



Subject: Application for Class II Permissive Change
Authorization under FCC ID: AS5ONEBTS-25,
to Add the UMTS Emission Designator 4M10F9W
to the Initial Filing.

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October 27, 2011

EXHIBIT 9: TEST REPORT

INTRODUCTION:

The exhibits presented in this test report demonstrate that the Alcatel-Lucent UMTS/WCDMA **1900MHz High Efficiency RF Power Amplifier (HE PAM)**, deployed in the **9391 OneBTS Macrocells**, is in full compliance with all requirements of the Rules of the Commission as specified in the Code of Federal Regulations (CFR), Title 47 – Telecommunication; Part 24, Subpart E – Broadband PCS; Section 24.238 - Emission limitations for Broadband PCS equipment; effective October 1, 2010. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2010. It also demonstrates compliance with the spurious emissions limitations specified in ETSI TS 125 141 V7.15.0 (2010-02); Universal Mobile Telecommunications System (UMTS); Base Station Conformance Testing (FDD), (3GPP TS 25.141, Version 7.15.0, Release 7). This standard was the guideline used in the design of the MCR1900 transceiver system

The initial FCC Grant of Equipment Authorization, under FCC ID: AS5ONEBTS-25, was issued April 7, 2010 for a CDMA product. The objective of this Class II Permissive Change request is to obtain authorization to add the UMTS/WCDMA emission designator, 4M10F9W, to the filing for the same product.

The UMTS-CDMA 1900 MHz Transceiver System, incorporating the 1900MHz High Efficiency Power Amplifier (HE-PAM) which is the subject of this Class II Permissive Change request, consists of the principle RF components: (1) Crystal Reference Oscillator Module (OMA) at 15 MHz, (2) UMTS-CDMA Multi-Carrier Radio (MCR1900), Model BNJ64, which was previously authorized by the Federal Communications Commission under FCC ID: AS5ONEBTS-09, (3) High Efficiency RF Power Amplifier (HE PAM), and (4) 60 MHz bandwidth Dual Duplex (DDpx), low loss, transmit filters covering the Broadband PCS frequency spectrum: 1930 — 1990 MHz.

As a Transceiver System, all conducted RF characteristics and emissions measurements were performed at the transmit antenna terminal (downlink), using a production equipment frame. All testing was performed by Global Product Compliance Laboratory (GPCL), Murray Hill, NJ.

Since the Reference Frequency Oscillator and the frequency determining and stabilization circuitry incorporated in the MCR1900 transceiver are unchanged from the initial Grant, frequency stability measurements were not repeated.

As a Class II Permissive Change, only the characteristics that could be affected by the Change need be evaluated. This report fully documents all required tests and the test results, sufficient to show full compliance with the Rules of the Commission.

APPLICABLE FCC RULES AND INDUSTRY STANDARDS:

The exhibits presented in this test report demonstrate that the Alcatel-Lucent UMTS/WCDMA **1900MHz High Efficiency RF Power Amplifier (HE PAM)** is in full compliance with all requirements of the Rules of the Commission as specified in the Code of Federal Regulations (CFR), Title 47 – Telecommunication; Part 24, Subpart E – Broadband PCS; Section 24.238 – Emission limitations for Broadband PCS Equipment; effective October 1, 2010. All testing was performed in accordance with CFR 47, Part 2, Subpart J – Equipment Authorization Procedures; effective October 1, 2010. It also demonstrates compliance with the spurious emissions limitations specified in ETSI TS 125 141 V7.15.0 (2010-02): Universal Mobile Telecommunications System (UMTS); Base Station Conformance Testing (FDD), (3GPP TS 25.141, Version 7.15.0, Release 7). The specific test procedures that are both required for and are applicable to this Class II certification are listed below. Note that Frequency Stability measurements need not be repeated.

Part 2.1046	RF Power Output	Pages 2 – 4
Part 2.1047	Modulation Characteristics	Pages 5 – 12
Part 2.1049	Occupied Bandwidth	Pages 13 – 26
Part 2.1051	Spurious Emissions at the Antenna Terminals.	Pages 27 – 33
Part 2.1053	Field Strength of Spurious Radiation	Page 34
Part 2.1057	Frequency Spectrum to be Investigated	
Part 22	Public Mobile Services; Subpart H – Cellular Radiotelephone Service	
Part 22.917	Emission Limitations for Cellular Equipment	
ETSI	TS 125 141 V7.15.0 (2010-02): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Conformance Testing (FDD), (3GPP TS 25.141, Version 7.15.0, Release 7).	
ETSI	TS 125 104 V8.3.0 (2008-06): Universal Mobile Telecommunications System (UMTS); Base Station (BS) Radio Transmission and Reception (FDD), (3GPP TS 25.104, Version 8.3.0, Release 8).	
ANSI C63.4-2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic in the Range of 9 kHz to 40 GHz; September 15, 2009.	

PART 2.1046 MEASUREMENTS REQUIRED: RF POWER OUTPUT

The **single UMTS/WCDMA 1900MHz High Efficiency RF Power Amplifier (HE PAM)** is designed to provide a **single carrier** with the maximum rated power level of 72W, measured at the transmit (downlink) antenna terminal.

Single High Efficiency RF Power Amplifier (HE PAM)

Number of Carriers	Rated RF Power per Carrier	Measured RF Power	HE PAM 1900MHz PA Configuration
1	72W	48.6 dBm (72W)	1 Single

The carrier channel frequencies used were the lowest settable and the highest settable of each 15MHz frequency block (A,B & C), plus mid-band for the 5MHz frequency blocks (D, E & F).

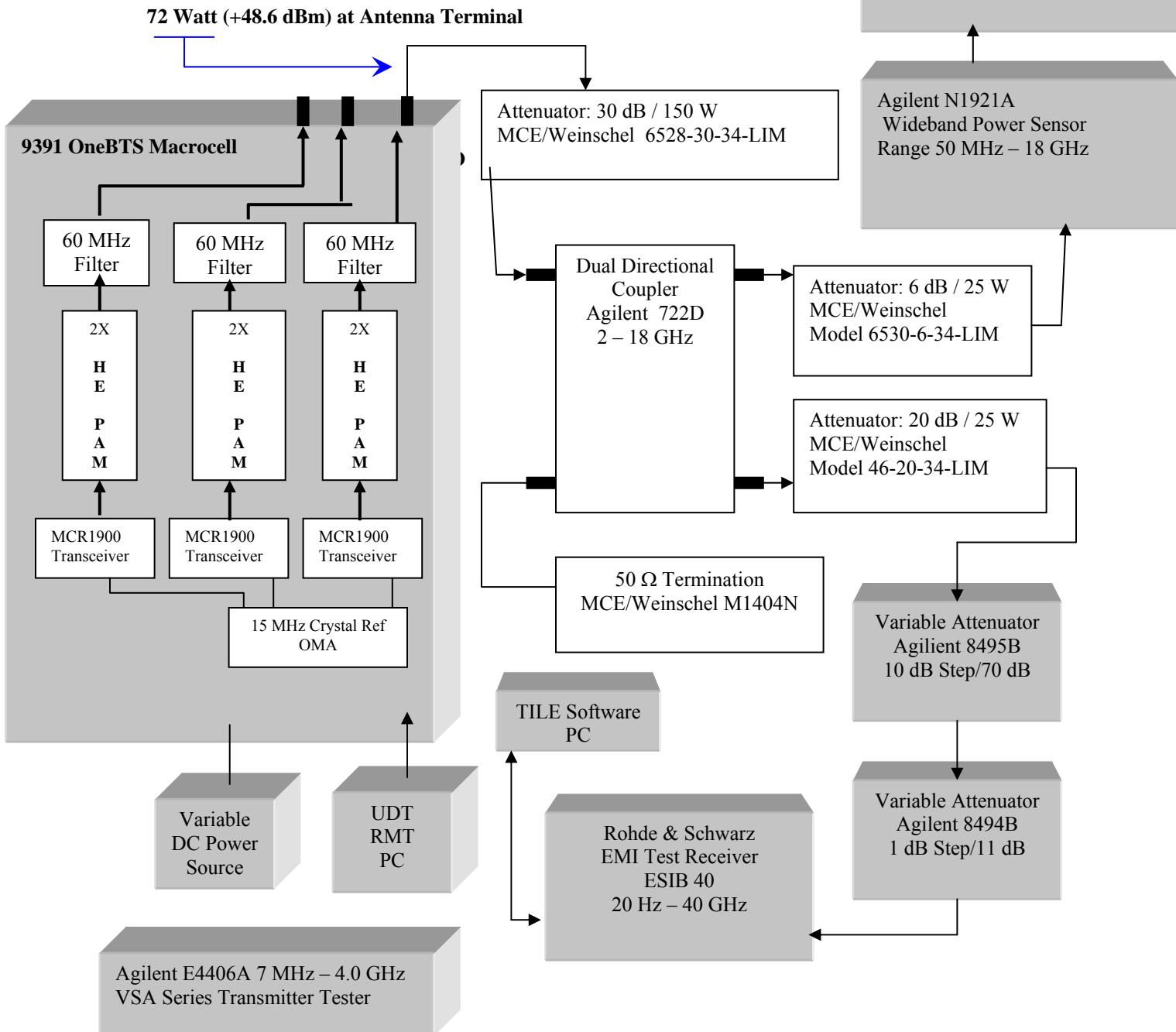
The 1900 MHz Single Carrier Test Frequencies at 72 W (+48.6 dBm) are:

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency
A1	Lowest Settable Channel	12	1932.5 MHz
A3	Highest Settable Channel	62	1942.5 MHz
D	Block Center	87	1947.5 MHz
B1	Lowest Settable Channel	112	1952.5 MHz
B3	Highest Settable Channel	162	1962.5 MHz
E	Block Center	187	1967.5 MHz
F	Block Center	212	1972.5 MHz
C3	Lowest Settable Channel	237	1977.5 MHz
C5	Highest Settable Channel	287	1987.5 MHz

Note: UARFCN = UTRA Absolute Radio Frequency Channel Number

Results: The UMTS 1900 MHz HE PAM is compliant with the manufacturer's rated power level at the transmit antenna terminal for the above listed carrier frequencies.

Block Diagram Of The Power Measurement Test Set-Up And Test Equipment Configuration for the Alcatel-Lucent UMTS 1900 MHz High Efficiency RF Power Amplifier (HE PAM)



PART 2.1047 MEASUREMENTS REQUIRED: MODULATION CHARACTERISTICS

Modulation characteristics are a property of the transceiver, which is unchanged from the initial filing. However, this test will be repeated with the 1900 MHz HE-PAM as part of the transceiver system.

The modulation accuracy was measured at the Equipment Antenna Terminal (EAC) for each of the *single carrier* test frequencies and power level previously cited, i.e., the lowest and highest settable carrier frequencies for the A, B and C-Blocks and mid-band for D, E and F-Blocks. The data is tabulated below. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

In accordance with ETSI TS 25.141, the Error Vector Magnitude (EVM) was measured for two test modulation (TM) schemes:

- 1) **TM1-64** with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %
- 2) **TM 5-44** with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Limit: EVM RMS < 12.5 %.

In each test, the power level was set to Pmax: 72W (48.6 dBm). The test equipment used was an Agilent E4406A VSA Series Transmitter Tester. Modulation accuracy measurement mode was Composite EVM, using the Peak/Average Metrics.

RMS Error Vector Magnitude (EVM) Measurement Summary at the Antenna Terminal:**TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm)**

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency TM1-64 (QPSK)	Modulation Accuracy Average < 17.5 %	Modulation Accuracy Peak Hold < 17.5 %
A1	Lowest Settable Channel	12	1932.5 MHz	6.86 %	7.81 %
A3	Highest Settable Channel	62	1942.5 MHz	6.56 %	7.51 %
D	Block Center	87	1947.5 MHz	6.60 %	7.50 %
B1	Lowest Settable Channel	112	1952.5 MHz		
B3	Highest Settable Channel	162	1962.5 MHz	6.58 %	7.50 %
E	Block Center	187	1967.5 MHz	6.60 %	7.59 %
F	Block Center	212	1972.5 MHz	6.59 %	7.48 %
C3	Lowest Settable Channel	237	1977.5 MHz	6.61 %	7.49 %
C5	Highest Settable Channel	287	1987.5 MHz	6.58 %	7.61 %

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm)

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency TM5-44 (16QAM)	Modulation Accuracy Average < 12.5 %	Modulation Accuracy Peak Hold < 12.5 %
A1	Lowest Settable Channel	12	1932.5 MHz	5.87 %	6.66 %
A3	Highest Settable Channel	62	1942.5 MHz	5.58 %	6.38 %
D	Block Center	87	1947.5 MHz	5.58 %	6.36 %
B1	Lowest Settable Channel	112	1952.5 MHz	5.58 %	6.34 %
B3	Highest Settable Channel	162	1962.5 MHz	5.60 %	6.47 %
E	Block Center	187	1967.5 MHz	5.62 %	6.32 %
F	Block Center	212	1972.5 MHz	5.60 %	6.56 %
C3	Lowest Settable Channel	237	1977.5 MHz	5.60 %	6.37 %
C5	Highest Settable Channel	287	1987.5 MHz	5.64 %	6.39 %

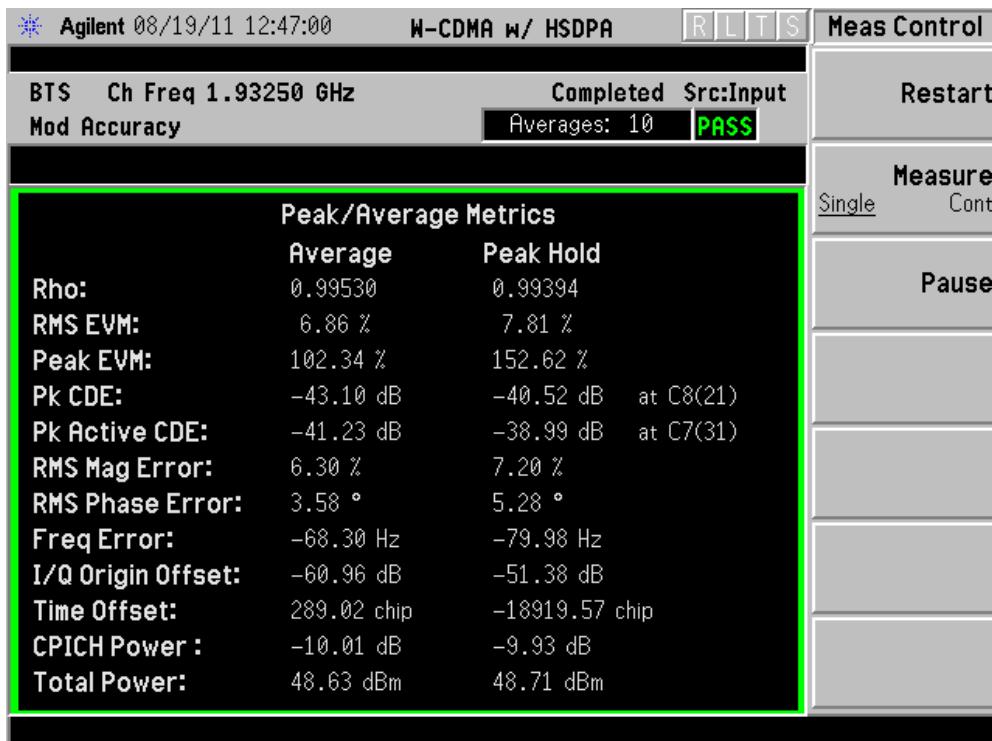
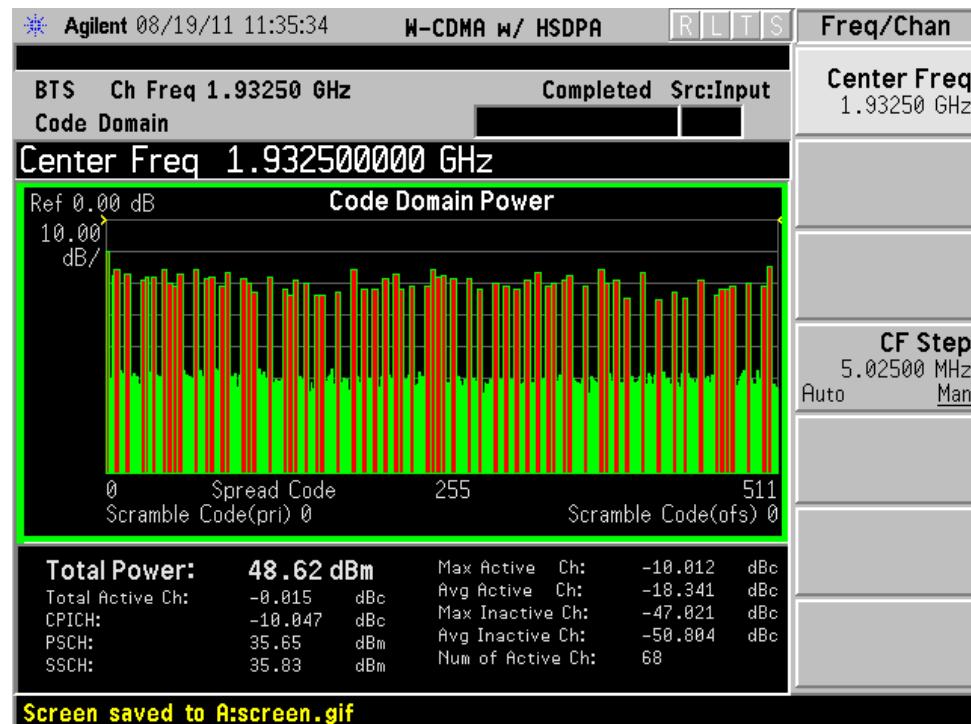
Minimum Standard Requirement: The minimum standard requirement is that the RMS Error Vector Magnitude (EVM) shall be less than 17.5% for TM1-64 (QPSK) and less than 12.5% for TM5-44 (16QAM).

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement, with exception that the ESIB-40 EMI Test Receiver is replaced by Agilent E4406A VSA Series Transmitter Tester, 7 MHz – 4.0 GHz

RESULTS: The UMTS/WCDMA **1900MHz High Efficiency RF Power Amplifier (HE PAM)** demonstrated full compliance with the modulation accuracy requirements specified in ETSI TS 25.141. All channels measured were less than the 12.5% RMS limitation. The plots for each channel are recorded and stored on file. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

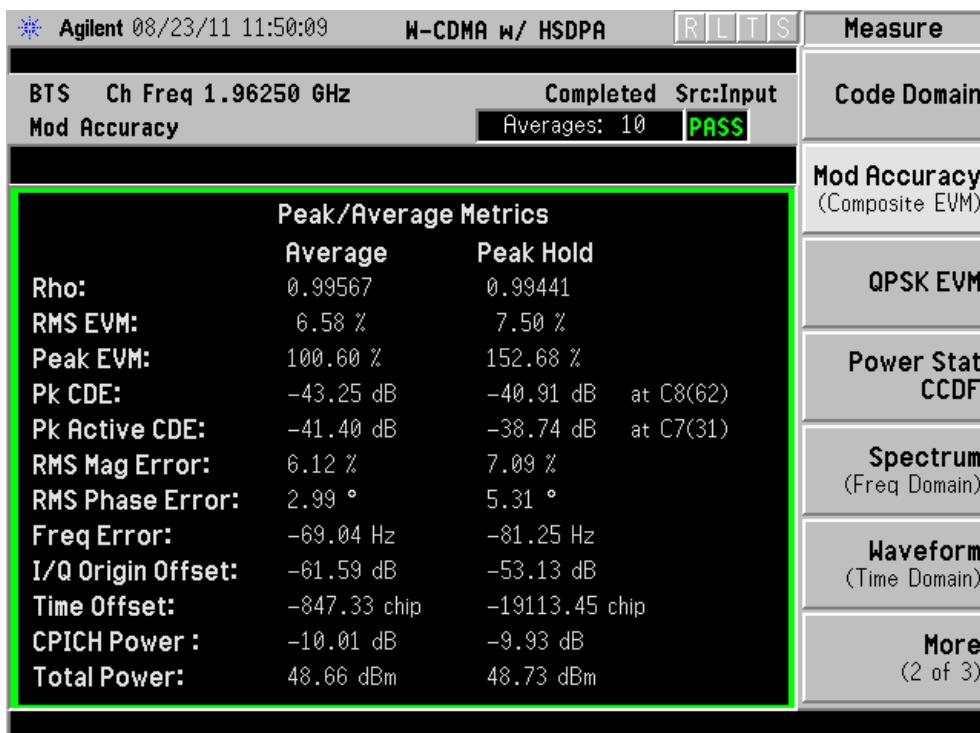
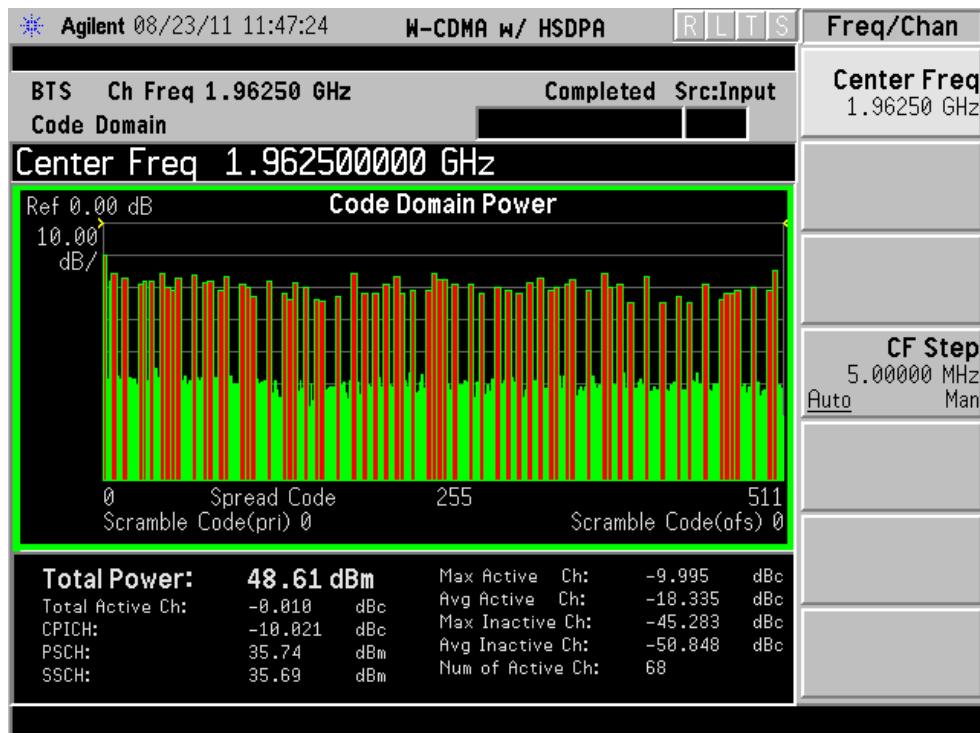
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



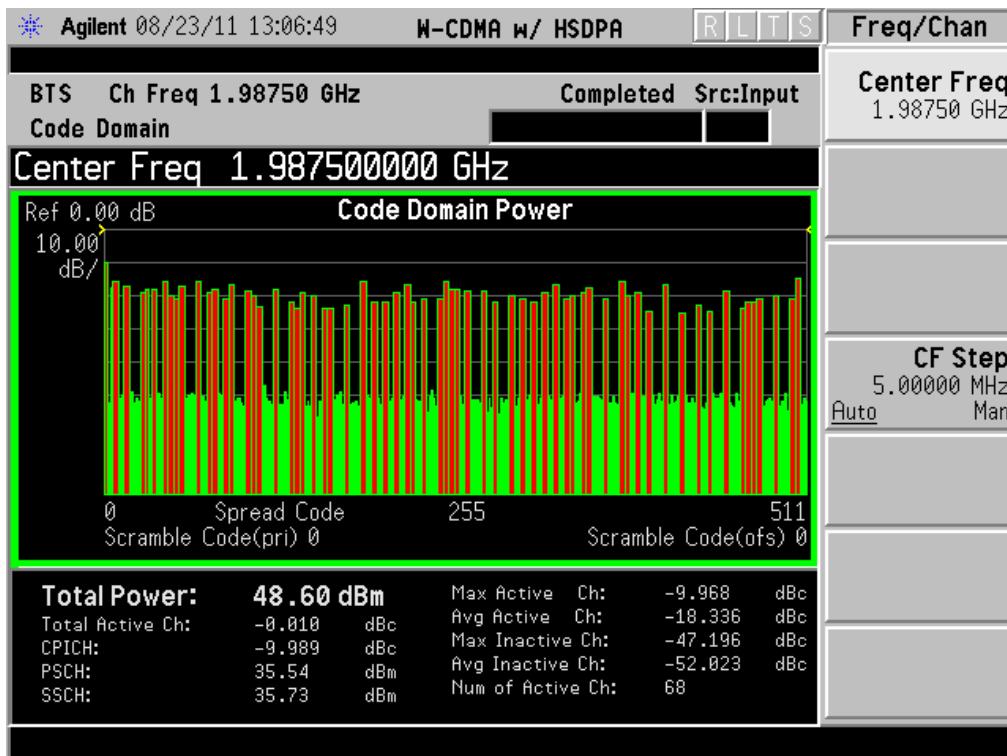
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



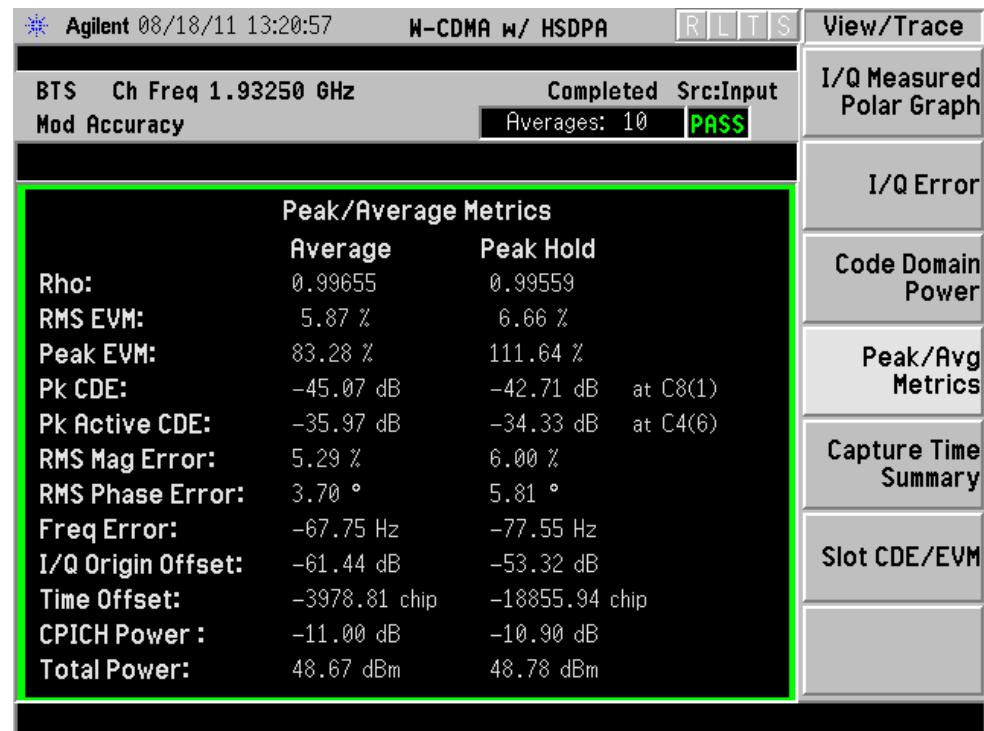
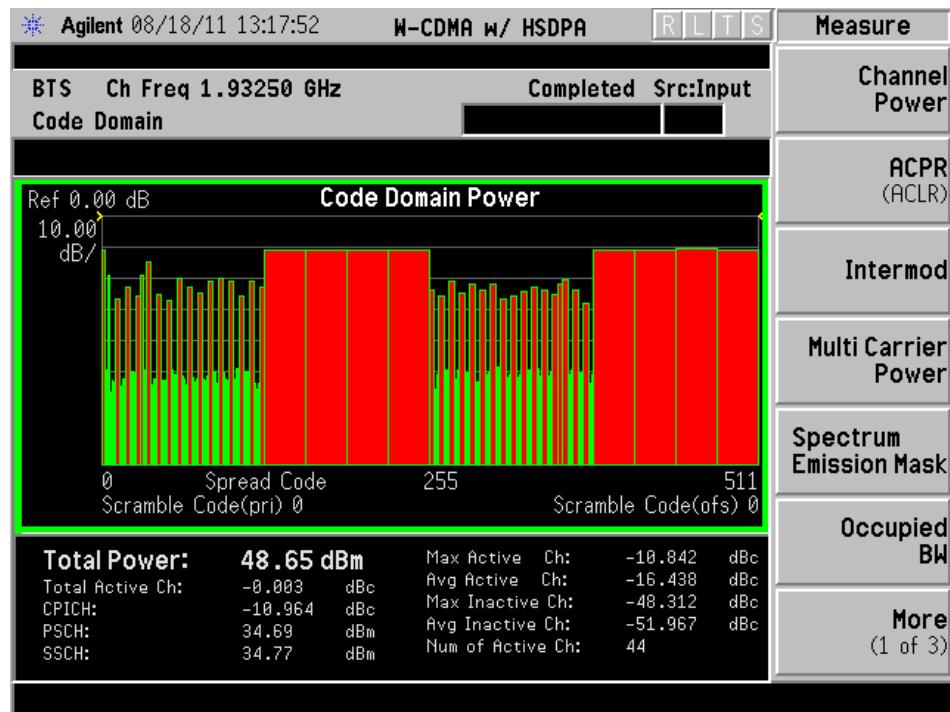
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Limit: EVM RMS < 17.5 %

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



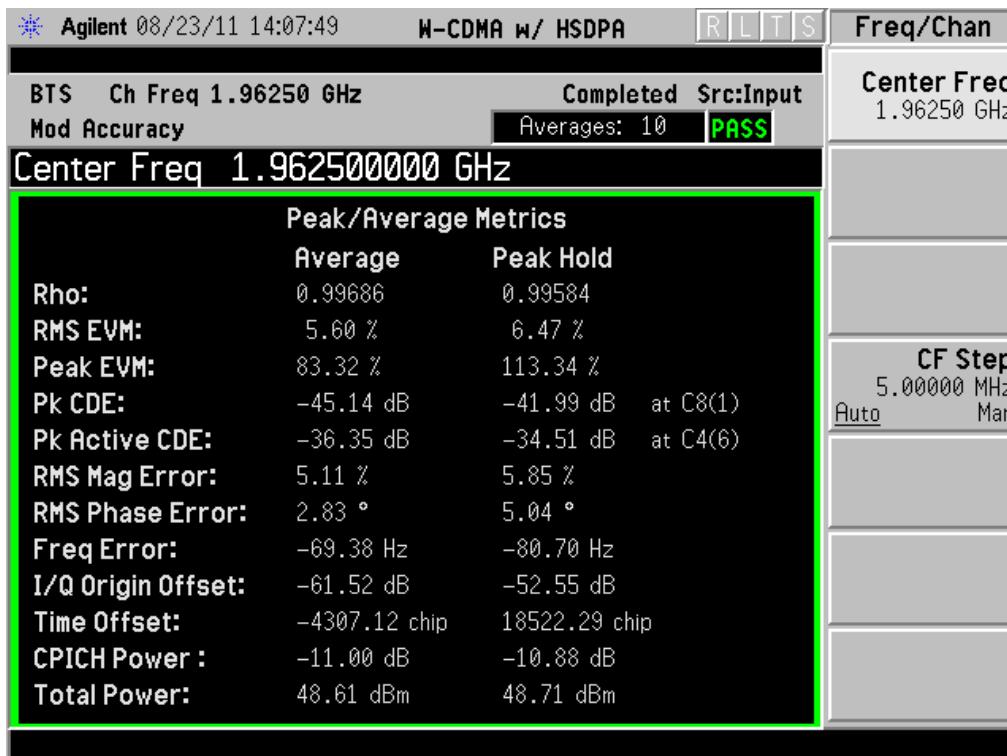
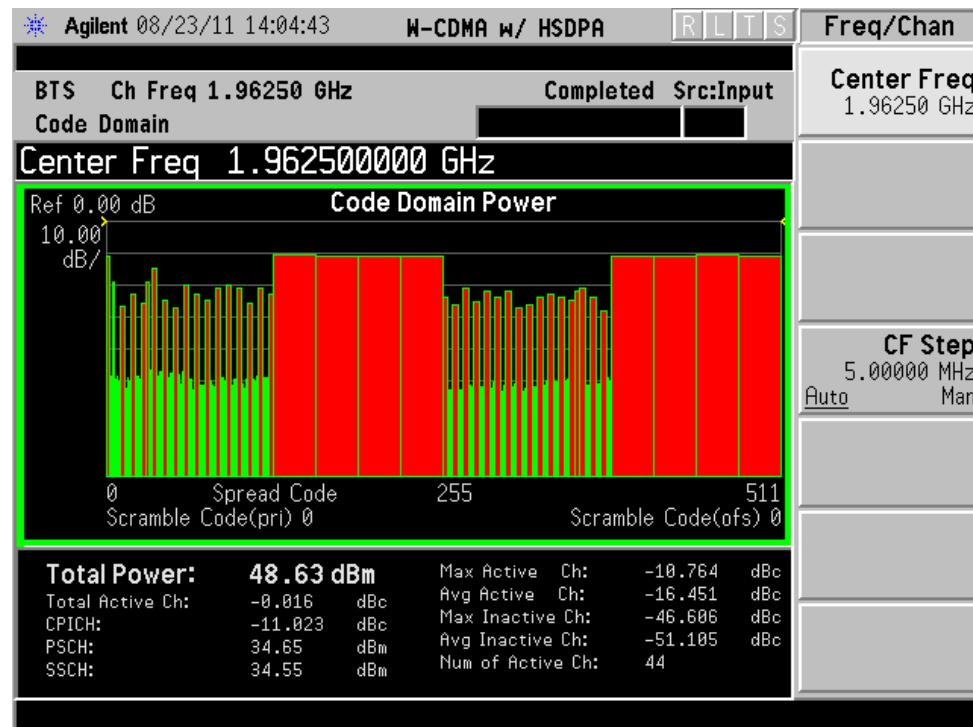
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Limit: EVM RMS < 12.5 %.

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



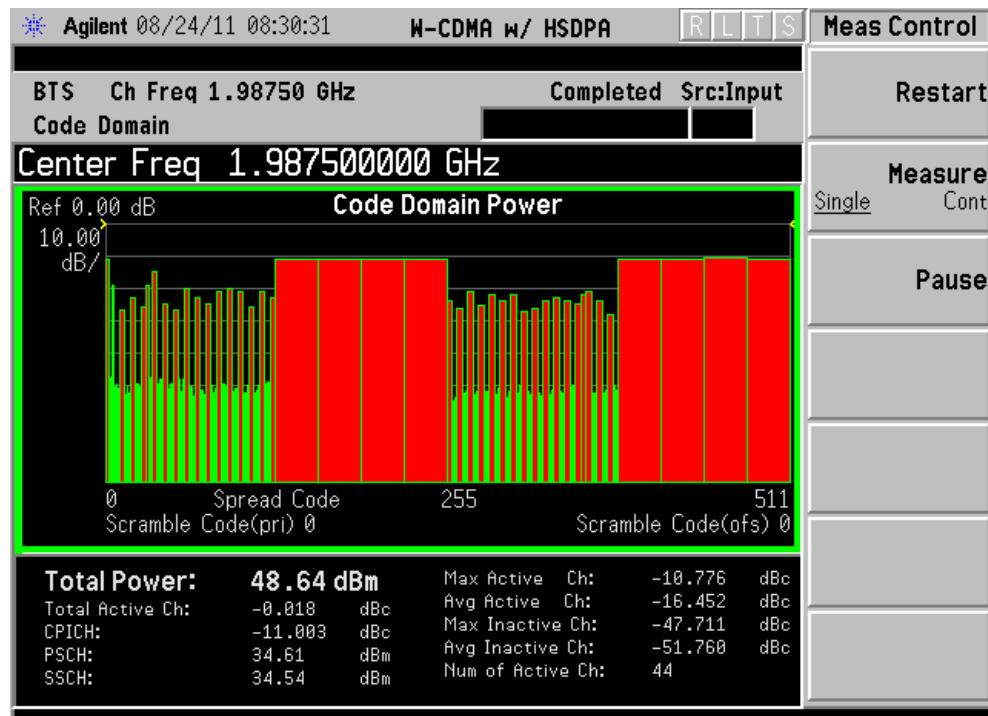
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Limit: EVM RMS < 12.5 %.

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Limit: EVM RMS < 12.5 %.

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH

The occupied bandwidth was measured at the Equipment Antenna Terminal (EAC) for the previously cited Single-Carrier Frequencies at 72W (48.6 dBm). The configuration and power level evaluated was:

Single Carrier Operation (3S1C) at 72 Watts (+48.6 dBm) with a Single HE PAM

Compliance was demonstrated for the ETSI TS 25.141 emission masks, using both the TM1-64 and TM5-44 test modulations, for the above configuration and power level.

The occupied bandwidth was measured by two methods:

1. The carrier 99% power bandwidth, which is also the necessary bandwidth, using an Agilent E4406A VSA Series Transmitter Tester 7MHz-4.0 GHz.
2. Emission mask limitation using a Rohde & Schwarz ESIB-40 EMI Test Receiver, to demonstrate compliance with the ETSI TS 25.141 emission mask requirements and with Part 24.238

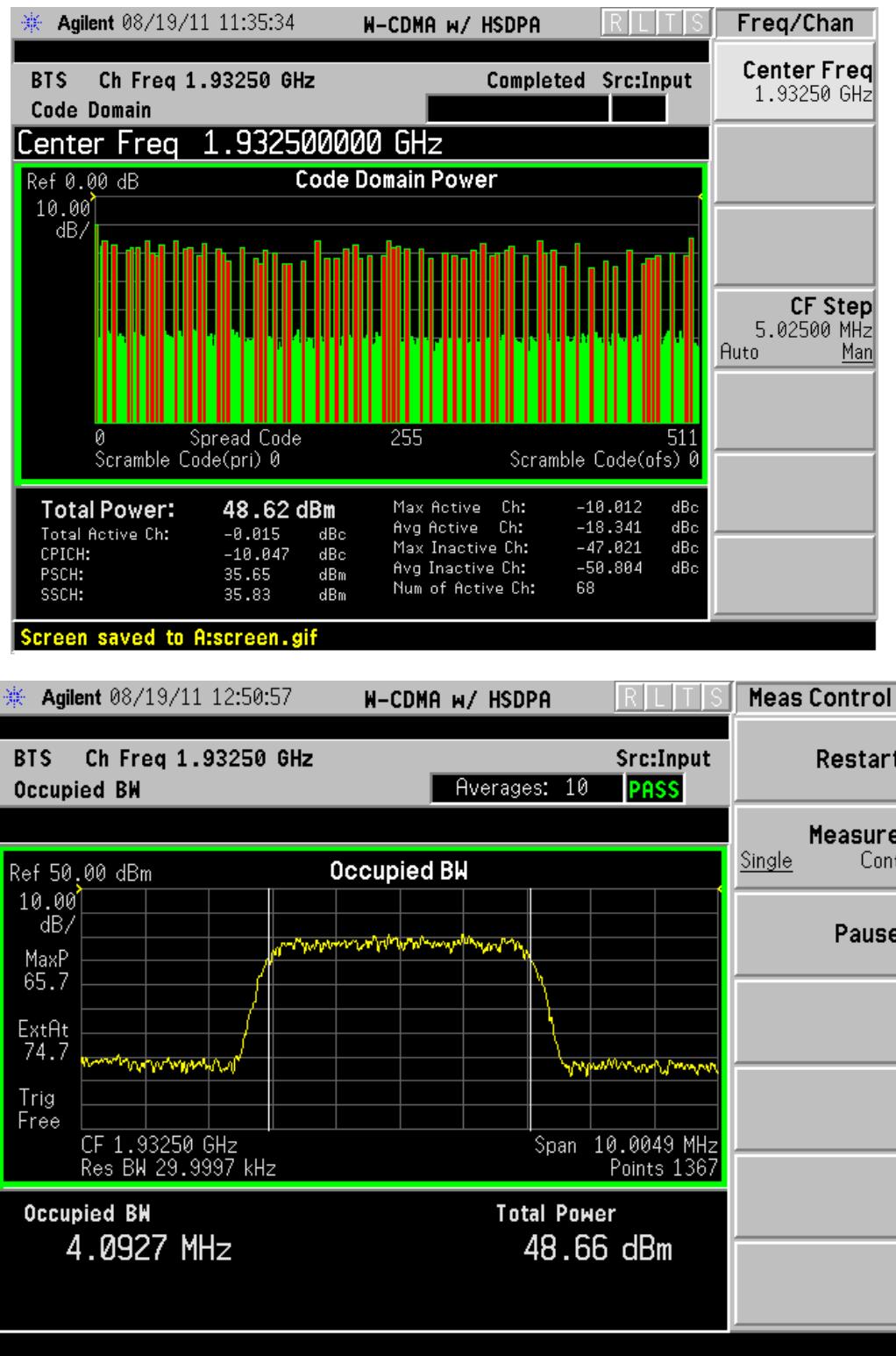
Method 1: The carrier 99% power bandwidth was measured at the Equipment Antenna Terminal (EAC) for the single carrier configuration shown above at 72W (48.6 dBm) for both TM1-64 (QPSK) and TM5-44 (16QAM) test modulations.

PCS Frequency	PCS Frequency Block	UARFCN Channel Number	Carrier Center Frequency 72W (48.6 dBm)	Measured Carrier 99% Power Bandwidth TM1-64	Measured Carrier 99% Power Bandwidth TM5-44
A1	Lowest Settable Channel	12	1932.5 MHz	4.0927 MHz	4.1020 MHz
A3	Highest Settable Channel	62	1942.5 MHz	4.0953 MHz	4.0945 MHz
D	Block Center	87	1947.5 MHz	4.1037 MHz	4.0990 MHz
B1	Lowest Settable Channel	112	1952.5 MHz	4.1008 MHz	4.0910 MHz
B3	Highest Settable Channel	162	1962.5 MHz	4.0925 MHz	4.0989 MHz
E	Block Center	187	1967.5 MHz	4.0966 MHz	4.1026 MHz
F	Block Center	212	1972.5 MHz	4.1019 MHz	4.1037 MHz
C3	Lowest Settable Channel	237	1977.5 MHz	4.1018 MHz	4.0937 MHz
C5	Highest Settable Channel	287	1987.5 MHz	4.1054 MHz	4.1028 MHz

Results: The 99% occupied bandwidth measurement confirms that the carrier's emission designator remains at 4M10F9W. The plots for each channel are recorded and stored on file. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

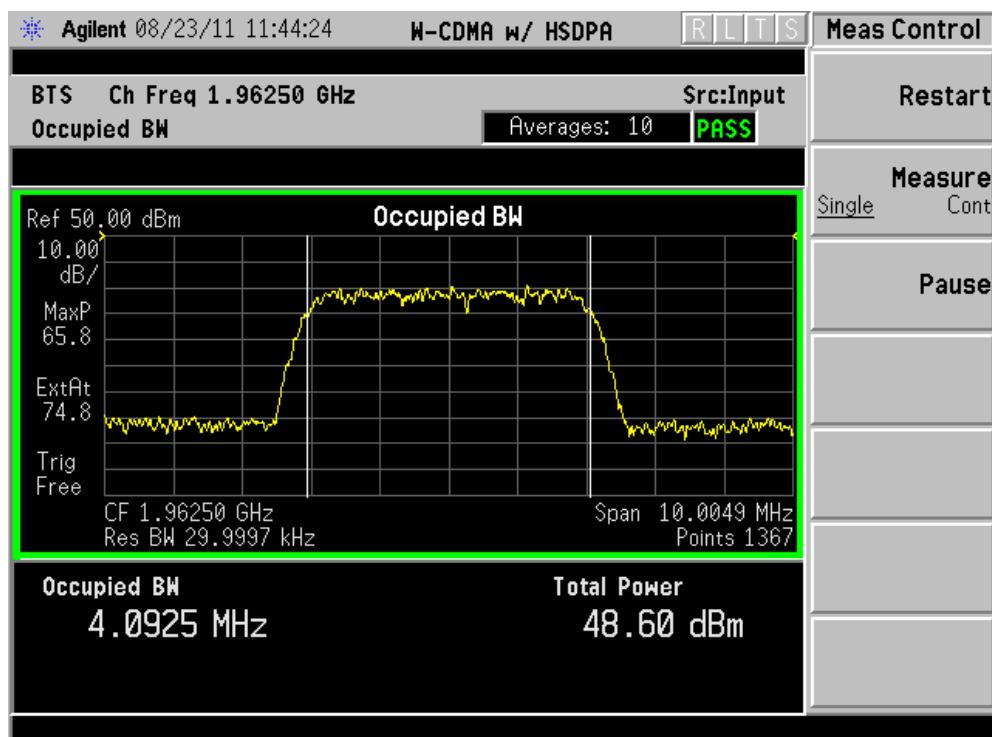
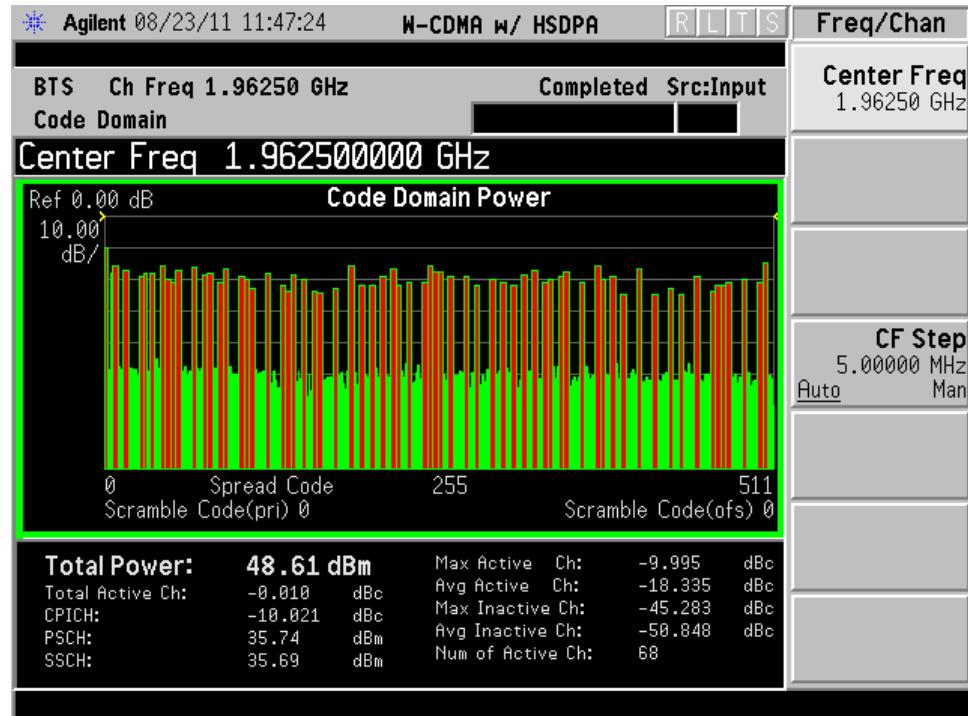
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). 99% Occupied Bandwidth

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



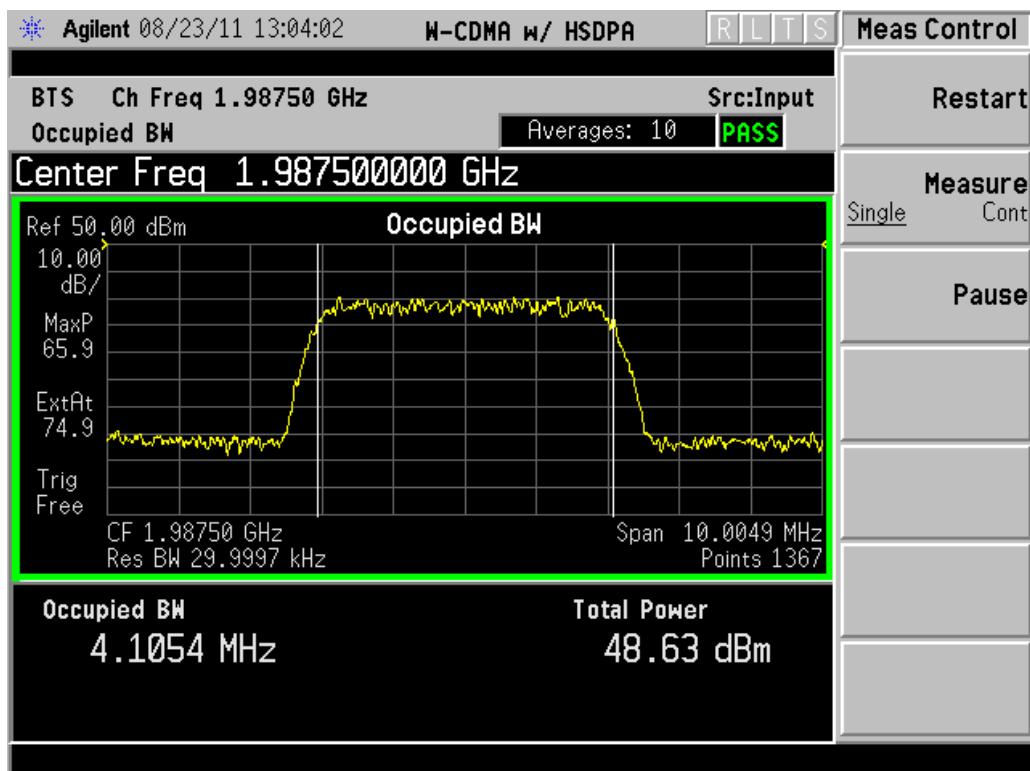
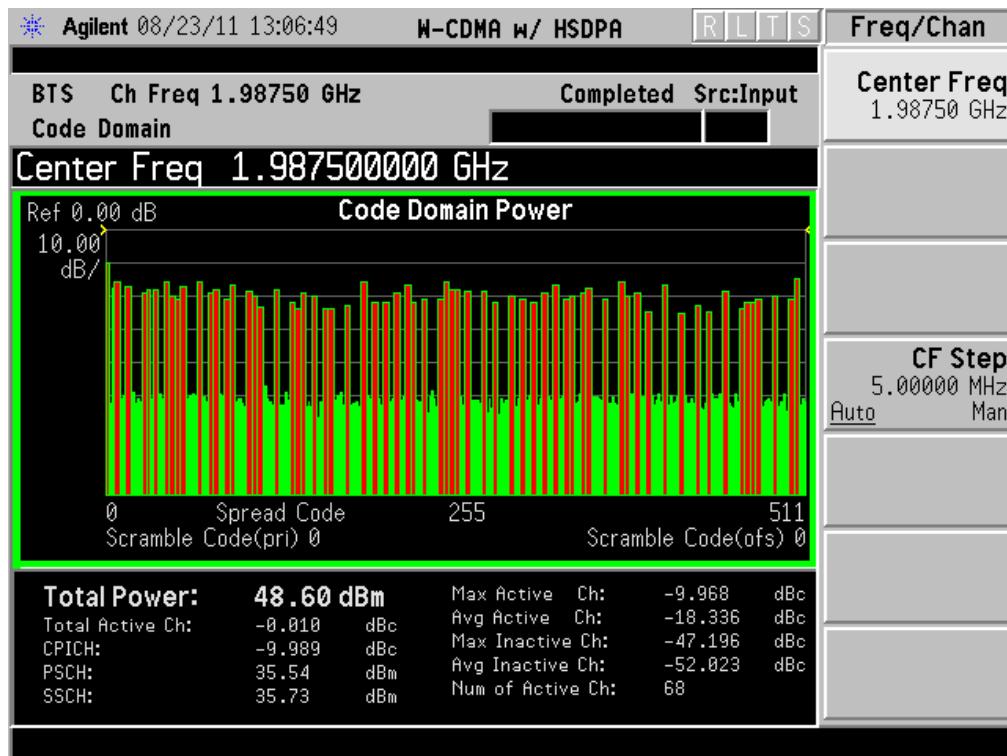
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). 99% Occupied Bandwidth

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



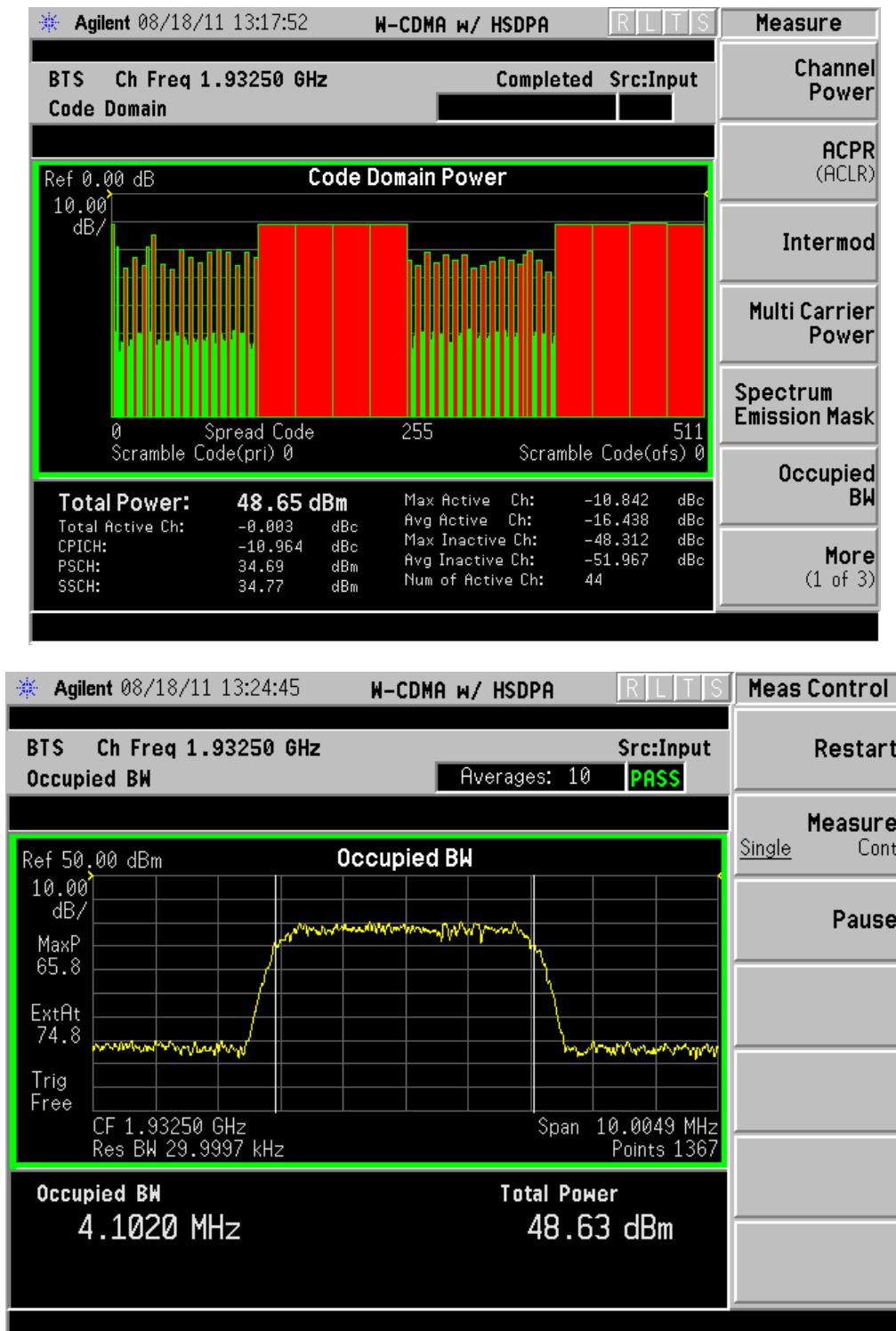
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). 99% Occupied Bandwidth

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



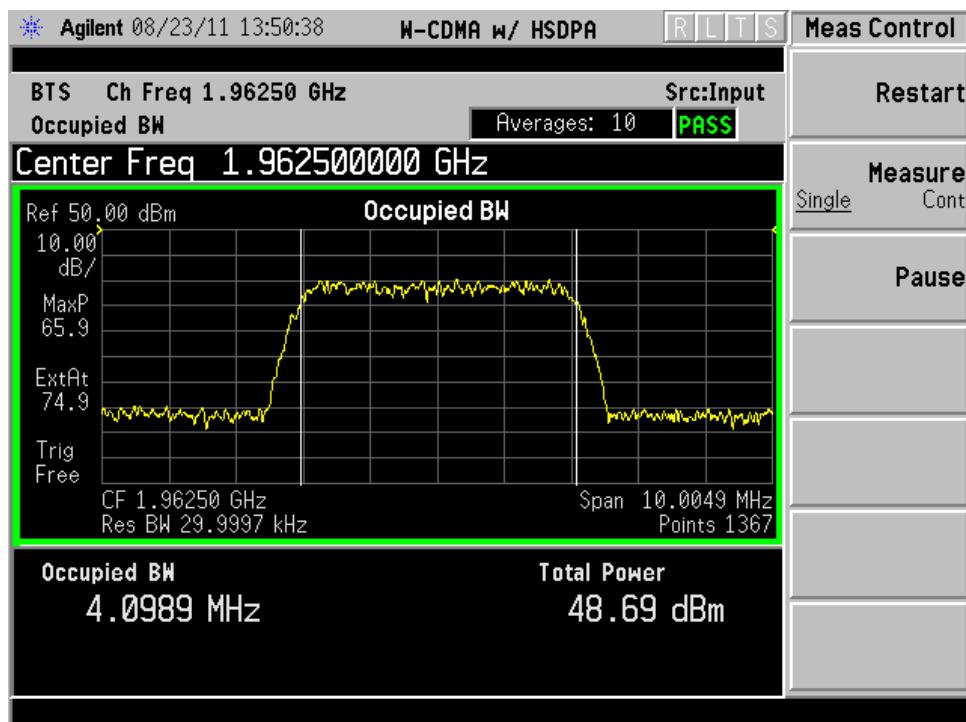
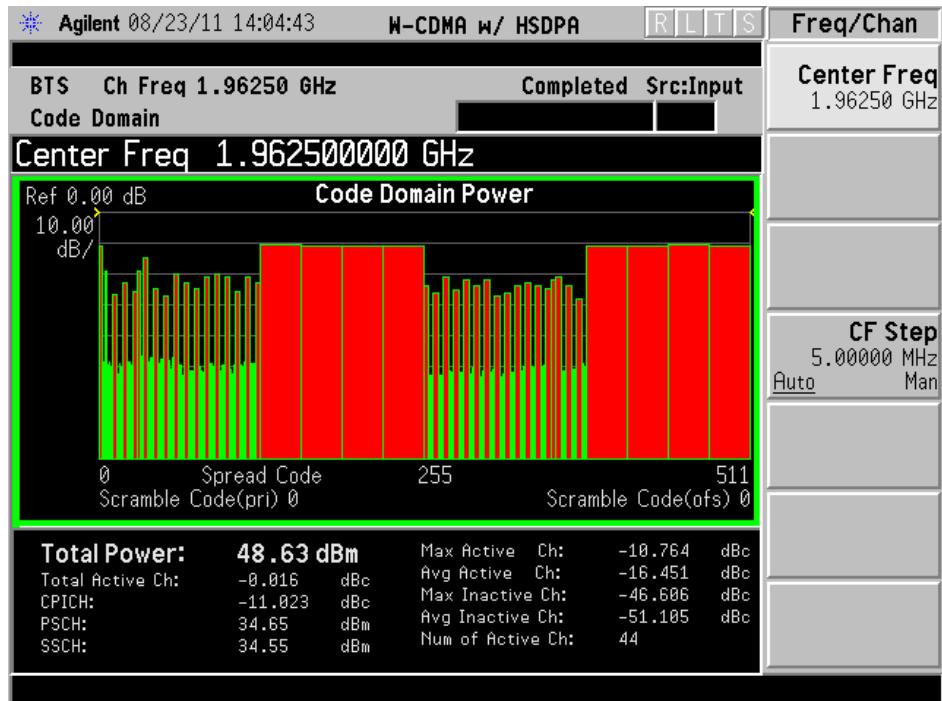
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). 99% Occupied Bandwidth

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



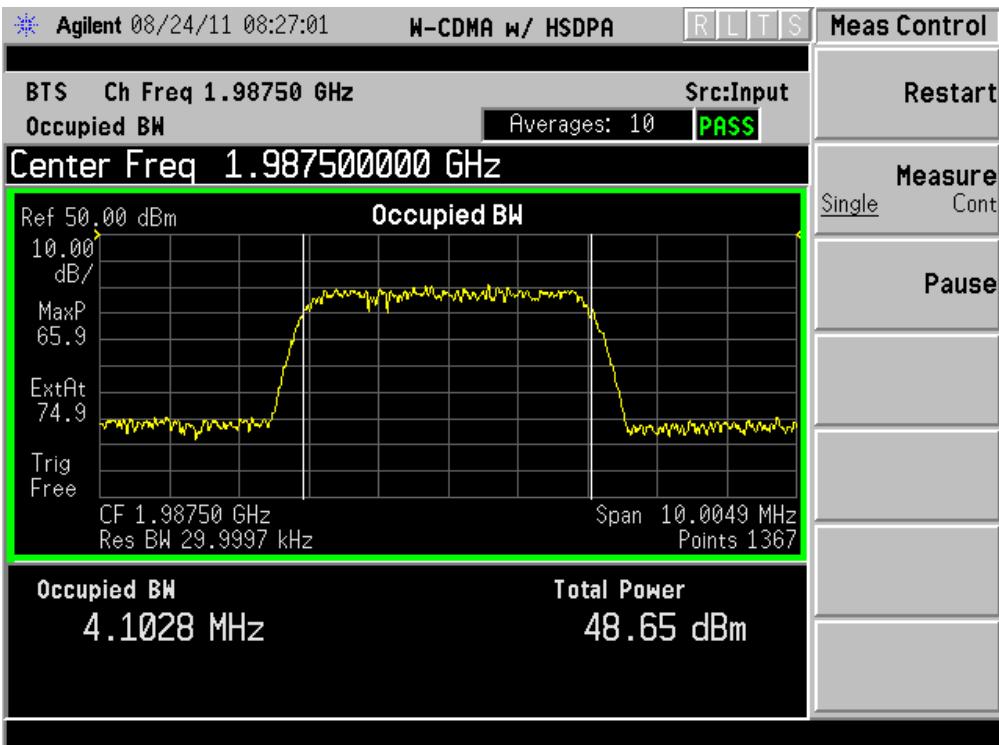
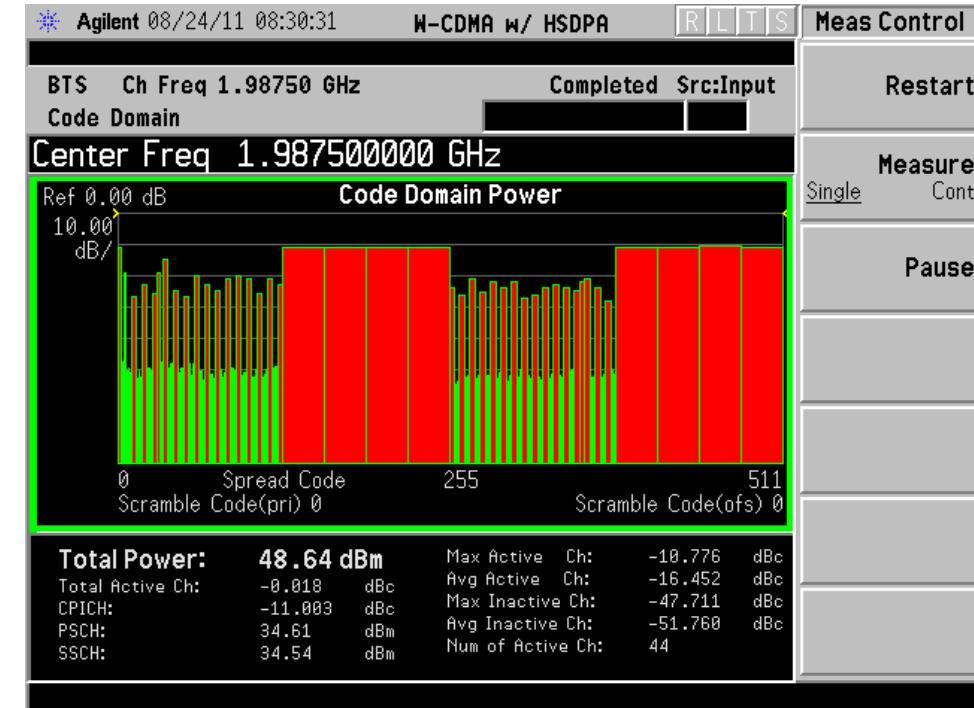
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). 99% Occupied Bandwidth

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). 99% Occupied Bandwidth

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



PART 2.1049 MEASUREMENTS REQUIRED: OCCUPIED BANDWIDTH

Method 2. Emission mask limitation using a Rohde & Schwarz ESIB-40 EMI Test Receiver with Total Integrated Laboratory Environment (TILE) test software.

Compliance with the ETSI TS 25.141 occupied bandwidth emission mask requirements and with Part 24.238 was demonstrated using a Rohde & Schwarz ESIB-40 EMI Test Receiver, in combination with the Total Integrated Laboratory Environment (TILE) EMI test software, by ETS-Lindgren. The occupied bandwidth/emission mask compliance measurements were performed for the single-carrier operation, with both TM1-64 and TM5-44 ETSI test modulations. Measurements were performed at the Equipment Antenna Terminal (EAC) for the following configuration:

Single Carrier Operation (3S1C) at 72 Watts (+48.6 dBm) with a Single HE PAM

The same UARFCN channels as previously cited were repeated. The emission mask used to demonstrate compliance was as specified in ETSI TS 25.141 for $P \geq +43$ dBm. The mask attenuation values were based on a 30 kHz resolution bandwidth, which made the modulated 5 MHz carrier to be offset from +48.6 dBm by -22.218 dB, in accordance with the equation:

$$\text{Carrier Offset} = 10 \log (30 \text{ kHz}/5 \text{ MHz}) = -22.218 \text{ dB}$$

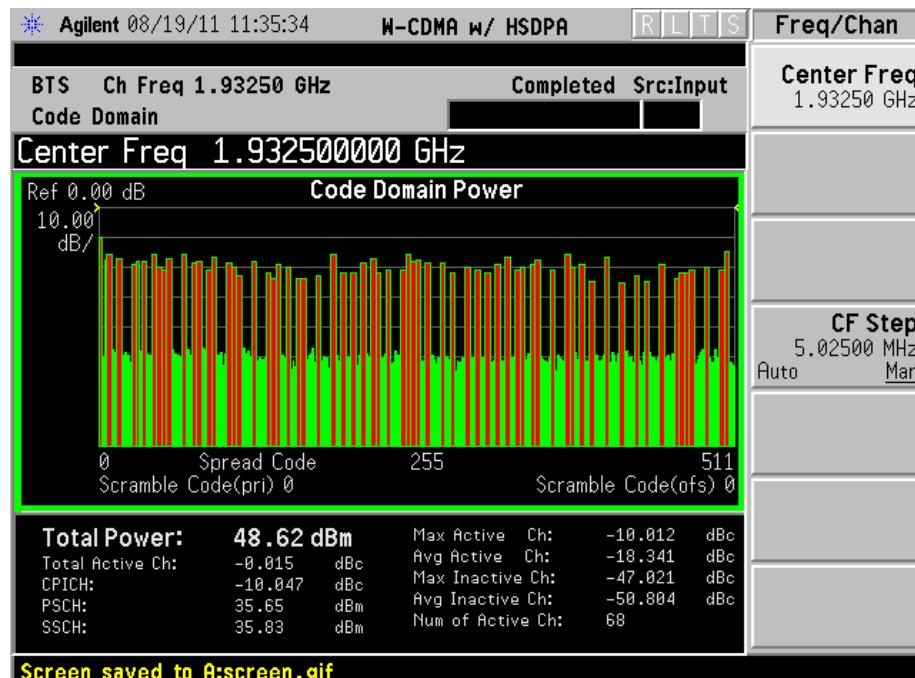
The plots for each channel measured are recorded and stored on file. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

RESULTS: All UARFCN channels measured demonstrate compliance with the emission mask specified by ETSI TS 25.141; the carriers do not exceed the mask limitation. The data plots attached below show characteristics consistent with all measurements. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

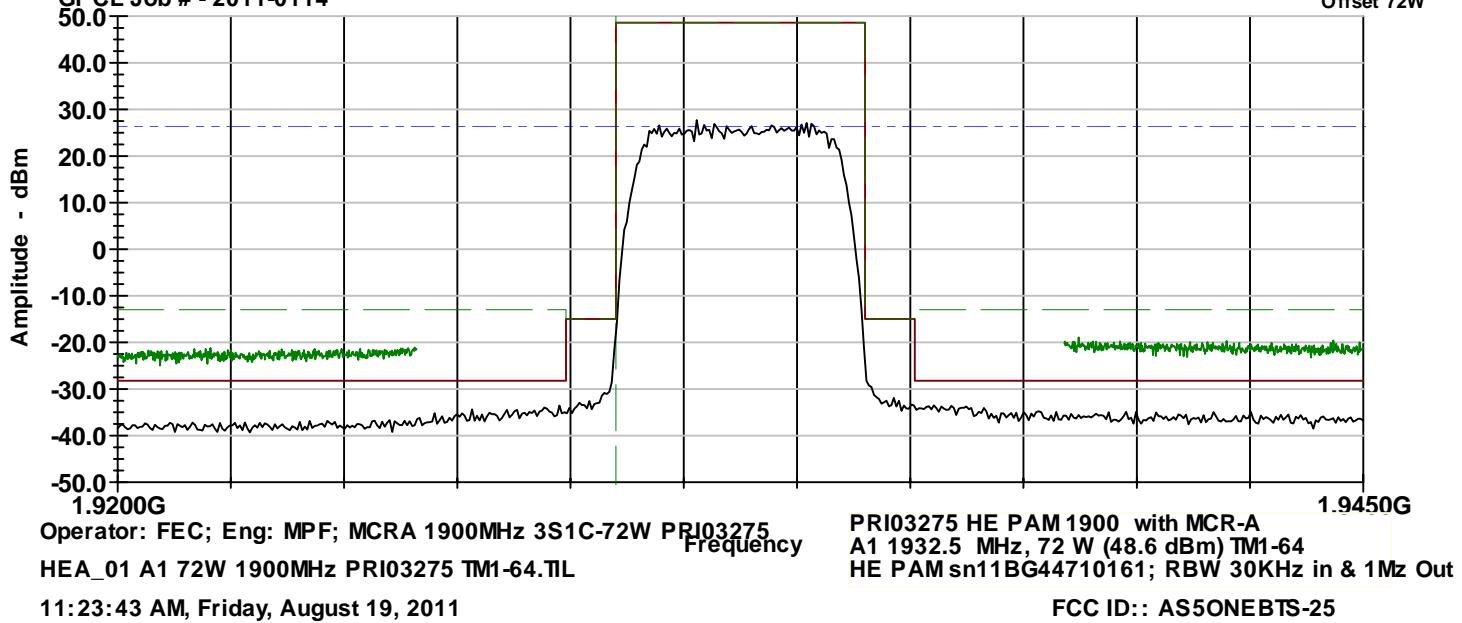
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Emission Mask Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



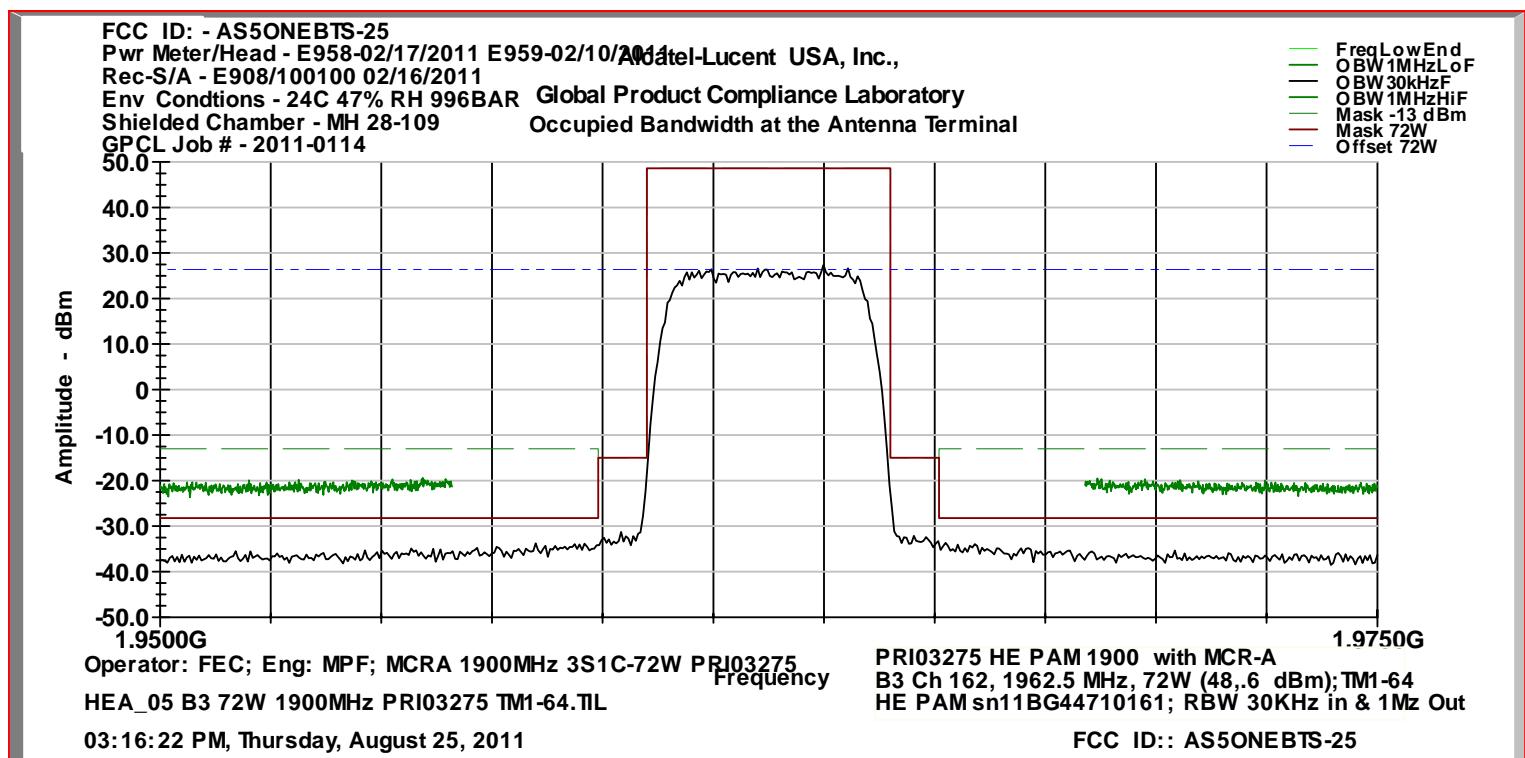
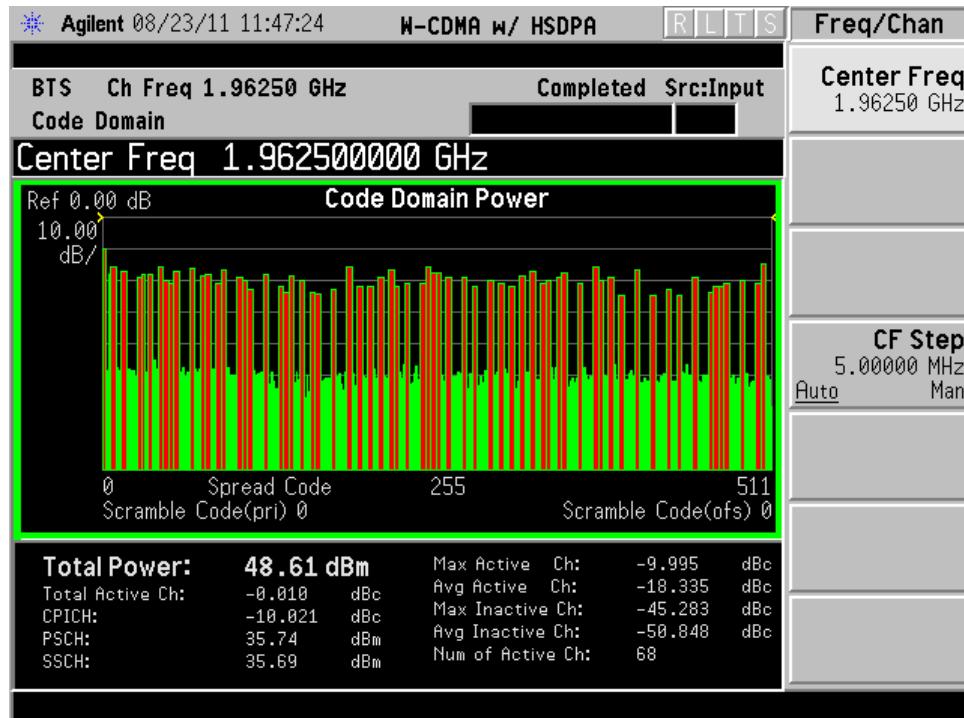
FCC ID: - AS5ONEBTS-25
 Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,
 Rec-S/A - E908/100100 02/16/2011
 Env Conitions - 24C 55% RH 998BAR Global Product Compliance Laboratory
 Shielded Chamber - 28-109 Occupied Bandwidth at the Antenna Terminal
 GPCL Job # - 2011-0114

FreqLowEnd
 OBW1MHzLoF
 OBW30kHzF
 OBW1MHzHiF
 Mask 72W
 Mask -13dBm
 Offset 72W



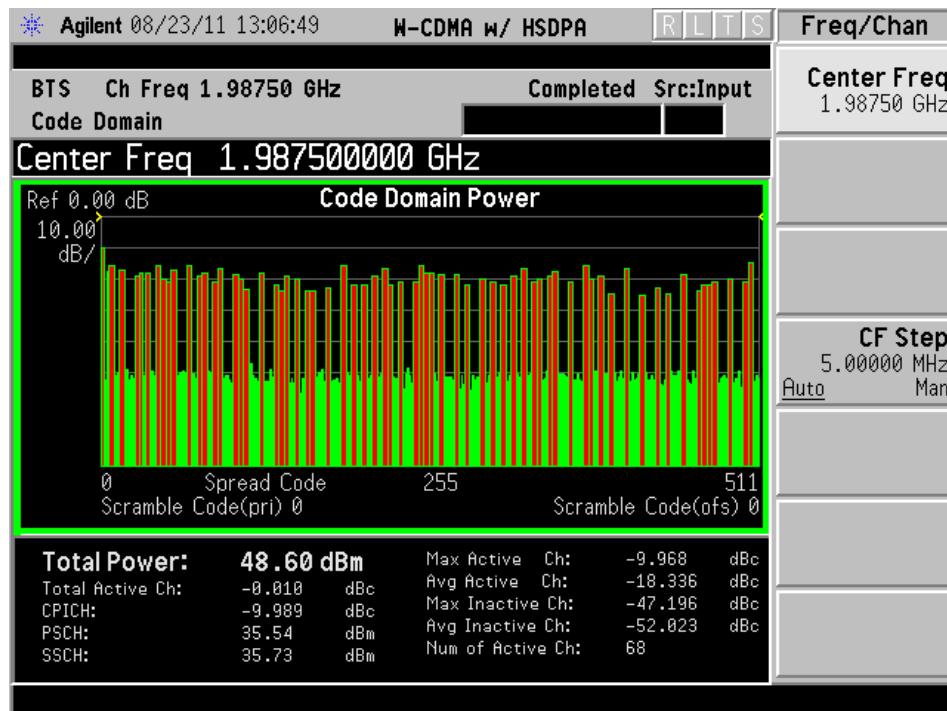
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Emission Mask Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Emission Mask Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



FCC ID: - AS5ONEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,

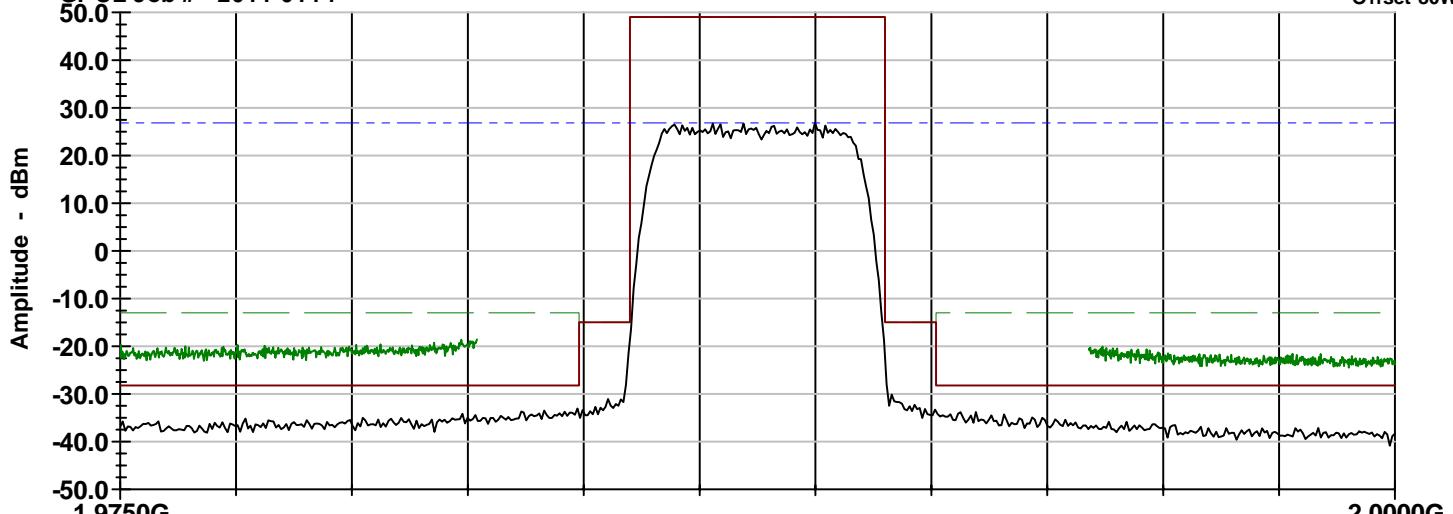
Rec-S/A - E908/100100 02/16/2011

Env Conditions - 22C 52% RH 1002BAR Global Product Compliance Laboratory

Shielded Chamber - MH 28-109 Occupied Bandwidth at the Antenna Terminal

GPCL Job # - 2011-0114

— FreqLowEnd
— OBW1MHzLoF
— OBW30kHzF
— OBW1MHzHiF
— Mask -13dBm
— Mask 80W
— Offset 80W



Operator: FEC; Eng: MPF; MCRA 1900MHz 3S1C-72W PRJ03275
HEA_09 C5 72W 1900MHz PRI03275 TM1-64.TIL

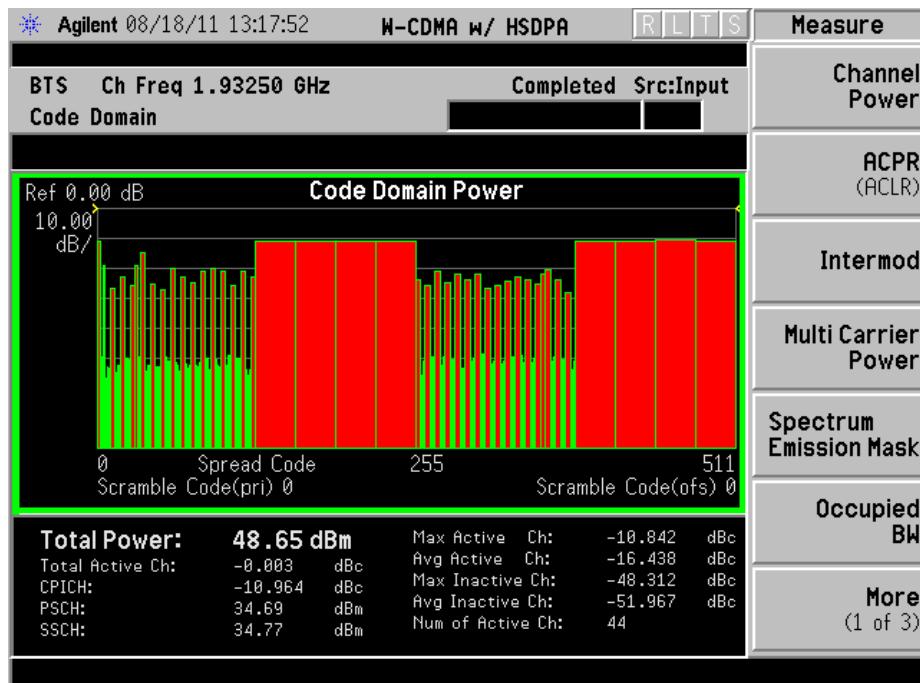
PRI03275 HE PAM 1900 with MCR-A
C5 Ch 287 1987.5 MHz, 72W (48.6 dBm); TM1-64
HE PAM sn11BG44710161; RBW 30KHz in & 1Mz Out

08:26:54 AM, Tuesday, August 23, 2011

FCC ID: AS5ONEBTS-25

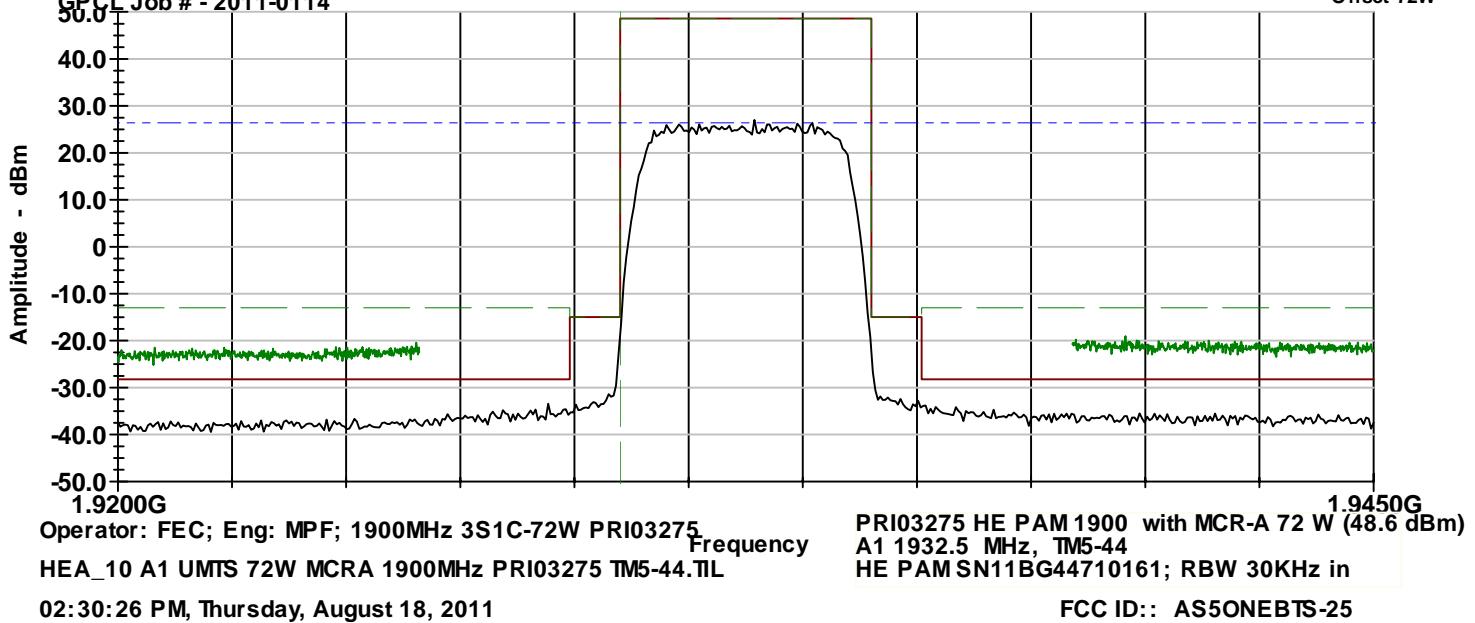
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Emission Mask Requirement

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



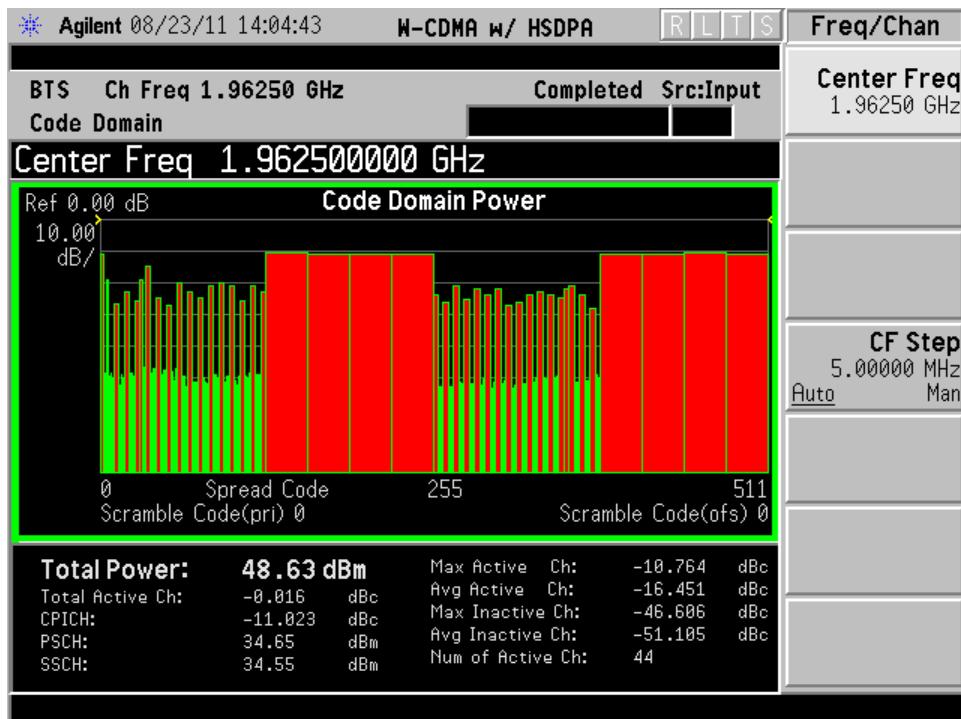
FCC ID: - AS5ONEBTS-25
 Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,
 Rec-S/A - E908/100100 02/16/2011 Global Product Compliance Laboratory
 Env Conditions - 24C & 61% RH 1002BAK
 Shielded Chamber - 28-109 Occupied Bandwidth at the Antenna Terminal
 GPCL Job # - 2011-0114

FreqLowEnd
 OBW1MHzLoF
 OBW30kHzF
 OBW1MHzHiF
 Mask 72W
 Mask -13dBm
 Offset 72W



Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Emission Mask Requirement

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



FCC ID: - AS5ONEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/17/2011
Rec-S/A - E908/100100 02/16/2011

Env Conditions - 24C 47% RH 999E

Shielded Chamber - MH 28-109

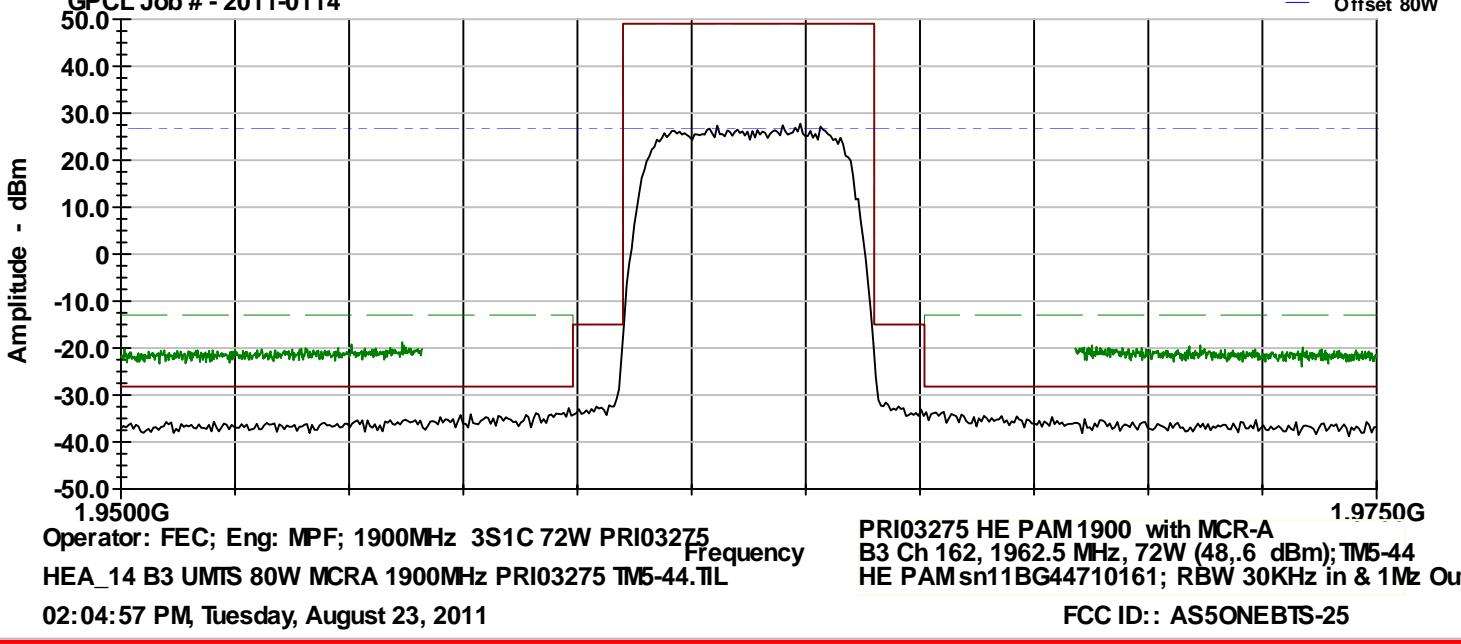
GPCL Job # - 2011-0114

Alcatel-Lucent USA, Inc.,

Global Product Compliance Laboratory

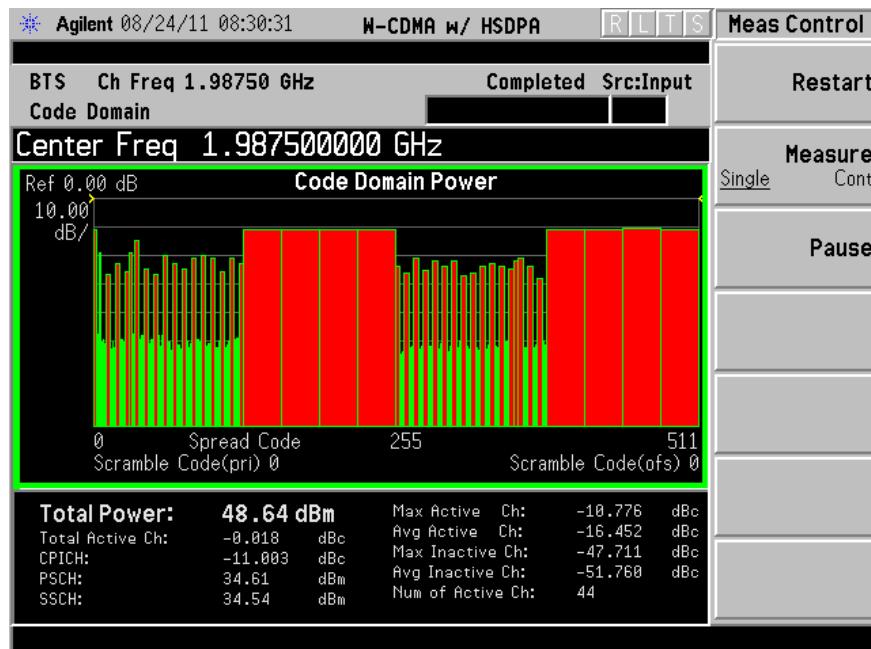
Occupied Bandwidth at the Antenna Terminal

— FreqLowEnd
— OBW1MHzLoF
— OBW30kHzF
— OBW1MHzHiF
— Mask -13 dBm
— Mask 80W
— Offset 80W



Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Emission Mask Requirement

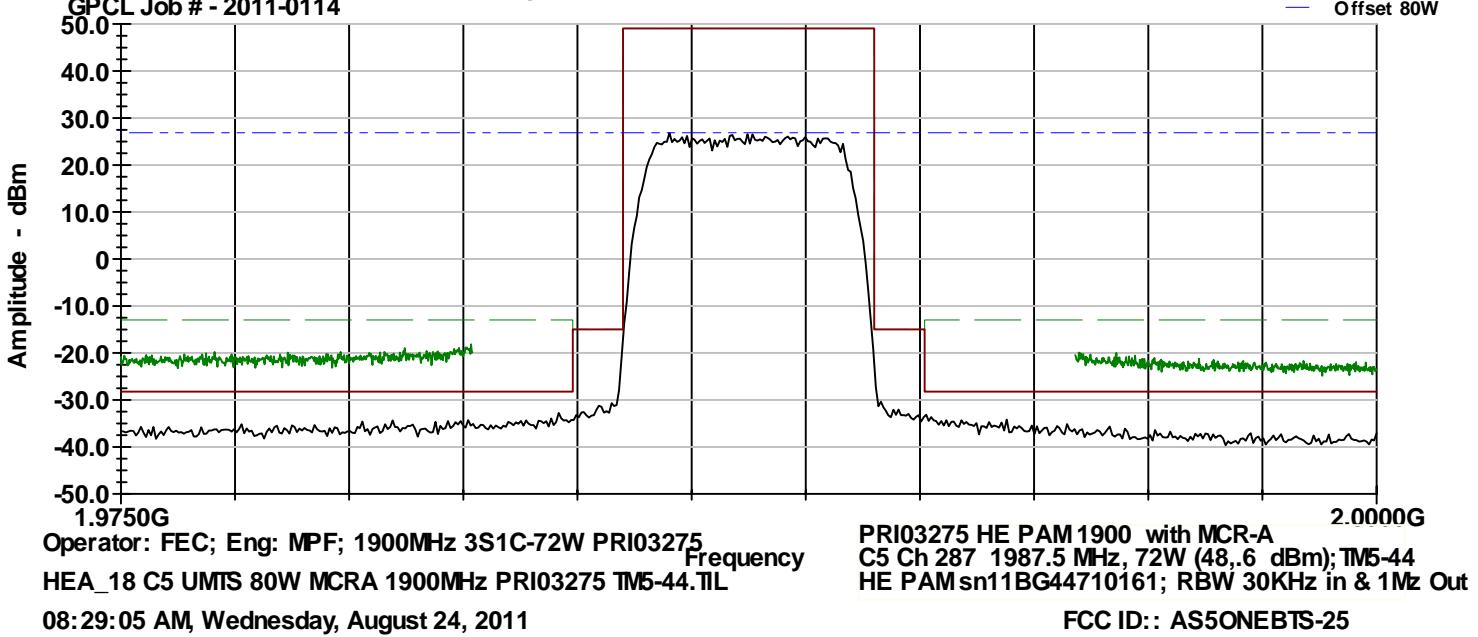
TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



FCC ID: - AS5ONEBTS-25
Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011
Rec-S/A - E908/100100 02/16/2011
Env. Conditions - 23C 40% RH 1000h
Alcatel-Lucent USA, Inc.
Global Product Compliance Lab

REC-S/A E908 100100 02/10/2011
Env Conditions - 22C 49% RH 1004 Global Product Compliance Laboratory
Shielded Chamber - MH 28-109 Occupied Bandwidth at the Antenna Terminal
GPO: JUN 4 2011 2114

— FreqLowEnd
— OBW1MHzLoF
— OBW30kHzF
— OBW1MHzHiF
— Mask -13dBm
— Mask 80W
— Offset 80W



PART 2.1051 MEASUREMENTS REQUIRED: SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS.

This test procedure is an extension of the occupied bandwidth measurement at the Equipment Antenna Connector (EAC) terminal, i.e., the downlink transmit antenna, using the same carrier frequencies, configurations, power level settings and test modulations.

In accordance with Part 2.1057(a), the required frequency spectrum to be investigated extends from the lowest RF signal generated to the 10th harmonic of the carrier at the EAC terminal. The emission limits at the antenna terminal are specified in Part 24.238 (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 $43 + 10 \log(P)$ dBc.*

The power P is the average carrier power measured at the EAC (antenna) terminal in Watts. Setting the power level at EAC as shown below, produces the corresponding emission attenuation below the carrier in dBc, which all equate to -13 dBm.

Single Carrier Operation (3S1C) at 72 Watts (+48.6 dBm) with a Single HE PAM

Part 24.238 (b) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. In accordance with Part 2.1051, "the magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified"; i.e., these are not reportable. Hence, the measurement equipment must be adjusted and configured to provide an instrumentation noise floor that is at least 20 dB or more below the $43 + 10 \log(P)$ dBc limit. The pertinent test parameters are:

1. Frequency Spectrum:	10 MHz to 20 GHz
2. Resolution Bandwidth:	1 MHz or greater (Part 24.238)
3. Emission Limitation:	$43 + 10 \log(P)$ dBc
4. Instrumentation Noise Floor:	at least 20 dB greater than " $43 + 10 \log(P)$ dBc"

Test Set-up and Configuration: Same as previously used for Part 2.1046 RF Power Measurement.

Method of Measurement:

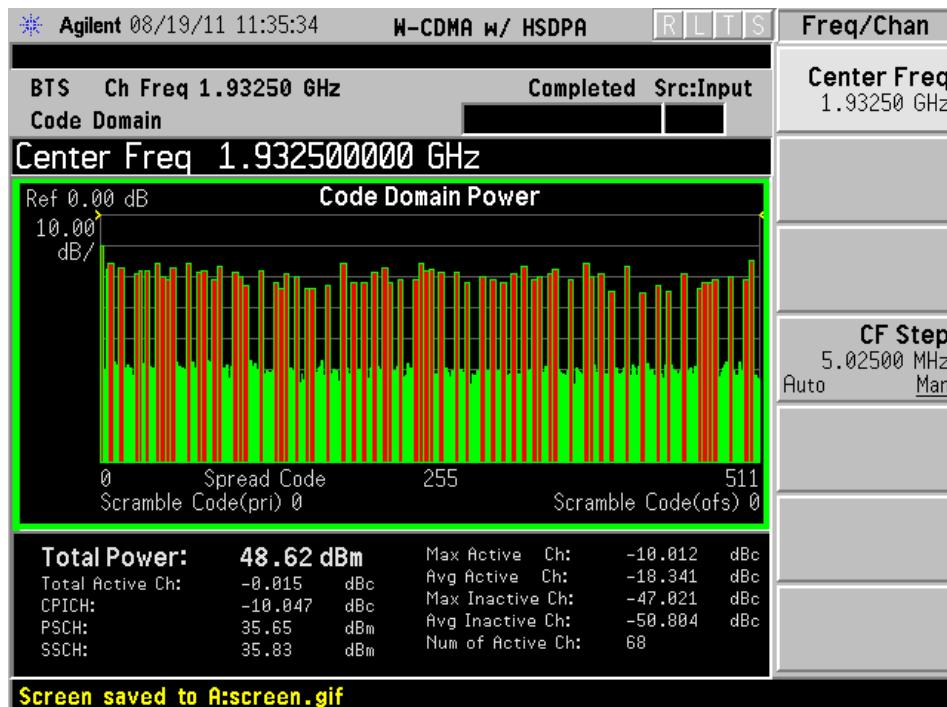
In order to suppress the instrumentation noise floor sufficient to detect and measure spurious signals that have power levels as low as 20 dB below the required limit, an EMC software package was employed to drive the spectrum analyzer, collect and compile the acquired data, perform mathematical corrections to the data by incorporating pre-measured path losses into the software, and then generate a graphical display as shown in this exhibit. The software package is: *TILE/IC (Total Integrated Laboratory Environment/Instrument Control System)*; purchased and licensed from ETS-Lindgren. The instrumentation noise floor is suppressed by the software's ability to split the spectrum being measured into many small segments,

Part 24.238 requires that emissions over the required spectrum 10 MHz to 20 GHz be measured using an instrumentation resolution bandwidth of 1 MHz or greater. The TILE/IC software was able to sufficiently suppress the noise floor by measuring the spectrum in a sequential series of short segments using a peak detector, perform mathematical corrections to each segment, and then sequentially compile all the segments into a continuous graphical display. These measurements were performed in combination with an appropriate instrumentation low-pass filter and high-pass filter, installed at the input terminal of the spectrum analyzer.

Results: For each UMTS carrier, there were no reportable emissions. Data plots for each carrier, previously displayed under 2.1049, are attached to this exhibit. The plots for each channel are recorded and stored on file. However, for brevity, only the lowest and highest settable, and mid-band, carrier frequencies for the complete spectrum (1930—1990 MHz) will be displayed.

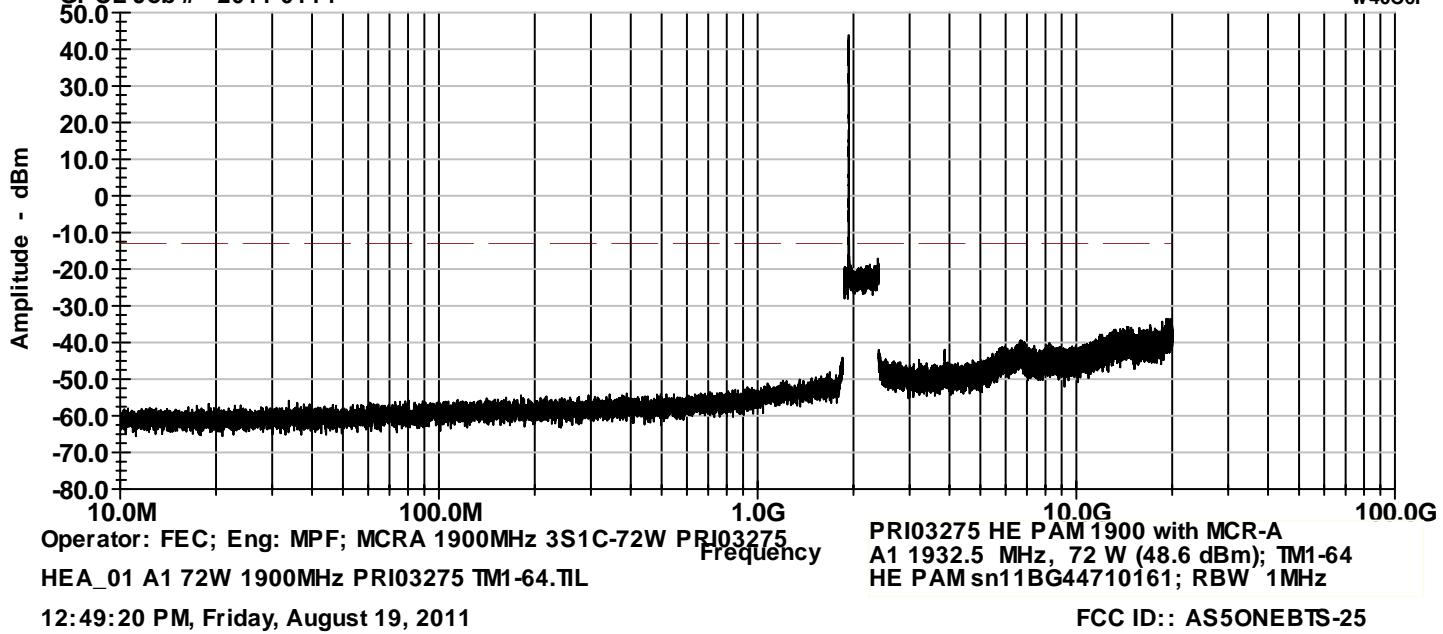
Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Conducted Emission Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



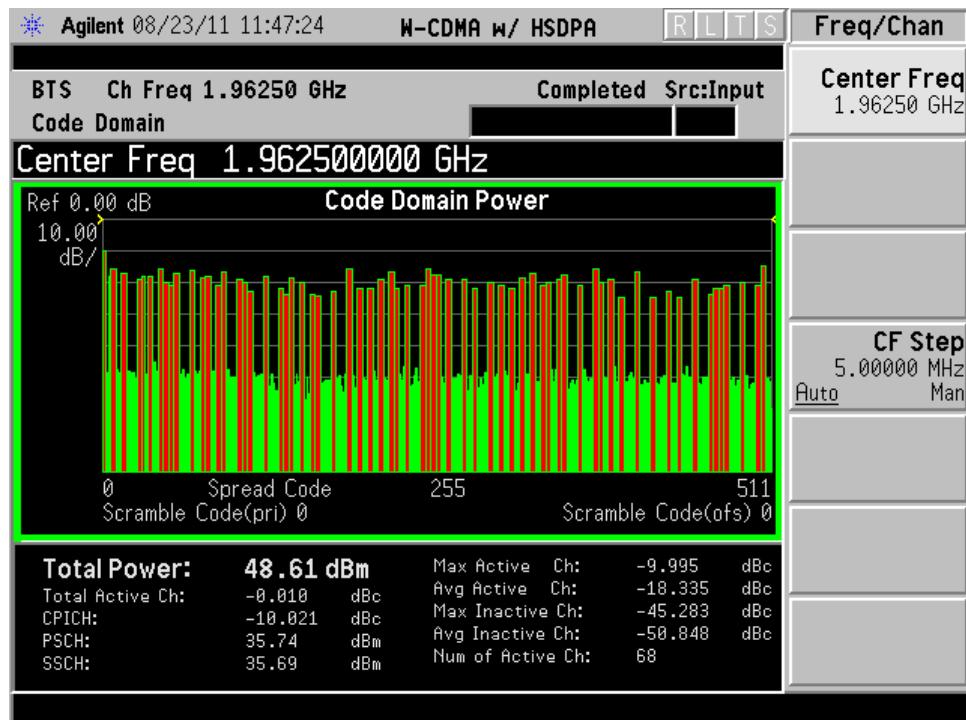
FCC ID: - AS5ONEBTS-25
 Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,
 Rec-S/A - E908/100100 02/16/2011
 Env Conitions - 24C 55% RH 998BAR Global Product Compliance Laboratory
 Shielded Chamber - 28-109 Conducted Emissions at the Antenna Terminal
 GPCL Job # - 2011-0114

— FCClimit
 — w40C1F
 — w40C2F
 — w40C3F
 — w40C4F
 — w40C5F
 — w40C6F



Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Conducted Emission Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



FCC ID: - AS5ONEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.

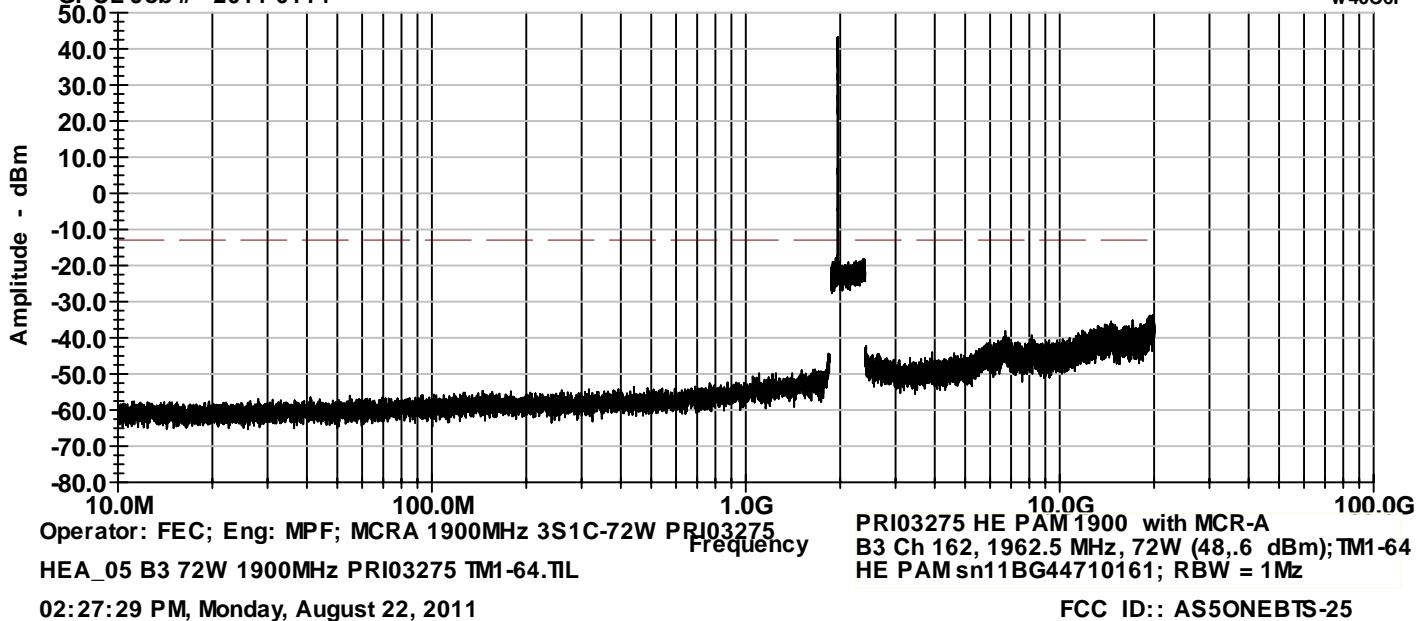
Rec-S/A - E908/100100 02/16/2011

Env Conditions - 24C 47% RH 996BAR Global Product Compliance Laboratory

Shielded Chamber - MH 28-109 Conducted Emissions at the Antenna Terminal

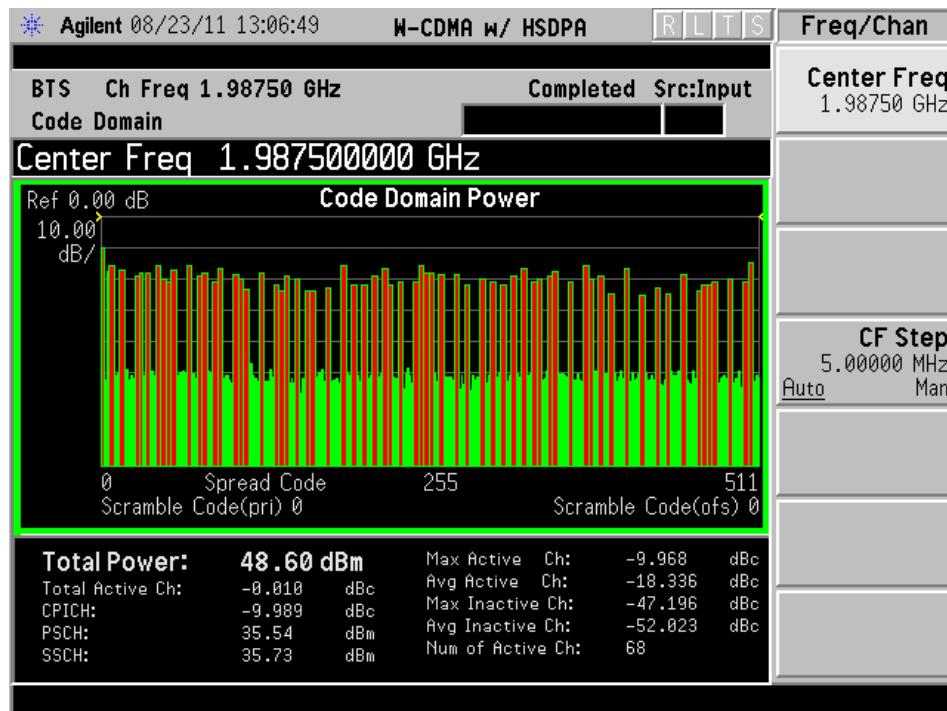
GPCL Job # - 2011-0114

— FCCLimit
 — w40C1F
 — w40C2F
 — w40C3F
 — w40C4F
 — w40C5F
 — w40C6F



Test Modulation: TM1-64 with 68 active channels: 64 voice + 4 control (QPSK). Conducted Emission Requirement

TM1-64 (QPSK) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



FCC ID: - AS5ONEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,

Rec-S/A - E908/100100 02/16/2011

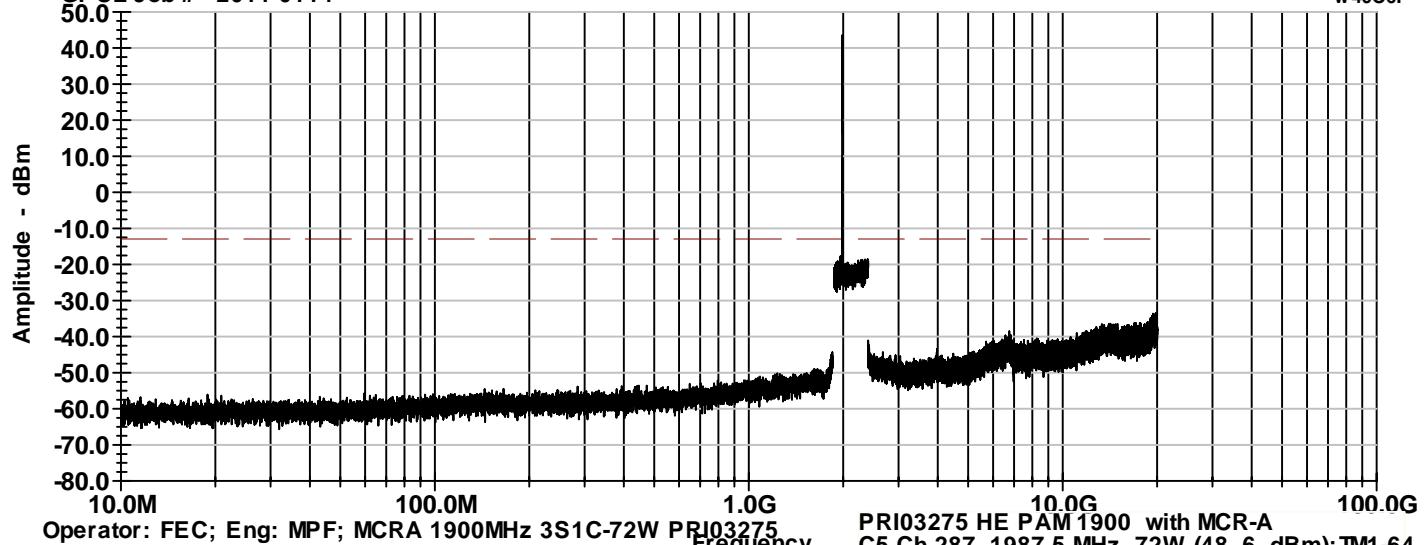
Env Conditions - 22C 52% RH 1002BAR Global Product Compliance Laboratory

Shielded Chamber - MH 28-109

Conducted Emissions at the Antenna Terminal

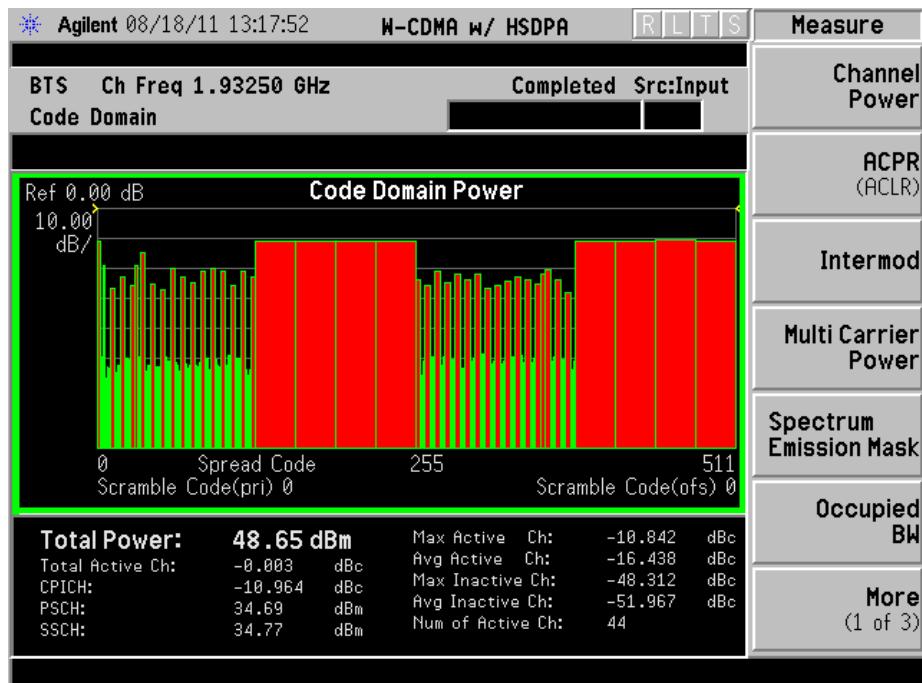
GPCL Job # - 2011-0114

— FCC limit
 — w40C1F
 — w40C2F
 — w40C3F
 — w40C4F
 — w40C5F
 — w40C6F



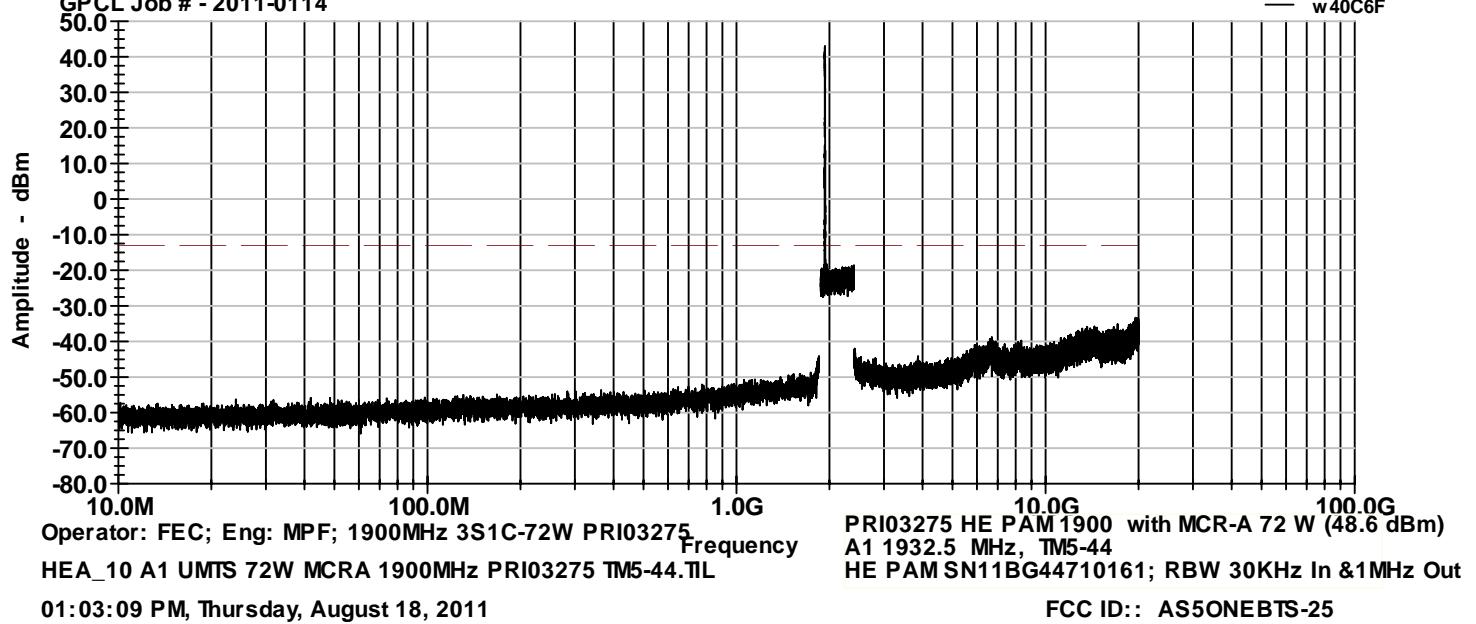
Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Conducted Emission Requirement

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1932.5 MHz (Lowest Settable)



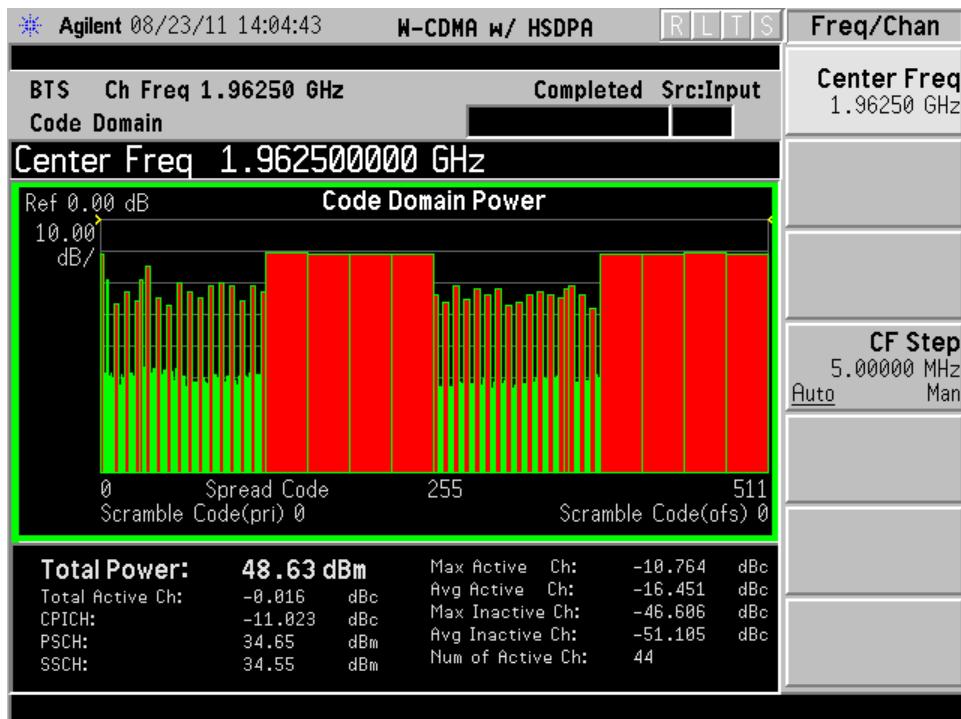
FCC ID: - AS5ONEBTS-25
 Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011 Alcatel-Lucent USA, Inc.,
 Rec-S/A - E908/100100 02/16/2011
 Env Conditions - 24C & 61% RH 1002B Global Product Compliance Laboratory
 Shielded Chamber - 28-109 Conducted Emissions at the Antenna Terminal
 GPCL Job # - 2011-0114

FCCLimit
 w40C1F
 w40C2F
 w40C3F
 w40C4F
 w40C5F
 w40C6F



Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Conducted Emission Requirement

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1962.5 MHz (Mid Band)



FCC ID: - AS50NEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011

Rec-S/A - E908/100100 02/16/2011

Env Conditions - 24C 47% RH 999h

Shielded Chamber - MH 28-109

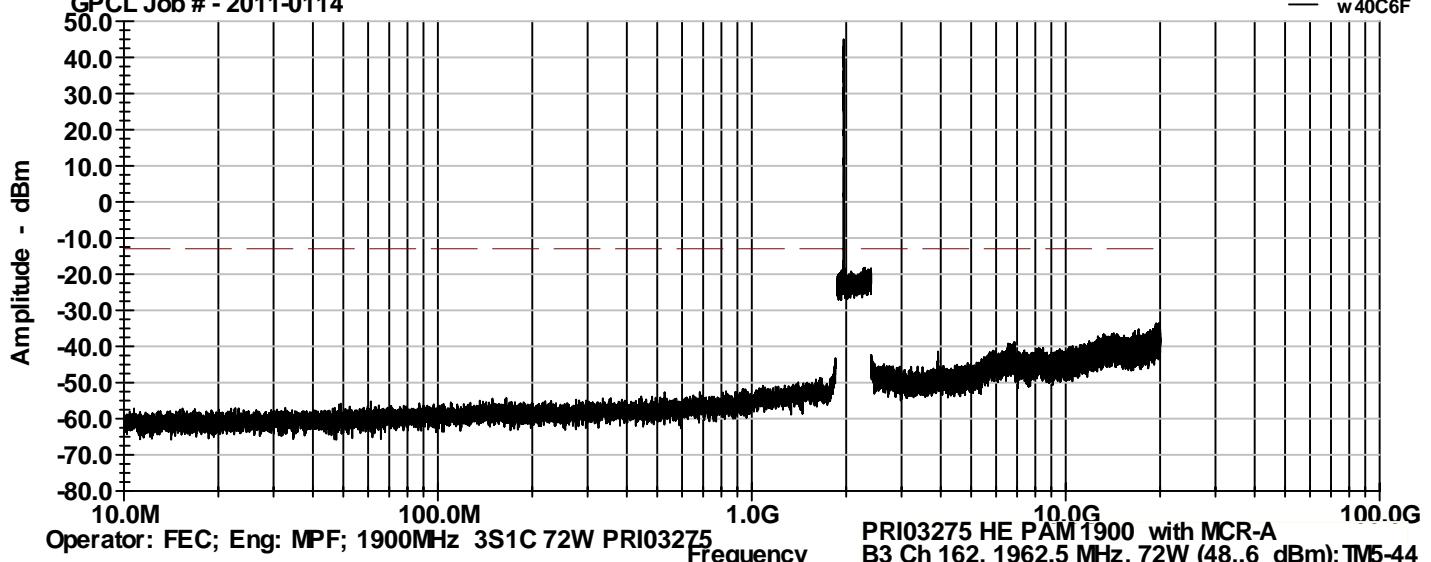
GPCL Job # - 2011-0114

Alcatel-Lucent USA, Inc.

Global Product Compliance Laboratory

Conducted Emissions at the Antenna Terminal

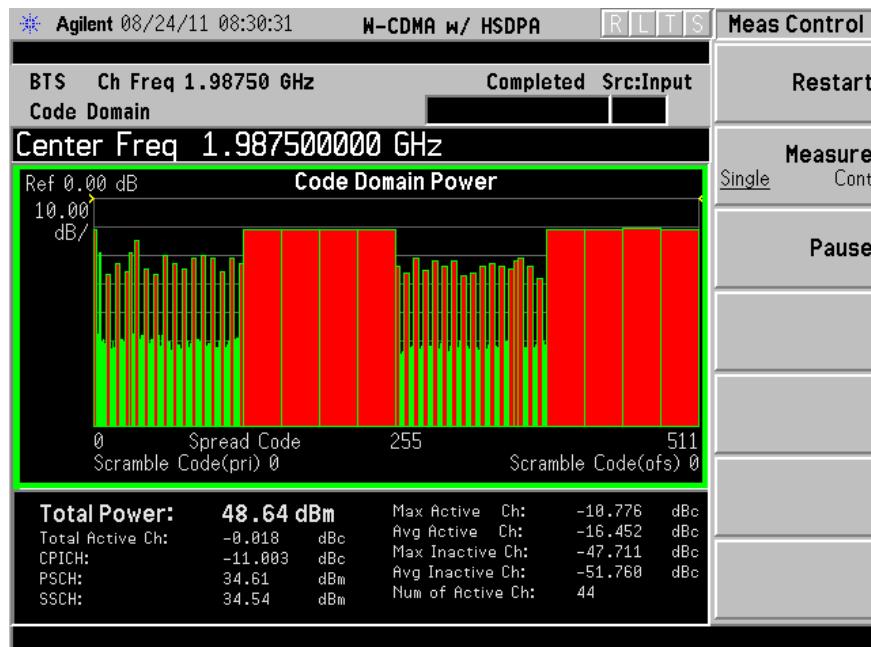
FCCLimit
w40C1F
w40C2F
w40C3F
w40C4F
w40C5F
w40C6F



FCC ID: AS50NEBTS-25

Test Modulation: TM 5-44 with 44 active channels: 30 voice + 8 HSDPA (High Speed Downlink Packet Access) channels + 6 control (16QAM). Conducted Emission Requirement

TM5-44 (16QAM) - Single Carrier at 72W (48.6 dBm) - 1987.5 MHz (Highest Settable)



FCC ID: - AS5ONEBTS-25

Pwr Meter/Head - E958-02/17/2011 E959-02/10/2011

Rec-S/A - E908/100100 02/16/2011

Env Conditions - 22C 49% RH 100% RH

Shielded Chamber - MH 28-109

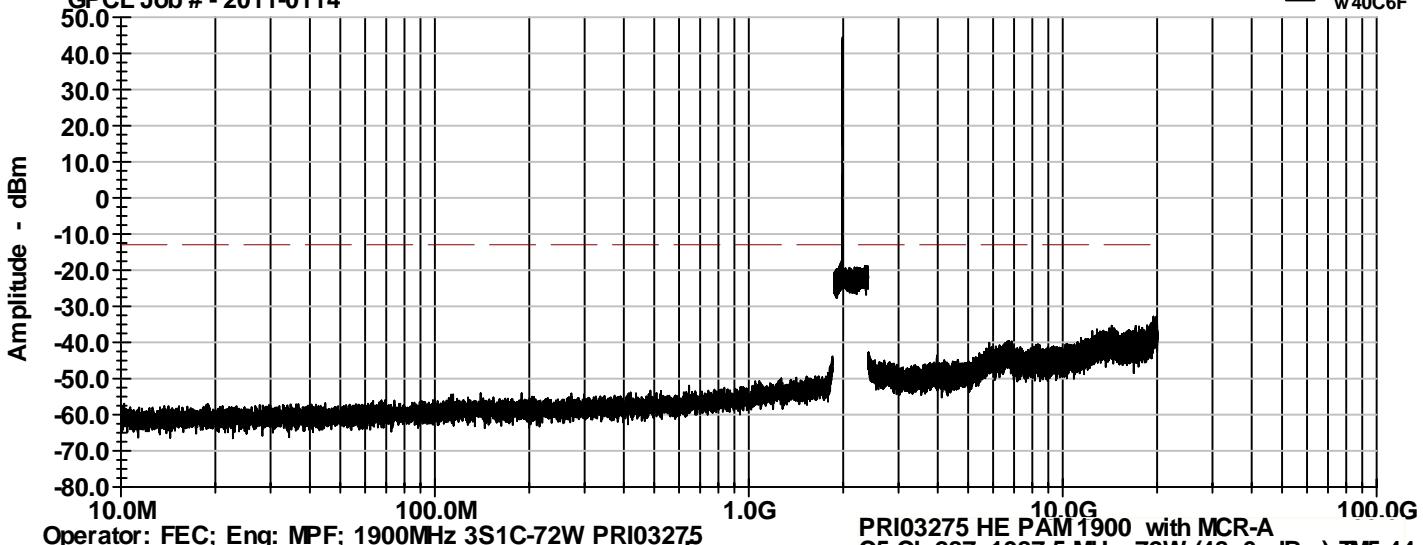
GPCL Job # - 2011-0114

Alcatel-Lucent USA, Inc.,

Global Product Compliance Laboratory

Conducted Emissions at the Antenna Terminal

— FCClimit
— w40C1F
— w40C2F
— w40C3F
— w40C4F
— w40C5F
— w40C6F



08:40:37 AM, Wednesday, August 24, 2011

FCC ID: AS5ONEBTS-25

PART 2.1053 MEASUREMENTS REQUIRED: FIELD STRENGTH OF SPURIOUS RADIATION

This test was performed for a single 1900 MHz hardware and carrier configuration 3S1C at 72W. As required, the frequency range investigated was from 30 MHz to 20 GHz (10th harmonic of the carrier) as in the previous conducted spurious emissions test procedure. The carrier frequencies utilized were the same as in the previous Occupied Bandwidth tests. The single configuration evaluated was:

3S1C	72W (48.6 dBm) 1900 MHz
MSR-A	3x 1900
HE PAM	3x HE PAM
Dual Duplex Filter	3x 1900 MHz
Tx 1	1932.5 MHz
Tx 2	1962.5 MHz
Tx 3	1987.5 MHz

The equipment under test (EUT) was configured as recommended for *floor standing equipment*, following the guidelines of ANSI C63.4-2009. The EUT was installed and operated as in the *normal mode of operation* with external alarm and T1 cables connected to the EUT and routed as prescribed in ANSI C63.4-2009. Field strength measurements of radiated spurious emissions were evaluated in a 10m semi-anechoic chamber (FCC Site RN 263912), using an EUT-to-Antenna separation of 3-meters. Test software was Vasona by EMiSoft.

The spectrum from 10 MHz to the tenth harmonic of the carrier was searched for spurious radiation. Measurements were made using both horizontally and vertically polarized broadband antennas. Per FCC regulations, the comparison of out of band spurious emissions directly to the limit is appropriately made using the substitution method. However, **when the emissions are more than 20 dB below the specification limit, the use of field strength measurements for compliance determination is acceptable and those emissions are considered not reportable** (Section 2.1057 and the FCC Interpretive database for 2.1053).

For this case the evaluation of acceptable radiated field strength is as follows.

The calculated emission levels were found by:

$$\text{Pmeas (dBm)} + \text{Cable Loss(dB)} + \text{Antenna Factor(dB)} + 107 \text{ (dB}\mu\text{V/dBm)} - \text{Amplifier Gain (dB)} = \text{Field Strength (dB}\mu\text{V/m)}$$

Section 24.238 and 2.1053 contains the requirements for the levels of spurious radiation as a function of the EIRP of the unmodulated carrier. The reference level for the unmodulated carrier is calculated as the field produced by an isotropic radiator excited by the transmitter output power according to the following relation taken from Reference Data for Radio Engineers, page 27-7, 6th edition, IT&T Corp.

$$E = (120\pi P)^{1/2} = [(30*P)^{1/2}] / R$$

$$20 \log (E*10^6) - (43 + 10 \log P) = 82.23 \text{ dB }\mu\text{V/meter}$$

Where: E = Field Intensity in Volts/ meter
P = Transmitted Power in watts = 72W

R = Distance in meters = 3 m

Results:

Over the out-of-band spectrum investigated from 30 MHz to the tenth harmonic of the carrier (20 GHz), the power levels of all emissions observed were >> 20 dB below the 82.23 dB μ V/meter limit. Therefore, there were no reportable radiated spurious emissions.