TECHNICAL REPORT

Report No:	FCC	1702053-05
File reference No:		2017-02-22

Applicant:	AOC
Product:	Tablet PC
Model No:	A724G
Trademark:	AOC
Test Standards:	FCC 47 CFR Part 2, 22(H), 24(E)
Test result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4, FCC Part 22H and 24E for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung
Manager

Dated: February 22, 2017

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Special Statement:

The testing quality ability of our laboratory meet with “Quality Law of People’s Republic of China” Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

Test Report Conclusion

Content

1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.
Address: Room 512-519,5/F., East Tower,Building 4, Anhua Industrial Zone, Futian District,Shenzhen, Guangdong China
Telephone: (755) 83448688
Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: AOC
Address: 14F-5, No. 258, Liancheng Rd., Zhonghe Dist., New Taipei City, Taiwan
Telephone: --
Fax: --

1.3 Description of EUT

Product:	Tablet PC
Manufacturer:	AOC
Address:	14F-5, No. 258, Liancheng Rd., Zhonghe Dist., New Taipei City, Taiwan
Brand Name:	AOC
Model Number:	A724G
Additional Model Number:	N/A
Power Adapter:	Model No.: JHD-AP013U-050150BB-A Input: 100-240V, 50/60Hz, 0.35A; Output: 5V, 1500mA
Tx Frequency	GSM850 : 824.2 MHz ~ 848.8 MHz GSM1900 : 1850.2 MHz ~ 1909.8 MHz WCDMA Band V : 826.4 MHz ~ 846.6 MHz WCDMA Band II : 1852.4 MHz ~ 1907.6 MHz
Rx Frequency	GSM850 : 869.2 MHz ~ 893.8 MHz GSM1900 : 1930.2 MHz ~ 1989.8 MHz WCDMA Band V : 871.4 MHz ~ 891.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850 : 32.55dBm GSM1900 : 29.29 dBm WCDMA Band V : 24.82 dBm WCDMA Band II : 25.08 dBm
Antenna Type	Integral Antenna

Antenna Peak Gain	824 ~ 849 MHz : -1.45 dBi 1850~1910 MHz : 2.34dBi
Type of Modulation	GSM / GPRS : GMSK EDGE : GMSK/8PSK WCDMA : QPSK HSDPA : QPSK / 16QAM HSUPA : QPSK
EMISSION DESIGNATOR	GSM : 255KGXW EGPRS : 245KG7W WCDMA: 4M11F9W
FCC ID:	2AEB5-A724

1.4 Submitted Sample: 2 Samples

1.5 Test Duration
2017-02-17 to 2017-02-22

1.6 Test Uncertainty
Conducted Emissions Uncertainty =3.6dB
Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer
The sample tested by Terry Tang

Print Name: Terry Tang

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	N/A	PASS	-
3.2	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
3.2	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.3	§2.1049 §22.917(a) §24.238(a)	Occupied Bandwidth	N/A	PASS	-
3.4	§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.5	§2.1051 §22.917(a) §24.238(a)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.6	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	-
3.7	§2.1055 §22.355 §24.235	Frequency Stability for Temperature & Voltage	< 2.5 ppm	PASS	-
3.8	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.9	Part 15B	Main Conducted Emissions	See part 15.107 and 207	PASS	-

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range. Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link
GSM 1900	■ GSM Link ■ EDGE 8 Link	■ GSM Link ■ EDGE 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

Note: The maximum power levels are GSM mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

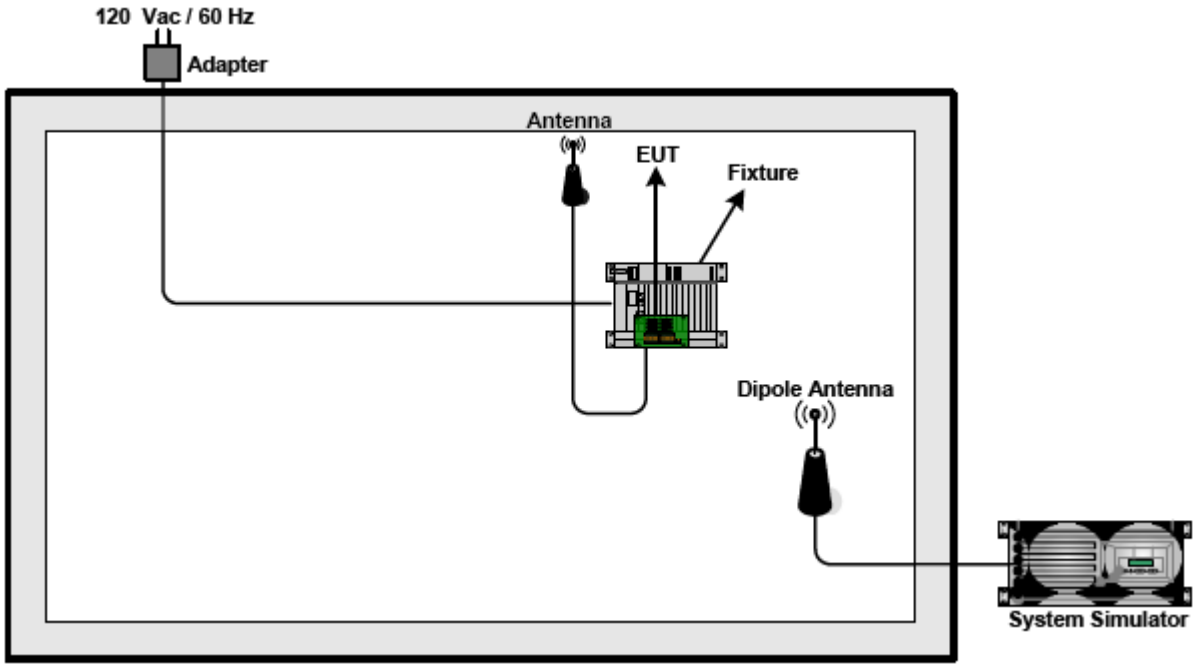
The conducted power tables are as follows:

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	32.38	32.47	32.51	29.28	29.24	29.21
GPRS (GMSK, 1-Slot)	32.43	32.49	32.55	29.29	29.26	29.21
GPRS (GMSK, 2-Slot)	31.66	31.75	31.87	28.39	28.33	28.27
GPRS (GMSK, 3-Slot)	30.05	30.16	30.20	26.69	26.70	26.65
GPRS (GMSK, 4-Slot)	29.09	29.13	29.22	25.35	25.39	25.31
EGPRS(8PSK, 1-Slot)	27.40	27.46	27.55	24.14	24.12	24.08
EGPRS(8PSK, 2-Slot)	26.77	26.82	26.87	23.27	23.23	23.21
EGPRS(8PSK, 3-Slot)	25.39	25.44	25.51	22.15	21.09	22.10
EGPRS(8PSK, 4-Slot)	23.88	23.91	23.98	21.72	21.69	21.66

Remark: GPRS, CS4 coding scheme. EGPRS, MCS9 coding scheme.
Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link
Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link
Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link

Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4183	4233	9262	9400	9538
Frequency (MHz)	826.4	836.6	846.6	1852.4	1880.0	1907.6
AMR 12.2Kbps	24.66	24.75	24.77	24.40	24.88	24.98
RMC 12.2Kbps	24.73	24.82	24.82	24.49	24.95	25.08
HSDPA Subtest-1	24.56	24.63	24.65	24.33	24.82	24.93
HSDPA Subtest-2	24.39	24.43	24.44	24.40	24.87	25.01
HSDPA Subtest-3	24.61	24.69	24.70	24.21	24.76	24.87
HSDPA Subtest-4	24.46	24.52	24.51	24.25	24.78	24.92
HSUPA Subtest-1	24.15	24.26	24.28	23.89	24.37	24.46
HSUPA Subtest-2	24.20	24.33	24.32	23.98	24.50	24.63
HSUPA Subtest-3	24.08	24.15	24.15	24.05	24.63	24.72
HSUPA Subtest-4	24.23	24.35	24.38	23.85	24.31	24.40
HSUPA Subtest-5	24.20	24.29	24.30	23.79	24.26	24.33

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

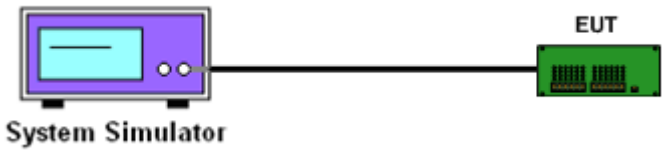
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

Cellular Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM850 (GSM)	128 (Low)	824.2	32.43	1.750
	190 (Mid)	836.6	32.49	1.774
	251 (High)	848.8	32.55	1.799
GSM850 (EDGE 8)	128 (Low)	824.2	27.40	0.550
	190 (Mid)	836.4	27.46	0.557
	251 (High)	848.8	27.55	0.569
WCDMA Band V (RMC 12.2Kbps)	4132 (Low)	826.4	24.73	0.297
	4183 (Mid)	836.6	24.82	0.303
	4233 (High)	846.6	24.82	0.303

PCS Band				
Modes	**Channel**	**Frequency (MHz)**	**Conducted Power (dBm)**	**Conducted Power (Watts)**
GSM1900 (GSM)	512 (Low)	1850.2	29.29	0.849
	661 (Mid)	1880.0	29.26	0.843
	810 (High)	1909.8	29.21	0.834
GSM1900 (EDGE 8)	512 (Low)	1850.2	24.14	0.259
	661 (Mid)	1880.0	24.12	0.258
	810 (High)	1909.8	24.08	0.256
WCDMA Band II (RMC 12.2Kbps)	9262 (Low)	1852.4	24.49	0.281
	9400 (Mid)	1880.0	24.95	0.313
	9538 (High)	1907.6	25.08	0.322

3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-C-2004, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

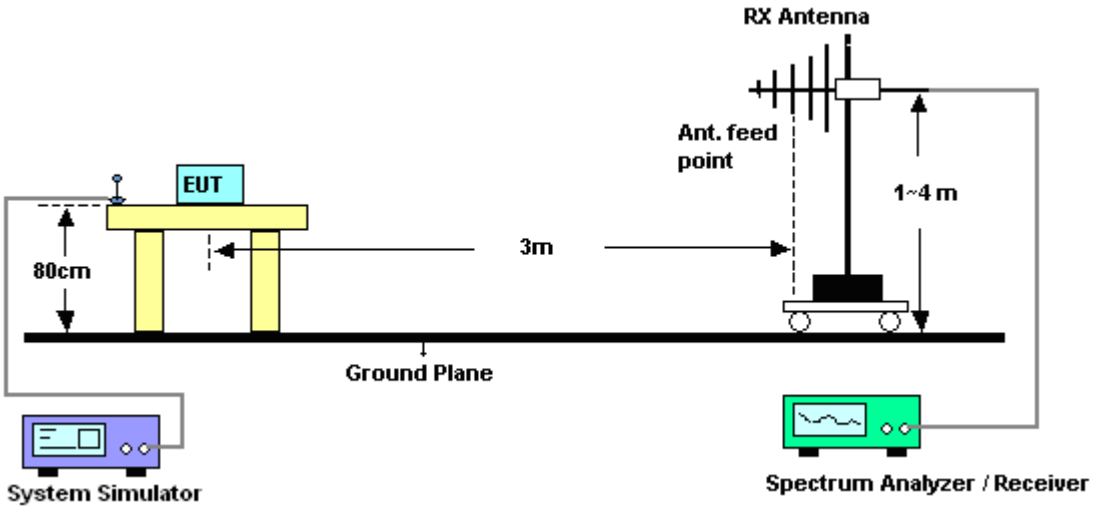
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
   UMTS operating modes: Set RBW= 100 kHz, VBW= 300 kHz, RMS detector over frame, and use channel power option with bandwidth=5MHz, per KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.3.5 Test Result of ERP

GSM850 (GSM) Radiated Power ERP					
Frequency (MHz)	ERP (dBm)		ERP (W)		Result
	Polarization		Polarization		
	H	V	H	V	
824.20	30.32	29.75	1.076	0.944	Pass
836.60	30.49	29.64	1.119	0.920	Pass
848.80	30.53	29.82	1.130	0.959	Pass

GSM850 (EDGE8) Radiated Power ERP					
Frequency (MHz)	ERP (dBm)		ERP (W)		Result
	Polarization		Polarization		
	H	V	H	V	
824.20	25.13	24.15	0.326	0.260	Pass
836.60	25.24	24.22	0.334	0.264	Pass
848.80	25.06	23.27	0.321	0.212	Pass

WCDMA Band V (RMC 12.2Kbps) Radiated Power ERP					
Frequency (MHz)	ERP (dBm)		ERP (W)		Result
	Polarization		Polarization		
	H	V	H	V	
826.40	20.25	19.53	0.106	0.090	Pass
836.60	20.41	19.82	0.110	0.096	Pass
846.60	20.32	19.74	0.108	0.094	Pass

3.3.6 Test Result of EIRP

GSM1900 (GSM) Radiated Power EIRP					
Frequency (MHz)	EIRP (dBm) Polarization		EIRP (W) Polarization		Result
	H	V	H	V	
1850.20	29.62	28.46	0.916	0.701	Pass
1880.00	29.53	28.57	0.897	0.719	Pass
1909.80	29.70	28.62	0.933	0.728	Pass

GSM1900 (EDGE class 8) Radiated Power EIRP					
Frequency (MHz)	EIRP (dBm) Polarization		EIRP (W) Polarization		Result
	H	V	H	V	
1850.20	24.26	23.42	0.267	0.220	Pass
1880.00	23.45	23.28	0.221	0.213	Pass
1909.80	23.31	23.07	0.214	0.203	Pass

WCDMA Band II (RMC 12.2Kbps) Radiated Power EIRP					
Frequency (MHz)	EIRP (dBm) Polarization		EIRP (W) Polarization		Result
	H	V	H	V	
1852.40	21.75	20.58	0.150	0.114	Pass
1880.00	21.91	20.36	0.155	0.109	Pass
1907.60	21.64	20.42	0.146	0.110	Pass

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

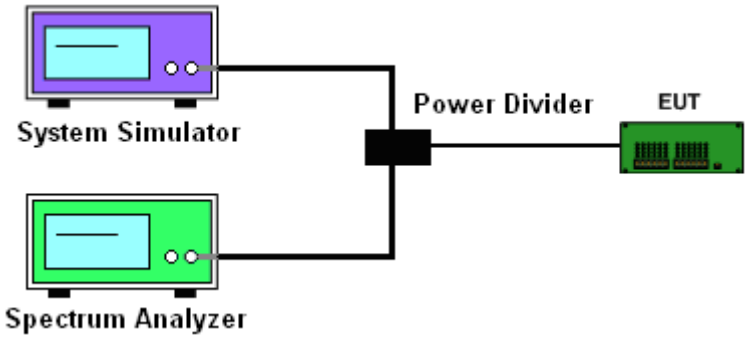
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 10*RBW, Peak detector, trace maximum hold.
4. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

3.3.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth and 26dB Bandwidth

Cellular Band						
Modes	**GSM850 (GSM)**			**GSM850 (EDGE class 8)**		
Channel	**128 (Low)**	**190 (Mid)**	**251 (High)**	**128 (Low)**	**190 (Mid)**	**251 (High)**
Frequency (MHz)	**824.2**	**836.6**	**848.8**	**824.2**	**836.6**	**848.8**
99% OBW (kHz)	244.58	247.21	246.88	243.57	241.61	244.36
26dB BW (kHz)	319.66	317.48	318.03	317.90	320.64	312.79

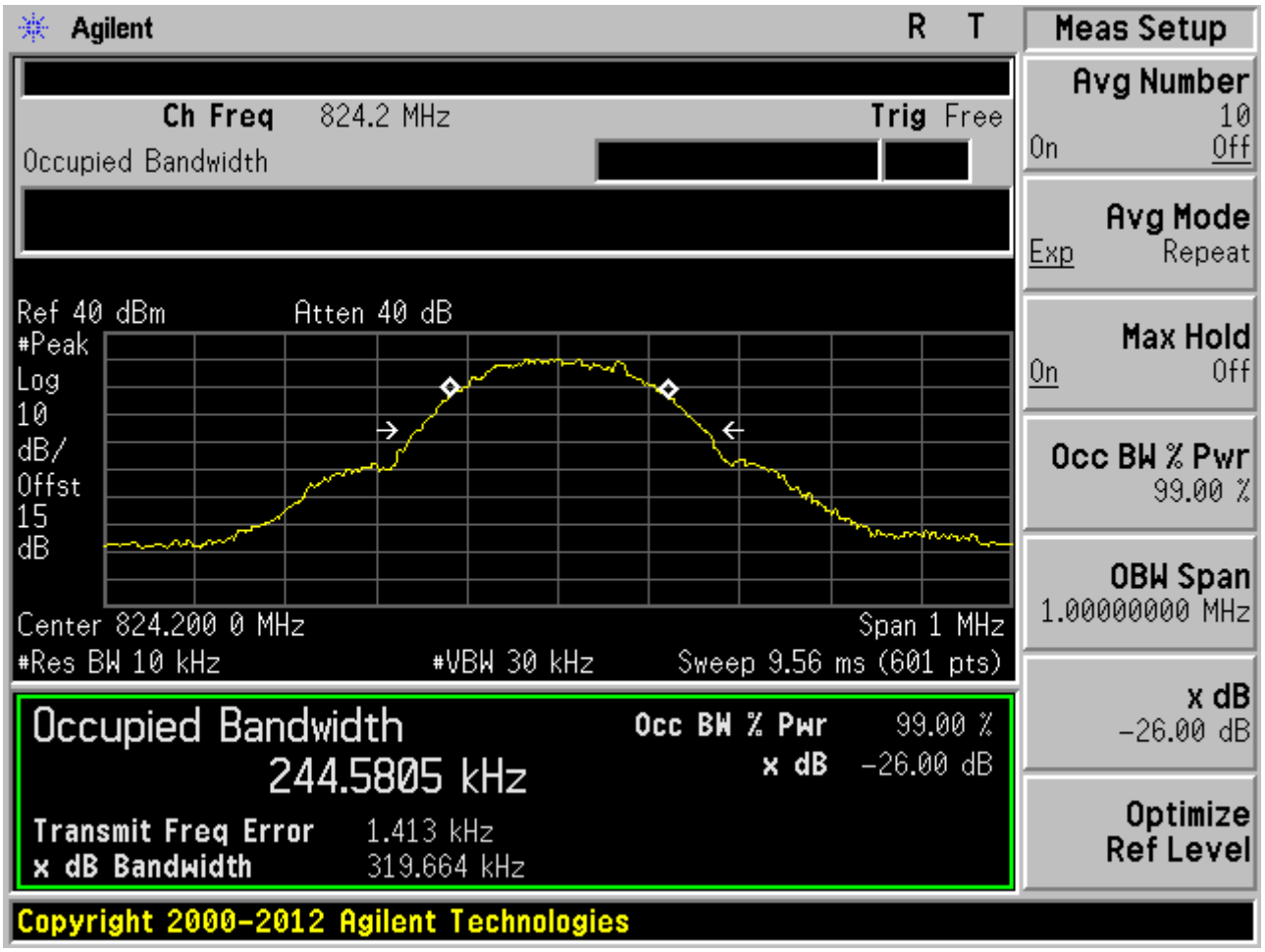
PCS Band						
Modes	**GSM1900 (GSM)**			**GSM1900 (EDGE class 8)**		
Channel	**512 (Low)**	**661 (Mid)**	**810 (High)**	**512 (Low)**	**661 (Mid)**	**810 (High)**
Frequency (MHz)	**1850.2**	**1880**	**1909.8**	**1850.2**	**1880**	**1909.8**
99% OBW (kHz)	249.79	255.27	247.96	243.80	244.27	244.90
26dB BW (kHz)	323.14	326.13	316.85	315.85	322.01	315.56

Cellular Band			
Modes	**WCDMA Band V (RMC 12.2Kbps)**		
Channel	**4132 (Low)**	**4182 (Mid)**	**4233 (High)**
Frequency (MHz)	**826.4**	**836.4**	**846.6**
99% OBW (MHz)	4.15	4.16	4.15
26dB BW (MHz)	4.70	4.73	4.71

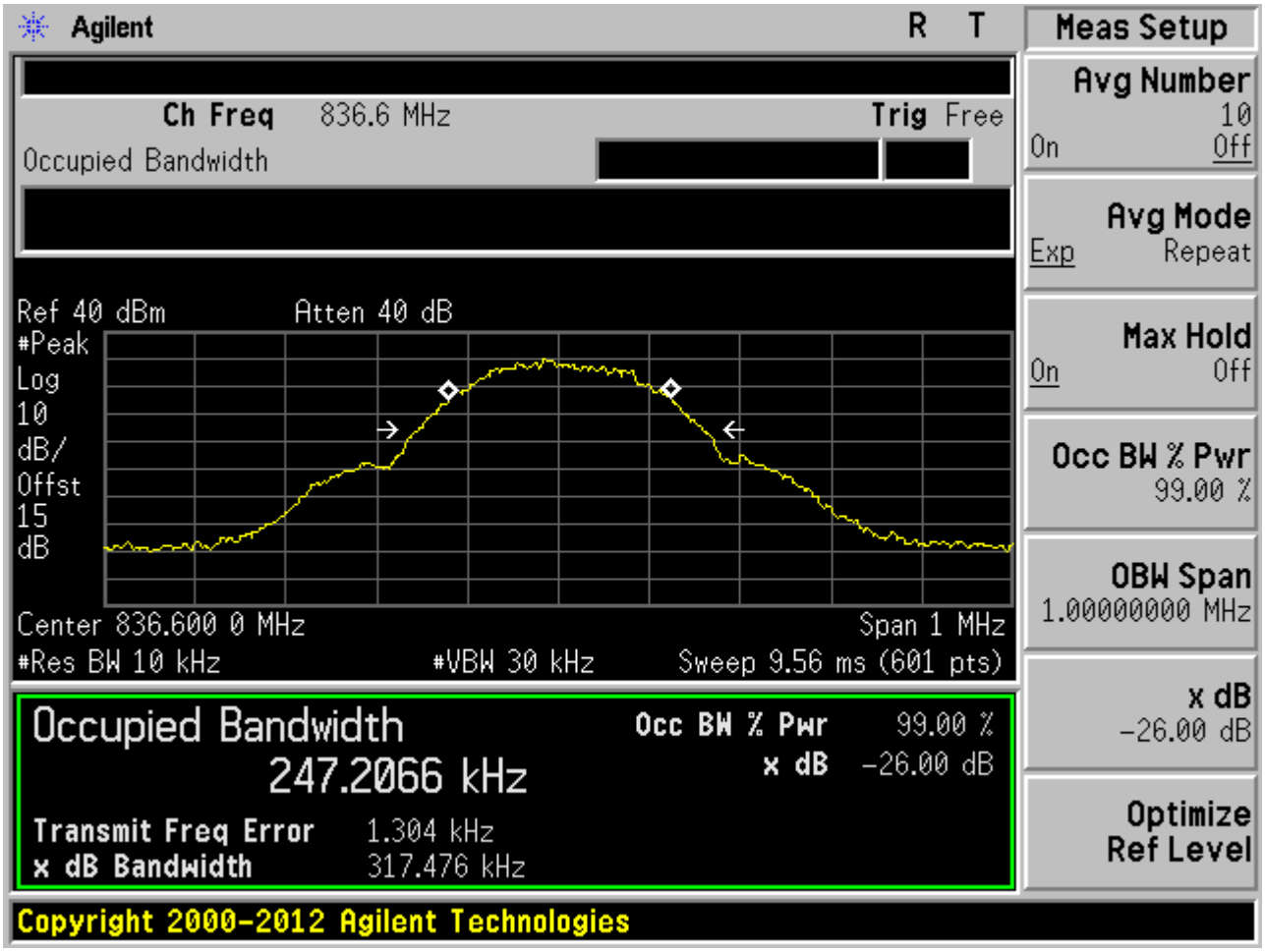
PCS Band			
Modes	**WCDMA Band II (RMC 12.2Kbps)**		
Channel	**9262 (Low)**	**9400 (Mid)**	**9538 (High)**
Frequency (MHz)	**1852.4**	**1880**	**1907.6**
99% OBW (MHz)	4.17	4.16	4.17
26dB BW (MHz)	4.72	4.70	4.69

3.4.6 T e s t Result (Plots) of Occupied Bandwidth and 26dB Bandwidth

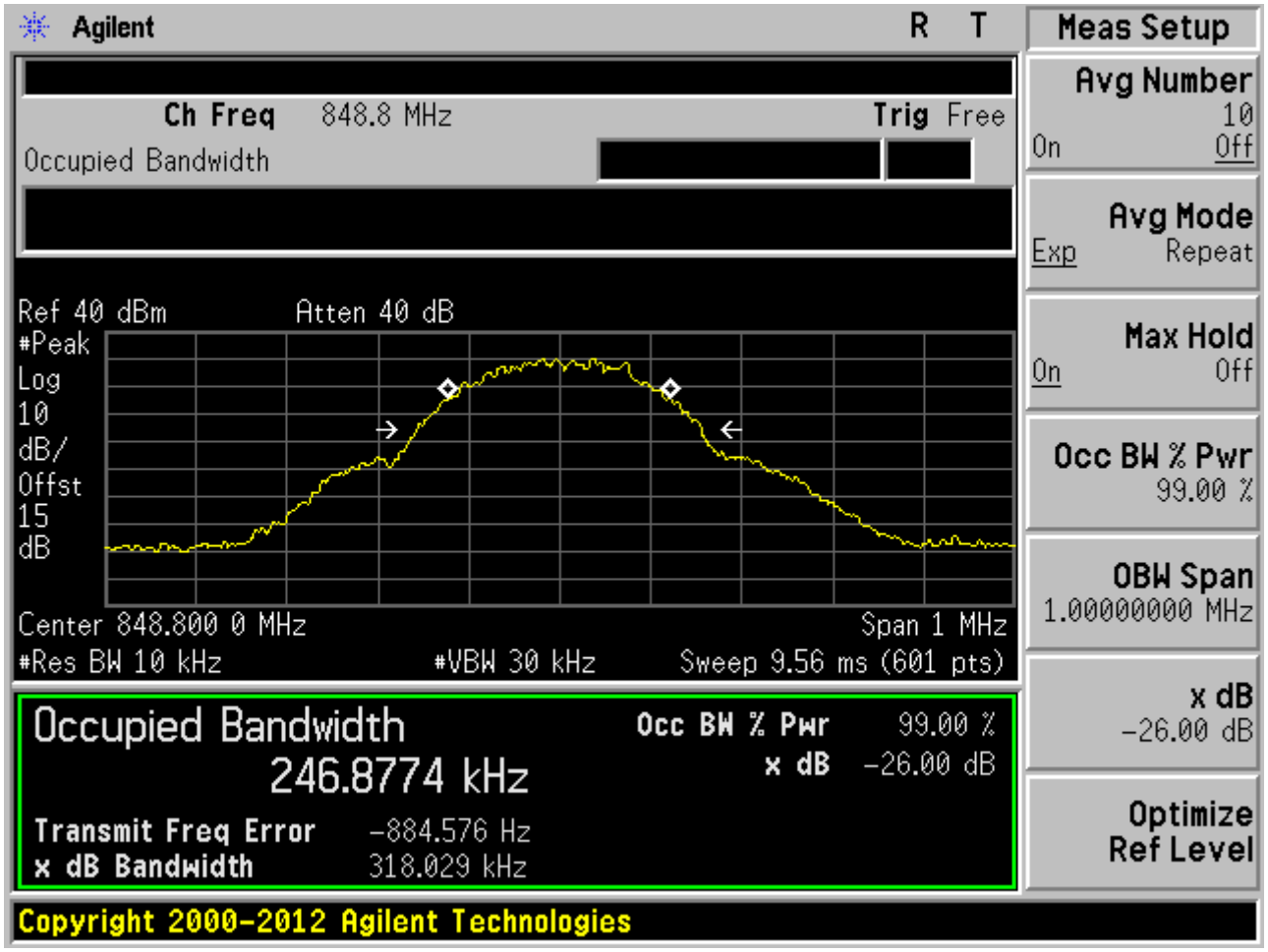
GSM 850MHz Channel = 128



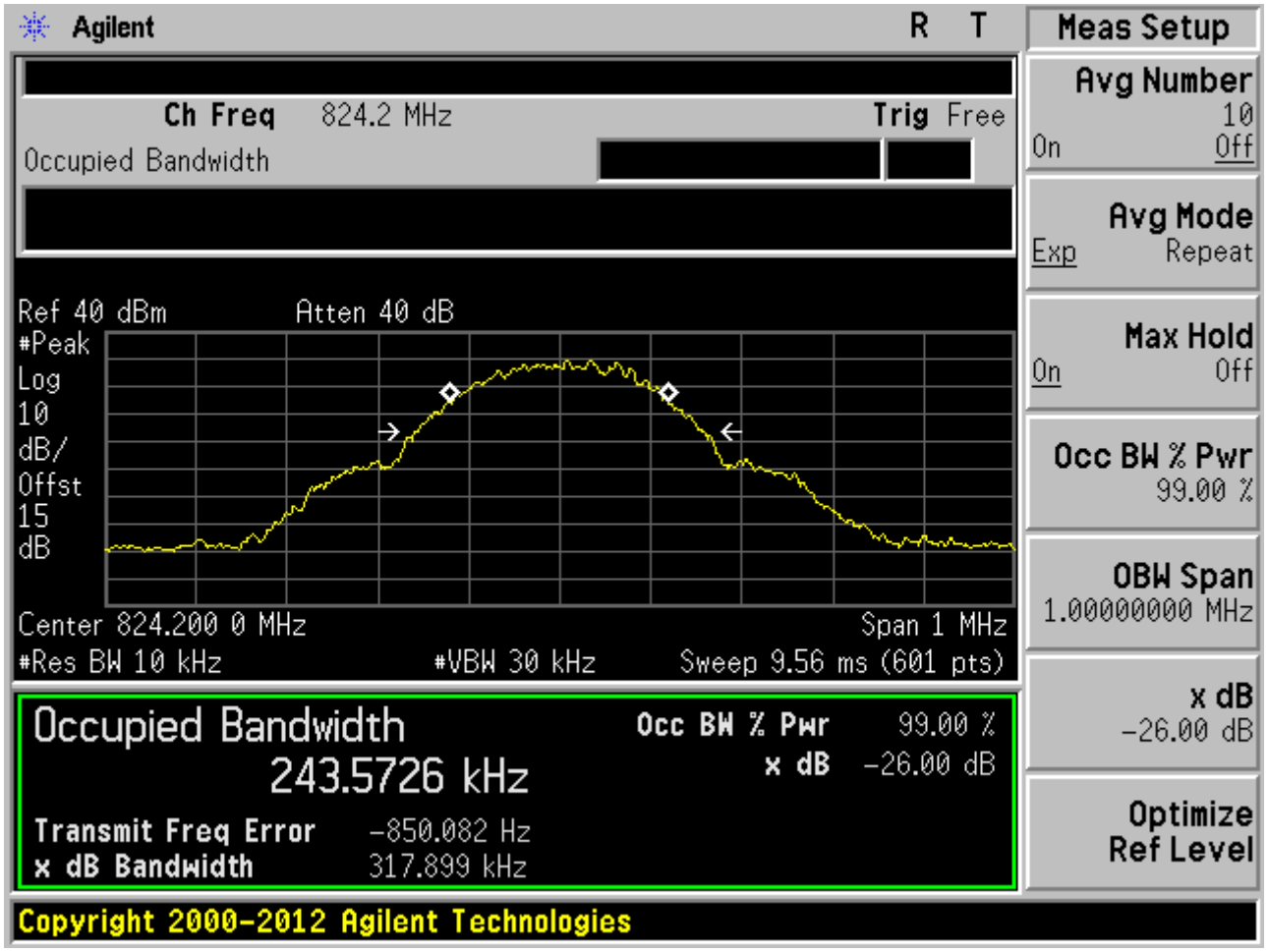
GSM 850MHz Channel = 190



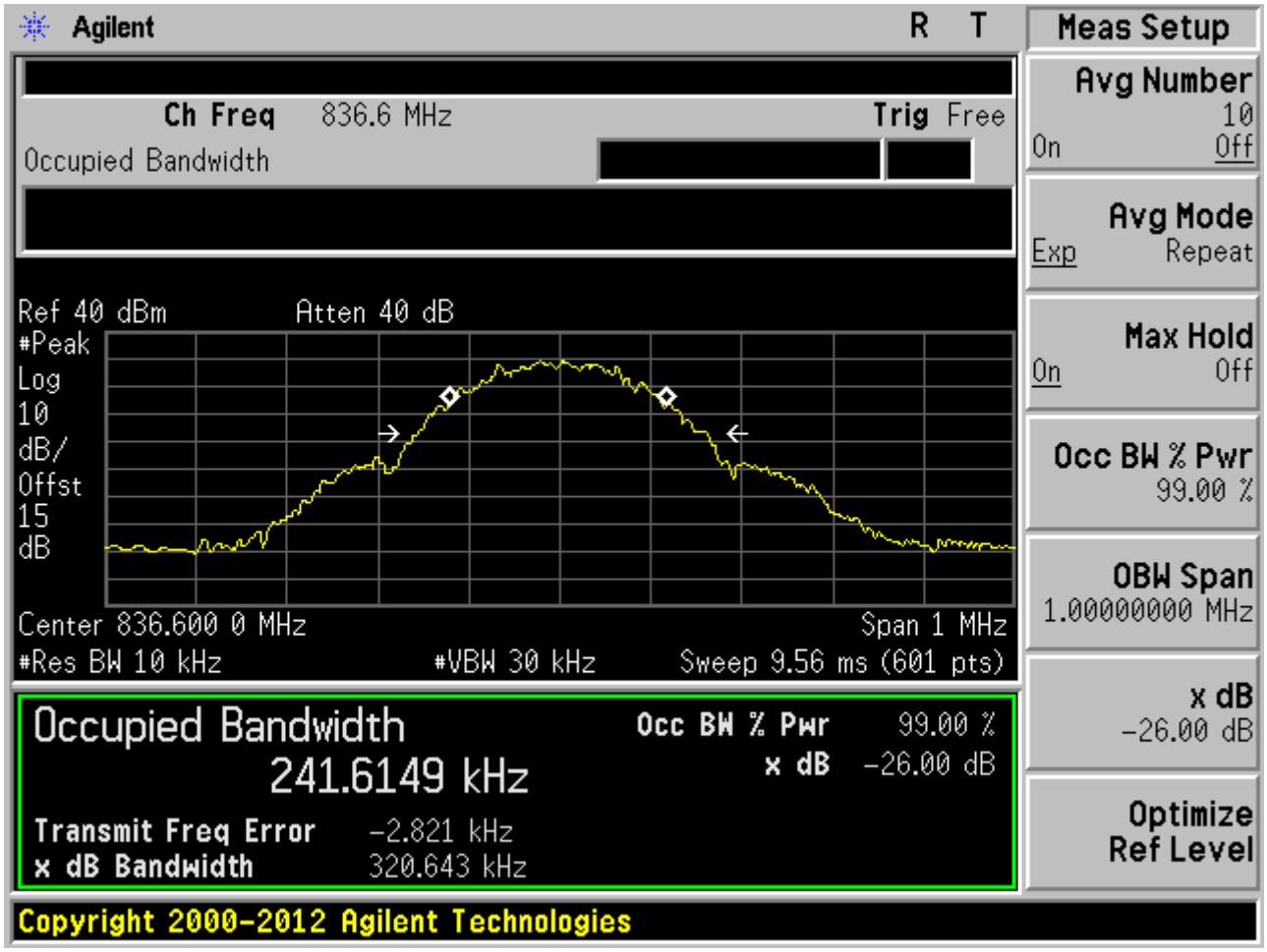
GSM 850MHz Channel = 251



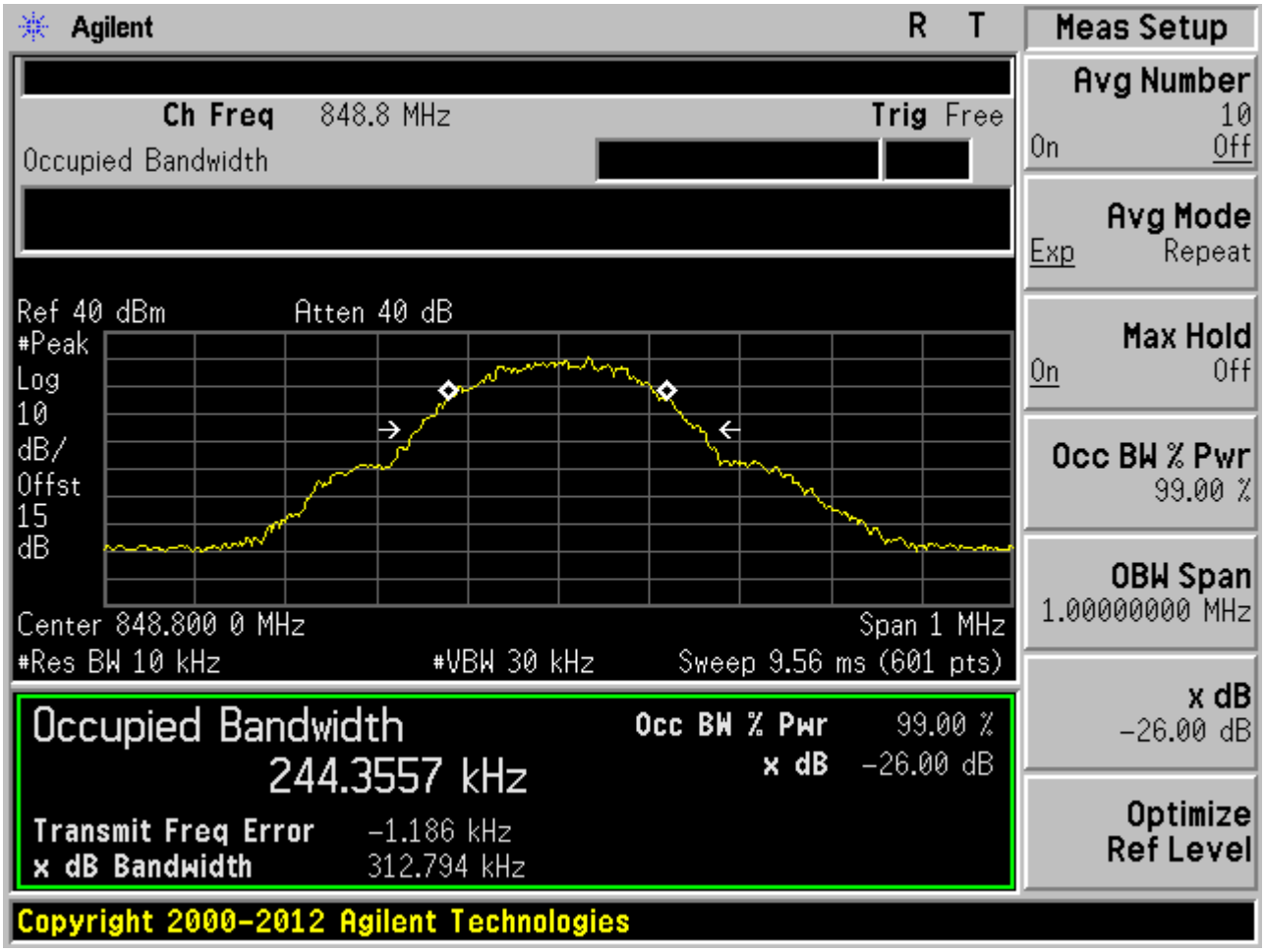
GSM850 EDGE Class8 Channel = 128



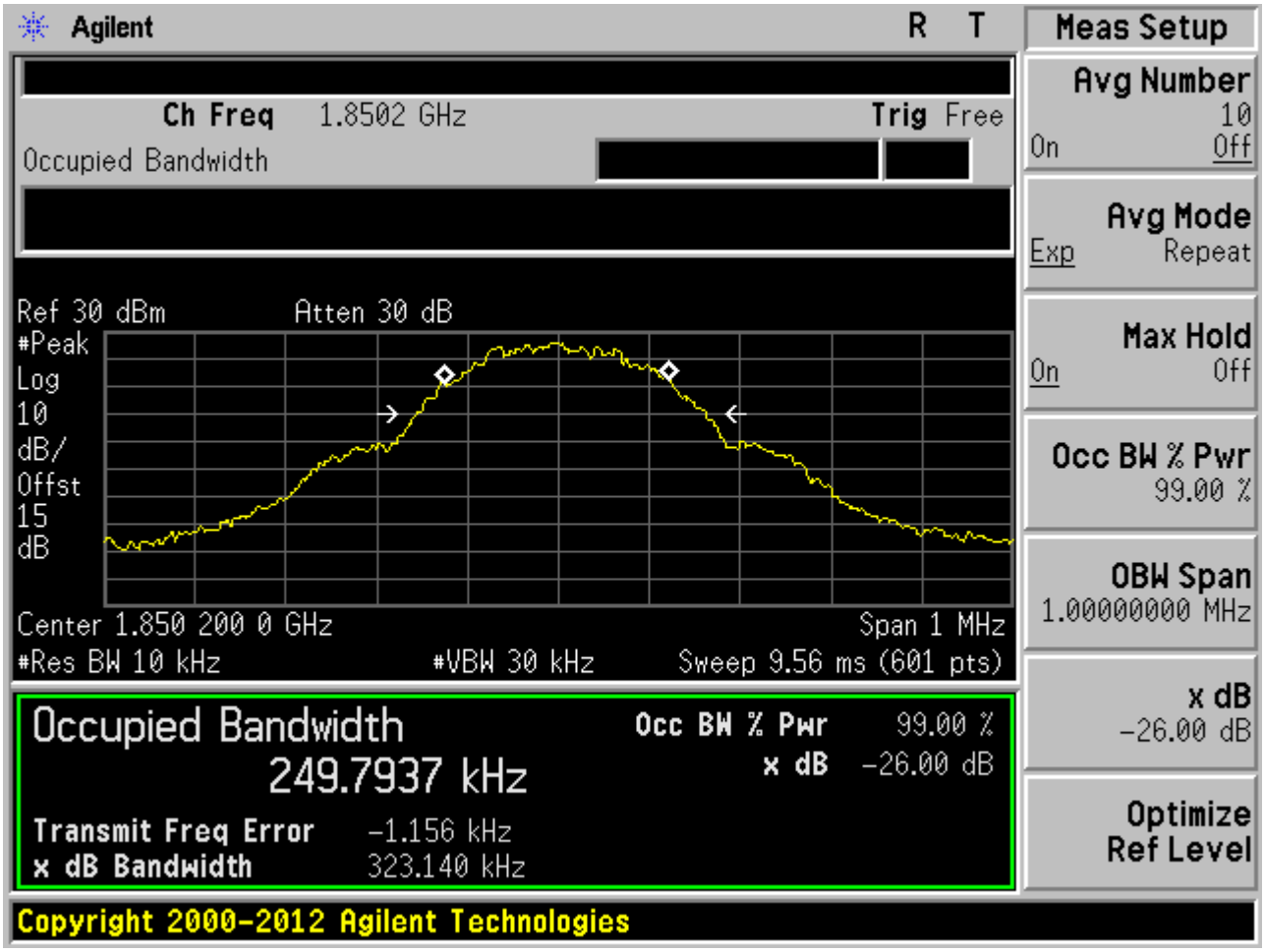
GSM850 EDGE Class8 EDGE Channel = 190



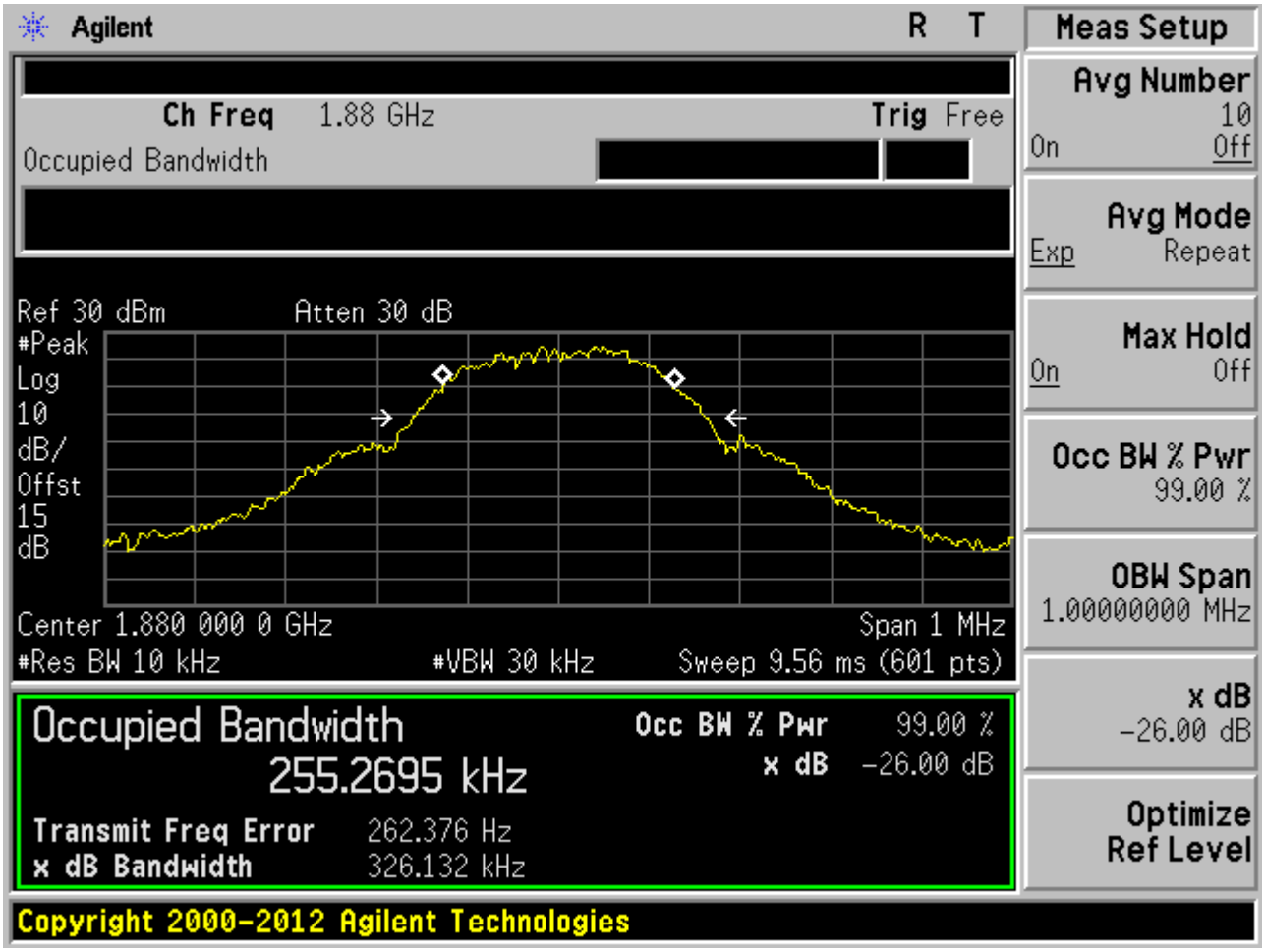
GSM850 EDGE Class8 EDGE Channel = 251



GSM 1900MHz Channel = 512



GSM 1900MHz Channel = 661



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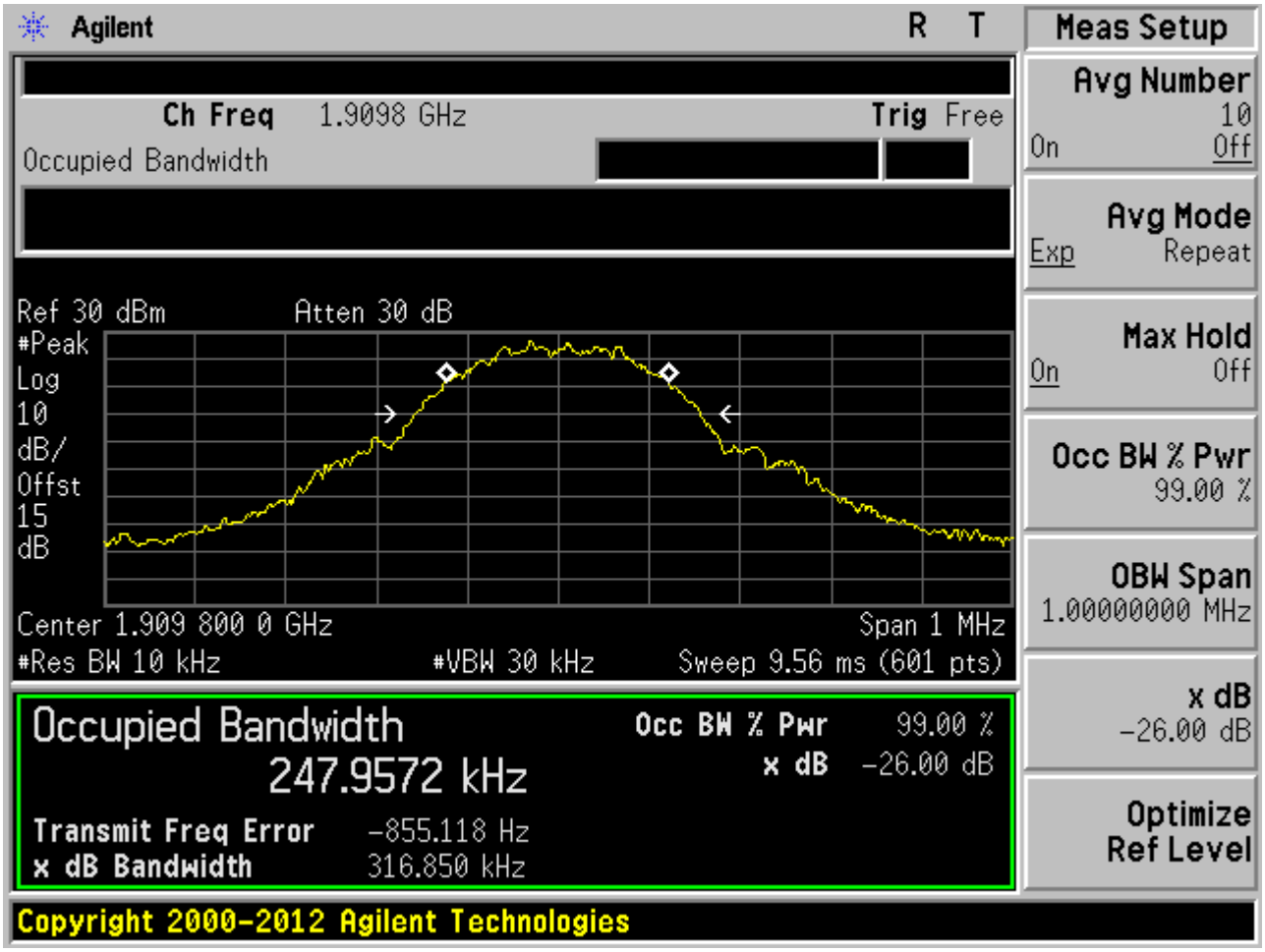
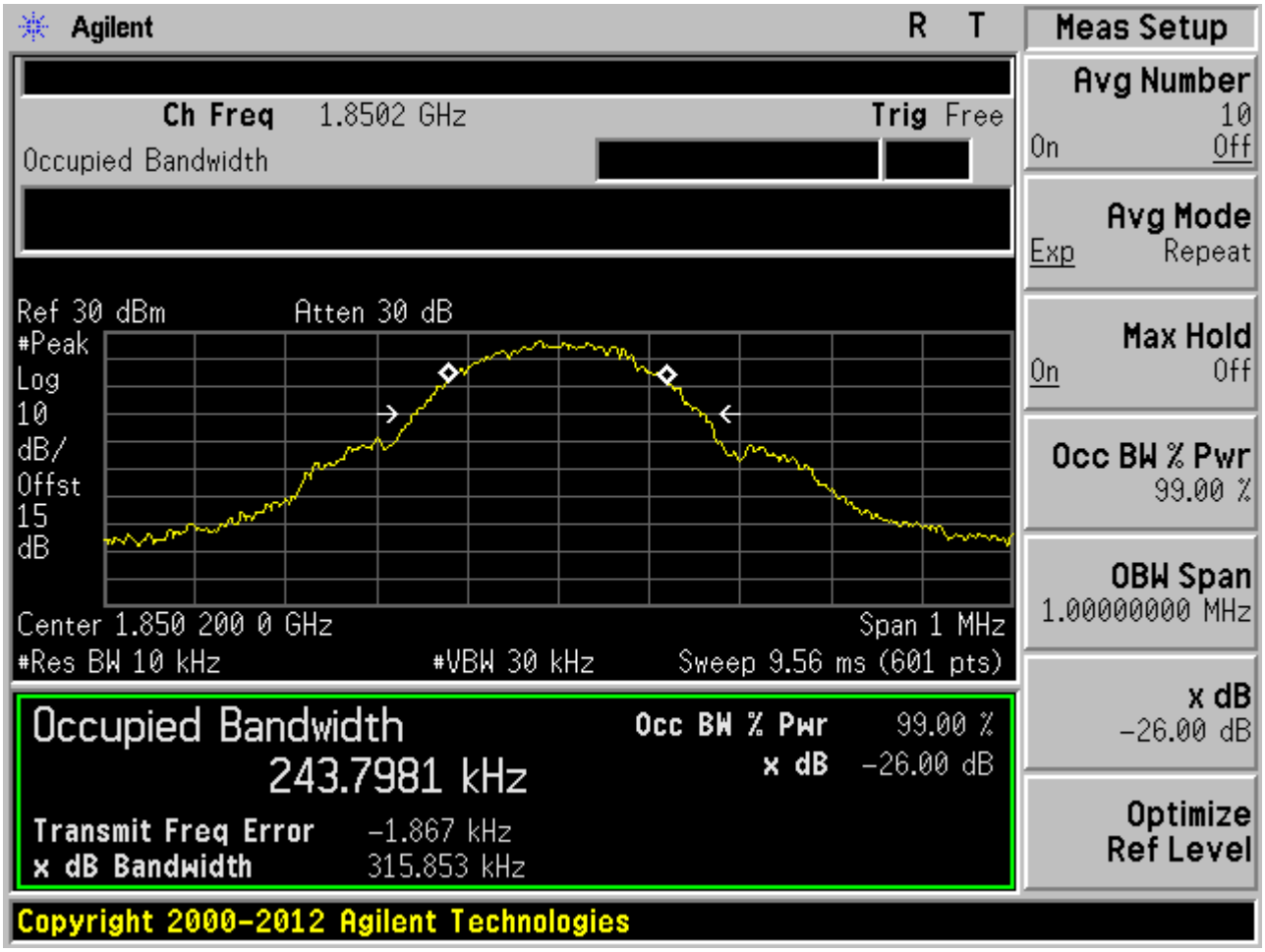
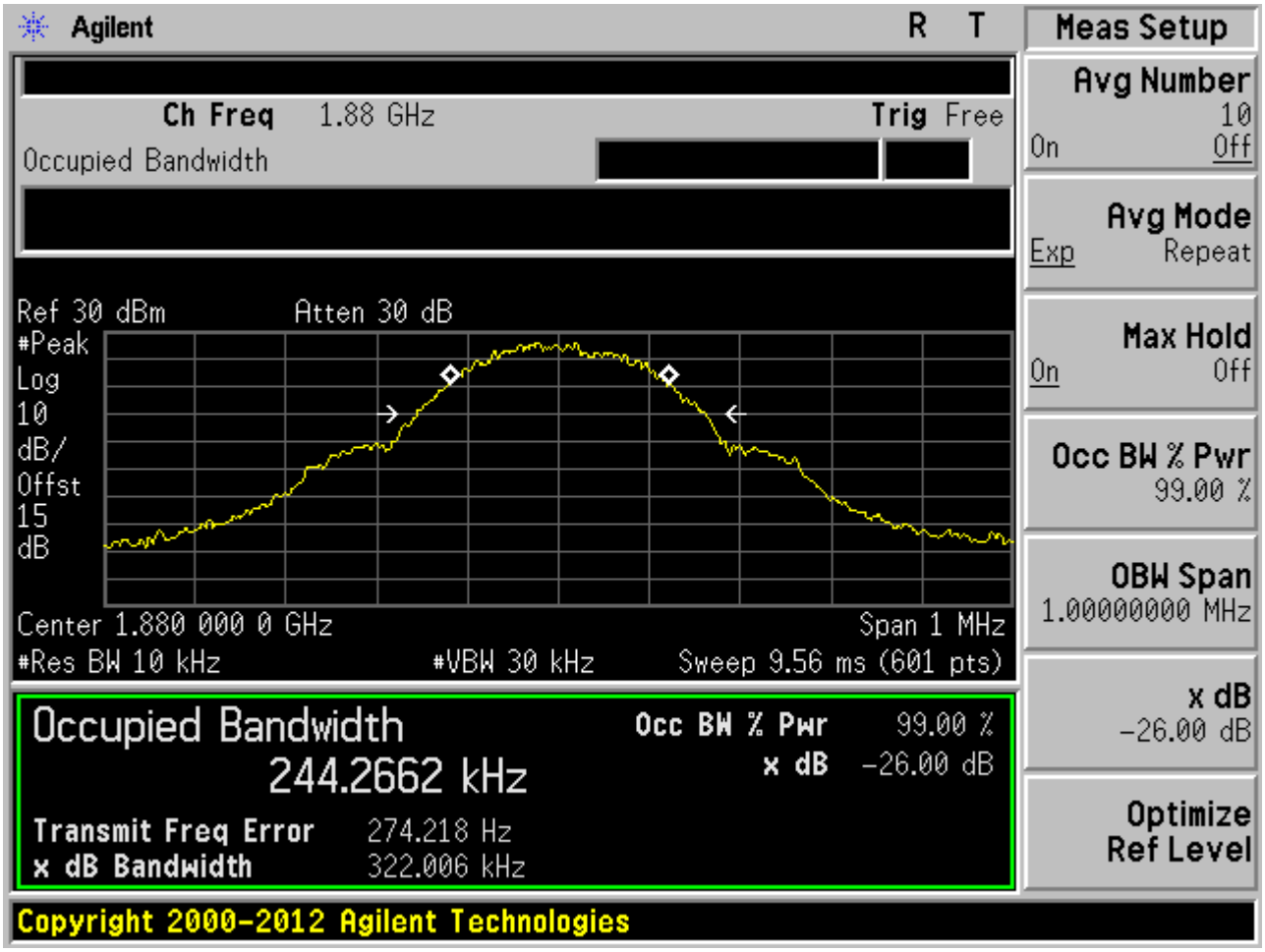


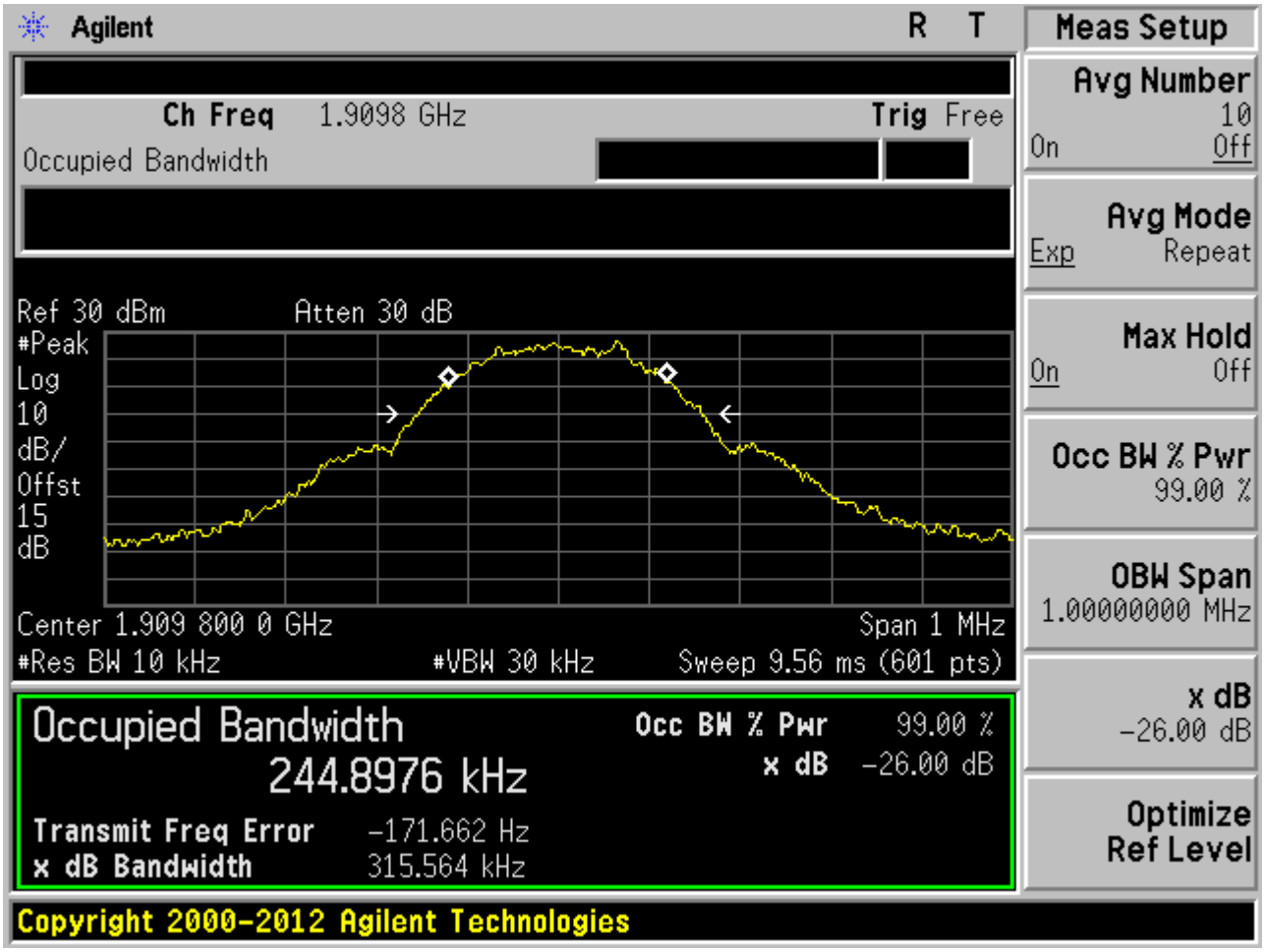
GSM1900 EDGE Class8 Channel =512



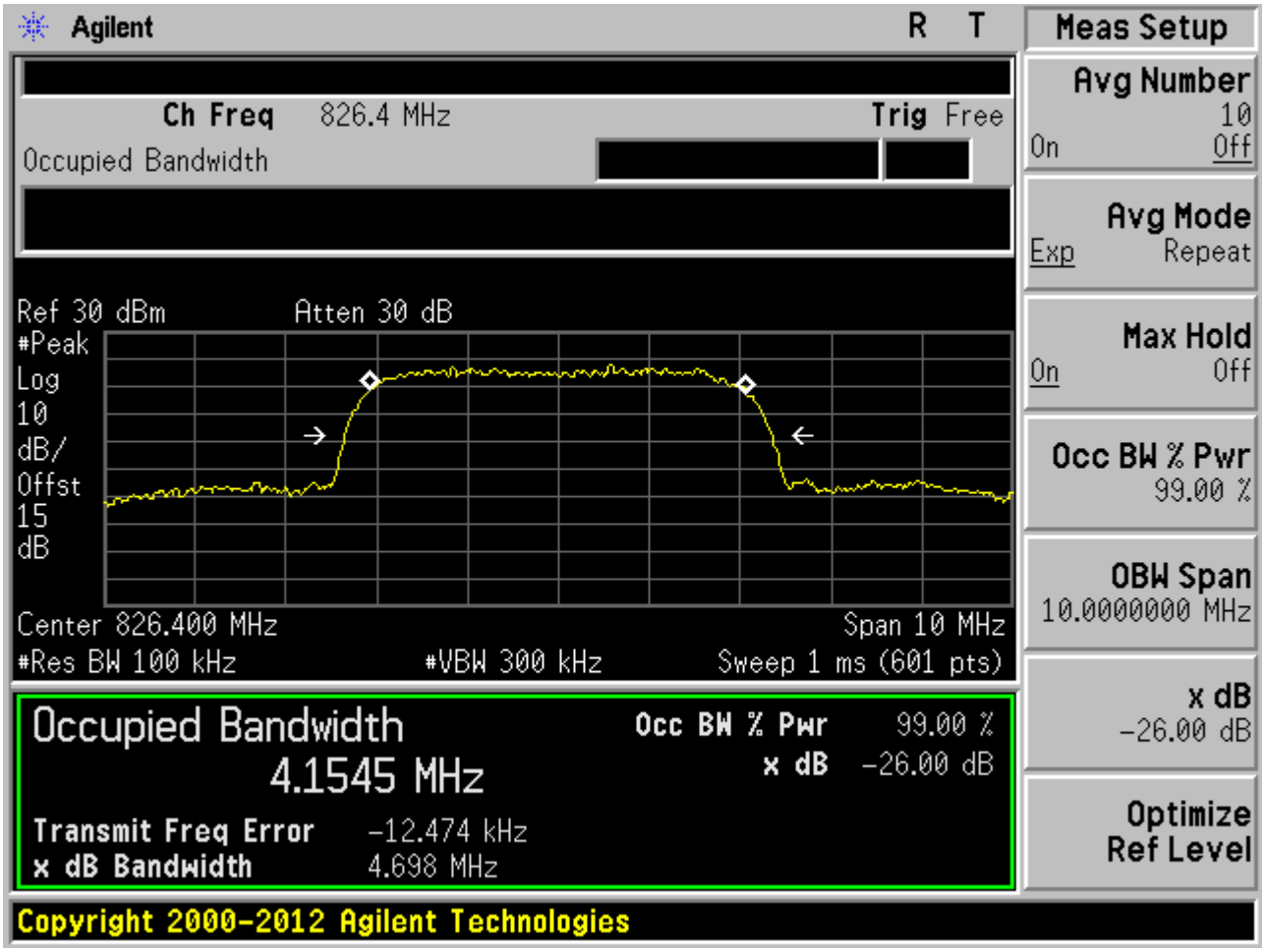
GSM1900 EDGE Class8 Channel =661



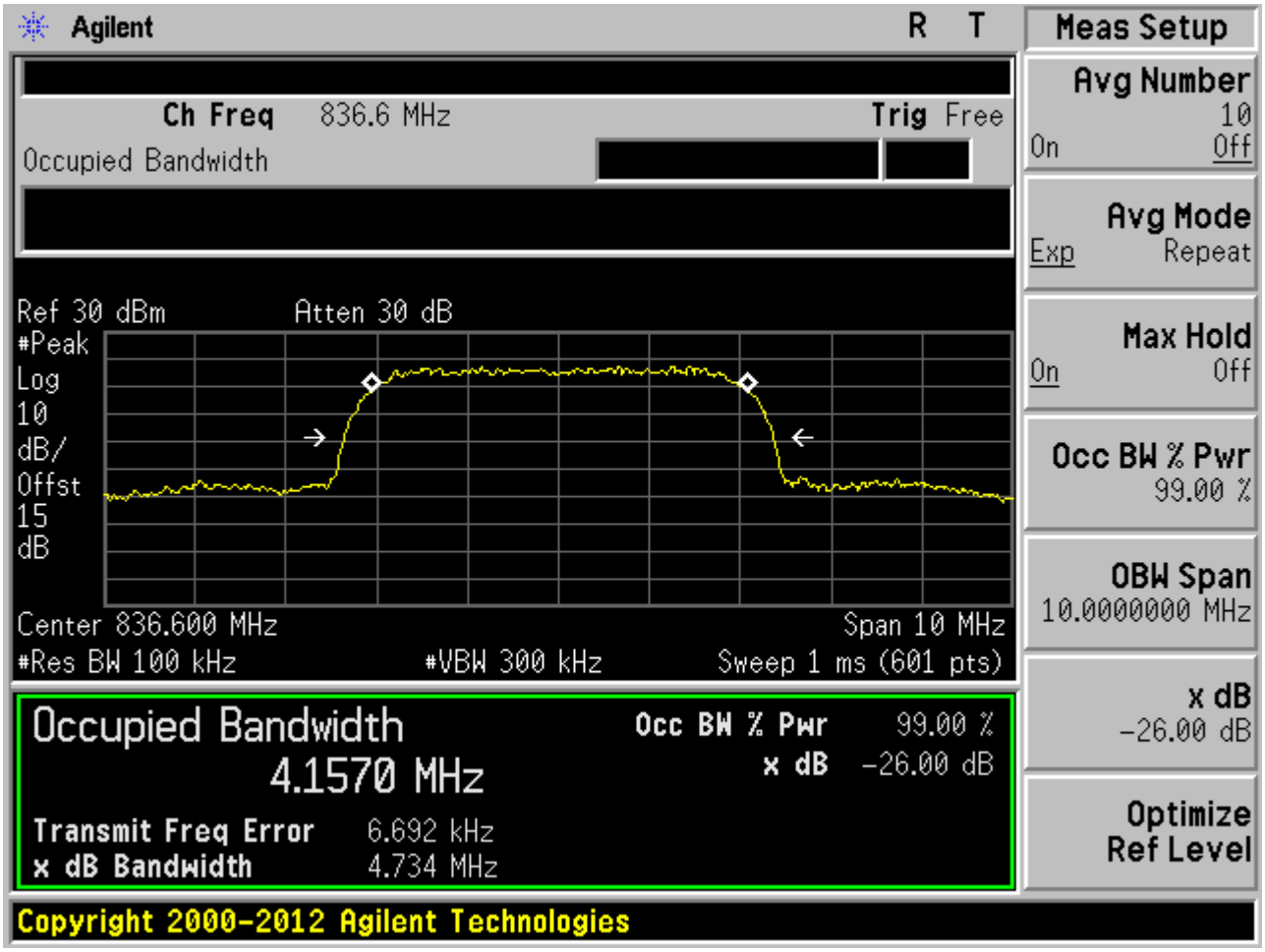
GSM1900 EDGE Class8 Channel =810



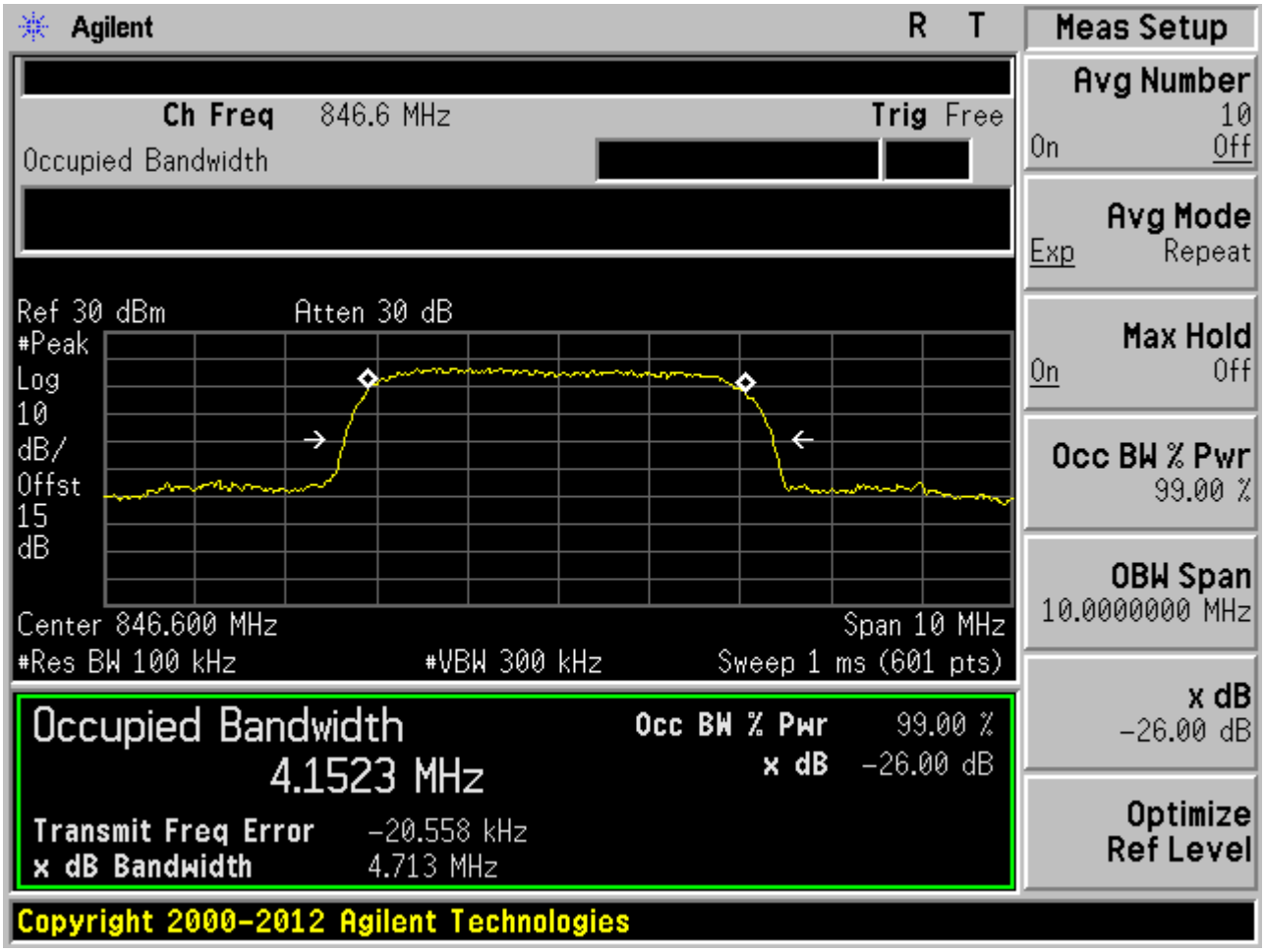
WCDMA 850MHz Channel = 4132



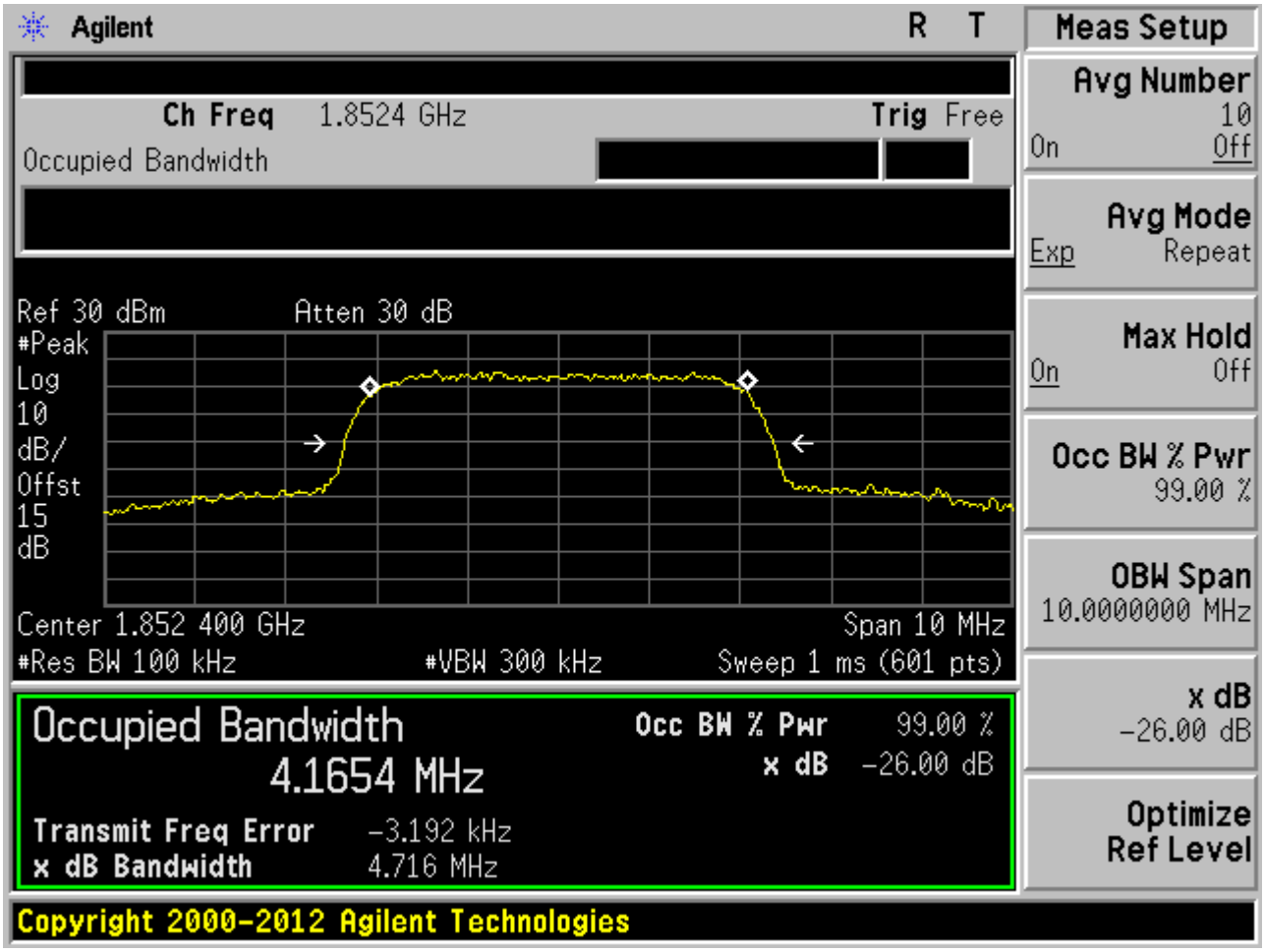
WCDMA 850MHz Channel = 4182



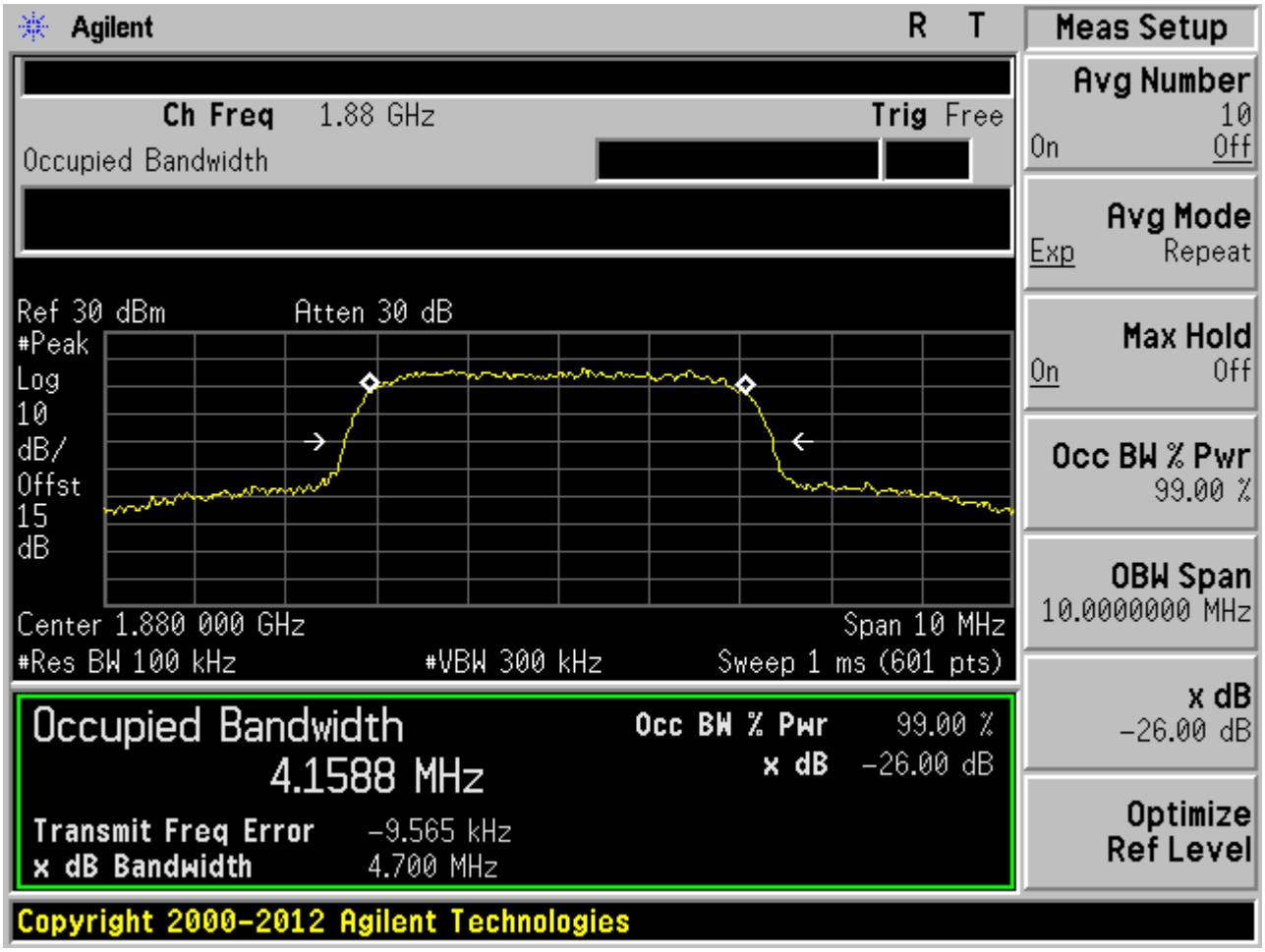
WCDMA 850MHz Channel = 4233



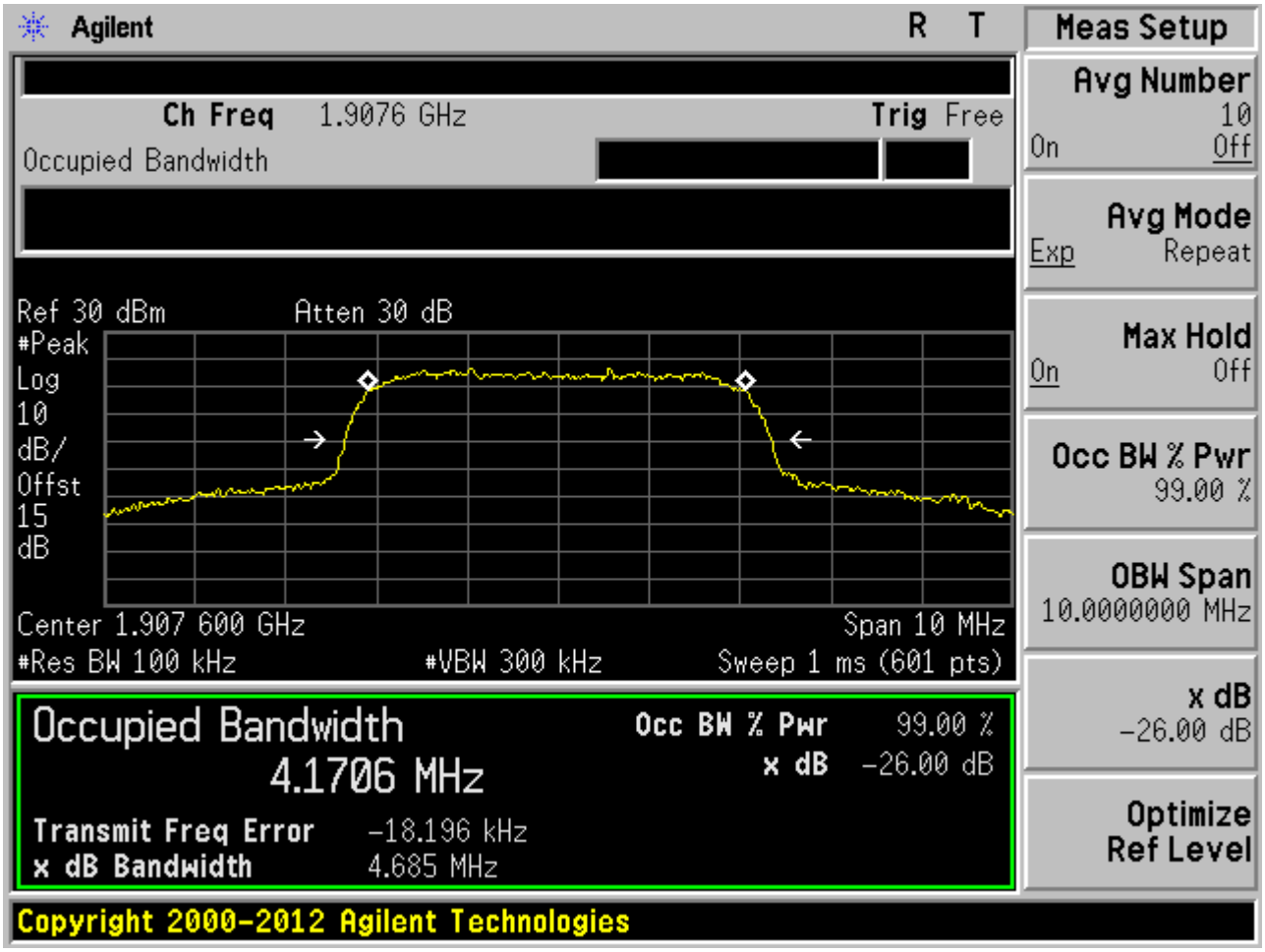
WCDMA 1900MHz Channel = 9262



WCDMA 1900MHz Channel = 9400



WCDMA 1900MHz Channel = 9538



3.4 Band Edge Measurement

3.4.1 Description of Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

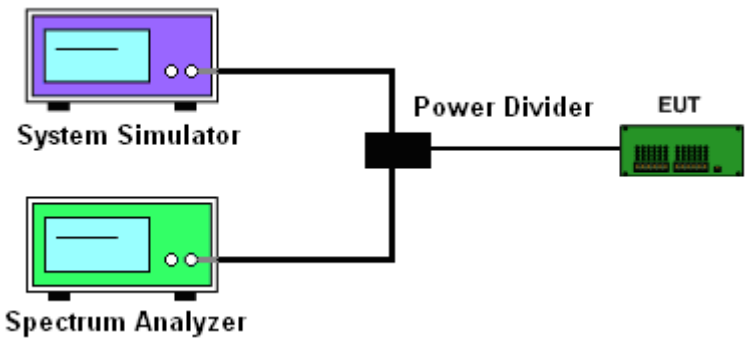
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 43 + 10log (P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

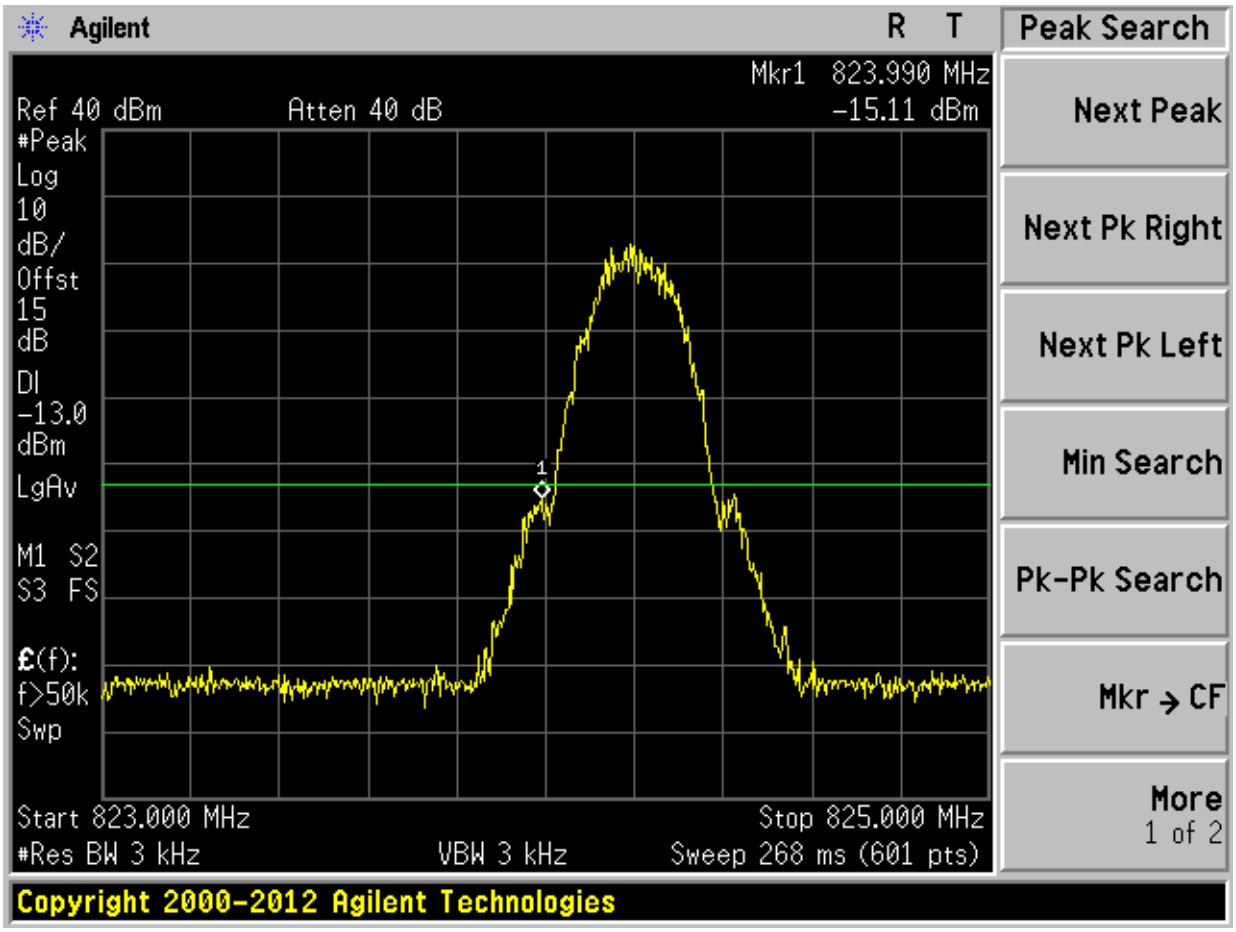
3.4.4 Test Setup



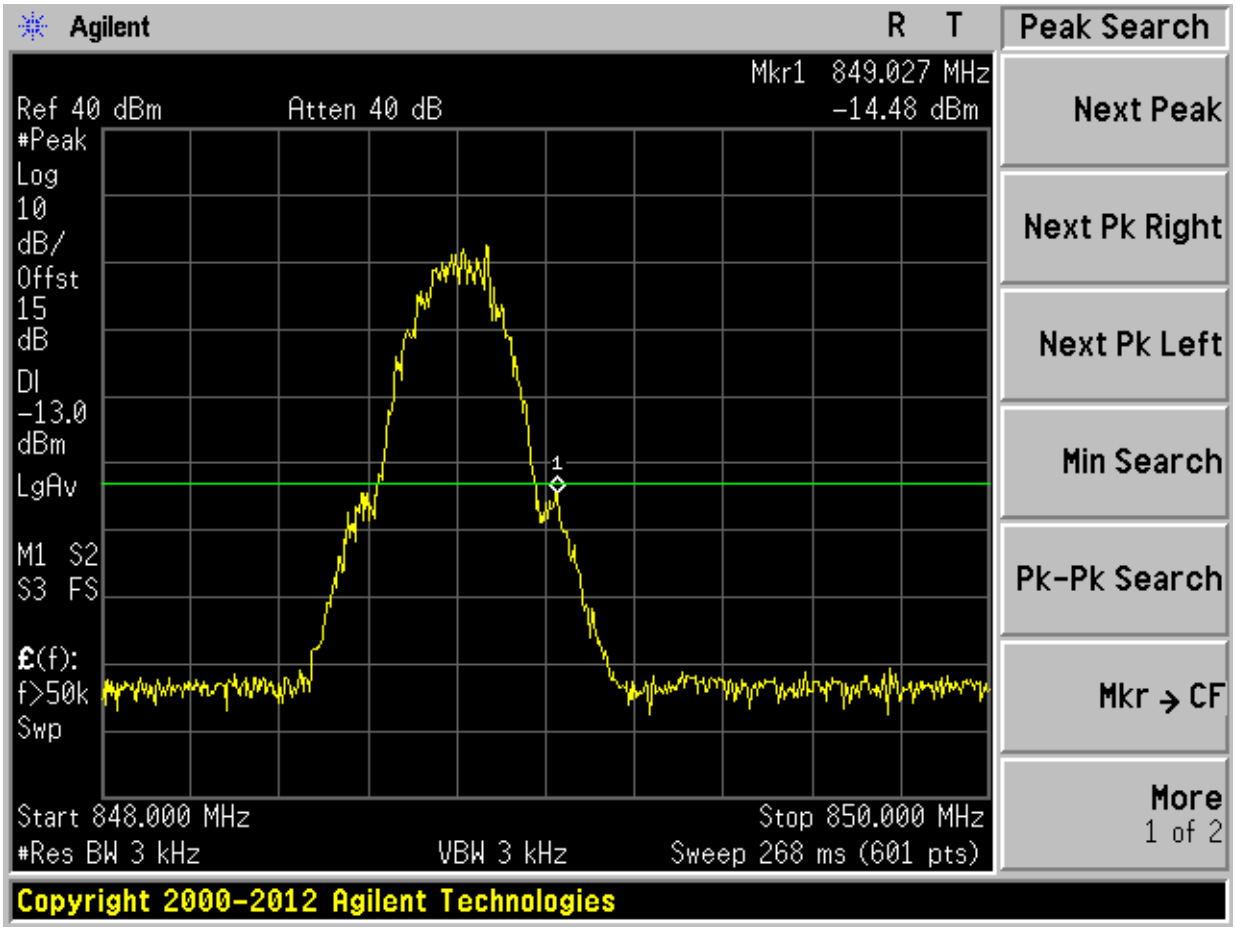
3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	GSM850	**Power Stage :**	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 128

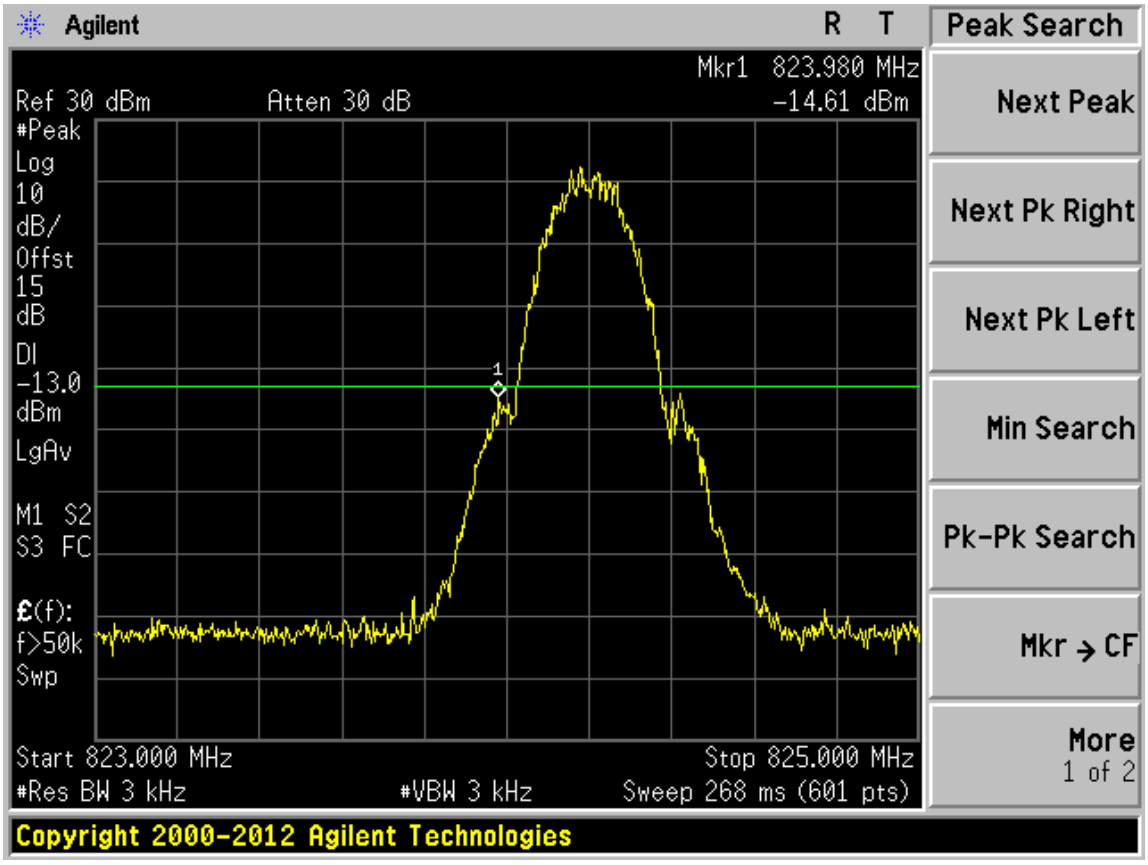


Higher Band Edge Plot on Channel 251

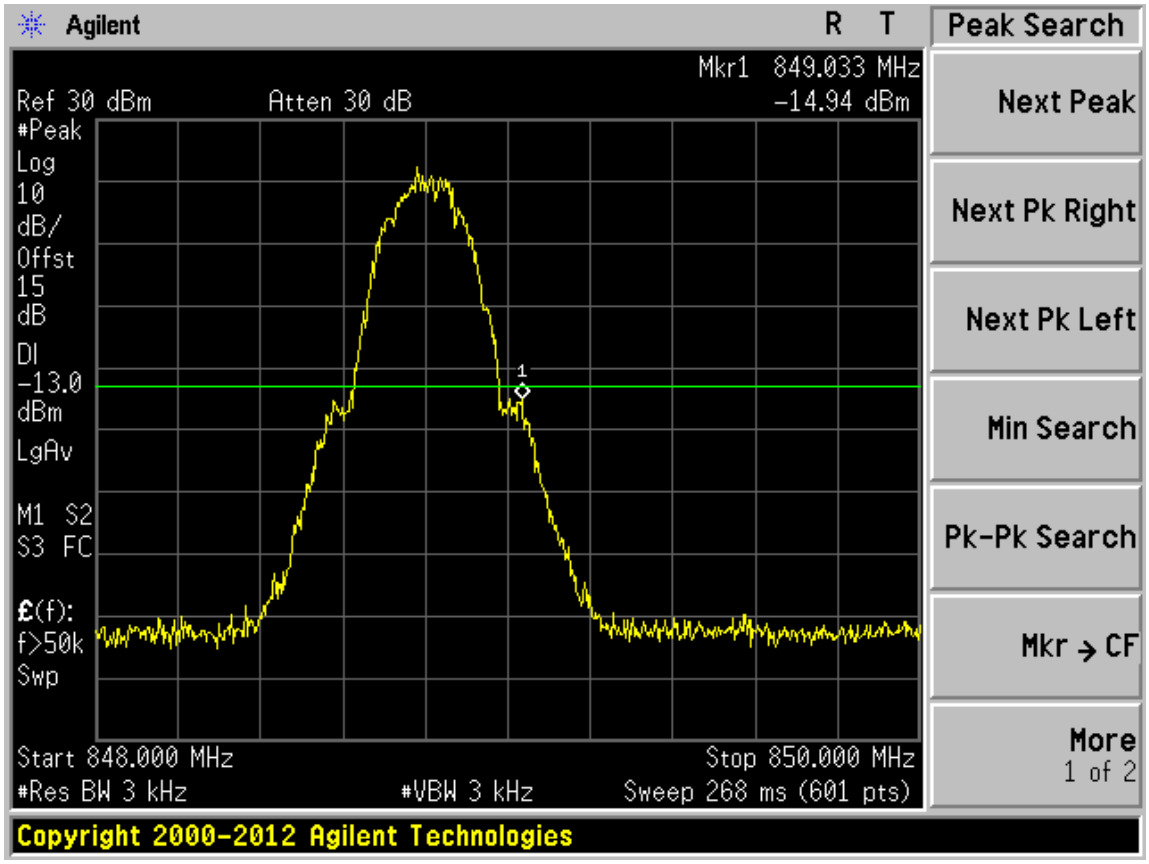


Band :	GSM850	Power Stage :	High
Test Mode :	EDGE Class 8 Link		

Lower Band Edge Plot on Channel 128

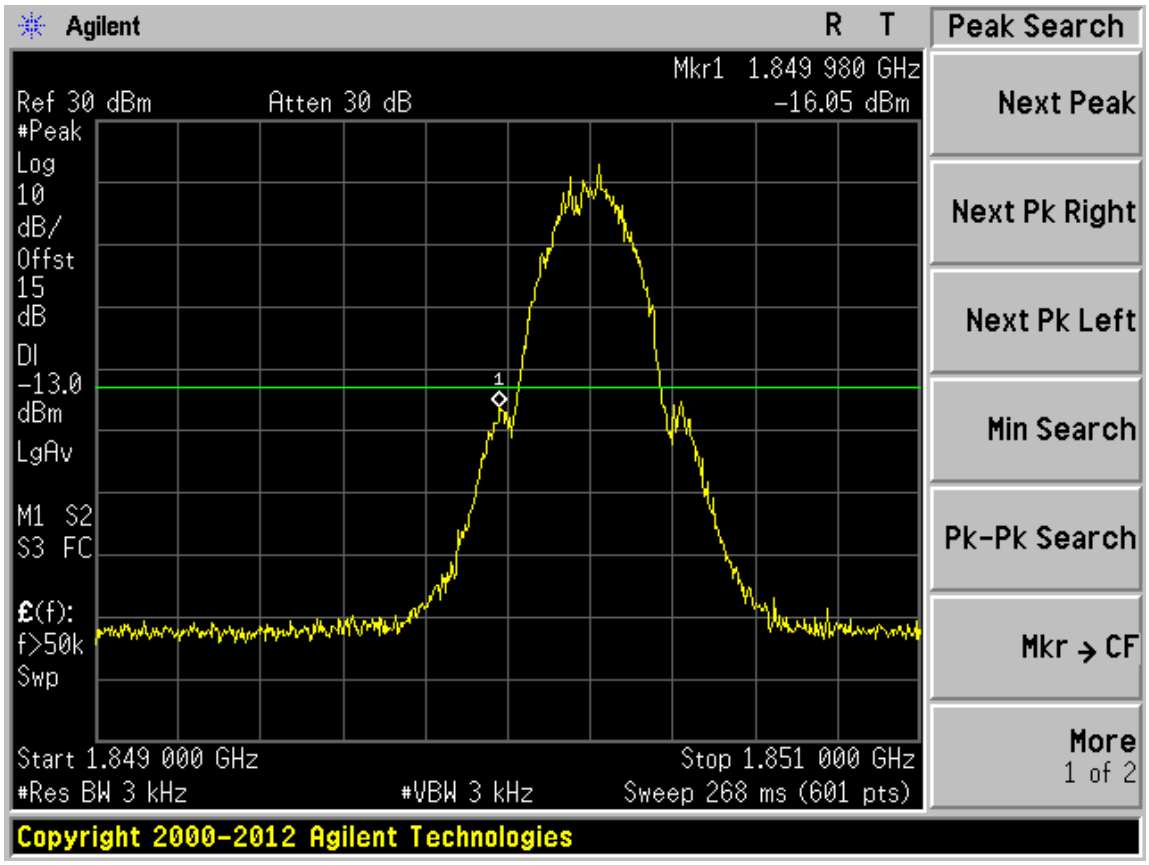


Higher Band Edge Plot on Channel 251

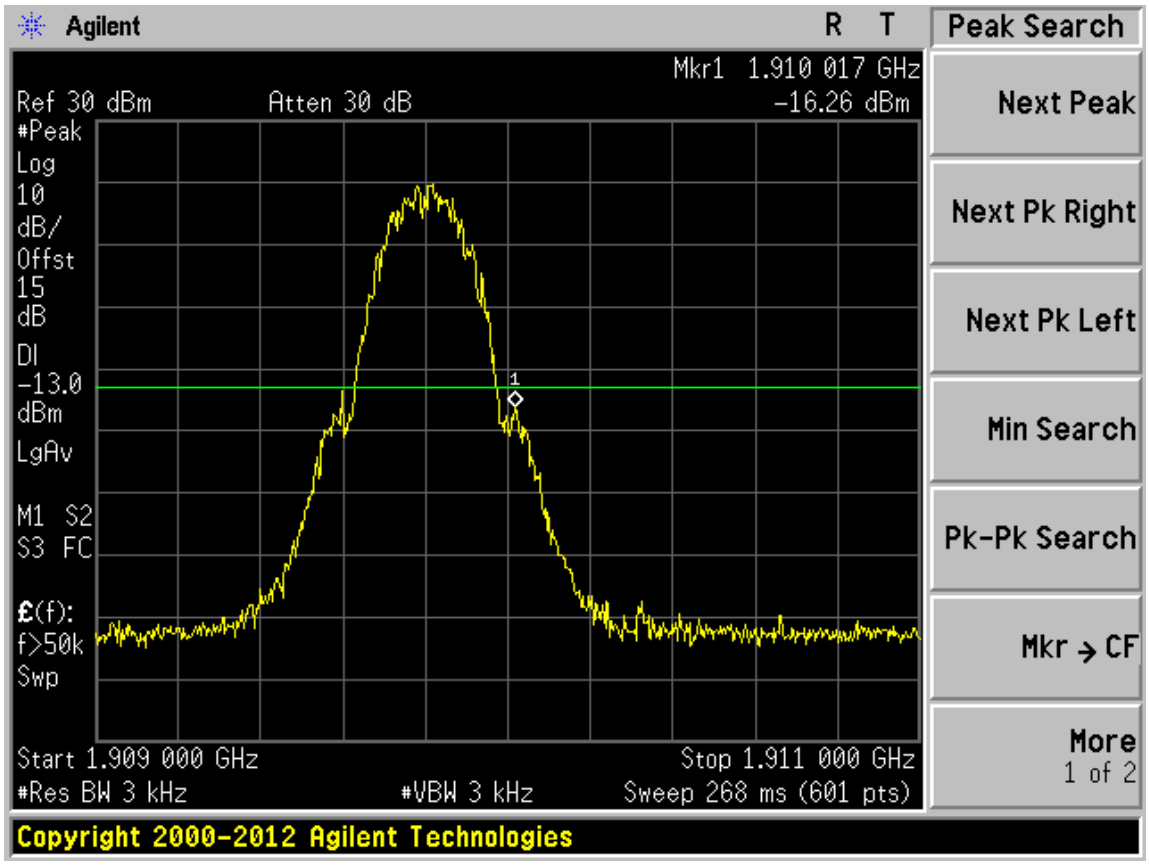


Band :	GSM1900	**Power Stage :**	High
Test Mode :	GSM Link		

Lower Band Edge Plot on Channel 512

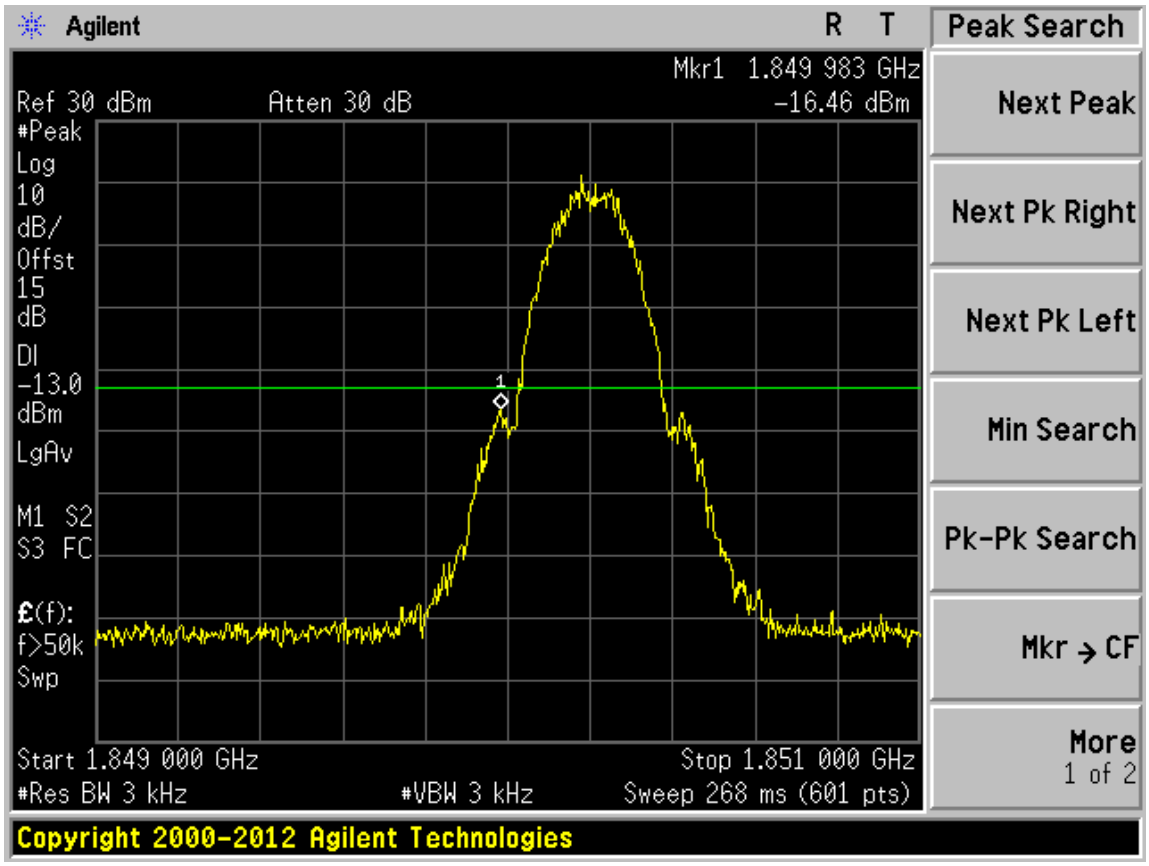


Higher Band Edge Plot on Channel 810

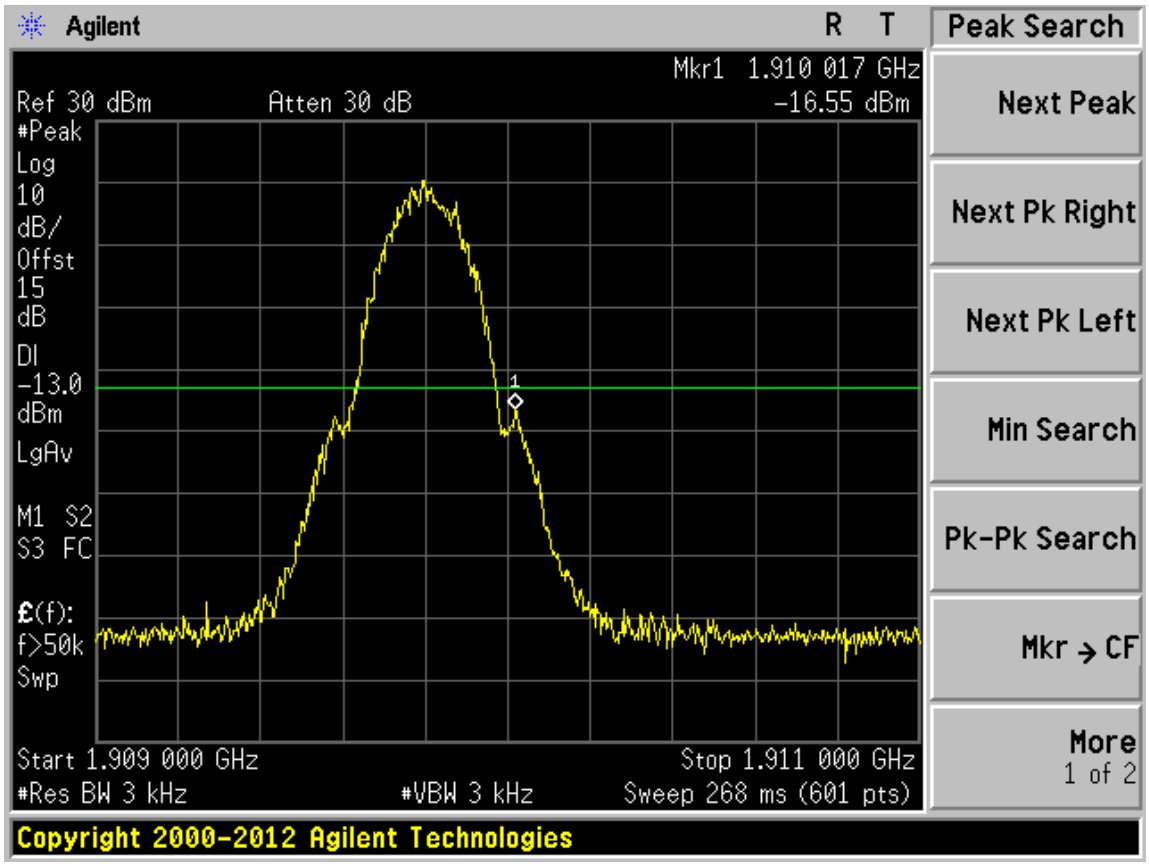


Band :	GSM1900	Power Stage :	High
Test Mode :	EDGE Class 8 Link		

Lower Band Edge Plot on Channel 512

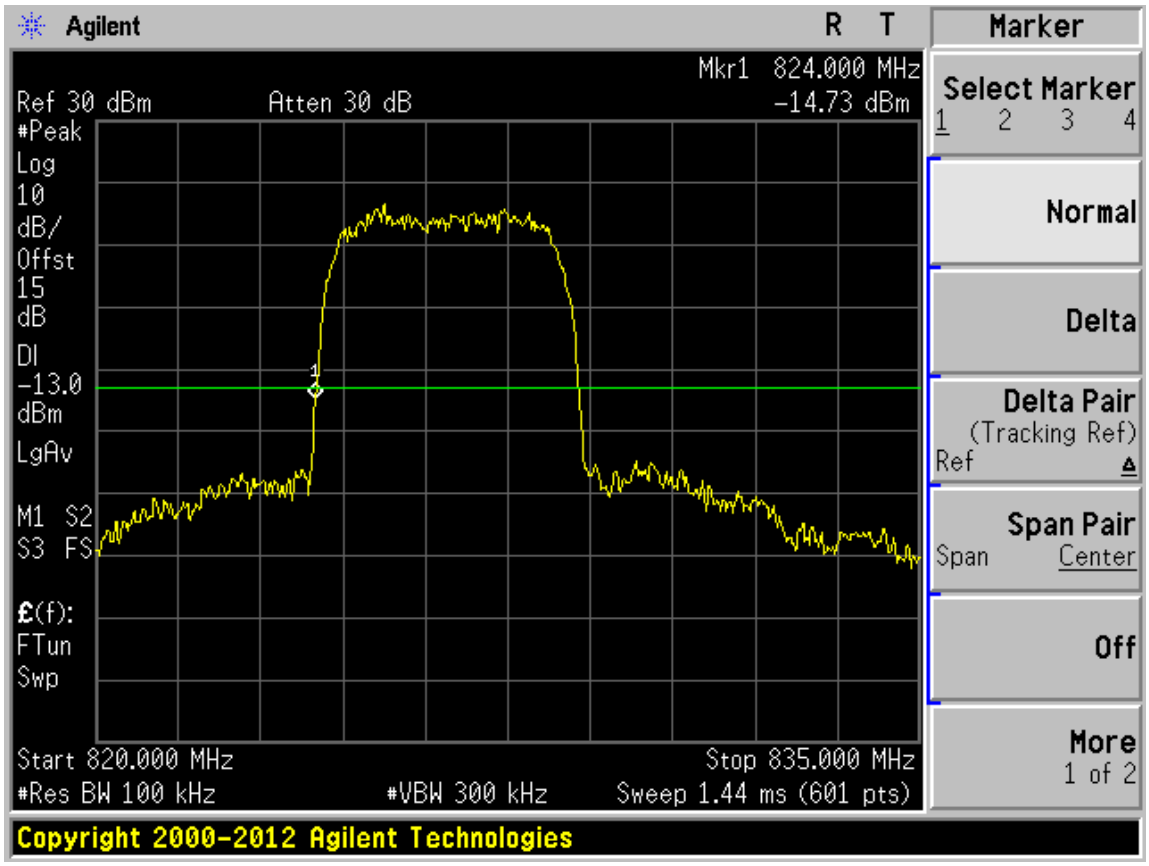


Higher Band Edge Plot on Channel 810

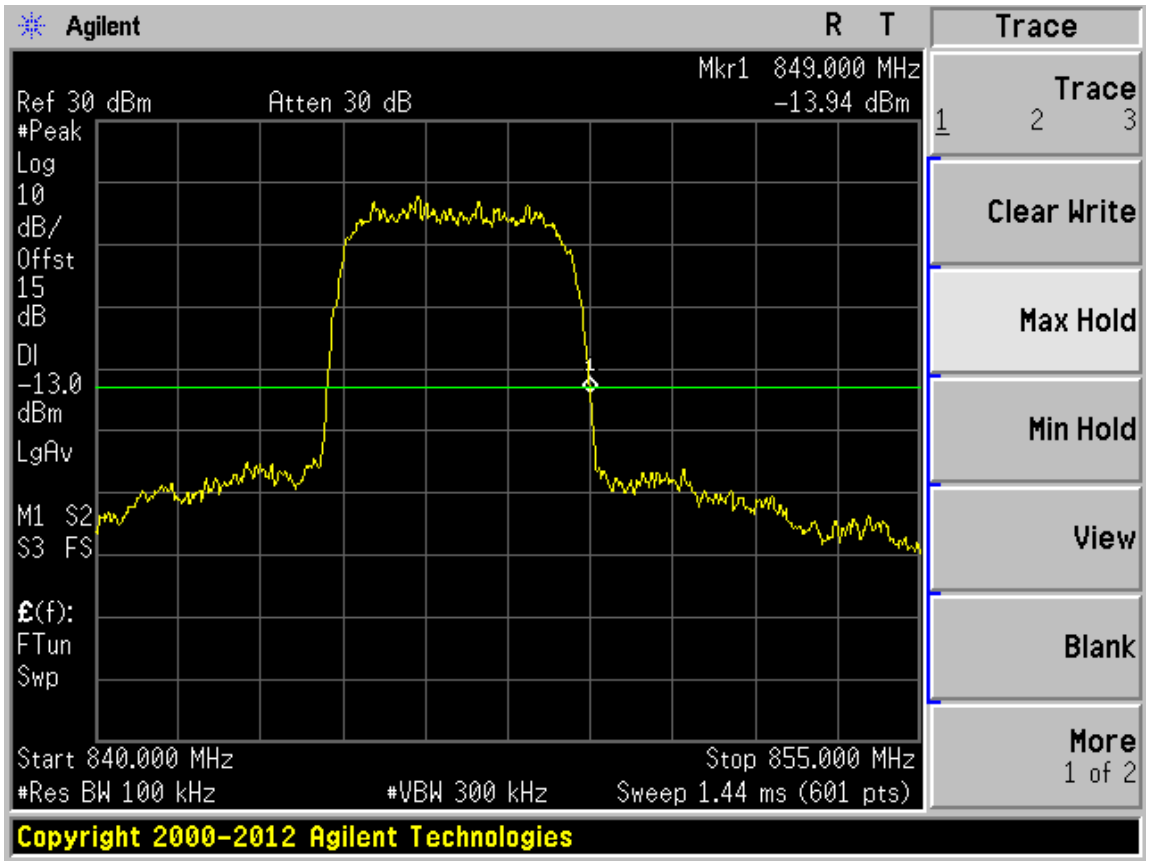


Band :	WCDMA Band V	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link		

Lower Band Edge Plot on Channel 4132

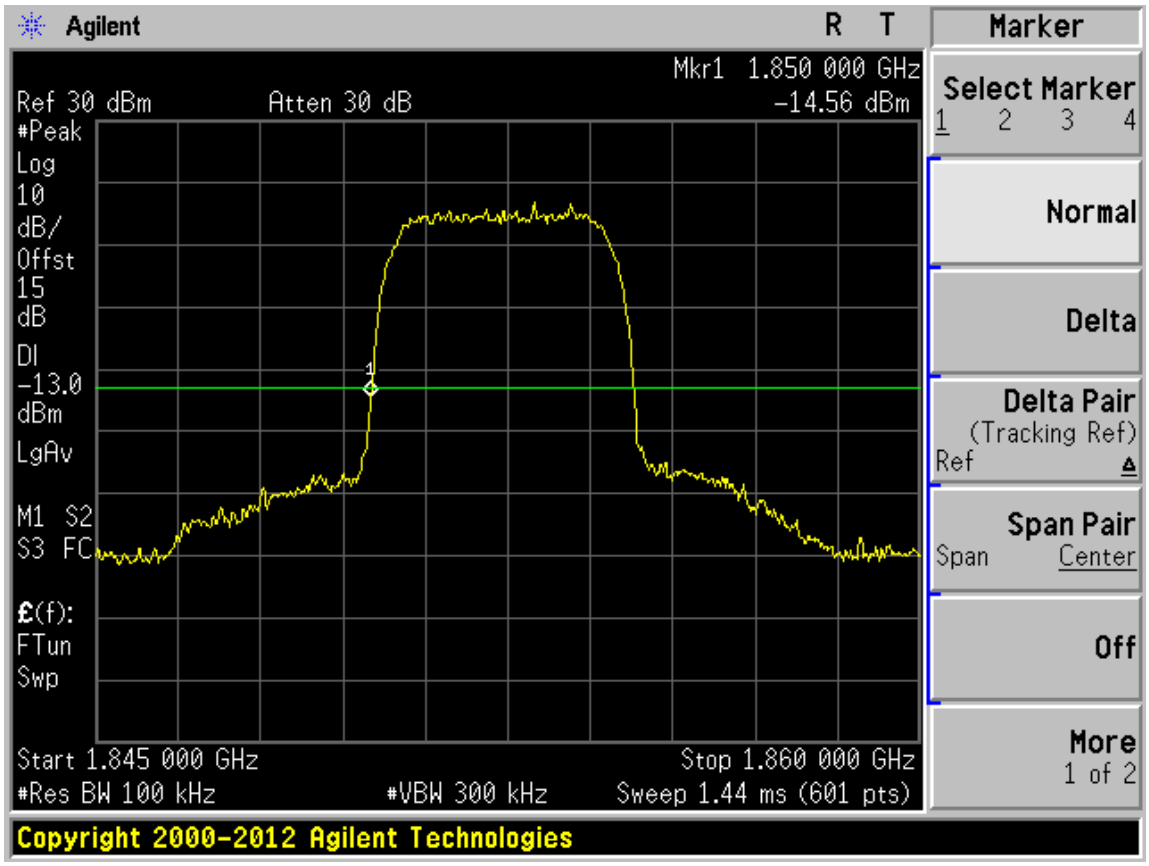


Higher Band Edge Plot on Channel 4233

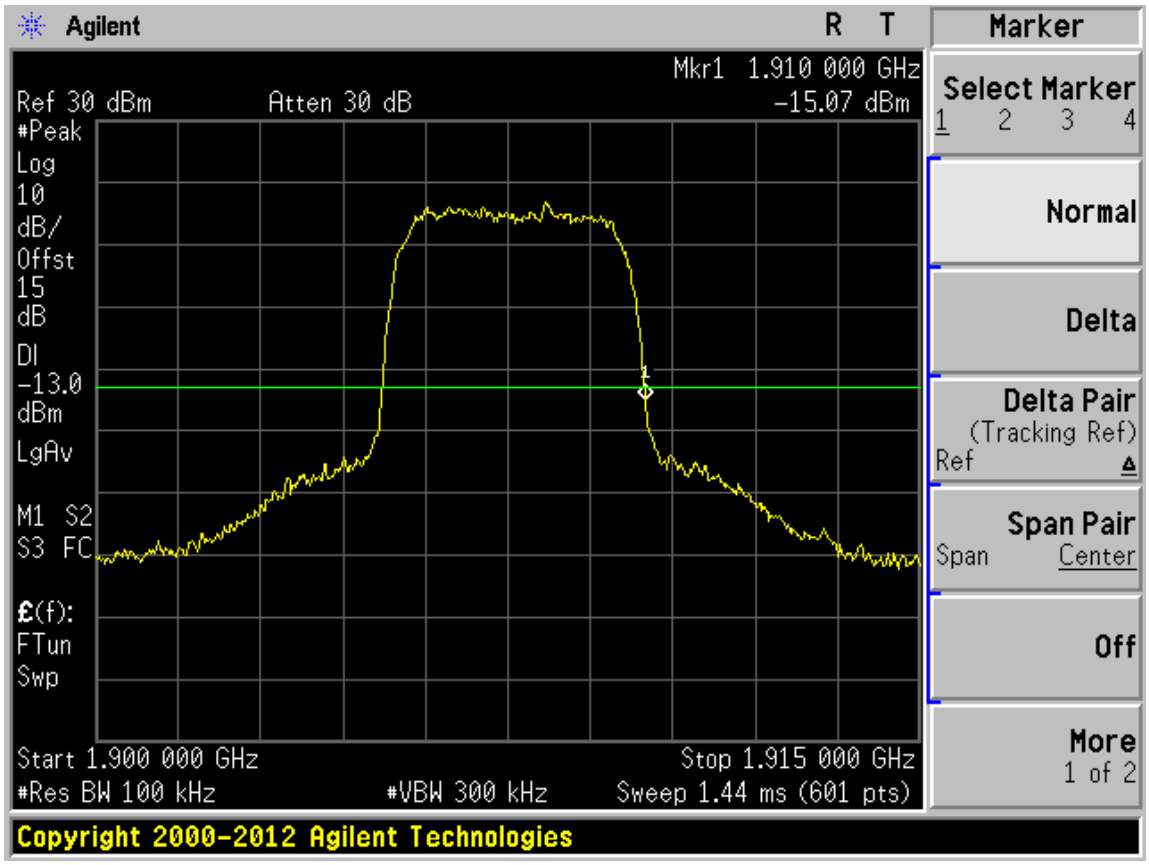


Band :	WCDMA Band II	Power Stage :	High
Test Mode :	RMC 12.2Kbps Link		

Lower Band Edge Plot on Channel 9262



Higher Band Edge Plot on Channel 9538



3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

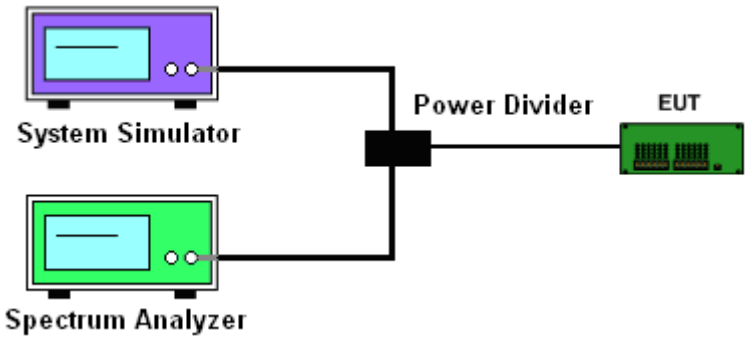
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm

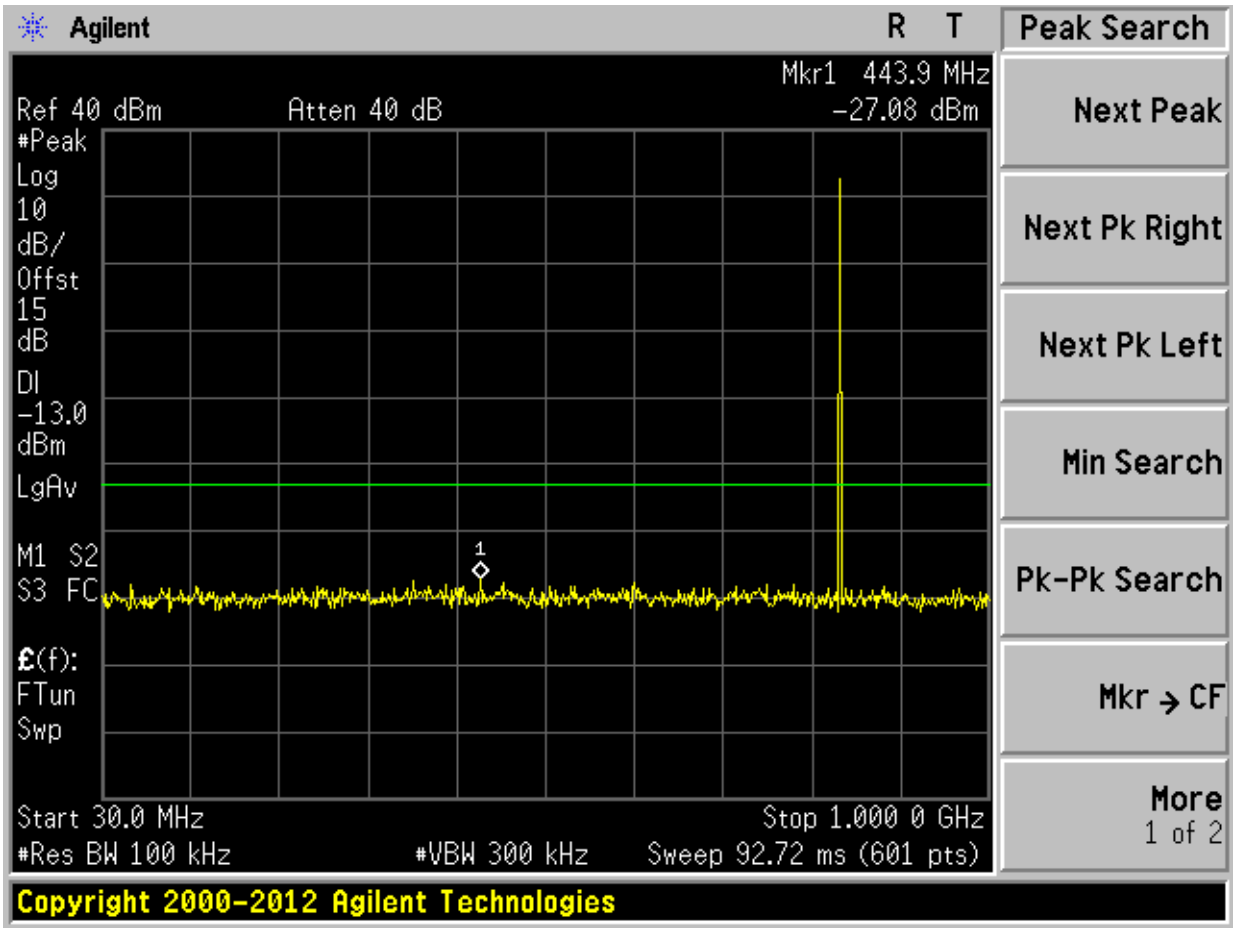
3.5.4 Test Setup



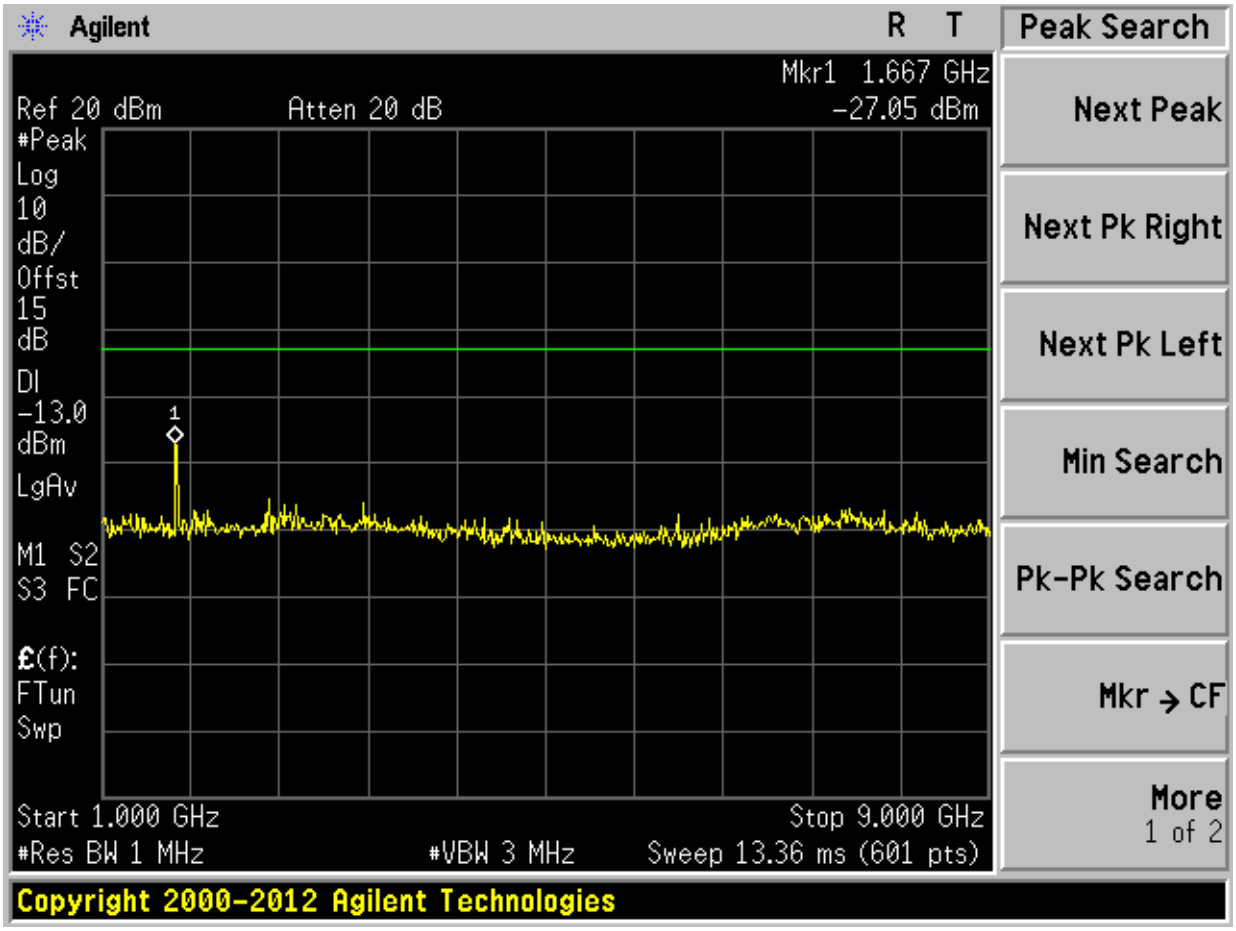
3.5.5 Test Result (Plots) of Conducted Emission

Band :	GSM850	Channel :	CH190
Test Mode :	GSM Link		

Conducted Emission Plot between 30MHz ~ 1GHz

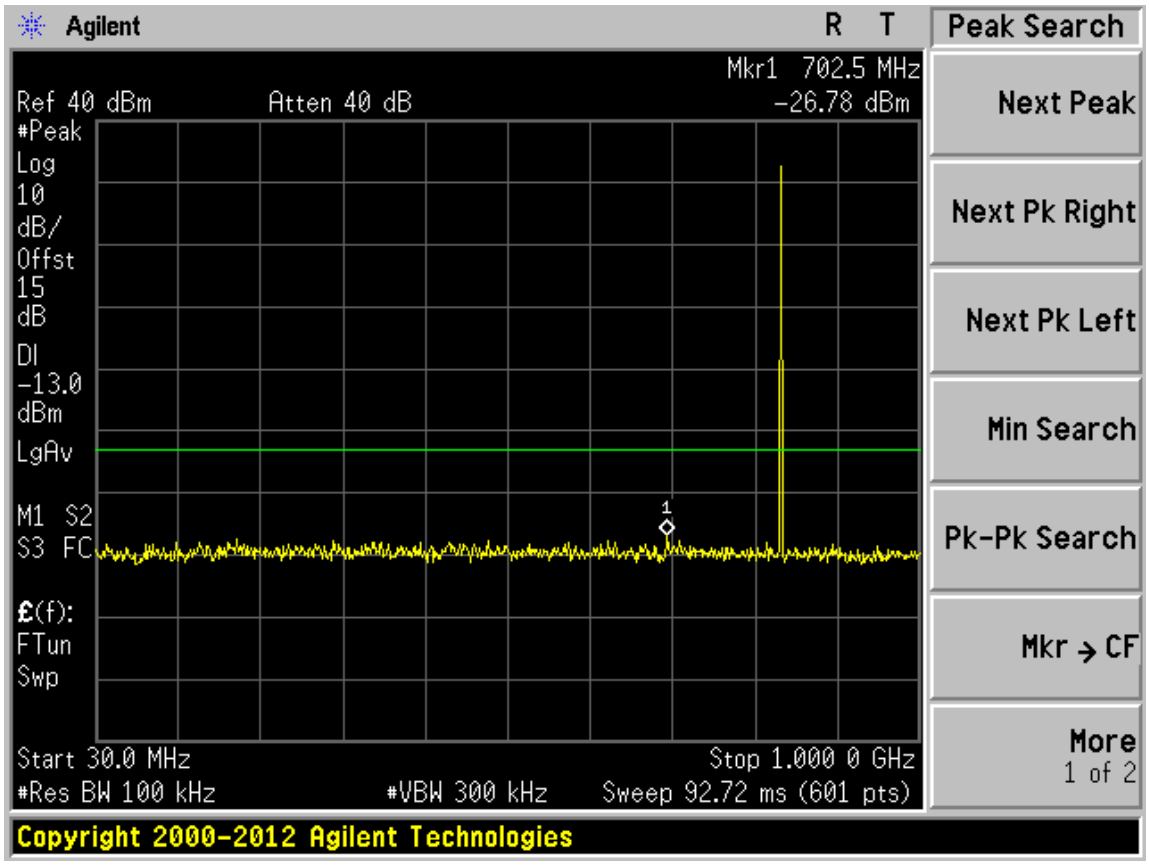


Conducted Emission Plot between 1GHz ~ 9GHz

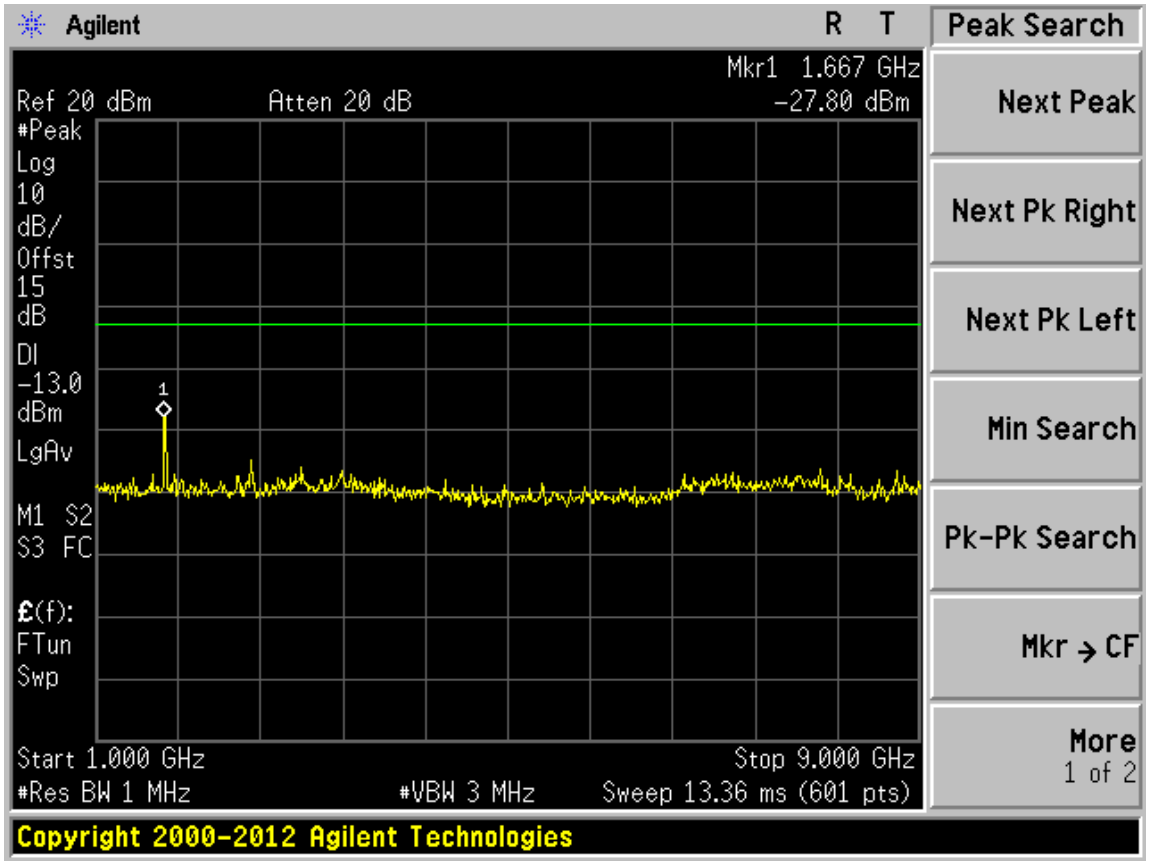


Band :	GSM850	Channel :	CH190
Test Mode :	EDGE Class 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz

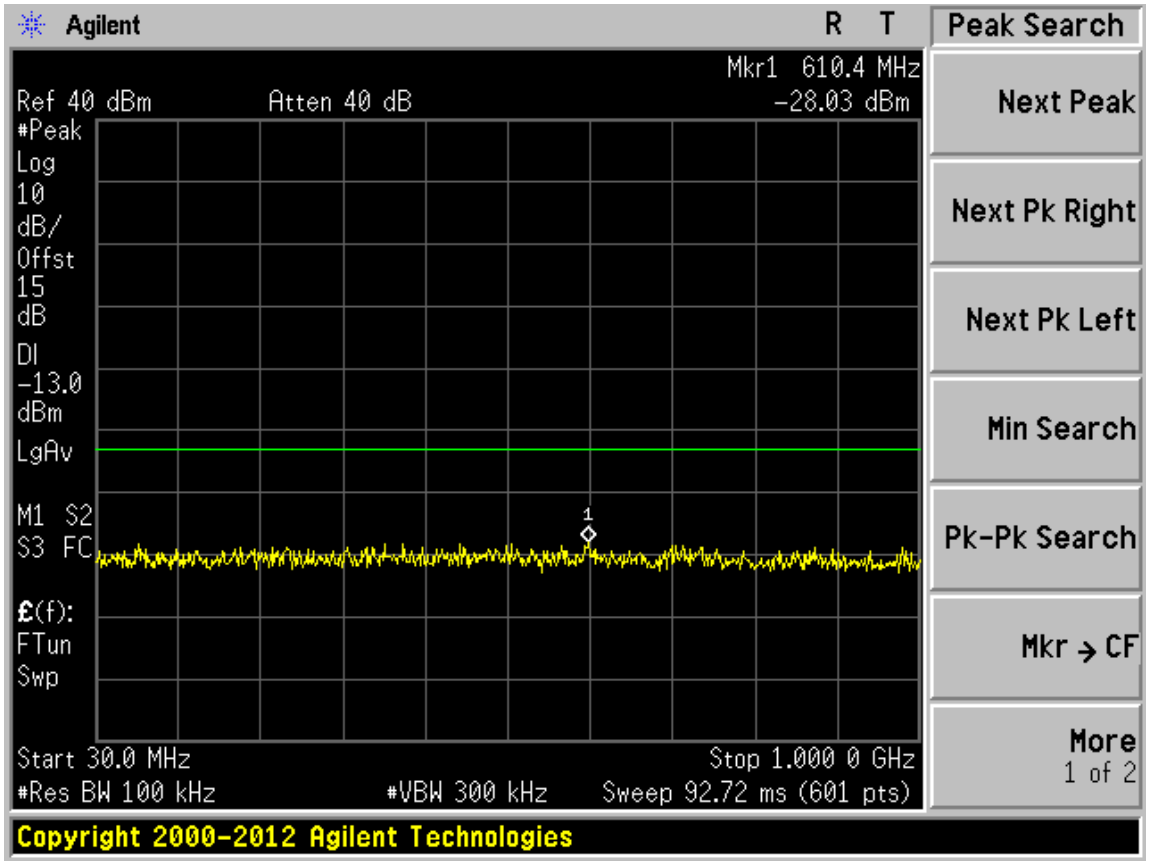


Conducted Emission Plot between 1GHz ~ 9GHz

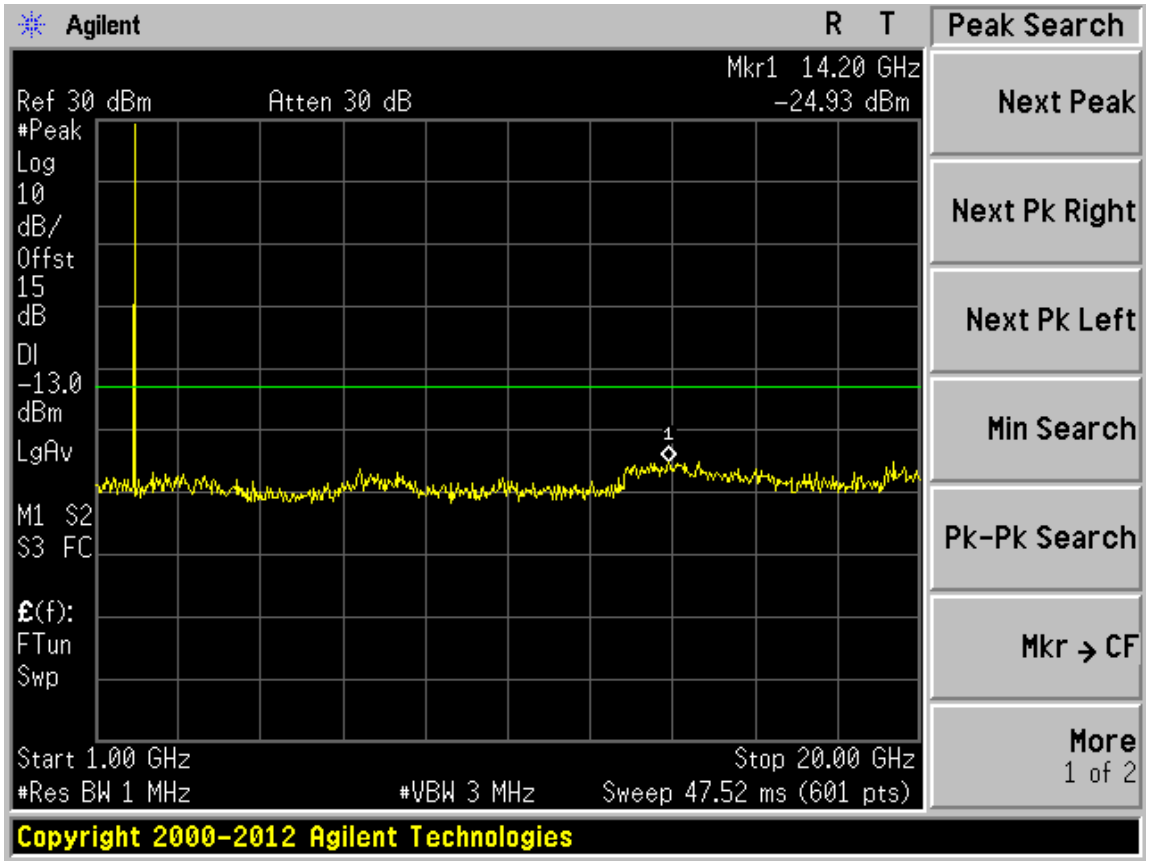


Band :	GSM1900	Channel :	CH661
Test Mode :	GSM Link		

Conducted Emission Plot between 30MHz ~ 1GHz

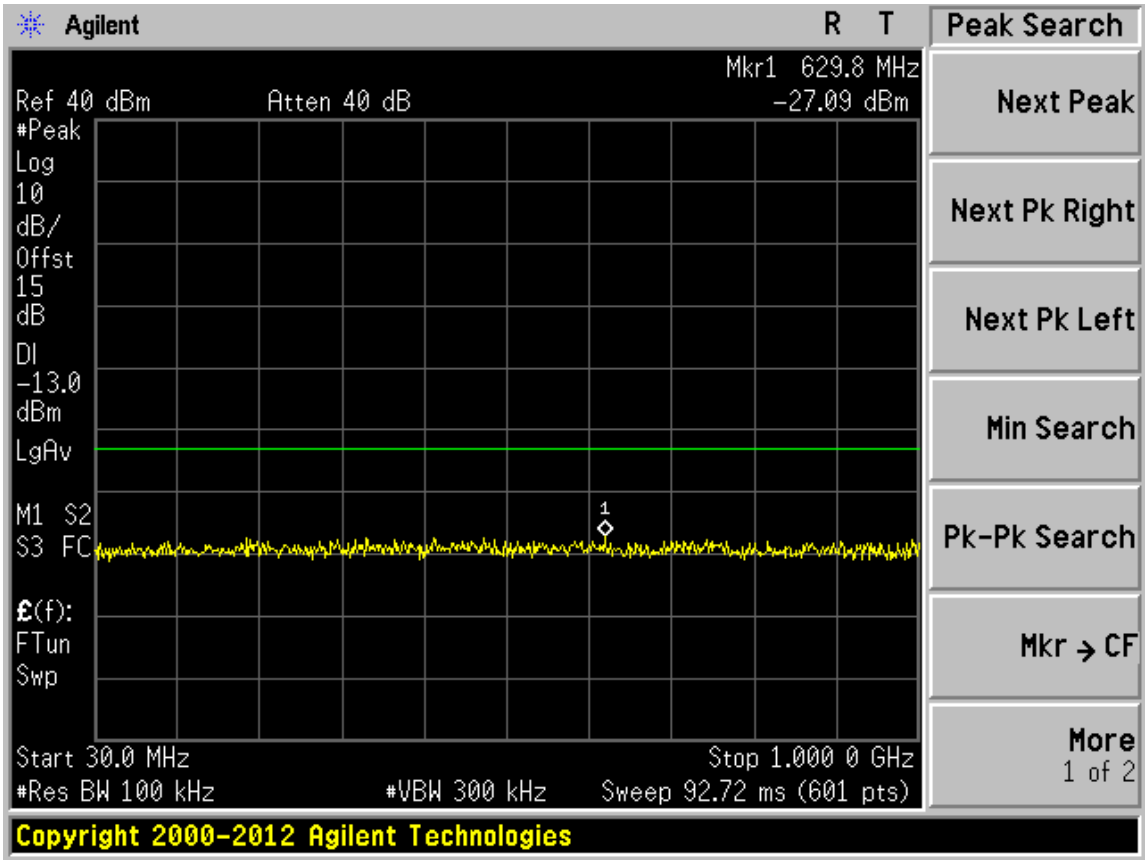


Conducted Emission Plot between 1GHz ~ 20GHz

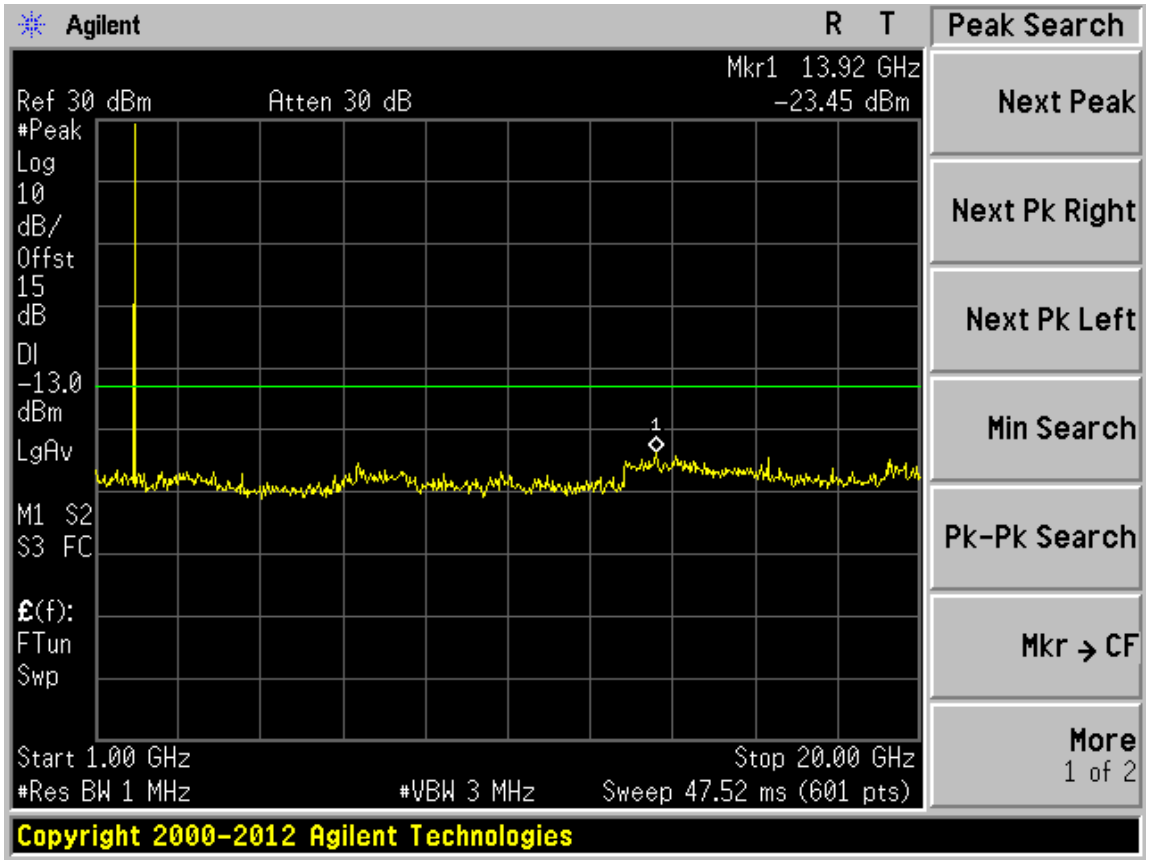


Band :	GSM1900	Channel :	CH661
Test Mode :	EDGE Class 8 Link		

Conducted Emission Plot between 30MHz ~ 1GHz

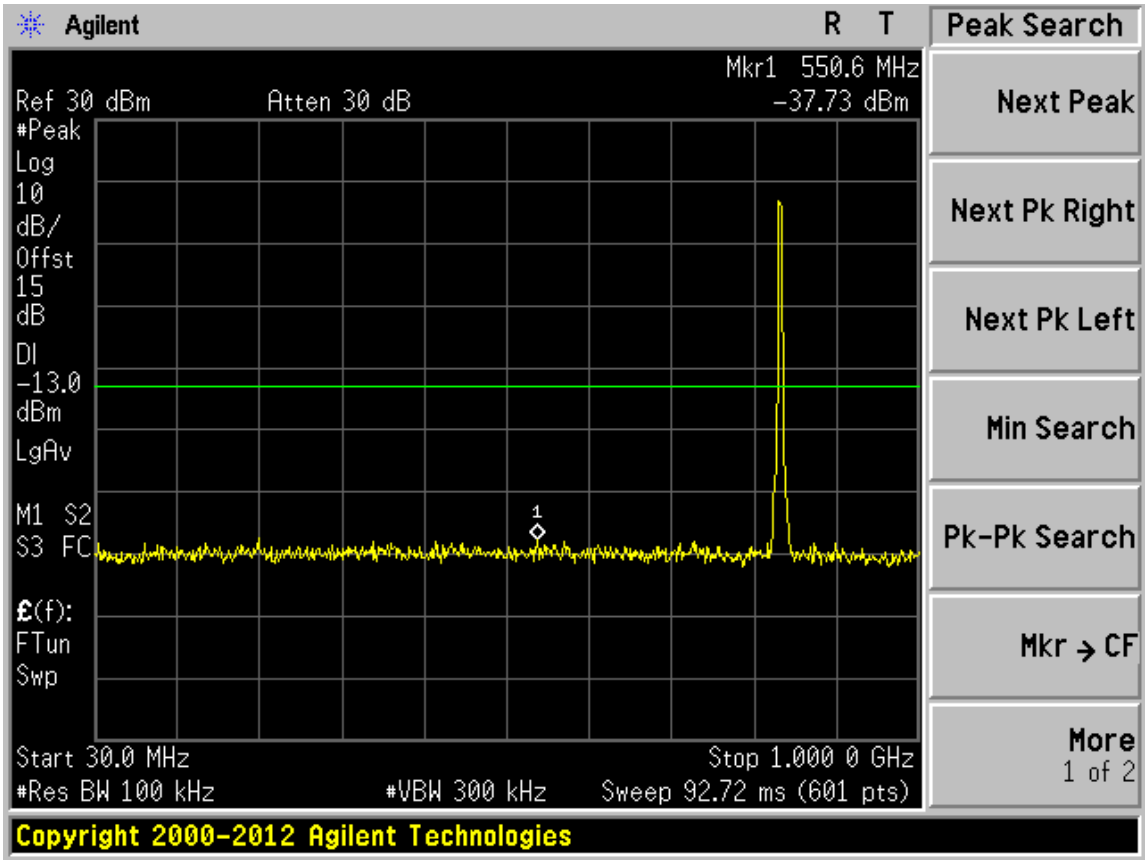


Conducted Emission Plot between 1GHz ~ 20GHz

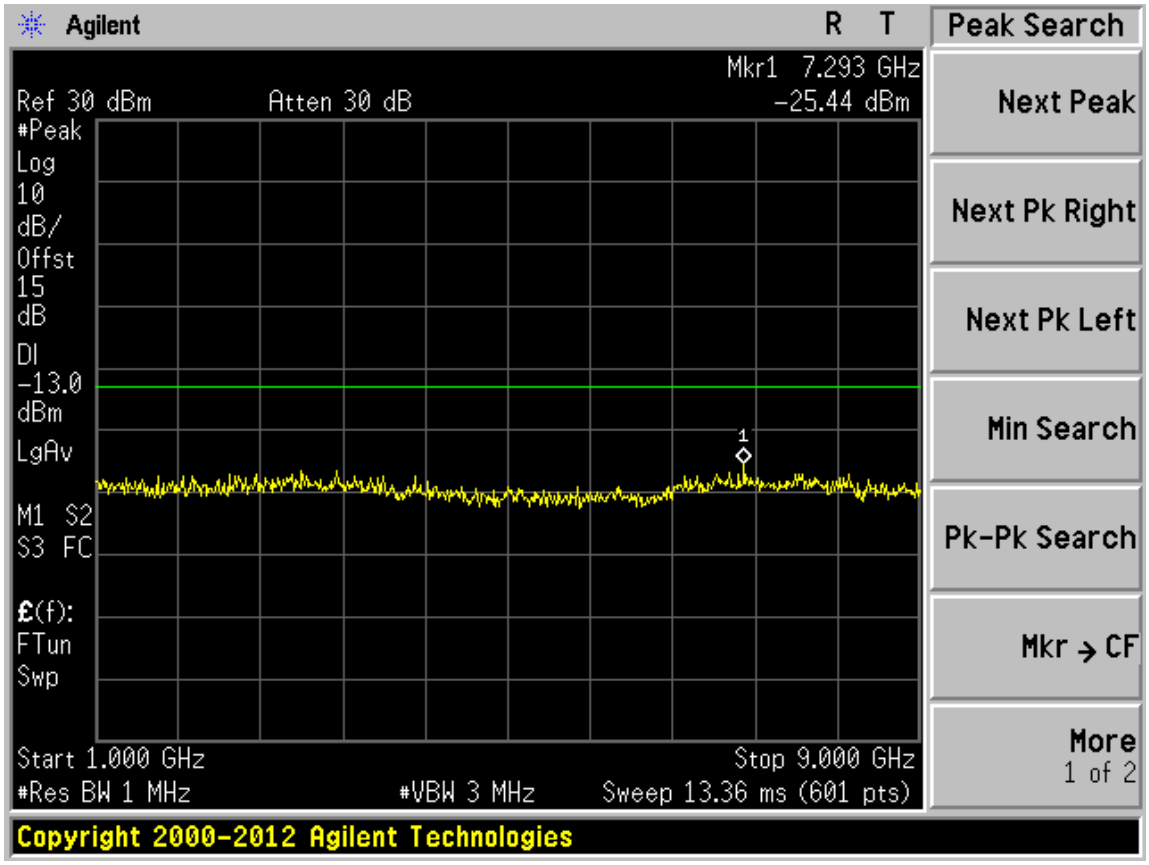


Band :	WCDMA Band V	Channel :	CH4183
Test Mode :	RMC 12.2Kbps Link		

Conducted Emission Plot between 30MHz ~ 1GHz

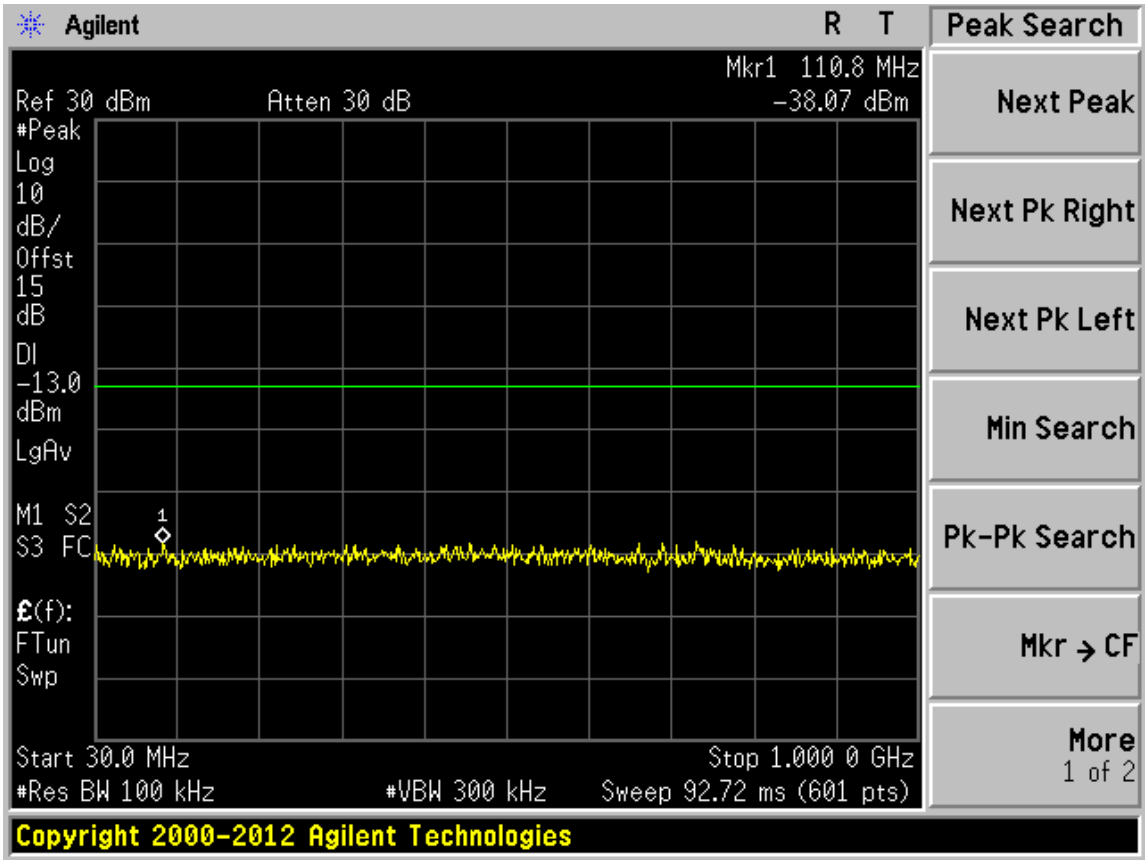


Conducted Emission Plot between 1GHz ~ 9GHz

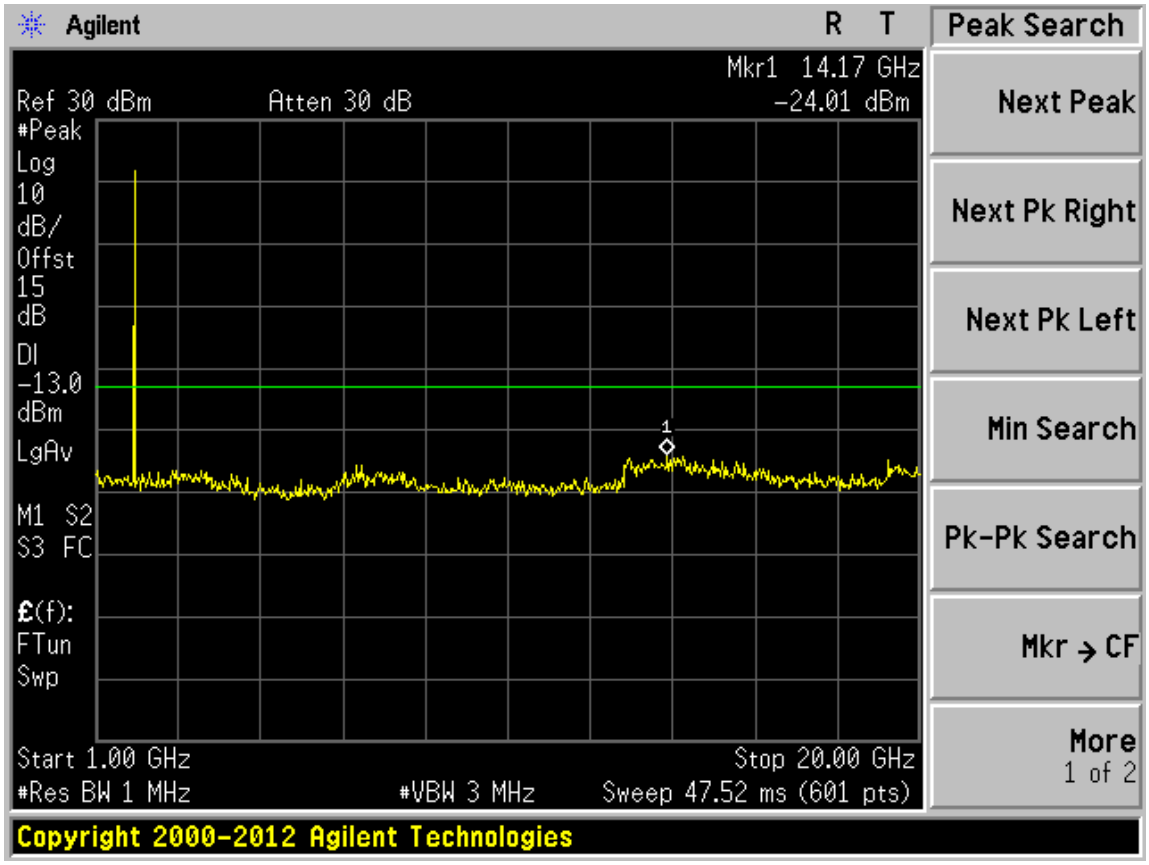


Band :	WCDMA Band II	Channel :	CH9400
Test Mode :	RMC 12.2Kbps Link		

Conducted Emission Plot between 30MHz ~ 1GHz



Conducted Emission Plot between 1GHz ~ 20GHz



3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

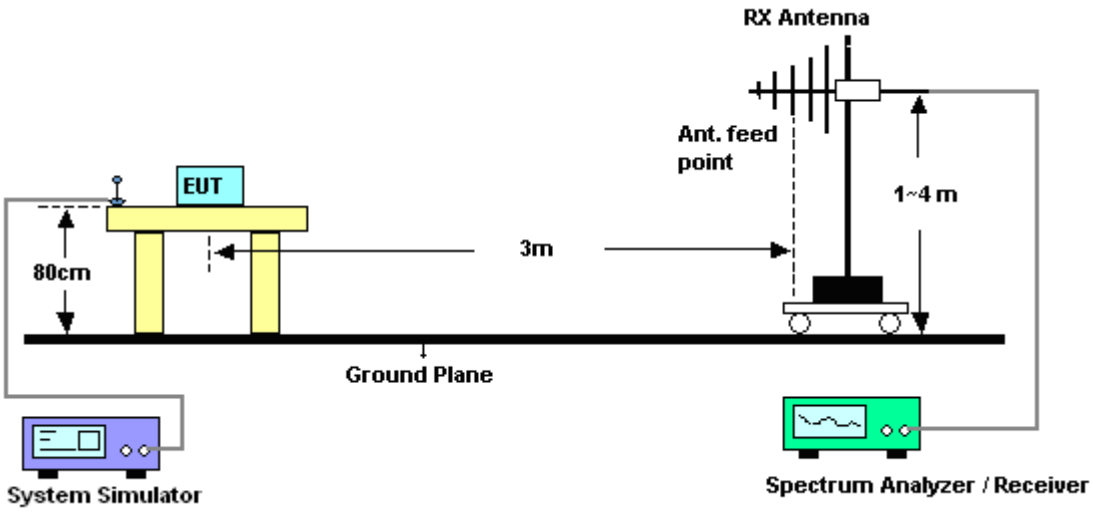
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.
12. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
13. ERP (dBm) = EIRP - 2.15

3.6.4 Test Setup



3.6.5 Test Result of Field Strength of Spurious Radiated

Test Mode	GSM850 GSM		Test Channel	Low
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1648.40	Vertical	-37.32	-13	Pass
2472.60	Vertical	-41.76	-13	Pass
1648.40	Horizontal	-30.85	-13	Pass
2472.60	Horizontal	-45.43	-13	Pass

Test Mode	GSM850 GSM		Test Channel	Middle
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1673.20	Vertical	-35.28	-13	Pass
2509.80	Vertical	-42.15	-13	Pass
1673.20	Horizontal	-32.33	-13	Pass
2509.80	Horizontal	-46.74	-13	Pass

Test Mode	GSM850 GSM		Test Channel	High
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1697.60	Vertical	-34.92	-13	Pass
2546.41	Vertical	-40.56	-13	Pass
1697.60	Horizontal	-34.34	-13	Pass
2546.41	Horizontal	-47.65	-13	Pass

Test Mode	GSM1900 GSM		Test Channel	Low
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3700.40	Vertical	-42.11	-13	Pass
5550.60	Vertical	-43.50	-13	Pass
3700.40	Horizontal	-38.04	-13	Pass
5550.60	Horizontal	-40.19	-13	Pass

Test Mode	GSM1900 GSM		Test Channel	Middle
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3760.00	Vertical	-41.53	-13	Pass
5640.00	Vertical	-48.02	-13	Pass
3760.00	Horizontal	-36.27	-13	Pass
5640.00	Horizontal	-44.31	-13	Pass

Test Mode	GSM1900 GSM		Test Channel	High
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3819.60	Vertical	-42.05	-13	Pass
5729.40	Vertical	-45.16	-13	Pass
3819.60	Horizontal	-38.24	-13	Pass
5729.40	Horizontal	-41.32	-13	Pass

Test Mode	WCDMA Band V RMC 12.2Kbps		Test Channel	Low
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1652.80	Vertical	-45.04	-13	Pass
2479.20	Vertical	-47.13	-13	Pass
1652.80	Horizontal	-42.28	-13	Pass
2479.20	Horizontal	-43.76	-13	Pass

Test Mode	WCDMA Band V RMC 12.2Kbps		Test Channel	Middle
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1673.20	Vertical	-44.15	-13	Pass
2509.80	Vertical	-46.29	-13	Pass
1673.20	Horizontal	-41.54	-13	Pass
2509.80	Horizontal	-43.62	-13	Pass

Test Mode	WCDMA Band V RMC 12.2Kbps		Test Channel	High
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
1693.20	Vertical	-43.52	-13	Pass
2539.80	Vertical	-49.13	-13	Pass
1693.20	Horizontal	-40.64	-13	Pass
2539.80	Horizontal	-46.35	-13	Pass

Test Mode	WCDMA Band II RMC 12.2Kbps		Test Channel	Low
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3704.80	Vertical	-45.26	-13	Pass
5557.20	Vertical	-47.38	-13	Pass
3704.80	Horizontal	-40.15	-13	Pass
5557.20	Horizontal	-45.42	-13	Pass

Test Mode	WCDMA Band V RMC 12.2Kbps		Test Channel	Middle
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3760	Vertical	-44.67	-13	Pass
5640	Vertical	-47.31	-13	Pass
3760	Horizontal	-44.10	-13	Pass
5640	Horizontal	-46.97	-13	Pass

Test Mode	WCDMA Band V RMC 12.2Kbps		Test Channel	High
Frequency (MHz)	Spurious Emissions		Limit (dBm)	Result
	Polarization	Level(dBm)		
3815.20	Vertical	-41.85	-13	Pass
5722.80	Vertical	-48.03	-13	Pass
3815.20	Horizontal	-43.62	-13	Pass
5722.80	Horizontal	-45.34	-13	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

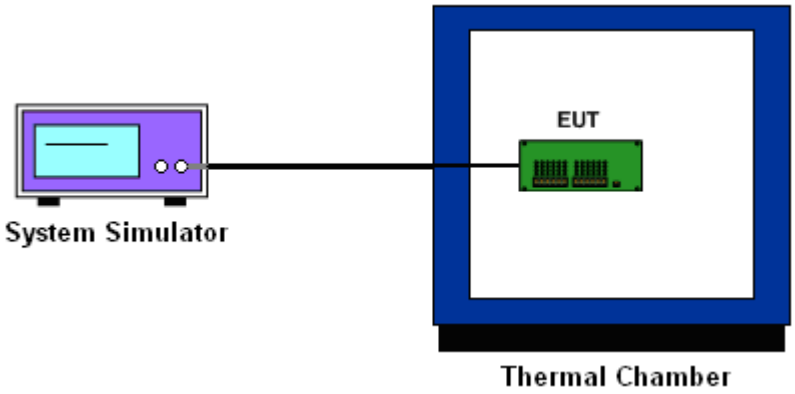
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10℃ step up to 50℃. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30℃, the testing lowest temperature will be raised in 10℃ step until the EUT can be turned on.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature and Voltage Variation

GSM850, Middle Channel

Middle channel, fo =836.6MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.1	-40	-0.05	2.5
	3.7	-43	-0.05	2.5
	4.3	-33	-0.04	2.5
-20	3.1	-27	-0.03	2.5
	3.7	-29	-0.03	2.5
	4.3	-26	-0.03	2.5
-10	3.1	-45	-0.05	2.5
	3.7	-33	-0.04	2.5
	4.3	-27	-0.03	2.5
0	3.1	-38	-0.05	2.5
	3.7	-30	-0.04	2.5
	4.3	-33	-0.04	2.5
10	3.1	-32	-0.04	2.5
	3.7	-26	-0.03	2.5
	4.3	-32	-0.04	2.5
20	3.1	-47	-0.06	2.5
	3.7	-28	-0.03	2.5
	4.3	-35	-0.04	2.5
30	3.1	-51	-0.06	2.5
	3.7	-36	-0.04	2.5
	4.3	-44	-0.05	2.5
40	3.1	-39	-0.05	2.5
	3.7	-37	-0.04	2.5
	4.3	-25	-0.03	2.5
50	3.1	-43	-0.05	2.5
	3.7	-47	-0.06	2.5
	4.3	-52	-0.06	2.5

Note: The extreme voltage was declared by the manufacturer.

EDGE Class 8, Middle Channel

Middle channel, fo =836.6MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.1	-64	-0.08	2.5
	3.7	-43	-0.05	2.5
	4.3	-35	-0.04	2.5
-20	3.1	-30	-0.04	2.5
	3.7	-36	-0.04	2.5
	4.3	-29	-0.03	2.5
-10	3.1	-42	-0.05	2.5
	3.7	-37	-0.04	2.5
	4.3	-49	-0.06	2.5
0	3.1	-44	-0.05	2.5
	3.7	-38	-0.05	2.5
	4.3	-43	-0.05	2.5
10	3.1	-26	-0.03	2.5
	3.7	-25	-0.03	2.5
	4.3	-32	-0.04	2.5
20	3.1	-39	-0.05	2.5
	3.7	-43	-0.05	2.5
	4.3	-48	-0.06	2.5
30	3.1	-52	-0.06	2.5
	3.7	-57	-0.07	2.5
	4.3	-40	-0.05	2.5
40	3.1	-33	-0.04	2.5
	3.7	-37	-0.04	2.5
	4.3	-52	-0.06	2.5
50	3.1	-47	-0.06	2.5
	3.7	-45	-0.05	2.5
	4.3	-61	-0.07	2.5

Note: The extreme voltage was declared by the manufacturer.

GSM1900 Middle Channel:

Middle channel, fo =1880.0MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.1	-62	-0.03	2.5
	3.7	-70	-0.04	2.5
	4.3	-64	-0.03	2.5
-20	3.1	-58	-0.03	2.5
	3.7	-62	-0.03	2.5
	4.3	-67	-0.04	2.5
-10	3.1	-49	-0.03	2.5
	3.7	-31	-0.02	2.5
	4.3	-55	-0.03	2.5
0	3.1	-69	-0.04	2.5
	3.7	-64	-0.03	2.5
	4.3	-48	-0.03	2.5
10	3.1	-49	-0.03	2.5
	3.7	-63	-0.03	2.5
	4.3	-42	-0.02	2.5
20	3.1	-56	-0.03	2.5
	3.7	-51	-0.03	2.5
	4.3	-36	-0.02	2.5
30	3.1	-34	-0.02	2.5
	3.7	-65	-0.03	2.5
	4.3	-57	-0.03	2.5
40	3.1	-49	-0.03	2.5
	3.7	-43	-0.02	2.5
	4.3	-67	-0.04	2.5
50	3.1	-44	-0.02	2.5
	3.7	-58	-0.03	2.5
	4.3	-66	-0.04	2.5

Note: The extreme voltage was declared by the manufacturer.

EDGE Class 8 Middle Channel:

Middle channel, fo =1880.0MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.3	-77	-0.04	2.5
	3.7	-85	-0.05	2.5
	4.3	-74	-0.04	2.5
-20	3.3	-60	-0.03	2.5
	3.7	-67	-0.04	2.5
	4.3	-51	-0.03	2.5
-10	3.3	-62	-0.03	2.5
	3.7	-59	-0.03	2.5
	4.3	-54	-0.03	2.5
0	3.3	-68	-0.04	2.5
	3.7	-65	-0.03	2.5
	4.3	-51	-0.03	2.5
10	3.3	-66	-0.04	2.5
	3.7	-53	-0.03	2.5
	4.3	-57	-0.03	2.5
20	3.3	-44	-0.02	2.5
	3.7	-58	-0.03	2.5
	4.3	-61	-0.03	2.5
30	3.3	-45	-0.02	2.5
	3.7	-64	-0.03	2.5
	4.3	-60	-0.03	2.5
40	3.3	-45	-0.02	2.5
	3.7	-52	-0.03	2.5
	4.3	-68	-0.04	2.5
50	3.3	-83	-0.04	2.5
	3.7	-71	-0.04	2.5
	4.3	-92	-0.05	2.5

Note: The extreme voltage was declared by the manufacturer.

WCDMA Band V

Middle channel, fo =836.6MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.3	-28	-0.03	2.5
	3.7	-35	-0.04	2.5
	4.3	-42	-0.05	2.5
-20	3.3	-47	-0.06	2.5
	3.7	-53	-0.06	2.5
	4.3	-58	-0.07	2.5
-10	3.3	-43	-0.05	2.5
	3.7	-39	-0.05	2.5
	4.3	-30	-0.04	2.5
0	3.3	-44	-0.05	2.5
	3.7	-37	-0.04	2.5
	4.3	-49	-0.06	2.5
10	3.3	-33	-0.04	2.5
	3.7	-19	-0.02	2.5
	4.3	-43	-0.05	2.5
20	3.3	-36	-0.04	2.5
	3.7	-51	-0.06	2.5
	4.3	-40	-0.05	2.5
30	3.3	-48	-0.06	2.5
	3.7	-42	-0.05	2.5
	4.3	-32	-0.04	2.5
40	3.3	-46	-0.05	2.5
	3.7	-28	-0.03	2.5
	4.3	-53	-0.06	2.5
50	3.3	-67	-0.08	2.5
	3.7	-72	-0.09	2.5
	4.3	-58	-0.07	2.5

Note: The extreme voltage was declared by the manufacturer.

WCDMA Band II

Middle channel, fo =1880.0MHz				
Temperature (℃)	**Power Supplied (V)**	**Frequency Error (Hz)**	**Error (ppm)**	**Limit (ppm)**
-30	3.3	-46	-0.02	2.5
	3.7	-62	-0.03	2.5
	4.3	-75	-0.04	2.5
-20	3.3	-51	-0.03	2.5
	3.7	-83	-0.04	2.5
	4.3	-54	-0.03	2.5
-10	3.3	-59	-0.03	2.5
	3.7	-65	-0.03	2.5
	4.3	-62	-0.03	2.5
0	3.3	-78	-0.04	2.5
	3.7	-40	-0.02	2.5
	4.3	-53	-0.03	2.5
10	3.3	-47	-0.03	2.5
	3.7	-79	-0.04	2.5
	4.3	-38	-0.02	2.5
20	3.3	-44	-0.02	2.5
	3.7	-48	-0.03	2.5
	4.3	-66	-0.04	2.5
30	3.3	-57	-0.03	2.5
	3.7	-71	-0.04	2.5
	4.3	-52	-0.03	2.5
40	3.3	-49	-0.03	2.5
	3.7	-65	-0.03	2.5
	4.3	-72	-0.04	2.5
50	3.3	-68	-0.04	2.5
	3.7	-61	-0.03	2.5
	4.3	-82	-0.04	2.5

Note: The extreme voltage was declared by the manufacturer.

3.8 Peak-to-Average Ratio

3.8.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

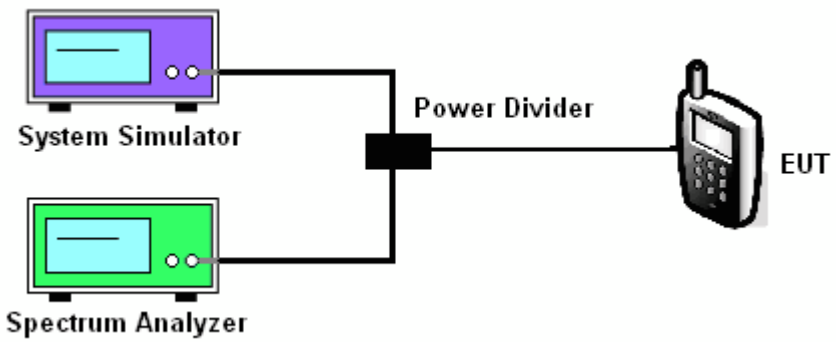
3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.8.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
   a. Set EUT in maximum power output.
   b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
   c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in spectrum analyzer for second trace.
   d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator synchronized with the spectrum analyzer.
3. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.8.4 Test Setup



3.8.5 T e s t Result of Peak-to-Average Ratio

PCS Band									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	1.63	1.70	1.82	2.32	2.39	2.28	2.73	2.66	2.80

3.9 Mains Conducted Emissions

3.9.1 Measurement Method

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

3.9.2 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 GSM850 mode is the worst condition and the test result as following:

A: **Conducted Emission on Live Terminal (150kHz to 30MHz)**

EUT Operating Environment

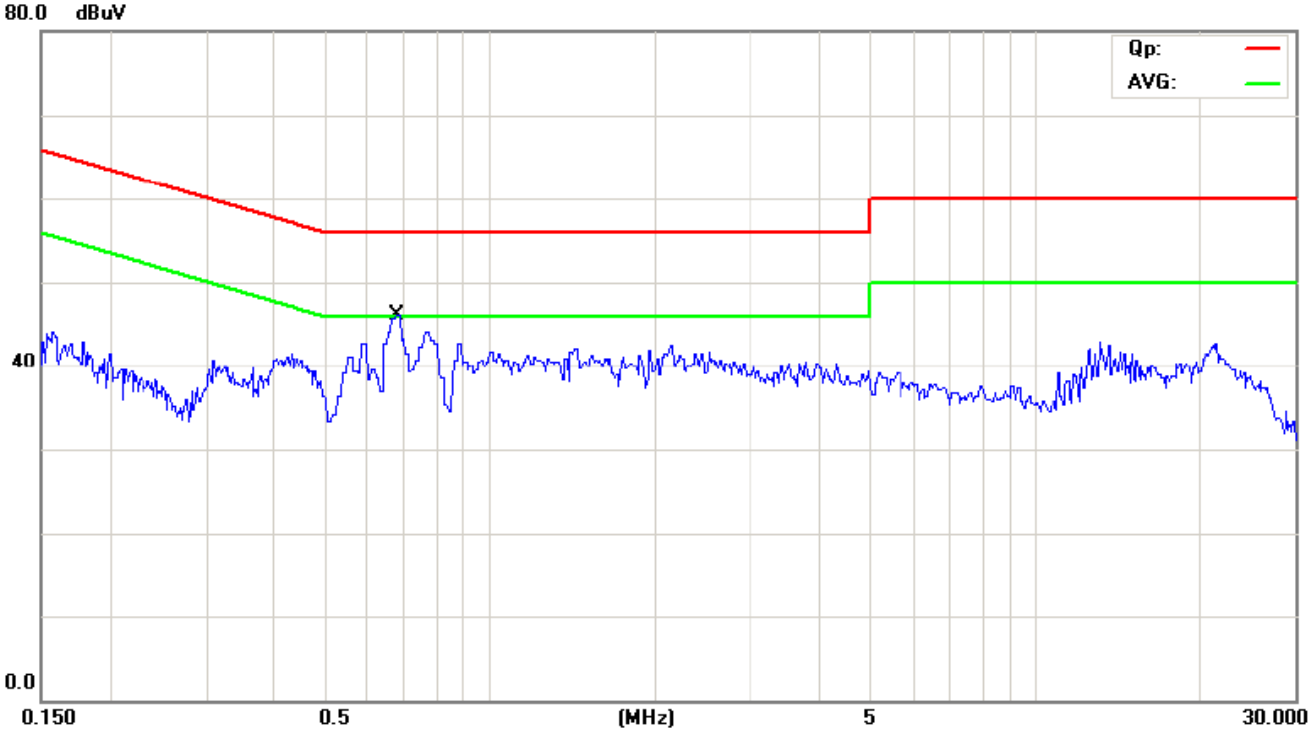
Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Communication by GSM850

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.6740	32.30	10.49	42.79	56.00	-13.21	QP	
2	*	0.6740	22.80	10.49	33.29	46.00	-12.71	AVG	

B: **Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

EUT Operating Environment

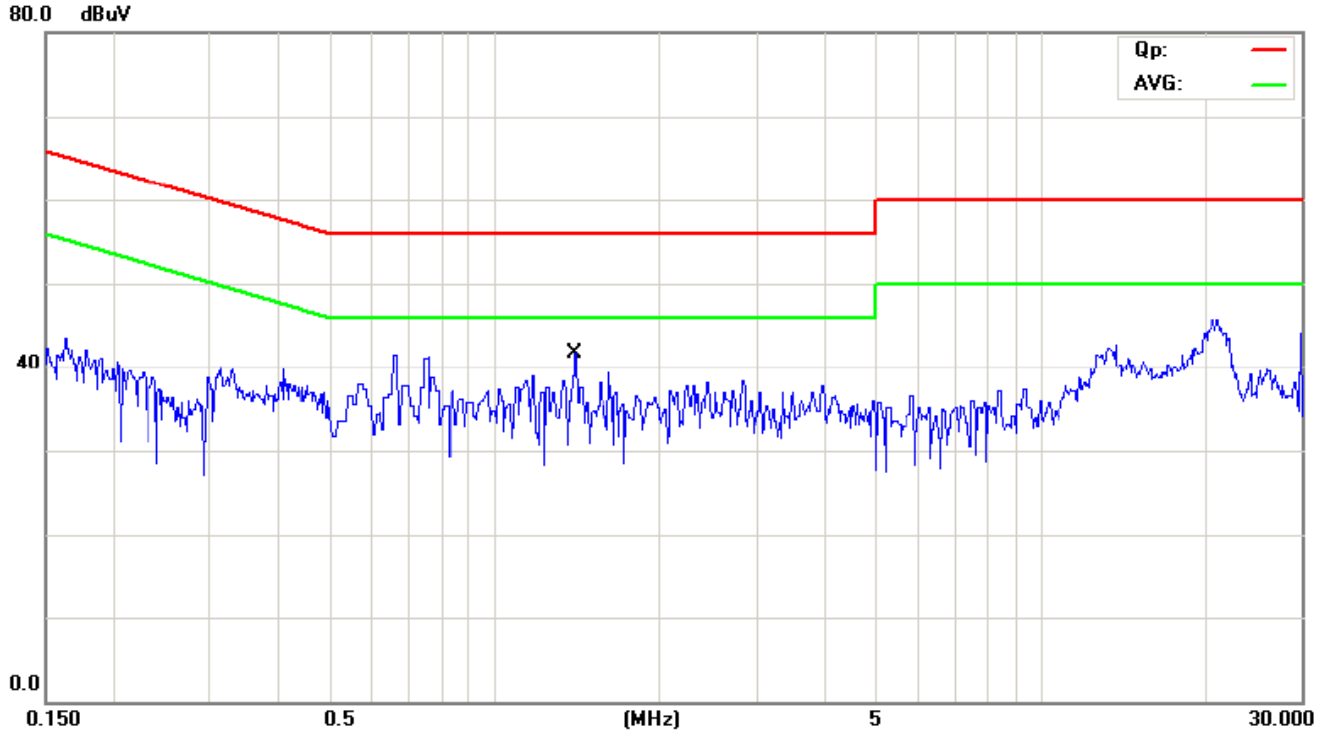
Temperature: 26℃ Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Communication by GSM850

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



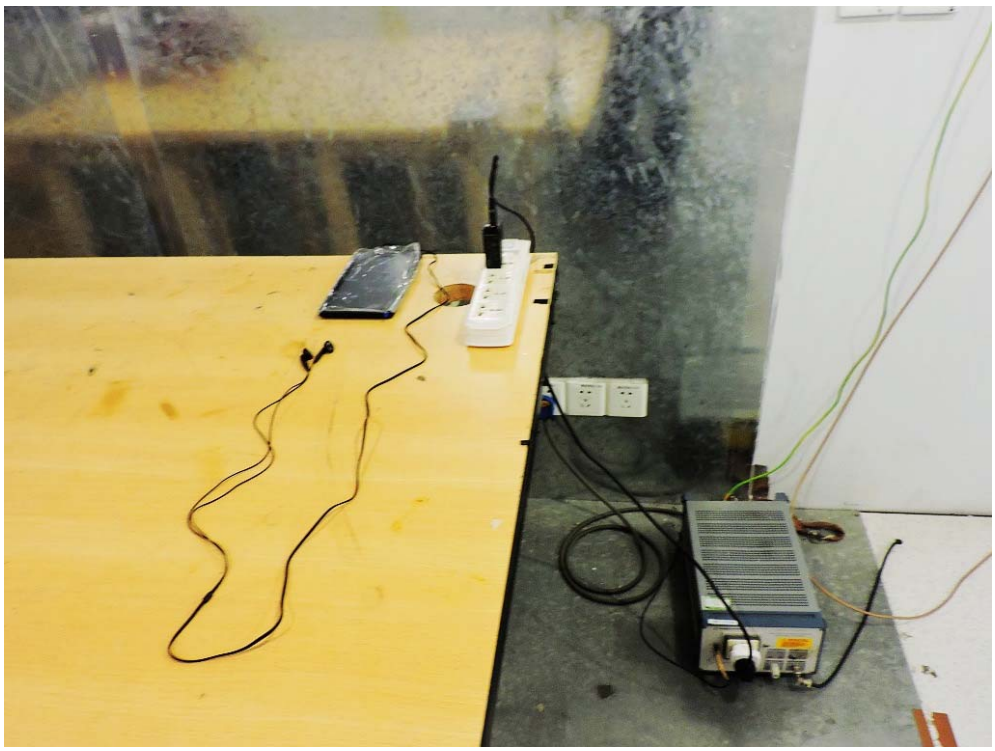
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	1.3810	15.70	10.89	26.59	56.00	-29.41	QP	
2		1.3810	-4.40	10.89	6.49	46.00	-39.51	AVG	

4 List of Measuring Equipment

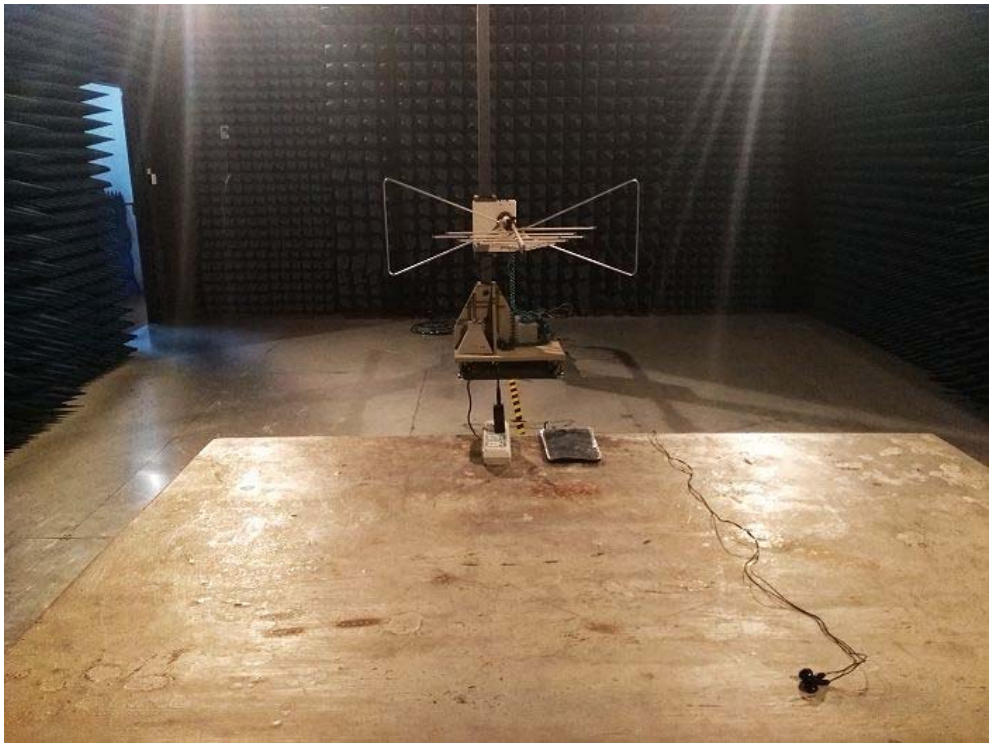
2.0 Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2016-08-22	2017-08-21
TWO Line-V-NETW	R&S	EZH3-Z5	100294	2016-08-22	2017-08-21
TWO Line-V-NETW	R&S	EZH3-Z5	100253	2016-08-22	2017-08-21
Ultra Broadband ANT	R&S	HL562	100157	2016-08-23	2017-08-22
ESDV Test Receiver	R&S	ESDV	100008	2016-08-22	2017-08-21
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2016-08-22	2017-08-21
System Controller	CT	SC100	-	--	--
Printer	EPSON	PHOTO EX3	CFNH234850	--	--
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-
Loop Antenna	EMCO	6502	00042960	2016-08-23	2017-08-22
ESPI Test Receiver	R&S	ESI26	838786/013	2016-08-22	2017-08-21
3m OATS	--	--	N/A	2016-08-24	2017-08-23
Horn Antenna	R&S	BBHA 9170	BBHA9170265	2016-08-24	2017-08-23
Horn Antenna	R&S	BBHA 9120D	9120D-631	2016-08-24	2017-08-23
Power meter	Anritsu	ML2487A	6K00003613	2016-08-22	2017-08-21
Power sensor	Anritsu	MA2491A	32263	2016-08-22	2017-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2016-08-23	2017-08-21
LISN	AFJ	LS16C	10010947251	2016-08-22	2017-08-21
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2016-08-23	2017-08-22
9*6*6 Anechoic	--	--	N/A	2016-08-24	2017-08-23
EMI Test Receiver	RS	ESCS30	100139	2016-08-22	2017-08-21
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	1100.0008.02	2016-08-24	2017-08-23
Fading Simulator	Rohde & Schwarz	ABFS	100177	2016-08-24	2017-08-23

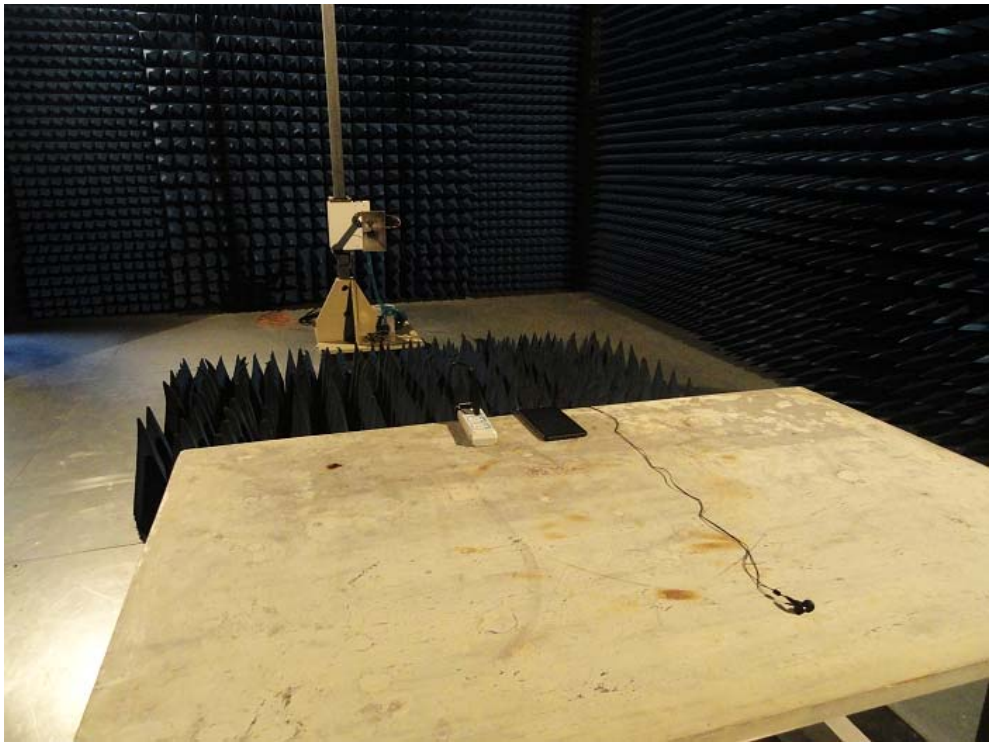
5.0 Photographs

Conducted Emission Test Setup:



Radiated Emission Test Setup:

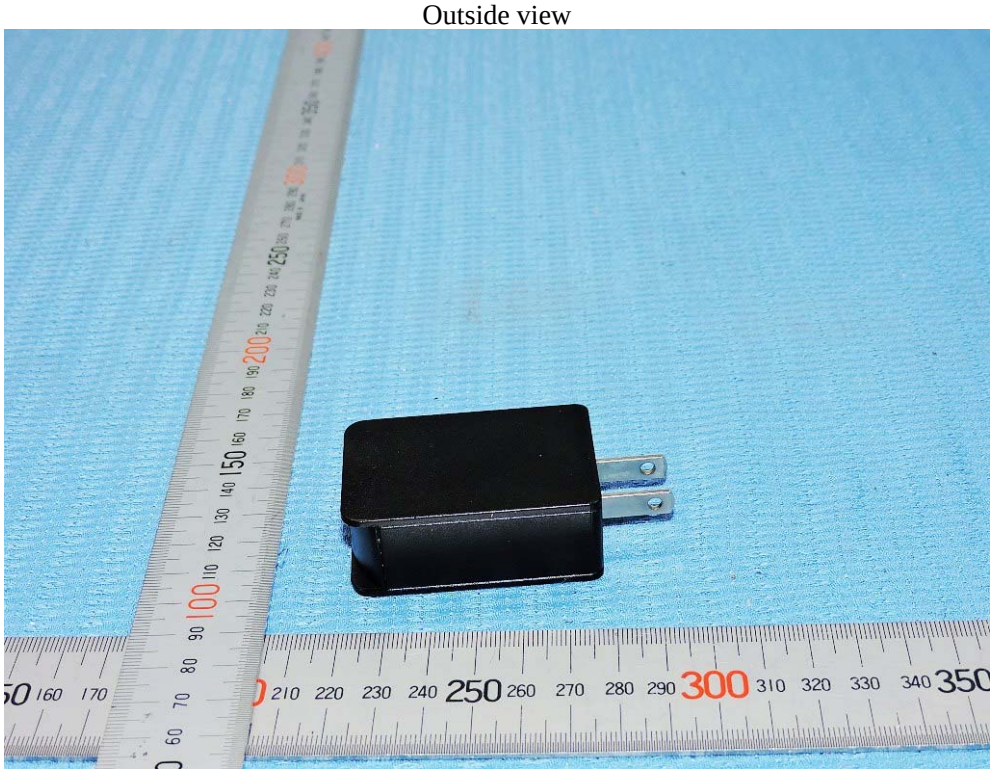


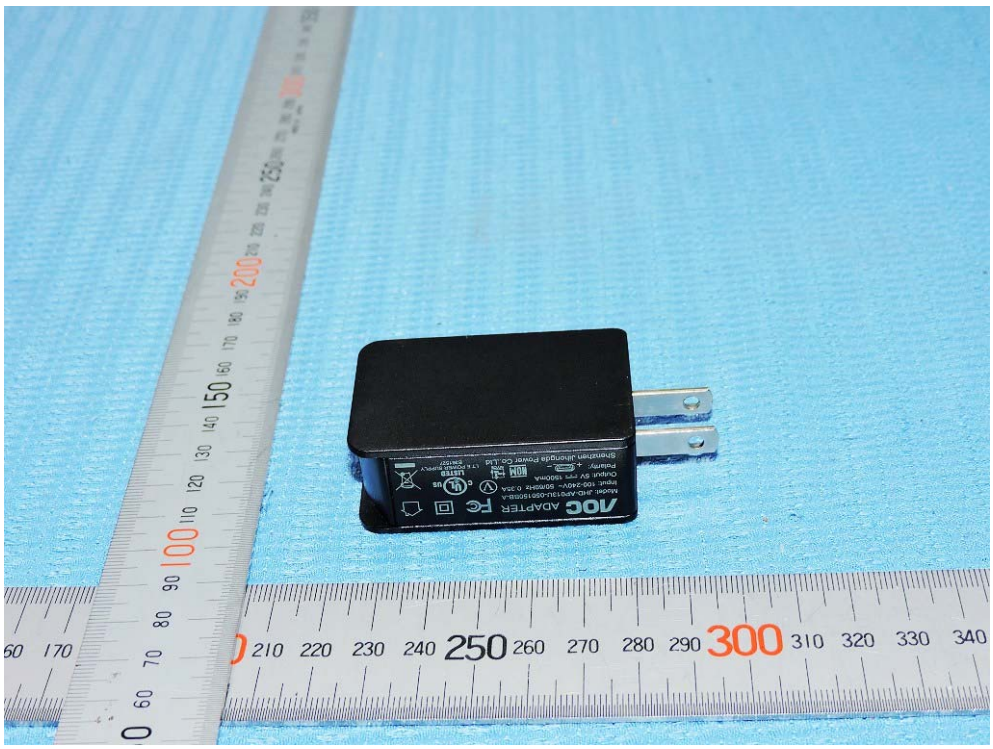


Photographs – EUT

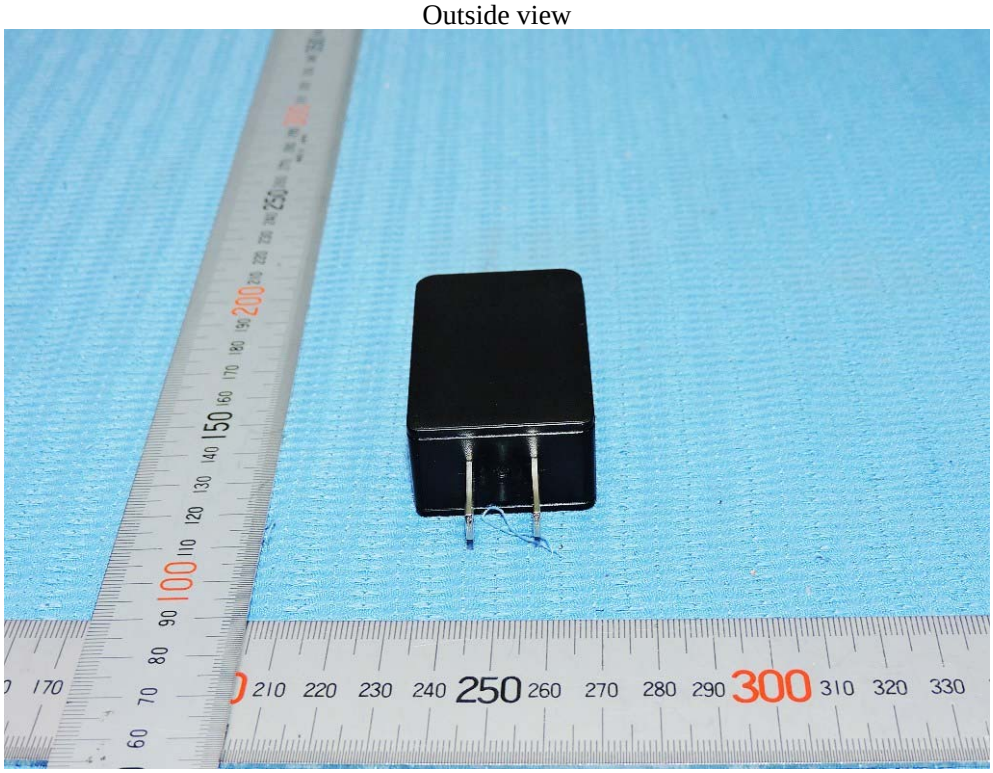
Outside view

Outside view



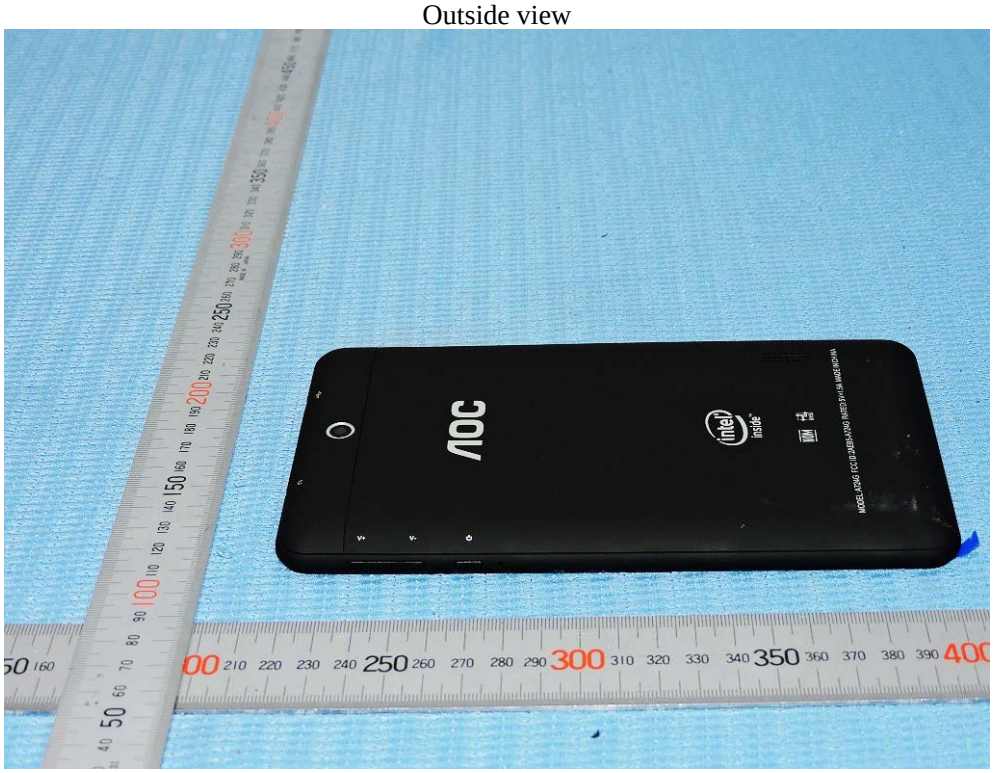


Outside view



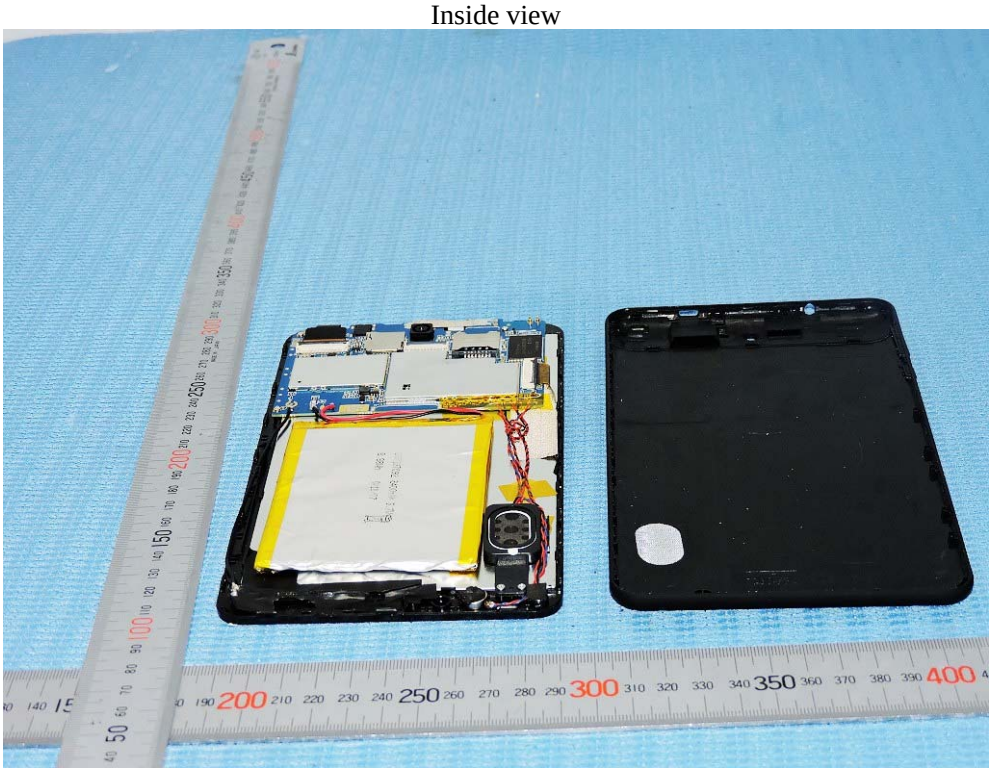
Outside view

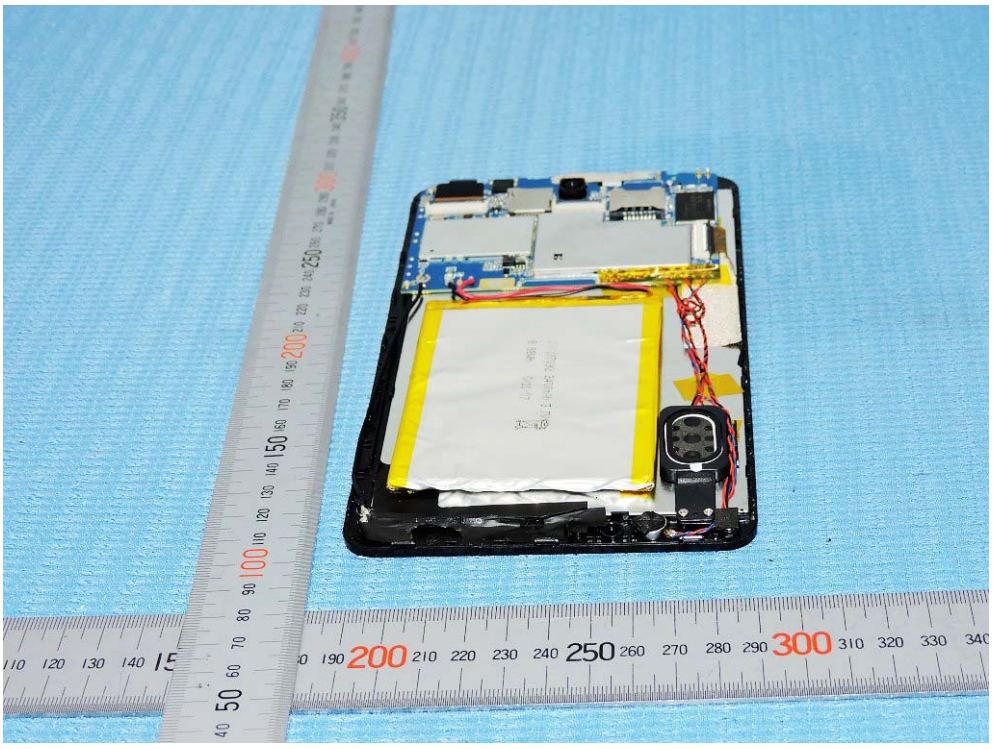
Outside view



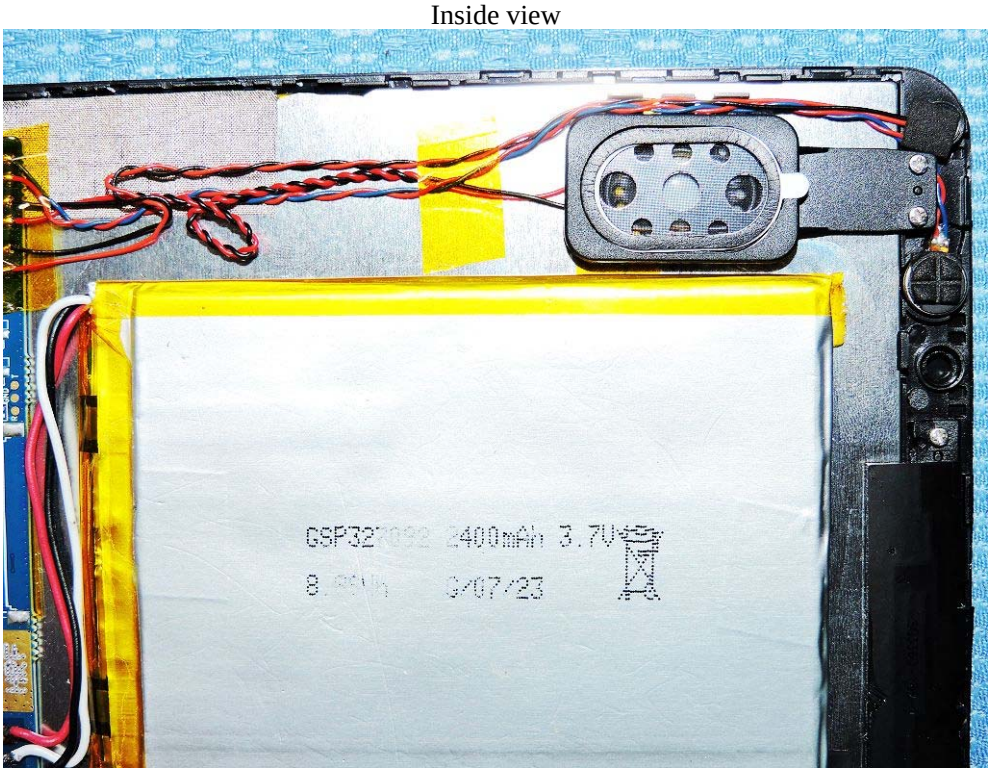
Outside view

Inside view

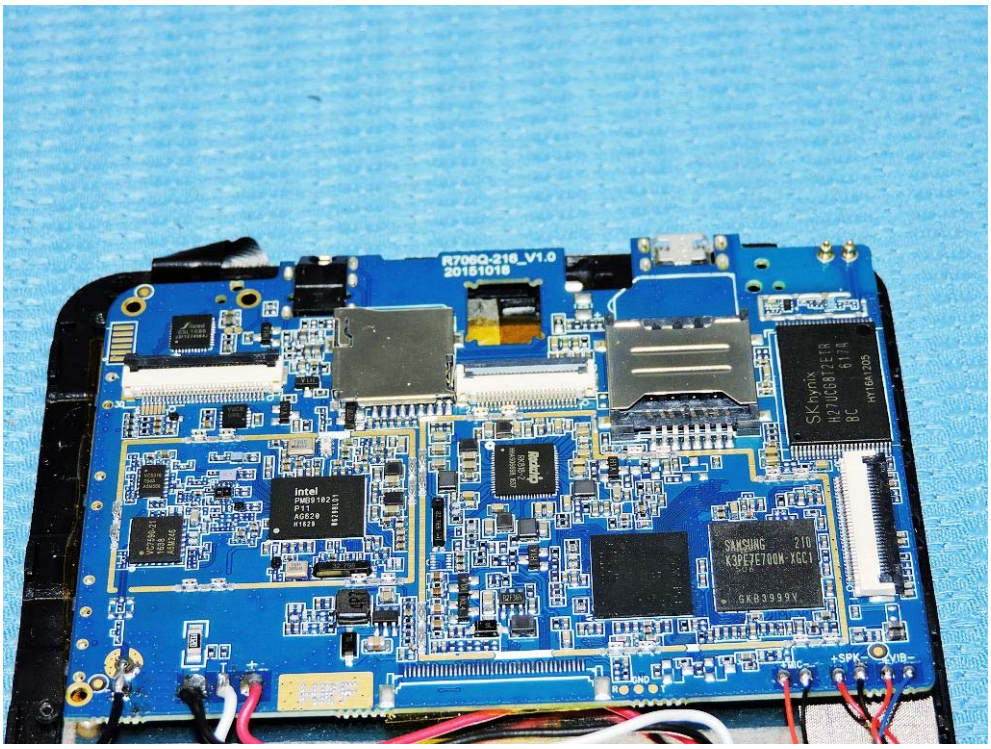




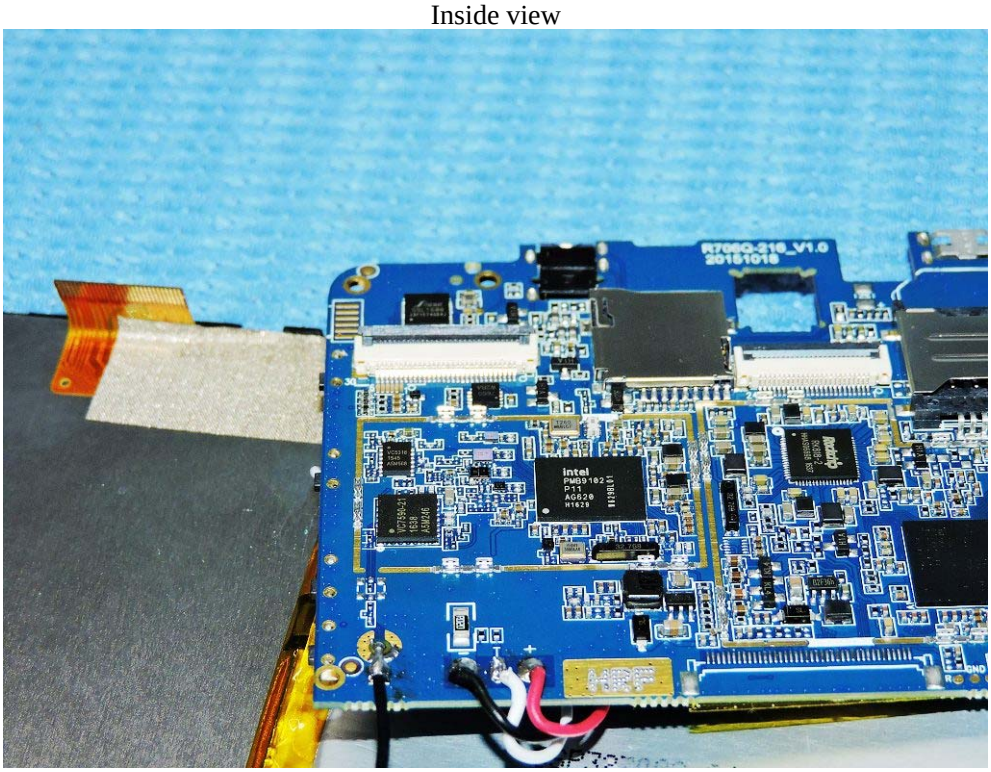
Inside view

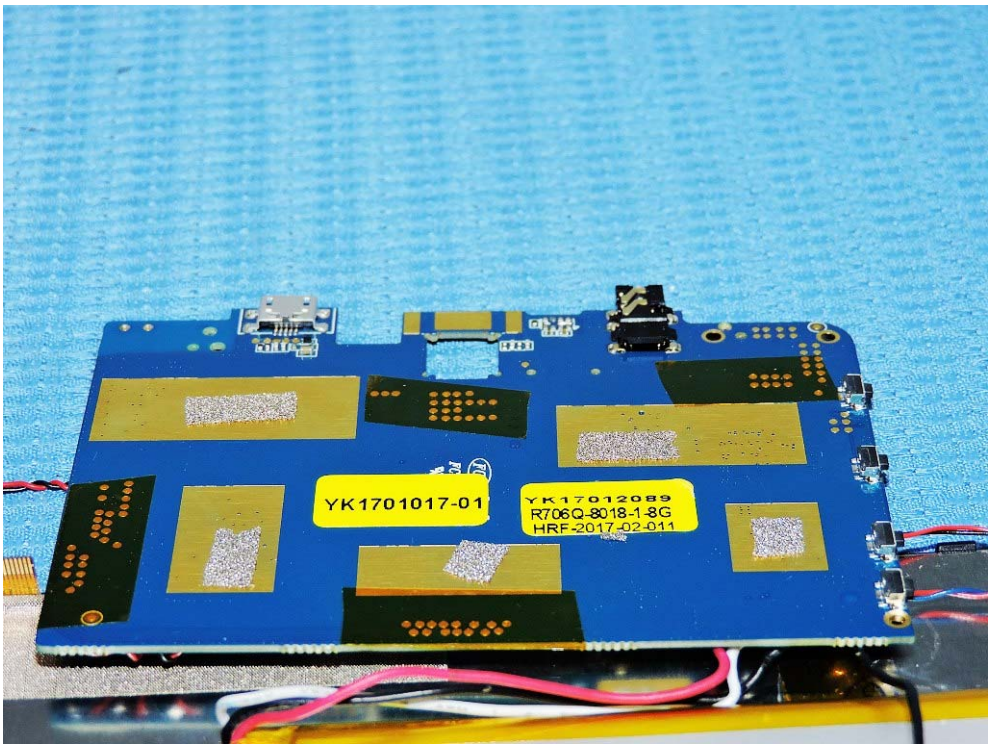


Inside view

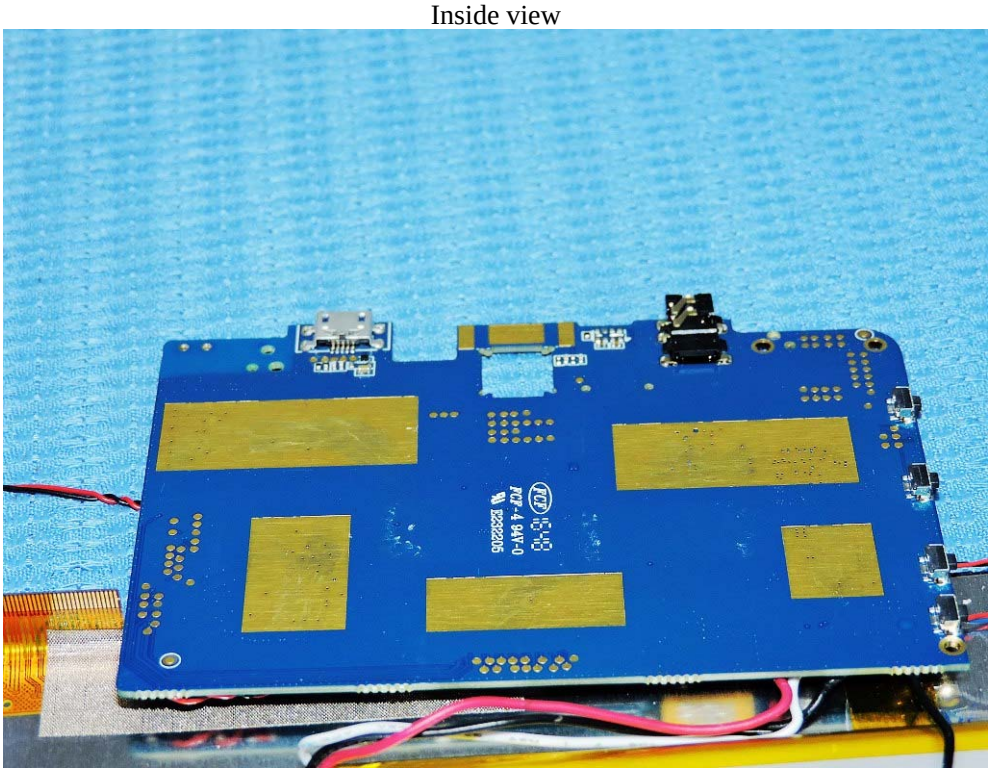


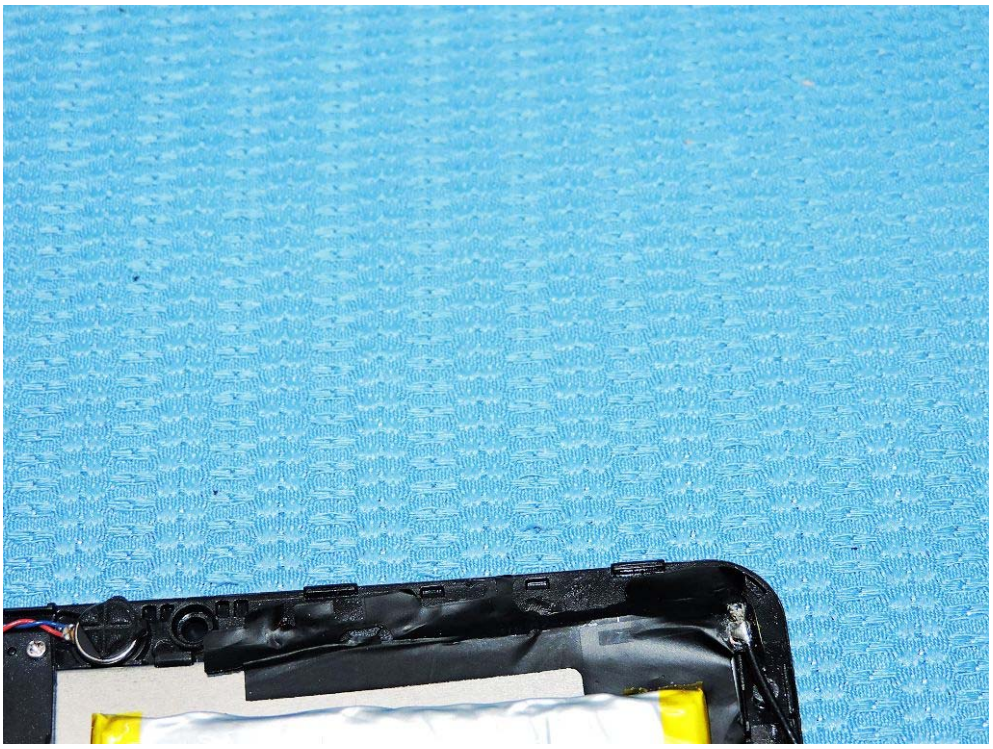
Inside view





Inside view





End of the report