

9 FCC §2.1046 & §30.202 – Power Limits

9.1 Applicable Standards

According to FCC §30.202:

(a) For fixed and base stations operating in connection with mobile systems, the average power of the sum of all antenna elements is limited to an equivalent isotopically radiated power (EIRP) density of +75dBm/100 MHz. For channel bandwidths less than 100 megahertz the EIRP must be reduced proportionally and linearly based on the bandwidth relative to 100 megahertz.

9.2 Measurement Procedure

EIRP Measurement

According to ANSI C63.26-2015 section 5.2.7 Radiated power measurements

$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.

$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

Based on both equations above, the offset should equal to Antenna Factor(dB/m) + Cable Loss(dB) + 107 + 20log(D) -104.8 when set the unit to dBm on the PSA. The duty cycle correction factor in section 2.3 was also added in the offset for average measurement.

9.3 Far Field Distance Calculation

Note: Measurements were taken in the far field distance R based on the formula $R \geq 2D^2/\lambda$, where D is the antenna length, λ is the wavelength. Wavelength = v/f , where v is the speed of light (3×10^9 m/s).

EUT antenna dimension 44mm, TX range: 37000 MHz – 40000 MHz

R range: 0.0478 m to 0.0516 m.

Receiving antenna frequency range and dimension are shown in the following table:

Frequency (GHz)	Antenna	Dimension (Length) (mm)	Far Field Range (m)
26.5 – 40	ARH-2823-02	66	0.077 – 0.116

Note: measurement was made at 3 meters.

9.4 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer 44 GHz	E4446A	US44300386	2021-04-27	1 year
-	RF Cable	-	-	Each Time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years
Keysight	Signal Generator	E8257D	MY59140095	2021-06-25	1 year

Note¹: cable and attenuator included in the test set-up will be checked each time before testing.

Statement of Traceability: **BACL Corp.** attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 “A2LA Policy on Metrological Traceability”.

9.5 Test Environmental Conditions

Temperature:	23° C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Giriraj Gurjar from 2021-07-29 to 2021-07-30 in 5m3 Chamber.

9.6 Test Results

1CC:

Bandwidth (MHz)	Modulation	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
100	QPSK	37050	39.99	39.43	42.73	75
		38500	39.76	39.55	42.67	75
		39950	39.82	39.51	42.68	75
	16QAM	37050	39.94	39.41	42.69	75
		38500	39.55	39.47	41.26	75
		39950	39.69	39.54	42.63	75
	64QAM	37050	39.94	39.24	42.61	75
		38500	39.68	39.20	42.46	75
		39950	39.55	39.27	42.42	75

2CC

QPSK

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	36.09	36.39	39.25	75
	37150	36.43	36.00	39.23	75
Middle	38450	36.22	36.44	39.34	75
	38550	36.13	36.74	39.46	75
High	39850	36.49	36.43	39.47	75
	39950	36.47	36.79	39.64	75

16QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	36.74	36.48	39.62	75
	37150	36.87	36.17	39.54	75
Middle	38450	36.10	36.61	39.37	75
	38550	36.46	36.48	39.48	75
High	39850	36.63	36.29	39.47	75
	39950	36.06	36.74	39.42	75

64QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	36.43	36.60	39.53	75
	37150	36.12	36.02	39.08	75
Middle	38450	36.16	36.54	39.36	75
	38550	36.06	36.64	39.37	75
High	39850	36.42	36.19	39.32	75
	39950	36.66	36.60	39.64	75

2CC (Channel Power):

Bandwidth (MHz)	Modulation	Frequency (MHz)	EIRP-Horizontal (dBm)	EIRP-Vertical (dBm)	H + V (dBm)
200	QPSK	37100	39.24	39.23	42.25
		38500	39.21	39.56	42.40
		39900	39.86	39.62	42.75
	16QAM	37100	39.05	39.25	42.16
		38500	39.13	39.35	42.25
		39900	39.27	39.61	42.45
	64QAM	37100	39.51	39.25	42.39
		38500	39.11	39.55	42.35
		39900	39.42	39.62	42.53

3CC**QPSK**

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	35.49	35.51	38.51	75
	37150	35.57	35.56	38.58	75
	37250	35.43	35.56	38.51	75
Middle	38400	35.06	35.75	38.43	75
	38500	35.03	35.45	38.26	75
	38600	35.03	35.62	38.35	75
High	39750	35.58	35.16	38.39	75
	39850	35.27	35.14	38.22	75
	39950	35.20	35.59	38.41	75

16QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	35.10	35.00	38.06	75
	37150	35.08	35.13	38.12	75
	37250	35.06	35.07	38.08	75
Middle	38400	35.04	35.36	38.21	75
	38500	35.11	35.28	38.21	75
	38600	35.23	35.10	38.18	75
High	39750	35.29	35.23	38.27	75
	39850	35.80	35.16	38.50	75
	39950	35.43	35.49	38.47	75

64QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	35.32	35.56	38.45	75
	37150	35.17	35.53	38.36	75
	37250	35.07	35.09	38.09	75
Middle	38400	35.32	35.65	38.50	75
	38500	35.14	35.34	38.25	75
	38600	35.01	35.13	38.08	75
High	39750	35.47	35.09	38.29	75
	39850	35.67	35.39	38.54	75
	39950	35.18	35.46	38.33	75

3CC (Channel Power):

Bandwidth (MHz)	Modulation	Frequency (MHz)	EIRP-Horizontal (dBm)	EIRP-Vertical (dBm)	H + V (dBm)
300	QPSK	37150	39.56	39.53	42.56
		38500	39.58	39.58	42.59
		39850	39.51	39.44	42.49
	16QAM	37150	39.15	39.32	42.25
		38500	39.31	39.54	42.44
		39850	39.55	39.42	42.50
	64QAM	37150	39.48	39.50	42.50
		38500	39.49	39.51	42.51
		39850	39.54	39.56	42.56

4CC

QPSK

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	33.41	33.55	36.49	75
	37150	33.62	33.98	36.81	75
	37250	33.74	33.77	36.77	75
	37350	33.64	33.67	36.67	75
Middle	38350	33.25	33.49	36.38	75
	38450	33.52	33.37	36.46	75
	38550	33.66	33.48	36.58	75
	38650	33.38	33.39	36.40	75
High	39650	33.08	33.12	36.11	75
	39750	33.99	33.53	36.78	75
	39850	33.59	33.47	36.54	75
	39950	33.58	33.28	36.44	75

16QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	33.87	33.66	36.78	75
	37150	33.12	33.75	36.46	75
	37250	33.25	33.65	36.46	75
	37350	33.61	33.67	36.65	75
Middle	38350	33.10	33.48	36.30	75
	38450	33.26	33.11	36.20	75
	38550	33.42	33.22	36.33	75
	38650	33.22	33.05	36.15	75
High	39650	33.58	33.09	36.35	75
	39750	33.46	33.50	36.49	75
	39850	33.46	33.50	36.49	75
	39950	33.33	33.24	36.30	75

64QAM

Channel	Frequency (MHz)	EIRP-Horizontal (dBm/100MHz)	EIRP-Vertical (dBm/100MHz)	H + V (dBm/100MHz)	Limit (dBm/100MHz)
Low	37050	33.64	33.69	36.68	75
	37150	33.80	33.86	36.84	75
	37250	33.90	33.80	36.86	75
	37350	33.29	33.76	36.54	75
Middle	38350	33.17	33.23	36.21	75
	38450	33.54	33.06	36.32	75
	38550	33.31	33.03	36.18	75
	38650	33.10	33.09	36.11	75
High	39650	33.19	33.19	36.20	75
	39750	33.89	33.79	36.85	75
	39850	33.33	33.23	36.29	75
	39950	33.49	33.59	36.55	75

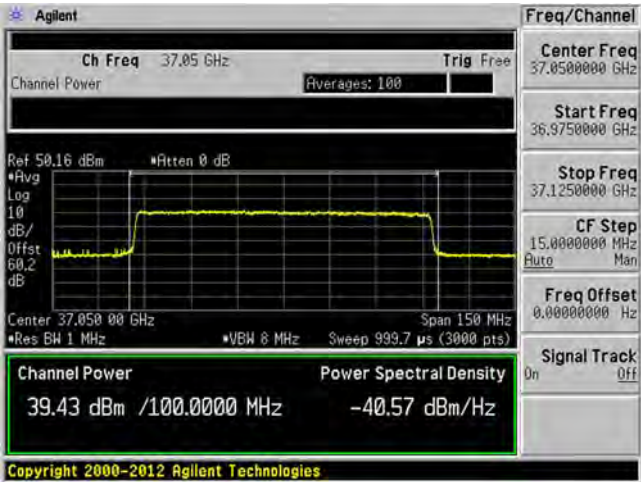
4CC (Channel Power):

Bandwidth (MHz)	Modulation	Frequency (MHz)	EIRP-Horizontal (dBm)	EIRP-Vertical (dBm)	H + V (dBm)
400	QPSK	37200	39.50	39.68	42.60
		38500	39.55	39.51	42.54
		39500	39.59	39.60	42.61
	16QAM	37200	39.43	39.47	42.46
		38500	39.25	39.15	42.21
		39500	39.50	39.46	42.49
	64QAM	37200	39.48	39.75	42.63
		38500	39.25	39.42	42.35
		39500	39.53	39.39	42.47

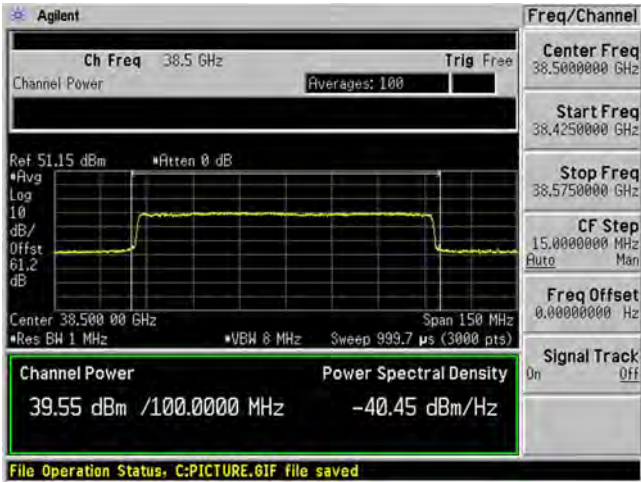
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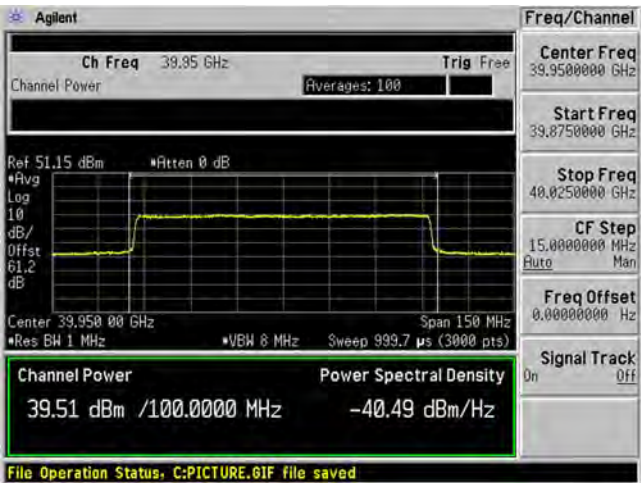
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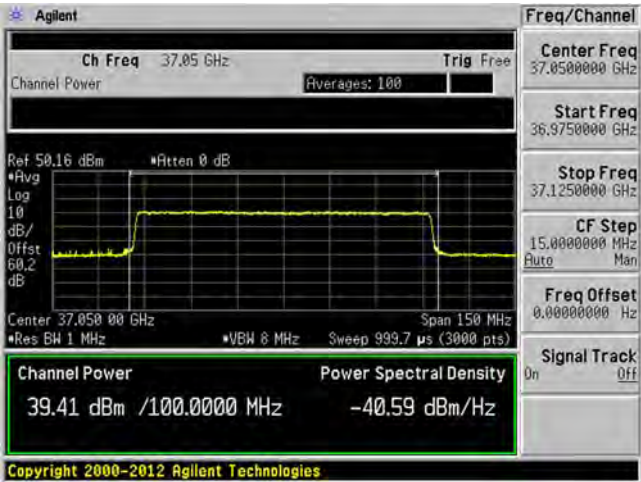
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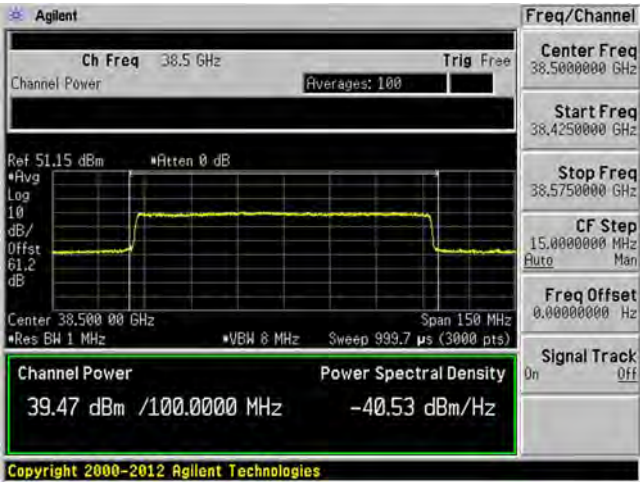
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1CC – 16QAM

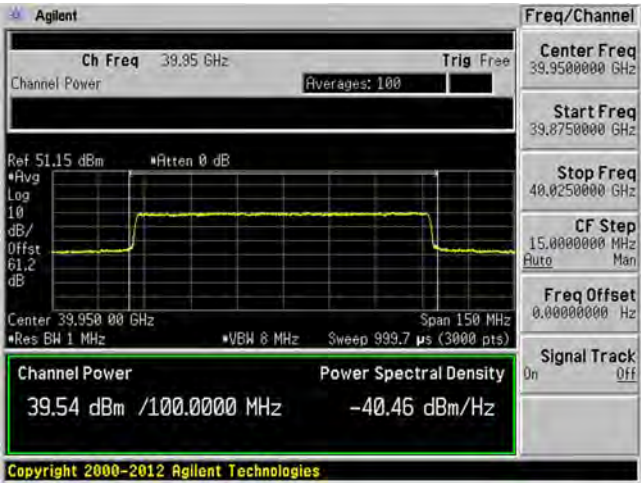
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Middle Channel



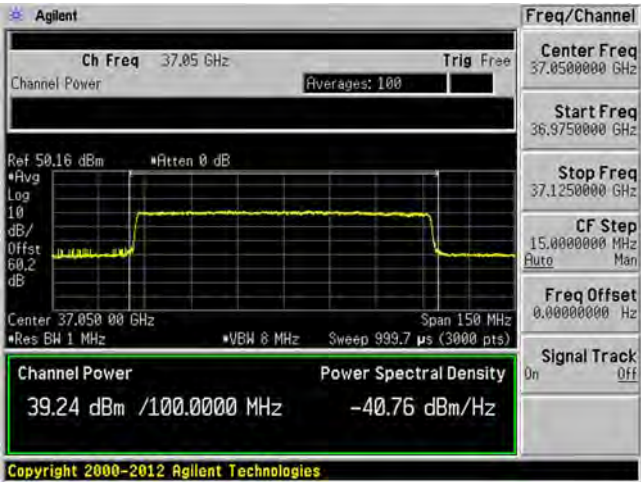
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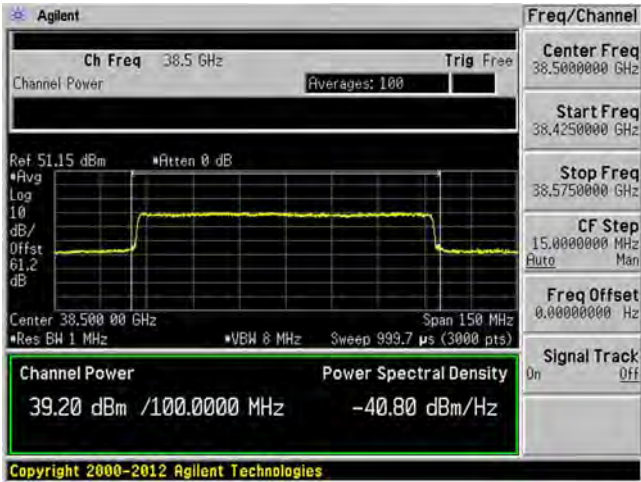
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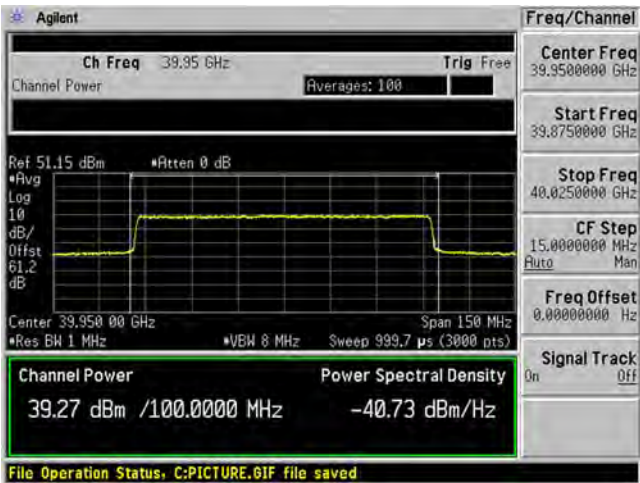
Low Channel



Middle Channel



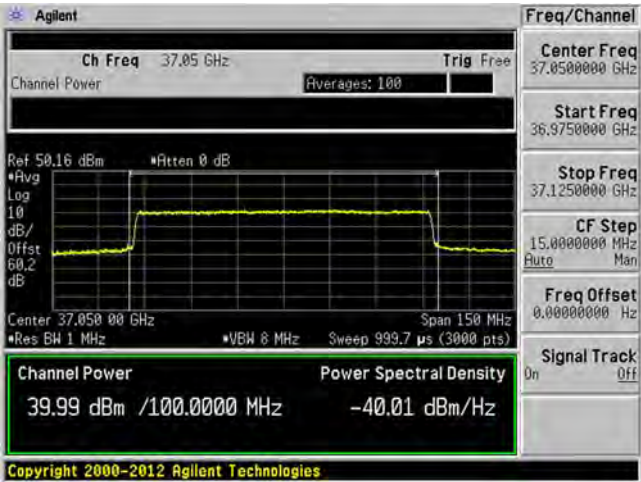
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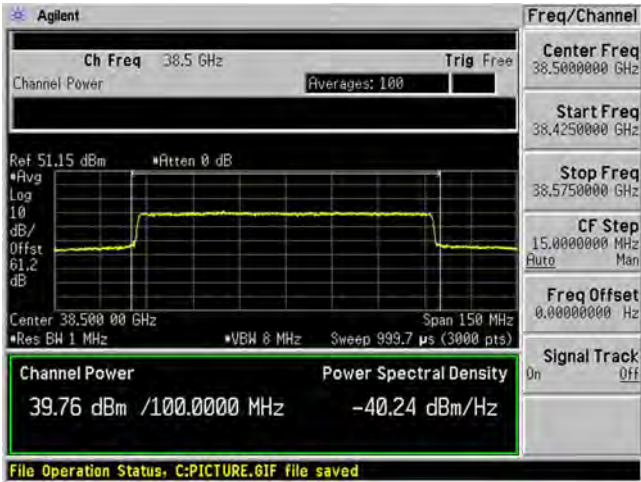
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ICC – QPSK

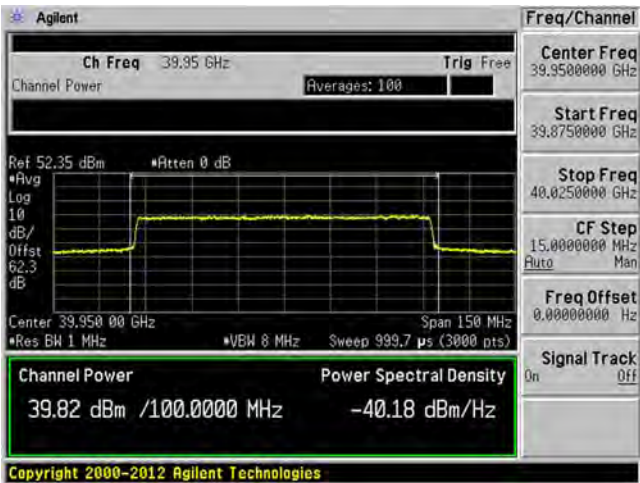
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Middle Channel



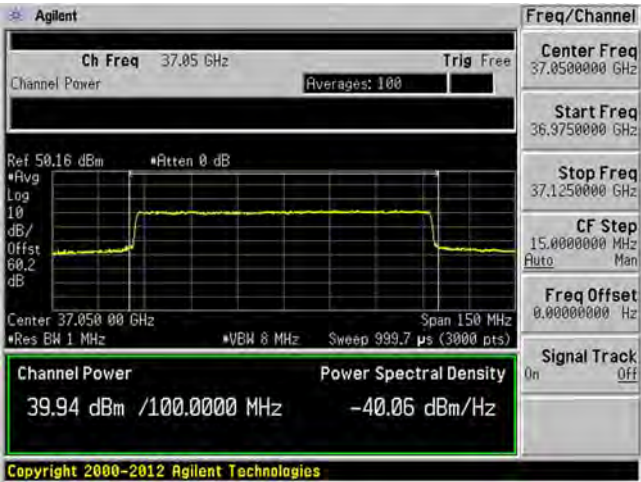
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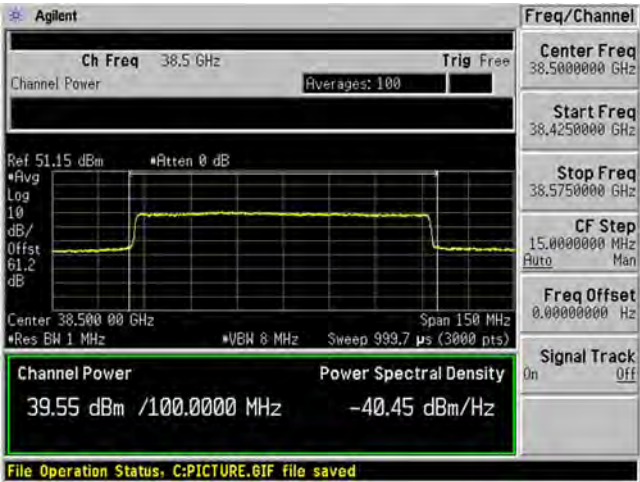
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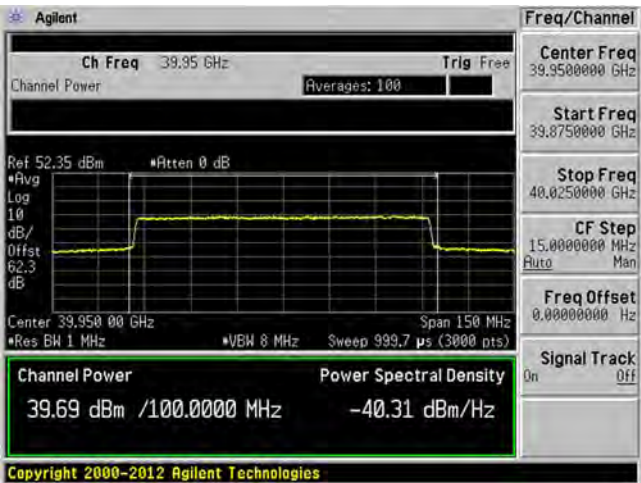
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Middle Channel



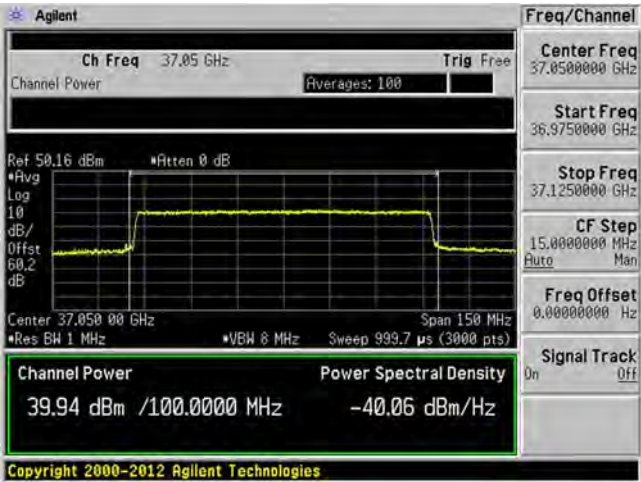
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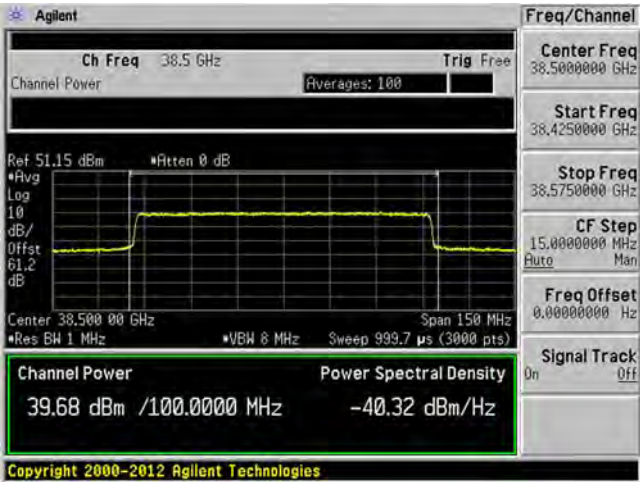
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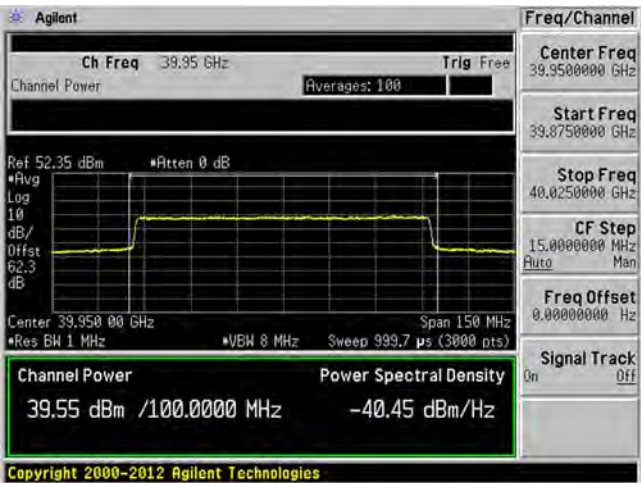
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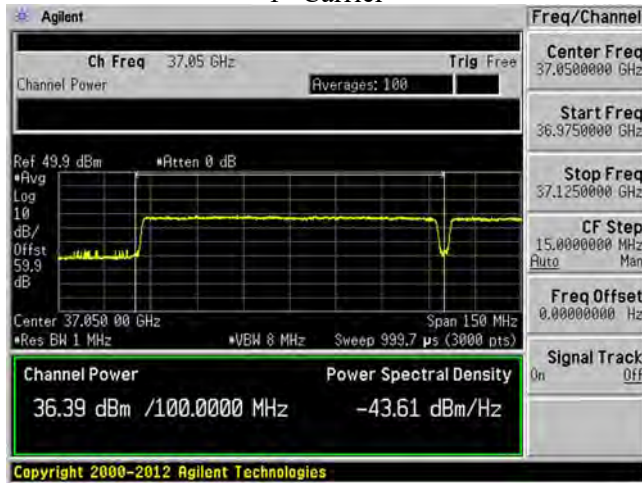
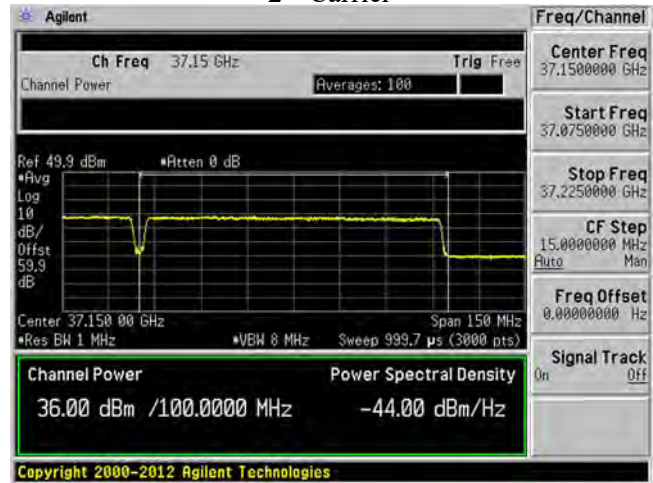
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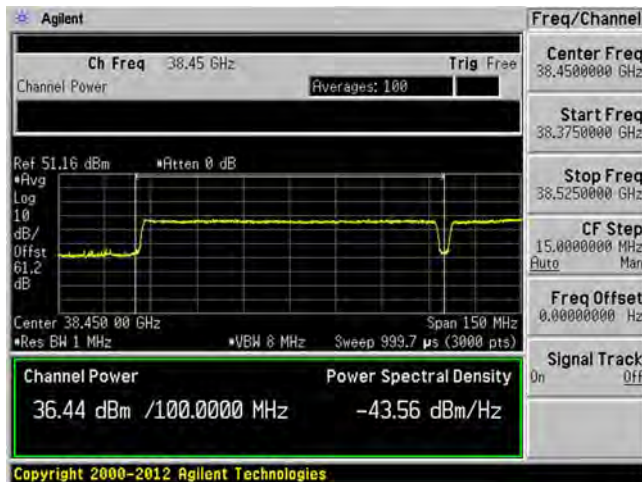
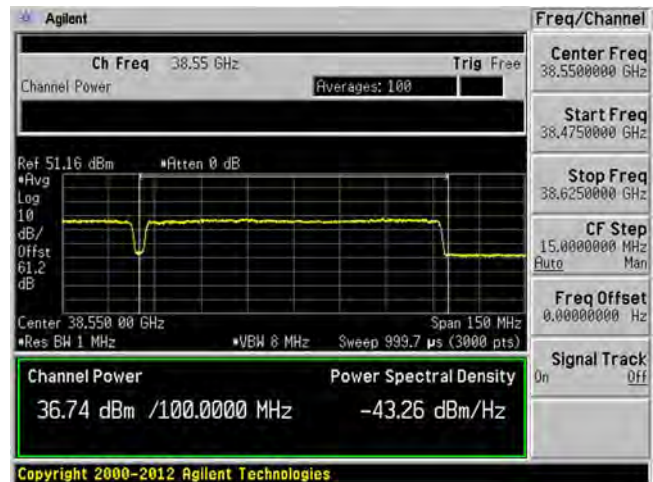
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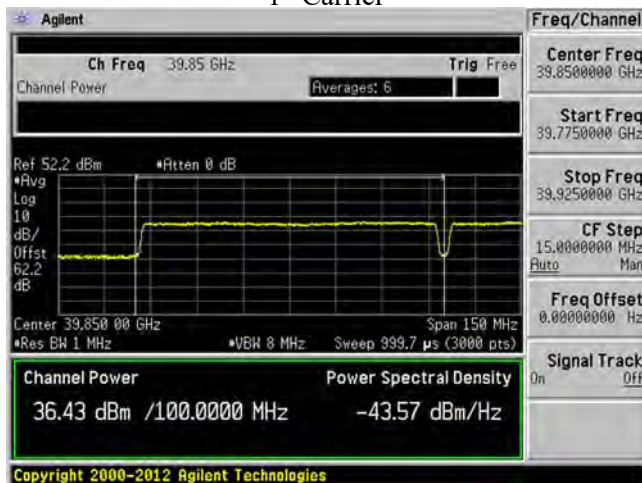
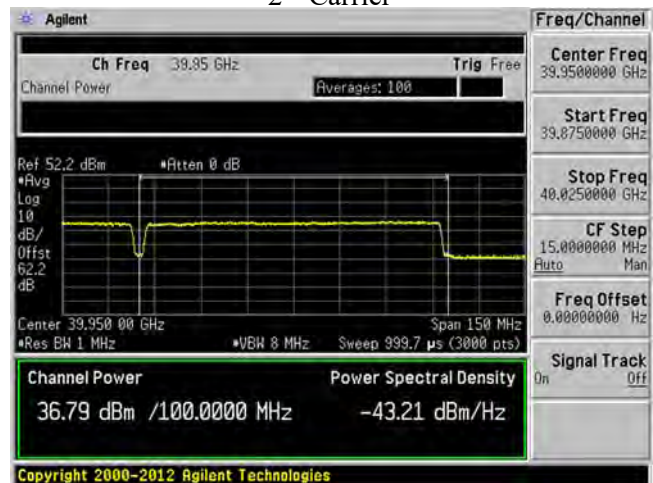
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2CC – QPSK – Low Channel

1st Carrier2nd Carrier

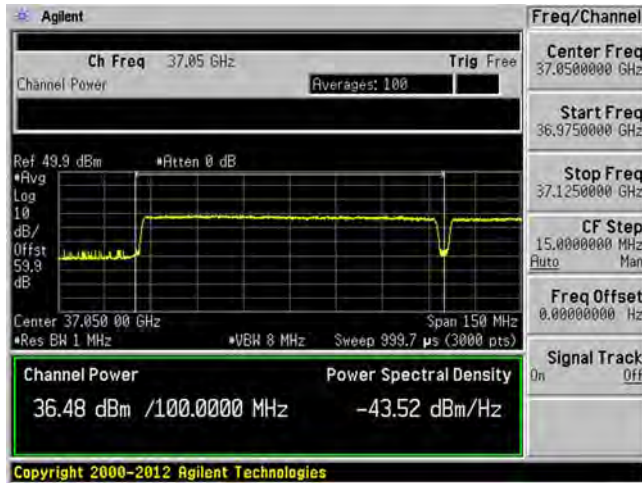
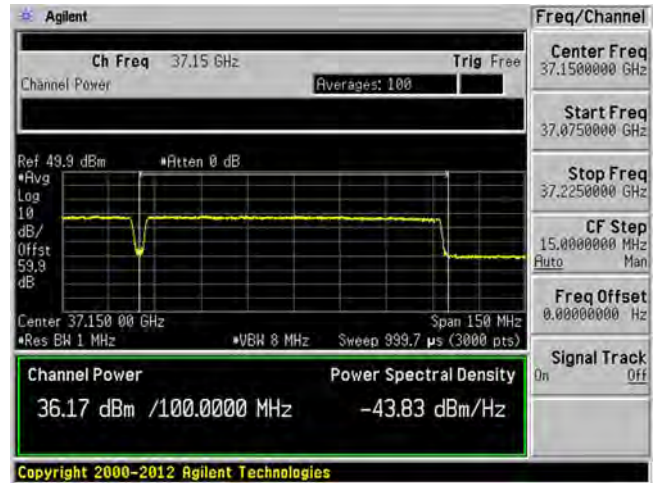
2CC – QPSK – Mid Channel

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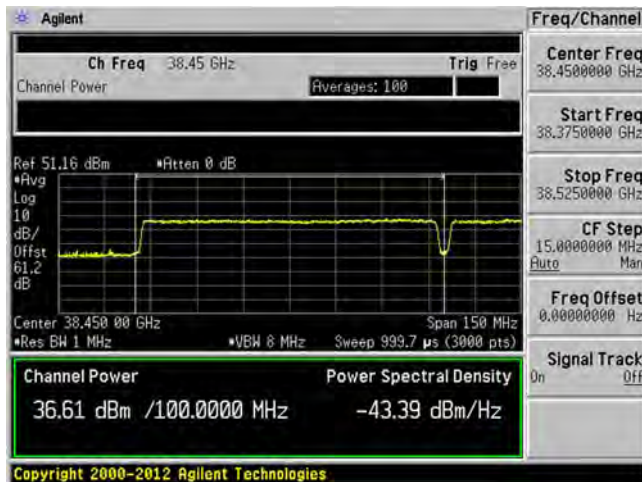
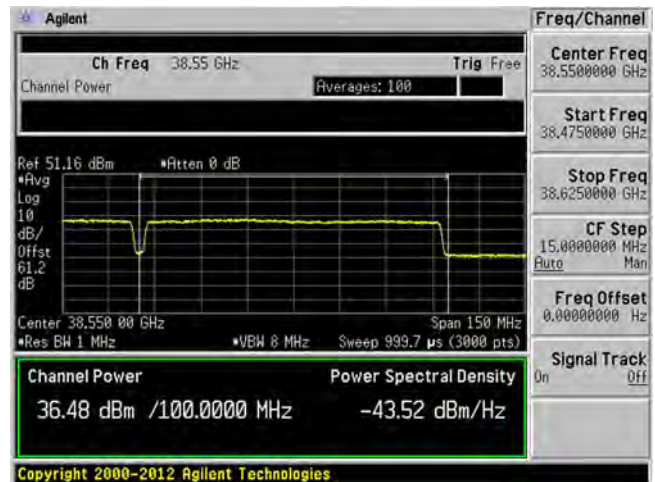
2CC – QPSK – High Channel

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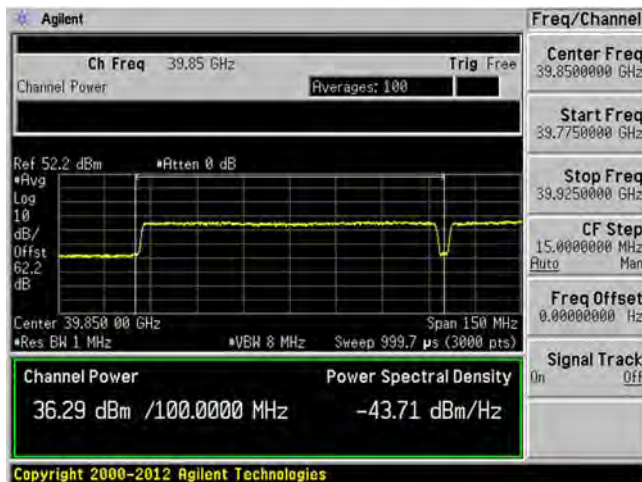
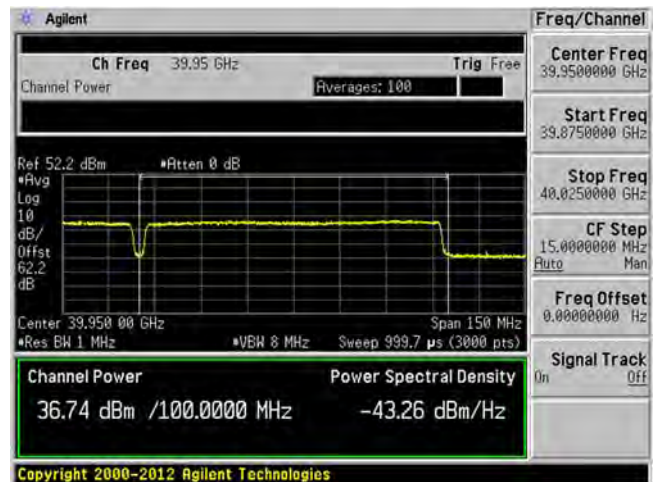
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2CC – 16QAM – Low Channel

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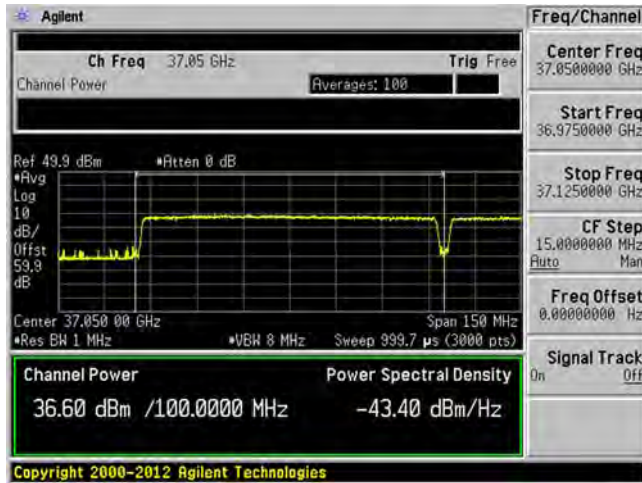
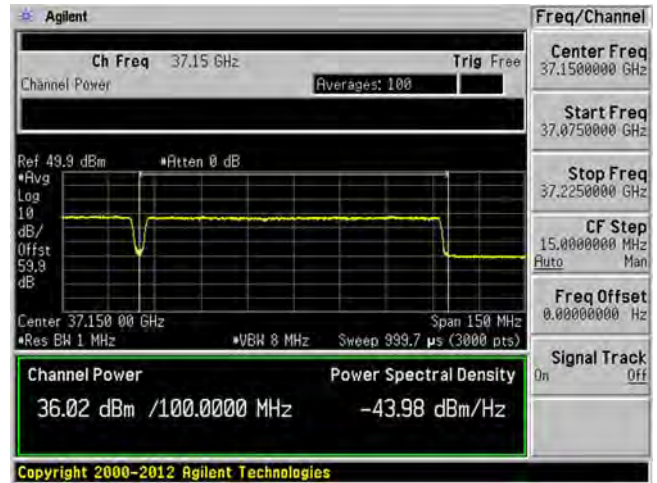
2CC – 16QAM – Mid Channel

1st Carrier2nd Carrier

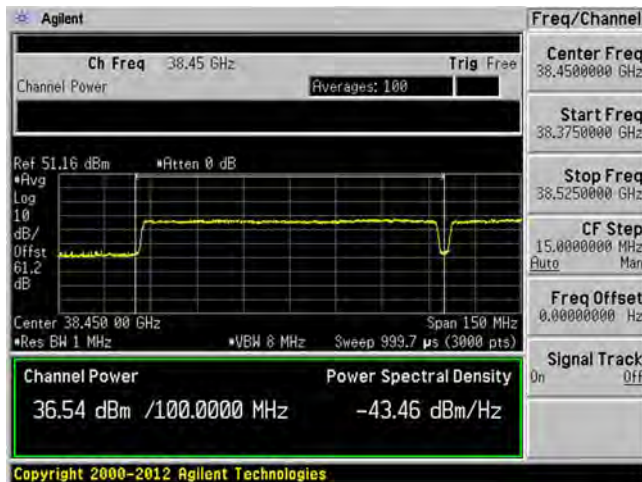
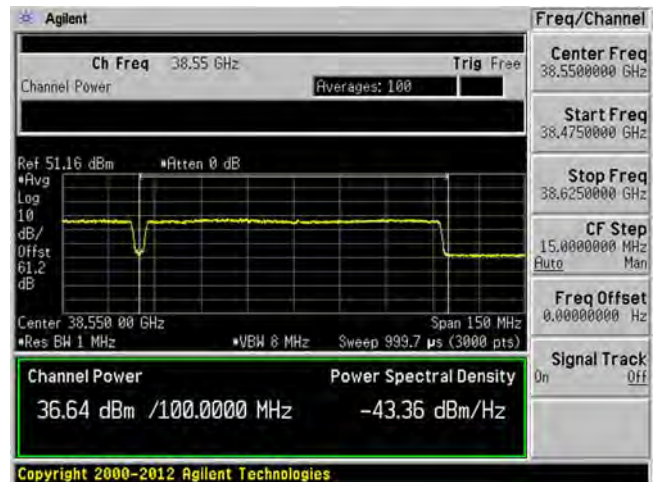
2CC – 16QAM – High Channel

1st Carrier2nd Carrier

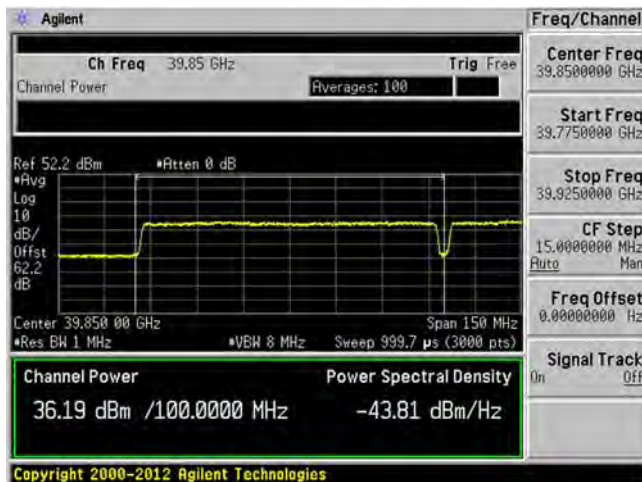
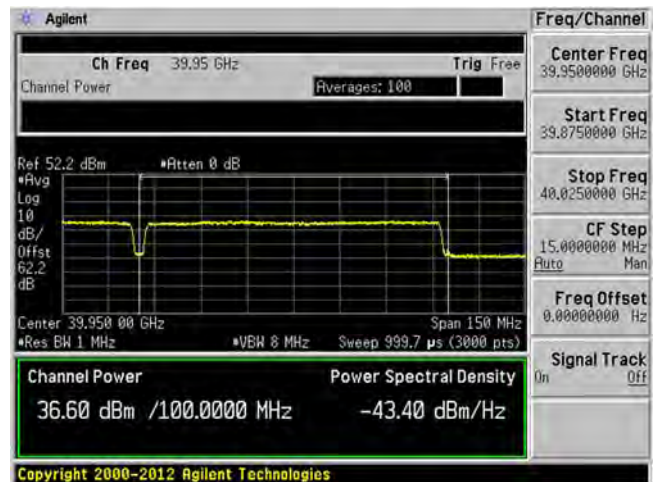
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2CC – 64QAM – Low Channel

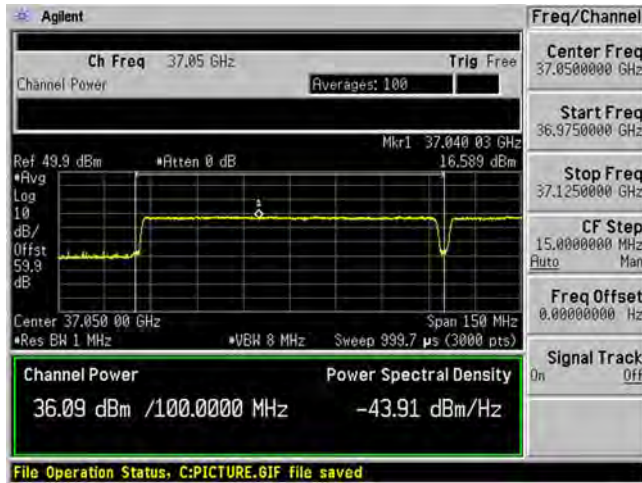
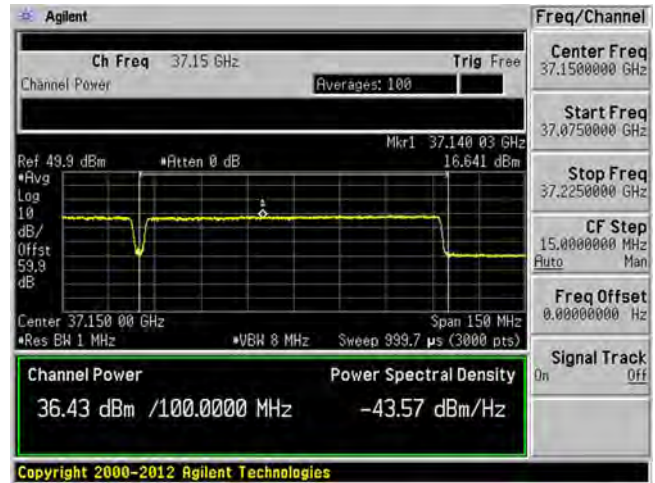
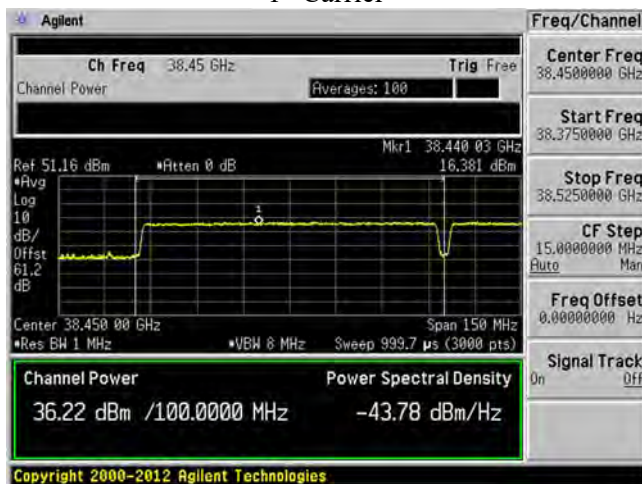
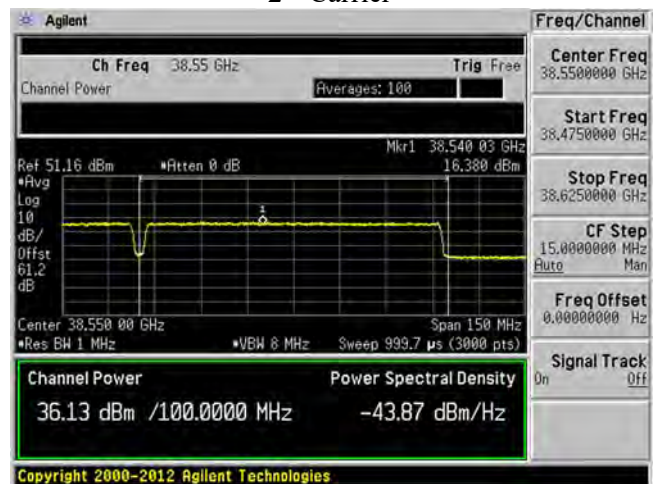
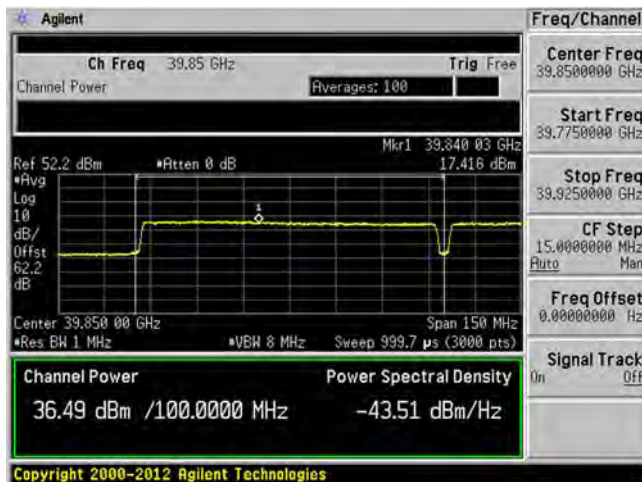
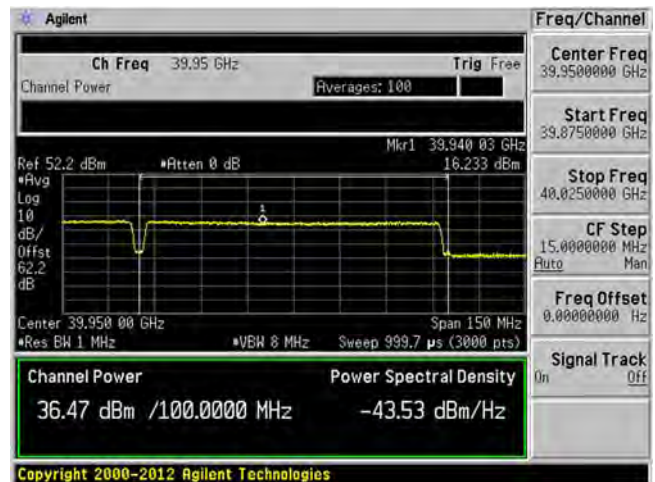
1st Carrier2nd Carrier

2CC – 64QAM – Mid Channel

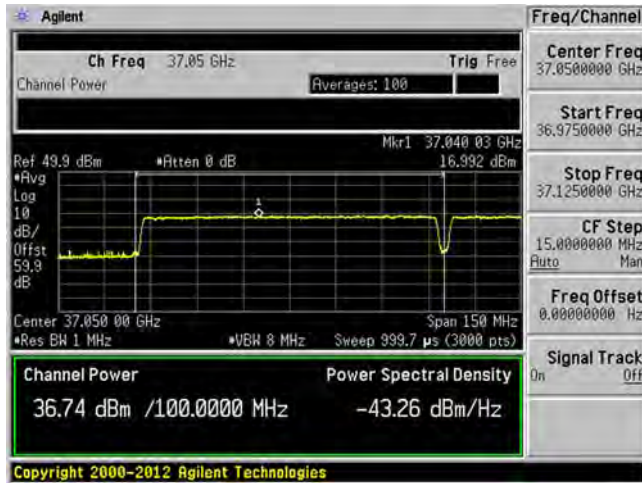
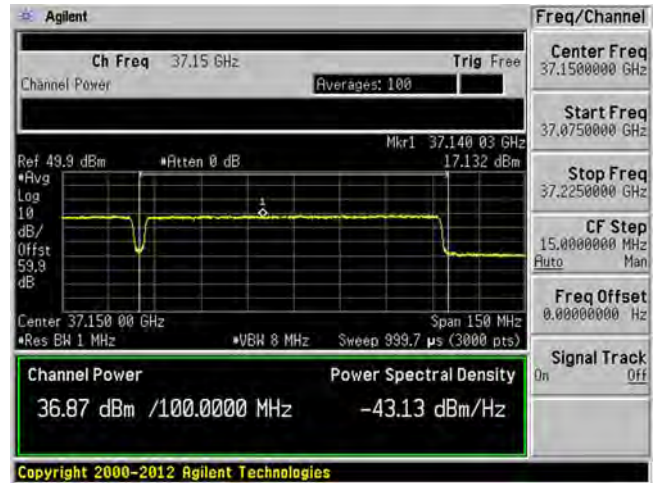
1st Carrier2nd Carrier

2CC – 64QAM – High Channel

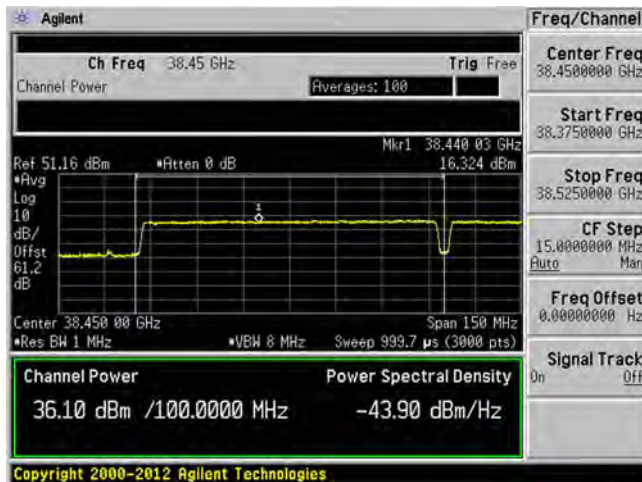
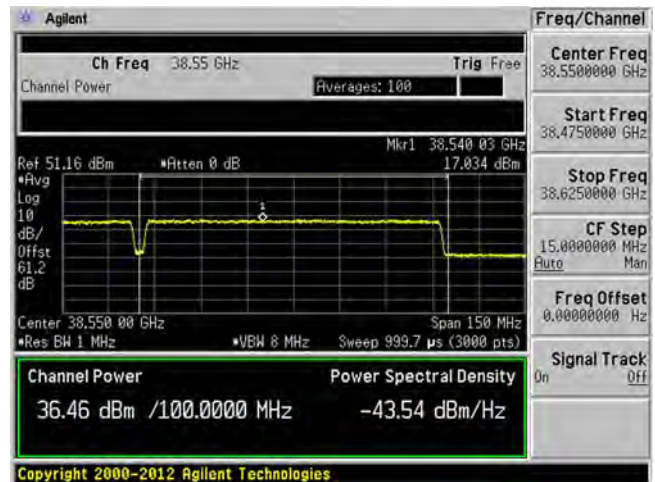
1st Carrier2nd Carrier

Beam ID: 139 (Horizontal)
2CC – QPSK – Low Channel1st Carrier2nd Carrier**2CC – QPSK – Mid Channel**1st Carrier2nd Carrier**2CC – QPSK – High Channel**1st Carrier2nd Carrier

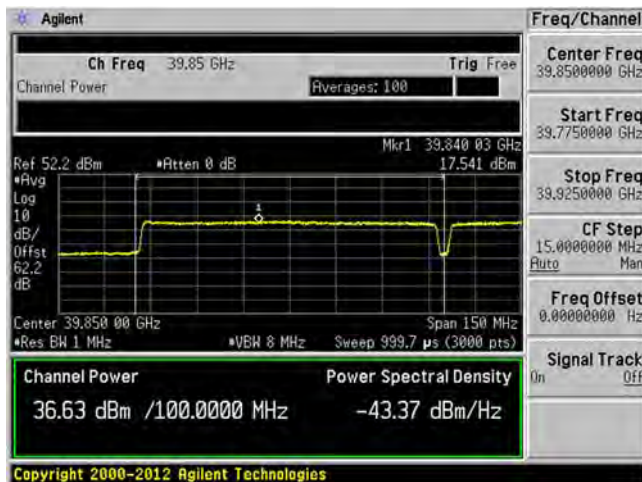
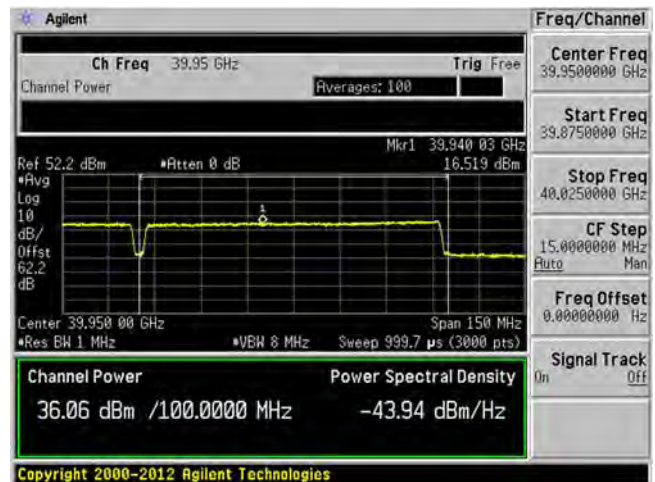
Beam ID: 139 (Horizontal)
2CC – 16QAM – Low Channel

1st Carrier2nd Carrier

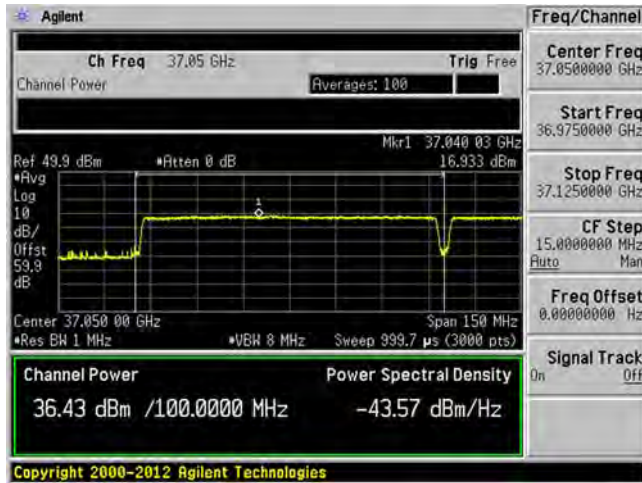
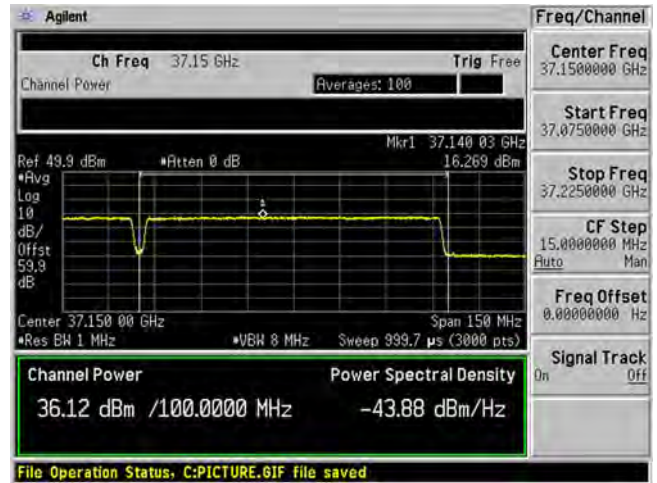
2CC – 16QAM – Mid Channel

1st Carrier2nd Carrier

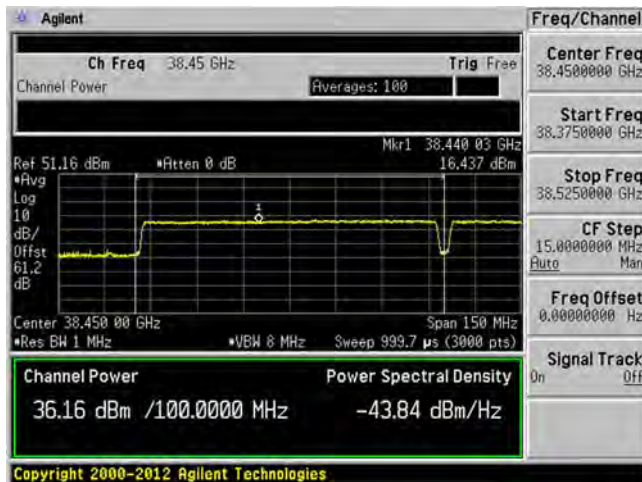
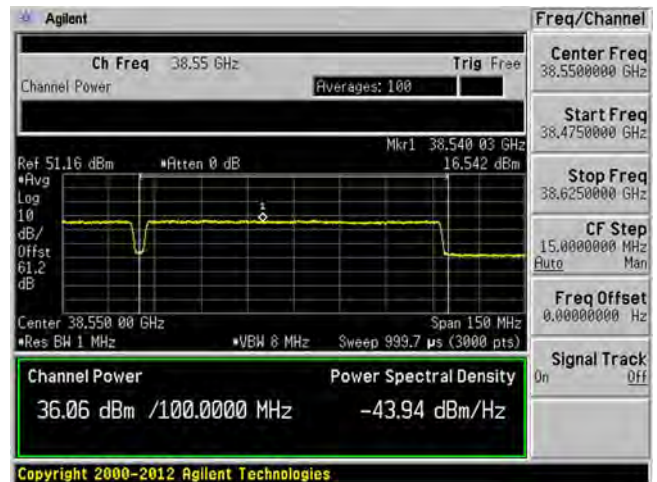
2CC – 16QAM – High Channel

1st Carrier2nd Carrier

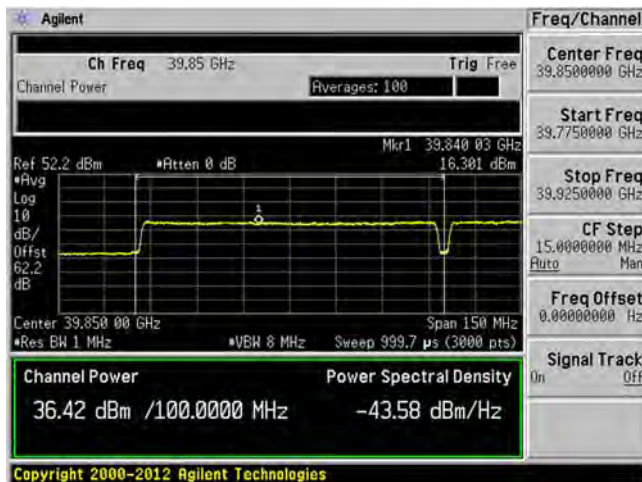
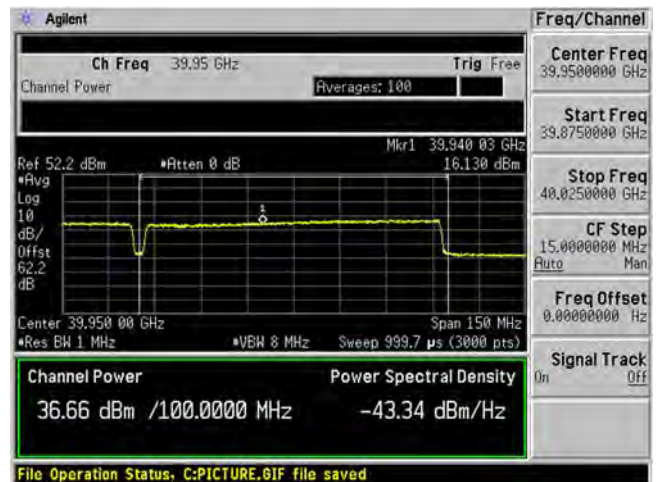
Beam ID: 139 (Horizontal)
2CC – 64QAM – Low Channel

1st Carrier2nd Carrier

2CC – 64QAM – Mid Channel

1st Carrier2nd Carrier

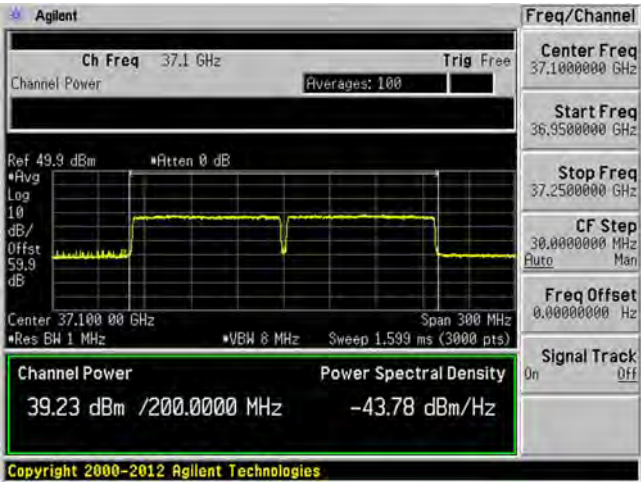
2CC – 64QAM – High Channel

1st Carrier2nd Carrier

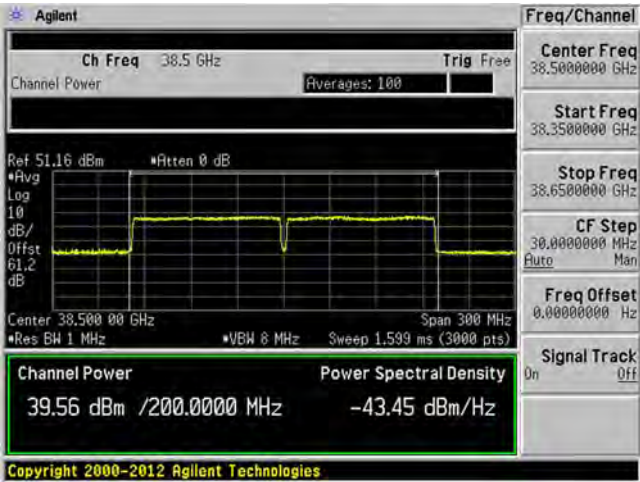
Beam ID: 11 (Vertical) (Channel Power)

2CC – QPSK

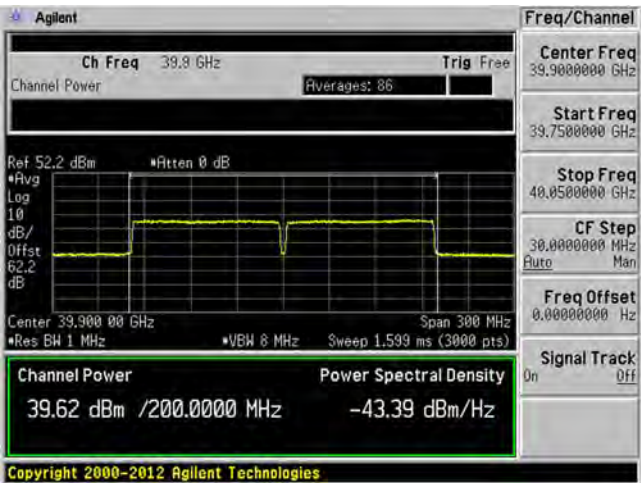
Low Channel



Middle Channel



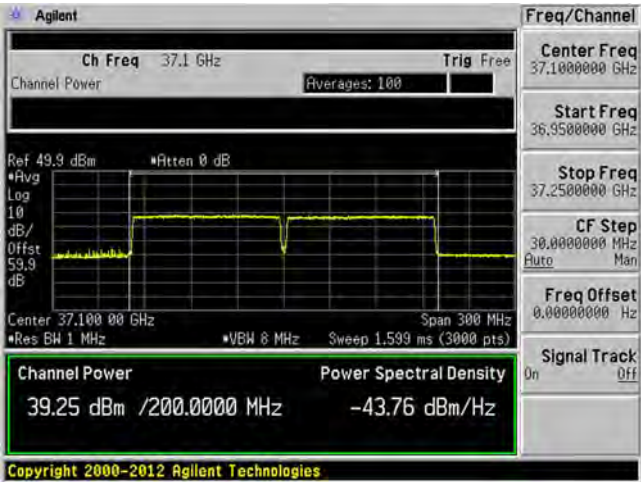
High Channel



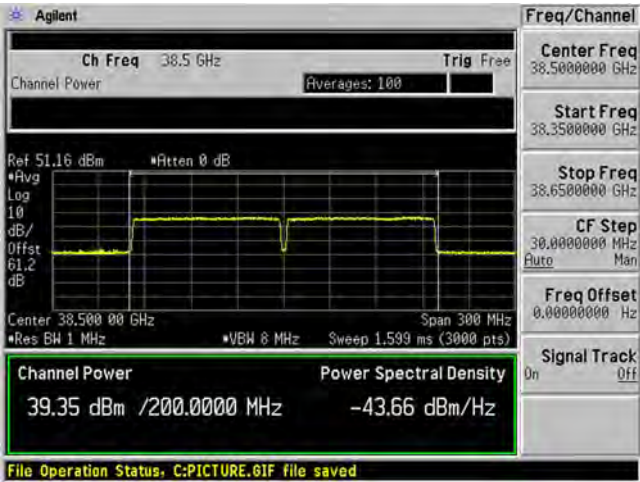
Beam ID: 11 (Vertical) (Channel Power)

2CC – 16QAM

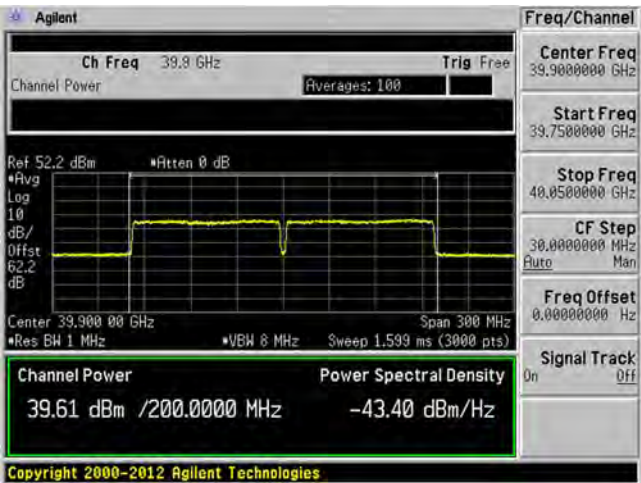
Low Channel



Middle Channel



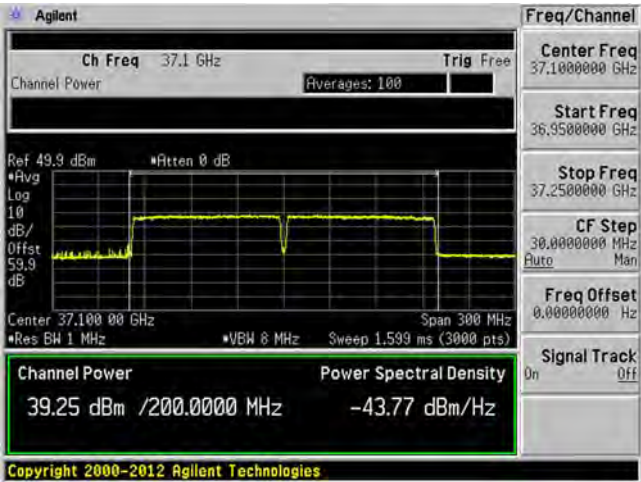
High Channel



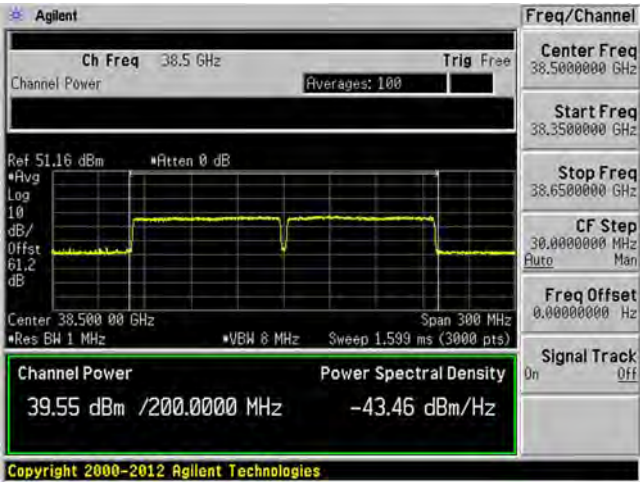
Beam ID: 11 (Vertical) (Channel Power)

2CC – 64QAM

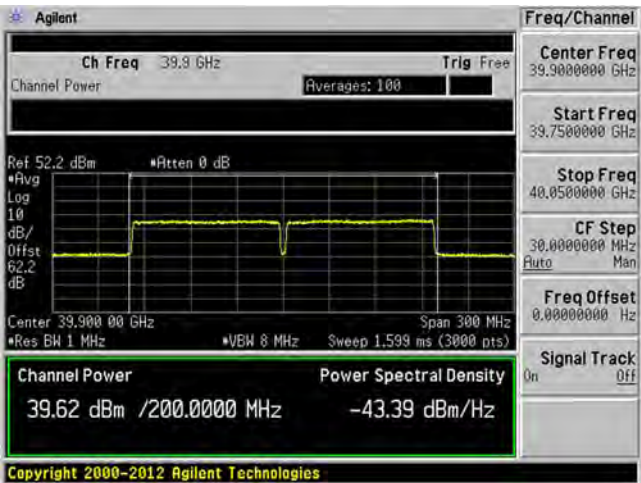
Low Channel



Middle Channel



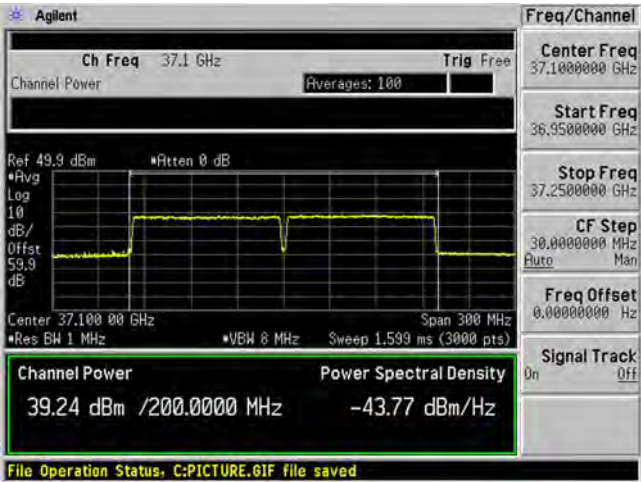
High Channel



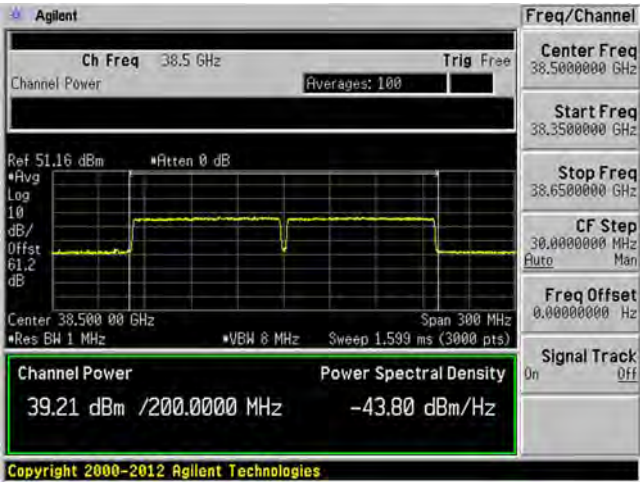
Beam ID: 139 (Horizontal) (Channel Power)

2CC – QPSK

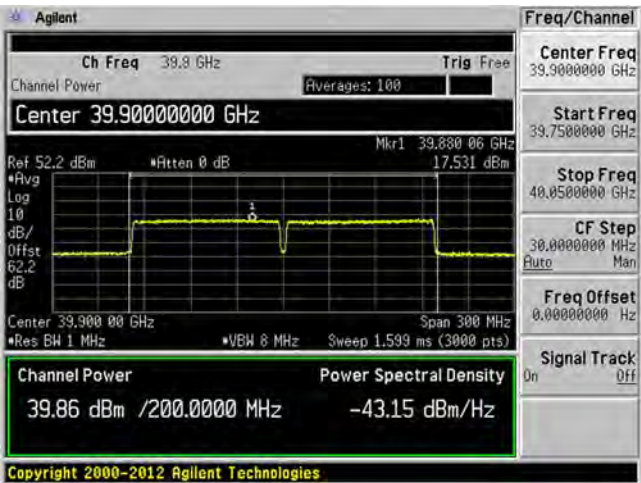
Low Channel



Middle Channel



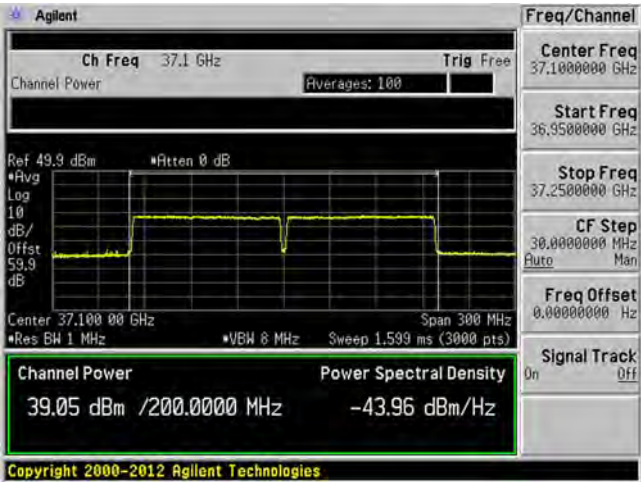
High Channel



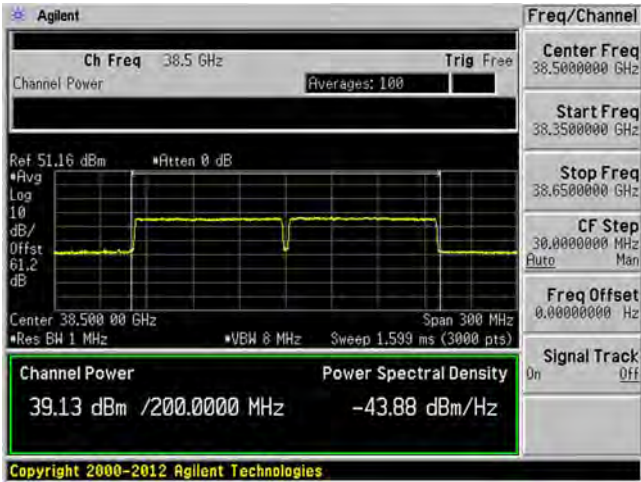
Beam ID: 139 (Horizontal) (Channel Power)

2CC – 16QAM

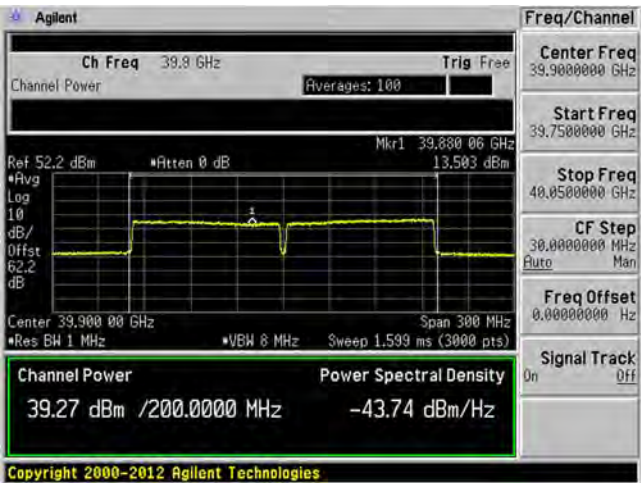
Low Channel



Middle Channel



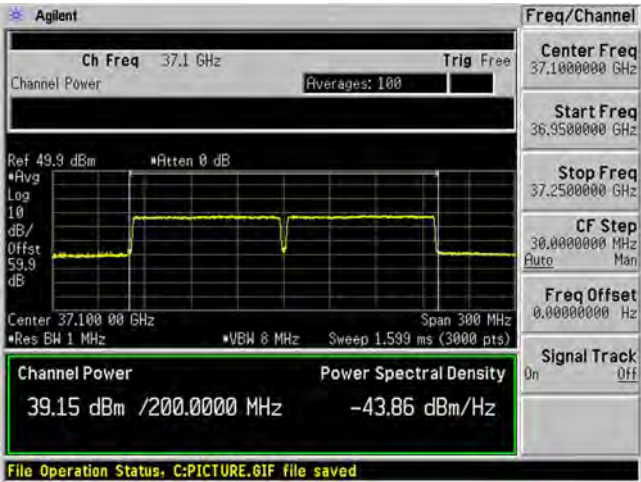
High Channel



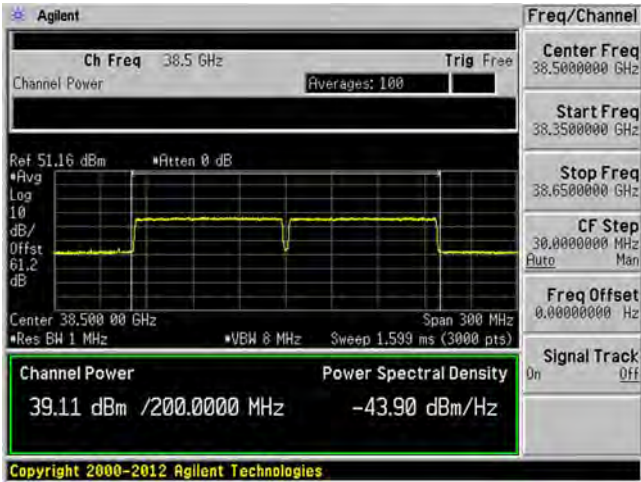
Beam ID: 139 (Horizontal) (Channel Power)

2CC – 64QAM

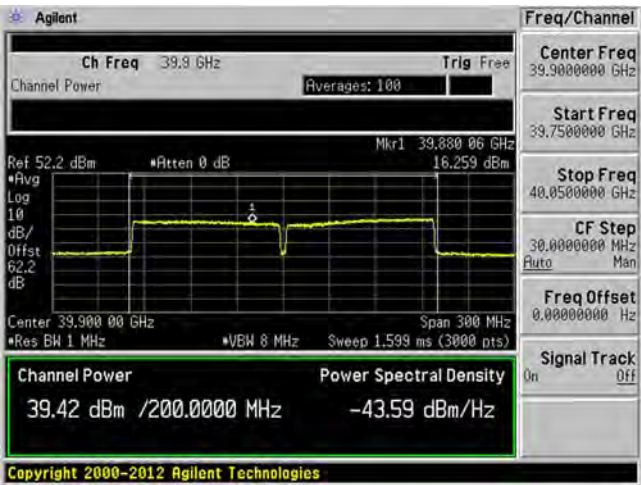
Low Channel



Middle Channel



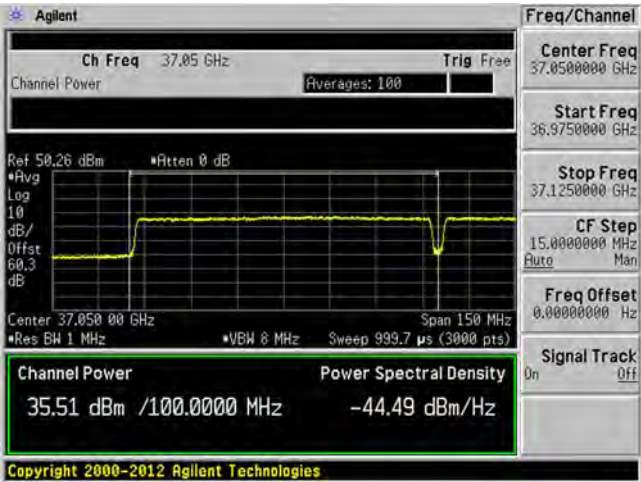
High Channel



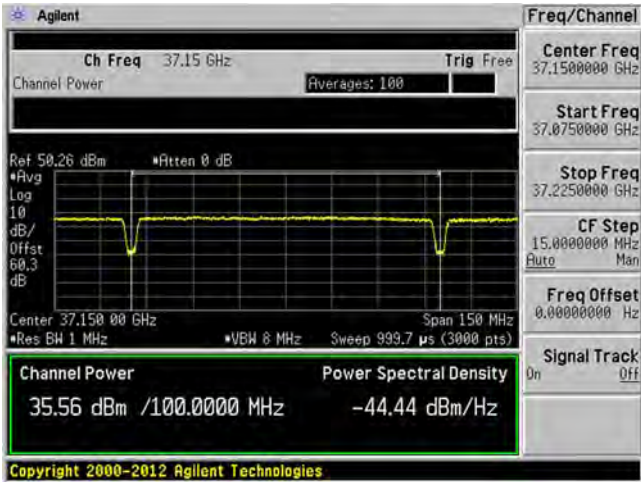
Beam ID: 11 (Vertical)

3CC – QPSK – Low Channel

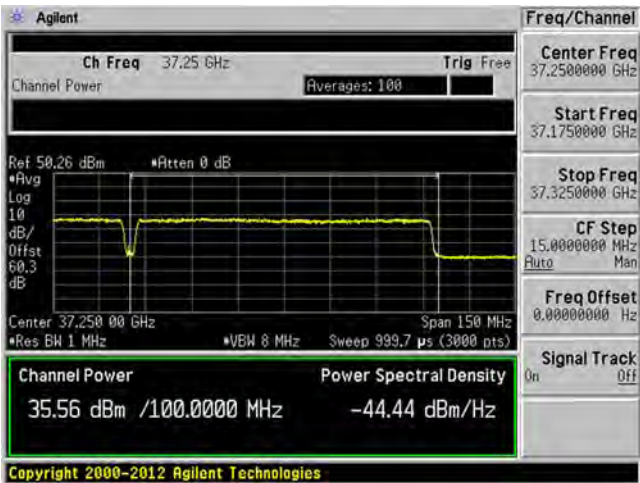
1st Carrier



2nd Carrier



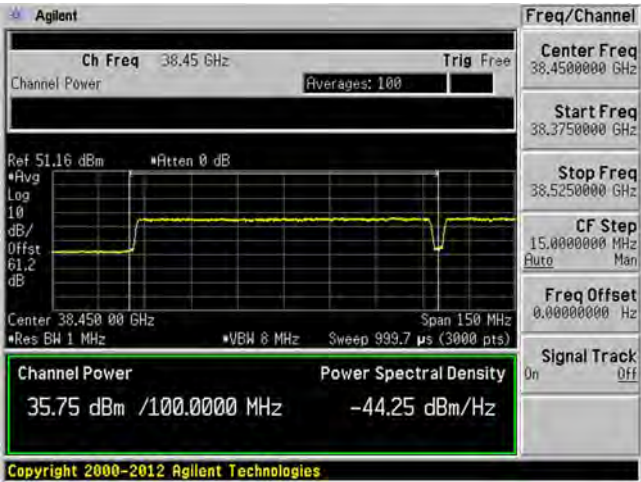
3rd Carrier



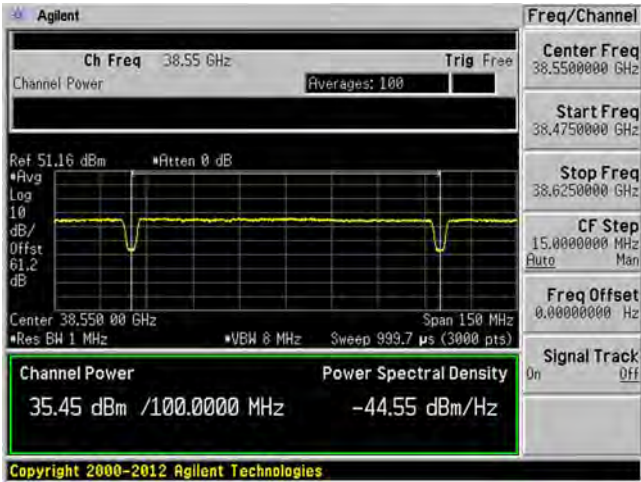
Beam ID: 11 (Vertical)

3CC – QPSK – Middle Channel

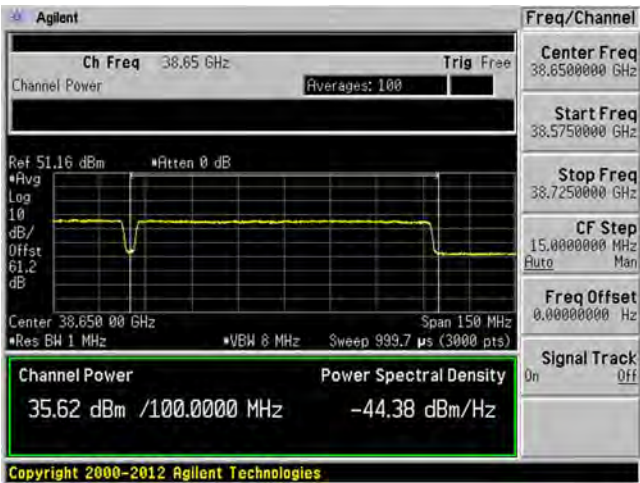
1st Carrier



2nd Carrier



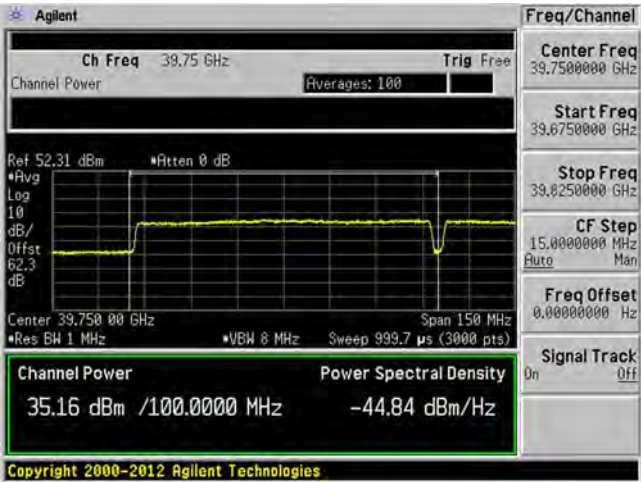
3rd Carrier



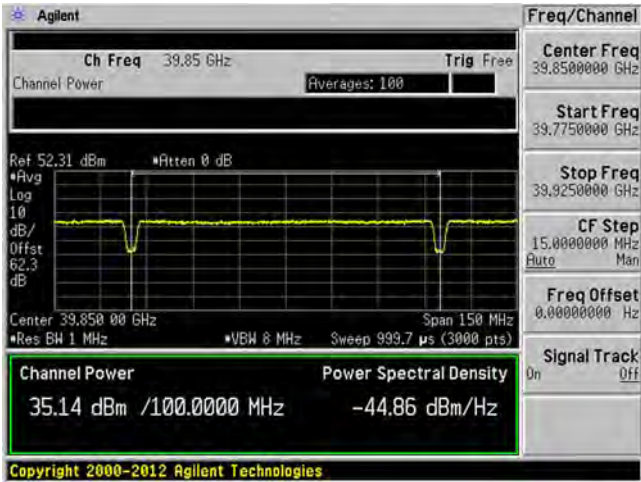
Beam ID: 11 (Vertical)

3CC – QPSK – High Channel

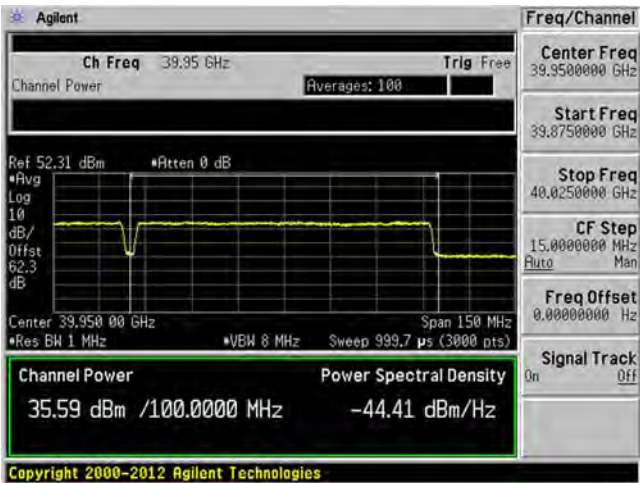
1st Carrier



2nd Carrier



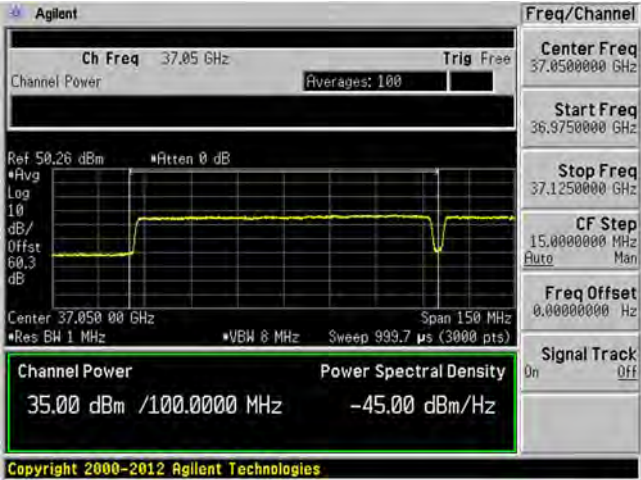
3rd Carrier



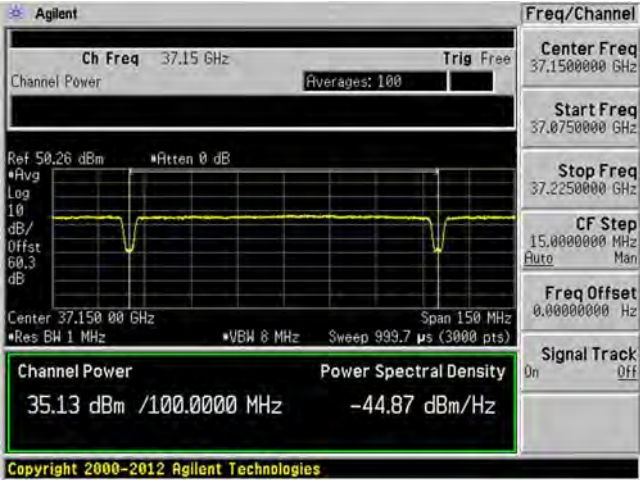
Beam ID: 11 (Vertical)

3CC – 16QAM – Low Channel

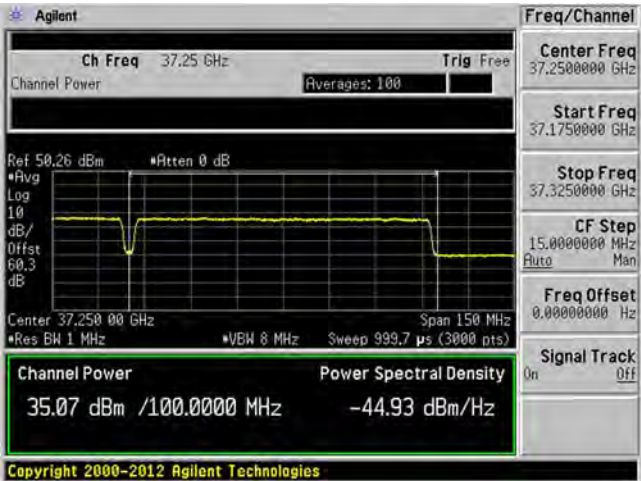
1st Carrier



2nd Carrier



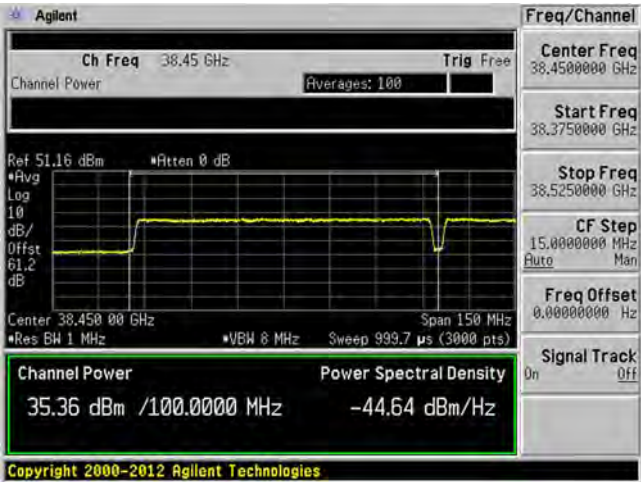
3rd Carrier



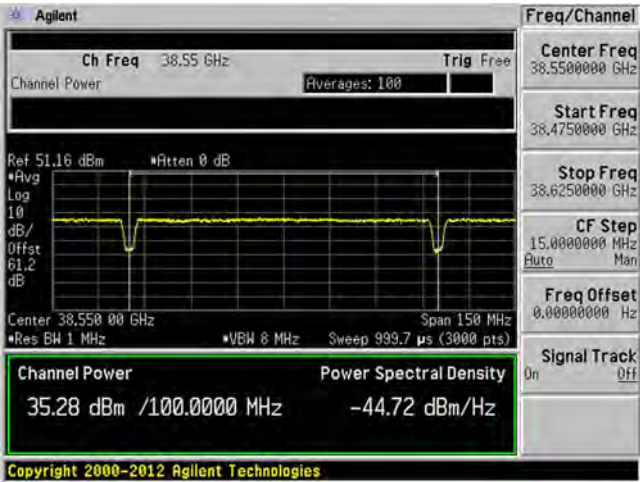
Beam ID: 11 (Vertical)

3CC – 16QAM – Middle Channel

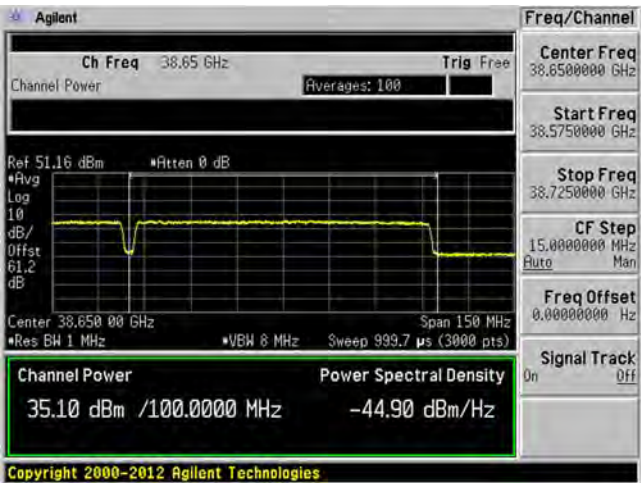
1st Carrier



2nd Carrier



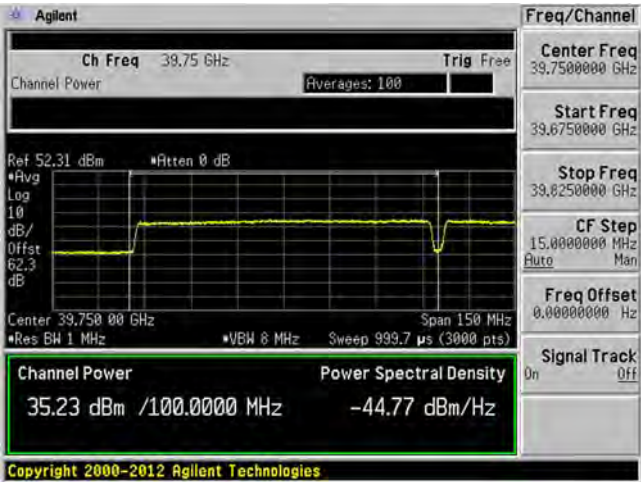
3rd Carrier



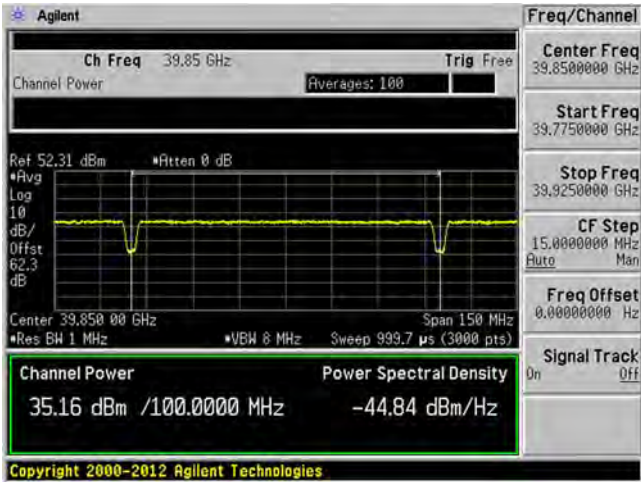
Beam ID: 11 (Vertical)

3CC – 16QAM – High Channel

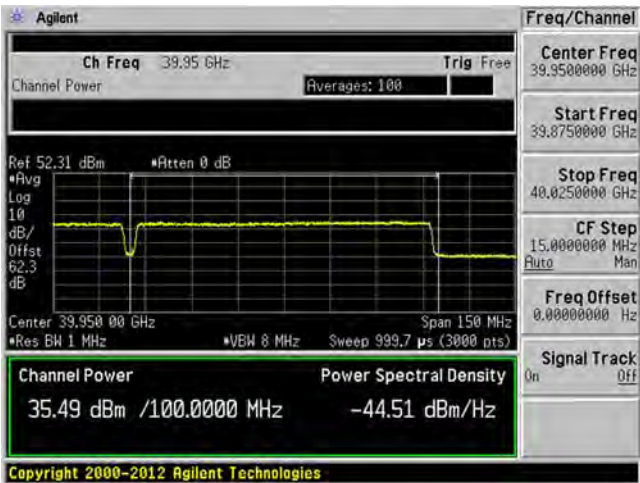
1st Carrier



2nd Carrier



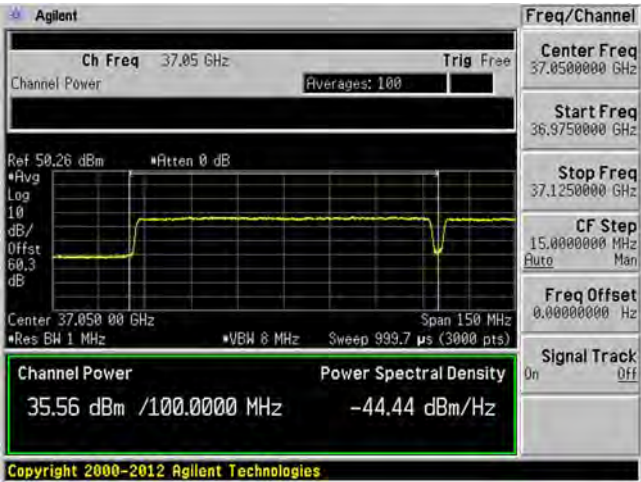
3rd Carrier



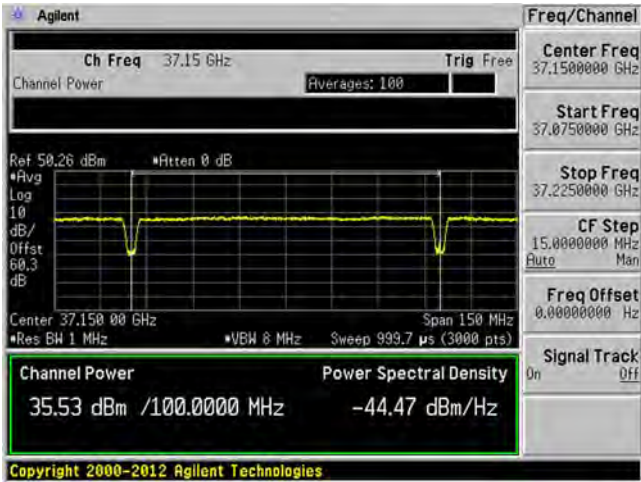
Beam ID: 11 (Vertical)

3CC – 64QAM – Low Channel

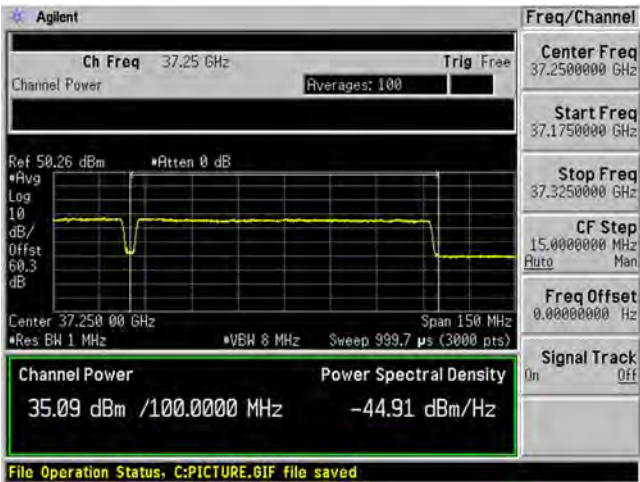
1st Carrier



2nd Carrier



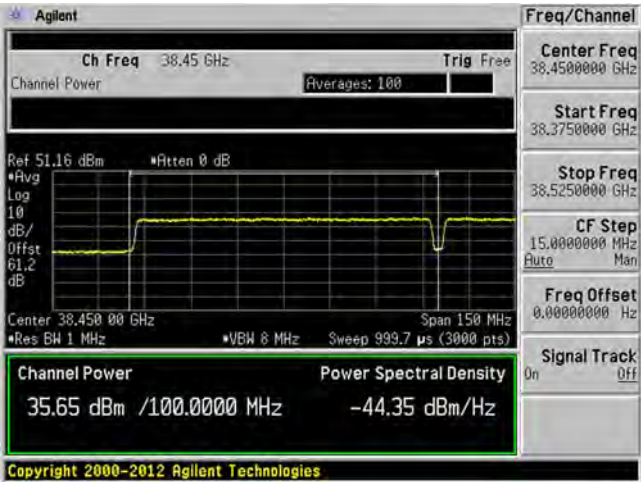
3rd Carrier



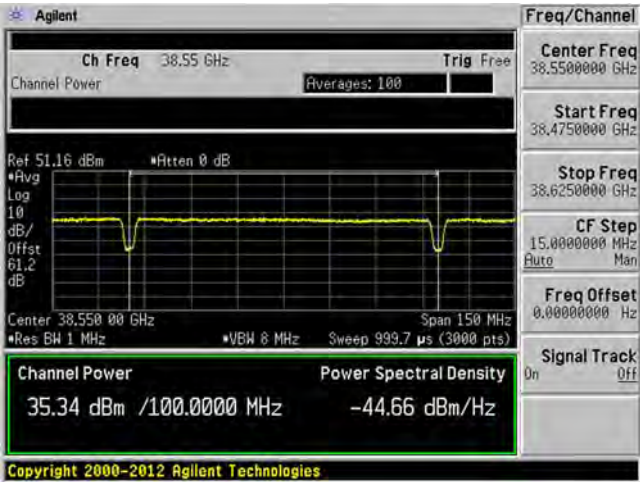
Beam ID: 11 (Vertical)

3CC – 64QAM – Middle Channel

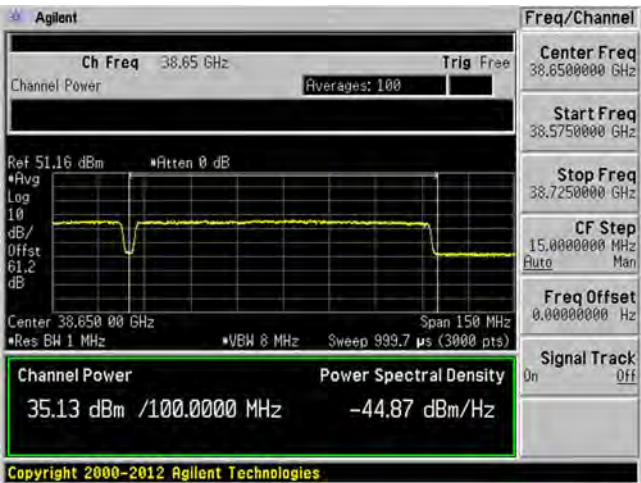
1st Carrier



2nd Carrier



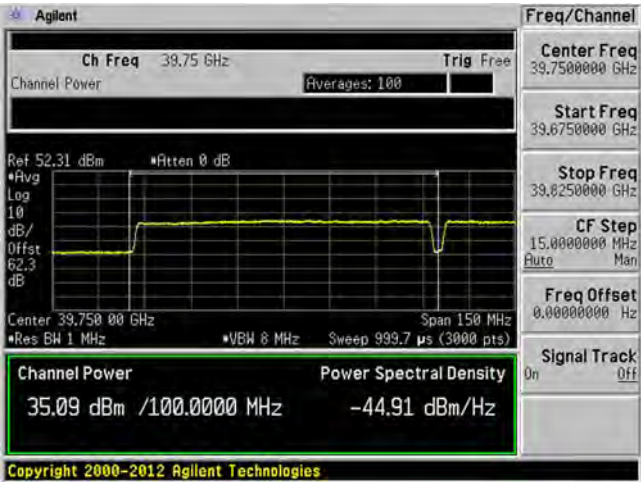
3rd Carrier



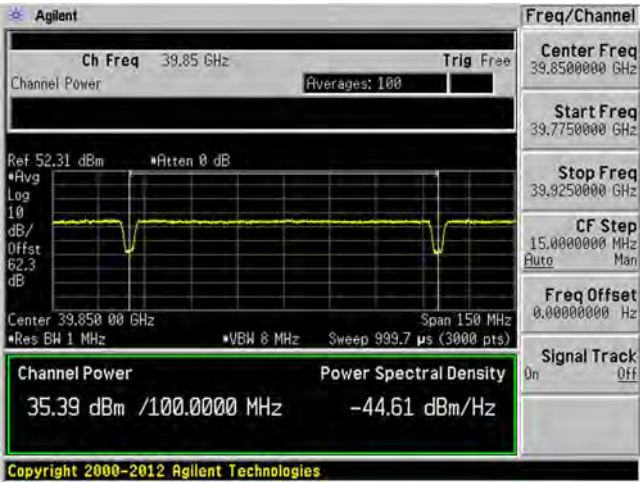
Beam ID: 11 (Vertical)

3CC – 64QAM – High Channel

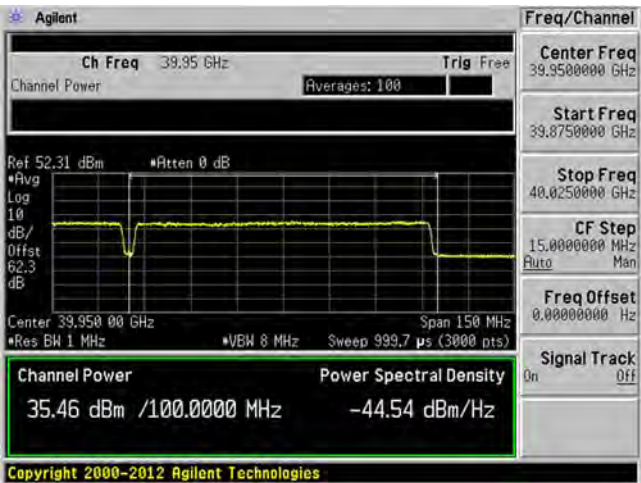
1st Carrier



2nd Carrier



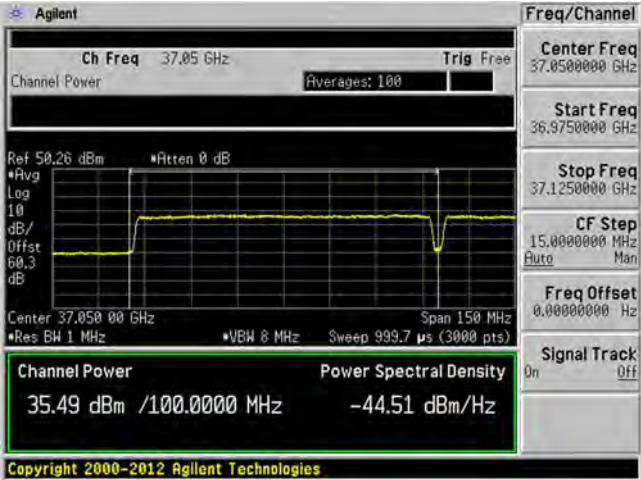
3rd Carrier



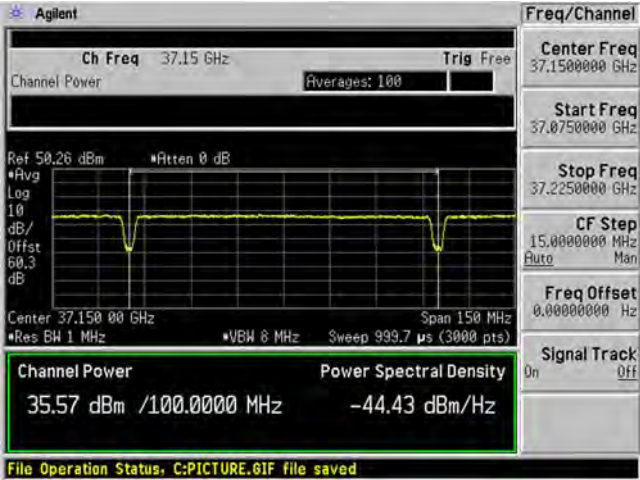
Beam ID: 139 (Horizontal)

3CC – QPSK – Low Channel

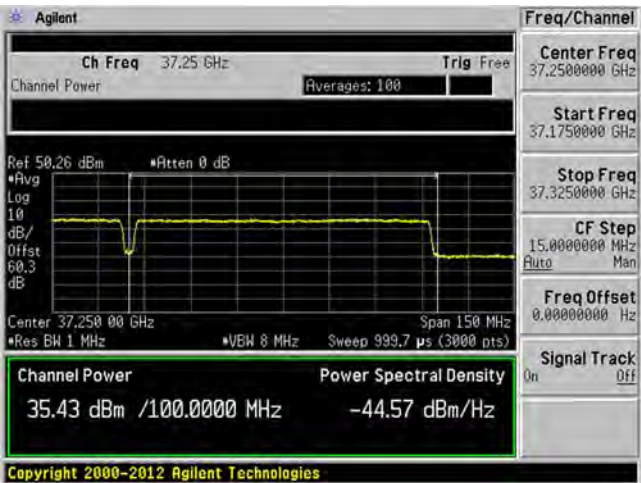
1st Carrier



2nd Carrier

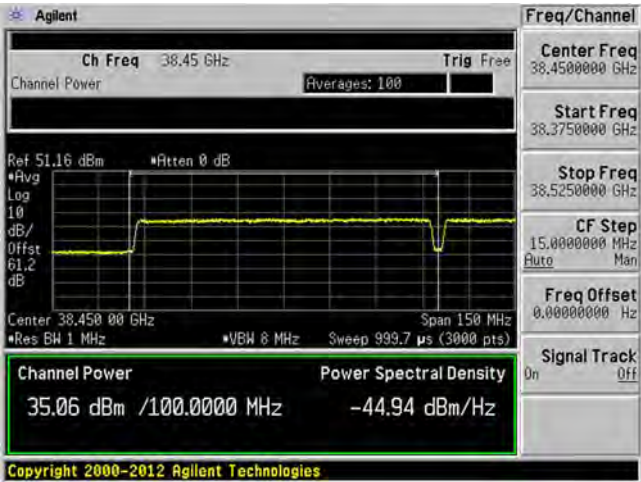


3rd Carrier

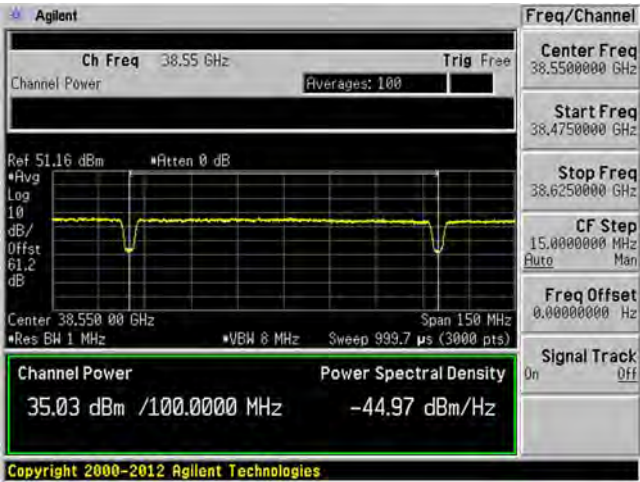


Beam ID: 139 (Horizontal)
3CC – QPSK – Middle Channel

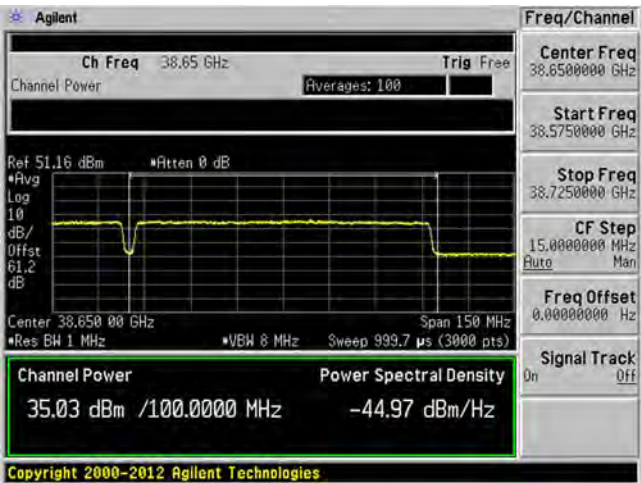
1st Carrier



2nd Carrier



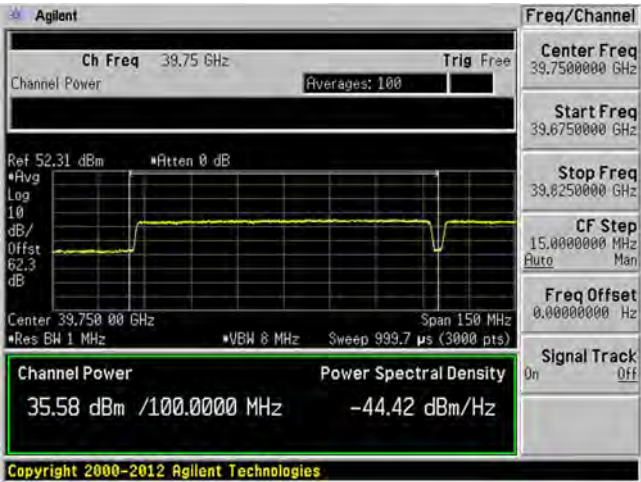
3rd Carrier



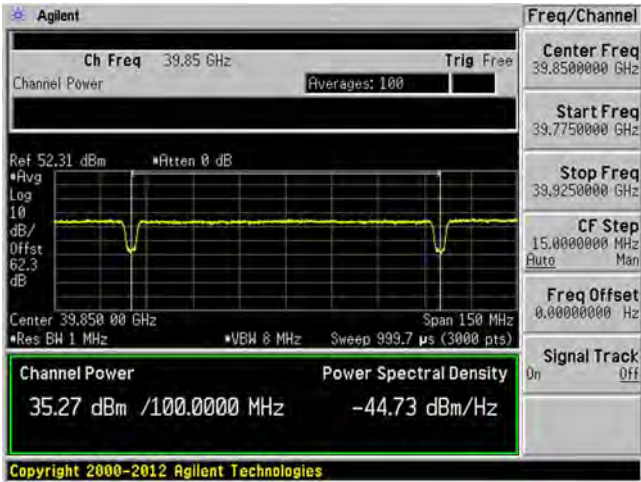
Beam ID: 139 (Horizontal)

3CC – QPSK – High Channel

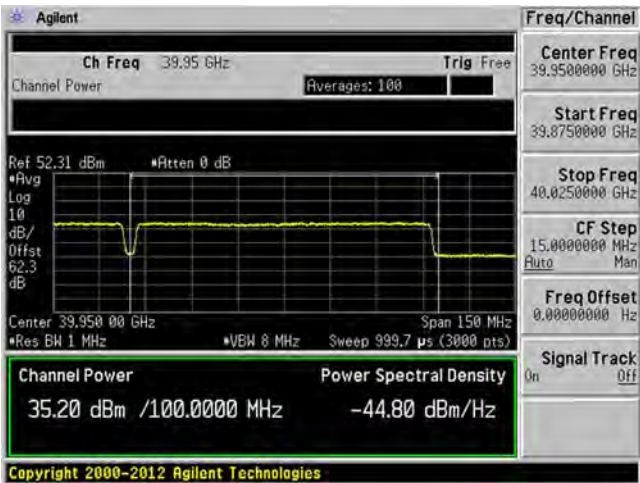
1st Carrier



2nd Carrier



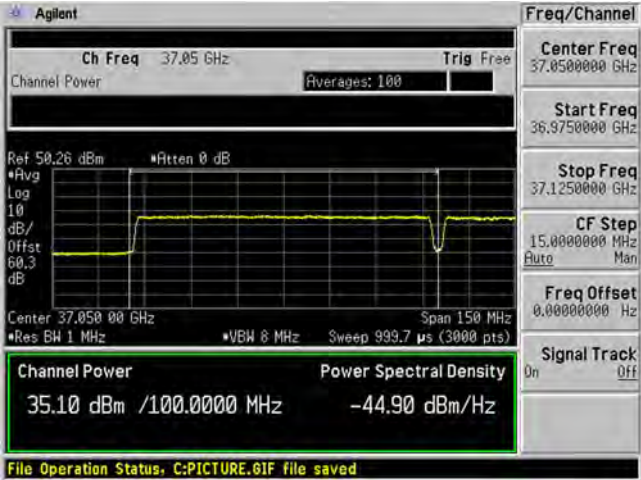
3rd Carrier



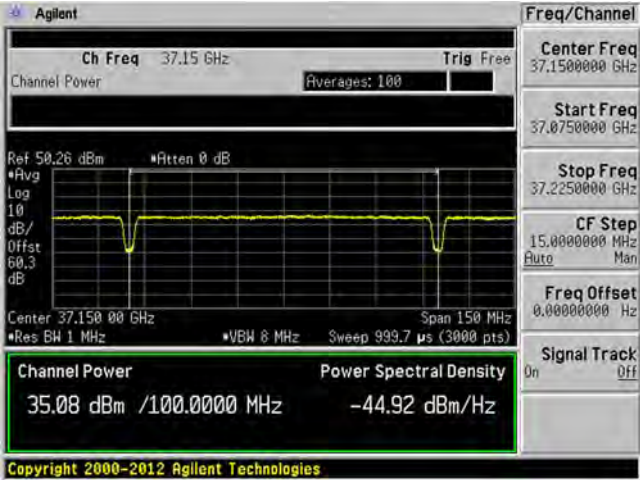
Beam ID: 139 (Horizontal)

3CC – 16QAM – Low Channel

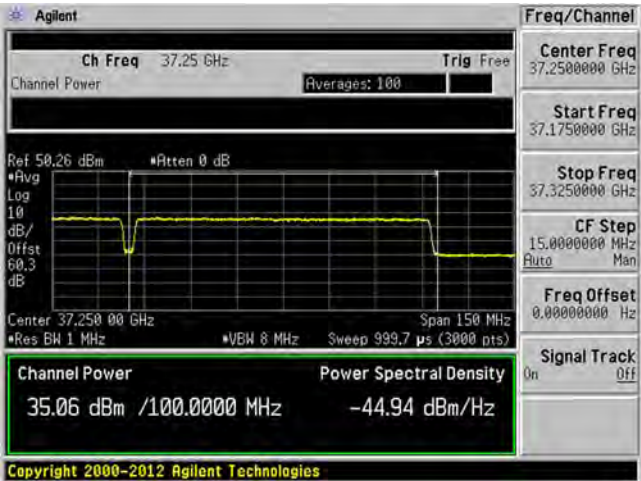
1st Carrier



2nd Carrier



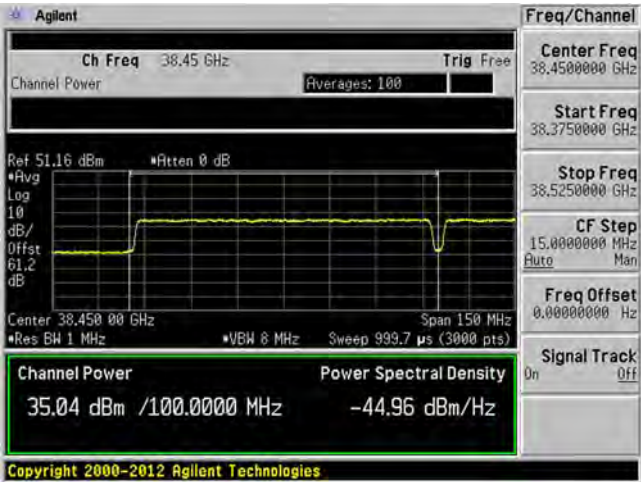
3rd Carrier



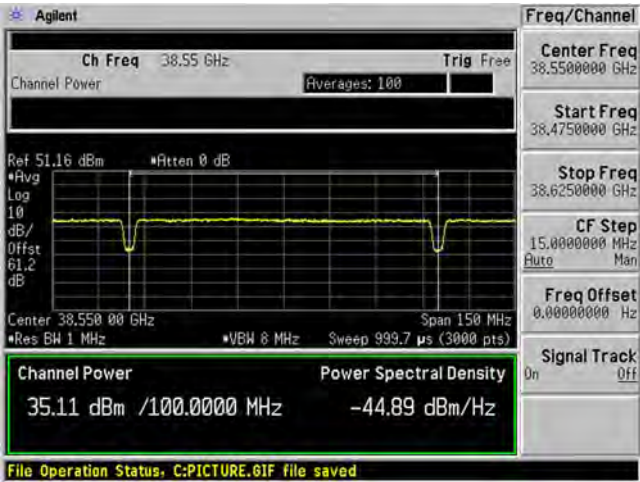
Beam ID: 139 (Horizontal)

3CC – 16QAM – Middle Channel

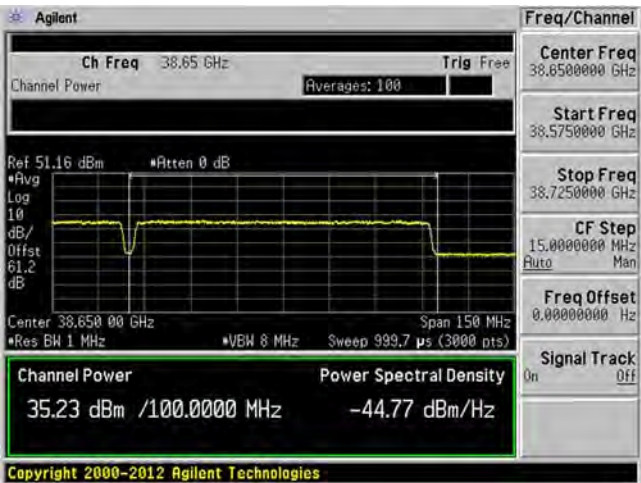
1st Carrier



2nd Carrier



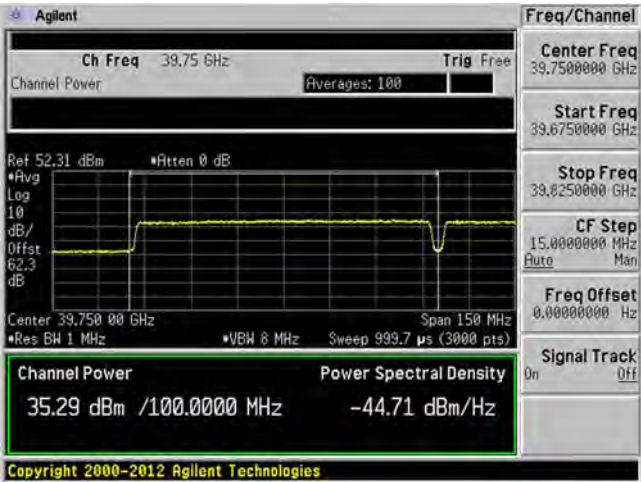
3rd Carrier



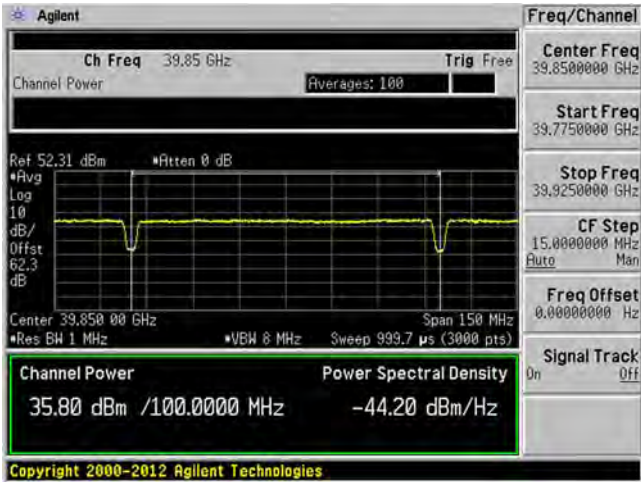
Beam ID: 139 (Horizontal)

3CC – 16QAM – High Channel

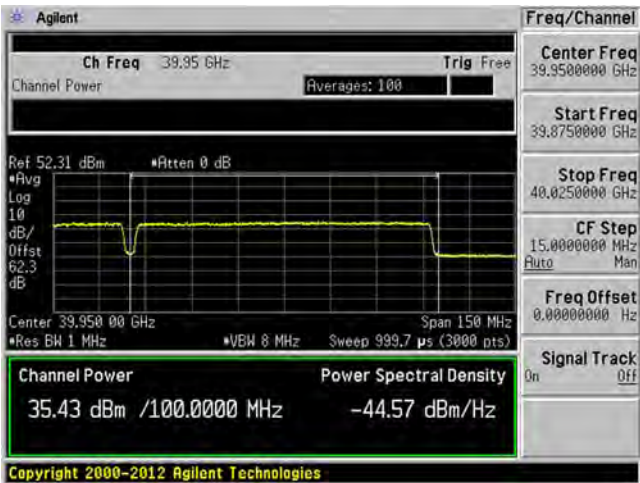
1st Carrier



2nd Carrier



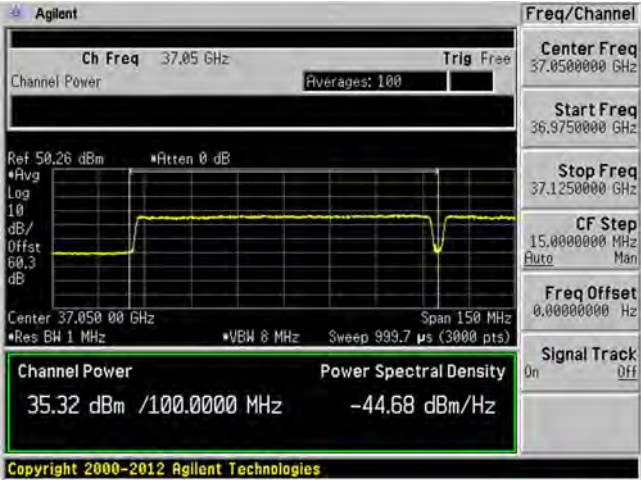
3rd Carrier



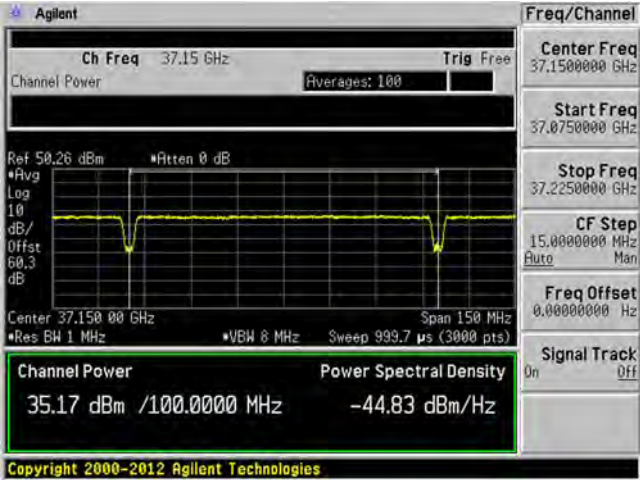
Beam ID: 139 (Horizontal)

3CC – 64QAM – Low Channel

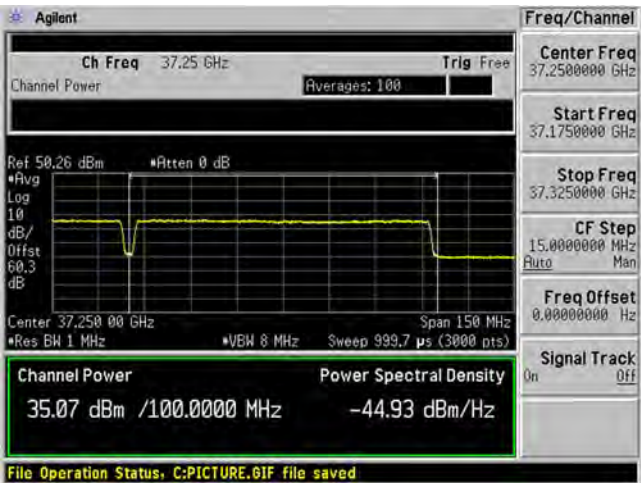
1st Carrier



2nd Carrier



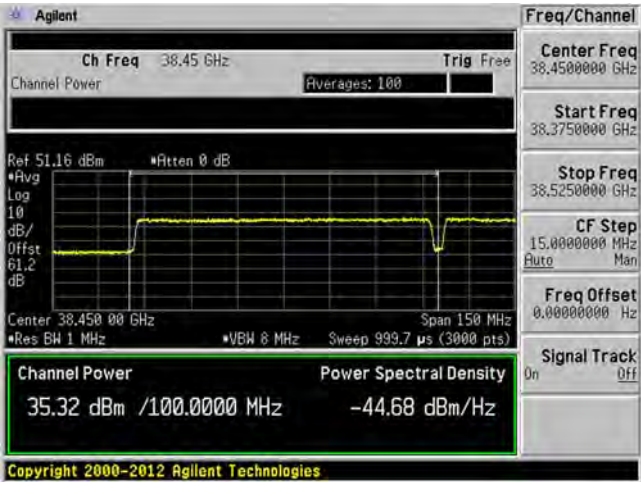
3rd Carrier



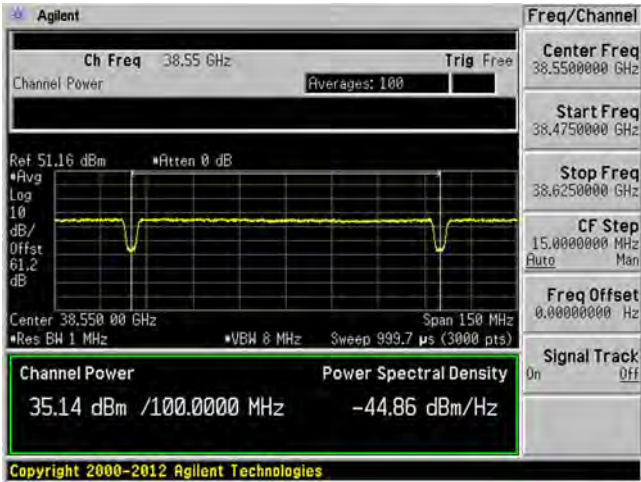
Beam ID: 139 (Horizontal)

3CC – 64QAM – Middle Channel

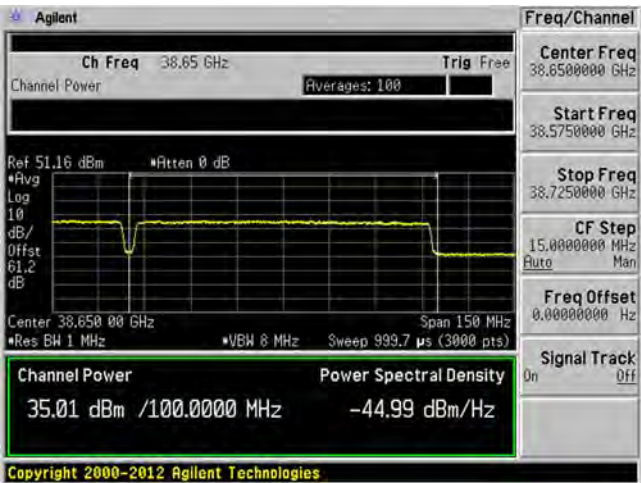
1st Carrier



2nd Carrier



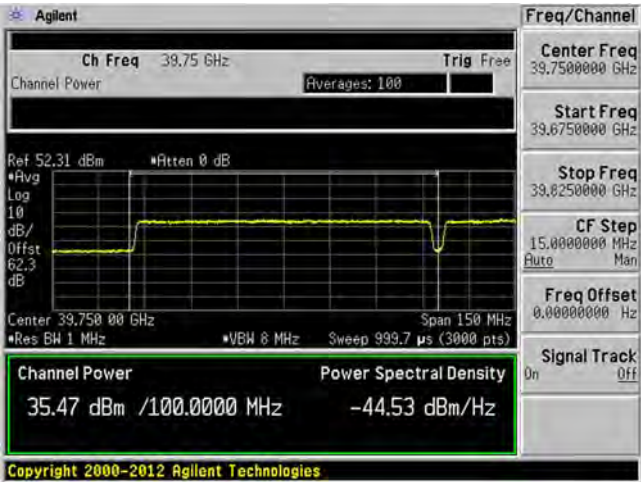
3rd Carrier



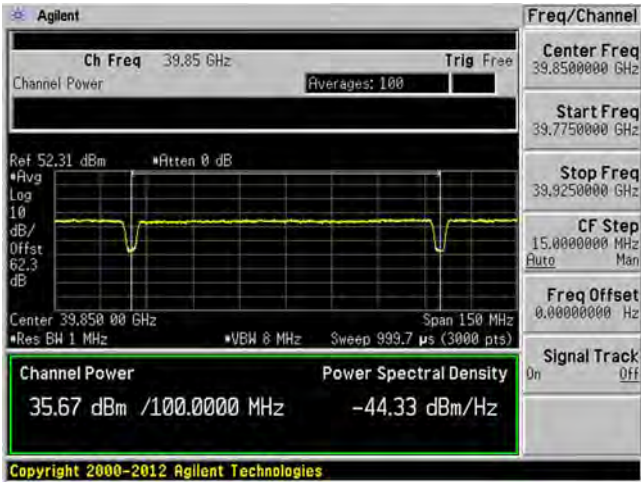
Beam ID: 139 (Horizontal)

3CC – 64QAM – High Channel

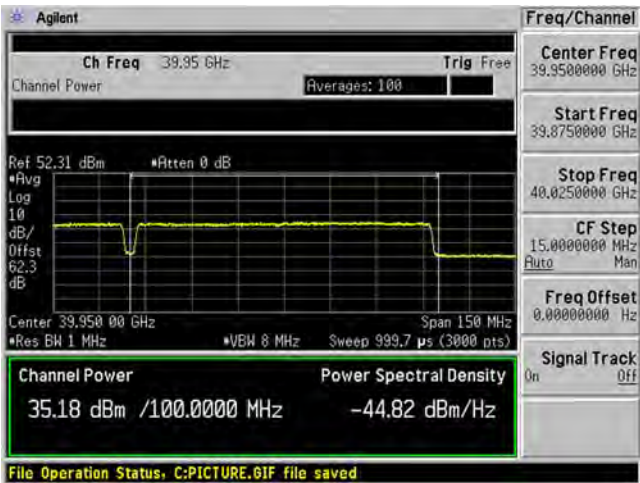
1st Carrier



2nd Carrier



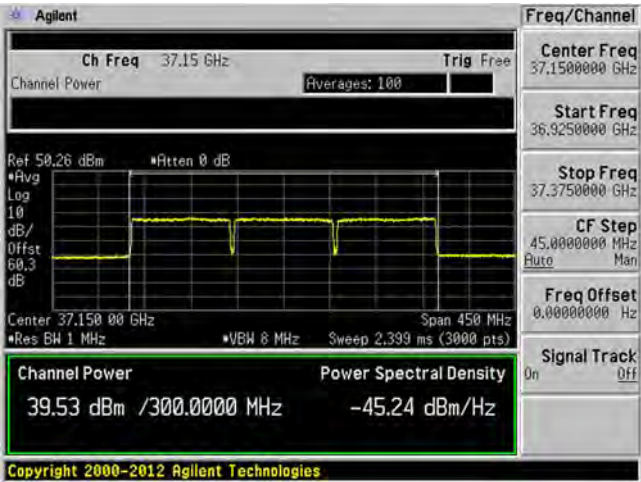
3rd Carrier



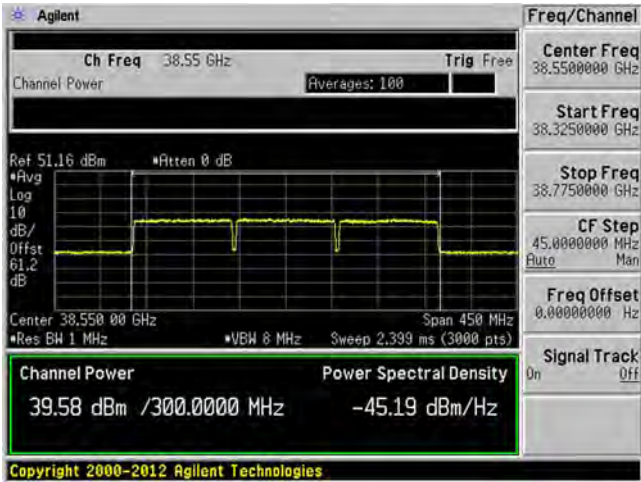
Beam ID: 11 (Vertical) (Channel Power)

3CC – QPSK

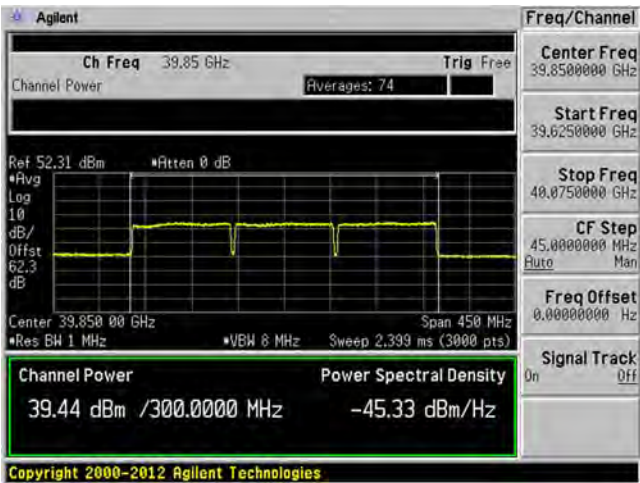
Low Channel



Middle Channel



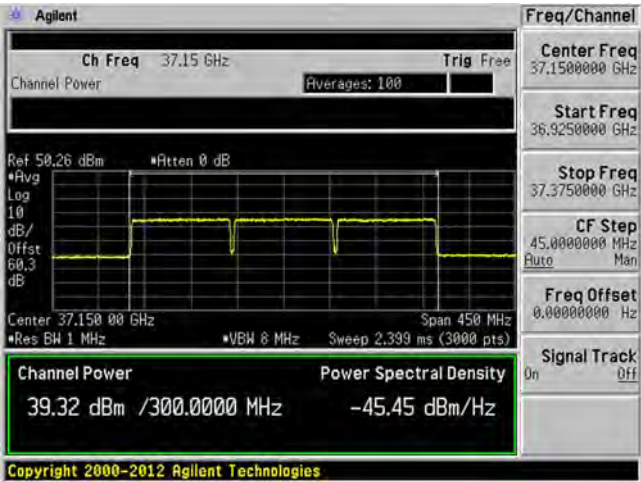
High Channel



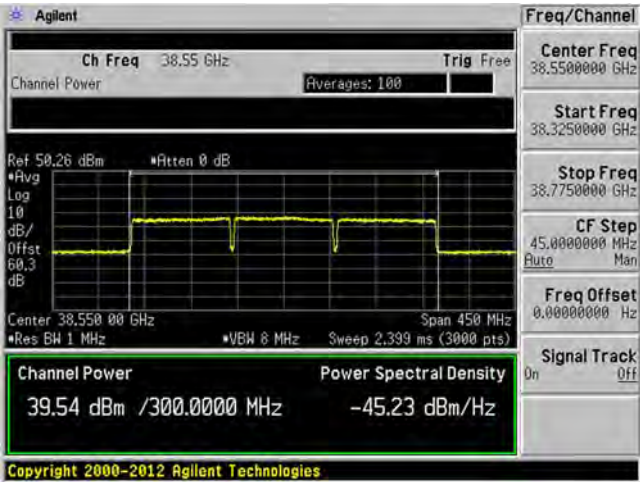
Beam ID: 11 (Vertical) (Channel Power)

3CC – 16QAM

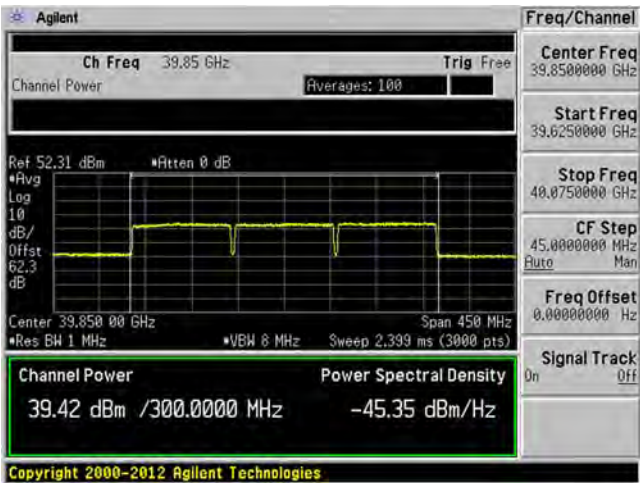
Low Channel



Middle Channel



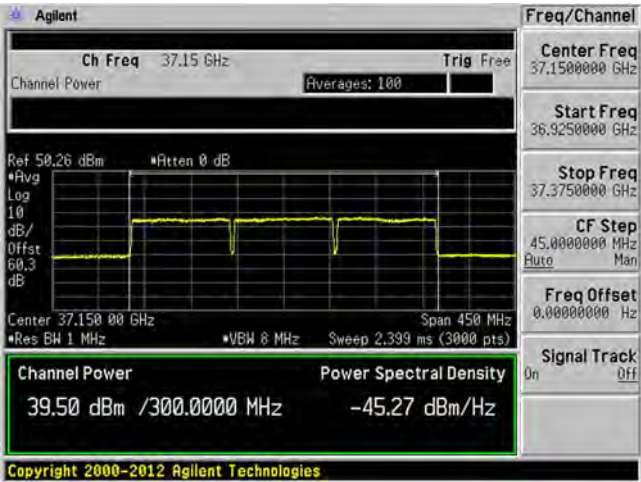
High Channel



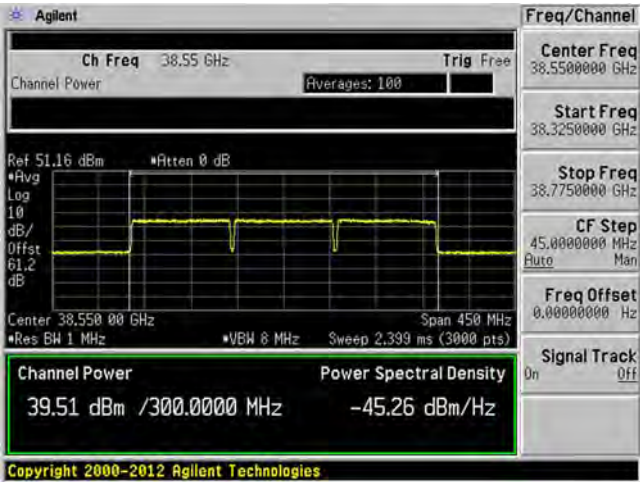
Beam ID: 11 (Vertical) (Channel Power)

3CC – 64QAM

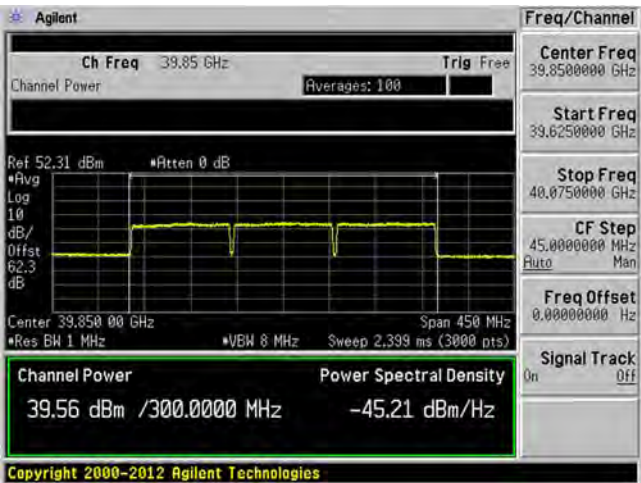
Low Channel



Middle Channel



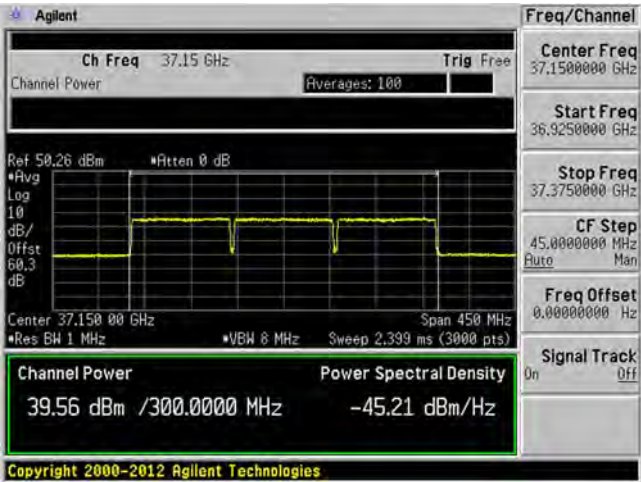
High Channel



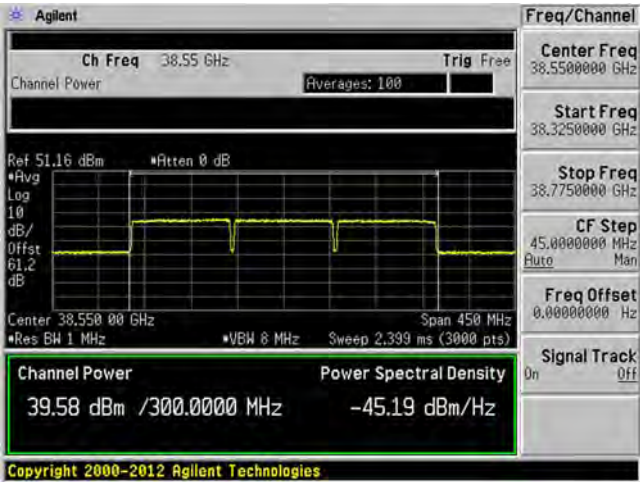
Beam ID: 139 (Horizontal) (Channel Power)

3CC – QPSK

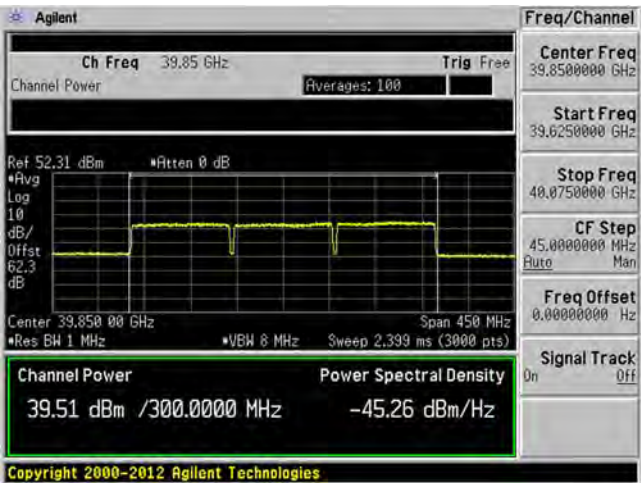
Low Channel



Middle Channel



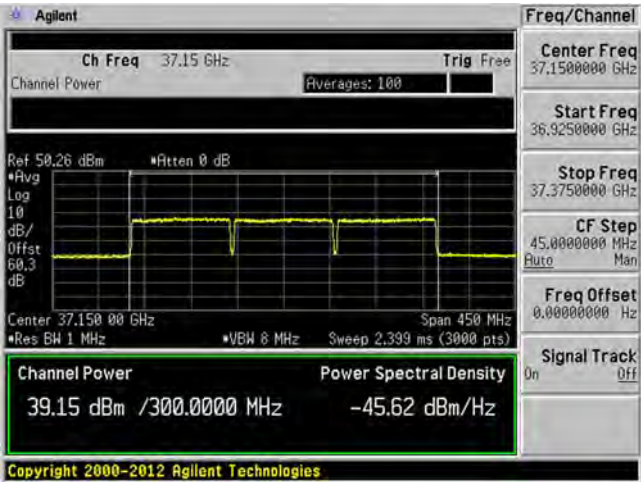
High Channel



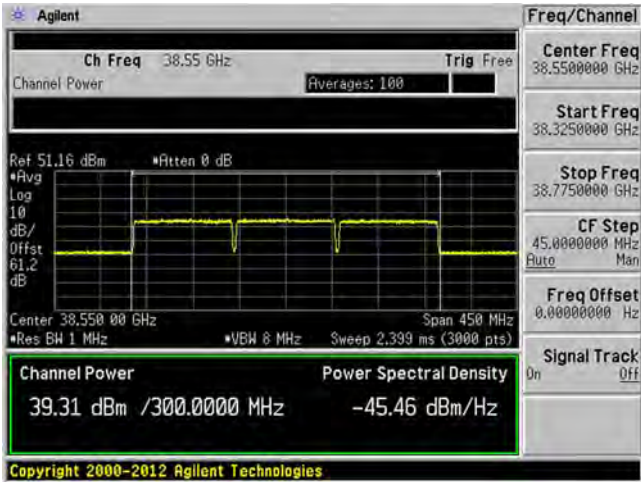
Beam ID: 139 (Horizontal) (Channel Power)

3CC – 16QAM

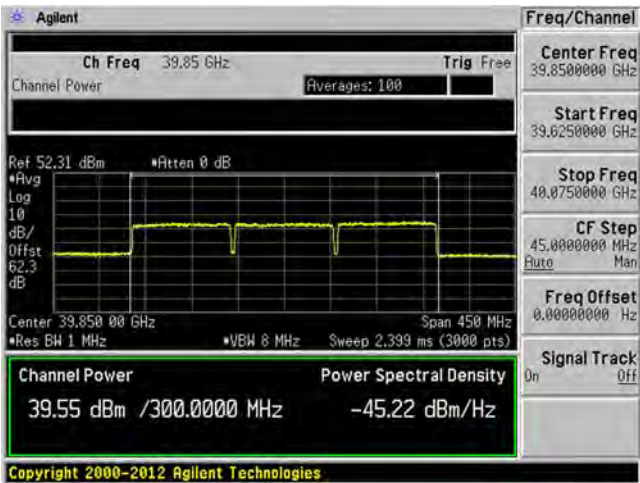
Low Channel



Middle Channel



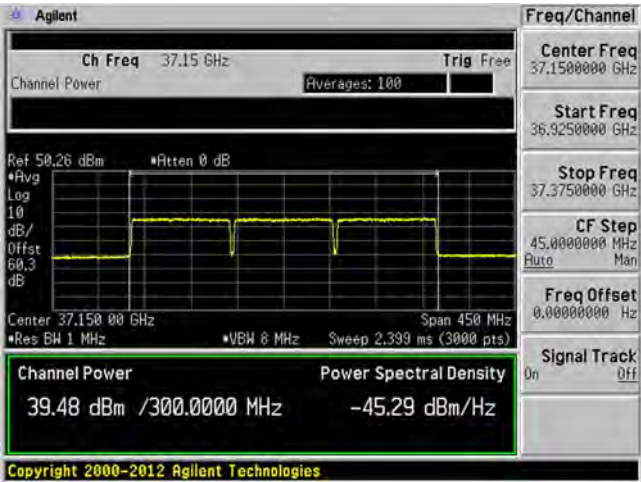
High Channel



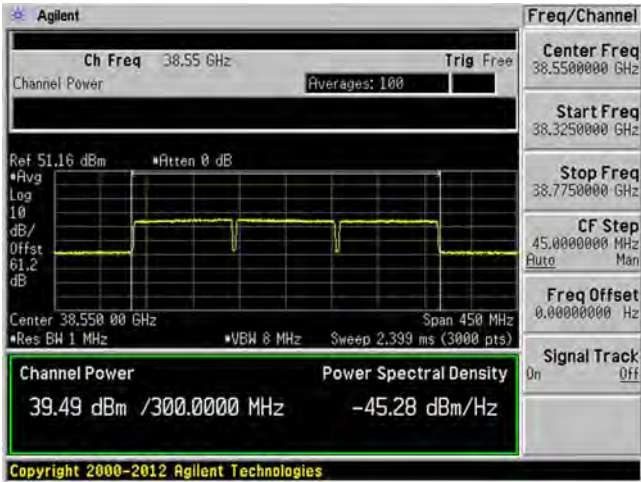
Beam ID: 139 (Horizontal) (Channel Power)

3CC – 64QAM

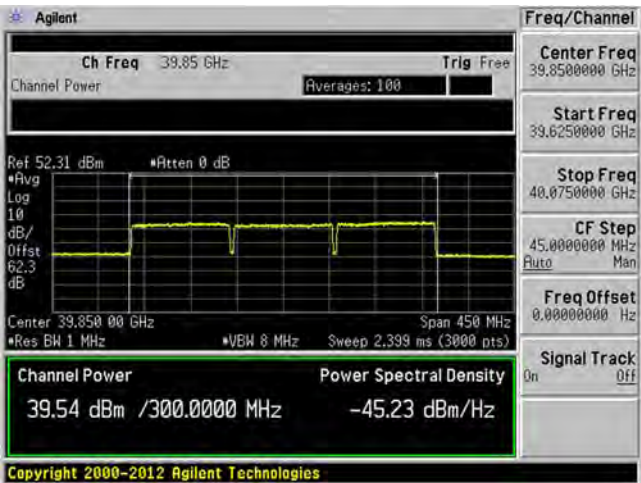
Low Channel



Middle Channel



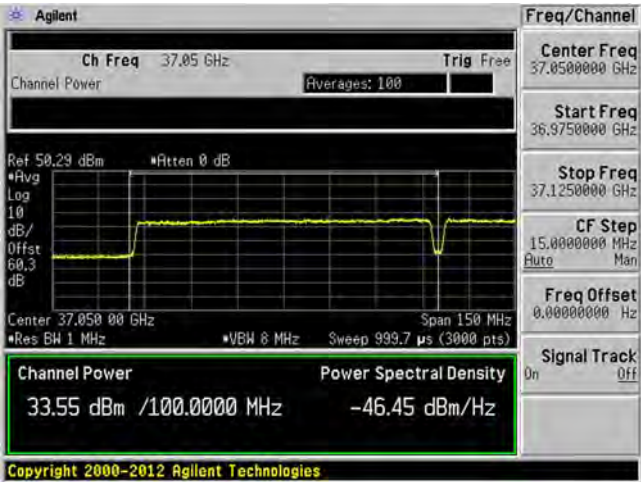
High Channel



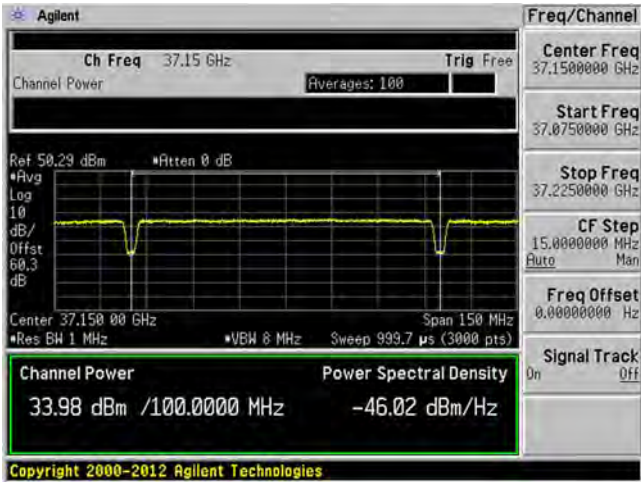
Beam ID: 11 (Vertical)

4CC – QPSK – Low Channel

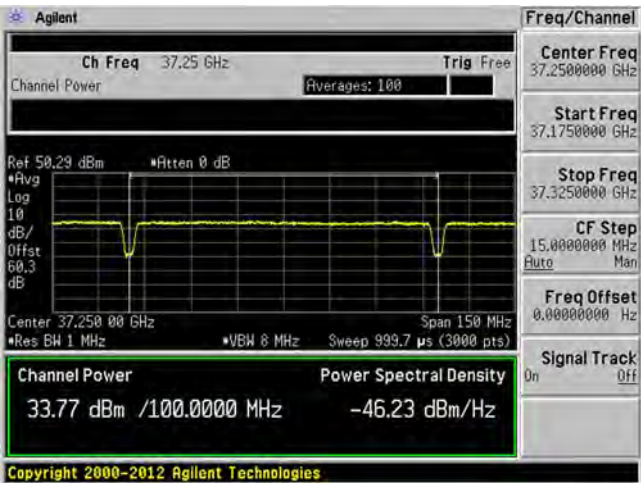
1st Carrier



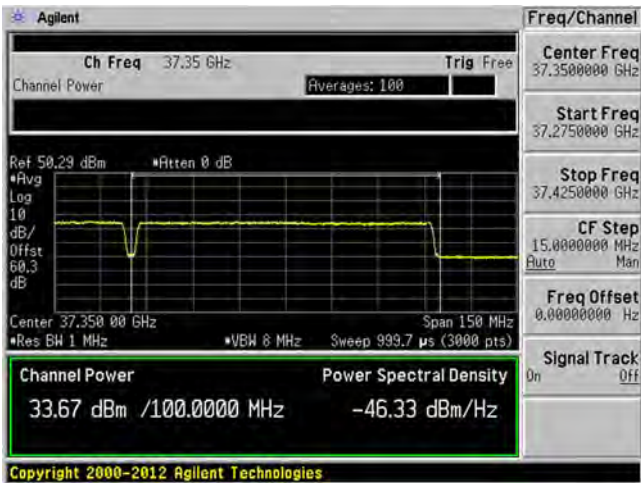
2nd Carrier



3rd Carrier



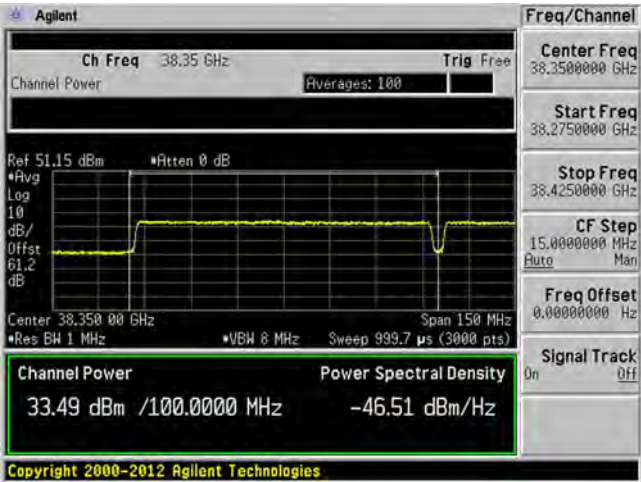
4th Carrier



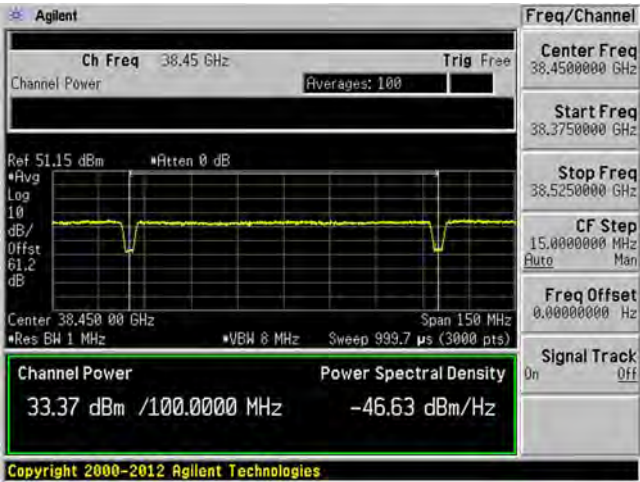
Beam ID: 11 (Vertical)

4CC – QPSK – Middle Channel

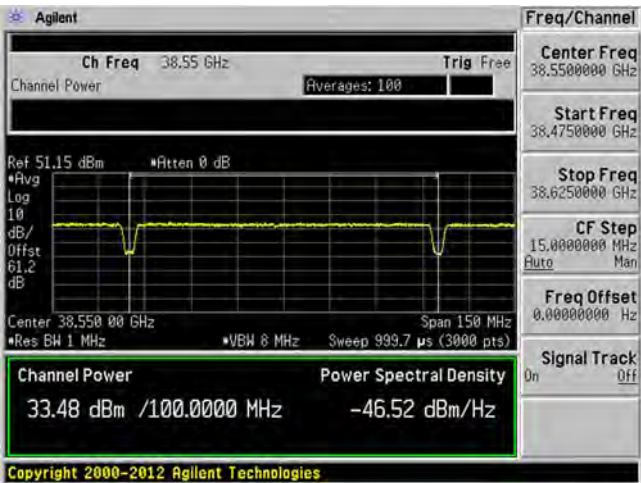
1st Carrier



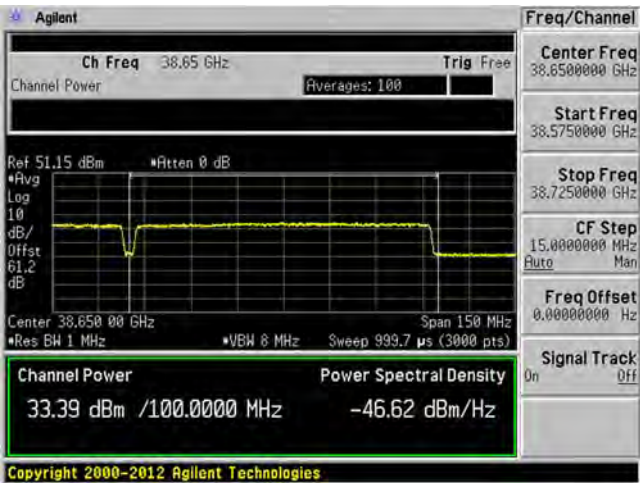
2nd Carrier



3rd Carrier



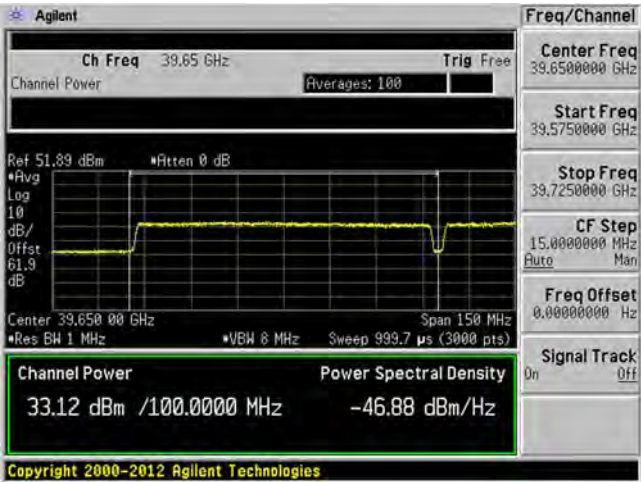
4th Carrier



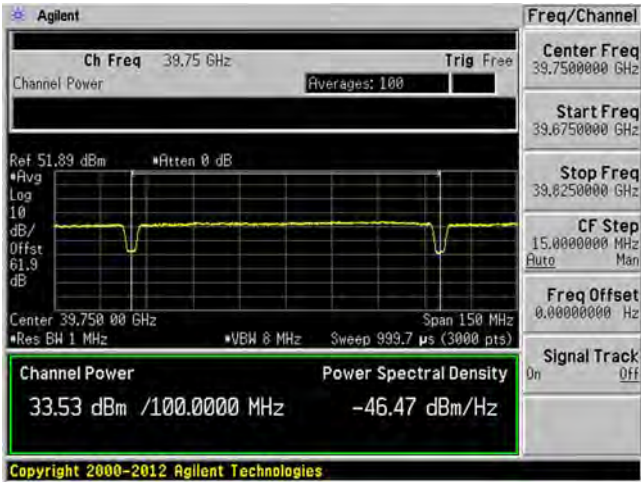
Beam ID: 11 (Vertical)

4CC – QPSK – High Channel

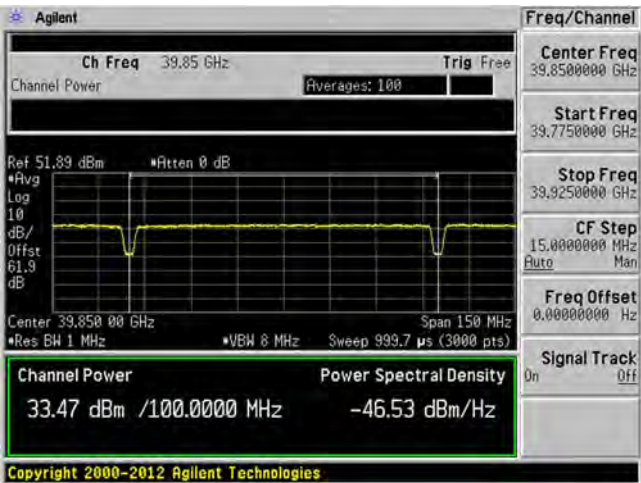
1st Carrier



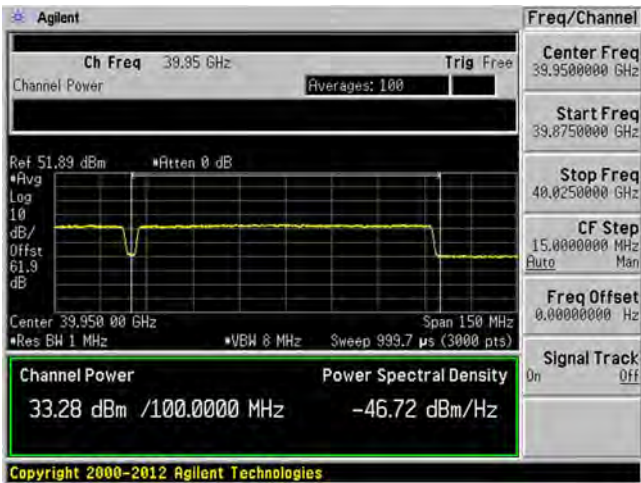
2nd Carrier



3rd Carrier



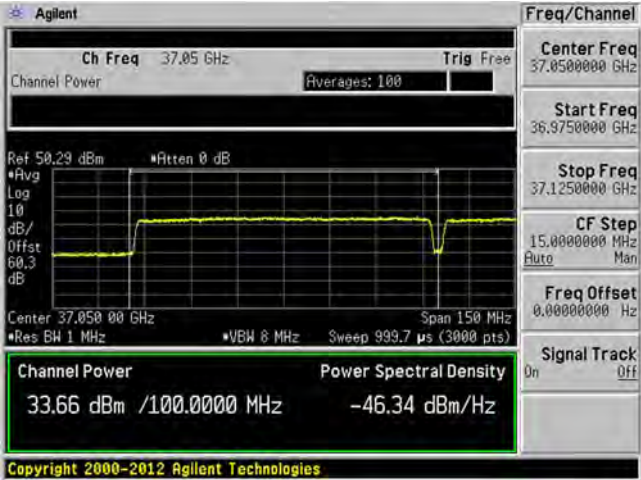
4th Carrier



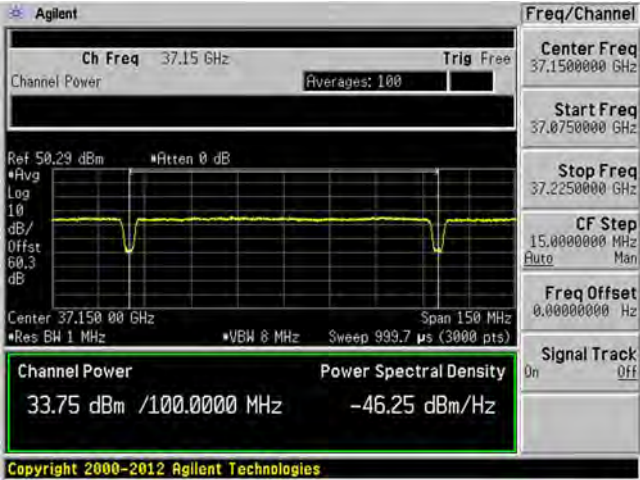
Beam ID: 11 (Vertical)

4CC – 16QAM – Low Channel

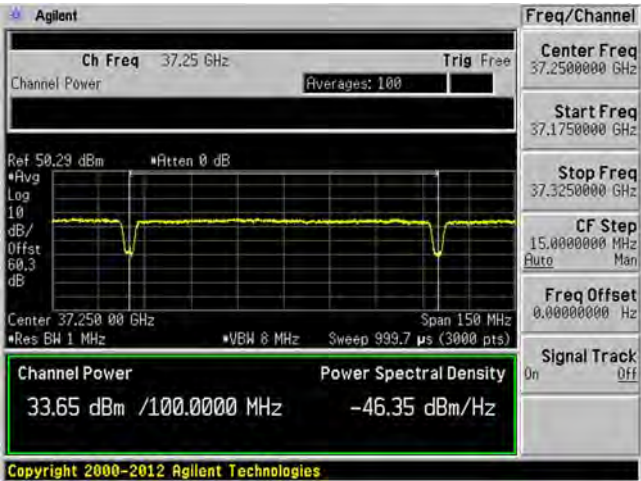
1st Carrier



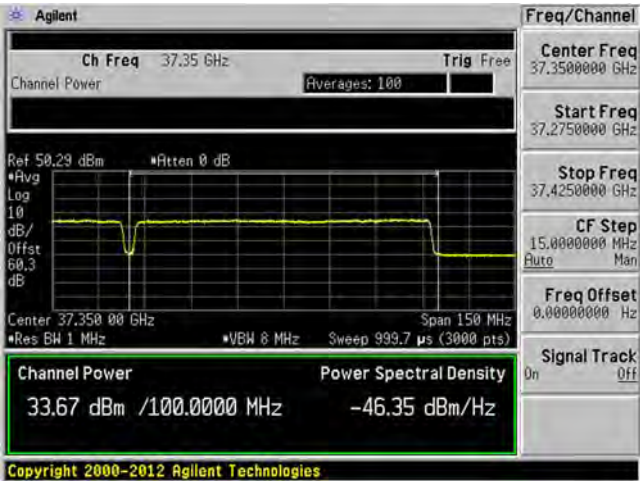
2nd Carrier



3rd Carrier

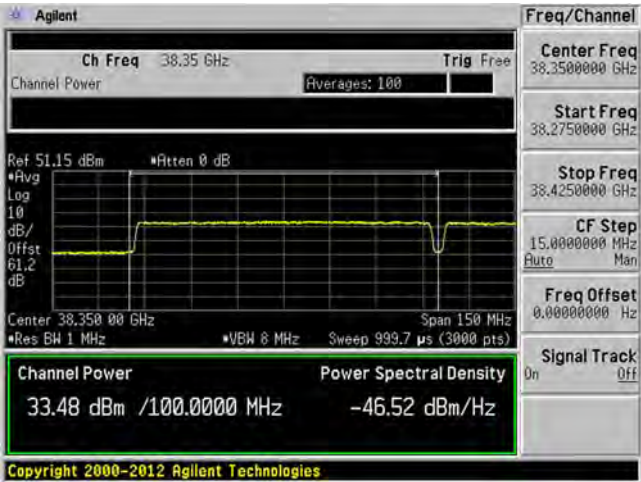


4th Carrier

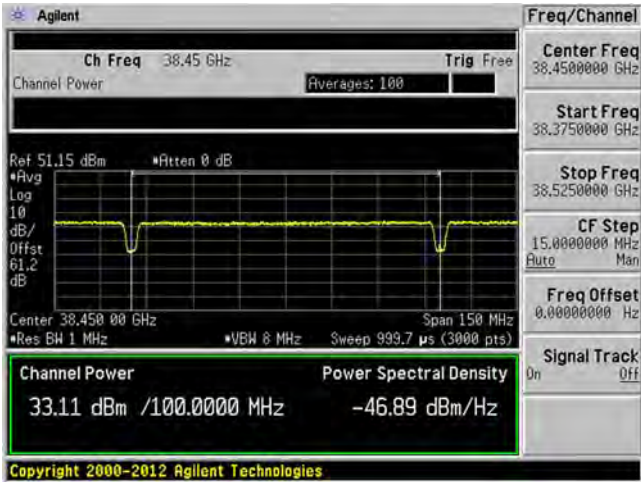


Beam ID: 11 (Vertical)
4CC – 16QAM – Middle Channel

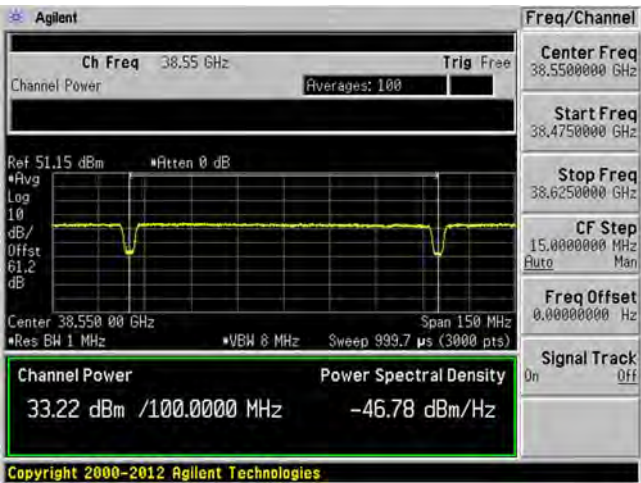
1st Carrier



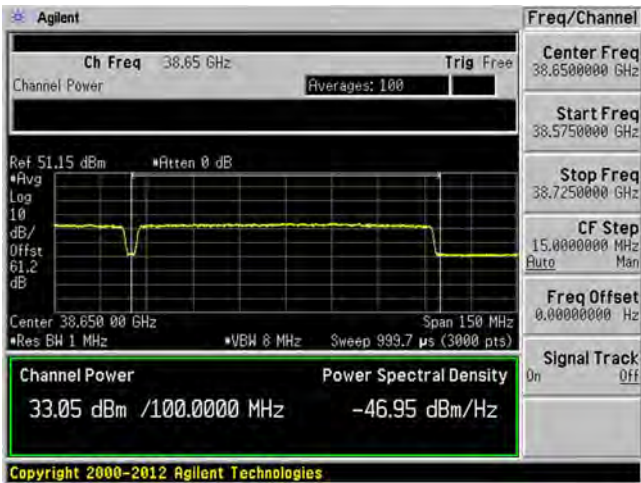
2nd Carrier



3rd Carrier



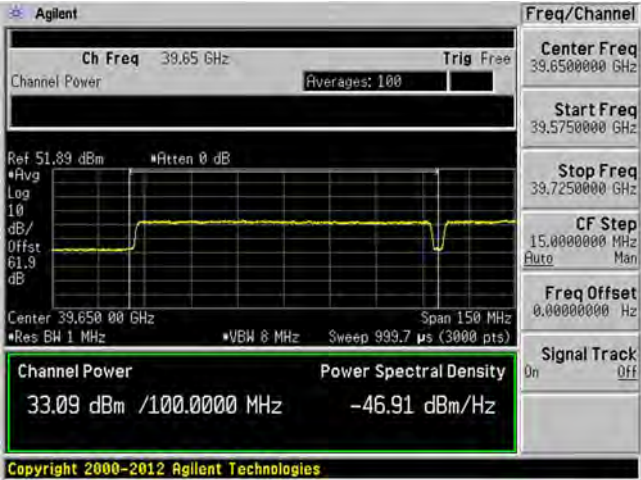
4th Carrier



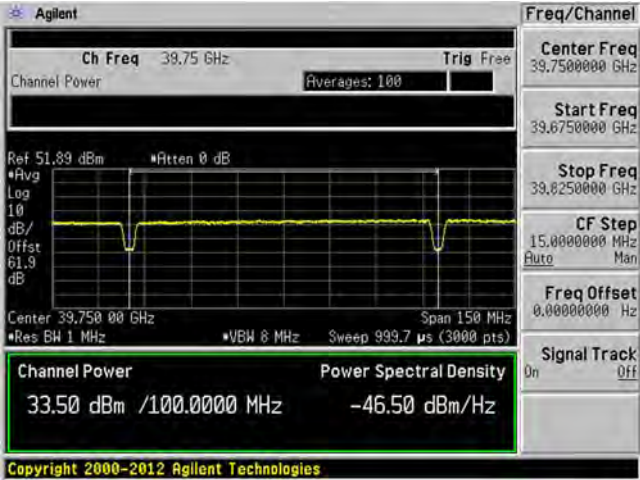
Beam ID: 11 (Vertical)

4CC – 16QAM – High Channel

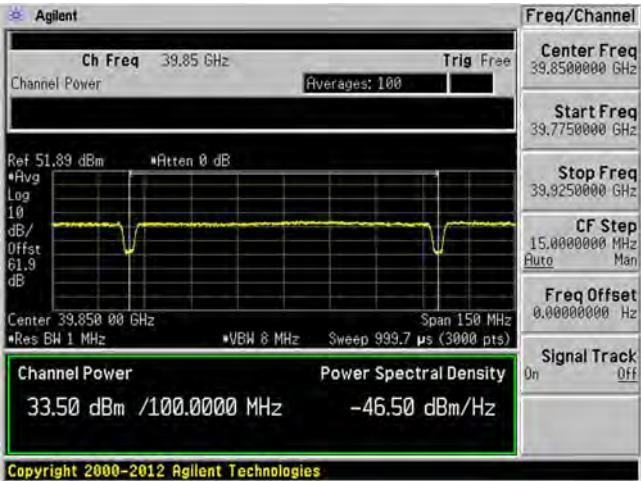
1st Carrier



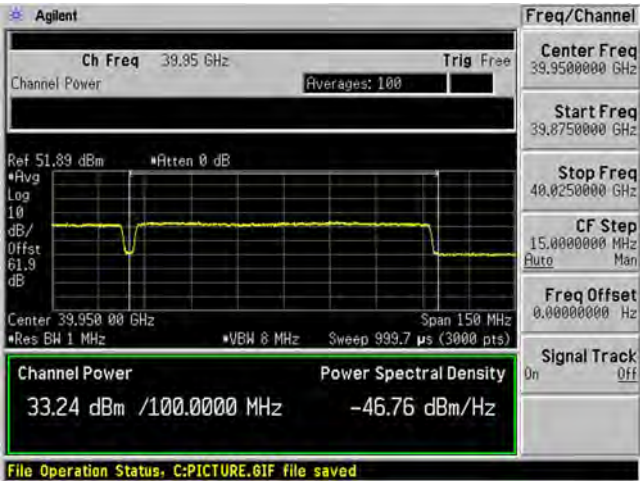
2nd Carrier



3rd Carrier



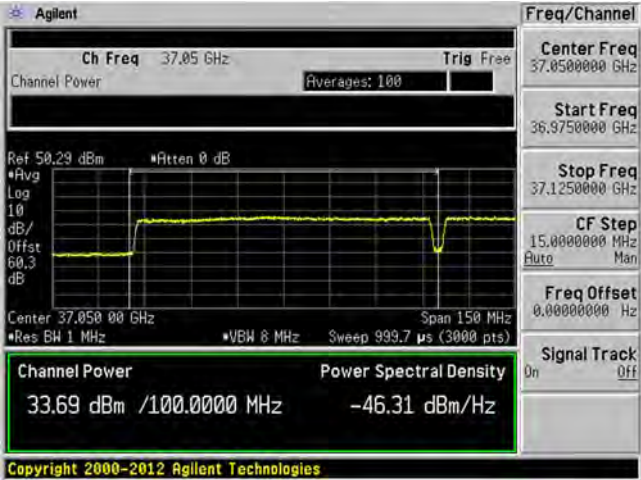
4th Carrier



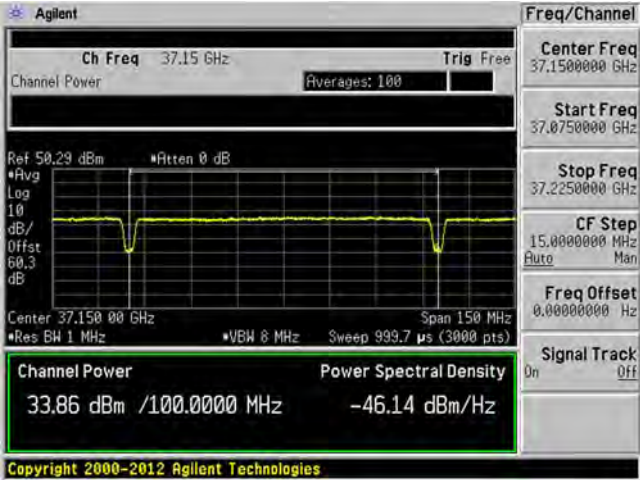
Beam ID: 11 (Vertical)

4CC – 64QAM – Low Channel

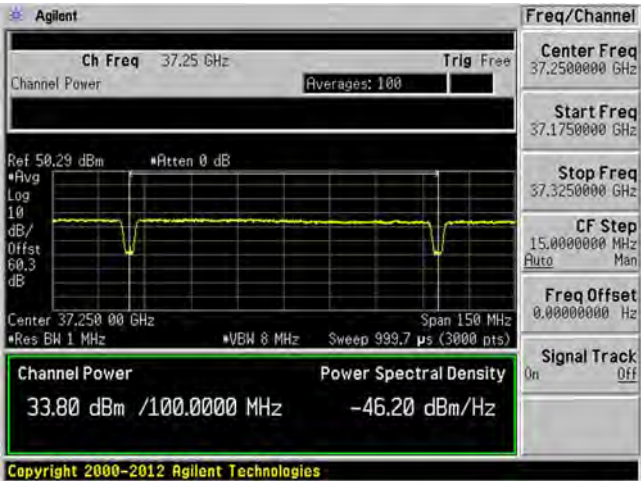
1st Carrier



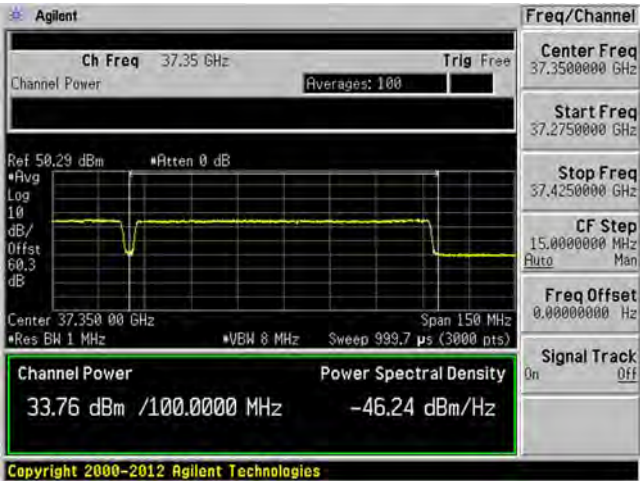
2nd Carrier



3rd Carrier



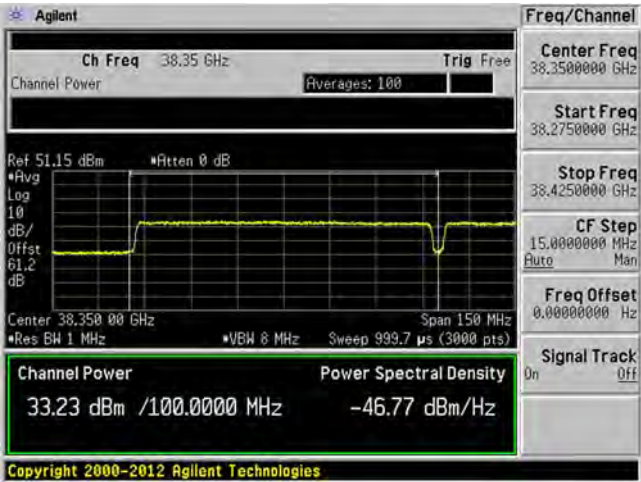
4th Carrier



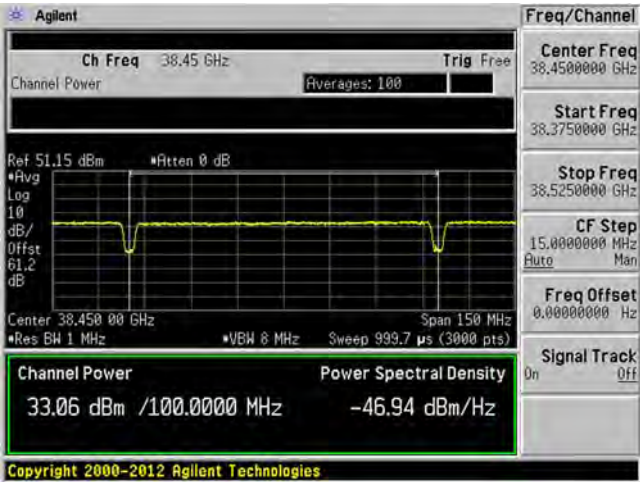
Beam ID: 11 (Vertical)

4CC – 64QAM – Middle Channel

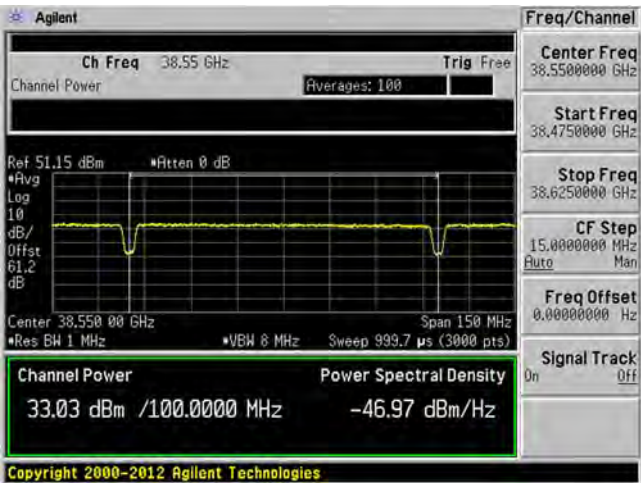
1st Carrier



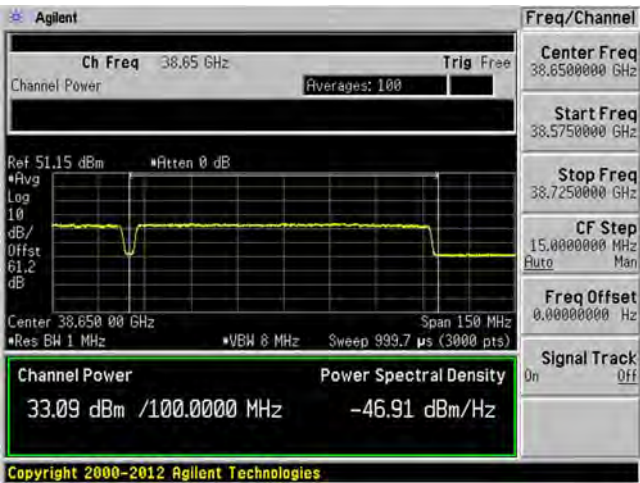
2nd Carrier



3rd Carrier



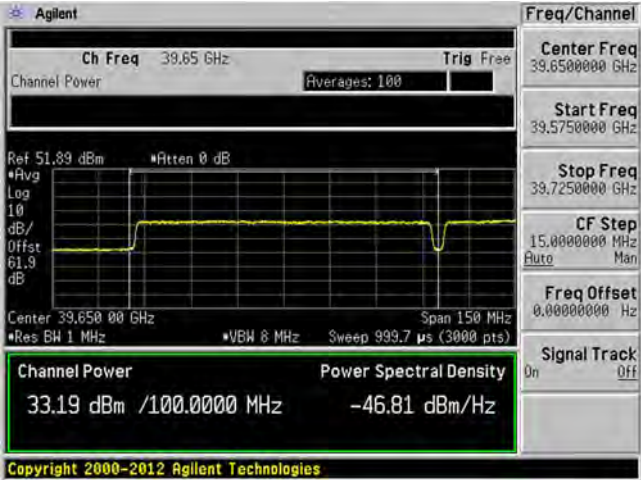
4th Carrier



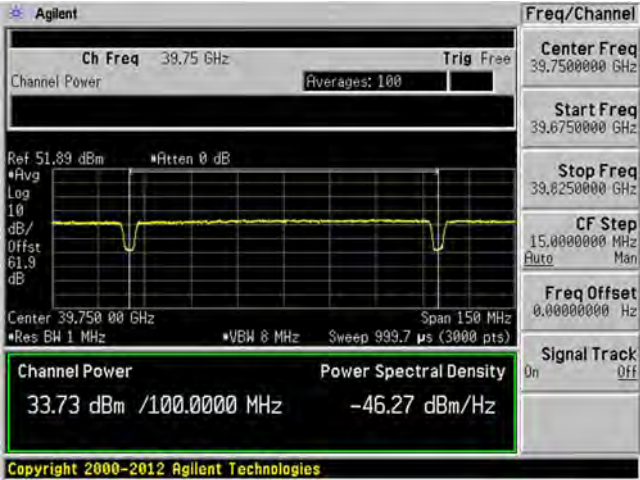
Beam ID: 11 (Vertical)

4CC – 64QAM – High Channel

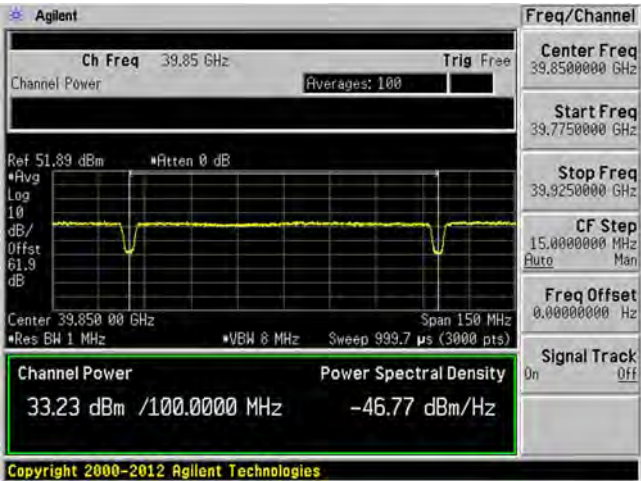
1st Carrier



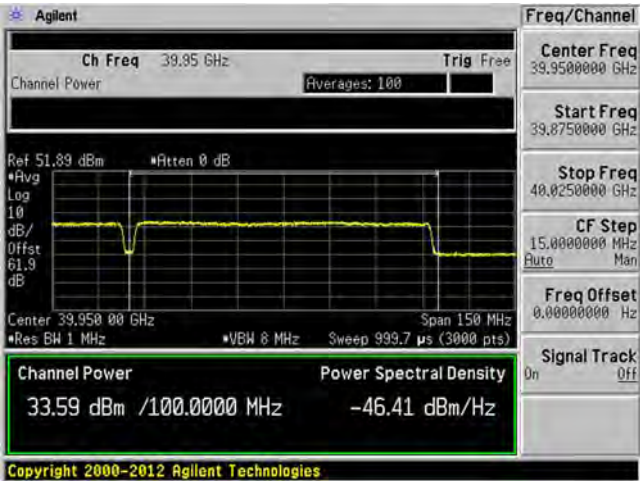
2nd Carrier



3rd Carrier



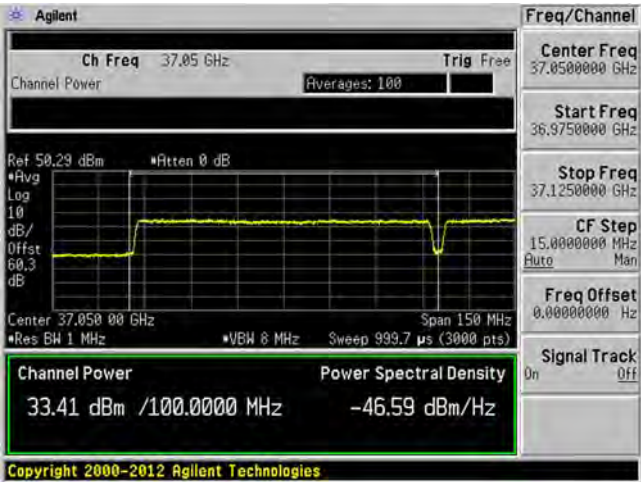
4th Carrier



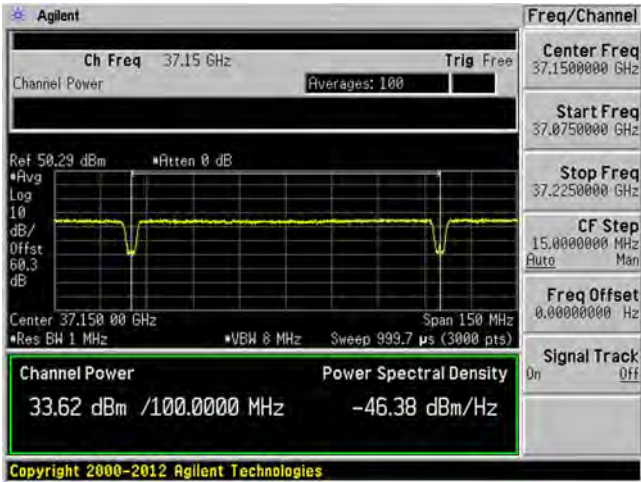
Beam ID: 139 (Horizontal)

4CC – QPSK – Low Channel

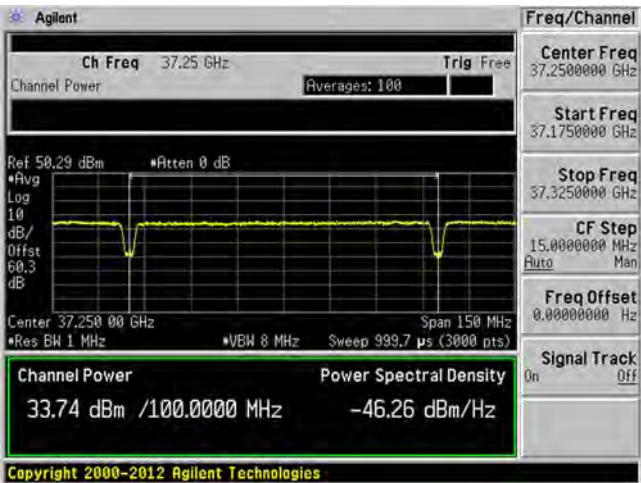
1st Carrier



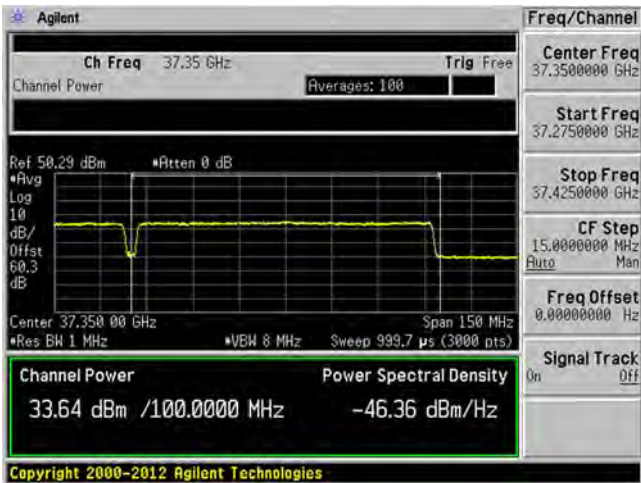
2nd Carrier



3rd Carrier

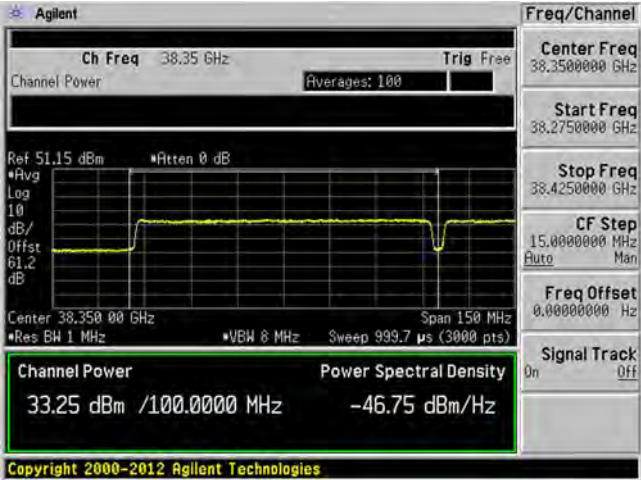


4th Carrier

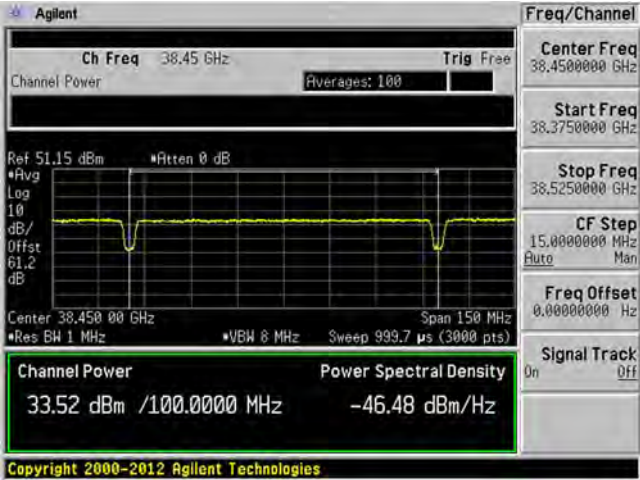


Beam ID: 139 (Horizontal)
4CC – QPSK – Middle Channel

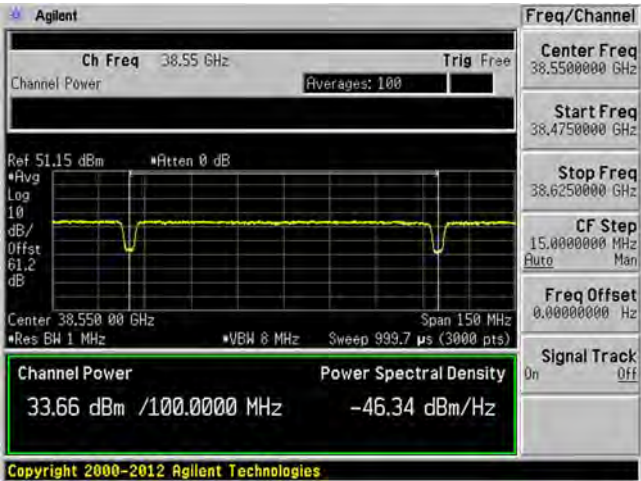
1st Carrier



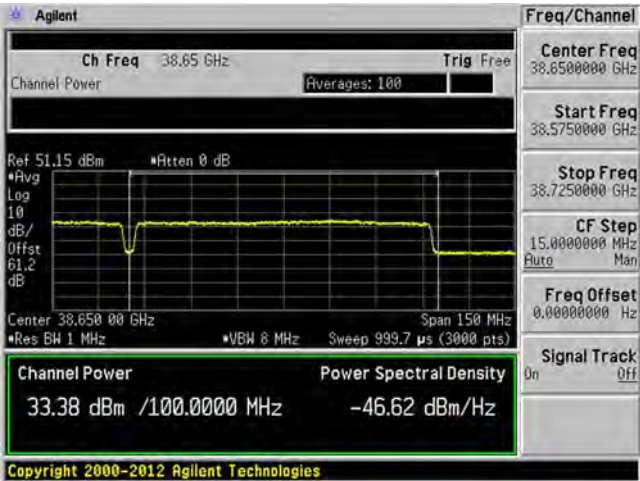
2nd Carrier



3rd Carrier

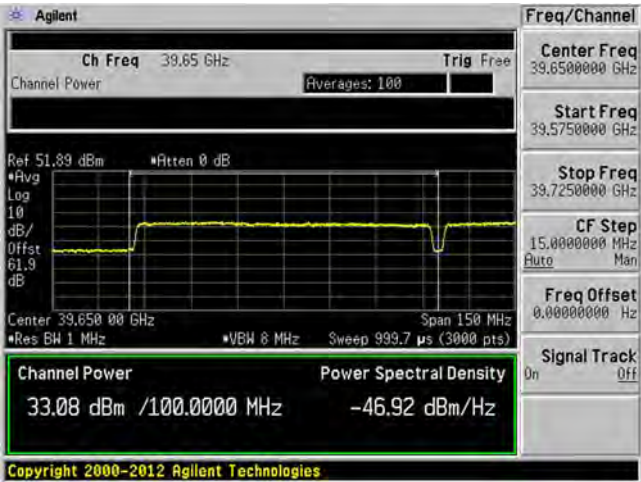


4th Carrier

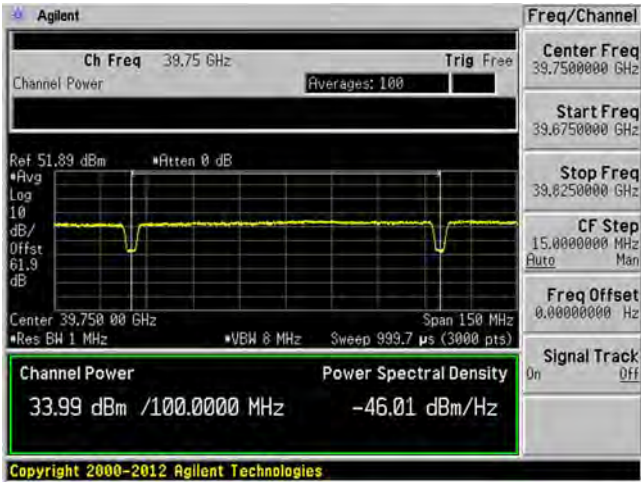


Beam ID: 139 (Horizontal)
4CC – QPSK – High Channel

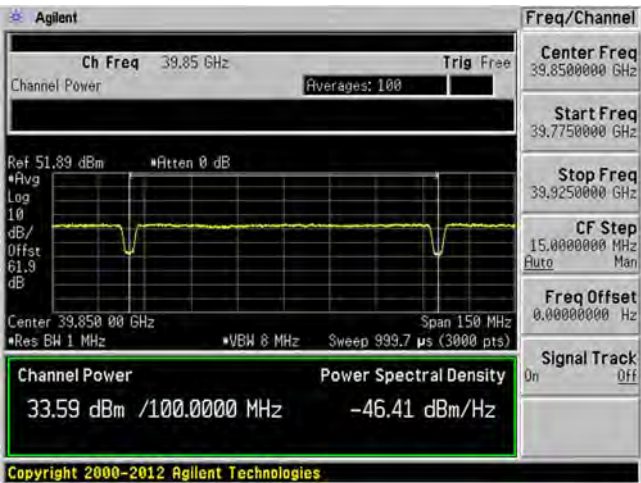
1st Carrier



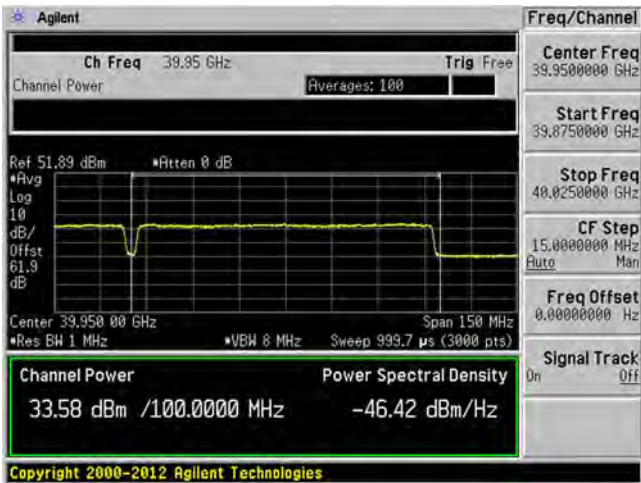
2nd Carrier



3rd Carrier



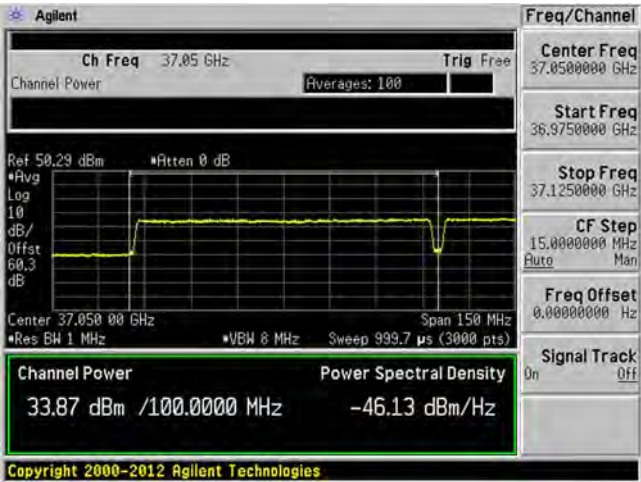
4th Carrier



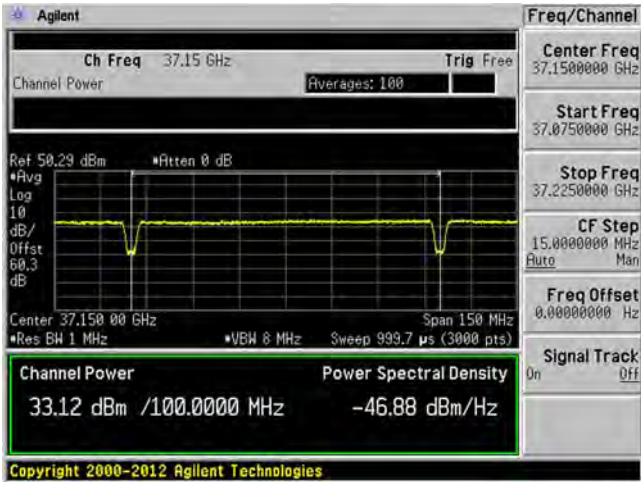
Beam ID: 139 (Horizontal)

4CC – 16QAM – Low Channel

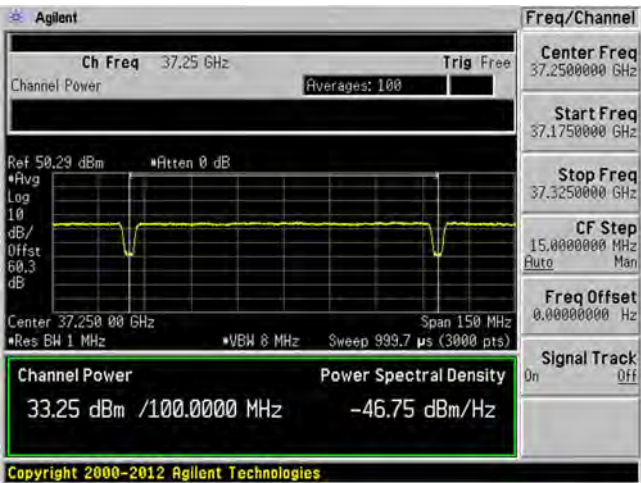
1st Carrier



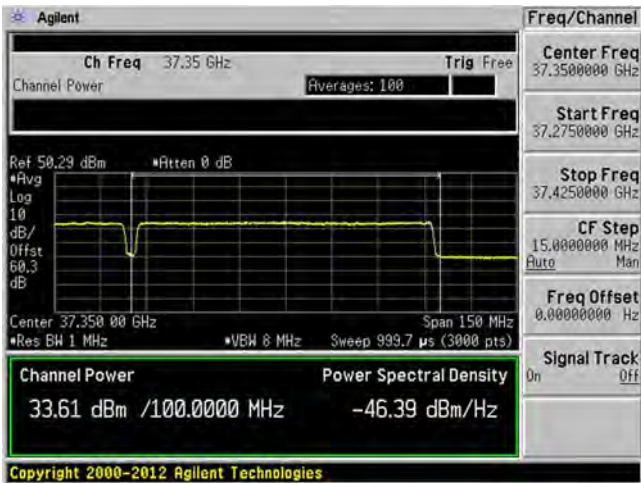
2nd Carrier



3rd Carrier



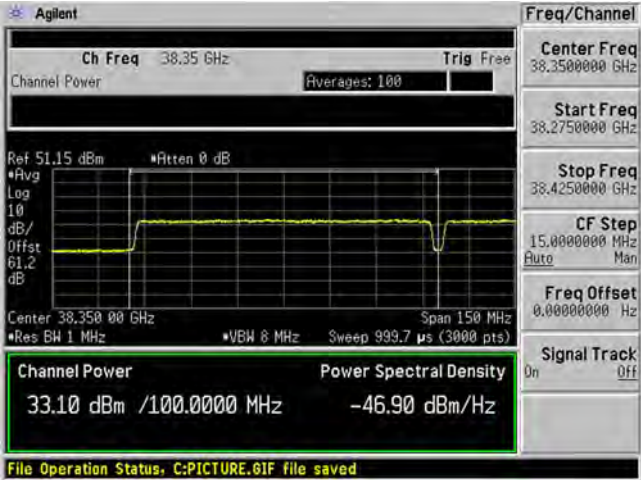
4th Carrier



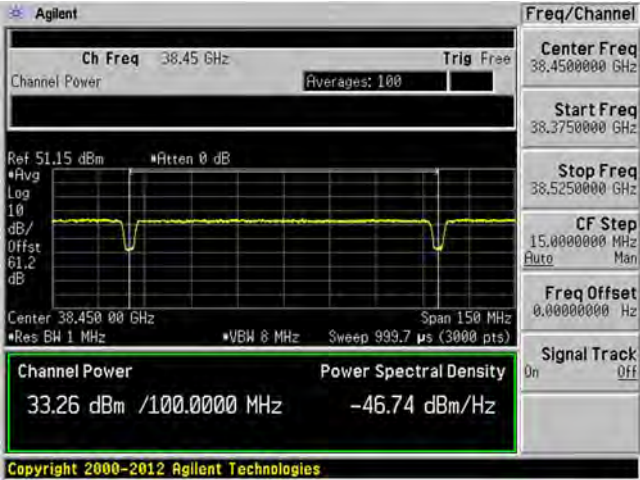
Beam ID: 139 (Horizontal)

4CC – 16QAM – Middle Channel

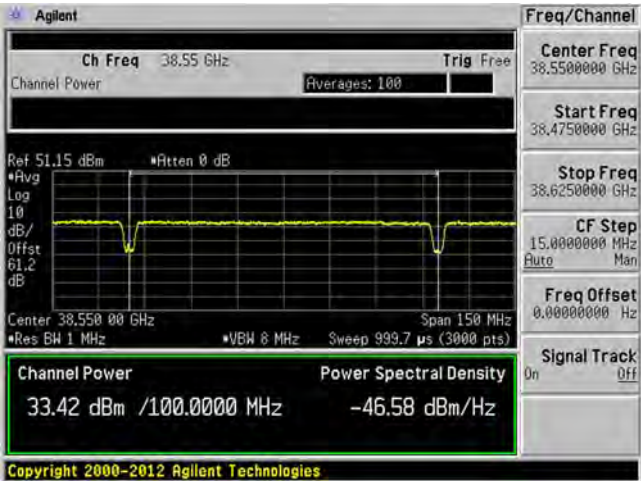
1st Carrier



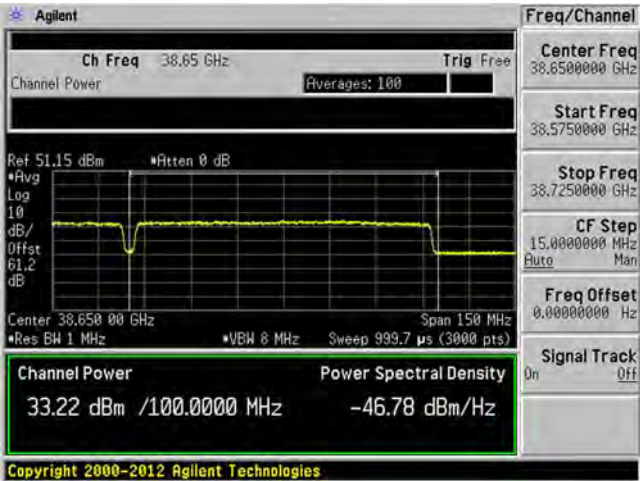
2nd Carrier



3rd Carrier



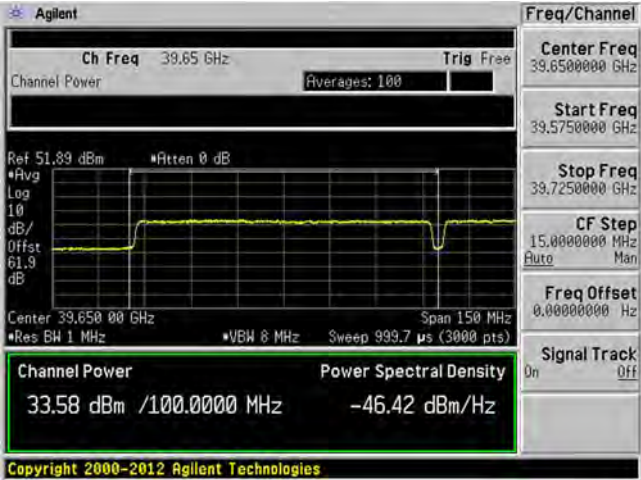
4th Carrier



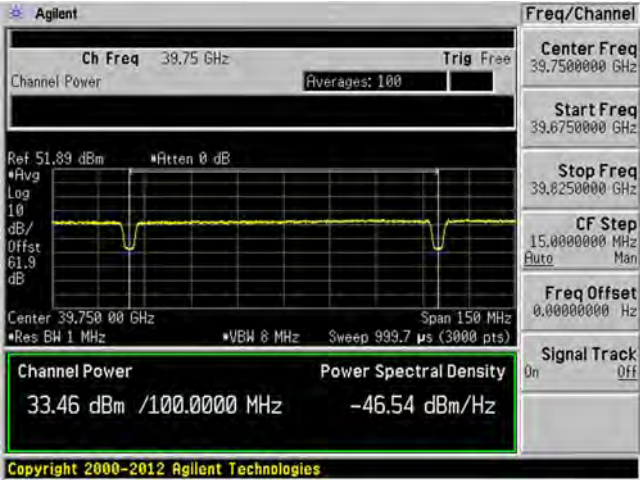
Beam ID: 139 (Horizontal)

4CC – 16QAM – High Channel

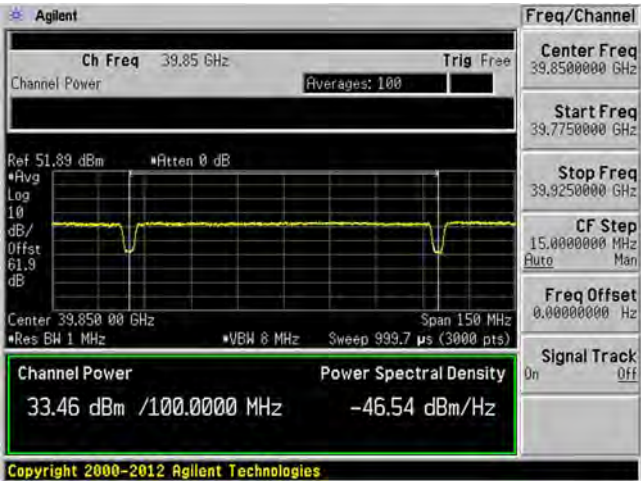
1st Carrier



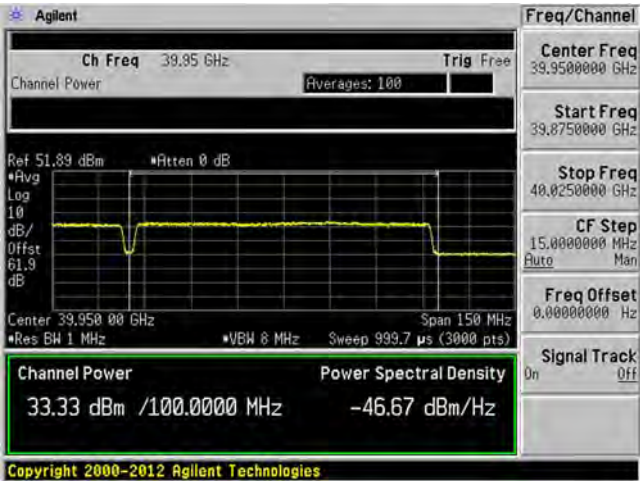
2nd Carrier



3rd Carrier



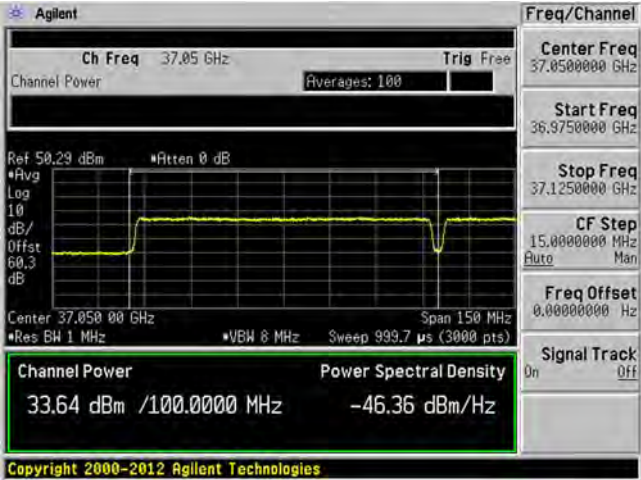
4th Carrier



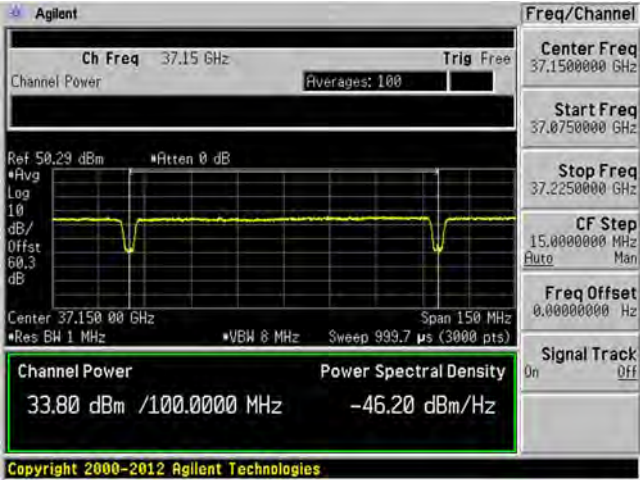
Beam ID: 139 (Horizontal)

4CC – 64QAM – Low Channel

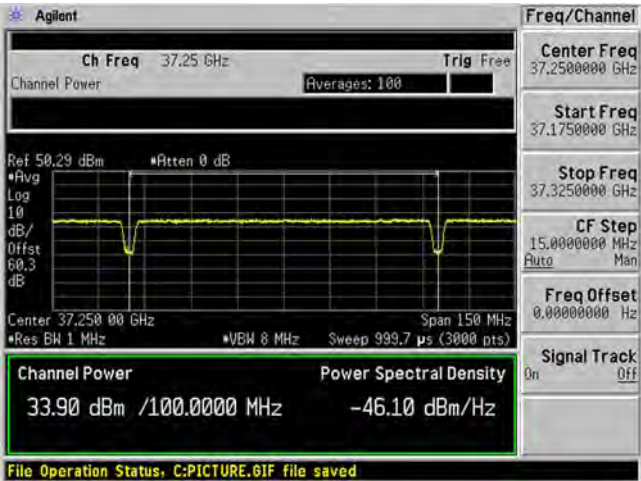
1st Carrier



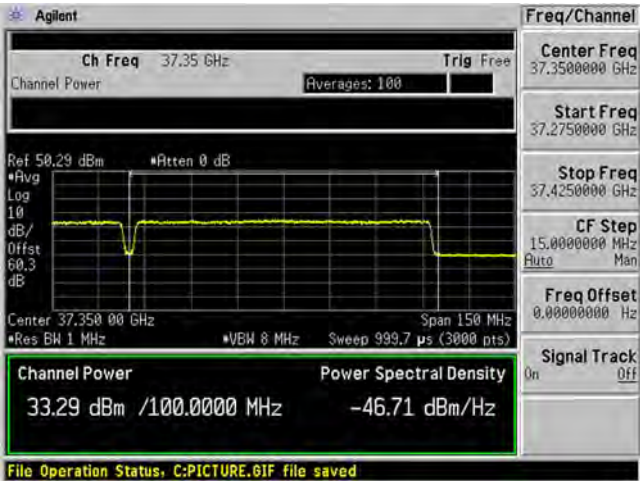
2nd Carrier



3rd Carrier



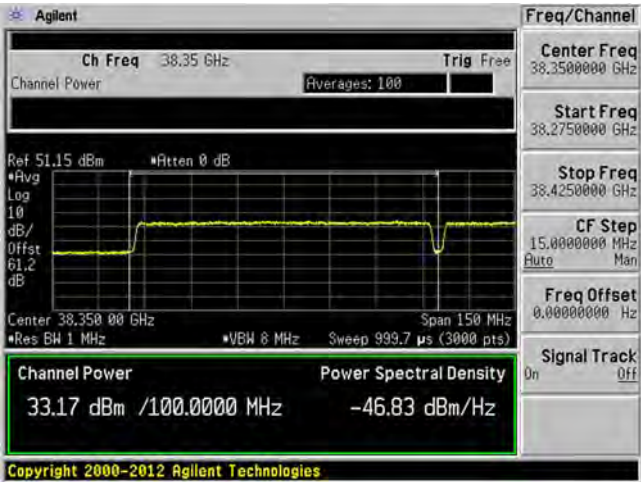
4th Carrier



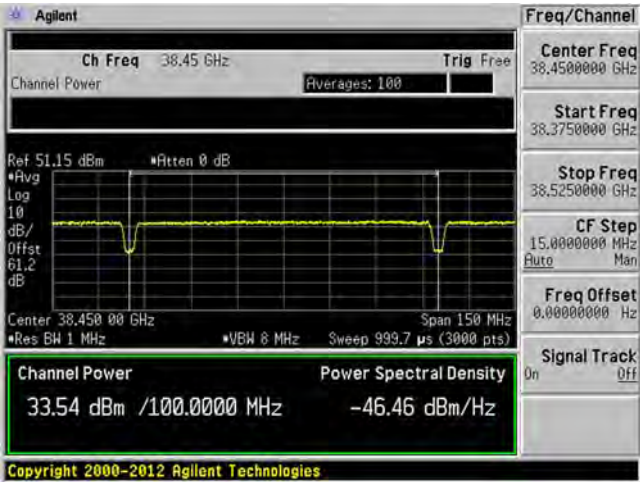
Beam ID: 139 (Horizontal)

4CC – 64QAM – Middle Channel

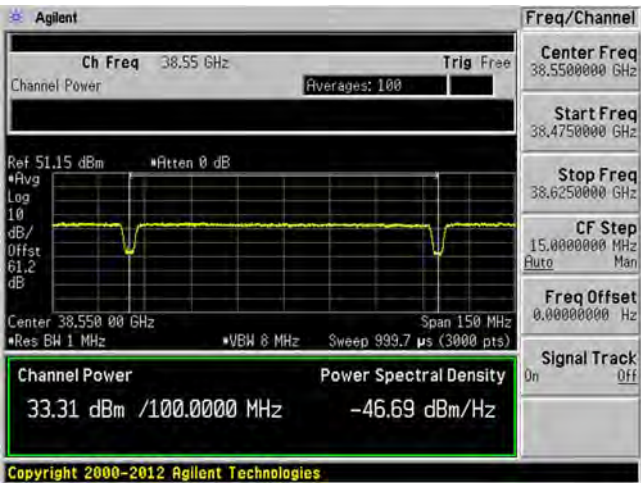
1st Carrier



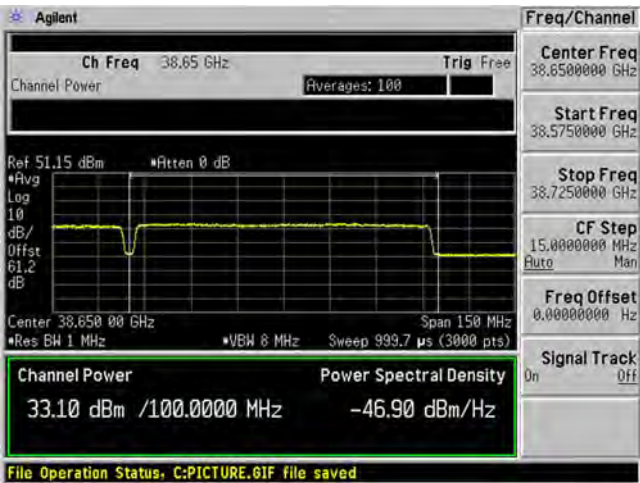
2nd Carrier



3rd Carrier



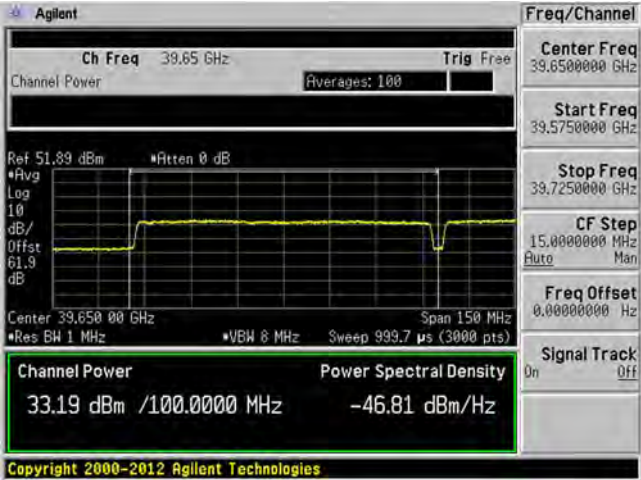
4th Carrier



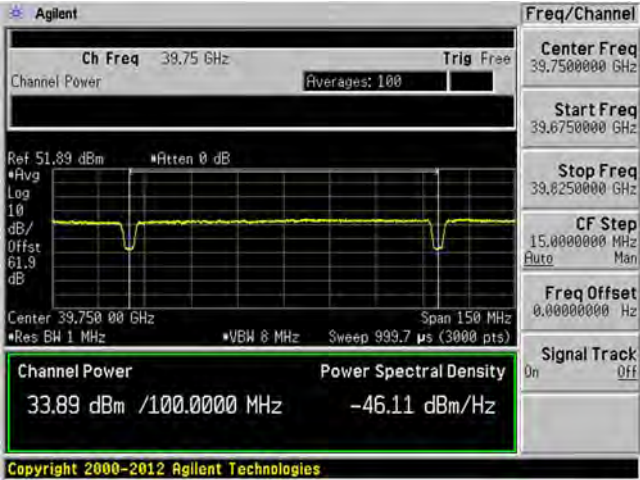
Beam ID: 139 (Horizontal)

4CC – 64QAM – High Channel

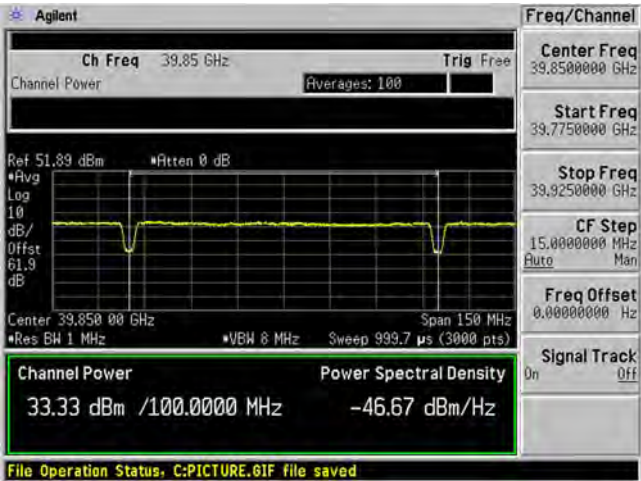
1st Carrier



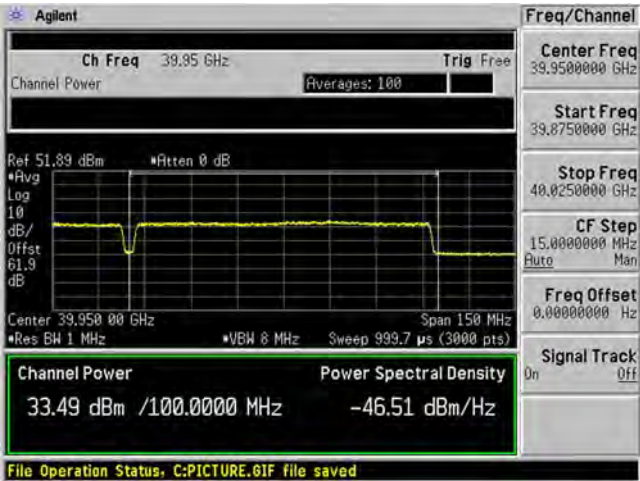
2nd Carrier



3rd Carrier



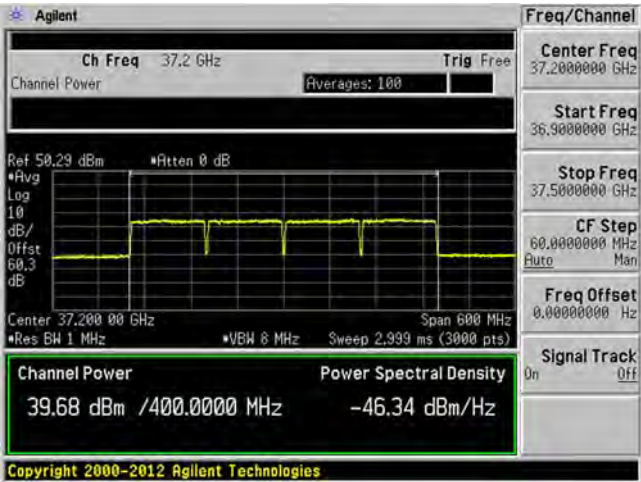
4th Carrier



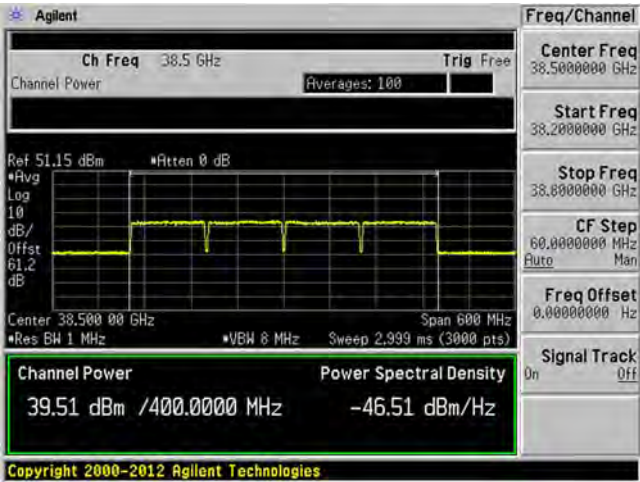
Beam ID: 11 (Vertical) (Channel Power)

4CC – QPSK

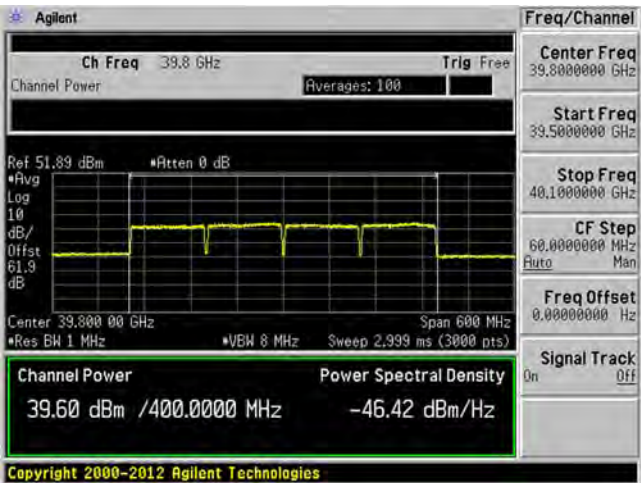
Low Channel



Middle Channel



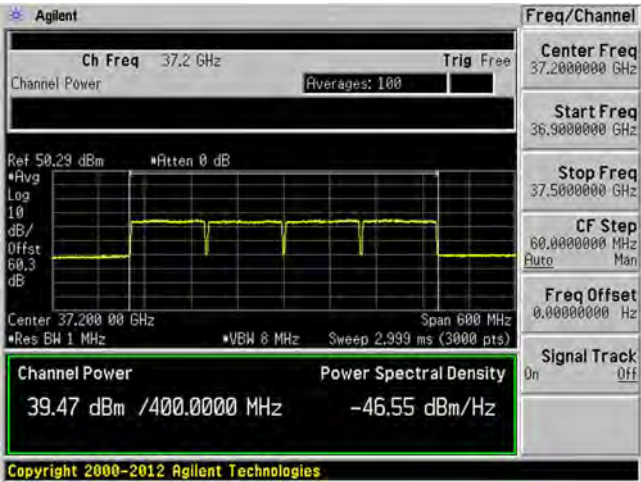
High Channel



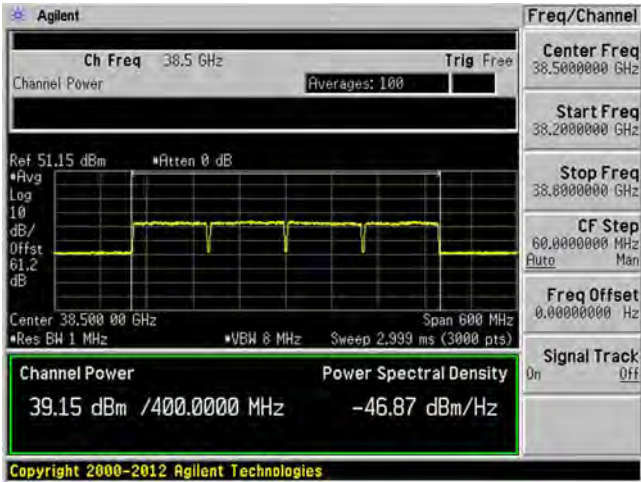
Beam ID: 11 (Vertical) (Channel Power)

4CC – 16QAM

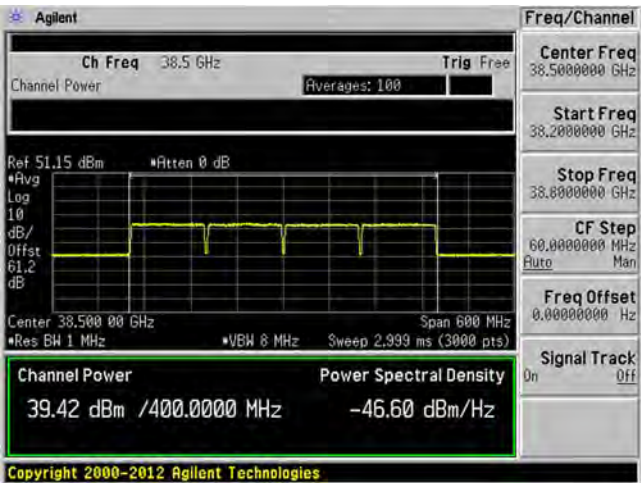
Low Channel



Middle Channel



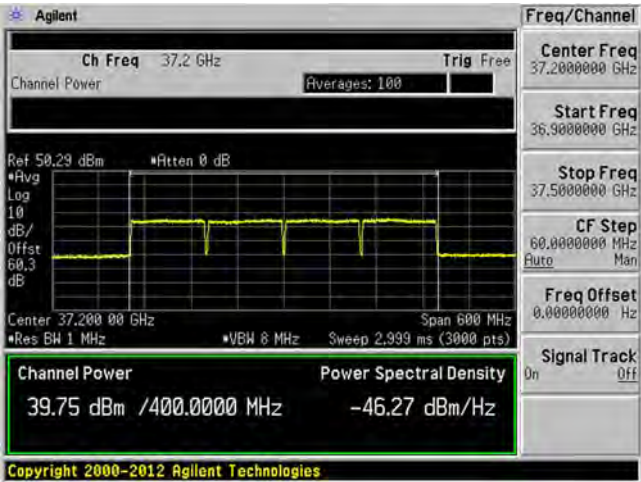
High Channel



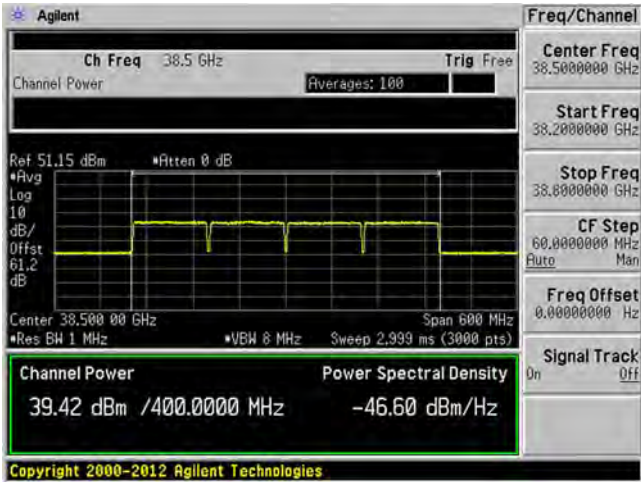
Beam ID: 11 (Vertical) (Channel Power)

4CC – 64QAM

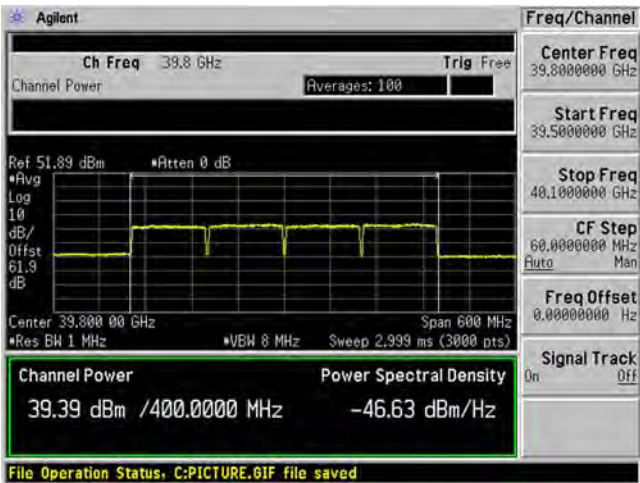
Low Channel



Middle Channel



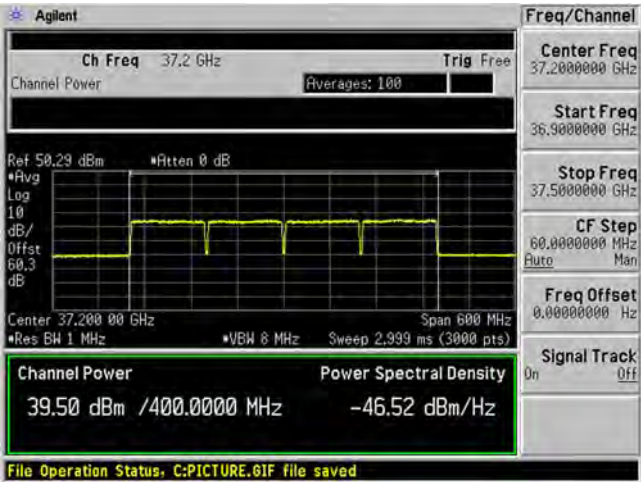
High Channel



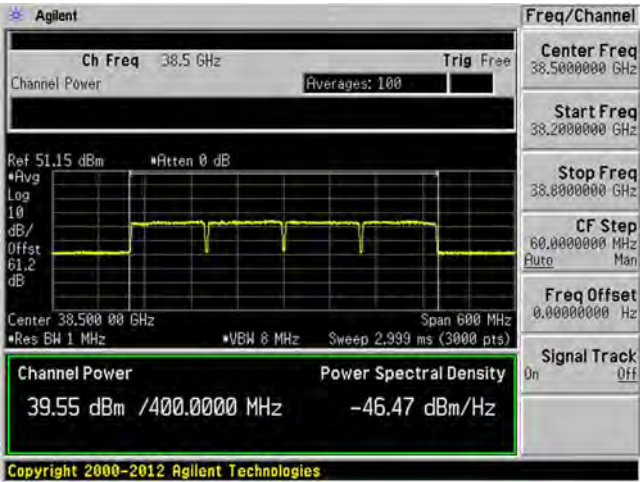
Beam ID: 139 (Horizontal) (Channel Power)

4CC – QPSK

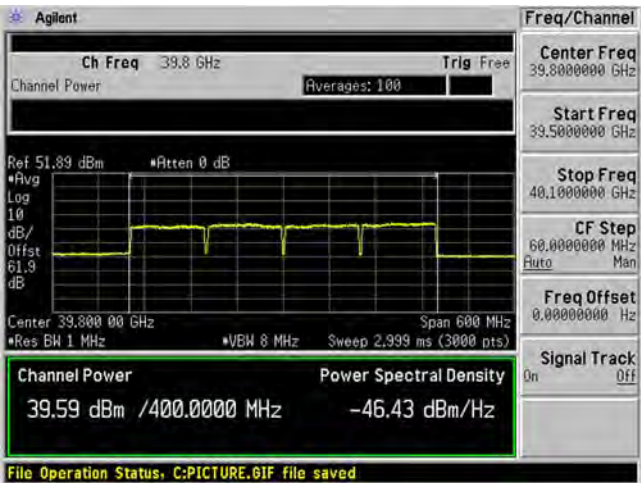
Low Channel



Middle Channel



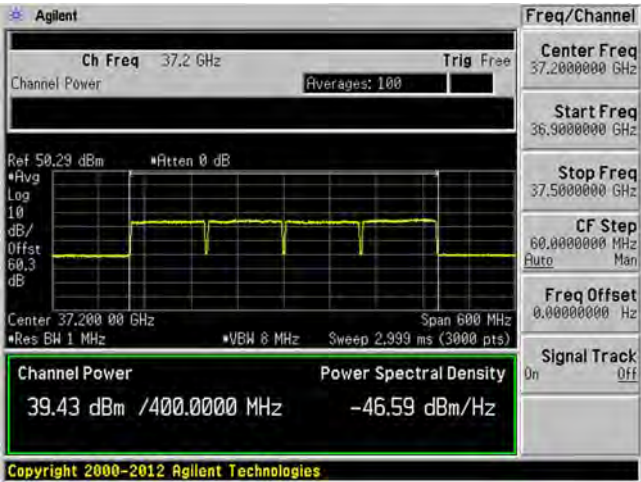
High Channel



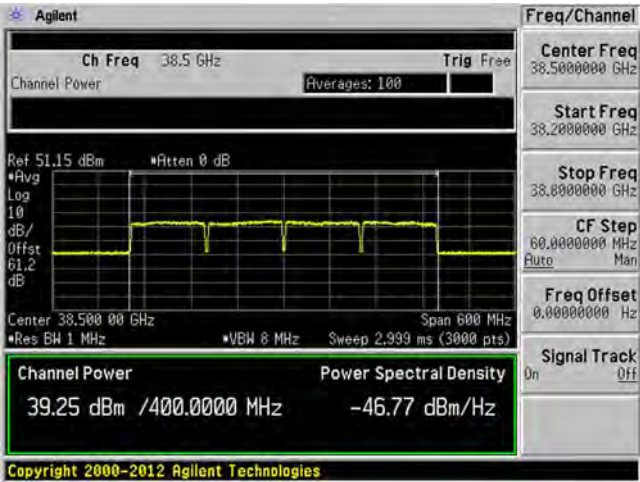
Beam ID: 139 (Horizontal) (Channel Power)

4CC – 16QAM

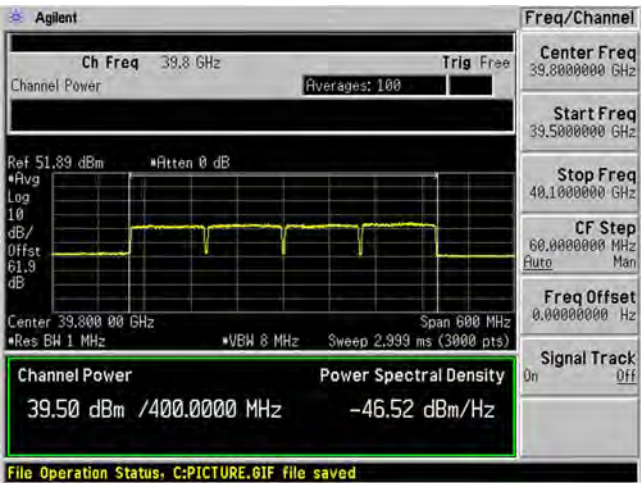
Low Channel



Middle Channel



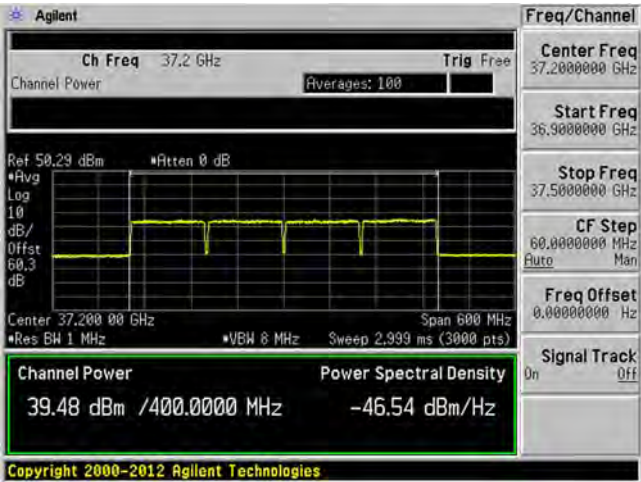
High Channel



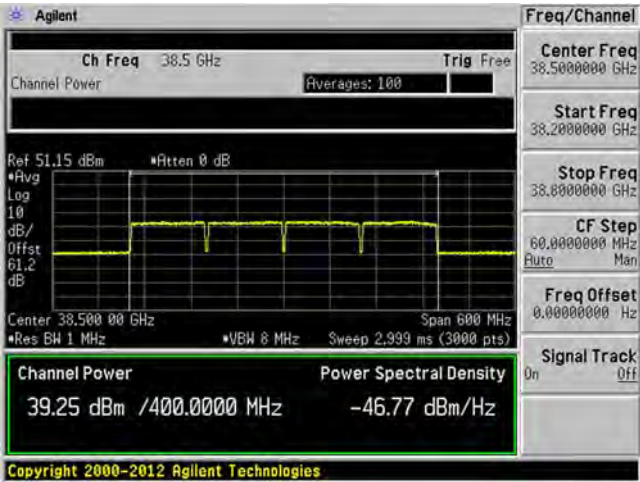
Beam ID: 139 (Horizontal) (Channel Power)

4CC – 64QAM

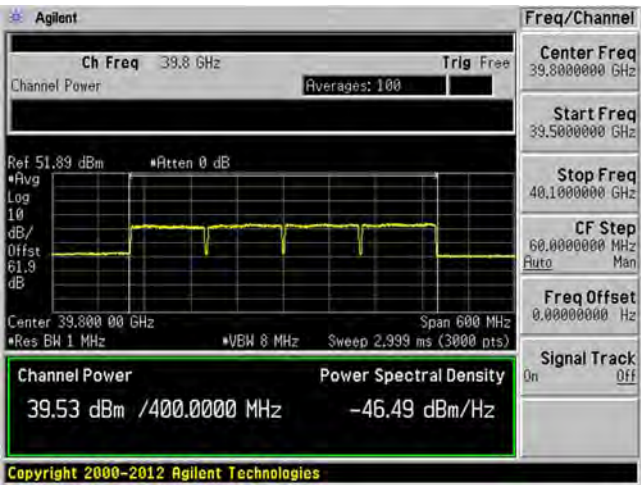
Low Channel



Middle Channel



High Channel



10 FCC §2.1053 & §30.203 - Out of Band Emissions at the Band-Edge

10.1 Applicable Standards

According to FCC §30.203

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

10.2 Measurement Procedure

Unwanted Emission Measurement:

According to ANSI C63.26-2015 section 5.2.7 Radiated power measurements

$E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.

$\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

Based on both equations above, the offset should equal to $\text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + 107 + 20\log(D) - 104.8$ when set the unit to dBm on the PSA. The duty cycle correction factor in section 2.3 was also added in the offset for average measurement.

Maximum emission levels are measured by setting the analyzer as follows:

- i. RBW = 1 MHz
- ii. VBW $\geq$ 3 MHz
- iii. Detector = Peak
- iv. Sweep time = auto
- v. Trace mode = Average 100 traces

Note: EUT antenna gain 22.5 dBi was subtracted in the offset for the conductive power measurement.

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Spectrum Analyzer 44 GHz	E4446A	US44300386	2021-04-27	1 year
-	RF Cable	-	-	Each time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years
Keysight	Signal Generator	E8257D	MY59140095	2021-06-25	1 year

Note¹: equipment included in the test set-up will be checked each time before testing.

Statement of Traceability: BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".

10.4 Test Environmental Conditions

Temperature:	22-24° C
Relative Humidity:	41 %
ATM Pressure:	102.1 kPa

The testing was performed by Giriraj Gurjar on 2021-07-30 in 5m3 Chamber.

10.5 Test Results

1CC

Modulation	Channel	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
QPSK	Low	-25.93	-25.82	-22.86	-5	-17.86
		-29.44	-29.63	-26.52	-13	-13.52
	High	-23.48	-30.18	-22.64	-5	-17.64
		-24.89	-29.95	-23.71	-13	-10.71
16QAM	Low	-25.93	-28.55	-24.04	-5	-19.04
		-28.82	-29.31	-26.05	-13	-13.05
	High	-23.05	-31.25	-22.44	-5	-17.44
		-24.39	-29.94	-23.32	-13	-10.32
64QAM	Low	-24.46	-23.77	-21.09	-5	-16.09
		-29.14	-27.17	-25.03	-13	-12.03
	High	-23.09	-29.49	-22.19	-5	-17.19
		-25.01	-30.13	-23.85	-13	-10.85

2CC

Modulation	Channel	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
QPSK	Low	-25.85	-26.55	-23.18	-5	-18.18
		-28.71	-30.76	-26.60	-13	-13.60
	High	-24.16	-25.74	-21.87	-5	-16.87
		-26.74	-26.77	-23.74	-13	-10.74
16QAM	Low	-26.53	-29.95	-24.90	-5	-19.90
		-25.55	-31.22	-24.51	-13	-11.51
	High	-25.84	-25.56	-22.69	-5	-17.69
		-25.76	-26.67	-23.18	-13	-10.18
64QAM	Low	-30.19	-28.08	-26.00	-5	-21.00
		-28.79	-30.33	-26.48	-13	-13.48
	High	-25.23	-25.09	-22.15	-5	-17.15
		-26.75	-26.38	-23.55	-13	-10.55

3CC

Modulation	Channel	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
QPSK	Low	-29.64	-29.65	-26.63	-5	-21.63
		-30.75	-30.46	-27.59	-13	-14.59
	High	-26.41	-28.23	-24.22	-5	-19.22
		-27.14	-28.08	-24.57	-13	-11.57
16QAM	Low	-33.41	-30.54	-28.73	-5	-23.73
		-33.05	-30.49	-28.57	-13	-15.57
	High	-26.94	-29.00	-24.84	-5	-19.84
		-27.92	-27.88	-24.89	-13	-11.89
64QAM	Low	-30.99	-30.26	-27.60	-5	-22.60
		-31.35	-30.49	-27.89	-13	-14.89
	High	-29.05	-28.52	-25.77	-5	-20.77
		-29.08	-28.55	-25.80	-13	-12.80

4CC

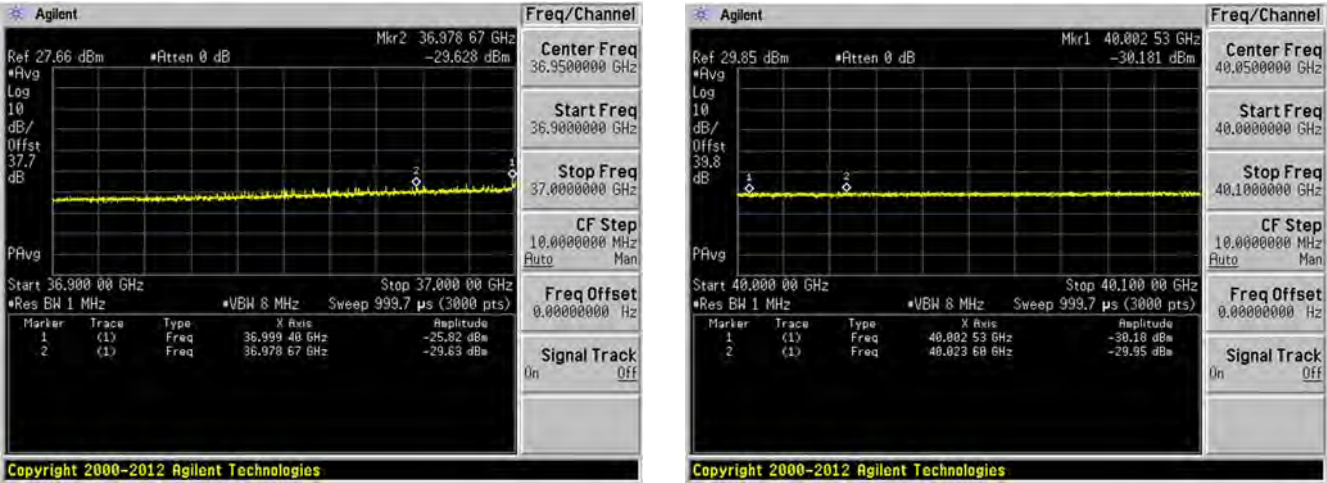
Modulation	Channel	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
QPSK	Low	-30.83	-33.49	-28.95	-5	-23.95
		-31.30	-32.02	-28.63	-13	-15.63
	High	-27.15	-29.46	-25.14	-5	-20.14
		-27.52	-30.11	-25.61	-13	-12.61
16QAM	Low	-28.05	-31.64	-26.47	-5	-21.47
		-28.78	-32.79	-27.33	-13	-14.33
	High	-27.06	-30.88	-25.55	-5	-20.55
		-28.02	-30.82	-26.19	-13	-13.19
64QAM	Low	-27.91	-32.52	-26.62	-5	-21.62
		-28.48	-32.53	-27.04	-13	-14.04
	High	-28.05	-29.77	-25.82	-5	-20.82
		-28.01	-29.96	-25.87	-13	-12.87

Please refer to the following plots for details

1CC-QPSK Beam ID=11 (Vertical)

Low Channel

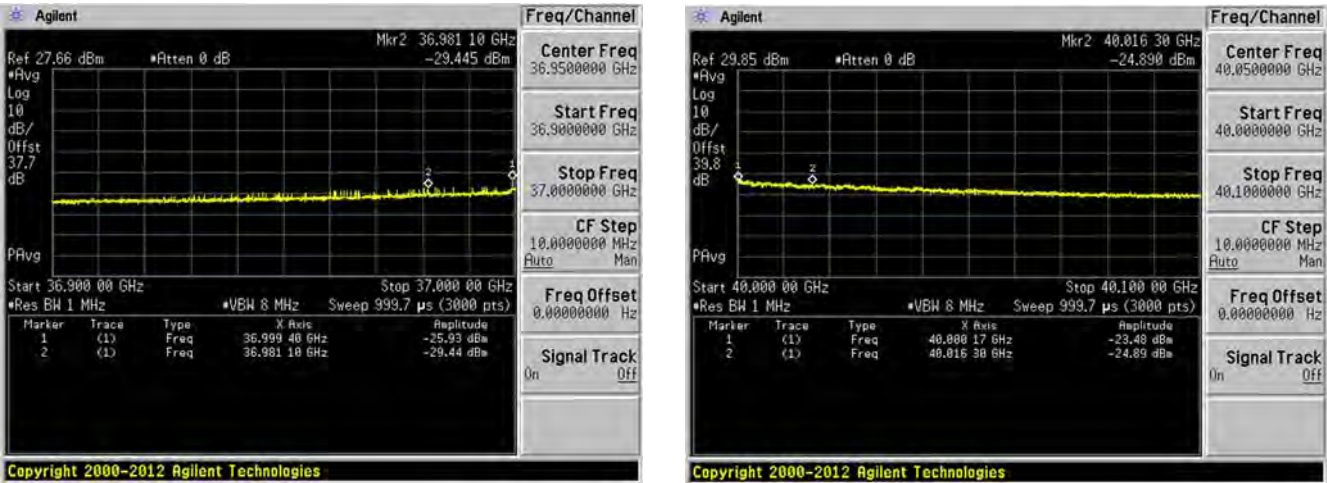
High Channel



1CC-QPSK Beam ID=139 (Horizontal)

Low Channel

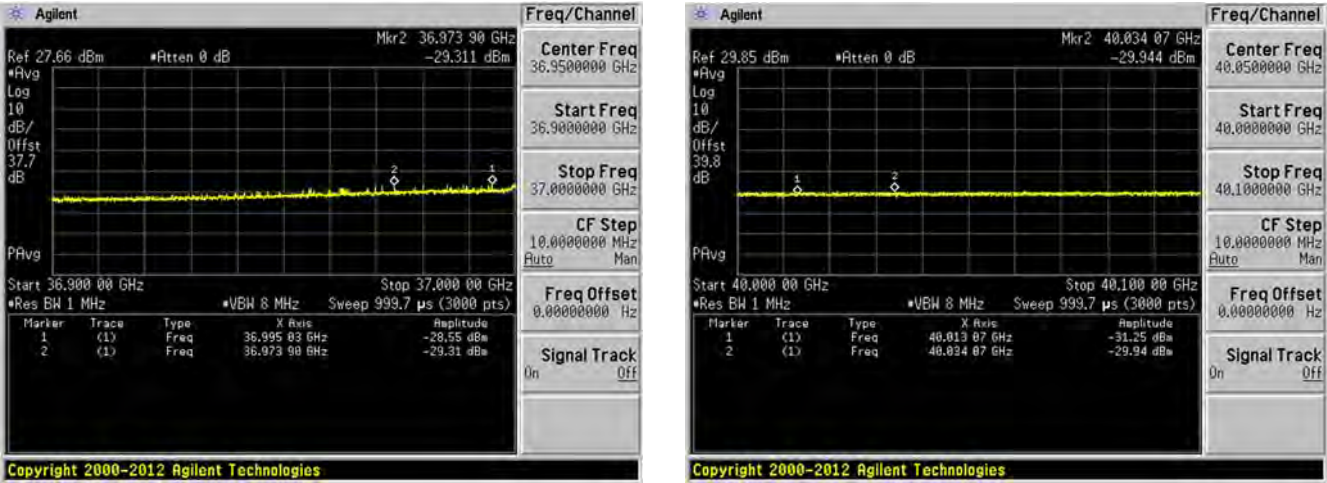
High Channel



1CC-16QAM Beam ID=11 (Vertical)

Low Channel

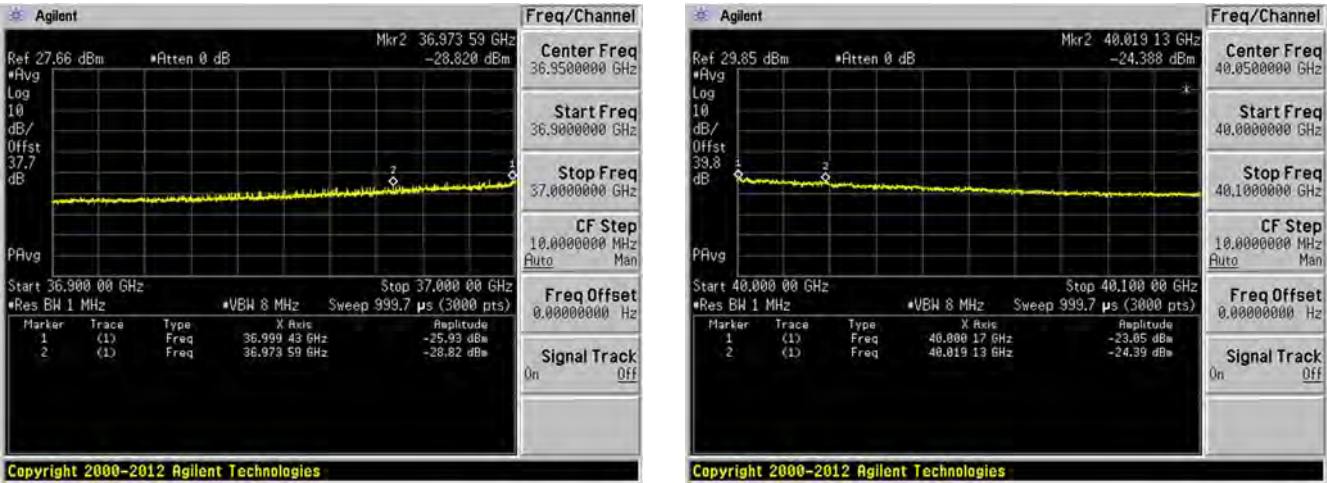
High Channel



1CC-16QAM Beam ID=139 (Horizontal)

Low Channel

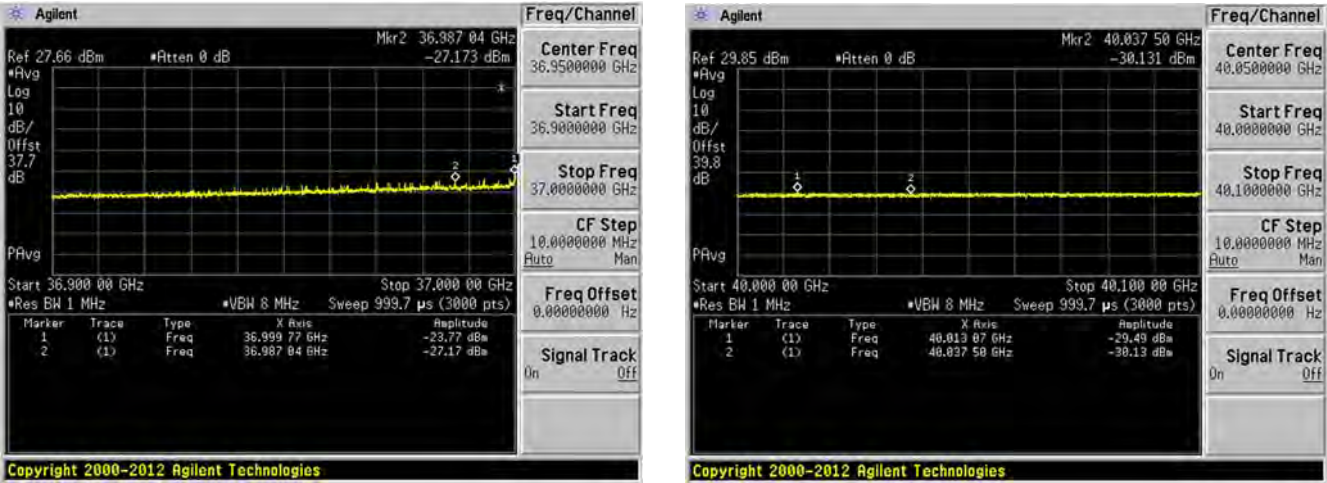
High Channel



1CC-64QAM Beam ID=11 (Vertical)

Low Channel

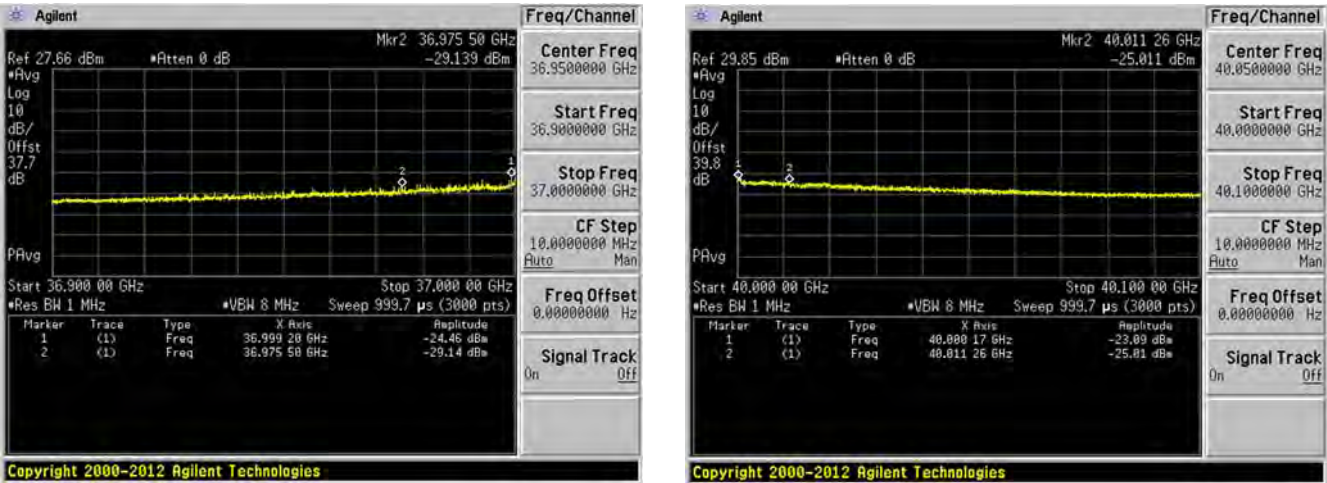
High Channel



1CC-64QAM Beam ID=139 (Horizontal)

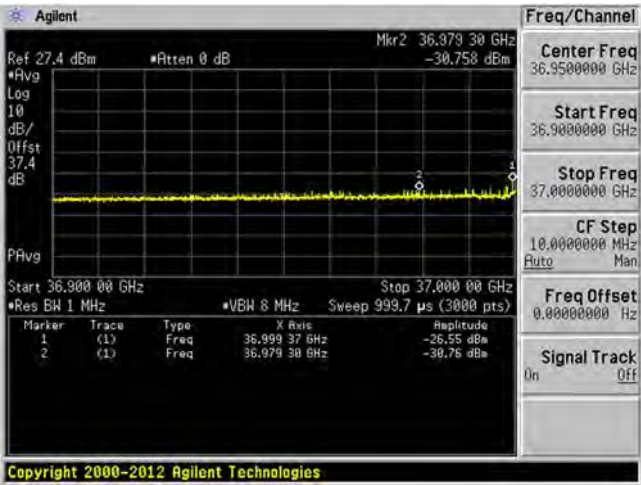
Low Channel

High Channel

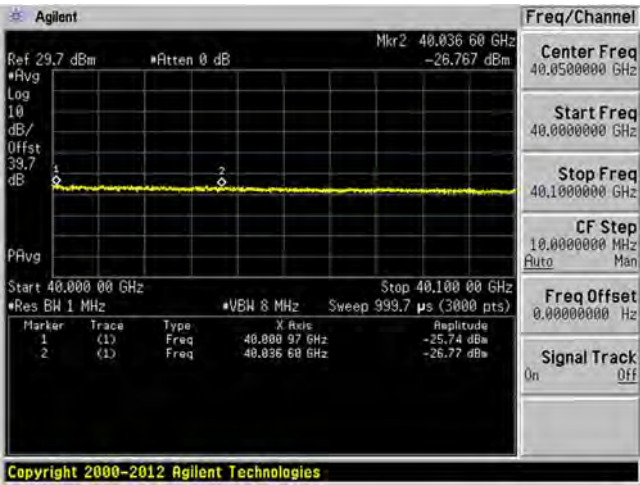


2CC-QPSK Beam ID=11 (Vertical)

Low Channel

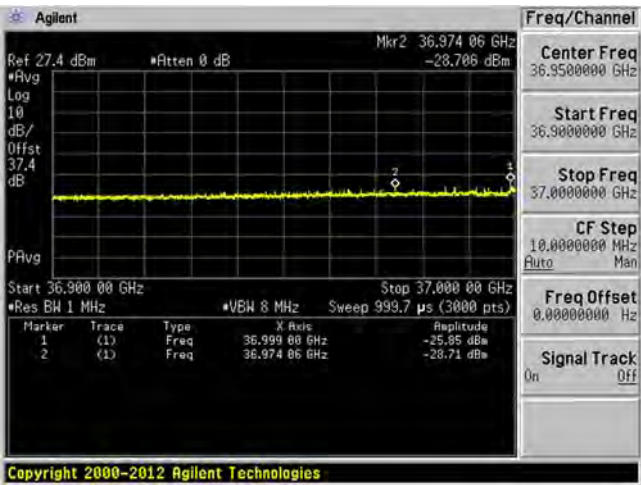


High Channel

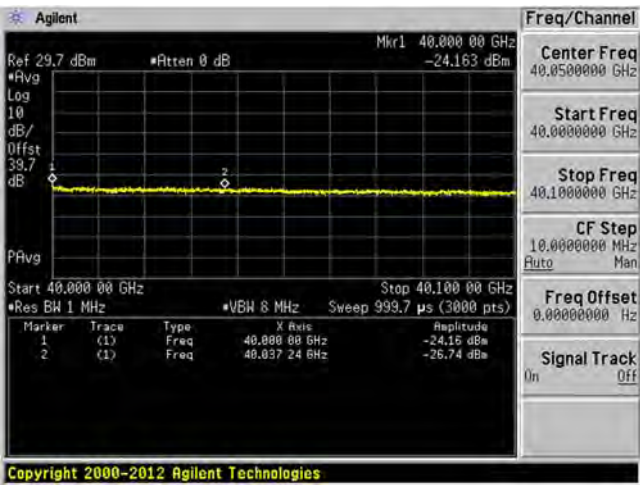


2CC-QPSK Beam ID=139 (Horizontal)

Low Channel



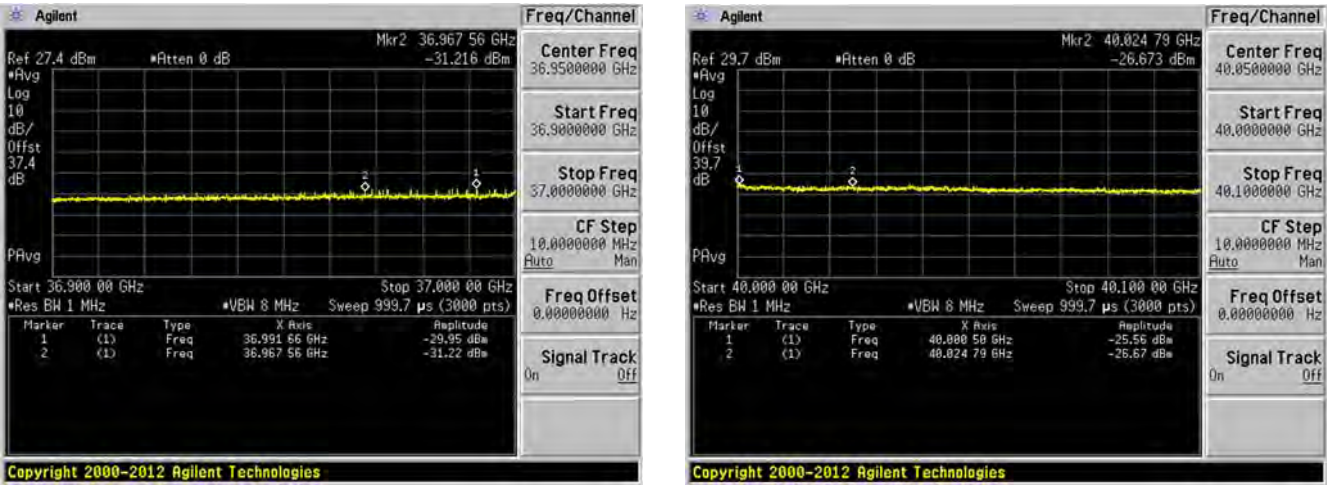
High Channel



2CC-16QAM Beam ID=11 (Vertical)

Low Channel

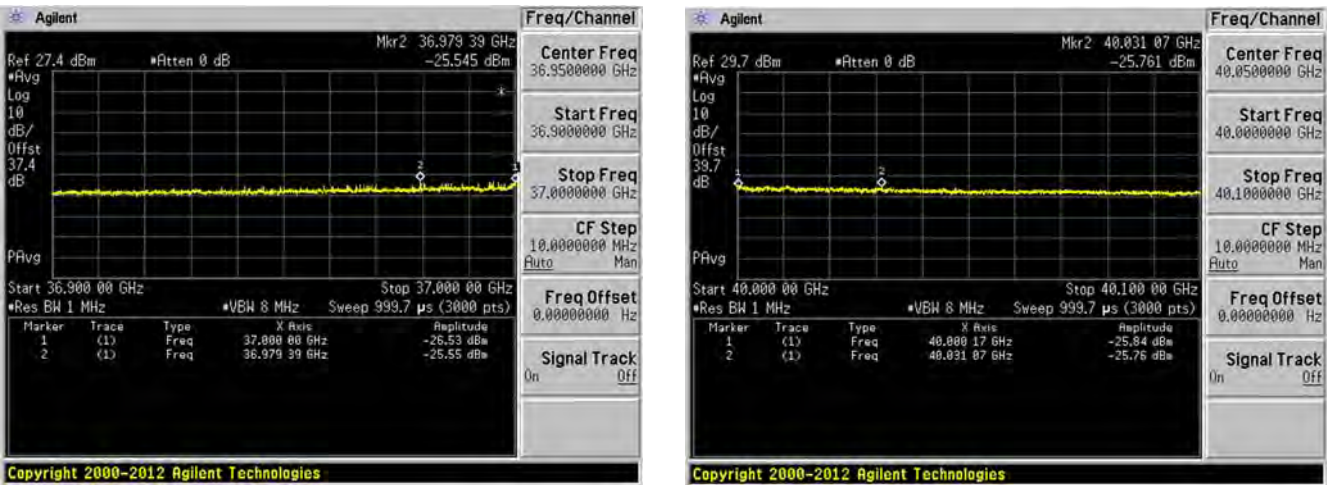
High Channel



2CC-16QAM Beam ID=139 (Horizontal)

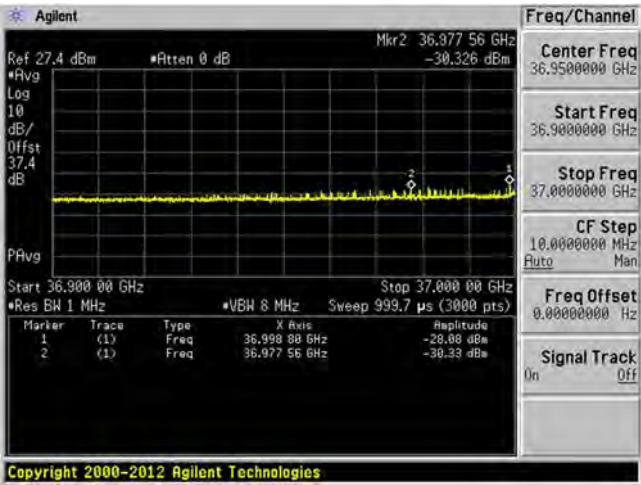
Low Channel

High Channel

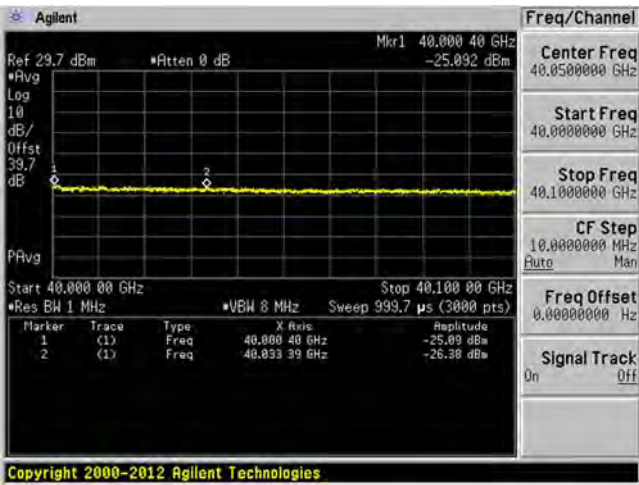


2CC-64QAM Beam ID=11 (Vertical)

Low Channel

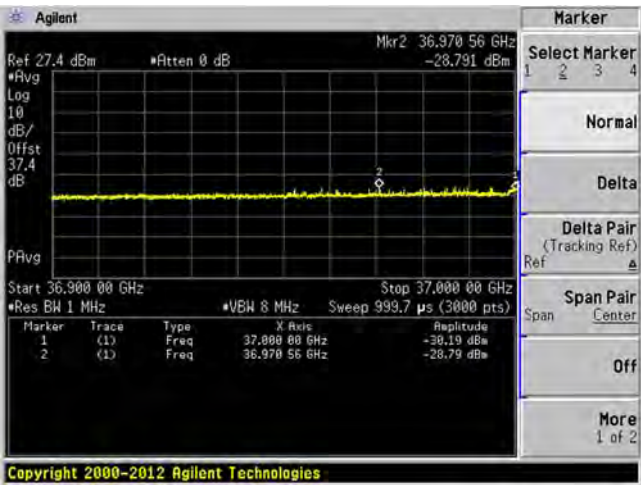


High Channel

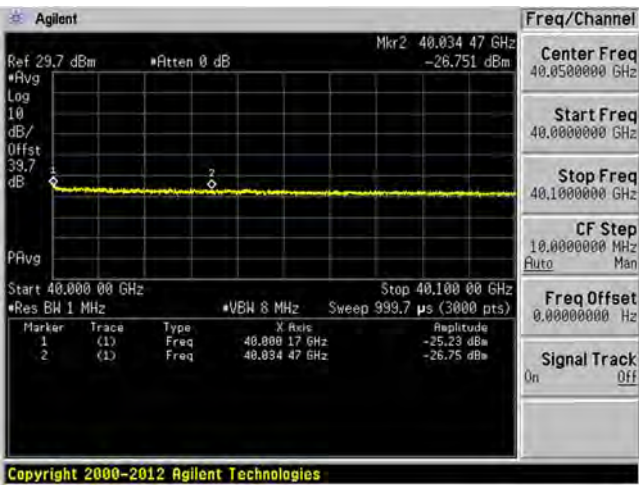


2CC-64QAM Beam ID=139 (Horizontal)

Low Channel

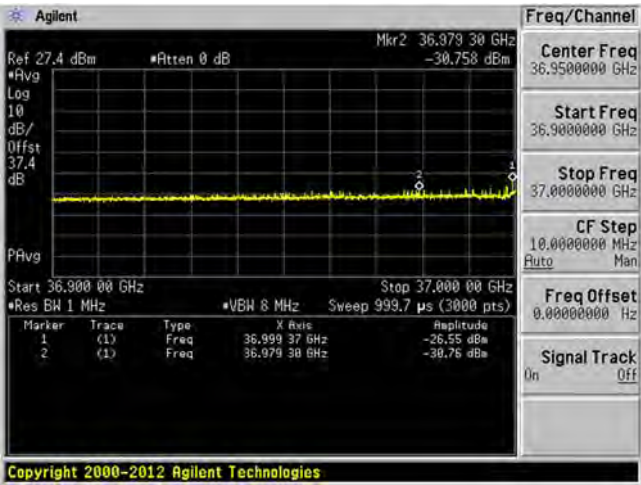


High Channel

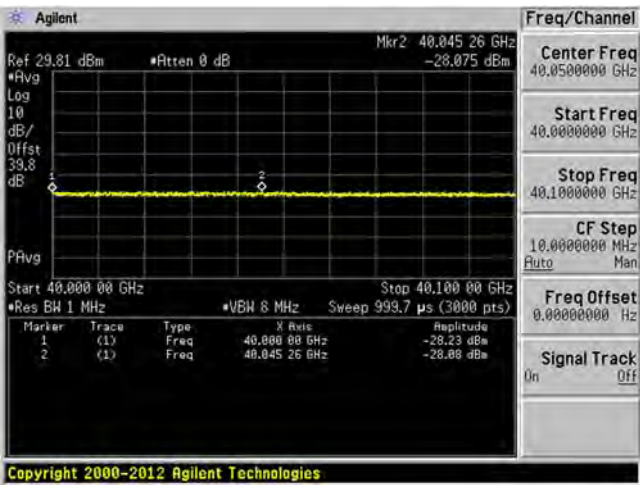


3CC-QPSK Beam ID=11 (Vertical)

Low Channel

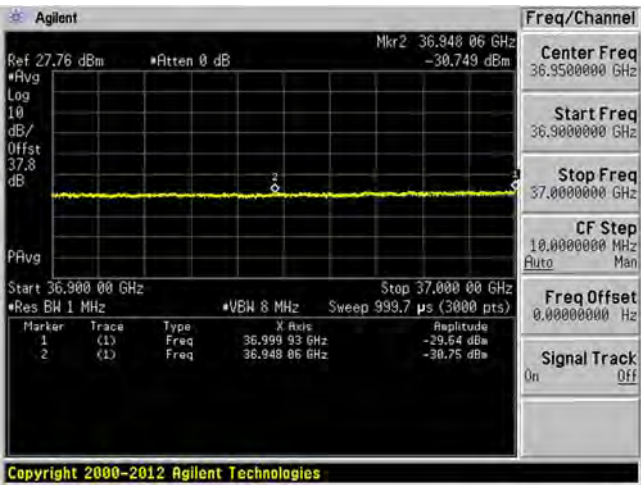


High Channel

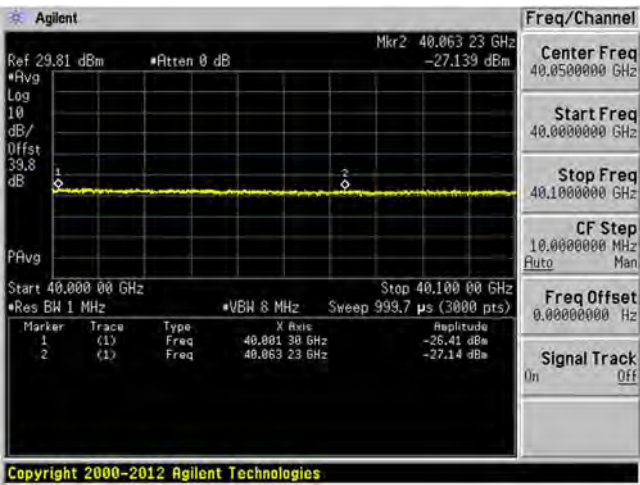


3CC-QPSK Beam ID=139 (Horizontal)

Low Channel



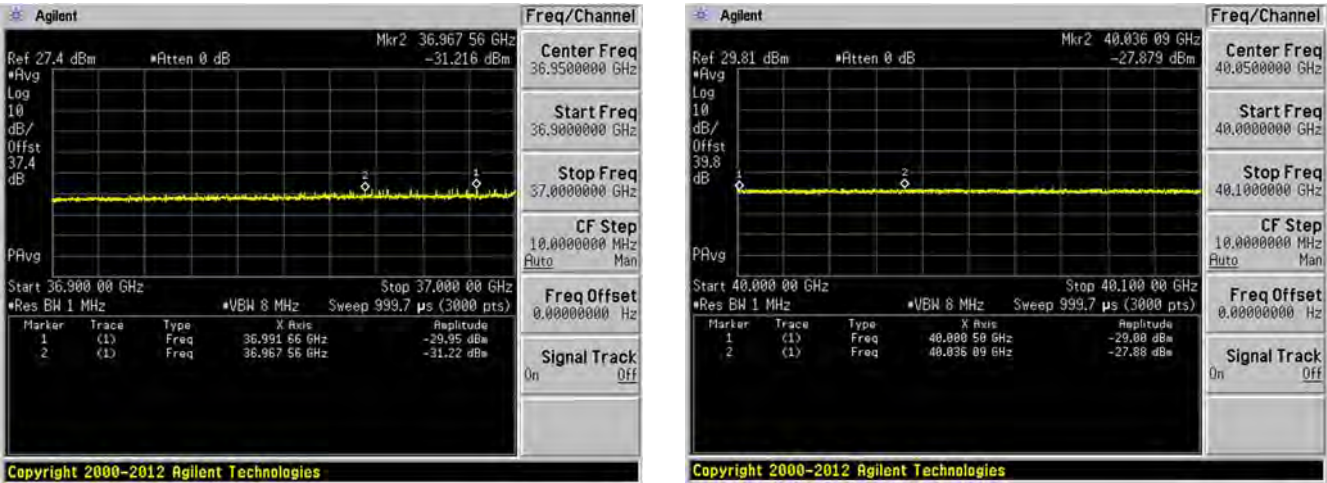
High Channel



3CC-16QAM Beam ID=11 (Vertical)

Low Channel

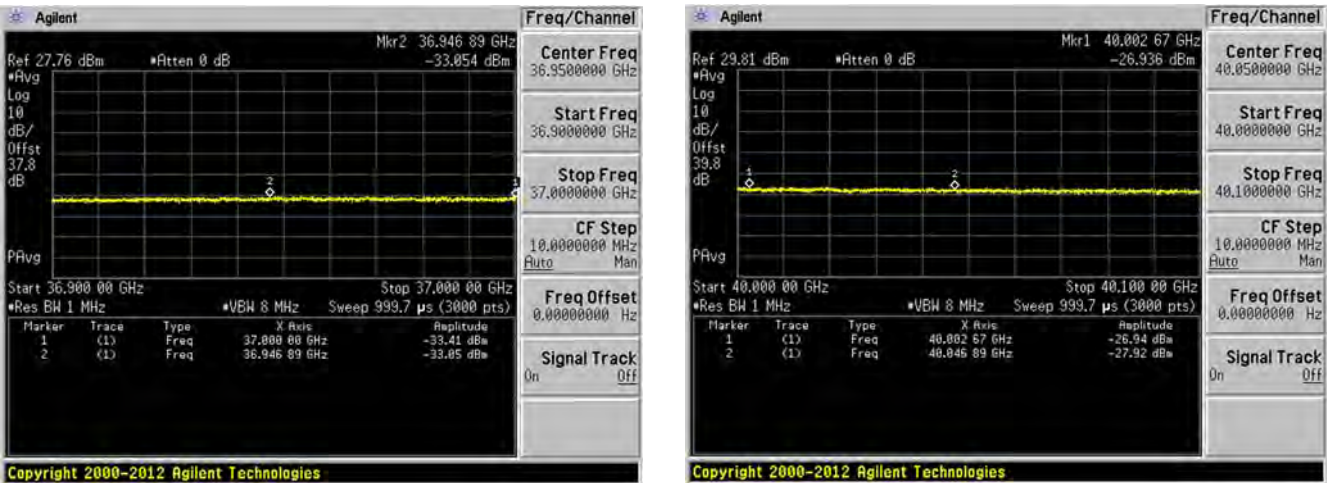
High Channel



3CC-16QAM Beam ID=139 (Horizontal)

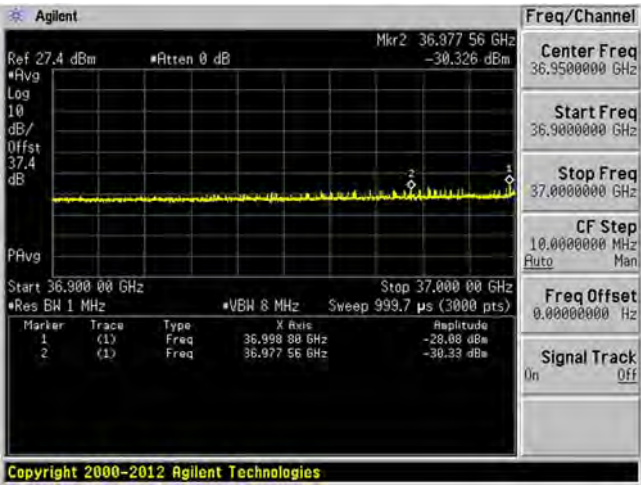
Low Channel

High Channel

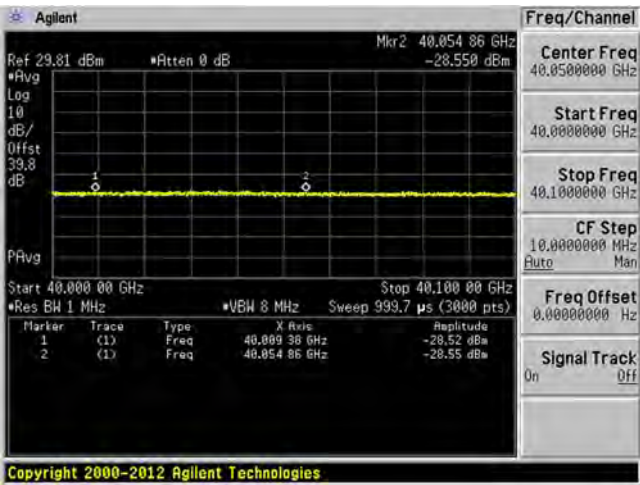


3CC-64QAM Beam ID=11 (Vertical)

Low Channel

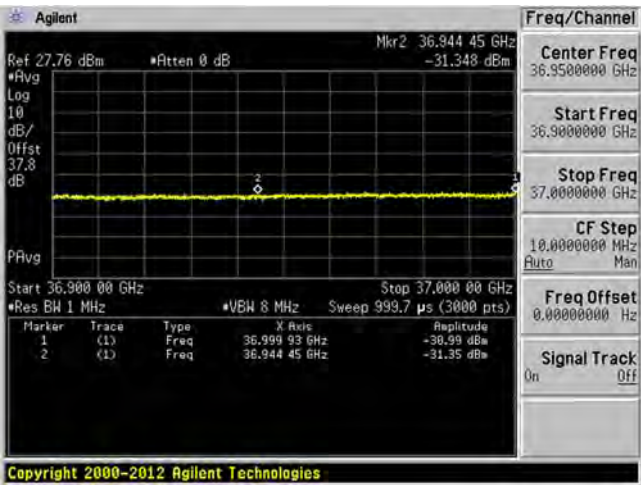


High Channel

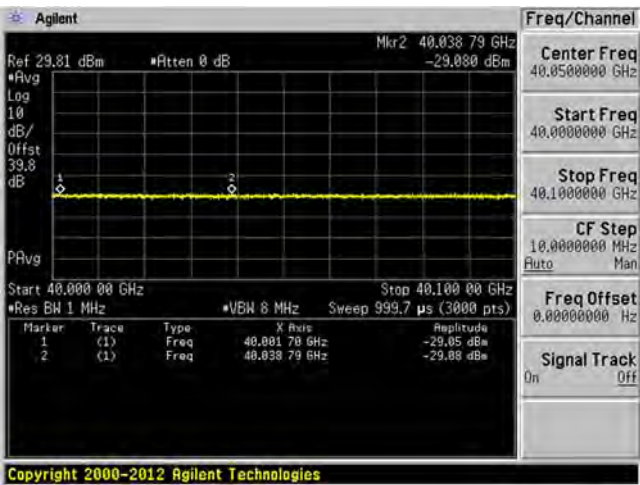


3CC-64QAM Beam ID=139 (Horizontal)

Low Channel



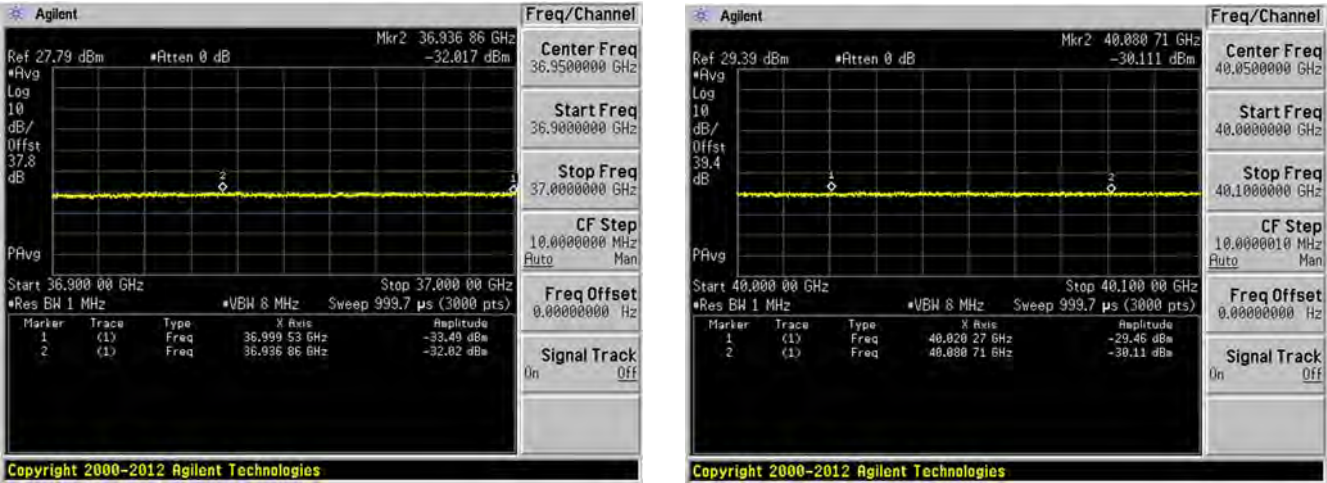
High Channel



4CC-QPSK Beam ID=11 (Vertical)

Low Channel

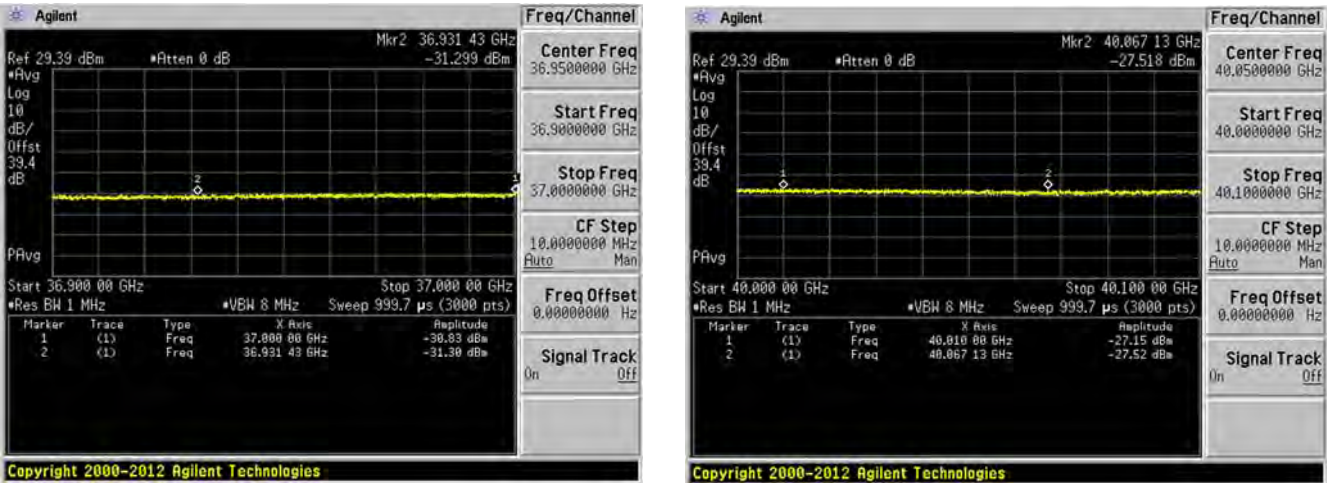
High Channel



4CC-QPSK Beam ID=139 (Horizontal)

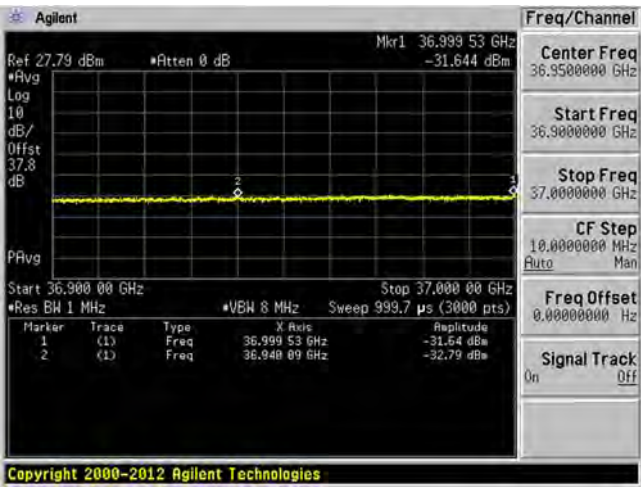
Low Channel

High Channel

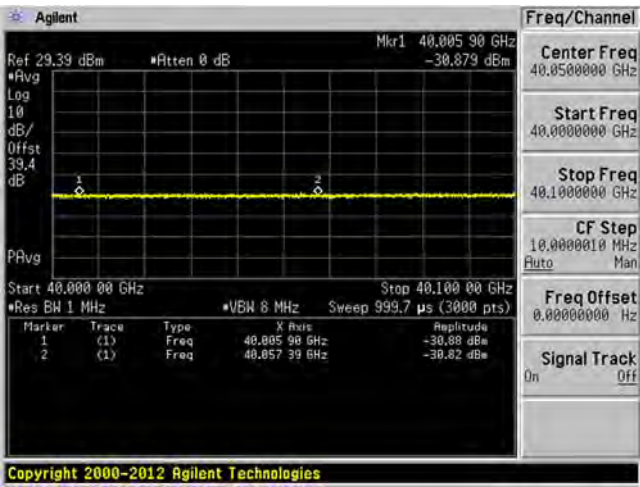


4CC-16QAM Beam ID=11 (Vertical)

Low Channel

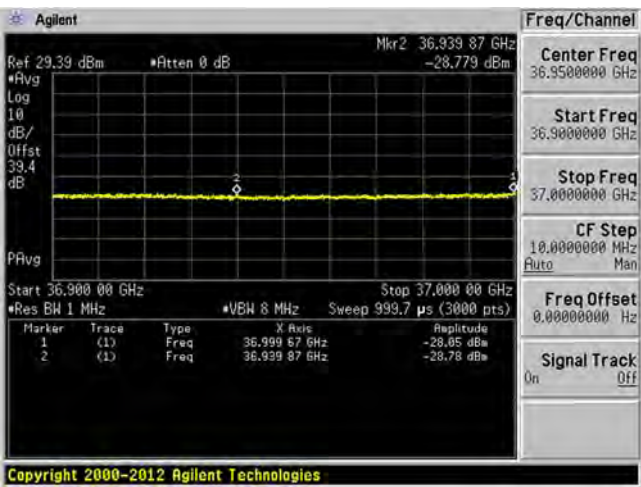


High Channel

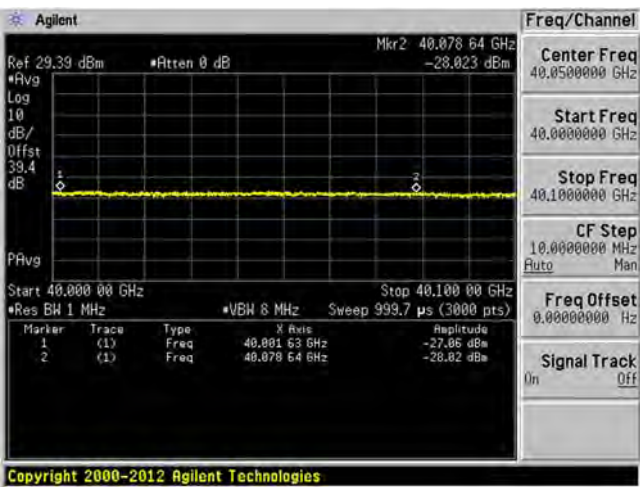


4CC-16QAM Beam ID=139 (Horizontal)

Low Channel

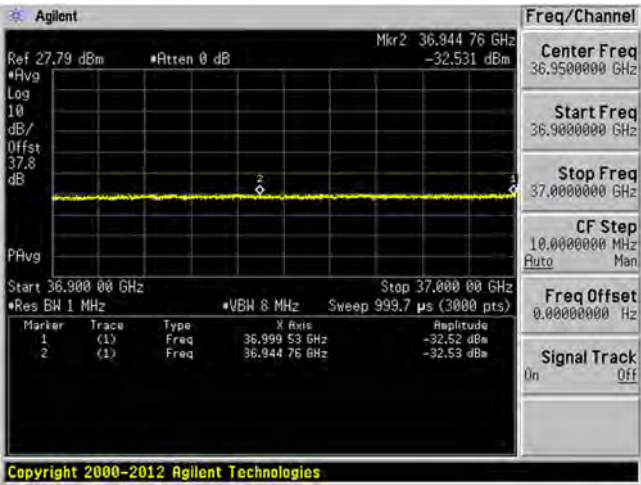


High Channel

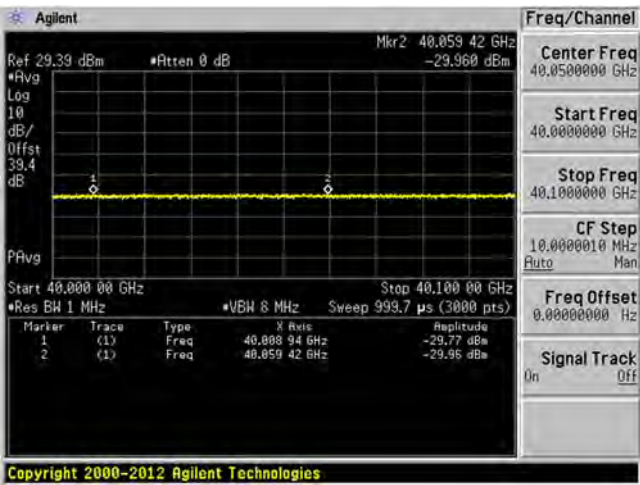


4CC-64QAM Beam ID=11 (Vertical)

Low Channel

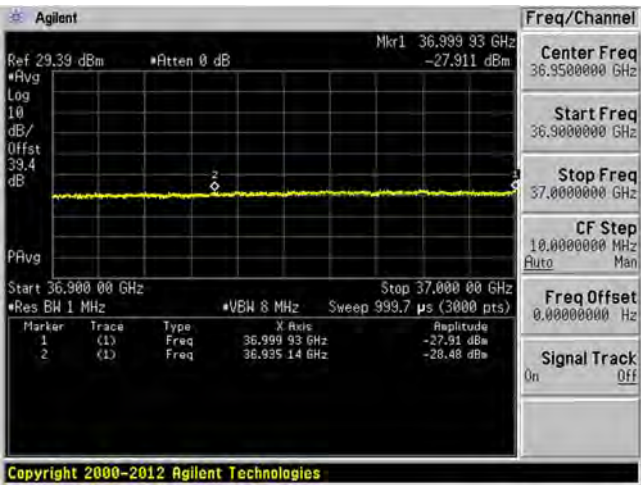


High Channel

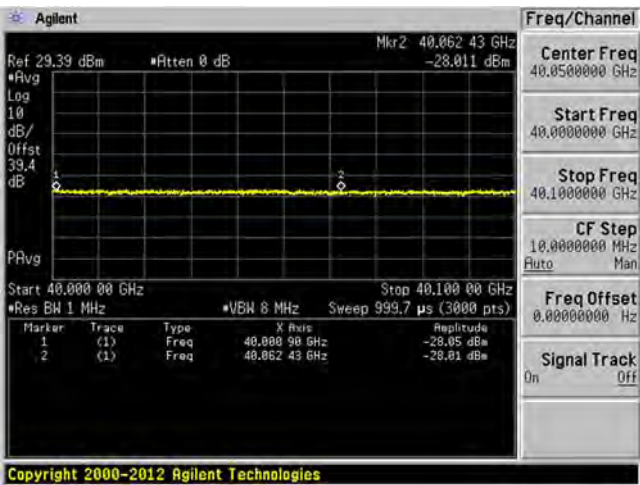


4CC-64QAM Beam ID=139 (Horizontal)

Low Channel



High Channel



11 FCC §2.1055 - Frequency Stability

11.1 Applicable Standards

As per FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

11.2 Measurement Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be recording the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be holding the ± 0.5 °C during the measurement testing. Each temperature step shall be at least 0.5 hours, consider the

EUT could be test under the stability condition.

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
HP	Spectrum Analyzer 46 GHz	E4446A	US44300386	2019-08-24	24 Months
-	RF Cable	-	-	Each Time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years
BACL	Temp and Humi Chamber	BTH-150-40	30078	2020-06-25	15 months
Interpower	Power Source	85510510	39711	-	-

Note¹: cable and attenuator included in the test set-up will be checked each time before testing.

Statement of Traceability: **BACL Corp.** attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with the latest version of A2LA policy P102 "A2LA Policy on Metrological Traceability".

11.4 Test Environmental Conditions

Temperature:	22-24 °C
Relative Humidity:	40-41 %
ATM Pressure:	103.1-104.1 kPa

The testing was performed by Giriraj Gurjar on 2021-07-28 at RF Site.

11.5 Test Results

Frequency Error Vs. Voltage

Voltage (Vac)	Measured Frequency (MHz)	Norminal Frequency (MHz)	Frequency Error (ppm)	Result
108	38499.84392	38500	-4.0540	Pass
120	38499.84379	38500	-4.0574	Pass
132	38499.84361	38500	-4.0621	Pass

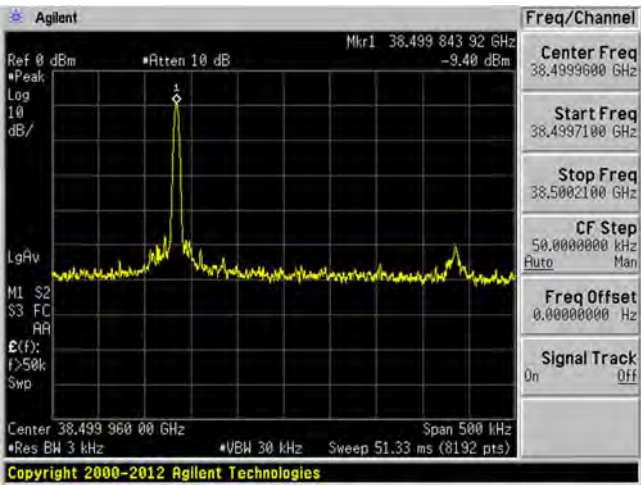
Frequency Error Vs. Temperature

Voltage (Vac)	Measured Frequency (MHz)	Norminal Frequency (MHz)	Frequency Error (ppm)	Result
0	38499.84239	38500	-4.0938	Pass
10	38499.84227	38500	-4.0969	Pass
20	38499.84227	38500	-4.0969	Pass
30	38499.84300	38500	-4.0779	Pass
40	38499.84453	38500	-4.0382	Pass
45	38499.84441	38500	-4.0413	Pass

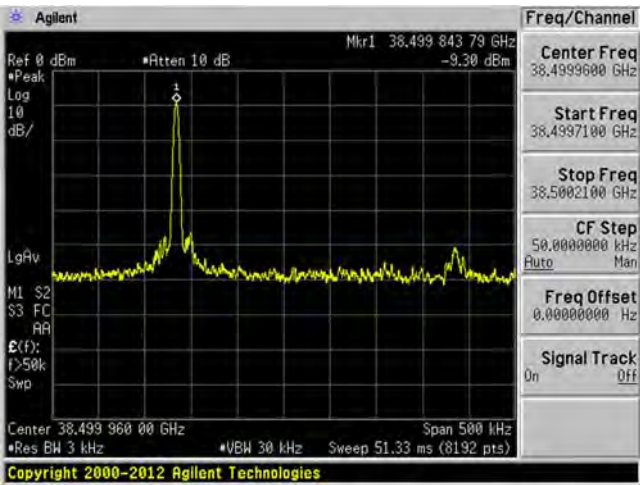
Please refer to the following plots.

Frequency Vs. Voltage

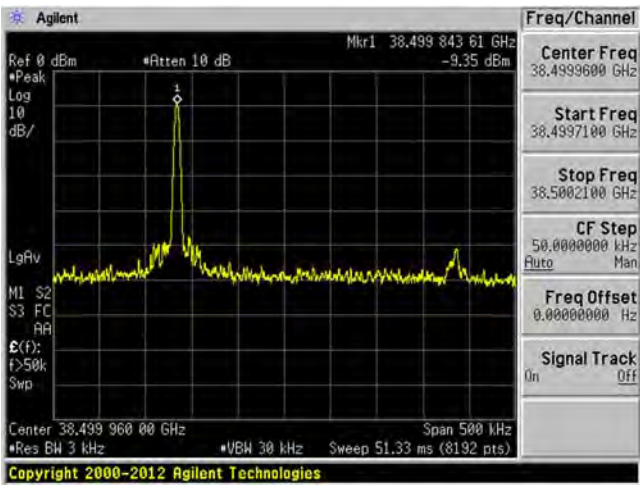
Low Voltage (108 V)



Normal Voltage (120 V)

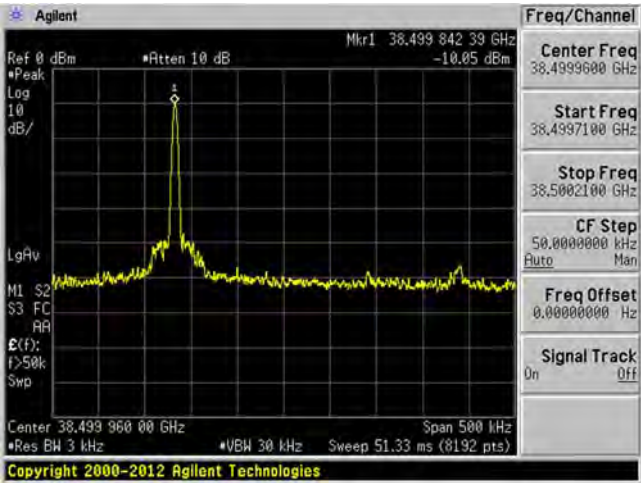


High Voltage (132 V)

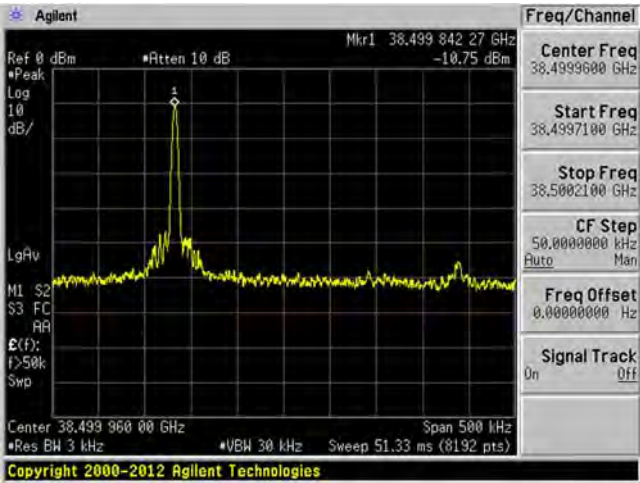


Frequency vs. Temperature

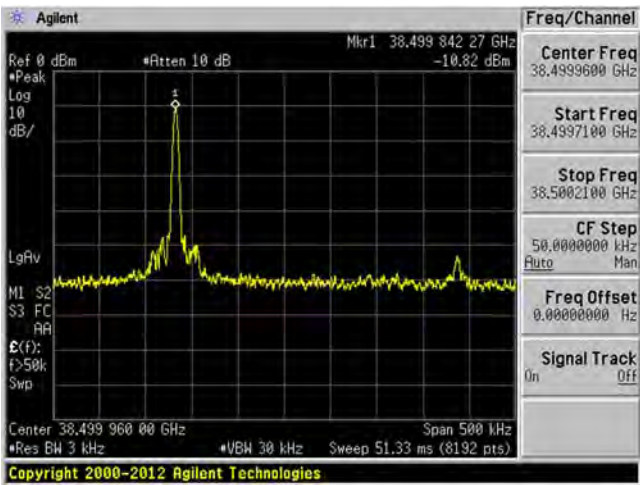
At 0 °C



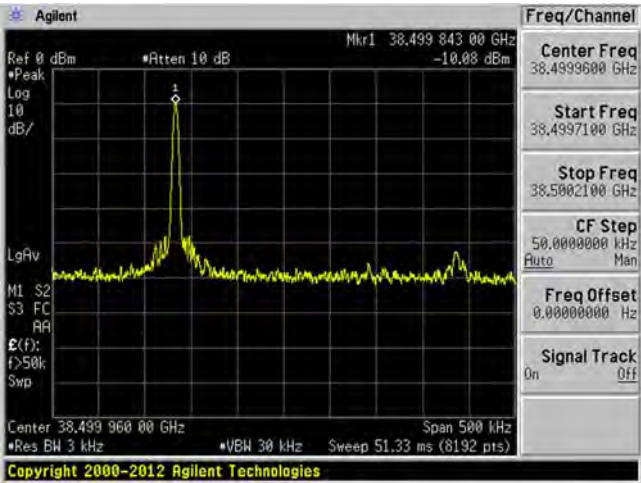
At 10 °C



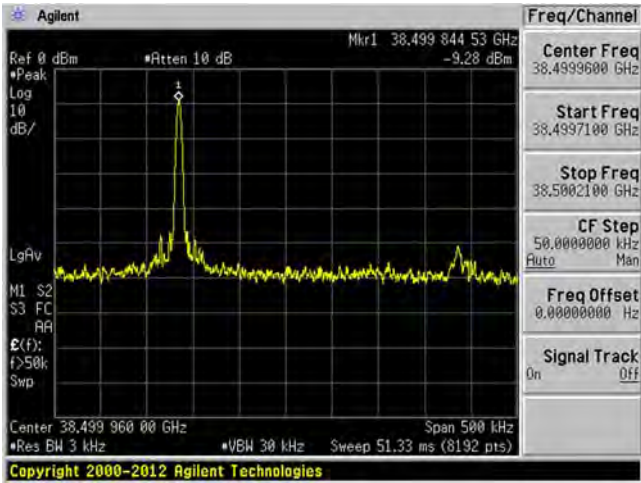
At 20 °C



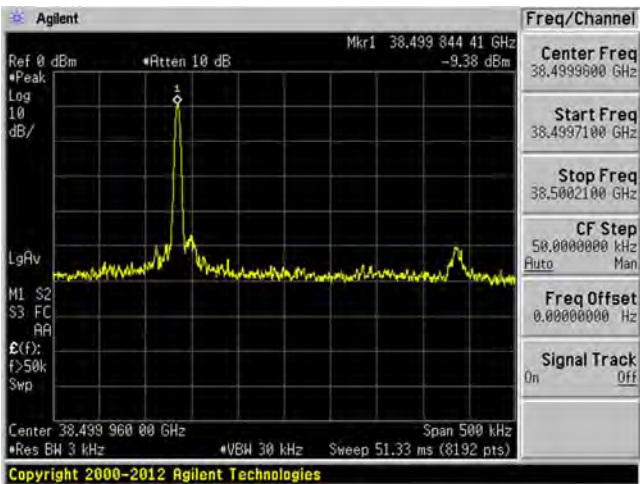
At 30 °C



At 40 °C



At 45°C



12 Annex A (Normative) - EUT Test Setup Photographs

Please refer to the attachment.

13 Annex B (Normative) - EUT External Photographs

Please refer to the attachment.

14 Annex C (Normative) - EUT Internal Photographs

Please refer to the attachment.

15 Annex D (Normative) - Equipment Calibration Certificates

Please refer to the attachment.

16 Annex E (Normative) - Accredited Test Firm Scope

OET Accredited Test firm scope List

Test Firm: **Bay Area Compliance Laboratories Corporation**

Scope	FCC Rule Parts	Maximum Assessed Frequency in Mhz	Status	Expiration Date	Recognition Date
Unintentional Radiators	FCC Part15, Subpart B	40000.00	Approved	09-30-2022	12-15-2020
Industrial, Scientific, and Medical Equipment	FCC Part 18	325000.00	Approved	09-30-2022	12-15-2020
Intentional Radiators	FCC Part 15 Subpart C	200000.00	Approved	09-30-2022	12-15-2020
UPCS	FCC Part 15, Subpart D	200000.00	Approved	09-30-2022	12-15-2020
U-NII without DFS	FCC Part 15, Subpart E	200000.00	Approved	09-30-2022	12-15-2020
Intentional Radiators	FCC Part 15, Subpart E	200000.00	Approved	09-30-2022	12-15-2020
U-NII with DFS	FCC Part 15, Subpart E	200000.00	Approved	09-30-2022	12-15-2020
Intentional Radiators	FCC Part 15, Subpart F	200000.00	Approved	09-30-2022	12-15-2020
UWB Intentional Radiators	FCC Part 15, Subpart F	200000.00	Approved	09-30-2022	12-15-2020
BPL Intentional Radiators	FCC Part 15, Subpart G	40000.00	Approved	09-30-2022	12-15-2020
White Space Device	FCC Part 15, Subpart H	200000.00	Approved	09-30-2022	12-15-2020
Intentional Radiators	FCC Part 15, Subpart H	200000.00	Approved	09-30-2022	12-15-2020
Commercial Mobile Services	Part 22 (cellular), Part 24, Part 25 (below 3 GHz), Part 27	200000.00	Approved	09-30-2022	12-15-2020
General Mobile Radio Services	Part 22 (non-cellular), Part 90 (below 3 GHz), Part 95 (below 3 GHz), Part 97 (below 3 GHz),Part 101 (below 3 GHz)	200000.00	Approved	09-30-2022	12-15-2020
Citizens Broadband Radio Services	Part 96	200000.00	Approved	03-31-2022	12-15-2020
Maritime and Aviation Radio Services	Part 80, Part 87	200000.00	Approved	09-30-2022	12-15-2020
Microwave and Millimeter Bands Radio Services	Part 25 (above 3 GHz), Part 30, Part 74, Part 90 (above 3 GHz), Part 95 (above 3 GHz), Part 97 (above 3 GHz) Part 101	200000.00	Approved	09-30-2022	12-15-2020
Broadcast Radio Services	Part 73, Part 74 (below 3 GHz)	200000.00	Approved	09-30-2022	12-15-2020
RF Exposure		6000.00	Approved	09-30-2022	12-15-2020
Hearing Aid Compatibility	Part 20	6000.00	Approved	09-30-2022	12-15-2020
Signal Boosters	Part 20, Part 90.219	200000.00	Approved	09-30-2022	12-15-2020

17 Annex F (Normative) - A2LA Electrical Testing Certificate**Accredited Laboratory**

A2LA has accredited

BAY AREA COMPLIANCE LABORATORIES CORP.

Sunnyvale, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets A2LA R222 - *Specific Requirements EPA ENERGY STAR Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 10th day of March 2021.

A blue ink signature of Trace McInturff.

Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2022

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

Please follow the web link below for a full ISO 17025 scope

<https://www.a2la.org/scopepdf/3297-02.pdf>

--- END OF REPORT ---