FCC RADIO TEST REPORT
FCC ID: 2AB3YL800

Product：	smart phone
Trade Name：	N/A
Model Number：	L800
Serial Model：	L800S

Prepared for

JIN HUITENG COMMUNICATION EQUIPMENT CO.,LTD.

3rd Floor, block A, Xufa science and technology park, Second Industrial park, Fenghuang, Fuyong, Shenzhen

Prepared by

Shenzhen STONE Testing Technology Co.,Ltd.

F/6, Bldg.12, Zhongxing Industrial City, Chuangye Rd., Nanshan District Shenzhen P.R. China

TEST RESULT CERTIFICATION

Applicant's name	JIN HUITENG COMMUNICATION EQUIPMENT CO.,LTD.
Address	3rd Floor, block A, Xufa science and technology park, Second Industrial park, Fenghuang, Fuyong, Shenzhen
Manufacture's Name	JIN HUITENG COMMUNICATION EQUIPMENT CO.,LTD.
Address	3rd Floor, block A, Xufa science and technology park, Second Industrial park, Fenghuang, Fuyong, Shenzhen
Product name	smart phone
Model and/or type reference	L800
Serial Model:	L800S
Standards	FCC Part 22H and 24E
Test procedure	ANSI C63.4-2003, TIA/EIA 603

This device described above has been tested by STT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test	
Date (s) of performance of tests	10 Mar. 2014 ~19 Mar. 2014
Date of Issue	19 Mar. 2014
Test Result	**Pass**

Testing Engineer	:	Eric Wang (Eric Wang)
Technical Manager	:	Jerry You (Jerry You)
Authorized Signatory	:	Jack yu (Jack yu)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	smart phone
Hardware version:	--
Software version:	--
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:	FPCB Antenna
Antenna gain:	0dBi
Power Supply:	DC 3.7V by battery or DC 5.0V supplied by adapter
Battery parameter:	DC 3.7V, 2000mAh
Adapter Input:	AC 100-240V, 50/60Hz,150mA
Adapter Output:	DC 5.0V, 0.5A
GPRS Class	Multi-Class12 Only 4 timeslots are used for GPRS
Extreme Vol. Limits:	DC3.5 V to 4.2 V (Nominal DC3.7 V)
Extreme Temp. Tolerance	-10℃ to +50℃
SIM CARD	The Phone has dual SIM Card sockets but only one of the dual SIM Card can be transmitting when the two SIM Cards are inserting the phone together. Anyone of the SIM Card socket was tested
** Note: The High Voltage 4.2V and Low Voltage 3.5V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

MODE	Max. Conducted Average Power (dBm)
GSM850	32.65
GPRS 850	32.61
GSM1900	30.42
GPRS 1900	30.40
UMTS BAND II	22.52

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID:2AB3YL800** filing to comply with the FCC Part 22H&24E .

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:
STT Testing Technology Co., Ltd.
F/6, Bldg.12, Zhongxing Industrial City, Chuangye Rd., Nanshan District Shenzhen P.R. China.
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC Registration No.: 323508
IC Registration No.: 11043A

1.5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	E4440A	US44300399	2014.7.04
TEST RECEIVER	R&S	ESCI	A0304218	2014.7.04
COMMUNICATION TESTER	AGILENT	8960	3104A03367	2014.7.04
COMMUNICATION TESTER	R&S	CMU200	A0304247	2014.6.26
TEST RECEIVER	R&S	FCKL1528	A0304230	2014.6.26
LISN	SCHWARZBECK	NSLK8127	A0304233	2014.6.26
CLIMATE CHAMBER	ALBATROSS	--	--	2014.6.26
Loop Antenna	Daze	ZN30900N	SEL0097	2014.8.13
Loop Antenna	Daze	ZN30900N	SEL0124	2014.8.13
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	N/A	2014.8.13
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	N/A	2014.8.13
Horn Antenna	EM	EM-AH-10180	N/A	2014.8.13
Horn Antenna	EM	EM-AH-10180	N/A	2014.8.13
Power Meter	Anristu	ML2495A	1145054	2014.08.16
Power Sensor	Anristu	MA2411B	1126096	2014.08.16

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	Frequency Stability		2.1055 /24.235
4	Occupied Bandwidth		2.1049 (h)(i)
5	Emission Bandwidth		22.917(b) / 24.238 (b)
6	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	smart phone	L800	FCC ID:**2AB3YL800**	EUT

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	Frequency Stability		2.1055 /24.235	Pass
4	Occupied Bandwidth		2.1049 (h)(i)	Pass
5	Emission Bandwidth		22.917(b) / 24.238 (b)	Pass
6	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 GPRS850 and GPRS1900 frequency band.

Note: GSM/GPRS850, GSM/GPRS1900, HSDPA band II, HSUPA band II modes have been tested during the test. the worst condition (GSM850，GSM1900 RMC 12.2k) 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(GPRS/EDGE850, GPRS/EDGE1900, HSDPA band II) 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 GSM 850 MHZ		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM850	32 dBm	+/- 1
GPRS 850-1TS:	32 dBm	+/- 1
GPRS 850-2TS:	30 dBm	+/- 1
GPRS 850-3TS:	27.5 dBm	+/- 1
GPRS 850-4TS:	27 dBm	+/- 1

Conducted Output Power Limits for PCS 1900 MHZ		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM1900	30dBm	+/- 1
GPRS 1900-1TS:	30dBm	+/- 1
GPRS 1900-2TS:	28.5dBm	+/- 1
GPRS 1900-3TS:	27dBm	+/- 1
GPRS 1900-4TS:	25dBm	+/- 1

Conducted Output Power Limits for WCDMA band II		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
RCM	22 dBm	+/- 1
AMR	22 dBm	+/- 1
HSDPA Subtest 1	22 dBm	+/- 1
HSDPA Subtest 2	22 dBm	+/- 1
HSDPA Subtest 3	22 dBm	+/- 1
HSDPA Subtest 4	22 dBm	+/- 1
HSUPA Subtest 1	22 dBm	+/- 1
HSUPA Subtest 2	22 dBm	+/- 1
HSUPA Subtest 3	22 dBm	+/- 1
HSUPA Subtest 4	22 dBm	+/- 1
HSUPA Subtest 5	22 dBm	+/- 1

GSM 850:

Mode	**Frequency (MHz)**	Maximum Burst-Average Output Power
GSM850	824.2	32.54
	836.6	32.36
	848.8	32.65
GPRS850 (1 Slot)	824.2	32.42
	836.6	32.46
	848.8	32.61
GPRS850 (2 Slot)	824.2	31.88
	836.6	31.97
	848.8	32.28
GPRS850 (3 Slot)	824.2	29.67
	836.6	30.19
	848.8	30.42
GPRS850 (4 Slot)	824.2	29.98
	836.6	29.39
	848.8	29.64

PCS 1900:

Mode	**Frequency (MHz)**	Maximum Burst-Average Output Power
GSM1900	1850.2	30.12
	1880	30.42
	1909.8	30.41
GPRS1900 (1 Slot)	1850.2	30.19
	1880	30.09
	1909.8	29.98
GPRS1900 (2 Slot)	1850.2	29.64
	1880	29.48
	1909.8	29.18
GPRS1900 (3 Slot)	1850.2	27.65
	1880	27.18
	1909.8	26.98
GPRS1900 (4 Slot)	1850.2	25.67
	1880	25.12
	1909.8	25.33

UMTS BAND II

Mode	Frequency (MHz)	Maximum Burst-Average Output Power
WCDMA 1900 RCM	1852.4	22.52
	1880	22.33
	1907.6	22.17
WCDMA 1900 AMR	1852.4	22.16
	1880	21.95
	1907.6	21.88
HSDPA Subtest 1	1852.4	21. 32
	1880	21.41
	1907.6	21.38
HSDPA Subtest 2	1852.4	21.55
	1880	21.33
	1907.6	21.74
HSDPA Subtest 3	1852.4	21.32
	1880	21.78
	1907.6	21.02
HSDPA Subtest 4	1852.4	21.33
	1880	21.12
	1907.6	21.35
HSPA Subtest 1	1852.4	21.12
	1880	21.36
	1907.6	21.28
HSPA Subtest 2	1852.4	21.33
	1880	21.23
	1907.6	21.64
HSPA Subtest 3	1852.4	21.37
	1880	21.29
	1907.6	21.21
HSPA Subtest 4	1852.4	21.22
	1880	21.54
	1907.6	21.21
HSPA Subtest 5	1852.4	21.32
	1880	21.04
	1907.6	21.11

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.

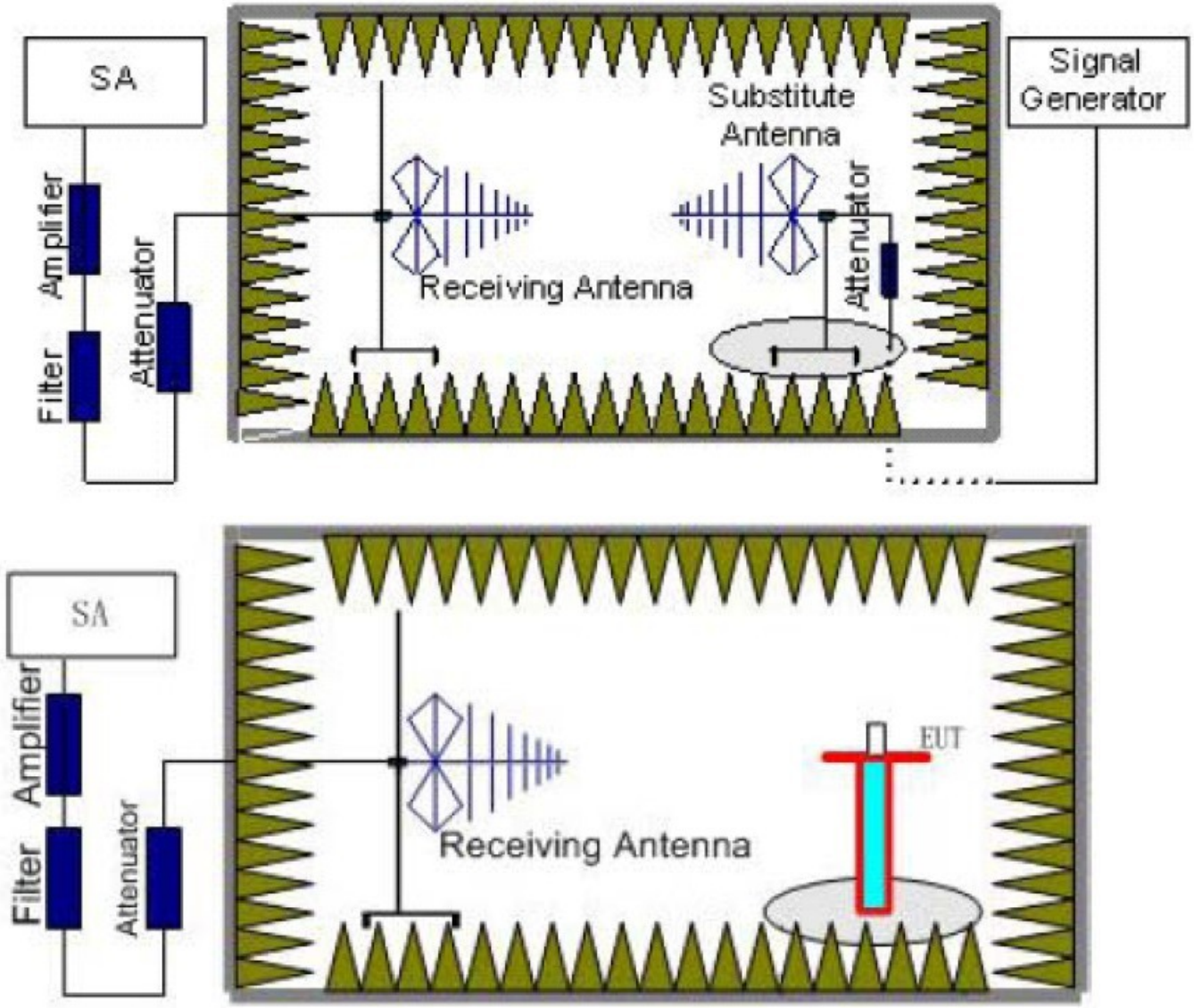
The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

5.2 Radiated Output Power

5.2.1 TEST DESCRIPTION

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.”

5.2.2 TEST CONFIGURATION



5.2.3 TEST PROCEDURE

1. EUT was placed on a 0.80 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 EUT for emission measurements. The height of receiving antenna is 0.80m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}- P_{Ag} - P_{cl} + G_a
   We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:
   Power(EIRP)=P_{Mea}- P_{cl} + G_a
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

5.2.4 TEST LIMIT

According to 22.913(a) and 24.232(c), the ERP should be not exceed following table limits

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

5.2.5 MEASUREMENT RESULT

GSM850						
Frequency (MHz)	**P_{Mea} (dBm)**	**P_{cl} (dB)**	**G_a Antenna Gain (dB)**	**Correction (dB)**	**ERP (dBm)**	**Polarization**
824.20	23.61	1.56	8.45	2.15	28.35	H
836.60	22.46	1.50	8.45	2.15	27.26	H
848.80	24.76	1.67	8.39	2.15	29.33	H
824.20	23.67	1.56	8.45	2.15	28.41	V
836.60	21.77	1.50	8.45	2.15	26.57	V
848.80	25.31	1.67	8.39	2.15	29.88	V

GPRS 850						
Frequency (MHz)	**P_{Mea} (dBm)**	**P_{cl} (dB)**	**G_a Antenna Gain (dB)**	**Correction (dB)**	**ERP (dBm)**	**Polarization**
824.20	22.71	1.56	8.45	2.15	27.45	H
836.60	23.44	1.50	8.45	2.15	28.24	H
848.80	23.66	1.67	8.39	2.15	28.23	H
824.20	24.14	1.56	8.45	2.15	28.88	V
836.60	23.57	1.50	8.45	2.15	28.37	V
848.80	23	1.67	8.39	2.15	**27.57**	V

PCS1900						
Frequency (MHz)	**P_{Mea} (dBm)**	**P_{cl} (dB)**	**G_a Antenna Gain (dB)**	**Correction (dB)**	**EIRP (dBm)**	**Polarization**
1850.20	24.56	3.52	8.35	2.15	27.24	H
1880.00	23.74	3.61	8.29	2.15	26.27	H
1909.80	25.6	3.67	8.37	2.15	28.15	H
1850.20	23.65	3.52	8.35	2.15	26.33	V
1880.00	24.7	3.61	8.29	2.15	27.23	V
1909.80	24.77	3.67	8.37	2.15	27.32	V

GPRS1900						
Frequency (MHz)	**P_{Mea} (dBm)**	**P_{cl} (dB)**	**G_a Antenna Gain (dB)**	**Correction (dB)**	**EIRP (dBm)**	**Polarization**
1850.20	23.73	3.52	8.35	2.15	26.41	H
1880.00	23.79	3.61	8.29	2.15	26.32	H
1909.80	23.82	3.67	8.37	2.15	26.37	H
1850.20	23.54	3.52	8.35	2.15	26.22	V
1880.00	23.12	3.61	8.29	2.15	25.65	V
1909.80	24.56	3.67	8.37	2.15	27.11	V

UMTS band II						
Frequency (MHz)	**P_{Mea} (dBm)**	**P_{cl} (dB)**	**G_a Antenna Gain (dB)**	**Correction (dB)**	**EIRP (dBm)**	**Polarization**
1852.4	18.53	3.52	8.35	2.15	21.21	H
1880.00	19.15	3.61	8.29	2.15	21.68	H
1907.6	19.57	3.67	8.37	2.15	22.12	H
1852.4	19.36	3.52	8.35	2.15	22.04	V
1880.00	19.92	3.61	8.29	2.15	22.45	V
1907.6	18.82	3.67	8.37	2.15	21.37	V

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

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/GPRS	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS/ GPRS	
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

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.

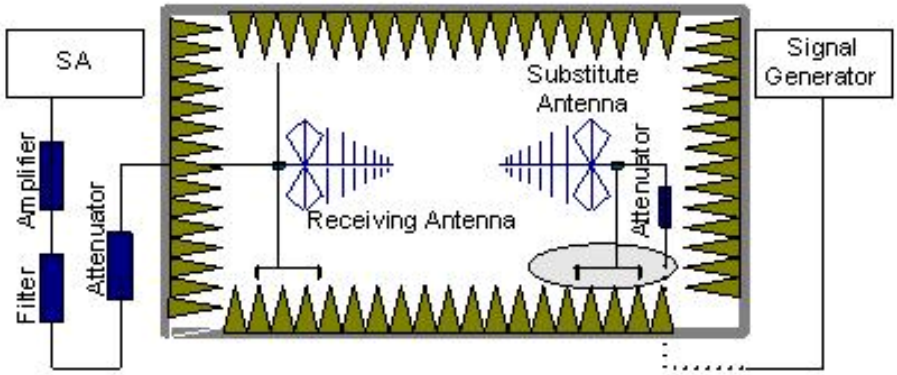
2. As no emission found in standby or receive mode, no recording in this report.

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 V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.Only shown the worst data.

The procedure of radiated spurious emissions is as follows:



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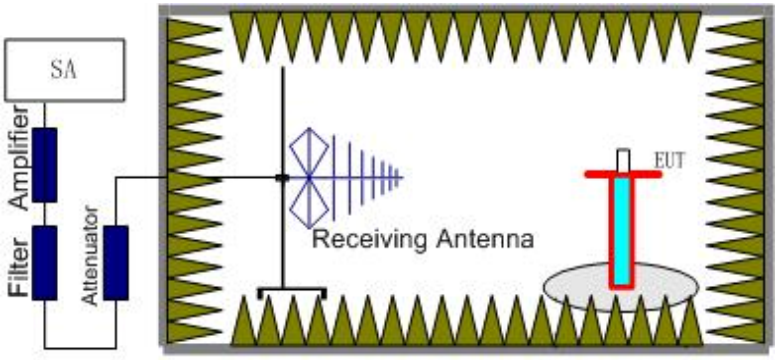


Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band V(826.4MHz, 835.0MHz, 846.6MHz) . It was decided 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.

1. EUT was placed on a 0.80 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 EUT for emission measurements. The height of receiving antenna is 0.80m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}- P_{Ag} - P_{cl} + G_a
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.
8. In order to make sure test results more clearly,we set frequency range and sweep time for difference frequency range as follows table:

Working Frequency	Subrange (GHz)	RBW	VBW	Sweep time (s)
850MHz	0.03~1	100KHz	300KHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
1900MHz	0.03~1	100KHz	300KHz	10

	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2

TEST LIMITS

According to 24.238 and 22.917 specify that 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.

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.

Frequency	Channel	Frequency Range	Verdict
GSM 850MHz	Low	30MHz-10GHz	PASS
	Middle	30MHz-10GHz	PASS
	High	30MHz-10GHz	PASS
GSM 1900MHz	Low	30MHz-20GHz	PASS
	Middle	30MHz-20GHz	PASS
	High	30MHz-20GHz	PASS

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

6.2.3 MEASUREMENT RESULT

GSM850							
Channel Number: 128				Test Frequency: 824.20 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
1648.4	-26.58	4.32	6.77	2.15	-17.64	-13	H
1648.4	-36.52	4.55	12.25	2.15	-21.87	-13	V
2472.6	-32.08	4.7	12.92	2.15	-16.61	-13	H
2472.6	-28.21	4.32	6.77	2.15	-19.27	-13	V
3296.8	-37.72	4.55	12.25	2.15	-23.07	-13	H
3296.8	-38.14	4.59	12.76	2.15	-22.94	-13	V

GSM850							
Channel Number: 190				Test Frequency: 836.60 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
1673.2	-35.93	4.55	12.25	2.15	-21.28	-13	H
1673.2	-37.91	4.59	12.76	2.15	-22.71	-13	V
2509.8	-34.99	4.78	12.88	2.15	-19.48	-13	H
2509.8	-35.67	4.55	12.25	2.15	-21.02	-13	V
3346.4	-39.87	4.59	12.76	2.15	-24.67	-13	H
3346.4	-38.03	4.78	12.88	2.15	-22.52	-13	V

GSM850							
Channel Number: 251				Test Frequency: 848.80 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
1697.6	-24.99	4.32	6.77	2.15	-16.05	-13	H
1697.6	-34.22	4.55	12.25	2.15	-19.57	-13	V
2546.4	-29.52	4.7	12.92	2.15	-14.05	-13	H
2546.4	-24.12	4.32	6.77	2.15	-15.18	-13	V
3395.2	-32.47	4.55	12.25	2.15	-17.82	-13	H
3395.2	-35.53	4.59	12.76	2.15	-20.33	-13	V

PCS1900							
Channel Number: 512				Test Frequency: 1850.20 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3700.4	-33.57	4.55	12.34	2.15	-18.83	-13	H
3700.4	-41.68	5.05	13.53	2.15	-25.25	-13	V
5550.6	-37.35	4.64	11.6	2.15	-23.26	-13	H
5550.6	-39.3	4.55	12.34	2.15	-24.56	-13	V
7400.8	-37.5	5.05	13.53	2.15	-21.07	-13	H
7400.8	-37.18	4.64	11.6	2.15	-23.09	-13	V

PCS1900							
Channel Number: 661				Test Frequency: 1880.00 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3760	-37.28	4.55	12.4	2.15	-22.48	-13	H
3760	-42.19	4.96	13.6	2.15	-25.78	-13	V
5640	-35.53	4.71	11.89	2.15	-21.08	-13	H
5640	-37.48	4.55	12.4	2.15	-22.68	-13	V
7520	-40.32	4.96	13.6	2.15	-23.91	-13	H
7520	-39.1	4.71	11.89	2.15	-24.65	-13	V

PCS1900							
Channel Number: 810				Test Frequency: 1909.80 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3819.6	-36.66	4.51	12.43	2.15	-21.87	-13	H
3819.6	-40.76	4.9	13.61	2.15	-24.4	-13	V
5729.4	-31.23	4.78	12	2.15	-16.6	-13	H
5729.4	-35.46	4.51	12.43	2.15	-20.67	-13	V
7639.2	-36.86	4.9	13.61	2.15	-20.5	-13	H
7639.2	-38.13	4.78	12	2.15	-23.5	-13	V

UMTS band II							
Channel Number: 9538				Test Frequency: 1909.6 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3819.2	-36.66	4.51	12.43	2.15	-21.87	-13	H
3819.2	-39.75	4.9	13.61	2.15	-23.39	-13	V
5728.8	-33.19	4.78	12	2.15	-18.56	-13	H
5728.8	-35.5	4.51	12.43	2.15	-20.71	-13	V

UMTS band II							
Channel Number: 9400				Test Frequency: 1880.00 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3760	-33.26	4.55	12.4	2.15	-18.46	-13	H
3760	-36.39	4.96	13.6	2.15	-19.98	-13	V
5640	-32.16	4.71	11.89	2.15	-17.71	-13	H
5640	-30.49	4.55	12.4	2.15	-15.69	-13	V

UMTS band II							
Channel Number: 9262				Test Frequency: 1850.4 MHz			
Frequency (MHz)	P_{Mea} (dBm)	Path Loss	Antenna Gain	Correction (dB)	Peak ERP(dBm)	Limit (dBm)	Polarization
3700.8	-31.68	4.46	12.41	2.15	-16.96	-13	H
3700.8	-34.27	4.65	12.75	2.15	-19.02	-13	V
5551.2	-33.34	4.64	12.23	2.15	-18.62	-13	H
5551.2	-34.42	4.79	12.57	2.15	-19.21	-13	V

Note: 1. In general, the worse case attenuation requirement shown above was applied.

7. FREQUENCY STABILITY

7.1 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.

7.2 PROVISIONS APPLICABLE

7.2.1 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 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. 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.

7.2.2 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.

7.3 MEASUREMENT RESULT

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for GSM 850 MHz		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	17	0.0203
3.7	19	0.0227
4.2	24	0.0287
Frequency Error Against Temperature for GSM 850 MHz		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	29	0.0347
0	23	0.0275
10	20	0.0239
20	19	0.0227
30	20	0.0239
40	24	0.0287
50	27	0.0323

Frequency Error Against Voltage for GPRS 850 MHz		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	16	0.0191
3.7	20	0.0239
4.2	21	0.0251
Frequency Error Against Temperature for GPRS 850 MHz		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	25	0.0299
0	24	0.0287
10	23	0.0275
20	22	0.0263
30	25	0.0299
40	21	0.0251
50	27	0.0323

Frequency Error Against Voltage for GSM 1900 MHz		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	31	0.0165
3.7	35	0.0186
4.2	38	0.0202
Frequency Error Against Temperature for GSM 1900 MHz		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	36	0.0191
0	32	0.0170
10	33	0.0176
20	34	0.0181
30	37	0.0197
40	35	0.0186
50	33	0.0176

Frequency Error Against Voltage for GPRS 1900 MHz		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	32	0.0170
3.7	30	0.0160
4.2	33	0.0176
Frequency Error Against Temperature for GPRS 1900 MHz		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	34	0.0181
0	31	0.0165
10	36	0.0191
20	37	0.0197
30	32	0.0170
40	35	0.0186
50	33	0.0176

Frequency Error Against Voltage for UMTS BAND Ⅱ		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.5	31	0.0165
3.7	35	0.0186
4.2	38	0.0202
Frequency Error Against Temperature for UMTS BAND Ⅱ		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	36	`
0	32	0.0170
10	33	0.0176
20	34	0.0181
30	37	0.0197
40	35	0.0186
50	33	0.0176

8. OCCUPIED BANDWIDTH

8.1 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.

8.2 PROVISIONS APPLICABLE

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

8.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	242.0175
Middle Channel	836.6	248.462
High Channel	848.8	249.387
Occupied Bandwidth (99%) for GPRS 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	244.005
Middle Channel	836.6	246.974
High Channel	848.8	249.386
Occupied Bandwidth (99%) for GSM1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	247.809
Middle Channel	1880.0	248.665
High Channel	1909.8	247.776
Occupied Bandwidth (99%) for GPRS1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	246.237
Middle Channel	1880.0	245.173
High Channel	1909.8	249.226

Occupied Bandwidth (99%) for UMTS band II		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1852.4	4.181
Middle Channel	1880.0	4.188
High Channel	1907.6	4.193

9. EMISSION 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 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

9.3 MEASUREMENT RESULT

Emission Bandwidth (-26dBc) for GSM850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	316.035
Middle Channel	836.6	322.104
High Channel	848.8	320.512
Emission Bandwidth (-26dBc) for GPRS850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	326.756
Middle Channel	836.6	311.002
High Channel	848.8	320.512

Emission Bandwidth (-26dBc) for GSM1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	323.676
Middle Channel	1880.0	315.871
High Channel	1909.8	320.435
Emission Bandwidth (-26dBc) for GPRS1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	320.404
Middle Channel	1880.0	324.252
High Channel	1909.8	314.733

Emission Bandwidth (-26dBc) for UMTS band II		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	1852.4	4.73
Middle Channel	1880.0	4.75
High Channel	1907.6	4.74

10. BAND EDGE

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

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

10.3 MEASUREMENT RESULT

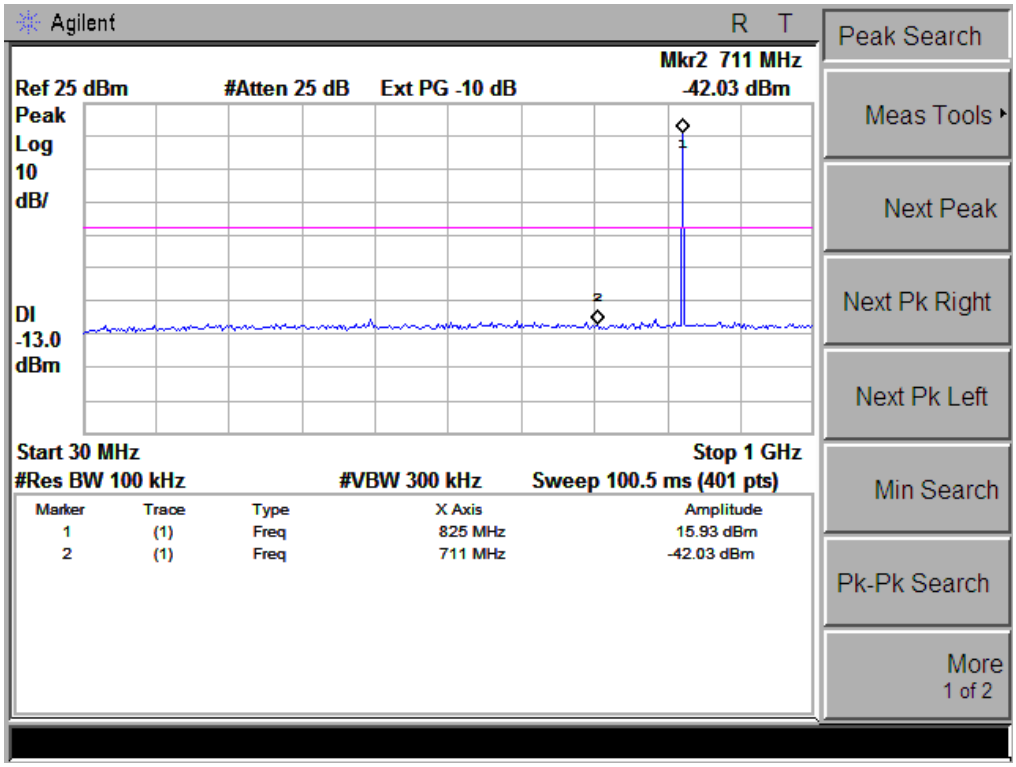
Please refers to Appendix III for compliance test plots for band edges

APPENDIX I

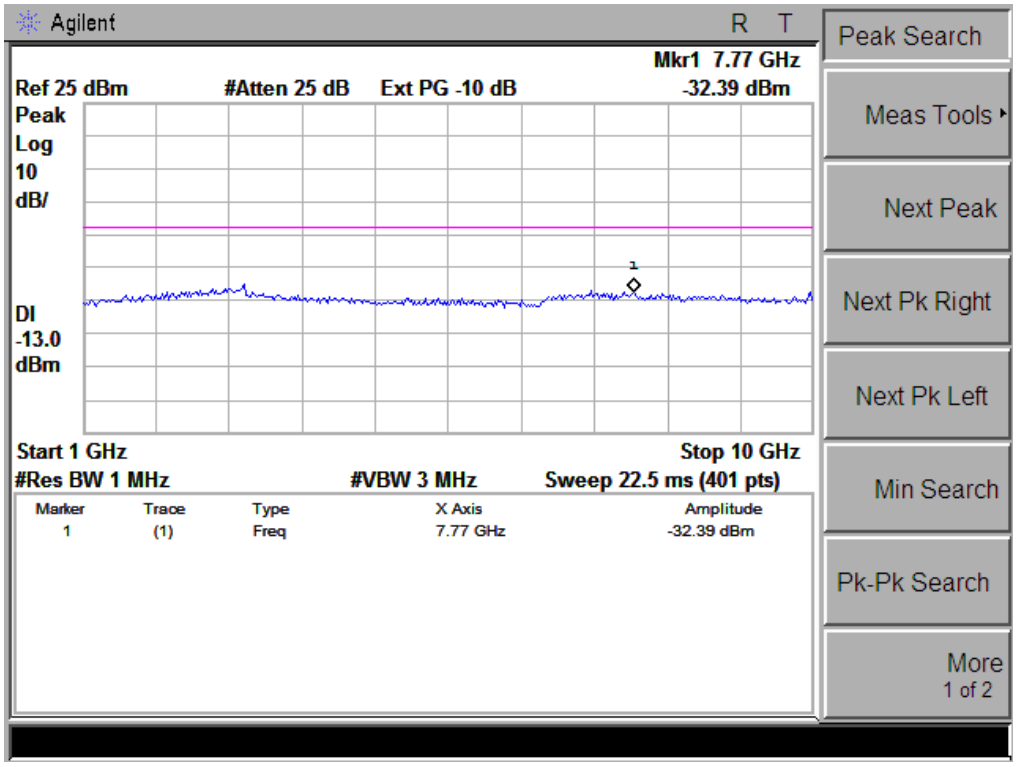
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM 850 BAND

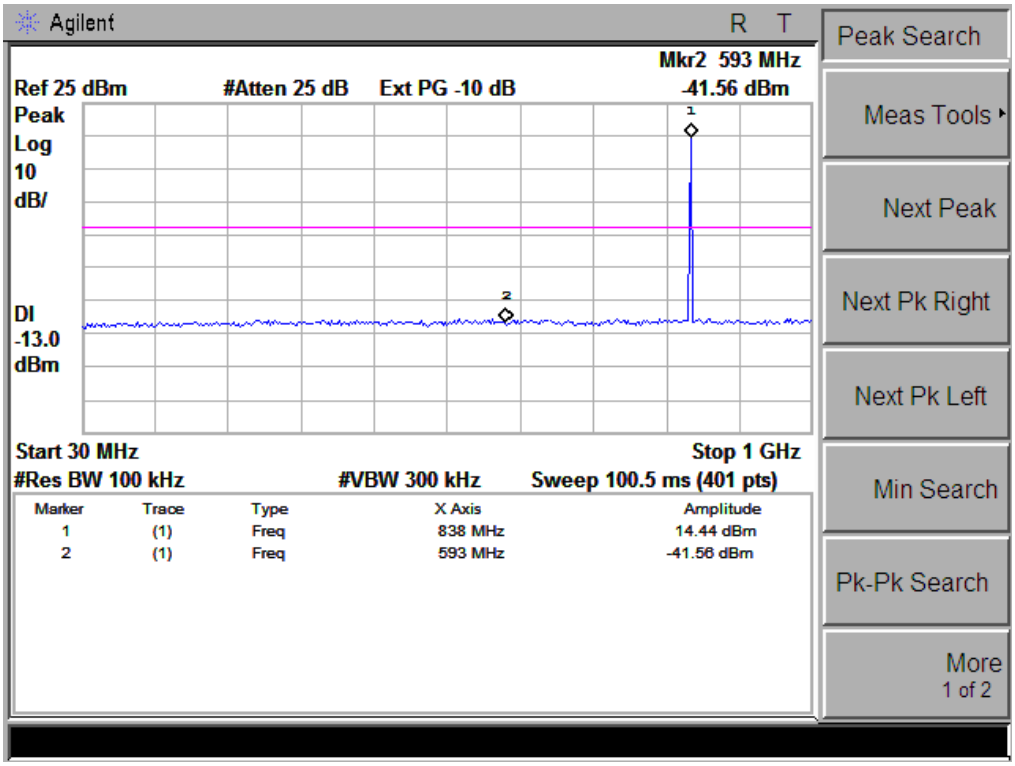
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



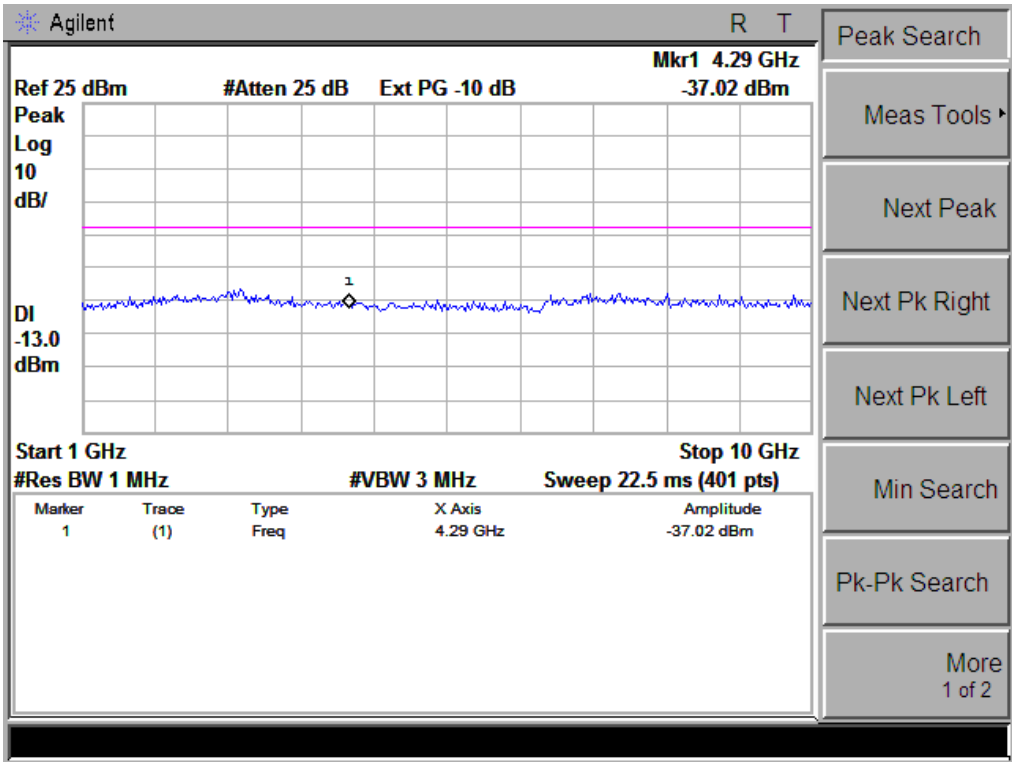
Conducted Emission Transmitting Mode CH 128 1GHz – 10GHz



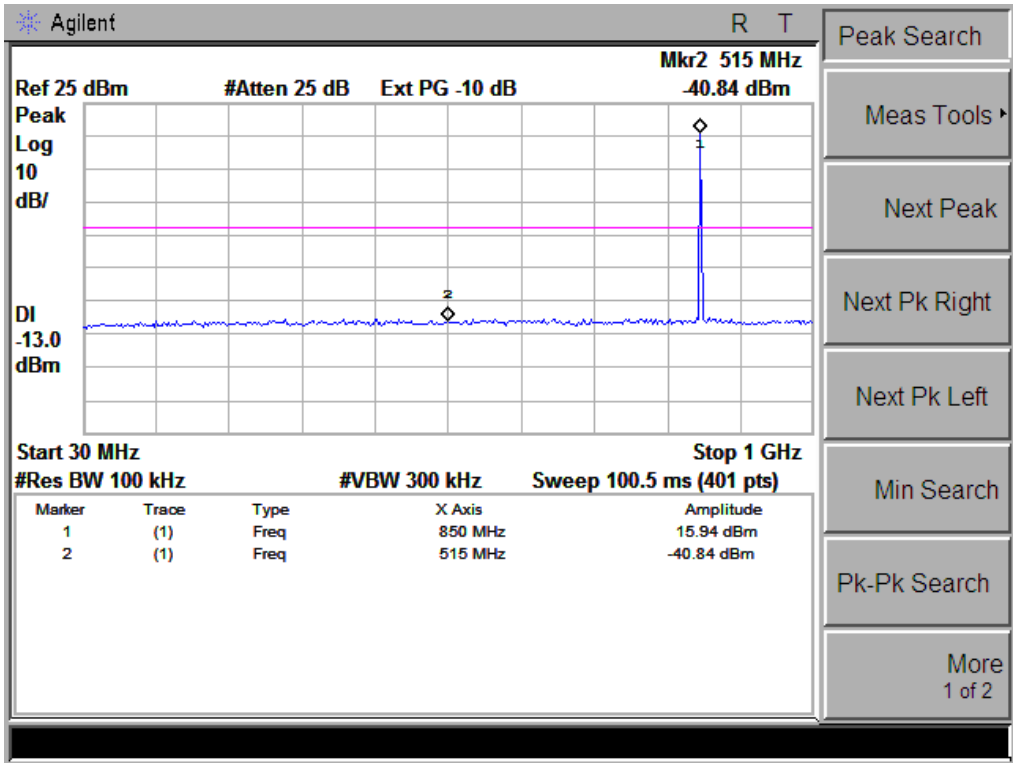
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



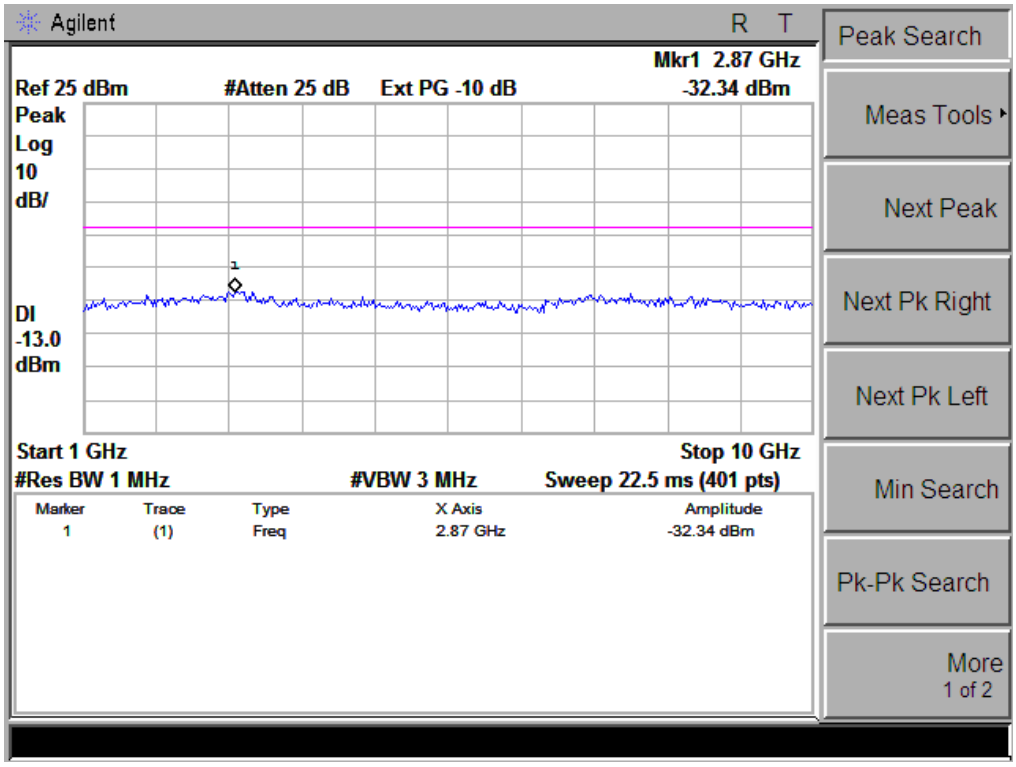
Conducted Emission Transmitting Mode CH 190 1GHz – 10GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

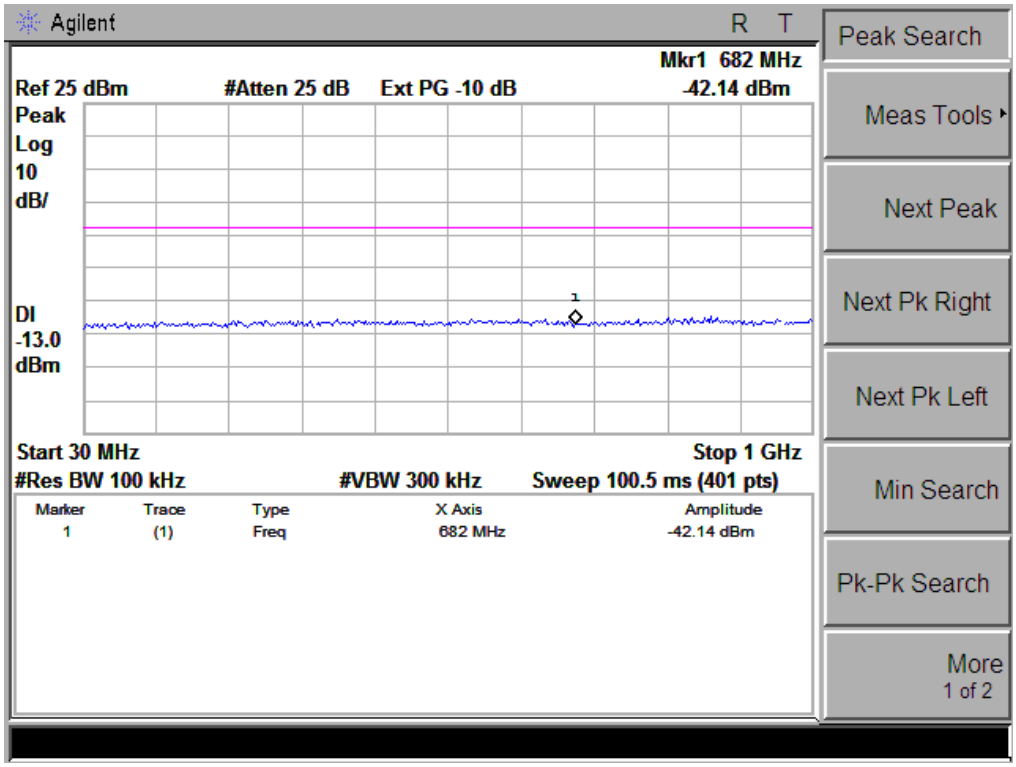


Conducted Emission Transmitting Mode CH 251 1GHz – 10GHz

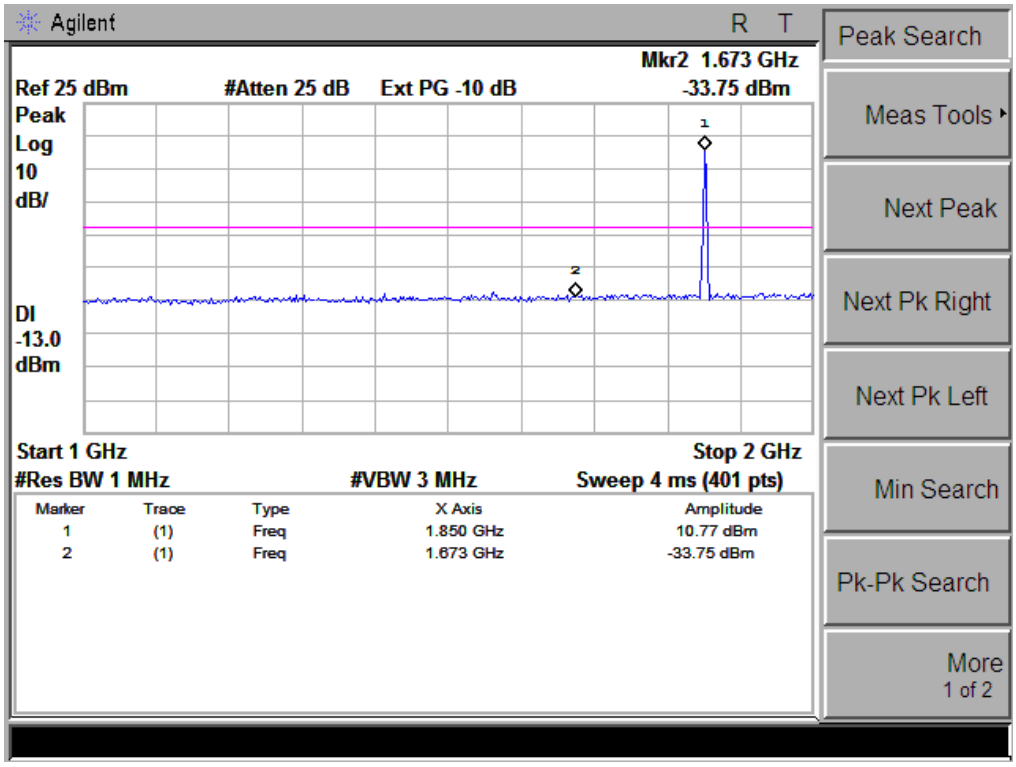


CONDUCTED EMISSION IN GSM1900 BAND

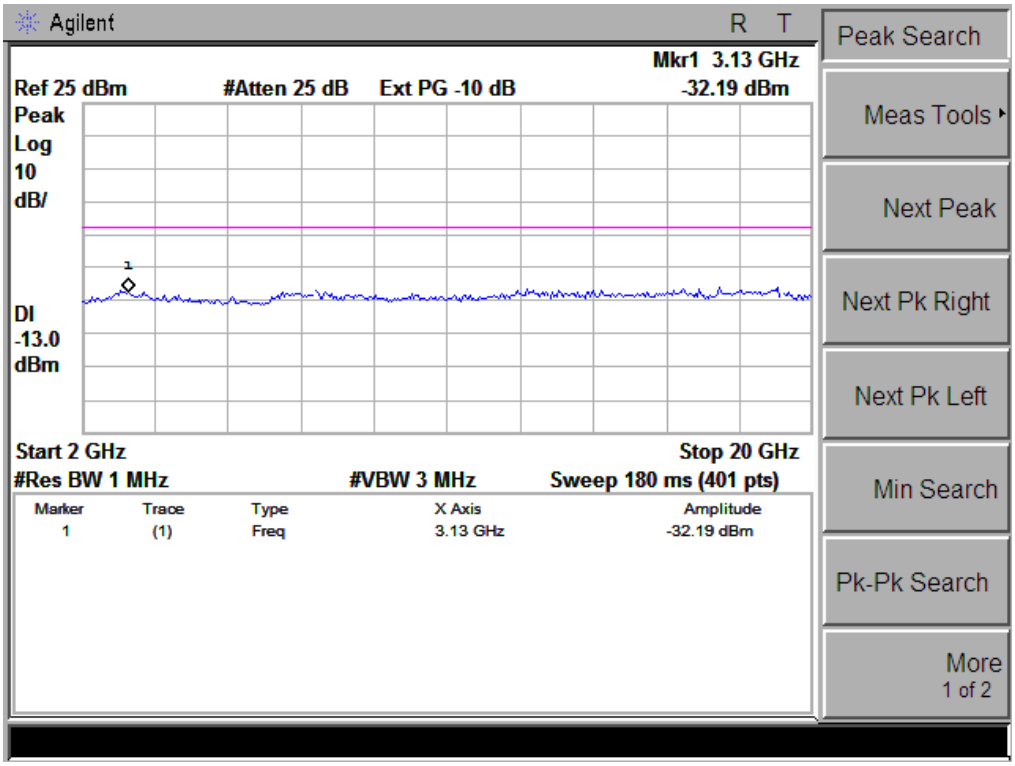
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



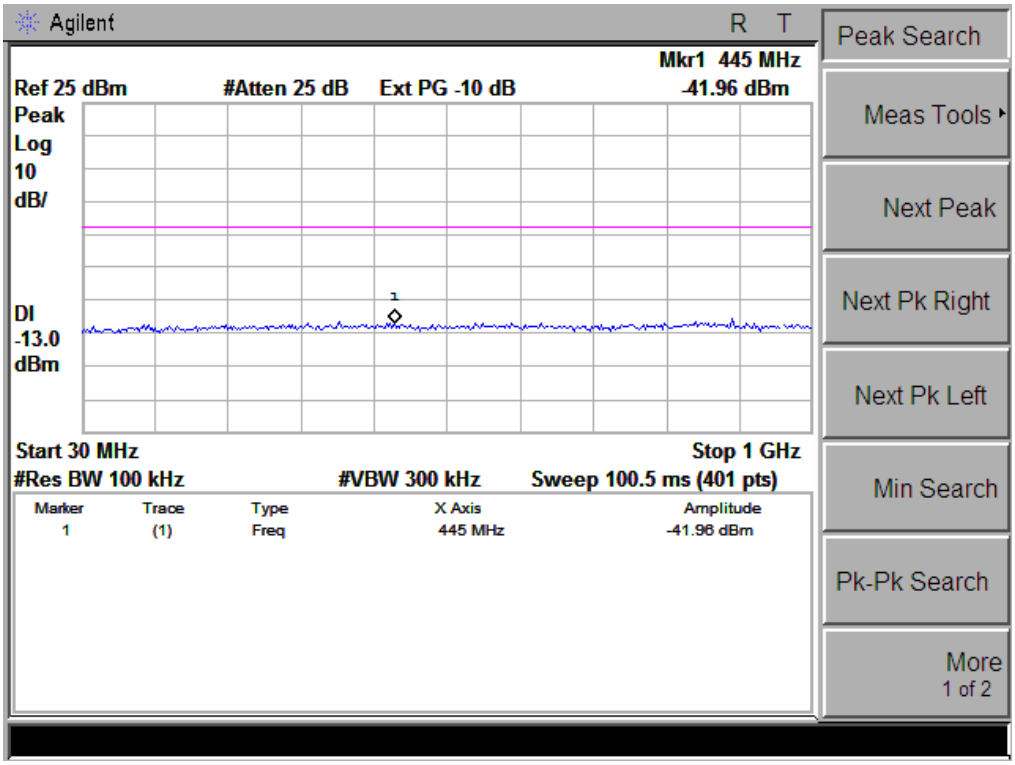
Conducted Emission Transmitting Mode CH 512 1GHz – 2GHz



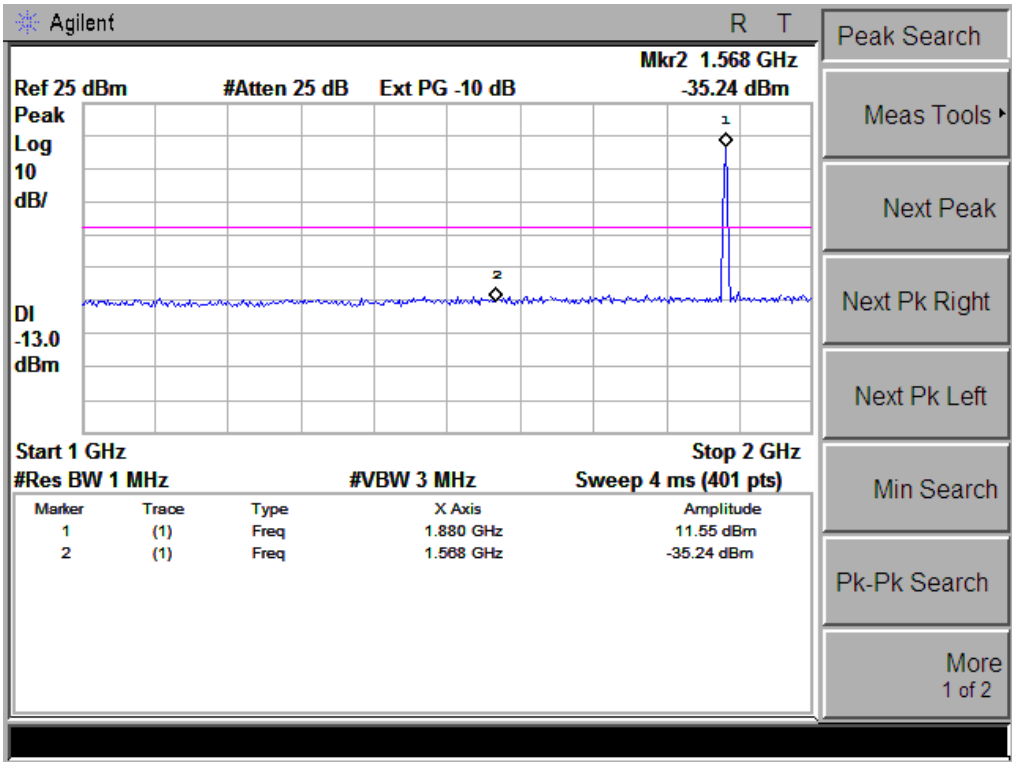
Conducted Emission Transmitting Mode CH 512 2GHz – 20GHz



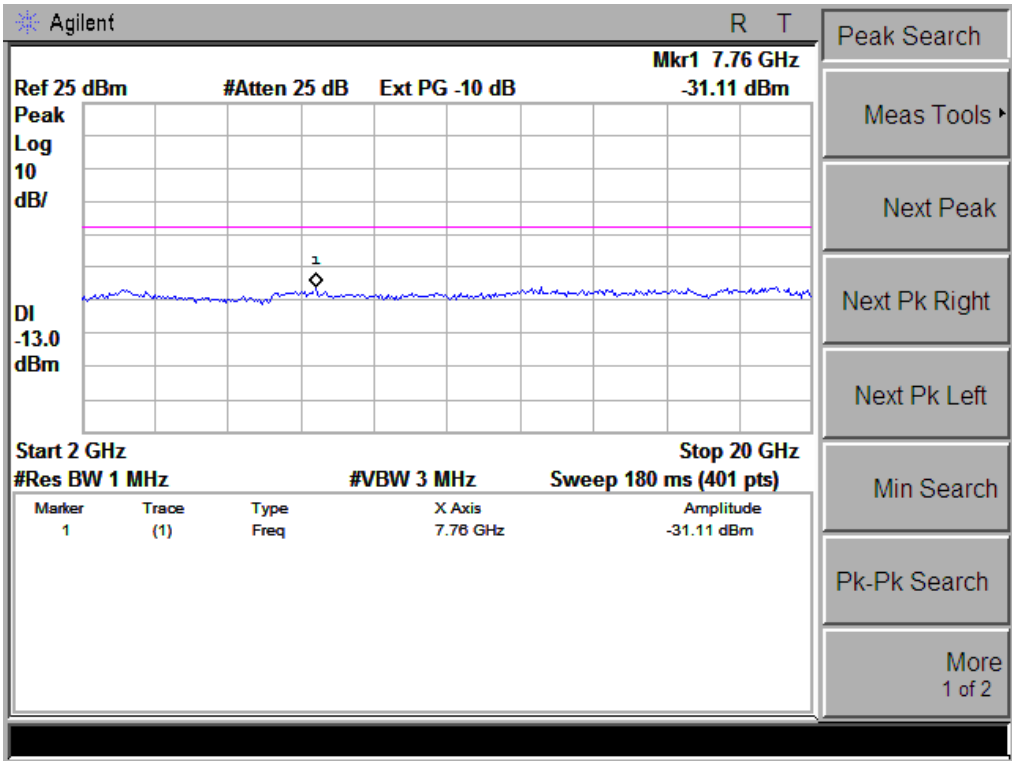
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



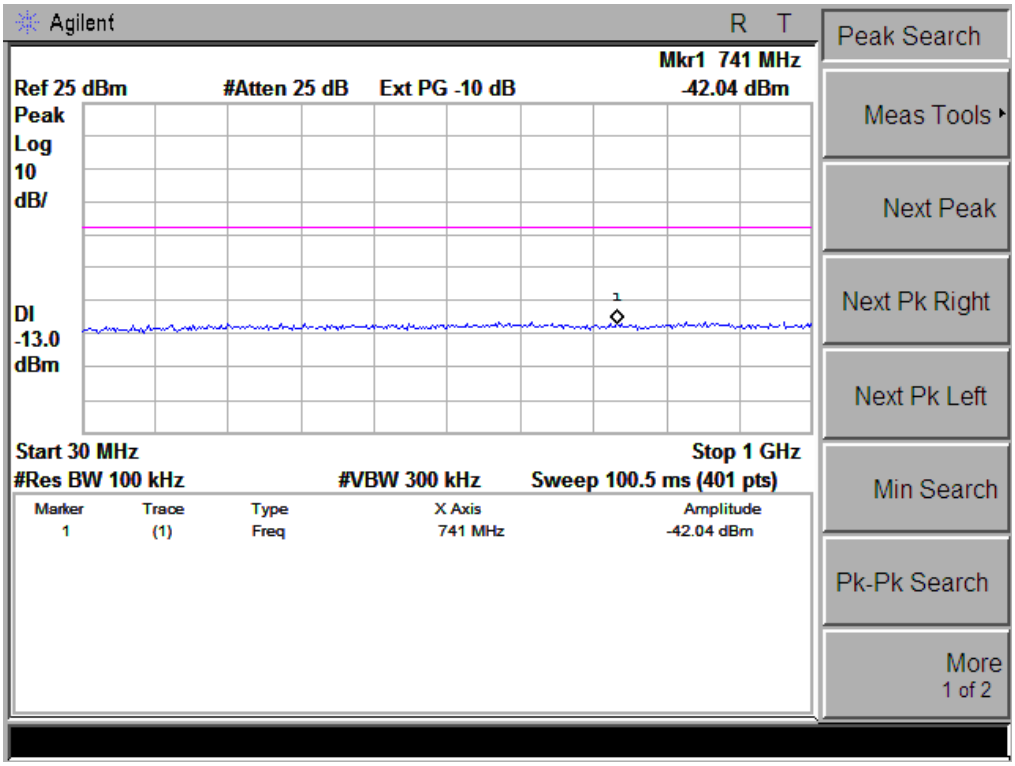
Conducted Emission Transmitting Mode CH 661 1GHz – 2GHz



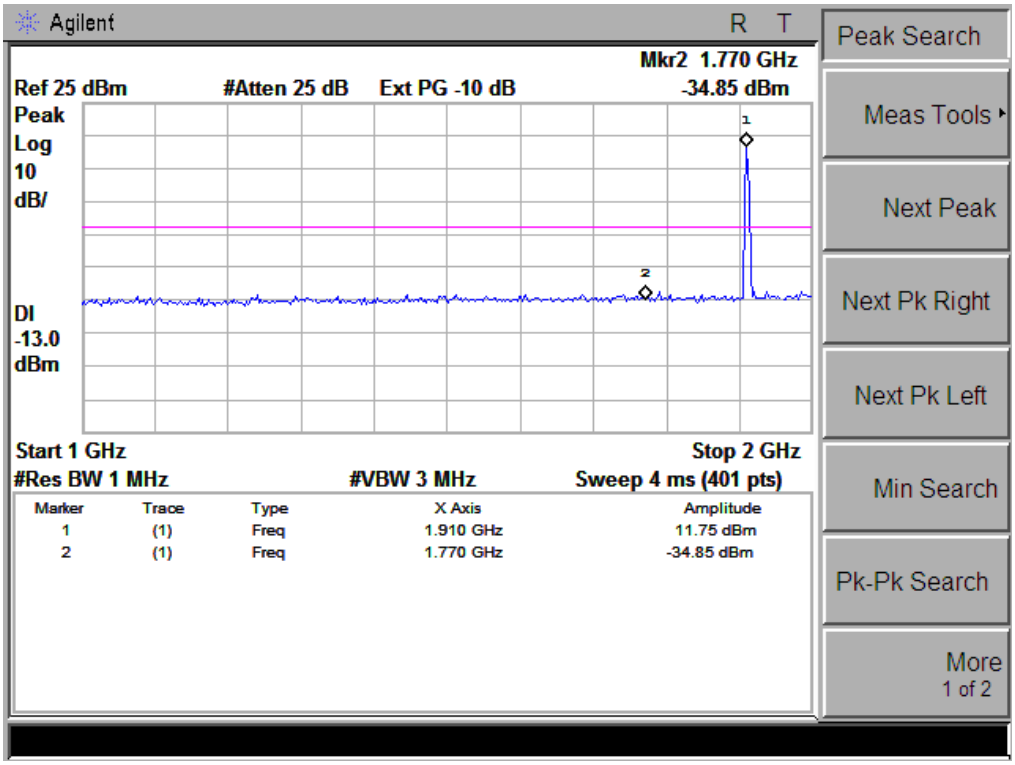
Conducted Emission Transmitting Mode CH 661 2GHz – 20GHz



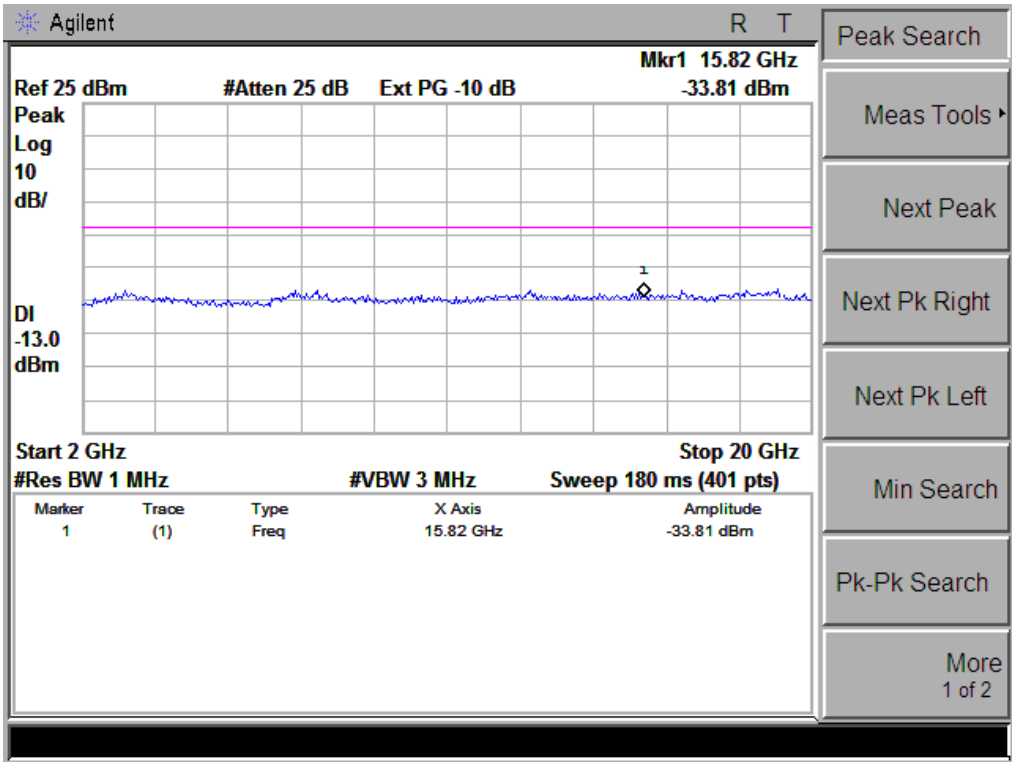
Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 810 1GHz – 2GHz

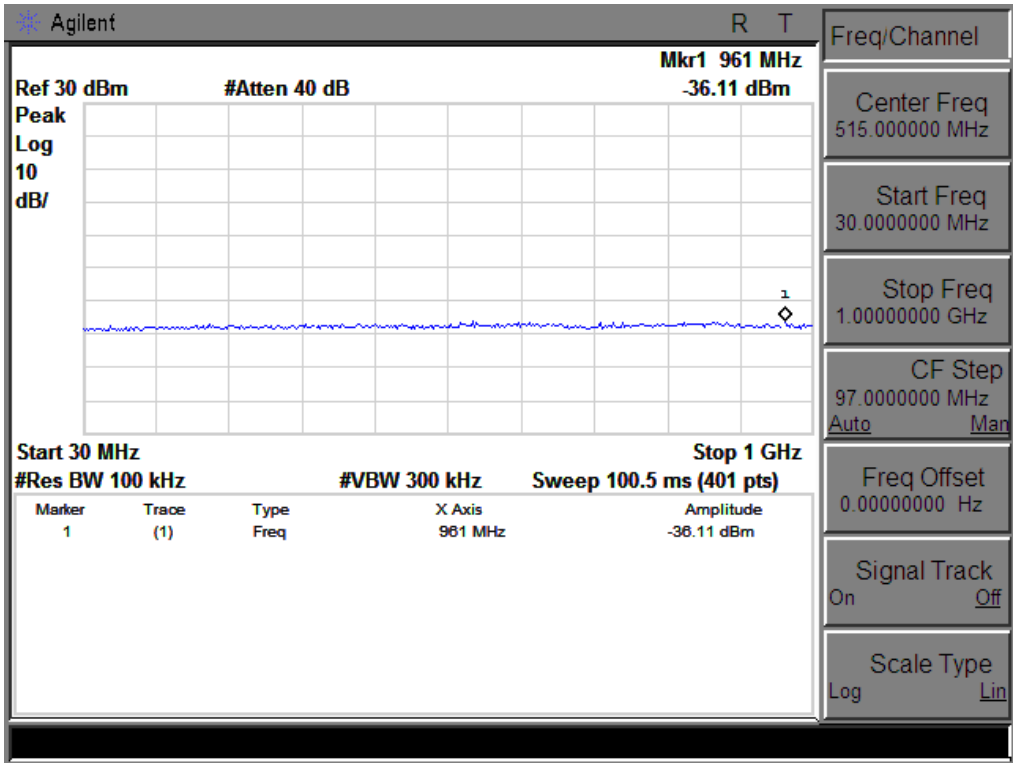


Conducted Emission Transmitting Mode CH 810 2GHz – 20GHz

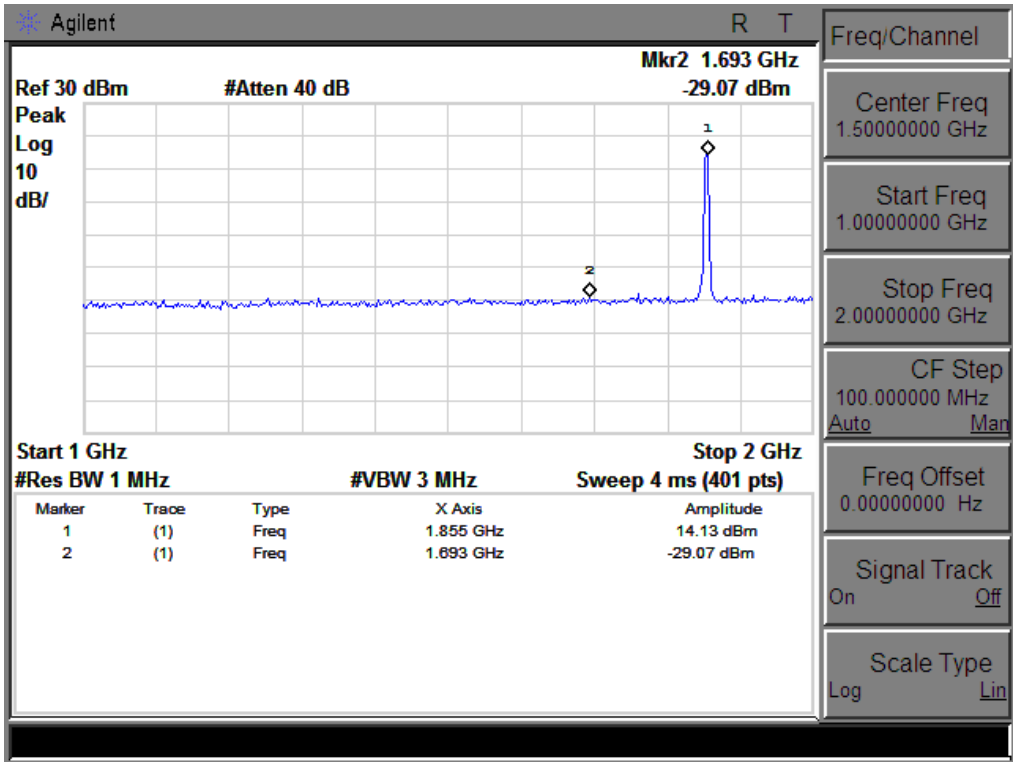


CONDUCTED EMISSION IN UMTS band II

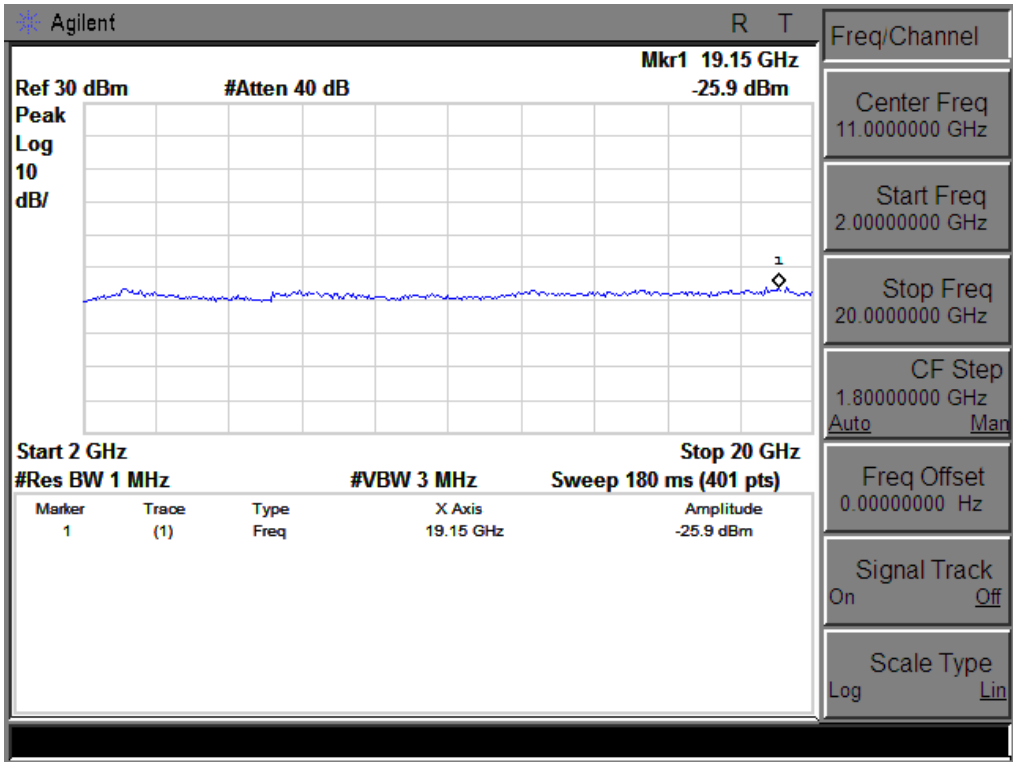
Conducted Emission Transmitting Mode CH 9262 30MHz – 1GHz



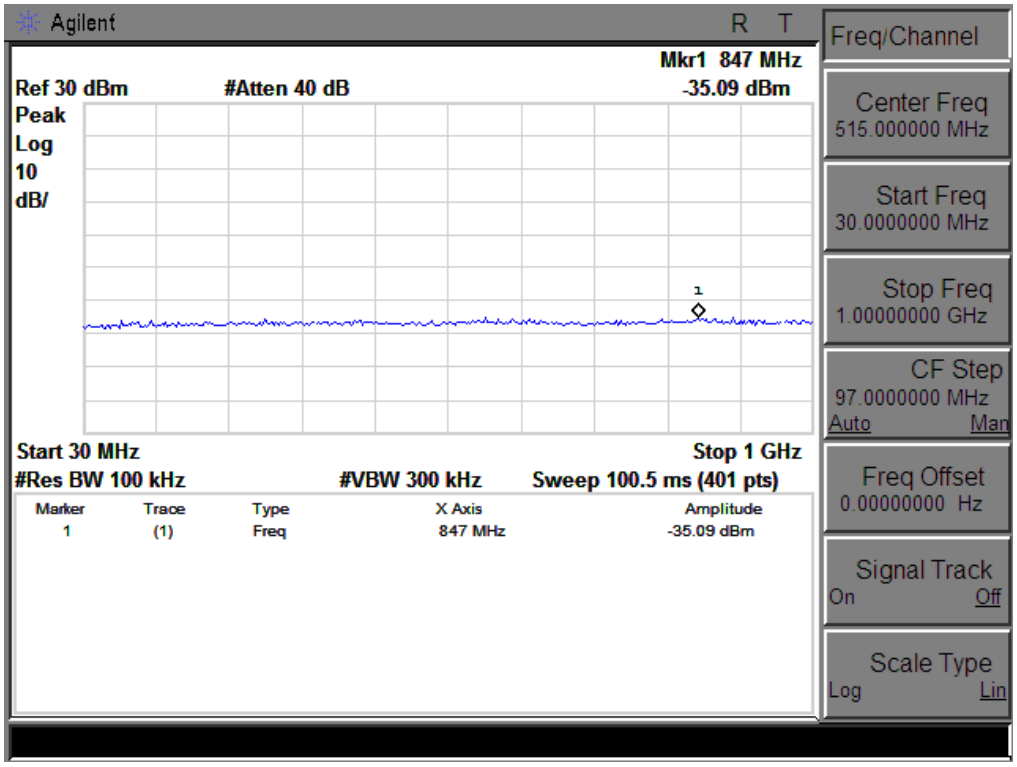
Conducted Emission Transmitting Mode CH 9262 1GHz – 2GHz



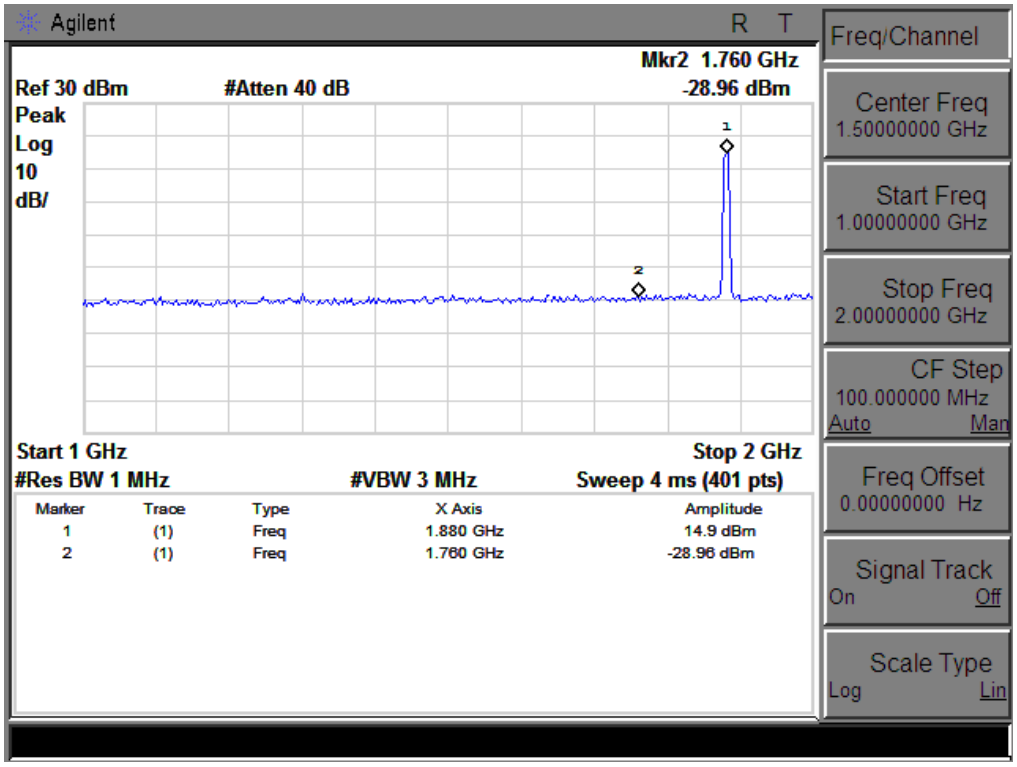
Conducted Emission Transmitting Mode CH 9262 2GHz – 20GHz



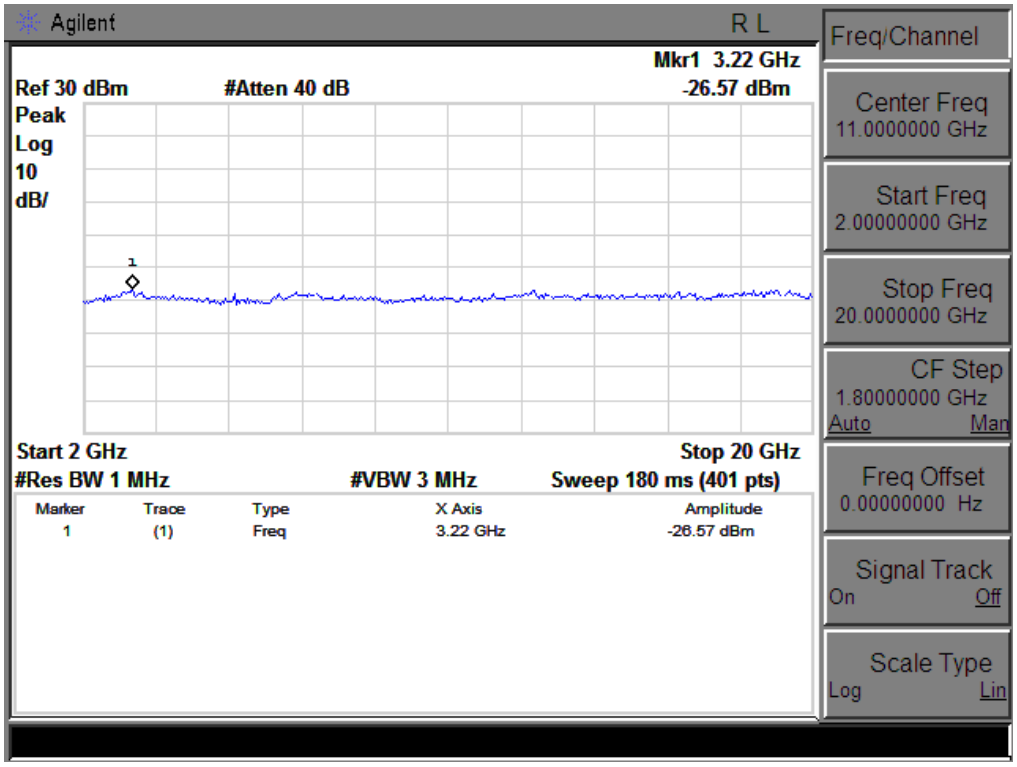
Conducted Emission Transmitting Mode CH 9400 30GHz – 1GHz



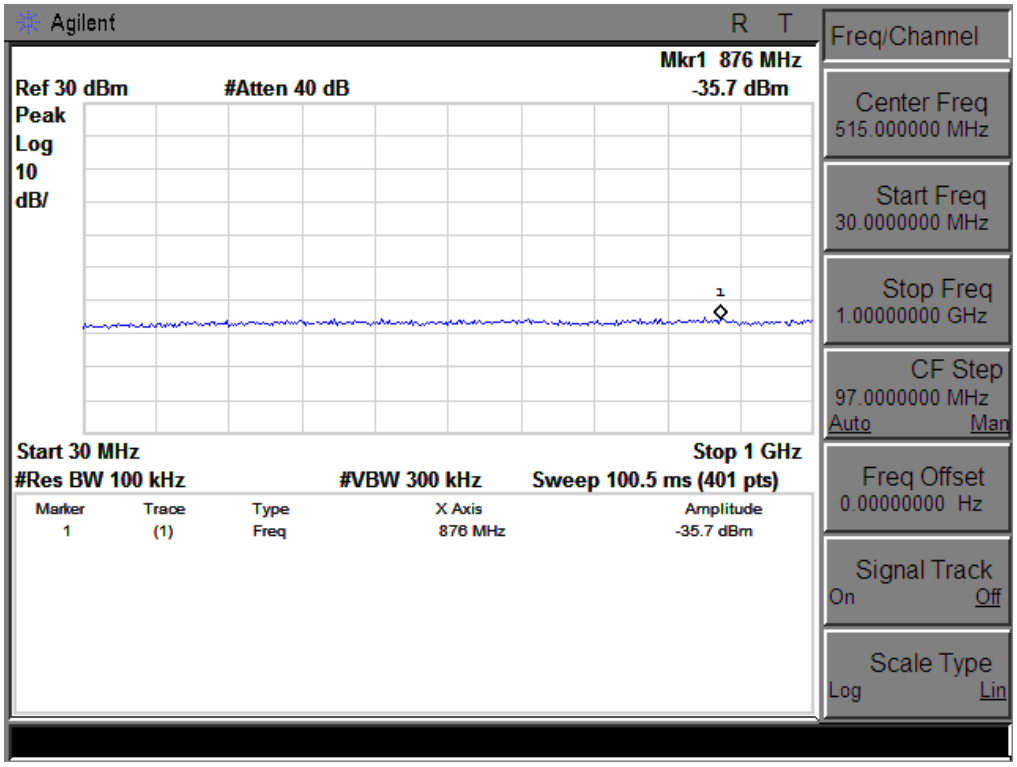
Conducted Emission Transmitting Mode CH 9400 1GHz – 2GHz



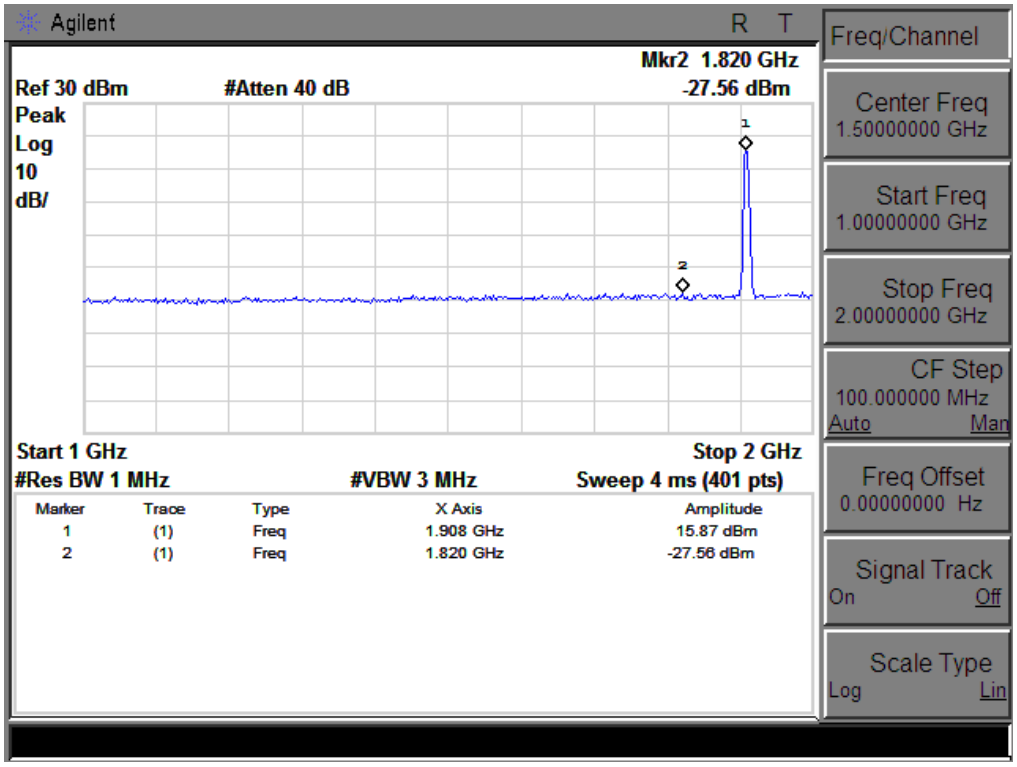
Conducted Emission Transmitting Mode CH 9400 2GHz – 20GHz



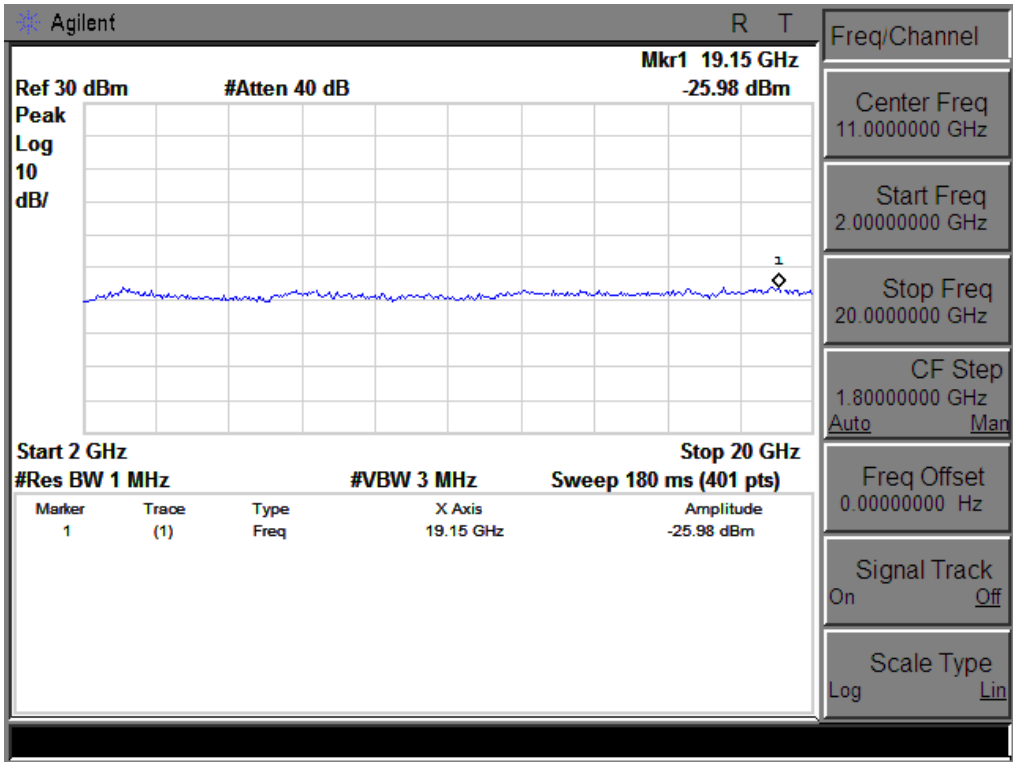
Conducted Emission Transmitting Mode CH 9538 30GHz – 1GHz



Conducted Emission Transmitting Mode CH 9538 1GHz – 2GHz

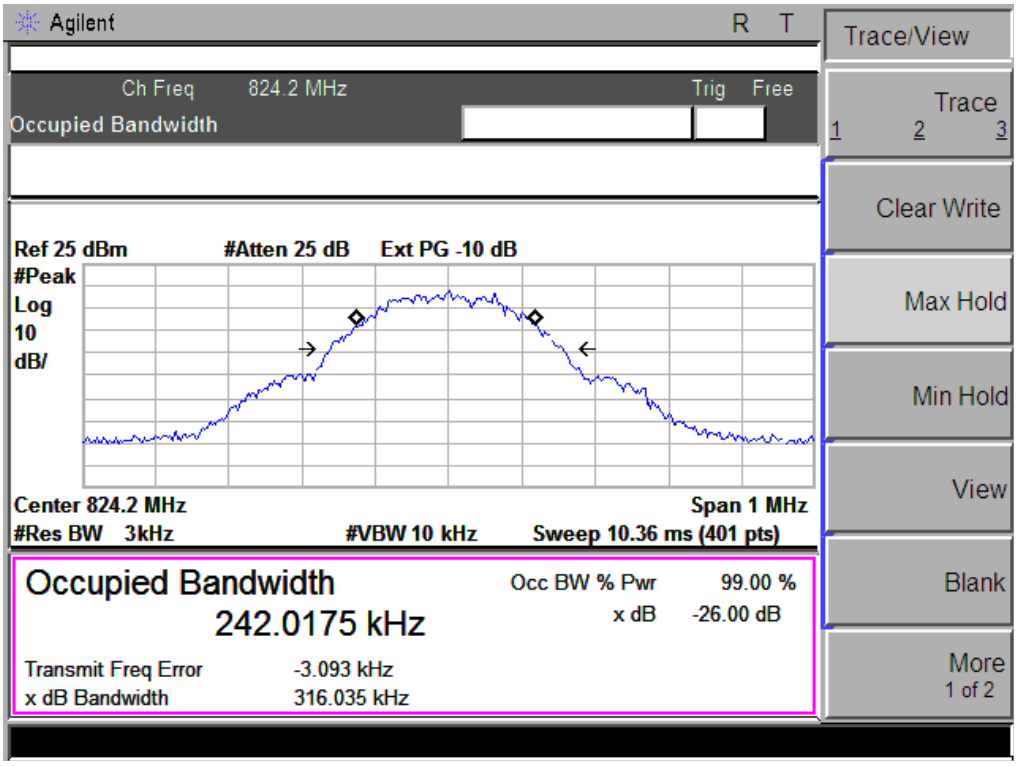


Conducted Emission Transmitting Mode CH 9538 2GHz – 20GHz

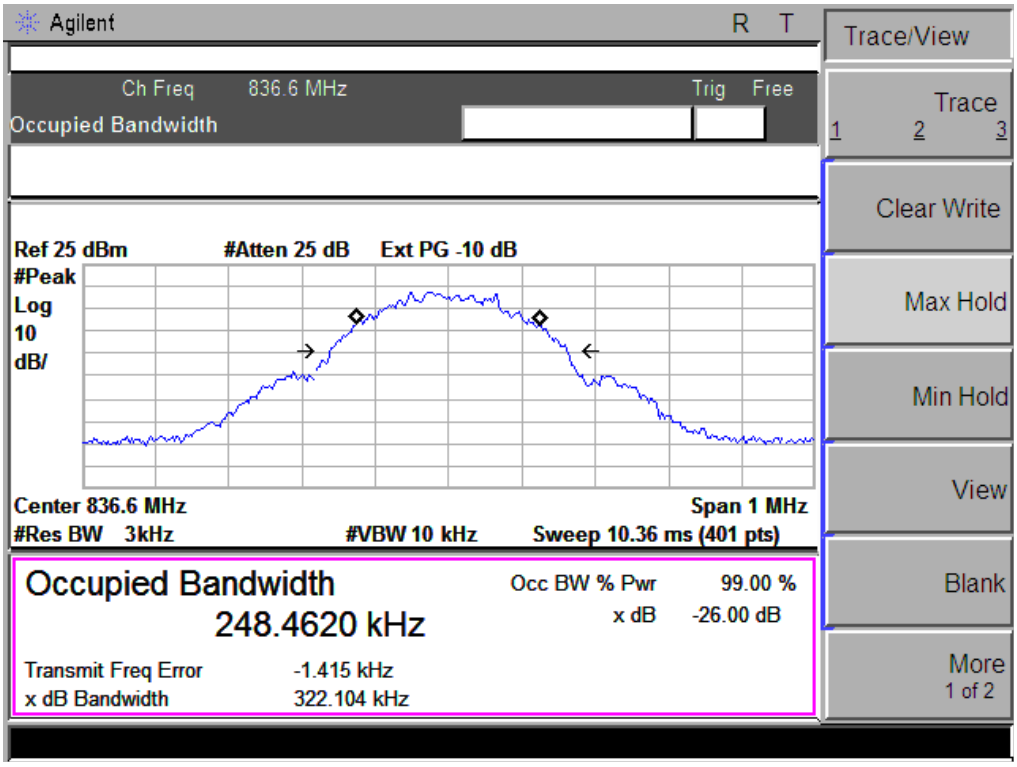


APPENDIX II
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)
EMISSION BANDWIDTH (-26dBC)

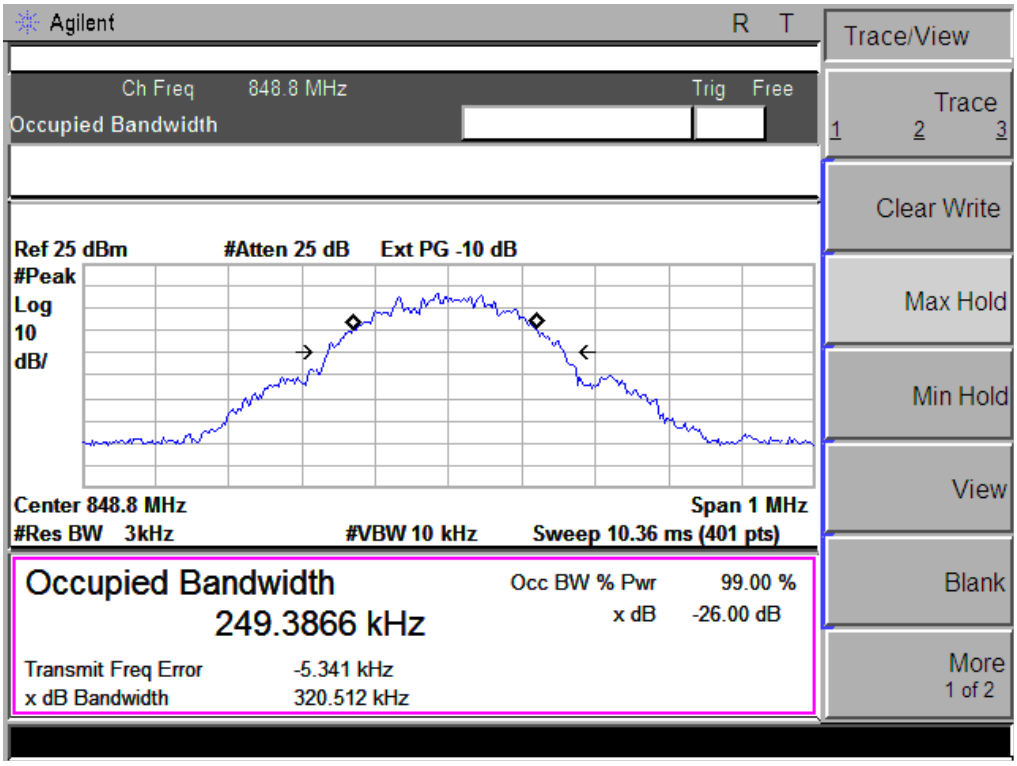
Occupied Bandwidth (99%) GSM 850 BAND CH 128



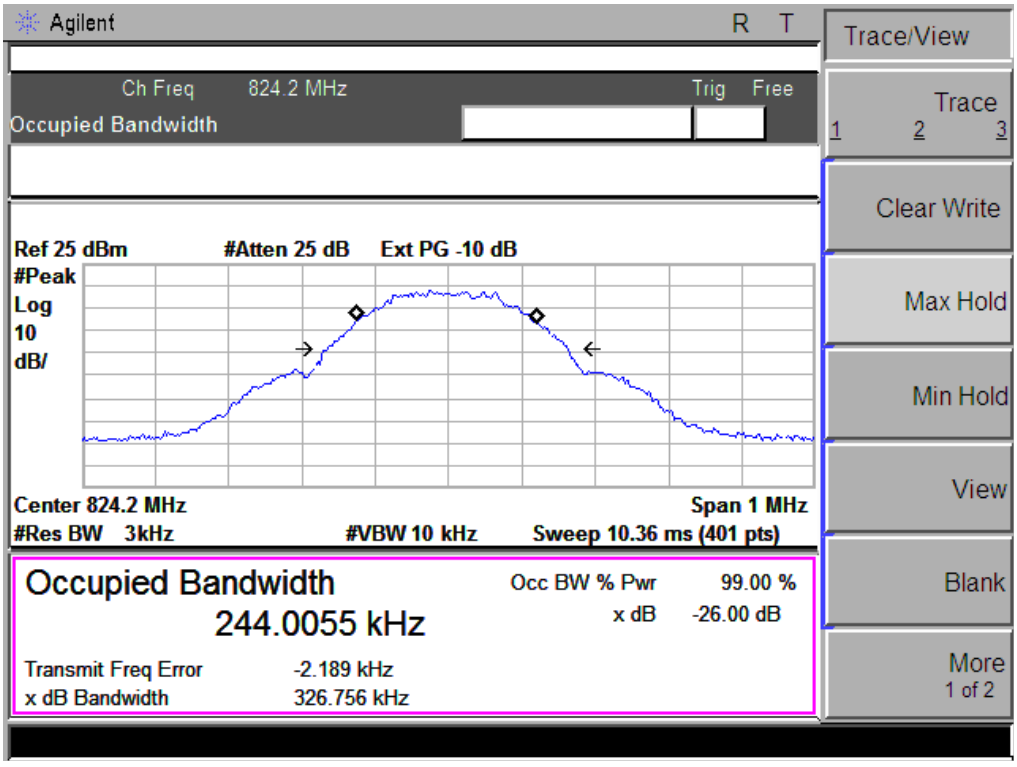
Occupied Bandwidth (99%) GSM 850 BAND CH 190



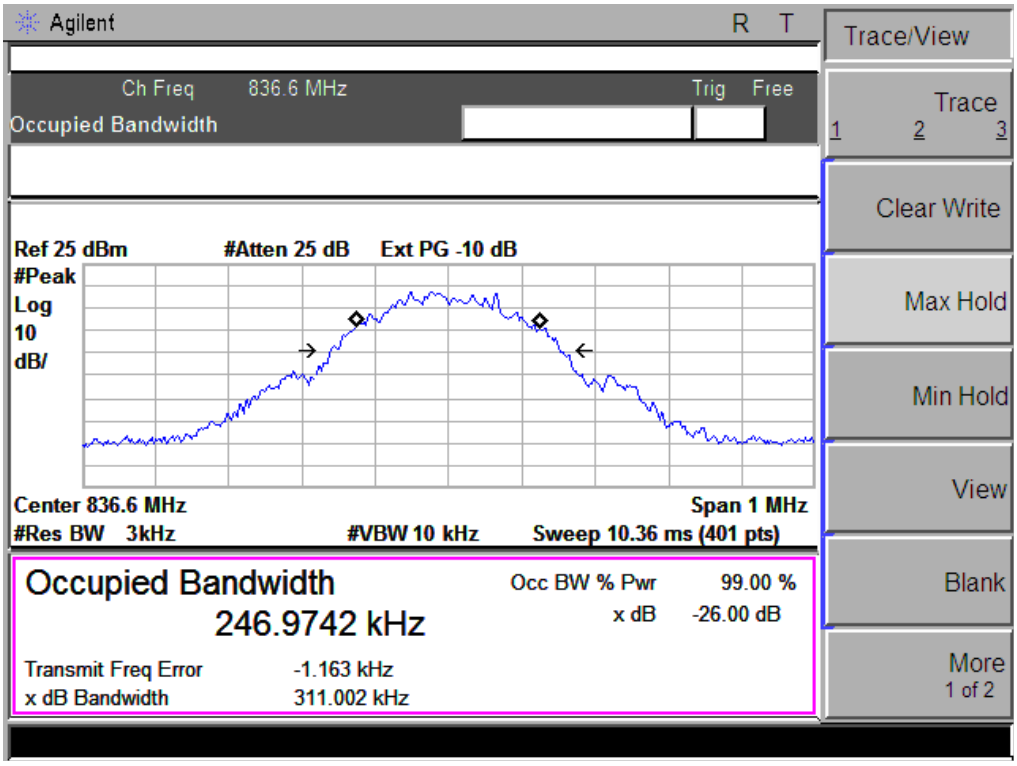
Occupied Bandwidth (99%) GSM 850 BAND CH 251



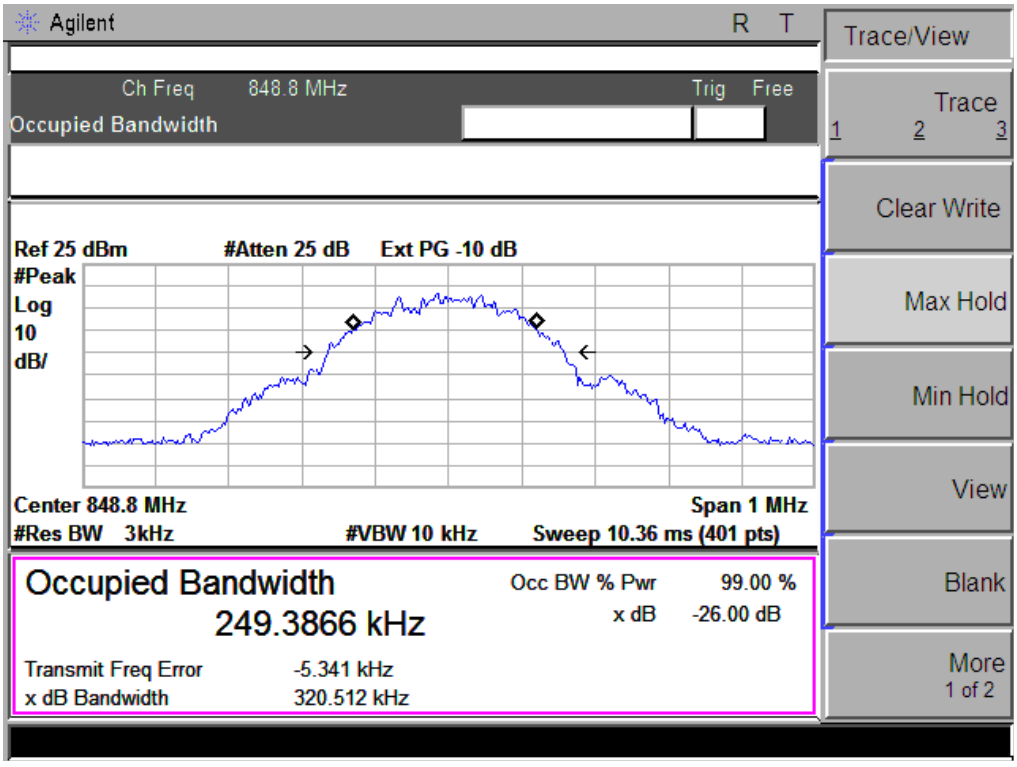
Occupied Bandwidth (99%) GPRS 850 BAND CH 128



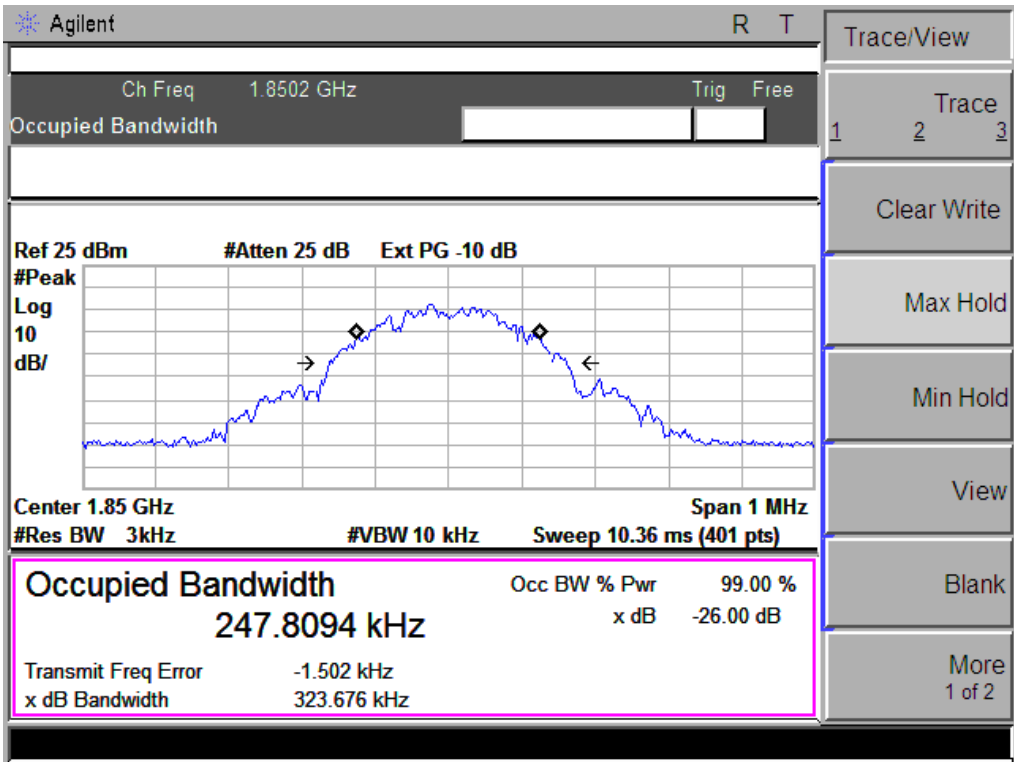
Occupied Bandwidth (99%) GPRS 850 BAND CH 190



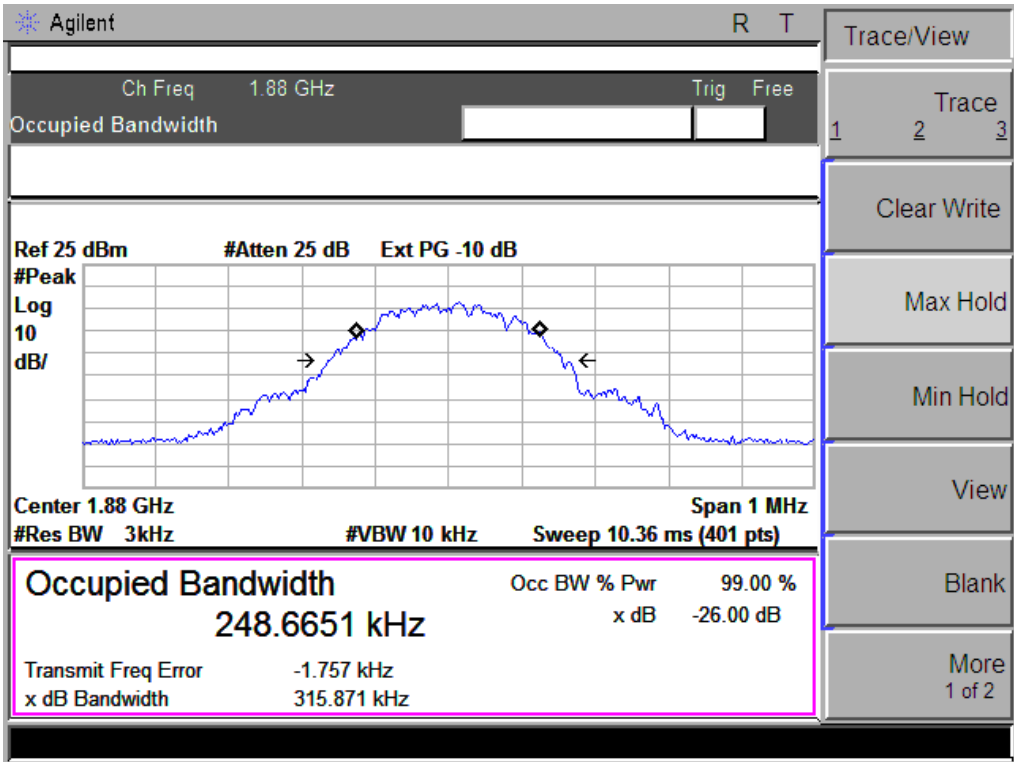
Occupied Bandwidth (99%) GPRS 850 BAND CH 251



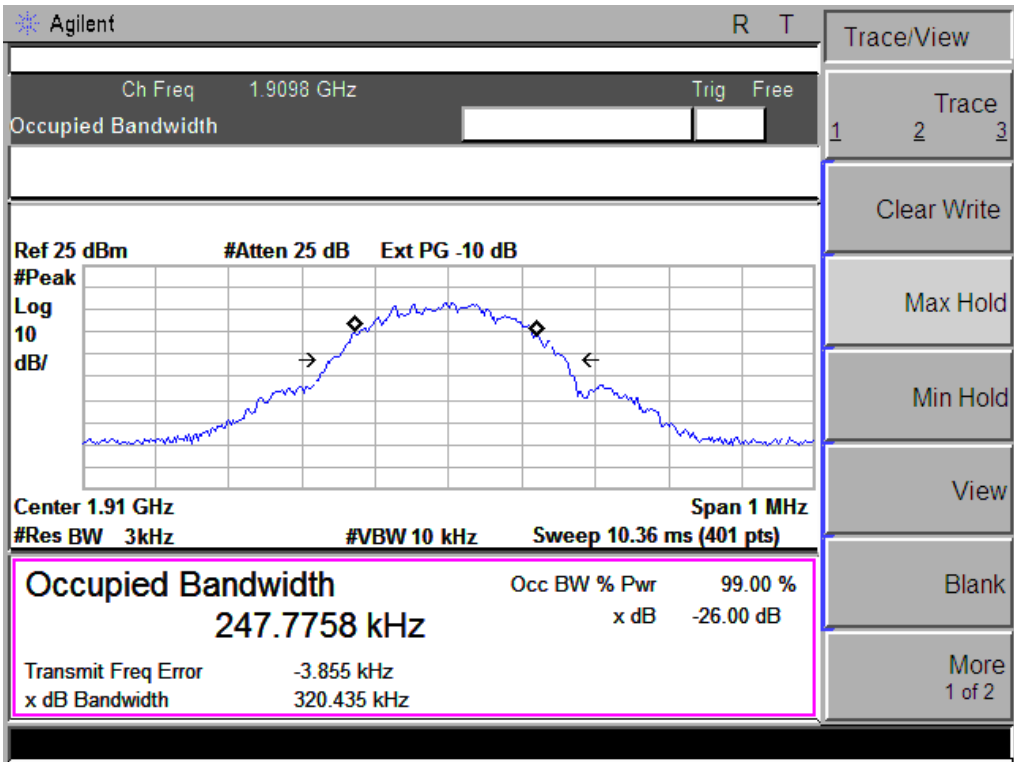
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



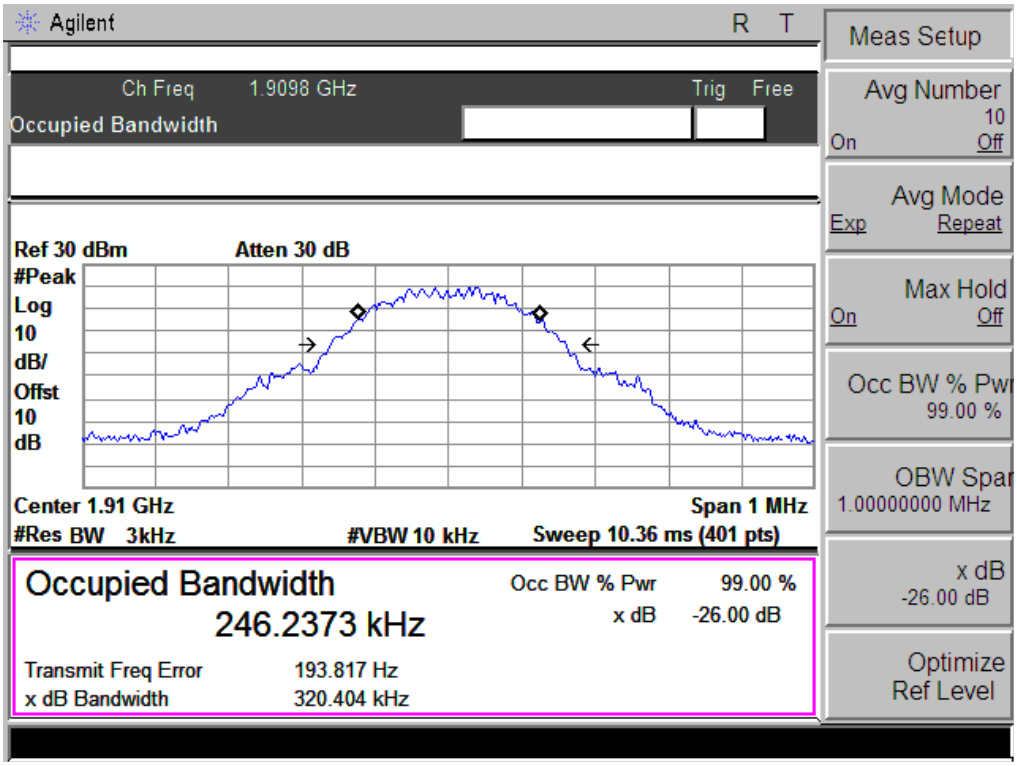
Occupied Bandwidth (99%) PCS 1900 BAND CH 661



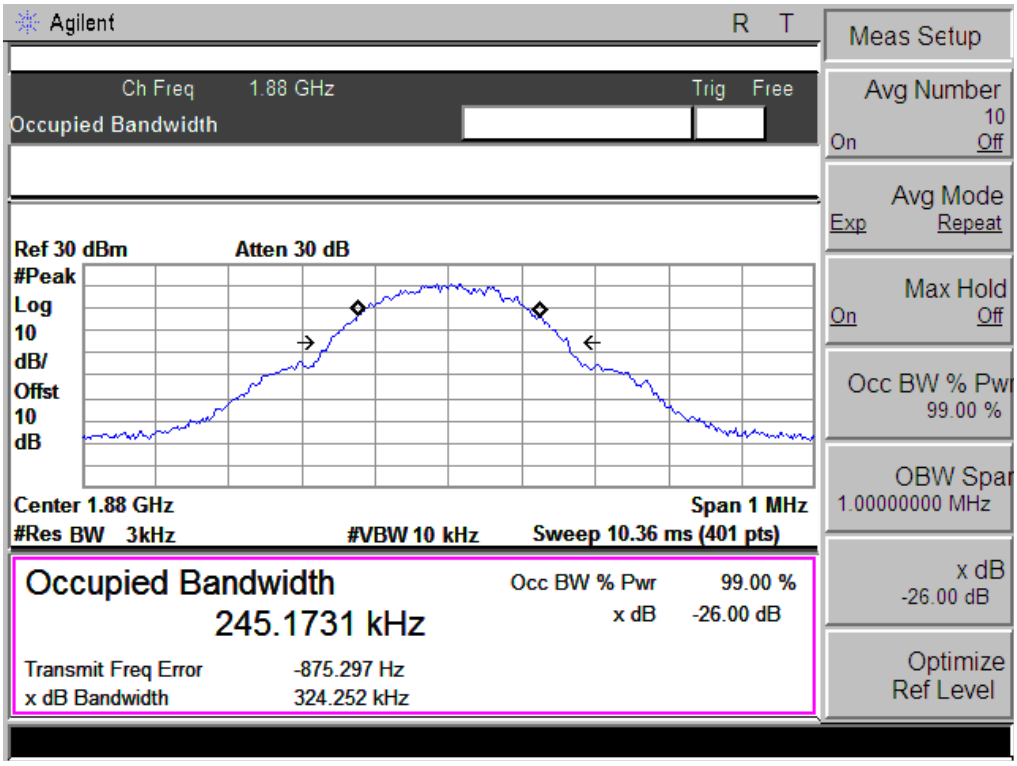
Occupied Bandwidth (99%) PCS 1900 BAND CH 810



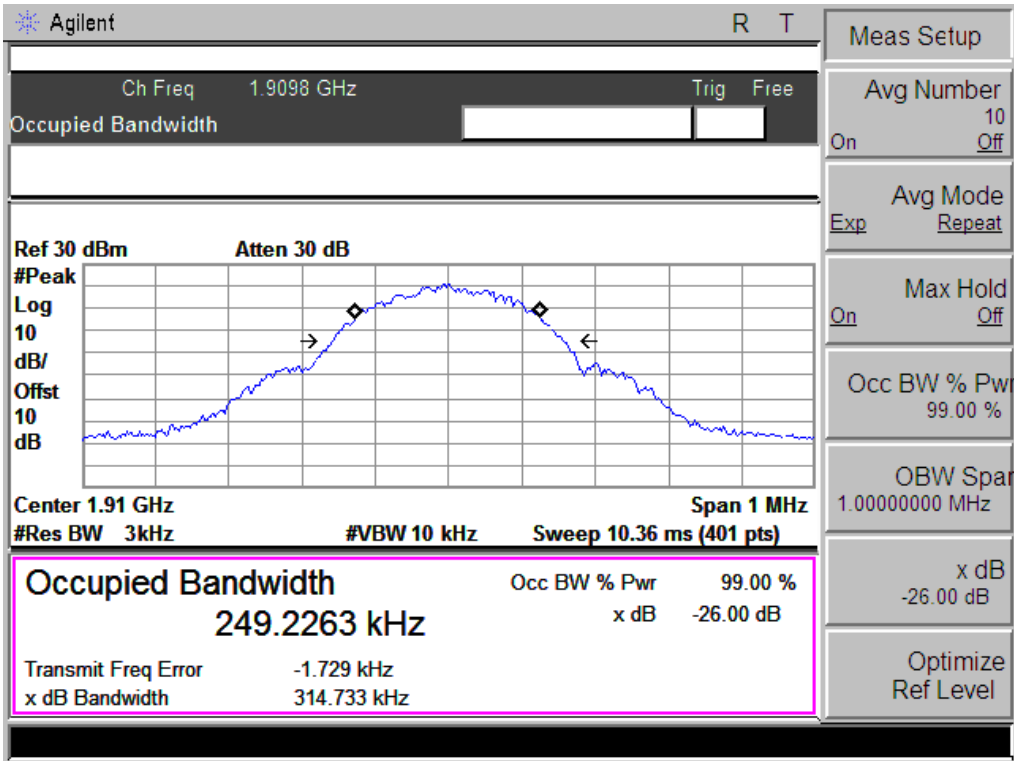
Occupied Bandwidth (99%) GPRS 1900 BAND CH 512



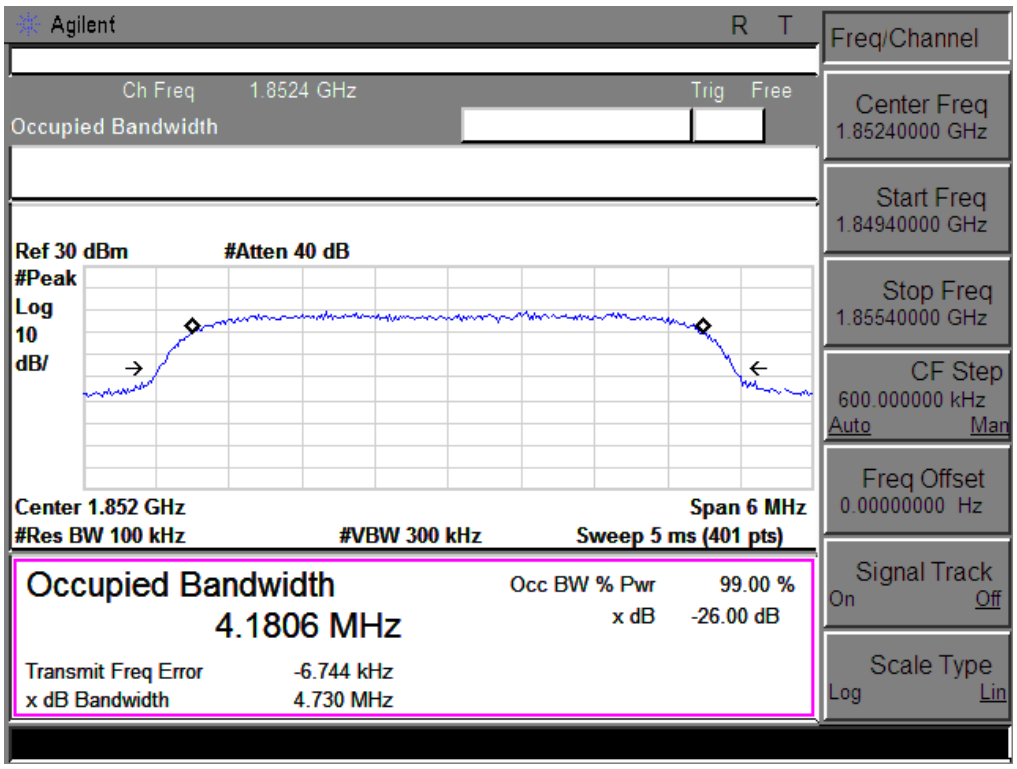
Occupied Bandwidth (99%) GPRS 1900 BAND CH 661



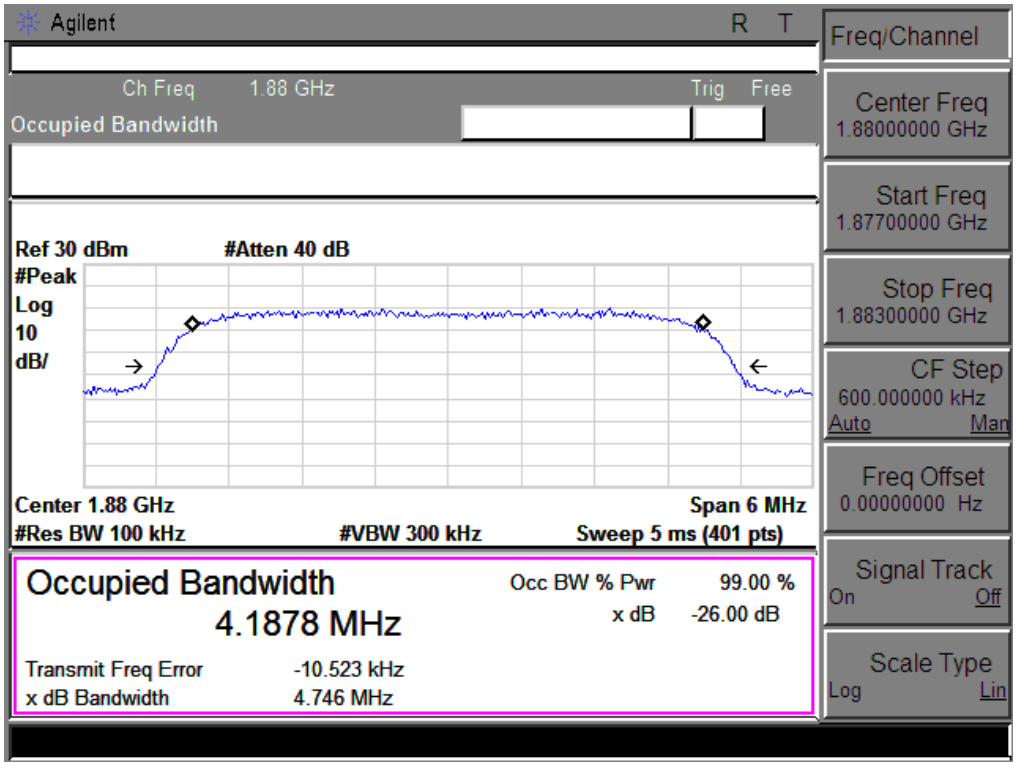
Occupied Bandwidth (99%) GPRS 1900 BAND CH 810



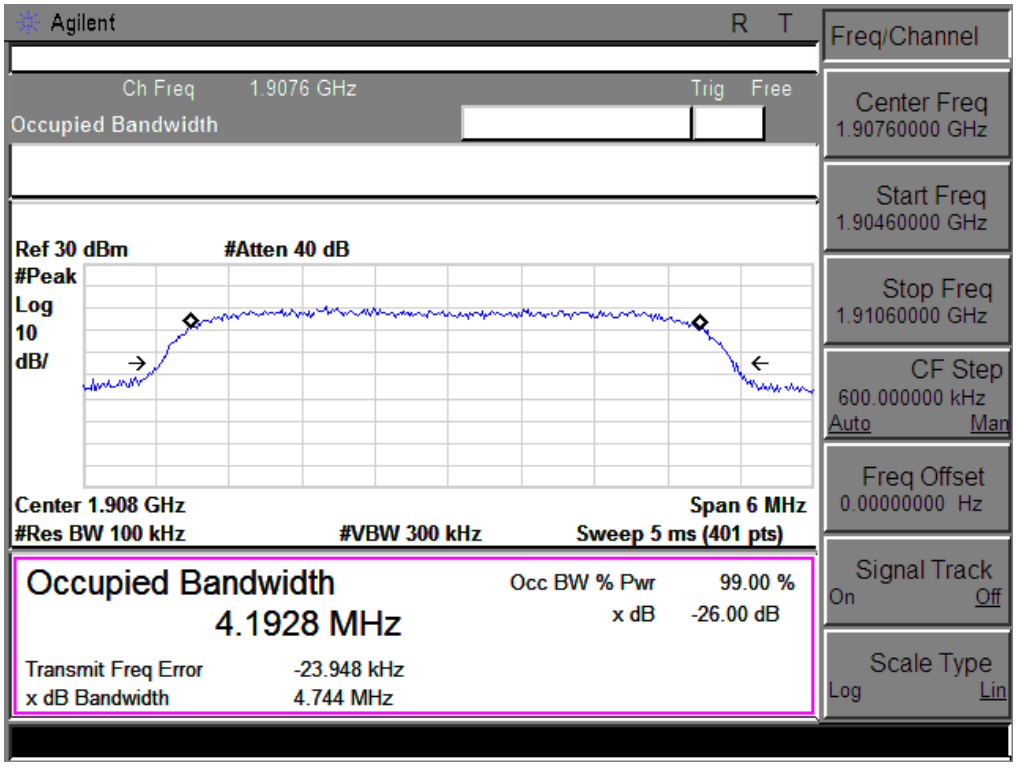
Occupied Bandwidth (99%) UMTS band II CH 9262



Occupied Bandwidth (99%) UMTS band II CH 9400



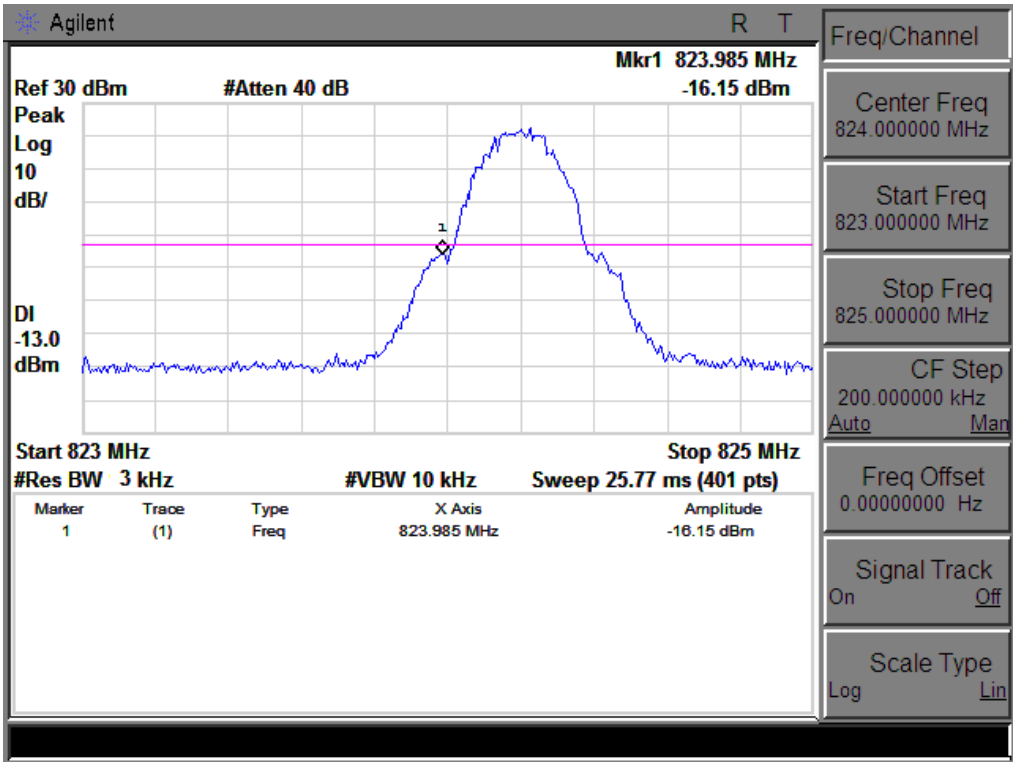
Occupied Bandwidth (99%) UMTS band II CH 9538



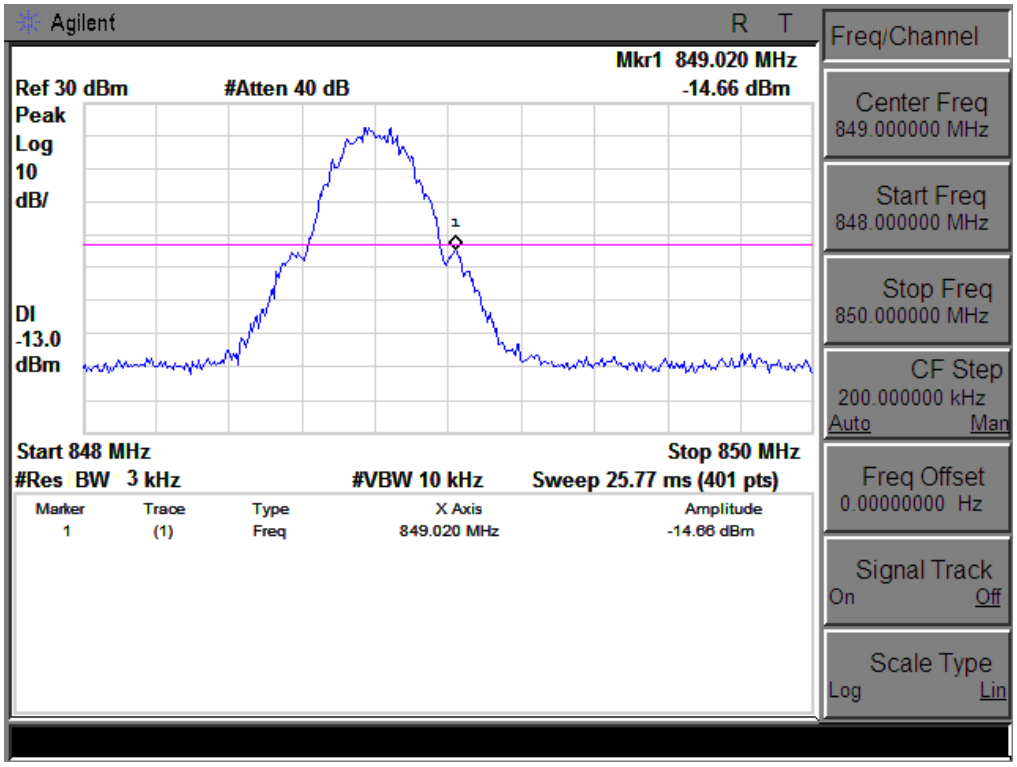
APPENDIX III

TEST PLOTS FOR BAND EDGES

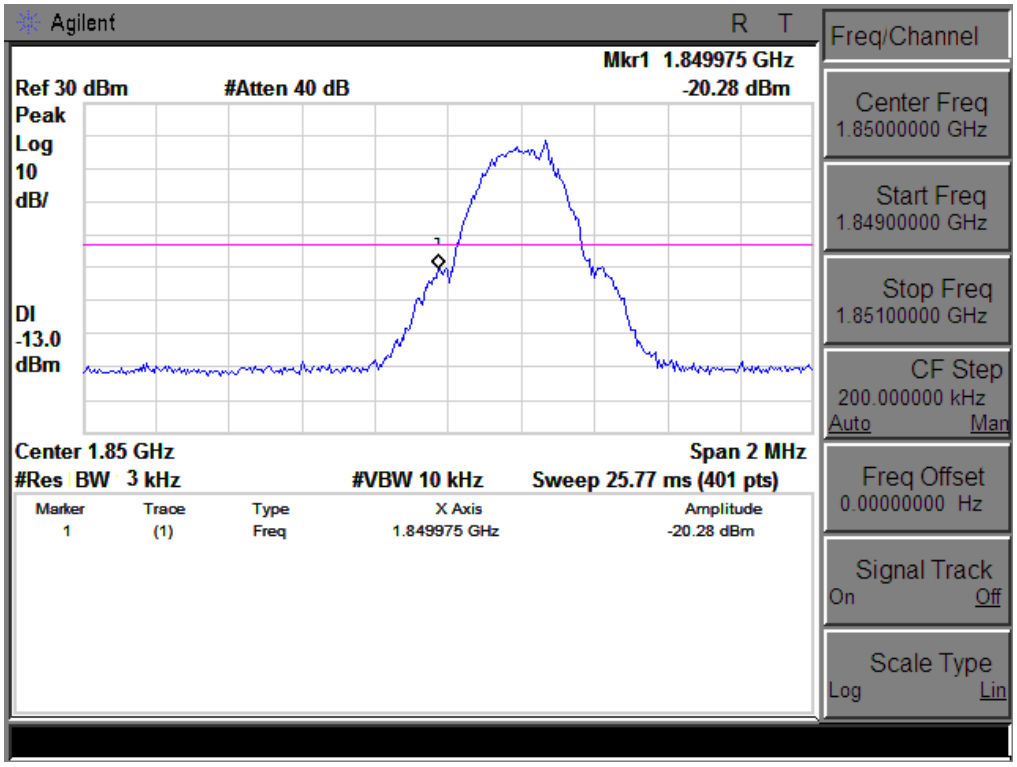
Low Band Edge GSM 850 BAND CH 128



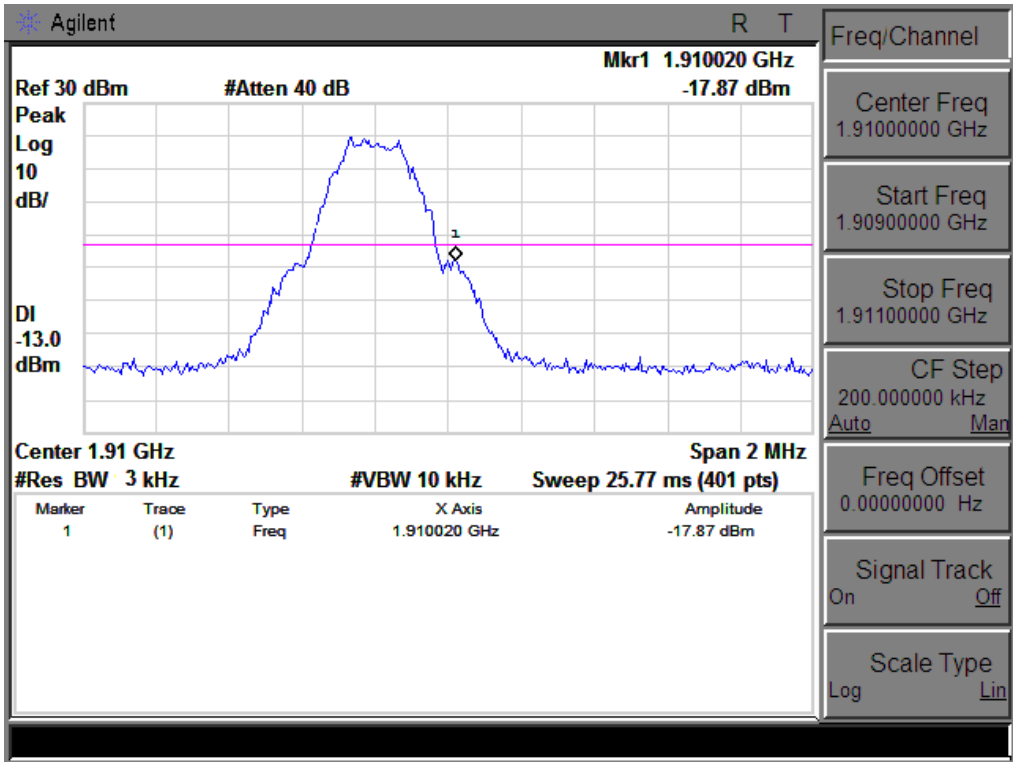
High Band Edge GSM 850 BAND CH 251



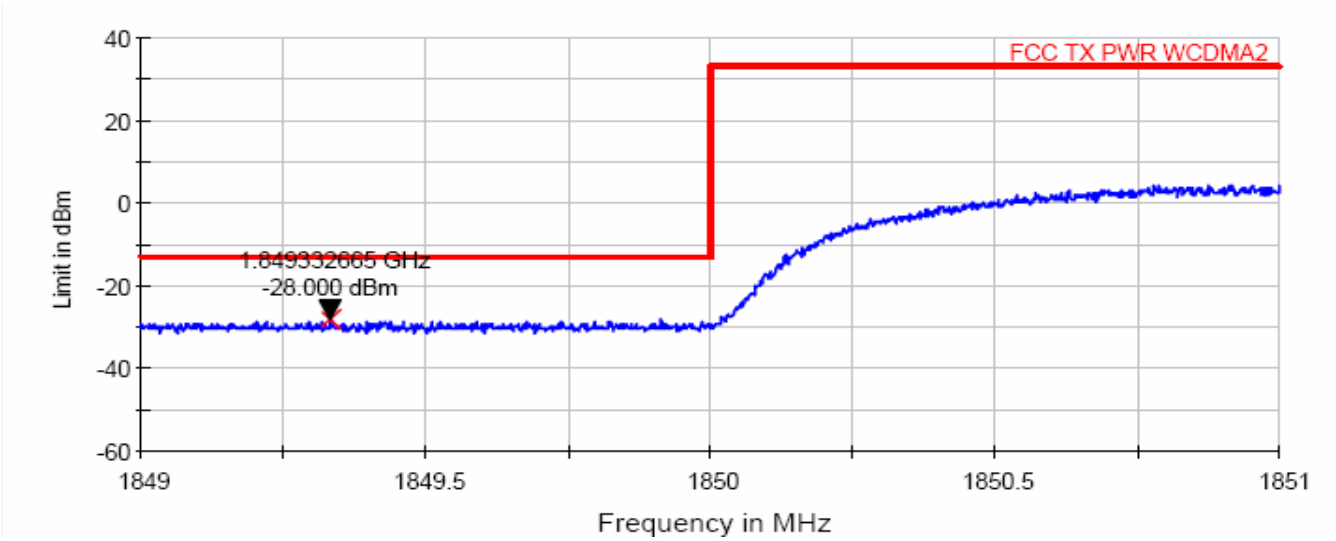
Low Band Edge PCS 1900 BAND CH 512



High Band Edge PCS 1900 BAND CH 810

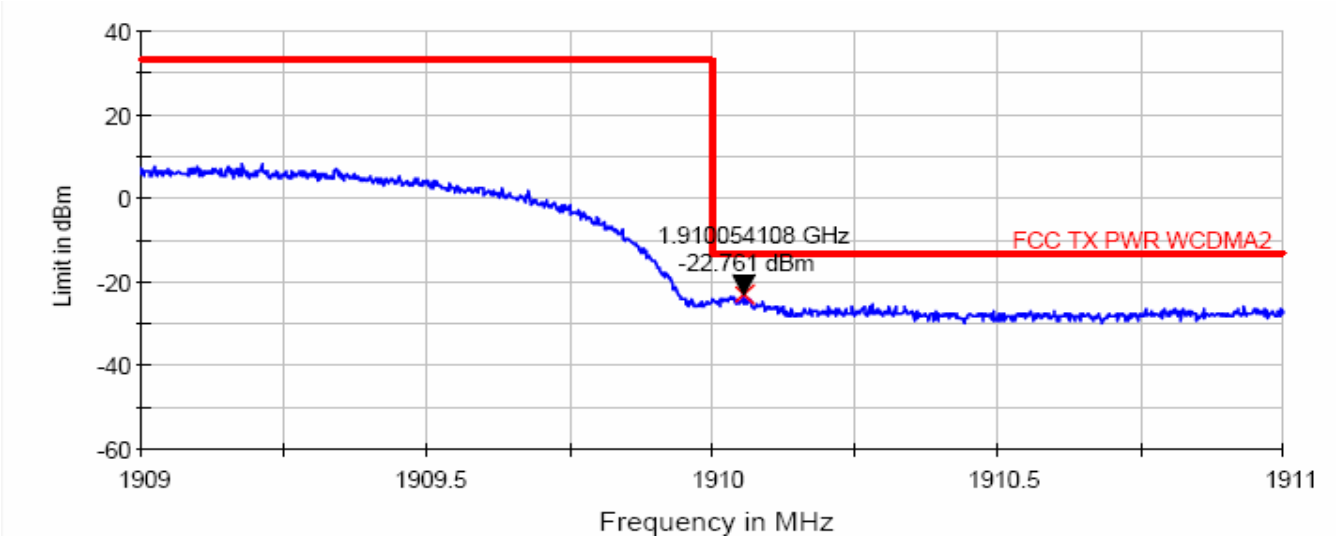


Low Band Edge UMTS BAND II CH 9262



RMS(RBW:50kHz,VBW:50kHz,MAX.Hold)

High Band Edge UMTS BAND II CH 9538

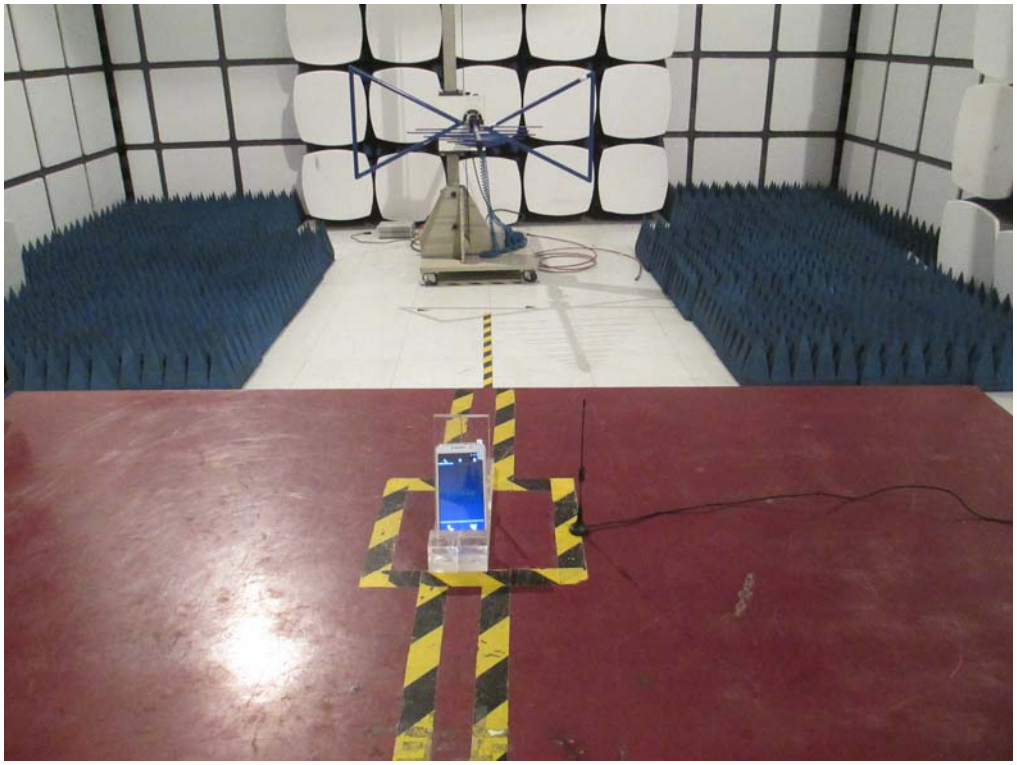


RMS(RBW:50kHz,VBW:50kHz,MAX.Hold)

APPENDIX IV

PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION



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