Underwriters Laboratories Inc.
333 Pfingsten Rd.
Northbrook, IL 60062

www.ul.com/emc
(847) 272-8800

Job Number:	1001003252
Project Number:	08NK15446
File Number:	MC15197
Date:	August 26, 2008
Model:	iCell DOrA Compact BTS Macro 1F 1900 MHz

Electromagnetic Compatibility Test Report

For

UT Starcom

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Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **333 Pfingsten Rd.** **Northbrook, IL 60062**
Tests Performed For:	**UT Starcom** **3800 W. Golf Road** **Rolling Meadows, IL 60008**
Applicant Contact: Phone: E-mail:	**Bill Stamos** **(847) 631-9457** **Bill.Stamos@utstar.com**
Test Report Date:	**August 26, 2008**
Product Type:	**Cellular Base Station**
Product standards	**47 CFR Part 24E and RSS-133**
Model Number:	iCell DOrA Compact BTS Macro 1F 1900 MHz
Sample Serial Number:	**Engineering Prototype**
EUT Category:	**Transmitter**
Testing Start Date:	**July 24, 2008**
Date Testing Complete:	**August 12, 2008**
Overall Results:	**Compliant**

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Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None			

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The Compact iBTS is part of the Star Solutions All-IP Wireless Network for CDMA for CDMA2000© Radio Access Networks.

Star Solutions All-IP Wireless Network for CDMA is an end-to-end, all-Internet-Protocol (IP)-based, wireless communication solution. Star Solutions All-IP Wireless Network for CDMA provides the mobility and media-control traditionally associated with a circuit-switched Mobile Switching Center (MSC), but in a packet-based environment.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Information Technology Equipment	Global Star Solutions	iCell DOrA Compact BTS Macro 1F 1900 MHz	120 VAC, 60 Hz
AE	NTP Server	UT Starcom	1U TC 3100 configured as NTP Server	None
AE	Ethernet Router	Linksys	Wireless G	None
AE	Laptop Test Computer	Sony	Vaio PCG 9W7L	None

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains, AC	AC	N	N	None
2	Antenna Port (Main)	I/O	Y		50 Ohm Coaxial
3	Ethernet	I/O	Y	N	None
4	GPS	I/O	Y		50 Ohm Coaxial

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.2.3 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120Vac	4	450W	60Hz	Single Phase	None

1.3 EUT Configurations

Mode #	Description
1	3U iBTS Chassis: - Power Supply, 5VDC/12 VDC - Power Supply, 24 VDC - DOrA Module - ACMj Module - Power Amplifier Module - Diplexer Module - LNA Module (2)

1.4 EUT Operation Modes

Mode #	Description
1	Test Mode. EUT was started and placed into transmit mode with simulated traffic. Frequency/Channel were selected as appropriate for the testing performed. Power level and frequency were verified. When necessary for the test, the EUT was commanded to new frequencies or modulations.. For the frequency stability test, the NTP server was augmented with an actual GPS signal from the satellite constellation visible at the time of test. During radiated and conducted emissions testing, the EUT main antenna port was terminated into a nominal 50 Ohm resistive termination. During the remainder of testing, the EUT main antenna port was terminated in a test instrument (typically a spectrum analyzer) with a nominal input impedance of 50 ohms through 50 Ohm RF attenuators. The receiver was in operation during all tests.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
47 CFR Part 15, Subpart B	Radio Frequency Devices	2008
47 CFR Part 24E	Broadband PCS	2007
RSS-Gen	General Requirements and Information for the Certification of Radiocommunication Equipment	2007
RSS-133	2GHz Personal Communication Services	2008

2.4 Results Summary

This product is considered Class A

Requirement – Test	Result (Compliant / Non-Compliant)*
RF Power Output	Compliant
Occupied Bandwidth	Compliant
Out of Band Emissions	Compliant
Radiated Emissions 30MHz – 1GHz	Compliant
Frequency Stability	Compliant

Test Engineer:

Bartlomiej Mucha (Ext.41216)
Senior Project Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:

Jack L. Steiner(Ext.42307)
Section Manager
International EMC Services
Conformity Assessment Services

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3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- United States and Canada ----------

Code of Federal Regulations Title 47	Part 15, Digital Devices
Code of Federal Regulations Title 47	Part 24E, Broadband PCS
Industry Canada	RSS-133 Spectrum Management and Telecommunications Radio Standard Specification 2 GHz Personal Communications Services
Industry Canada	RSS-Gen General Requirements and Information for the Certification of Radiocommunication Equipment

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

4.1 RF Power Output

Test Description	For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in Sec. 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.	
Basic Standard	47 CFR Part 24.232 and 47 CFR Part 2.1046 (a) RSS-133, Section 4.1, and 6.4	
UL LPG	N/A	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	1931.25MHz – 1988.75MHz	Antenna Port Measurement
Limits		
Device Type	Limit (dBm)	
	RMS Power	
CDMA1900	50	
Supplementary information: None		

Table 1 RF Power Output EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 2 RF Power Output

Description	Manufacturer	Model	Identifier
RF Power Meter	Rhode & Schwarz	NRVD	EMC4074
RF Power Sensor	Rhode & Schwarz	NRV-Z55	EMC4265
Attenuator	Pasternack	PE7019-30	NA
Attenuator	Minicircuit	10dB	NA
Attenuator	HP	6dB	NA

Figure 1 Test setup for RF Power Output

Table 3 RF Power Output Data Points

Channel Number / PCS Block	Modulation	Frequency MHz	Attenuator / Cable Loss dB	Power Meter Reading	Measured Power dBm	Power W
25/A	QPSK	1931.25	48.1	-4.51	43.59	22.86
25/A	8PSK	1931.25	48.1	-4.55	43.55	22.65
25/A	16QAM	1931.25	48.1	-4.55	43.55	22.65
150/A	QPSK	1937.5	48.1	-4.28	43.82	24.10
150/A	8PSK	1937.5	48.1	-4.22	43.88	24.43
150/A	16QAM	1937.5	48.1	-4.25	43.85	24.27
275/A	QPSK	1943.75	48.2	-4.44	43.76	23.77
275/A	8PSK	1943.75	48.2	-4.38	43.82	24.10
275/A	16QAM	1943.75	48.2	-4.41	43.79	23.93
325/D	QPSK	1946.25	48.2	-4.18	44.02	25.23
325/D	8PSK	1946.25	48.2	-4.11	44.09	25.64
325/D	16QAM	1946.25	48.2	-4.13	44.07	25.53
350/D	QPSK	1947.5	48.3	-4.22	44.08	25.59
350/D	8PSK	1947.5	48.3	-4.12	44.18	26.18
350/D	16QAM	1947.5	48.3	-4.14	44.16	26.06
375/D	QPSK	1948.75	48.3	-4.37	43.93	24.72
375/D	8PSK	1948.75	48.3	-4.33	43.97	24.95
375/D	16QAM	1948.75	48.3	-4.33	43.97	24.95
425/B	QPSK	1951.25	48.4	-4.34	44.06	25.47
425/B	8PSK	1951.25	48.4	-4.34	44.06	25.47
425/B	16QAM	1951.25	48.4	-4.35	44.05	25.41
550/B	QPSK	1957.5	48.4	-4.32	44.08	25.59
550/B	8PSK	1957.5	48.4	-4.31	44.09	25.64
550/B	16QAM	1957.5	48.4	-4.31	44.09	25.64
675/B	QPSK	1963.75	48.4	-4.45	43.95	24.83
675/B	8PSK	1963.75	48.4	-4.35	44.05	25.41
675/B	16QAM	1963.75	48.4	-4.41	43.99	25.06
725/E	QPSK	1966.25	48.4	-4.38	44.02	25.23
725/E	8PSK	1966.25	48.4	-4.42	43.98	25.00
725/E	16QAM	1966.25	48.4	-4.52	43.88	24.43
750/E	QPSK	1967.5	48.4	-4.42	43.98	25.00
750/E	8PSK	1967.5	48.4	-4.36	44.04	25.35
750/E	16QAM	1967.5	48.4	-4.31	44.09	25.64
775/E	QPSK	1968.75	48.4	-4.33	44.07	25.53
775/E	8PSK	1968.75	48.4	-4.42	43.98	25.00
775/E	16QAM	1968.75	48.4	-4.43	43.97	24.95
825/F	QPSK	1971.25	48.4	-4.31	44.09	25.64
825/F	8PSK	1971.25	48.4	-4.31	44.09	25.64
825/F	16QAM	1971.25	48.4	-4.39	44.01	25.18
850/F	QPSK	1972.5	48.2	-4.35	43.85	24.27
850/F	8PSK	1972.5	48.2	-4.32	43.88	24.43
850/F	16QAM	1972.5	48.2	-4.33	43.87	24.38
875/F	QPSK	1973.75	48.2	-4.23	43.97	24.95
875/F	8PSK	1973.75	48.2	-4.35	43.85	24.27
875/F	16QAM	1973.75	48.2	-4.36	43.84	24.21
925/C	QPSK	1976.25	48.1	-4.27	43.83	24.15
925/C	8PSK	1976.25	48.1	-4.37	43.73	23.60
925/C	16QAM	1976.25	48.1	-4.32	43.78	23.88
1050/C	QPSK	1982.5	48.1	-4.97	43.13	20.56
1050/C	8PSK	1982.5	48.1	-4.96	43.14	20.61
1050/C	16QAM	1982.5	48.1	-4.99	43.11	20.46
1175/C	QPSK	1988.75	48.1	-4.27	43.83	24.15
1175/C	8PSK	1988.75	48.1	-4.23	43.87	24.38
1175/C	16QAM	1988.75	48.1	-4.22	43.88	24.43

4.2 Test Conditions and Results – Occupied Bandwidth

Test Description	The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable: (g) Transmitters in which the modulating baseband comprises not more than three independent channels--when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition. (h) Transmitters employing digital modulation techniques--when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.	
Basic Standard	47 CFR Part 2.1049 RSS-Gen, Section 4.6	
UL LPG	N/A	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	1930MHz – 1990MHz	Antenna Port Measurement
Occupied Bandwidth Limits		
Supplementary information: The bandwidth was measured using the 99% channel power feature of the spectrum analyzer.		

Table 4 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

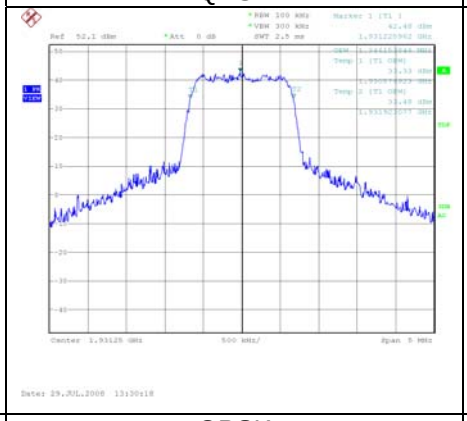
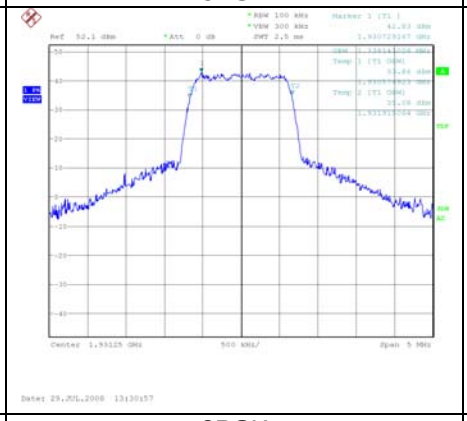
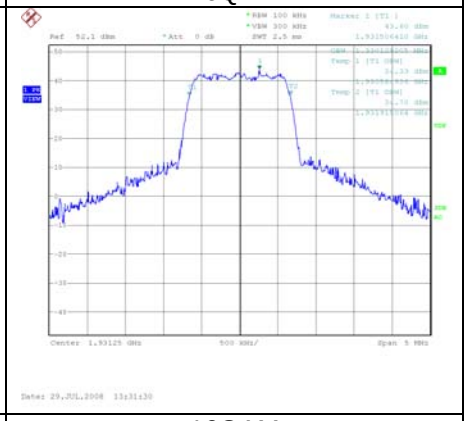
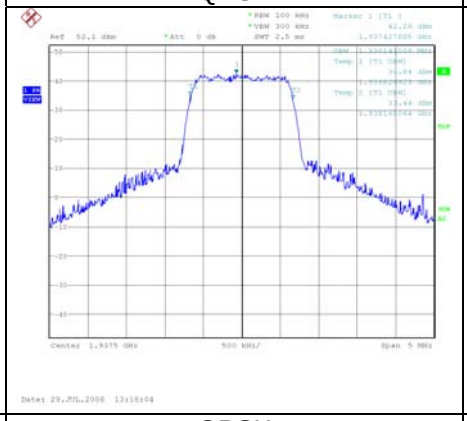
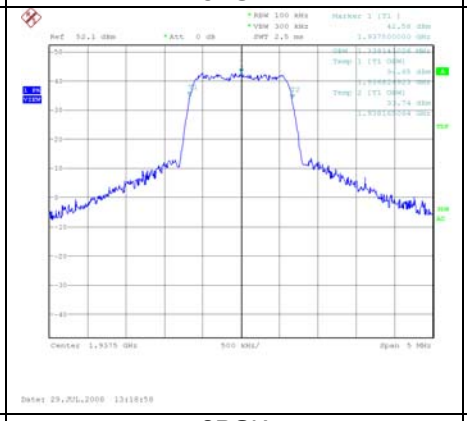
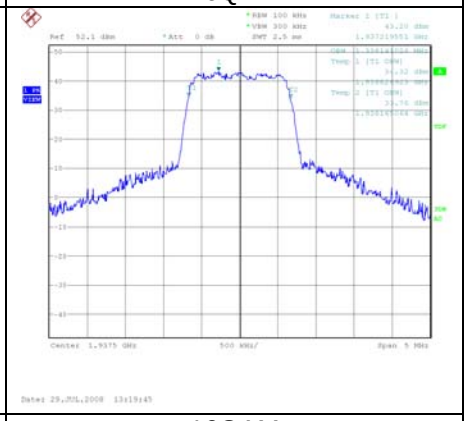
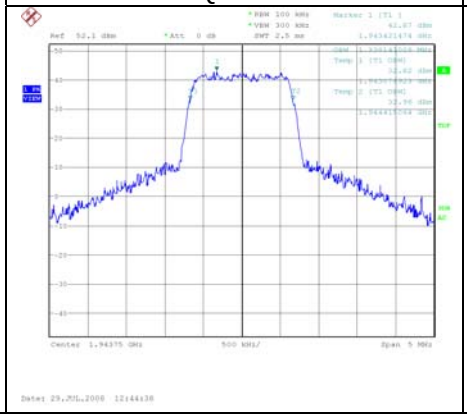
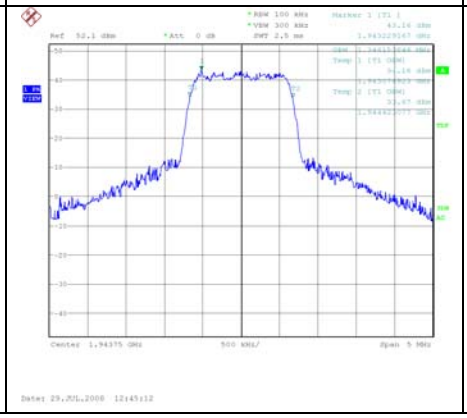
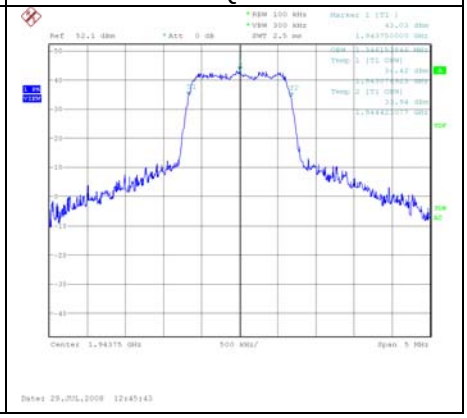
Table 5 Occupied Bandwidth Test Equipment

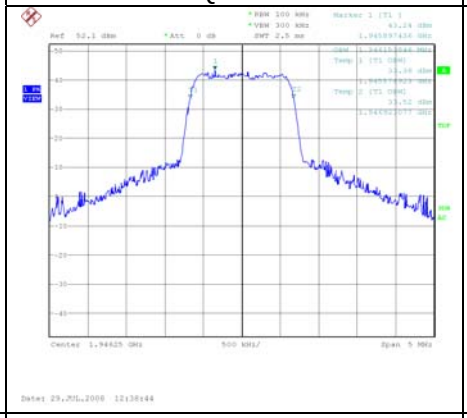
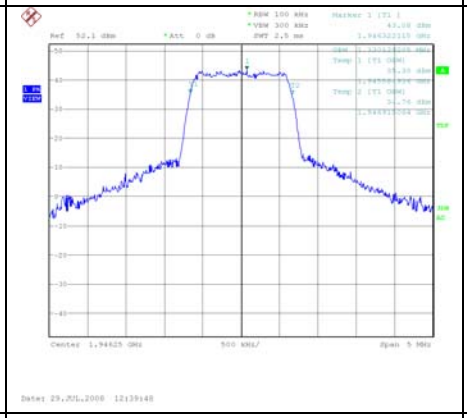
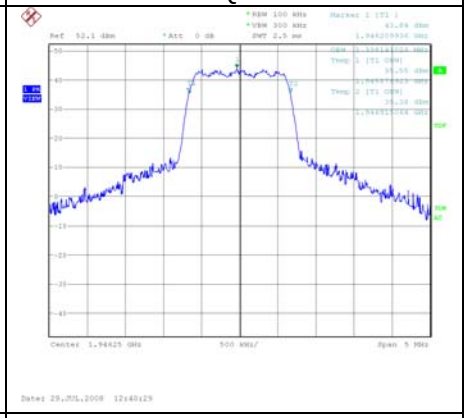
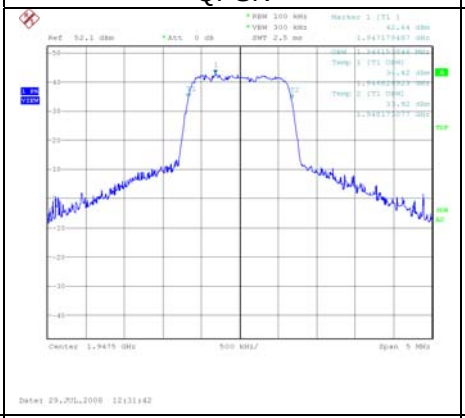
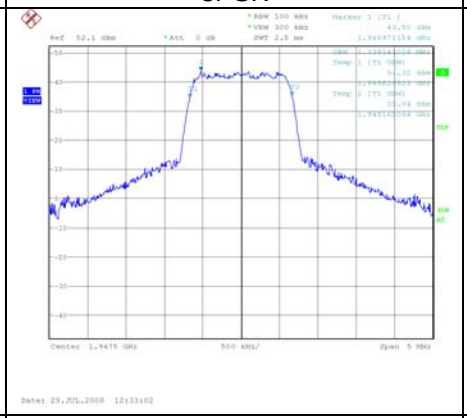
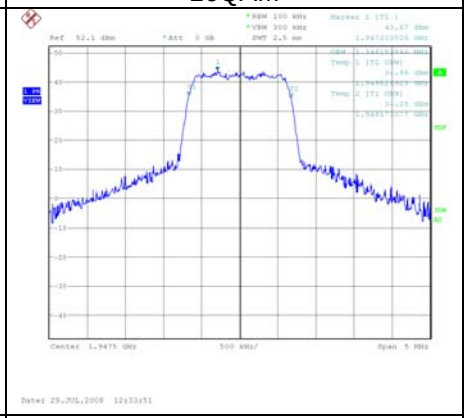
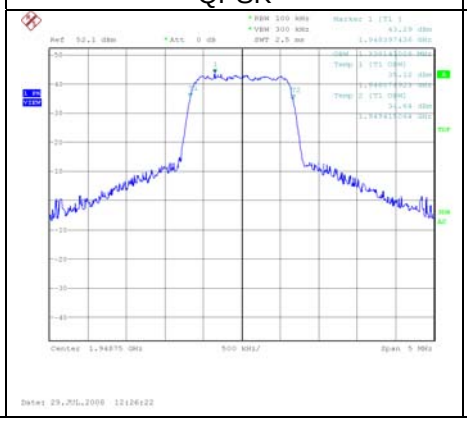
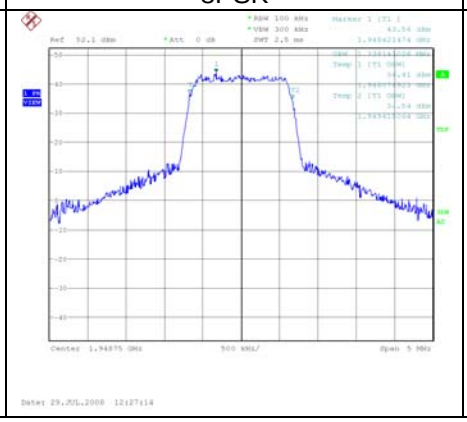
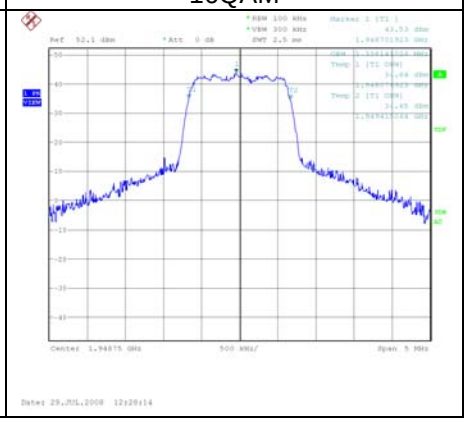
Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Rhode & Schwarz	ESU	
Attenuator	Pasternack	PE7019-30	NA
Attenuator	Minicircuit	10dB	NA
Attenuator	HP	6dB	NA

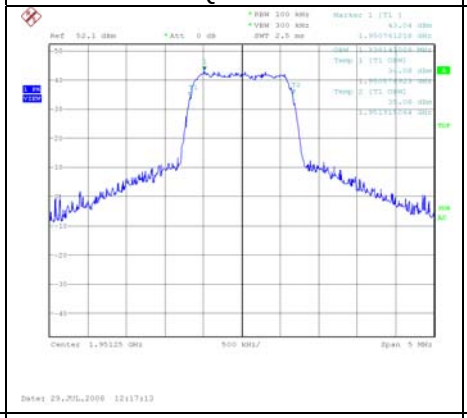
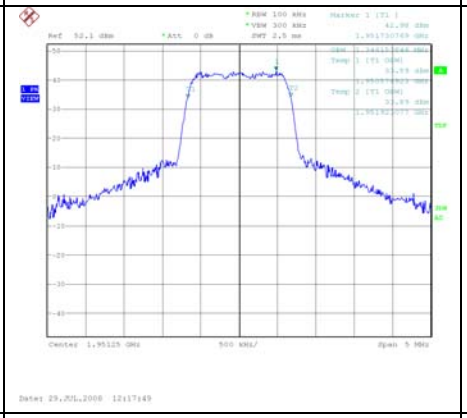
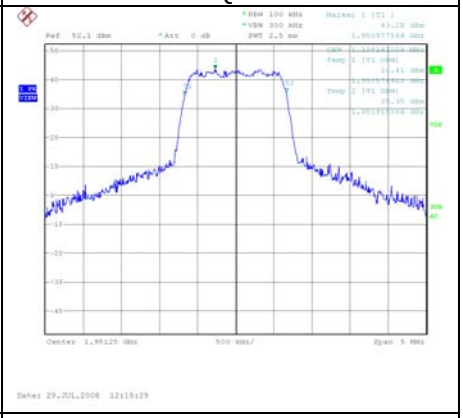
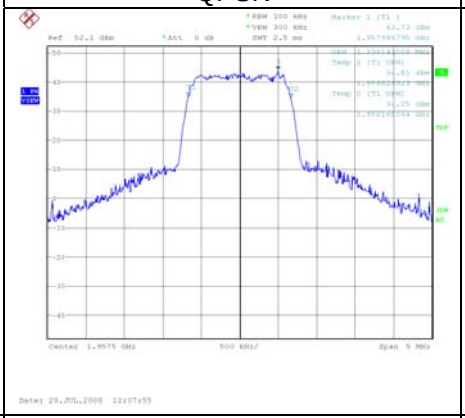
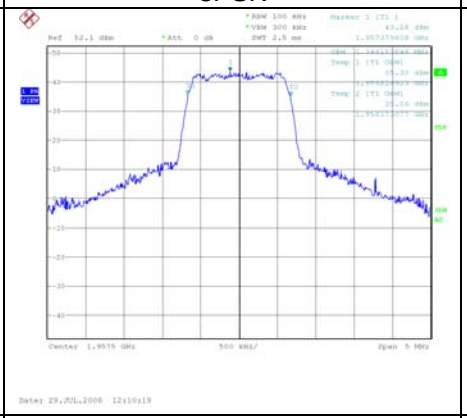
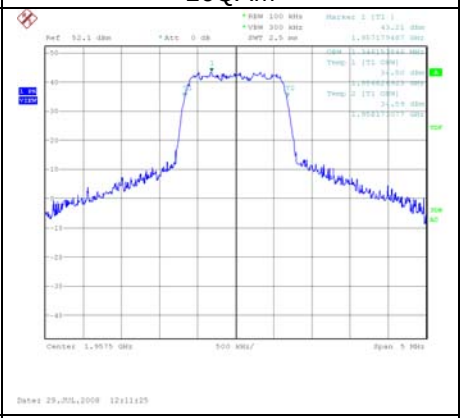
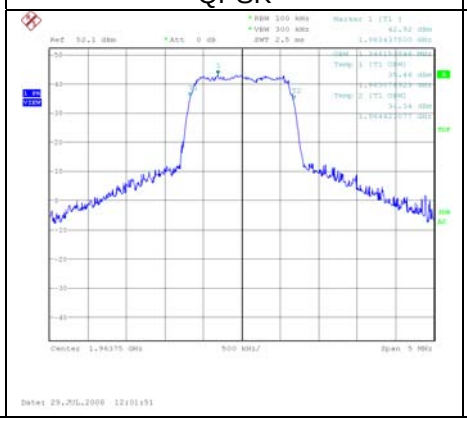
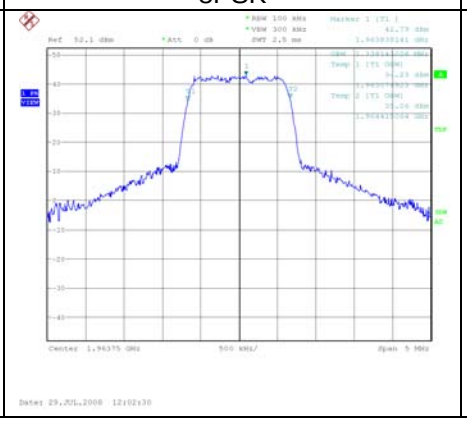
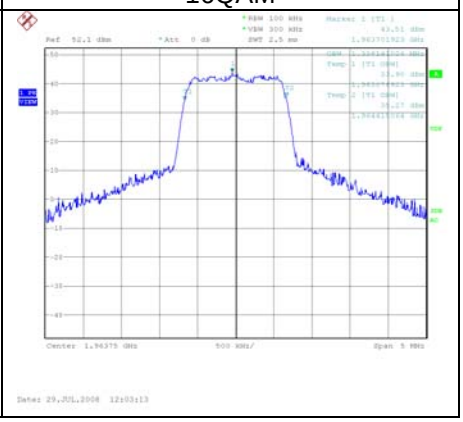
Figure 2 Test Setup for Occupied Bandwidth

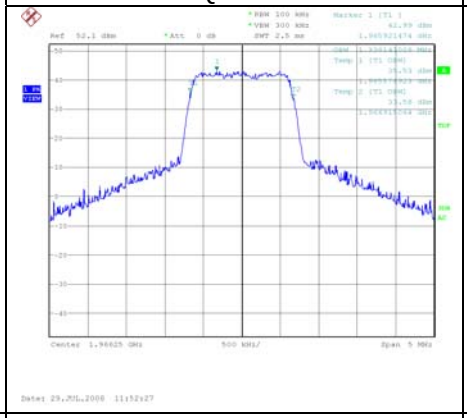
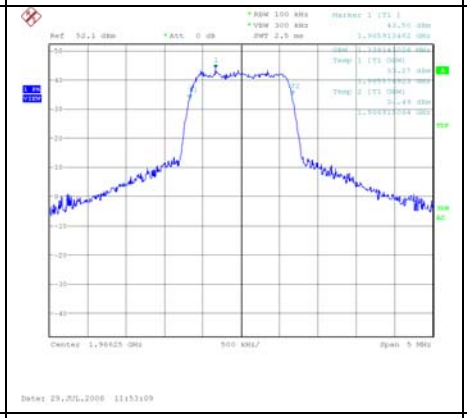
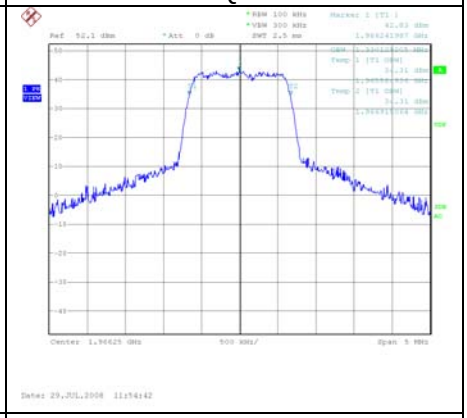
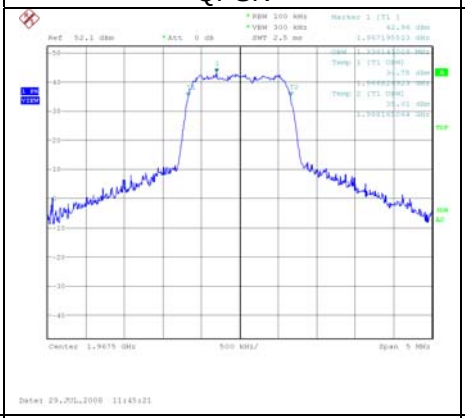
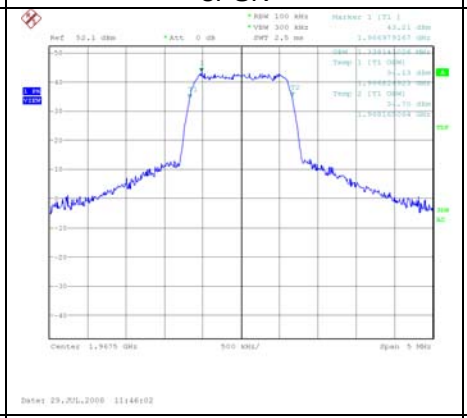
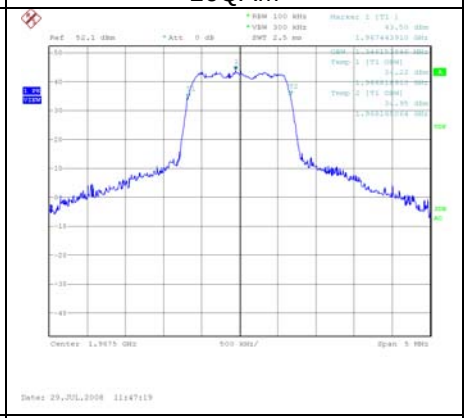
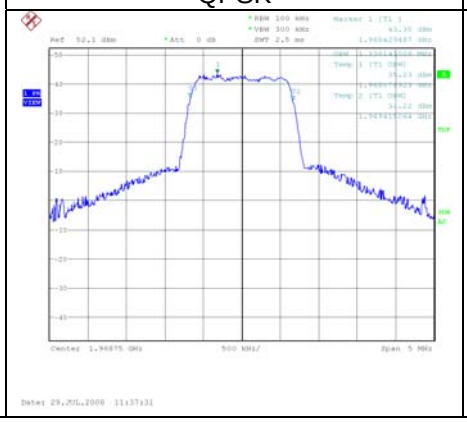
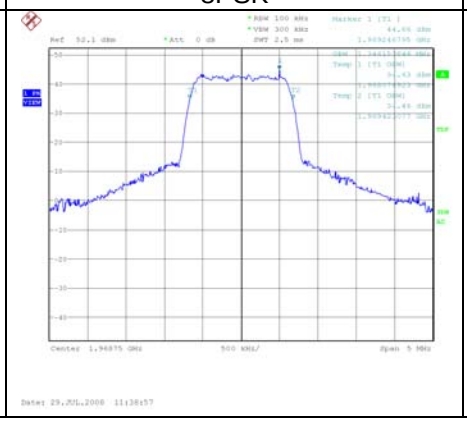
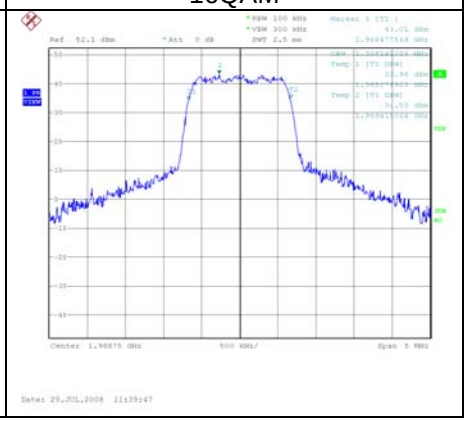
The above test setup represents power measurements, however the same test setup was used for Occupied Bandwidth measurements, except the power meter was replaced with Spectrum Analyzer.

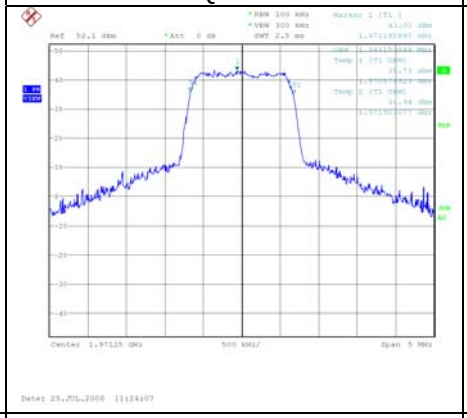
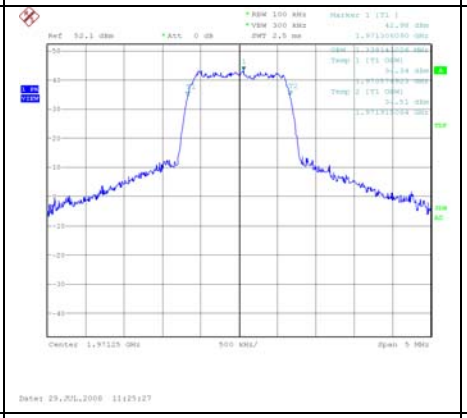
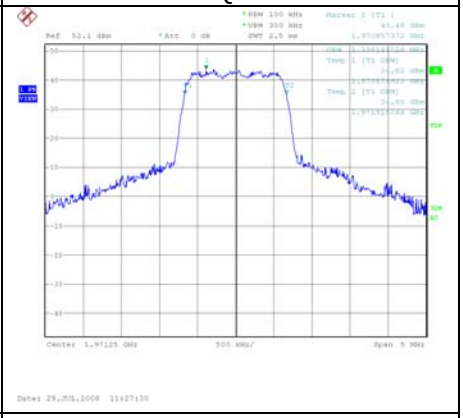
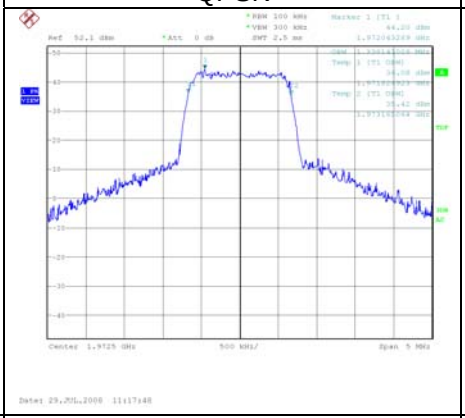
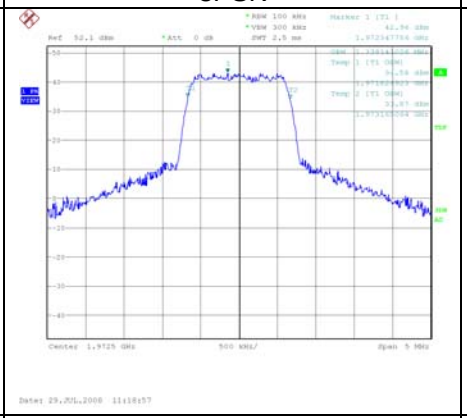
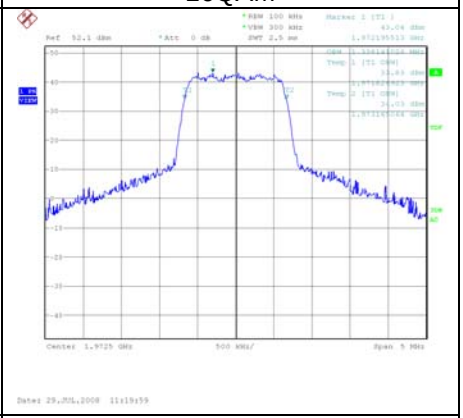
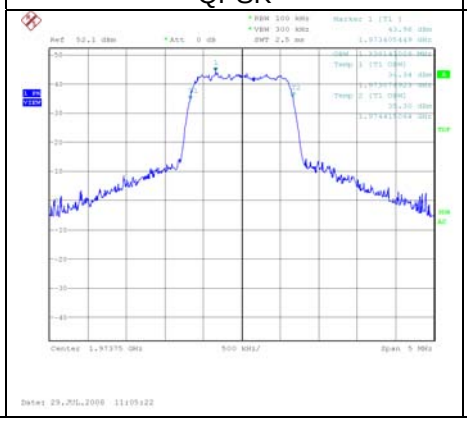
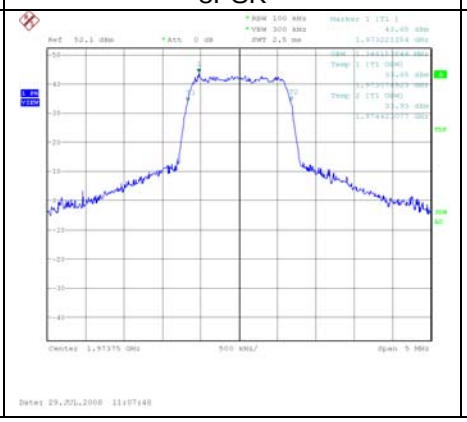
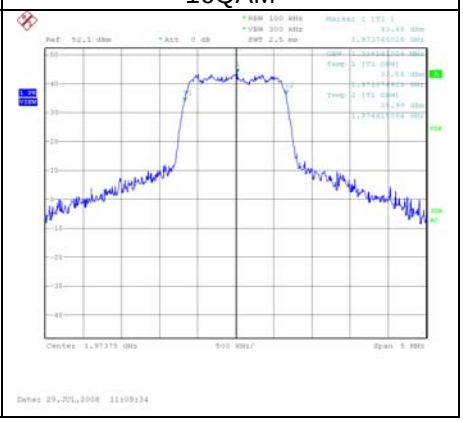
Figure 3 Occupied Bandwidth Graphs

	QPSK	8PSK	16QAM
CH25/A			
CH150/A			
CH275/A			

	QPSK	8PSK	16QAM
CH325/D			
CH350/D			
CH375/D			

	QPSK	8PSK	16QAM
CH425/B			
CH550/B			
CH675/B			

	QPSK	8PSK	16QAM
CH725/E			
CH750/E			
CH775/E			

	QPSK	8PSK	16QAM
CH825/F			
CH850/F			
CH875/F			

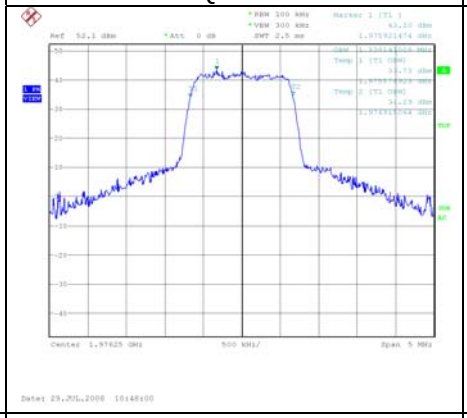
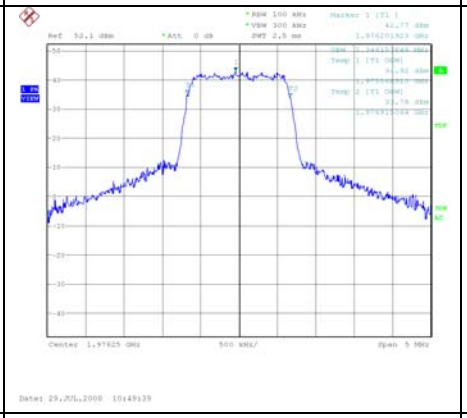
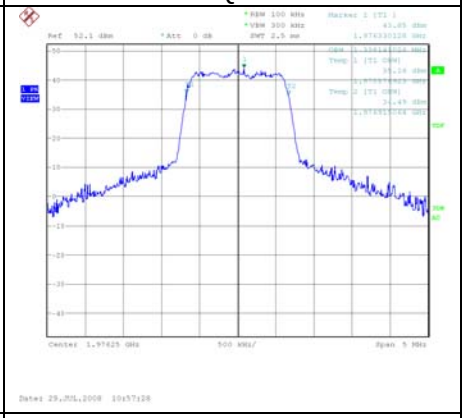
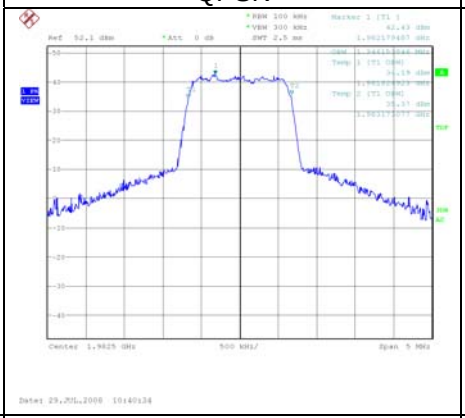
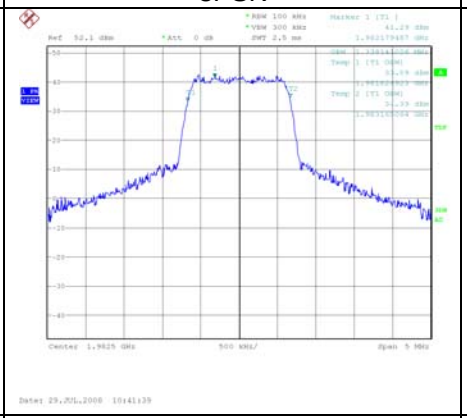
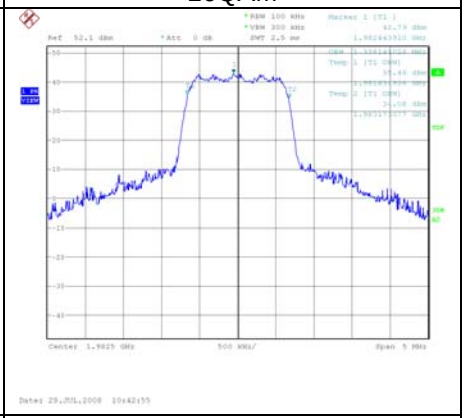
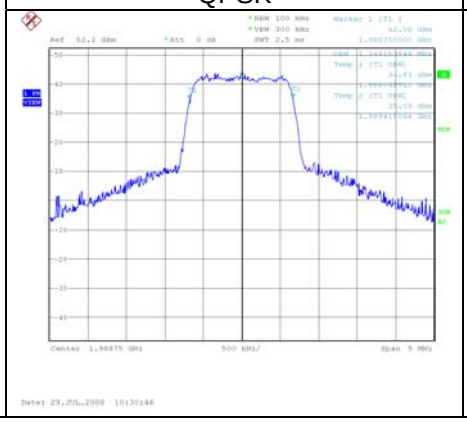
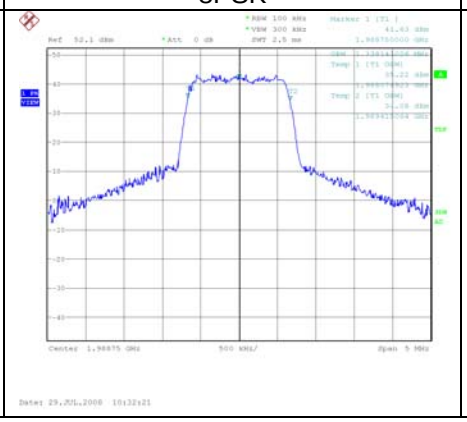
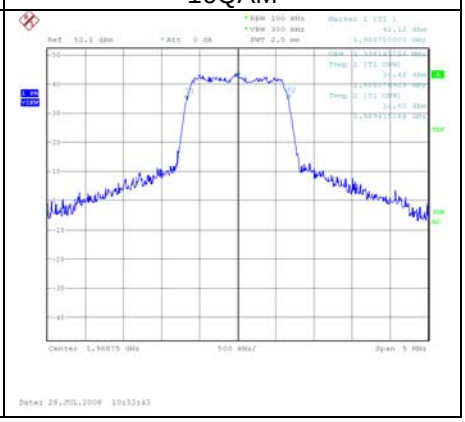
	QPSK	8PSK	16QAM
CH925/C			
CH1050/C			
CH1175/C			

Table 6 Occupied Bandwidth Test Results

Channel Number / PCS Block	Modulation	Frequency MHz	Occupied Bandwidth MHz 99%
25/A	QPSK	1931.25	1.346153846
25/A	8PSK	1931.25	1.338141026
25/A	16QAM	1931.25	1.330128205
150/A	QPSK	1937.5	1.338141026
150/A	8PSK	1937.5	1.338141026
150/A	16QAM	1937.5	1.338141026
275/A	QPSK	1943.75	1.338141026
275/A	8PSK	1943.75	1.346153846
275/A	16QAM	1943.75	1.346153846
325/D	QPSK	1946.25	1.346153846
325/D	8PSK	1946.25	1.330128205
325/D	16QAM	1946.25	1.338141026
350/D	QPSK	1947.5	1.346153846
350/D	8PSK	1947.5	1.338141026
350/D	16QAM	1947.5	1.346153846
375/D	QPSK	1948.75	1.338141026
375/D	8PSK	1948.75	1.338141026
375/D	16QAM	1948.75	1.338141026
425/B	QPSK	1951.25	1.338141026
425/B	8PSK	1951.25	1.346153846
425/B	16QAM	1951.25	1.338141026
550/B	QPSK	1957.5	1.338141026
550/B	8PSK	1957.5	1.346153846
550/B	16QAM	1957.5	1.346153846
675/B	QPSK	1963.75	1.346153846
675/B	8PSK	1963.75	1.338141026
675/B	16QAM	1963.75	1.338141026
725/E	QPSK	1966.25	1.338141026
725/E	8PSK	1966.25	1.338141026
725/E	16QAM	1966.25	1.330128205
750/E	QPSK	1967.5	1.338141026
750/E	8PSK	1967.5	1.338141026
750/E	16QAM	1967.5	1.346153846
775/E	QPSK	1968.75	1.338141026
775/E	8PSK	1968.75	1.346153846
775/E	16QAM	1968.75	1.338141026
825/F	QPSK	1971.25	1.346153846
825/F	8PSK	1971.25	1.338141026
825/F	16QAM	1971.25	1.338141026
850/F	QPSK	1972.5	1.338141026
850/F	8PSK	1972.5	1.338141026
850/F	16QAM	1972.5	1.338141026
875/F	QPSK	1973.75	1.338141026
875/F	8PSK	1973.75	1.346153846
875/F	16QAM	1973.75	1.338141026
925/C	QPSK	1976.25	1.338141026
925/C	8PSK	1976.25	1.346153846
925/C	16QAM	1976.25	1.338141026
1050/C	QPSK	1982.5	1.346153846
1050/C	8PSK	1982.5	1.338141026
1050/C	16QAM	1982.5	1.338141026
1175/C	QPSK	1988.75	1.346153846
1175/C	8PSK	1988.75	1.338141026
1175/C	16QAM	1988.75	1.338141026

4.3 Test Conditions and Results – Out of Band Emissions

Test Description	Sec. 2.1051 Measurements required: Spurious emissions at antenna terminals. The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in Sec. 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified. Sec. 2.1057 Frequency spectrum to be investigated. (a) In all of the measurements set forth in Sec. Sec. 2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below: (1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (b) Particular attention should be paid to harmonics and subharmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked. (c) The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported. Sec. 24.238 Emission limitations for Broadband PCS equipment. The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service. (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Basic Standard	47 CFR Part 2.1051, 2.1057 and 47 CFR Part 24.238 RSS-133, Section 6.5.2	
UL LPG	N/A	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 20GHz	Antenna Port Measurement
Limits		
Frequency (MHz)	dBm	
30 to 20,000	Must be attenuated by factor of 43 + 10 Log (P) dB below the maximum power level (-13dBm)	
Supplementary information: P=Power in Watts, Final Limit is: Measured Power dBm – (43+10*Log(P)) Two measurements methods were used to show compliance with the Band Edge / Block Edge limits. For the band edges (below 1930 and above 1990) for the first 1MHz outside the frequency band a 1kHz RBW was used. This when used with 1% of the 26dB BW requires a correction factor of 12.11dB. Below 1929MHz and above 1991MHz adjacent channel power measurement was used. Between the block edges only reduced RBW (1kHz) was used and 12.11dB correction was applied. For all measurement the cable and attenuator factors are included in S/A reading.		

Table 7 Out of Band Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 8 Out of Band Emissions Test Equipment

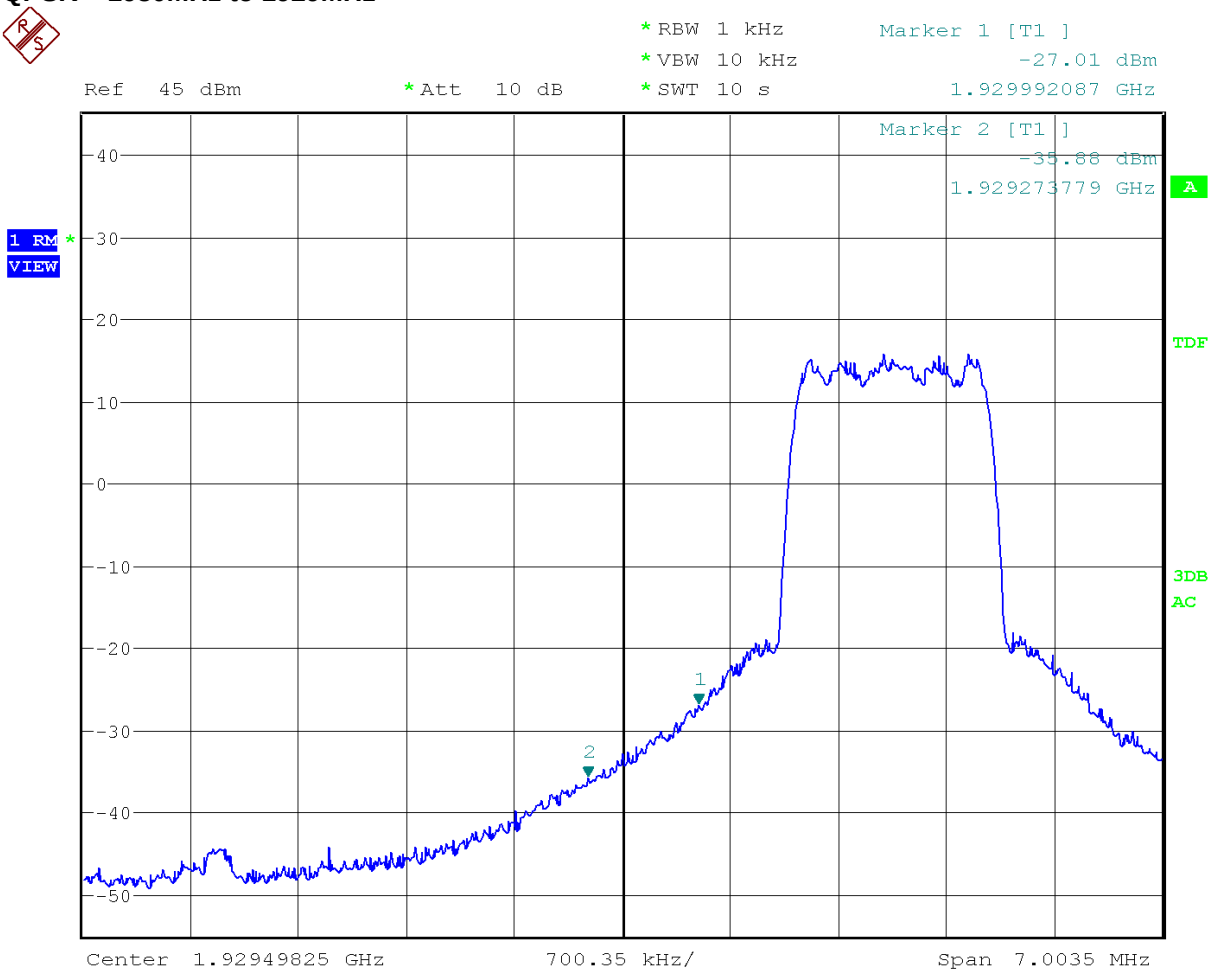
Description	Manufacturer	Model	Identifier
Spectrum Analyzer	HP	8566B	EMC4085
Quasi-Peak Detector	HP	85650A	EMC4016
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6108	EMC4076
Bicon Antenna	Electro-Metrics	EM6912A	EMC4070
Log-P Antenna	Chase	UPA6109	EMC4258
Log-P Antenna	Chase	UPA6109	EMC4313
Horn Antenna	EMCO	3115	EMC4030
Horn Antenna	EMCO	3115	EMC4253
Rod Antenna - 104cm	EMCO	3301B	EMC4168
Loop Antenna	EMCO	6502/1	EMC4026
Spectrum Analyzer	Rhode & Schwartz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276
Amplified 1GHz – 10GHz System	UL w/ EMCO Horn Antenna	3117	EMC4293

Figure 4 Test setup for Out of Band Emissions

The above test setup represents power measurements, however the same test setup was used for Occupied Bandwidth measurements, except the power meter was replaced with Spectrum Analyzer.

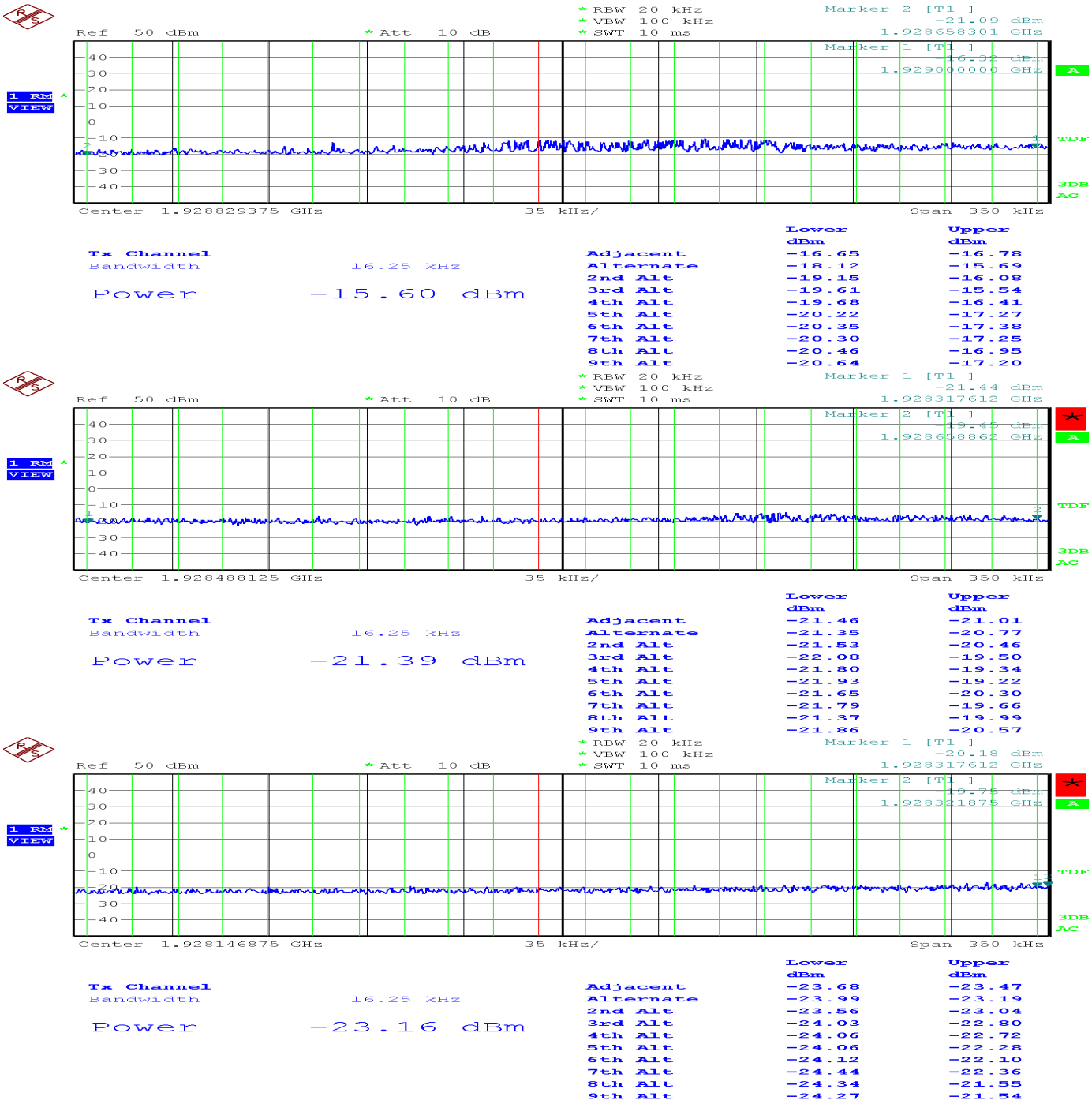
Figure 5 Out of Band Emissions Graph – CH25 – below 1930MHz

QPSK – 1930MHz to 1929MHz



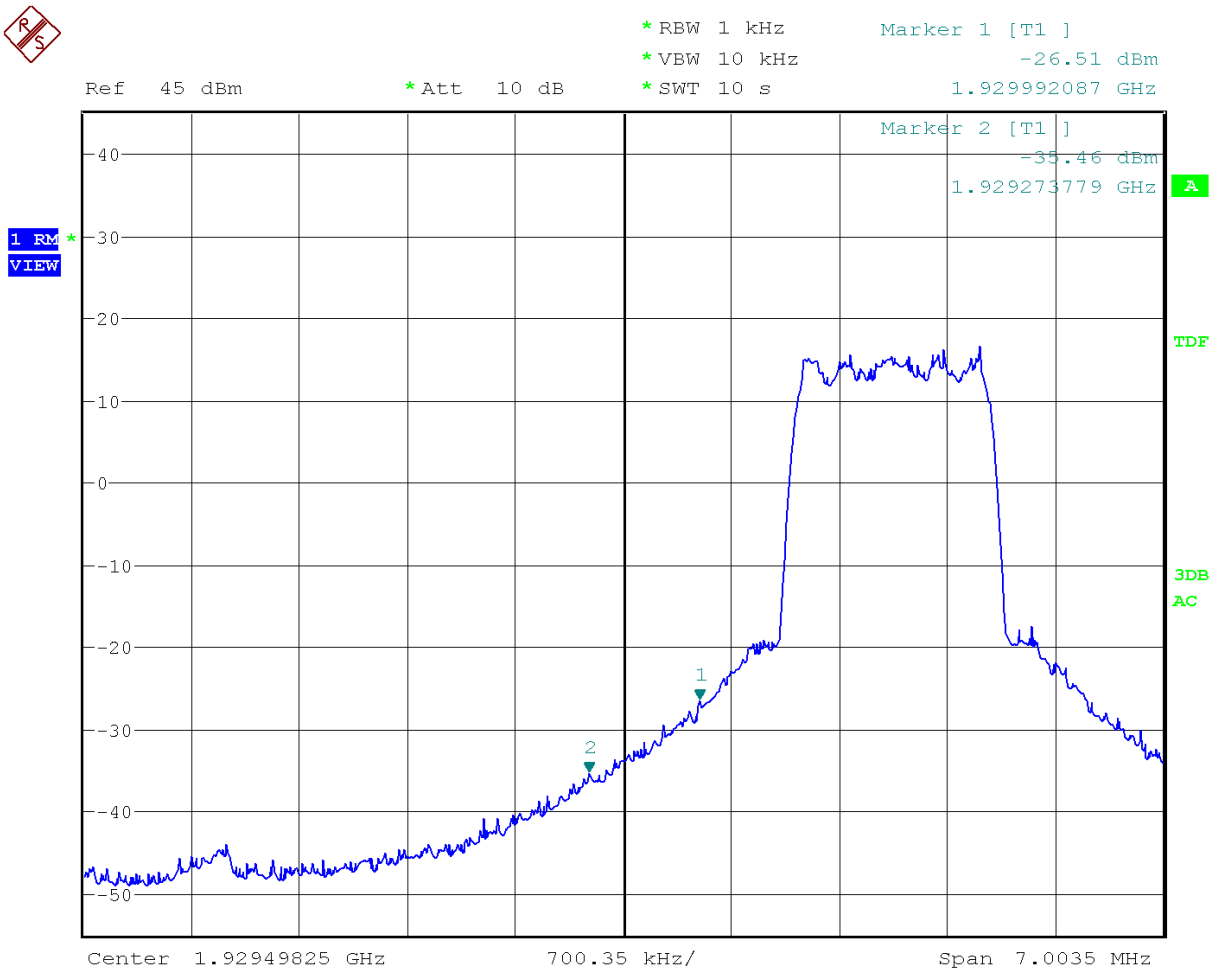
Highest level measured at 1919.99MHz is –27.01dBm
-27.01dBm + 12.11dB = -14.9dBm

QPSK – below 1929MHz



Highest level recorded is **–15.54dBm**

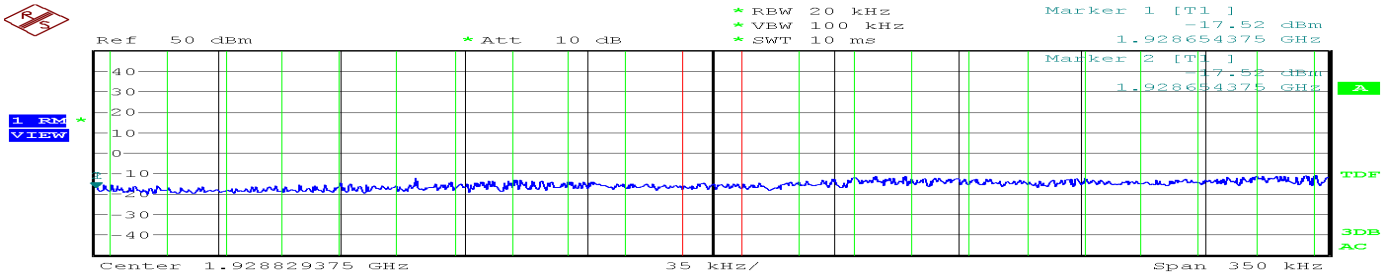
8PSK – 1930MHz to 1929MHz



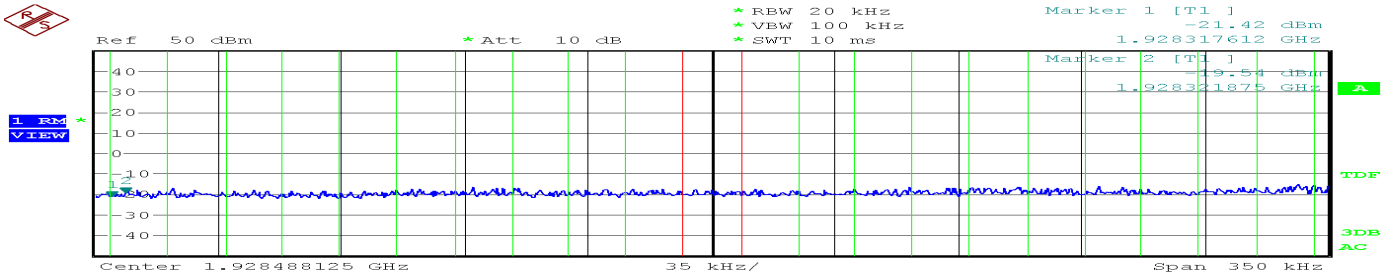
Date: 4.AUG.2008 13:29:52

Highest level measured at 1919.99MHz is –26.51dBm
-26.51dBm + 12.11dB = -14.4dBm

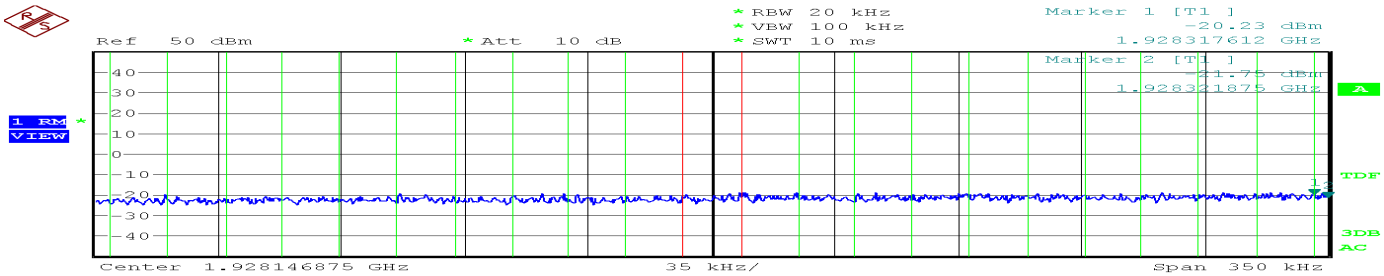
8PSK – below 1929MHz



		Lower dBm	Upper dBm
Tx Channel Bandwidth 16.25 kHz	Adjacent	-18.14	-17.88
	Alternate	-17.36	-16.41
	2nd Alt	-17.09	-15.22
Power −17.90 dBm	3rd Alt	-17.70	-15.40
	4th Alt	-18.25	-16.00
	5th Alt	-18.81	-16.24
	6th Alt	-19.41	-16.00
	7th Alt	-19.74	-16.07
	8th Alt	-19.95	-15.17
	9th Alt	-19.52	-14.55



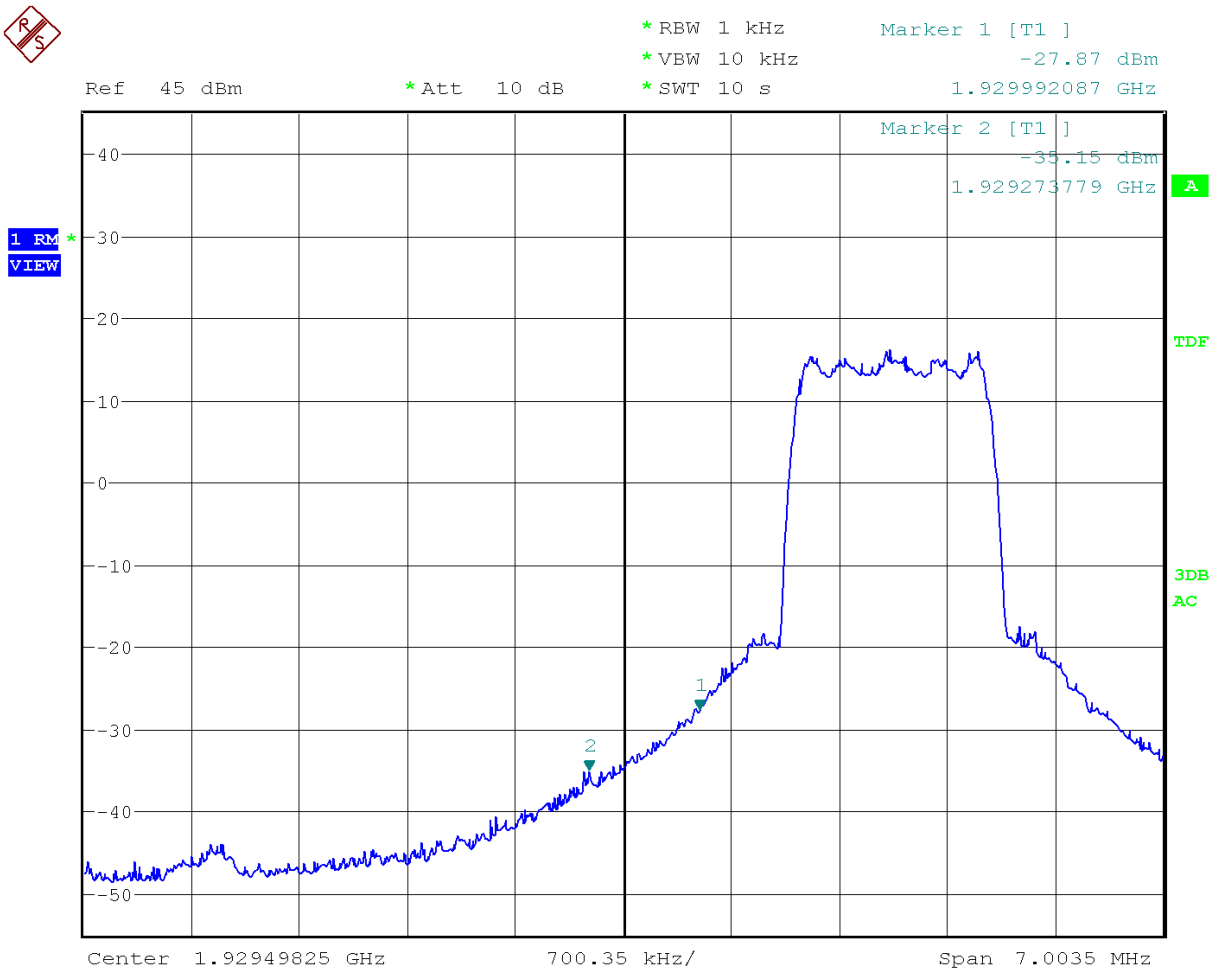
		Lower dBm	Upper dBm
Tx Channel Bandwidth 16.25 kHz	Adjacent	-20.98	-21.24
	Alternate	-21.15	-21.20
	2nd Alt	-21.08	-20.82
Power −21.17 dBm	3rd Alt	-20.86	-20.48
	4th Alt	-21.07	-19.77
	5th Alt	-21.84	-20.39
	6th Alt	-22.01	-20.41
	7th Alt	-21.86	-21.00
	8th Alt	-21.44	-20.06
	9th Alt	-21.75	-19.41



		Lower dBm	Upper dBm
Tx Channel Bandwidth 16.25 kHz	Adjacent	-23.76	-22.75
	Alternate	-24.07	-23.33
	2nd Alt	-23.59	-23.14
Power −23.36 dBm	3rd Alt	-24.23	-22.76
	4th Alt	-23.65	-22.77
	5th Alt	-24.10	-22.93
	6th Alt	-24.04	-23.15
	7th Alt	-24.25	-22.73
	8th Alt	-24.51	-22.41
	9th Alt	-24.47	-22.31

Highest level recorded is **–14.55dBm**

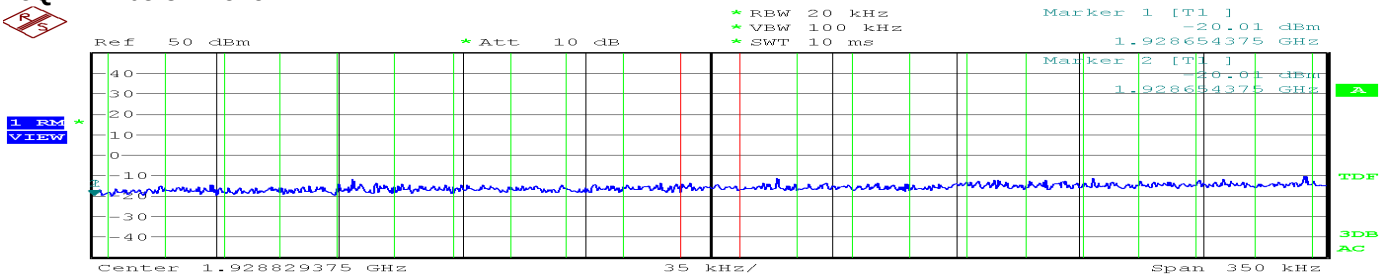
16QAM – 1930MHz to 1929MHz



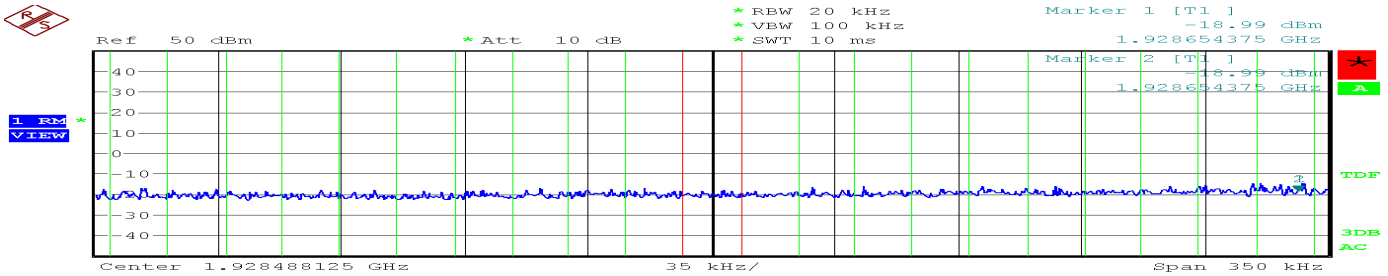
Date: 4.AUG.2008 13:26:59

Highest level measured at 1919.99MHz is –27.87dBm
-26.87dBm + 12.11dB = -15.76dBm

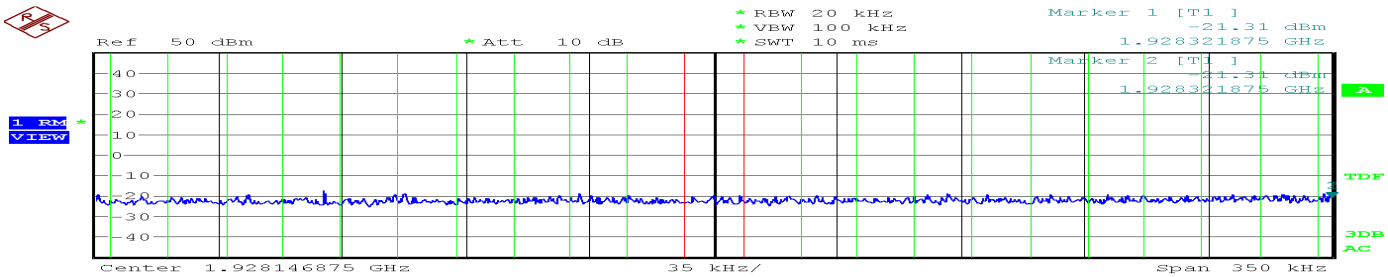
16QAM – below 1929MHz



Tx Channel		Lower dBm	Upper dBm
Bandwidth 16.25 kHz	Adjacent	-17.73	-17.32
	Alternate	-18.25	-17.39
Power −17.49 dBm	2nd Alt	-18.26	-17.58
	3rd Alt	-18.10	-17.12
	4th Alt	-18.02	-16.33
	5th Alt	-17.72	-16.40
	6th Alt	-18.96	-16.39
	7th Alt	-19.21	-16.30
	8th Alt	-18.71	-16.01
	9th Alt	-19.40	-15.96



Tx Channel		Lower dBm	Upper dBm
Bandwidth 16.25 kHz	Adjacent	-21.52	-21.82
	Alternate	-21.30	-21.50
Power −21.83 dBm	2nd Alt	-21.98	-21.25
	3rd Alt	-21.98	-20.95
	4th Alt	-22.72	-20.41
	5th Alt	-22.47	-20.84
	6th Alt	-22.29	-20.56
	7th Alt	-22.14	-20.22
	8th Alt	-21.97	-19.89
	9th Alt	-22.01	-19.38

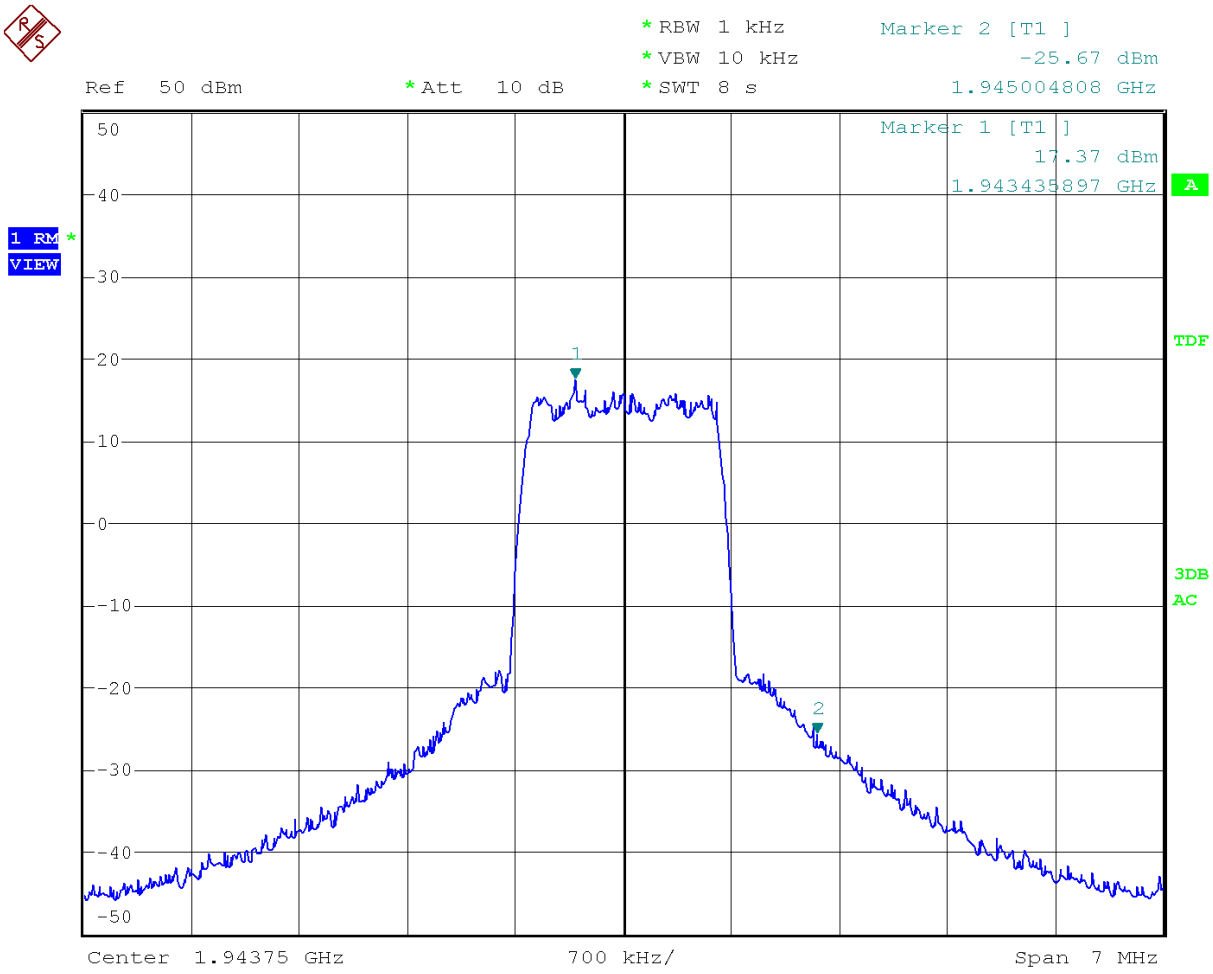


Tx Channel		Lower dBm	Upper dBm
Bandwidth 16.25 kHz	Adjacent	-24.12	-23.92
	Alternate	-23.66	-23.81
Power −23.92 dBm	2nd Alt	-23.77	-23.96
	3rd Alt	-24.24	-23.41
	4th Alt	-24.06	-23.88
	5th Alt	-24.19	-23.48
	6th Alt	-24.08	-23.53
	7th Alt	-24.31	-23.66
	8th Alt	-24.13	-23.17
	9th Alt	-24.51	-22.92

Highest level recorded is **–15.96dBm**

Figure 6 Out of Band Emissions (Block Edge) Graph – CH275

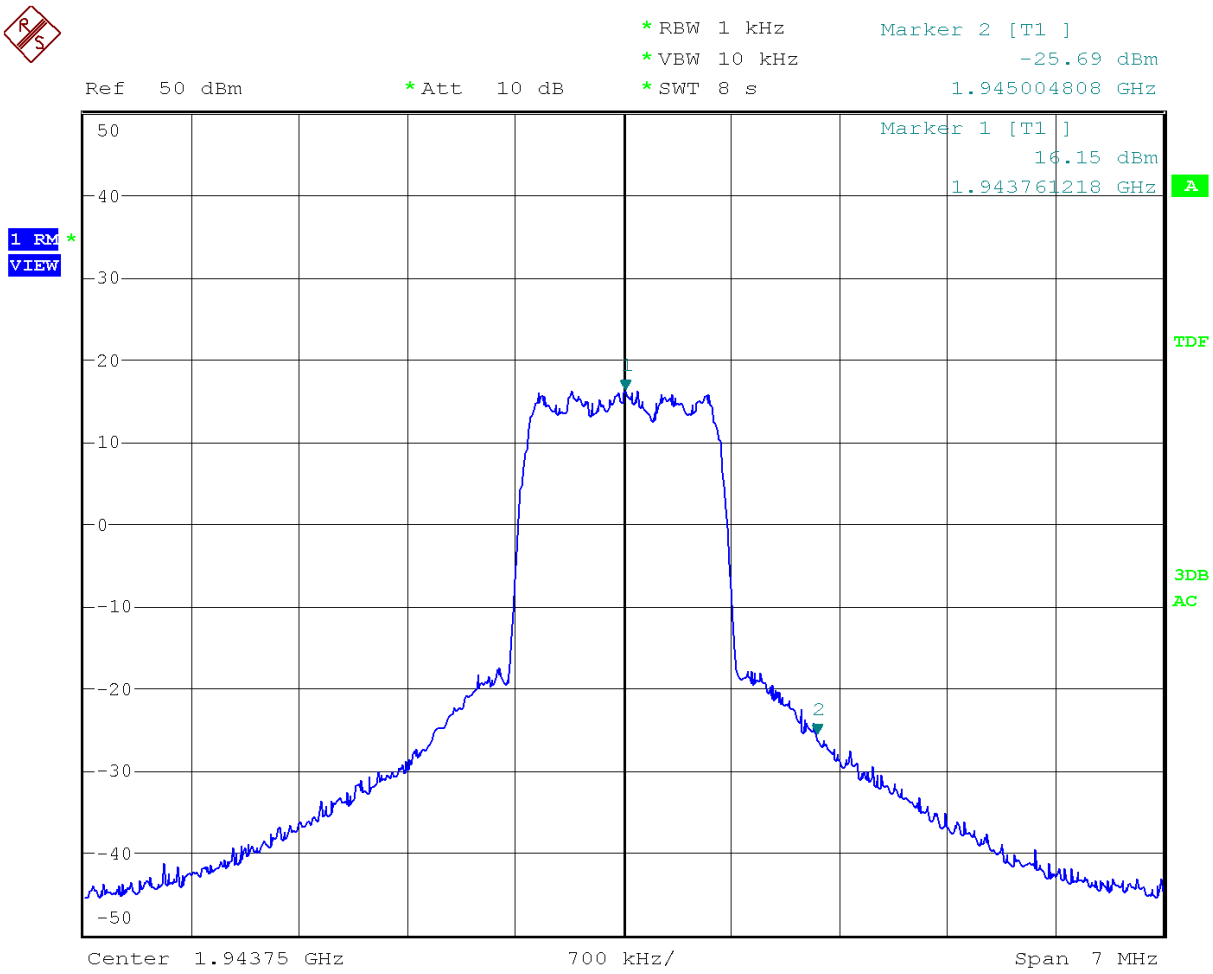
QPSK



Date: 5.AUG.2008 12:21:37

Highest level measured at 1945.004MHz is –25.67dBm
-25.67dBm + 12.11dB = -13.56dBm

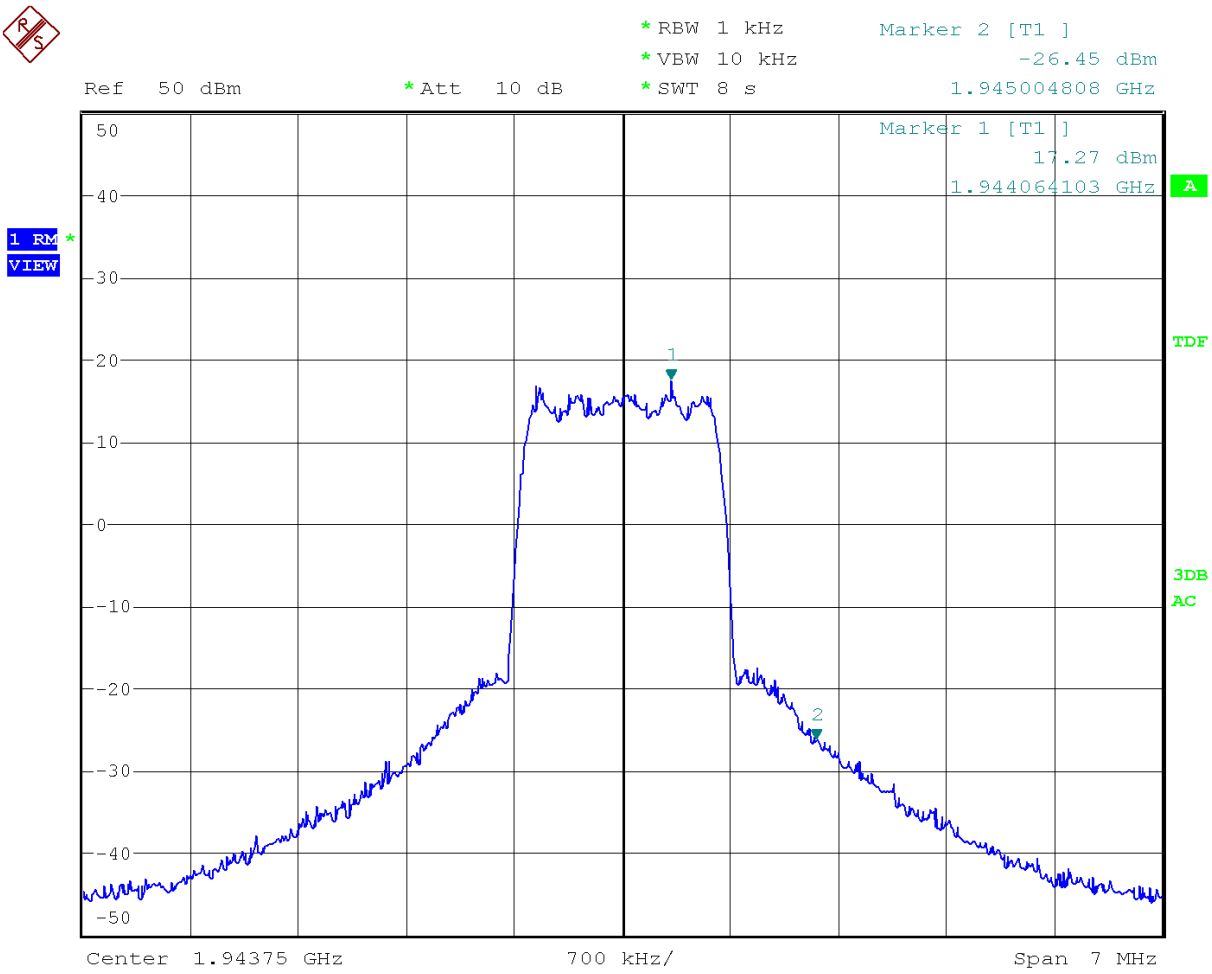
8PSK



Date: 5.AUG.2008 12:24:23

Highest level measured at 1945.004MHz is –25.67dBm
-25.69dBm + 12.11dB = -13.58dBm

16QAM

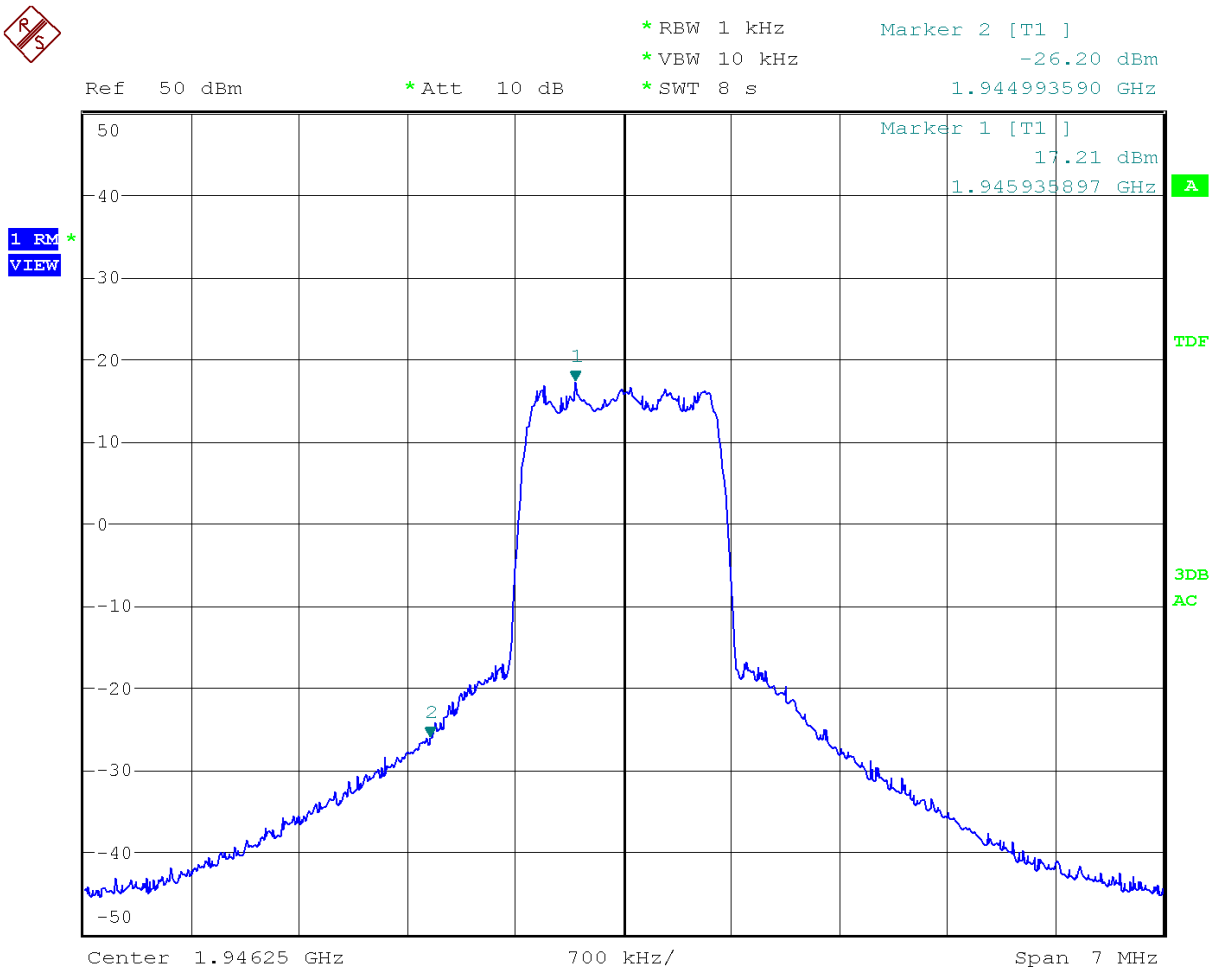


Date: 5.AUG.2008 12:27:43

Highest level measured at 1945.004MHz is –25.67dBm
-26.45dBm + 12.11dB = -14.34dBm

Figure 7 Out of Band Emissions (Block Edge) Graph – CH325

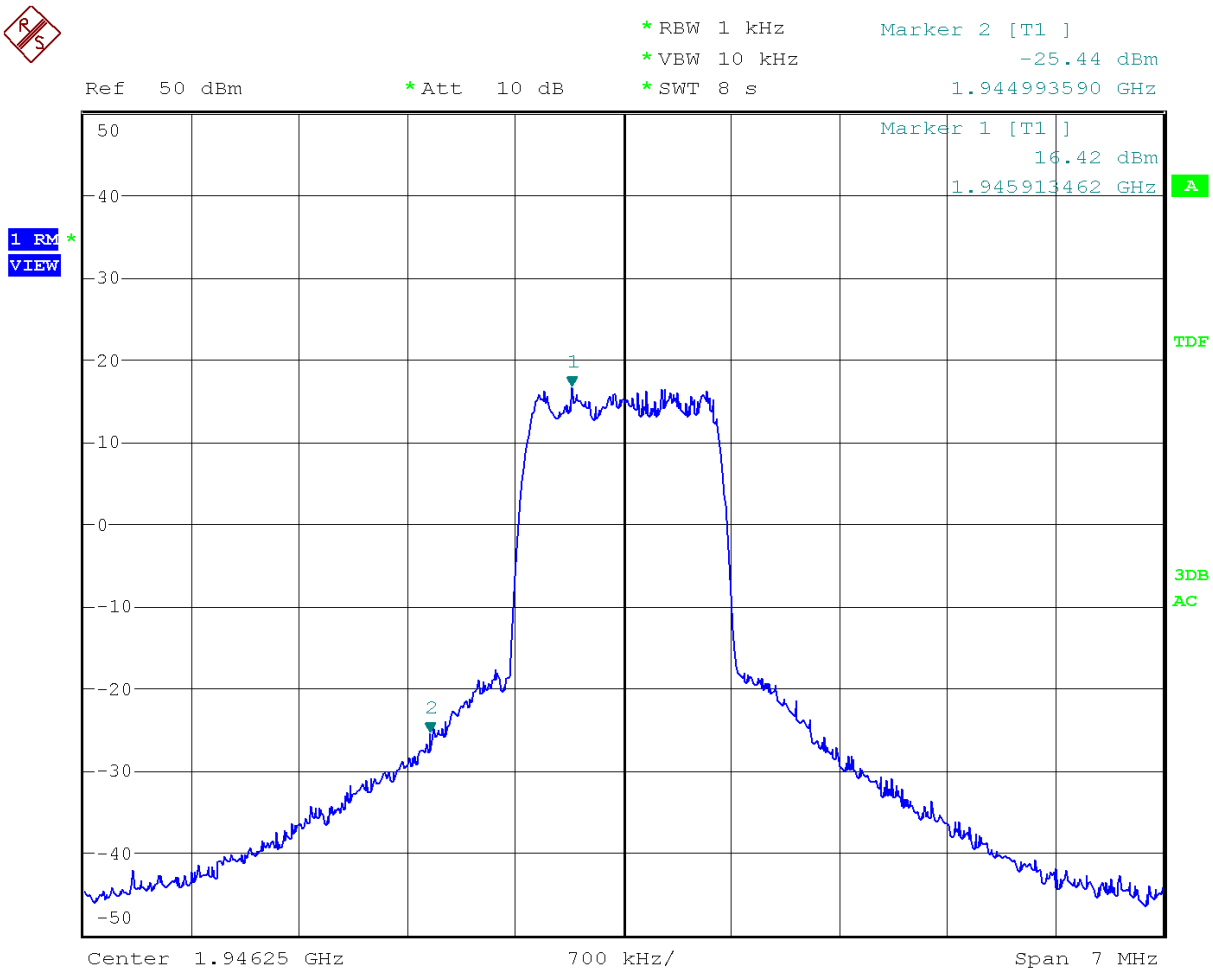
QPSK



Date: 5.AUG.2008 12:09:05

Highest level measured at 1944.994MHz is –26.20dBm
-26.20dBm + 12.11dB = -14.09dBm

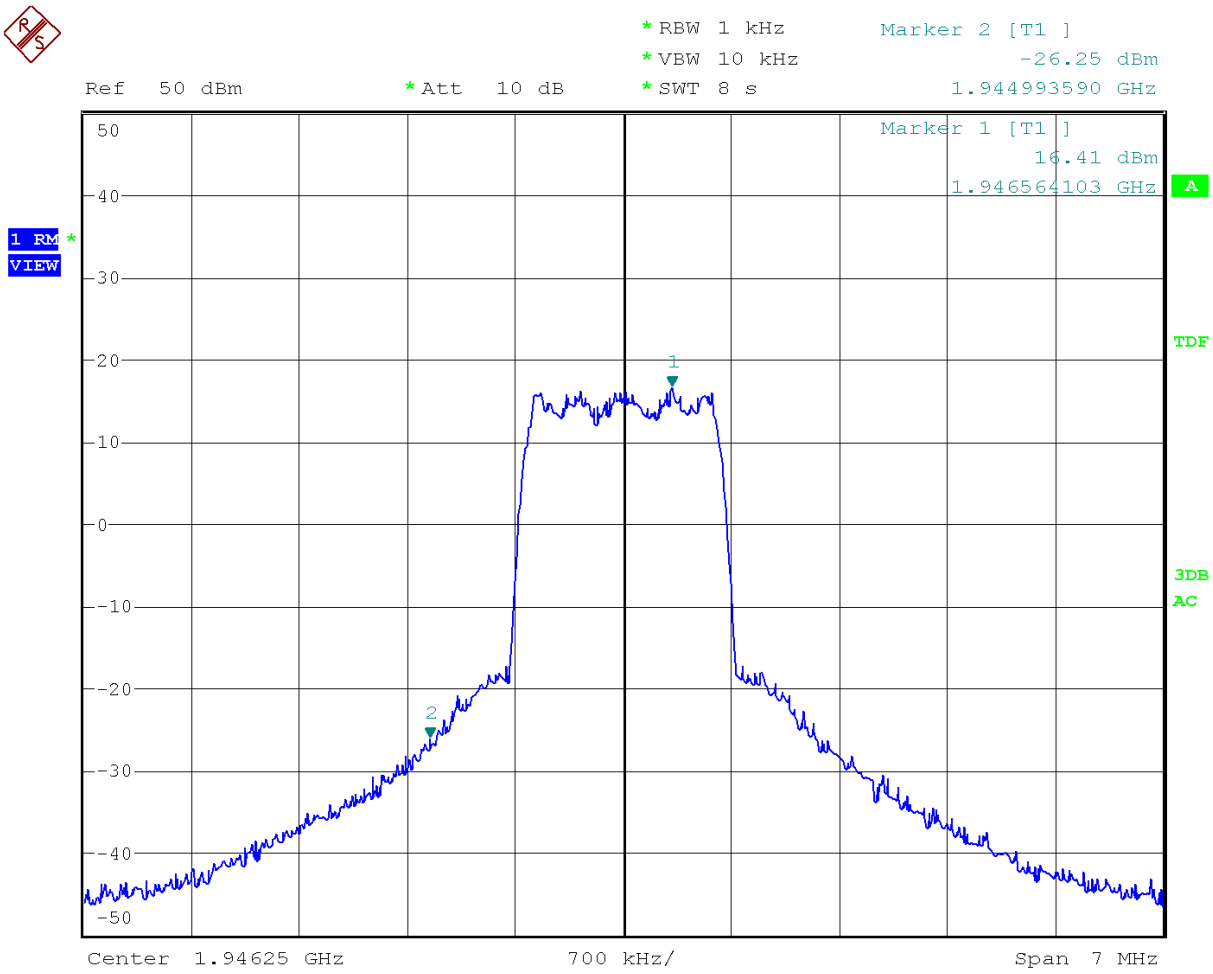
8PSK



Date: 5.AUG.2008 12:01:59

Highest level measured at 1944.994MHz is –25.44dBm
-25.44dBm + 12.11dB = -13.33dBm

16QAM

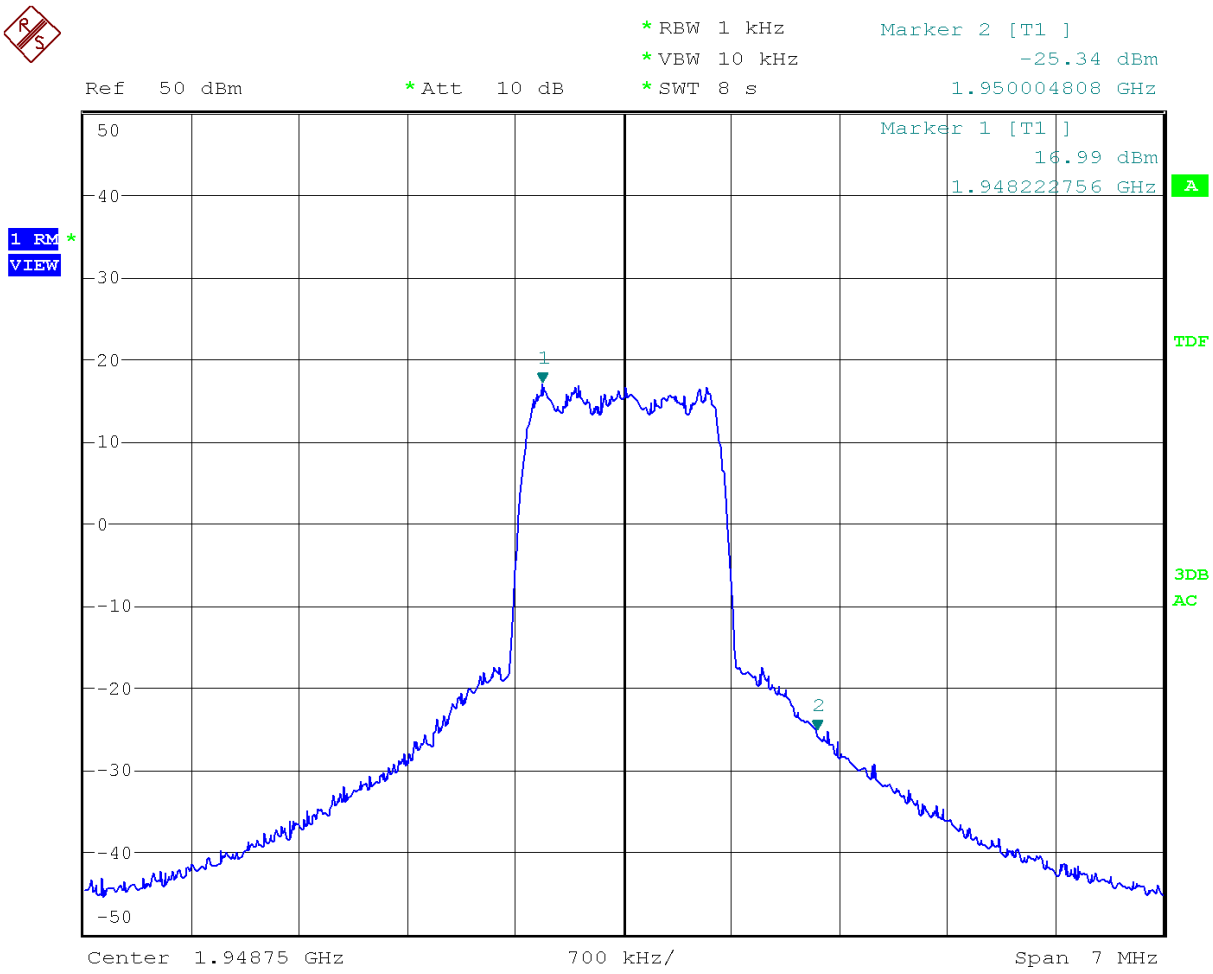


Date: 5.AUG.2008 11:55:36

Highest level measured at 1990.001MHz is –26.25dBm
-26.25dBm + 12.11dB = -14.14dBm

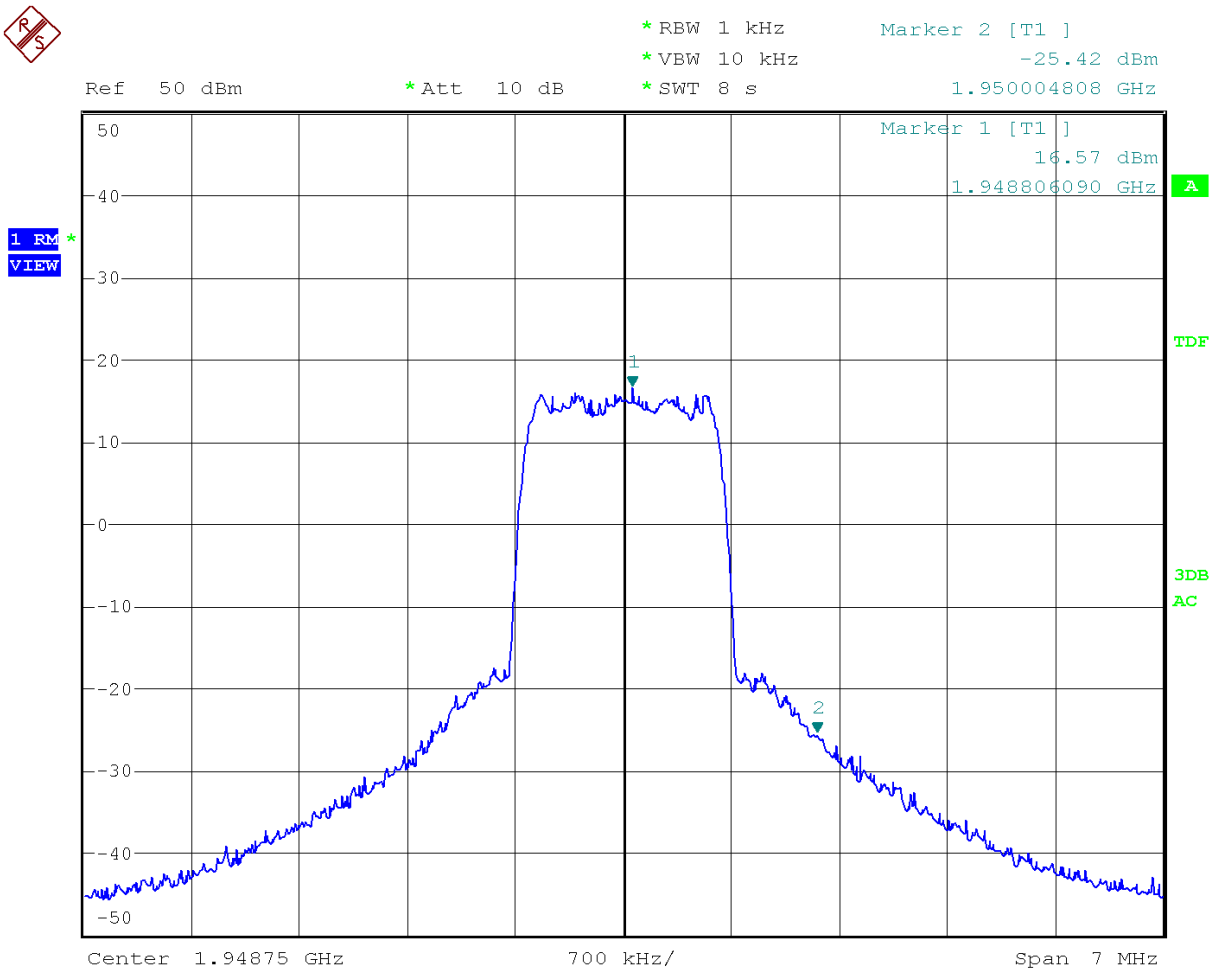
Figure 8 Out of Band Emissions (Block Edge) Graph – CH375

QPSK



Highest level measured at 1990.004MHz is –25.34dBm
-25.34dBm + 12.11dB = -13.23dBm

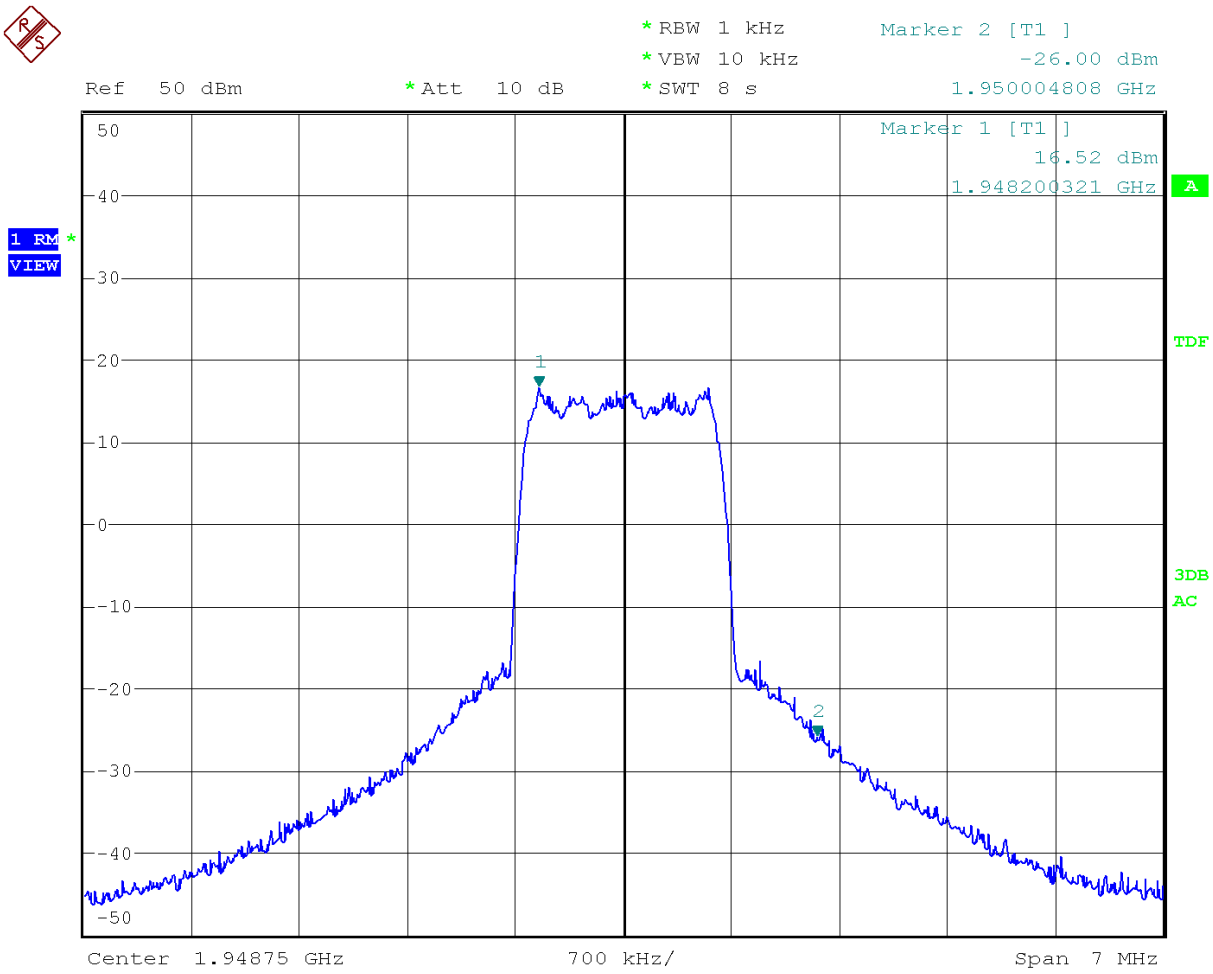
8PSK



Date: 5.AUG.2008 11:15:18

Highest level measured at 1950.004MHz is –25.42dBm
-25.42dBm + 12.11dB = -13.31dBm

16QAM

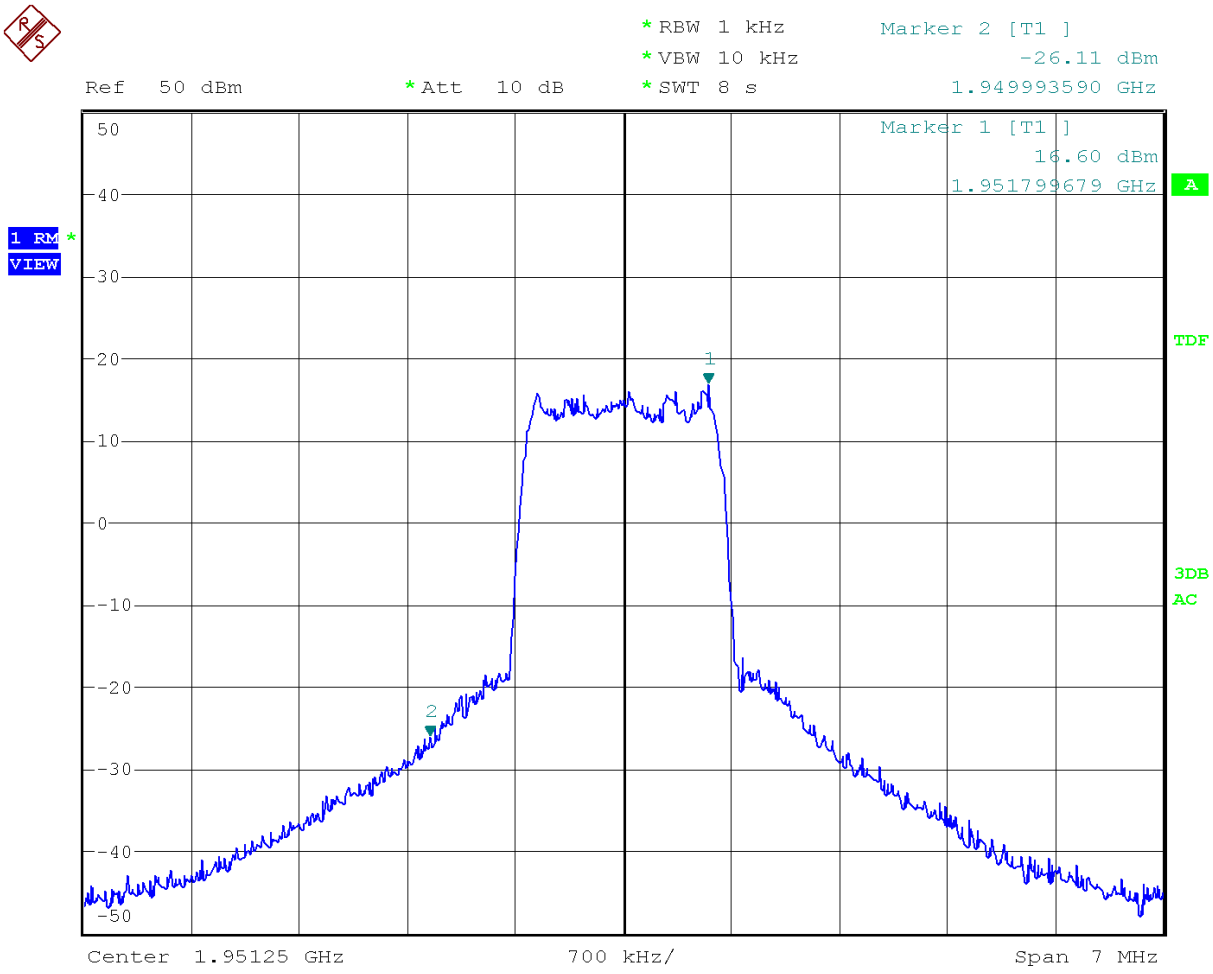


Date: 5.AUG.2008 11:17:39

Highest level measured at 1945.004MHz is –26.00dBm
-26.00dBm + 12.11dB = -13.89dBm

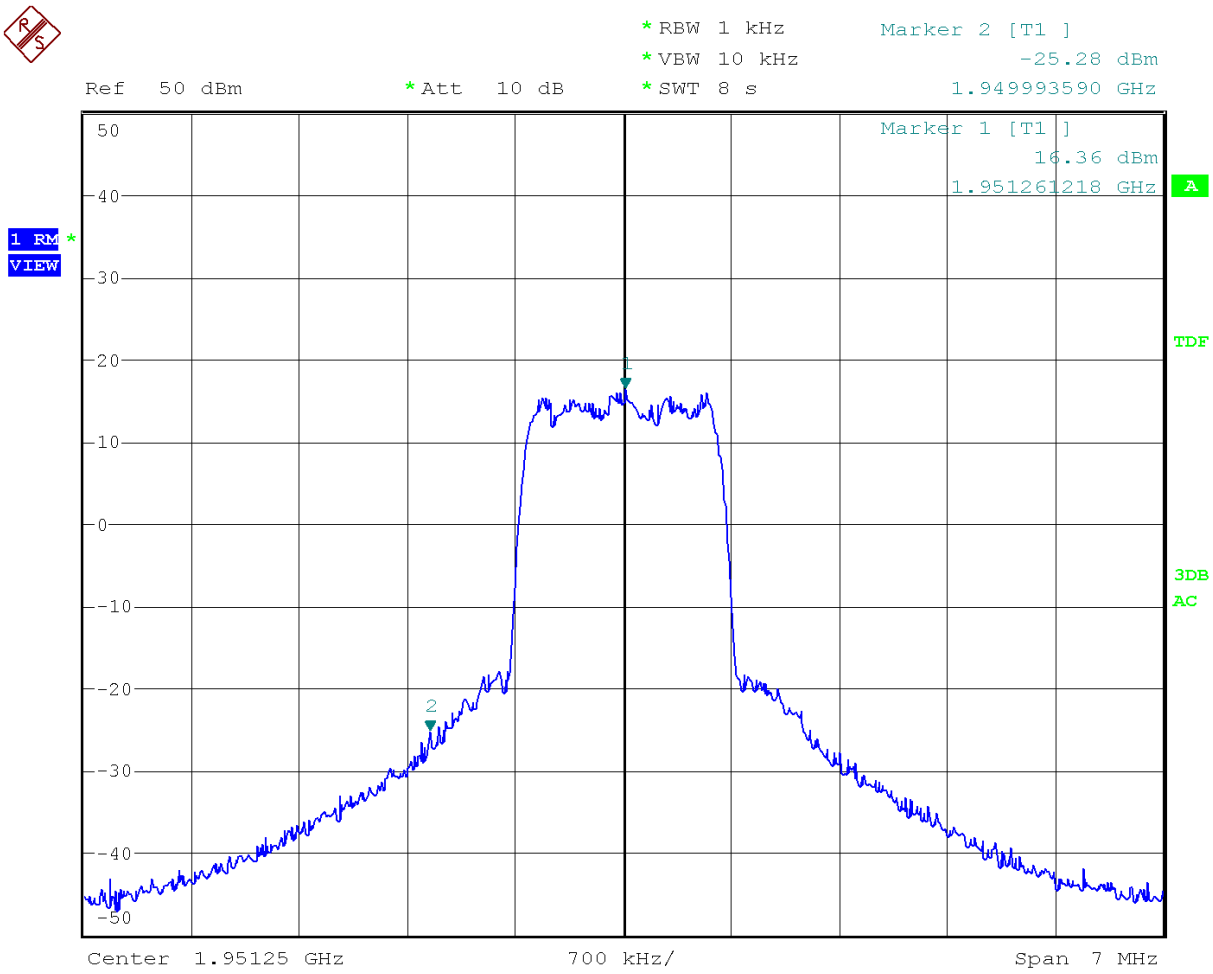
Figure 9 Out of Band Emissions (Block Edge) Graph – CH425

QPSK



Highest level measured at 1949.994MHz is –26.11dBm
-26.11dBm + 12.11dB = -14.00dBm

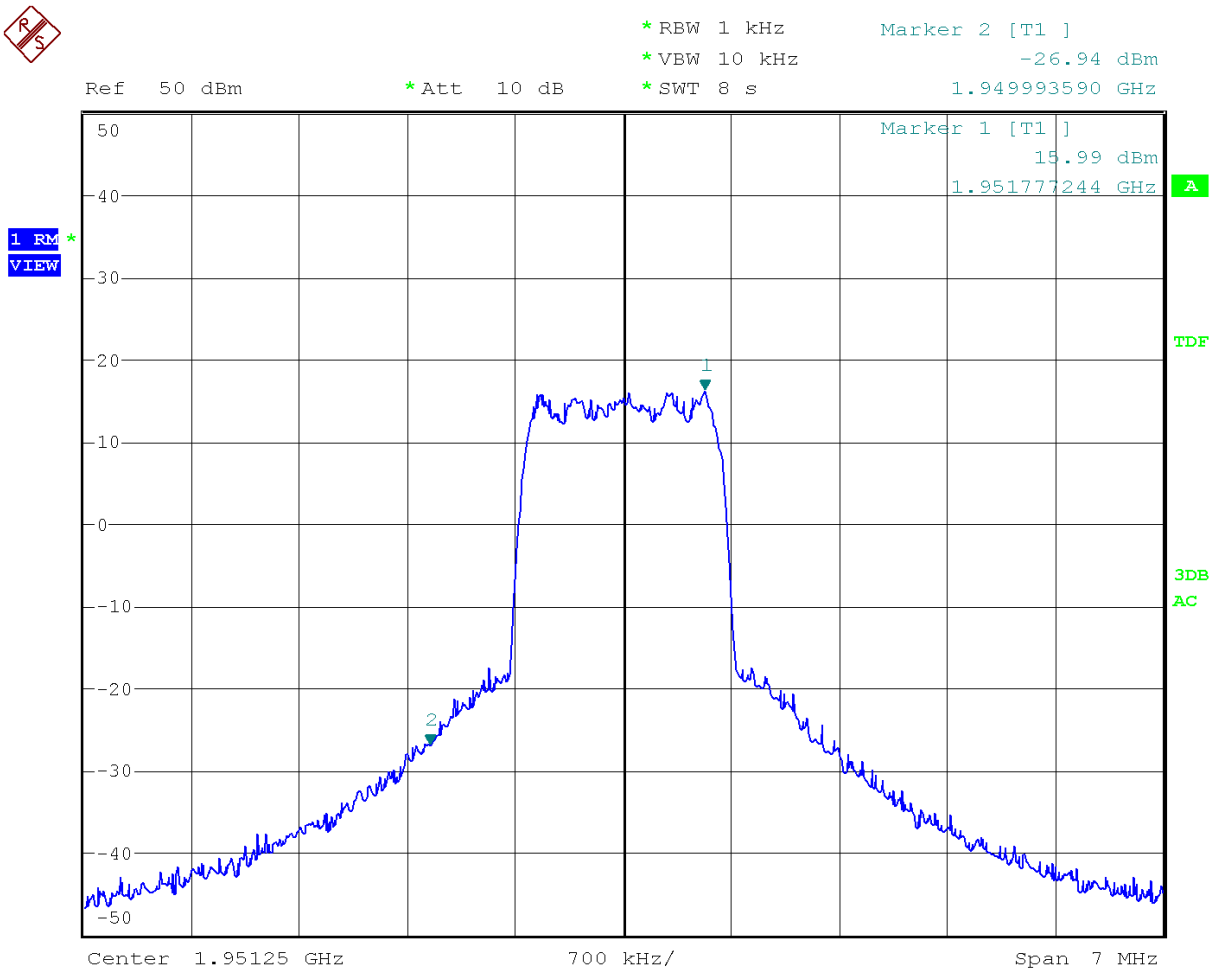
8PSK



Date: 5.AUG.2008 11:01:15

Highest level measured at 1949.994MHz is –25.28dBm
-25.28dBm + 12.11dB = -13.17dBm

16QAM

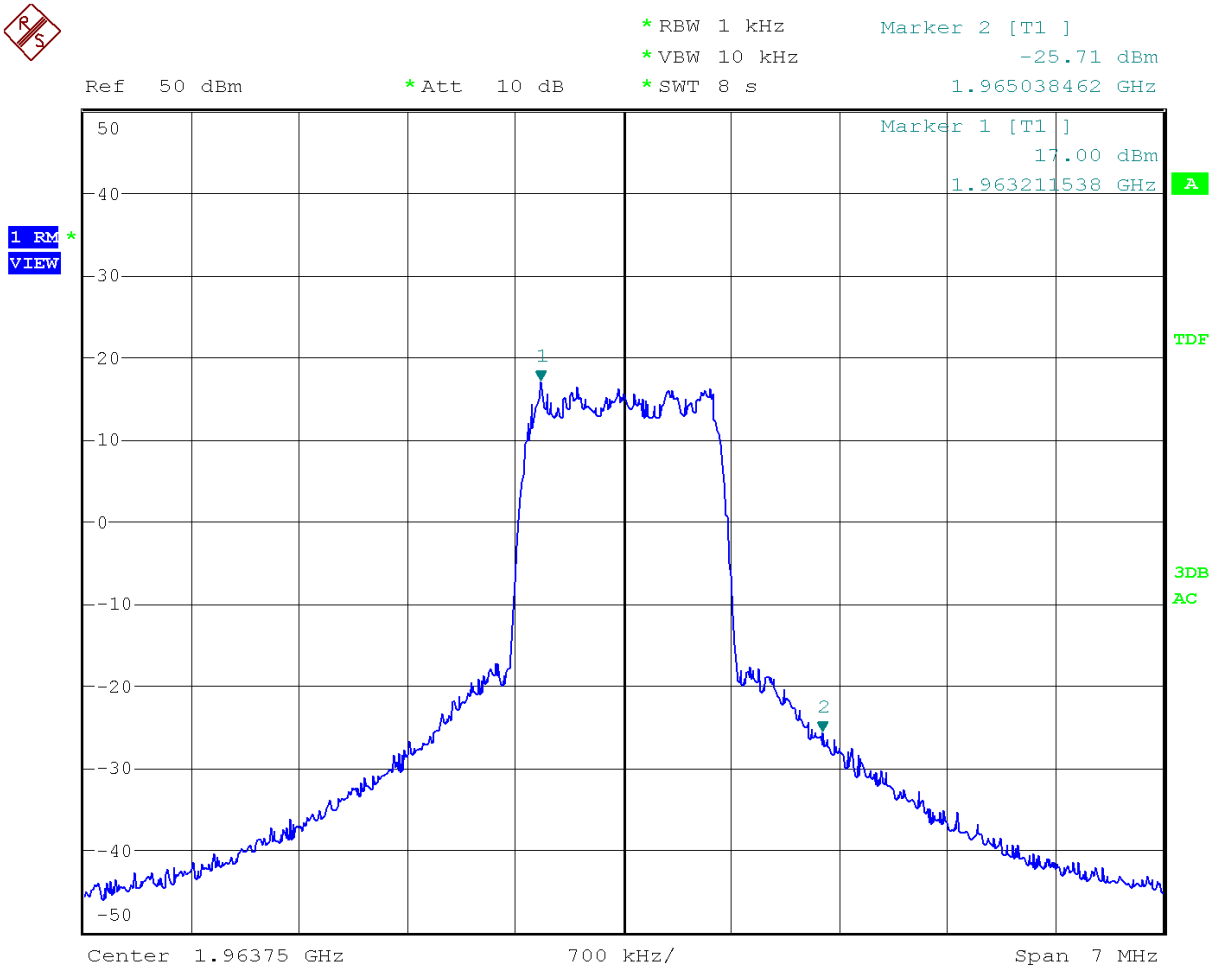


Date: 5.AUG.2008 10:59:50

Highest level measured at 1949.994MHz is –26.94dBm
-26.94dBm + 12.11dB = -14.83dBm

Figure 10 Out of Band Emissions (Block Edge) Graph – CH675

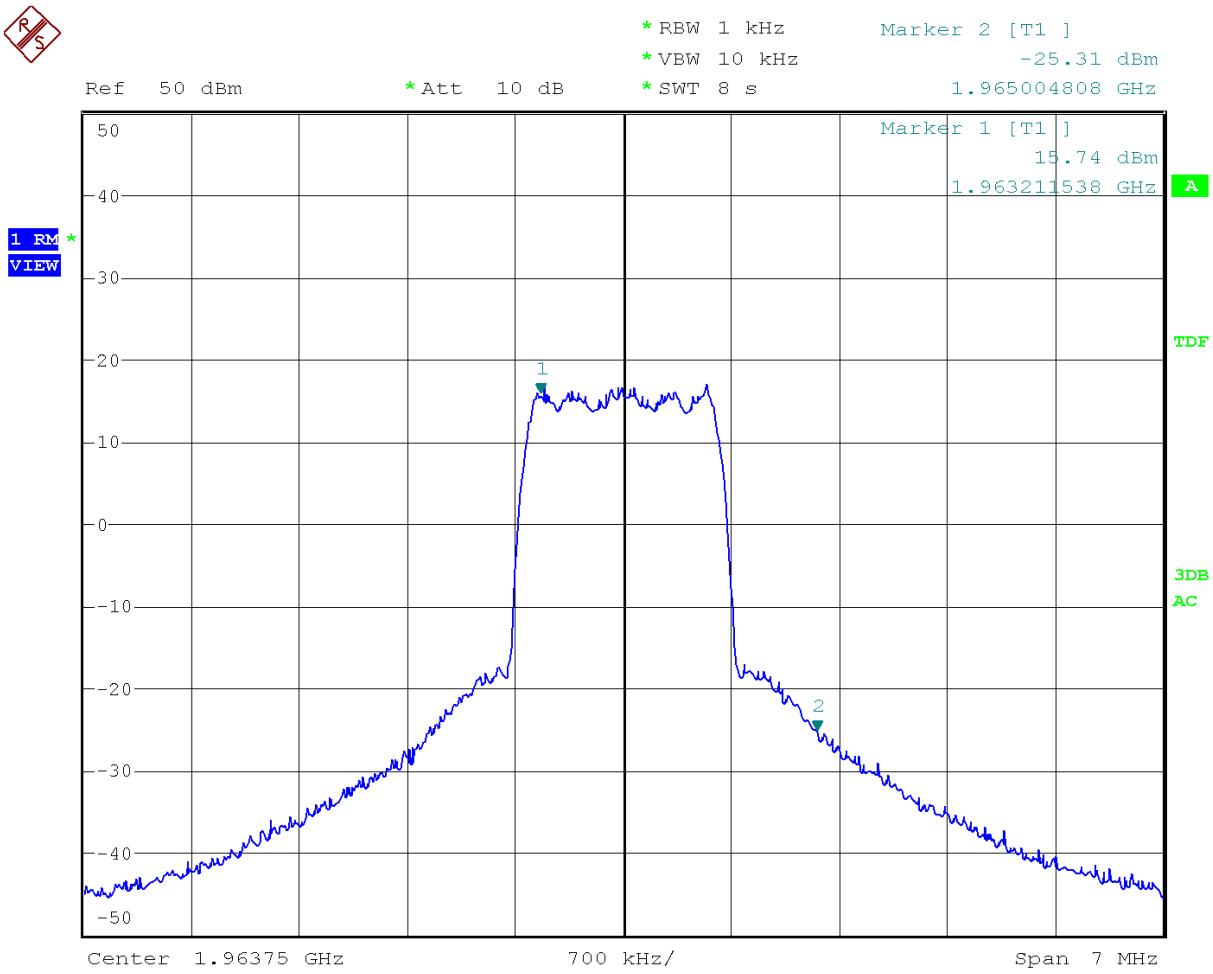
QPSK



Date: 5.AUG.2008 11:07:06

Highest level measured at 1965.038MHz is –25.71dBm
-25.71dBm + 12.11dB = -13.60dBm

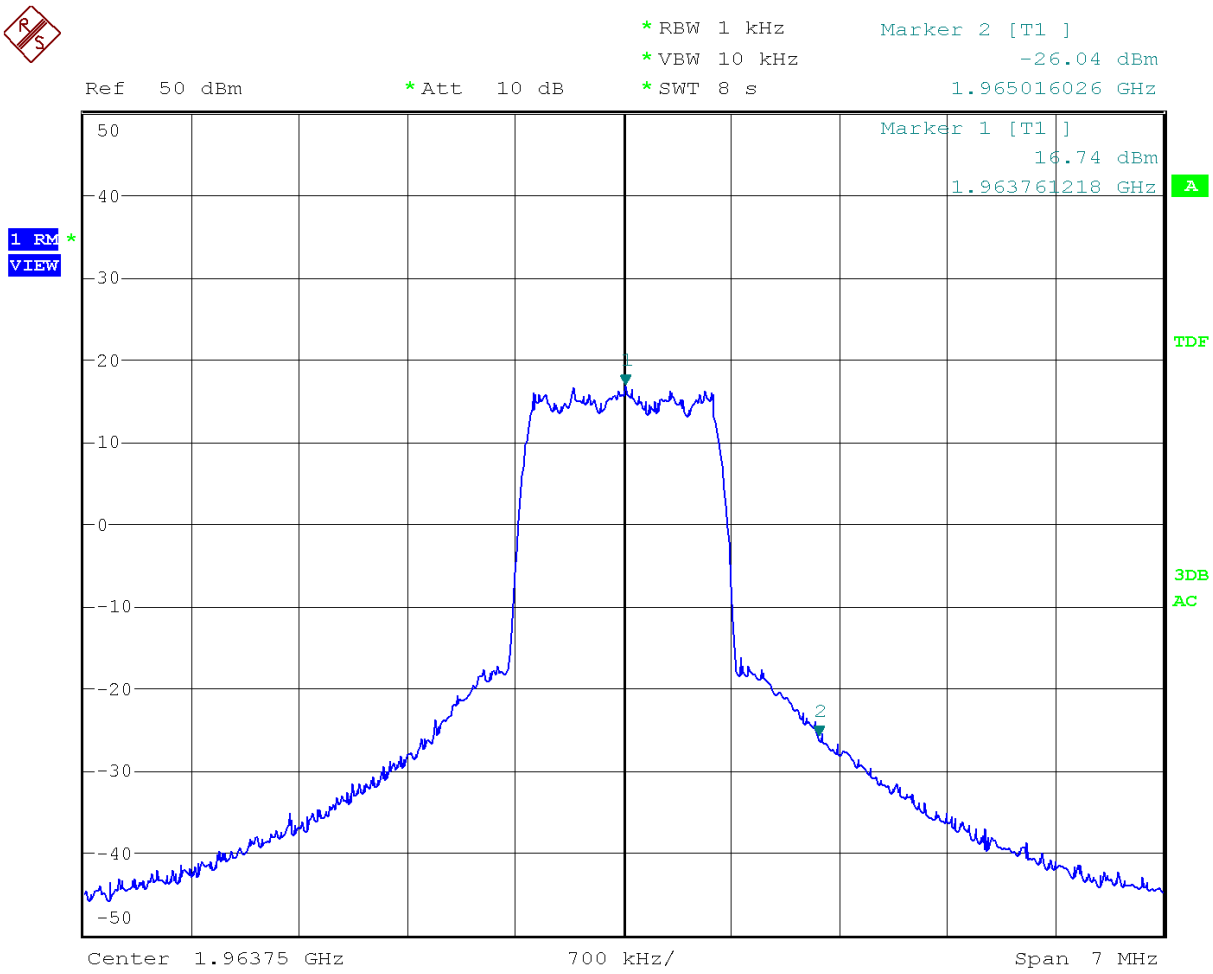
8PSK



Date: 5.AUG.2008 11:12:32

Highest level measured at 1965.004MHz is –25.31dBm
-25.31dBm + 12.11dB = -13.20dBm

16QAM

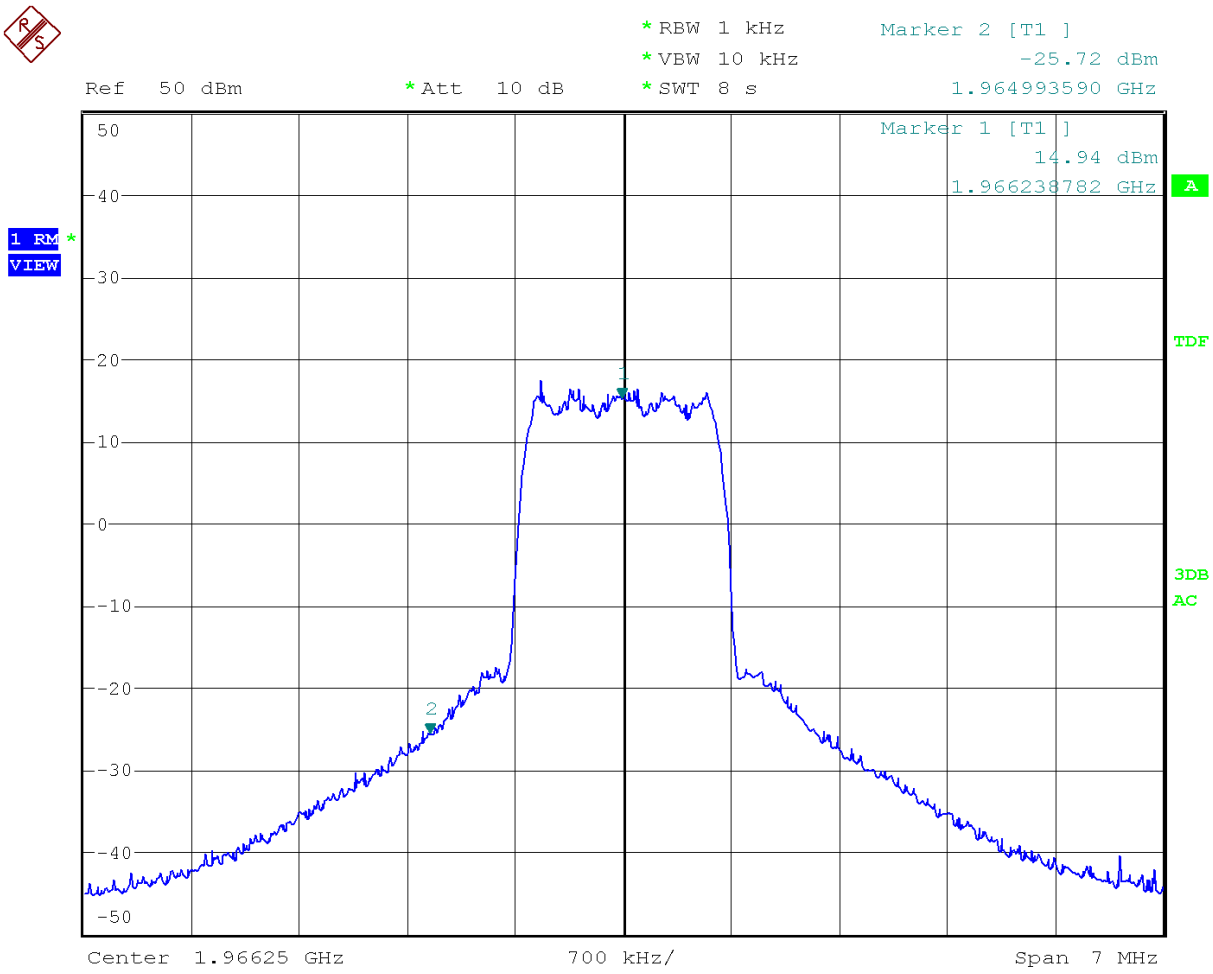


Date: 5.AUG.2008 11:18:32

Highest level measured at 1990.001MHz is –26.04dBm
-26.04dBm + 12.11dB = -13.93dBm

Figure 11 Out of Band Emissions (Block Edge) Graph – CH725

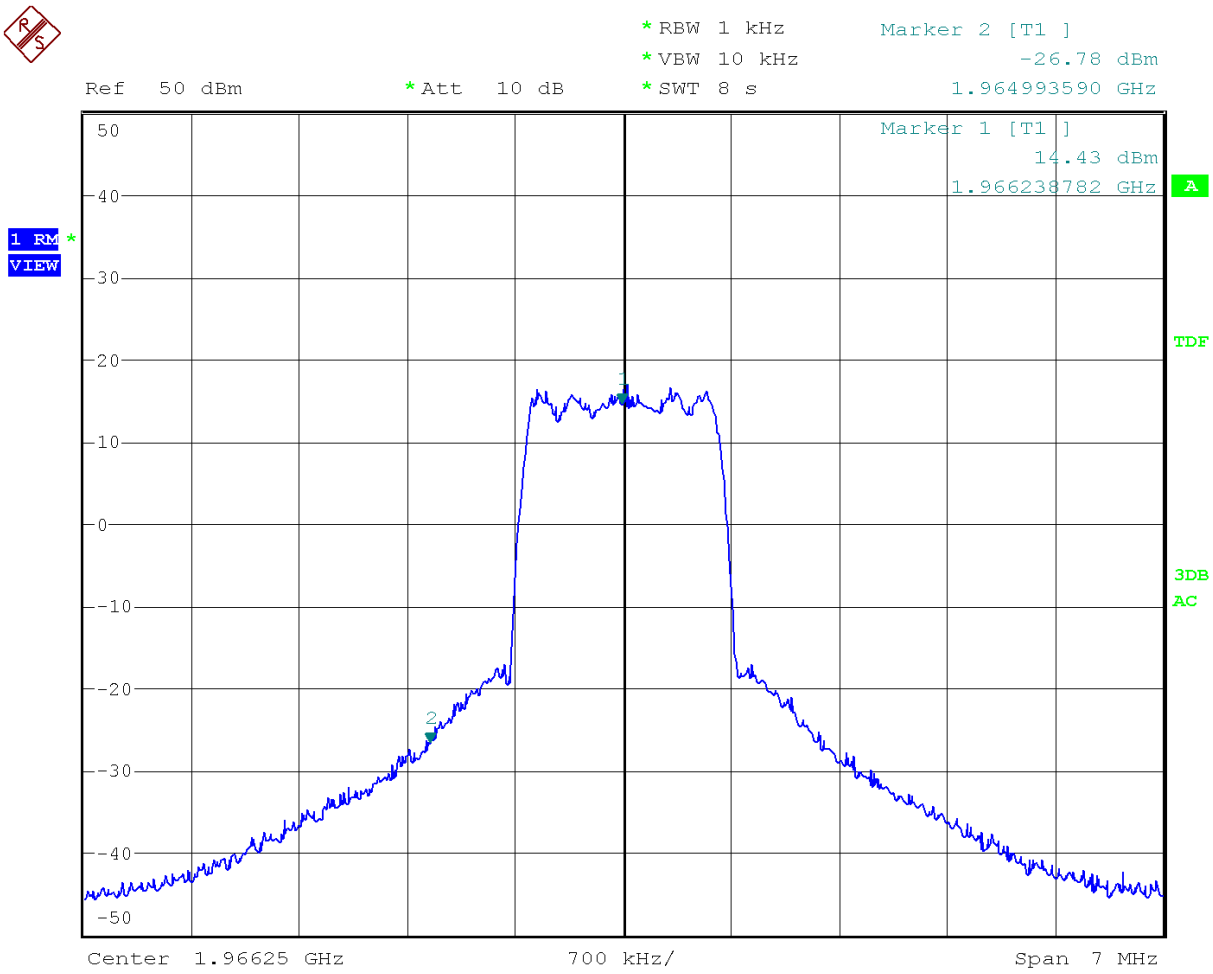
QPSK



Date: 5.AUG.2008 10:59:00

Highest level measured at 1964.994MHz is –25.72dBm
-25.72dBm + 12.11dB = -13.61dBm

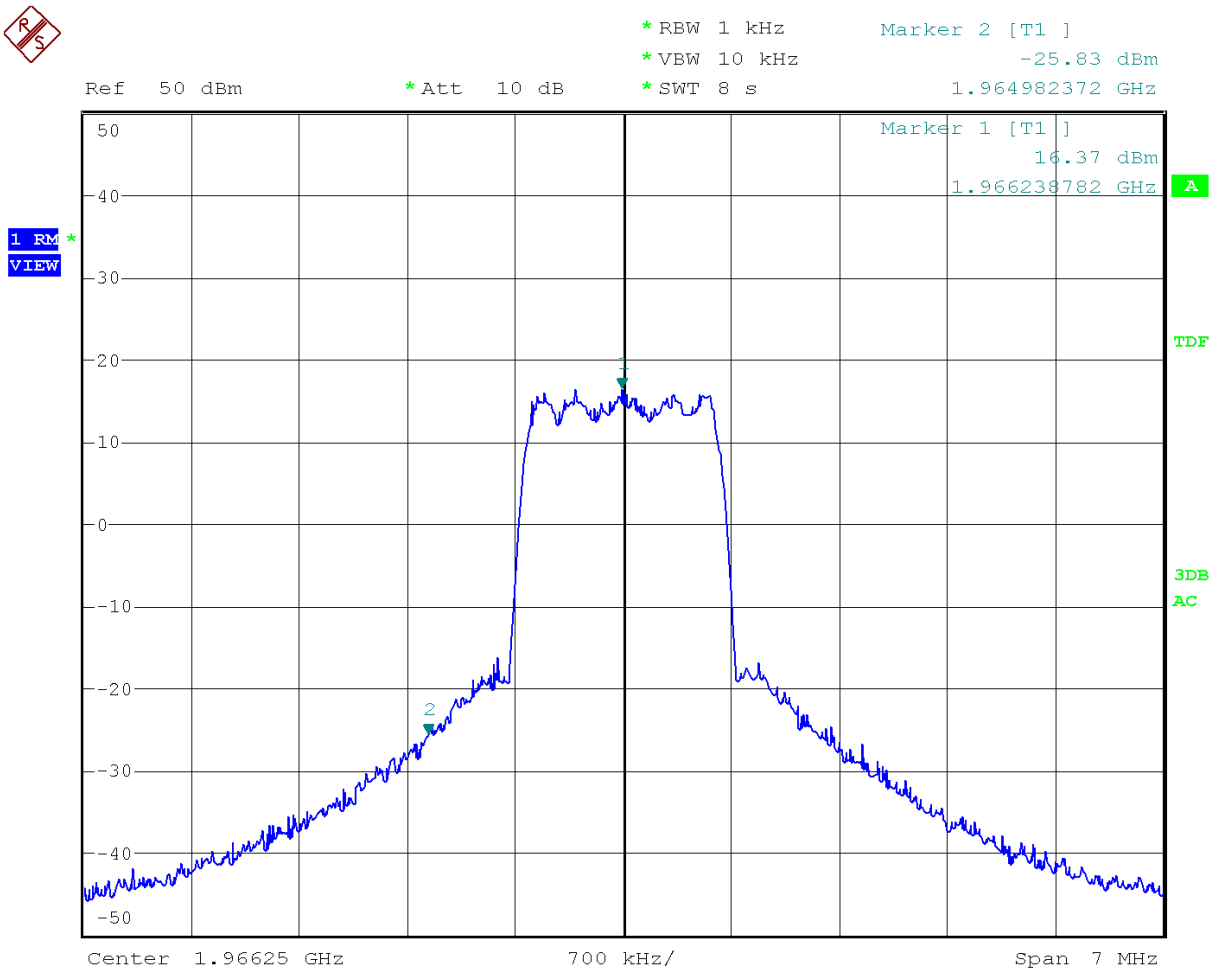
8PSK



Date: 5.AUG.2008 10:56:05

Highest level measured at 1964.994MHz is –26.78dBm
-26.78dBm + 12.11dB = -14.67dBm

16QAM

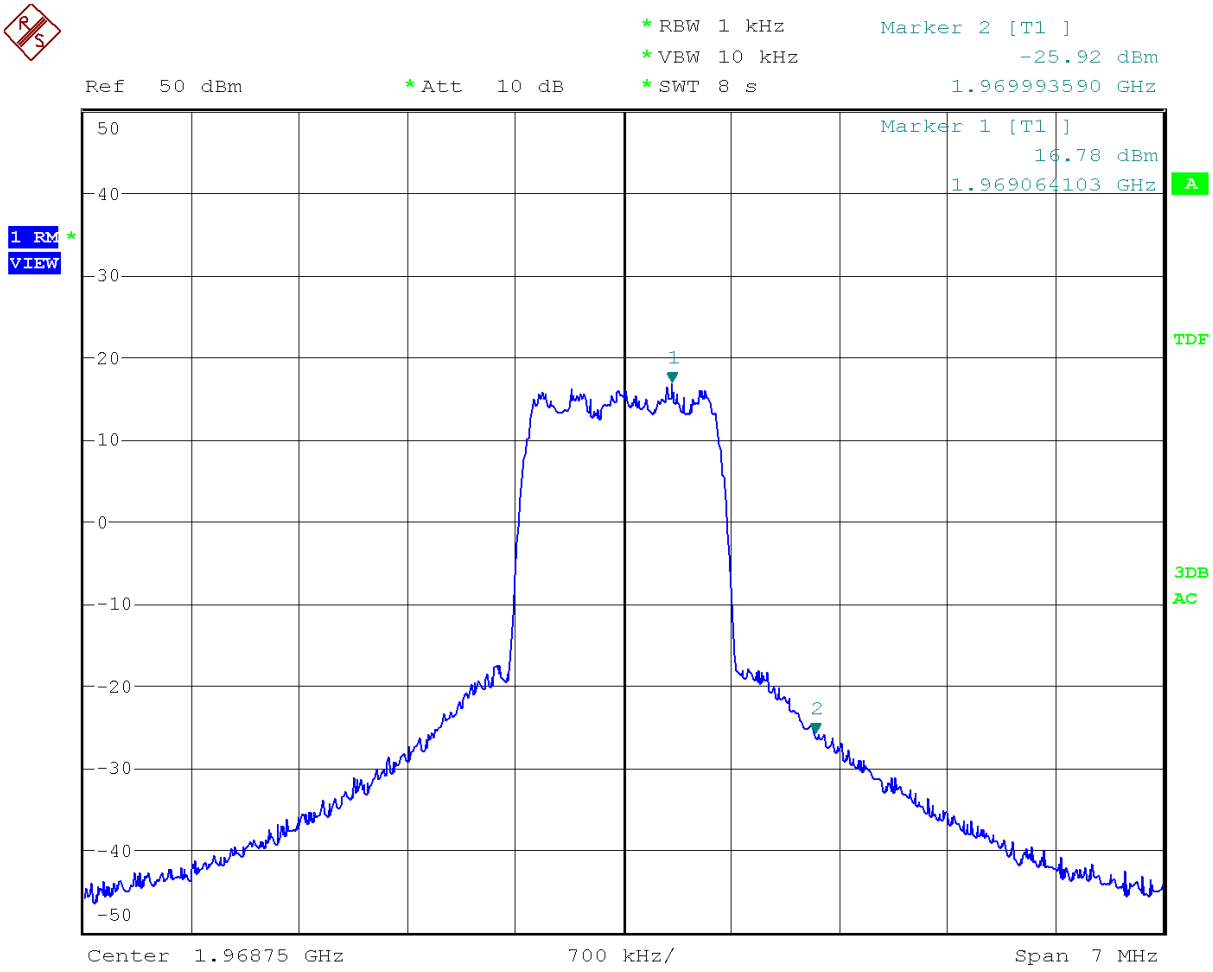


Date: 5.AUG.2008 10:53:22

Highest level measured at 1964.982MHz is –25.83dBm
-25.83dBm + 12.11dB = -13.72dBm

Figure 12 Out of Band Emissions (Block Edge) Graph – CH775

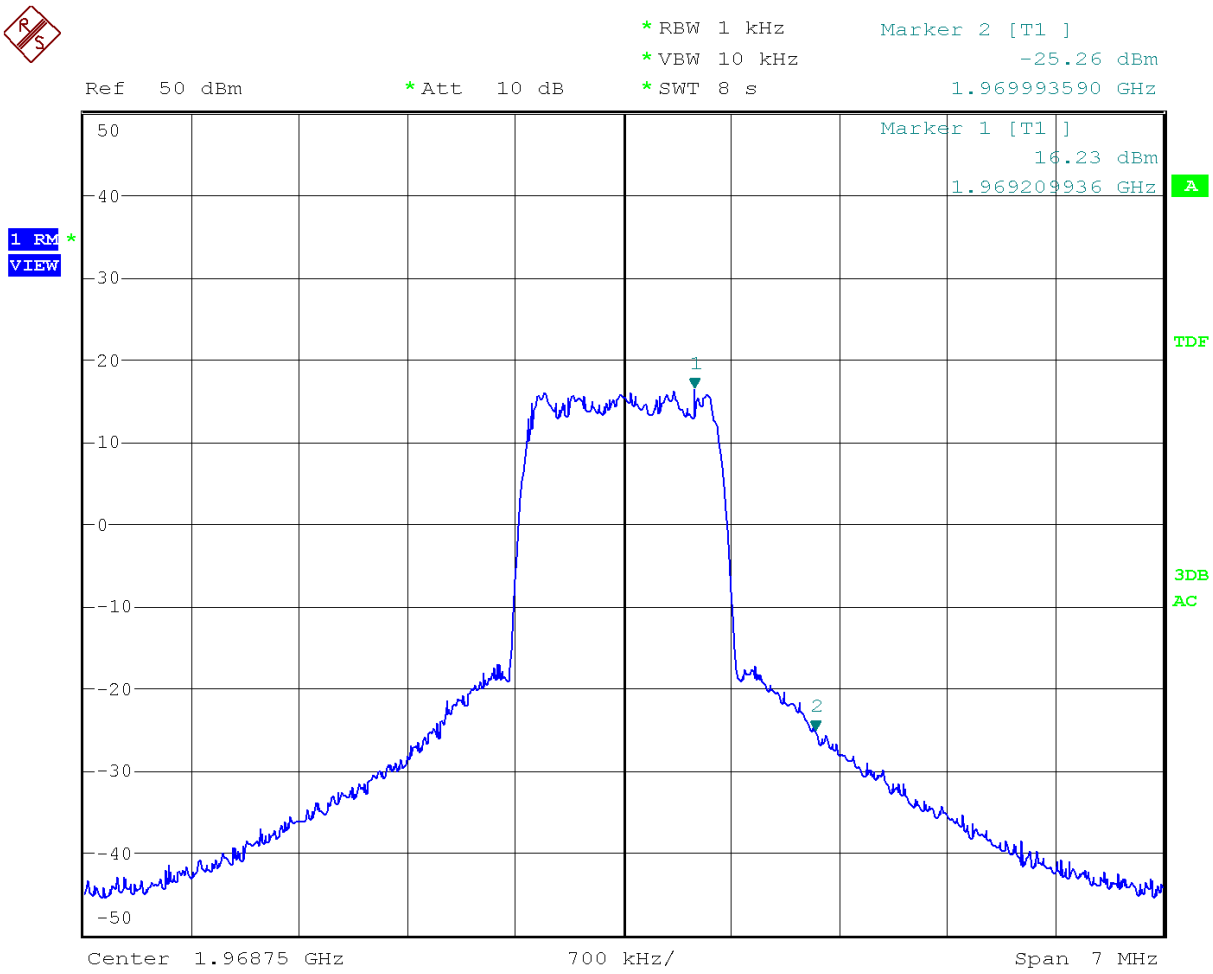
QPSK



Date: 4.AUG.2008 17:49:51

Highest level measured at 1969.994MHz is –25.92dBm
-25.92dBm + 12.11dB = -13.81dBm

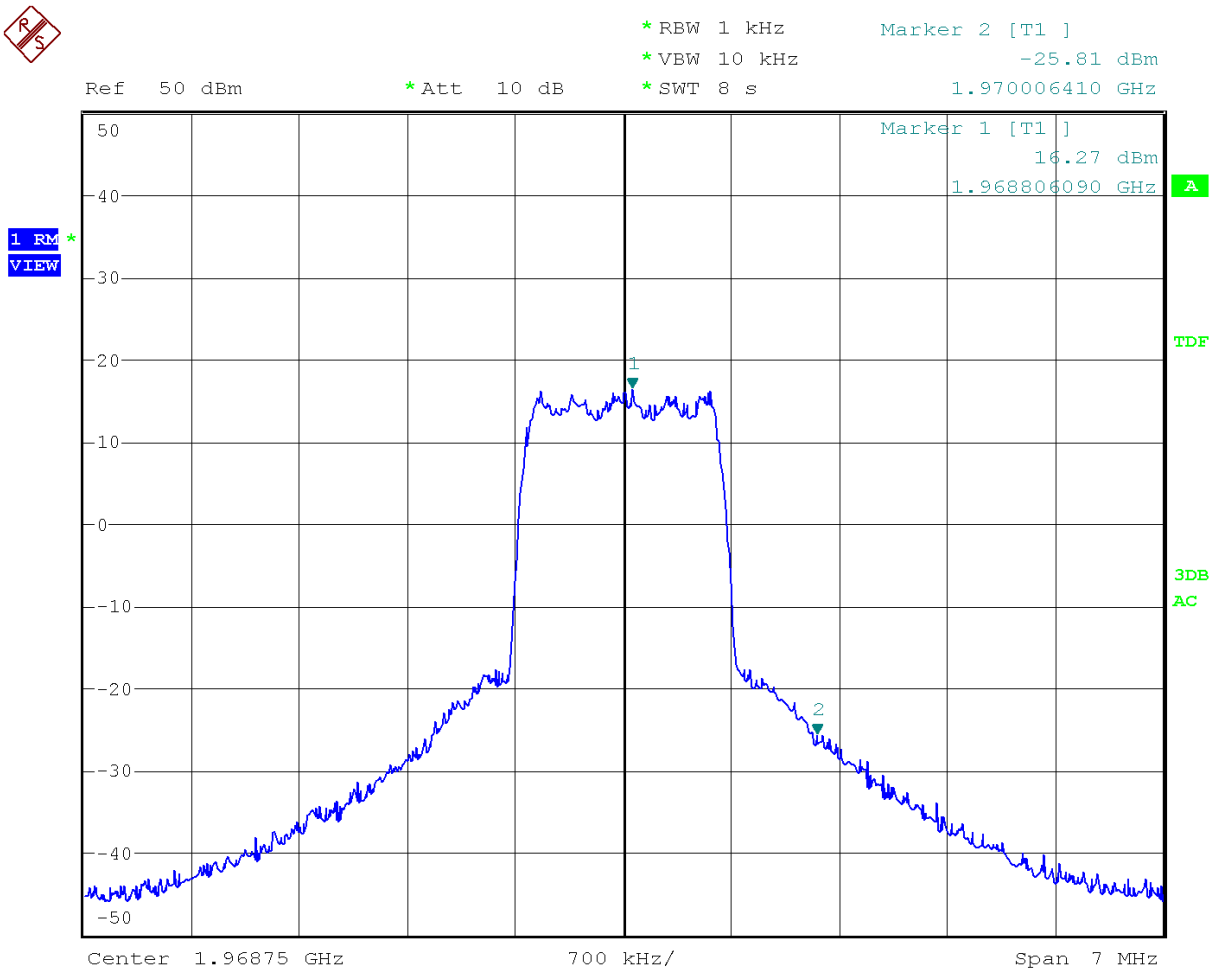
8PSK



Date: 4.AUG.2008 17:52:13

Highest level measured at 1969.994MHz is –25.26dBm
-25.26dBm + 12.11dB = -13.15dBm

16QAM

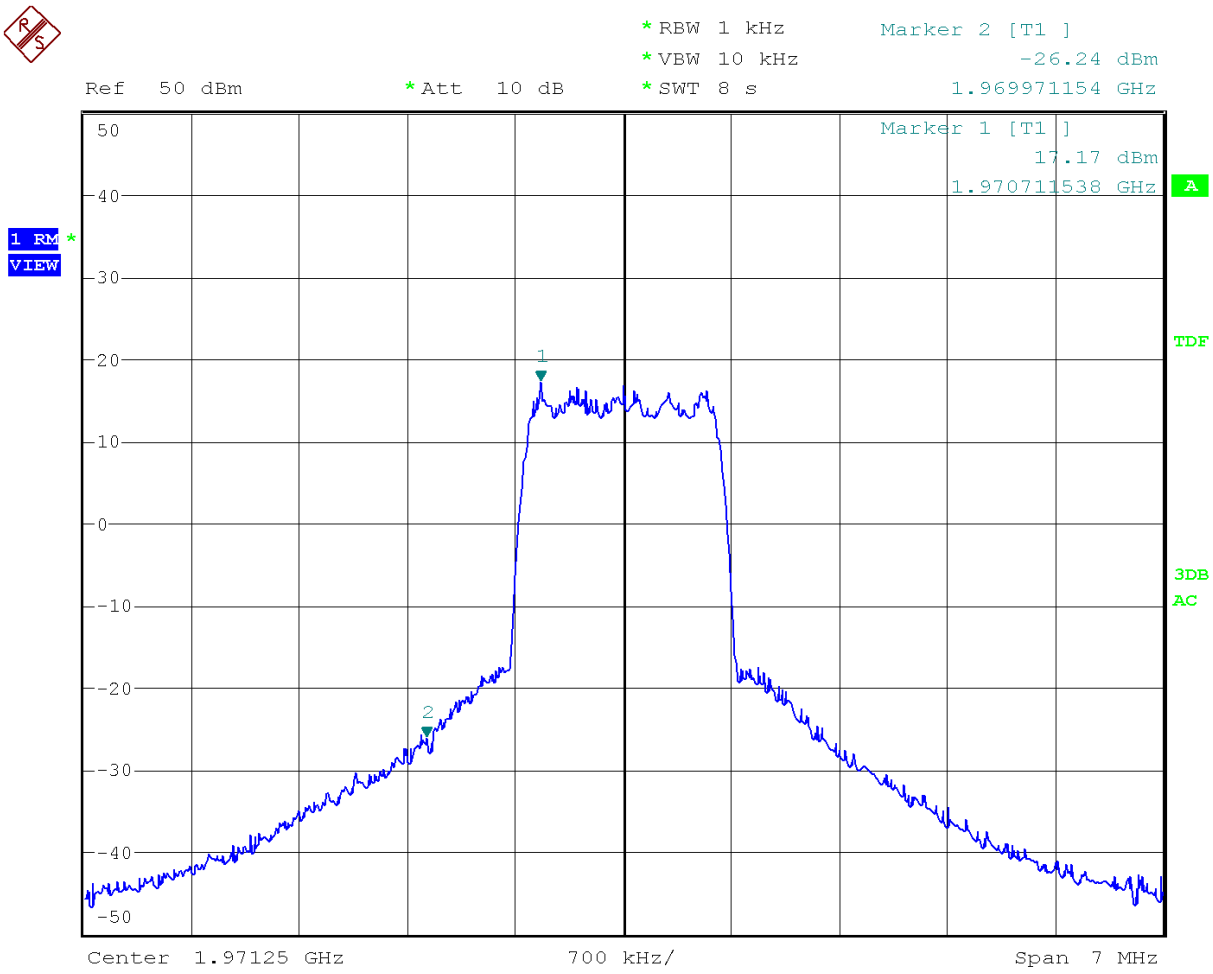


Date: 4.AUG.2008 17:54:20

Highest level measured at 1970.006MHz is –25.81dBm
-25.81dBm + 12.11dB = -13.70dBm

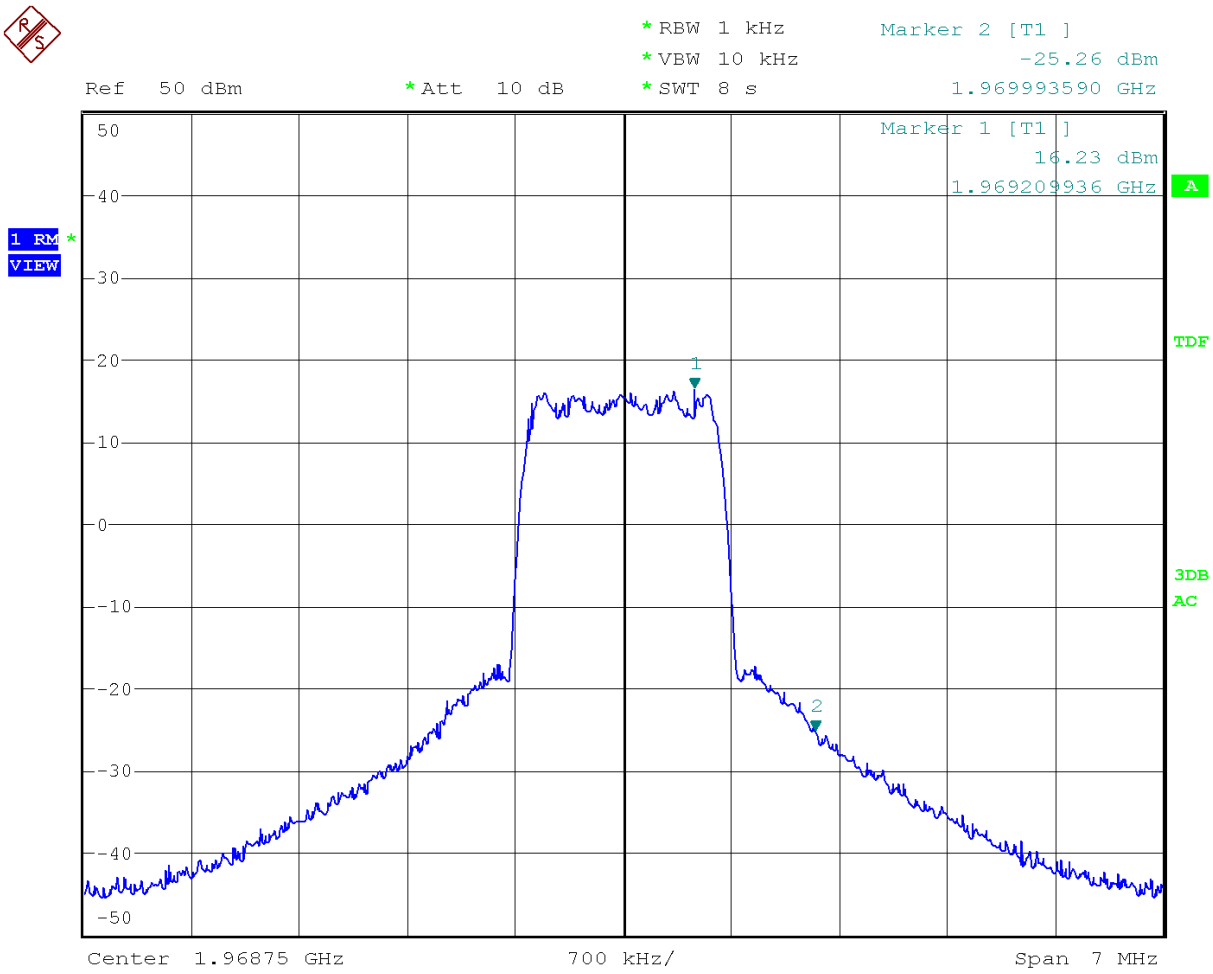
Figure 13 Out of Band Emissions (Block Edge) Graph – CH825

QPSK



Highest level measured at 1969.971MHz is –26.24dBm
-26.24dBm + 12.11dB = -14.13dBm

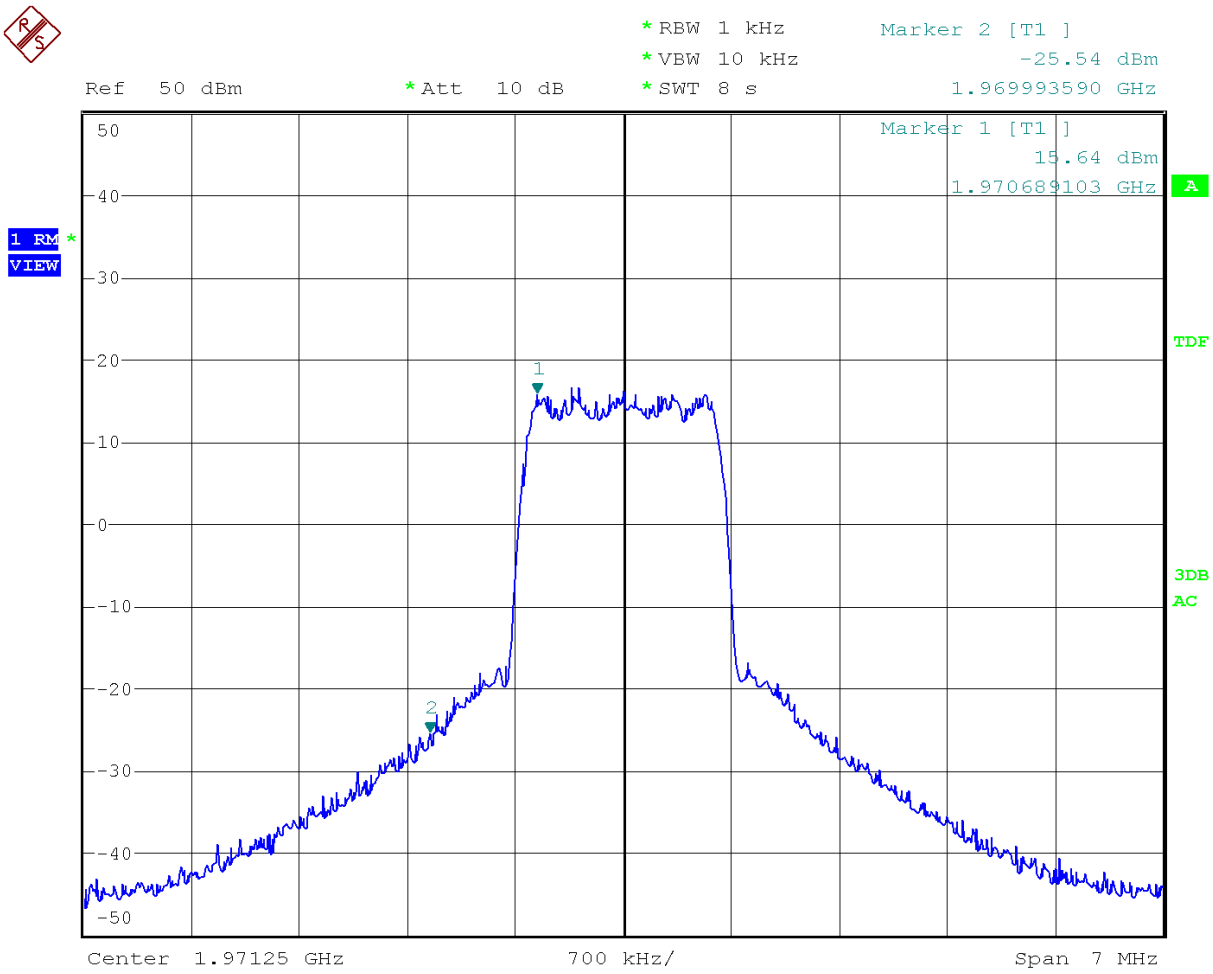
8PSK



Date: 4.AUG.2008 17:52:13

Highest level measured at 1969.993MHz is –25.26dBm
-25.26dBm + 12.11dB = -13.15dBm

16QAM

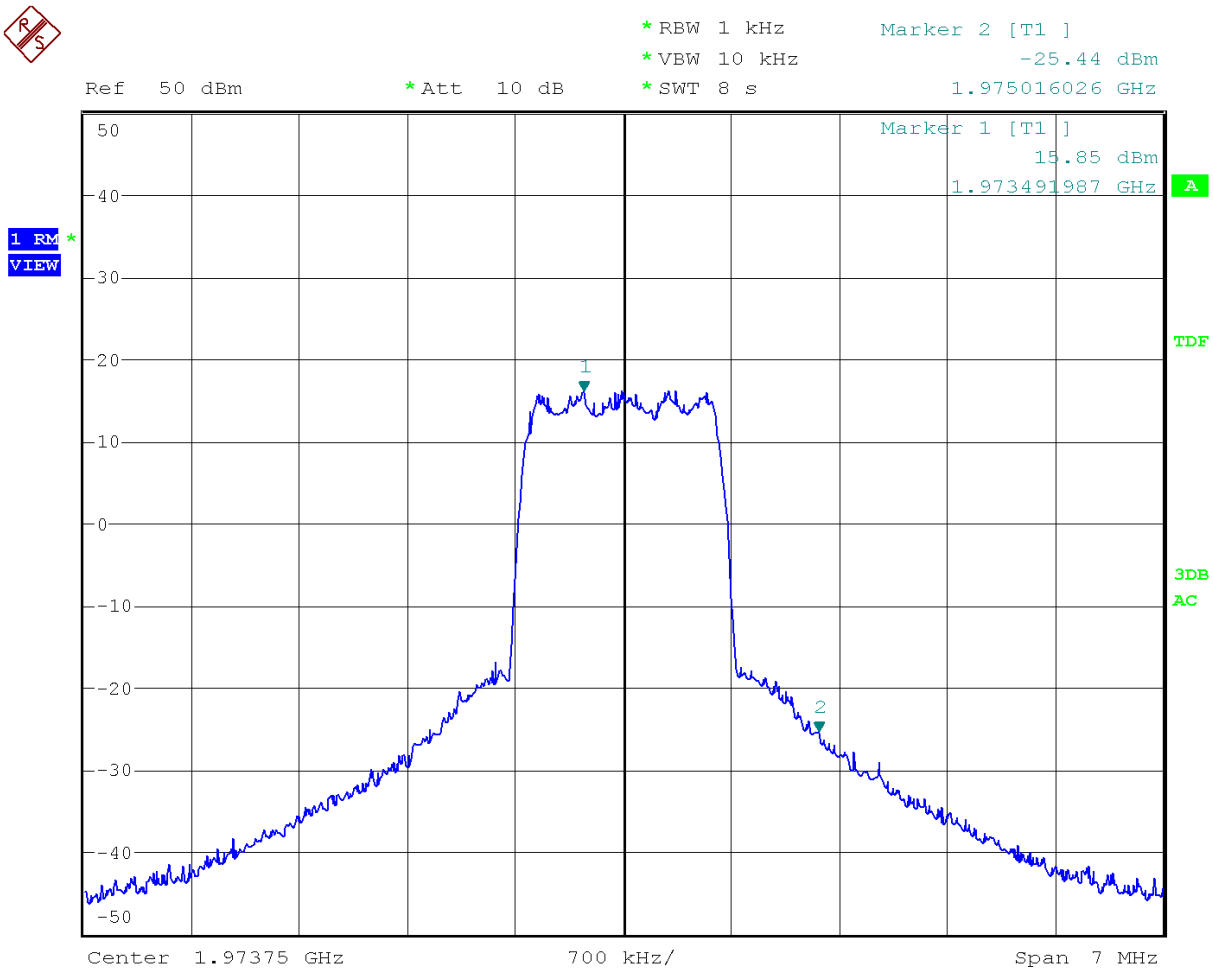


Date: 4.AUG.2008 16:30:42

Highest level measured at 1969.994MHz is –25.54dBm
-25.54dBm + 12.11dB = -13.43dBm

Figure 14 Out of Band Emissions (Block Edge) Graph – CH875

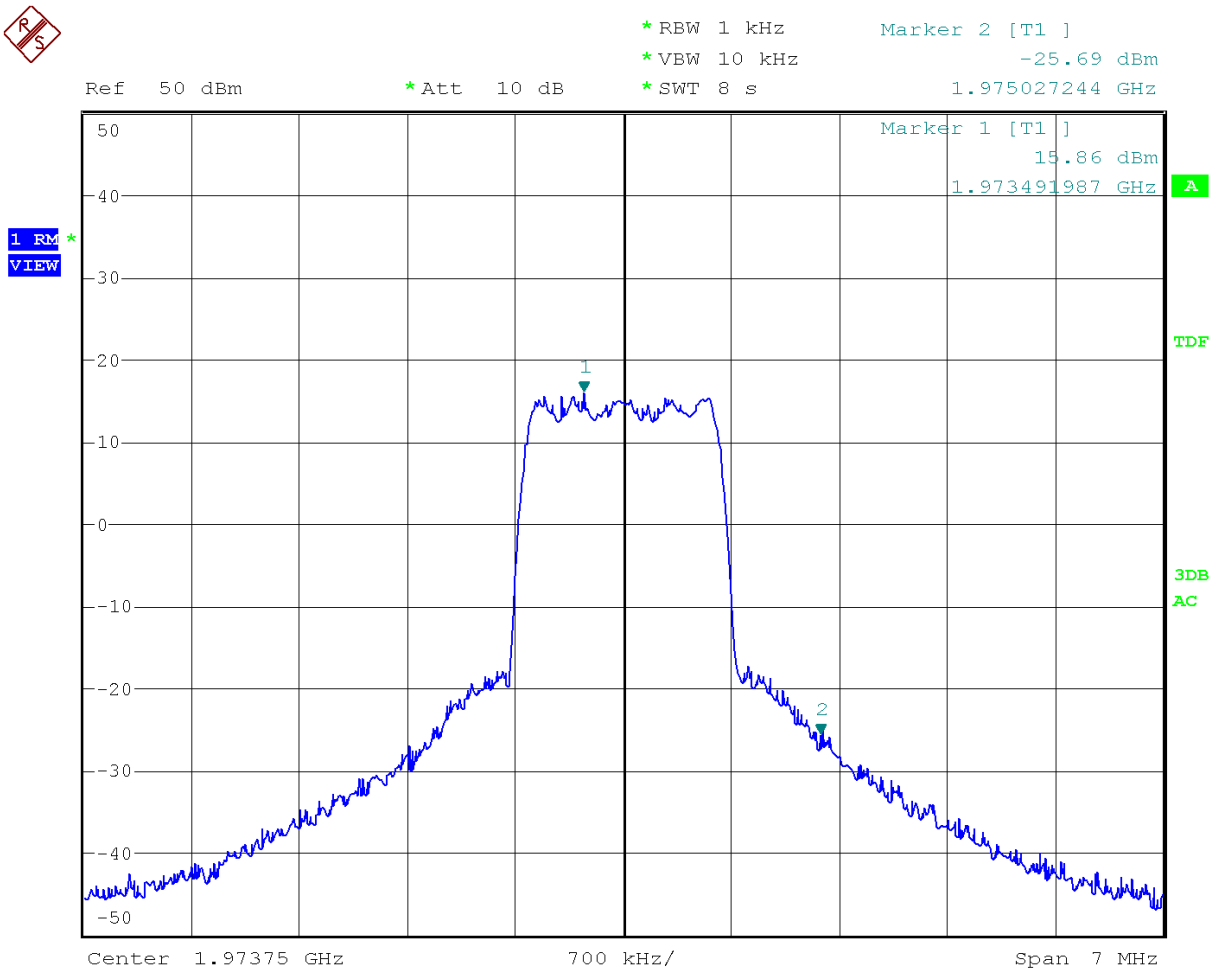
QPSK



Date: 4.AUG.2008 15:46:15

Highest level measured at 1975.016MHz is –25.44dBm
-25.44dBm + 12.11dB = -13.33dBm

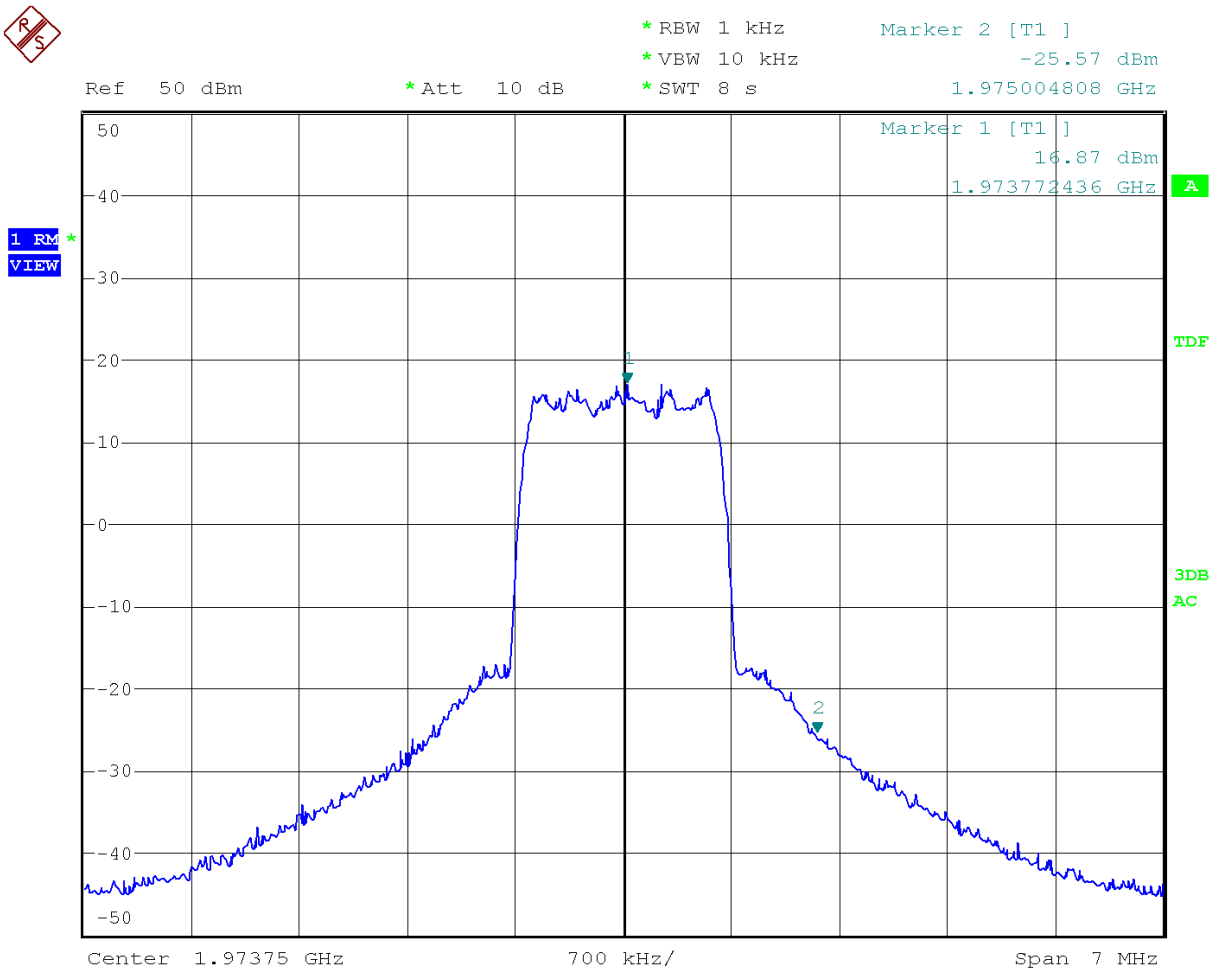
8PSK



Date: 4.AUG.2008 15:38:13

Highest level measured at 1975.027MHz is –25.69dBm
-25.69dBm + 12.11dB = -13.58dBm

16QAM

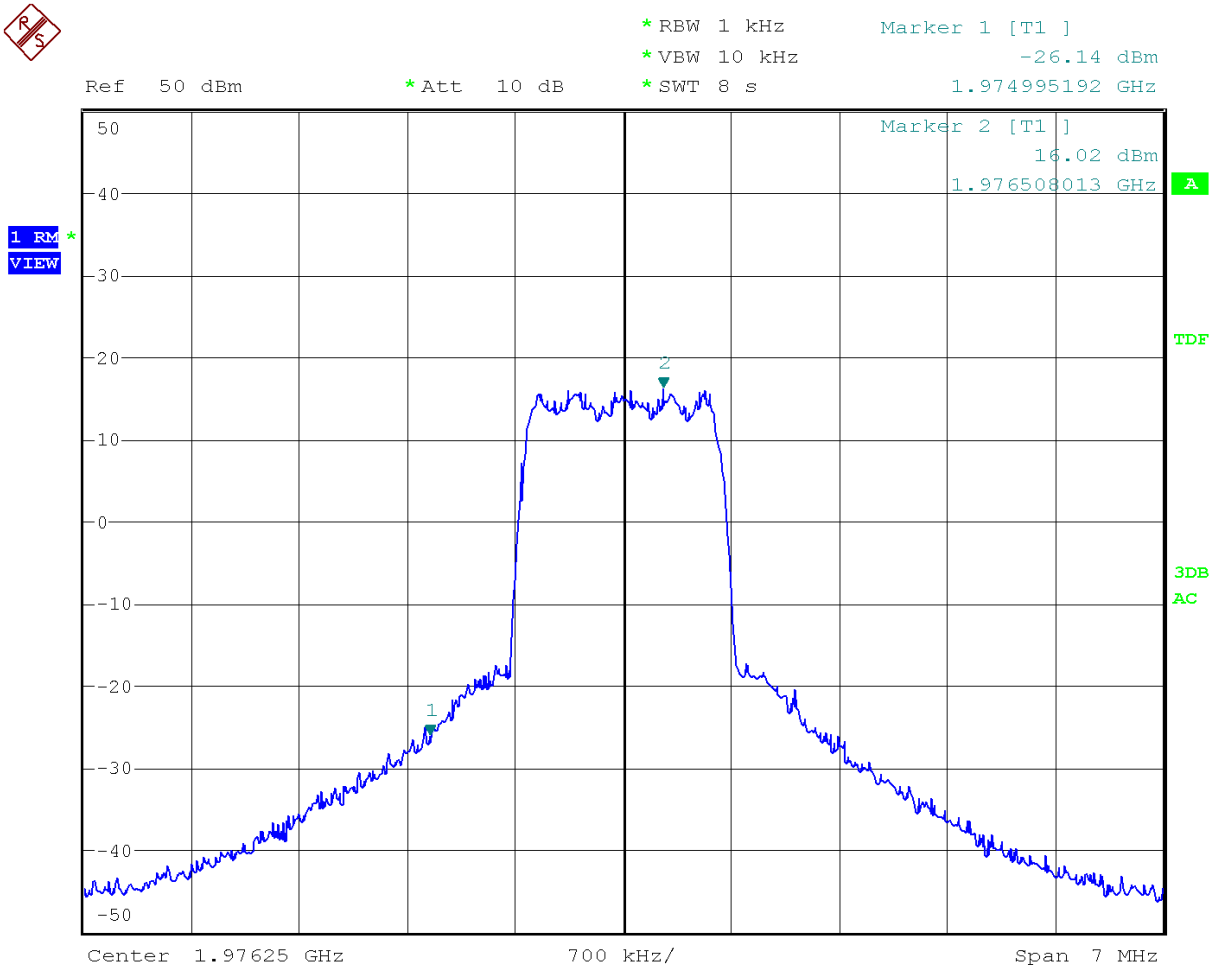


Date: 4.AUG.2008 15:50:06

Highest level measured at 1975.005MHz is –25.57dBm
-25.57dBm + 12.11dB = -13.46dBm

Figure 15 Out of Band Emissions (Block Edge) Graph – CH925

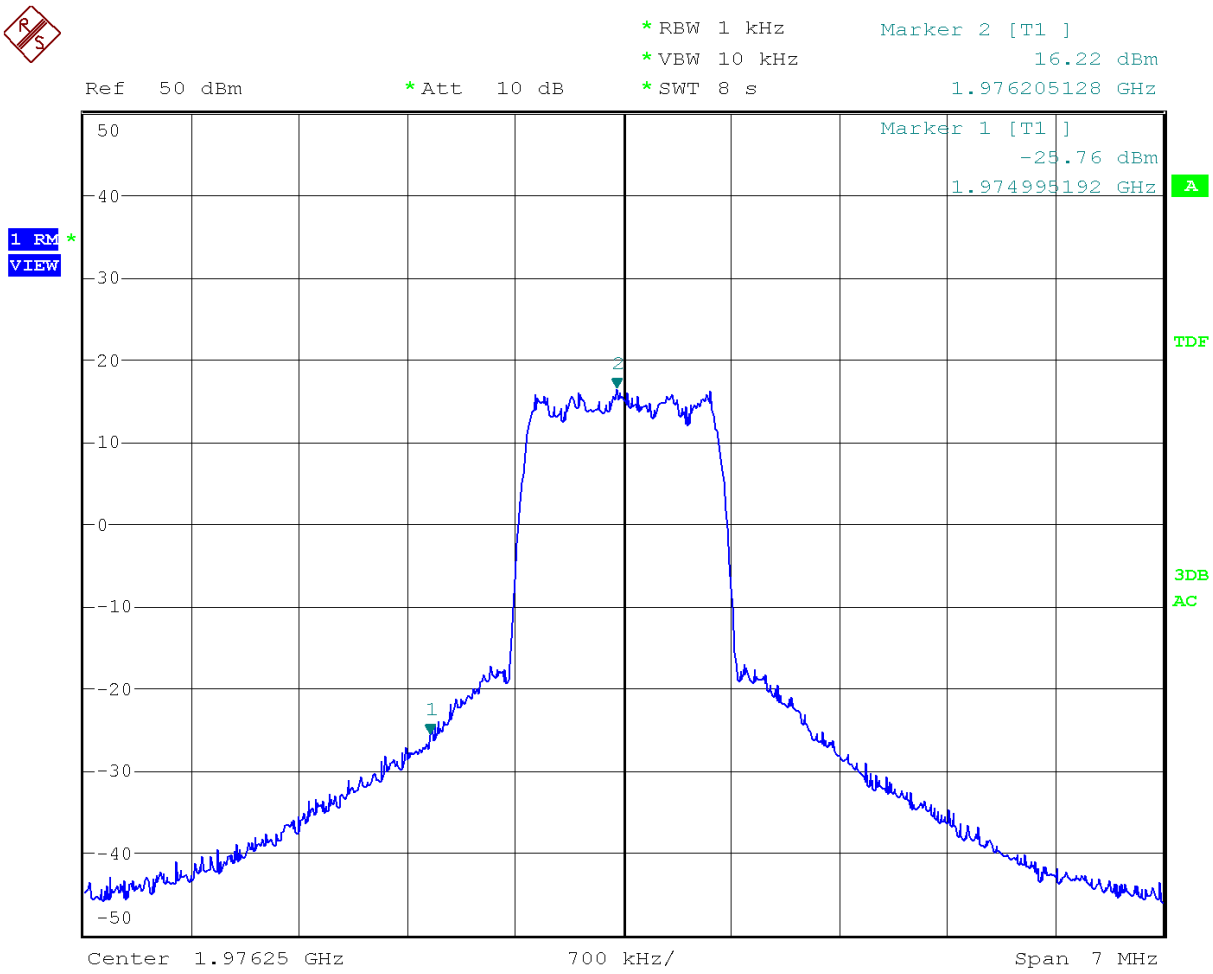
QPSK



Date: 4.AUG.2008 15:28:14

Highest level measured at 1974.995MHz is –26.14dBm
-26.14dBm + 12.11dB = -14.03dBm

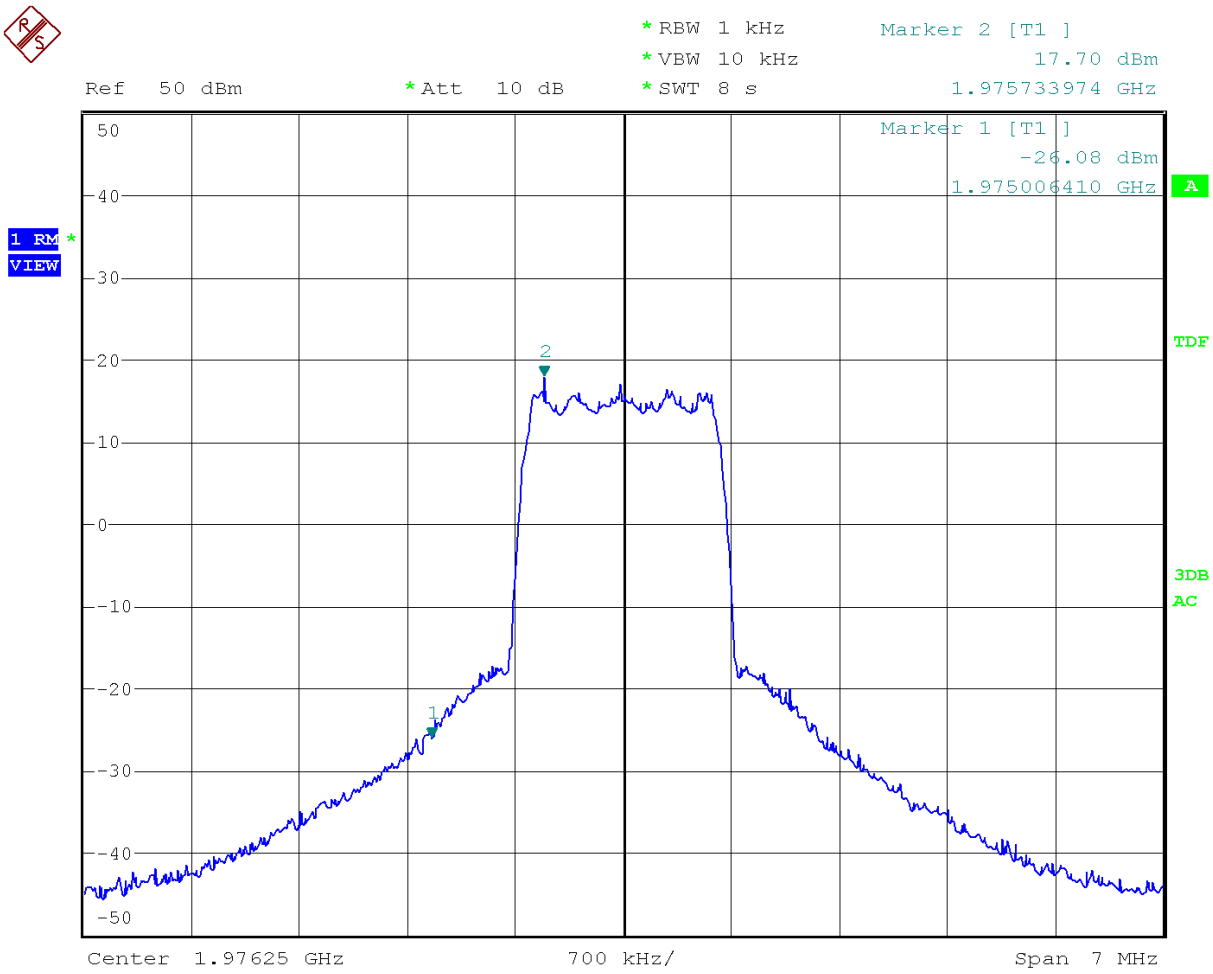
8PSK



Date: 4.AUG.2008 15:25:32

Highest level measured at 194.995MHz is –25.76dBm
-25.76dBm + 12.11dB = -13.65dBm

16QAM

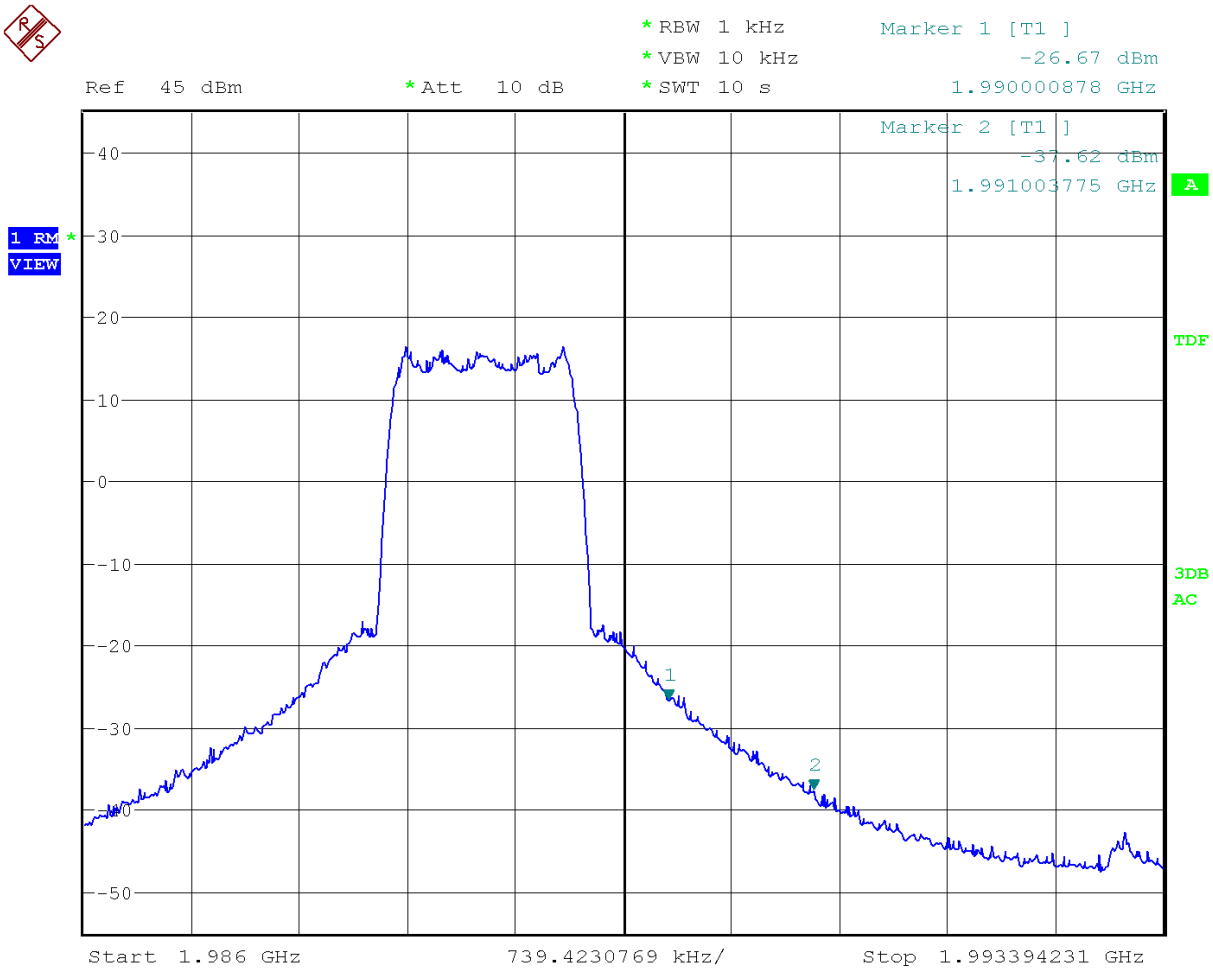


Date: 4.AUG.2008 15:18:44

Highest level measured at 1975.006MHz is –26.08dBm
-26.08dBm + 12.11dB = -13.97dBm

Figure 16 Out of Band Emissions Graph – 1175 – above 1990MHz

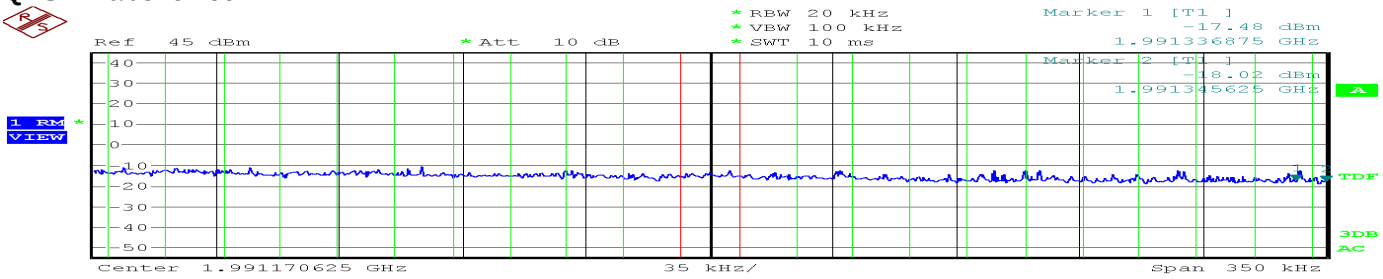
QPSK – 1990MHz to 1991MHz



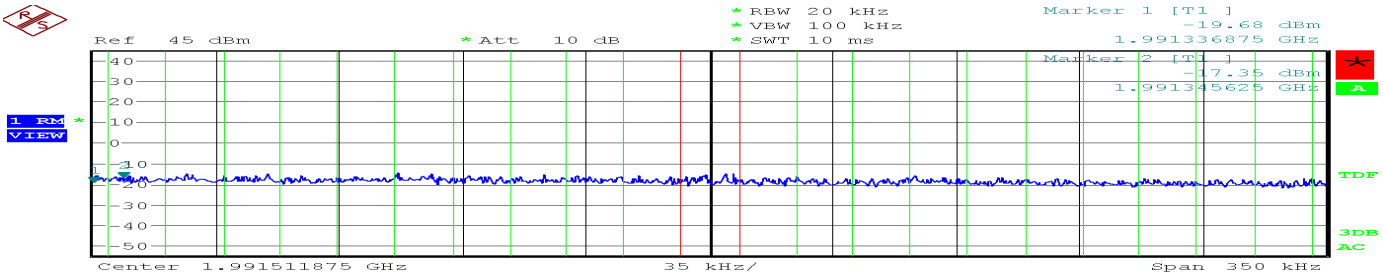
Date: 4.AUG.2008 13:47:53

Highest level measured at 1990.MHz is –26.67dBm
-26.67dBm + 12.11dB = -14.56dBm

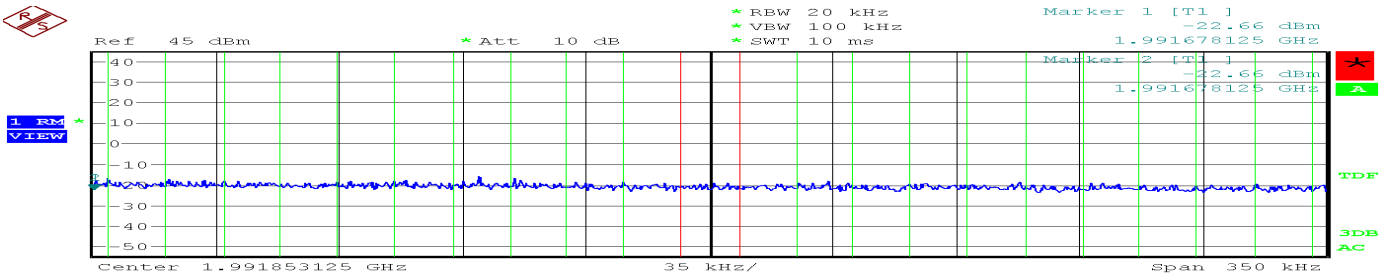
QPSK – above 1991MHz



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-16.57 dBm		
	Adjacent	-17.34	-17.24
	Alternate	-16.75	-17.07
	2nd Alt	-16.53	-18.06
	3rd Alt	-16.56	-18.65
	4th Alt	-15.94	-18.23
	5th Alt	-15.45	-18.03
	6th Alt	-15.75	-18.62
	7th Alt	-15.53	-18.25
	8th Alt	-14.73	-18.88
	9th Alt	-15.09	-18.52



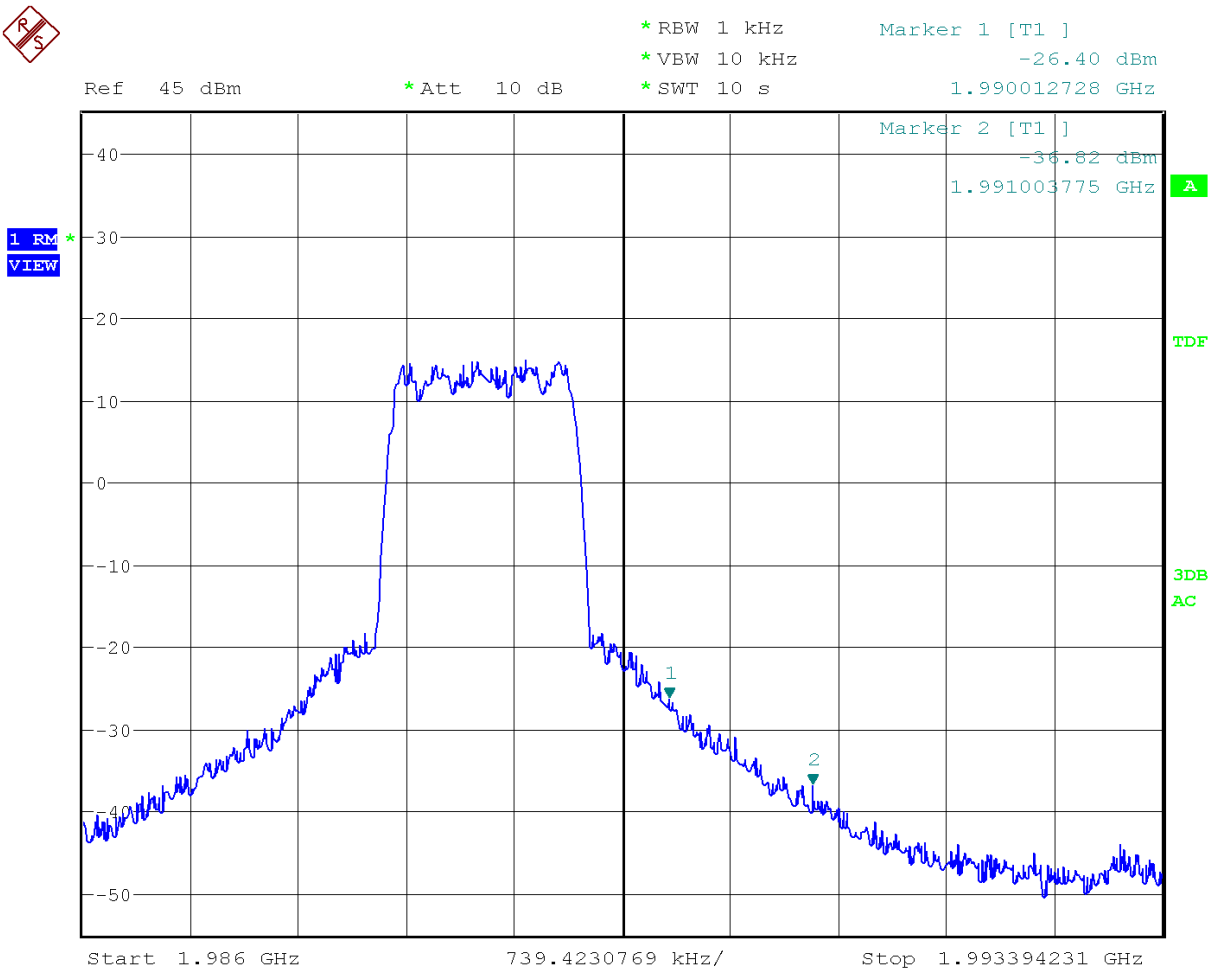
		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-19.56 dBm		
	Adjacent	-20.23	-20.31
	Alternate	-19.58	-20.42
	2nd Alt	-19.79	-20.52
	3rd Alt	-19.45	-20.02
	4th Alt	-19.08	-20.81
	5th Alt	-19.64	-20.96
	6th Alt	-19.68	-21.18
	7th Alt	-19.18	-20.98
	8th Alt	-19.23	-21.26
	9th Alt	-19.30	-21.51



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-22.79 dBm		
	Adjacent	-22.70	-22.93
	Alternate	-22.49	-22.69
	2nd Alt	-21.84	-23.19
	3rd Alt	-21.69	-22.60
	4th Alt	-21.71	-22.93
	5th Alt	-21.80	-23.52
	6th Alt	-22.04	-23.15
	7th Alt	-21.69	-23.63
	8th Alt	-21.28	-23.66
	9th Alt	-21.52	-23.34

Highest level recorded is **–14.73dBm**

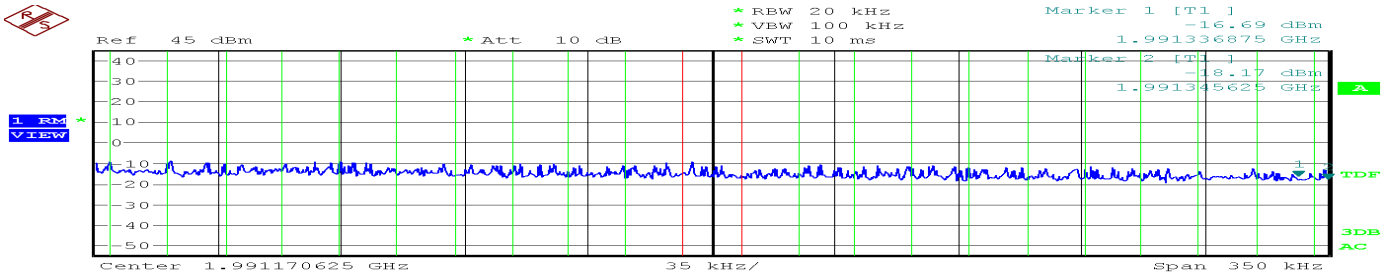
8PSK – 1990MHz to 1991MHz



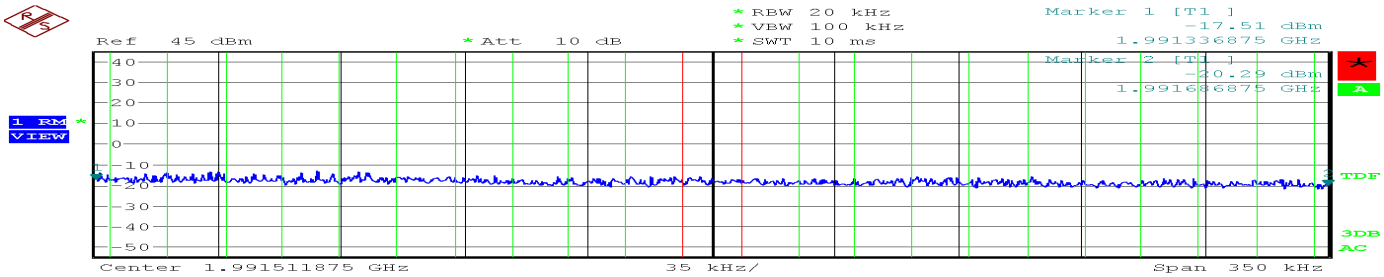
Date: 4.AUG.2008 13:50:02

Highest level measured at 1990.001MHz is –26.40dBm
-26.40dBm + 12.11dB = -14.29dBm

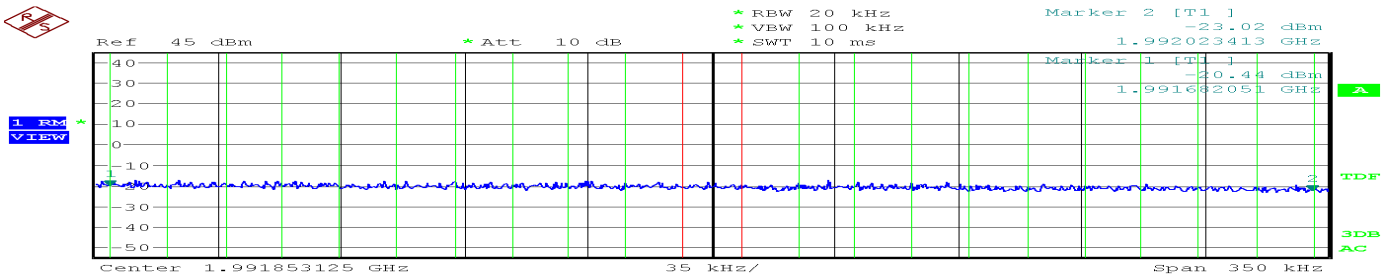
8PSK – above 1991MHz



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-16.11 dBm		
	Adjacent	-15.86	-17.09
	Alternate	-16.25	-16.54
	2nd Alt	-15.72	-16.48
	3rd Alt	-15.88	-16.51
	4th Alt	-15.67	-17.22
	5th Alt	-14.83	-17.54
	6th Alt	-14.80	-17.27
	7th Alt	-15.31	-17.81
	8th Alt	-14.93	-18.07
	9th Alt	-15.59	-18.56



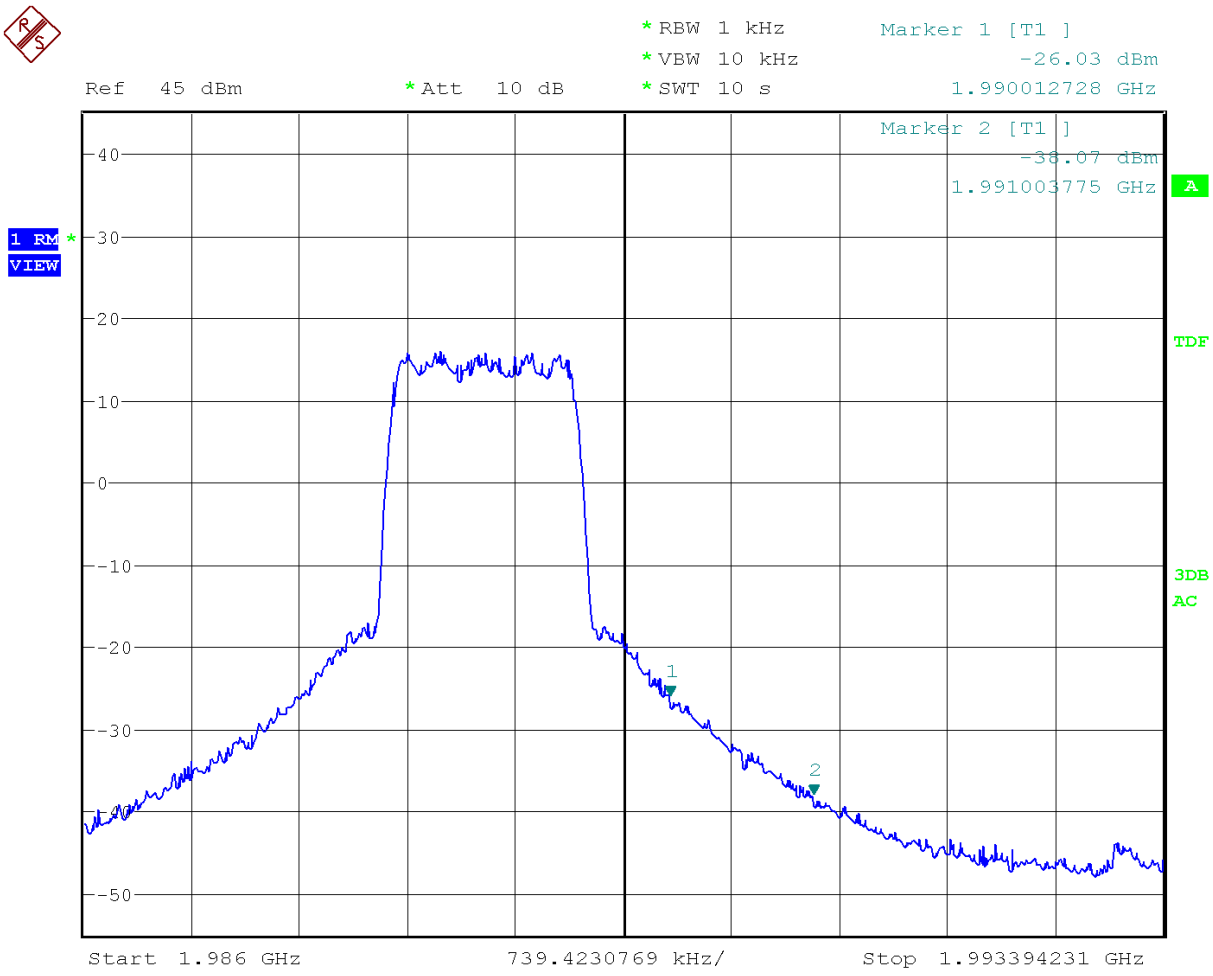
		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-19.70 dBm		
	Adjacent	-19.50	-20.27
	Alternate	-20.19	-20.46
	2nd Alt	-20.31	-20.34
	3rd Alt	-19.56	-19.87
	4th Alt	-18.84	-20.34
	5th Alt	-18.49	-20.69
	6th Alt	-18.81	-21.31
	7th Alt	-18.83	-20.60
	8th Alt	-18.23	-21.08
	9th Alt	-18.73	-20.99



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-22.19 dBm		
	Adjacent	-21.93	-22.71
	Alternate	-21.80	-22.16
	2nd Alt	-21.78	-22.21
	3rd Alt	-21.88	-22.34
	4th Alt	-21.79	-23.00
	5th Alt	-21.85	-22.89
	6th Alt	-21.36	-22.64
	7th Alt	-21.22	-23.01
	8th Alt	-21.36	-23.25
	9th Alt	-21.27	-23.59

Highest level recorded is **–14.80dBm**

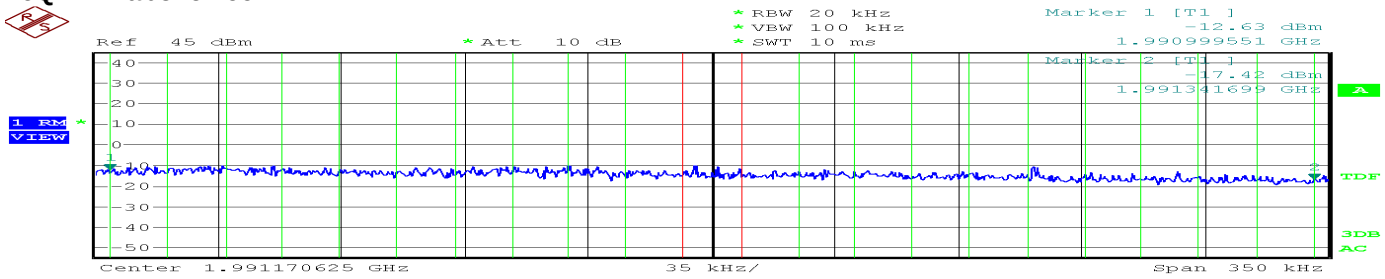
16QAM – 1990MHz to 1991MHz



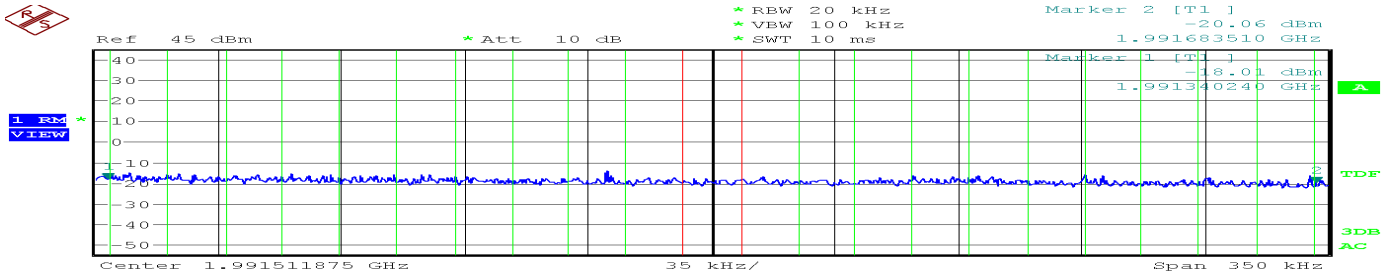
Date: 4.AUG.2008 13:51:38

Highest level measured at 1990.001MHz is –26.03dBm
-26.03dBm + 12.11dB = -13.92dBm

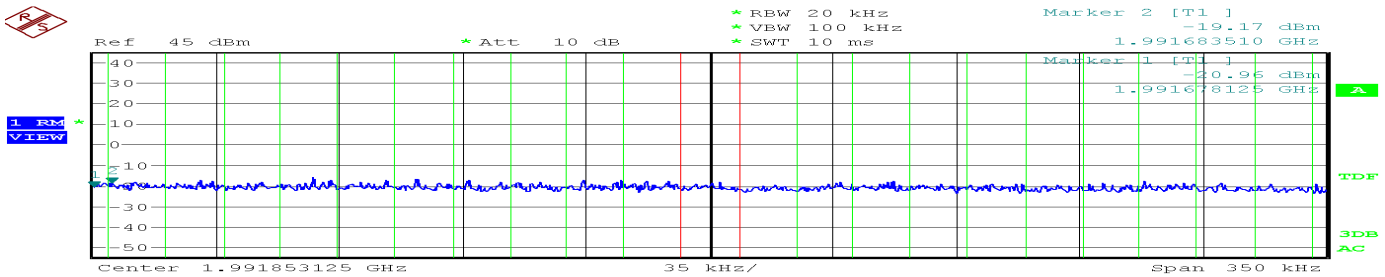
16QAM – above 1991MHz



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-15.84 dBm		
	Adjacent	-15.85	-16.50
	Alternate	-15.10	-16.15
	2nd Alt	-14.62	-16.33
	3rd Alt	-14.73	-17.07
	4th Alt	-15.16	-17.24
	5th Alt	-15.22	-17.32
	6th Alt	-14.93	-18.08
	7th Alt	-14.02	-18.31
	8th Alt	-13.78	-18.60
	9th Alt	-14.58	-19.13



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-21.14 dBm		
	Adjacent	-20.86	-20.94
	Alternate	-20.41	-21.31
	2nd Alt	-20.76	-20.97
	3rd Alt	-20.45	-20.44
	4th Alt	-20.16	-20.65
	5th Alt	-19.89	-21.60
	6th Alt	-19.76	-21.30
	7th Alt	-19.66	-21.77
	8th Alt	-19.70	-21.62
	9th Alt	-19.02	-21.96



		Lower dBm	Upper dBm
Tx Channel Bandwidth	16.25 kHz		
Power	-22.57 dBm		
	Adjacent	-21.95	-23.26
	Alternate	-21.99	-22.62
	2nd Alt	-22.28	-22.43
	3rd Alt	-22.48	-22.70
	4th Alt	-22.10	-22.66
	5th Alt	-21.97	-23.30
	6th Alt	-21.55	-23.09
	7th Alt	-22.20	-22.37
	8th Alt	-21.83	-23.19
	9th Alt	-21.67	-23.32

Highest level recorded is **–13.78dBm**

Figure 17 Out of Band Emissions Graph – CH25 – 1,000MHz – 20,000MHz

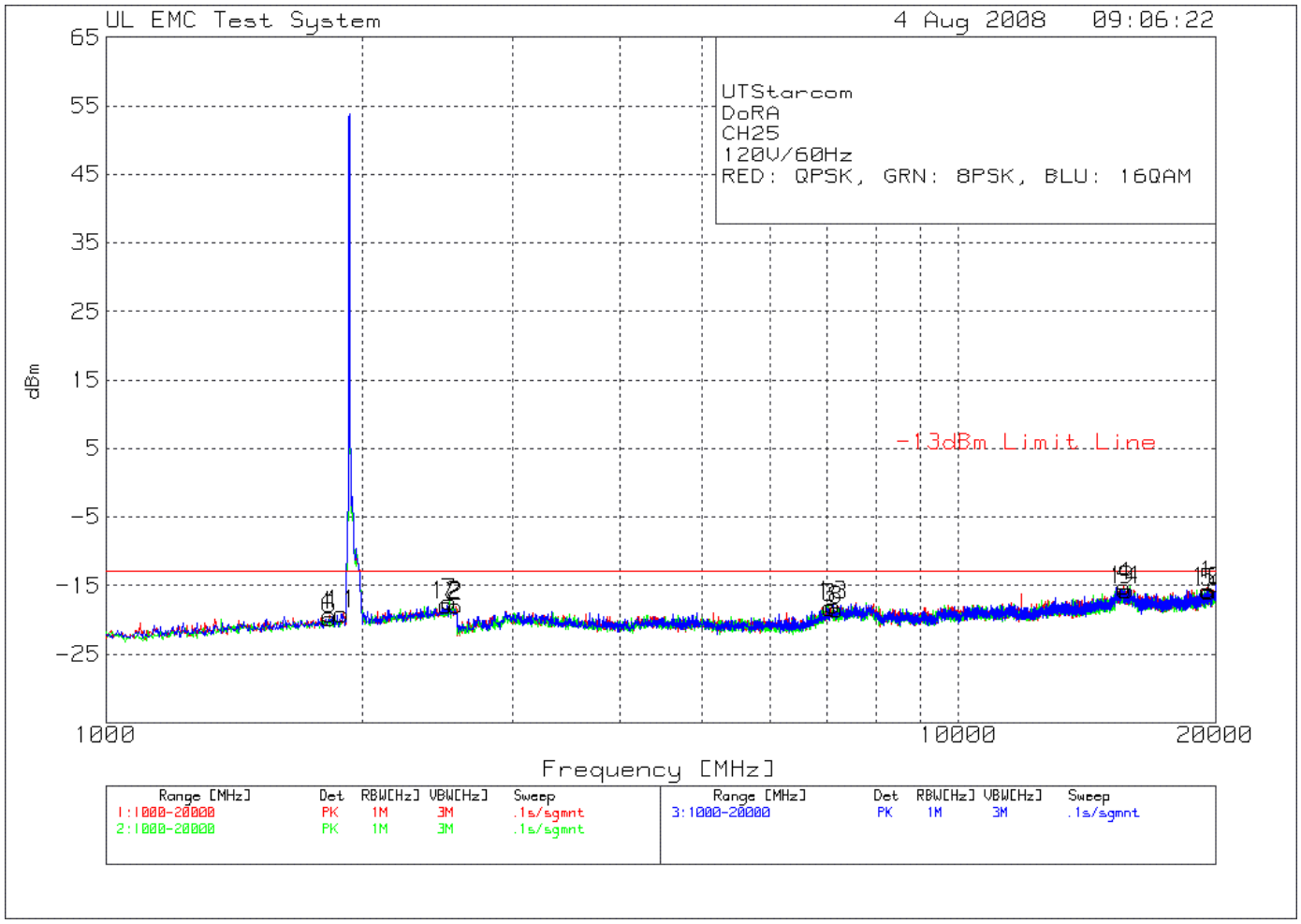


Figure 18 Out of Band Emissions Graph – CH150 – 1,000MHz – 20,000MHz

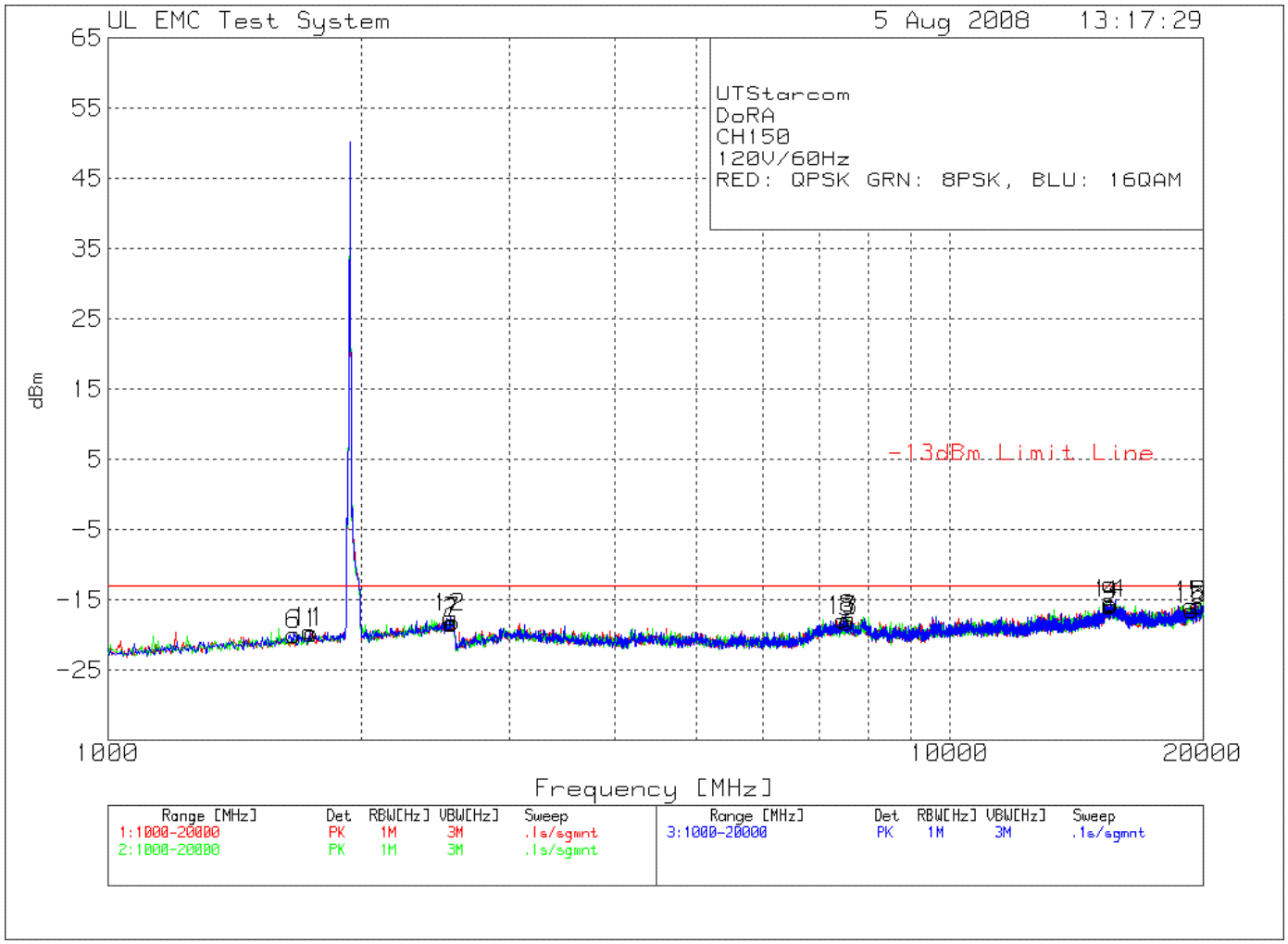


Figure 19 Out of Band Emissions Graph – CH275 – 1,000MHz – 20,000MHz

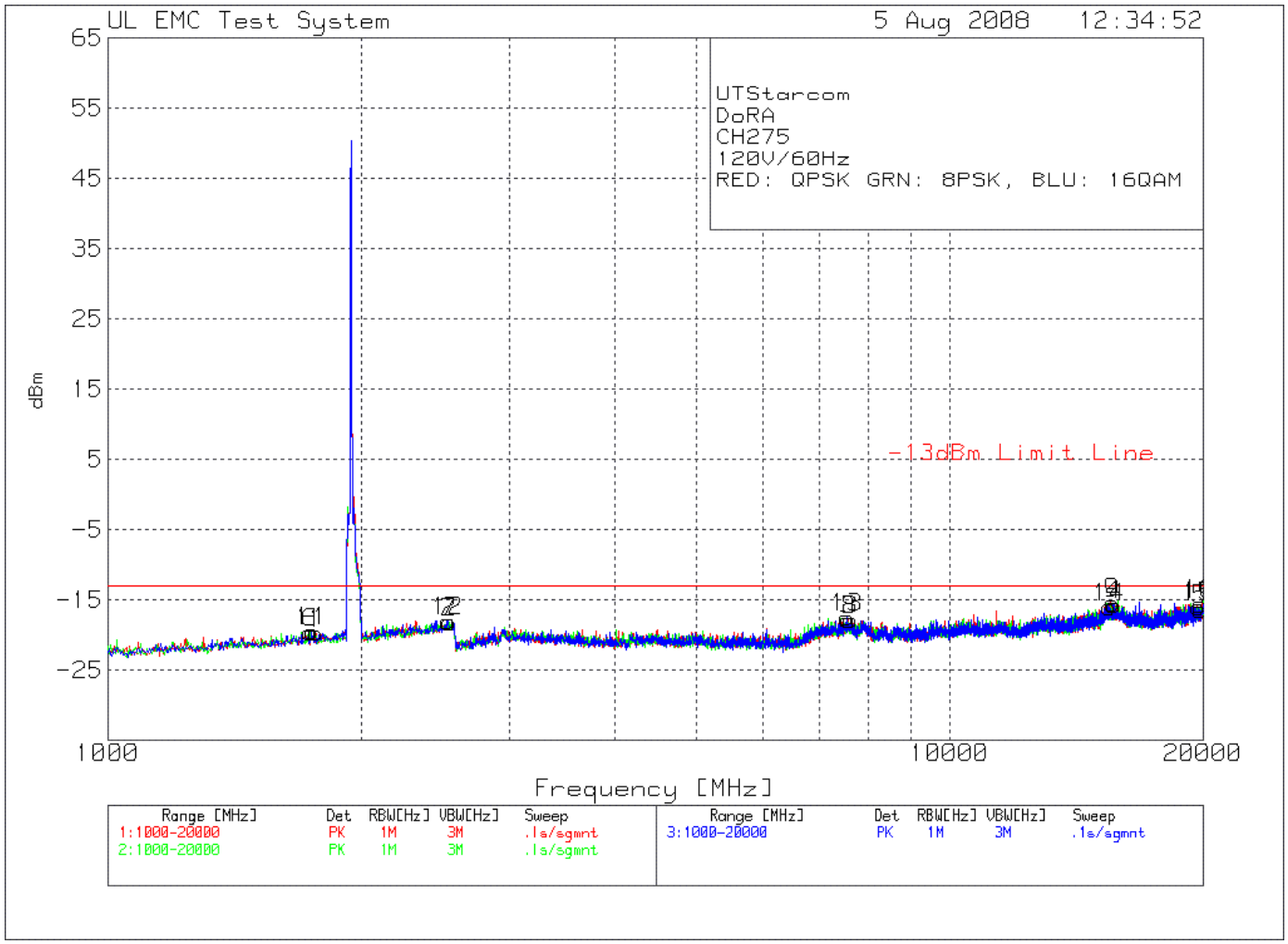


Figure 20 Out of Band Emissions Graph – CH325 – 1,000MHz – 20,000MHz

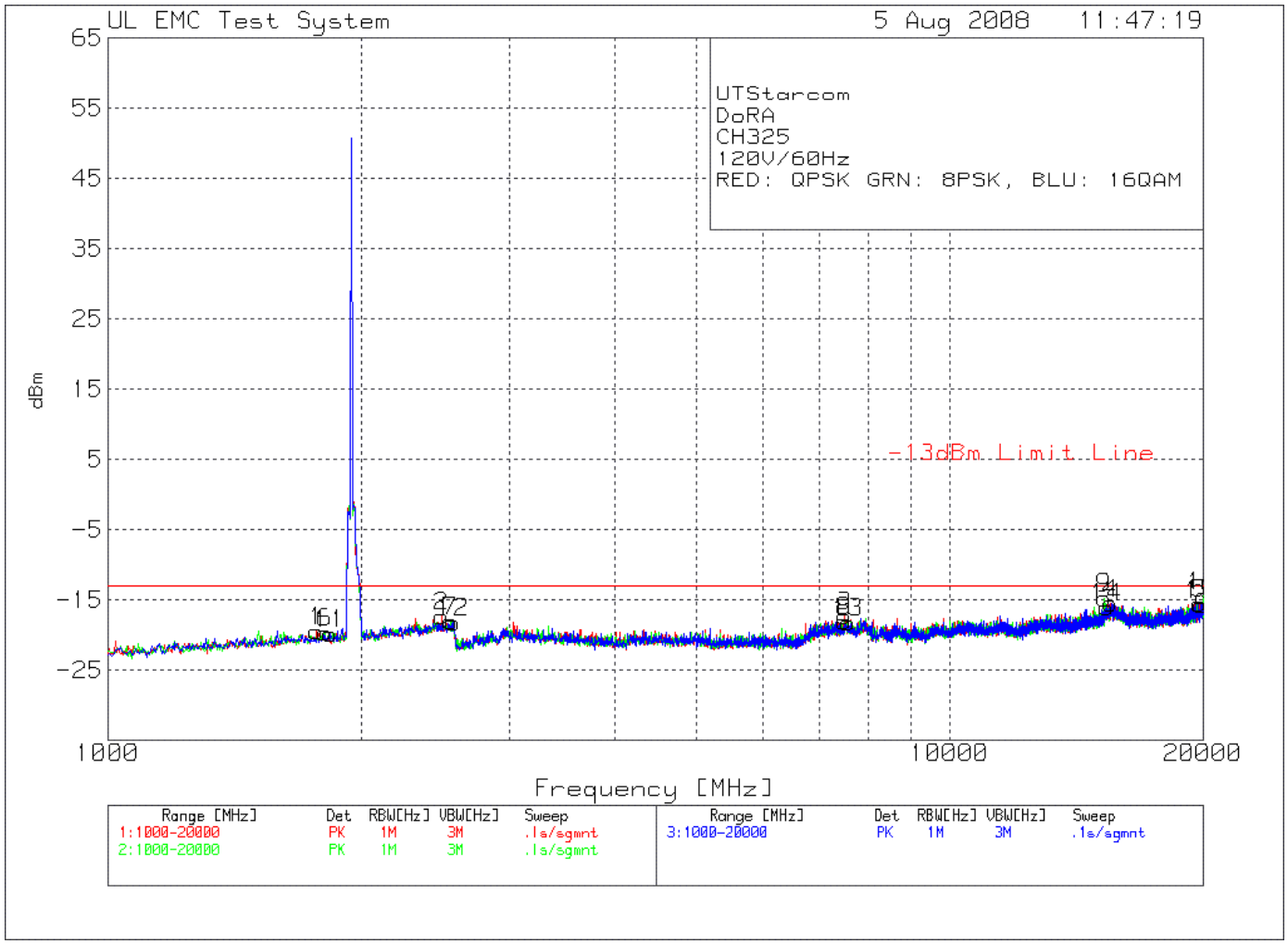


Figure 21 Out of Band Emissions Graph – CH350 – 1,000MHz – 20,000MHz

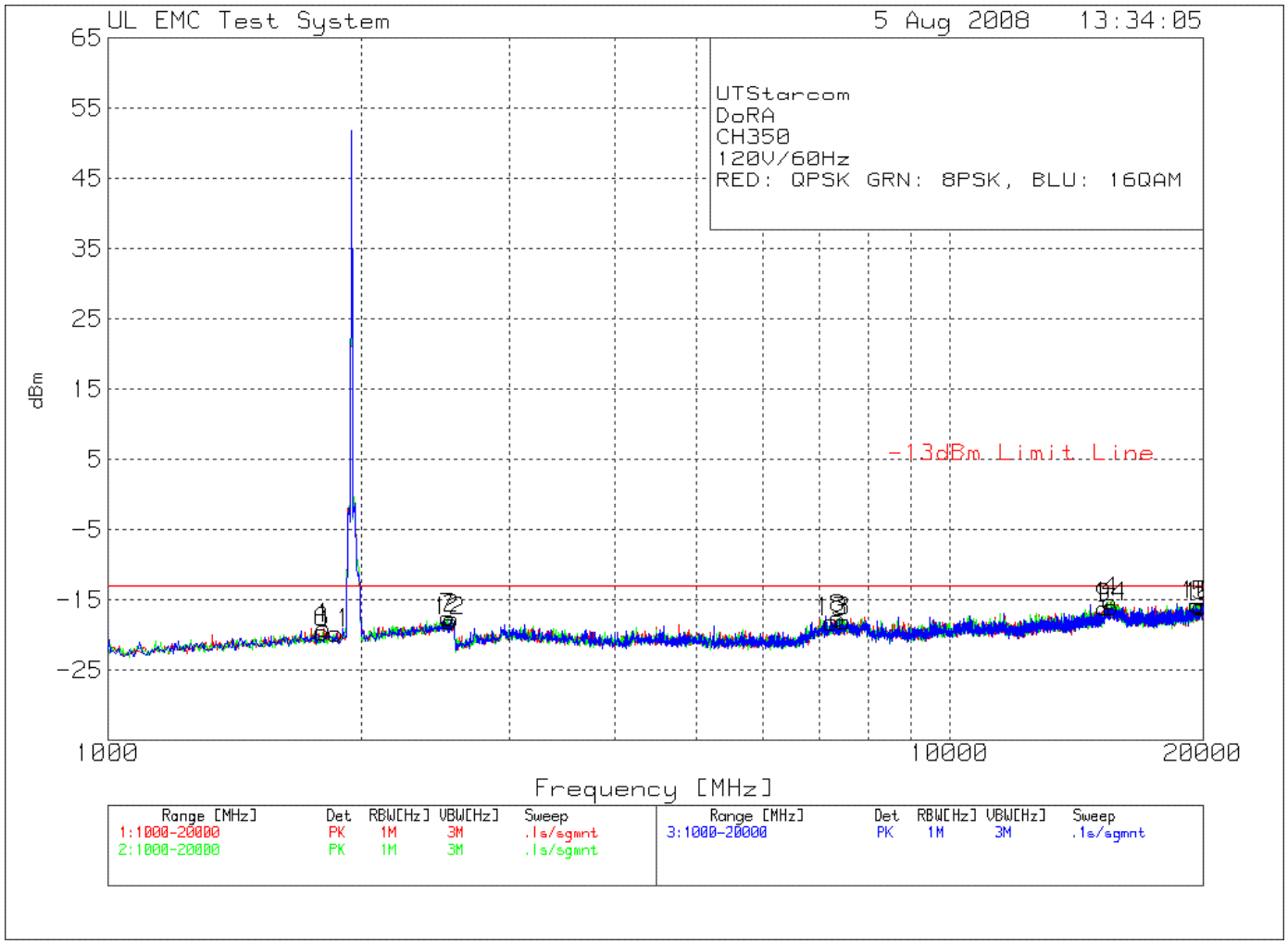


Figure 22 Out of Band Emissions Graph – CH375 – 1,000MHz – 20,000MHz

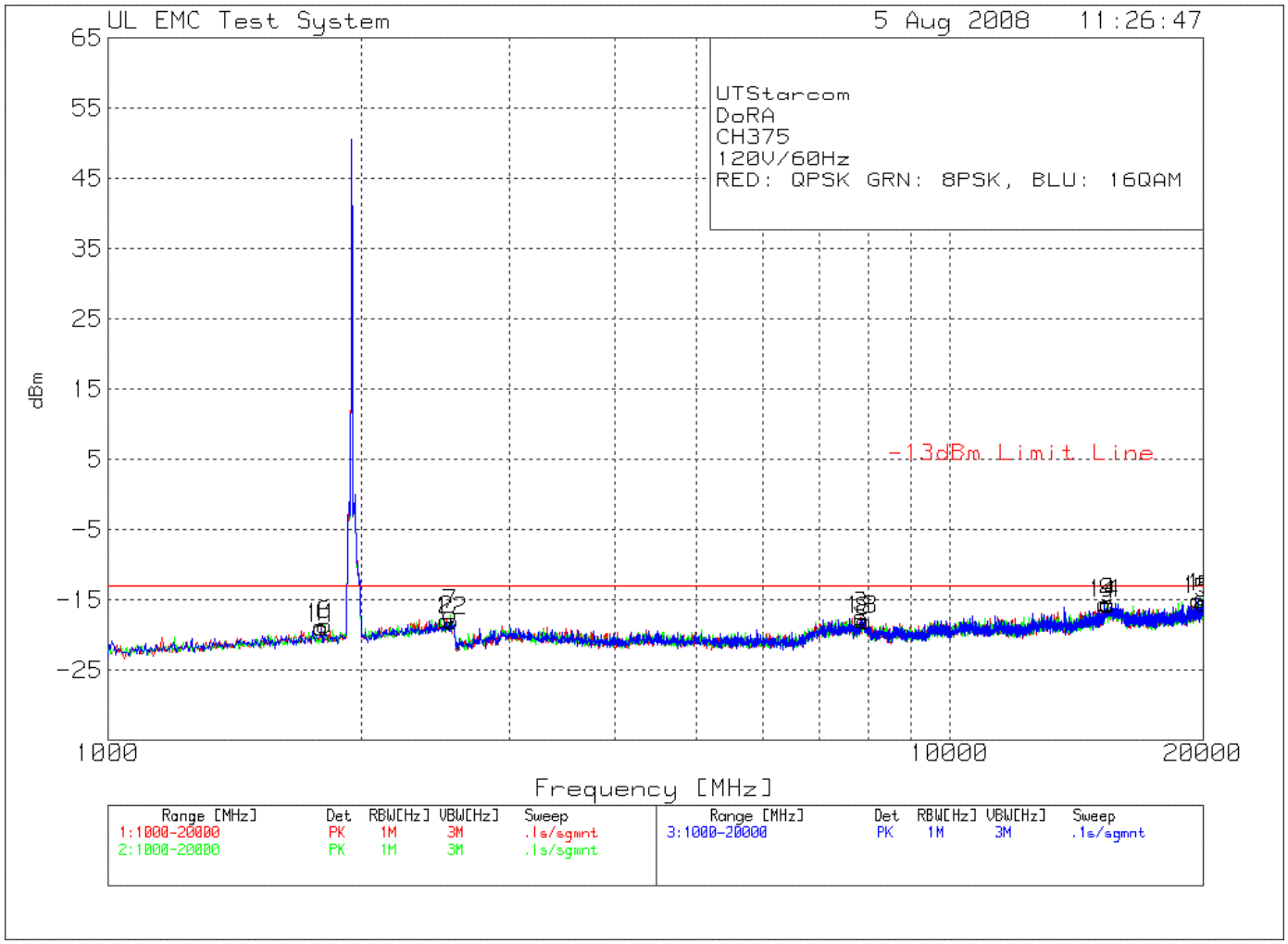


Figure 23 Out of Band Emissions Graph – CH425 – 1,000MHz – 20,000MHz

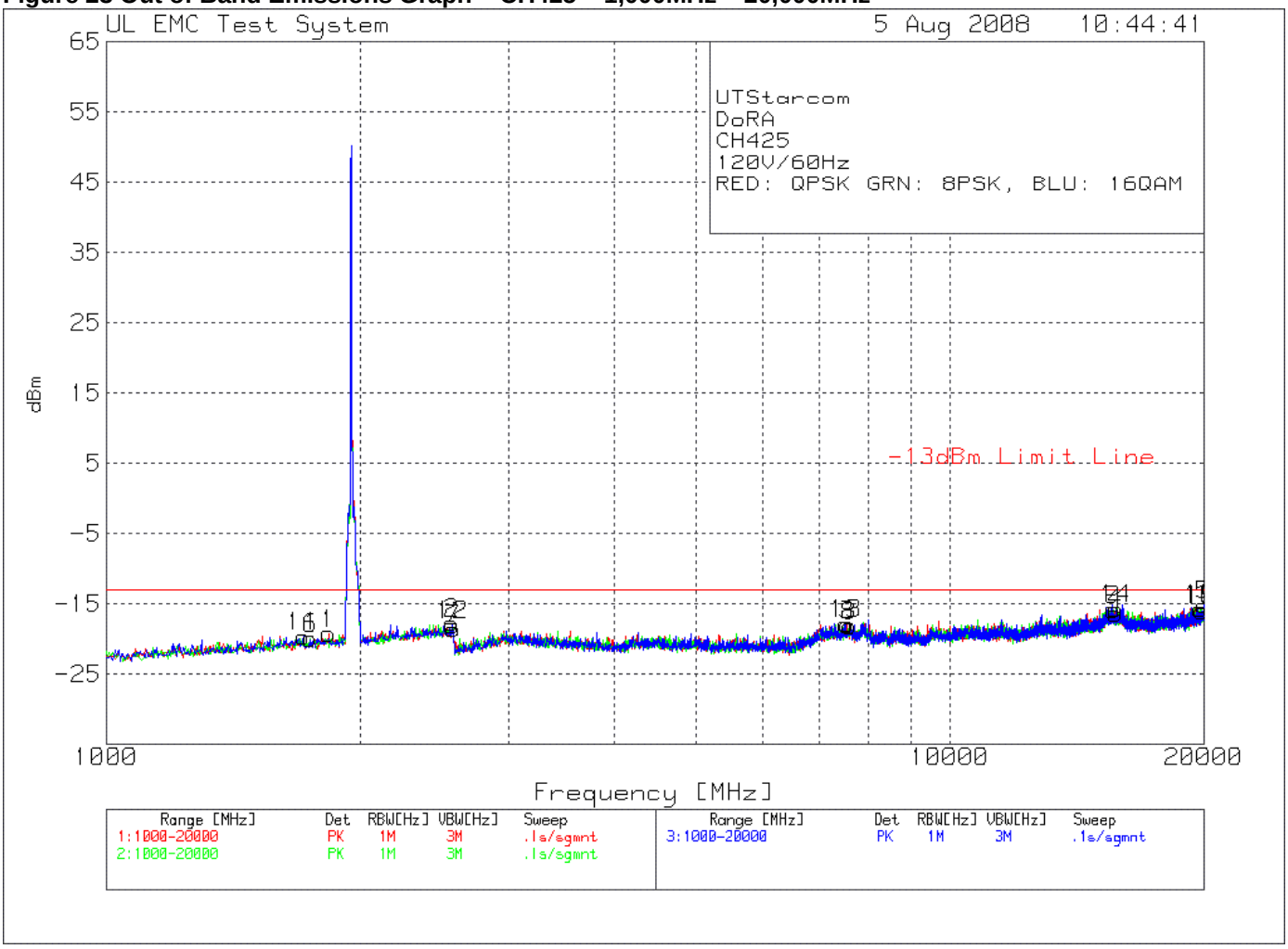


Figure 24 Out of Band Emissions Graph – CH550 – 1,000MHz – 20,000MHz

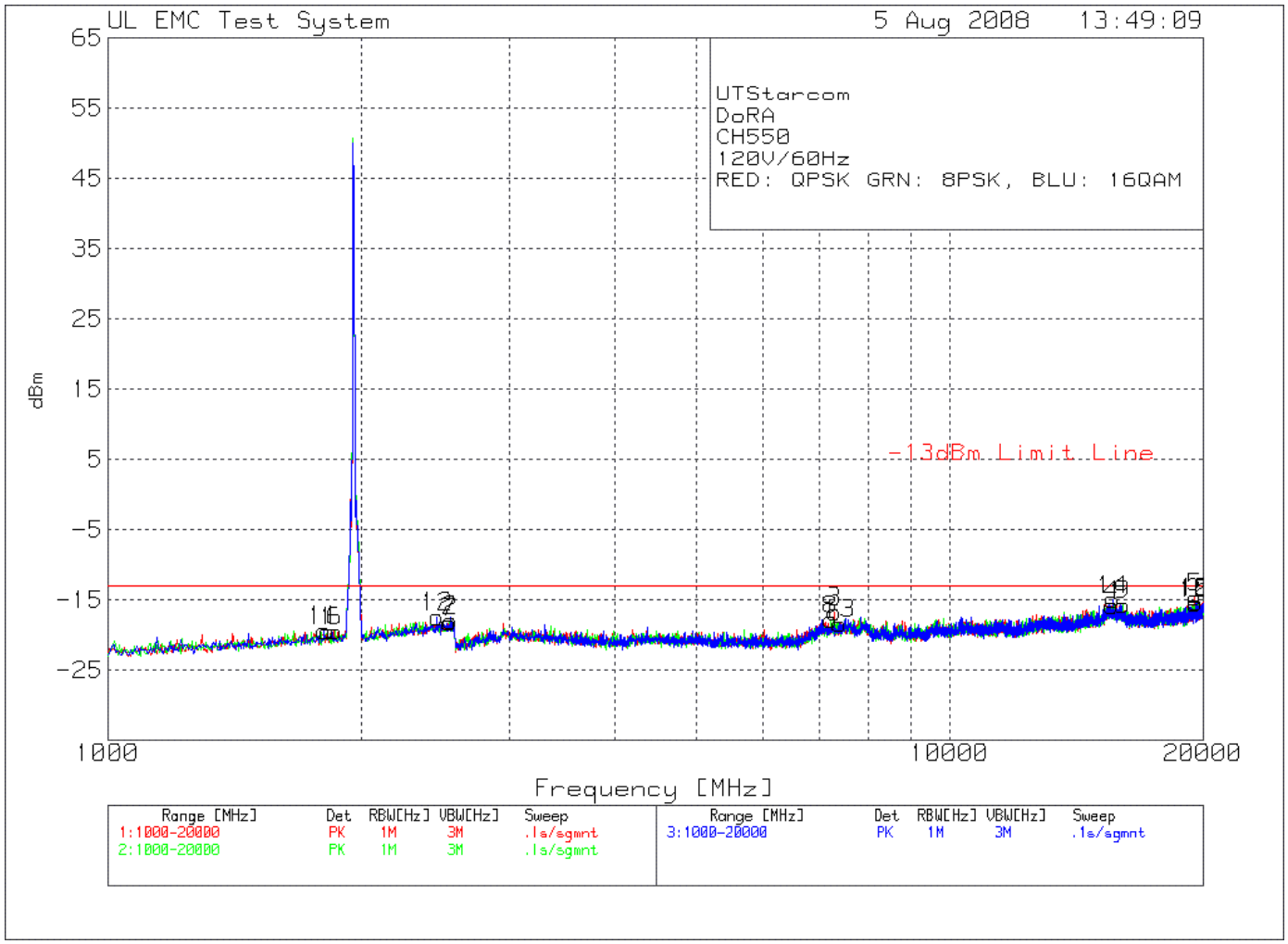


Figure 25 Out of Band Emissions Graph – CH675 – 1,000MHz – 20,000MHz

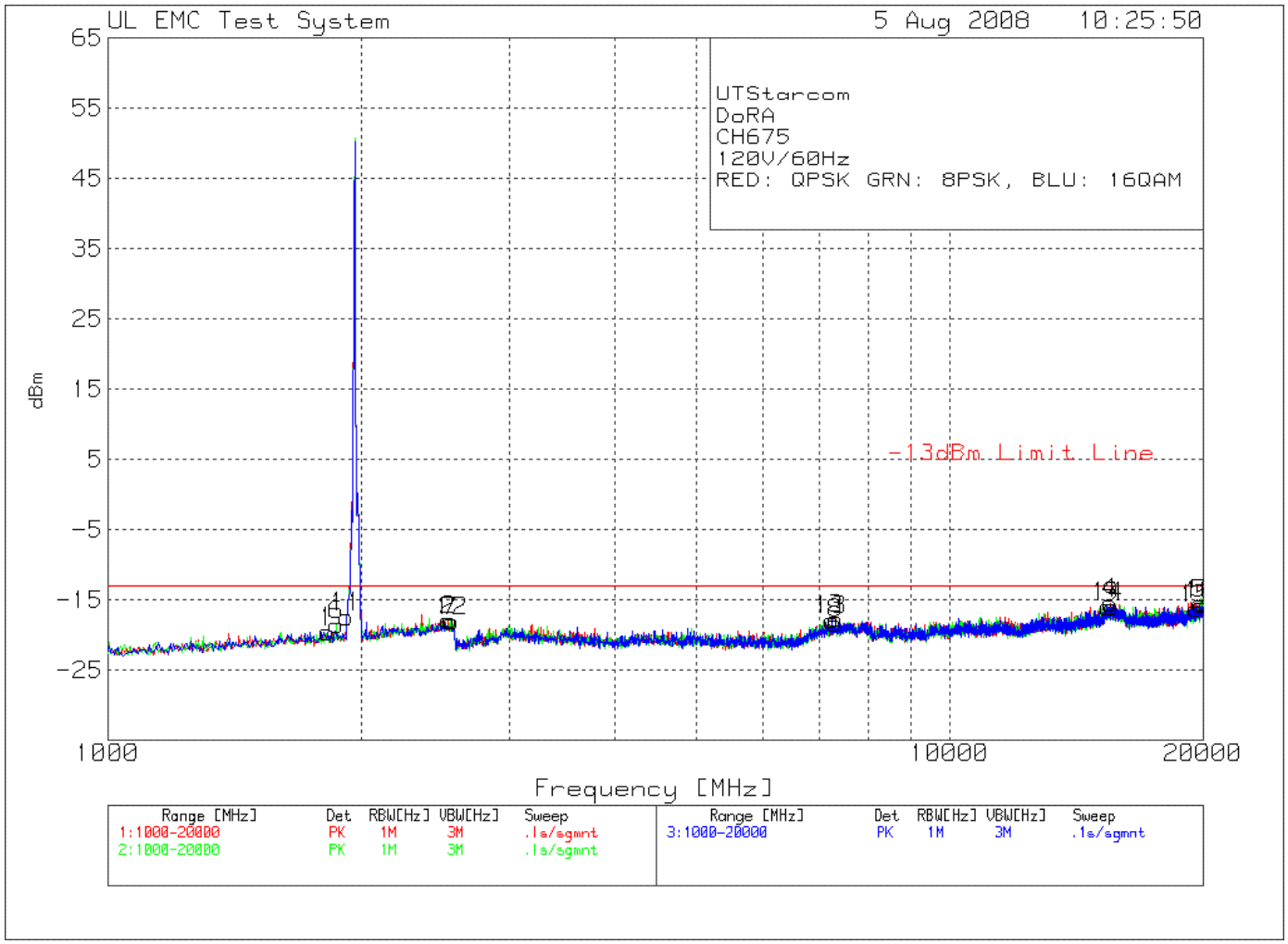


Figure 26 Out of Band Emissions Graph – CH725 – 1,000MHz – 20,000MHz

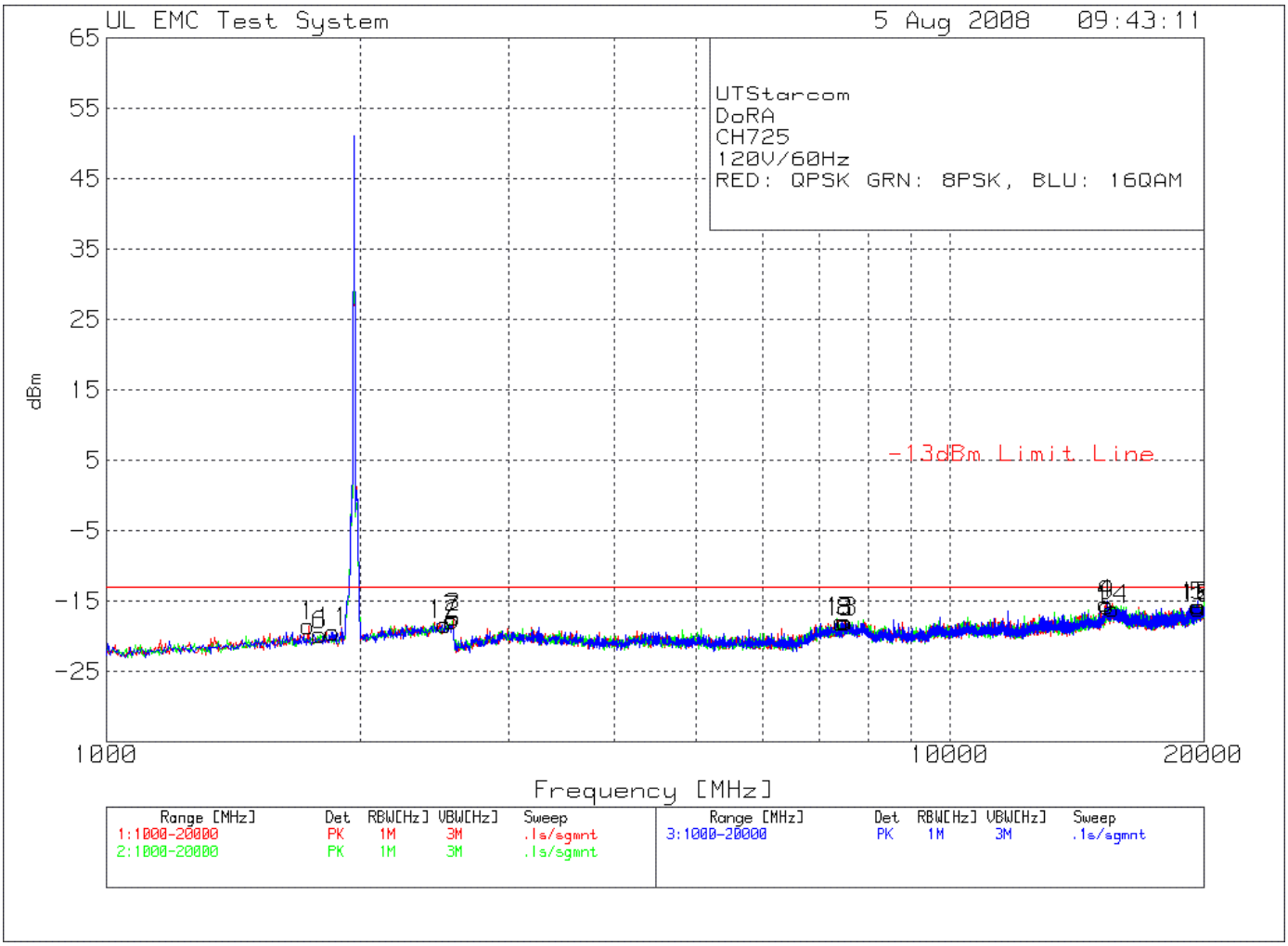


Figure 27 Out of Band Emissions Graph – CH750 – 1,000MHz – 20,000MHz

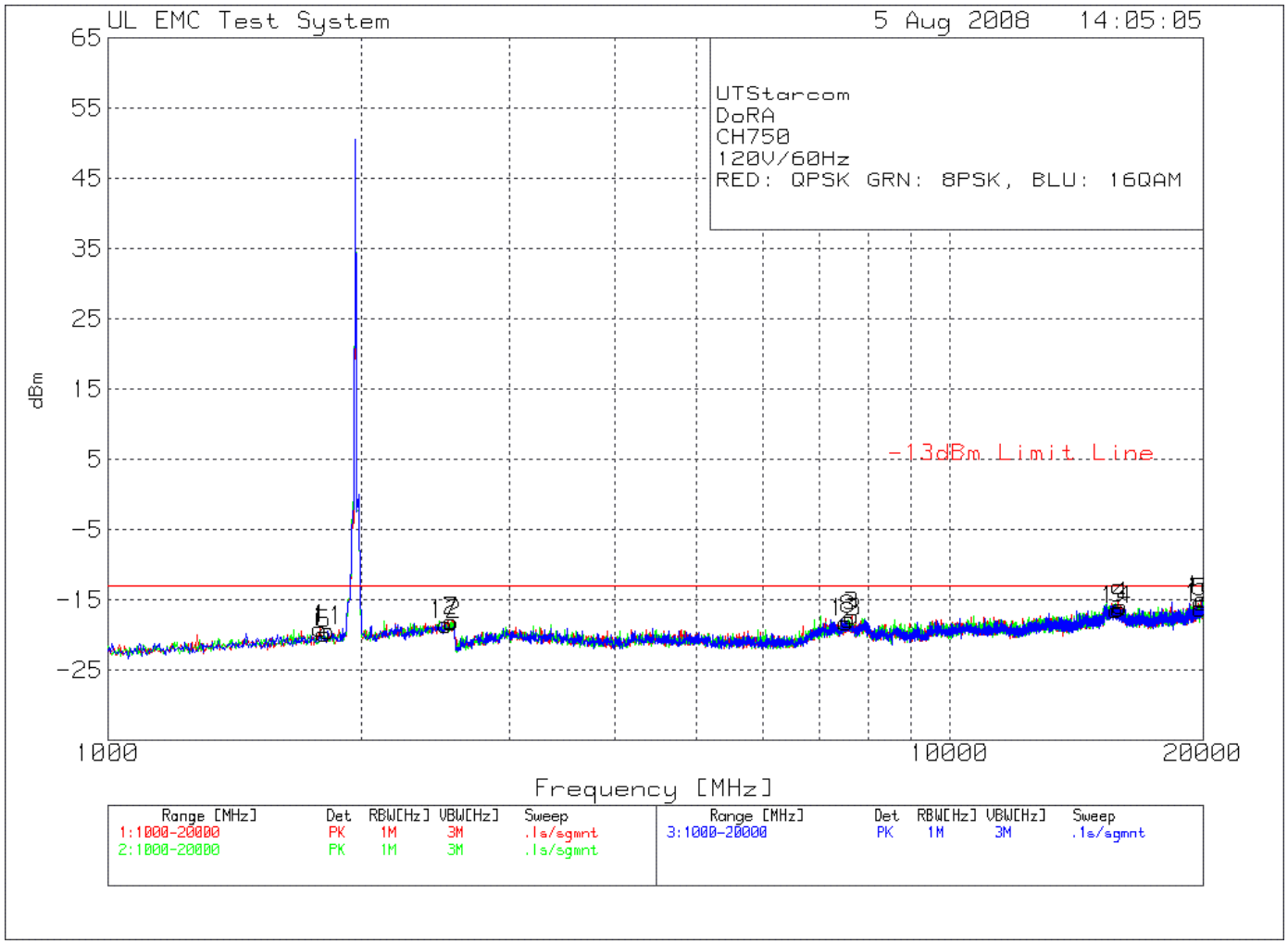


Figure 28 Out of Band Emissions Graph – CH775 – 1,000MHz – 20,000MHz

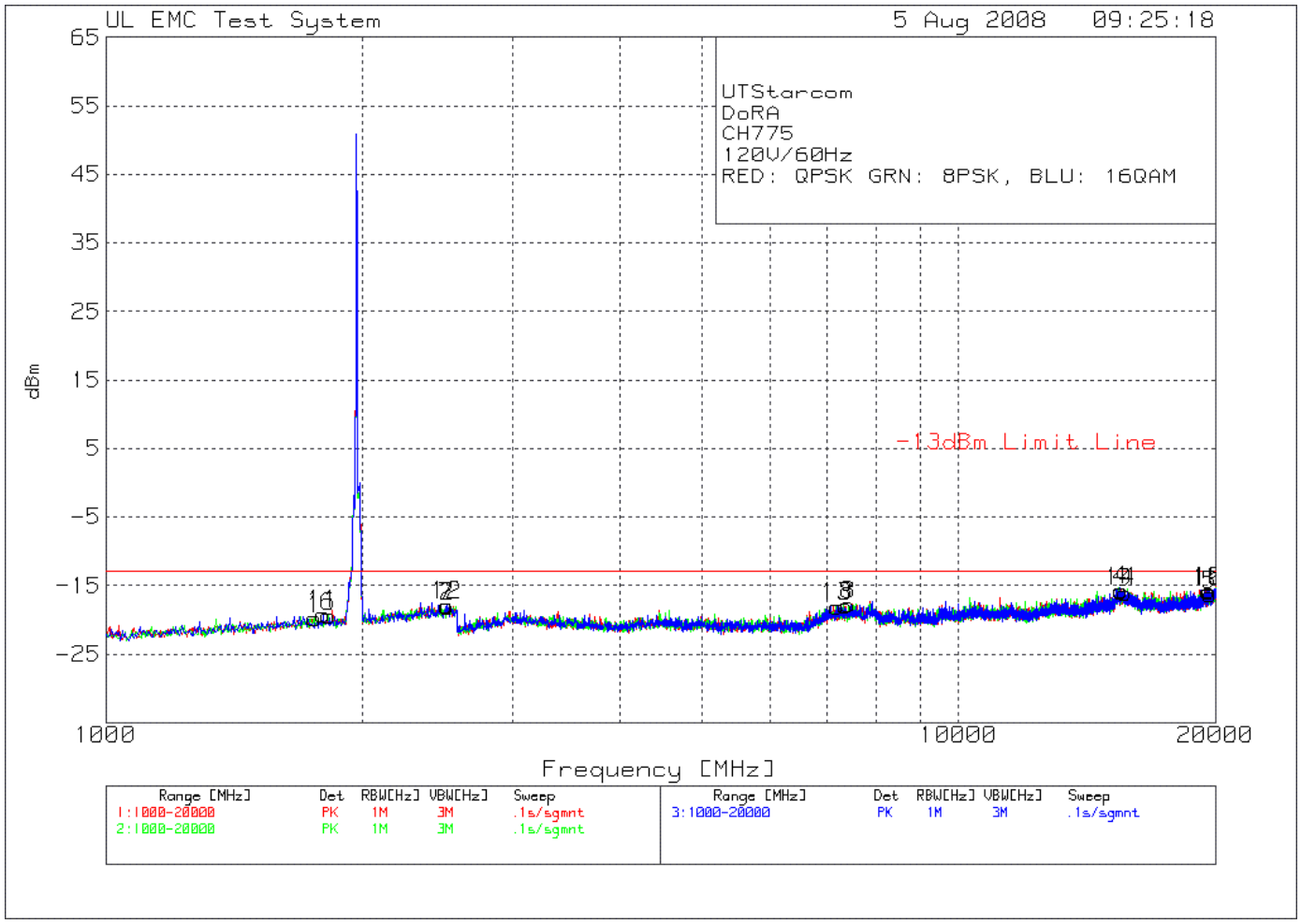


Figure 29 Out of Band Emissions Graph – CH825 – 1,000MHz – 20,000MHz

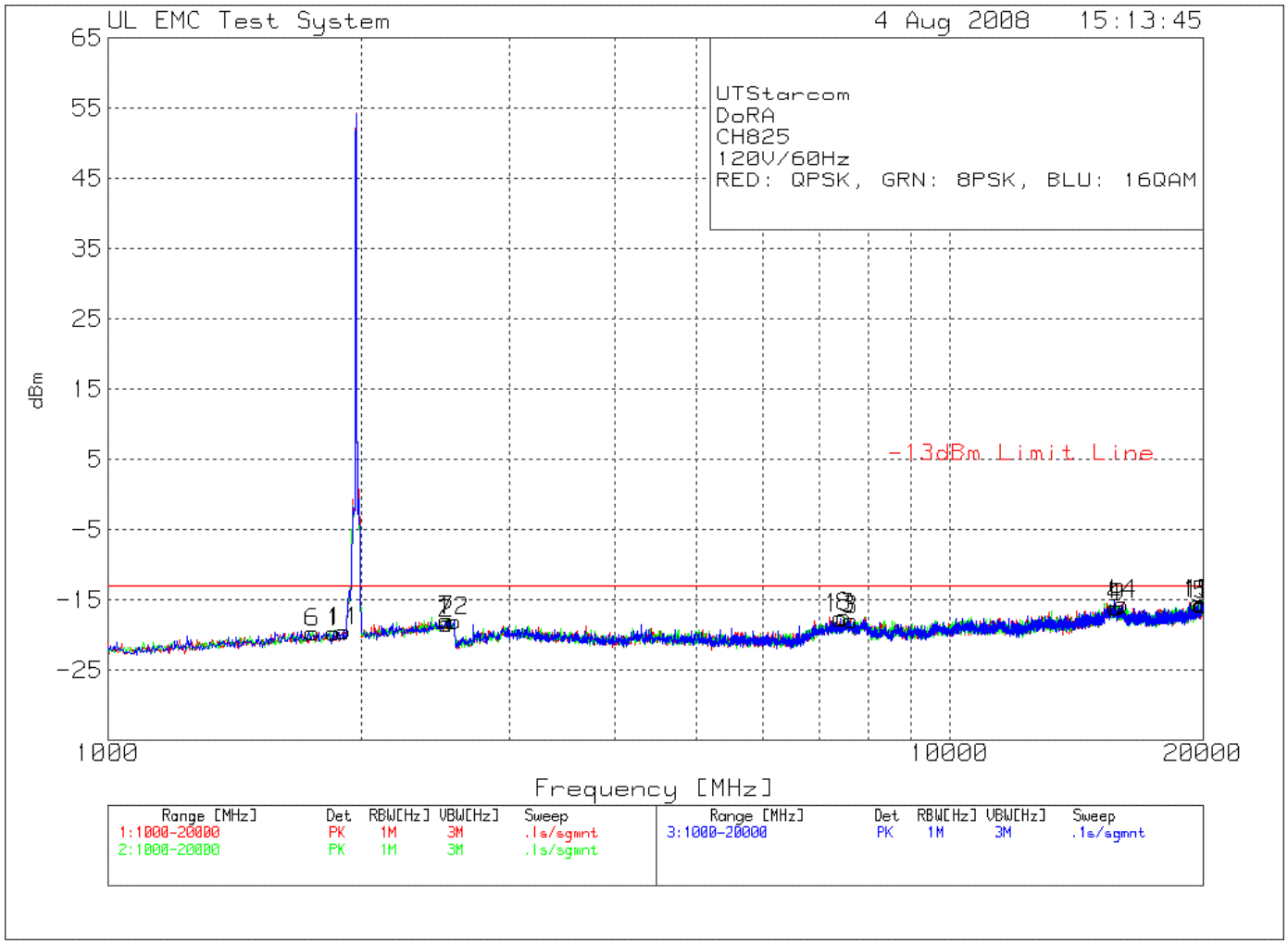


Figure 30 Out of Band Emissions Graph – CH825 – 1,000MHz – 20,000MHz

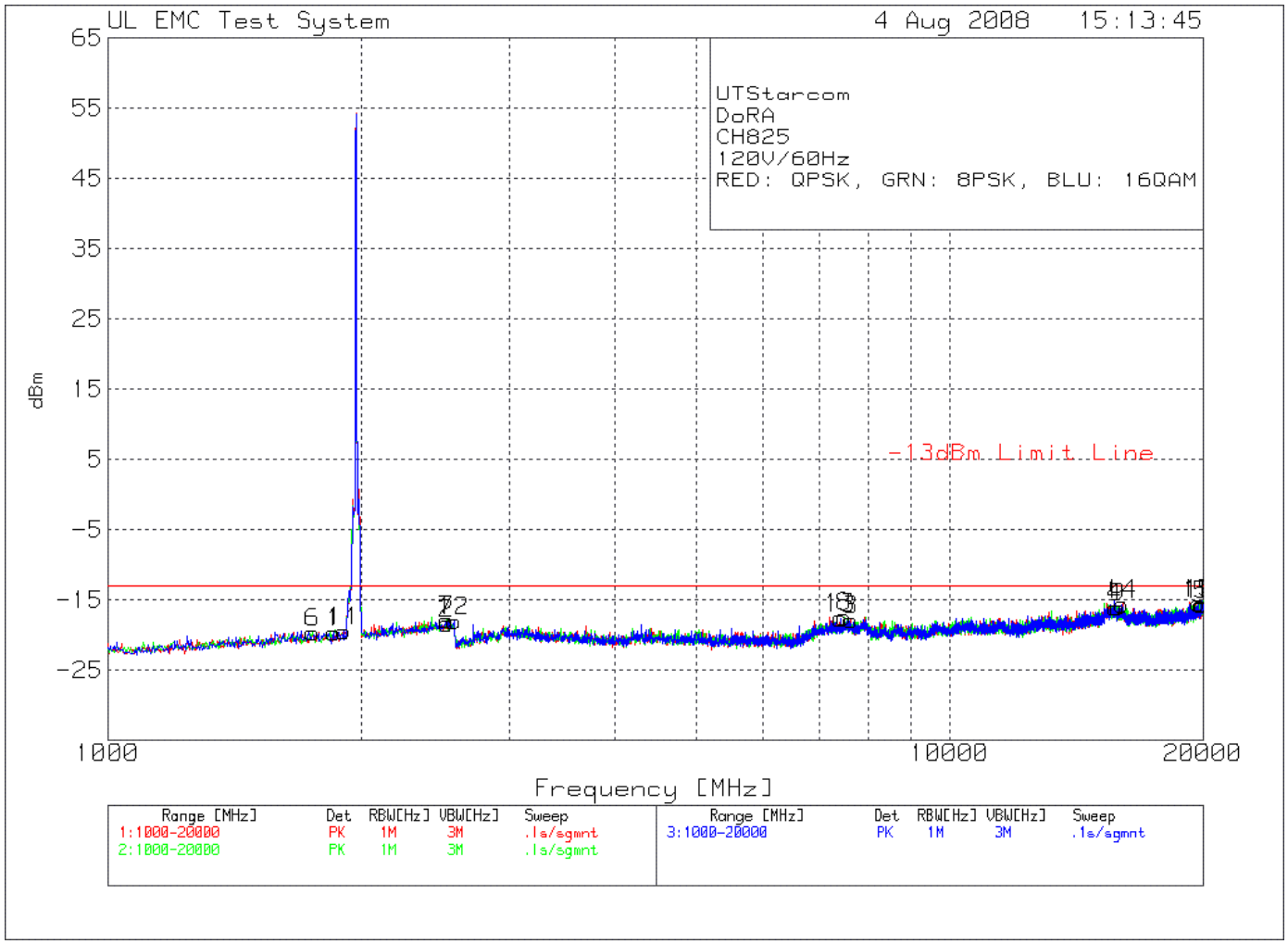


Figure 31 Out of Band Emissions Graph – CH850 – 1,000MHz – 20,000MHz

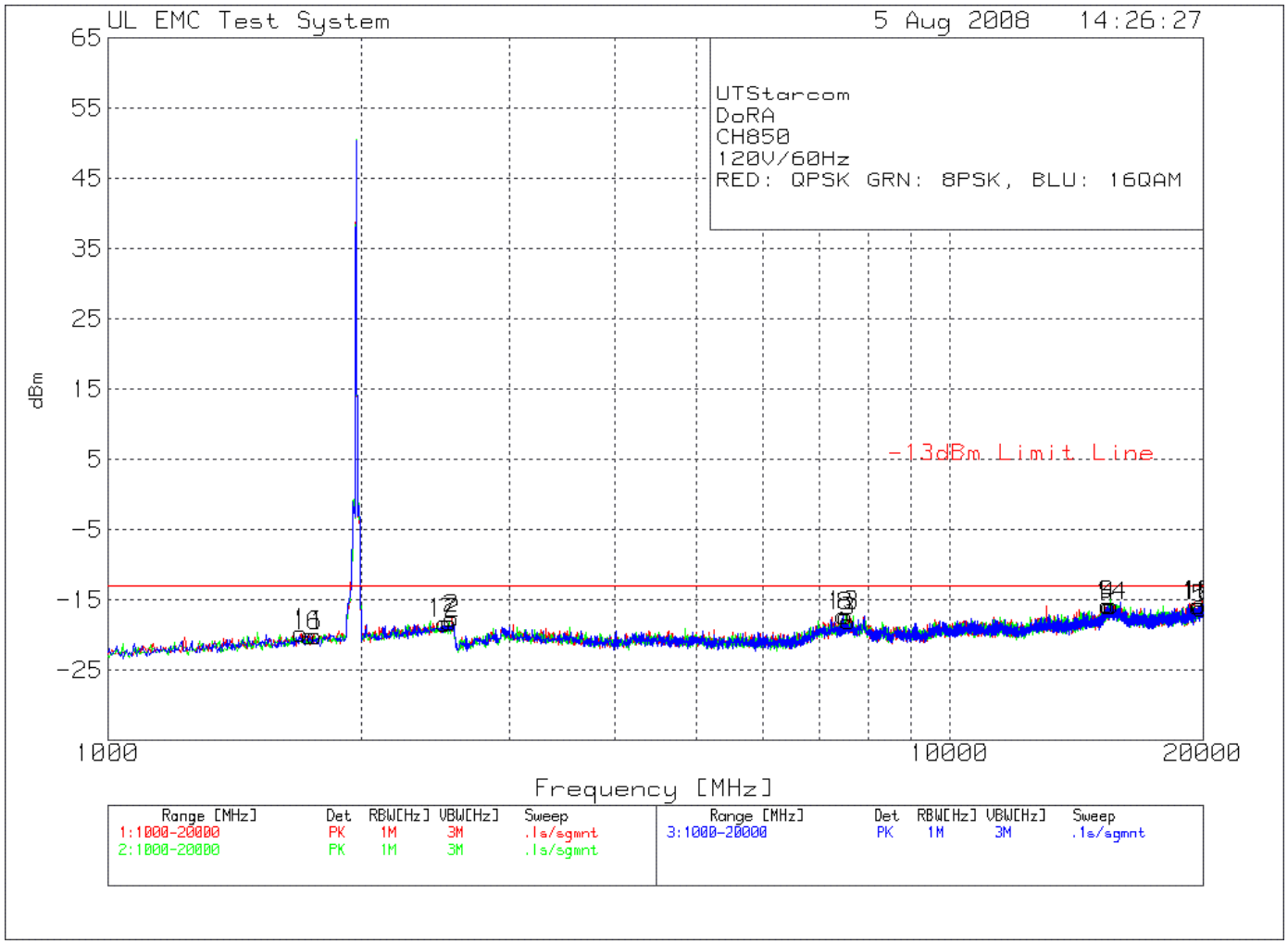


Figure 32 Out of Band Emissions Graph – CH875 – 1,000MHz – 20,000MHz

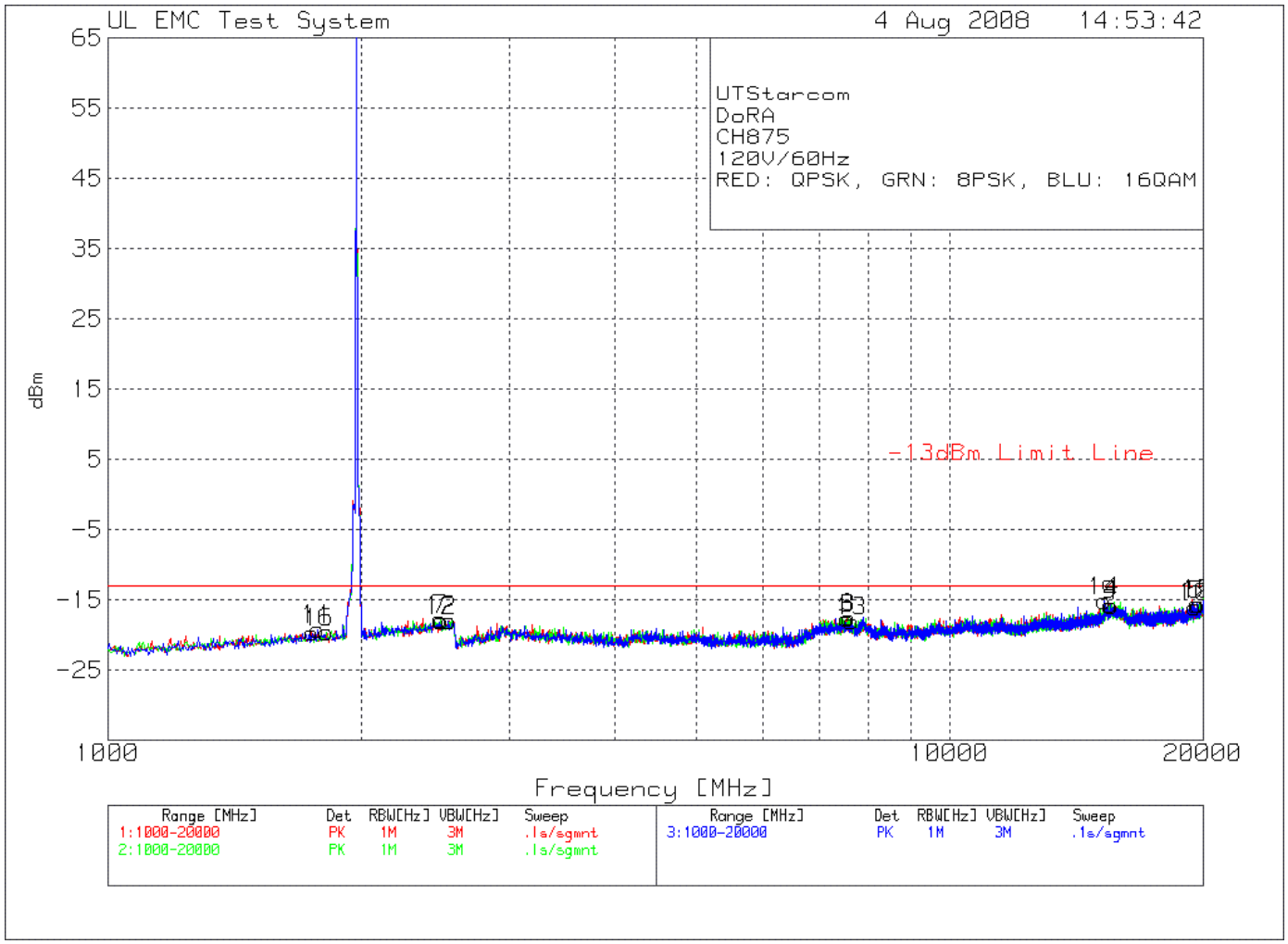


Figure 33 Out of Band Emissions Graph – CH925 – 1,000MHz – 20,000MHz

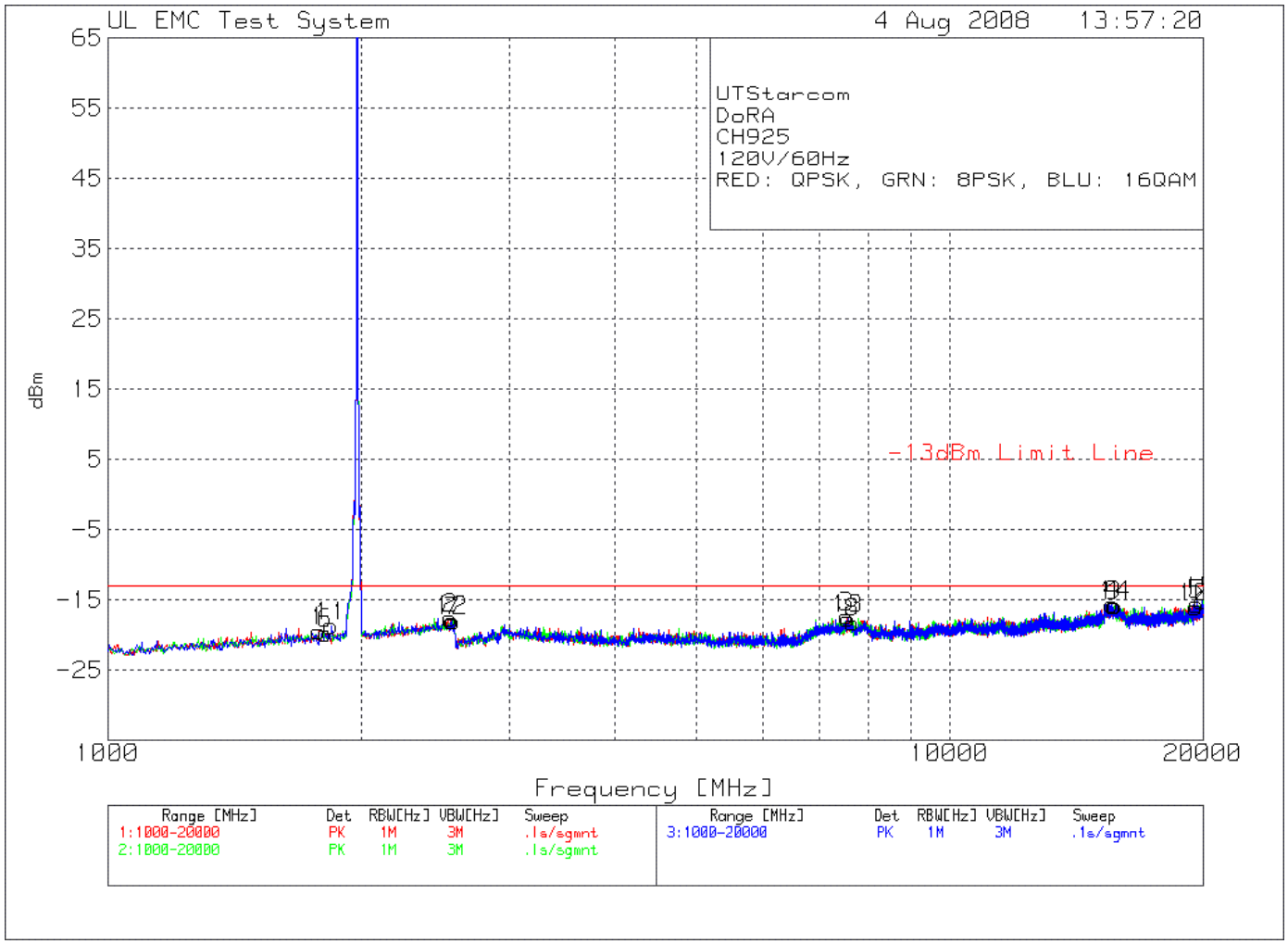


Figure 34 Out of Band Emissions Graph – CH1050 – 1,000MHz – 20,000MHz

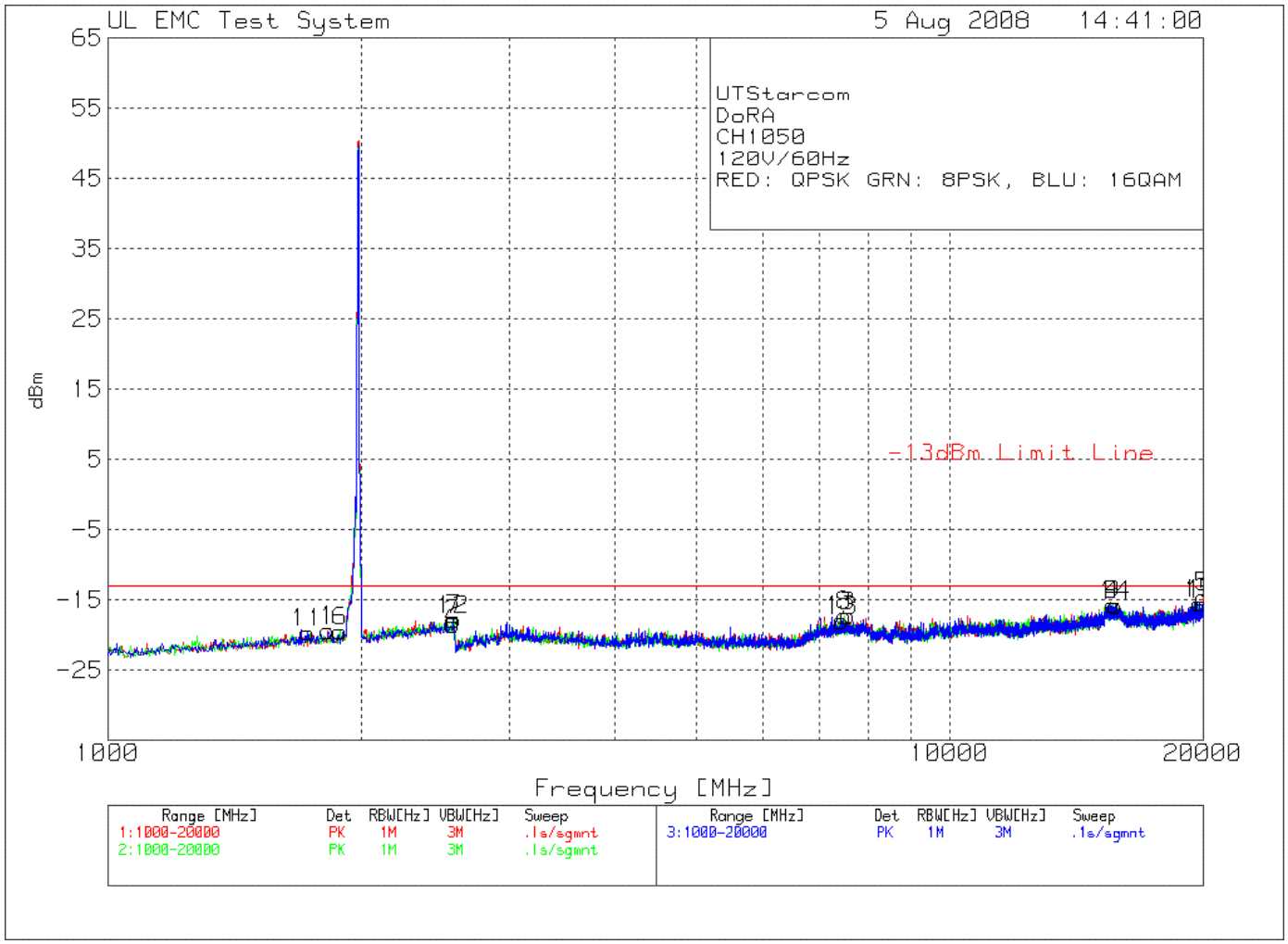
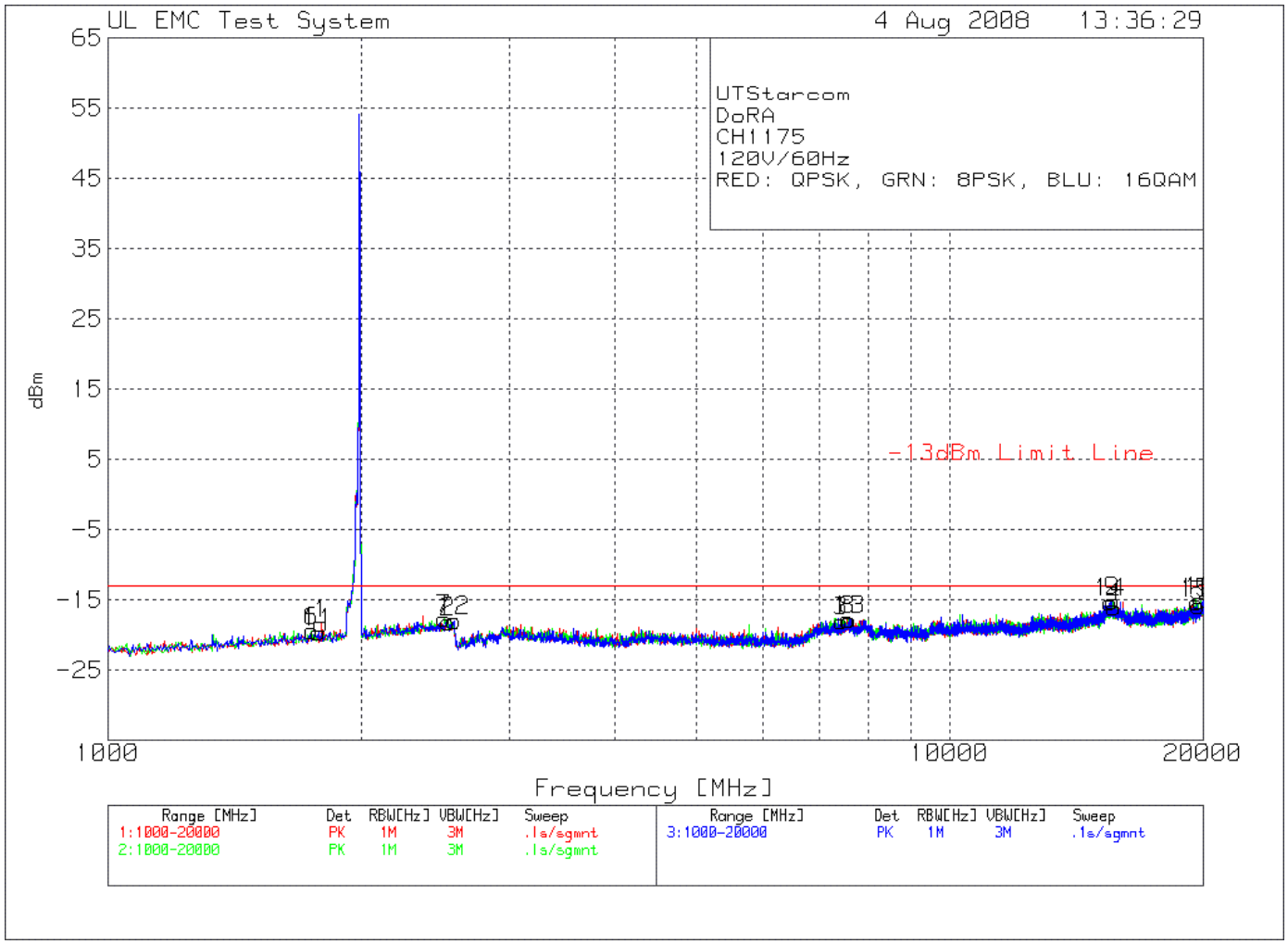


Figure 35 Out of Band Emissions Graph – CH1175 – 1,000MHz – 20,000MHz



4.4 Test Conditions and Results – RADIATED EMISSIONS 30MHz – 20GHz

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	47 CFR Part 15, Subpart B and Part 24.238 RSS-133, Section 6.6	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	10-meter distance
	1GHz – 20GHz	3-meter distance

Limits - Class A

Frequency (MHz)	Limits	
	Quasi-Peak	ERP (Calculated)
30 to 88	39.08dBuV/m @ 10-meter	NA
88 to 216	43.52dBuV/m @ 10-meter	NA
216 to 960	46.44dBuV/m @ 10-meter	NA
960 to 1000	49.54dBuV/m @ 10-meter	NA
Above 1,000 digital	60dBuV/m @ 10-meter	NA
Above 1,000 TX	NA	82.2dBuV/m @ 3m

Supplementary information: None

Table 9 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1

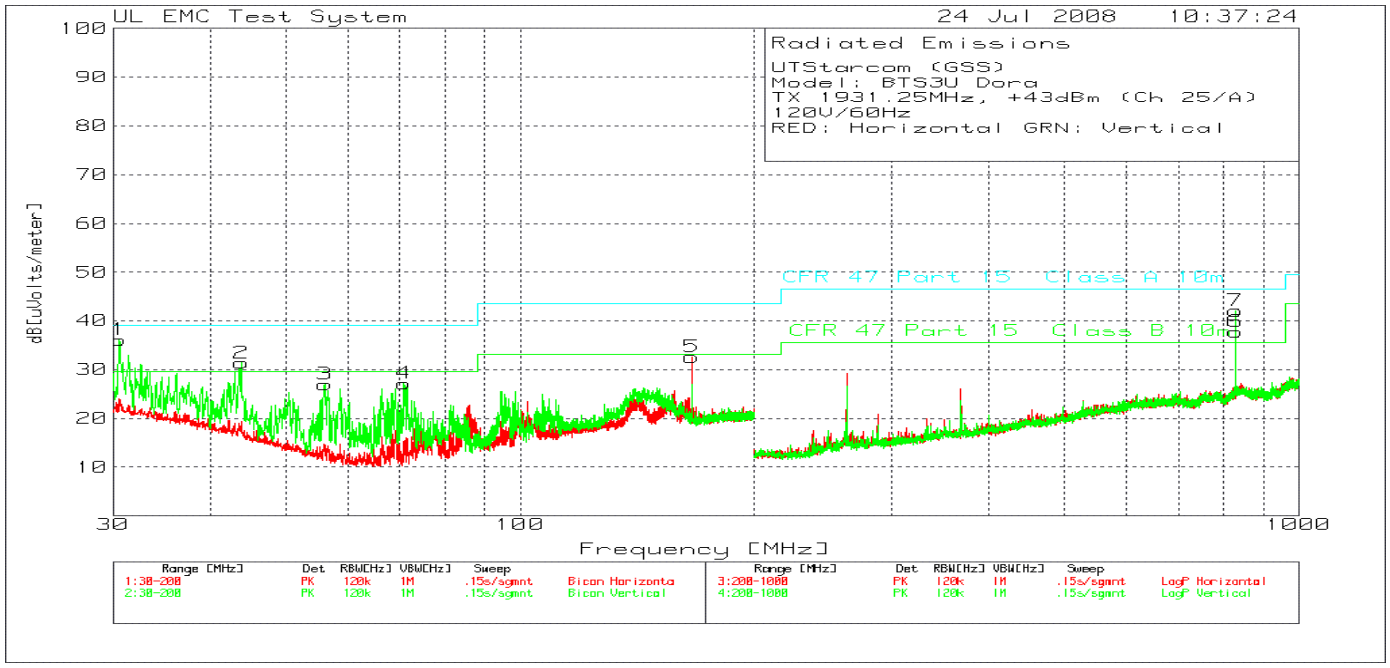
Supplementary information: None

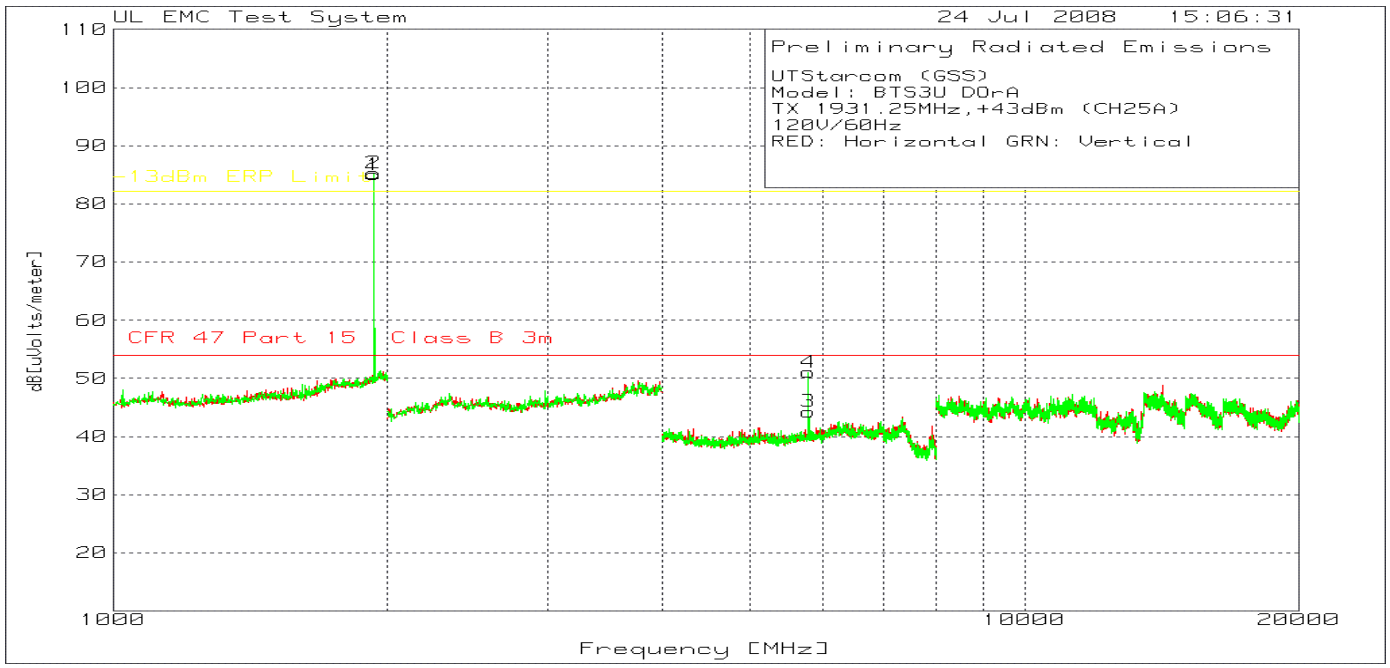
Table 10 Radiated Emissions Test Equipment

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	HP	8566B	EMC4085
Quasi-Peak Detector	HP	85650A	EMC4016
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6108	EMC4076
Bicon Antenna	Electro-Metrics	EM6912A	EMC4070
Log-P Antenna	Chase	UPA6109	EMC4258
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwartz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Figure 36 Test setup for Radiated Emissions

Figure 37 Radiated Emissions Graph – CH25





No emissions within 20dB of the ERP Level were detected.

Table 11 Radiated Emissions Data Points CH25

UTStarcom (GSS)
Model: BTS3U Dora
TX 1931.25MHz, +43dBm (Ch 25/A)
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
5	166.0255	47.5 pk	-30	15.1	32.6	-	-	43.5	33.1	-	-
	Azimuth:257	Height:300 Horz	Margin [dB]			-	-	-10.9	-.5	-	-
1	30.5521	48.8 pk	-30.4	17.7	36.1	-	-	39.1	29.6	-	-
	Azimuth:307	Height:100 Vert	Margin [dB]			-	-	-3	6.5	-	-
2	43.8021	49.3 pk	-30.3	12.4	31.4	-	-	39.1	29.6	-	-
	Azimuth:332	Height:100 Vert	Margin [dB]			-	-	-7.7	1.8	-	-
3	56.0754	49.6 pk	-30.2	7.6	27	-	-	39.1	29.6	-	-
	Azimuth:8	Height:200 Vert	Margin [dB]			-	-	-12.1	-2.6	-	-
4	70.8968	51.2 pk	-30.2	6.2	27.2	-	-	39.1	29.6	-	-
	Azimuth:81	Height:200 Vert	Margin [dB]			-	-	-11.9	-2.4	-	-
6	829.9276	46.8 pk	-31.7	22.7	37.8	-	-	46.4	35.6	-	-
	Azimuth:67	Height:99 Horz	Margin [dB]			-	-	-8.6	2.2	-	-
7	829.9276	51.1 pk	-31.7	22.7	42.1	-	-	46.4	35.6	-	-
	Azimuth:206	Height:176 Vert	Margin [dB]			-	-	-4.3	6.5	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

Only peaks within 6dB of the limit are measured.

Frequency [MHz]	Test	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Bicon Horizonta 30 - 200MHz											
30.582	45.85 qp	-30.4	17.7	33.15		-	-	39.1	29.6	-	-
Azimuth: 270	Height:111 Vert		Margin [dB]:			-	-	-5.95	3.55	-	-
LogP Vertical 200 - 1000MHz											
829.9379	49.25 qp	-31.7	22.7	40.25		-	-	46.4	35.6	-	-
Azimuth: 164	Height:176 Vert		Margin [dB]:			-	-	-6.15	4.65	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

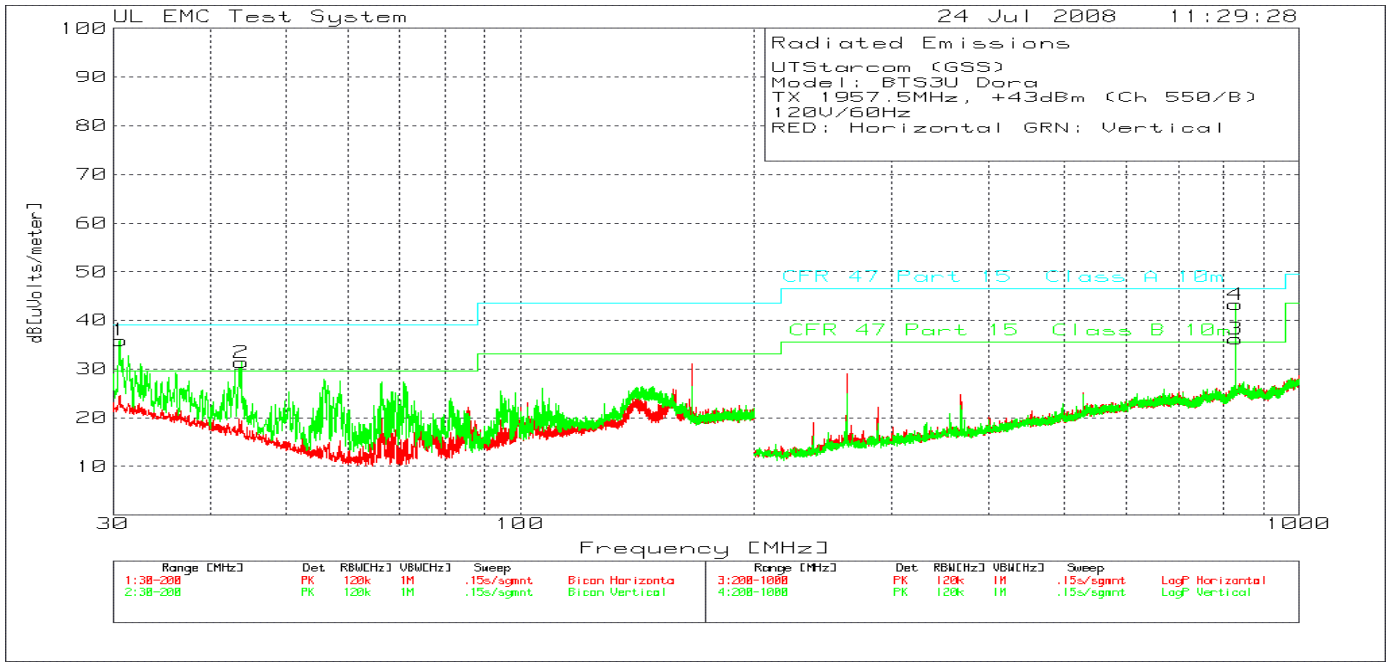
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Fundamental Frequency											
1	1931.864	54.25 pk	3.57	27.2	85.02	54	82.2	-	-	-	-
		Height:100 Horz	Margin [dB]			31.02	2.82	-	-	-	-
3	5793.195	65.3 pk	-49.73	28.7	44.27	54	82.2	-	-	-	-
		Height:101 Horz	Margin [dB]			-9.73	-37.93	-	-	-	-
Fundamental Frequency											
2	1931.864	54.53 pk	3.57	27.2	85.3	54	82.2	-	-	-	-
		Height:150 Vert	Margin [dB]			31.3	3.1	-	-	-	-
4	5793.195	72.07 pk	-49.73	28.7	51.04	54	82.2	-	-	-	-
		Height:150 Vert	Margin [dB]			-2.96	-31.16	-	-	-	-

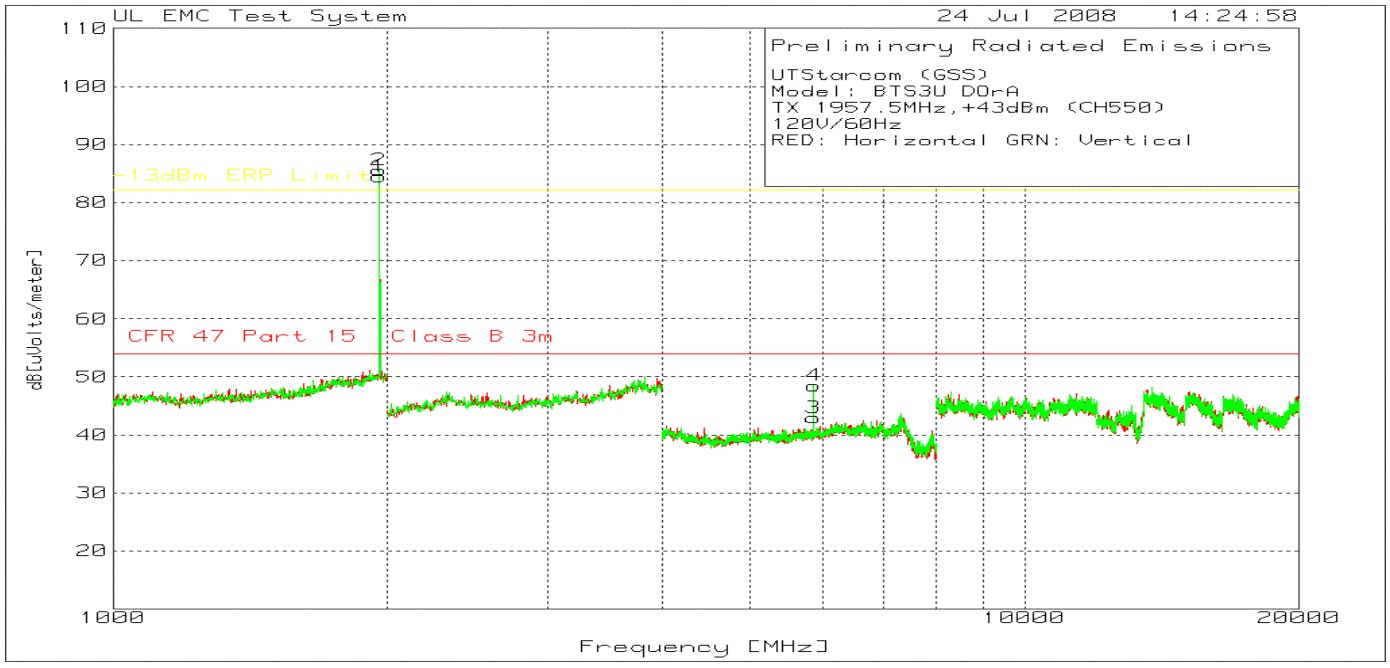
LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: -13dBm ERP Limit

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

Average measurements were not required.

Figure 38 Radiated Emissions Graph – CH550



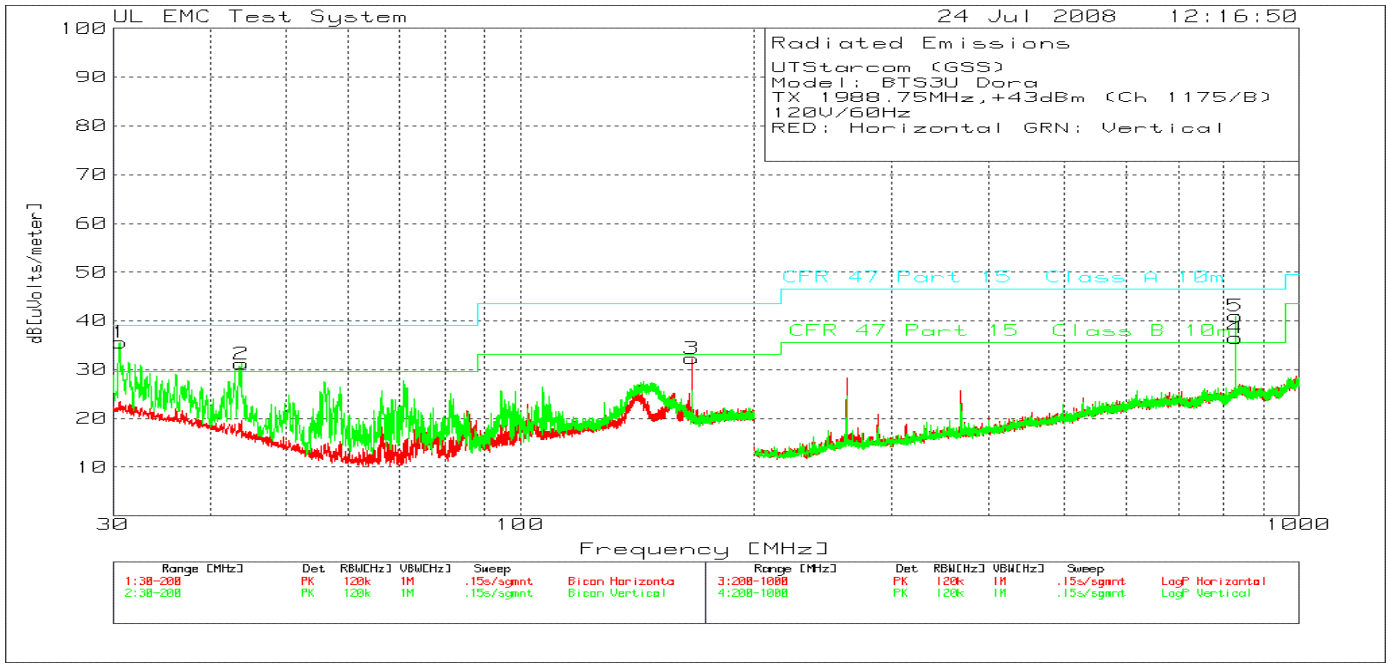


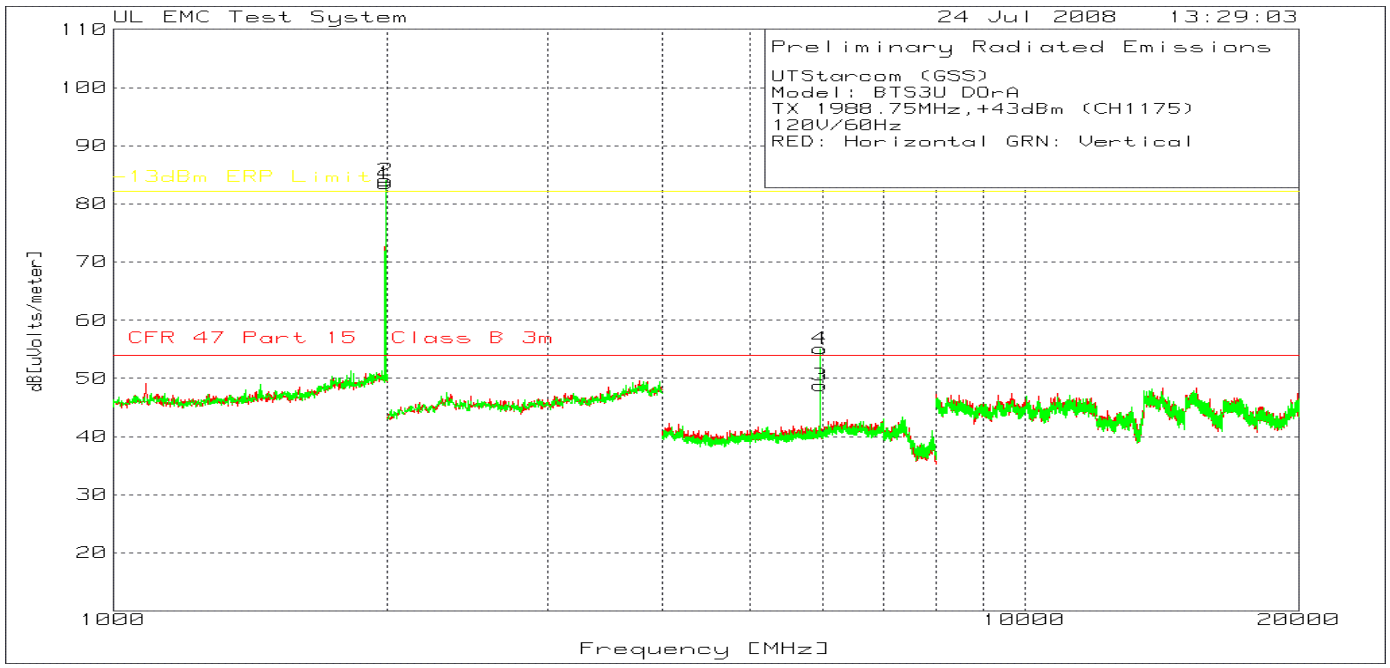
No emissions within 20dB of the ERP Level were detected.

Table 12 Radiated Emissions Data Points – CH550

```
 UTStarcom (GSS)
 Model: BTS3U Dora
 TX 1957.5MHz, +43dBm (Ch 550/B)
 120V/60Hz
 RED: Horizontal GRN: Vertical

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4       5       6
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
=============================================================================================================
1  30.5946      48.6 pk      -30.4     17.7      35.9      -        -     39.1    29.6      -       -
   Azimuth:3     Height:100 Vert     Margin [dB]           -        -     -3.2    6.3       -       -
2  43.8021      49.3 pk      -30.3     12.4      31.4      -        -     39.1    29.6      -       -
   Azimuth:105   Height:100 Vert     Margin [dB]           -        -     -7.7    1.8       -       -
3  829.9276     45.2 pk      -31.7     22.7      36.2      -        -     46.4    35.6      -       -
   Azimuth:67    Height:99 Horz      Margin [dB]           -        -     -10.2   .6        -       -
4  829.9276     52.3 pk      -31.7     22.7      43.3      -        -     46.4    35.6      -       -
   Azimuth:205   Height:178 Vert     Margin [dB]           -        -     -3.1    7.7       -       -

LIMIT 3: CFR 47 Part 15  Class A 10m
LIMIT 4: CFR 47 Part 15  Class B 10m

pk - Peak detector
qp - Quasi-Peak detector

 UTStarcom (GSS)
 Model: BTS3U Dora
 TX 1957.5MHz, +43dBm (Ch 550/B)
 120V/60Hz
 RED: Horizontal GRN: Vertical

  Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4       5       6
Frequency  Reading    Factor     Factor  dB[uVolts/meter]
 [MHz]     [dB(uV)]     [dB]      [dB]
=============================================================================================================
30.5776    44.92 qp      -30.4     17.7      32.22     -        -     39.1    29.6      -       -
Azimuth: 254  Height:105 Vert         Margin [dB]:      -        -     -6.88   2.62      -       -

829.9412   49.23 qp      -31.7     22.7      40.23     -        -     46.4    35.6      -       -
Azimuth: 164  Height:186 Vert         Margin [dB]:      -        -     -6.17   4.63      -       -

LIMIT 3: CFR 47 Part 15  Class A 10m
LIMIT 4: CFR 47 Part 15  Class B 10m

pk - Peak detector
qp - Quasi-Peak detector


Only peaks within 6dB of the limit are measured.


 UTStarcom (GSS)
 Model: BTS3U DOrA
 TX 1957.5MHz,+43dBm (CH550)
 120V/60Hz
 RED: Horizontal GRN: Vertical

      Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4       5       6
No. Frequency  Reading    Factor     Factor  dB[uVolts/meter]
     [MHz]     [dB(uV)]     [dB]      [dB]
=============================================================================================================
1  1957.916     53.37 pk      3.87     27.3      84.54   54       82.2      -       -       -       -
                 Height:99 Horz      Margin [dB]          30.54    2.34      -       -       -       -

3  5870.58      63.86 pk     -49.62    28.7      42.94   54       82.2      -       -       -       -
                 Height:101 Horz     Margin [dB]          -11.06   -39.26    -       -       -       -

2  1957.916     54.42 pk      3.87     27.3      85.59   54       82.2      -       -       -       -
                 Height:150 Vert     Margin [dB]          31.59    3.39      -       -       -       -

4  5873.249     69.42 pk     -49.64    28.7      48.48   54       82.2      -       -       -       -
                 Height:100 Vert     Margin [dB]          -5.52    -33.72    -       -       -       -


LIMIT 1: CFR 47 Part 15  Class B 3m
LIMIT 2: -13dBm ERP Limit
```

Figure 39 Radiated Emissions Graph – CH1175





No emissions within 20dB of the ERP Level were detected.

Table 13 Radiated Emissions Data Points - CH1175

UTStarcom (GSS)
Model: BTS3U Dora
TX 1988.75MHz,+43dBm (Ch 1175/B)
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
3	166.0679	47.2 pk	-30	15.1	32.3	-	-	43.5	33.1	-	-
	Azimuth:257	Height:299 Horz	Margin [dB]			-	-	-11.2	-.8	-	-
1	30.5946	48.3 pk	-30.4	17.7	35.6	-	-	39.1	29.6	-	-
	Azimuth:307	Height:200 Vert	Margin [dB]			-	-	-3.5	6	-	-
2	43.8021	49.1 pk	-30.3	12.4	31.2	-	-	39.1	29.6	-	-
	Azimuth:345	Height:100 Vert	Margin [dB]			-	-	-7.9	1.6	-	-
4	829.9276	45.5 pk	-31.7	22.7	36.5	-	-	46.4	35.6	-	-
	Azimuth:67	Height:100 Horz	Margin [dB]			-	-	-9.9	.9	-	-
5	829.9276	50 pk	-31.7	22.7	41	-	-	46.4	35.6	-	-
	Azimuth:218	Height:177 Vert	Margin [dB]			-	-	-5.4	5.4	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

UTStarcom (GSS)
Model: BTS3U Dora
TX 1988.75MHz,+43dBm (Ch 1175/B)
120V/60Hz
RED: Horizontal GRN: Vertical

Frequency [MHz]	Test	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
30.5759	47.42 qp	-30.4	17.7	34.72	-	-	39.1	29.6	-	-	
Azimuth: 325	Height:150 Vert		Margin [dB]:		-	-	-4.38	5.12	-	-	
829.9389	48.95 qp	-31.7	22.7	39.95	-	-	46.4	35.6	-	-	
Azimuth: 163	Height:183 Vert		Margin [dB]:		-	-	-6.45	4.35	-	-	

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

pk - Peak detector
qp - Quasi-Peak detector

UTStarcom (GSS)
Model: BTS3U DOrA
TX 1988.75MHz,+43dBm (CH1175)
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	1989.98	52.4 pk	3.65	27.5	83.55	54	82.2	-	-	-	-
		Height:100 Horz	Margin [dB]			29.55	1.35	-	-	-	-
3	5966.644	69.49 pk	-49.39	28.7	48.8	54	82.2	-	-	-	-
		Height:100 Horz	Margin [dB]			-5.2	-33.4	-	-	-	-
2	1989.98	52.92 pk	3.65	27.5	84.07	54	82.2	-	-	-	-
		Height:100 Vert	Margin [dB]			30.07	1.87	-	-	-	-
4	5966.644	75.79 pk	-49.39	28.7	55.1	54	82.2	-	-	-	-
		Height:100 Vert	Margin [dB]			1.1	-27.1	-	-	-	-

LIMIT 1: CFR 47 Part 15 Class B 3m
LIMIT 2: -13dBm ERP Limit

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector

4.5 Test Conditions and Results – Frequency Stability

Test Description	Sec. 24.235 Frequency stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. Sec. 2.1055 Measurements required: Frequency stability. (a) The frequency stability shall be measured with variation of ambient temperature as follows: (1) From -30[deg] to +50[deg] centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section. (b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10[deg] centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

Basic Standard	47 CFR Part 2.1055 and 47 CFR Part 24.235 Rss-133, Section 6.3	
UL LPG	N/A	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	1988.75MHz	Antenna Port Measurement

Limits	
Frequency (MHz)	dBm
30 to 20,000	Must stay within the frequency block

Supplementary information: EUT would not operate below –10°C and above 45°C. In addition do to limitation of the Spectrum Analyzer resolution multiple measurements were taken and averaged together.

Table 14 Frequency Stability Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1

Supplementary information: None

Table 15 Frequency Stability Test Equipment

Description	Manufacturer	Model	Identifier
Spectrum Analyzer	Rhode & Schwarz	ESU	
Attenuator	Pasternack	PE7019-30	NA

Description	Manufacturer	Model	Identifier
Attenuator	Minicircuit	10dB	NA
Attenuator	HP	6dB	NA

Figure 40 Test Setup for Frequency Stability

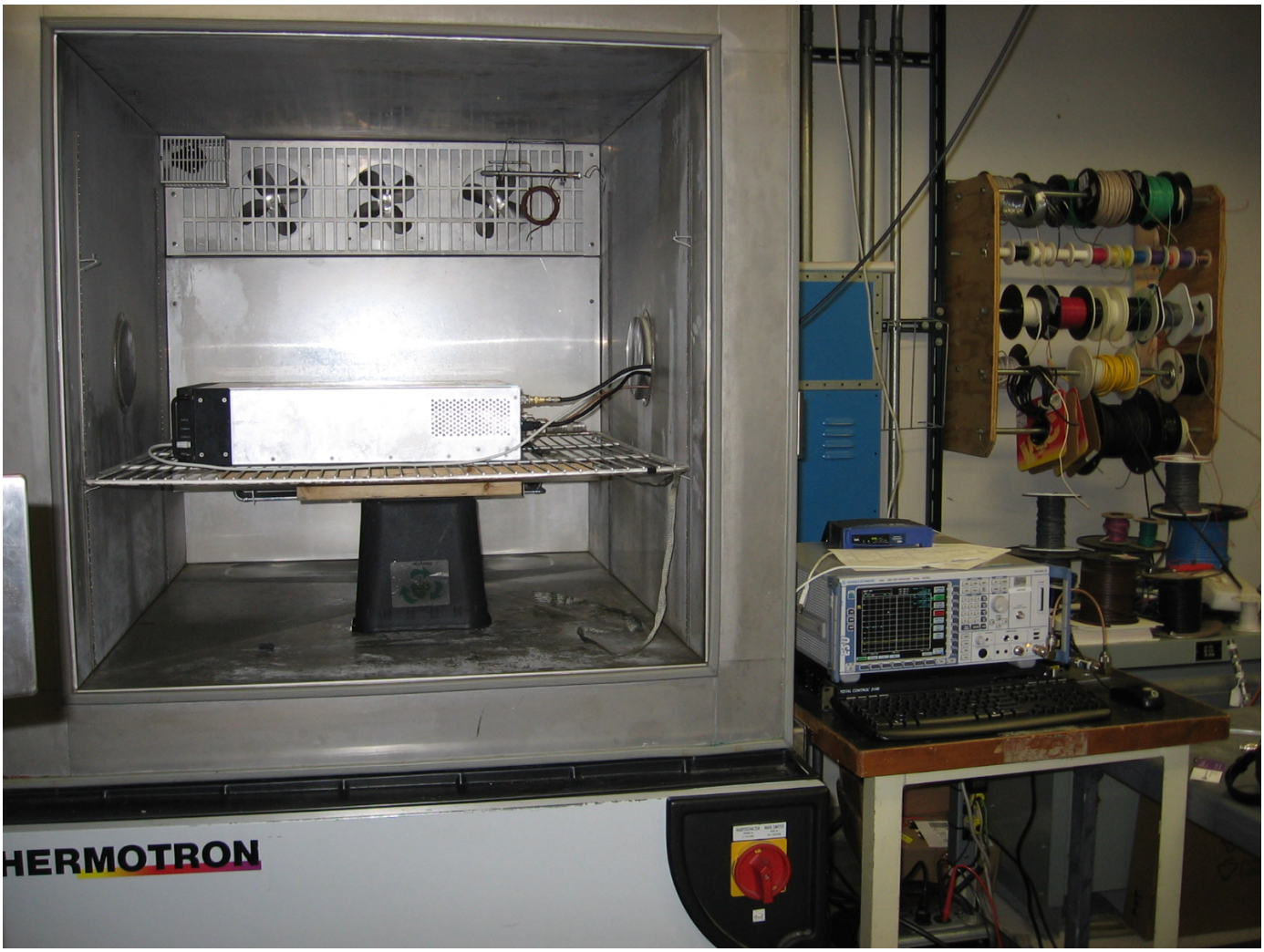


Table 16 Frequency Stability Data – Frequency vs. Voltage at 20°C

Voltage / Temp	Frequency (MHz)	PPM Error
102V/60Hz / 20°C	1988.750000	0
120V/60Hz / 20°C	1988.750000	Reference Data
138V/60Hz / 20°C	1988.748397	0.8

Table 17 Frequency Stability Data – Frequency vs. Input Voltage

Temp / Voltage	Frequency (MHz)	Input Voltage Variation (%)
-10°C / 120V	1988.749199	0.4
0°C / 120V	1988.750000	0
10°C / 120V	1988.750000	0
20°C / 120V	1988.750000	Reference Data
30°C / 120V	1988.751583	0.8
40°C / 120V	1988.750801	0.4
45°C / 120V	1988.750000	0

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6