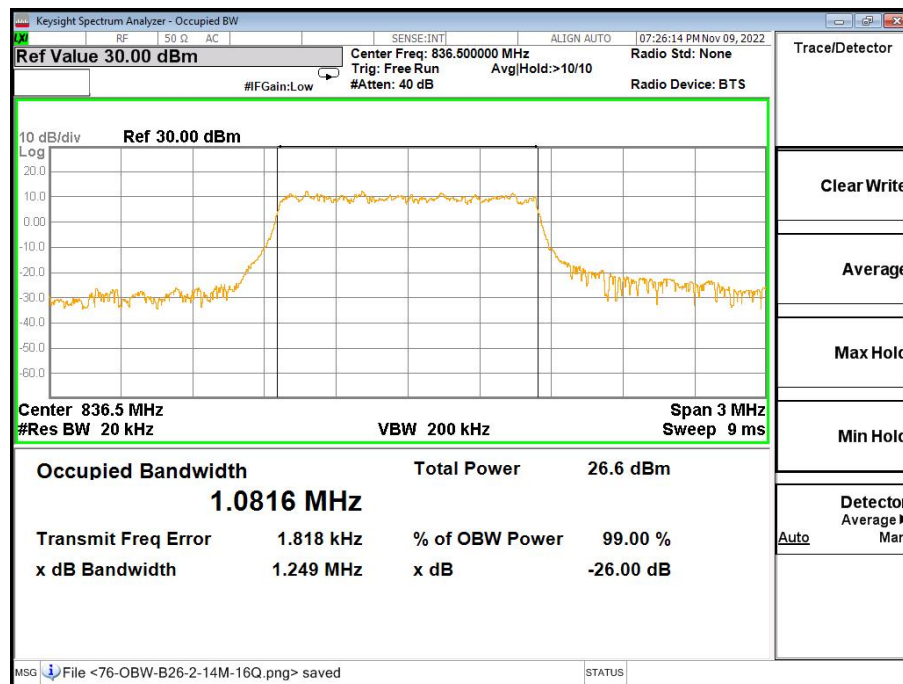
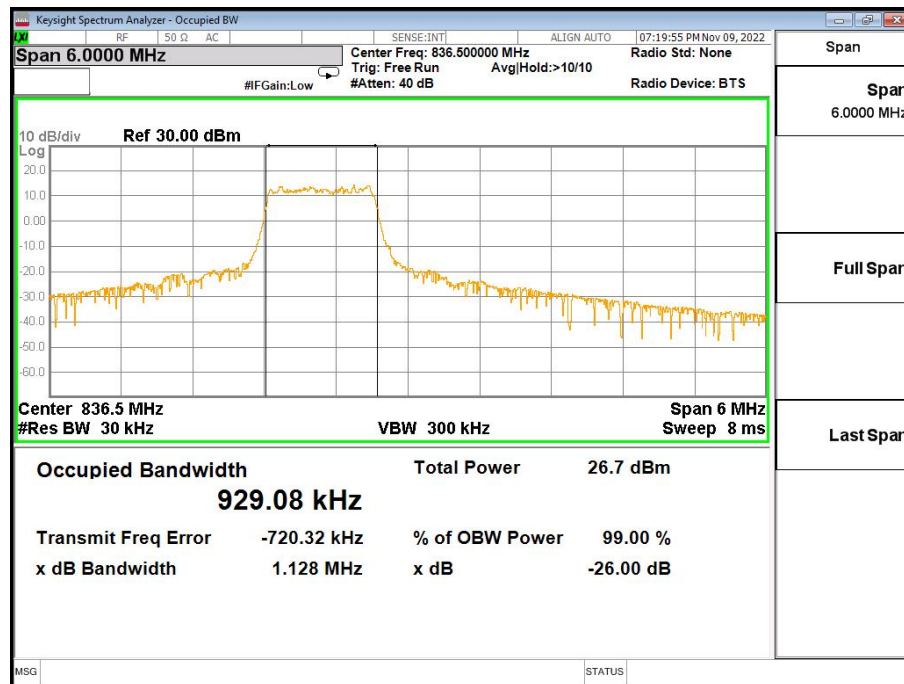


Band26-26dB OBW-26915 Channel-1.4MHz Bandwidth-16QAM



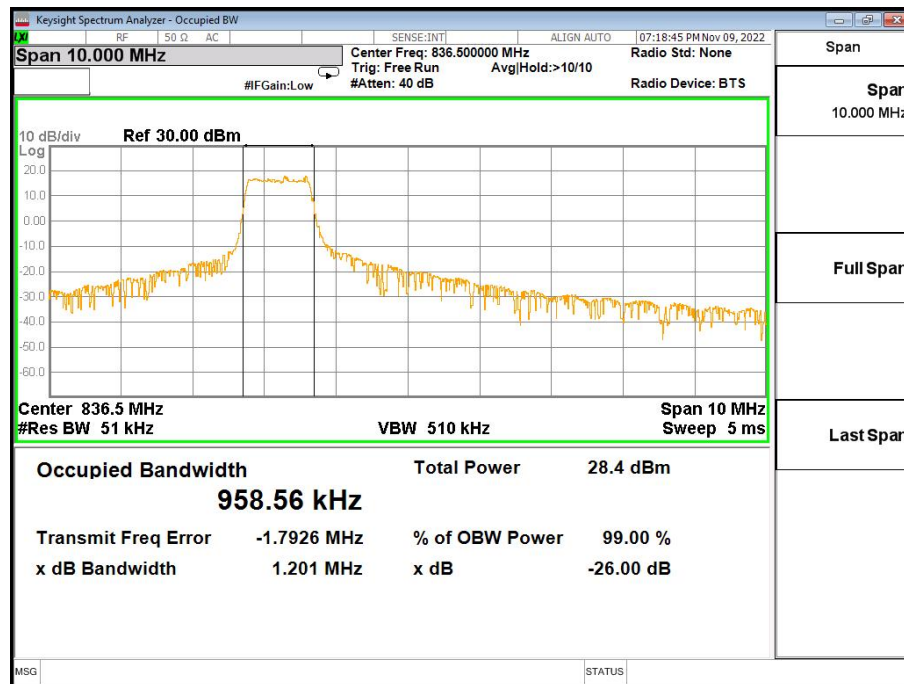
Band26-99% OBW-26915 Channel-1.4MHz Bandwidth-QPSK



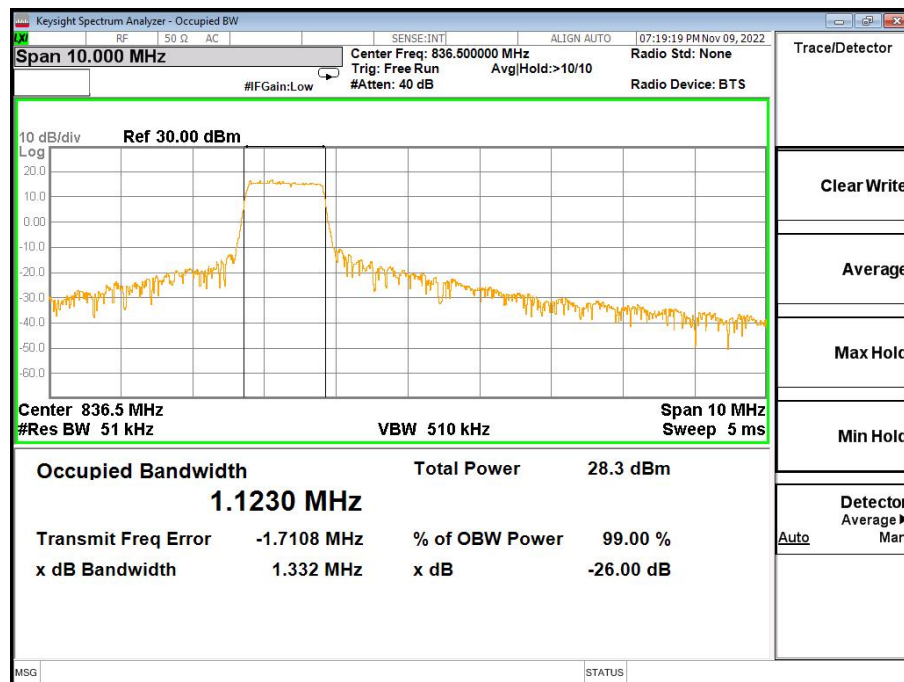
Band26-26dB OBW-26915 Channel-3MHz Bandwidth-16QAM



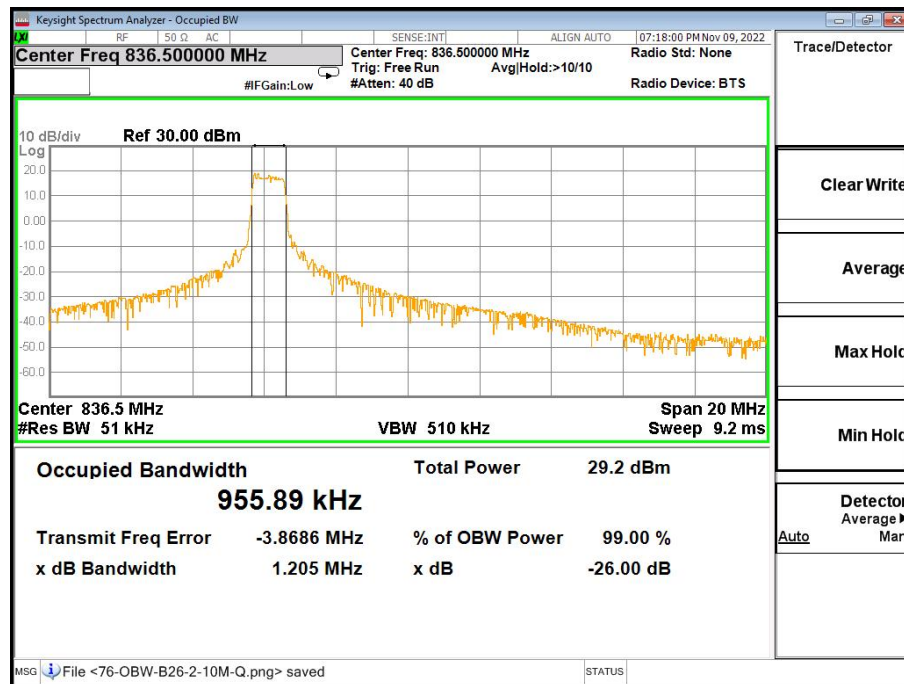
Band26-99% OBW-26915 Channel-3MHz Bandwidth-QPSK



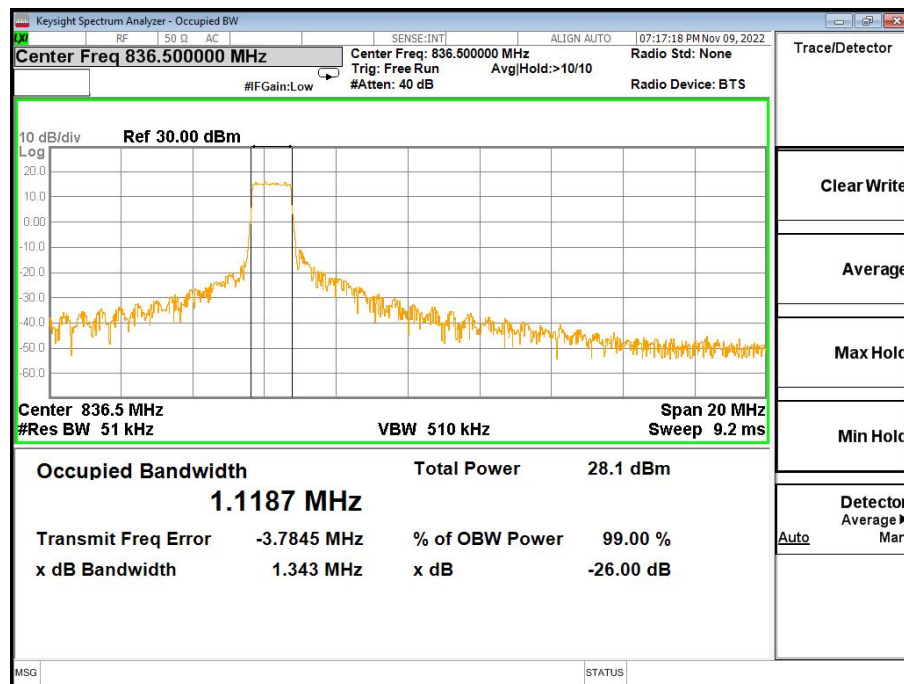
Band26-26dB OBW-26915 Channel-5MHz Bandwidth-16QAM



Band26-99% OBW-26915 Channel-5MHz Bandwidth-QPSK



Band26-26dB OBW-26915 Channel-10MHz Bandwidth-16QAM



Band26-99% OBW-26915 Channel-10MHz Bandwidth-QPSK

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## 6.5. Conducted spurious emissions

<b>Specifications:</b>	FCC Part 2.1051,24.238,2.1053,22.917, 27.53,90.691
<b>DUT Serial Number:</b>	865456056939661
<b>Test conditions:</b>	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
<b>Test Results:</b>	Pass

### Limit Level Construction:

**According to Part 22.917 (a)**, i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

**According to Part 24.238 (a)**, i.e., Out of Band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB, so the limit level is:  $P(\text{dBm}) - (43 + 10 \log(P)) \text{ dB} = -13\text{dBm}$ .

### According to Part 27.53(c):

On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

### According to Part 27.53(f):

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

### According to Part 27.53(g):

For operations in the 600 MHz Band and the 698-746 MHz Band, the power of any emission outside a licensee's frequency Band(s) of operation shall be attenuated below the transmitter power (P) within the licensed Band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution Bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz Bands immediately outside and adjacent to a licensee's frequency block, a resolution Bandwidth of at least 30 kHz may be employed.

### According to Part 90.691:

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as

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follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

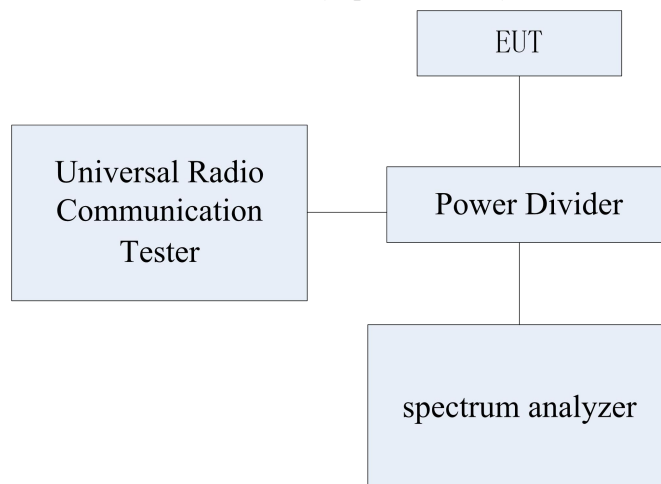
(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

**Measurement Uncertainty:**

Item	Uncertainty	
Expanded Uncertainty	$9\text{kHz} < f \leq 4\text{GHz}$	0.71 dB (k=2)
	$4\text{GHz} \leq f < 12.75\text{GHz}$	0.74 dB (k=2)
	$12.75\text{GHz} \leq f < 26\text{GHz}$	2.70 dB (k=2)

**Test Setup:**

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



**Test Method:**

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-Band emissions, if any, up to 10th harmonic. The EUT was scanned for spurious emissions from 30MHz to 20GHz with sufficient Bandwidth and video resolution.

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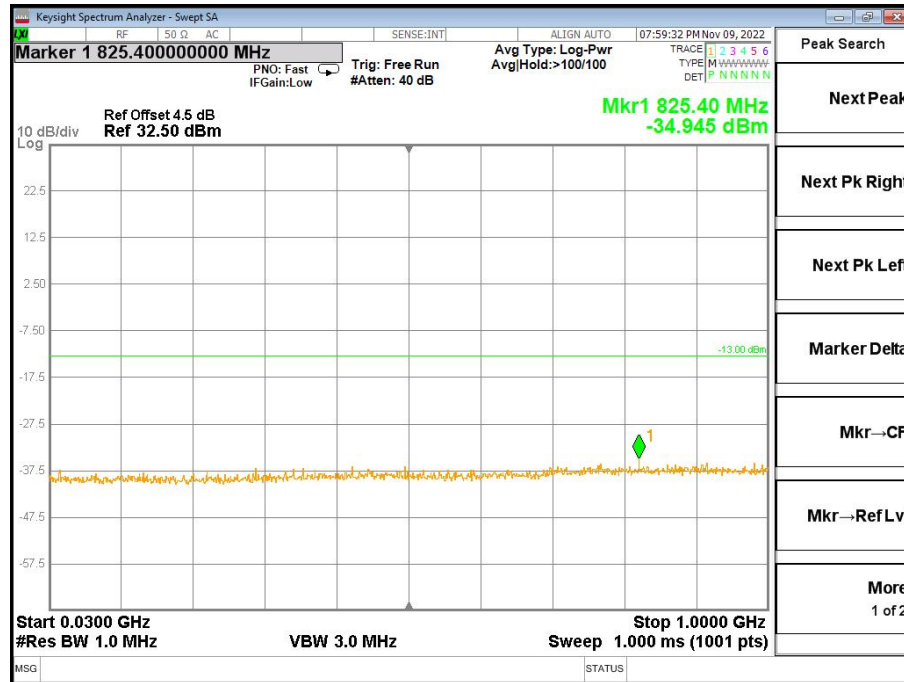


## Report No.: I22W00076-CAT-M RF-FCC\_Rev2

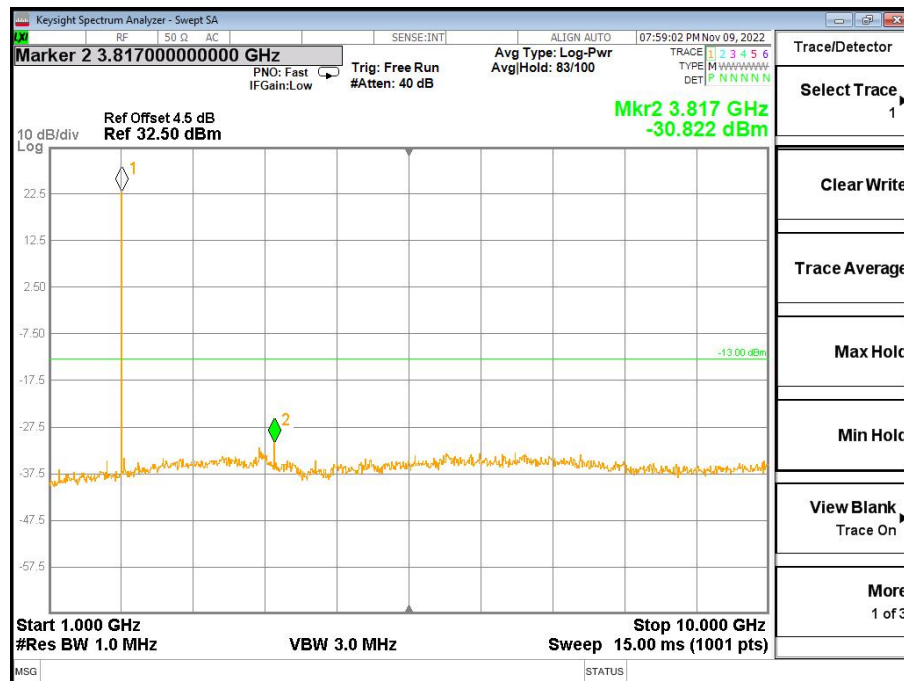
The spectrum analyzer was set to Maximum hold mode to ensure that the worst-case emissions were captured.

**Note:** worst case test mode is QPSK mode.

### 6.5.1 CAT-M B2 Conducted Spurious Emission Results



Band2-High Channel-1.4MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

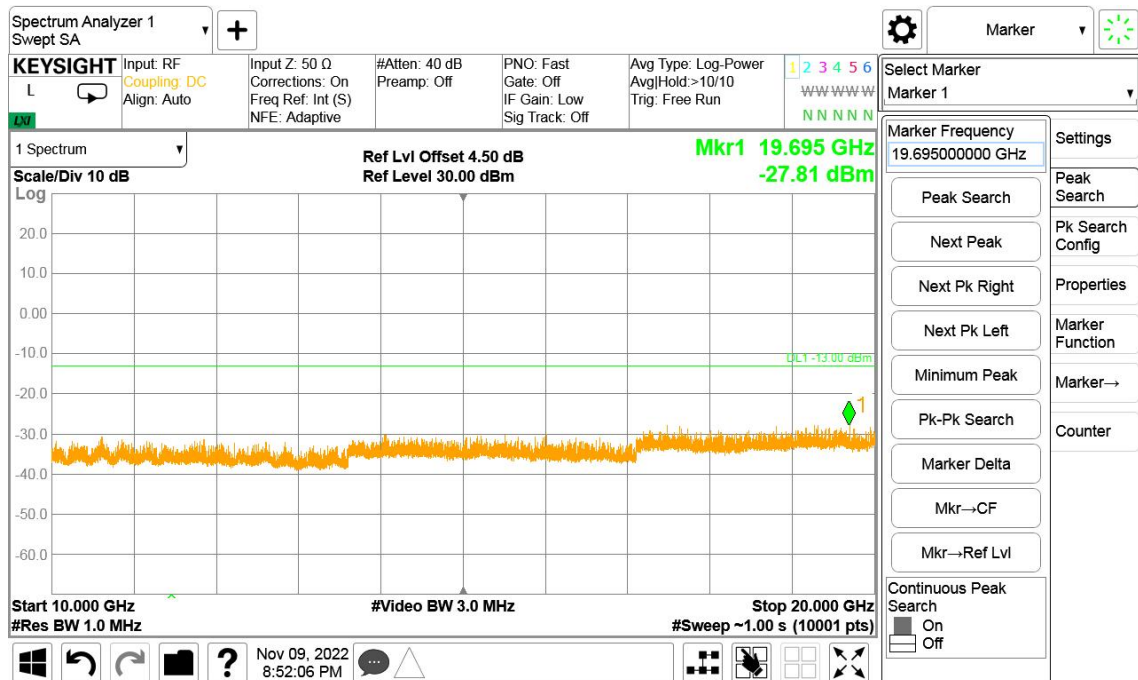


Band2-High Channel-1.4MHz Bandwidth-1RB-QPSK-1GHz to 10GHz

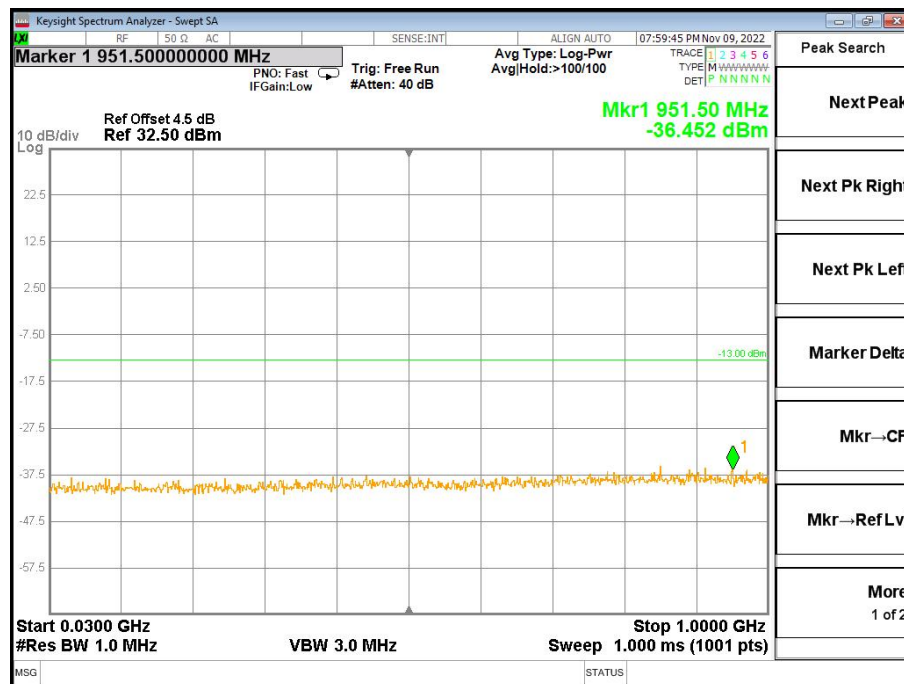
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Band2-High Channel-1.4MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

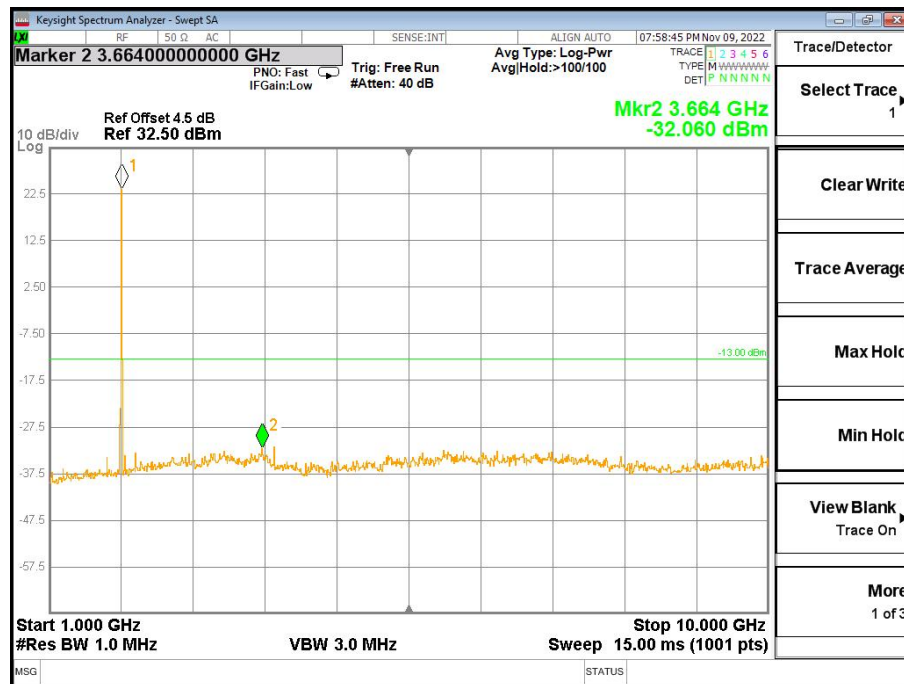


Band2-High Channel-3MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

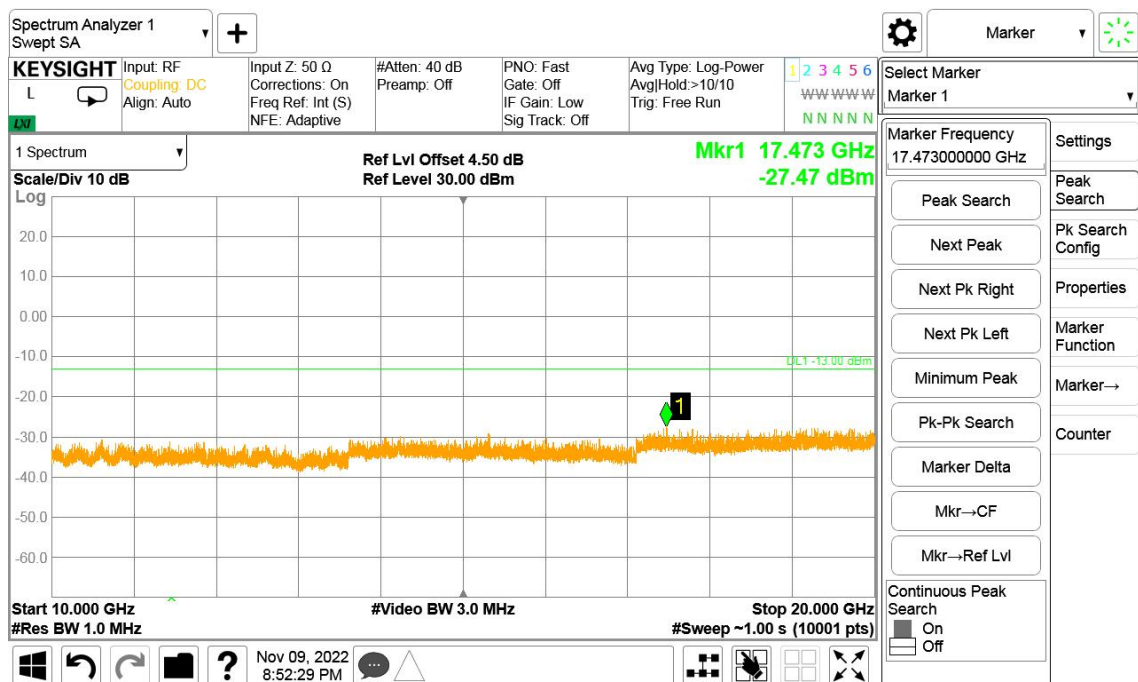
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Band2-High Channel-3MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



Band2-High Channel-3MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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Keysight Spectrum Analyzer - Sweep SA

RF 50  $\Omega$  AC SENSE:INT ALIGN AUTO 07:58:33 PM Nov 09, 2022

Marker 2 3.727000000000 GHz PNO: Fast IF Gain: Low Trig: Free Run Avg|Hold: 64/100

Ref Offset 4.5 dB Ref 32.50 dBm

10 dB/div Log

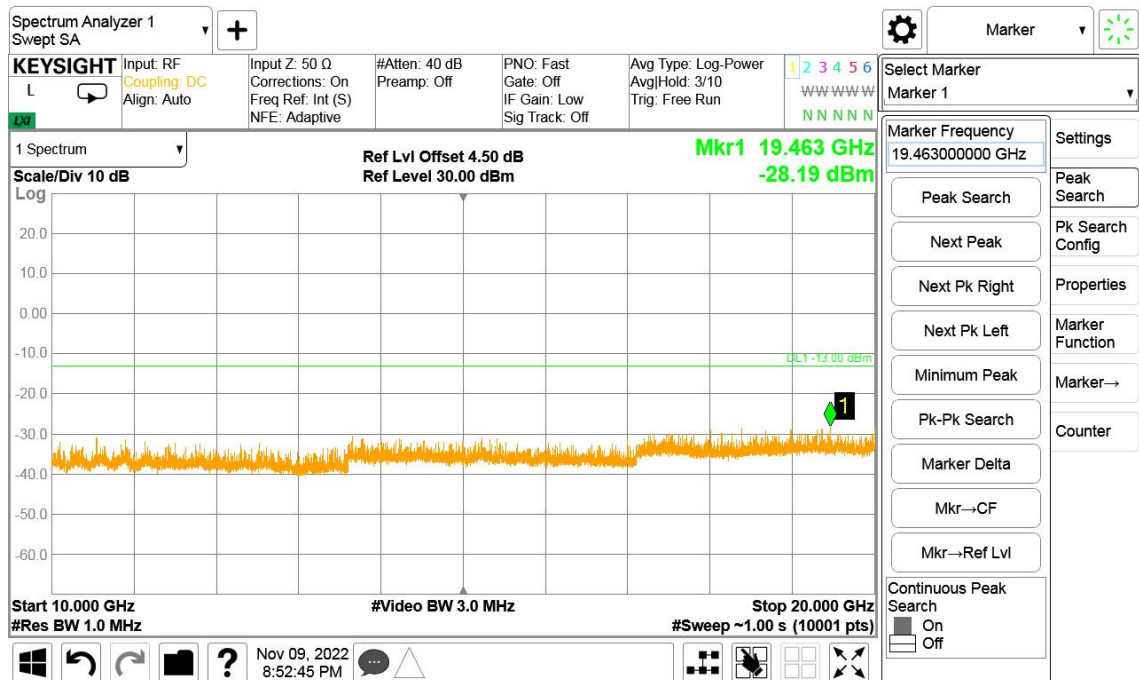
Mkr2 3.727 GHz -33.404 dBm

Start 1.000 GHz Stop 10.000 GHz  
#Res BW 1.0 MHz VBW 3.0 MHz Sweep 15.00 ms (1001 pts)

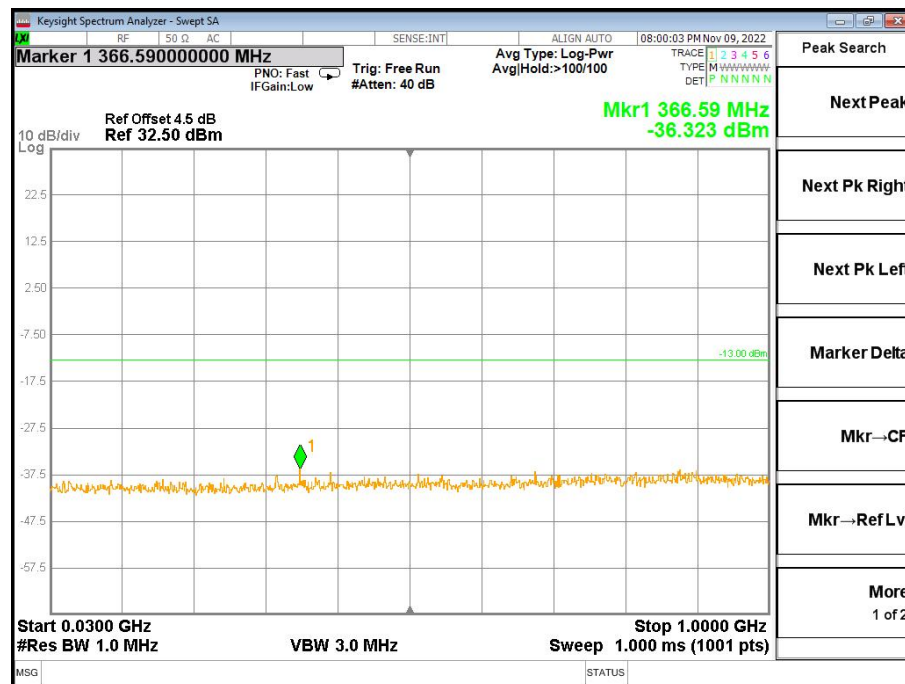
MSG STATUS

Trace/Detector  
Select Trace  
Clear Write  
Trace Average  
Max Hold  
Min Hold  
View Blank Trace On  
More 1 of 3

Page 70 of 384



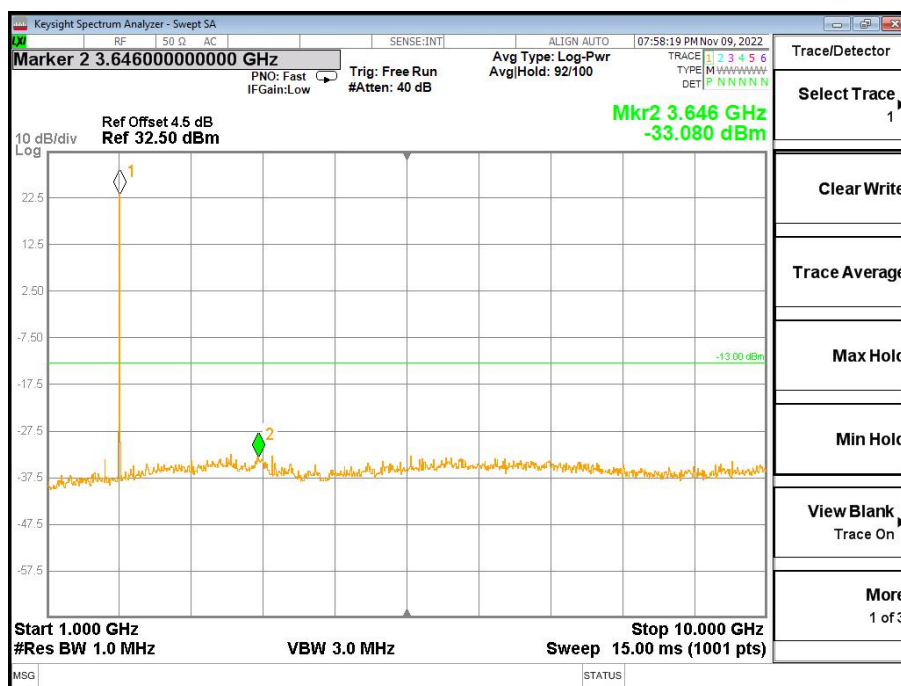
Band2-High Channel-5MHz Bandwidth-1RB-QPSK-10GHz to 20GHz



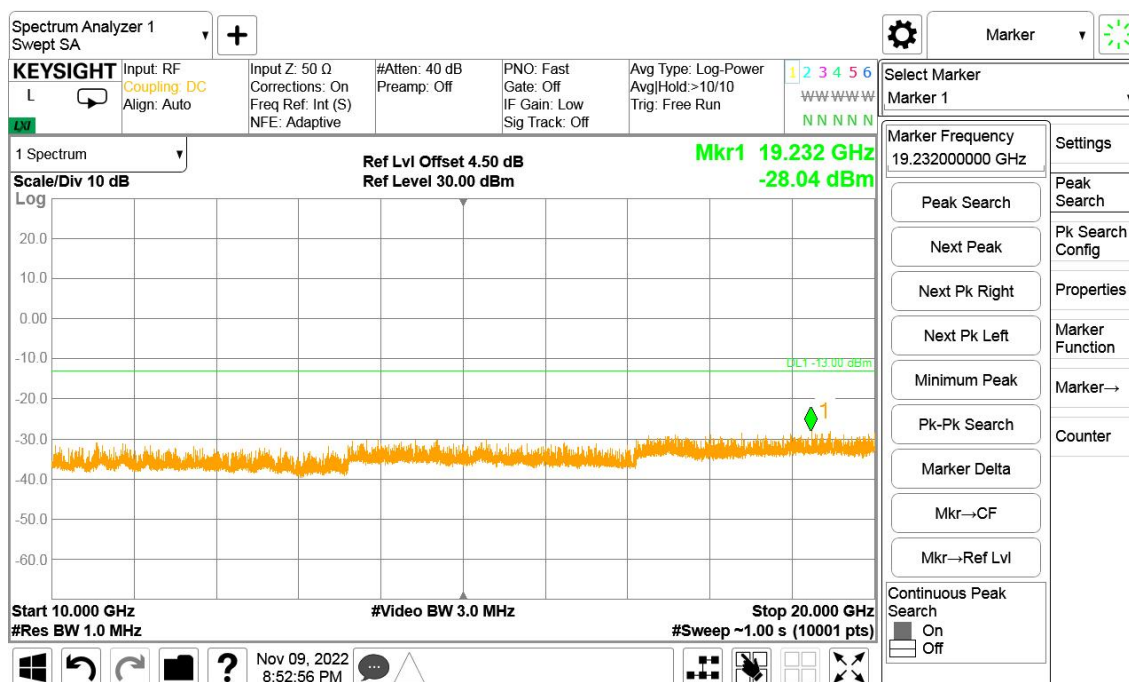
Band2-High Channel-10MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

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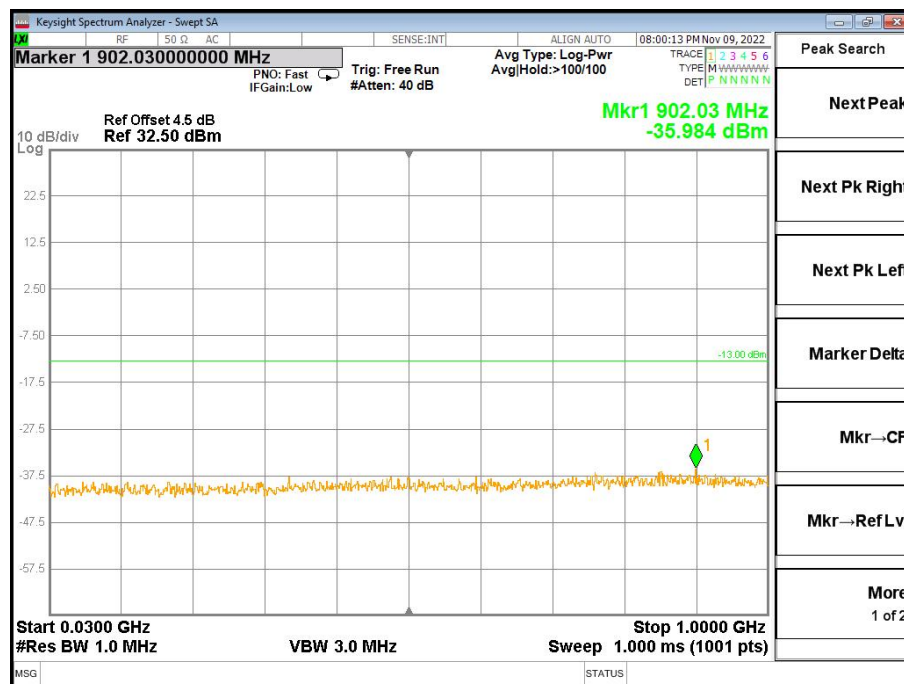
Band2-High Channel-10MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



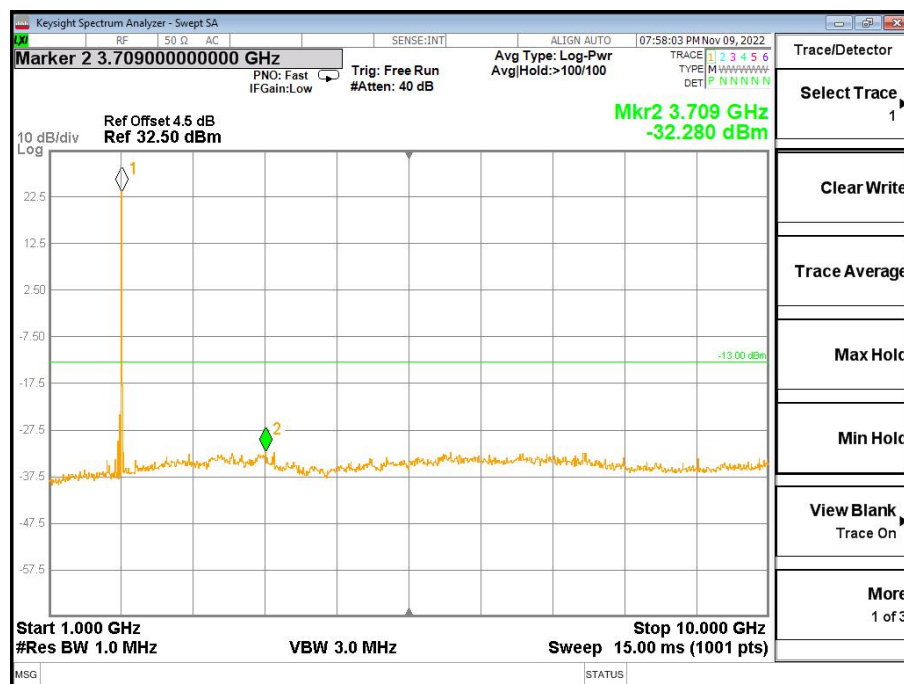
Band2-High Channel-10MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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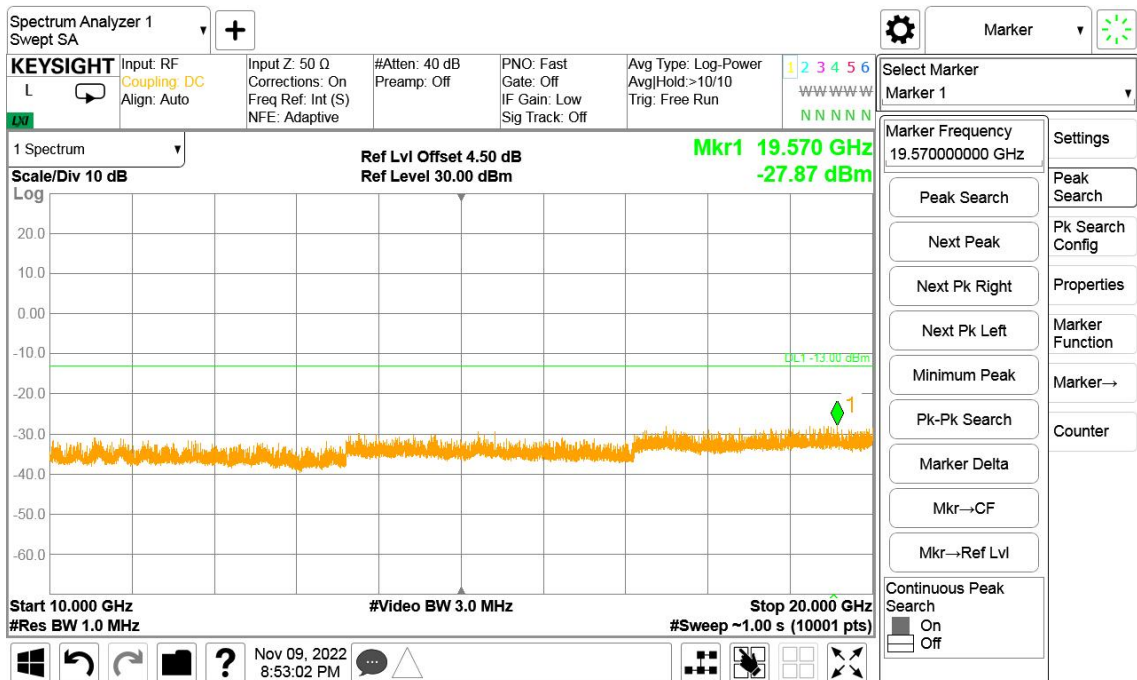


Band2-High Channel-15MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

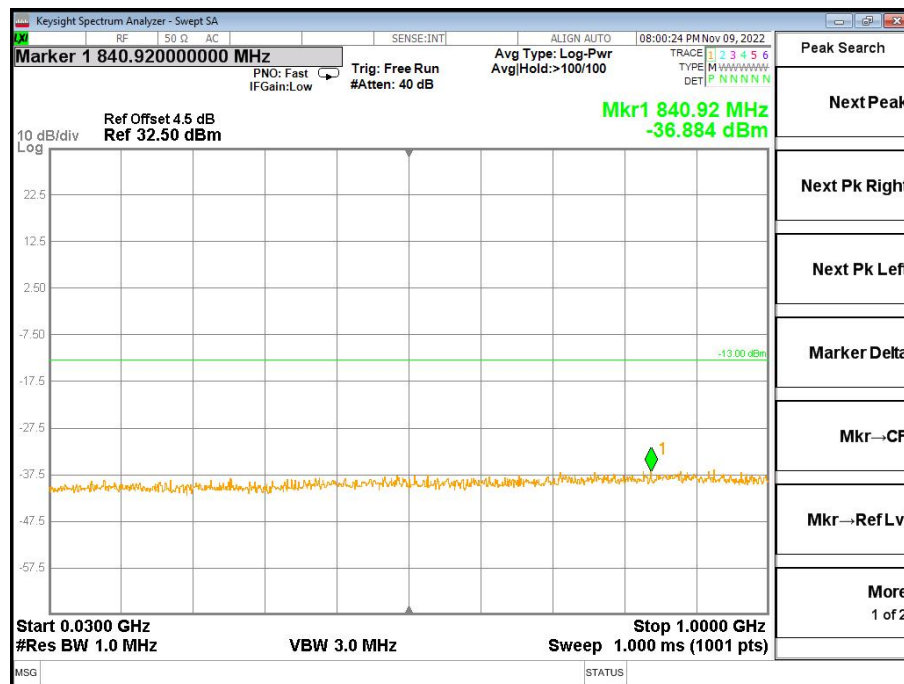


Band2-High Channel-15MHz Bandwidth-1RB-QPSK-1GHz to 10GHz





Band2-High Channel-15MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

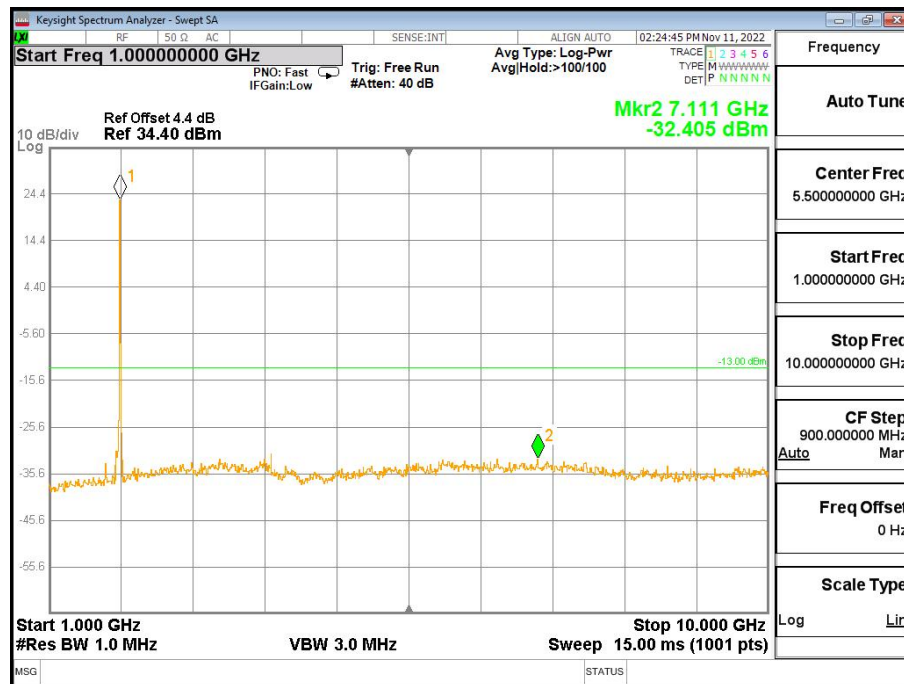


Band2-High Channel-20MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

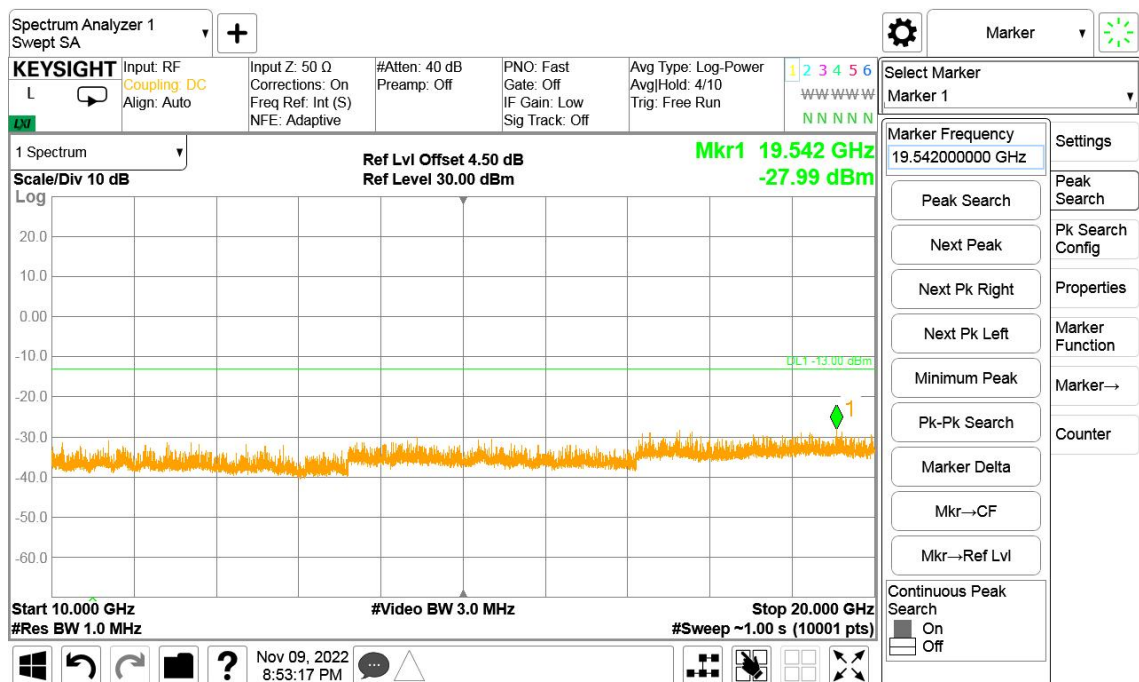
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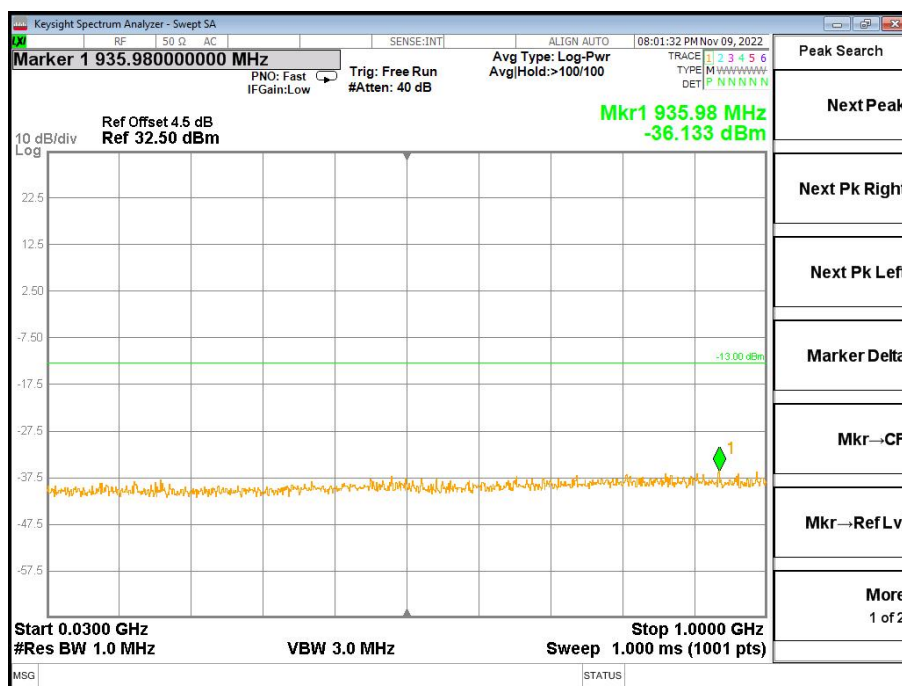
Band2-High Channel-20MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



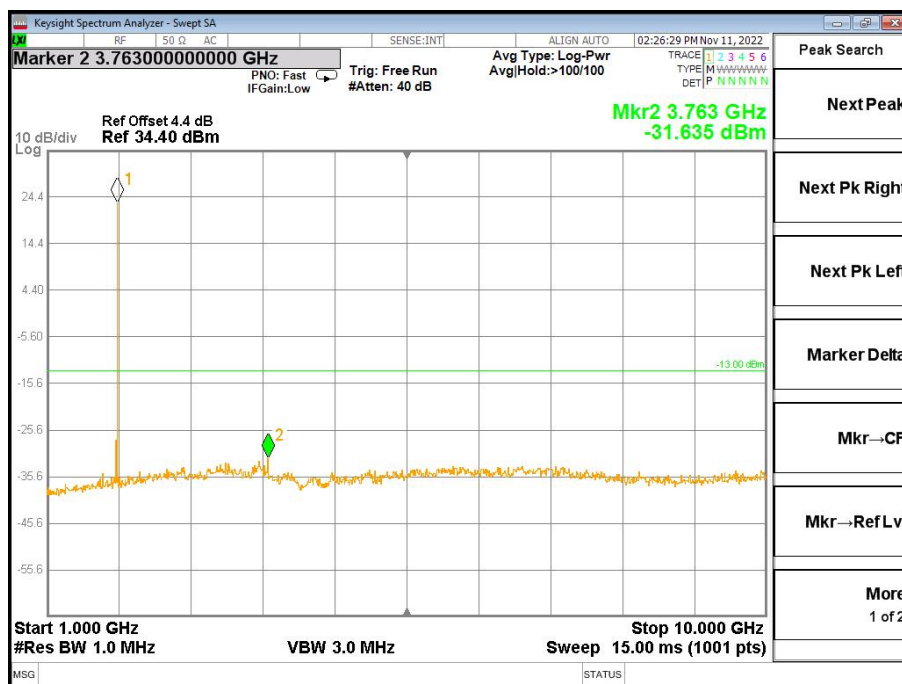
Band2-High Channel-20MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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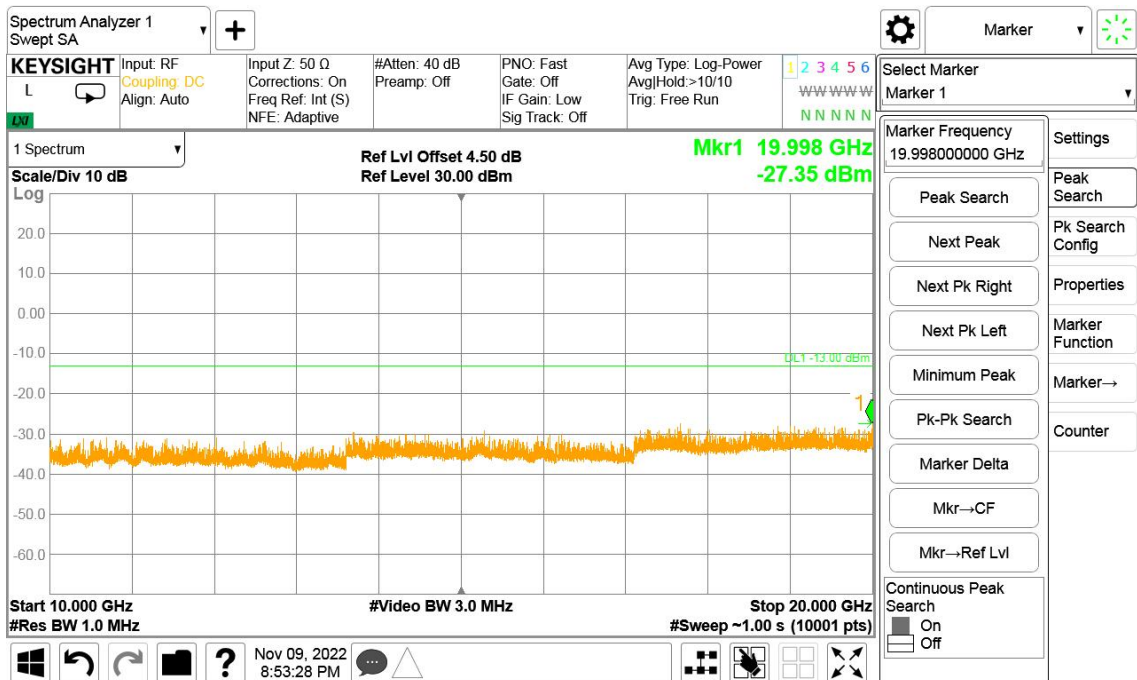
Band2-Middle Channel-1.4MHz Bandwidth-1RB-QPSK-30MHz to 1GHz



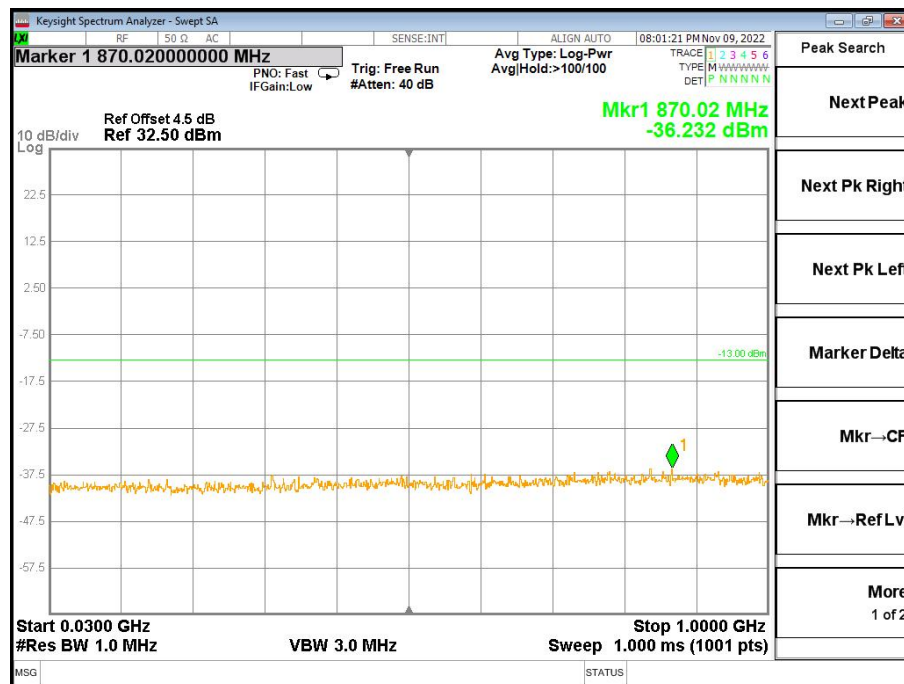
Band2-Middle Channel-1.4MHz Bandwidth-1RB-QPSK-1GHz to 10GHz

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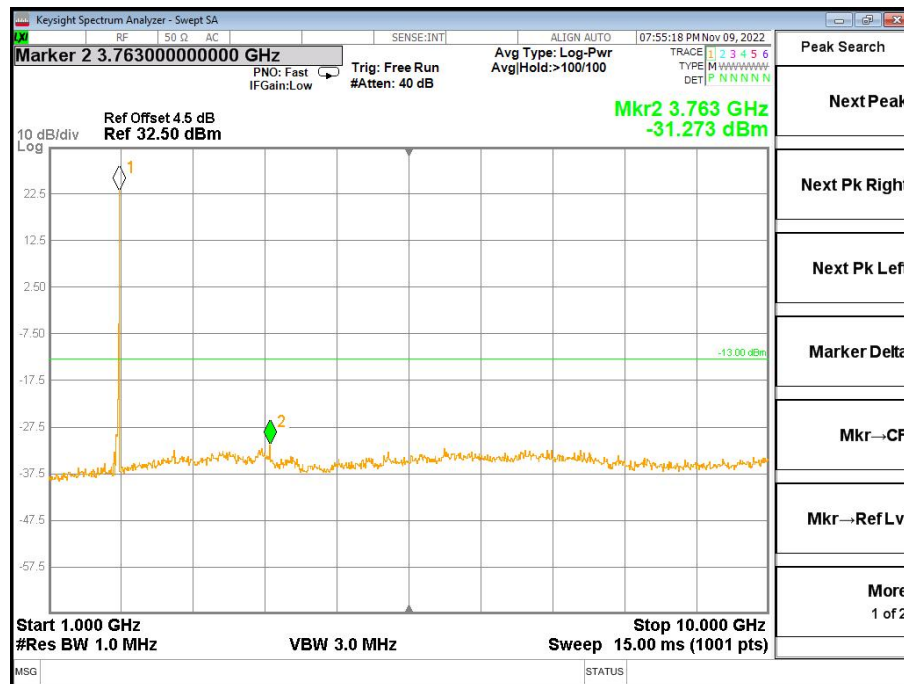
Band2-Middle Channel-1.4MHz Bandwidth-1RB-QPSK-10GHz to 20GHz



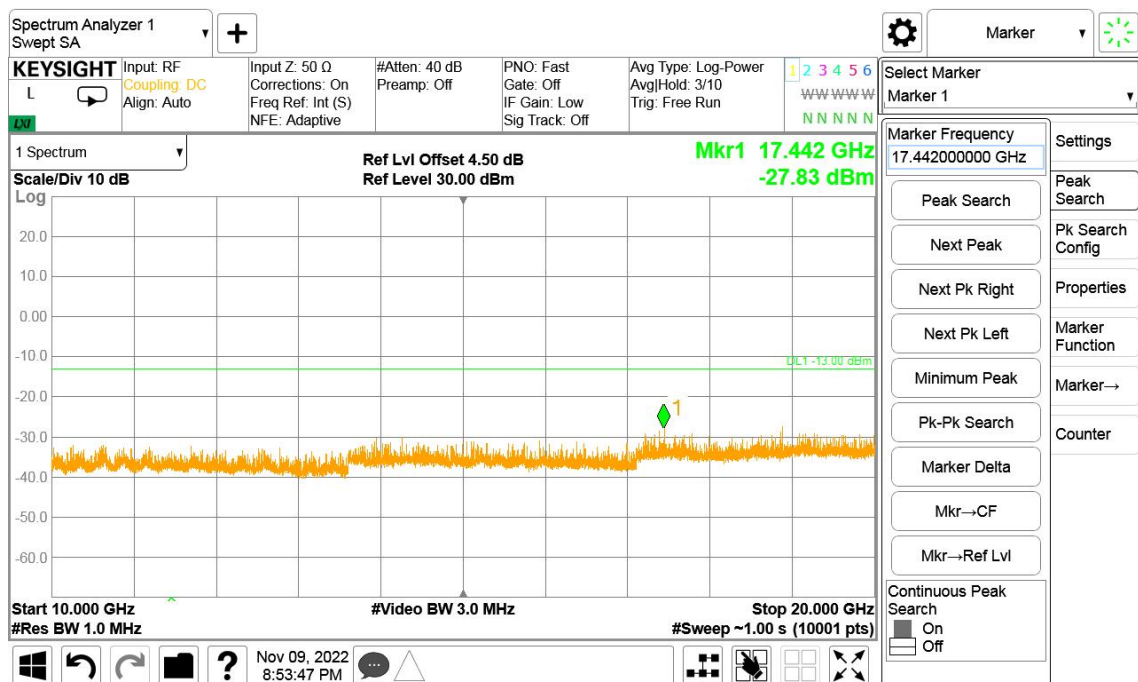
Band2-Middle Channel-3MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

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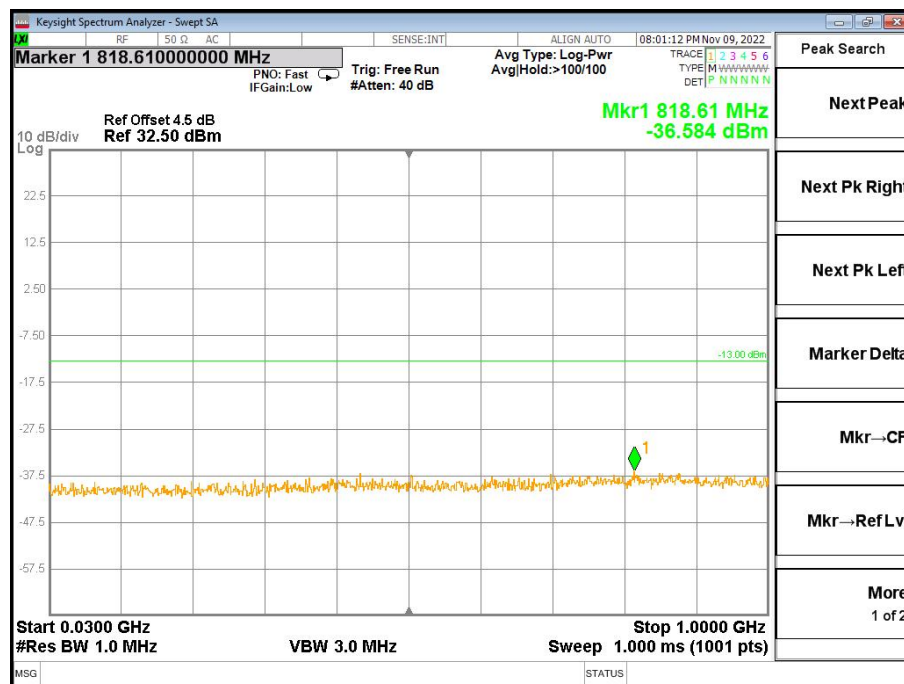
Band2-Middle Channel-3MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



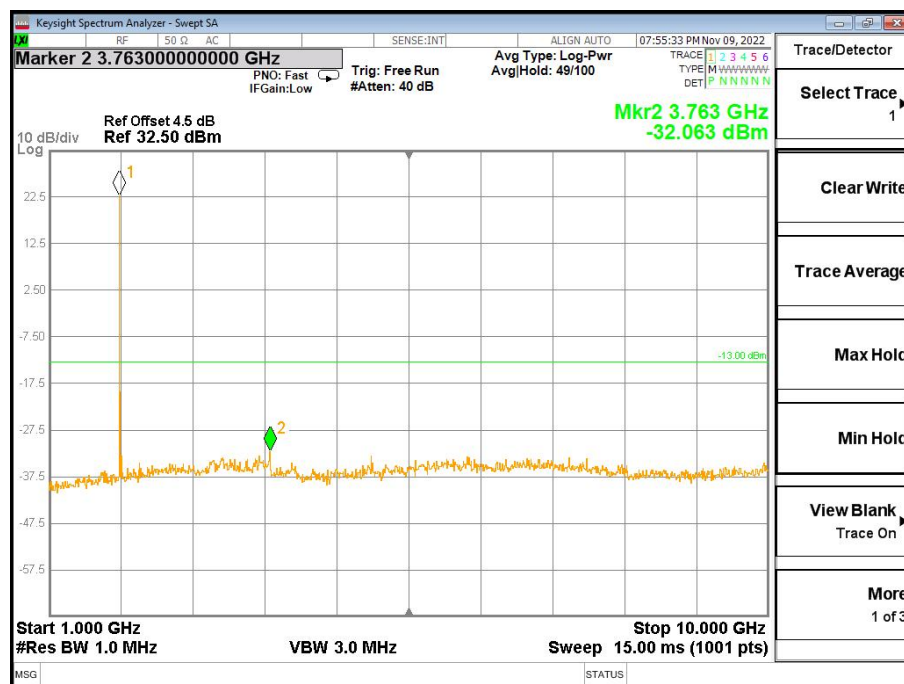
Band2-Middle Channel-3MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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Band2-Middle Channel-5MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

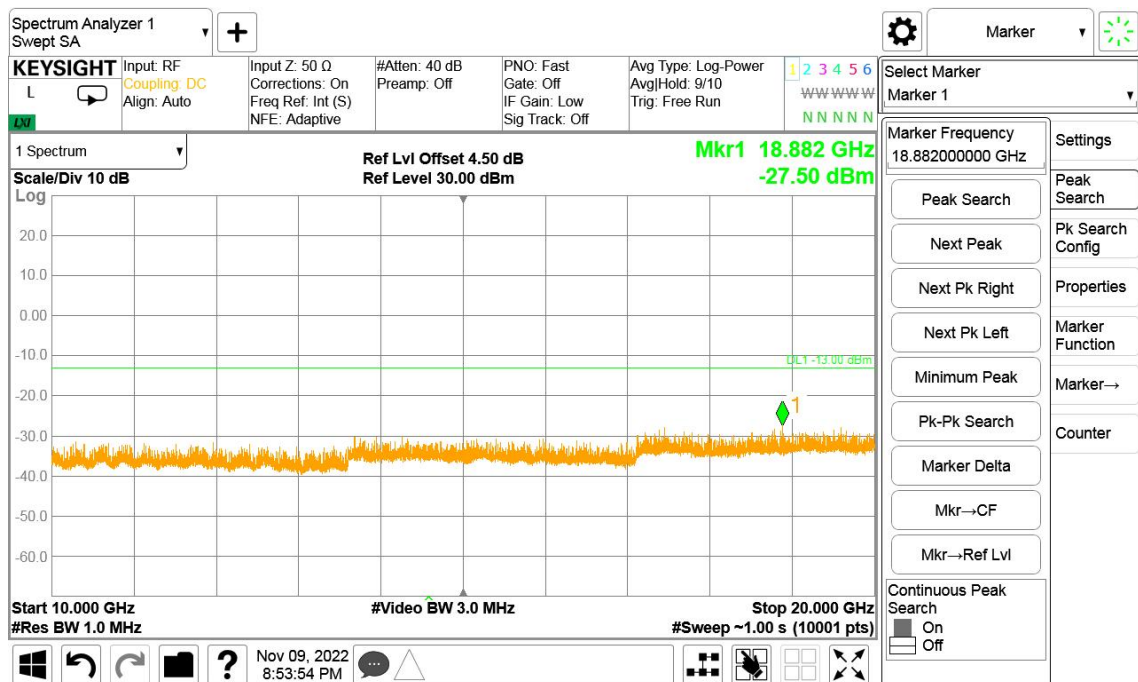


Band2-Middle Channel-5MHz Bandwidth-1RB-QPSK-1GHz to 10GHz

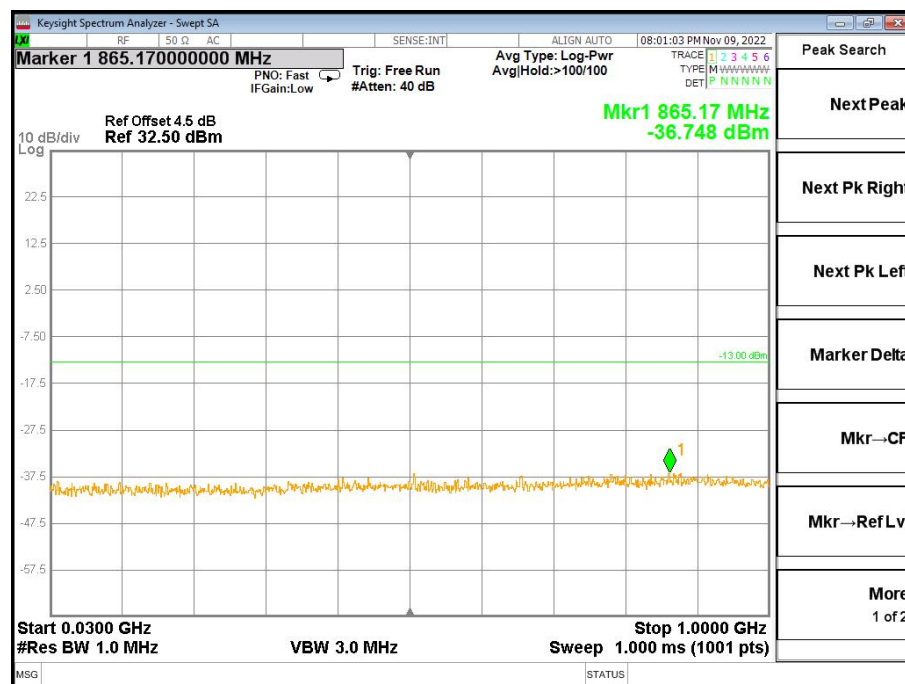
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Band2-Middle Channel-5MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

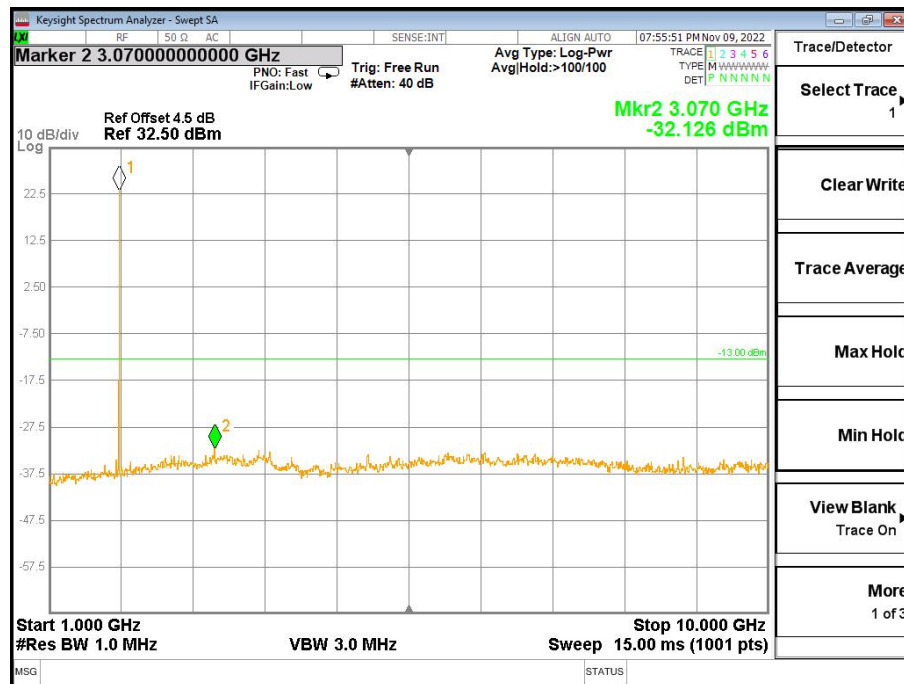


Band2-Middle Channel-10MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

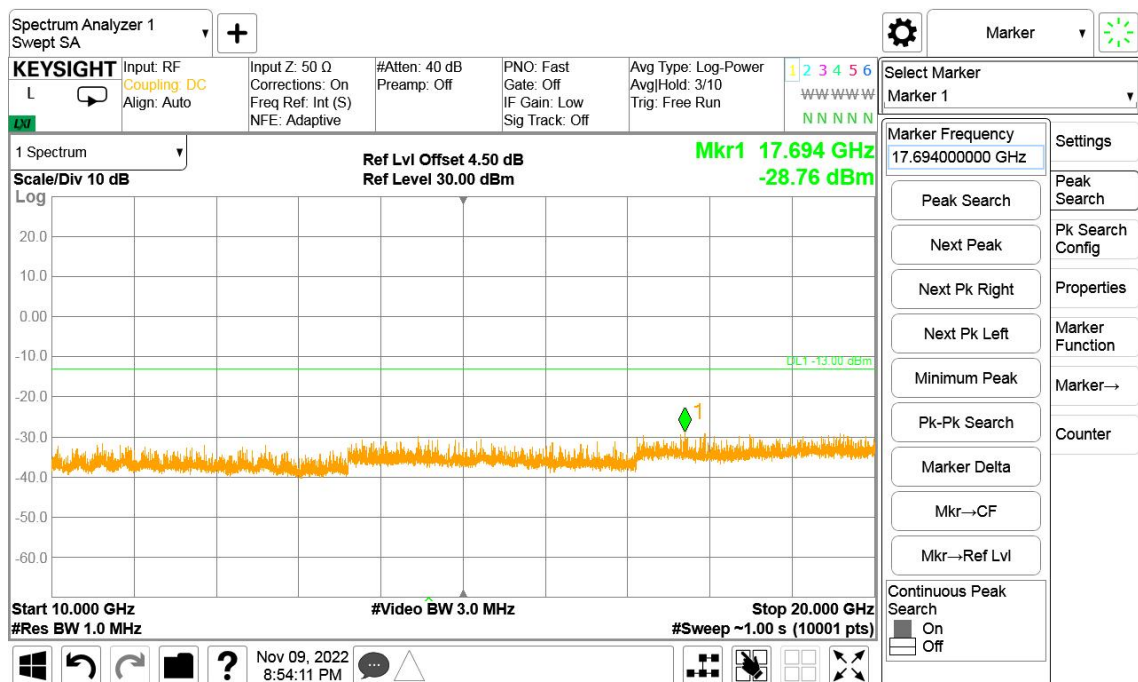
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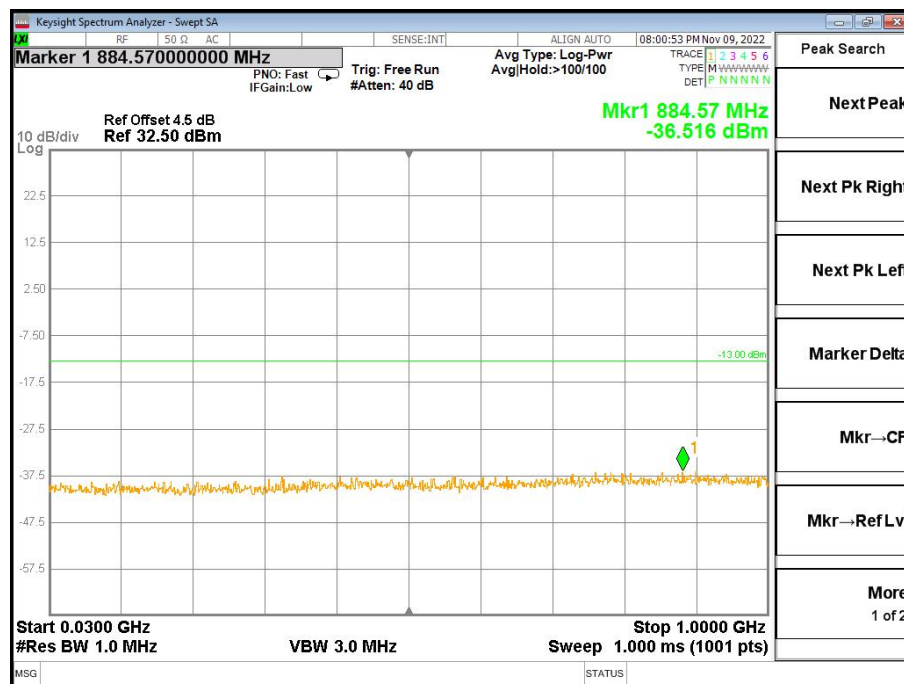
Band2-Middle Channel-10MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



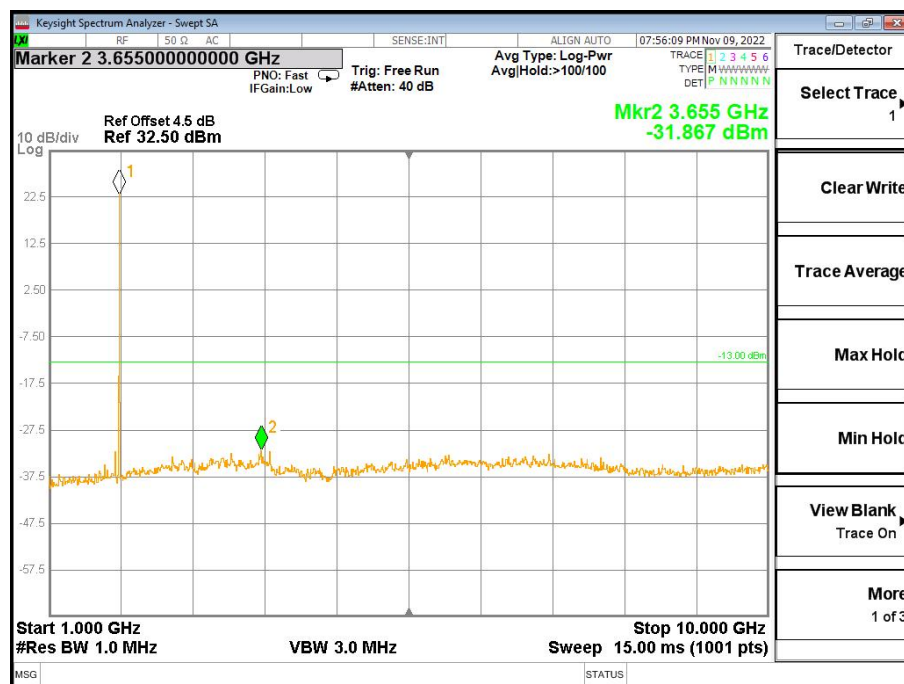
Band2-Middle Channel-10MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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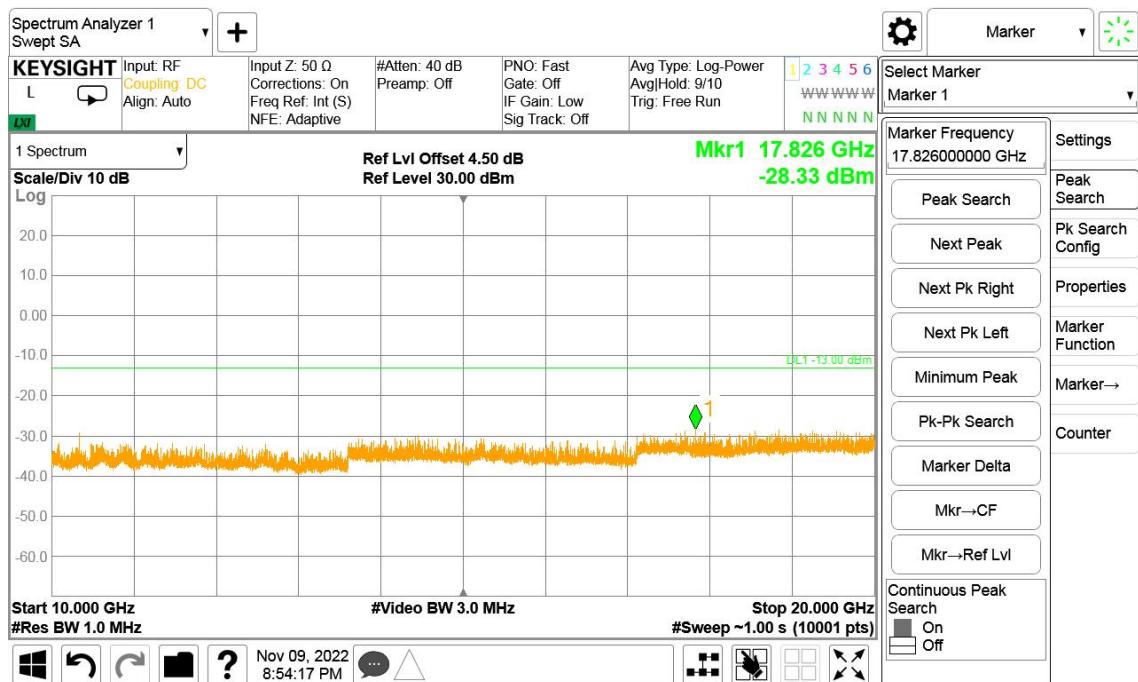
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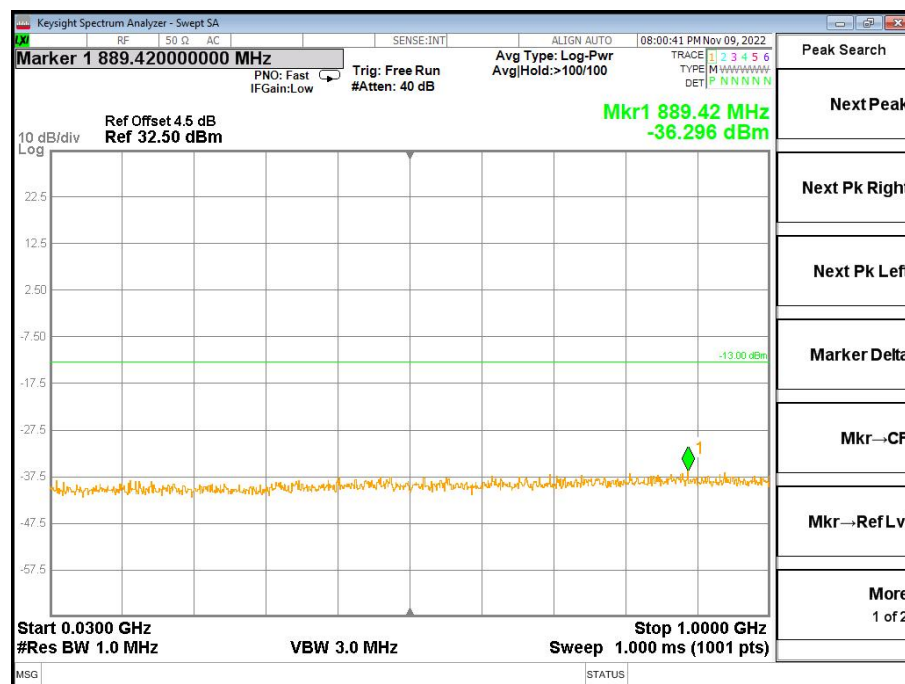
Band2-Middle Channel-15MHz Bandwidth-1RB-QPSK-30MHz to 1GHz



Band2-Middle Channel-15MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



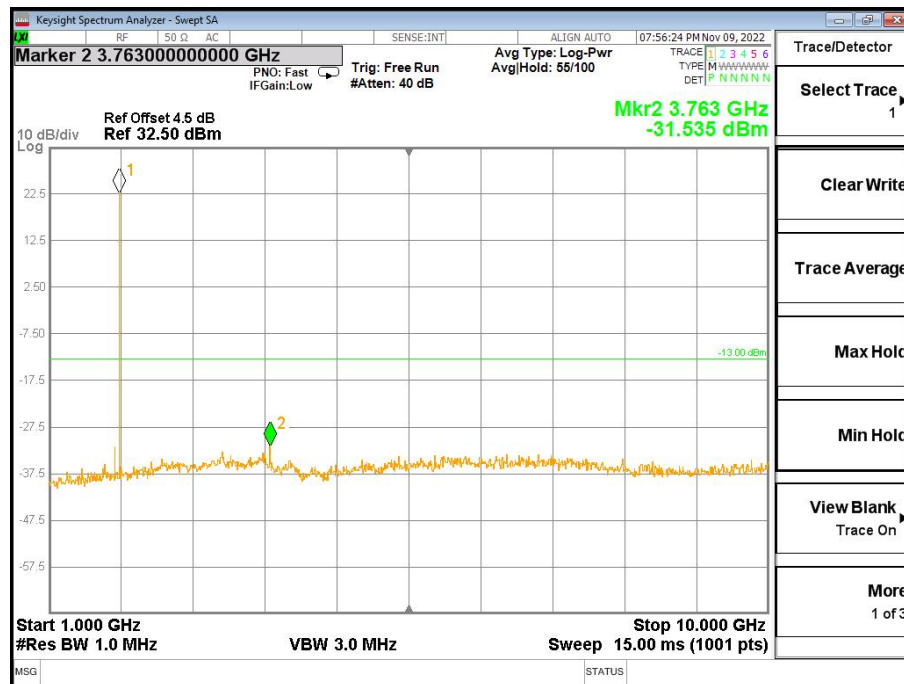
Band2-Middle Channel-15MHz Bandwidth-1RB-QPSK-10GHz to 20GHz



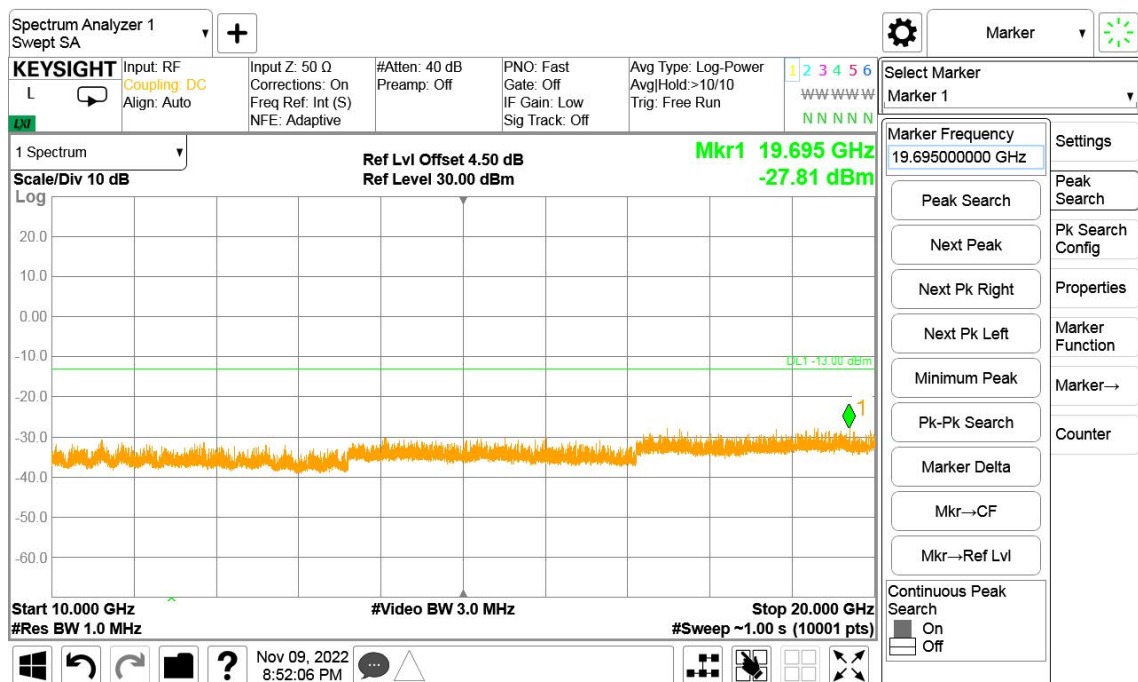
Band2-Middle Channel-20MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

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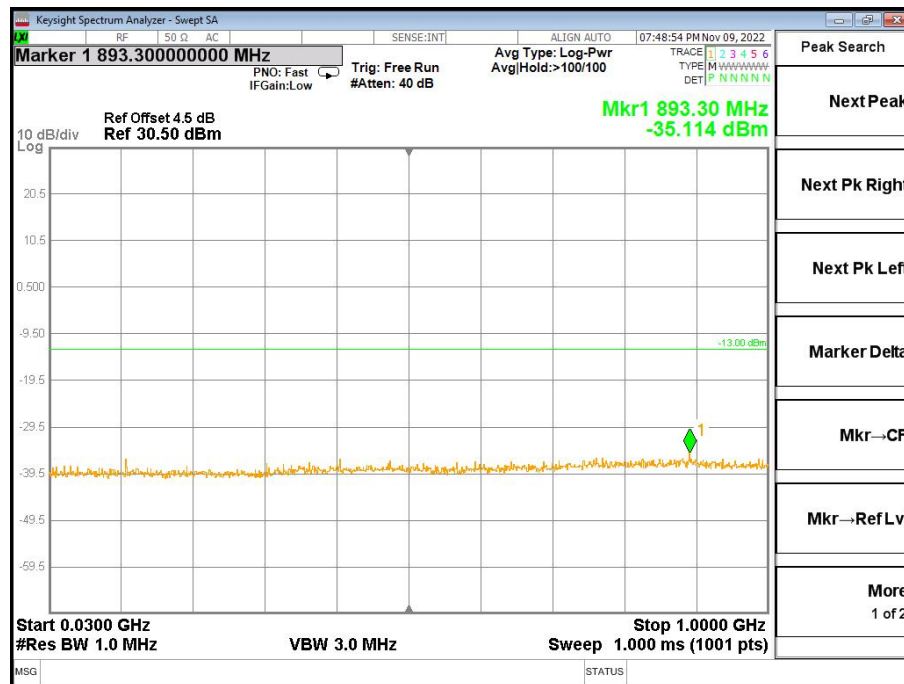
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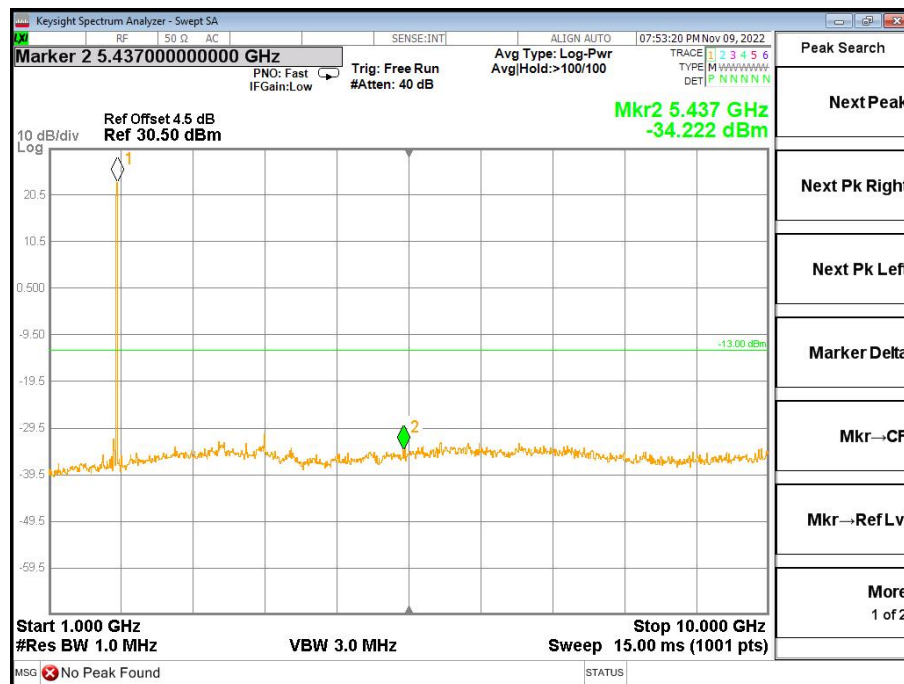
Band2-Middle Channel-20MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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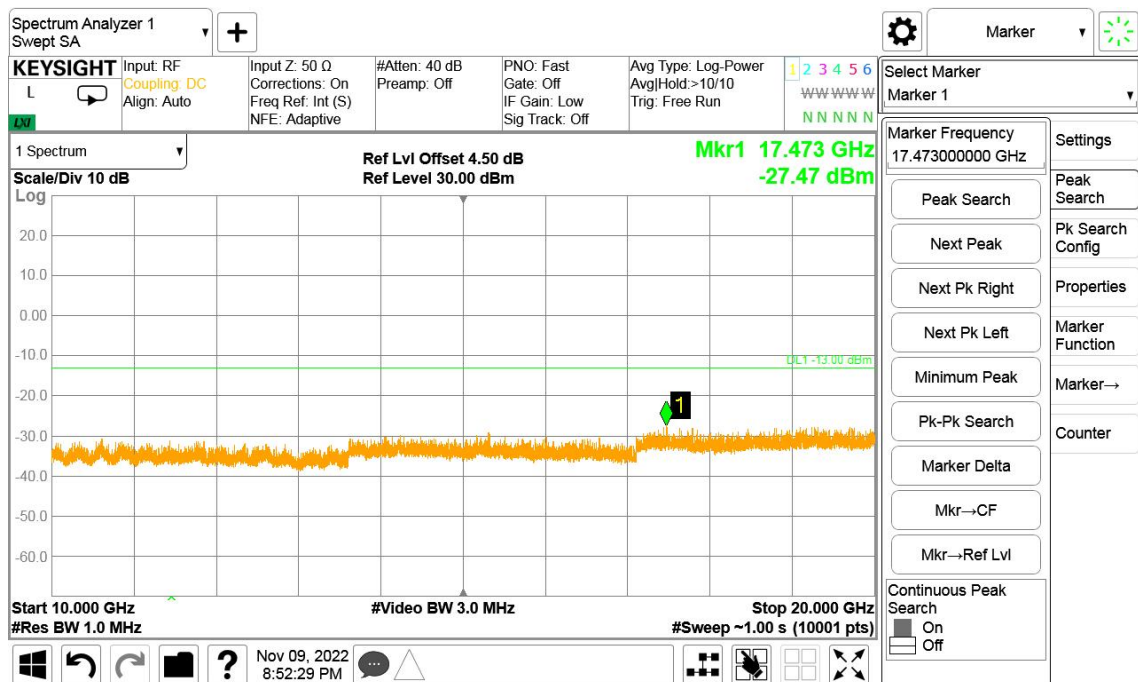


Band2-Low Channel-1.4MHz Bandwidth-1RB-QPSK-30MHz to 1GHz

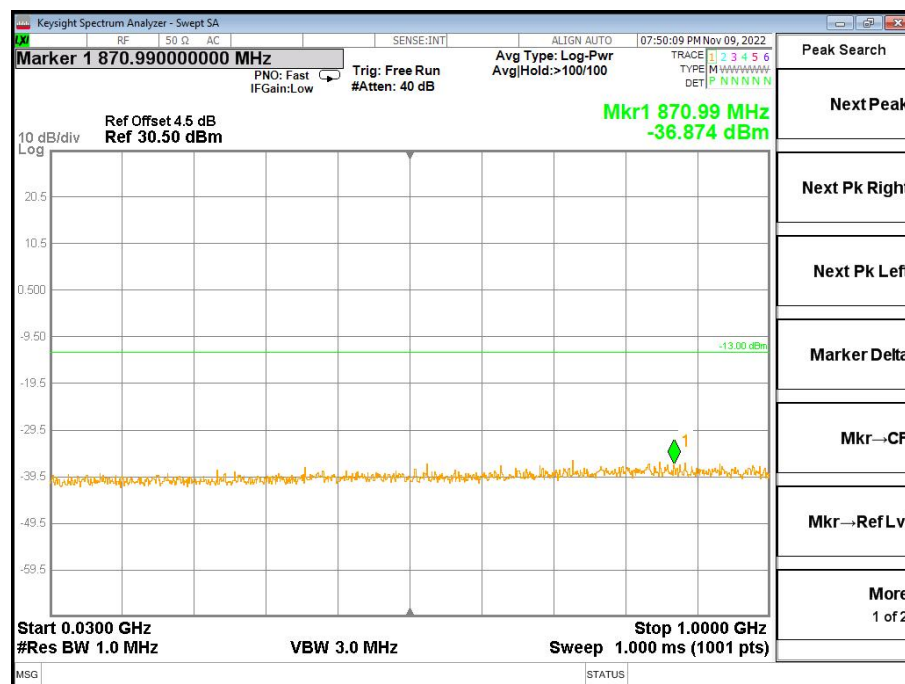


Band2-Low Channel-1.4MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



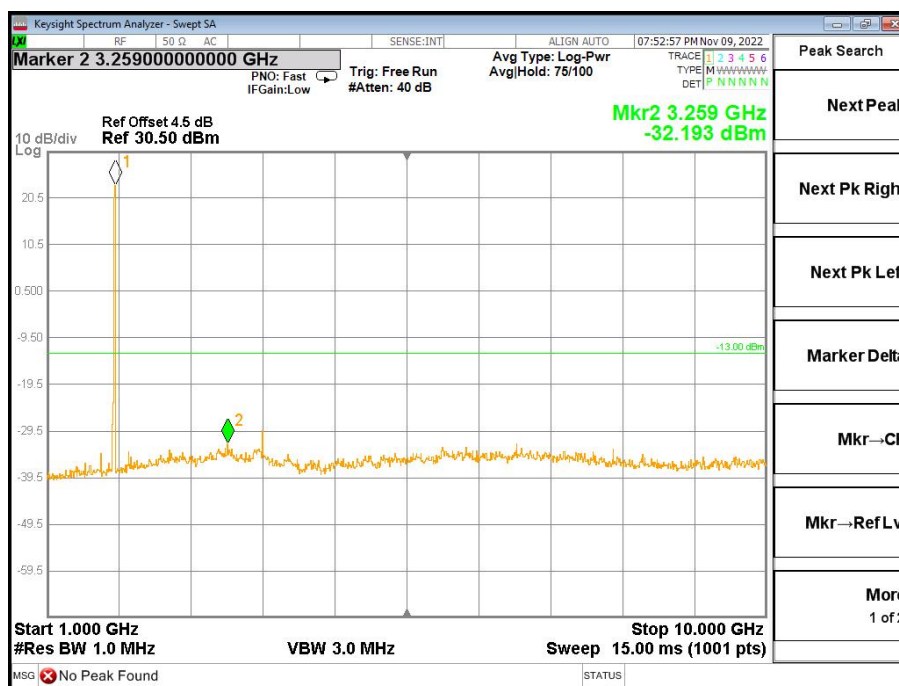


Band2-Low Channel-1.4MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

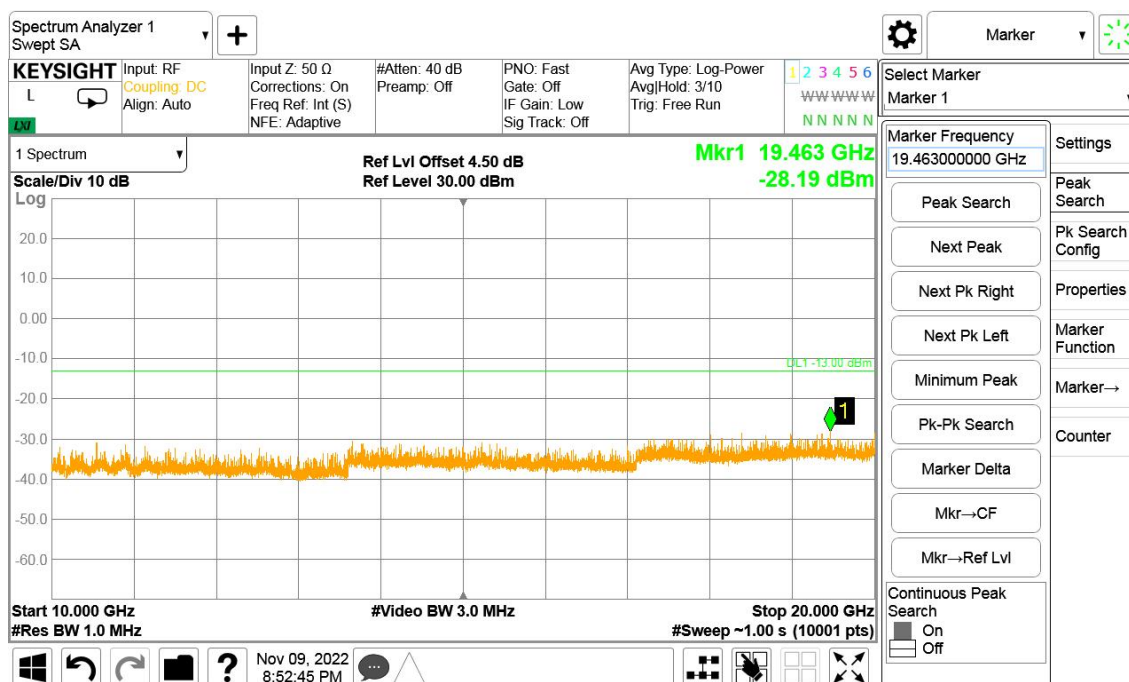


Band2-Low Channel-3MHz Bandwidth-1RB-QPSK-30MHz to 1GHz





Band2-Low Channel-3MHz Bandwidth-1RB-QPSK-1GHz to 10GHz



Band2-Low Channel-3MHz Bandwidth-1RB-QPSK-10GHz to 20GHz

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