FCC Test Report

Report No.: AGC00529140702FE02

FCC ID	:	2ABN6E500
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Titan HD
BRAND NAME	:	POSH
MODEL NAME	:	E500A, E500B
CLIENT	:	Posh Mobile Limited
DATE OF ISSUE	:	Aug.22, 2014
STANDARD(S)	:	FCC Part 22H & 24E&27(L)Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd.

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug.22, 2014	Valid	Original Report

TABLE OF CONTENTS

1.VERIFICATION OF COMPLIANCE

Applicant	Posh Mobile Limited
Address	1011A, 10/F., Harbour Centre Tower 1, No.1 Hok Cheung St., Hung Hom, Kowloon, Hong Kong
Manufacturer	Shenzhen Posh Mobile Limited
Address	Room 6G,Block C, NEO Building, Chegongmiao, Futian District, Shenzhen, P.R.China
Product Designation	Titan HD
Brand Name	POSH
Test Model	E500A
Series Model	E500B
Difference description	All the same except for the model name.
Date of test	Aug.15, 2014 to Aug.21, 2014
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

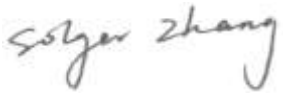
The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003 and TIA/EIA 603. The sample tested as described in this report is in compliance with the FCC Rules Part 22H and 24E and 27(L).
The test results of this report relate only to the tested sample identified in this report.

Tested By : 

Bart Xie Aug.22, 2014

Reviewed By : 

Kidd Yang Aug.22, 2014

Approved By: 

Solger Zhang Aug.22, 2014

2. GENERAL INFORMATION

2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Titan HD
Hardware version:	S510
Software version:	N/A
Frequency Bands:	☒GSM 850 ☒PCS 1900 (U.S. Bands) ☒GSM 900 ☒DCS 1800 (Non-U.S. Bands) ☒UMTS FDD Band II ☒UMTS FDD Band V ☒UMTS FDD Band IV (U.S. Bands) ☒UMTS FDD Band I ☐UMTS FDD Band VIII (Non-U.S. Bands)
Antenna:	PIFA Antenna
Antenna gain:	0dBi(GSM/WCDMA 850), 0dBi (GSM/WCDMA 1900) 0dBi (WCDMA 1700)
Power Supply:	DC 3.7V by Battery
Battery parameter:	DC3.7V/2200 mAh
Adapter Input:	AC100-240V 50/60Hz, 0.15A
Adapter Output:	DC5V, 1A
Dual Card:	WCDMA / GSM Card Slot GSM Card Slot
GPRS Class	12
Extreme Vol. Limits:	DC3.4 V to 4.2 V (Normal: DC3.7 V)
Extreme Temp. Tolerance	-10℃ to +50℃
*** Note: The High Voltage DC4.2V and Low Voltage DC3.4V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage. Other functions have been performed according to verification procedure except for Bluetooth and MS function. Card 1 can't transmit with Card 2 simultaneously.	

***** Note:** The maximum power levels are GSM for MCS-4: GMSK link, EDGE for MCS-9:8PSK link, and RMC 12.2kbps mode for WCDMA band II, WCDMA band V, WCDMA band IV, only these modes were used for all tests.

We found out the test mode with the highest power level after we analyze all the data rates. So we chose worst case as a representative.

WCDMA Card Slot:

	Maximum ERP/EIRP (dBm)	Max. Conducted Power (dBm)	Max. Average Burst Power (dBm)
GSM 850	30.68	32.48	31.77
PCS 1900	27.67	29.51	28.82
UMTS BAND II	21.72	23.33	22.75
UMTS BAND IV	21.62	22.82	22.23
UMTS BAND V	21.64	23.22	22.75

GSM Card Slot:

	Maximum ERP/EIRP (dBm)	Max. Conducted Power (dBm)	Max. Average Burst Power (dBm)
GSM 850	30.15	32.12	31.32
PCS 1900	27.09	29.16	28.43

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ABN6E500**, filing to comply with the FCC Part 22H&24E requirements.

2.3 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.
KDB 971168 D01 Power Meas License Digital Systems v02r01

2.4 TEST FACILITY

The test site used to collect the radiated data is located at:
Attestation of Global Compliance (Shenzhen) Co., Ltd.
2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC register No.: 259865

2.5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	July 25, 2014	July 24, 2015
TEST RECEIVER	R&S	ESCI	100694	July 25, 2014	July 24, 2015
COMMUNICATION TESTER	AGILENT	8960	122500087	Oct.21, 2013	Oct.20, 2014
COMMUNICATION TESTER	R&S	CMU200	122500166	Feb.27,2014	Feb.26,2015
SIGNAL GENERATOR	AGILENT	E4438C	MY44260051	Feb.23,2014	Feb. 22,2015
LISN	R&S	ESH3-Z5	8389791009	July 25, 2014	July 24, 2015
CLIMATE CHAMBER	ALBATROSS	--	--	July 25, 2014	July 24, 2015
Loop Antenna	A.H.	SAS-562B	SEL0097	July 25, 2014	July 24, 2015
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	26	June 6, 2014	June 5, 2015
Substitution Antenna	EMCO	3142C	---	June 6, 2014	June 5, 2015
Substitution Antenna	EM	EM-AH-10180	69	Apr.19, 2014	Apr.18, 2015
Horn Antenna	EM	EM-AH-10180	67	Apr.19, 2014	Apr.18, 2015
Horn Antenna	A.H. Systems Inc.	SAS-574	--	June 6, 2014	June 5, 2015

2.6 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.

2.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 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.

3.2 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.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	2.1046/22.913(a) (2) / 24.232 (c) /27.50(d)(2)
		Radiated output power	
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)/27.50(d)(5)
3	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238/27.53(h)
		Radiated spurious emission	
4	Mains Conducted Emission		15.107 / 15.207/27.53(h)
5	Frequency Stability		2.1055/22.355 /24.235 /27.54
6	Occupied Bandwidth		2.1049 (h)(i)
7	Emission Bandwidth		22.917(a)/24.238(a) /27.53(h)
8	Band Edge		22.917(a)/24.238(a) /27.53(h)

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

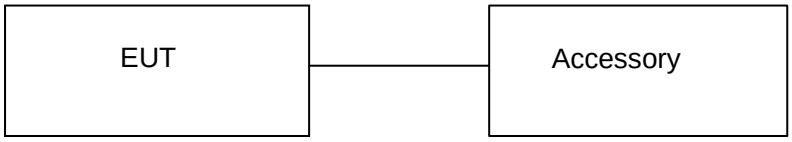


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Titan HD	E500A	FCC ID: 2ABN6E500	EUT
2	Adapter	E500	DC5.0V / 1A	Accessory
3	Battery	S500	DC3.7V / 2200mAh	Accessory
4	Earphone	E500A	N/A	Accessory
5	USB Cable	E500A	N/A	Accessory

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

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	2.1046/22.913(a) (2) / 24.232 (c)/ 27.50(d)(2)	Pass
		Radiated Output Power		
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)/27.50(d)(5)	Pass
3	Spurious Emission	Conducted Spurious Emission	2.1051/22.917/24.238/27.53(h)	Pass
		Radiated Spurious Emission		
4	Mains Conducted Emission		15.107 / 15.207/27.53(h)	Pass
5	Frequency Stability		2.1055/22.355 /24.235 /27.54	Pass
6	Occupied Bandwidth		2.1049 (h)(i)	Pass
7	Emission Bandwidth		22.917(a)/24.238(a) /27.53(h)	Pass
8	Band Edge		22.917(a)/24.238(a) /27.53(h)	Pass

5. DESCRIPTION OF TEST MODES

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

*****Note:** GSM/GPRS/EGPRS 850, GSM/GPRS/EGPRS 1900, WCDMA/HSPA band II, WCDMA/HSPA band IV, WCDMA/HSPA band V, mode have been tested during the test.

The worst condition was recorded in the test report if no other modes test data.

6. OUTPUT POWER

6.1 Conducted Output Power

6.1.1 MEASUREMENT METHOD

The transmitter output port was connected to base station.

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.

Measure the maximum burst average power and average power for other modulation signal.

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 (GSM/GPRS/EGPRS 850, GSM/GPRS/EGPRS1900, WCDMA/HSPA band II, WCDMA/HSPA band IV, WCDMA/HSPA band V) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

6.1.2 MEASUREMENT RESULT

Conducted Output Power Limits for GSM850/EDGE band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	33 dBm (2W)	- 2
EDGE	27 dBm(0.5W)	±2
Conducted Output Power Limits for PCS1900/EDGE band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	30 dBm (1W)	- 2
EDGE	26 dBm (0.4W)	±2
Conducted Output Power Limits for UMTS band II		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
WCDMA	24 dBm (0.25W)	- 2
Conducted Output Power Limits for UMTS band IV		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
WCDMA	24 dBm (0.25W)	- 2
Conducted Output Power Limits for UMTS band V		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
WCDMA	24 dBm (0.25W)	- 2

GSM 850:

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850	824.2	33	32.37	-0.63	31.75	-9	22.75
	836.6	33	**32.48**	-0.52	31.77	-9	22.77
	848.8	33	32.32	-0.68	31.55	-9	22.55
GPRS850 (1 Slot)	824.2	33	32.28	-0.72	31.51	-9	22.51
	836.6	33	32.26	-0.74	31.42	-9	22.42
	848.8	33	32.14	-0.86	31.36	-9	22.36
GPRS850 (2 Slot)	824.2	30	29.82	-0.18	29.23	-6	23.23
	836.6	30	29.64	-0.36	28.85	-6	22.85
	848.8	30	29.46	-0.54	28.78	-6	22.78
GPRS850 (3 Slot)	824.2	28.23	27.73	-0.5	26.89	-4.26	22.63
	836.6	28.23	27.53	-0.7	26.78	-4.26	22.52
	848.8	28.23	27.42	-0.81	26.76	-4.26	22.5
GPRS850 (4 Slot)	824.2	27	26.54	-0.46	25.74	-3	22.74
	836.6	27	26.66	-0.34	25.83	-3	22.83
	848.8	27	26.34	-0.66	25.63	-3	22.63

Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Avg.Burst Power (dBm)
EDGE (1 Slot)	128	824.2	26.52	26.11
	189	836.6	26.81	26.38
	251	848.8	26.62	26.23
EDGE (2 Slot)	128	824.2	25.42	24.71
	189	836.6	25.55	24.82
	251	848.8	25.48	24.64
EDGE (3 Slot)	128	824.2	23.66	22.79
	189	836.6	23.56	22.68
	251	848.8	23.47	22.62
EDGE (4 Slot)	128	824.2	22.43	21.88
	189	836.6	22.59	21.72
	251	848.8	22.39	21.62

PCS 1900:

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM1900	1850.2	30	**29.51**	-0.49	28.82	-9	19.82
	1880	30	29.42	-0.58	28.77	-9	19.77
	1909.8	30	29.37	-0.63	28.64	-9	19.64
GPRS1900 (1 Slot)	1850.2	30	29.44	-0.56	28.82	-9	19.82
	1880	30	29.39	-0.61	28.76	-9	19.76
	1909.8	30	29.36	-0.64	28.63	-9	19.63
GPRS1900 (2 Slot)	1850.2	27	26.48	-0.52	25.74	-6	19.74
	1880	27	26.43	-0.57	25.69	-6	19.69
	1909.8	27	26.55	-0.45	25.65	-6	19.65
GPRS1900 (3 Slot)	1850.2	25.23	24.61	-0.62	23.83	-4.26	19.57
	1880	25.23	24.51	-0.72	23.81	-4.26	19.55
	1909.8	25.23	24.42	-0.81	23.72	-4.26	19.46
GPRS1900 (4 Slot)	1850.2	24	23.59	-0.41	22.76	-3	19.76
	1880	24	23.51	-0.49	22.77	-3	19.77
	1909.8	24	23.44	-0.56	22.56	-3	19.56

Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Avg.Burst Power (dBm)
EDGE (1 Slot)	512	1850.2	25.72	25.25
	661	1880	25.48	25.11
	810	1909.8	25.53	25.12
EDGE (2 Slot)	512	1850.2	24.26	23.73
	661	1880	24.28	23.68
	810	1909.8	24.34	23.82
EDGE (3 Slot)	512	1850.2	22.68	22.12
	661	1880	22.77	22.14
	810	1909.8	22.62	22.21
EDGE (4 Slot)	512	1850.2	21.28	20.83
	661	1880	21.23	20.75
	810	1909.8	21.31	20.86

UMTS BAND II

Mode	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
WCDMA 1900 RMC	1852.4	24	23.12	-0.88	22.68
	1880	24	**23.33**	-0.67	22.75
	1907.6	24	23.25	-0.75	22.71
WCDMA 1900 AMR	1852.4	24	21.82	-2.18	21.36
	1880	24	21.62	-2.38	21.26
	1907.6	24	21.54	-2.46	21.14
HSDPA Subtest 1	1852.4	24	21.33	-2.67	21.02
	1880	24	21.62	-2.38	21.19
	1907.6	24	21.45	-2.55	21.06
HSDPA Subtest 2	1852.4	24	21.64	-2.36	21.08
	1880	24	21.53	-2.47	21.04
	1907.6	24	21.41	-2.59	21.11
HSDPA Subtest 3	1852.4	24	21.72	-2.28	21.23
	1880	24	21.66	-2.34	21.15
	1907.6	24	21.53	-2.47	21.12
HSDPA Subtest 4	1852.4	24	21.49	-2.51	21.05
	1880	24	21.58	-2.42	21.16
	1907.6	24	21.63	-2.37	21.13
HSUPA Subtest 1	1852.4	24	21.75	-2.25	21.22
	1880	24	21.63	-2.37	21.16
	1907.6	24	21.72	-2.28	21.28
HSUPA Subtest 2	1852.4	24	21.52	-2.48	21.18
	1880	24	21.58	-2.42	21.25
	1907.6	24	21.47	-2.53	21.07
HSUPA Subtest 3	1852.4	24	21.42	-2.58	21.01
	1880	24	21.38	-2.62	21.04
	1907.6	24	21.52	-2.48	21.12
HSUPA Subtest 4	1852.4	24	21.41	-2.59	21.06
	1880	24	21.77	-2.23	21.32
	1907.6	24	21.63	-2.37	21.17
HSUPA Subtest 5	1852.4	24	21.56	-2.44	21.09
	1880	24	21.75	-2.25	21.24
	1907.6	24	21.46	-2.54	21.08

UMTS BAND IV

Mode	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
WCDMA 1700 RMC	1712.5	24	**22.82**	-1.18	22.23
	1732.5	24	22.79	-1.21	22.18
	1752.5	24	22.64	-1.36	22.13
WCDMA 1700 AMR	1712.5	24	21.78	-2.22	21.26
	1732.5	24	21.68	-2.32	21.16
	1752.5	24	21.62	-2.38	21.13
HSDPA Subtest 1	1712.5	24	21.75	-2.25	21.22
	1732.5	24	21.59	-2.41	21.27
	1752.5	24	21.63	-2.37	21.24
HSDPA Subtest 2	1712.5	24	21.56	-2.44	21.13
	1732.5	24	21.59	-2.41	21.16
	1752.5	24	21.61	-2.39	21.12
HSDPA Subtest 3	1712.5	24	21.72	-2.28	21.15
	1732.5	24	21.78	-2.22	21.18
	1752.5	24	21.63	-2.37	21.21
HSDPA Subtest 4	1712.5	24	21.66	-2.34	21.25
	1732.5	24	21.52	-2.48	21.06
	1752.5	24	21.54	-2.46	21.08
HSUPA Subtest 1	1712.5	24	21.59	-2.41	21.09
	1732.5	24	21.71	-2.29	21.23
	1752.5	24	21.73	-2.27	21.27
HSUPA Subtest 2	1712.5	24	21.68	-2.32	21.17
	1732.5	24	21.64	-2.36	21.15
	1752.5	24	21.71	-2.29	21.26
HSUPA Subtest 3	1712.5	24	21.55	-2.45	21.21
	1732.5	24	21.58	-2.42	21.28
	1752.5	24	21.69	-2.31	21.23
HSUPA Subtest 4	1712.5	24	21.74	-2.26	21.14
	1732.5	24	21.82	-2.18	21.16
	1752.5	24	21.78	-2.22	21.13
HSUPA Subtest 5	1712.5	24	21.71	-2.29	21.28
	1732.5	24	21.66	-2.34	21.26
	1752.5	24	21.63	-2.37	21.19

UMTS BAND V

Mode	Frequency (MHz)	Reference power	Peak Power	Tolerance	Avg.Burst Power
WCDMA 850 RMC	826.4	24	23.15	-0.85	22.63
	836.6	24	**23.22**	-0.78	22.75
	846.6	24	23.07	-0.93	22.56
WCDMA 850 AMR	826.4	24	21.83	-2.17	21.33
	836.6	24	21.81	-2.19	21.28
	846.6	24	21.75	-2.25	21.23
HSDPA Subtest 1	826.4	24	21.68	-2.32	21.14
	836.6	24	21.64	-2.36	21.16
	846.6	24	21.73	-2.27	21.27
HSDPA Subtest 2	826.4	24	21.62	-2.38	21.12
	836.6	24	21.69	-2.31	21.14
	846.6	24	21.72	-2.28	21.25
HSDPA Subtest 3	826.4	24	21.64	-2.36	21.26
	836.6	24	21.73	-2.27	21.21
	846.6	24	21.56	-2.44	21.28
HSDPA Subtest 4	826.4	24	21.78	-2.22	21.17
	836.6	24	21.82	-2.18	21.32
	846.6	24	21.67	-2.33	21.28
HSUPA Subtest 1	826.4	24	21.46	-2.54	21.02
	836.6	24	21.78	-2.22	21.26
	846.6	24	21.81	-2.19	21.23
HSUPA Subtest 2	826.4	24	21.62	-2.38	21.24
	836.6	24	21.79	-2.21	21.18
	846.6	24	21.65	-2.35	21.15
HSUPA Subtest 3	826.4	24	21.63	-2.37	21.13
	836.6	24	21.62	-2.38	21.16
	846.6	24	21.57	-2.43	21.09
HSUPA Subtest 4	826.4	24	21.54	-2.46	21.06
	836.6	24	21.61	-2.39	21.17
	846.6	24	21.68	-2.32	21.12
HSUPA Subtest 5	826.4	24	21.82	-2.18	21.24
	836.6	24	21.74	-2.26	21.28
	846.6	24	21.67	-2.33	21.29

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.

6.2 RADIATED OUTPUT POWER

6.2.1 MEASUREMENT METHOD

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

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

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

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

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

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

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c) and 27.50(d)(4). The "reference path loss" from Step1 is added to this result.

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

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

6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) and 27.50(d)(4) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) and 27.50(d)(4) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

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

6.2.3 MEASUREMENT RESULT

Radiated Power (ERP) for GSM 850/EDGE 8				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GSM850	824.2	**30.68**	Horizontal	Pass
	836.6	30.54	Horizontal	Pass
	848.8	30.48	Horizontal	Pass
	824.2	28.92	Vertical	Pass
	836.6	28.96	Vertical	Pass
	848.8	28.83	Vertical	Pass
EDGE	824.2	25.74	Horizontal	Pass
	836.6	25.61	Horizontal	Pass
	848.8	25.56	Horizontal	Pass
	824.2	25.63	Vertical	Pass
	836.6	25.69	Vertical	Pass
	848.8	25.52	Vertical	Pass

Radiated Power (E.I.R.P) for PCS 1900/EDGE 8				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
GSM 1900	1850.2	**27.67**	Horizontal	Pass
	1880.0	27.52	Horizontal	Pass
	1909.8	27.56	Horizontal	Pass
	1850.2	26.68	Vertical	Pass
	1880.0	26.54	Vertical	Pass
	1909.8	26.51	Vertical	Pass
EDGE	1850.2	24.58	Horizontal	Pass
	1880.0	24.55	Horizontal	Pass
	1909.8	24.66	Horizontal	Pass
	1850.2	23.54	Vertical	Pass
	1880.0	23.58	Vertical	Pass
	1909.8	23.53	Vertical	Pass

Radiated Power (E.I.R.P) for UMTS band II				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P (dBm)	Polarization Of Max. E.I.R.P	
RMC 12.2kbps	1852.4	**21.72**	Horizontal	Pass
	1880	21.65	Horizontal	Pass
	1907.6	21.56	Horizontal	Pass
	1852.4	21.53	Vertical	Pass
	1880	21.42	Vertical	Pass
	1907.6	21.38	Vertical	Pass

Radiated Power (E.I.R.P) for UMTS band IV				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	1712.5	**21.62**	Horizontal	Pass
	1732.5	21.55	Horizontal	Pass
	1752.5	21.46	Horizontal	Pass
	1712.5	21.61	Vertical	Pass
	1732.5	21.53	Vertical	Pass
	1752.5	21.48	Vertical	Pass

Radiated Power (ERP) for UMTS band V				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. E.I.R.P.	
RMC 12.2kbps	826.4	**21.64**	Horizontal	Pass
	836.6	21.48	Horizontal	Pass
	846.6	21.52	Horizontal	Pass
	826.4	21.44	Vertical	Pass
	836.6	21.36	Vertical	Pass
	846.6	21.28	Vertical	Pass

Note: Above is worst mode data.

6.3. Peak-to-Average Ratio

6.3.1 MEASUREMENT METHOD

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = PPk (dBm) - PAvg (dBm).

6.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

6.3.3 MEASUREMENT RESULT

Modes	GSM850(GSM)		
Channel	128	190	251
	(Low)	(Mid)	(High)
Frequency (MHz)	824.2	836.6	848.8
Peak-To-Average Ratio (dB)/GSM	0.62	0.71	0.77
Peak-To-Average Ratio (dB)/EDGE	0.41	0.43	0.39

Modes	PCS 1900 (GSM)		
Channel	512	661	810
	(Low)	(Mid)	(High)
Frequency (MHz)	1850.2	1880	1909.8
Peak-To-Average Ratio (dB)/GSM	0.69	0.65	0.73
Peak-To-Average Ratio (dB)/EDGE	0.47	0.37	0.41

Modes	UMTS BAND II		
Channel	9662	9800	9938
	(Low)	(Mid)	(High)
Frequency (MHz)	1852.4	1880	1907.6
Peak-To-Average Ratio (dB)	0.44	0.58	0.54

Modes	UMTS BAND IV		
Channel	1887	1987	2087
	(Low)	(Mid)	(High)
Frequency (MHz)	1712.5	1732.5	1752.5
Peak-To-Average Ratio (dB)	0.59	0.61	0.51

Modes	UMTS BAND V		
Channel	4357	4408	4458
	(Low)	(Mid)	(High)
Frequency (MHz)	826.4	836.6	846.6
Peak-To-Average Ratio (dB)	0.52	0.47	0.51

7. SPURIOUS EMISSION

7.1 CONDUCTED SPURIOUS EMISSION

7.1.1 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 GSM 850, data taken from 30 MHz to 9 GHz.
2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of GSM 850/EDGE 8	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS 1900/EDGE 8	
Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

Typical Channels for testing of UMTS band II	
Channel	Frequency (MHz)
9662	1852.4
9800	1880
9938	1907.6

Typical Channels for testing of UMTS band IV	
Channel	Frequency (MHz)
1887	1712.5
1987	1732.5
2087	1752.5

Typical Channels for testing of UMTS band V	
Channel	Frequency (MHz)
4357	826.4
4408	836.6
4458	846.6

7.1.2 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.

7.1.3 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.

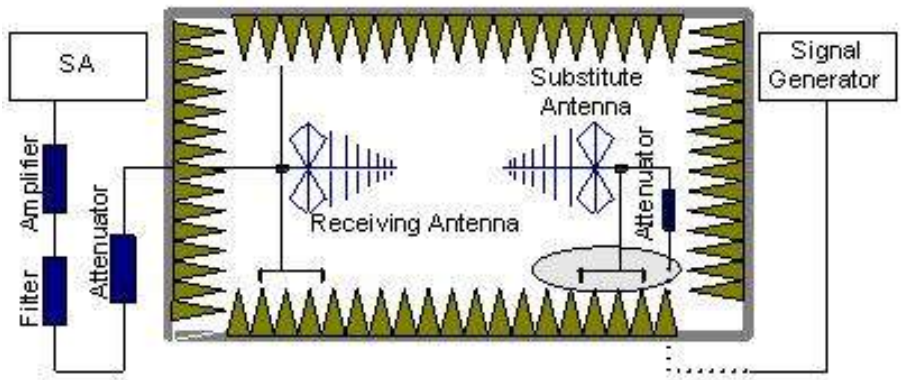
7.2 Radiated Spurious Emission

7.2.1 MEASUREMENT METHOD

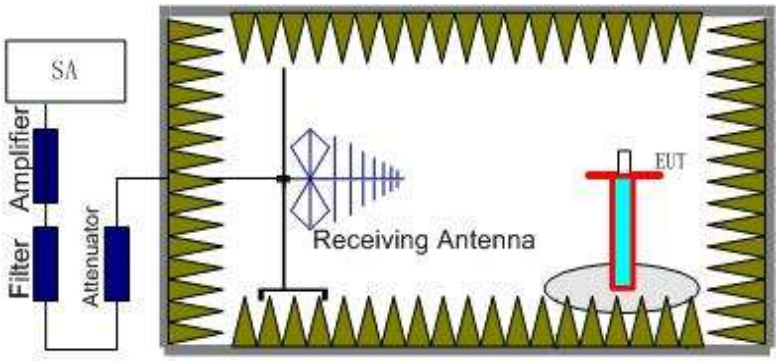
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS/EGPRS 850, GPRS/EGPRS 1900, HSPA band II, HSPA band IV, HSPA band V) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

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



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



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), UMTS band II(1852.4MHz, 1880MHz, 1907.6MHz), UMTS band IV(1712.5MHz, 1732.5MHz, 1752.5MHz), UMTS band V(826.4MHz, 836.6MHz, 846.6MHz) . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

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

7.2.2 PROVISIONS APPLICABLE

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

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

7.2.3 MEASUREMENT RESULT

GSM 850:

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1685.23	-43.33	-5.01	-48.34	-13.00	Horizontal
2456.12	-45.82	-2.18	-48.00	-13.00	Vertical
3645.78	-47.62	3.46	-44.16	-13.00	Vertical
4536.58	-43.88	2.79	-41.09	-13.00	Horizontal

GSM 850(EDGE 8):

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1696.28	-46.45	-2.26	-48.71	-13.00	Horizontal
2162.19	-47.63	-3.12	-50.75	-13.00	Vertical
3645.78	-48.68	-1.74	-50.42	-13.00	Vertical
9257.65	-44.52	8.46	-36.06	-13.00	Horizontal

PCS 1900:

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1429.36	-45.82	-3.22	-49.04	-13.00	Vertical
2563.47	-46.35	-0.24	-46.59	-13.00	Vertical
3645.26	-47.63	3.98	-43.65	-13.00	Horizontal
4563.56	-47.33	11.56	-35.77	-13.00	Vertical
5689.25	-45.41	17.89	-27.52	-13.00	Horizontal

PCS 1900(EDGE 8):

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1430.15	-53.26	2.7	-50.56	-13.00	Vertical
9367.91	-53.63	11.6	-42.03	-13.00	Vertical
13356.68	-54.82	14.89	-39.93	-13.00	Horizontal
15249.71	-54.42	13.87	-40.55	-13.00	Vertical
17913.63	-56.45	19.76	-36.69	-13.00	Horizontal

UMTS band II:

The Worst Test Results for Channel 9938/1907.6MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
2000.00	-38.42	-2.25	-40.67	-13.00	Vertical
9548.50	-41.58	-3.03	-44.61	-13.00	Horizontal
13367.40	-44.69	-1.87	-46.56	-13.00	Horizontal
15277.80	-42.56	8.52	-34.04	-13.00	Vertical
17931.60	-51.47	18.7	-32.77	-13.00	Horizontal

UMTS band IV

The Worst Test Results for Channel 2087/1752.5MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1536.98	-46.26	9.7	-36.56	-13.00	Vertical
2536.41	-44.85	11.6	-33.25	-13.00	Horizontal
3786.52	-46.48	14.89	-31.59	-13.00	Horizontal
5123.56	-43.96	13.87	-30.09	-13.00	Vertical
6615.32	-47.45	19.76	-27.69	-13.00	Horizontal

UMTS band V:

The Worst Test Results for Channel 4458/846.6MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit（dBm）	Polarity
1598.26	-41.25	-2.26	-43.51	-13.00	Vertical
2365.78	-39.48	-3.12	-42.6	-13.00	Horizontal
4967.65	-42.11	-1.74	-43.85	-13.00	Horizontal
6457.86	-39.63	8.74	-30.89	-13.00	Vertical
7896.56	-42.25	17.89	-24.36	-13.00	Horizontal

Note: ARpl= Factor=Antenna Factor+ Cable loss-Amplifier gain.

The “Factor” value can be calculated automatically by software of measurement system.

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

8. MAINS CONDUCTED EMISSION

8.1 MEASUREMENT METHOD

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

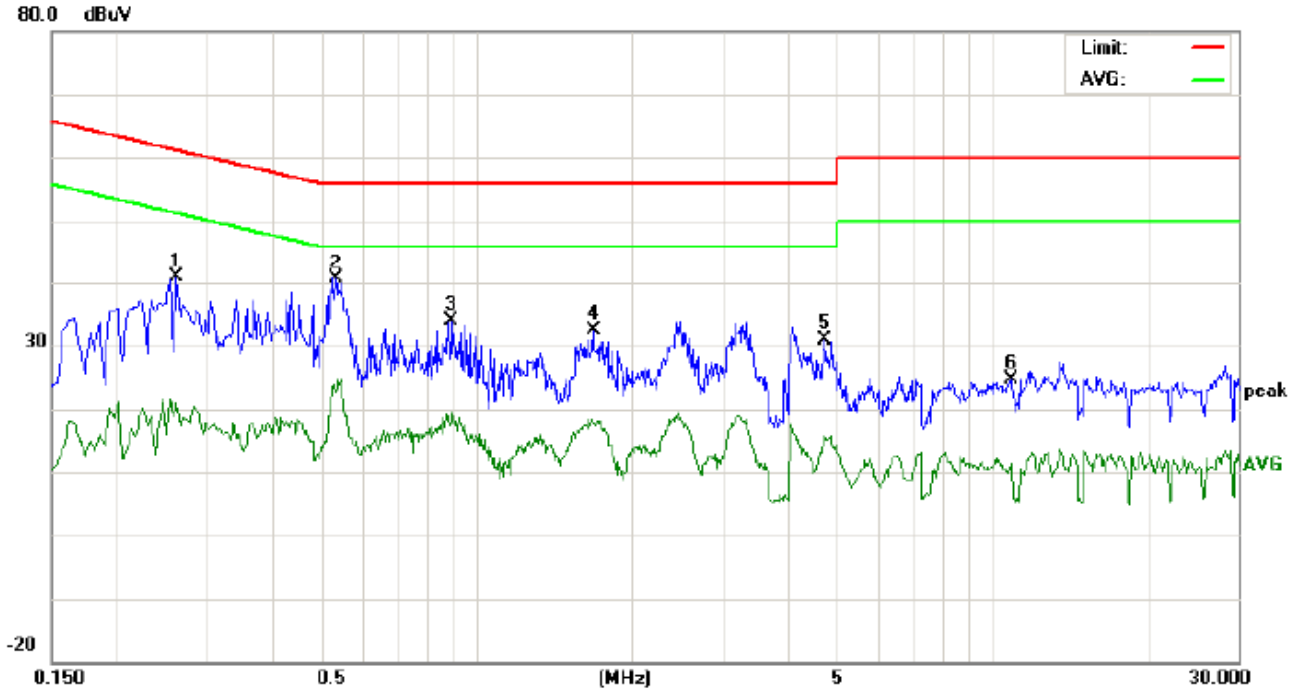
8.2 PROVISIONS APPLICABLE

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:

8.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION - L



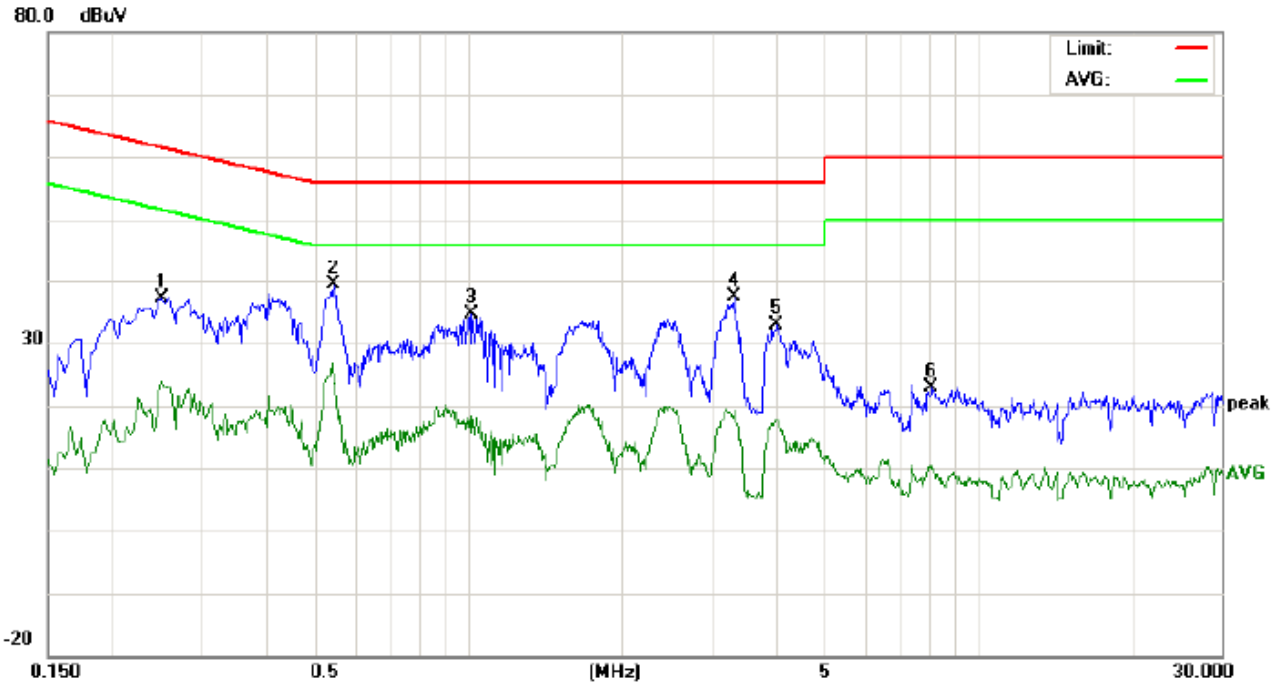
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Titan HD
M/N: E500A
Mode: Call
Note:

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2620	30.65		10.59	10.27	40.92		20.86	61.36	51.36	-20.44	-30.50	P	
2	0.5340	30.37		12.20	10.37	40.74		22.57	56.00	46.00	-15.26	-23.43	P	
3	0.8980	23.44		8.90	10.41	33.85		19.31	56.00	46.00	-22.15	-26.69	P	
4	1.6858	22.11		7.26	10.32	32.43		17.58	56.00	46.00	-23.57	-28.42	P	
5	4.7458	20.67		5.42	10.22	30.89		15.64	56.00	46.00	-25.11	-30.36	P	
6	10.8817	14.59		1.03	10.10	24.69		11.13	60.00	50.00	-35.31	-38.87	P	

LINE CONDUCTED EMISSION - N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Titan HD
M/N: E500A
Mode: Call
Note:

Phase: N
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2500	26.88		13.64	10.27	37.15		23.91	61.75	51.75	-24.60	-27.84	P	
2	0.5460	29.01		13.28	10.36	39.37		23.64	56.00	46.00	-16.63	-22.36	P	
3	1.0180	24.20		8.08	10.37	34.57		18.45	56.00	46.00	-21.43	-27.55	P	
4	3.3340	26.82		8.54	10.52	37.34		19.06	56.00	46.00	-18.66	-26.94	P	
5	4.0339	22.38		7.52	10.41	32.79		17.93	56.00	46.00	-23.21	-28.07	P	
6	8.1416	12.51		0.09	10.35	22.86		10.44	60.00	50.00	-37.14	-39.56	P	

Note: The GSM850 mode is the worst condition.

9. FREQUENCY STABILITY

9.1 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.

9.2 PROVISIONS APPLICABLE

9.2.1 For Hand carried battery powered equipment

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

9.2.2 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.

9.3 MEASUREMENT RESULT (WORST)

Frequency Error Against Voltage for GSM850/EDGE 8 band				
Voltage(V)	GSM		EDGE 8	
	Frequency error(Hz)	Frequency error(ppm)	Frequency error(Hz)	Frequency error(ppm)
3.4	16	0.019	15	0.018
3.7	18	0.022	13	0.016
4.2	15	0.018	17	0.020

Frequency Error Against Temperature for GSM850/EDGE 8 band				
temperature(℃)	GSM		EDGE 8	
	Frequency error(Hz)	Frequency error(ppm)	Frequency error(Hz)	Frequency error(ppm)
-10	21	0.025	27	0.032
0	16	0.019	24	0.029
10	18	0.022	22	0.026
20	22	0.026	26	0.031
30	26	0.031	24	0.029
40	21	0.025	22	0.026
50	23	0.028	26	0.031

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for PCS1900/EDGE 8 band				
Voltage(V)	GSM		EDGE 8	
	Frequency error(Hz)	Frequency error(ppm)	Frequency error(Hz)	Frequency error(ppm)
3.4	22	0.012	26	0.014
3.7	26	0.014	21	0.011
4.2	15	0.008	25	0.013

Frequency Error Against Voltage for PCS1900/EDGE 8 band				
temperature(℃)	GSM		EDGE 8	
	Frequency error(Hz)	Frequency error(ppm)	Frequency error(Hz)	Frequency error(ppm)
-10	21	0.011	26	0.014
0	23	0.012	23	0.012
10	26	0.014	24	0.013
20	16	0.009	19	0.010
30	25	0.013	24	0.013
40	26	0.014	26	0.014
50	22	0.012	22	0.012

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band II		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	22	0.012
3.7	27	0.014
4.2	24	0.013

Frequency Error Against Temperature for UMTS band II		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	36	0.019
0	31	0.016
10	35	0.019
20	33	0.018
30	31	0.016
40	34	0.018
50	37	0.020

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band IV (Channel 1987)		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.4	34	0.020
3.7	33	0.019
4.2	35	0.020

Frequency Error Against Temperature for UMTS band IV (Channel 1987)		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	36	0.021
0	38	0.022
10	32	0.018
20	36	0.021
30	37	0.021
40	31	0.018
50	33	0.019

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for UMTS band V		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.3	25	0.030
7.4	26	0.031
8.5	23	0.028

Frequency Error Against Temperature for UMTS band V		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	22	0.026
0	25	0.030
10	24	0.029
20	25	0.030
30	26	0.031
40	22	0.026
50	27	0.032
55	23	0.028

Note: The EUT doesn't work below -10℃

10. OCCUPIED BANDWIDTH

10.1 MEASUREMENT METHOD

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

10.2 PROVISIONS APPLICABLE

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

10.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM850 band			
	Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
GSM	Low Channel	824.2	242.97
	Middle Channel	836.6	246.51
	High Channel	848.8	246.09
EDGE 8	Low Channel	824.2	247.89
	Middle Channel	836.6	241.17
	High Channel	848.8	248.97

Occupied Bandwidth (99%) for PCS1900 band			
	Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
GSM	Low Channel	1850.2	246.69
	Middle Channel	1880.0	243.71
	High Channel	1909.8	243.87
EDGE 8	Low Channel	1850.2	241.46
	Middle Channel	1880.0	257.05
	High Channel	1909.8	241.98

Occupied Bandwidth (99%) for UMTS band II		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1852.4	4.17
Middle Channel	1880	4.16
High Channel	1907.6	4.16

Occupied Bandwidth (99%) for UMTS band IV		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1712.5	4.15
Middle Channel	1732.5	4.15
High Channel	1752.5	4.15

Occupied Bandwidth (99%) for UMTS band V		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	826.4	4.16
Middle Channel	836.6	4.15
High Channel	846.6	4.13

11. EMISSION BANDWIDTH

11.1 MEASUREMENT METHOD

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

11.2 PROVISIONS APPLICABLE

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

11.3 MEASUREMENT RESULT

Emission Bandwidth (-26dBc) for GSM850 (EDGE 8) band			
	Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
GSM	Low Channel	824.2	309.09
	Middle Channel	836.6	311.53
	High Channel	848.8	309.64
EDGE 8	Low Channel	824.2	311.37
	Middle Channel	836.6	321.05
	High Channel	848.8	322.81

Emission Bandwidth (-26dBc) for PCS1900 (EDGE 8) band			
	Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
GSM	Low Channel	1850.2	305.35
	Middle Channel	1880.0	313.18
	High Channel	1909.8	315.53
EDGE 8	Low Channel	1850.2	310.29
	Middle Channel	1880.0	315.02
	High Channel	1909.8	312.22

Emission Bandwidth (-26dBc) for UMTS band II		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	1852.4	4.70
Middle Channel	1880	4.70
High Channel	1907.6	4.74

Emission Bandwidth (-26dBc) for UMTS band IV		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
Low Channel	1712.5	4.69
Middle Channel	1732.5	4.65
High Channel	1752.5	4.69

Emission Bandwidth (-26dBc) for UMTS band V		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(MHz)
Low Channel	826.4	4.65
Middle Channel	836.6	4.66
High Channel	846.6	4.66

12. BAND EDGE

12.1 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.

12.2 PROVISIONS APPLICABLE

As Specified in FCC rules of 22.917(a) and 24.238(a)

12.3 MEASUREMENT RESULT

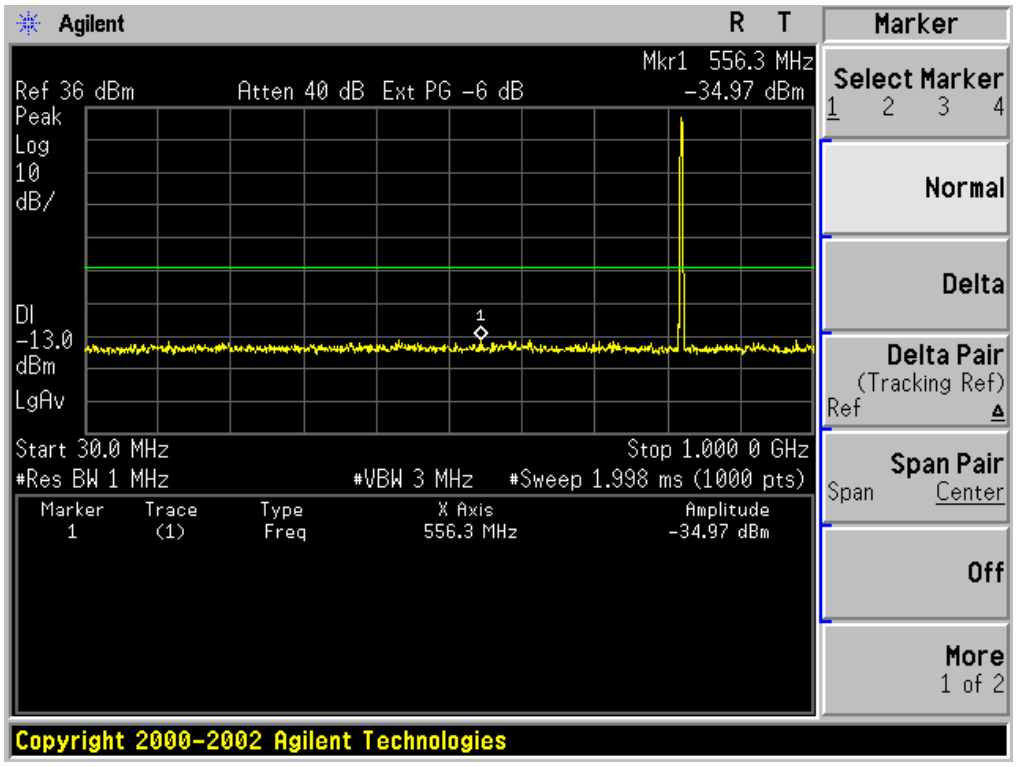
Please refers to Appendix III for compliance test plots for band edges

APPENDIX A

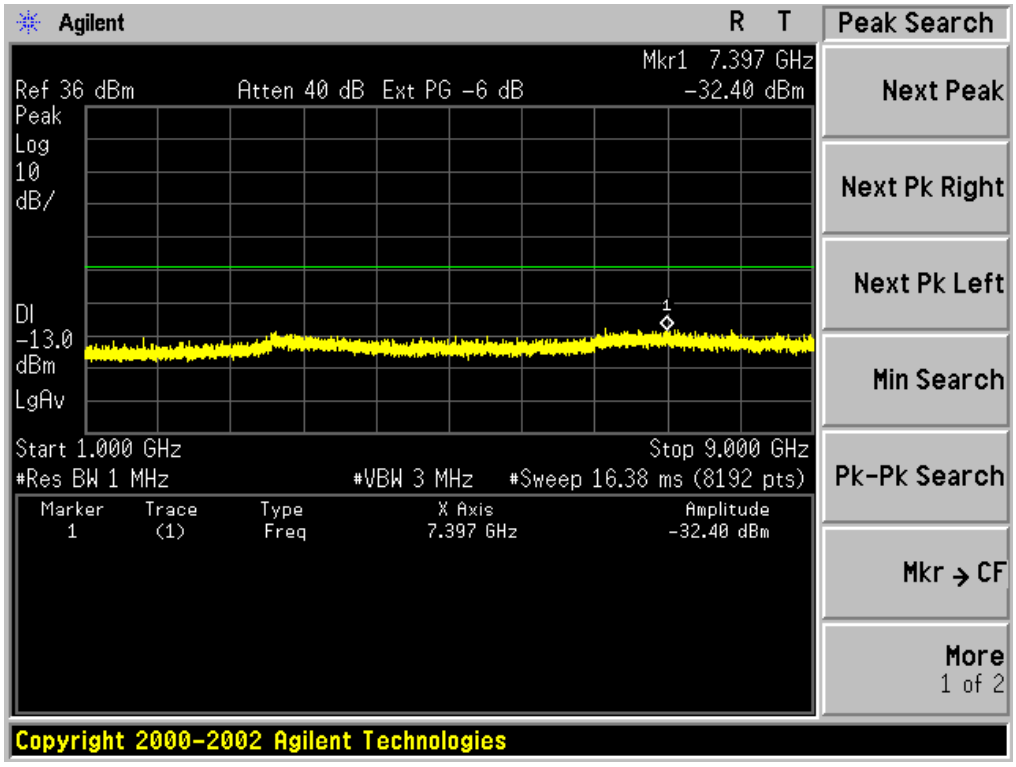
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM850 BAND

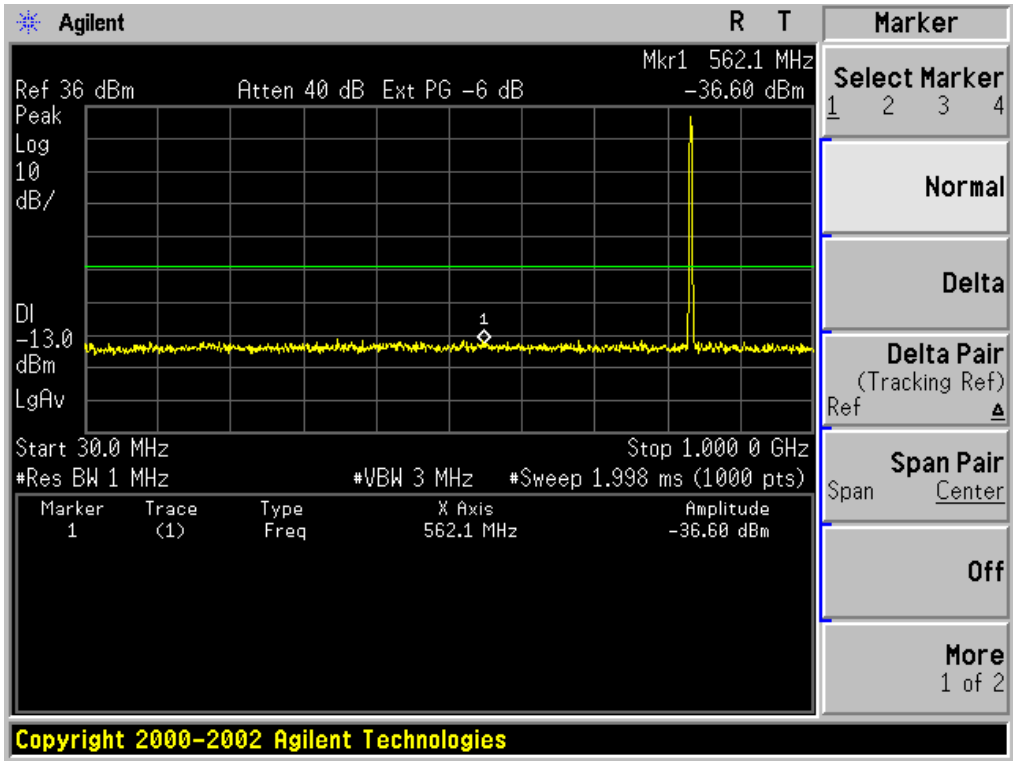
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



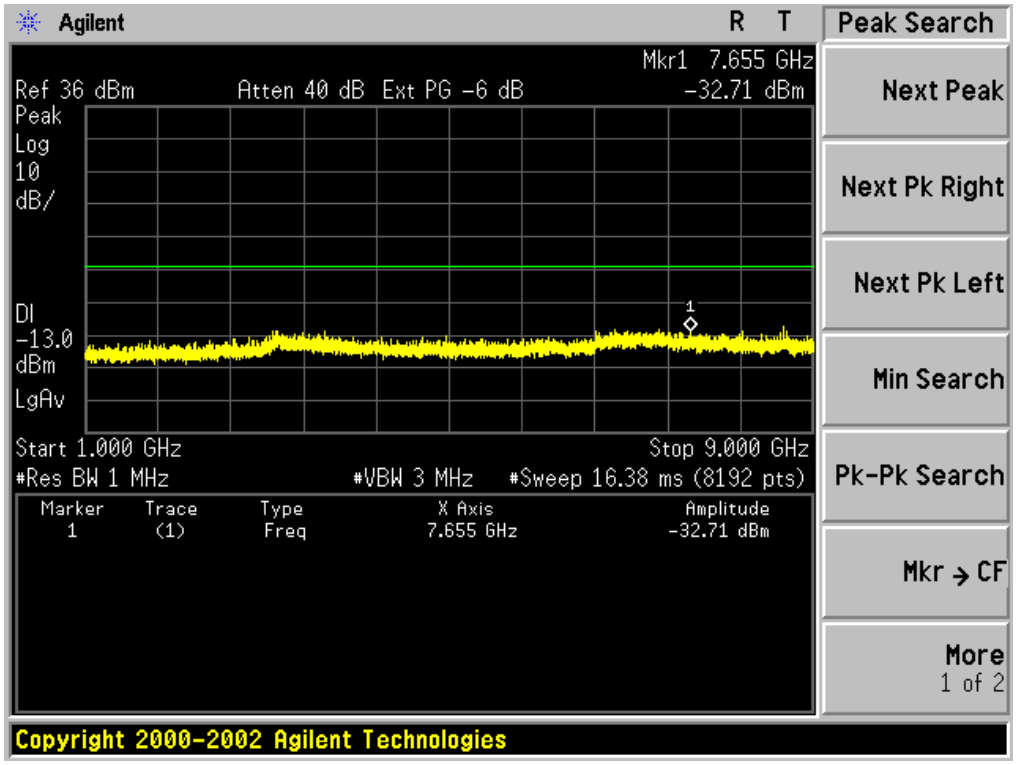
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



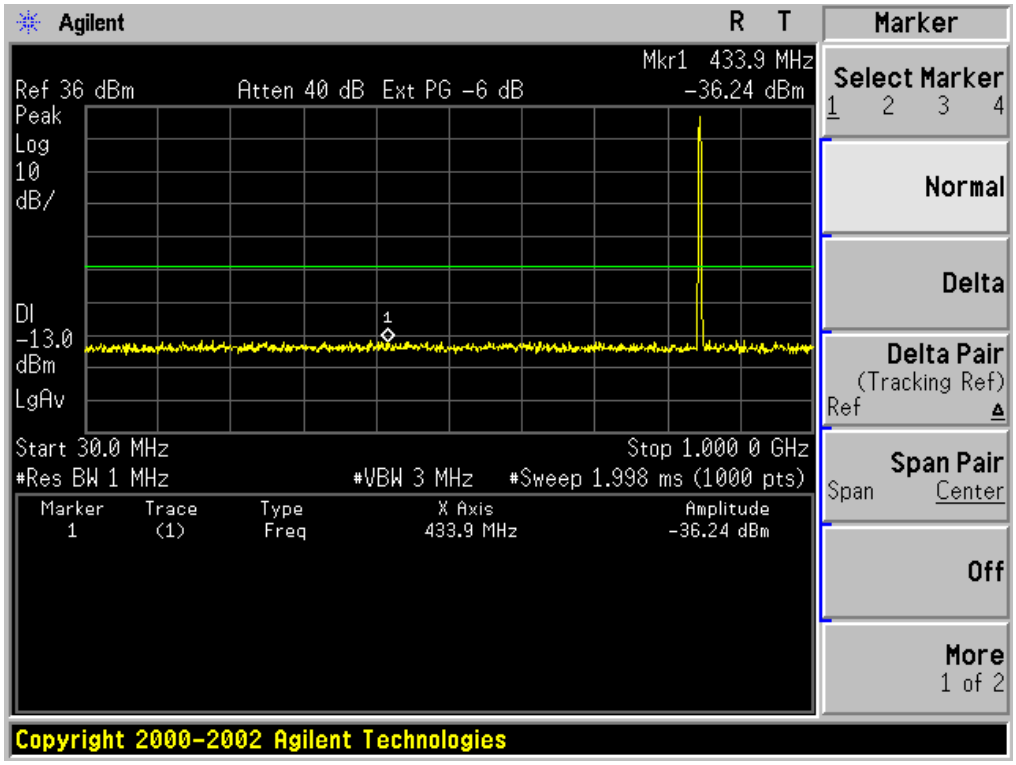
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



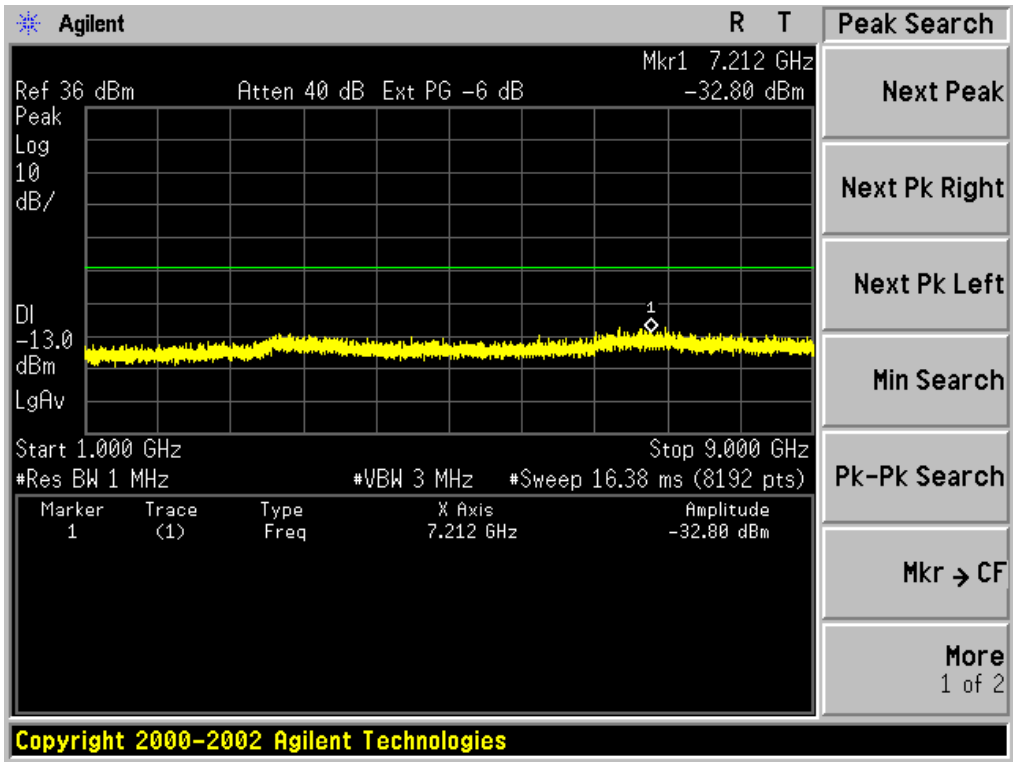
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

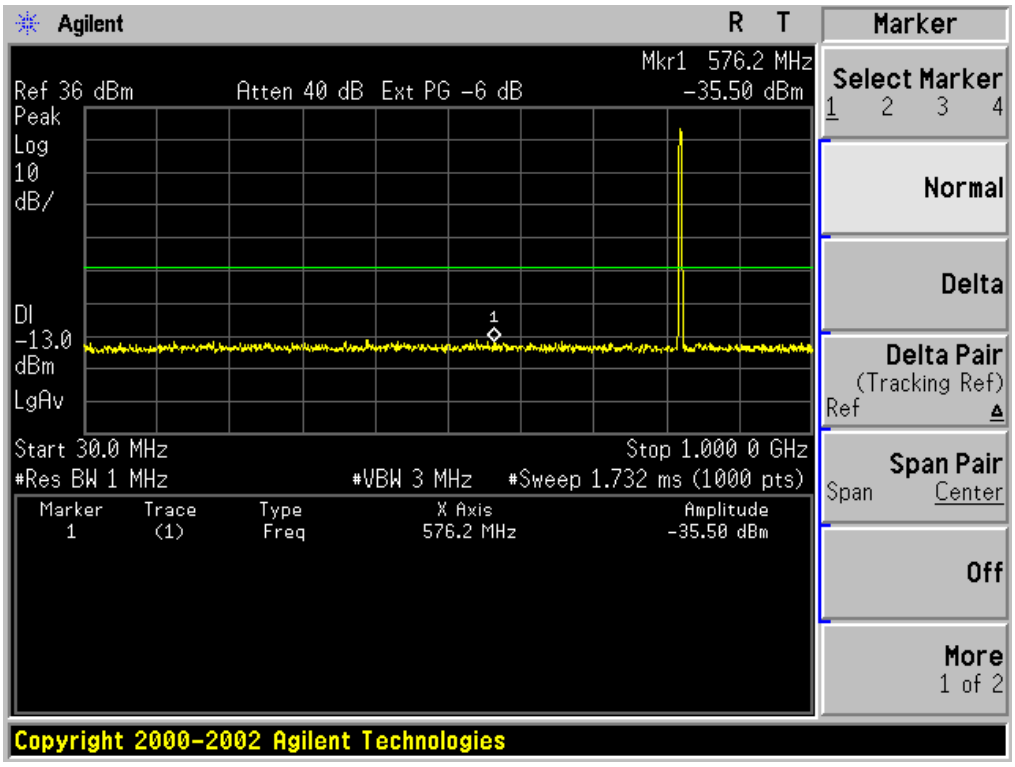


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

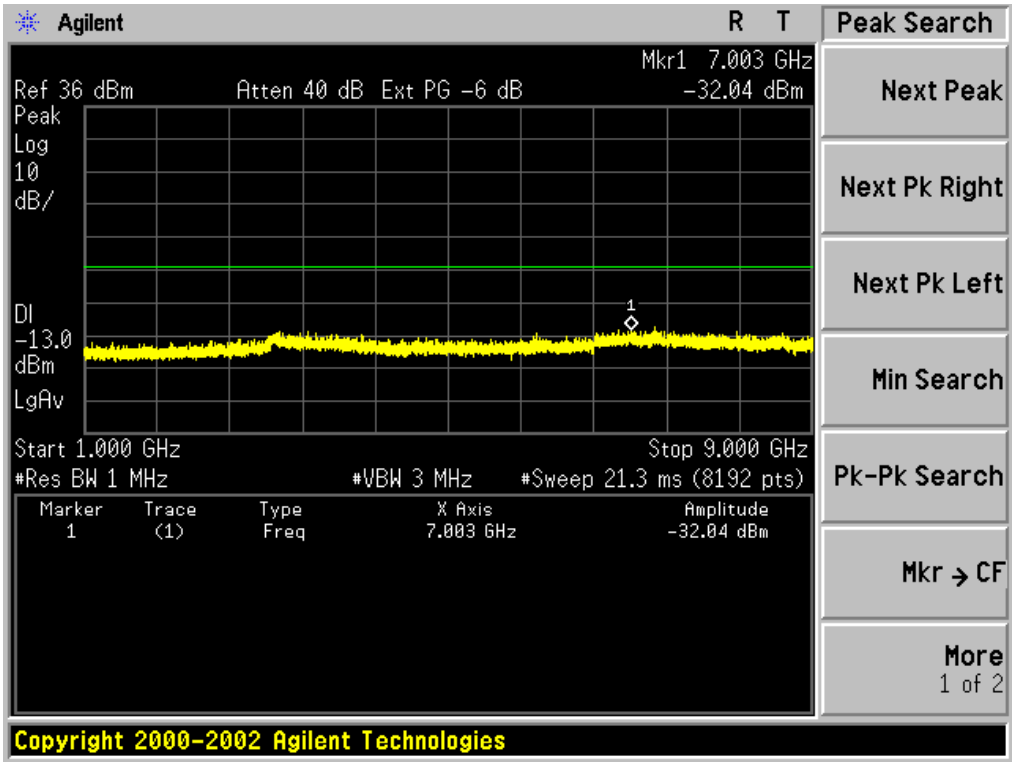


CONDUCTED EMISSION IN GSM850 (EDGE 8) BAND

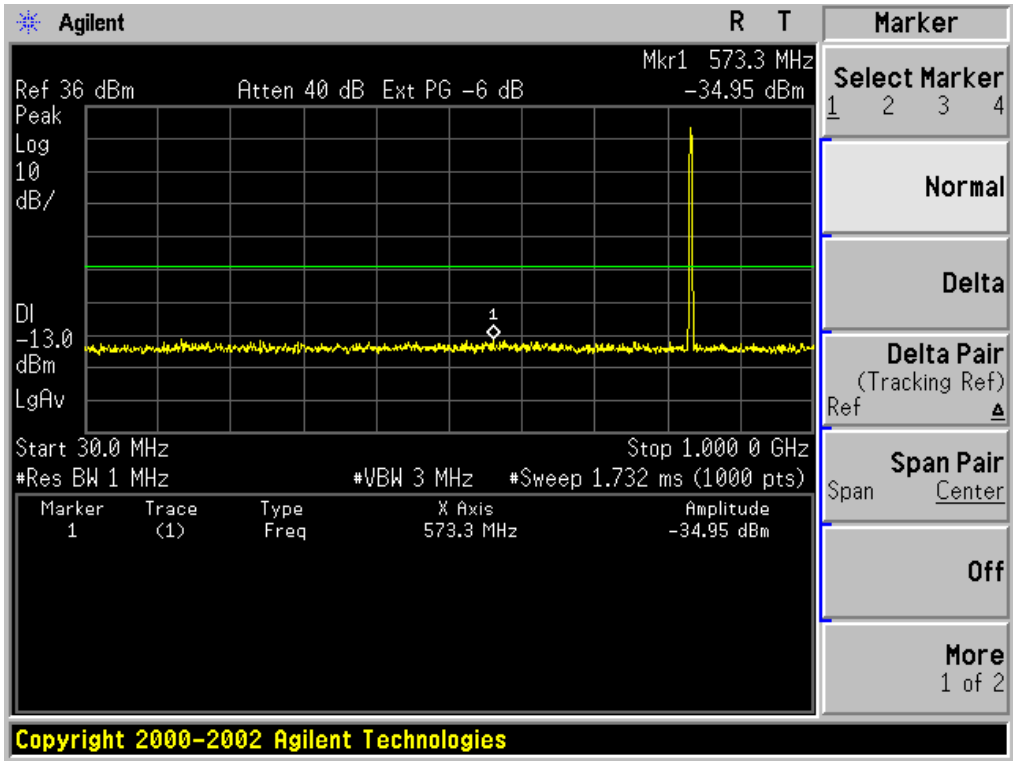
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



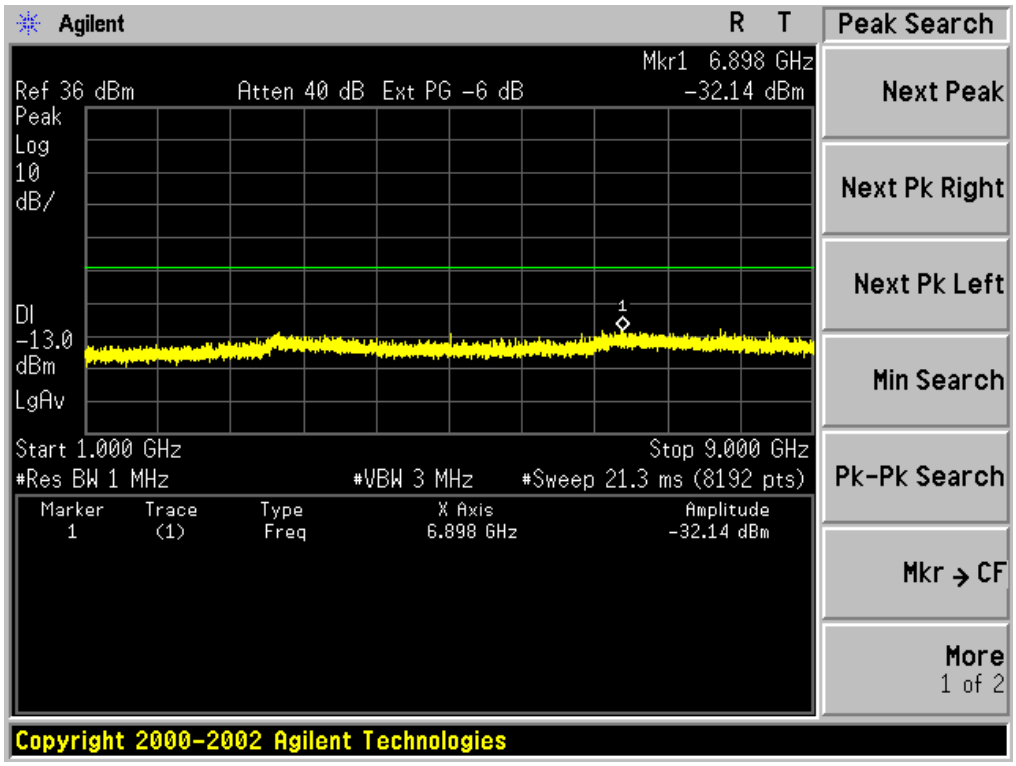
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



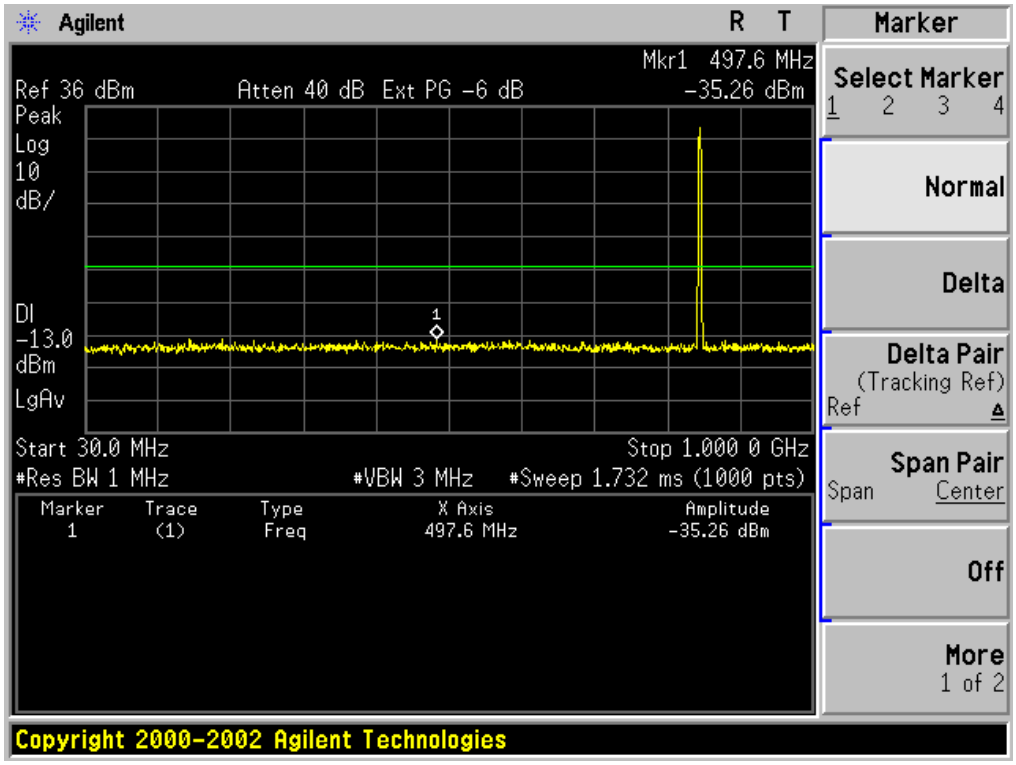
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



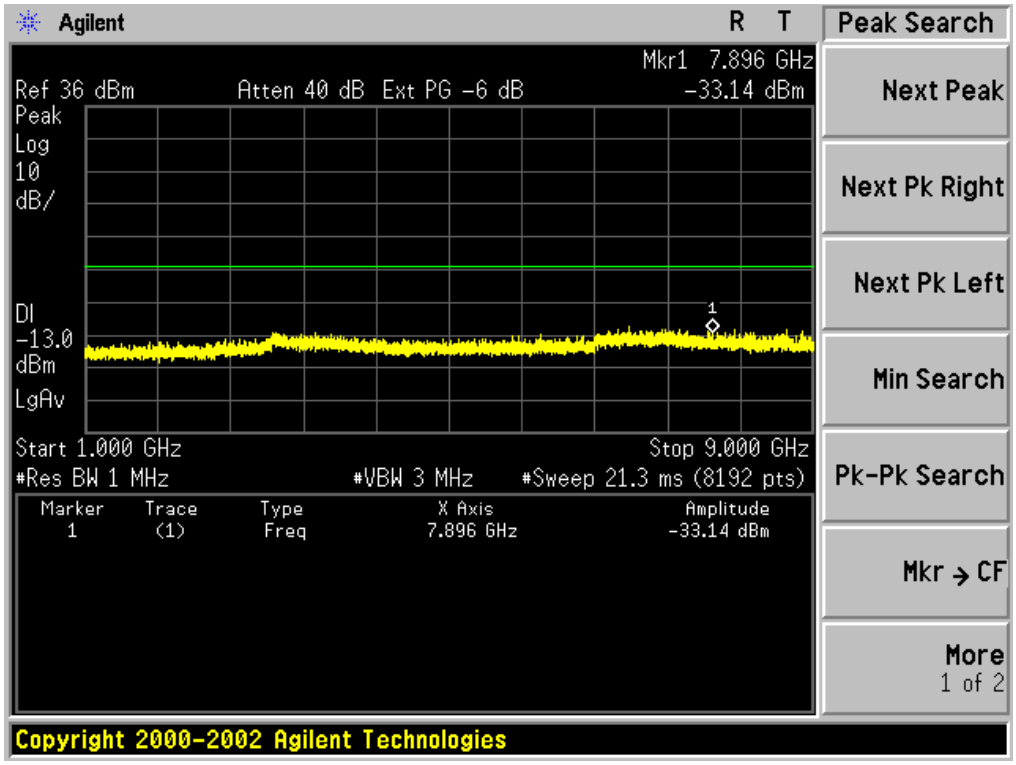
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

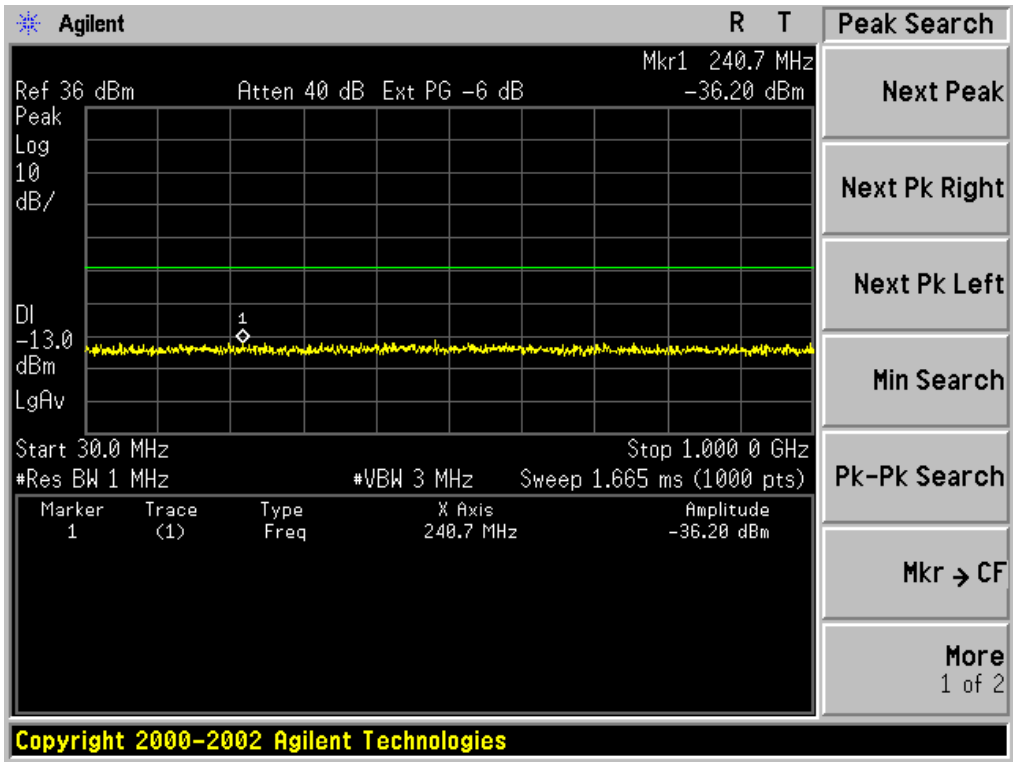


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

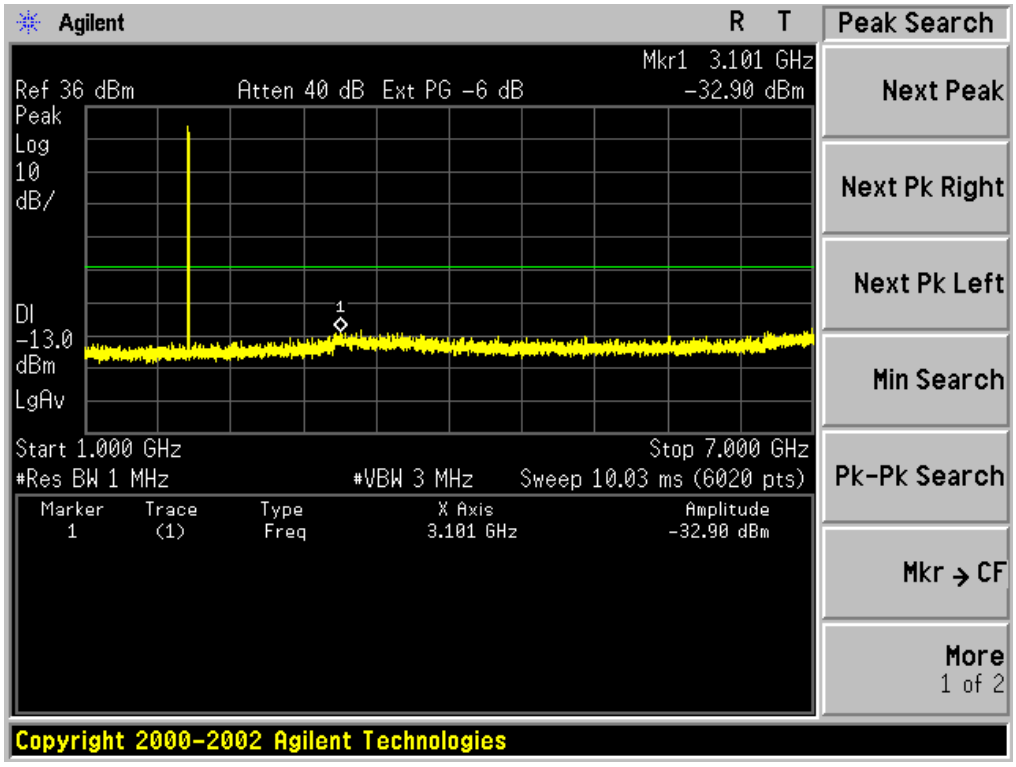


CONDUCTED EMISSION IN PCS1900 BAND

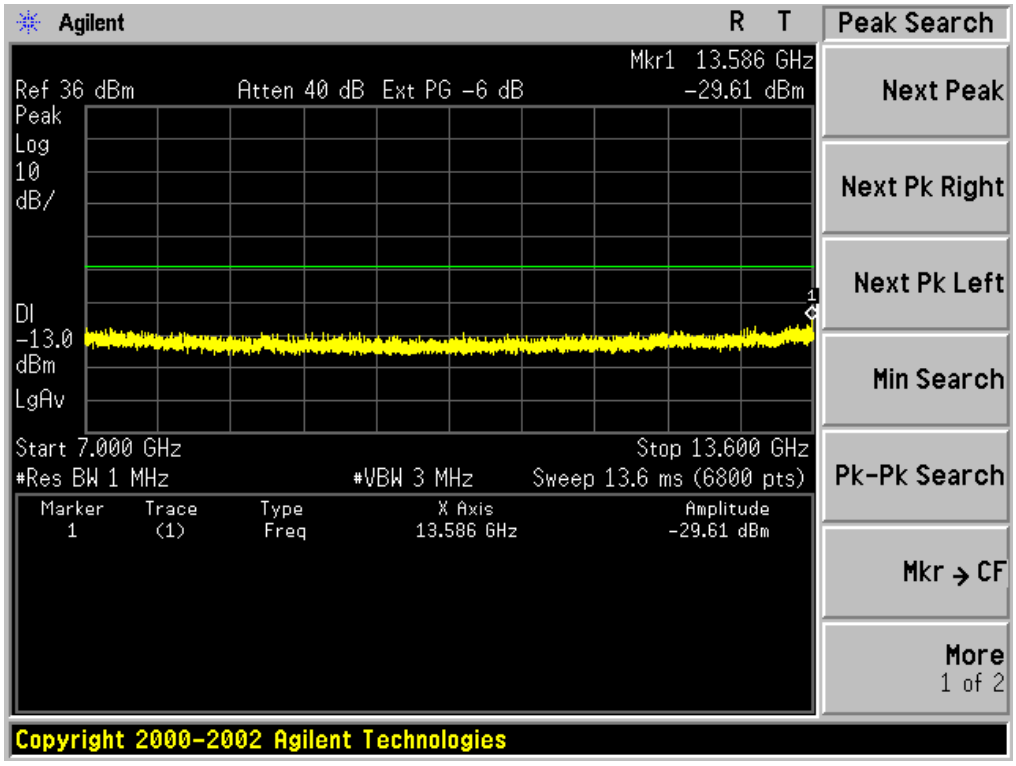
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



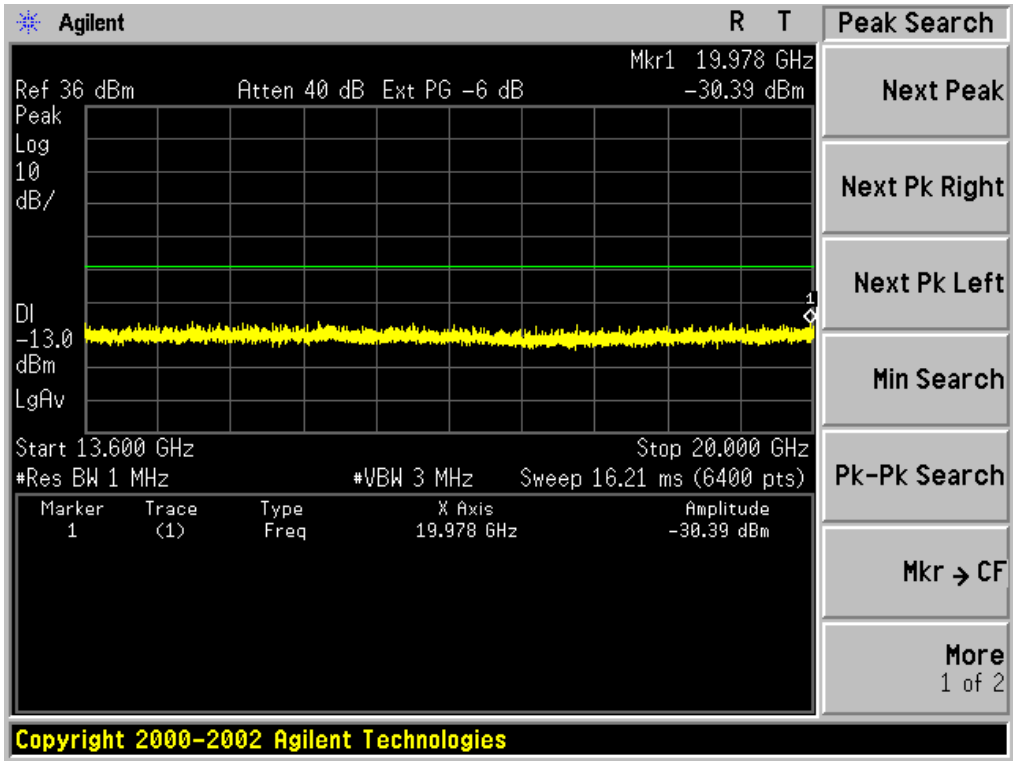
Conducted Emission Transmitting Mode CH 512 1GHz – 7GHz



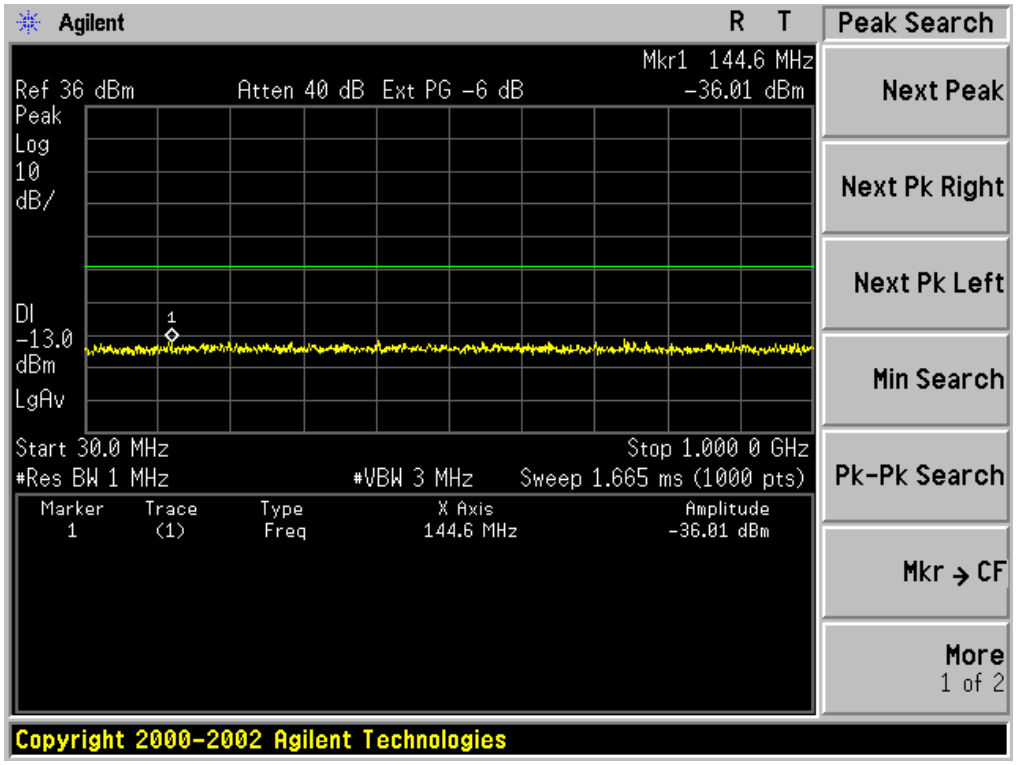
Conducted Emission Transmitting Mode CH 512 7GHz – 13.6GHz



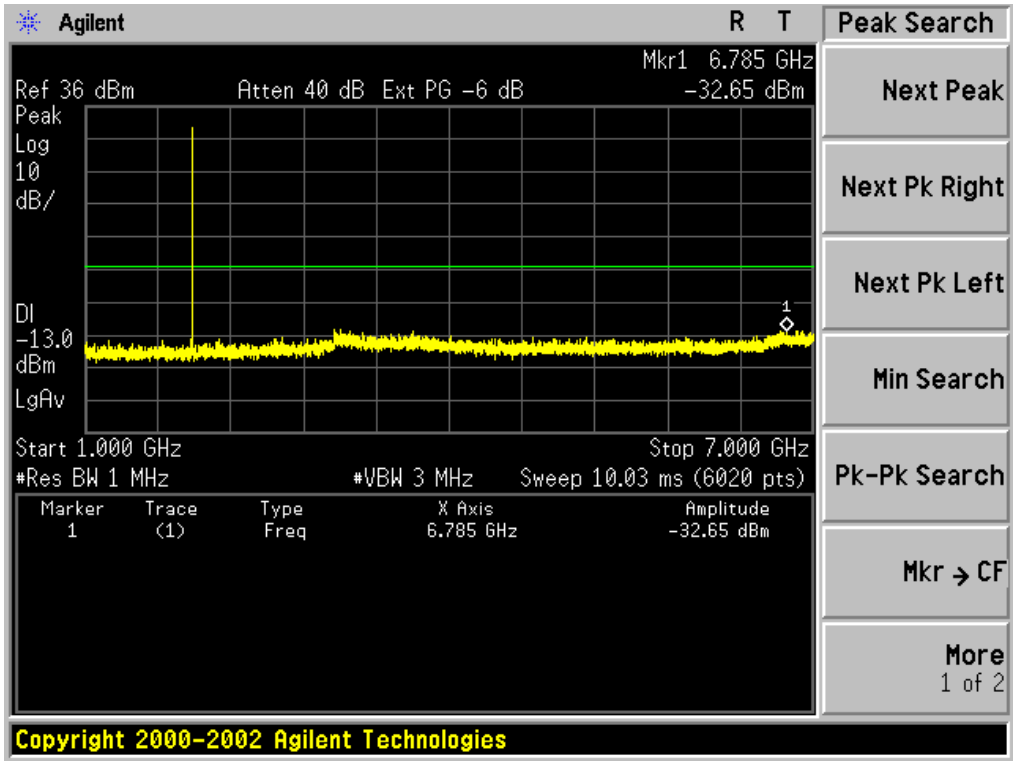
Conducted Emission Transmitting Mode CH 512 13.6GHz – 20GHz



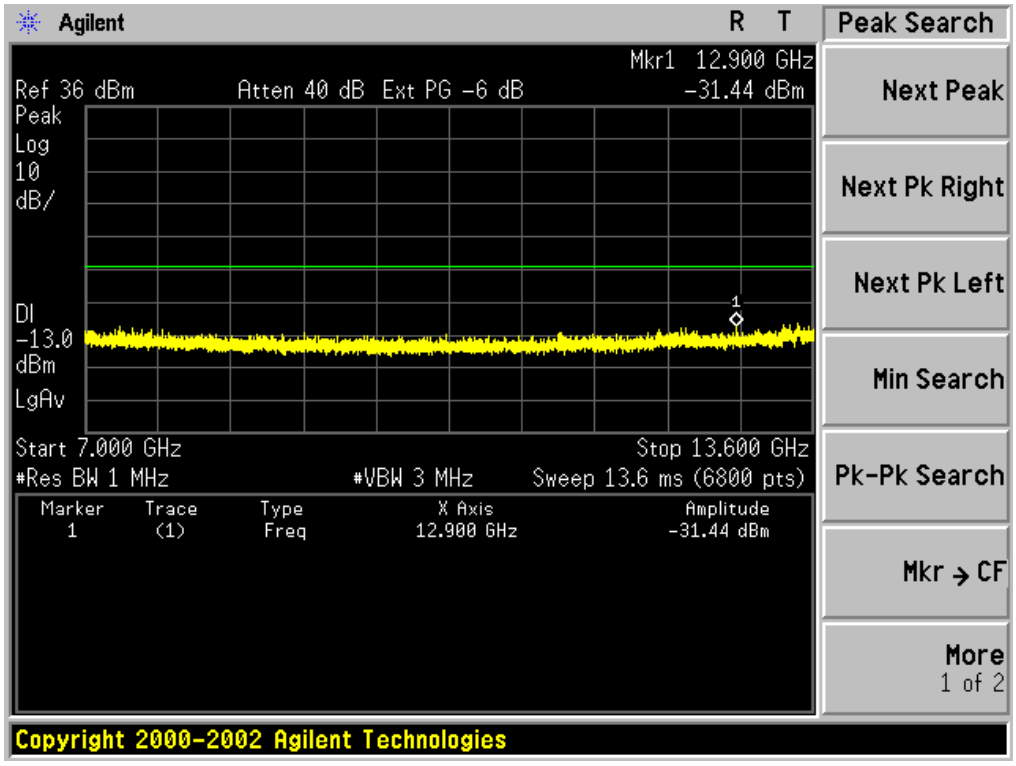
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



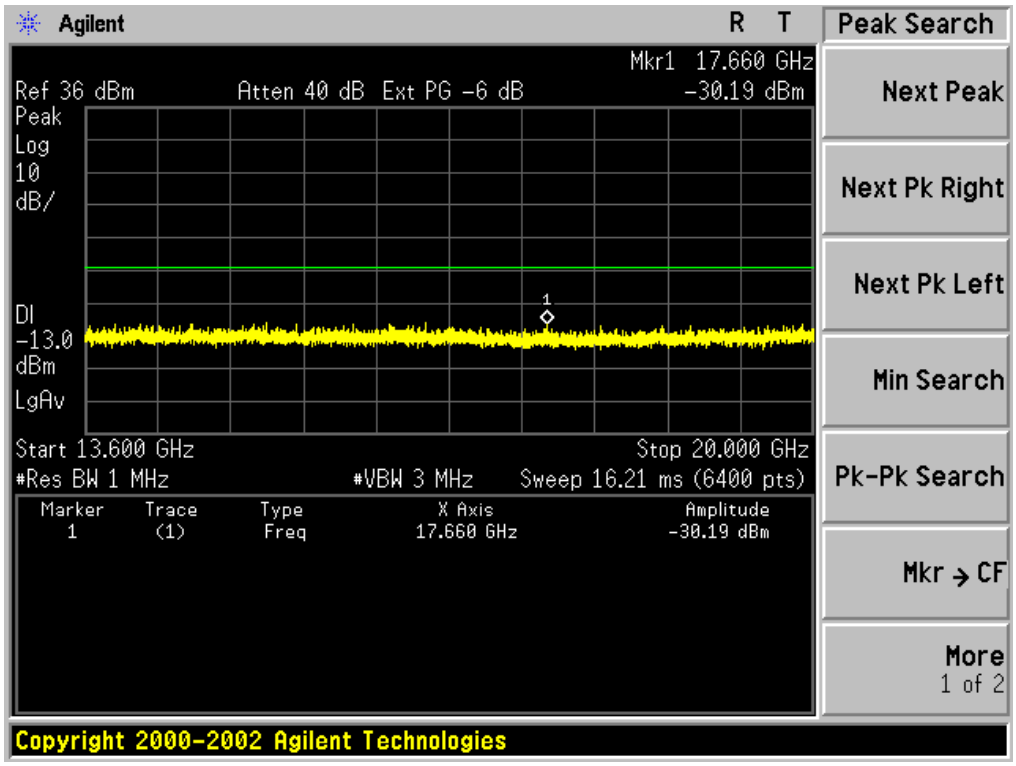
Conducted Emission Transmitting Mode CH 661 1GHz – 7GHz



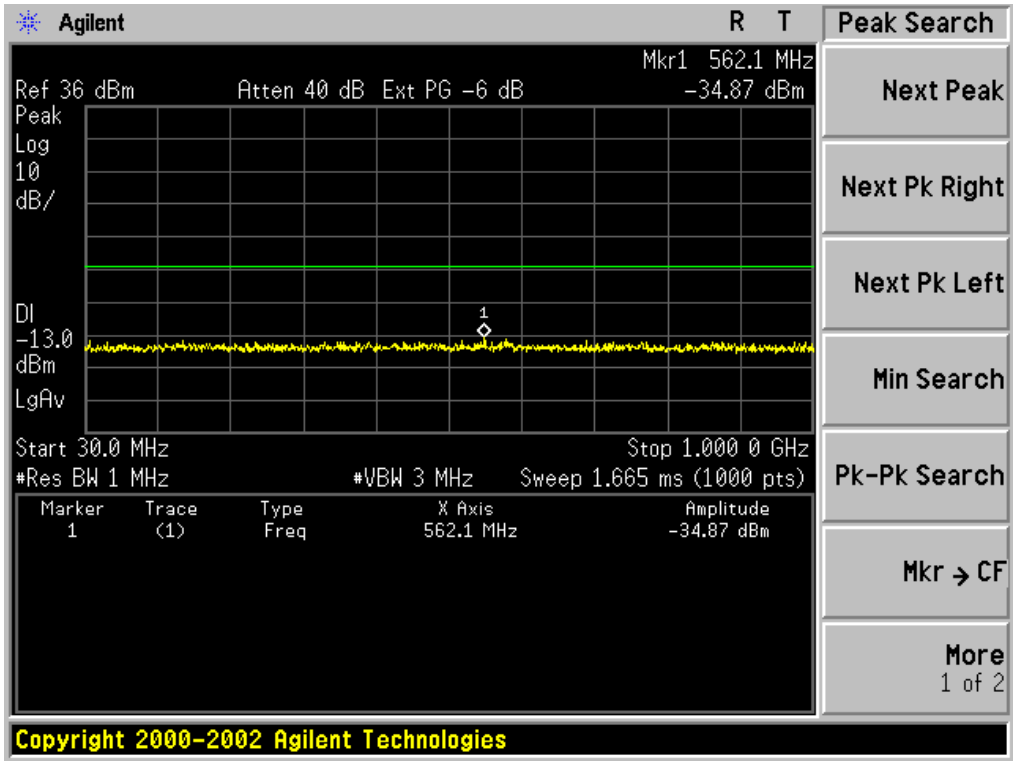
Conducted Emission Transmitting Mode CH 661 7GHz – 13.6GHz



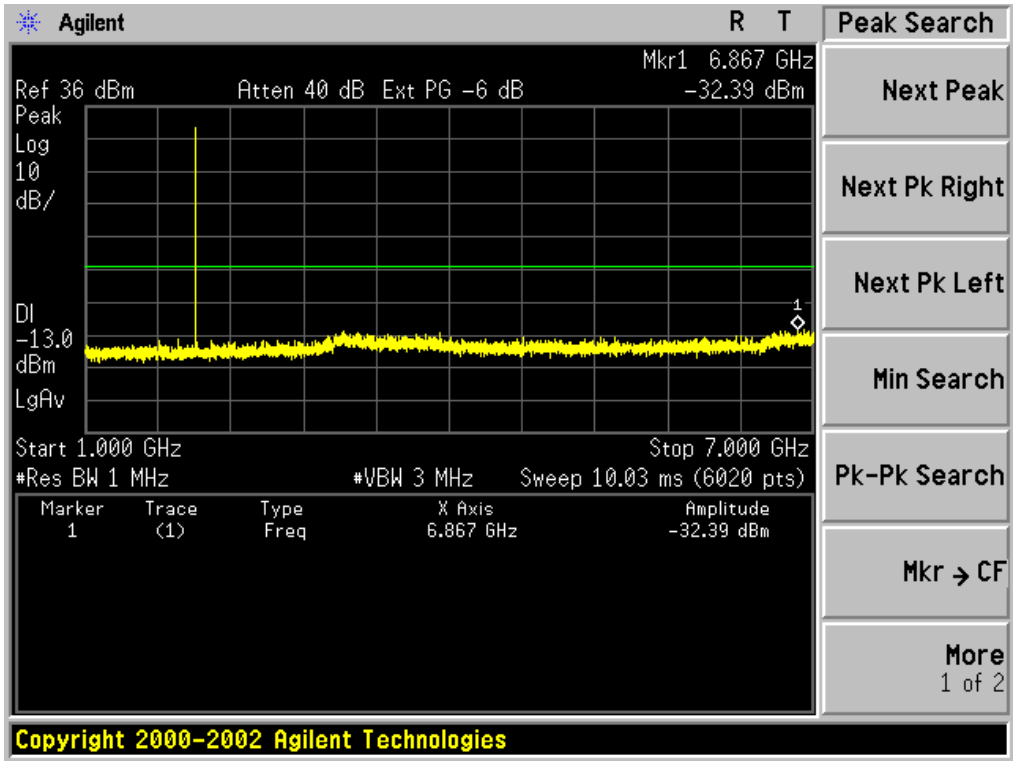
Conducted Emission Transmitting Mode CH 661 13.6GHz – 20GHz



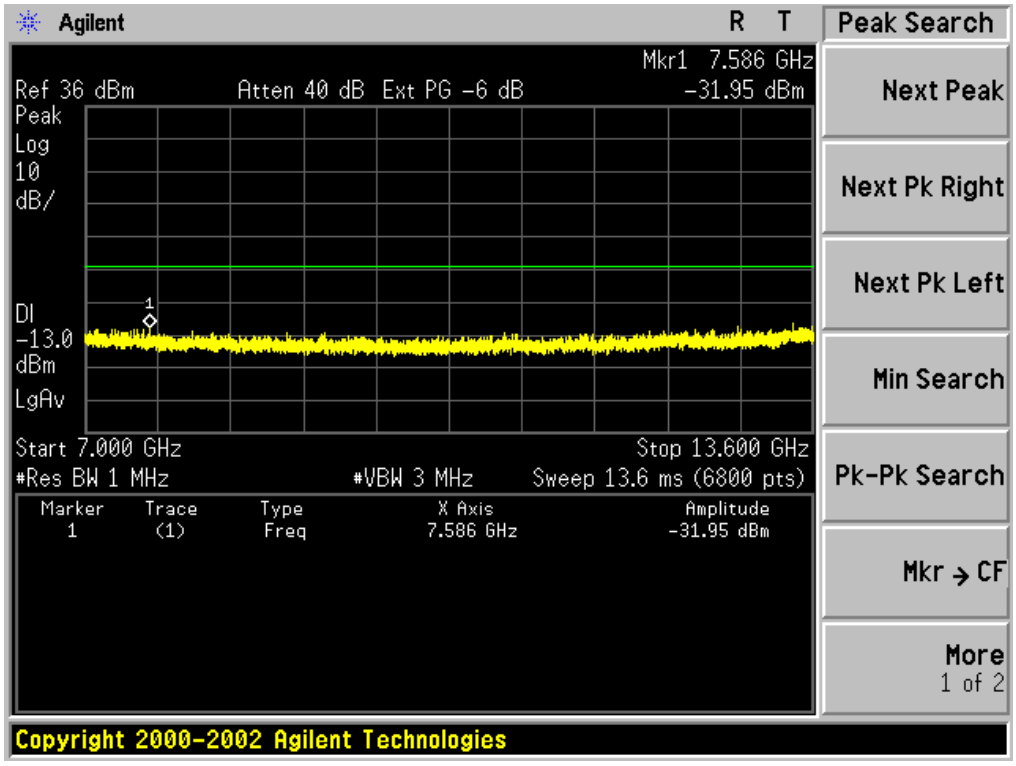
Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



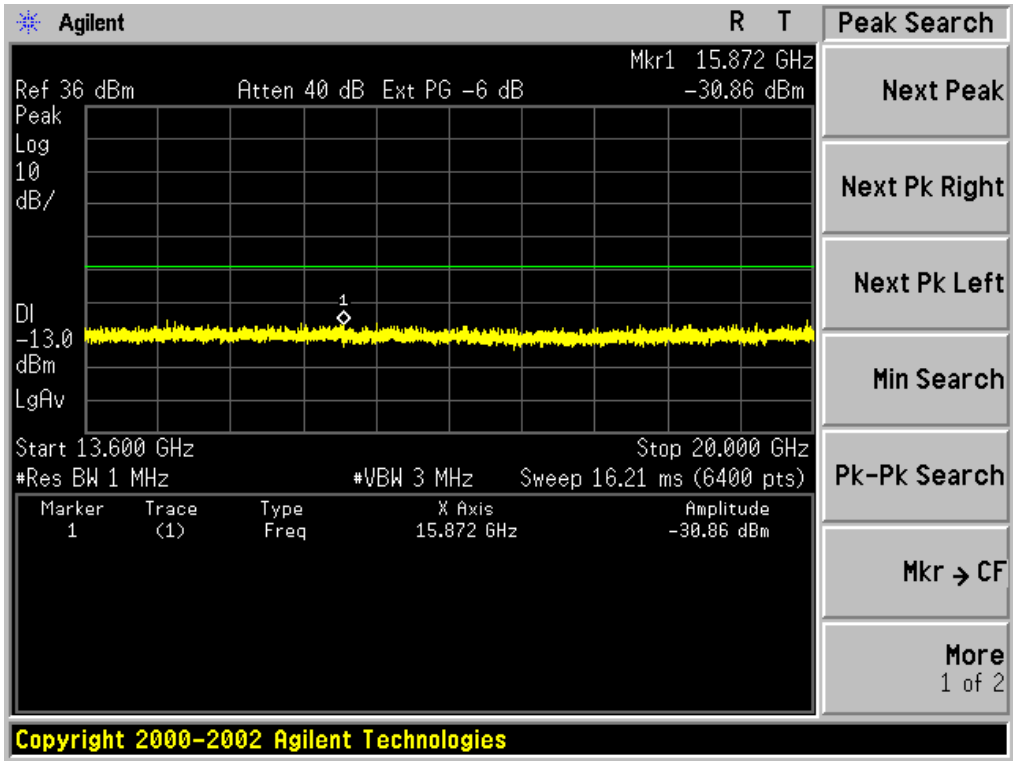
Conducted Emission Transmitting Mode CH 810 1GHz – 7GHz



Conducted Emission Transmitting Mode CH 810 7GHz – 13.6GHz

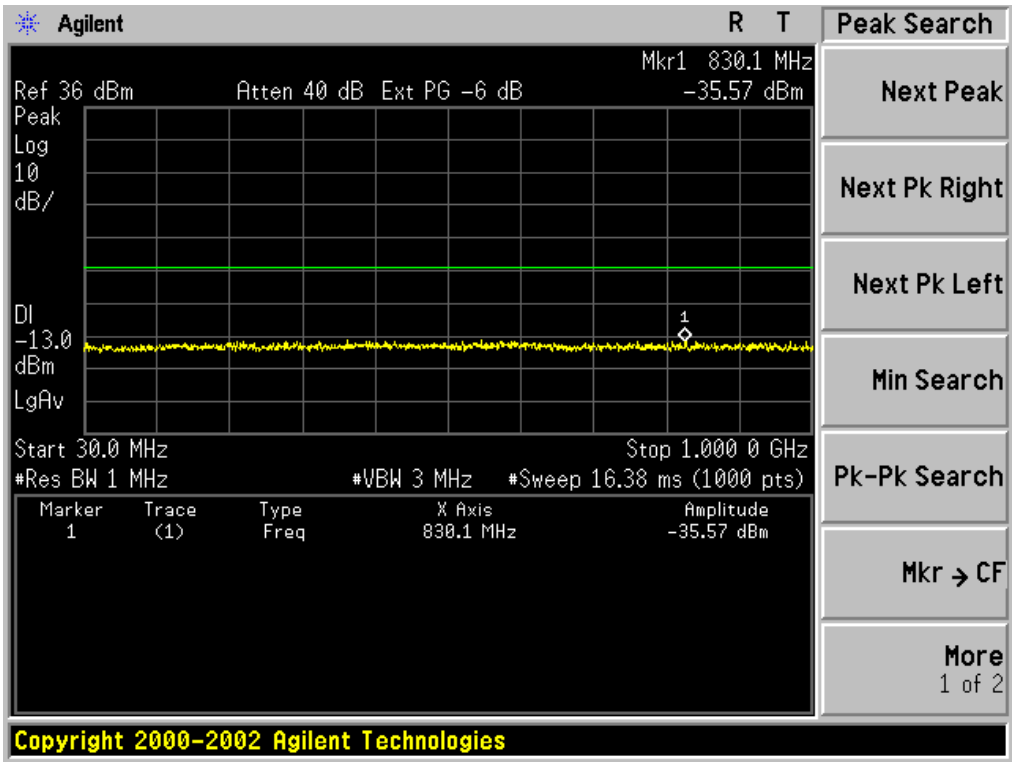


Conducted Emission Transmitting Mode CH 810 13.6GHz – 20GHz

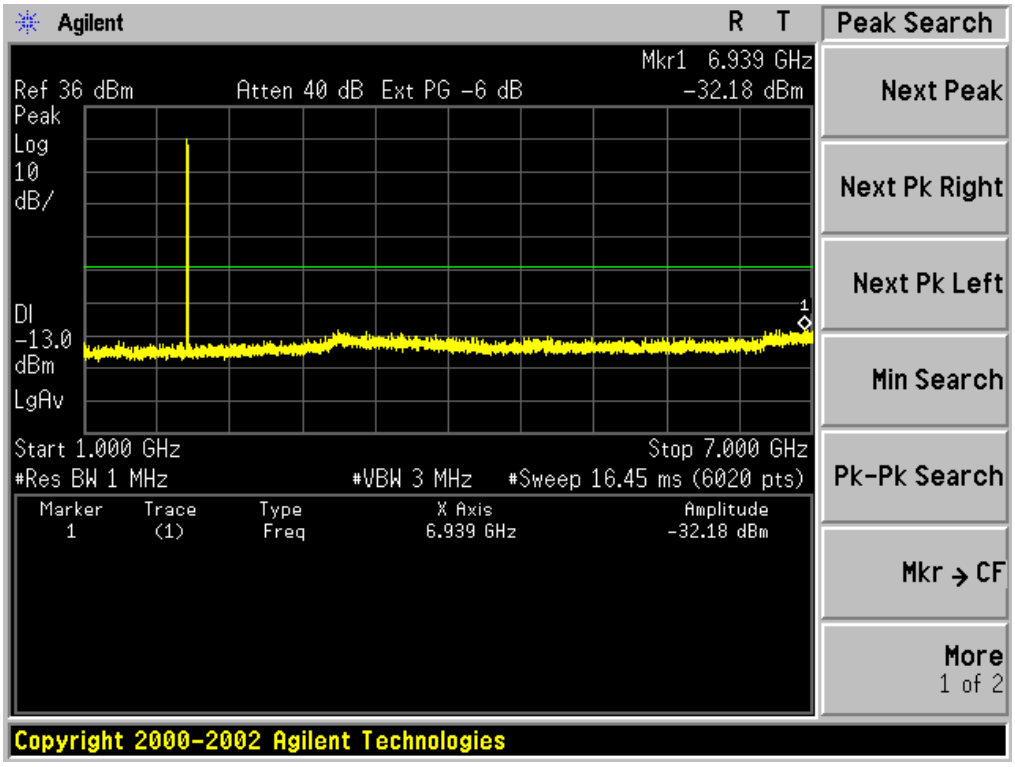


CONDUCTED EMISSION IN PCS1900 (EDGE 8) BAND

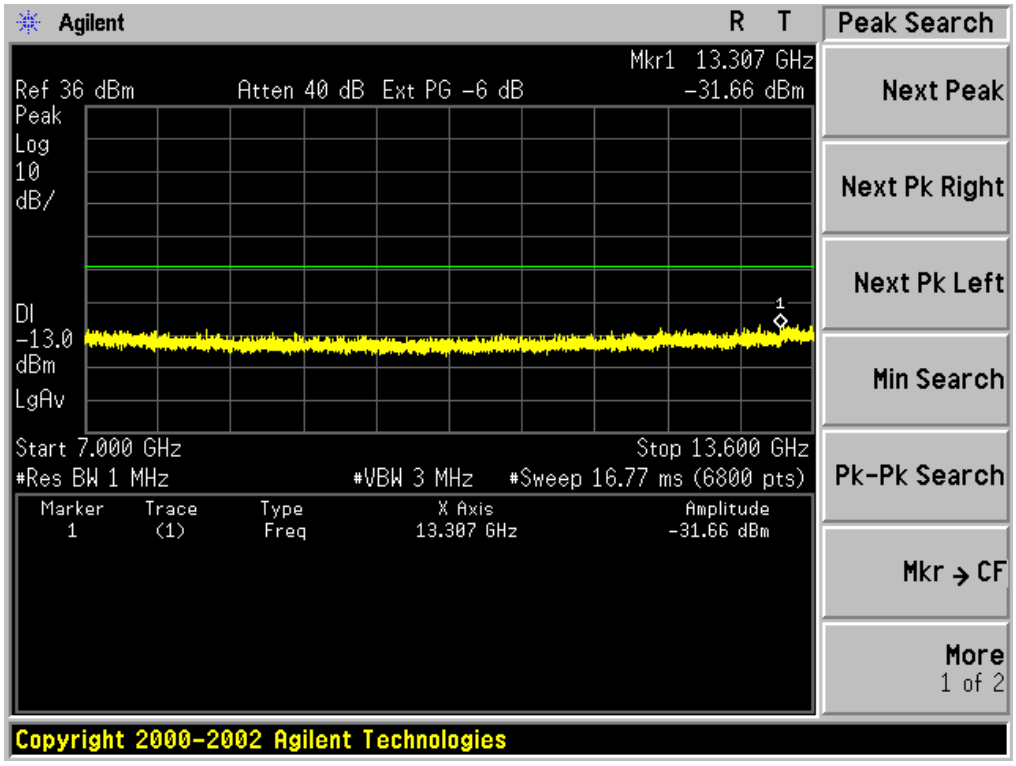
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



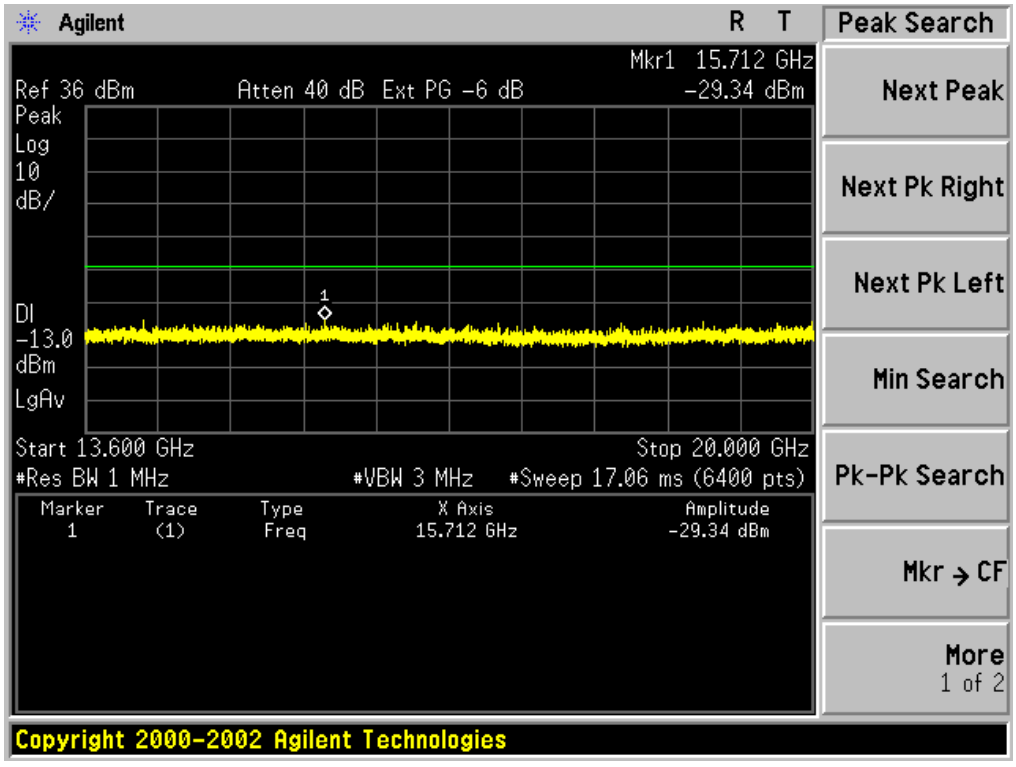
Conducted Emission Transmitting Mode CH 512 1GHz – 7GHz



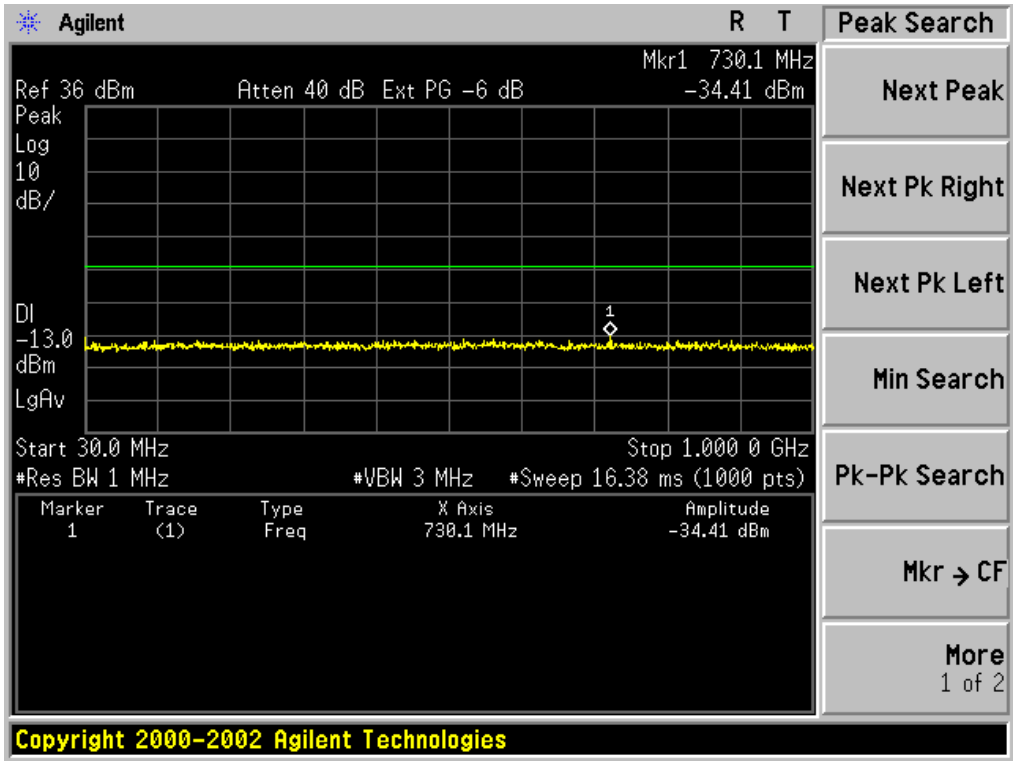
Conducted Emission Transmitting Mode CH 512 7GHz – 13.6GHz



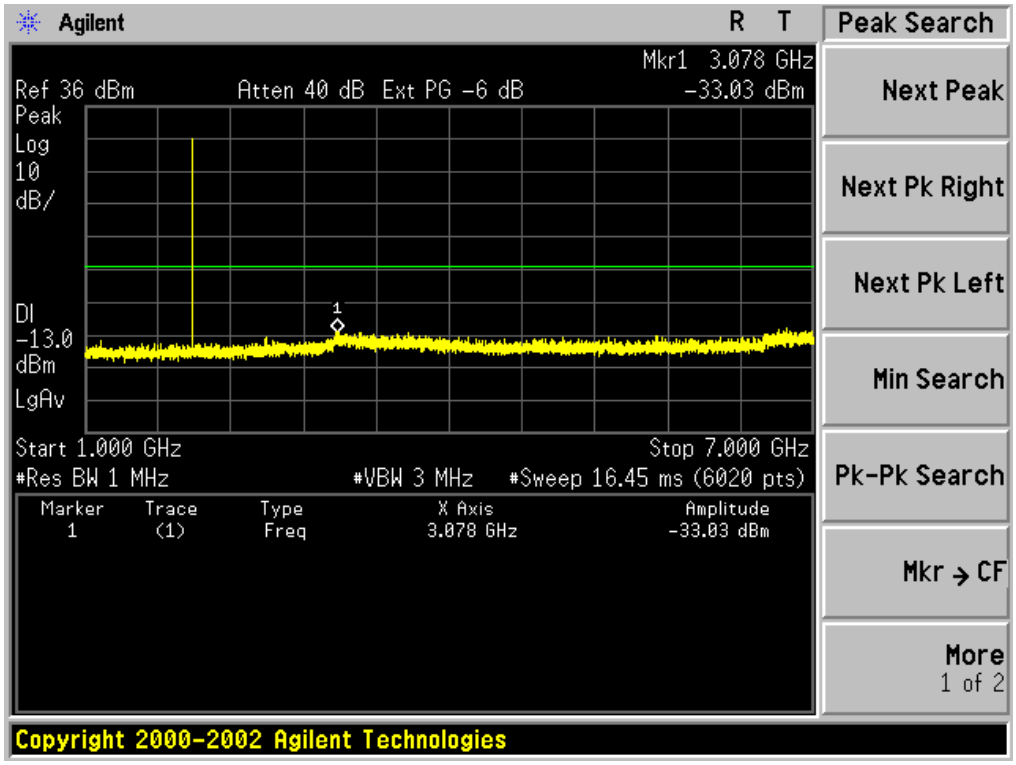
Conducted Emission Transmitting Mode CH 512 13.6GHz – 20GHz



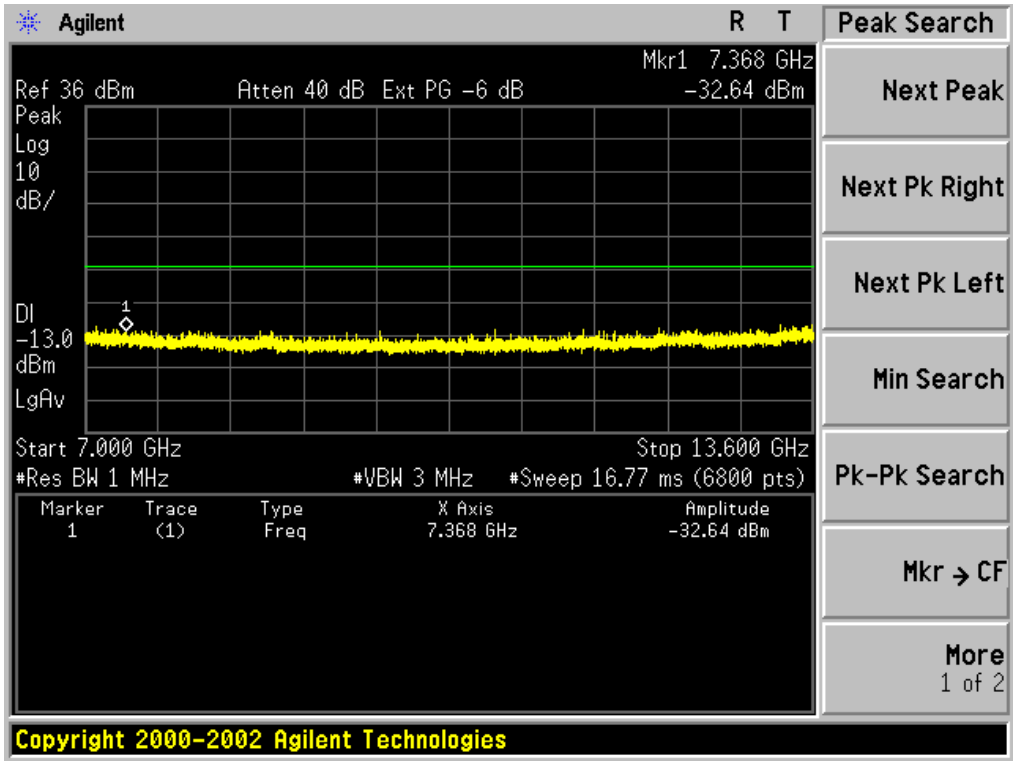
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



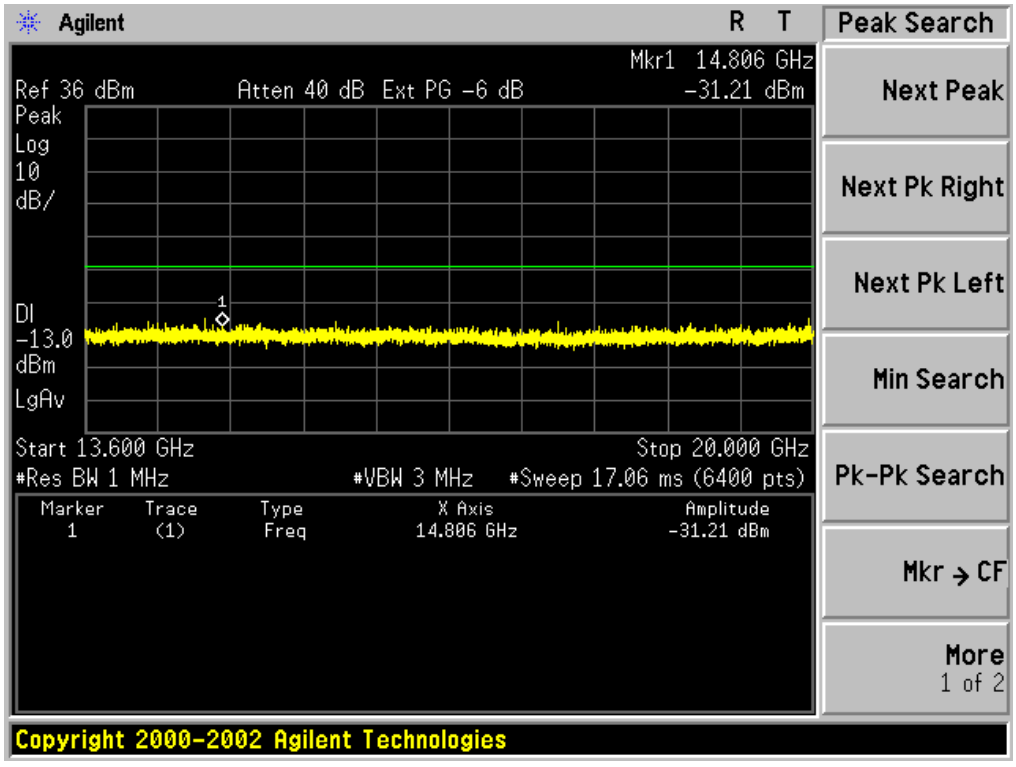
Conducted Emission Transmitting Mode CH 661 1GHz – 7GHz



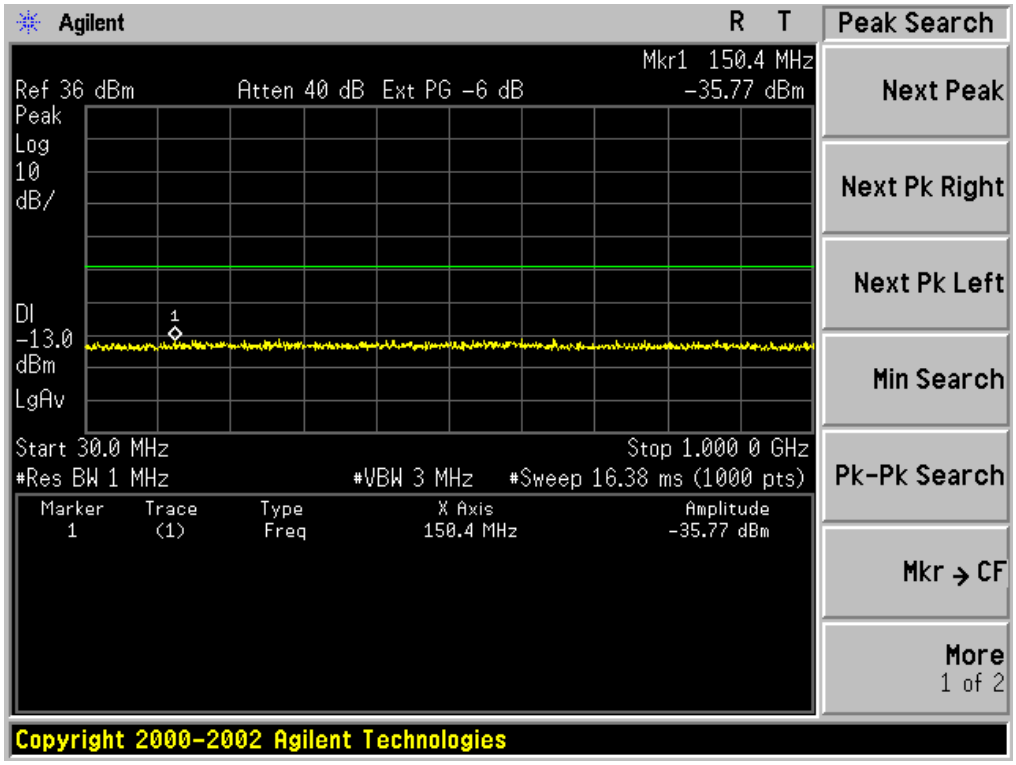
Conducted Emission Transmitting Mode CH 661 7GHz – 13.6GHz



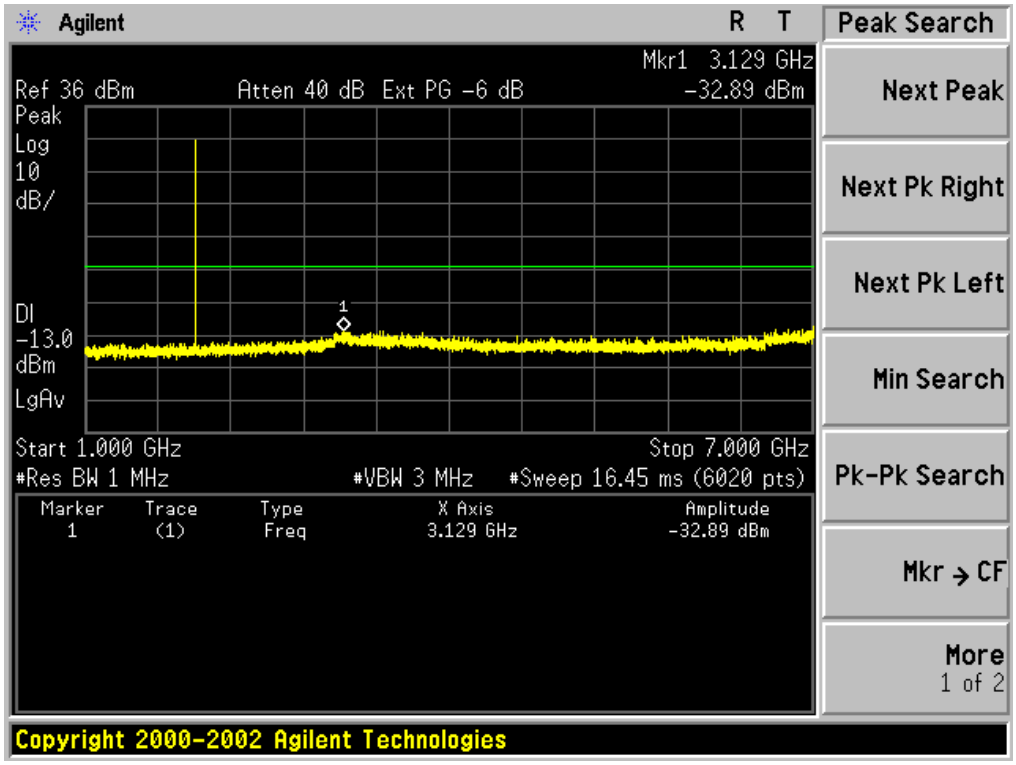
Conducted Emission Transmitting Mode CH 661 13.6GHz – 20GHz



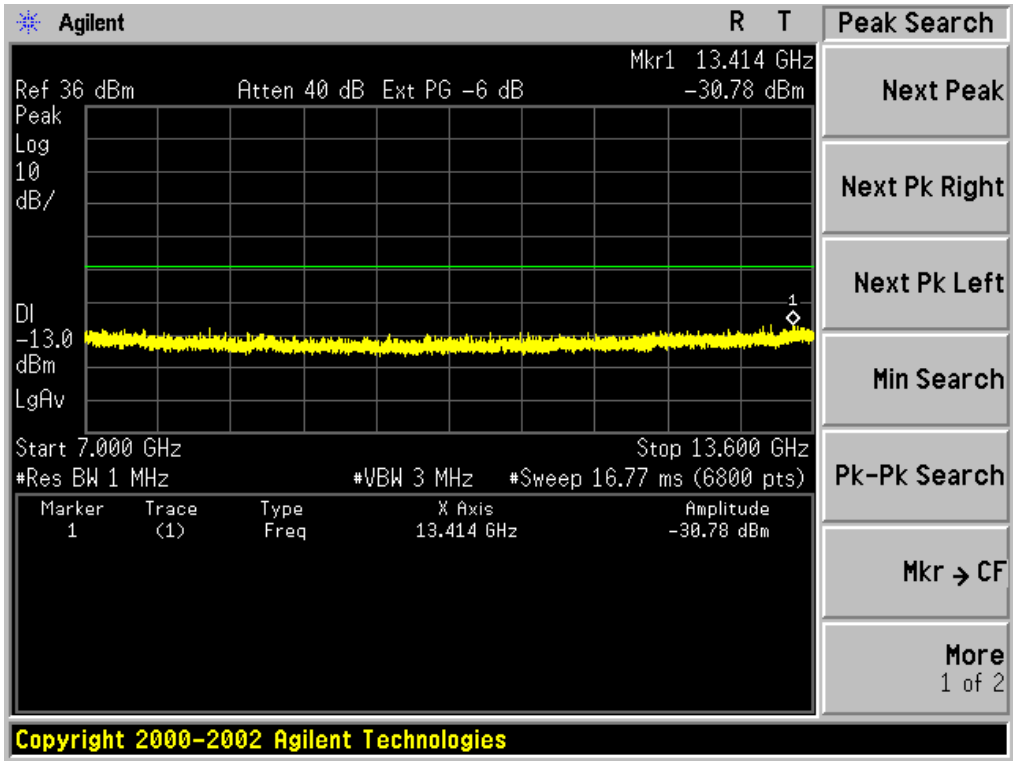
Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



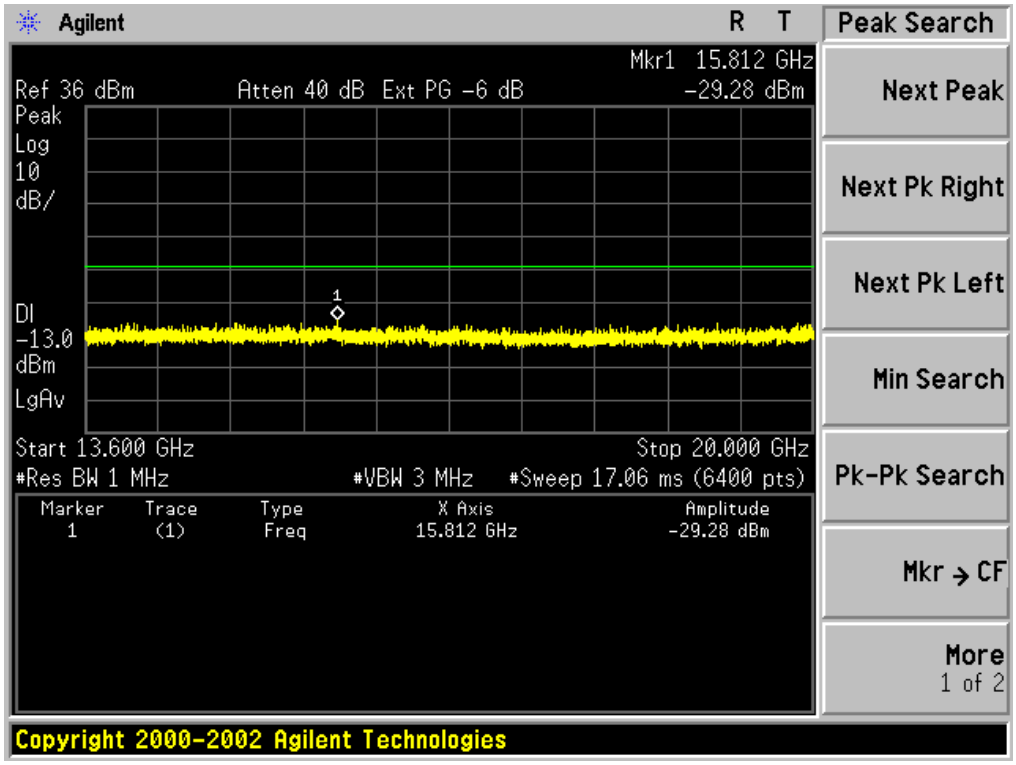
Conducted Emission Transmitting Mode CH 810 1GHz – 7GHz



Conducted Emission Transmitting Mode CH 810 7GHz – 13.6GHz

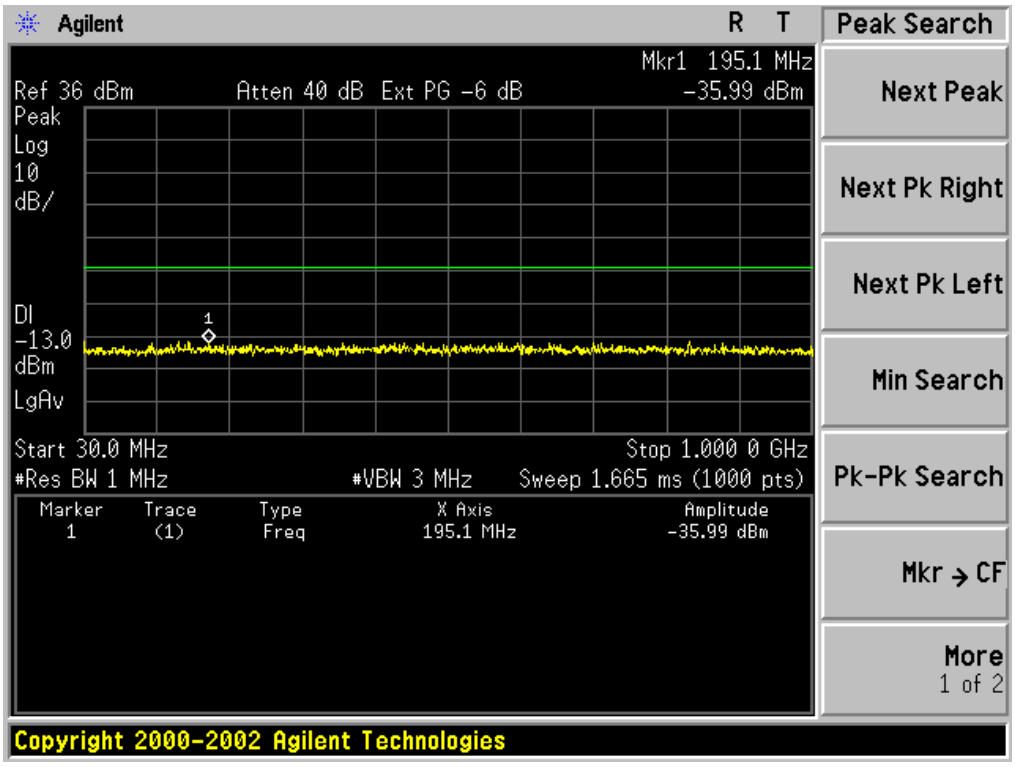


Conducted Emission Transmitting Mode CH 810 13.6GHz – 20GHz

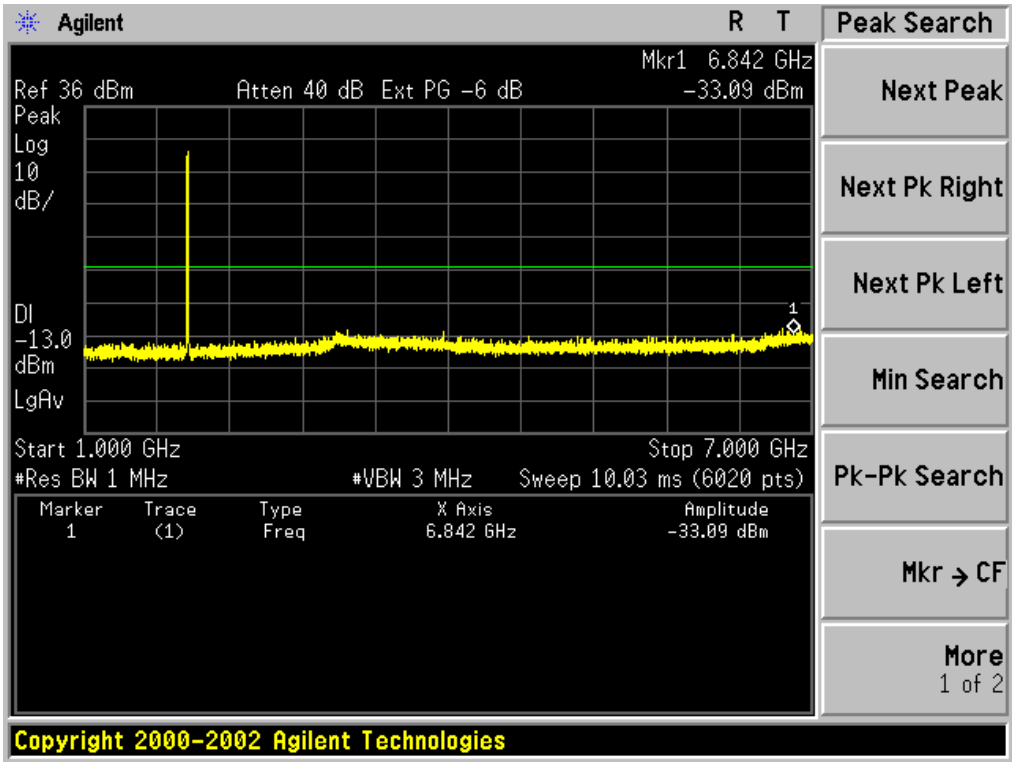


CONDUCTED EMISSION IN UMTS band II

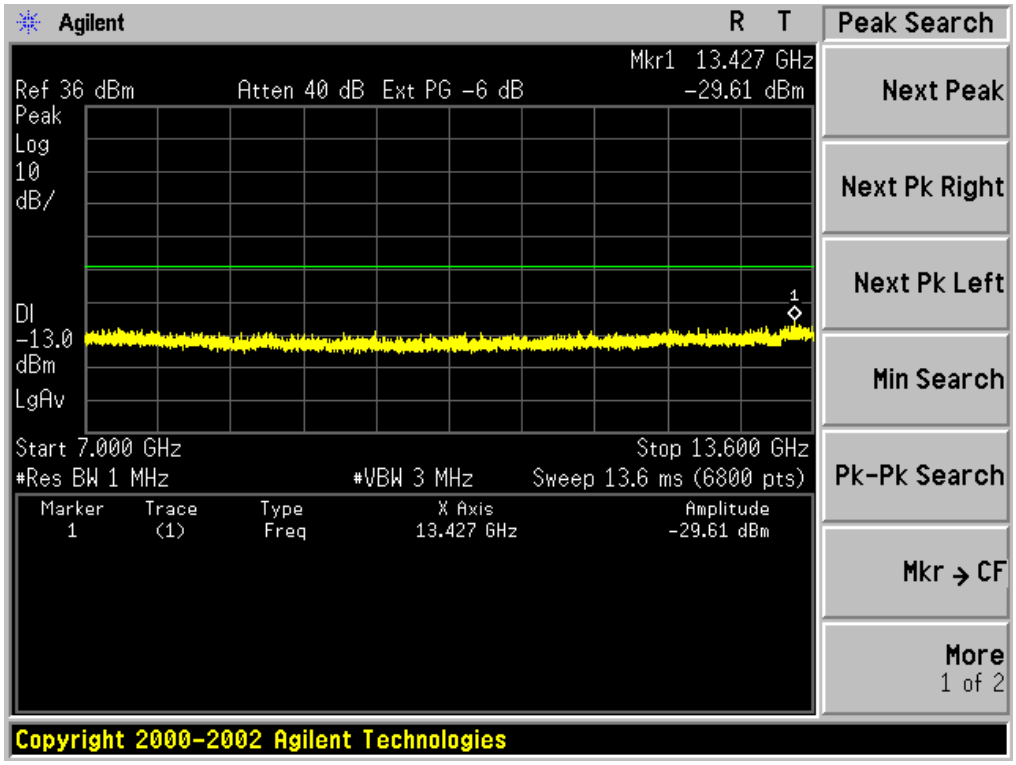
Conducted Emission Transmitting Mode CH 9662 30MHz – 1GHz



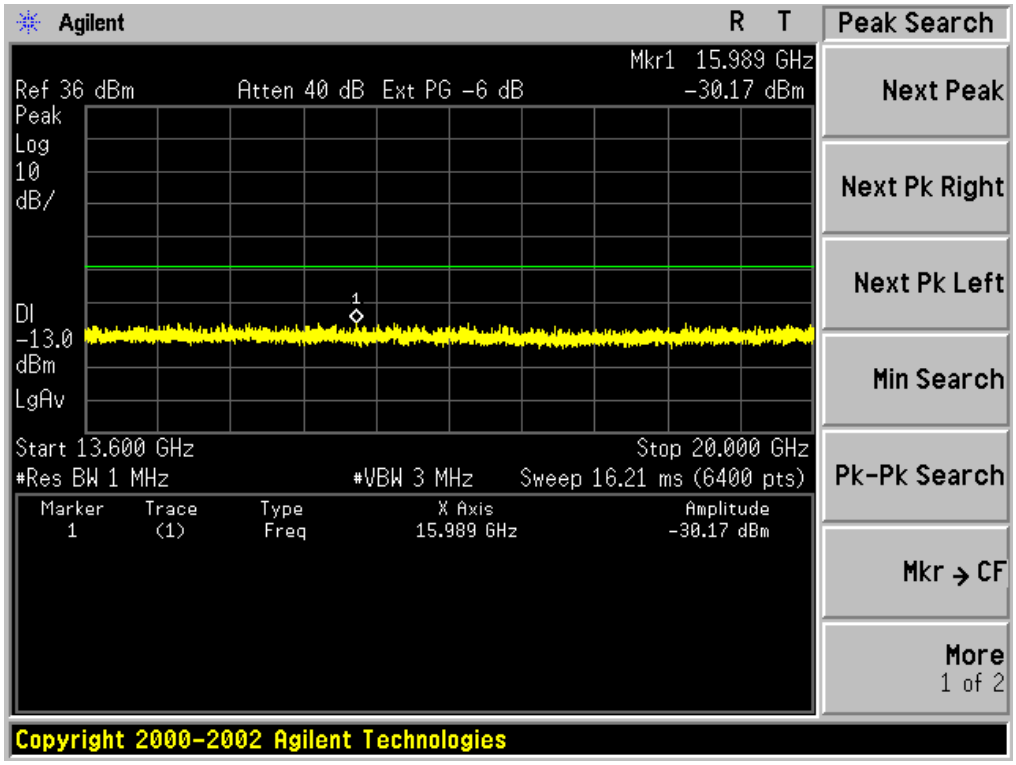
Conducted Emission Transmitting Mode CH 9662 1GHz – 7GHz



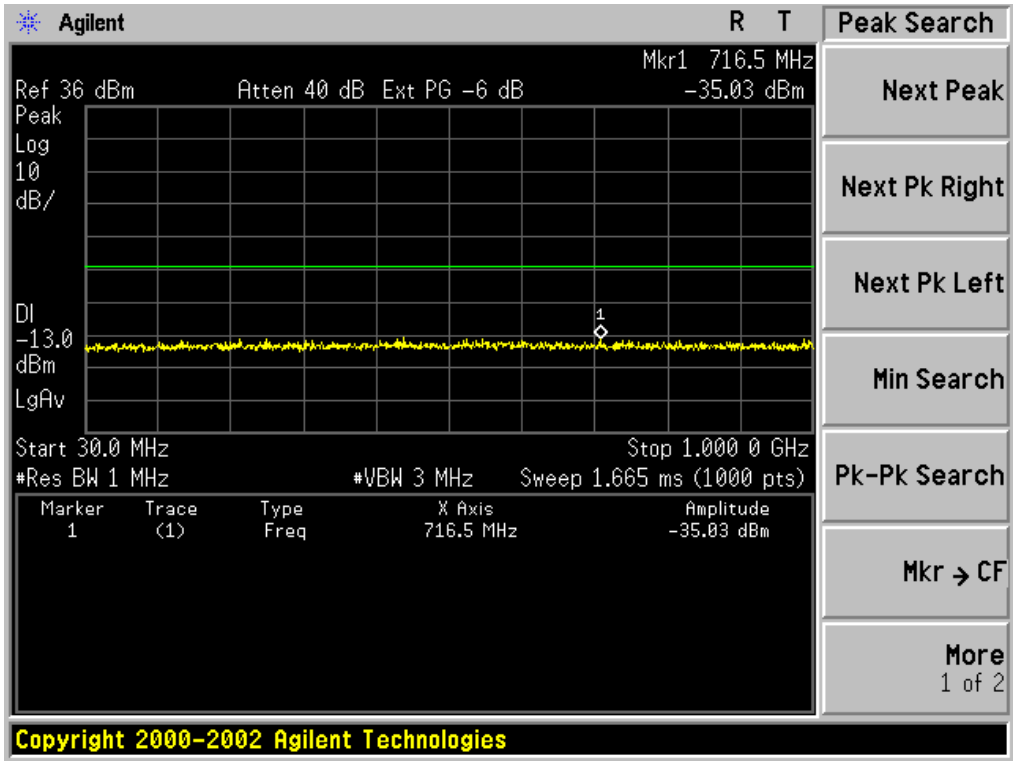
Conducted Emission Transmitting Mode CH 9662 7GHz – 13.6GHz



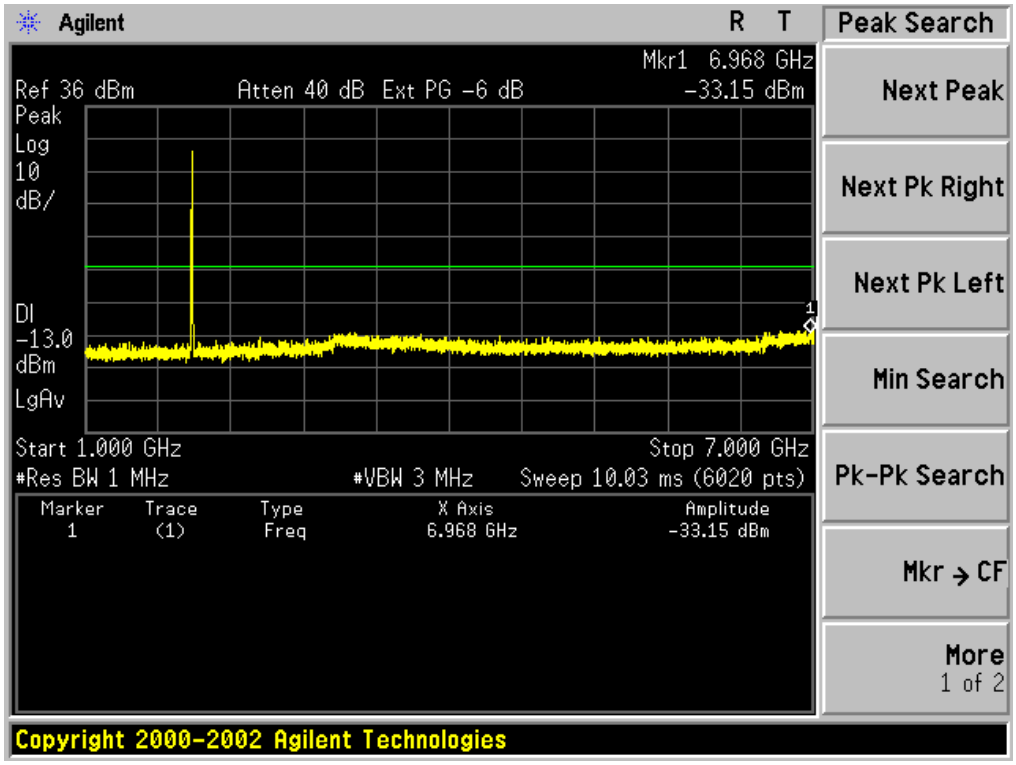
Conducted Emission Transmitting Mode CH 9662 13.6GHz – 20GHz



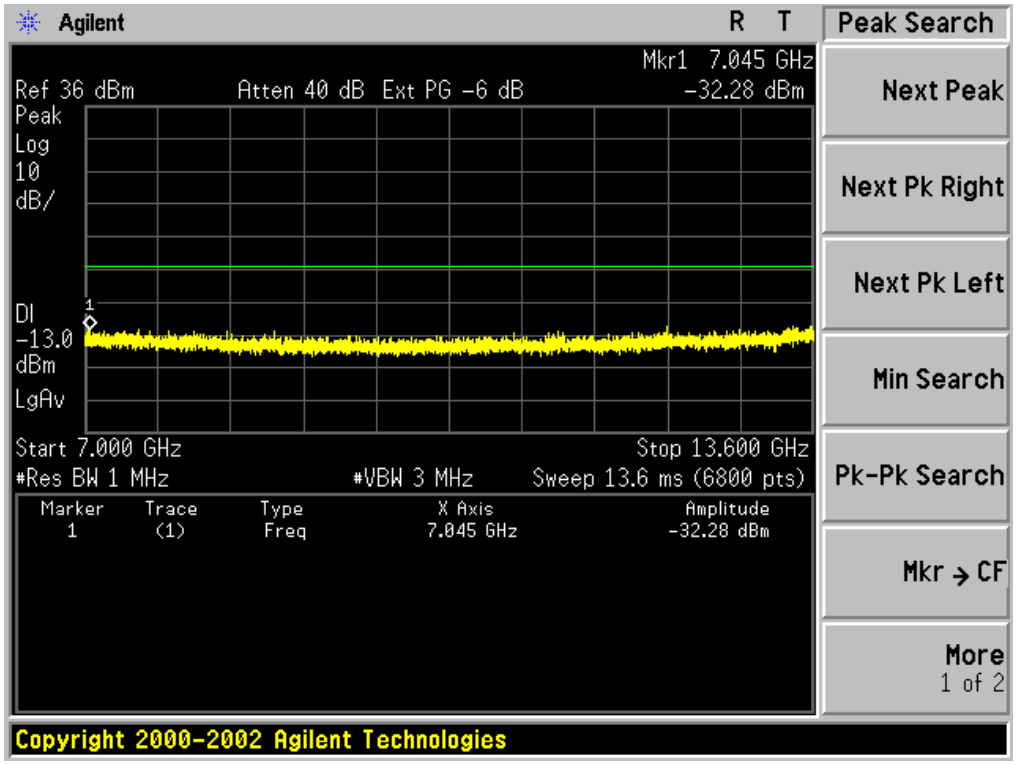
Conducted Emission Transmitting Mode CH 9800 30MHz – 1GHz



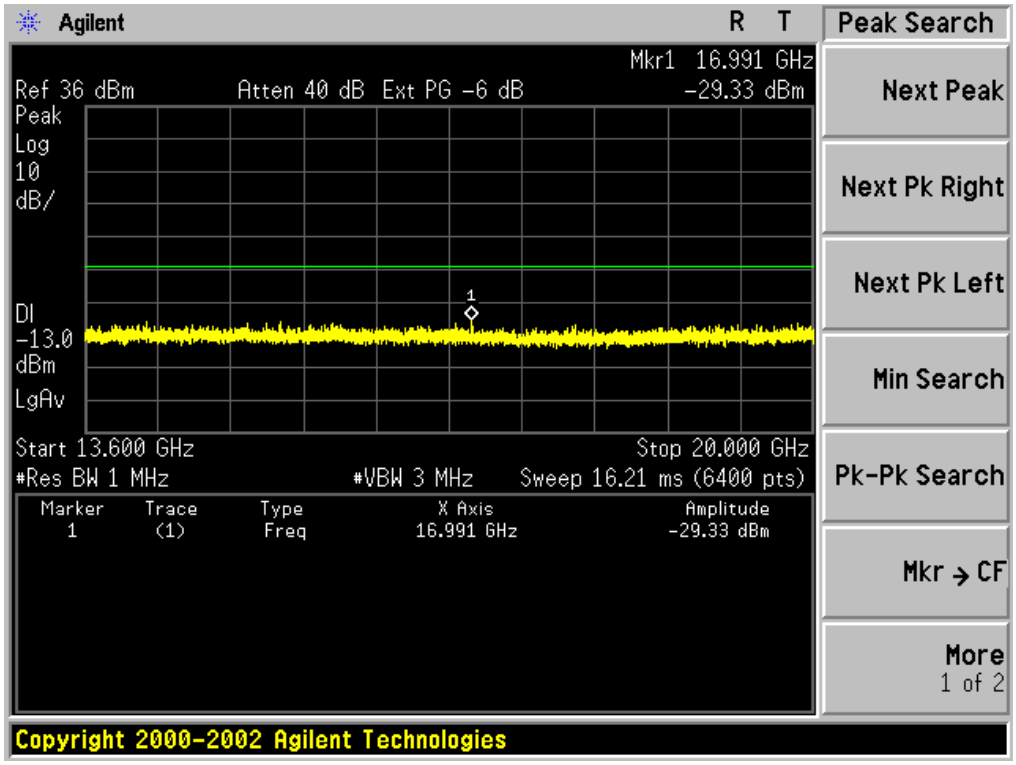
Conducted Emission Transmitting Mode CH 9800 1GHz – 7GHz



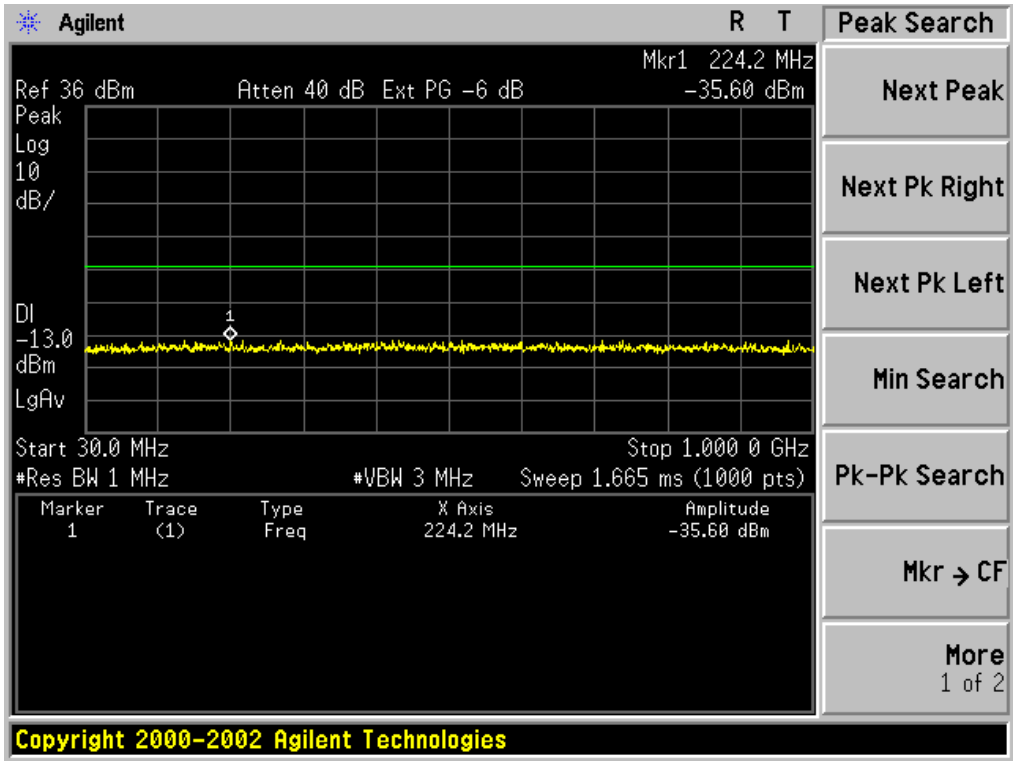
Conducted Emission Transmitting Mode CH 9800 7GHz – 13.6GHz



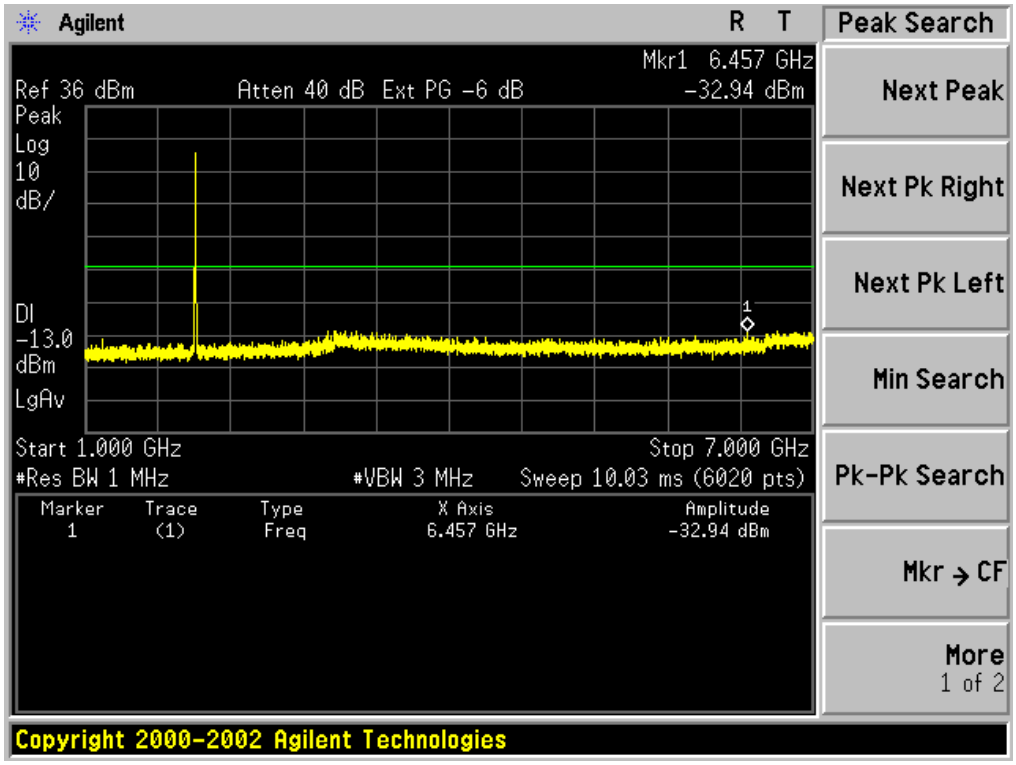
Conducted Emission Transmitting Mode CH 9800 13.6GHz – 20GHz



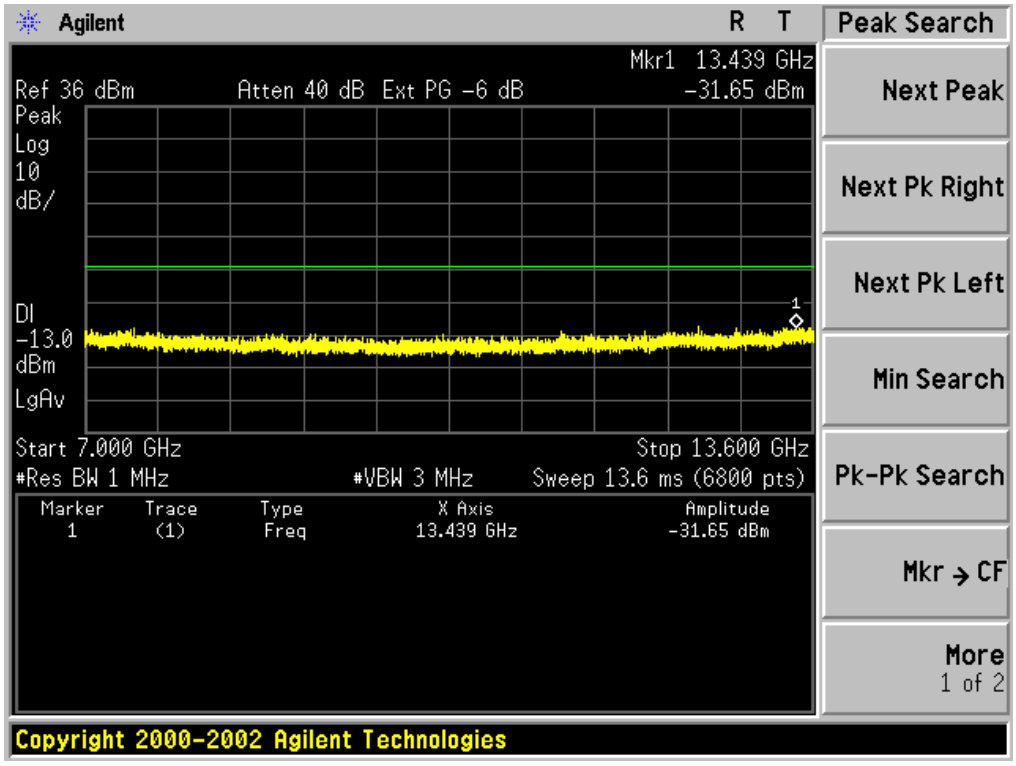
Conducted Emission Transmitting Mode CH 9938 30MHz – 1GHz



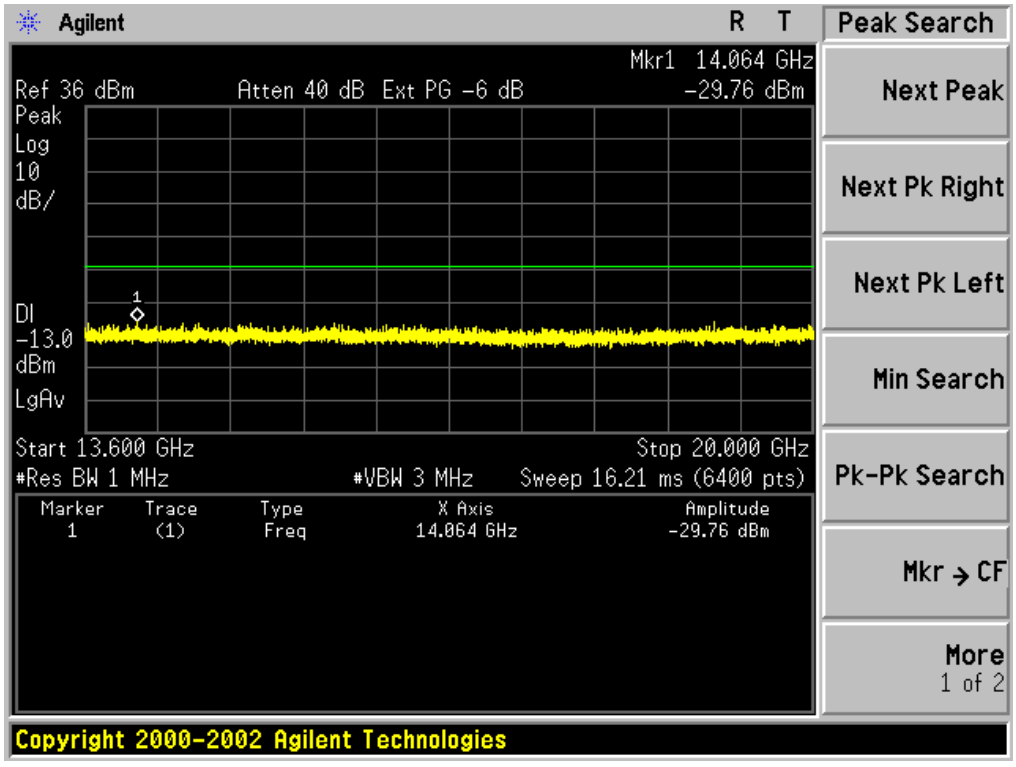
Conducted Emission Transmitting Mode CH 9938 1GHz – 7GHz



Conducted Emission Transmitting Mode CH 9938 7GHz – 13.6GHz

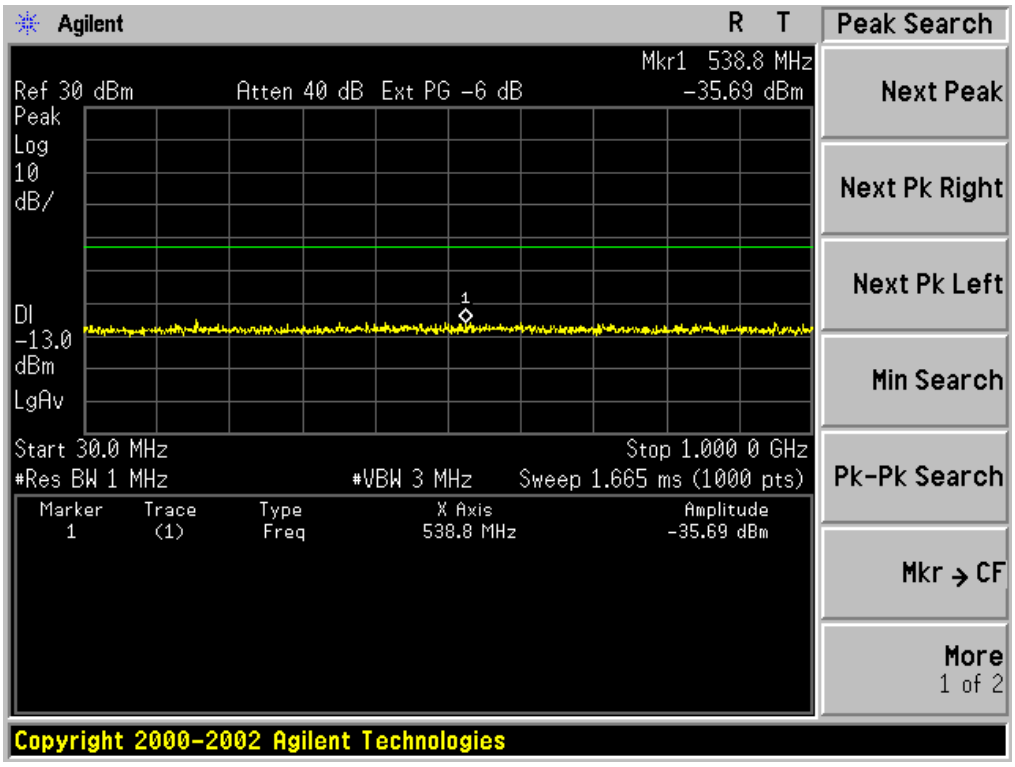


Conducted Emission Transmitting Mode CH 9938 13.6GHz – 20GHz

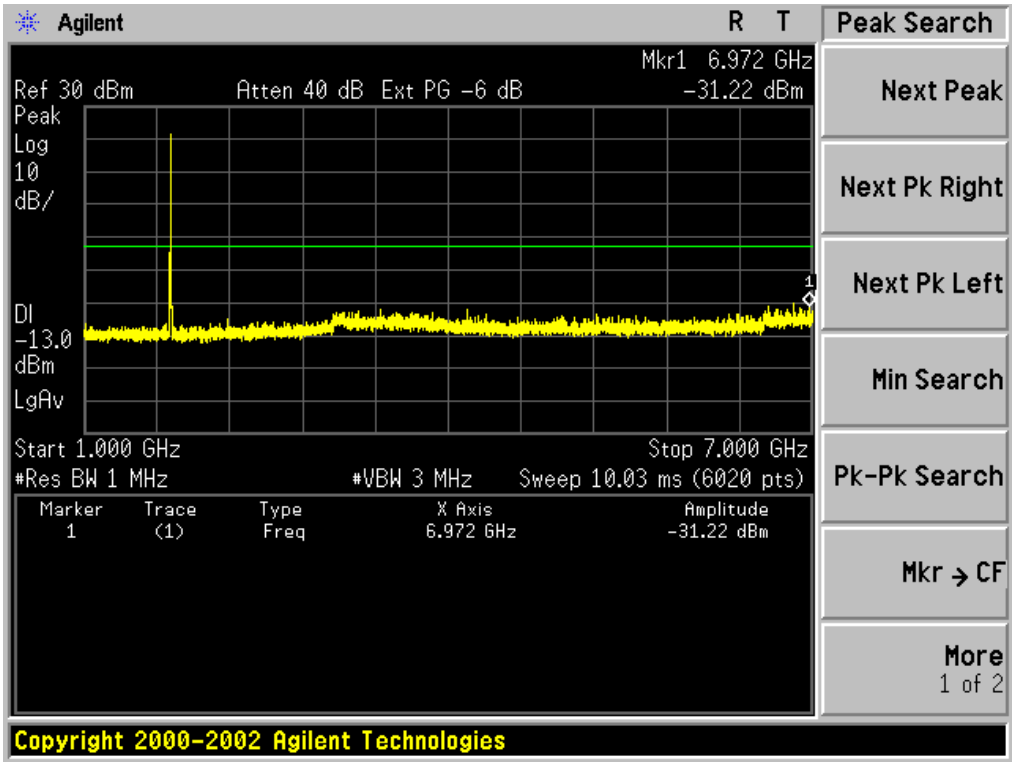


CONDUCTED EMISSION IN UMTS band IV

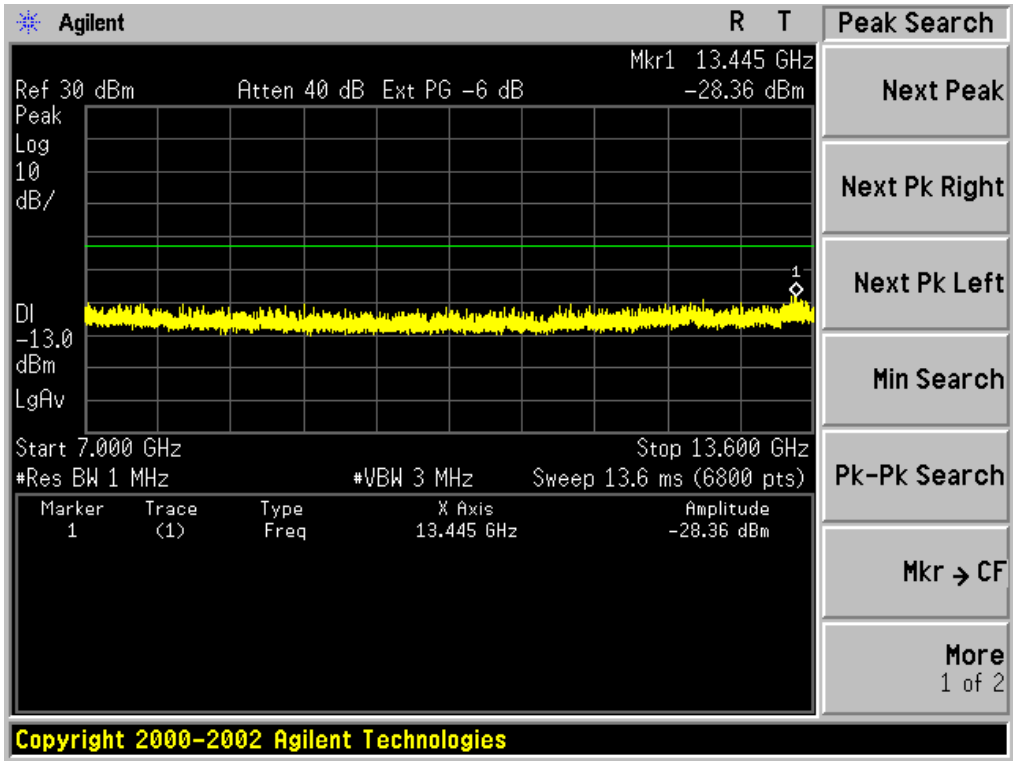
Conducted Emission Transmitting Mode CH 1887 30MHz – 1GHz



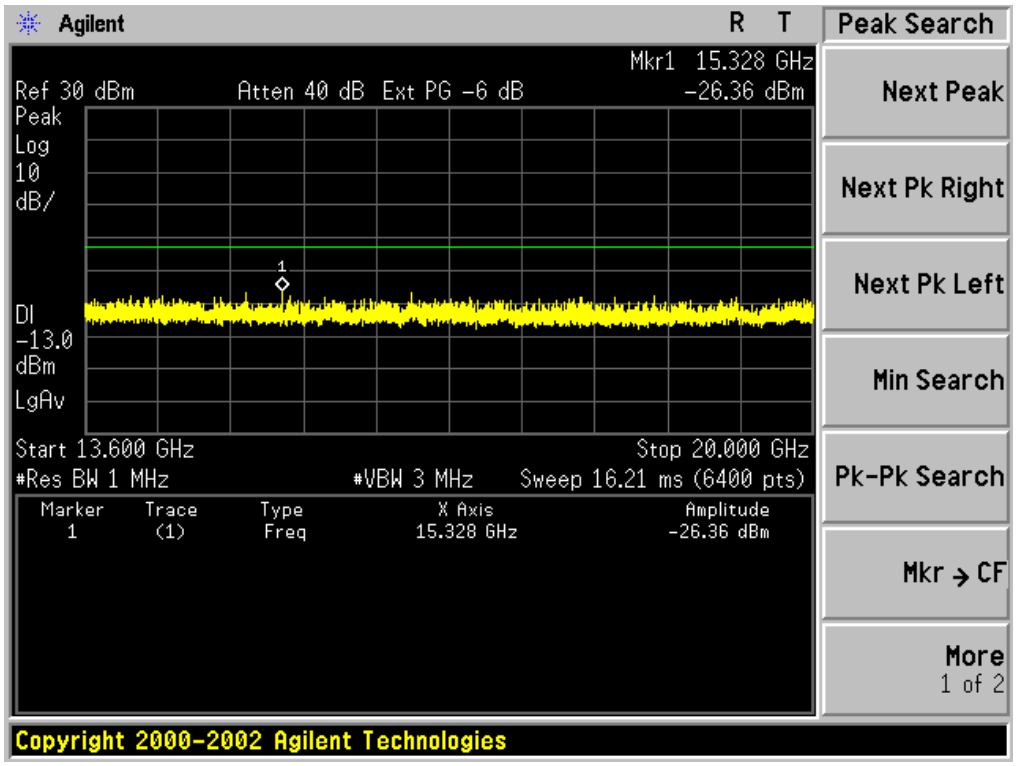
Conducted Emission Transmitting Mode CH 1887 1GHz – 7GHz



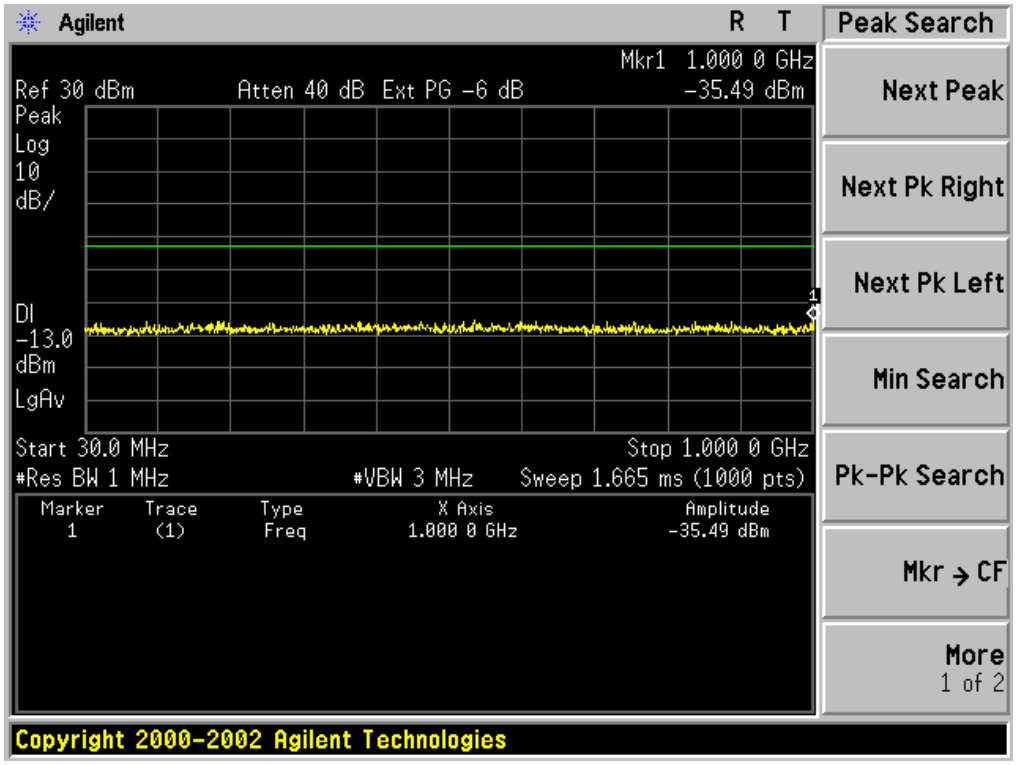
Conducted Emission Transmitting Mode CH 1887 7GHz – 13.6GHz



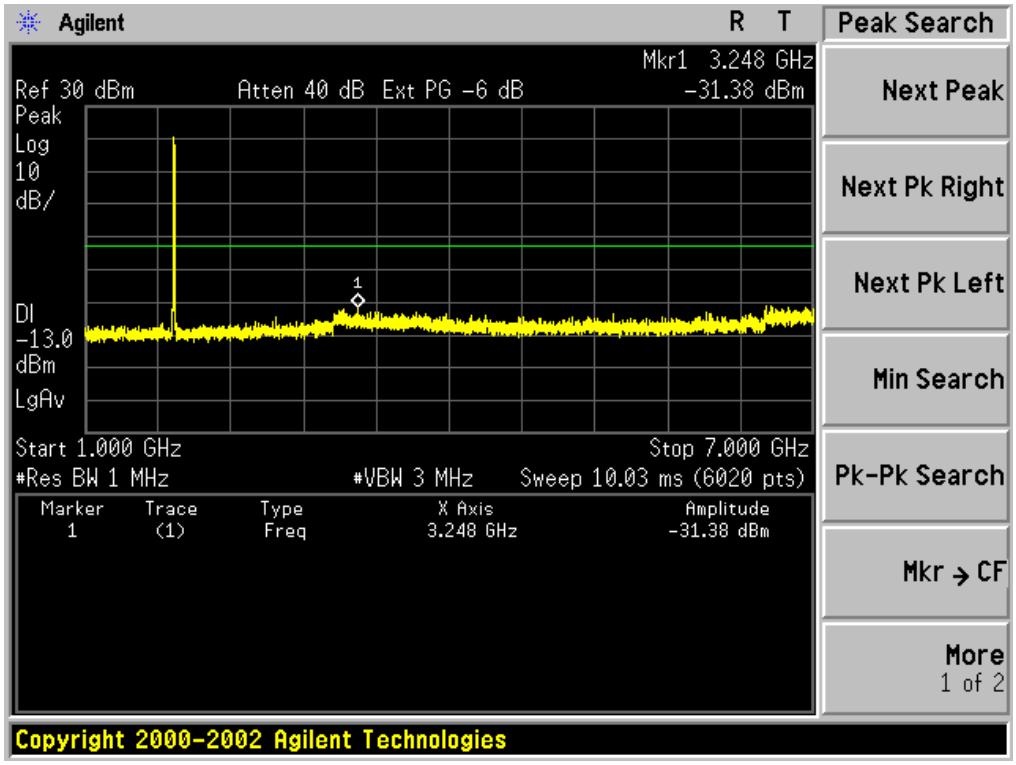
Conducted Emission Transmitting Mode CH 1887 13.6GHz – 20GHz



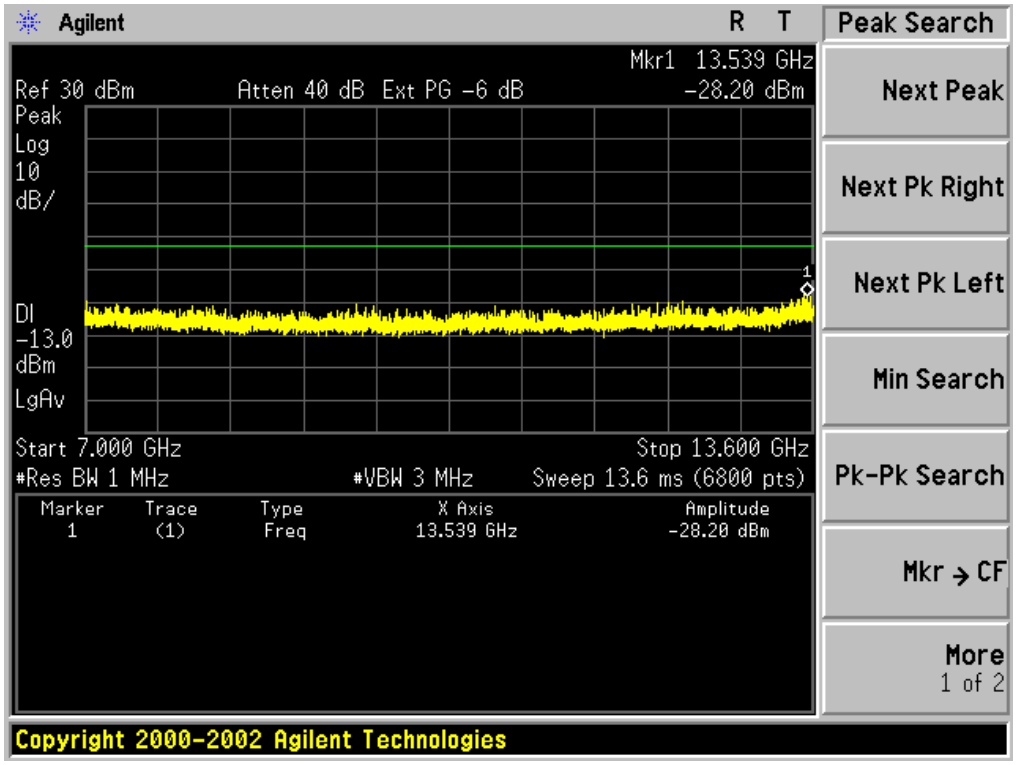
Conducted Emission Transmitting Mode CH 1987 30MHz – 1GHz



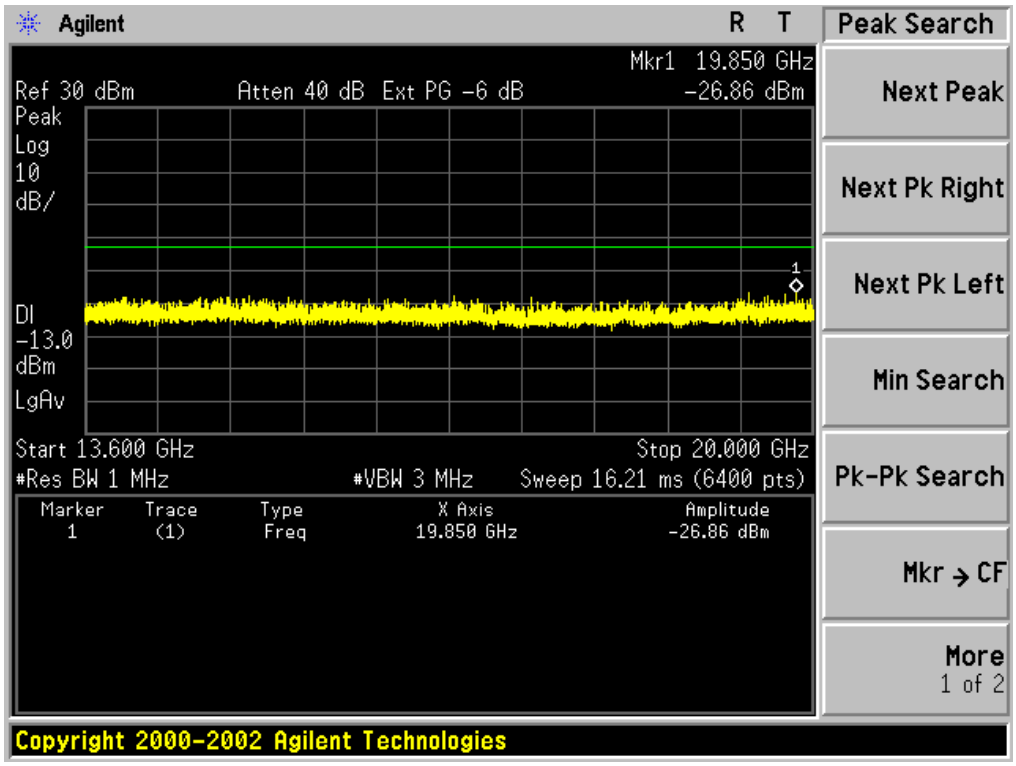
Conducted Emission Transmitting Mode CH 1987 1GHz – 7GHz



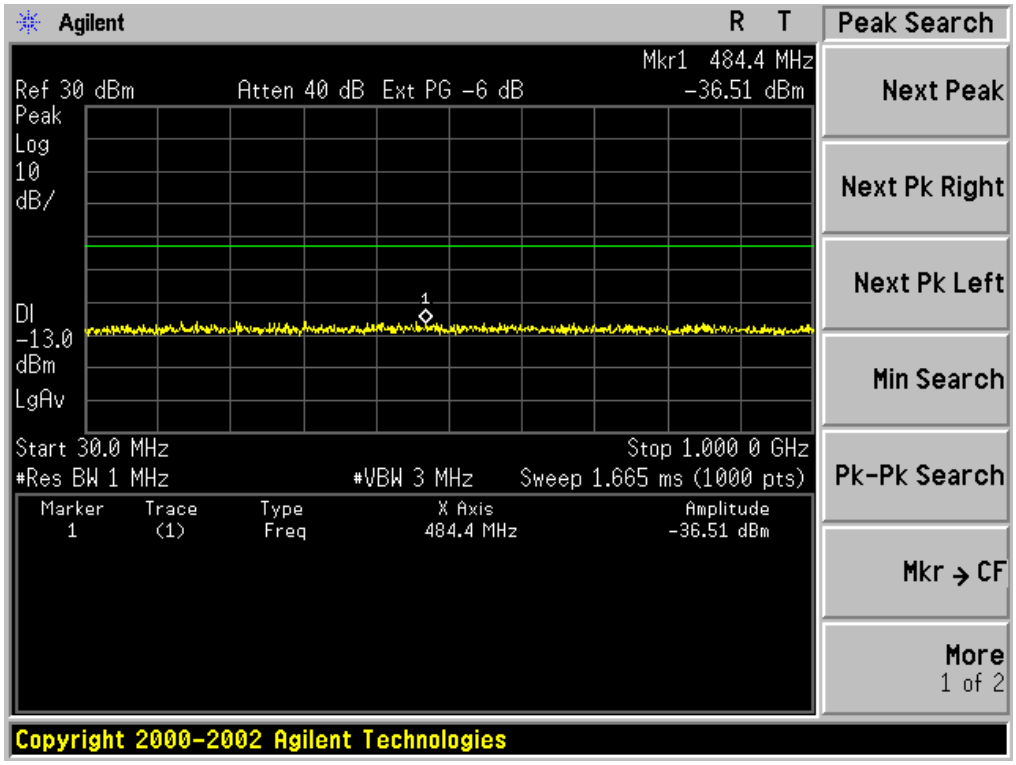
Conducted Emission Transmitting Mode CH 1987 7GHz – 13.6GHz



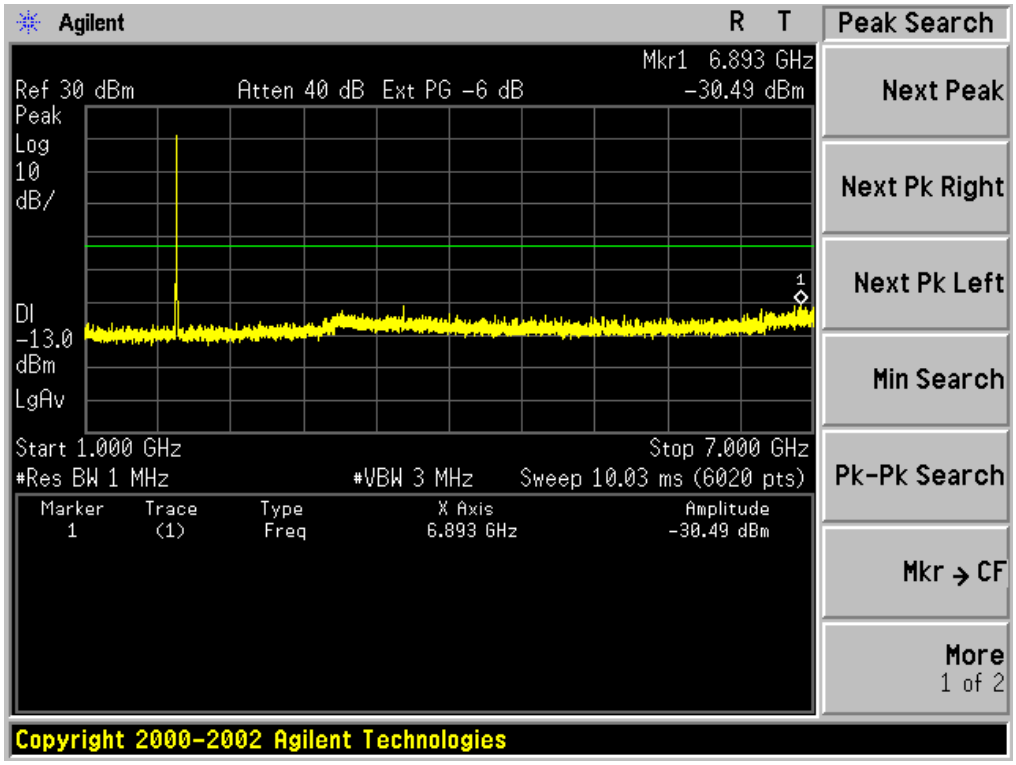
Conducted Emission Transmitting Mode CH 1987 13.6GHz – 20GHz



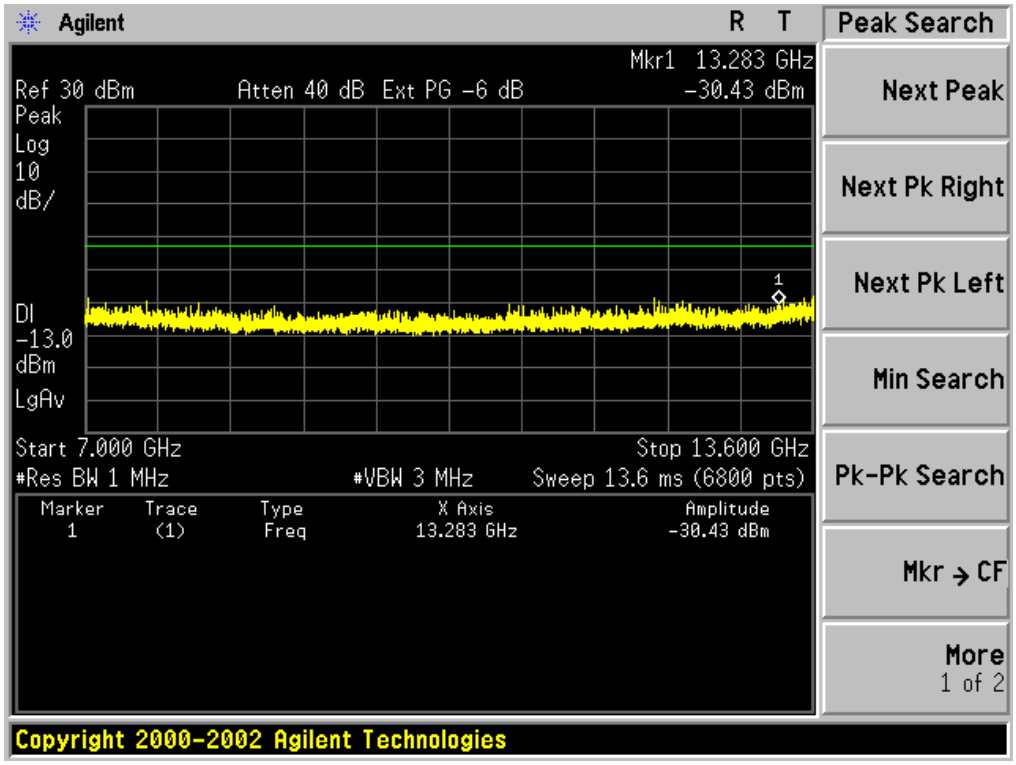
Conducted Emission Transmitting Mode CH 2087 30MHz – 1GHz



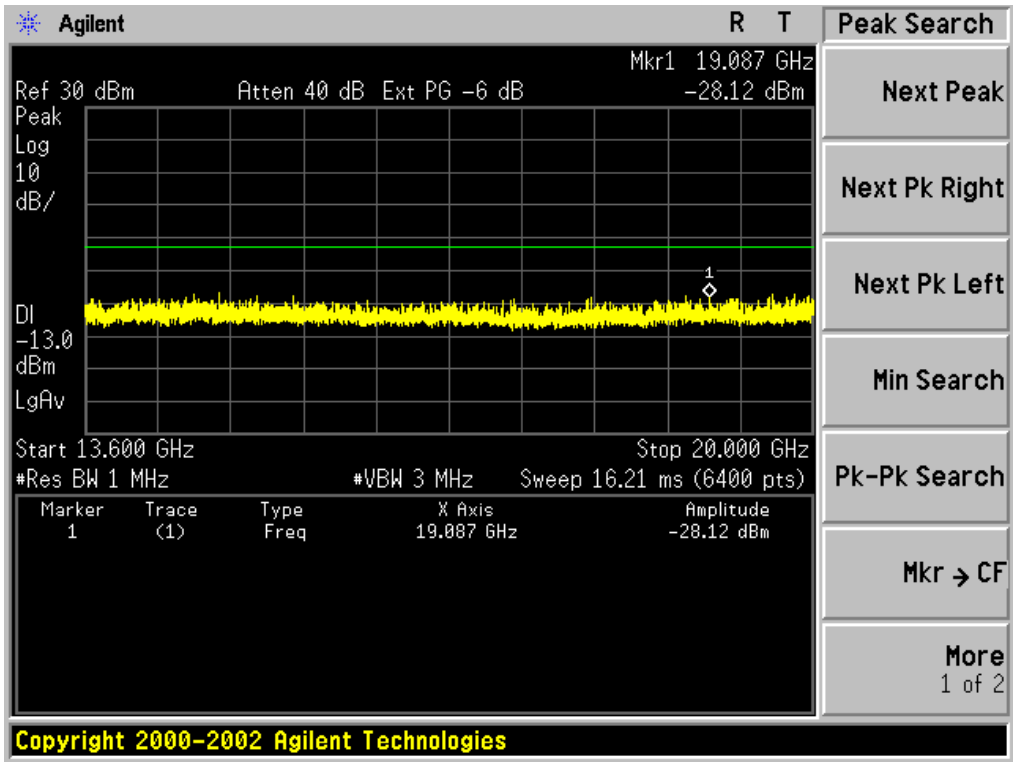
Conducted Emission Transmitting Mode CH 2087 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 2087 7GHz – 13.6GHz

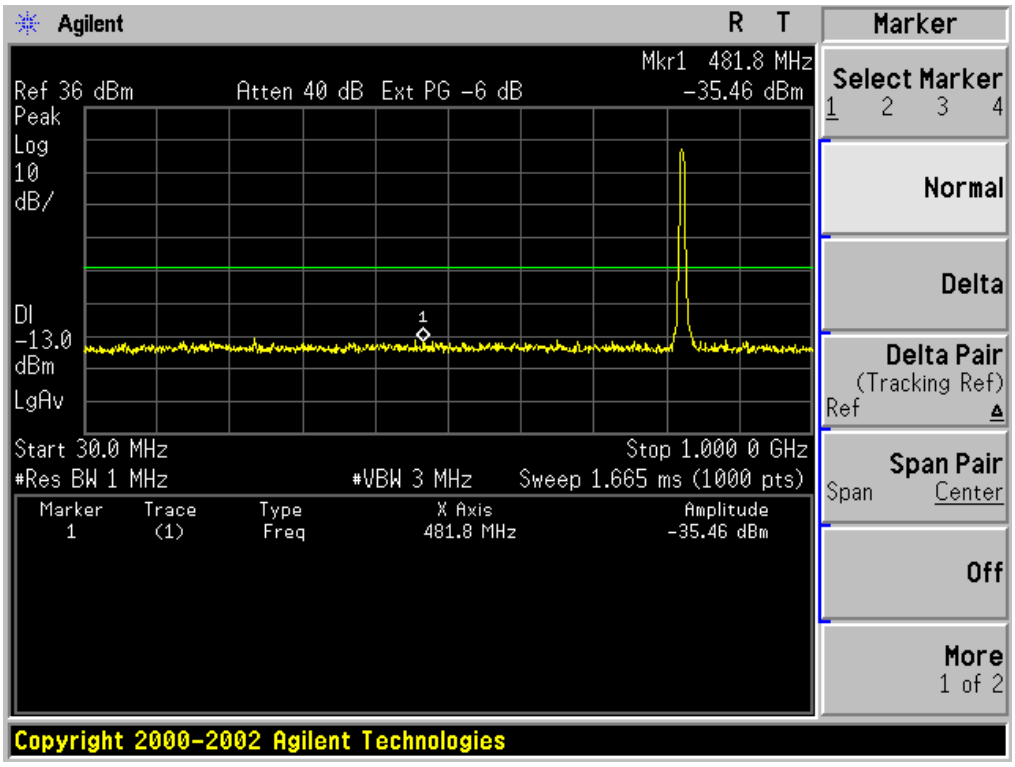


Conducted Emission Transmitting Mode CH 2087 13.6GHz – 20GHz

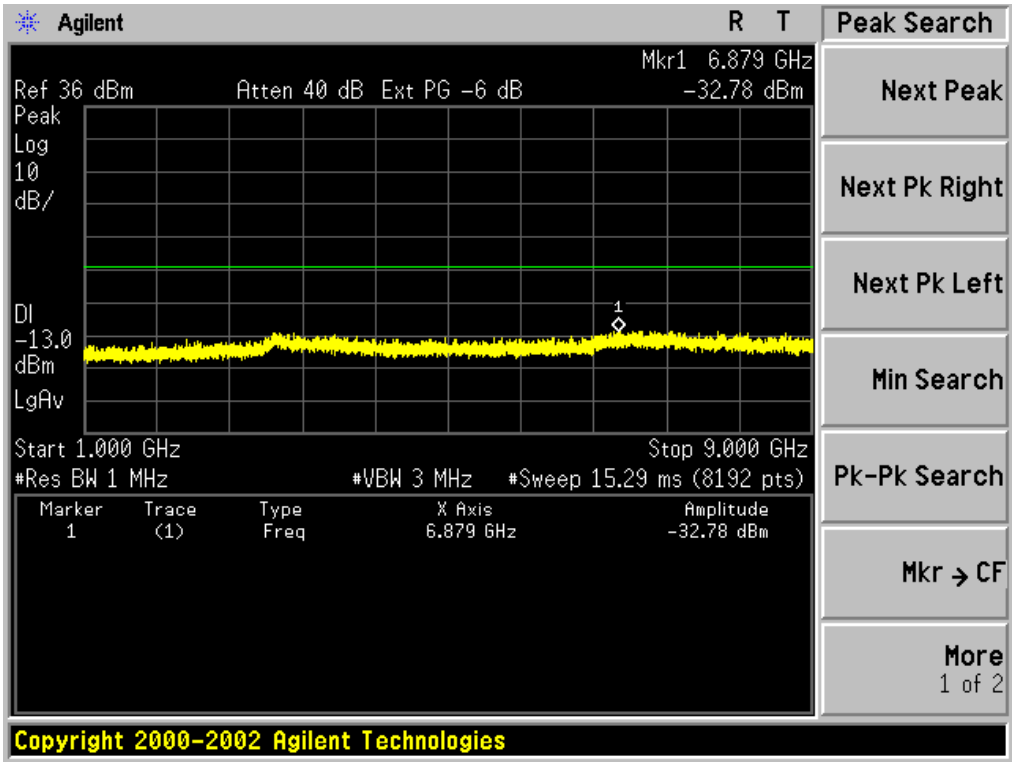


CONDUCTED EMISSION IN UMTS band V

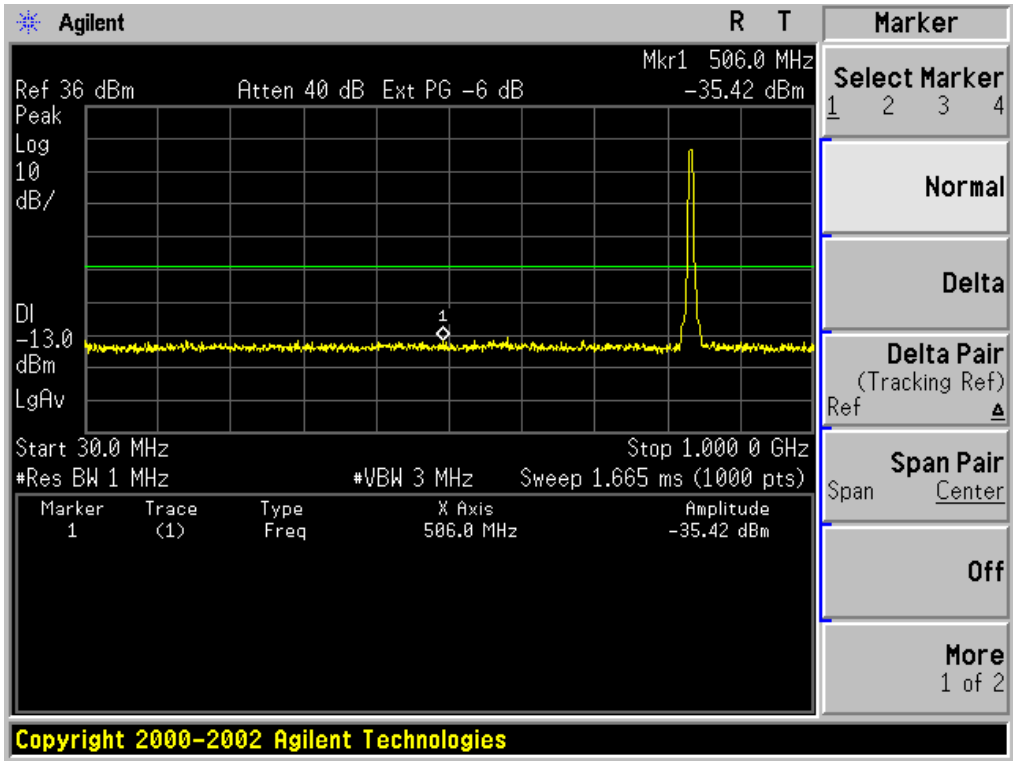
Conducted Emission Transmitting Mode CH 4357 30MHz – 1GHz



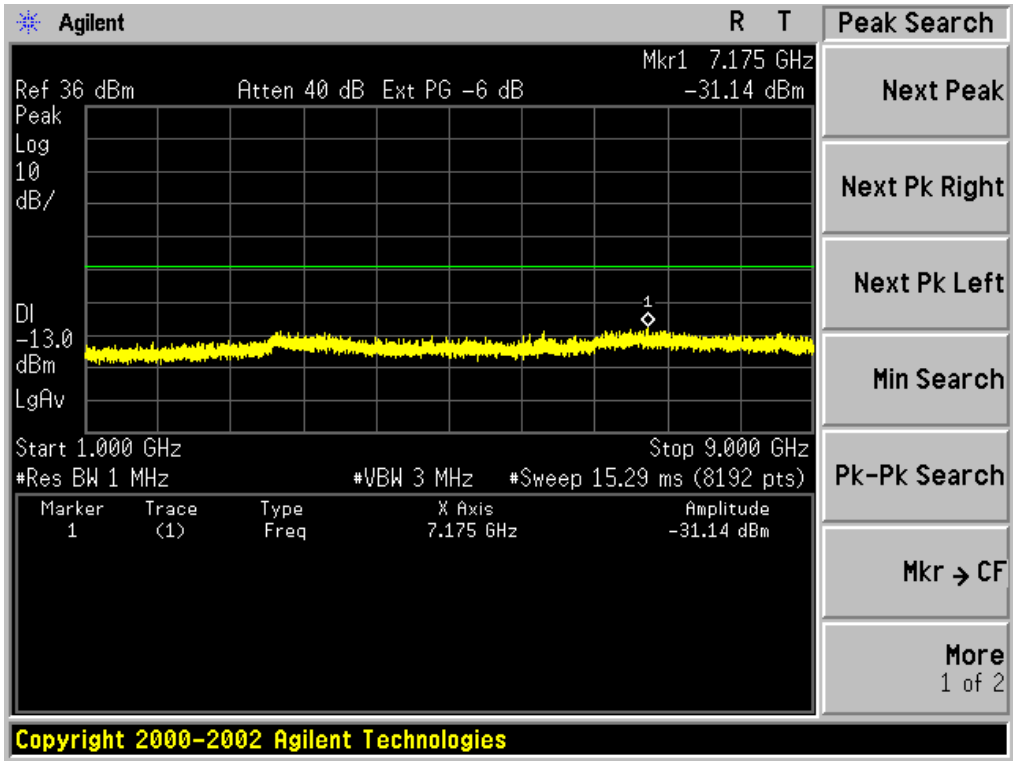
Conducted Emission Transmitting Mode CH 4357 1GHz – 9GHz



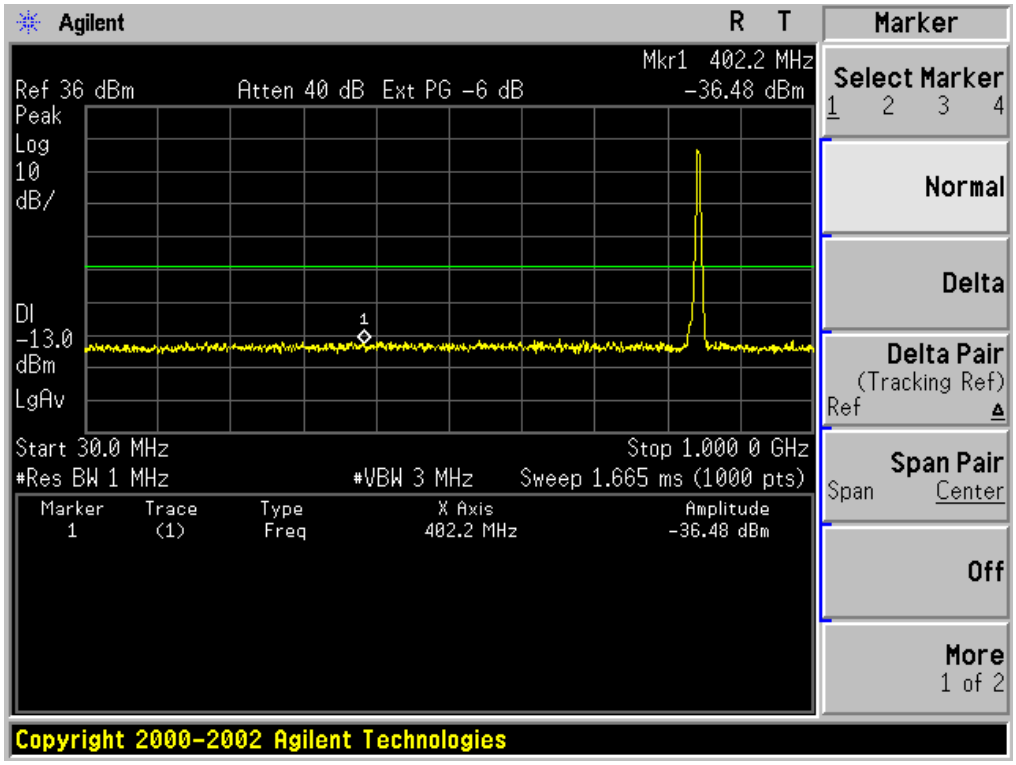
Conducted Emission Transmitting Mode CH 4408 30MHz – 1GHz



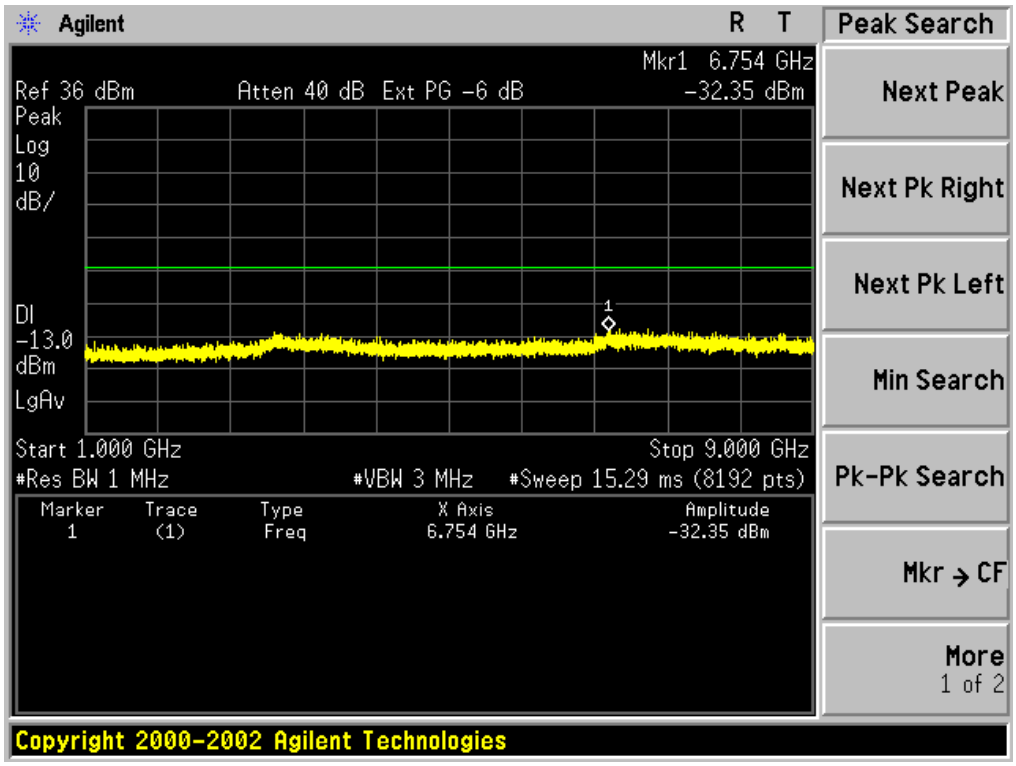
Conducted Emission Transmitting Mode CH 4408 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 4458 30MHz – 1GHz

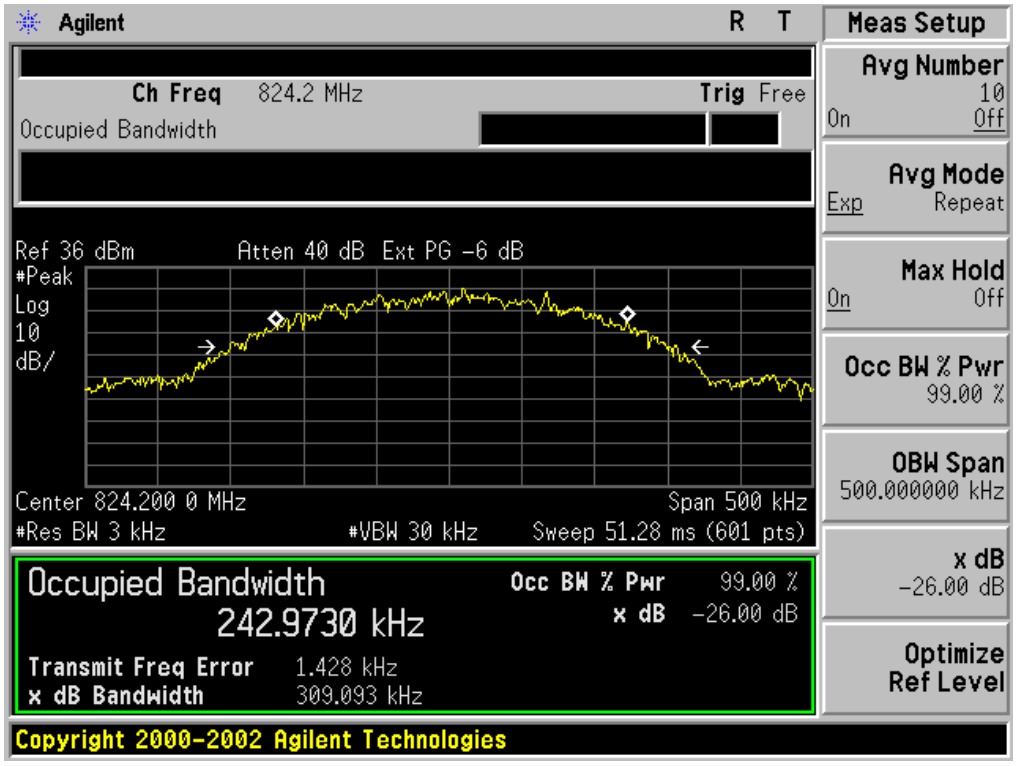


Conducted Emission Transmitting Mode CH 4458 1GHz – 9GHz

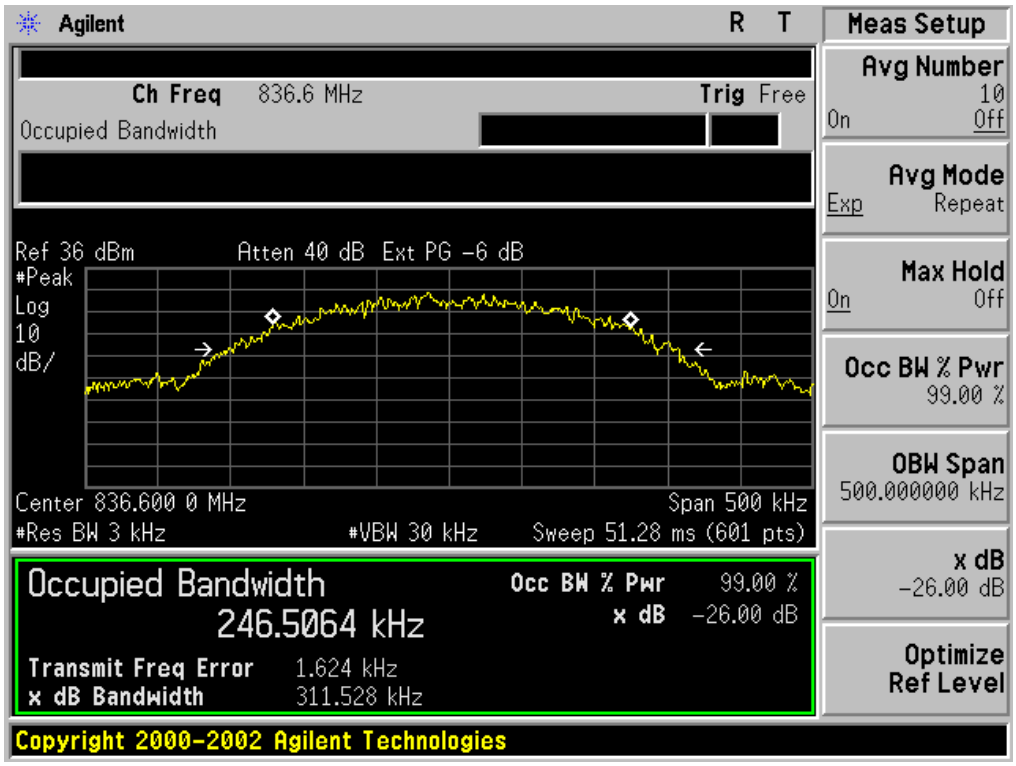


APPENDIX B
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)
EMISSION BANDWIDTH (-26dBC)

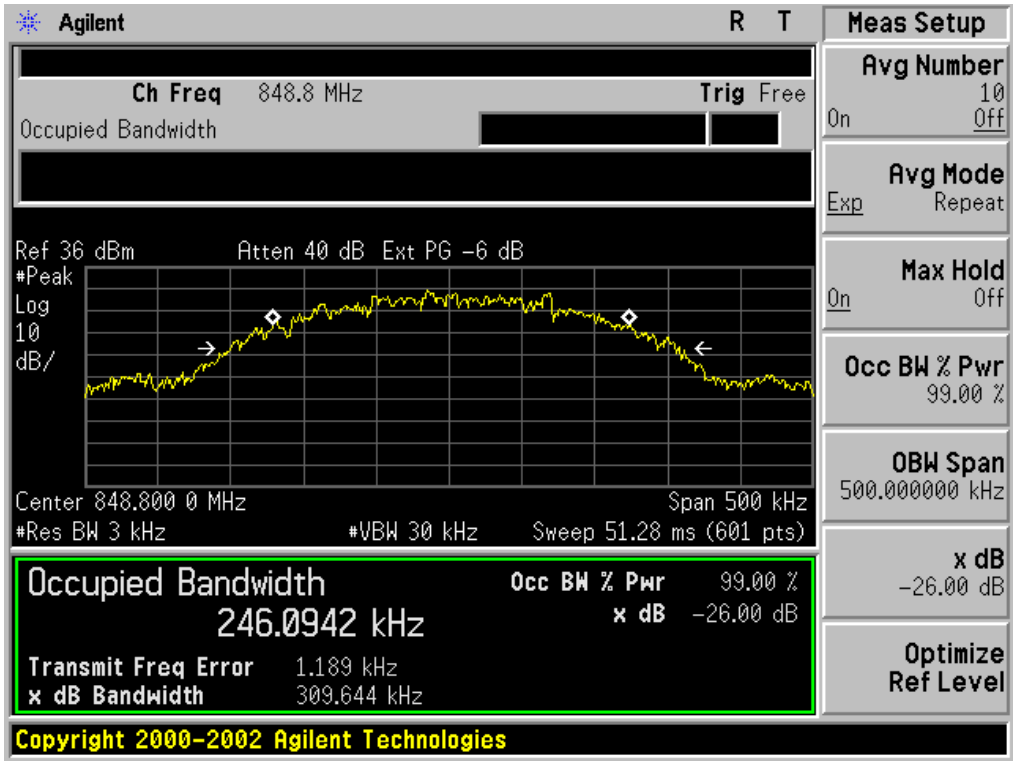
Occupied Bandwidth (99%) GSM 850 BAND CH 128



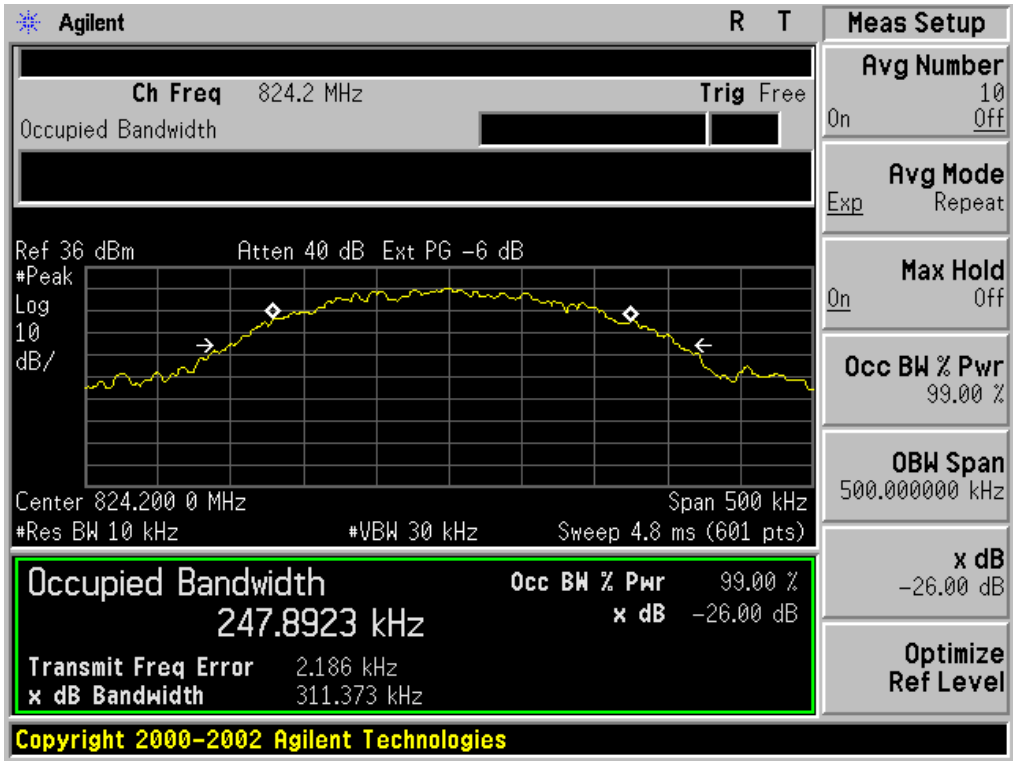
Occupied Bandwidth (99%) GSM 850 BAND CH 190



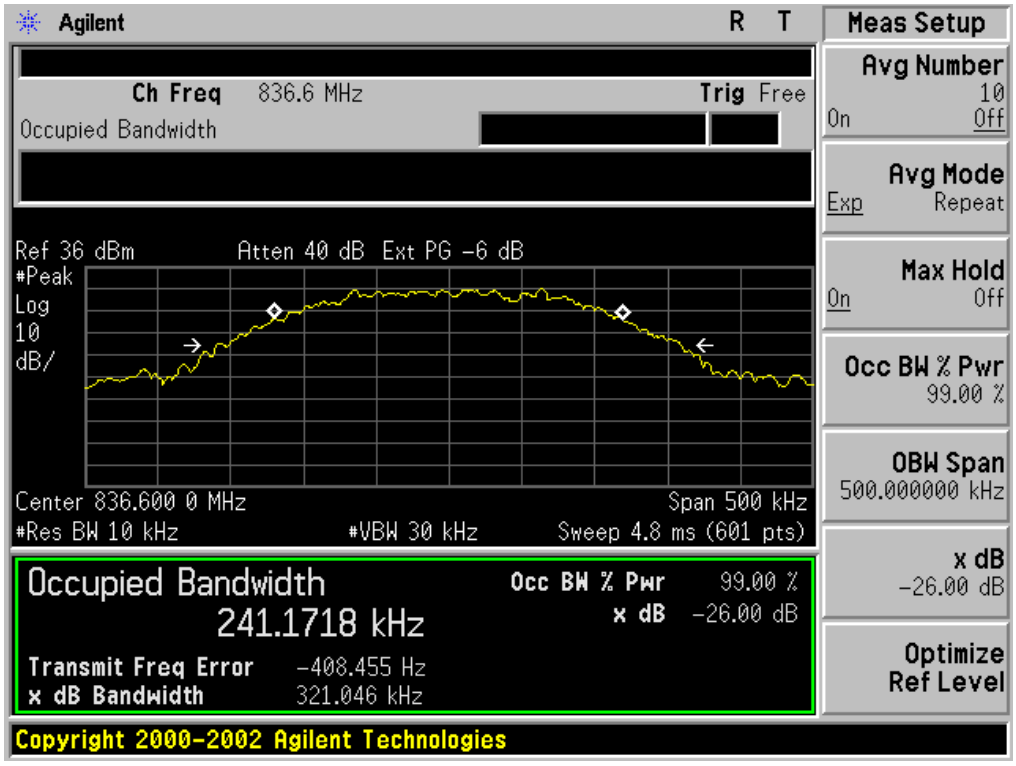
Occupied Bandwidth (99%) GSM 850 BAND CH 251



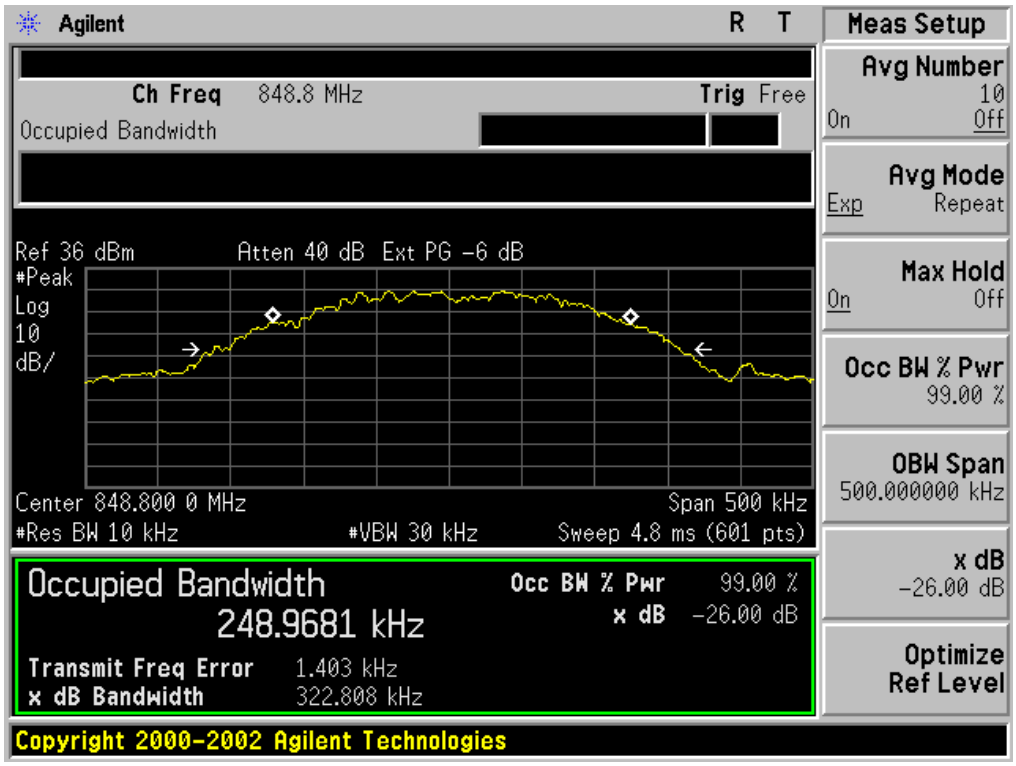
Occupied Bandwidth (99%) GSM 850(EDGE 8) BAND CH 128



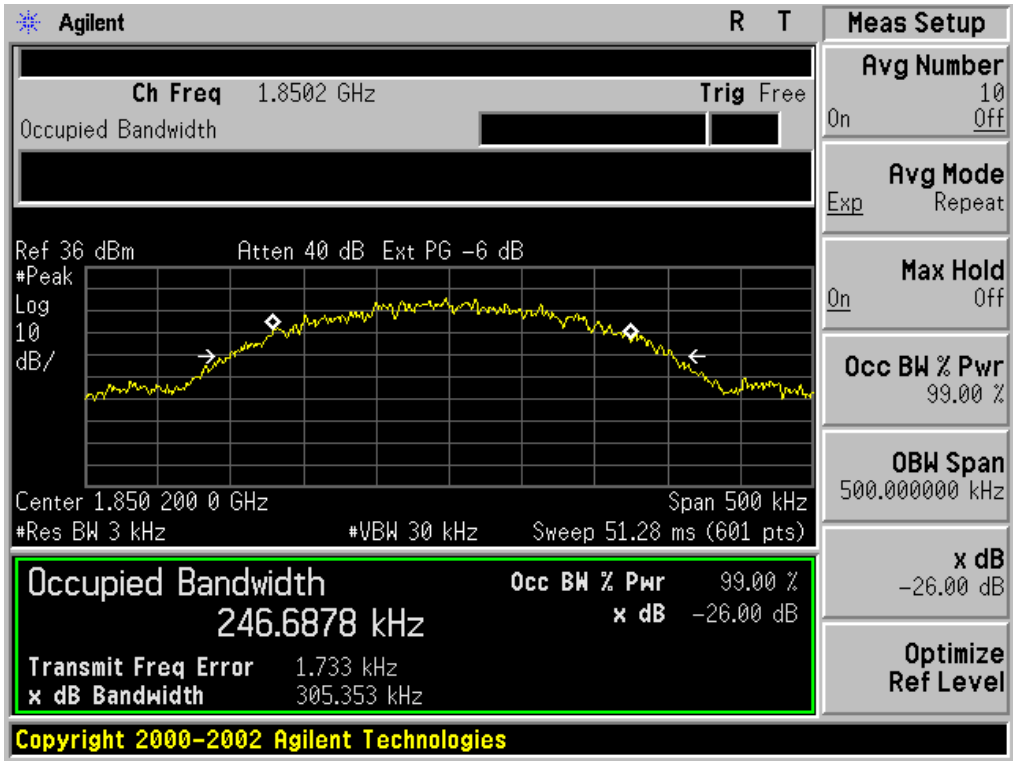
Occupied Bandwidth (99%) GSM 850 (EDGE 8) BAND CH 190



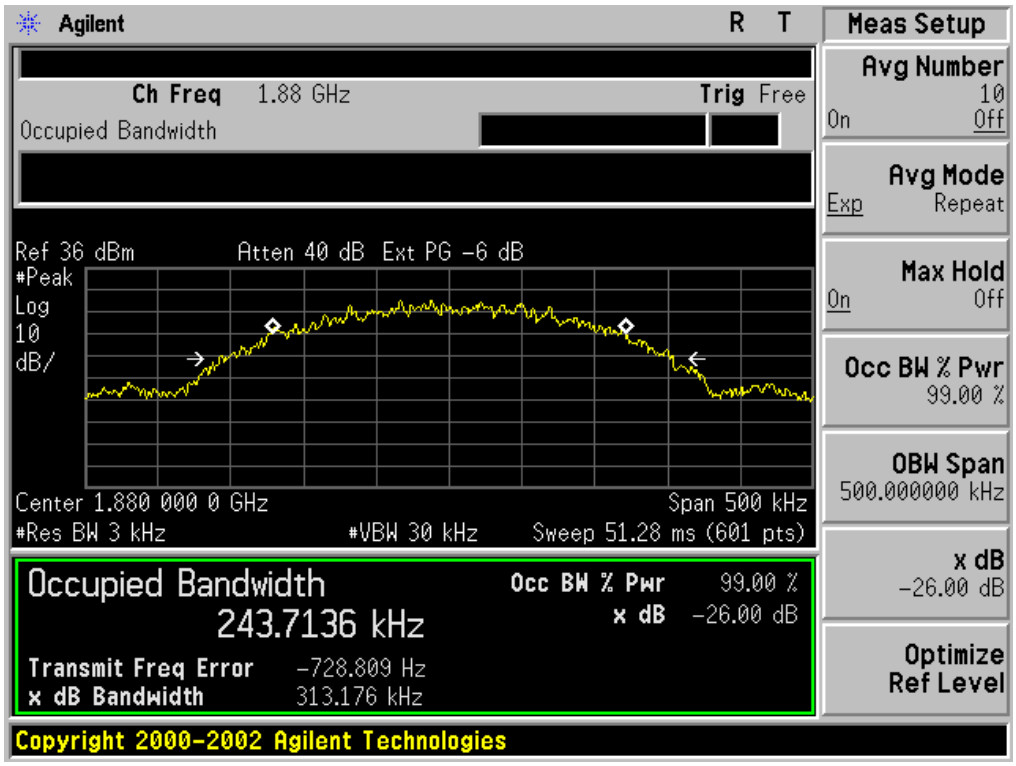
Occupied Bandwidth (99%) GSM 850 (EDGE 8) BAND CH 251



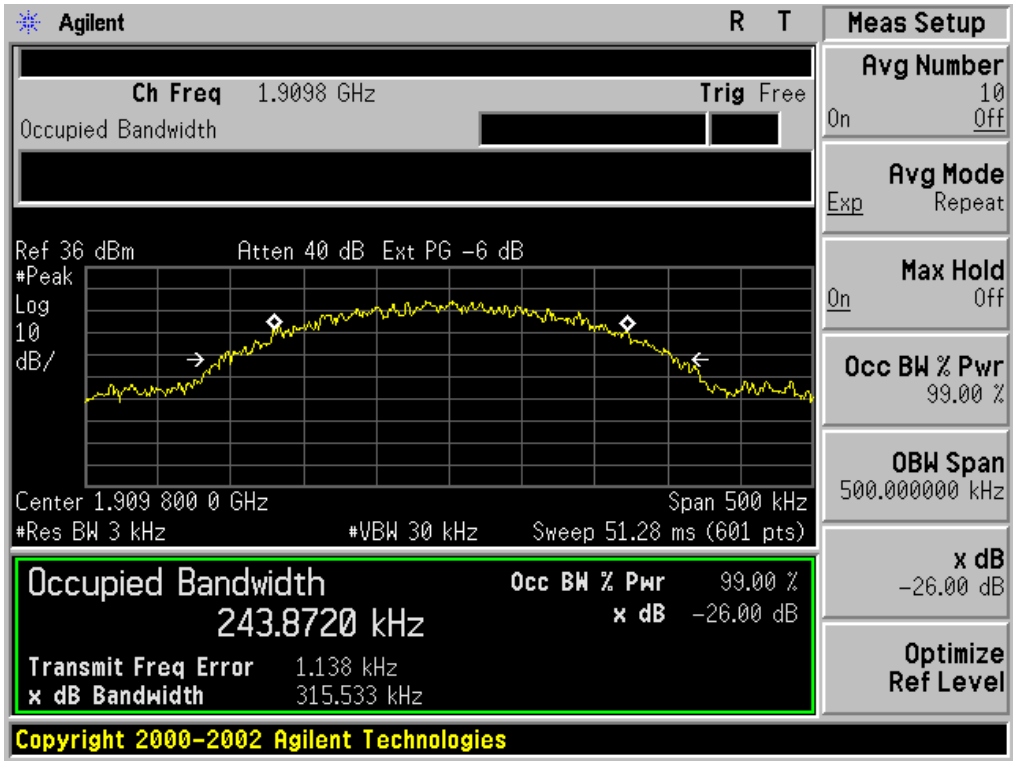
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



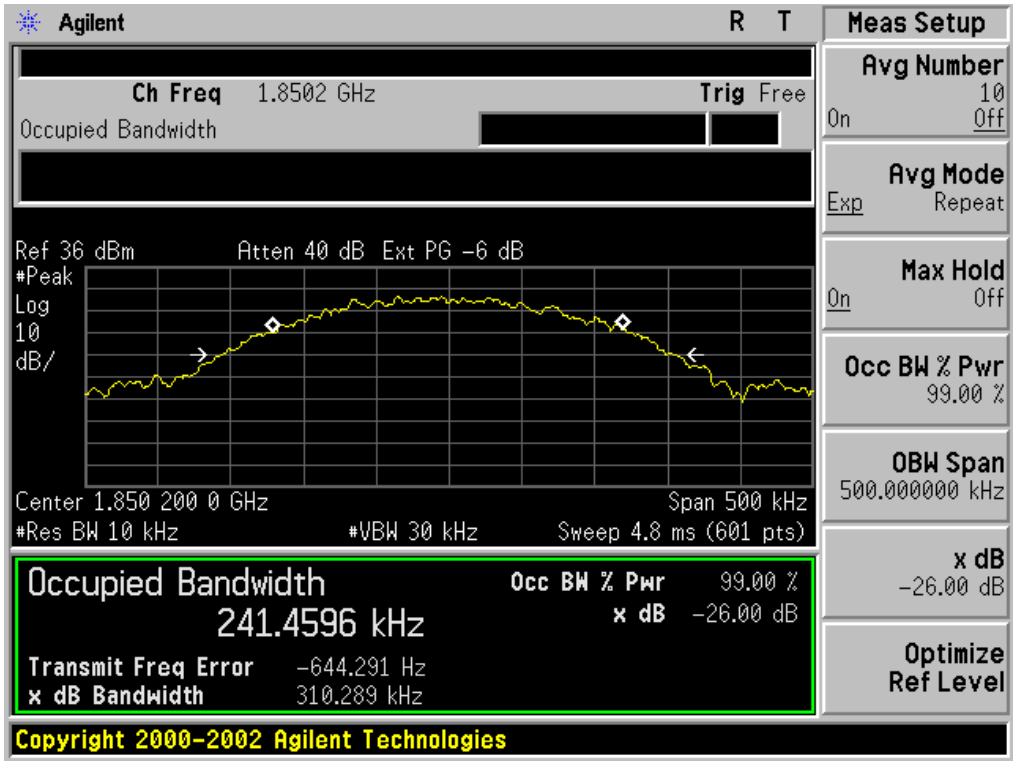
Occupied Bandwidth (99%) PCS 1900 BAND CH 661



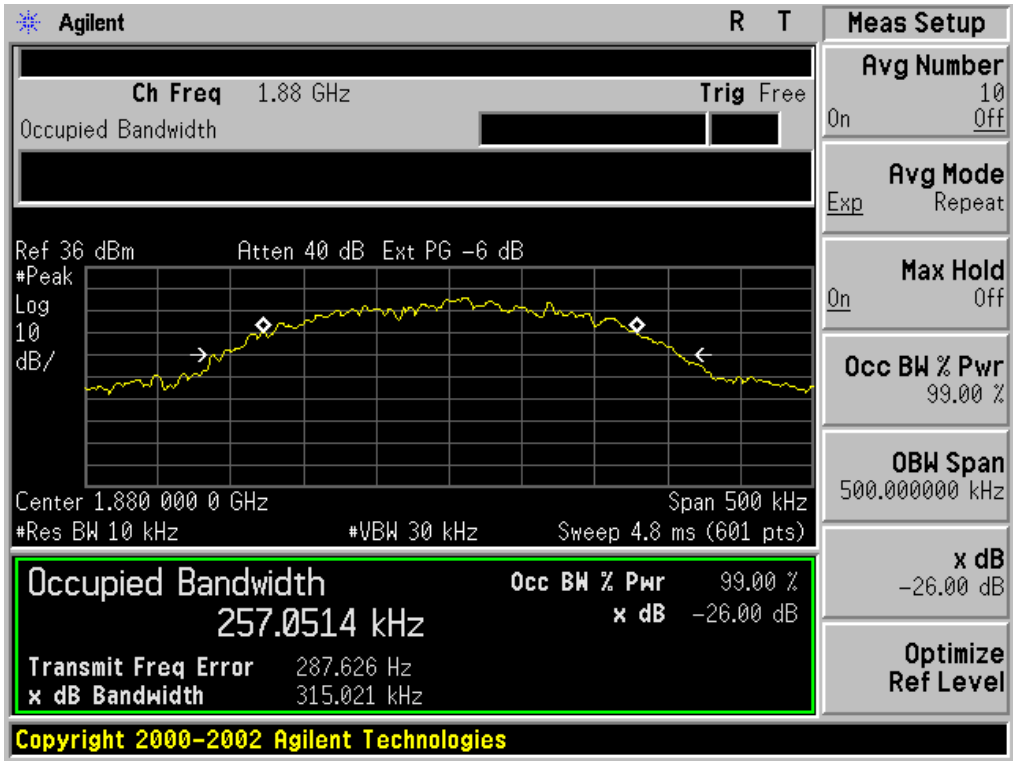
Occupied Bandwidth (99%) PCS 1900 BAND CH 810



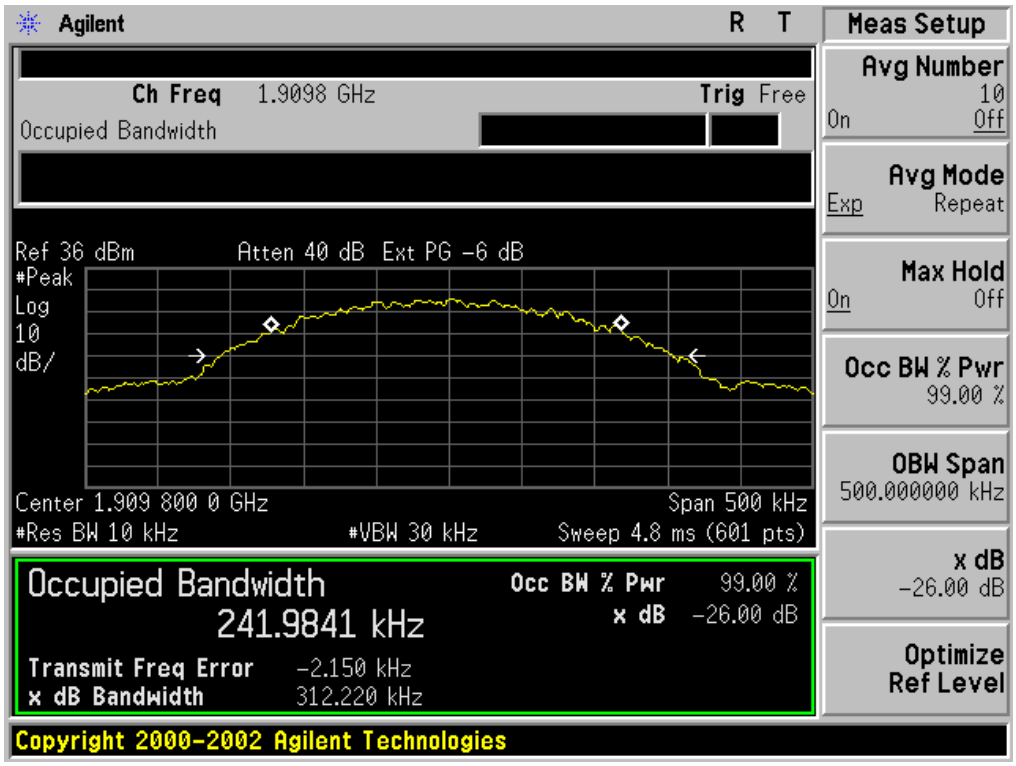
Occupied Bandwidth (99%) PCS 1900 (EDGE 8) BAND CH 512



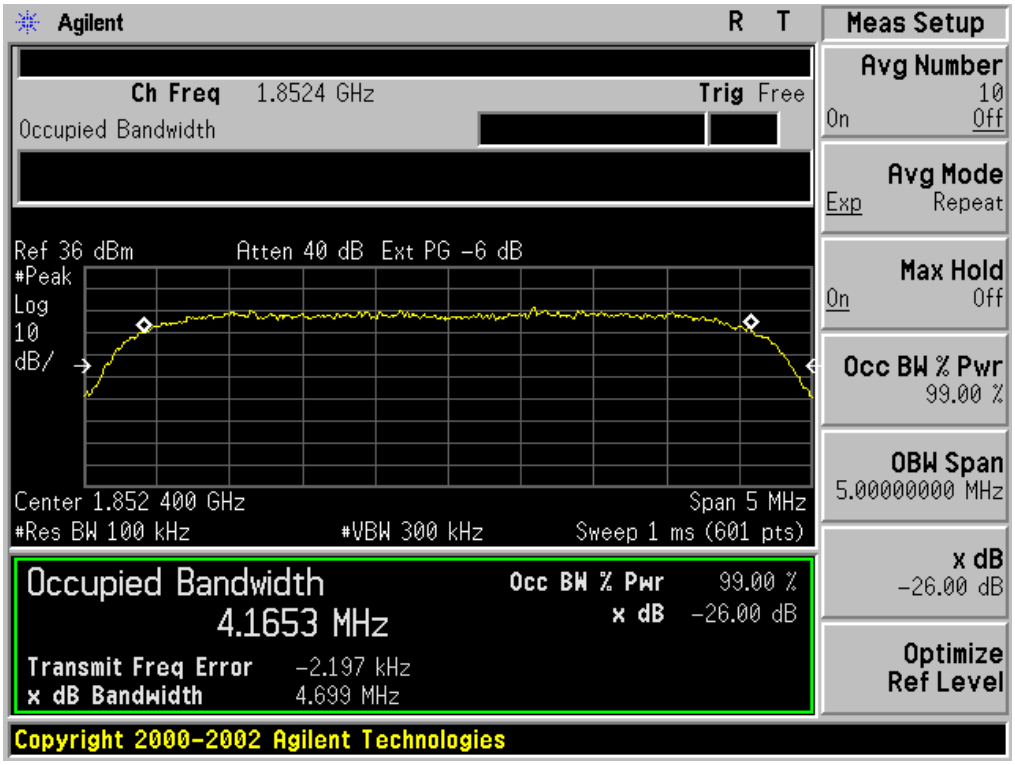
Occupied Bandwidth (99%) PCS 1900 (EDGE 8) BAND CH 661



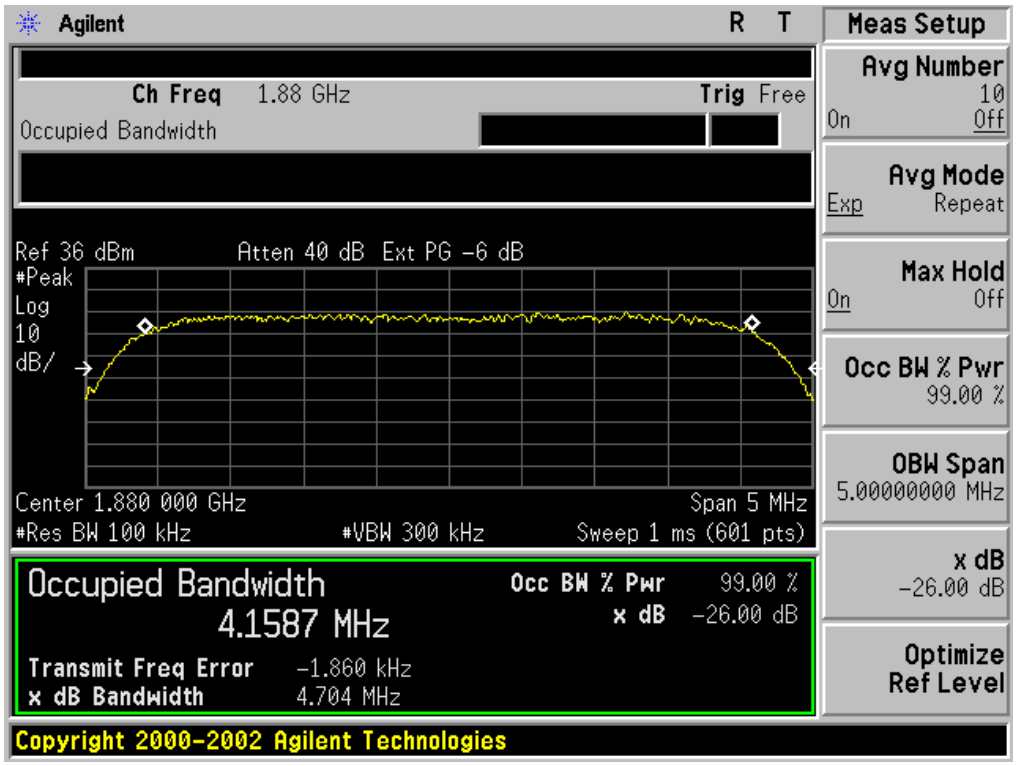
Occupied Bandwidth (99%) PCS 1900 (EDGE 8) BAND CH 810



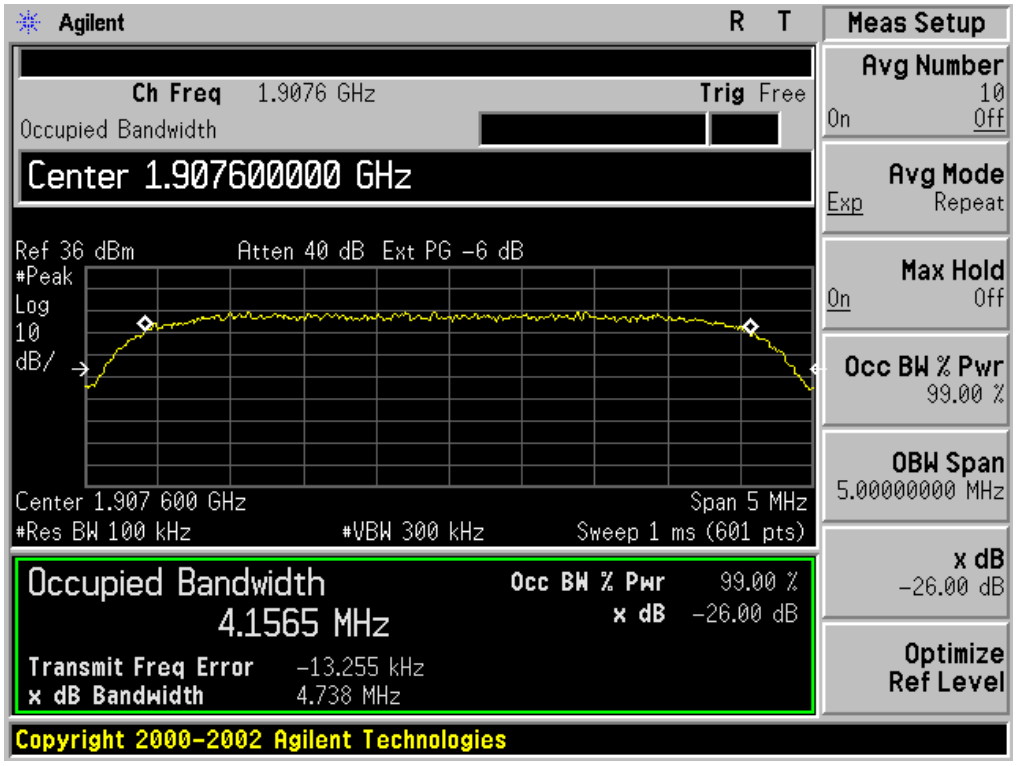
Occupied Bandwidth (99%) UMTS band II CH 9662



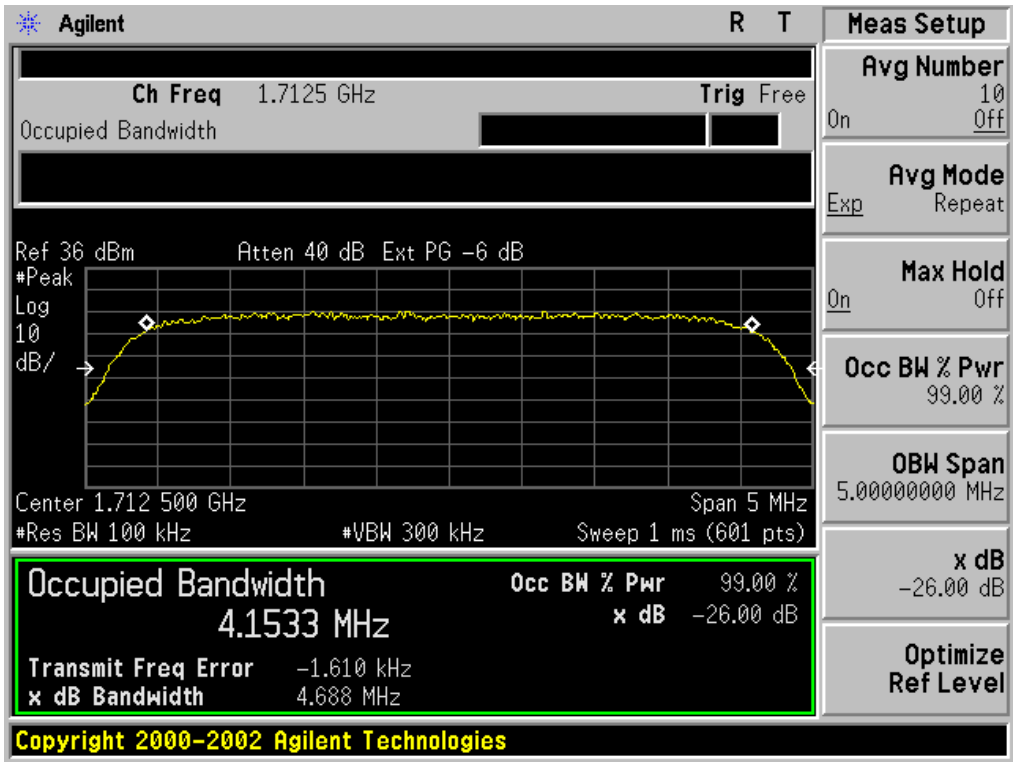
Occupied Bandwidth (99%) UMTS band II CH 9800



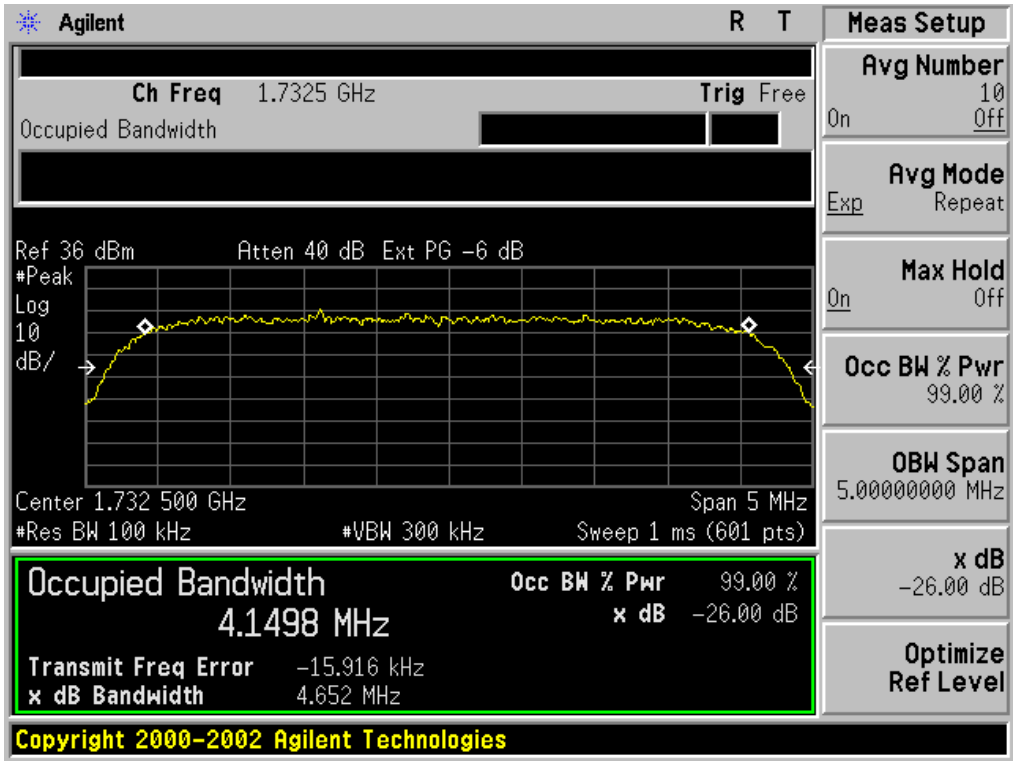
Occupied Bandwidth (99%) UMTS band II CH 9938



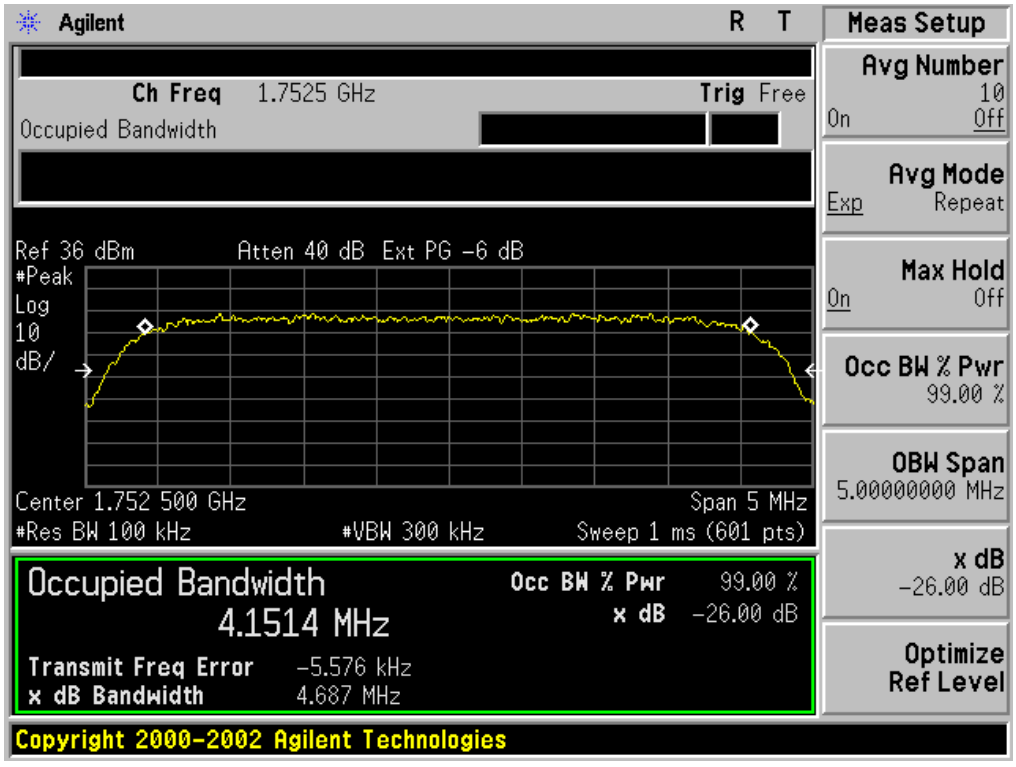
Occupied Bandwidth (99%) UMTS band IV CH 1887



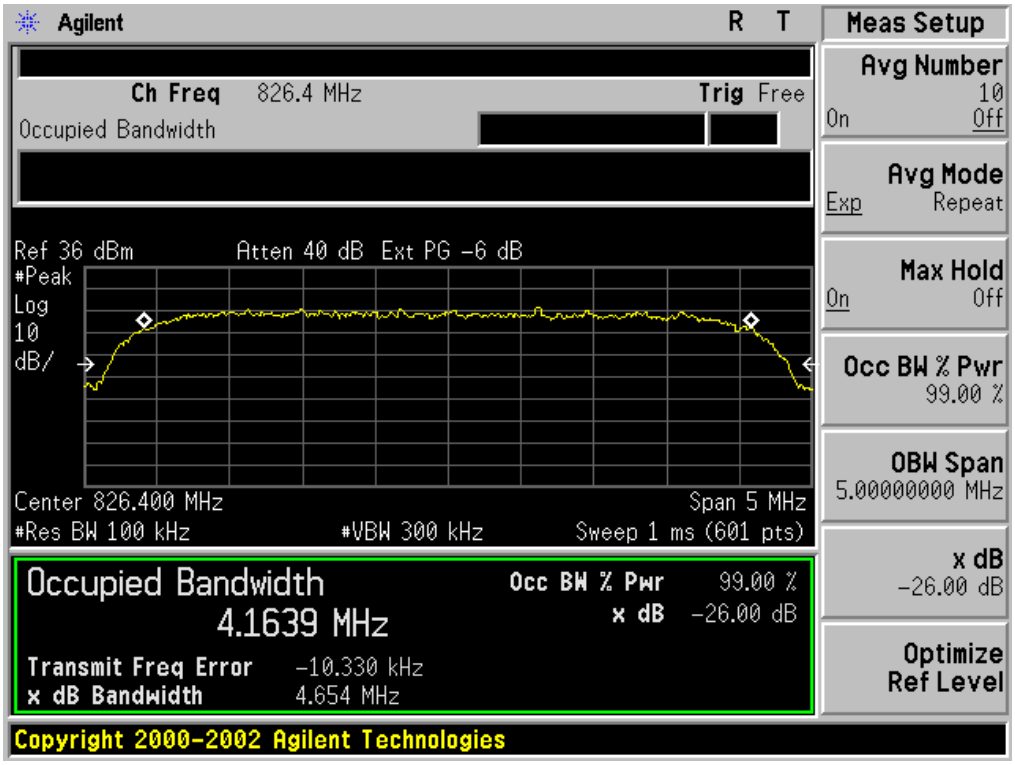
Occupied Bandwidth (99%) UMTS band IV CH 1987



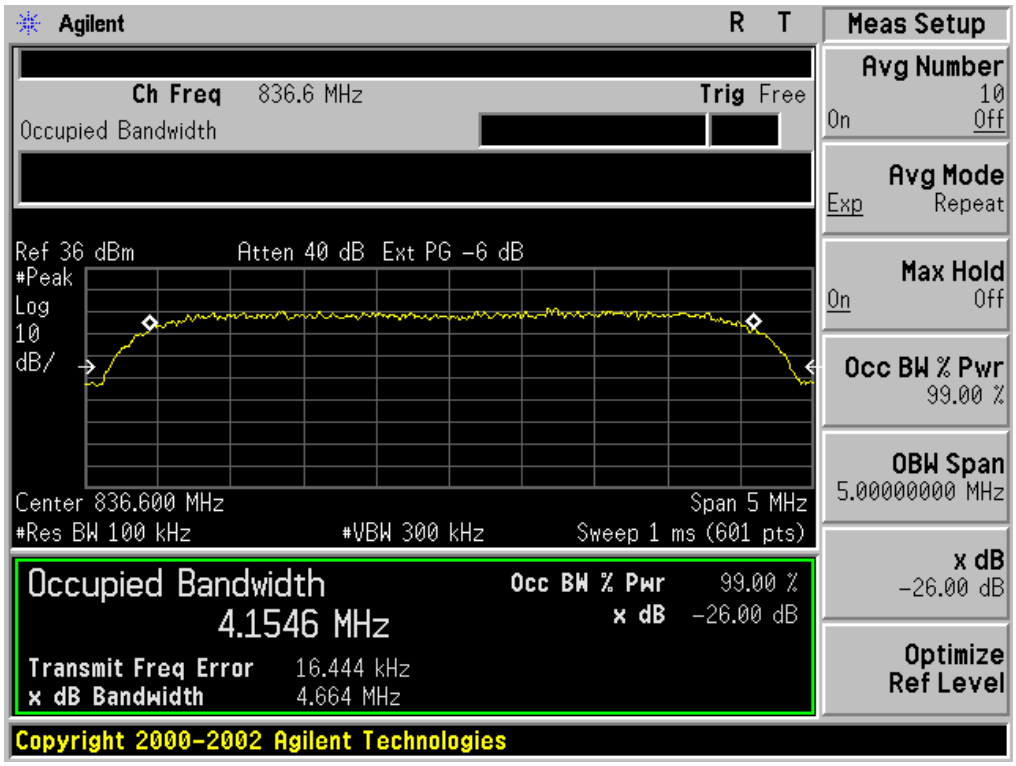
Occupied Bandwidth (99%) UMTS band IV CH 2087



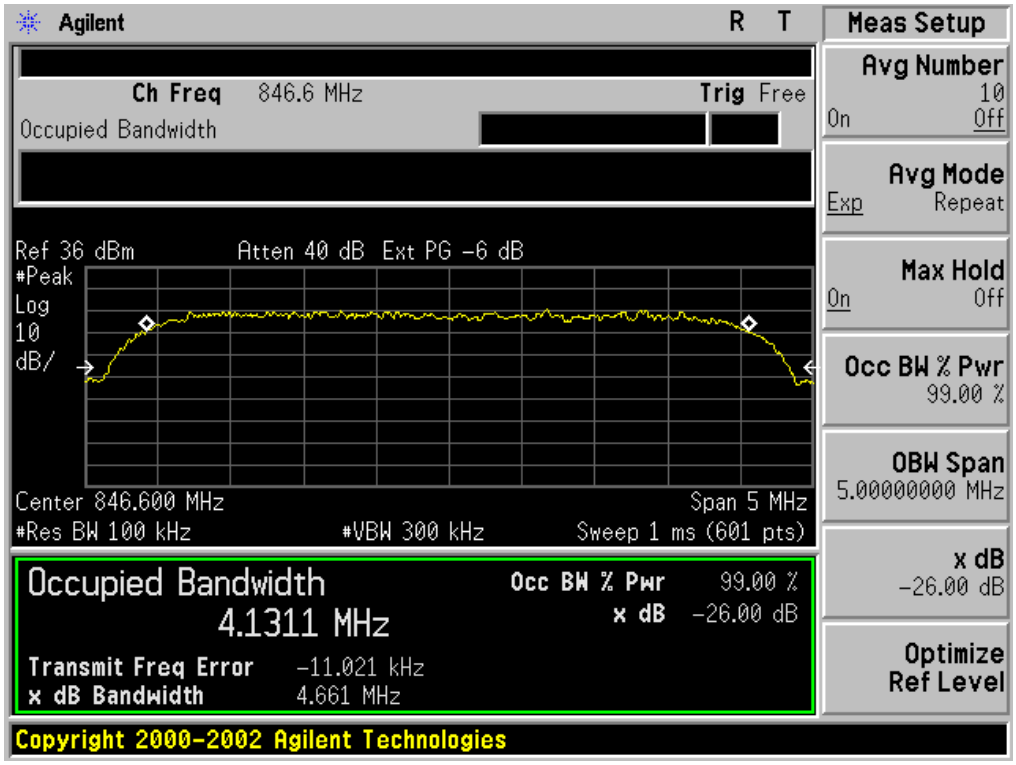
Occupied Bandwidth (99%) UMTS band V CH 4357



Occupied Bandwidth (99%) UMTS band V CH 4408



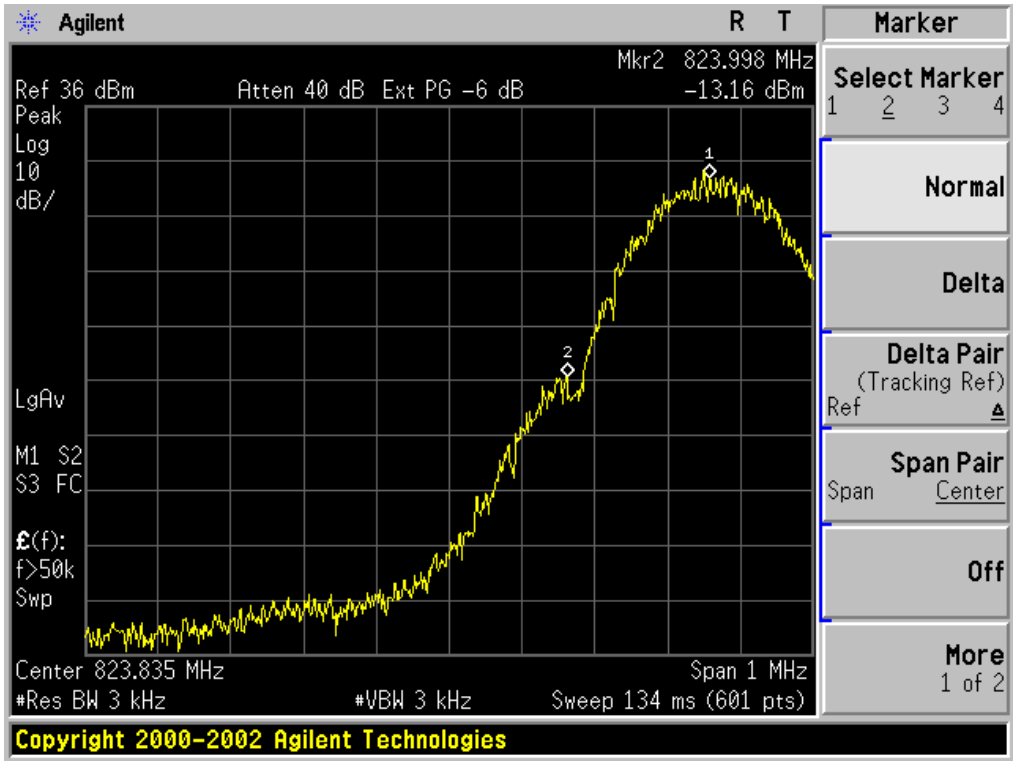
Occupied Bandwidth (99%) UMTS band V CH 4458



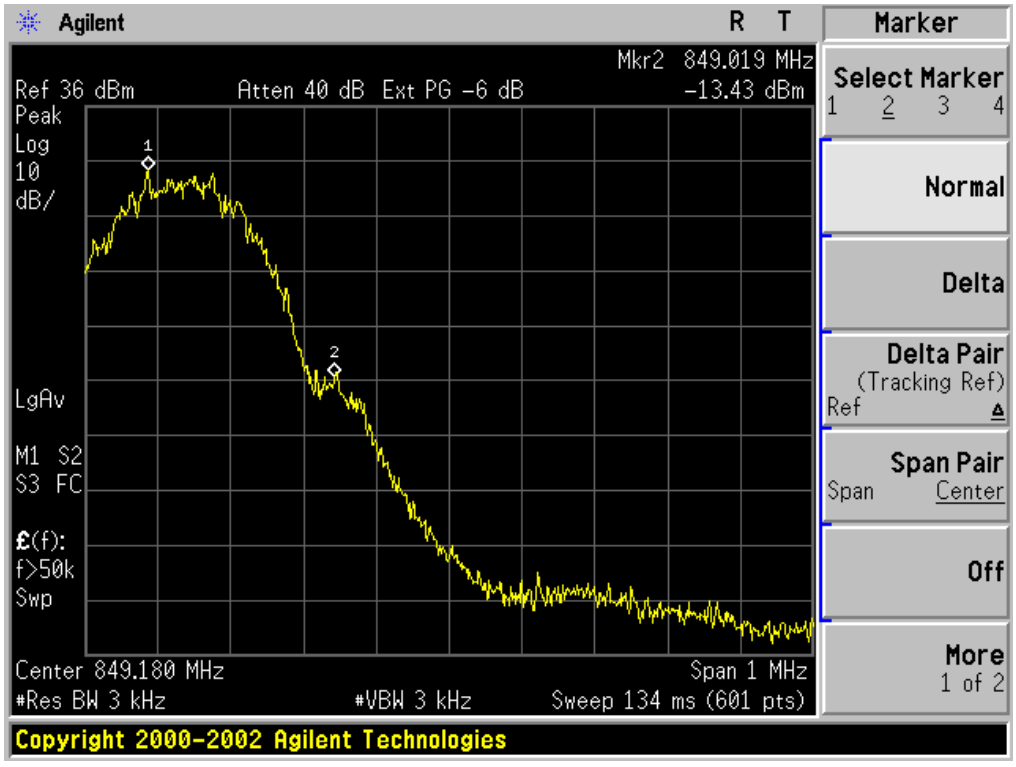
APPENDIX C

TEST PLOTS FOR BAND EDGES

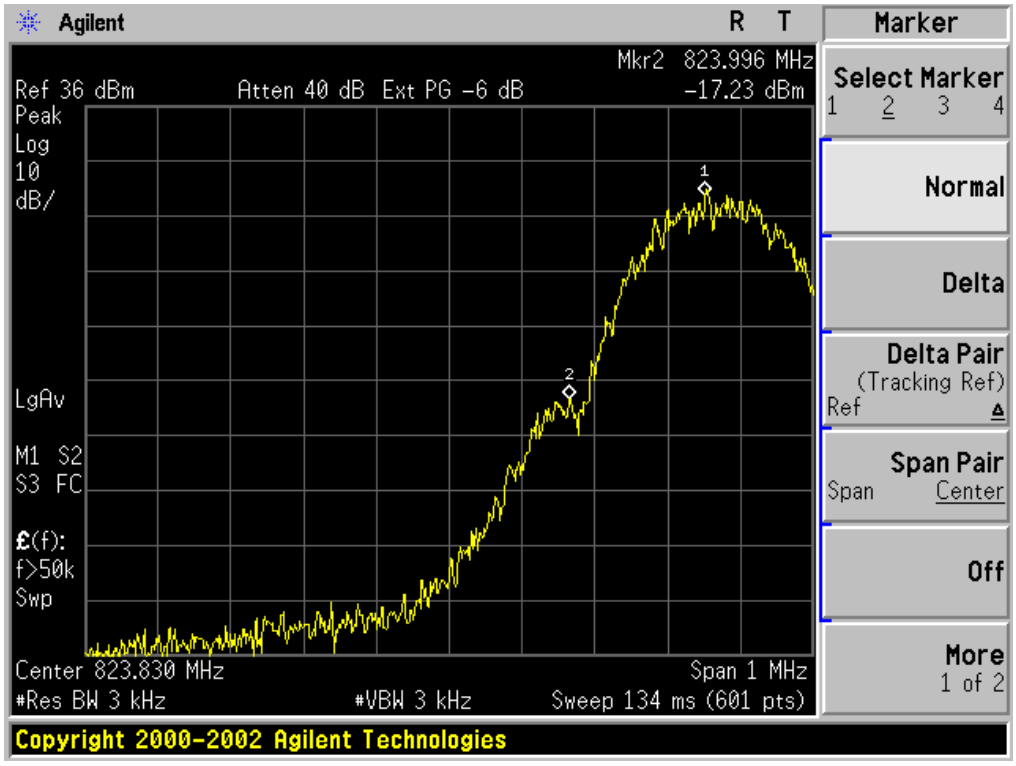
Low Band Edge GSM 850 BAND CH 128



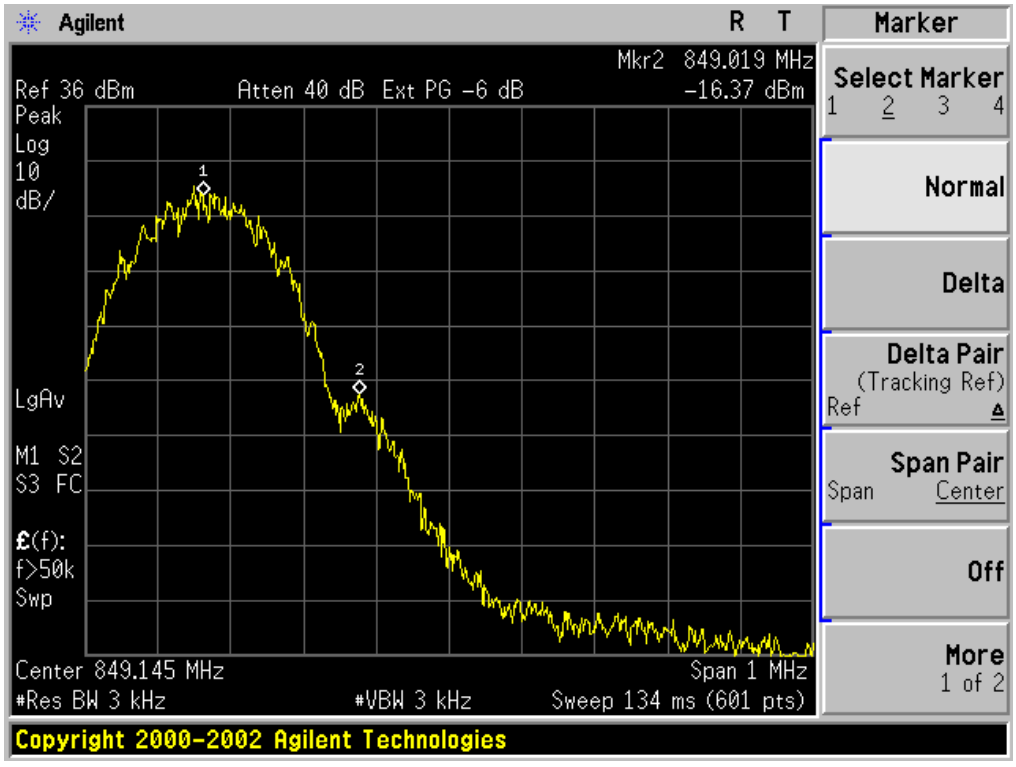
High Band Edge GSM 850 BAND CH 251



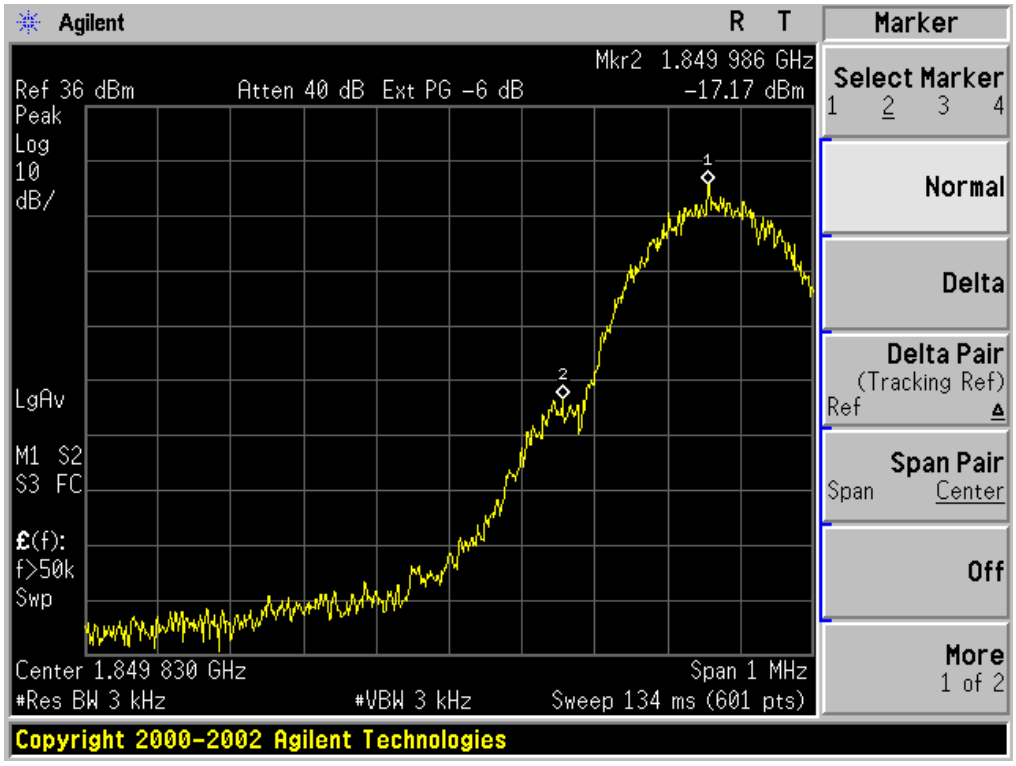
Low Band Edge GSM 850 (EDGE 8) BAND CH 128



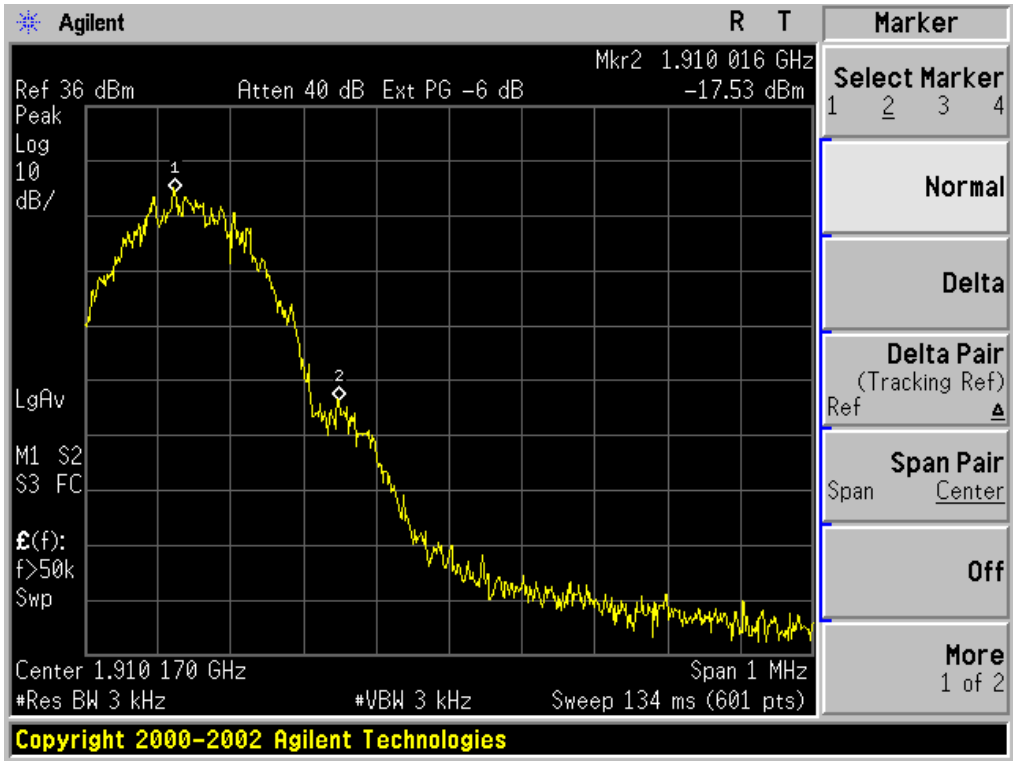
High Band Edge GSM 850 (EDGE 8) BAND CH 251



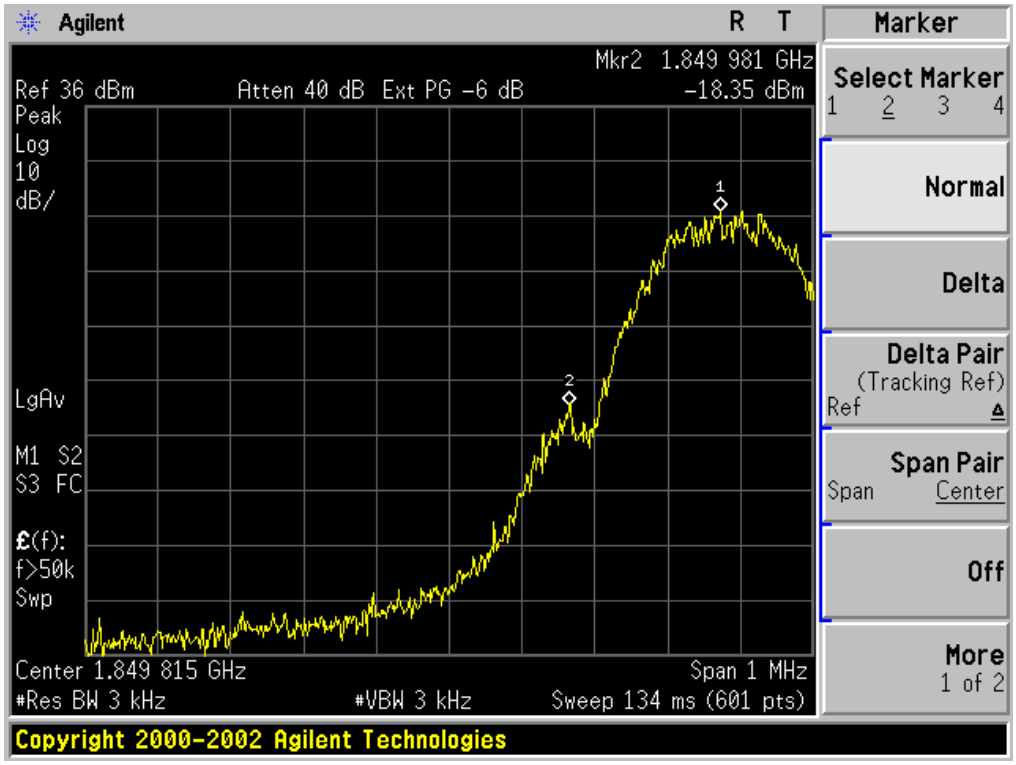
Low Band Edge PCS 1900 BAND CH 512



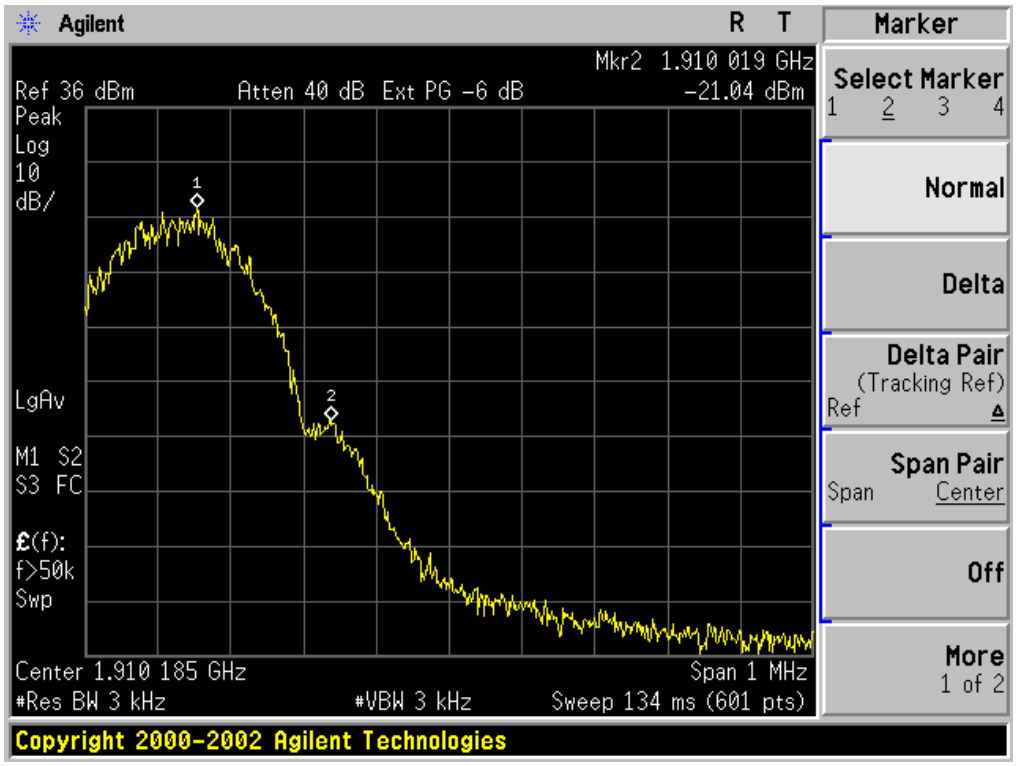
High Band Edge PCS 1900 BAND CH 810



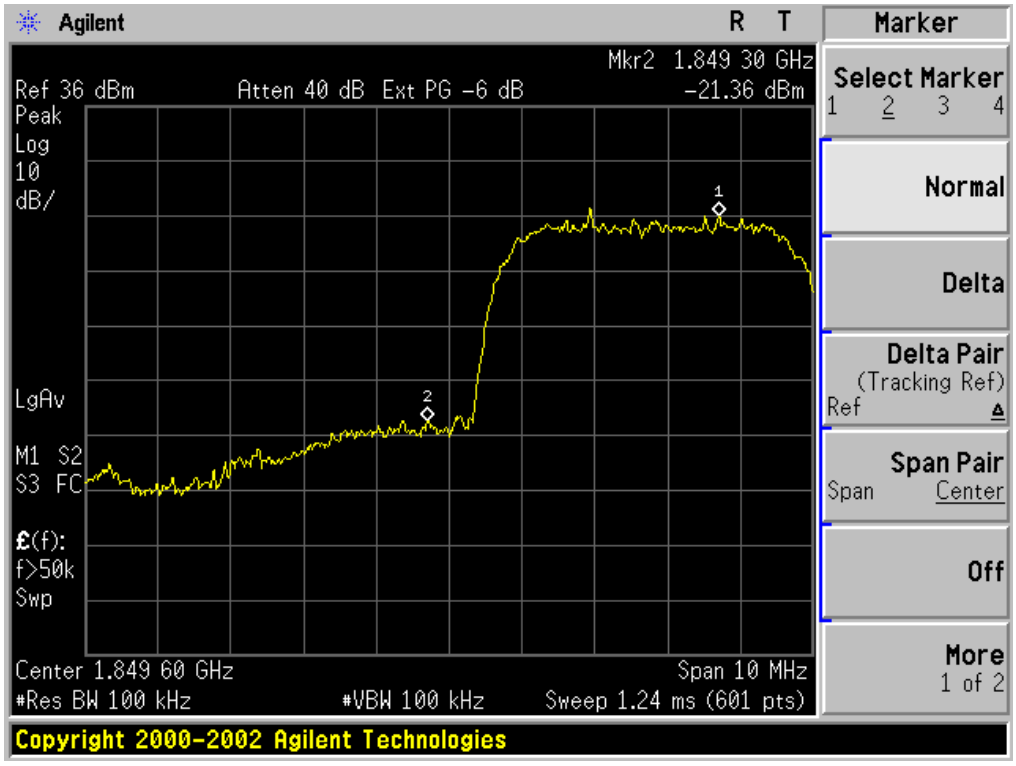
Low Band Edge PCS 1900 (EDGE 8) BAND CH 512



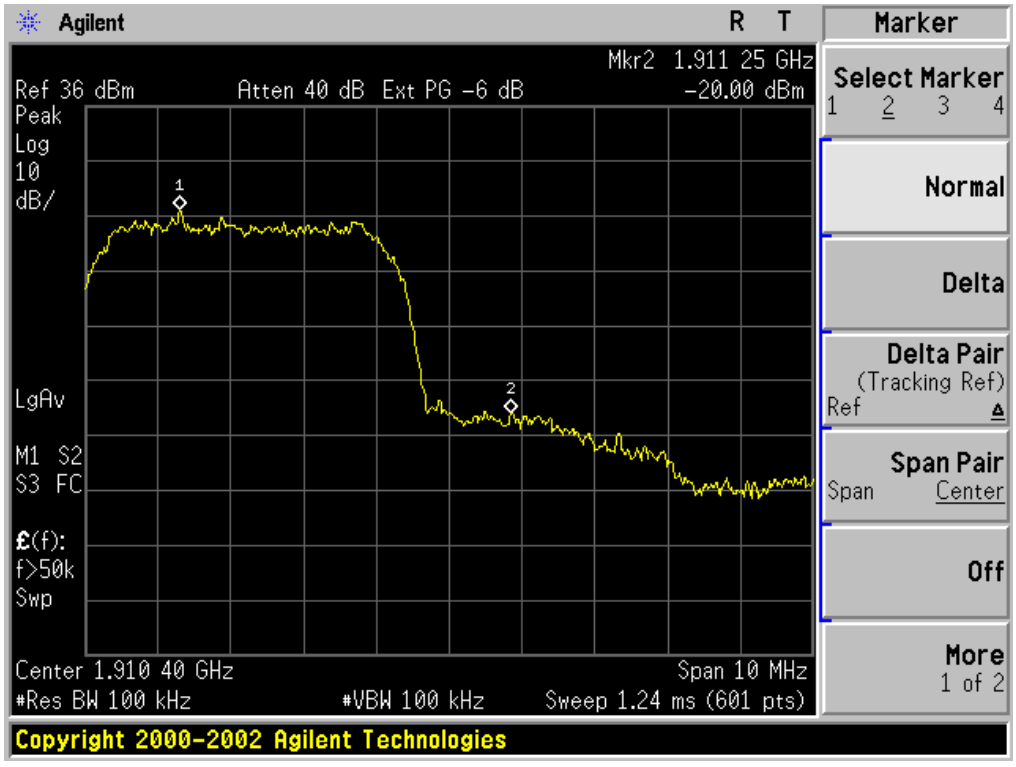
High Band Edge PCS 1900 (EDGE 8) BAND CH 810



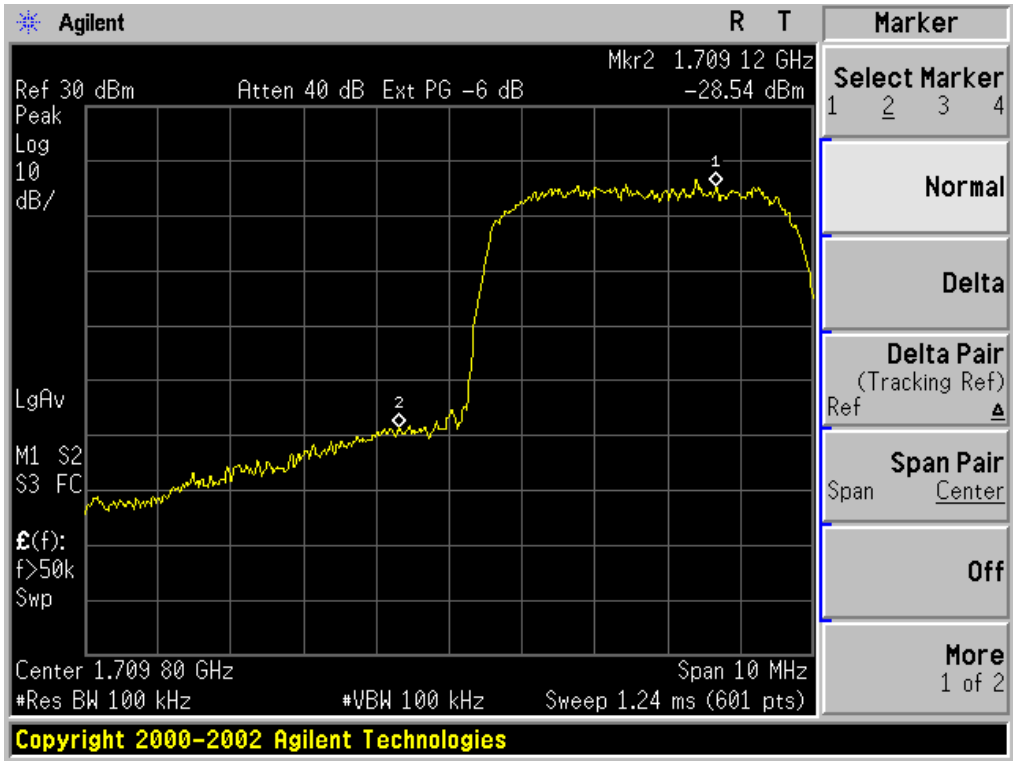
Low Band Edge UMTS BAND II CH 9662



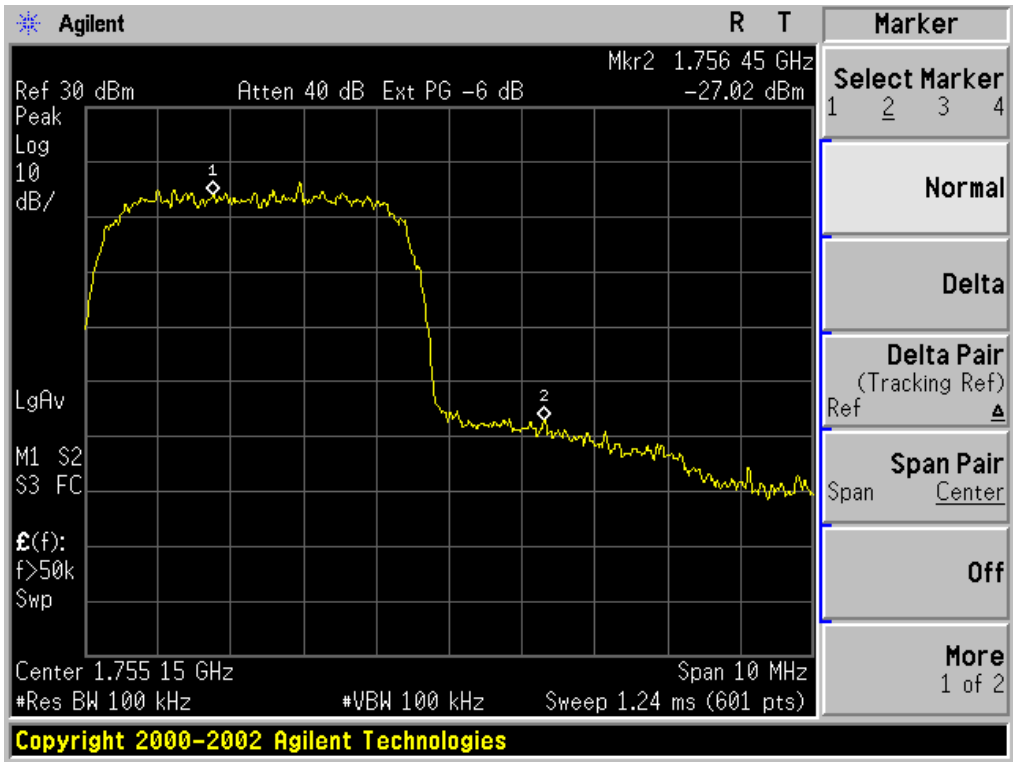
High Band Edge UMTS BAND II CH 9938



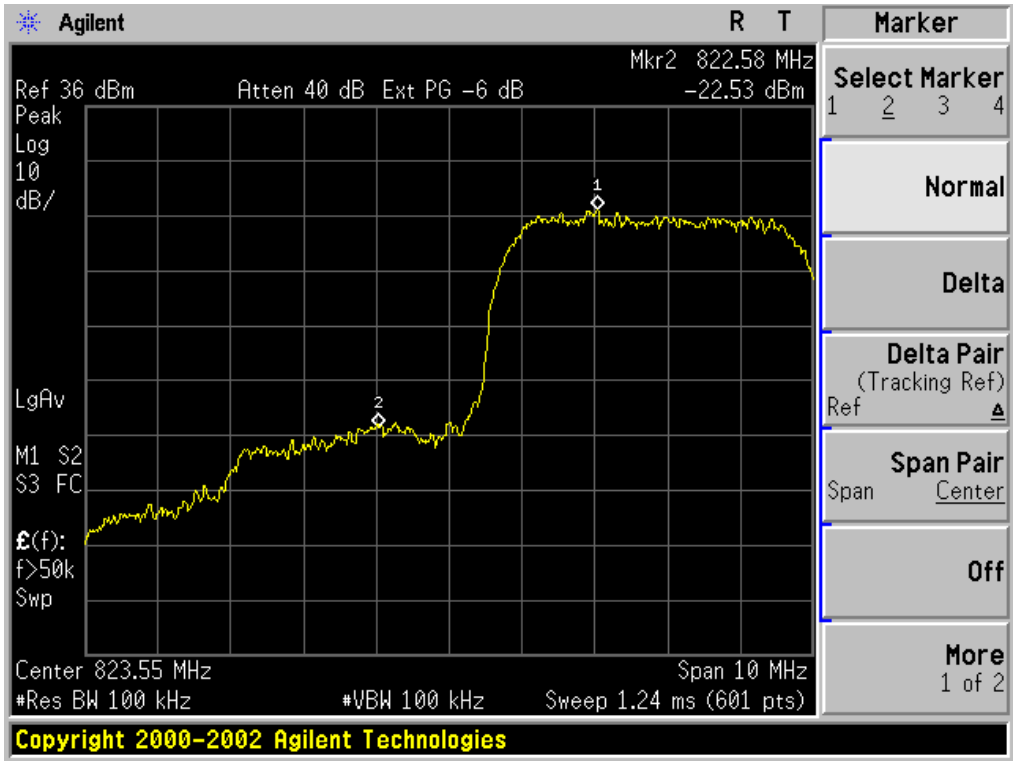
Low Band Edge UMTS BAND IV CH 1887



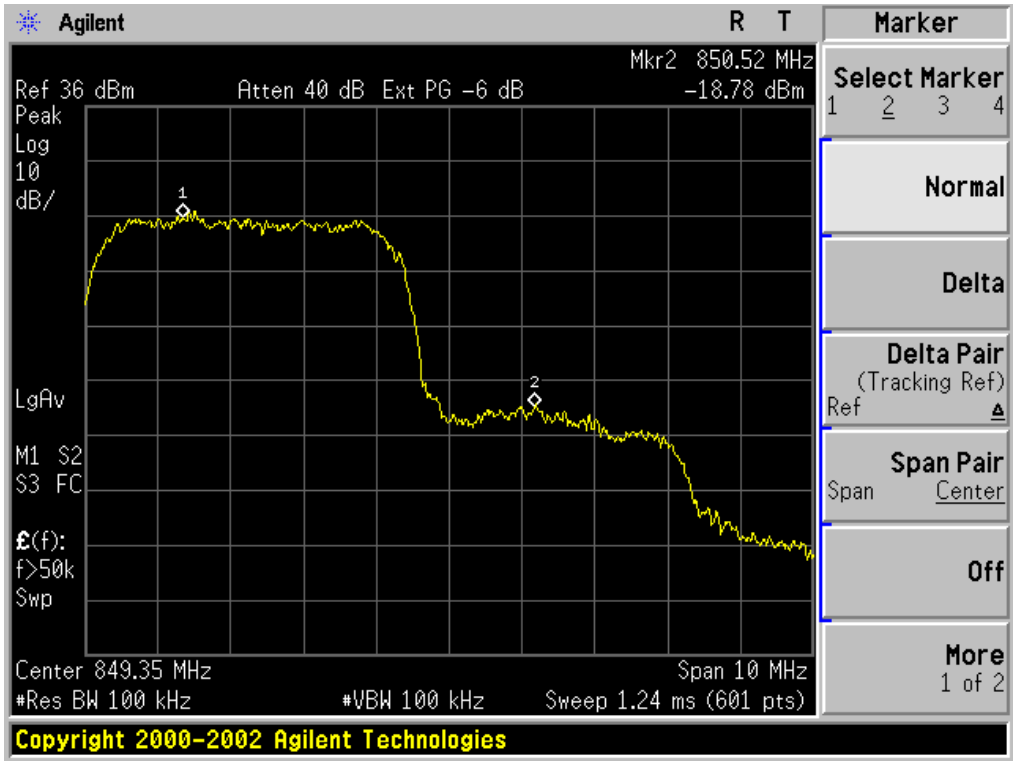
High Band Edge UMTS BAND IV CH 2087



Low Band Edge UMTS BAND V CH 4357



High Band Edge UMTS BAND V CH 4458

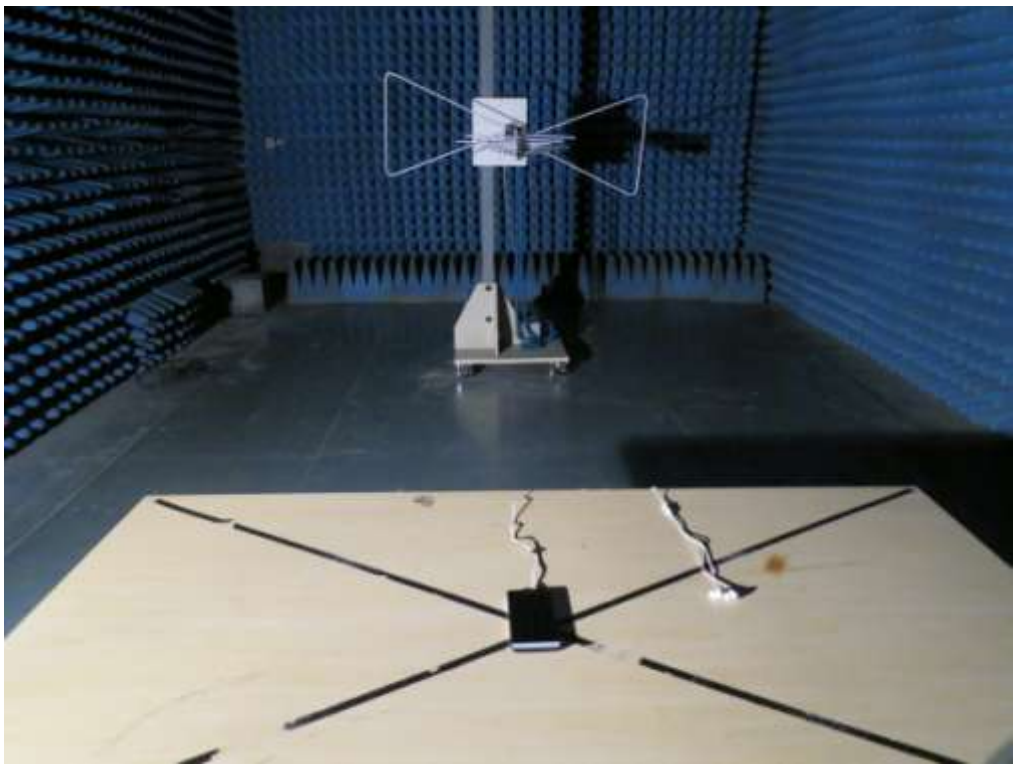


APPENDIX D

PHOTOGRAPHS OF TEST SETUP

CONDUCTED EMISSION

RADIATED SPURIOUS EMISSION

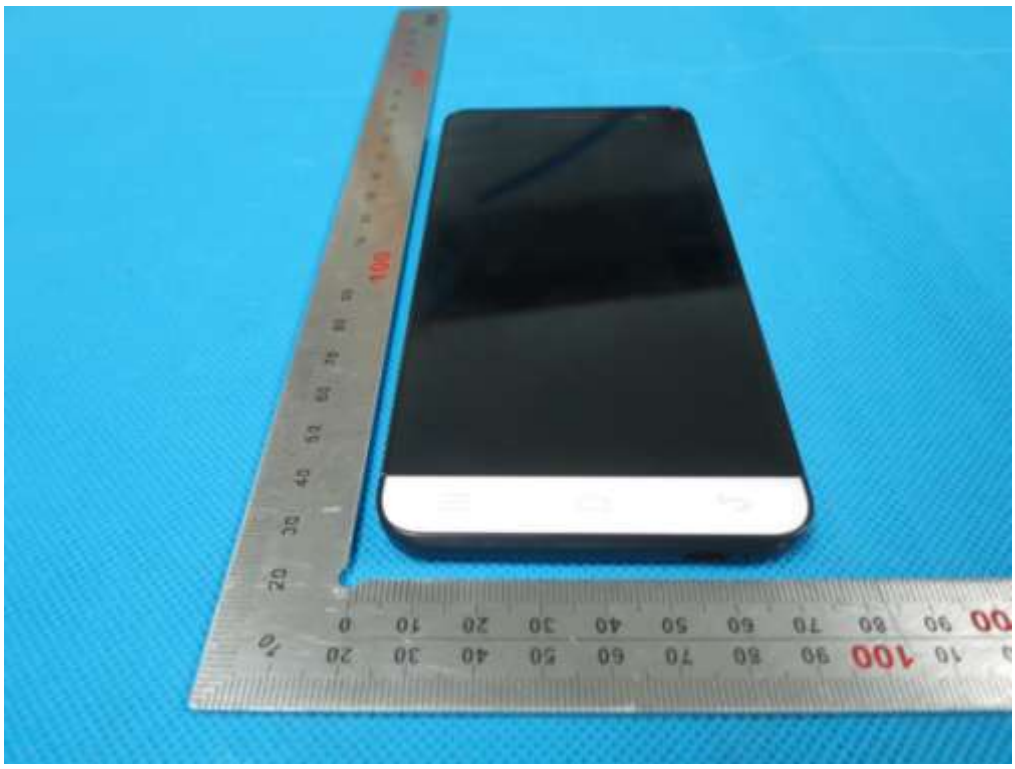


APPENDIX E
PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT

TOP VIEW OF EUT

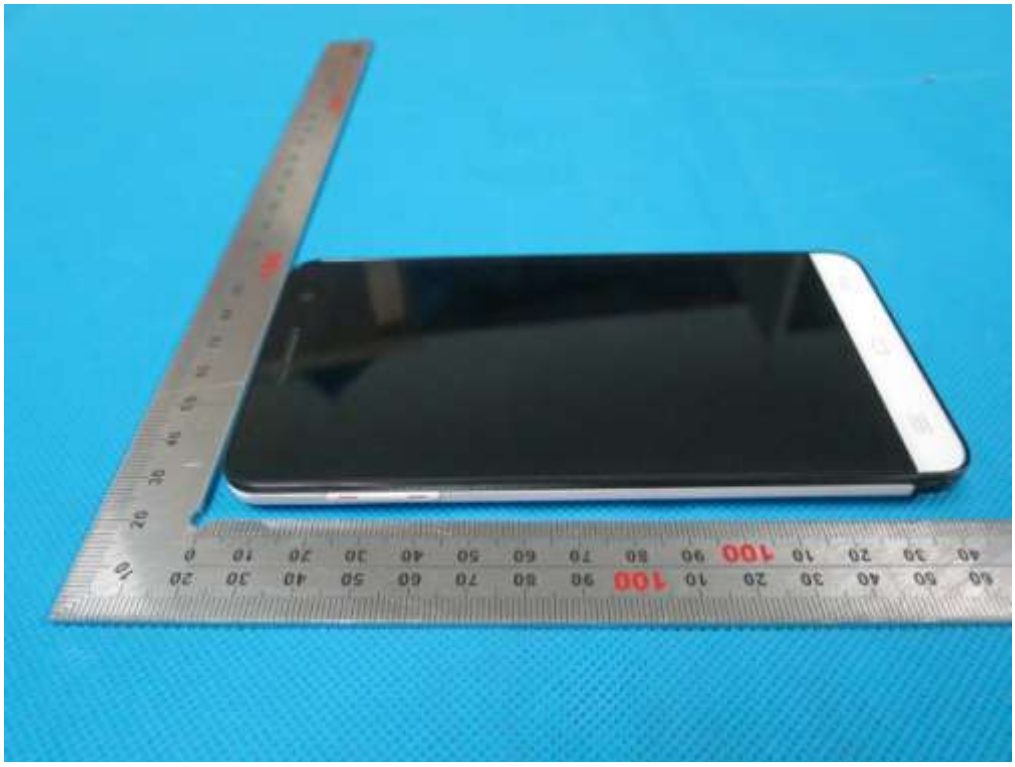
BOTTOM VIEW OF EUT



FRONT VIEW OF EUT

BACK VIEW OF EUT

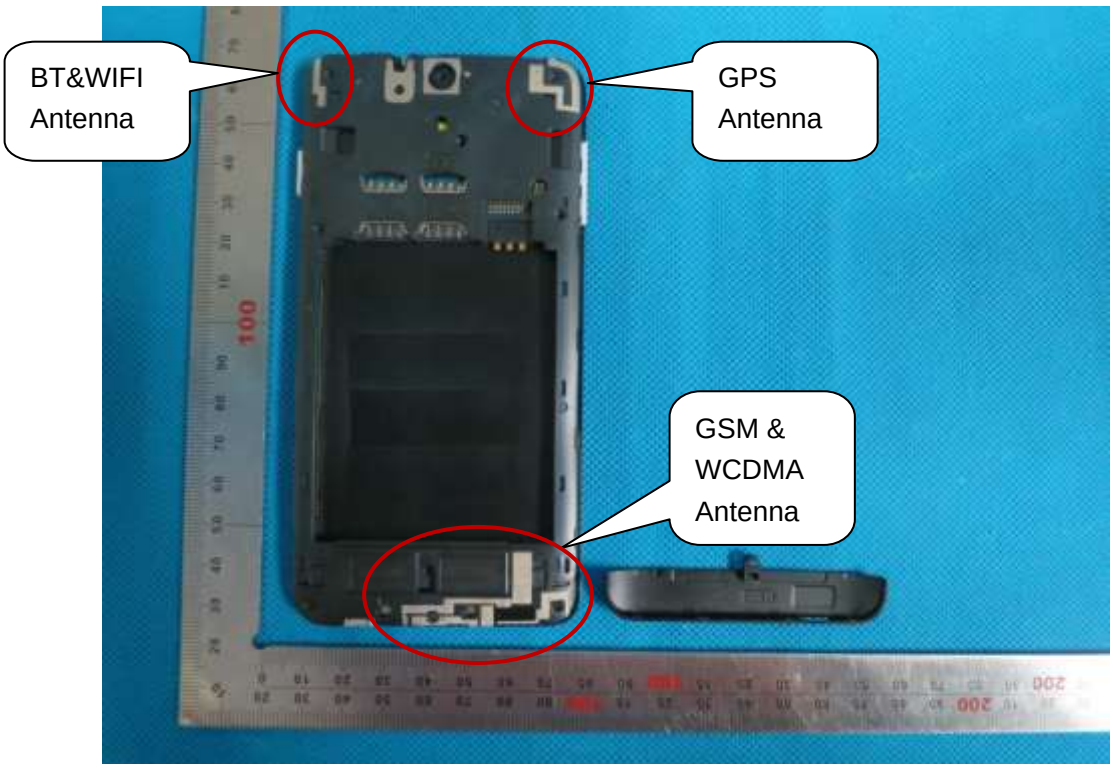
LEFT VIEW OF EUT



RIGHT VIEW OF EUT

OPEN VIEW OF EUT-1

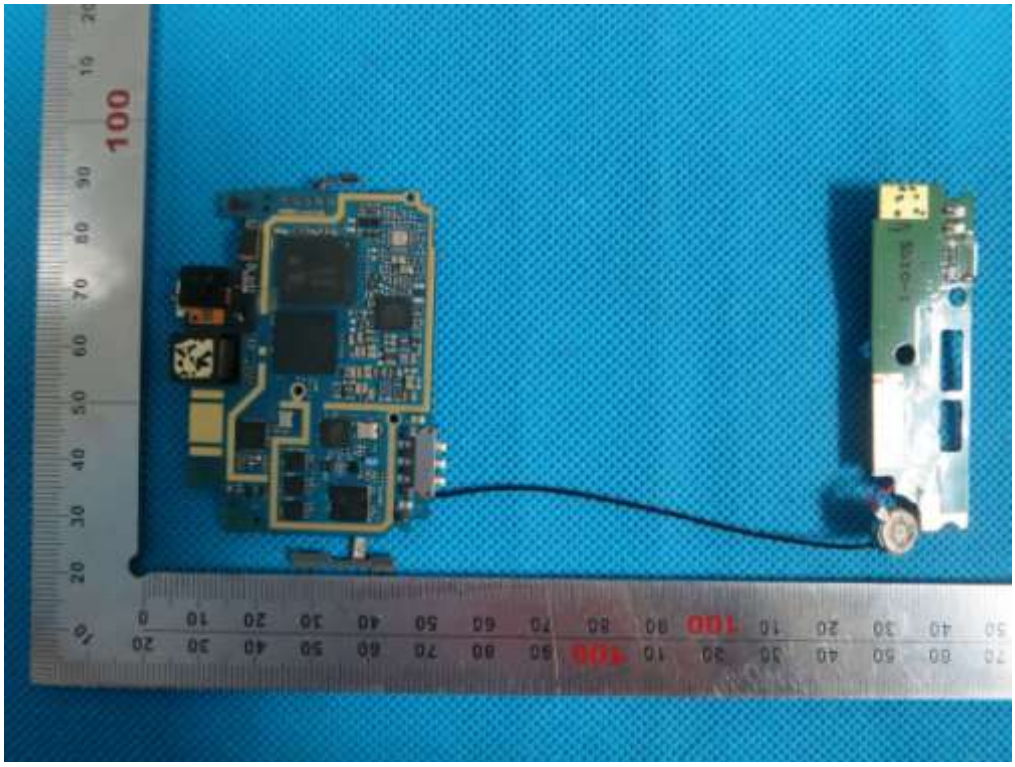
OPEN VIEW OF EUT-2



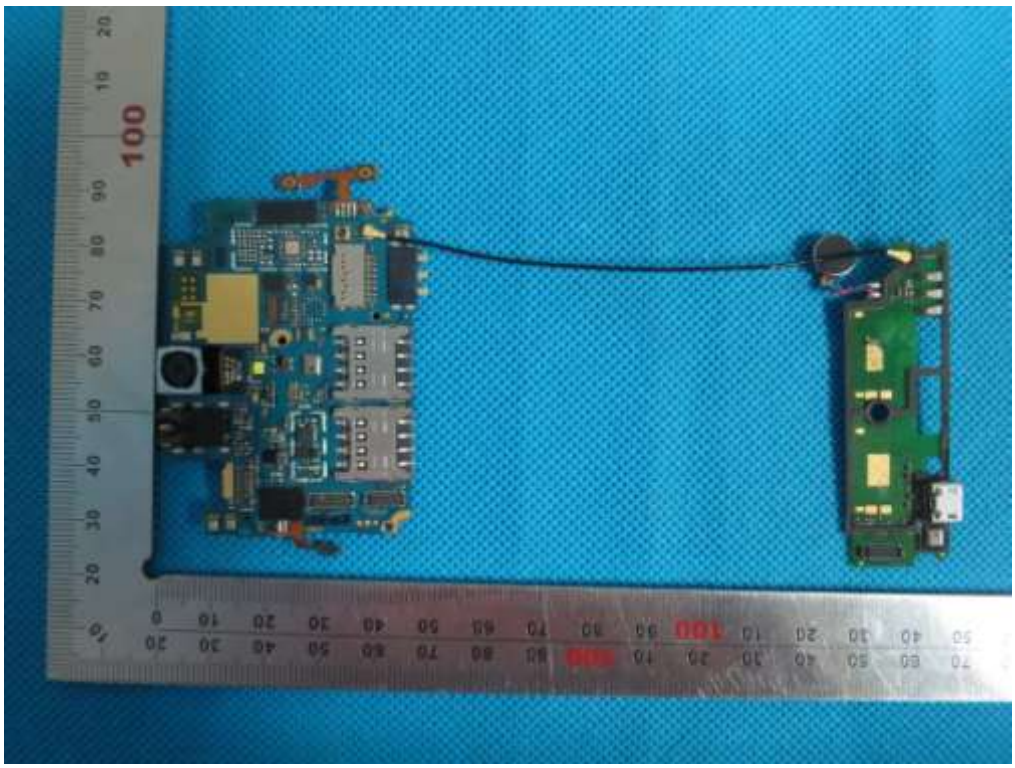
OPEN VIEW OF EUT-3

OPEN VIEW OF EUT-4

INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



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