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FCC 2G3G REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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

Date of Issue:
September 03, 2020

Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-RF-2008-FC040-R1

FCC ID:	**A3LSMG781V**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-G781V
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §24, §27, §2, §90

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	248 KGXW	0.357	25.52
GSM850 EDGE			252 KG7W	0.097	19.86
WCDMA850	826.4 – 846.6	871.4 – 891.6	4M17F9W	0.054	17.30
CDMA Secondary800	817.9 – 823.1	862.9 – 868.1	1M27F9W	0.065	18.12
CDMA 850	824.70– 848.31	869.70– 893.31	1M27F9W	0.066	18.23

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	248 KGXW	0.473	26.75
GSM1900 EDGE			245 KG7W	0.145	21.60
WCDMA1900	1852.4 – 1907.6	1932.4 – 1987.6	4M17F9W	0.142	21.51
WCDMA1700	1712.4 – 1752.6	2112.4 – 2152.6	4M15F9W	0.151	21.80
CDMA PCS	1851.25– 1 908.75	1 931.25– 1 988.75	1M28F9W	0.141	21.49

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
CDMA Secondary800	817.9 – 823.1	862.9 – 868.1	1M27F9W	0.314	24.97

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)

REVIEWED BY

Report prepared by : Se Wook Park
Engineer of Telecommunication Testing Center

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

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2008-FC040	August 25, 2020	- First Approval Report
HCT-RF-2008-FC040-R1	September 03, 2020	- Add the Secondary 800 Conducted Output Power

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

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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:	A3LSMG781V
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §24, §27, §2, §90
EUT Type:	Mobile Phone
Model(s):	SM-G781V
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) 1 712.4 – 1 752.6 MHz (WCDMA1700) 824.70 — 848.31 MHz (CDMA BC0) 1 851.25 – 1 908.75 MHz (PCS CDMA BC1) 817.90 — 823.10 MHz (Secondary CDMA BC10)
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) 2 112.4 – 2 152.6 MHz (WCDMA1700) 869.70 — 893.31 MHz (CDMA BC0) 1 931.25 – 1 988.75 MHz (PCS CDMA BC1) 862.90 — 868.10 MHz (Secondary CDMA BC10)
Date(s) of Tests:	July 06, 2020 ~ August 12, 2020

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS, CDMA(BC0, 1, 10) and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (HT20/40/80), Bluetooth, BT LE, NFC, WPT, mmWave(n260/261).

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 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- KDB 971168 D01 v03r01 – Section 5.2.4 - ANSI C63.26-2015 – Section 5.2.1 & 5.2.4.2 * See SAR Report except Secondary 800
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI C63.26-2015 – Section 5.2 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 CONDUCTED OUTPUT POWER

Test Overview

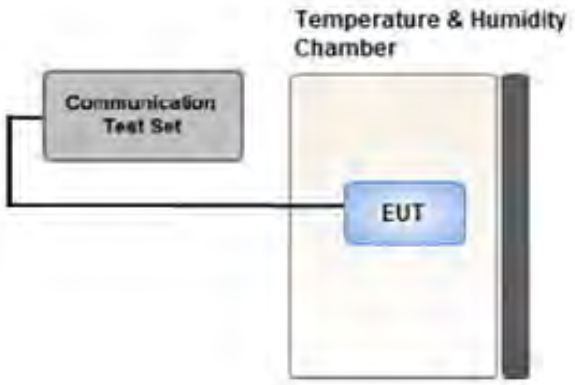
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

Test setup



3.3 RADIATED POWER

Test Overview

Radiated tests 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-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. 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;

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

   Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.
3. The maximum value 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
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.4 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10^{th} harmonics from 9 kHz.

Test Note

1. Measurements value 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.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test dat
3. For spurious 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 spurious emissions is calculated by the following formula;

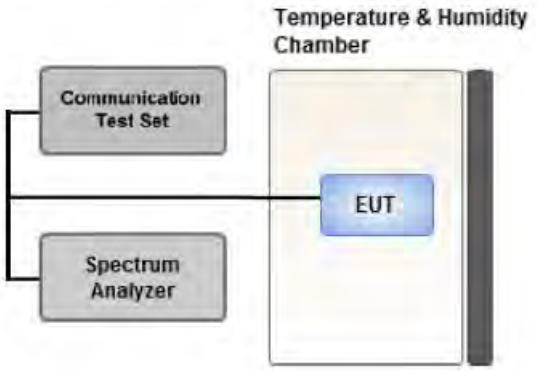
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   Where: $P_g$is the generator output power into the substitution antenna.

   If the fundalmatal frequency is below 1GHz, RF output power has been converted to EIRP.

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

3.5 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
   .- for continuous transmissions, set to 1 ms,
   .- or 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.
4. Record the maximum PAPR level associated with a probability of 0.1%.

② Alternate Procedure for PAPR

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk}.

Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and record as P_{Avg}. Determine the P.A.R. from:

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

Test Settings(Peak Power)

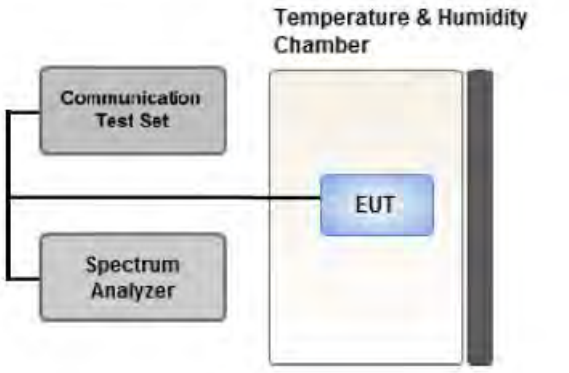
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 x log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 x log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

3.6 OCCUPIED BANDWIDTH.



Test setup

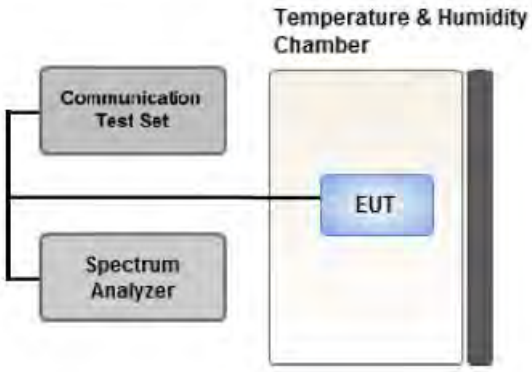
The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.
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

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

3.7 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

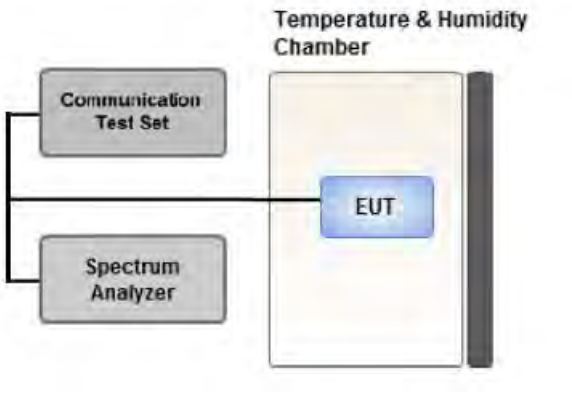
Test Settings(GSM)

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

Test Settings(WCDMA)

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

3.8 BAND EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

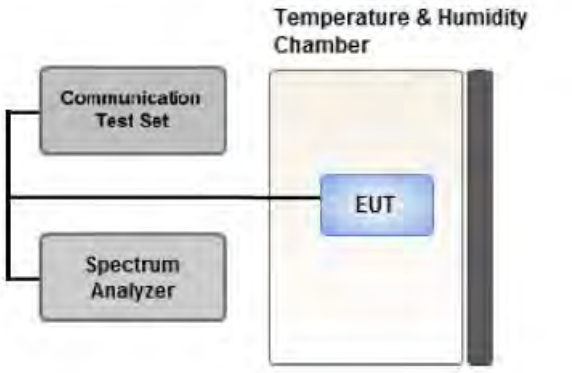
Test Notes

According to FCC 22.917, 24.238, 27.53 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 x 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.

3.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.

The frequency stability of the transmitter is measured by:

1. Temperature:

   The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

2. Primary Supply Voltage:

   .- Unless otherwise specified, vary primary supply voltage from 85% to 115% of the nominal value for other than hand carried battery equipment.

   .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes 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.
3. 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.

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

Test Description	Modulation	Test Channel
Occupied Bandwidth	GSM : Voice & EDGE(1 TX Slot) WCDMA : QPSK(RMC) CDMA : RC3/SO55	Low, Mid, High
Band Edge	GSM : Voice & EDGE(1 TX Slot) WCDMA : QPSK(RMC) CDMA : RC3/SO55	Low, High
Spurious and Harmonic Emissions at Antenna Terminal	GSM : Voice WCDMA : QPSK(RMC) CDMA : RC3/SO55	Low, Mid, High

[Test Channel]

	UplinkChannel							
	2G (GSM850)	2G (GSM1900)	3G (WCDMA B2)	3G (WCDMA B4)	3G (WCDMA B5)	CDMA (BC 0)	CDMA (BC 1)	CDMA (BC 10)
Low	128	512	9262	1312	4132	1013	25	476
Mid	190	661	9400	1412	4183	384	600	580
High	251	810	9538	1513	4233	777	1175	684

3.11 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.

[Worst case_3G]

Test Description	Modulation	Paging Service	Axis	Test Channel
Effective Radiated Power, Effective Isotropic Radiated Power	QPSK (WCDMA)	12.2 kbps RMC	WCDMA B2 : Z WCDMA B4 : Z WCDMA B5 : X	Low, Mid, High
Radiated Spurious and Harmonic Emissions	QPSK (WCDMA)	12.2 kbps RMC	WCDMA B2 : Z WCDMA B4 : Y WCDMA B5 : Y	Low, Mid, High

[Worst case_2G]

Test Description	Mod	Axis	Test Channel
Effective Radiated Power, Effective Isotropic Radiated Power	Voice	GSM850 : Y GSM1900 : Z	Low, Mid, High
	EDGE(1 TX Slot)	GSM850 : Y GSM1900 : Z	GSM 850 : Mid GSM1900 : Mid
Radiated Spurious and Harmonic Emissions	Voice	GSM850 : Z GSM1900 : X	Low, Mid, High

[Worst case_CDMA]

Test Description	Modulation	Axis	Test Channel
Effective Radiated Power, Effective Isotropic Radiated Power	RC3/SO55	CDMA BC0 : Y CDMA BC1 : Z CDMA BC10 : Y	Low, Mid, High
Radiated Spurious and Harmonic Emissions	RC3/SO55	CDMA BC0 : Z CDMA BC1 : Z CDMA BC10 : X	Low, Mid, High

[Test Channel]

	UplinkChannel							
	2G (GSM850)	2G (GSM1900)	3G (WCDMA B2)	3G (WCDMA B4)	3G (WCDMA B5)	CDMA (BC 0)	CDMA (BC 1)	CDMA (BC 10)
Low	128	512	9262	1312	4132	1013	25	476
Mid	190	661	9400	1412	4183	384	600	580
High	251	810	9538	1513	4233	777	1175	684

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
WAINWRIGHT INSTRUMENT	WHNX6.0/26.5G-6SS/H.P.F	1	03/19/2020	Annual	03/19/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
Hewlett Packard	E3632A/DC Power Supply	MY4004427	09/27/2019	Annual	09/27/2020
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93008124	03/18/2020	Annual	03/18/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2019	Annual	10/14/2020
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/27/2019	Annual	08/27/2020
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	04/26/2019	Biennial	04/26/2021
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/12/2019	Biennial	03/12/2021
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/22/2020	Annual	01/22/2021
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	E7515B / 5G Wireless Tester	MY58300756	01/07/2020	Annual	01/07/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
Mini-Circuits	ZC4PD-K1844+ / 4-Way Divider	942907	09/05/2019	Annual	09/05/2020
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

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 (±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)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §22.917(a), §24.238(a), §27.53(h), §90.691	< 43 + 10 x log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046, §90.635	N/A	See Note1
Peak- to- Average Ratio	§24.232(d), §27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§2.1055, §90.213, § 22.355	< 2.5 ppm	PASS
	§24.235, §27.54	Emission must remain in band	PASS

Note:

1. See SAR Report
2. The same samples were used for SAR and EMC

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§22.913(a)(5)	< 7 Watts max. ERP	PASS
Equivalent Isotropic Radiated Power	§24.232(c), §27.50(d)(4)	< 2 Watts max. EIRP < 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a), §27.53(h), §90.691	< 43 + 10 x log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

ERP = Substitute LEVEL(dBm) + Ant. Gain – 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.

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – 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 equivalent isotropic radiated power.

7.3. Emission Desi0gnator

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)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

16QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 CONDUCTED OUTPUT POWER

Channel	SO2	SO2	SO55	SO55	TDSO SO32	1xEvDO REV.0	1xEvDO REV.0	1xEvDO REV.A	1xEvDO REV.A
	RC1/1	RC3/3	RC1/1	RC3/3	RC3/3	FTAP	RTAP	FETAP	FETAP
	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
476	24.96	24.94	24.94	24.93	24.95	24.92	24.91	24.92	24.90
580	24.94	24.94	24.97	24.96	24.97	24.93	24.93	24.92	24.93
684	24.92	24.91	24.90	24.93	24.95	24.89	24.87	24.89	24.88

8.2 EFFECTIVE RADIATED POWER

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	-27.14	36.26	-10.25	1.39	V	< 7.00	0.290	24.62
	190	836.6	-27.10	36.83	-10.19	1.41	V		0.333	25.23
	251	848.8	-27.16	37.08	-10.14	1.42	V		0.357	25.52
EDGE	251	848.8	-32.82	31.42	-10.14	1.42	V		0.097	19.86

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	-34.63	28.94	-10.24	1.40	H	< 7.00	0.054	17.30
	4183	836.6	-35.68	28.25	-10.19	1.41	H		0.046	16.65
	4233	846.6	-35.42	28.58	-10.15	1.42	H		0.050	17.01

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
CDMA Secondary 800	476	817.9	-33.67	29.50	-10.27	1.39	V	< 100	0.061	17.84
	580	820.5	-33.52	29.77	-10.26	1.39	V		0.065	18.12
	684	823.1	-33.66	29.75	-10.25	1.39	V		0.065	18.11

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	Limit	ERP	
	channel	Freq.(MHz)						W	W	dBm
CDMA850	1013	824.7	-33.63	29.87	-10.24	1.40	V	< 7.00	0.066	18.23
	384	836.5	-34.42	29.51	-10.19	1.41	V		0.062	17.91
	777	848.3	-34.55	29.59	-10.14	1.42	V		0.063	18.03

8.3 EQUIVALENT ISOTROPIC RADIATED POWER

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	-16.20	17.88	10.10	2.11	V	< 2.00	0.386	25.87
	661	1880.0	-16.31	18.24	10.15	2.15	V		0.421	26.24
	810	1909.8	-15.87	18.67	10.23	2.15	V		0.473	26.75
EDGE	810	1909.8	-21.02	13.52	10.23	2.15	V		0.145	21.60

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	-21.99	12.09	10.10	2.11	V	< 2.00	0.102	20.08
	9400	1880.0	-21.66	12.89	10.15	2.15	V		0.123	20.89
	9538	1907.6	-21.11	13.43	10.23	2.15	V		0.142	21.51

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
WCDMA1700	1312	1712.4	-19.64	14.00	9.85	2.05	V	< 1.00	0.151	21.80
	1412	1732.4	-19.84	13.89	9.90	2.05	V		0.149	21.74
	1513	1752.6	-20.02	13.73	10.00	2.06	V		0.147	21.67

Mode	Ch./ Freq.		Measured Level (dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBi)	C.L	Pol.	Limit	EIRP	
	channel	Freq.(MHz)						W	W	dBm
CDMA PCS	25	1851.3	-21.49	12.59	10.10	2.11	V	< 2.00	0.114	20.58
	600	1880.0	-21.74	12.81	10.15	2.15	V		0.121	20.81
	1175	1908.8	-21.13	13.41	10.23	2.15	V		0.141	21.49

8.4 RADIATED SPURIOUS EMISSIONS

▣ MODULATION SIGNAL: GSM850

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
128 (824.2)	1,648.40	-53.22	9.50	-62.83	1.99	H	-55.32	-13.00
	2,472.60	-44.95	10.60	-49.08	2.47	H	-40.95	-13.00
	3,296.80	-57.89	12.25	-58.98	2.89	V	-49.61	-13.00
190 (836.6)	1,673.20	-50.03	9.65	-59.80	2.01	V	-52.16	-13.00
	2,509.80	-41.67	10.75	-45.39	2.50	H	-37.14	-13.00
	3,346.40	-56.91	12.48	-57.89	2.92	H	-48.34	-13.00
251 (848.8)	1,697.60	-48.70	9.80	-58.22	2.04	V	-50.46	-13.00
	2,546.40	-43.91	10.88	-47.19	2.52	H	-38.83	-13.00
	3,395.20	-57.94	12.68	-59.00	2.94	H	-49.26	-13.00

▣ MODULATION SIGNAL: GSM1900

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
512 (1850.2)	3,700.40	-52.51	12.40	-56.58	3.08	H	-47.26	-13.00
	5,550.60	-56.30	13.10	-54.27	3.81	H	-44.98	-13.00
	7,400.80	-56.65	11.10	-46.69	4.44	V	-40.03	-13.00
661 (1880.0)	3,760.00	-51.99	12.48	-55.86	3.10	H	-46.48	-13.00
	5,640.00	-56.36	13.30	-54.19	3.85	V	-44.74	-13.00
	7,520.00	-56.90	11.30	-46.33	4.46	H	-39.49	-13.00
810 (1909.8)	3,819.60	-54.00	12.40	-58.43	3.14	H	-49.17	-13.00
	5,729.40	-56.69	13.35	-54.03	3.87	H	-44.55	-13.00
	7,639.20	-57.37	11.65	-46.84	4.47	V	-39.66	-13.00

▣ MODULATION SIGNAL: WCDMA850

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
4,132 (826.4)	1,652.80	-53.01	9.50	-62.62	1.99	V	-55.11	-13.00
	2,479.20	-47.39	10.60	-51.66	2.48	H	-43.54	-13.00
	3,305.60	-57.98	12.33	-59.06	2.90	V	-49.63	-13.00
4,183 (836.6)	1,673.20	-51.37	9.65	-61.14	2.01	V	-53.50	-13.00
	2,509.80	-48.06	10.75	-51.78	2.50	H	-43.53	-13.00
	3,346.40	-57.92	12.48	-58.90	2.92	H	-49.35	-13.00
4,233 (846.6)	1,693.20	-50.55	9.73	-60.23	2.03	H	-52.53	-13.00
	2,539.80	-50.34	10.85	-53.87	2.51	H	-45.53	-13.00
	3,386.40	-58.07	12.63	-59.15	2.94	V	-49.46	-13.00

▣ MODULATION SIGNAL: WCDMA1900

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
9262 (1852.4)	3,704.80	-52.25	12.40	-56.32	3.08	V	-47.00	-13.00
	5,557.20	-56.14	13.15	-54.33	3.82	V	-45.00	-13.00
	7,409.60	-55.92	11.13	-45.74	4.45	V	-39.06	-13.00
9400 (1880.0)	3,760.00	-54.61	12.48	-58.48	3.10	H	-49.10	-13.00
	5,640.00	-54.04	13.30	-51.87	3.85	H	-42.42	-13.00
	7,520.00	-56.90	11.30	-46.33	4.46	V	-39.49	-13.00
9538 (1907.6)	3,815.20	-52.23	12.40	-56.62	3.14	H	-47.35	-13.00
	5,722.80	-56.32	13.35	-53.35	3.88	H	-43.88	-13.00
	7,630.40	-54.68	11.60	-44.35	4.48	H	-37.23	-13.00

▣ MODULATION SIGNAL: WCDMA1700

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
1312 (1712.4)	3,424.80	-51.20	12.60	-57.10	2.96	H	-47.45	-13.00
	5,137.20	-56.41	12.45	-53.56	3.66	V	-44.77	-13.00
	6,849.60	-55.64	12.20	-49.02	4.25	V	-41.07	-13.00
1412 (1732.4)	3,464.80	-50.66	12.48	-56.45	2.97	H	-46.94	-13.00
	5,197.20	-56.36	12.90	-54.94	3.70	H	-45.74	-13.00
	6,929.60	-54.63	12.05	-47.33	4.28	H	-39.56	-13.00
1513 (1752.6)	3,505.20	-48.89	12.28	-54.67	2.98	H	-45.37	-13.00
	5,257.80	-55.77	13.25	-54.96	3.71	H	-45.42	-13.00
	7,010.40	-55.72	11.65	-47.70	4.32	H	-40.37	-13.00

▣ MODULATION SIGNAL: CDMA Secondary800

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
476 (817.9)	1,635.80	-51.42	9.43	-61.02	1.98	H	-53.57	-13.00
	2,453.70	-47.68	10.52	-51.60	2.46	H	-43.54	-13.00
	3,271.60	-57.83	12.10	-58.89	2.88	H	-49.67	-13.00
580 (820.5)	1,641.00	-52.93	9.45	-62.68	1.98	H	-55.21	-13.00
	2,461.50	-44.99	10.55	-49.12	2.46	H	-41.03	-13.00
	3,282.00	-56.27	12.12	-57.43	2.88	V	-48.19	-13.00
684 (823.1)	1,646.20	-51.74	9.48	-61.42	1.99	V	-53.93	-13.00
	2,469.30	-43.92	10.59	-48.05	2.47	H	-39.93	-13.00
	3,292.40	-57.50	12.22	-58.61	2.88	H	-49.27	-13.00

▣ MODULATION SIGNAL: CDMA850

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
1013 (824.7)	1,649.40	-50.63	9.50	-60.24	1.99	H	-52.73	-13.00
	2,474.10	-43.21	10.60	-47.42	2.47	H	-39.29	-13.00
	3,298.80	-54.99	12.30	-56.05	2.89	V	-46.64	-13.00
384 (836.5)	1,673.00	-50.47	9.65	-60.24	2.01	H	-52.60	-13.00
	2,509.50	-43.35	10.75	-47.07	2.50	H	-38.82	-13.00
	3,346.00	-57.77	12.48	-58.76	2.92	H	-49.20	-13.00
777 (848.3)	1,696.60	-51.22	9.76	-60.81	2.04	V	-53.09	-13.00
	2,544.90	-42.42	10.88	-45.71	2.52	H	-37.35	-13.00
	3,393.20	-57.61	12.65	-58.42	2.94	H	-48.71	-13.00

▣ MODULATION SIGNAL: CDMA PCS

▣ DISTANCE: 3 meters

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit
25 (1851.3)	3,702.60	-51.89	12.40	-55.96	3.08	V	-46.64	-13.00
	5,553.90	-53.22	13.13	-51.38	3.81	V	-42.06	-13.00
	7,405.20	-56.14	11.12	-46.07	4.45	V	-39.40	-13.00
600 (1880.0)	3,760.00	-51.63	12.48	-55.50	3.10	V	-46.12	-13.00
	5,640.00	-54.46	13.30	-52.29	3.85	V	-42.84	-13.00
	7,520.00	-56.29	11.30	-45.72	4.46	H	-38.88	-13.00
1175 (1908.8)	3,817.60	-51.58	12.40	-56.01	3.14	H	-46.75	-13.00
	5,726.40	-54.82	13.35	-52.00	3.88	V	-42.53	-13.00
	7,635.20	-56.78	11.63	-46.35	4.48	H	-39.20	-13.00

8.5 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
				Tx_{Total} (ms)	Tx_{On} (ms)	Factor (dB)			
GSM1900	661	29.451	19.56	4.6160	0.5475	9.26	0.63	13	Pass
GSM1900 EDGE	661	27.791	15.15	4.616	0.5475	9.26	3.38		
WCDMA1900	9400	CCDF Procedure					2.99		
WCDMA1700	1732.4						2.91		
CDMA PCS	600						4.14		

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 79 ~ 87.

2. Only GSM(include EDGE) Mode was tested by alternate procedure for PAPR

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

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

8.6 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
GSM850	128	824.20	245.47
	190	836.60	245.67
	251	848.80	247.93
GSM850 EDGE	128	824.20	245.36
	190	836.60	242.61
	251	848.80	252.07
GSM1900	512	1,850.20	237.66
	661	1,880.00	247.63
	810	1,909.80	244.56
GSM1900 EDGE	512	1,850.20	238.30
	661	1,880.00	245.35
	810	1,909.80	238.74
WCDMA850	4132	826.40	4.1553
	4183	836.60	4.1652
	4233	846.60	4.1352
WCDMA1900	9262	1852.40	4.1677
	9400	1880.00	4.1638
	9538	1907.60	4.1422
WCDMA1700	1312	1712.40	4.1343
	1412	1732.40	4.1427
	1513	1752.60	4.1483

Band	Channel	Frequency(MHz)	Data (CDMA : MHz)
CDMA Secondary800	476	817.9	1.2706
	580	820.5	1.2681
	684	823.1	1.2741
CDMA850	1013	824.7	1.2717
	384	836.5	1.2686
	777	848.3	1.2709
CDMA PCS	25	1851.3	1.2727
	600	1880.0	1.2759
	1175	1908.8	1.2737

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 59 ~ 78.

8.7 CONDUCTED SPURIOUS EMISSIONS

Band	Channel	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result	(dBm)
GSM850	128	2.6920	27.976	-57.76	-29.788	-13.00
	190	2.5709	27.976	-57.59	-29.618	
	251	3.7309	27.976	-57.00	-29.026	
GSM1900	512	18.92197	29.489	-51.959	-22.470	
	661	16.66242	29.489	-53.237	-23.748	
	810	16.49366	29.489	-53.061	-23.572	
WCDMA850	4132	2.4766	27.976	-76.361	-48.385	
	4183	2.5075	27.976	-77.035	-49.059	
	4233	2.5375	27.976	-76.429	-48.453	
WCDMA1900	9262	18.9325	29.489	-72.830	-43.341	
	9400	18.8980	29.489	-73.107	-43.618	
	9538	18.9112	29.489	-73.192	-43.703	
WCDMA1700	1712.4	18.91172	29.489	-73.013	-43.524	
	1732.4	18.86247	29.489	-73.096	-43.607	
	1752.6	18.92897	29.489	-72.849	-43.360	
CDMA Secondary800	476	2.4542	27.976	-71.674	-43.698	
	580	2.4627	27.976	-72.396	-44.420	
	684	2.4702	27.976	-71.810	-43.834	
CDMA850	1013	2.4751	27.976	-72.222	-44.246	
	384	2.5095	27.976	-71.949	-43.973	
	777	2.5454	27.976	-71.545	-43.569	
CDMA PCS	25	18.9342	29.489	-73.510	-44.021	
	600	18.9025	29.489	-73.137	-43.648	
	1175	18.9180	29.489	-73.070	-43.581	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 135 ~ 162.

2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

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

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

8.8 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 88 ~ 134.

8.9 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: GSM850

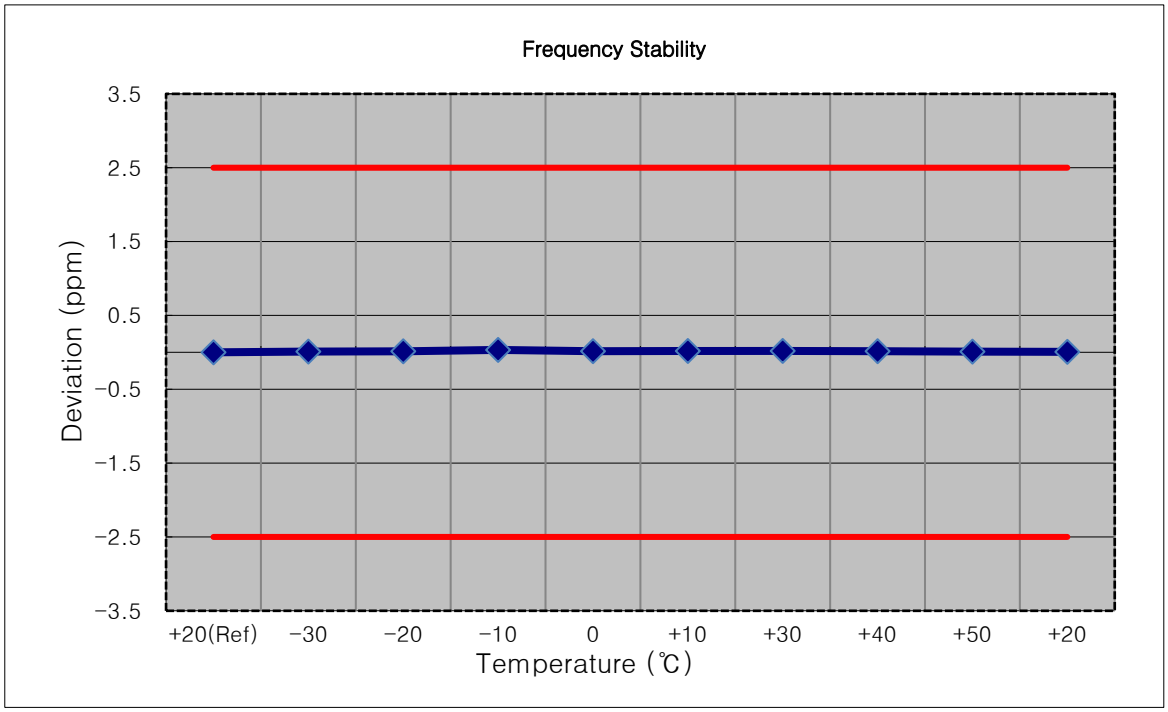
▣ OPERATING FREQUENCY: 836,600,000 Hz

▣ 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%	3.850	+20(Ref)	836 599 990	0.0	0.000 000	0.0000
100%		-30	836 599 998	8.6	0.000 001	0.0103
100%		-20	836 600 001	11.7	0.000 001	0.0140
100%		-10	836 600 017	27.1	0.000 003	0.0324
100%		0	836 600 002	12.5	0.000 001	0.0149
100%		+10	836 600 005	15.0	0.000 002	0.0180
100%		+30	836 600 005	15.6	0.000 002	0.0187
100%		+40	836 600 002	12.8	0.000 002	0.0153
100%		+50	836 599 998	7.9	0.000 001	0.0095
Batt. Endpoint	3.400	+20	836 599 995	5.7	0.000 001	0.0068



▣ Mode: GSM1900

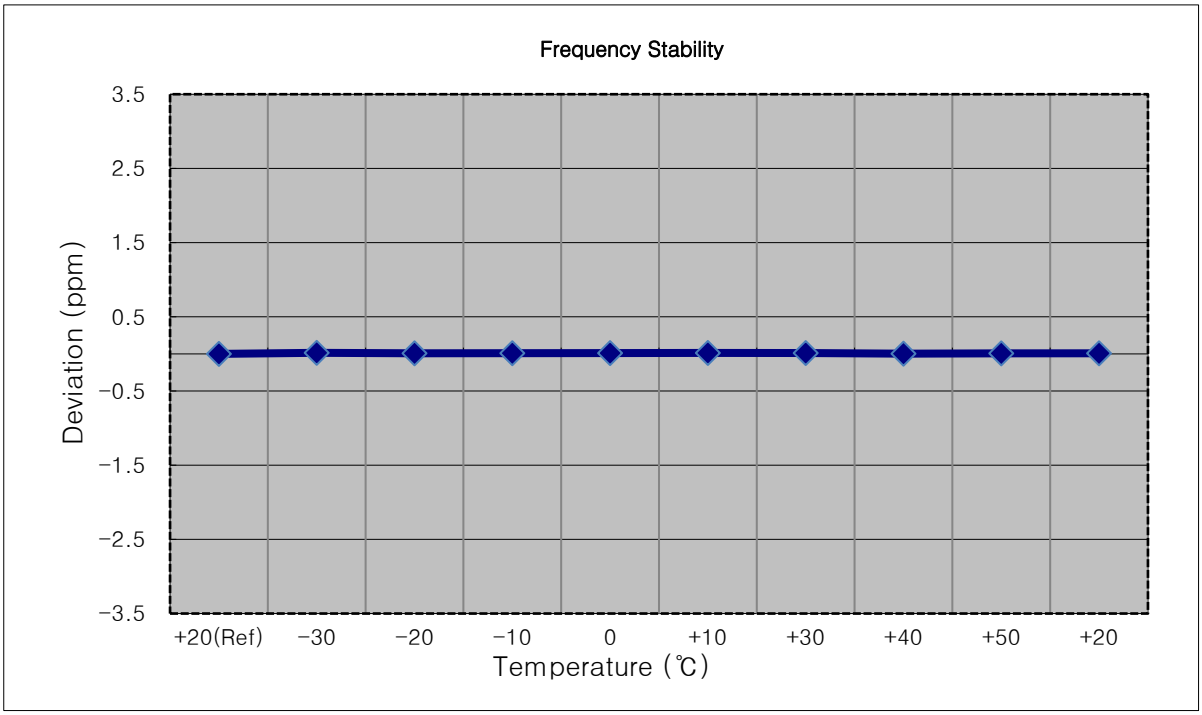
▣ OPERATING FREQUENCY: 1850,200,000 Hz

▣ CHANNEL: 512

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1850 200 021	0.0	0.000 000	0.0000
100%		-30	1850 200 047	26.2	0.000 001	0.0141
100%		-20	1850 200 036	15.3	0.000 001	0.0083
100%		-10	1850 200 038	17.5	0.000 001	0.0095
100%		0	1850 200 040	19.8	0.000 001	0.0107
100%		+10	1850 200 045	24.6	0.000 001	0.0133
100%		+30	1850 200 041	20.9	0.000 001	0.0113
100%		+40	1850 200 027	6.1	0.000 000	0.0033
100%		+50	1850 200 034	13.1	0.000 001	0.0071
Batt. Endpoint	3.400	+20	1850 200 035	14.3	0.000 001	0.0078



▣ Mode: GSM1900

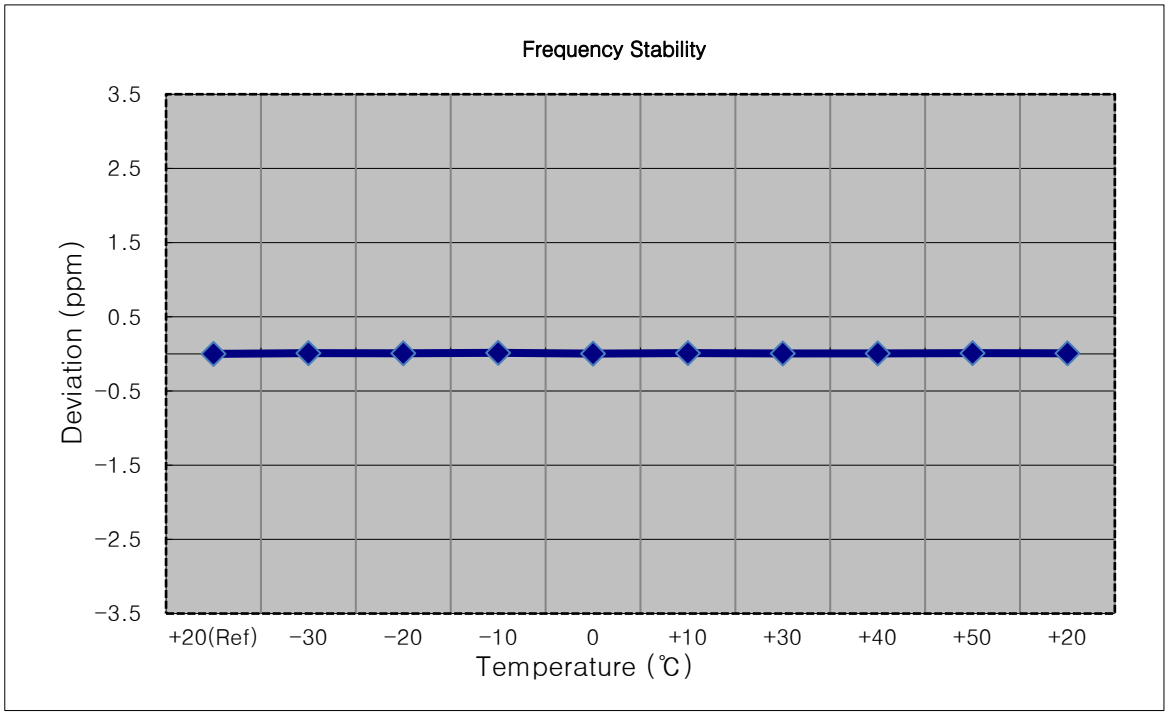
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 661

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1879 999 994	0.0	0.000 000	0.000
100%		-30	1880 000 014	19.3	0.000 001	0.010
100%		-20	1880 000 009	14.7	0.000 001	0.008
100%		-10	1880 000 021	27.2	0.000 001	0.014
100%		0	1880 000 002	7.4	0.000 000	0.004
100%		+10	1880 000 014	20.2	0.000 001	0.011
100%		+30	1880 000 005	10.5	0.000 001	0.006
100%		+40	1880 000 006	11.9	0.000 001	0.006
100%		+50	1880 000 013	18.7	0.000 001	0.010
Batt. Endpoint	3.400	+20	1880 000 009	14.9	0.000 001	0.008



▣ Mode: GSM1900

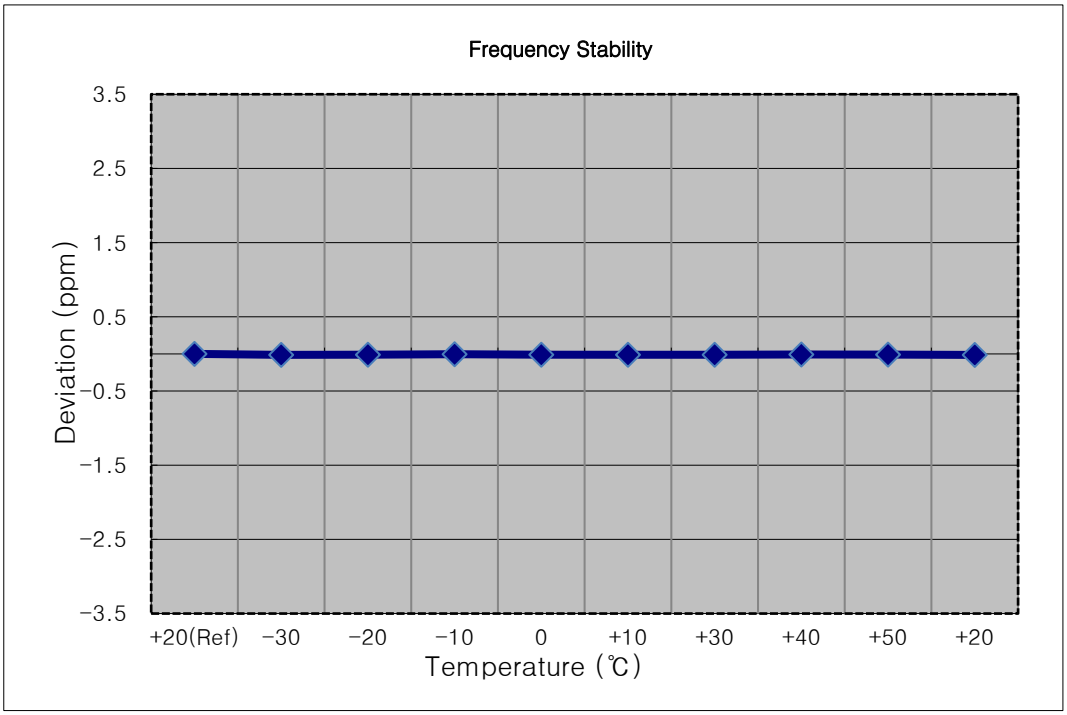
▣ OPERATING FREQUENCY: 1909,800,000 Hz

▣ CHANNEL: 810

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1909 799 982	0.0	0.000 000	0.000
100%		-30	1909 799 957	-24.2	-0.000 001	-0.013
100%		-20	1909 799 961	-20.9	-0.000 001	-0.011
100%		-10	1909 799 974	-8.0	0.000 000	-0.004
100%		0	1909 799 961	-20.4	-0.000 001	-0.011
100%		+10	1909 799 960	-21.8	-0.000 001	-0.011
100%		+30	1909 799 960	-21.5	-0.000 001	-0.011
100%		+40	1909 799 966	-15.2	-0.000 001	-0.008
100%		+50	1909 799 964	-17.3	-0.000 001	-0.009
Batt. Endpoint	3.400	+20	1909 799 956	-25.5	-0.000 001	-0.013



▣ Mode: WCDMA850

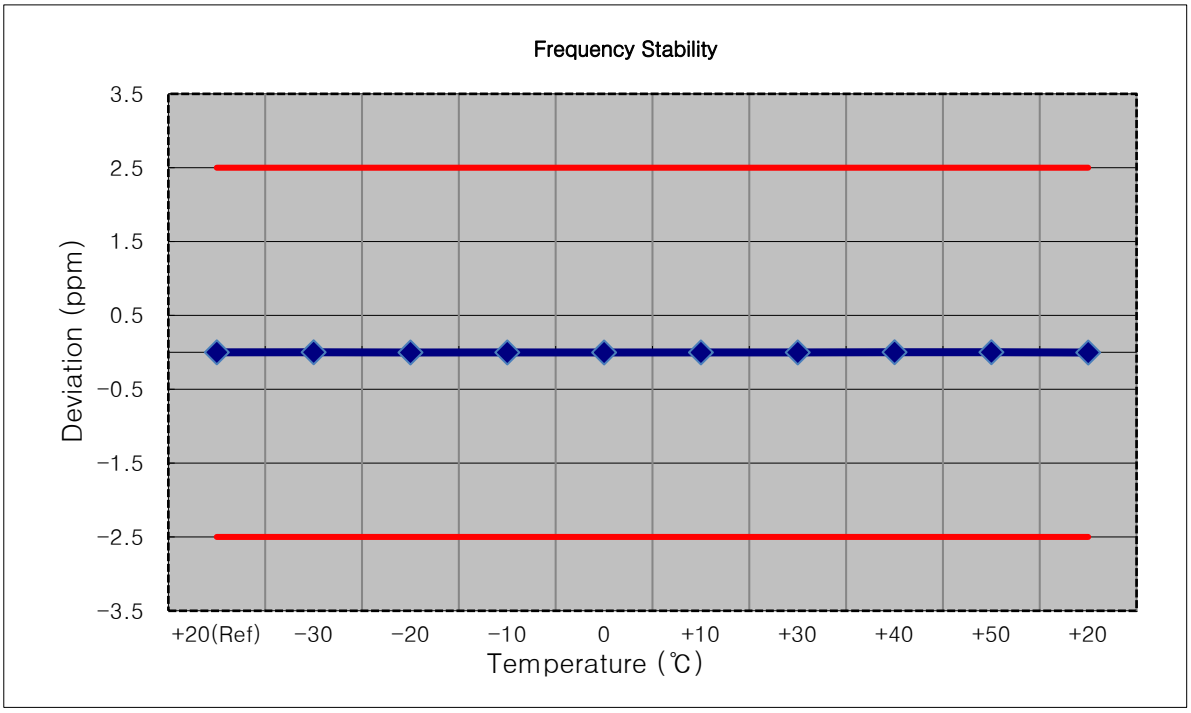
▣ OPERATING FREQUENCY: 836,600,000 Hz

▣ 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%	3.850	+20(Ref)	836 599 998	0.0	0.000 000	0.0000
100%		-30	836 599 999	0.8	0.000 000	0.0009
100%		-20	836 599 996	-2.0	0.000 000	-0.0024
100%		-10	836 599 997	-1.3	0.000 000	-0.0015
100%		0	836 599 996	-2.0	0.000 000	-0.0024
100%		+10	836 599 997	-1.2	0.000 000	-0.0014
100%		+30	836 599 997	-1.4	0.000 000	-0.0017
100%		+40	836 600 000	1.5	0.000 000	0.0017
100%		+50	836 600 000	1.3	0.000 000	0.0016
Batt. Endpoint	3.400	+20	836 599 996	-2.2	0.000 000	-0.0026



▣ Mode: WCDMA1900

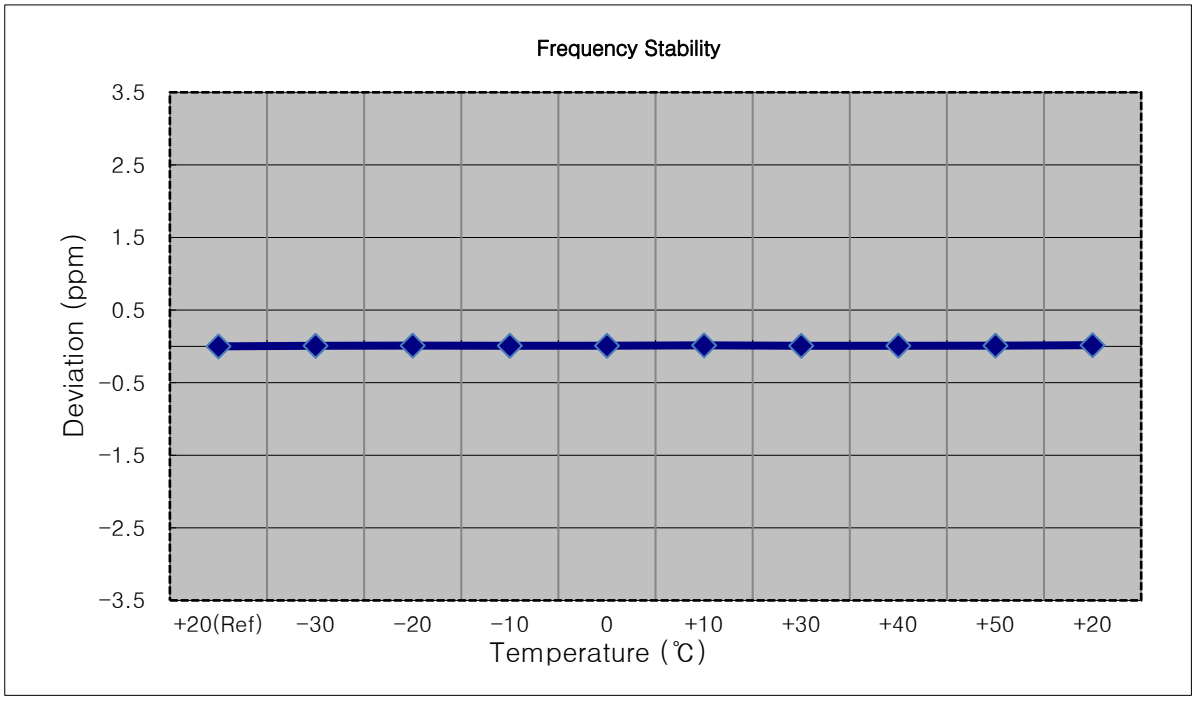
▣ OPERATING FREQUENCY: 1,852,400,000 Hz

▣ CHANNEL: 9262

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1852 400 015	0.0	0.000 000	0.0000
100%		-30	1852 400 030	14.9	0.000 001	0.0080
100%		-20	1852 400 034	18.9	0.000 001	0.0102
100%		-10	1852 400 030	14.6	0.000 001	0.0079
100%		0	1852 400 031	15.9	0.000 001	0.0086
100%		+10	1852 400 042	26.5	0.000 001	0.0143
100%		+30	1852 400 031	15.5	0.000 001	0.0084
100%		+40	1852 400 031	15.9	0.000 001	0.0086
100%		+50	1852 400 033	17.5	0.000 001	0.0094
Batt. Endpoint	3.400	+20	1852 400 046	30.7	0.000 002	0.0165



▣ Mode: WCDMA1900

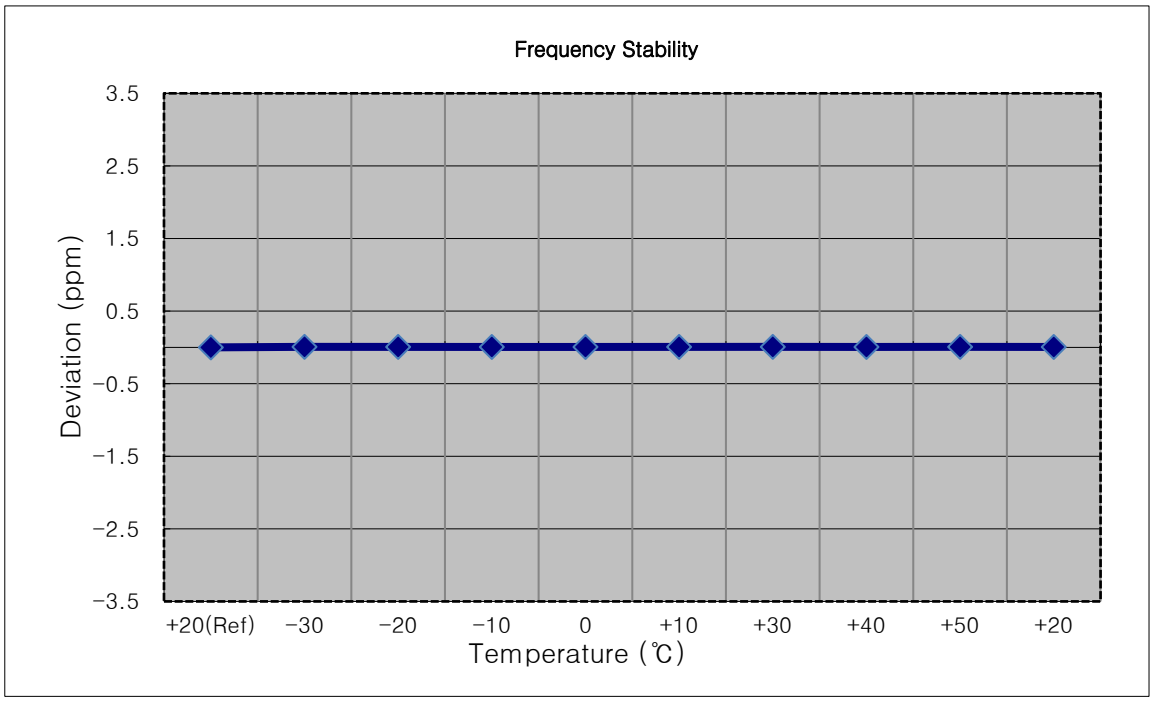
▣ OPERATING FREQUENCY: 1,880,000,000 Hz

▣ CHANNEL: 9400

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 015	0.0	0.000 000	0.0000
100%		-30	1880 000 029	14.2	0.000 001	0.0075
100%		-20	1880 000 027	12.1	0.000 001	0.0064
100%		-10	1880 000 026	11.8	0.000 001	0.0063
100%		0	1880 000 027	12.0	0.000 001	0.0064
100%		+10	1880 000 027	12.6	0.000 001	0.0067
100%		+30	1880 000 028	13.5	0.000 001	0.0072
100%		+40	1880 000 026	11.2	0.000 001	0.0060
100%		+50	1880 000 029	14.7	0.000 001	0.0078
Batt. Endpoint	3.400	+20	1880 000 026	11.7	0.000 001	0.0062



▣ Mode: WCDMA1900

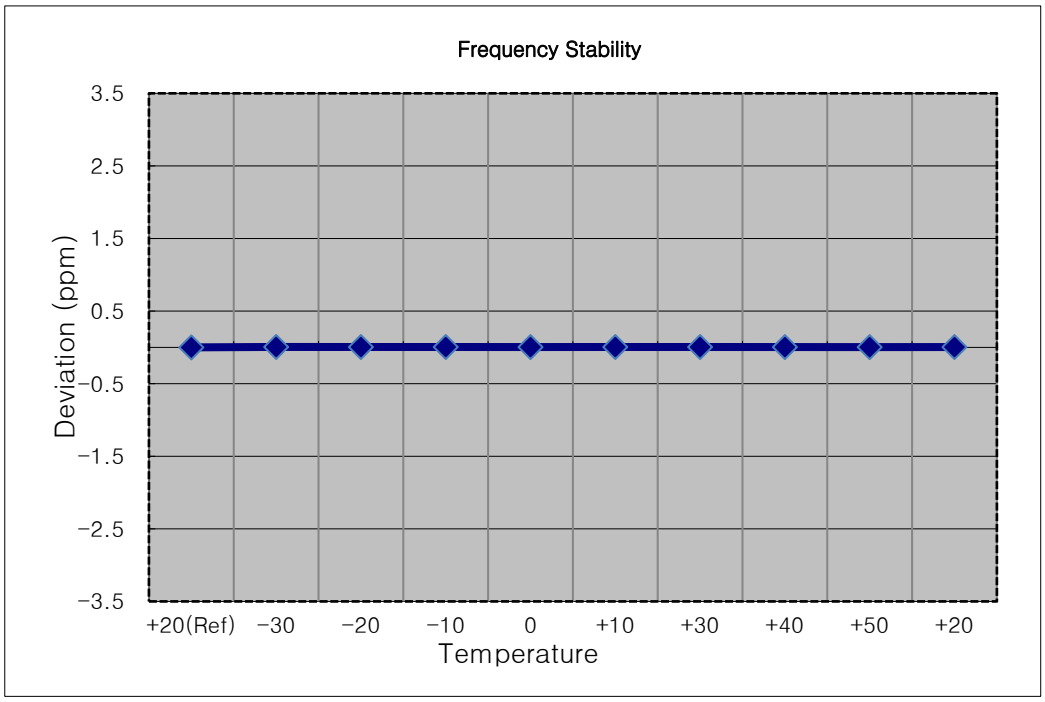
▣ OPERATING FREQUENCY: 1,907,600,000 Hz

▣ CHANNEL: 9538

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1907 600 009	0.0	0.000 000	0.0000
100%		-30	1907 600 020	11.2	0.000 001	0.0058
100%		-20	1907 600 020	10.5	0.000 001	0.0055
100%		-10	1907 600 018	9.5	0.000 000	0.0050
100%		0	1907 600 018	8.6	0.000 000	0.0045
100%		+10	1907 600 019	9.6	0.000 001	0.0050
100%		+30	1907 600 019	10.0	0.000 001	0.0053
100%		+40	1907 600 018	9.3	0.000 000	0.0049
100%		+50	1907 600 017	7.7	0.000 000	0.0040
Batt. Endpoint	3.400	+20	1907 600 018	8.8	0.000 000	0.0046



▣ Mode: WCDMA1700

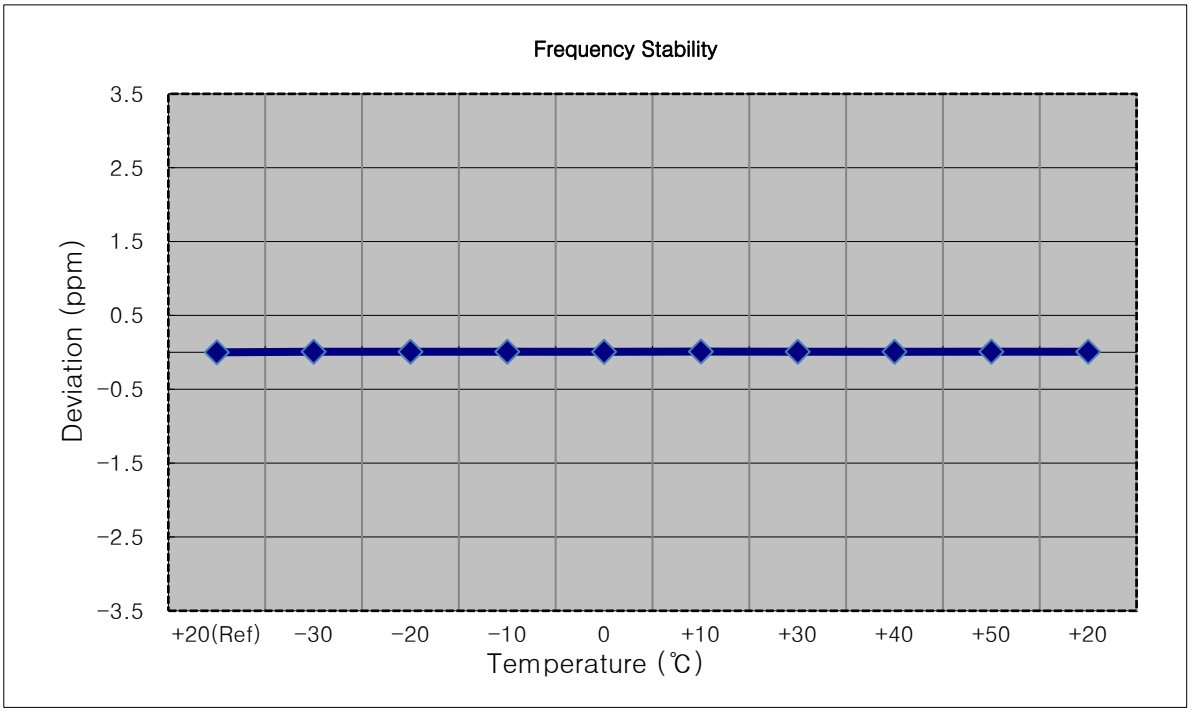
▣ OPERATING FREQUENCY: 1,712,400,000 Hz

▣ CHANNEL: 1312

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1712 400 013	0.0	0.000 000	0.0000
100%		-30	1712 400 026	13.1	0.000 001	0.0076
100%		-20	1712 400 027	14.1	0.000 001	0.0083
100%		-10	1712 400 027	13.5	0.000 001	0.0079
100%		0	1712 400 026	12.7	0.000 001	0.0074
100%		+10	1712 400 030	16.7	0.000 001	0.0097
100%		+30	1712 400 026	13.5	0.000 001	0.0079
100%		+40	1712 400 026	12.7	0.000 001	0.0074
100%		+50	1712 400 028	15.4	0.000 001	0.0090
Batt. Endpoint	3.400	+20	1712 400 027	14.0	0.000 001	0.0082



▣ Mode: WCDMA1700

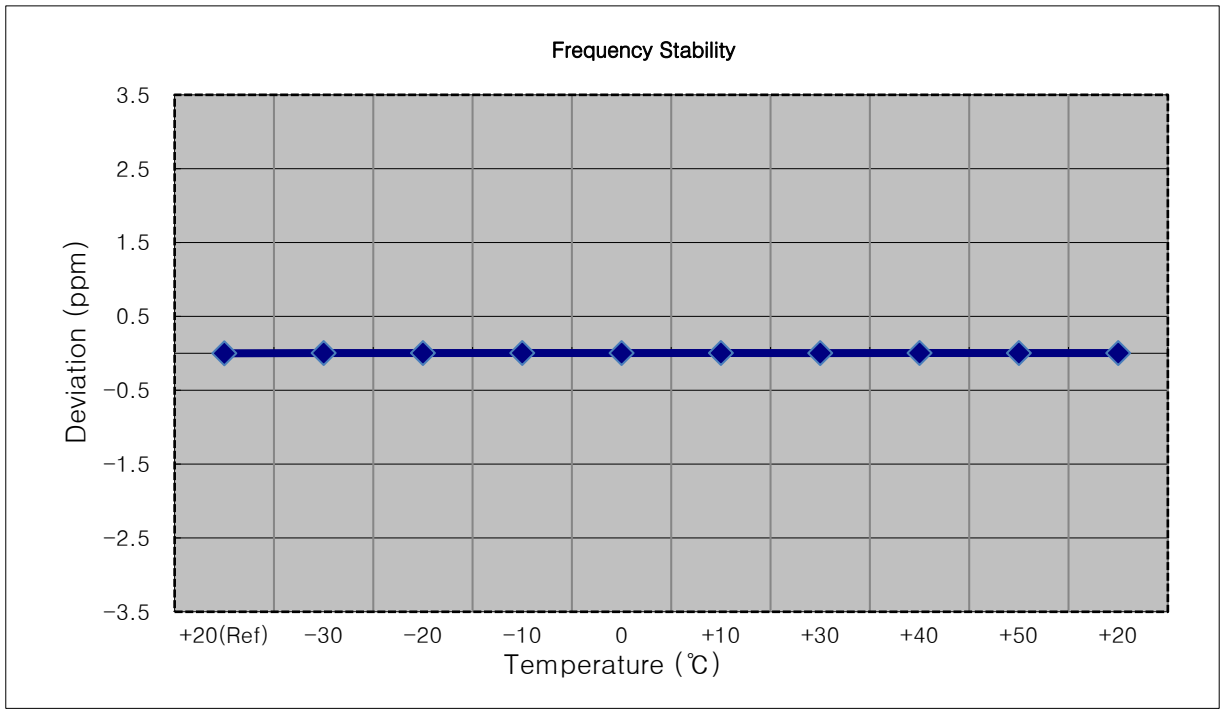
▣ OPERATING FREQUENCY: 1,732,400,000 Hz

▣ CHANNEL: 1412

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 400 005	0.0	0.000 000	0.0000
100%		-30	1732 400 012	6.7	0.000 000	0.0038
100%		-20	1732 400 011	6.0	0.000 000	0.0035
100%		-10	1732 400 012	6.9	0.000 000	0.0040
100%		0	1732 400 012	6.8	0.000 000	0.0039
100%		+10	1732 400 012	7.3	0.000 000	0.0042
100%		+30	1732 400 010	5.0	0.000 000	0.0029
100%		+40	1732 400 013	7.9	0.000 000	0.0046
100%		+50	1732 400 011	6.1	0.000 000	0.0035
Batt. Endpoint	3.400	+20	1732 400 011	6.2	0.000 000	0.0036



▣ Mode: WCDMA1700

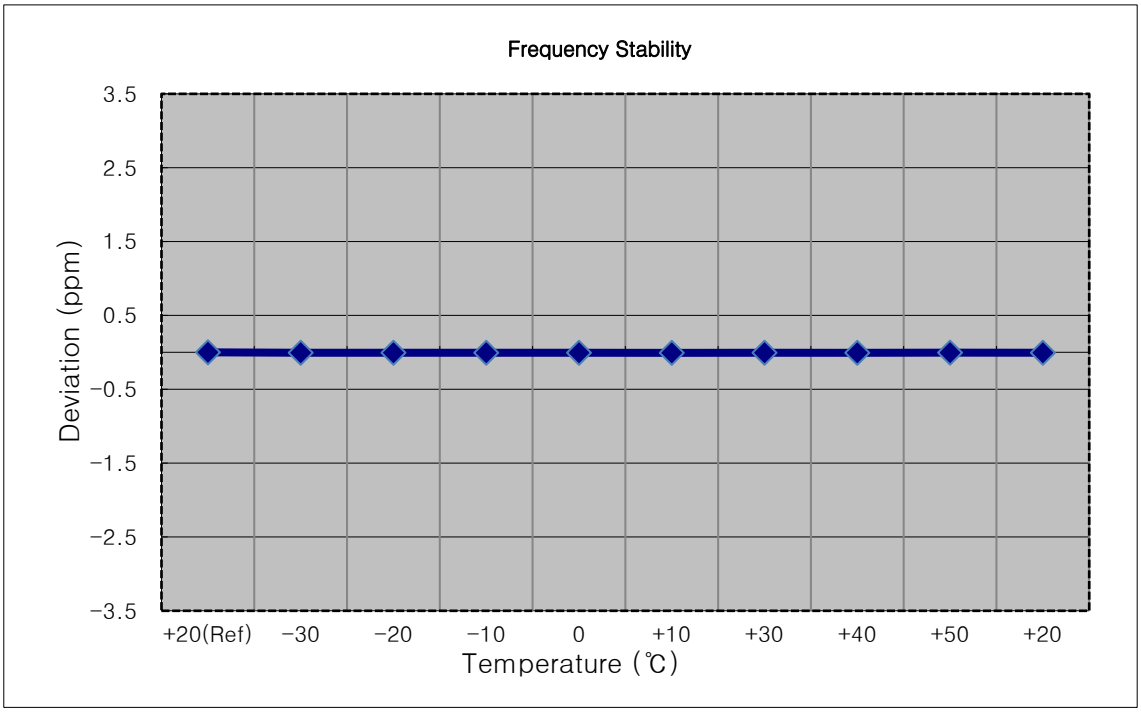
▣ OPERATING FREQUENCY: 1,752,600,000 Hz

▣ CHANNEL: 1513

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1752 599 990	0.0	0.000 000	0.0000
100%		-30	1752 599 980	-9.7	-0.000 001	-0.0056
100%		-20	1752 599 979	-10.2	-0.000 001	-0.0058
100%		-10	1752 599 979	-10.4	-0.000 001	-0.0059
100%		0	1752 599 979	-10.2	-0.000 001	-0.0058
100%		+10	1752 599 977	-12.6	-0.000 001	-0.0072
100%		+30	1752 599 979	-10.7	-0.000 001	-0.0061
100%		+40	1752 599 979	-11.0	-0.000 001	-0.0063
100%		+50	1752 599 982	-8.0	0.000 000	-0.0046
Batt. Endpoint	3.400	+20	1752 599 980	-9.9	-0.000 001	-0.0057



▣ Mode: CDMA850

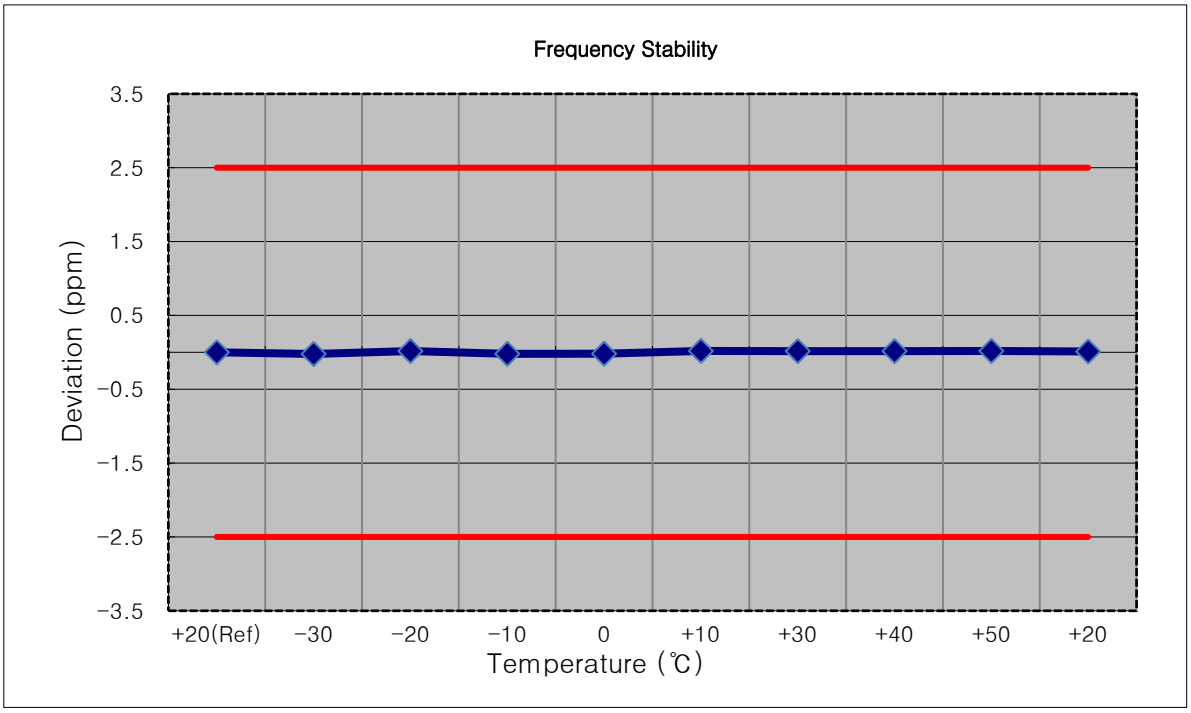
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 384

▣ 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%	3.850	+20(Ref)	836 499 983	0.0	0.000 000	0.0000
100%		-30	836 499 964	-19.0	-0.000 002	-0.0227
100%		-20	836 499 998	14.5	0.000 002	0.0173
100%		-10	836 499 967	-16.9	-0.000 002	-0.0202
100%		0	836 499 968	-15.7	-0.000 002	-0.0188
100%		+10	836 499 999	16.0	0.000 002	0.0191
100%		+30	836 499 996	13.0	0.000 002	0.0156
100%		+40	836 499 997	13.1	0.000 002	0.0156
100%		+50	836 499 999	15.4	0.000 002	0.0184
Batt. Endpoint	3.400	+20	836 499 993	9.5	0.000 001	0.0113



▣ Mode: CDMA Secondary800

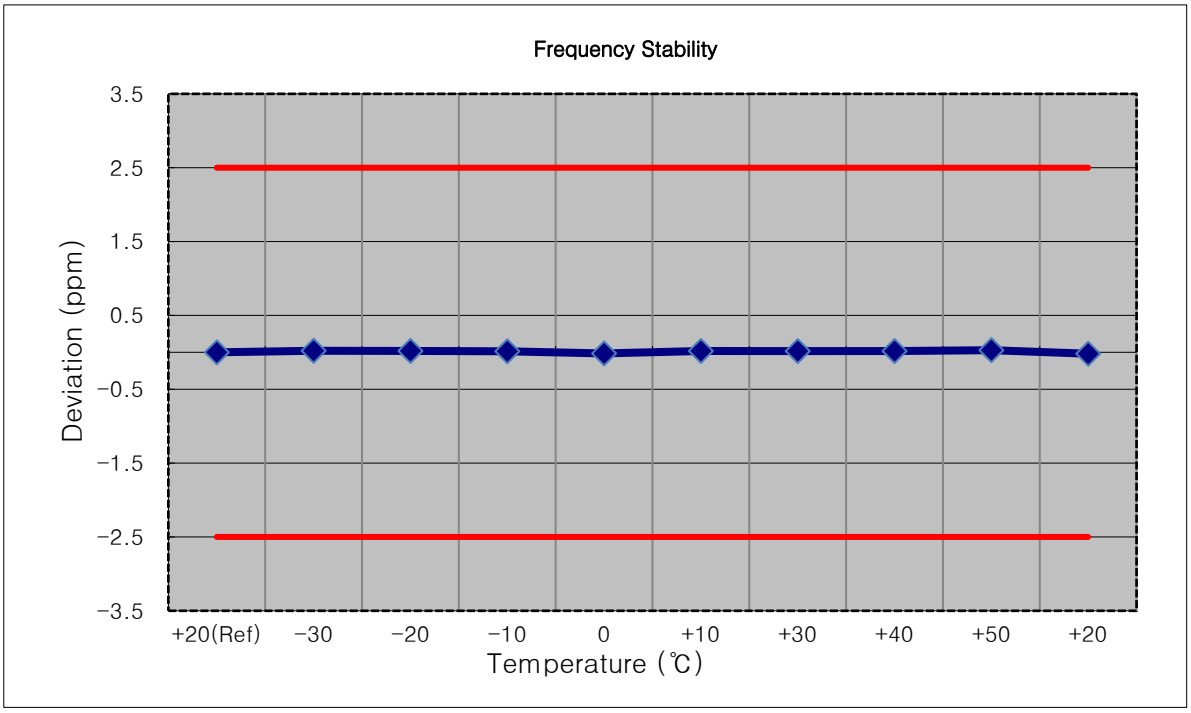
▣ OPERATING FREQUENCY: 820,500,000 Hz

▣ CHANNEL: 580

▣ 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%	3.850	+20(Ref)	820 500 013	0.0	0.000 000	0.0000
100%		-30	820 500 030	17.1	0.000 002	0.0209
100%		-20	820 500 029	15.4	0.000 002	0.0188
100%		-10	820 500 024	11.2	0.000 001	0.0137
100%		0	820 500 001	-12.3	-0.000 002	-0.0150
100%		+10	820 500 028	14.8	0.000 002	0.0180
100%		+30	820 500 027	13.4	0.000 002	0.0164
100%		+40	820 500 028	14.5	0.000 002	0.0176
100%		+50	820 500 037	23.6	0.000 003	0.0288
Batt. Endpoint	3.400	+20	820 499 997	-15.7	-0.000 002	-0.0191



▣ Mode: CDMA PCS

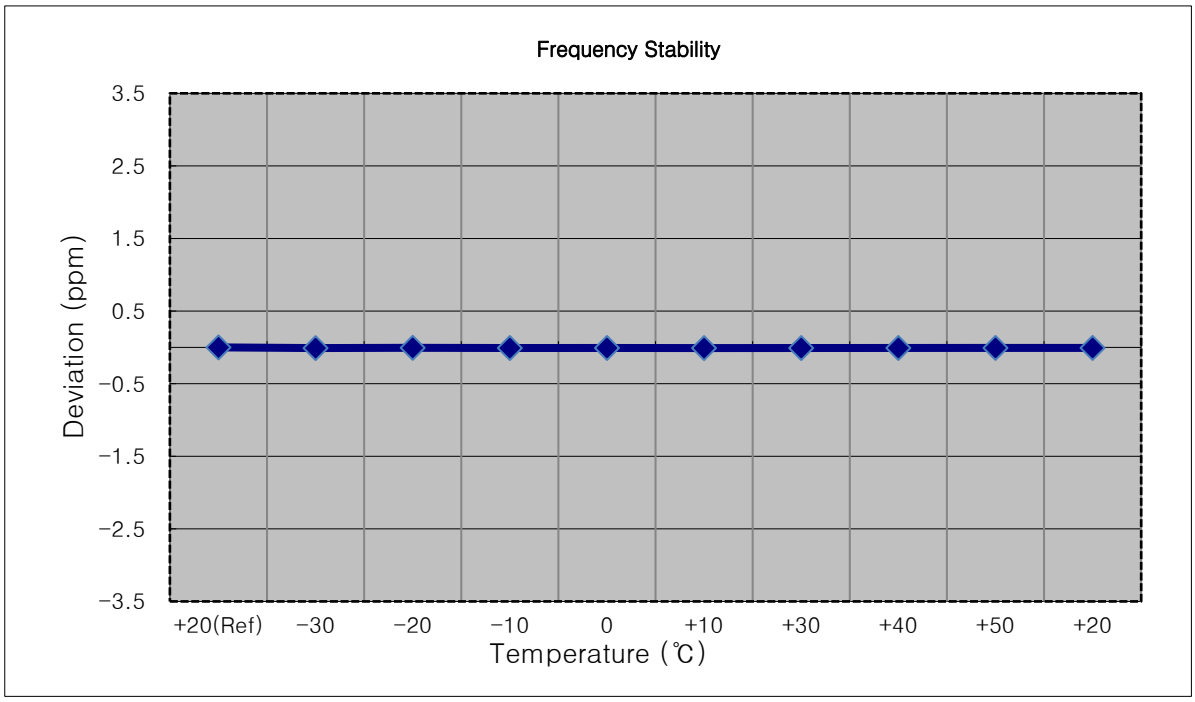
▣ OPERATING FREQUENCY: 1,851,250,000 Hz

▣ CHANNEL: 25

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1851 250 011	0.0	0.000 000	0.0000
100%		-30	1851 249 994	-17.1	-0.000 001	-0.0092
100%		-20	1851 250 000	-10.5	-0.000 001	-0.0057
100%		-10	1851 249 995	-16.2	-0.000 001	-0.0087
100%		0	1851 249 996	-14.7	-0.000 001	-0.0079
100%		+10	1851 249 994	-17.0	-0.000 001	-0.0092
100%		+30	1851 249 995	-15.7	-0.000 001	-0.0085
100%		+40	1851 249 995	-15.4	-0.000 001	-0.0083
100%		+50	1851 249 997	-13.3	-0.000 001	-0.0072
Batt. Endpoint	3.400	+20	1851 249 998	-13.2	-0.000 001	-0.0071



▣ Mode: CDMA PCS

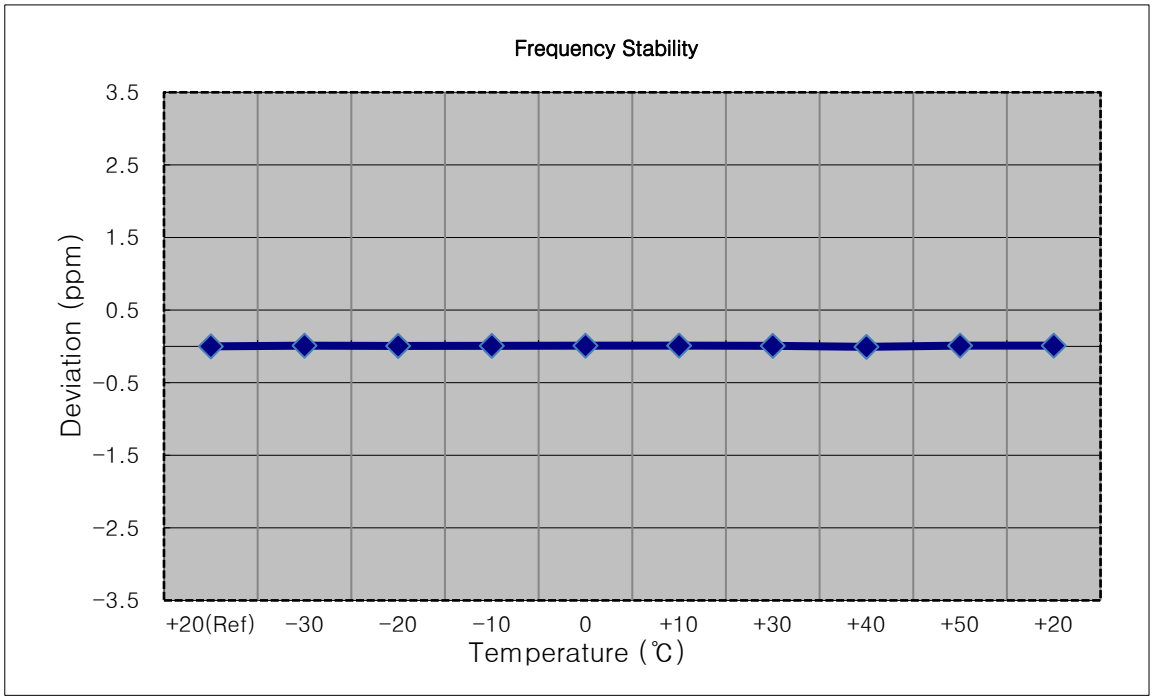
▣ OPERATING FREQUENCY: 1,880,000,000 Hz

▣ CHANNEL: 600

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 014	0.0	0.000 000	0.0000
100%		-30	1880 000 032	18.5	0.000 001	0.0098
100%		-20	1880 000 025	11.7	0.000 001	0.0062
100%		-10	1880 000 028	14.8	0.000 001	0.0078
100%		0	1880 000 032	17.9	0.000 001	0.0095
100%		+10	1880 000 033	19.6	0.000 001	0.0104
100%		+30	1880 000 028	14.7	0.000 001	0.0078
100%		+40	1880 000 001	-12.5	-0.000 001	-0.0067
100%		+50	1880 000 033	19.1	0.000 001	0.0102
Batt. Endpoint	3.400	+20	1880 000 033	19.4	0.000 001	0.0103



▣ Mode: CDMA PCS

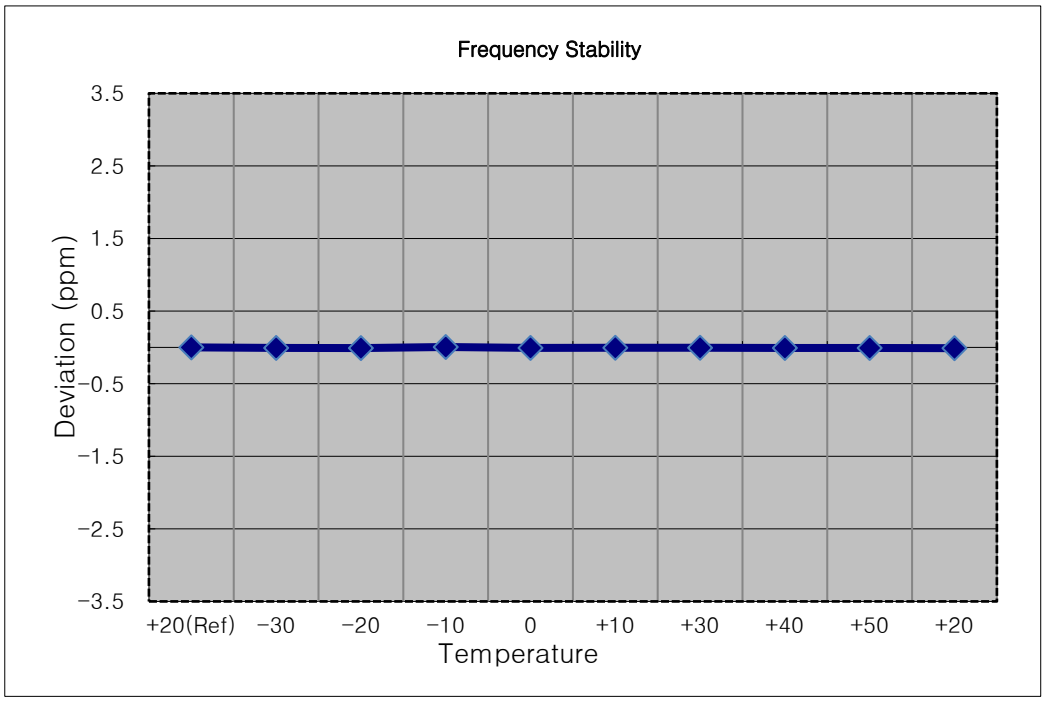
▣ OPERATING FREQUENCY: 1,908,750,000 Hz

▣ CHANNEL: 1175

▣ REFERENCE VOLTAGE: 3.85 VDC

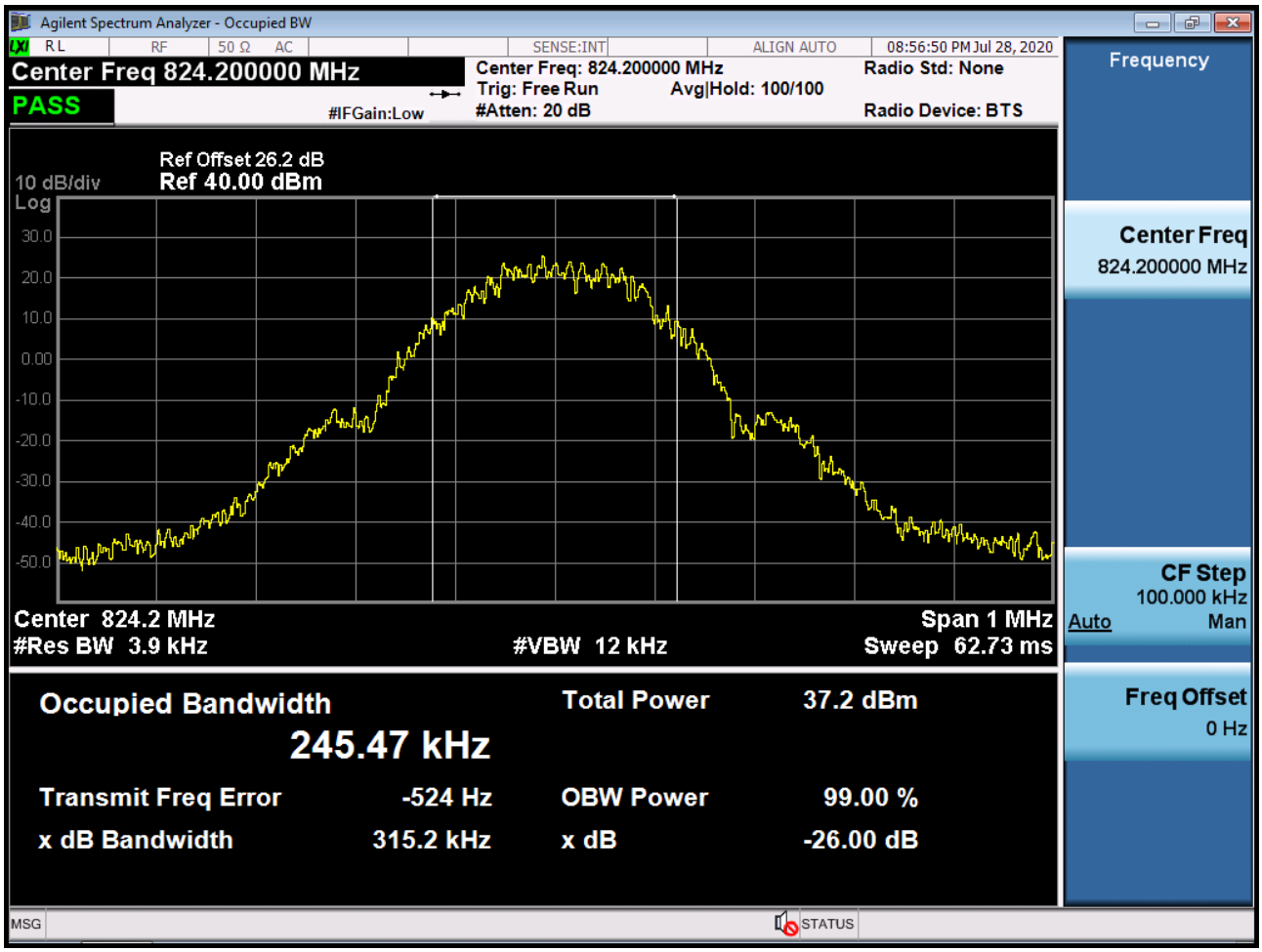
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1908 749 984	0.0	0.000 000	0.0000
100%		-30	1908 749 970	-14.1	-0.000 001	-0.0074
100%		-20	1908 749 967	-17.3	-0.000 001	-0.0091
100%		-10	1908 749 995	10.6	0.000 001	0.0056
100%		0	1908 749 970	-13.8	-0.000 001	-0.0072
100%		+10	1908 749 974	-10.1	-0.000 001	-0.0053
100%		+30	1908 749 975	-9.2	0.000 000	-0.0048
100%		+40	1908 749 968	-15.8	-0.000 001	-0.0083
100%		+50	1908 749 969	-15.1	-0.000 001	-0.0079
Batt. Endpoint	3.400	+20	1908 749 963	-20.8	-0.000 001	-0.0109

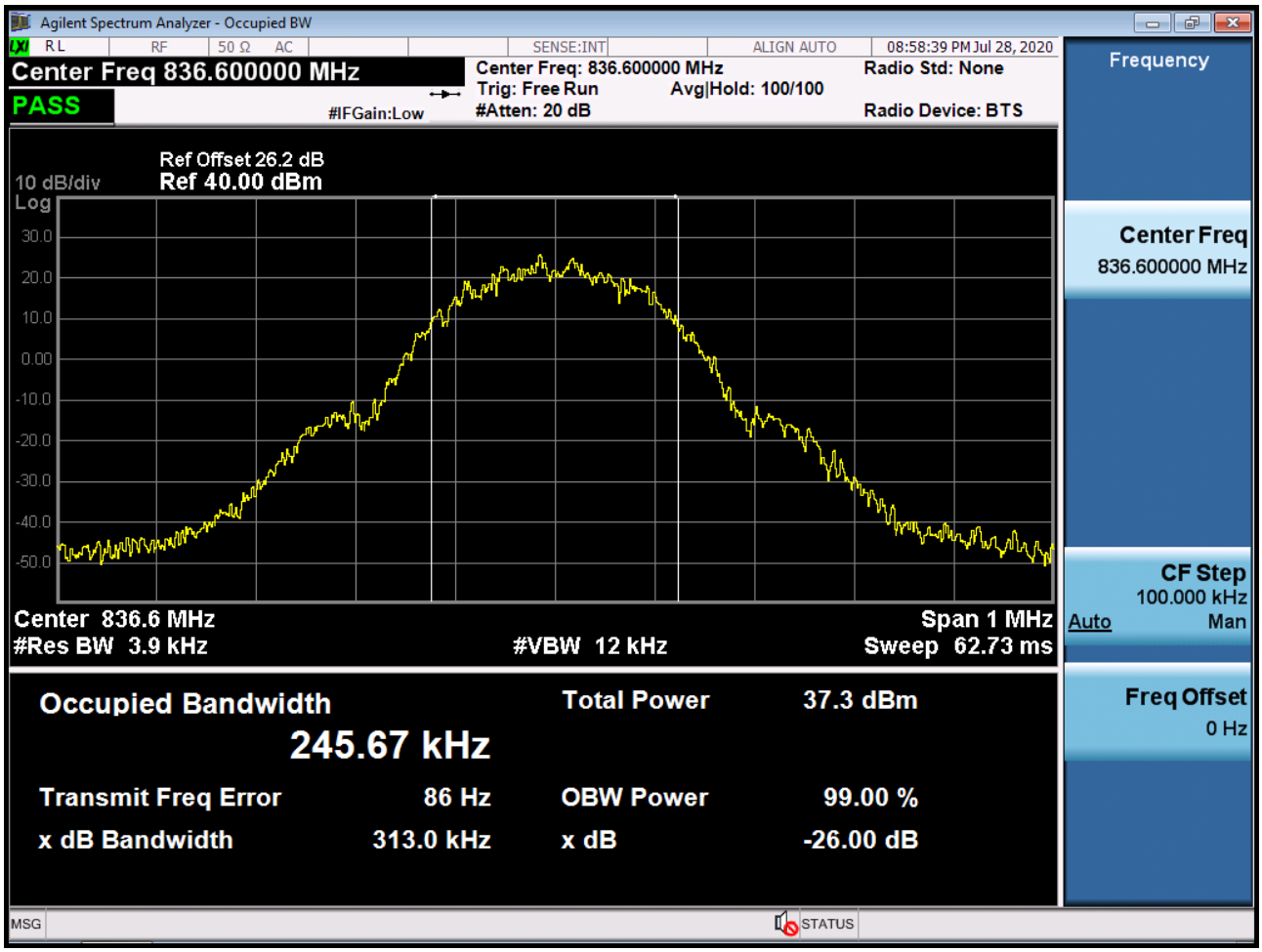


9. TEST PLOTS

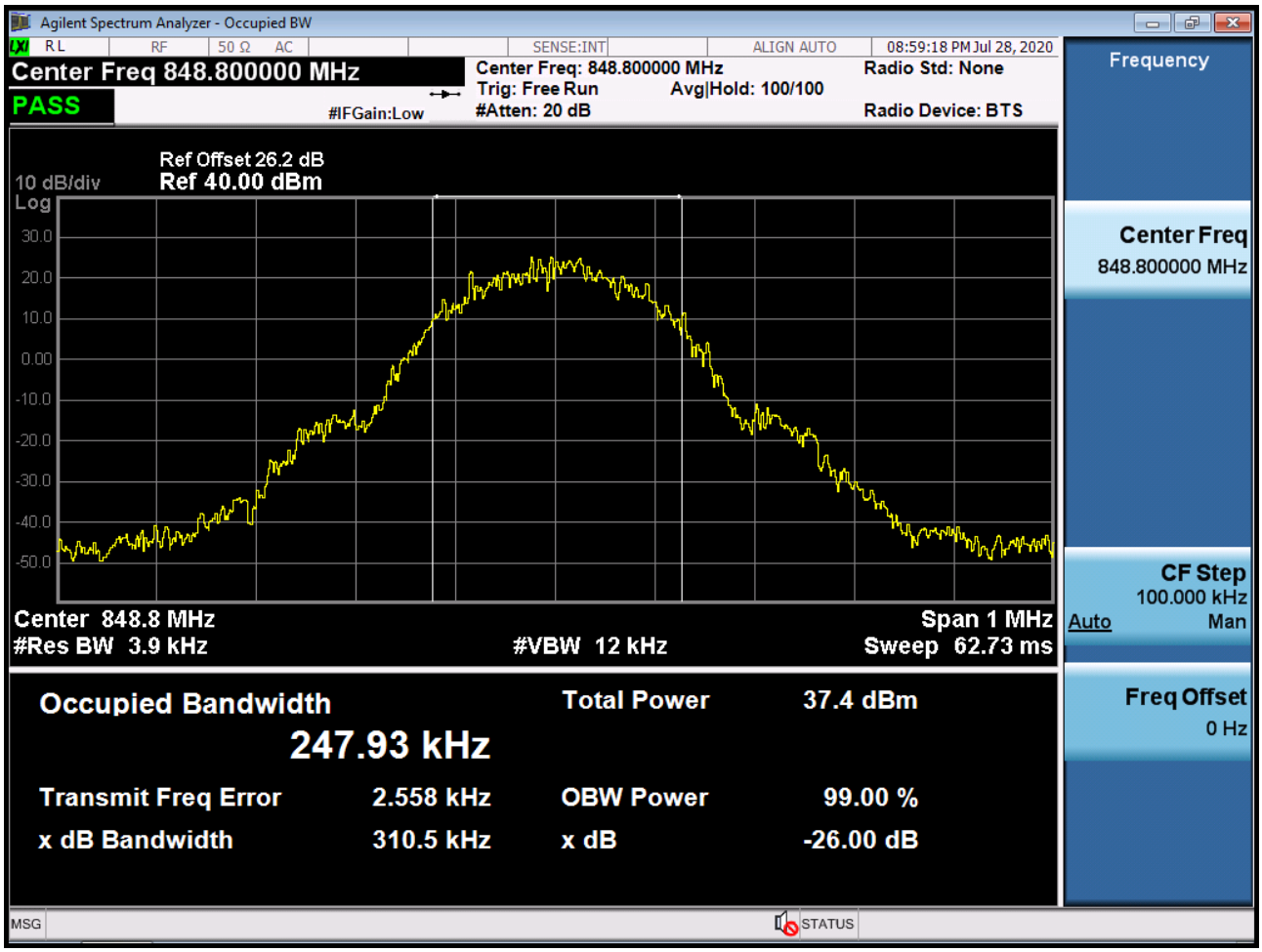
■ GSM850 MODE (128 CH.) Occupied Bandwidth



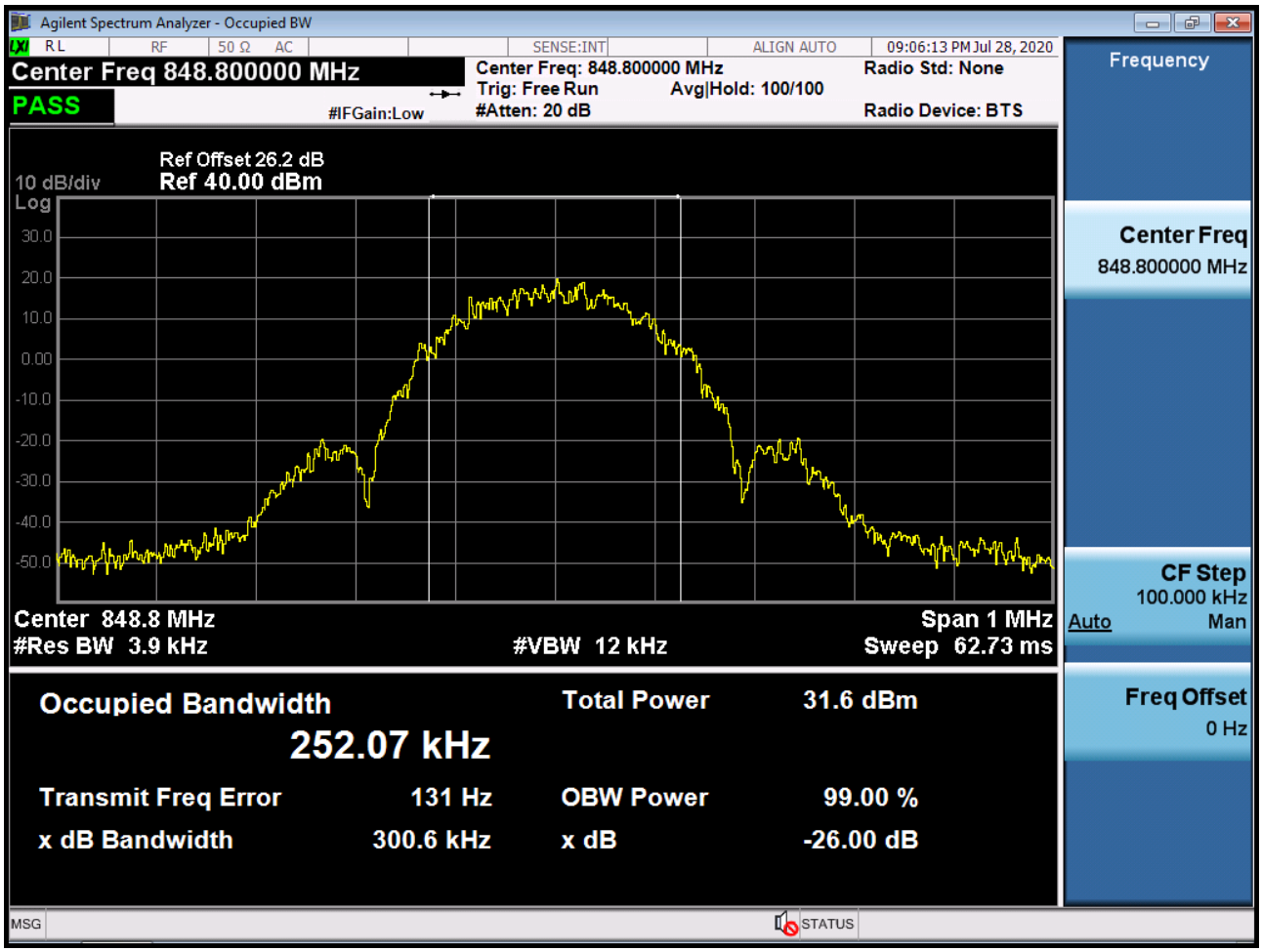
■ GSM850 MODE (190 CH.) Occupied Bandwidth



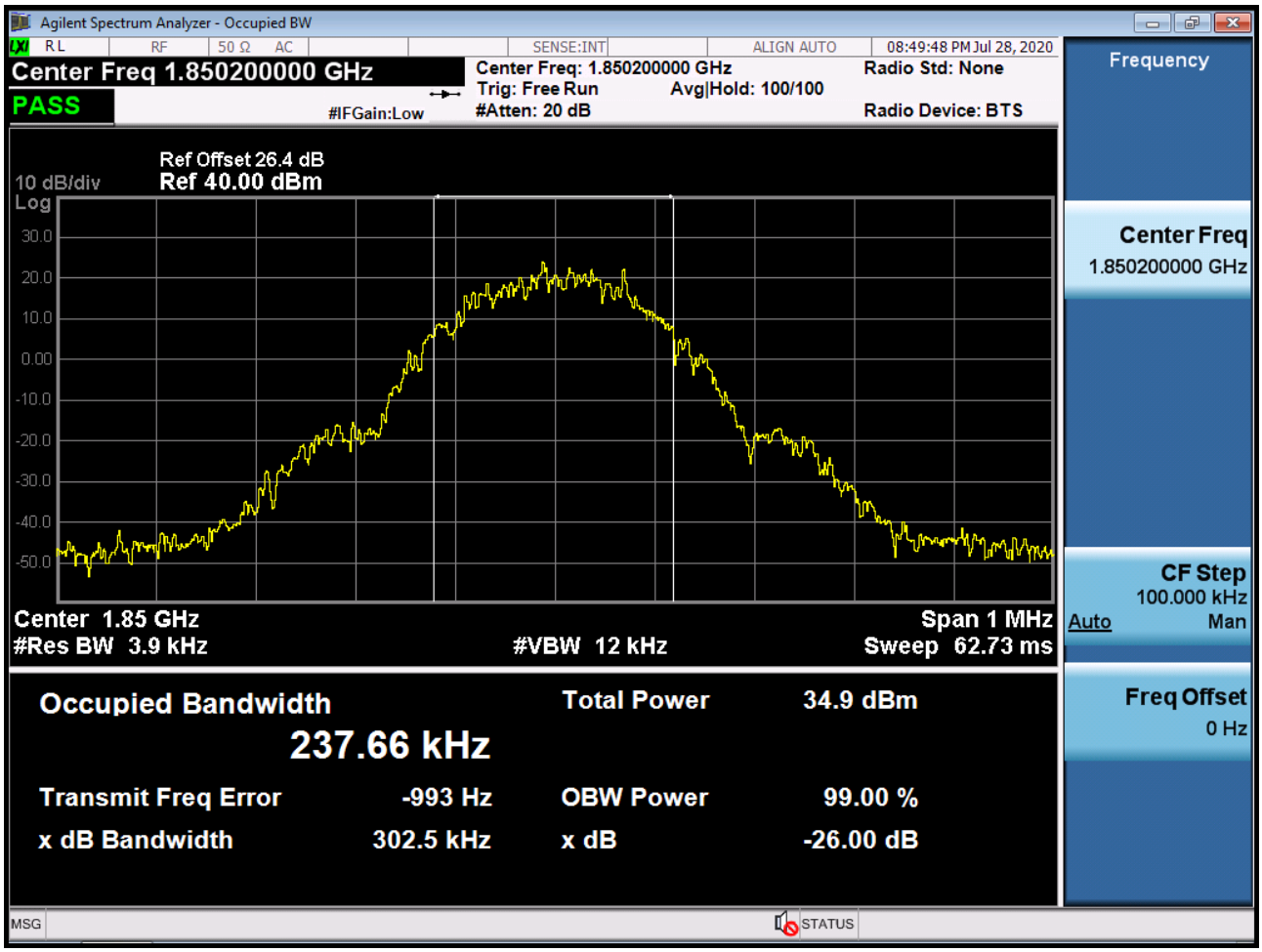
■ GSM850 MODE (251 CH.) Occupied Bandwidth



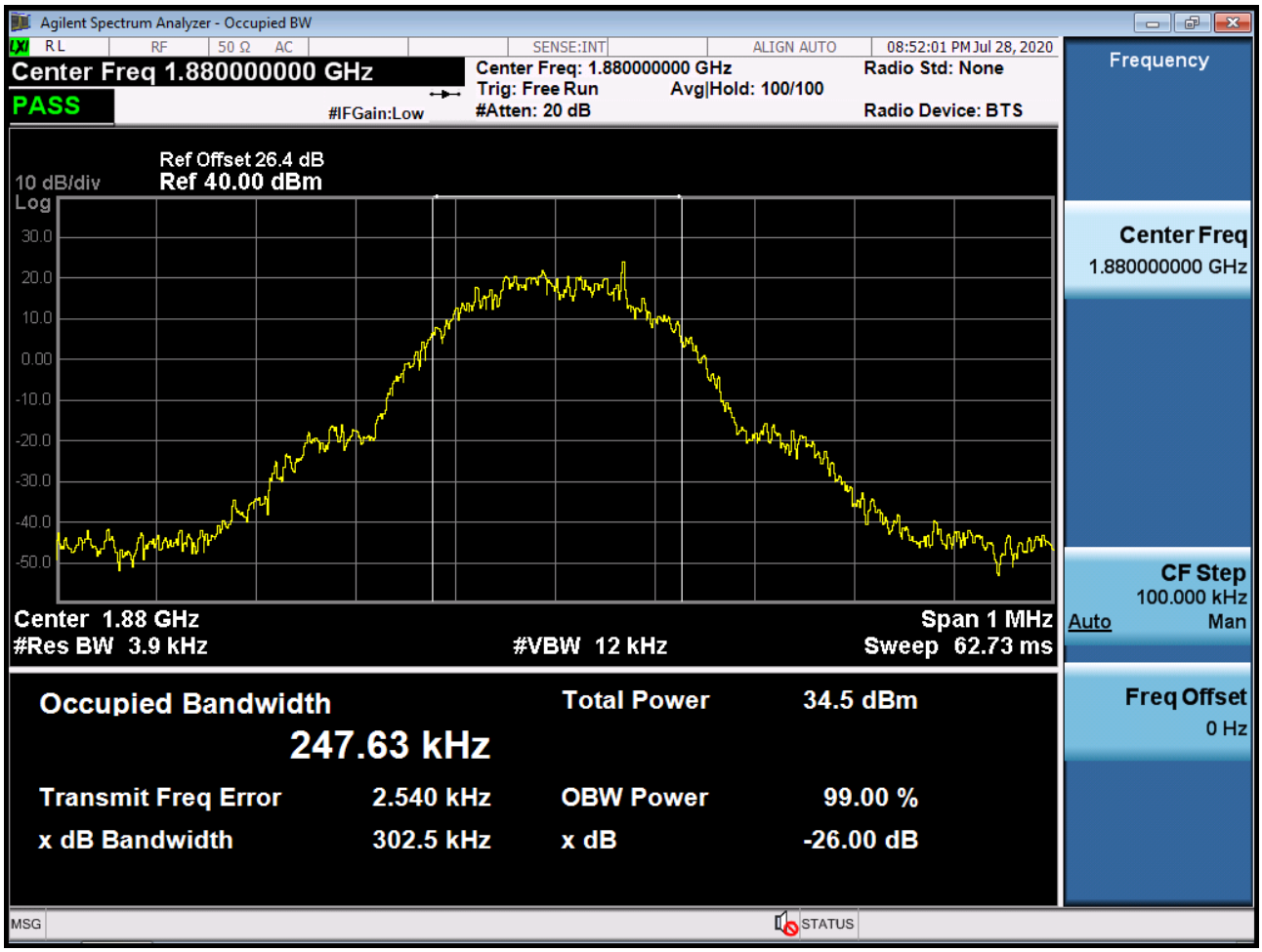
■ GSM850 EDGE (251 CH.) Occupied Bandwidth



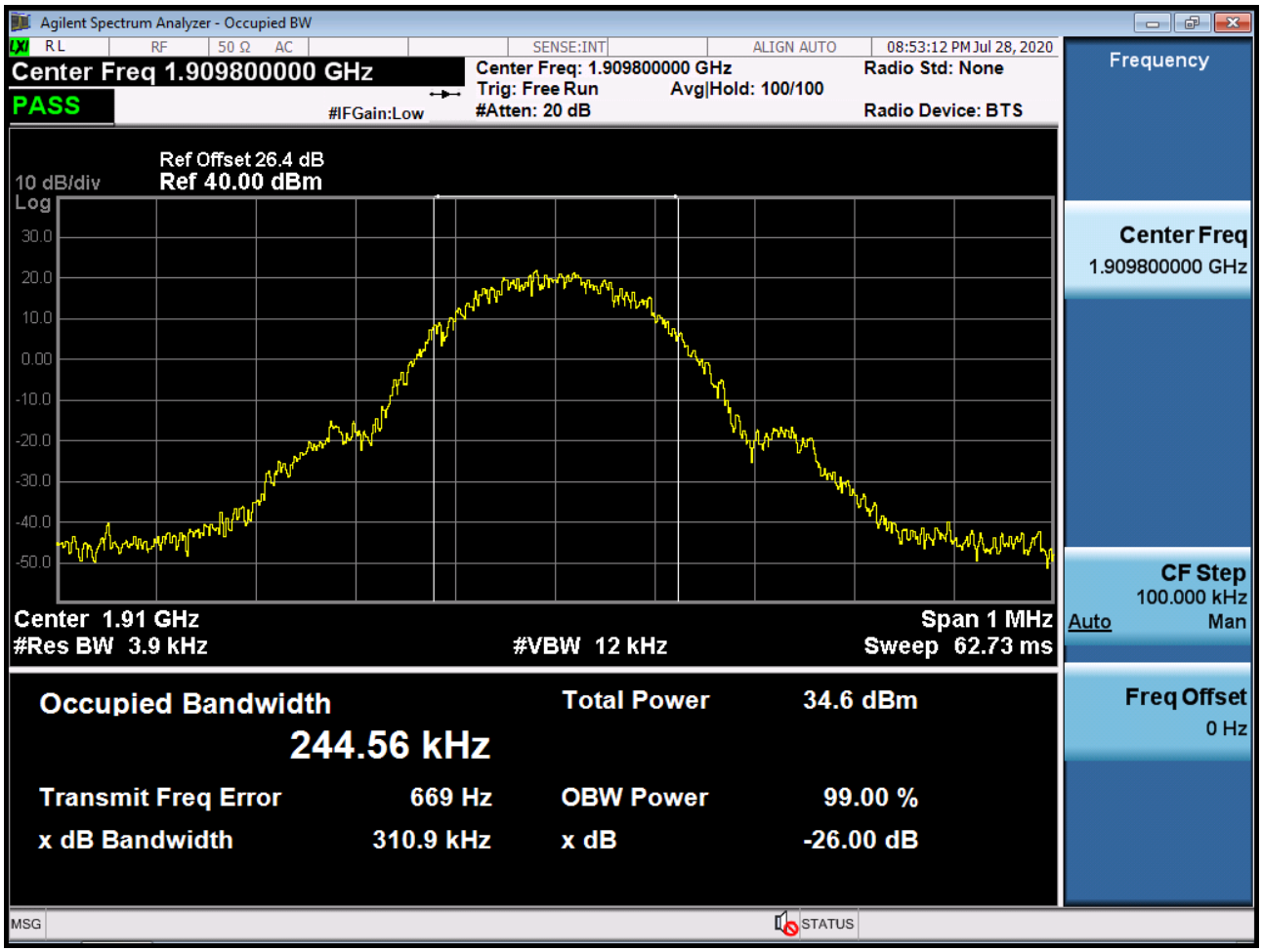
■ GSM1900 MODE (512 CH.) Occupied Bandwidth



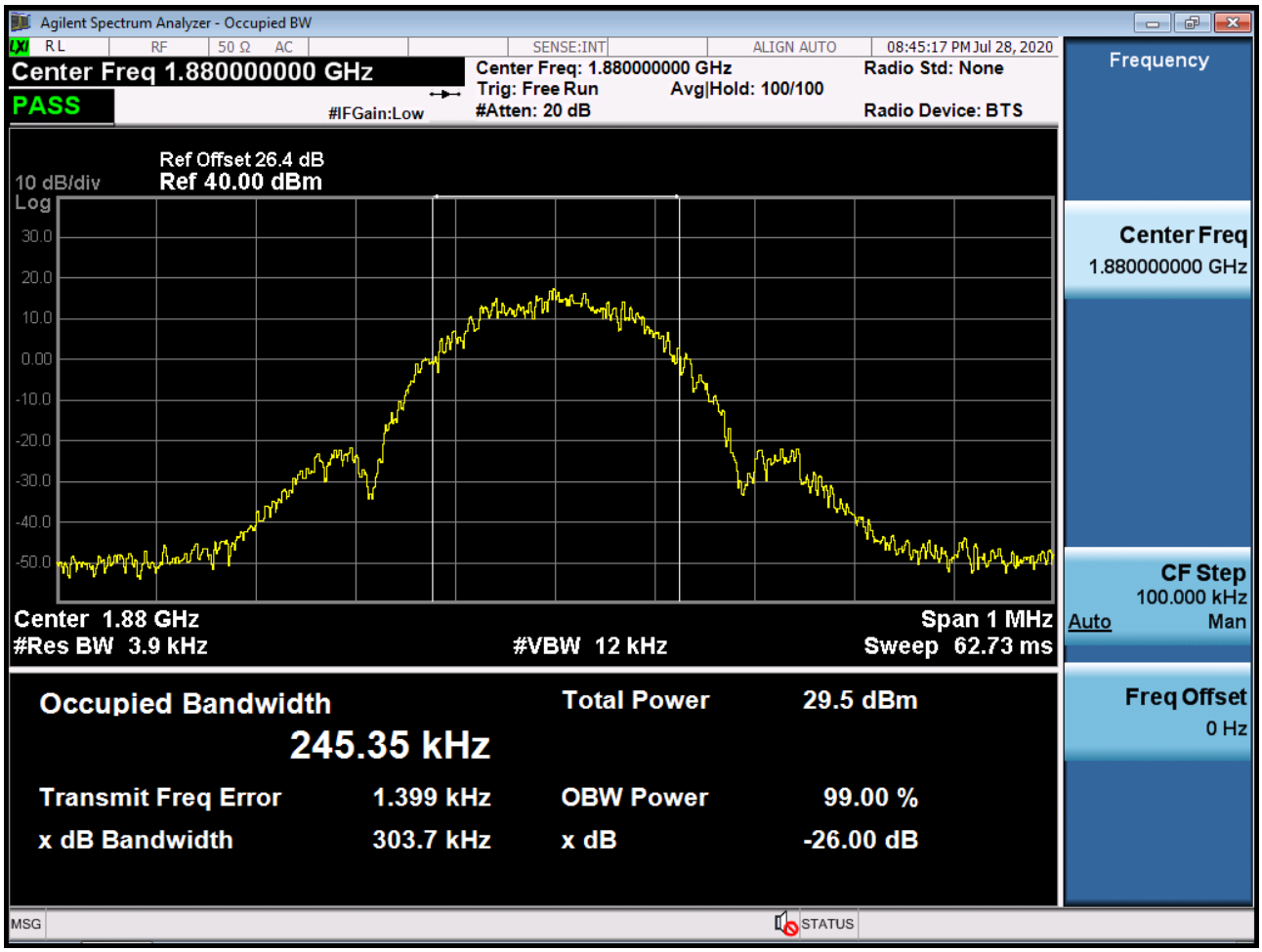
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



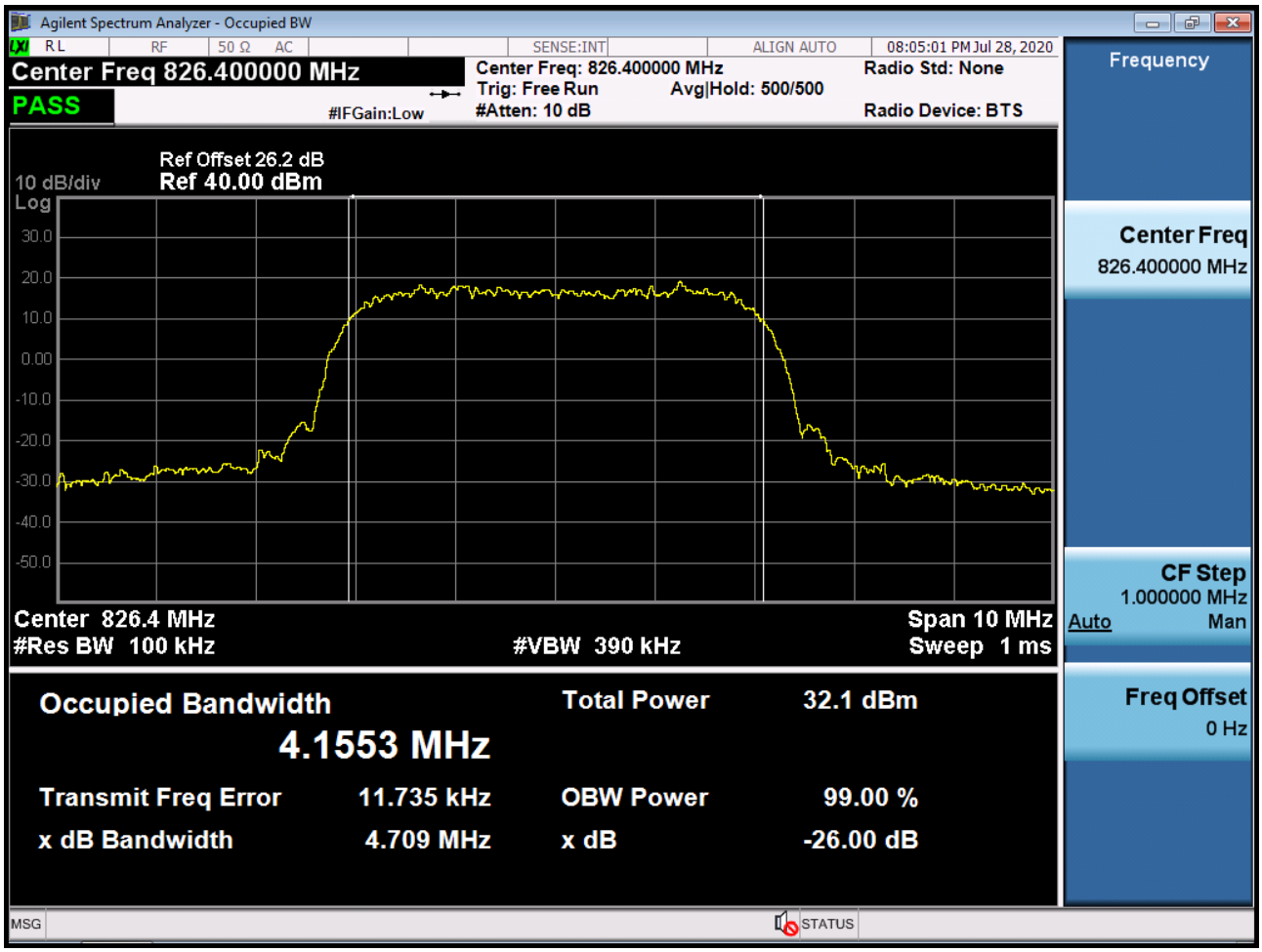
■ GSM1900 MODE (810 CH.) Occupied Bandwidth



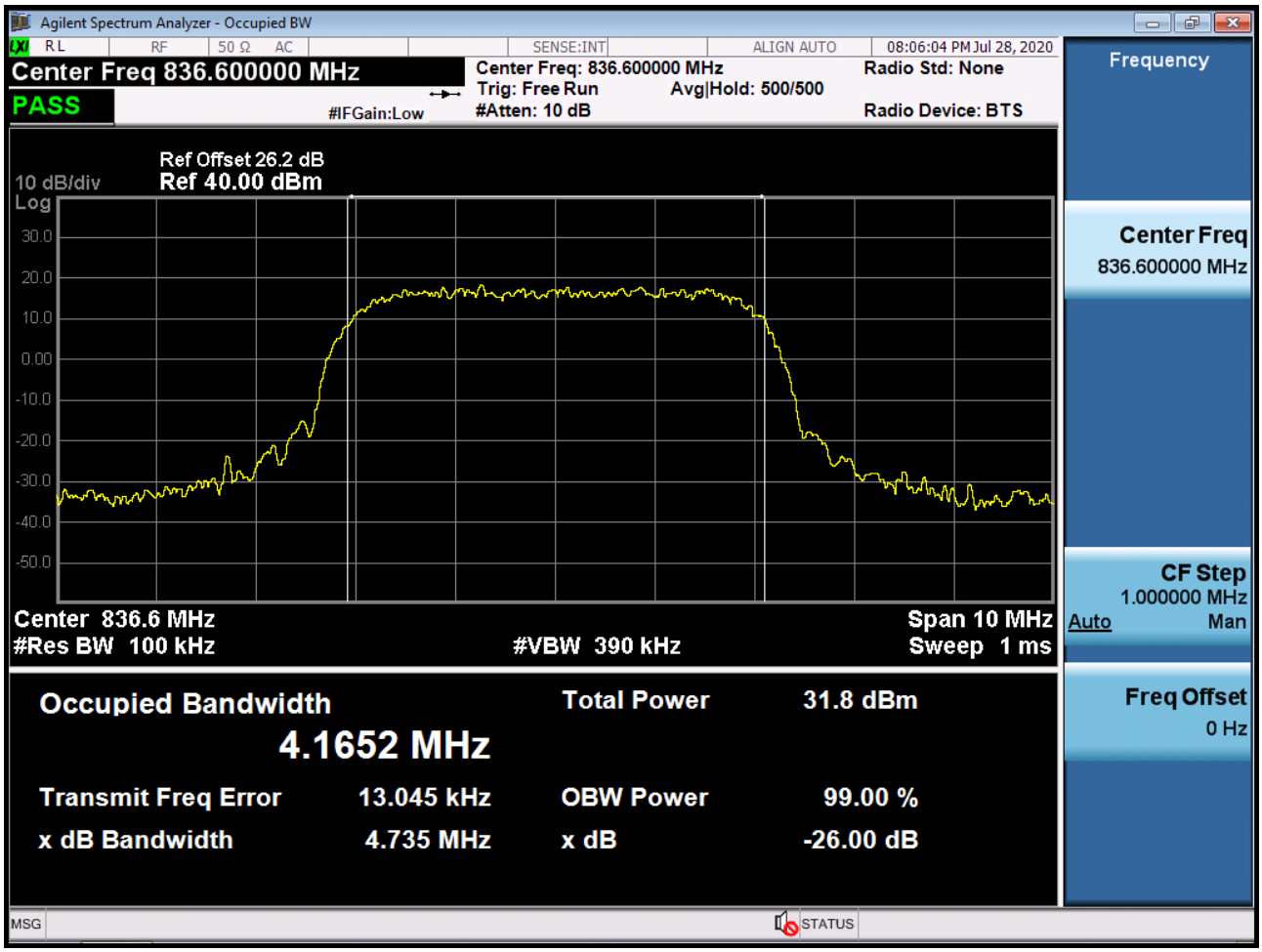
■ GSM1900 EDGE (661 CH.) Occupied Bandwidth



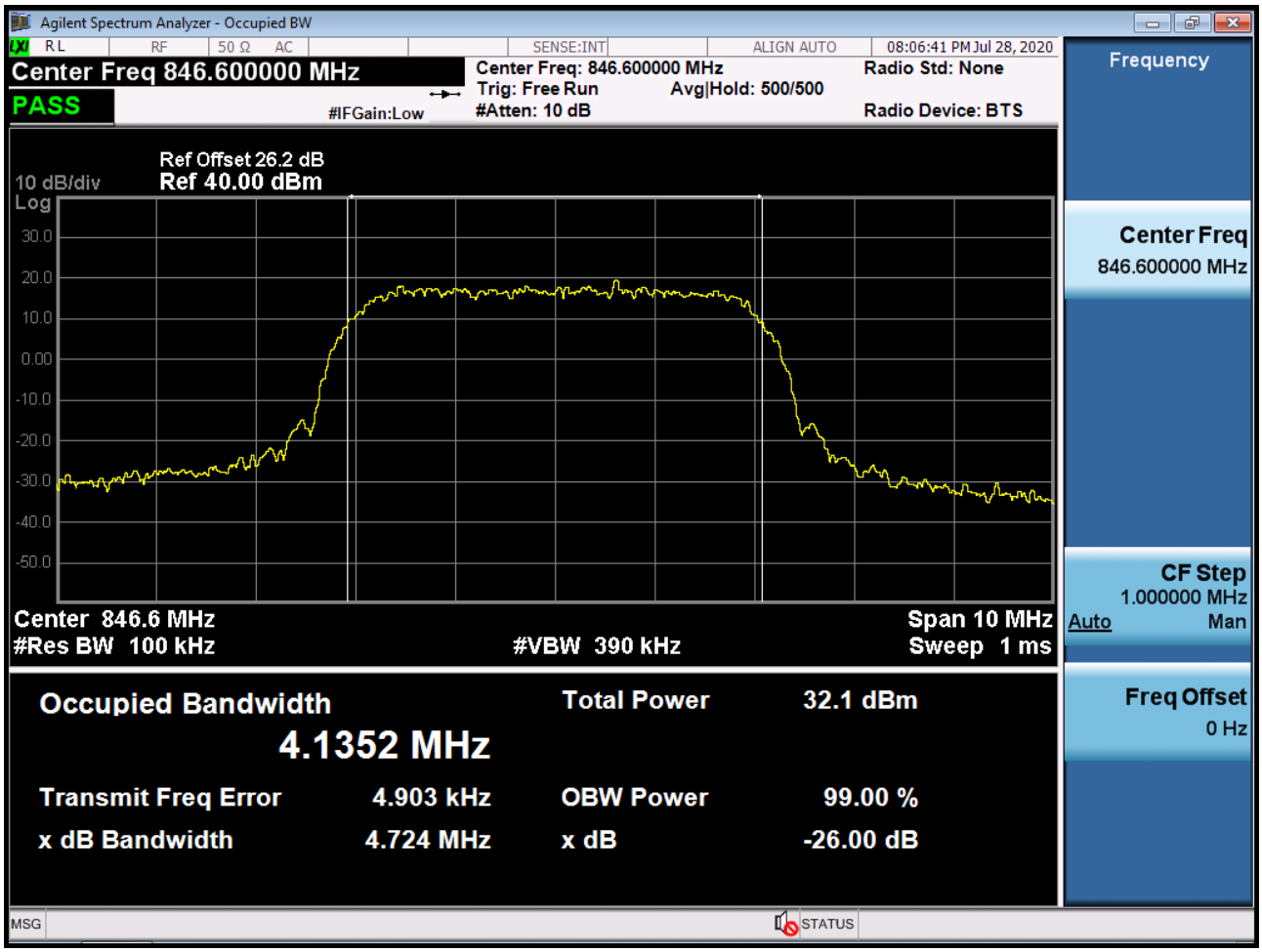
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



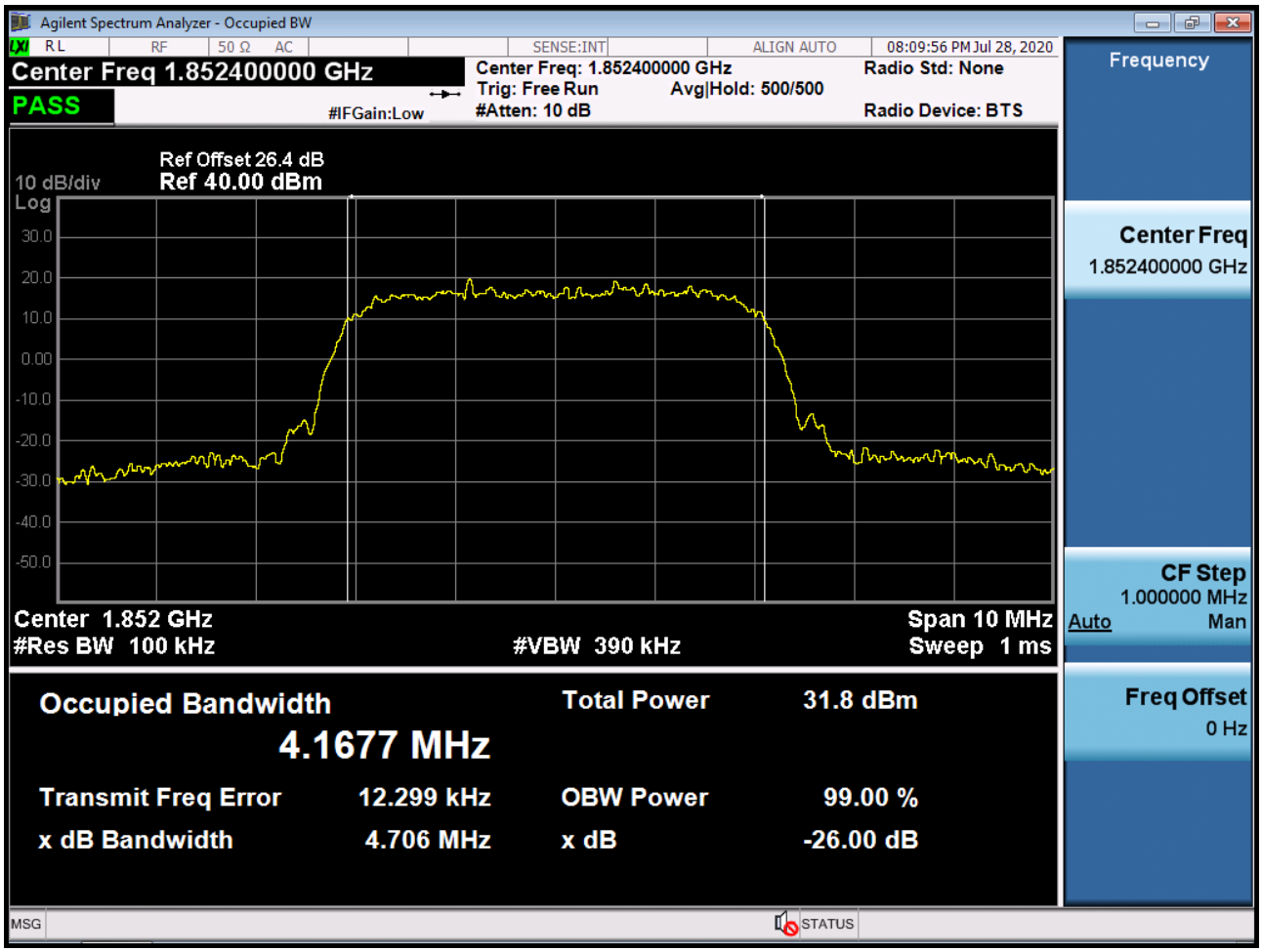
■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



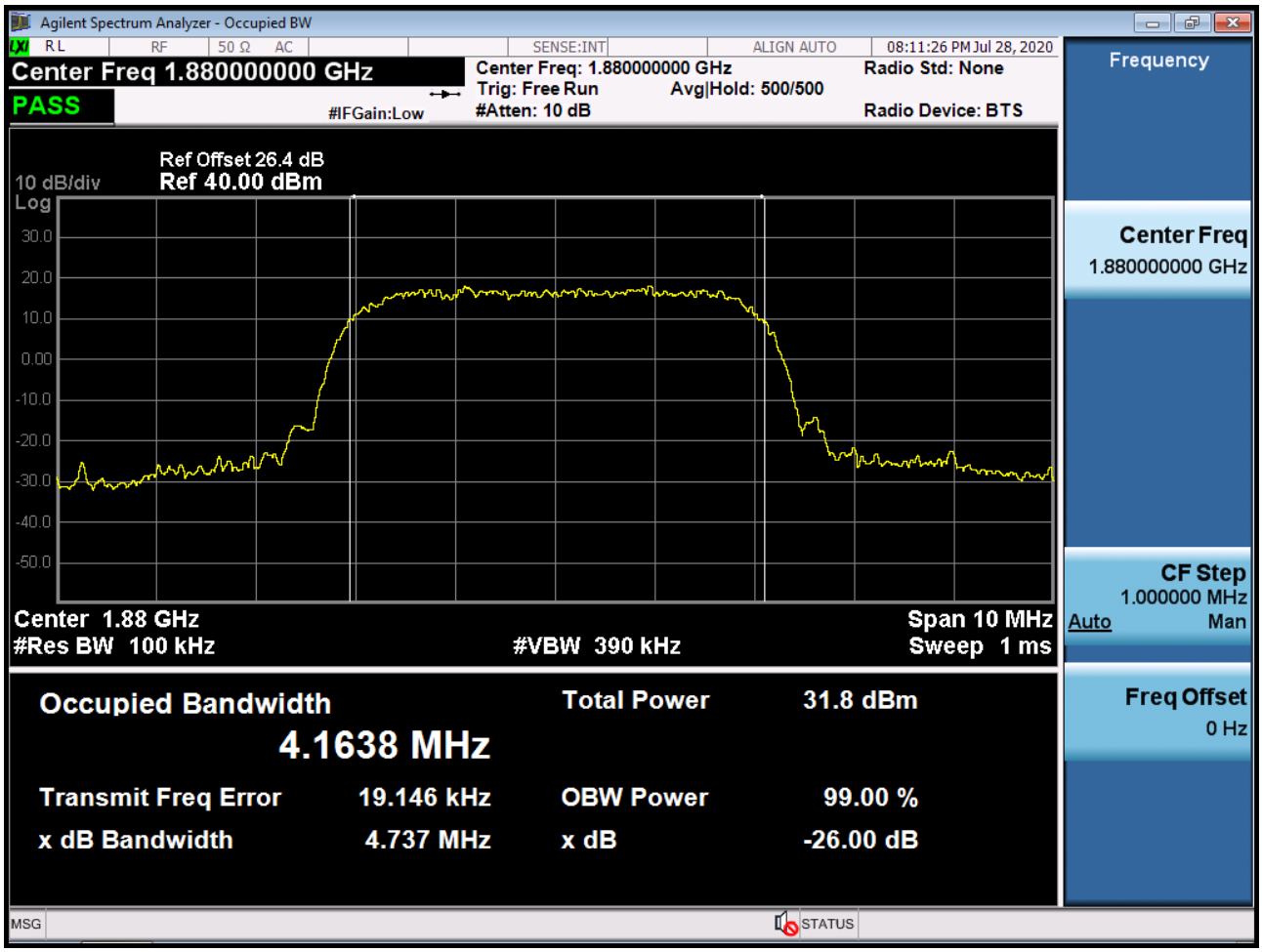
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



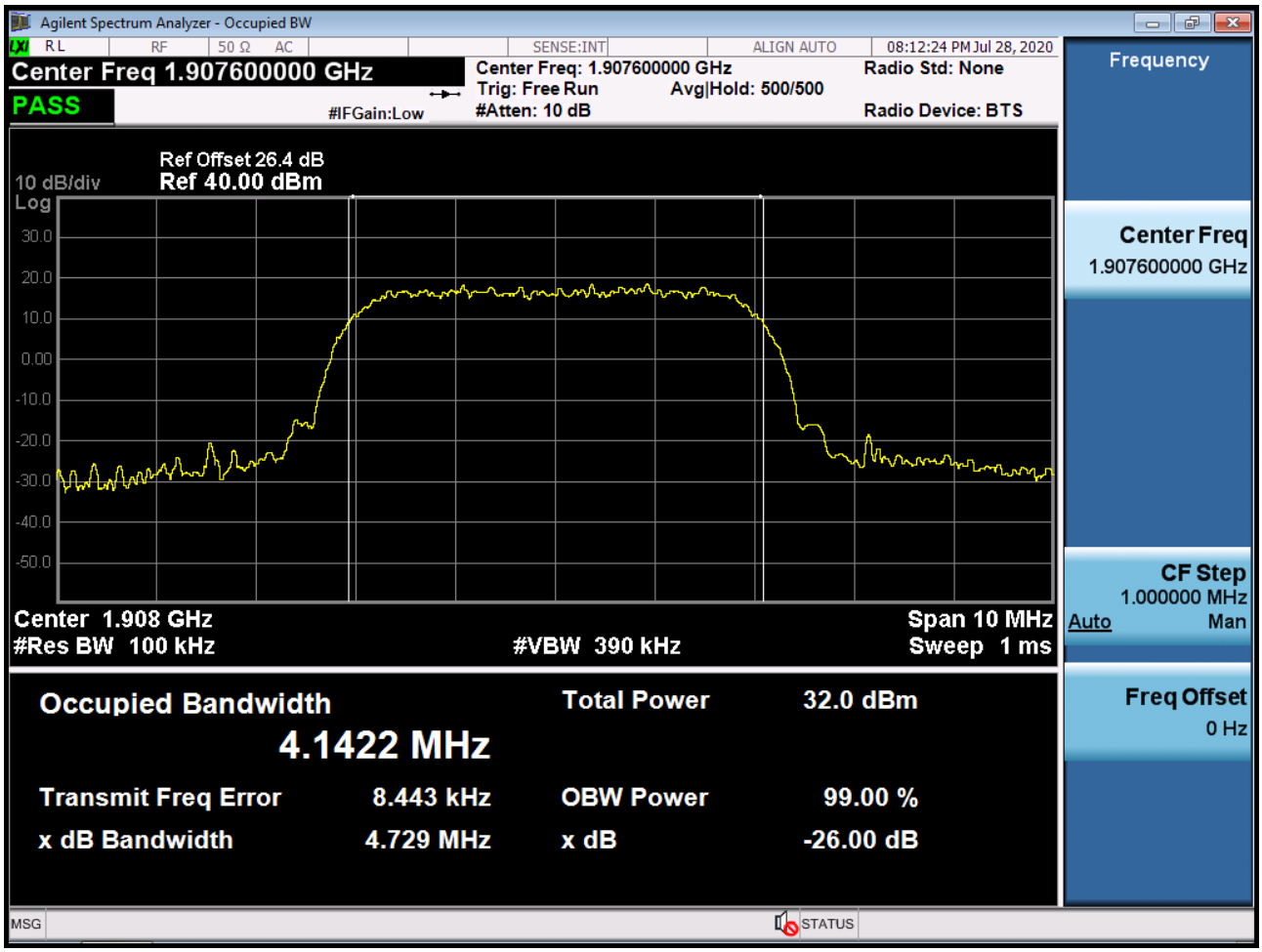
■ WCDMA1900 MODE (9262 CH.) Occupied Bandwidth



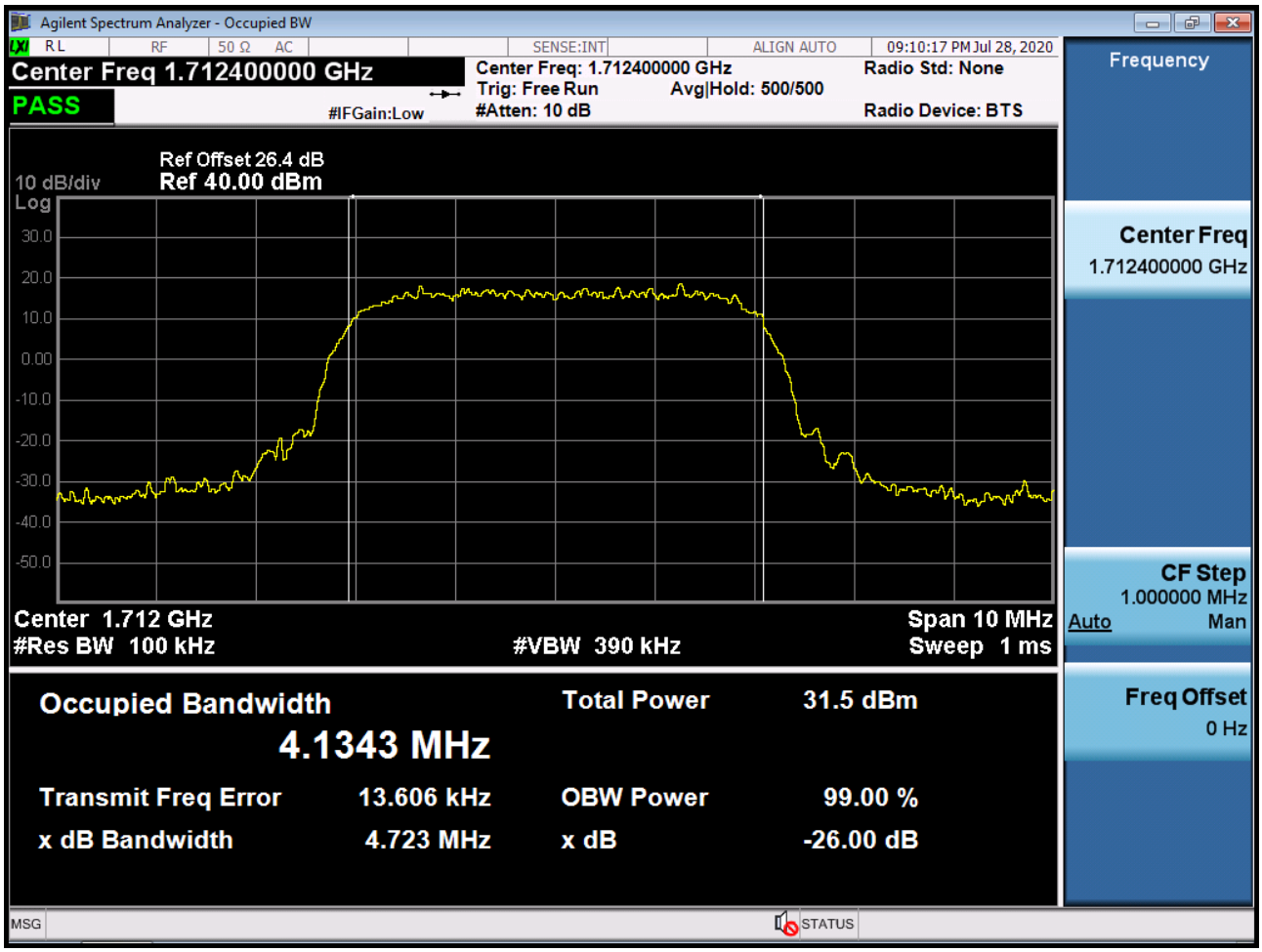
■ WCDMA1900 MODE (9400 CH.) Occupied Bandwidth



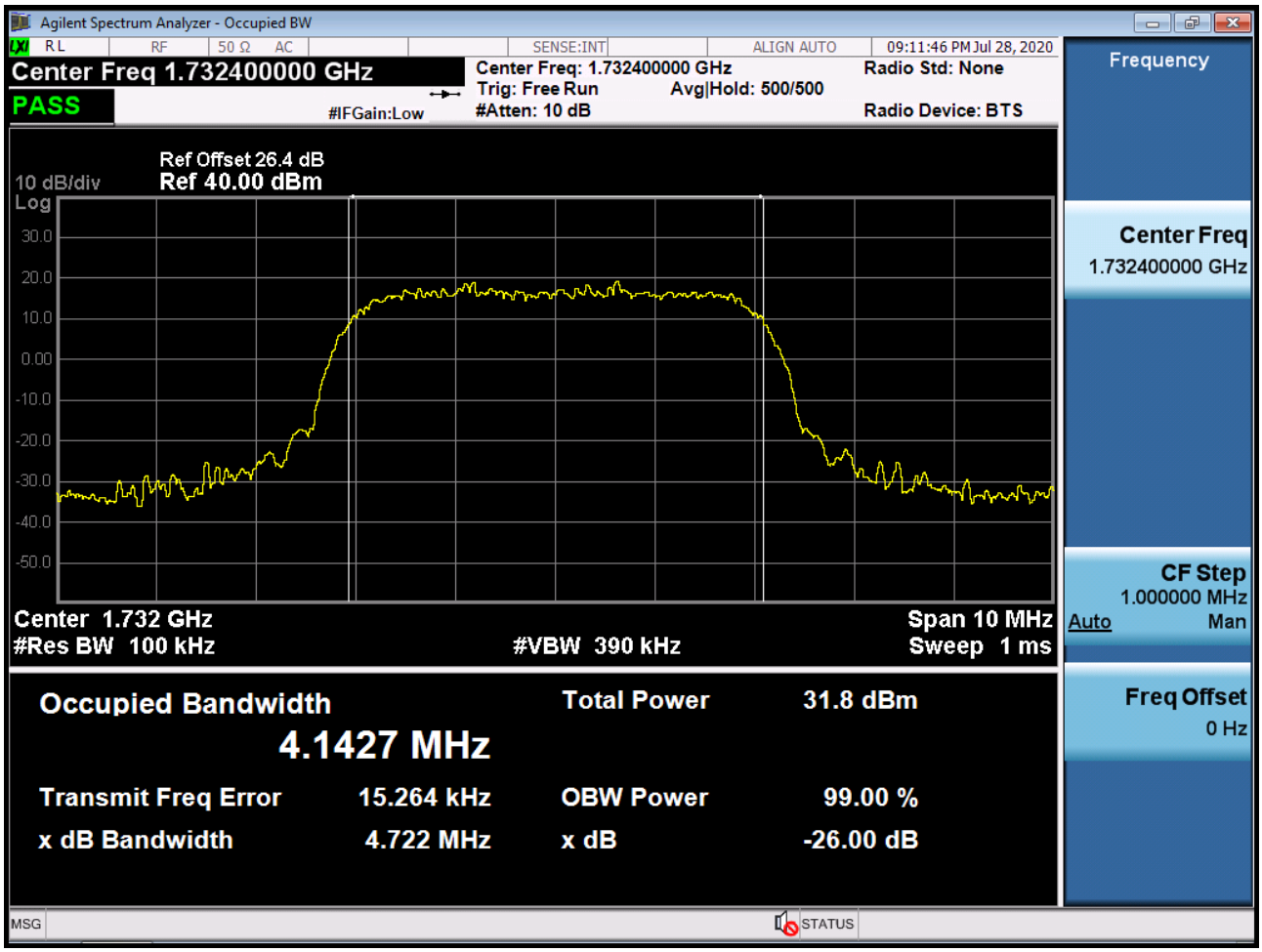
■ WCDMA1900 MODE (9538 CH.) Occupied Bandwidth



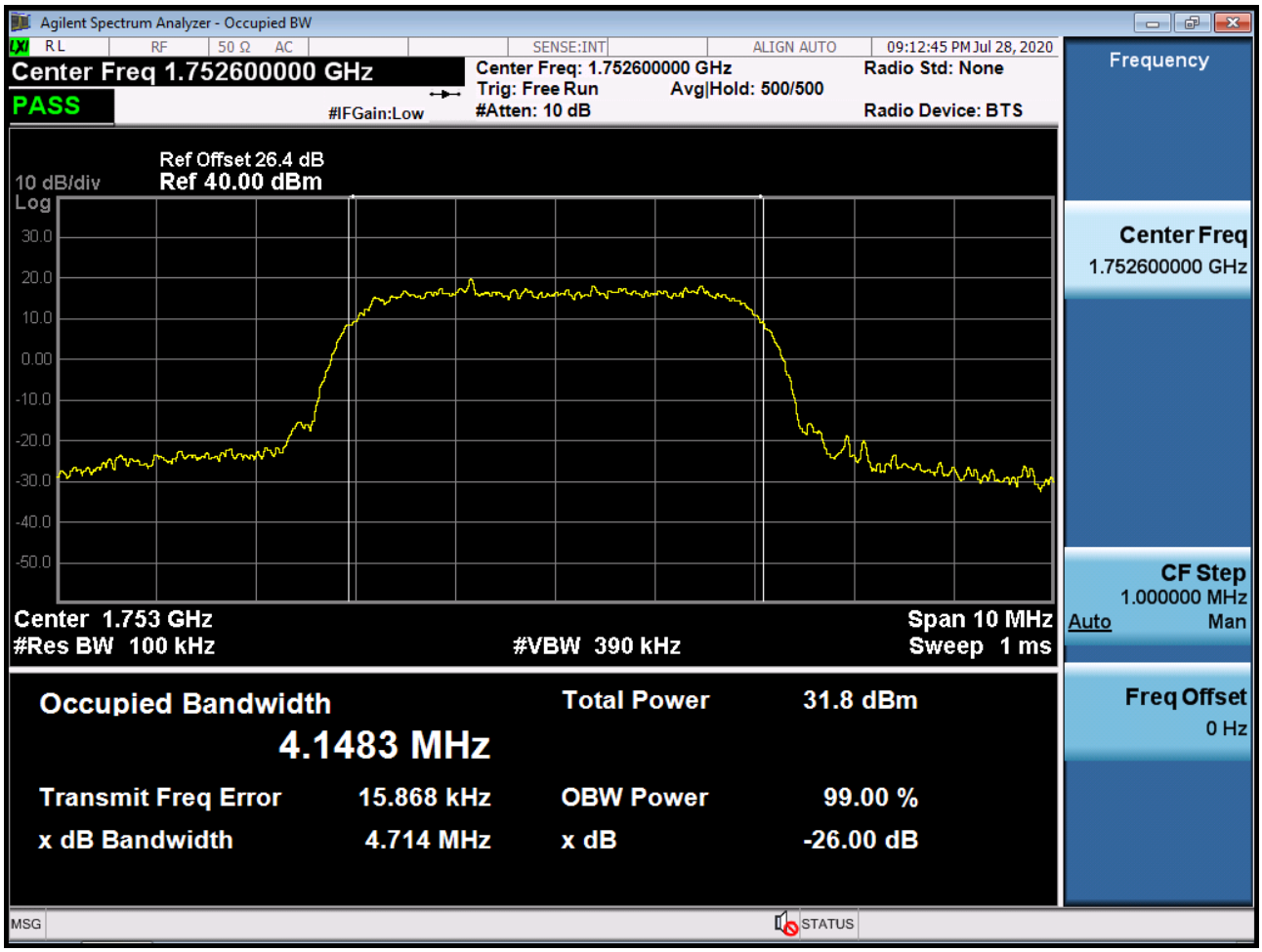
■ WCDMA1700 MODE (1712.4 CH.) Occupied Bandwidth



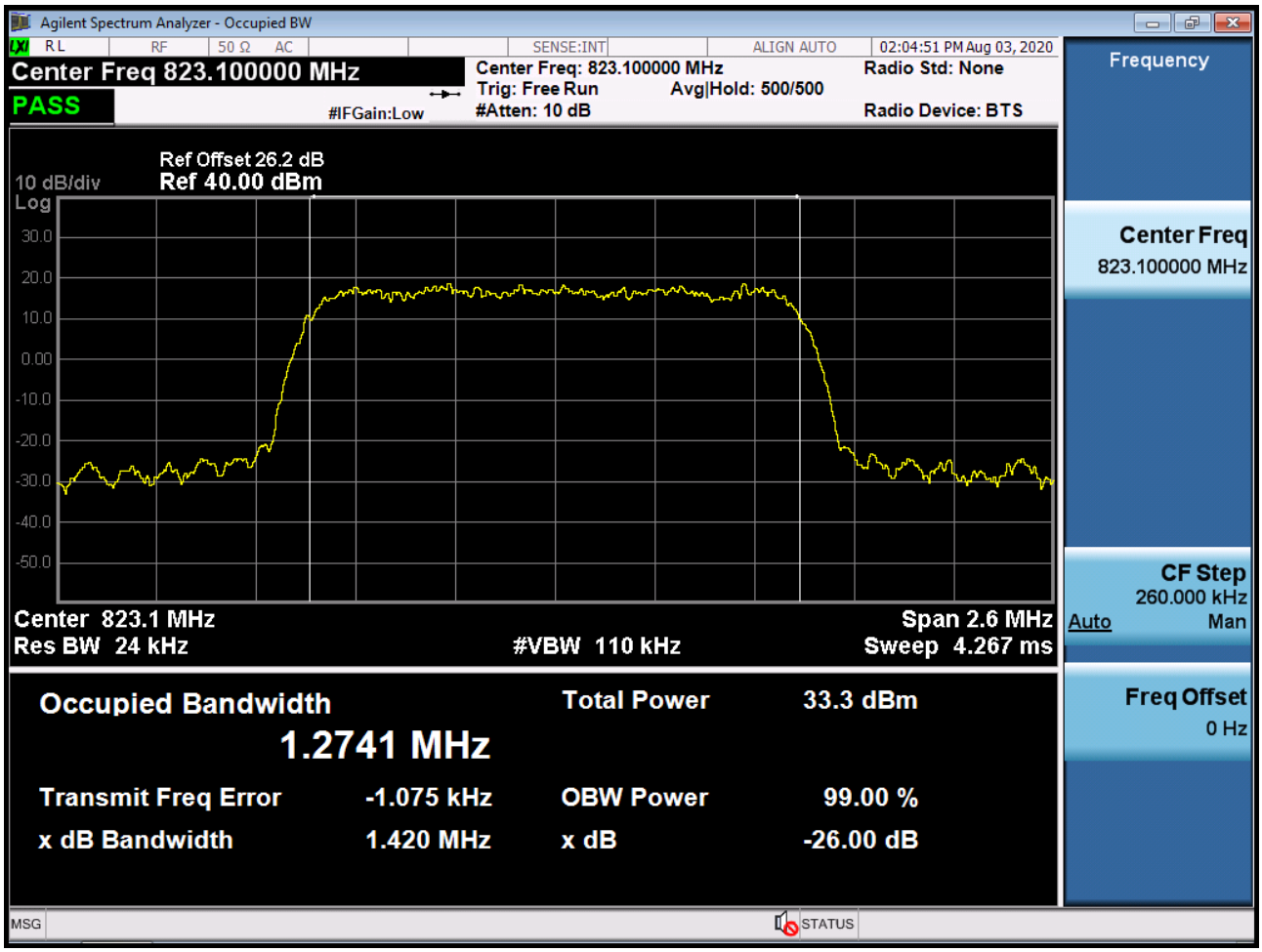
■ WCDMA1700 MODE (1732.4 CH.) Occupied Bandwidth



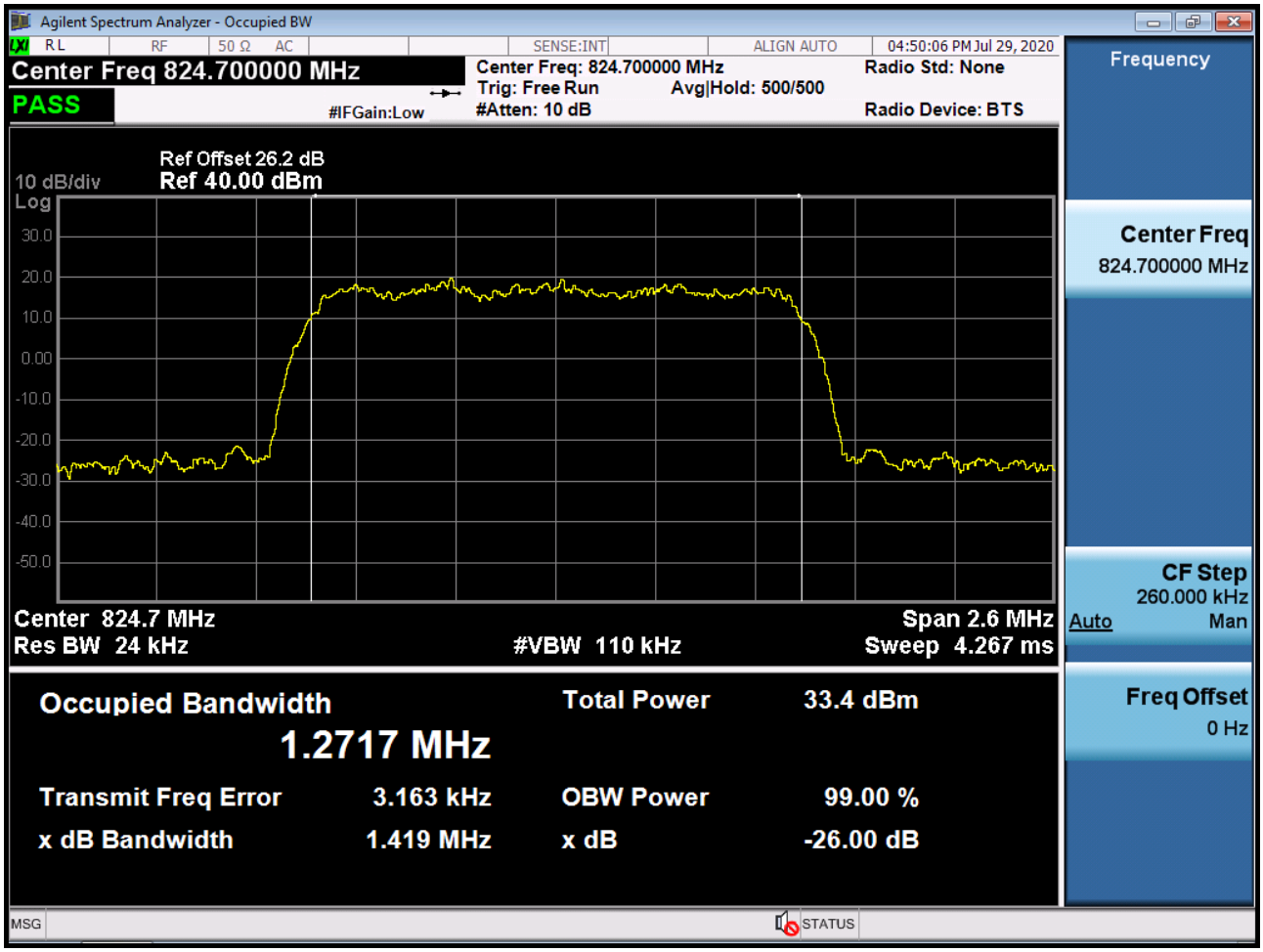
■ WCDMA1700 MODE (1752.6 CH.) Occupied Bandwidth



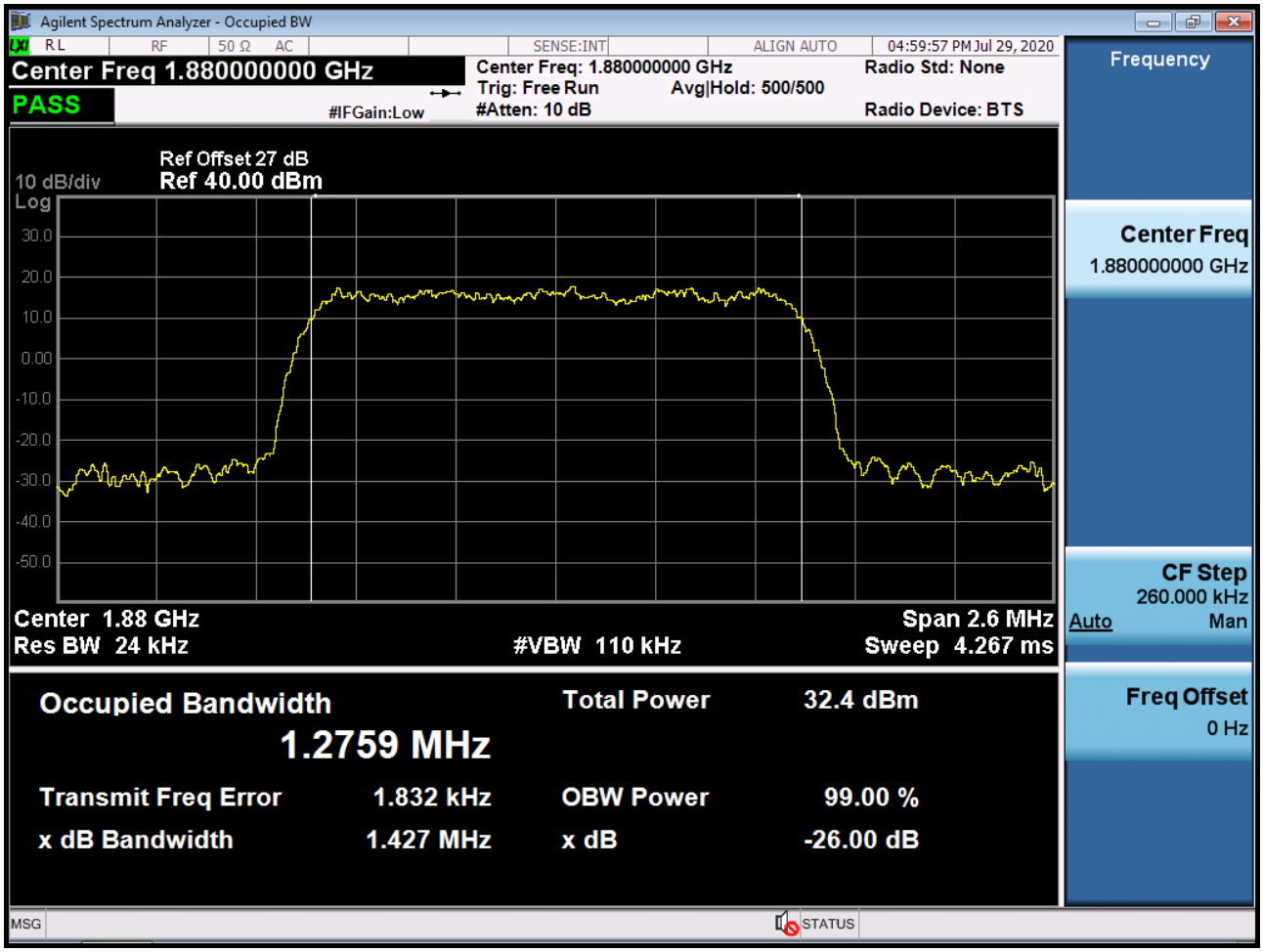
■ Secondary800_BC10 MODE (684 CH.) Occupied Bandwidth



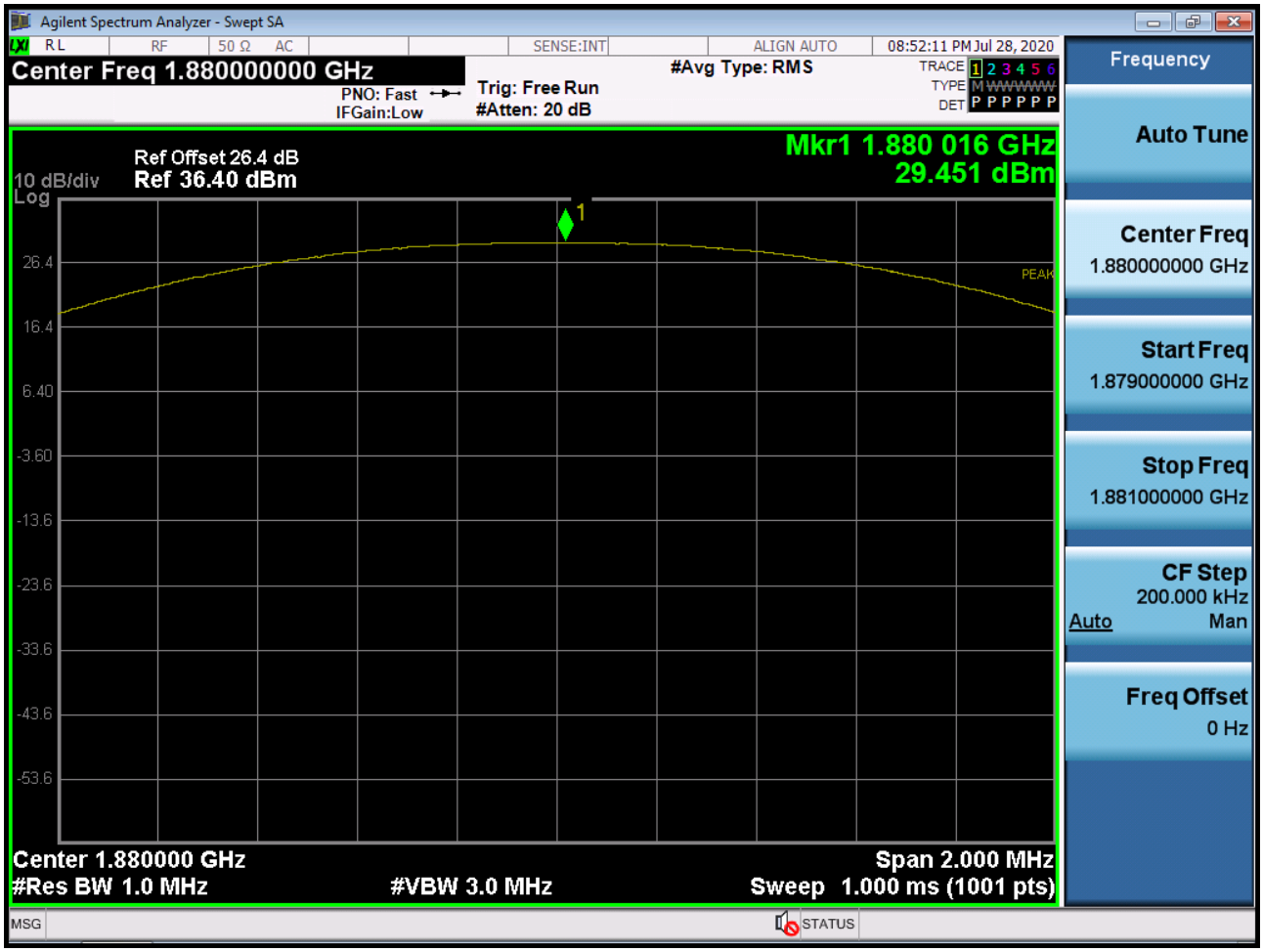
■ CDMA850_BC0 MODE (1013 CH.) Occupied Bandwidth



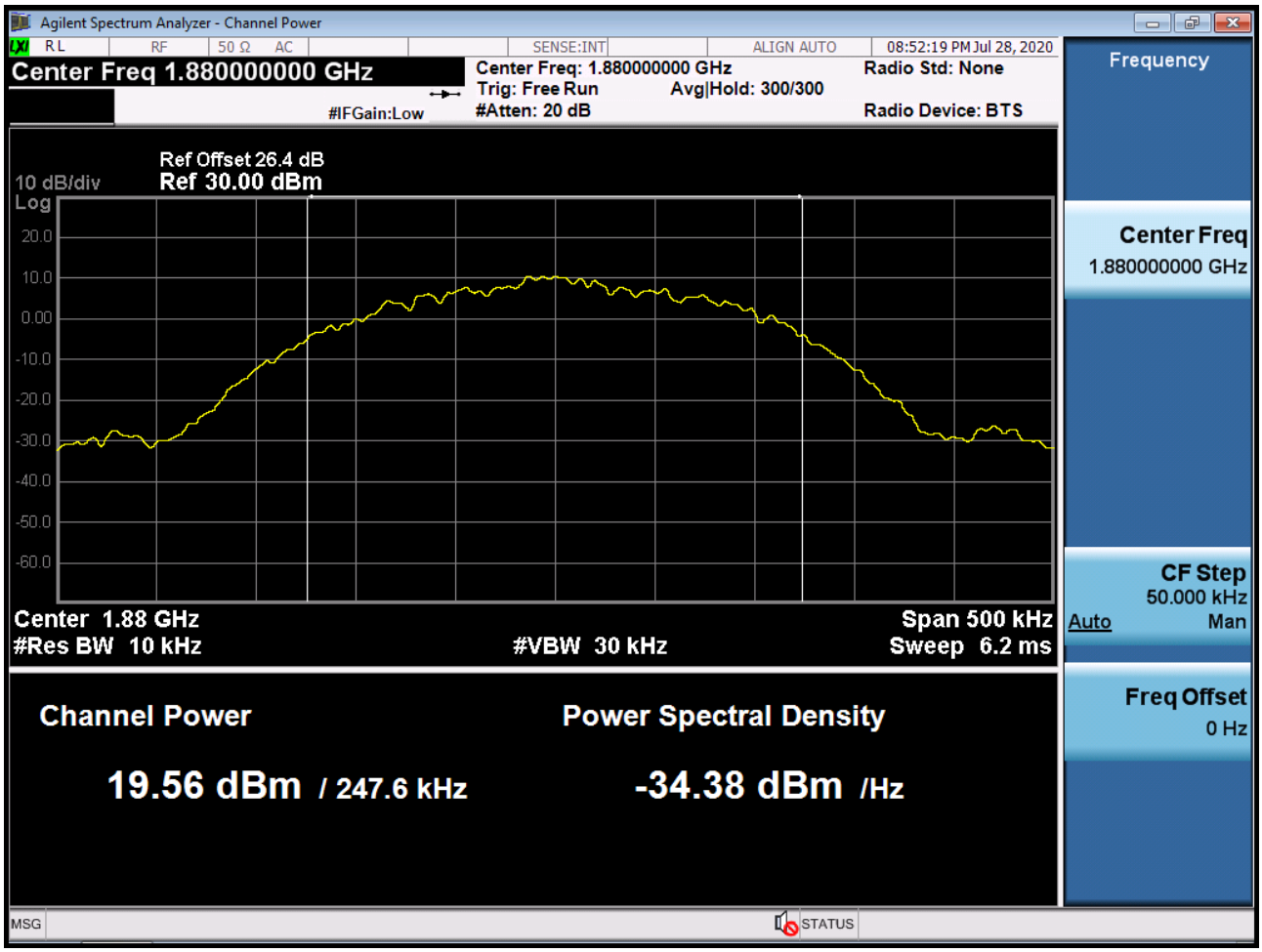
■ PCS CDMA MODE (600 CH.) Occupied Bandwidth



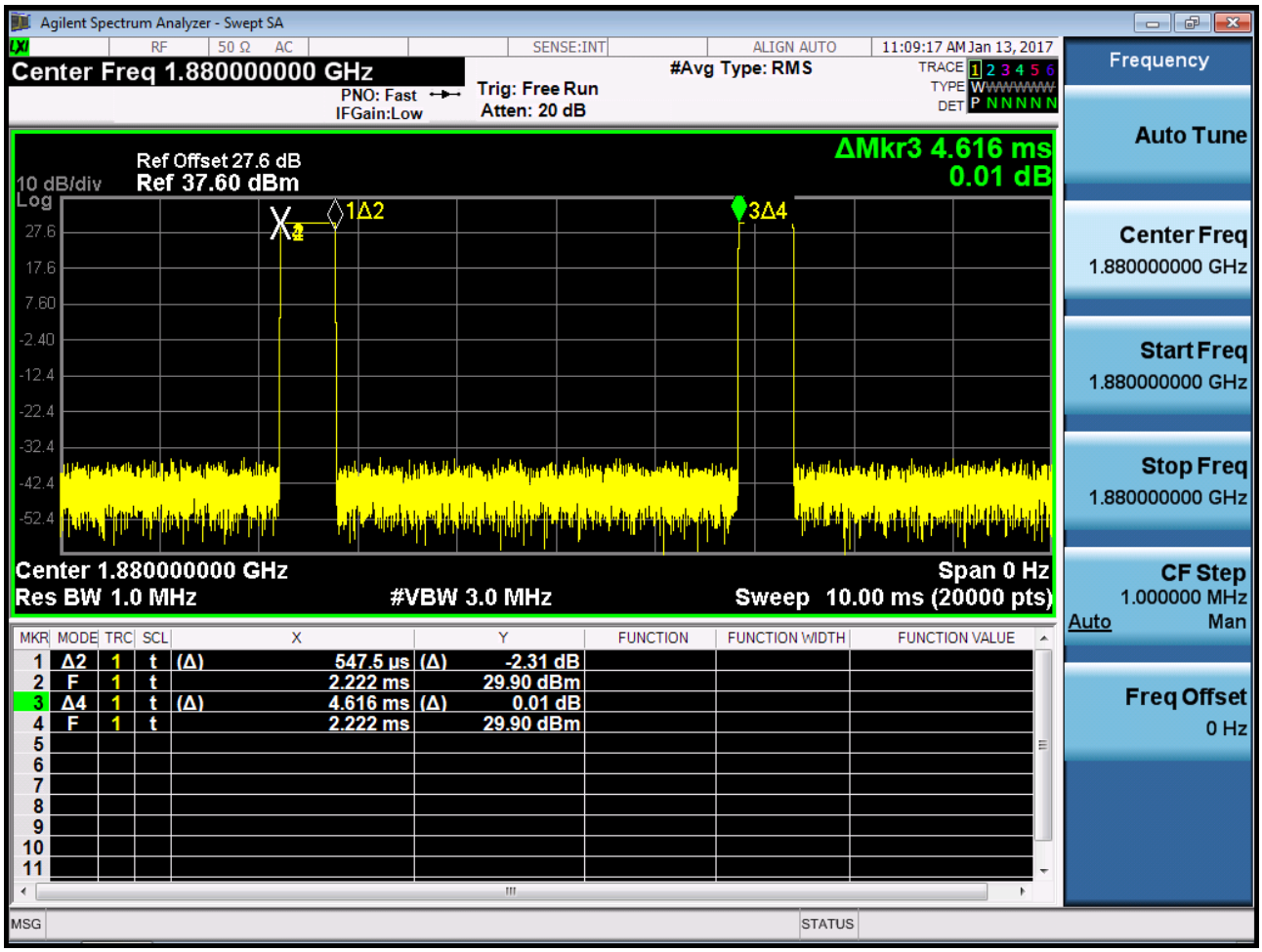
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Pk}



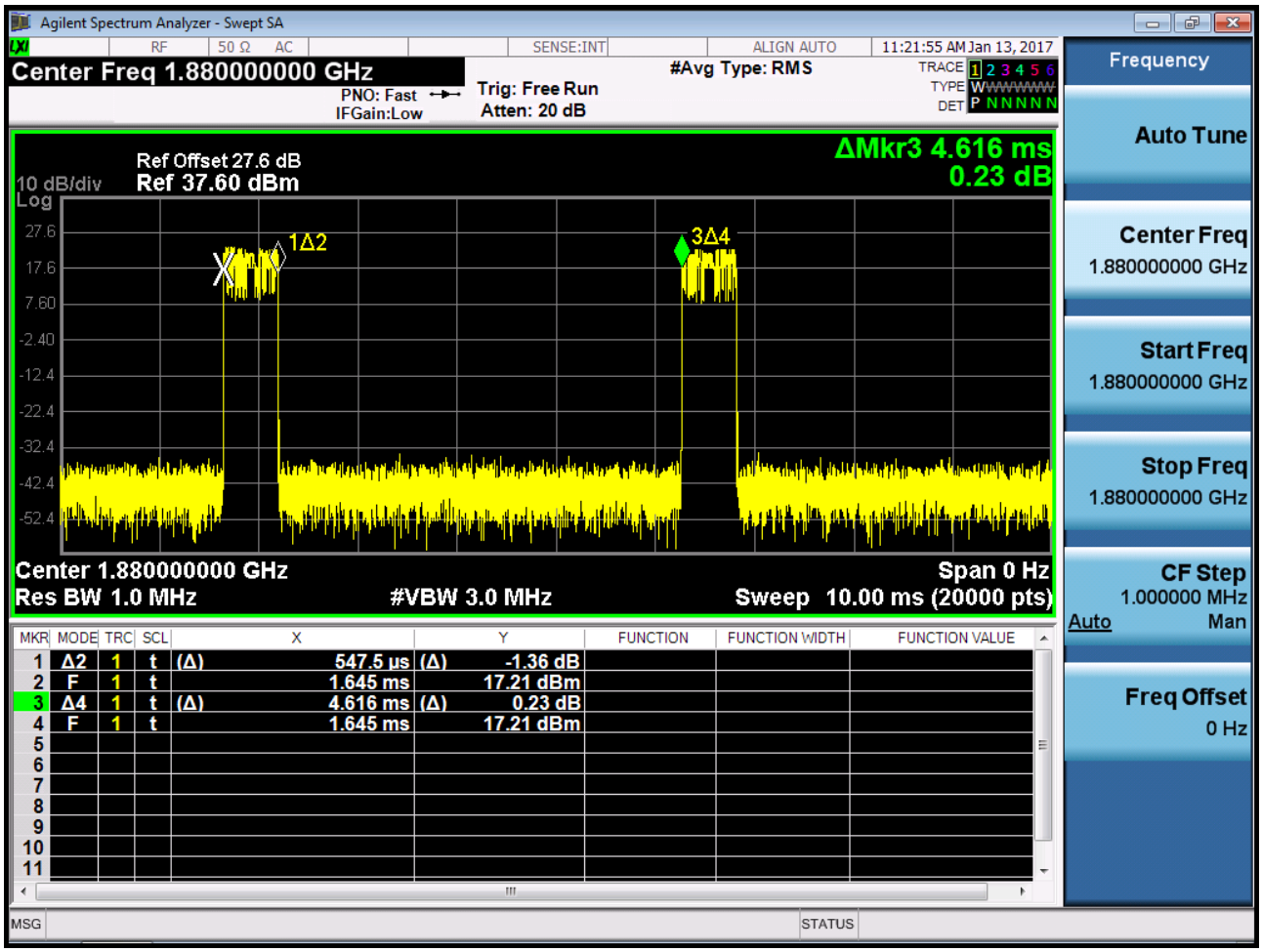
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Avg}



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

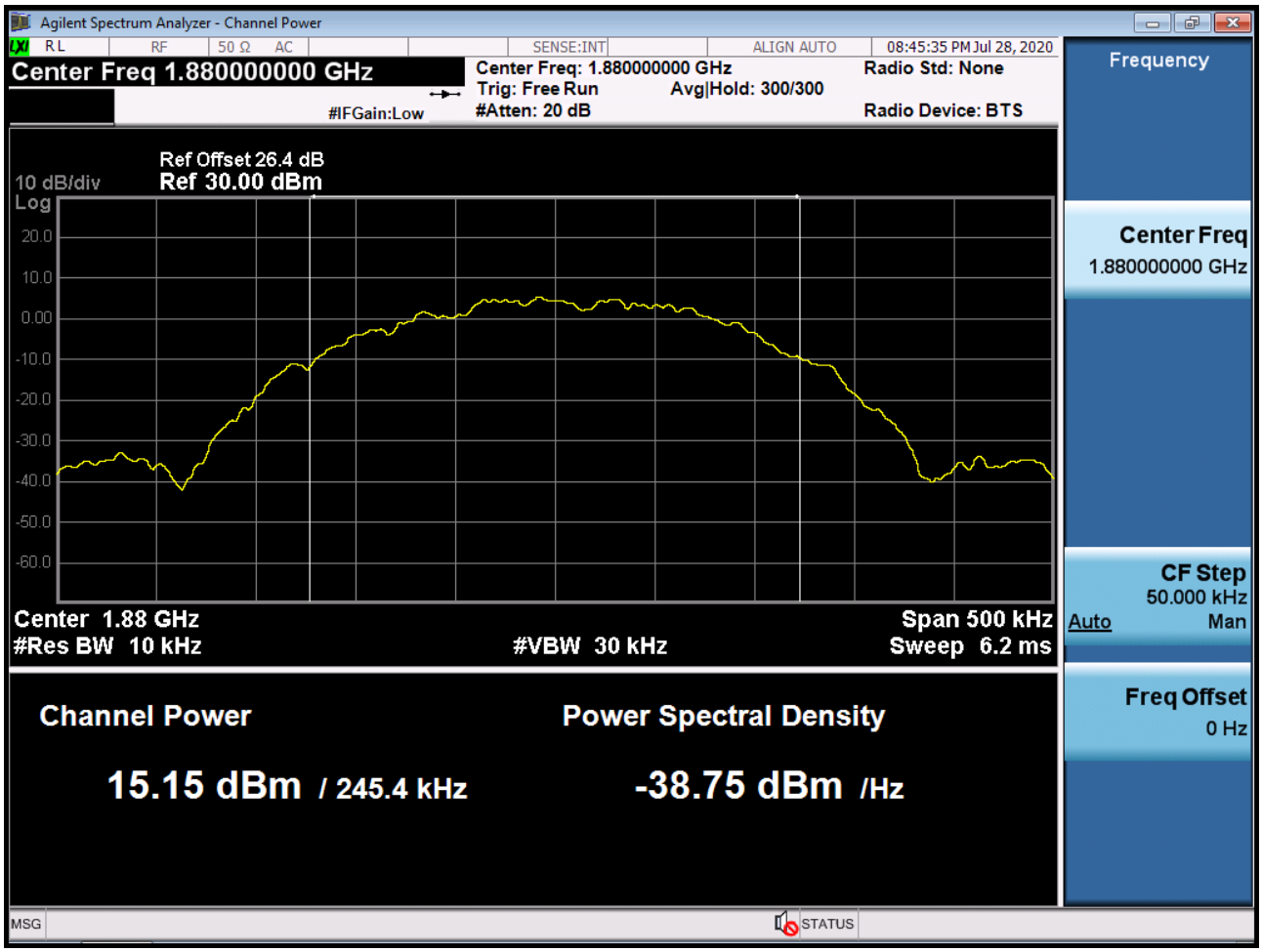


■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio Duty

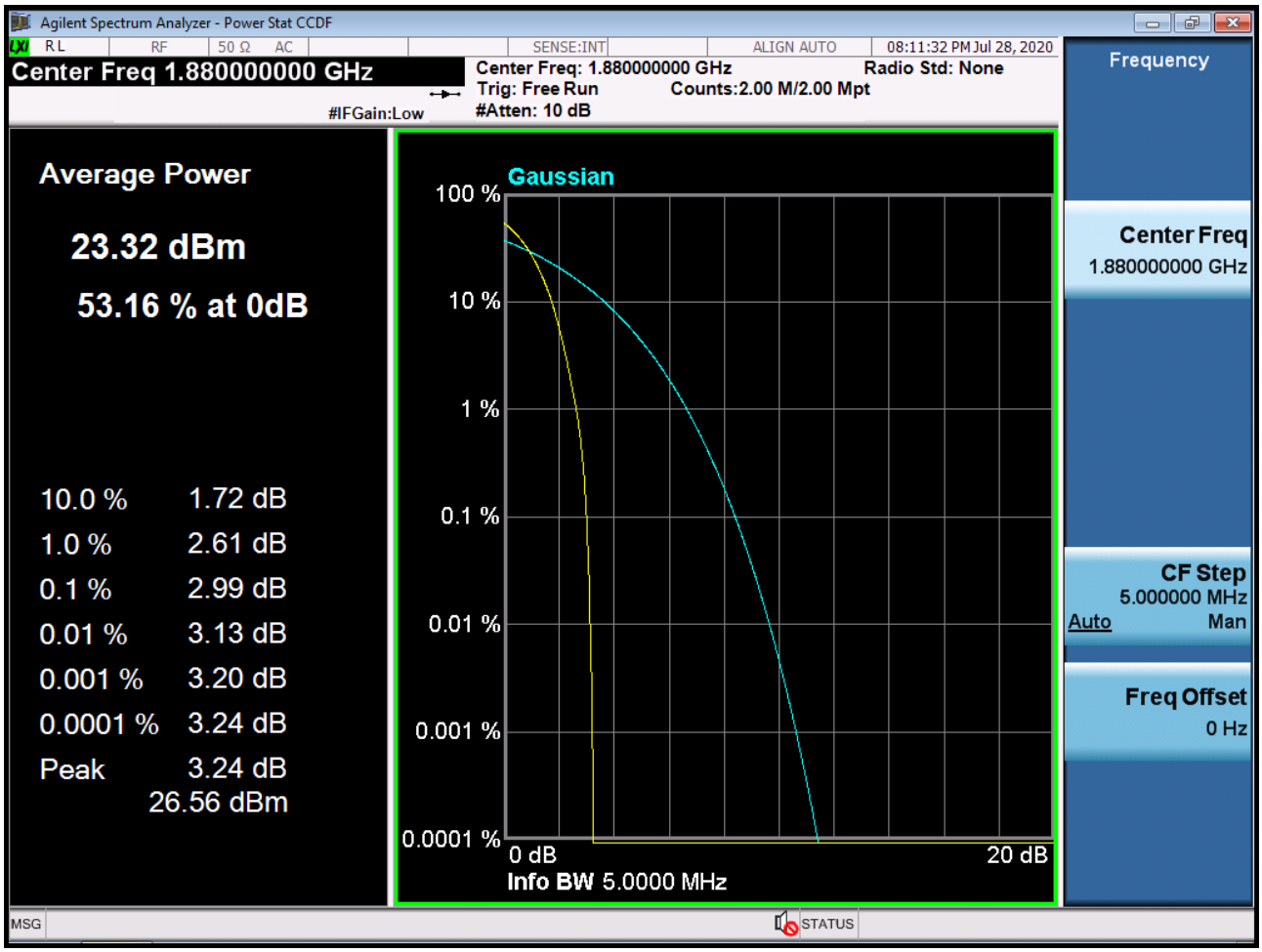


■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Pk}

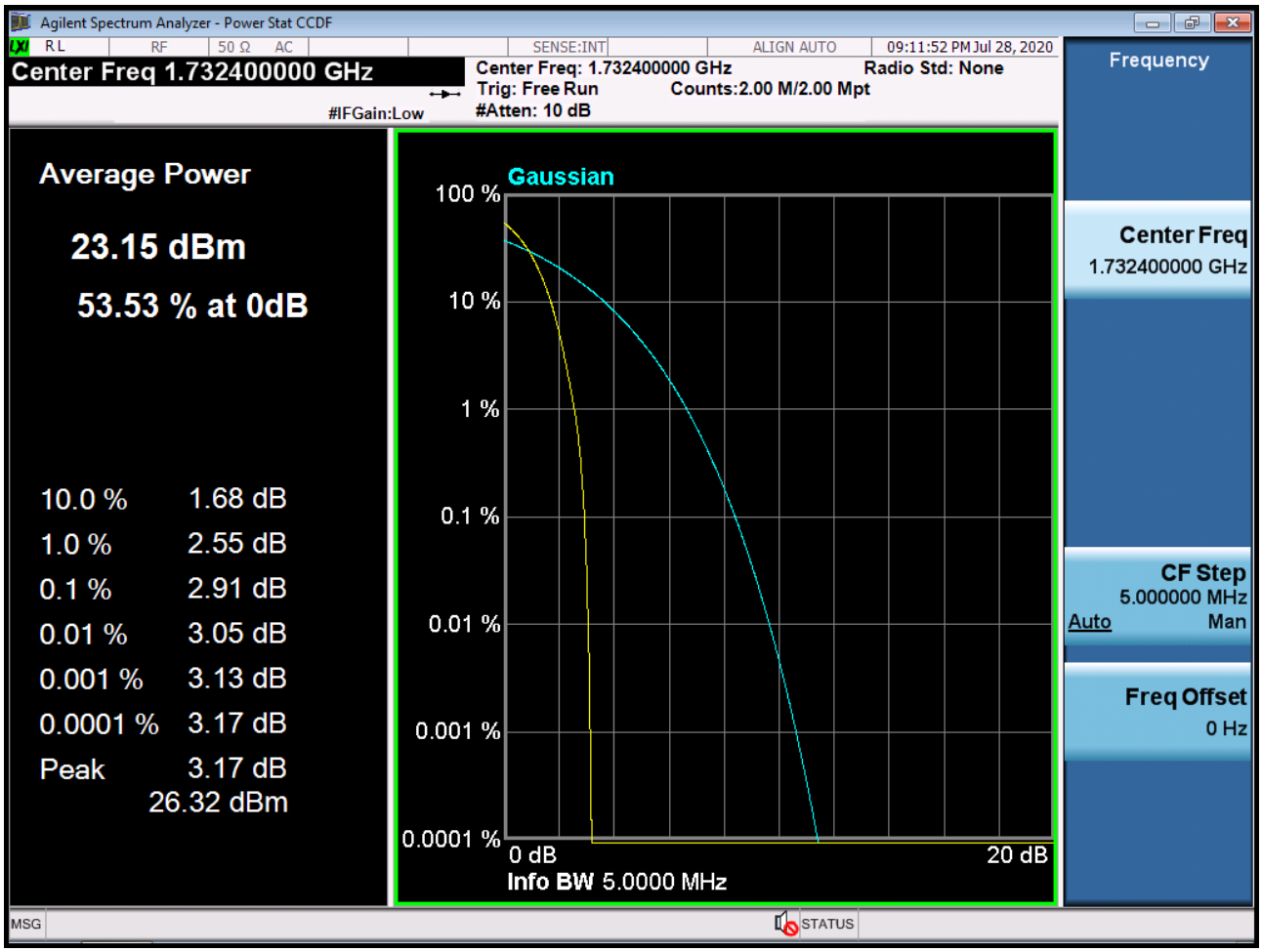
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Avg}



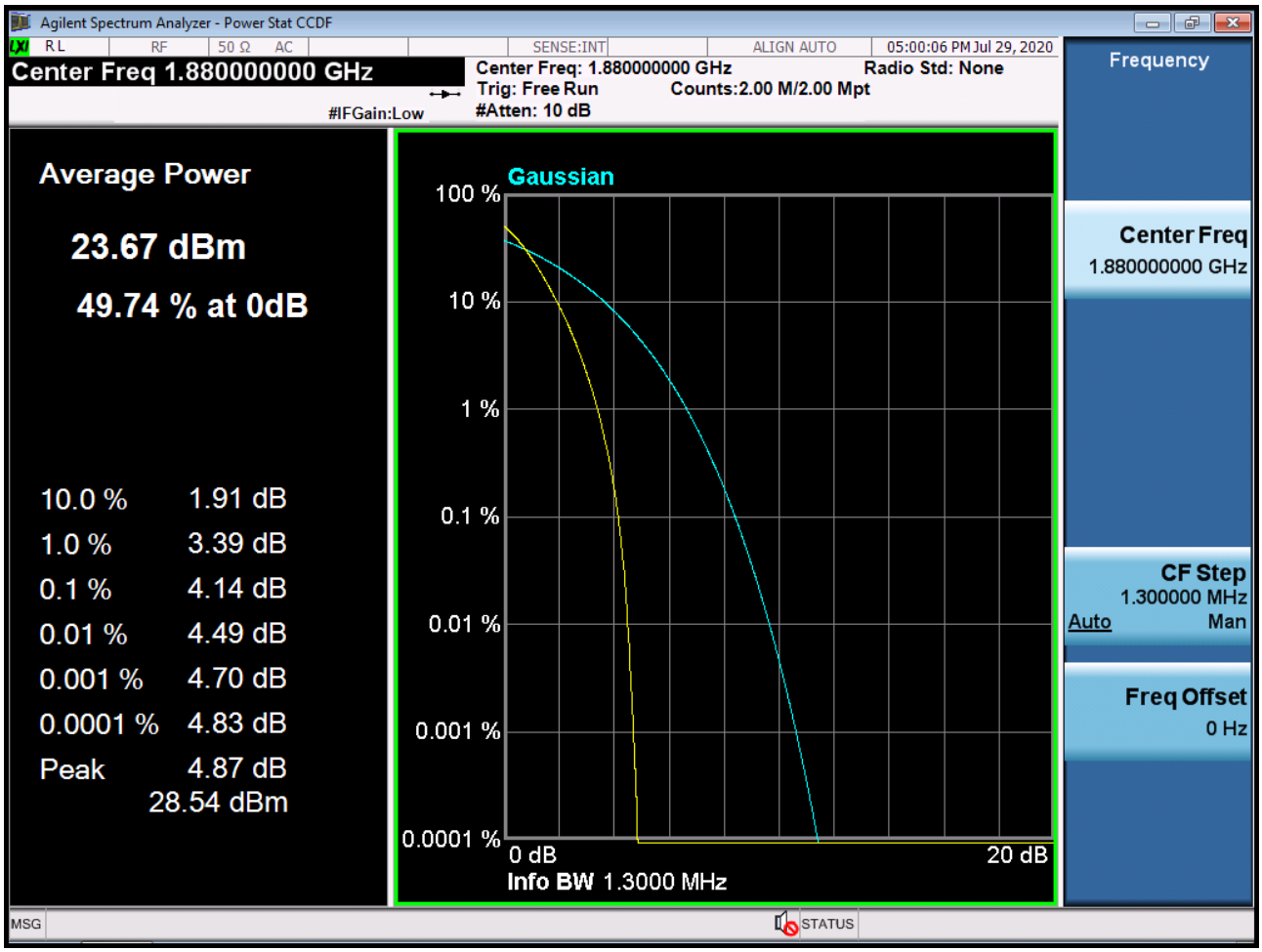
■ WCDMA1900 MODE (9400 CH.) Peak-to-Average Ratio



■ WCDMA1700 MODE (1412 CH.) Peak-to-Average Ratio

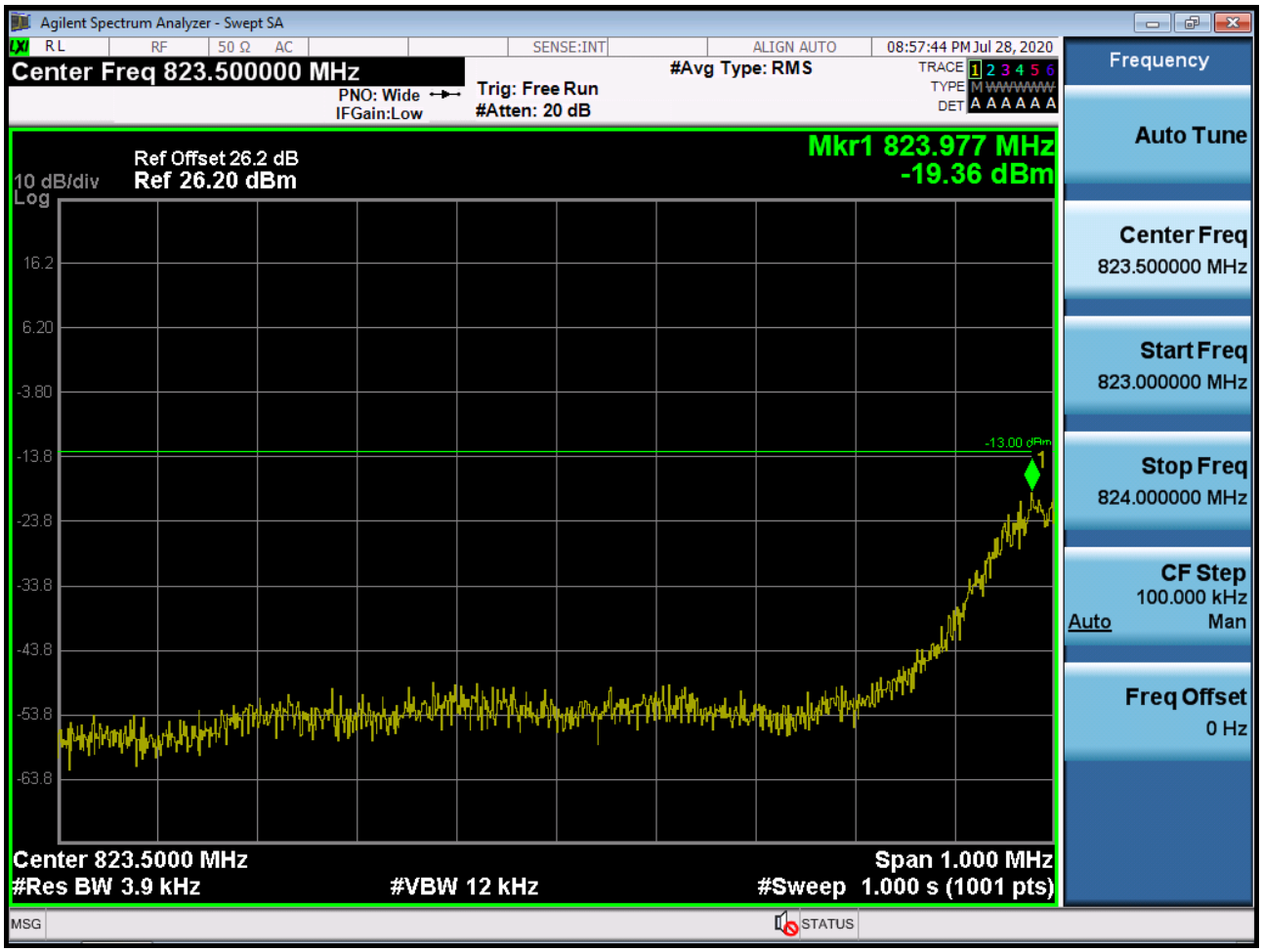


■ PCS CDMA MODE (600 CH.) Peak-to-Average Ratio



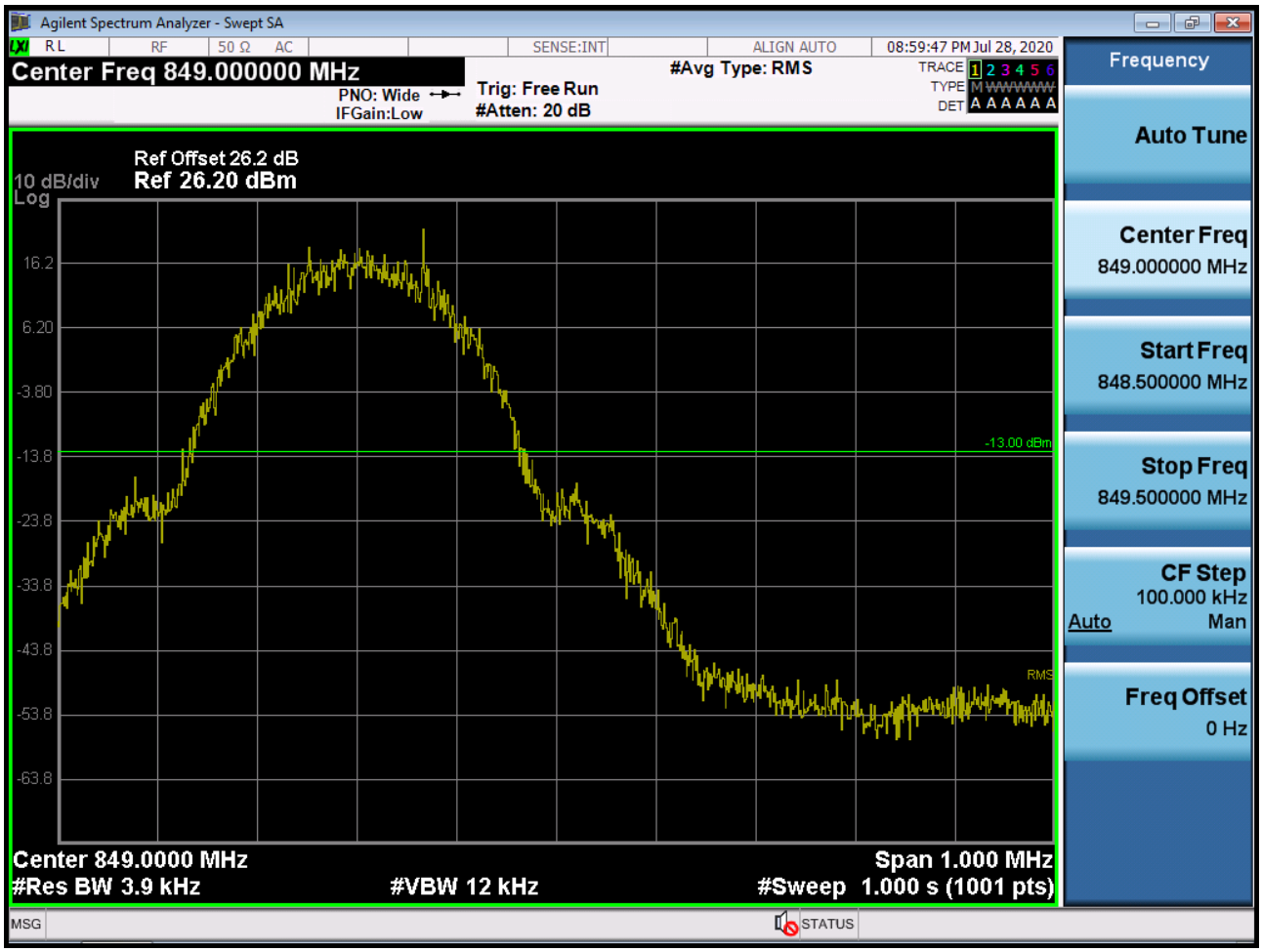
■ GSM850 MODE (128 CH.) Block Edge 1

■ GSM850 MODE (128 CH.) Block Edge 2



■ GSM850 MODE (128 CH.) Block Edge 3

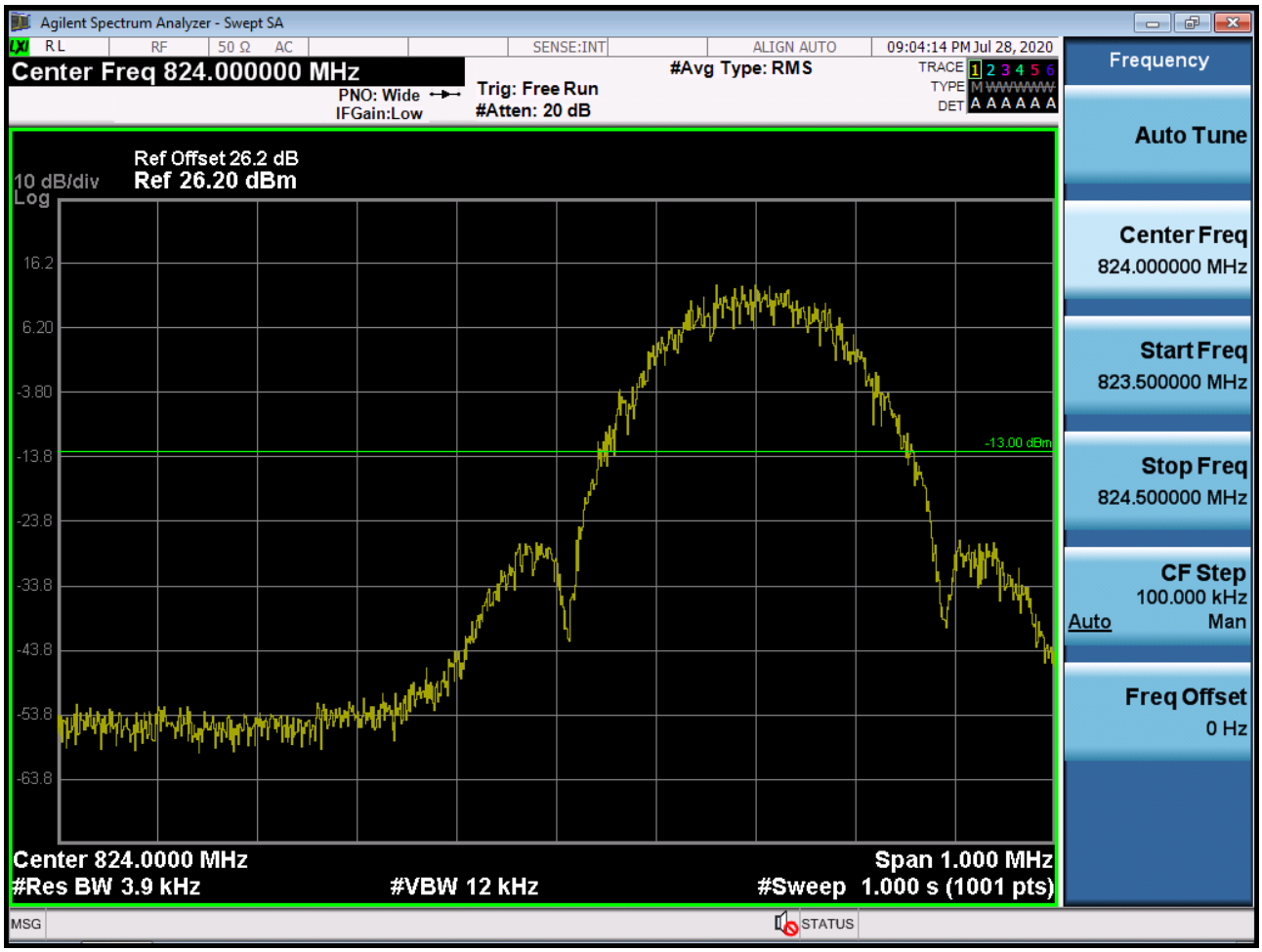
■ GSM850 MODE (251 CH.) Block Edge 1



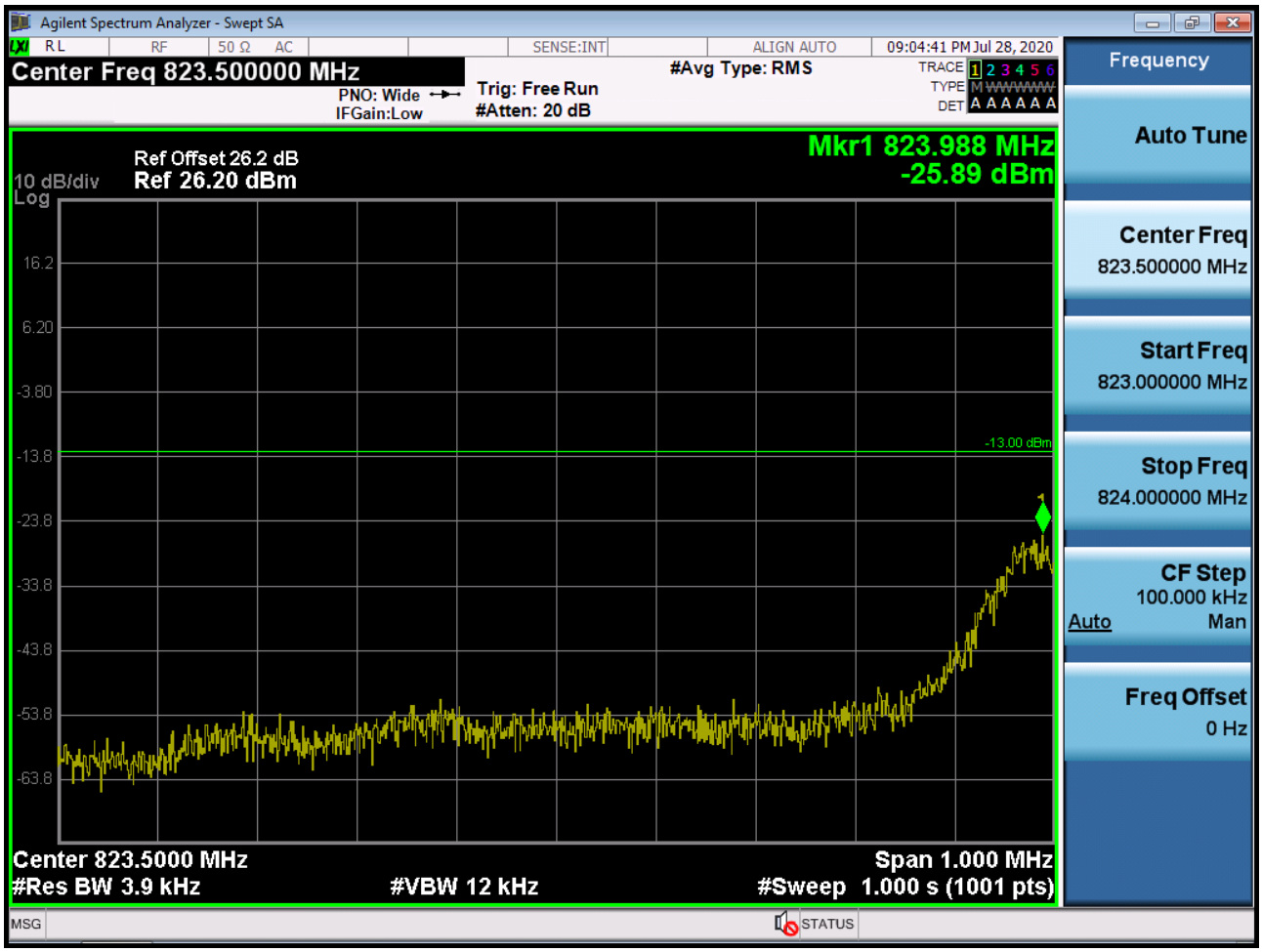
■ GSM850 MODE (251 CH.) Block Edge 2

■ GSM850 MODE (251 CH.) Block Edge 3

■ EDGE MODE (128 CH.) Block Edge 1

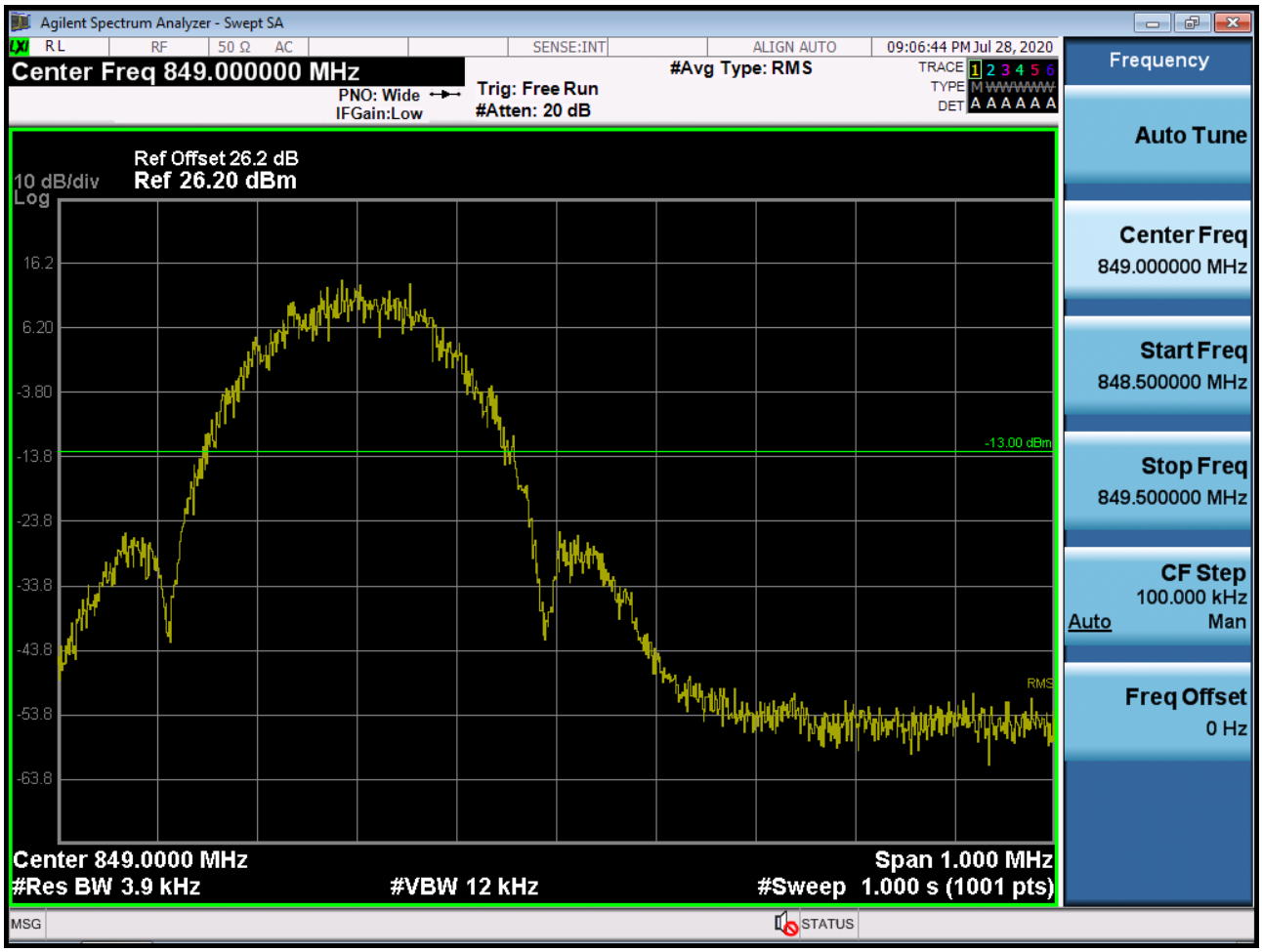


■ EDGE MODE (128 CH.) Block Edge 2

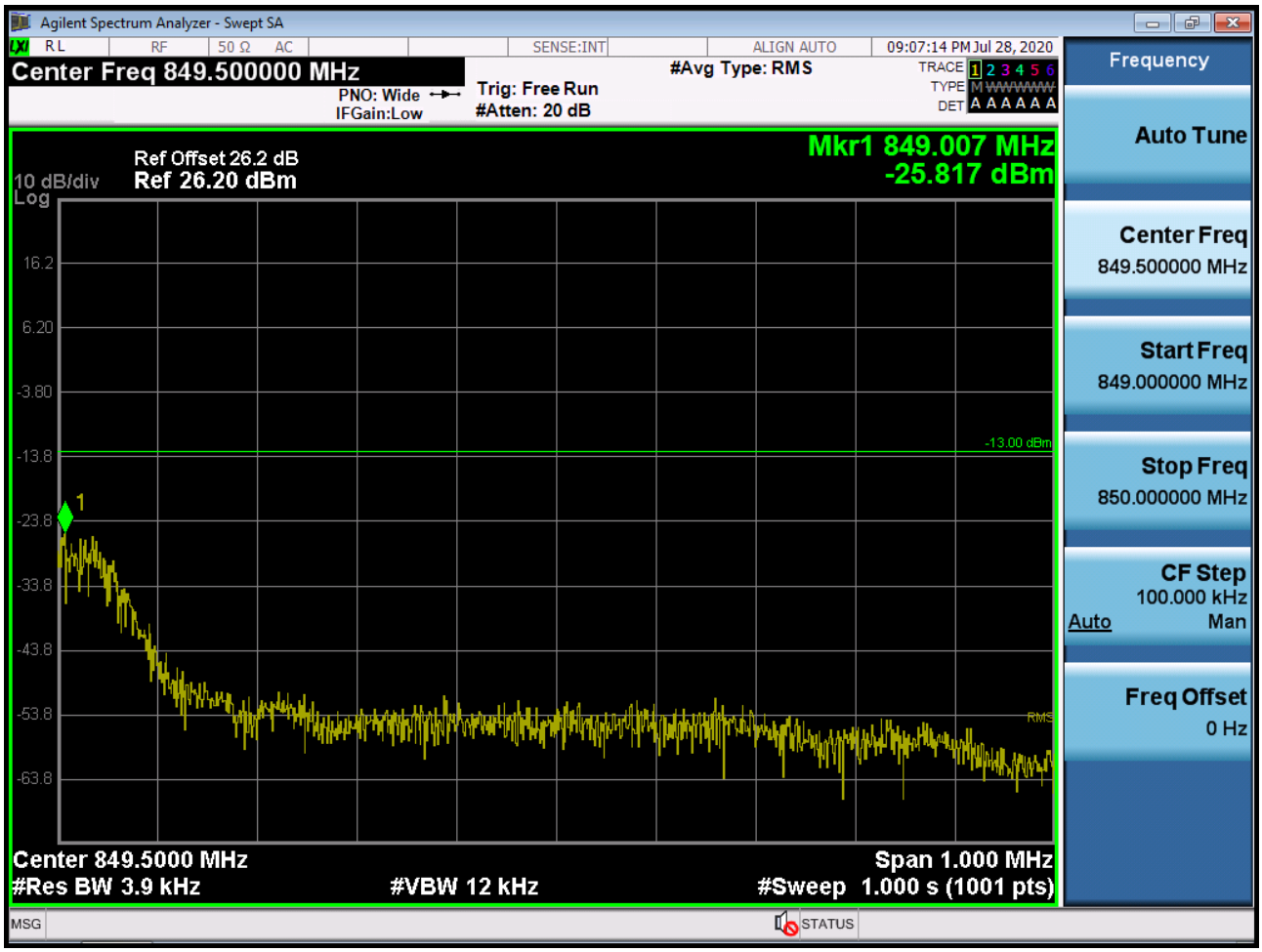


■ EDGE MODE (128 CH.) Block Edge 3

■ EDGE MODE (251 CH.) Block Edge 1

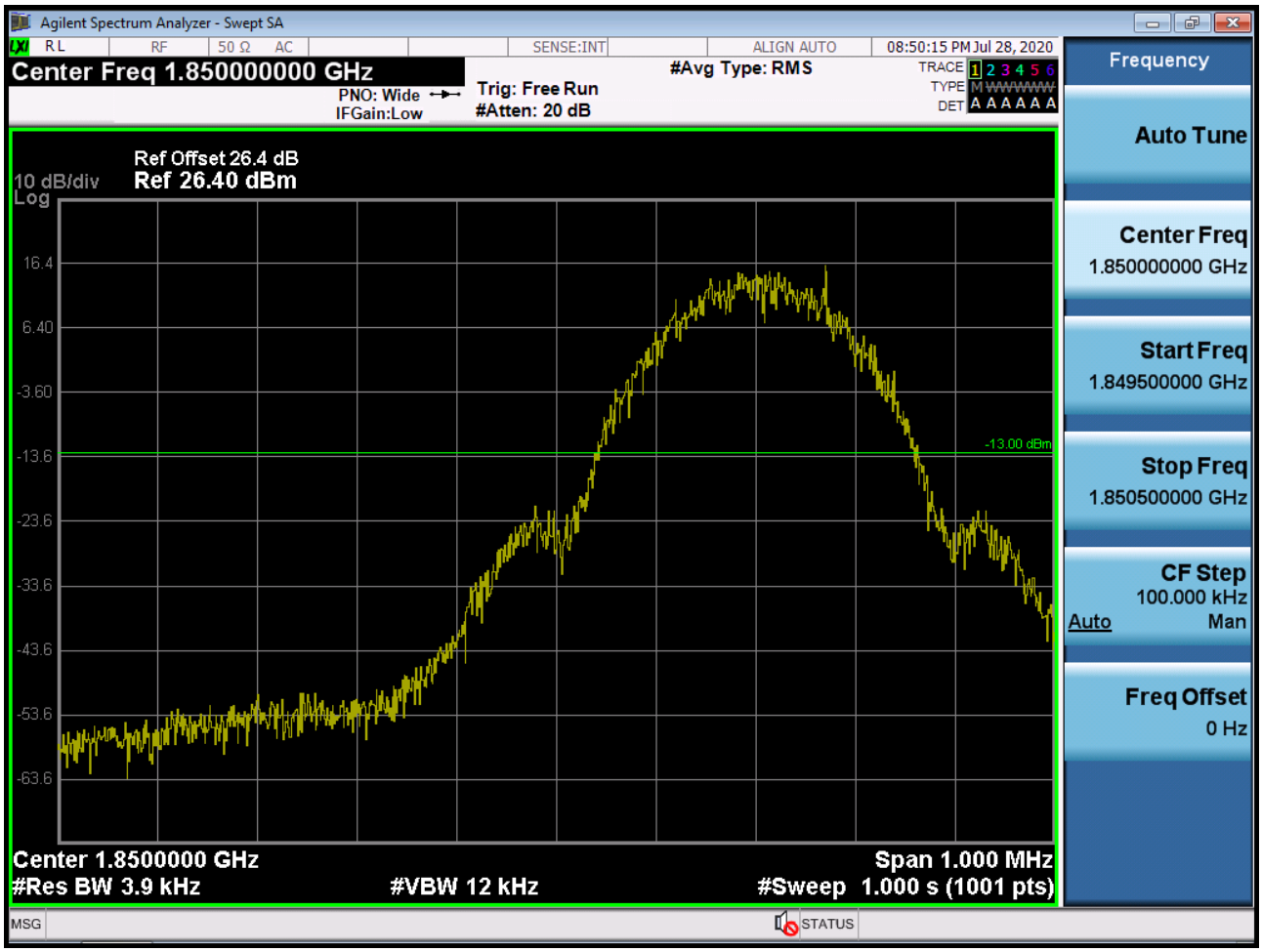


■ EDGE MODE (251 CH.) Block Edge 2

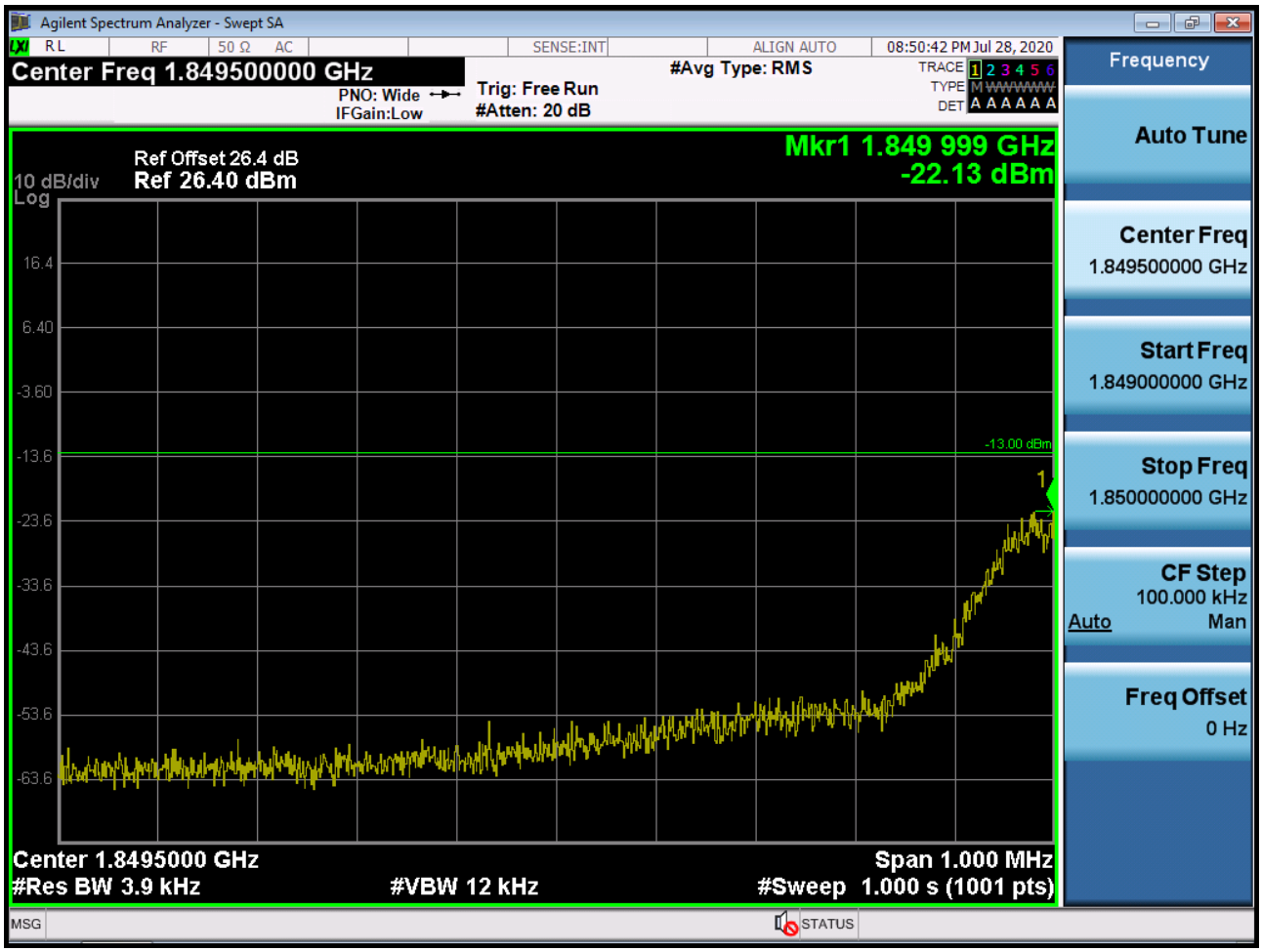


■ EDGE MODE (251 CH.) Block Edge 3

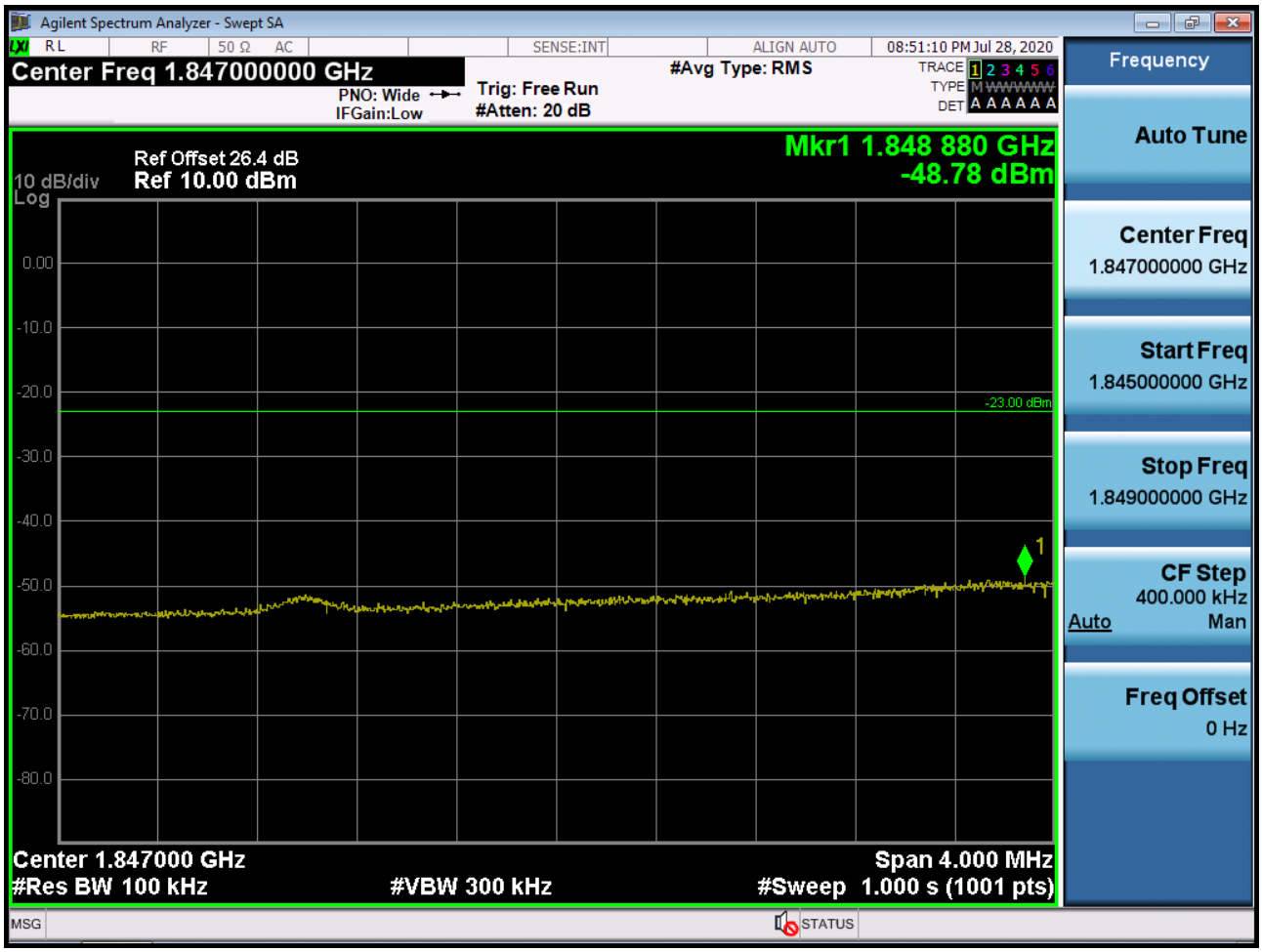
■ GSM1900 MODE (512 CH.) Block Edge 1



■ GSM1900 MODE (512 CH.) Block Edge 2



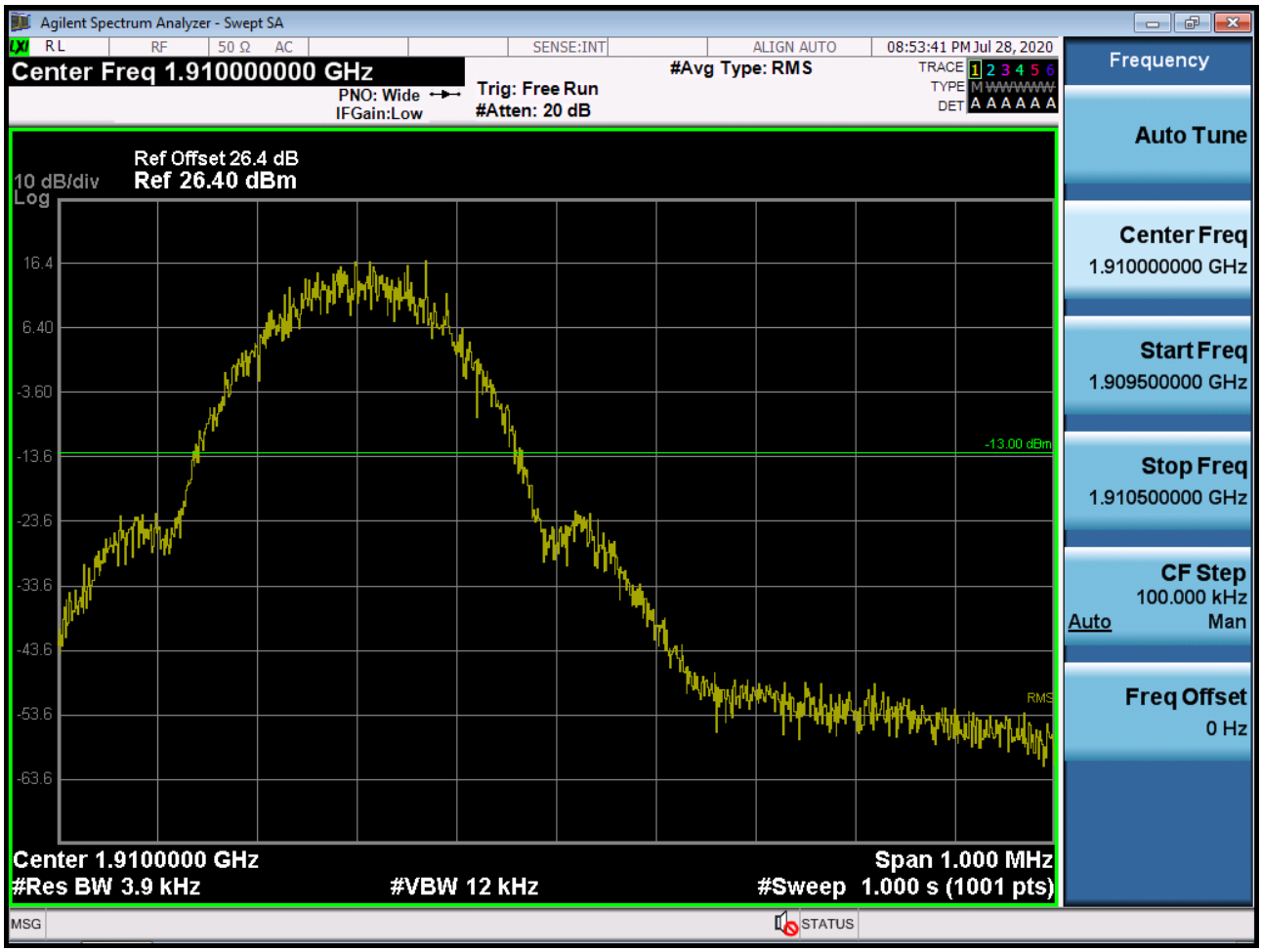
■ GSM1900 MODE (512 CH.) Block Edge 3



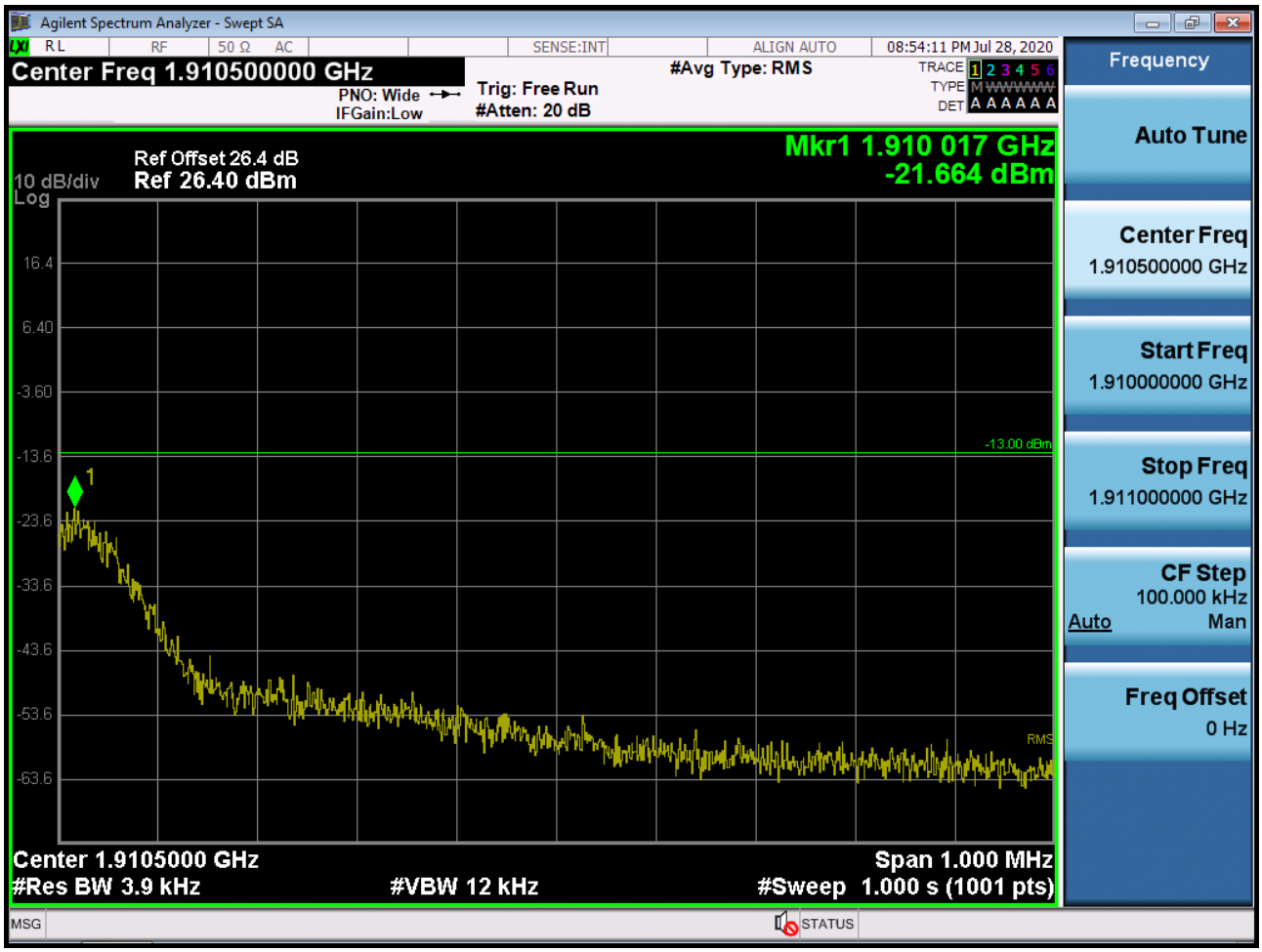
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -48.78 dBm + 10 dB = -38.78 dBm

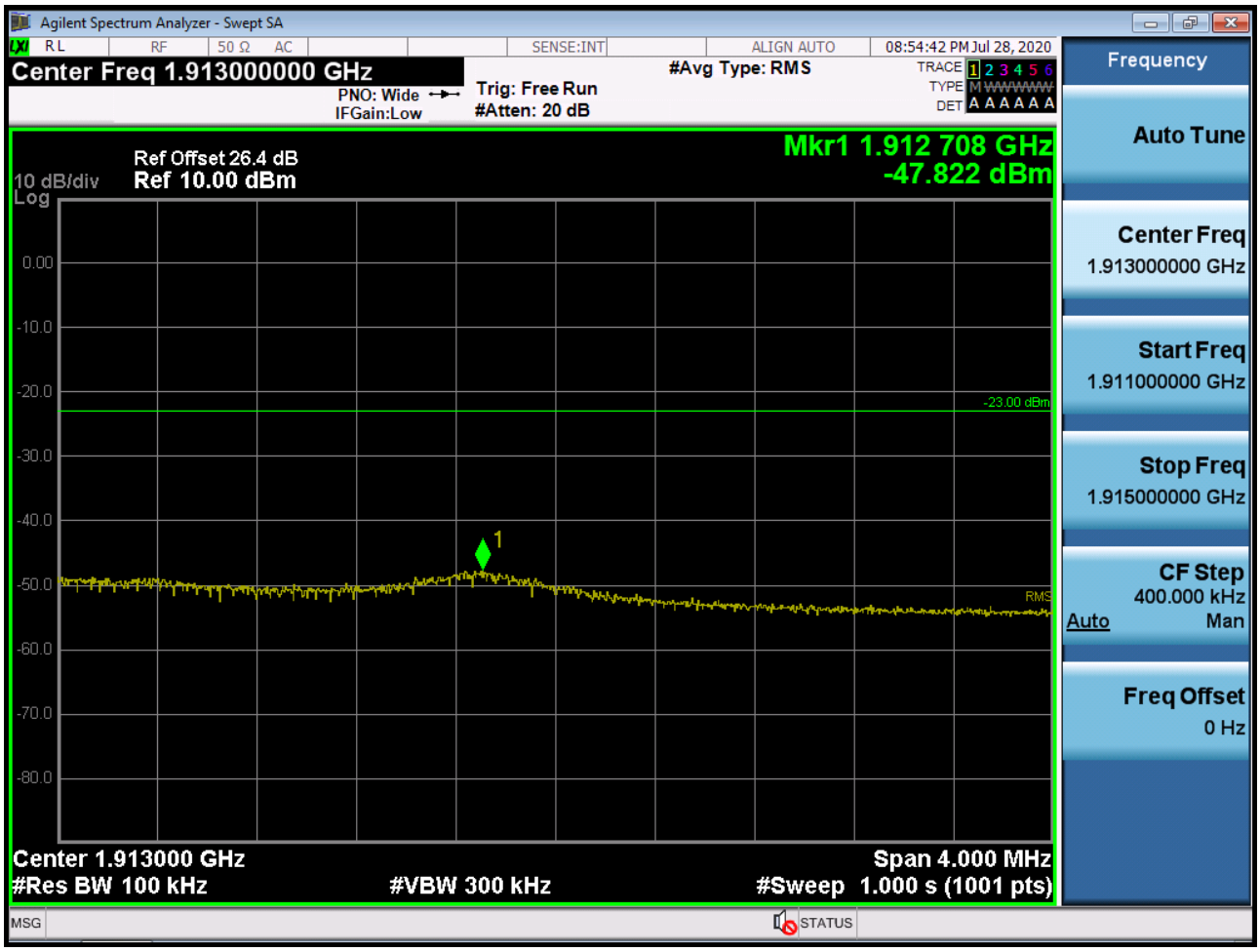
■ GSM1900 MODE (810 CH.) Block Edge 1



■ GSM1900 MODE (810 CH.) Block Edge 2



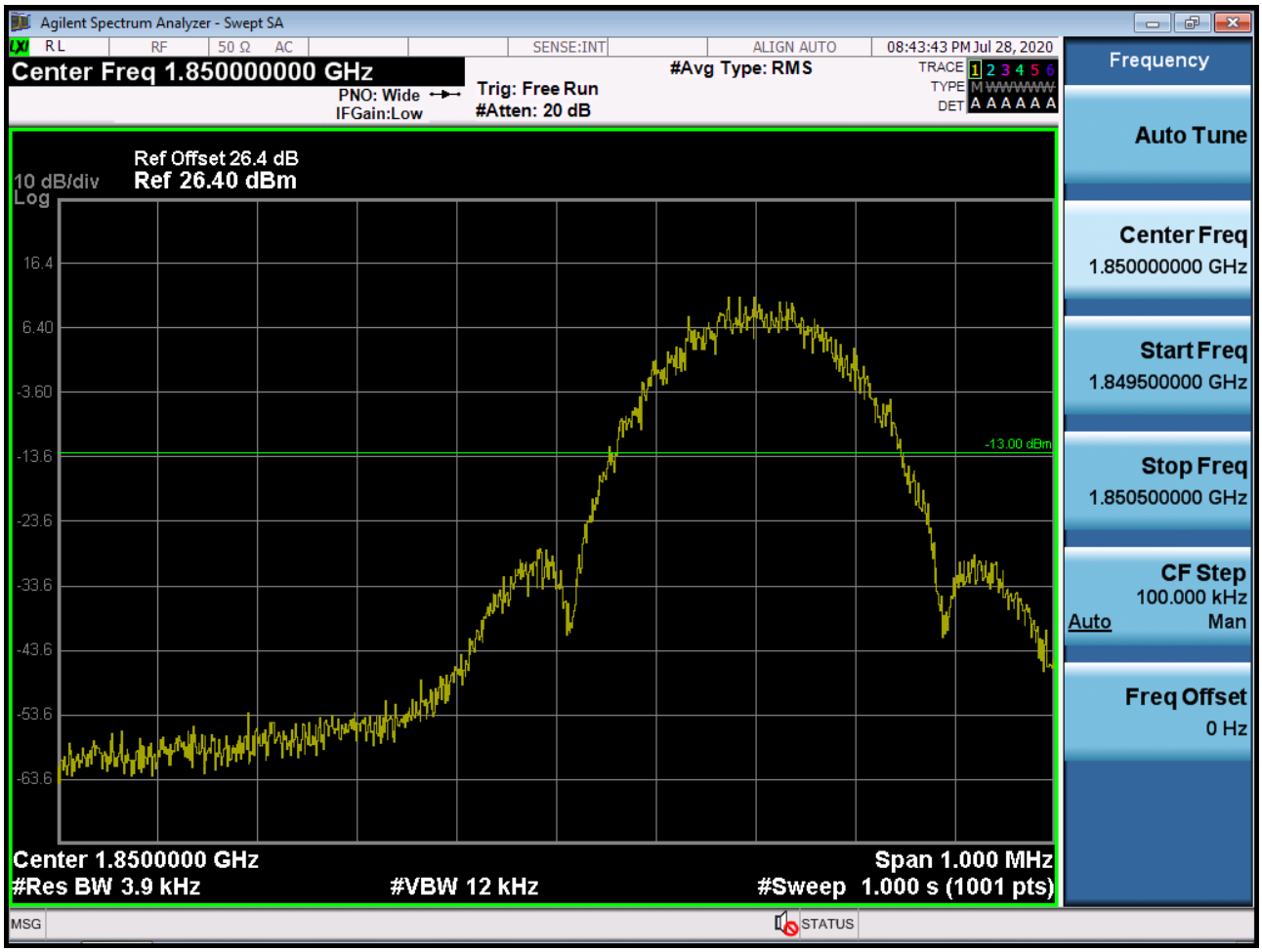
■ GSM1900 MODE (810 CH.) Block Edge 3



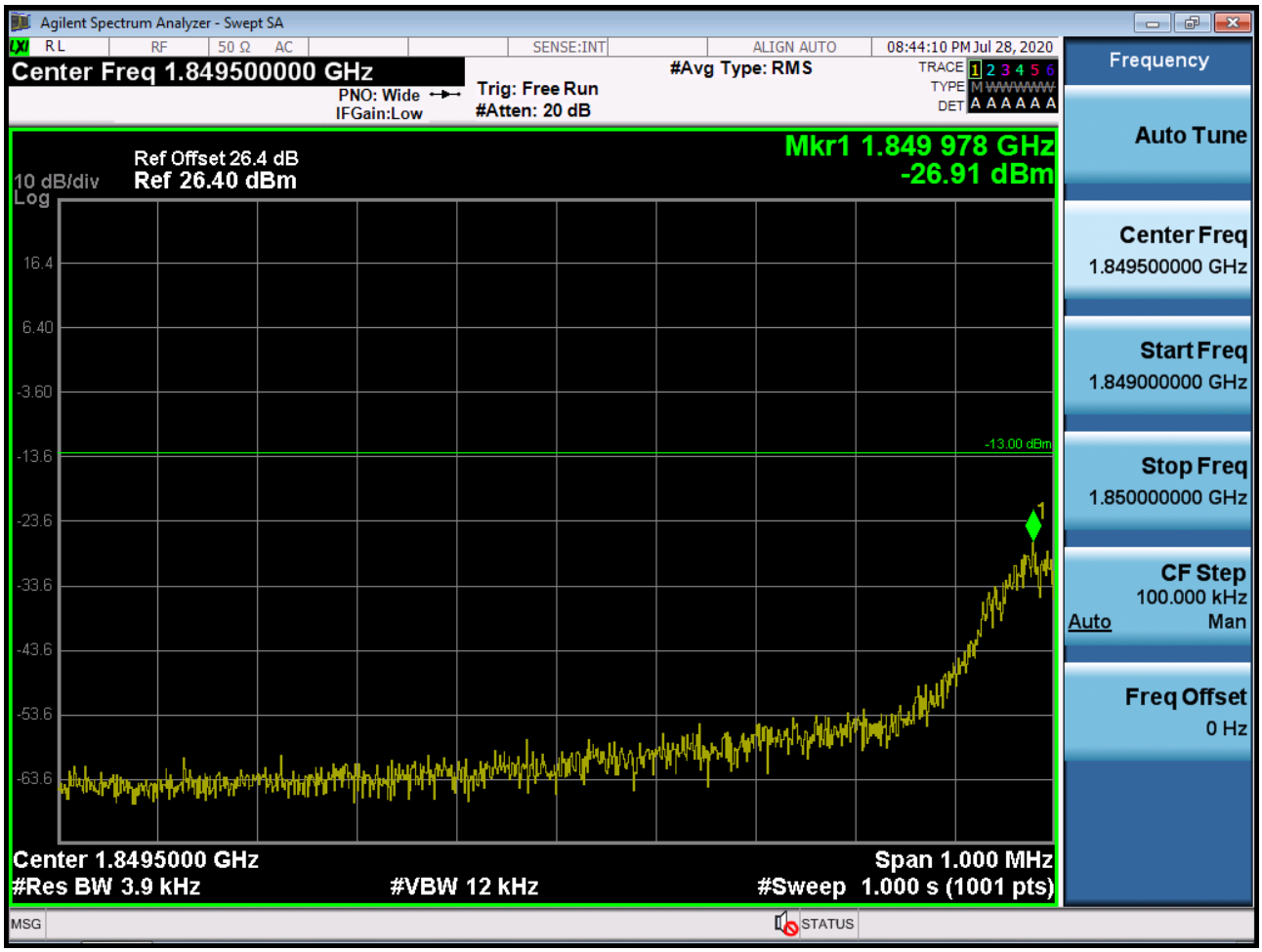
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -47.822 dBm + 10 dB = -37.822 dBm

■ EDGE MODE (512 CH.) Block Edge 1



■ EDGE MODE (512 CH.) Block Edge 2

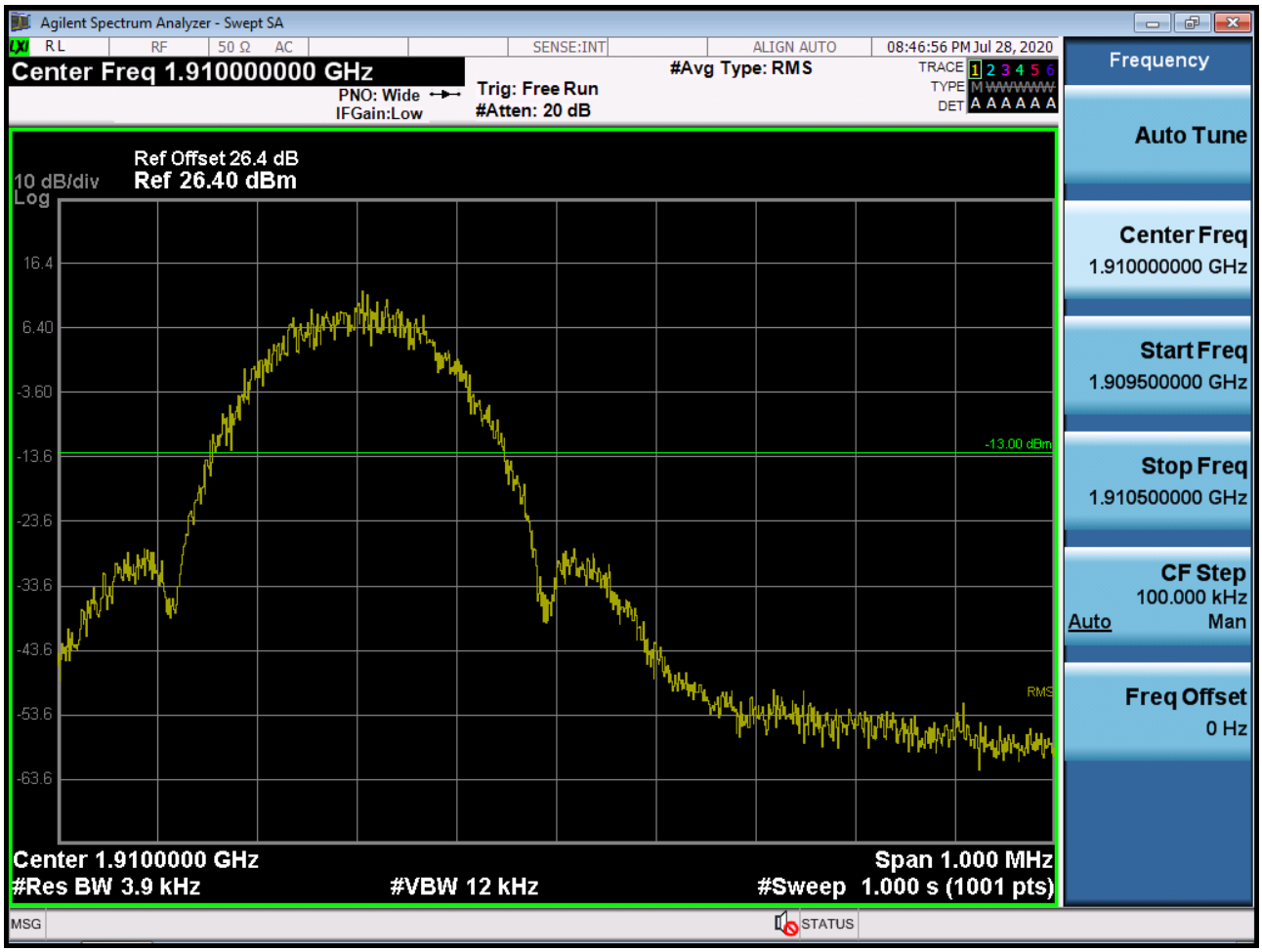


■ EDGE MODE (512 CH.) Block Edge 3

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

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -51.109 dBm + 10 dB = -41.109 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 x log(1 MHz/100 kHz) dB = -50.547 dBm + 10 dB = -40.547 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

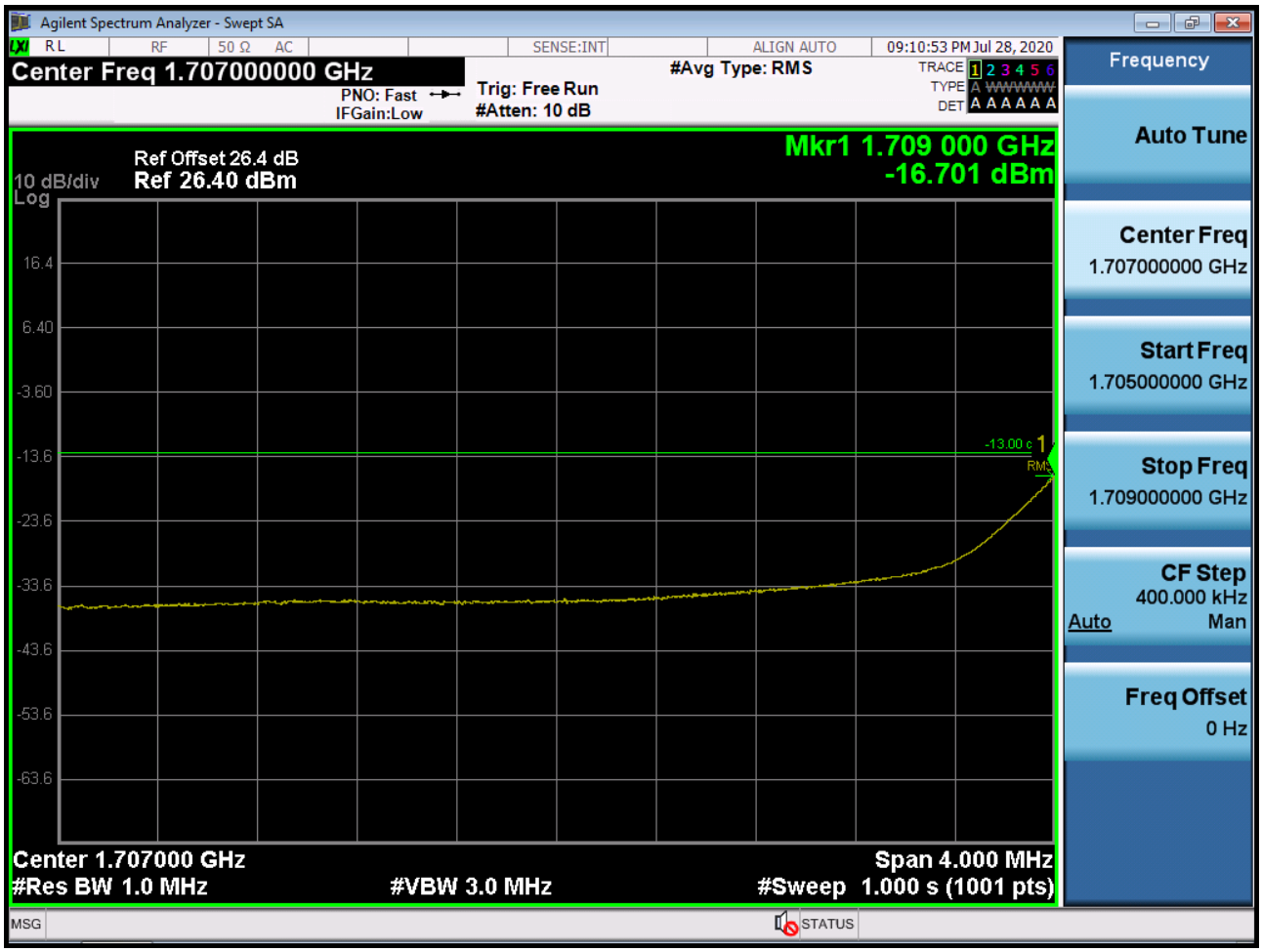
■ WCDMA1900 MODE (9262 CH.) – 4 MHz Span

■ WCDMA1900 MODE (9538 CH.) Block Edge

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

■ WCDMA1700 MODE (1312 CH.) Block Edge

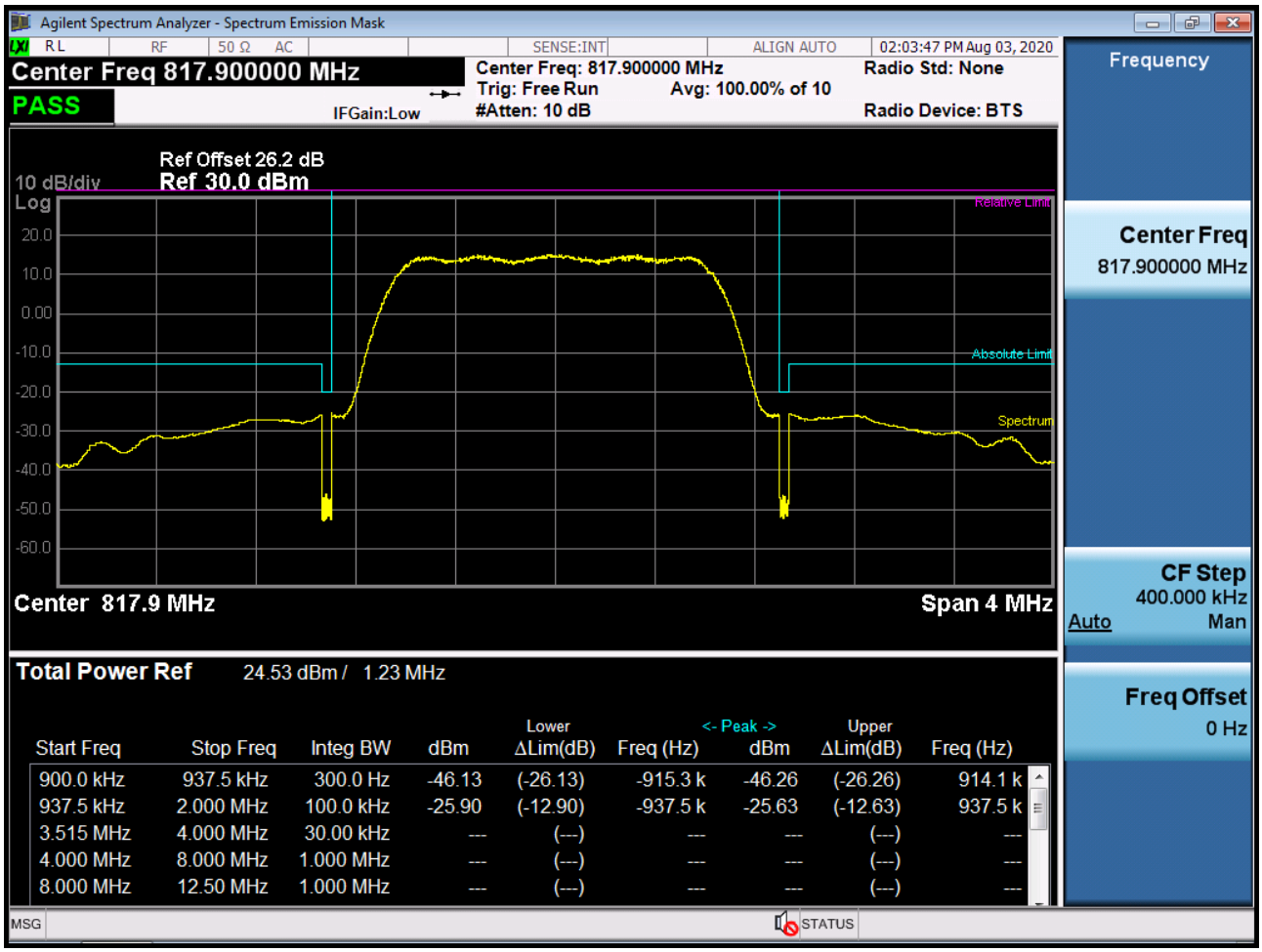
■ WCDMA1700 MODE (1312 CH.) – 4 MHz Span



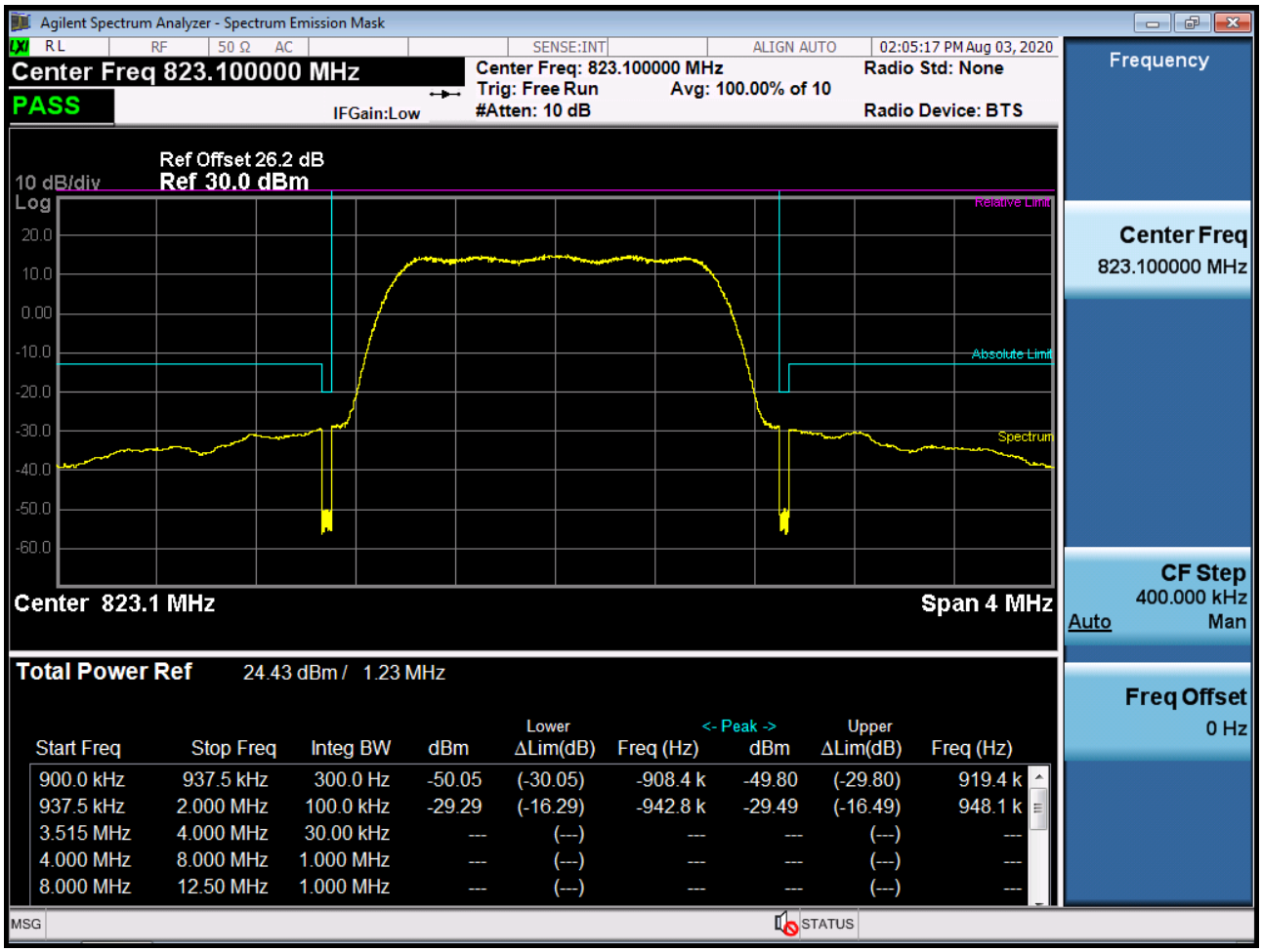
■ WCDMA1700 MODE (1513 CH.) Block Edge

■ WCDMA1700 MODE (1513 CH.) – 4 MHz Span

■ CDMA Secondary800 MODE (476 CH.) Block Edge



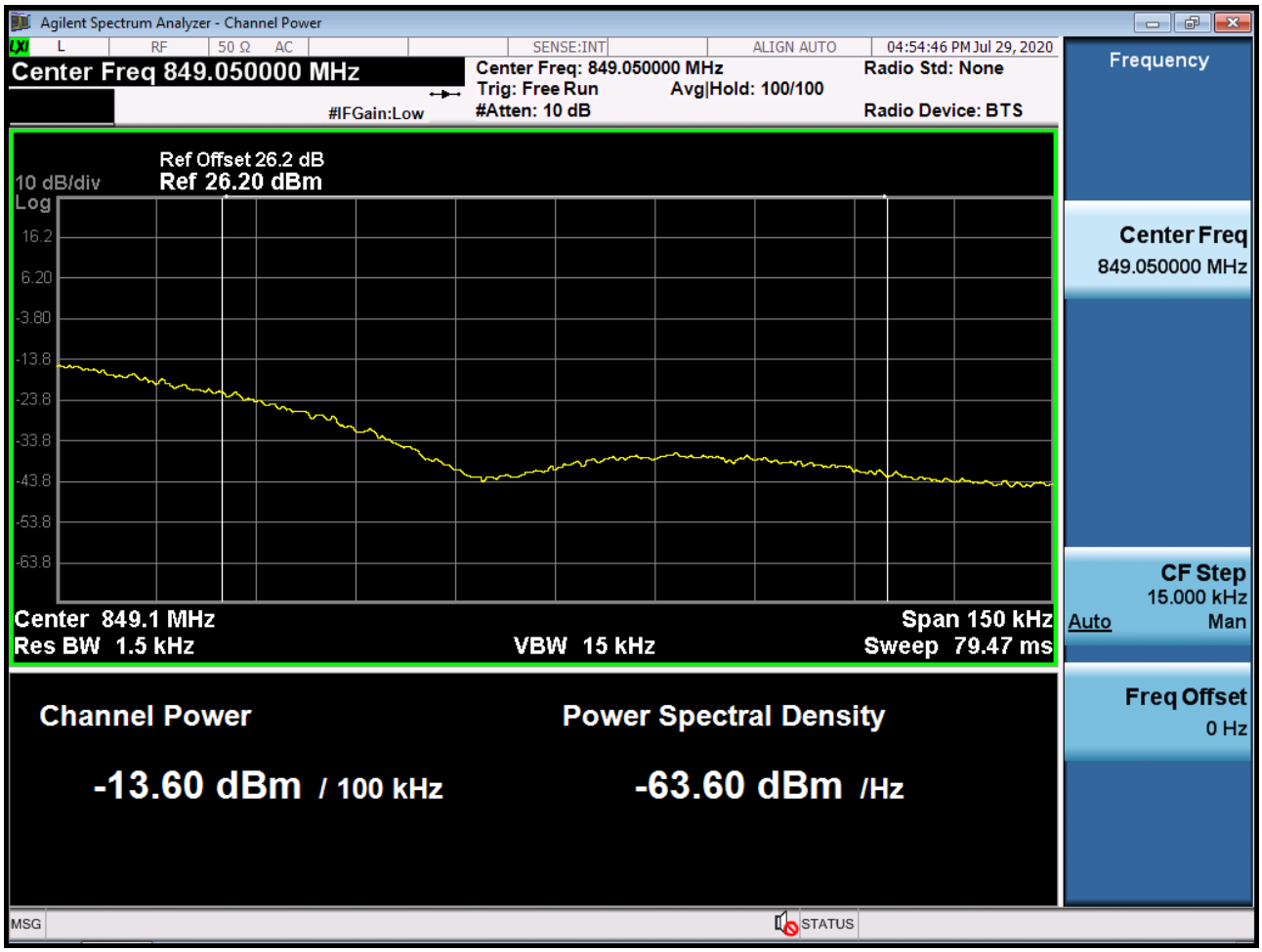
■ CDMA Secondary800 MODE (684 CH.) Block Edge



■ CDMA850 MODE (1013 CH.) Block Edge

■ CDMA850 MODE (1013 CH.) 4 MHz Span

■ CDMA850 MODE (777 CH.) Block Edge_1

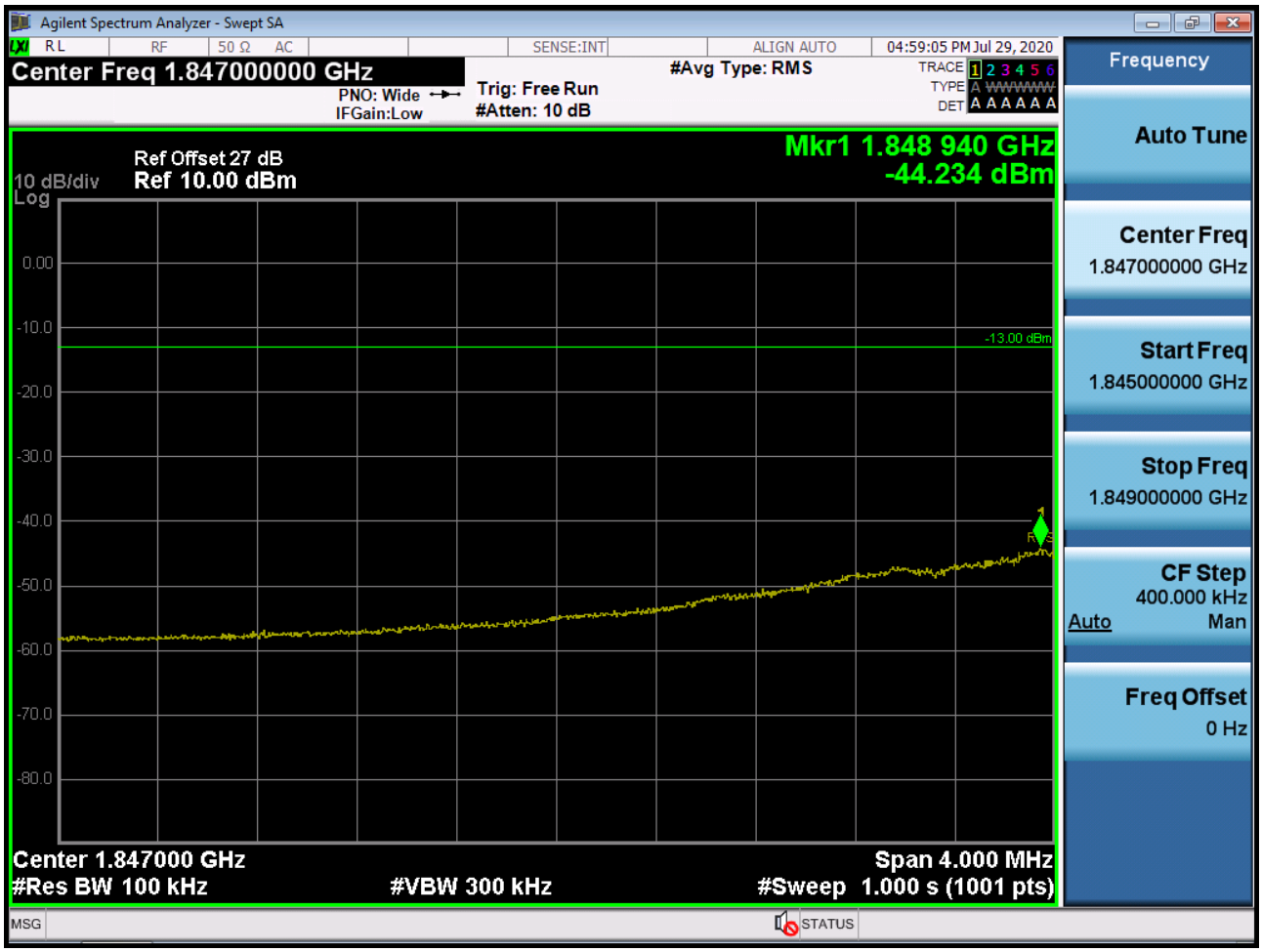


■ CDMA850 MODE (777 CH.) Block Edge_2

■ CDMA850 MODE (777 CH.) 4 MHz Span

■ CDMA PCS MODE (25 CH.) Block Edge pan

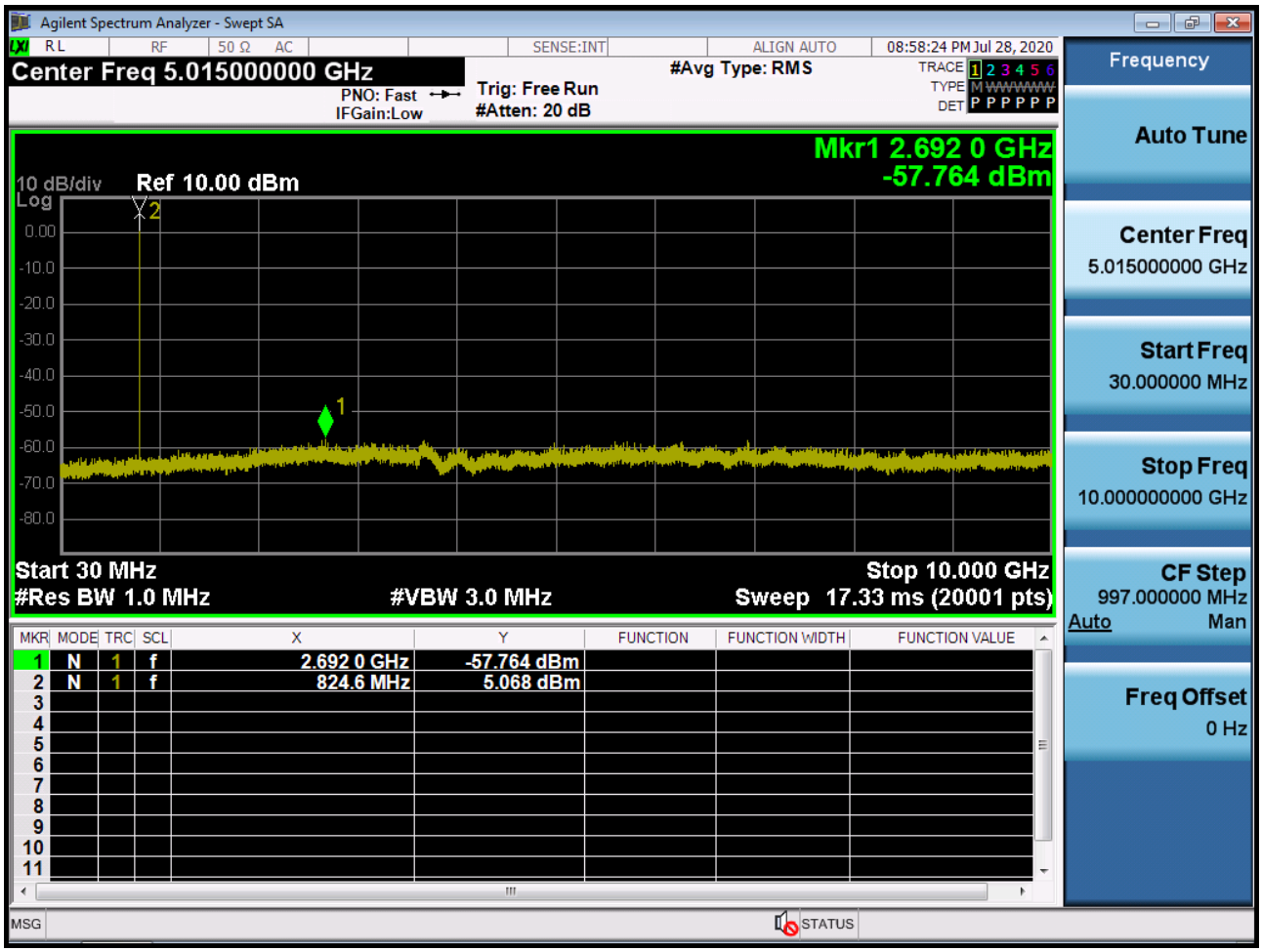
■ CDMA PCS MODE (25 CH.) 4 MHz Span



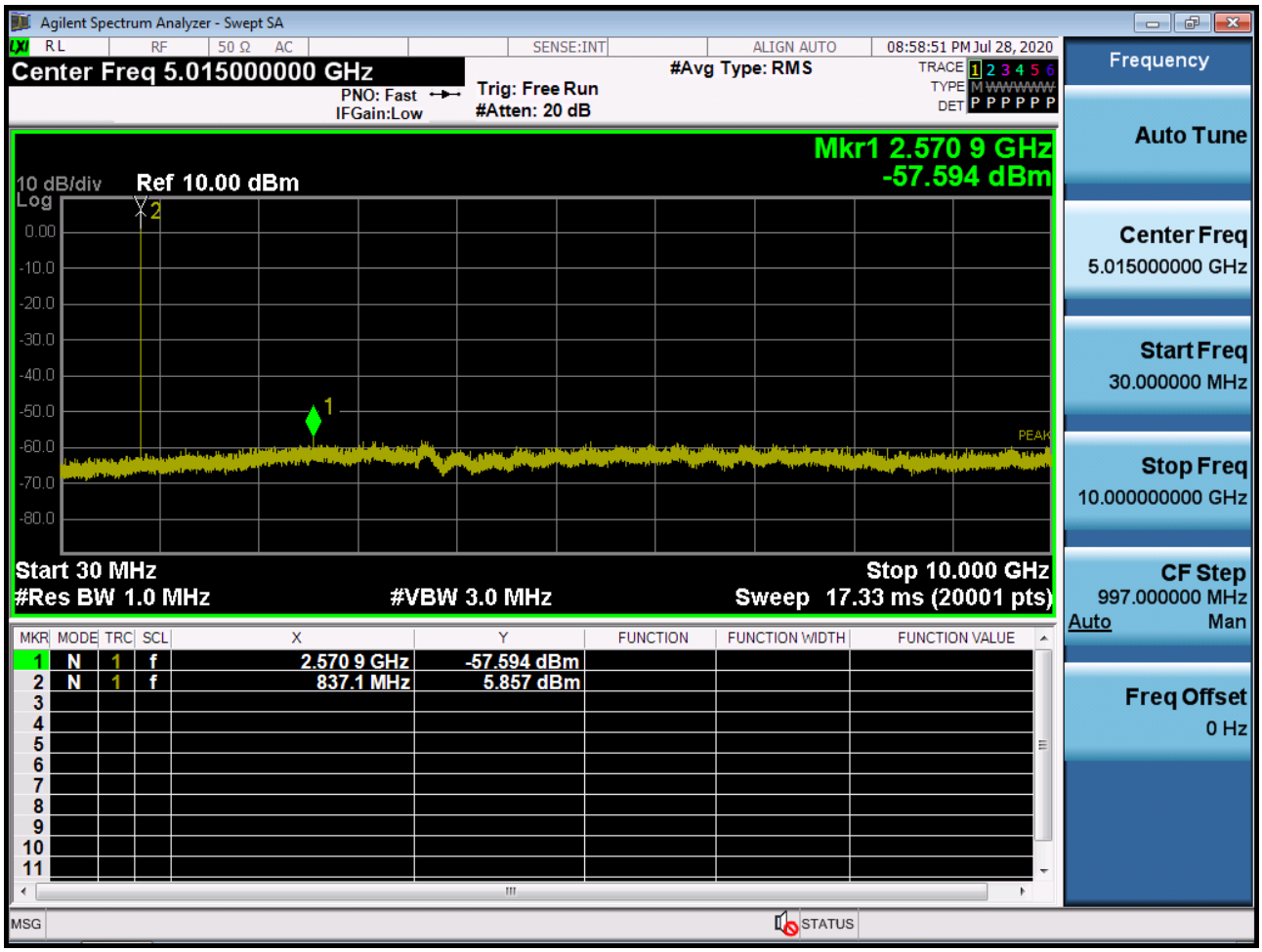
■ CDMA PCS MODE (1175 CH.) Block Edge

■ CDMA PCS MODE (1175 CH.) 4 MHz Span

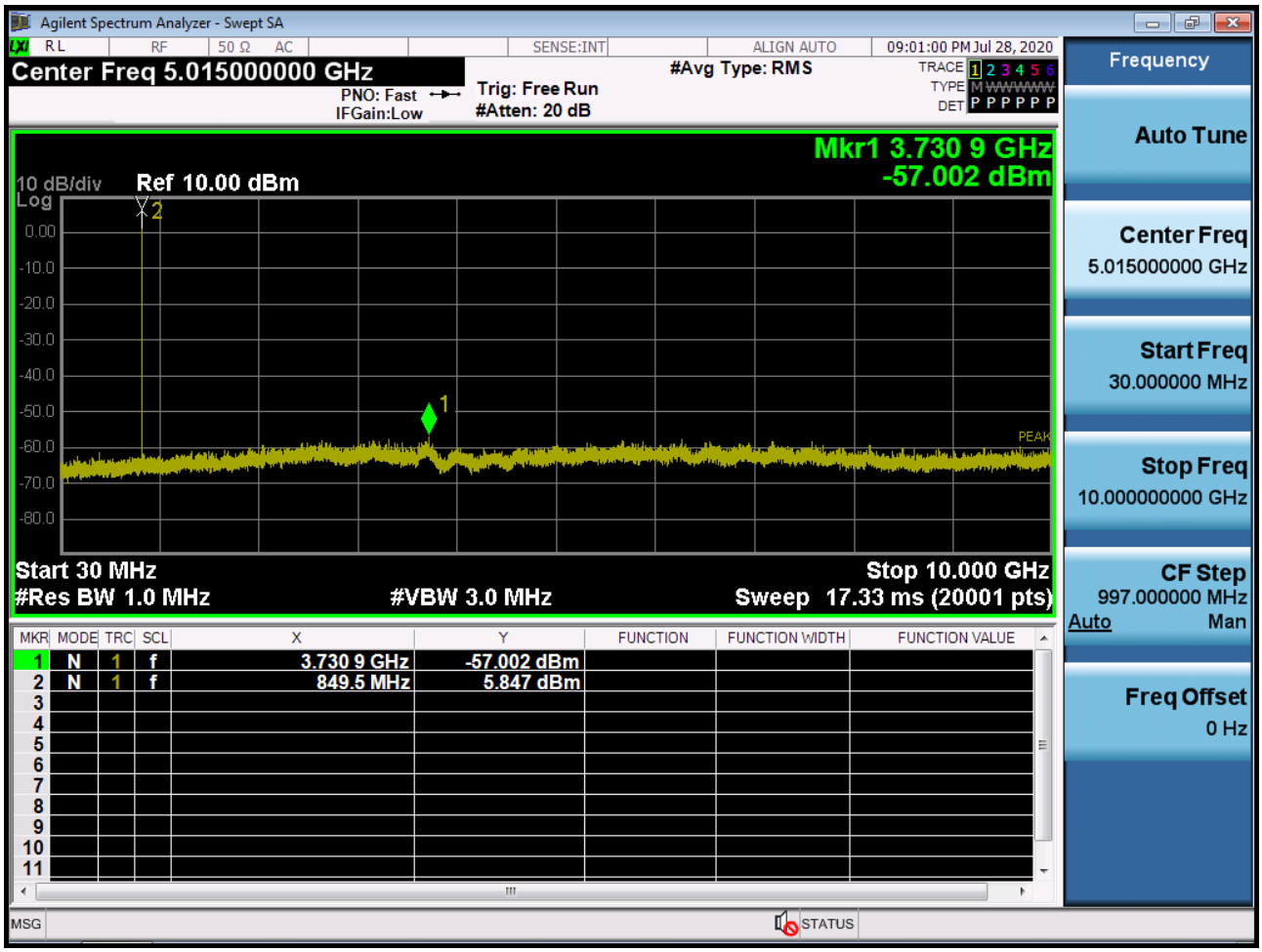
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions



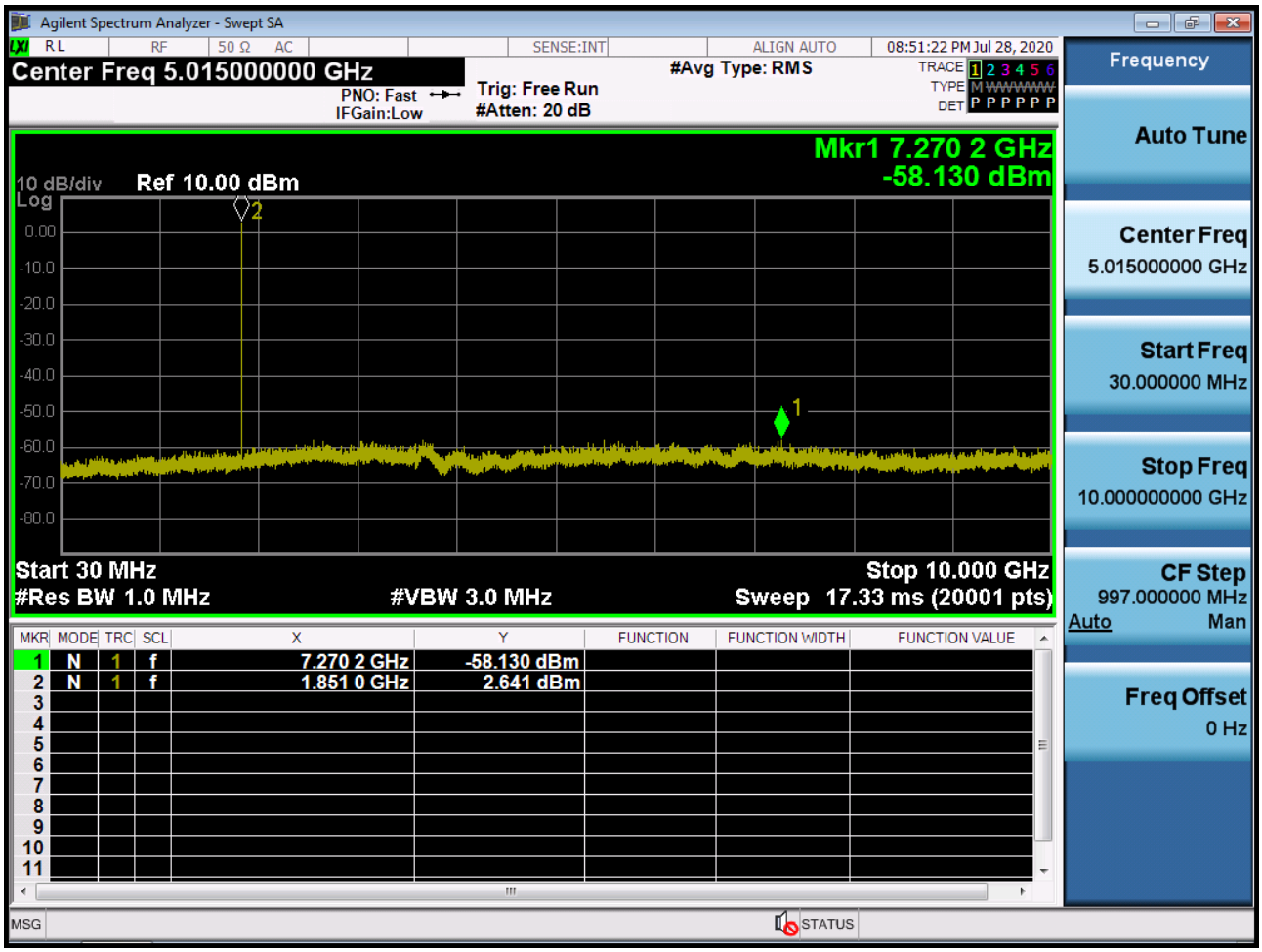
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions



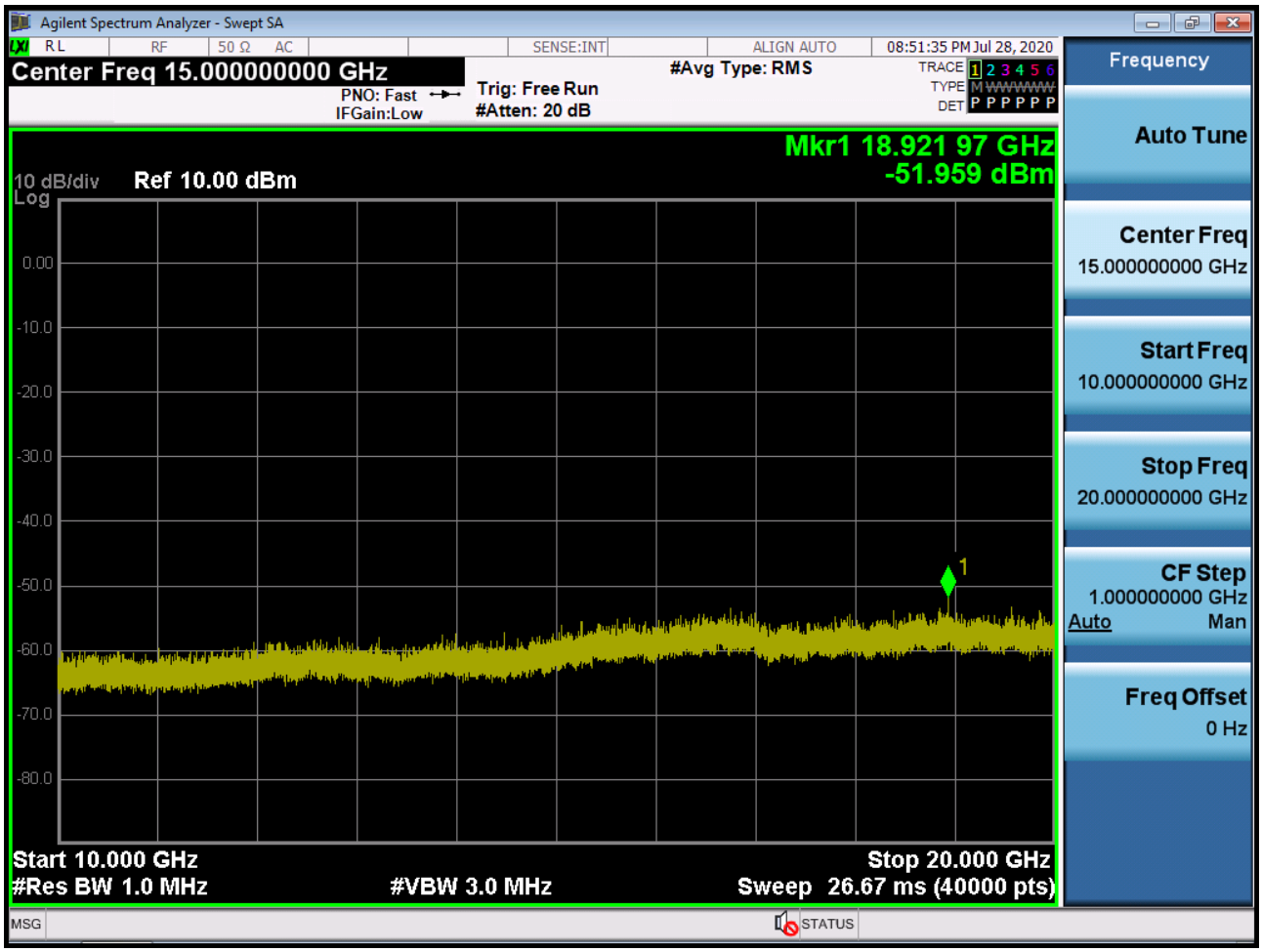
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions



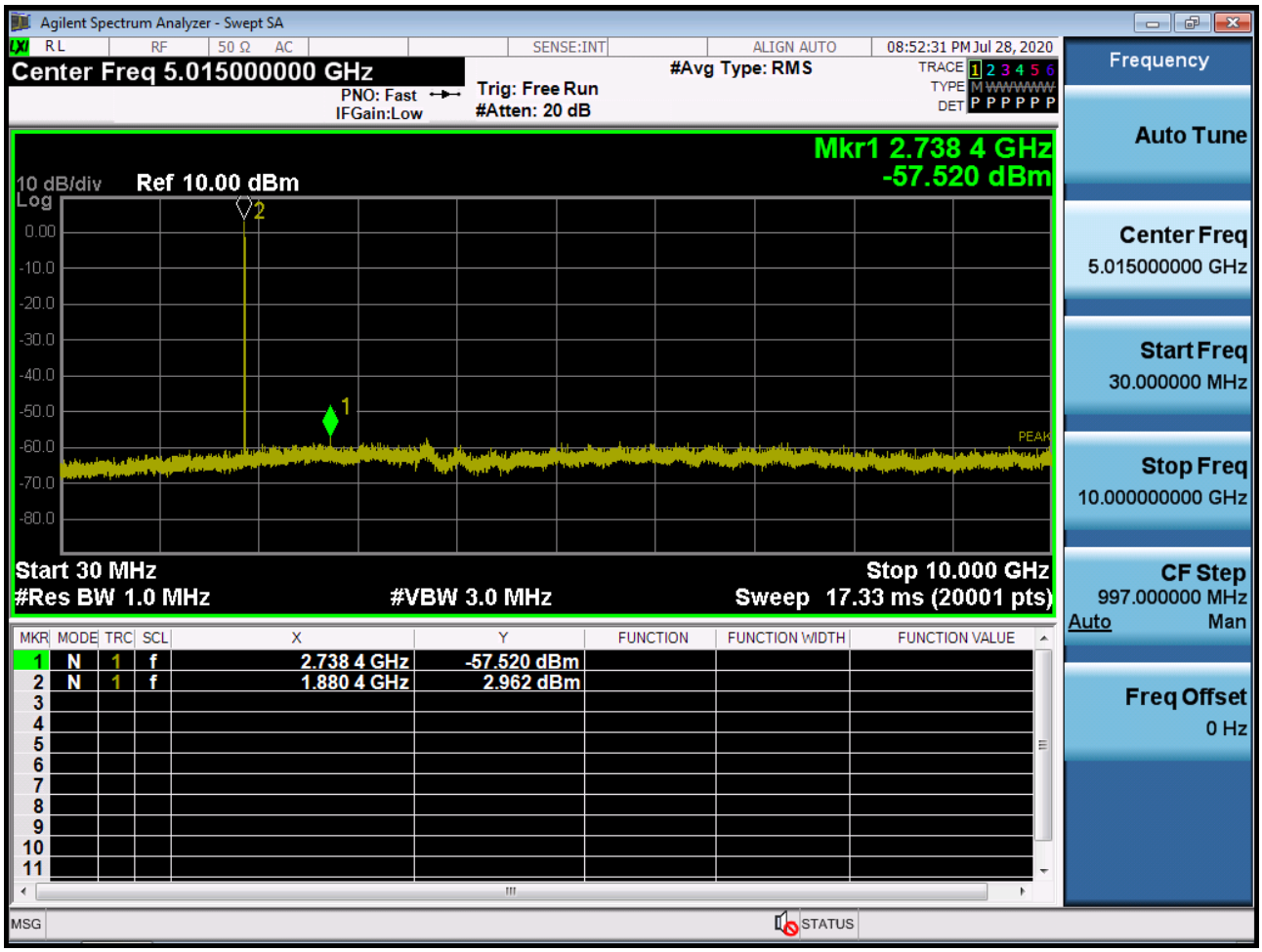
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1



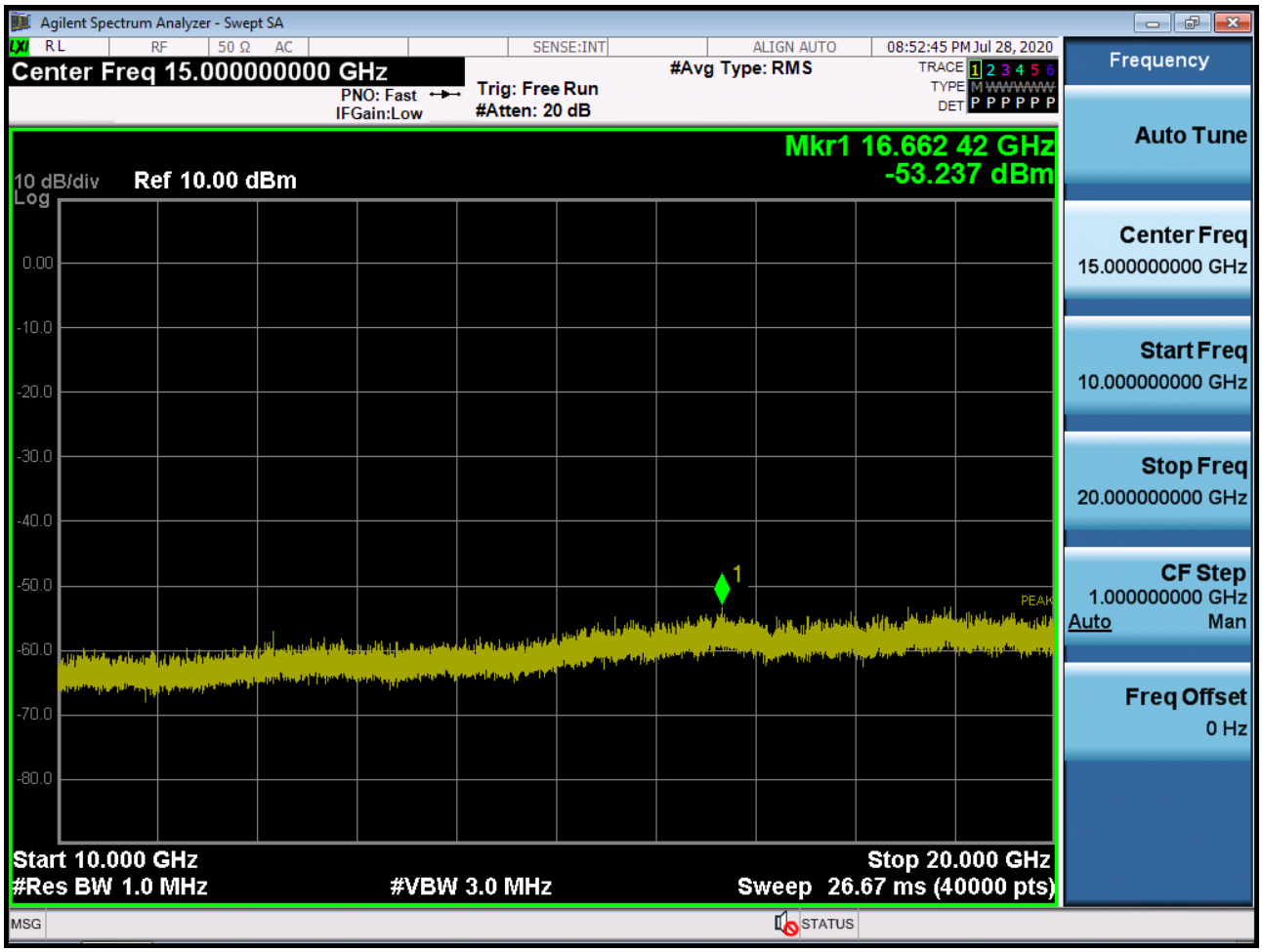
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



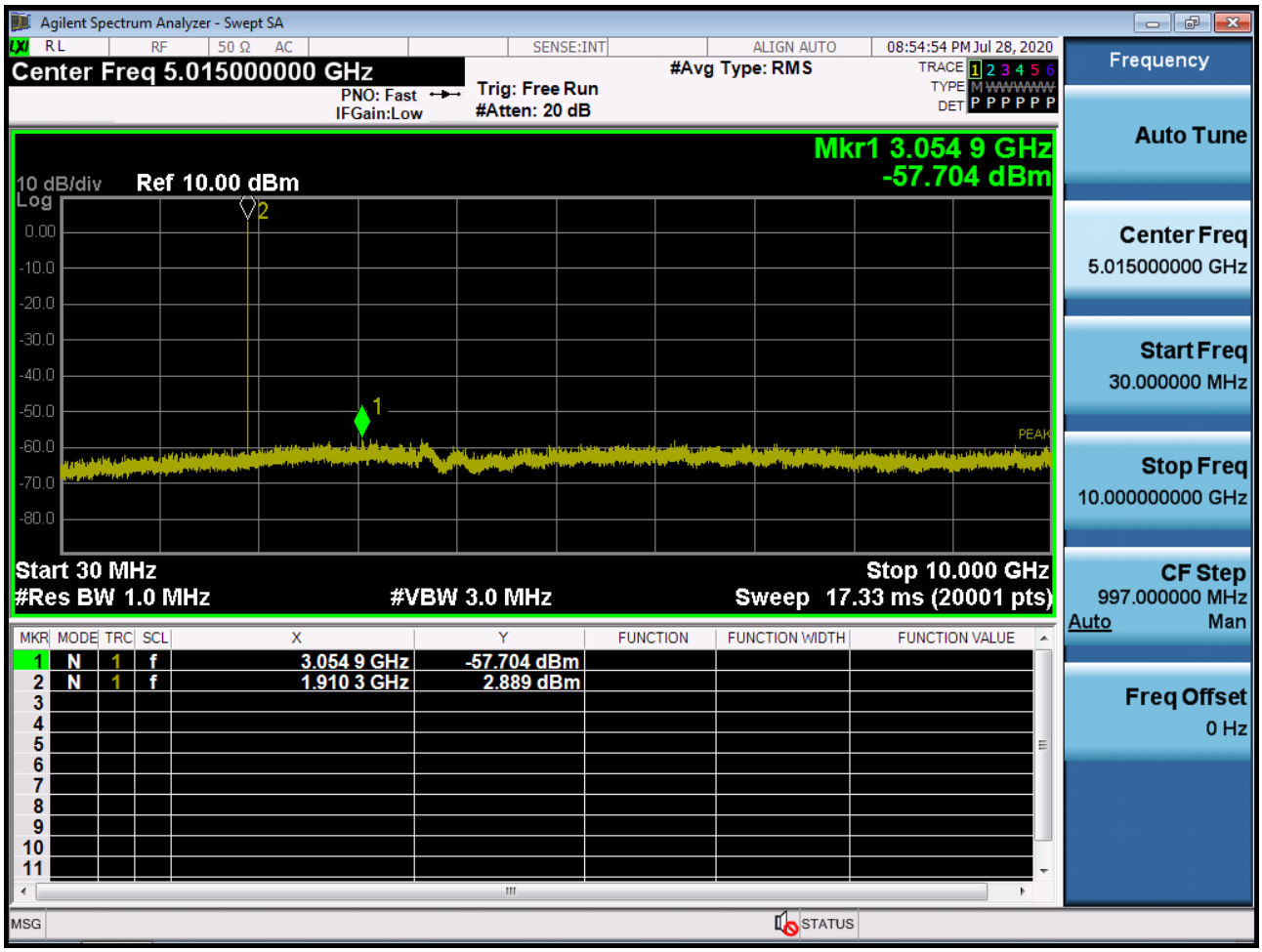
■ GSM1900 MODE (661 CH) Conducted Spurious Emissions1



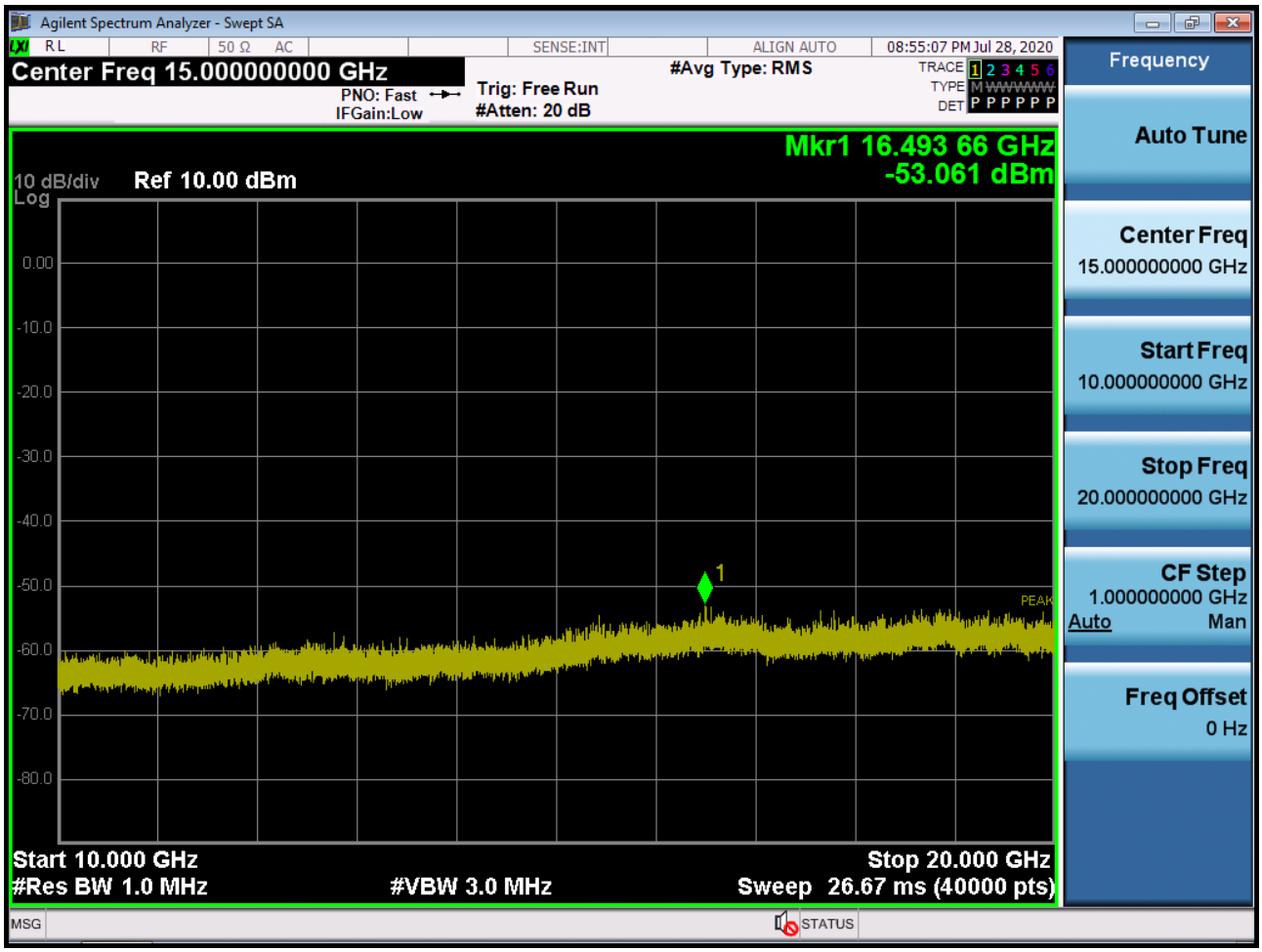
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2



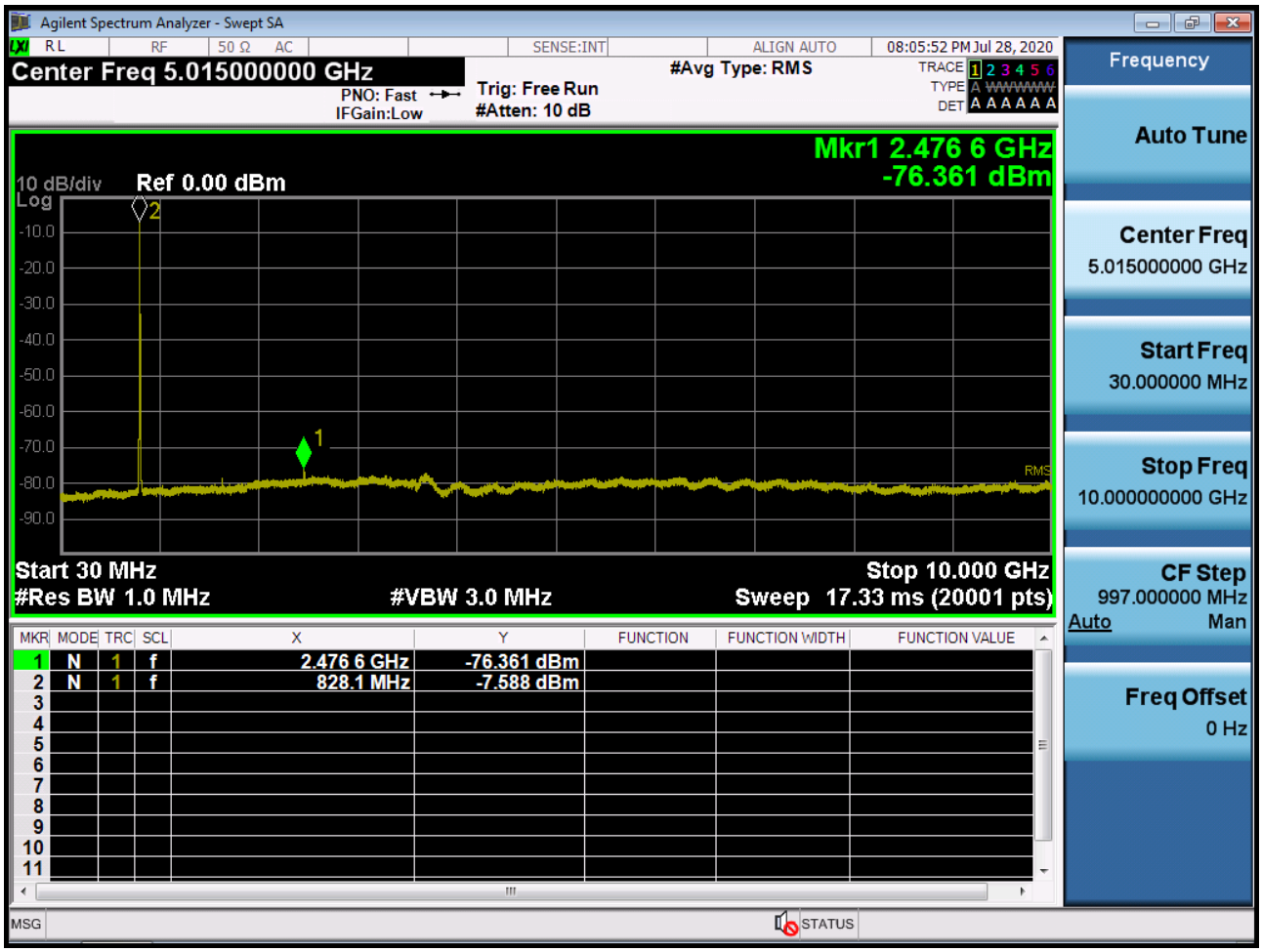
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1



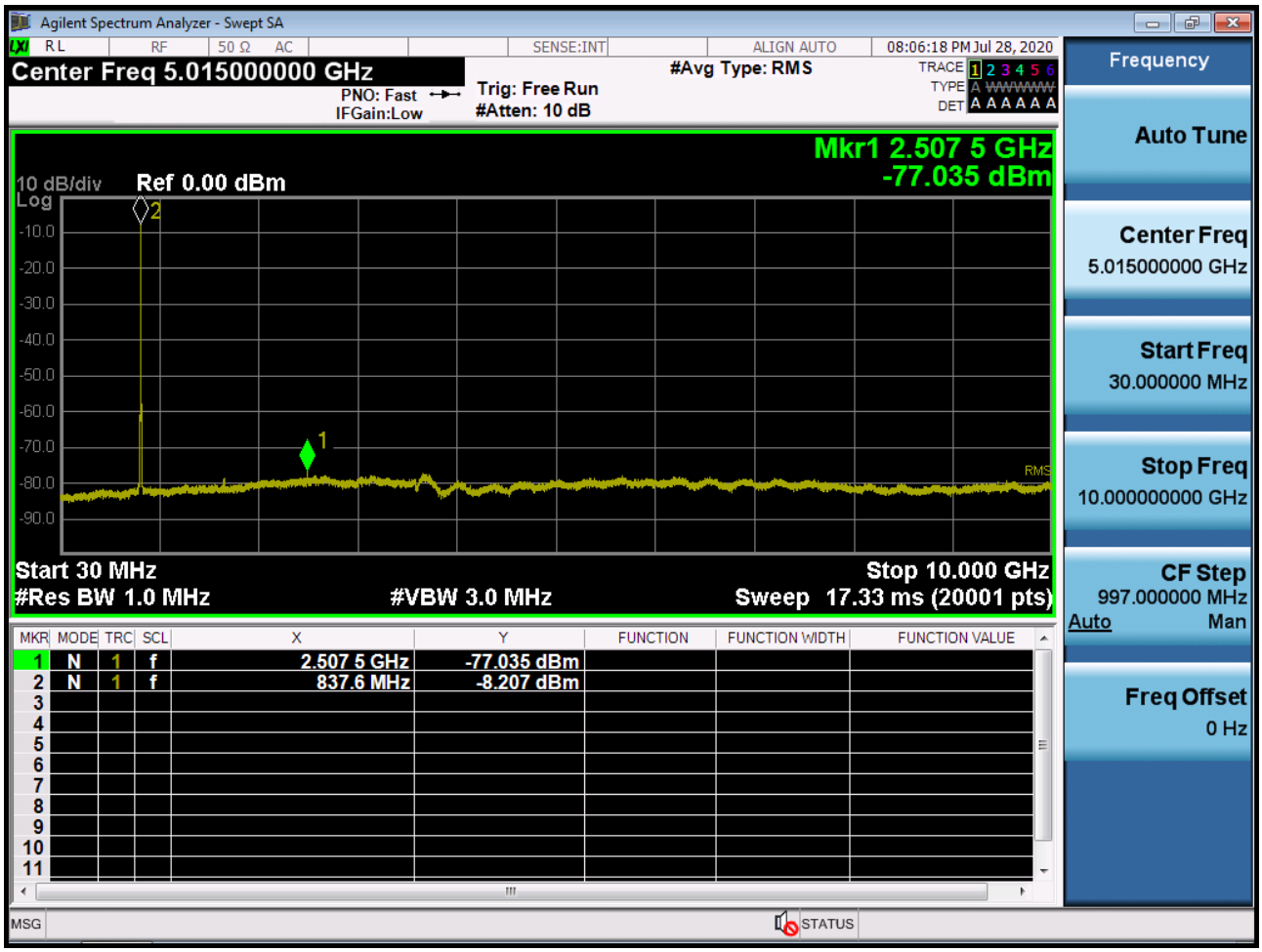
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



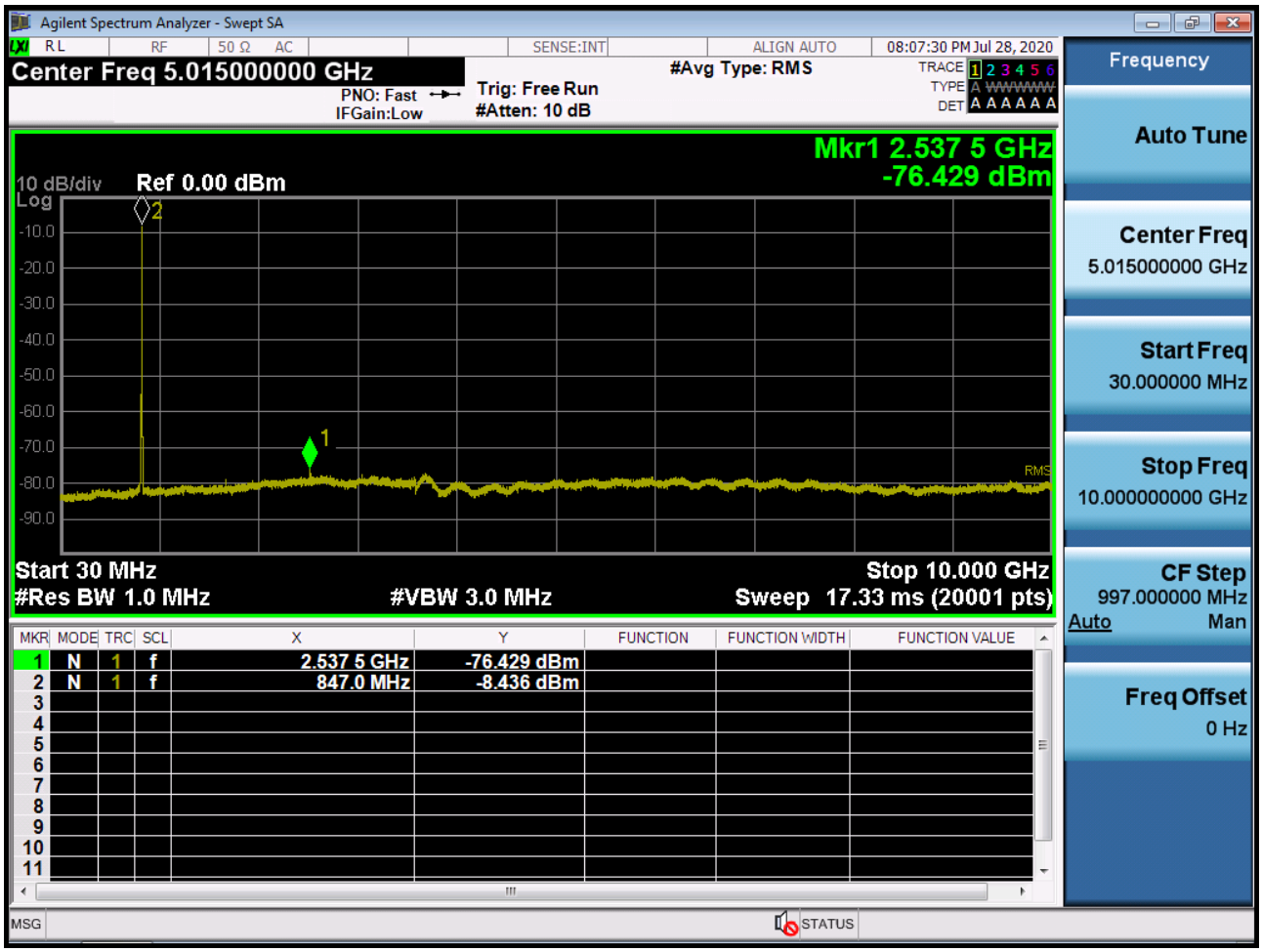
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions



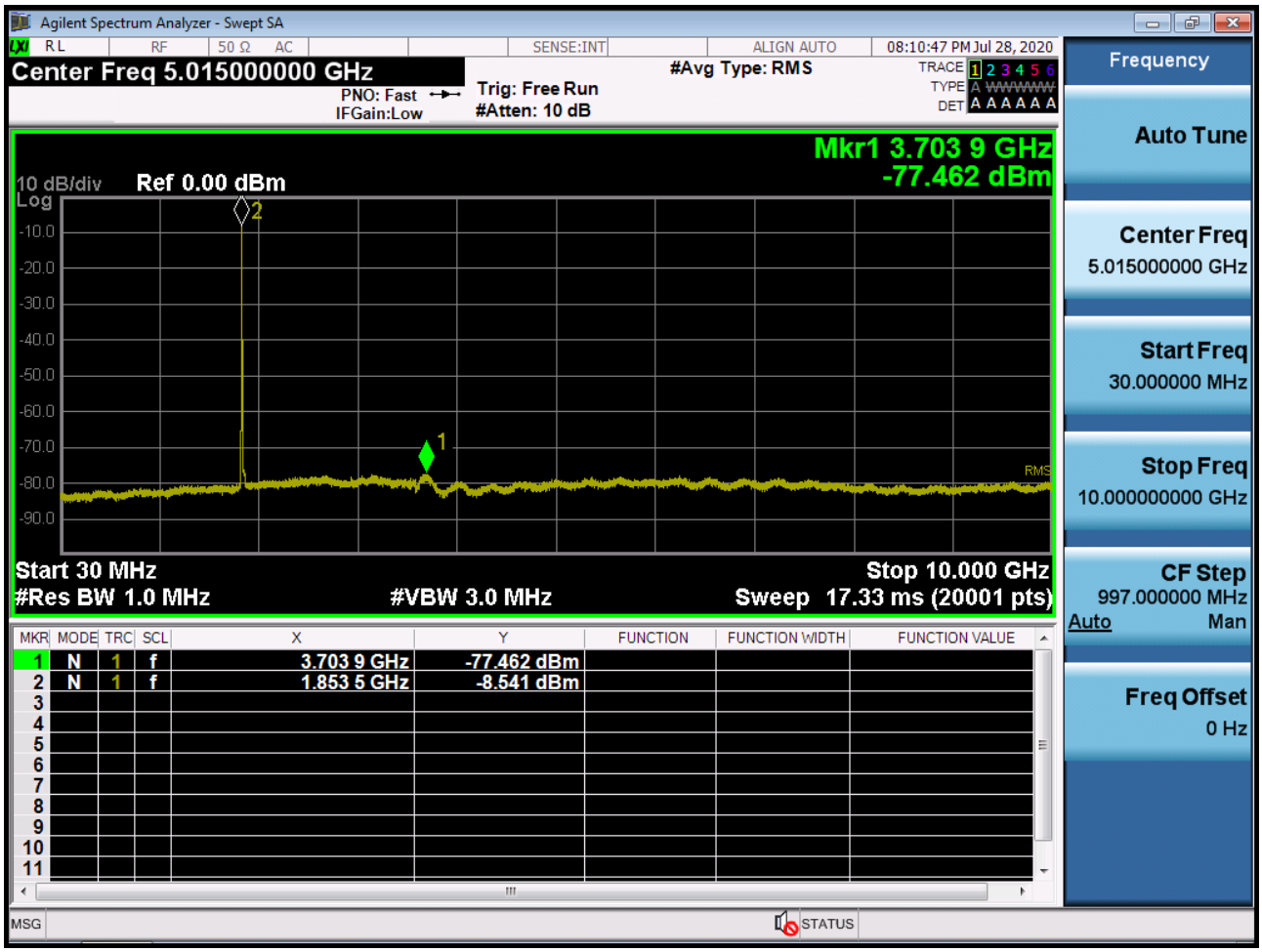
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions



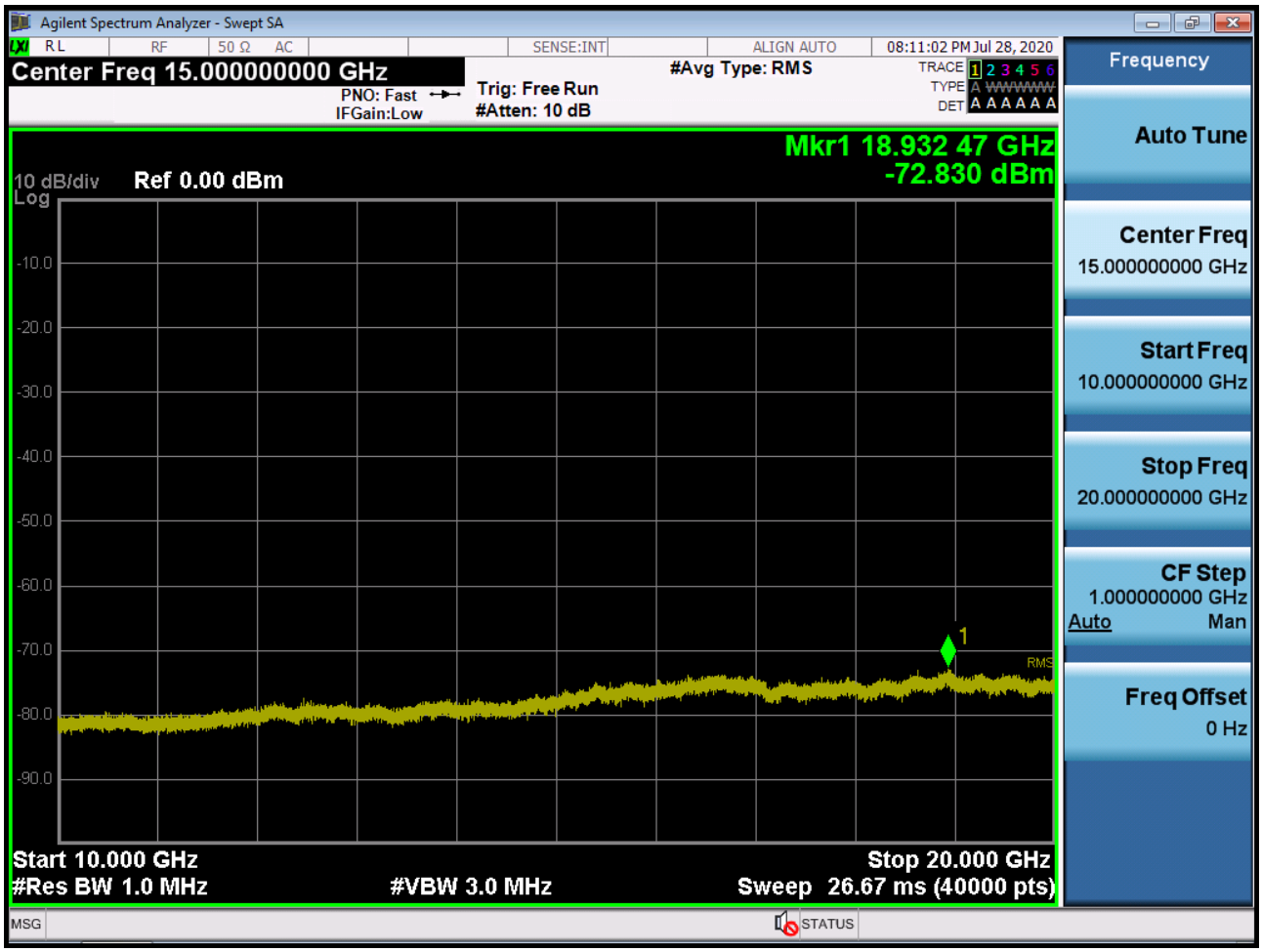
■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions



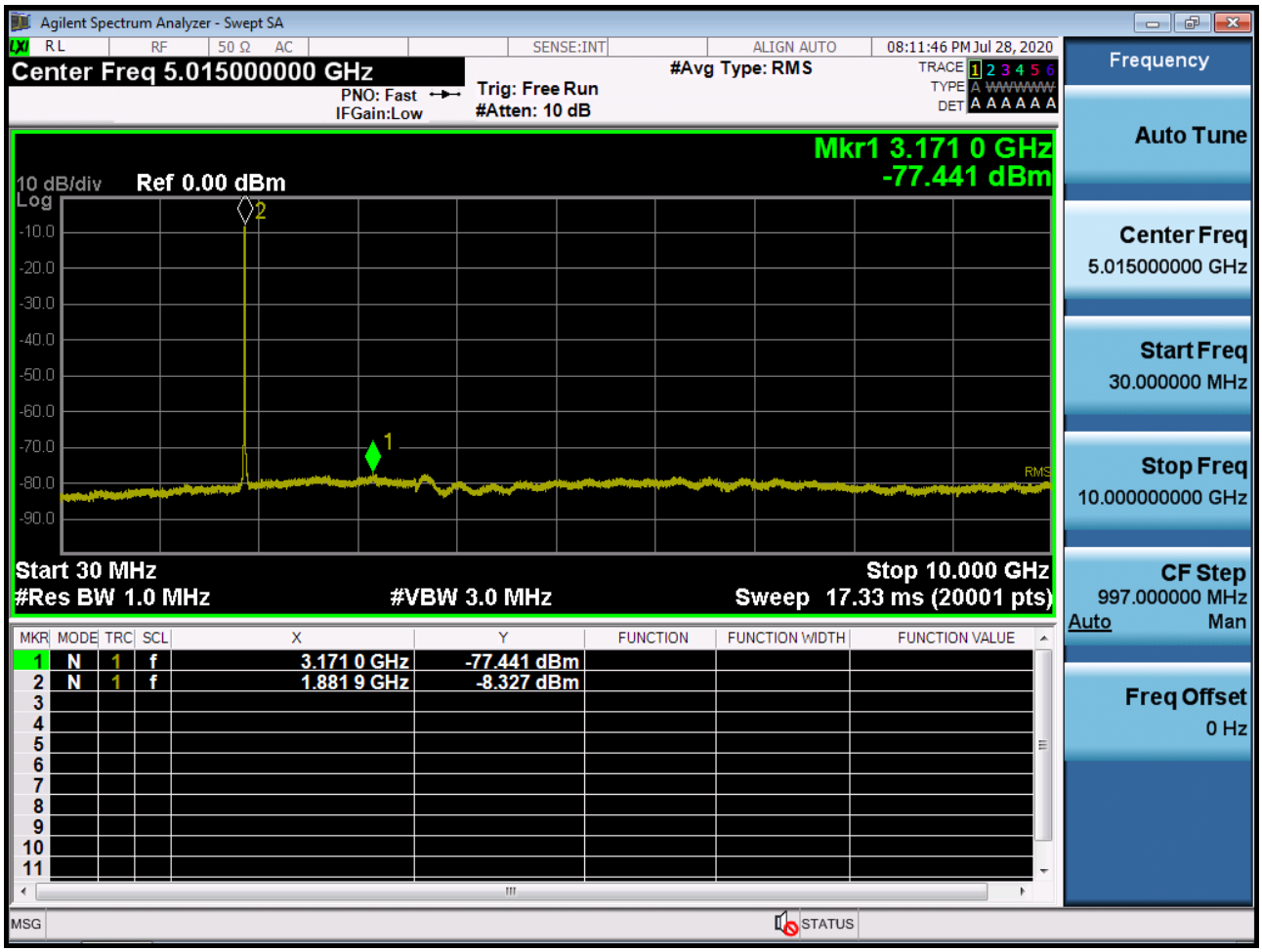
■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions1



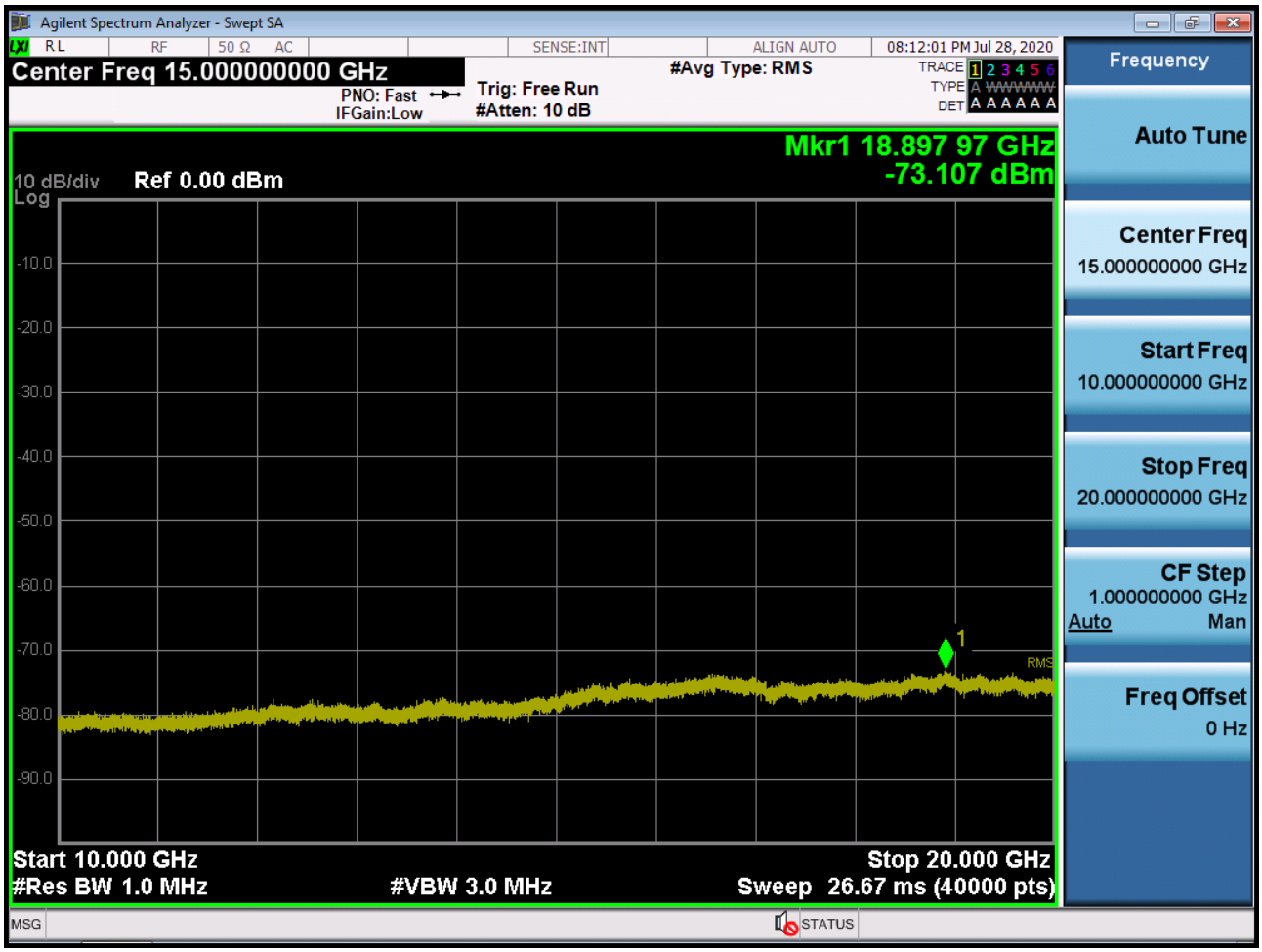
■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions2



■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions1



■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions2



■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions1