

FCC GSM/WCDMA REPORT

FCC Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: August 03, 2017
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
	Report No.: HCT-R-1707-F015 HCT FRN: 0005866421

FCC ID: A3LSMC7100

APPLICANT: SAMSUNG Electronics Co., Ltd.

FCC Model(s): SM-C7100
Additional FCC Model(s): SM-C7108
EUT Type: Mobile Phone
FCC Classification: Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s): §22, §24, §2

DEF Mode

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	ERP	
				Max. Power (W)	Max. Power (dBm)
GSM850	824.2 – 848.8	869.2 – 893.8	246 KGXW	0.940	29.73
GSM850 EDGE			253 KG7W	0.237	23.75
WCDMA850	826.4 – 846.6	871.4 – 891.6	4M17F9W	0.105	20.23

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	EIRP	
				Max. Power (W)	Max. Power (dBm)
GSM1900	1850.2 – 1909.8	1930.2 – 1989.8	249 KGXW	0.815	29.11
GSM1900 EDGE			250 KG7W	0.174	22.40
WCDMA1900	1852.4 – 1907.6	1932.4 – 1987.6	4M18F9W	0.100	19.98

ALT Mode

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	ERP	
				Max. Power (W)	Max. Power (dBm)
GSM850	824.2 – 848.8	869.2 – 893.8	245 KGXW	0.284	24.53
GSM850 EDGE			248 KG7W	0.075	18.75
WCDMA850	826.4 – 846.6	871.4 – 891.6	4M17F9W	0.043	16.35

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	EIRP	
				Max. Power (W)	Max. Power (dBm)
GSM1900	1850.2 – 1909.8	1930.2 – 1989.8	246 KGXW	0.530	27.24
GSM1900 EDGE			247 KG7W	0.122	20.87
WCDMA1900	1852.4 – 1907.6	1932.4 – 1987.6	4M17F9W	0.060	17.78

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S. C.853(a)



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Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1707-F015	August 03, 2017	- First Approval Report

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name: SAMSUNG Electronics Co., Ltd.

Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

FCC ID: A3LSMC7100

Application Type: Certification

FCC Classification: Licensed Portable Transmitter Held to Ear (PCE)

FCC Rule Part(s): §22, §24, §2

EUT Type: Mobile Phone

FCC Model(s): SM-C7100

Additional FCC Model(s): SM-C7108

Tx Frequency: 824.20 - 848.80 MHz (GSM850)
826.40 - 846.60 MHz (WCDMA850)
1 850.20 - 1 909.80 MHz (GSM1900)
1 852.4 - 1 907.6 MHz (WCDMA1900)

Rx Frequency: 869.20 - 893.80 MHz (GSM850)
871.40 - 891.60 MHz (WCDMA850)
1 930.20 - 1 989.80 MHz (GSM1900)
1 932.4 - 1 987.6 MHz (WCDMA1900)

Max. RF Output Power: **DEF Mode:**
0.940 W GSM850 (29.73 dBm) / 0.815 W GSM1900 (29.11 dBm)
0.237 W GSM850 EDGE (23.75 dBm) / 0.174 W GSM1900 EDGE (22.40 dBm)
0.105 W WCDMA850 (20.23 dBm) / 0.100 W WCDMA1900 (19.98 dBm)
ALT Mode:
0.284 W GSM850 (24.53 dBm) / 0.530 W GSM1900 (27.24 dBm)
0.075 W GSM850 EDGE (18.75 dBm) / 0.122 W GSM1900 EDGE (20.87 dBm)
0.043 W WCDMA850 (16.35 dBm) / 0.060 W WCDMA1900 (17.78 dBm)

Emission Designator(s): **DEF Mode:**
246 KGXW (GSM850) 249 KGXW (GSM1900)
253 KG7W (GSM850 EDGE) 250 KG7W (GSM1900 EDGE)
4M17F9W (WCDMA850) 4M18F9W (WCDMA1900)

Emission Designator(s): **ALT Mode:**
245 KGXW (GSM850) 246 KGXW (GSM1900)
248 KG7W (GSM850 EDGE) 247 KG7W (GSM1900 EDGE)
4M17F9W (WCDMA850) 4M17F9W (WCDMA1900)

Date(s) of Tests: June 12, 2017 ~ August 02, 2017

2. INTRODUCTION

2.1. EUT DESCRIPTION

The SAMSUNG Electronics Co., Ltd. SM-C7100 Mobile Phone consists of GPRS Class12, EDGE12, GSM850, GSM1900, WCDMA850, WCDMA1900, HSDPA, HSUPA, HSPA+, DC-HSDPA and DC-HSUPA.

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 Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.**

3. DESCRIPTION OF TESTS

3.1 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

Note: ERP(Effective Radiated Power), EIRP(Effective Isotropic Radiated Power)

Test Procedure

Radiated emission measurements are performed in the Fully-anechoic chamber. The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-D-2010 Clause 2.2.17. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using RMS detector.

A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

$$P_{d(dBm)} = P_{g(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

Radiated spurious emissions

1. Frequency Range : 9 kHz ~ 10th Harmonics of highest channel fundamental frequency.
2. The EUT was setup to maximum output power. The 100 kHz RBW was used to scan from 30 MHz to 1 GHz. Also, the 1 MHz RBW was used to scan from 1 GHz to 10 GHz(GSM850/WCDMA850) or 20 GHz(GSM1900/WCDMA1900). The high, low and a middle channel were tested for out of band measurements.

3.2 PEAK- TO- AVERAGE RATIO

Test Procedure

Peak to Average Power Ratio is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 5.7.

- Section 5.7.1 CCDF Procedure for PAPR

- a) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- b) Set the number of counts to a value that stabilizes the measured CCDF curve;
- c) Set the measurement interval as follows:
 - 1) for continuous transmissions, set to 1 ms,
 - 2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
- d) Record the maximum PAPR level associated with a probability of 0.1%.

- Section 5.7.2 Alternate Procedure for PAPR

Use one of the procedures presented in 5.1 to measure the total peak power and record as P_{Pk} . Use one of the applicable procedures presented 5.2 to measure the total average power and record as P_{Avg} . Determine the P.A.R. from: $P.A.R_{(dB)} = P_{Pk (dBm)} - P_{Avg (dBm)}$ (P_{Avg} = Average Power + Duty cycle Factor)

5.1.1 Peak power measurements with a spectrum/signal analyzer or EMI receiver

The following procedure can be used to determine the total peak output power.

- a) Set the RBW $\geq$ OBW.
- b) Set VBW $\geq 3 \times$ RBW.
- c) Set span $\geq 2 \times$ RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Ensure that the number of measurement points $\geq$ span/RBW.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the peak amplitude level.

5.2.2 Procedures for use with a spectrum/signal analyzer when EUT cannot be configured to transmit continuously and sweep triggering/signal gating cannot be properly implemented

If the EUT cannot be configured to transmit continuously (burst duty cycle < 98%), then one of the following procedures can be used. The selection of the applicable procedure will depend on the characteristics of the measured burst duty cycle.

Measure the burst duty cycle with a spectrum/signal analyzer or EMC receiver can be used in zero-span mode if the response time and spacing between bins on the sweep are sufficient to permit accurate measurement of the burst on/off time of the transmitted signal.

5.2.2.2 Constant burst duty cycle

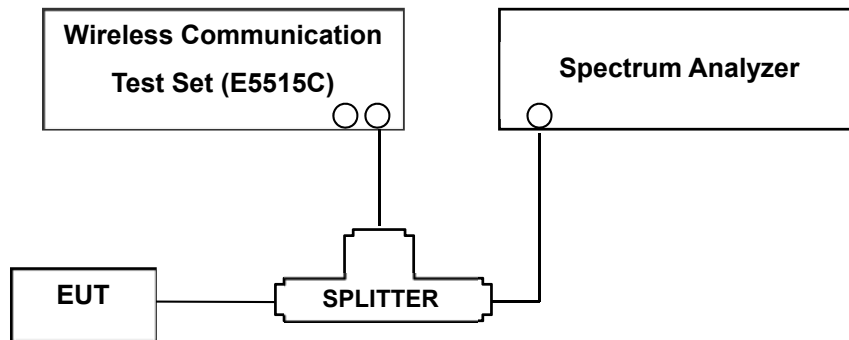
If the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then:

- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- c) Set VBW $\geq 3 \times$ RBW.
- d) Number of points in sweep $\geq 2 \times$ span / RBW. (This gives bin-to-bin spacing $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- f) Detector = RMS (power averaging).
- g) Set sweep trigger to "free run".
- h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- j) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).

For example, add $10 \log (1/0.25) = 6$ dB if the duty cycle is a constant 25%.

3.3 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)

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

Test Procedure

OBW is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 4.2.

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels(low, middle and high operational range.)

The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

Spurious and harmonic emissions at antenna terminal is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 6.0.

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

On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The RBW settings used in the testing are greater than 1 % of the occupied bw. The 1 MHz RBW was used to scan from 10 MHz to 10 GHz. (GSM1900 Mode: 10 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Measurements of all out of band are made on RBW = 1MHz and VBW $\geq$ 3 MHz in the worst case despite RBW = 100 kHz and VBW $\geq$ 300 kHz upon 1 GHz.

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Trace Mode = max hold
- Sweep time = auto
- Number of points in sweep $\geq 2 * \text{Span} / \text{RBW}$

- Band Edge Requirement :

According to FCC 22.917, 24.238 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels(low and high operational frequency range.)

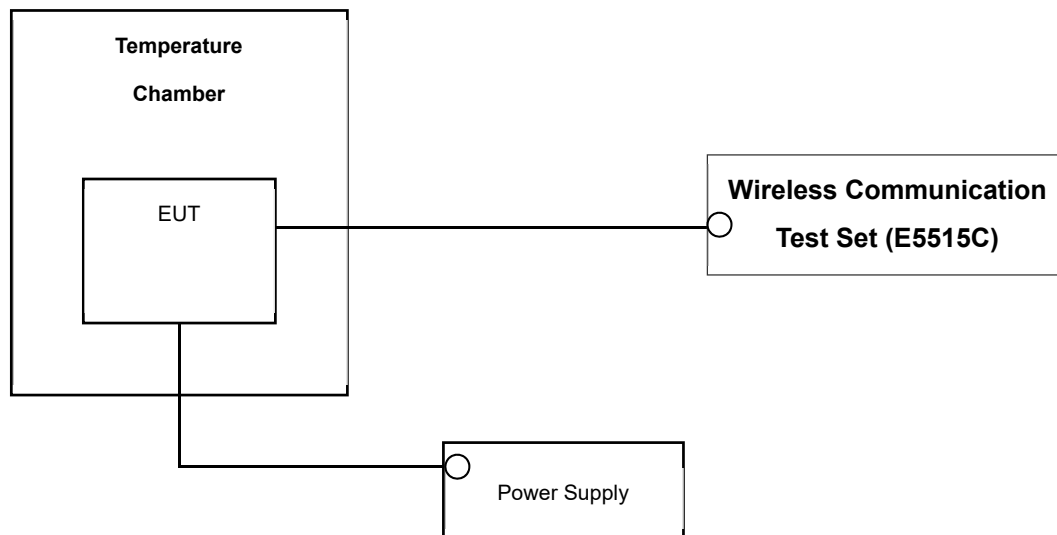
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

In GSM mode, the center frequency of spectrum set to the band edge frequency. The span is 1MHz (RBW = at least 1 % of the EBW, VBW $\geq 3*RBW$, Detector = Average).

In WCDMA mode, the center frequency of spectrum set to the band edge frequency. The span is 7MHz (RBW = at least 1% of the EBW, $\geq 3*RBW$, Detector = Average).

3.5 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



* Nominal Operating Voltage

Test Procedure

Frequency stability is tested in accordance with ANSI/TIA-603-D-2010 section 2.2.2.

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 100 % 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(GSM1900/WCDMA1900). The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency(GSM850/WCDMA850).

Time Period and Procedure:

The carrier frequency of the transmitter is measured at room temperature (20°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

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/24/2017	Annual	04/24/2018
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/10/2017	Annual	04/10/2018
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/10/2017	Annual	04/10/2018
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	05/04/2017	Annual	05/04/2018
HP	E3632A/DC Power Supply	KR94907553	06/30/2017	Annual	06/30/2018
Schwarzbeck	UHAP/ Dipole Antenna	557	03/31/2017	Biennial	03/31/2019
Schwarzbeck	UHAP/ Dipole Antenna	558	03/31/2017	Biennial	03/31/2019
ESPEC	SU-642 / Chamber	0093008124	03/31/2017	Annual	03/31/2018
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	09/09/2016	Biennial	09/09/2018
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	1298	10/14/2016	Biennial	10/14/2018
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/25/2017	Biennial	04/25/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	04/25/2017	Biennial	04/25/2019
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY52090906	06/01/2017	Annual	06/01/2018
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/22/2017	Annual	06/22/2018
REOHDE & SCHWARZ	FSV40-N/Spectrum Analyzer	101068-SZ	09/23/2016	Annual	09/23/2017
Agilent	8960 (E5515C)/ Base Station	MY48360800	10/19/2016	Annual	10/19/2017
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	04/06/2017	Biennial	04/06/2019
Schwarzbeck	VULB9160/ Bilog Antenna	3150	09/30/2016	Biennial	09/30/2018
Schwarzbeck	VULB9160/ Bilog Antenna	3368	10/14/2016	Biennial	10/14/2018
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6200863156	02/15/2017	Annual	02/15/2018
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	02/13/2017	Annual	02/13/2018
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/18/2017	Annual	07/18/2018

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	6.07

6. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a), 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	$< 43 + 10\log_{10} (P[\text{Watts}])$ at Band Edge and for all out-of-band emissions		PASS
2.1046	* Conducted Output Power	-		PASS
24.232(d)	Peak- to- Average Ratio	$< 13 \text{ dB}$		PASS
2.1055, 22.355	Frequency stability / variation of ambient temperature	$< 2.5 \text{ ppm (Part22)}$		PASS
24.235		Emission must remain in band (Part24)		PASS
22.913(a)(2)	Effective Radiated Power	$< 7 \text{ Watts max. ERP}$	RADIATED	PASS
24.232(c)	Equivalent Isotropic Radiated Power	$< 2 \text{ Watts max. EIRP}$		PASS
2.1053, 22.917(a), 24.238(a)	Radiated Spurious and Harmonic Emissions	$< 43 + 10\log_{10} (P[\text{Watts}])$ for all out-of band emissions		PASS

*: See SAR Report

7. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL(dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
GSM850	128	824.20	-21.37	38.40	-10.61	0.95	H	< 7.00	0.483	26.84

$$\text{ERP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (ERP).

B. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

8. TEST DATA

8.1 EFFECTIVE RADIATED POWER(DEF Mode)

(GSM850 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
GSM850	128	824.2	-21.27	40.91	-10.59	1.31	V	< 7.00	0.796	29.01
	190	836.6	-20.99	41.59	-10.54	1.32	V		0.940	29.73
	251	848.8	-21.66	40.41	-10.49	1.33	V		0.723	28.59
EDGE	190	836.6	-26.97	35.61	-10.54	1.32	V		0.237	23.75

(WCDMA850 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA850	4132	826.4	-31.90	31.05	-10.58	1.31	V	< 7.00	0.082	19.16
	4183	836.6	-31.44	32.00	-10.54	1.32	V		0.103	20.14
	4233	846.6	-31.17	32.06	-10.50	1.33	V		0.105	20.23

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. Turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WCDMA, GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW $\geq 3 \times$ RBW, Detector = RMS. 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. 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 WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is y plane in GSM850 and WCDMA850 mode. Also worst case of detecting Antenna is in vertical polarization in GSM850 and WCDMA850 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

8.2 EFFECTIVE RADIATED POWER(ALT Mode)

(GSM850 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
GSM850	128	824.2	-25.75	36.43	-10.59	1.31	H	< 7.00	0.284	24.53
	190	836.6	-26.26	36.32	-10.54	1.32	H		0.279	24.46
	251	848.8	-26.02	36.05	-10.49	1.33	H		0.265	24.23
EDGE	128	824.2	-31.53	30.65	-10.59	1.31	H		0.075	18.75

(WCDMA850 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA850	4132	826.4	-34.86	28.09	-10.58	1.31	V	< 7.00	0.042	16.20
	4183	836.6	-35.23	28.21	-10.54	1.32	V		0.043	16.35
	4233	846.6	-35.76	27.47	-10.50	1.33	V		0.037	15.64

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. Turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WCDMA, GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW $\geq 3 \times$ RBW, Detector = RMS. 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. 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 WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is x plane in GSM850 and WCDMA850 (y plane) mode. Also worst case of detecting Antenna is in horizontal polarization in GSM850 and WCDMA850 (vertical polarization) mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

8.3 EQUIVALENT ISOTROPIC RADIATED POWER(DEF Mode)

(GSM1900 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
GSM1900	512	1850.2	-12.11	20.82	9.82	2.00	H	< 2.00	0.731	28.64
	661	1880.0	-12.42	20.56	9.91	2.02	H		0.700	28.45
	810	1909.8	-12.24	21.15	10.00	2.04	H		0.815	29.11
EDGE	810	1909.8	-18.95	14.44	10.00	2.04	H		0.174	22.40

(WCDMA1900 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA1900	9262	1852.4	-20.77	12.16	9.82	2.00	H	< 2.00	0.100	19.98
	9400	1880.0	-21.30	11.68	9.91	2.02	H		0.091	19.57
	9538	1907.6	-21.34	12.00	10.00	2.04	H		0.099	19.96

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method

according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. Turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WCDMA, GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW ≥ 3 x RBW, Detector = RMS. 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 receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is x plane in GSM1900 and WCDMA1900 mode. Also worst case of detecting Antenna is in horizontal polarization in GSM1900 and WCDMA1900 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

8.4 EQUIVALENT ISOTROPIC RADIATED POWER(ALT Mode)

(GSM1900 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
GSM1900	512	1850.2	-14.76	18.17	9.82	2.00	H	< 2.00	0.397	25.99
	661	1880.0	-14.77	18.21	9.91	2.02	H		0.407	26.10
	810	1909.8	-14.11	19.28	10.00	2.04	H		0.530	27.24
EDGE	810	1909.8	-20.48	12.91	10.00	2.04	H		0.122	20.87

(WCDMA1900 Mode)

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA1900	9262	1852.4	-23.56	9.37	9.82	2.00	H	< 2.00	0.052	17.19
	9400	1880.0	-23.97	9.01	9.91	2.02	H		0.049	16.90
	9538	1907.6	-23.52	9.82	10.00	2.04	H		0.060	17.78

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method

according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. Turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For WCDMA, GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW ≥ 3 x RBW, Detector = RMS. 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 receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. This unit was tested with its standard battery. Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is x plane in GSM1900 and WCDMA1900 (z plane) mode. Also worst case of detecting Antenna is in horizontal polarization in GSM1900 and WCDMA1900 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

8.5 RADIATED SPURIOUS EMISSIONS(DEF Mode)

8.5.1 RADIATED SPURIOUS EMISSIONS (GSM850)

- MEASURED OUTPUT POWER: 29.73 dBm = 0.940 W
- MODULATION SIGNAL: GSM850
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 42.73 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBd)	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
128 (824.2)	1,648.40	-53.77	9.15	-66.19	1.88	H	-58.92	88.65
	2,472.60	-52.64	10.92	-61.54	2.33	H	-52.95	82.68
	3,296.80	-54.27	11.93	-63.51	2.72	H	-54.30	84.03
190 (836.6)	1,673.20	-51.24	9.23	-63.71	1.90	H	-56.38	86.11
	2,509.80	-51.79	10.96	-61.05	2.36	H	-52.45	82.18
	3,346.40	-56.51	12.04	-66.07	2.74	H	-56.77	86.50
251 (848.8)	1,697.60	-46.50	9.33	-58.94	1.92	H	-51.53	81.26
	2,546.40	-52.17	10.98	-61.22	2.39	H	-52.63	82.36
	3,395.20	-56.97	12.14	-66.39	2.77	H	-57.02	86.75

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.2 RADIATED SPURIOUS EMISSIONS(GSM1900)

- MEASURED OUTPUT POWER: 19.11 dBm = 0.815 W
- MODULATION SIGNAL: GSM1900
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 42.11 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
512 (1850.2)	3,700.40	-56.40	12.52	-62.20	2.92	H	-52.60	81.71
	5,550.60	-55.91	13.29	-56.15	3.60	V	-46.46	75.57
	7,400.80	-54.51	11.72	-49.75	4.26	V	-42.29	71.40
661 (1880.0)	3,760.00	-54.32	12.56	-59.82	2.91	V	-50.17	79.28
	5,640.00	-56.02	13.30	-55.90	3.64	H	-46.24	75.35
	7,520.00	-53.78	11.70	-48.81	4.09	H	-41.20	70.31
810 (1909.8)	3,819.60	-52.95	12.60	-58.25	2.98	H	-48.63	77.74
	5,729.40	-55.43	13.31	-54.34	3.66	H	-44.69	73.80
	7,639.20	-52.36	11.61	-47.84	4.27	V	-40.50	69.61

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.3 RADIATED SPURIOUS EMISSIONS (WCDMA850)

- MEASURED OUTPUT POWER: 20.23 dBm = 0.105 W
- MODULATION SIGNAL: WCDMA850
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 33.23 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	ERP (dBm)	dBc
4,132 (826.4)	1,652.80	-56.44	9.17	-68.90	1.88	V	-61.61	81.84
	2,479.20	-56.46	10.93	-65.74	2.34	H	-57.15	77.38
	3,305.60	-56.87	11.95	-66.10	2.72	V	-56.87	77.10
4,183 (836.6)	1,673.20	-55.28	9.24	-67.76	1.90	H	-60.42	80.65
	2,509.80	-54.94	10.96	-64.20	2.36	H	-55.60	75.83
	3,346.40	-56.03	12.04	-65.59	2.74	V	-56.29	76.52
4,233 (846.6)	1,693.20	-54.58	9.30	-67.05	1.91	H	-59.66	79.89
	2,539.80	-55.64	10.98	-64.39	2.39	H	-55.80	76.03
	3,386.40	-56.59	12.12	-66.14	2.77	V	-56.79	77.02

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.5.4 RADIATED SPURIOUS EMISSIONS (WCDMA1900)

- MEASURED OUTPUT POWER: 19.98 dBm = 0.100 W
- MODULATION SIGNAL: WCDMA1900
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 32.98 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBi)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	EIRP (dBm)	dBc
9262 (1852.4)	3,704.80	-54.97	12.52	-60.62	2.91	H	-51.01	70.99
	5,557.20	-56.88	13.29	-57.10	3.60	H	-47.41	67.39
	7,409.60	-54.09	11.72	-48.95	4.26	V	-41.49	61.47
9400 (1880.0)	3,760.00	-56.49	12.56	-61.99	2.91	H	-52.34	72.32
	5,640.00	-57.16	13.30	-57.04	3.64	V	-47.38	67.36
	7,520.00	-55.00	11.70	-50.03	4.09	H	-42.42	62.40
9538 (1907.6)	3,815.20	-56.87	12.60	-62.32	2.97	H	-52.69	72.67
	5,722.80	-56.98	13.31	-55.74	3.66	H	-46.09	66.07
	7,630.40	-52.94	11.62	-48.36	4.29	H	-41.03	61.01

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6 RADIATED SPURIOUS EMISSIONS(ALT Mode)

8.6.1 RADIATED SPURIOUS EMISSIONS (GSM850)

- MEASURED OUTPUT POWER: 24.53 dBm = 0.284 W
- MODULATION SIGNAL: GSM850
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 37.53 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBd)	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
128 (824.2)	1,648.40	-31.27	9.15	-43.69	1.88	H	-36.42	60.95
	2,472.60	-16.31	10.92	-25.21	2.33	H	-16.62	41.15
	3,296.80	-47.35	11.93	-56.59	2.72	V	-47.38	71.91
	4,121.00	-46.31	12.73	-53.54	3.07	H	-43.88	68.41
	4,945.20	-48.96	12.59	-53.70	3.38	H	-44.49	69.02
190 (836.6)	1,673.20	-31.89	9.23	-44.36	1.90	V	-37.03	61.56
	2,509.80	-19.45	10.96	-28.71	2.36	H	-20.11	44.64
	3,346.40	-42.19	12.04	-51.75	2.74	H	-42.45	66.98
	4,183.00	-50.91	12.74	-58.26	3.08	H	-48.60	73.13
251 (848.8)	1,697.60	-31.99	9.33	-44.43	1.92	V	-37.02	61.55
	2,546.40	-24.87	10.98	-33.92	2.39	V	-25.33	49.86
	3,395.20	-49.73	12.14	-59.15	2.77	H	-49.78	74.31
	4,244.00	-53.34	12.74	-60.64	3.11	H	-51.01	75.54

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6.2 RADIATED SPURIOUS EMISSIONS(GSM1900)

- MEASURED OUTPUT POWER: 27.24 dBm = 0.530 W
- MODULATION SIGNAL: GSM1900
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 40.24 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBi)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	EIRP (dBm)	dBc
512 (1850.2)	3,700.40	-54.06	12.52	-59.86	2.92	V	-50.26	77.50
	5,550.60	-55.30	13.29	-55.54	3.60	V	-45.85	73.09
	7,400.80	-53.07	11.72	-48.31	4.26	V	-40.85	68.09
661 (1880.0)	3,760.00	-53.04	12.56	-58.54	2.91	H	-48.89	76.13
	5,640.00	-54.27	13.30	-54.15	3.64	H	-44.49	71.73
	7,520.00	-53.84	11.70	-48.87	4.09	H	-41.26	68.50
810 (1909.8)	3,819.60	-52.91	12.60	-58.21	2.98	H	-48.59	75.83
	5,729.40	-55.42	13.31	-54.33	3.66	V	-44.68	71.92
	7,639.20	-50.91	11.61	-46.39	4.27	H	-39.05	66.29

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6.3 RADIATED SPURIOUS EMISSIONS (WCDMA850)

- MEASURED OUTPUT POWER: 16.35 dBm = 0.043 W
- MODULATION SIGNAL: WCDMA850
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 29.35 dBc

Ch.	Freq.(MHz)	<u>Measured Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> <u>Level</u> [dBm]	C.L	Pol.	ERP (dBm)	dBc
4,132 (826.4)	1,652.80	-42.90	9.17	-55.36	1.88	V	-48.07	64.42
	2,479.20	-51.67	10.93	-60.95	2.34	H	-52.36	68.71
	3,305.60	-55.36	11.95	-64.59	2.72	V	-55.36	71.71
4,183 (836.6)	1,673.20	-41.92	9.24	-54.40	1.90	V	-47.06	63.41
	2,509.80	-55.56	10.96	-64.82	2.36	V	-56.22	72.57
	3,346.40	-54.54	12.04	-64.10	2.74	V	-54.80	71.15
4,233 (846.6)	1,693.20	-42.27	9.30	-54.74	1.91	V	-47.35	63.70
	2,539.80	-55.52	10.98	-64.27	2.39	H	-55.68	72.03
	3,386.40	-54.61	12.12	-64.16	2.77	V	-54.81	71.16

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6.4 RADIATED SPURIOUS EMISSIONS (WCDMA1900)

- MEASURED OUTPUT POWER: 17.78 dBm = 0.060 W
- MODULATION SIGNAL: WCDMA1900
- DISTANCE: 3 meters
- LIMIT: $43 + 10 \log_{10}(W) =$ 30.78 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
9262 (1852.4)	3,704.80	-56.86	12.52	-62.51	2.91	H	-52.90	70.68
	5,557.20	-56.64	13.29	-56.86	3.60	V	-47.17	64.95
	7,409.60	-55.61	11.72	-50.47	4.26	H	-43.01	60.79
9400 (1880.0)	3,760.00	-57.68	12.56	-63.18	2.91	V	-53.53	71.31
	5,640.00	-56.92	13.30	-56.80	3.64	V	-47.14	64.92
	7,520.00	-54.79	11.70	-49.82	4.09	V	-42.21	59.99
9538 (1907.6)	3,815.20	-55.97	12.60	-61.42	2.97	V	-51.79	69.57
	5,722.80	-56.11	13.31	-54.87	3.66	V	-45.22	63.00
	7,630.40	-54.73	11.62	-50.15	4.29	H	-42.82	60.60

- NOTES:**
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
 2. We are performed all frequency to 10th harmonics from 9 kHz. Measurements above show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
 3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.7 PEAK-TO-AVERAGE RATIO

Band	Ch.	Measured P _{Pk} (dBm)	Measured P _{Avg} (dBm)	P _{Avg} (Duty Cycle)			P.A.R. = P _{Pk} - P _{Avg} (dB)	Limit (dB)	Pass / Fail
				TxTotal (ms)	TxOn (ms)	Factor (dB)			
GSM1900	661	30.327	20.470	4.620	0.550	9.240	0.614	13	Pass
GSM1900 EDGE	661	29.141	16.470	4.620	0.550	9.240	3.428		
WCDMA1900	9400	CCDF Procedure					2.990		

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 51 ~ 54.
2. DEF Mode

Band	Ch.	Measured P _{Pk} (dBm)	Measured P _{Avg} (dBm)	P _{Avg} (Duty Cycle)			P.A.R. = P _{Pk} - P _{Avg} (dB)	Limit (dB)	Pass / Fail
				TxTotal (ms)	TxOn (ms)	Factor (dB)			
GSM1900	661	27.890	18.440	4.620	0.550	9.240	0.207	13	Pass
GSM1900 EDGE	661	27.576	15.010	4.620	0.550	9.240	3.323		
WCDMA1900	9400	CCDF Procedure					2.990		

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 88 ~ 91.
2. ALT Mode

Note:

Peak to Average Power Ratio was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 5.7.

Only GSM(include EDGE) Mode was tested by Section 5.7.2 Alternate Procedure

$P.A.R_{(dB)} = P_{Pk} (dBm) - P_{Avg} (dBm)$ (P_{Avg} = Average Power + Duty cycle Factor)

Duty cycle Factor = $10 \log (1/x)$, $x = Tx_{On} / Tx_{Total}$

8.8 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
GSM850	128	824.20	244.21
	190	836.60	245.40
	251	848.80	245.55
GSM850 EDGE	251	848.80	253.38
GSM1900	512	1,850.20	249.42
	661	1,880.00	249.49
	810	1,909.80	248.33
GSM1900 EDGE	661	1,880.00	249.89
WCDMA850	4132	826.40	4.1580
	4183	836.60	4.1629
	4233	846.60	4.1657
WCDMA1900	9262	1852.40	4.1780
	9400	1880.00	4.1673
	9538	1907.60	4.1742

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 44 ~ 50.
2. DEF Mode

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
GSM850	128	824.20	244.46
	190	836.60	245.38
	251	848.80	244.19
GSM850 EDGE	190	836.60	247.93
GSM1900	512	1,850.20	245.82
	661	1,880.00	245.21
	810	1,909.80	244.14
GSM1900 EDGE	512	1,850.20	247.27
WCDMA850	4132	826.40	4.1575
	4183	836.60	4.1681
	4233	846.60	4.1612
WCDMA1900	9262	1852.40	4.1701
	9400	1880.00	4.1731
	9538	1907.60	4.1589

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 81 ~ 87.
2. ALT Mode

8.9 CONDUCTED SPURIOUS EMISSIONS

■ FACTORS FOR FREQUENCY

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20	30.131

Note:

Factor(dB) = Cable Loss + Attenuator + Power Splitter

Band	Channel	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result	(dBm)
GSM850	128	3.1960	27.976	-57.130	-29.154	-13.00
	190	2.6915	27.976	-57.365	-29.389	
	251	3.7194	27.976	-57.293	-29.317	
GSM1900	512	18.90472	29.489	-53.119	-23.630	
	661	18.91822	29.489	-52.566	-23.077	
	810	18.91822	29.489	-52.631	-23.142	
WCDMA850	4132	3.6855	27.976	-77.375	-49.399	
	4183	3.6815	27.976	-77.259	-49.283	
	4233	3.6915	27.976	-77.263	-49.287	
WCDMA1900	9262	18.92647	29.489	-72.781	-43.292	
	9400	19.54174	29.489	-72.989	-43.500	
	9538	18.90647	29.489	-72.907	-43.418	

Note:

1. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
2. Plots of the EUT's Conducted Spurious Emissions are shown Page 70 ~ 79.
3. DEF Mode

Band	Channel	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result	(dBm)
GSM850	128	6.1217	28.591	-57.418	-28.827	-13.00
	190	5.9063	28.591	-57.089	-28.498	
	251	3.7528	27.976	-56.963	-28.987	
GSM1900	512	19.59524	29.489	-53.184	-23.695	
	661	18.92922	29.489	-52.998	-23.509	
	810	18.97547	29.489	-52.849	-23.360	
WCDMA850	4132	3.6895	27.976	-77.122	-49.146	
	4183	3.7020	27.976	-77.154	-49.178	
	4233	3.7119	27.976	-76.932	-48.956	
WCDMA1900	9262	18.87847	29.489	-72.653	-43.164	
	9400	18.92422	29.489	-72.515	-43.026	
	9538	18.90497	29.489	-72.641	-43.152	

Note:

1. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
2. Plots of the EUT's Conducted Spurious Emissions are shown Page 107 ~ 116.
3. ALT Mode

8.9.1 BAND EDGE

DEF Mode

: Plots of the EUT's Band Edge are shown Page 54 ~ 70.

ALT Mode

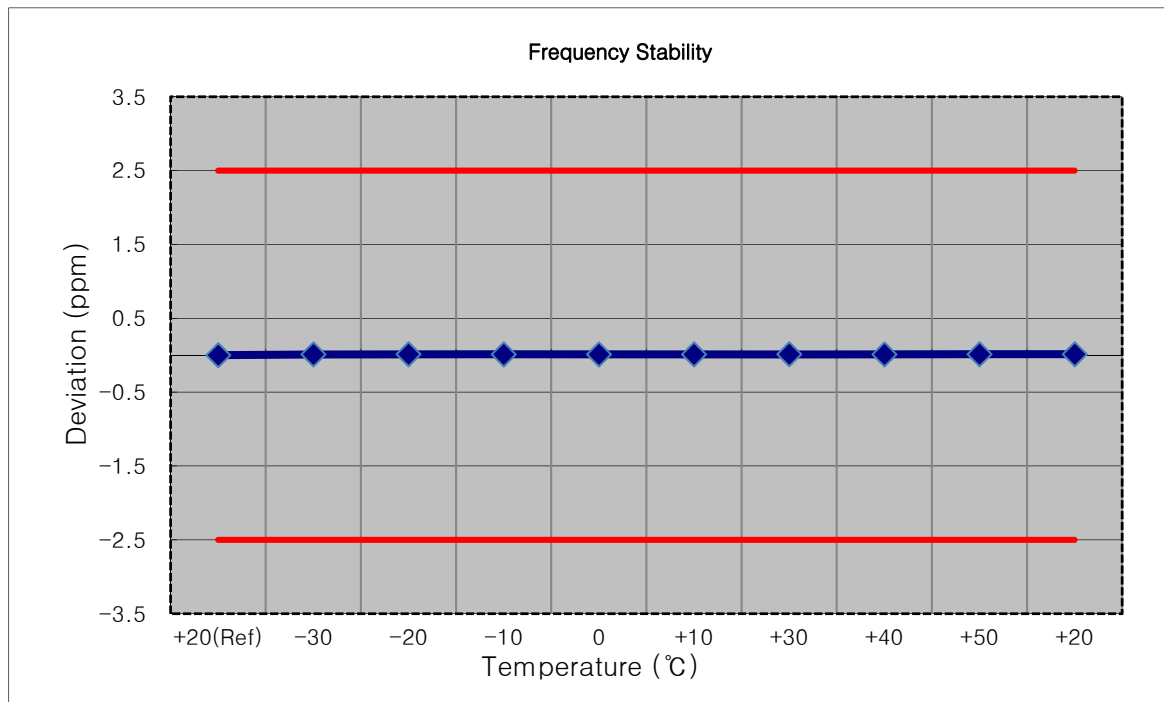
: Plots of the EUT's Band Edge are shown Page 91 ~ 107.

8.10 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE(DEF Mode)

8.10.1 FREQUENCY STABILITY (GSM850)

- OPERATING FREQUENCY: 836,600,000 Hz
- CHANNEL: 190
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

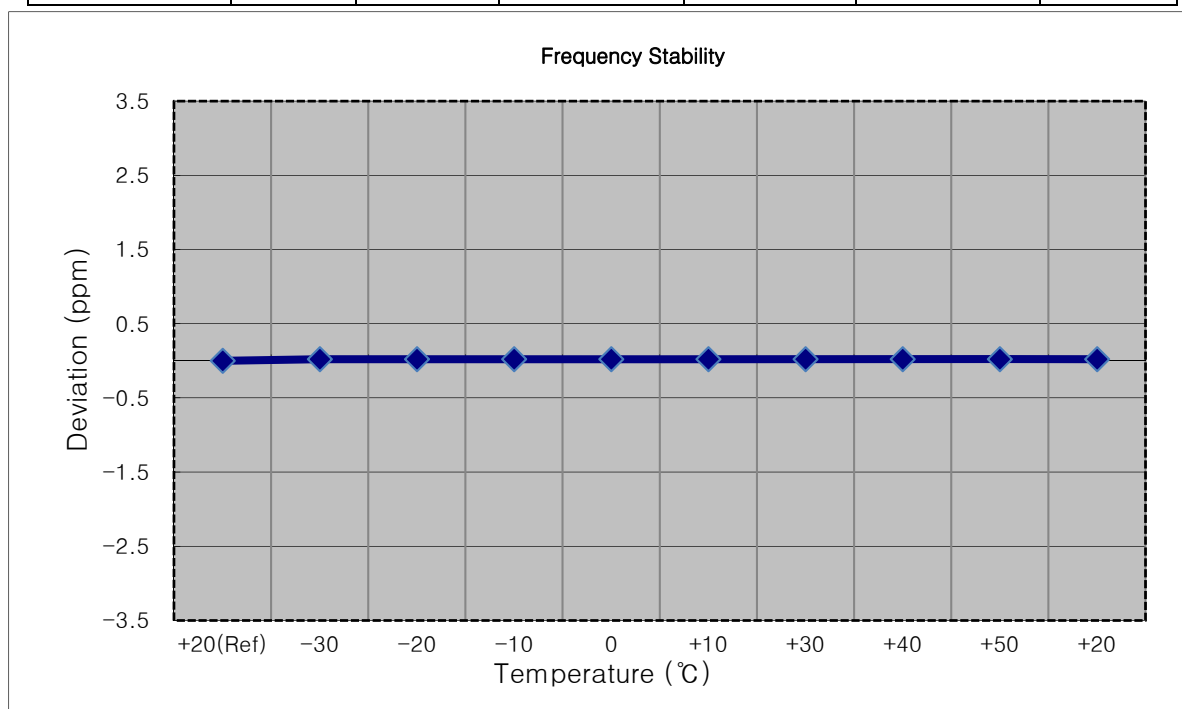
Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	836 600 009	0.0	0.000 000	0.0000
100%		-30	836 600 017	8.6	0.000 001	0.0103
100%		-20	836 600 019	10.3	0.000 001	0.0124
100%		-10	836 600 018	9.2	0.000 001	0.0110
100%		0	836 600 018	9.2	0.000 001	0.0110
100%		+10	836 600 017	8.8	0.000 001	0.0105
100%		+30	836 600 018	9.7	0.000 001	0.0116
100%		+40	836 600 017	8.3	0.000 001	0.0099
100%		+50	836 600 019	10.9	0.000 001	0.0130
Batt. Endpoint	3.60	+20	836 600 020	11.2	0.000 001	0.0134



8.10.2 FREQUENCY STABILITY (GSM1900)

- OPERATING FREQUENCY: 1880,000,000 Hz
- CHANNEL: 661
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: Emission must remain in band

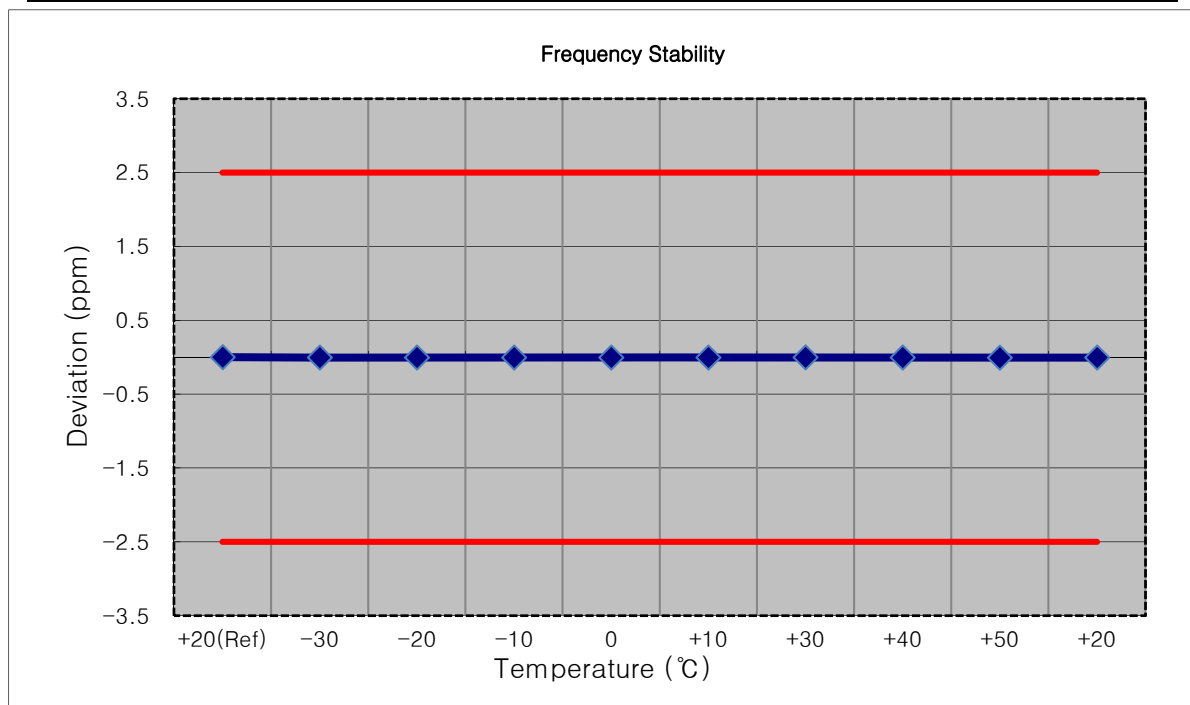
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	1880 000 040	0.0	0.000 000	0.0000
100%		-30	1880 000 080	39.7	0.000 002	0.0211
100%		-20	1880 000 080	39.7	0.000 002	0.0211
100%		-10	1880 000 081	40.7	0.000 002	0.0217
100%		0	1880 000 080	40.0	0.000 002	0.0213
100%		+10	1880 000 082	41.3	0.000 002	0.0220
100%		+30	1880 000 080	39.5	0.000 002	0.0210
100%		+40	1880 000 081	40.9	0.000 002	0.0218
100%		+50	1880 000 082	42.0	0.000 002	0.0223
Batt. Endpoint	3.60	+20	1880 000 081	40.9	0.000 002	0.0218



8.10.3 FREQUENCY STABILITY (WCDMA850)

- OPERATING FREQUENCY: 836,600,000 Hz
- CHANNEL: 4183
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

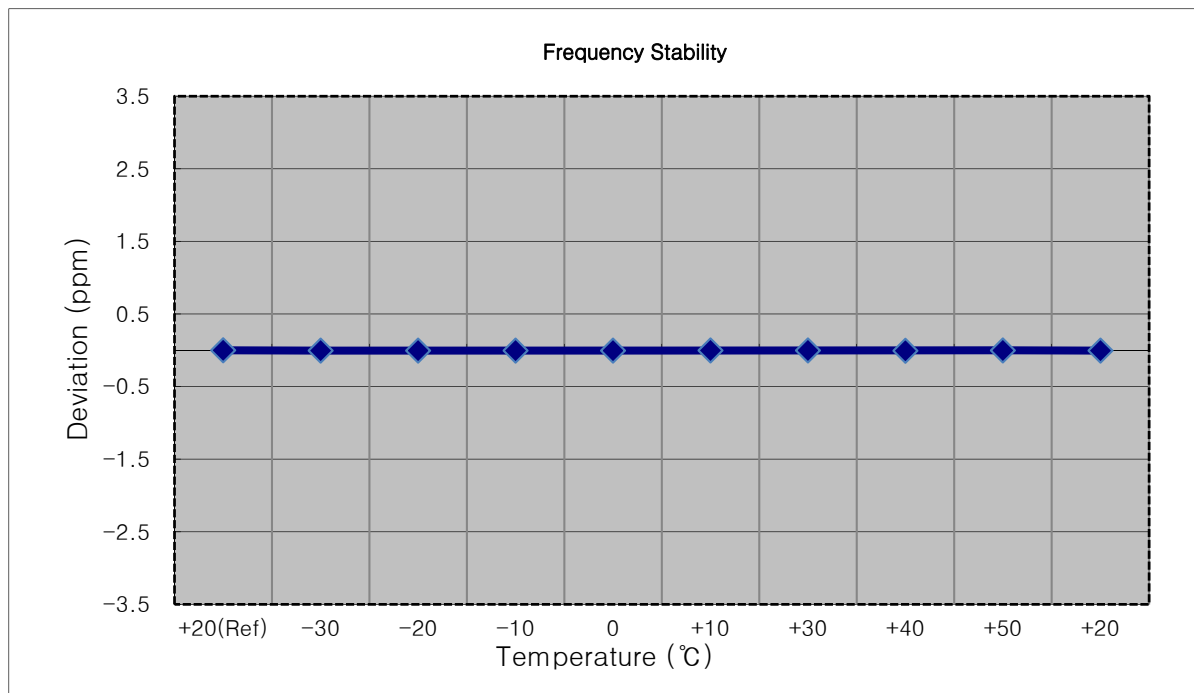
Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	836 599 999	0.0	0.000 000	0.0000
100%		-30	836 599 994	-4.4	-0.000 001	-0.0053
100%		-20	836 599 995	-4.2	0.000 000	-0.0050
100%		-10	836 599 995	-3.8	0.000 000	-0.0046
100%		0	836 599 995	-3.5	0.000 000	-0.0042
100%		+10	836 599 994	-4.4	-0.000 001	-0.0053
100%		+30	836 599 997	-1.6	0.000 000	-0.0019
100%		+40	836 599 994	-4.3	-0.000 001	-0.0051
100%		+50	836 599 993	-5.5	-0.000 001	-0.0065
Batt. Endpoint	3.60	+20	836 599 994	-4.8	-0.000 001	-0.0058



8.10.4 FREQUENCY STABILITY (WCDMA1900)

- OPERATING FREQUENCY: 1,880,000,000 Hz
- CHANNEL: 9400
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	1879 999 991	0.0	0.000 000	0.0000
100%		-30	1879 999 983	-8.3	0.000 000	-0.0044
100%		-20	1879 999 983	-8.5	0.000 000	-0.0045
100%		-10	1879 999 983	-8.5	0.000 000	-0.0045
100%		0	1879 999 983	-8.0	0.000 000	-0.0042
100%		+10	1879 999 987	-4.5	0.000 000	-0.0024
100%		+30	1879 999 988	-3.1	0.000 000	-0.0016
100%		+40	1879 999 981	-10.6	-0.000 001	-0.0056
100%		+50	1879 999 989	-2.5	0.000 000	-0.0013
Batt. Endpoint	3.60	+20	1879 999 984	-7.9	0.000 000	-0.0042

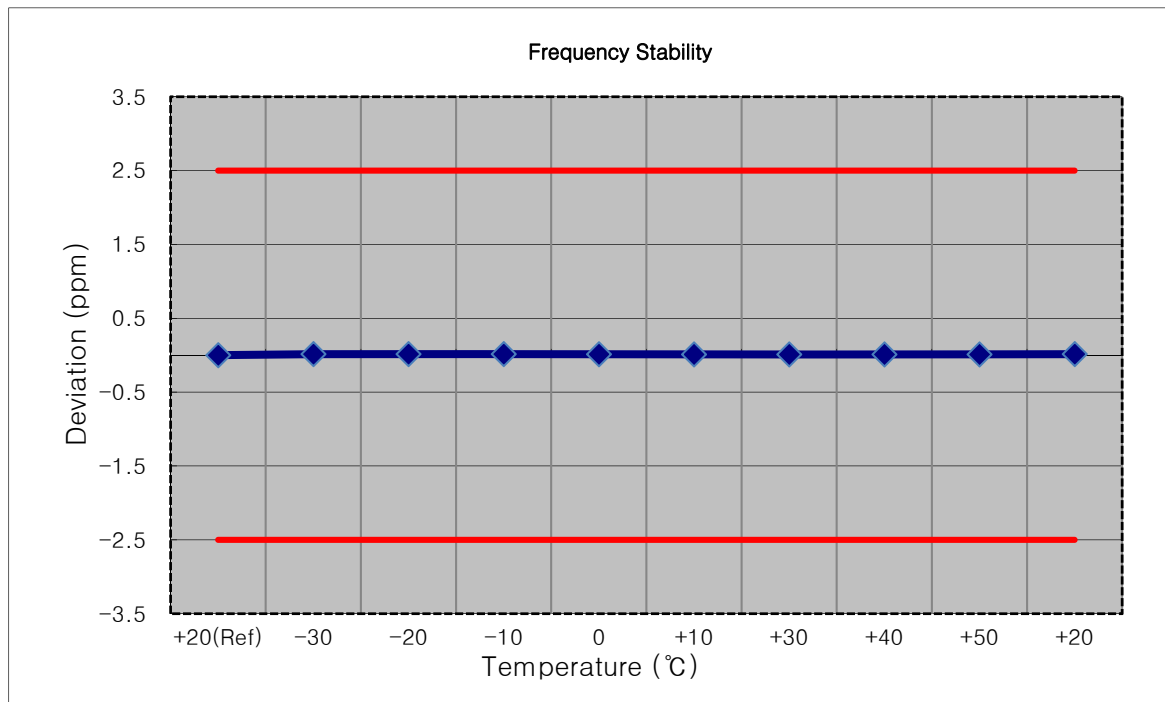


8.11 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE(ALT Mode)

8.11.1 FREQUENCY STABILITY (GSM850)

- OPERATING FREQUENCY: 836,600,000 Hz
- CHANNEL: 190
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

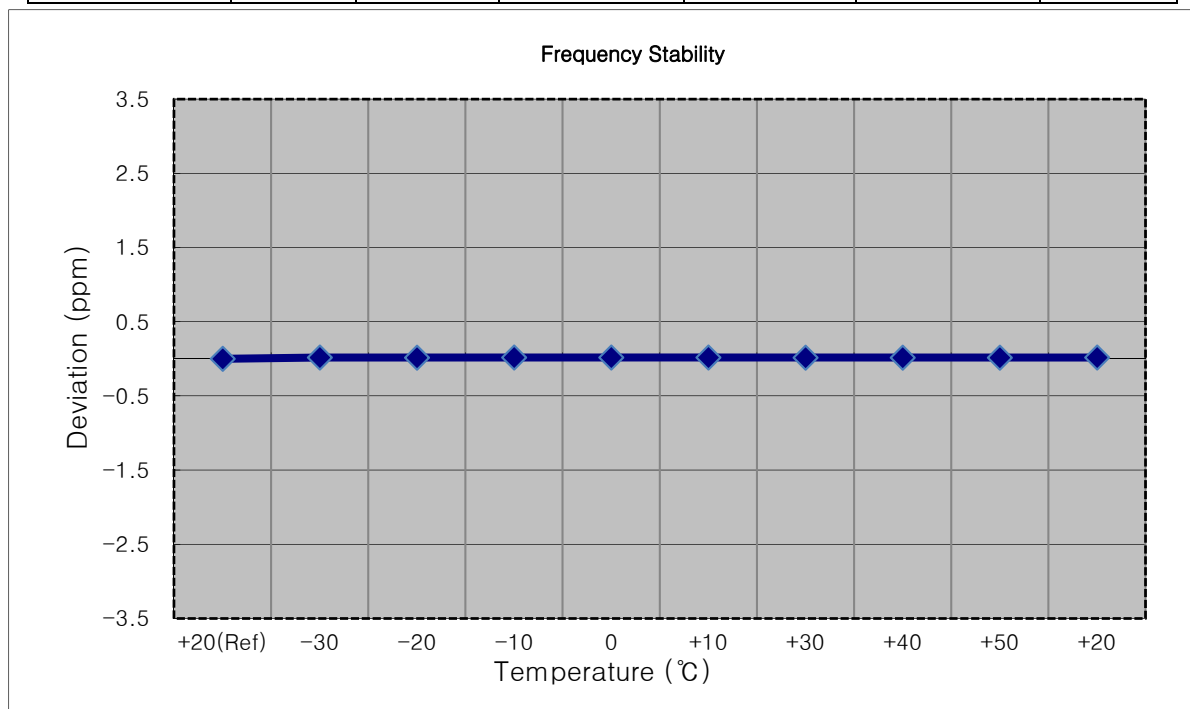
Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	836 600 011	0.0	0.000 000	0.0000
100%		-30	836 600 023	12.3	0.000 001	0.0147
100%		-20	836 600 024	12.4	0.000 001	0.0148
100%		-10	836 600 023	11.9	0.000 001	0.0143
100%		0	836 600 021	9.9	0.000 001	0.0119
100%		+10	836 600 020	9.1	0.000 001	0.0109
100%		+30	836 600 020	9.0	0.000 001	0.0108
100%		+40	836 600 020	8.7	0.000 001	0.0104
100%		+50	836 600 020	9.2	0.000 001	0.0111
Batt. Endpoint	3.60	+20	836 600 023	11.8	0.000 001	0.0141



8.11.2 FREQUENCY STABILITY (GSM1900)

- OPERATING FREQUENCY: 1880,000,000 Hz
- CHANNEL: 661
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: Emission must remain in band

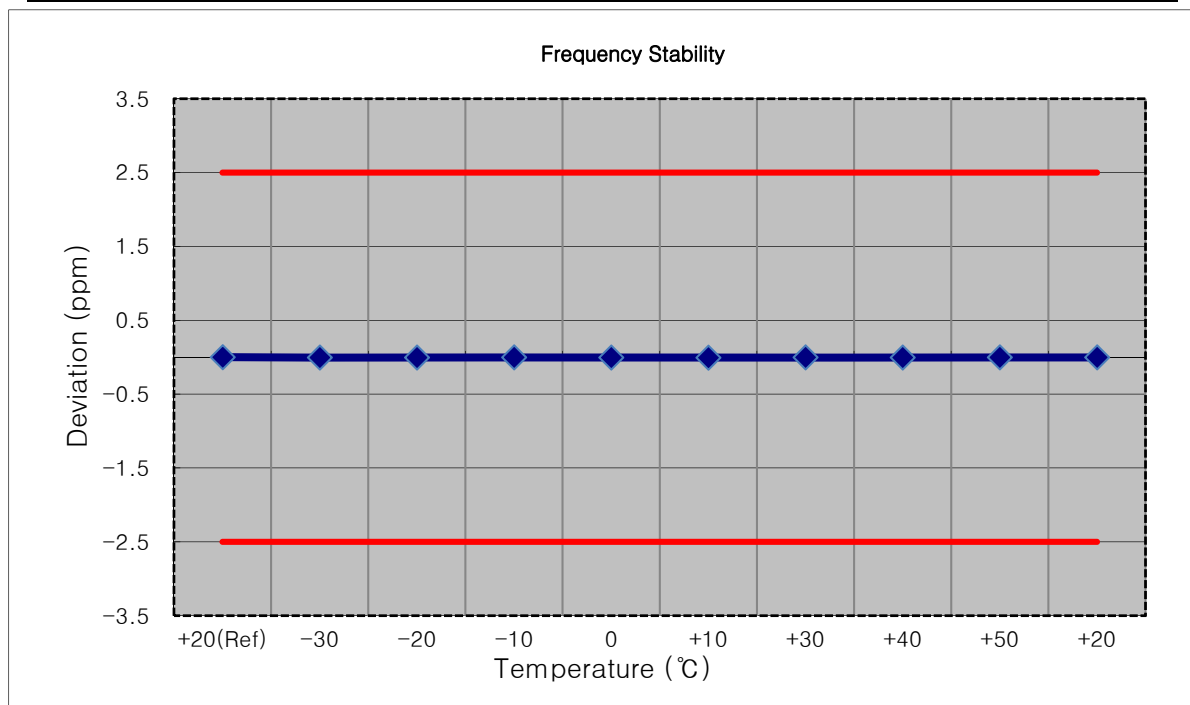
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	1880 000 034	0.0	0.000 000	0.0000
100%		-30	1880 000 065	31.9	0.000 002	0.0170
100%		-20	1880 000 064	30.0	0.000 002	0.0159
100%		-10	1880 000 065	31.5	0.000 002	0.0168
100%		0	1880 000 067	33.0	0.000 002	0.0176
100%		+10	1880 000 067	33.4	0.000 002	0.0178
100%		+30	1880 000 065	31.0	0.000 002	0.0165
100%		+40	1880 000 064	30.2	0.000 002	0.0161
100%		+50	1880 000 064	30.9	0.000 002	0.0164
Batt. Endpoint	3.60	+20	1880 000 067	33.0	0.000 002	0.0175



8.11.3 FREQUENCY STABILITY (WCDMA850)

- OPERATING FREQUENCY: 836,600,000 Hz
- CHANNEL: 4183
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

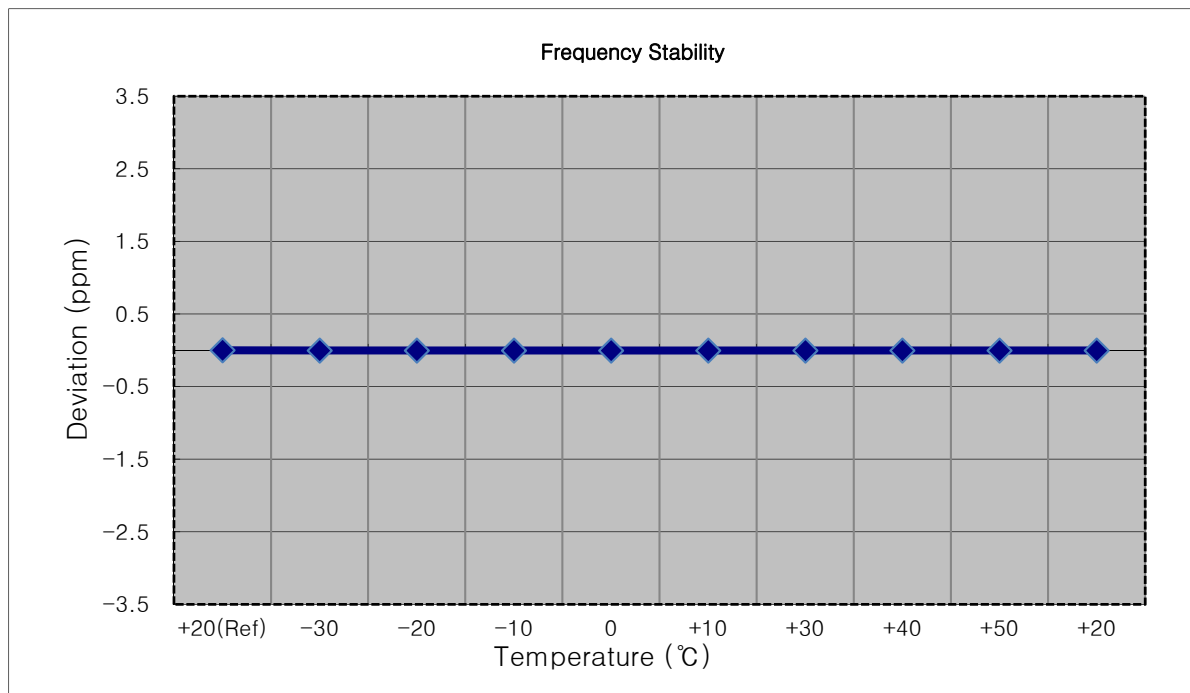
Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	836 599 998	0.0	0.000 000	0.0000
100%		-30	836 599 994	-4.1	0.000 000	-0.0049
100%		-20	836 599 994	-4.4	-0.000 001	-0.0053
100%		-10	836 599 996	-2.1	0.000 000	-0.0025
100%		0	836 599 994	-4.5	-0.000 001	-0.0054
100%		+10	836 599 993	-5.4	-0.000 001	-0.0065
100%		+30	836 599 996	-2.3	0.000 000	-0.0027
100%		+40	836 599 994	-4.5	-0.000 001	-0.0054
100%		+50	836 599 996	-2.8	0.000 000	-0.0034
Batt. Endpoint	3.60	+20	836 599 996	-2.5	0.000 000	-0.0030



8.11.4 FREQUENCY STABILITY (WCDMA1900)

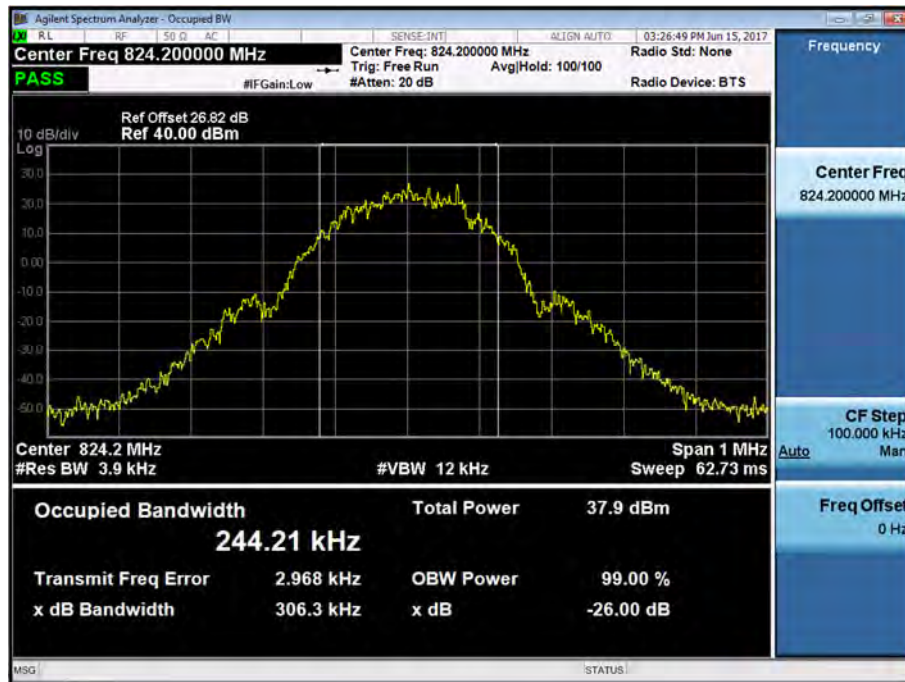
- OPERATING FREQUENCY: 1,880,000,000 Hz
- CHANNEL: 9400
- REFERENCE VOLTAGE: 3.85 VDC
- DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.85	+20(Ref)	1879 999 994	0.0	0.000 000	0.0000
100%		-30	1879 999 987	-6.6	0.000 000	-0.0035
100%		-20	1879 999 987	-6.1	0.000 000	-0.0033
100%		-10	1879 999 988	-5.6	0.000 000	-0.0030
100%		0	1879 999 986	-7.9	0.000 000	-0.0042
100%		+10	1879 999 987	-6.5	0.000 000	-0.0035
100%		+30	1879 999 988	-5.8	0.000 000	-0.0031
100%		+40	1879 999 987	-7.0	0.000 000	-0.0037
100%		+50	1879 999 986	-7.2	0.000 000	-0.0038
Batt. Endpoint	3.60	+20	1879 999 988	-5.3	0.000 000	-0.0028

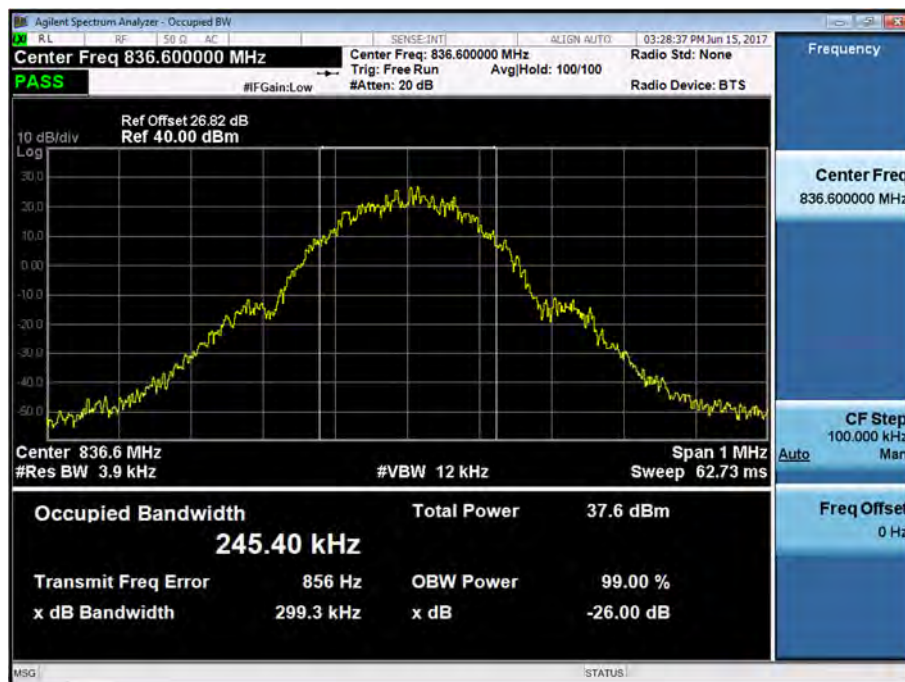


9. TEST PLOTS: DEF Mode

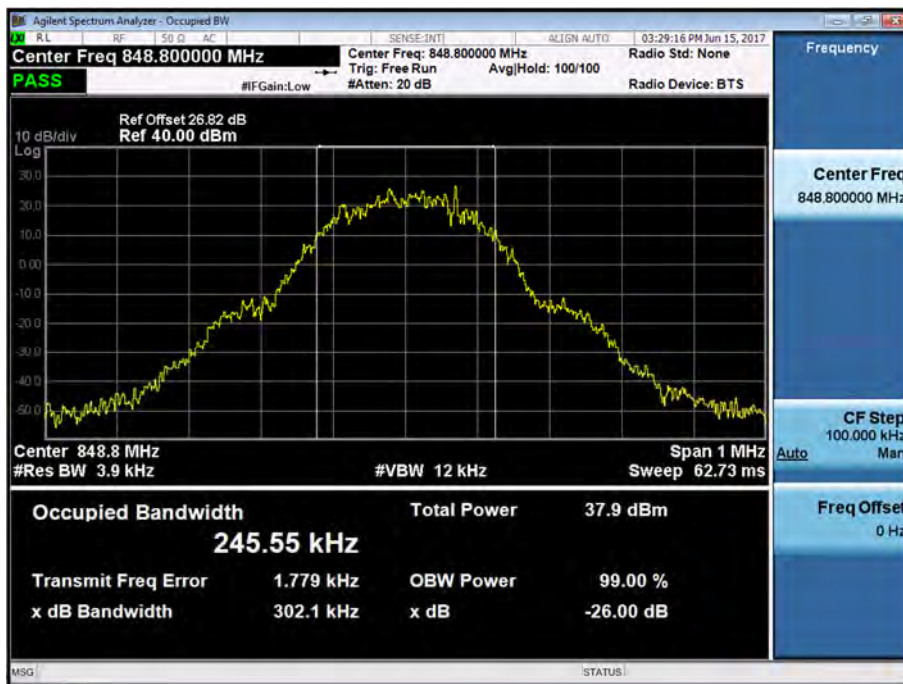
■ GSM850 MODE (128 CH.) Occupied Bandwidth



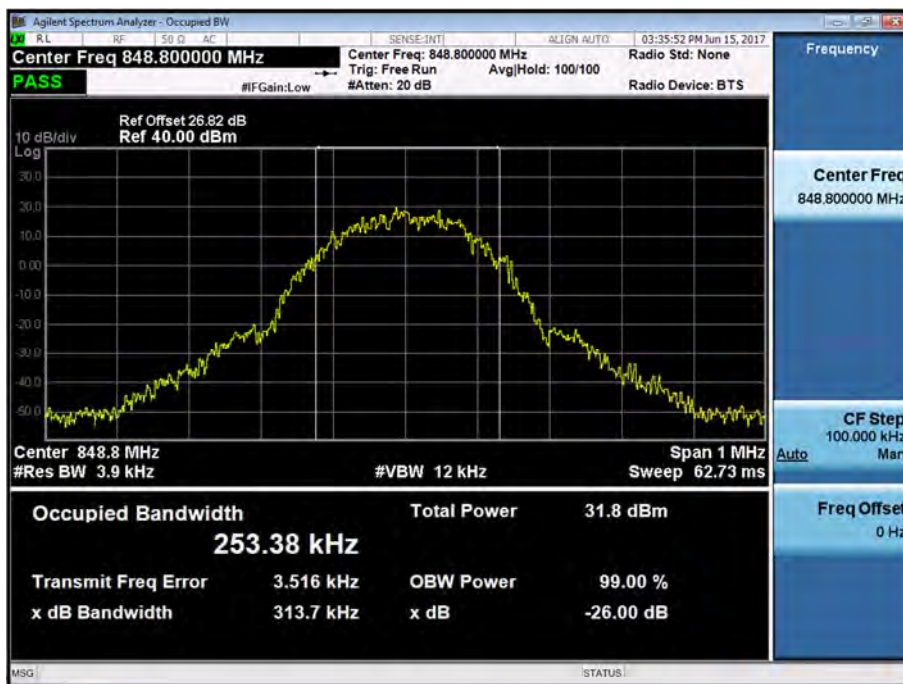
■ GSM850 MODE (190 CH.) Occupied Bandwidth



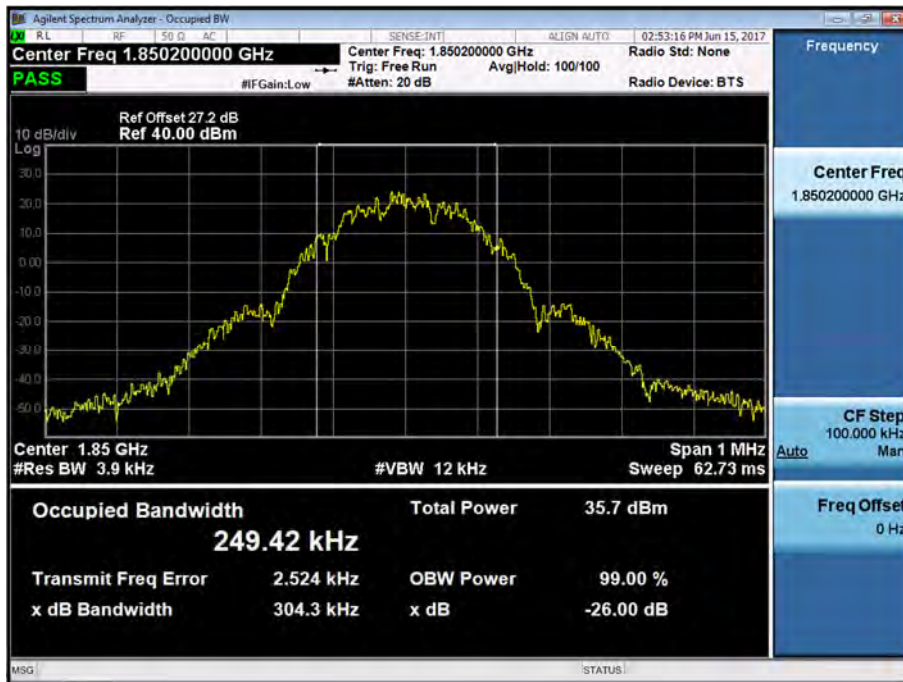
■ GSM850 MODE (251 CH.) Occupied Bandwidth



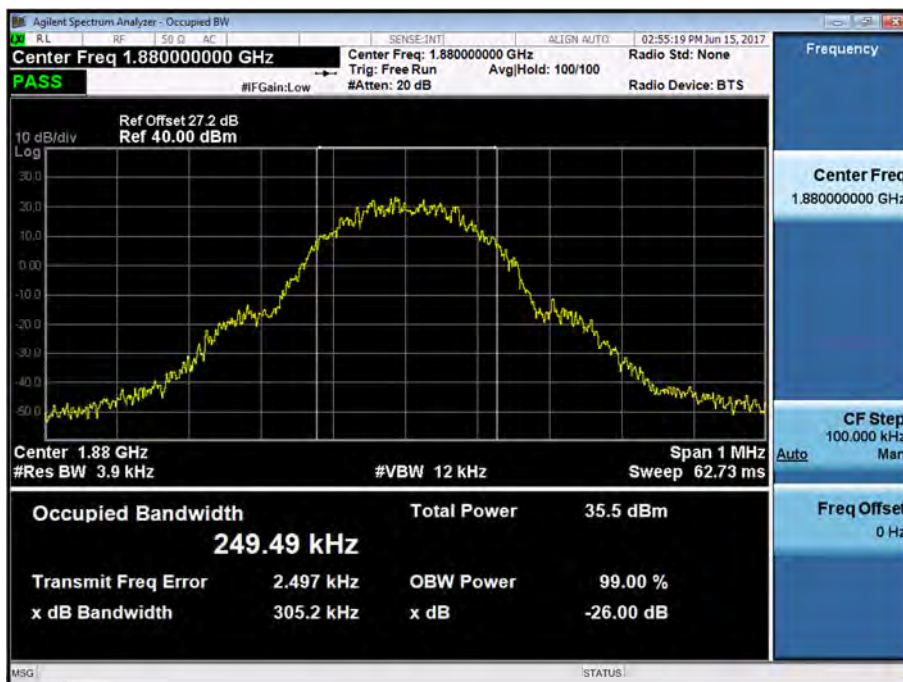
■ GSM850 EDGE (251 CH.) Occupied Bandwidth



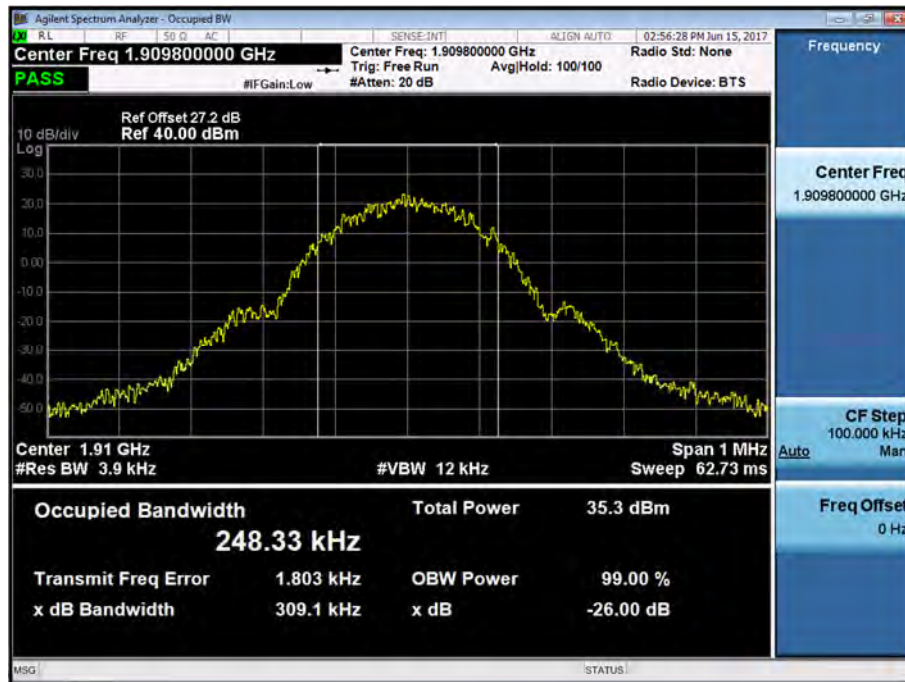
■ GSM1900 MODE (512 CH.) Occupied Bandwidth



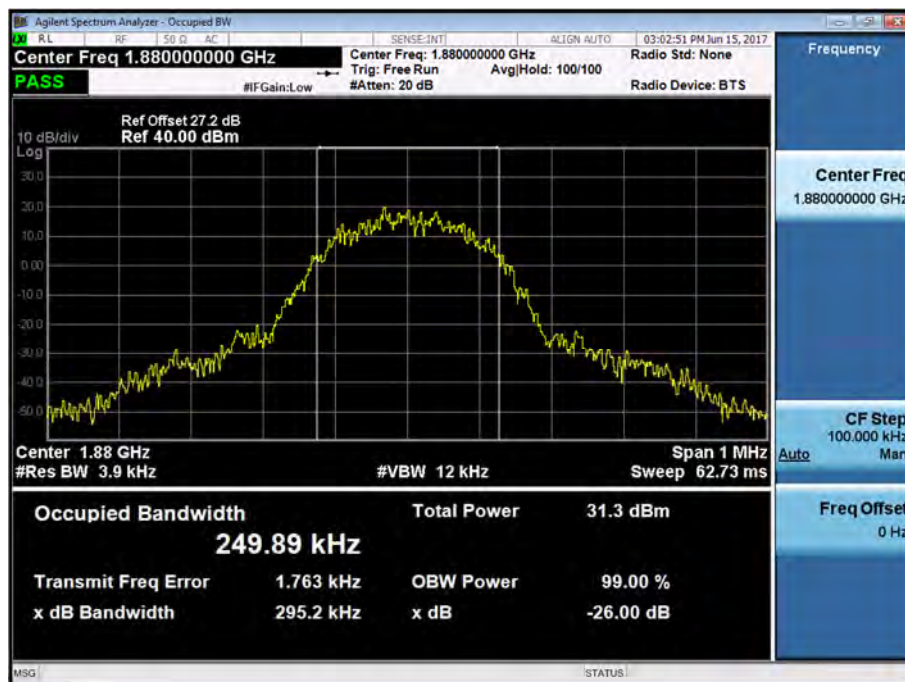
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



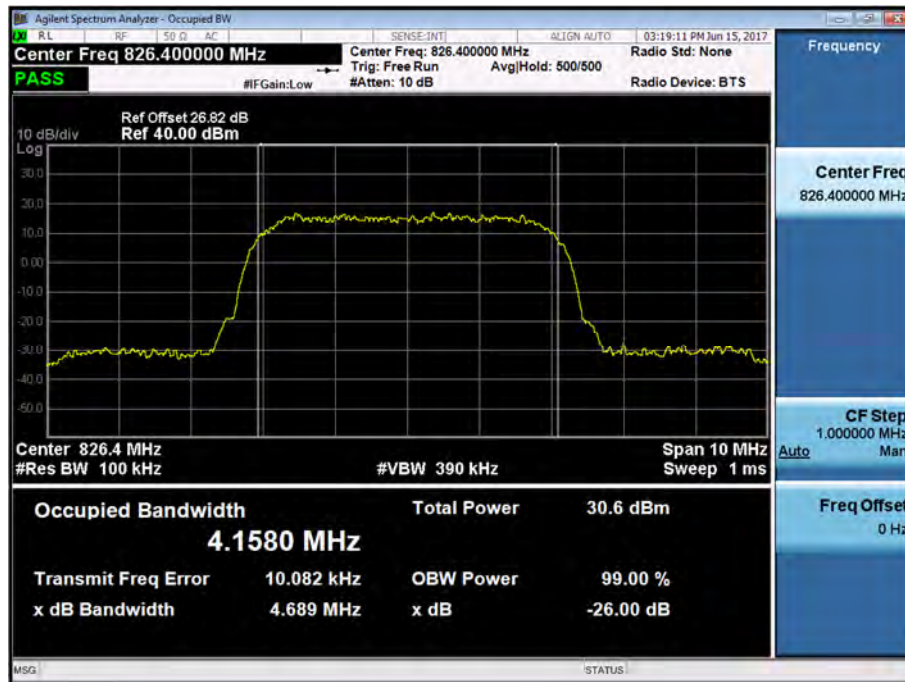
■ GSM1900 MODE (810 CH.) Occupied Bandwidth



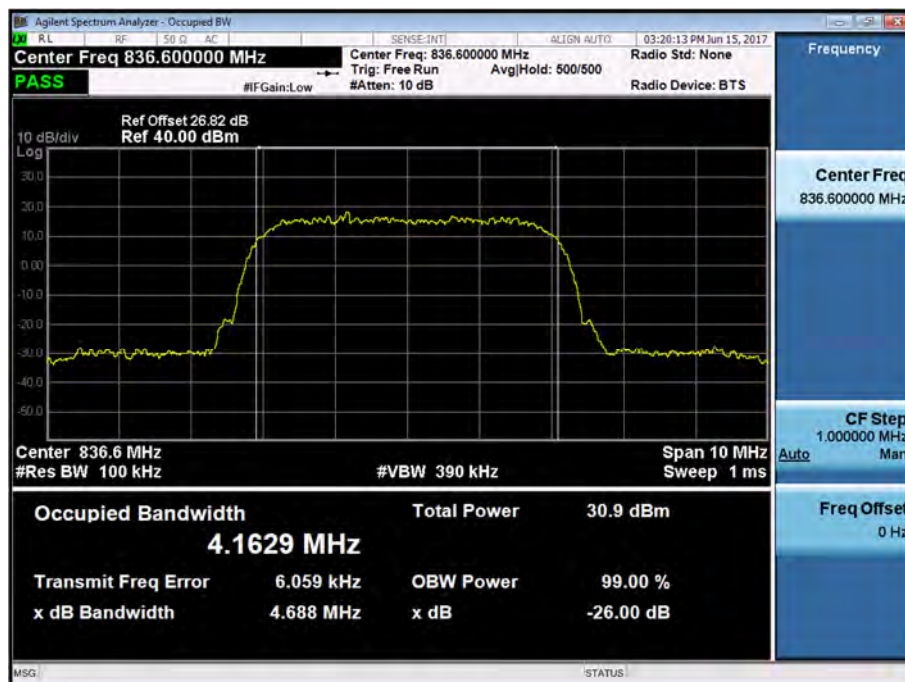
■ GSM1900 EDGE (661 CH.) Occupied Bandwidth



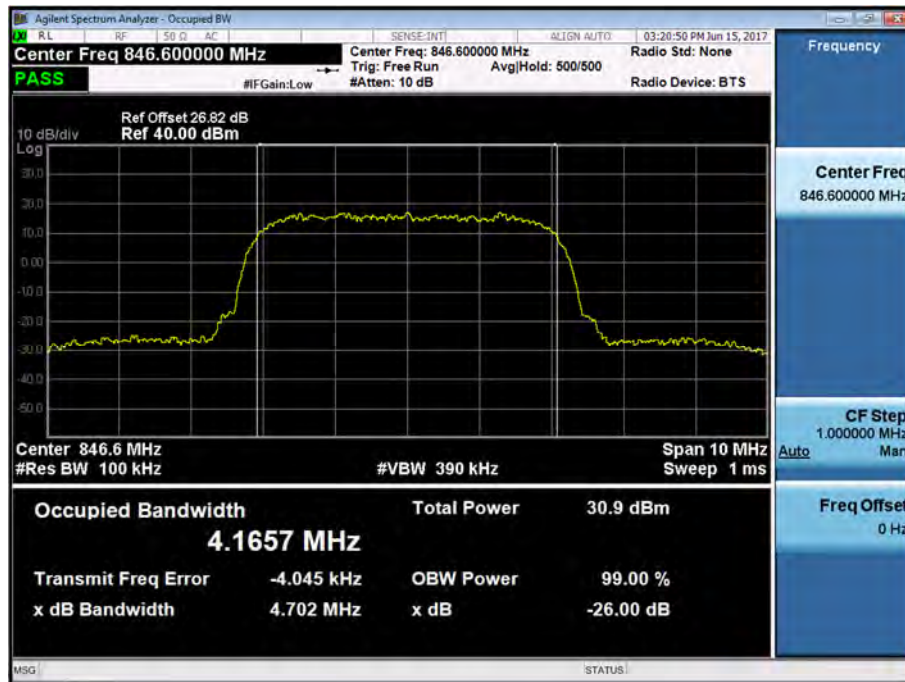
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



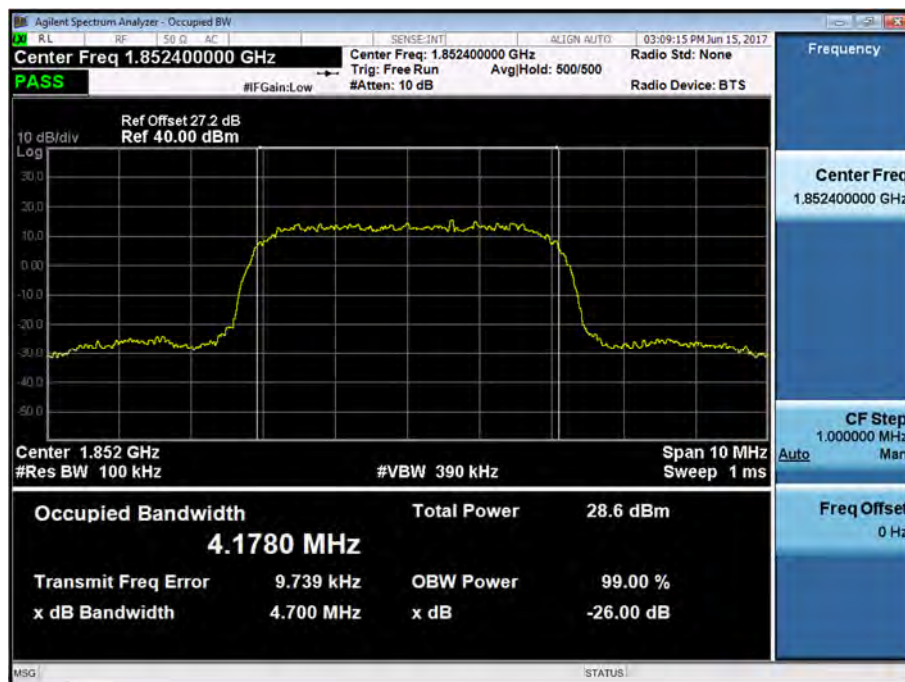
■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



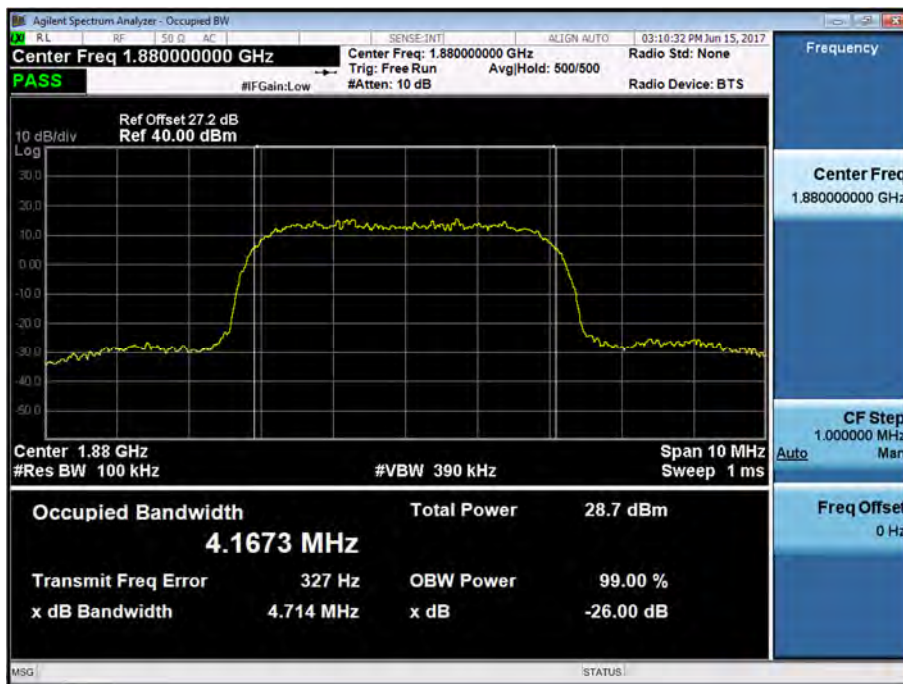
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



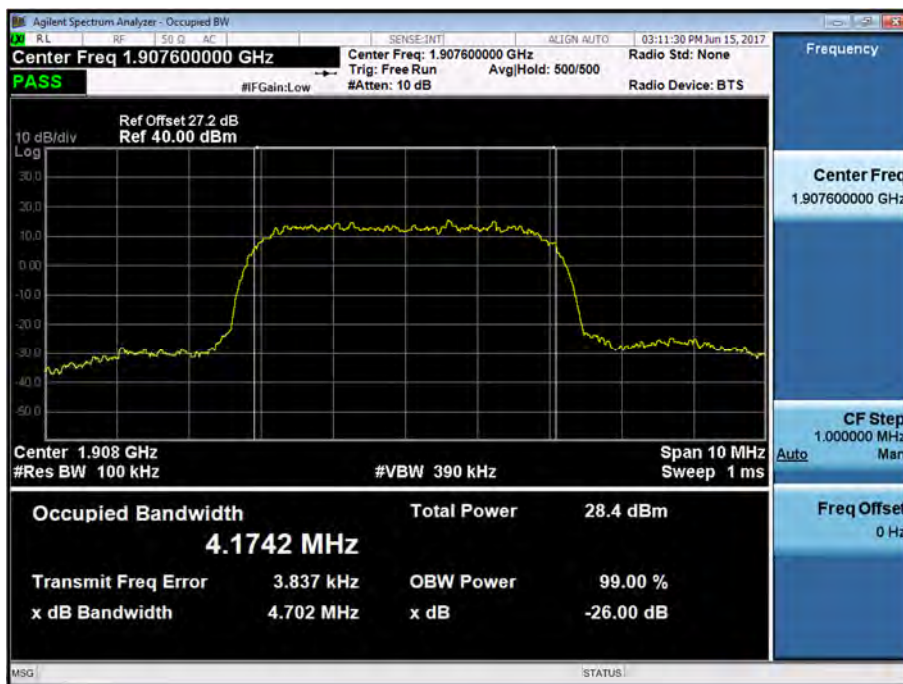
■ WCDMA1900 MODE (9262 CH.) Occupied Bandwidth



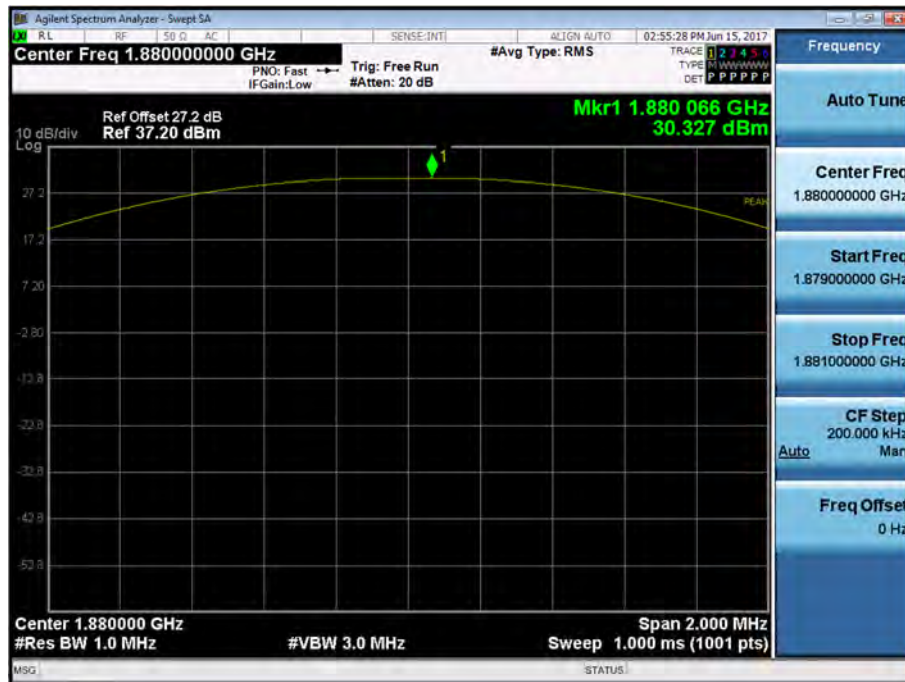
■ WCDMA1900 MODE (9400 CH.) Occupied Bandwidth



■ WCDMA1900 MODE (9538 CH.) Occupied Bandwidth



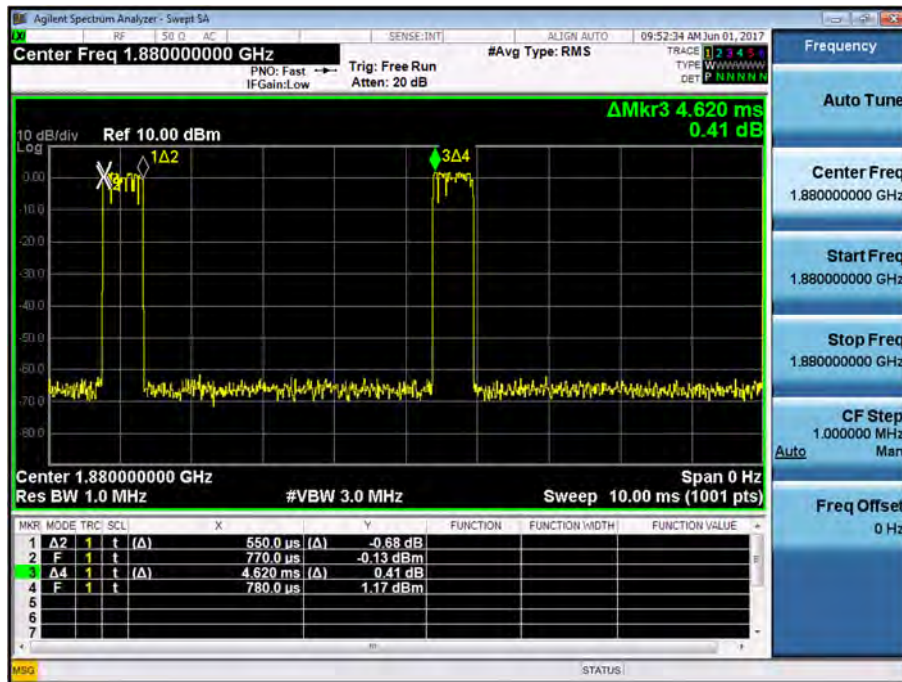
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Pk}



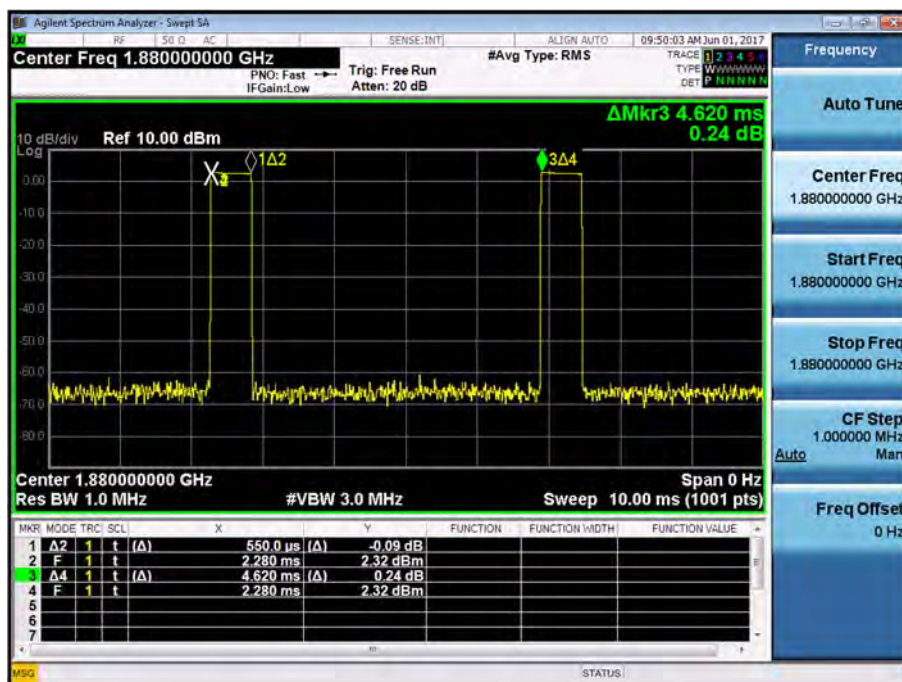
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Avg}



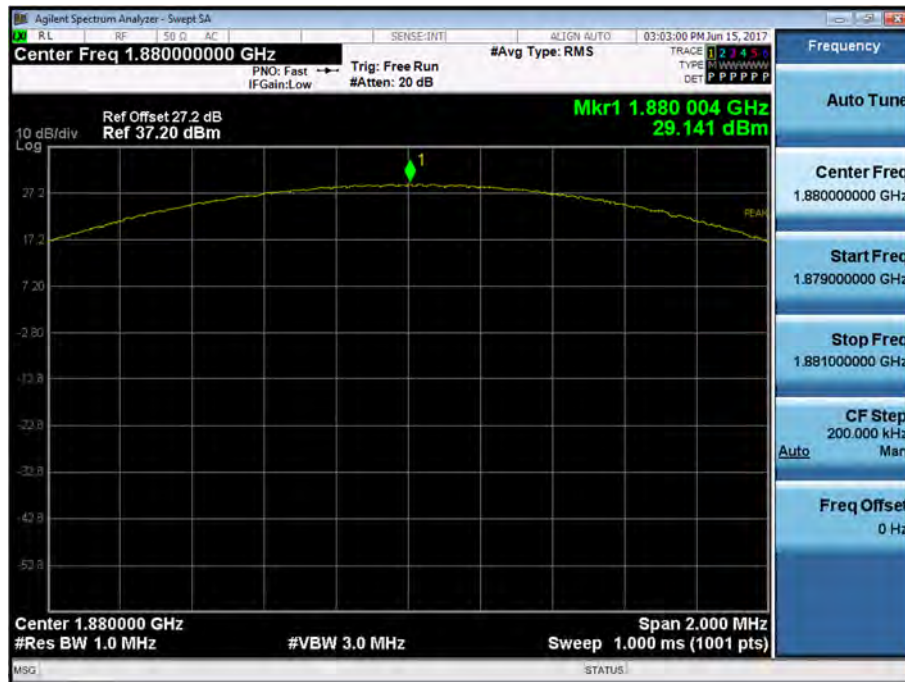
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio Duty



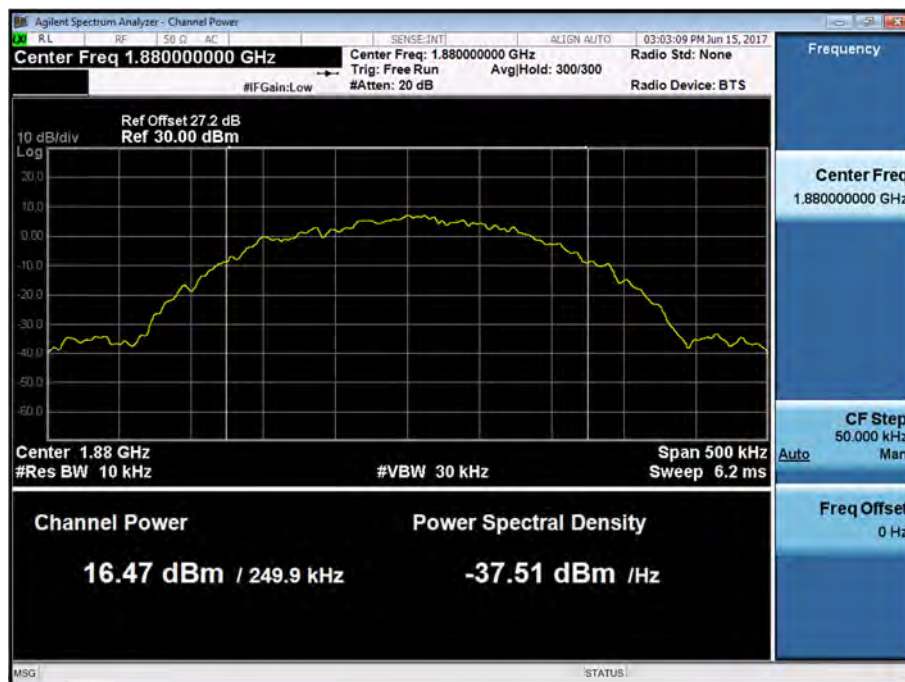
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio Duty



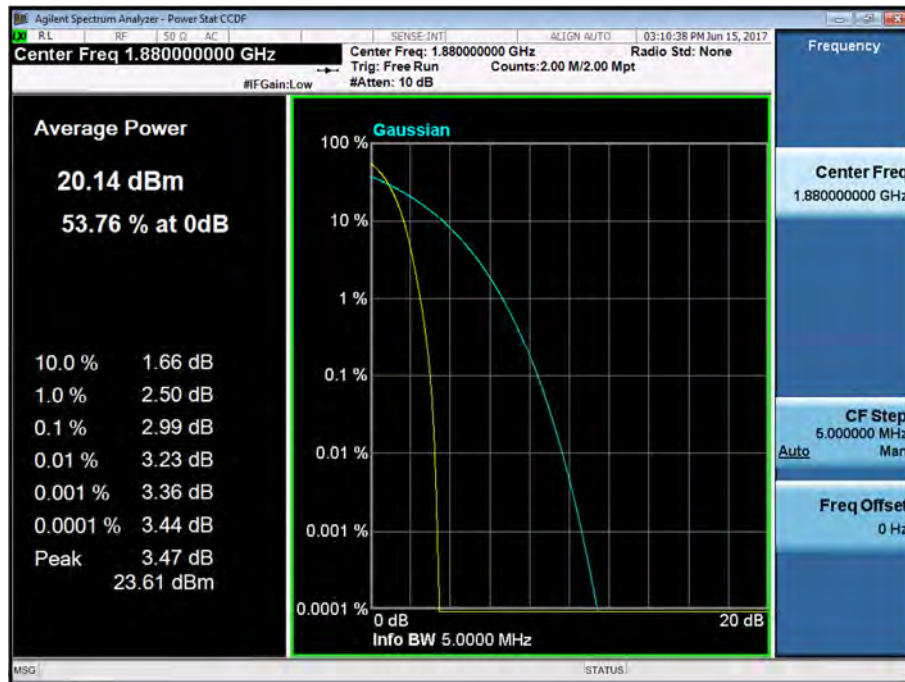
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Pk}



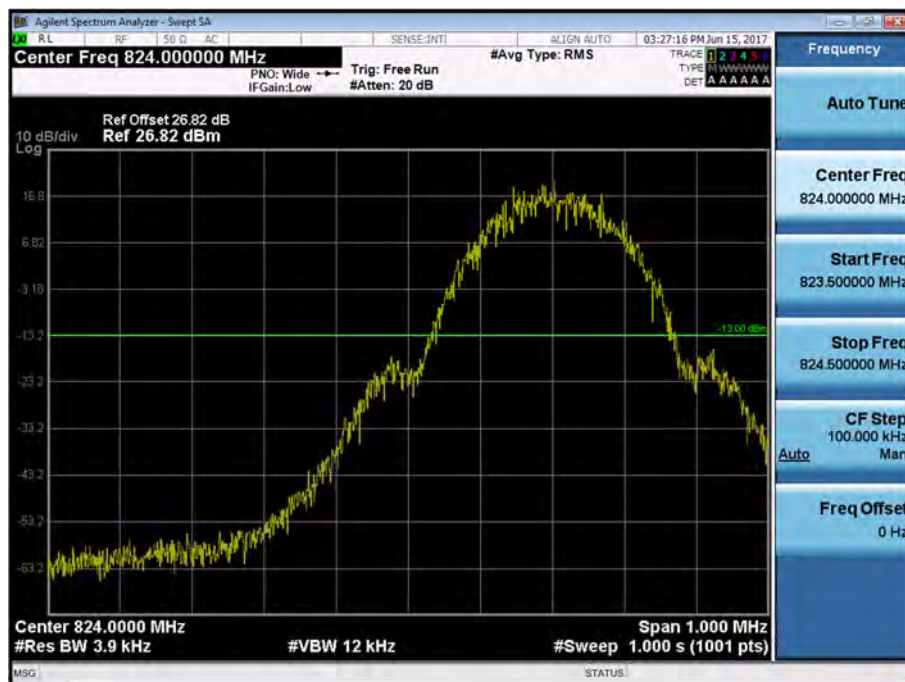
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Avg}



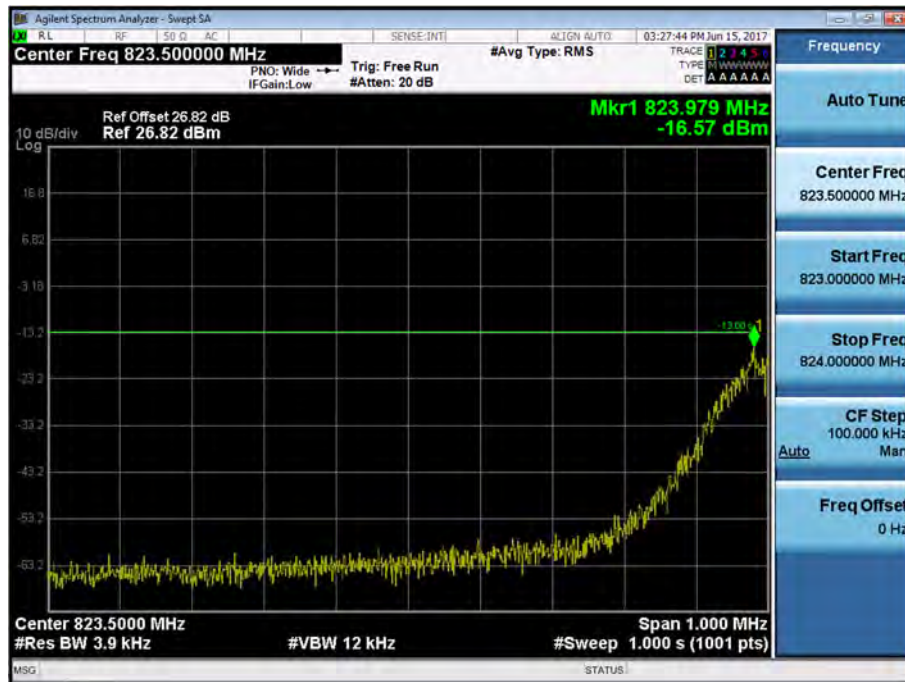
■ WCDMA1900 MODE (9400 CH.) Peak-to-Average Ratio



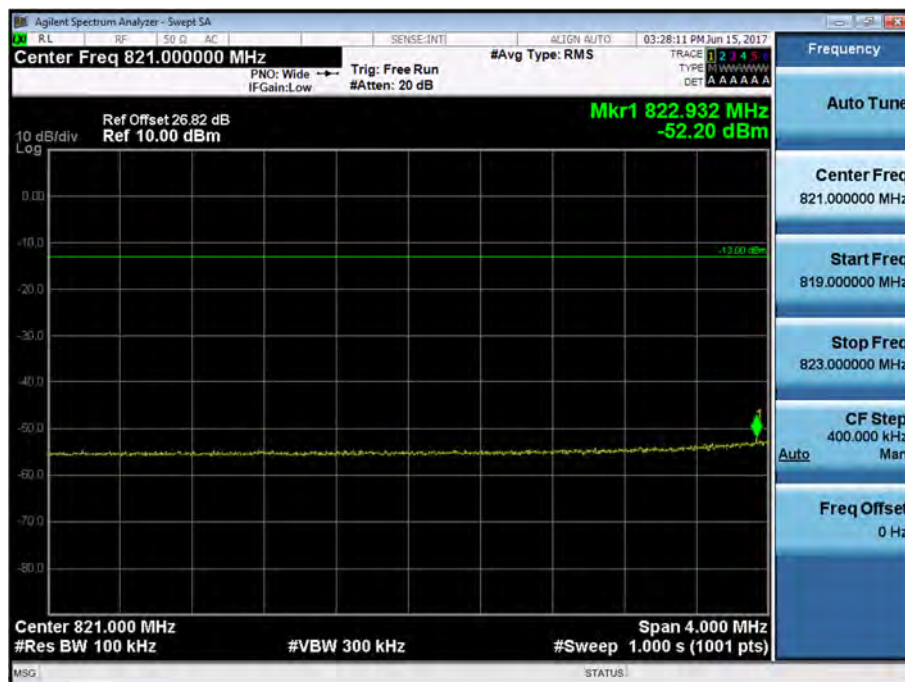
■ GSM850 MODE (128 CH.) Block Edge 1



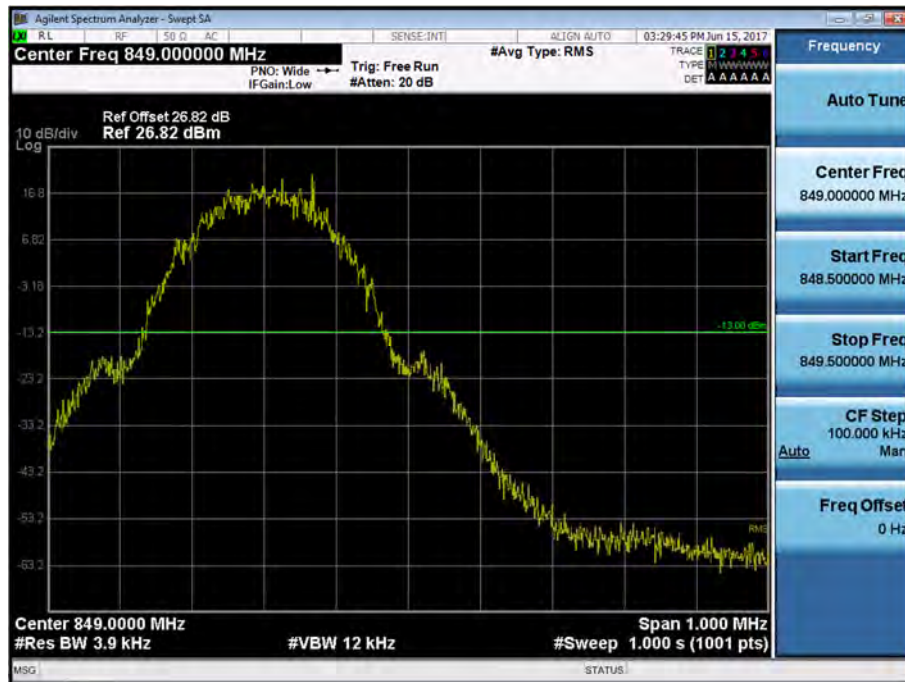
■ GSM850 MODE (128 CH.) Block Edge 2



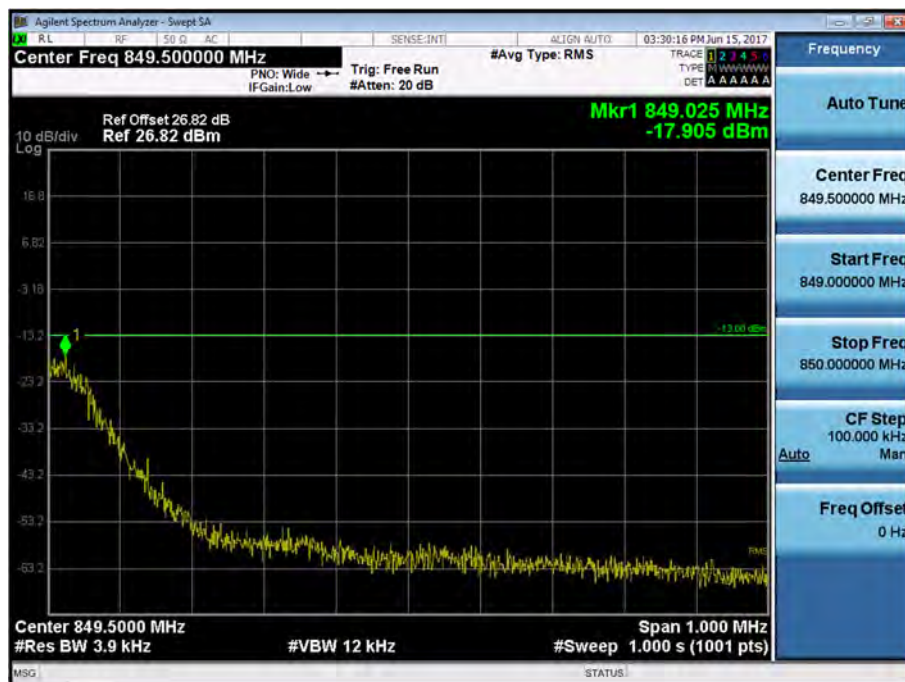
■ GSM850 MODE (128 CH.) Block Edge 3



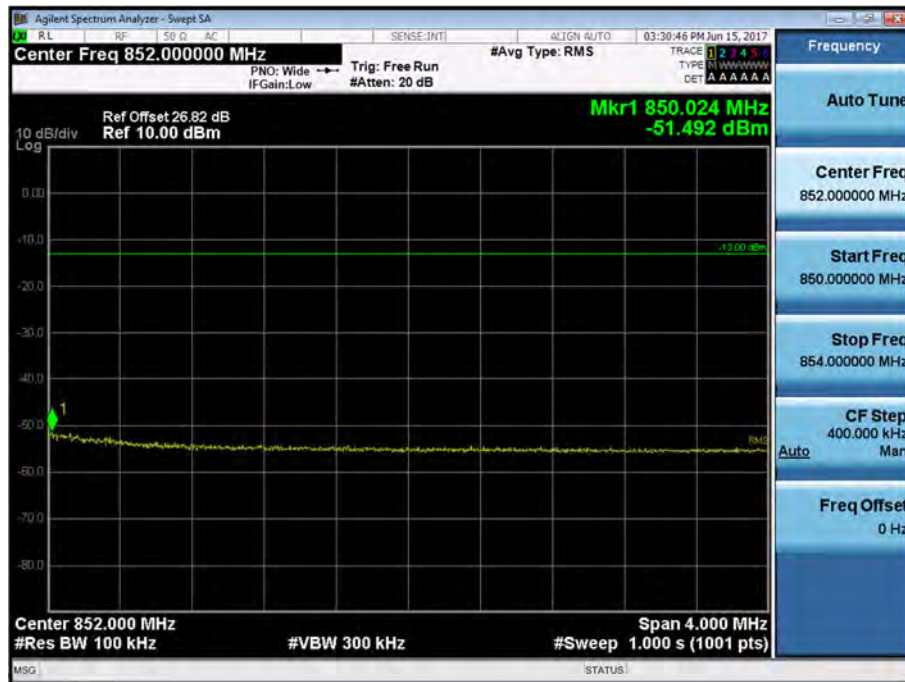
■ GSM850 MODE (251 CH.) Block Edge 1



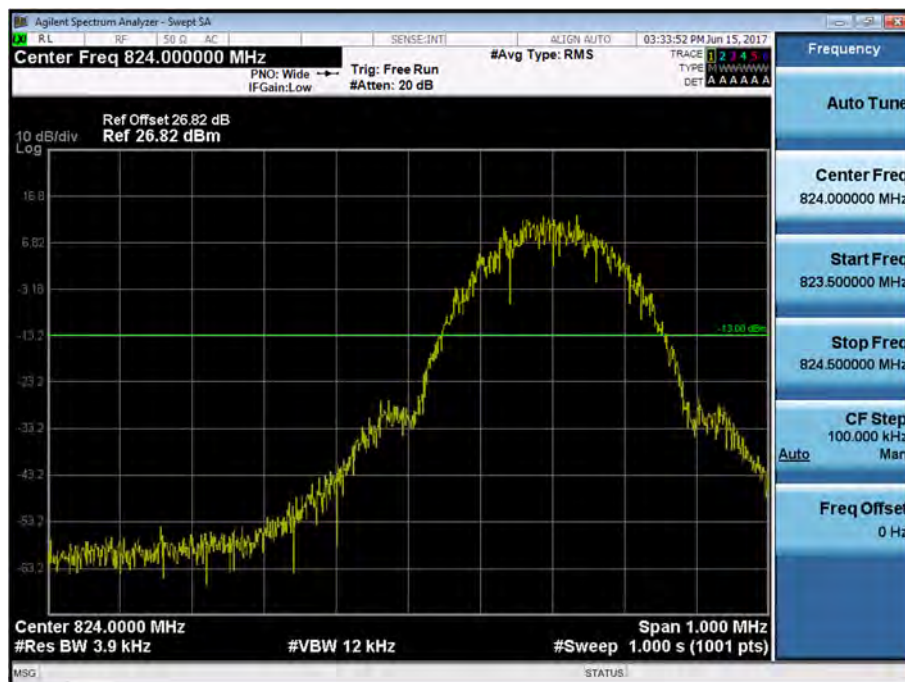
■ GSM850 MODE (251 CH.) Block Edge 2



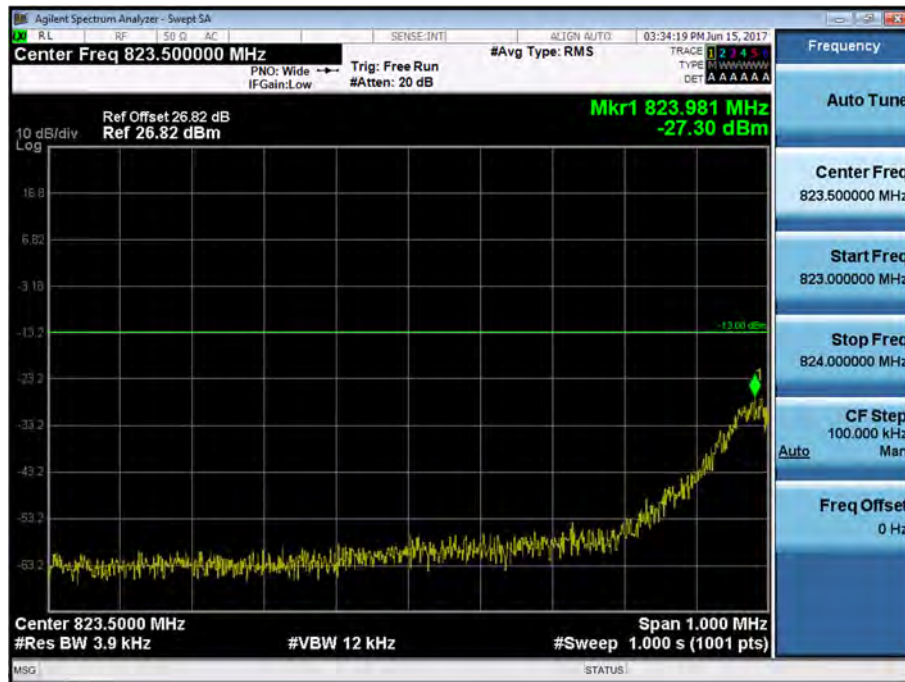
■ GSM850 MODE (251 CH.) Block Edge 3



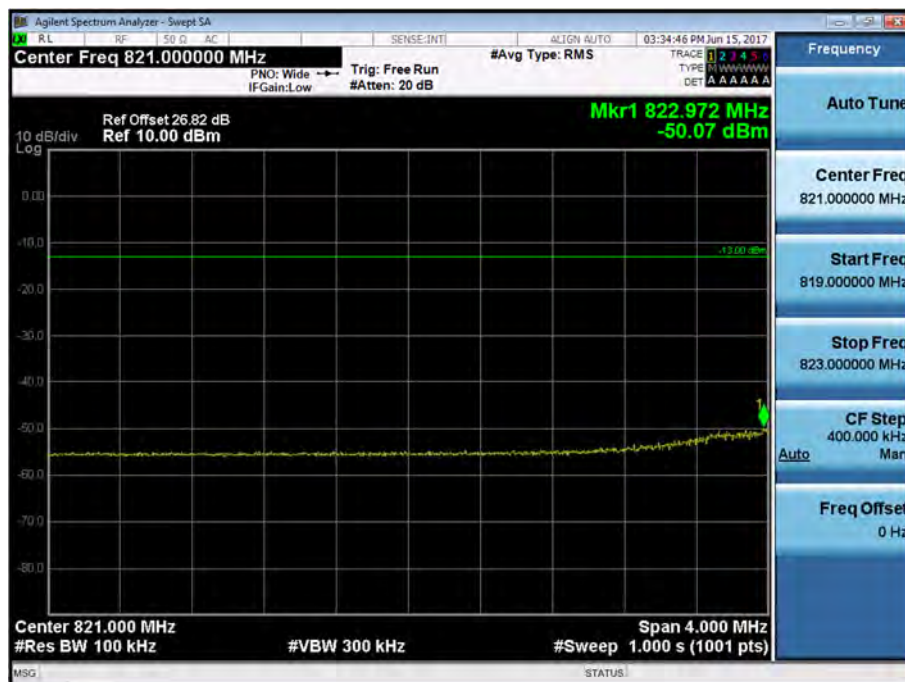
■ EDGE MODE (128 CH.) Block Edge 1



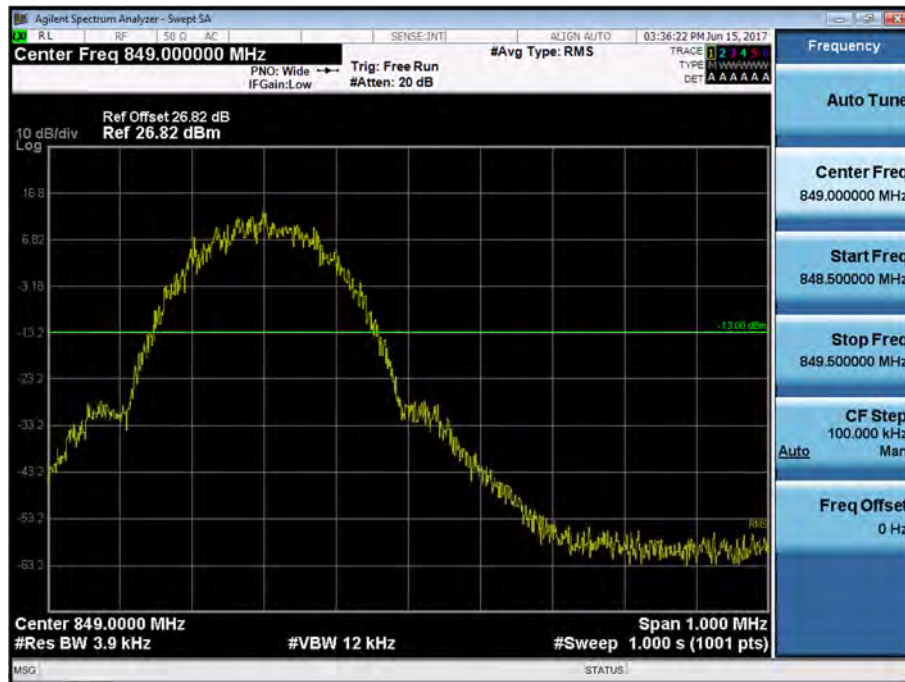
■ EDGE MODE (128 CH.) Block Edge 2



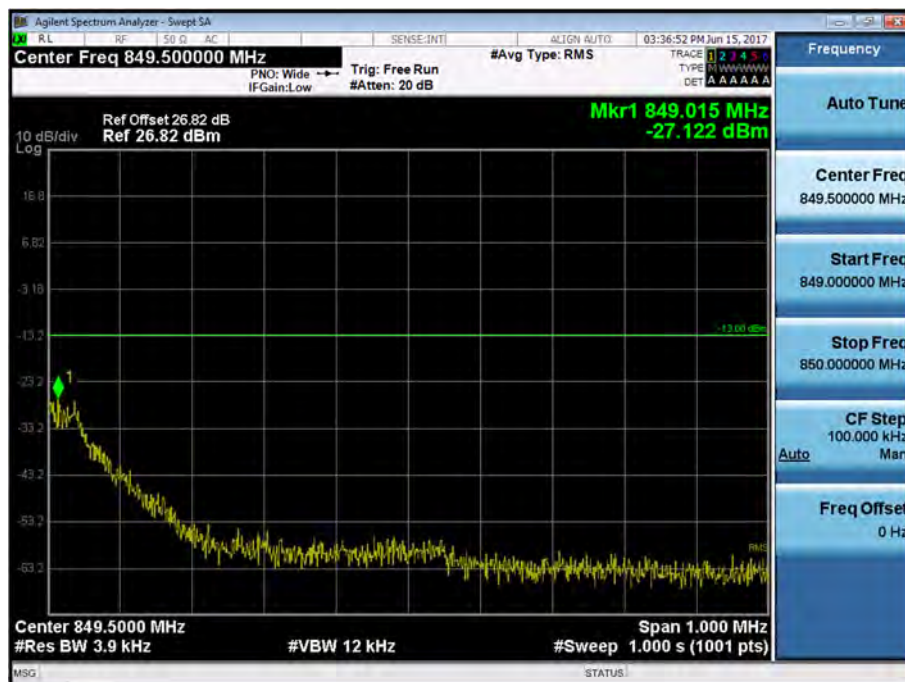
■ EDGE MODE (128 CH.) Block Edge 3



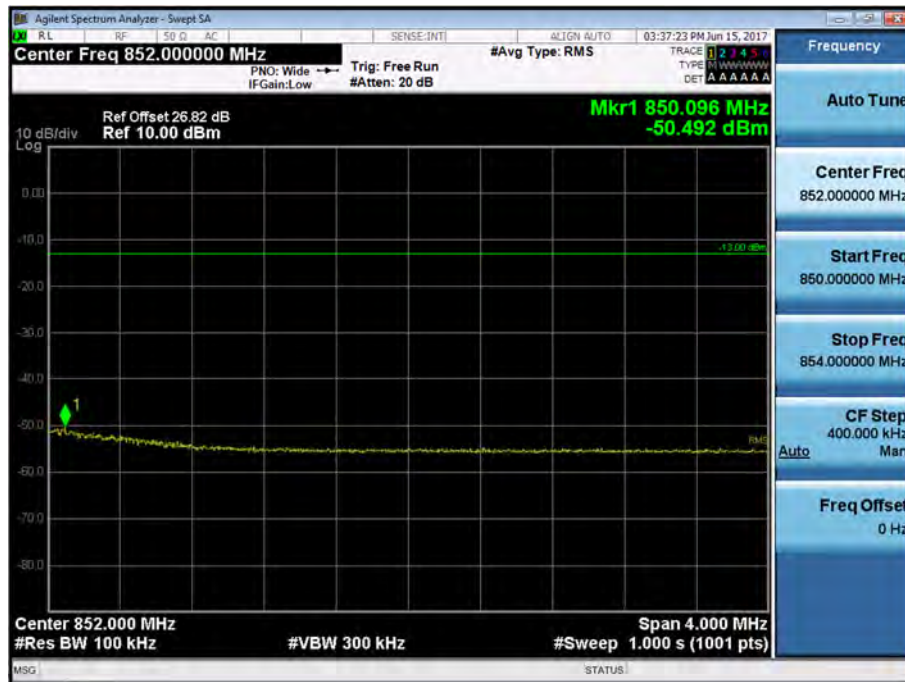
■ EDGE MODE (251 CH.) Block Edge 1



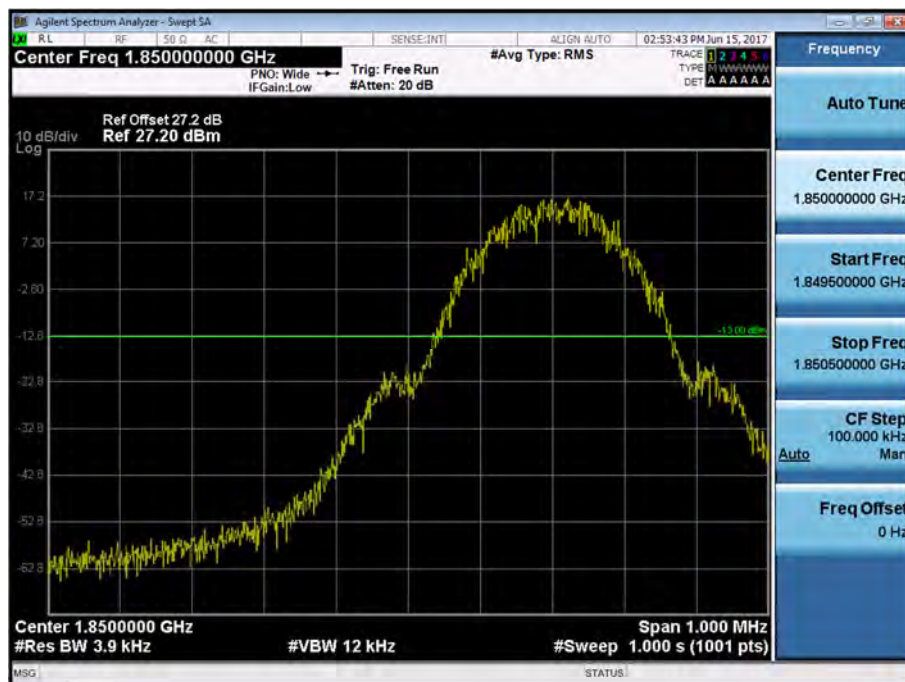
■ EDGE MODE (251 CH.) Block Edge 2



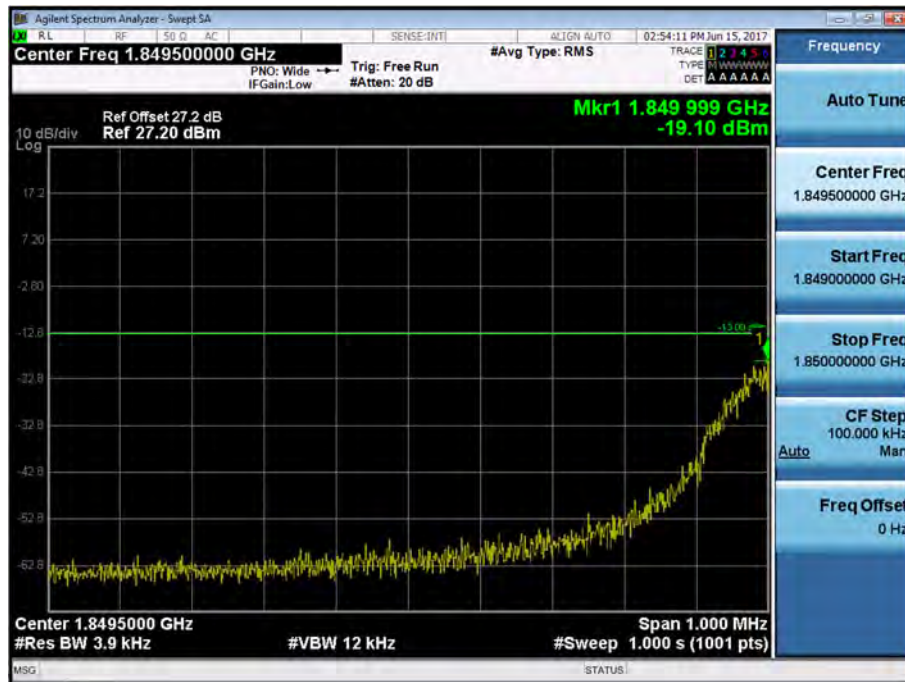
■ EDGE MODE (251 CH.) Block Edge 3



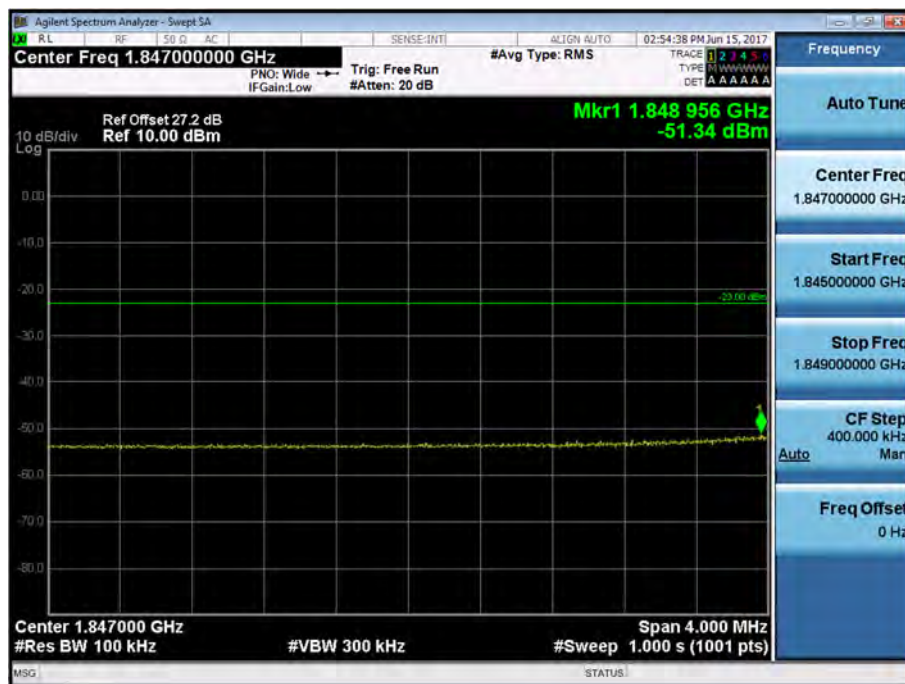
■ GSM1900 MODE (512 CH.) Block Edge 1



■ GSM1900 MODE (512 CH.) Block Edge 2



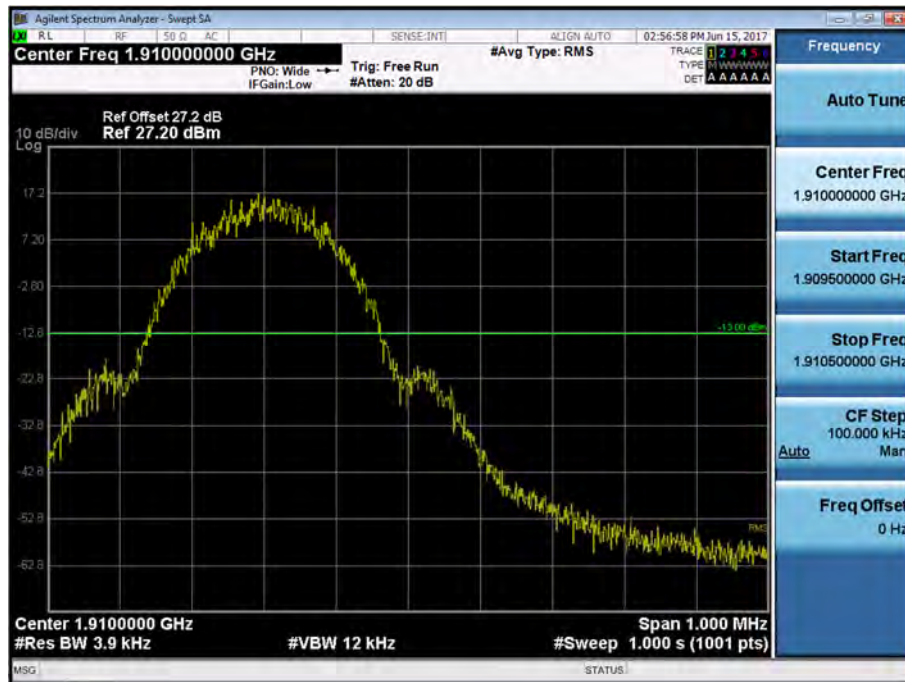
■ GSM1900 MODE (512 CH.) Block Edge 3



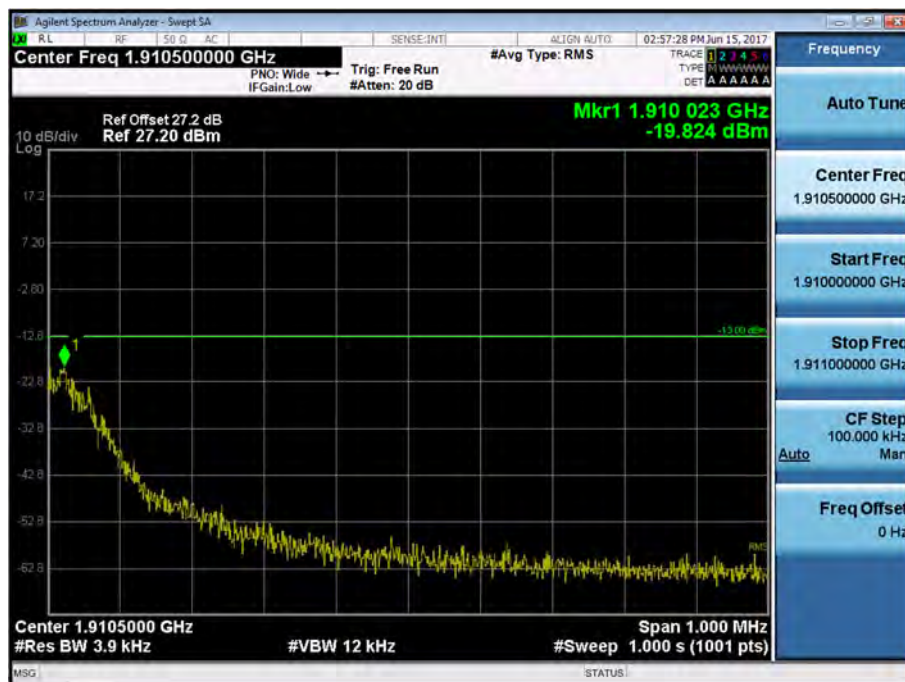
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB} = -51.34 \text{ dBm} + 10 \text{ dB} = -41.34 \text{ dBm}$

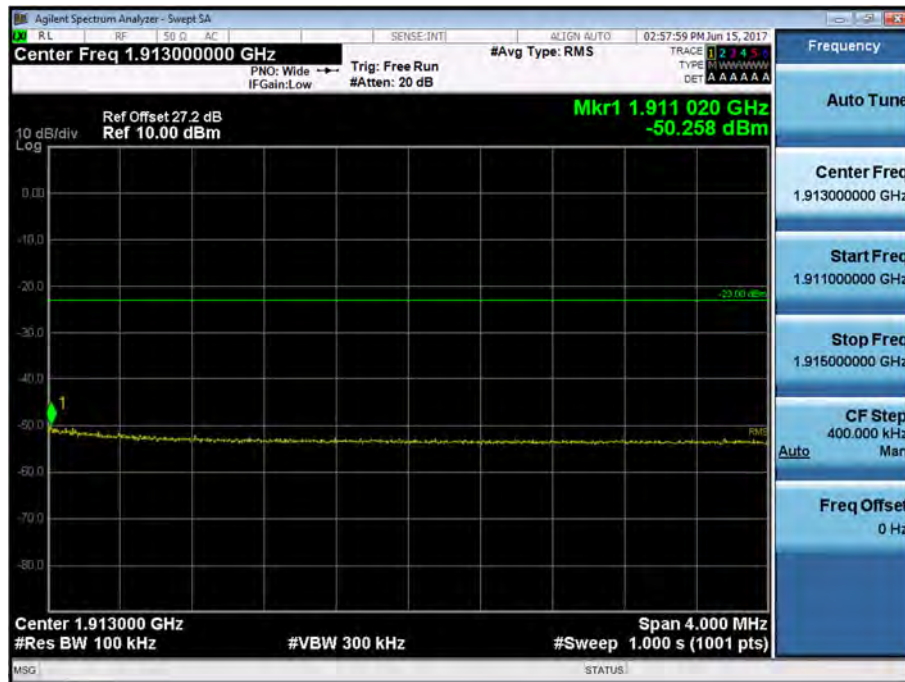
■ GSM1900 MODE (810 CH.) Block Edge 1



■ GSM1900 MODE (810 CH.) Block Edge 2



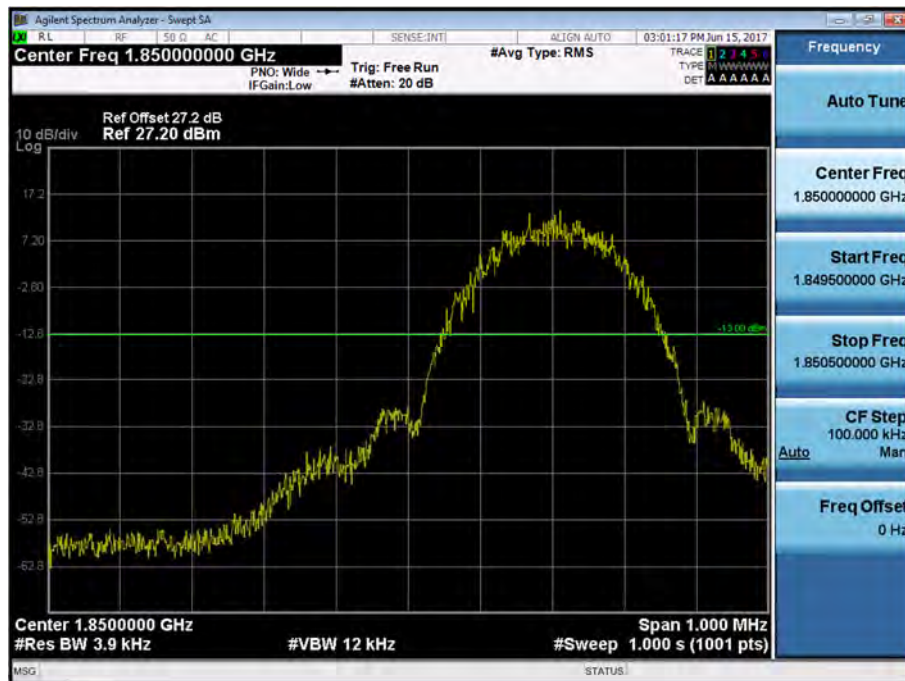
■ GSM1900 MODE (810 CH.) Block Edge 3



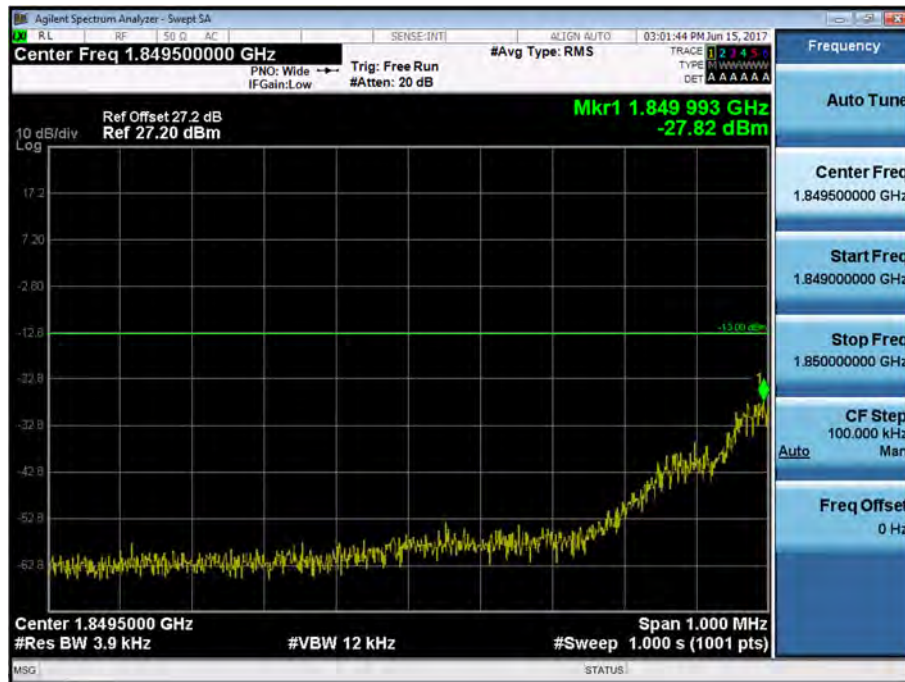
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB}$ = -50.258 dBm + 10 dB = **-40.258 dBm**

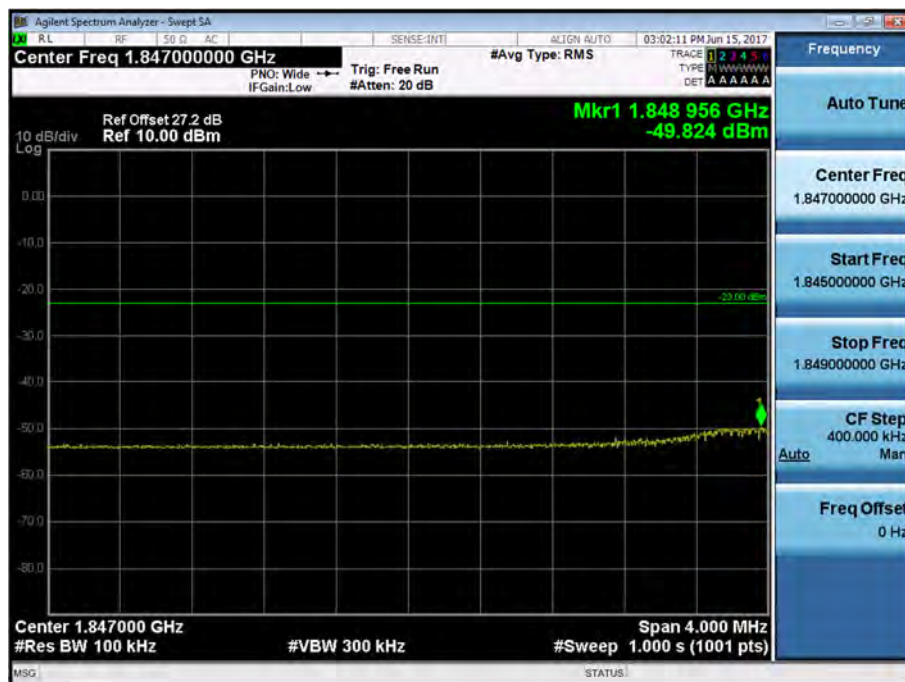
■ EDGE MODE (512 CH.) Block Edge 1



■ EDGE MODE (512 CH.) Block Edge 2



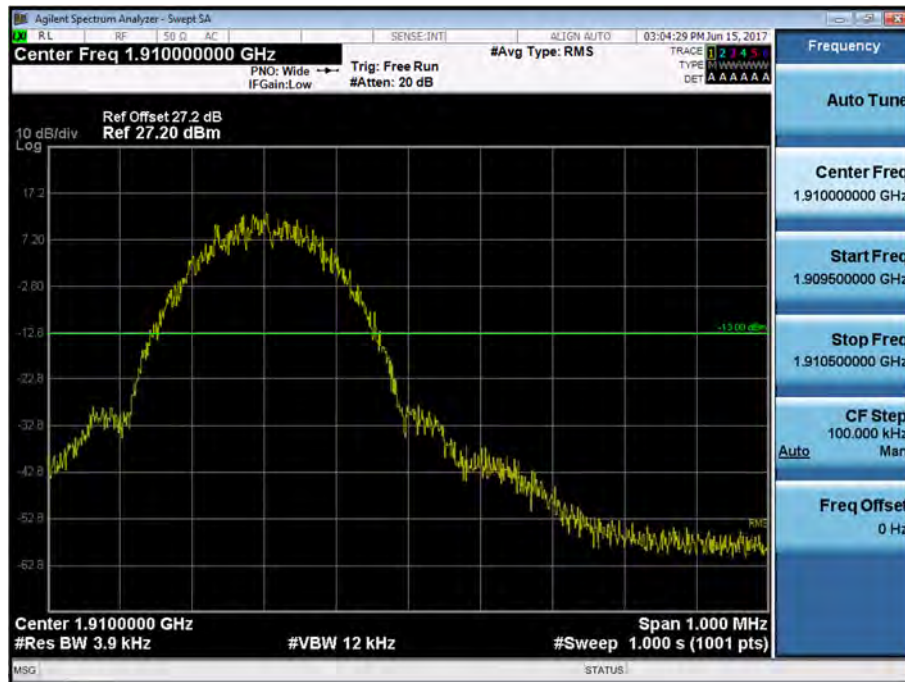
■ EDGE MODE (512 CH.) Block Edge 3



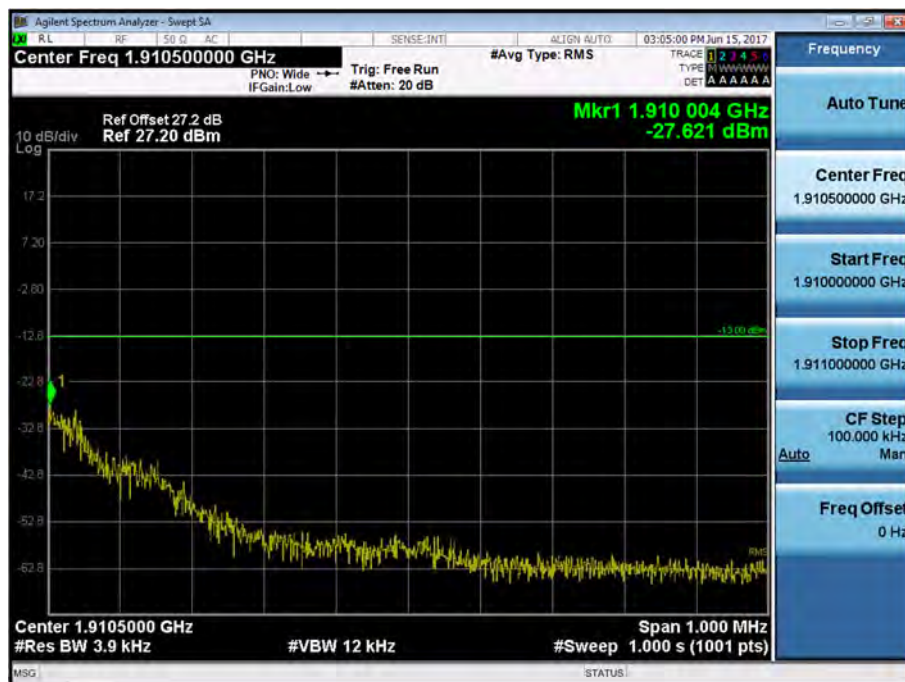
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz} / 100 \text{ kHz}) \text{ dB}$ = -49.824 dBm + 10 dB = **-39.824 dBm**

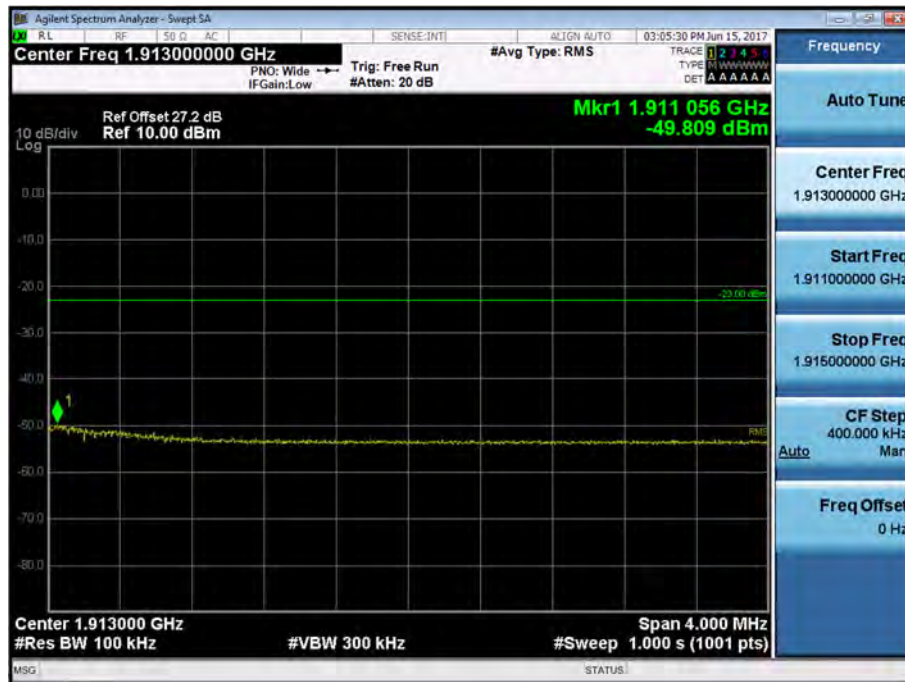
■ EDGE MODE (810 CH.) Block Edge 1



■ EDGE MODE (810 CH.) Block Edge 2



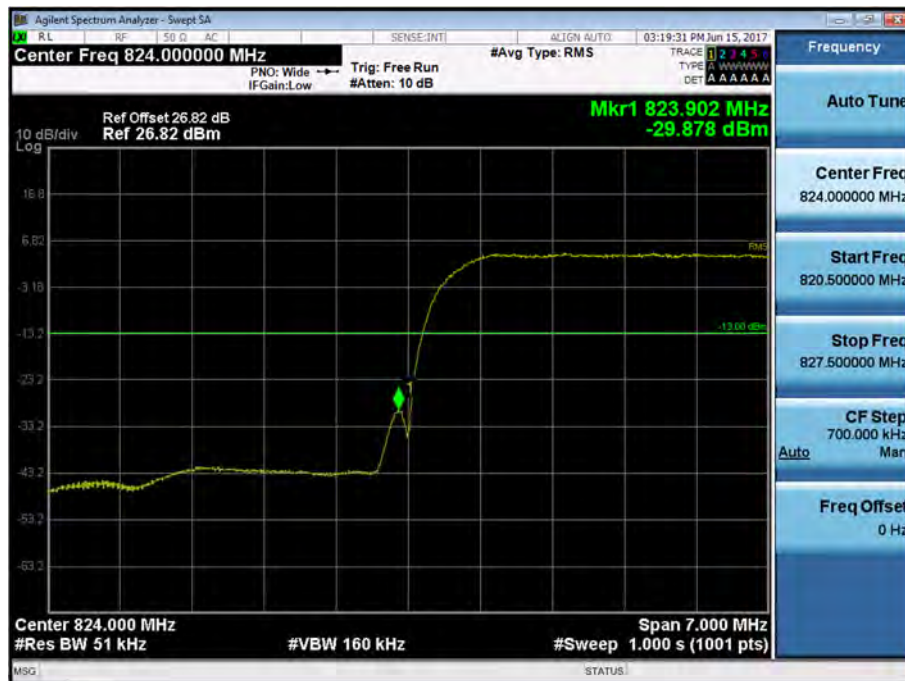
■ EDGE MODE (810 CH.) Block Edge 3



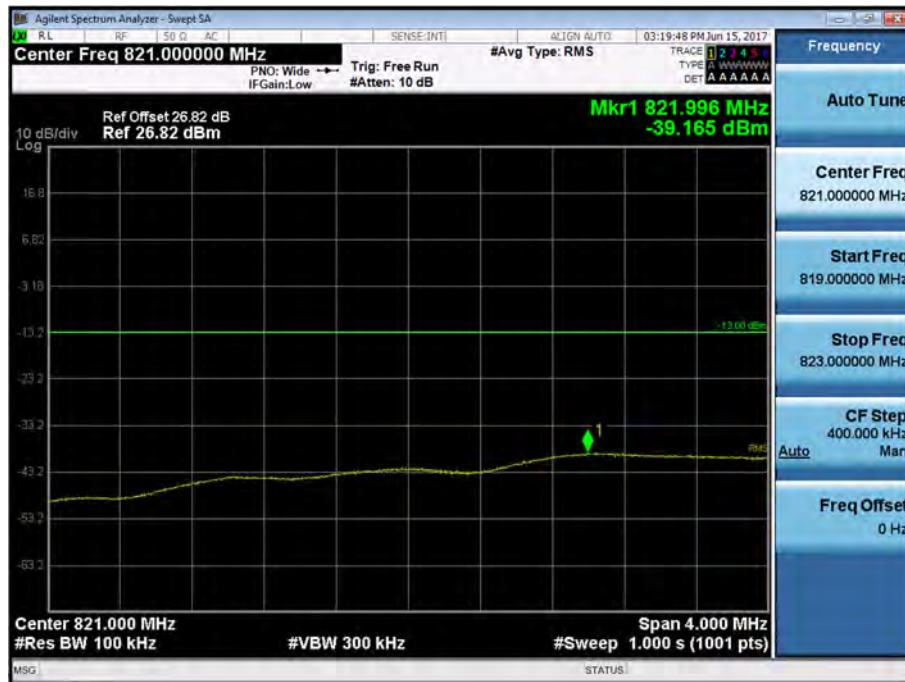
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB} = -49.809 \text{ dBm} + 10 \text{ dB} = -39.809 \text{ dBm}$

■ WCDMA850 MODE (4132 CH.) Block Edge



■ WCDMA850 MODE (4132 CH.) – 4 MHz Span



■ WCDMA850MODE (4233 CH.) Block Edge



■ WCDMA850MODE (4233 CH.) – 4 MHz Span



■ WCDMA1900 MODE (9262 CH.) Block Edge



■ WCDMA1900 MODE (9262 CH.) – 4 MHz Span



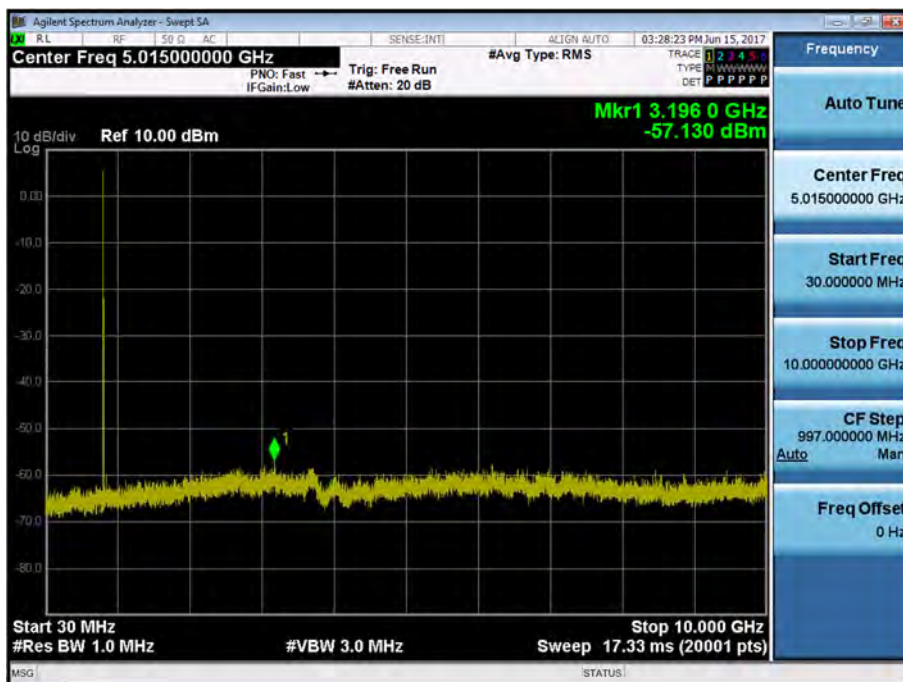
■ WCDMA1900 MODE (9538 CH.) Block Edge



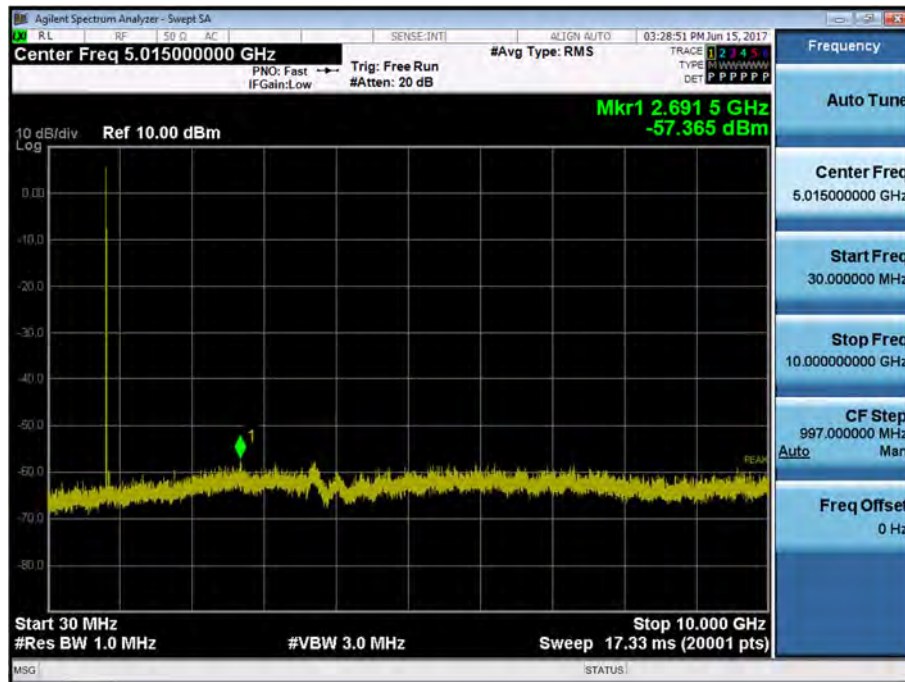
■ WCDMA1900 MODE (9538 CH.) – 4 MHz Span



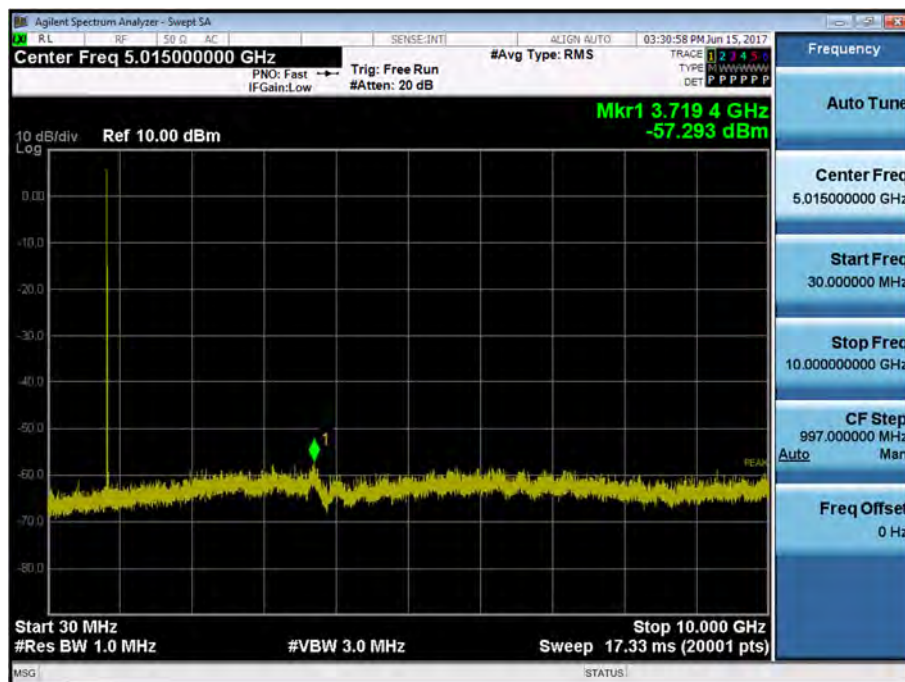
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions



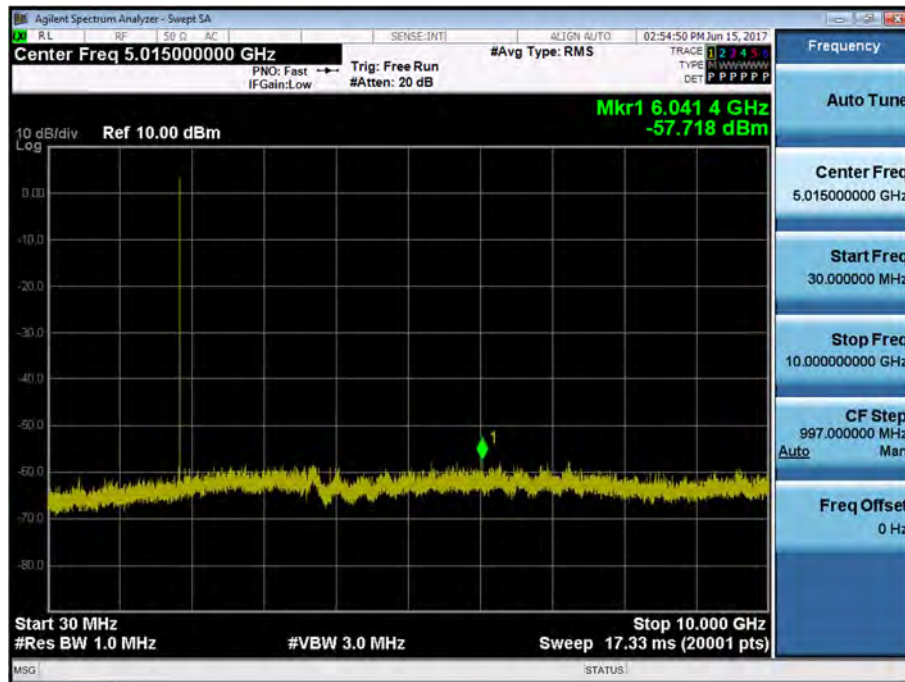
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions



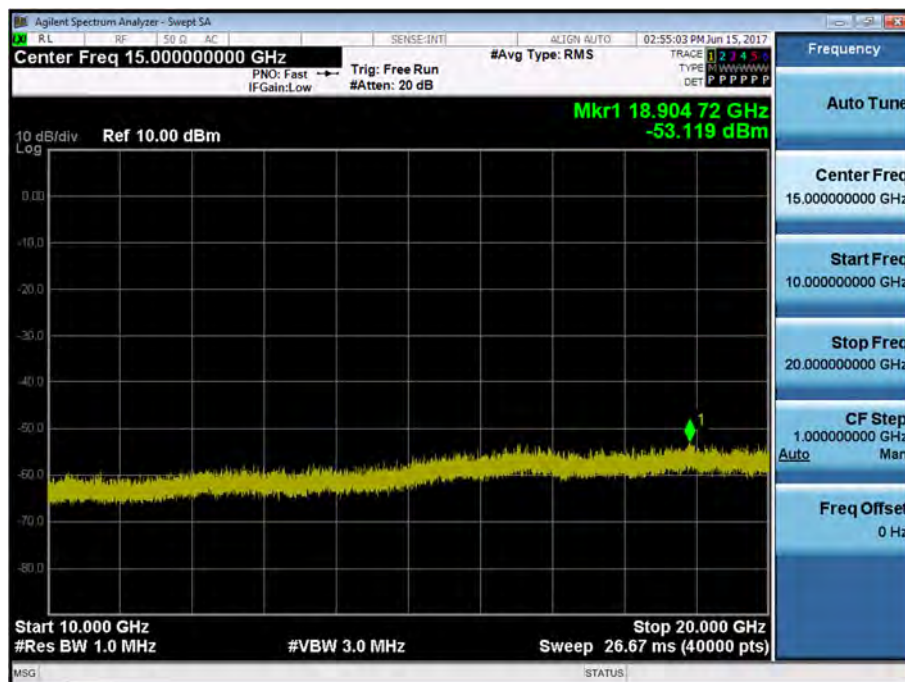
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions



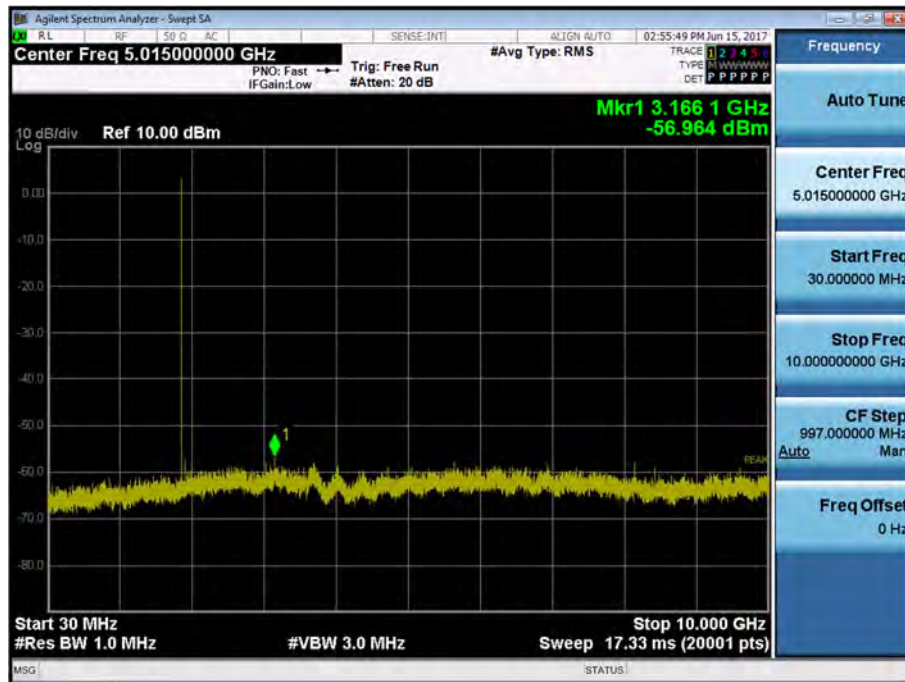
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1



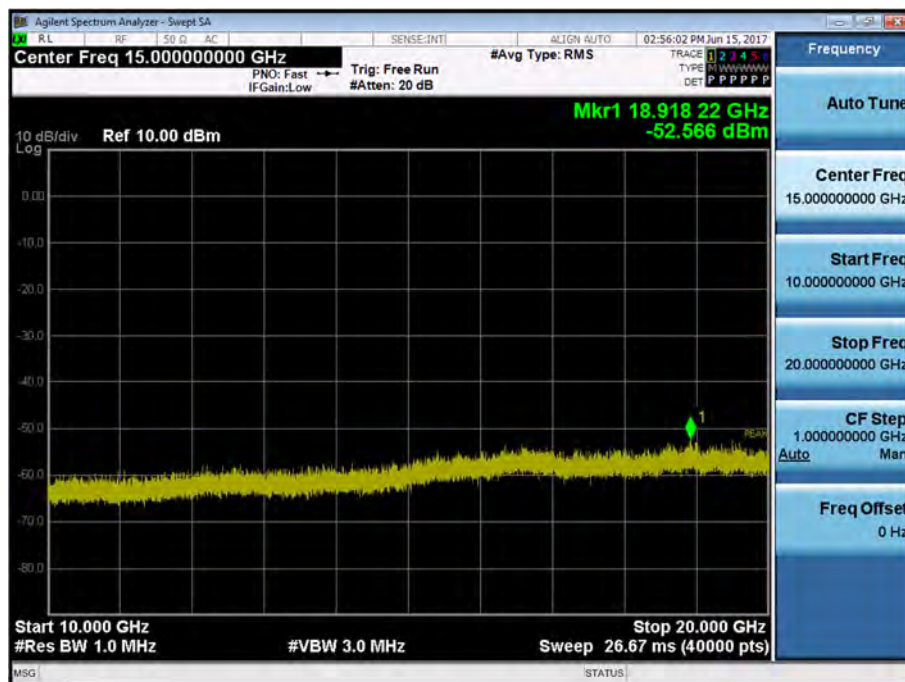
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



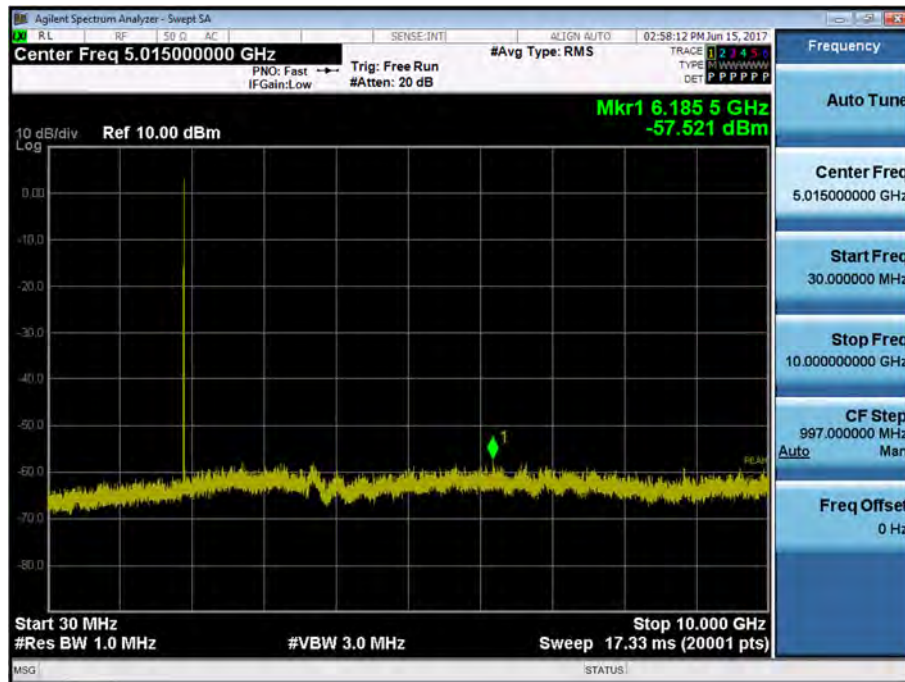
■ GSM1900 MODE (661 CH) Conducted Spurious Emissions1



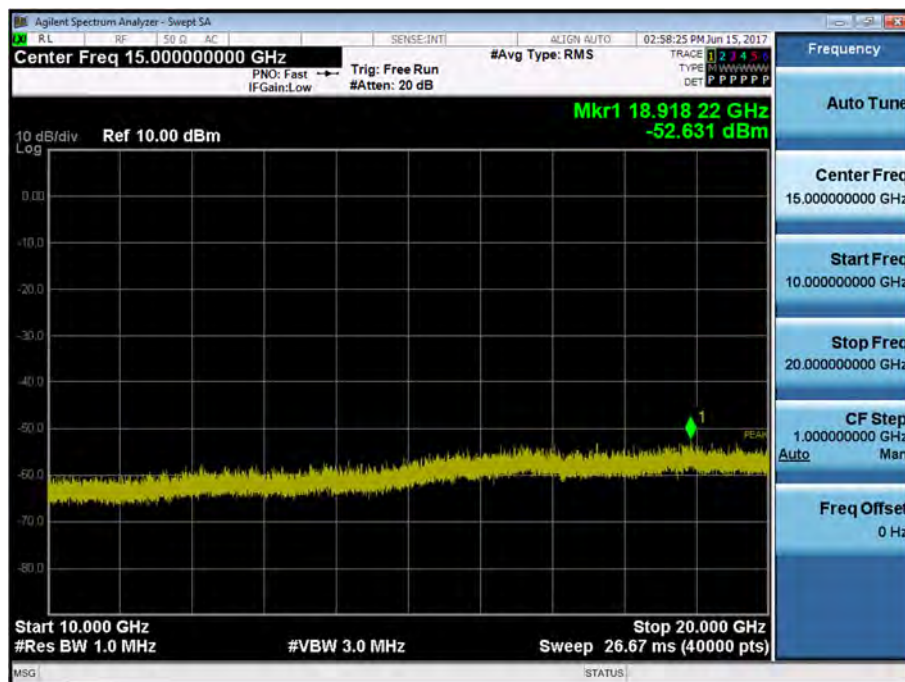
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2



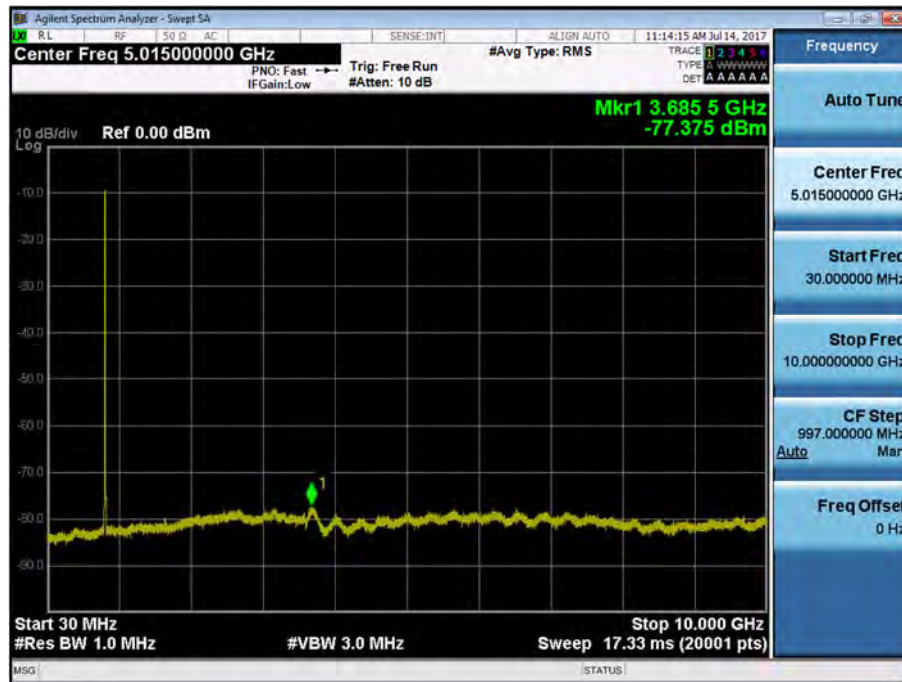
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1



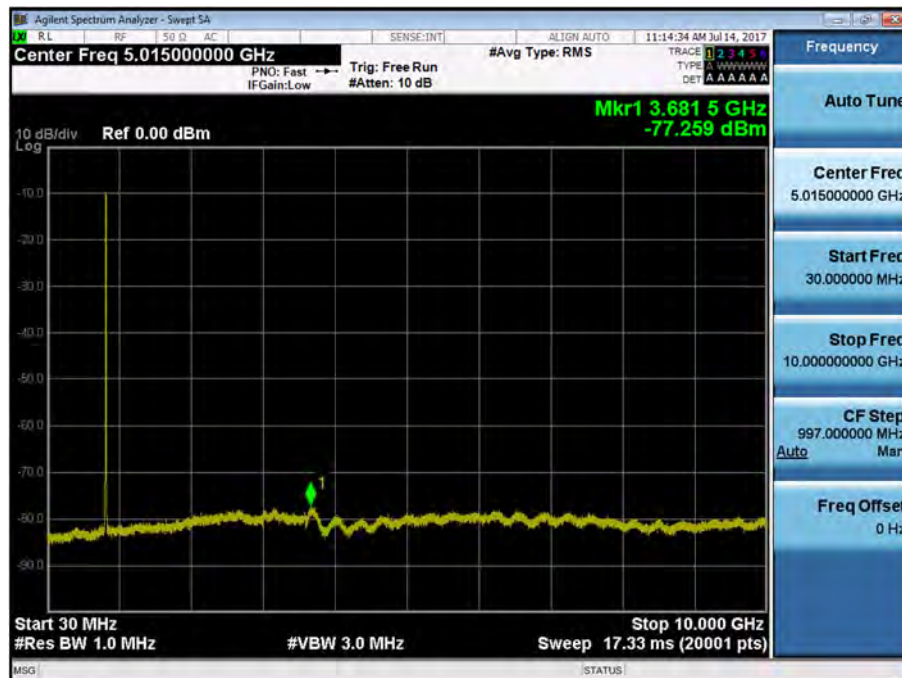
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions



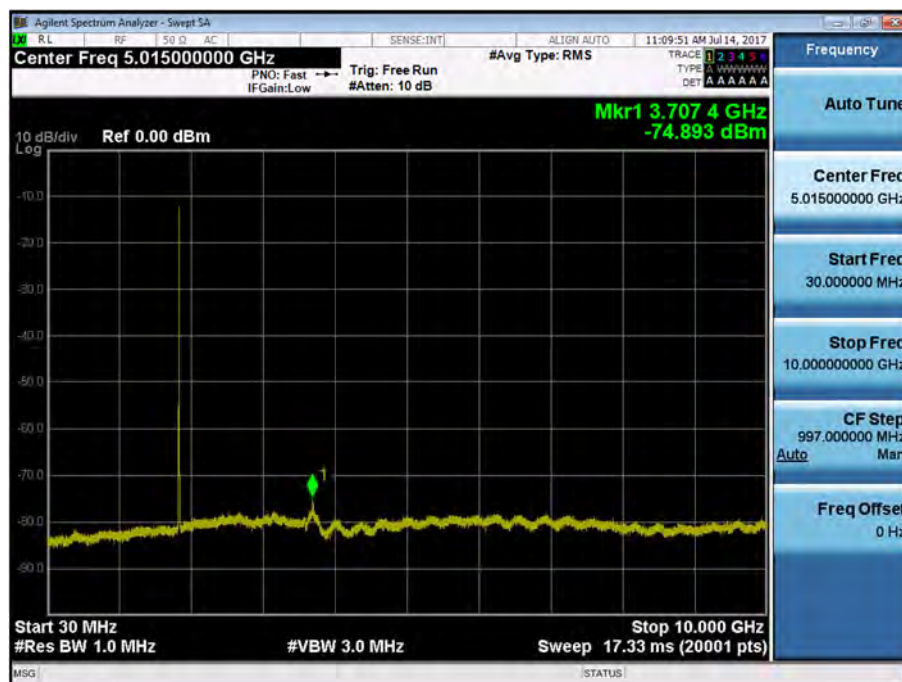
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions



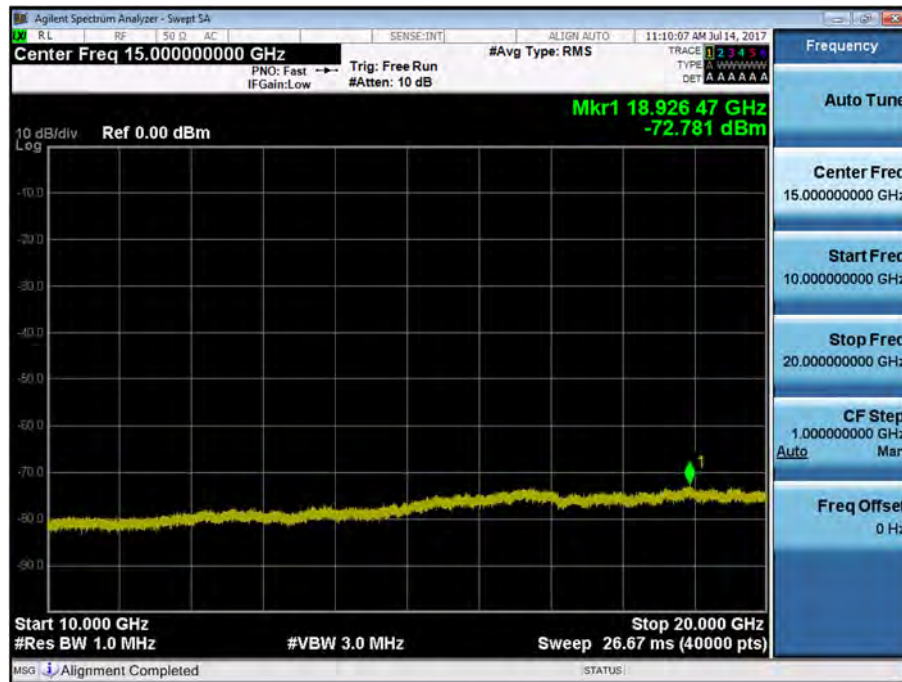
■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions



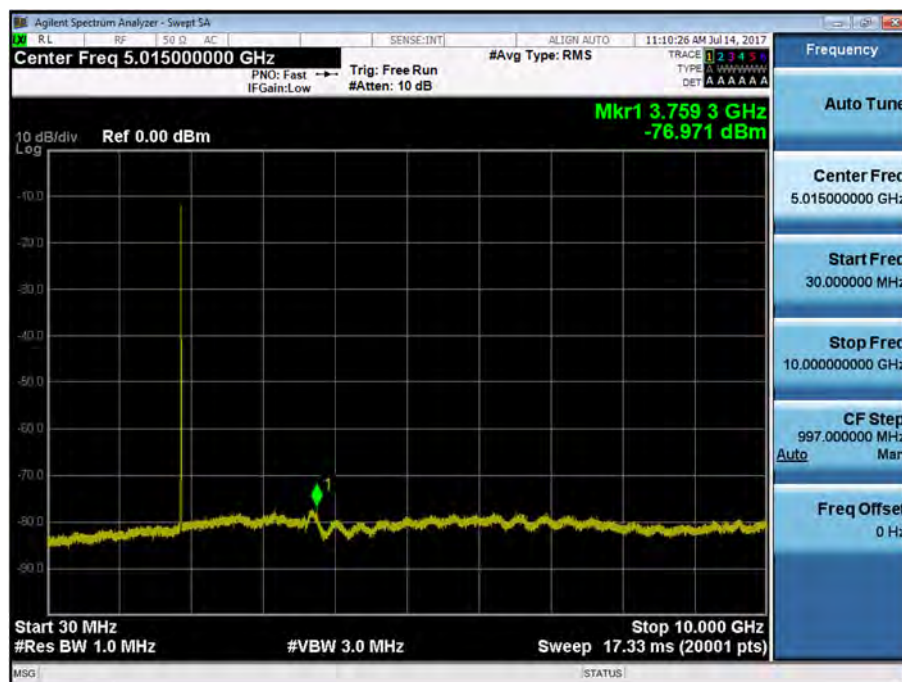
■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions1



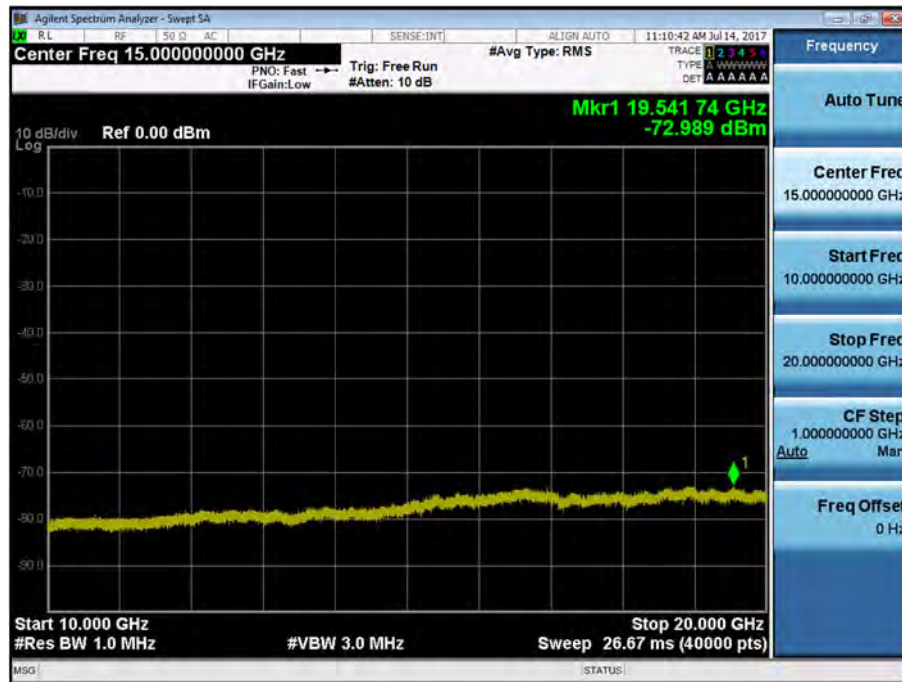
■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions2



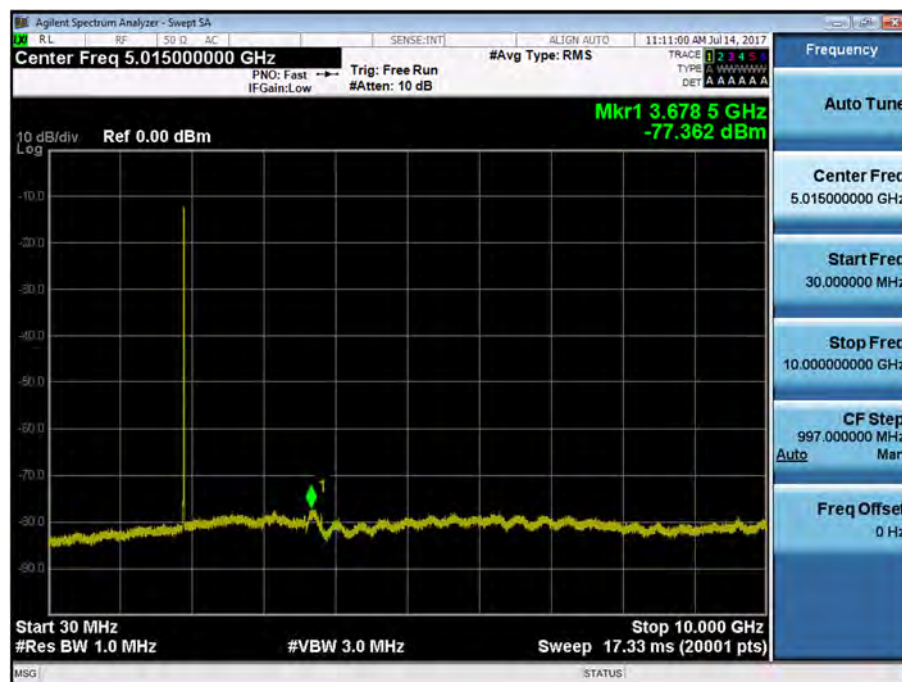
■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions1



■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions2



■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions1

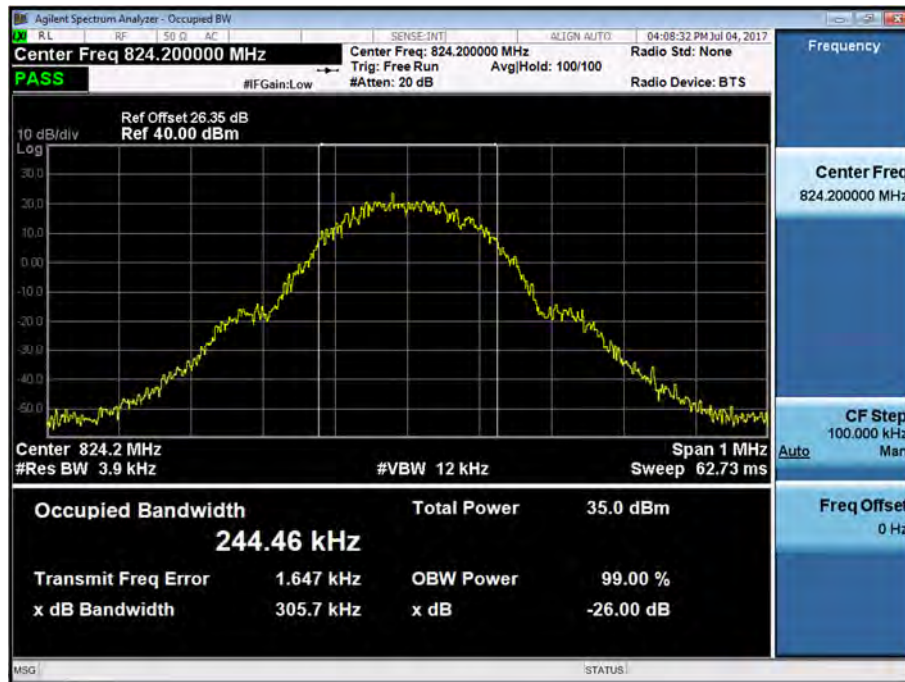


■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions2

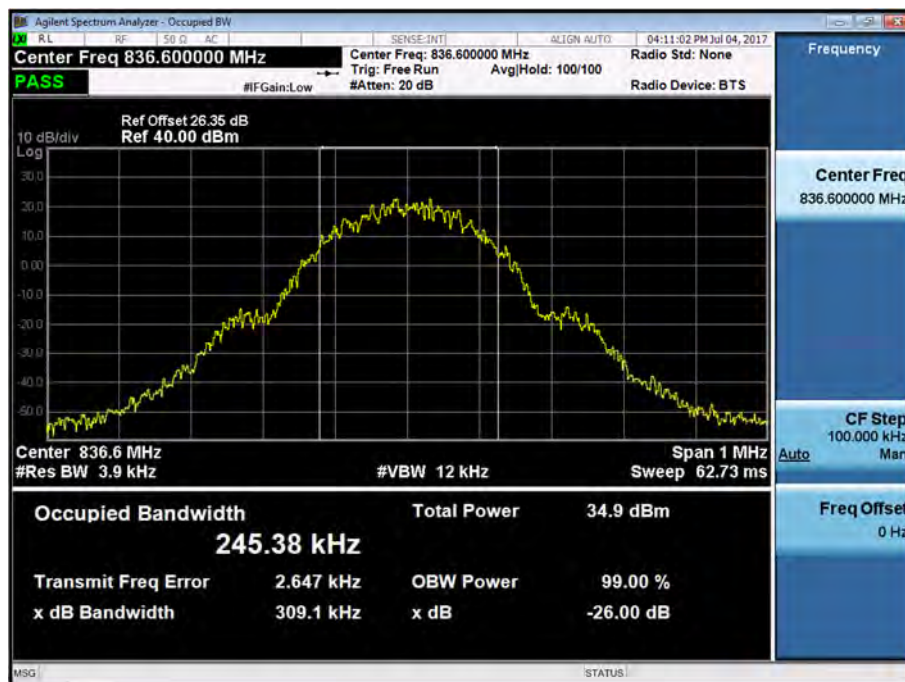


10. TEST PLOTS: ALT Mode

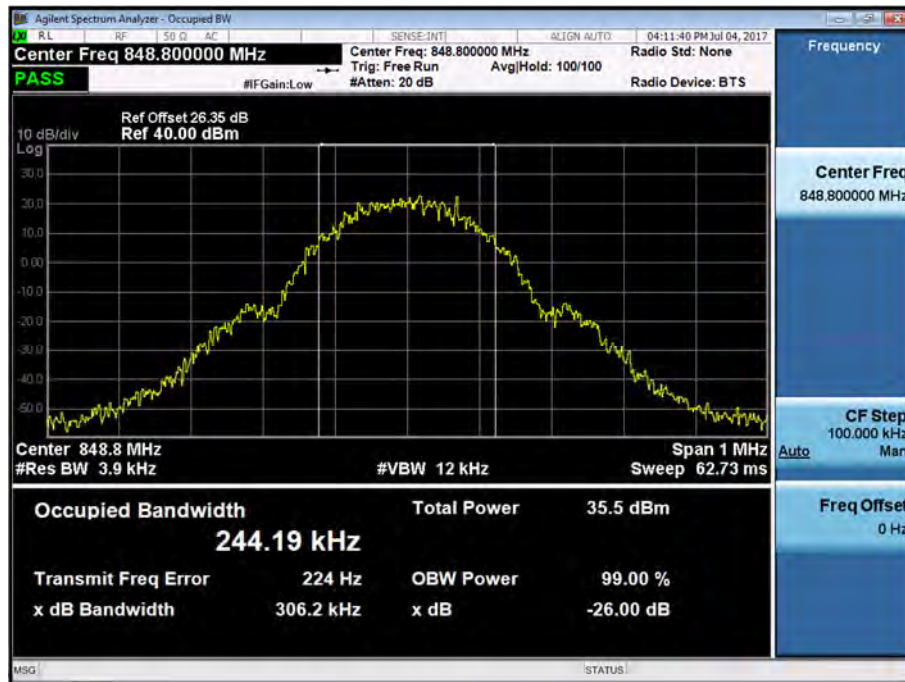
■ GSM850 MODE (128 CH.) Occupied Bandwidth



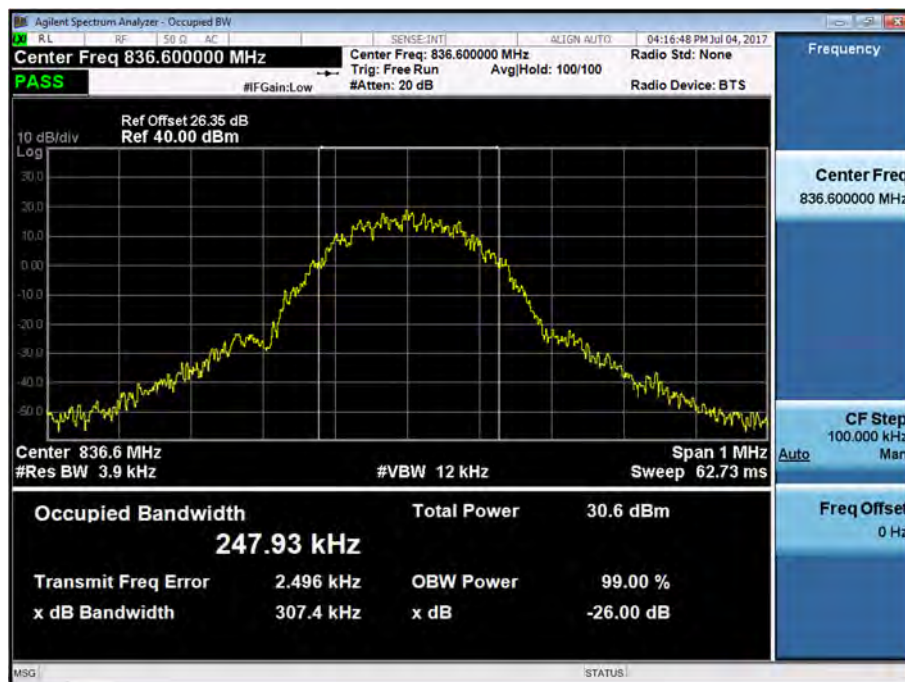
■ GSM850 MODE (190 CH.) Occupied Bandwidth



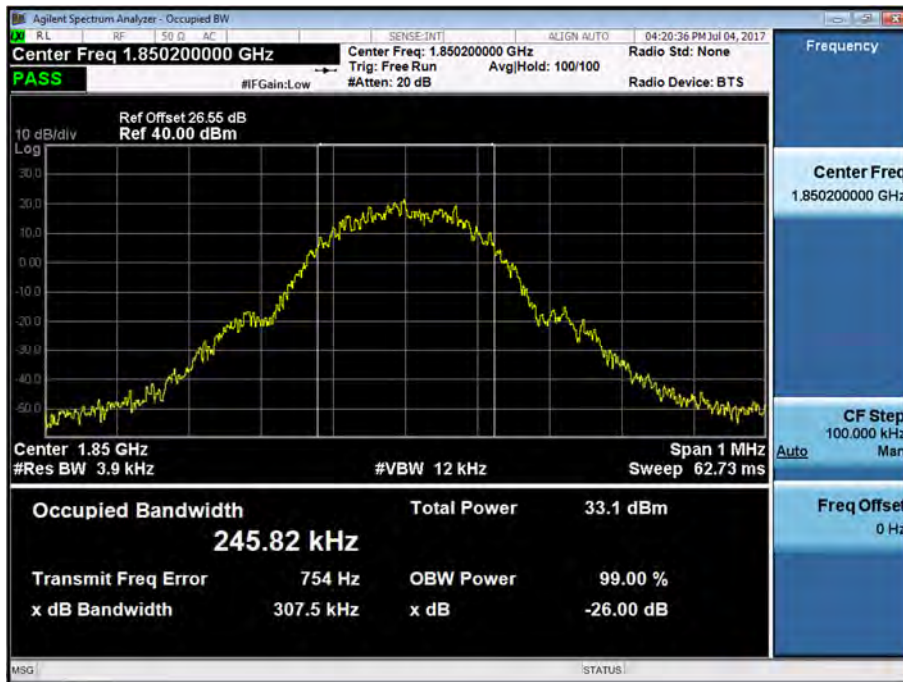
■ GSM850 MODE (251 CH.) Occupied Bandwidth



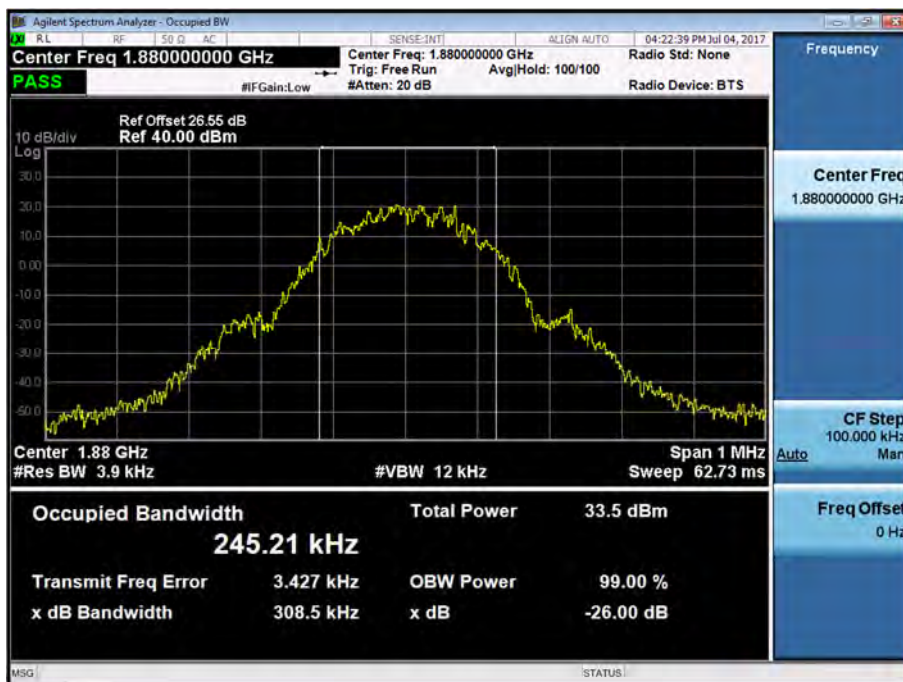
■ GSM850 EDGE (190 CH.) Occupied Bandwidth



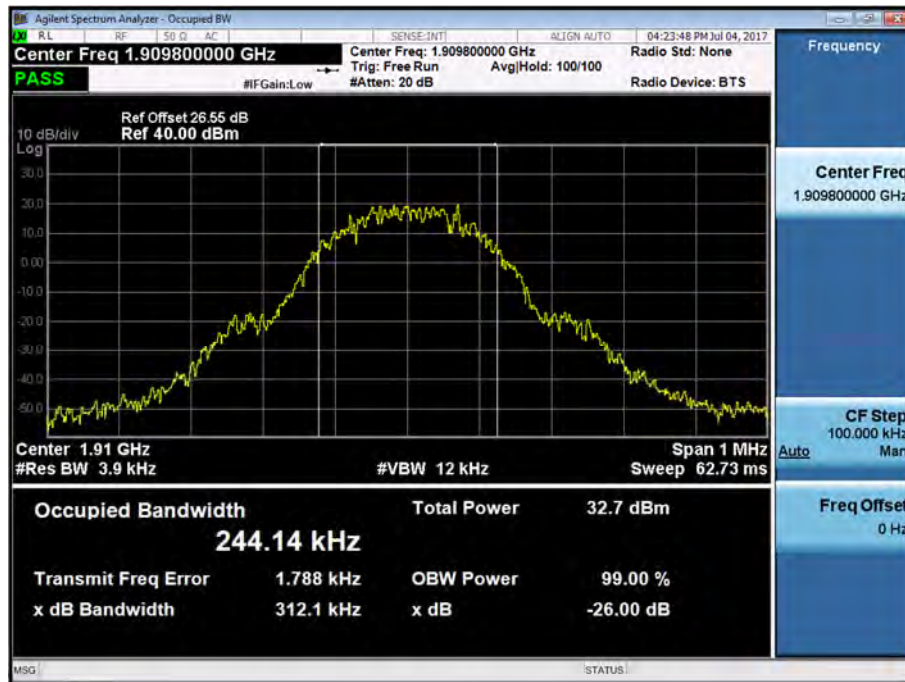
■ GSM1900 MODE (512 CH.) Occupied Bandwidth



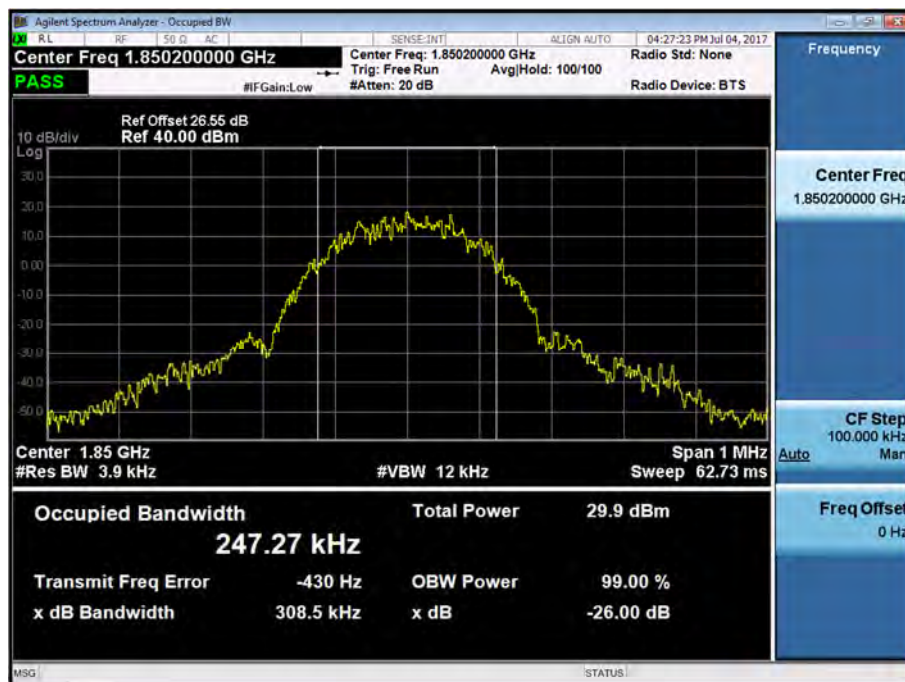
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



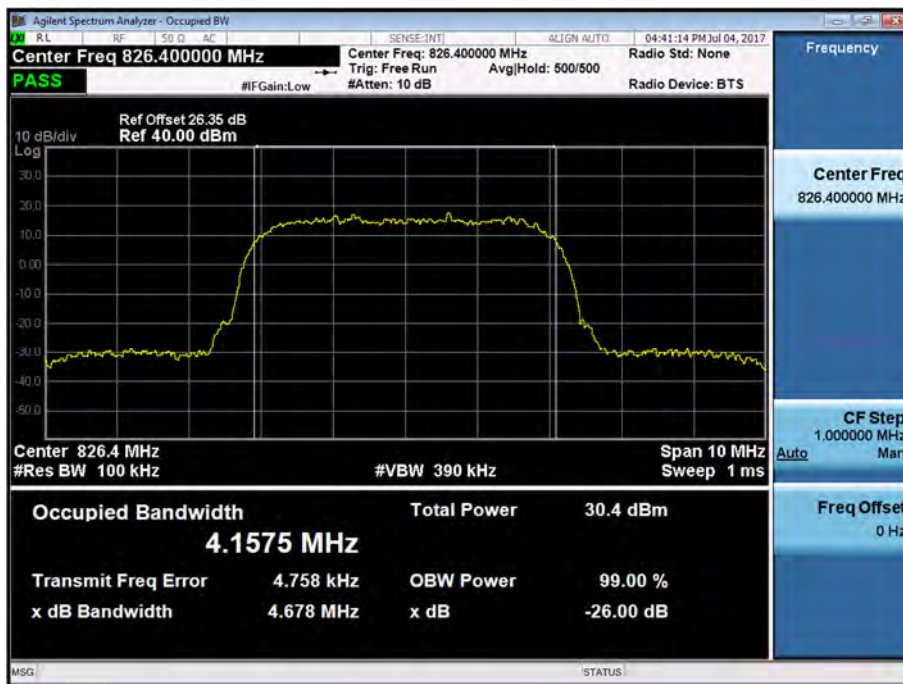
■ GSM1900 MODE (810 CH.) Occupied Bandwidth



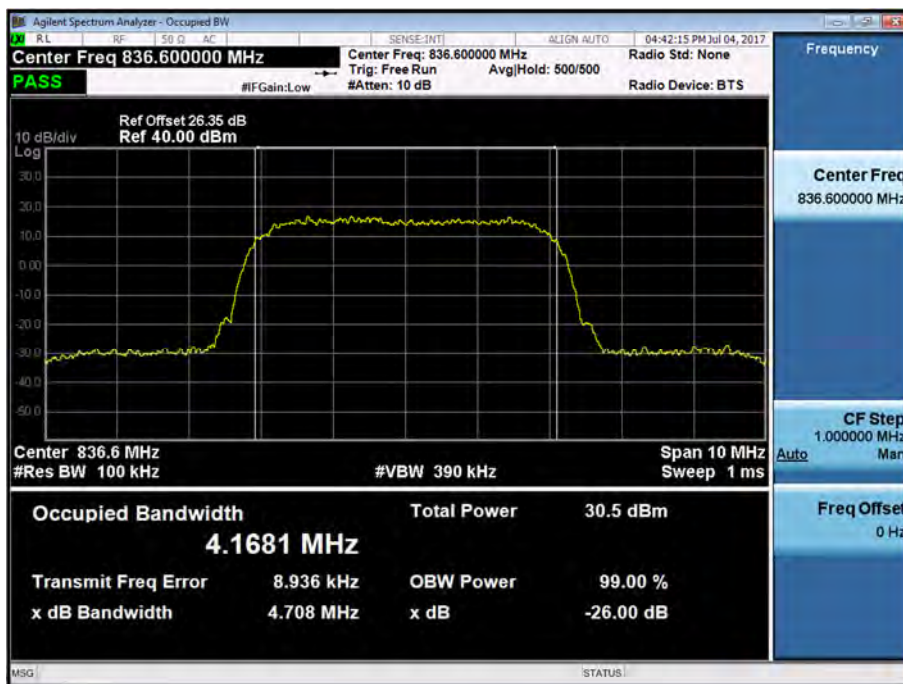
■ GSM1900 EDGE (512 CH.) Occupied Bandwidth



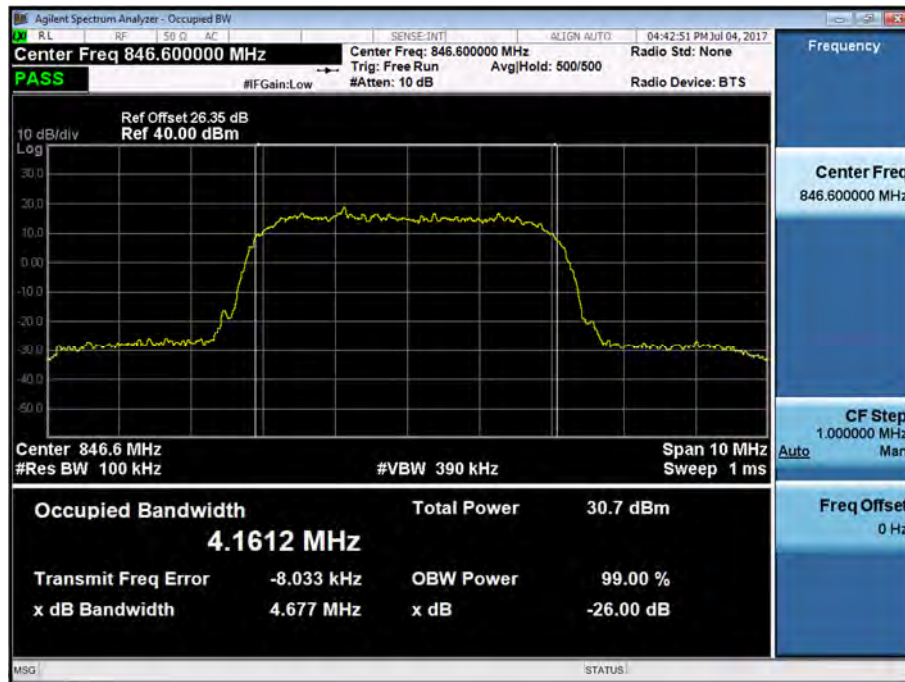
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



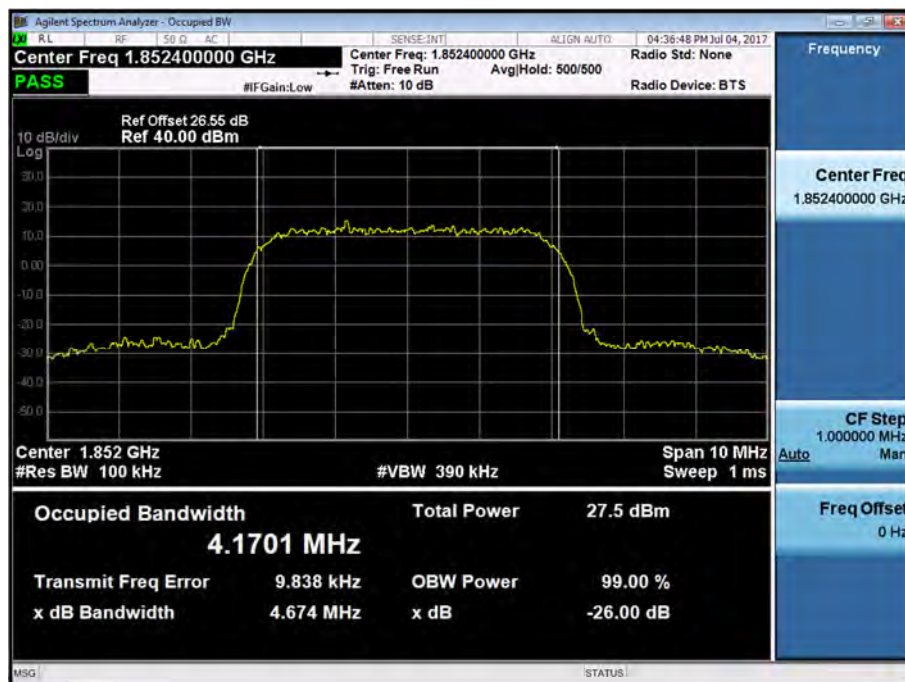
■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



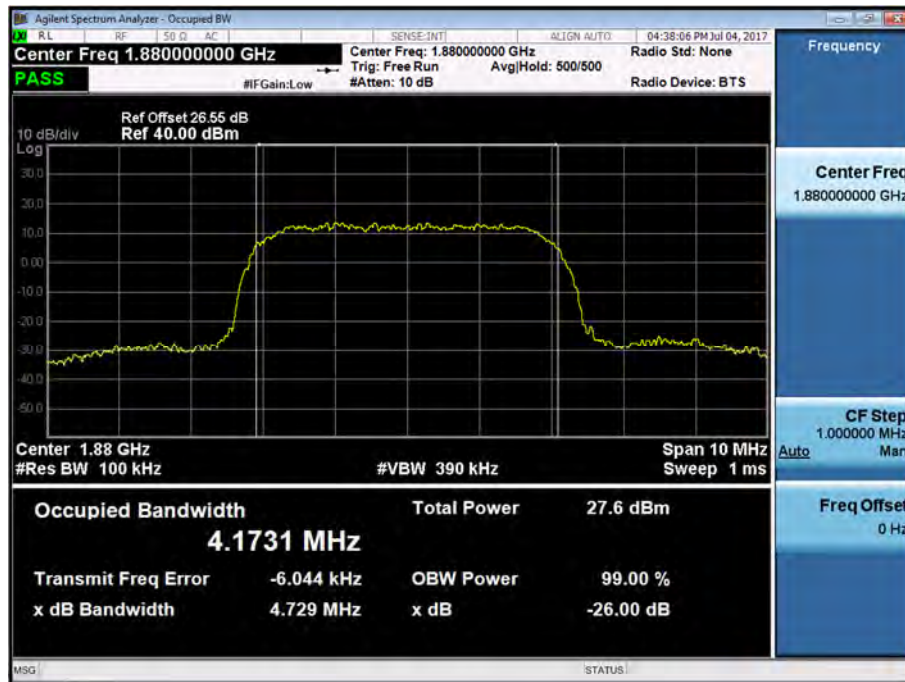
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



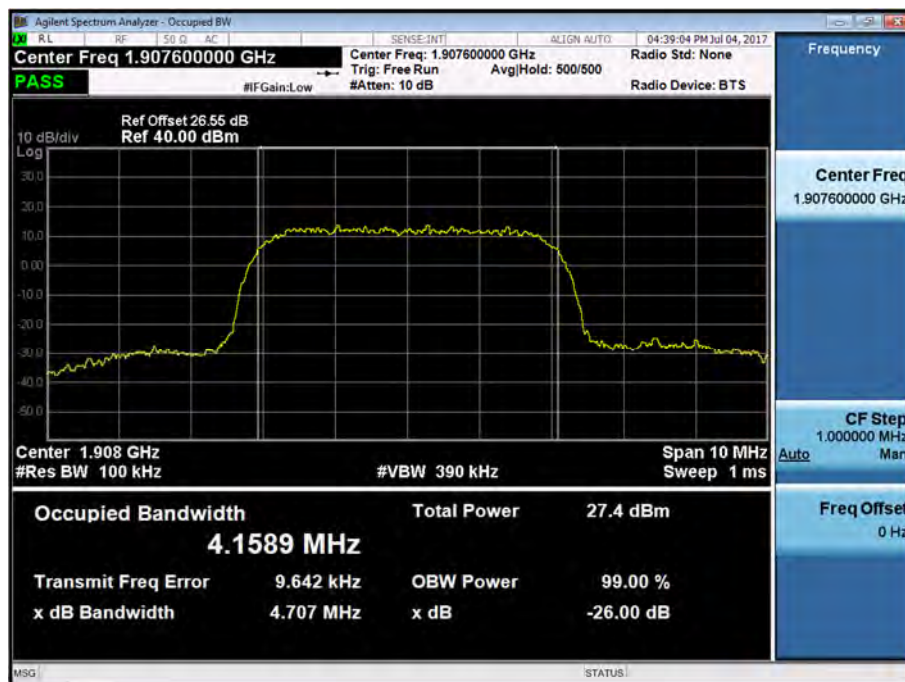
■ WCDMA1900 MODE (9262 CH.) Occupied Bandwidth



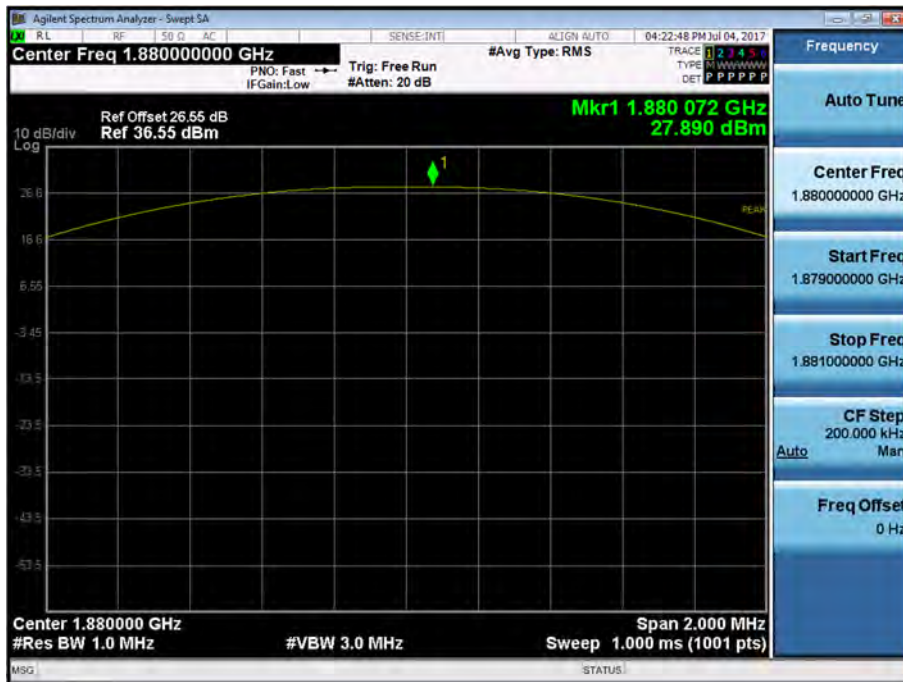
■ WCDMA1900 MODE (9400 CH.) Occupied Bandwidth



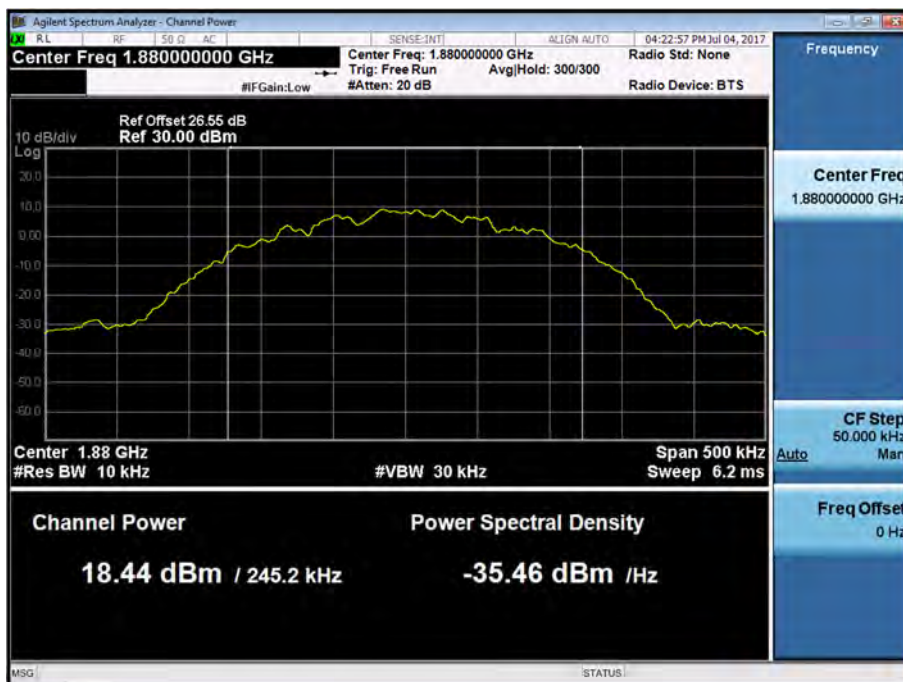
■ WCDMA1900 MODE (9538 CH.) Occupied Bandwidth



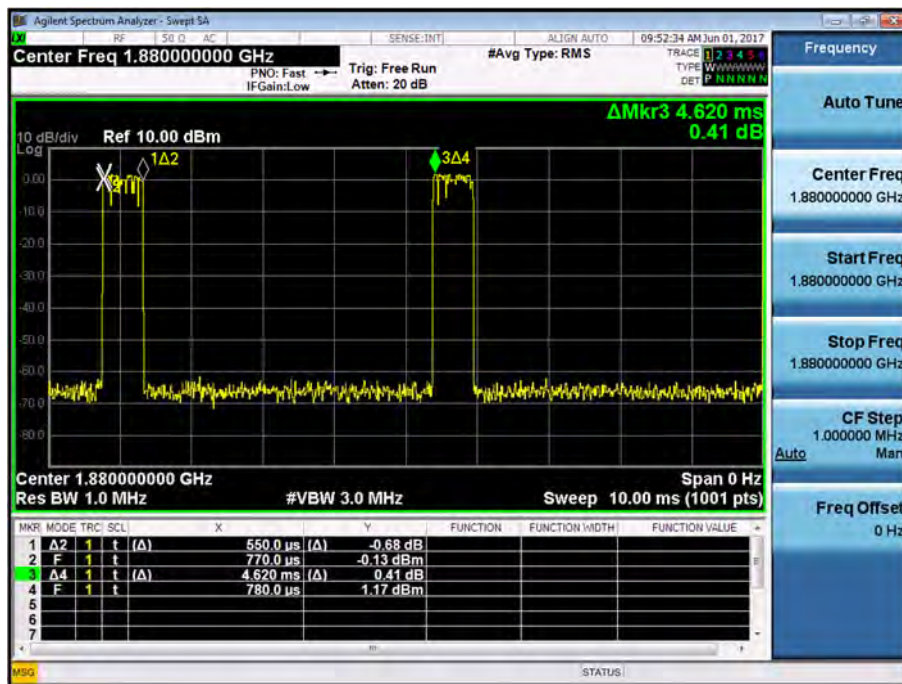
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Pk}



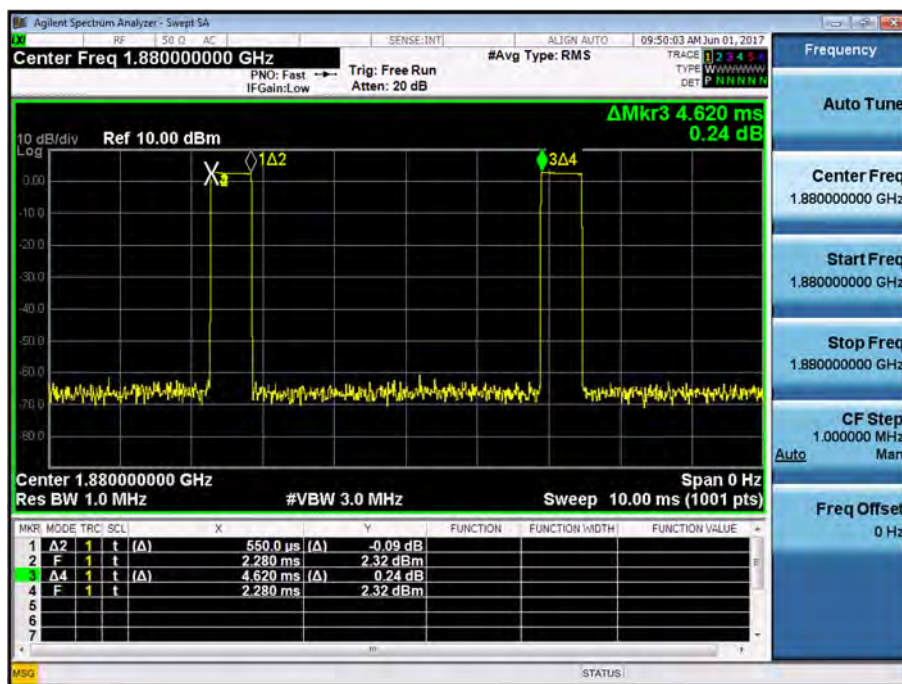
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Avg}



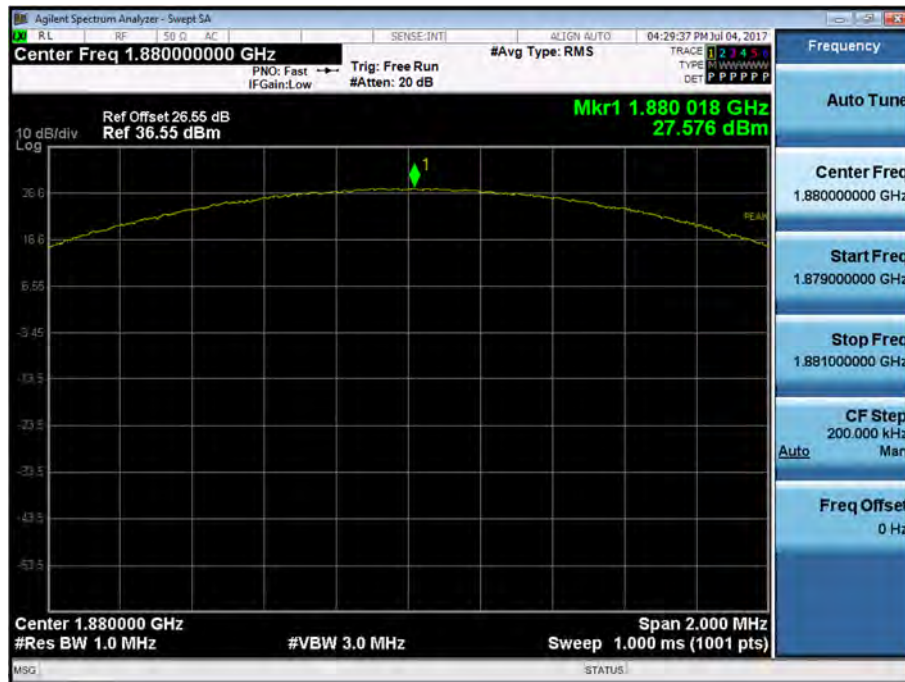
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio Duty



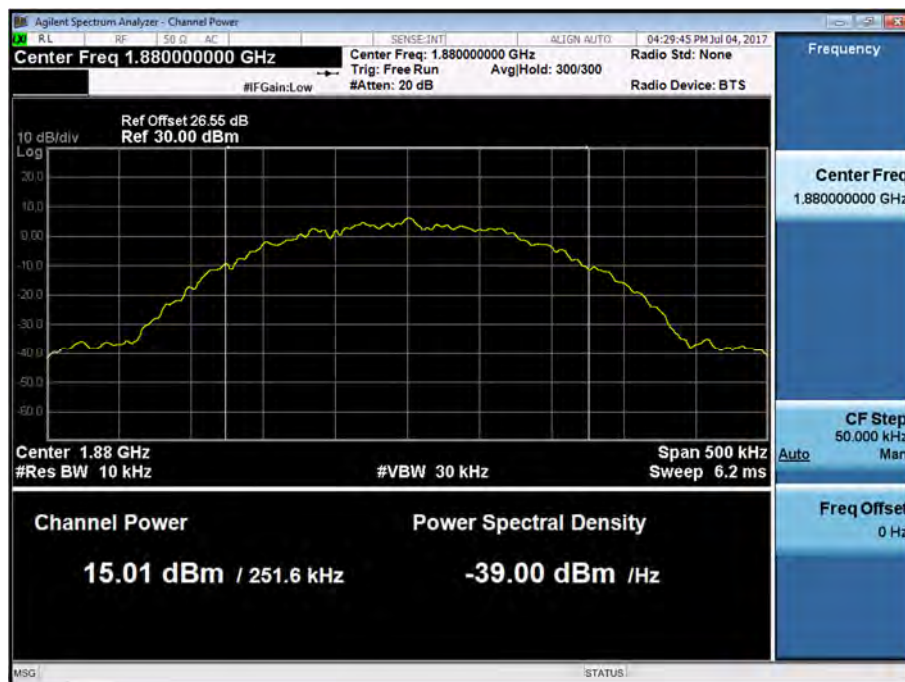
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio Duty



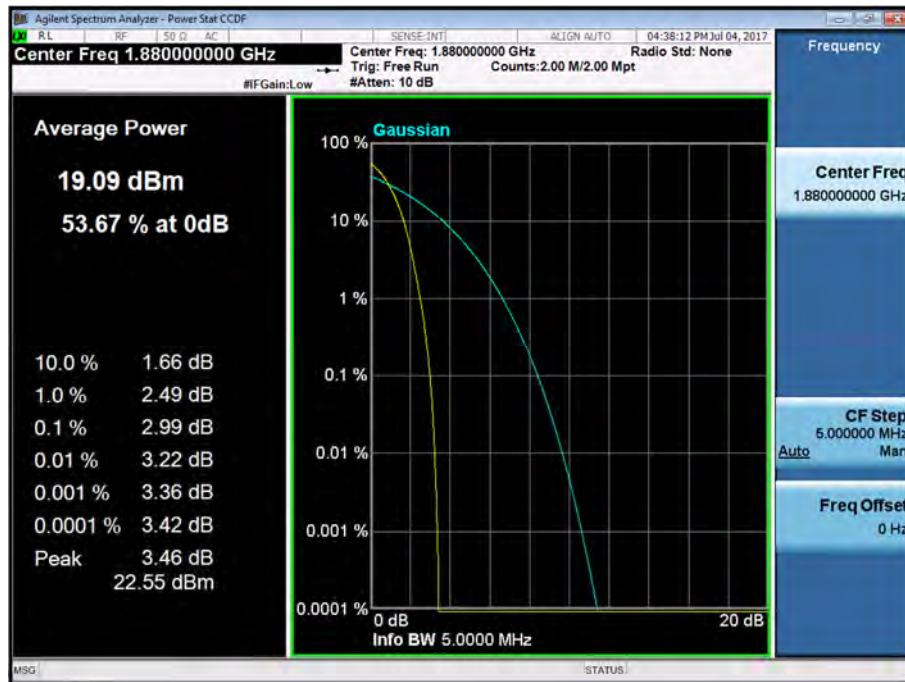
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Pk}



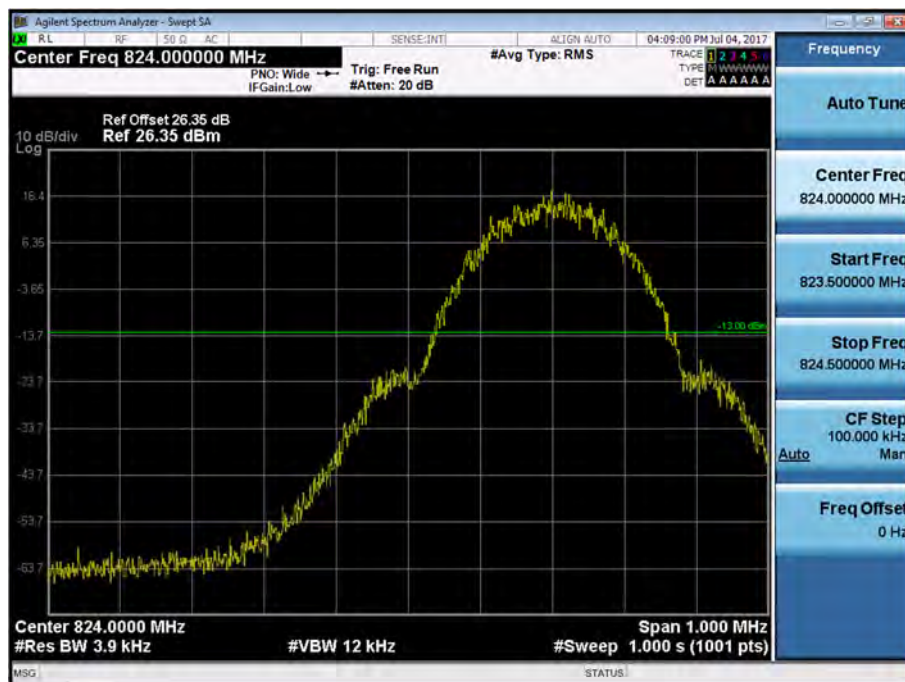
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Avg}



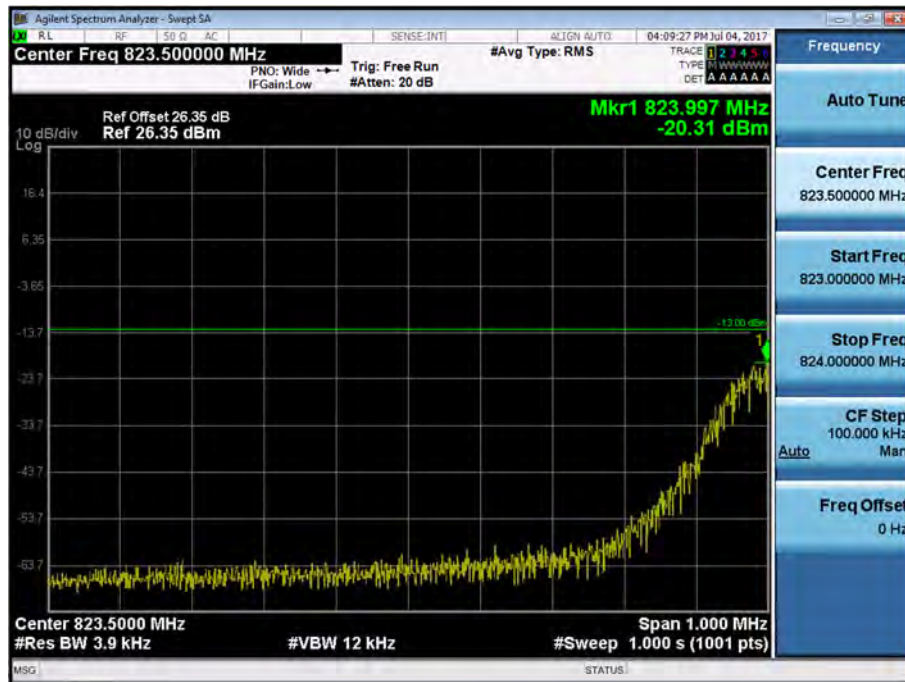
■ WCDMA1900 MODE (9400 CH.) Peak-to-Average Ratio



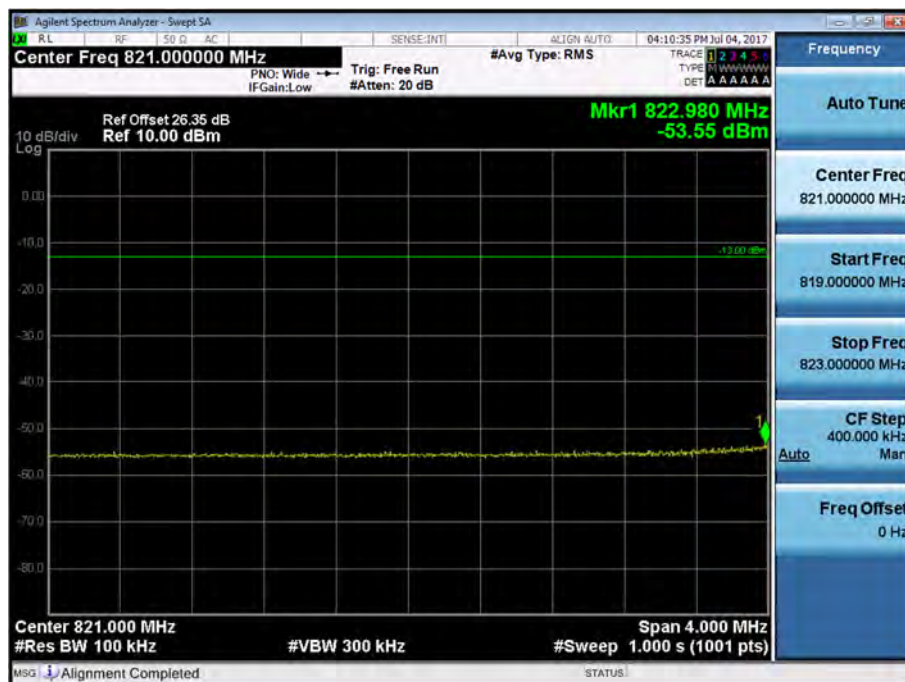
■ GSM850 MODE (128 CH.) Block Edge 1



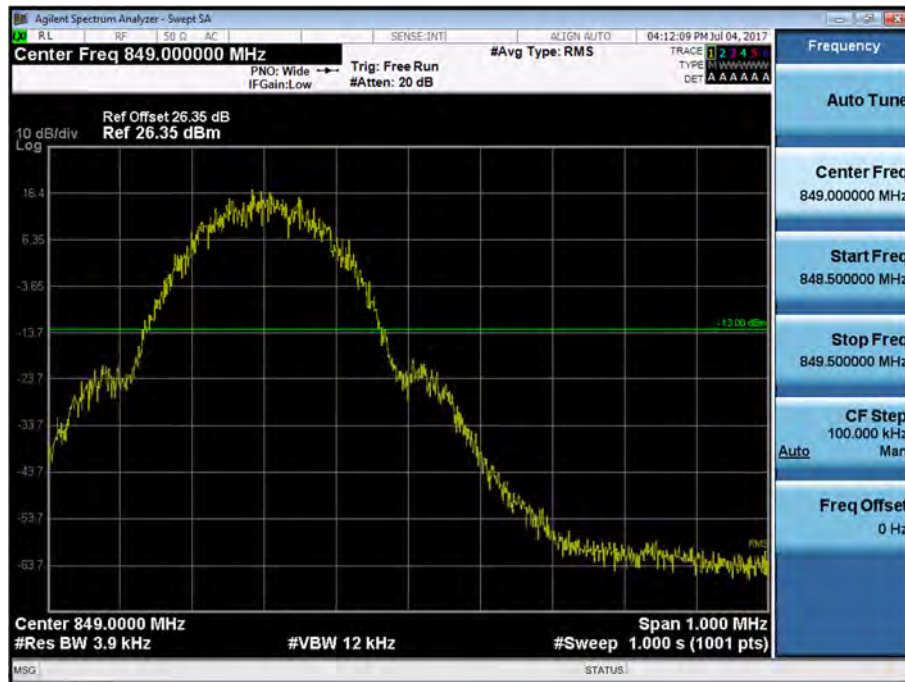
■ GSM850 MODE (128 CH.) Block Edge 2



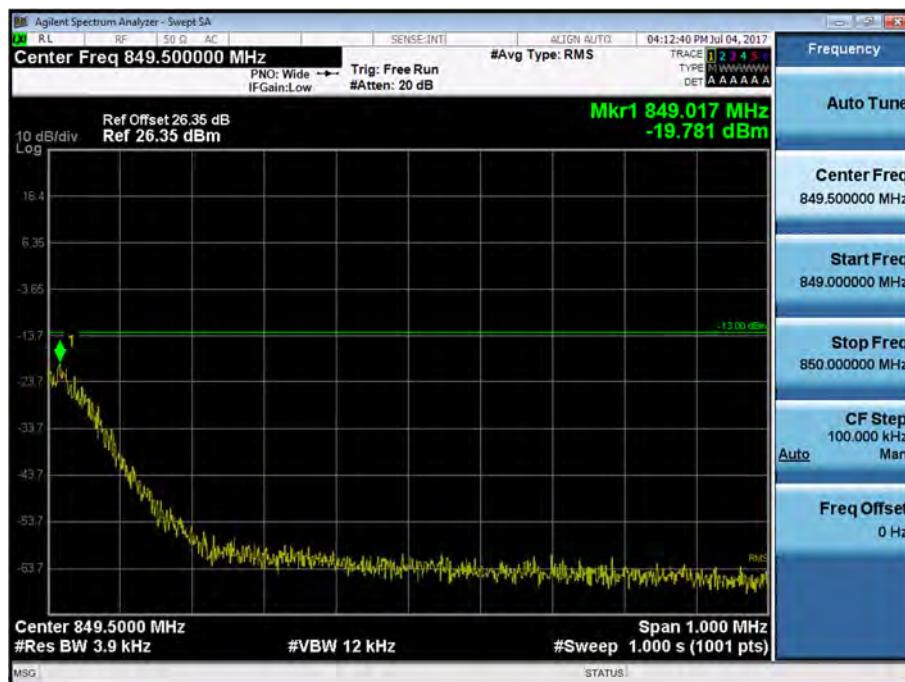
■ GSM850 MODE (128 CH.) Block Edge 3



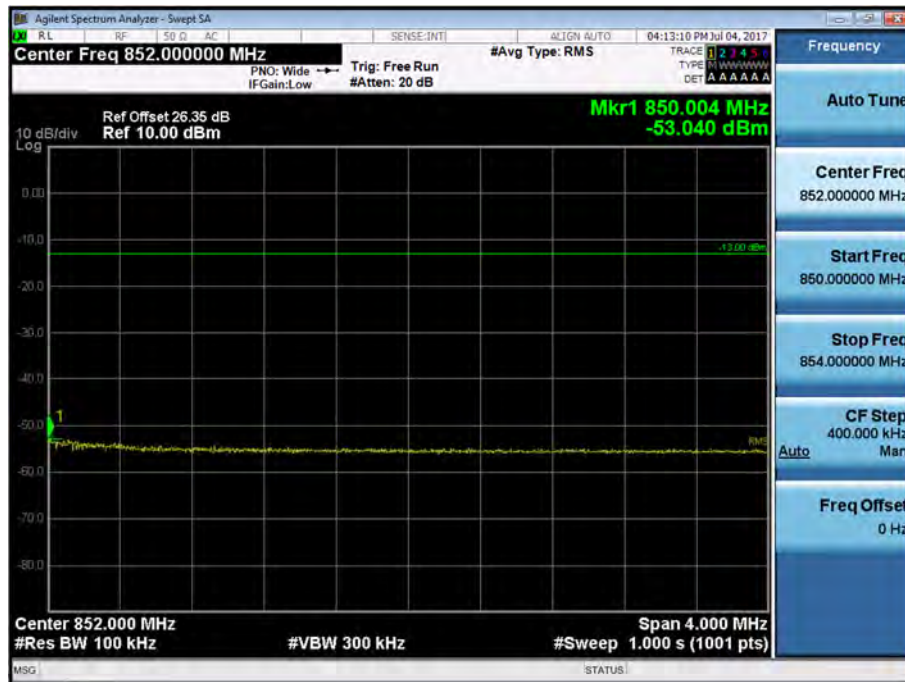
■ GSM850 MODE (251 CH.) Block Edge 1



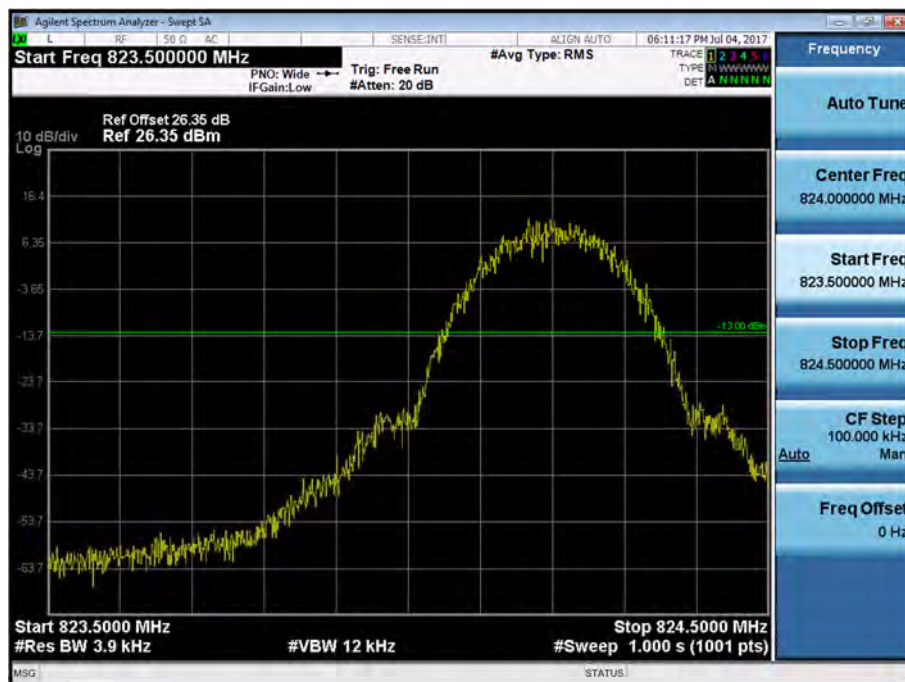
■ GSM850 MODE (251 CH.) Block Edge 2



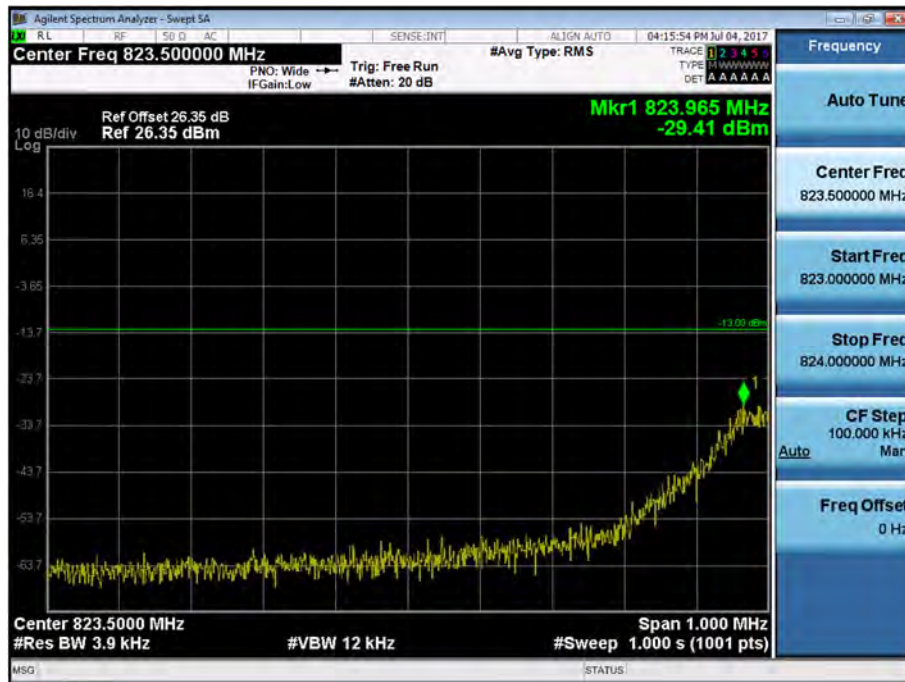
■ GSM850 MODE (251 CH.) Block Edge 3



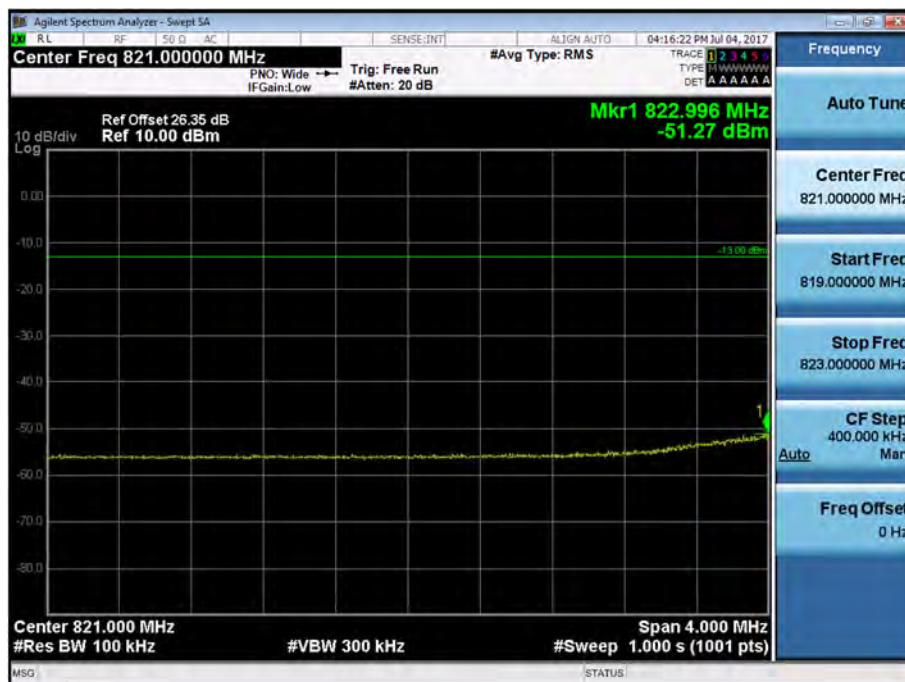
■ EDGE MODE (128 CH.) Block Edge 1



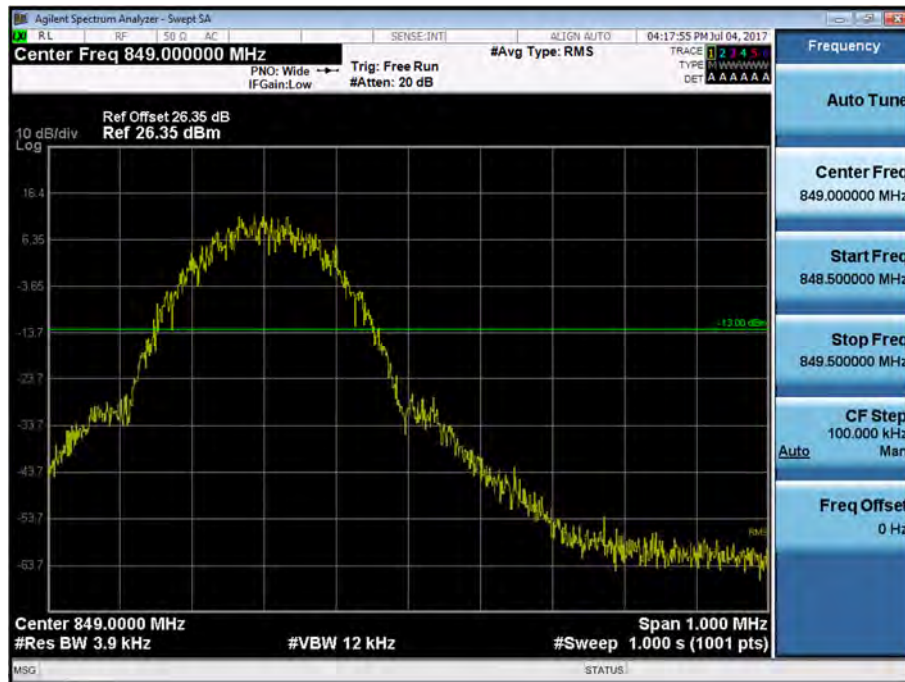
■ EDGE MODE (128 CH.) Block Edge 2



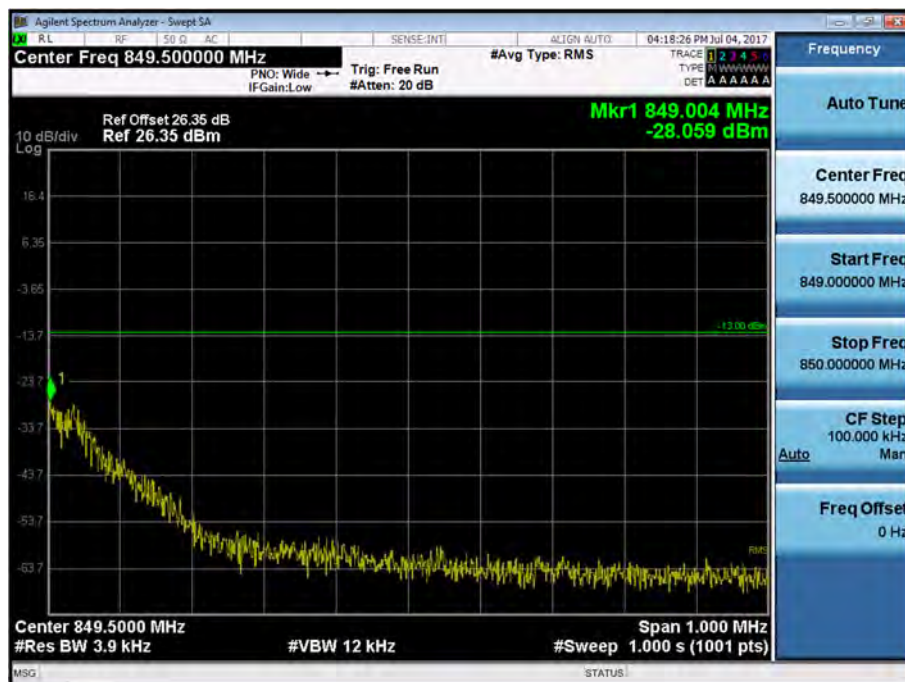
■ EDGE MODE (128 CH.) Block Edge 3



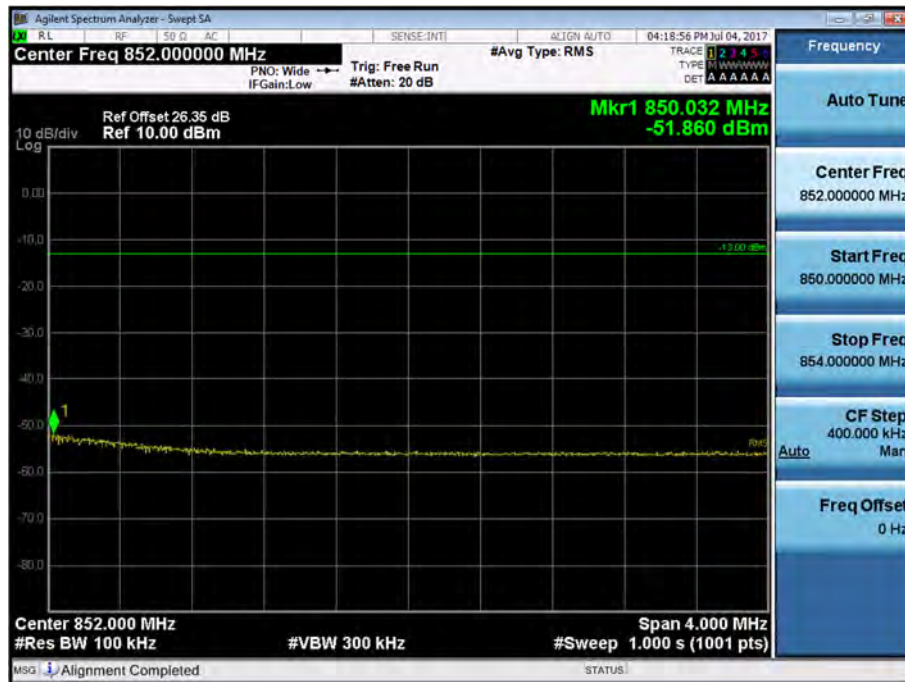
■ EDGE MODE (251 CH.) Block Edge 1



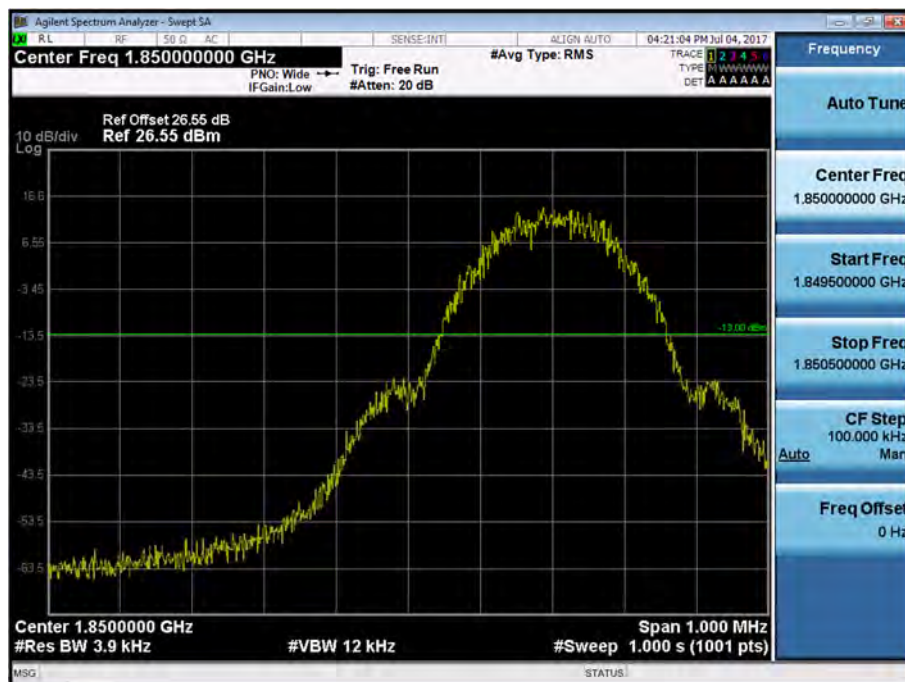
■ EDGE MODE (251 CH.) Block Edge 2



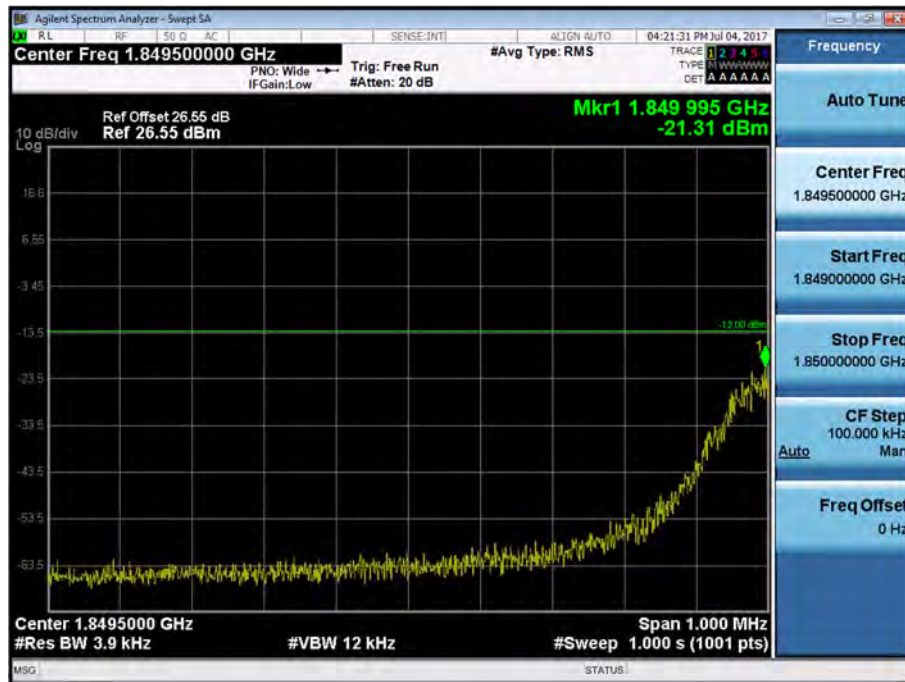
■ EDGE MODE (251 CH.) Block Edge 3



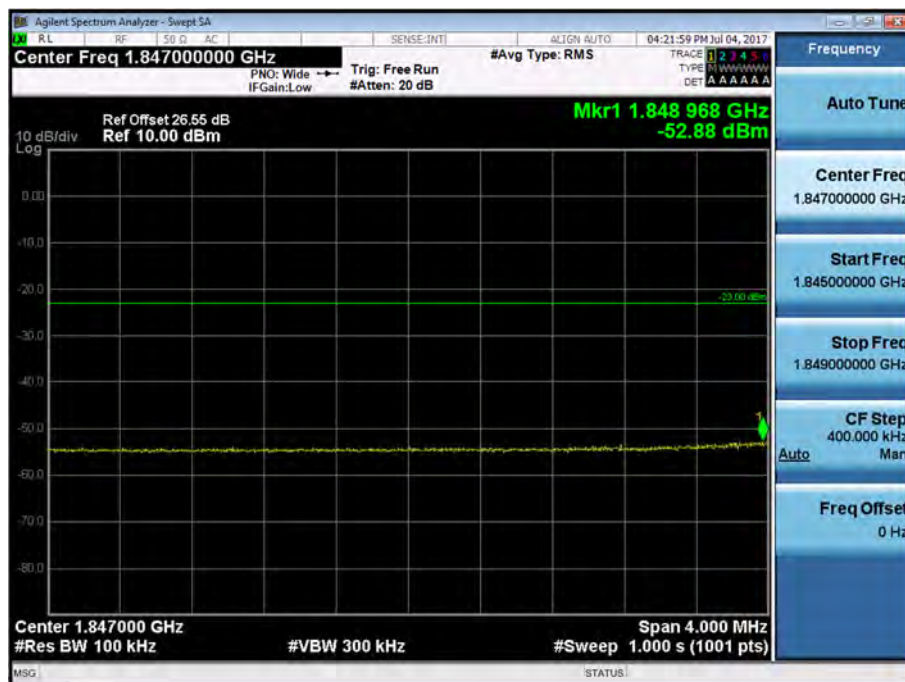
■ GSM1900 MODE (512 CH.) Block Edge 1



■ GSM1900 MODE (512 CH.) Block Edge 2



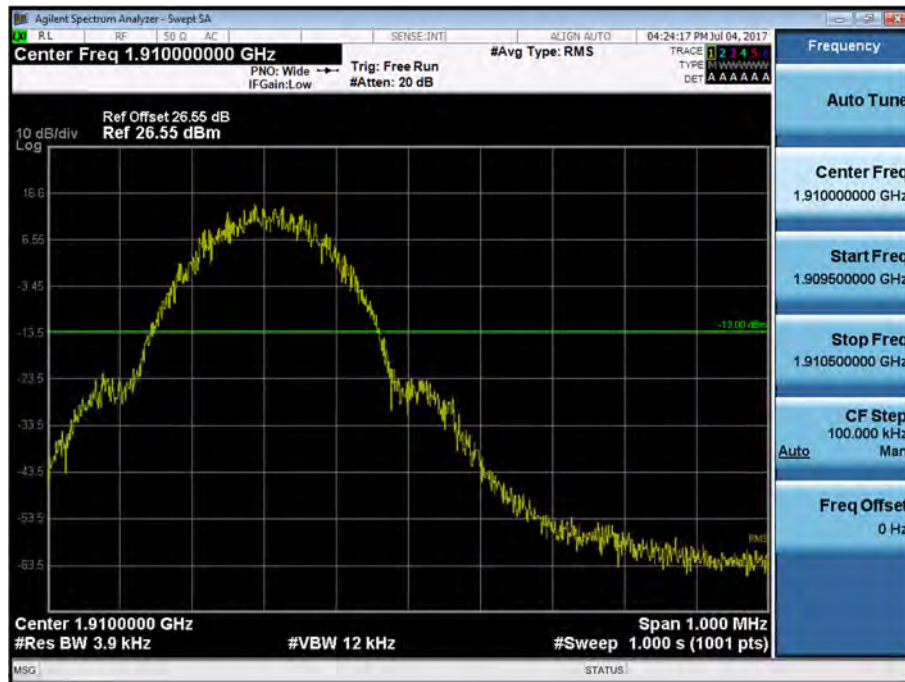
■ GSM1900 MODE (512 CH.) Block Edge 3



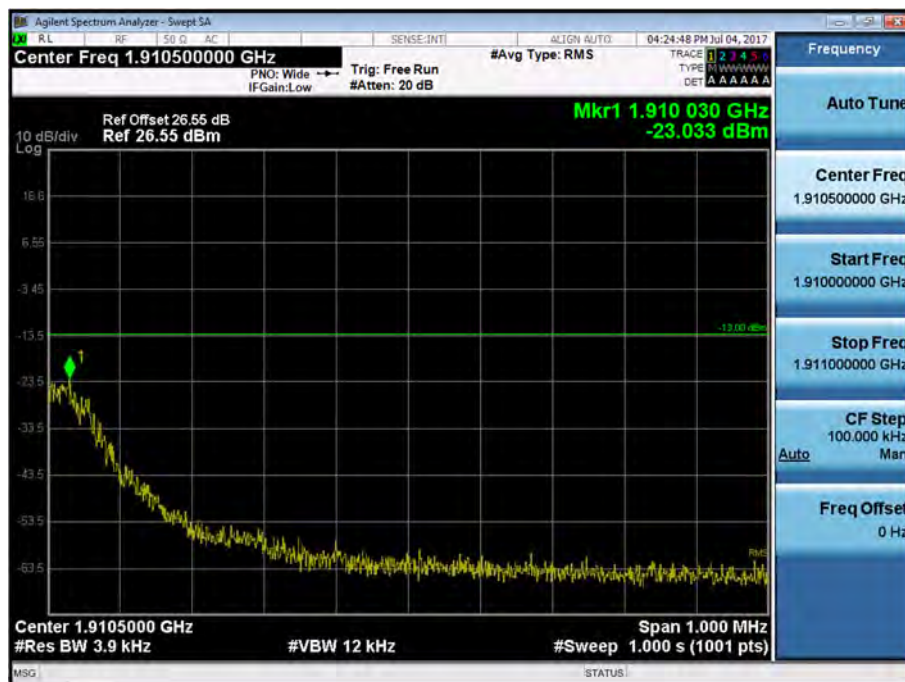
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB}$ = -52.88 dBm + 10 dB = **-42.88 dBm**

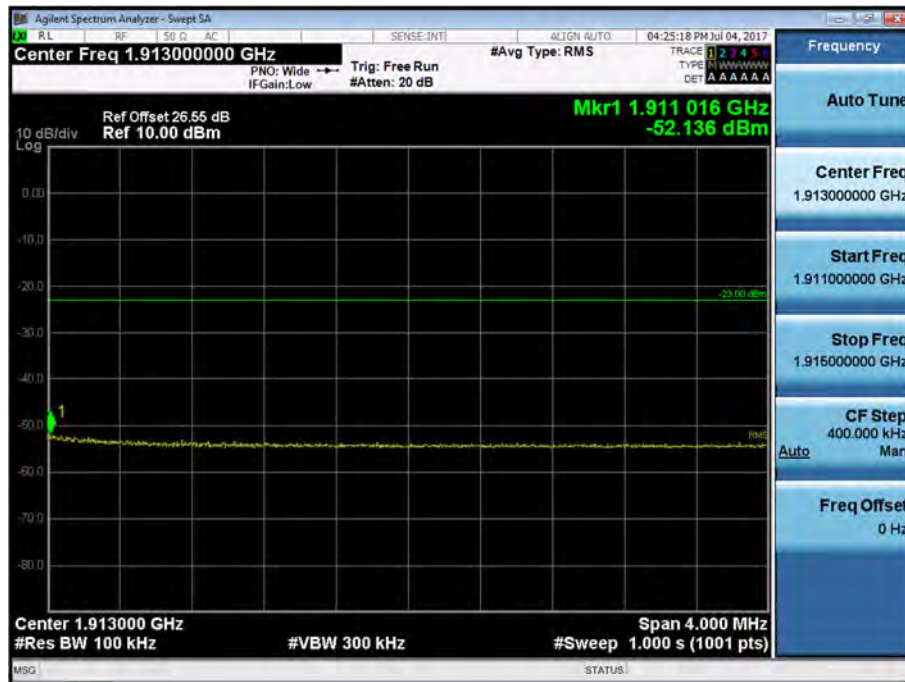
■ GSM1900 MODE (810 CH.) Block Edge 1



■ GSM1900 MODE (810 CH.) Block Edge 2



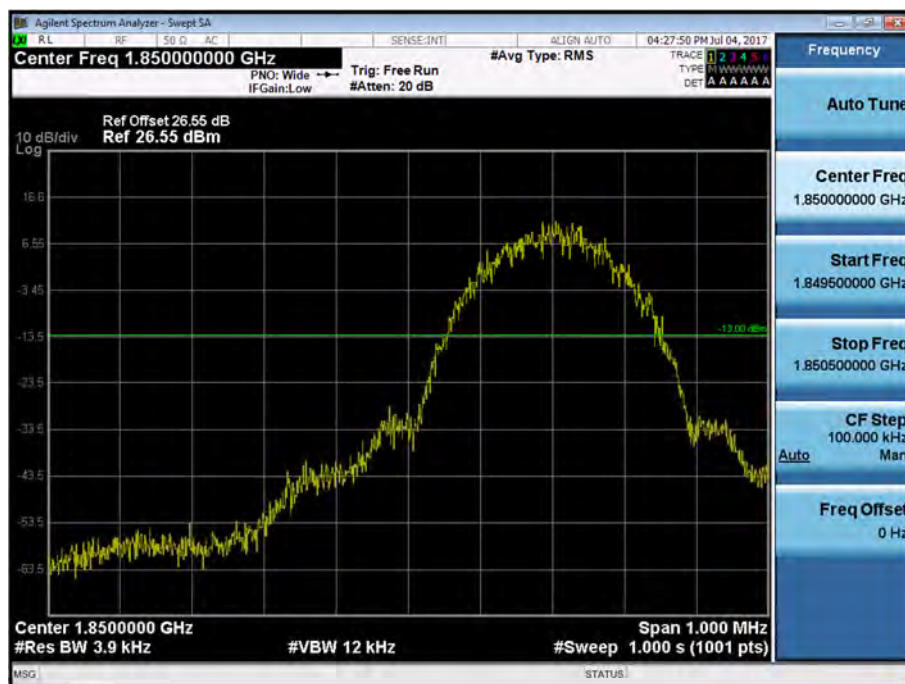
■ GSM1900 MODE (810 CH.) Block Edge 3



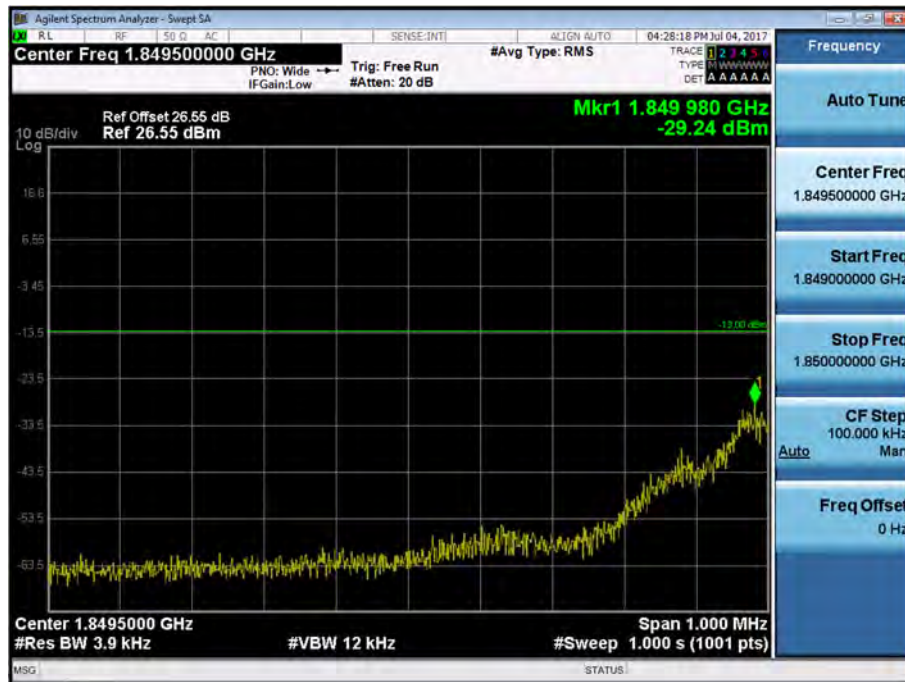
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB} = -52.136 \text{ dBm} + 10 \text{ dB} = -42.136 \text{ dBm}$

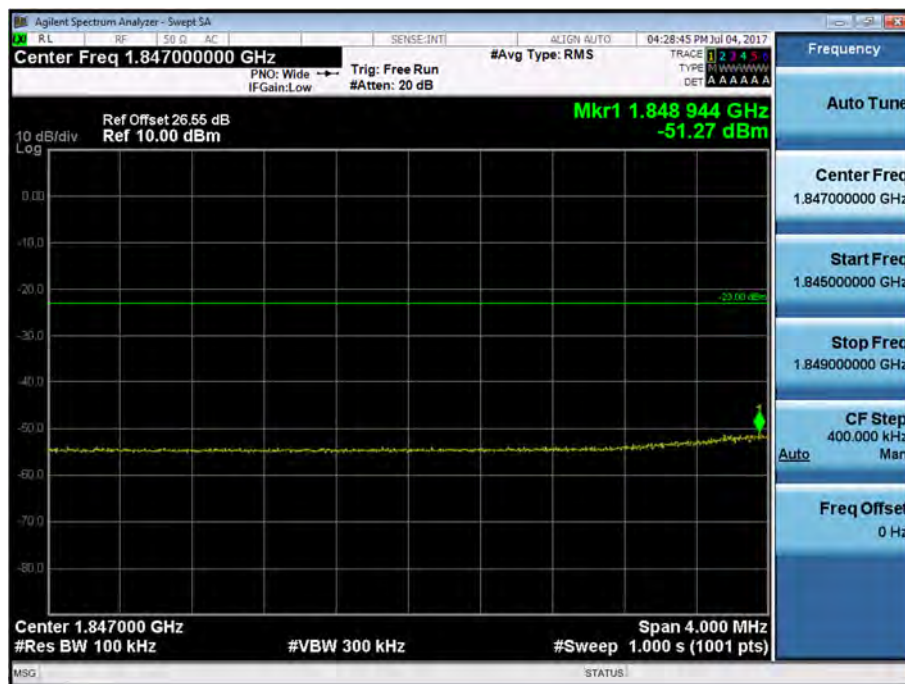
■ EDGE MODE (512 CH.) Block Edge 1



■ EDGE MODE (512 CH.) Block Edge 2



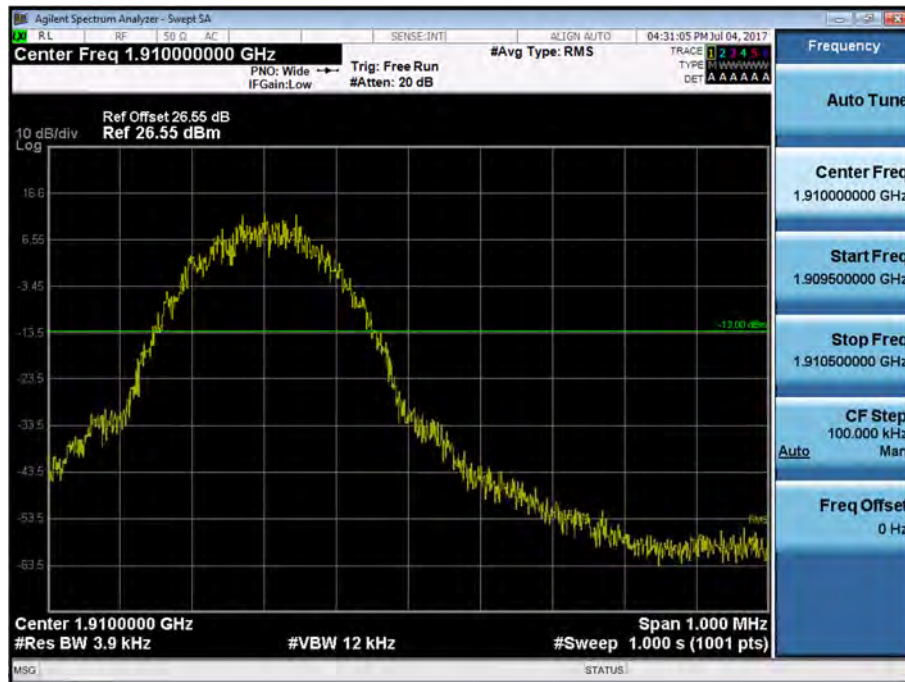
■ EDGE MODE (512 CH.) Block Edge 3



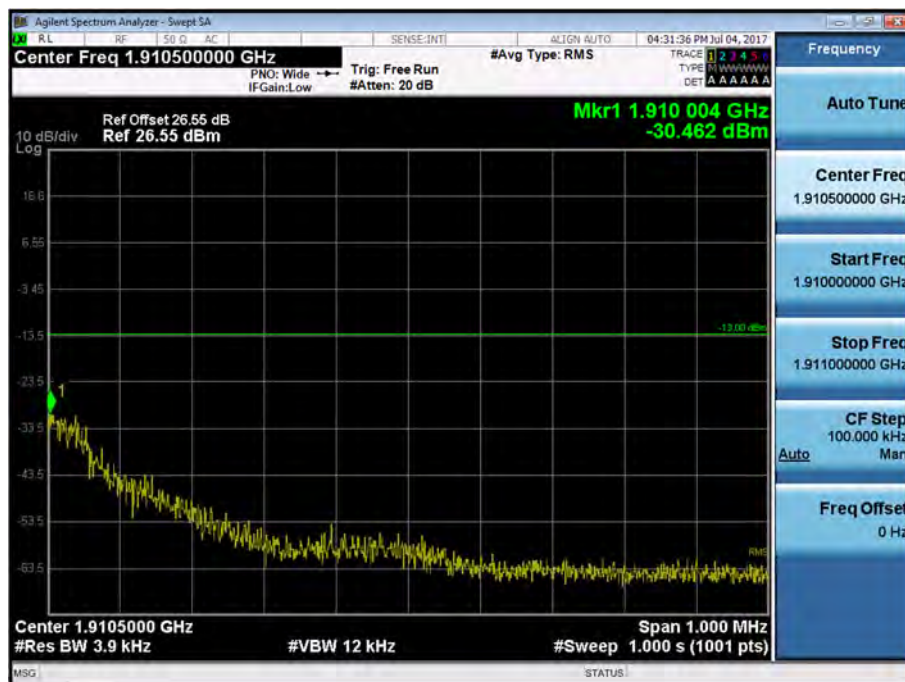
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB} = -51.27 \text{ dBm} + 10 \text{ dB} = -41.27 \text{ dBm}$

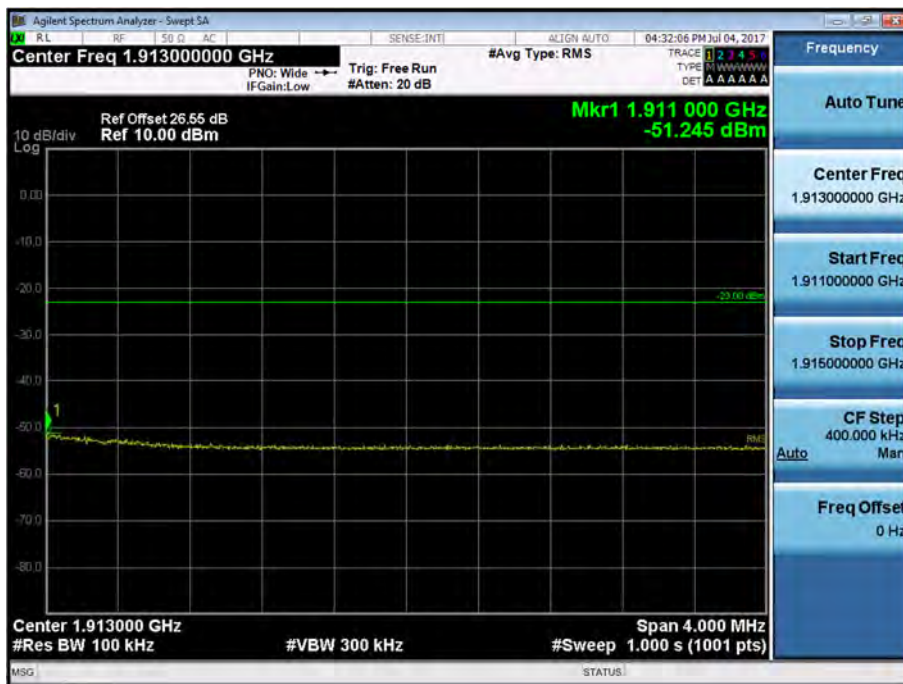
■ EDGE MODE (810 CH.) Block Edge 1



■ EDGE MODE (810 CH.) Block Edge 2



■ EDGE MODE (810 CH.) Block Edge 3



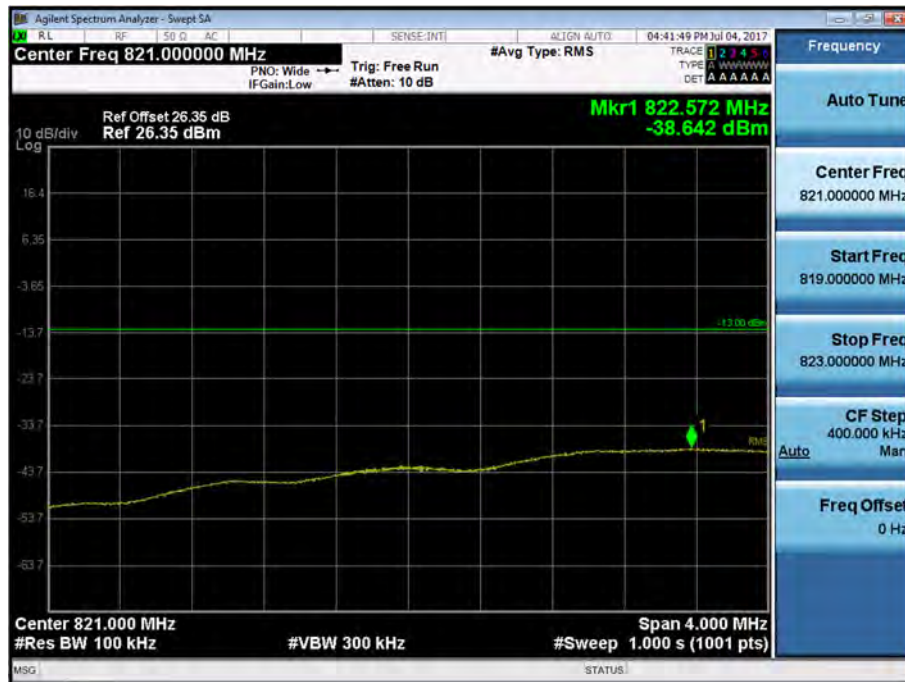
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + $10 \cdot \log(1 \text{ MHz}/100 \text{ kHz}) \text{ dB}$ = -51.245 dBm + 10 dB = **-41.245 dBm**

■ WCDMA850 MODE (4132 CH.) Block Edge



■ WCDMA850 MODE (4132 CH.) – 4 MHz Span



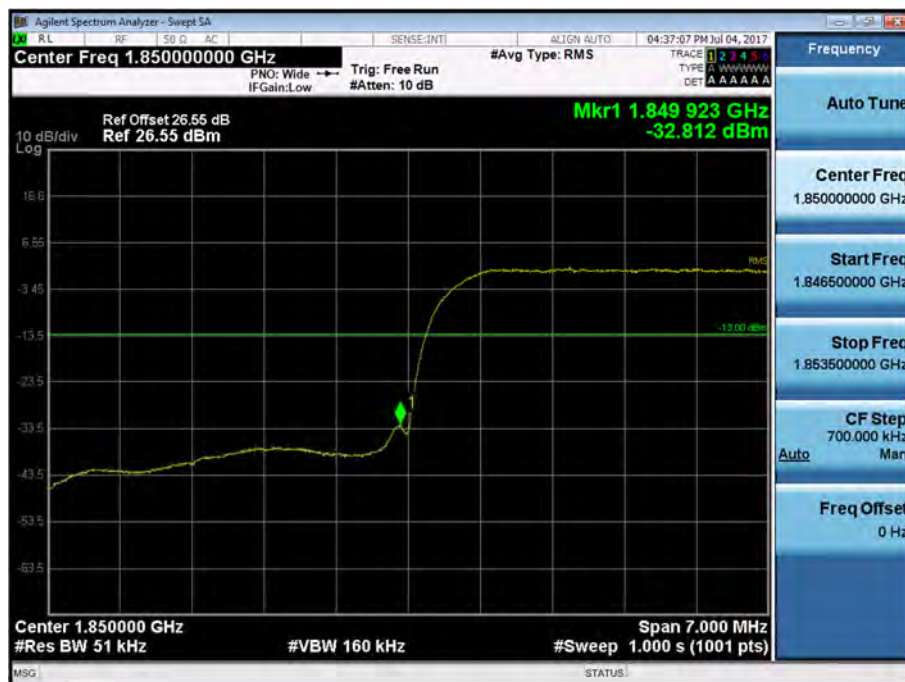
■ WCDMA850MODE (4233 CH.) Block Edge



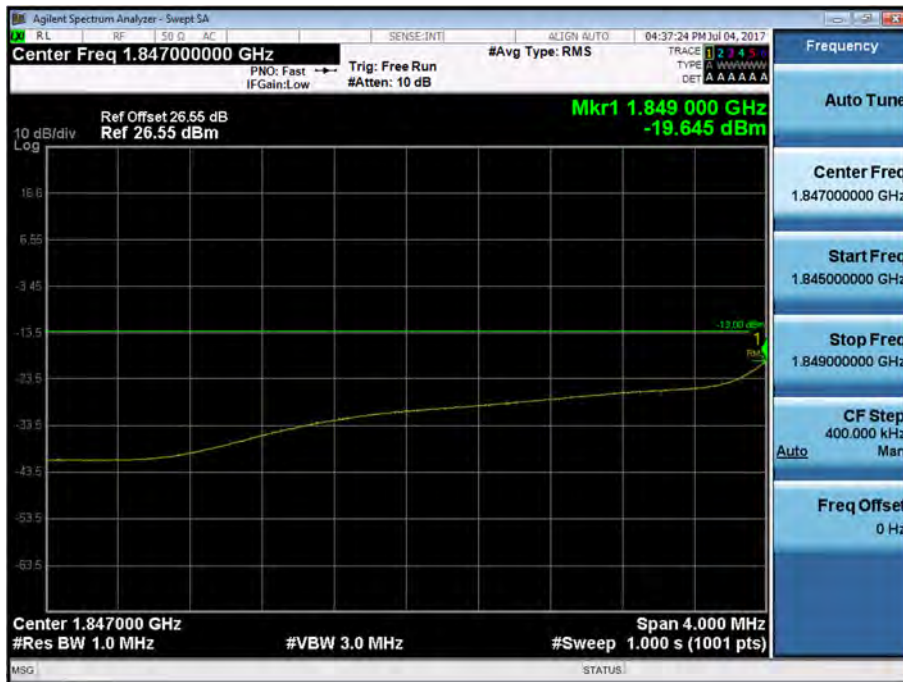
■ WCDMA850MODE (4233 CH.) – 4 MHz Span



■ WCDMA1900 MODE (9262 CH.) Block Edge



■ WCDMA1900 MODE (9262 CH.) – 4 MHz Span



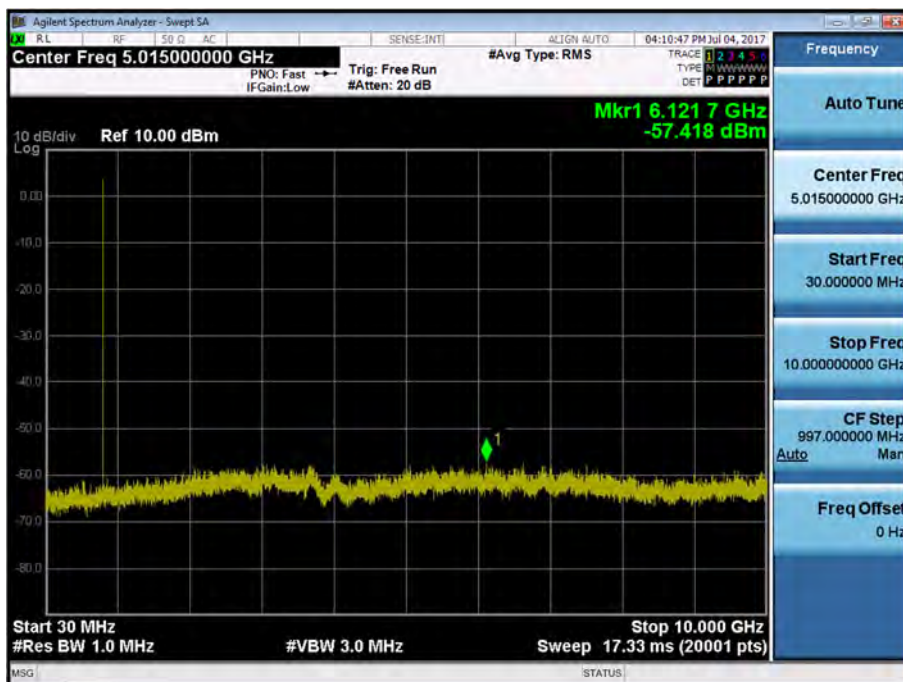
■ WCDMA1900 MODE (9538 CH.) Block Edge



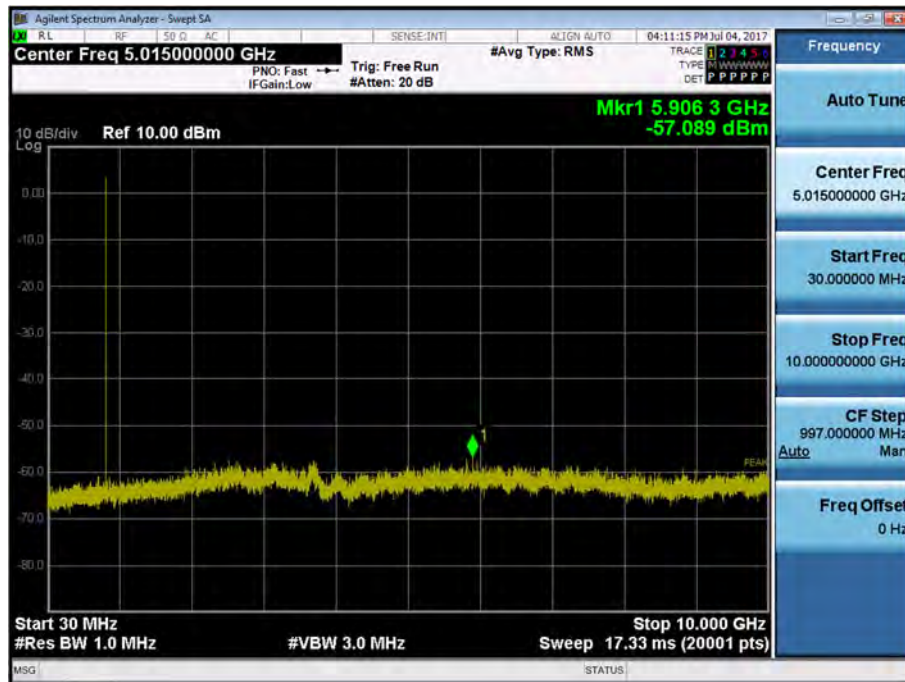
■ WCDMA1900 MODE (9538 CH.) – 4 MHz Span



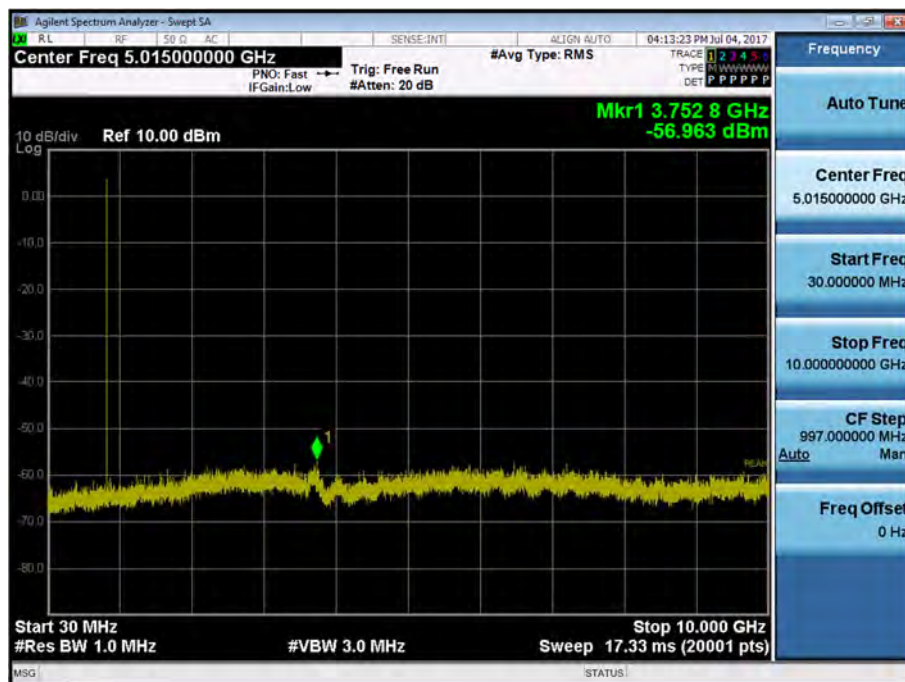
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions



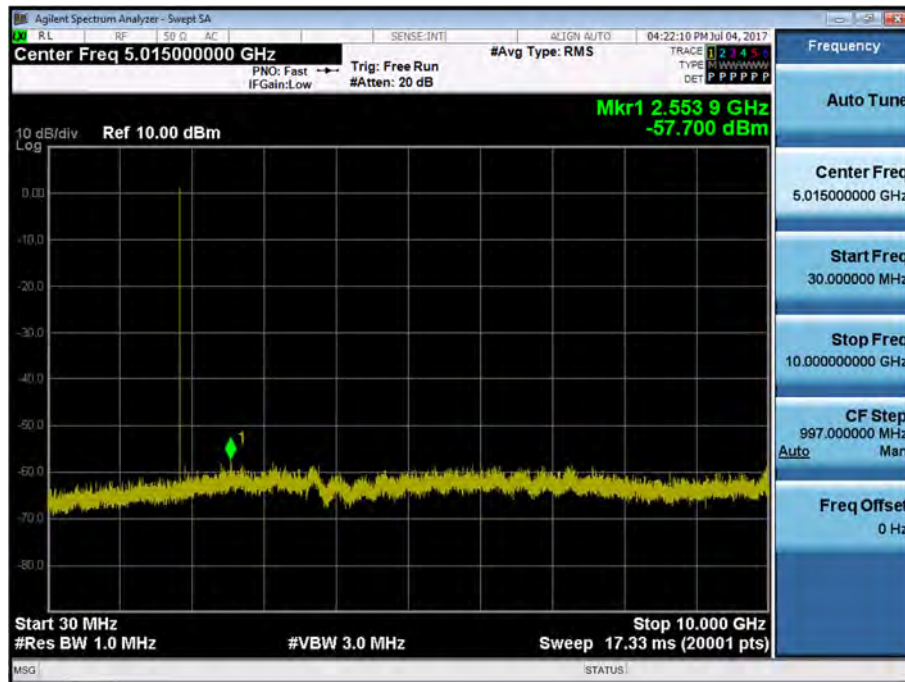
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions



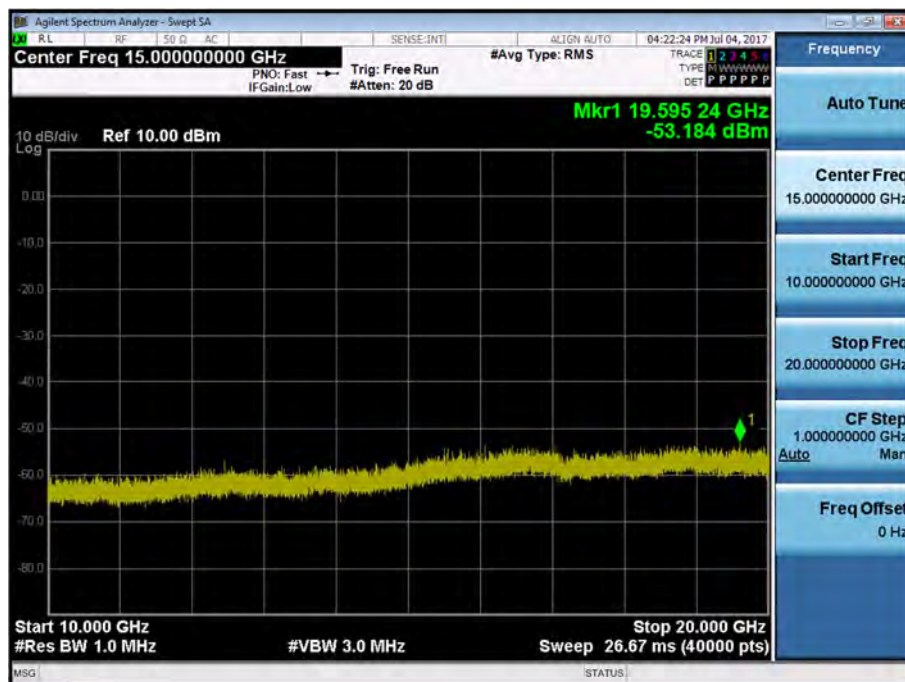
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions



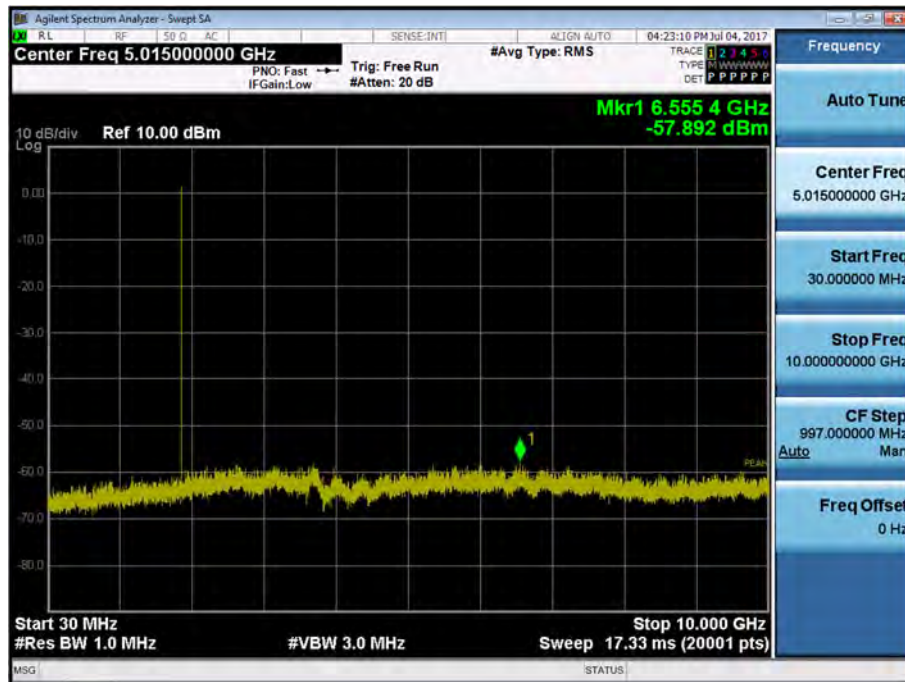
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1



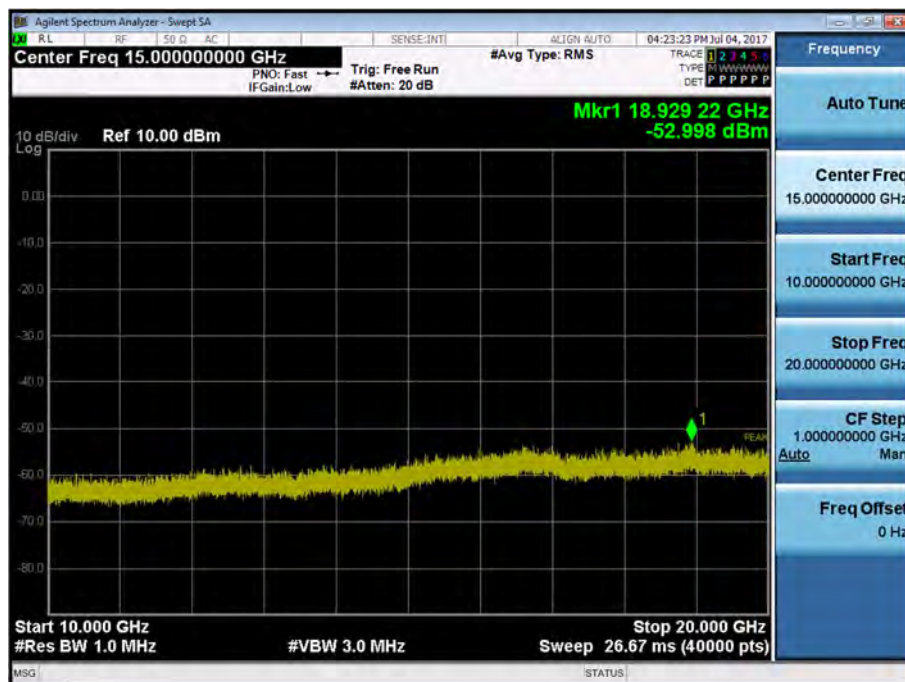
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



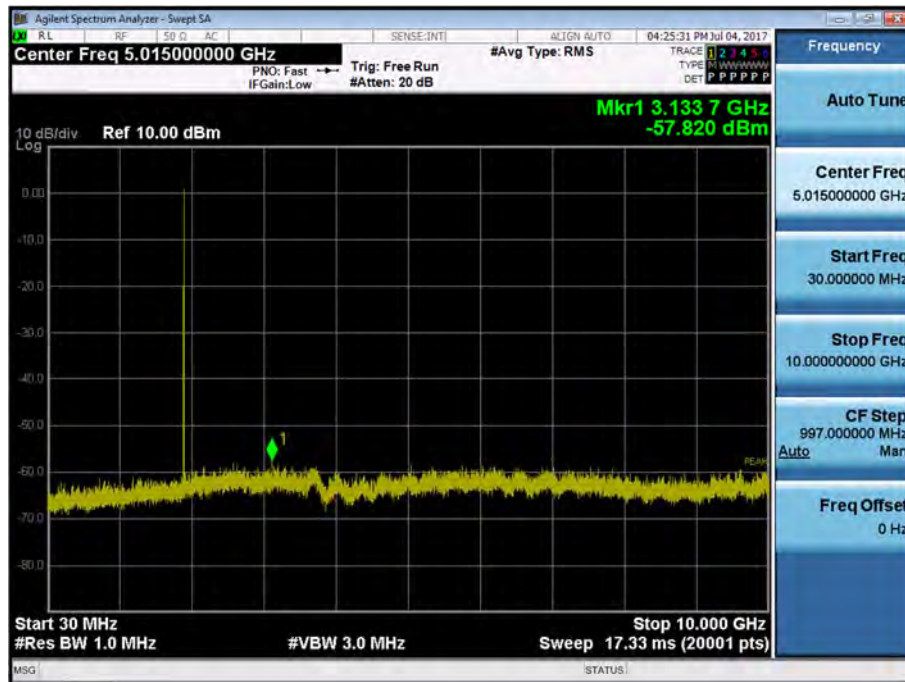
■ GSM1900 MODE (661 CH) Conducted Spurious Emissions1



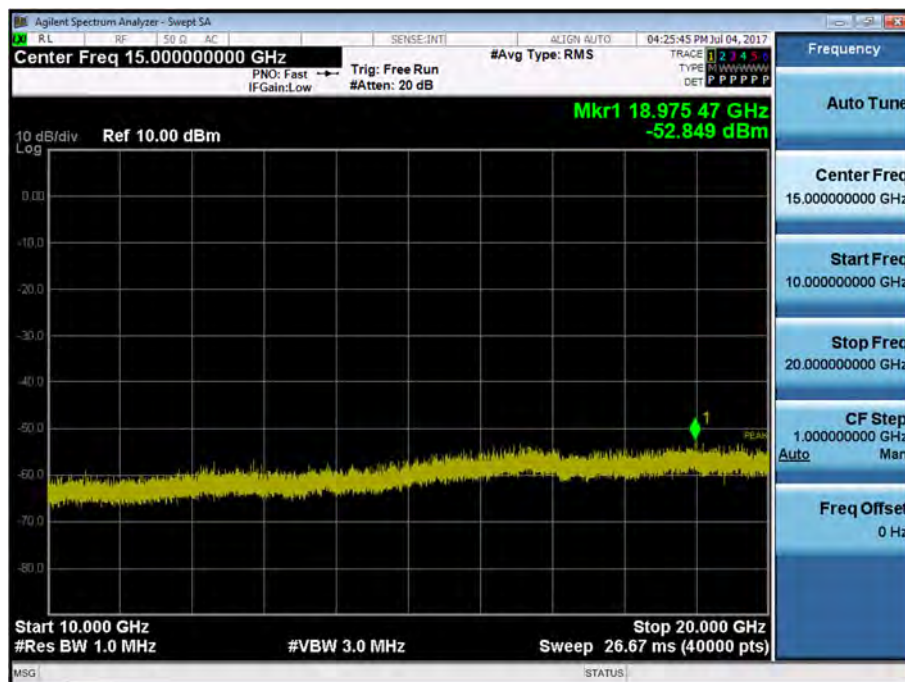
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2



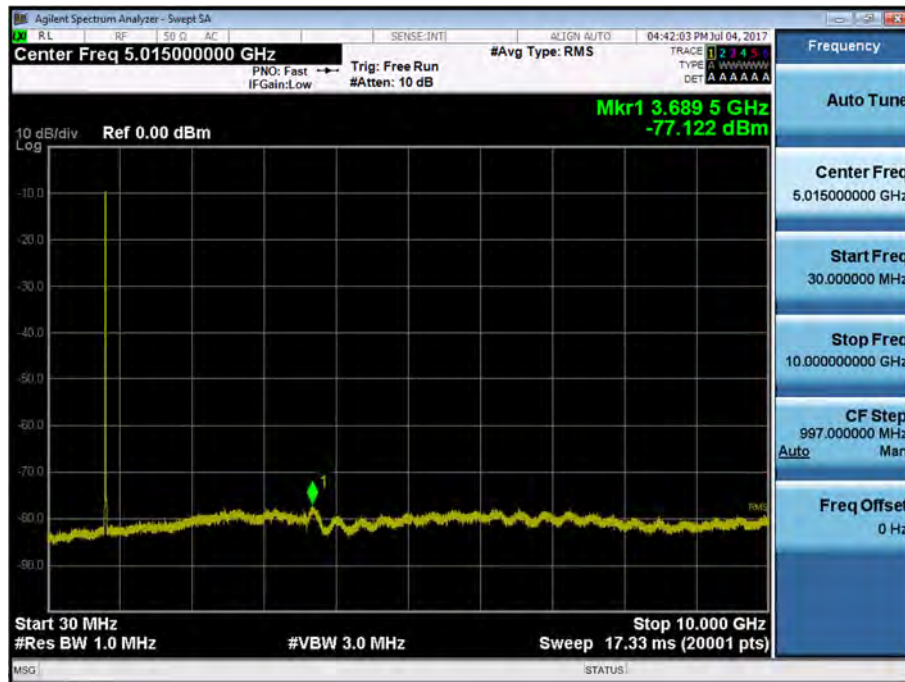
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1



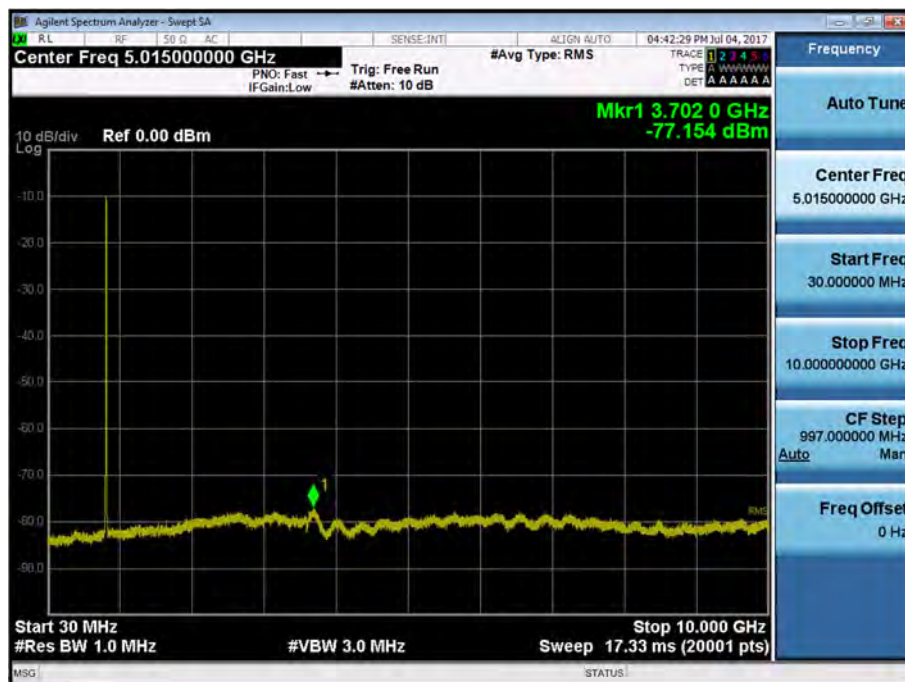
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



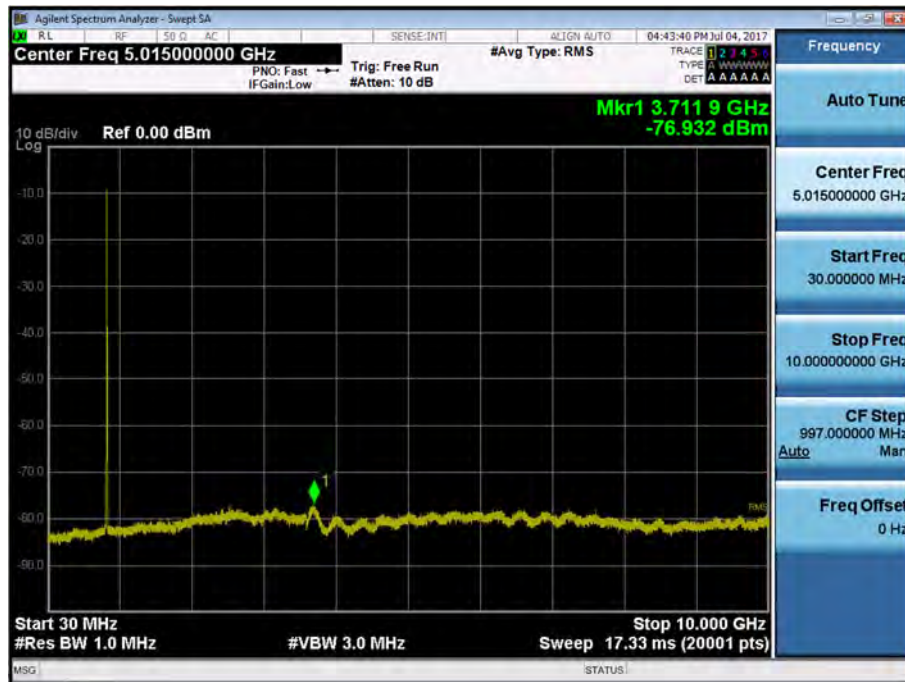
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions



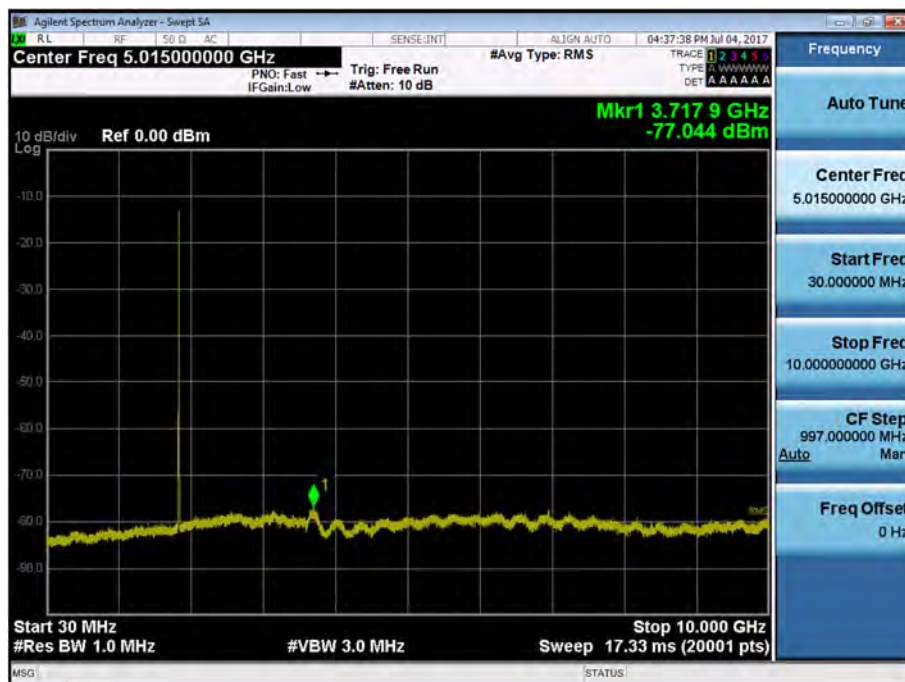
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions



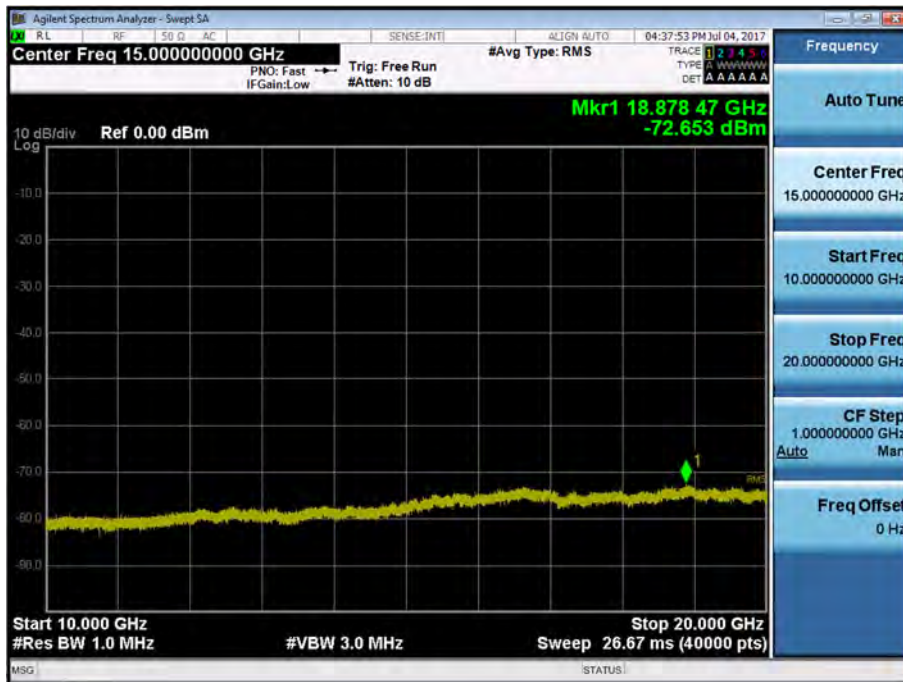
■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions



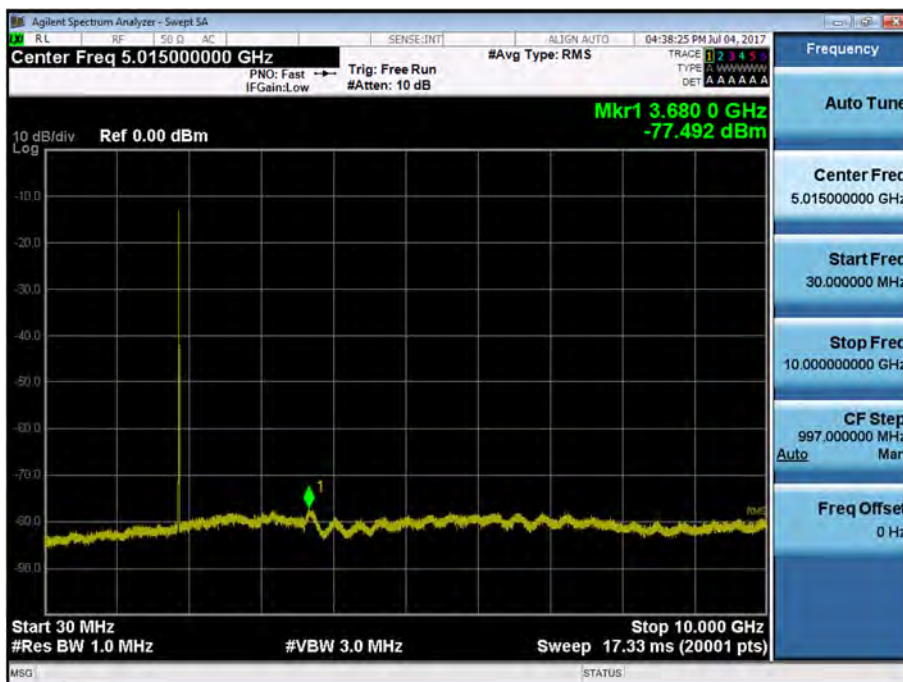
■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions1



■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions2



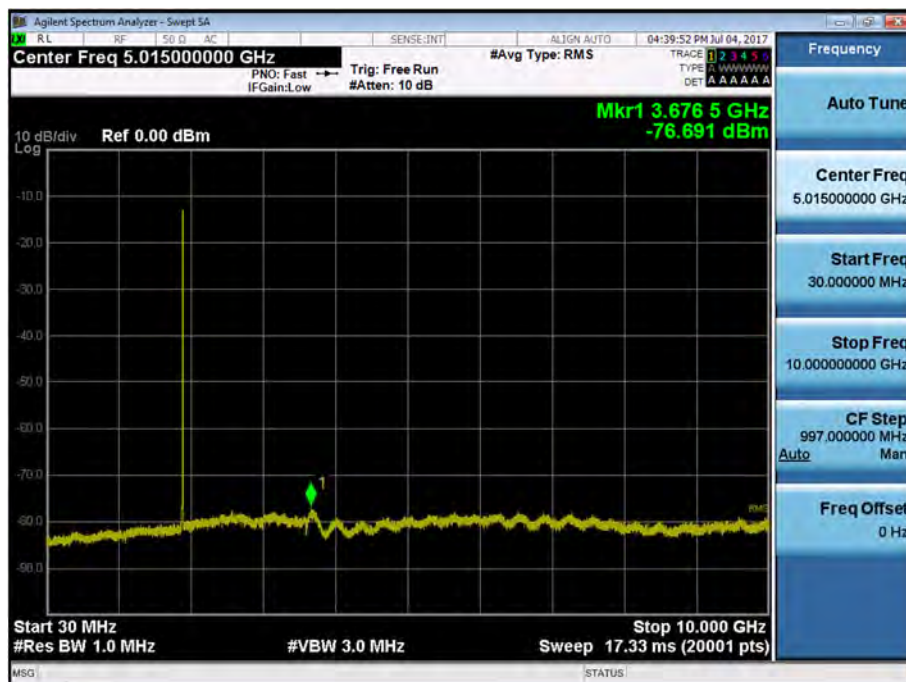
■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions1



■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions2



■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions1



■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions2

