849 NW STATE ROAD 45
NEWBERRY, FL 32669 USA
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COMPLIANCE TEST REPORT

PER FCC PT 90, PT 24

AND RSS-119 AND RSS-134

APPLICANT	MOTOROLA MOBILITY, INC.
ADDRESS	8000 W. SUNRISE BLVD MAIL STOP 52-5JJ PLANTATION FLORIDA 33322 USA
FCC ID	IHDT56MH1
IC CERTIFICATION	1090-T56MH1
MODEL NUMBER	H78XAN9JR9AN
PRODUCT DESCRIPTION	iDEN i1Q/i1X
DATE SAMPLE RECEIVED	1/25/2011
DATES TESTED	1/31/2011 – 2/7/2011
TESTED BY	Richard Block
APPROVED BY	Mario de Aranzeta
TIMCO REPORT NO.	159AT11TestReport i1Q i1X iDEN TX Part 90.pdf
TEST RESULTS	☒ PASS ☐ FAIL

ACCREDITED
Certificate # 0955-01

TABLE OF CONTENTS

ATTESTATIONS

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025:2005 requirements.

ACCREDITED

Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, Fl 32669

Authorized Signatory Name:

Mario de Aranzeta C.E.T.
Compliance Engineer/ Lab. Supervisor

Date: February 9, 2011

REPORT SUMMARY

Disclaimer	The test results relate only to the items tested.
Purpose of Test	To demonstrate compliance with FCC CFR 47, Part 90 requirements. To demonstrate compliance with FCC CFR 47, Part 24 requirements for narrow band PCS equipment. To demonstrate compliance with IC RSS-119 requirements. To demonstrate compliance with IC RSS-134 requirements.
Test Standards	ANSI/TIA 603-C: 2004, FCC CFR 47 Part 90, ANSI C63.4: 2003 RSS-119, RSS-134, RSS-GEN
Related Approval	Digital portion is verified

TEST ENVIRONMENT AND TEST SETUP

Test Facility	RF output power and radiated emission were conducted by: Timco Engineering Inc. 849 NW State Road 45, Newberry, FL 32669 USA
Laboratory Test Condition	The temperature was 26°C with a relative humidity of 50%.
Deviation from the standards	No deviation
Modification to the DUT	No modification was made.
Test Exercise (software etc.)	The DUT was placed in continuous transmitting mode of operation.
System Setup	Stand alone device.

DUT SPECIFICATION

DUT Description	iDEN i1Q/i1X
FCC ID	IHDT56MH1
IC CERTIFICATION	1090-T56MH1
Model Number	H78XAN9JR9AN
Serial Number	364VLYK5VR
Hardware	P1B-1
Software	DCD.00.18
Operating Frequency	806.0125 – 824.9875 MHz 896.01875 – 901.98125 MHz
DUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ DC Power 12V
	☒ Battery Operated
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☐ Mobile
	☒ Portable

EQUIPMENT LIST

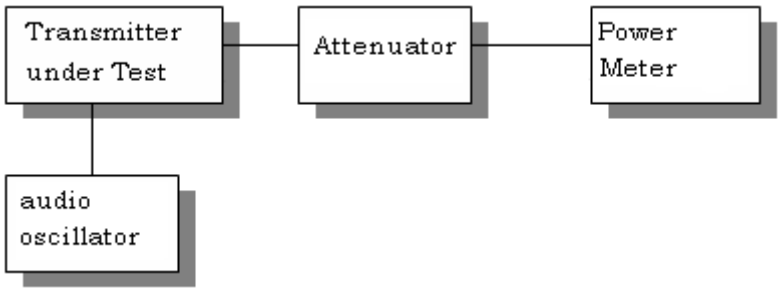
Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 3/10/10	3/10/12
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/11
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/11
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/10	4/25/12

TEST PROCEDURE

Power Line Conducted Interference: The procedure used was ANSI/TIA 603-C: 2004, using a 50uH LISN. Both lines were observed with the DUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

Bandwidth 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Power Output: The RF power output was measured at the antenna feed point using a peak power meter. A 50-ohm, resistive wattmeter was connected to the RF output connector. With a nominal battery voltage or supply voltage, and the transmitter properly adjusted the RF output measures:



Antenna Conducted Emissions: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

Radiation Interference: The test procedure used was ANSI/TIA 603-C: 2004, using an Agilent spectrum receiver with preselector. The bandwidth (RBW) of the spectrum ANSI/TIA 603-C: 2004, receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

[Continued]

Modulation Characteristic

Audio frequency response
The audio frequency response was measured in accordance with ANSI/TIA 603-C: 2004. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 – 5000Hz shall be submitted. The audio frequency response curve is shown below.

Audio Low Pass Filter
The audio low pass filter for voice-modulated equipment was measured in accordance with ANSI/TIA 603-C: 2004. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all the circuitry installed between the modulation limiter and the modulated stage shall be submitted.

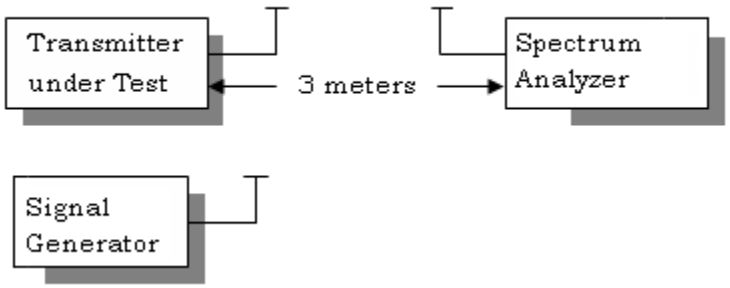
Audio Input versus modulation
The audio input level needed for a particular percentage of modulation was measured in accordance with ANSI/TIA 603-C: 2004. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

Frequency Stability

The frequency stability was measured per ANSI/TIA 603-C: 2004.

Field Strength of Spurious Emissions

The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-C: 2004 using the substitution method.



RF POWER OUTPUT

Rule Part No.: Pt 2.1046(a), Pt 90, Pt 24, RSS-119, RSS-134

Test Requirements: Pt 2.1046(a), Pt 90, Pt 24, RSS-119, RSS-134

Test Data:

OUTPUT POWER: Nominal – 0.603 Watts

Part 2.1033 (c)(8) DC Input into the final amplifier

FOR HIGH POWER SETTING INPUT POWER: (3.7V)(1.2A) = 4.44 Watts

OCCUPIED BANDWIDTH

Part 2.1049(c) EMISSION BANDWIDTH:
Part 90.210(b) 25kHz Channel Spacing

Data in the plots show that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35 dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth: At least 43 + 10log(P)dB.

Part 90.210(c) 12.5kHz Channel Spacing Not Equipped with a Low Pass Filter

For transmitters that are not equipped with an audio low pass filter pursuant to S90.211 (b), the power of any emission must be attenuated below the un-modulated carrier output power as follows; (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz but not more than10 kHz: At least 83 log (fd/5) dB; (2) ON any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but not more than 250% of the authorized bandwidth: At least 29 log(fd2/11)dB or 50 dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth: At least 43+10 log(Po)dB.

Part 90.210(d) Emission Mask D - 12.5 kHz channel BW equipment.
For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

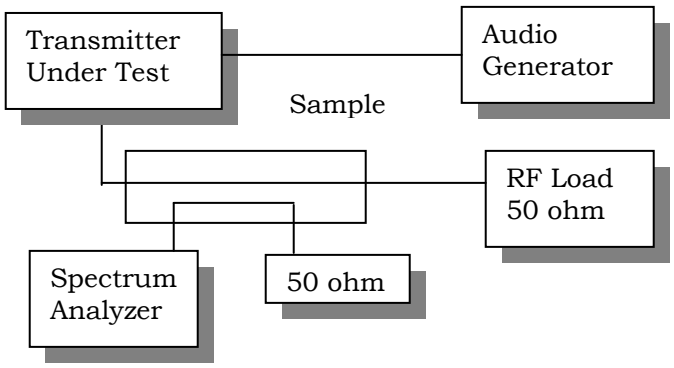
(1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.
(2) On any frequency from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27 (fd - 2.88 kHz) dB.
(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + 10log(P) dB or 70 dB, whichever is the lesser attenuation.

Part 90.210(e) Emission Mask E – 6.25 kHz channel BW equipment.
For transmitters designed to operate with a 6.25 kHz bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f0 to 3.0 kHz removed from f0: Zero dB.
(2) On any frequency from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd – 3.0 kHz) or 55 + 10 Log(P) or 65, whichever us the lesser attenuation.
(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6kHz: At least 55 + 10log(P) dB or 65 dB, whichever is the lesser attenuation.

Method of Measurement: ANSI/TIA 603-C: 2004

Test Setup Diagram:



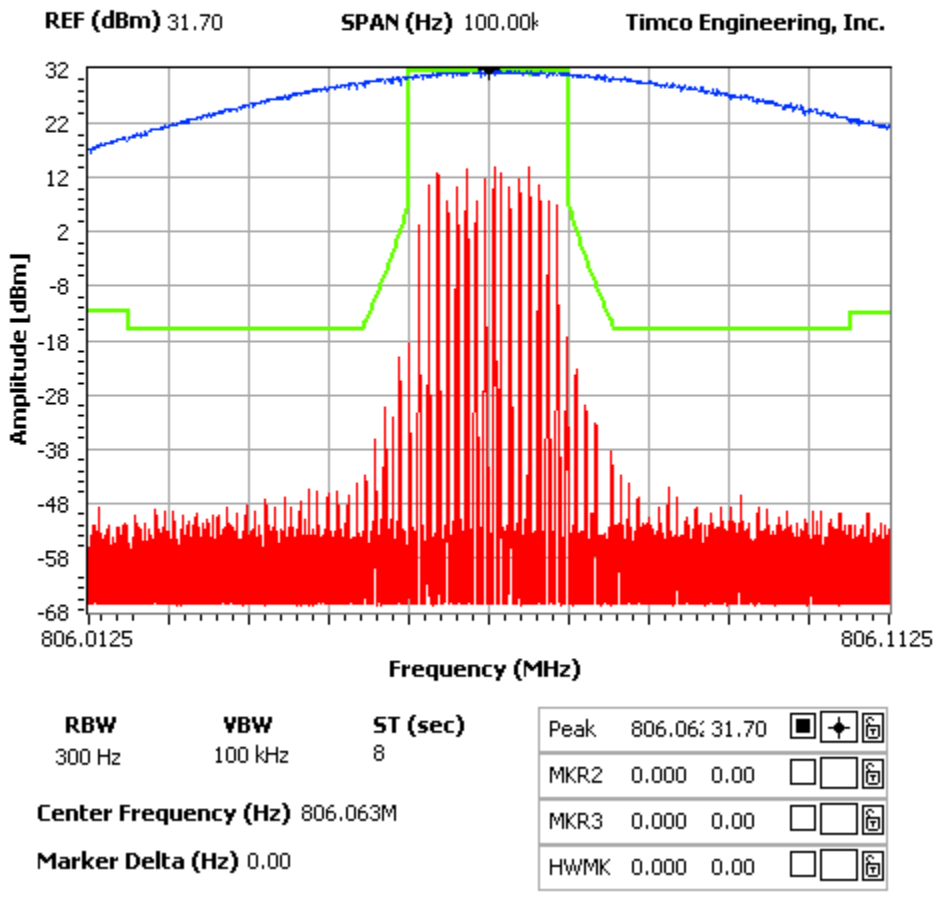
Test Data: See the plots below

OCCUPIED BANDWIDTH PLOTS

NOTES:

OCCUPIED BANDWIDTH -- 806.0625 MHz -- QPSK -- MAX POWER

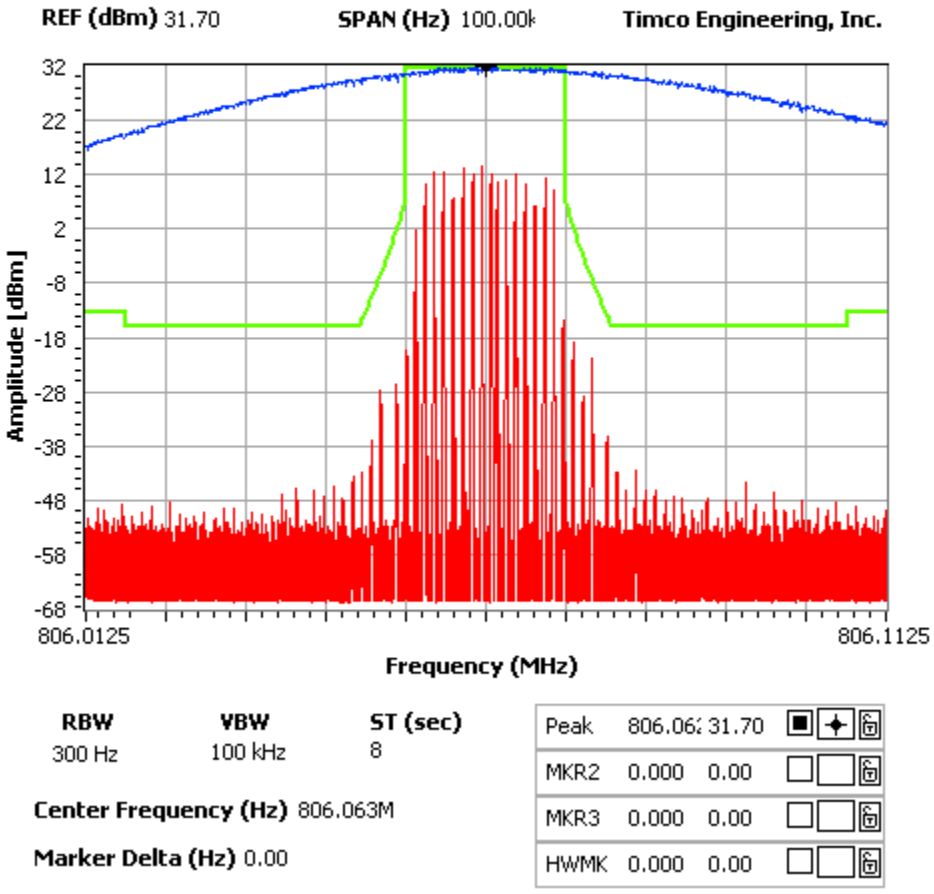
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 806.0625 MHz -- 16QAM -- MAX POWER

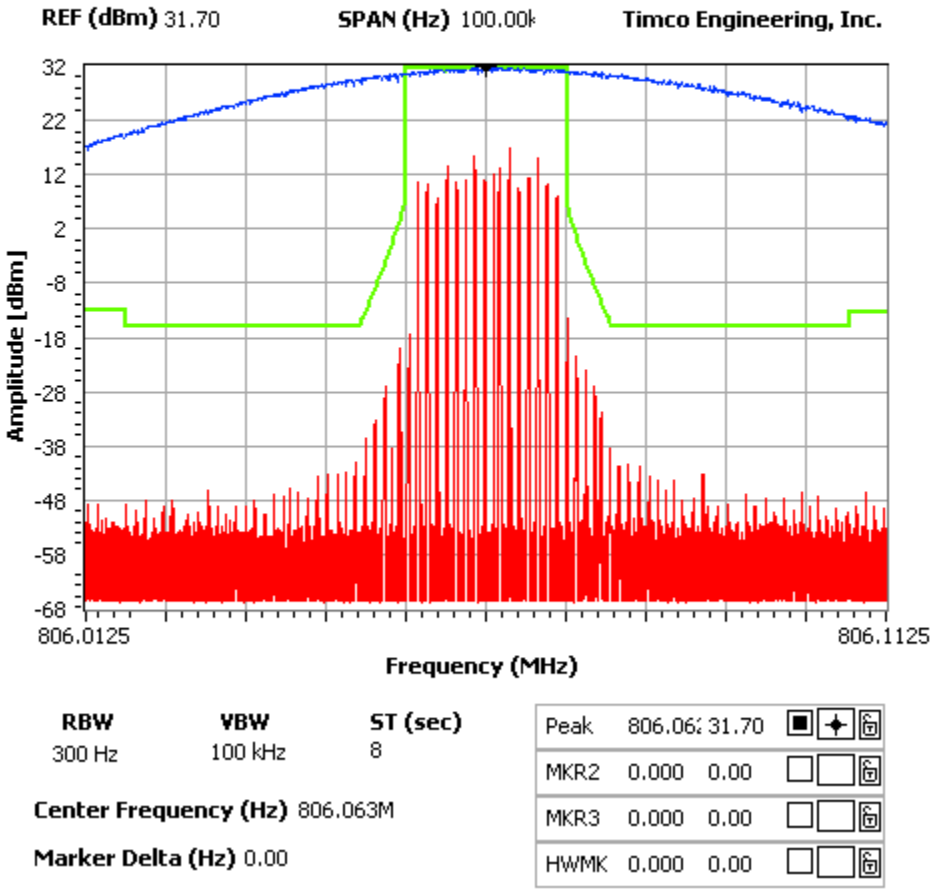
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 806.0625 MHz -- 64QAM -- MAX POWER

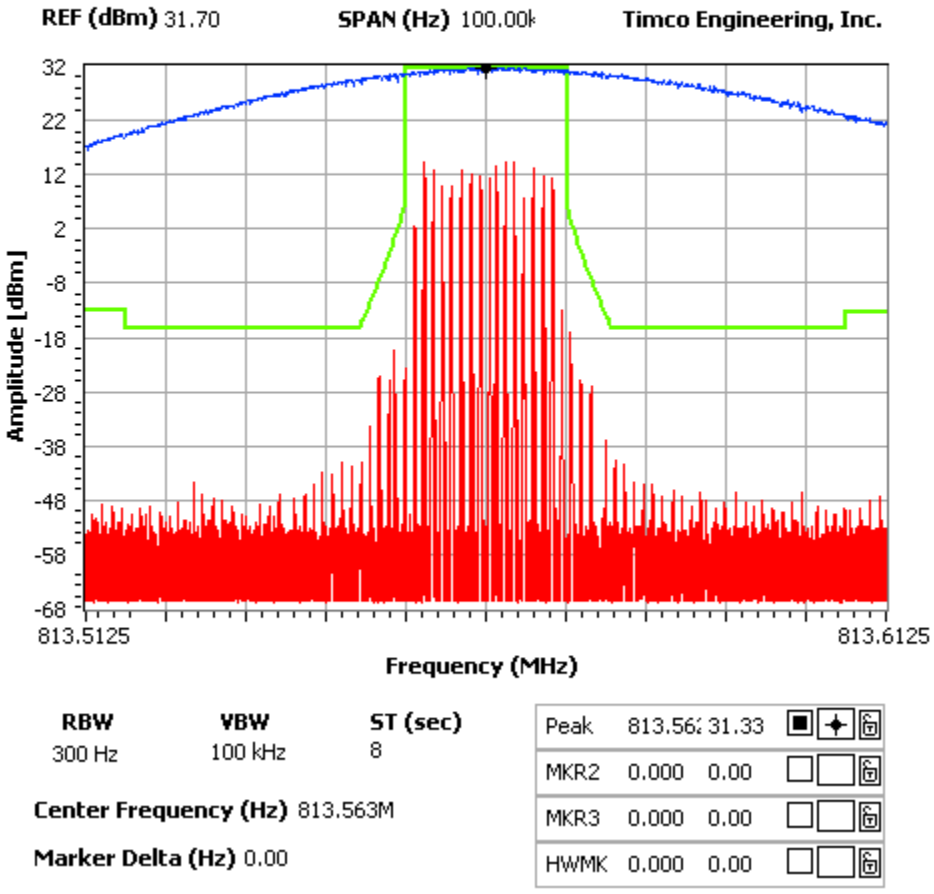
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 813.5625 MHz -- QPSK -- MAX POWER

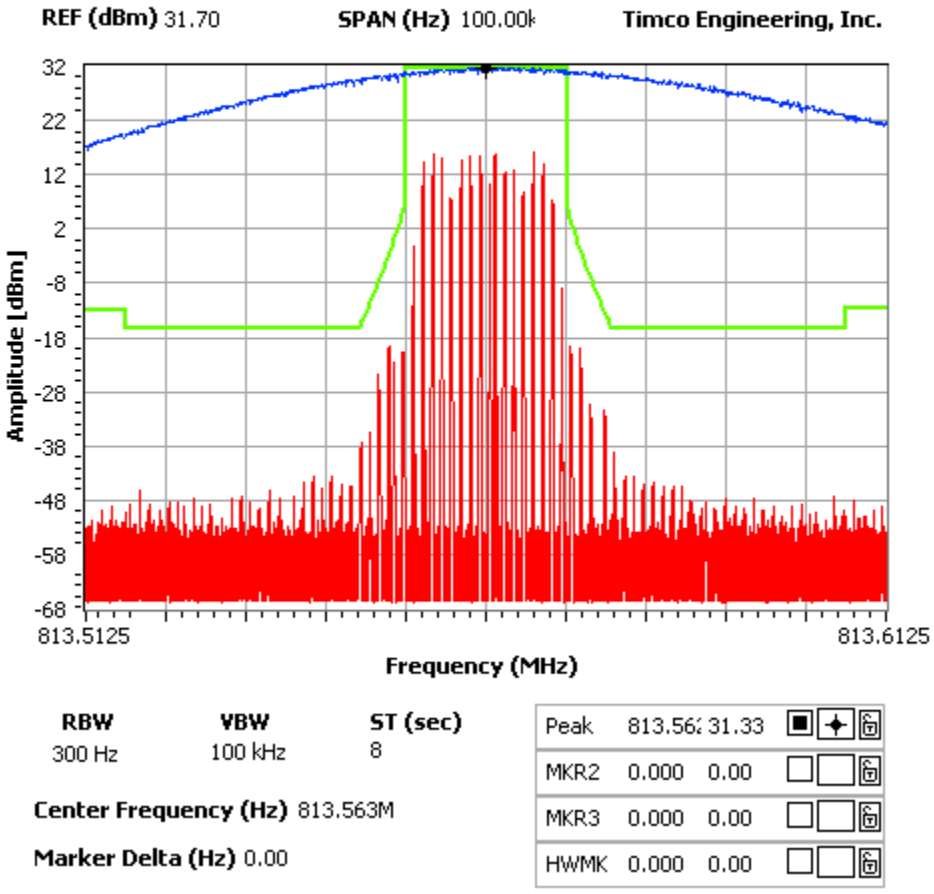
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 813.5625 MHz -- 16QAM -- MAX POWER

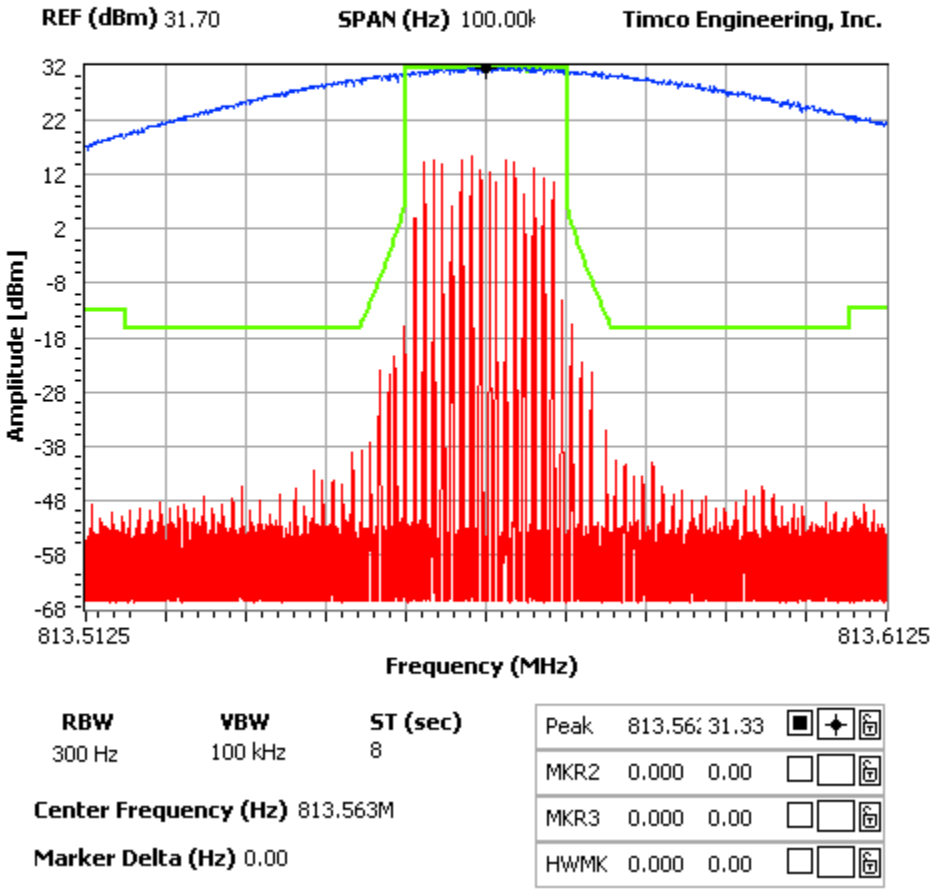
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 813.5625 MHz -- 64QAM -- MAX POWER

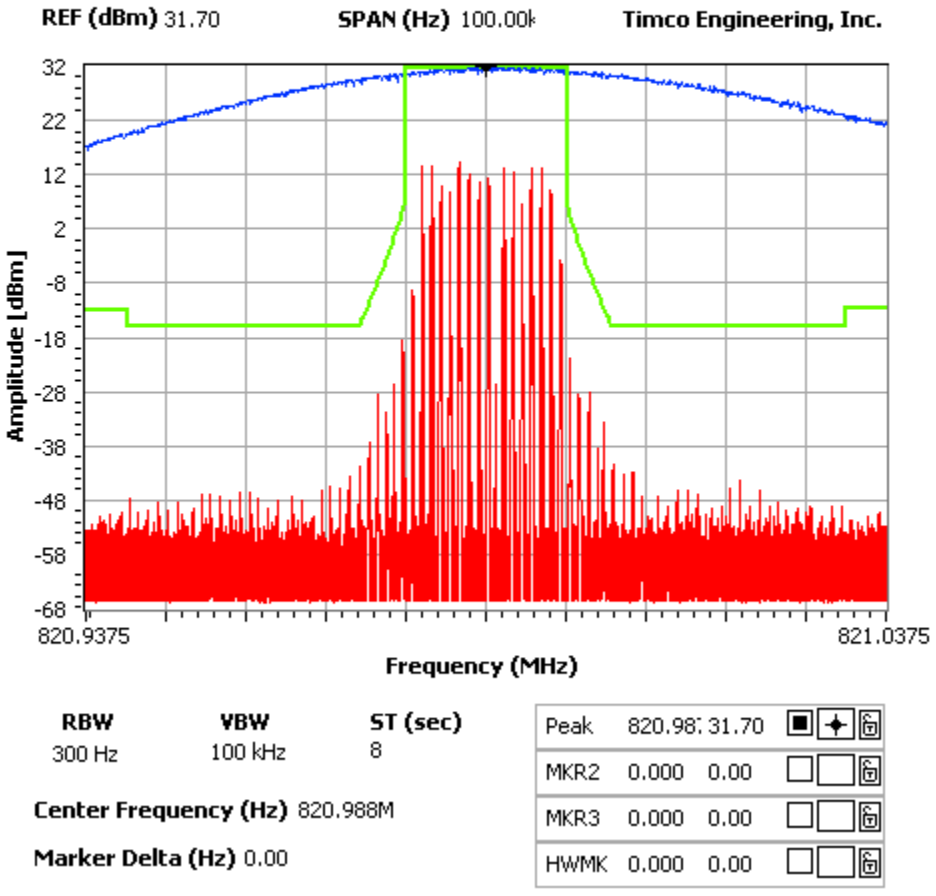
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 820.9875 MHz -- QPSK -- MAX POWER

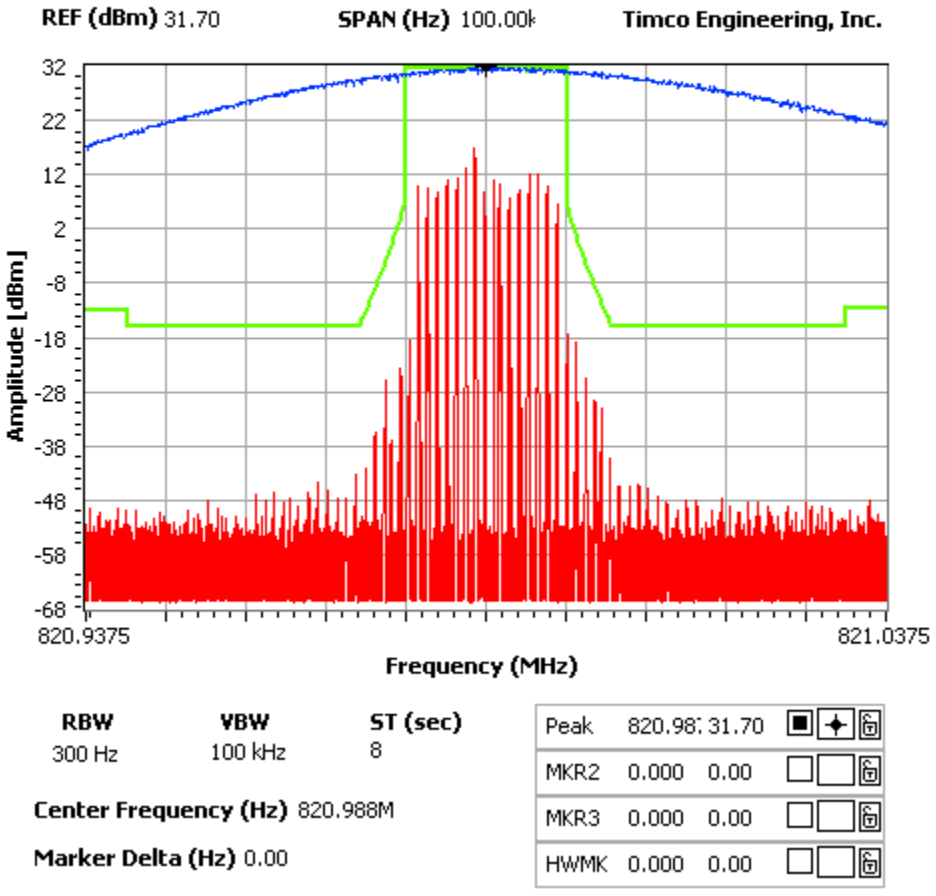
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 820.9875 MHz -- 16QAM -- MAX POWER

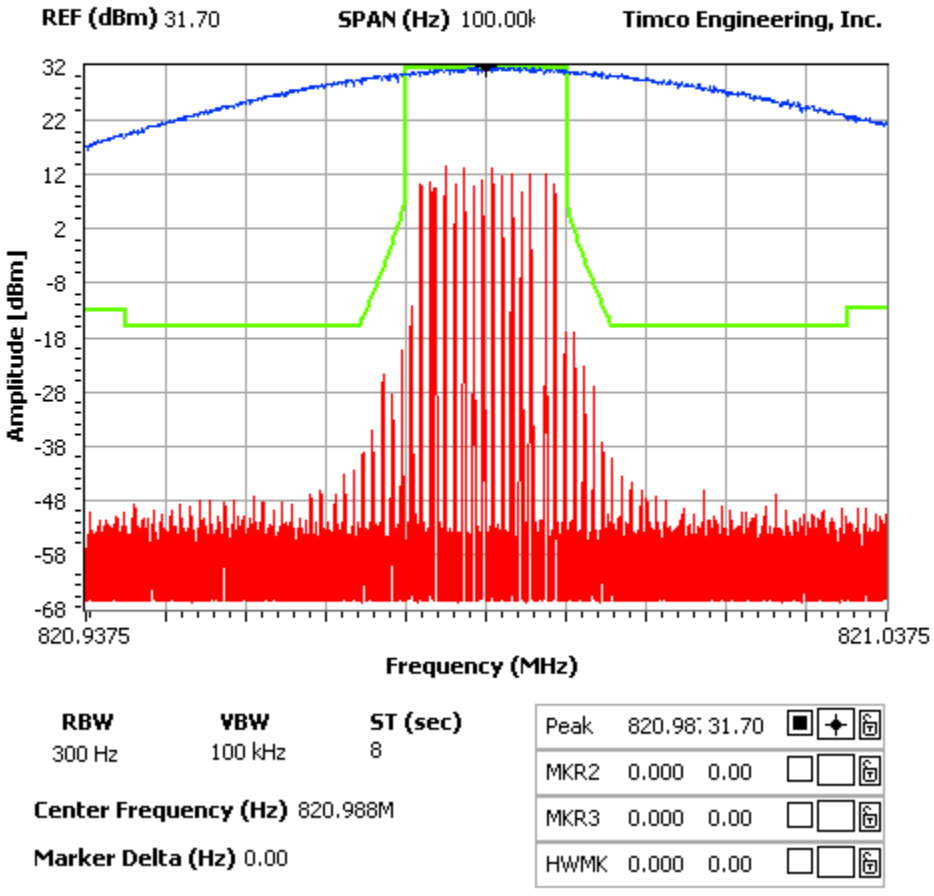
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 820.9875 MHz -- 64QAM -- MAX POWER

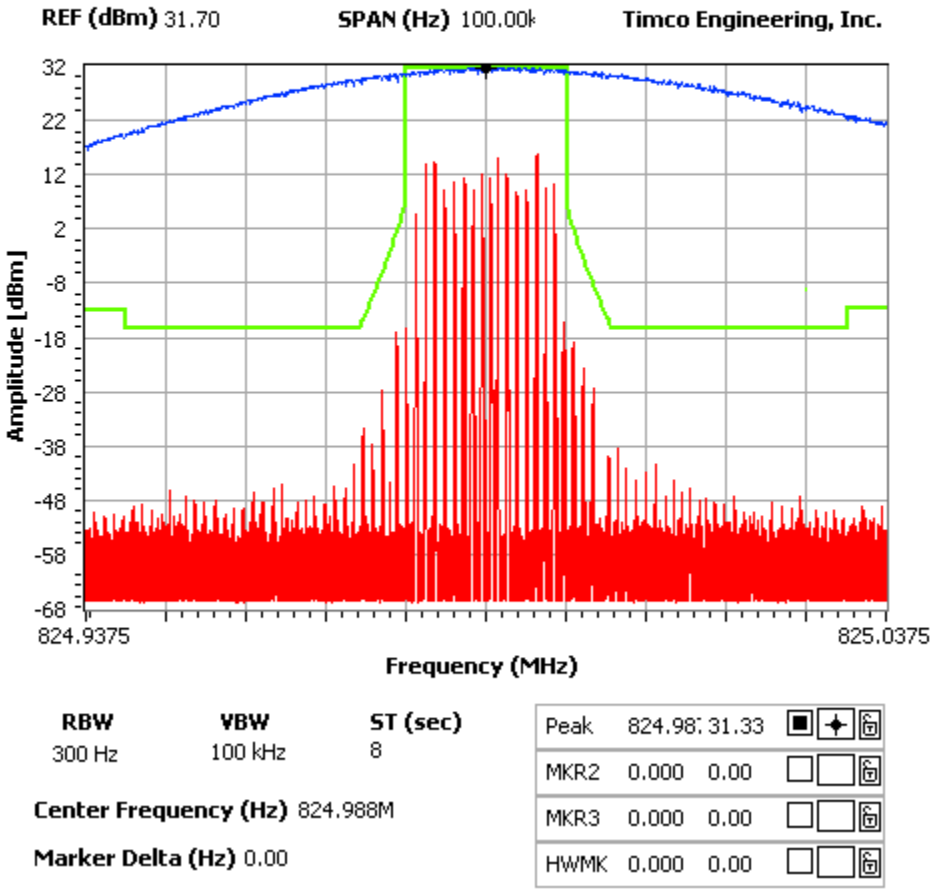
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 824.9875 MHz -- QPSK -- MAX POWER

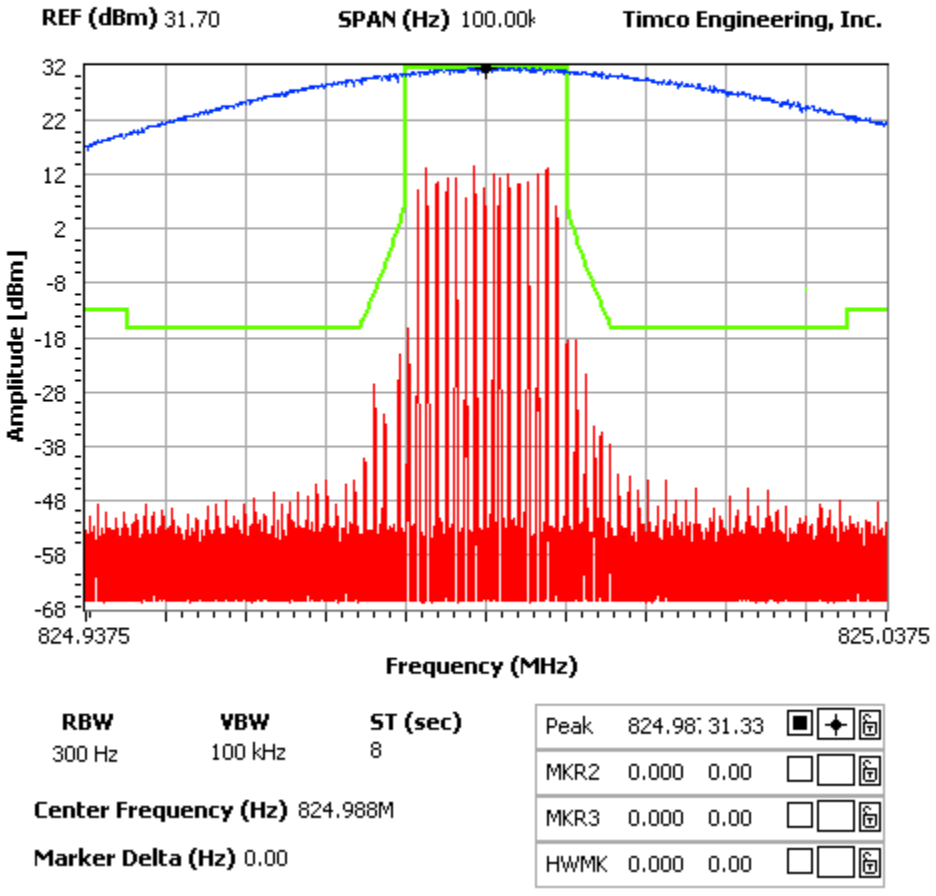
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 824.9875 MHz -- 16QAM -- MAX POWER

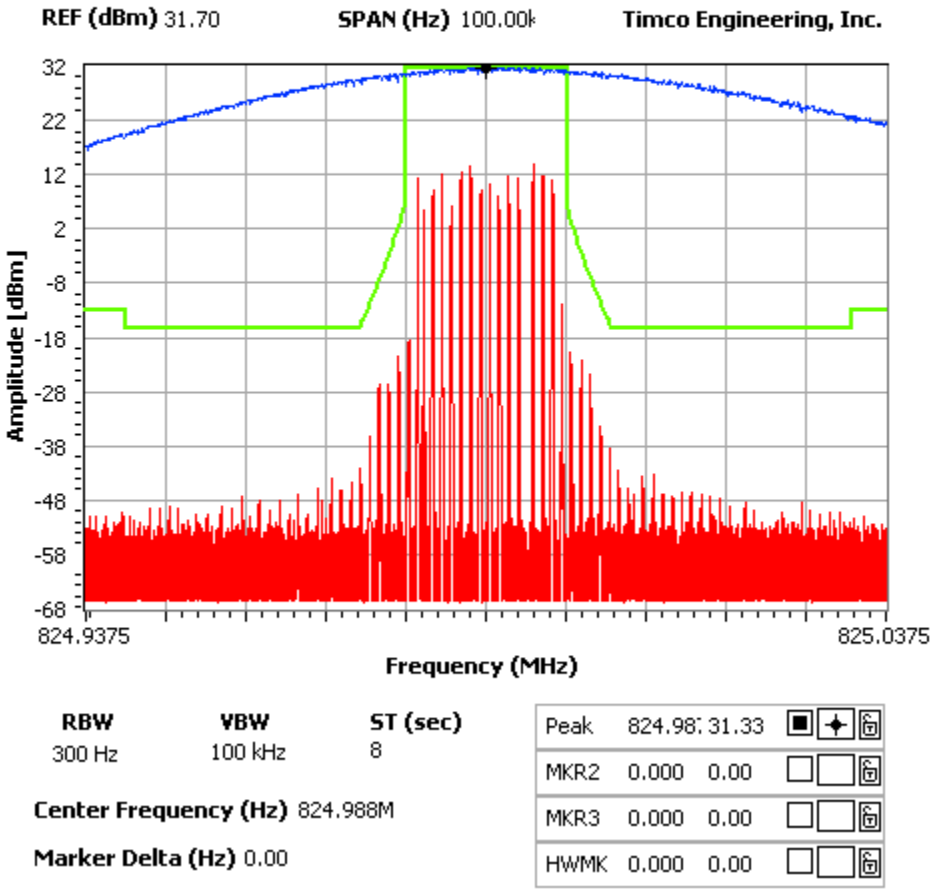
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 824.9875 MHz -- 64QAM -- MAX POWER

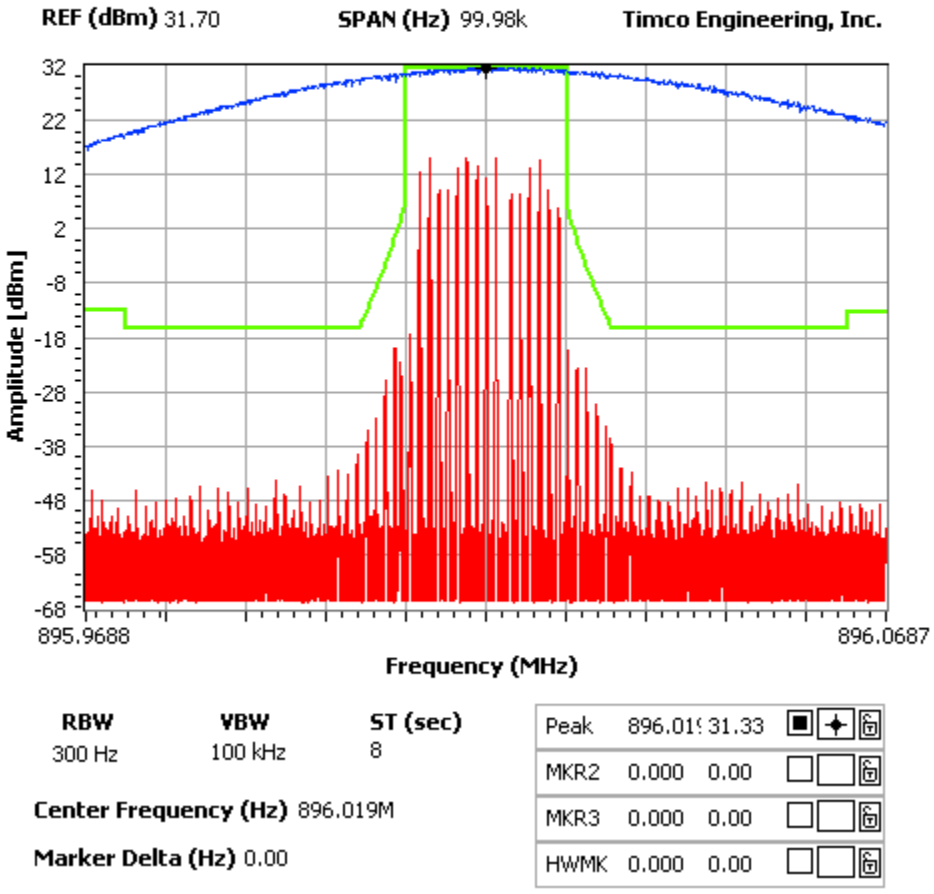
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 896.01875 MHz -- QPSK -- MAX POWER

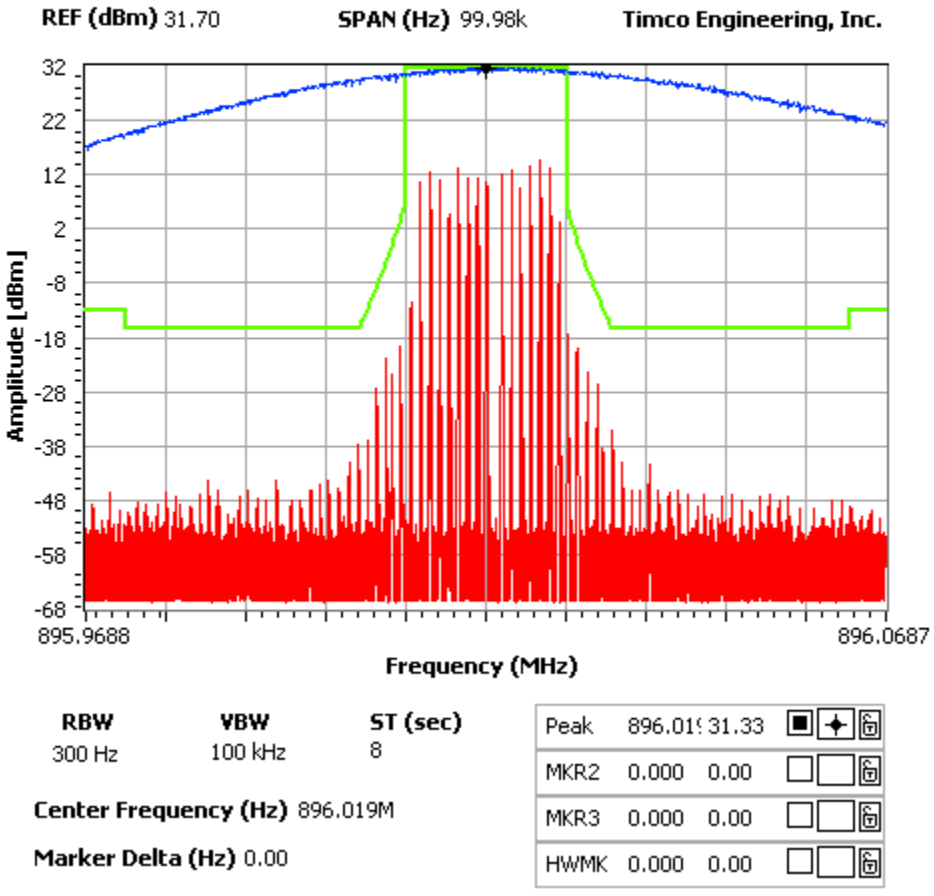
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 896.01875 MHz -- 16QAM -- MAX POWER

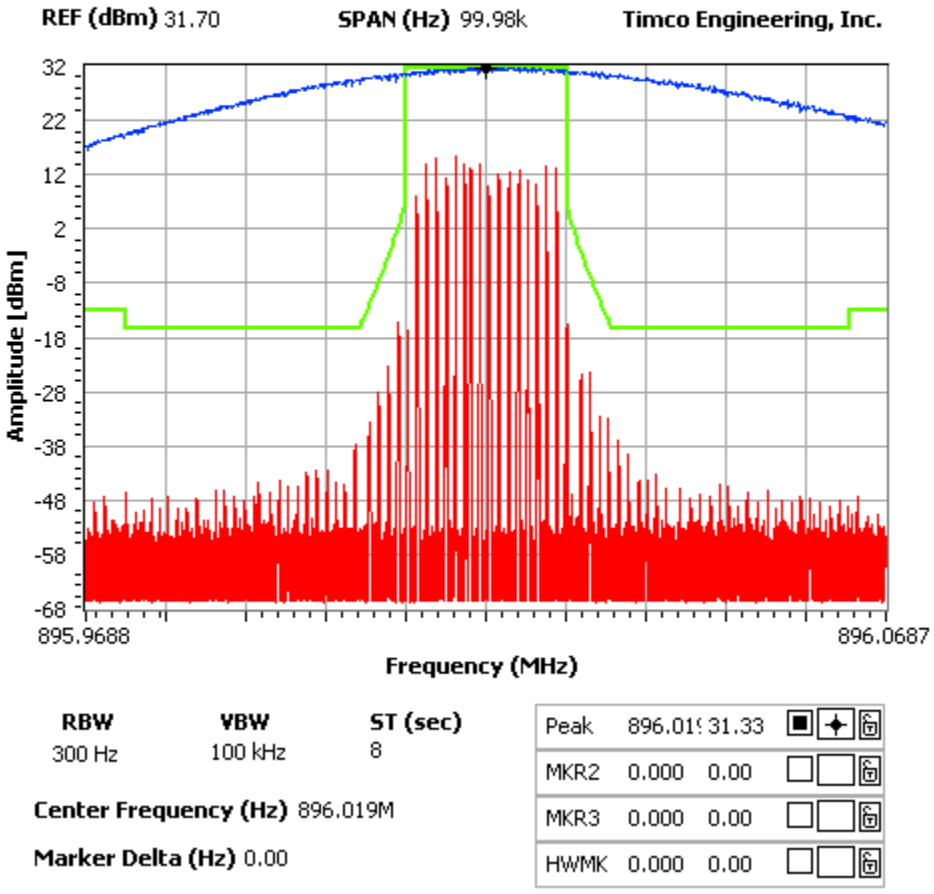
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 896.01875 MHz -- 64QAM -- MAX POWER

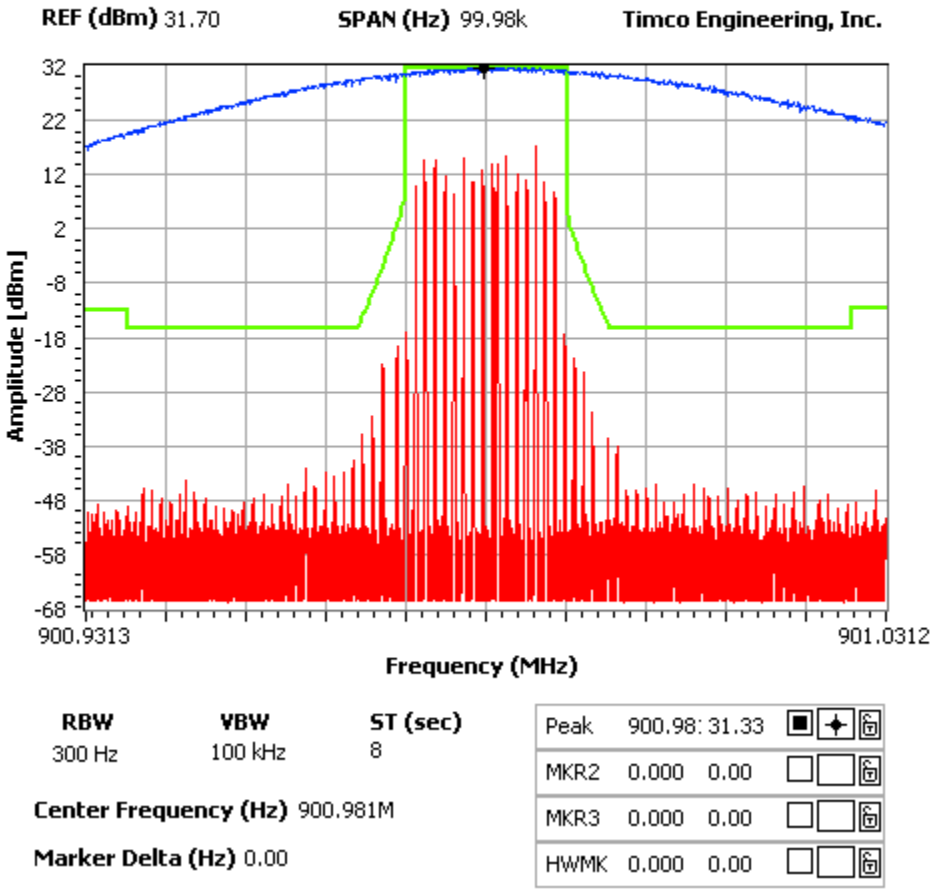
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 900.98125 MHz -- QPSK -- MAX POWER

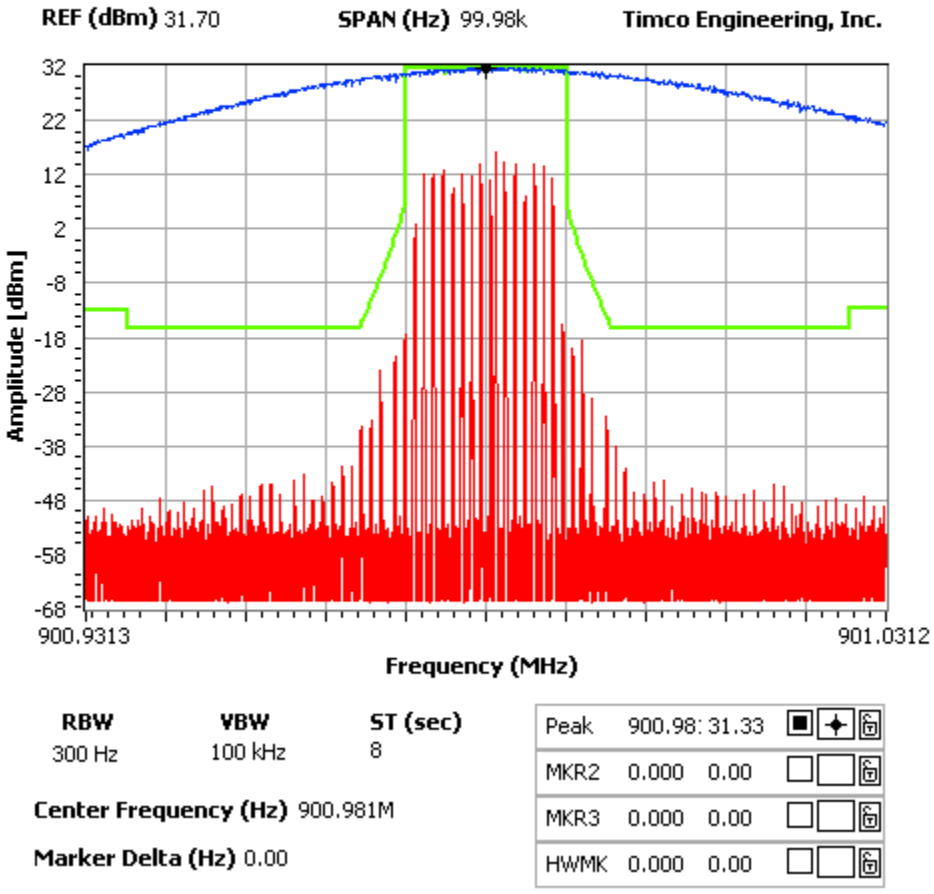
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 900.98125 MHz -- 16QAM -- MAX POWER

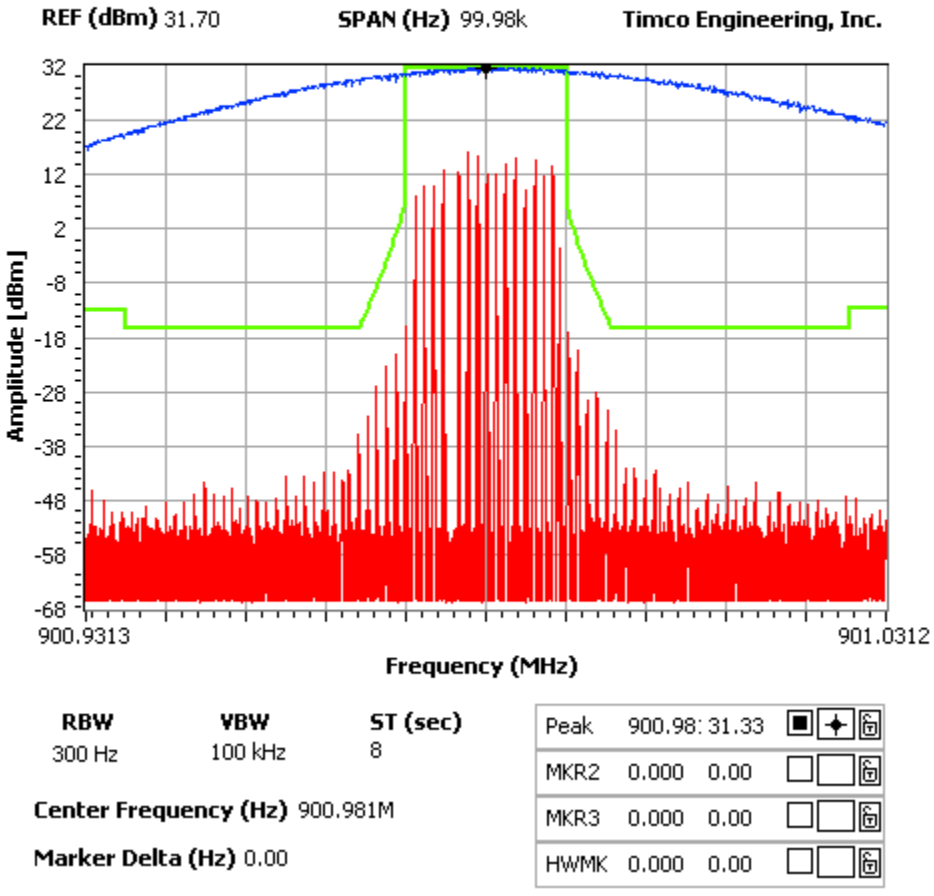
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 900.98125 MHz -- 64QAM -- MAX POWER

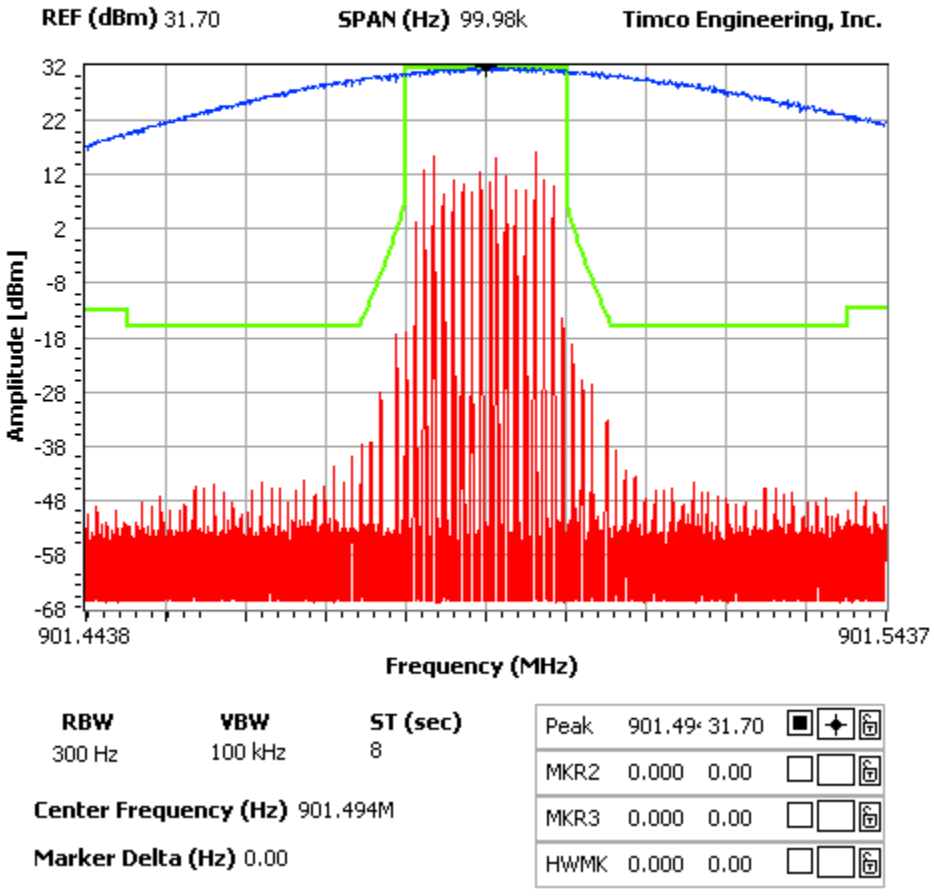
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 901.49375 MHz -- QPSK -- MAX POWER

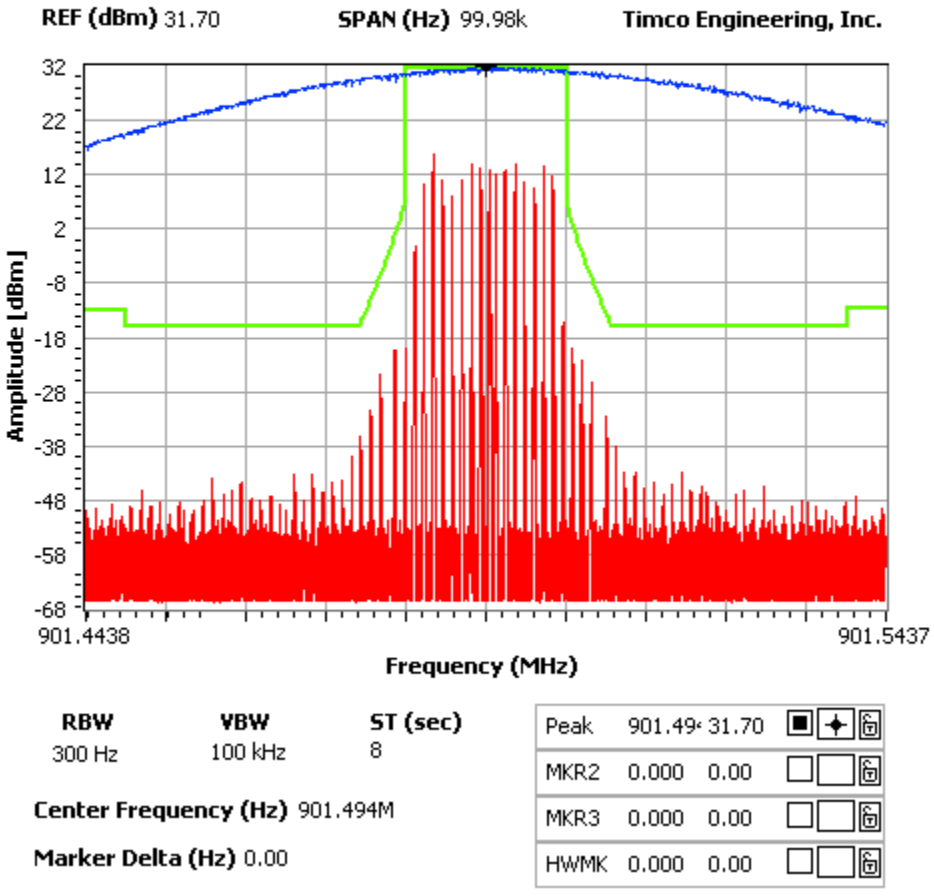
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 901.49375 MHz -- 16QAM -- MAX POWER

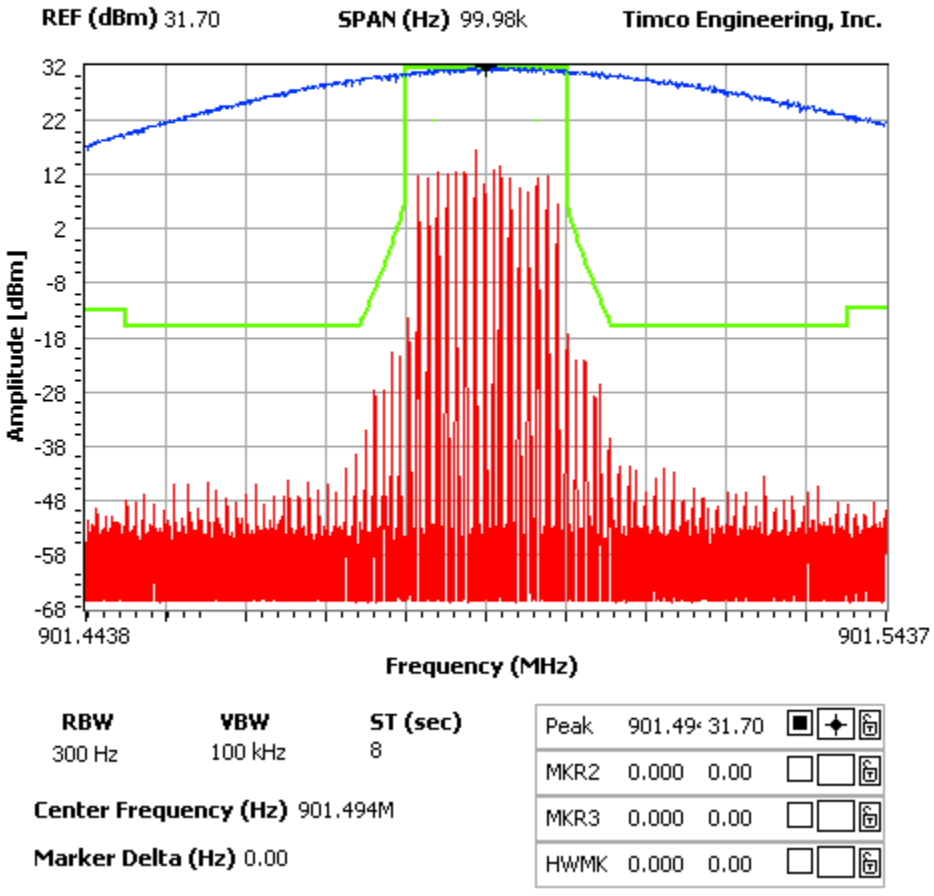
FCC 90.210 Mask G



NOTES:

OCCUPIED BANDWIDTH -- 901.49375 MHz -- 64QAM -- MAX POWER

FCC 90.210 Mask G



FIELD STRENGTH OF SPURIOUS EMISSIONS - Max Power

Rule Parts. No.: Part 2.1051(a), Pt 90, Pt 24, RSS-119, RSS-134

Requirements: 25 kHz Channel Spacing = 43+10log(0.603) = 40.8 dBc

Test Data:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
806.0625	0	0.00		813.5625	0	0.00
1612.1250	V	81.05		1627.1250	V	81.44
2418.1875	V	83.71		2440.6875	H	84.15
3224.2500	V	83.06		3254.2500	V	78.44
4030.3125	V	80.48		4067.8125	V	82.23
4836.3750	V	79.56		4881.3750	V	79.02
5642.4375	V	73.50		5694.9375	H	74.04
6448.5000	H	78.80		6508.5000	V	79.85
7254.5625	V	79.36		7322.0625	V	77.29
8060.6250	V	78.74		8135.6250	V	79.98

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
820.9875	0	0.00		824.9875	0	0.00
1641.9750	V	82.34		1649.9750	V	81.13
2462.9625	V	83.29		2474.9625	H	85.15
3283.9500	V	80.73		3299.9500	H	83.62
4104.9375	V	82.18		4124.9375	H	82.05
4925.9250	V	80.48		4949.9250	V	82.91
5746.9125	H	76.28		5774.9125	H	77.04
6567.9000	V	81.02		6599.9000	V	78.91
7388.8875	V	79.93		7424.8875	V	80.23
8209.8750	H	78.91		8249.8750	V	81.21

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
896.01875	0	0.00		900.98125	0	0.00		901.49375	0	0.00
1792.03750	V	74.37		1801.96250	V	74.97		1802.98750	V	73.07
2688.05625	V	85.25		2702.94375	V	82.14		2704.48125	H	86.14
3584.07500	V	82.85		3603.92500	V	80.85		3605.97500	V	81.25
4480.09375	H	80.93		4504.90625	V	78.90		4507.46875	V	81.00
5376.11250	V	80.90		5405.88750	V	79.48		5408.96250	V	76.48
6272.13125	H	80.27		6306.86875	H	80.29		6310.45625	H	80.19
7168.15000	V	81.78		7207.85000	V	80.80		7211.95000	V	80.20
8064.16875	H	79.74		8108.83125	H	79.45		8113.44375	V	80.75
8960.18750	H	76.06		9009.81250	H	77.36		9014.93750	V	77.76

*** = 20 dB or more below the limit**

FIELD STRENGTH OF SPURIOUS EMISSIONS - Max Cutback

Rule Parts. No.: Part 2.1051(a), Pt 90, Pt 24, RSS-119, RSS-134

Requirements: 25 kHz Channel Spacing = 43+10log(0.001) = 13.0 dBc

Test Data:

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
806.0625	0	0.00		813.5625	0	0.00
1612.1250	V	54.75		1627.1250	H	53.44
2418.1875	V	55.91		2440.6875	H	55.25
3224.2500	H	52.96		3254.2500	V	53.04
4030.3125	V	52.38		4067.8125	V	53.13
4836.3750	H	49.16		4881.3750	V	49.02
5642.4375	H	46.10		5694.9375	V	48.14
6448.5000	V	51.30		6508.5000	V	50.05
7254.5625	H	49.16		7322.0625	V	49.79
8060.6250	V	49.54		8135.6250	H	49.48

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
820.9875	0	0.00		824.9875	0	0.00
1641.9750	H	53.54		1649.9750	V	52.93
2462.9625	H	56.49		2474.9625	H	54.35
3283.9500	V	51.93		3299.9500	V	53.52
4104.9375	H	52.78		4124.9375	H	52.85
4925.9250	H	49.98		4949.9250	H	50.91
5746.9125	H	47.28		5774.9125	H	47.44
6567.9000	V	50.12		6599.9000	H	50.61
7388.8875	V	49.73		7424.8875	H	48.23
8209.8750	V	50.61		8249.8750	H	48.61

Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)		Emission Frequency MHz	Ant. Polarity	dB Below Carrier (dBc)
896.01875	0	0.00		900.98125	0	0.00		901.49375	0	0.00
1792.03750	V	52.07		1801.96250	V	45.07		1802.98750	H	49.37
2688.05625	H	55.05		2702.94375	V	54.14		2704.48125	V	53.54
3584.07500	H	51.65		3603.92500	V	51.75		3605.97500	H	52.45
4480.09375	H	50.83		4504.90625	H	50.40		4507.46875	V	51.30
5376.11250	H	47.30		5405.88750	V	48.18		5408.96250	H	46.78
6272.13125	H	49.17		6306.86875	V	51.09		6310.45625	V	50.19
7168.15000	V	49.88		7207.85000	V	50.30		7211.95000	V	50.50
8064.16875	H	48.44		8108.83125	H	49.45		8113.44375	H	48.15
8960.18750	H	46.46		9009.81250	V	46.56		9014.93750	H	46.66

*** = 20 dB or more below the limit**