FCC PART 30

TEST REPORT

For

Corning Optical Communication LLC

475 Sycamore Drive, Milpitas, CA 95035, USA

FCC ID: OJFRN510

Report Type:	Product Type:
Class II Permissive Change Report	5G mmWave SmallCell Radio Node

Prepared By:	Giriraj Gurjar Test Engineer
Report Number:	R2106163
Report Date:	2021-07-28
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ACCREDITED
CERTIFICATE #3297.02

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2106163	Original report	2021-07-28

1 General Description

1.1 Product Description for Equipment under Test (EUT)

This test report was prepared on behalf of *Corning Optical Communication LLC*, and their product model: SCRN-510-28G1, FCC ID: OJFRN510 or the "EUT" as referred to in this report. It is a 5G mmWave SmallCell Radio Node. The device is a Fixed Base Station Device.

1.2 Mechanical Description of EUT

SCRN-510-28G1 measures approximately 30 cm (Length) x 30 cm (Width) x 10.5 cm (High), and weighs approximately 5.45kg.

The data gathered are from the production samples provided by Corning Optical Communication SN: 693920025

1.3 Objective

This report was prepared on behalf of Corning Optical Communication LLC in accordance with FCC Part 30.

The objective was to determine continue compliance with FCC Part 30 rules for EIRP, 99% Bandwidth, Out of Band Emissions at the Band-edge for the additionally enabled modulation and carrier component configurations. Based on engineering evaluation and preliminary scans, spurious emissions covered by the test report in the original filing represents the worst case. Therefore, spurious emissions for the additional modulation and carrier component are not covered in this report.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.26-2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services, and FCC KDB 842590 D01 Upper Microwave Flexible Use Service v01r01.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report.

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment;

Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.03)*** to certify

- For the USA (Federal Communications Commission):
  - 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  - 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  - 3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
  - 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
  - 2 All Scope 2-Licensed Personal Mobile Radio Services;
  - 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
  - 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
  - 5 All Scope 5-Licensed Fixed Microwave Radio Services
  - 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Info-Communications Development Authority (IDA)):
  - 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
  - 2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2
- For the Hong Kong Special Administrative Region:
  - 1 All Radio Equipment, per KHCA 10XX-series Specifications;
  - 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  - 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  - 1 MIC Telecommunication Business Law (Terminal Equipment):
    - All Scope A1 - Terminal Equipment for the Purpose of Calls;
    - All Scope A2 - Other Terminal Equipment
  - 2 Radio Law (Radio Equipment):
    - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
    - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
    - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

D- ***A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Innovation, Science and Economic development Canada - ISEDC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
  - Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
  - Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Media Development Authority - IMDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
  - Nationally Recognized Test Laboratory (NRTL) – US OSHA
- Vietnam: APEC Tel MRA -Phase I;

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.26-2015 and FCC KDB 842590 D01 Upper Microwave Flexible Use Service v01r01.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The test software used was QRCT. The software is compliant with the standard requirements being tested against.

Beam ID tested was selected based on customer's declaration for worst case. The following configurations were enabled by software in addition to the radio configurations that was tested in the original FCC ID filing. Please refer to the power setting below.

Bandwidth (MHz)	Polarity	Beam ID	Mode	Channel No.	Frequency (MHz)	Power Settings
100 (1CC)	Vertical	11	16QAM	2071666	27550	430
				2077916	27925	430
				2084166	28300	430
	Horizontal	139	16QAM	2071666	27550	430
				2077916	27925	430
				2084166	28300	430
200 (2CC)	Vertical	11	QPSK	2072500	27600	430
				2077918	27925	430
				2083332	28250	430
			16QAM	2072500	27600	430
				2077918	27925	430
				2083332	28250	430
			64QAM	2072500	27600	430
				2077918	27925	430
				2083332	28250	430
	Horizontal	139	QPSK	2072500	27600	430
				2077918	27925	430
				2083332	28250	430
			16QAM	2072500	27600	430
				2077918	27925	430
				2083332	28250	430
			64QAM	2072500	27600	430
				2077918	27925	430
				2083332	28250	430

Bandwidth (MHz)	Polarity	Beam ID	Mode	Channel No.	Frequency (MHz)	Power Settings
300 (3CC)	Vertical	11	QPSK	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
			16QAM	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
			64QAM	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
	Horizontal	139	QPSK	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
			16QAM	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
			64QAM	2073333	27650	430
				2077915	27925	430
				2082499	28200	430
400 (4CC)	Vertical	11	16QAM	2074166	27700	430
				2077918	27925	430
				2081666	28150	430
	Horizontal	139	16QAM	2074166	27700	430
				2077918	27925	430
				2081666	28150	430

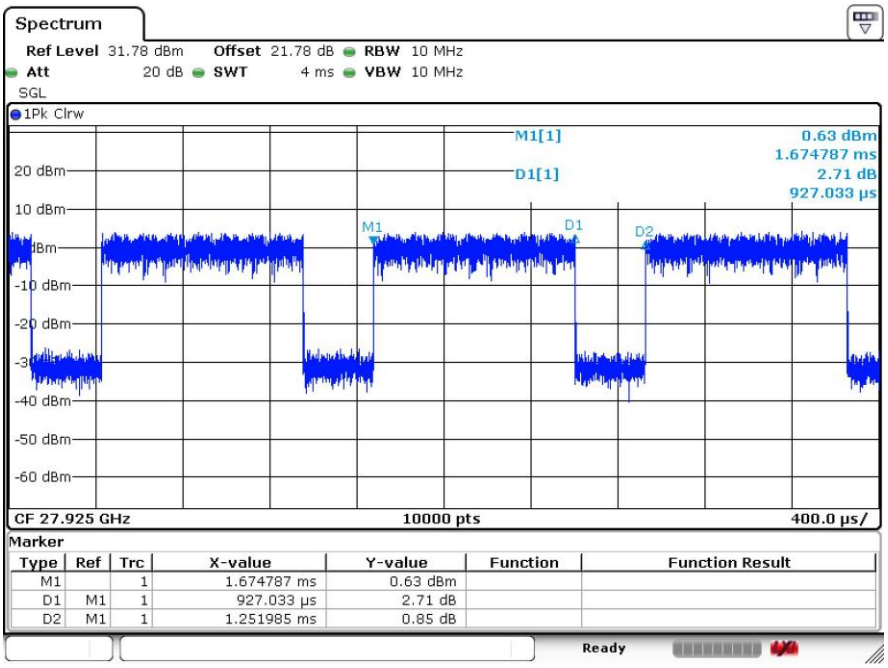
2.3 Duty Cycle Correction Factor

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
1CC-16QAM	0.927	1.251985	74.04242	1.86948
2CC-QPSK	0.923	1.252585	73.68761	1.86739
2CC-16QAM	0.927	1.253985	73.92433	1.86879
2CC-64QAM	0.929	1.249985	74.32089	1.87111
3CC-QPSK	0.928	1.252385	74.09862	1.86981
3CC-16QAM	0.928	1.252385	74.09862	1.86981
3CC-64QAM	0.928	1.251985	74.12229	1.86995
4CC-16QAM	0.927	1.249985	74.16089	1.87017

Note: Duty Cycle = On Time (ms)/ Period (ms)
Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

Please refer to the following plots.

1CC-16QAM



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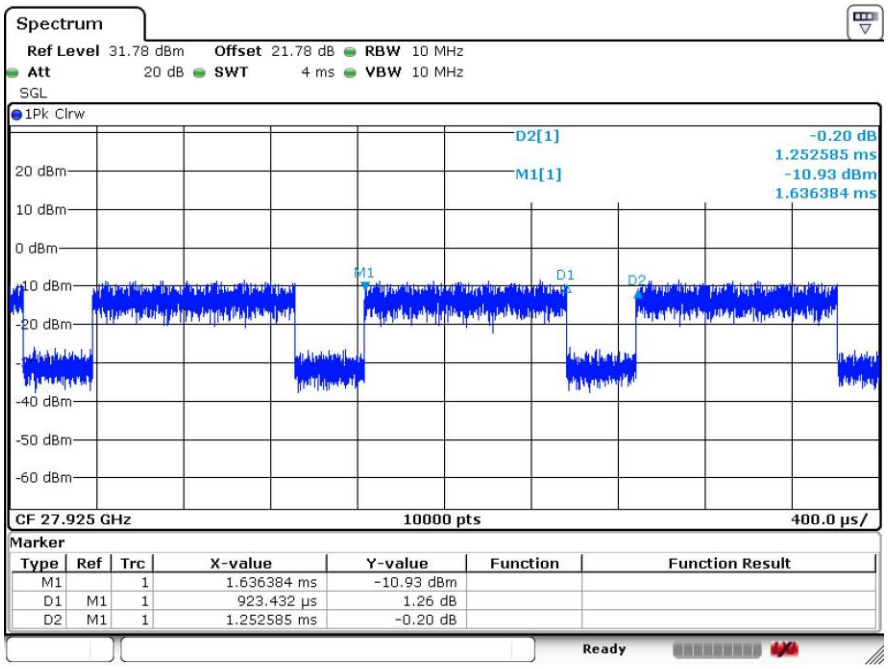
2CC – QPSK



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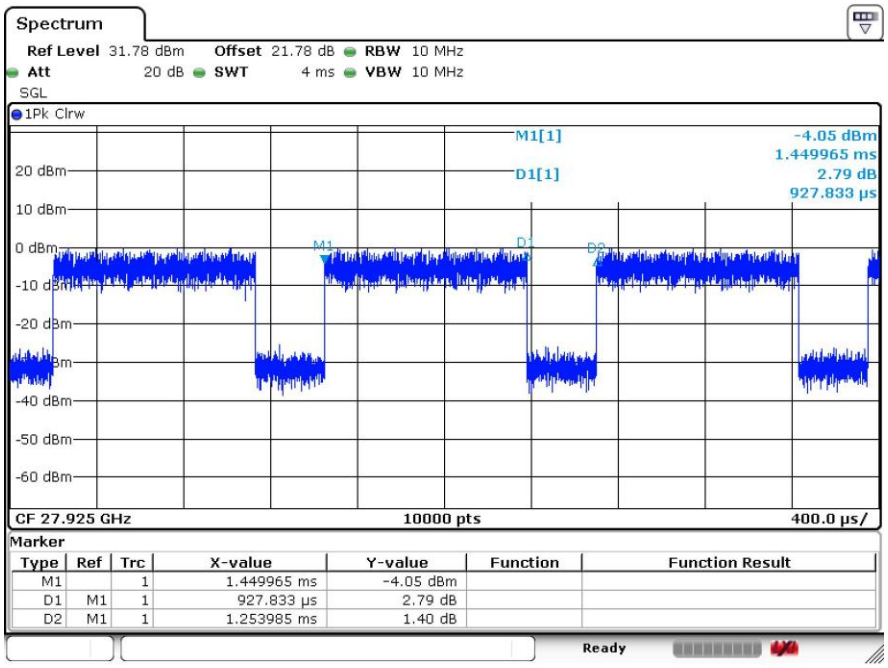

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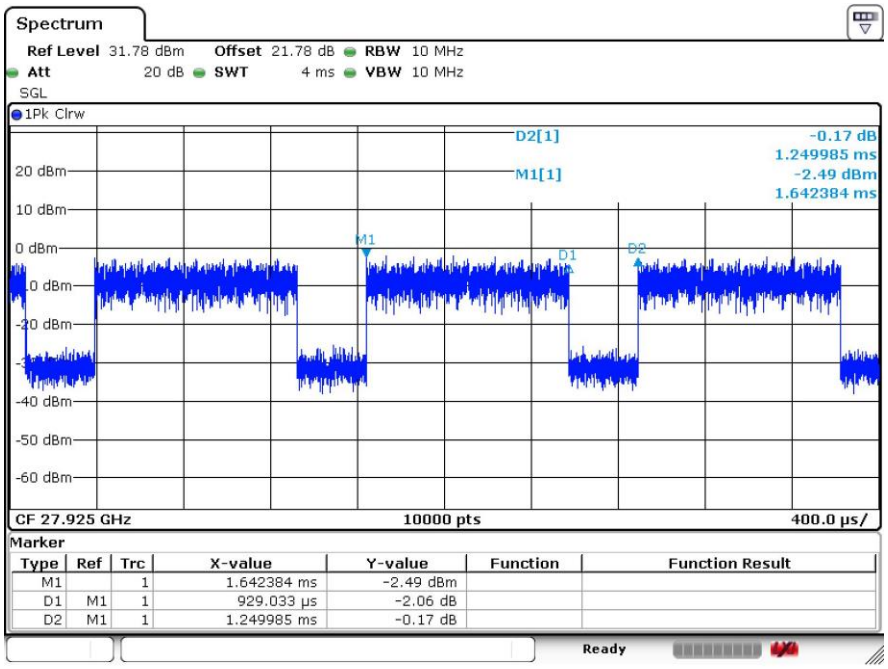

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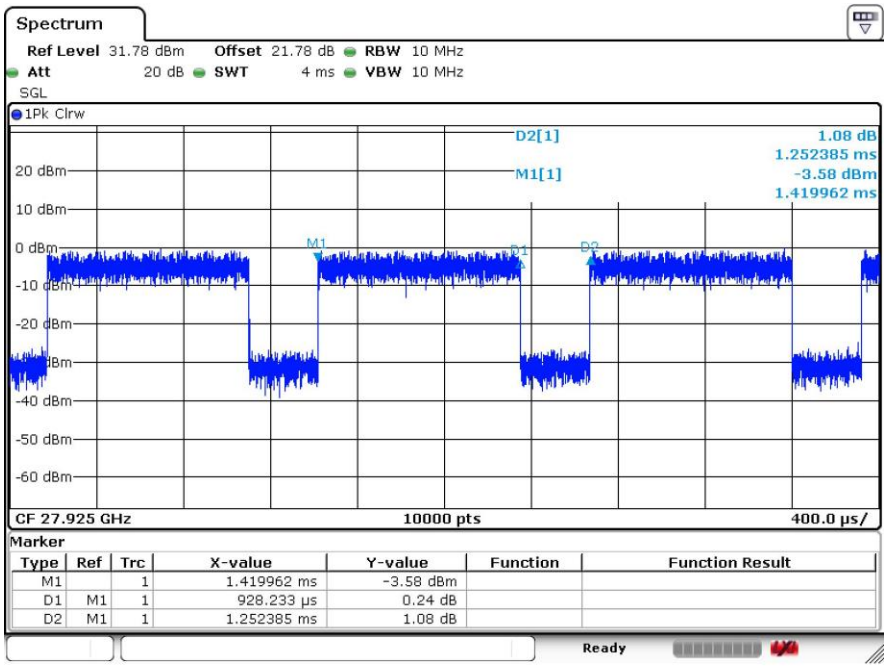

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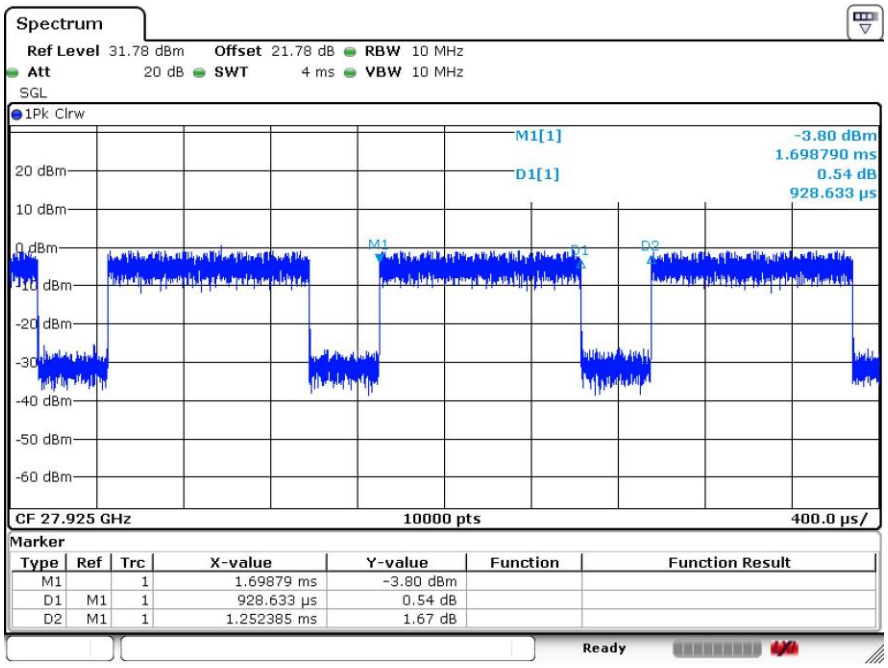

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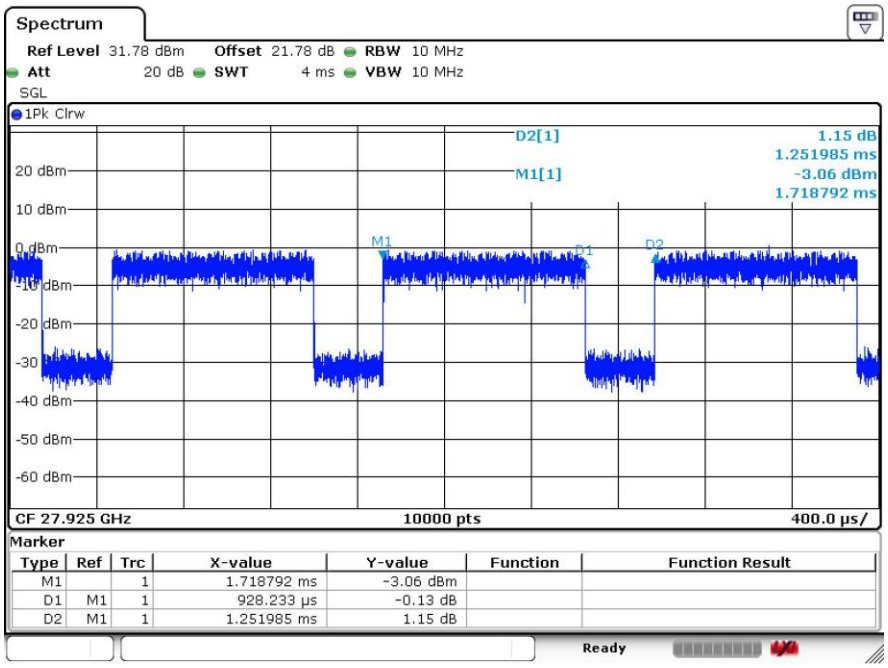

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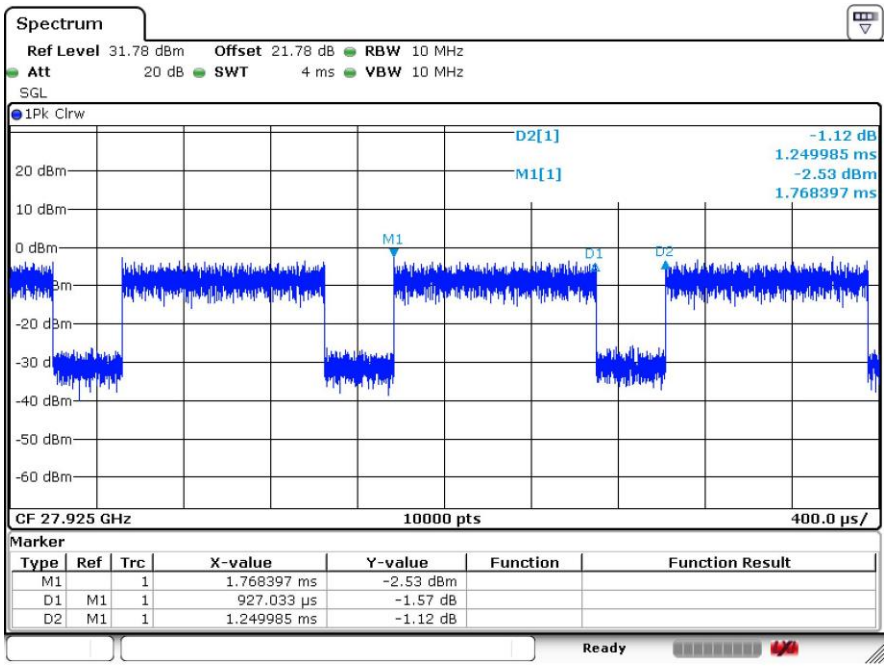
4CC – 16QAM



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2.4 Equipment Modifications

None

2.5 Local Support Equipment

None

2.6 Remote Support Equipment

Manufacturer	Description	Model
Dell	Laptop	Latitude E5520
MikroTik	10 Gigabit SFP+ Switch	CRS305-1G-4S+IN

2.7 Interface Ports and Cabling

Cable Description	Length (m)	To	From
Ethernet Cable	1m	Laptop	Switch
Power Cable	> 5m	EUT	Power Source
Fiber Cable	> 10 m	EUT	Switch

3 Summary of Test Results

FCC Rules	Description of Test	Result
§2.1049	99% Bandwidth	Compliant
§2.1051, §30.202(a)	EIRP	Compliant
§2.1053, §30.203	Out of Band Emission at the Band-edge	Compliant

4 FCC §2.1049 - Occupied Bandwidth

4.1 Applicable Standards

As per FCC §2.1049, Occupied bandwidth of tranmissions falls within authorized bands

4.2 Measurement Procedure

1. The spectrum analyzer's automatic bandwidth measurement function was used to perform the 99% occupied bandwidth measurement.

2. Set the RBW =1~5% of the anticipated OBW, and the VBW≥3 x RBW.

3. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

4. Sweep = auto couple.

5. Record the test plots and test results.

4.3 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 years
-	RF Cable	-	-	Each Time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years

Note[1]: 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".*

4.4 Test Environmental Conditions

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

The testing was performed by Giriraj Gurjar on 2021-06-21 at 5m3 chamber.

4.5 Test Results

Please refer to the following tables and plots.

Beam ID: 11 (Vertical)

Band	Component Carriers	Modulation	Channel	Occupied Bandwidth (MHz)
n261	1CC	16QAM	Low	94.7103
			Middle	94.3702
			High	94.5270
	2CC	QPSK	Low	193.3898
			Middle	193.2216
			High	193.6434
		16QAM	Low	193.4998
			Middle	194.4602
			High	193.8463
		64QAM	Low	195.2616
			Middle	193.8483
			High	194.7358
	3CC	QPSK	Low	292.3500
			Middle	291.8351
			High	291.3982
		16QAM	Low	293.3109
			Middle	292.5046
			High	292.1315
		64QAM	Low	293.5785
			Middle	291.9825
			High	291.3963
	4CC	16QAM	Low	392.2019
			Middle	390.4703
			High	390.0466

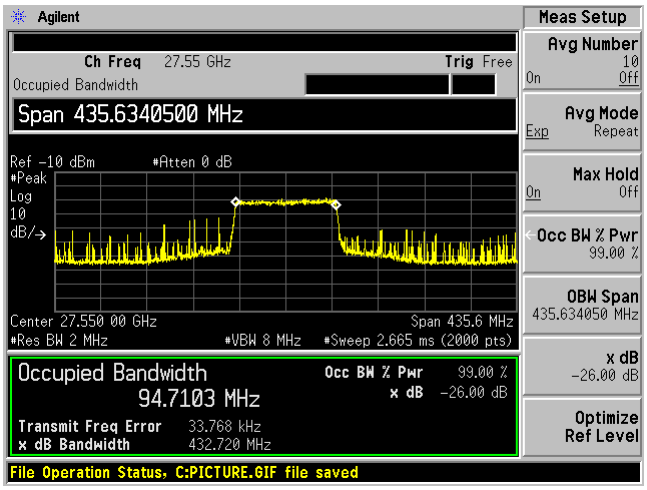
Beam ID: 139 (Horizontal)

Band	Component Carriers	Modulation	Channel	Occupied Bandwidth (MHz)
n261	1CC	16QAM	Low	95.4530
			Middle	95.5862
			High	95.4557
	2CC	QPSK	Low	194.5497
			Middle	193.9512
			High	194.0296
		16QAM	Low	193.3512
			Middle	193.8076
			High	193.9998
		64QAM	Low	194.8569
			Middle	194.5146
			High	193.1813
	3CC	QPSK	Low	292.7444
			Middle	291.6593
			High	291.0580
		16QAM	Low	292.5204
			Middle	291.9278
			High	291.5456
		64QAM	Low	292.2039
			Middle	291.6827
			High	291.7019
	4CC	16QAM	Low	391.9357
			Middle	390.8074
			High	390.7109

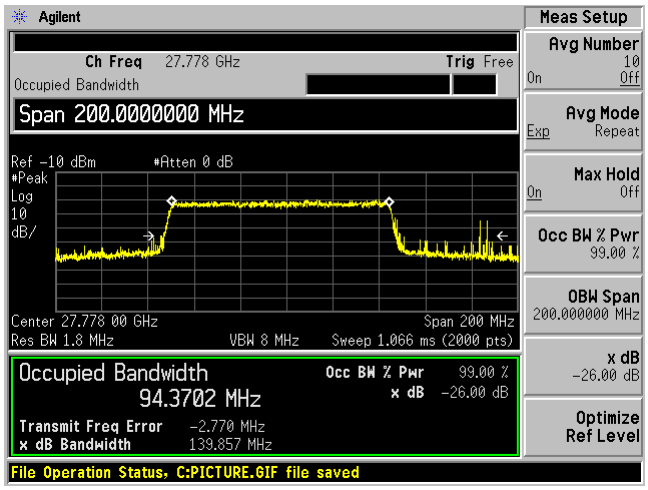
Beam ID: 11 (Vertical)

1CC – 16QAM

Low Channel



Middle Channel



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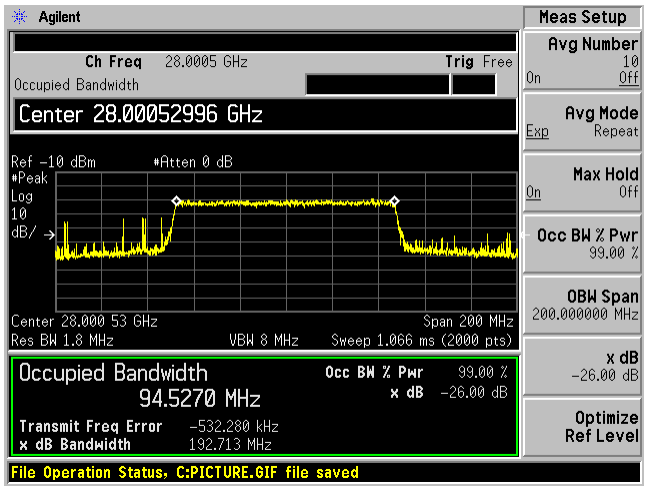

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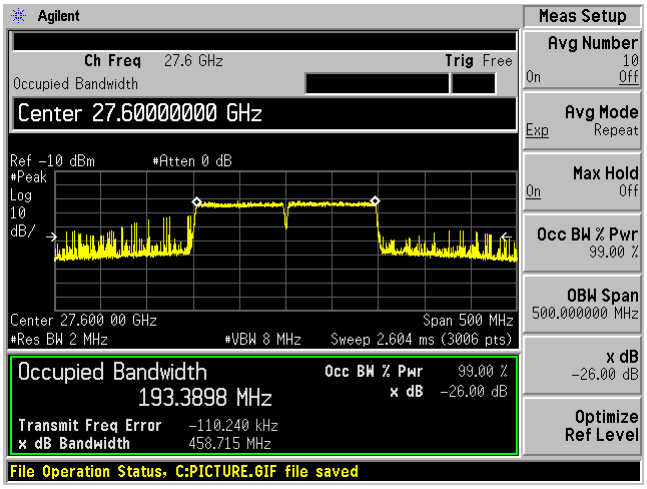
2CC - QPSK

Low Channel



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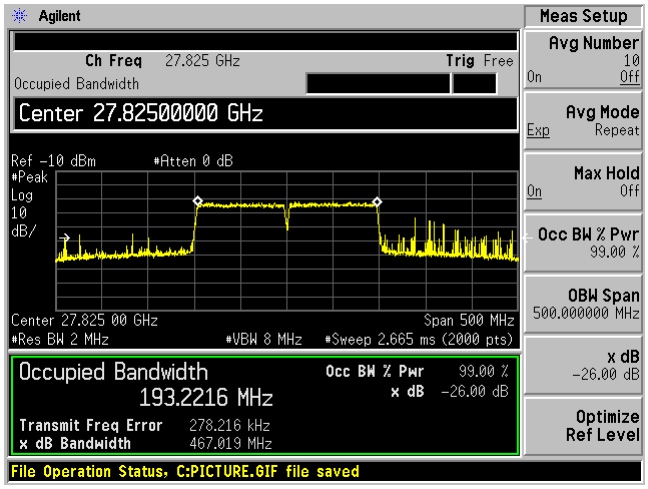

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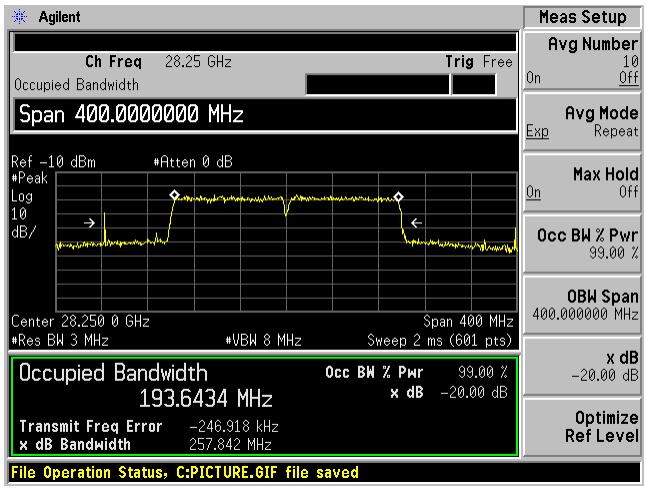

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2CC – 16QAM

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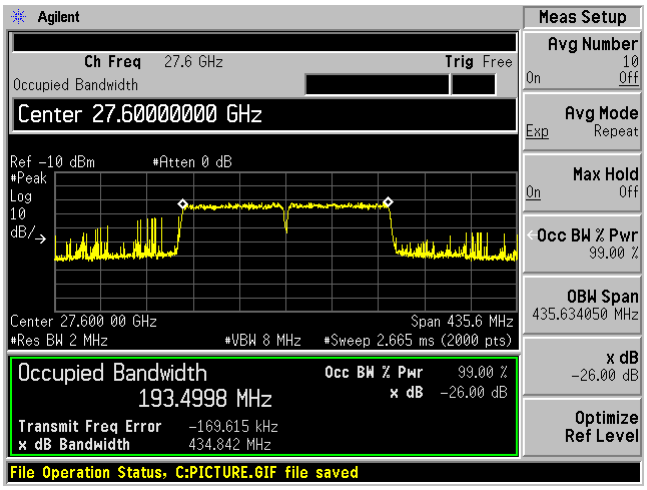

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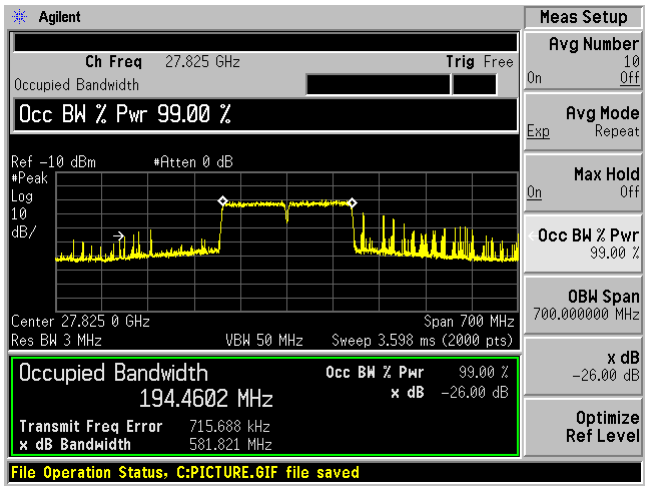

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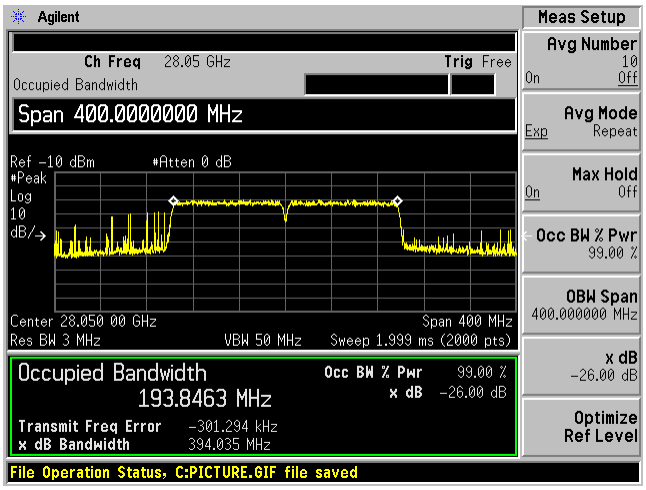

Beam ID: 11 (Vertical)

2CC – 64QAM

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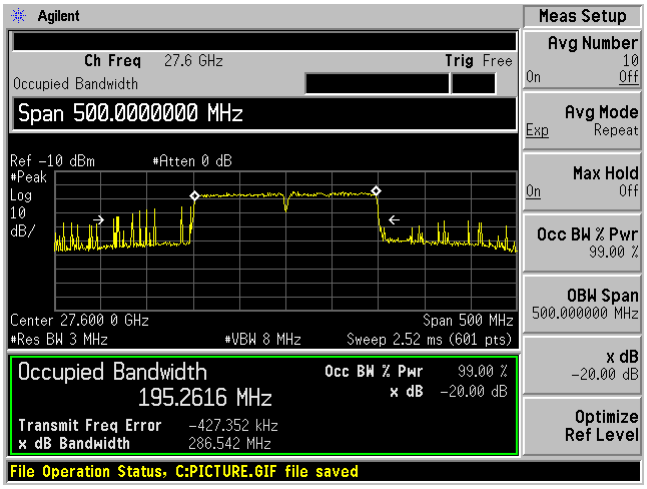

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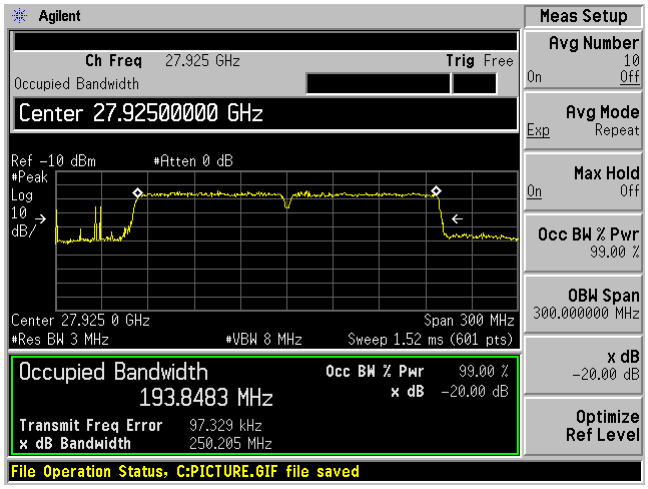

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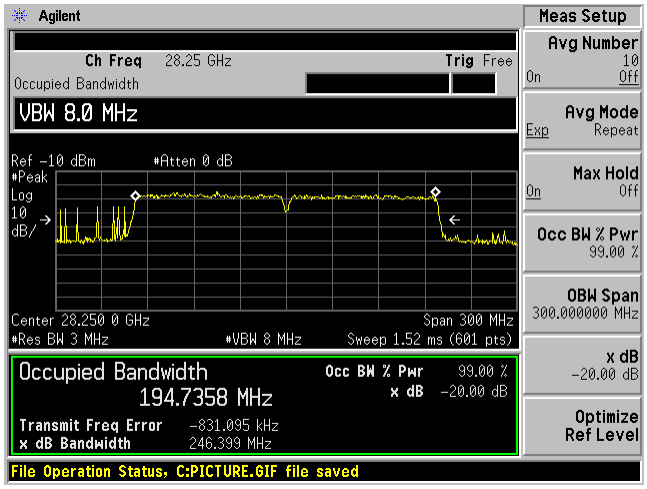
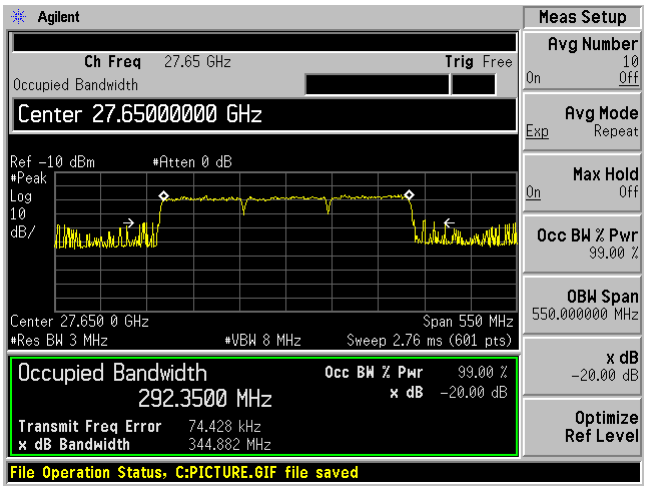


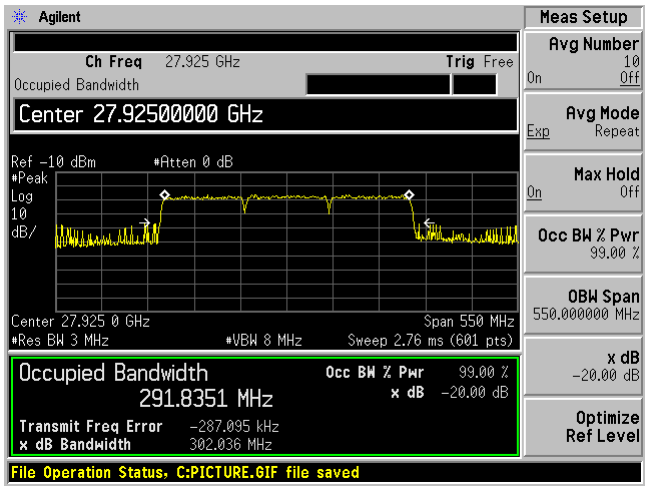
Beam ID: 11 (Vertical)

3CC - QPSK

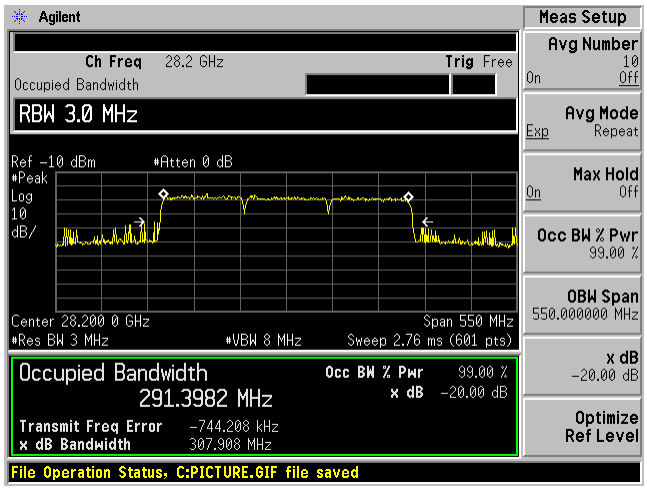
Low Channel



Middle Channel



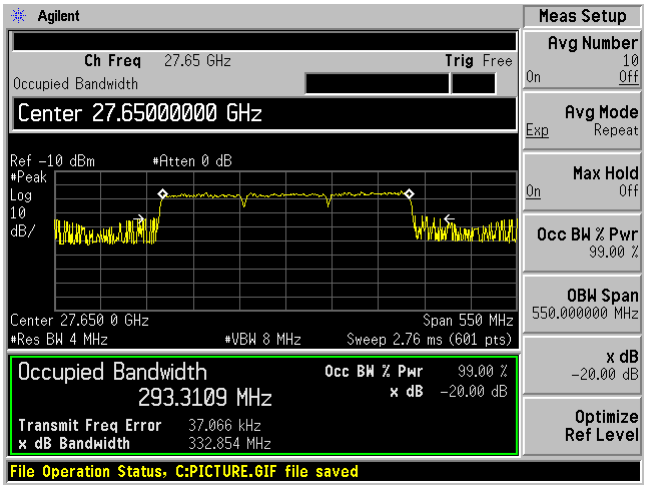
High Channel



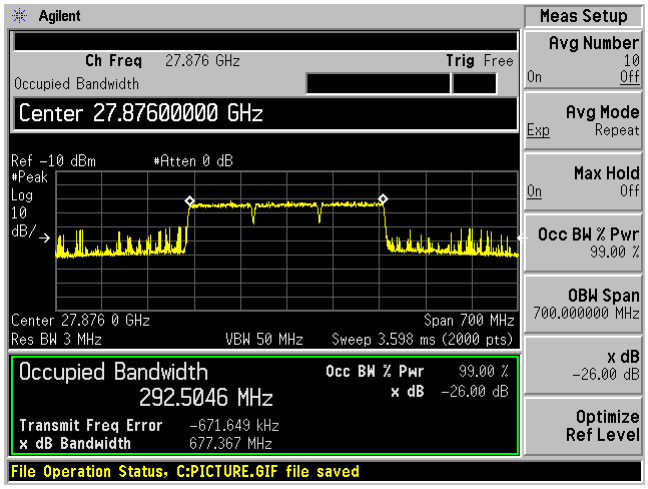
Beam ID: 11 (Vertical)

3CC – 16QAM

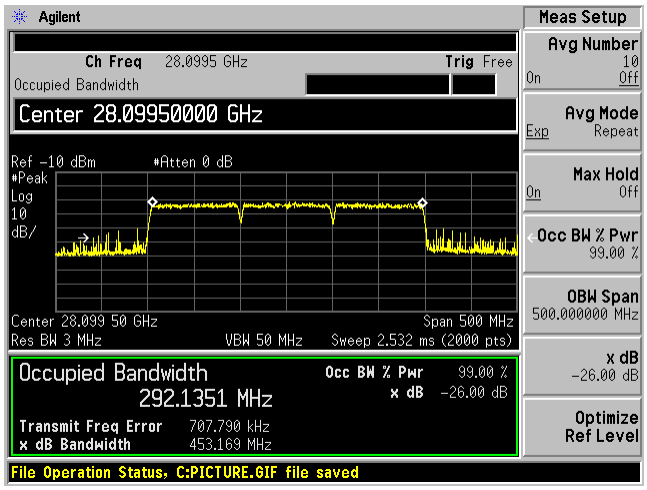
Low Channel



Middle Channel



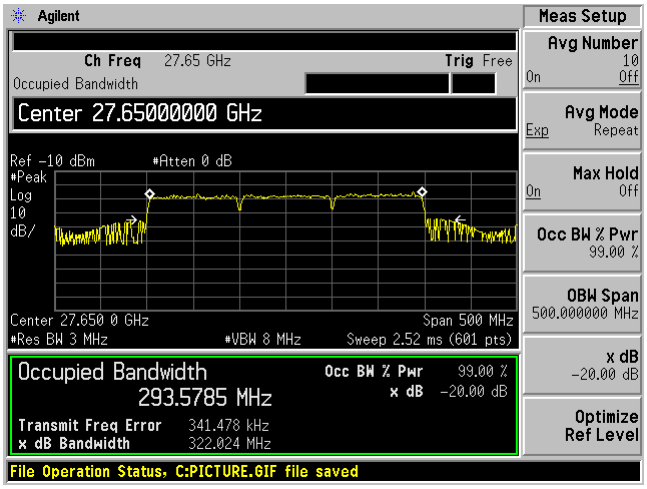
High Channel



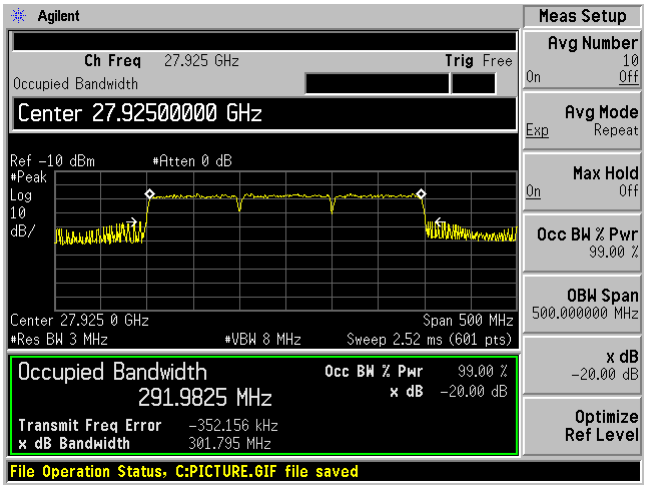
Beam ID: 11 (Vertical)

3CC – 64QAM

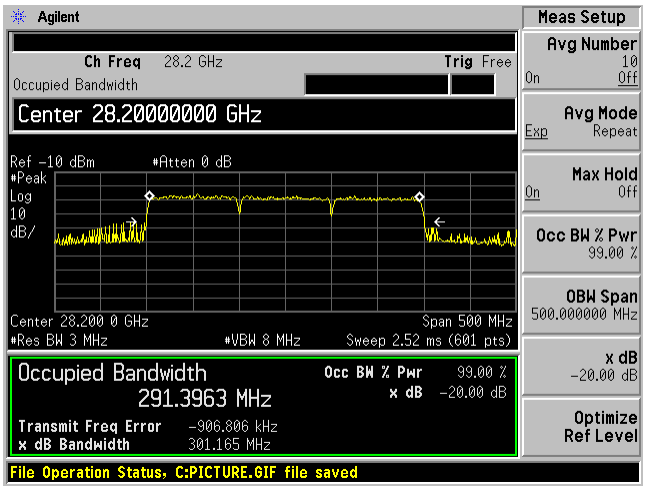
Low Channel



Middle Channel



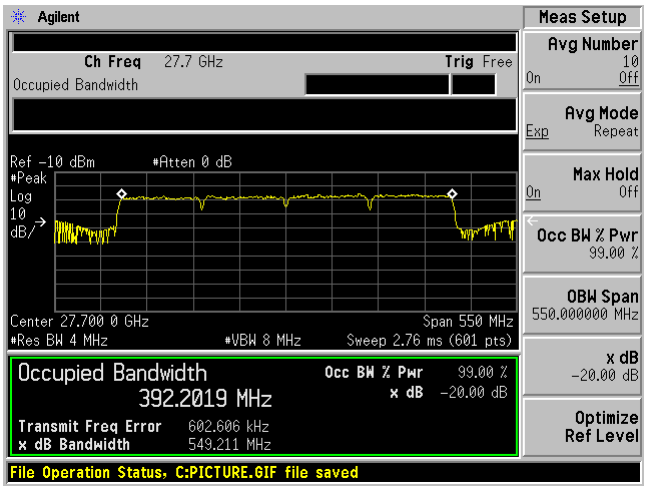
High Channel



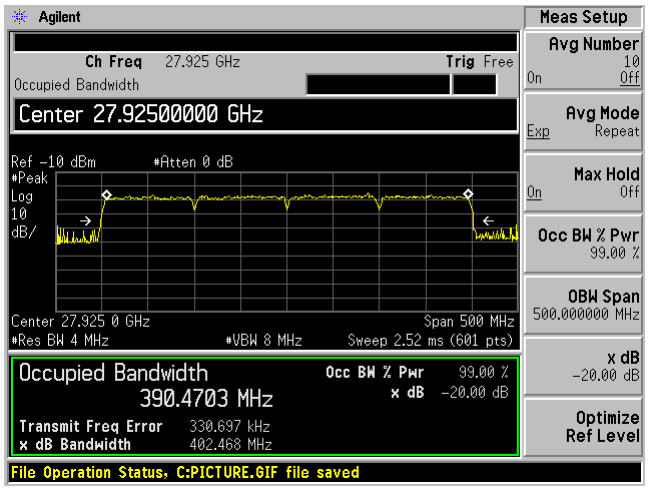
Beam ID: 11 (Vertical)

4CC – 16QAM

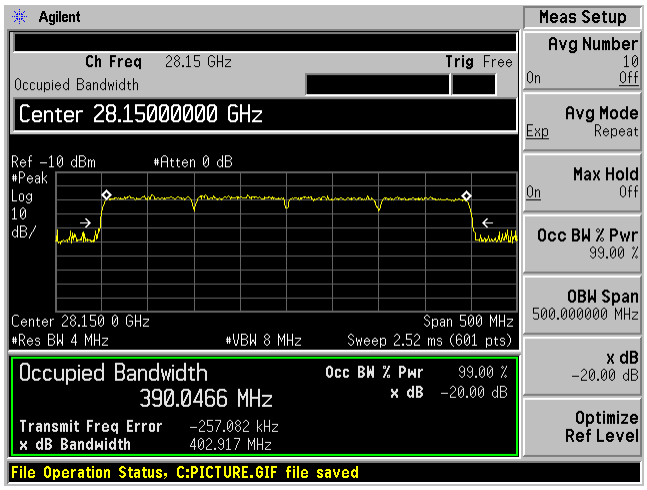
Low Channel



Middle Channel



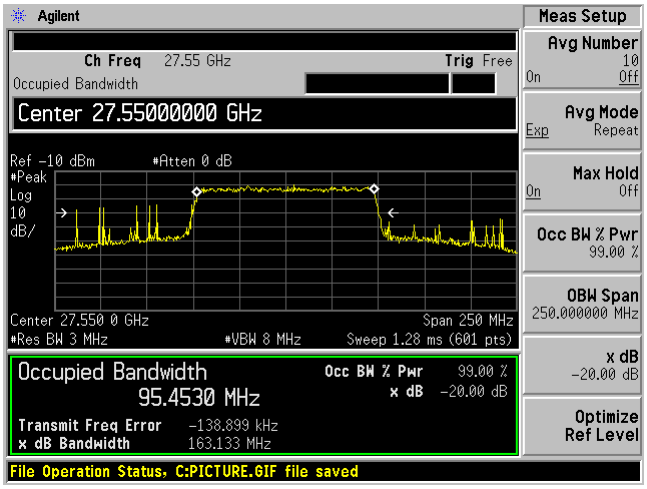
High Channel



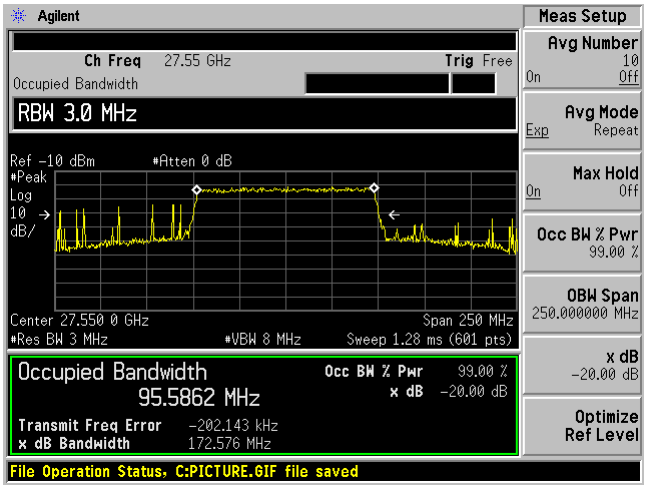
Beam ID: 139 (Horizontal)

1CC – 16QAM

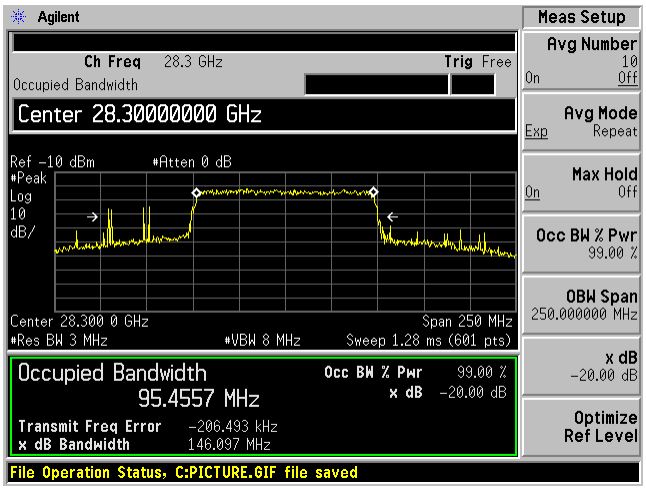
Low Channel



Middle Channel



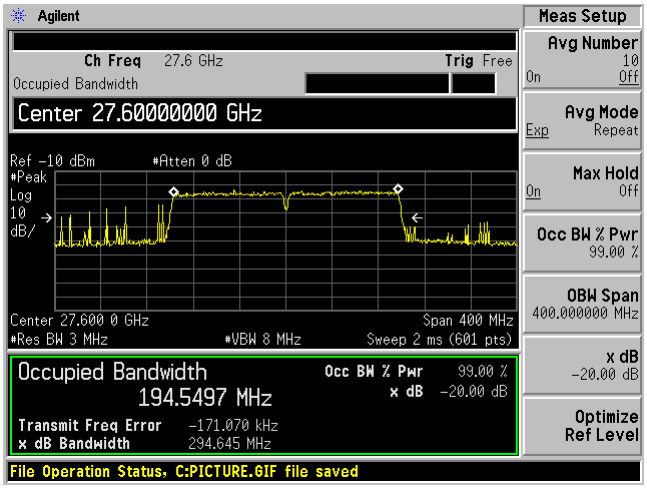
High Channel



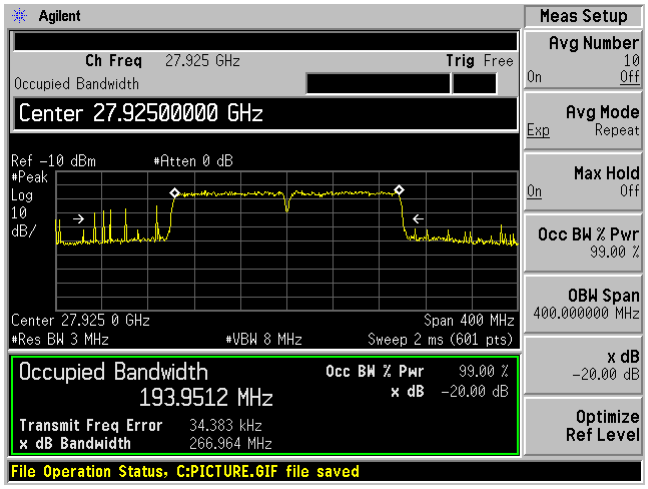
Beam ID: 139 (Horizontal)

2CC – QPSK

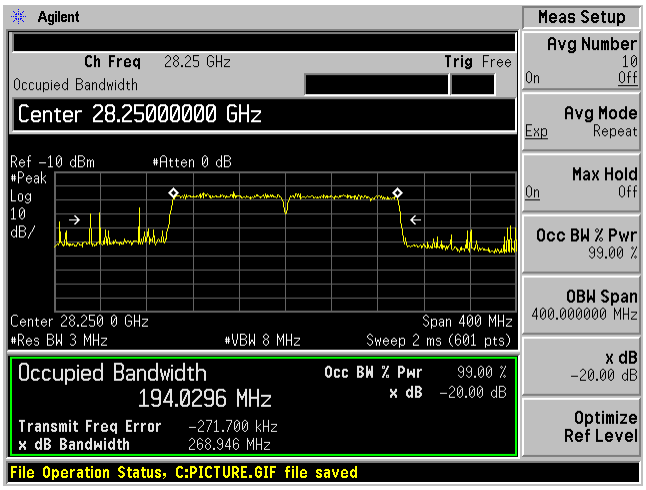
Low Channel



Middle Channel



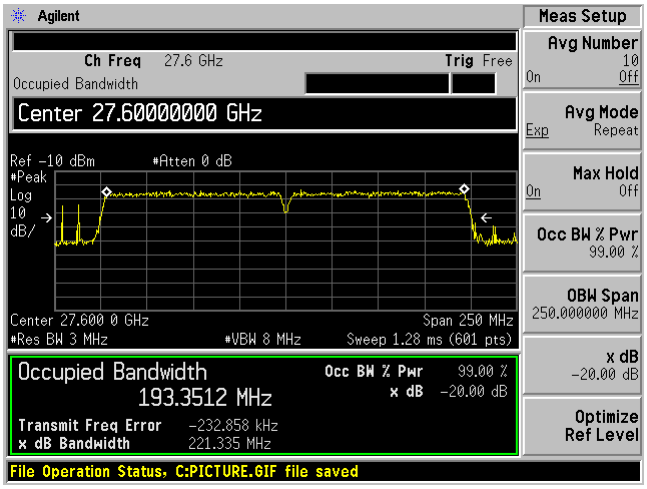
High Channel



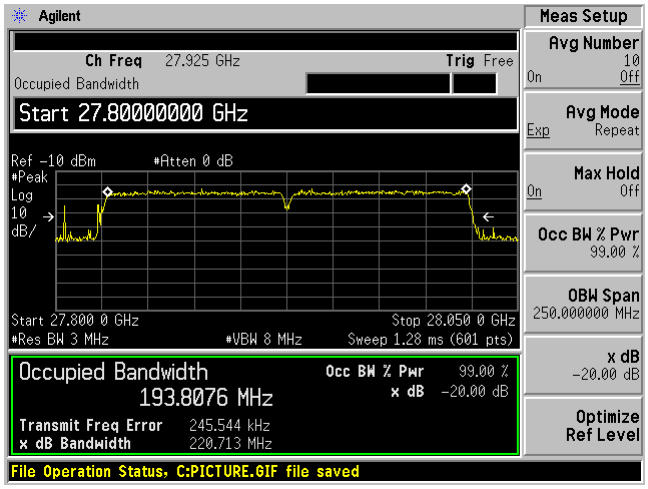
Beam ID: 139 (Horizontal)

2CC – 16QAM

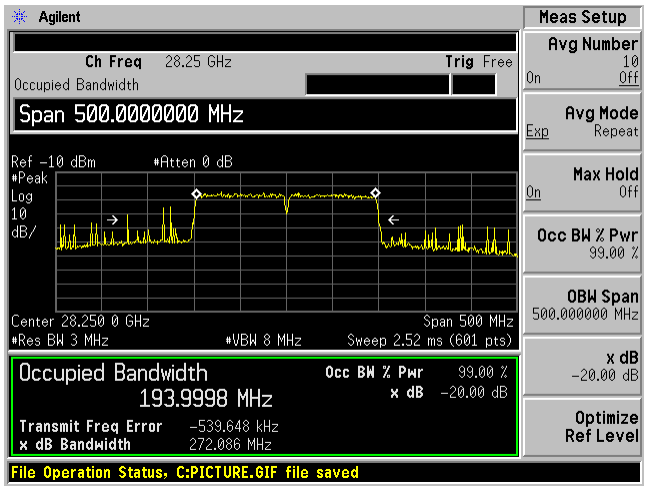
Low Channel



Middle Channel



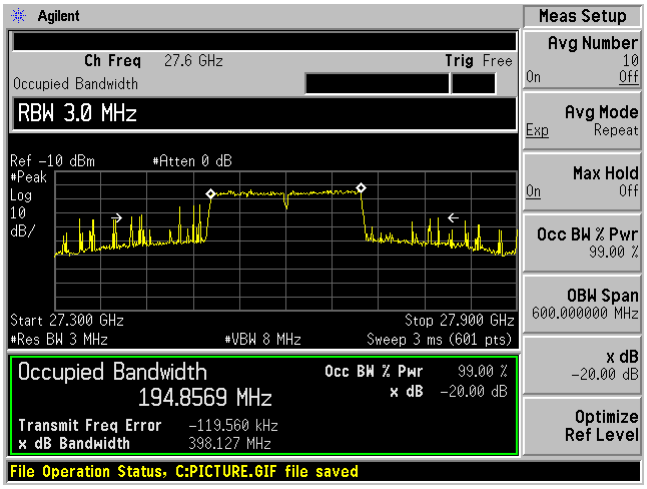
High Channel



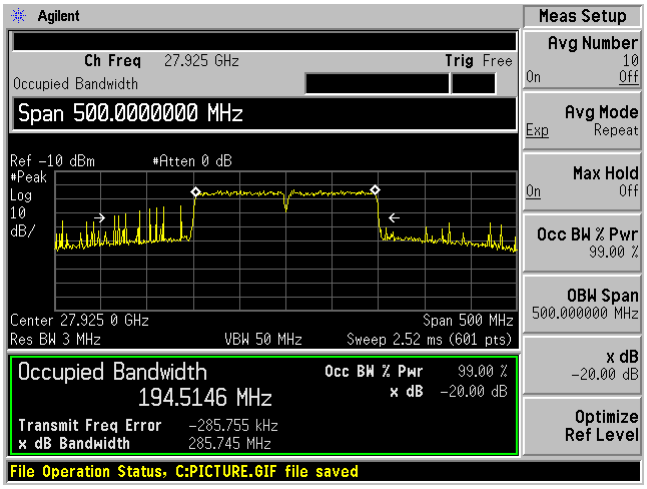
Beam ID: 139 (Horizontal)

2CC – 64QAM

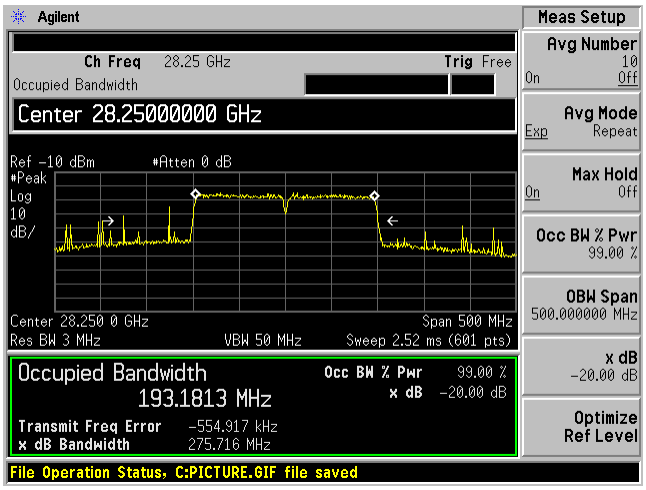
Low Channel



Middle Channel



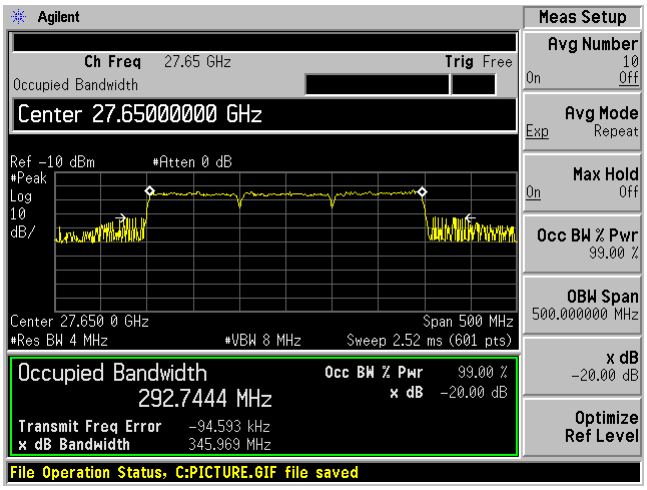
High Channel



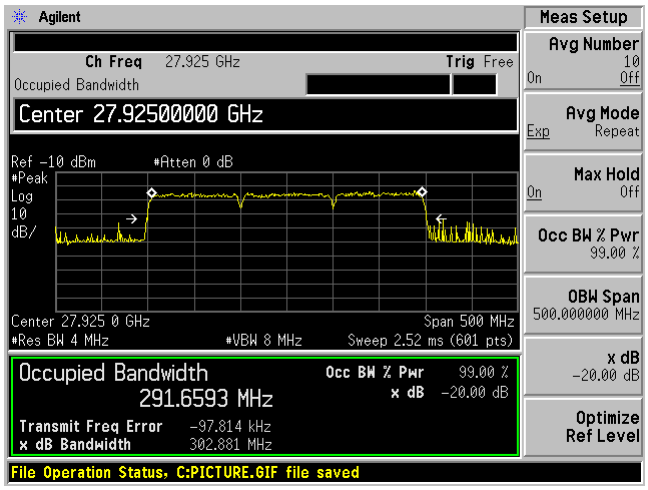
Beam ID: 139 (Horizontal)

3CC – QPSK

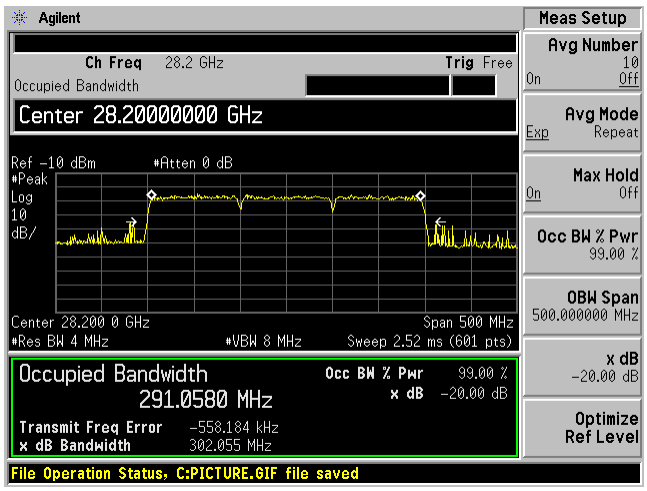
Low Channel



Middle Channel



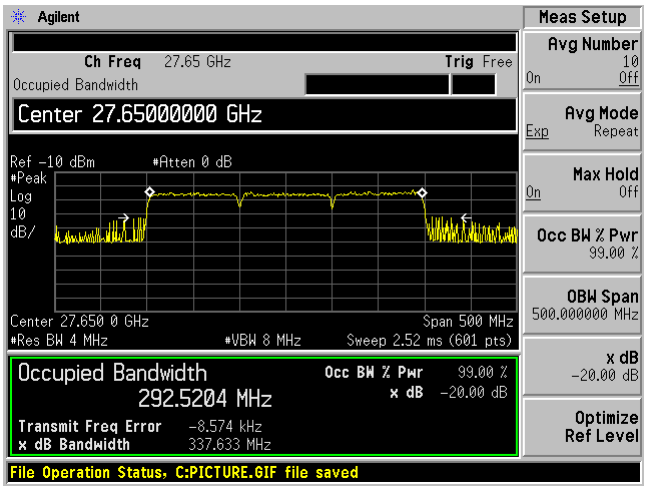
High Channel



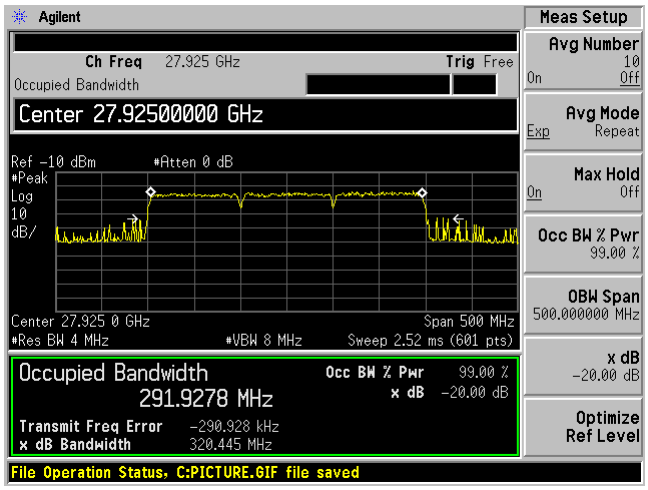
Beam ID: 139 (Horizontal)

CC – 16QAM

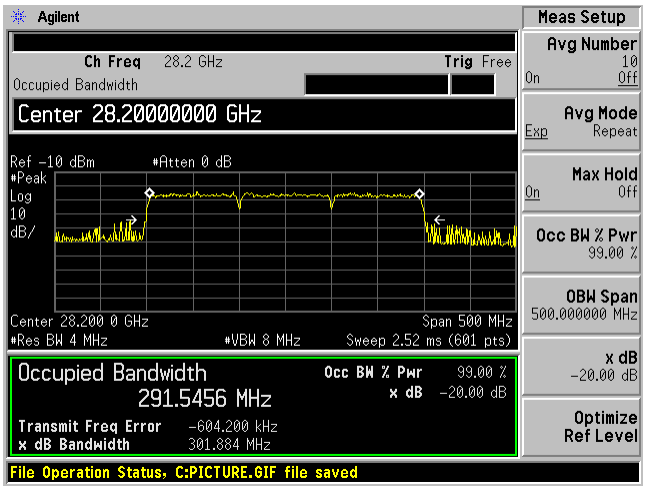
Low Channel



Middle Channel



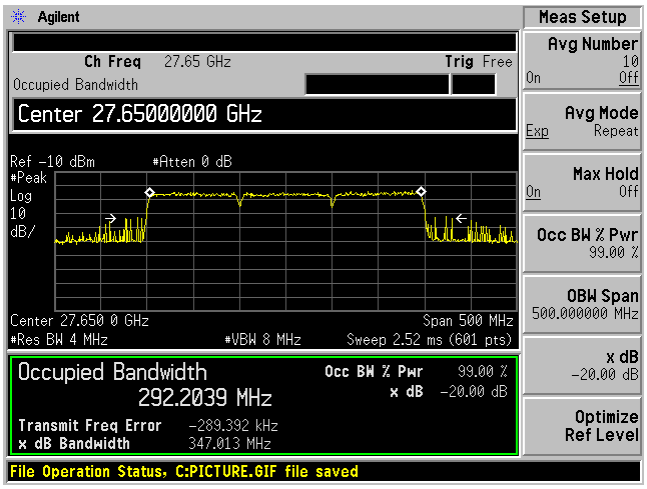
High Channel



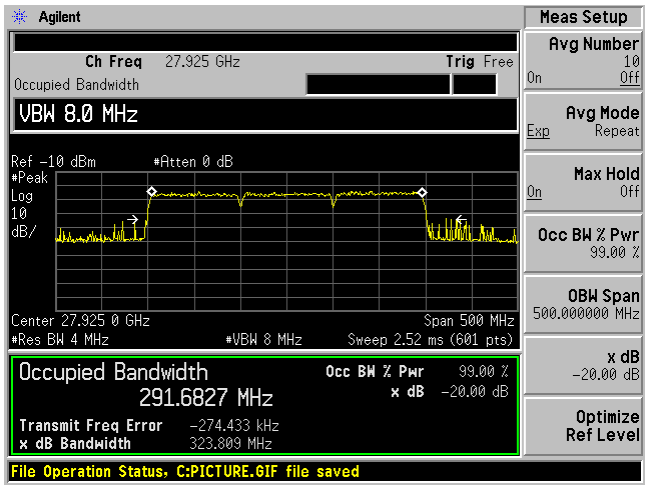
Beam ID: 139 (Horizontal)

3CC – 64QAM

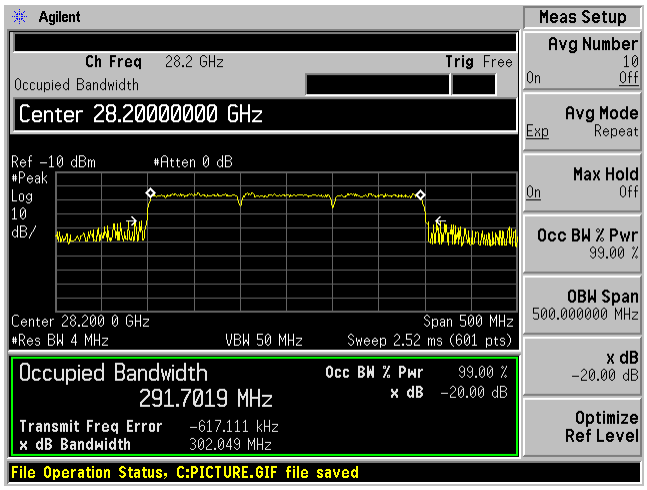
Low Channel



Middle Channel



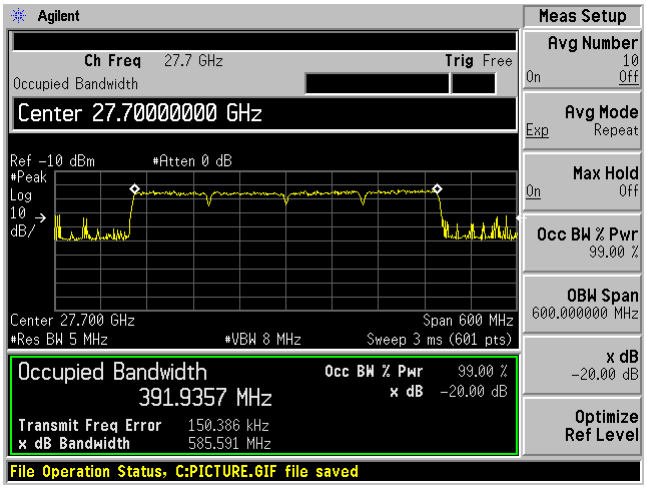
High Channel



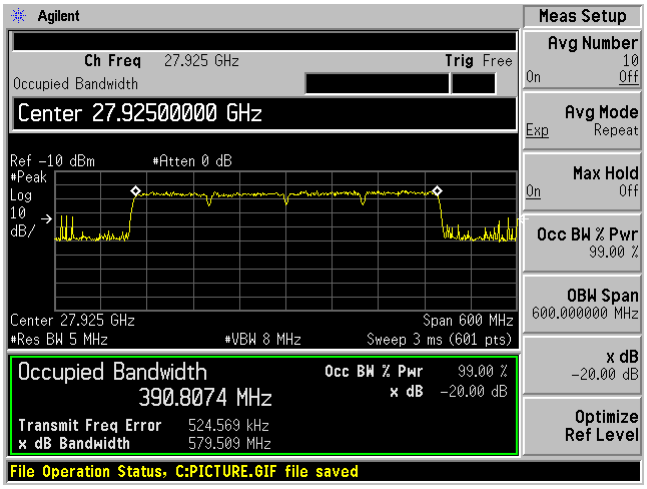
Beam ID: 139 (Horizontal)

4CC – 16QAM

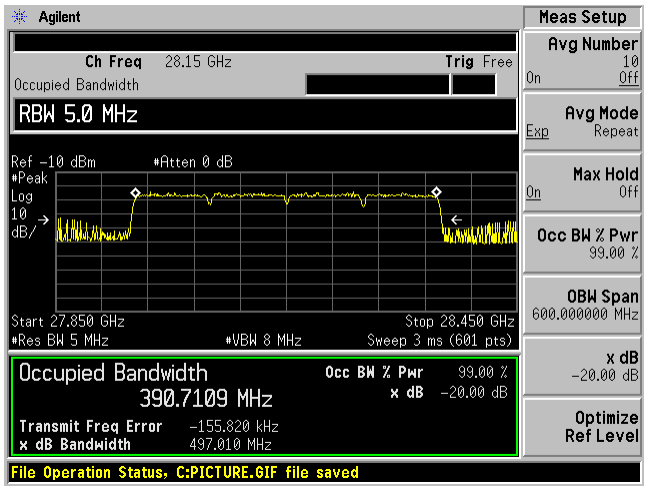
Low Channel



Middle Channel



High Channel



5 FCC §30.202 (a) & §2.1051 - Power Limits

5.1 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.

5.2 Measurement Procedure

EIRP Measurement

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

E (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).

EIRP (dBm) = E (dBμV/m) + 20log(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.

5.3 Far Field Distance Calculation

Note: Measurements were taken in the far field distance R based on the firmular $R \geq 2D^2/\lambda$, 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: 27500 MHz – 28350 MHz
R range: 0.0355 m to 0.0366 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.

5.4 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 years
-	RF Cable	-	-	Each Time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years

Note[1]: 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".*

5.5 Test Environmental Conditions

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

The testing was performed by Giriraj Gurjar from 2021-06-23 to 2021-06-24 in 5m3 Chamber.

5.6 Test Results

1CC

Modulation	Channel Frequency (MHz)	EIRP Horizontal (dBm/100MHz)	EIRP Vertical (dBm/100MHz)	H + V (MIMO) (dBm/100MHz)	Limit (dBm/100MHz)	Margin (dB)
16QAM	27550	39.54	39.51	42.53	75	-32.46
	27925	39.48	39.26	42.38	75	-32.61
	28300	39.35	39.39	42.38	75	-32.61

2CC

Modulation	Channel	CC Frequency (MHz)	EIRP Horizontal (dBm/100MHz)	EIRP Vertical (dBm/100MHz)	H + V (MIMO) (dBm/100MHz)	Limit (dBm/100MHz)	Margin (dB)
QPSK	Low	27550.02	36.75	36.75	39.76	75	-35.24
		27649.98	38.03	37.33	40.70	75	-34.30
	Middle	27875.04	37.23	37.31	40.28	75	-34.72
		27975	37.33	37.08	40.22	75	-34.78
	High	28200.06	37.58	37.83	40.72	75	-34.28
		28300.02	36.36	37.25	39.84	75	-35.16
16QAM	Low	27550.02	36.79	36.1	39.47	75	-35.53
		27649.98	37.64	37.07	40.37	75	-34.63
	Middle	27875.04	37.51	37.17	40.35	75	-34.65
		27975	37.70	37.18	40.46	75	-34.54
	High	28200.06	37.43	36.61	40.05	75	-34.95
		28300.02	36.82	36.51	39.68	75	-35.32
64QAM	Low	27550.02	36.77	36.46	39.63	75	-35.37
		27649.98	38.20	37.39	40.82	75	-34.18
	Middle	27875.04	37.36	37.21	40.30	75	-34.70
		27975	37.45	37.11	40.29	75	-34.71
	High	28200.06	37.01	37.23	40.13	75	-34.87
		28300.02	37.28	37.00	40.15	75	-34.85

2CC Total EIRP across 200 MHz Bandwidth

Modulation	Channel Frequency (MHz)	EIRP Horizontal (dBm/200MHz)	EIRP Vertical (dBm/200MHz)	H + V (MIMO) (dBm/200MHz)
QPSK	27600	39.38	39.24	42.32
	27925	39.31	39.18	42.26
	28250	39.30	39.41	42.37
16QAM	27600	39.19	39.23	42.22
	27925	39.24	39.37	42.32
	28250	39.21	39.14	42.19
64QAM	27600	39.37	39.10	42.25
	27925	39.20	39.27	42.25
	28250	39.21	39.16	42.20

3CC

Modulation	Channel	CC Frequency (MHz)	EIRP Horizontal (dBm/100MHz)	EIRP Vertical (dBm/100MHz)	H + V (MIMO) (dBm/100MHz)	Limit (dBm/100MHz)	Margin (dB)
QPSK	Low	27550.02	35.50	34.88	38.21	75	-36.79
		27649.98	35.50	35.11	38.32	75	-36.68
		27749.94	36.34	35.37	38.89	75	-36.11
	Middle	27825.06	34.69	34.93	37.82	75	-37.18
		27925.02	35.62	35.54	38.59	75	-36.41
		28024.98	35.96	35.75	38.87	75	-36.13
	High	28100.1	35.49	36.18	38.86	75	-36.14
		28200.06	35.82	35.51	38.68	75	-36.32
		28300.02	35.65	35.48	38.58	75	-36.42
16QAM	Low	27550.02	35.10	34.52	37.83	75	-37.17
		27649.98	35.26	35.12	38.20	75	-36.80
		27749.94	35.77	35.49	38.64	75	-36.36
	Middle	27825.06	35.06	34.86	37.97	75	-37.03
		27925.02	34.94	35.39	38.18	75	-36.82
		28024.98	35.61	35.34	38.49	75	-36.51
	High	28100.1	36.01	35.73	38.88	75	-36.12
		28200.06	35.90	35.52	38.72	75	-36.28
		28300.02	35.65	34.62	38.18	75	-36.82
64QAM	Low	27550.02	35.68	34.52	38.15	75	-36.85
		27649.98	35.54	35.29	38.43	75	-36.57
		27749.94	36.09	35.57	38.85	75	-36.15
	Middle	27825.06	34.35	35.21	37.81	75	-37.19
		27925.02	35.69	35.44	38.58	75	-36.42
		28024.98	36.00	34.91	38.50	75	-36.50
	High	28100.1	35.76	35.95	38.87	75	-36.13
		28200.06	36.04	35.23	38.66	75	-36.34
		28300.02	35.58	35.51	38.56	75	-36.44

3CC Total EIRP across 300 MHz Bandwidth

Modulation	Channel Frequency (MHz)	EIRP Horizontal (dBm/300MHz)	EIRP Vertical (dBm/300MHz)	H + V (MIMO) (dBm/300MHz)
QPSK	27650	39.27	39.33	42.31
	27925	39.28	39.21	42.26
	28200	39.25	39.25	42.26
16QAM	27650	39.38	39.29	42.35
	27925	39.33	39.17	42.26
	28200	39.27	39.20	42.25
64QAM	27650	39.19	39.31	42.26
	27925	39.36	39.49	42.44
	28200	39.30	39.27	42.30

4CC

Modulation	Channel	CC Frequency (MHz)	EIRP Horizontal (dBm/100MHz)	EIRP Vertical (dBm/100MHz)	H + V (MIMO) (dBm/100MHz)	Limit (dBm/100MHz)	Margin (dB)
16QAM	Low	27550.08	33.59	33.07	36.35	75	-38.65
		27650.04	33.20	33.26	36.24	75	-38.76
		27750	33.75	34.29	37.04	75	-37.96
		27849	34.80	34.53	37.68	75	-37.32
	Middle	27750.2	32.77	33.88	36.37	75	-38.63
		27875.16	33.64	34.19	36.93	75	-38.07
		27975.12	33.95	34.04	37.01	75	-37.99
		28075.08	33.90	34.27	37.10	75	-37.90
	High	28000.08	33.72	34.11	36.93	75	-38.07
		28100.04	34.35	34.73	37.55	75	-37.45
		28200	34.39	34.26	37.34	75	-37.66
		28299.96	34.17	34.14	37.17	75	-37.83

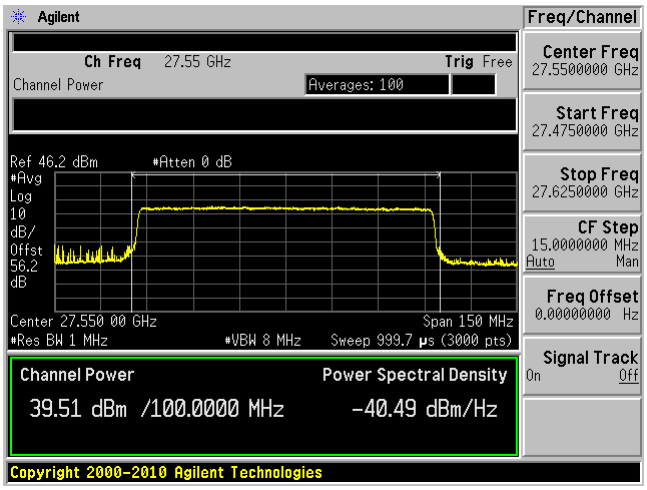
4CC Total EIRP across 400 MHz Bandwidth

Modulation	Channel Frequency (MHz)	EIRP Horizontal (dBm/400MHz)	EIRP Vertical (dBm/400MHz)	H + V (MIMO) (dBm/400MHz)
16QAM	27700	39.31	39.25	42.29
	27925	39.33	39.41	42.38
	28150	39.39	39.20	42.31

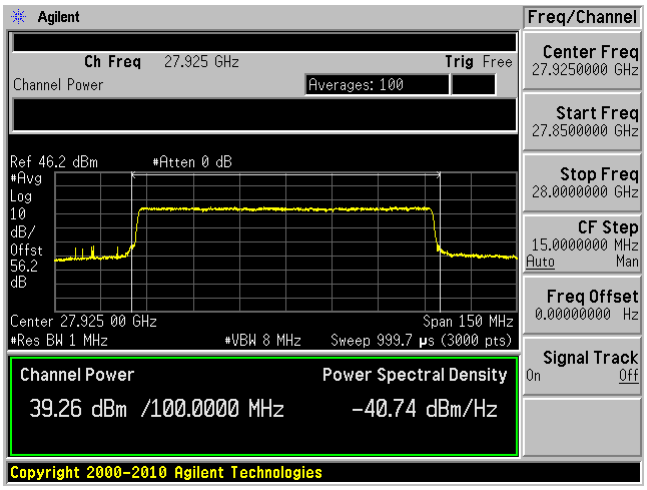
Beam ID: 11 (Vertical)

1CC – QPSK

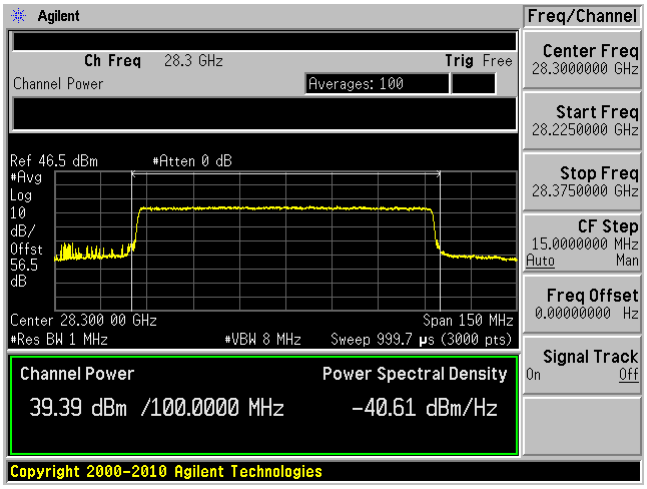
Low Channel



Middle Channel

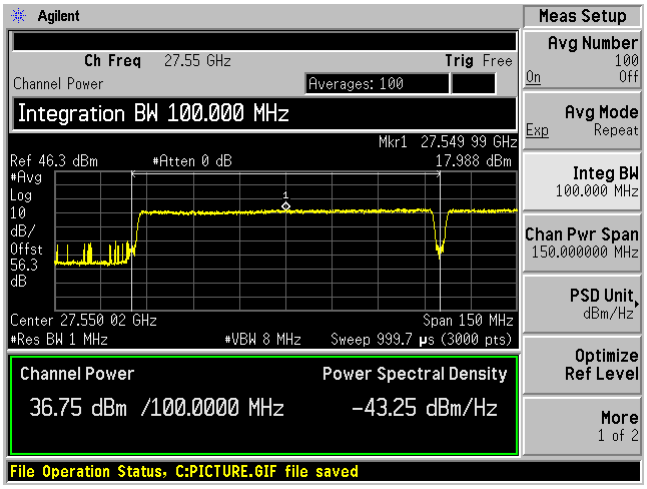


High Channel

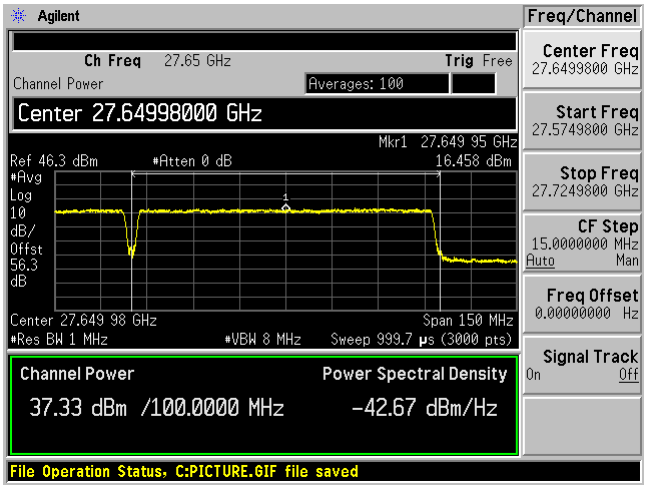


Beam ID: 11 (Vertical)
2CC – QPSK – Low Channel

1st Carrier

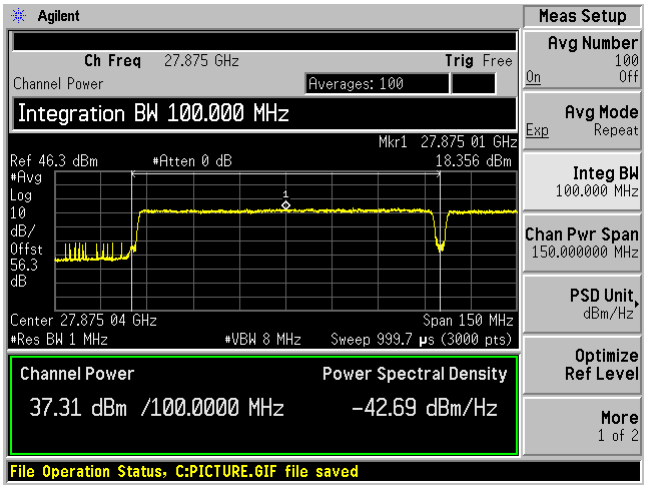


2nd Carrier

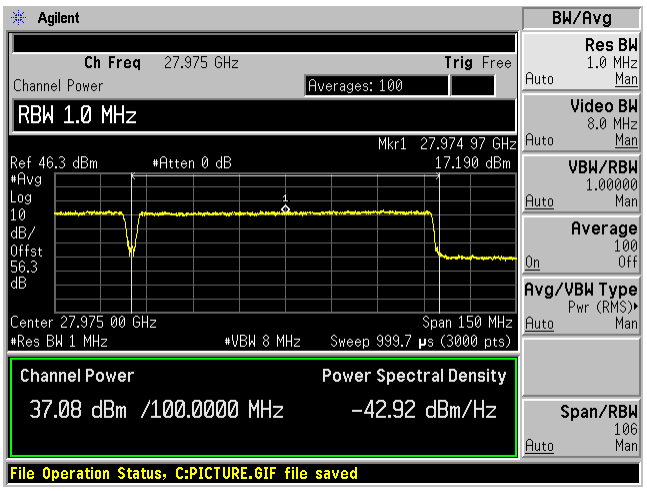


2CC – QPSK – Middle Channel

1st Carrier

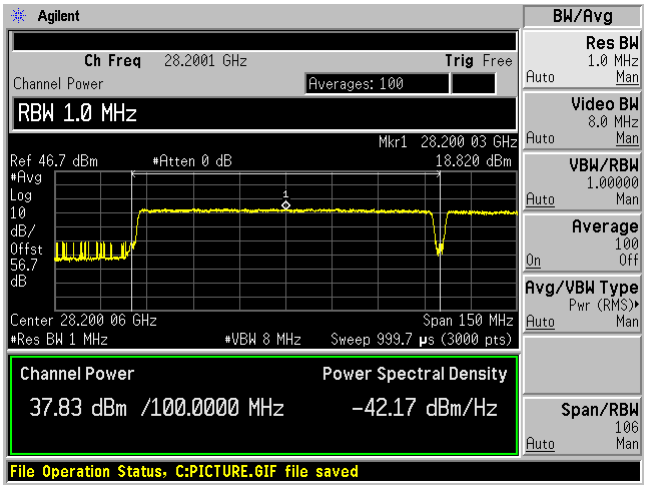


2nd Carrier

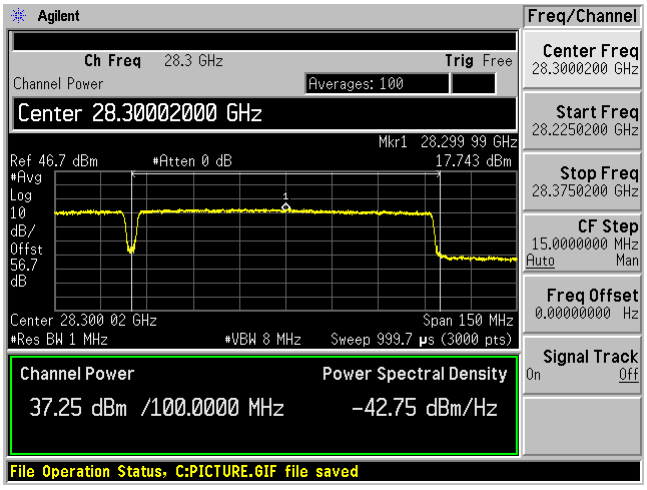


2CC – QPSK – High Channel

1st Carrier

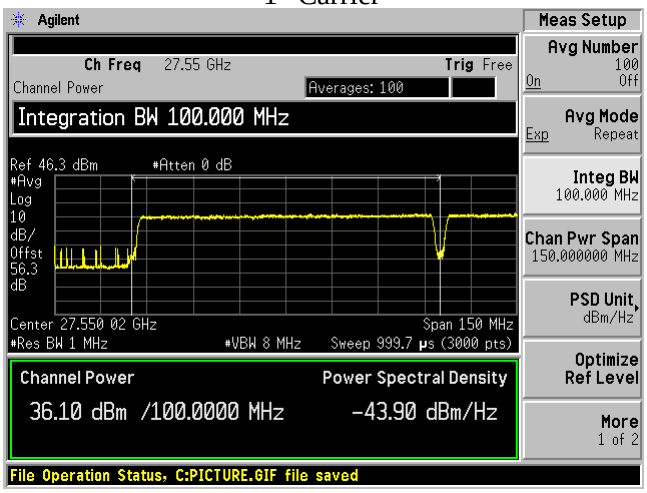


2nd Carrier

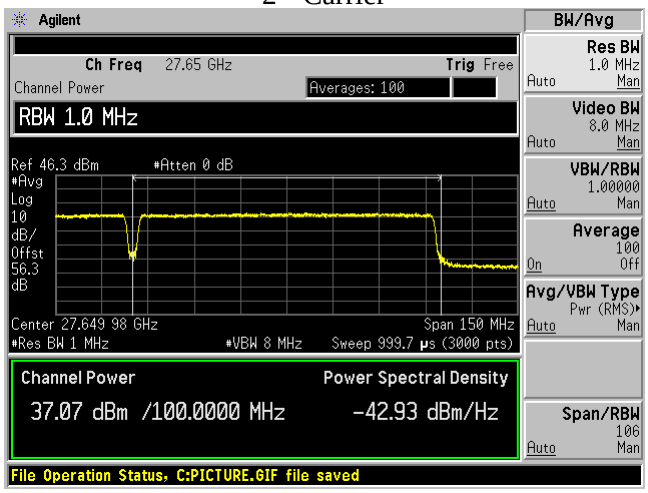


Beam ID: 11 (Vertical)
2CC – 16QAM – Low Channel

1st Carrier

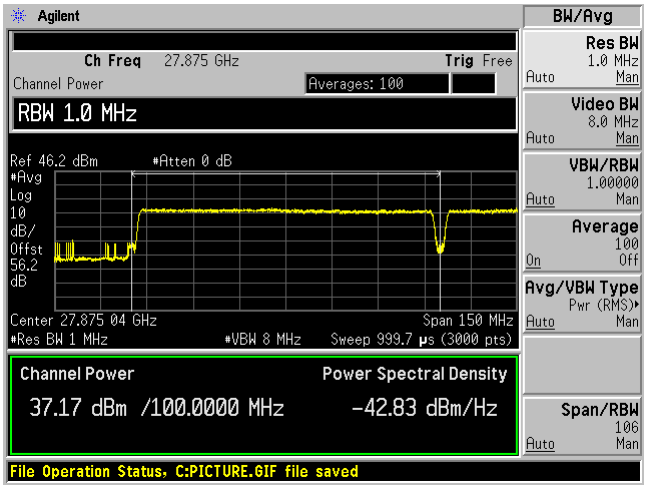


2nd Carrier

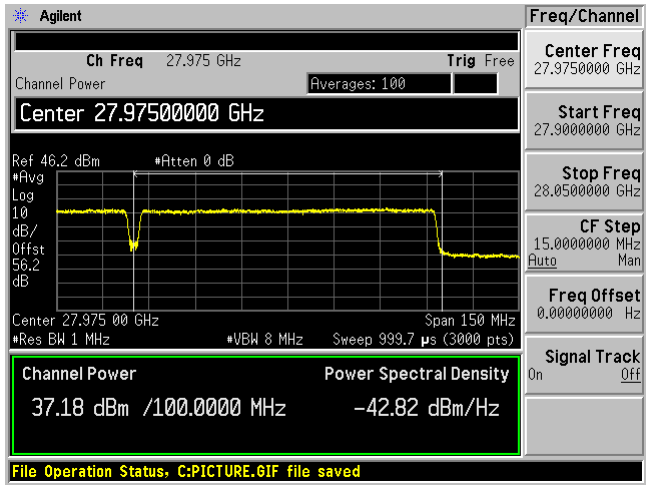


2CC – 16QAM – Middle Channel

1st Carrier

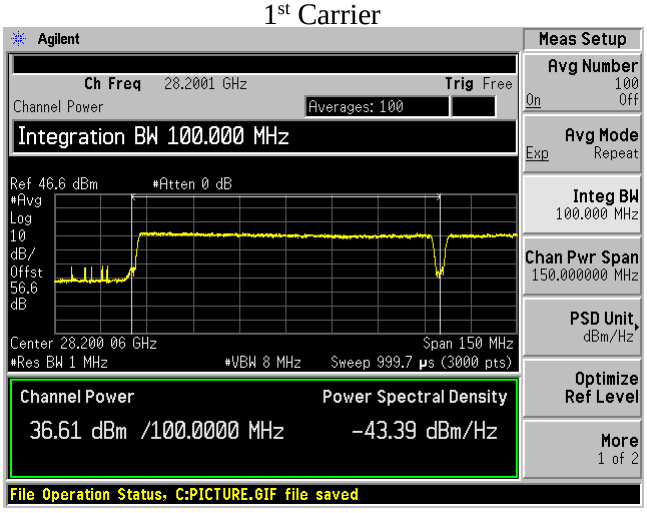


2nd Carrier

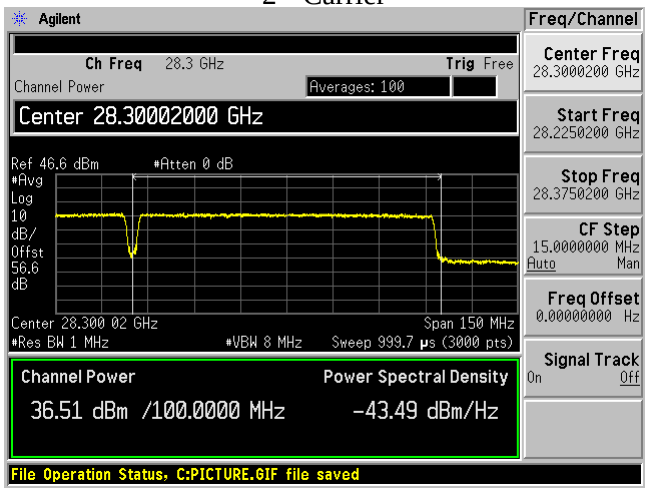


2CC – 16QAM – High Channel

1st Carrier

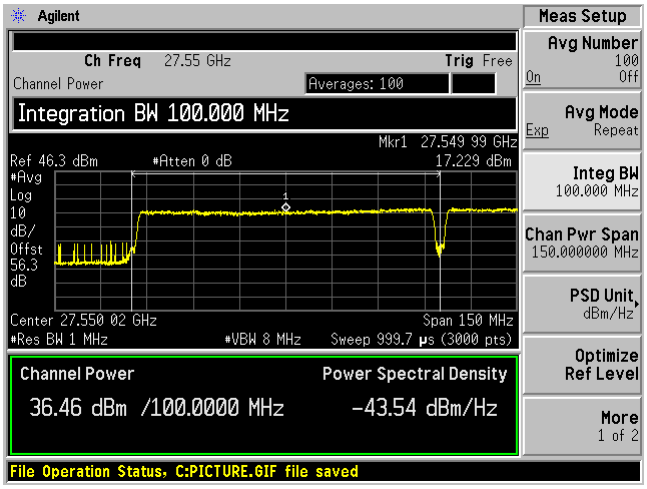


2nd Carrier

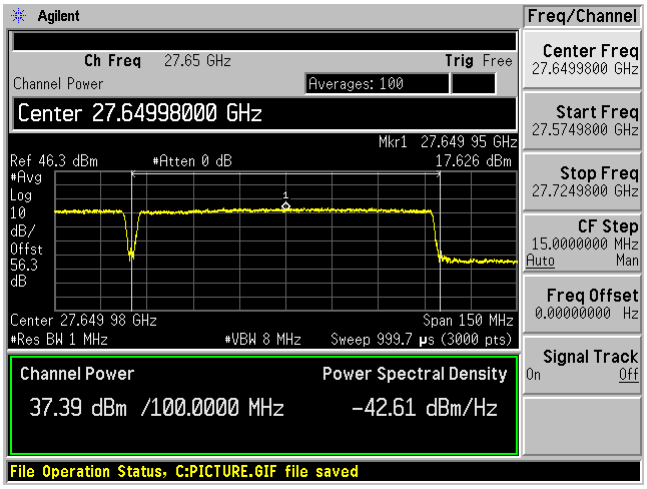


Beam ID: 11 (Vertical)
2CC – 64QAM – Low Channel

1st Carrier

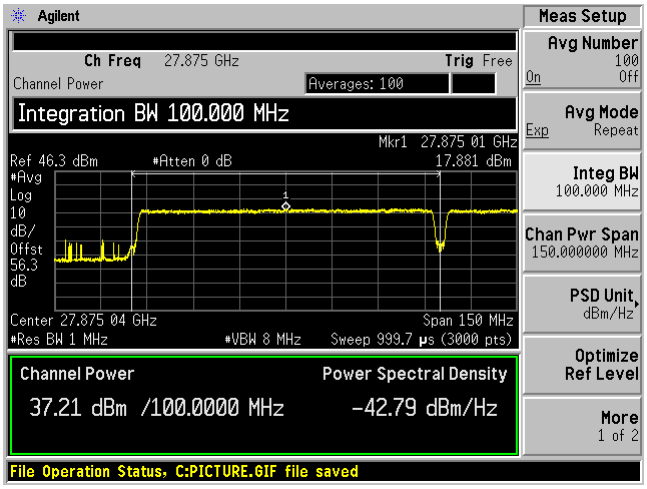


2nd Carrier

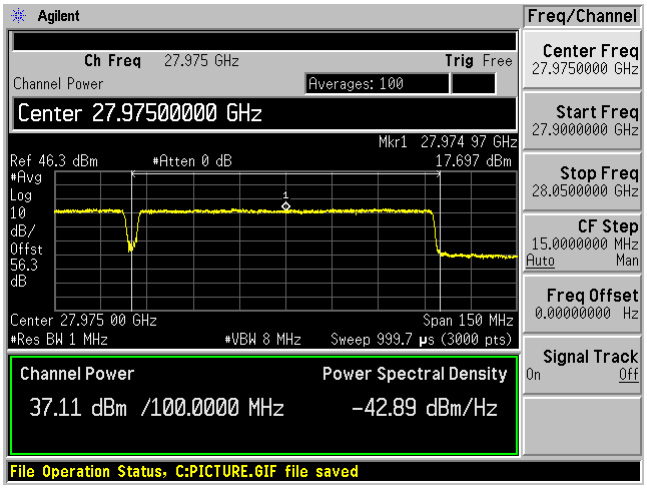


2CC – 64QAM – Middle Channel

1st Carrier

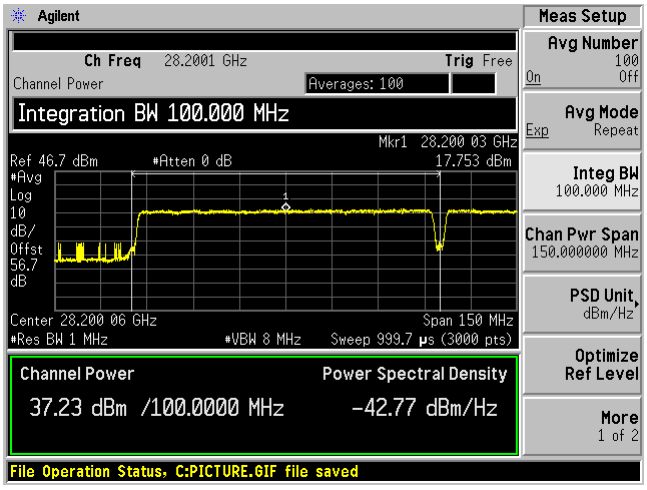


2nd Carrier

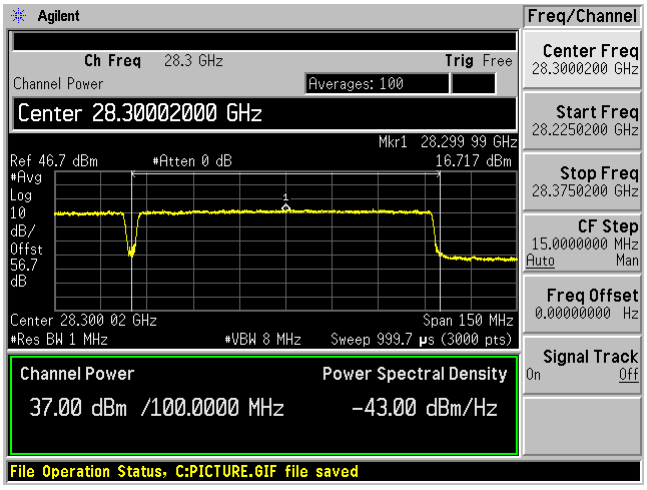


2CC – 64QAM – High Channel

1st Carrier



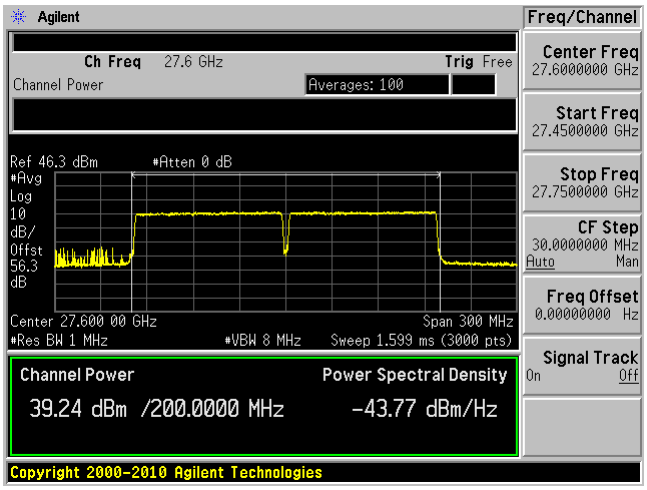
2nd Carrier



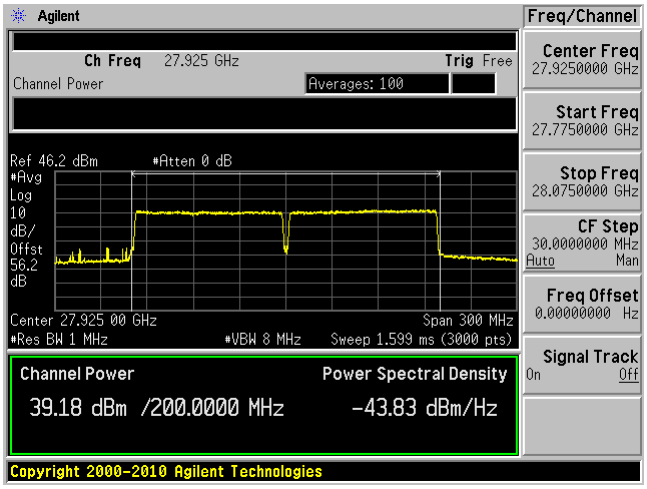
Beam ID: 11 (Vertical) (Channel Power)

2CC QPSK

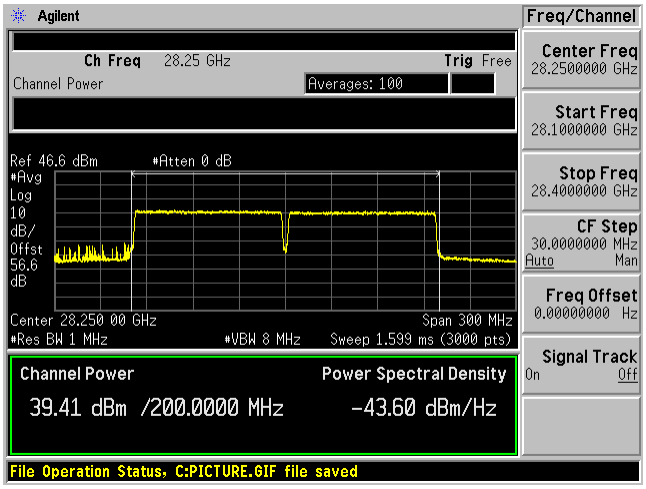
Low Channel



Middle Channel



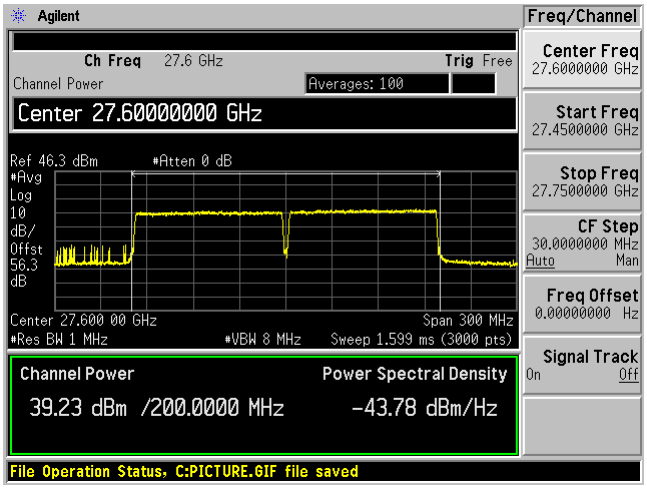
High Channel



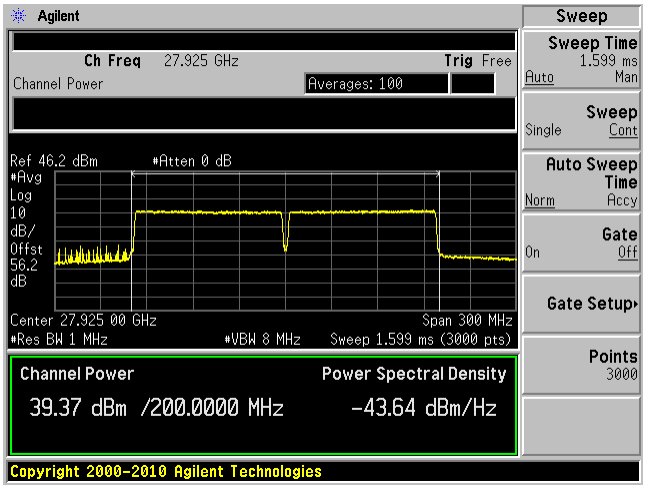
Beam ID: 11 (Vertical) (Channel Power)

2CC – 16QAM

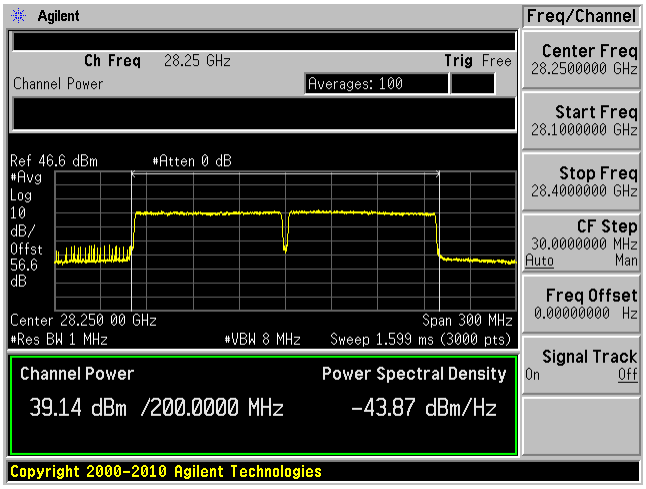
Low Channel



Middle Channel



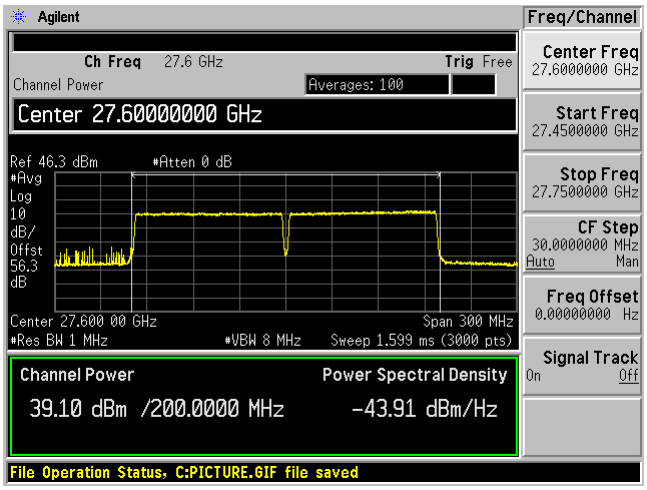
High Channel



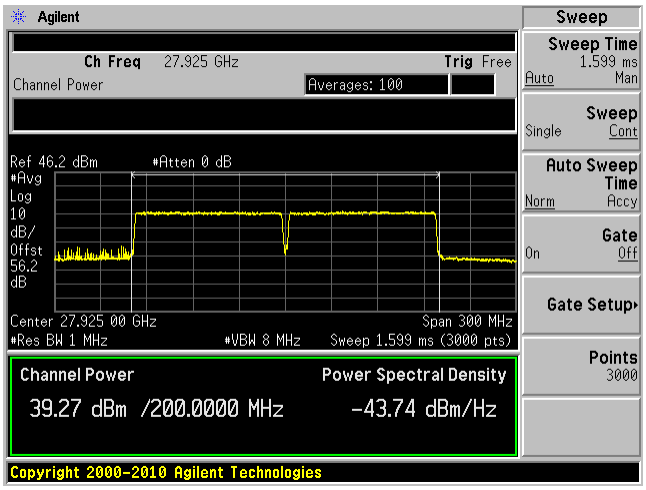
Beam ID: 11 (Vertical) (Channel Power)

2CC – 64QAM

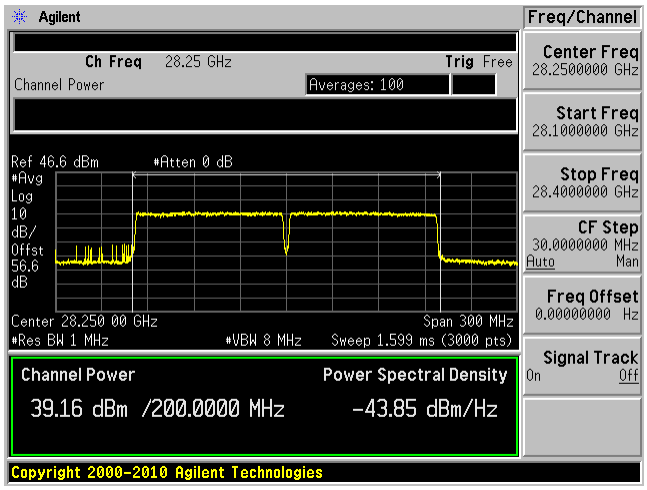
Low Channel



Middle Channel



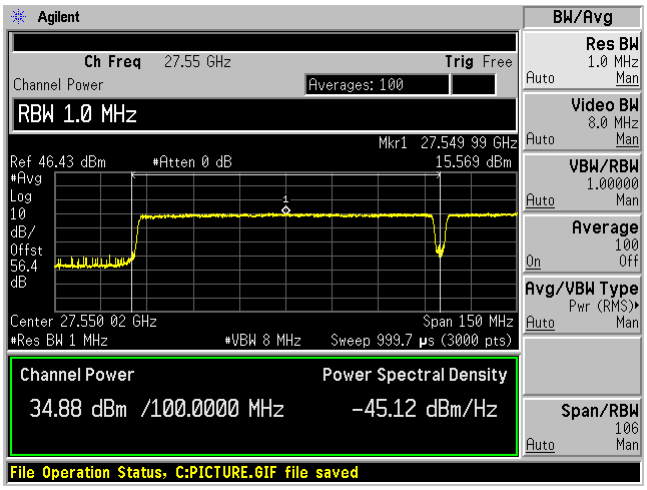
High Channel



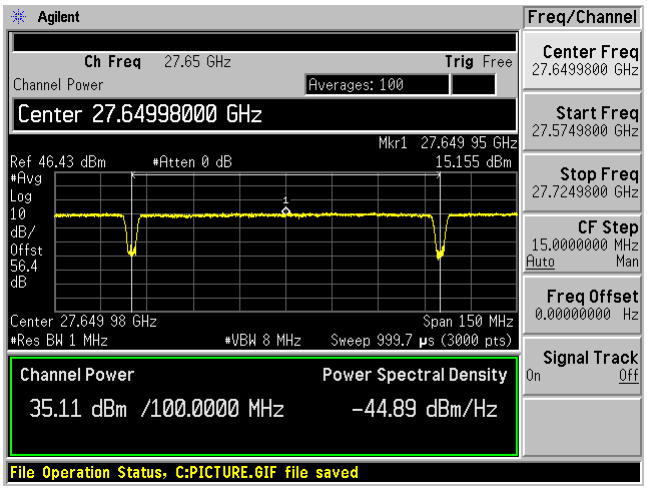
Beam ID: 11 (Vertical)

3CC – QPSK – Low Channel

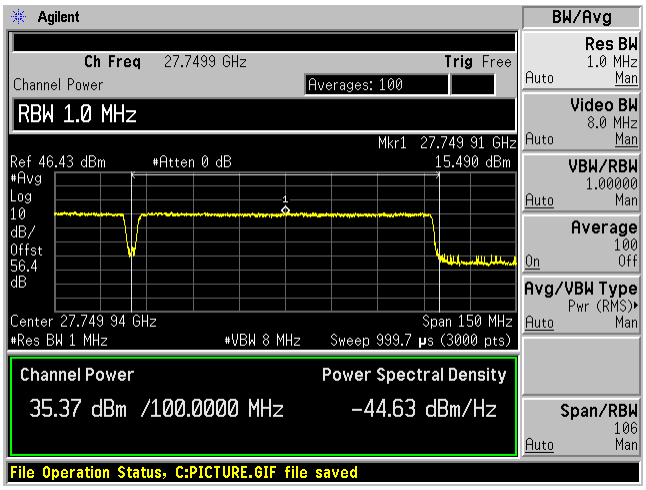
1st Carrier



2nd Carrier



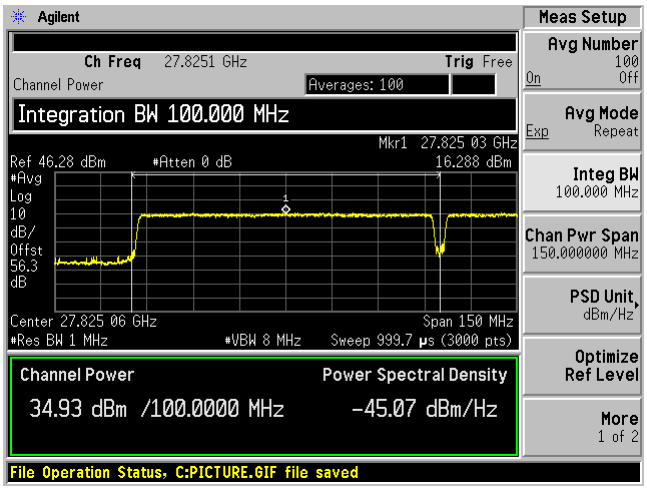
3rd Carrier



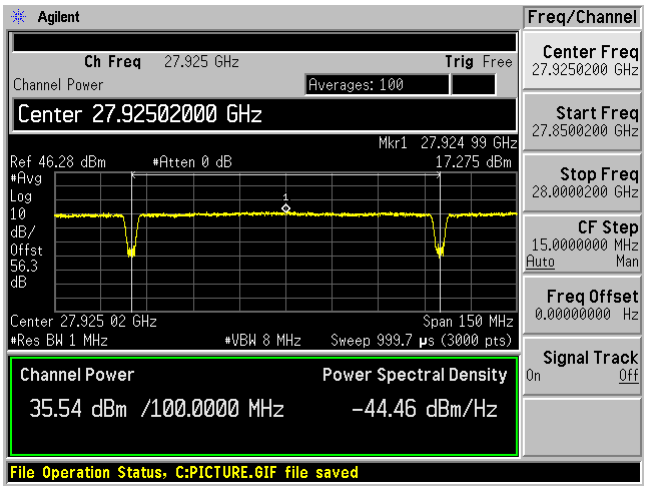
Beam ID: 11 (Vertical)

3CC – QPSK – Middle Channel

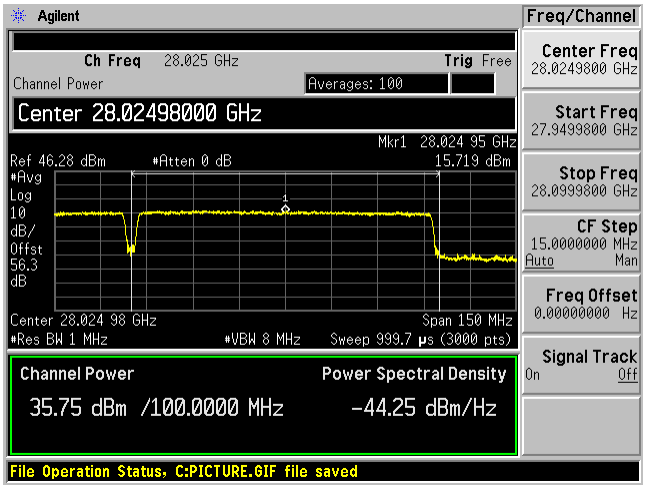
1st Carrier



2nd Carrier



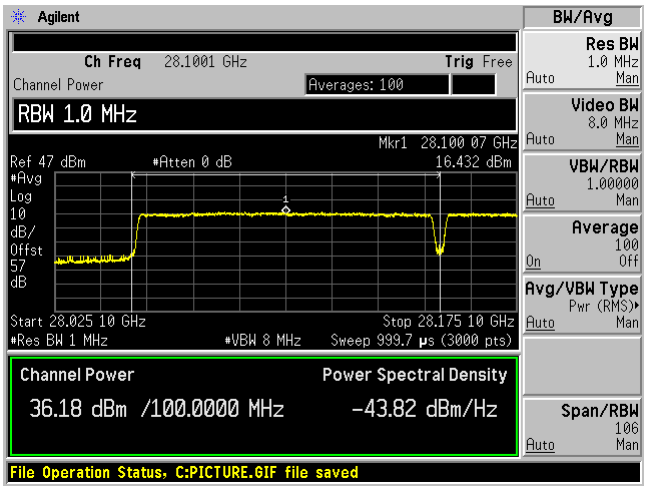
3rd Carrier



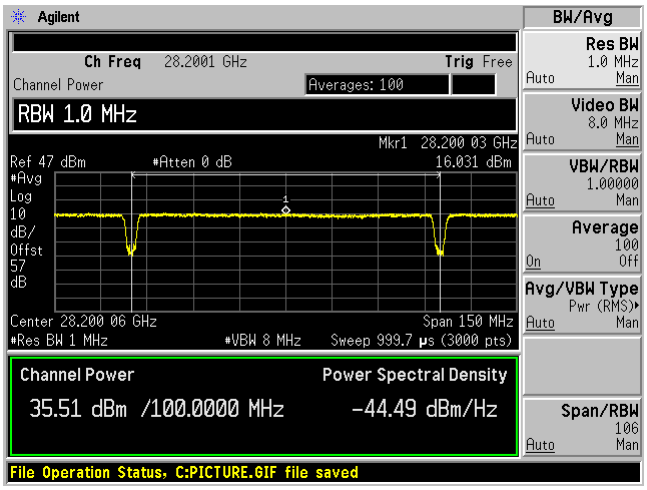
Beam ID: 11 (Vertical)

3CC – QPSK – High Channel

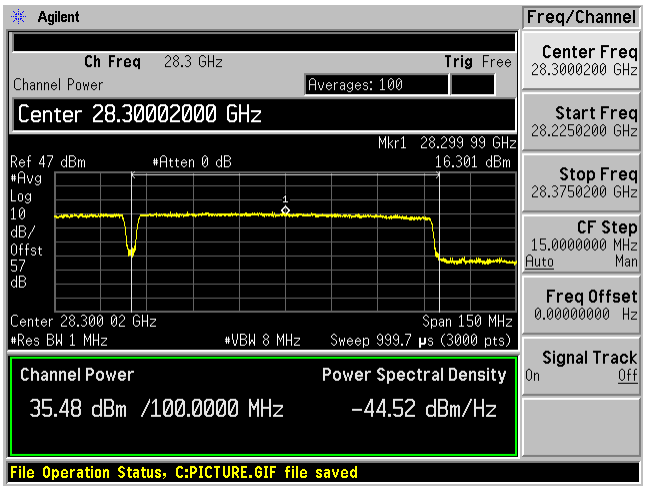
1st Carrier



2nd Carrier



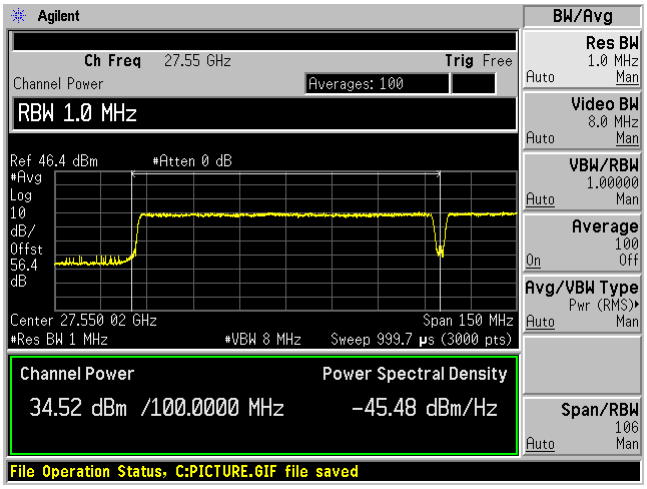
3rd Carrier



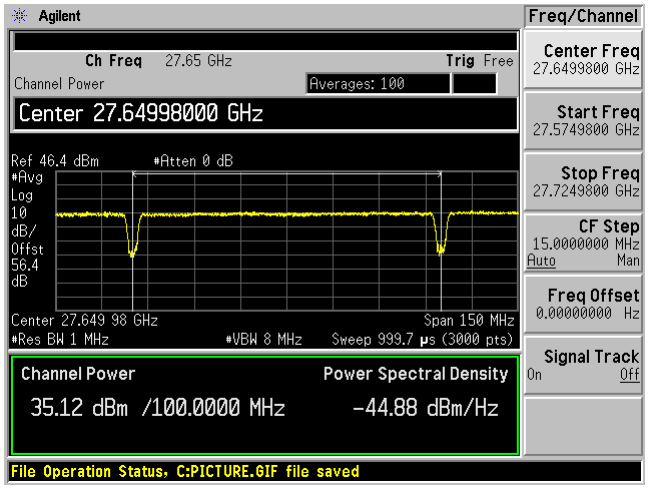
Beam ID: 11 (Vertical)

3CC – 16QAM – Low Channel

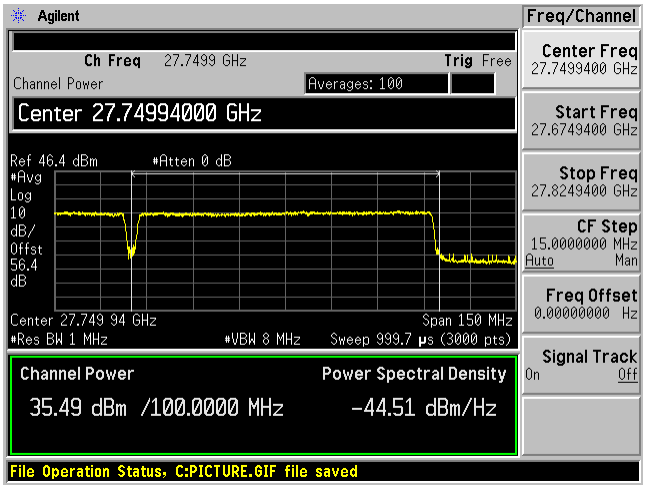
1st Carrier



2nd Carrier



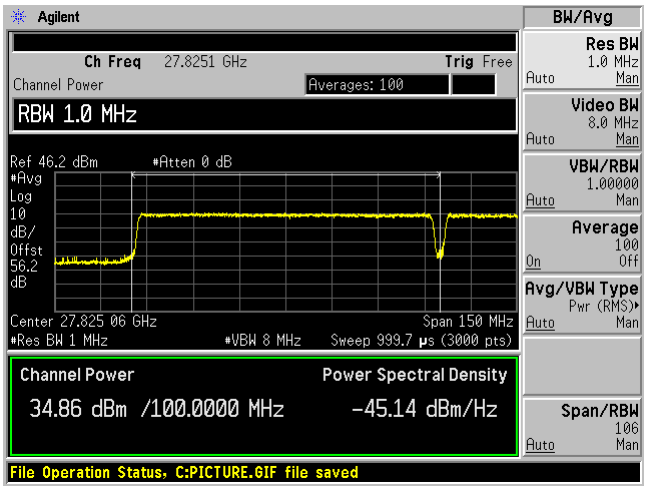
3rd Carrier



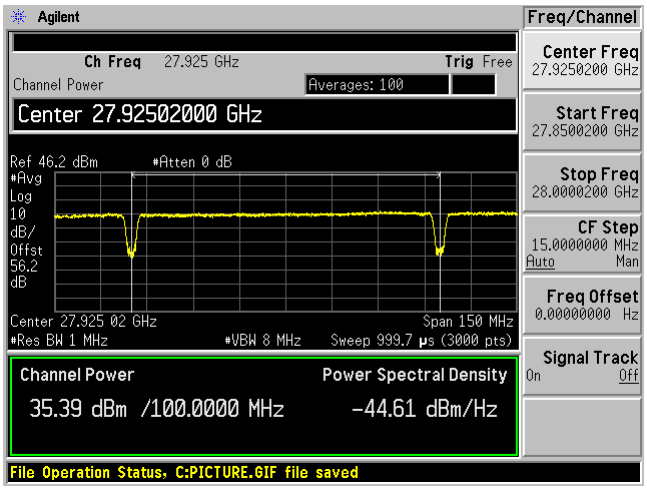
Beam ID: 11 (Vertical)

3CC – 16QAM – Middle Channel

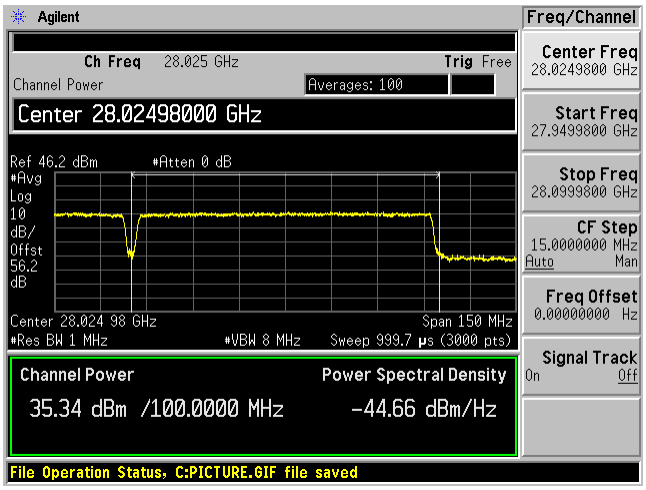
1st Carrier



2nd Carrier



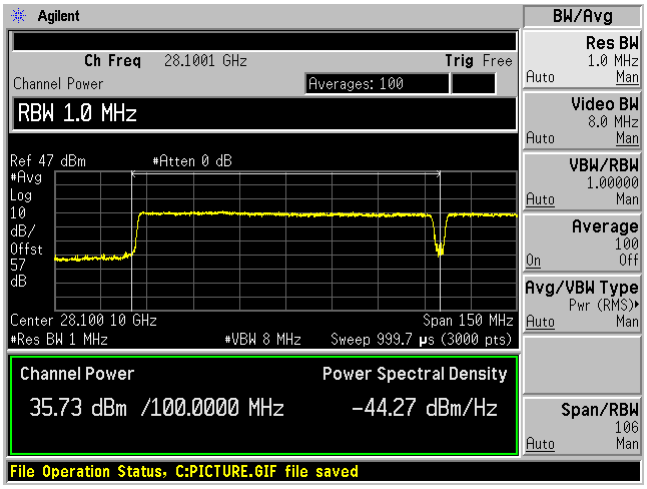
3rd Carrier



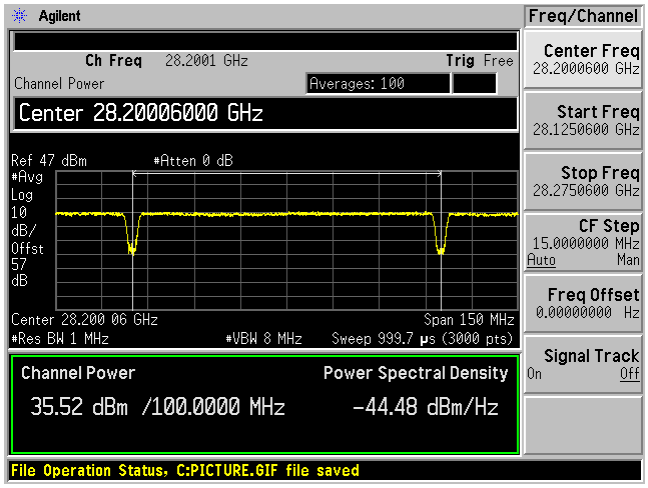
Beam ID: 11 (Vertical)

3CC – 16QAM – High Channel

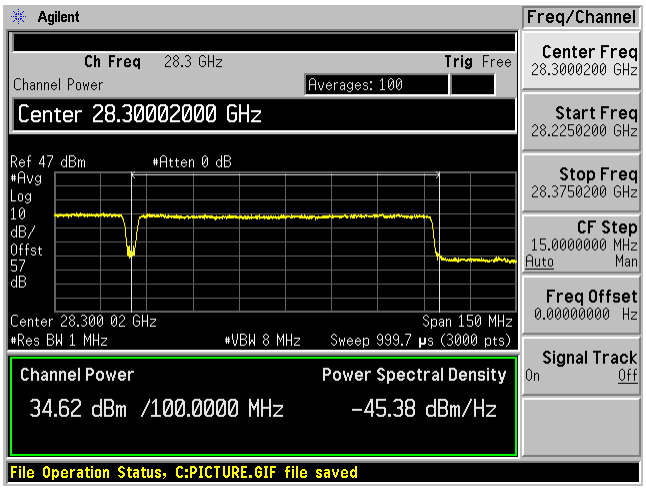
1st Carrier



2nd Carrier



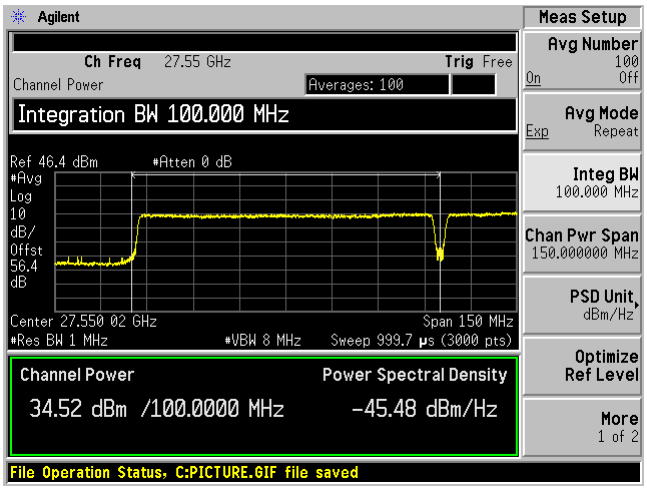
3rd Carrier



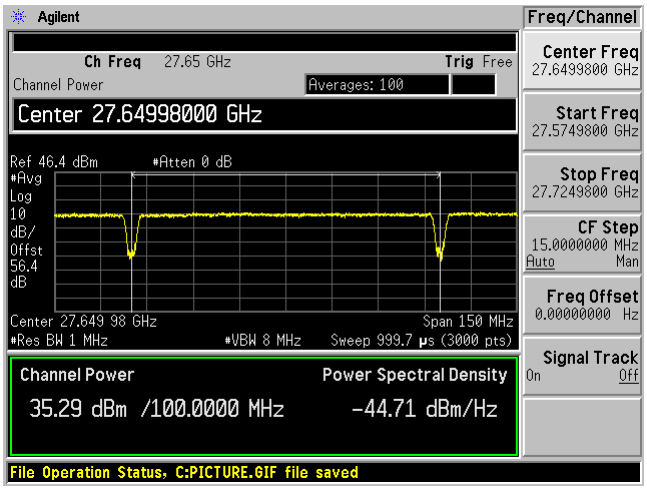
Beam ID: 11 (Vertical)

3CC – 64QAM – Low Channel

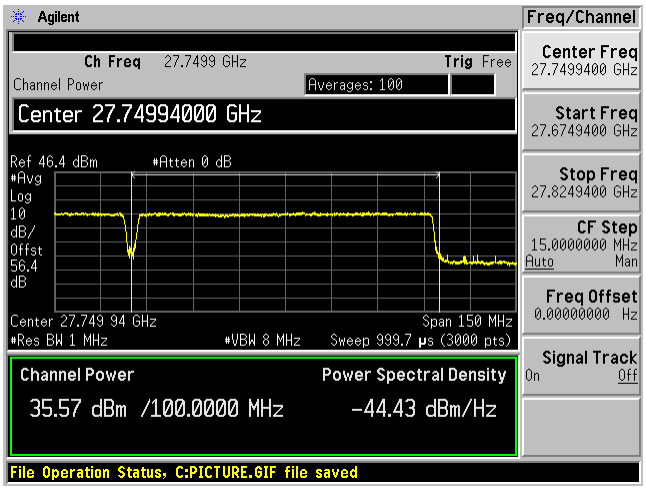
1st Carrier



2nd Carrier



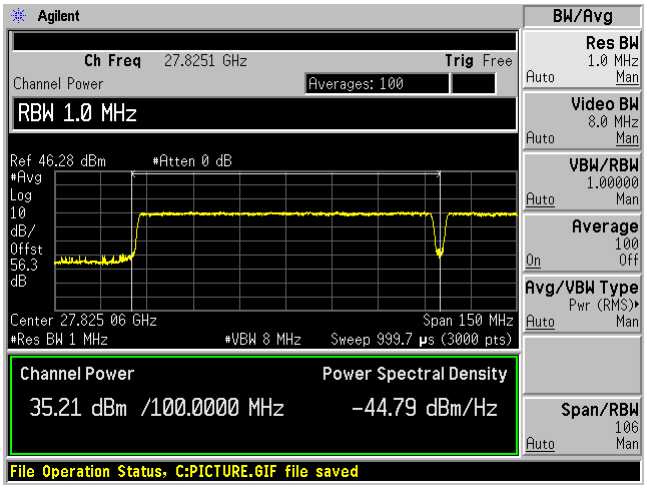
3rd Carrier



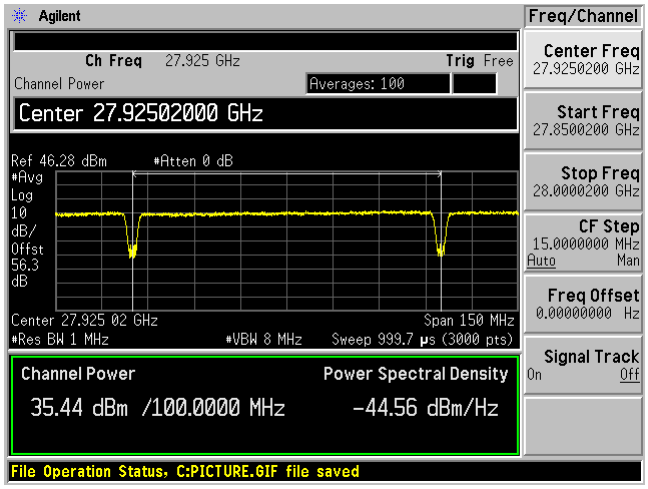
Beam ID: 11 (Vertical)

3CC – 64QAM – Middle Channel

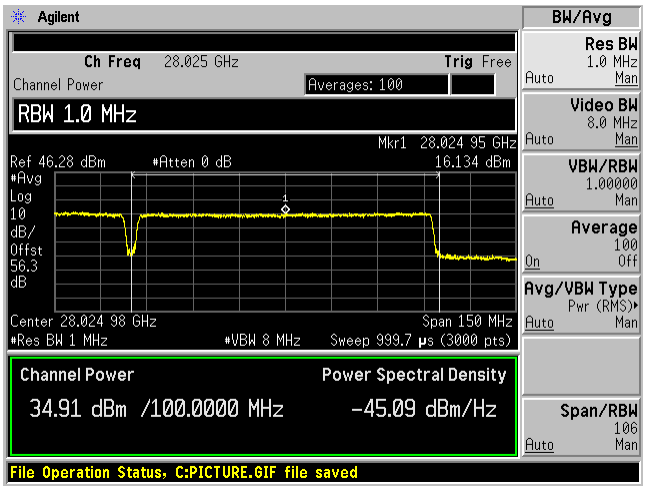
1st Carrier



2nd Carrier



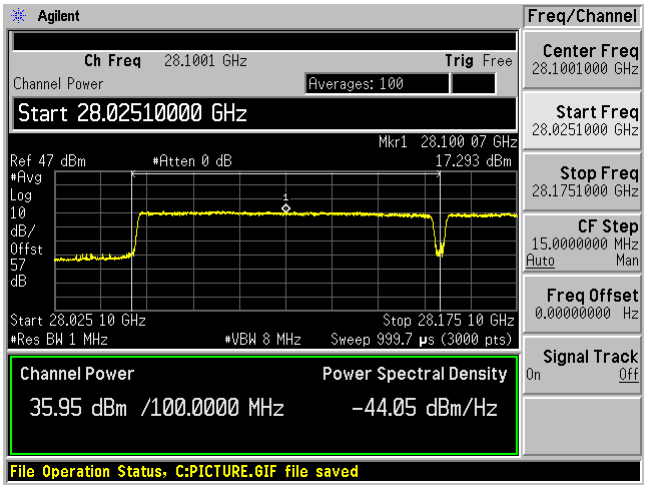
3rd Carrier



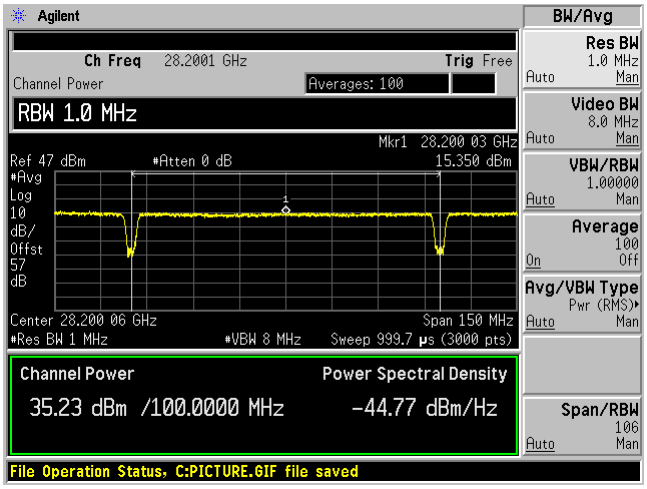
Beam ID: 11 (Vertical)

3CC – 64QAM – High Channel

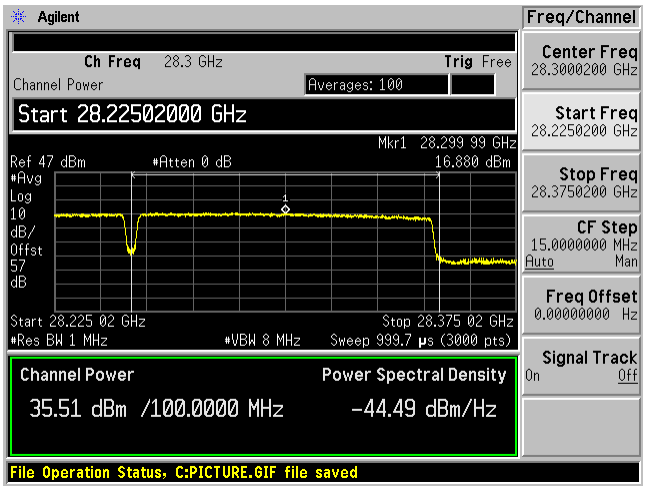
1st Carrier



2nd Carrier



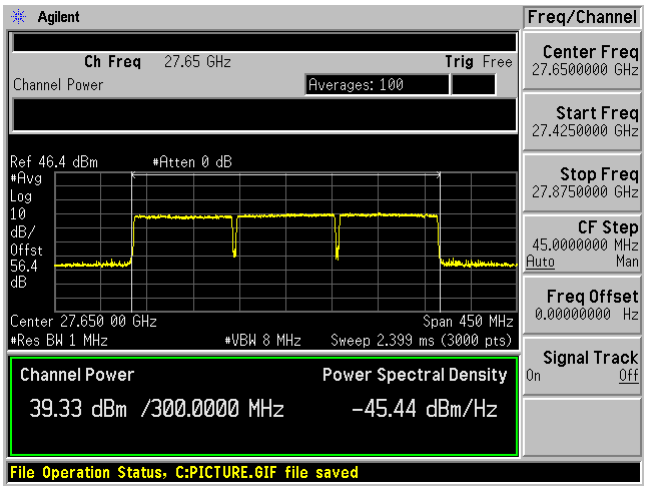
3rd Carrier



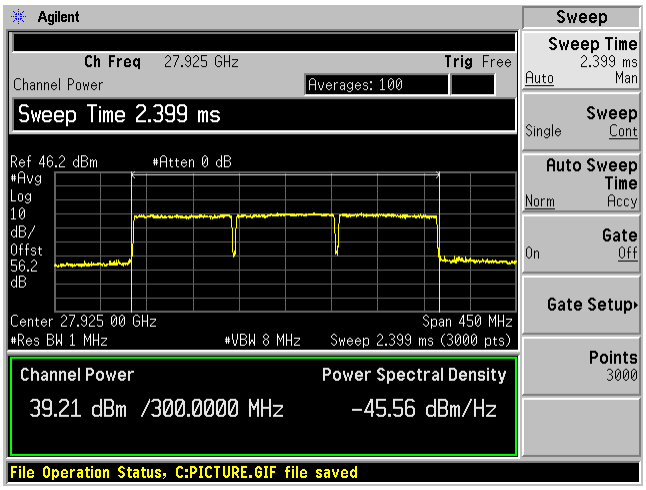
Beam ID: 11 (Vertical) (Channel Power)

3CC QPSK

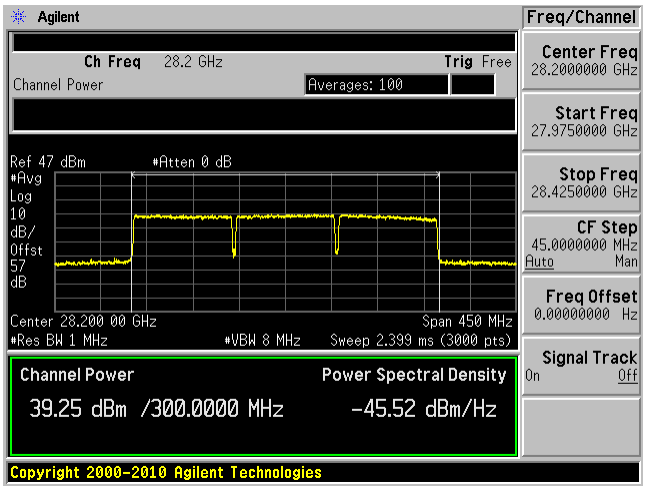
Low Channel



Middle Channel



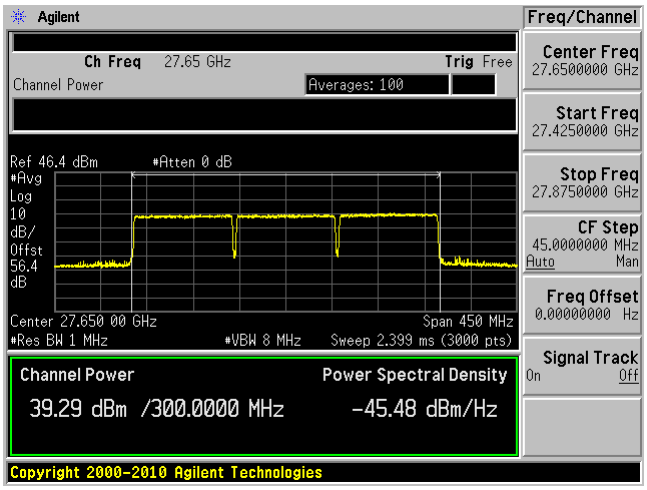
High Channel



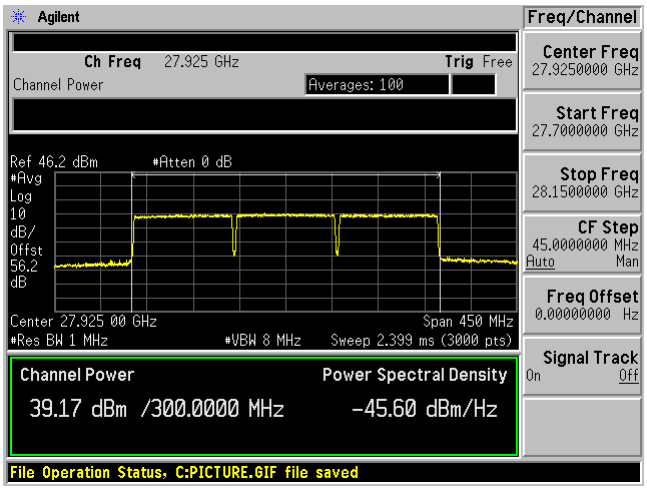
Beam ID: 11 (Vertical) (Channel Power)

3CC – 16QAM

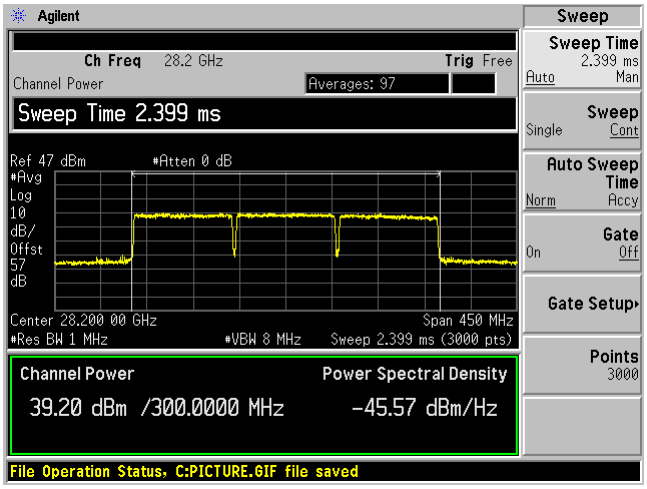
Low Channel



Middle Channel



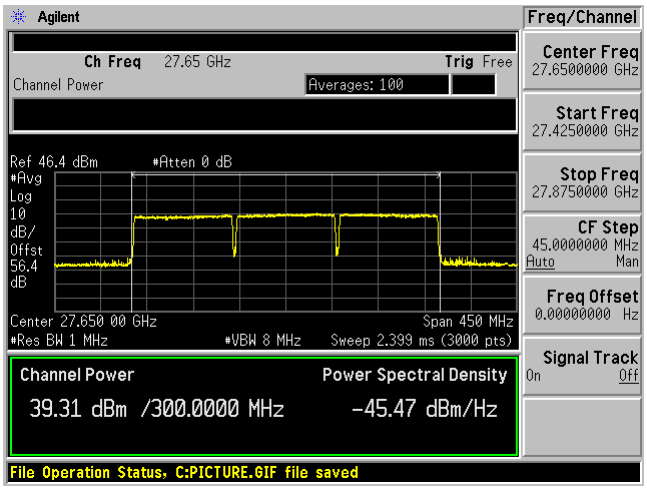
High Channel



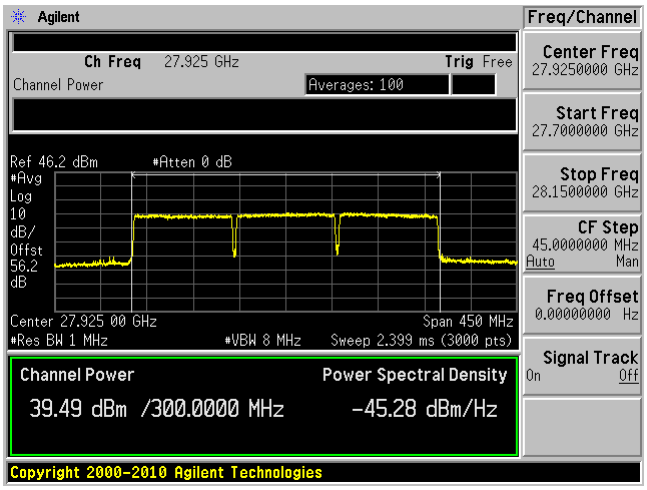
Beam ID: 11 (Vertical) (Channel Power)

3CC – 64QAM

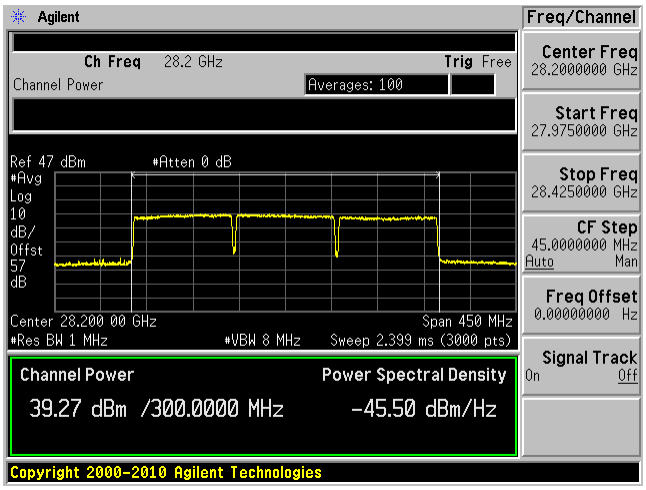
Low Channel



Middle Channel



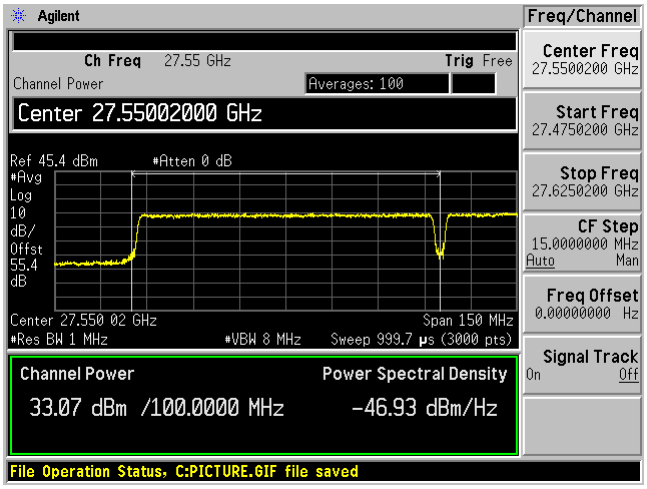
High Channel



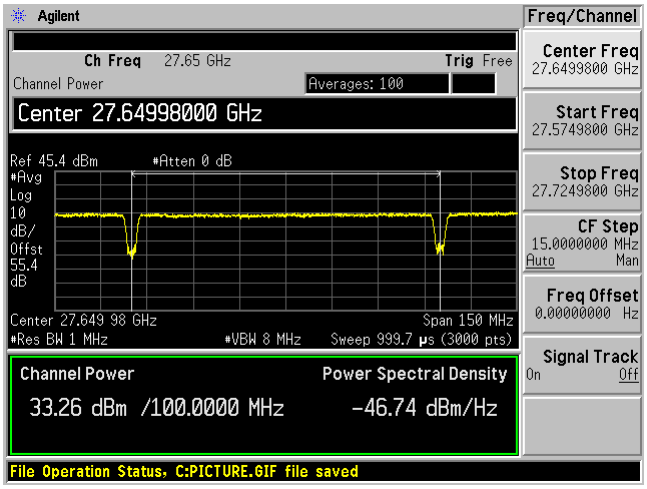
Beam ID: 11 (Vertical)

4CC – 16QAM– Low Channel

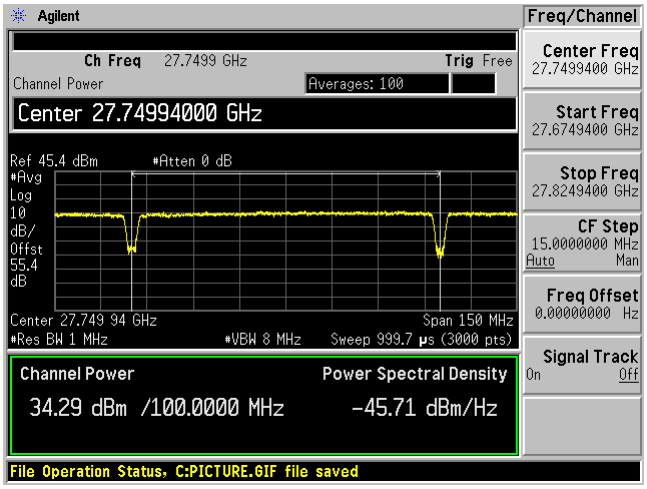
1st Carrier



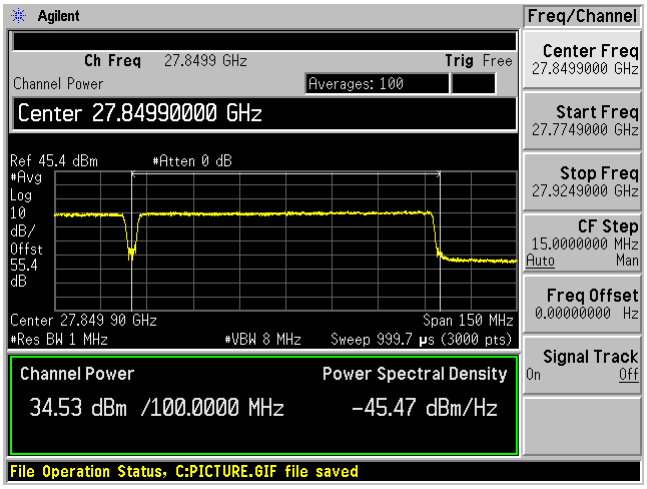
2nd Carrier



3rd Carrier



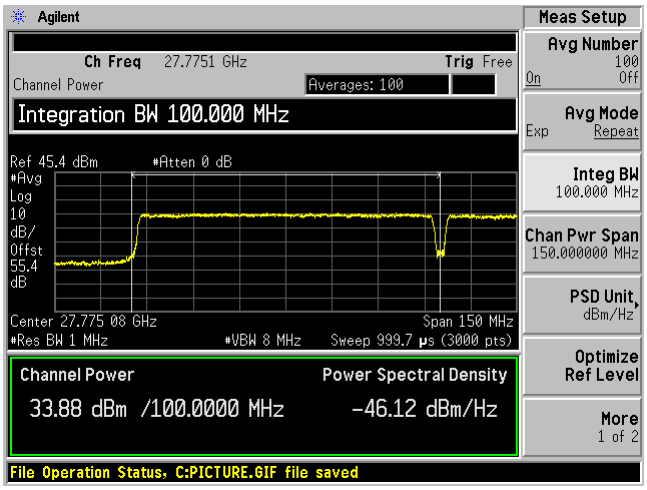
4th Carrier



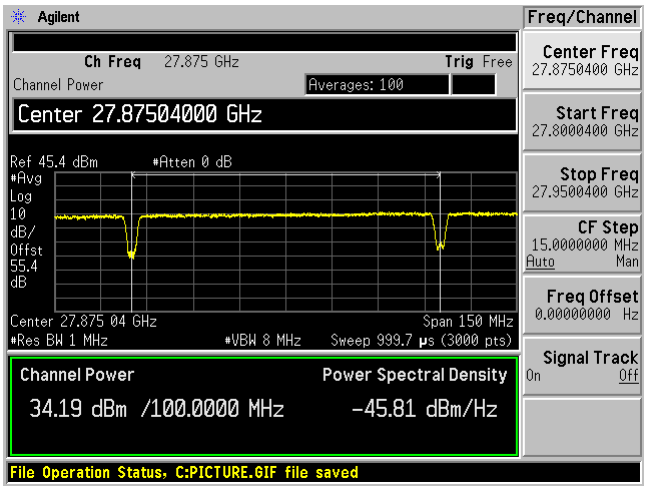
Beam ID: 11 (Vertical)

4CC – 16QAM – Middle Channel

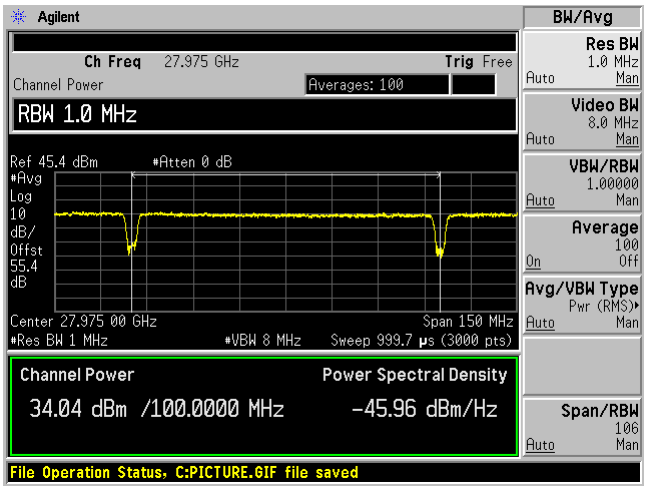
1st Carrier



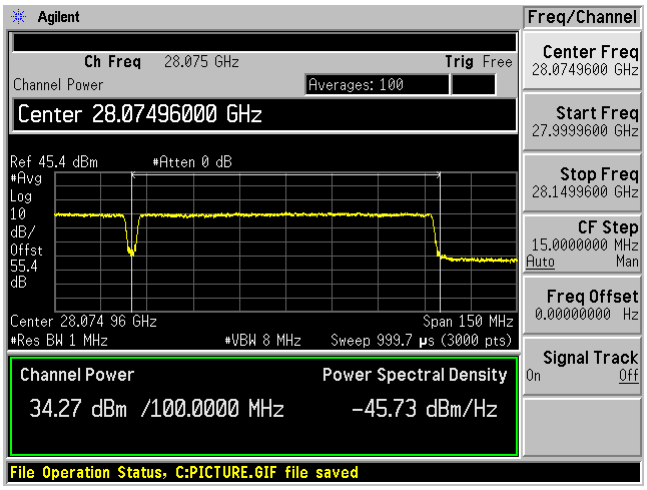
2nd Carrier



3rd Carrier



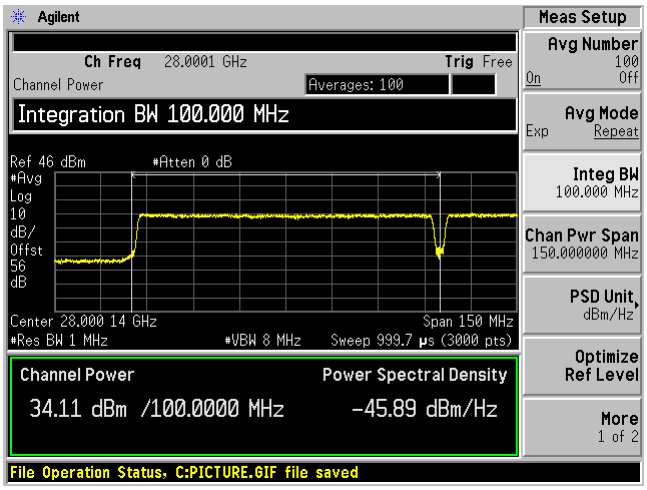
4th Carrier



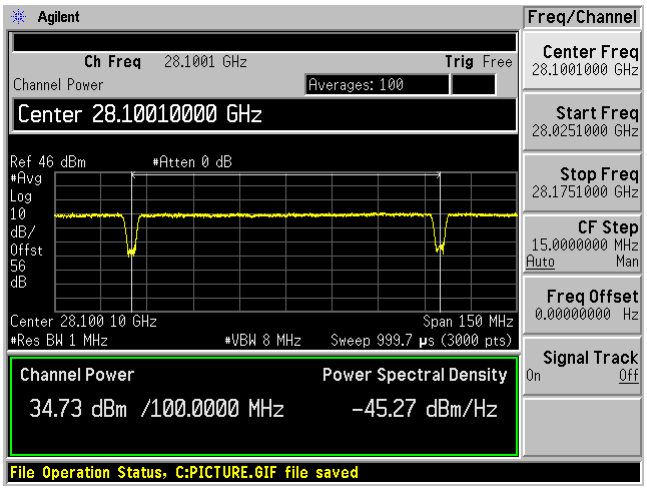
Beam ID: 11 (Vertical)

4CC – 16QAM – High Channel

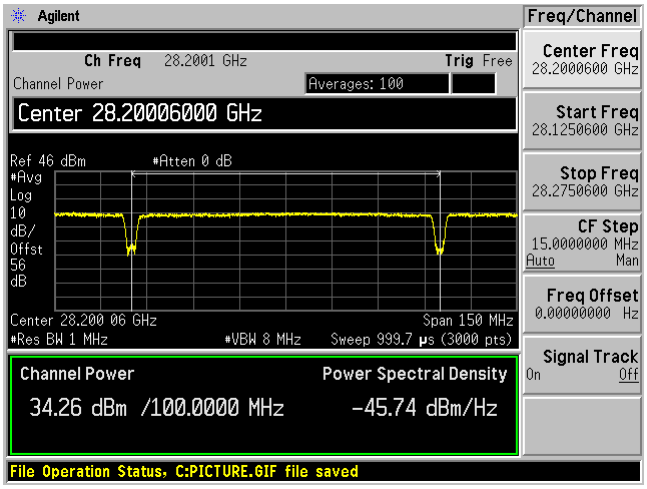
1st Carrier



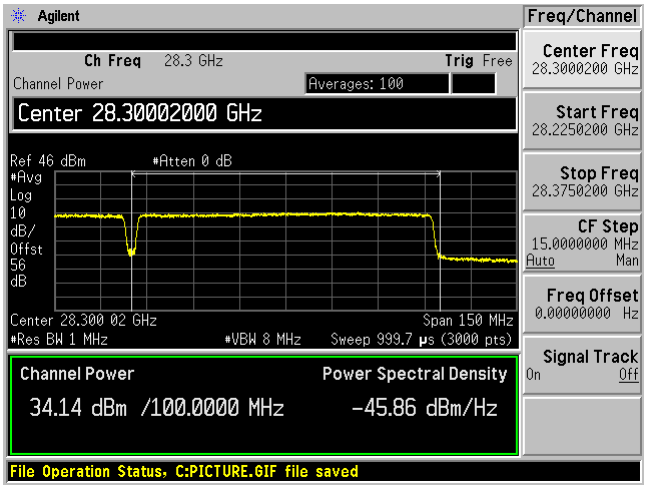
2nd Carrier



3rd Carrier



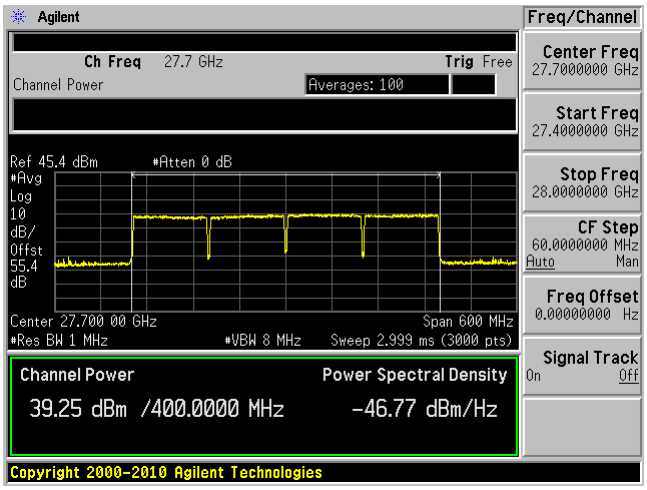
4th Carrier



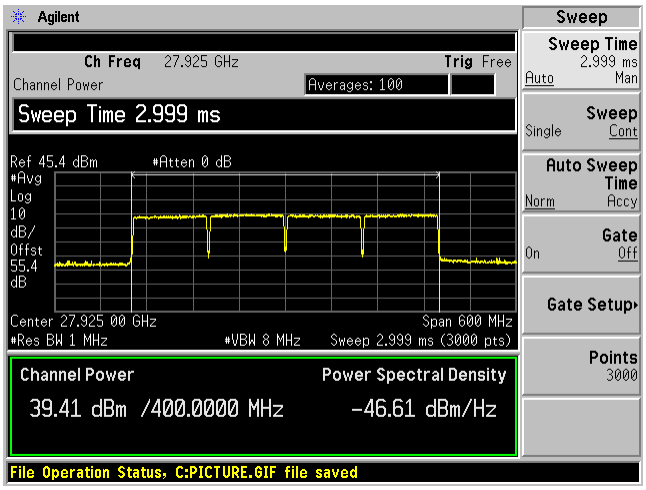
Beam ID: 11 (Vertical)

4CC – 16QAM

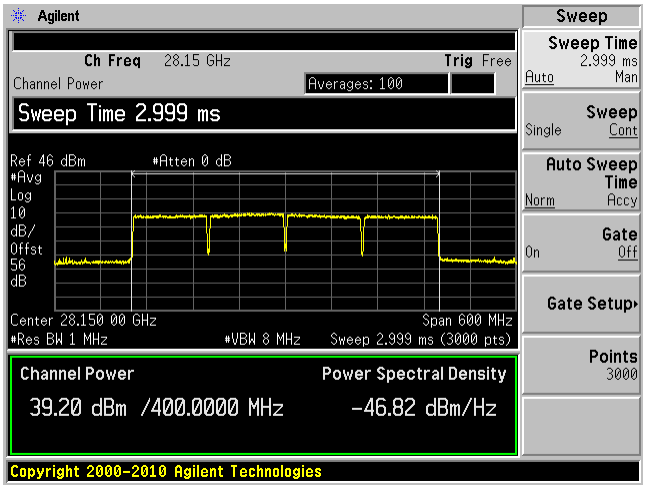
Low Channel



Middle Channel



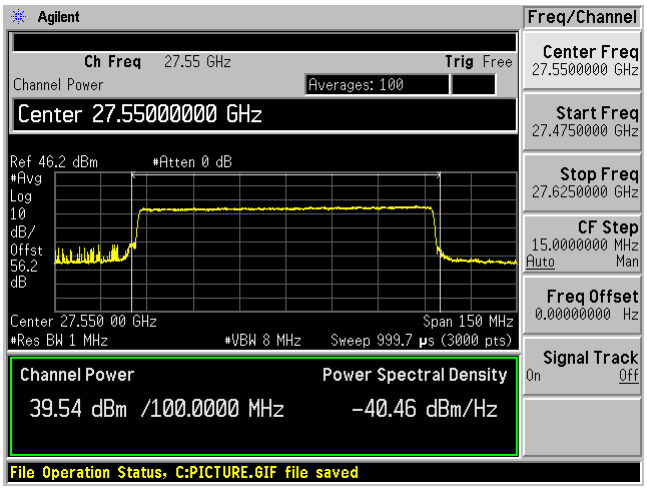
High Channel



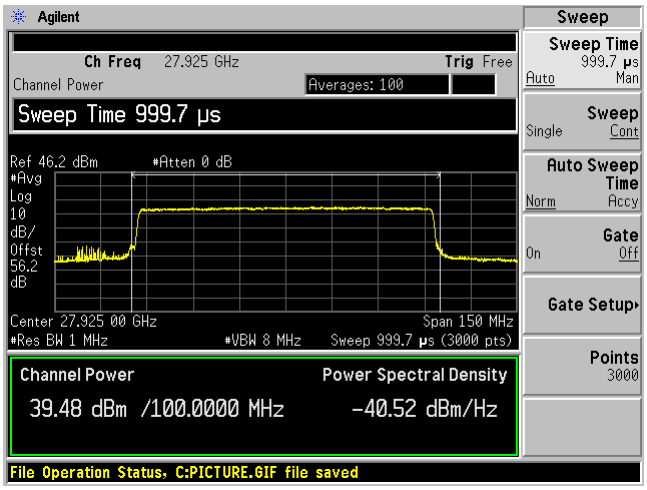
Beam ID: 139 (Horizontal)

1CC – 16QAM

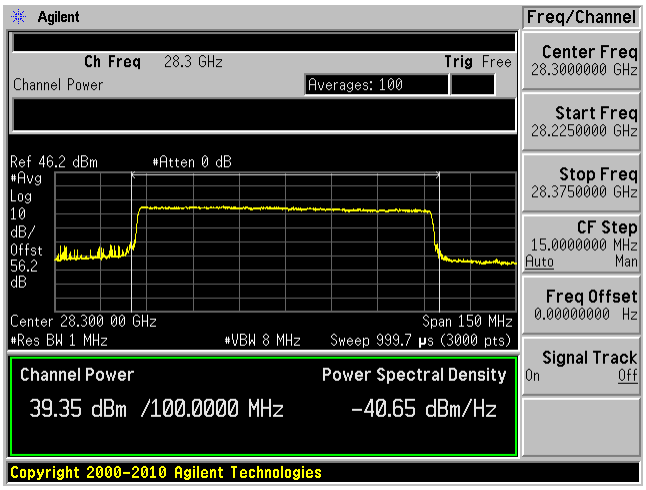
Low Channel



Middle Channel



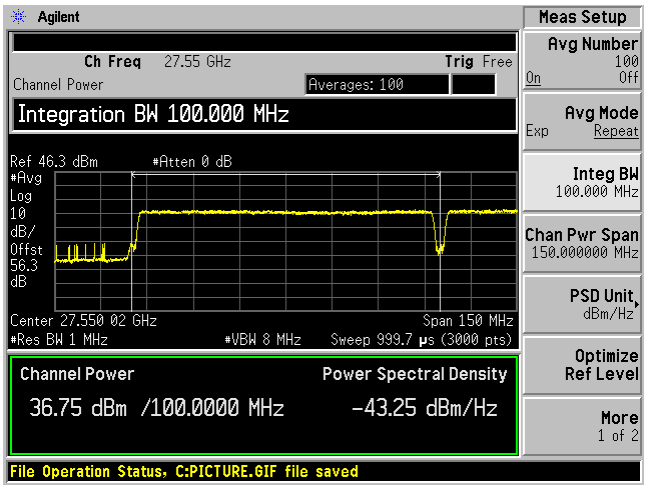
High Channel



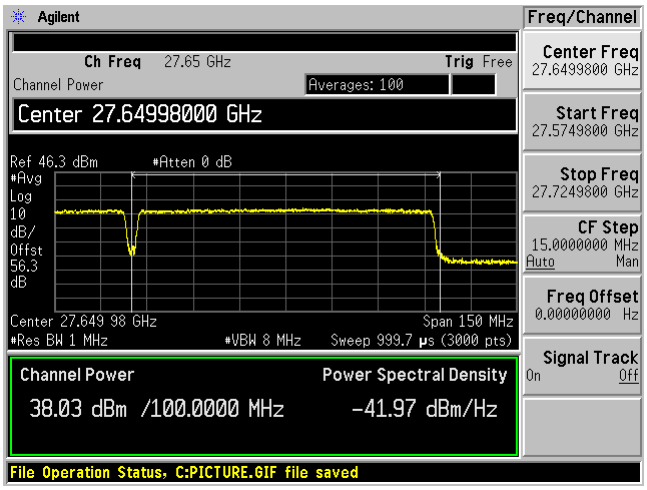
Beam ID: 139 (Horizontal)

2CC – QPSK – Low Channel

1st Carrier



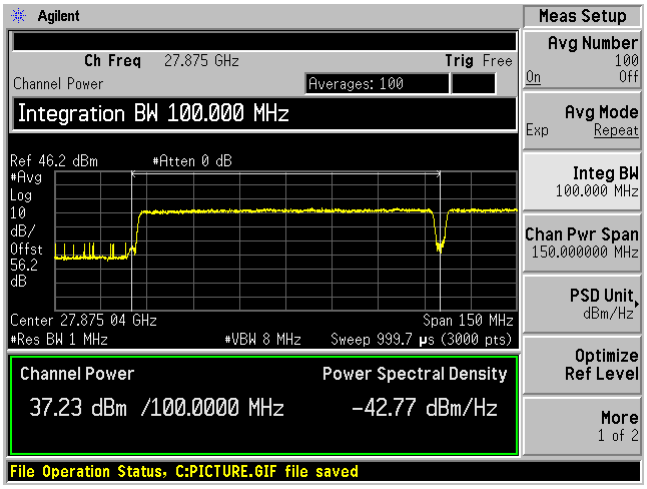
2nd Carrier



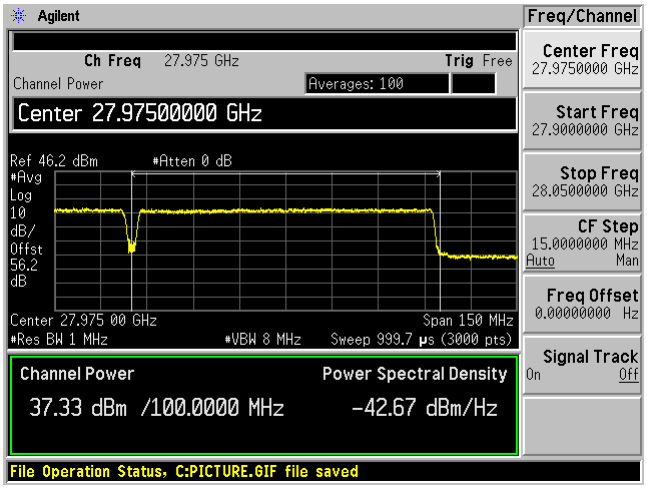
Beam ID: 139 (Horizontal)

2CC – QPSK – Middle Channel

1st Carrier



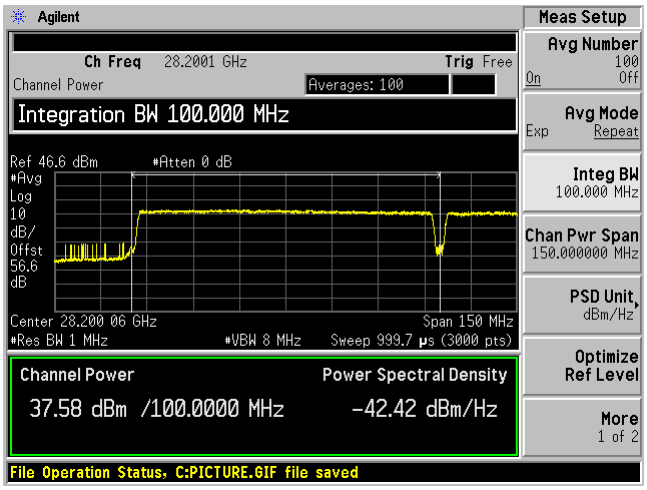
2nd Carrier



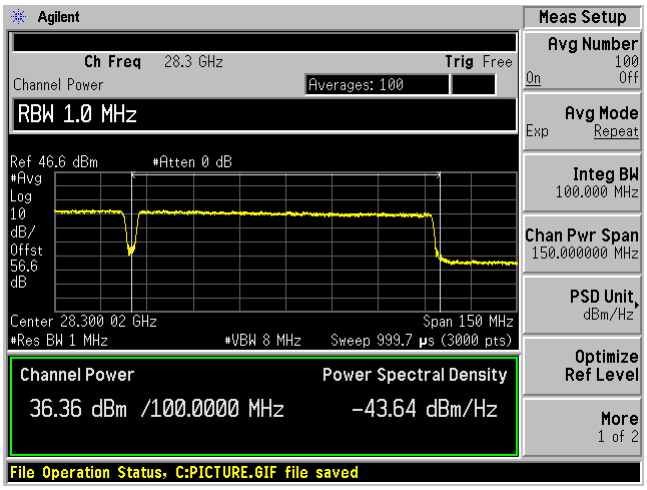
Beam ID: 139 (Horizontal)

2CC – QPSK – High Channel

1st Carrier



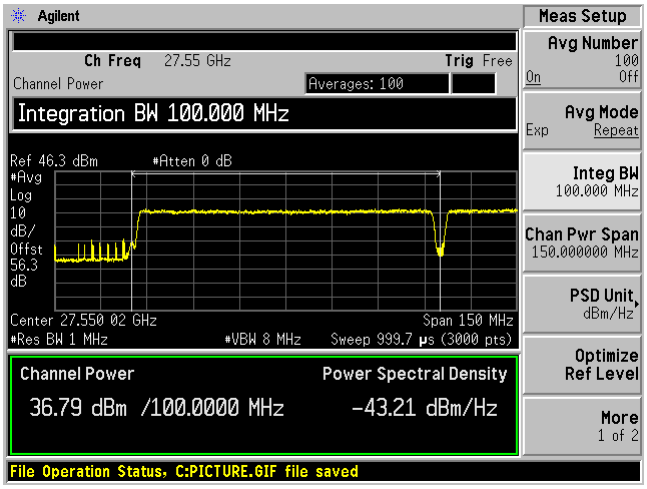
2nd Carrier



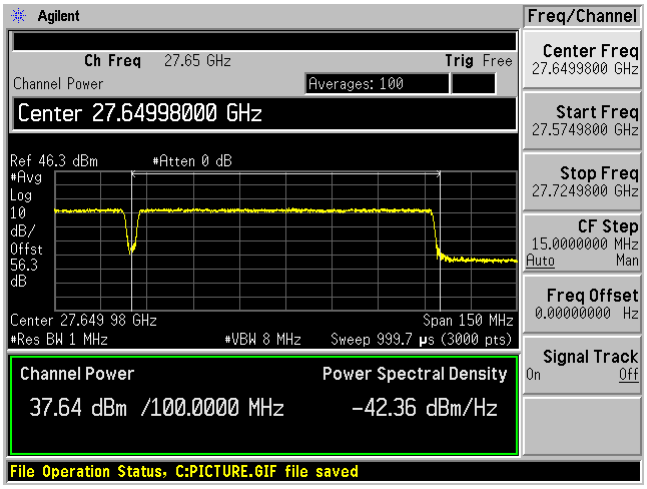
Beam ID: 139 (Horizontal)

2CC – 16QAM – Low Channel

1st Carrier



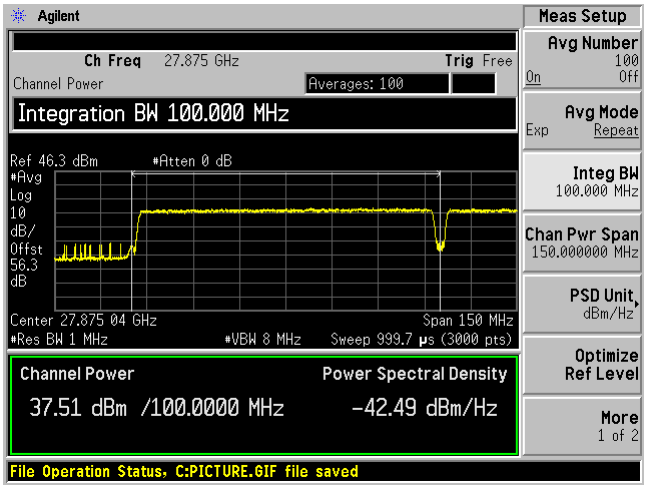
2nd Carrier



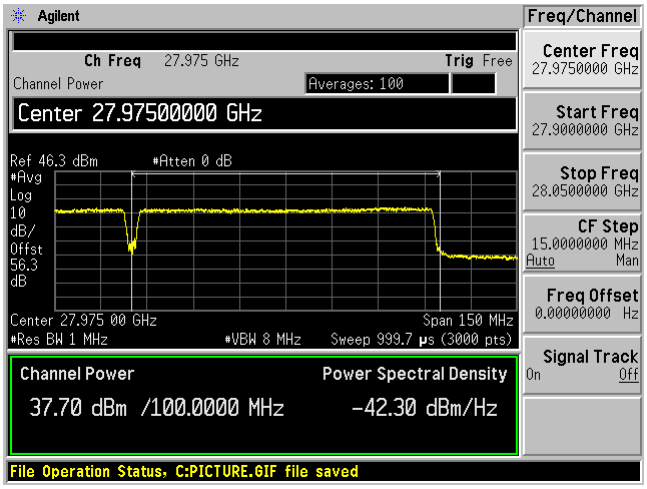
Beam ID: 139 (Horizontal)

2CC – 16QAM – Middle Channel

1st Carrier



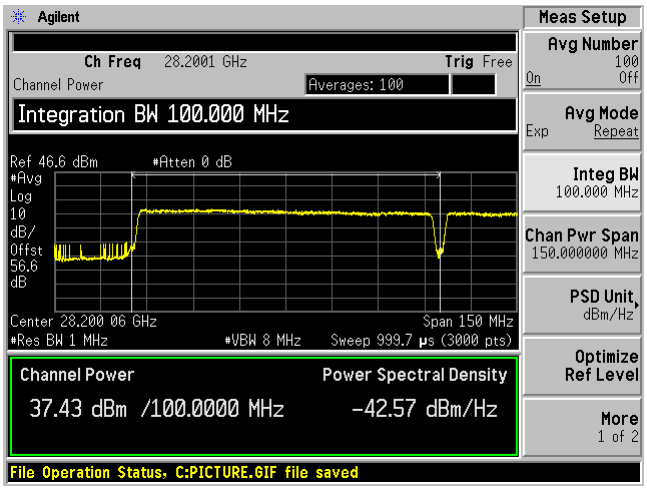
2nd Carrier



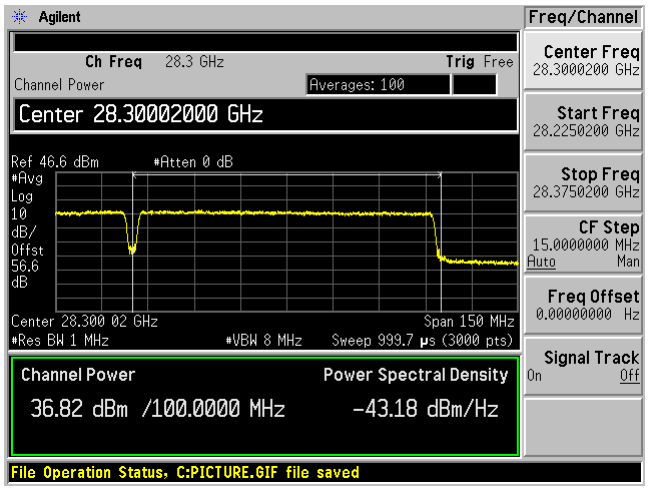
Beam ID: 139 (Horizontal)

2CC – 16QAM – High Channel

1st Carrier



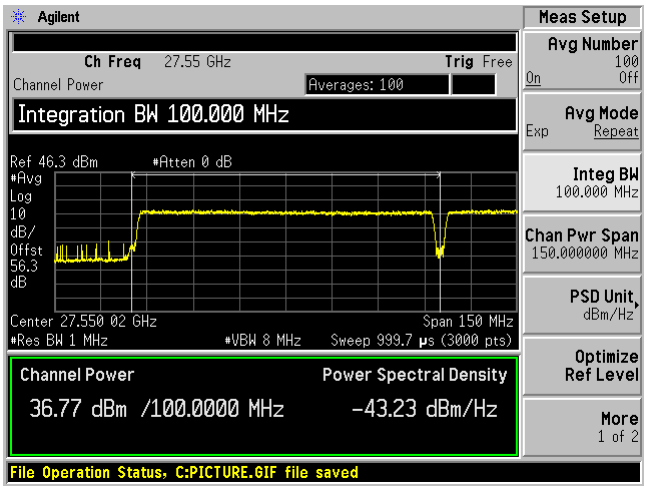
2nd Carrier



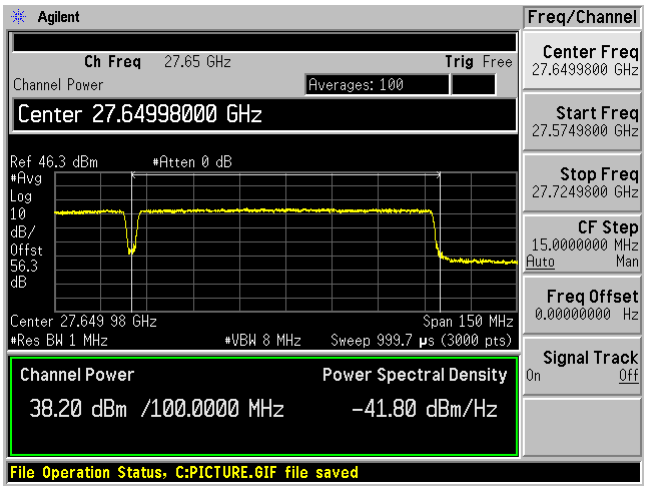
Beam ID: 139 (Horizontal)

2CC – 64QAM – Low Channel

1st Carrier



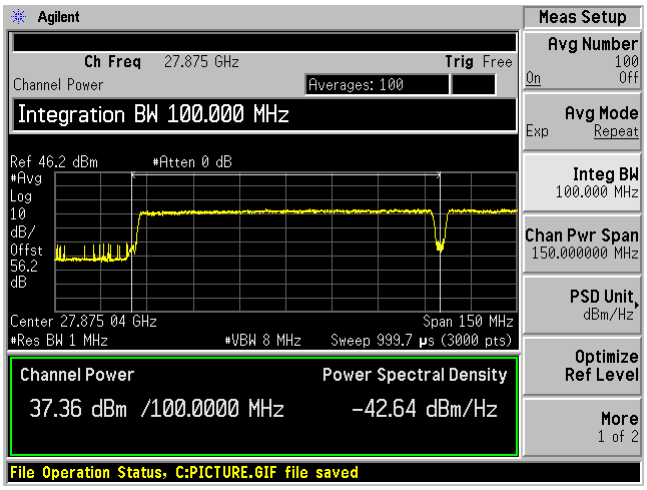
2nd Carrier



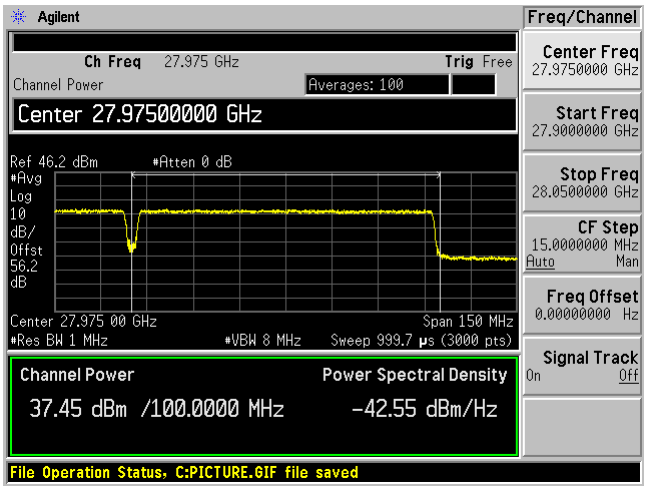
Beam ID: 139 (Horizontal)

2CC – 64QAM – Middle Channel

1st Carrier



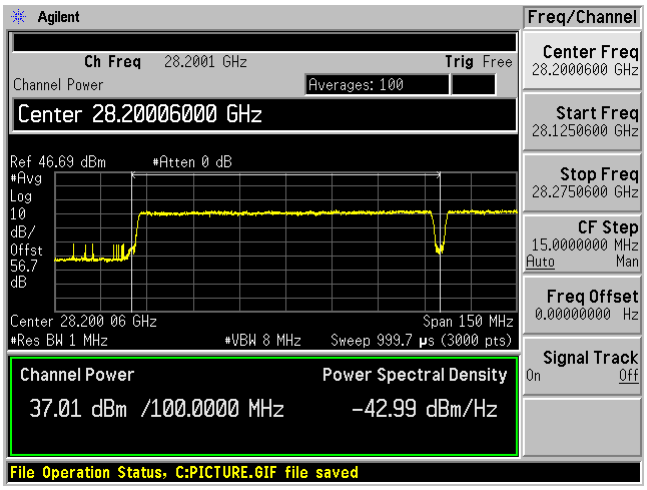
2nd Carrier



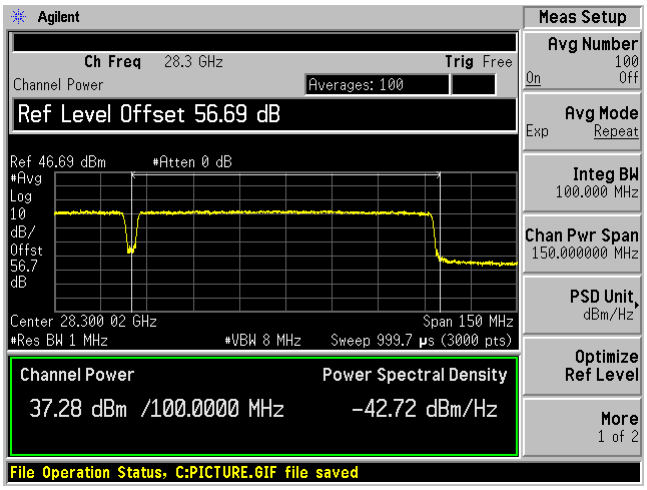
Beam ID: 139 (Horizontal)

2CC – 64QAM – High Channel

1st Carrier



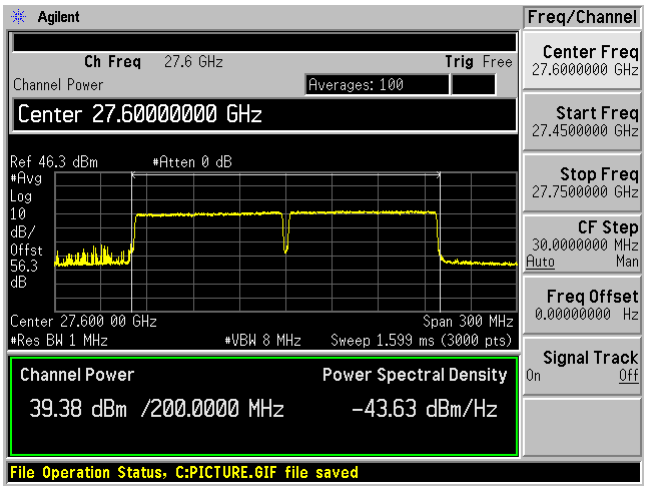
2nd Carrier



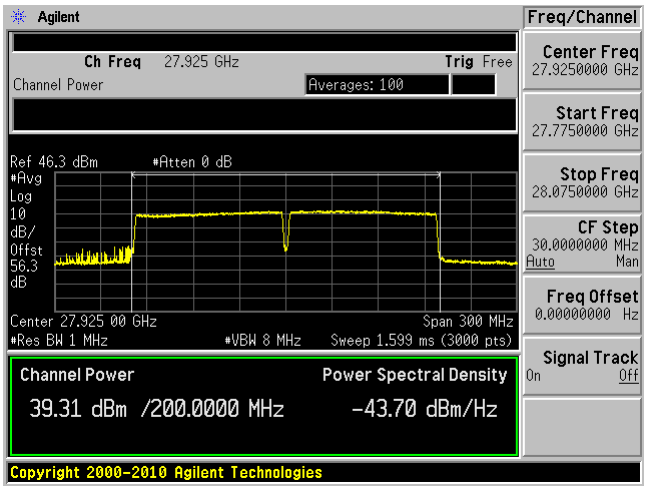
Beam ID: 139 (Horizontal) (Channel Power)

2CC – QPSK

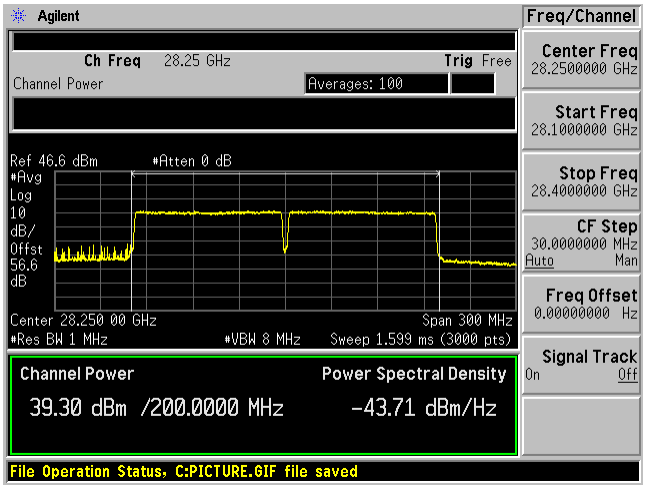
Low Channel



Middle Channel



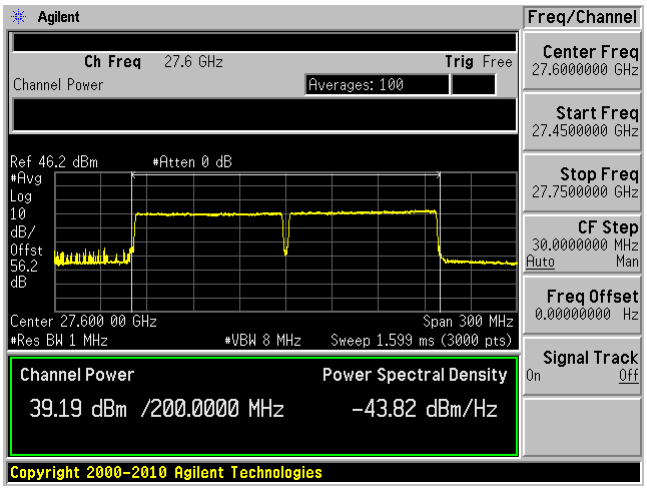
High Channel



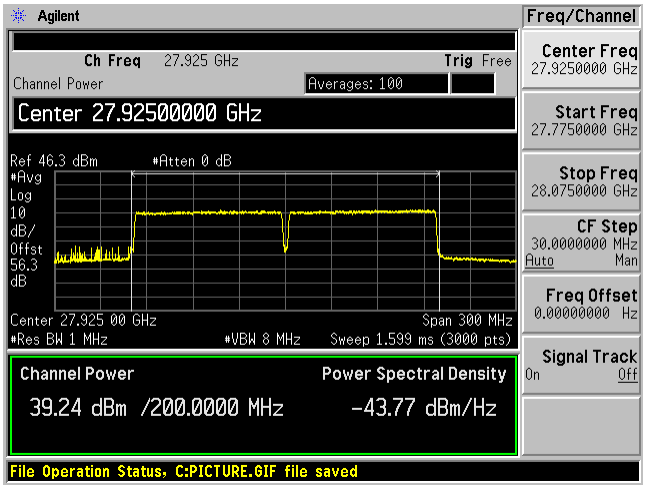
Beam ID: 139 (Horizontal) (Channel Power)

2CC – 16QAM

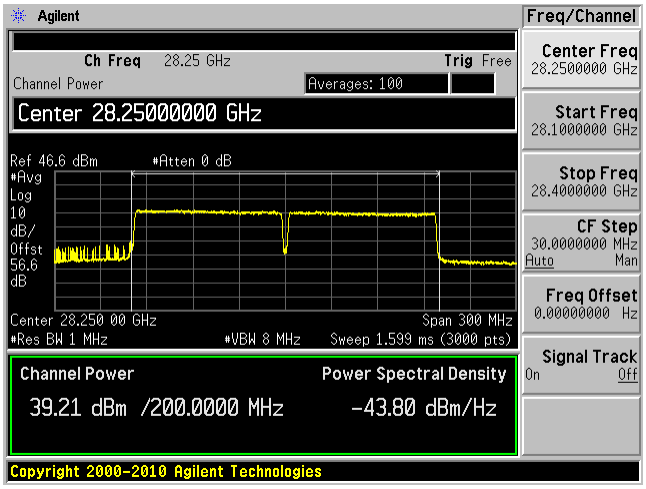
Low Channel



Middle Channel



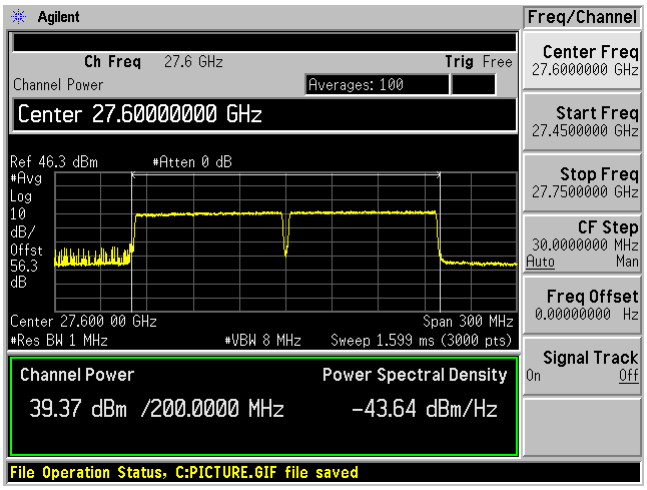
High Channel



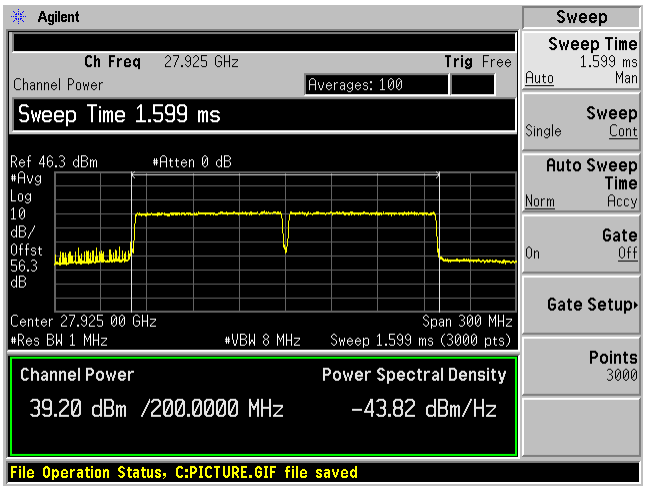
Beam ID: 139 (Horizontal) (Channel Power)

2CC – 64QAM

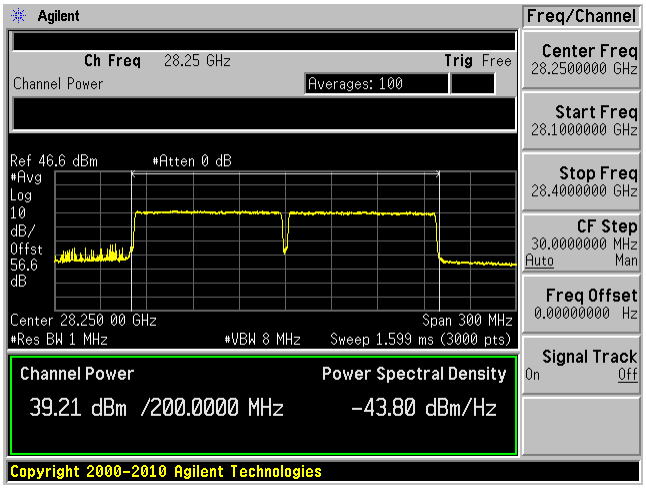
Low Channel



Middle Channel



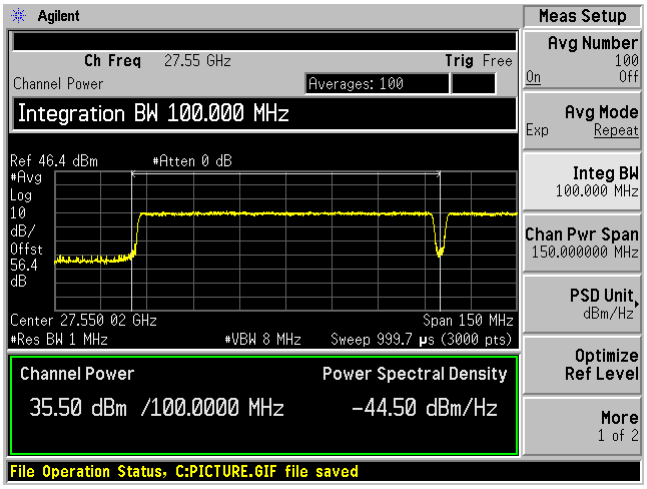
High Channel



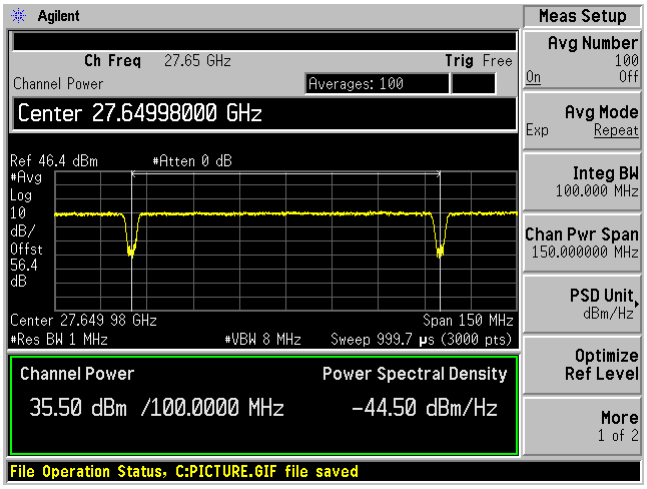
Beam ID: 139 (Horizontal)

3CC – QPSK – Low Channel

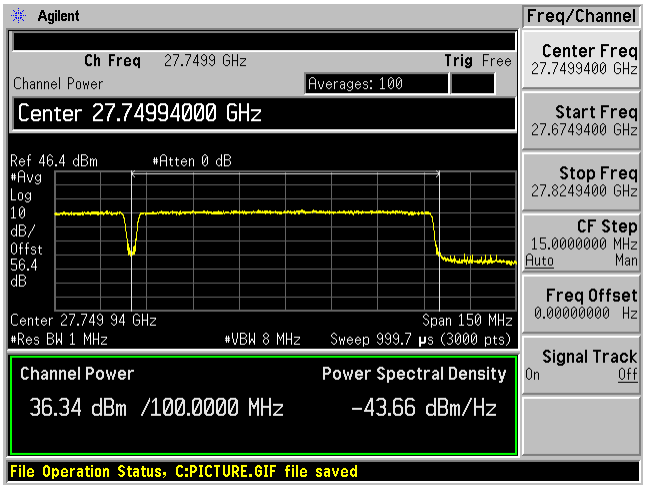
1st Carrier



2nd Carrier



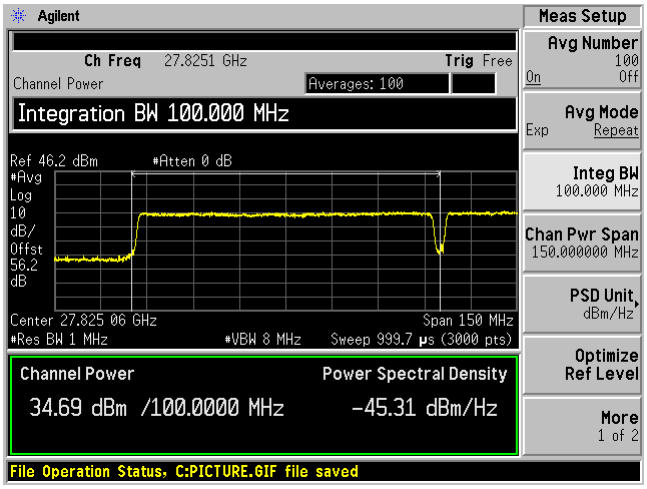
3rd Carrier



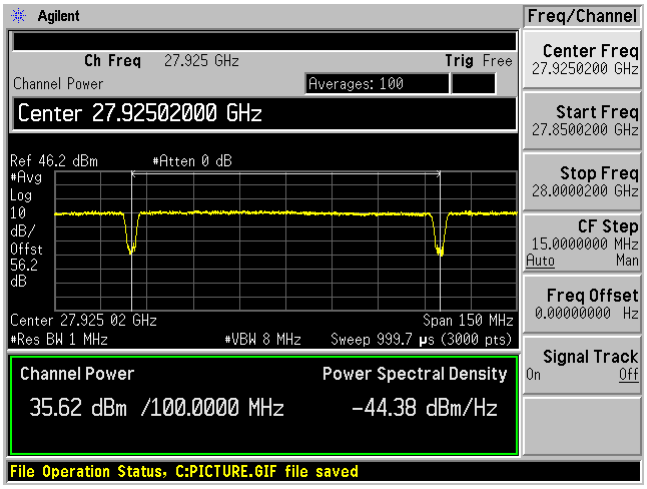
Beam ID: 139 (Horizontal)

3CC – QPSK – Middle Channel

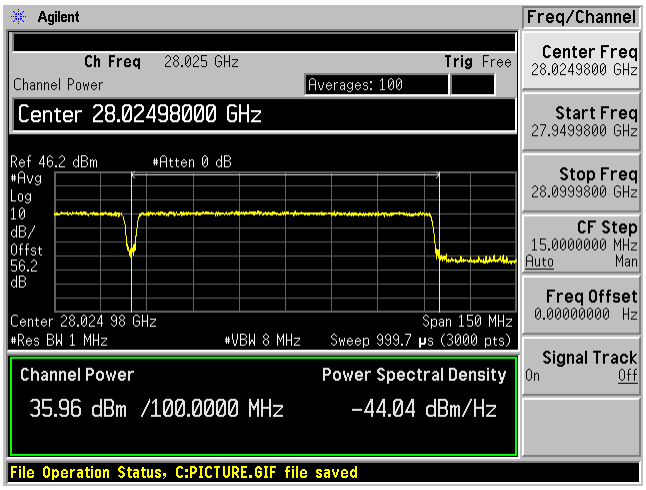
1st Carrier



2nd Carrier



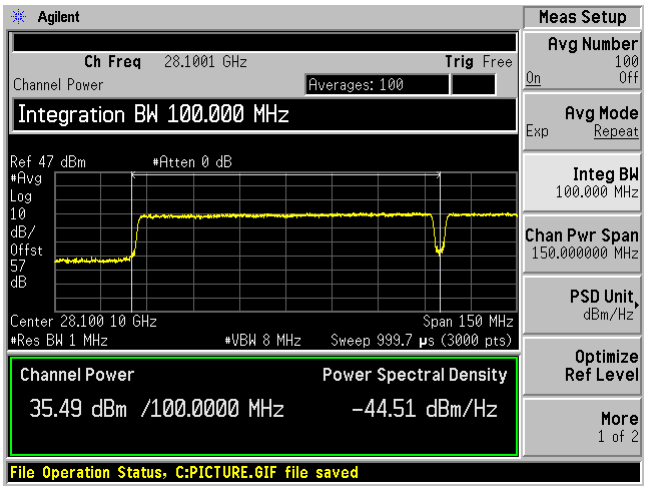
3rd Carrier



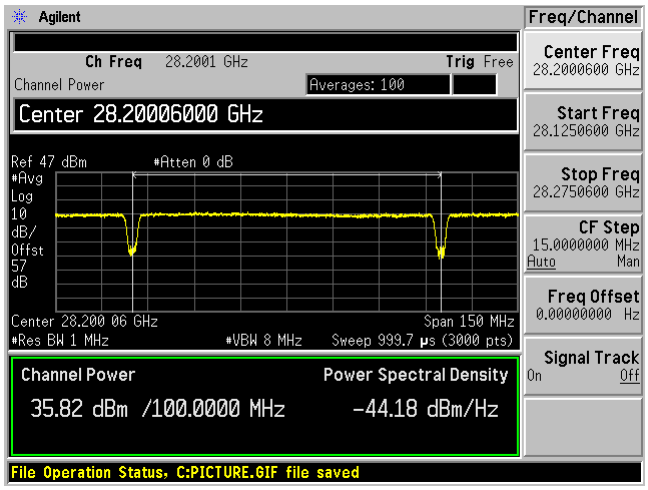
Beam ID: 139 (Horizontal)

3CC – QPSK – High Channel

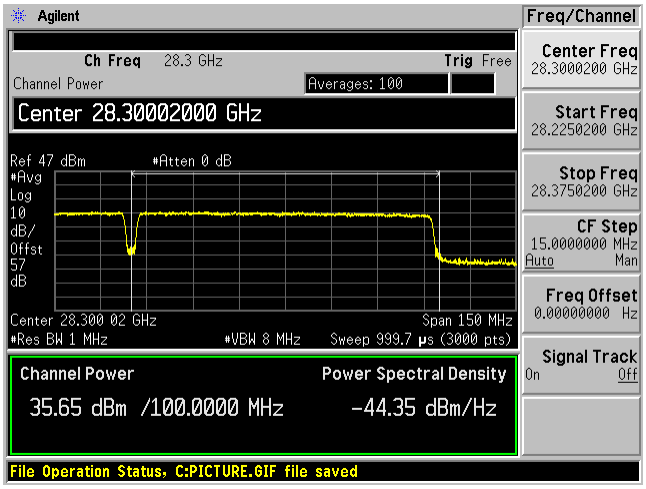
1st Carrier



2nd Carrier



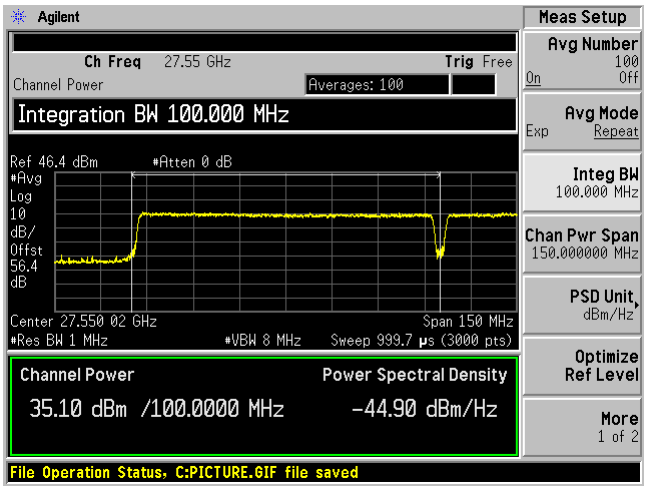
3rd Carrier



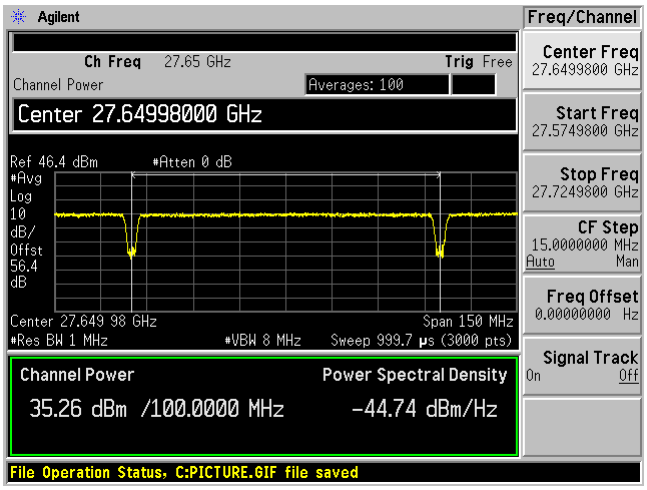
Beam ID: 139 (Horizontal)

3CC – 16QAM – Low Channel

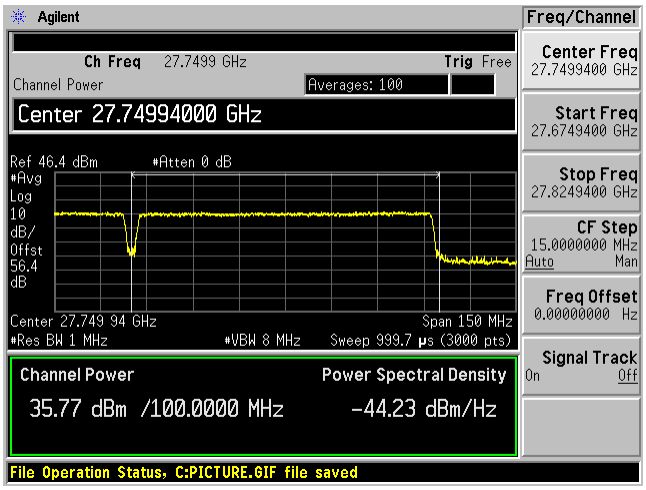
1st Carrier



2nd Carrier



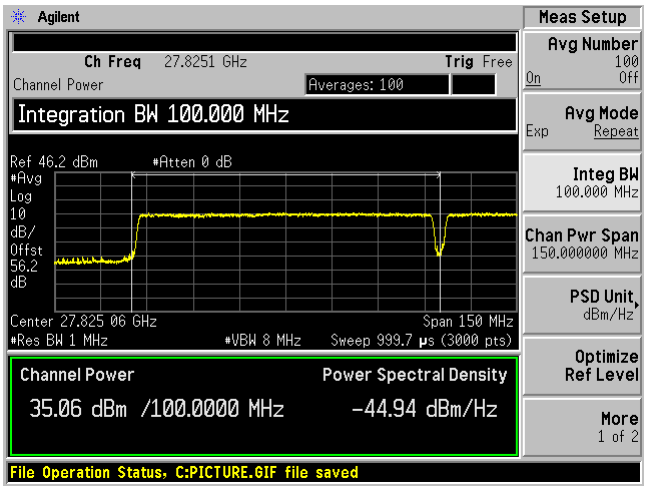
3rd Carrier



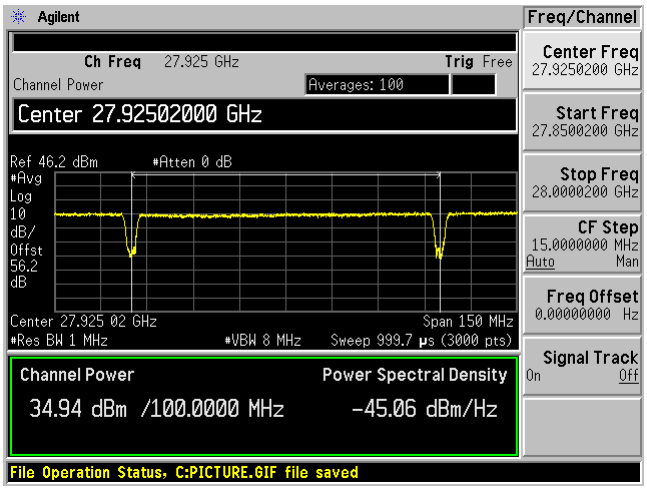
Beam ID: 139 (Horizontal)

3CC – 16QAM – Middle Channel

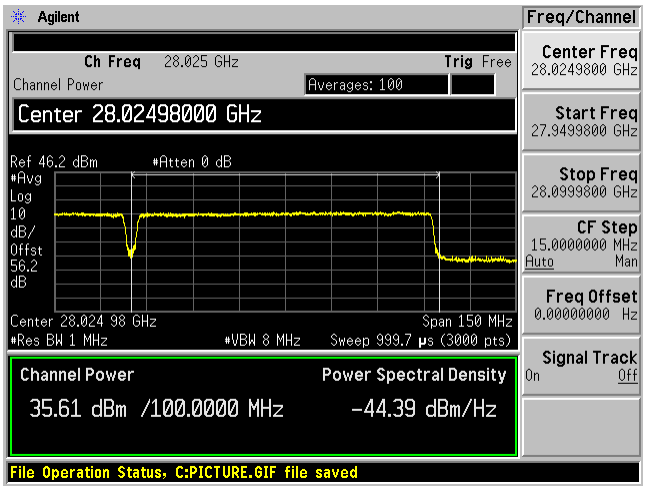
1st Carrier



2nd Carrier



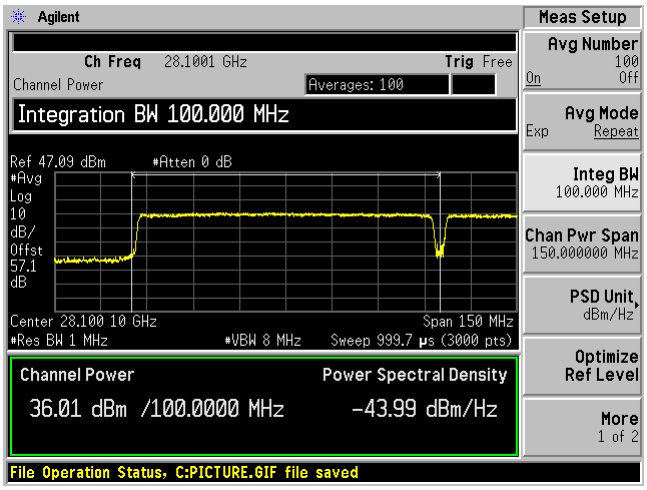
3rd Carrier



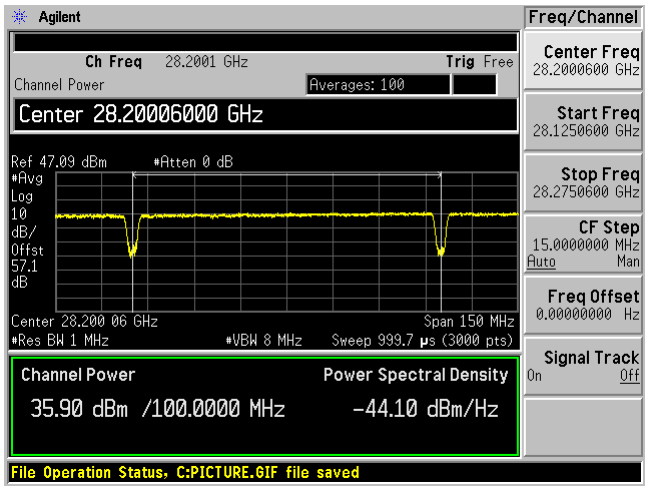
Beam ID: 139 (Horizontal)

3CC – 16QAM – High Channel

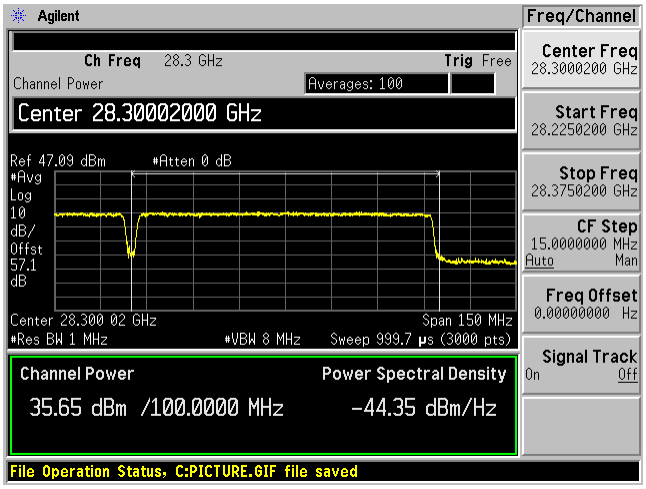
1st Carrier



2nd Carrier



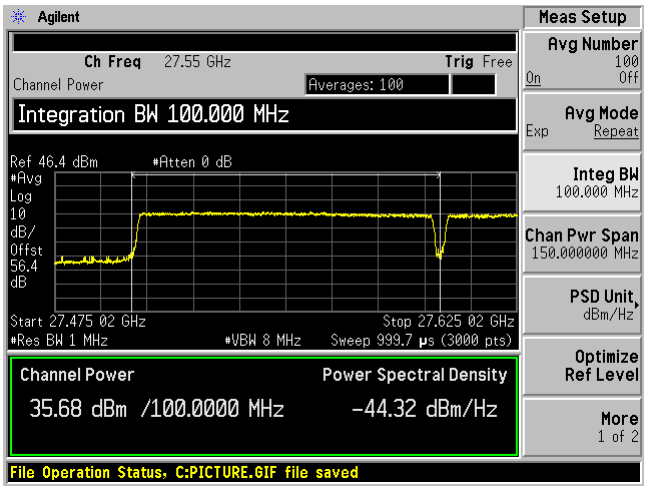
3rd Carrier



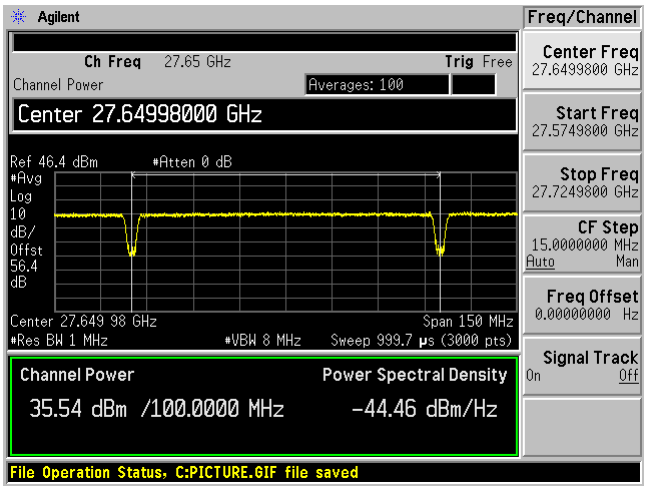
Beam ID: 139 (Horizontal)

3CC – 64QAM – Low Channel

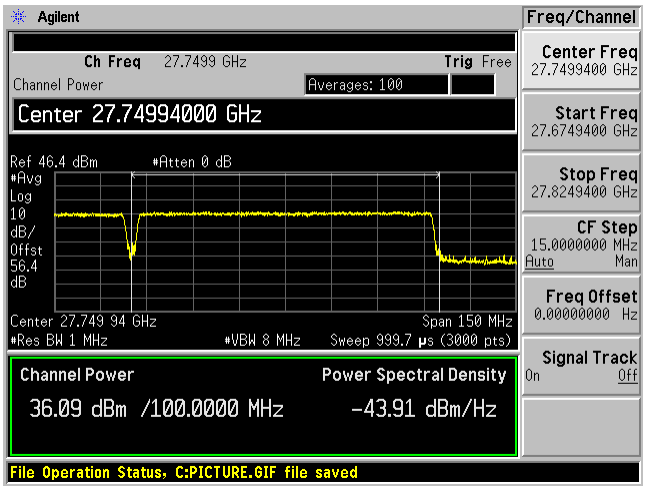
1st Carrier



2nd Carrier



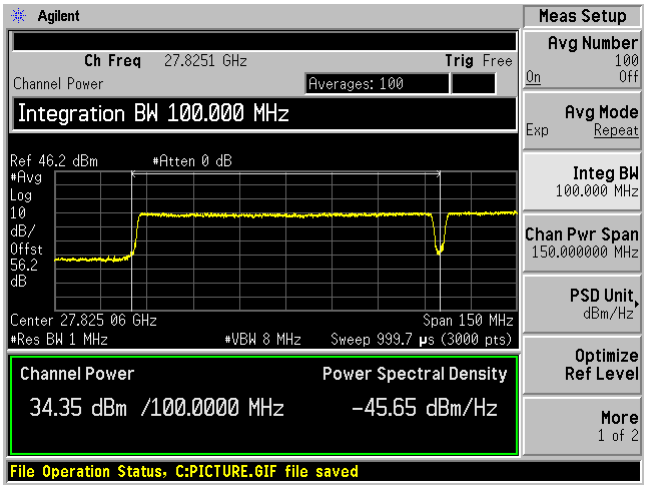
3rd Carrier



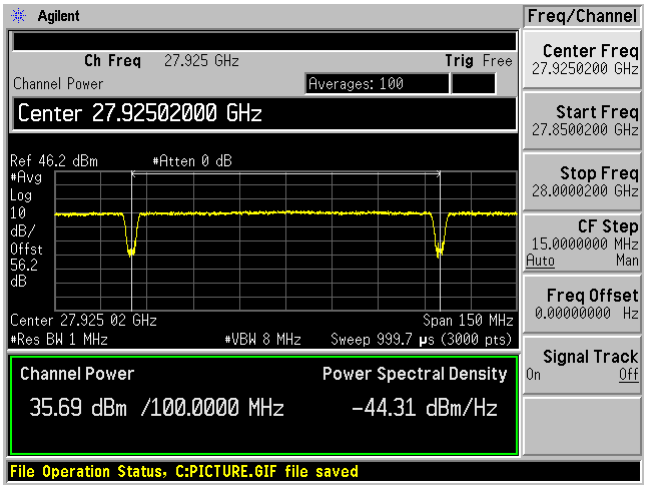
Beam ID: 139 (Horizontal)

3CC – 64QAM – Middle Channel

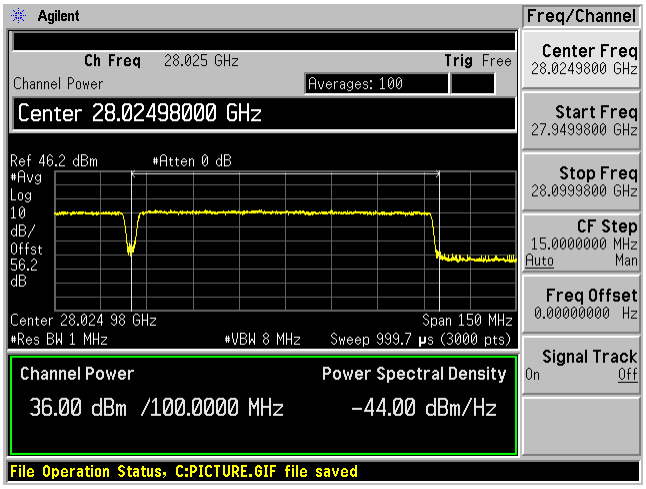
1st Carrier



2nd Carrier



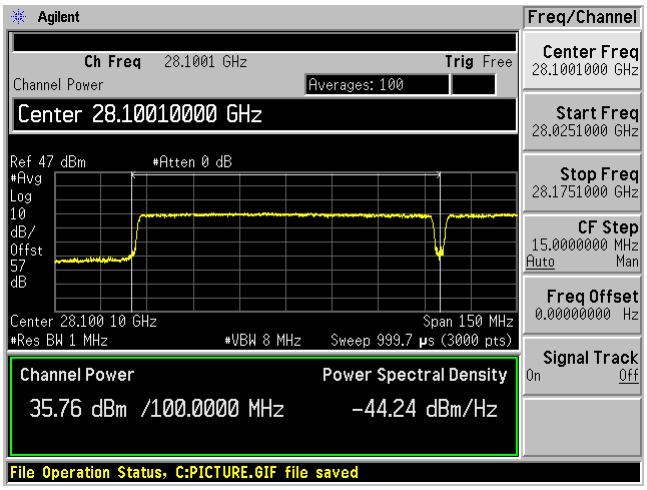
3rd Carrier



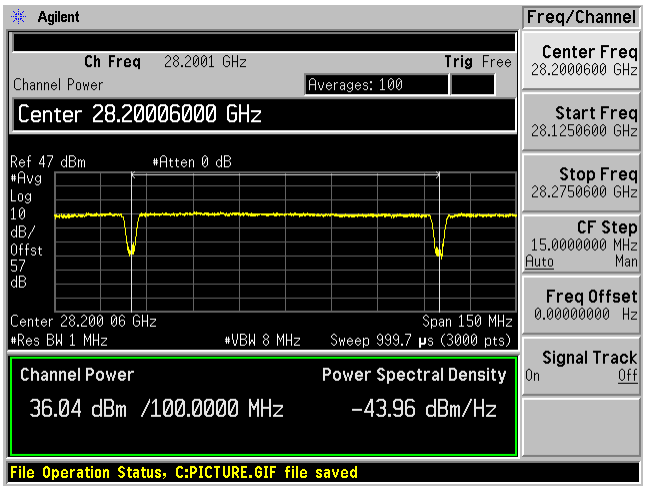
Beam ID: 139 (Horizontal)

3CC – 64QAM – High Channel

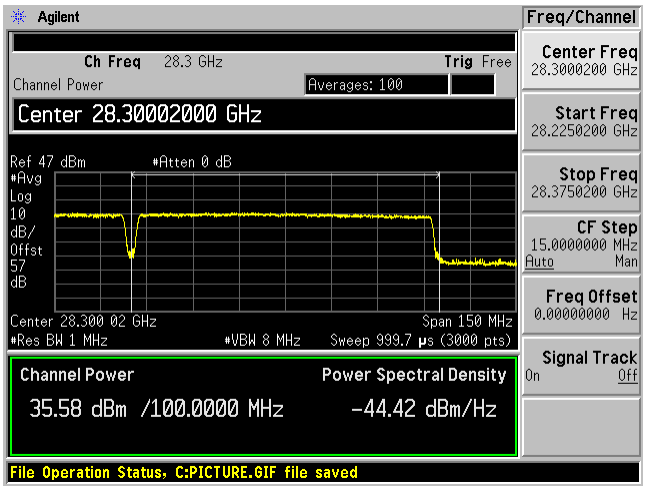
1st Carrier



2nd Carrier



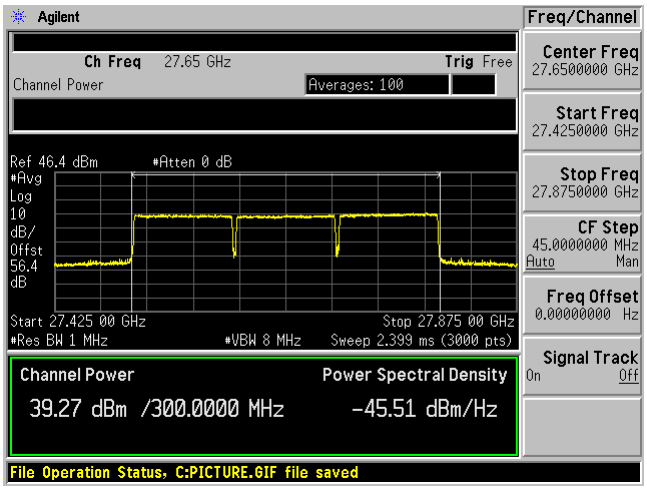
3rd Carrier



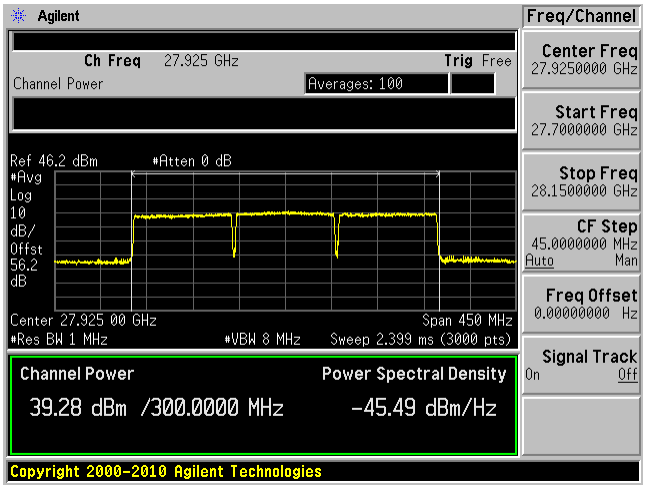
Beam ID: 139 (Horizontal) (Channel Power)

3CC – QPSK

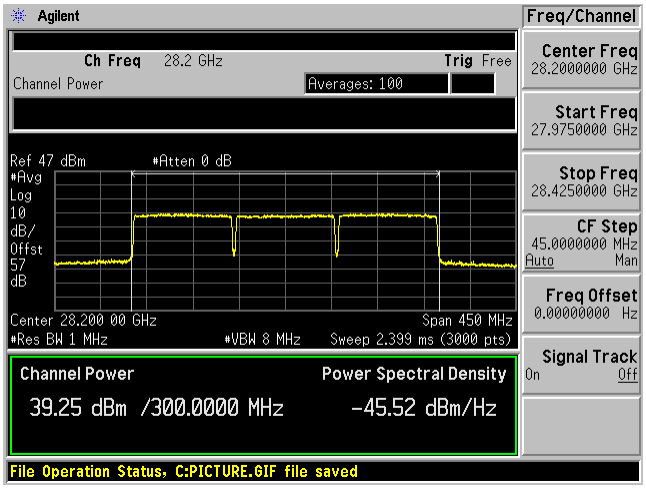
Low Channel



Middle Channel



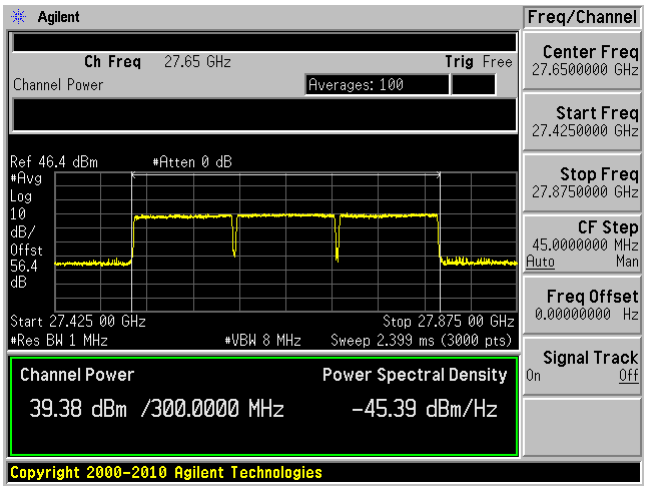
High Channel



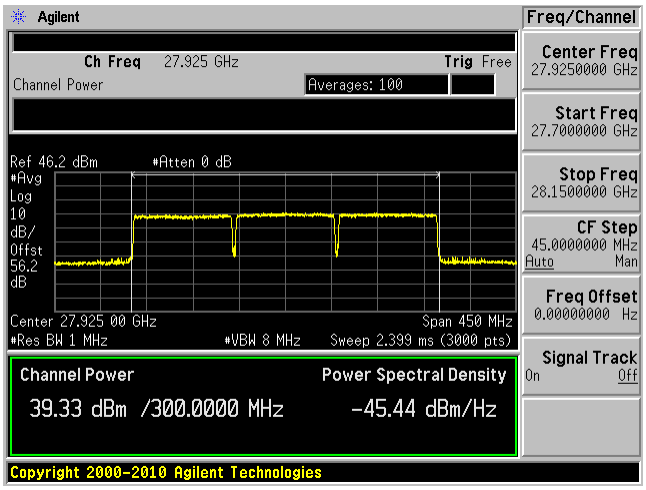
Beam ID: 139 (Horizontal) (Channel Power)

3CC – 16QAM

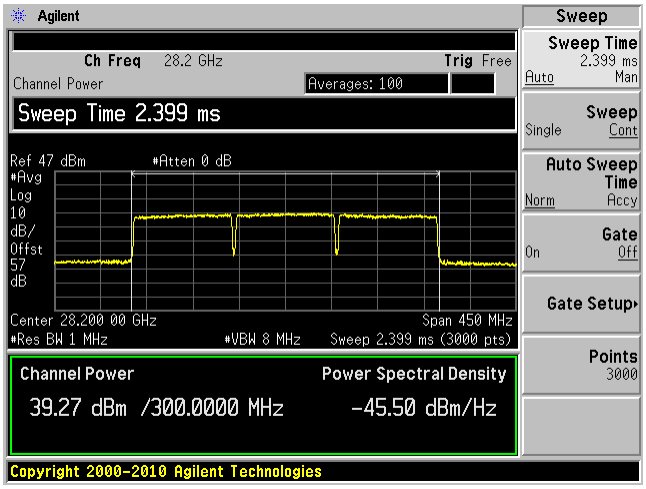
Low Channel



Middle Channel



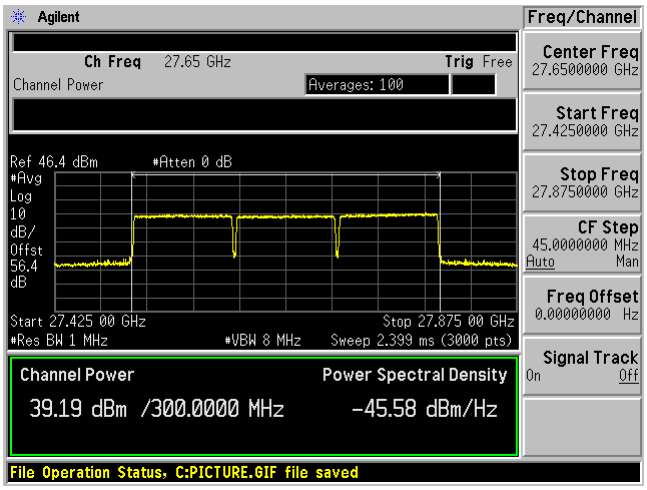
High Channel



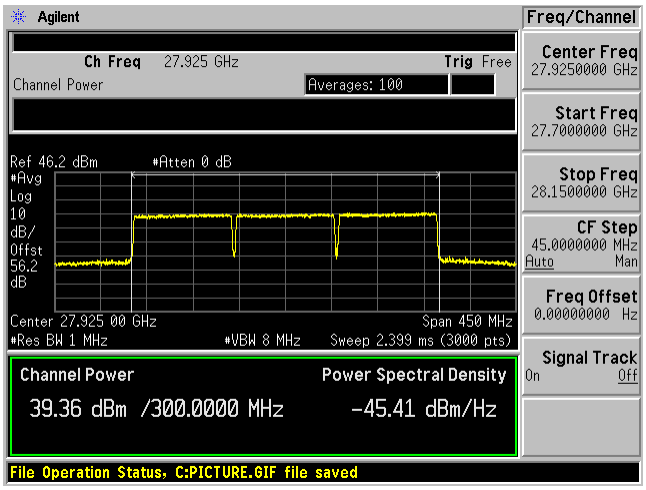
Beam ID: 139 (Horizontal) (Channel Power)

3CC – 64QAM

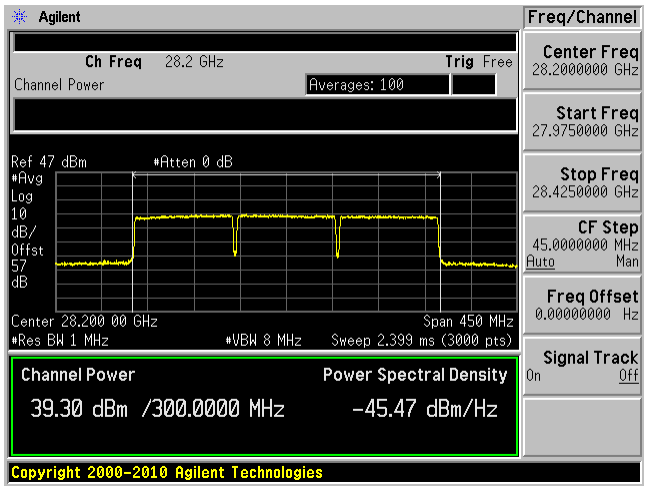
Low Channel



Middle Channel



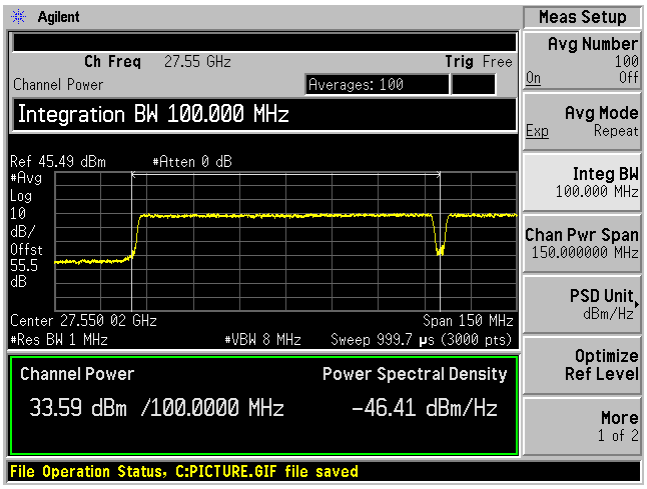
High Channel



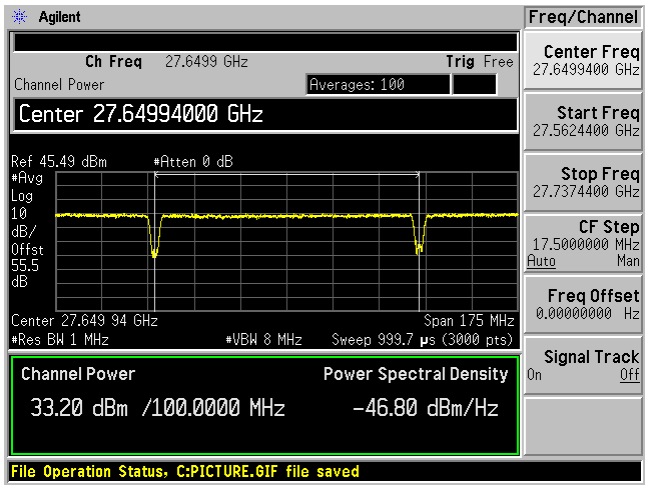
Beam ID: 139 (Horizontal)

4CC – 16QAM– Low Channel

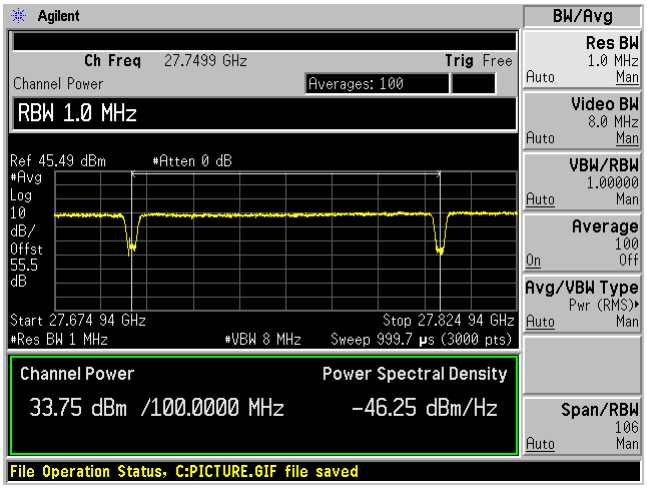
1st Carrier



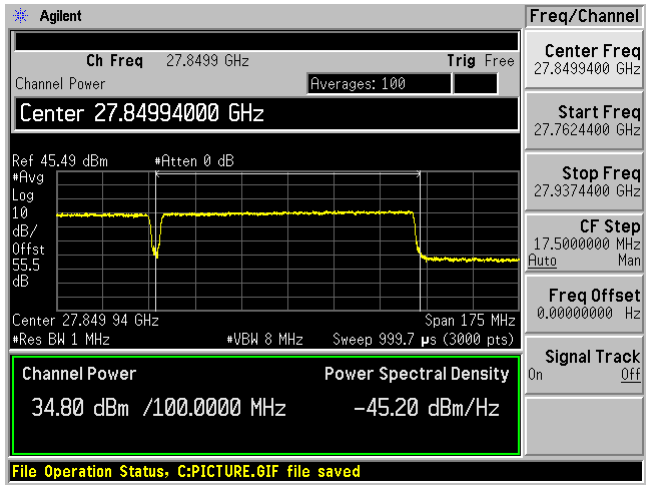
2nd Carrier



3rd Carrier



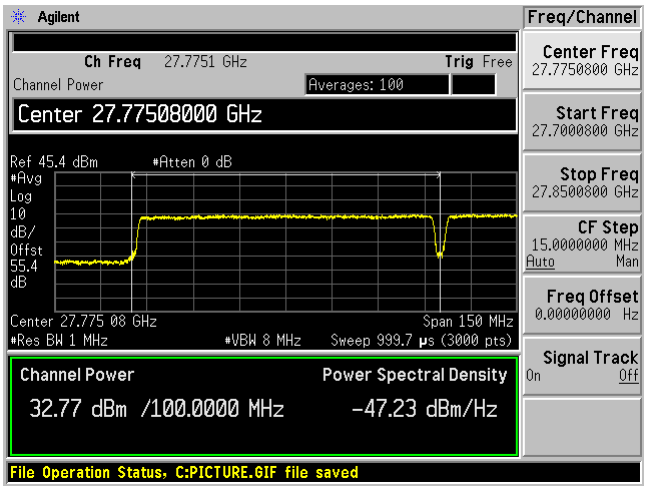
4th Carrier



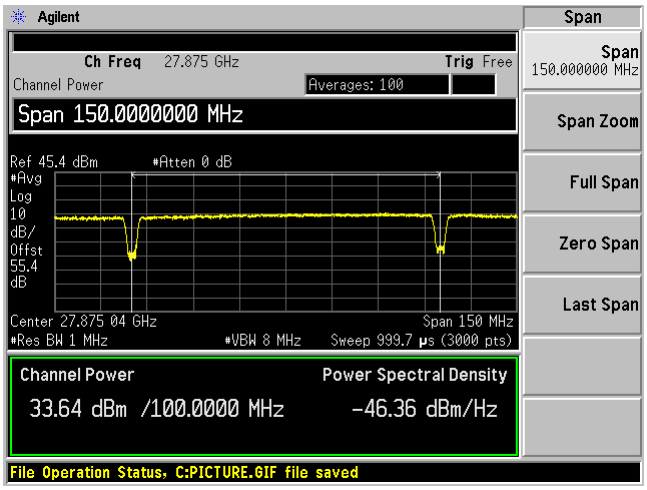
Beam ID: 139 (Horizontal)

4CC – 16QAM – Middle Channel

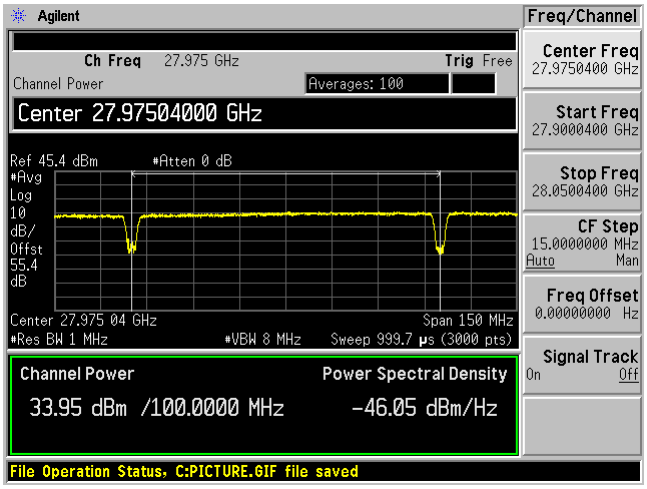
1st Carrier



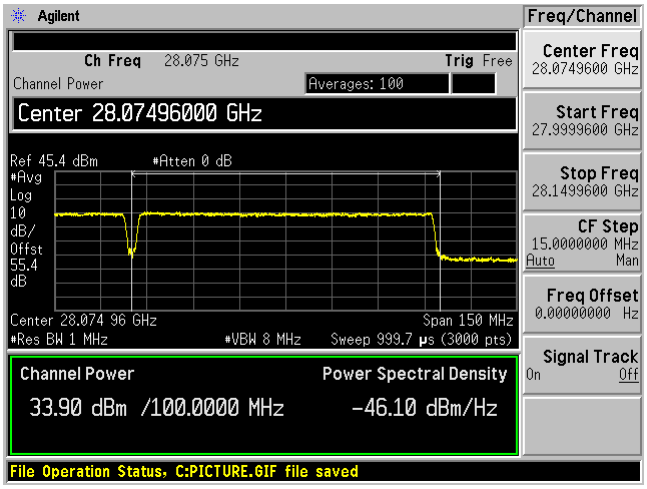
2nd Carrier



3rd Carrier



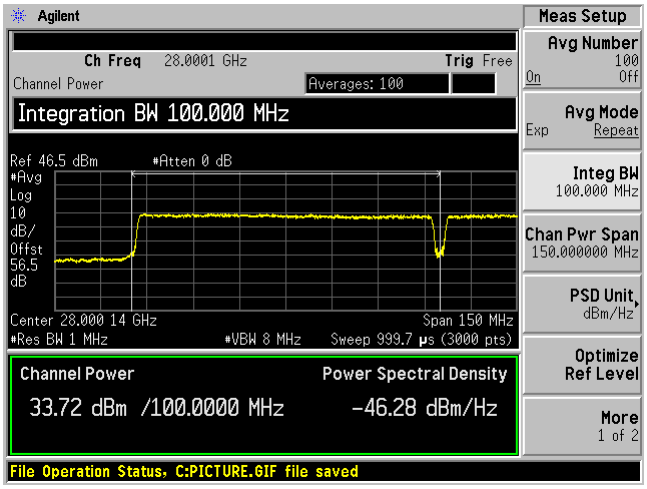
4th Carrier



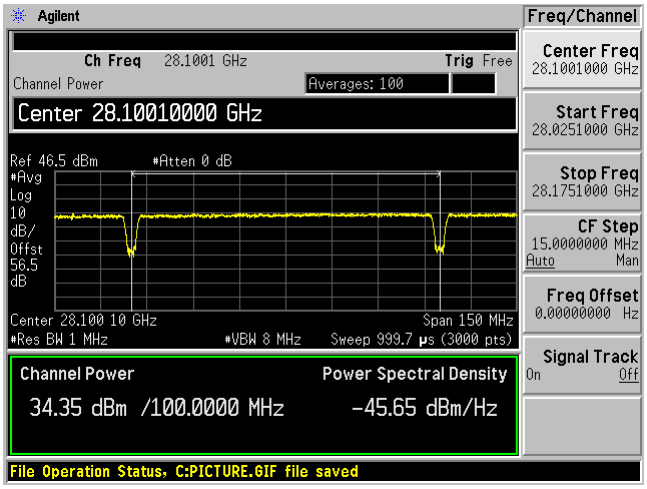
Beam ID: 139 (Horizontal)

4CC – 16QAM – High Channel

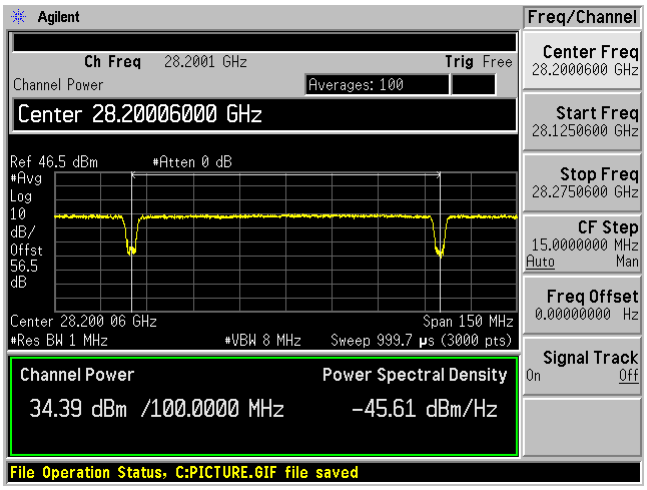
1st Carrier



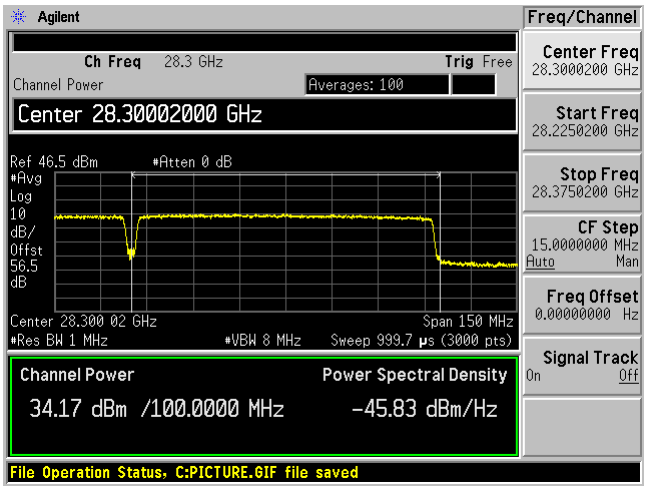
2nd Carrier



3rd Carrier



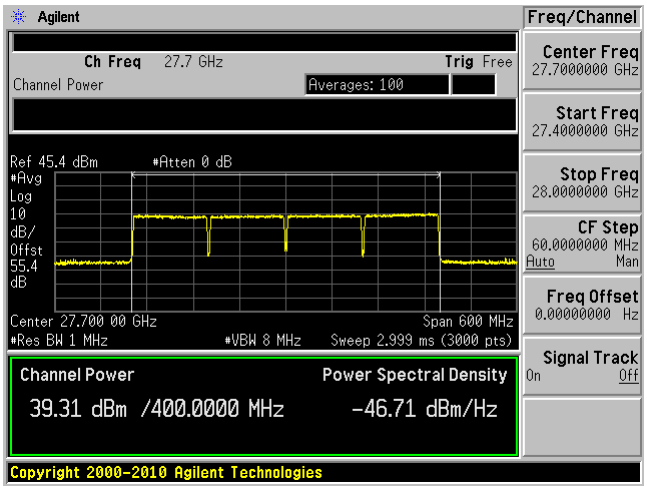
4th Carrier



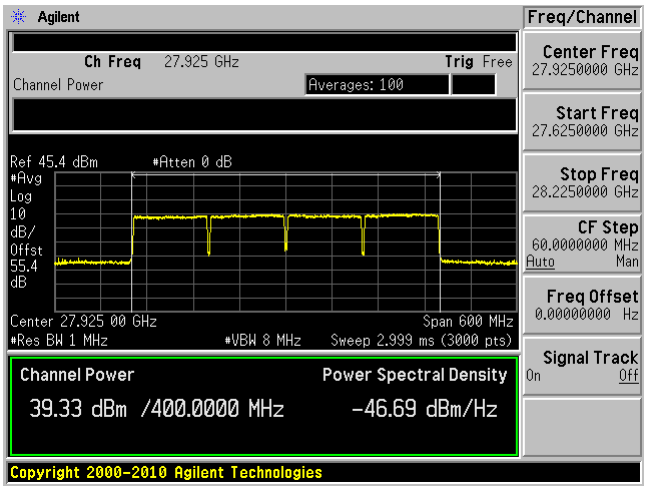
Beam ID: 139 (Horizontal) (Channel Power)

4CC – 16QAM

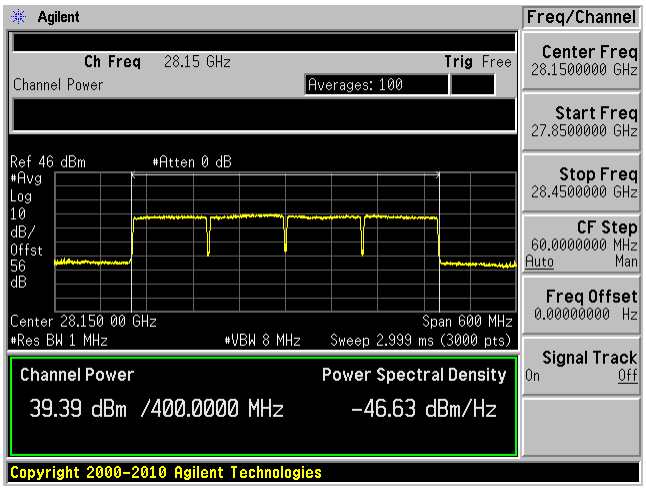
Low Channel



Middle Channel



High Channel



6 FCC §30.203 & §2.1053 - Out of Band Emissions at the Band-edge

6.1 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.

6.2 Measurement Procedure

Unwanted Emission Measurement:

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

E (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).

EIRP (dBm) = E (dBμV/m) + 20log(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.

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

i. RBW = 1 MHz
ii. VBW ≥ 3 MHz
iii. Detector = RMS(average)
iv. Sweep time = auto
v. Trace mode = max hold to present worst case

Note: Lower limit -13dBm was selected to show compliance
Note: EUT antenna gain 22.5 dBi was subtracted in the offset for the conductive power measurement.

6.3 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 years
-	RF Cable	-	-	Each Time	-
Wisewave	Antenna, Horn	ARH-2823-02	10555-02	2020-02-27	2 years

Note[1]: 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".*

6.4 Test Environmental Conditions

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

The testing was performed by Giriraj Gurjar on 2021-06-25 in 5m3 Chamber.

6.5 Test Results

1CC

Channel	Modulation	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
Low	16QAM	-23.27	-25.98	-21.4067	-5	-16.4067
		-25.39	-29.13	-23.859	-13	-10.859
High		-29.45	-31.28	-27.259	-5	-22.259
		-38.48	-37.48	-34.941	-13	-21.941

2CC

Channel	Modulation	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
Low	QPSK	-23.48	-25.95	-21.5314	-5	-16.5314
		-29.22	-29.25	-26.2247	-13	-13.2247
High		-34.76	-35.82	-32.2474	-5	-27.2474
		-39.93	-41.17	-37.4956	-13	-24.4956
Low	16QAM	-23.45	-27.90	-22.1181	-5	-17.1181
		-28.24	-30.03	-26.0331	-13	-13.0331
High		-39.13	-34.86	-33.4798	-5	-28.4798
		-41.89	-39.29	-37.388	-13	-24.388
Low	64QAM	-23.38	-26.52	-21.6619	-5	-16.6619
		-30.64	-25.64	-24.4467	-13	-11.4467
High		-34.70	-34.61	-31.6445	-5	-26.6445
		-39.41	-40.38	-36.8577	-13	-23.8577

3CC

Channel	Modulation	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
Low	QPSK	-34.22	-37.40	-32.5149	-5	-27.5149
		-36.24	-40.25	-34.7874	-13	-21.7874
High		-35.95	-36.65	-33.2756	-5	-28.2756
		-40.25	-40.65	-37.4351	-13	-24.4351
Low	16QAM	-34.94	-37.23	-32.9255	-5	-27.9255
		-37.39	-39.32	-35.2384	-13	-22.2384
High		-36.21	-36.92	-33.5402	-5	-28.5402
		-39.19	-41.48	-37.1755	-13	-24.1755
Low	64QAM	-32.51	-36.66	-31.0968	-5	-26.0968
		-35.03	-39.00	-33.566	-13	-20.566
High		-35.99	-39.67	-34.4411	-5	-29.4411
		-40.00	-41.97	-37.8639	-13	-24.8639

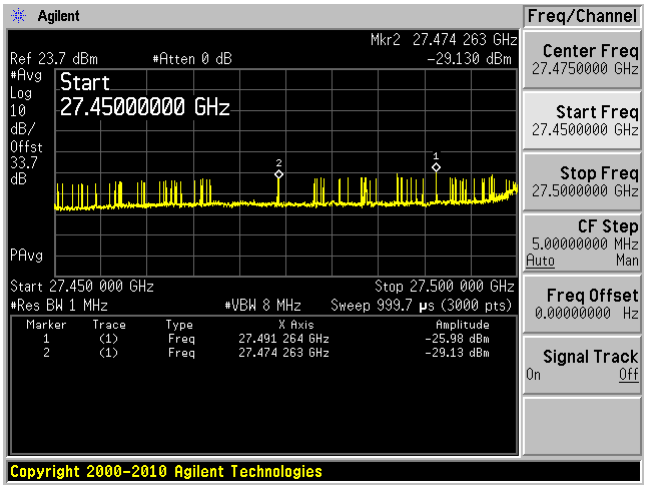
4CC

Channel	Modulation	Conducted Emission (dBm/MHz)		Total Conducted Emission (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
		Horizontal	Vertical			
Low	16QAM	-35.15	-37.99	-33.3316	-5	-28.3316
		-37.99	-38.71	-35.3248	-13	-22.3248
High		-36.62	-37.71	-34.1206	-5	-29.1206
		-42.16	-37.91	-36.5243	-13	-23.5243

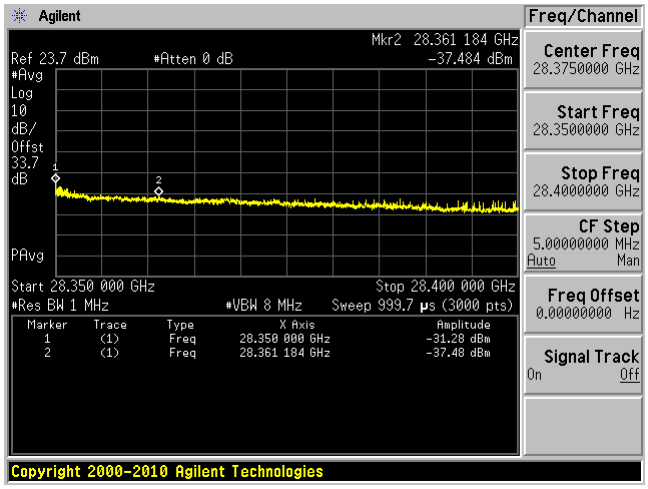
Please refer to the following plots

1CC-16QAM

Low Channel – Beam ID=11 (Vertical)

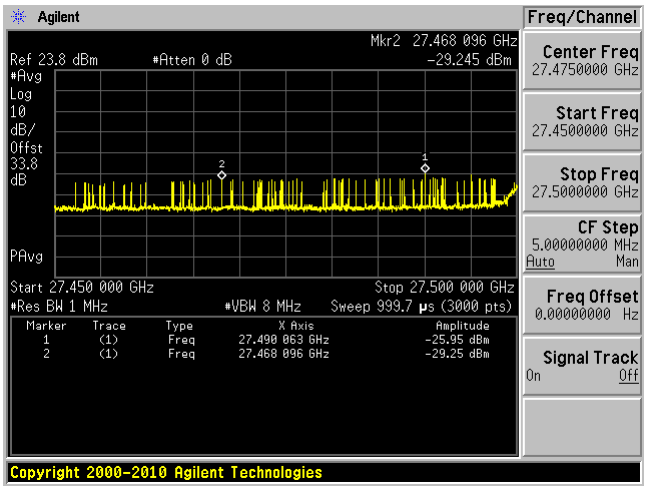


High Channel – Beam ID=11 (Vertical)

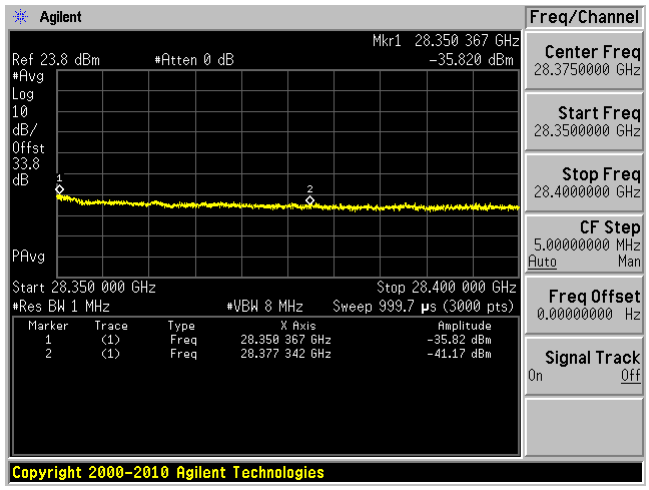


2CC-QPSK

Low Channel – Beam ID=11 (Vertical)

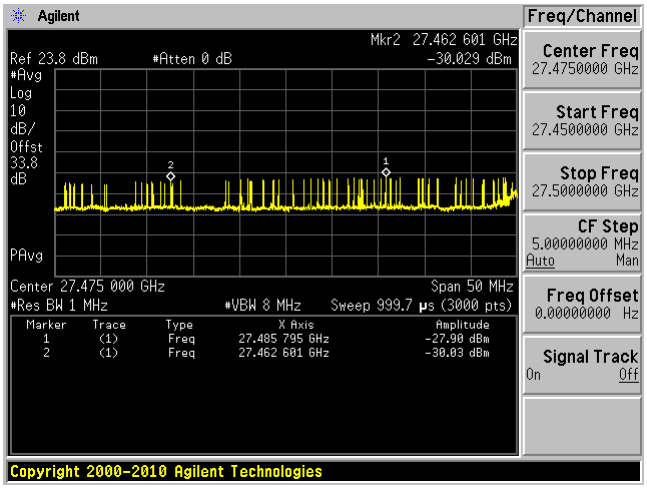


High Channel – Beam ID=11 (Vertical)

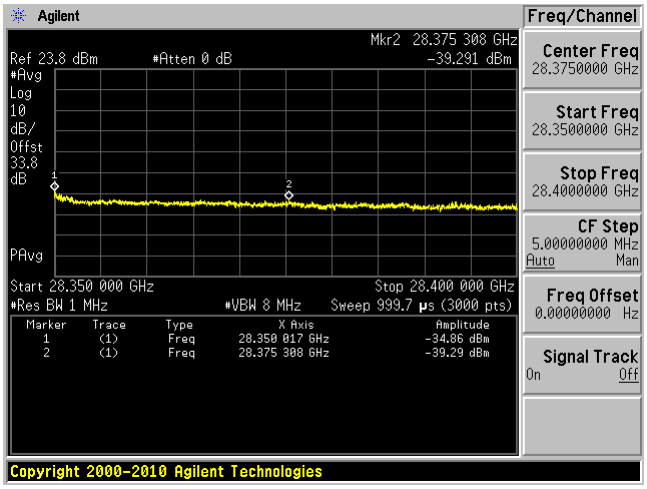


2CC-16QAM

Low Channel – Beam ID=11 (Vertical)

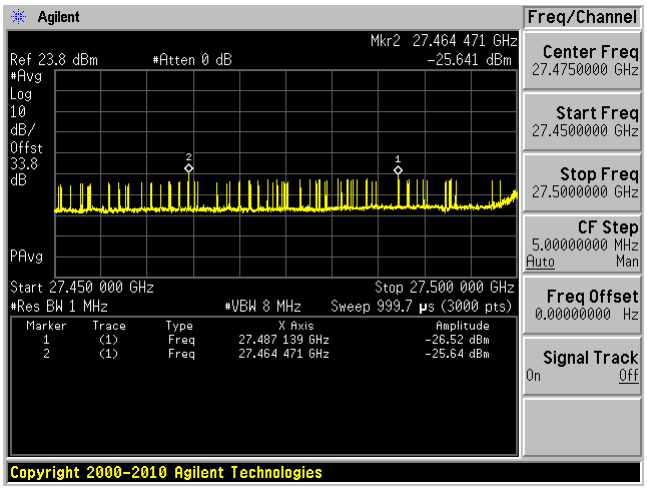


High Channel – Beam ID=11 (Vertical)

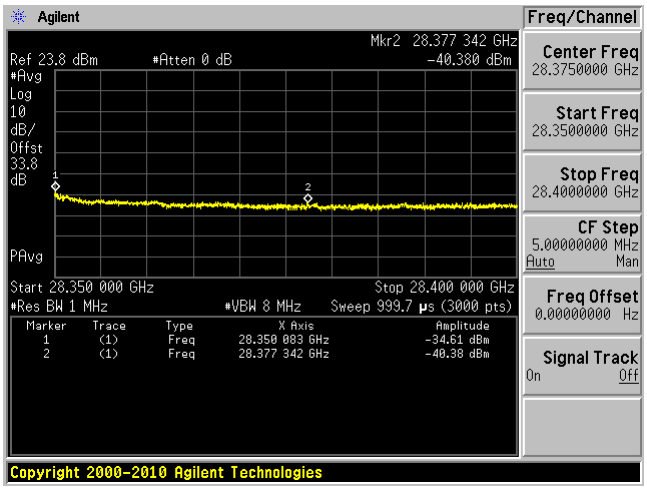


2CC-64QAM

Low Channel – Beam ID=11 (Vertical)

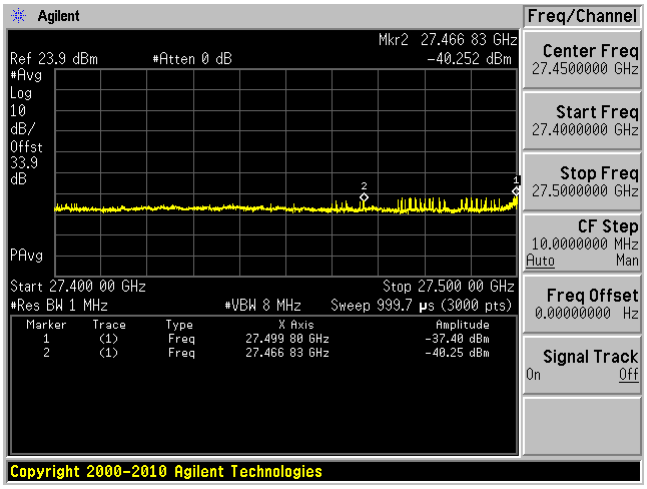


High Channel – Beam ID=11 (Vertical)

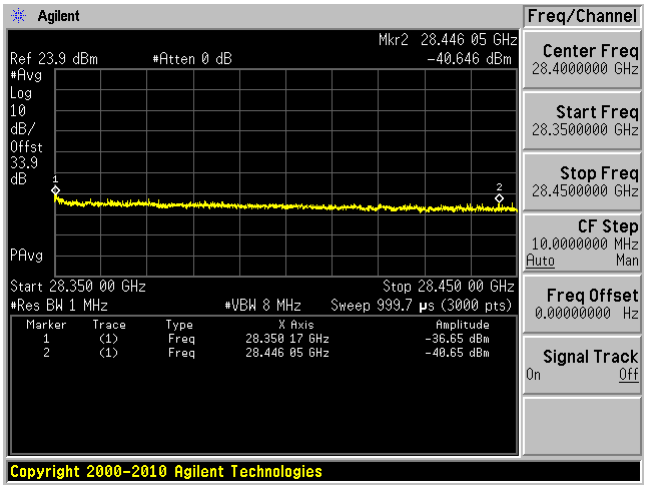


3CC-QPSK

Low Channel – Beam ID=11 (Vertical)

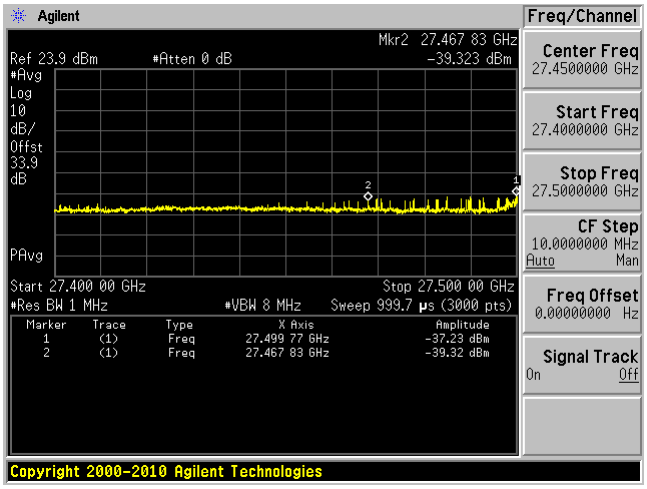


High Channel – Beam ID=11 (Vertical)

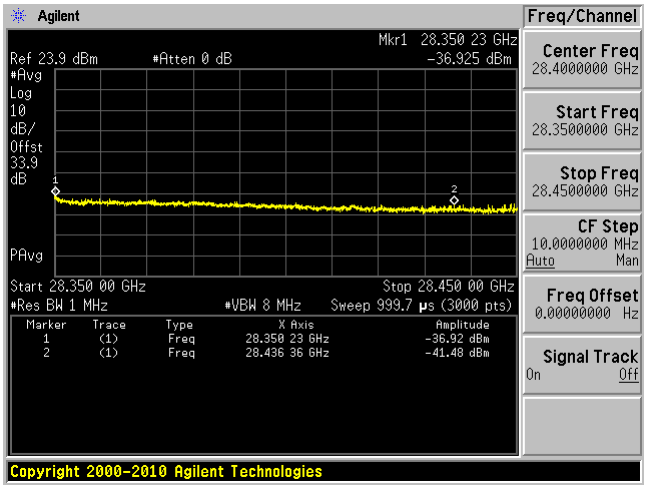


3CC-16QAM

Low Channel – Beam ID=11 (Vertical)

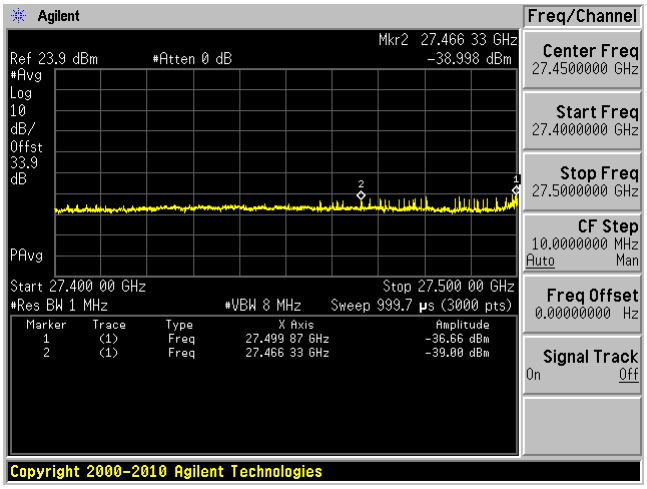


High Channel – Beam ID=11 (Vertical)

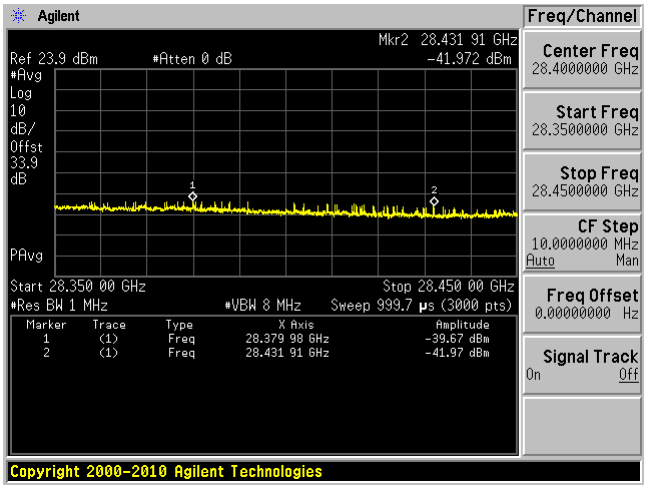


3CC-64QAM

Low Channel – Beam ID=11 (Vertical)

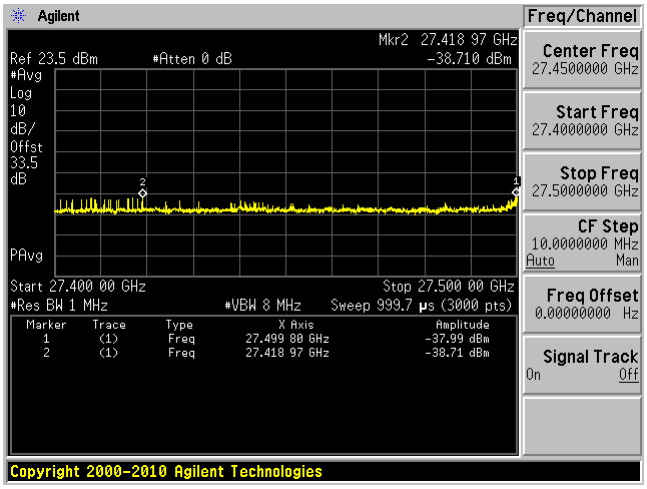


High Channel – Beam ID=11 (Vertical)

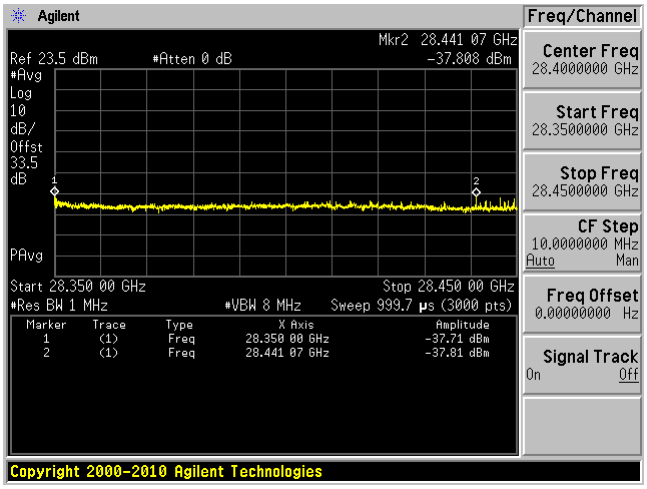


4CC-16QAM

Low Channel – Beam ID=11 (Vertical)

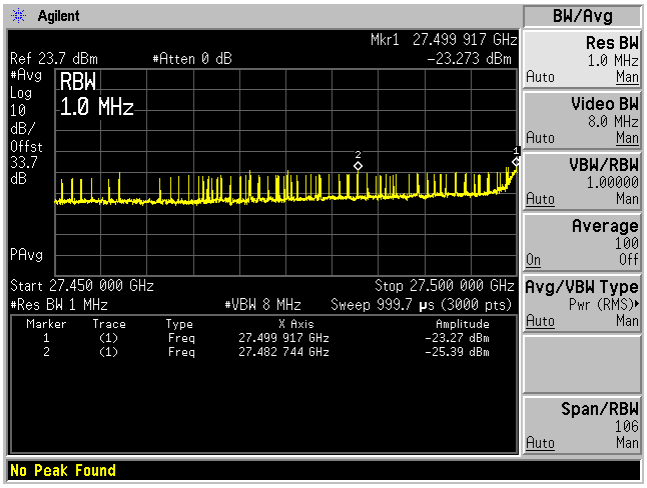


High Channel – Beam ID=11 (Vertical)

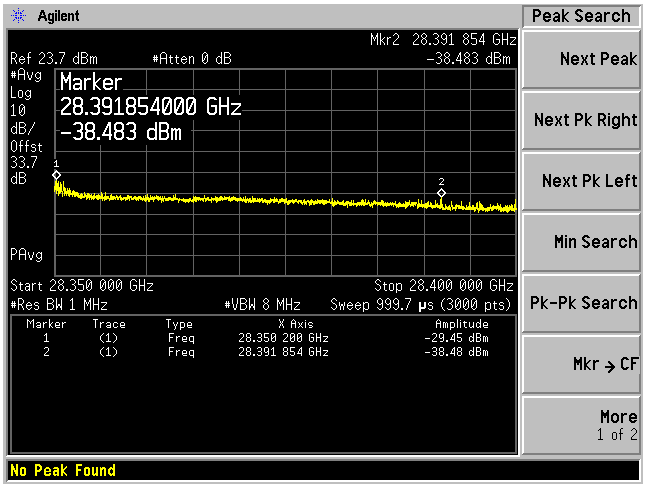


1CC-16QAM

Low Channel – Beam ID=139 (Horizontal)

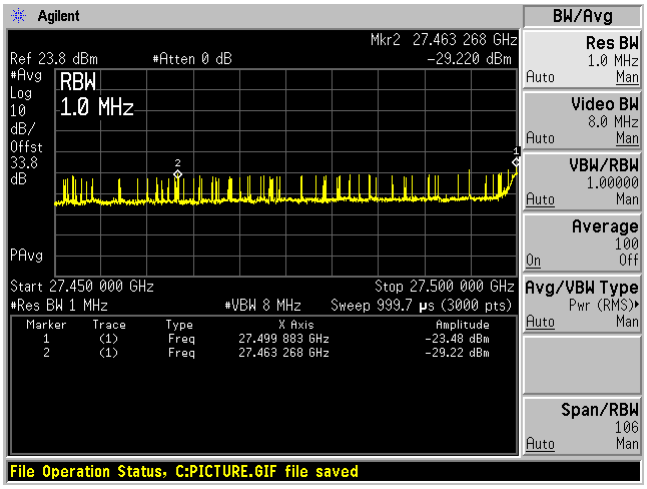


High Channel – Beam ID=139 (Horizontal)

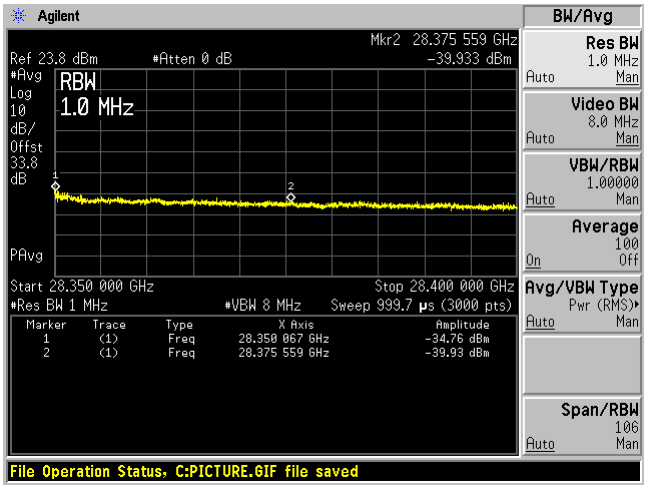


2CC-QPSK

Low Channel – Beam ID=139 (Horizontal)

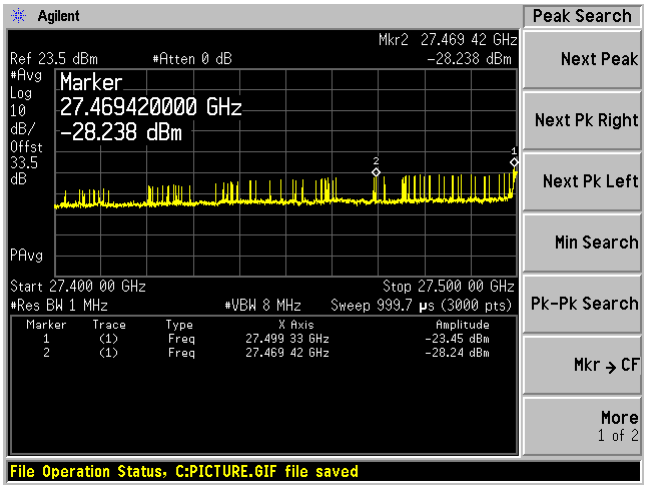


High Channel – Beam ID=139 (Horizontal)

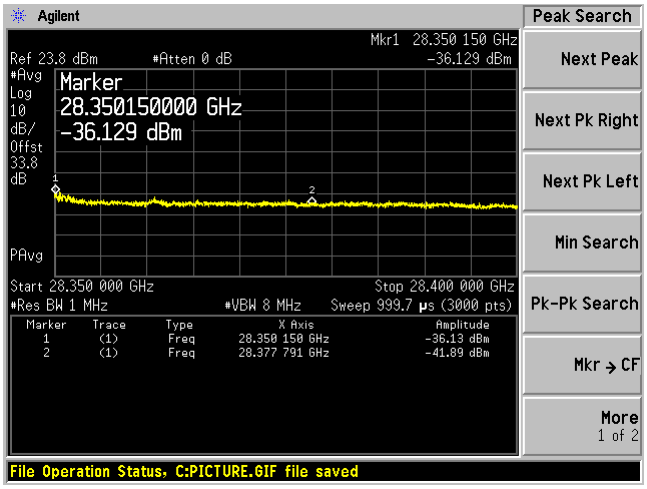


2CC-16QAM

Low Channel – Beam ID=139 (Horizontal)

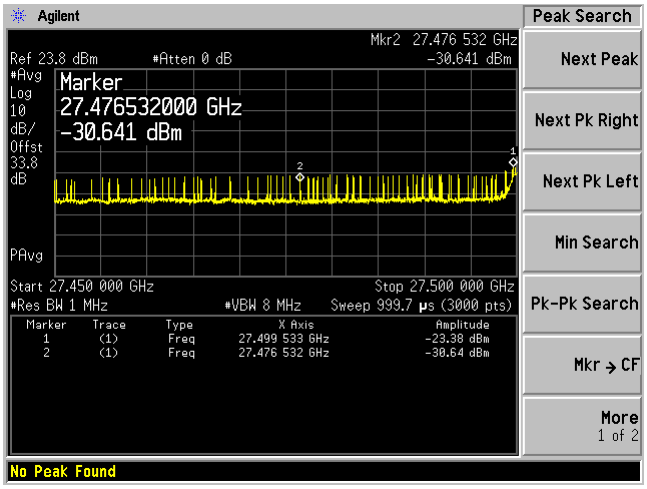


High Channel – Beam ID=139 (Horizontal)

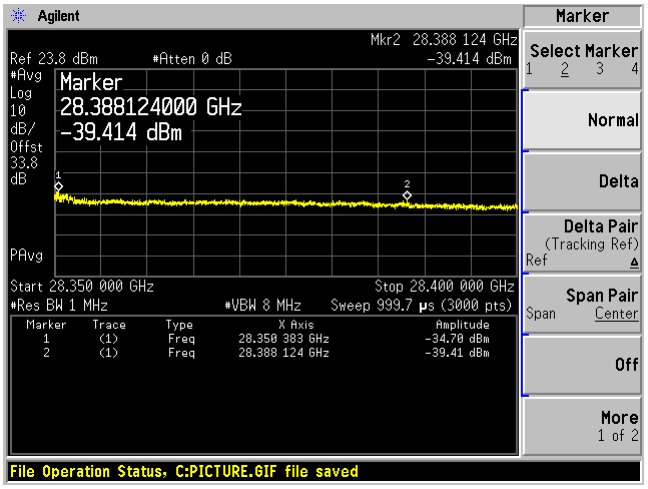


2CC-64QAM

Low Channel – Beam ID=139 (Horizontal)

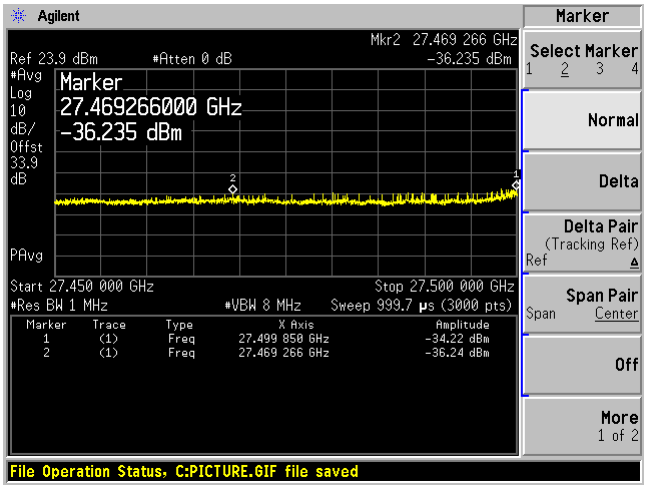


High Channel – Beam ID=139 (Horizontal)

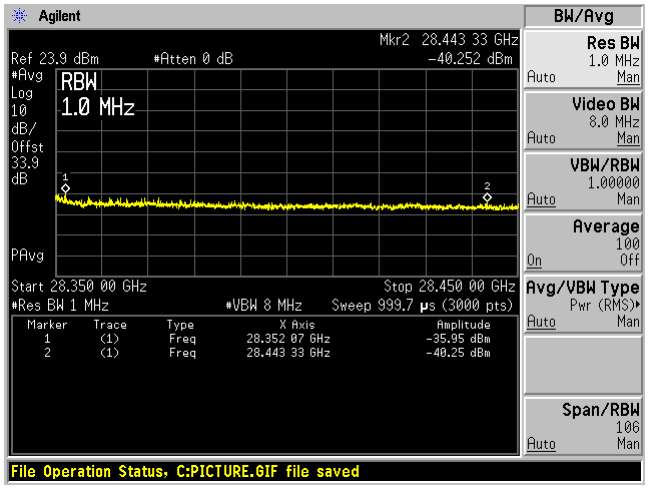


3CC-QPSK

Low Channel – Beam ID=139 (Horizontal)

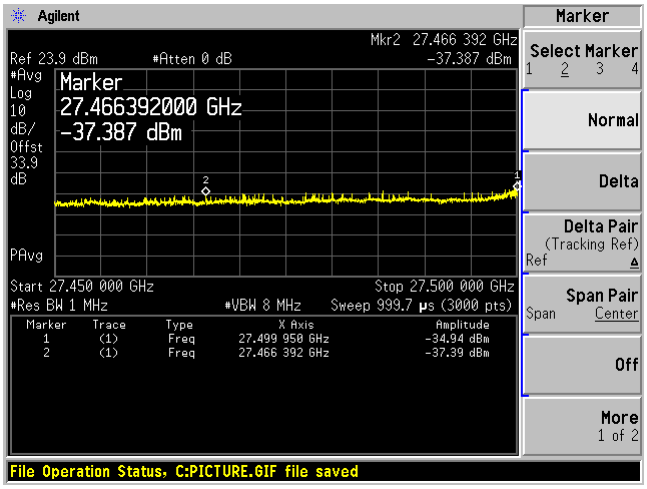


High Channel – Beam ID=139 (Horizontal)

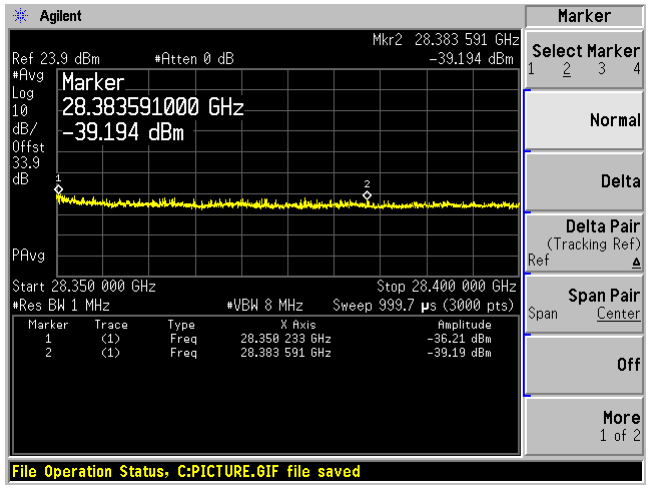


3CC-16QAM

Low Channel – Beam ID=139 (Horizontal)

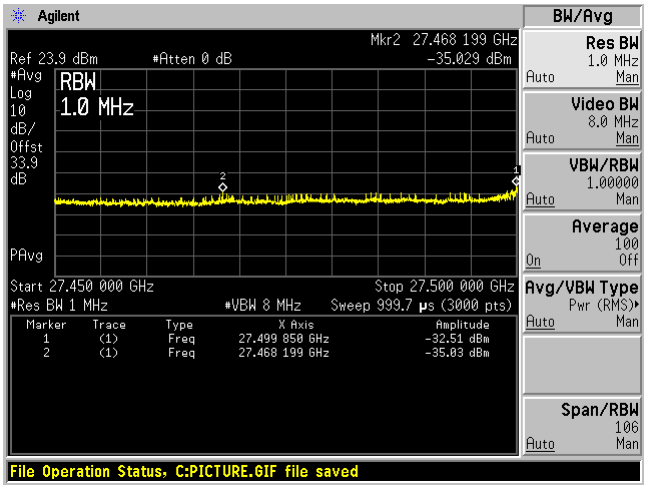


High Channel – Beam ID=139 (Horizontal)

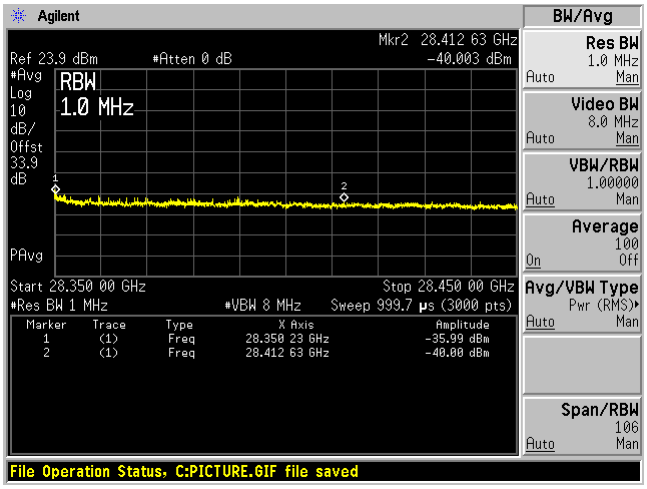


3CC-64QAM

Low Channel – Beam ID=139 (Horizontal)

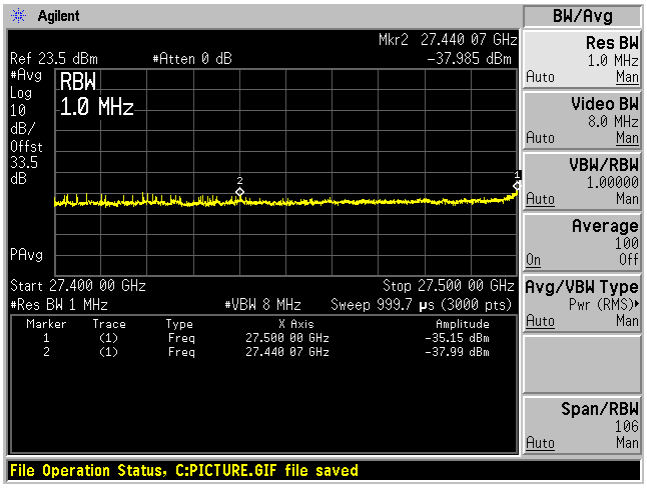


High Channel – Beam ID=139 (Horizontal)

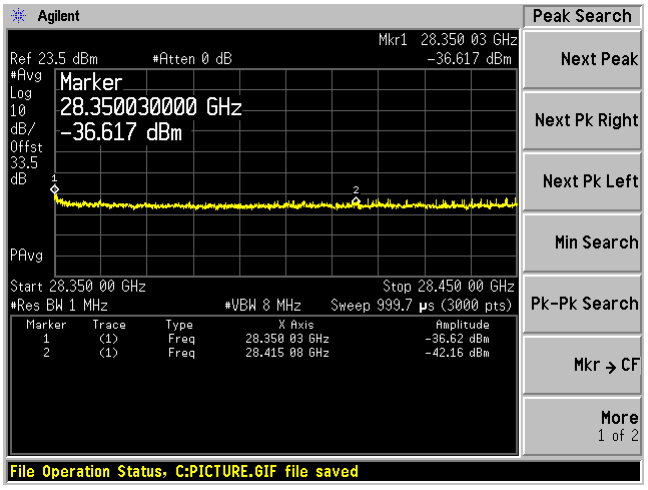


4CC-16QAM

Low Channel – Beam ID=139 (Horizontal)



High Channel – Beam ID=139 (Horizontal)



7 Annex A (Normative) - EUT Test Setup Photographs

Please refer to the attachment.

8 Annex B (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 Intentional Radiators	FCC Part 15, Subpart E	200000.00	Approved	09-30-2022	12-15-2020
U-NII with DFS Intentional Radiators	FCC Part 15, Subpart E	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 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

9 Annex C (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.

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 ---