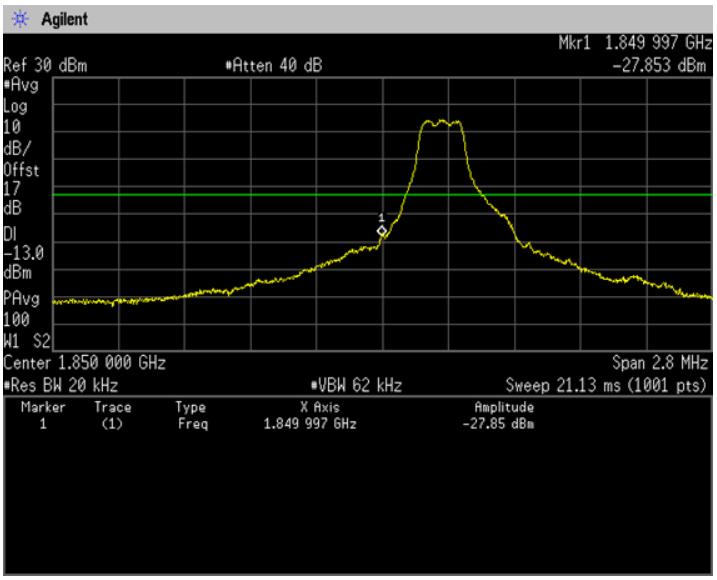
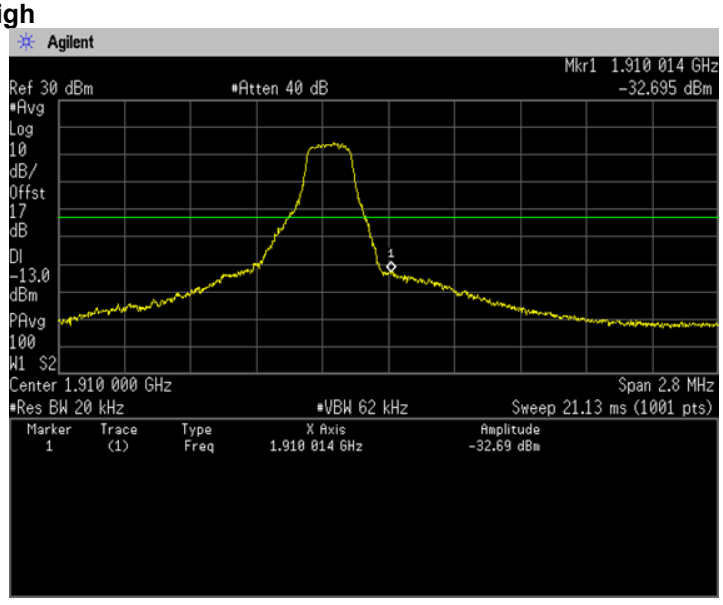
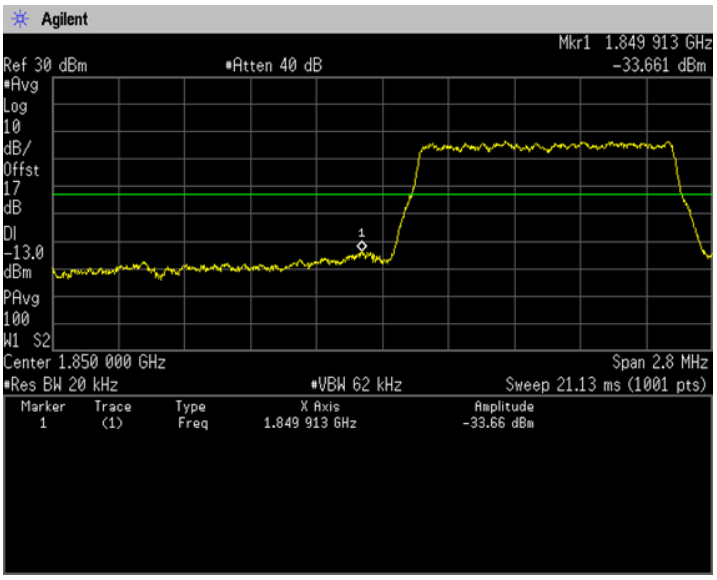
16QAM, BW 1.4MHz, RB1-0
Channel: Low



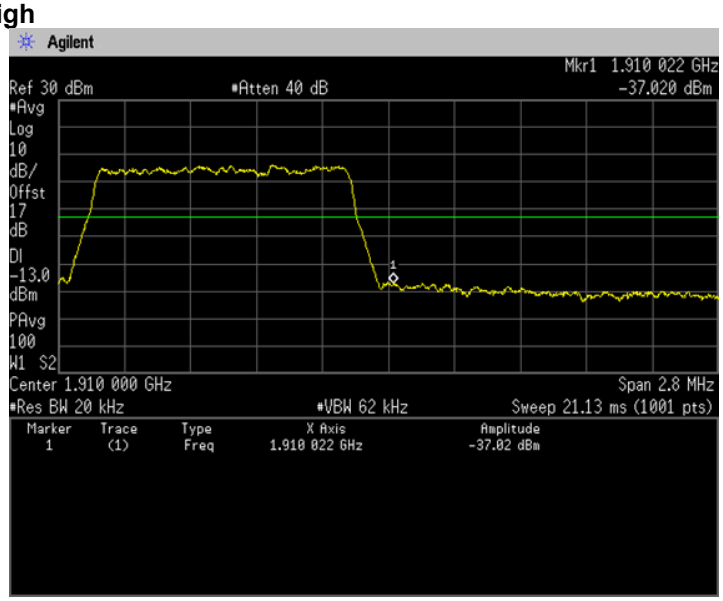
16QAM, BW 1.4MHz, RB1-5
Channel: High



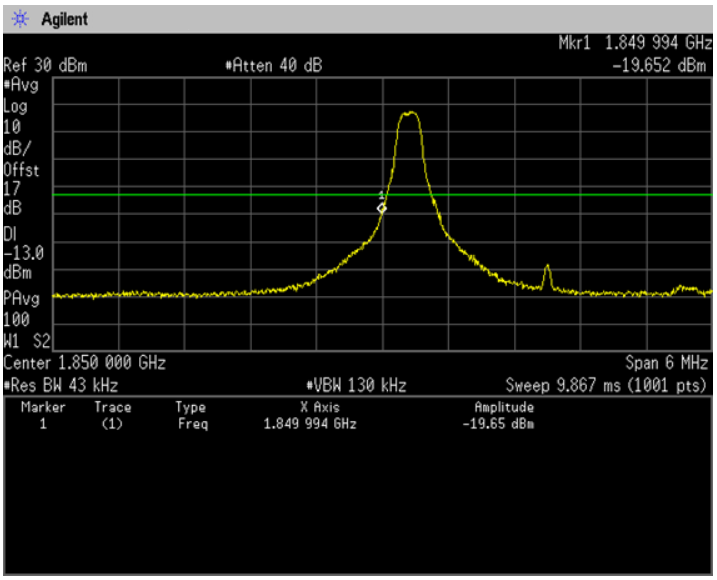
16QAM, BW 1.4MHz, RB6-0
Channel: Low



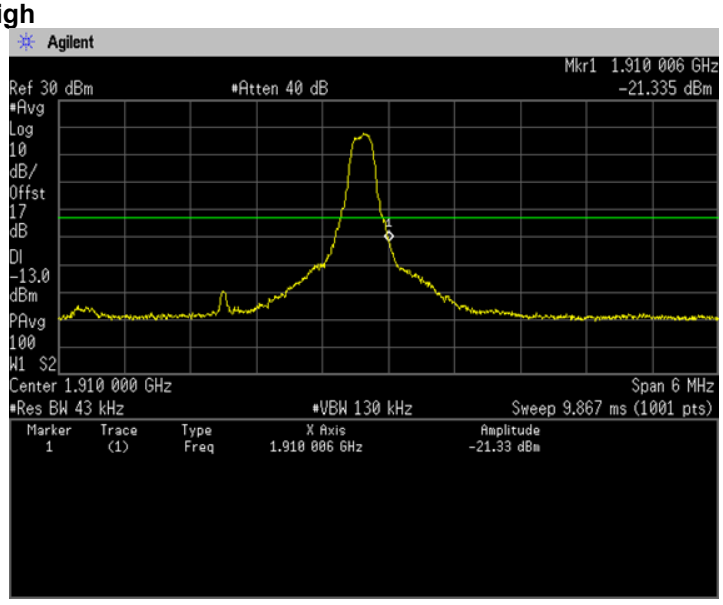
16QAM, BW 1.4MHz, RB6-0
Channel: High



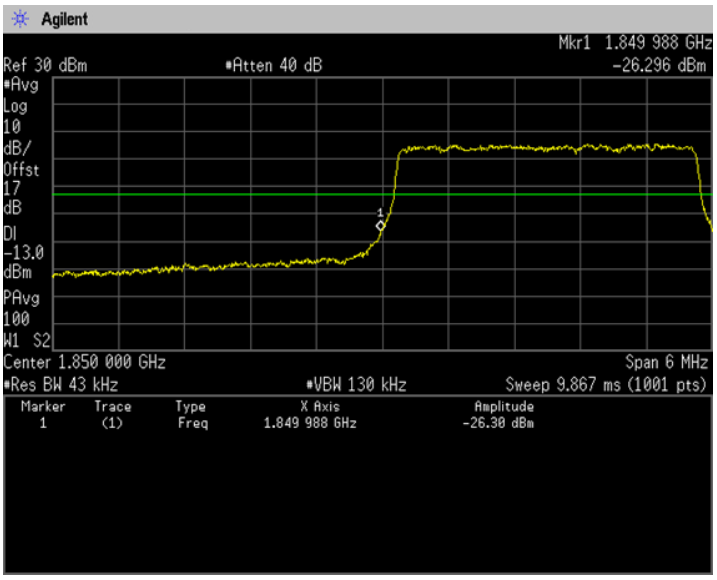
16QAM, BW 3MHz, RB1-0
Channel: Low



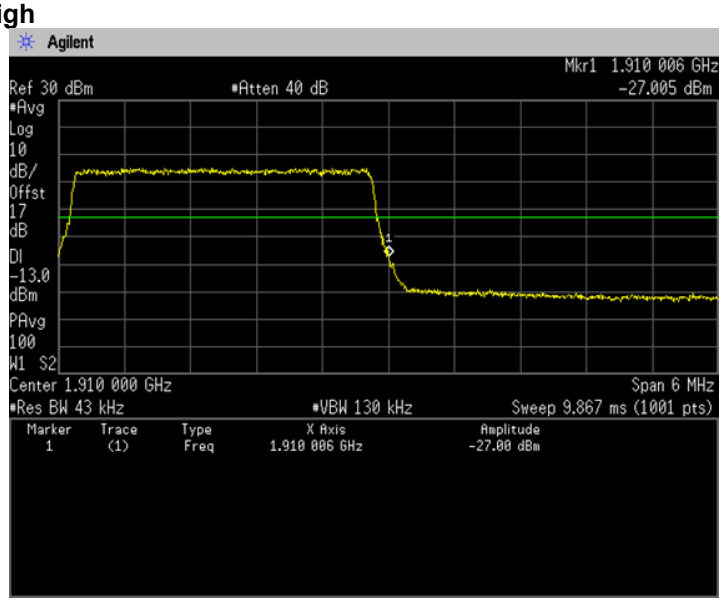
16QAM, BW 3MHz, RB1-14
Channel: High



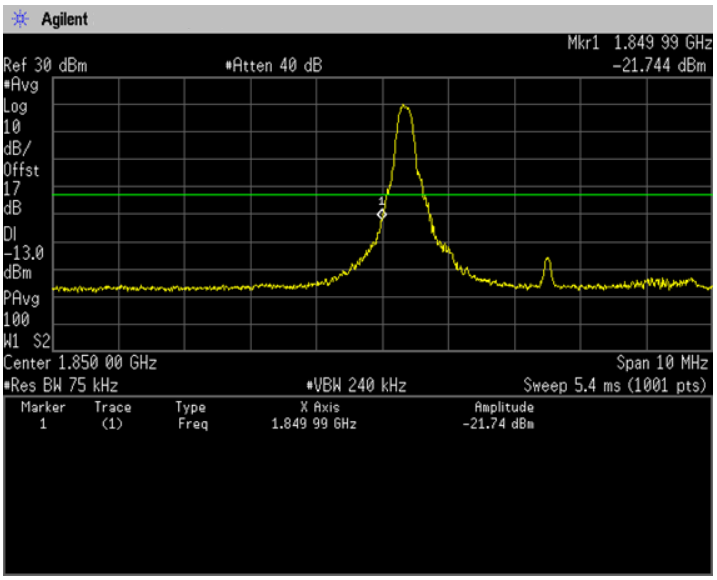
16QAM, BW 3MHz, RB15-0
Channel: Low



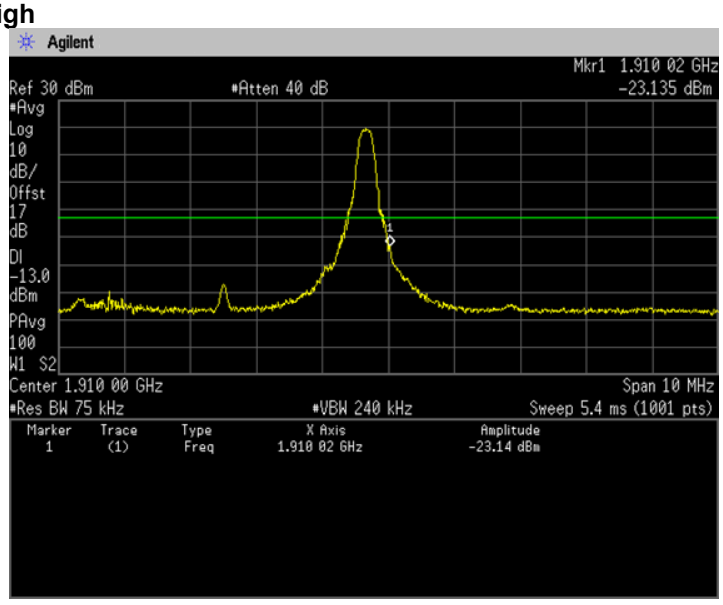
16QAM, BW 3MHz, RB15-0
Channel: High



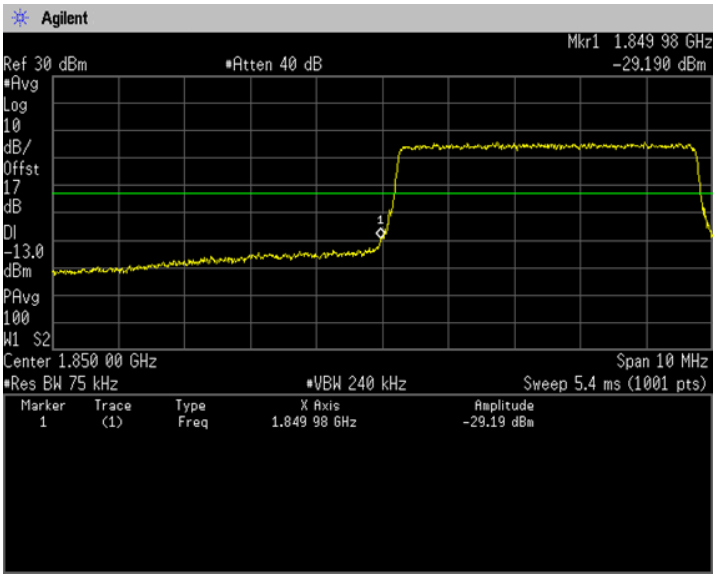
16QAM, BW 5MHz, RB1-0
Channel: Low



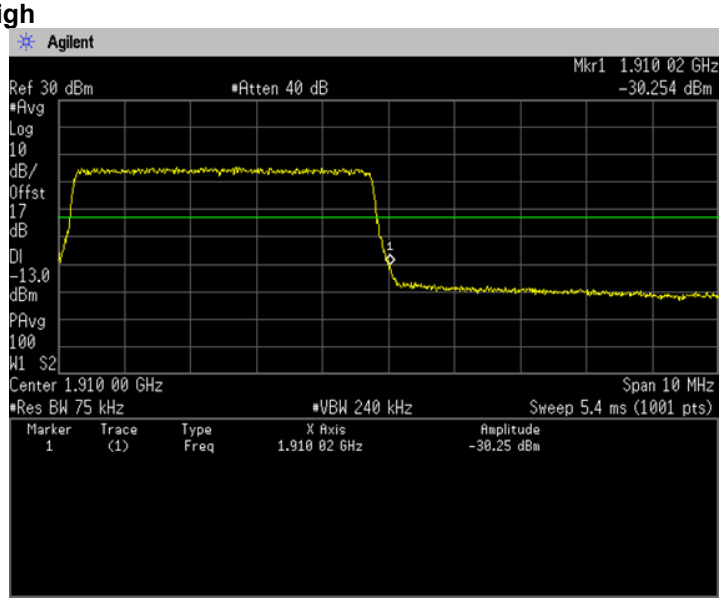
16QAM, BW 5MHz, RB1-24
Channel: High



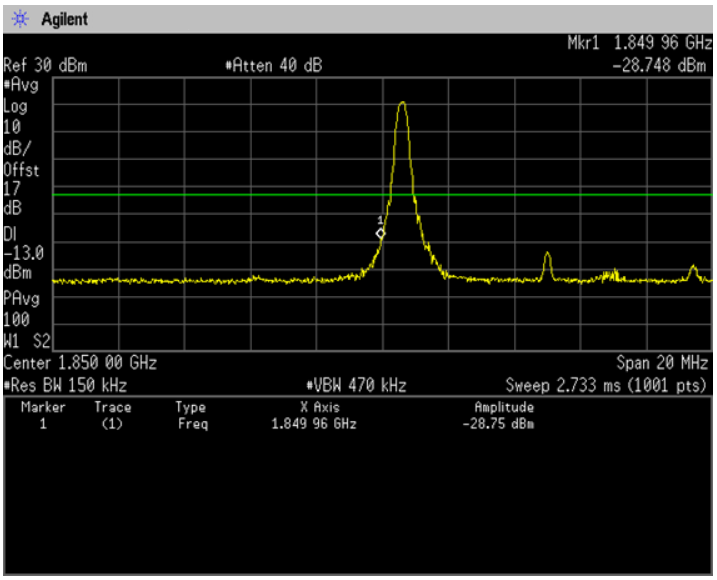
16QAM, BW 5MHz, RB25-0
Channel: Low



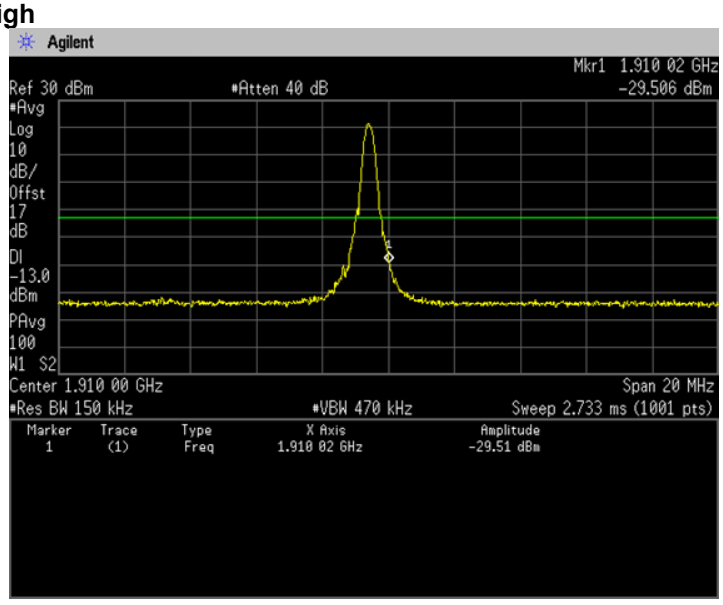
16QAM, BW 5MHz, RB25-0
Channel: High



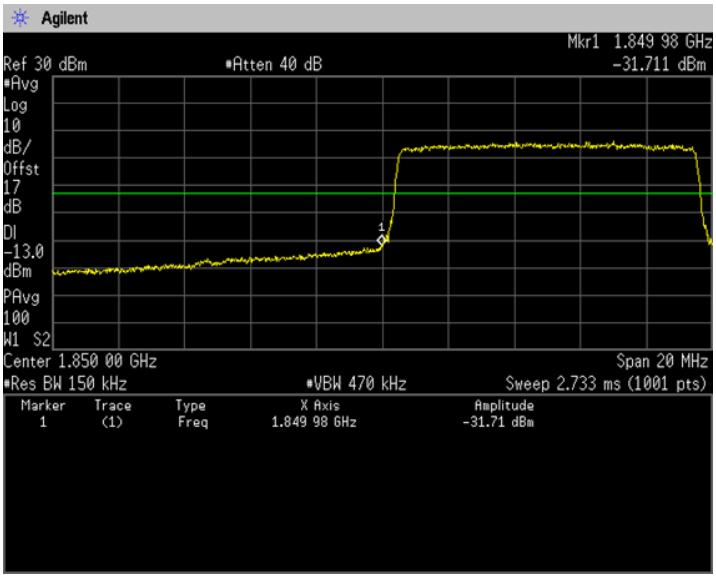
16QAM, BW 10MHz, RB1-0
Channel: Low



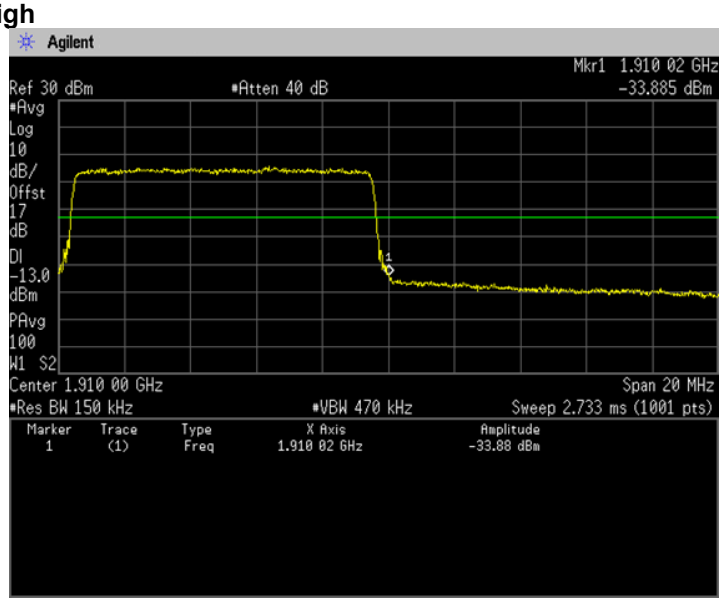
16QAM, BW 10MHz, RB1-49
Channel: High



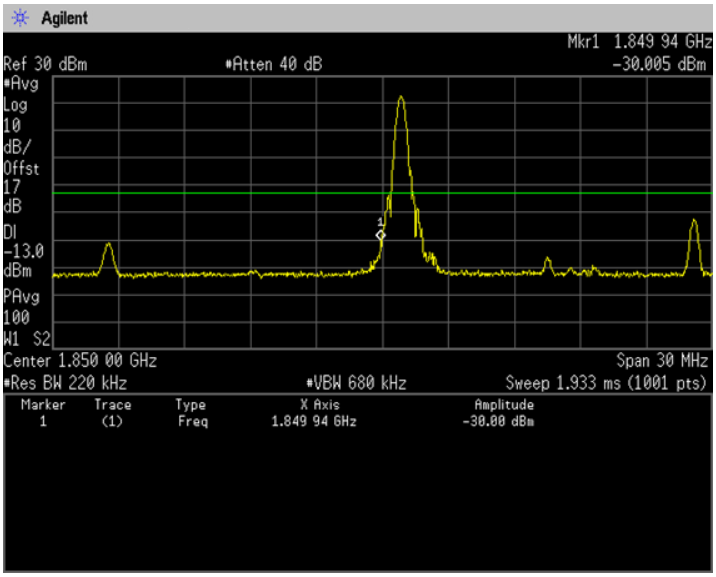
16QAM, BW 10MHz, RB50-0
Channel: Low



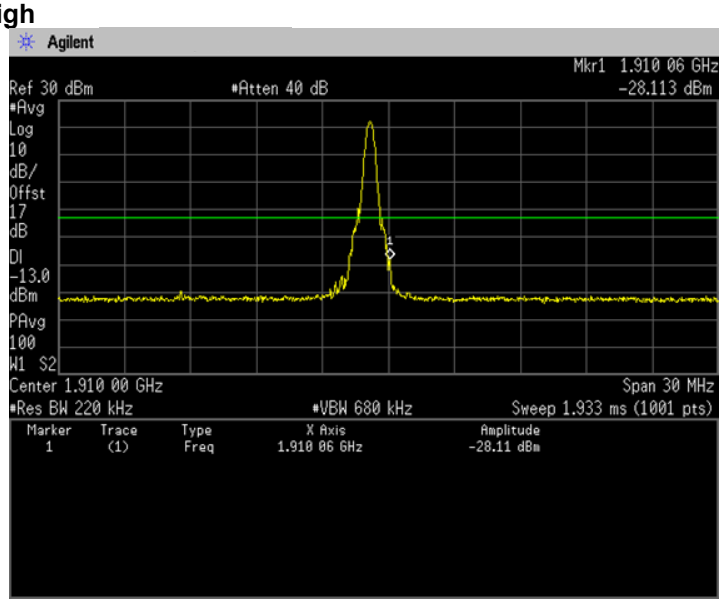
16QAM, BW 10MHz, RB50-0
Channel: High



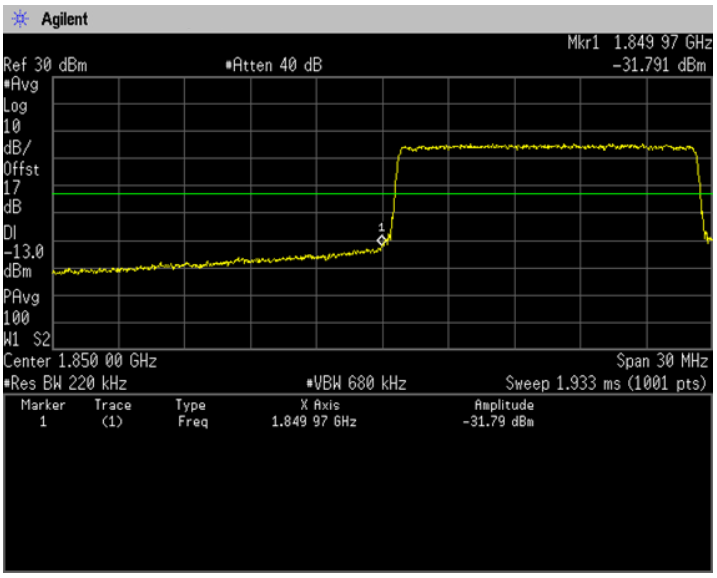
16QAM, BW 15MHz, RB1-0
Channel: Low



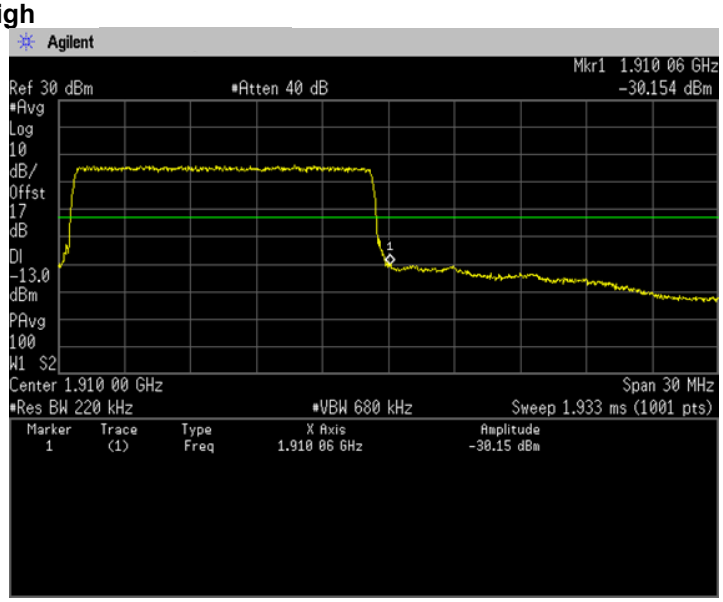
16QAM, BW 15MHz, RB1-74
Channel: High



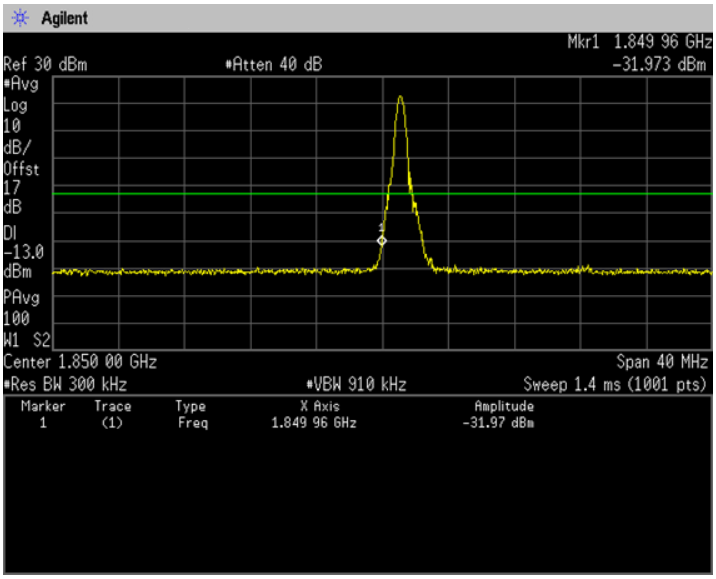
16QAM, BW 15MHz, RB75-0
Channel: Low



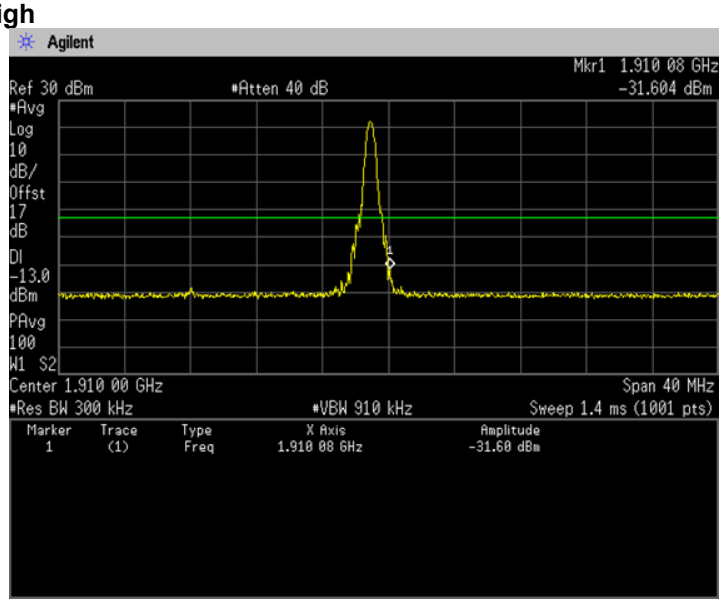
16QAM, BW 15MHz, RB75-0
Channel: High



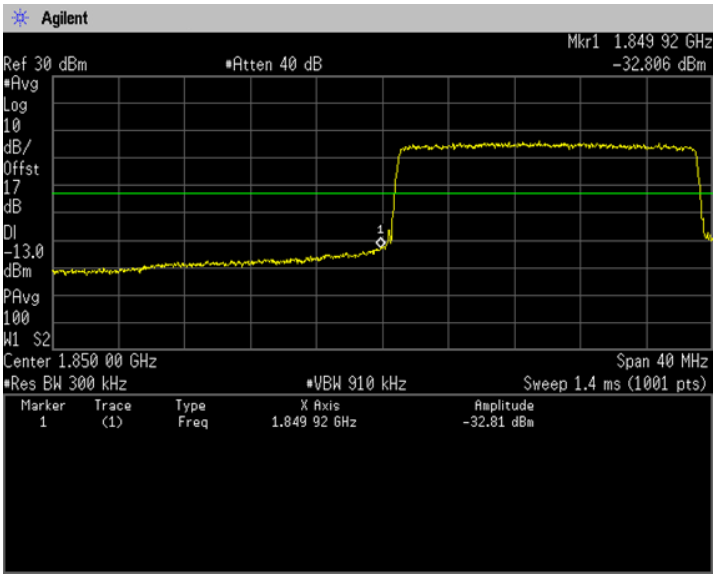
16QAM, BW 20MHz, RB1-0
Channel: Low



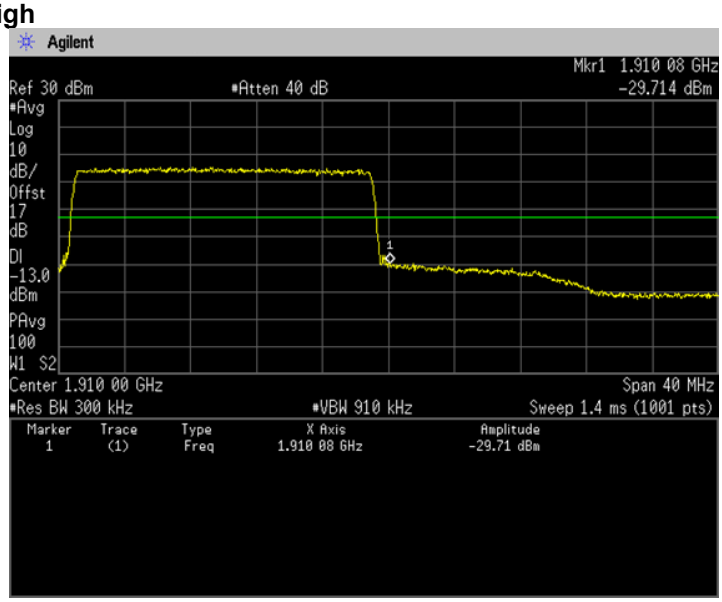
16QAM, BW 20MHz, RB1-99
Channel: High



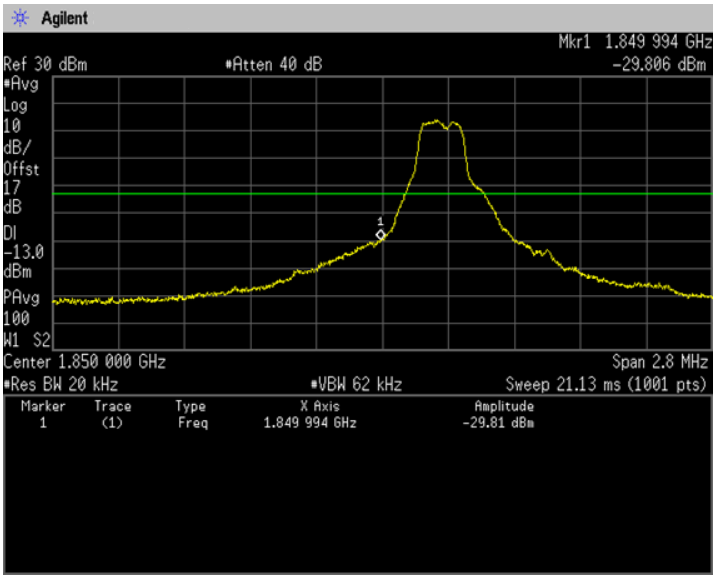
16QAM, BW 20MHz, RB100-0
Channel: Low



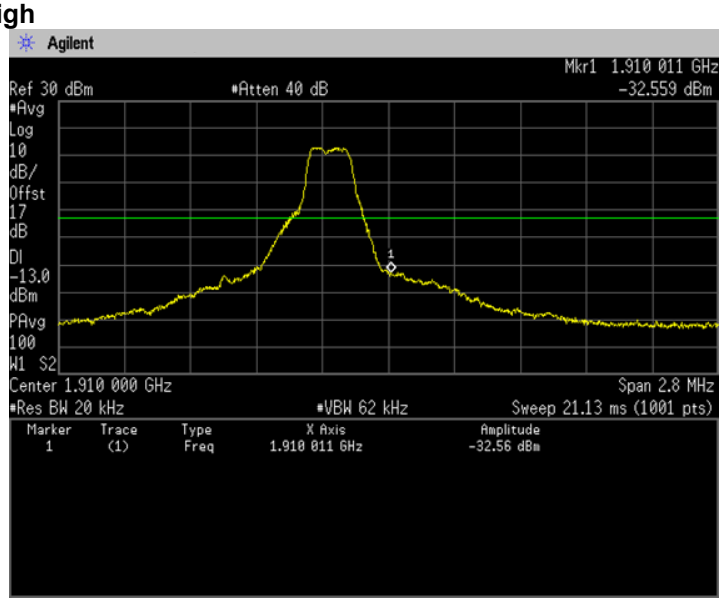
16QAM, BW 20MHz, RB100-0
Channel: High



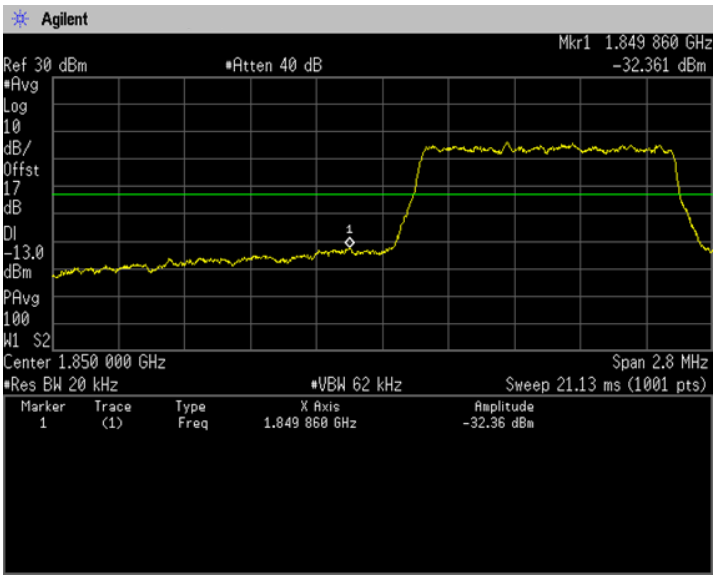
64QAM, BW 1.4MHz, RB1-0
Channel: Low



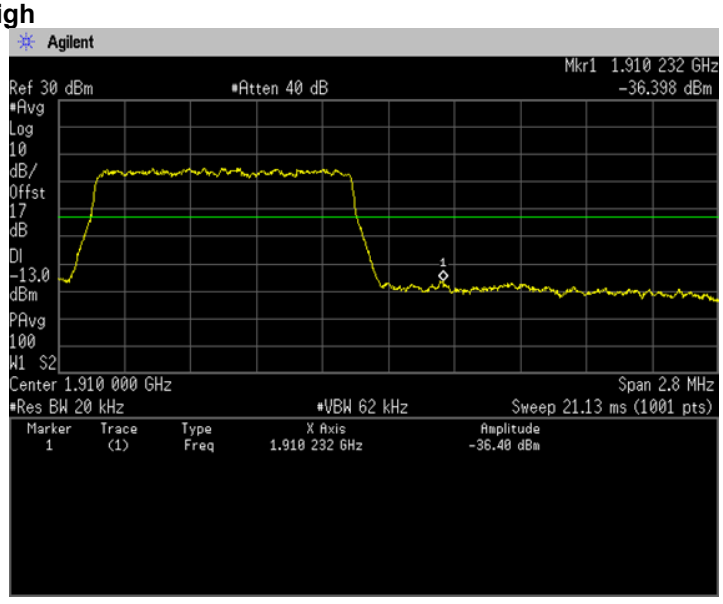
64QAM, BW 1.4MHz, RB1-5
Channel: High



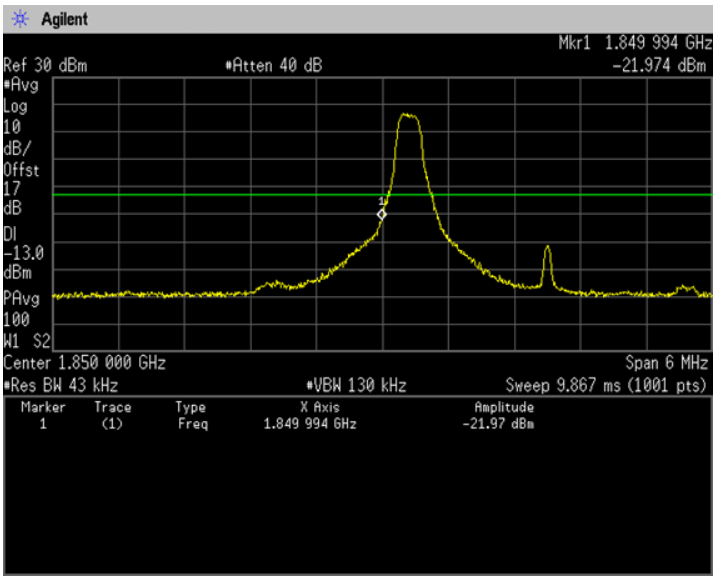
64QAM, BW 1.4MHz, RB6-0
Channel: Low



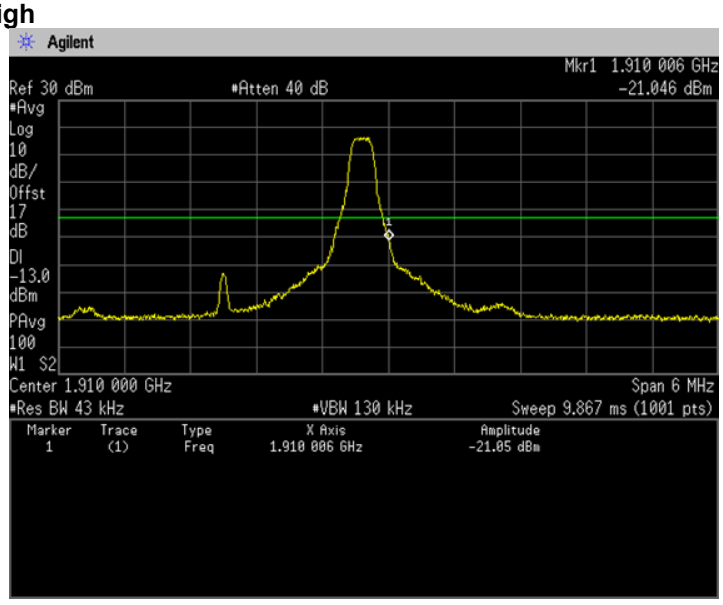
64QAM, BW 1.4MHz, RB6-0
Channel: High



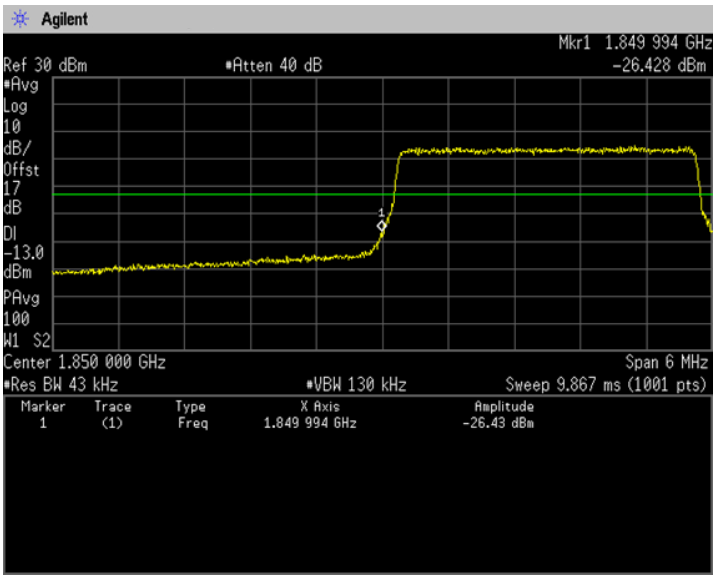
64QAM, BW 3MHz, RB1-0
Channel: Low



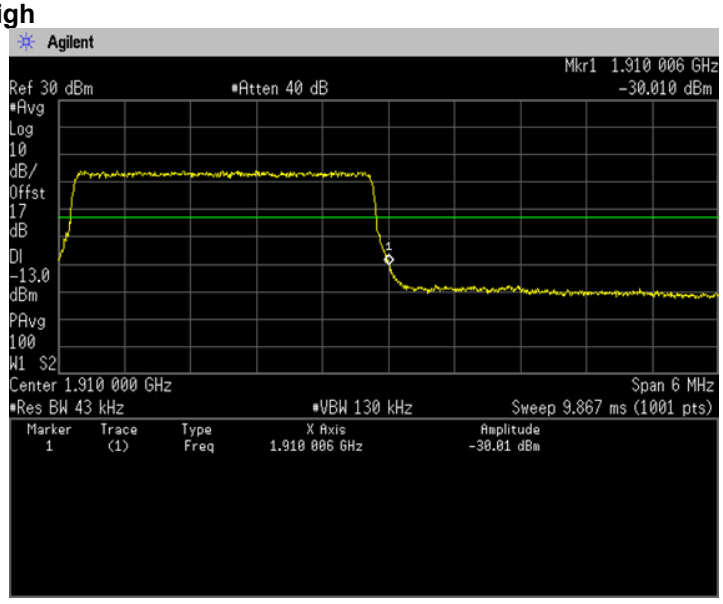
64QAM, BW 3MHz, RB1-14
Channel: High



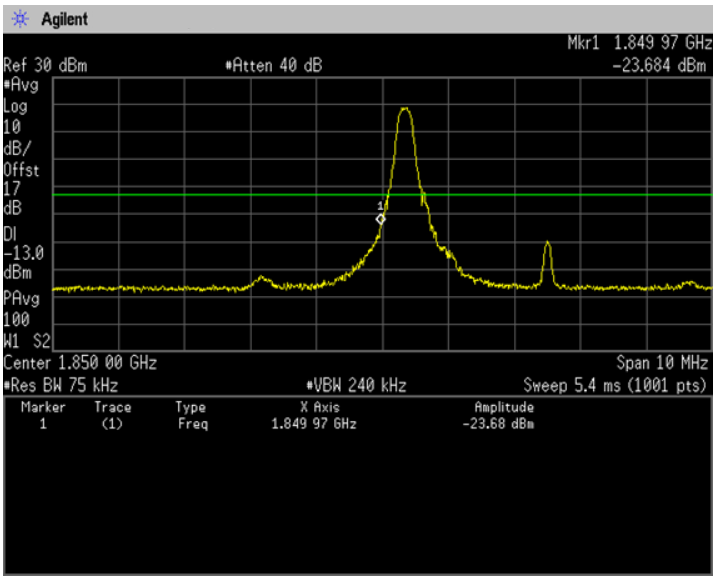
64QAM, BW 3MHz, RB15-0
Channel: Low



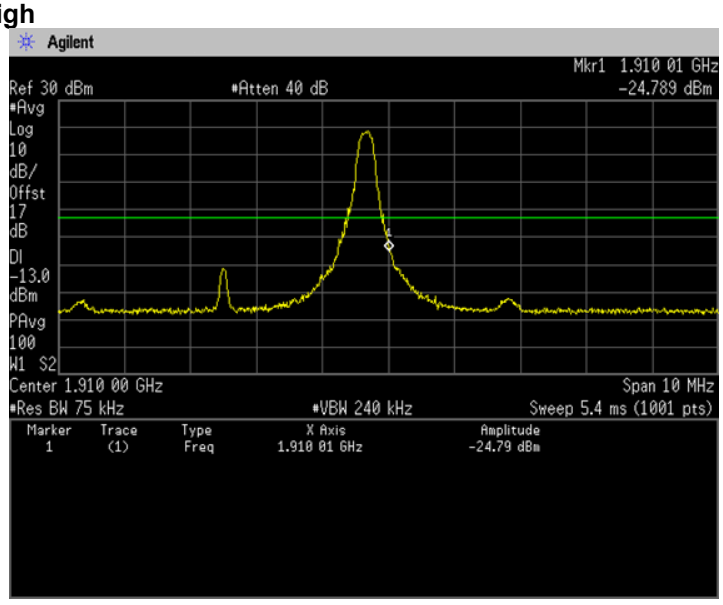
64QAM, BW 3MHz, RB15-0
Channel: High



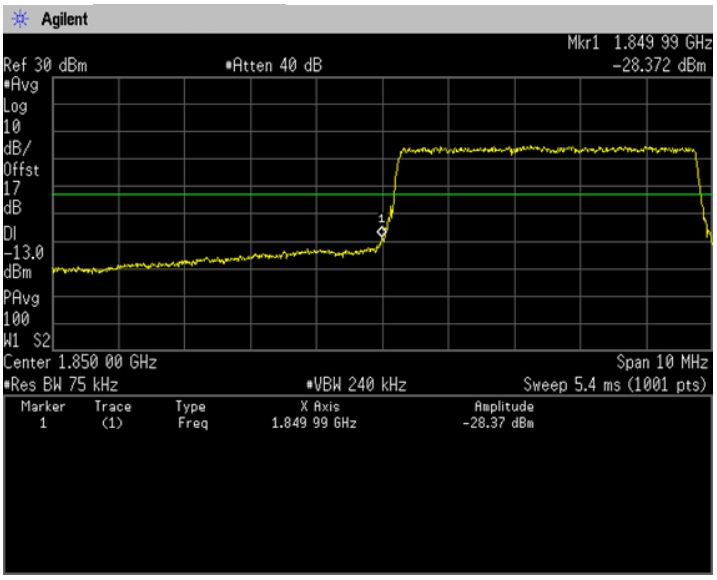
64QAM, BW 5MHz, RB1-0
Channel: Low



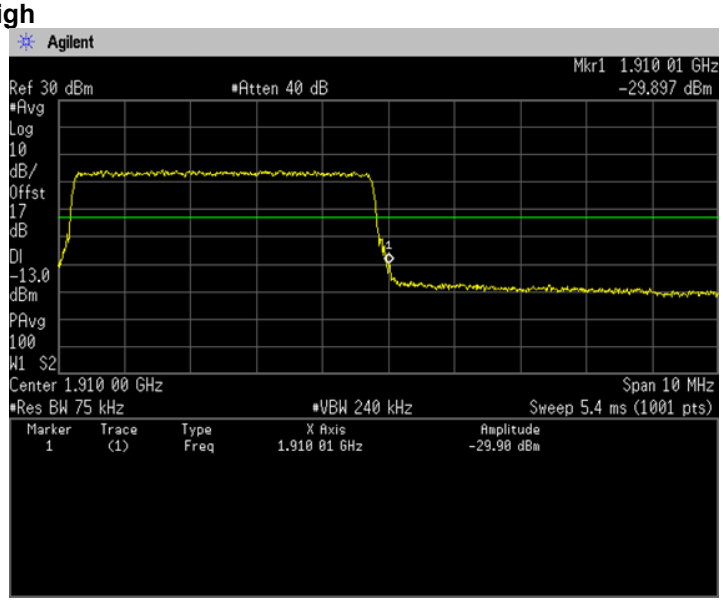
64QAM, BW 5MHz, RB1-24
Channel: High



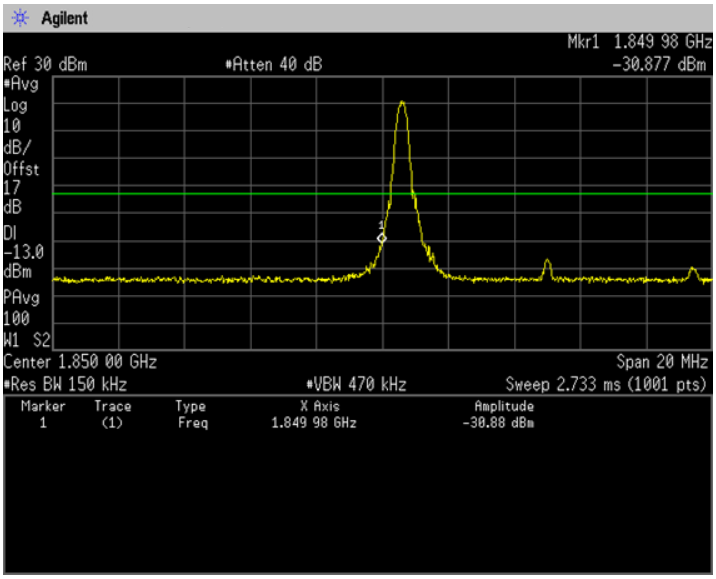
64QAM, BW 5MHz, RB25-0
Channel: Low



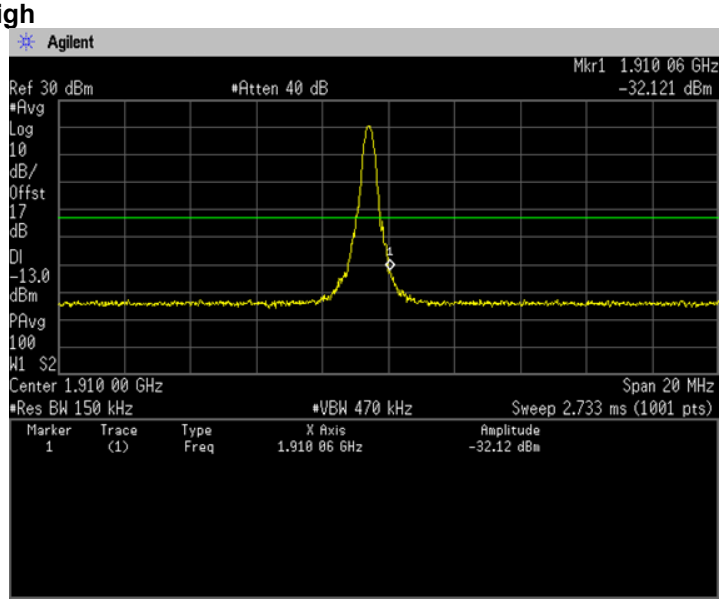
64QAM, BW 5MHz, RB25-0
Channel: High



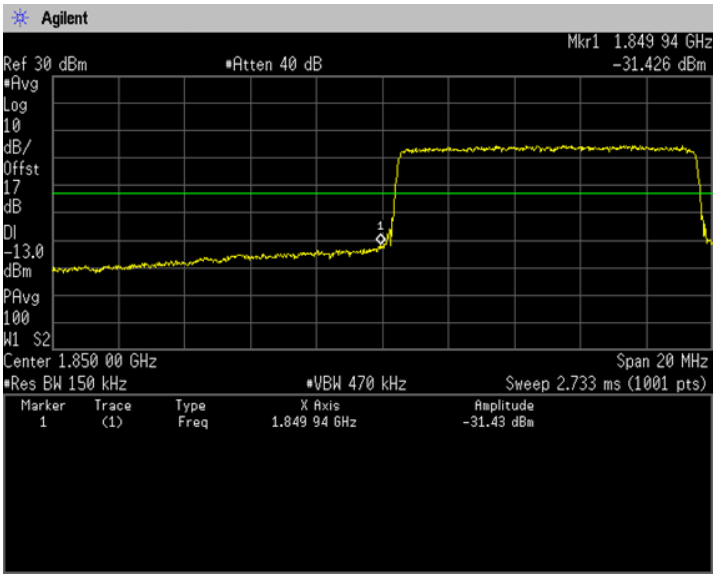
64QAM, BW 10MHz, RB1-0
Channel: Low



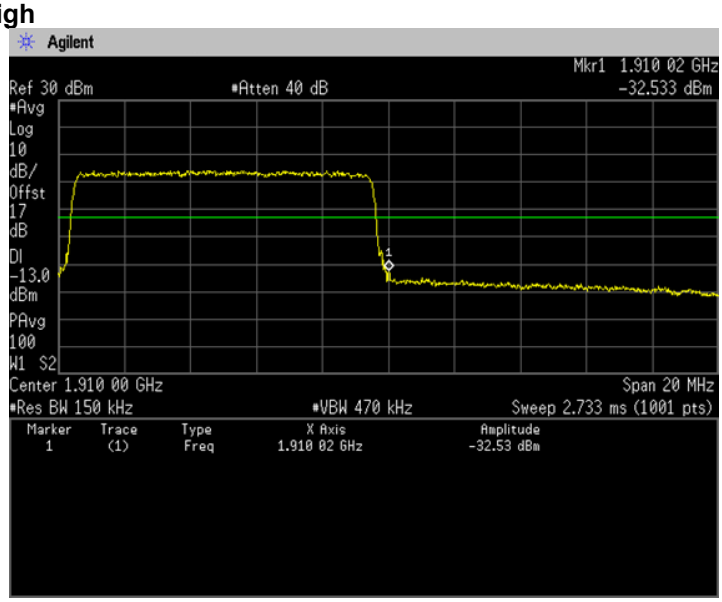
64QAM, BW 10MHz, RB1-49
Channel: High



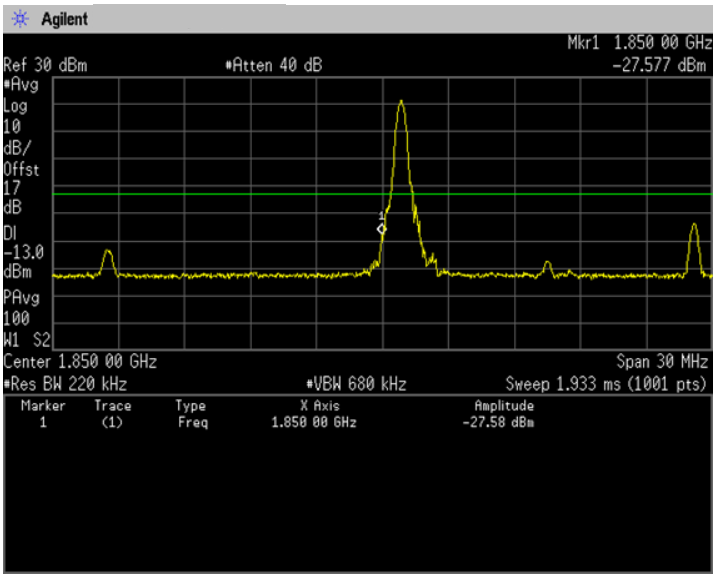
64QAM, BW 10MHz, RB50-0
Channel: Low



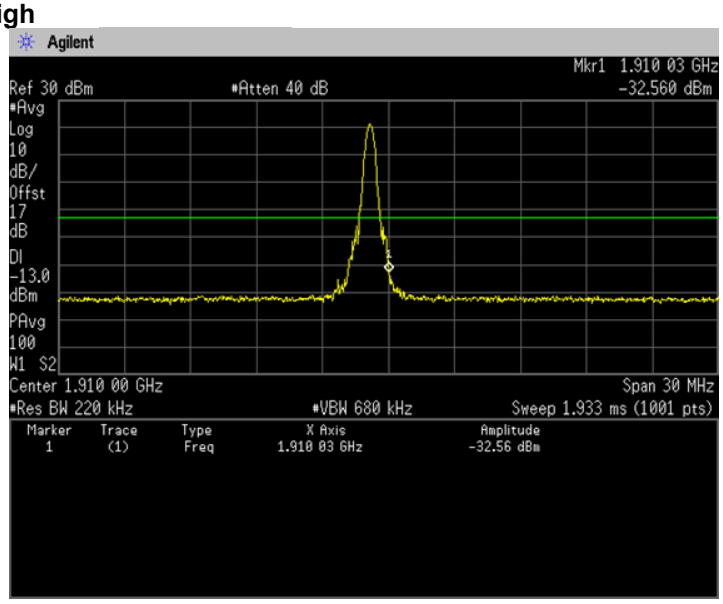
64QAM, BW 10MHz, RB50-0
Channel: High



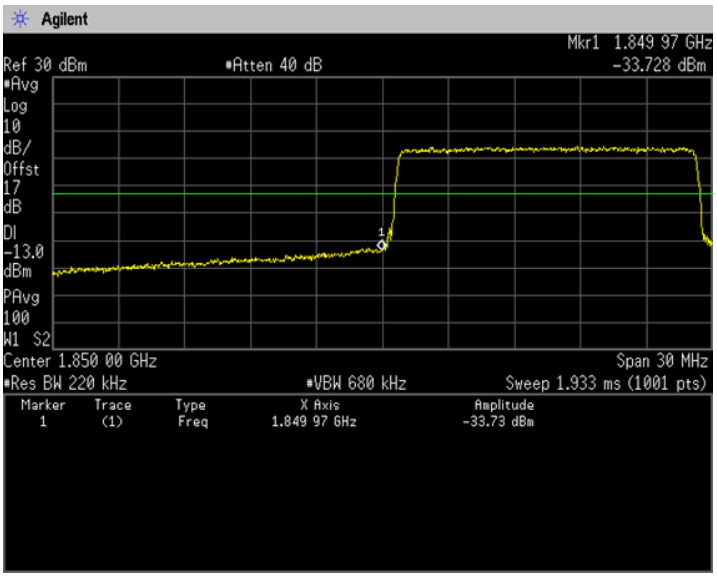
64QAM, BW 15MHz, RB1-0
Channel: Low



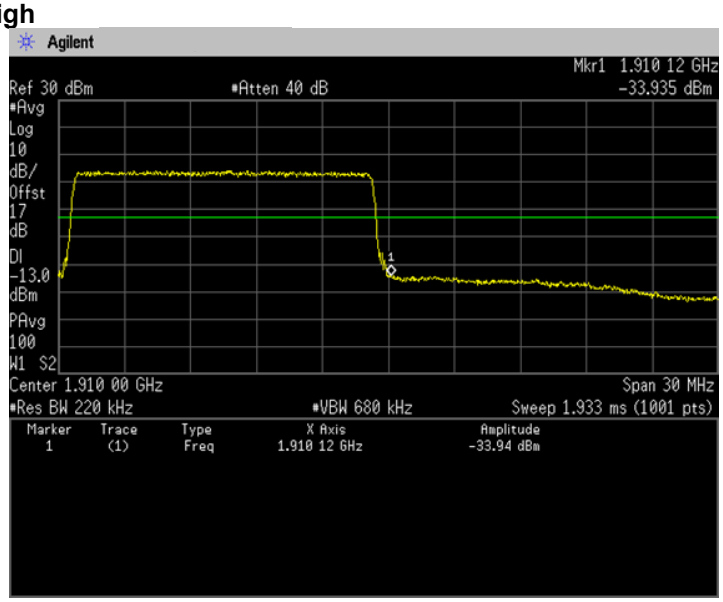
64QAM, BW 15MHz, RB1-74
Channel: High



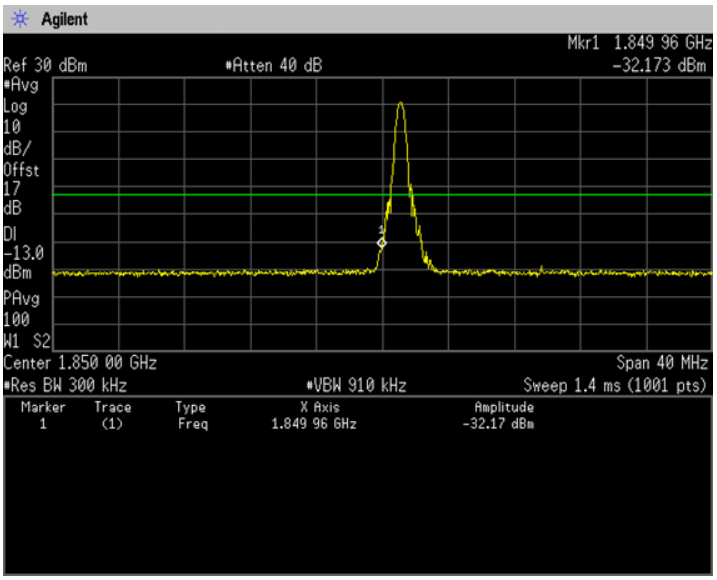
64QAM, BW 15MHz, RB75-0
Channel: Low



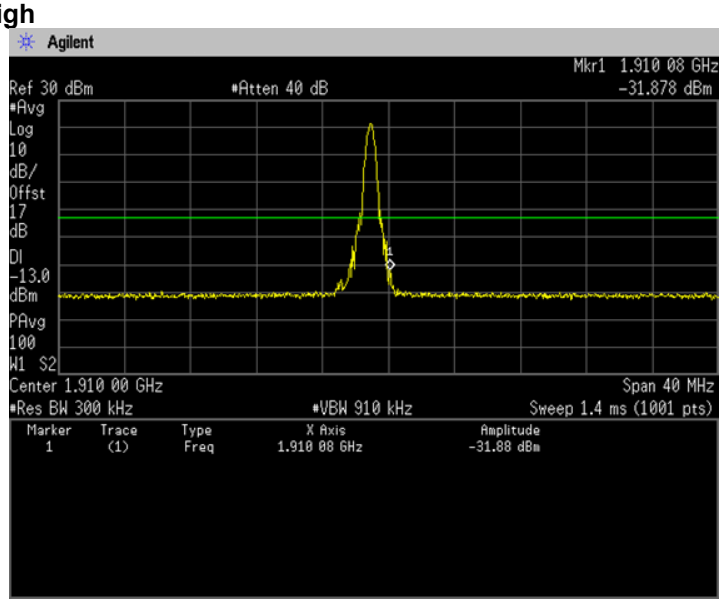
64QAM, BW 15MHz, RB75-0
Channel: High



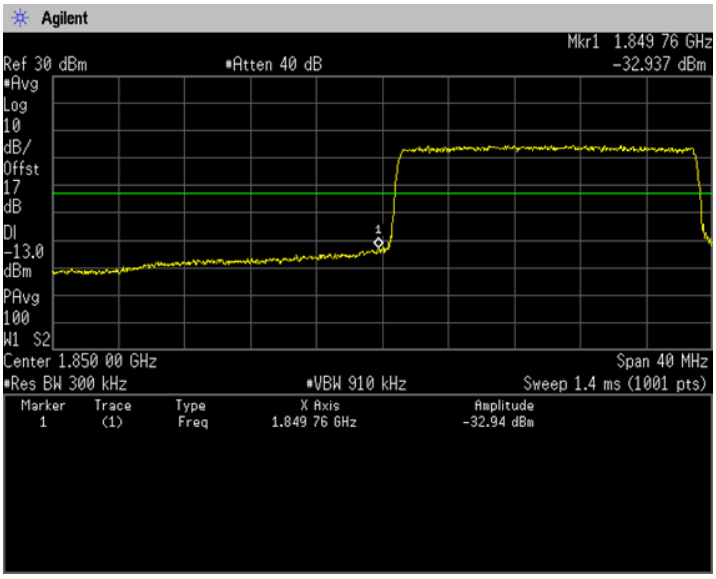
64QAM, BW 20MHz, RB1-0
Channel: Low



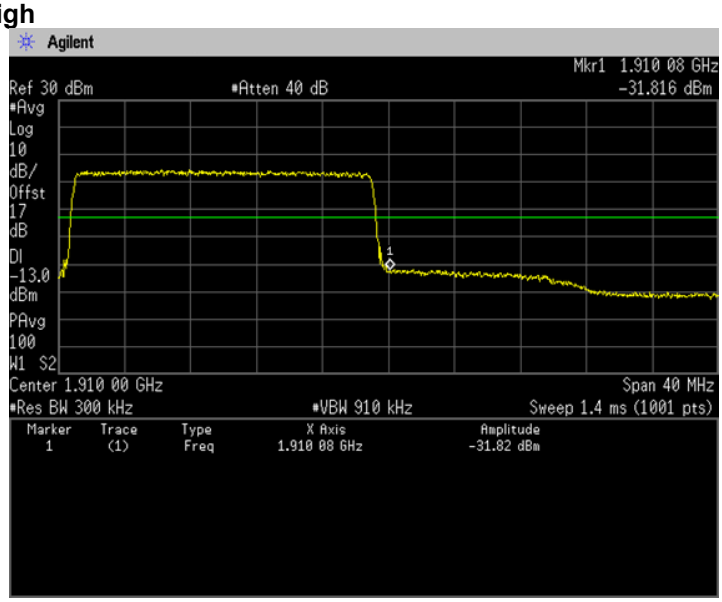
64QAM, BW 20MHz, RB1-99
Channel: High



64QAM, BW 20MHz, RB100-0
Channel: Low



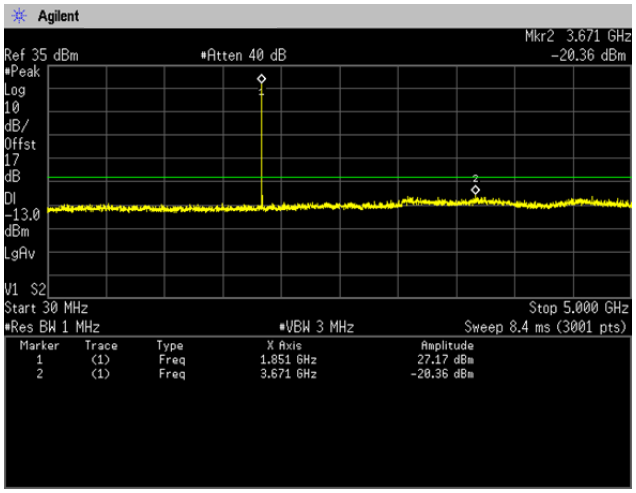
64QAM, BW 20MHz, RB100-0
Channel: High



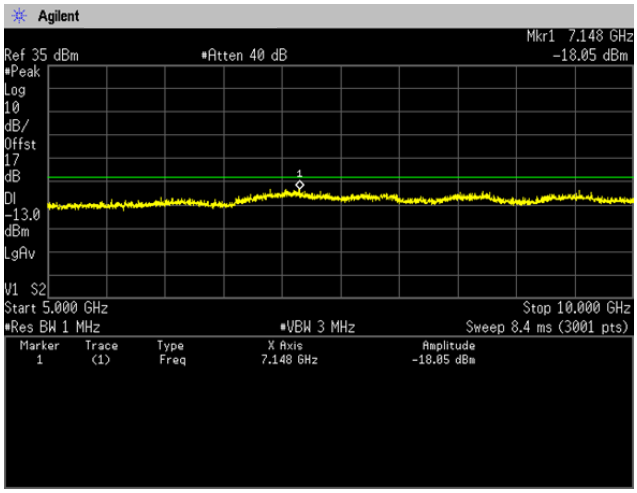
(Spurious Emissions)
Note: Conducted spurious test was measured in the worst case of Effective Radiated Power.

QPSK, BW 1.4MHz
Channel: 18607

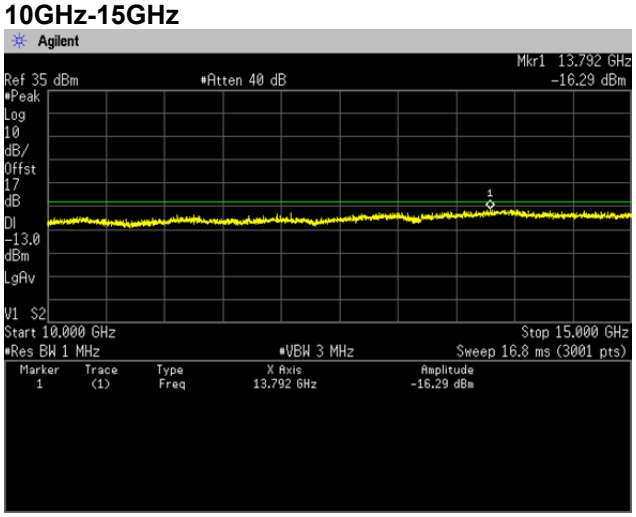
30MHz-5GHz



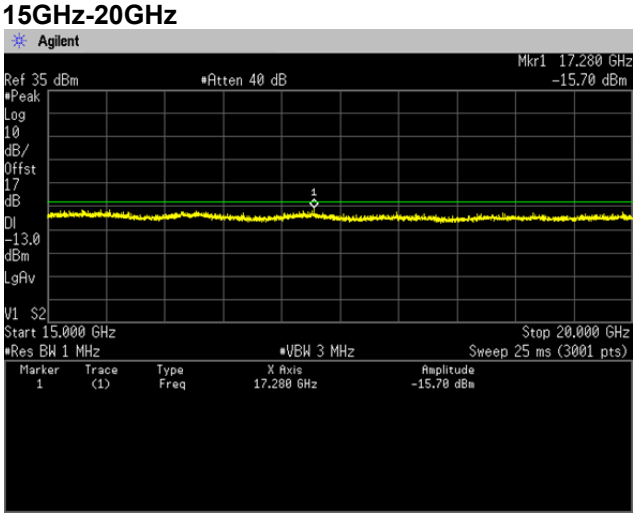
5GHz-10GHz



10GHz-15GHz

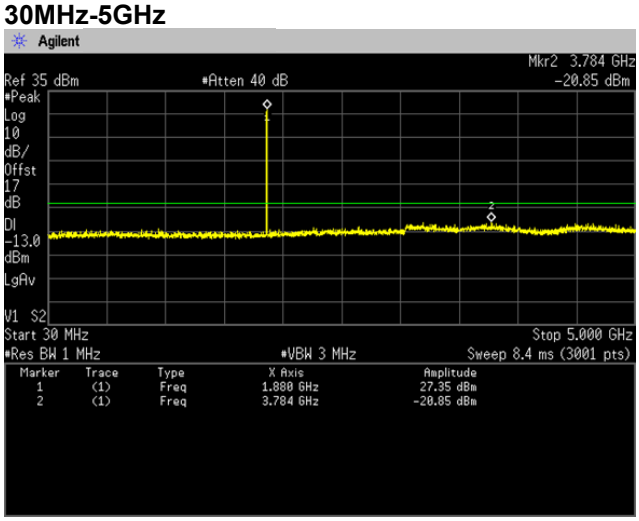


15GHz-20GHz

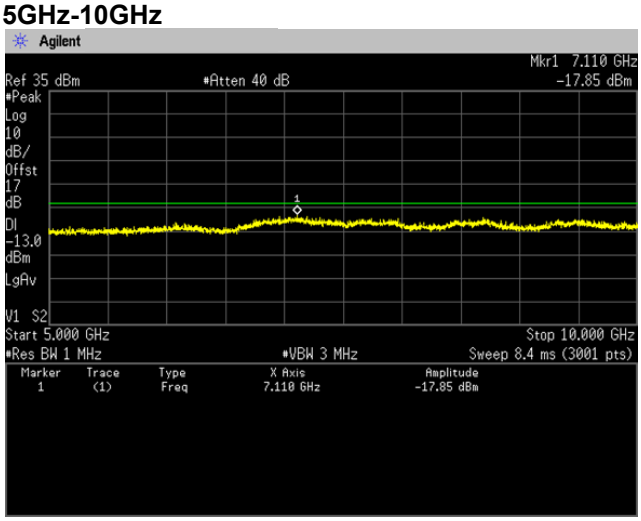


Channel: 18900

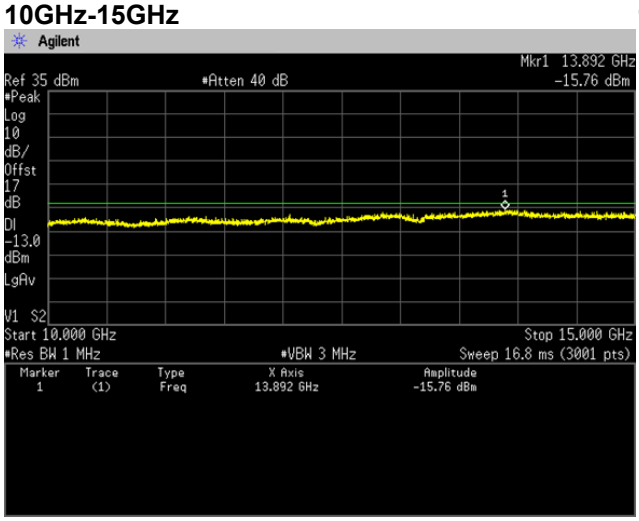
30MHz-5GHz



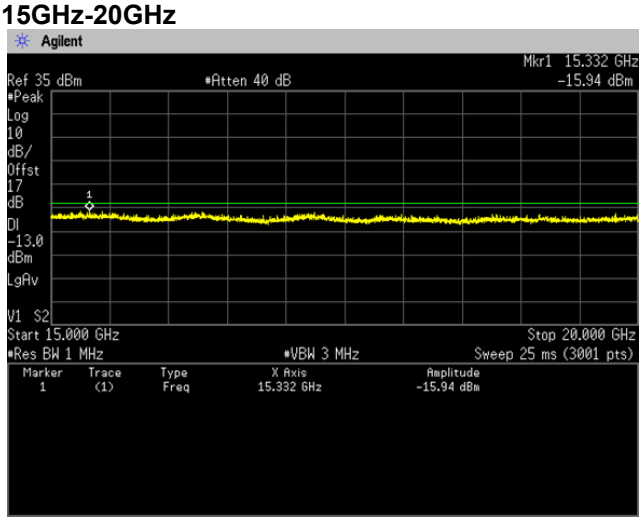
5GHz-10GHz



10GHz-15GHz

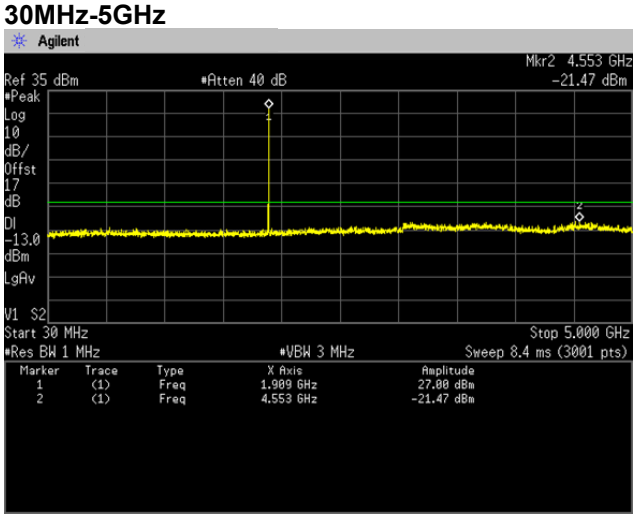


15GHz-20GHz

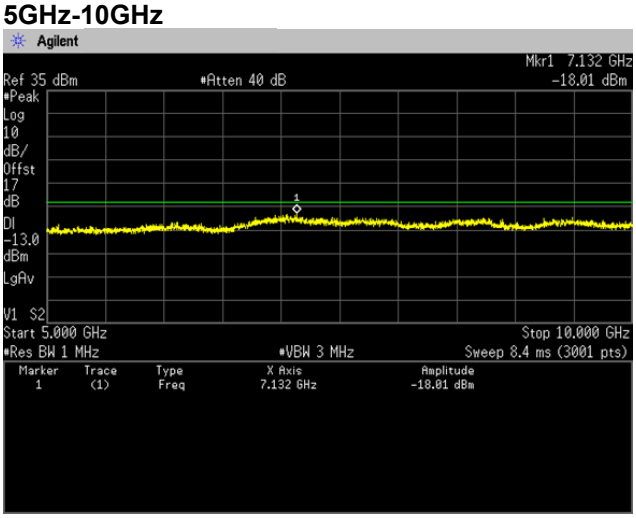


Channel: 19193

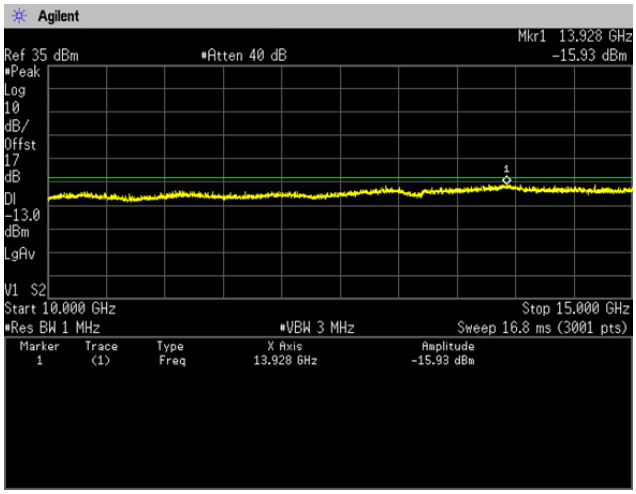
30MHz-5GHz



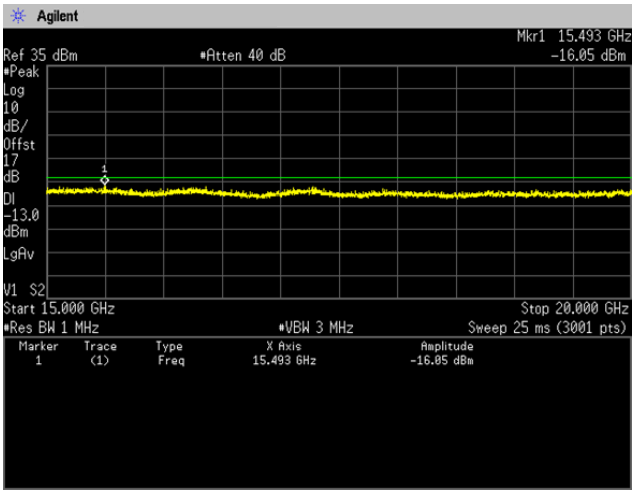
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



Japan

4.5 Radiated Emissions and Harmonic Emissions

4.5.1 Measurement procedure

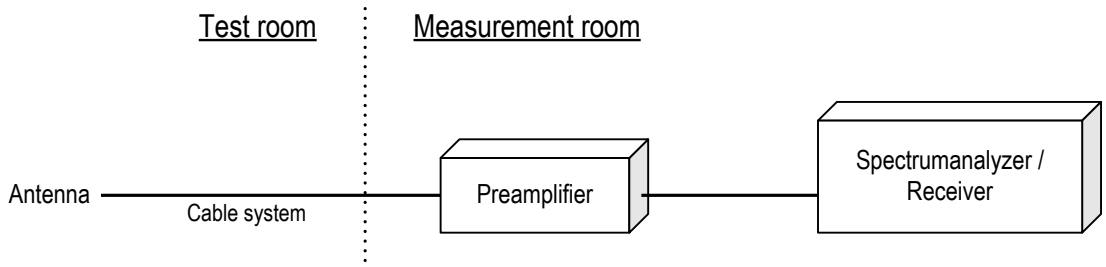
[FCC 24.238(a), 2.1053]

<Step 1>
The EUT and support equipment are placed on a 1 meter x 1 meter surface, 0.8 meter height (Below 1GHz) or 0.6 meter x 0.6 meter surface, 1.5 meter height (Above 1GHz) styrene foam table. Radiated emission measurements are performed at 3 meter distance with the broadband antenna (Biconical antenna, Log periodic antenna and double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1 to 4 meters and stopped at height producing the maximum emission.
The bandwidth of the spectrum analyzer is set to 1 MHz. The turntable is rotated by 360 degrees and stopped at azimuth of producing the maximum emission. The frequency is investigated up to 20 GHz.

<Step 2>
The substitution antenna is replaced by the transmitter antenna (EUT).
The frequency of the signal generator is adjusted to the measurement frequency.
Level of the signal generator is adjusted to the level that is obtained from step 1, and record the emission level of signal generator.

The spectrum analyzer is set to;
a) RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 x RBW
b) Detector = Peak
c) Trace mode = Max hold
d) Sweep time = auto-couple

- Test configuration



Japan

4.5.2 Calculation method

Result (EIRP) = Ant. Input - Cable loss + Antenna Gain
Margin = Limit – Result (EIRP)

Example:
Limit @ 3760.0 MHz : -13.0 dBm
Ant. Input = -55.6 dBm Cable loss = 1.6 dB Ant. Gain = 9.2 dBi
Result = -55.6 - 1.6 + 9.2 = -48.0 dBm
Margin = -13.0 - (-48.0) = 35.0 dB

4.5.3 Limit

-13 dBm or less

4.5.4 Test data

Date	:	5-September-2021			
Temperature	:	22.9 [˚C]			
Humidity	:	62.3 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Chiaki Kanno

Date	:	29-September-2021			
Temperature	:	20.2 [˚C]			
Humidity	:	58.7 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Chiaki Kanno

Date	:	3-October-2021			
Temperature	:	19.6 [˚C]			
Humidity	:	63.0 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Kazunori Saito

Date	:	4-October-2021			
Temperature	:	21.7 [˚C]			
Humidity	:	60.1 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Chiaki Kanno

Date	:	7-October-2021			
Temperature	:	22.3 [˚C]			
Humidity	:	55.8 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Chiaki Kanno

[GSM1900]
Channel: 512

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3700.4	-50.3	-42.7	1.6	8.2	-36.2	-13.0	23.2

Channel: 661

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-50.7	-42.9	1.6	8.2	-36.3	-13.0	23.3

Channel: 810

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3819.6	-52.5	-46.9	1.7	8.3	-40.3	-13.0	27.3

[WCDMA Band II]
Channel: 9262

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3704.8	-53.8	-47.7	1.6	8.2	-41.2	-13.0	28.2

Channel: 9400

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-54.9	-48.7	1.6	8.2	-42.1	-13.0	29.1

Channel: 9538

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3815.2	-55.0	-48.9	1.7	8.3	-42.3	-13.0	29.3

[LTE Band II]
QPSK, BW 1.4MHz
Channel: 18607

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3701.4	-51.3	-45.4	1.6	8.2	-38.9	-13.0	25.9

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.7	-45.5	1.6	8.2	-38.9	-13.0	25.9

Channel: 19193

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3818.6	-51.2	-44.8	1.7	8.3	-38.2	-13.0	25.2

16QAM, BW 1.4MHz
Channel: 18607

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3701.4	-51.3	-45.4	1.6	8.2	-38.9	-13.0	25.9

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.9	-45.7	1.6	8.2	-39.1	-13.0	26.1

Channel: 19193

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3818.6	-51.4	-45.0	1.7	8.3	-38.4	-13.0	25.4

64QAM, BW 1.4MHz
Channel: 18607

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3701.4	-51.2	-45.3	1.6	8.2	-38.8	-13.0	25.8

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.8	-45.6	1.6	8.2	-39.0	-13.0	26.0

Channel: 19193

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3818.6	-51.2	-44.8	1.7	8.3	-38.2	-13.0	25.2

QPSK, BW 3MHz
Channel: 18615

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3703.0	-51.4	-45.3	1.6	8.2	-38.8	-13.0	25.8

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.3	-46.1	1.6	8.2	-39.5	-13.0	26.5

Channel: 19185

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3817.0	-51.0	-44.5	1.7	8.3	-37.9	-13.0	24.9

16QAM, BW 3MHz
Channel: 18615

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3703.0	-51.5	-45.4	1.6	8.2	-38.9	-13.0	25.9

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.1	-45.9	1.6	8.2	-39.3	-13.0	26.3

Channel: 19185

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3817.0	-51.5	-45.0	1.7	8.3	-38.4	-13.0	25.4

64QAM, BW 3MHz
Channel: 18615

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3703.0	-51.2	-45.1	1.6	8.2	-38.6	-13.0	25.6

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.2	-46.0	1.6	8.2	-39.4	-13.0	26.4

Channel: 19185

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3817.0	-51.3	-44.8	1.7	8.3	-38.2	-13.0	25.2

QPSK, BW 5MHz
Channel: 18625

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3705.0	-51.2	-45.1	1.6	8.2	-38.6	-13.0	25.6

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.8	-45.6	1.6	8.2	-39.0	-13.0	26.0

Channel: 19175

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3815.0	-51.6	-45.4	1.7	8.3	-38.8	-13.0	25.8

16QAM, BW 5MHz
Channel: 18625

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3705.0	-51.3	-45.2	1.6	8.2	-38.7	-13.0	25.7

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.0	-45.8	1.6	8.2	-39.2	-13.0	26.2

Channel: 19175

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3815.0	-51.4	-45.2	1.7	8.3	-38.6	-13.0	25.6

64QAM, BW 5MHz
Channel: 18625

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3705.0	-51.1	-45.0	1.6	8.2	-38.5	-13.0	25.5

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.0	-45.8	1.6	8.2	-39.2	-13.0	26.2

Channel: 19175

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3815.0	-51.3	-45.1	1.7	8.3	-38.5	-13.0	25.5

QPSK, BW 10MHz
Channel: 18650

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3710.0	-51.1	-44.7	1.6	8.2	-38.2	-13.0	25.2

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.7	-45.5	1.6	8.2	-38.9	-13.0	25.9

Channel: 19150

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3810.0	-52.3	-46.2	1.7	8.3	-39.6	-13.0	26.6

16QAM, BW 10MHz
Channel: 18650

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3710.0	-51.0	-44.6	1.6	8.2	-38.1	-13.0	25.1

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.8	-45.6	1.6	8.2	-39.0	-13.0	26.0

Channel: 19150

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3810.0	-52.2	-46.1	1.7	8.3	-39.5	-13.0	26.5

64QAM, BW 10MHz
Channel: 18650

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3710.0	-51.1	-44.7	1.6	8.2	-38.2	-13.0	25.2

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.0	-45.8	1.6	8.2	-39.2	-13.0	26.2

Channel: 19150

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3810.0	-52.1	-46.0	1.7	8.3	-39.4	-13.0	26.4

QPSK, BW 15MHz
Channel: 18675

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3715.0	-51.1	-45.0	1.6	8.2	-38.5	-13.0	25.5

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.4	-46.2	1.6	8.2	-39.6	-13.0	26.6

Channel: 19125

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3805.0	-53.1	-46.3	1.7	8.3	-39.7	-13.0	26.7

16QAM, BW 15MHz
Channel: 18675

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3715.0	-51.3	-45.2	1.6	8.2	-38.7	-13.0	25.7

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.2	-46.0	1.6	8.2	-39.4	-13.0	26.4

Channel: 19125

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3805.0	-53.2	-46.4	1.7	8.3	-39.8	-13.0	26.8

64QAM, BW 15MHz
Channel: 18675

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3715.0	-51.0	-44.9	1.6	8.2	-38.4	-13.0	25.4

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-52.1	-45.9	1.6	8.2	-39.3	-13.0	26.3

Channel: 19125

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3805.0	-53.4	-46.6	1.7	8.3	-40.0	-13.0	27.0

QPSK, BW 20MHz
Channel: 18700

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3720.0	-51.3	-45.2	1.6	8.2	-38.7	-13.0	25.7

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.7	-45.5	1.6	8.2	-38.9	-13.0	25.9

Channel: 19100

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3800.0	-53.7	-47.4	1.7	8.3	-40.8	-13.0	27.8

16QAM, BW 20MHz
Channel: 18700

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3720.0	-51.3	-45.2	1.6	10.4	-36.5	-13.0	23.5

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.9	-45.7	1.6	10.4	-36.9	-13.0	23.9

Channel: 19100

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3800.0	-53.4	-47.1	1.7	10.5	-38.3	-13.0	25.3

64QAM, BW 20MHz
Channel: 18700

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3720.0	-51.1	-45.0	1.6	10.4	-36.3	-13.0	23.3

Channel: 18900

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3760.0	-51.7	-45.5	1.6	10.4	-36.7	-13.0	23.7

Channel: 19100

H/V	Frequency [MHz]	S.A Reading [dBm]	Ant. Input [dBm]	Cable loss [dB]	Ant.Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
H	3800.0	-53.4	-47.1	1.7	10.5	-38.3	-13.0	25.3

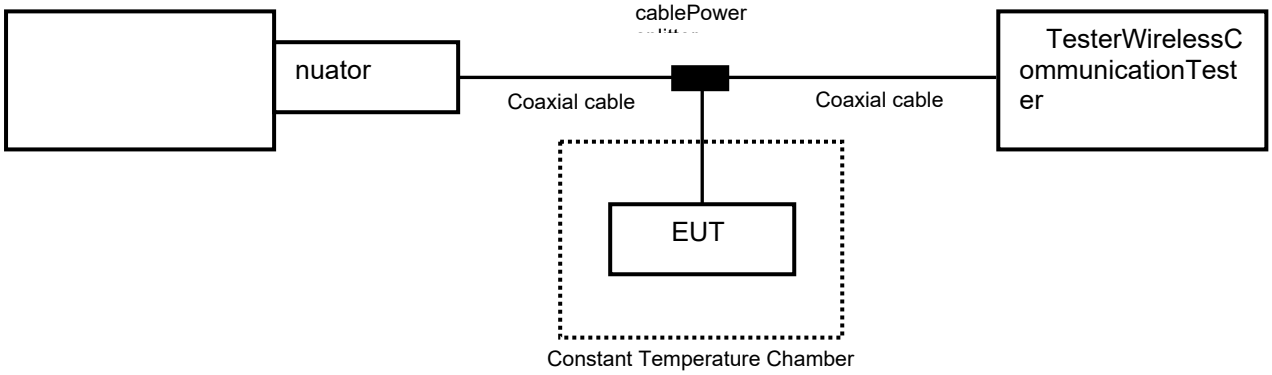
4.6 Frequency Stability

4.6.1 Measurement procedure

[FCC 24.235, 2.1055]

The EUT was placed of an inside of an constant temperature chamber as the temperature in the chamber was varied between -30˚C and +50˚C. The temperature was incremented by 10˚C intervals and the unit was allowed to stabilize at each measurement. The frequency drift was measured with the normal Temperature and voltage tolerance and it is presented as the ppm unit.

- Test configuration



4.6.2 Limit

±2.5 ppm

4.6.3 Measurement result

Date : 15-September-2021
Temperature : 23.6 [˚C]
Humidity : 54.4 [%] Test engineer :
Test place : Shielded room No.4 Kazunori Saito

Date : 16-September-2021
Temperature : 23.1 [˚C]
Humidity : 51.8 [%] Test engineer :
Test place : Shielded room No.4 Kazunori Saito

[GSM1900]
Channel: 661

Limit: ±0.00025% = ±2.5 ppm					
Power Supply [V]	**Temperature [ºC]**	**Measurements Frequency [Hz]**	**Frequency Tolerance [ppm]**	**Limit [ppm]**	**Result**
3.87	25(Ref.)	1,880,000,052	0.00000	±2.5	Pass
	50	1,880,000,051	-0.00021	±2.5	Pass
	40	1,880,000,039	-0.00673	±2.5	Pass
	30	1,880,000,056	0.00227	±2.5	Pass
	20	1,880,000,063	0.00587	±2.5	Pass
	10	1,880,000,063	0.00610	±2.5	Pass
	0	1,880,000,046	-0.00301	±2.5	Pass
	-10	1,880,000,040	-0.00634	±2.5	Pass
	-20	1,880,000,079	0.01461	±2.5	Pass
	-30	1,879,999,954	-0.05186	±2.5	Pass
3.48	25	1,880,000,038	-0.00730	±2.5	Pass
4.26	25	1,880,000,064	0.00625	±2.5	Pass

Calculation;
Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

[WCDMA Band II]
Channel: 9400

Limit: ±0.00025% = ±2.5 ppm					
Power Supply [V]	**Temperature [ºC]**	**Measurements Frequency [Hz]**	**Frequency Tolerance [ppm]**	**Limit [ppm]**	**Result**
3.87	25(Ref.)	1,880,000,016	0.00000	±2.5	Pass
	50	1,880,000,012	-0.00188	±2.5	Pass
	40	1,880,000,013	-0.00156	±2.5	Pass
	30	1,880,000,015	-0.00058	±2.5	Pass
	20	1,880,000,015	-0.00053	±2.5	Pass
	10	1,880,000,015	-0.00020	±2.5	Pass
	0	1,880,000,016	0.00036	±2.5	Pass
	-10	1,880,000,015	-0.00023	±2.5	Pass
	-20	1,880,000,018	0.00109	±2.5	Pass
	-30	1,880,000,019	0.00146	±2.5	Pass
3.48	25	1,880,000,015	-0.00067	±2.5	Pass
4.26	25	1,880,000,018	0.00128	±2.5	Pass

Calculation;
Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

[LTE Band II]
QPSK, BW 20MHz
Channel: 18900

Limit: ±0.00025% = ±2.5 ppm					
Power Supply [V]	**Temperature [ºC]**	**Measurements Frequency [Hz]**	**Frequency Tolerance [ppm]**	**Limit [ppm]**	**Result**
3.87	25(Ref.)	1,880,000,011	0.00000	±2.5	Pass
	50	1,879,999,990	-0.01117	±2.5	Pass
	40	1,879,999,989	-0.01201	±2.5	Pass
	30	1,879,999,987	-0.01302	±2.5	Pass
	20	1,879,999,990	-0.01136	±2.5	Pass
	10	1,879,999,988	-0.01216	±2.5	Pass
	0	1,879,999,991	-0.01099	±2.5	Pass
	-10	1,879,999,989	-0.01170	±2.5	Pass
	-20	1,880,000,009	-0.00127	±2.5	Pass
	-30	1,879,999,986	-0.01356	±2.5	Pass
3.48	25	1,880,000,011	0.00001	±2.5	Pass
4.26	25	1,879,999,988	-0.01253	±2.5	Pass

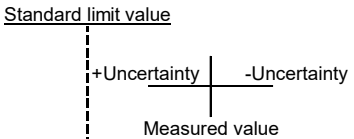
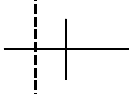
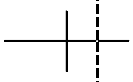
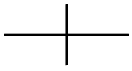
Calculation;
Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

Japan

5 Measurement Uncertainty

Expanded uncertainties stated are calculated with a coverage Factor k=2.
Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.2 dB
Radiated emission (30 MHz – 1000 MHz)	±5.3 dB
Radiated emission (1 GHz – 6 GHz)	±4.8 dB
Radiated emission (6 GHz – 18 GHz)	±4.5 dB
Radiated emission (18 GHz – 40 GHz)	±6.4 dB
Radio Frequency	$\pm 1.4 * 10^{-8}$
RF power, conducted	±0.8 dB
Adjacent channel power	±2.4 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Judge	Measured value and standard limit value
PASS	**Case1**  Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2  Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	**Case3**  Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4  Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

6 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881

Accreditation and Registration
A2LA
Certificate #3686.03

VLAC
Accreditation No.: VLAC-013

BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada
ISED#: 4224A

VCCI Council
Registration number: A-0166

Japan

Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2021	20-Aug-2020
				30-Sep-2022	01-Sep-2021
Attenuator	Weinschel	56-10	J4993	31-Dec-2021	14-Dec-2020
Microwave cable	HUBER+SUHNER	SUCOFLEX 104/1m	199120/4	31-Dec-2021	14-Dec-2020
Microwave cable	HUBER+SUHNER	SUCOFLEX104/1m	SN MY20492/6	31-Mar-2022	10-Mar-2021
Power divider	Keysight	11636B	MY51359874	30-Sep-2021	29-Sep-2020
				30-Sep-2022	15-Sep-2021
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	126079	31-Oct-2021	21-Oct-2020
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	116338	30-Sep-2021	02-Sep-2020
				31-Aug-2022	04-Aug-2021
Temperature and humidity chamber	ESPEC	PL1KP	14007261	30-Sep-2021	02-Sep-2020
				30-Sep-2022	03-Sep-2021

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Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2021	28-Sep-2020
				30-Sep-2022	15-Sep-2021
Spectrum analyzer	Agilent Technologies	E4447A	MY46180188	31-Mar-2022	11-Mar-2021
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	30-Jun-2022	08-Jun-2021
Preamplifier	SONOMA	310	372170	30-Sep-2021	29-Sep-2020
				30-Sep-2022	15-Sep-2021
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1333	31-Dec-2021	15-Dec-2020
Log periodic antenna	Schwarzbeck	VUSLP9111B	345	31-Oct-2021	19-Oct-2020
Attenuator	TOYO Connector	NA-PJ-6/6dB	N/A(S541)	30-Sep-2021	29-Sep-2020
				30-Sep-2022	16-Sep-2021
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2022	20-Jul-2021
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Dec-2021	15-Dec-2020
Attenuator	AEROFLEX	26A-10	081217-08	31-Dec-2021	14-Dec-2020
Double ridged guide antenna	ETS LINDGREN	3117	00052315	31-Mar-2022	30-Mar-2021
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2340)	31-Dec-2021	15-Dec-2020
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	30-Sep-2021	02-Sep-2020
				31-Aug-2022	02-Aug-2021
Preamplifier	TSJ	MLA-1840-B03-35	1240332	30-Sep-2021	02-Sep-2020
				31-Aug-2022	02-Aug-2021
Band rejection filter	Micro-Tronics	BRC50720	014	31-Dec-2021	14-Dec-2020
Signal generator	ROHDE&SCHWARZ	SMB100A	177525	31-Dec-2021	23-Dec-2020
RF power amplifier	R&K	CGA020M602-2633R	B40240	30-Jun-2022	15-Jun-2021
Microwave cable	HUBER+SUHNER	SUCOFELX102/2m	31648	31-Mar-2022	10-Mar-2021
Double ridged guide antenna	ETS LINDGREN	3117	00218815	31-Dec-2021	07-Dec-2020
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	126079	31-Oct-2021	21-Oct-2020
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	116338	30-Sep-2021	02-Sep-2020
				31-Aug-2022	04-Aug-2021
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1m	my24610/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/8m	SN MY30033/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104	MY32976/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1.5m	SN MY28404/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/7m	41625/6	31-Dec-2021	15-Dec-2020
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V6.0.140	N/A	N/A
Absorber	RIKEN	PFP30	N/A	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2022	20-May-2021
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2022	20-May-2021

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.