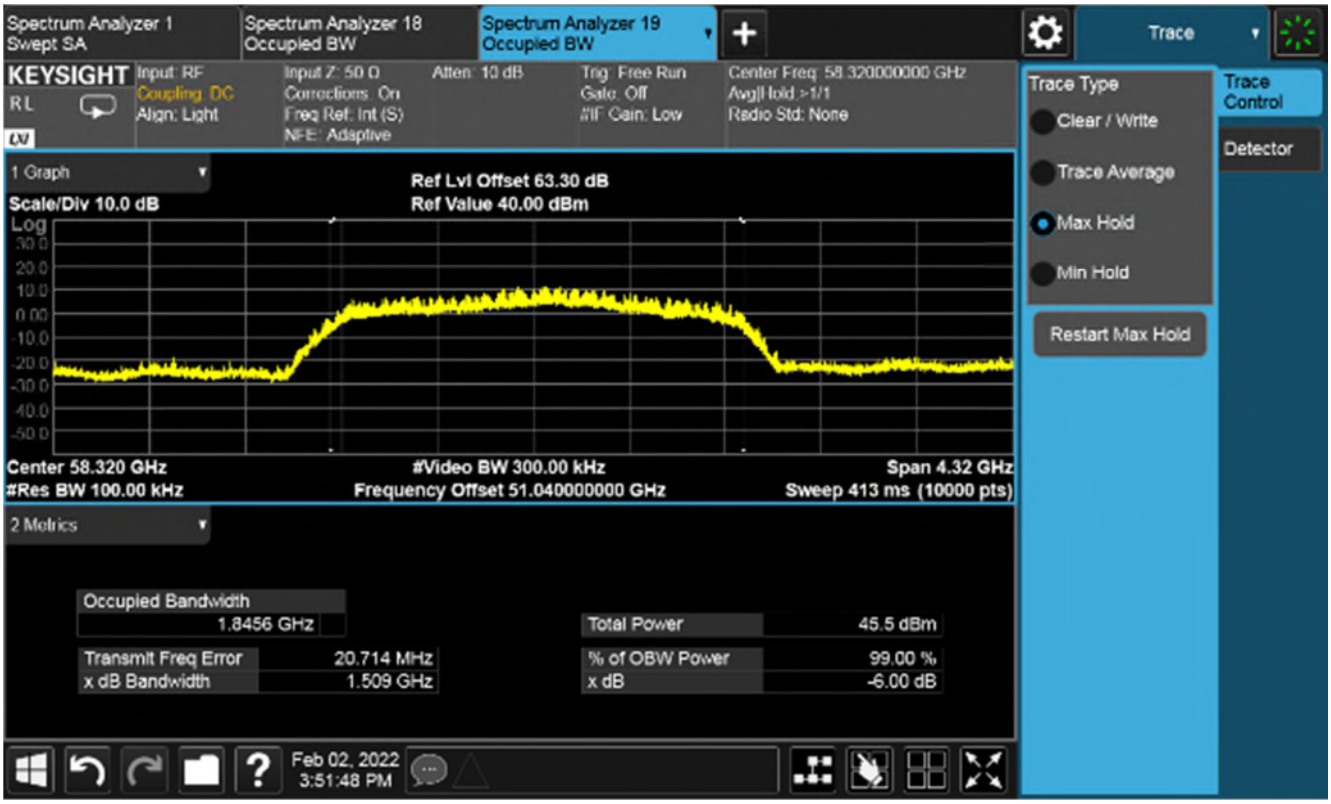
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 69.12 GHz



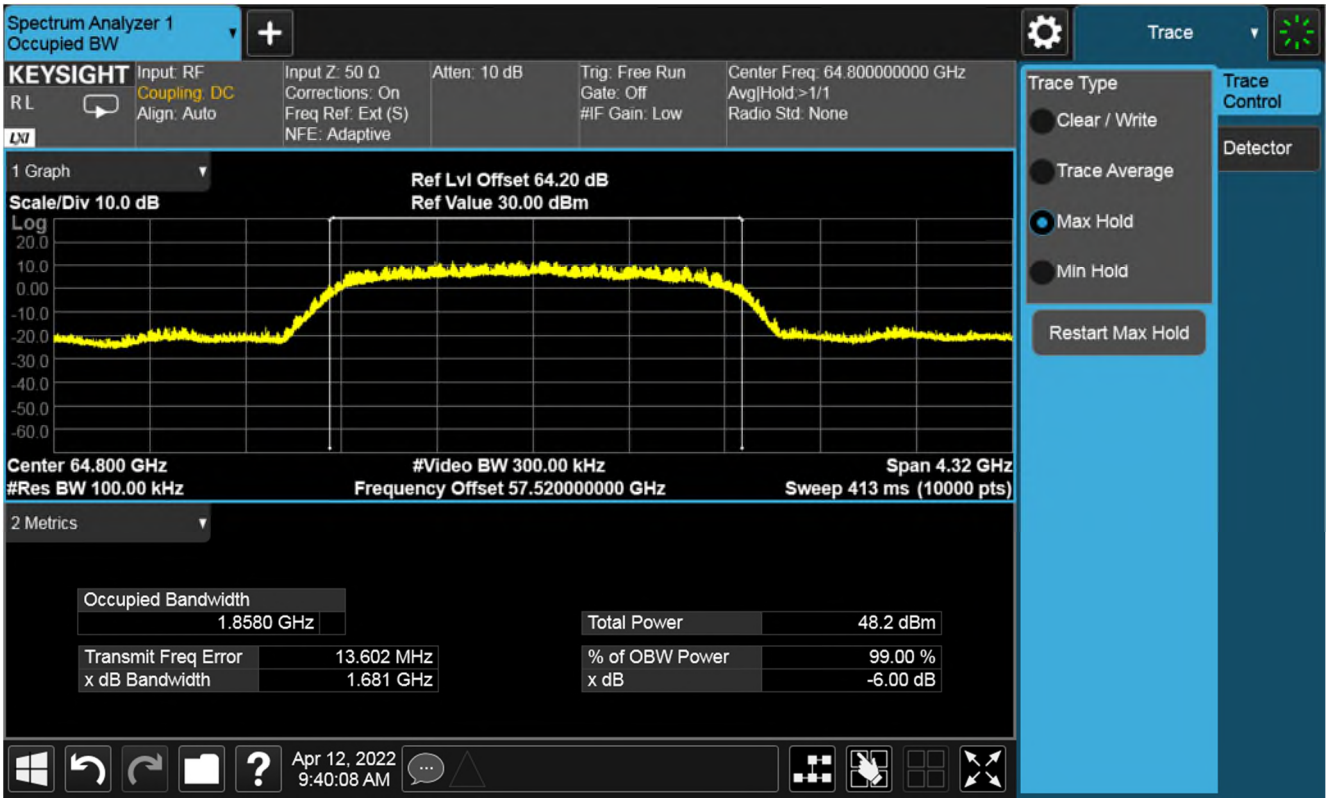
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 58.32 GHz



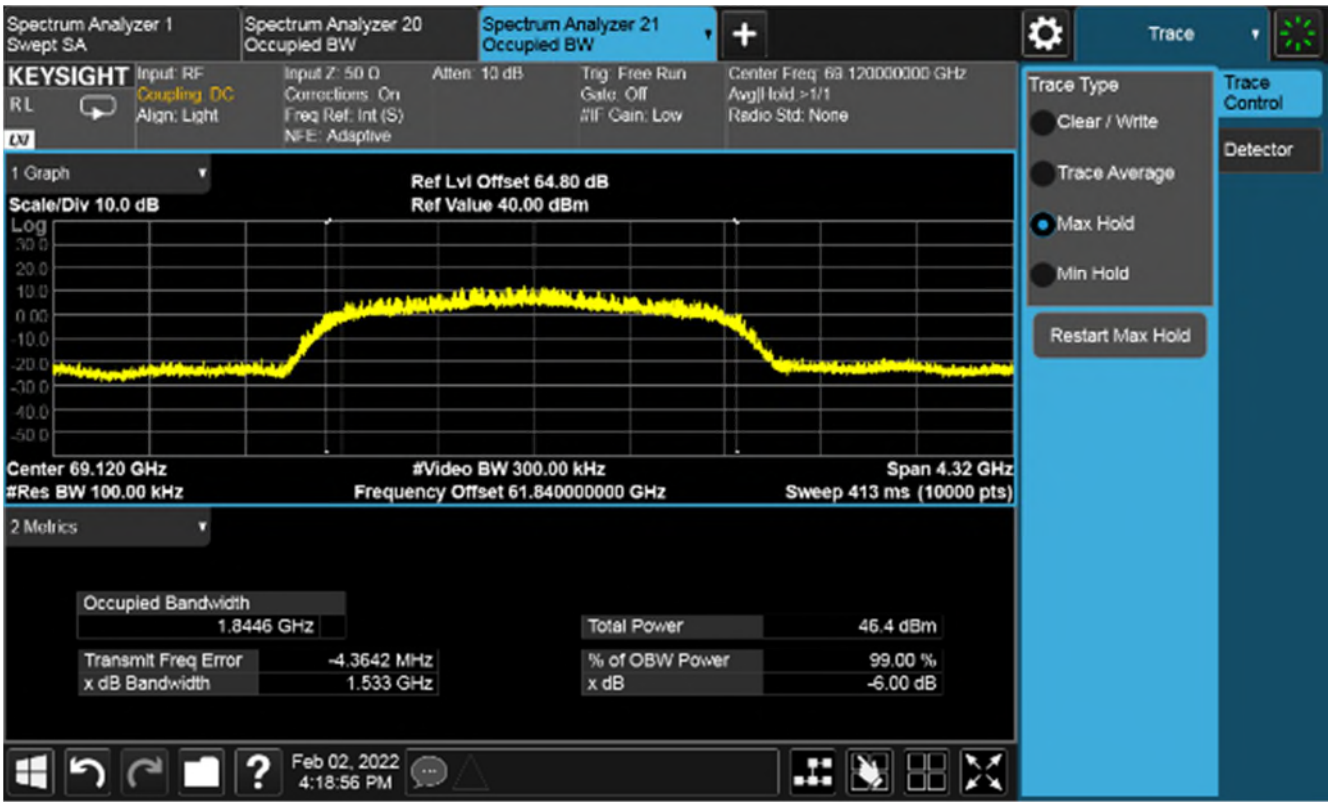
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 64.8 GHz



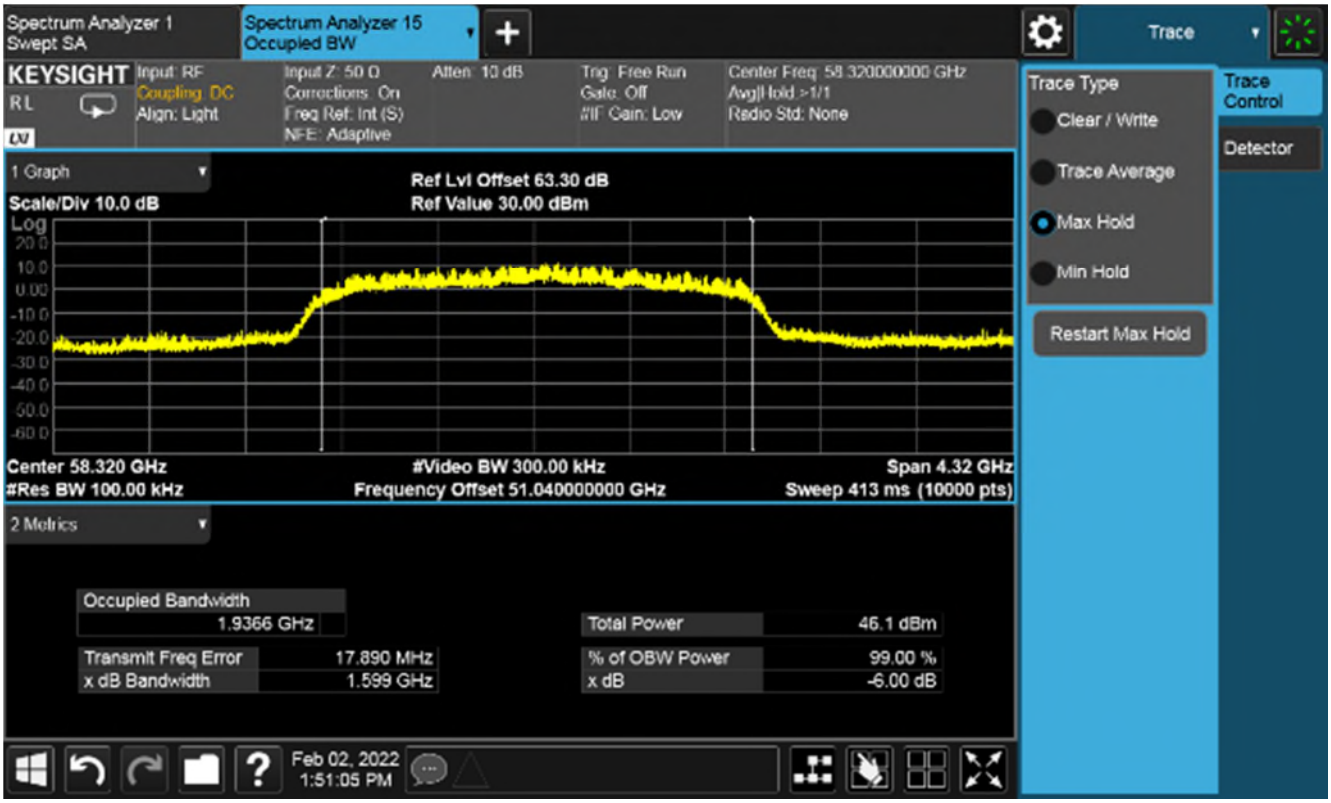
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS5, Channel 69.12 GHz



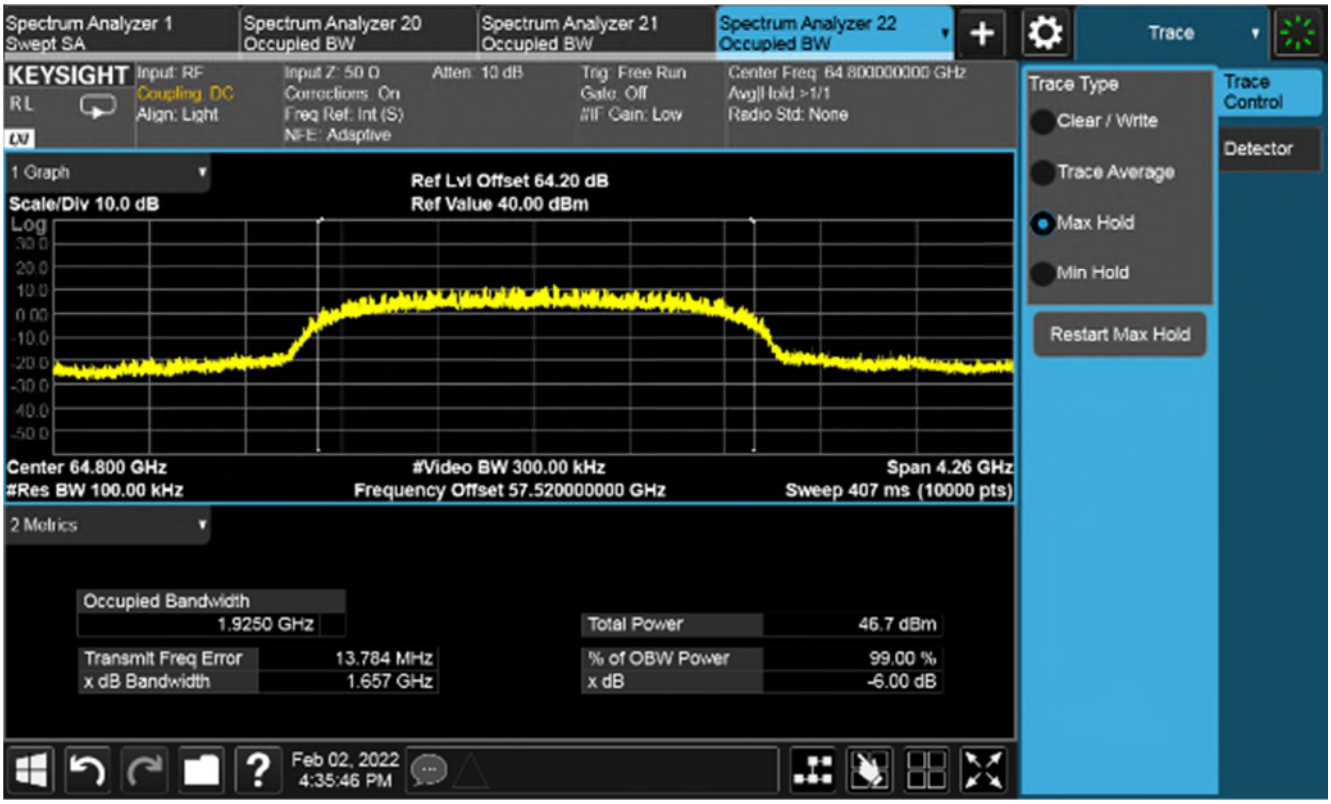
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 58.32 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 64.8 GHz

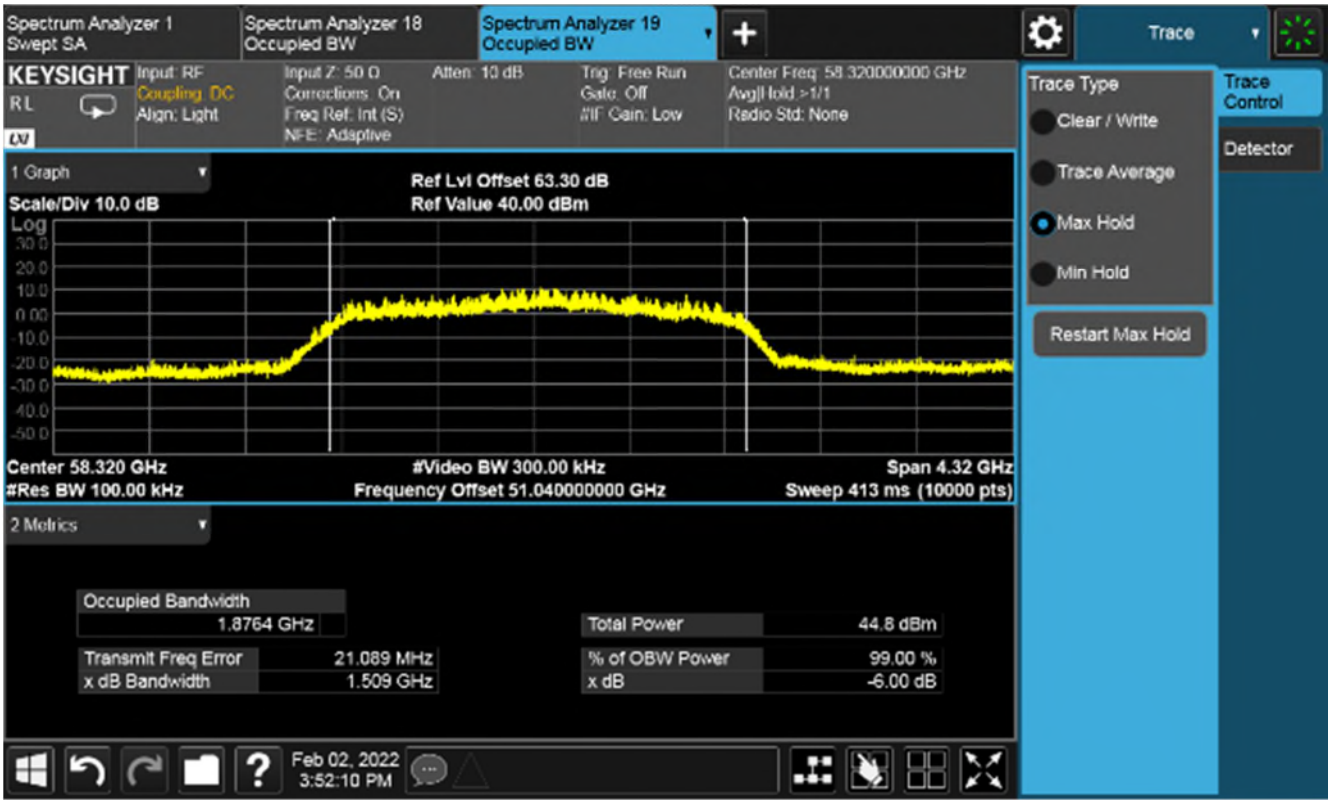


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 69.12 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 58.32 GHz

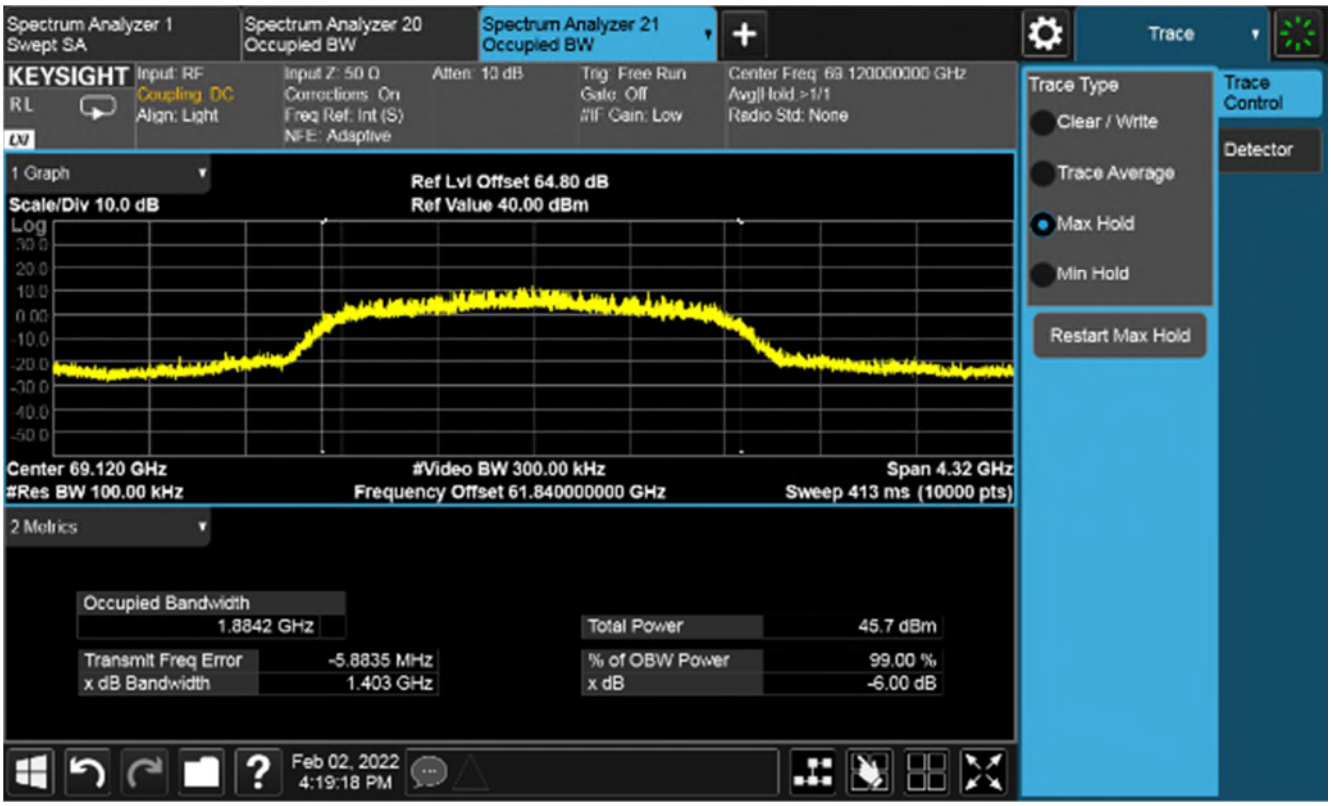


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 64.8 GHz

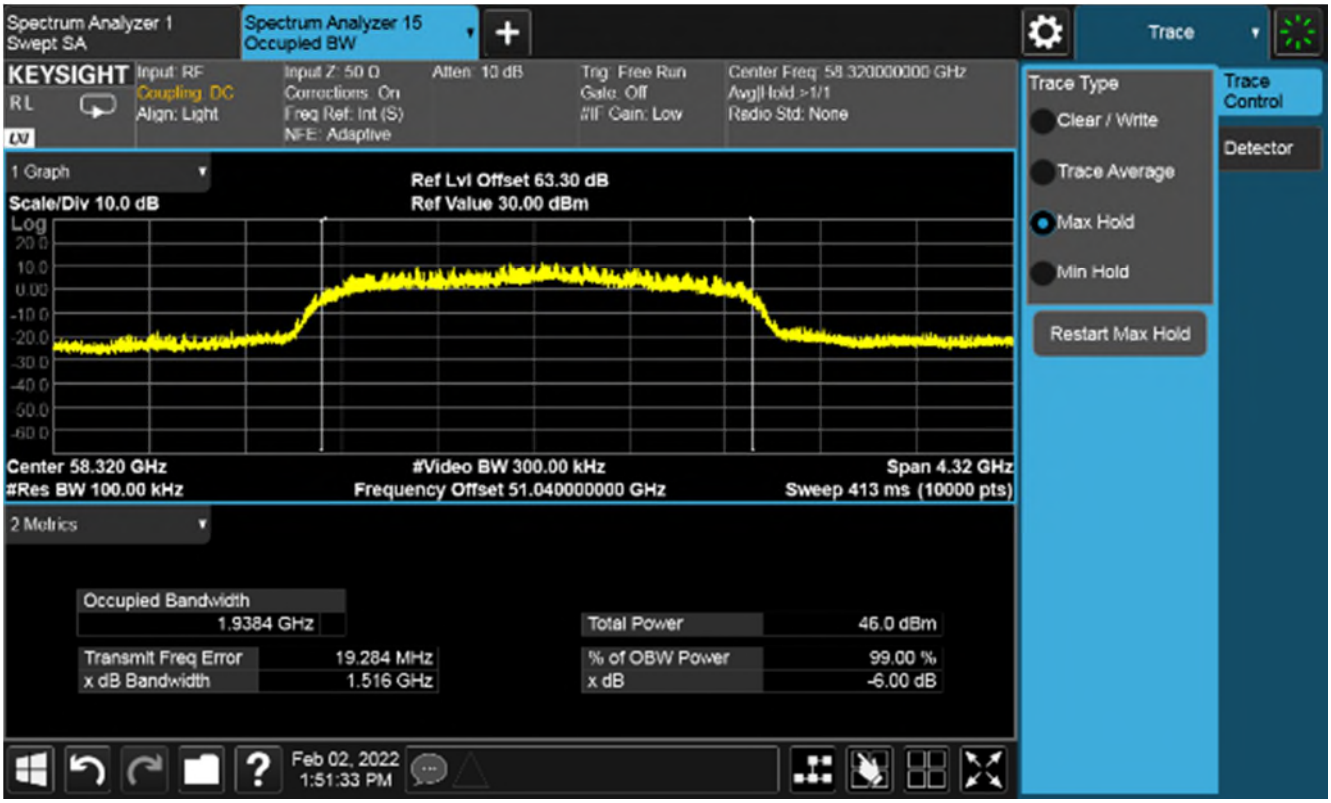
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS6, Channel 69.12 GHz



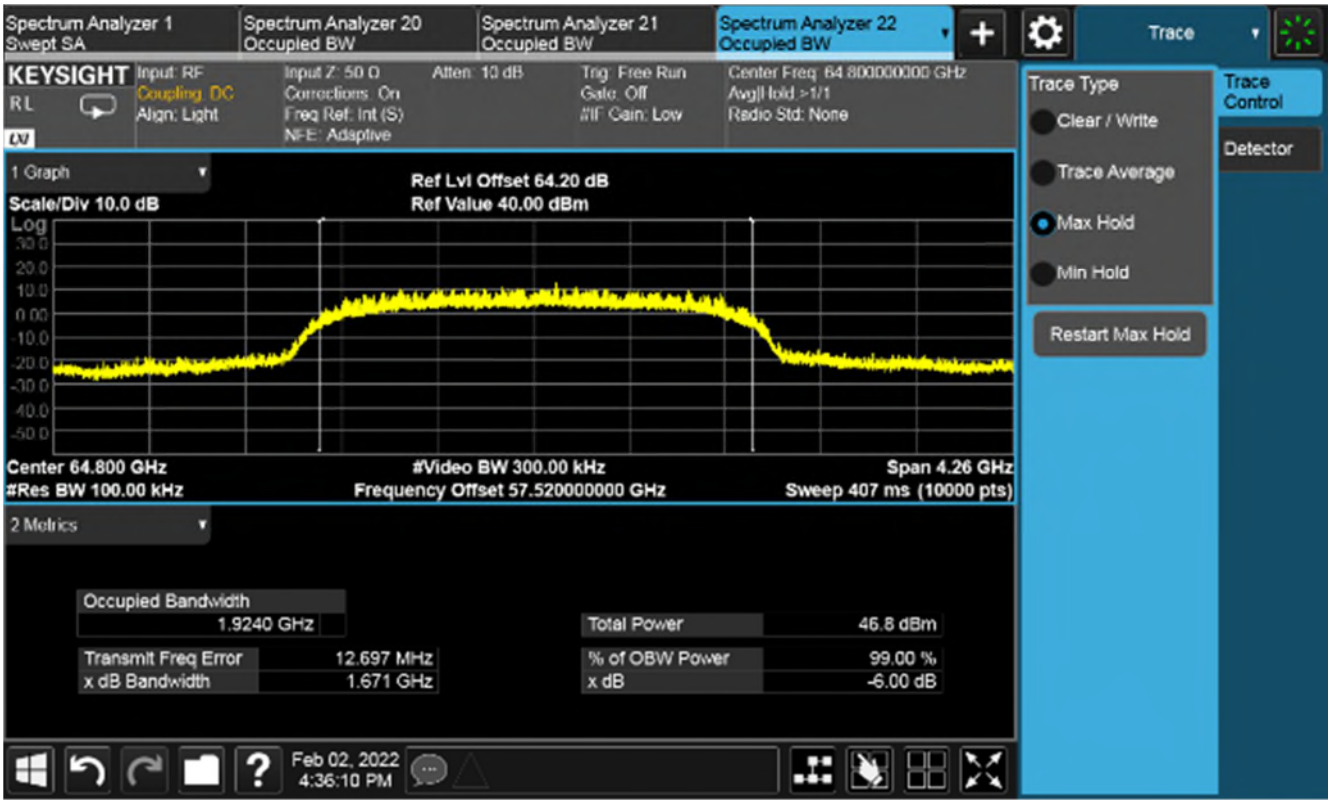
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 58.32 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 64.8 GHz

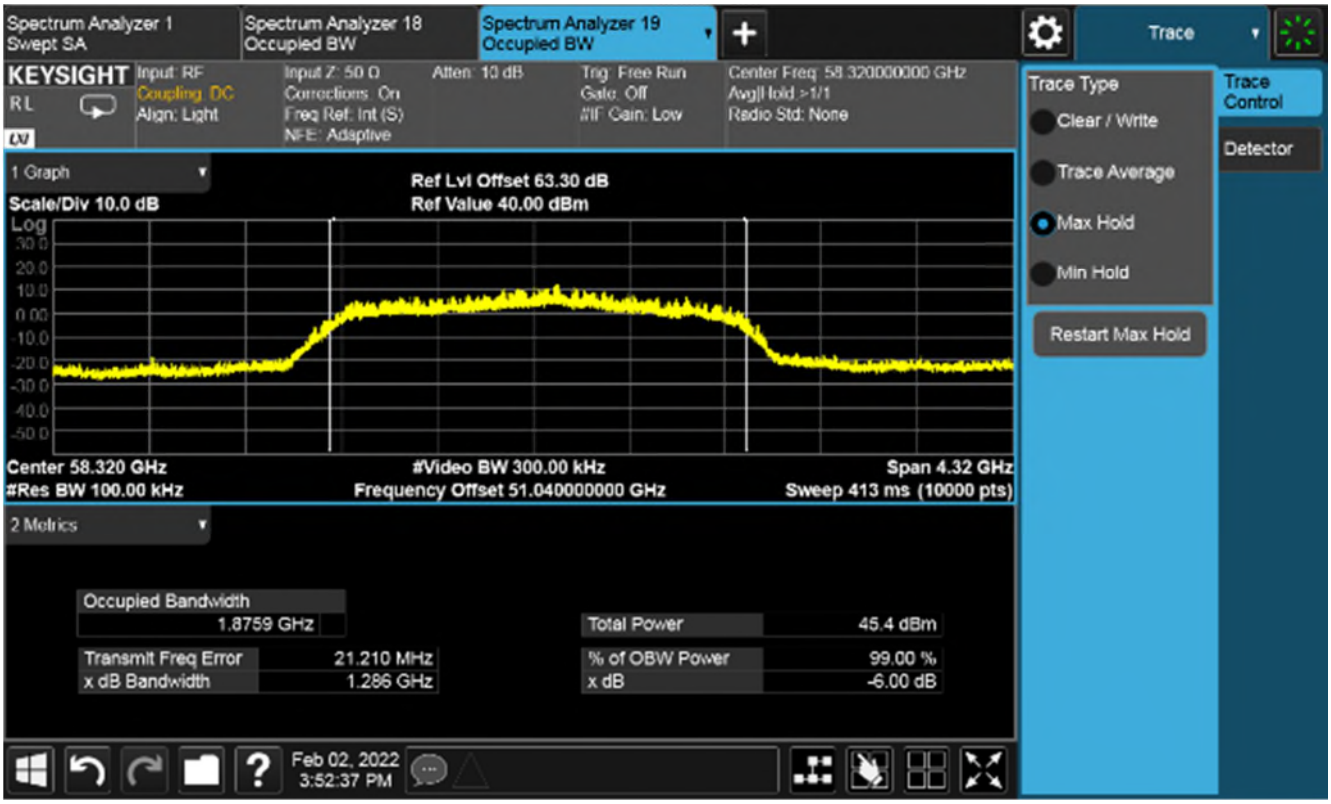


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 69.12 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 58.32 GHz

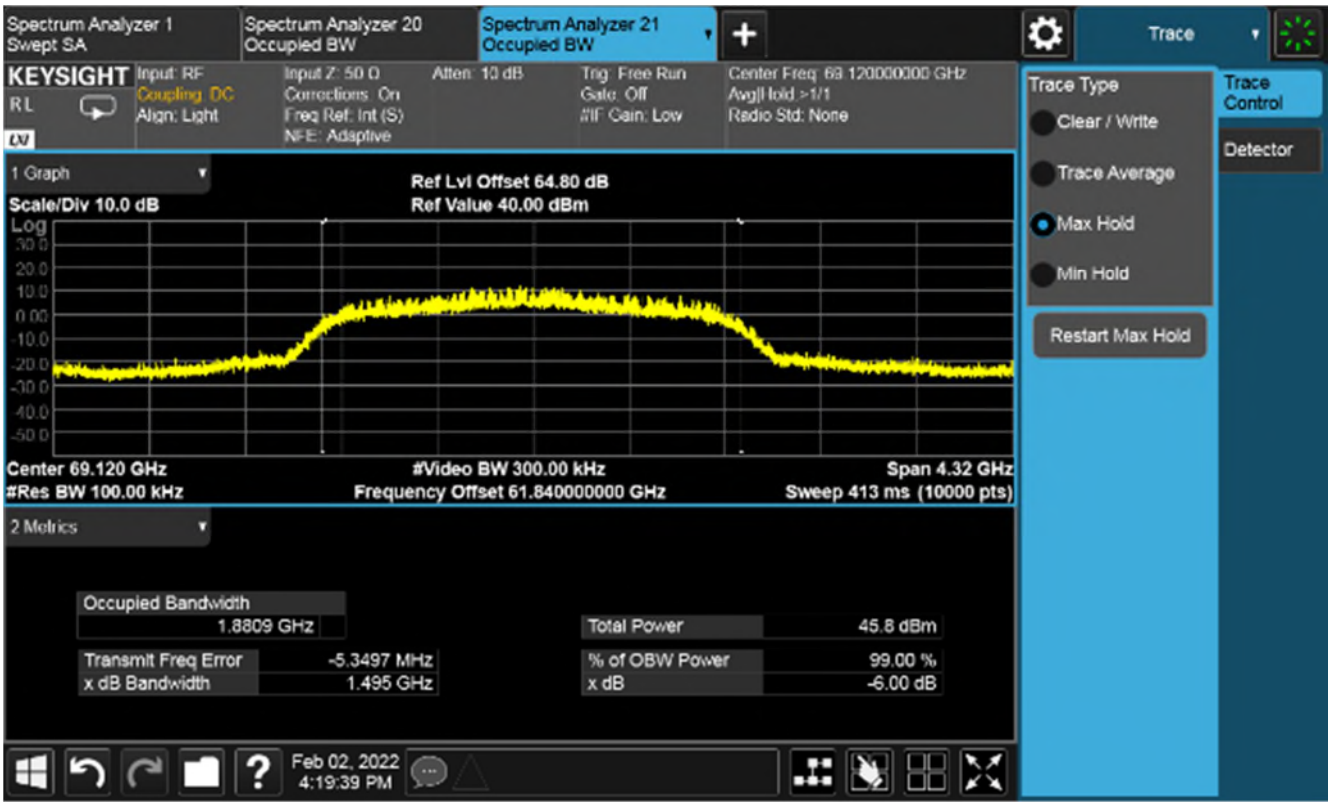


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 64.8 GHz

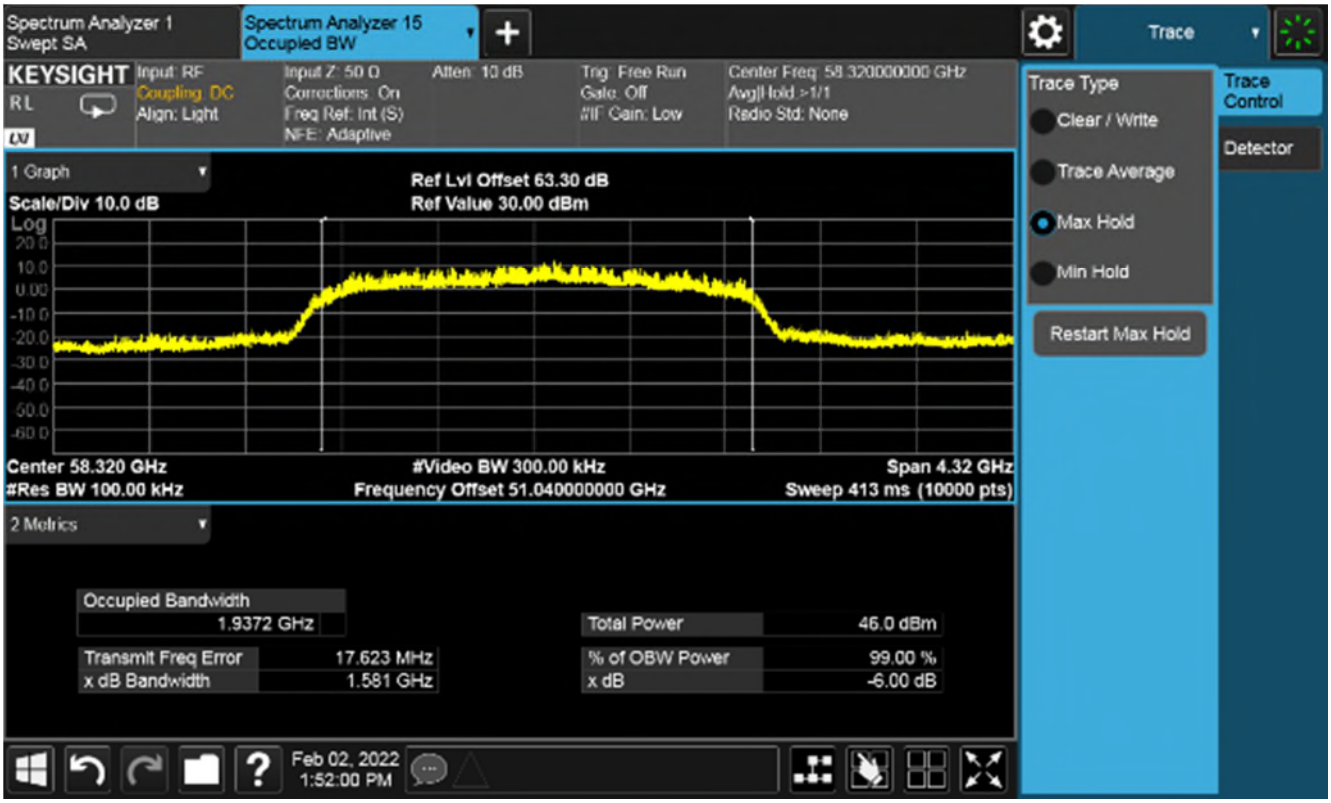
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS7, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 58.32 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

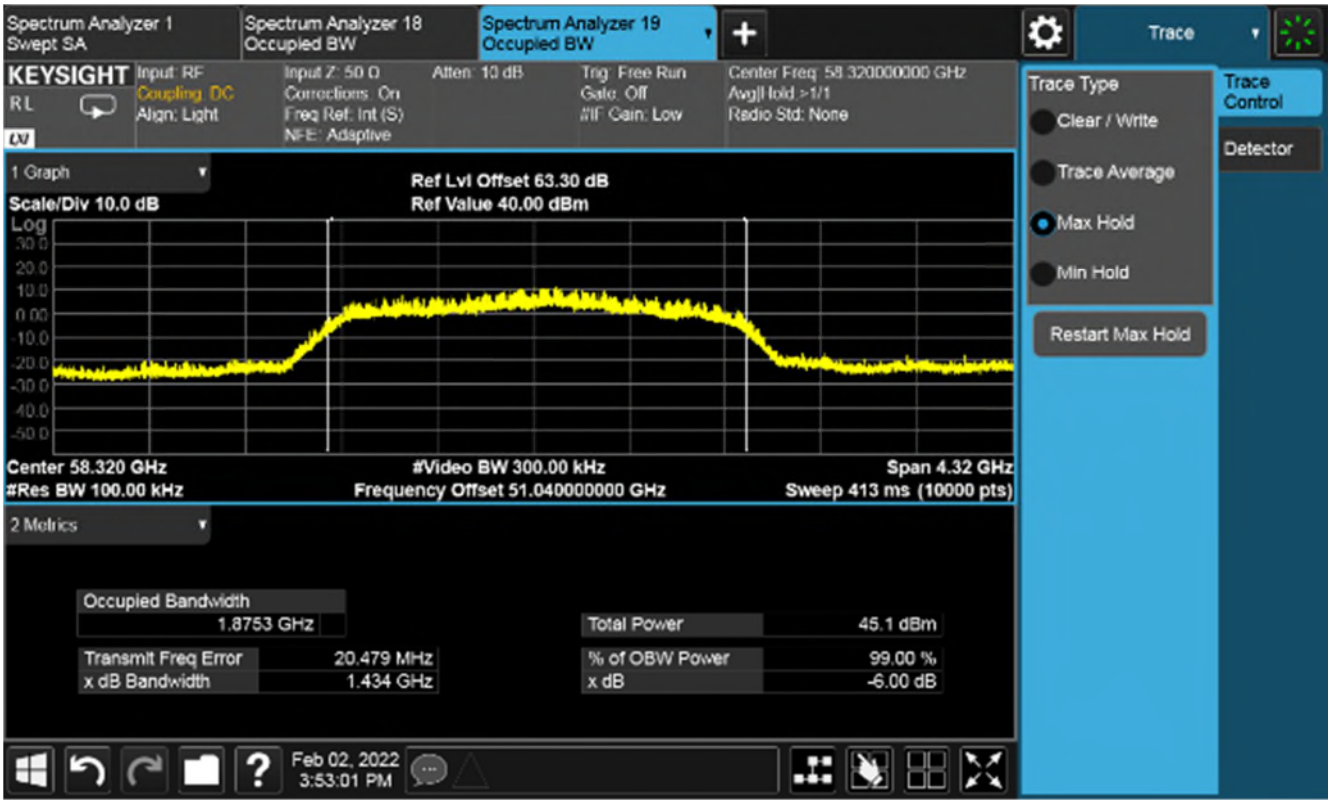
RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 64.8 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 69.12 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 58.32 GHz

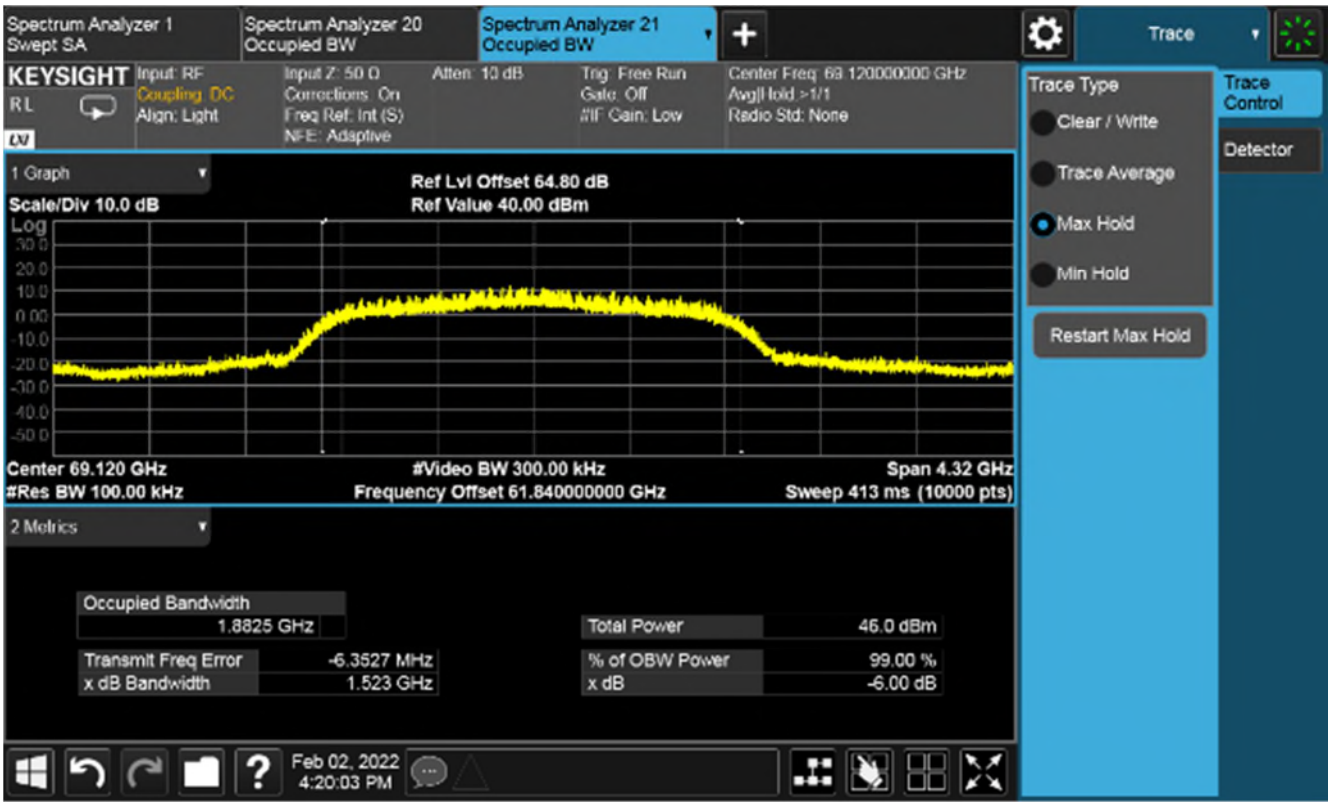


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 64.8 GHz

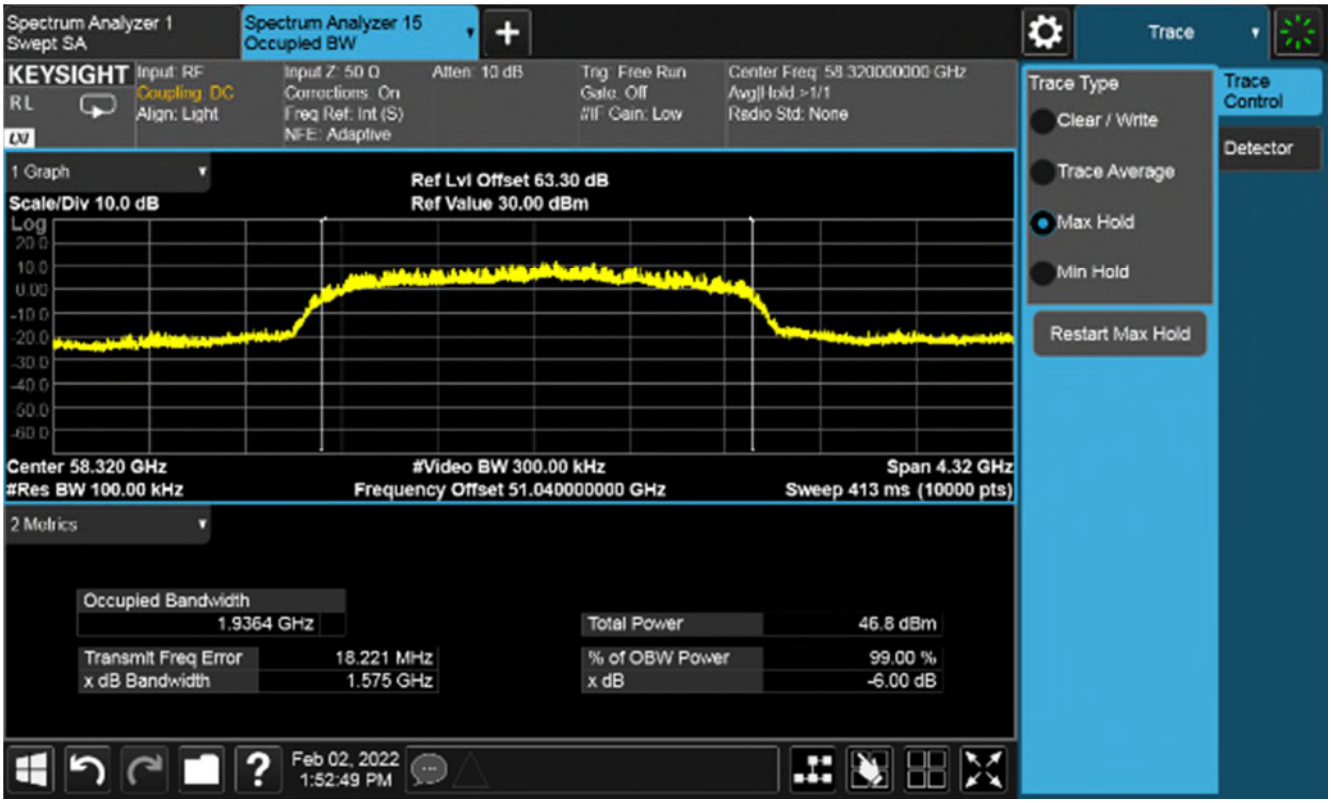
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS8, Channel 69.12 GHz



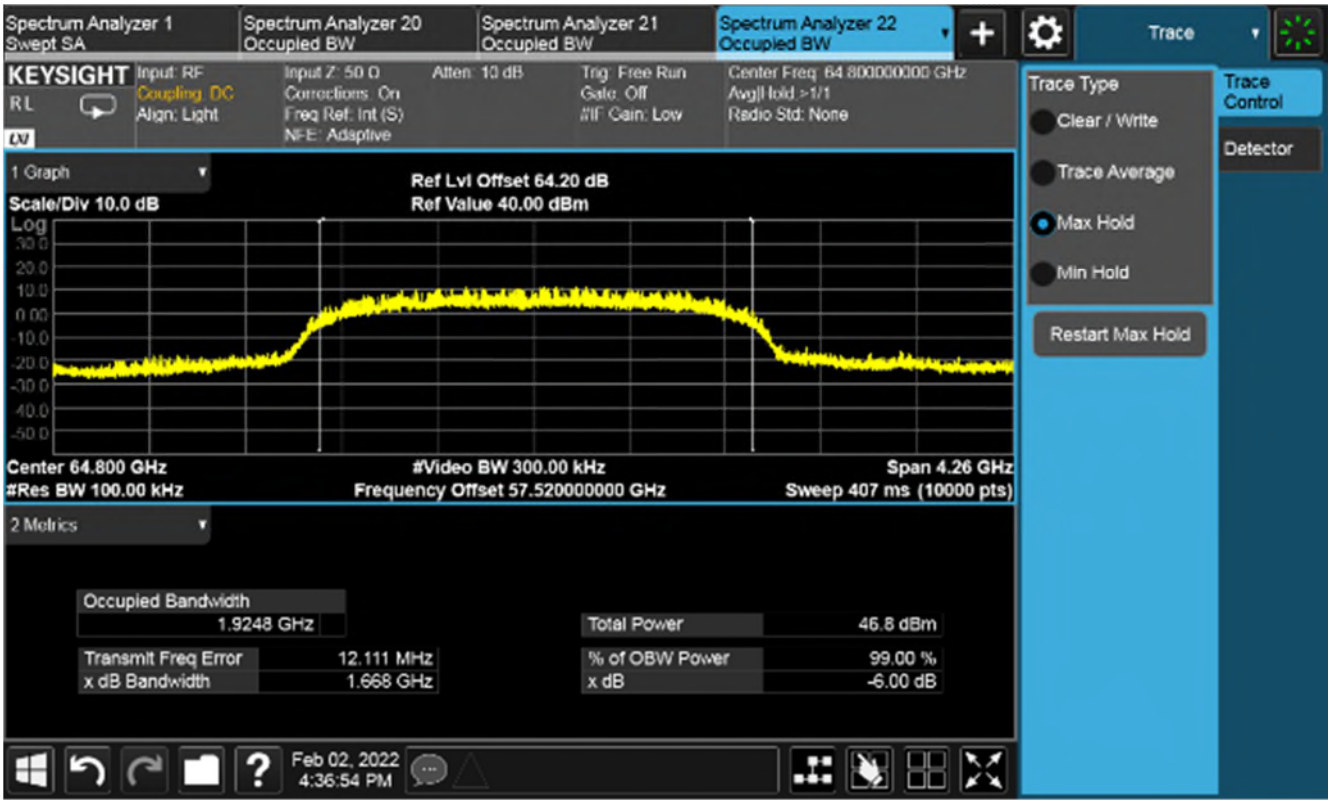
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 58.32 GHz



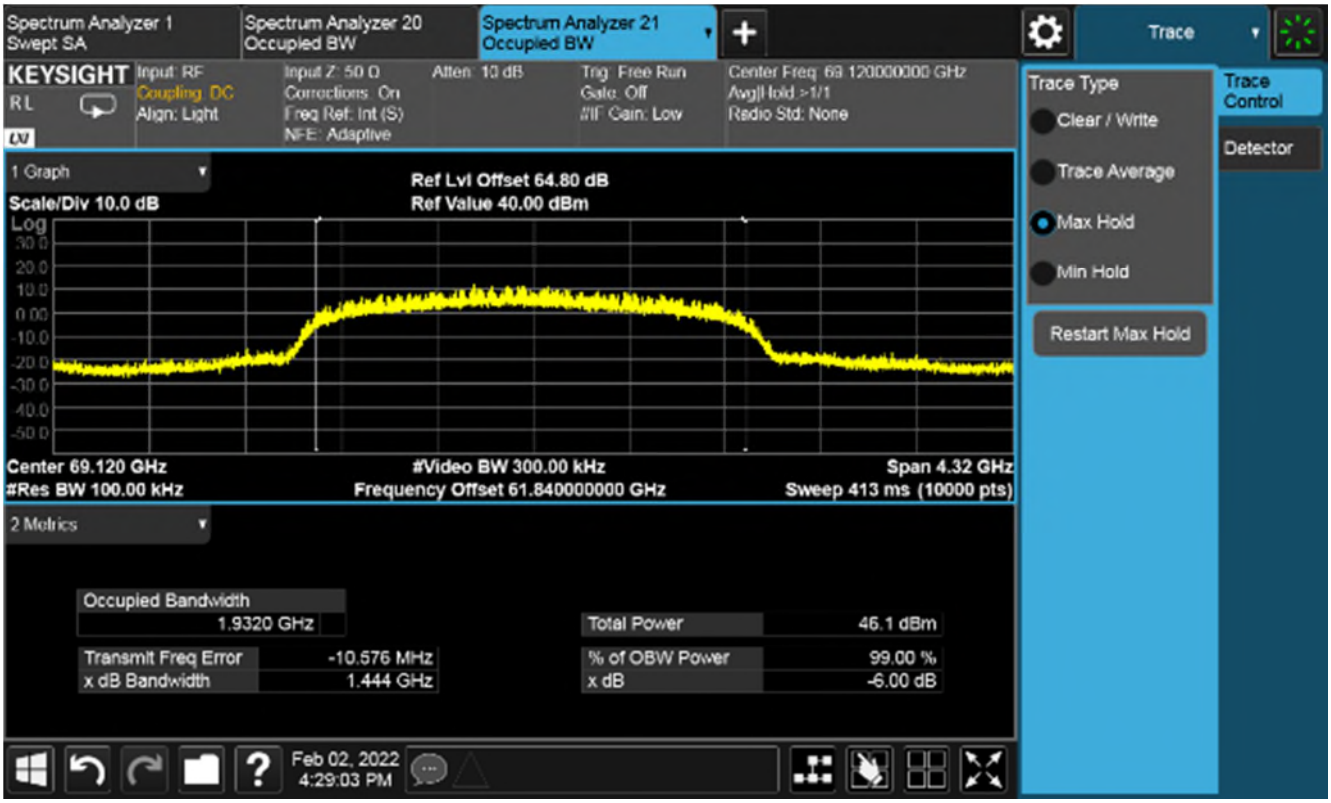
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 64.8 GHz



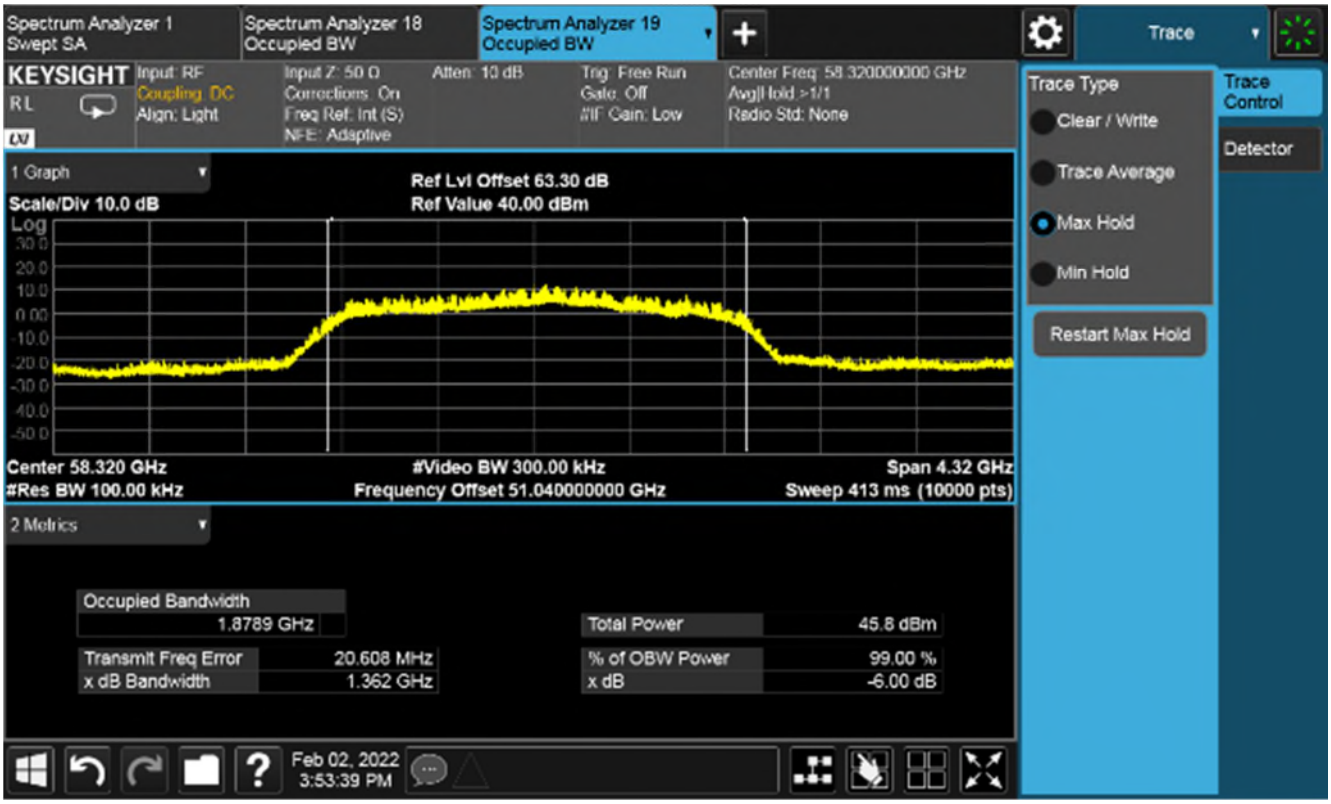
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 58.32 GHz

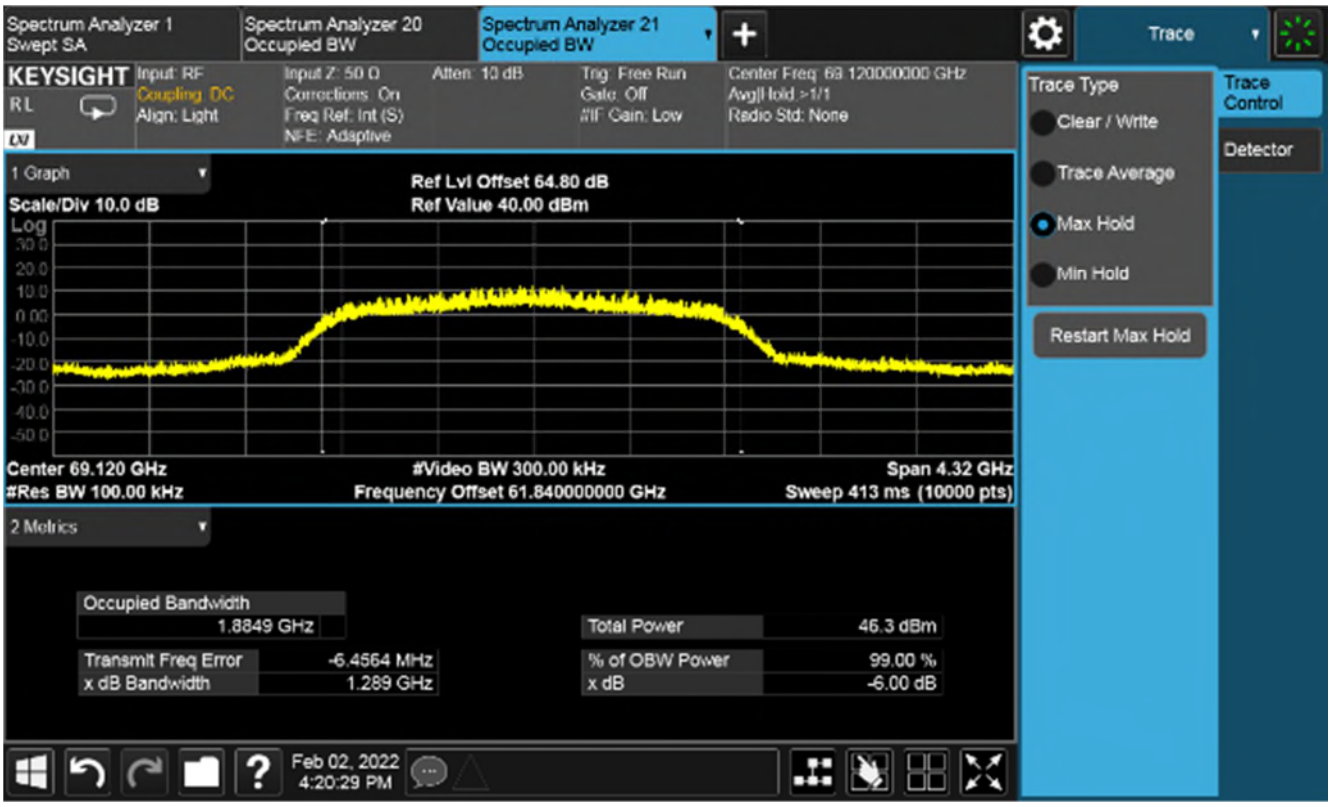


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 64.8 GHz

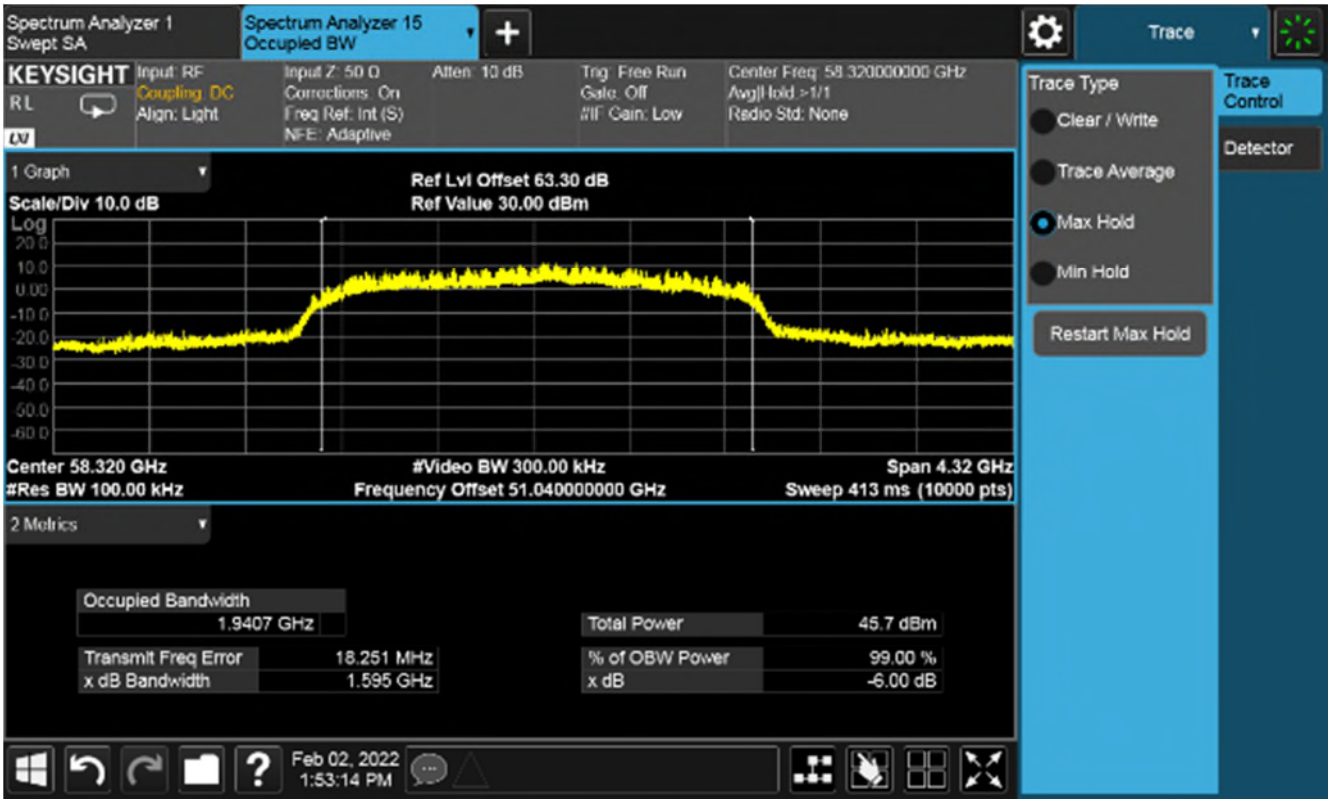
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS9, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 58.32 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

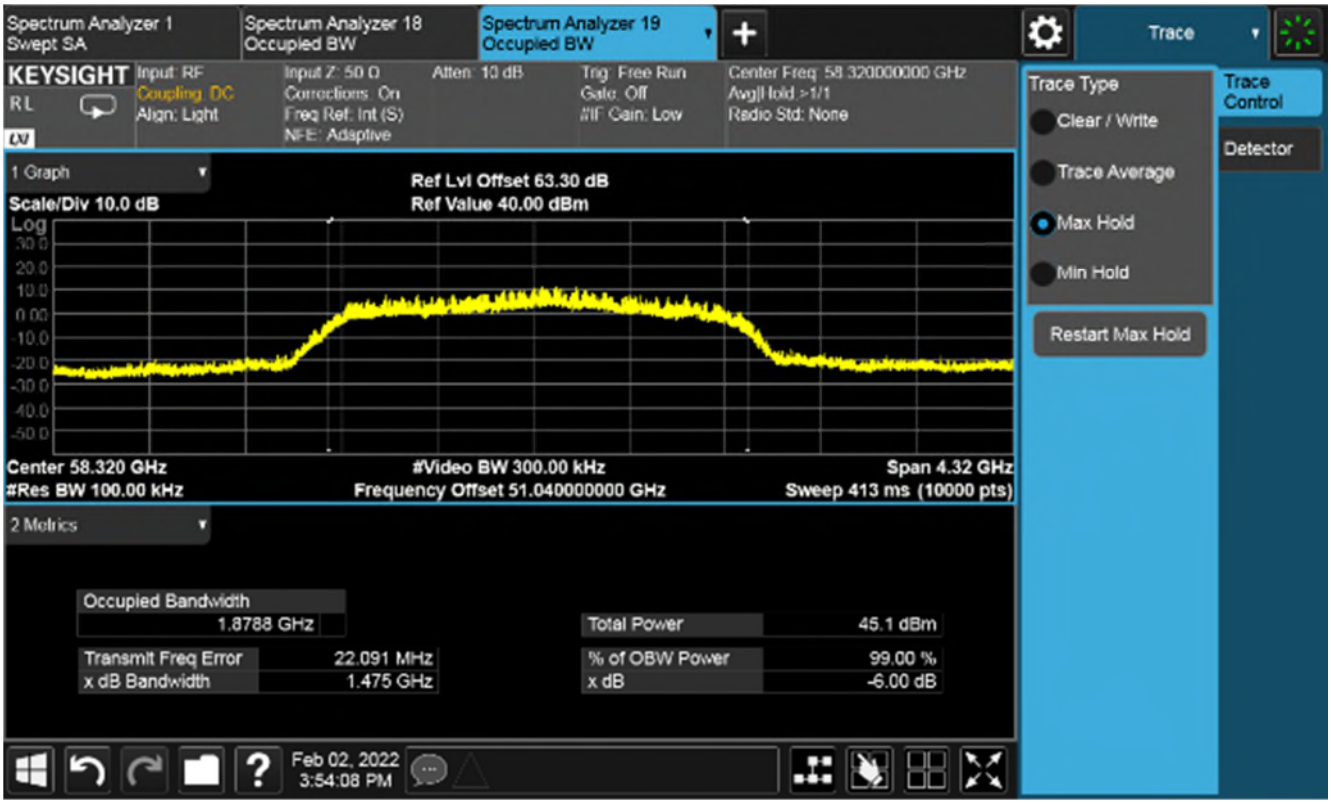
RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 64.8 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 69.12 GHz

Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 58.32 GHz

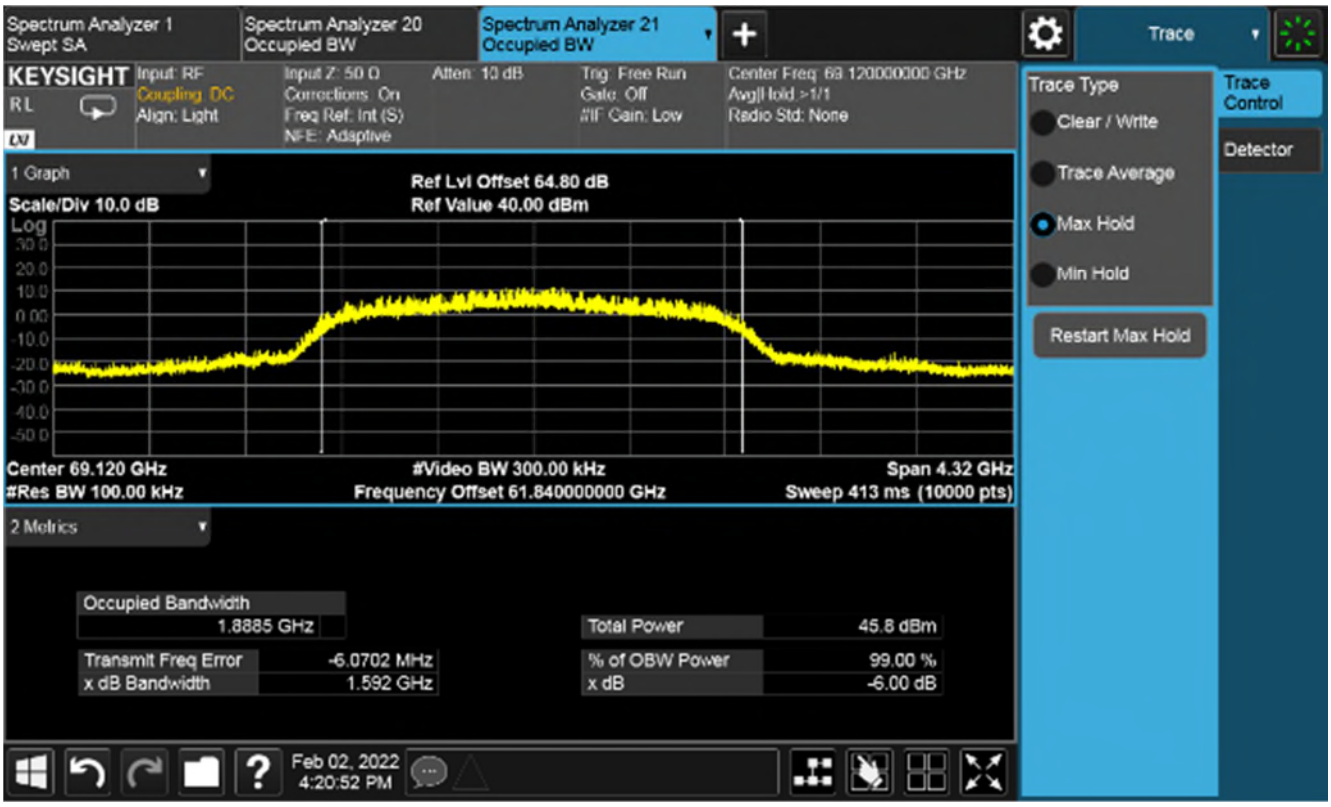


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 64.8 GHz

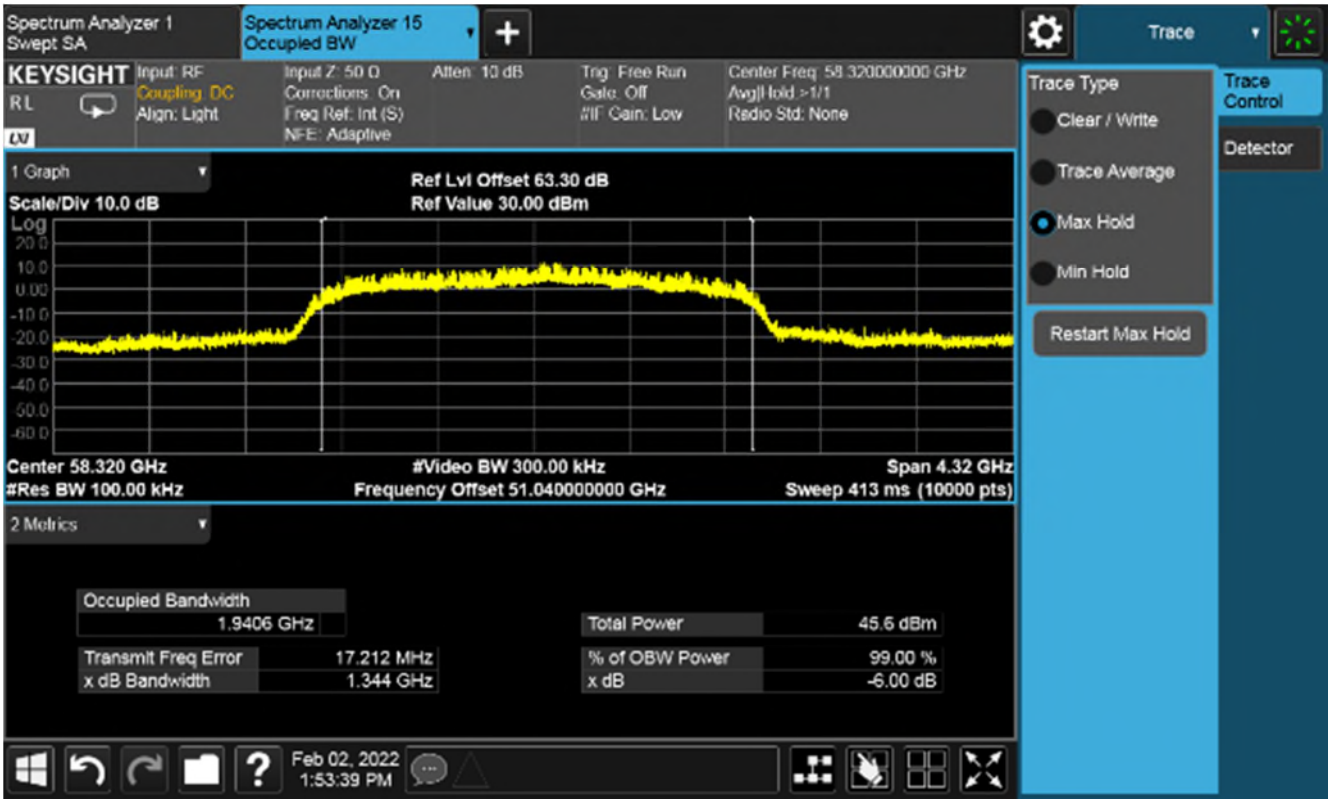
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS10, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 58.32 GHz

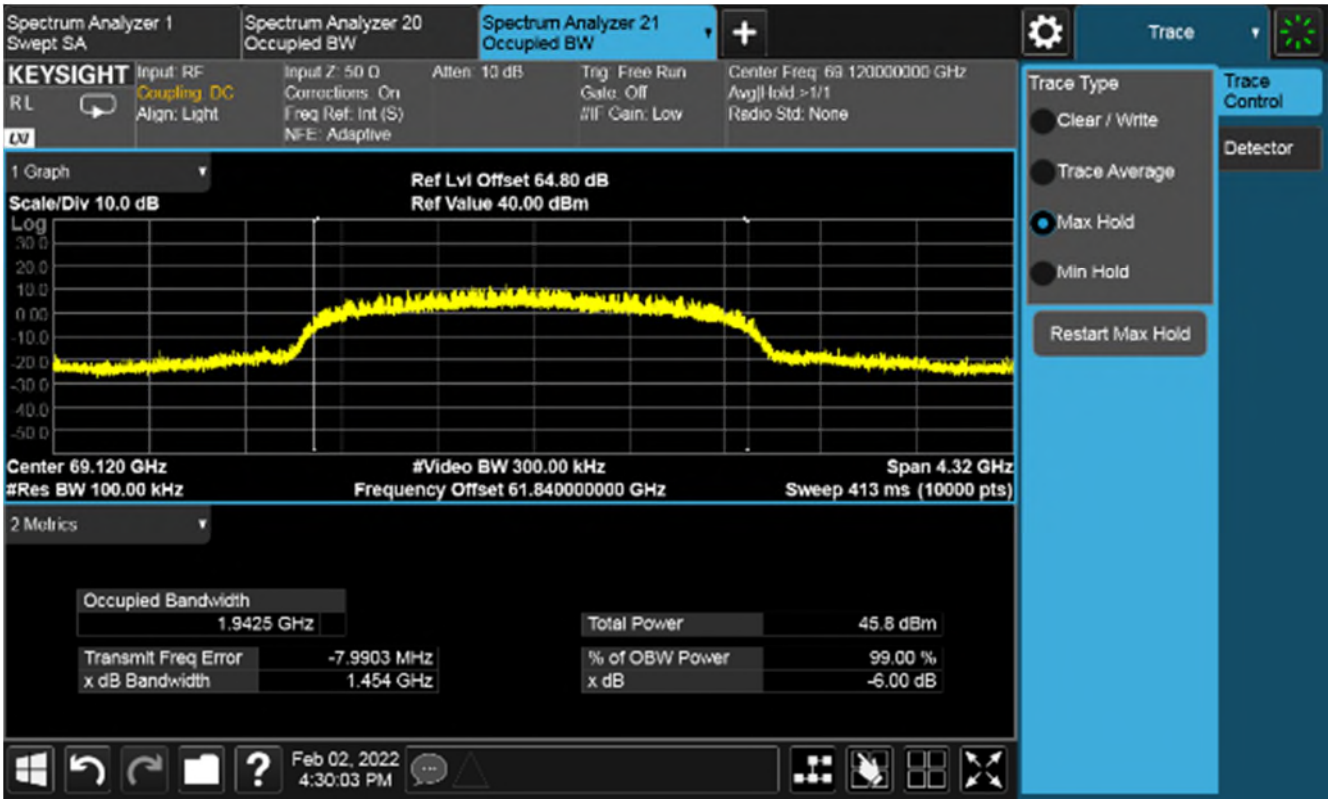


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 64.8 GHz

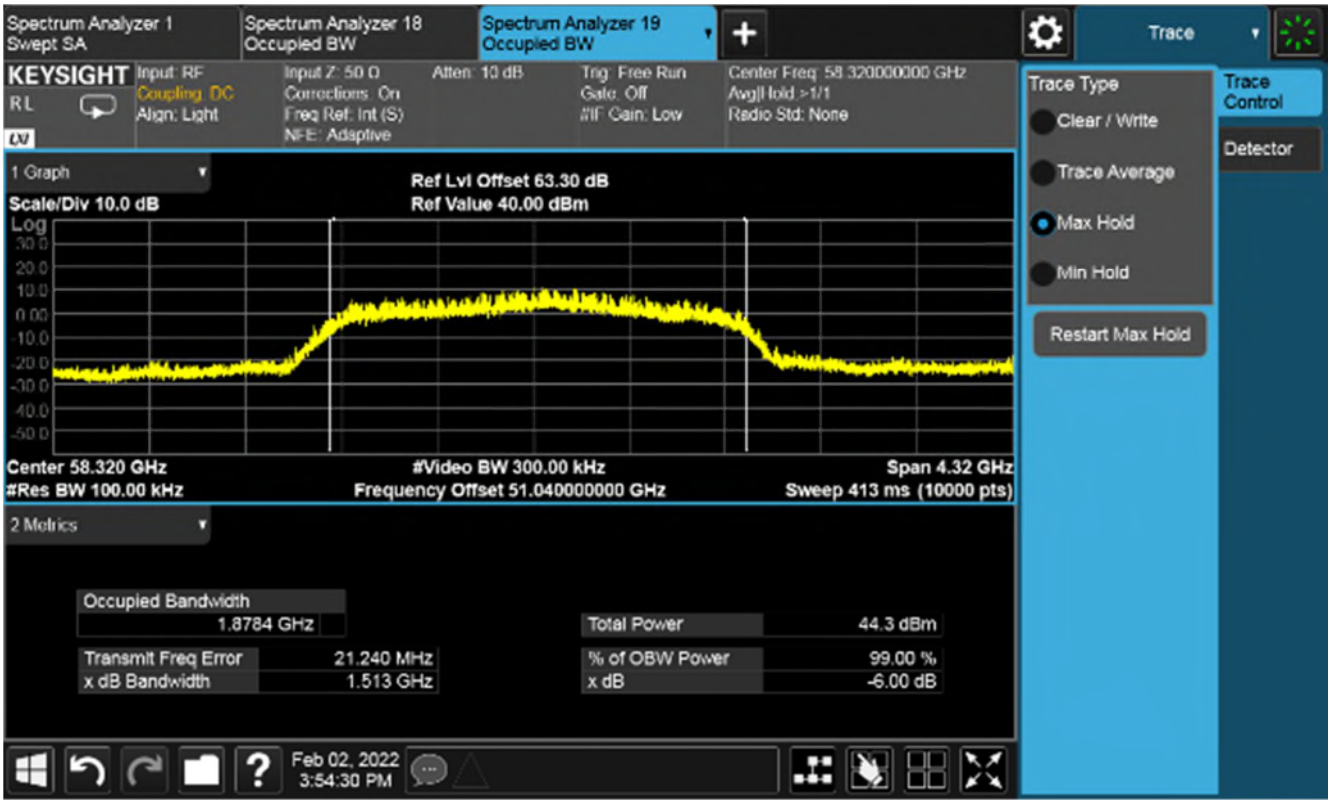
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 58.32 GHz

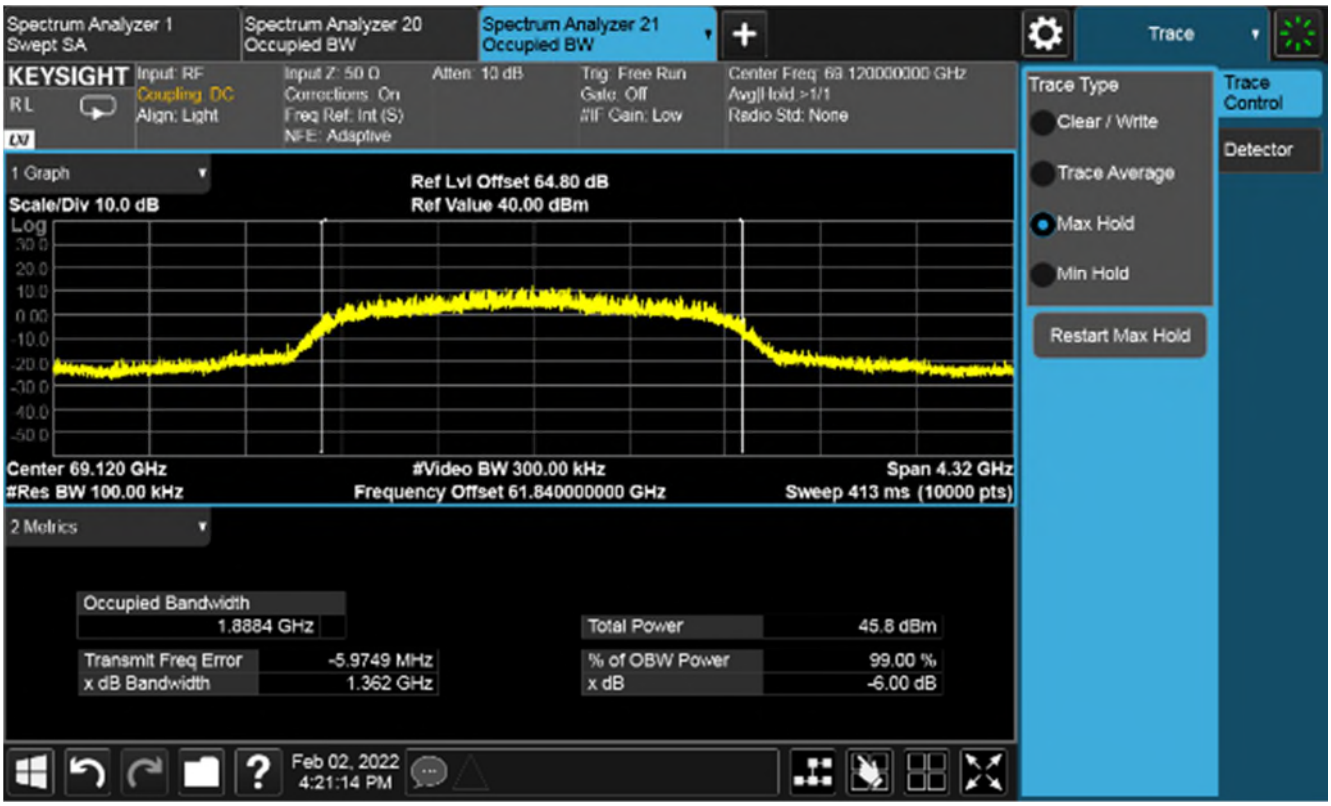


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 64.8 GHz

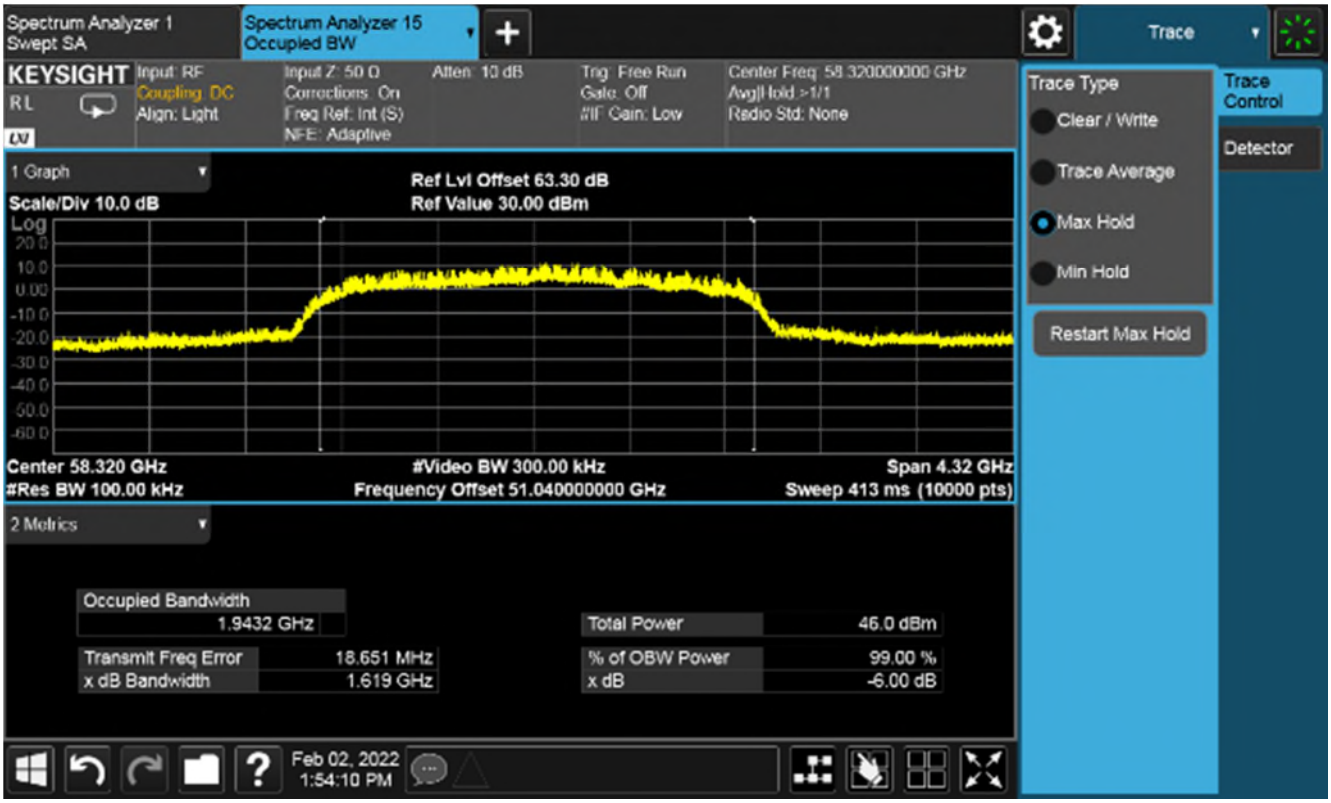
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS11, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 58.32 GHz

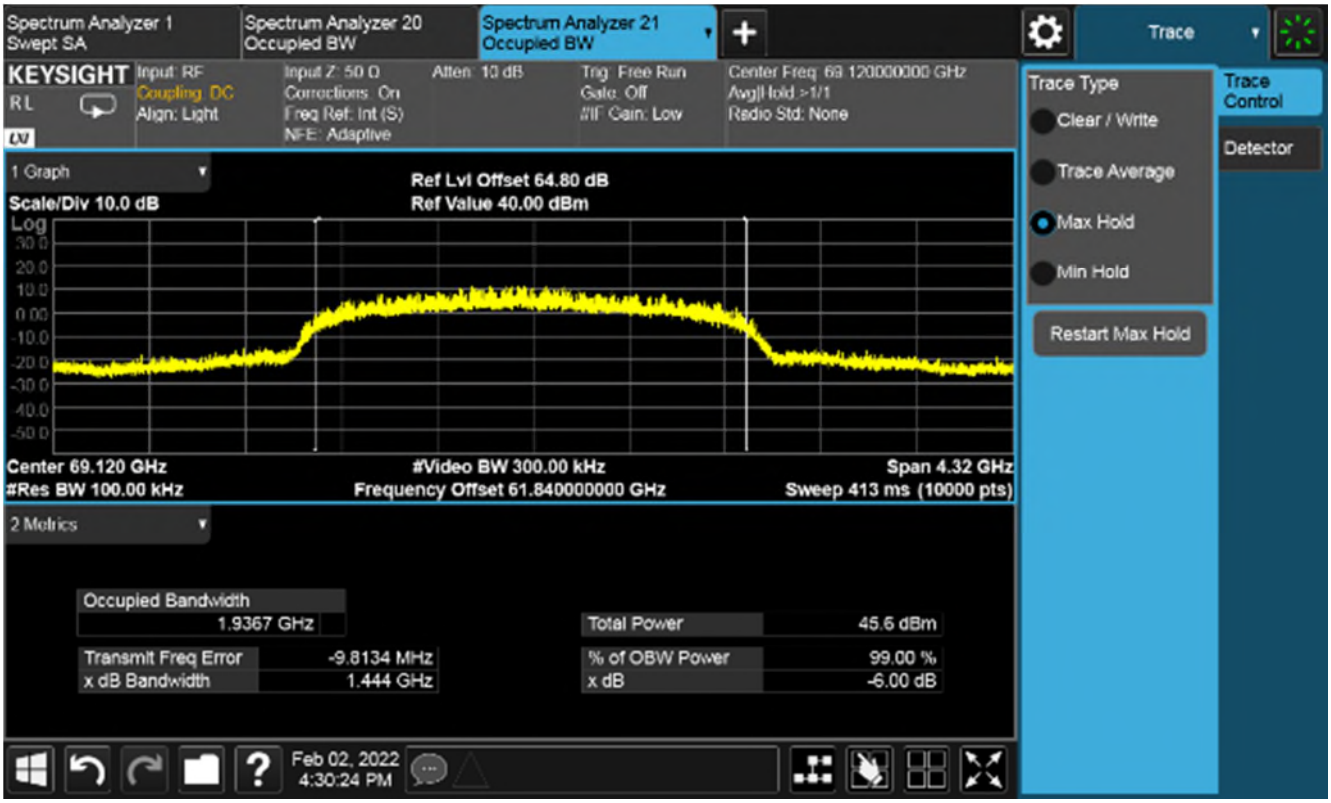


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 64.8 GHz

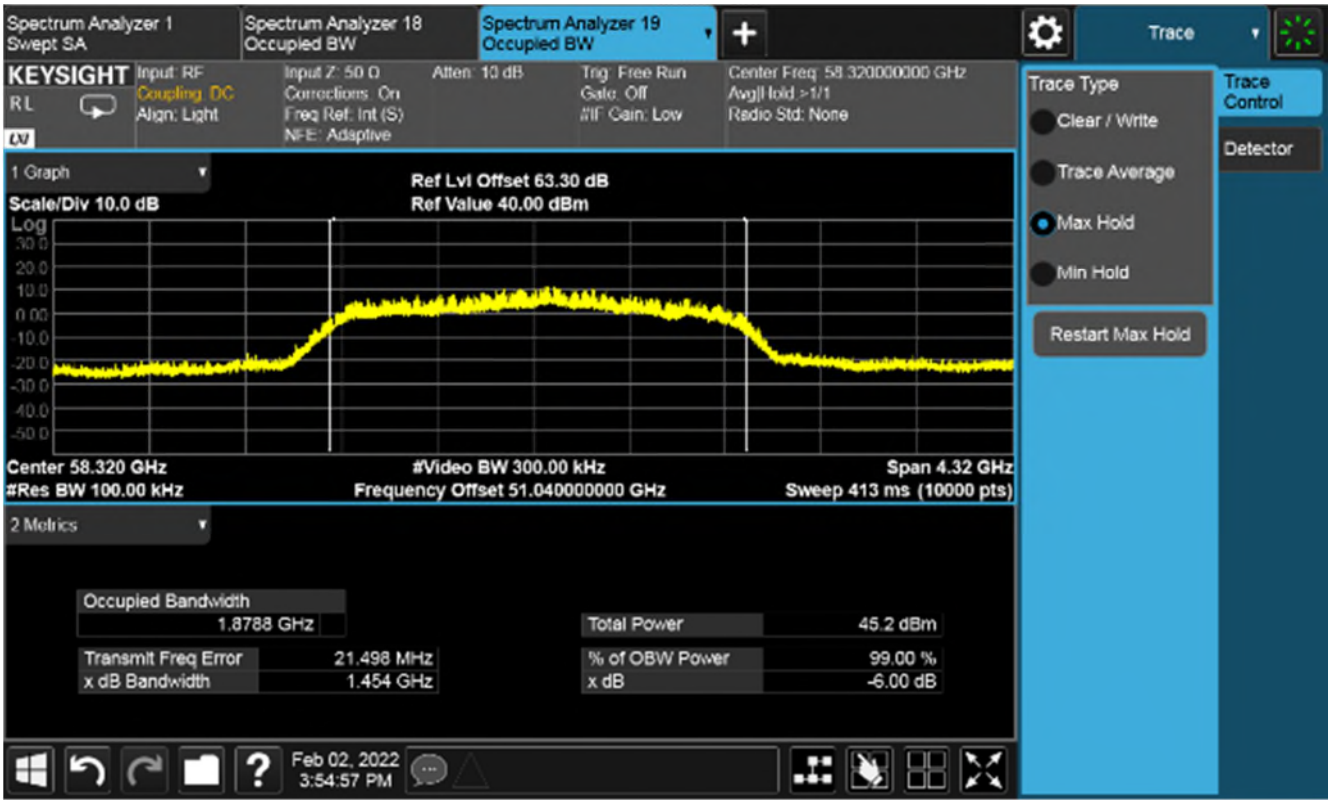
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 69.12 GHz



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 58.32 GHz

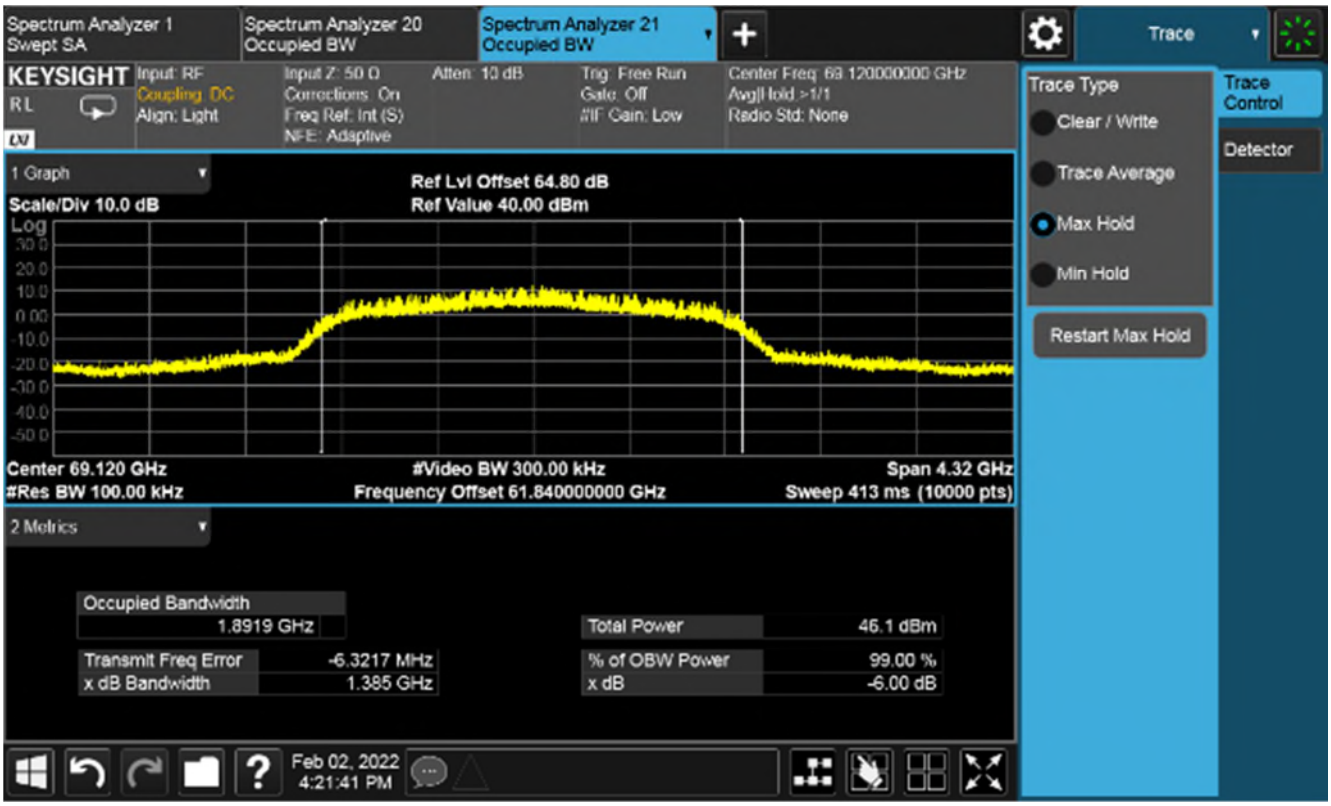


Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 64.8 GHz

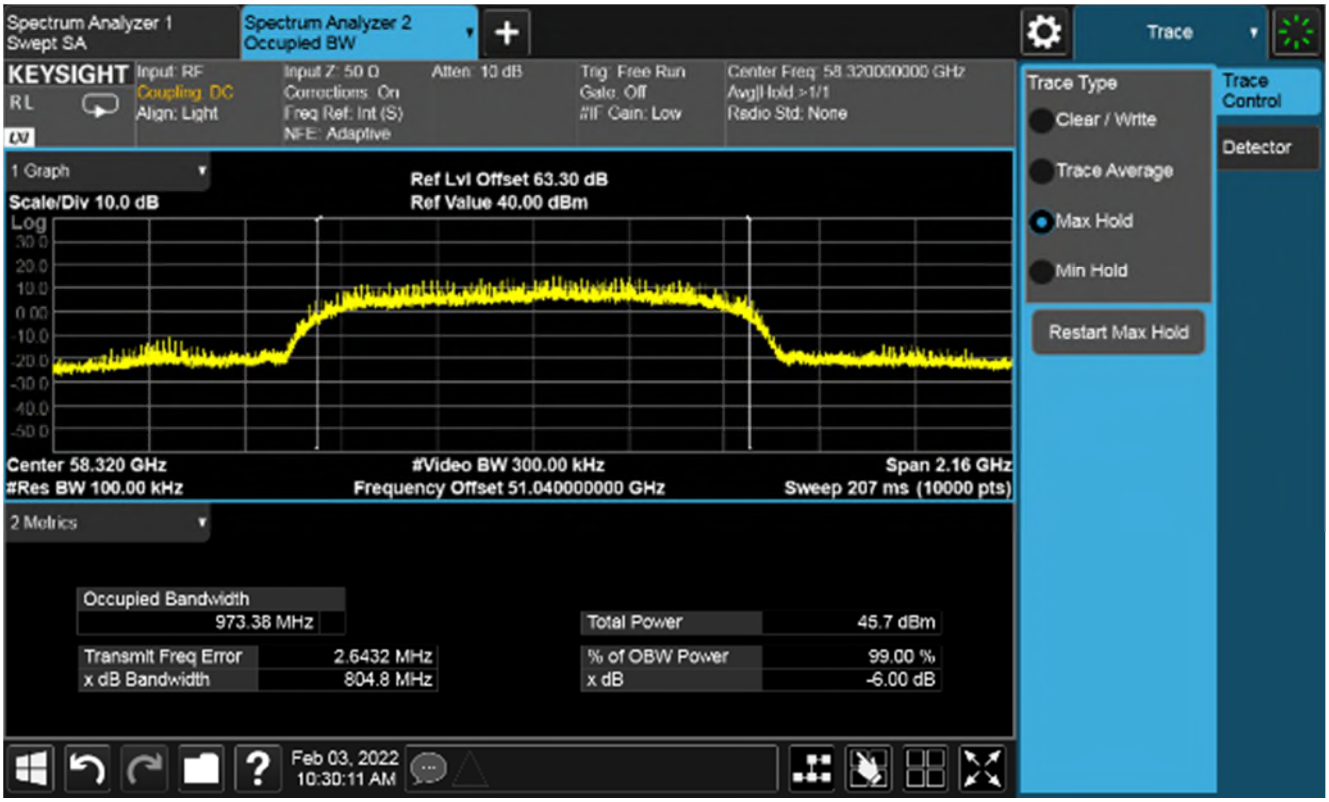
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 1), Power 39 dBm, Channel Spacing 2.16 GHz, Modulation MCS12, Channel 69.12 GHz



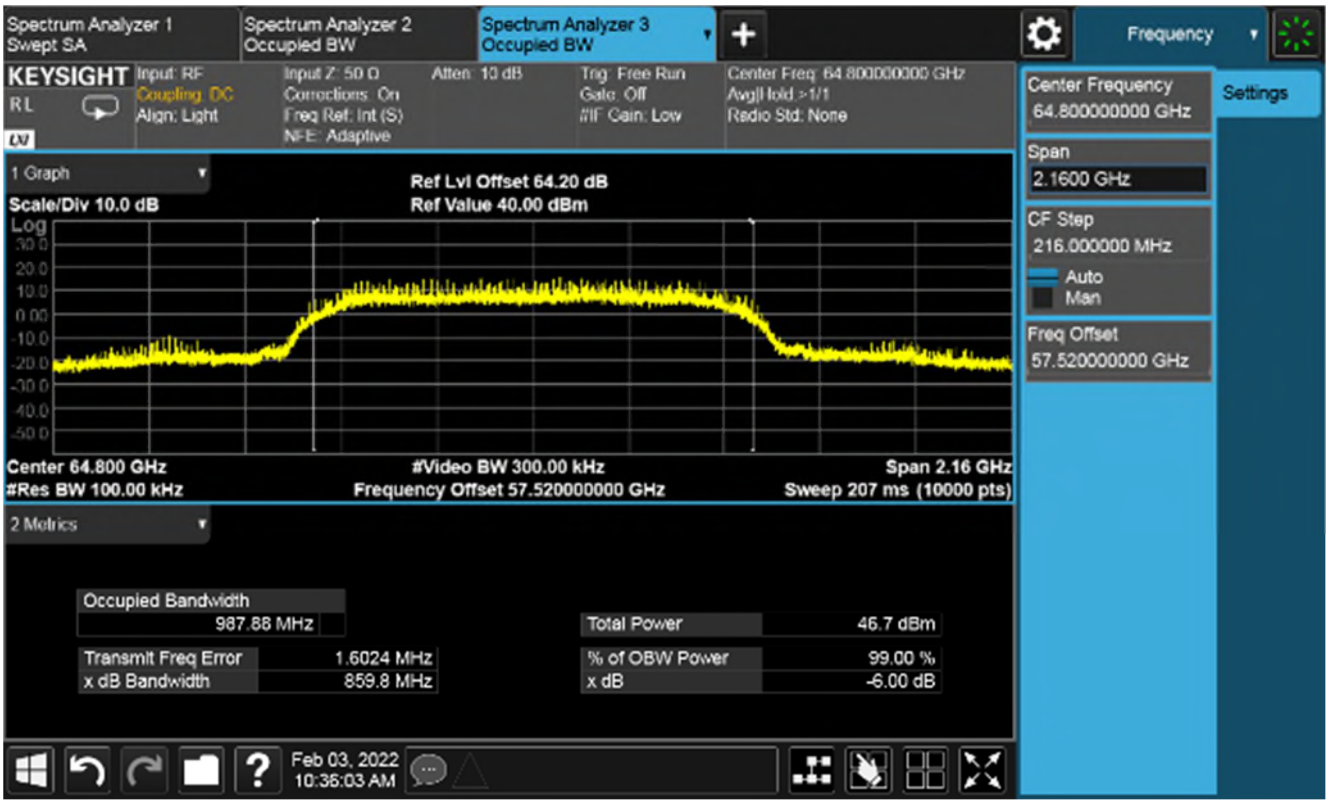
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 1.08 GHz, Modulation MCS8, Channel 58.32 GHz Half Band



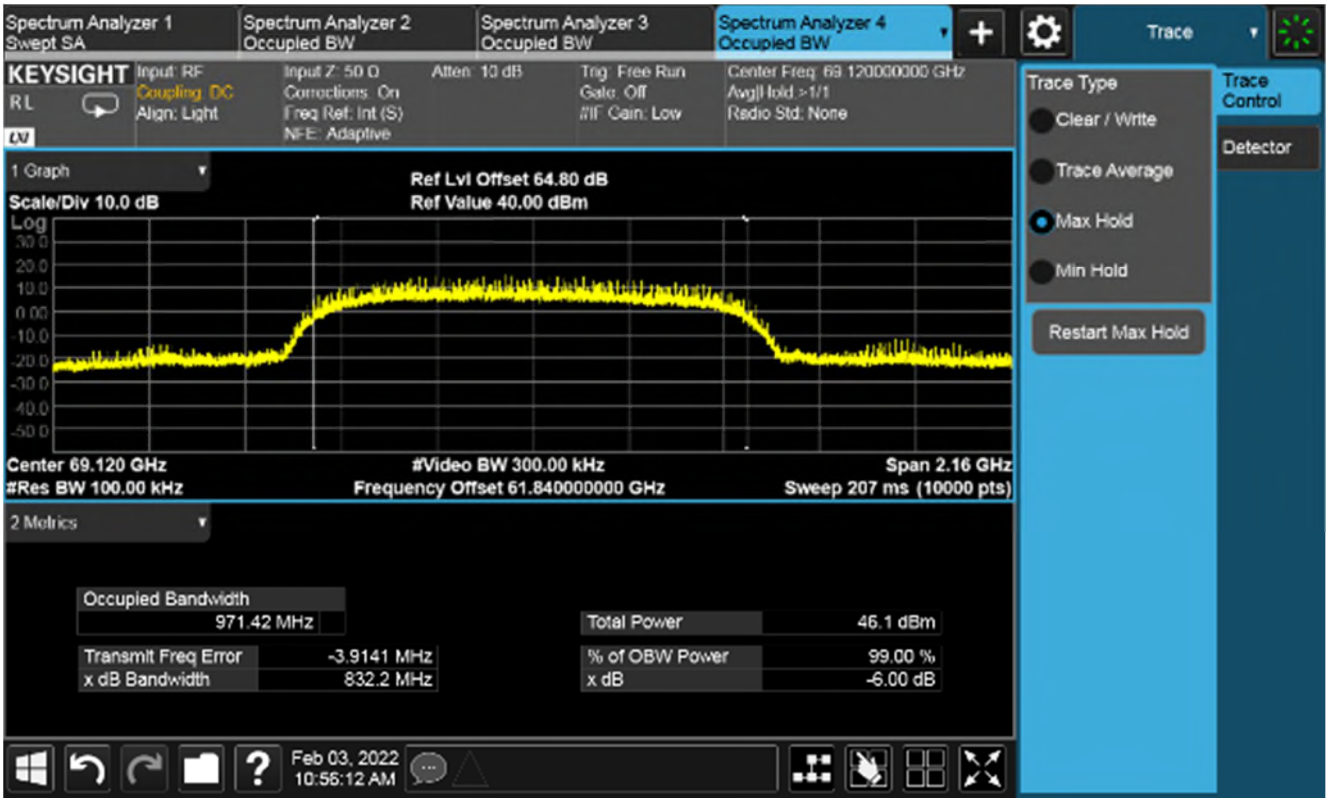
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 1.08 GHz, Modulation MCS8, Channel 64.8 GHz Half Band



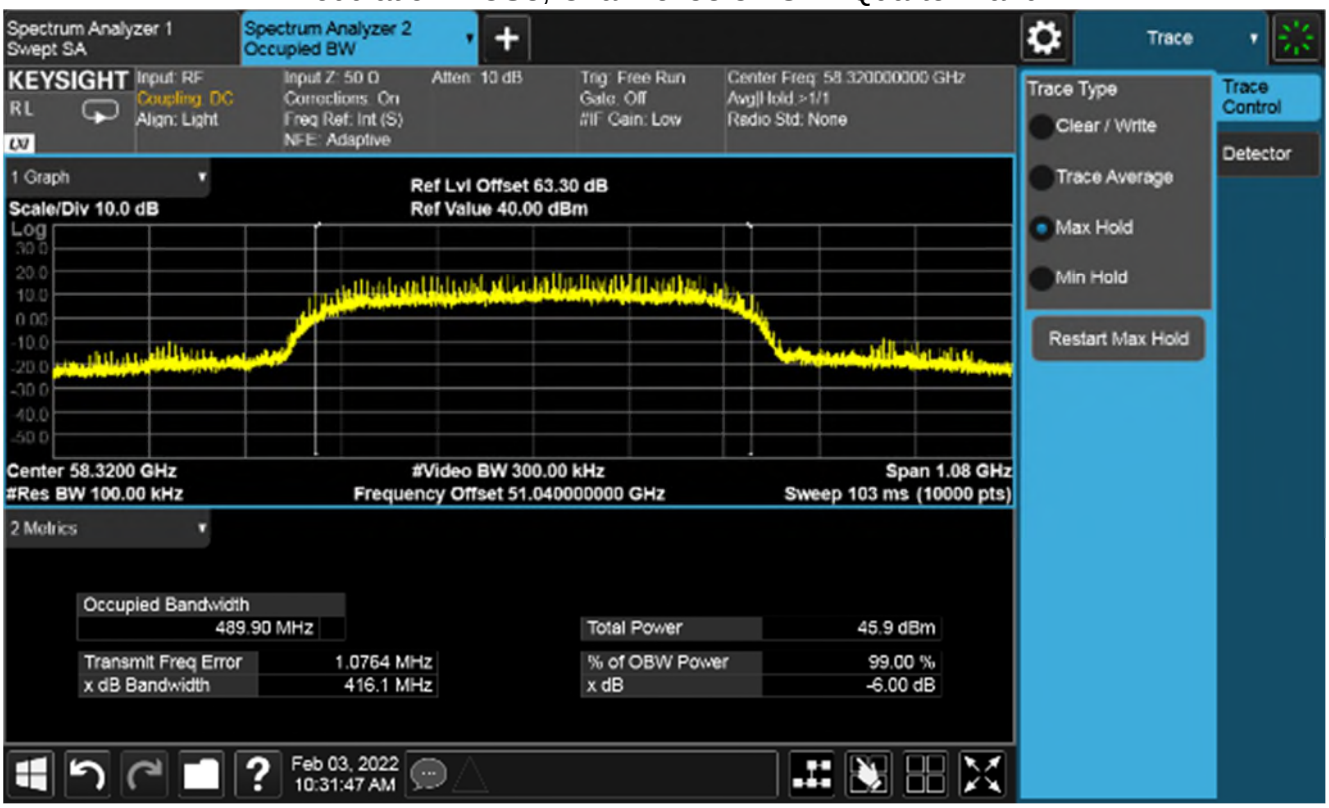
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 1.08 GHz, Modulation MCS8, Channel 69.12 GHz Half Band



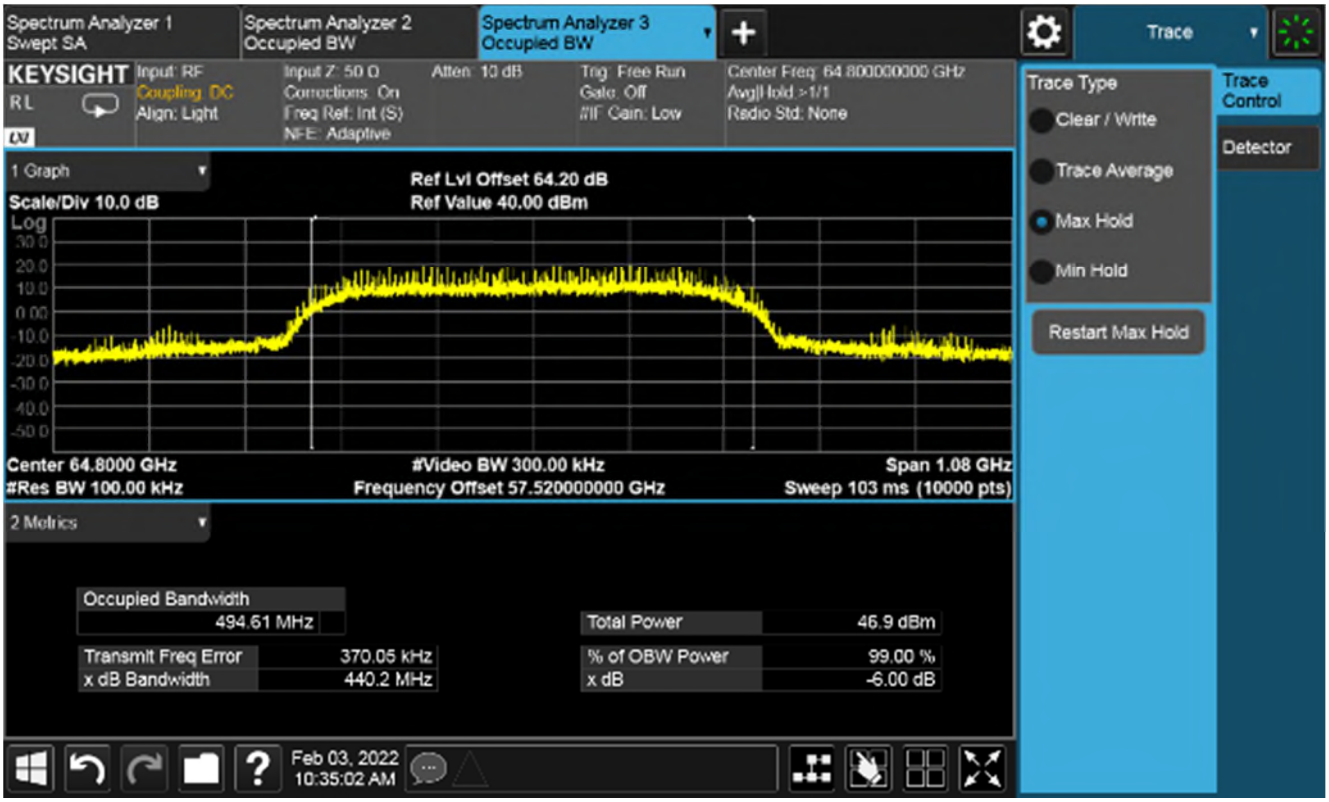
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 0.54 GHz, Modulation MCS8, Channel 58.32 GHz Quarter Band



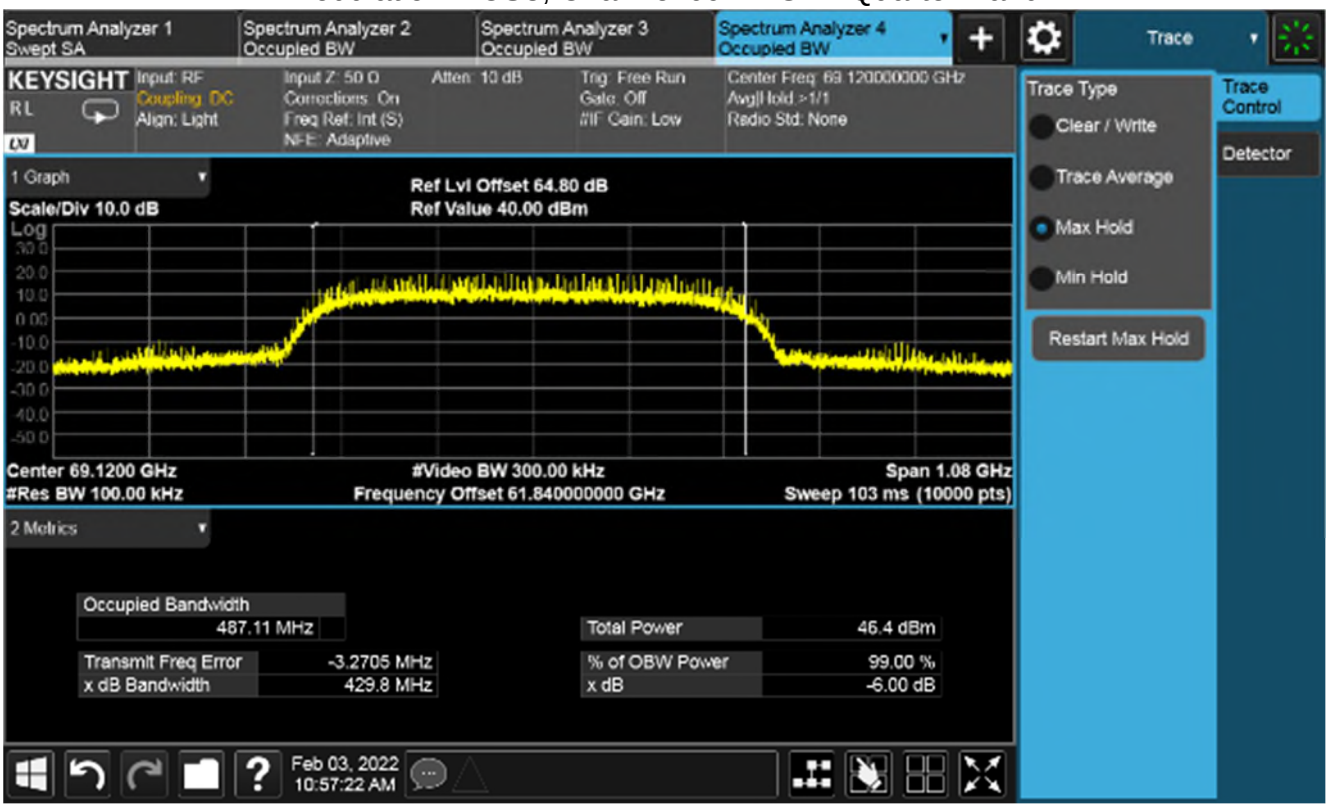
Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 0.54 GHz, Modulation MCS8, Channel 64.8 GHz Quarter Band



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

RF Parameters: Band 57-71 GHz (Radio 0), Power 39 dBm, Channel Spacing 0.54 GHz, Modulation MCS8, Channel 69.12 GHz Quarter Band



Plot for 6 dB Bandwidth (MHz) Nominal Temp & Volts

7 Explanatory Notes

7.1 Explanation of Table of Signals Measured

Measurements are made as required by the standard. These measurements are made and recorded using detectors, either peak, quasi peak or average dependant on the test. A table of results has been given following the relevant plots. This table looks similar to the one illustrated below dependant on the measurements required by the test: -

Signal No.	Freq (MHz)	Peak Amp (dBuV)	Pk – Lim 1 (dB)	QP Amp (dBuV)	QP - Lim1 (dB)	Av Amp (dBuV)	Av - Lim1 (dB)
1	12345	54.9	-10.5	48	-12.6	37.6	-14.4

Column One - Labelled Signal No. is an incremental number that the receiver has given to each signal that has been measured.

Column Two - Labelled Freq (MHz) is the approximate frequency of the signal received.

Column Three - Labelled Peak Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the peak detector.

Column Four - Labelled Pk - Lim1 (dB) is the difference in level from the peak signal given to the active limit line. If this column appears in the table the peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Five - Labelled QP Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the quasi-peak detector.

Column Six - Labelled QP - Lim1 (dB) is the difference in level from the quasi-peak signal given to the active limit line. If this column appears in the table the quasi-peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Seven - Labelled Av Amp (dBμV) is the level of received signal that was measured in dB above 1μV using the average detector.

Column Eight - Labelled Av - Lim1 (dB) is the difference in level from the average signal given to the active limit line. If this column appears in the table the average detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Only signals highlighted in red are deemed to exceed the limit of the detector required.

7.2 Explanation of limit line calculations for radiated measurements

The limits given in the test standard are normally expressed as absolute values (e.g. in μV/m at a specified distance), whereas the measured values are expressed as peak, quasi peak or average values in dBμV/m referenced to the measuring instrument inputs. RN Electronics calibrate the test set-up to account for any path losses, antenna gains, etc. so that the value read at the receiver relates directly to the absolute value required, except that it is expressed in dB relative to one microVolt and may need to take account of any alternative measuring distance used. Examples:

(a) limit of 500 μV/m equates to 20.log (500) = 54 dB μV/m.

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(b) limit of 300 µV/m at 10m equates to 20.log (300 . 10/3) = 60 dB µV/m at 3m
(c) limit of 30 µV/m at 30m, but below 30MHz, equates to 20.log(30) + 40.log(30/3) = 69.5 dBµV/m at 3m, as extrapolation factor below 30MHz is 40dB/decade per 15.31(f)(2).

The measurement receiver used for emissions testing, performs the field strength (FS) calculations automatically. The receiver combines the signal amplitude (RA), Antenna Factor (AF) and Cable Loss (CL) factors for the frequency to be measured.

Example calculation: - FS = RA + AF + CL.

Receiver amplitude (RA)	Antenna factor (3m) (AF)	Cable loss (CL)	Field strength result (3m) (FS)
20dBuV	25 dB	3 dB	48dBuV/m

Additional calculation examples per ANSI C63.10 clause 9.4 – 9.6 equations 21, 22, 25 & 26:

Equation 21: $E_{Linear} = 10^{((E_{log}-120)/20)}$
And therefore equation 21 transposed is: $E_{Log} = 20xLog(E_{Linear}) +120$

Where:
E_{Linear} is the field strength of the emission in V/m
E_{Log} is the field strength of the emissions in dBµV/m

Equation 22: EIRP = $E_{Meas} + 20log(d_{Meas}) -104.7$

Where:
EIRP is equivalent isotropically radiated power in dBm
E_{Meas} is the field strength of the emission at the measurement distance in dBµV/m
d_{Meas} is the measurement distance in metres

Equation 25: PD = $EIRP_{Linear} / 4\pi d^2$
And therefore equation 25 transposed is: $EIRP_{Linear} = PD \times 4\pi d^2$

Where:
PD is the power density at distance specified by the limit, in W/m^2
$EIRP_{Linear}$ is the equivalent isotropically radiated power in Watts
d is the distance at which the power density limit is specified in metres

Equation 26: PD = $E^2_{Speclimit} / 377$
And therefore equation 26 transposed is: $E_{Spec\ limit} = \sqrt{(PD \times 377)}$

Where:
PD is the power density at distance specified by the limit, in W/m^2
$E_{spec\ limit}$ is the field strength at the distance specified by the limit in V/m

Example:

Radiated spurious emissions limit at 3metres of $90pW/cm^2$.

$90pW/cm^2 \times 100^2 = 0.9\ \mu W/m^2$ = (EIRP Linear)

Equation 25 transposed: $0.9 \times 10^{-6} \times 4 \times \pi \times 3^2 = 0.0001017876$ W

And
Equation 26 transposed: $E_{Spec\ limit} = \sqrt{(0.9x10^{-6} \times 377)} = 0.01842$ V/m.

And Equation 21 transposed: $E_{Log} = 20Log(0.01842) +120 = 85.3dB\mu V/m$ @ 3m.

8 Photographs

No photographs are included in this section due to the short term confidentiality request associated with the certification.

8.1 Radiated emission diagrams

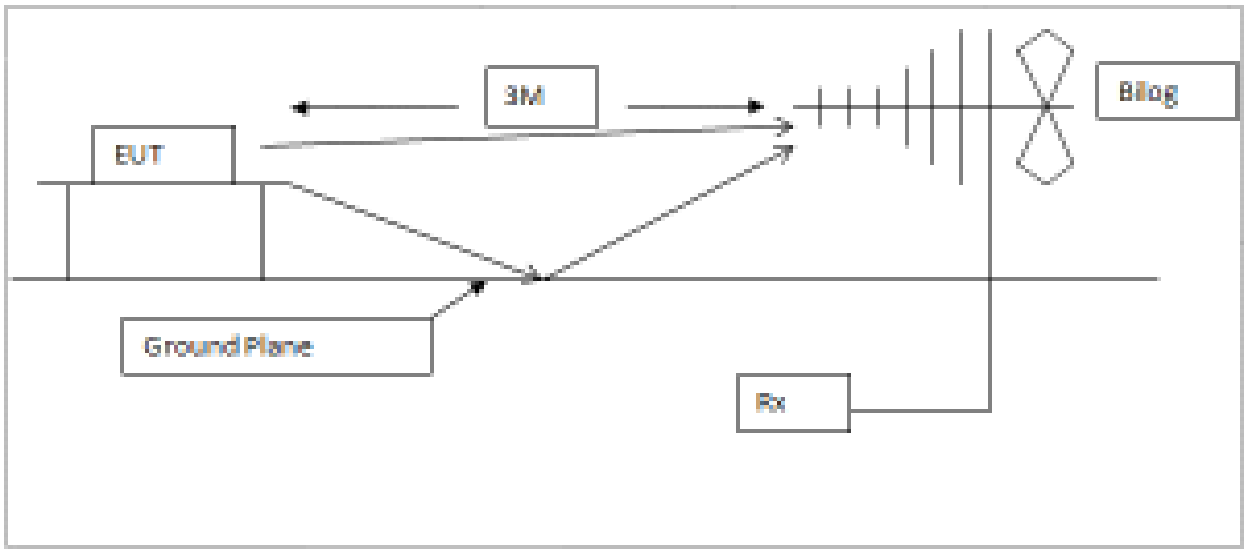

Diagram of the radiated emissions test setup 30 - 1000 MHz

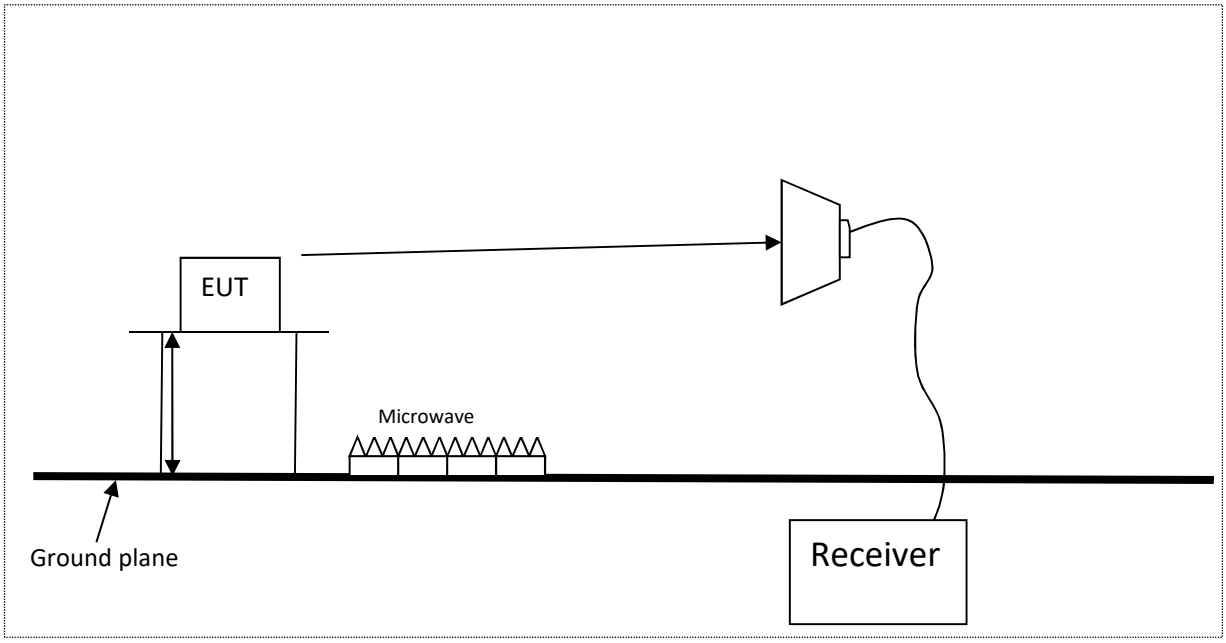

Diagram of the radiated emissions test setup above 1GHz

8.2 AC powerline conducted emission diagram

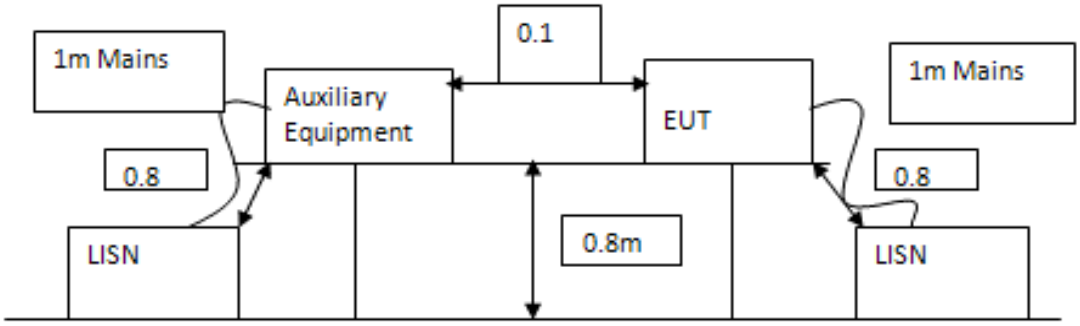

Diagram of the AC conducted emissions test setup

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9 Test equipment calibration list

The following is a list of the test equipment used by R.N. Electronics Ltd to test the unit detailed within this report. In line with our procedures, the equipment was within calibration for the period during which testing was carried out.

RN No.	Model No.	Description	Manufacturer	Calibration date	Cal period
E035	11947A	Transient Limiter 9kHz - 200MHz	Hewlett Packard	14-Dec-2021	12 months
E150	MN2050	LISN 13A	Chase	22-Apr-2021	12 months
E296-2	11970A	Harmonic Mixer 26.5-40GHz	Hewlett Packard	07-Jul-2021	12 months
E330	2224-20	Horn Antenna 26.5-40GHz	Flann (FMI)	26-Apr-2021	12 months
E411	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies	08-Jul-2021	12 months
E434	G3RUH	10MHz GPS Disciplined Oscillator	G3RUH - James Miller	#23-Feb-2022	12 months
E485	11974-60028	Preselector PSU	Agilent Technologies	#10-Feb-2022	12 months
E487	11974U	Preselect Mixer 40 - 60GHz	Agilent Technologies	17-Dec-2020	24 months
E555	CMV 5E-1	Variac 5A	Carroll & Meynell Ltd	04-Aug-2021	12 months
E580	24240	Horn Std Gain 40GHz - 60GHz	Flann (FMI)	26-Apr-2021	12 months
E624	E4440A	PSA 3 Hz - 26.5 GHz	Agilent Technologies	08-Jul-2021	24 months
E638	11974VE01	Preselected Mixer 50 - 80GHz	Agilent Technologies	#21-Feb-2019	24 months
E717		Horn Std Gain 50-75GHz		29-Apr-2021	12 months
E718		Horn Std Gain 75-110GHz		26-Apr-2021	12 months
E719		Horn Std Gain 90-140GHz		23-Jul-2021	12 months
E722	861G/387	Horn Std Gain 140-220GHz	Alpha Industries Inc	23-Jul-2021	12 months
E743	2017 4/2dB	Attenuator 4/2dB 30-1000MHz	RN Electronics	#10-Mar-2022	12 months
E755	N9030B	PXA Signal Analyser 3 Hz to 50 GHz	Keysight Technologies	20-Jul-2021	12 months
E760	M05HWDX	Mixer 140-220GHz	OML Inc	25-Jun-2019	24 months
E777	MG3695B	Signal Generator 8 MHz - 50 GHz	Anritsu	14-Jun-2021	12 months
E781	MX4-15-F	Multiplier 50 - 75GHz X4 WR15	MMWave Group (Quantum)	21-Aug-2020	24 months
E810	1705	Digital Multimeter	TTI	07-Mar-2022	12 months
E908	00365-60004	Isolator 50-75GHz WR15	Hewlett Packard	23-Jun-2020	24 months
E920	FTL 6541	Mixer 60 - 90GHz	Farran Technology	#31-Jan-2022	12 months
E941	M08HWDX	Mixer 90-140GHz	OML Inc	06-Dec-2021	24 months
E942	-	Cable SMA - SMA ~1m Blue	OML Inc	09-Nov-2021	12 months
F015	11974A	Preselect Mixer 26.5 - 40GHz	Hewlett Packard	26-Nov-2021	12 months
H070	M1970W	Waveguide Harmonic Mixer 75 - 110 GHz	Keysight Technologies	18-Feb-2021	24 months
H074	QMC-MX4-15-F	Multiplier 50 - 75GHz X4 WR15	MMWave Group (Quantum)	Not applicable	
LPE364	CBL6112A	Antenna BiLog 30MHz - 2GHz	Chase Electronics Ltd	07-Mar-2020	24 months
N579	71043	Frequency Standard Distribution	-	08-Nov-2021	12 months
NSA-M	NSA - M	NSA - Site M	RN Electronics	29-Nov-2021	36 months
S034	Kewcheck R2	Socket Test Connector	Kewtech	Not Applicable	
TMS38	VMT04/140	Environmental Oven	Heraeus Votsch	Not Applicable	
TMS81	6502	Antenna Active Loop	EMCO	22-Jul-2021	24 months
ZSW1	V2.5.2	Measurement Software Suite	RN Electronics	Not Applicable	

Equipment was within calibration dates for tests and has been re-calibrated since/during date of tests.

10 Auxiliary and peripheral equipment

10.1 Customer supplied equipment

Item No.	Model No.	Description	Manufacturer	Serial No.
1	Latitude 5400	Laptop PC	Dell	F7CQ0Z2
2	CRS305-1G-4S+IN	Fibre and ethernet switch	MikroTic	B9EB0C00358F/021

10.2 RN Electronics supplied equipment

RN No.	Model No.	Description	Manufacturer	Serial No
E465	PCR2000LA	AC Power Source 2kVA	Kikusui	HJ000995
E555	CMV 5E-1	Variac 5A	Carroll & Meynell Ltd	424/52000
E810	1705	Digital Multimeter	TTI	208725
P276	D30 4	PSU 30V 4A	Farnell power supply	179
S034	Kewcheck R2	Socket Test Connector	Kewtech	31565-0001

11 Condition of the equipment tested

In order for the EUT to produce the results shown within this report the following modifications, if any, were implemented.

11.1 Modifications before test

Test	Modification	Time of modification
TX PK and AV EIRP	Power settings were changed on radio0 and radio 1 on Channel 4 in order for the power limit to be met. Radio0 was changed from a setting of -16 to a setting of -28. Radio1 was changed from a setting of 0 to a setting of -12. In order to change the power setting values the same method of setting the unit into the relevant channels and modulation schemes was used. An SSH terminal was opened using Mobaxterm and the relevant command line entered which allowed over writing of the stored power calibration file for the specific channel. The EUT remained running the same software / firmware but utilised the updated power calibration figures.	Before testing

11.2 Modifications during test

No modifications were made during test by RN Electronics Ltd.

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12 Description of test sites

Site A Radio Laboratory and Anechoic Chamber

Site B Semi-Anechoic Chamber and Control Room
FCC Registration No. 293246, ISED Registration No. 5612A-4

Site C Transient Laboratory

Site D Screened Room (Conducted Immunity)

Site E Screened Room (Control Room for Site D)

Site F Screened Room (Conducted Emissions)

Site G Screened Room (Control Room for Site H)

Site H 3m Semi-Anechoic Chamber (indoor OATS)
FCC Registration No. 293246, ISED Registration No. 5612A-2, VCCI Registration No. 4065

Site J Transient Laboratory

Site K Screened Room (Control Room for Site M)

Site M 3m Semi-Anechoic Chamber (indoor OATS)
FCC Registration No. 293246, ISED Registration No. 5612A-3

Site N Radio Laboratory

Site Q Fully-Anechoic Chamber

Site OATS 3m and 10m Open Area Test Site
FCC Registration No. 293246, ISED Registration No. 5612A-1

Site R Screened Room (Conducted Immunity)

Site S Safety Laboratory

Site T Transient Laboratory

RN Electronics CAB identifier as issued by Innovation, Science and Economic Development Canada is UK0002
RN Electronics CAB identifier as issued by FCC is UK0015

13 Abbreviations and units

%	Percent	LBT	Listen Before Talk
µA/m	microAmps per metre	LO	Local Oscillator
µV	microVolts	mA	milliAmps
µW	microWatts	max	maximum
AC	Alternating Current	kPa	Kilopascal
ALSE	Absorber Lined Screened Enclosure	Mbit/s	MegaBits per second
AM	Amplitude Modulation	MHz	MegaHertz
Amb	Ambient	mic	Microphone
ATPC	Automatic Transmit Power Control	min	minimum
BER	Bit Error Rate	mm	milliMetres
ºC	Degrees Celsius	ms	milliSeconds
C/I	Carrier / Interferer	mW	milliWatts
CEPT	European Conference of Postal and Telecommunications Administrations	NA	Not Applicable
COFDM	Coherent OFDM	nom	Nominal
CS	Channel Spacing	nW	nanoWatt
CW	Continuous Wave	OATS	Open Area Test Site
dB	deciBels	OFDM	Orthogonal Frequency Division Multiplexing
dBµA/m	deciBels relative to 1µA/m	ppm	Parts per million
dBµV	deciBels relative to 1µV	PRBS	Pseudo Random Bit Sequence
dBc	deciBels relative to Carrier	QAM	Quadrature Amplitude Modulation
dBm	deciBels relative to 1mW	QPSK	Quadrature Phase Shift Keying
DC	Direct Current	R&TTE	Radio and Telecommunication Terminal Equipment
DTA	Digital Transmission Analyser	Ref	Reference
EIRP	Equivalent Isotropic Radiated Power	RF	Radio Frequency
ERP	Effective Radiated Power	RFC	Remote Frequency Control
EU	European Union	RSL	Received Signal Level
EUT	Equipment Under Test	RTP	Room Temperature and Pressure
FM	Frequency Modulation	RTPC	Remote Transmit Power Control
FSK	Frequency Shift Keying	Rx	Receiver
g	Grams	s	Seconds
GHz	GigaHertz	SINAD	Signal to Noise And Distortion
Hz	Hertz	Tx	Transmitter
IF	Intermediate Frequency	V	Volts
kHz	kiloHertz		

= = = = END OF TEST REPORT = = = =