RF TEST REPORT

Test item	:	Mobile Phone
Model No.	:	202K
Order No.	:	DEMC1304-01287
Date of receipt	:	2013-04-15
Test duration	:	2013-05-17 ~ 2013-05-24
Date of issue	:	2013-05-28
Use of report	:	FCC Original Grant

Applicant : KYOCERA Corporation
2-1-1 Kagahara, Tsuzuki-ku, Yokohama-Shi, Kanagawa 224-8502, Japan

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, 449-080, Korea

Test specification	:	§24(E)
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:	Witnessed by:	Reviewed by:
Engineer HyunSu Son	N/A	Technical Director Harvey Sung

Test Report Version

Test Report No.	Date	Description
DRTFCC1305-0534	May. 28, 2013	Initial issue

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1. GENERAL INFORMATION

Applicant Name: **KYOCERA Corporation**

Address: **2-1-1 Kagahara, Tsuzuki-ku, Yokohama-Shi, Kanagawa 224-8502, Japan**

FCC ID	:	JOY202K
FCC Classification	:	Licensed Portable Transmitter Held to Ear (PCE)
EUT Type	:	Mobile Phone
Model Name	:	202K
Add Model Name	:	N/A
Supplying power	:	Standard Battery - Type: Li-Ion Battery - M/N: 5AAXBT065JAA - Rating: DC 3.8V & 1800mAh 6.9Wh
Antenna Information	:	Internal Antenna - Type: Built-In type
Tx Frequency	:	GSM1900 = 1850.2 ~ 1909.80 MHz
Rx Frequency	:	GSM1900 = 1930.20 ~ 1989.80 MHz
Max. RF Output Power	:	GSM1900 = 1.114W EIRP(30.47dBm)
Emission Designator(s)	:	GSM1900 = 246KGXW

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Equipment Under Test(EUT) supports a GSM/GPRS of PCS band with Bluetooth, 2.4GHz/5GHz WLAN

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

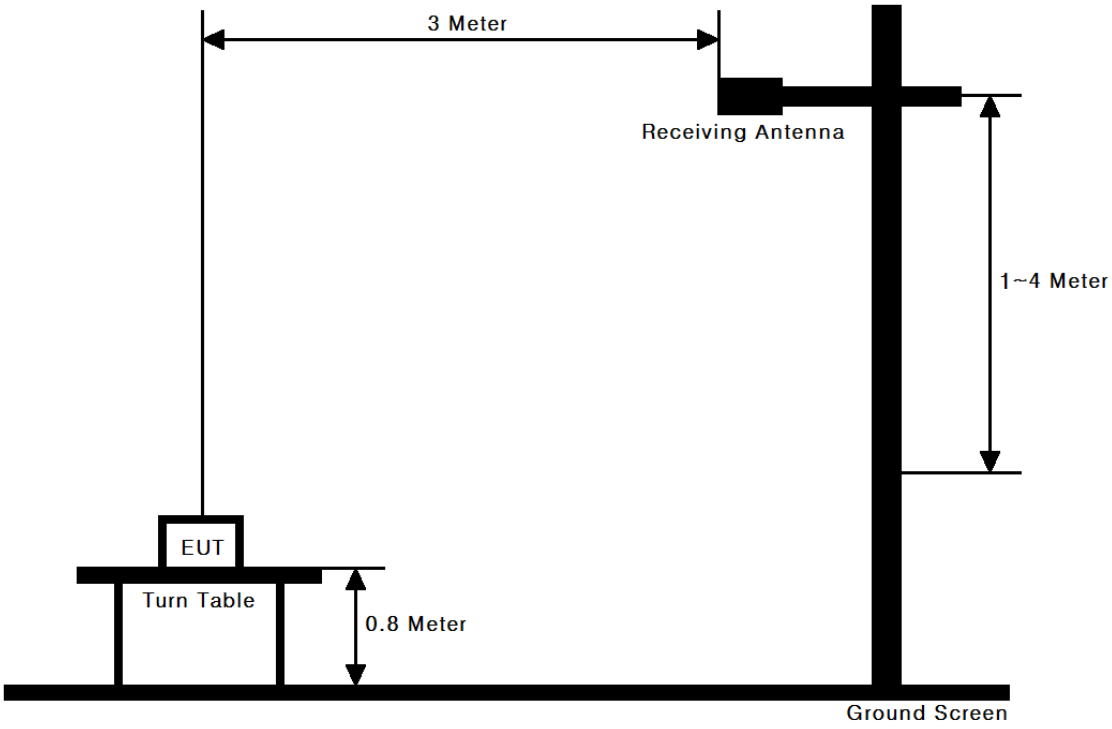
The 3&10M test site and conducted measurement facility used to collect the radiated data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- 3&10M test site registration Number: 678747

3. DESCRIPTION OF TESTS

3.1 ERP&EIRP
(Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up



Test Procedure

These measurements were performed at 3test site. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading.

For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

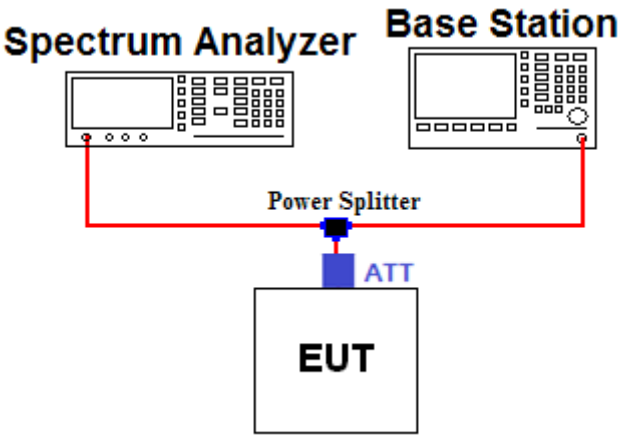
3.2 PEAK TO AVERAGE RATIO

A peak to average ratio measurement is performed at the conducted port of the EUT. For CDMA and WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. Plots of the EUT's Peak- to- Average Ratio are shownherein.

3.3 OCCUPIED BANDWIDTH.

Test set-up

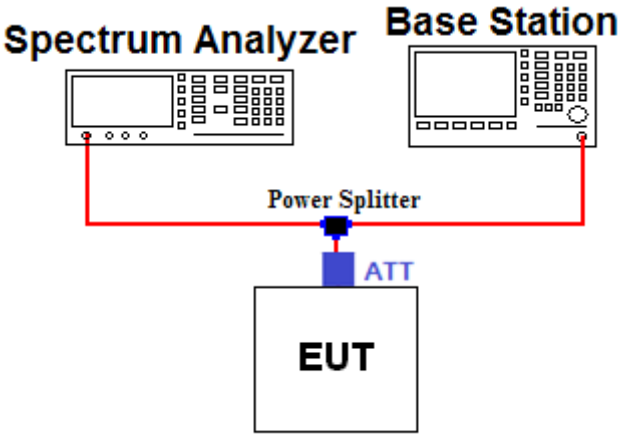


Test Procedure

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test set-up



Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with -13dBm limit [43+10log(P)], in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block.

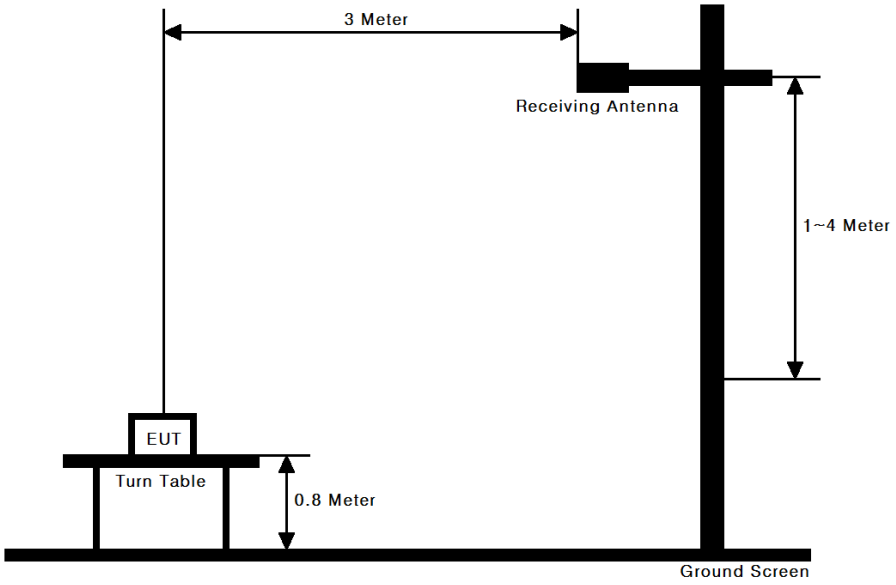
A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Band Edge Requirement

In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of thetransmitter may be employed to measure the out of band Emissions.

3.5 RADIATED SPURIOUS EMISSIONS

Test Set-up



Test Procedure

This measurement was performedat 3meter test range. The equipment under test is placed on a wooden turntable 0.8-meters above the ground plane and 3-meters from the receive antenna.

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

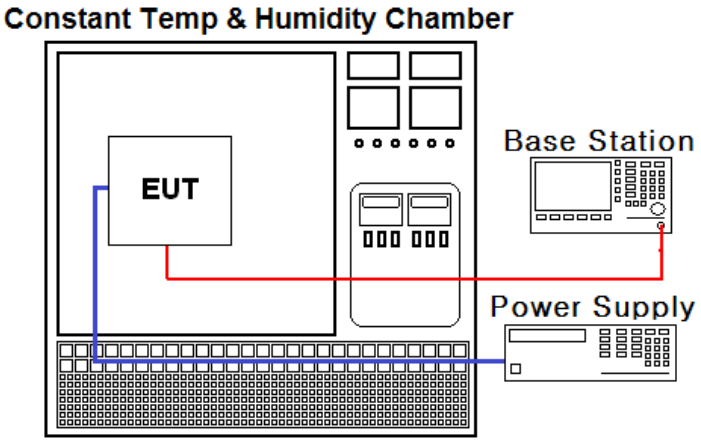
For radiated power measurements below 1GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



Test Procedure

The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification - the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency.

Time Period and Procedure:

The carrier frequency of the transmitter is measured at room temperature.
(25°C to provide a reference).

1. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

2. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

NOTE: The EUT is tested down to the battery endpoint.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
HORN ANT	ETS	3115	11/09/06	13/09/06	21097
Digital Multi-meter	H.P	34401A	13/02/27	14/02/27	3146A13475
DC Power Supply	H.P	6622A	13/02/27	14/02/27	3448A03760
HORN ANT	ETS	3115	12/02/20	14/02/20	6419
Power Splitter	Anritsu	K241B	12/09/17	13/09/17	020611
TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	12/09/17	13/09/17	30604493/021031
Dipole Antenna	Schwarzbeck	VHA9103	12/03/22	14/03/22	2116
Dipole Antenna	Schwarzbeck	VHA9103	12/03/22	14/03/22	2117
Dipole Antenna	Schwarzbeck	UHA9105	12/03/22	14/03/22	2261
Dipole Antenna	Schwarzbeck	UHA9105	12/03/22	14/03/22	2262
Attenuator (10dB)	WEINSCHEL	23-10-34	12/09/17	13/09/17	BP4386
HORN ANT	A.H.Systems	SAS-574	13/03/20	15/03/20	154
Thermo hygrometer	BODYCOM	BJ5478	13/01/14	14/01/14	090205-4
PreAmplifier	Agilent	8449B	12/02/27	14/02/27	3008A00370
Signal Generator	Rohde Schwarz	SMR20	13/02/27	14/02/27	101251
High-Pass Filter	Wainwright	WHNX2.1	12/09/17	13/09/17	1
8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	13/02/28	14/02/28	GB43461134
Vector Signal Generator	Rohde Schwarz	SMJ100A	13/01/08	14/01/08	100148
Attenuator (3dB)	WEINSCHEL	56-3	12/09/17	13/09/17	Y2342
Spectrum Analyzer	Agilent	E4440A	12/10/22	13/10/22	US45303022
Amplifier (22dB)	H.P	8447E	13/01/08	14/01/08	2945A02865
Amplifier	EMPOWER	BBS3Q7ELU	12/09/18	13/09/18	1020
HORN ANT	ETS	3160-09	12/10/22	14/10/22	00102642

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Parameter	Status Note 1
2.1046	RSS-133 (4.1)	Conducted Output Power	C
24.232(c)	RSS-133 (6.4) [SRSP-510(5.1.2)]	Equivalent Isotropic Radiated Power	C
2.1049	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	C
24.238(a) 2.1051	RSS-133 (6.5.1)	Band Edge Spurious and Harmonic Emissions at Antenna Terminal	C
24.232(d)	RSS-133 (6.4)	Peak to Average Ratio	C
24.238(a) 2.1053	RSS-133 (6.5.1)	Radiated Spurious and Harmonic Emissions	C
24.235 2.1055	RSS-133 (6.3)	Frequency Stability	C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

The sample was tested according to the following specification:
ANSI/TIA/EIA-603-C-2004

6. SAMPLE CALCULATION

A. Emission Designator

GSM1900 Emission Designator

Emission Designator = **246KGXW**

GSM OBW = 246.3638kHz

(Measured at the 99.75% power bandwidth)

G = Phase Modulation

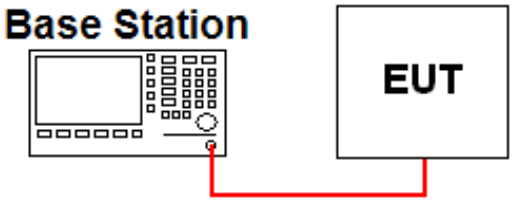
X = Cases not otherwise covered

W = Combination (Audio/Data)

7. TEST DATA

7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.



▪GSM / GPRS

Band	Channel	Test Result(dBm)								
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
Cellular	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	190	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	251	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PCS	512	30.0	30.0	26.9	25.1	23.9	N/A	N/A	N/A	N/A
	661	30.1	30.1	27.0	25.2	23.9	N/A	N/A	N/A	N/A
	810	30.1	30.0	27.0	25.2	23.8	N/A	N/A	N/A	N/A

The output power was measured using the Agilent E5515C

7.2 PEAKTOAVERAGE RATIO

- Plots of the EUT's Peak- to- Average Ratio are shown in Clause 8.1

7.3 OCCUPIED BANDWIDTH

Band	Channel	Test Result(KHz)
GSM1900	512	244.8045
	661	245.4490
	810	246.3638

- Plots of the EUT's Occupied Bandwidth are shown in Clause 8.2

7.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

- Plots of the EUT's Conducted Spurious Emissions are shown in Clause 8.3

7.5BAND EDGE

- Plots of the EUT's Band Edge are shown in Clause 8.4

7.6 EQUIVALENT ISOTROPIC RADIATED POWER

- GSM1900 data

CH.	EUT Position (Axis)	TEST CONDITIONSPower Step: 0							
		Reading Value (dBm)	Pol. (H/V)	LEVEL@ TX ANTENNA TERMINAL (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Power Supply	Note.
512	Z	-11.52	V	20.28	8.59	28.87	0.771	DC 3.8V	-
661	Y	-9.88	V	21.29	8.68	29.97	0.993	DC 3.8V	-
810	***Z***	***-9.32***	***V***	***21.70***	***8.77***	***30.47***	***1.114***	***DC 3.8V***	***-***

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.
A half-wave dipole is substituted in place of the EUT. This dipole antenna is driven by a signal generator and the level of the signal generator is adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all configurations and the highest power is reported in GSM mode. This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.
The worst case data is reported.

7.8 RADIATED SPURIOUS EMISSIONS

7.8.1 RADIATED SPURIOUS EMISSIONS (GSM1900)

Channel (EIRP)	Freq. (MHz)	EUT Position (Axis)	POL (H/V)	LEVEL@ ANTENNA TERMINAL (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	Result (dBc)	Limit (dBc)
512 (0.771W)	3700.22	X	V	-58.27	9.67	-48.60	77.47	41.87
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
661 (0.993W)	3759.69	X	V	-57.82	9.68	-48.14	78.11	42.97
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
810 (1.114W)	3819.46	X	V	-56.21	9.68	-46.53	77.00	43.47
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	

- Limit Calculation = 43 + 10 $\log_{10}$(EIRP [W]) [dBc]
- No other spurious and harmonic emissions were reportedgreater than listed emissions above table.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT is placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation is adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This device was tested under all configurations and the highest power is reported in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band.

This EUT was tested with the fully charged battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization of detecting antenna.

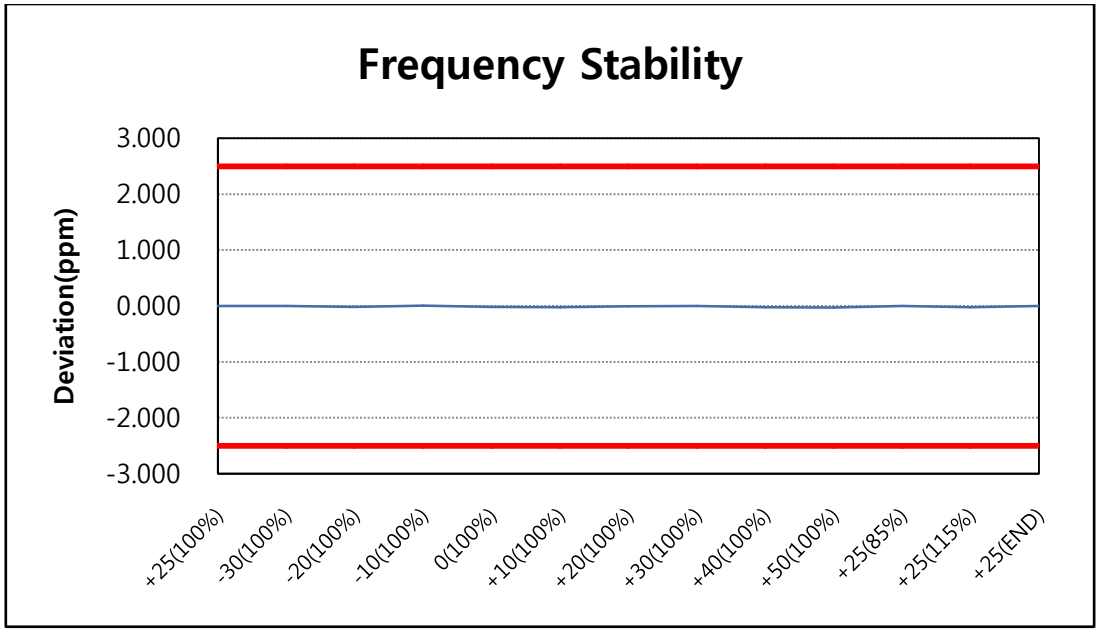
The worst case data is reported.

7.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.9.1 FREQUENCY STABILITY (GSM1900)

OPERATING FREQUENCY : 1,880,000,033 Hz
CHANNEL : 661(Mid)
REFERENCE VOLTAGE : 3.80 V DC
DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

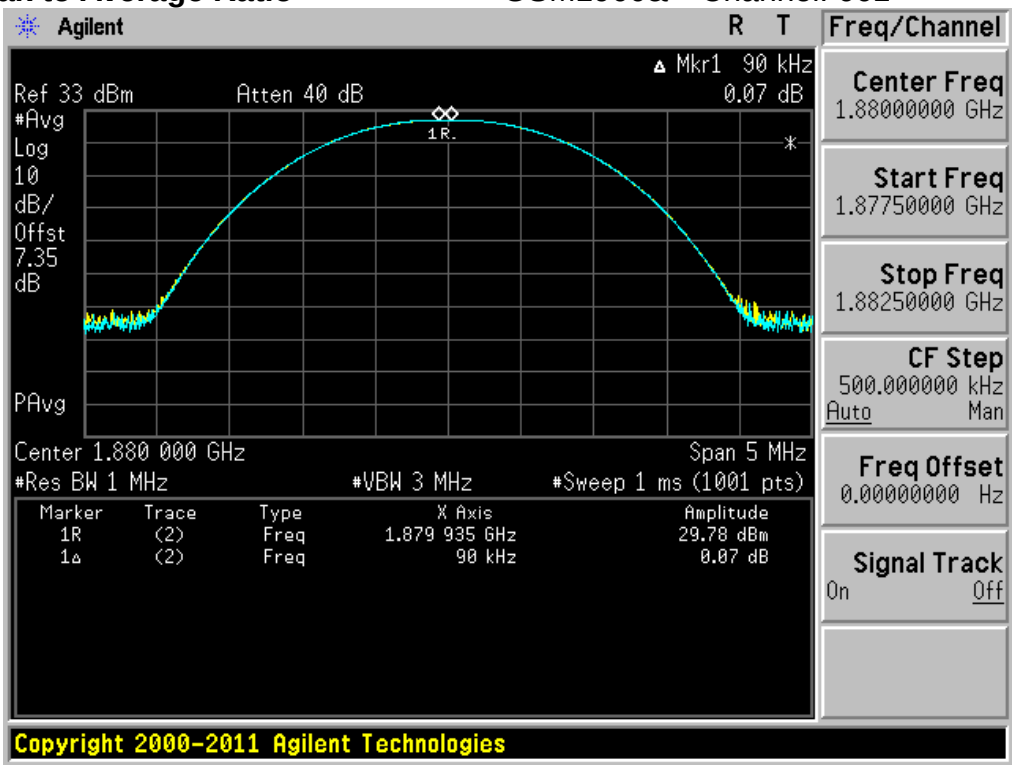
VOLTAGE (%)	POWER (V DC)	TEMP (℃)	FREQ (Hz)	Deviation	
				(ppm)	(%)
100%	3.80	+25(Ref)	1,880,000,033	0.000	0.00000000
100%		-30	1,880,000,036	0.002	0.00000016
100%		-20	1,880,000,006	-0.014	-0.00000144
100%		-10	1,880,000,040	0.004	0.00000037
100%		0	1,880,000,004	-0.015	-0.00000154
100%		+10	1,879,999,990	-0.023	-0.00000229
100%		+20	1,880,000,023	-0.005	-0.00000053
100%		+30	1,880,000,030	-0.002	-0.00000016
100%		+40	1,879,999,988	-0.024	-0.00000239
100%		+50	1,879,999,981	-0.028	-0.00000277
85%	3.23	+25	1,880,000,030	-0.002	-0.00000016
115%	4.37	+25	1,879,999,988	-0.024	-0.00000239
BATT.ENDPOINT	3.20	+25	1,880,000,030	-0.002	0.00000000



8. TEST PLOTS

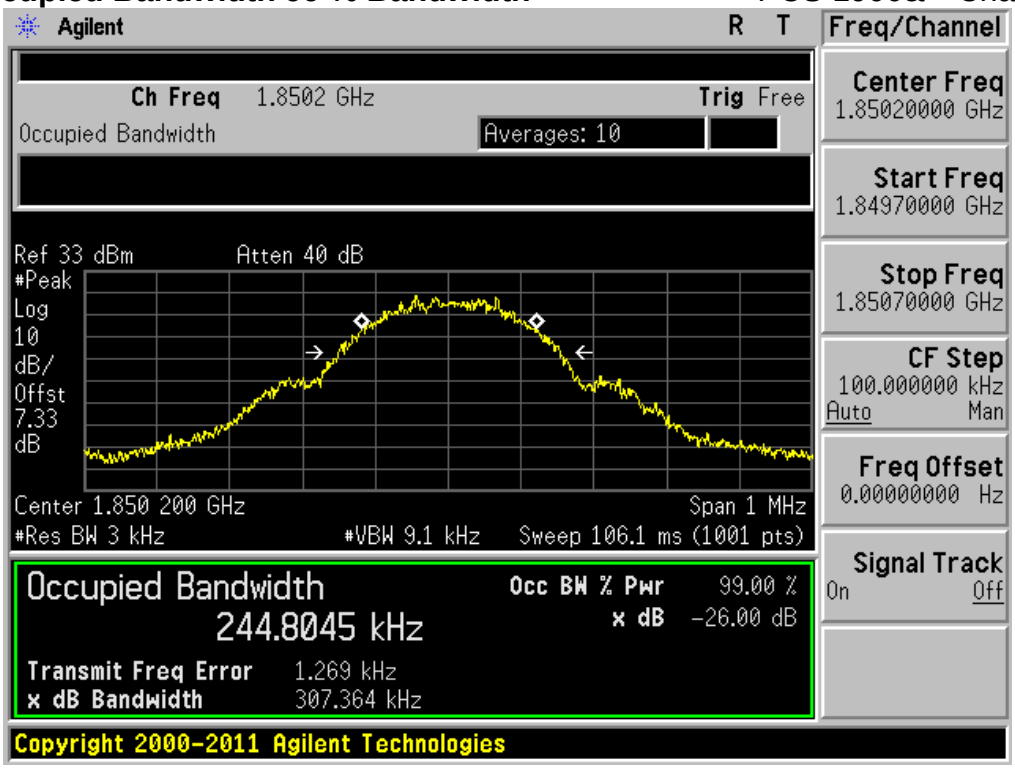
8.1 Peak to Average Ratio

GSM1900& Channel: 661

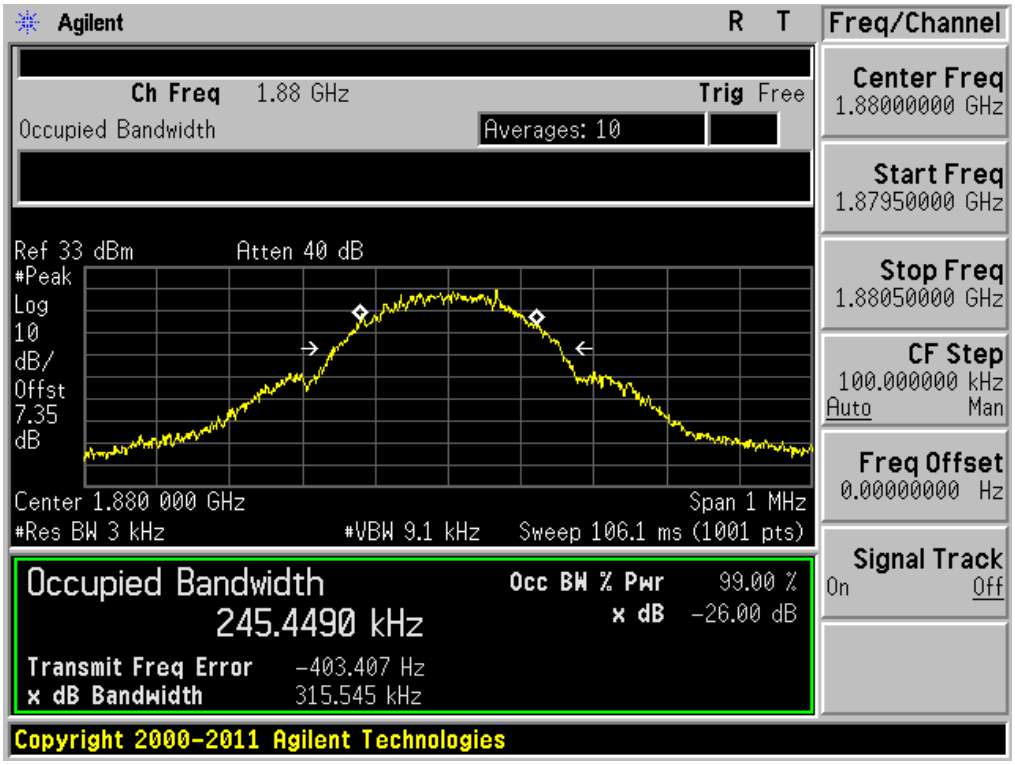


8.2 Occupied Bandwidth 99 % Bandwidth

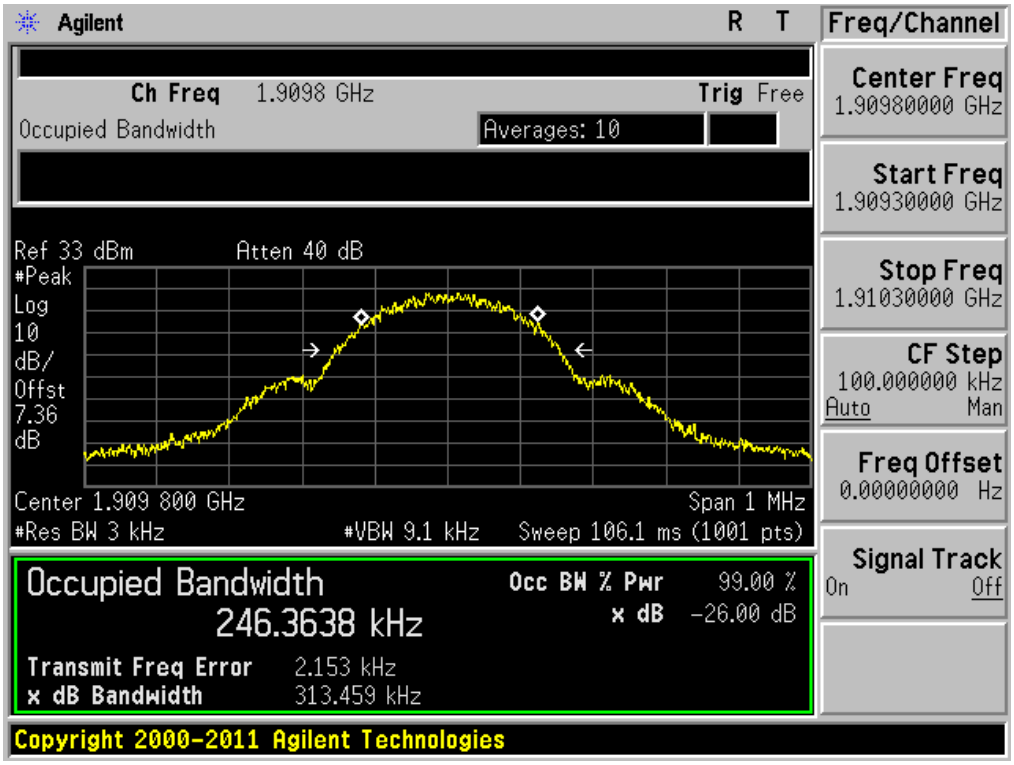
PCS 1900& Channel: 512



PCS 1900& Channel: 661

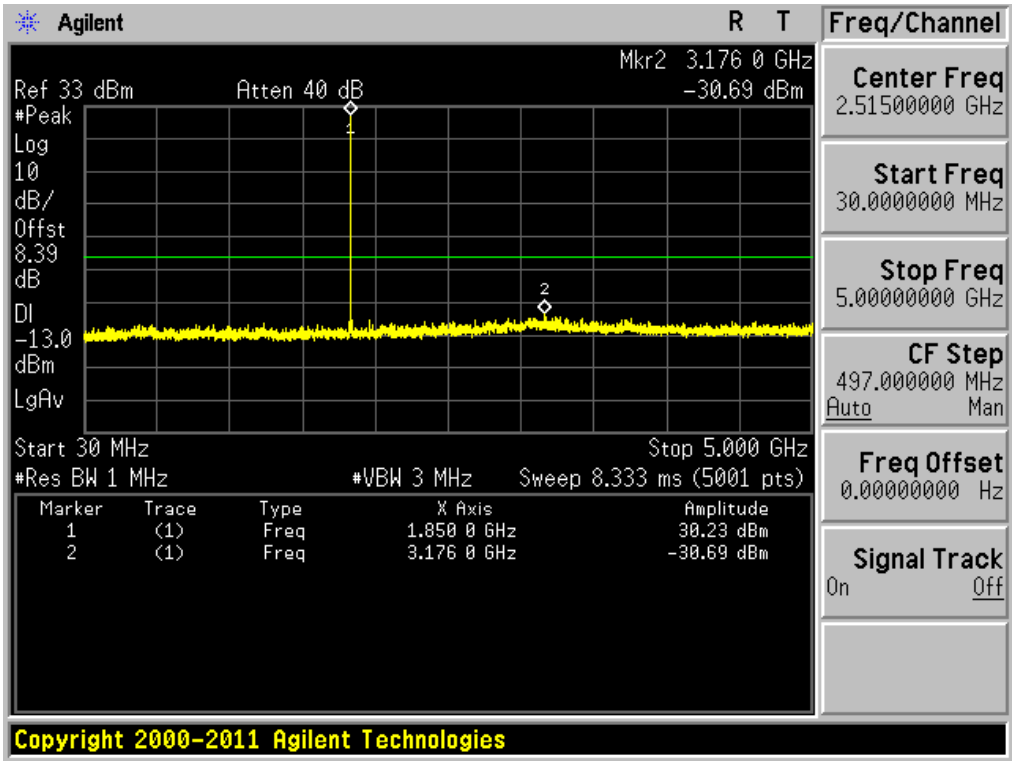


PCS 1900& Channel: 810

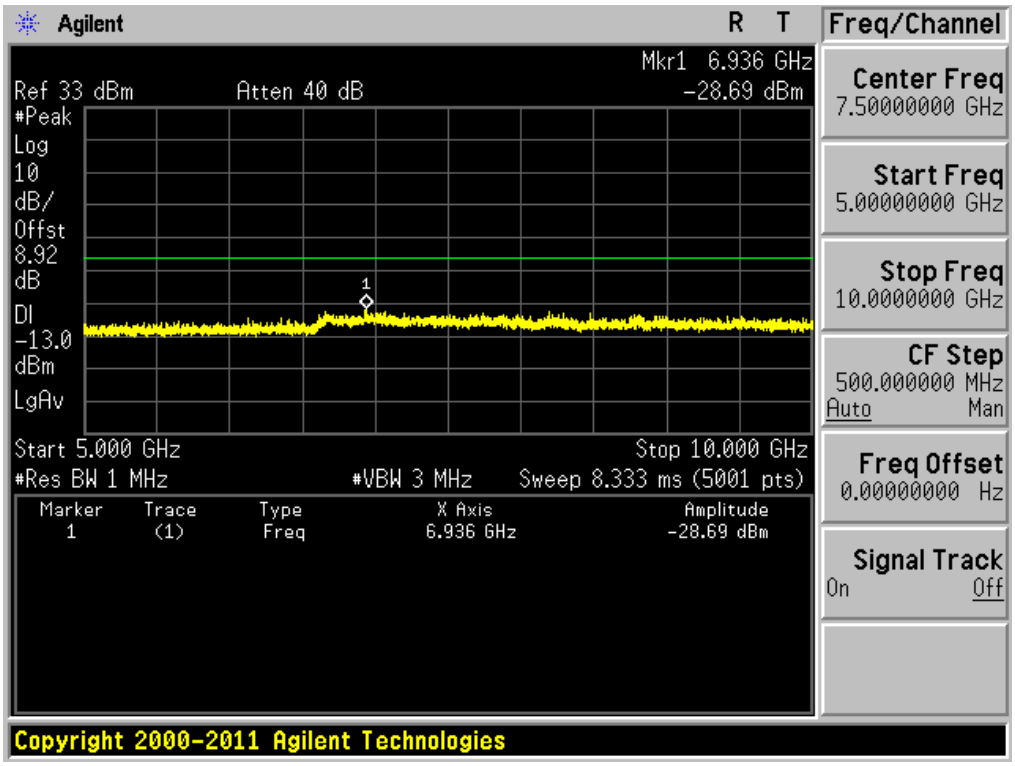


8.3 Spurious Emissions at Antenna Terminal

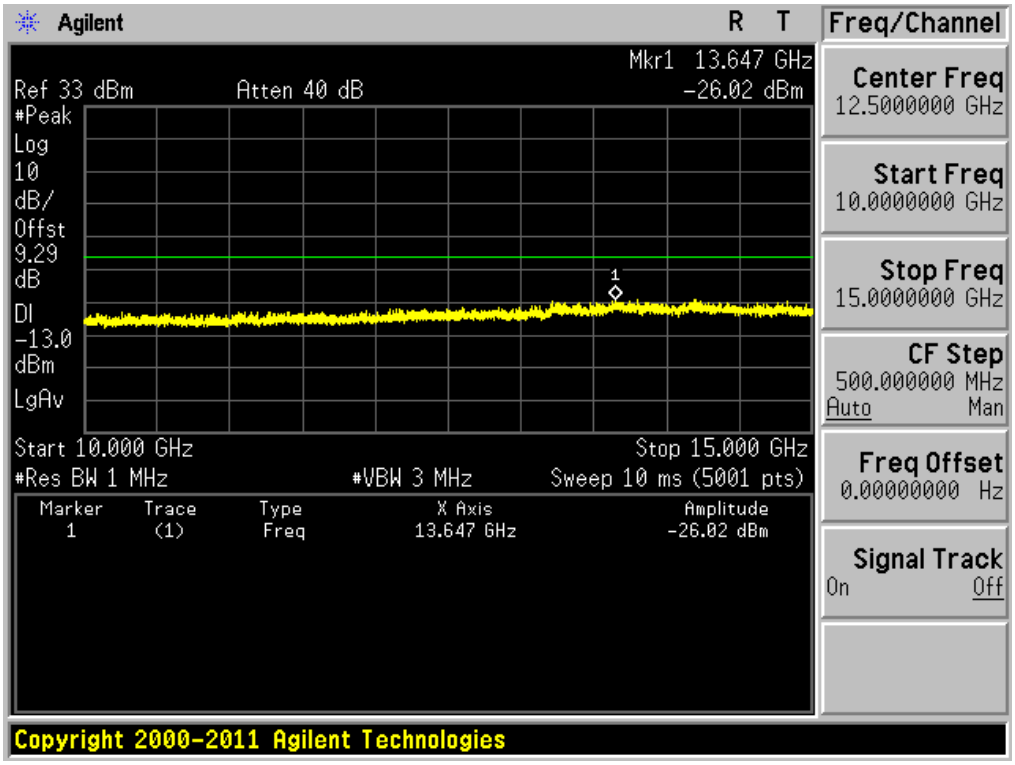
PCS 1900 & Channel: 512



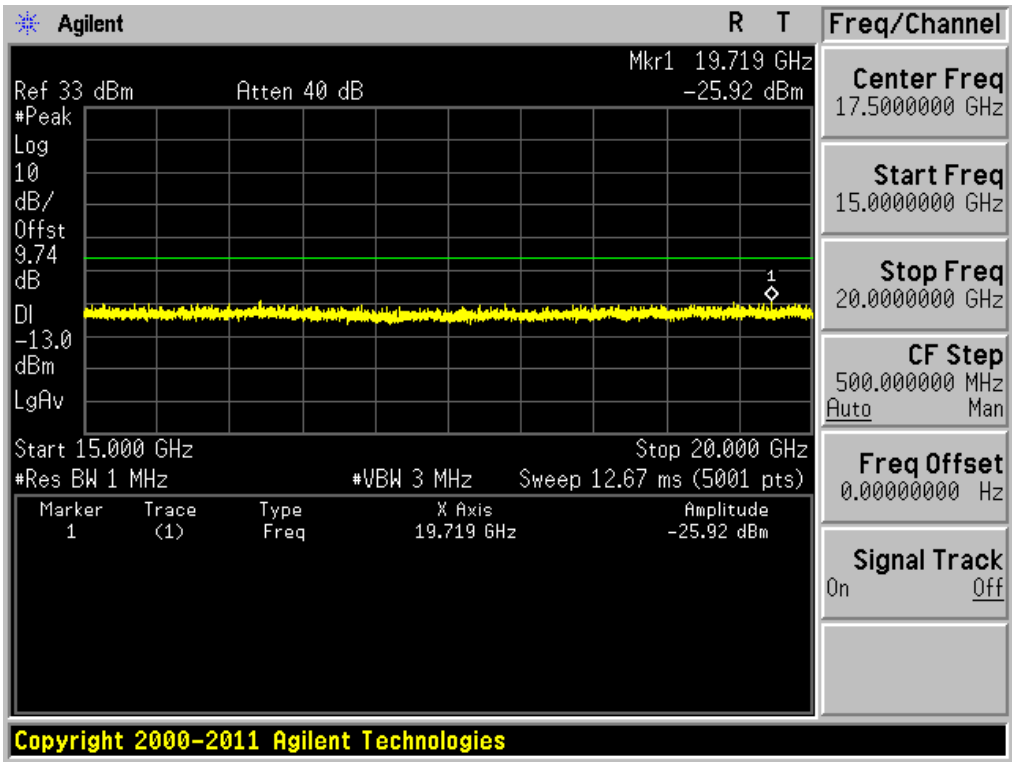
PCS 1900& Channel: 512



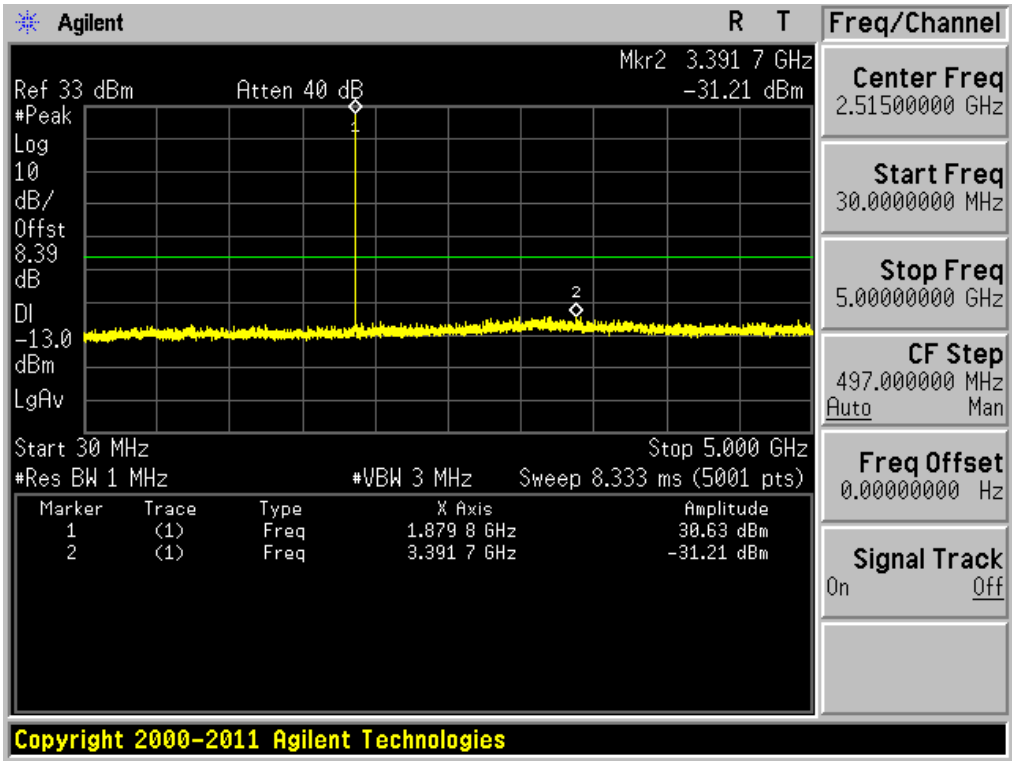
PCS 1900 & Channel: 512



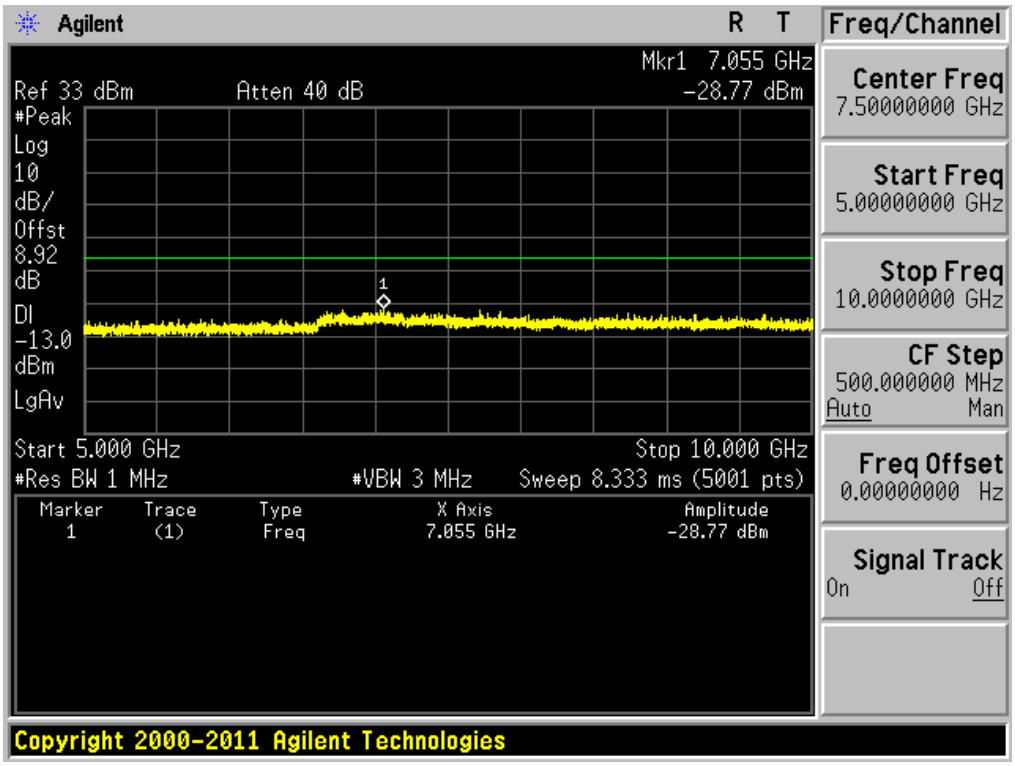
PCS 1900 & Channel: 512



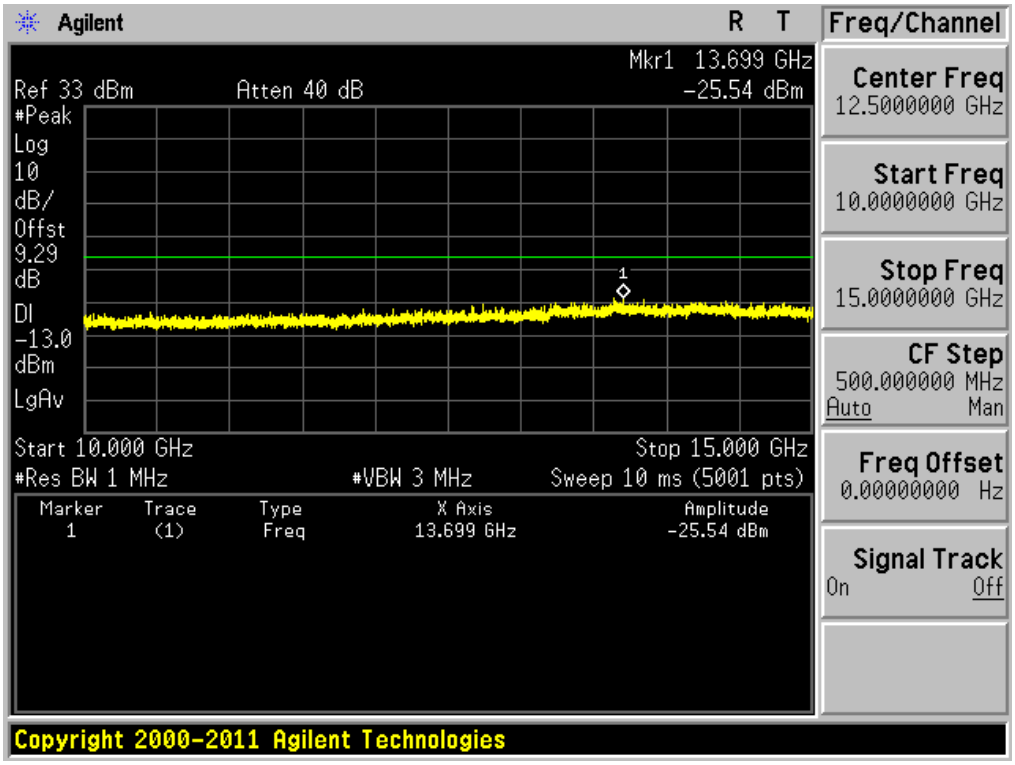
PCS 1900 & Channel: 661



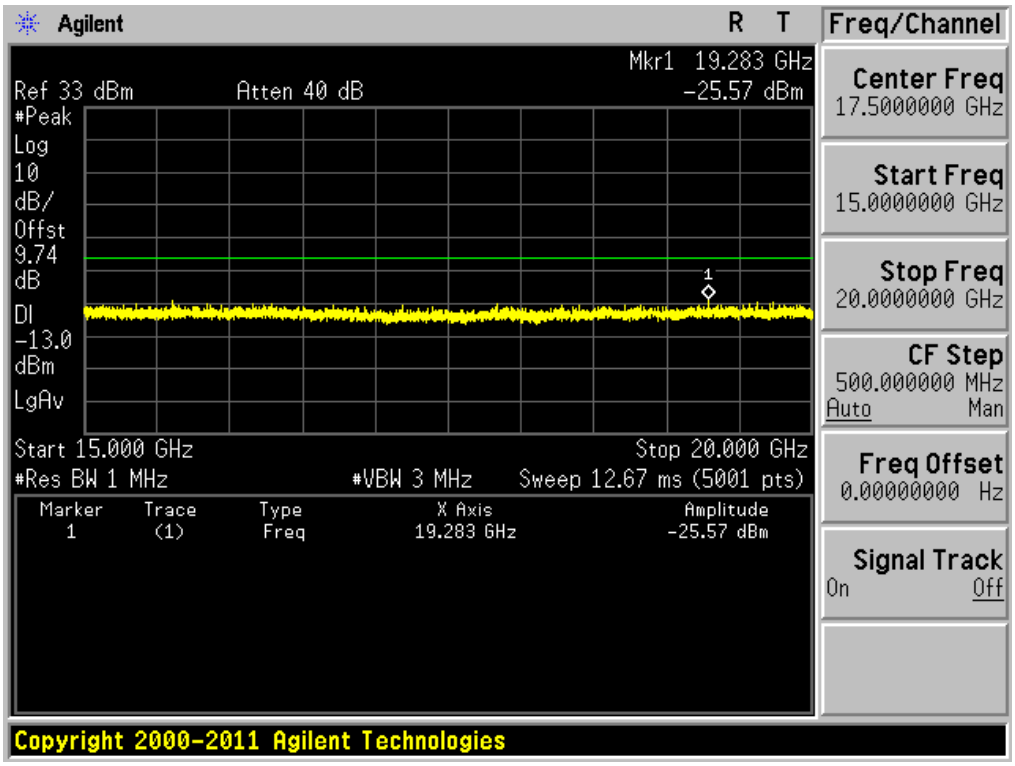
PCS 1900 & Channel: 661



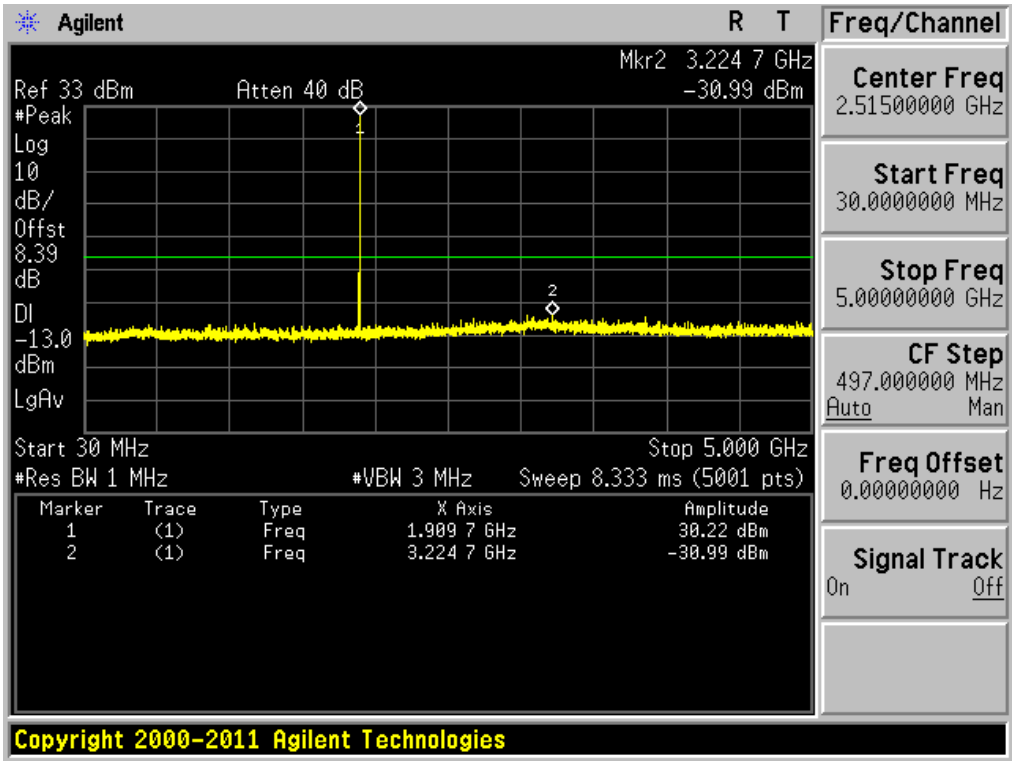
PCS 1900 & Channel: 661



PCS 1900 & Channel: 661



PCS 1900 & Channel: 810



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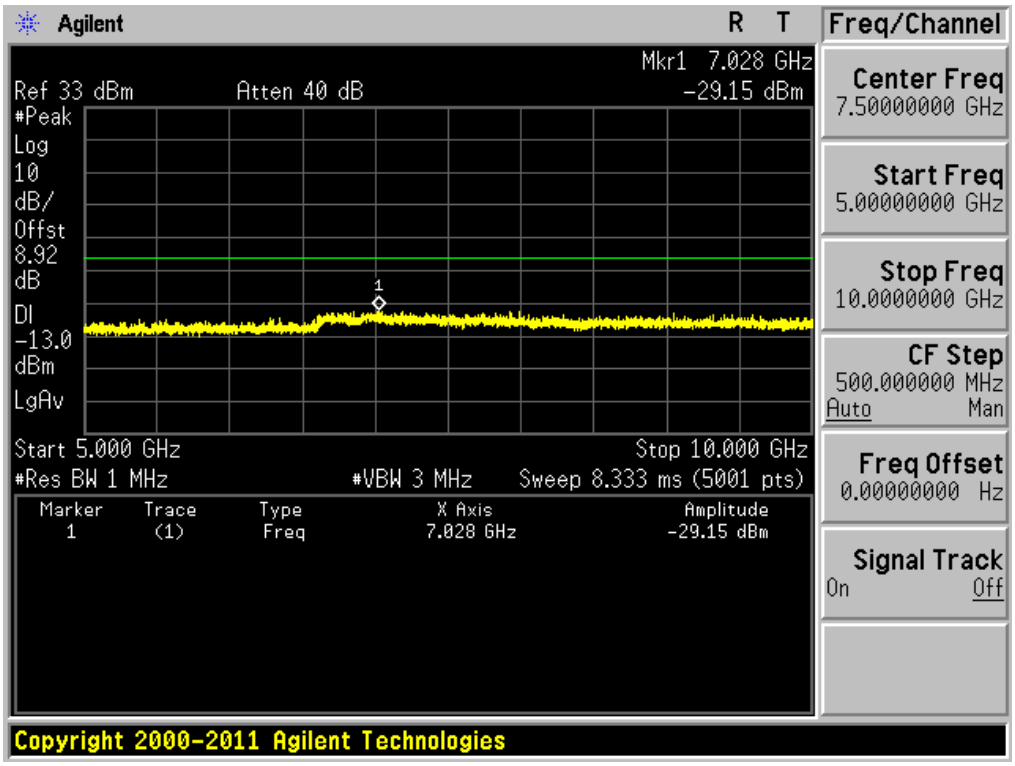

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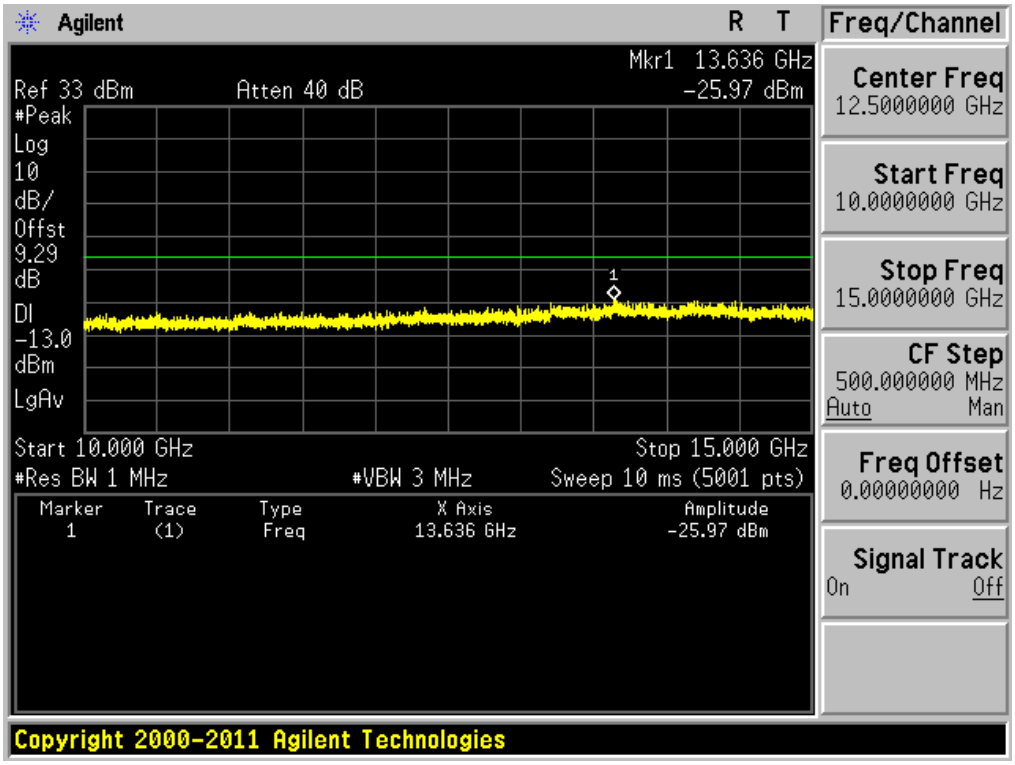

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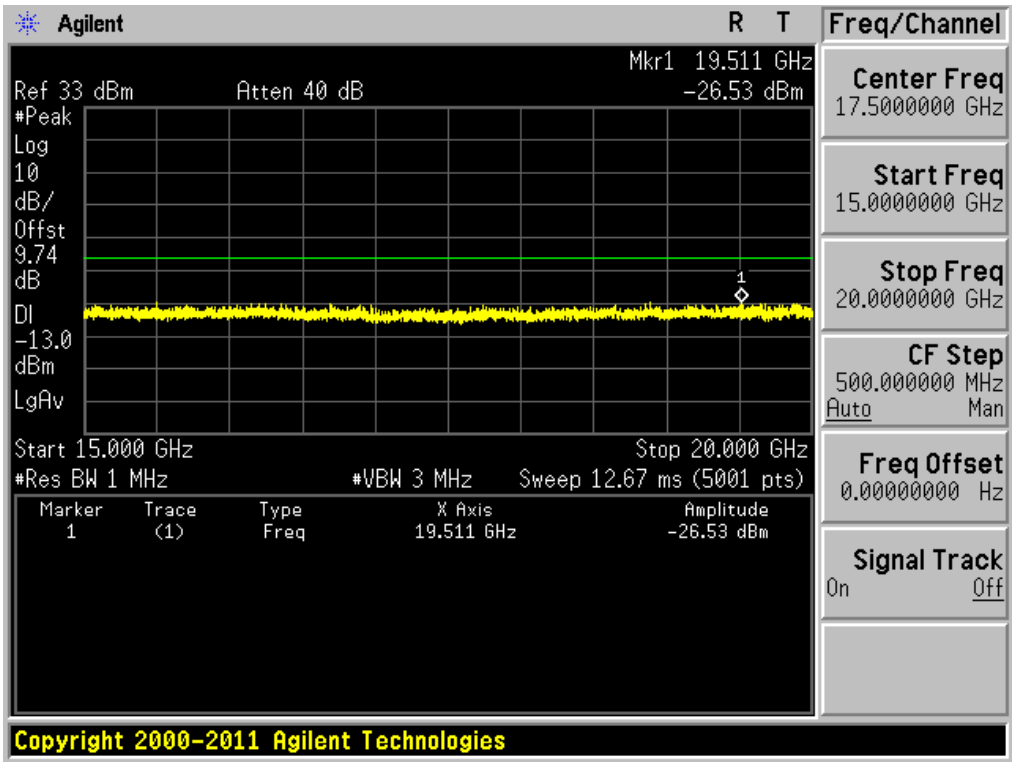
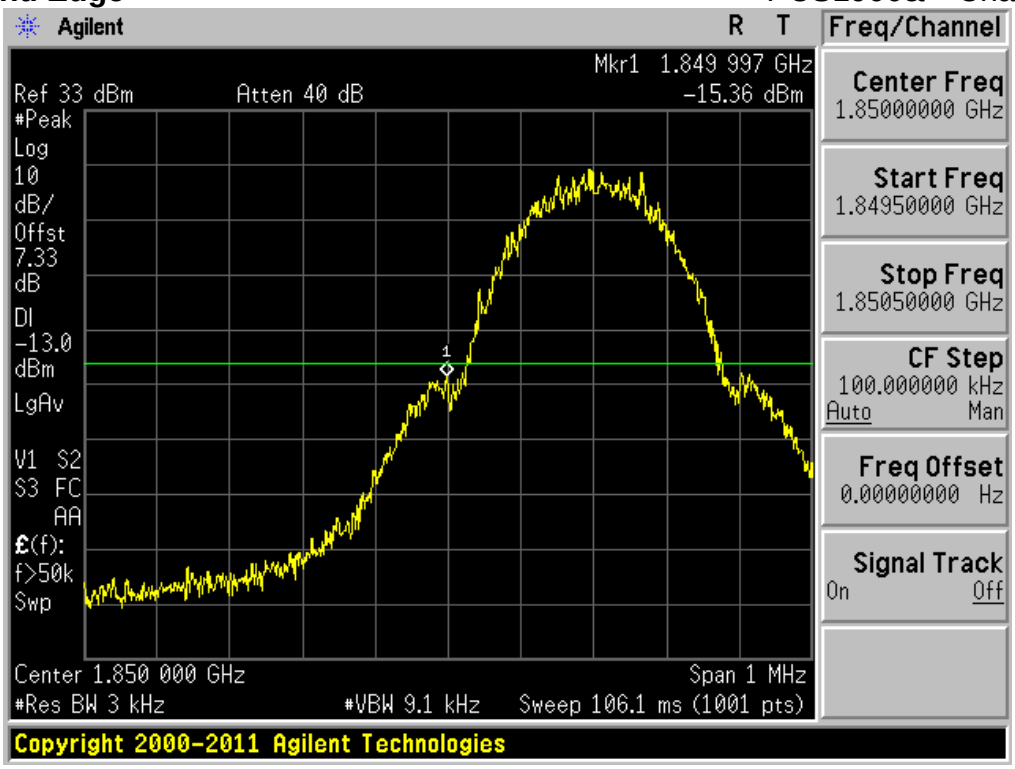


8.4 Band Edge

PCS1900& Channel: 512



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