FCC Test Report

Report No.: AGC19C120201-1F2A

FCC ID	:	ZL5B10
PRODUCT DESIGNATION	:	3G Mobile Phone
BRAND NAME	:	CAT
TEST MODEL	:	B10
CLIENT	:	Bullitt Group
DATE OF ISSUE	:	Mar. 06, 2012
STANDARD(S)	:	FCC Part 22H & 24E Rules

Attestation of ***G***lobal ***C***ompliance Co., Ltd.

VERIFICATION OF COMPLIANCE

Applicant:	Bullitt Group
	No. 4, The Aquarium, King Street, United Kingdom RG1 2AN
Manufacturer:	Leadsky International Development Limited
	Room 401,Huahan Building A, Langshan North Road, Science and Technology Park, Nanshan District, Shenzhen, P.R.China
Product Description:	3G Mobile Phone
Brand Name:	CAT
Model Name:	B10
FCC ID:	ZL5B10
Report Number:	AGC19C120201-1F2A
Date of Test:	Mar. 01, 2012 to Mar. 04, 2012

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 22H and 24E

The test results of this report relate only to the tested sample identified in this report.

Tested By : Curoky Chen

Curoky Chen Mar. 06, 2012

Reviewed By : Forrest Lei

Forrest Lei Mar. 06, 2012

Approved By: Solger Zhang

Solger Zhang Mar. 06, 2012

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	3G Mobile Phone
Hardware version:	S401M001P200
Software version:	N/A
FCC ID:	ZL5B10
Frequency Bands:	☒GSM 850 ☒PCS 1900 (U.S. Bands) ☒GSM 900 ☒DCS 1800 (Non-U.S. Bands) U.S. Bands: ☒UMTS FDD Band II ☒UMTS FDD Band V Non-U.S. Bands: ☒UMTS FDD Band I ☒UMTS FDD Band VIII
Antenna:	Integrated Antenna
Antenna gain:	1.0dBi
Power Supply:	DC 7.4V by battery(charged by adapter) or supplied by adapter
Battery parameter:	DC7.4V/20Wh
Adapter Input:	AC100-240V, 50-60Hz
Adapter Output:	DC12V, 2A
GPRS Class	12
Extreme Vol. Limits:	DC3.4 V to 4.2 V (Nominal DC3.7 V)
Extreme Temp. Tolerance	-10℃ to +50℃
** Note: The High Voltage 4.2V and Low Voltage 3.4V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage. Other function have been performed according to verification procedure except for Bluetooth and MS function.	

	Maximum ERP/EIRP (dBm)	Max. Conducted Power (dBm)	Max. Average Brust Power (dBm)
GSM 850	30.11	32.81	32.75
PCS 1900	28.07	29.76	29.70
UMTS BAND II	20.91	23.32	23.26
UMTS BAND V	21.54	23.37	23.35

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: ZL5B10** filing to comply with the FCC Part 22H&24E and RSS-132&133requirements.

1.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:
Attestation of Global Compliance Co., Ltd.
1F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC register No.: 259865

1.5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	E4440A	US44300399	2012.6.26
TEST RECEIVER	R&S	ESCI	A0304218	2012.6.26
COMMUNICATION TESTER	AGILENT	8960	3104A03367	2012.6.26
COMMUNICATION TESTER	R&S	CMU200	A0304247	2012.6.26
TEST RECEIVER	R&S	FCKL1528	A0304230	2012.6.26
LISN	SCHWARZBECK	NSLK8127	A0304233	2012.6.26
CLIMATE CHAMBER	ALBATROSS	--	--	2012.6.26
Loop Antenna	Daze	ZN30900N	SEL0097	2012.6.26
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	N/A	2012.6.26
Horn Antenna	EM	EM-AH-10180	N/A	2012.6.26

1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	22.913(a) / 24.232 (b)
		Radiated output power	
2	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238
		Radiated spurious emission	
3	Mains Conducted Emission		15.107 / 15.207
4	Frequency Stability		2.1055 /24.235
5	Occupied Bandwidth		2.1049 (h)(i)
6	Emission Bandwidth		22.917(b) / 24.238 (b)
7	Band Edge		22.917(b) / 24.238 (b)

2.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

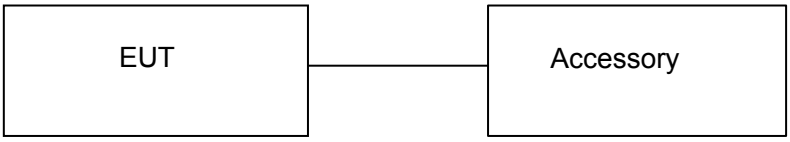


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	3G Mobile Phone	B10	FCC ID: ZL5B10	EUT
2	ADAPTER	Aquilstar/GangQ	ASUC30e-050050/ GQ07-050050-BGU	Accessory
3	BATTERY	B&K,Sinca	B10, TP909	Accessory
4	EARPHONE	N/A	N/A	Accessory
5	USB Cable	N/A	N/A	Accessory

Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

3. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	22.913(a) / 24.232 (b)	Pass
		Radiated Output Power		
2	Spurious Emission	Conducted Spurious Emission	2.1051 / 22.917 / 24.238	Pass
		Radiated Spurious Emission		
3	Mains Conducted Emission		15.107 / 15.207	Pass
4	Frequency Stability		2.1055 /24.235	Pass
5	Occupied Bandwidth		2.1049 (h)(i)	Pass
6	Emission Bandwidth		22.917(b) / 24.238 (b)	Pass
7	Band Edge		22.917(b) / 24.238 (b)	Pass

4. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and PCS frequency band.

Note: GPRS850, GPRS1900, HSDPA band II, HSUPA band II, HSDPA band V, HSUPA band V modes have been tested during the test.

the worst condition (GPRS 850) be recorded in the test report if no other modes test data.

5. OUTPUT POWER

5.1 Conducted Output Power

5.1.1 MEASUREMENT METHOD

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes(GPRS850, GPRS1900, HSDPA band II, HSUPA band II, HSDPA band V, HSUPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

5.1.2 MEASUREMENT RESULT

Conducted Output Power Limits for GSM850 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	33 dBm (2W)	- 1
GPRS	33 dBm (2W)	- 1
Conducted Output Power Limits for PCS1900 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	30 dBm (1W)	- 1
GPRS	30 dBm (1W)	- 1
Conducted Output Power Limits for UMTS band II		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	24 dBm (0.25W)	- 2
GPRS	24 dBm (0.25W)	- 2
Conducted Output Power Limits for UMTS band V		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	24 dBm (0.25W)	- 2
GPRS	24 dBm (0.25W)	- 2

GSM 850:

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850	824.2	33	32.61	-0.39	32.54	-9	23.54
	836.6	33	32.71	-0.29	32.65	-9	23.65
	848.8	33	**32.81**	-0.19	**32.75**	-9	23.75
GPRS850 (1 Slot)	824.2	33	32.11	-0.89	32.04	-9	23.04
	836.6	33	32.25	-0.75	32.15	-9	23.15
	848.8	33	32.43	-0.57	32.34	-9	23.34
GPRS850 (2 Slot)	824.2	30	29.14	-0.86	29.01	-6	23.01
	836.6	30	29.28	-0.72	29.21	-6	23.21
	848.8	30	29.57	-0.43	29.46	-6	23.46
GPRS850 (3 Slot)	824.2	28.23	28.01	-0.22	27.95	-4.25	23.7
	836.6	28.23	27.96	-0.27	27.87	-4.25	23.62
	848.8	28.23	28.07	-0.16	27.95	-4.25	23.7
GPRS850 (4 Slot)	824.2	27	26.14	-0.86	25.94	-3	22.94
	836.6	27	26.35	-0.65	26.04	-3	23.04
	848.8	27	26.59	-0.41	26.51	-3	23.51

PCS 1900:

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM1900	1850.2	30	29.44	-0.56	29.41	-9	20.41
	1880	30	29.59	-0.41	29.56	-9	20.56
	1909.8	30	**29.76**	-0.24	**29.7**	-9	20.7
GPRS1900 (1 Slot)	1850.2	30	29.31	-0.69	29.28	-9	20.28
	1880	30	29.43	-0.57	29.38	-9	20.38
	1909.8	30	29.57	-0.43	29.49	-9	20.49
GPRS1900 (2 Slot)	1850.2	27	26.36	-0.64	26.32	-6	20.32
	1880	27	26.39	-0.61	26.34	-6	20.34
	1909.8	27	26.51	-0.49	26.46	-6	20.46
GPRS1900 (3 Slot)	1850.2	25.23	24.71	-0.52	24.53	-4.25	20.28
	1880	25.23	24.81	-0.42	24.62	-4.25	20.37
	1909.8	25.23	24.96	-0.27	24.64	-4.25	20.39
GPRS1900 (4 Slot)	1850.2	24	23.41	-0.59	23.35	-3	20.35
	1880	24	23.56	-0.44	23.53	-3	20.53
	1909.8	24	23.72	-0.28	23.68	-3	20.68

UMTS BAND II

Mode	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
WCDMA 1900 RMC	1852.4	24	23.02	-0.98	22.97
	1880	24	23.14	-0.86	23.11
	1907.6	24	**23.32**	-0.68	**23.26**
WCDMA 1900 AMR	1852.4	24	22.96	-1.04	22.94
	1880	24	23.05	-0.95	22.99
	1907.6	24	23.12	-0.88	23.09
HSPA Subtest 1	1852.4	24	22.41	-1.59	22.36
	1880	24	22.61	-1.39	22.57
	1907.6	24	22.71	-1.29	22.67
HSPA Subtest 2	1852.4	24	22.36	-1.64	22.31
	1880	24	22.41	-1.59	22.36
	1907.6	24	22.54	-1.46	22.51
HSPA Subtest 3	1852.4	24	22.35	-1.65	22.31
	1880	24	22.49	-1.51	22.42
	1907.6	24	22.56	-1.44	22.51
HSPA Subtest 4	1852.4	24	22.41	-1.59	22.35
	1880	24	22.53	-1.47	22.50
	1907.6	24	22.65	-1.35	22.59
HSPA Subtest 5	1852.4	24	22.65	-1.35	22.63
	1880	24	22.75	-1.25	22.67
	1907.6	24	22.86	-1.14	22.84

UMTS BAND V

Mode	Frequency (MHz)	Reference power	Peak Power	tolerance	Avg.Burst Power
WCDMA 850 RMC	826.4	24	23.11	-0.89	23.05
	835.0	24	23.26	-0.74	23.25
	846.6	**24**	**23.37**	-0.63	**23.35**
WCDMA 850 AMR	826.4	24	22.97	-1.03	22.95
	835.0	24	23.14	-0.86	23.11
	846.6	24	23.23	-0.77	23.22
HSPA Subtest 1	826.4	24	22.54	-1.46	22.51
	835.0	24	22.56	-1.44	22.53
	846.6	24	22.71	-1.29	22.68
HSPA Subtest 2	826.4	24	22.76	-1.24	22.73
	835.0	24	22.81	-1.19	22.75
	846.6	24	22.87	-1.13	22.82
HSPA Subtest 3	826.4	24	22.68	-1.32	22.63
	835.0	24	22.75	-1.25	22.71
	846.6	24	22.83	-1.17	22.79
HSPA Subtest 4	826.4	24	22.62	-1.38	22.54
	835.0	24	22.64	-1.36	22.59
	846.6	24	22.68	-1.32	22.61
HSPA Subtest 5	826.4	24	22.49	-1.51	22.45
	835.0	24	22.68	-1.32	22.65
	846.6	24	22.86	-1.14	22.83

According to 3GPP 25.101 sub-clause 6.2.2 , the maximum output power is allowed to be reduced by following the table.

Table 6.1aA: UE maximum output power with HS-DPCCH and E-DCH

UE Transmit Channel Configuration	CM(db)	MPR(db)
For all combinations of ,DPDCH,DPCCH HS-DPDCH,E-DPDCH and E-DPCCH	0≤ CM≤3.5	MAX(CM-1,0)
Note: CM=1 for β_c/β_d=12/15, β_{hs}/β_c=24/15.For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.		

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (a function of the combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH).

When E-DPDCH channels are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

The SW currently recalculates the cubic metric every time the beta gains on the E-DPDCH are reduced. The cubic metric will likely get lower each time this is done .However, there is no reported reduction of maximum output power in the HSUPA mode since the device also provides a compensate for the power back-off by increasing the gain of TX_AGC in the transceiver (PA) device.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

5.2 Radiated Output Power

5.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

5.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Mode	Nominal Peak Power
GSM 850	<=38.45 dBm (7W)
PCS 1900	<=33 dBm (2W)
UMTS BAND II	<=33 dBm (2W)
UMTS BANDV	<=38.45 dBm (7W)

5.2.3 MEASUREMENT RESULT

Radiated Power (ERP) for GSM 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GSM850	824.2	29.64	Horizontal	Pass
	836.6	29.87	Horizontal	Pass
	848.8	**30.11**	Horizontal	Pass

Radiated Power (E.I.R.P) for PCS 1900 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
GSM 850	1850.2	27.62	Horizontal	Pass
	1880.0	27.98	Horizontal	Pass
	1909.8	**28.07**	Horizontal	Pass

Radiated Power (ERP) for UMTS band II				
Mode	Frequency	Result		
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
RMC 12.2kbps	1852.4	20.59	Horizontal	Pass
	1880	20.71	Horizontal	Pass
	1907.6	**20.91**	Horizontal	Pass

Radiated Power (E.I.R.P) for UMTS band V				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	826.4	20.78	Horizontal	Pass
	835.0	21.21	Horizontal	Pass
	846.6	**21.54**	Horizontal	Pass

NOTE: in the part, result the worst case GPRS 1slot for GSM 850 and PCS1900, and RMC 12.2kbps for UMTS band II and band V.

6. SPURIOUS EMISSION

6.1 CONDUCTED SPURIOUS EMISSION

6.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of GSM 850 MHz	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS 1900 MHz	
Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

Typical Channels for testing of UMTS band II	
Channel	Frequency (MHz)
9262	1852.4
9400	1880.0
9538	1907.6

Typical Channels for testing of UMTS band V	
Channel	Frequency (MHz)
4132	826.4
4175	835.0
4233	846.6

6.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

6.1.3 MEASUREMENT RESULT

PLEASE REFER TO : APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. Below 30MHZ no Spurious found and The GSM modes is the worst condition.
2. As no emission found in standby or receive mode, no recording in this report.

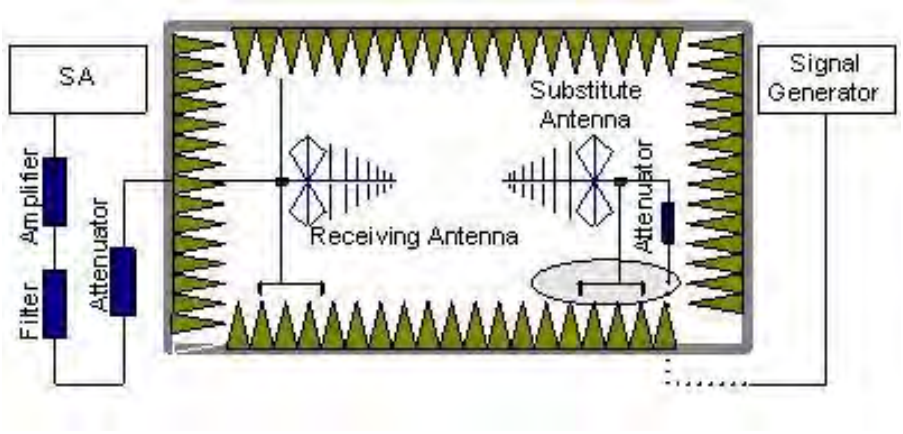
6.2 Radiated Spurious Emission

6.2.1 MEASUREMENT METHOD

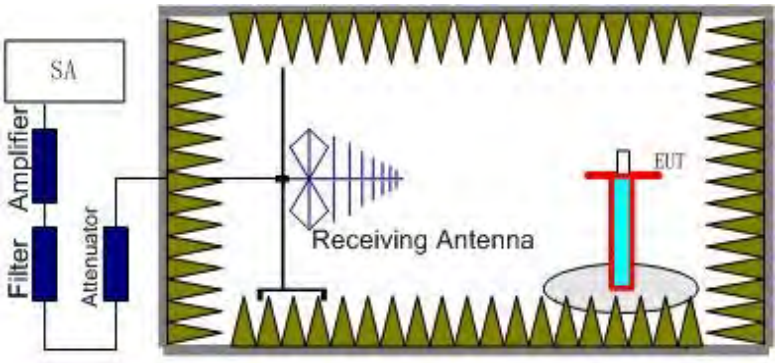
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS850, GPRS1900, HSDPA band II, HSDPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band V(826.4MHz, 835.0MHz, 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: $Power=P_{Mea}+A_{Rpl}$

6.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

6.2.3 MEASUREMENT RESULT

GSM 850:

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1685.23	-36.20	-4.89	-41.09	-13.00	Horizontal
2456.12	-36.17	-2.07	-38.25	-13.00	Vertical
3645.78	-36.32	3.79	-32.53	-13.00	Vertical
4536.58	-38.60	2.98	-35.63	-13.00	Horizontal

PCS 1900:

The Worst Test Results for Channel 881/1909.8MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1429.36	-43.49	9.9	-33.62	-13.00	Vertical
2563.47	-37.86	11.8	-26.02	-13.00	Vertical
3645.26	-36.57	15.0	-21.52	-13.00	Horizontal
4563.56	-39.58	14.9	-24.64	-13.00	Vertical
5689.25	-43.69	20.0	-23.72	-13.00	Horizontal

UMTS band II:

The Worst Test Results for Channel 9538/1907.6MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1536.98	-38.94	-2.25	-41.19	-13.00	Vertical
2536.41	-40.40	-3.03	-43.43	-13.00	Horizontal
3786.52	-45.51	-1.87	-47.38	-13.00	Horizontal
5123.56	-38.03	8.52	-29.51	-13.00	Vertical
6615.32	-56.36	18.7	-22.66	-13.00	Horizontal

UMTS band V:

The Worst Test Results for Channel 4233/846.6MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1598.26	-38.90	-2.25	-41.15	-13.00	Vertical
2365.78	-40.29	-3.03	-43.32	-13.00	Horizontal
4967.65	-45.47	-1.87	-47.34	-13.00	Horizontal
6457.86	-37.98	8.52	-29.46	-13.00	Vertical
7896.56	-51.23	16.85	-34.38	-13.00	Horizontal

Note: Below 30MHZ no Spurious found and The GSM modes is the worst condition.

7. MAINS CONDUCTED EMISSION

7.1 MEASUREMENT METHOD

The measurement procedure specified in ANSI C63.4-2003 was used for testing. Conducted Emission was measured with travel charger.

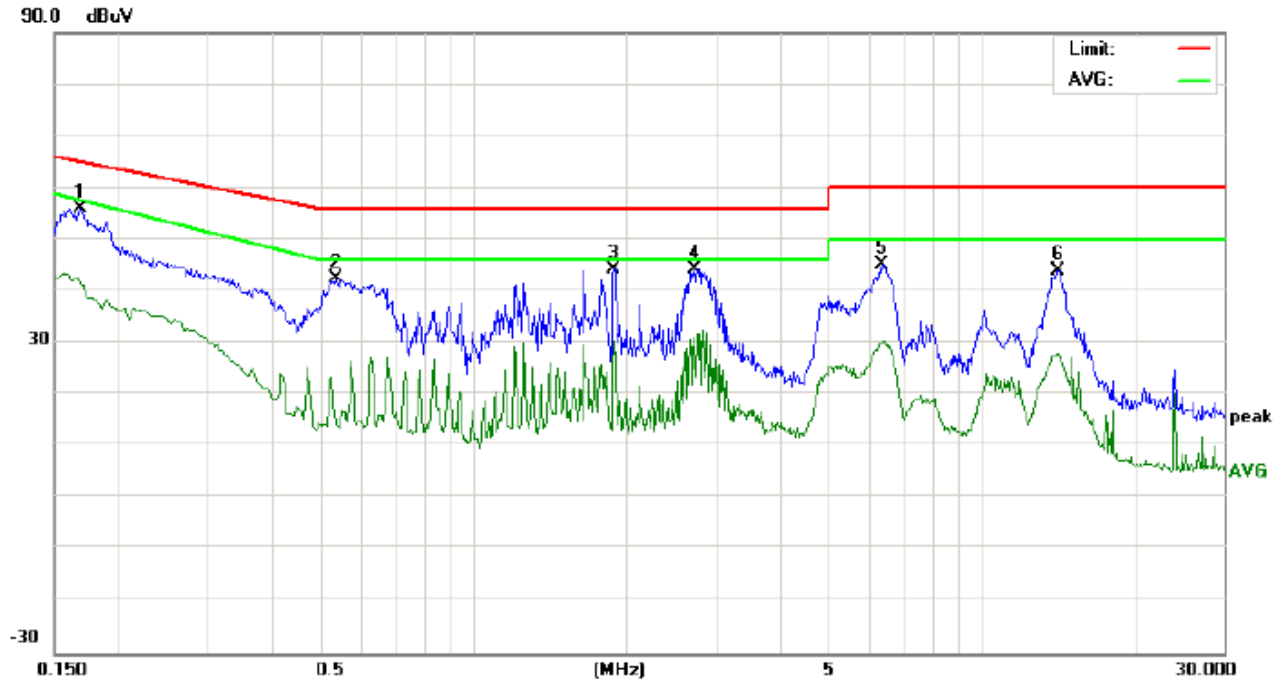
7.2 PROVISIONS APPLICABLE

Frequency of Emission (MHz)	Conducted Limit(dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
*Decreases with the logarithm of the frequency. *The lower limit shall apply at the transition frequency.		

Note: The GPRS850(1 UP Slot) mode is the worst condition and the test result as following:

7.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION - L



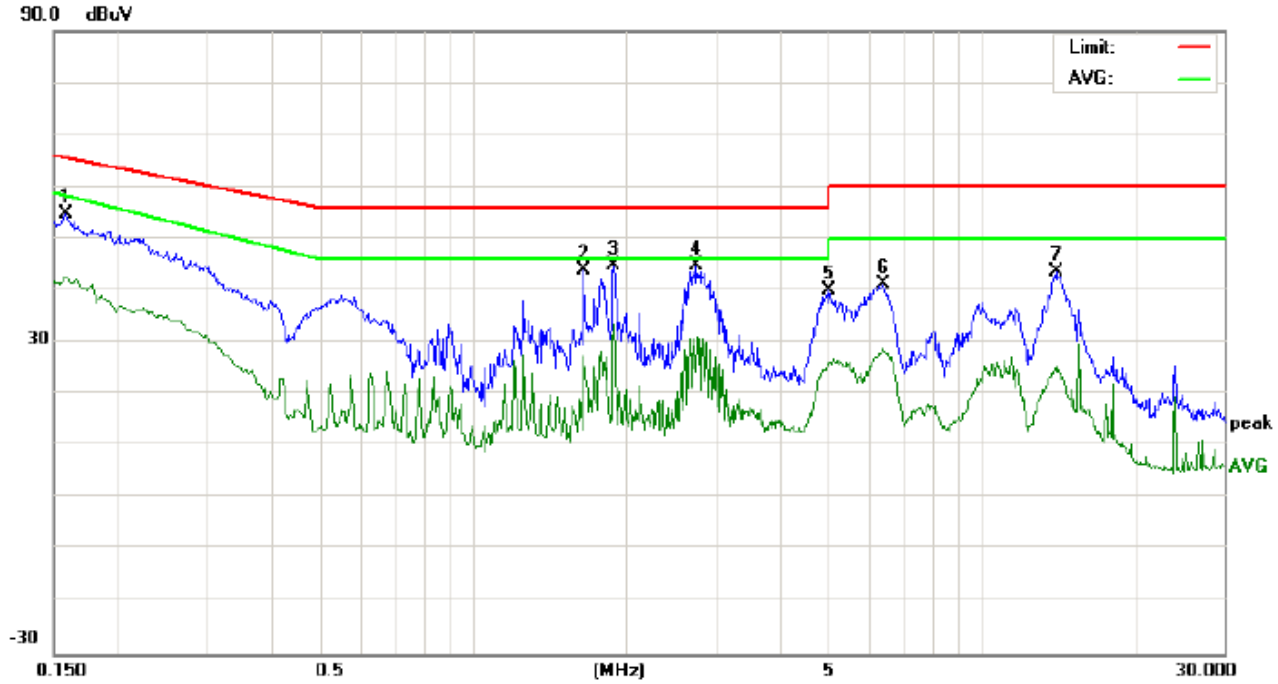
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: 3G Mobile phone
M/N: B10
Mode: GPRS850 1 UP SLOT
Note:

Phase: L1
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1685	45.70		31.66	10.18	55.88		41.84	65.03	57.74	-9.15	-15.90	P	
2	0.5380	32.13		4.01	10.37	42.50		14.38	56.00	46.00	-13.50	-31.62	P	
3	1.8939	34.08		20.06	10.25	44.33		30.31	56.00	46.00	-11.67	-15.69	P	
4	2.7259	33.79		20.57	10.48	44.27		31.05	56.00	46.00	-11.73	-14.95	P	
5	6.3539	34.92		19.97	10.29	45.21		30.26	60.00	50.00	-14.79	-19.74	P	
6	14.1659	33.88		17.79	10.12	44.00		27.91	60.00	50.00	-16.00	-22.09	P	

LINE CONDUCTED EMISSION - N



Site: Conduction
Limit: EN55014 Class B Conduction(QP)
EUT: 3G Mobile Phone
M/N: B10
Mode: GPRS850 1 UP SLOT
Note:

Phase: N
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1582	44.70		32.39	10.17	54.87		42.56	65.55	58.42	-10.68	-15.86	P	
2	1.6579	33.68		17.07	10.33	44.01		27.40	56.00	46.00	-11.99	-18.60	P	
3	1.8899	34.55		23.14	10.26	44.81		33.40	56.00	46.00	-11.19	-12.60	P	
4	2.7620	34.46		13.96	10.49	44.95		24.45	56.00	46.00	-11.05	-21.55	P	
5	5.0259	29.68		15.67	10.24	39.92		25.91	60.00	50.00	-20.08	-24.09	P	
6	6.4298	30.84		18.57	10.30	41.14		28.87	60.00	50.00	-18.86	-21.13	P	
7	14.0099	33.47		15.25	10.12	43.59		25.37	60.00	50.00	-16.41	-24.63	P	

8. FREQUENCY STABILITY

8.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1 , Measure the carrier frequency at room temperature.

2 , Subject the EUT to overnight soak at -10℃.

3 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 , Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 , Subject the EUT to overnight soak at +50℃.

7 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 , Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 , At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

8.2 PROVISIONS APPLICABLE

8.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 6.3VDC and 8.5VDC, with a nominal voltage of 7.4VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

8.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.

8.3 MEASUREMENT RESULT

Frequency Error Against Voltage for GSM850 band		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.3	29	0.035
7.4	24	0.029
8.5	31	0.037

Frequency Error Against Temperature for GSM850 band		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	43	0.051
0	34	0.041
10	28	0.033
20	26	0.031
30	31	0.037
40	28	0.033
50	45	0.054

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for PCS1900 band		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.3	42	0.022
7.4	33	0.018
8.5	47	0.025

Frequency Error Against Temperature for PCS1900 band		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	56	0.030
0	49	0.026
10	36	0.019
20	35	0.019
30	36	0.019
40	41	0.022
50	55	0.029

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band II		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.3	42	0.022
7.4	33	0.018
8.5	41	0.022

Frequency Error Against Temperature for UMTS band II		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	64	0.034
0	55	0.029
10	41	0.022
20	37	0.020
30	35	0.019
40	42	0.022
50	53	0.028

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band V		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.3	34	0.041
7.4	26	0.031
8.5	31	0.037

Frequency Error Against Temperature for UMTS band V		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	48	0.057
0	41	0.049
10	32	0.038
20	26	0.031
30	24	0.029
40	36	0.043
50	49	0.059

Note: The EUT doesn't work below -10℃

9. OCCUPIED BANDWIDTH

9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

9.2 PROVISIONS APPLICABLE

The occupied bandwidth (99%) shall not exceed 300 KHz.

9.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	246.62
Middle Channel	836.6	244.01
High Channel	848.8	246.08

Occupied Bandwidth (99%) for PCS1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	243.84
Middle Channel	1880.0	248.35
High Channel	1909.8	246.19

Occupied Bandwidth (99%) for UMTS band II		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1852.4	4.16
Middle Channel	1880	4.20
High Channel	1907.6	4.16

Occupied Bandwidth (99%) for UMTS band V		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	826.4	4.22
Middle Channel	835.0	4.19
High Channel	846.6	4.19

10. EMISSION BANDWIDTH

10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

10.3 MEASUREMENT RESULT

Emission Bandwidth (-26dBc) for GSM850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	311.06
Middle Channel	836.6	311.78
High Channel	848.8	309.54

Emission Bandwidth (-26dBc) for PCS1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	312.73
Middle Channel	1880.0	313.62
High Channel	1909.8	307.65

Emission Bandwidth (-26dBc) for UMTS band II		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	1852.4	4.67
Middle Channel	1880.0	4.69
High Channel	1907.6	4.66

Emission Bandwidth (-26dBc) for UMTS band V		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	826.4	4.68
Middle Channel	835.0	4.66
High Channel	846.6	4.68

11. BAND EDGE

11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

11.2 PROVISIONS APPLICABLE

as Specified in FCC rules of 22.917(b) and 24.238(b)

11.3 MEASUREMENT RESULT

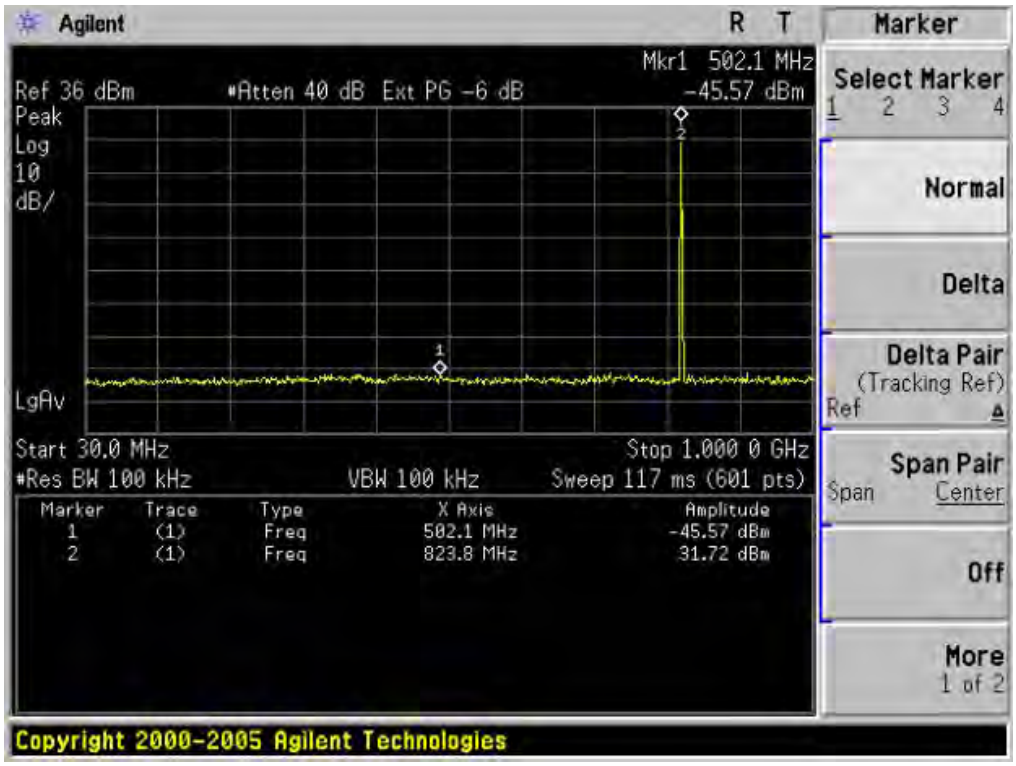
Please refers to Appendix III for compliance test plots for band edges

APPENDIX I

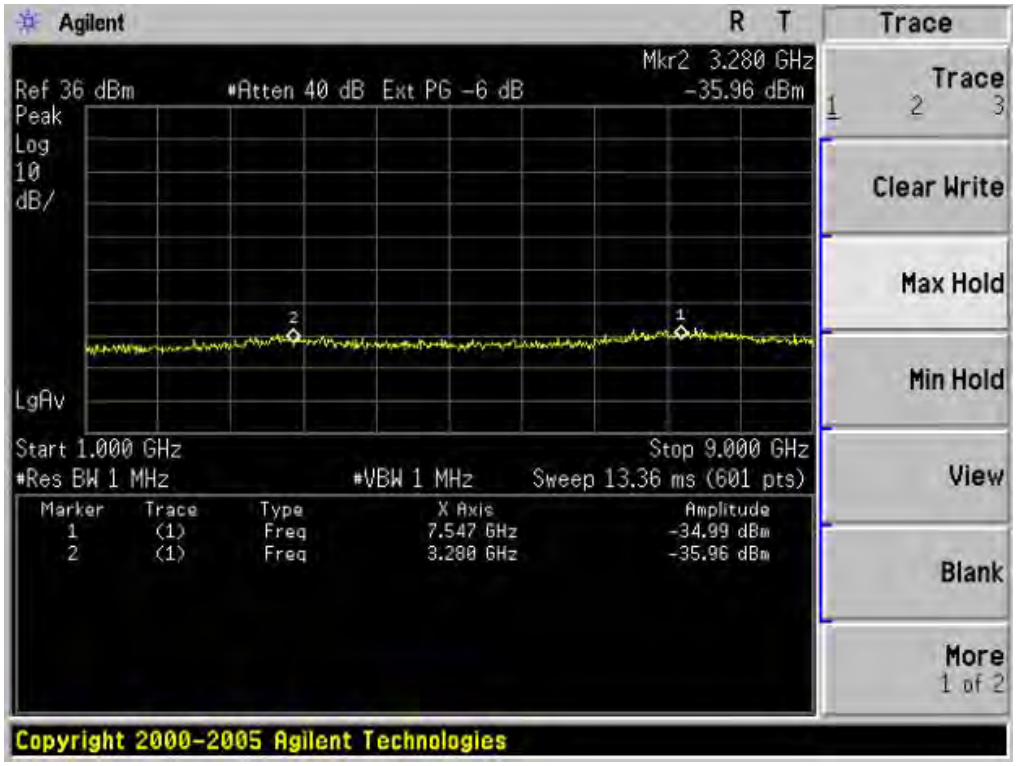
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM850 BAND

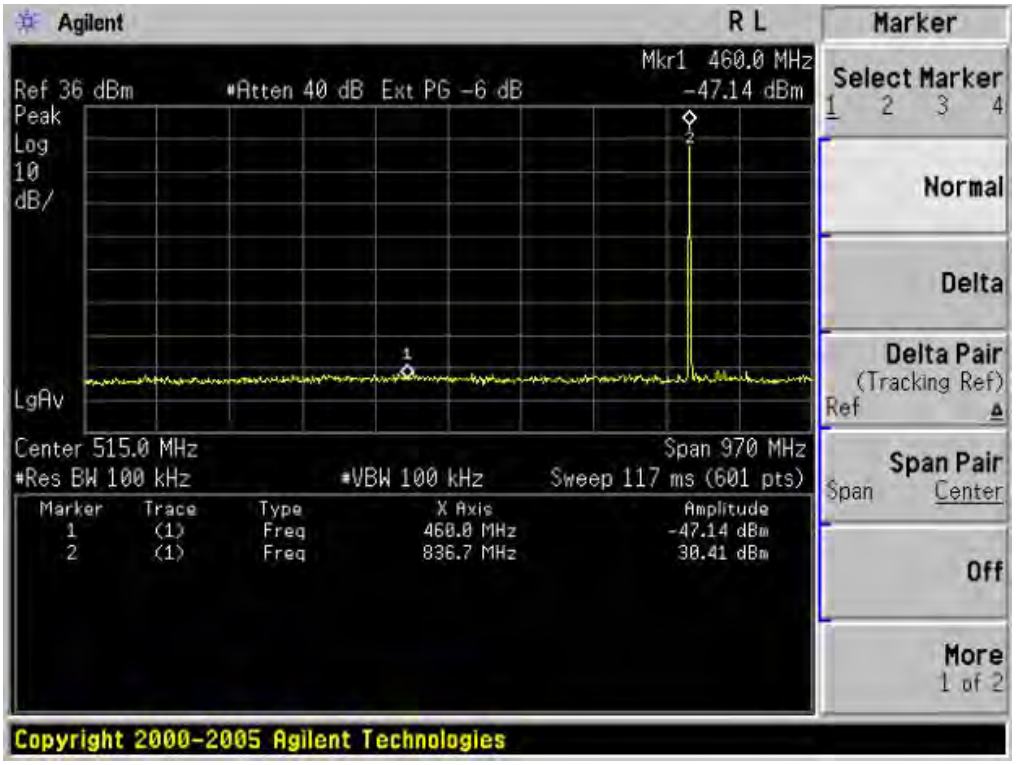
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



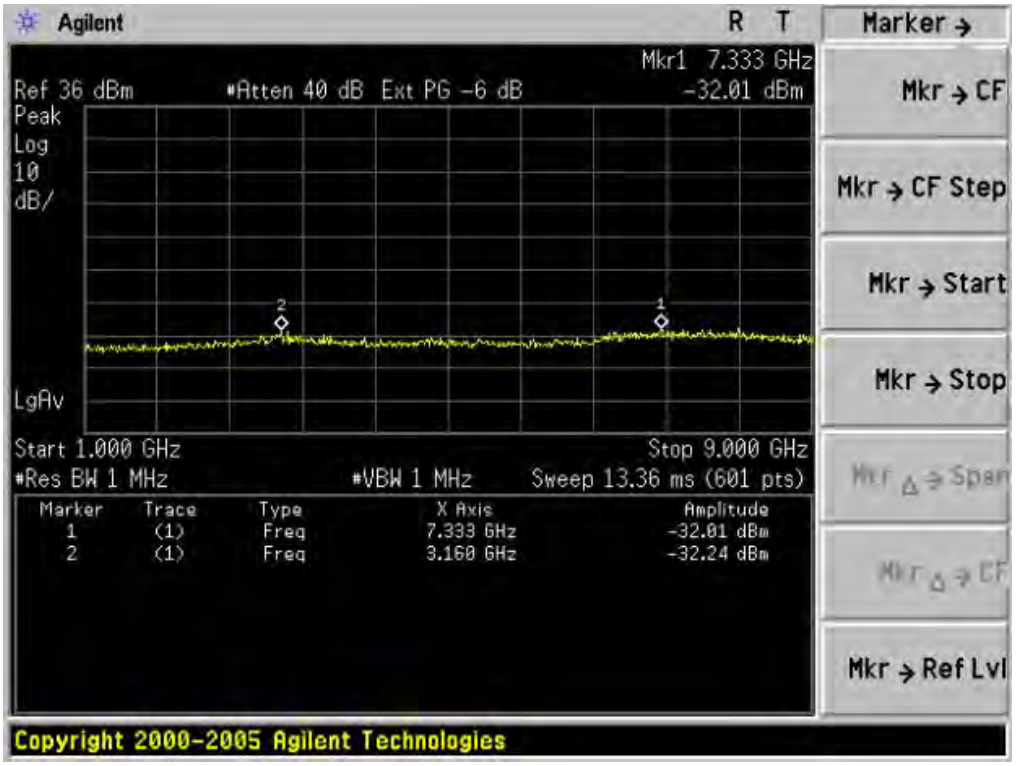
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



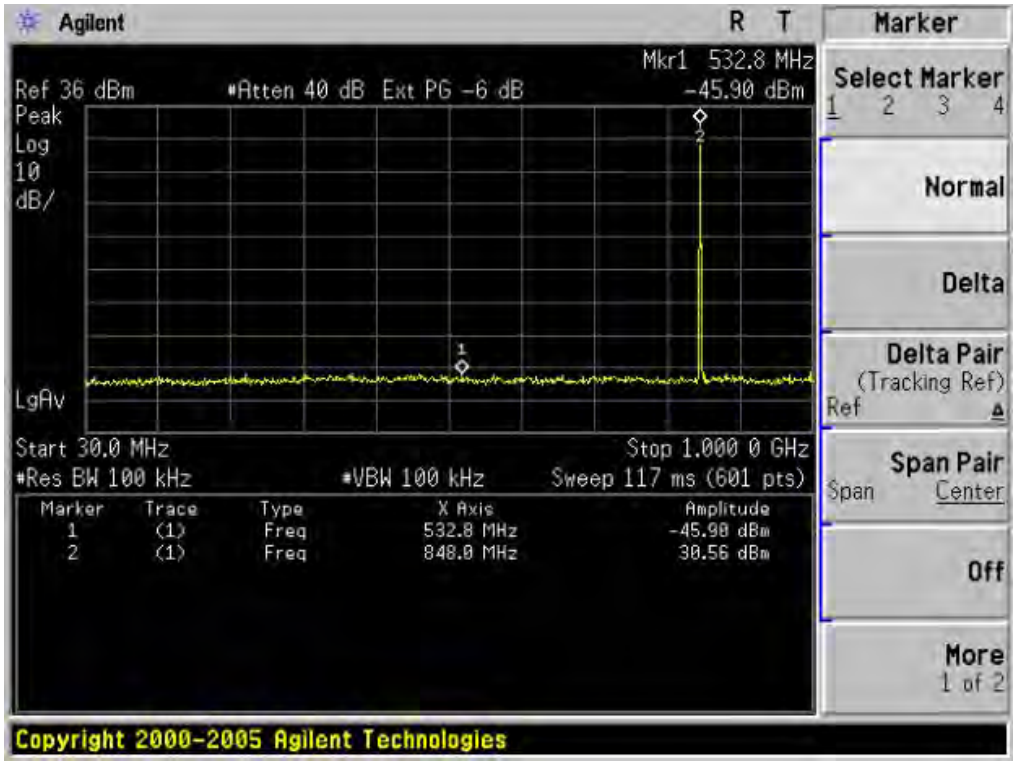
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



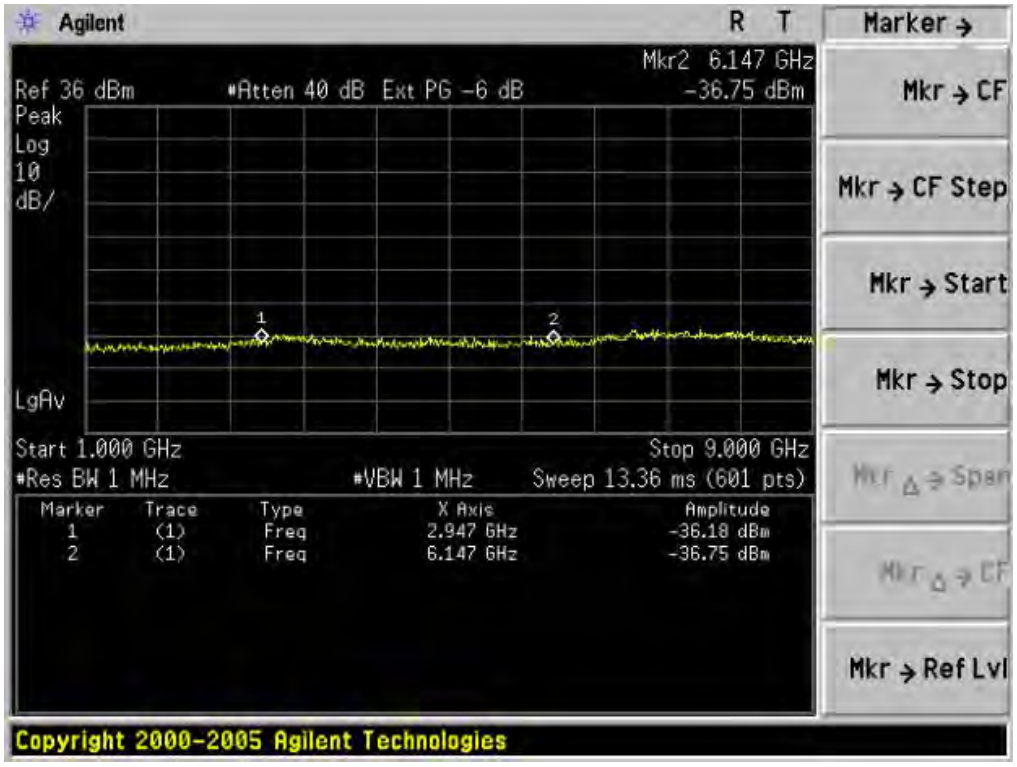
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

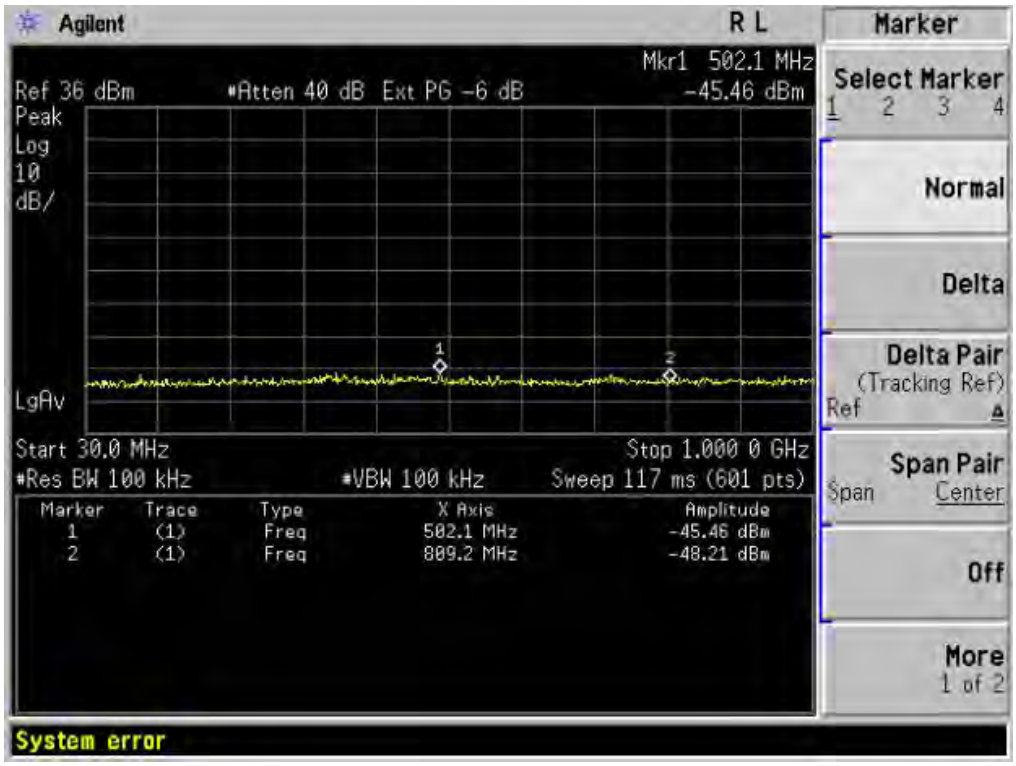


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

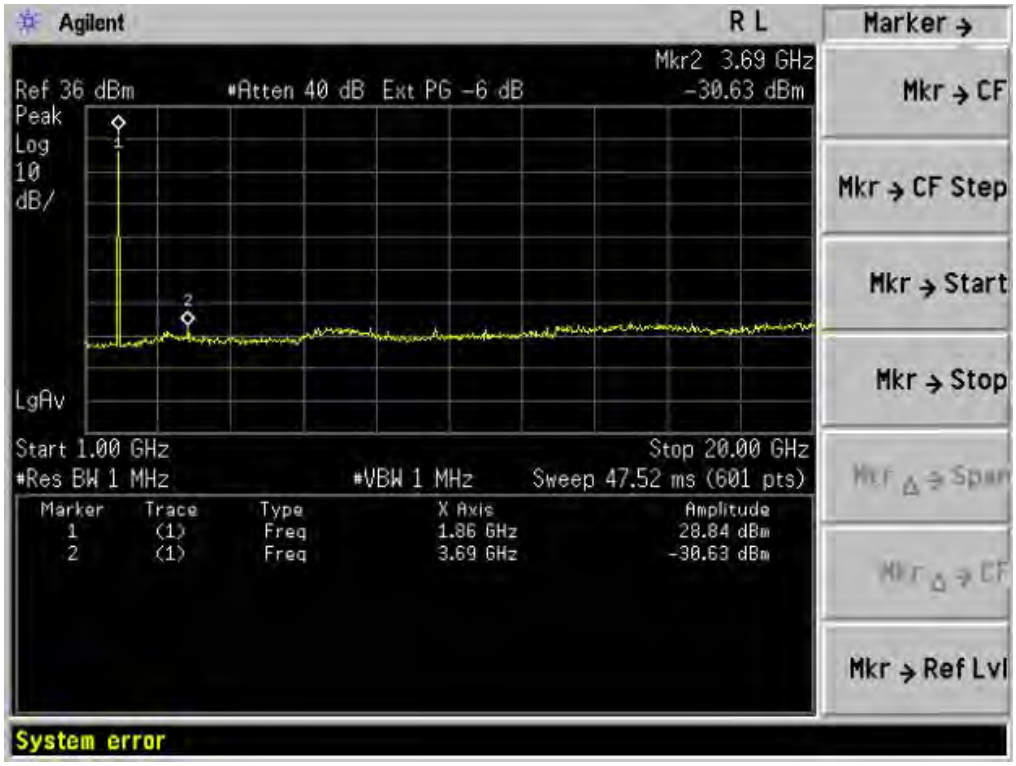


CONDUCTED EMISSION IN PCS1900 BAND

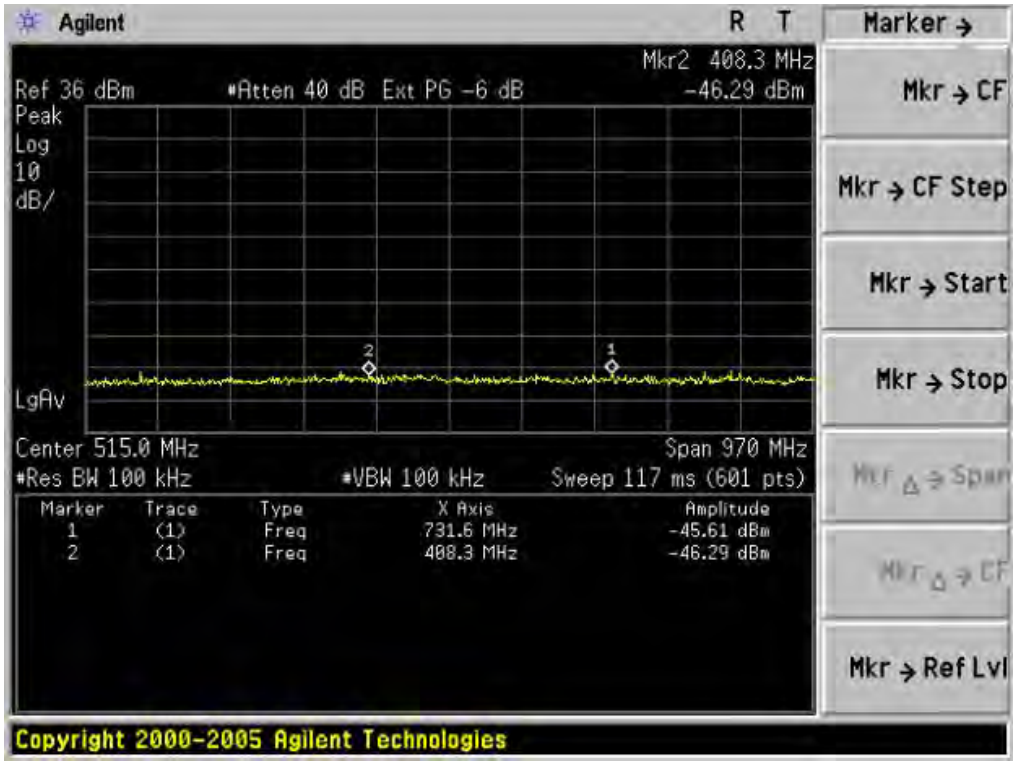
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



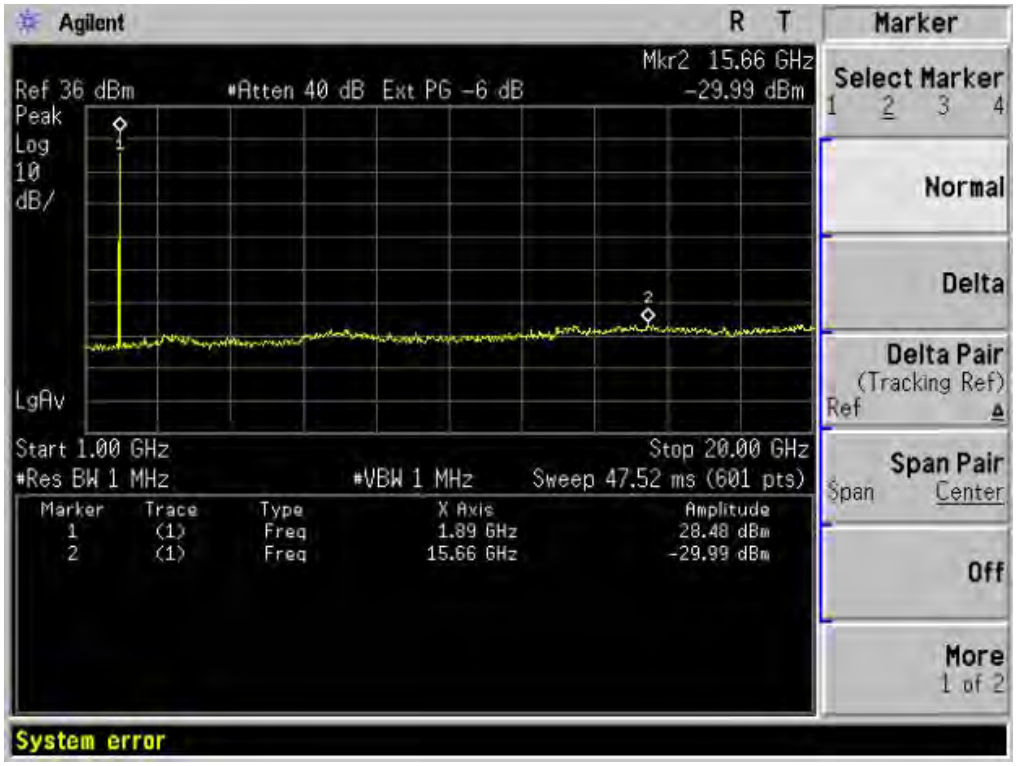
Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



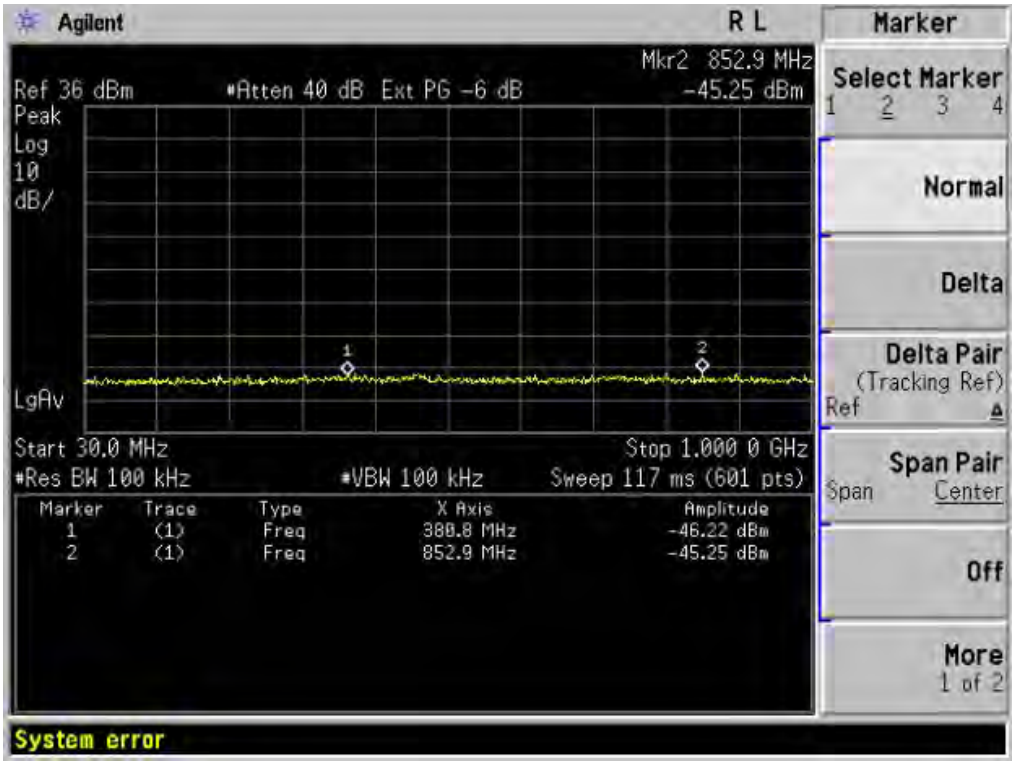
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



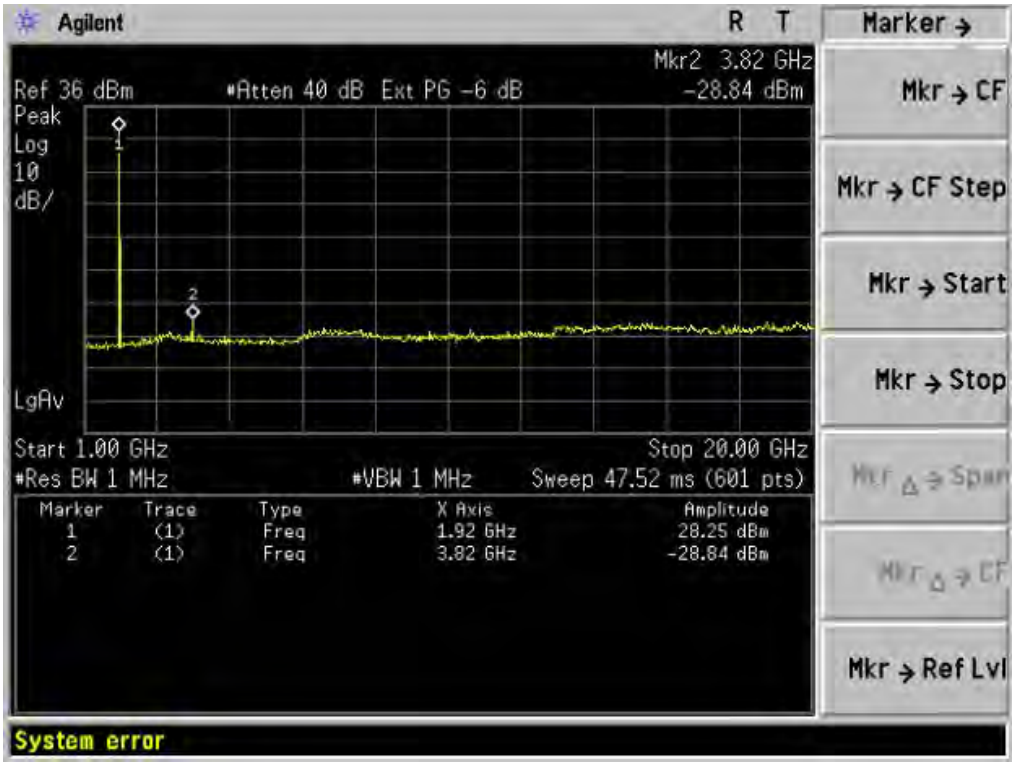
Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz

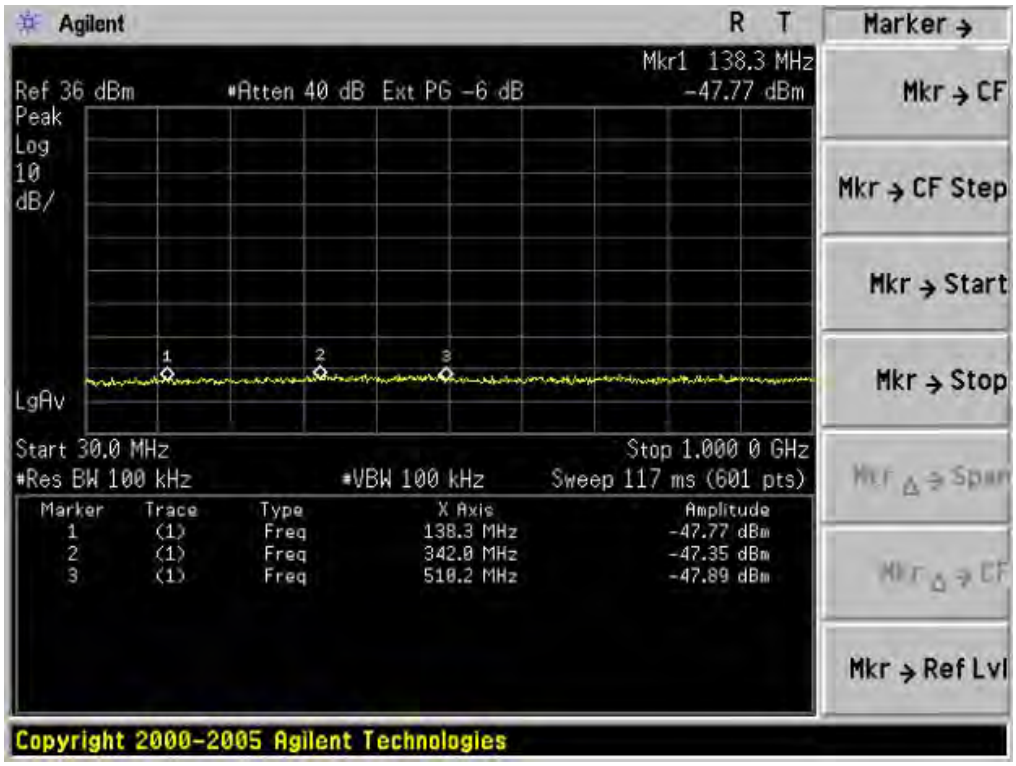


Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz

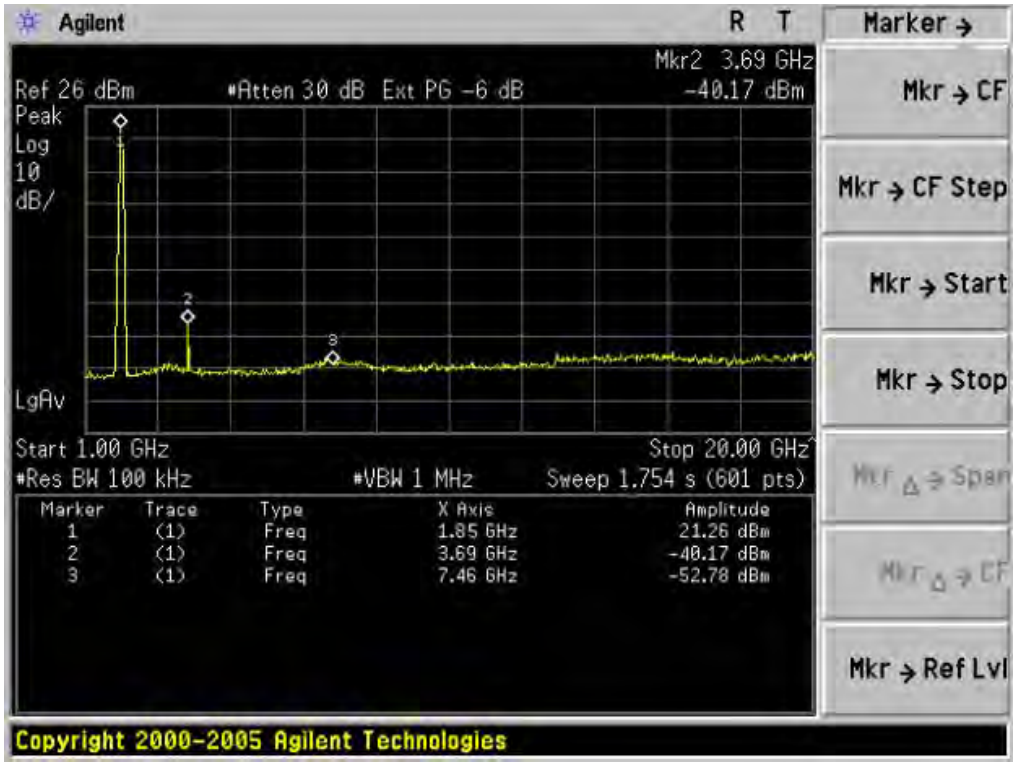


CONDUCTED EMISSION IN UMTS band II

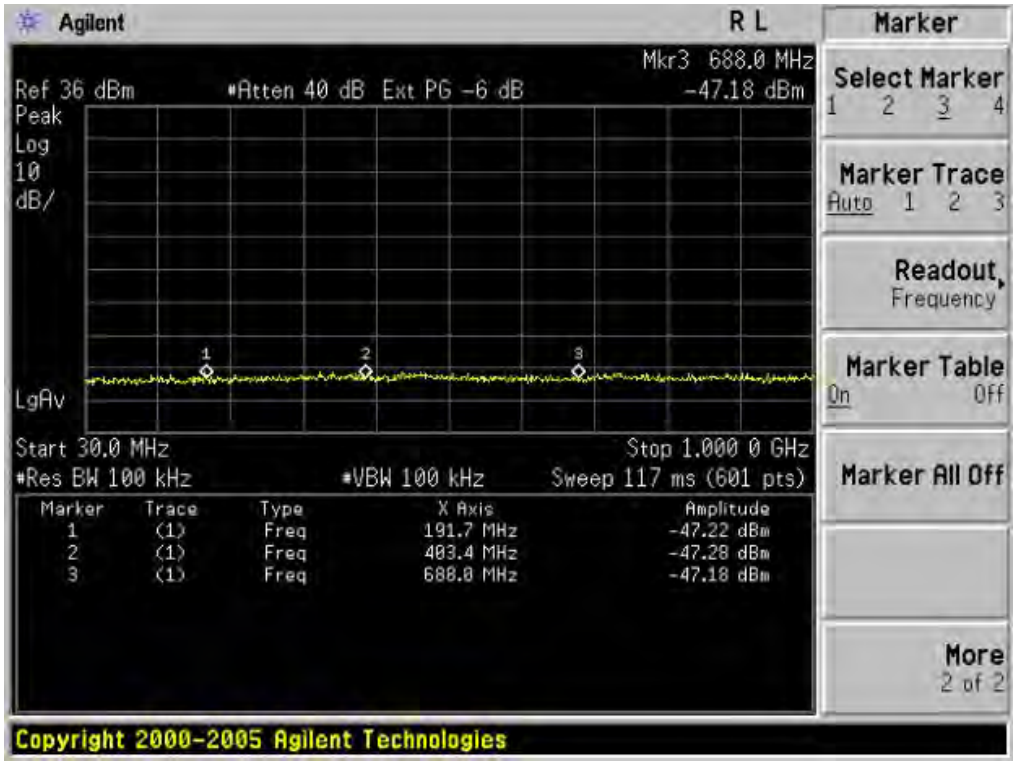
Conducted Emission Transmitting Mode CH 9262 30MHz – 1GHz



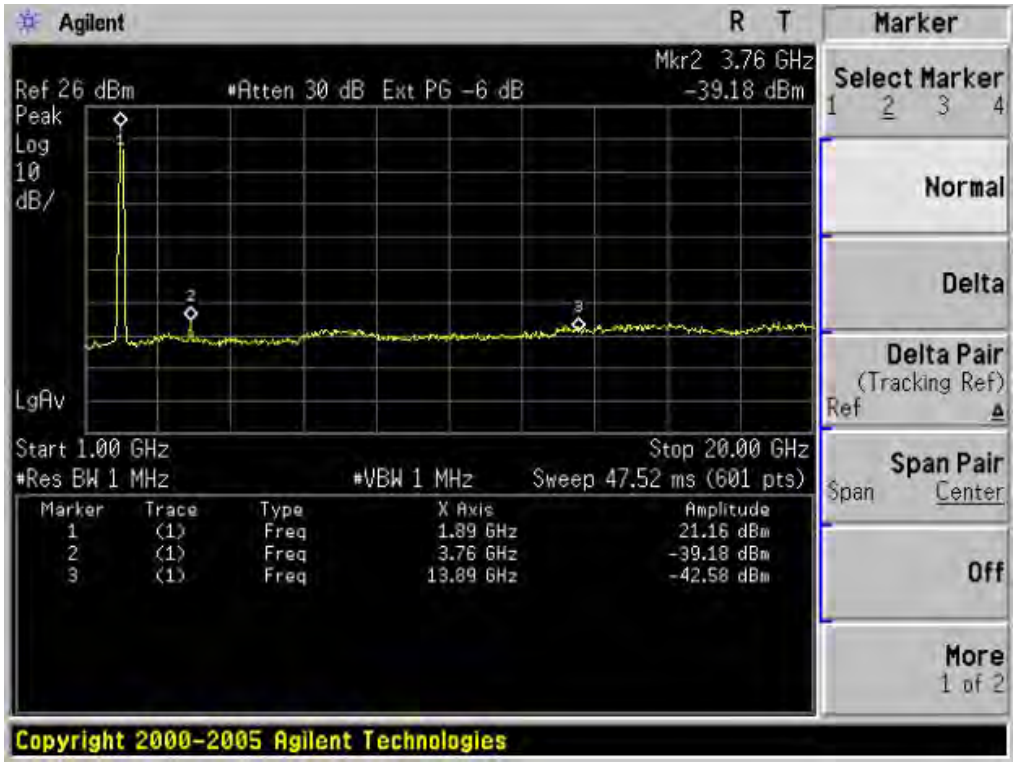
Conducted Emission Transmitting Mode CH 9262 1GHz – 20GHz



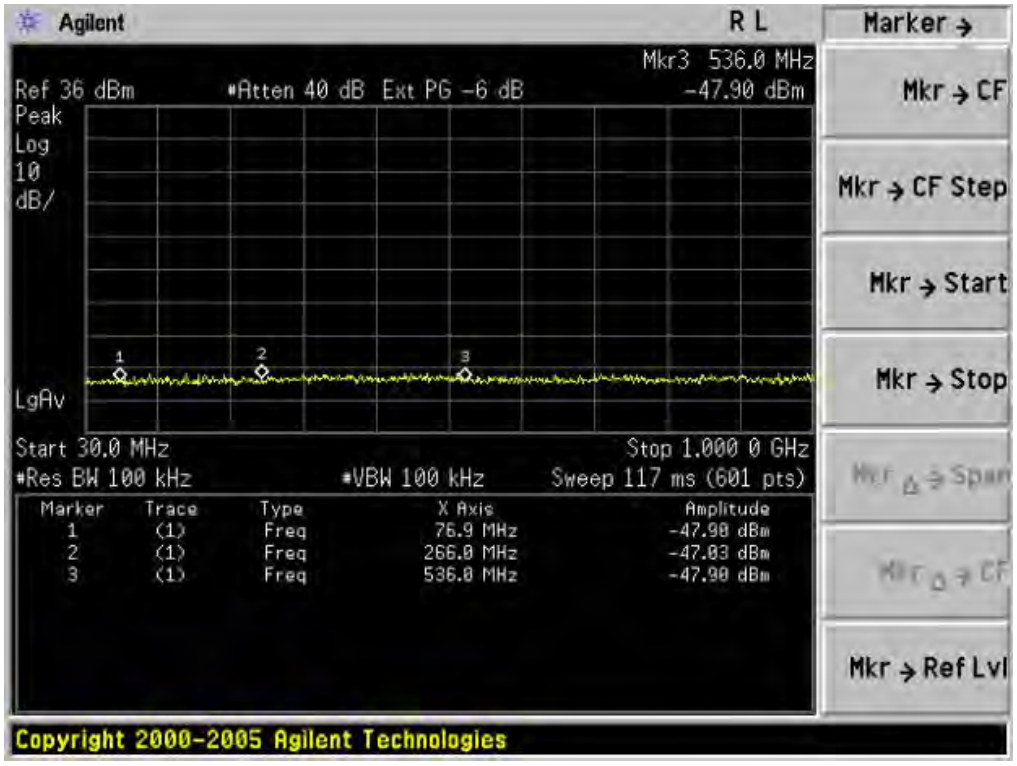
Conducted Emission Transmitting Mode CH 9400 30MHz – 1GHz



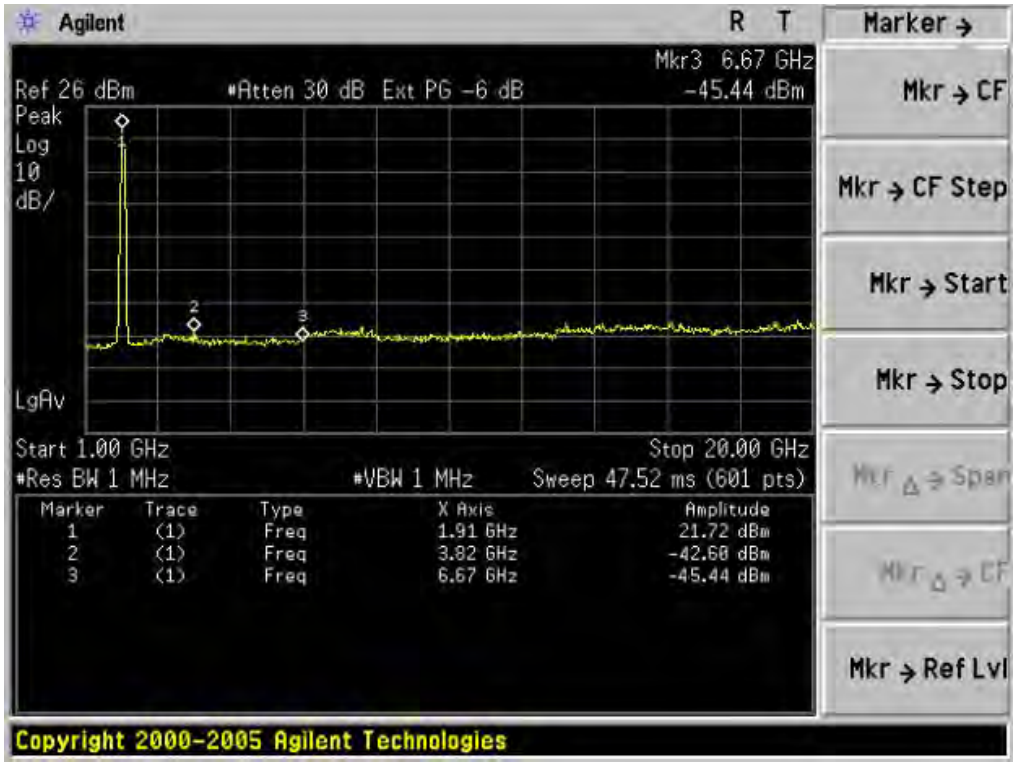
Conducted Emission Transmitting Mode CH 9400 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 1GHz

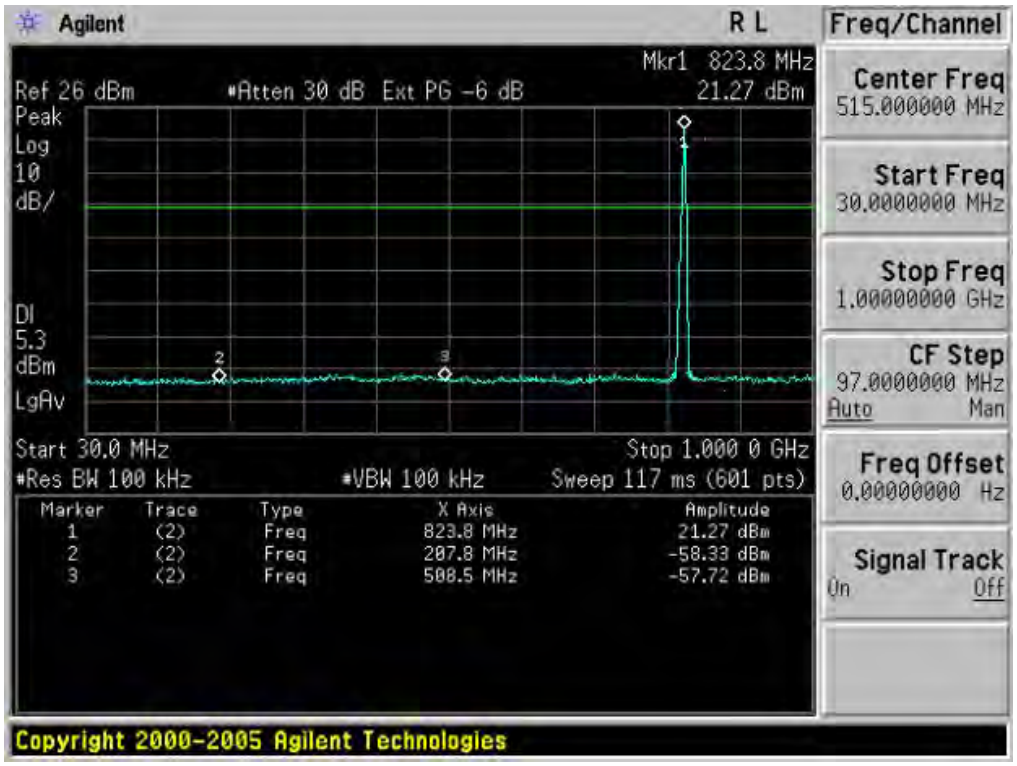


Conducted Emission Transmitting Mode CH 9538 1GHz – 20GHz

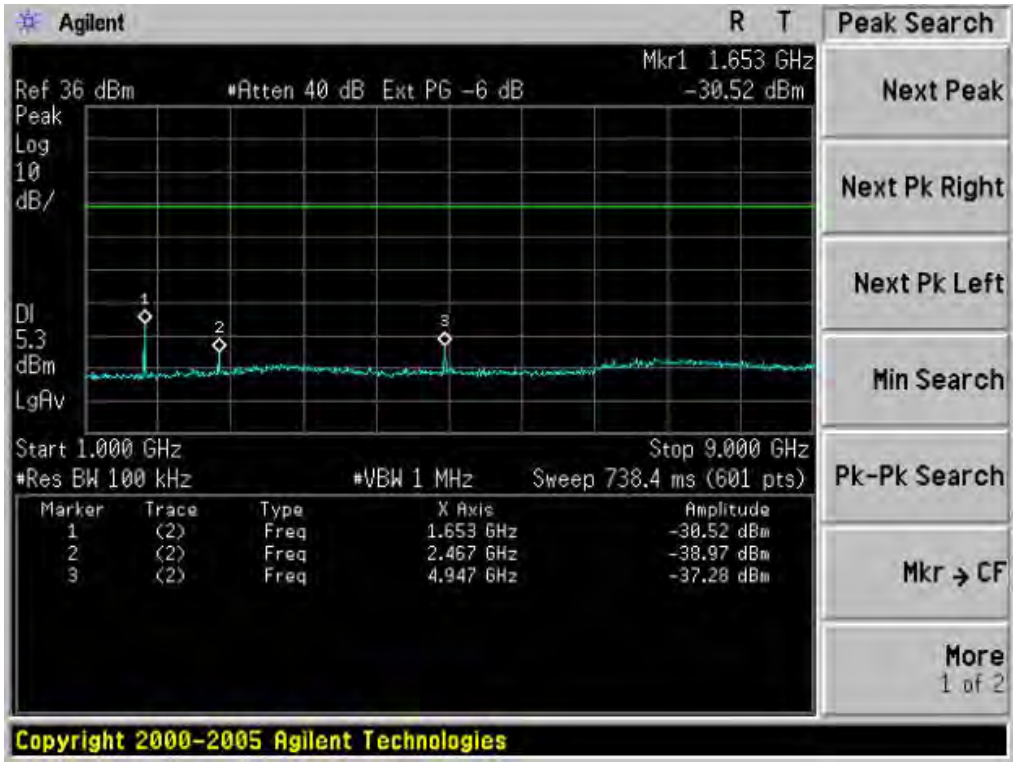


CONDUCTED EMISSION IN UMTS band V

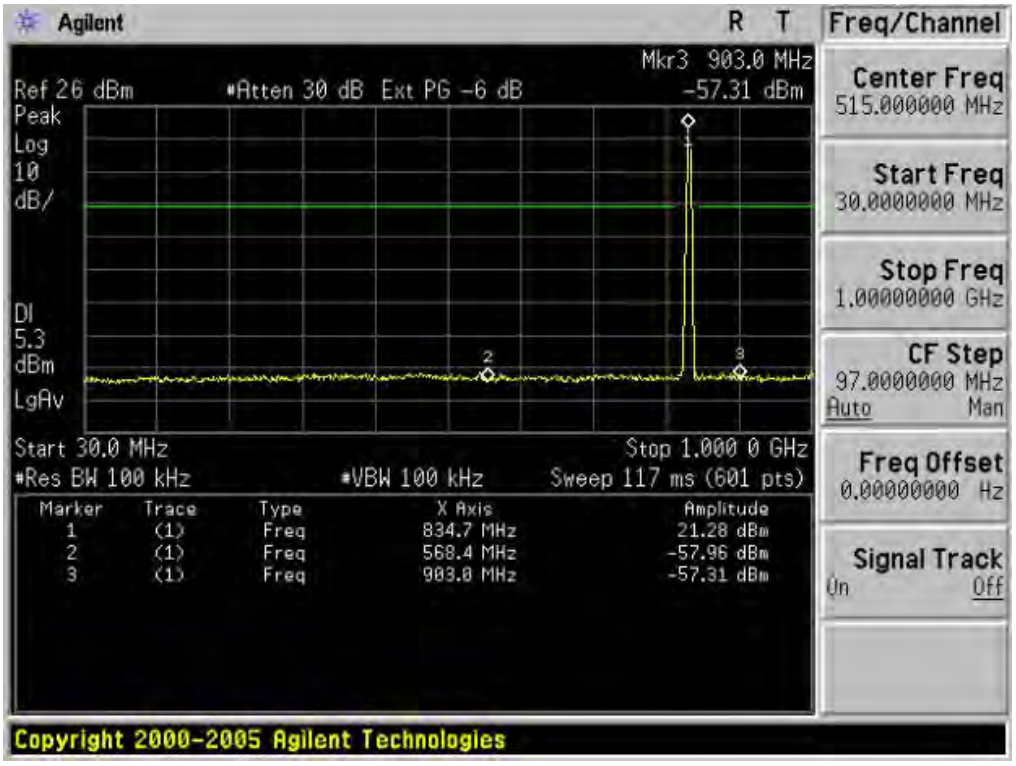
Conducted Emission Transmitting Mode CH 4132 30MHz – 1GHz



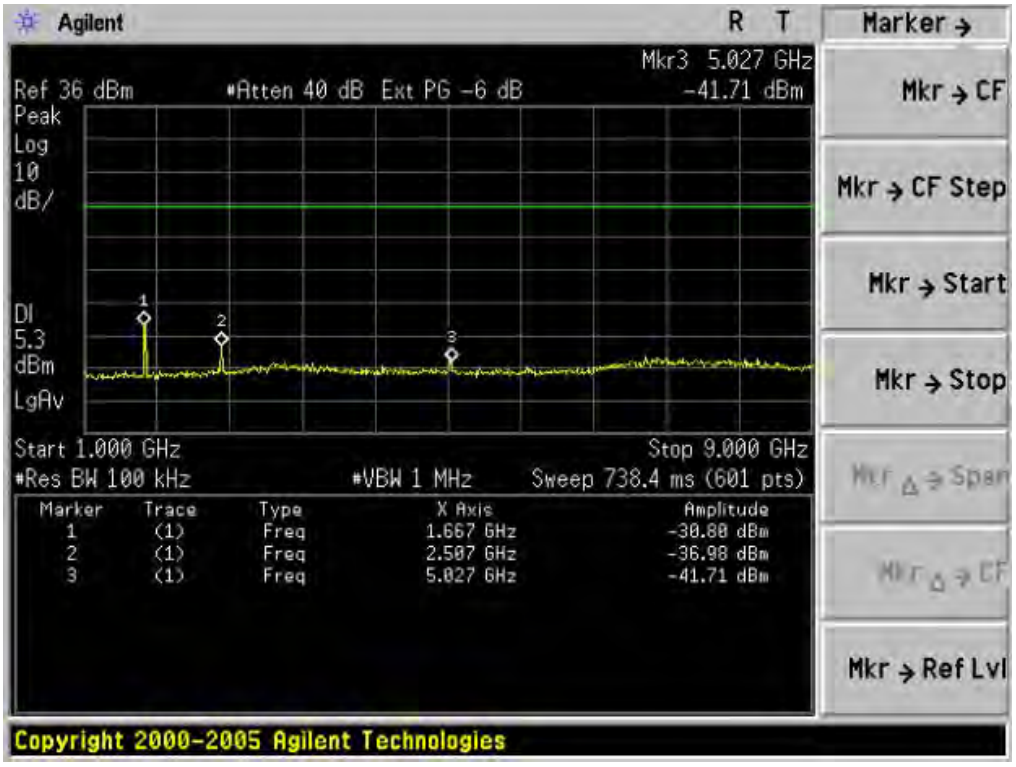
Conducted Emission Transmitting Mode CH 4132 1GHz – 9GHz



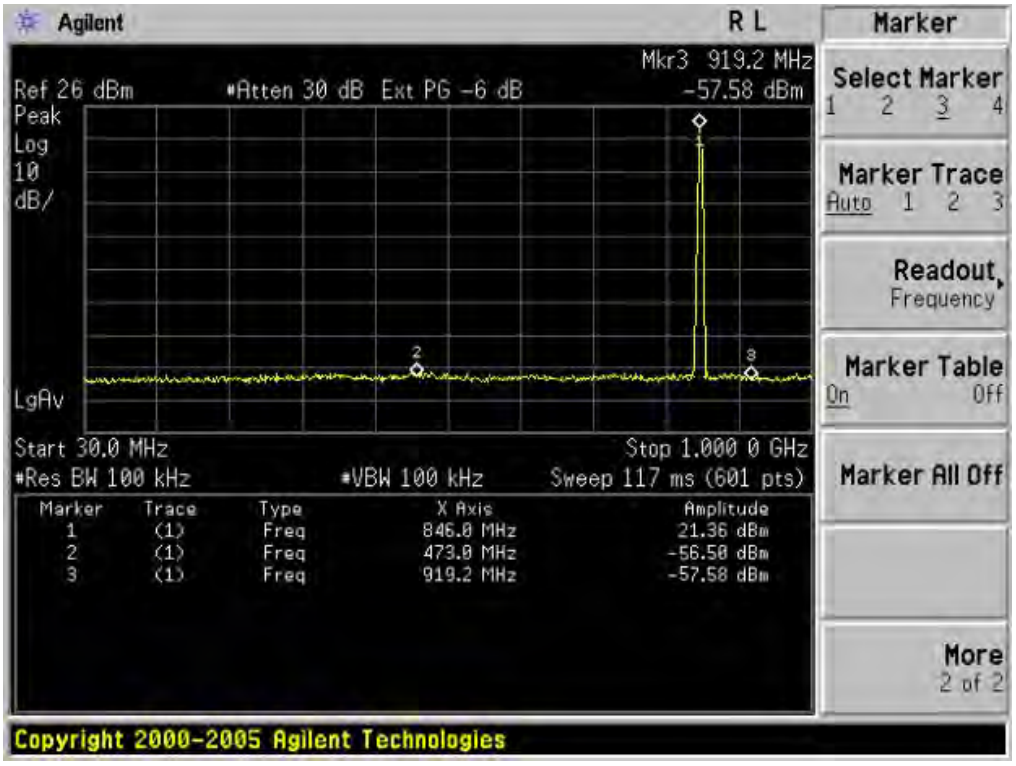
Conducted Emission Transmitting Mode CH 4175 30MHz – 1GHz



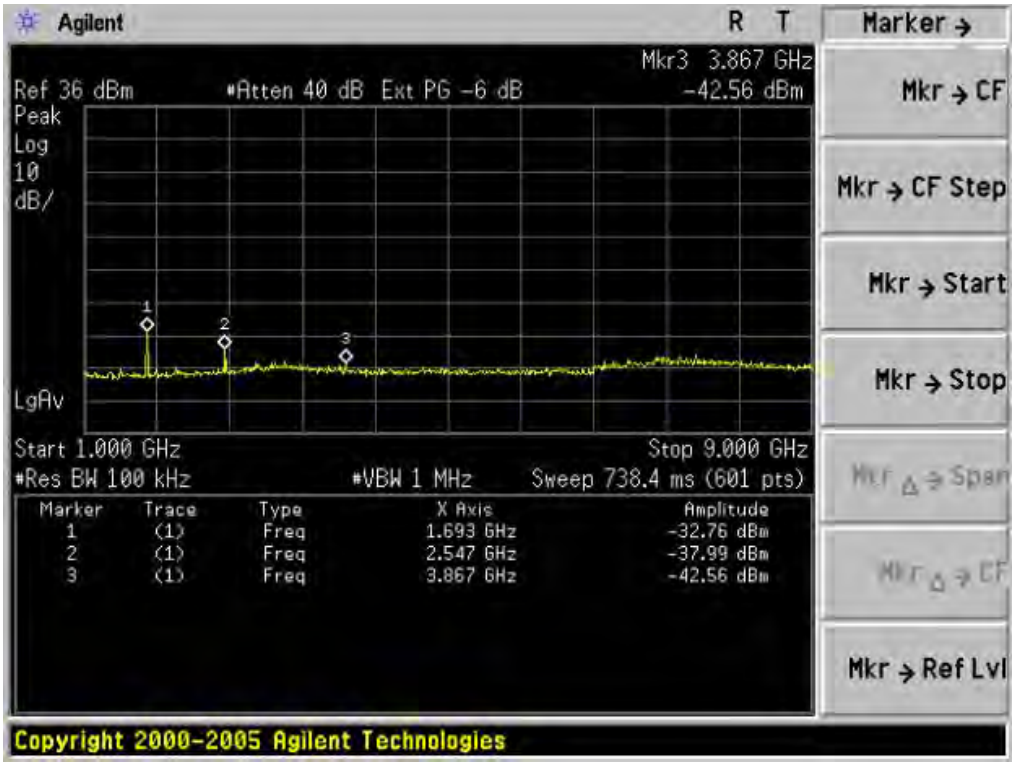
Conducted Emission Transmitting Mode CH 4175 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 9538 1GHz – 20GHz

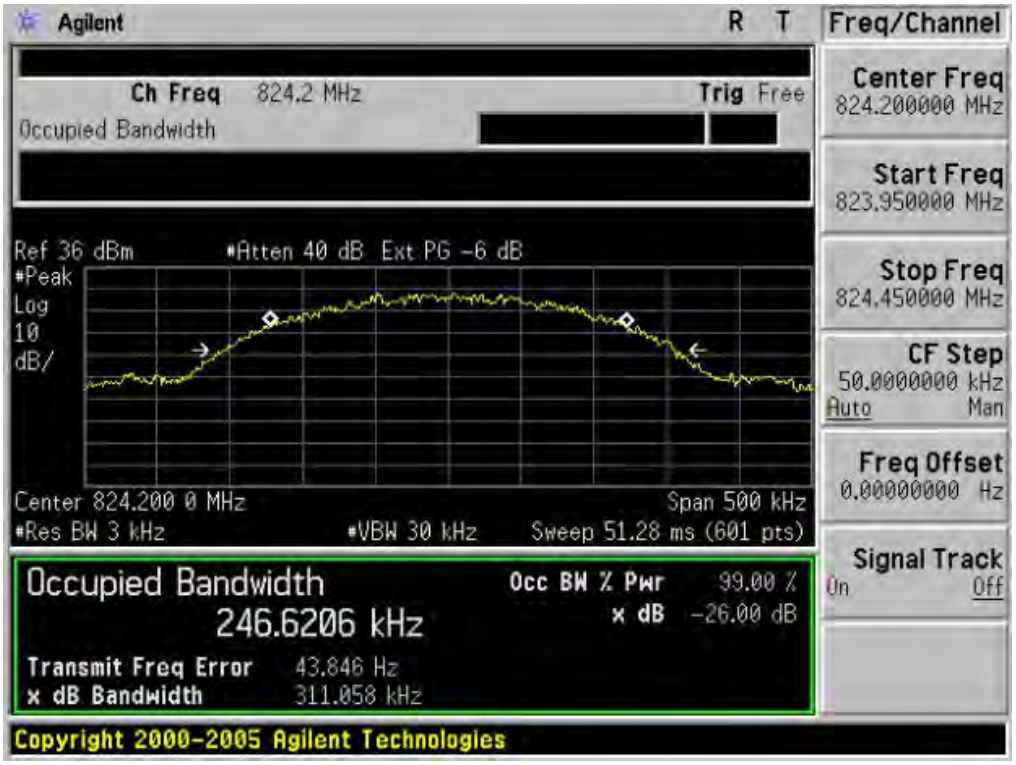


APPENDIX II

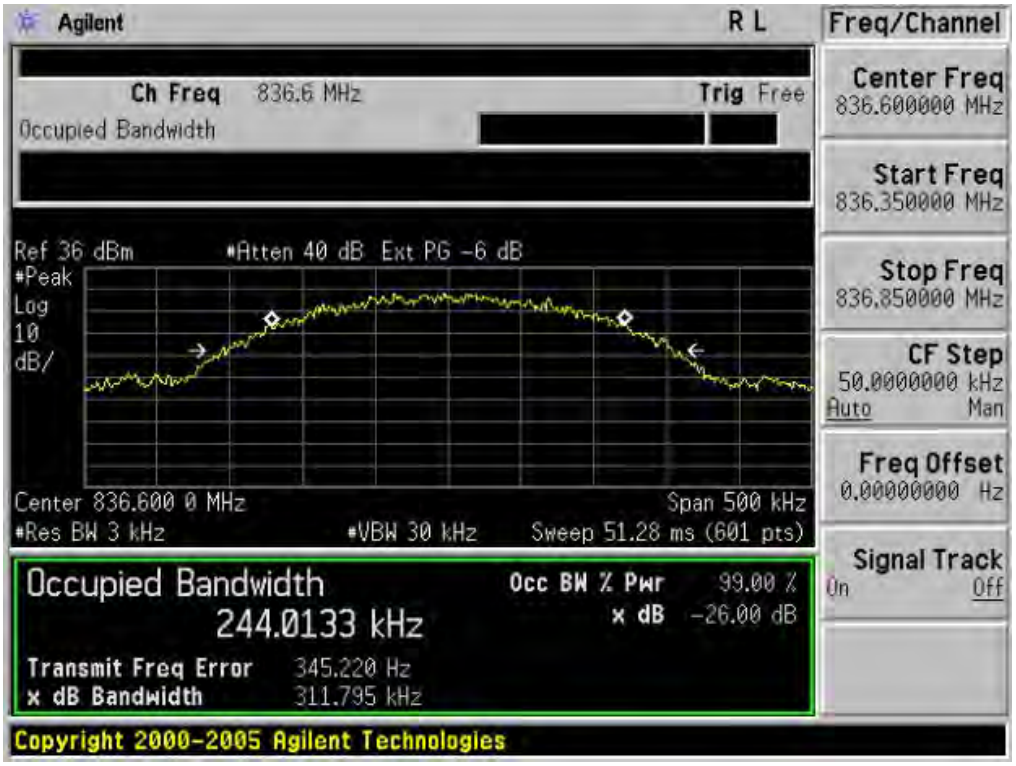
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)

EMISSION BANDWIDTH (-26dBC)

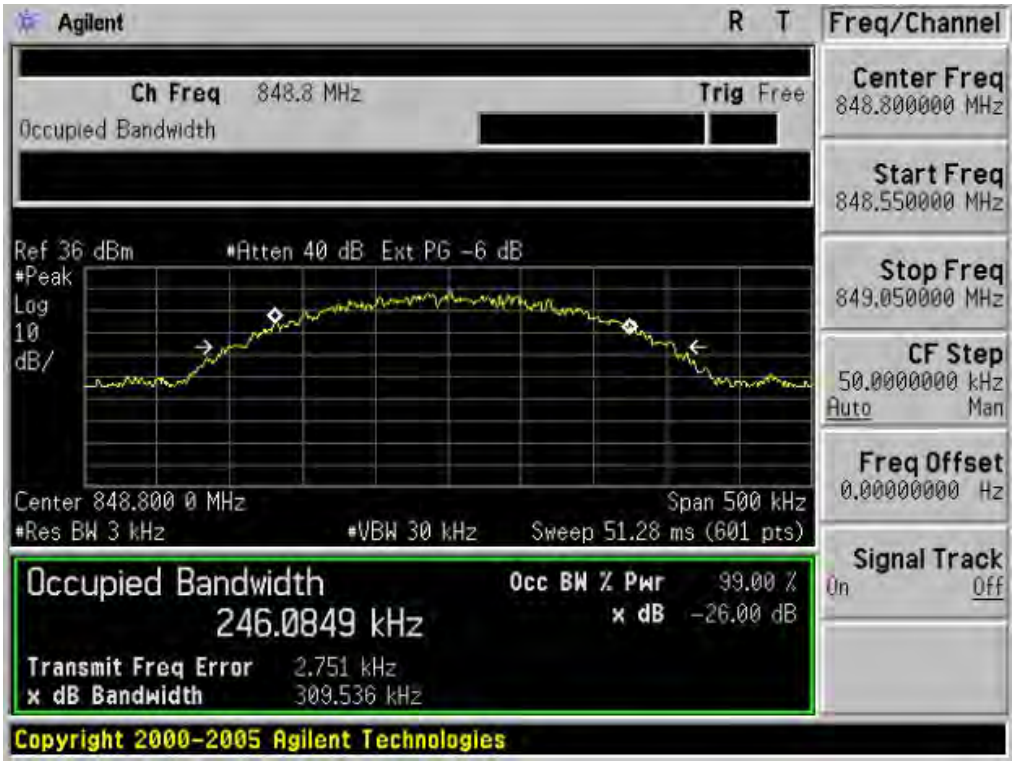
Occupied Bandwidth (99%) GSM 850 BAND CH 128



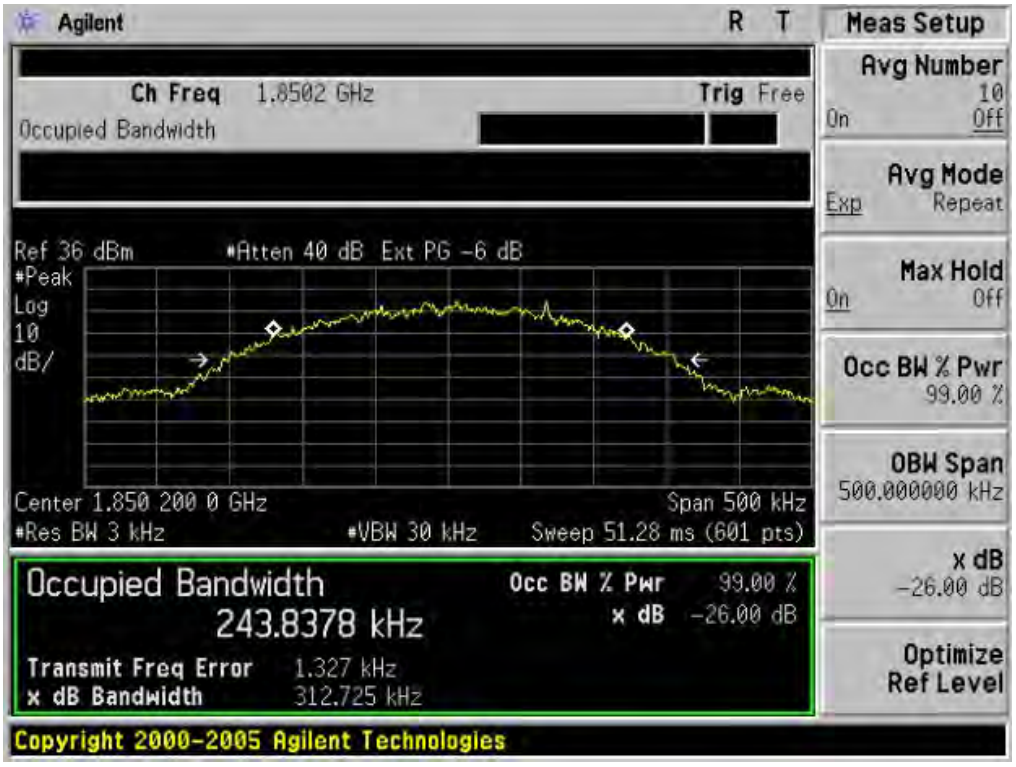
Occupied Bandwidth (99%) GSM 850 BAND CH 190



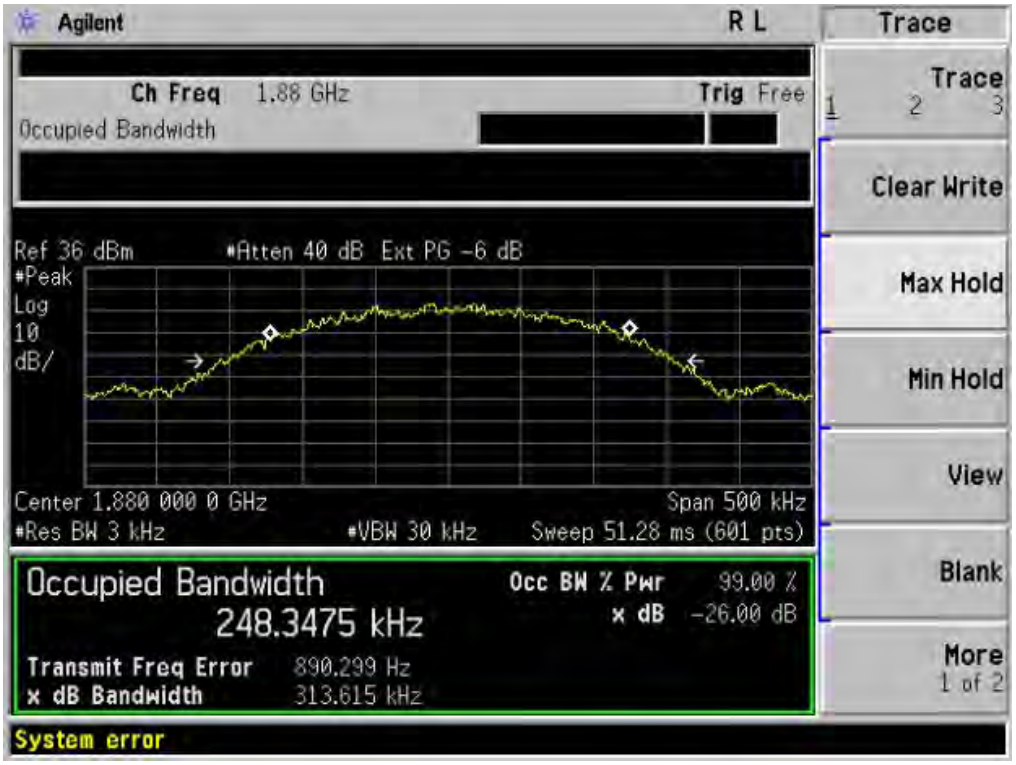
Occupied Bandwidth (99%) GSM 850 BAND CH 251



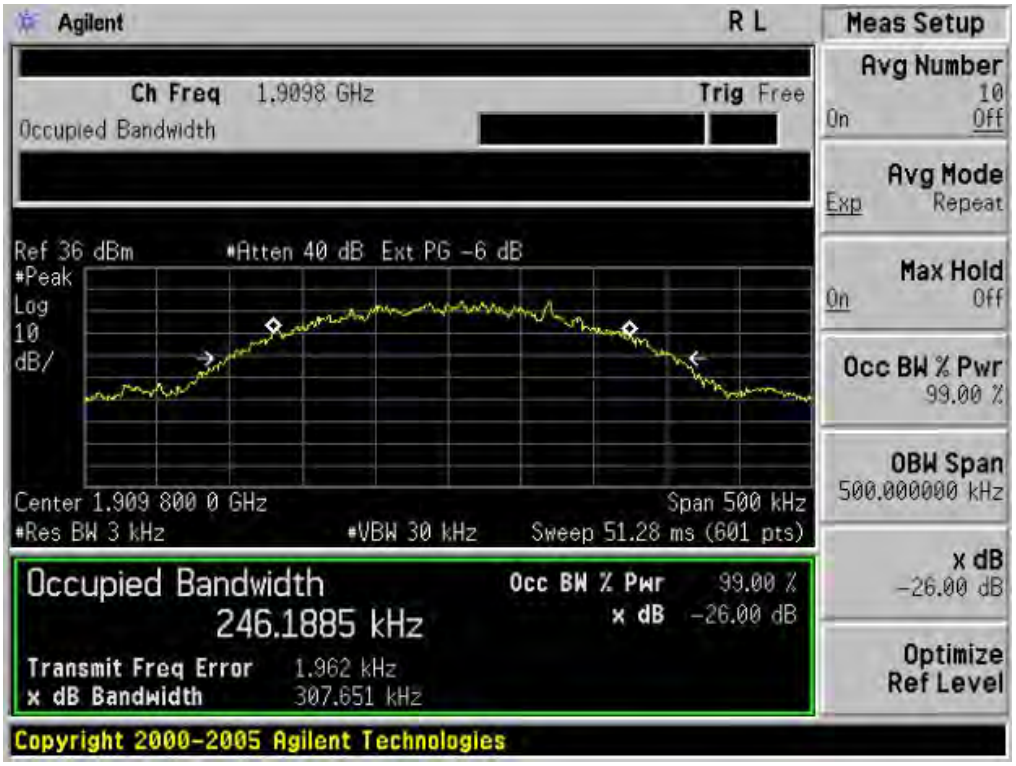
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



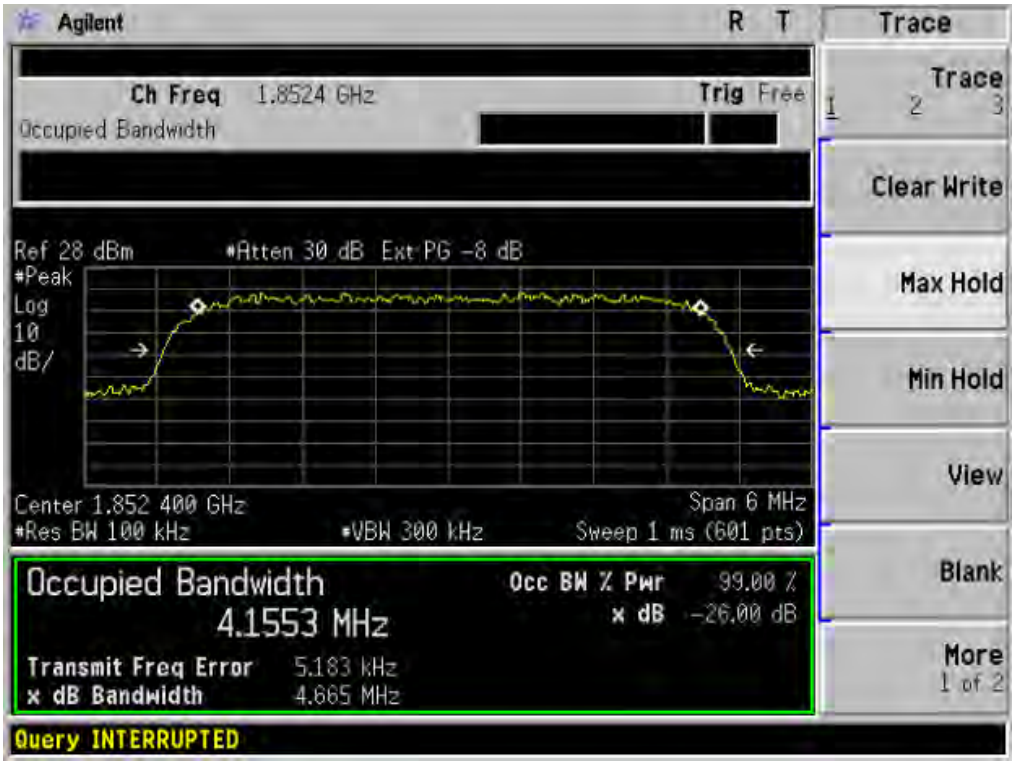
Occupied Bandwidth (99%) PCS 1900 BAND CH 661



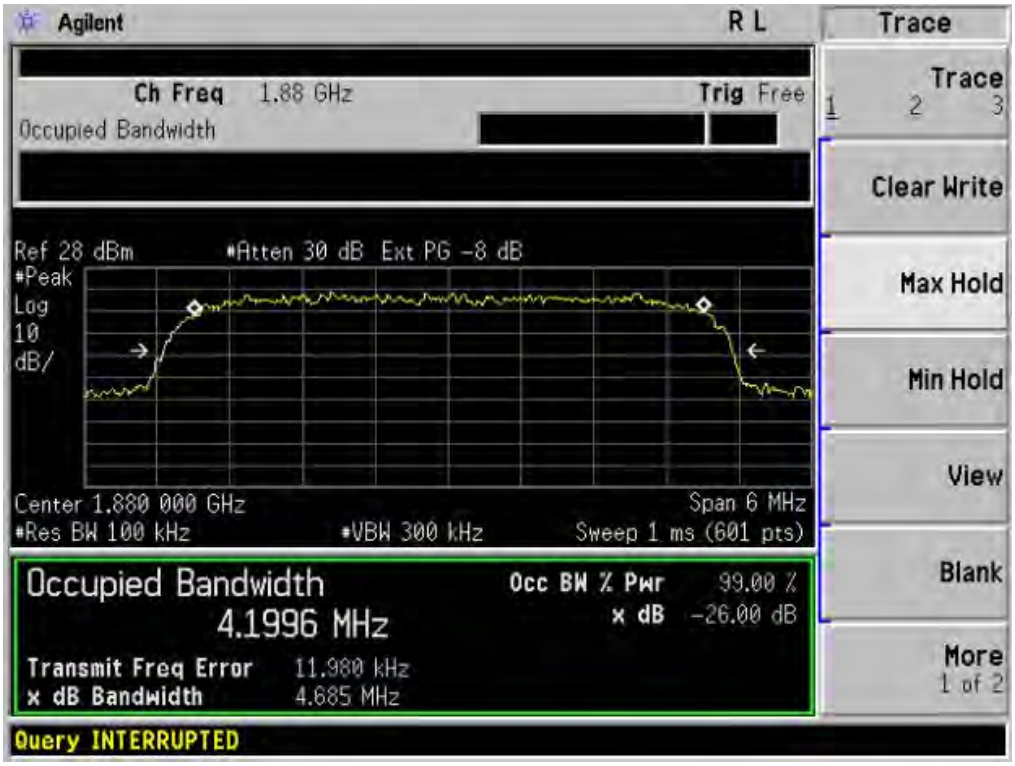
Occupied Bandwidth (99%) PCS 1900 BAND CH 810



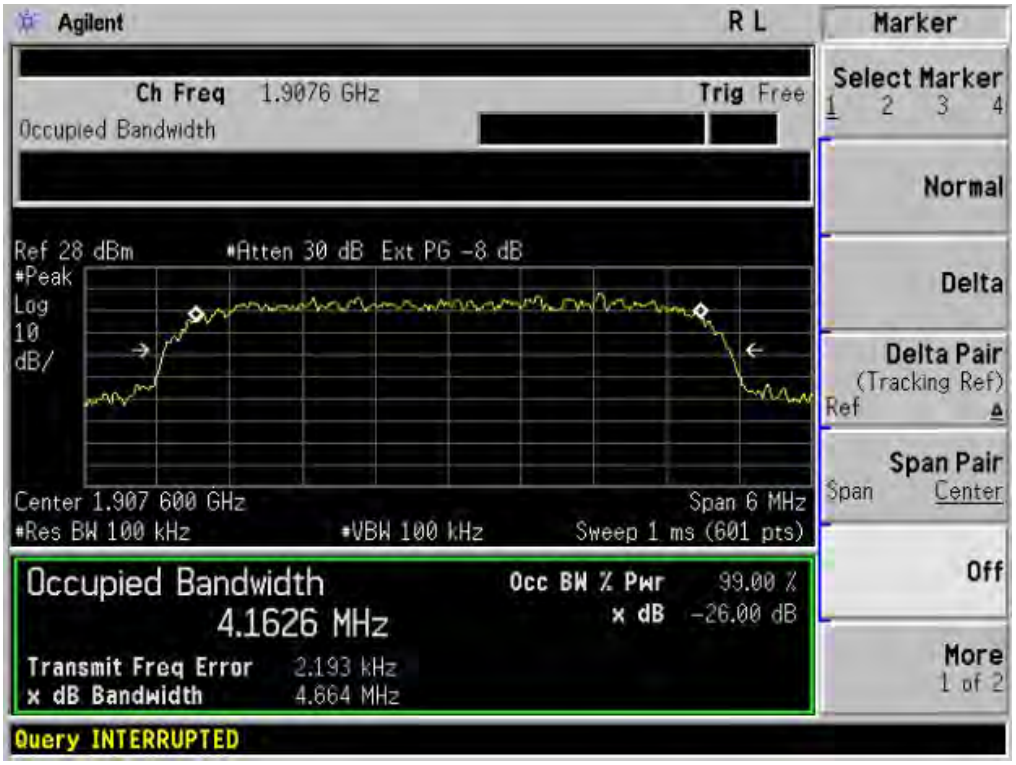
Occupied Bandwidth (99%) UMTS band II CH 9262



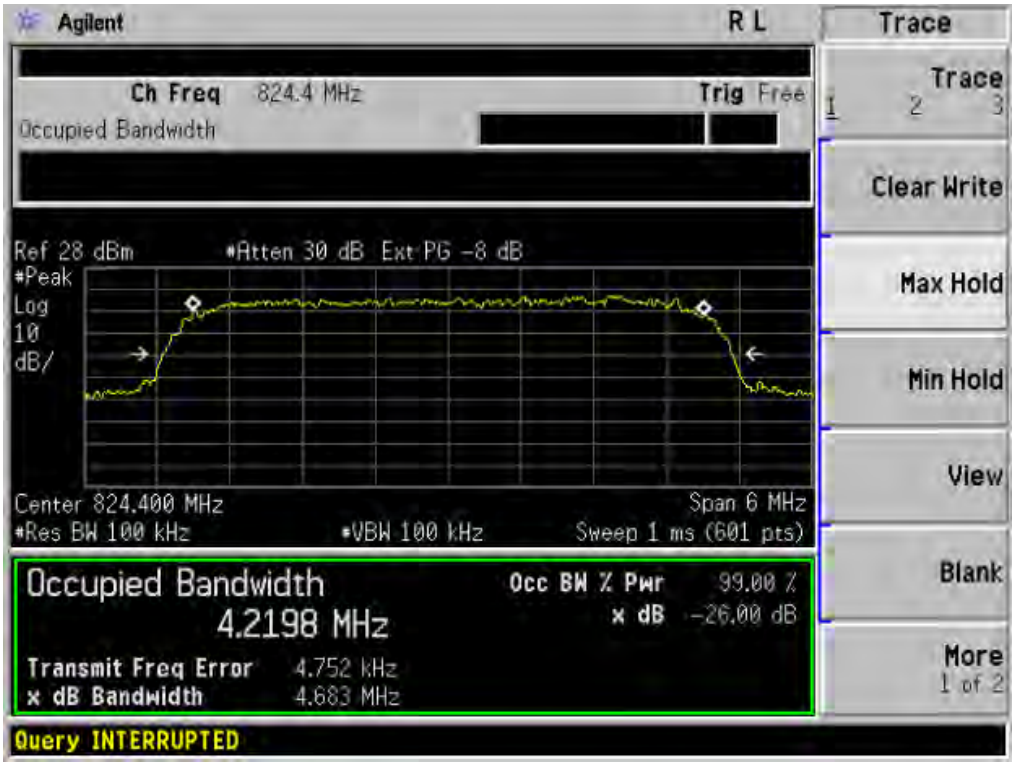
Occupied Bandwidth (99%) UMTS band II CH 9400



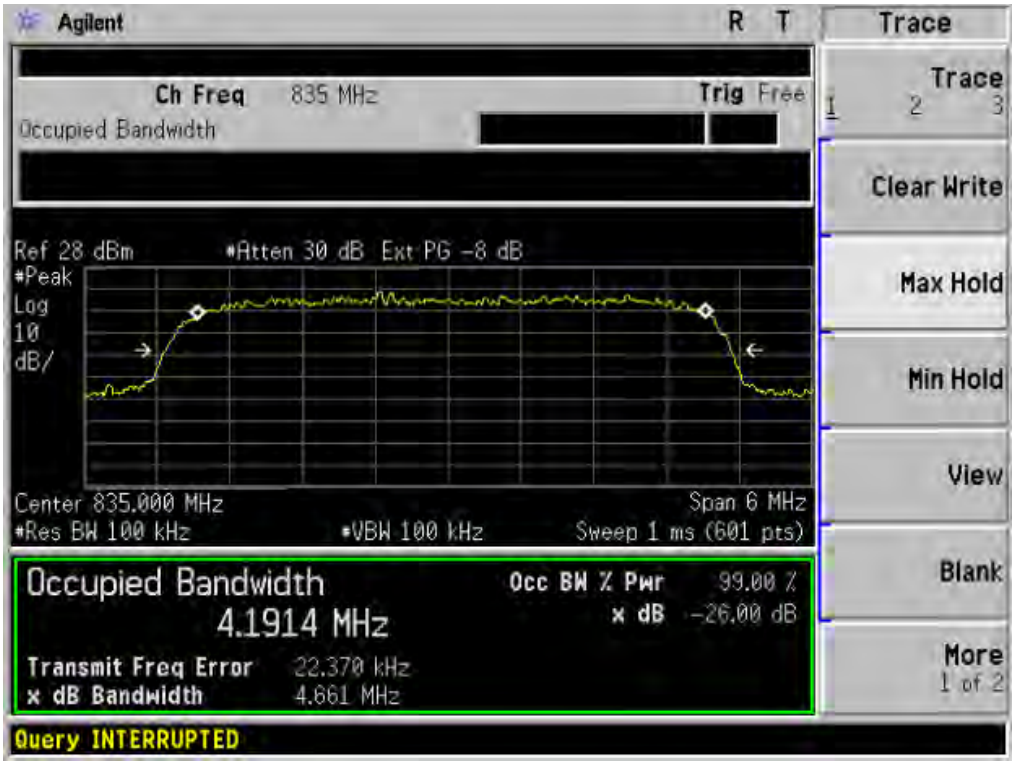
Occupied Bandwidth (99%) UMTS band II CH 9538



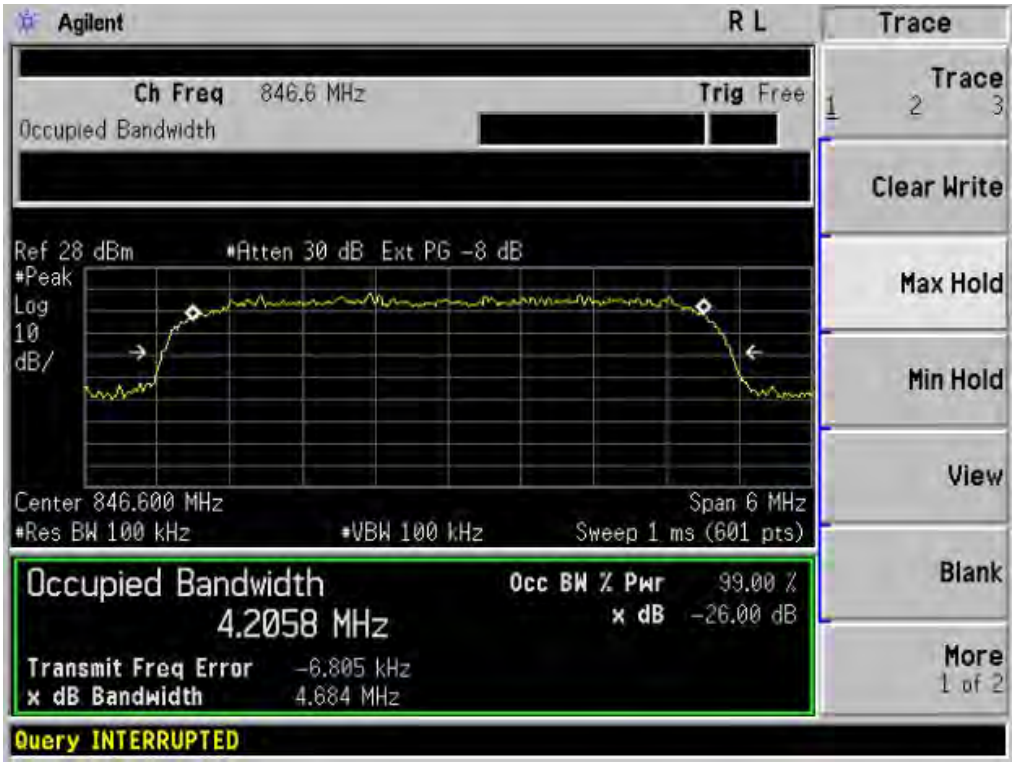
Occupied Bandwidth (99%) UMTS BAND V CH 4132



Occupied Bandwidth (99%) UMTS BAND V CH 4175



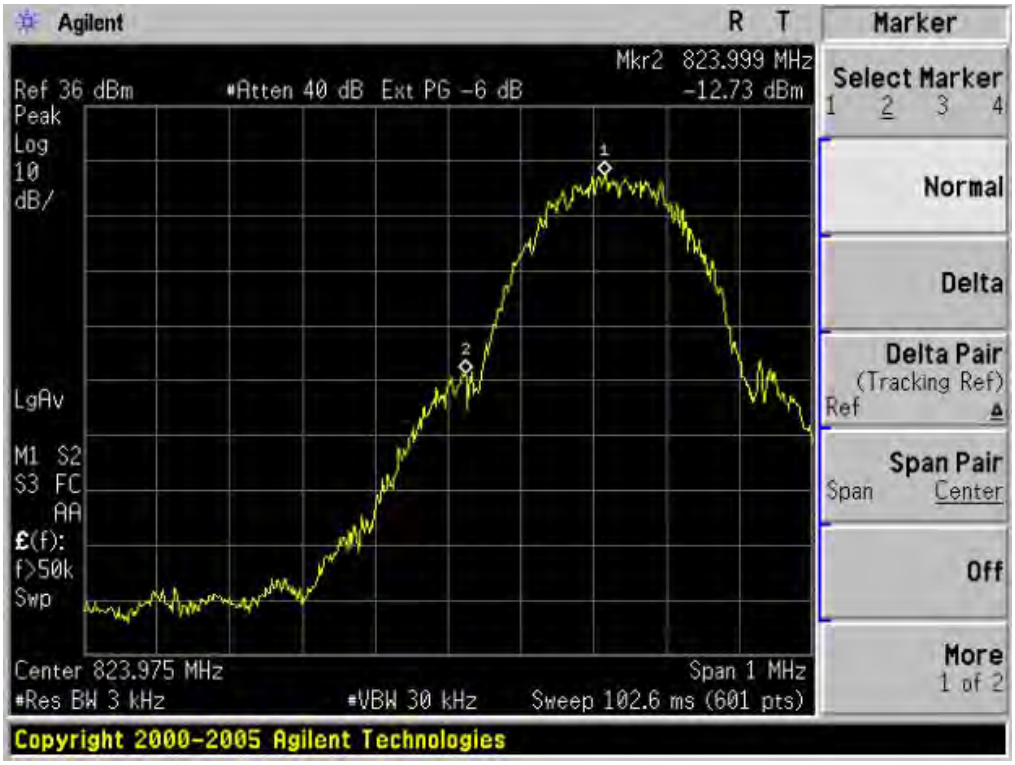
Occupied Bandwidth (99%) UMTS BAND V CH 4233



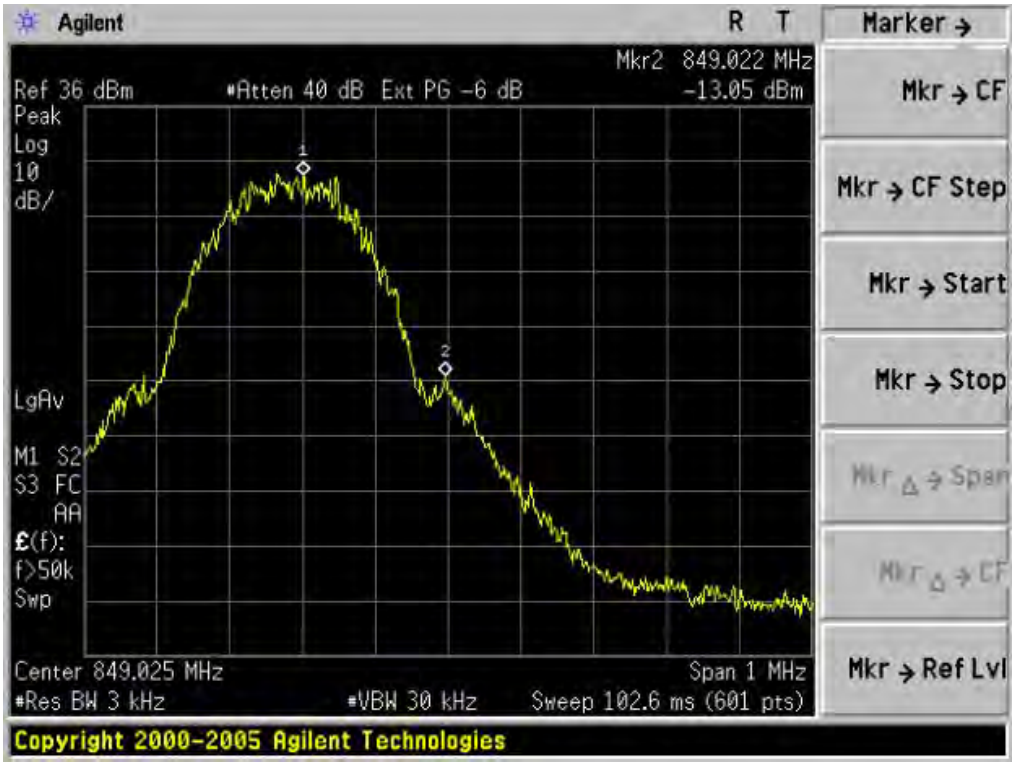
APPENDIX III

TEST PLOTS FOR BAND EDGES

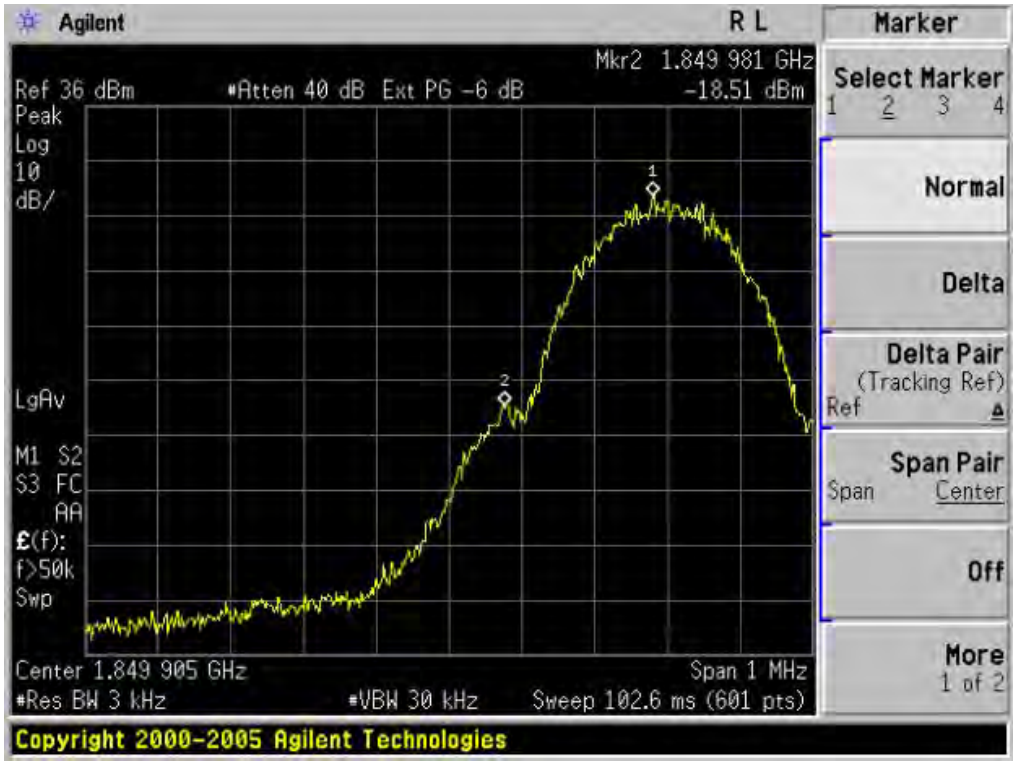
Low Band Edge GSM 850 BAND CH 128



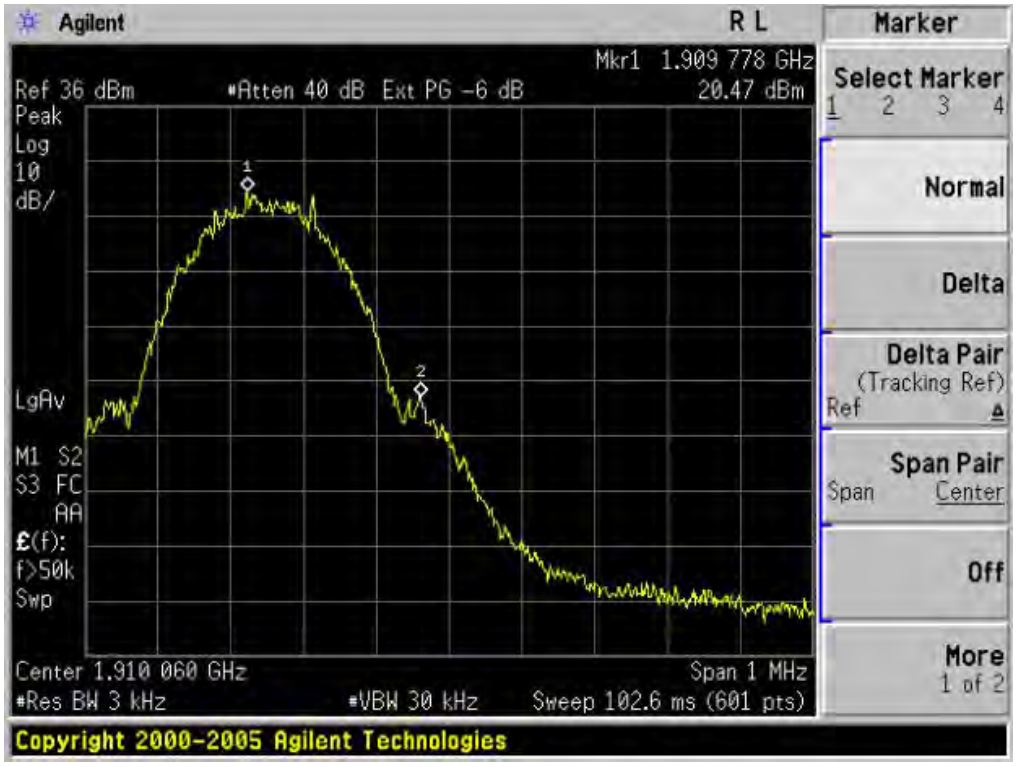
High Band Edge GSM 850 BAND CH 251



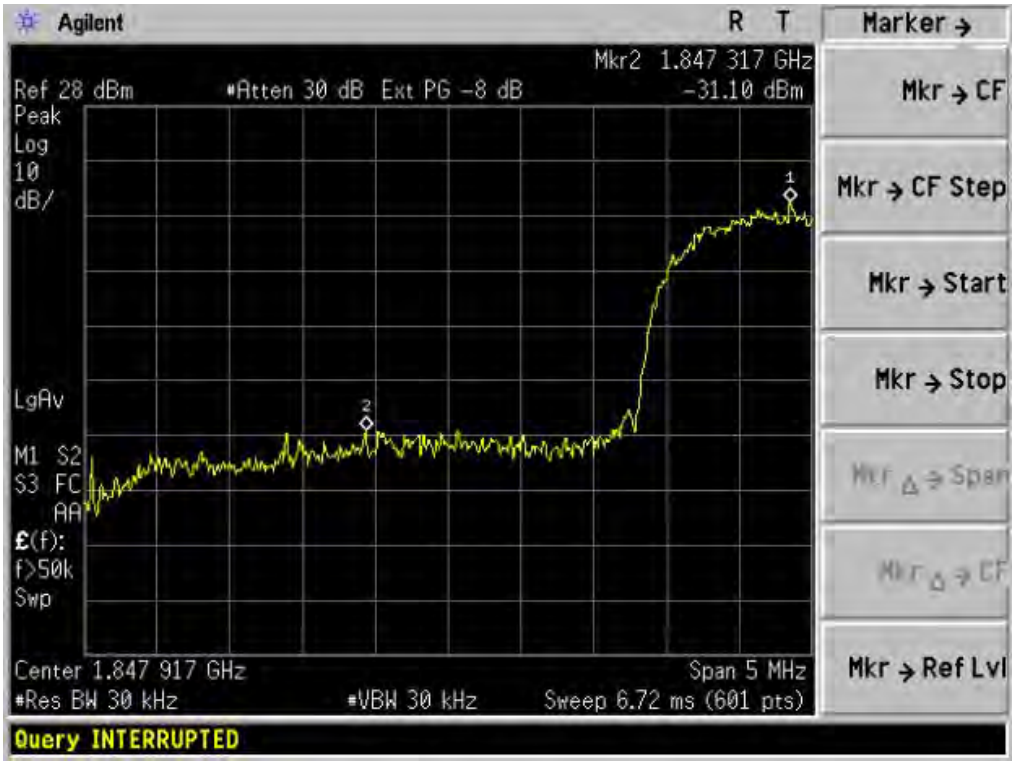
Low Band Edge PCS 1900 BAND CH 512



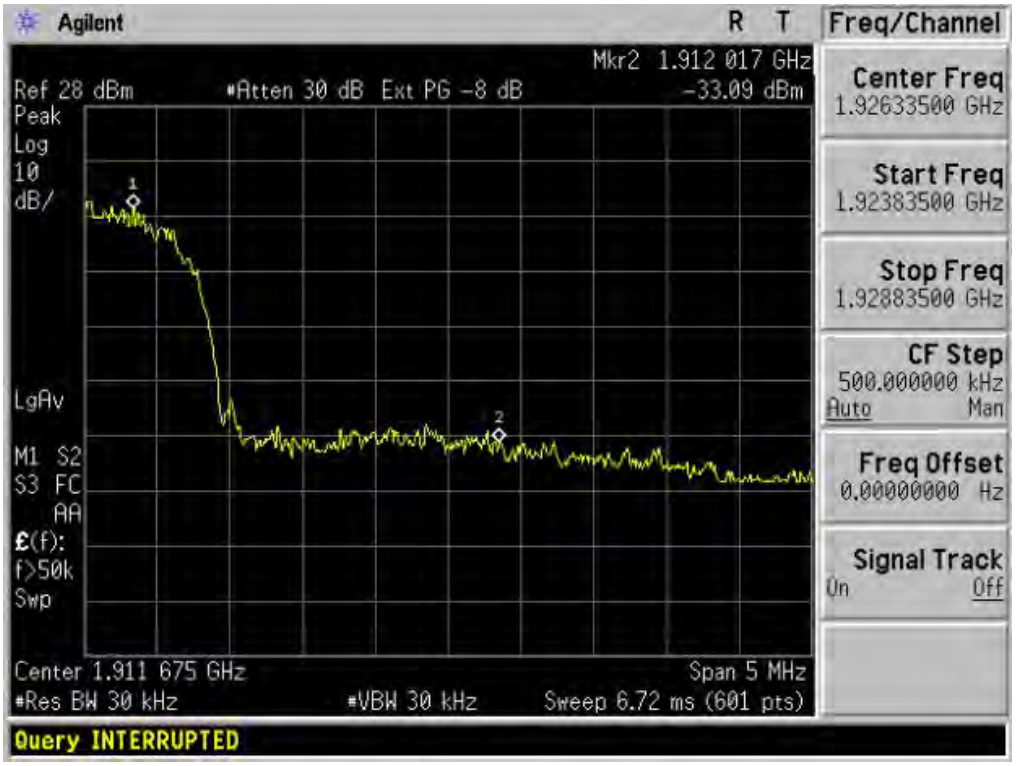
High Band Edge PCS 1900 BAND CH 810



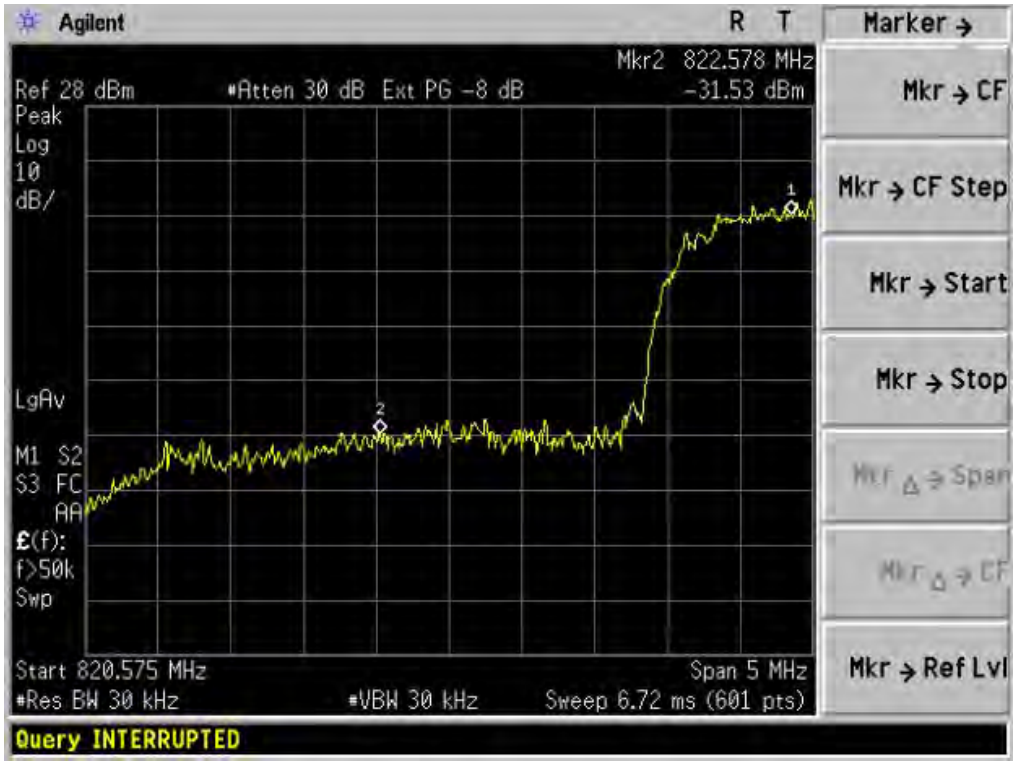
Low Band Edge UMTS BAND II CH 9262



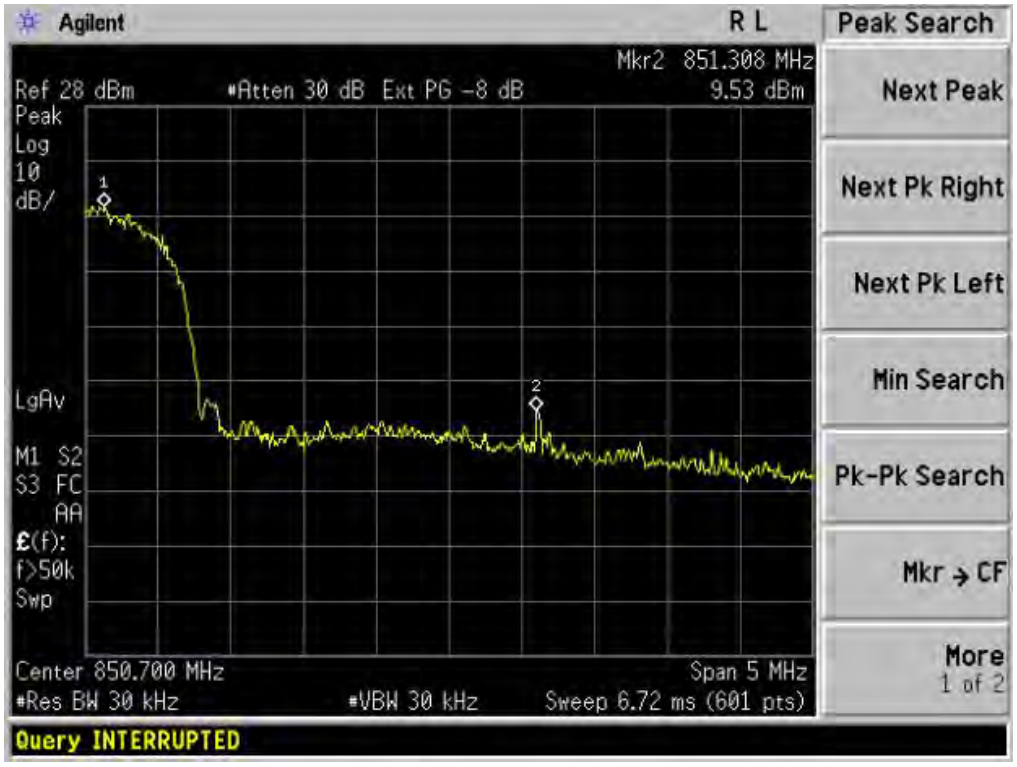
High Band Edge UMTS BAND II CH 9538



Low Band Edge UMTS BAND V CH 4132



High Band Edge UMTS BAND II CH 9538

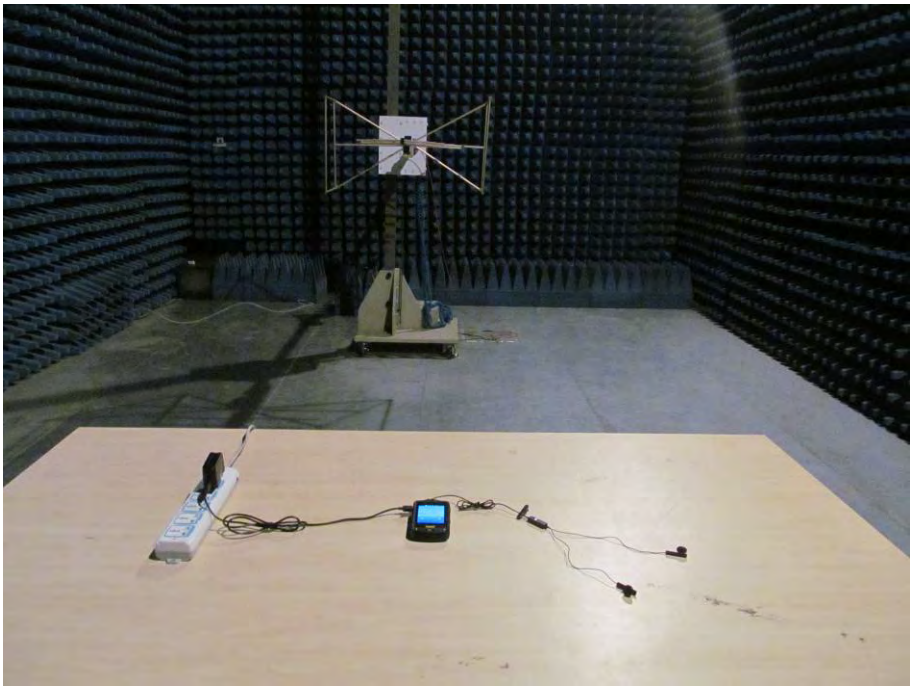


APPENDIX IV

PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION

RADIATED SPURIOUS EMISSION



APPENDIX V

PHOTOGRAPHS OF EUT

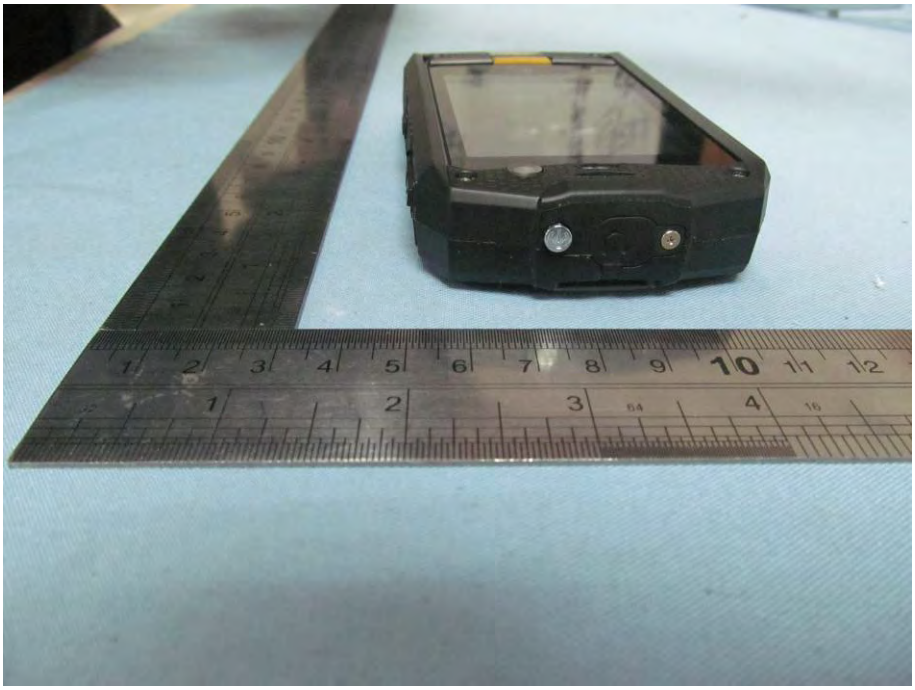
TOTAL VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

BACK VIEW OF EUT



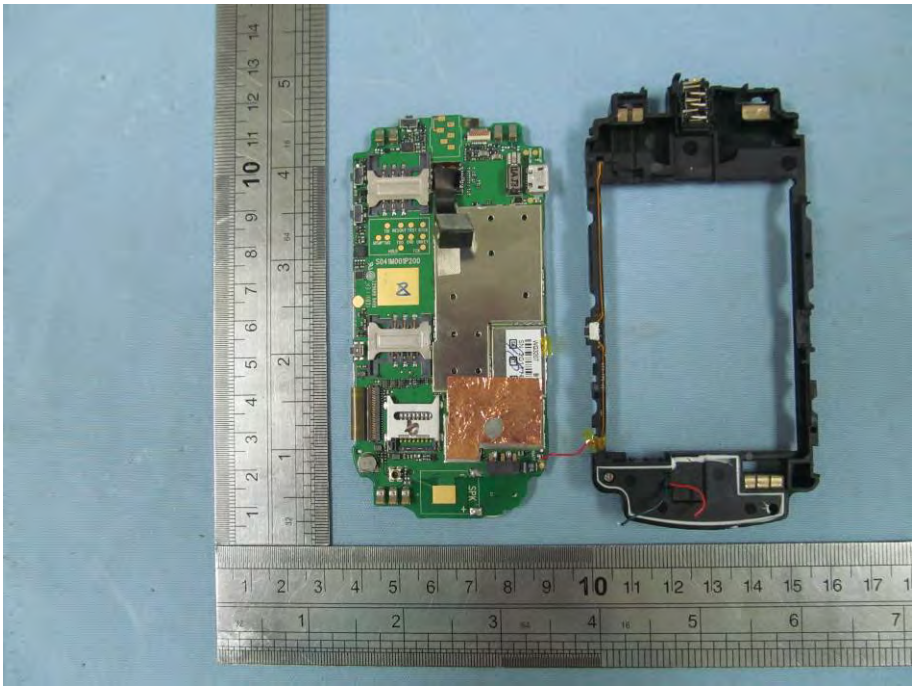
LEFT VIEW OF EUT

RIGHT VIEW OF EUT

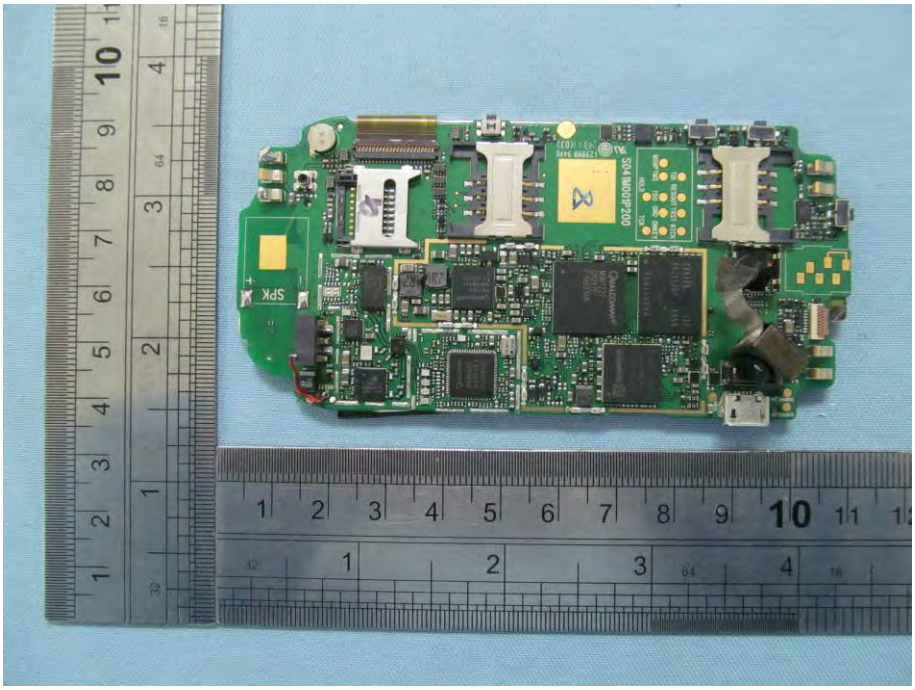
OPEN VIEW OF EUT-1

INTERNAL VIEW OF EUT-1

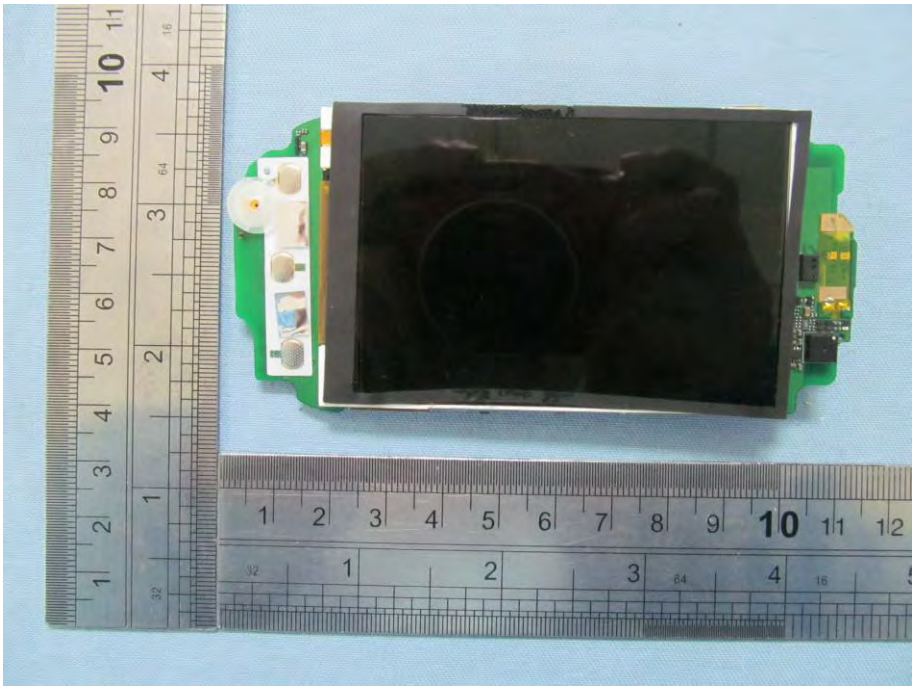
INTERNAL VIEW OF EUT-2



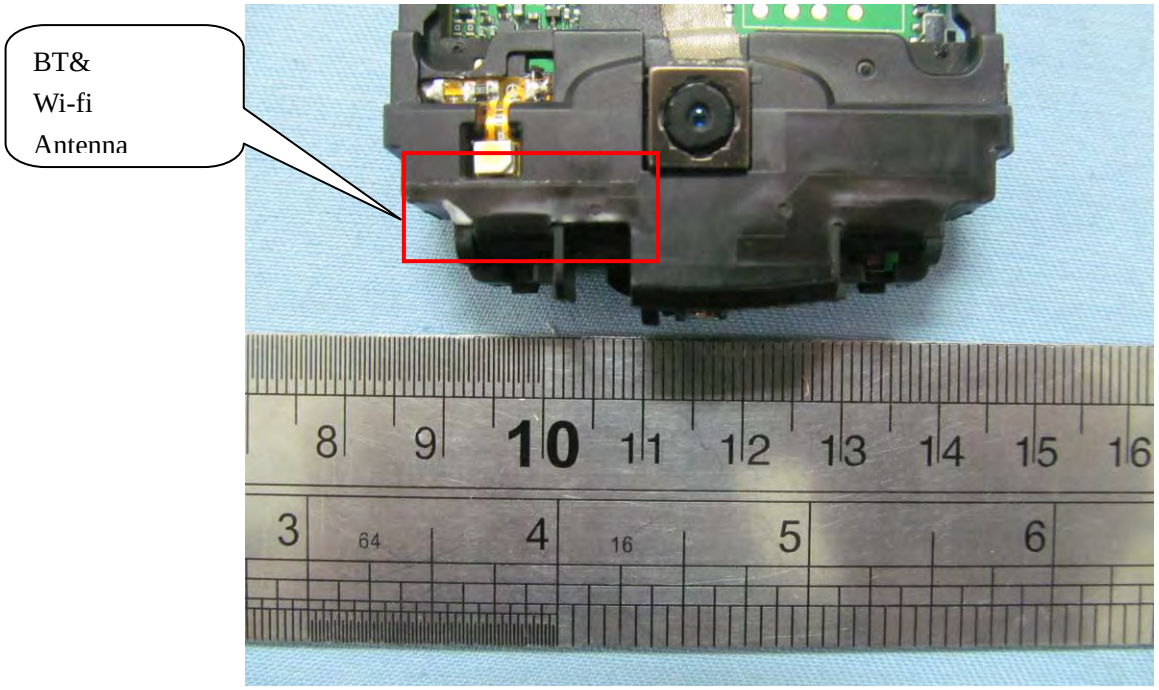
INTERNAL VIEW OF EUT-3



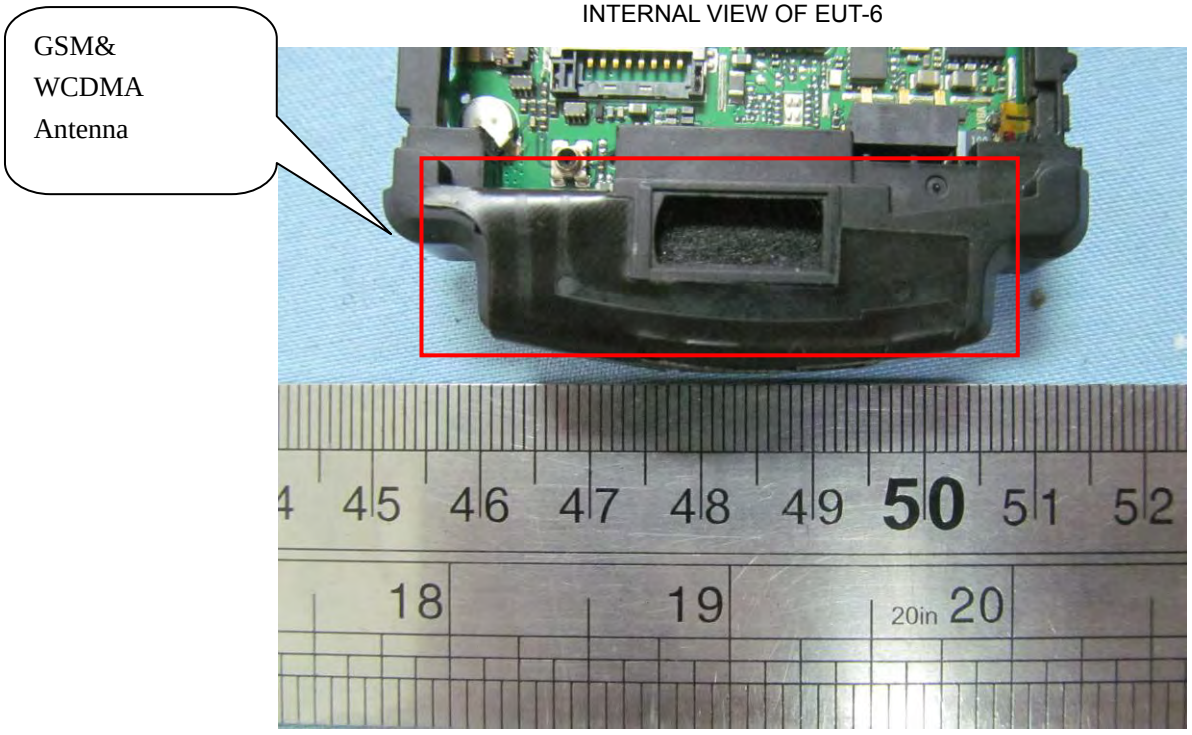
INTERNAL VIEW OF EUT-4



INTERNAL VIEW OF EUT-5



INTERNAL VIEW OF EUT-6



----END OF REPORT----