FCC 47 CFR PART 22H AND 24E
CERTIFICATION TEST REPORT

FOR

SMART BRACELET

MODEL NUMBER: MICA

FCC ID: 2AB8ZND2

REPORT NUMBER: 14U19370-E2, Revision C

ISSUE DATE: DECEMBER 05, 2014

Prepared for
INTEL CORPORATION
2200 MISSION COLLEGE BOULEVARD
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	11/21/14	Initial Issue	M. Hua
A	11/26/14	Addressed TCB's questions on Section 7.2, 7.3 & 7.4	C. Pang
B	12/01/14	Addressed TCB's questions on Section for 5.3	C. Pang
C	12/05/14	Address TCB's question on Section 7	C. Pang

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: INTEL CORPORATION
2200 MISSION COLLEGE BOULEVARD
SANTA CLARA, CA 95052, U.S.A.

EUT DESCRIPTION: SMART BRACELET

MODEL: MICA

SERIAL NUMBER: FZMK4440002B

DATE TESTED: NOVEMBER 12 – DECEMBER 05, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H and 24E	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, Part 22 and Part 24.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☒ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☒ Chamber F
	☐ Chamber G
	☐ Chamber H

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	±3.52 dB
Radiated Disturbance, 30 to 1000 MHz	±4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a smart bracelet with cellular GPRS/WCDMA/HSDPA and Bluetooth low power.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted and ERP / EIRP output powers as follows:

GSM MODES

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Peak)		ERP (Peak)	
		dBm	mW	dBm	mW
824 - 849	GPRS	33.30	2138.0	29.21	833.7

Part 24 1900MHz Band					
Frequency range (MHz)	Modulation	Conducted (Peak)		EIRP (Peak)	
		dBm	mW	dBm	mW
1850 - 1910	GPRS	30.10	1023.3	28.48	704.7

WCDMA MODES

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Peak)		ERP (Peak)	
		dBm	mW	dBm	mW
824 – 849	REL 99	27.28	534.6	20.59	114.6
	HSDPA	27.20	524.8	20.29	106.9

Part 24 1900MHz Band					
Frequency range (MHz)	Modulation	Conducted (Peak)		EIRP (Peak)	
		dBm	mW	dBm	mW
1850 – 1910	REL 99	27.20	524.8	26.28	424.6
	HSDPA	26.75	473.2	25.93	391.7

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a mono-pole type antenna for the following bands with a maximum peak gain as follow:

Frequency (MHz)	Gain (dBi)
Cell, 824 - 849	-7.5
PCS, 1850 - 1910	1.30

For more detail information, please see MICA 3G antenna document.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was xmm6321_xges2_ndg_mckee2.

5.5. WORST-CASE CONFIGURATION AND MODE

Based on the investigation results, the highest peak power and enhanced data rate is the worst-case scenario for all measurements.

- For Cellular and PCS band: GPRS
- For Cellular and PCS band: UMTS, REL 99 and HSDPA

For the fundamental investigation, since the EUT is a portable device that has two orientations; X, and Y orientations and the worst among X, and Y without AC/DC adapter have been investigated. The worst case was found to be at X-position (flatbed) for all PCS bands and Y-position (portrait) for Cell bands.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

N/A

I/O CABLES (RF Conducted Test)

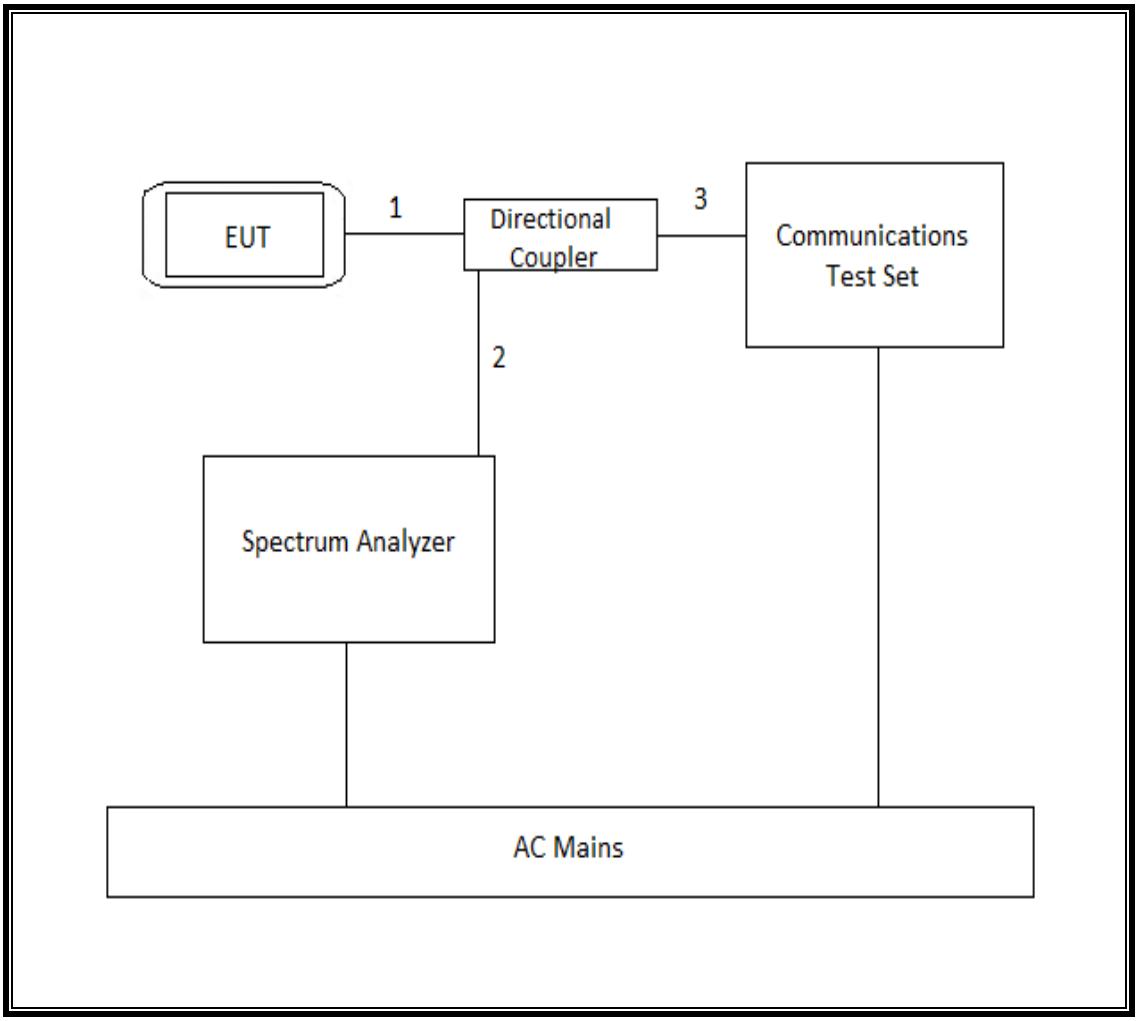
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RF In/Out	1	EUT	Un-shielded	1m	N/A
2	RF In/Out	1	Spectrum Analyzer	Un-shielded	1m	N/A
3	RF In/Out	1	Communication Test Set	Un-shielded	None	N/A

I/O CABLES (RF Radiated Test)

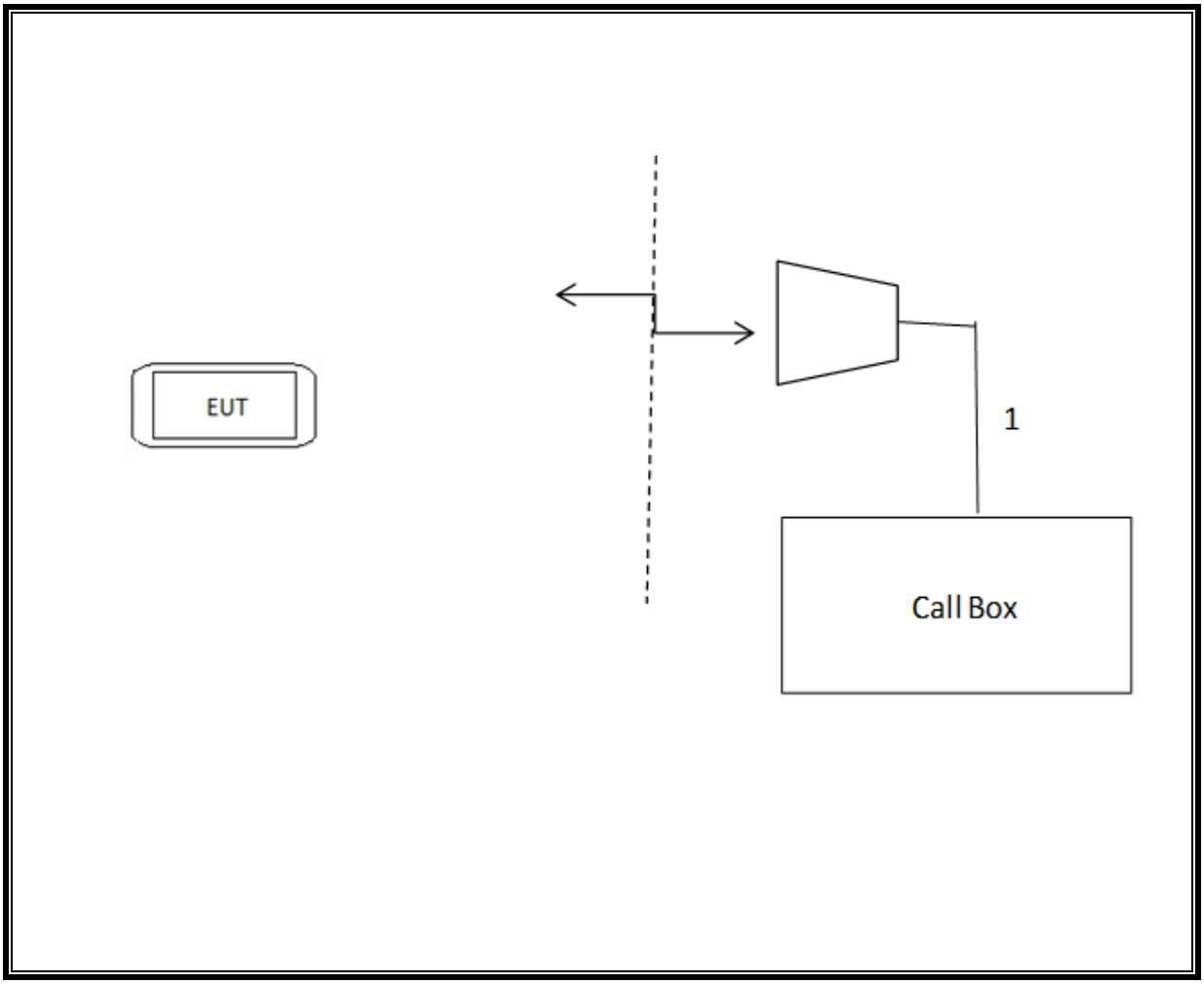
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RF In/Out	1	Antenna	Un-shielded	5m	NA

TEST SETUP

CONDUCTED SETUP



RADIATED SETUP



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report.

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Directional Coupler	Krytar	Directional Coupler	Krytar	CNR
Temperature / Humidity Chamber	CSZ	ZPHS-8-3.5-SCT/WC	None	04/10/15
Signal Generator, 100KHz - 6GHz	Agilent	8665B	F00124	03/12/15
Spectrum Analyzer, PSA, 26.5GHz	Agilent	E4440A	81018	05/01/15
Spectrum Analyzer, PXA, 44GHz	Agilent	N9030A	None	05/17/15
Antenna, Tuned Dipole 400~1000	ETS Lindgren	3121C DB4	C00993	01/23/15
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
Antenna, Horn 1-18GHz	ETS Lindgren	3117	None	04/14/15
Antenna, Horn, 18 GHz	EMCO	3115	C00872	01/06/15
Amplifier, 1 to 18GHz	Miteq	AMF-5D-01001800-40-20P	F00394	11/27/14
Amplifier	Sonoma	310	F00008	05/28/15
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB3	F00027	05/05/15
Power Supply, DC 20V 3A	Ametek	XT20-3	None	CNR
Wideband Radio Communication	R & S	CMW500	None	05/17/15
8960 Series 10 Wireless Communications Test Set	Agilent	E5515E	F00362	11/27/14

7. RF POWER OUTPUT VERIFICATION

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.
The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW ≥ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

Using CMU200 Communication Test Set

Function:	Menu select > GSM Mobile Station > GSM 850/900/1800/1900	
Press **Connection control** to choose the different menus Press **RESET** > choose all to reset all settings		
Connection	Press **Signal Off** to turn off the signal and change settings Network Support > GSM+GPRS or GSM+EGPRS Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. off	
MS Signal	Press Slot Config bottom on the right twice to select and change the number of time slots and power setting	
	> Slot configuration	> Uplink/Gamma > 33 dBm for GPRS 850/900 > 27 dBm for EGPRS 850/900 > 30 dBm for GPRS1800/1900 > 26 dBm for EGPRS1800/1900
BS Signal	Enter the same channel number for TCH channel (test channel) and BCCH channel	
	Frequency Offset >	+ 0 Hz
	Mode >	BCCH and TCH
	BCCH Level >	-85 dBm (May need to adjust if link is not stable)
	BCCH Channel >	choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]
	Channel Type >	Off
	P0>	4 dB
	Slot Config >	Unchanged (if already set under MS Signal)
	TCH >	choose desired test channel
	Hopping >	Off
	Main Timeslot >	3 (Default)
Network	Coding Scheme >	CS 4 (GPRS) and MCS5-9 (EGPRS)
	Bit Stream >	2E9-1PSR Bit Pattern
AF/RF	Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input	

Connection Press **Signal On** to turn on the signal and change settings

Using Agilent 8960A Communication Test Set

System Config: GSM/GPRS Mobile Test
E1968A A.06.31

Call Parms: BCH ➔ Cell Band: GSM850/PCS
TCH ➔ Traffic Band: GSM850/PCS
Traffic Channel: 128/192/251 or 512/661/810
MS Tx Level: 0
PDTCH ➔ Traffic Band: GSM850/PCS
Traffic Channel: 128/192/251 512/661/810
MS Tx Level: 0
Coding Scheme: CS-4 (GPRS)
Coding Scheme: MCS-5 to 9 (EGPRS)
MultiSlot Config: 1up, 1 down (Assuming that the highest conducted power)
Control: Active Cell ➔ GSM/GPRS

RESULTS

7.1. GSM

Part 22/24

Mode	Ch.	f (MHz)	1 time slot		2 time slots		3 time slot		4 time slots	
			Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)	Peak (dBm)	Average (dBm)
GPRS	128	824.2	**33.30**	**33.20**	30.70	30.60	28.80	28.70	27.90	27.80
	190	836.6	33.20	33.10	30.60	30.50	28.80	28.70	27.90	27.75
	251	848.8	33.20	33.10	30.60	30.50	28.90	28.80	27.90	27.80
GPRS	512	1850.2	29.95	29.87	27.50	27.43	25.70	25.59	24.40	24.29
	661	1880.0	30.07	29.89	27.52	27.49	25.73	25.67	24.50	24.40
	810	1909.8	**30.10**	**29.90**	27.60	27.53	25.80	25.73	24.60	24.52

7.2. UMTS REL99

The following summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	Not Applicable

RESULTS

Part 22 850MHz Band

Bands	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
				Peak	Average
UMTS850 (Band 5)	4132	4357	826.4	**27.28**	**23.54**
	4180	4405	836.0	26.92	23.33
	4230	4455	846.0	27.25	23.48

Part 24 1900MHz Band

Bands	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
				Peak	Average
UMTS1900 (Band 2)	9262	9662	1852.4	26.11	23.02
	9400	9800	1880.0	**26.65**	**23.15**
	9538	9938	1907.6	26.27	23.06

7.3. HSDPA REL 5

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

	Mode	Rel5 HSDPA			
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs =βhs/βc	30/15			

Result

Part 22 850MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS850 (Band 5)	1	4132	4357	826.4	**27.20**	**23.30**
		4180	4405	836.0	26.83	23.12
		4230	4455	846.0	27.16	23.24
	2	4132	4357	826.4	27.14	23.25
		4180	4405	836.0	27.10	23,10
		4230	4455	846.0	27.15	23.20
	3	4132	4357	826.4	26.80	22.70
		4180	4405	836.0	26.90	22.80
		4230	4455	846.0	26.80	22.80
	4	4132	4357	826.4	26.79	22.80
		4180	4405	836.0	26.75	22.84
		4230	4455	846.0	26.78	22.75

Part 24 1900MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS1900 (Band 2)	1	9262	9662	1852.4	26.56	22.82
		9400	9800	1880.0	**26.75**	**23.01**
		9538	9938	1907.6	26.40	22.97
	2	9262	9662	1852.4	26.50	22.80
		9400	9800	1880.0	26.70	23.00
		9538	9938	1907.6	26.60	22.95
	3	9262	9662	1852.4	26.10	22.50
		9400	9800	1880.0	26.20	22.45
		9538	9938	1907.6	25.90	22.35
	4	9262	9662	1852.4	26.00	22.40
		9400	9800	1880.0	25.88	22.37
		9538	9938	1907.6	25.85	22.35

7.4. HSPA REL 6 (HSDPA & HSUPA)

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15 47/15	56/75	47/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

RESULTS

Part 22 850MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS HSUPA 850MHz (Band 5)	1	4132	4357	826.4	**27.15**	**22.26**
		4180	4405	836.0	26.80	22.16
		4230	4455	846.0	27.14	22.24
	2	4132	4357	826.4	25.00	20.36
		4180	4405	836.0	24.41	20.25
		4230	4455	846.0	24.57	20.32
	3	4132	4357	826.4	26.50	21.50
		4180	4405	836.0	26.60	21.60
		4230	4455	846.0	26.65	21.65
	4	4132	4357	826.4	24.98	20.47
		4180	4405	836.0	24.49	20.38
		4230	4455	846.0	24.50	20.43
	5	4132	4357	826.4	27.13	22.20
		4180	4405	836.0	27.01	22.10
		4230	4455	846.0	27.12	21.15

Part 24 1900MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS HSUPA 1900MHz (Band 2)	1	9262	9662	1852.4	26.40	22.00
		9400	9800	1880.0	26.50	22.06
		9538	9938	1907.6	**26.60**	**22.09**
	2	9262	9662	1852.4	25.00	20.35
		9400	9800	1880.0	25.20	20.50
		9538	9938	1907.6	25.10	20.40
	3	9262	9662	1852.4	26.00	21.05
		9400	9800	1880.0	26.15	21.10
		9538	9938	1907.6	26.38	21.20
	4	9262	9662	1852.4	25.10	20.38
		9400	9800	1880.0	25.25	20.63
		9538	9938	1907.6	25.27	20.80
	5	9262	9662	1852.4	26.00	22.00
		9400	9800	1880.0	26.41	21.90
		9538	9938	1907.6	26.45	22.05

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

MODES TESTED

- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

GPRS MODE

Part 22 850MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
CELL	GPRS	128	824.2	**249.8210**	306.196
		190	836.6	242.8435	304.811
		251	848.8	239.3551	317.295

Part 24 1900MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	GPRS	512	1850.2	247.0060	307.368
		661	1880.0	**251.2732**	302.043
		810	1909.8	248.9907	304.427

WCDMA PART 22 AND 24

Band	Mode	DL Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
850MHz	UMTS Rel. 99	4357	826.40	4.0066	4.525
		4408	836.00	3.9427	4.472
		4458	846.60	**4.0498**	4.479
1900MHz		9662	1852.40	**4.1070**	4.496
		9800	1880.00	3.9569	4.496
		9938	1907.60	4.0341	4.488

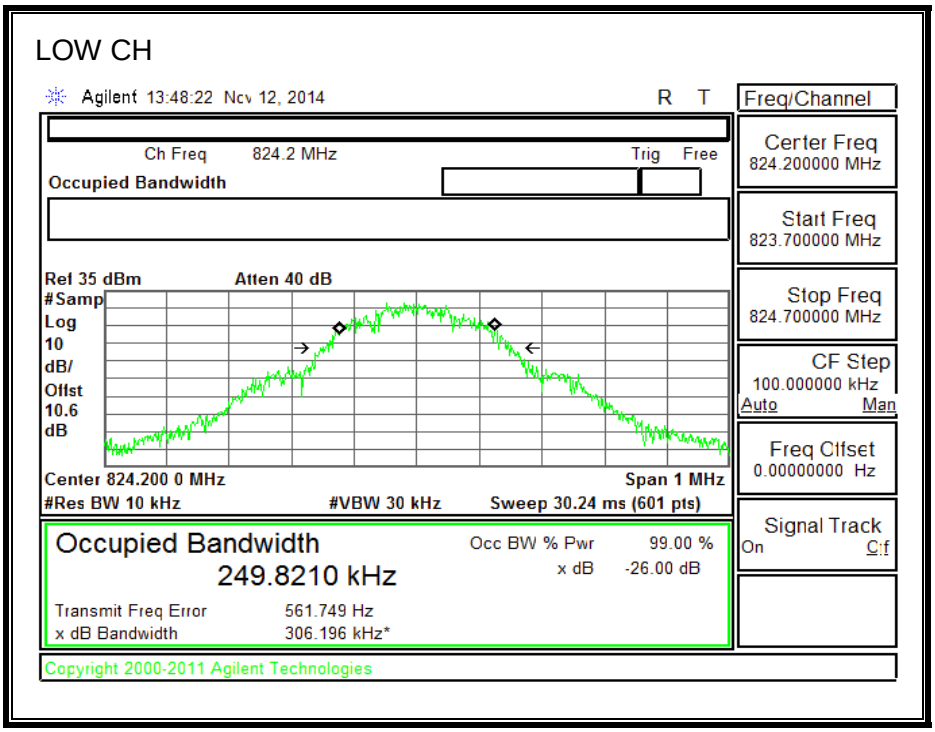
WCDMA PART 22 AND 24

Band	Mode	DL Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
850MHz	UMTS HSDPA	4357	826.40	**4.0785**	4.485
		4408	836.00	4.0346	4.498
		4458	846.60	3.9632	4.493
1900MHz		9662	1852.40	4.0358	4.571
		9800	1880.00	**4.1271**	4.500
		9938	1907.60	4.1043	4.455

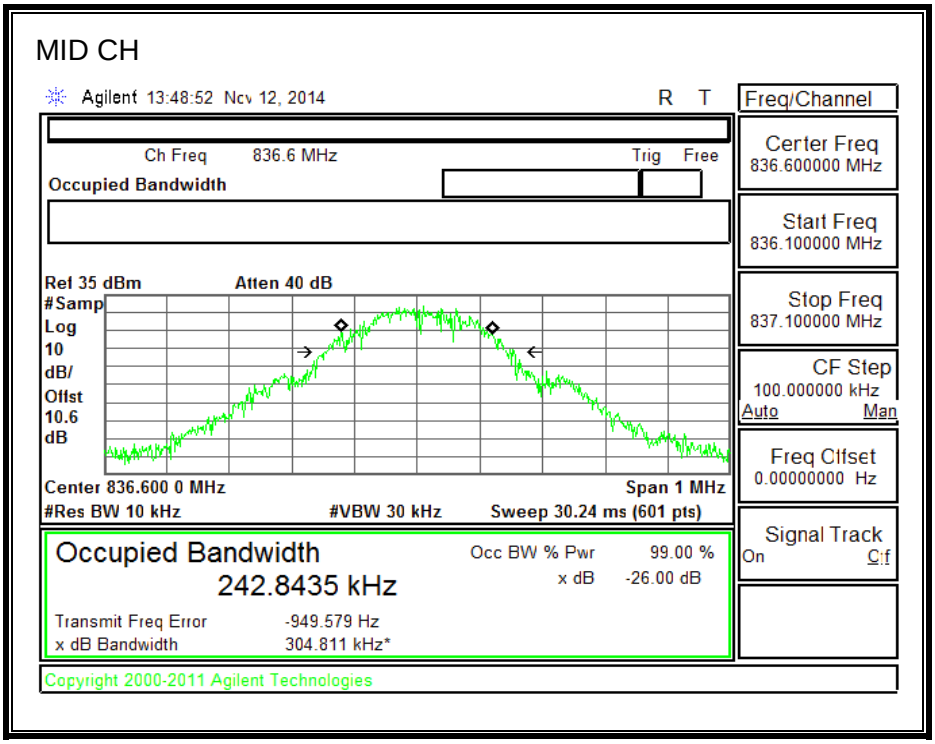
8.1.1. GSM-GPRS

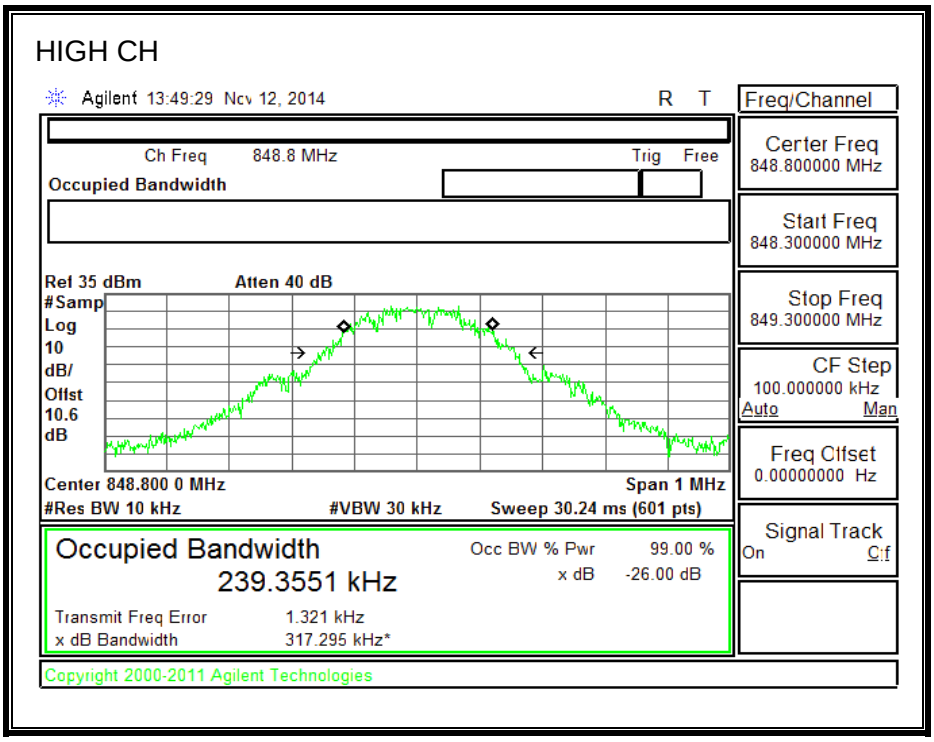
850MHz BAND

LOW CH

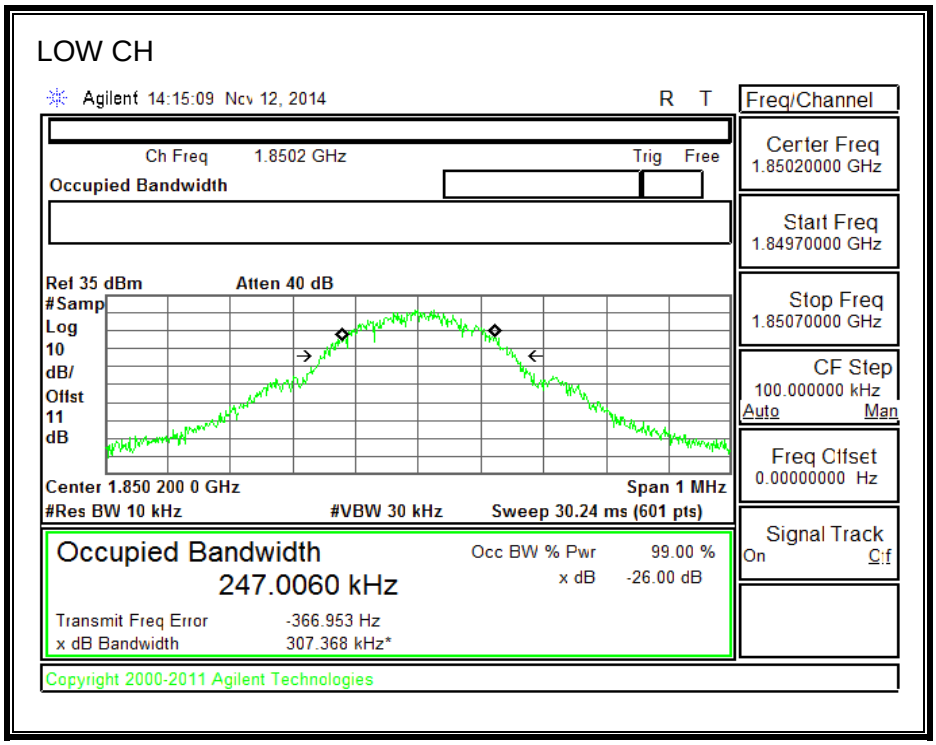


MID CH

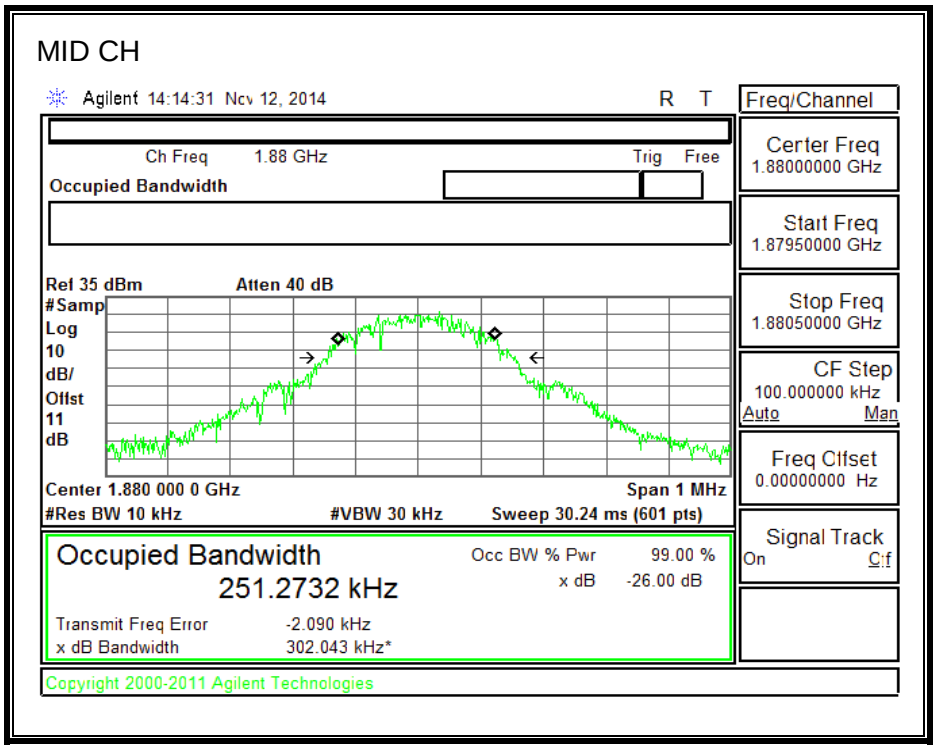




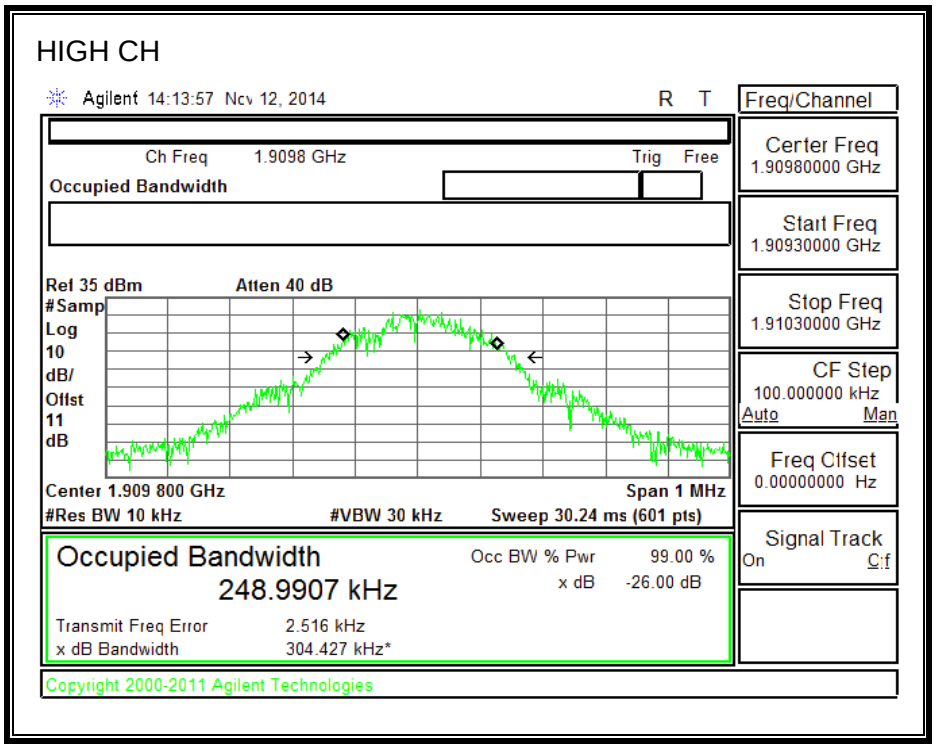
1900MHz BAND



MID CH



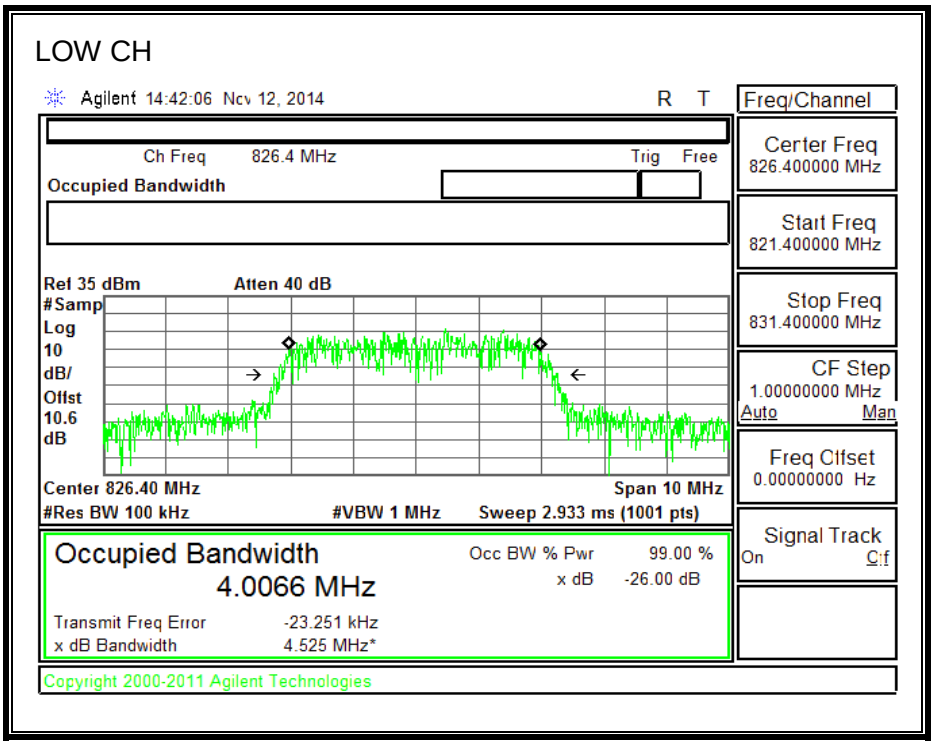
HIGH CH



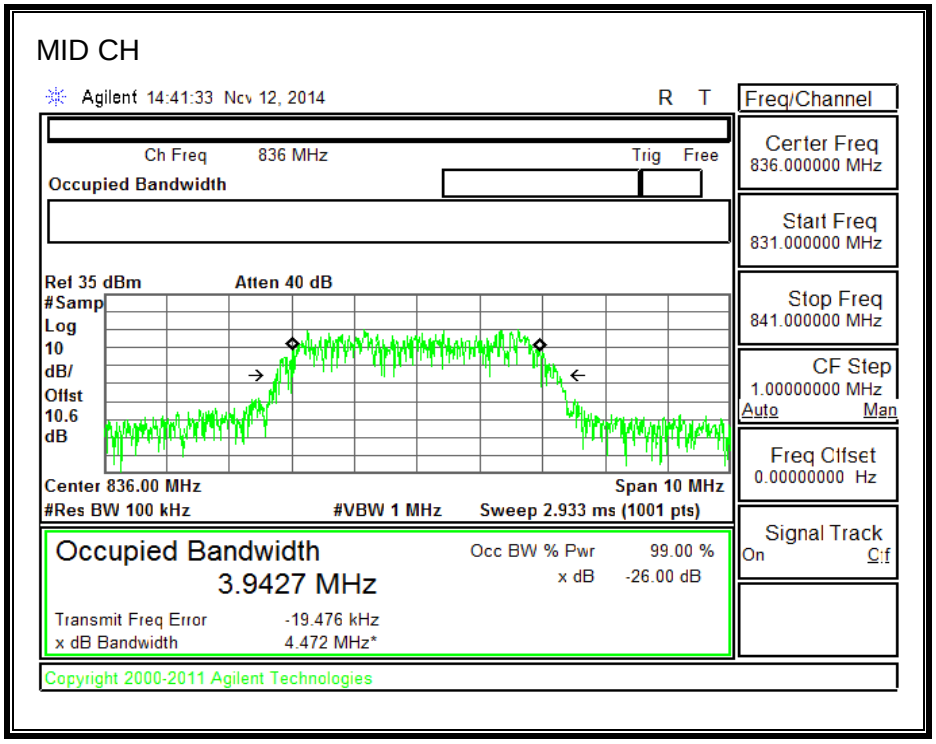
8.1.2. UMTS Rel. 99

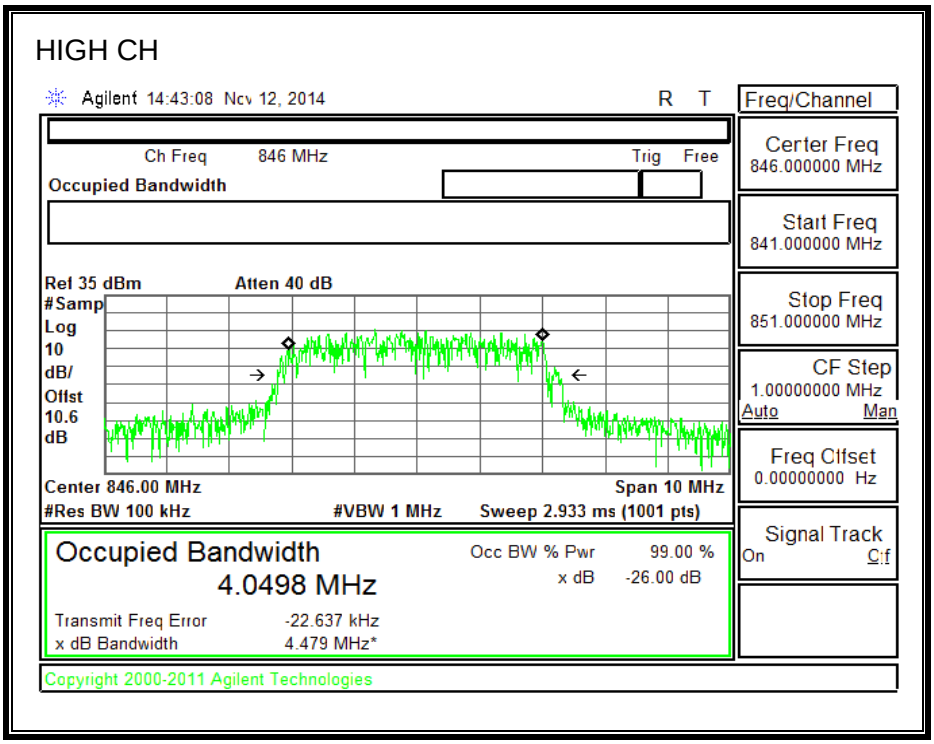
850MHz BAND

LOW CH

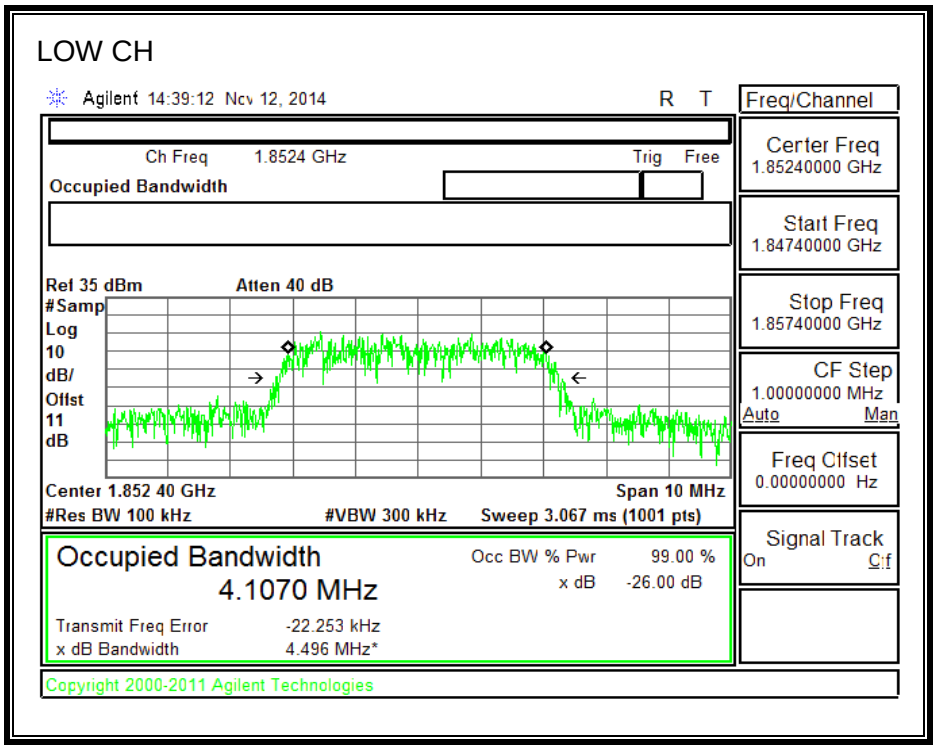


MID CH

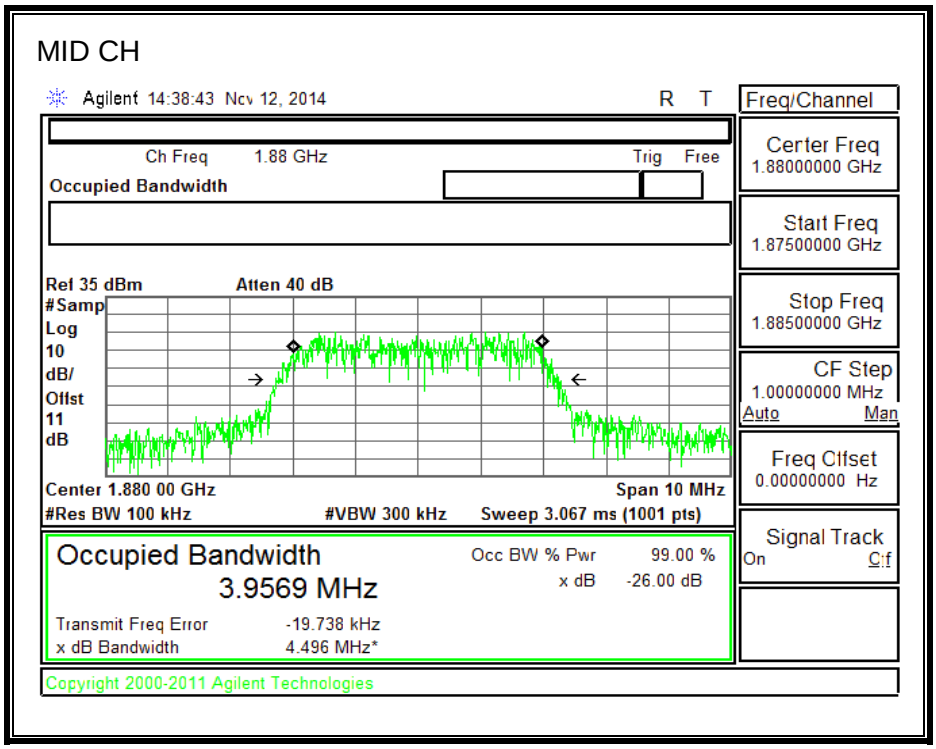




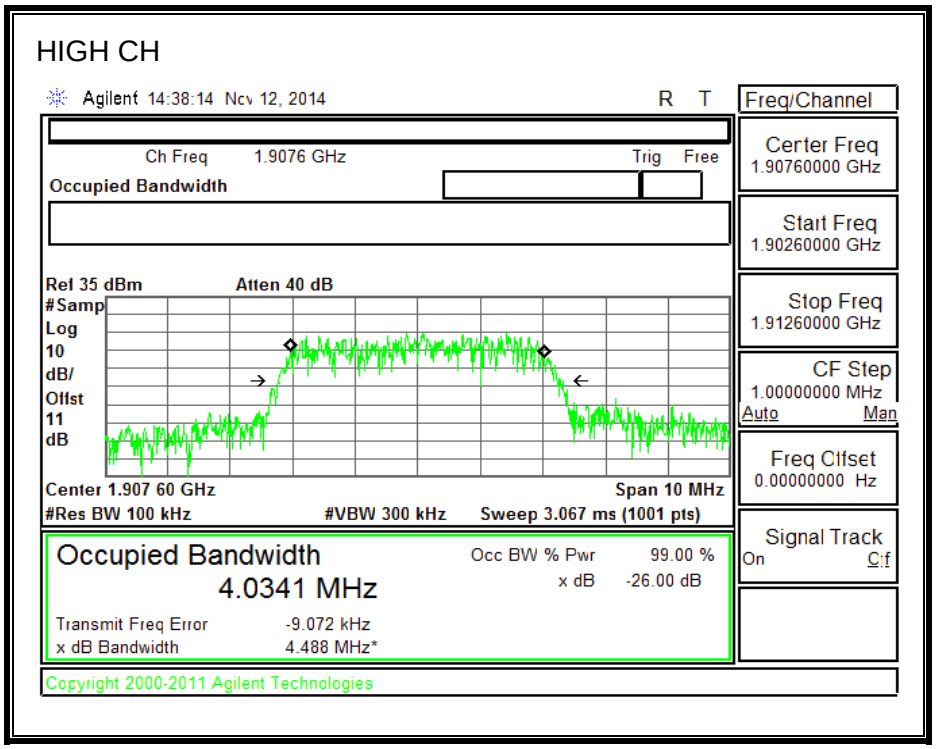
1900MHz BAND



MID CH



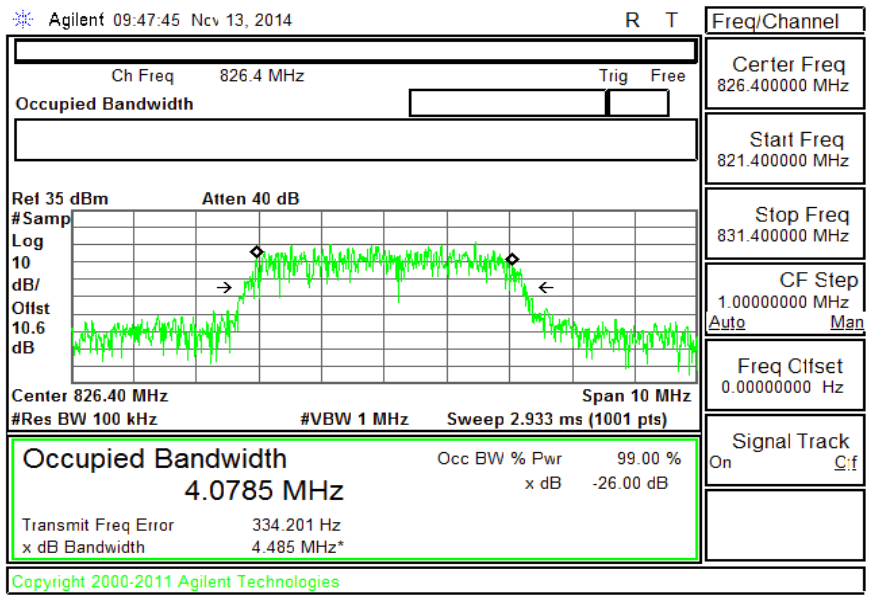
HIGH CH



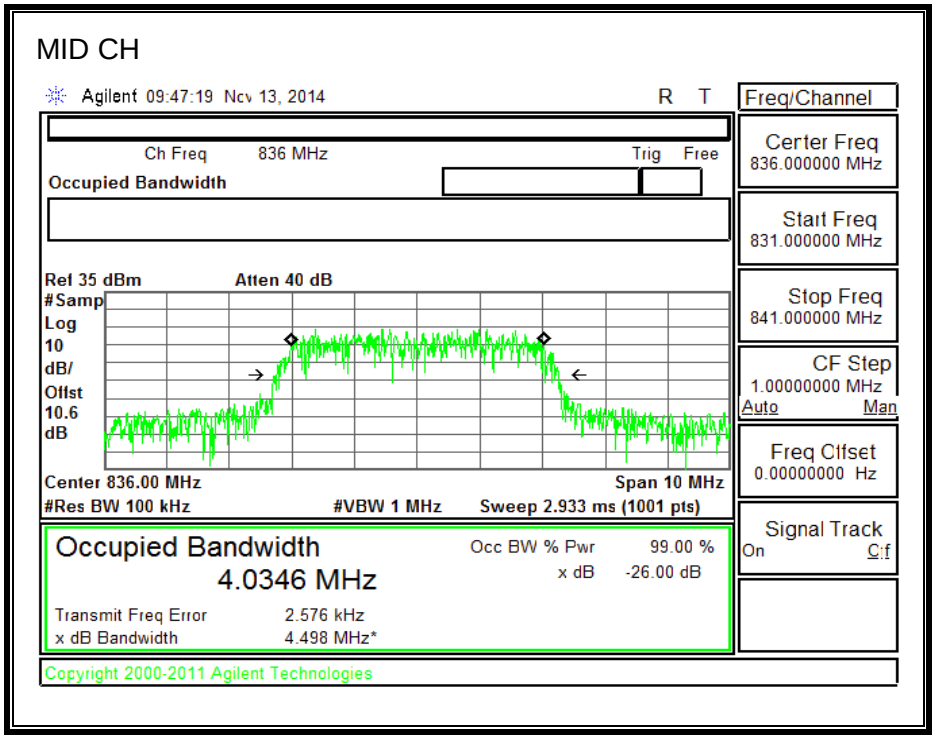
8.1.3. UMTS HSDPA

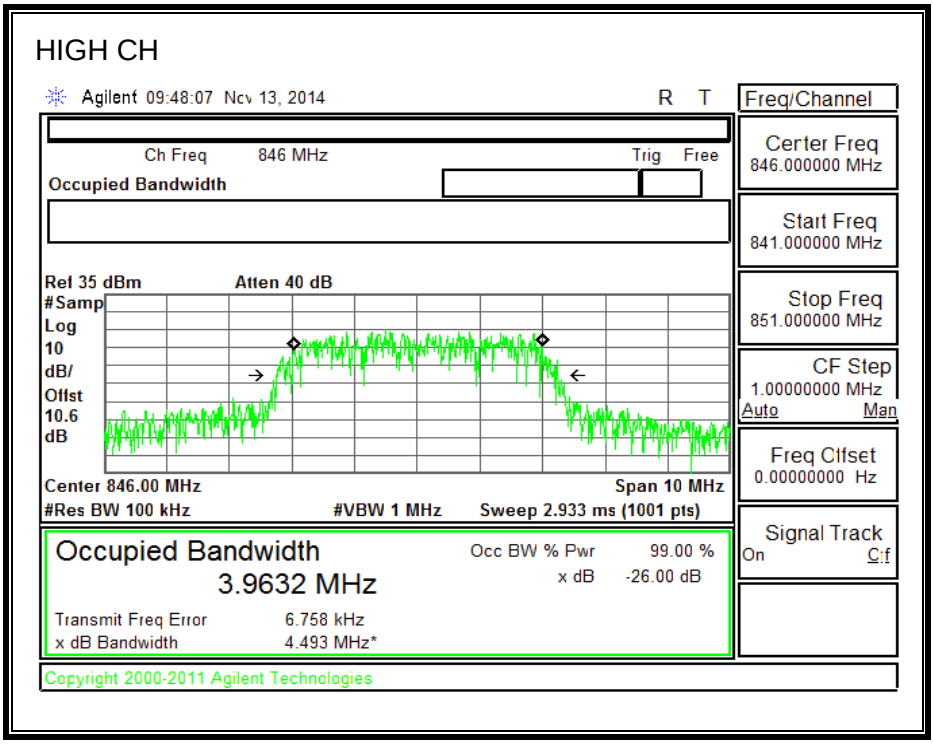
850MHz BAND

LOW CH

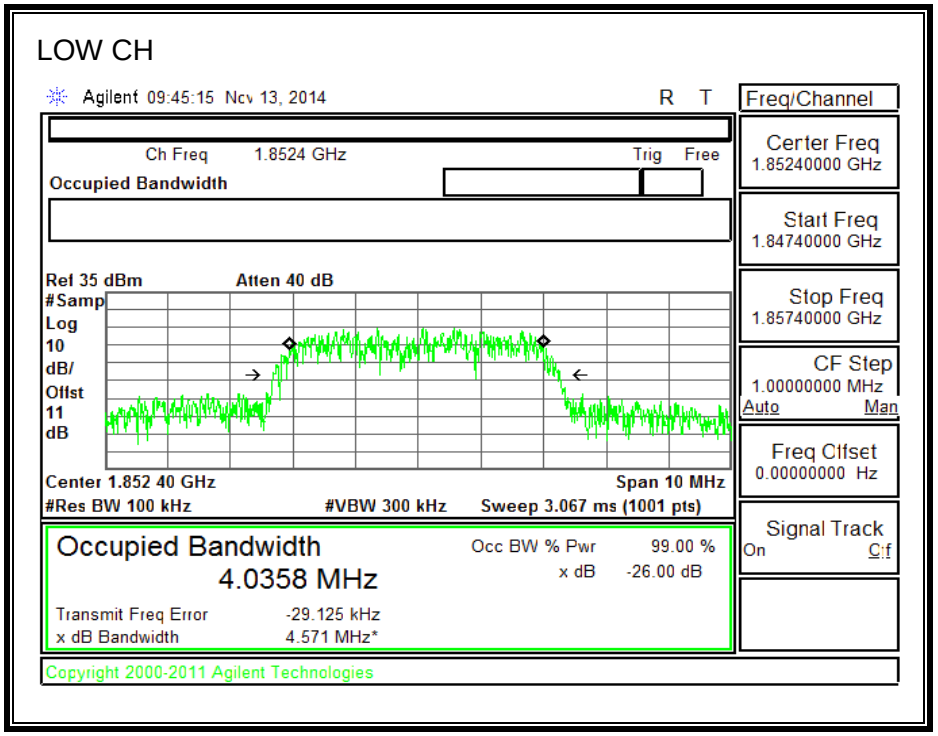


MID CH

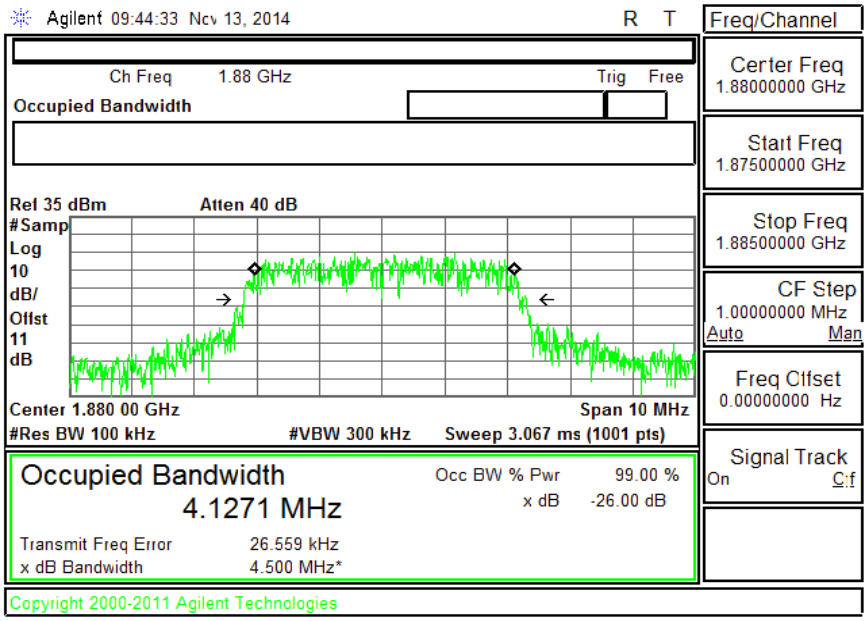




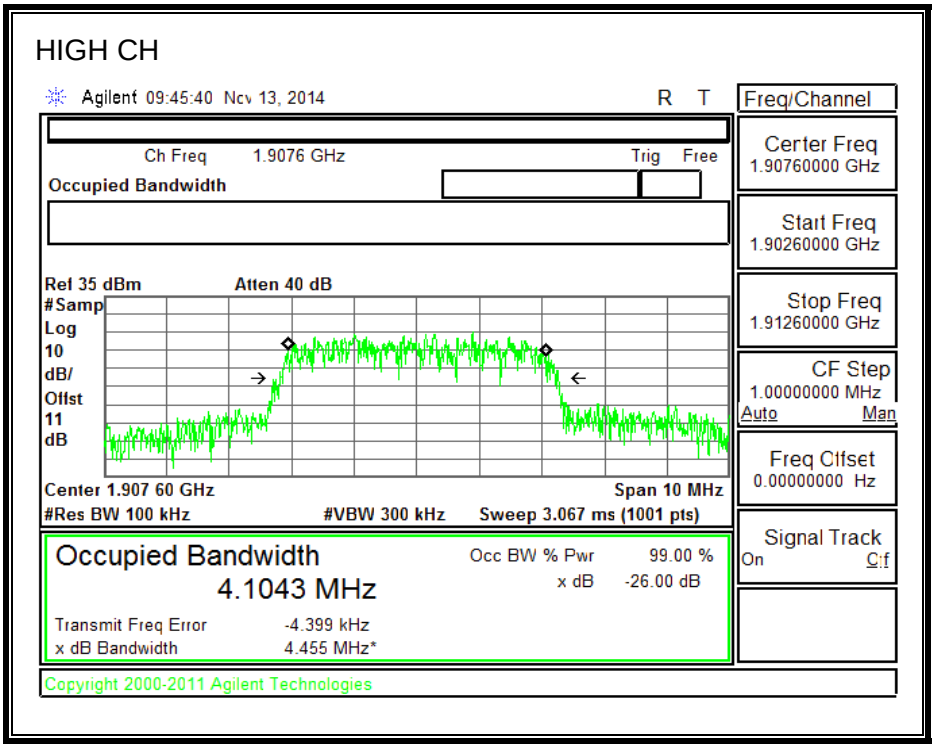
1900MHz BAND



MID CH



HIGH CH



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, §24.238

LIMITS

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.

Compliance with the provisions of paragraphs above of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

TEST PROCEDURE

The transmitter output was connected to a Agilent 8960 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.
For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency (824, 849, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

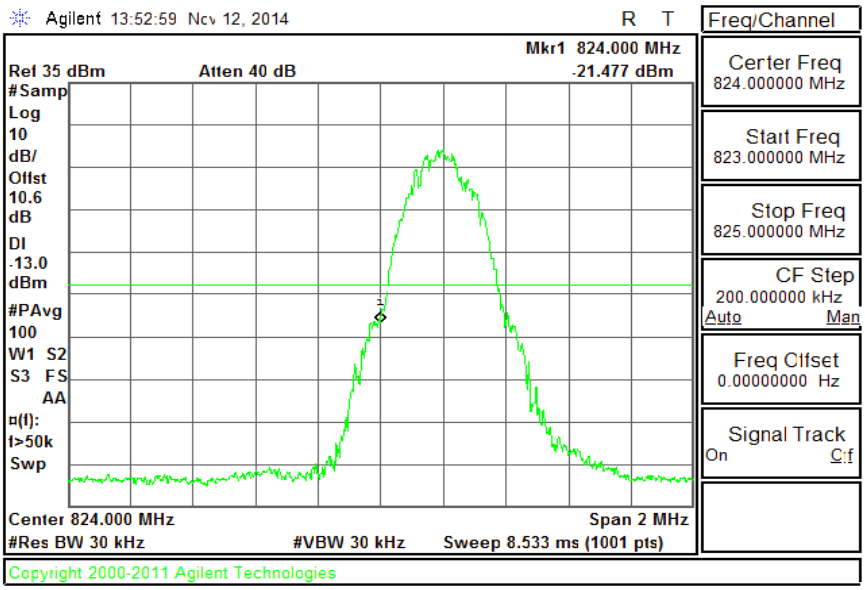
- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

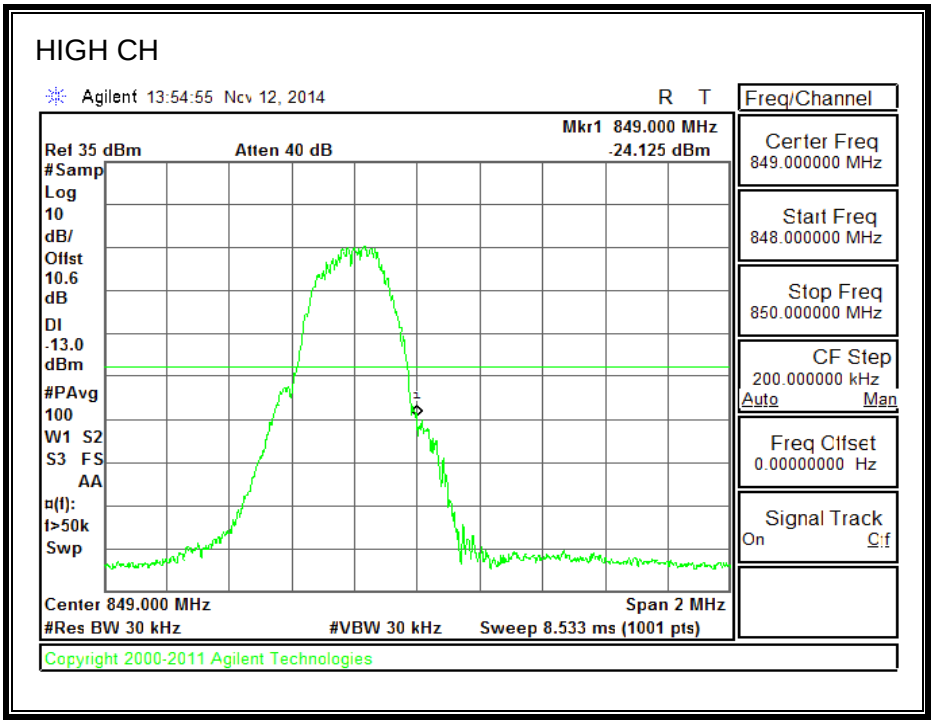
8.2.1. GSM-GPRS

850MHz BAND

LOW CH

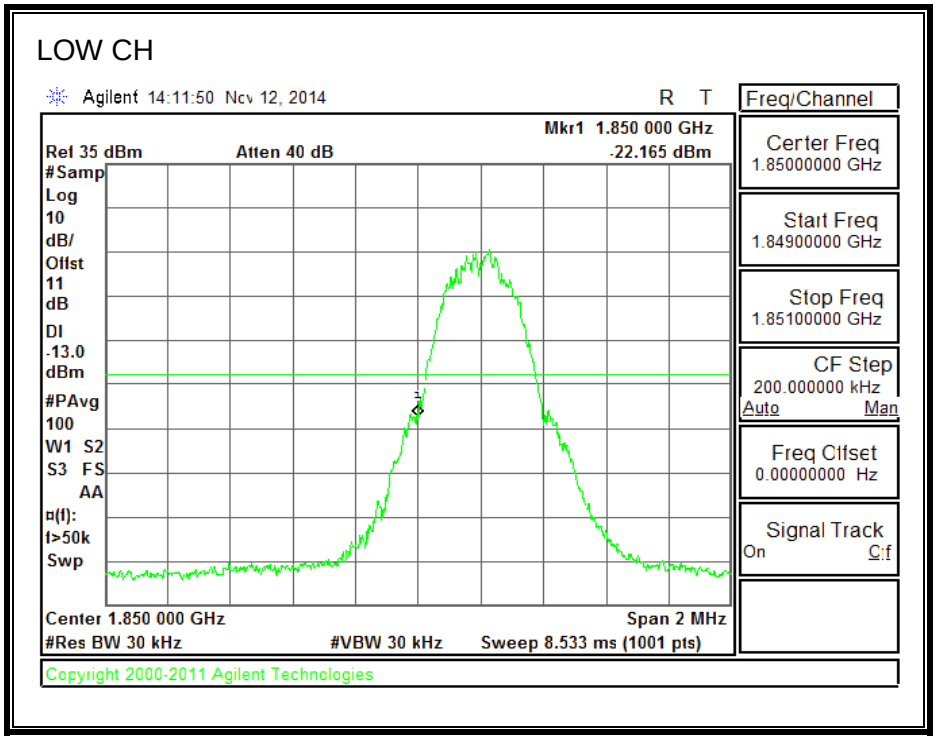


HIGH CH

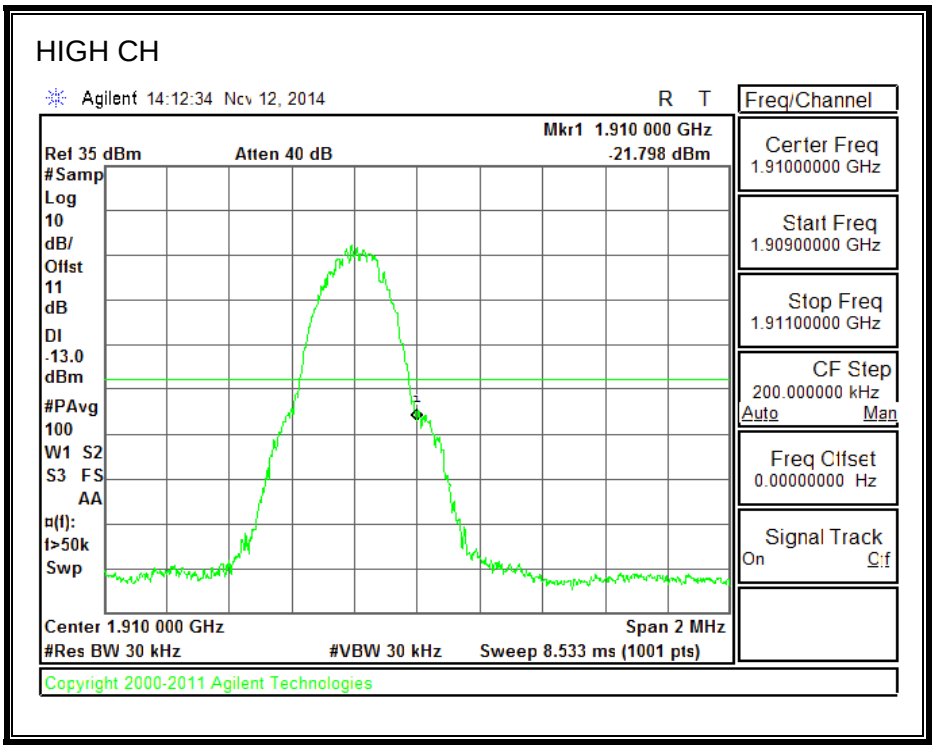


1900MHz BAND

LOW CH



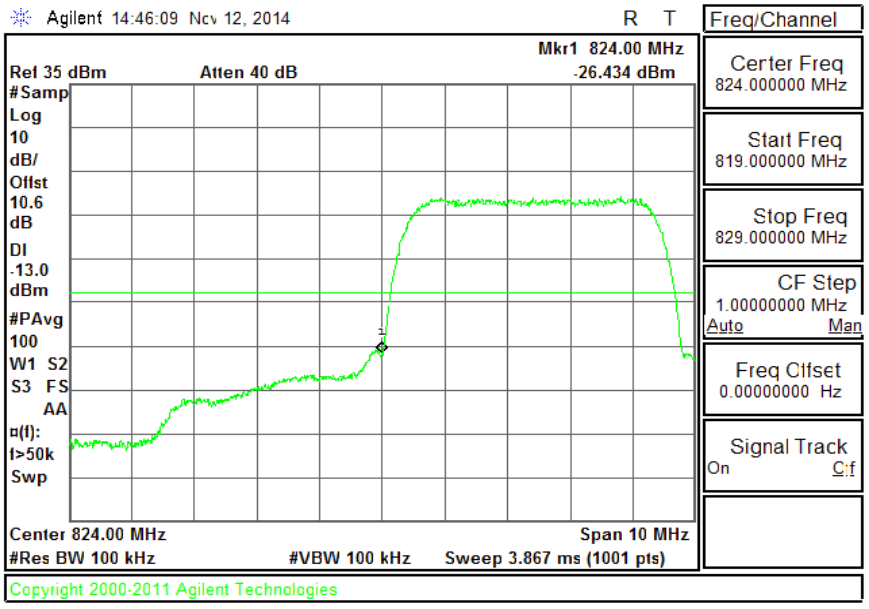
HIGH CH



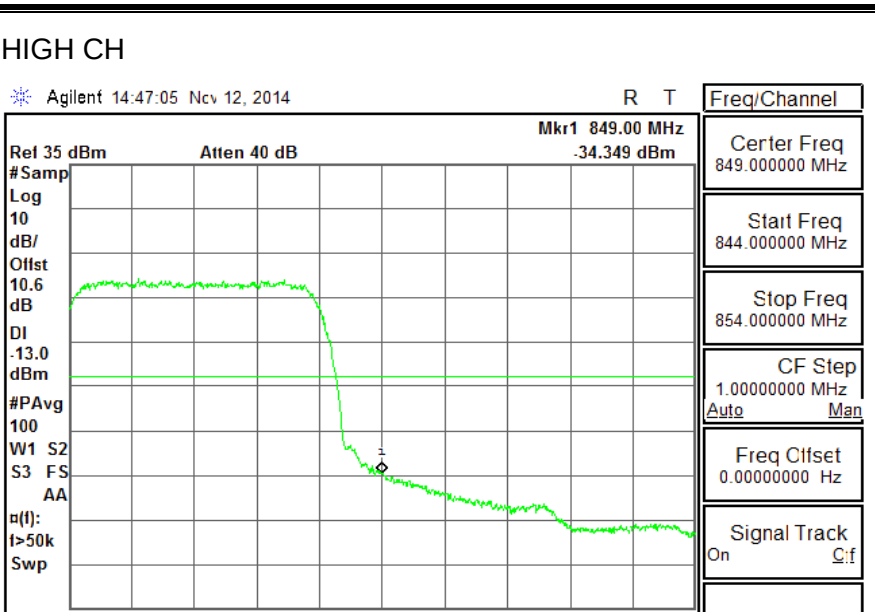
8.2.2. UMTS Rel. 99

850MHz BAND

LOW CH

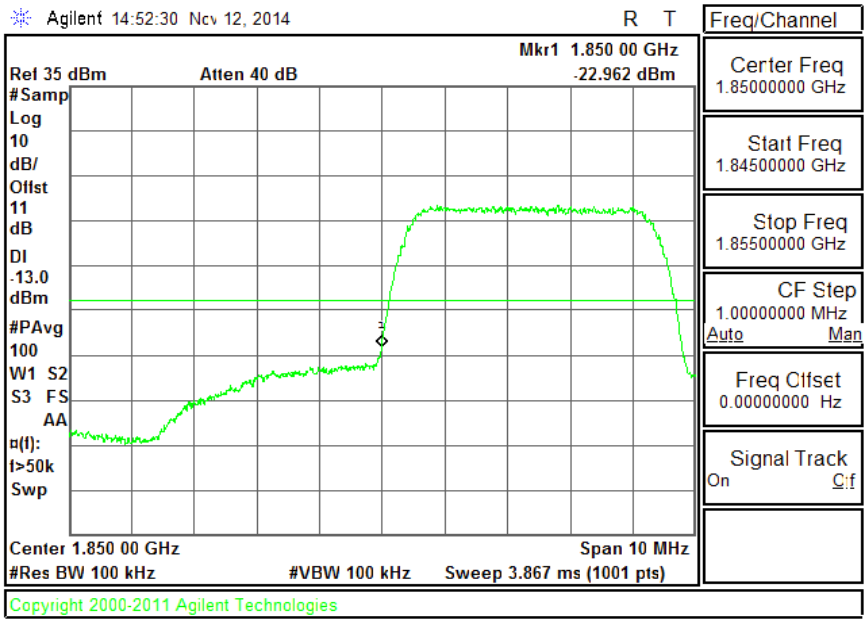


HIGH CH

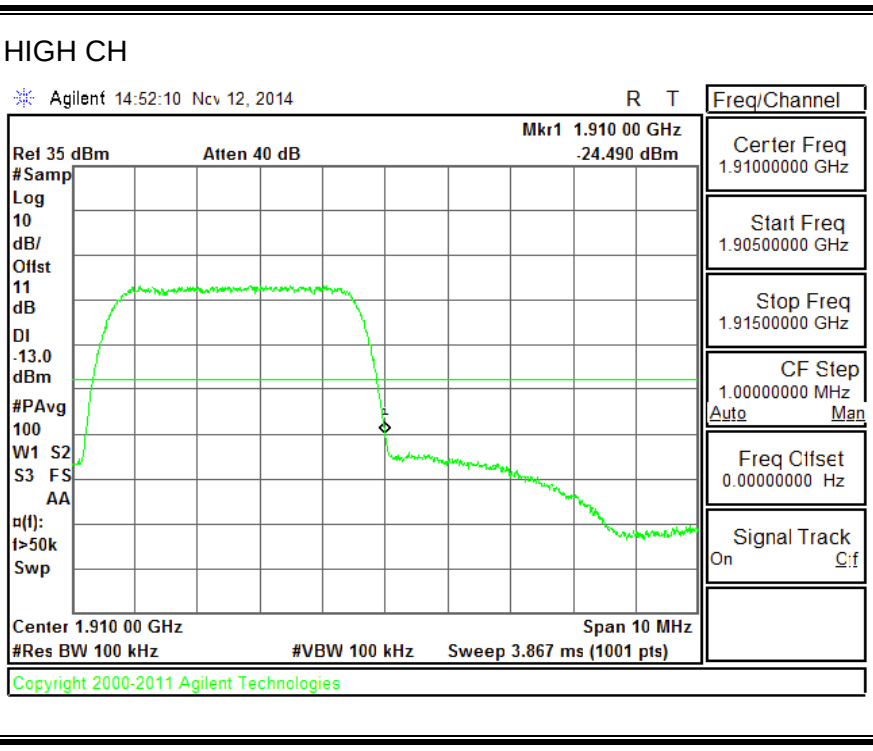


1900MHz BAND

LOW CH



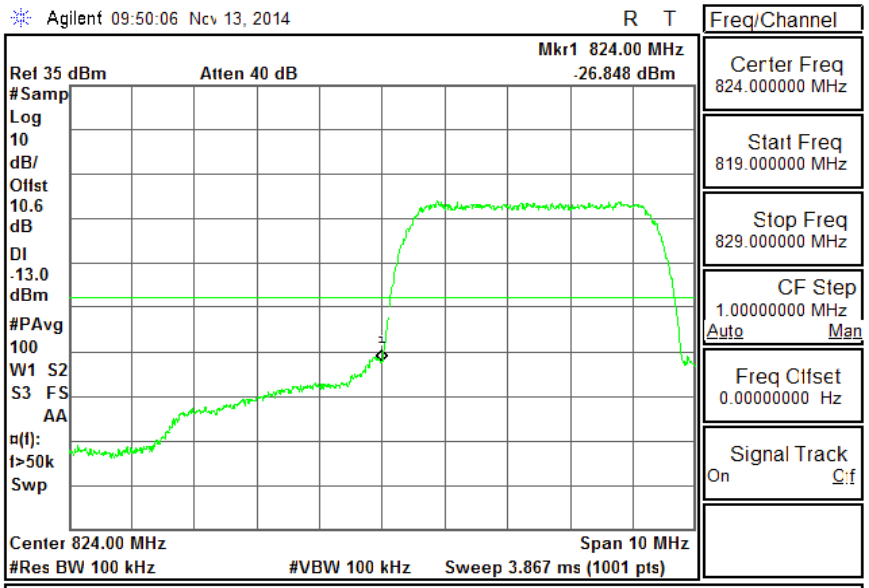
HIGH CH



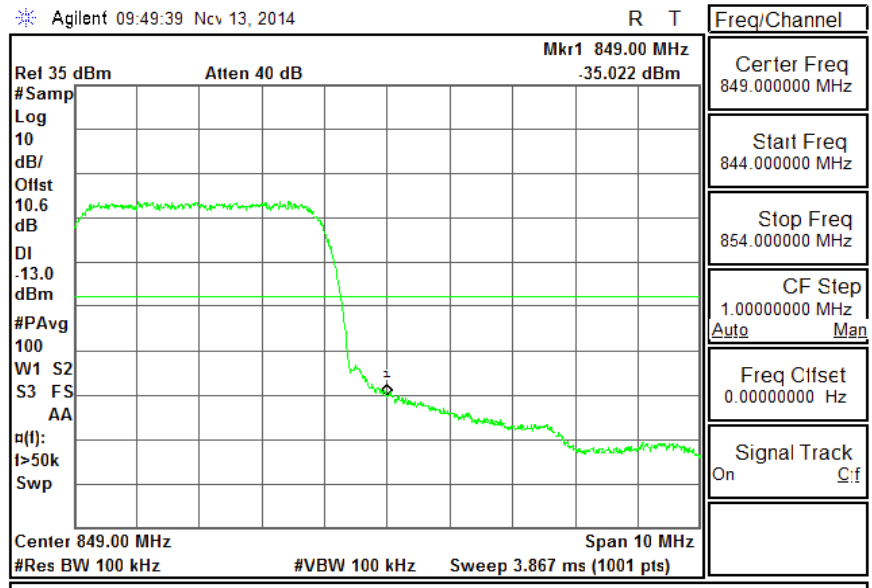
8.2.3. UMTS HSDPA

850MHz BAND

LOW CH

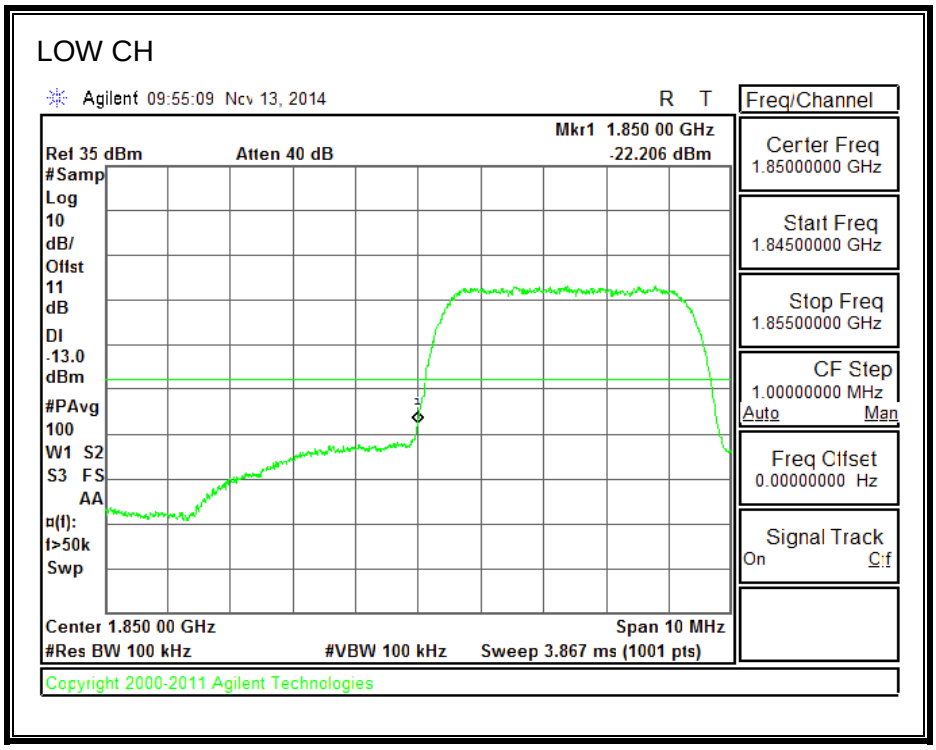


HIGH CH

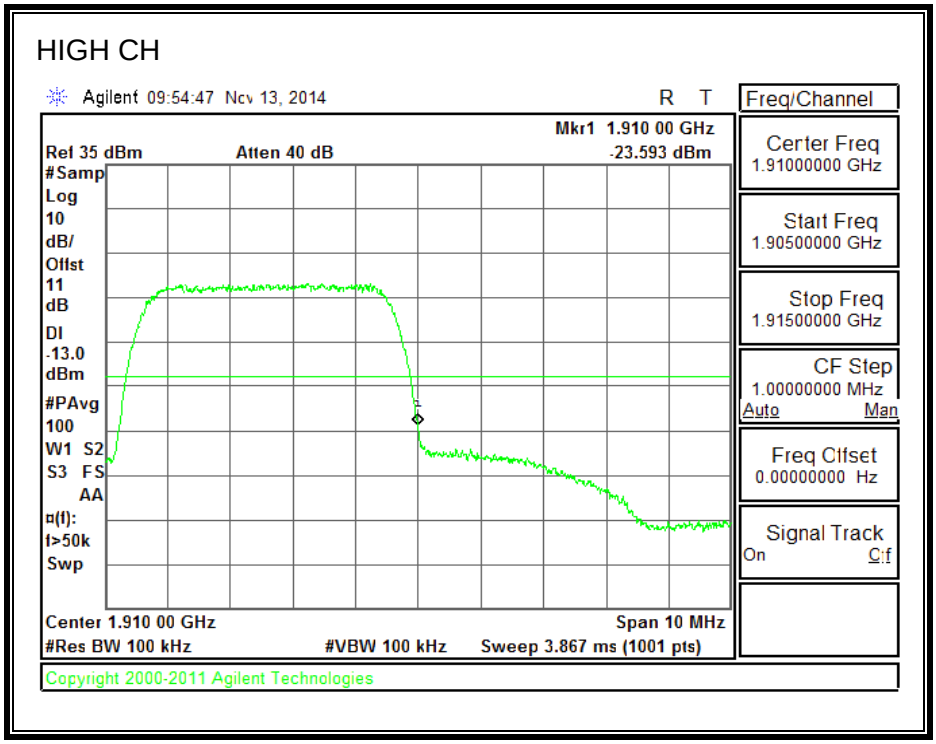


1900MHz BAND

LOW CH



HIGH CH



8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238

LIMITS

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.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.
-

MODES TESTED

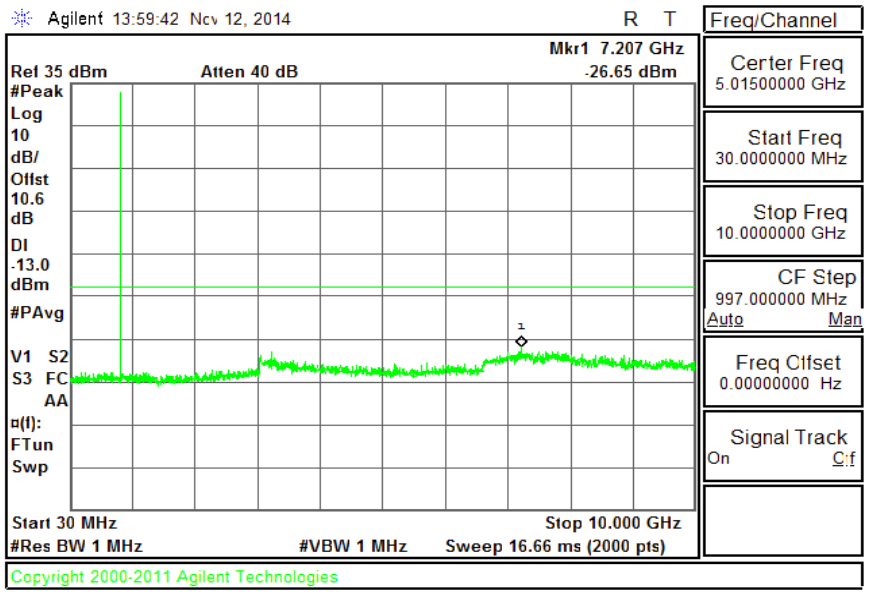
- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

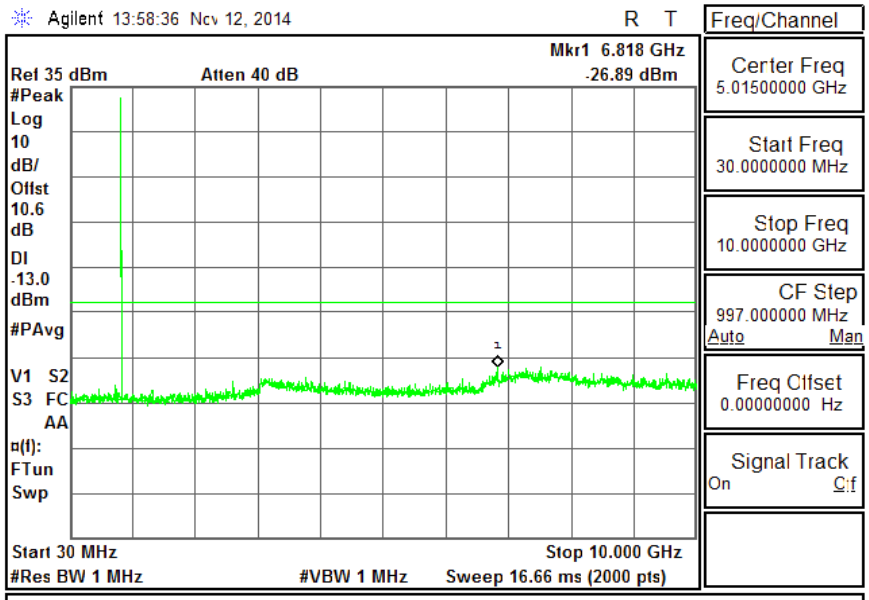
8.3.1. GSM-GPRS

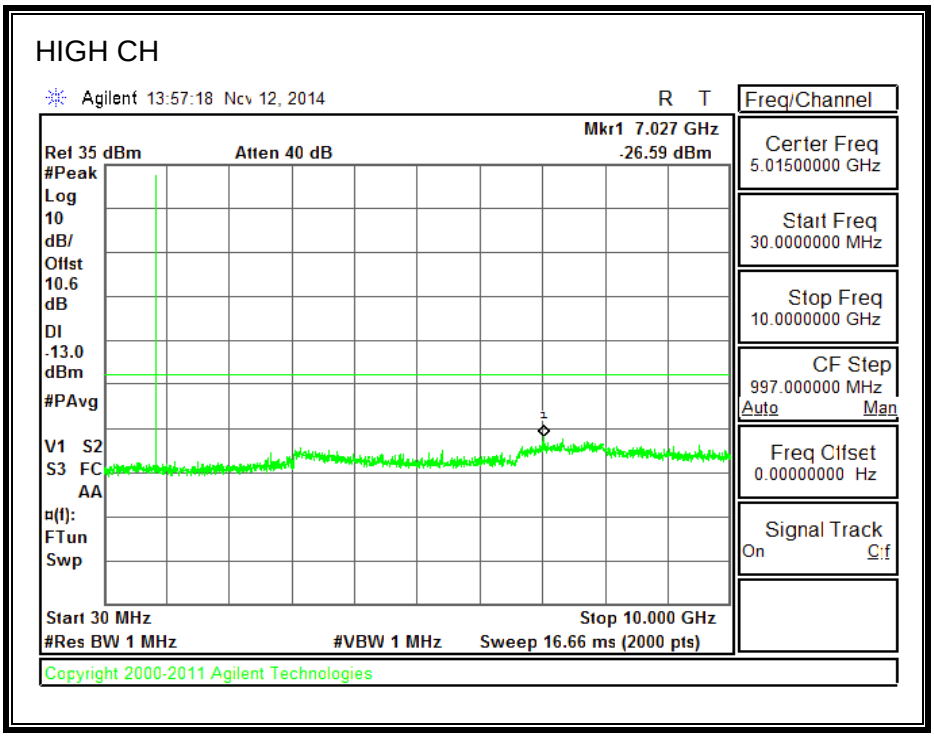
850MHz BAND

LOW CH

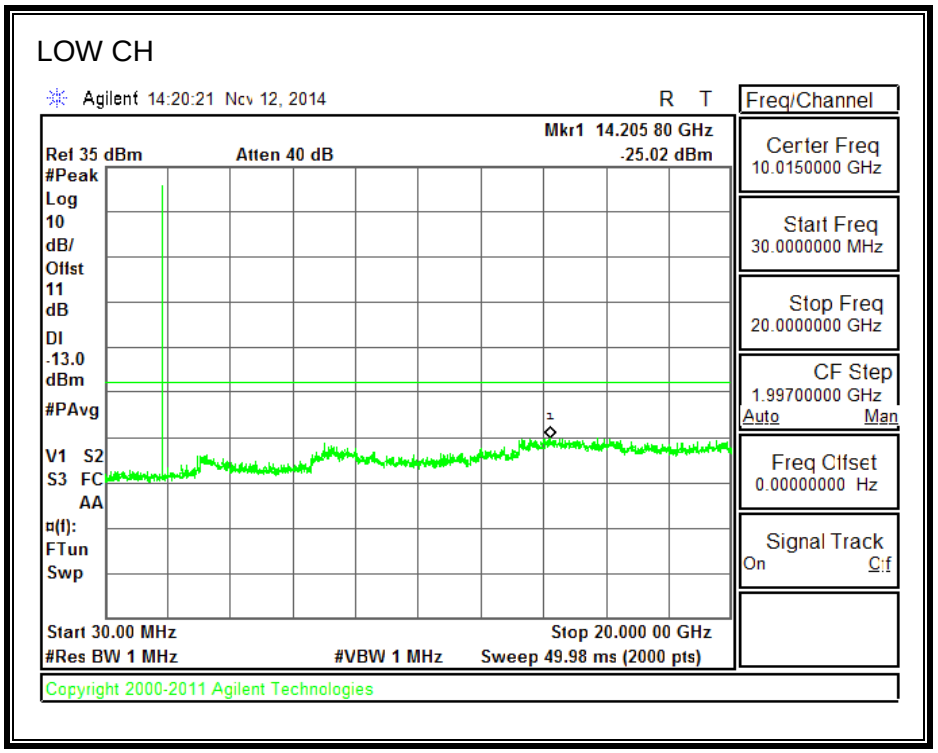


MID CH

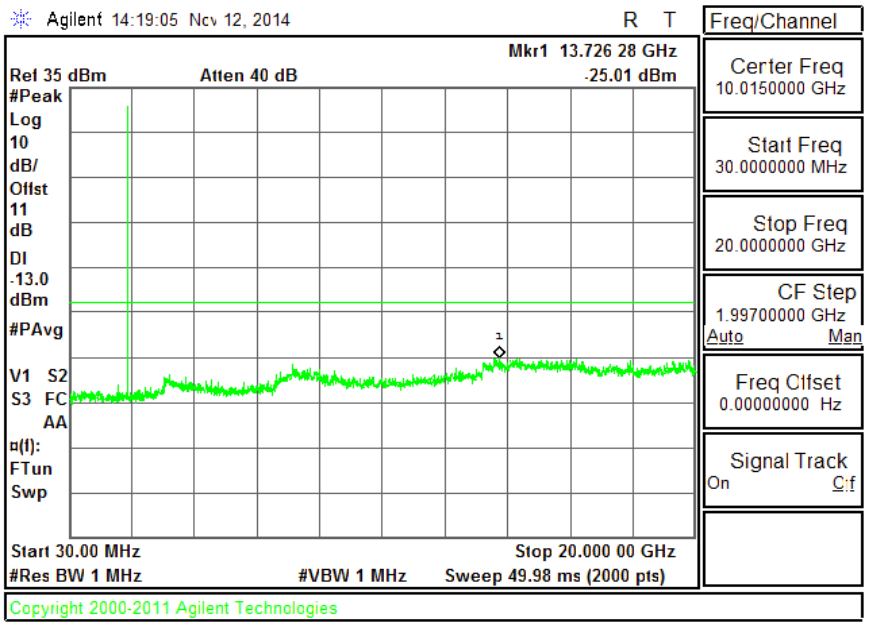




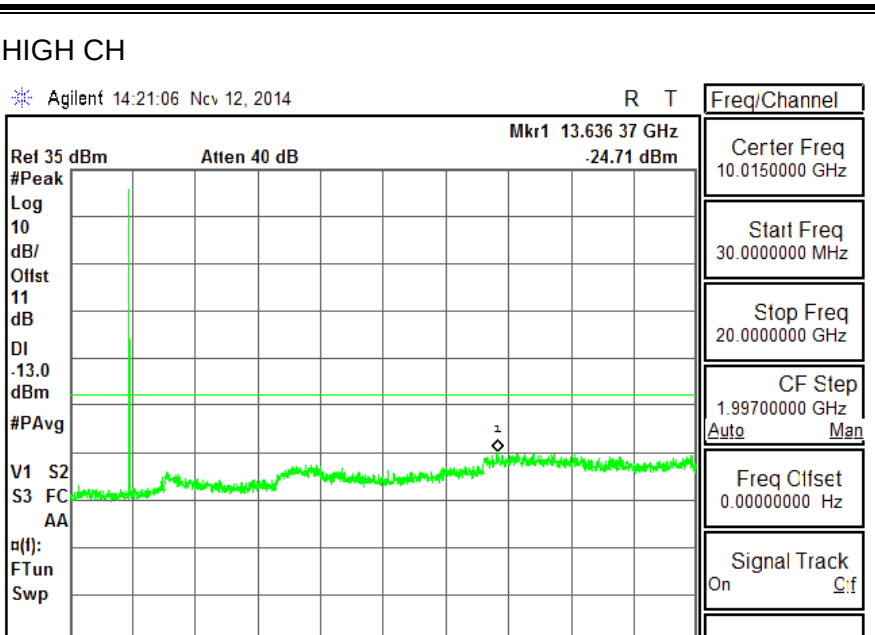
1900MHz BAND



MID CH



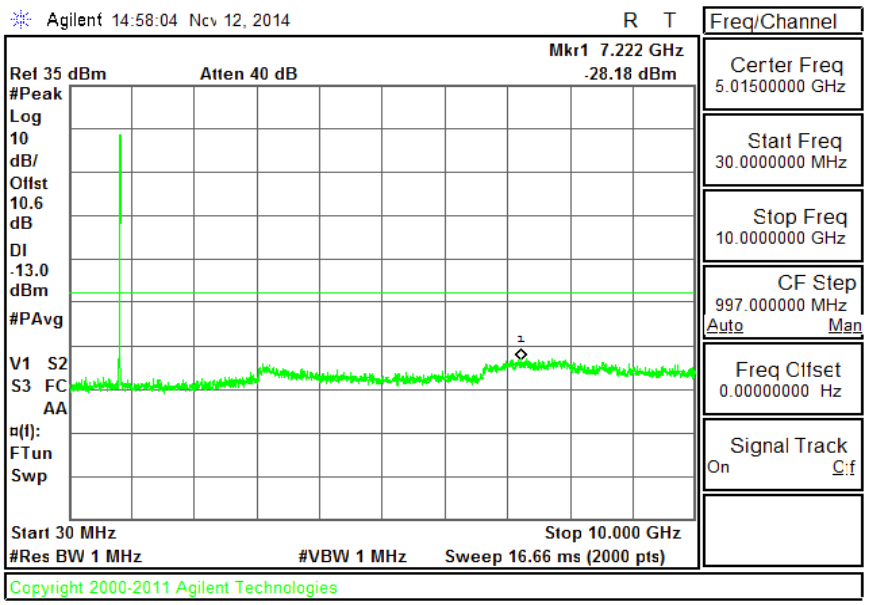
HIGH CH



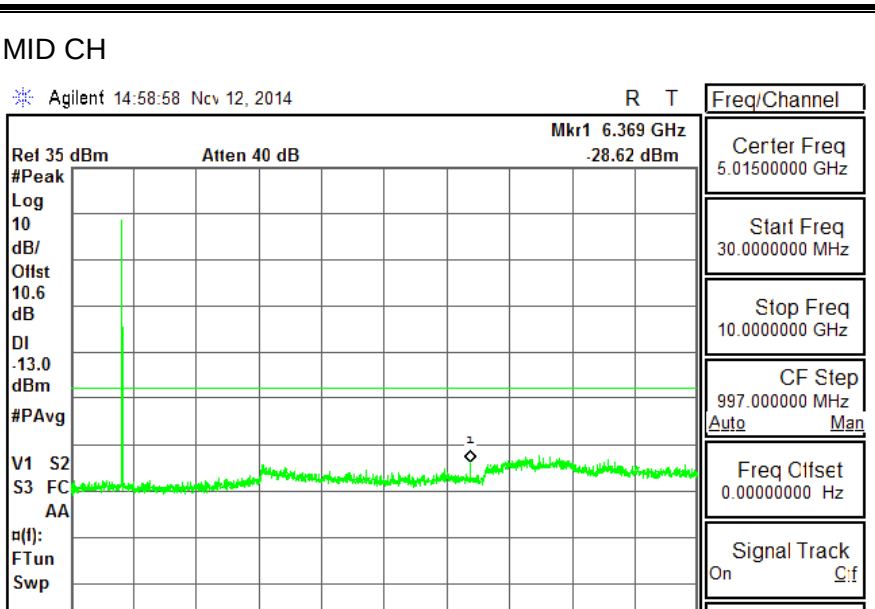
8.3.2. UMTS Rel. 99

850MHz BAND

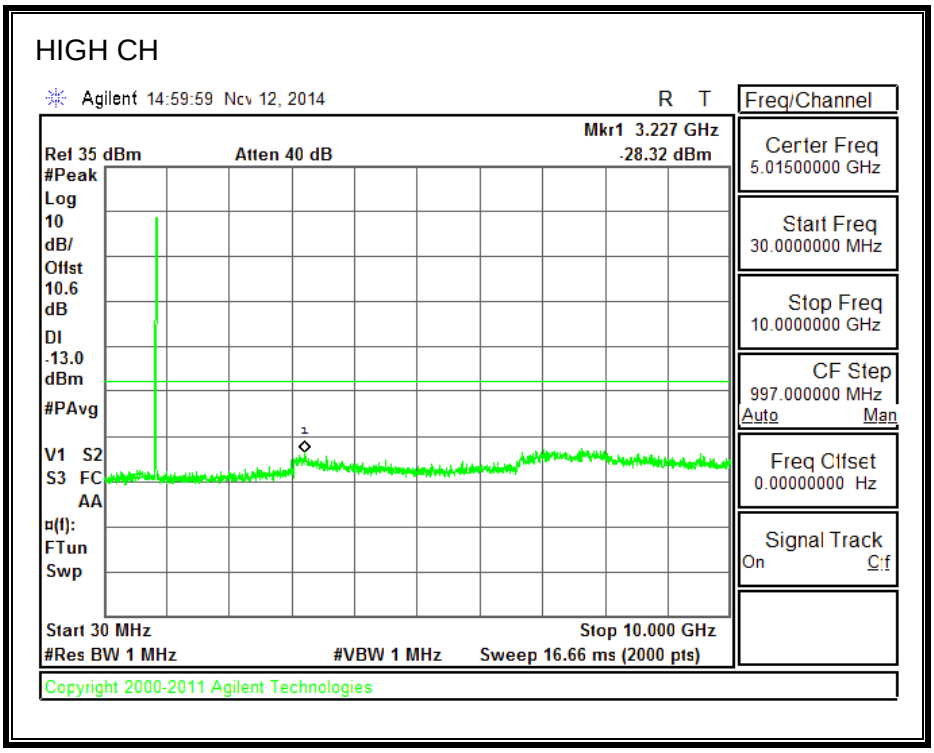
LOW CH



MID CH

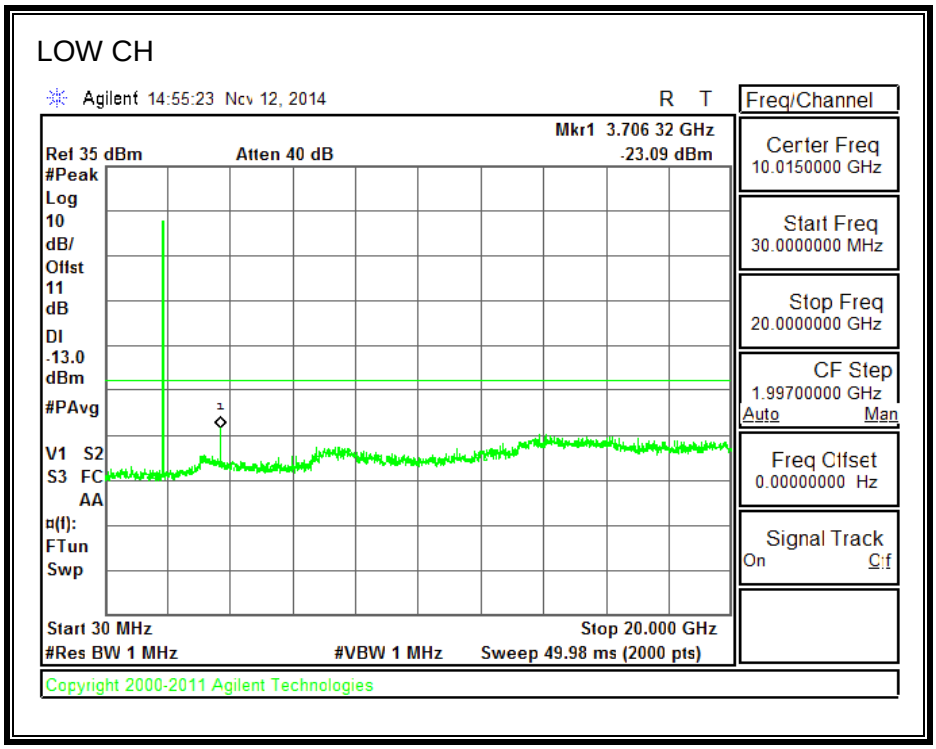


HIGH CH

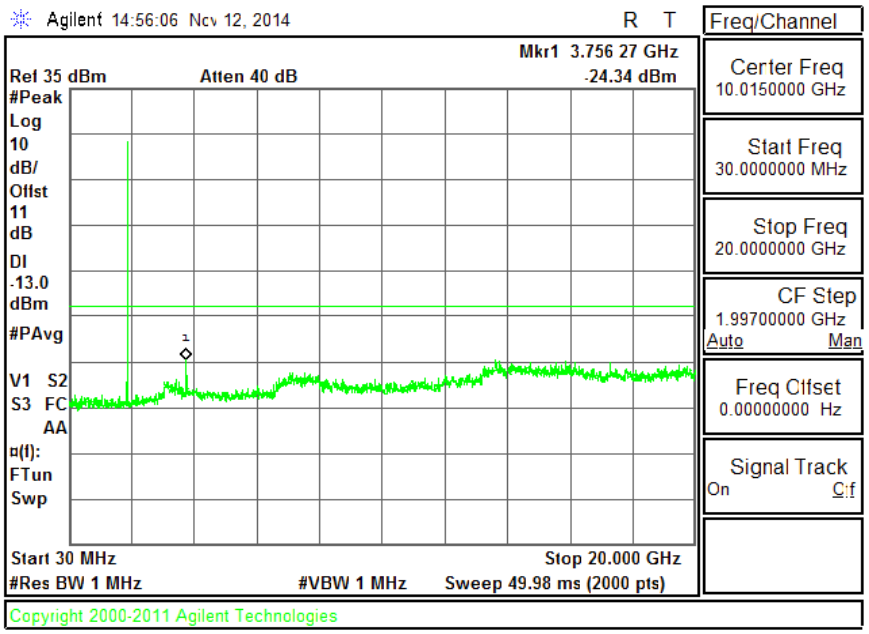


1900MHz BAND

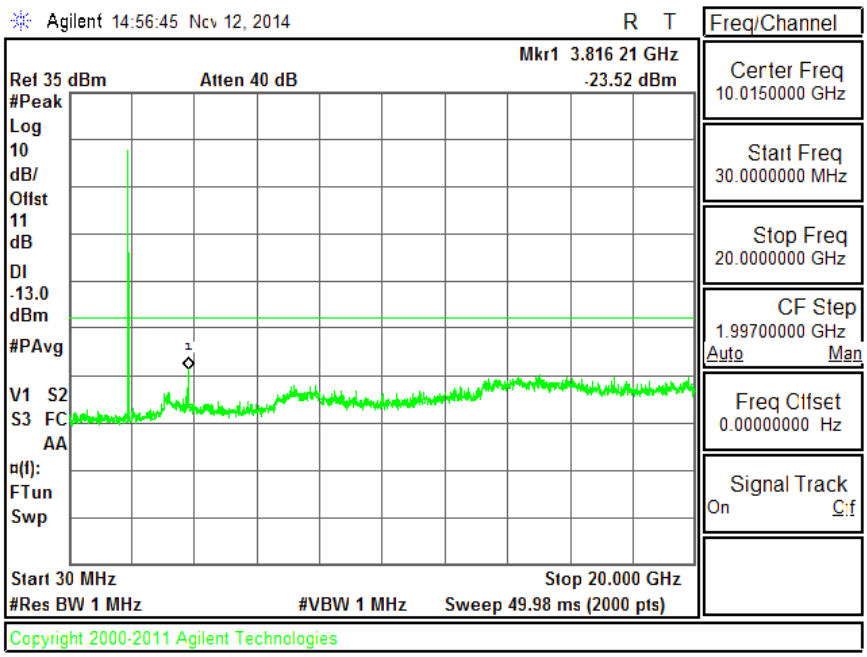
LOW CH



MID CH



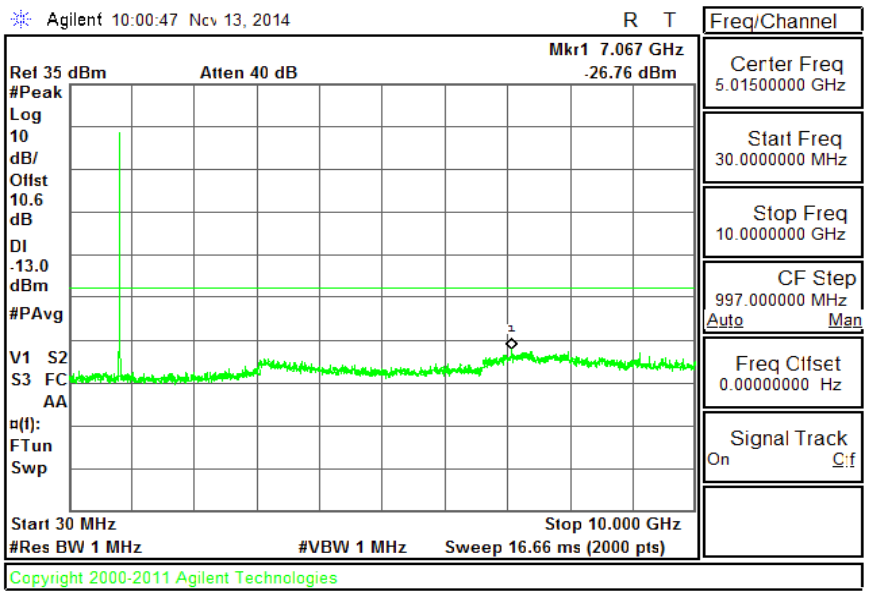
HIGH CH



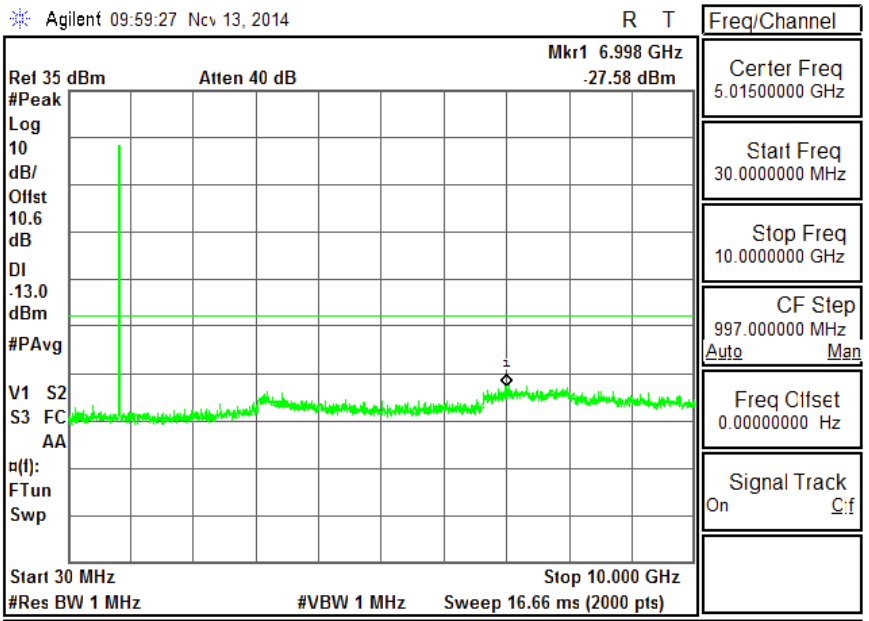
8.3.3. UMTS HSDPA

850MHz BAND

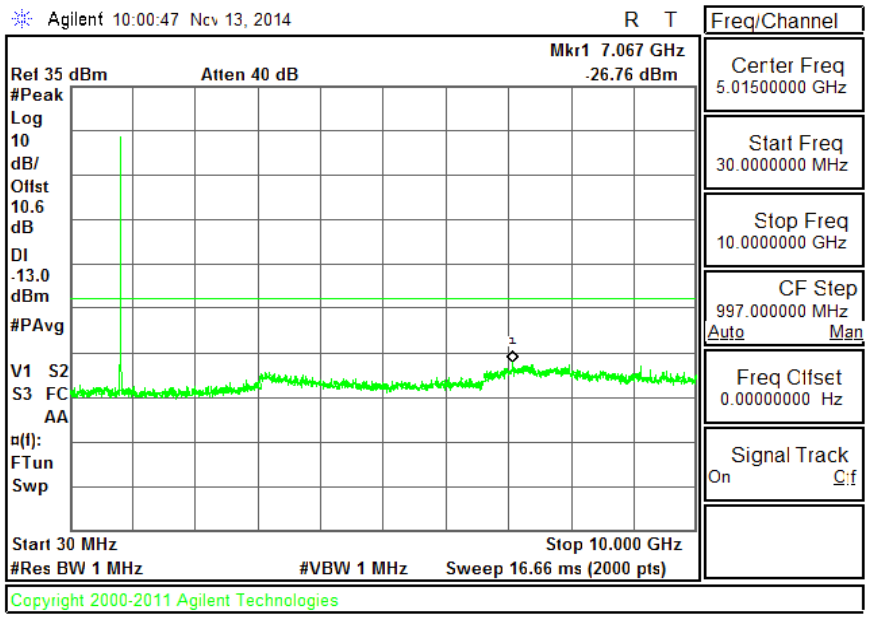
LOW CH



MID CH

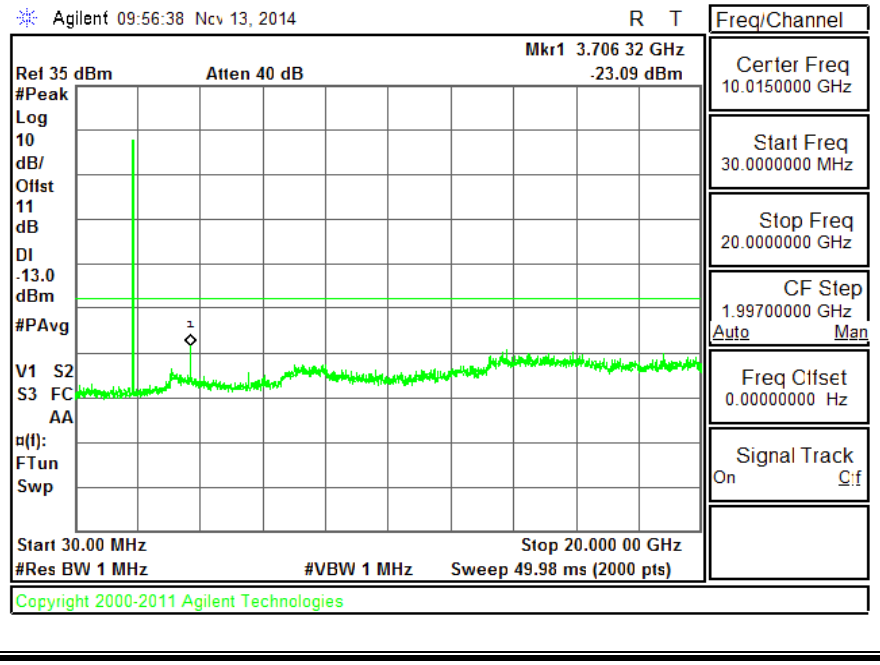


HIGH CH

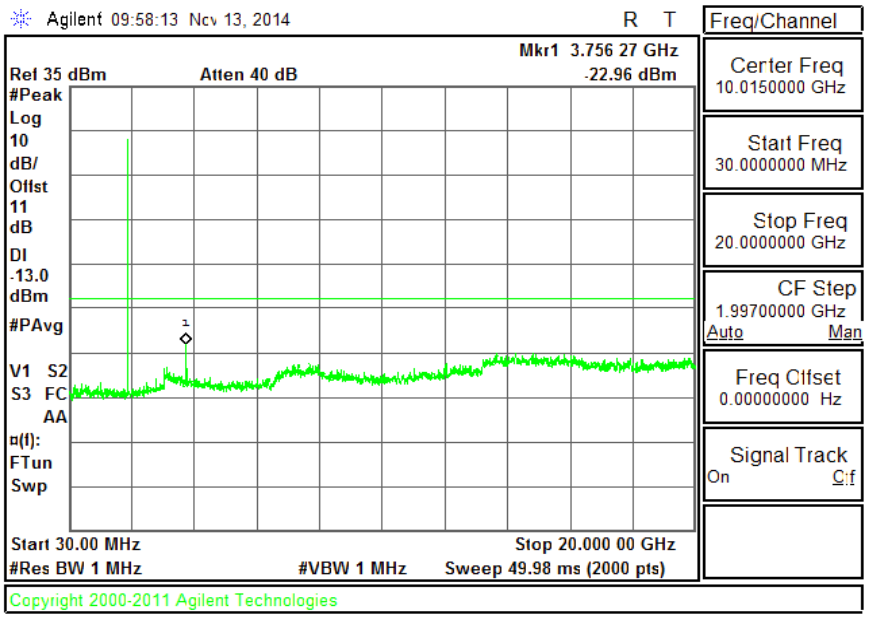


1900MHz BAND

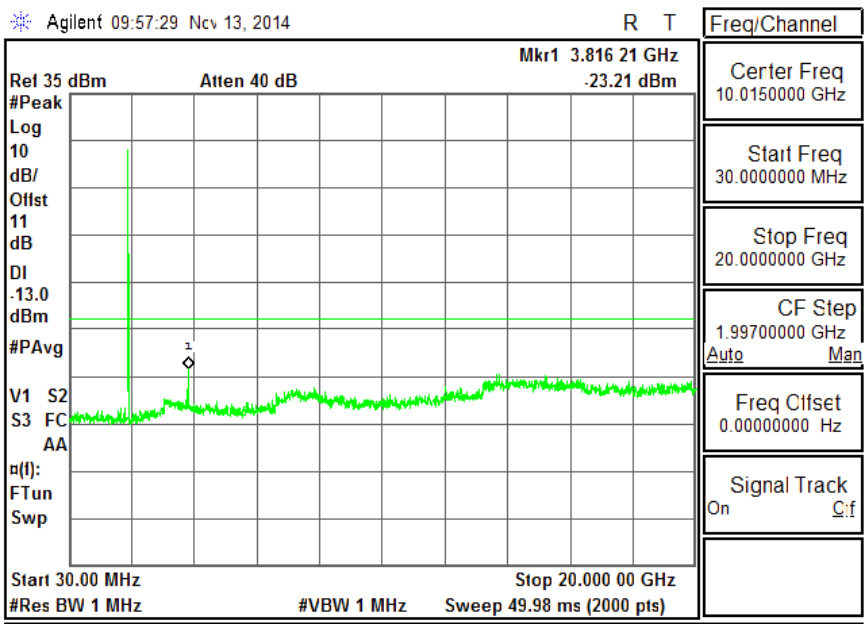
LOW CH



MID CH



HIGH CH



9. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355 & §24.235

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage = (85% - 115%)

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

- GPRS
- UMTS REL 99

RESULTS

See the following pages.

9.1. GSM

GPRS 850

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (25C)	Normal	824.0218	848.9699		
Extreme (50C)		824.0218	848.9699	15.7	0.019
Extreme (40C)		824.0218	848.9699	18.3	0.022
Extreme (30C)		824.0218	848.9699	15.1	0.018
Extreme (10C)		824.0218	848.9699	13.9	0.017
Extreme (0C)		824.0218	848.9699	17.4	0.021
Extreme (-10C)		824.0218	848.9699	8.7	0.010
Extreme (-20C)		824.0218	848.9699	10.5	0.013
Extreme (-30C)		824.0218	848.9699	11.6	0.014
25C	10%	824.0218	848.9699	9.2	0.011
	-10%	824.0218	848.9699	16.3	0.019
	End Point	824.0218	848.9699	12.7	0.015

GPRS 1900

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (25C)	Normal	1850.0315	1909.9737		
Extreme (50C)		1850.0315	1909.9737	-19.2	-0.010
Extreme (40C)		1850.0315	1909.9737	25.3	0.013
Extreme (30C)		1850.0315	1909.9737	22.4	0.012
Extreme (10C)		1850.0315	1909.9737	-22.1	-0.012
Extreme (0C)		1850.0315	1909.9737	-25.6	-0.014
Extreme (-10C)		1850.0315	1909.9737	-20.3	-0.011
Extreme (-20C)		1850.0315	1909.9737	-22.5	-0.012
Extreme (-30C)		1850.0315	1909.9737	-19.7	-0.010
25C	10%	1850.0315	1909.9737	-23.3	-0.012
	-10%	1850.0315	1909.9737	19.6	0.010
	End Point	1850.0315	1909.9737	24.2	0.013

9.2. WCDMA

WCDMA REL99 BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (25C)	Normal	1850.1415	1909.8482		
Extreme (50C)		1850.1414	1909.8481	-51.7	-0.027
Extreme (40C)		1850.1414	1909.8481	-51.4	-0.027
Extreme (30C)		1850.1414	1909.8481	-52.5	-0.028
Extreme (10C)		1850.1414	1909.8481	-53.3	-0.028
Extreme (0C)		1850.1415	1909.8482	50.2	0.027
Extreme (-10C)		1850.1415	1909.8482	10.1	0.005
Extreme (-20C)		1850.1414	1909.8481	-49.6	-0.026
Extreme (-30C)		1850.1415	1909.8482	49.7	0.026
25C	10%	1850.1414	1909.8481	-50.3	-0.027
	-10%	1850.1414	1909.8481	-51.7	-0.027
	End Point	1850.1415	1909.8482	49.9	0.027

WCDMA REL99 BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (25C)	Normal	824.1765	848.2338		
Extreme (50C)		824.1765	848.2338	-26.0	-0.031
Extreme (40C)		824.1765	848.2338	24.5	0.029
Extreme (30C)		824.1765	848.2338	-25.9	-0.031
Extreme (10C)		824.1765	848.2338	-24.6	-0.029
Extreme (0C)		824.1765	848.2338	25.7	0.031
Extreme (-10C)		824.1765	848.2338	6.2	0.007
Extreme (-20C)		824.1765	848.2338	-26.1	-0.031
Extreme (-30C)		824.1765	848.2338	-27.2	-0.033
25C	10%	824.1765	848.2338	25.4	0.030
	-10%	824.1765	848.2338	25.1	0.030
	End Point	824.1765	848.2338	24.2	0.029

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

§22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

§24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

KDB 971168 v02r01 RF Power output using broadband peak and average power meter method

MODES TESTED

- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

Part 22 850MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Peak)	
				dBm	mW
CELL	GPRS	128	824.2	28.32	679.20
		190	836.6	28.54	714.50
		251	848.8	**29.21**	833.68

Part 24 1900MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Peak)	
				dBm	mW
PCS	GPRS	512	1850.2	27.83	606.74
		661	1880.0	28.20	660.69
		810	1909.8	**28.48**	704.69

Part 22 850MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Peak)	
				dBm	mW
CELL	UMTS,REL 99	4357	826.4	19.88	97.27
		4405	836.0	20.28	106.66
		4455	846.0	**20.59**	114.55
	UMTS, HSDPA	4357	826.4	19.58	90.78
		4405	836.0	20.08	101.86
		4455	846.0	**20.29**	106.91

Part 24 1900MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Peak)	
				dBm	mW
PCS	UMTS,REL 99	9662	1852.4	**26.28**	424.62
		9800	1880.0	25.48	353.18
		9938	1907.6	23.92	246.60
	UMTS, HSDPA	9662	1852.4	**25.93**	391.74
		9800	1880.0	24.68	293.76
		9938	1907.6	25.22	332.66

GPRS, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber F

Company: Intel
Project #: 14U19730
Date: 11/26/14
Test Engineer: Francisco G
Configuration: EUT Only
Mode: GSM 850MHz

Test Equipment:
Receiving: Sunol T122, and Chamber F Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
824.20	22.3	V	0.6	0.0	21.69	23.84	38.45	40.60	-16.8	
824.20	28.9	H	0.6	0.0	28.32	30.47	38.45	40.60	-10.1	
Mid Ch										
836.60	23.3	V	0.6	0.0	22.71	24.86	38.45	40.60	-15.7	
836.60	29.2	H	0.6	0.0	28.54	30.69	38.45	40.60	-9.9	
High Ch										
848.80	24.8	V	0.6	0.0	24.14	26.29	38.45	40.60	-14.3	
848.80	29.8	H	0.6	0.0	29.21	31.36	38.45	40.60	-9.2	

Rev. 10.24.13

GPRS, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber D

Company: Intel
Project #: 14U19370
Date: 11/26/14
Test Engineer: Francisco G.
Configuration: EUT Only
Mode: GSM 1900MHz

Test Equipment:
Receiving: Horn T344 and Chamber D SMA Cables
Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.851	20.9	V	0.98	7.88	27.83	33.0	-5.2	
1.851	20.1	H	0.98	7.88	27.01	33.0	-6.0	
Mid Ch								
1.880	21.3	V	0.98	7.86	28.20	33.0	-4.8	
1.880	20.5	H	0.98	7.86	27.38	33.0	-5.6	
High Ch								
1.910	21.6	V	0.98	7.84	28.48	33.0	-4.5	
1.910	20.8	H	0.98	7.84	27.62	33.0	-5.4	

Rev. 06.18.14

UMTS REL 99, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber D

Company: Intel
Project #: 14U19370
Date: 11/21/14
Test Engineer: M. Hua
Configuration: EUT Only
Mode: WCDMA Rel 99 850MHz

Test Equipment:
Receiving: Sunol T407, and Chamber D Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch									
826.40	20.5	V	0.6	0.0	19.88	38.45	40.60	-18.6	
826.40	15.8	H	0.6	0.0	15.18	38.45	40.60	-23.3	
Mid Ch									
836.00	20.9	V	0.6	0.0	20.28	38.45	40.60	-18.2	
836.00	15.5	H	0.6	0.0	14.90	38.45	40.60	-23.5	
High Ch									
846.00	21.2	V	0.6	0.0	20.59	38.45	40.60	-17.9	
846.00	16.9	H	0.6	0.0	16.28	38.45	40.60	-22.2	

Rev. 06.18.14

UMTS HSDPA, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber D

Company: Intel
Project #: 14U19370
Date: 11/21/14
Test Engineer: M. Hua
Configuration: EUT w/ AC Adapter
Mode: WCDMA HSDPA 850MHz

Test Equipment:
Receiving: Sunol T407, and Chamber D Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch									
826.40	20.2	V	0.6	0.0	19.58	38.45	40.60	-18.9	
826.40	15.1	H	0.6	0.0	14.45	38.45	40.60	-24.0	
Mid Ch									
836.00	20.7	V	0.6	0.0	20.08	38.45	40.60	-18.4	
836.00	15.3	H	0.6	0.0	14.70	38.45	40.60	-23.7	
High Ch									
846.00	20.9	V	0.6	0.0	20.29	38.45	40.60	-18.2	
846.00	15.9	H	0.6	0.0	15.28	38.45	40.60	-23.2	

Rev. 06.18.14

UMTS REL 99, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber D

Company: Intel
Project #: 14U19370
Date: 11/14/14
Test Engineer: M. Hua
Configuration: EUT Only
Mode: WCDMA Rel 99 1900MHz

Test Equipment:
Receiving: Horn T344 and Chamber D SMA Cables
Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.852	15.4	V	0.98	7.88	22.33	33.0	-10.7	
1.852	19.4	H	0.98	7.88	26.28	33.0	-6.7	
Mid Ch								
1.880	14.1	V	0.98	7.86	20.97	33.0	-12.0	
1.880	18.6	H	0.98	7.86	25.48	33.0	-7.5	
High Ch								
1.908	15.3	V	0.98	7.84	22.11	33.0	-10.9	
1.908	17.1	H	0.98	7.84	23.92	33.0	-9.1	

Rev. 06.18.14

UMTS HSDPA, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber D

Company: Intel
Project #: 14U19370
Date: 11/14/14
Test Engineer: M. Hua
Configuration: EUT Only
Mode: WCDMA HSDPA 1900MHz

Test Equipment:
Receiving: Horn T344 and Chamber D SMA Cables
Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.852	15.2	V	0.98	7.88	22.13	33.0	-10.9	
1.852	19.0	H	0.98	7.88	25.93	33.0	-7.1	
Mid Ch								
1.880	14.4	V	0.98	7.86	21.25	33.0	-11.8	
1.880	17.8	H	0.98	7.86	24.68	33.0	-8.3	
High Ch								
1.908	15.0	V	0.98	7.84	21.81	33.0	-11.2	
1.908	18.4	H	0.98	7.84	25.22	33.0	-7.8	

Rev. 06.18.14

10.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

LIMIT

§22.917 (e) and §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) dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. 100 kHz 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.

For PCS equipment - 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.

MODES TESTED

- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

GPRS, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company: Intel
Project #: 14U19730
Date: 11/15/14
Test Engineer: T Wang
Configuration: EUT only
Mode: GSM GPRS 850

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 22

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (824.2MHz)										
1.648	-44.7	H	3.0	0.0	33.7	1.0	-32.7	-13.0	-19.7	
2.472	-57.6	H	3.0	-8.8	34.1	1.0	-42.0	-13.0	-29.0	
1.648	-45.8	V	3.0	1.1	33.7	1.0	-31.6	-13.0	-18.6	
2.472	-55.8	V	3.0	-6.4	34.1	1.0	-39.5	-13.0	-26.5	
Mid Channel (836.6MHz)										
1.673	-39.4	H	3.0	5.5	33.7	1.0	-27.2	-13.0	-14.2	
2.510	-56.2	H	3.0	-7.6	34.1	1.0	-40.7	-13.0	-27.7	
1.673	-41.7	V	3.0	5.3	33.7	1.0	-27.4	-13.0	-14.4	
2.510	-55.3	V	3.0	-6.1	34.1	1.0	-39.2	-13.0	-26.2	
High Channel (848.8MHz)										
1.698	-43.7	H	3.0	1.4	33.7	1.0	-31.3	-13.0	-18.3	
2.546	-55.2	H	3.0	-6.4	34.2	1.0	-39.6	-13.0	-26.6	
1.698	-45.6	V	3.0	1.4	33.7	1.0	-31.3	-13.0	-18.3	
2.546	-53.7	V	3.0	-4.3	34.2	1.0	-37.5	-13.0	-24.5	

Rev. 09.05.14

GPRS, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company: Intel
Project #: 14U19370
Date: 11/15/14
Test Engineer: T Wang
Configuration: EUT only
Mode: GSM GPRS 1900MHz

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 24

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1850.2MHz)										
3.700	-43.2	H	3.0	7.1	34.5	1.0	-26.4	-13.0	-13.4	
5.551	-56.6	H	3.0	-3.7	33.6	1.0	-36.4	-13.0	-23.4	
3.700	-44.4	V	3.0	6.2	34.5	1.0	-27.3	-13.0	-14.3	
5.551	-53.6	V	3.0	-0.5	33.6	1.0	-33.2	-13.0	-20.2	
Mid Channel (1880.0)										
3.760	-41.4	H	3.0	8.9	34.5	1.0	-24.6	-13.0	-11.6	
5.640	-52.6	H	3.0	0.4	33.6	1.0	-32.2	-13.0	-19.2	
3.760	-43.2	V	3.0	7.4	34.5	1.0	-26.1	-13.0	-13.1	
5.640	-54.3	V	3.0	-1.1	33.6	1.0	-33.7	-13.0	-20.7	
High Channel (1909.8MHz)										
3.820	-43.3	H	3.0	7.1	34.5	1.0	-26.4	-13.0	-13.4	
5.729	-53.5	H	3.0	-0.4	33.6	1.0	-33.0	-13.0	-20.0	
3.820	-46.4	V	3.0	4.3	34.5	1.0	-29.2	-13.0	-16.2	
5.729	-52.8	V	3.0	0.5	33.6	1.0	-32.1	-13.0	-19.1	

Rev. 09.05.14

UMTS REL 99, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 14U19370
Date: 11/15/14
Test Engineer: T Wang
Configuration: EUT only
Mode: WCDMA REL 99, 850MHz

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 22

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (826.4MHz)										
1.653	-65.7	H	3.0	-21.7	34.6	1.0	-55.3	-13.0	-42.3	
2.479	-66.5	H	3.0	-19.1	34.1	1.0	-52.2	-13.0	-39.2	
1.653	-64.9	V	3.0	-20.2	34.6	1.0	-53.7	-13.0	-40.7	
2.479	-67.2	V	3.0	-19.2	34.1	1.0	-52.3	-13.0	-39.3	
Mid Channel (836MHz)										
1.673	-62.5	H	3.0	-18.4	34.5	1.0	-52.0	-13.0	-39.0	
2.510	-65.9	H	3.0	-18.4	34.1	1.0	-51.5	-13.0	-38.5	
1.673	-64.1	V	3.0	-19.3	34.5	1.0	-52.8	-13.0	-39.8	
2.510	-67.2	V	3.0	-19.1	34.1	1.0	-52.2	-13.0	-39.2	
High Channel (846MHz)										
1.693	-64.8	H	3.0	-20.6	34.5	1.0	-54.2	-13.0	-41.2	
2.540	-66.3	H	3.0	-18.7	34.1	1.0	-51.8	-13.0	-38.8	
1.693	-65.7	V	3.0	-20.8	34.5	1.0	-54.3	-13.0	-41.3	
2.540	-66.1	V	3.0	-17.9	34.1	1.0	-51.1	-13.0	-38.1	

Rev. 09.05.14

UMTS HSDPA, 850MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company:
Project #: 14U19370
Date: 11/15/14
Test Engineer: T Wang
Configuration: Eut ONLY
Mode: WCDMA HSDPA 850MHz

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 22

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (826.4MHz)										
1.653	-66.3	H	3.0	-21.6	33.7	1.0	-54.3	-13.0	-41.3	
2.479	-66.8	H	3.0	-17.8	33.7	1.0	-50.5	-13.0	-37.5	
1.653	-66.2	V	3.0	-19.3	33.7	1.0	-52.0	-13.0	-39.0	
2.479	-66.6	V	3.0	-17.6	33.7	1.0	-50.2	-13.0	-37.2	
Mid Channel (836MHz)										
1.673	-65.5	H	3.0	-20.6	33.7	1.0	-53.3	-13.0	-40.3	
2.510	-66.4	H	3.0	-17.3	33.7	1.0	-50.0	-13.0	-37.0	
1.673	-65.0	H	3.0	-20.1	33.7	1.0	-52.8	-13.0	-39.8	
2.510	-66.4	H	3.0	-17.3	33.7	1.0	-50.0	-13.0	-37.0	
High Channel (846MHz)										
1.693	-66.3	H	3.0	-21.3	33.7	1.0	-53.9	-13.0	-40.9	
2.540	-66.9	H	3.0	-17.7	33.7	1.0	-50.4	-13.0	-37.4	
1.693	-66.1	H	3.0	-21.1	33.7	1.0	-53.7	-13.0	-40.7	
2.540	-66.4	H	3.0	-17.2	33.7	1.0	-49.9	-13.0	-36.9	

Rev. 09.05.14

UMTS REL 99, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company: Intel
Project #: 14U19730
Date: 11/15/14
Test Engineer: T Wang
Configuration: EUT only
Mode: WCDMA REL 99, 1900MHz

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 24

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1852.4MHz)										
3.705	-46.1	H	3.0	4.2	34.5	1.0	-29.3	-13.0	-16.3	
5.557	-48.5	H	3.0	4.4	33.6	1.0	-28.3	-13.0	-15.3	
3.705	-46.3	V	3.0	4.3	34.5	1.0	-29.2	-13.0	-16.2	
5.557	-47.2	V	3.0	5.9	33.6	1.0	-26.8	-13.0	-13.8	
Mid Channel (1880MHz)										
3.760	-46.0	H	3.0	4.3	34.5	1.0	-29.1	-13.0	-16.1	
5.640	-48.2	H	3.0	4.8	33.6	1.0	-27.8	-13.0	-14.8	
3.760	-46.3	V	3.0	4.3	34.5	1.0	-29.1	-13.0	-16.1	
5.640	-47.5	V	3.0	5.7	33.6	1.0	-26.9	-13.0	-13.9	
High Channel (1907.6MHz)										
3.815	-46.3	H	3.0	4.1	34.4	1.0	-29.3	-13.0	-16.3	
5.723	-48.4	H	3.0	4.7	33.6	1.0	-27.8	-13.0	-14.8	
3.815	-46.4	V	3.0	4.3	34.4	1.0	-29.1	-13.0	-16.1	
5.723	-47.3	V	3.0	6.0	33.6	1.0	-26.6	-13.0	-13.6	

Rev. 09.05.14

UMTS HSDPA, 1900MHz BAND

High Frequency Substitution Measurement
UL Fremont Radiated Chamber

Company: Intel
Project #: 14U19730
Date: 11/15/14
Test Engineer: T Wang
Configuration: EUT Only
Mode: WCDMA HSDPA 1900MHz

Test Equipment:
Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifer	Filter	Limit
3m Chamber F	3m Chamber F	Filter	Part 24

Frequency (GHz)	SA reading (dBm)	Ant. Pol. (H/V)	Distance	Path Loss @ SG End (dBm)	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1852.4MHz)										
3.705	-46.2	H	3.0	4.1	34.5	1.0	-29.4	-13.0	-16.4	
5.557	-48.6	H	3.0	4.3	33.6	1.0	-28.4	-13.0	-15.4	
3.705	-46.4	V	3.0	4.2	34.5	1.0	-29.3	-13.0	-16.3	
5.557	-47.4	V	3.0	5.7	33.6	1.0	-27.0	-13.0	-14.0	
Mid Channel (1880MHz)										
3.760	-46.2	H	3.0	4.1	34.5	1.0	-29.3	-13.0	-16.3	
5.640	-48.4	H	3.0	4.6	33.6	1.0	-28.0	-13.0	-15.0	
3.760	-46.5	V	3.0	4.1	34.5	1.0	-29.3	-13.0	-16.3	
5.640	-47.4	V	3.0	5.8	33.6	1.0	-26.8	-13.0	-13.8	
High Channel (1907.6MHz)										
3.815	-46.4	H	3.0	4.0	34.4	1.0	-29.4	-13.0	-16.4	
5.723	-48.5	H	3.0	4.6	33.6	1.0	-27.9	-13.0	-14.9	
3.815	-46.6	V	3.0	4.1	34.4	1.0	-29.3	-13.0	-16.3	
5.723	-47.5	V	3.0	5.8	33.6	1.0	-26.8	-13.0	-13.8	

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