

TEST REPORT

FCC LTE B4 Test for SM-A566E/DS
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2412-FC063

DATE OF ISSUE
December 23, 2024

Tested by
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TEST REPORT

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Additional Model

SM-A566E

Applicant

SAMSUNG Electronics Co., Ltd.

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

Product Name

Mobile Phone

Model Name

SM-A566E/DS

Date of Test

November 25, 2024 ~ December 20, 2024

FCC ID

A3LSMA566E

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

Test Standard Used

FCC Rule Part: § 27

Test Results

PASS

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	December 23, 2024	Initial Release

Notice

Content

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)

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked *.

Information provided by the applicant is marked **.

Test results provided by external providers are marked ***.

When confirmation of authenticity of this test report is required, please contact www.hct.co.kr

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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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:	A3LSMA566E
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 27
EUT Type:	Mobile phone
Model(s):	SM-A566E/DS
Additional Model(s)	SM-A566E
Tx Frequency:	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
Date(s) of Tests:	November 25, 2024 ~ December 20, 2024
Serial number:	Radiated : R3CXB08Q36K Conducted : R3CXB08Q33H
Antenna Information	Please refer to the Antenna Approval Specification document.

1.1. MAXIMUM OUTPUT POWER

Main 2 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M11G7D	QPSK	0.097	19.86
		1M09W7D	16QAM	0.081	19.09
		1M10W7D	64QAM	0.063	17.97
		1M10W7D	256QAM	0.031	14.95
LTE – Band4 (3)	1711.5 – 1753.5	2M72G7D	QPSK	0.097	19.89
		2M72W7D	16QAM	0.081	19.09
		2M71W7D	64QAM	0.063	17.99
		2M71W7D	256QAM	0.031	14.95
LTE – Band4 (5)	1712.5 – 1752.5	4M53G7D	QPSK	0.099	19.95
		4M54W7D	16QAM	0.082	19.14
		4M53W7D	64QAM	0.064	18.03
		4M53W7D	256QAM	0.032	15.00
LTE – Band4 (10)	1715.0 – 1750.0	9M02G7D	QPSK	0.105	20.21
		9M01W7D	16QAM	0.086	19.33
		9M01W7D	64QAM	0.067	18.23
		9M00W7D	256QAM	0.034	15.26
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.109	20.36
		13M5W7D	16QAM	0.091	19.57
		13M5W7D	64QAM	0.070	18.46
		13M5W7D	256QAM	0.035	15.38
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.099	19.94
		18M0W7D	16QAM	0.081	19.11
		18M0W7D	64QAM	0.063	18.00
		18M0W7D	256QAM	0.031	14.95

Sub 2 ANT

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M10G7D	QPSK	0.098	19.93
		1M10W7D	16QAM	0.082	19.13
		1M10W7D	64QAM	0.063	18.01
		1M10W7D	256QAM	0.032	15.01
LTE – Band4 (3)	1711.5 – 1753.5	2M72G7D	QPSK	0.100	20.00
		2M72W7D	16QAM	0.084	19.23
		2M71W7D	64QAM	0.065	18.12
		2M71W7D	256QAM	0.032	15.08
LTE – Band4 (5)	1712.5 – 1752.5	4M56G7D	QPSK	0.101	20.03
		4M53W7D	16QAM	0.083	19.20
		4M52W7D	64QAM	0.064	18.09
		4M53W7D	256QAM	0.032	15.11
LTE – Band4 (10)	1715.0 – 1750.0	9M02G7D	QPSK	0.106	20.26
		9M04W7D	16QAM	0.087	19.38
		9M01W7D	64QAM	0.067	18.28
		9M00W7D	256QAM	0.034	15.33
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.106	20.24
		13M5W7D	16QAM	0.086	19.34
		13M5W7D	64QAM	0.067	18.24
		13M5W7D	256QAM	0.034	15.30
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.096	19.82
		18M0W7D	16QAM	0.079	18.98
		17M9W7D	64QAM	0.061	17.86
		17M9W7D	256QAM	0.031	14.89

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6
It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80 MHz), Bluetooth, BT LE, NFC

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, Republic 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	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Radiated Power	- ANSI C63.26-2015 – Section 5.2.4.4 - KDB 971168 D01 v03r01 – Section 5.8
Radiated Spurious and Harmonic Emissions	- ANSI C63.26-2015 – Section 5.5.3 - KDB 971168 D01 v03r01 – Section 5.8

3.2 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

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 1 MHz
3. VBW $\geq$ 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 1 GHz, 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;

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

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.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method.

Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW $\geq$ 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 10th 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 data
3. For spurious emissions above 1 GHz, 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;

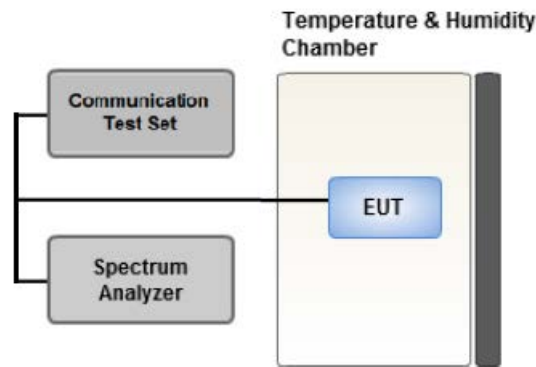
$$\text{Result}_{(\text{dBm})} = P_{g(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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

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

$$\text{EIRP}_{(\text{dBm})} = \text{ERP}_{(\text{dBm})} + 2.15$$

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth $\geq$ 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:

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

Test Settings(Peak Power)

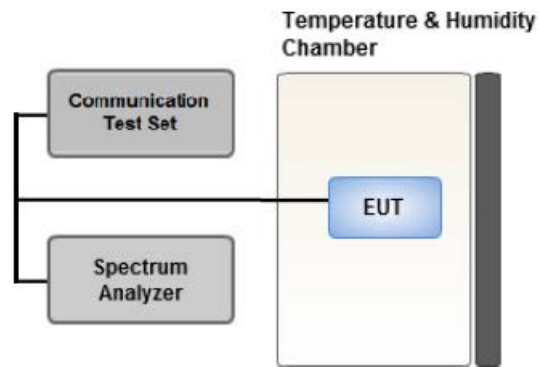
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

1. Set the RBW $\geq$ OBW.
2. Set VBW $\geq 3 \times$ RBW.
3. Set span $\geq 2 \times$ OBW.
4. Sweep time $\geq 10 \times$ (number of points in sweep) $\times$ (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 $2 \times$ to $3 \times$ the OBW.
2. Set RBW $\geq$ OBW.
3. Set VBW $\geq 3 \times$ RBW.
4. Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
5. Sweep time:
Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ 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 $[10 \log (1/\text{duty cycle})]$ to the measured maximum power level to compute the average power during continuous transmission. For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is a constant 25 %.

3.5 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.

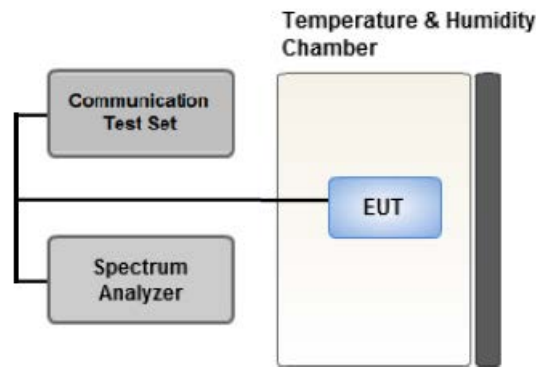
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

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 26 dB 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 $\geq$ 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

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

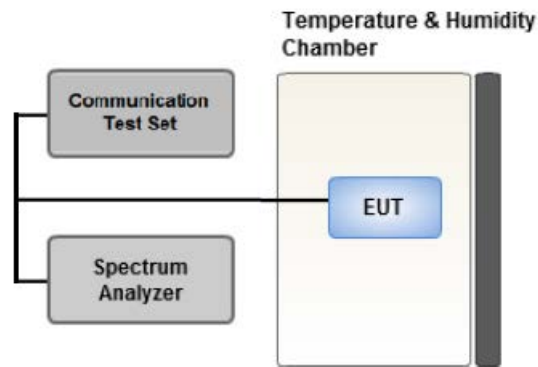
Test Overview

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

1. RBW = 1 MHz
2. VBW $\geq$ 3 MHz
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep $\geq$ 2 x Span / RBW

3.7 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 $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

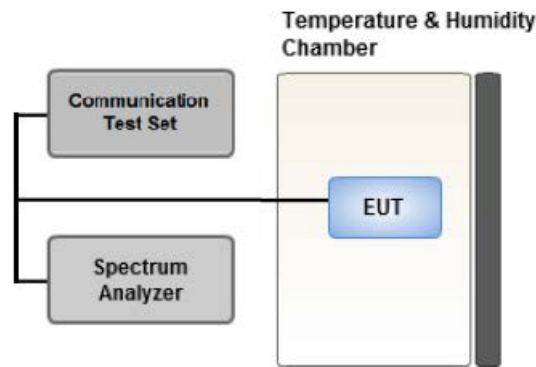
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block 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.

Where Margin < 1 dB the emission level is either corrected by $10 \log(1 \text{ MHz/ RB})$ or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

3.8 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.

3.9 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.
Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
Worst case : Stand alone
- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.
Therefore, only the worst case(stand-alone) results were reported.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 15 MHz(Main 2 ANT), 10 MHz(Sub 2 ANT))
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.
- SM-A566E/DS & additional models were tested and the worst case results are reported.
(Worst case : SM-A566E/DS)

[Main 2 ANT Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		Z
Radiated Spurious and Harmonic Emissions	QPSK	See Section 8.2		Z

[Sub 2 ANT Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 9.1		X
Radiated Spurious and Harmonic Emissions	QPSK	See Section 9.2		X

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
 - SM-A566E/DS & additional models were tested and the worst case results are reported.
- (Worst case : SM-A566E/DS)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0
Band Edge	QPSK	1.4	Low	1	0
			High	1	5
		3	Low	1	0
			High	1	14
		5	Low	1	0
			High	1	24
		10	Low	1	0
			High	1	49
		15	Low	1	0
			High	1	74
		20	Low	1	0
			High	1	99
		1.4, 3, 5, 10, 15, 20	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	QPSK	1.4, 3, 5, 10, 15, 20	Low, Mid, High	1	0

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.,	F1L1	08/21/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.,	F1L2	08/21/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.,	F1L4	08/21/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.,	F1L7	08/21/2025	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	Annual
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/06/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/13/2025	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	11/20/2025	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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 ($\pm$ kHz)
Occupied Bandwidth	95 (Confidence level about 95 %, $k=2$)
Frequency stability	28 (Confidence level about 95 %, $k=2$)

Parameter	Expanded Uncertainty ($\pm$ dB)
Block Edge	0.70 (Confidence level about 95 %, $k=2$)
Conducted Spurious Emissions	1.18 (Confidence level about 95 %, $k=2$)
Peak- to- Average Ratio	0.68 (Confidence level about 95 %, $k=2$)
Radiated Power	4.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

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, § 27.53(h)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	<u>See Note1</u>
Peak- to- Average Ratio	§ 27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§ 27.50(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 27.53(h)	< 43 + 10log10 (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

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

- 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.

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

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

- 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 equivalent isotropic radiated power.

7.3. 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)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

QAM 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(Main 2 ANT)

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1710.7	LTE B4 1.4 MHz	QPSK	-22.09	10.90	10.07	2.06	V	<1.00	0.078	18.91	1	5
		16-QAM	-22.95	10.04	10.07	2.06	V		0.064	18.05		
		64-QAM	-24.06	8.93	10.07	2.06	V		0.049	16.94		
		256-QAM	-26.98	6.01	10.07	2.06	V		0.025	14.02		
1732.5		QPSK	-21.68	11.55	10.34	2.08	V		0.096	19.81	1	5
		16-QAM	-22.40	10.83	10.34	2.08	V		0.081	19.09		
		64-QAM	-23.52	9.71	10.34	2.08	V		0.063	17.97		
		256-QAM	-26.63	6.60	10.34	2.08	V		0.031	14.86		
1754.3		QPSK	-21.99	11.47	10.47	2.08	V		0.097	19.86	1	5
		16-QAM	-22.79	10.67	10.47	2.08	V		0.081	19.06		
		64-QAM	-23.91	9.55	10.47	2.08	V		0.062	17.94		
		256-QAM	-26.90	6.56	10.47	2.08	V		0.031	14.95		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1711.5	LTE B4 3 MHz	QPSK	-22.04	10.95	10.07	2.06	V	< 1.00	0.079	18.96	1	14
		16-QAM	-22.87	10.12	10.07	2.06	V		0.065	18.13		
		64-QAM	-24.00	8.99	10.07	2.06	V		0.050	17.00		
		256-QAM	-26.97	6.02	10.07	2.06	V		0.025	14.03		
1732.5		QPSK	-21.67	11.56	10.34	2.08	V		0.096	19.82	1	8
		16-QAM	-22.44	10.79	10.34	2.08	V		0.080	19.05		
		64-QAM	-23.57	9.66	10.34	2.08	V		0.062	17.92		
		256-QAM	-26.68	6.55	10.34	2.08	V		0.030	14.81		
1753.5		QPSK	-21.96	11.50	10.47	2.08	V		0.098	19.89	1	14
		16-QAM	-22.76	10.70	10.47	2.08	V		0.081	19.09		
		64-QAM	-23.86	9.60	10.47	2.08	V		0.063	17.99		
		256-QAM	-26.90	6.56	10.47	2.08	V		0.031	14.95		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1712.5	LTE B4 5 MHz	QPSK	-22.05	11.03	10.12	2.06	V	< 1.00	0.081	19.09	1	0
		16-QAM	-22.91	10.17	10.12	2.06	V		0.067	18.23		
		64-QAM	-24.03	9.05	10.12	2.06	V		0.051	17.11		
		256-QAM	-26.96	6.12	10.12	2.06	V		0.026	14.18		
1732.5		QPSK	-21.72	11.51	10.34	2.08	V		0.095	19.77	1	13
		16-QAM	-22.48	10.75	10.34	2.08	V		0.080	19.01		
		64-QAM	-23.58	9.65	10.34	2.08	V		0.062	17.91		
		256-QAM	-26.68	6.55	10.34	2.08	V		0.030	14.81		
1752.5		QPSK	-21.90	11.56	10.47	2.08	V		0.099	19.95	1	0
		16-QAM	-22.71	10.75	10.47	2.08	V		0.082	19.14		
		64-QAM	-23.82	9.64	10.47	2.08	V		0.064	18.03		
		256-QAM	-26.85	6.61	10.47	2.08	V		0.032	15.00		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1715.0	LTE B4 10 MHz	QPSK	-21.92	11.16	10.12	2.06	V	< 1.00	0.084	19.22	1	49
		16-QAM	-22.81	10.27	10.12	2.06	V		0.068	18.33		
		64-QAM	-23.91	9.17	10.12	2.06	V		0.053	17.23		
		256-QAM	-26.83	6.25	10.12	2.06	V		0.027	14.31		
1732.5		QPSK	-21.72	11.51	10.34	2.08	V		0.095	19.77	1	25
		16-QAM	-22.52	10.71	10.34	2.08	V		0.079	18.97		
		64-QAM	-23.63	9.60	10.34	2.08	V		0.061	17.86		
		256-QAM	-26.70	6.53	10.34	2.08	V		0.030	14.79		
1750.0		QPSK	-21.89	11.82	10.46	2.07	V		0.105	20.21	1	0
		16-QAM	-22.77	10.94	10.46	2.07	V		0.086	19.33		
		64-QAM	-23.87	9.84	10.46	2.07	V		0.067	18.23		
		256-QAM	-26.84	6.87	10.46	2.07	V		0.034	15.26		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1717.5	LTE B4 15 MHz	QPSK	-21.82	11.34	10.18	2.06	V	< 1.00	0.088	19.46	1	74
		16-QAM	-22.69	10.47	10.18	2.06	V		0.072	18.59		
		64-QAM	-23.79	9.37	10.18	2.06	V		0.056	17.49		
		256-QAM	-26.77	6.39	10.18	2.06	V		0.028	14.51		
1732.5		QPSK	-21.69	11.54	10.34	2.08	V		0.096	19.80	1	38
		16-QAM	-22.50	10.73	10.34	2.08	V		0.079	18.99		
		64-QAM	-23.62	9.61	10.34	2.08	V		0.061	17.87		
		256-QAM	-26.70	6.53	10.34	2.08	V		0.030	14.79		
1747.5		QPSK	-21.74	11.97	10.46	2.07	V		0.109	20.36	1	0
		16-QAM	-22.53	11.18	10.46	2.07	V		0.091	19.57		
		64-QAM	-23.64	10.07	10.46	2.07	V		0.070	18.46		
		256-QAM	-26.72	6.99	10.46	2.07	V		0.035	15.38		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1720.0	LTE B4 20 MHz	QPSK	-21.80	11.36	10.18	2.06	V	< 1.00	0.089	19.48	1	99
		16-QAM	-22.60	10.56	10.18	2.06	V		0.074	18.68		
		64-QAM	-23.72	9.44	10.18	2.06	V		0.057	17.56		
		256-QAM	-26.78	6.38	10.18	2.06	V		0.028	14.50		
1732.5		QPSK	-21.78	11.45	10.34	2.08	V		0.094	19.71	1	50
		16-QAM	-22.61	10.62	10.34	2.08	V		0.077	18.88		
		64-QAM	-23.71	9.52	10.34	2.08	V		0.060	17.78		
		256-QAM	-26.78	6.45	10.34	2.08	V		0.030	14.71		
1745.0		QPSK	-21.79	11.58	10.43	2.07	V		0.099	19.94	1	0
		16-QAM	-22.62	10.75	10.43	2.07	V		0.082	19.11		
		64-QAM	-23.73	9.64	10.43	2.07	V		0.063	18.00		
		256-QAM	-26.78	6.59	10.43	2.07	V		0.031	14.95		

8.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE B4
 MODULATION SIGNAL: 15 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
20025 (1717.5)	3 435.00	-61.93	11.83	-62.74	3.03	V	-53.94	1	74
	5 152.50	-62.59	11.50	-56.57	3.76	V	-48.83		
	6 870.00	-63.77	11.09	-52.14	4.43	V	-45.48		
20175 (1732.5)	3 465.00	-61.44	12.02	-62.75	3.02	V	-53.75	1	38
	5 197.50	-62.41	11.66	-56.53	3.78	V	-48.65		
	6 930.00	-63.76	11.16	-51.78	4.40	V	-45.02		
20325 (1747.5)	3 495.00	-60.02	12.04	-60.80	3.04	V	-51.80	1	0
	5 242.50	-60.89	11.79	-55.28	3.80	V	-47.29		
	6 990.00	-63.81	11.16	-50.68	4.48	V	-44.00		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.69
			16-QAM			6.19
			64-QAM			6.44
			256-QAM			6.48
	3 MHz		QPSK	15		5.70
			16-QAM			6.26
			64-QAM			6.41
			256-QAM			6.47
	5 MHz		QPSK	25		5.64
			16-QAM			6.30
			64-QAM			6.43
			256-QAM			6.43
	10 MHz		QPSK	50		5.73
			16-QAM			6.25
			64-QAM			6.46
			256-QAM			6.43
	15 MHz		QPSK	75		5.62
			16-QAM			6.21
			64-QAM			6.35
			256-QAM			6.44
	20 MHz		QPSK	100		5.66
			16-QAM			6.30
			64-QAM			6.45
			256-QAM			6.49

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 80 ~ 103.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.1045
			16-QAM			1.0938
			64-QAM			1.0977
			256-QAM			1.0979
	3 MHz		QPSK	15		2.7160
			16-QAM			2.7239
			64-QAM			2.7097
			256-QAM			2.7078
	5 MHz		QPSK	25		4.5330
			16-QAM			4.5352
			64-QAM			4.5274
			256-QAM			4.5250
	10 MHz		QPSK	50		9.0217
			16-QAM			9.0099
			64-QAM			9.0108
			256-QAM			9.0038
	15 MHz		QPSK	75		13.495
			16-QAM			13.503
			64-QAM			13.491
			256-QAM			13.479
	20 MHz		QPSK	100		17.983
			16-QAM			17.959
			64-QAM			17.952
			256-QAM			17.996

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 104 ~ 127.

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
4	1.4	1710.7	3.7089	27.976	-66.212	-38.236	-13.00
		1732.5	3.4697	27.976	-67.982	-40.006	
		1754.3	3.5095	27.976	-65.481	-37.505	
	3	1711.5	3.1606	27.976	-66.970	-38.994	
		1732.5	3.4597	27.976	-67.131	-39.155	
		1753.5	3.6990	27.976	-67.541	-39.565	
	5	1712.5	3.4198	27.976	-66.718	-38.742	
		1732.5	3.4597	27.976	-64.024	-36.048	
		1752.5	3.5095	27.976	-64.176	-36.200	
	10	1715.0	3.4198	27.976	-66.943	-38.967	
		1732.5	3.4597	27.976	-66.943	-38.967	
		1750.0	3.5095	27.976	-65.823	-37.847	
	15	1717.5	3.4198	27.976	-64.783	-36.807	
		1732.5	2.3730	27.976	-68.024	-40.048	
		1747.5	3.5095	27.976	-65.530	-37.554	
	20	1720.0	3.4198	27.976	-67.185	-39.209	
		1732.5	1.6850	27.976	-65.492	-37.516	
		1745.0	3.5095	27.976	-64.473	-36.497	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 128 ~ 163.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. 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(26.5)	30.131

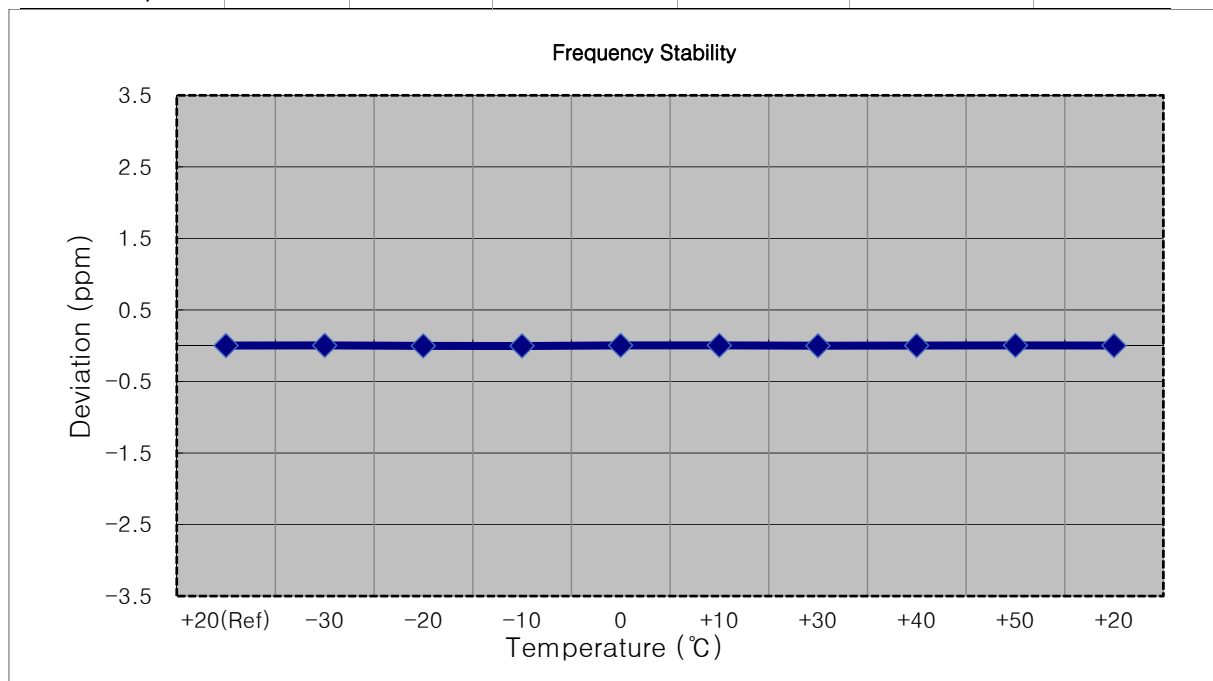
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 164 ~ 199.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

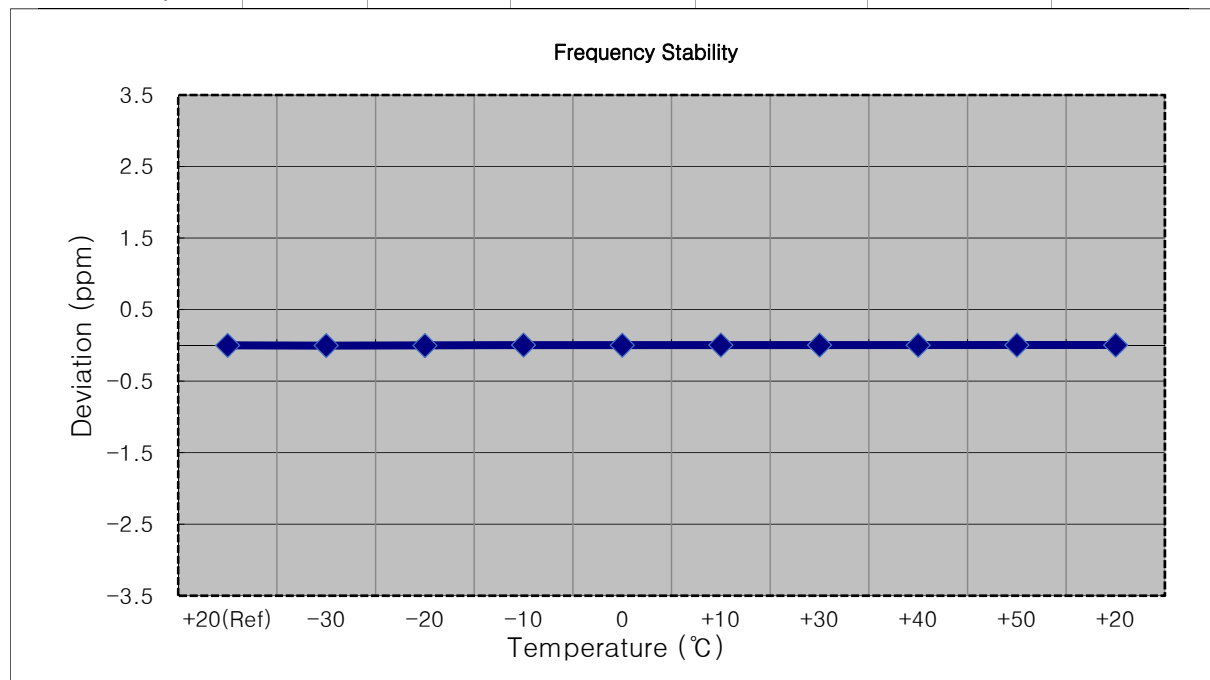
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1710,700,000 Hz</u>
CHANNEL:	<u>19957 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1710 700 006	0.0	0.000 000	0.000
100 %		-30	1710 700 012	6.1	0.000 000	0.004
100 %		-20	1710 700 001	-4.7	0.000 000	-0.003
100 %		-10	1710 700 000	-6.2	0.000 000	-0.004
100 %		0	1710 700 012	6.4	0.000 000	0.004
100 %		+10	1710 700 012	5.8	0.000 000	0.003
100 %		+30	1710 700 002	-3.5	0.000 000	-0.002
100 %		+40	1710 700 009	3.2	0.000 000	0.002
100 %		+50	1710 700 010	4.5	0.000 000	0.003
Batt. Endpoint	3.300	+20	1710 700 009	3.6	0.000 000	0.002



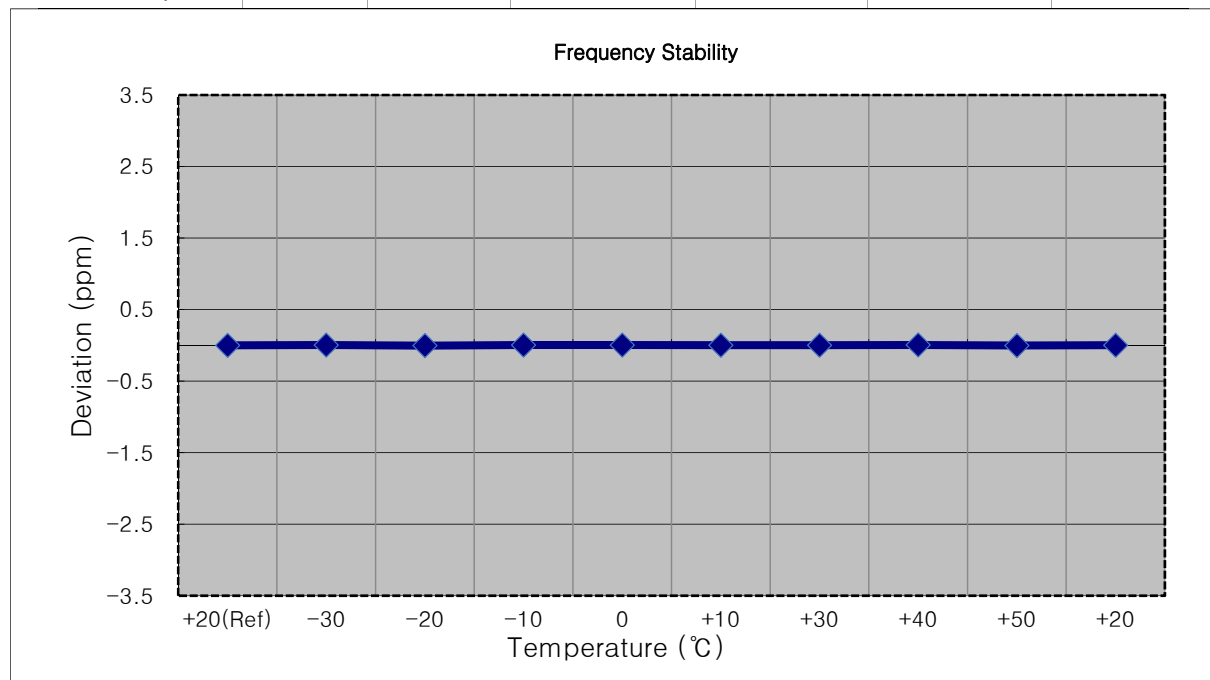
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1711,500,000 Hz</u>
CHANNEL:	<u>19965 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1711 499 997	0.0	0.000 000	0.000
100 %		-30	1711 499 992	-5.2	0.000 000	-0.003
100 %		-20	1711 499 992	-4.6	0.000 000	-0.003
100 %		-10	1711 500 003	5.7	0.000 000	0.003
100 %		0	1711 500 001	4.5	0.000 000	0.003
100 %		+10	1711 500 003	6.4	0.000 000	0.004
100 %		+30	1711 500 003	5.7	0.000 000	0.003
100 %		+40	1711 500 001	3.6	0.000 000	0.002
100 %		+50	1711 500 003	6.2	0.000 000	0.004
Batt. Endpoint	3.300	+20	1711 500 004	6.9	0.000 000	0.004



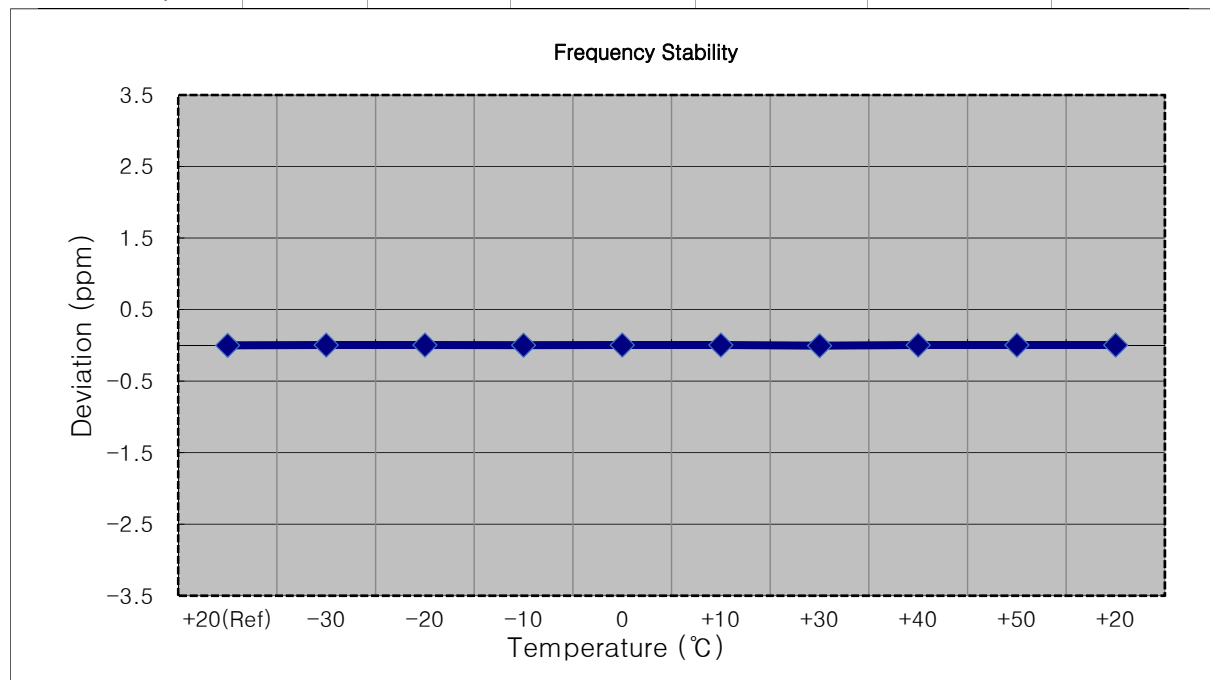
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1712,500,000 Hz</u>
CHANNEL:	<u>19975 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1712 499 993	0.0	0.000 000	0.000
100 %		-30	1712 500 000	7.3	0.000 000	0.004
100 %		-20	1712 499 987	-6.0	0.000 000	-0.004
100 %		-10	1712 499 999	5.8	0.000 000	0.003
100 %		0	1712 499 998	5.6	0.000 000	0.003
100 %		+10	1712 499 997	4.1	0.000 000	0.002
100 %		+30	1712 499 998	4.9	0.000 000	0.003
100 %		+40	1712 500 002	9.6	0.000 001	0.006
100 %		+50	1712 499 988	-5.3	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1712 499 997	4.5	0.000 000	0.003



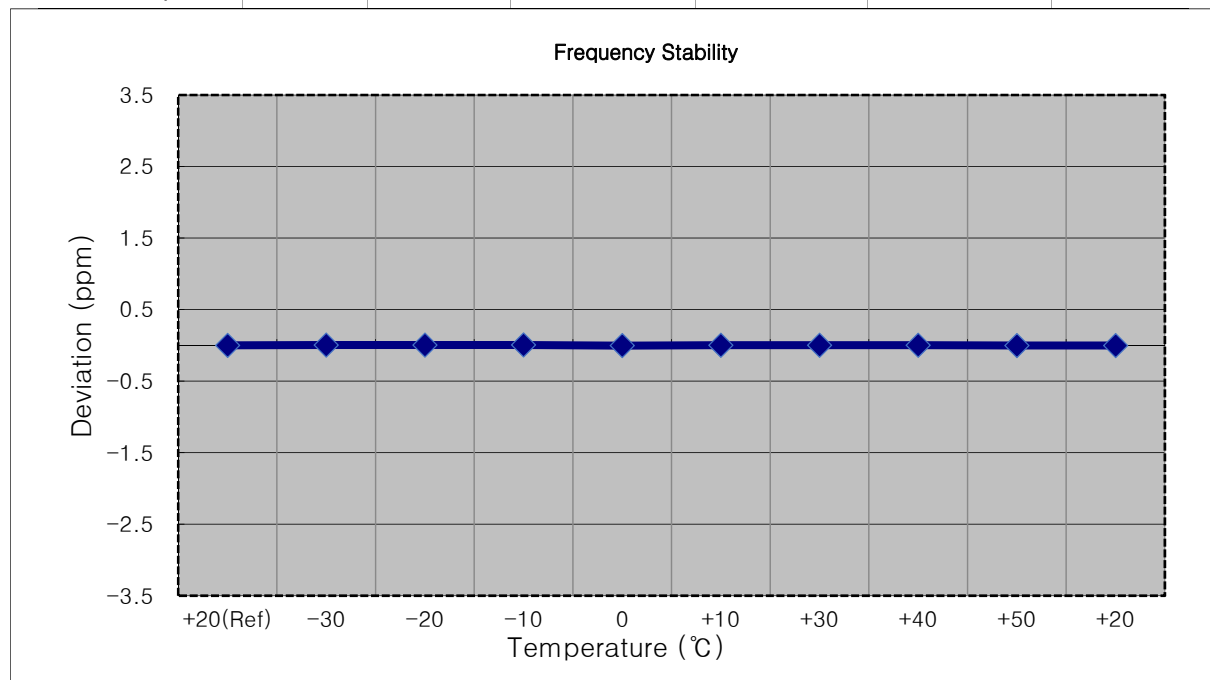
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1715,000,000 Hz</u>
CHANNEL:	<u>20000 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1715 000 007	0.0	0.000 000	0.000
100 %		-30	1715 000 013	6.3	0.000 000	0.004
100 %		-20	1715 000 012	5.6	0.000 000	0.003
100 %		-10	1715 000 011	4.9	0.000 000	0.003
100 %		0	1715 000 012	5.3	0.000 000	0.003
100 %		+10	1715 000 013	6.1	0.000 000	0.004
100 %		+30	1715 000 000	-6.5	0.000 000	-0.004
100 %		+40	1715 000 014	7.1	0.000 000	0.004
100 %		+50	1715 000 013	6.2	0.000 000	0.004
Batt. Endpoint	3.300	+20	1715 000 013	6.3	0.000 000	0.004



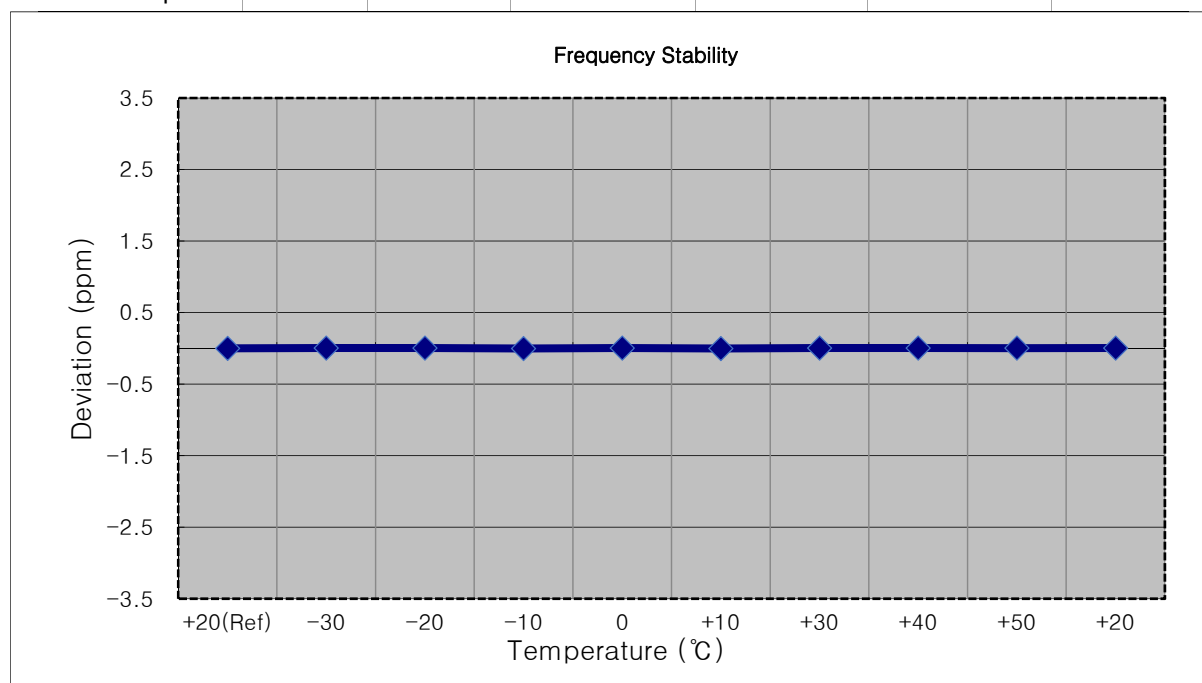
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1717,500,000 Hz</u>
CHANNEL:	<u>20225 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1717 499 994	0.0	0.000 000	0.000
100 %		-30	1717 500 002	7.9	0.000 000	0.005
100 %		-20	1717 500 000	5.5	0.000 000	0.003
100 %		-10	1717 500 004	9.7	0.000 001	0.006
100 %		0	1717 499 989	-4.9	0.000 000	-0.003
100 %		+10	1717 499 998	3.5	0.000 000	0.002
100 %		+30	1717 499 999	4.8	0.000 000	0.003
100 %		+40	1717 499 999	4.8	0.000 000	0.003
100 %		+50	1717 499 990	-4.7	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1717 499 990	-4.3	0.000 000	-0.003



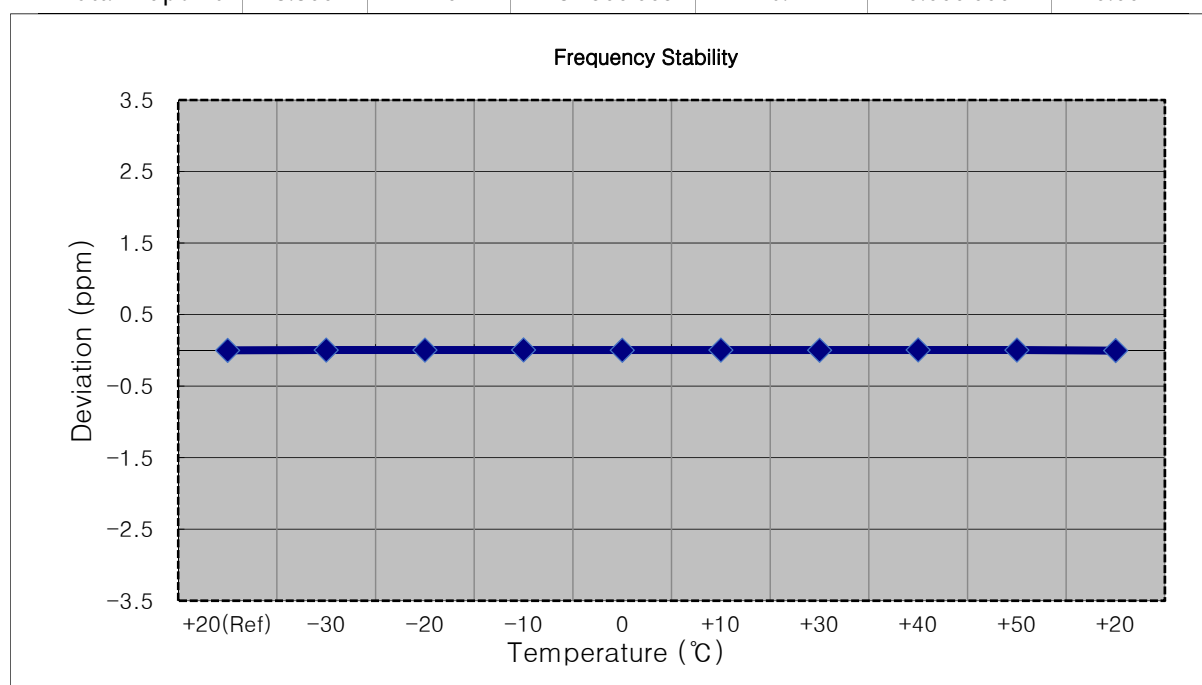
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1720,000,000 Hz
- ▣ CHANNEL: 20050 (20 MHz)
- ▣ REFERENCE VOLTAGE: 4.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	4.200	+20(Ref)	1720 000 005	0.0	0.000 000	0.000
100 %		-30	1720 000 011	5.6	0.000 000	0.003
100 %		-20	1720 000 010	5.3	0.000 000	0.003
100 %		-10	1720 000 001	-4.5	0.000 000	-0.003
100 %		0	1720 000 011	5.7	0.000 000	0.003
100 %		+10	1720 000 002	-3.5	0.000 000	-0.002
100 %		+30	1720 000 011	5.7	0.000 000	0.003
100 %		+40	1720 000 010	5.1	0.000 000	0.003
100 %		+50	1720 000 011	6.3	0.000 000	0.004
Batt. Endpoint	3.300	+20	1720 000 011	5.8	0.000 000	0.003



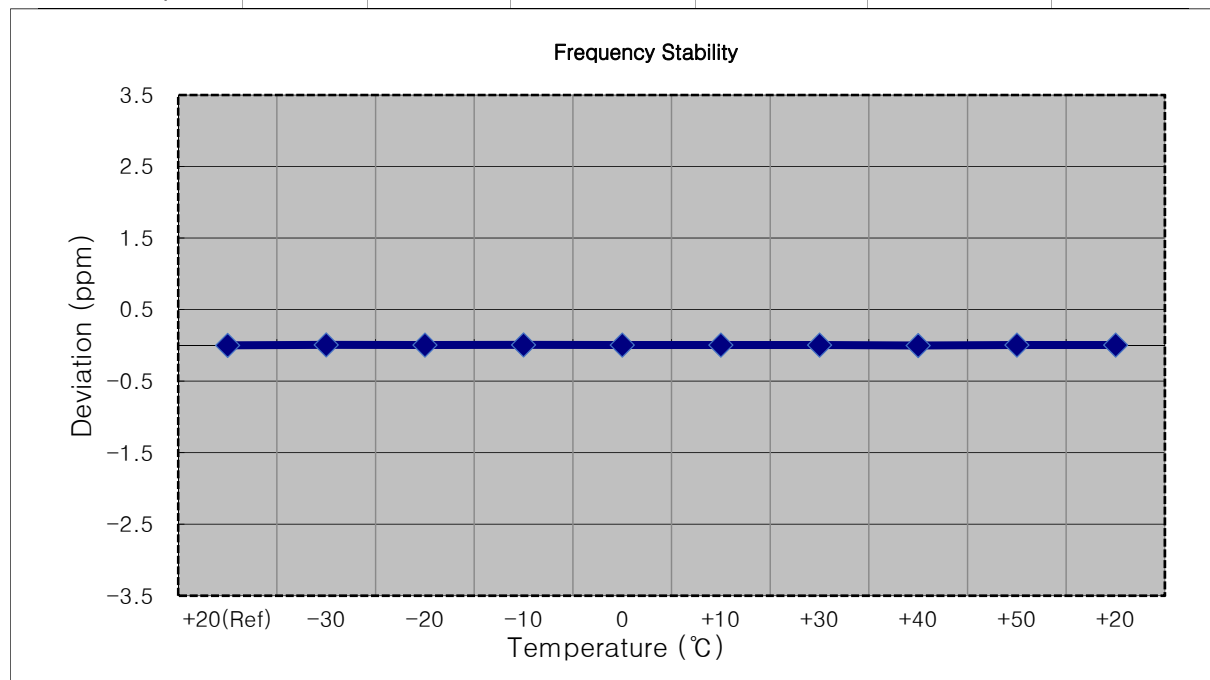
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	4.200	+20(Ref)	1732 500 011	0.0	0.000 000	0.000
100 %		-30	1732 500 017	6.1	0.000 000	0.004
100 %		-20	1732 500 017	6.4	0.000 000	0.004
100 %		-10	1732 500 023	11.9	0.000 001	0.007
100 %		0	1732 500 016	5.0	0.000 000	0.003
100 %		+10	1732 500 019	8.4	0.000 000	0.005
100 %		+30	1732 500 015	4.0	0.000 000	0.002
100 %		+40	1732 500 023	12.1	0.000 001	0.007
100 %		+50	1732 500 017	5.8	0.000 000	0.003
Batt. Endpoint	3.300	+20	1732 500 005	-6.4	0.000 000	-0.004



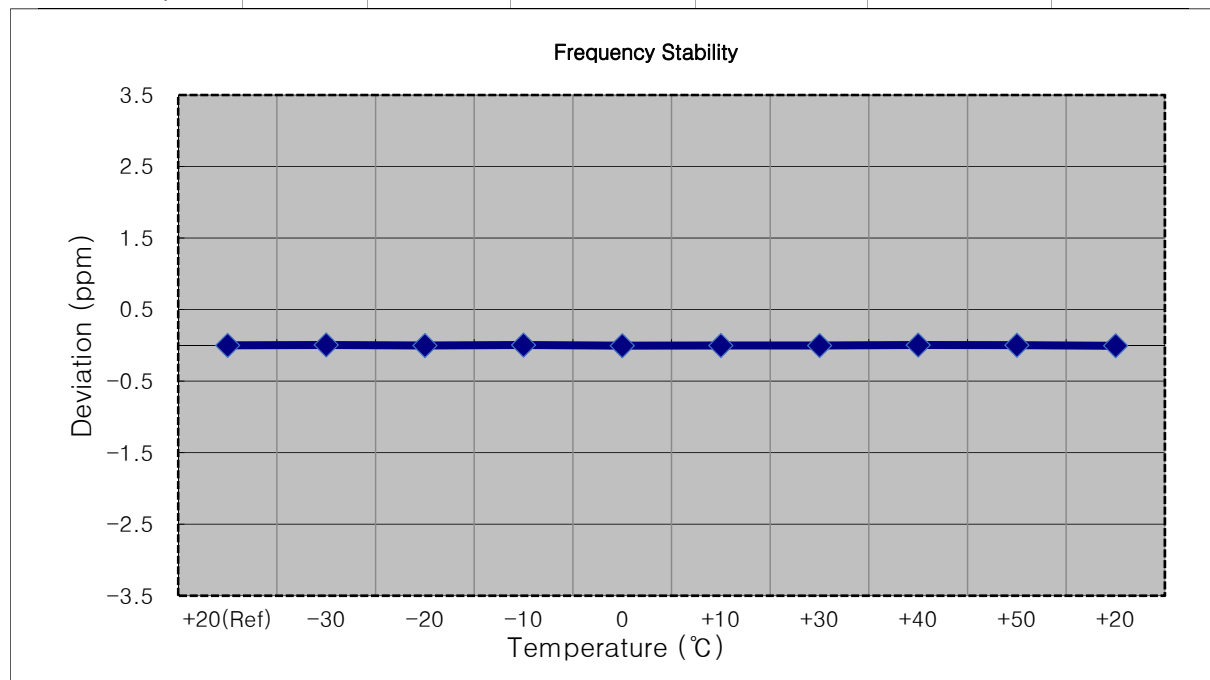
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 006	0.0	0.000 000	0.000
100 %		-30	1732 500 017	10.9	0.000 001	0.006
100 %		-20	1732 500 012	5.9	0.000 000	0.003
100 %		-10	1732 500 016	9.3	0.000 001	0.005
100 %		0	1732 500 014	7.8	0.000 000	0.005
100 %		+10	1732 500 012	5.7	0.000 000	0.003
100 %		+30	1732 500 014	7.5	0.000 000	0.004
100 %		+40	1732 500 002	-4.1	0.000 000	-0.002
100 %		+50	1732 500 012	6.0	0.000 000	0.003
Batt. Endpoint	3.300	+20	1732 500 014	7.2	0.000 000	0.004



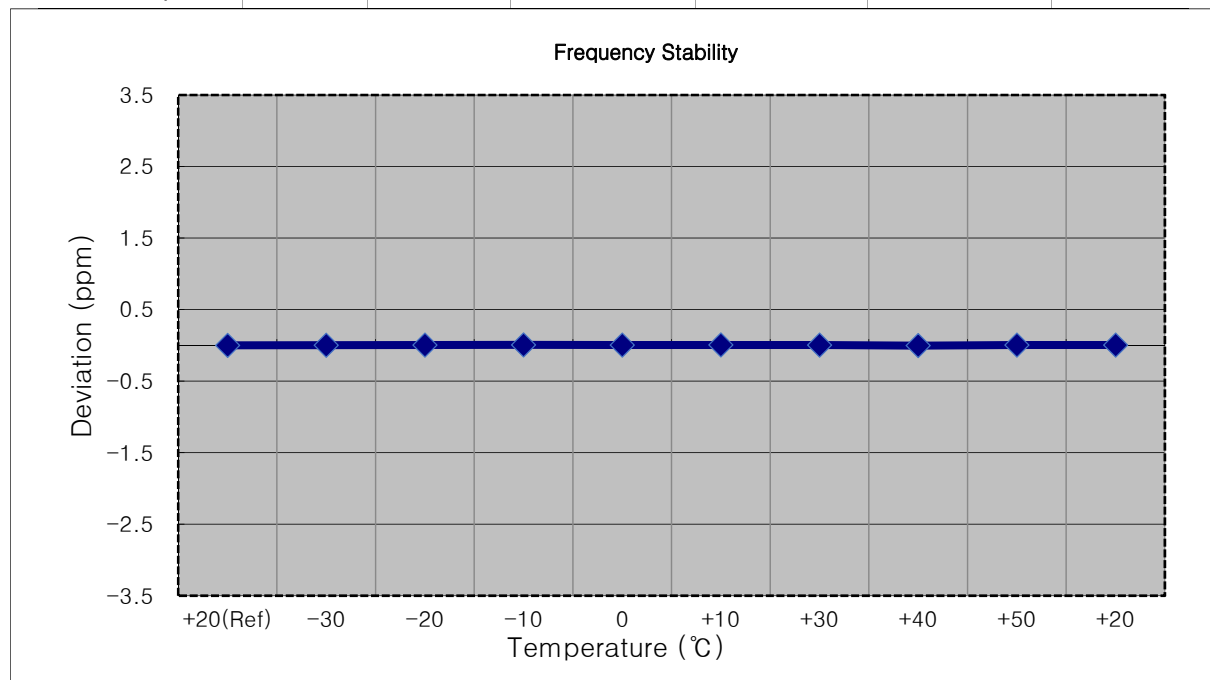
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 006	0.0	0.000 000	0.000
100 %		-30	1732 500 015	9.7	0.000 001	0.006
100 %		-20	1732 500 001	-4.7	0.000 000	-0.003
100 %		-10	1732 500 013	7.4	0.000 000	0.004
100 %		0	1732 499 999	-6.7	0.000 000	-0.004
100 %		+10	1732 500 000	-5.6	0.000 000	-0.003
100 %		+30	1732 500 000	-5.9	0.000 000	-0.003
100 %		+40	1732 500 013	7.5	0.000 000	0.004
100 %		+50	1732 500 010	4.6	0.000 000	0.003
Batt. Endpoint	3.300	+20	1732 499 996	-10.0	-0.000 001	-0.006



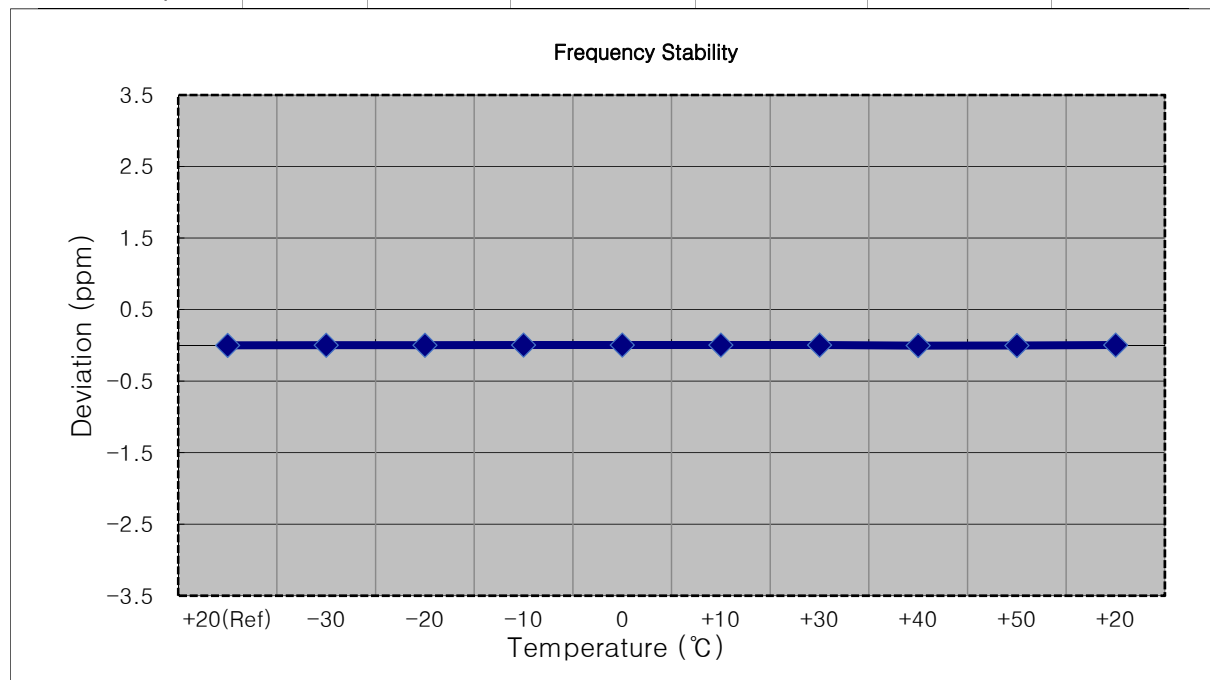
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 005	0.0	0.000 000	0.000
100 %		-30	1732 500 009	3.7	0.000 000	0.002
100 %		-20	1732 500 011	5.6	0.000 000	0.003
100 %		-10	1732 500 015	9.2	0.000 001	0.005
100 %		0	1732 500 011	5.5	0.000 000	0.003
100 %		+10	1732 500 015	9.3	0.000 001	0.005
100 %		+30	1732 500 012	6.5	0.000 000	0.004
100 %		+40	1732 500 001	-4.7	0.000 000	-0.003
100 %		+50	1732 500 012	6.5	0.000 000	0.004
Batt. Endpoint	3.300	+20	1732 500 013	7.6	0.000 000	0.004



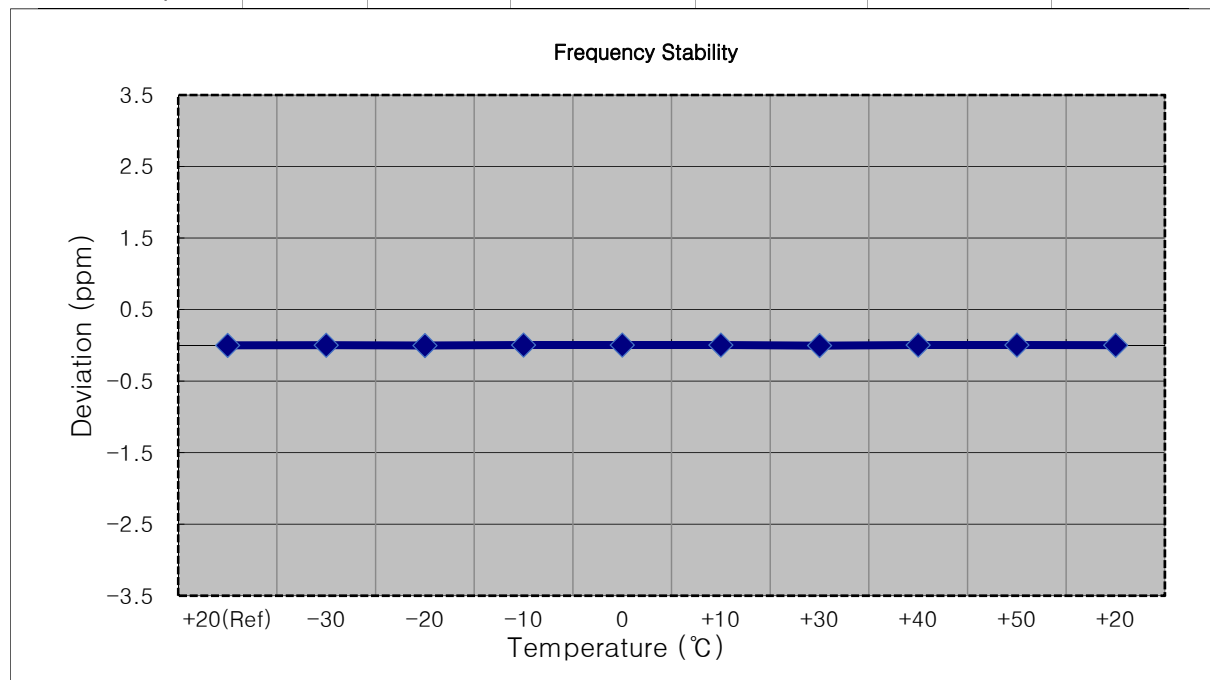
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (15 MHz)
- ▣ REFERENCE VOLTAGE: 4.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	4.200	+20(Ref)	1732 499 994	0.0	0.000 000	0.000
100 %		-30	1732 499 999	5.0	0.000 000	0.003
100 %		-20	1732 499 999	4.9	0.000 000	0.003
100 %		-10	1732 500 001	7.1	0.000 000	0.004
100 %		0	1732 500 001	7.1	0.000 000	0.004
100 %		+10	1732 499 999	5.2	0.000 000	0.003
100 %		+30	1732 500 001	6.7	0.000 000	0.004
100 %		+40	1732 499 988	-6.0	0.000 000	-0.003
100 %		+50	1732 499 989	-5.7	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1732 500 003	8.5	0.000 000	0.005



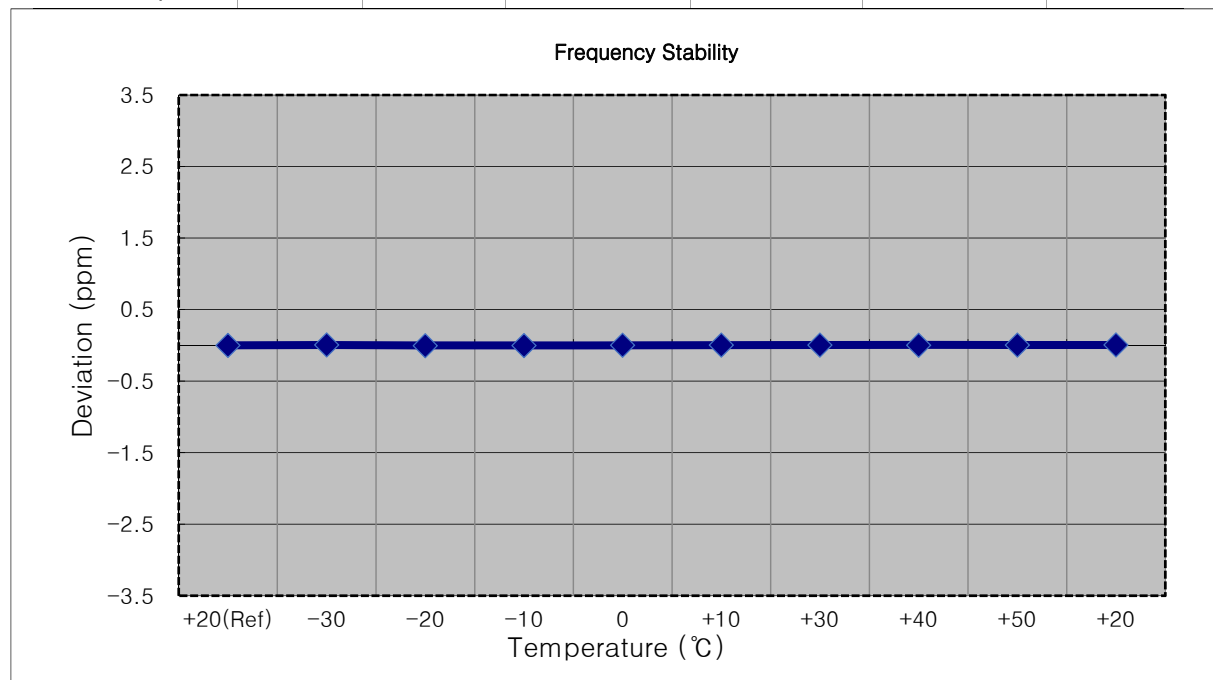
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 007	0.0	0.000 000	0.000
100 %		-30	1732 500 012	4.7	0.000 000	0.003
100 %		-20	1732 500 004	-3.3	0.000 000	-0.002
100 %		-10	1732 500 015	7.7	0.000 000	0.004
100 %		0	1732 500 014	6.5	0.000 000	0.004
100 %		+10	1732 500 013	5.4	0.000 000	0.003
100 %		+30	1732 500 003	-4.9	0.000 000	-0.003
100 %		+40	1732 500 015	7.5	0.000 000	0.004
100 %		+50	1732 500 015	7.2	0.000 000	0.004
Batt. Endpoint	3.300	+20	1732 500 012	4.5	0.000 000	0.003



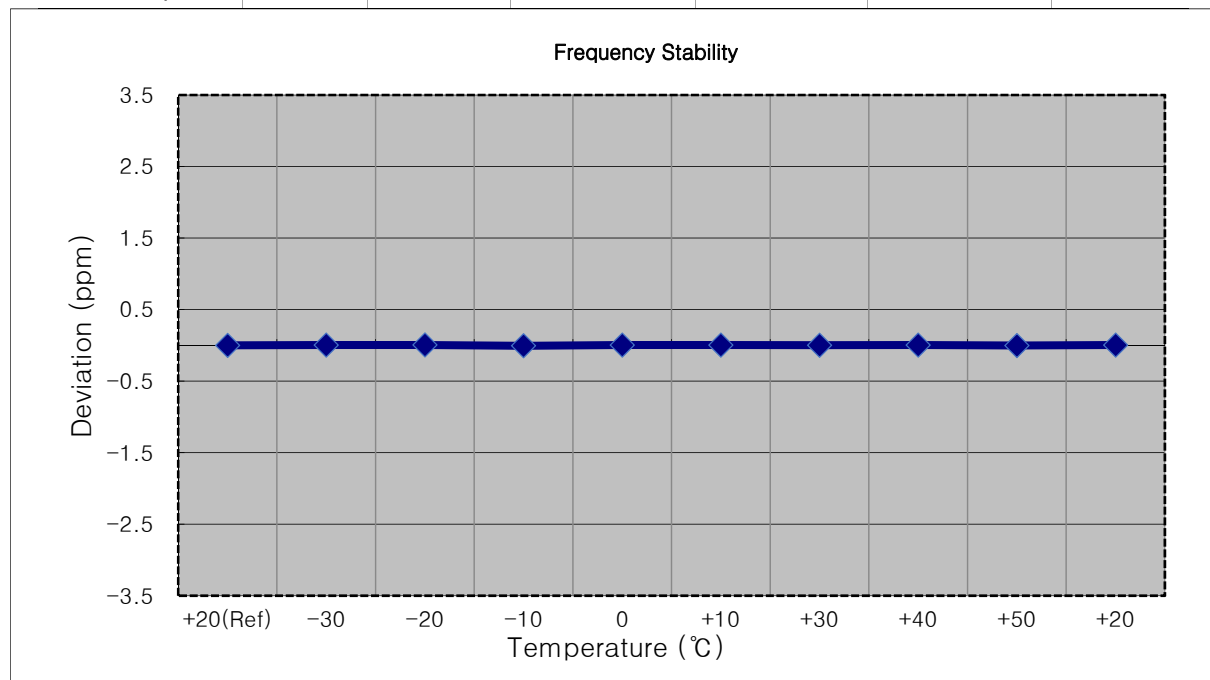
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1754,300,000 Hz</u>
CHANNEL:	<u>20393 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1754 300 007	0.0	0.000 000	0.000
100 %		-30	1754 300 017	9.8	0.000 001	0.006
100 %		-20	1754 300 000	-7.7	0.000 000	-0.004
100 %		-10	1754 300 003	-4.4	0.000 000	-0.003
100 %		0	1754 300 011	3.9	0.000 000	0.002
100 %		+10	1754 300 013	5.5	0.000 000	0.003
100 %		+30	1754 300 013	5.9	0.000 000	0.003
100 %		+40	1754 300 011	3.8	0.000 000	0.002
100 %		+50	1754 300 015	7.5	0.000 000	0.004
Batt. Endpoint	3.300	+20	1754 300 017	9.8	0.000 001	0.006



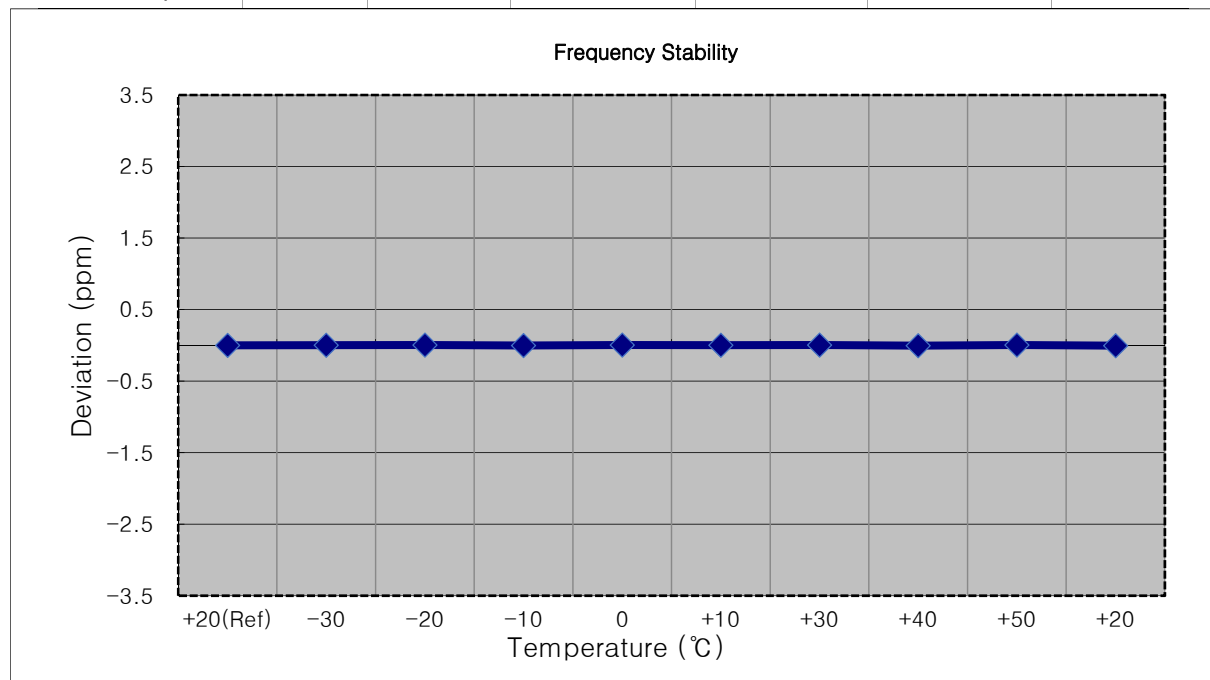
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1753,500,000 Hz</u>
CHANNEL:	<u>20385 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1753 500 009	0.0	0.000 000	0.000
100 %		-30	1753 500 016	7.2	0.000 000	0.004
100 %		-20	1753 500 018	9.4	0.000 001	0.005
100 %		-10	1753 499 999	-9.9	-0.000 001	-0.006
100 %		0	1753 500 017	7.7	0.000 000	0.004
100 %		+10	1753 500 017	7.5	0.000 000	0.004
100 %		+30	1753 500 012	3.2	0.000 000	0.002
100 %		+40	1753 500 016	6.9	0.000 000	0.004
100 %		+50	1753 500 004	-5.3	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1753 500 016	6.6	0.000 000	0.004



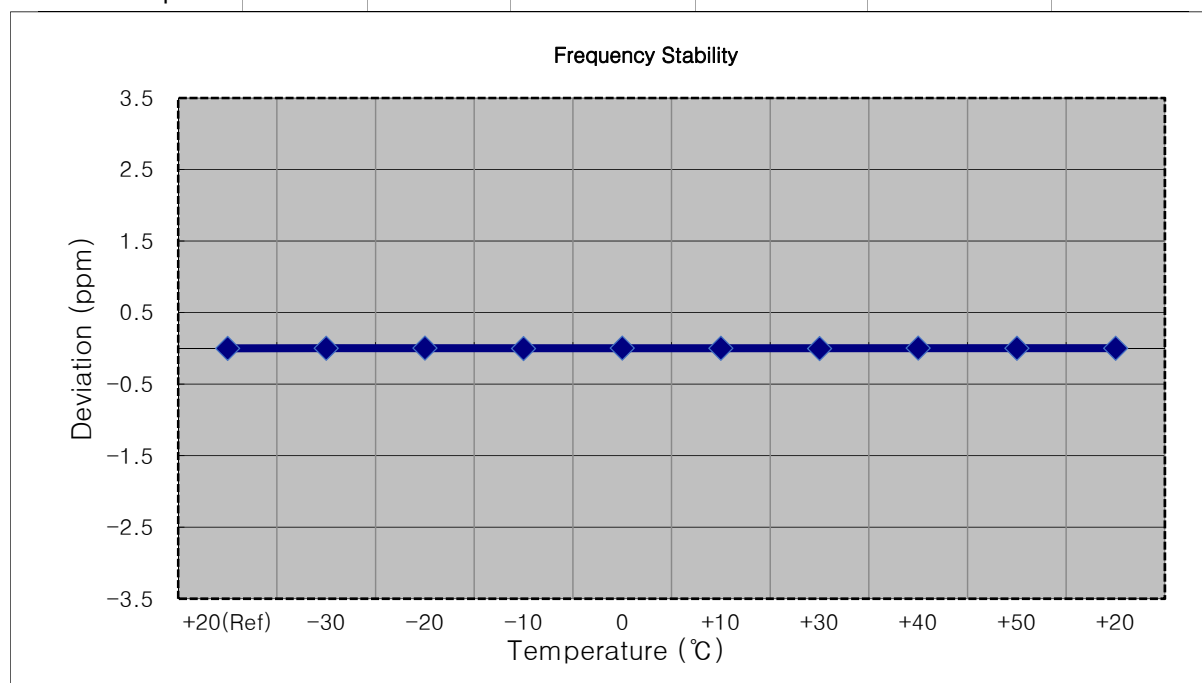
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1752,500,000 Hz</u>
CHANNEL:	<u>20375 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1752 500 008	0.0	0.000 000	0.000
100 %		-30	1752 500 012	4.3	0.000 000	0.002
100 %		-20	1752 500 016	8.3	0.000 000	0.005
100 %		-10	1752 500 003	-5.3	0.000 000	-0.003
100 %		0	1752 500 014	5.7	0.000 000	0.003
100 %		+10	1752 500 012	4.4	0.000 000	0.003
100 %		+30	1752 500 016	8.2	0.000 000	0.005
100 %		+40	1752 500 000	-7.9	0.000 000	-0.005
100 %		+50	1752 500 014	6.2	0.000 000	0.004
Batt. Endpoint	3.300	+20	1752 500 001	-6.7	0.000 000	-0.004



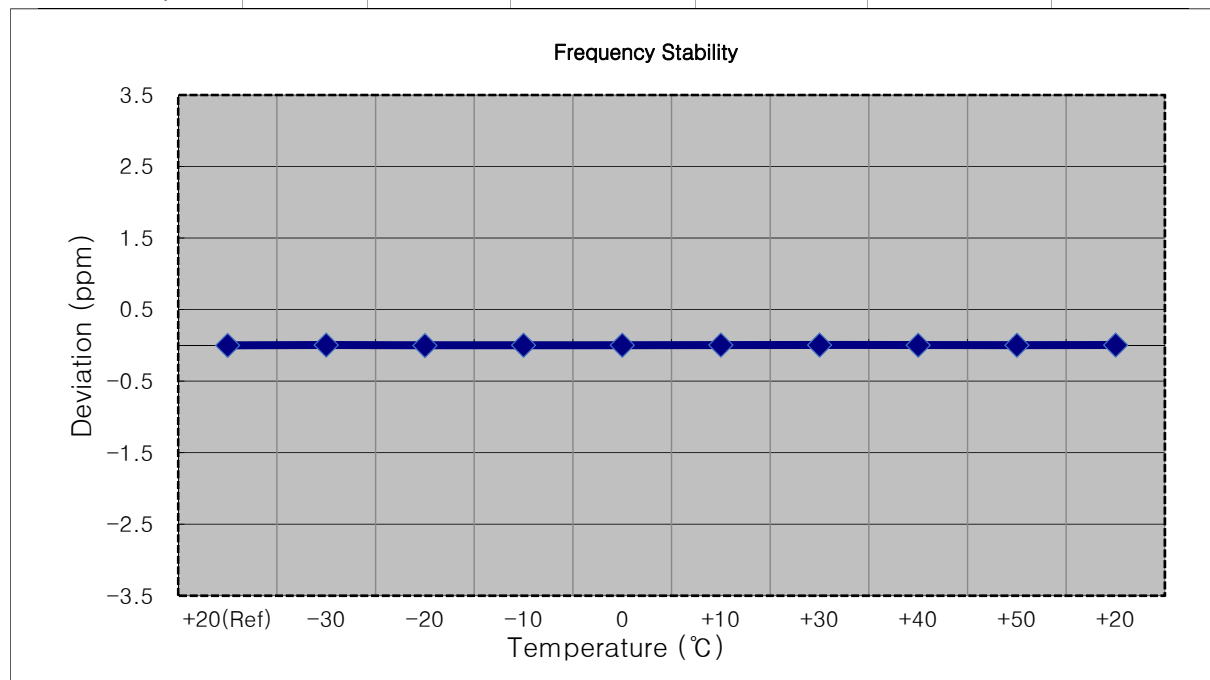
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1750,000,000 Hz</u>
CHANNEL:	<u>20350 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1750 000 005	0.0	0.000 000	0.000
100 %		-30	1750 000 010	4.7	0.000 000	0.003
100 %		-20	1750 000 012	7.4	0.000 000	0.004
100 %		-10	1750 000 002	-3.1	0.000 000	-0.002
100 %		0	1750 000 013	7.7	0.000 000	0.004
100 %		+10	1750 000 009	3.8	0.000 000	0.002
100 %		+30	1750 000 002	-3.3	0.000 000	-0.002
100 %		+40	1750 000 010	5.6	0.000 000	0.003
100 %		+50	1750 000 010	5.1	0.000 000	0.003
Batt. Endpoint	3.300	+20	1750 000 009	4.4	0.000 000	0.003



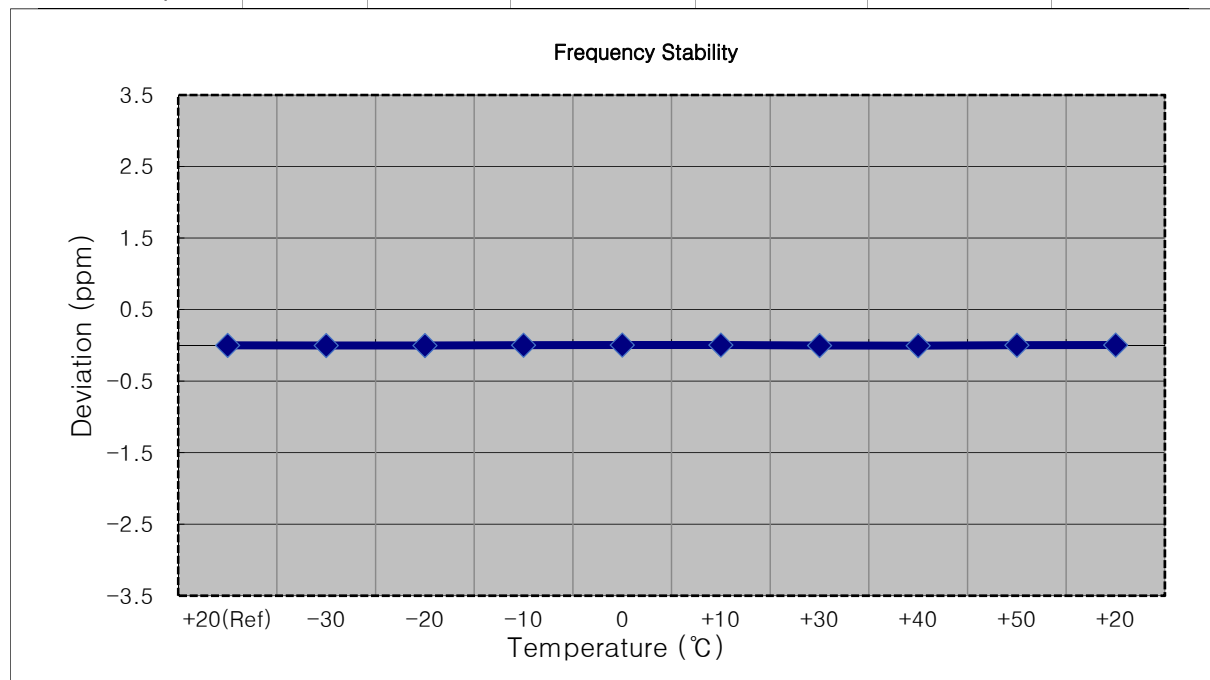
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1747,500,000 Hz</u>
CHANNEL:	<u>20325 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1747 500 006	0.0	0.000 000	0.000
100 %		-30	1747 500 013	6.8	0.000 000	0.004
100 %		-20	1747 500 002	-4.4	0.000 000	-0.003
100 %		-10	1747 500 011	5.0	0.000 000	0.003
100 %		0	1747 500 011	5.0	0.000 000	0.003
100 %		+10	1747 500 012	5.3	0.000 000	0.003
100 %		+30	1747 500 014	7.7	0.000 000	0.004
100 %		+40	1747 500 011	5.0	0.000 000	0.003
100 %		+50	1747 500 011	4.4	0.000 000	0.003
Batt. Endpoint	3.300	+20	1747 500 013	6.3	0.000 000	0.004



MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1745,000,000 Hz</u>
CHANNEL:	<u>20300 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1744 999 995	0.0	0.000 000	0.000
100 %		-30	1744 999 991	-4.6	0.000 000	-0.003
100 %		-20	1744 999 990	-5.8	0.000 000	-0.003
100 %		-10	1745 000 000	4.4	0.000 000	0.003
100 %		0	1745 000 003	7.4	0.000 000	0.004
100 %		+10	1745 000 002	6.5	0.000 000	0.004
100 %		+30	1744 999 991	-4.5	0.000 000	-0.003
100 %		+40	1744 999 989	-6.9	0.000 000	-0.004
100 %		+50	1745 000 000	4.2	0.000 000	0.002
Batt. Endpoint	3.300	+20	1745 000 003	8.0	0.000 000	0.005



8.8 UPLINK CARRIER AGGREGATION

Test Note

- All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
- All modes of operation were investigated and the worst case configuration results are reported in this section.
Please refer to the table below.
- The worst case is reported with the modulations, RB sizes and offsets.
 - 2A(Sub 2) - 4A(Main 2), 4A(Main 2) - 5A(Main 1)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)
 - 4A(Main 2) - 12A(Main 1)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 14)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
2A(Sub 2)	4A(Main 2)	15	18900	10	20325

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
4A(Main 2)	5A(Main 1)	10	20325	3	20635

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
4A(Main 2)	12A(Main 1)	10	20325	3	23025

8.8.1 RADIATED SPURIOUS EMISSIONS

2A(Sub 2) (PCC) - 4A(Main 2) (SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 760.00	-61.51	12.22	-67.24	3.12	V	-58.14	-13.00
5 640.00	-62.65	13.12	-62.54	3.92	V	-53.34	-13.00
7 520.00	-65.62	10.82	-54.78	4.61	V	-48.57	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 495.00	-61.14	12.04	-61.92	3.04	V	-52.92	-13.00
5 242.50	-60.20	11.79	-54.59	3.80	V	-46.60	-13.00
6 990.00	-63.38	11.16	-50.25	4.48	V	-43.57	-13.00

4A(Main 2) (PCC) - 5A(Main 1) (SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 495.00	-61.53	12.04	-62.31	3.04	V	-53.31	-13.00
5 242.50	-60.22	11.79	-54.61	3.80	V	-46.62	-13.00
6 990.00	-65.68	11.16	-52.55	4.48	V	-45.87	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 695.00	-58.05	9.91	-62.52	2.07	V	-54.68	-13.00
2 542.50	-60.32	10.66	-59.14	2.53	V	-51.01	-13.00
3 390.00	-60.75	11.53	-52.25	2.98	V	-43.70	-13.00

4A(Main 2) (PCC) - 12A(Main 1) (SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 495.00	-61.92	12.04	-62.70	3.04	V	-53.70	-13.00
5 242.50	-61.05	11.79	-55.44	3.80	V	-47.45	-13.00
6 990.00	-64.48	11.16	-51.35	4.48	V	-44.67	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 401.00	-58.56	12.54	-67.85	3.01	V	-58.32	-13.00
2 101.50	-54.02	12.29	-60.68	3.78	V	-52.17	-13.00
2 802.00	-57.34	11.98	-60.28	4.39	V	-52.69	-13.00

9. TEST DATA(Sub 2 ANT)

9.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1710.7	LTE B4 1.4 MHz	QPSK	-22.75	10.24	10.07	2.06	H	<1.00	0.067	18.25	1	0
		16-QAM	-23.60	9.39	10.07	2.06	H		0.055	17.40		
		64-QAM	-24.72	8.27	10.07	2.06	H		0.043	16.28		
		256-QAM	-27.65	5.34	10.07	2.06	H		0.022	13.35		
1732.5		QPSK	-21.67	11.56	10.34	2.08	H		0.096	19.82	1	5
		16-QAM	-22.41	10.82	10.34	2.08	H		0.081	19.08		
		64-QAM	-23.54	9.69	10.34	2.08	H		0.062	17.95		
		256-QAM	-26.65	6.58	10.34	2.08	H		0.031	14.84		
1754.3		QPSK	-21.92	11.54	10.47	2.08	H		0.098	19.93	1	5
		16-QAM	-22.72	10.74	10.47	2.08	H		0.082	19.13		
		64-QAM	-23.84	9.62	10.47	2.08	H		0.063	18.01		
		256-QAM	-26.84	6.62	10.47	2.08	H		0.032	15.01		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1711.5	LTE B4 3 MHz	QPSK	-22.59	10.40	10.07	2.06	H	< 1.00	0.069	18.41	1	14
		16-QAM	-23.42	9.57	10.07	2.06	H		0.057	17.58		
		64-QAM	-24.54	8.45	10.07	2.06	H		0.044	16.46		
		256-QAM	-27.50	5.49	10.07	2.06	H		0.022	13.50		
1732.5		QPSK	-21.57	11.66	10.34	2.08	H		0.098	19.92	1	14
		16-QAM	-22.27	10.96	10.34	2.08	H		0.084	19.22		
		64-QAM	-23.41	9.82	10.34	2.08	H		0.064	18.08		
		256-QAM	-26.58	6.65	10.34	2.08	H		0.031	14.91		
1753.5		QPSK	-21.85	11.61	10.47	2.08	H		0.100	20.00	1	14
		16-QAM	-22.62	10.84	10.47	2.08	H		0.084	19.23		
		64-QAM	-23.73	9.73	10.47	2.08	H		0.065	18.12		
		256-QAM	-26.77	6.69	10.47	2.08	H		0.032	15.08		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1712.5	LTE B4 5 MHz	QPSK	-22.54	10.54	10.12	2.06	H	< 1.00	0.072	18.60	1	24
		16-QAM	-23.43	9.65	10.12	2.06	H		0.059	17.71		
		64-QAM	-24.54	8.54	10.12	2.06	H		0.046	16.60		
		256-QAM	-27.44	5.64	10.12	2.06	H		0.023	13.70		
1732.5		QPSK	-21.58	11.65	10.34	2.08	H		0.098	19.91	1	24
		16-QAM	-22.32	10.91	10.34	2.08	H		0.083	19.17		
		64-QAM	-23.42	9.81	10.34	2.08	H		0.064	18.07		
		256-QAM	-26.52	6.71	10.34	2.08	H		0.031	14.97		
1752.5		QPSK	-21.82	11.64	10.47	2.08	H		0.101	20.03	1	24
		16-QAM	-22.65	10.81	10.47	2.08	H		0.083	19.20		
		64-QAM	-23.76	9.70	10.47	2.08	H		0.064	18.09		
		256-QAM	-26.74	6.72	10.47	2.08	H		0.032	15.11		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1715.0	LTE B4 10 MHz	QPSK	-22.24	10.84	10.12	2.06	H	< 1.00	0.078	18.90	1	49
		16-QAM	-23.15	9.93	10.12	2.06	H		0.063	17.99		
		64-QAM	-24.26	8.82	10.12	2.06	H		0.049	16.88		
		256-QAM	-27.17	5.91	10.12	2.06	H		0.025	13.97		
1732.5		QPSK	-21.76	11.47	10.34	2.08	H		0.094	19.73	1	49
		16-QAM	-22.55	10.68	10.34	2.08	H		0.078	18.94		
		64-QAM	-23.66	9.57	10.34	2.08	H		0.061	17.83		
		256-QAM	-26.74	6.49	10.34	2.08	H		0.030	14.75		
1750.0		QPSK	-21.84	11.87	10.46	2.07	H		0.106	20.26	1	49
		16-QAM	-22.72	10.99	10.46	2.07	H		0.087	19.38		
		64-QAM	-23.82	9.89	10.46	2.07	H		0.067	18.28		
		256-QAM	-26.77	6.94	10.46	2.07	H		0.034	15.33		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1717.5	LTE B4 15 MHz	QPSK	-22.02	11.14	10.18	2.06	H	< 1.00	0.084	19.26	1	74
		16-QAM	-22.88	10.28	10.18	2.06	H		0.069	18.40		
		64-QAM	-23.99	9.17	10.18	2.06	H		0.054	17.29		
		256-QAM	-26.96	6.20	10.18	2.06	H		0.027	14.32		
1732.5		QPSK	-21.78	11.45	10.34	2.08	H		0.094	19.71	1	74
		16-QAM	-22.57	10.66	10.34	2.08	H		0.078	18.92		
		64-QAM	-23.68	9.55	10.34	2.08	H		0.060	17.81		
		256-QAM	-26.74	6.49	10.34	2.08	H		0.030	14.75		
1747.5		QPSK	-21.86	11.85	10.46	2.07	H		0.106	20.24	1	74
		16-QAM	-22.76	10.95	10.46	2.07	H		0.086	19.34		
		64-QAM	-23.86	9.85	10.46	2.07	H		0.067	18.24		
		256-QAM	-26.80	6.91	10.46	2.07	H		0.034	15.30		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1720.0	LTE B4 20 MHz	QPSK	-21.85	11.31	10.18	2.06	H	< 1.00	0.088	19.43	1	99
		16-QAM	-22.64	10.52	10.18	2.06	H		0.073	18.64		
		64-QAM	-23.77	9.39	10.18	2.06	H		0.056	17.51		
		256-QAM	-26.83	6.33	10.18	2.06	H		0.028	14.45		
1732.5		QPSK	-21.77	11.46	10.34	2.08	H		0.094	19.72	1	99
		16-QAM	-22.52	10.71	10.34	2.08	H		0.079	18.97		
		64-QAM	-23.64	9.59	10.34	2.08	H		0.061	17.85		
		256-QAM	-26.73	6.50	10.34	2.08	H		0.030	14.76		
1745.0		QPSK	-21.91	11.46	10.43	2.07	H		0.096	19.82	1	99
		16-QAM	-22.75	10.62	10.43	2.07	H		0.079	18.98		
		64-QAM	-23.87	9.50	10.43	2.07	H		0.061	17.86		
		256-QAM	-26.84	6.53	10.43	2.07	H		0.031	14.89		

9.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE B4
 MODULATION SIGNAL: 10 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
20000 (1720.0)	3 430.00	-60.64	11.80	-61.54	3.01	H	-52.75	1	49
	5 145.00	-61.70	11.47	-55.34	3.78	H	-47.65		
	6 860.00	-64.31	11.06	-52.91	4.39	H	-46.24		
20175 (1732.5)	3 465.00	-61.19	12.02	-62.50	3.02	H	-53.50	1	49
	5 197.50	-61.45	11.66	-55.57	3.78	H	-47.69		
	6 930.00	-64.28	11.16	-52.30	4.40	H	-45.54		
20350 (1770.0)	3 500.00	-61.43	12.04	-62.24	3.04	H	-53.24	1	49
	5 250.00	-62.31	11.81	-56.53	3.80	H	-48.52		
	7 000.00	-63.32	11.13	-49.84	4.45	H	-43.16		

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.57
			16-QAM			6.05
			64-QAM			6.28
			256-QAM			6.44
	3 MHz		QPSK	15		5.59
			16-QAM			6.17
			64-QAM			6.35
			256-QAM			6.44
	5 MHz		QPSK	25		5.54
			16-QAM			6.19
			64-QAM			6.35
			256-QAM			6.35
	10 MHz		QPSK	50		5.59
			16-QAM			6.16
			64-QAM			6.37
			256-QAM			6.39
	15 MHz		QPSK	75		5.44
			16-QAM			6.12
			64-QAM			6.31
			256-QAM			6.41
	20 MHz		QPSK	100		5.48
			16-QAM			6.16
			64-QAM			6.36
			256-QAM			6.43

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 201 ~ 224.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.0994
			16-QAM			1.0999
			64-QAM			1.0989
			256-QAM			1.0953
	3 MHz		QPSK	15		2.7154
			16-QAM			2.7178
			64-QAM			2.7098
			256-QAM			2.7140
	5 MHz		QPSK	25		4.5555
			16-QAM			4.5272
			64-QAM			4.5222
			256-QAM			4.5288
	10 MHz		QPSK	50		9.0149
			16-QAM			9.0400
			64-QAM			9.0059
			256-QAM			8.9972
	15 MHz		QPSK	75		13.480
			16-QAM			13.481
			64-QAM			13.492
			256-QAM			13.479
	20 MHz		QPSK	100		17.950
			16-QAM			18.000
			64-QAM			17.916
			256-QAM			17.934

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 225 ~ 248.

9.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
4	1.4	1710.7	7.1885	28.591	-66.076	-37.485	-13.00
		1732.5	7.2682	28.591	-66.155	-37.564	
		1754.3	2.5823	27.976	-65.669	-37.693	
	3	1711.5	3.6990	27.976	-65.205	-37.229	
		1732.5	3.6890	27.976	-65.849	-37.873	
		1753.5	2.5424	27.976	-66.326	-38.350	
	5	1712.5	5.3041	28.591	-65.870	-37.279	
		1732.5	3.6691	27.976	-65.370	-37.394	
		1752.5	3.7289	27.976	-66.264	-38.288	
	10	1715.0	7.1586	28.591	-66.468	-37.877	
		1732.5	6.2313	28.591	-65.492	-36.901	
		1750.0	3.1406	27.976	-66.043	-38.067	
	15	1717.5	2.5923	27.976	-66.240	-38.264	
		1732.5	3.4497	27.976	-65.673	-37.697	
		1747.5	3.6790	27.976	-66.370	-38.394	
	20	1720.0	6.9093	28.591	-65.310	-36.719	
		1732.5	5.7229	28.591	-65.919	-37.328	
		1745.0	3.7089	27.976	-65.692	-37.716	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 249 ~ 284.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. 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(26.5)	30.131

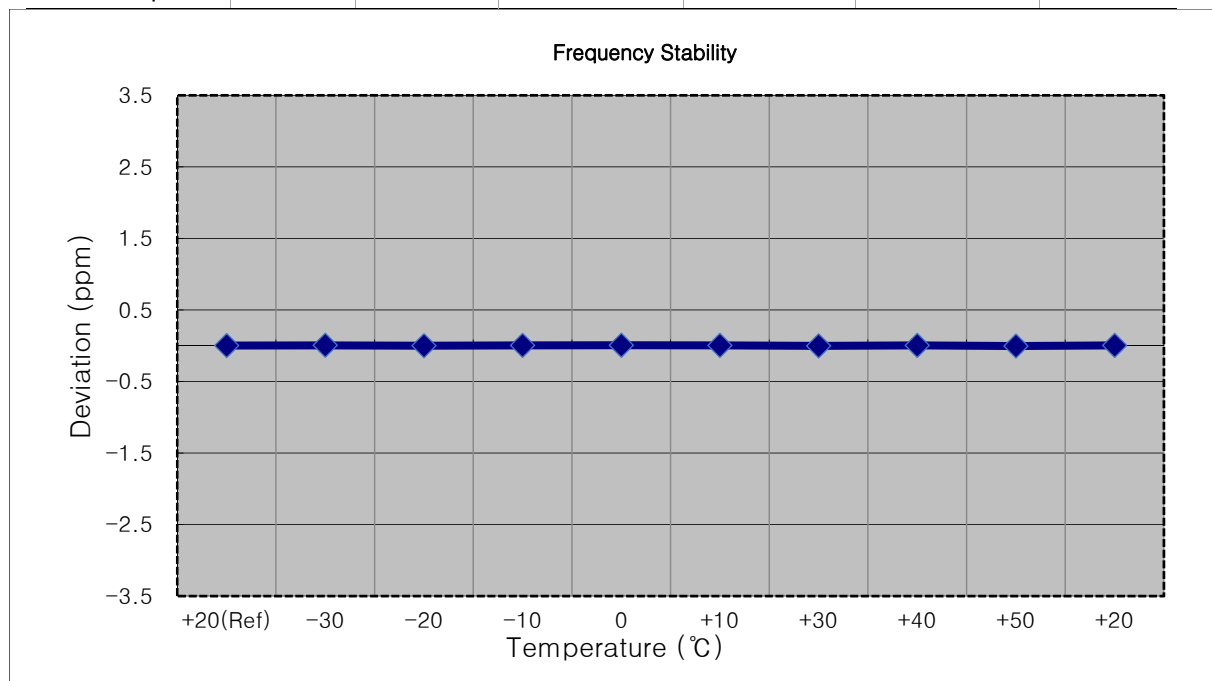
9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 285 ~ 320.

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

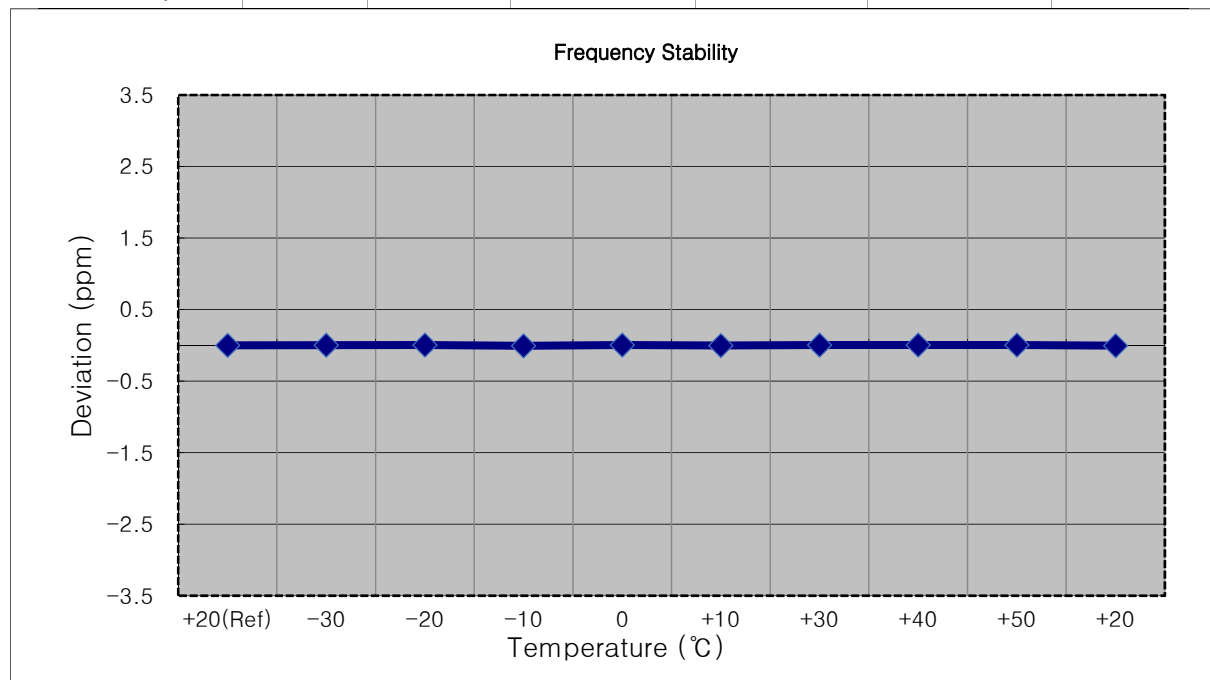
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1710,700,000 Hz</u>
CHANNEL:	<u>19957 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1710 700 007	0.0	0.000 000	0.000
100 %		-30	1710 700 015	8.6	0.000 001	0.005
100 %		-20	1710 700 003	-3.6	0.000 000	-0.002
100 %		-10	1710 700 014	6.9	0.000 000	0.004
100 %		0	1710 700 014	7.7	0.000 000	0.005
100 %		+10	1710 700 011	4.1	0.000 000	0.002
100 %		+30	1710 700 002	-4.3	0.000 000	-0.003
100 %		+40	1710 700 013	6.5	0.000 000	0.004
100 %		+50	1710 699 998	-9.1	-0.000 001	-0.005
Batt. Endpoint	3.300	+20	1710 700 013	6.4	0.000 000	0.004



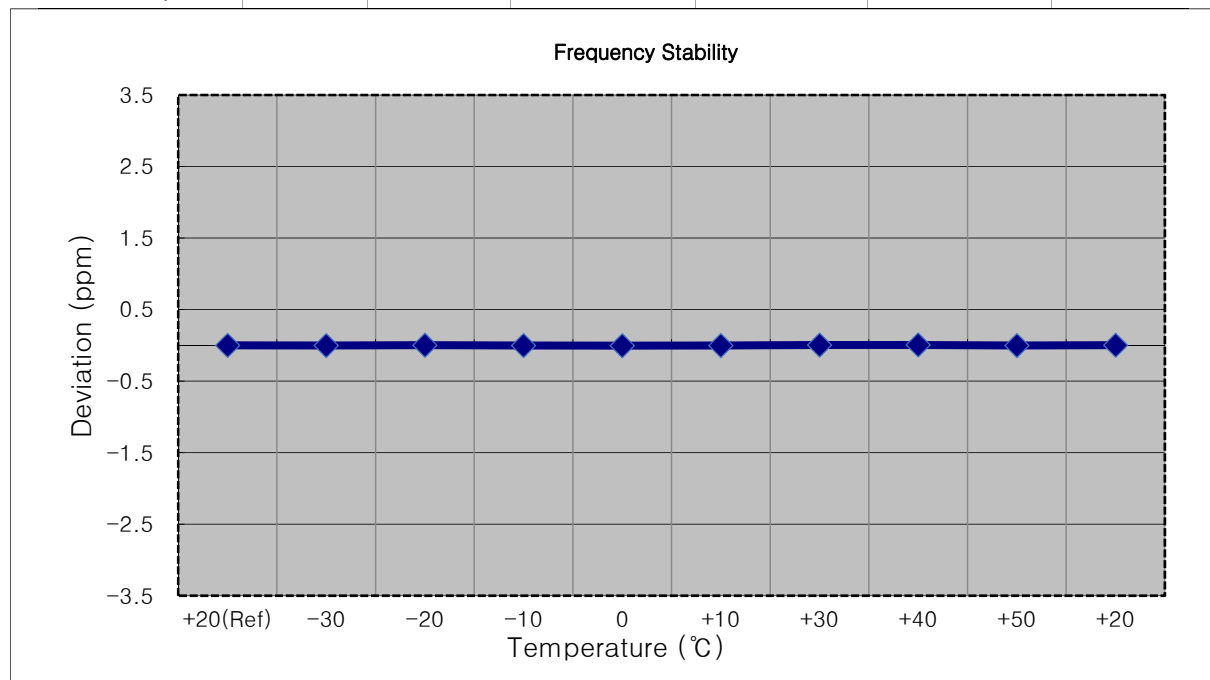
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1711,500,000 Hz</u>
CHANNEL:	<u>19965 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1711 500 004	0.0	0.000 000	0.000
100 %		-30	1711 500 009	4.9	0.000 000	0.003
100 %		-20	1711 500 012	8.0	0.000 000	0.005
100 %		-10	1711 499 993	-11.4	-0.000 001	-0.007
100 %		0	1711 500 011	6.1	0.000 000	0.004
100 %		+10	1711 499 998	-6.2	0.000 000	-0.004
100 %		+30	1711 500 011	6.9	0.000 000	0.004
100 %		+40	1711 500 011	6.6	0.000 000	0.004
100 %		+50	1711 500 011	6.2	0.000 000	0.004
Batt. Endpoint	3.300	+20	1711 499 997	-7.3	0.000 000	-0.004



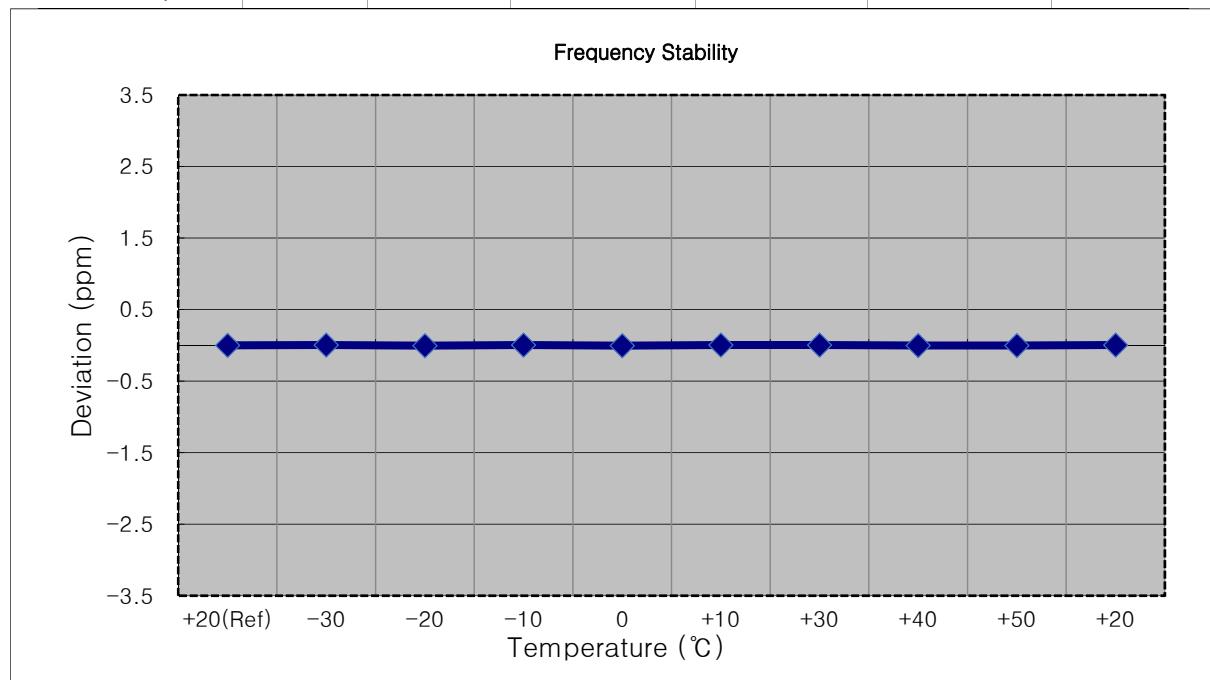
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1712,500,000 Hz</u>
CHANNEL:	<u>19975 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1712 499 994	0.0	0.000 000	0.000
100 %		-30	1712 499 988	-5.6	0.000 000	-0.003
100 %		-20	1712 499 998	4.3	0.000 000	0.003
100 %		-10	1712 499 990	-3.9	0.000 000	-0.002
100 %		0	1712 499 985	-8.3	0.000 000	-0.005
100 %		+10	1712 499 991	-3.1	0.000 000	-0.002
100 %		+30	1712 500 000	6.1	0.000 000	0.004
100 %		+40	1712 500 004	10.0	0.000 001	0.006
100 %		+50	1712 499 990	-4.1	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1712 499 998	4.3	0.000 000	0.003



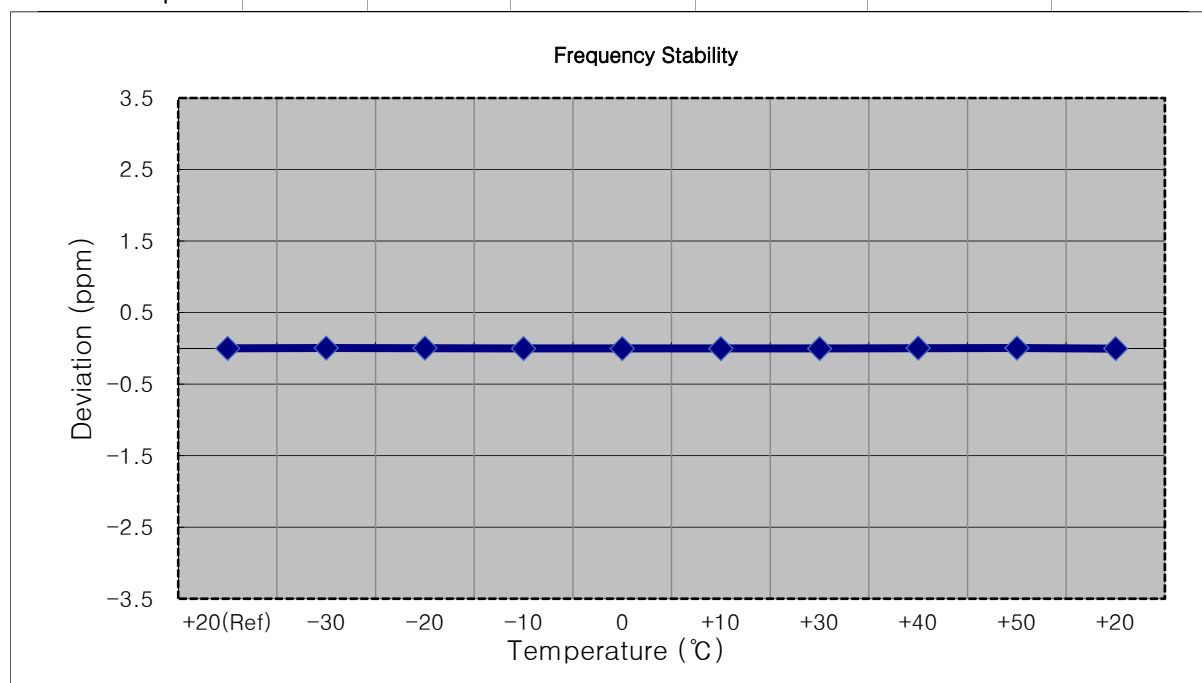
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1715,000,000 Hz</u>
CHANNEL:	<u>20000 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1714 999 993	0.0	0.000 000	0.000
100 %		-30	1715 000 001	8.7	0.000 001	0.005
100 %		-20	1714 999 985	-7.5	0.000 000	-0.004
100 %		-10	1715 000 001	8.0	0.000 000	0.005
100 %		0	1714 999 985	-8.1	0.000 000	-0.005
100 %		+10	1714 999 999	6.5	0.000 000	0.004
100 %		+30	1715 000 001	8.1	0.000 000	0.005
100 %		+40	1714 999 987	-6.1	0.000 000	-0.004
100 %		+50	1714 999 988	-4.6	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1714 999 999	6.5	0.000 000	0.004



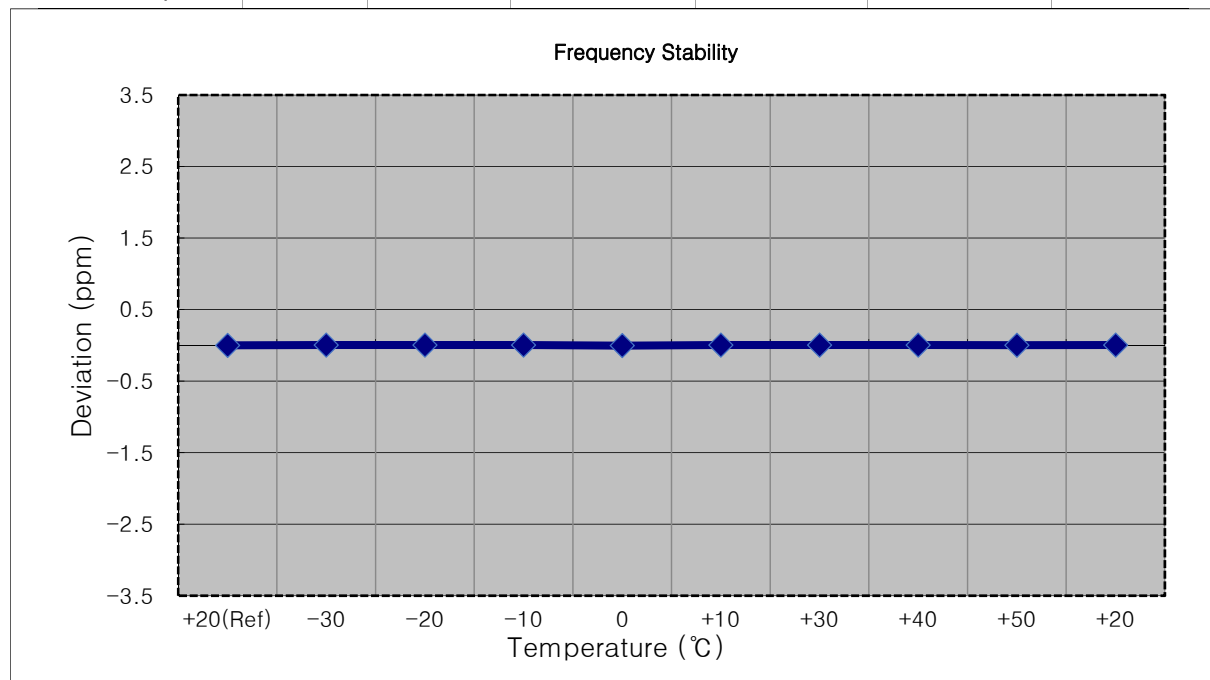
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1717,500,000 Hz</u>
CHANNEL:	<u>20225 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1717 500 008	0.0	0.000 000	0.000
100 %		-30	1717 500 014	6.3	0.000 000	0.004
100 %		-20	1717 500 014	6.5	0.000 000	0.004
100 %		-10	1717 500 002	-6.1	0.000 000	-0.004
100 %		0	1717 500 002	-5.5	0.000 000	-0.003
100 %		+10	1717 500 005	-3.4	0.000 000	-0.002
100 %		+30	1717 500 004	-4.4	0.000 000	-0.003
100 %		+40	1717 500 013	5.5	0.000 000	0.003
100 %		+50	1717 500 016	8.5	0.000 000	0.005
Batt. Endpoint	3.300	+20	1717 500 002	-6.4	0.000 000	-0.004



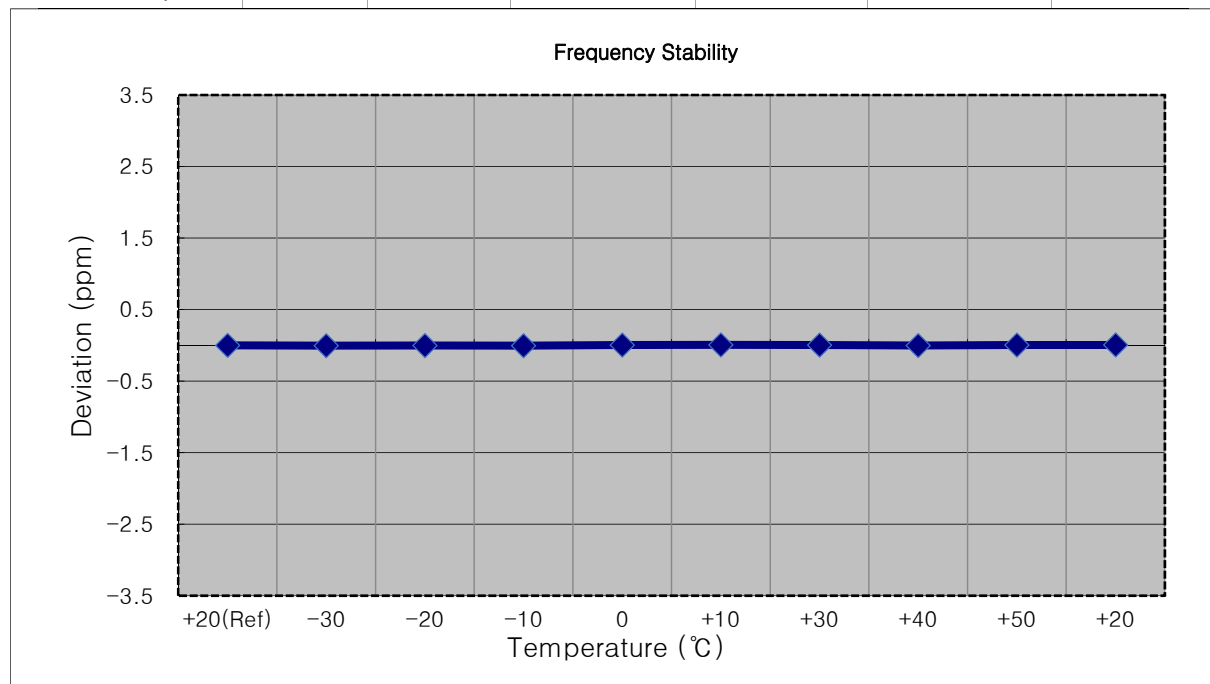
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1720,000,000 Hz</u>
CHANNEL:	<u>20050 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1720 000 006	0.0	0.000 000	0.000
100 %		-30	1720 000 013	6.7	0.000 000	0.004
100 %		-20	1720 000 014	7.2	0.000 000	0.004
100 %		-10	1720 000 015	8.5	0.000 000	0.005
100 %		0	1720 000 001	-5.8	0.000 000	-0.003
100 %		+10	1720 000 012	5.8	0.000 000	0.003
100 %		+30	1720 000 012	5.5	0.000 000	0.003
100 %		+40	1720 000 012	5.7	0.000 000	0.003
100 %		+50	1720 000 011	5.0	0.000 000	0.003
Batt. Endpoint	3.300	+20	1720 000 015	8.1	0.000 000	0.005



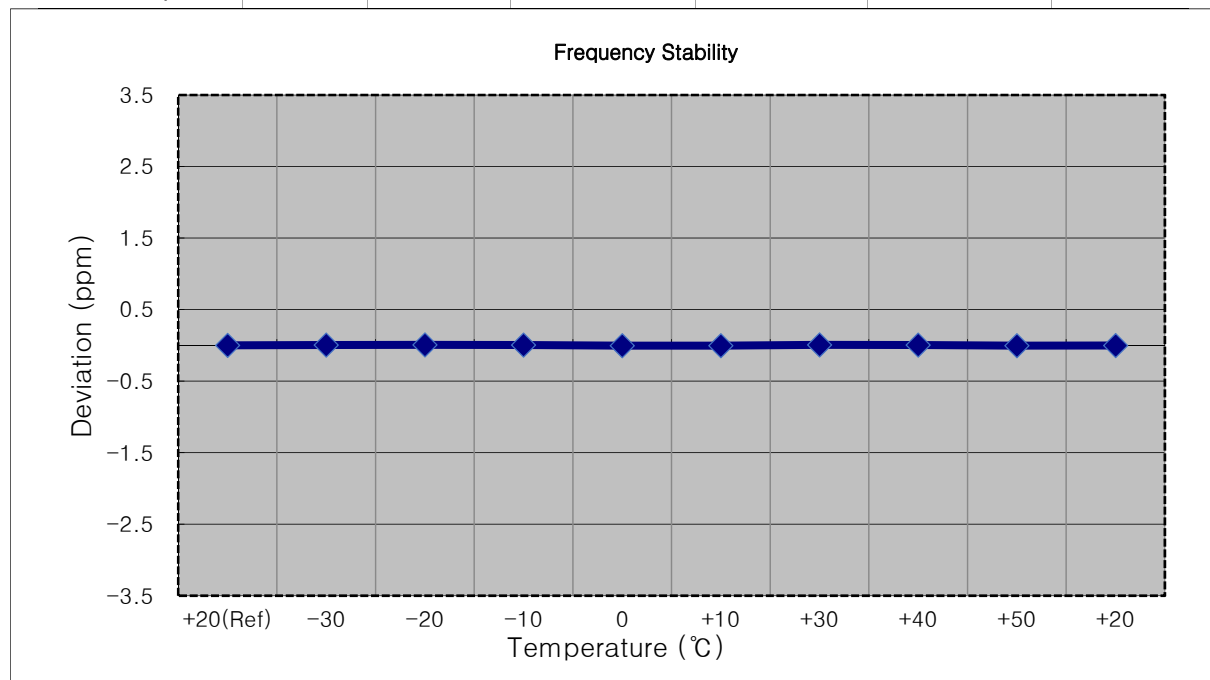
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 499 995	0.0	0.000 000	0.000
100 %		-30	1732 499 988	-6.8	0.000 000	-0.004
100 %		-20	1732 499 990	-5.1	0.000 000	-0.003
100 %		-10	1732 499 988	-7.4	0.000 000	-0.004
100 %		0	1732 500 002	6.7	0.000 000	0.004
100 %		+10	1732 500 005	9.7	0.000 001	0.006
100 %		+30	1732 500 001	5.7	0.000 000	0.003
100 %		+40	1732 499 989	-6.4	0.000 000	-0.004
100 %		+50	1732 500 002	6.8	0.000 000	0.004
Batt. Endpoint	3.300	+20	1732 500 005	9.8	0.000 001	0.006



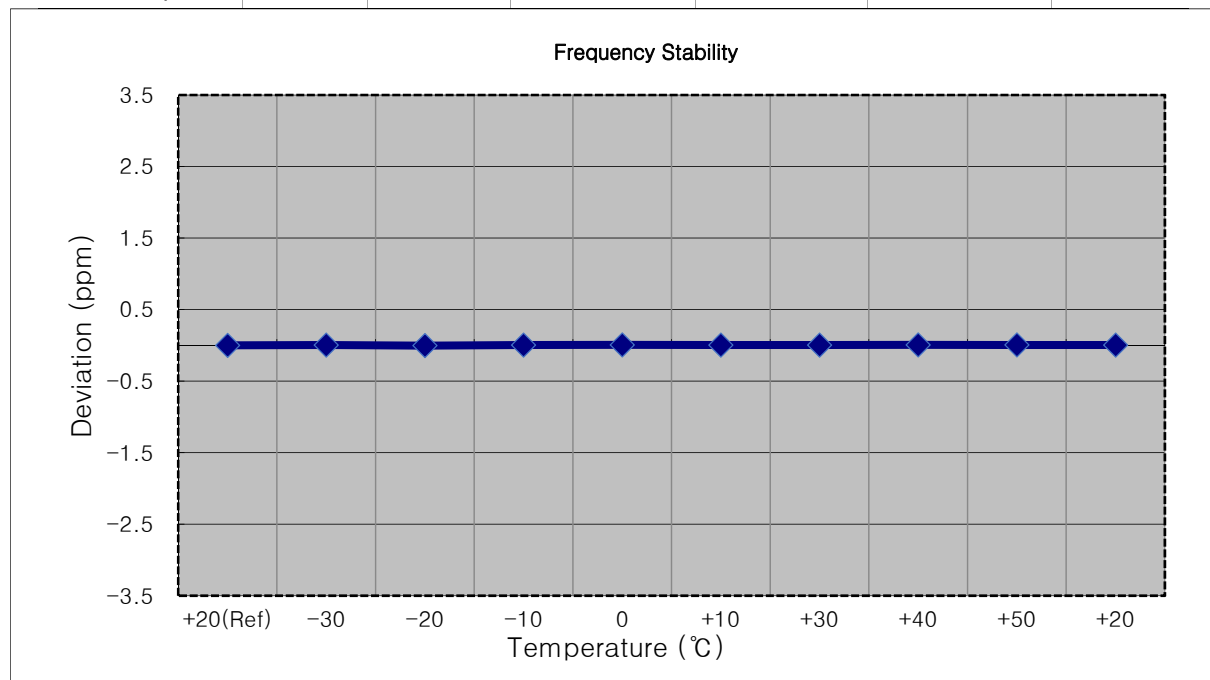
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 499 994	0.0	0.000 000	0.000
100 %		-30	1732 500 002	8.2	0.000 000	0.005
100 %		-20	1732 500 006	12.1	0.000 001	0.007
100 %		-10	1732 500 002	8.0	0.000 000	0.005
100 %		0	1732 499 986	-7.2	0.000 000	-0.004
100 %		+10	1732 499 986	-7.9	0.000 000	-0.005
100 %		+30	1732 500 004	10.0	0.000 001	0.006
100 %		+40	1732 499 999	5.3	0.000 000	0.003
100 %		+50	1732 499 987	-6.7	0.000 000	-0.004
Batt. Endpoint	3.300	+20	1732 499 987	-6.2	0.000 000	-0.004



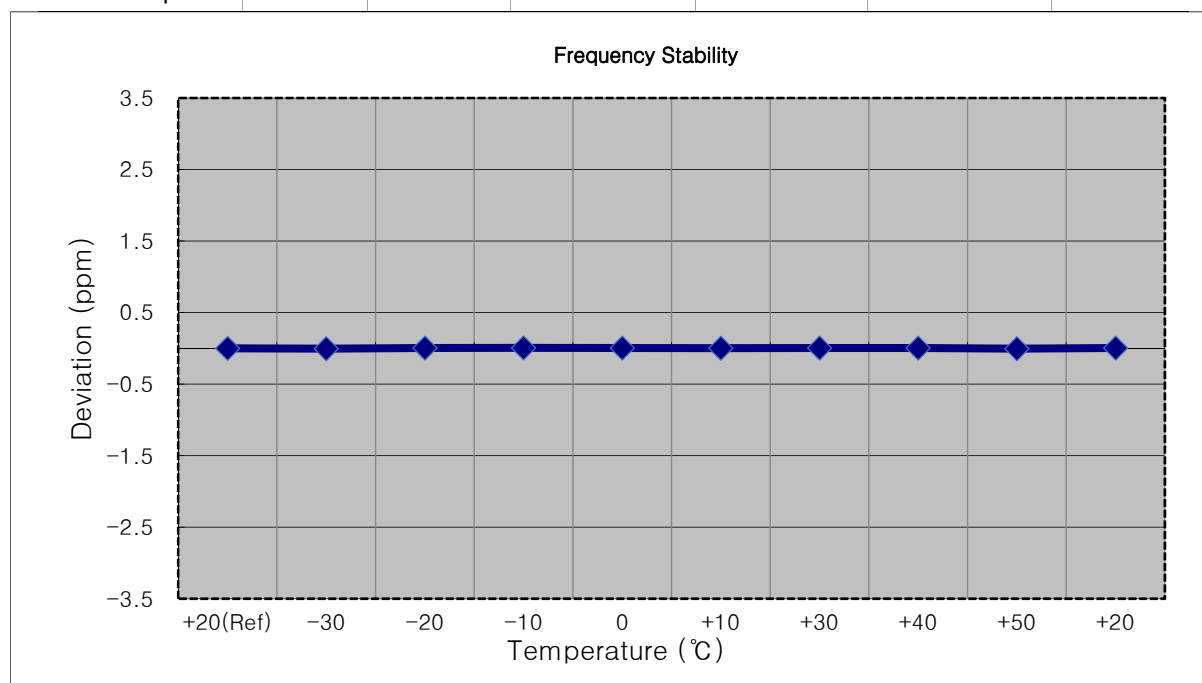
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 008	0.0	0.000 000	0.000
100 %		-30	1732 500 016	8.3	0.000 000	0.005
100 %		-20	1732 500 002	-5.7	0.000 000	-0.003
100 %		-10	1732 500 016	7.7	0.000 000	0.004
100 %		0	1732 500 018	10.4	0.000 001	0.006
100 %		+10	1732 500 014	6.0	0.000 000	0.003
100 %		+30	1732 500 016	8.1	0.000 000	0.005
100 %		+40	1732 500 018	10.3	0.000 001	0.006
100 %		+50	1732 500 018	10.5	0.000 001	0.006
Batt. Endpoint	3.300	+20	1732 500 013	5.4	0.000 000	0.003



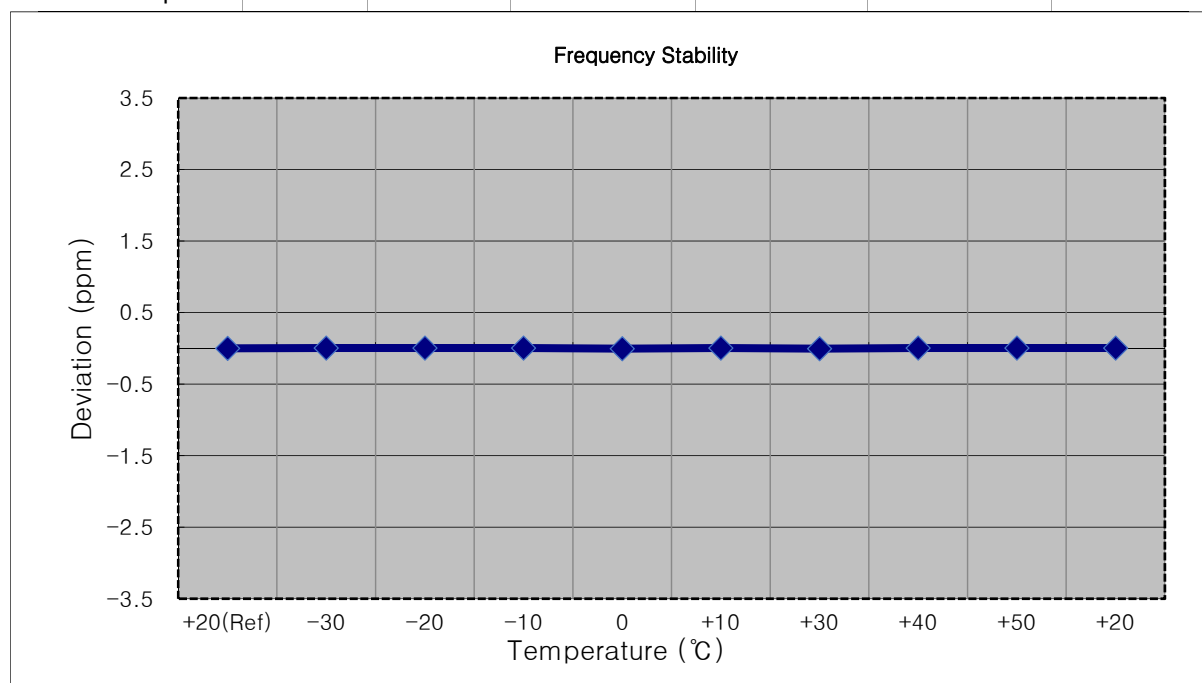
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 499 994	0.0	0.000 000	0.000
100 %		-30	1732 499 987	-6.7	0.000 000	-0.004
100 %		-20	1732 500 001	7.1	0.000 000	0.004
100 %		-10	1732 500 005	11.1	0.000 001	0.006
100 %		0	1732 500 000	6.1	0.000 000	0.004
100 %		+10	1732 499 998	4.1	0.000 000	0.002
100 %		+30	1732 500 002	8.3	0.000 000	0.005
100 %		+40	1732 500 000	6.6	0.000 000	0.004
100 %		+50	1732 499 986	-7.6	0.000 000	-0.004
Batt. Endpoint	3.300	+20	1732 500 001	6.7	0.000 000	0.004



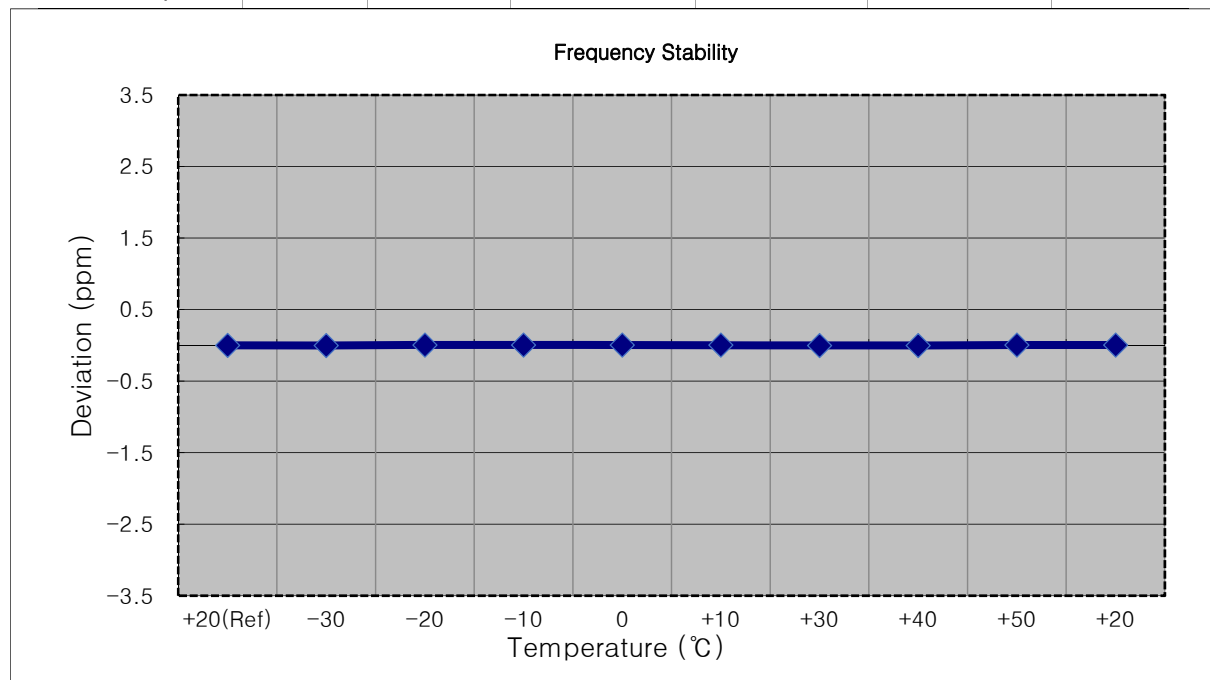
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 009	0.0	0.000 000	0.000
100 %		-30	1732 500 016	6.5	0.000 000	0.004
100 %		-20	1732 500 015	5.7	0.000 000	0.003
100 %		-10	1732 500 015	5.8	0.000 000	0.003
100 %		0	1732 500 002	-7.3	0.000 000	-0.004
100 %		+10	1732 500 014	5.2	0.000 000	0.003
100 %		+30	1732 500 002	-6.7	0.000 000	-0.004
100 %		+40	1732 500 016	6.6	0.000 000	0.004
100 %		+50	1732 500 017	7.7	0.000 000	0.004
Batt. Endpoint	3.300	+20	1732 500 016	6.8	0.000 000	0.004



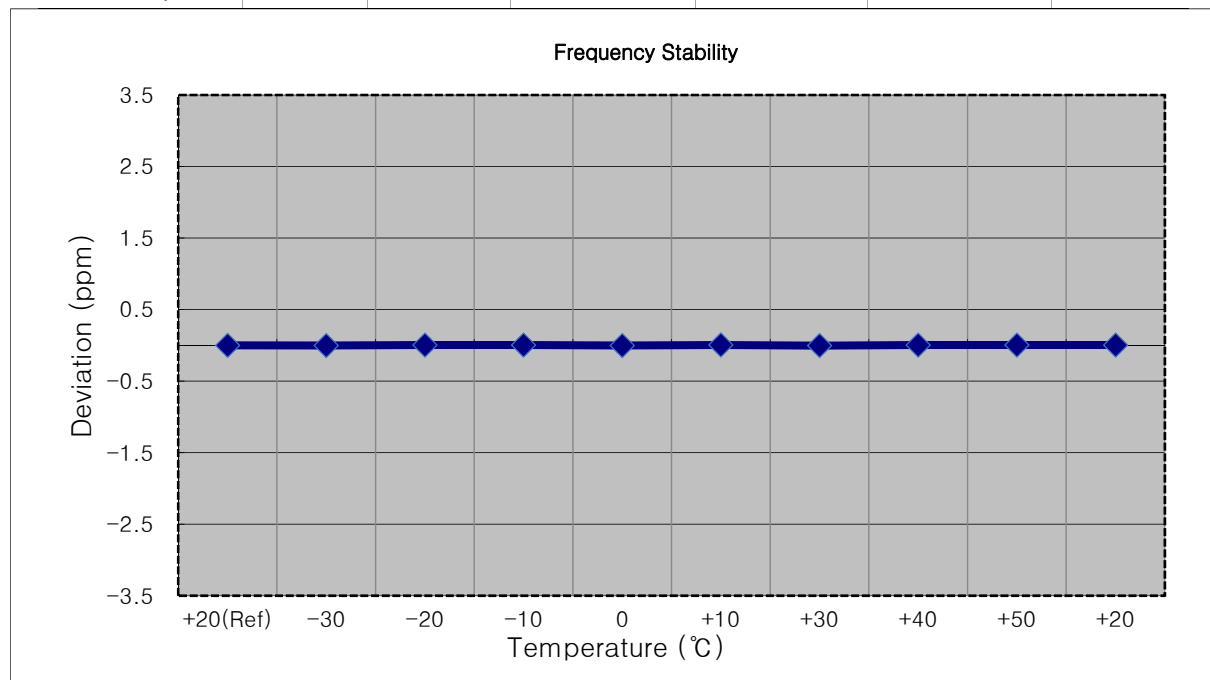
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1732,500,000 Hz</u>
CHANNEL:	<u>20175 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1732 500 005	0.0	0.000 000	0.000
100 %		-30	1732 500 000	-5.1	0.000 000	-0.003
100 %		-20	1732 500 010	5.6	0.000 000	0.003
100 %		-10	1732 500 012	7.1	0.000 000	0.004
100 %		0	1732 500 010	5.3	0.000 000	0.003
100 %		+10	1732 500 013	8.7	0.000 001	0.005
100 %		+30	1732 500 000	-4.8	0.000 000	-0.003
100 %		+40	1732 499 999	-5.3	0.000 000	-0.003
100 %		+50	1732 500 012	6.8	0.000 000	0.004
Batt. Endpoint	3.300	+20	1732 500 010	5.2	0.000 000	0.003



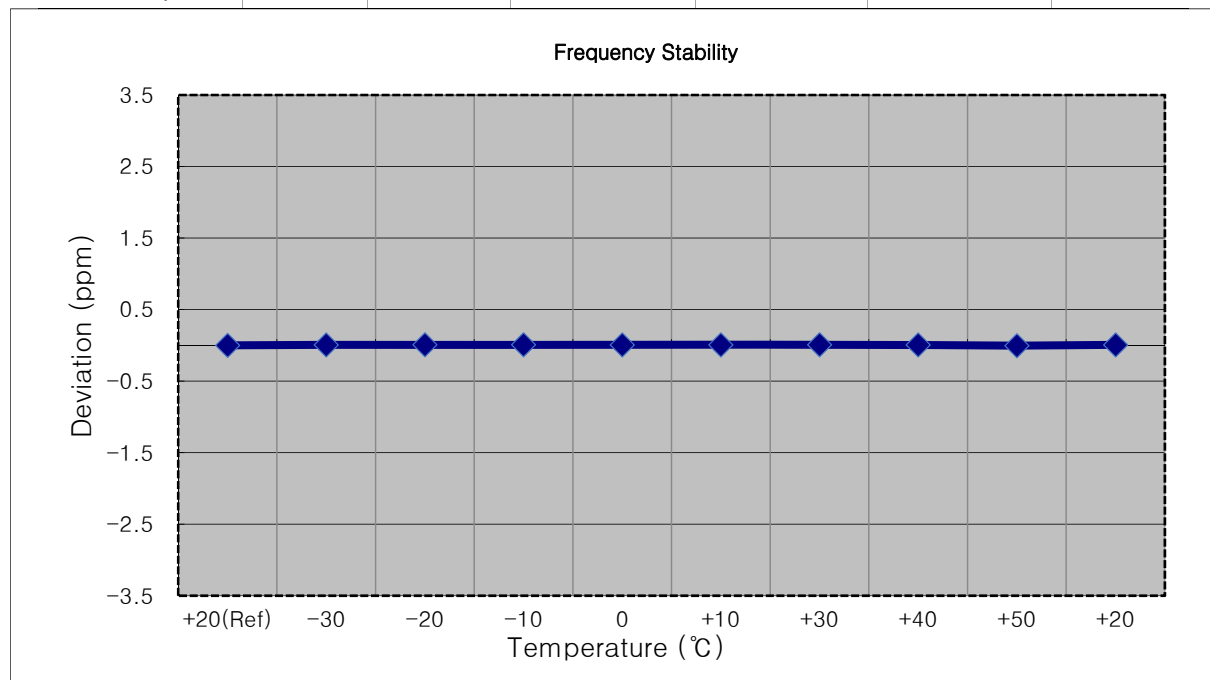
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1754,300,000 Hz</u>
CHANNEL:	<u>20393 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1754 300 006	0.0	0.000 000	0.000
100 %		-30	1754 300 002	-3.8	0.000 000	-0.002
100 %		-20	1754 300 014	8.4	0.000 000	0.005
100 %		-10	1754 300 013	7.5	0.000 000	0.004
100 %		0	1754 300 002	-3.5	0.000 000	-0.002
100 %		+10	1754 300 016	10.8	0.000 001	0.006
100 %		+30	1754 300 000	-5.2	0.000 000	-0.003
100 %		+40	1754 300 014	8.1	0.000 000	0.005
100 %		+50	1754 300 013	7.4	0.000 000	0.004
Batt. Endpoint	3.300	+20	1754 300 013	7.4	0.000 000	0.004



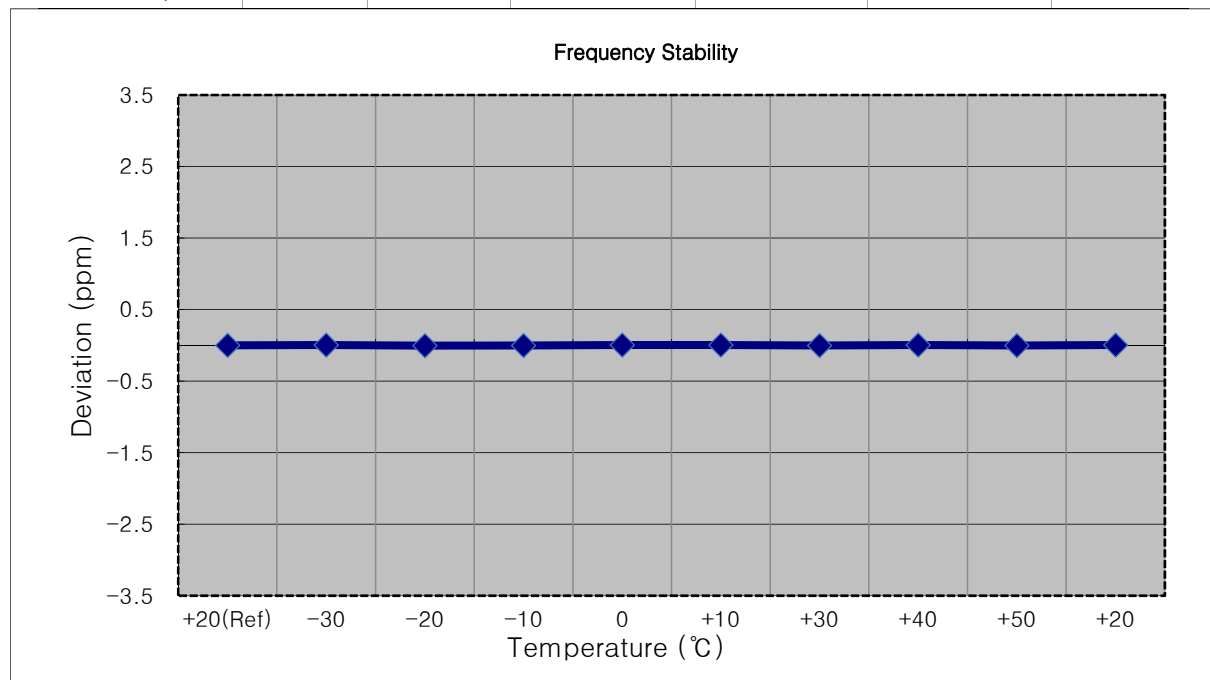
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1753,500,000 Hz</u>
CHANNEL:	<u>20385 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1753 500 008	0.0	0.000 000	0.000
100 %		-30	1753 500 021	12.6	0.000 001	0.007
100 %		-20	1753 500 022	13.8	0.000 001	0.008
100 %		-10	1753 500 023	14.7	0.000 001	0.008
100 %		0	1753 500 020	11.3	0.000 001	0.006
100 %		+10	1753 500 020	11.4	0.000 001	0.007
100 %		+30	1753 500 022	14.1	0.000 001	0.008
100 %		+40	1753 500 018	9.7	0.000 001	0.006
100 %		+50	1753 500 000	-8.4	0.000 000	-0.005
Batt. Endpoint	3.300	+20	1753 500 018	9.3	0.000 001	0.005



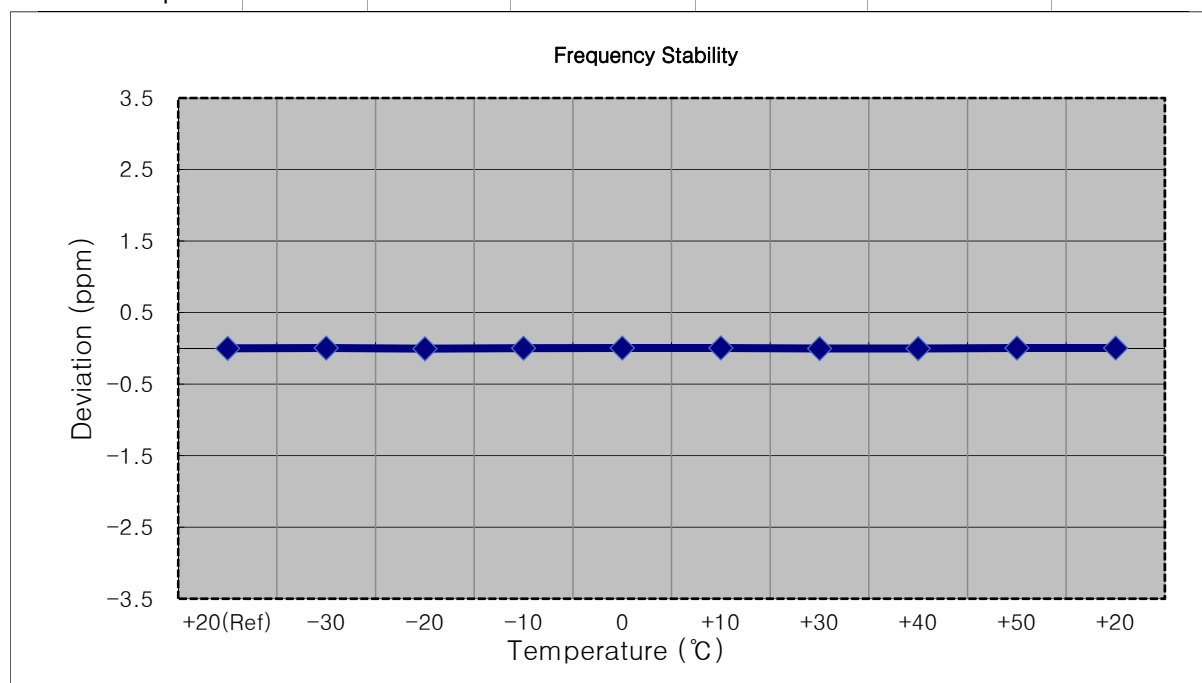
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1752,500,000 Hz</u>
CHANNEL:	<u>20375 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1752 499 996	0.0	0.000 000	0.000
100 %		-30	1752 500 003	7.3	0.000 000	0.004
100 %		-20	1752 499 987	-8.6	0.000 000	-0.005
100 %		-10	1752 499 990	-6.3	0.000 000	-0.004
100 %		0	1752 500 002	5.9	0.000 000	0.003
100 %		+10	1752 500 004	7.9	0.000 000	0.005
100 %		+30	1752 499 989	-6.5	0.000 000	-0.004
100 %		+40	1752 500 003	6.8	0.000 000	0.004
100 %		+50	1752 499 991	-4.6	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1752 500 002	6.4	0.000 000	0.004



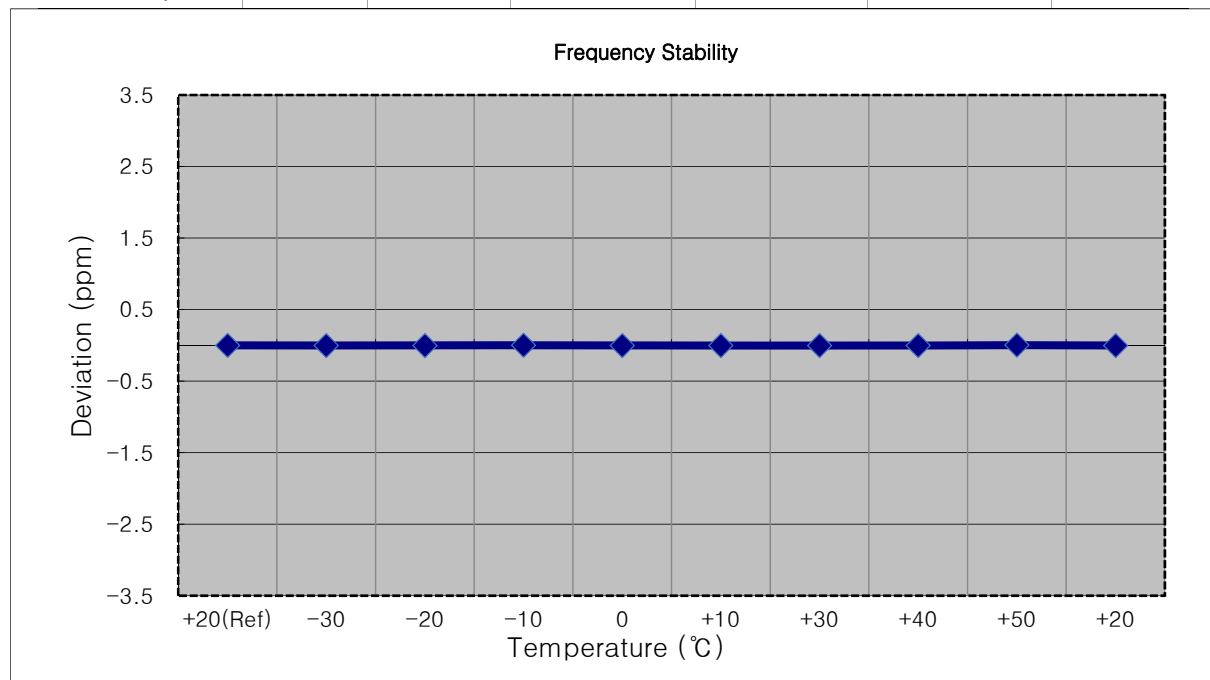
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1750,000,000 Hz</u>
CHANNEL:	<u>20350 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	4.200	+20(Ref)	1750 000 004	0.0	0.000 000	0.000
100 %		-30	1750 000 011	6.8	0.000 000	0.004
100 %		-20	1749 999 997	-6.9	0.000 000	-0.004
100 %		-10	1750 000 008	3.4	0.000 000	0.002
100 %		0	1750 000 010	5.7	0.000 000	0.003
100 %		+10	1750 000 013	9.1	0.000 001	0.005
100 %		+30	1750 000 001	-3.5	0.000 000	-0.002
100 %		+40	1749 999 999	-5.1	0.000 000	-0.003
100 %		+50	1750 000 011	7.3	0.000 000	0.004
Batt. Endpoint	3.300	+20	1750 000 010	5.9	0.000 000	0.003



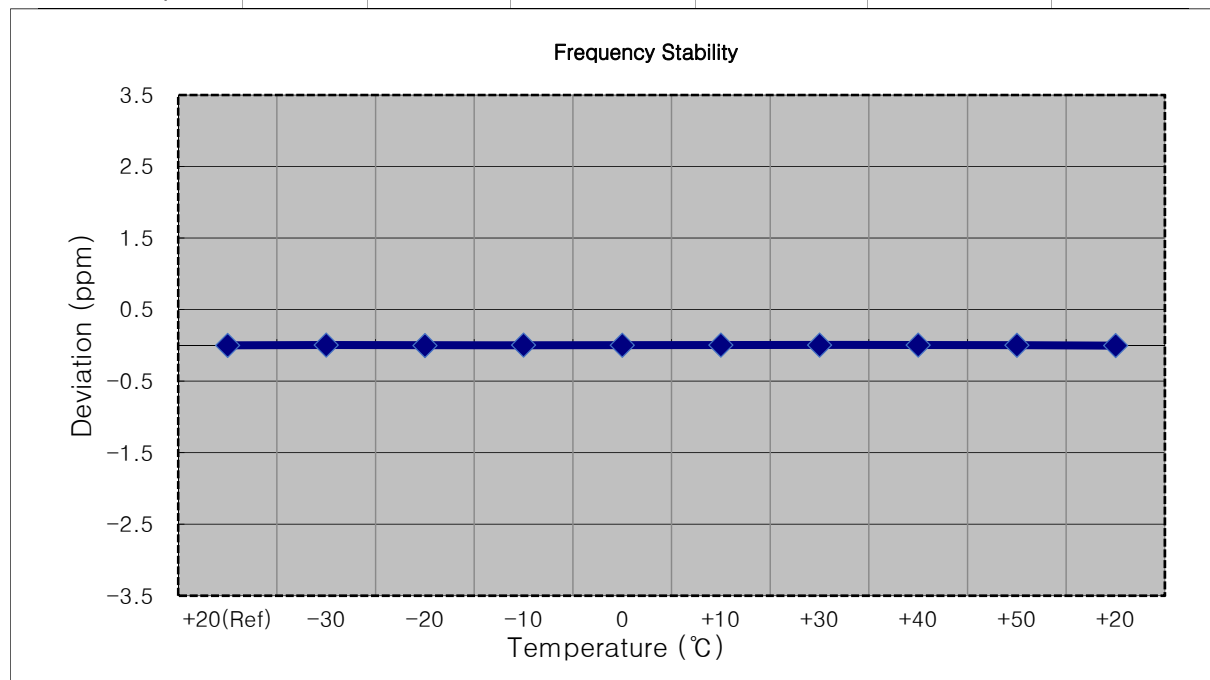
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1747,500,000 Hz</u>
CHANNEL:	<u>20325 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1747 499 996	0.0	0.000 000	0.000
100 %		-30	1747 499 991	-5.4	0.000 000	-0.003
100 %		-20	1747 499 993	-3.7	0.000 000	-0.002
100 %		-10	1747 500 001	4.8	0.000 000	0.003
100 %		0	1747 499 991	-5.3	0.000 000	-0.003
100 %		+10	1747 499 991	-5.1	0.000 000	-0.003
100 %		+30	1747 499 991	-5.0	0.000 000	-0.003
100 %		+40	1747 499 991	-5.5	0.000 000	-0.003
100 %		+50	1747 500 003	6.1	0.000 000	0.003
Batt. Endpoint	3.300	+20	1747 499 991	-5.2	0.000 000	-0.003



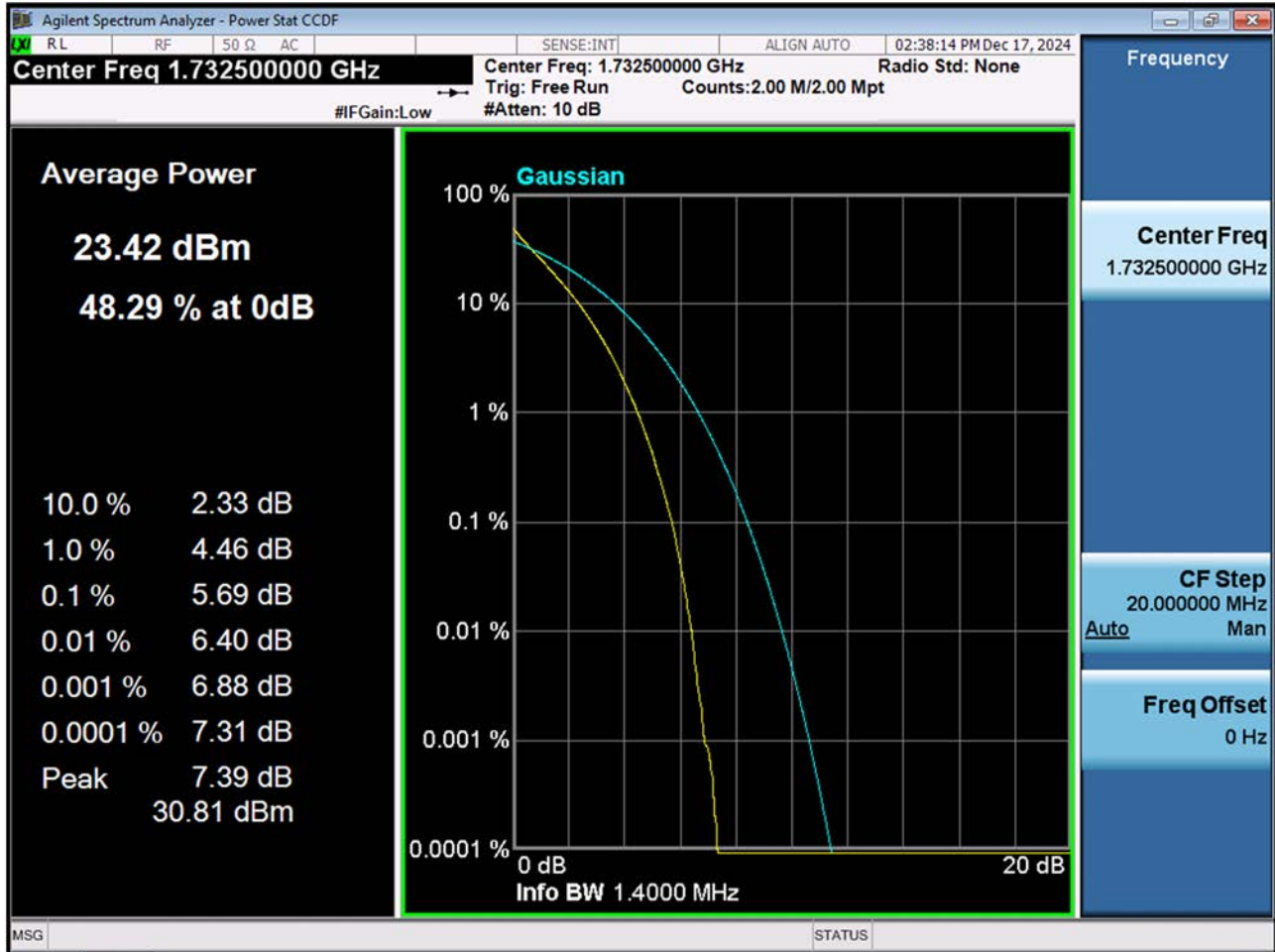
MODE:	<u>LTE 4</u>
OPERATING FREQUENCY:	<u>1745,000,000 Hz</u>
CHANNEL:	<u>20300 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>4.200 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 005	0.0	0.000 000	0.000
100 %		-30	1745 000 011	6.4	0.000 000	0.004
100 %		-20	1745 000 001	-3.9	0.000 000	-0.002
100 %		-10	1745 000 013	8.1	0.000 000	0.005
100 %		0	1745 000 010	4.7	0.000 000	0.003
100 %		+10	1745 000 012	6.6	0.000 000	0.004
100 %		+30	1745 000 012	7.1	0.000 000	0.004
100 %		+40	1745 000 011	5.7	0.000 000	0.003
100 %		+50	1745 000 010	4.9	0.000 000	0.003
Batt. Endpoint	3.300	+20	1745 000 000	-4.8	0.000 000	-0.003

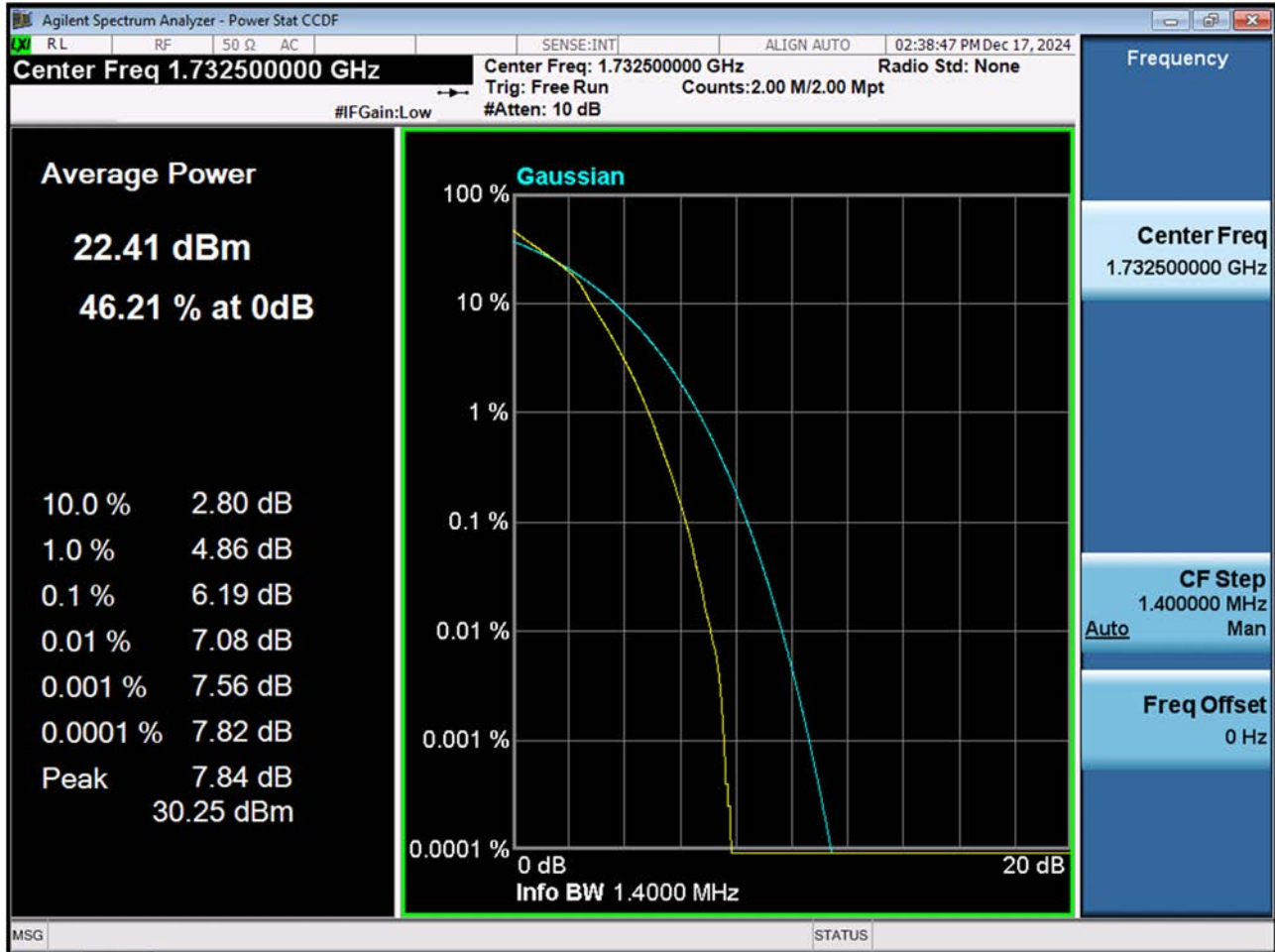


10. TEST PLOTS(Main 2 ANT)

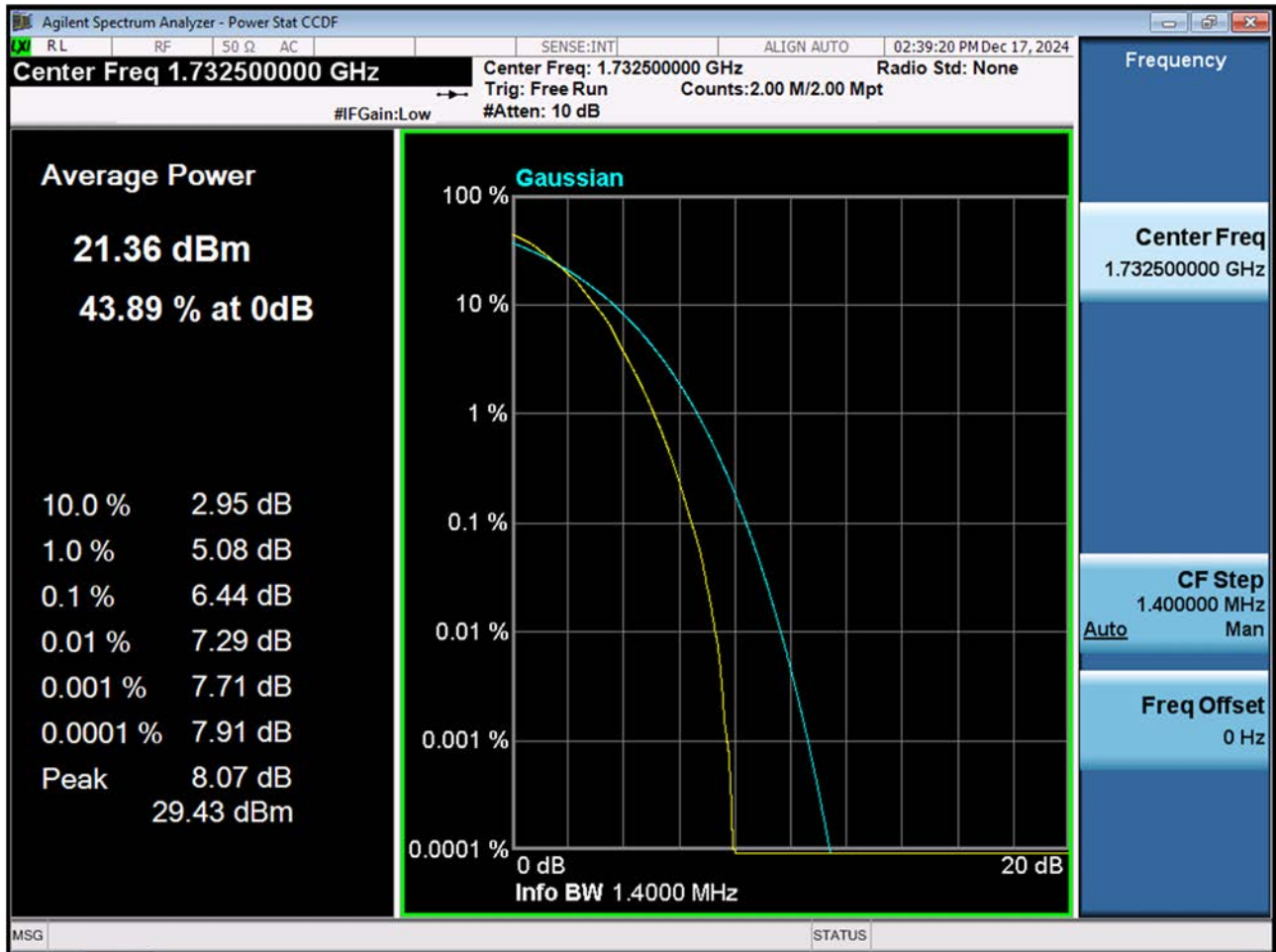
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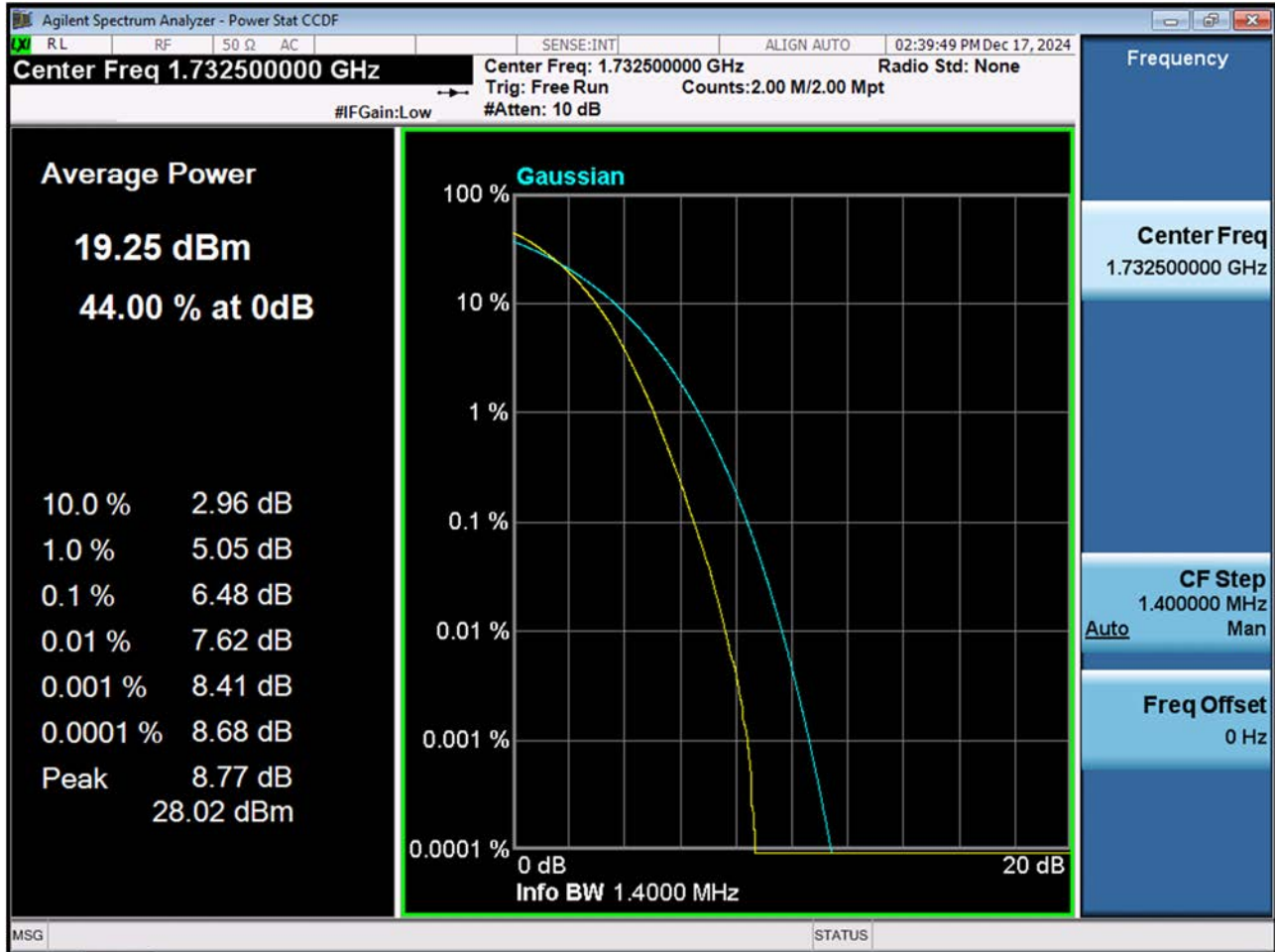
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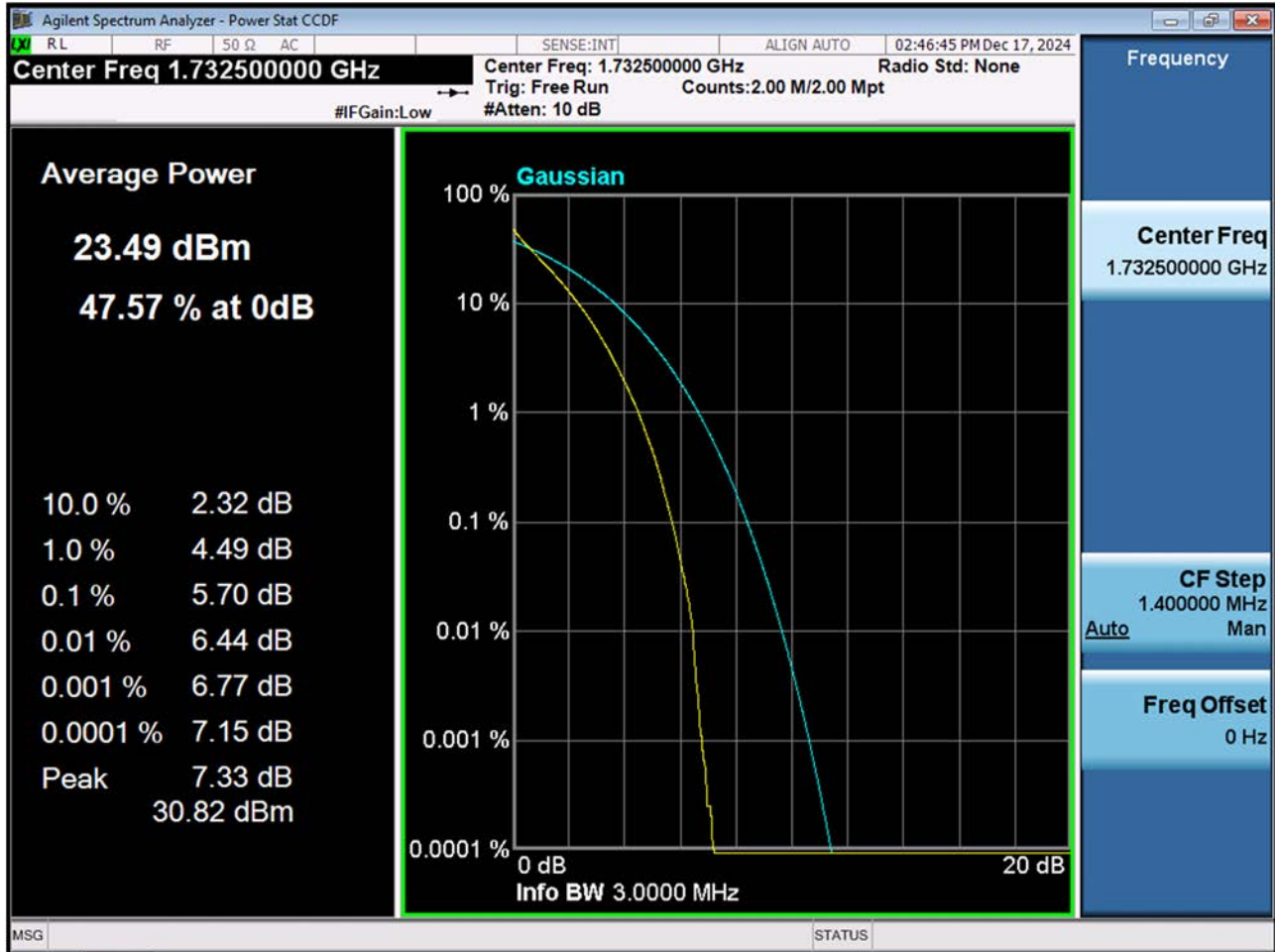
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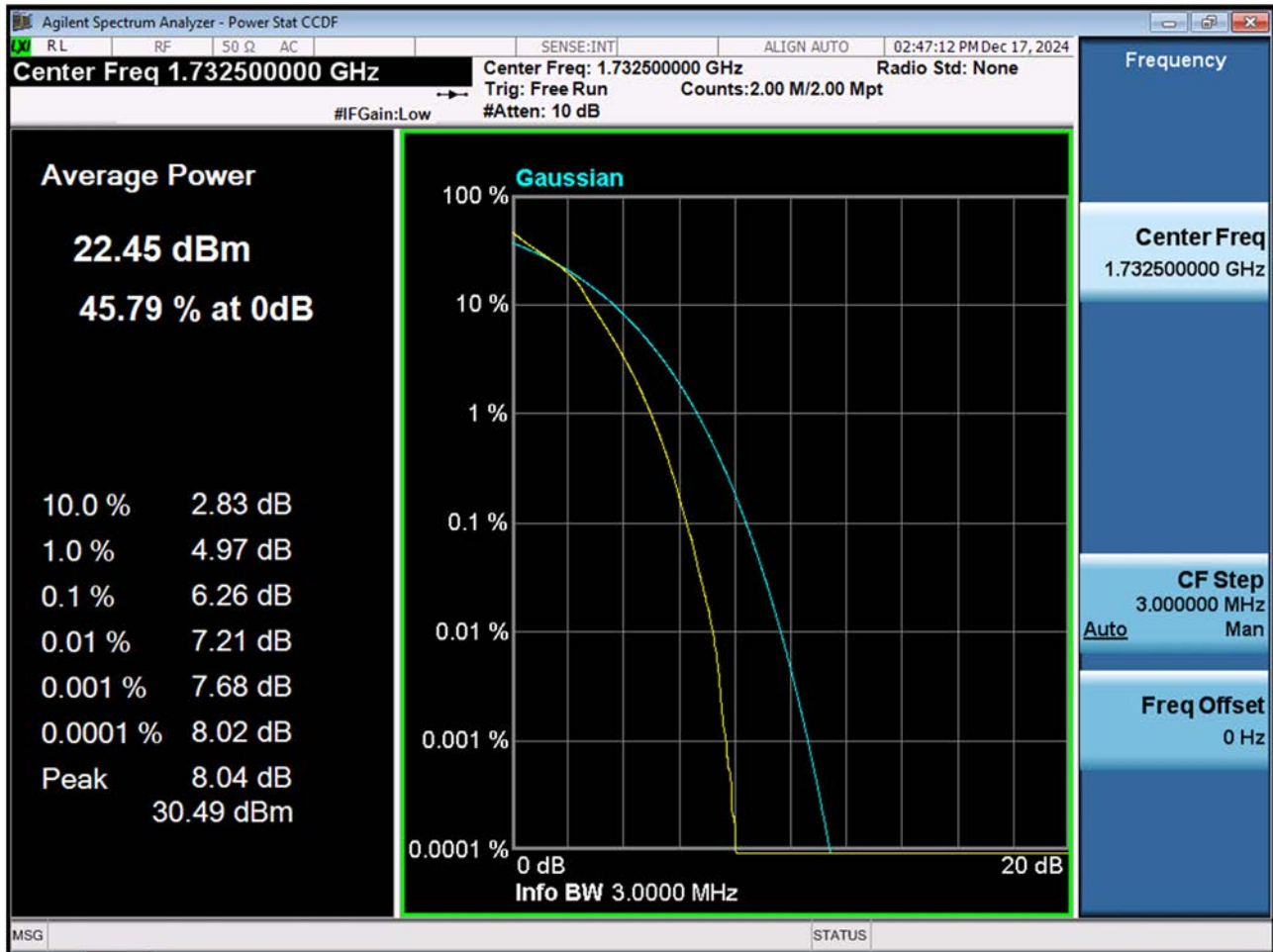
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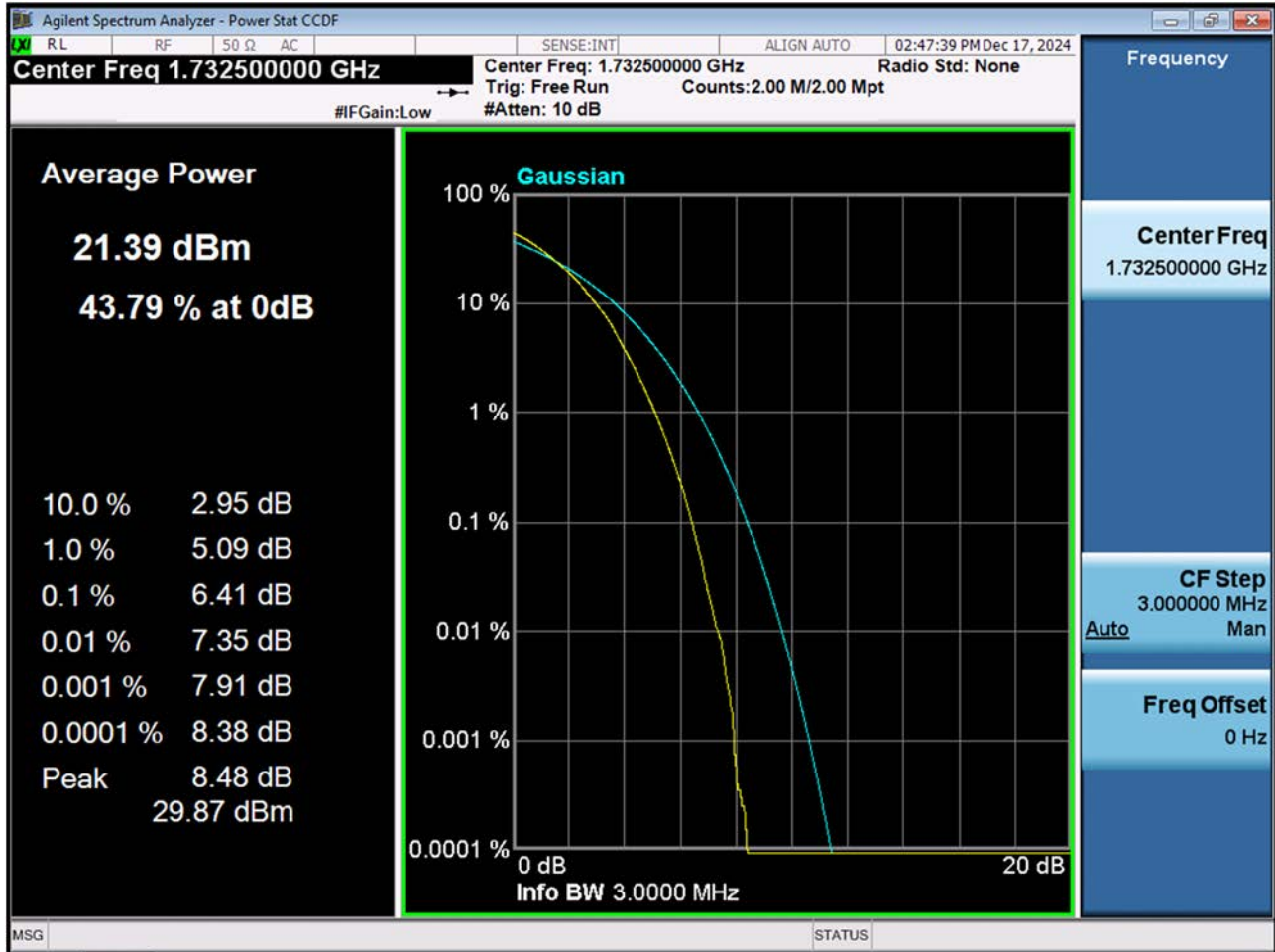
LTE B4_3 M_PAR_Mid_QPSK_FullRB



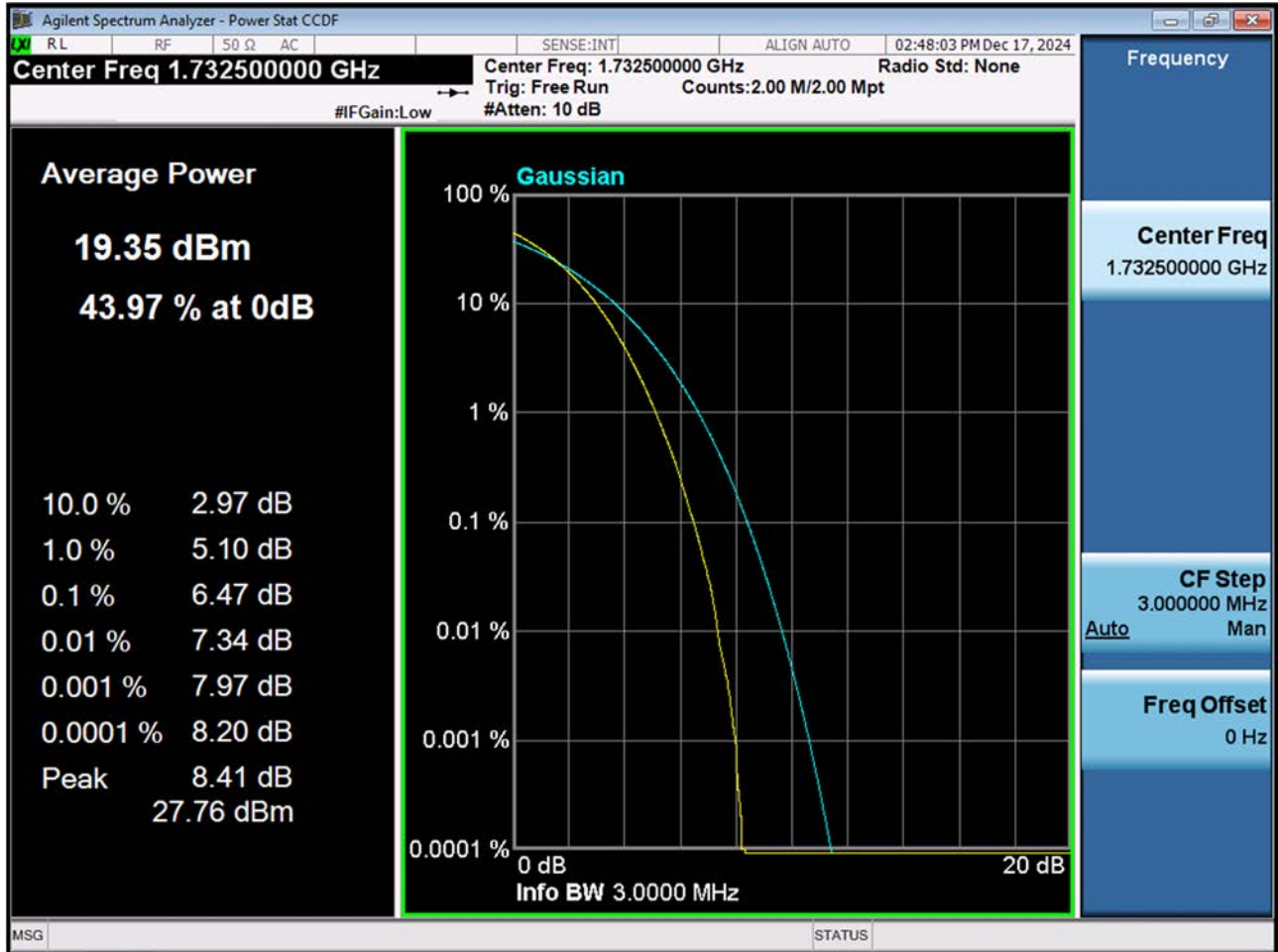
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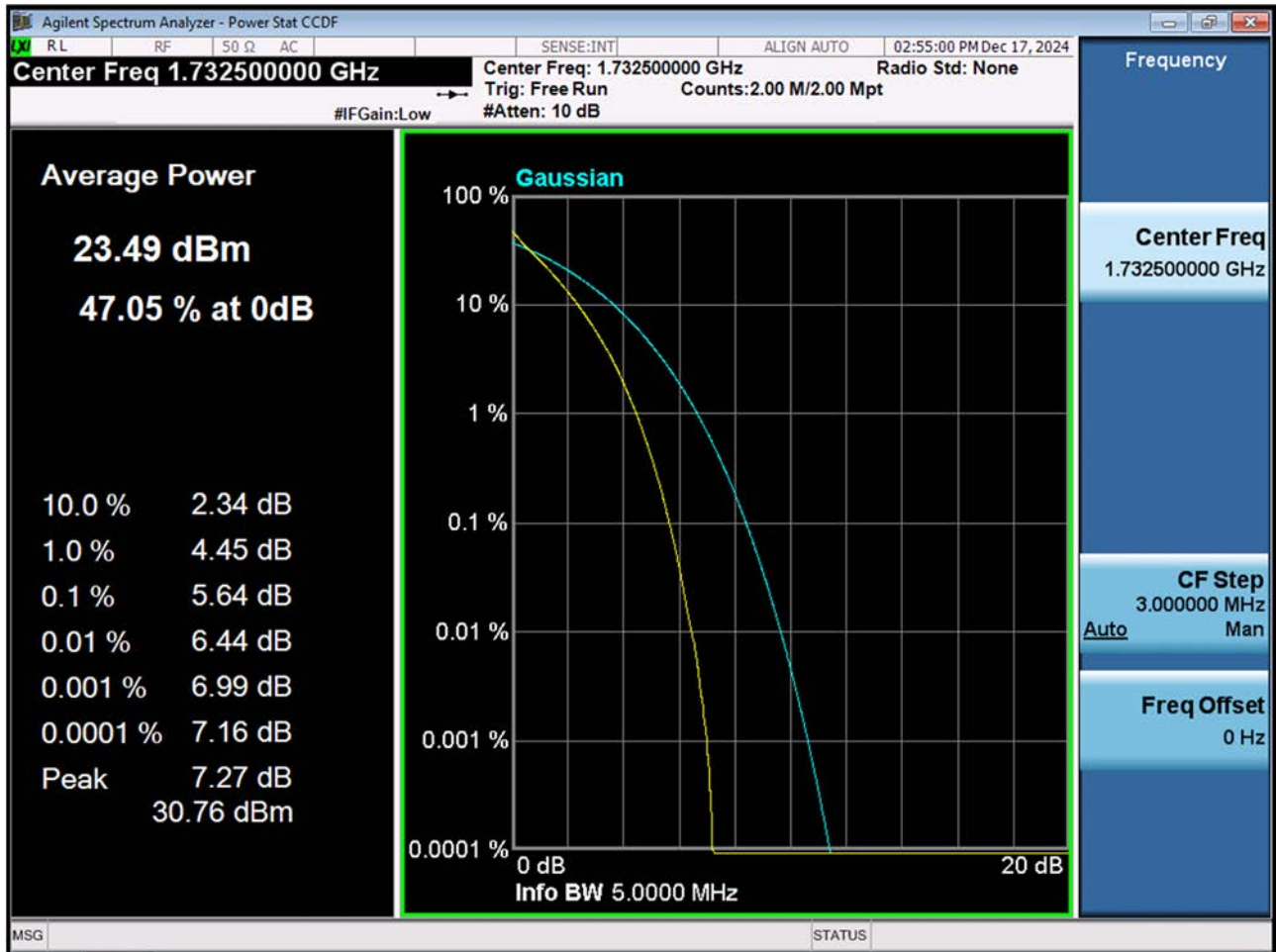
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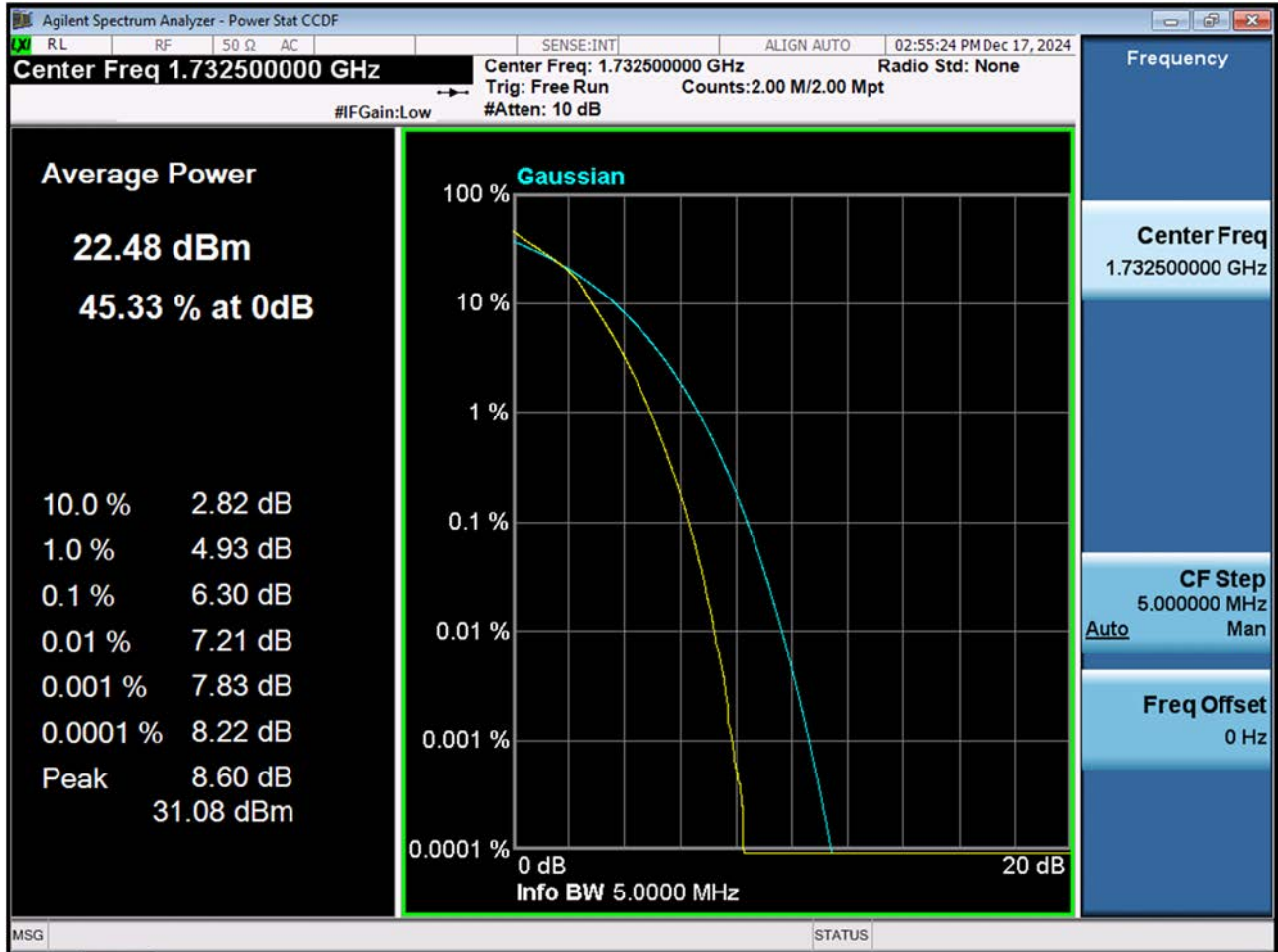
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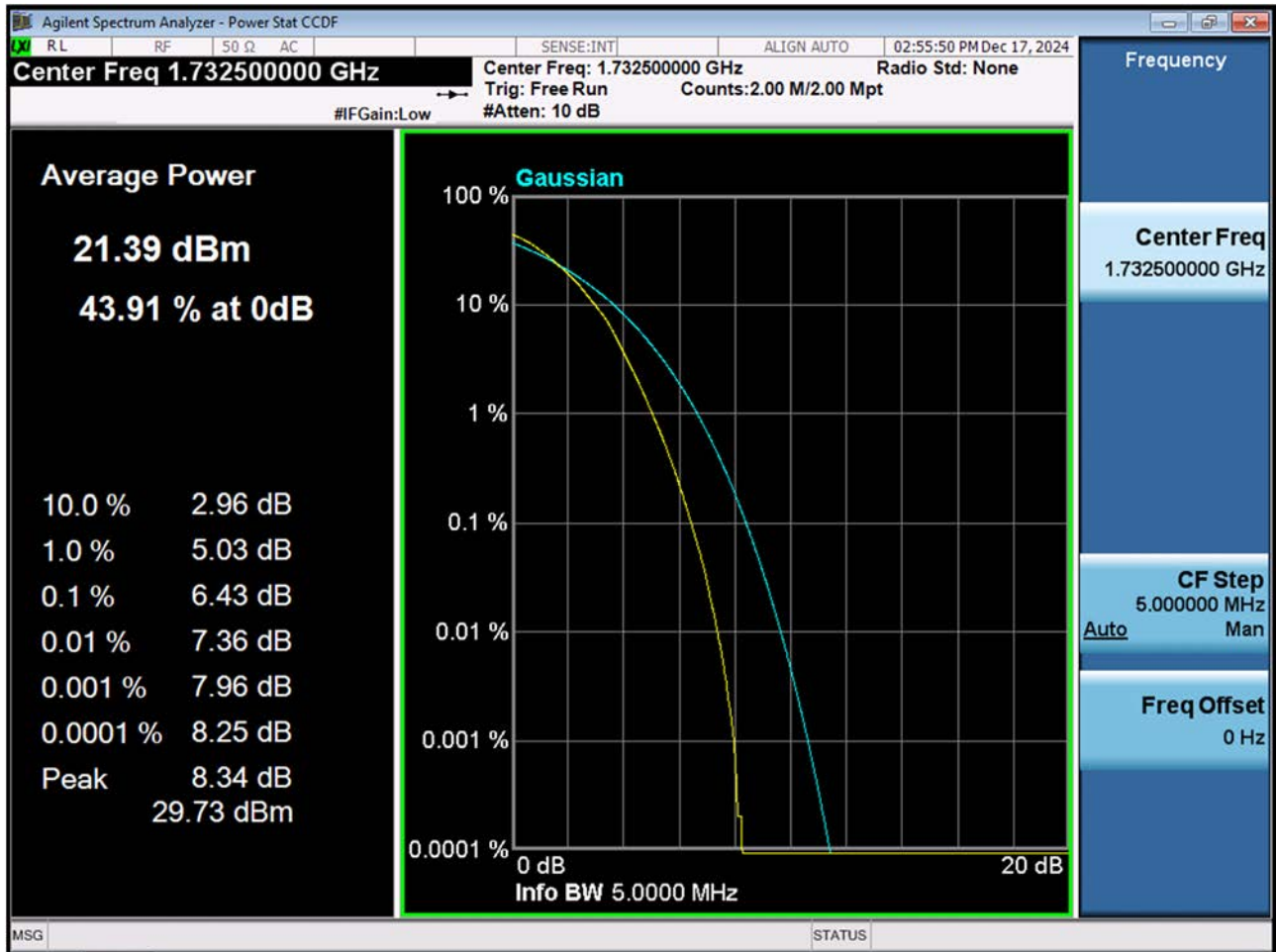
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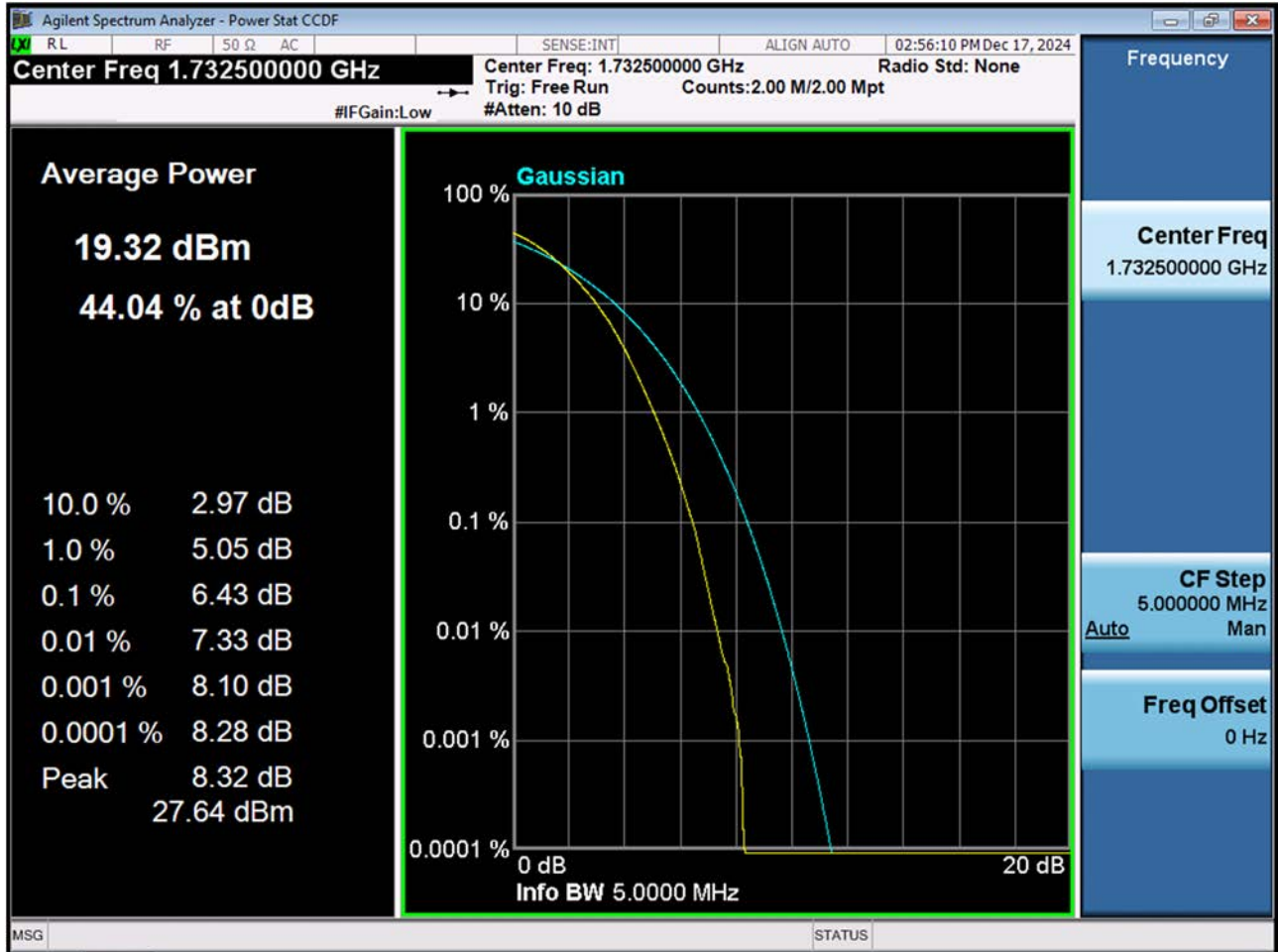
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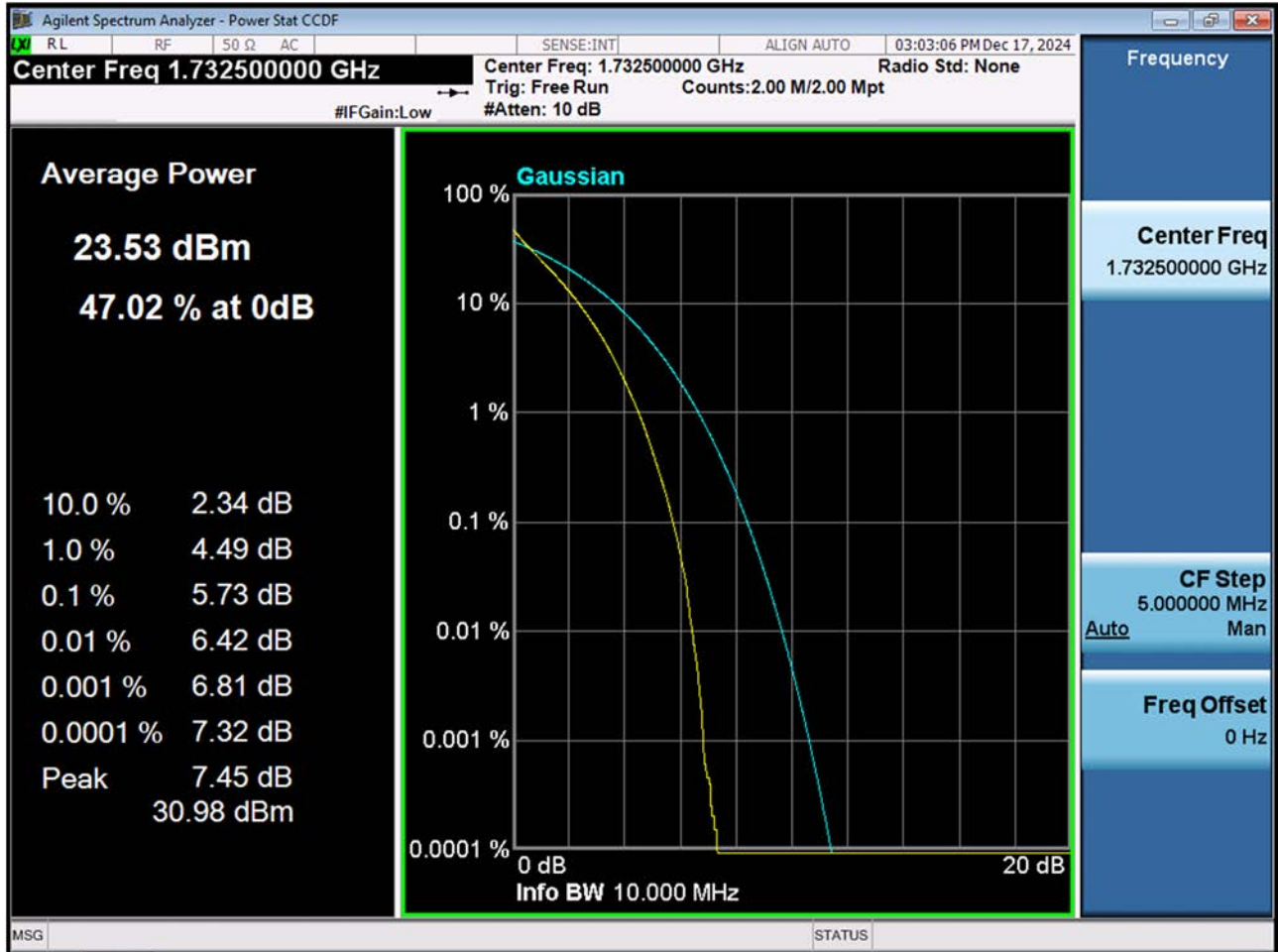
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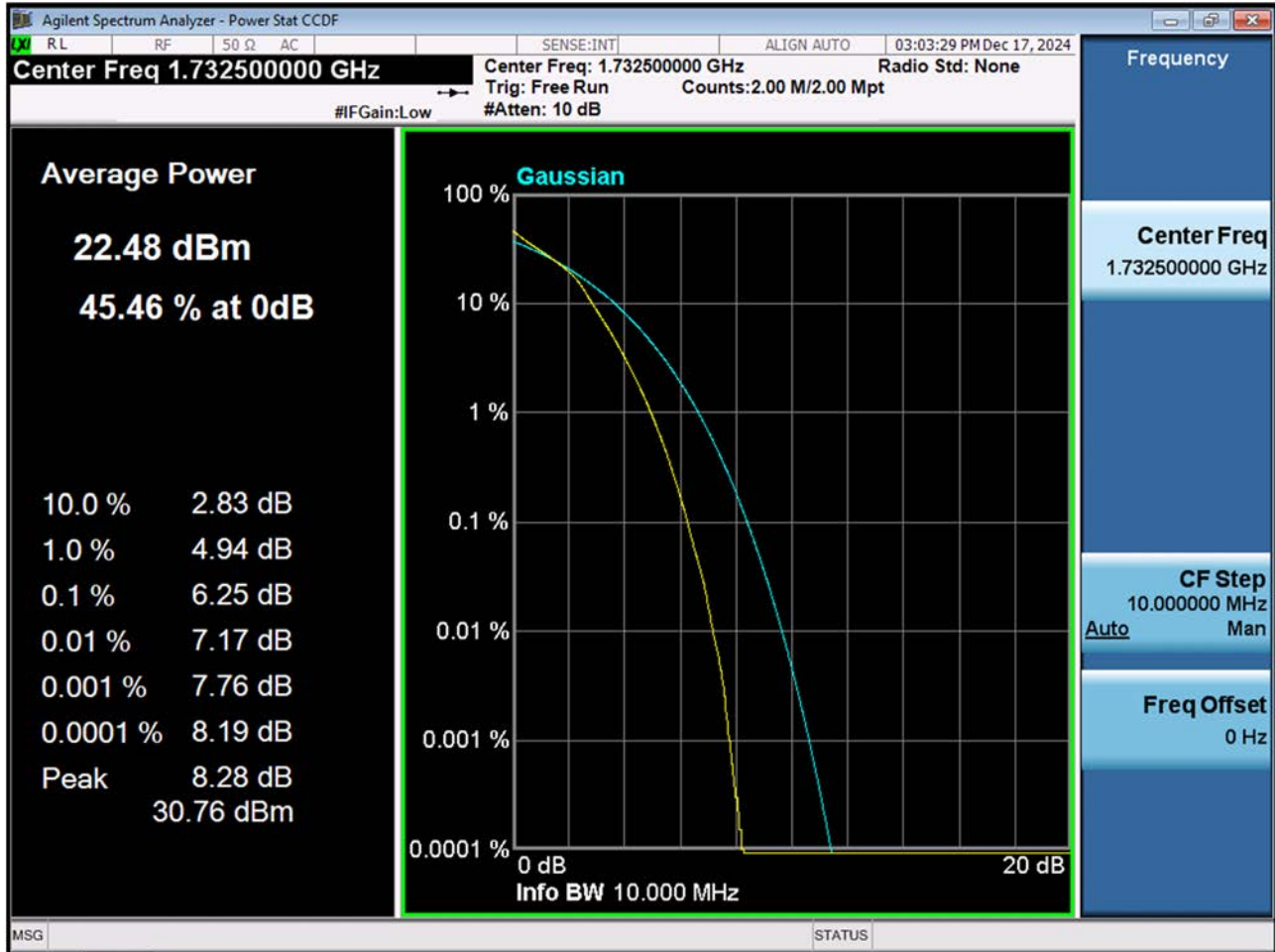
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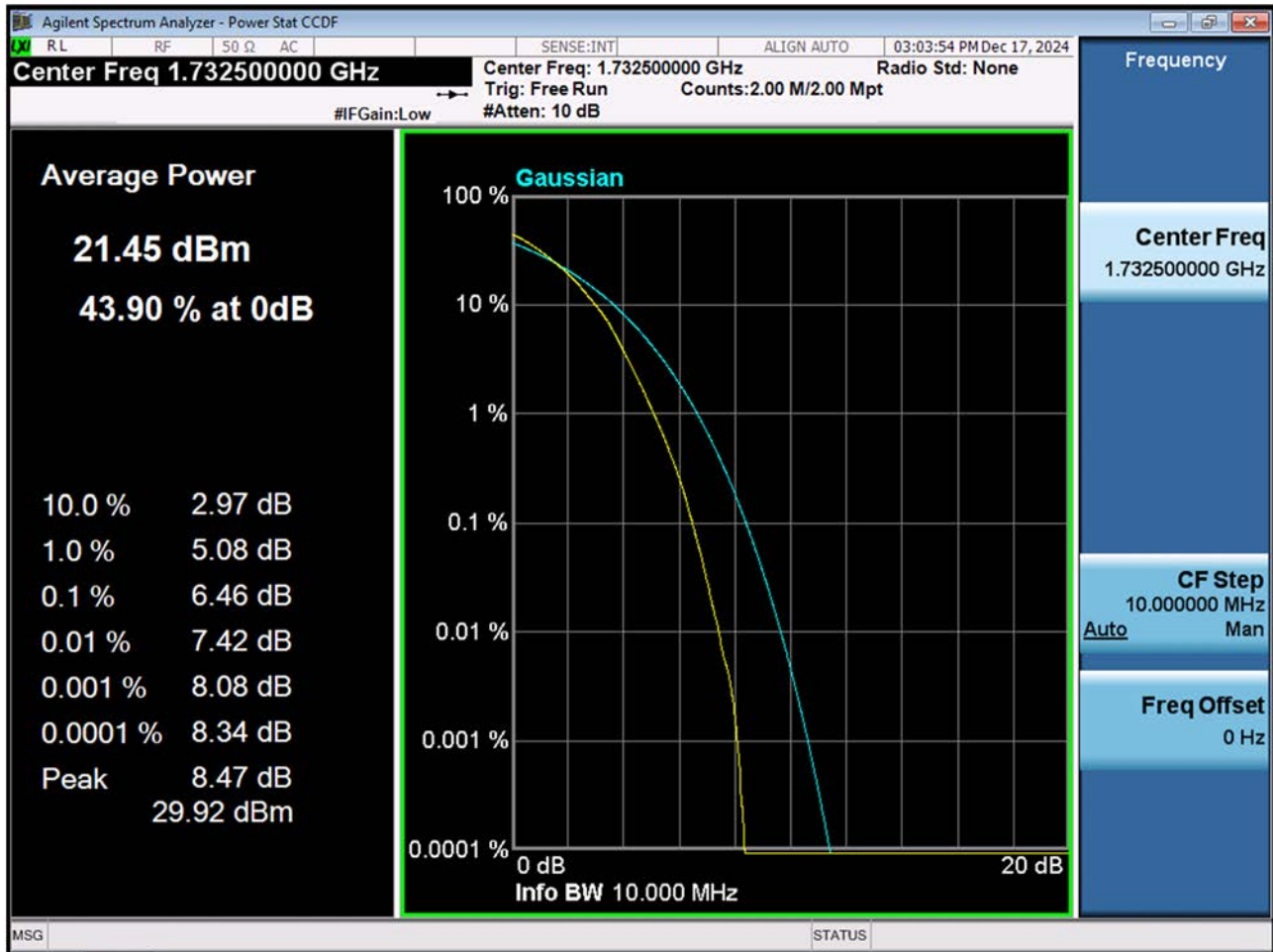
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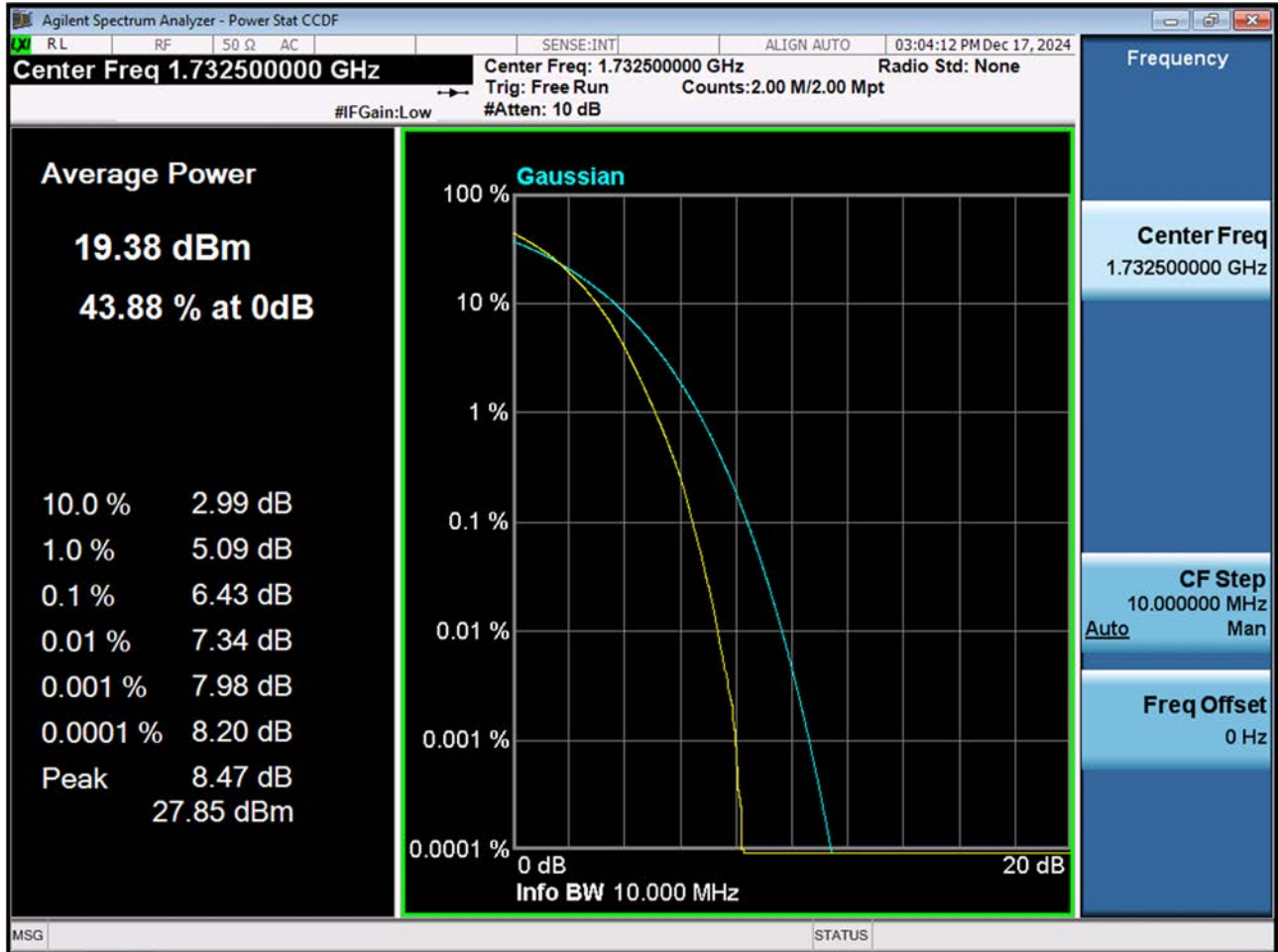
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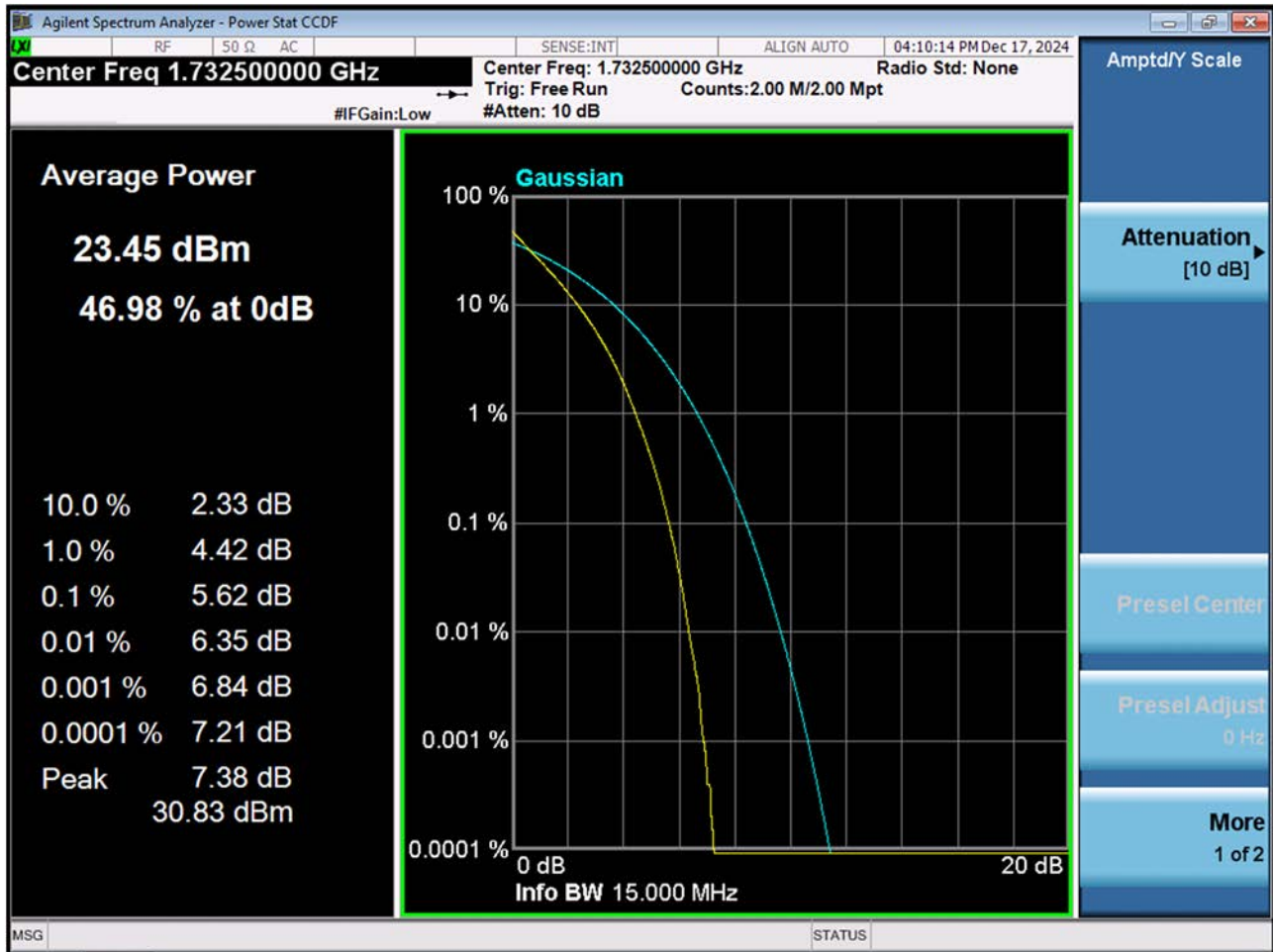
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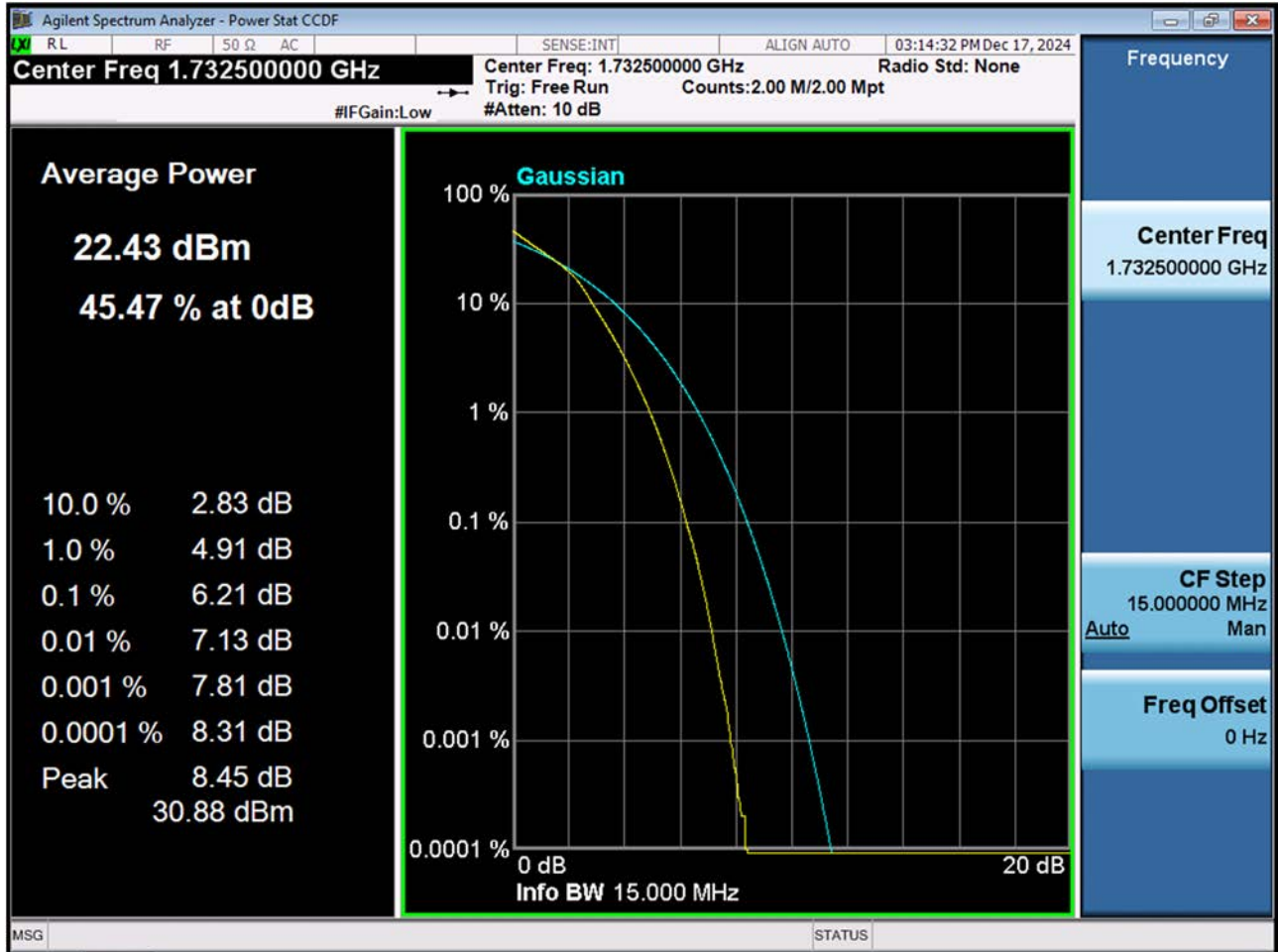
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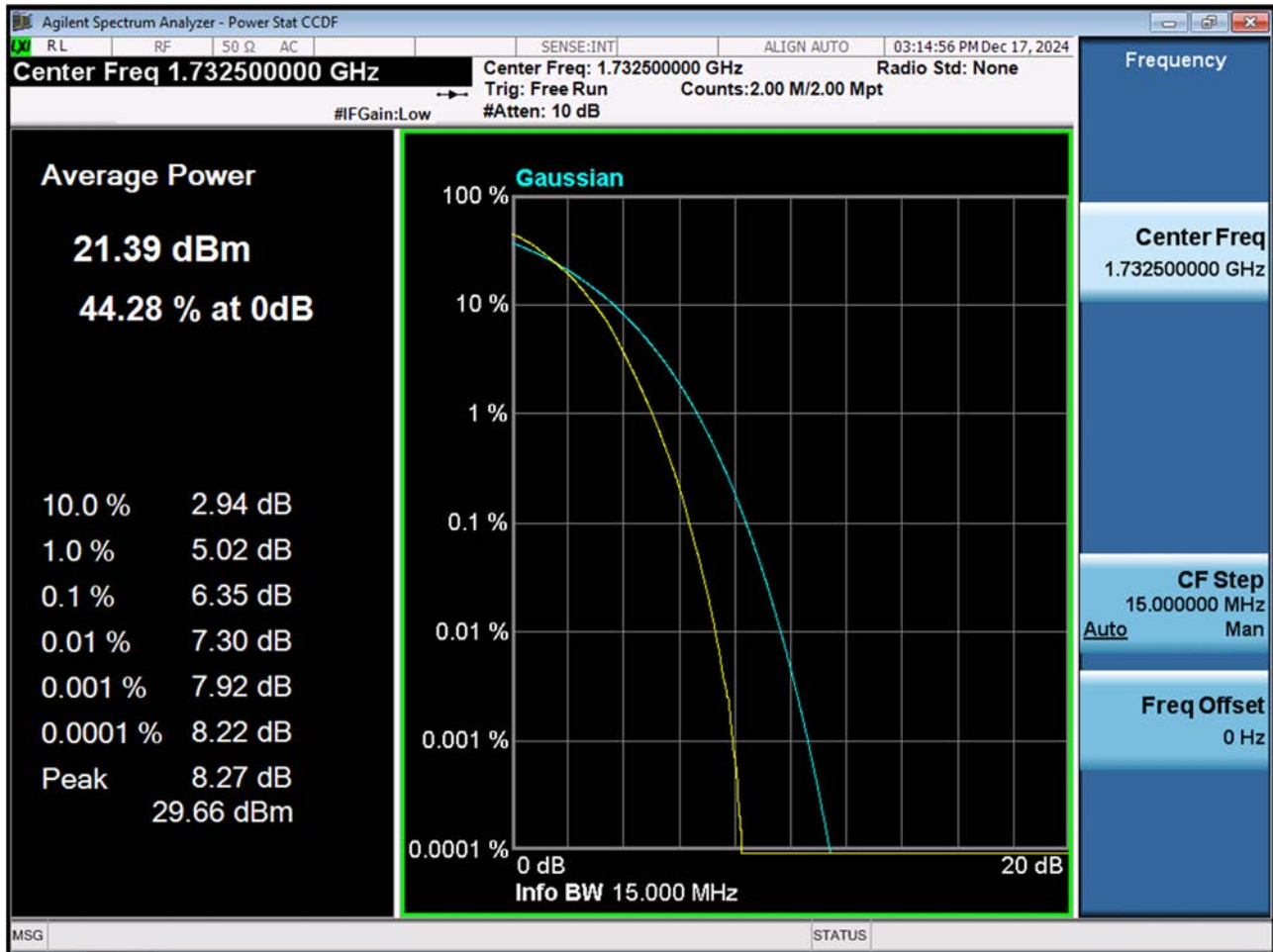
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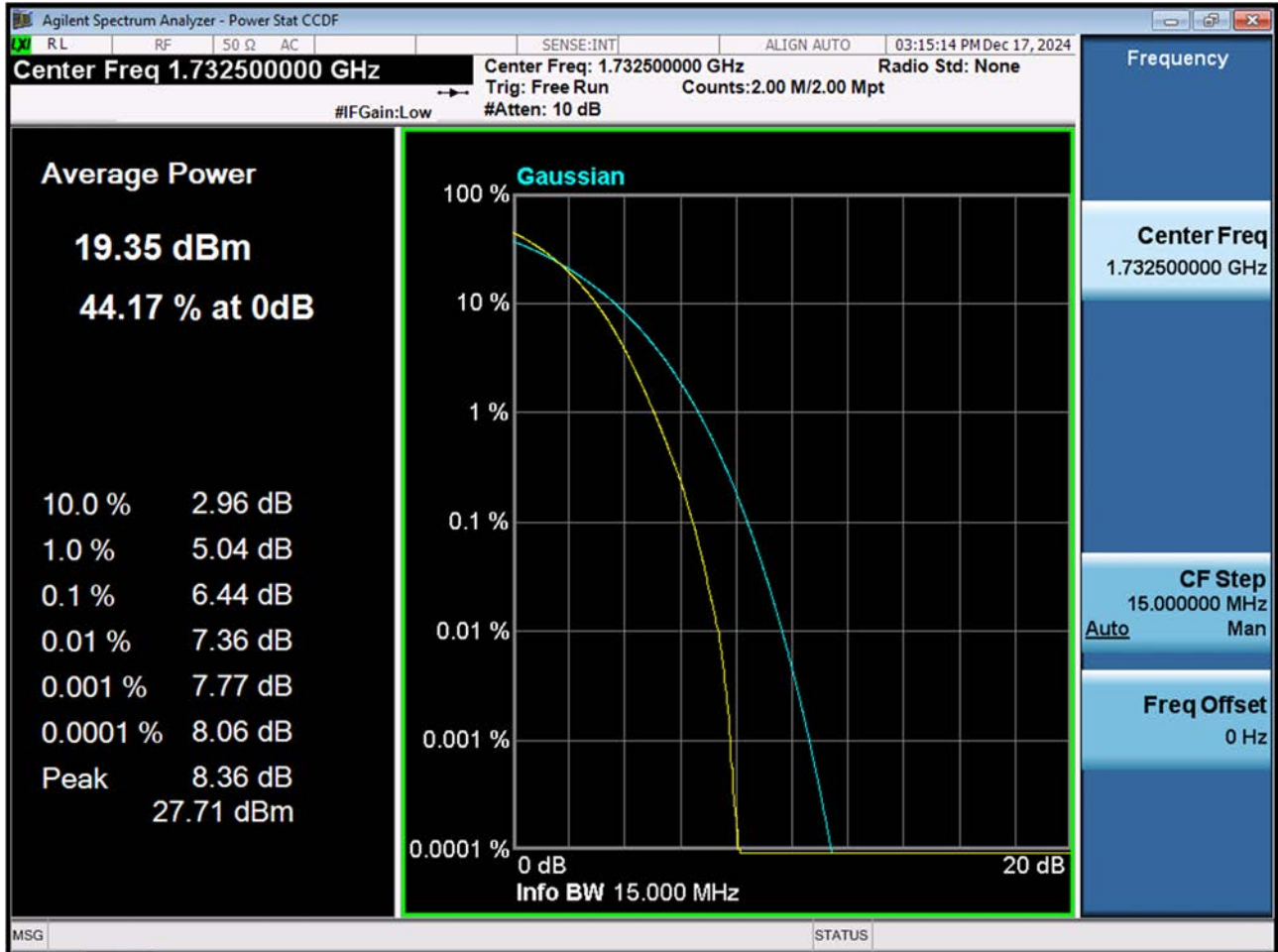
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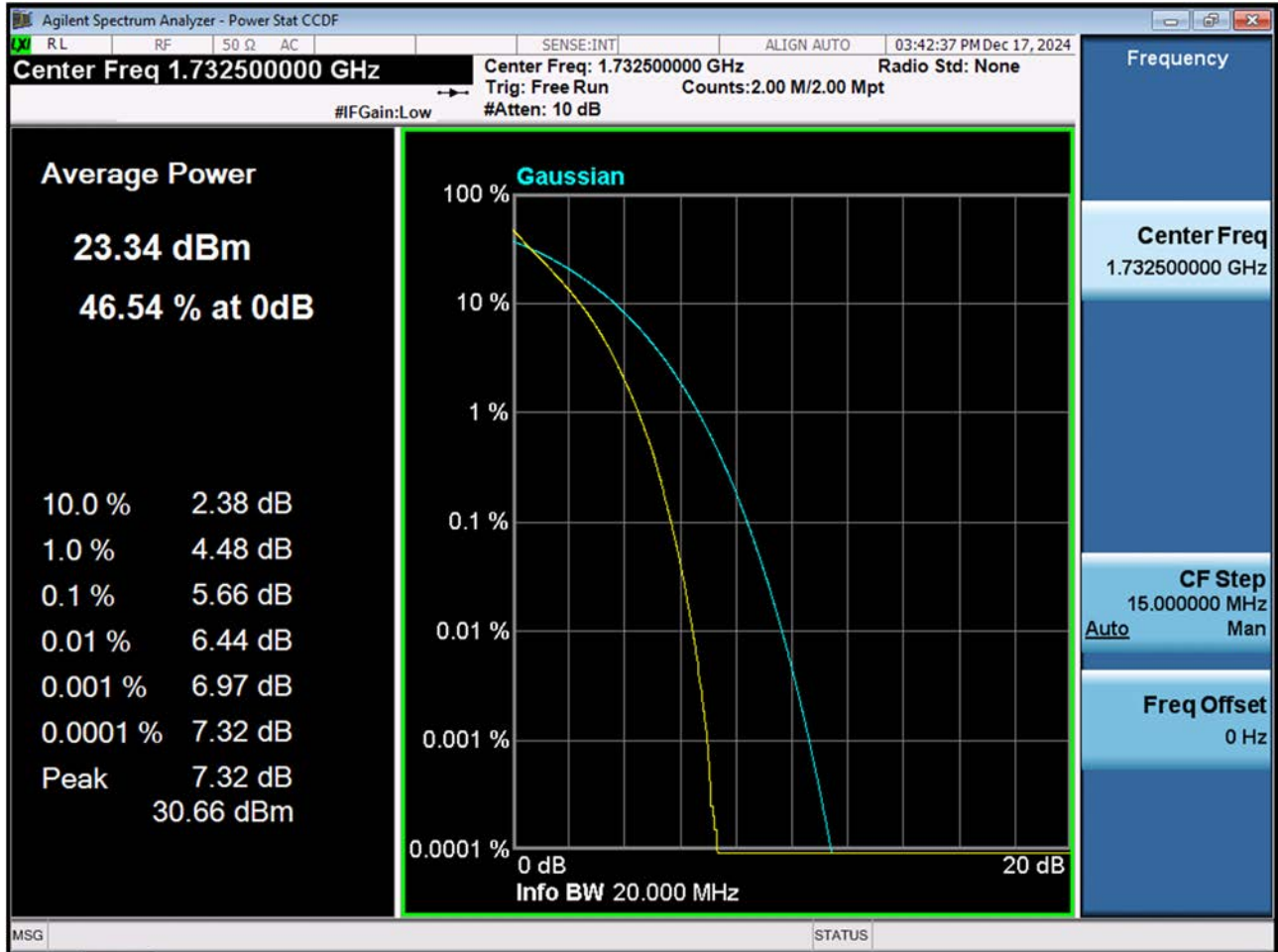
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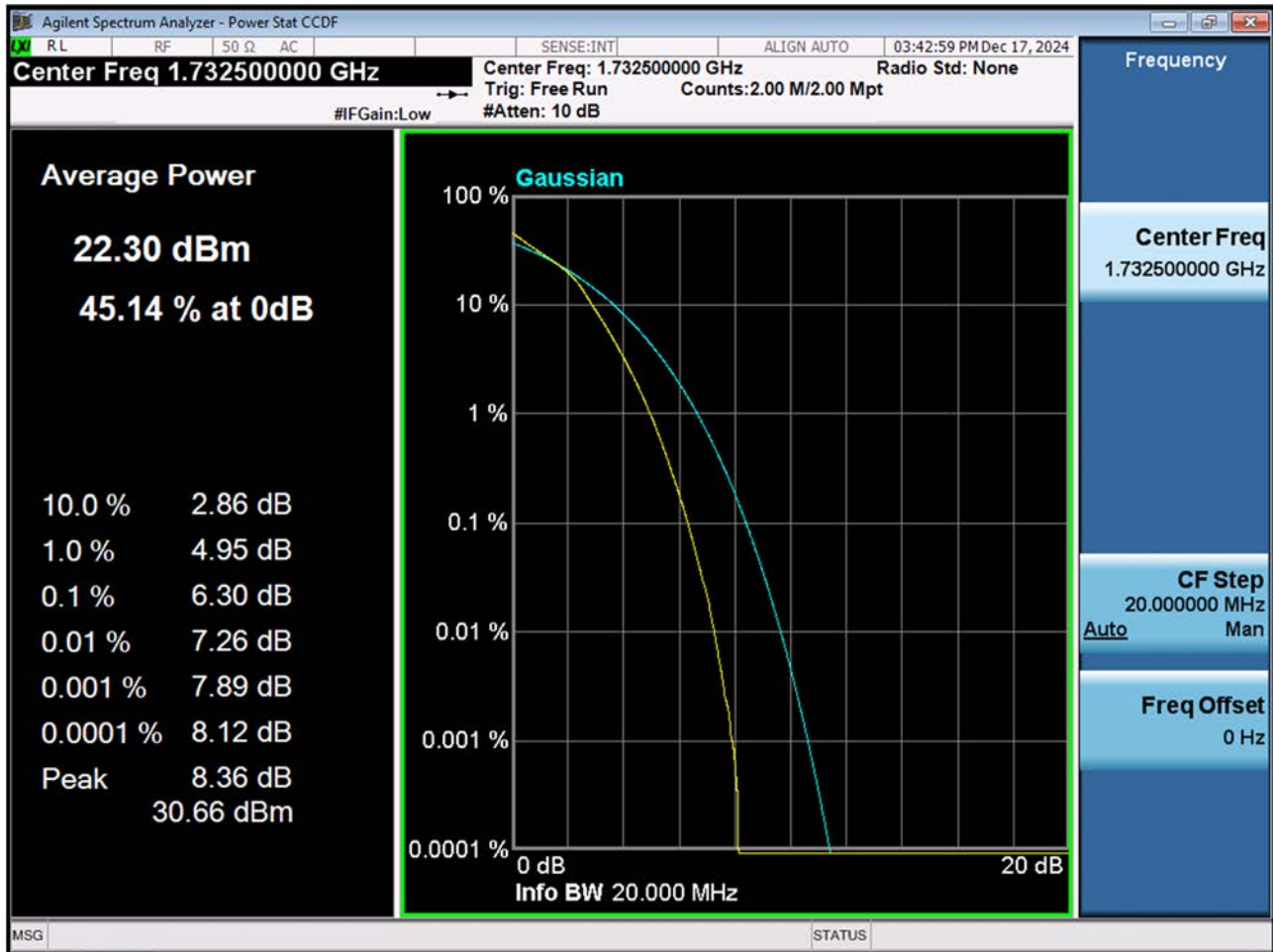
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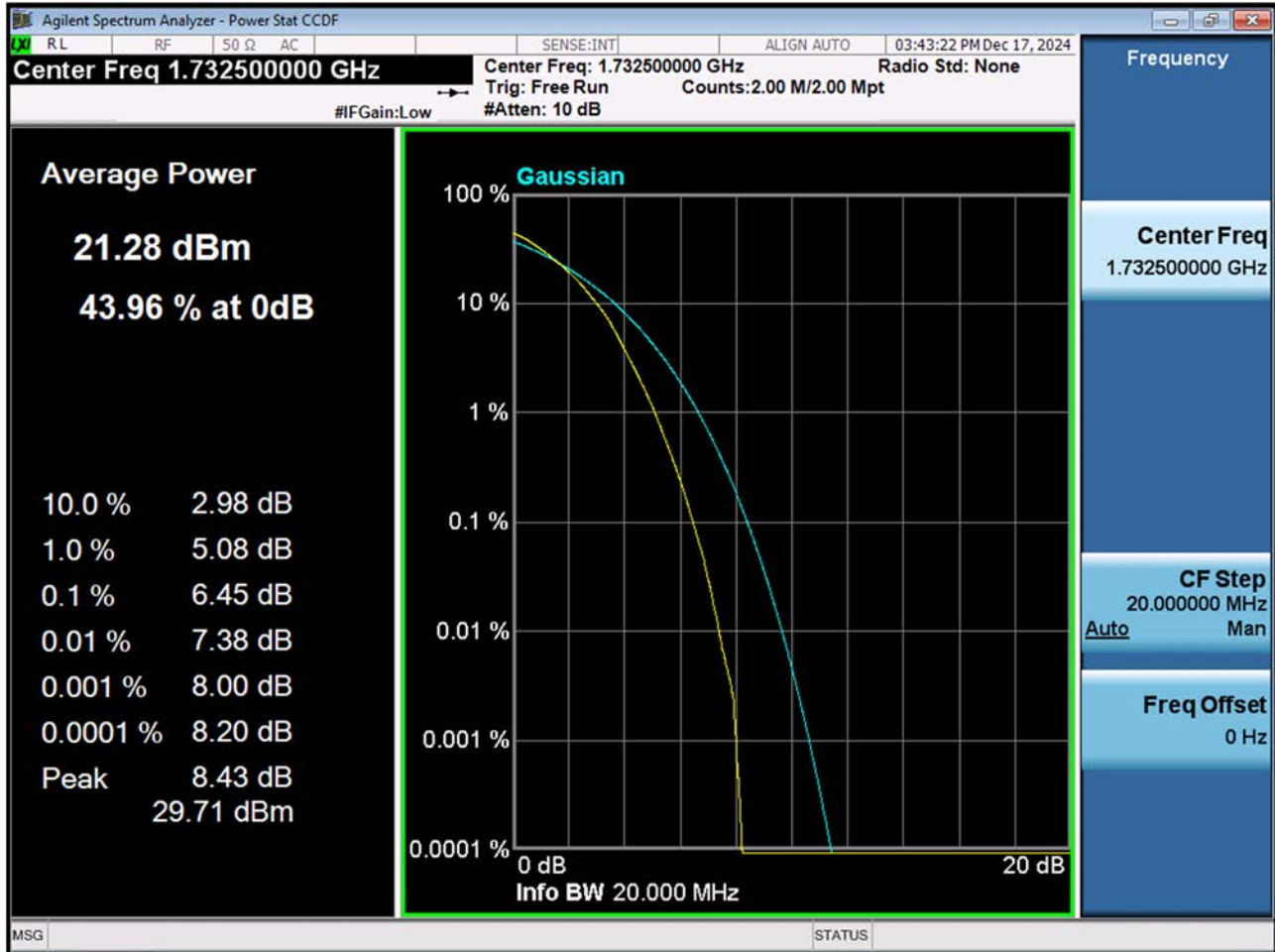
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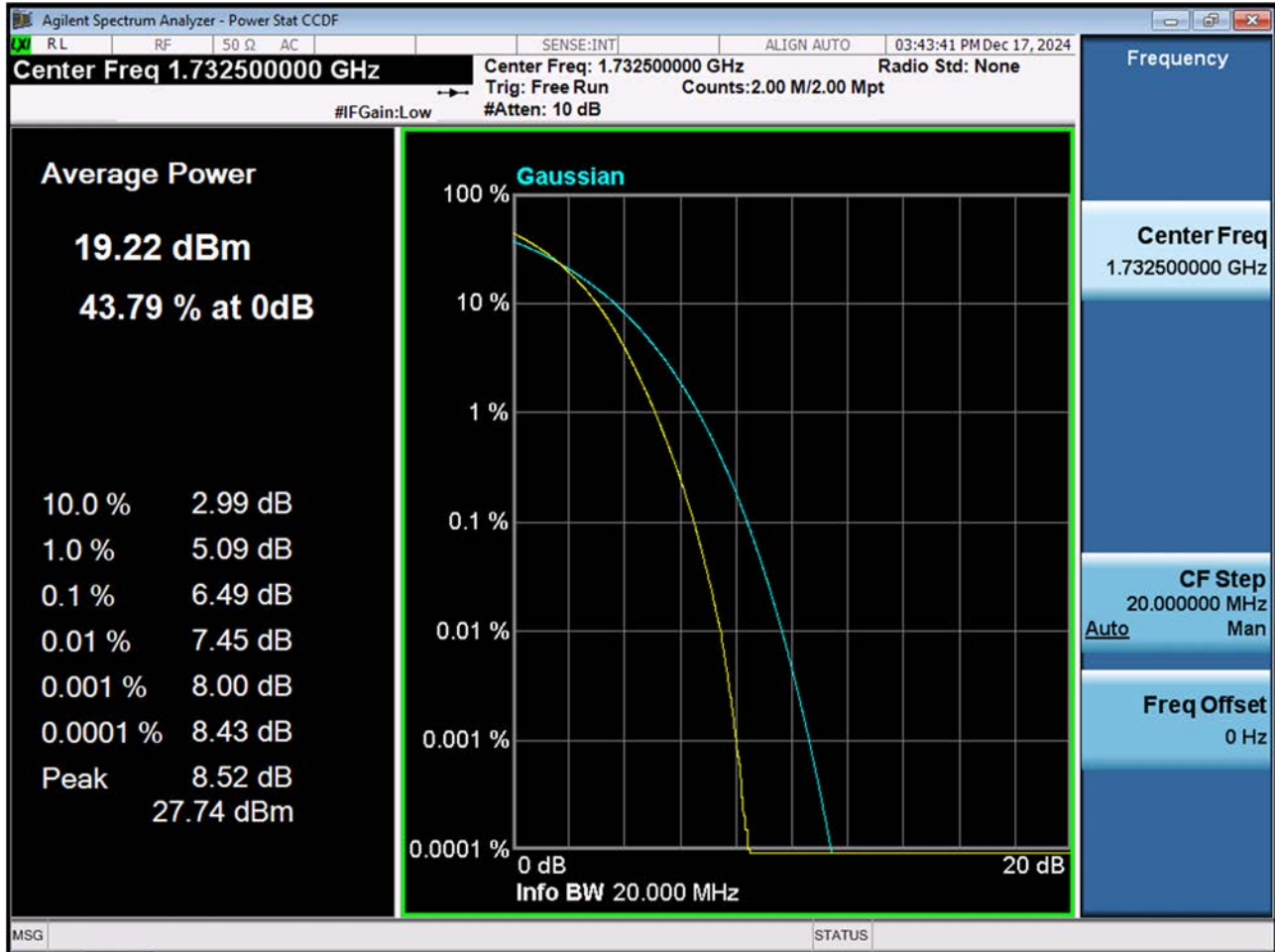
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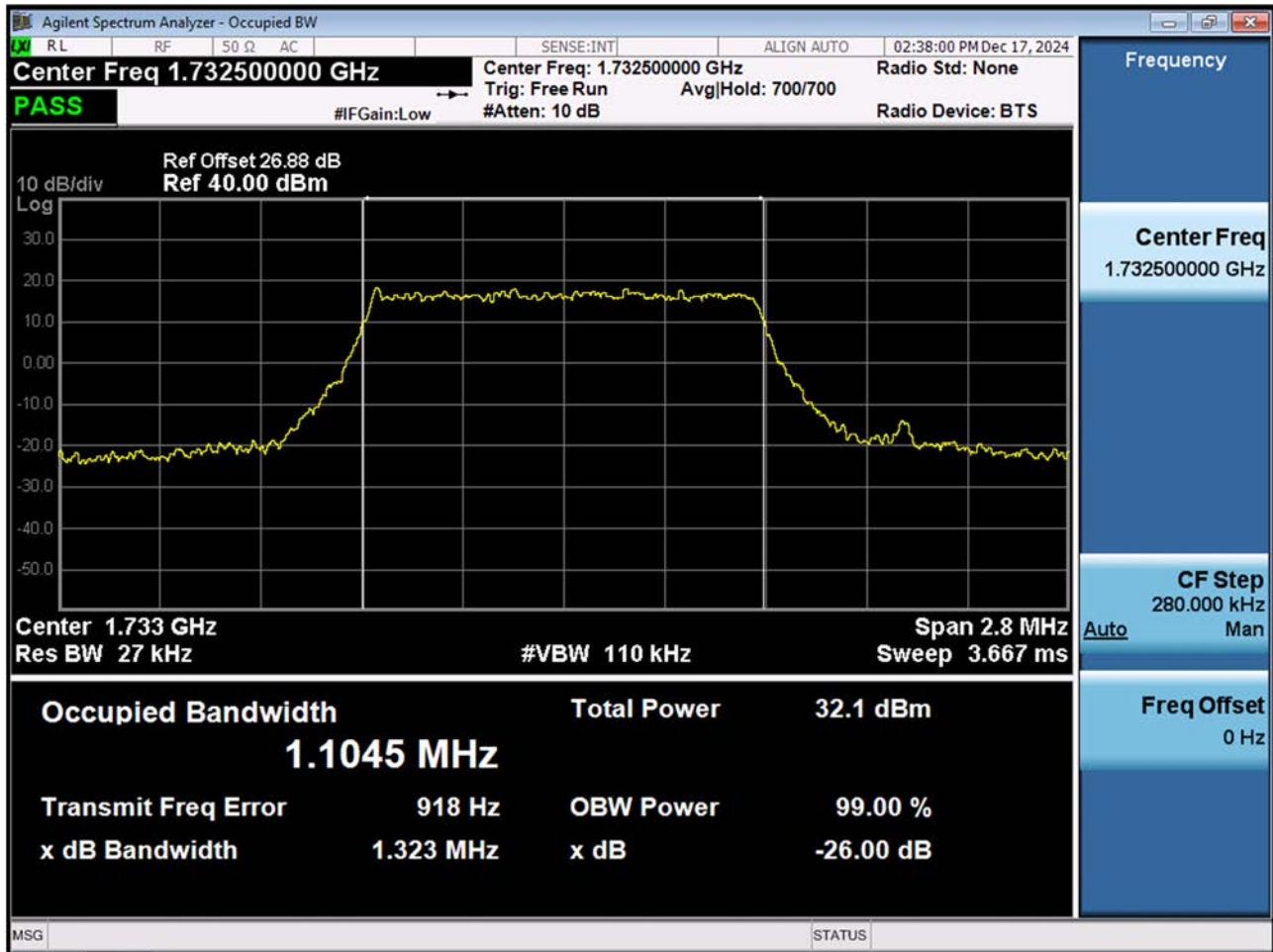
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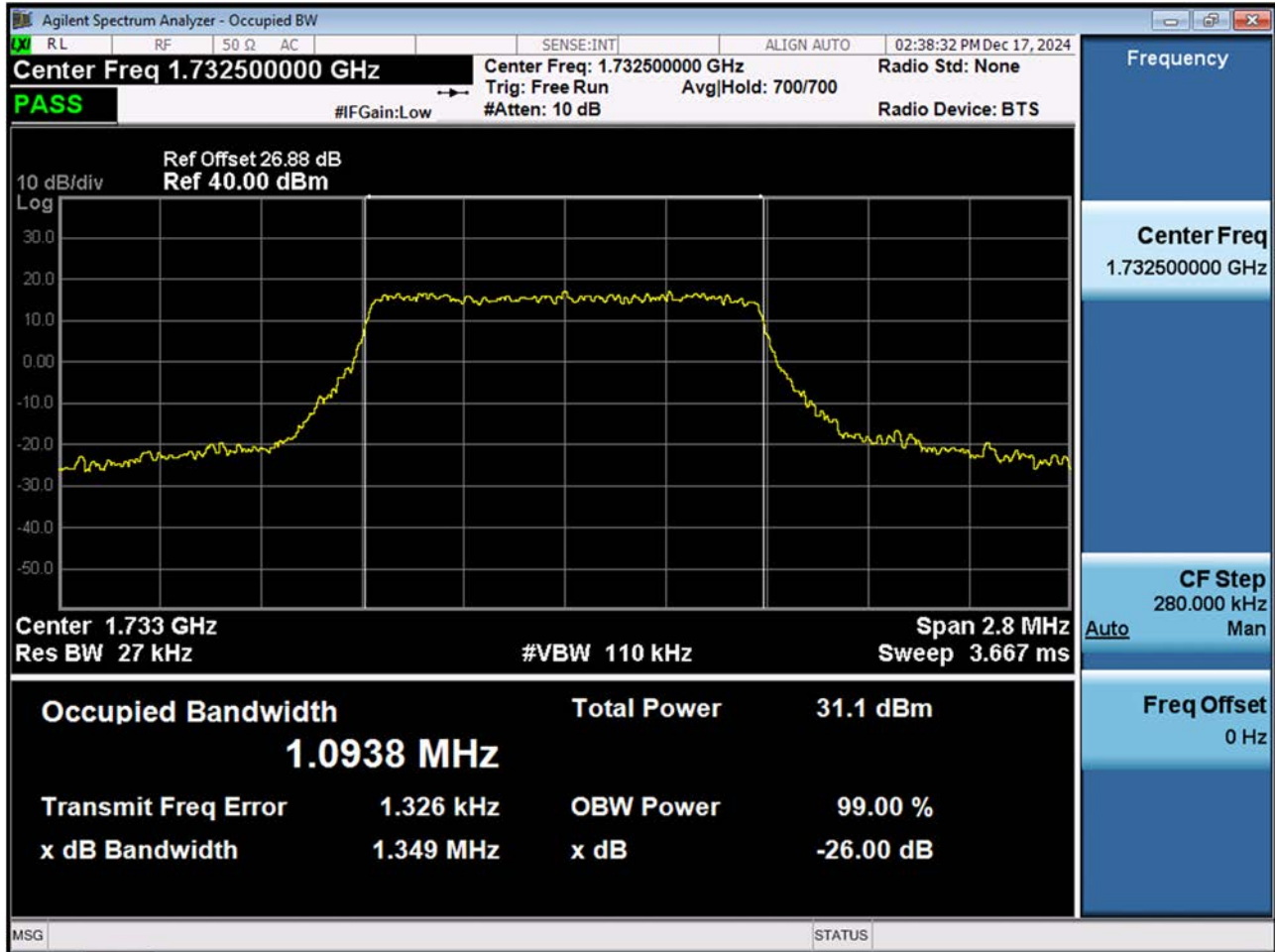
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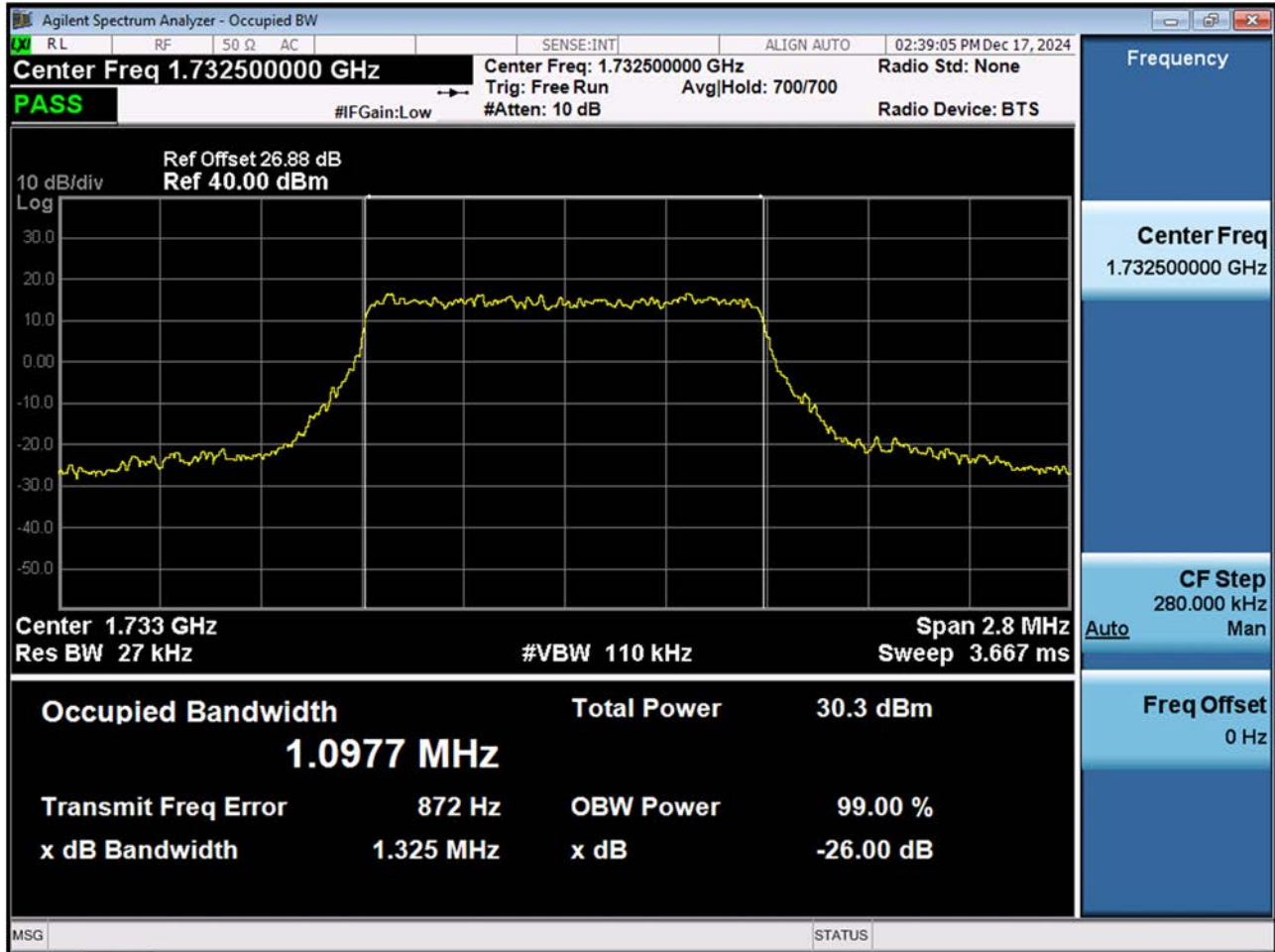
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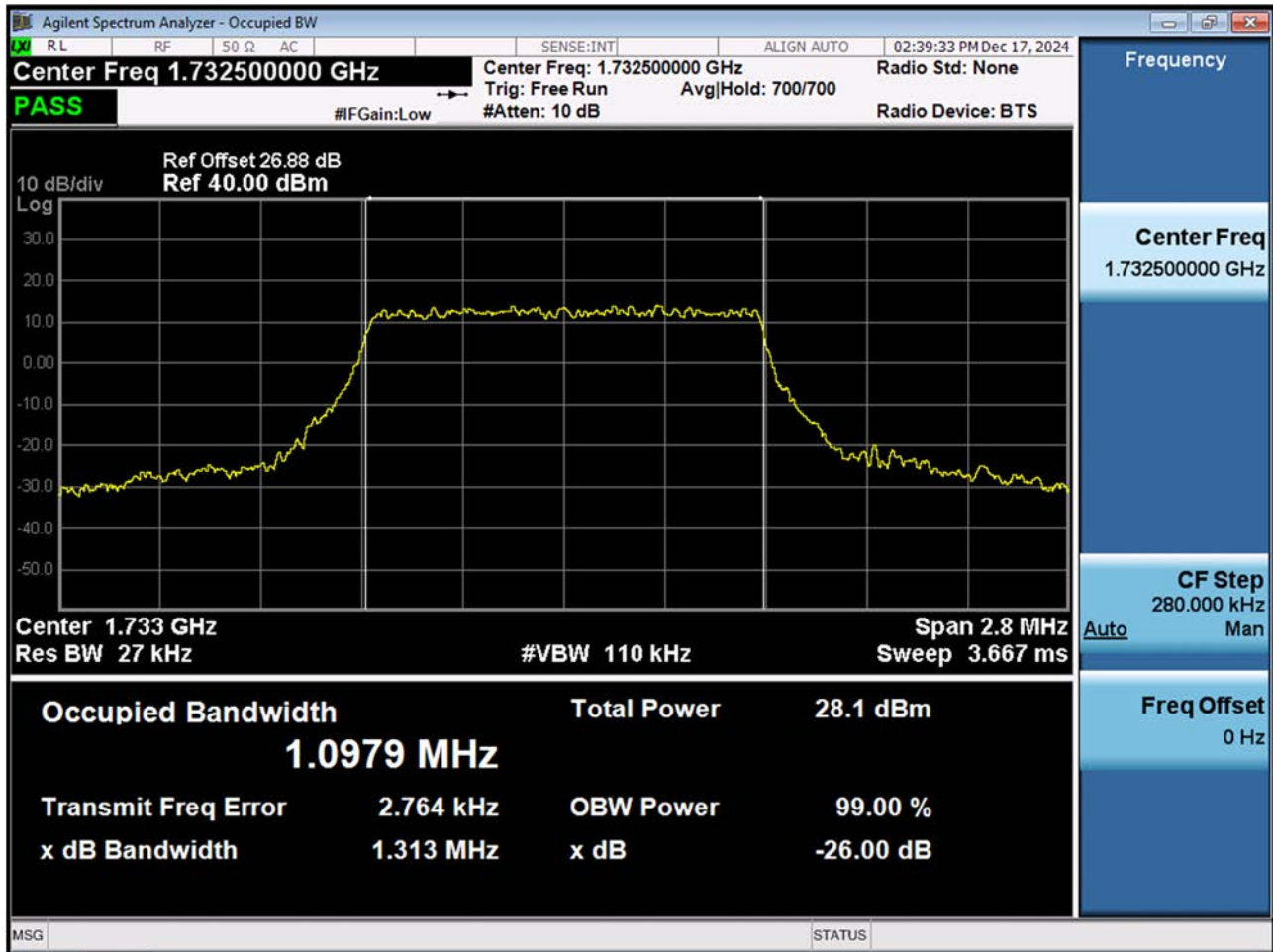
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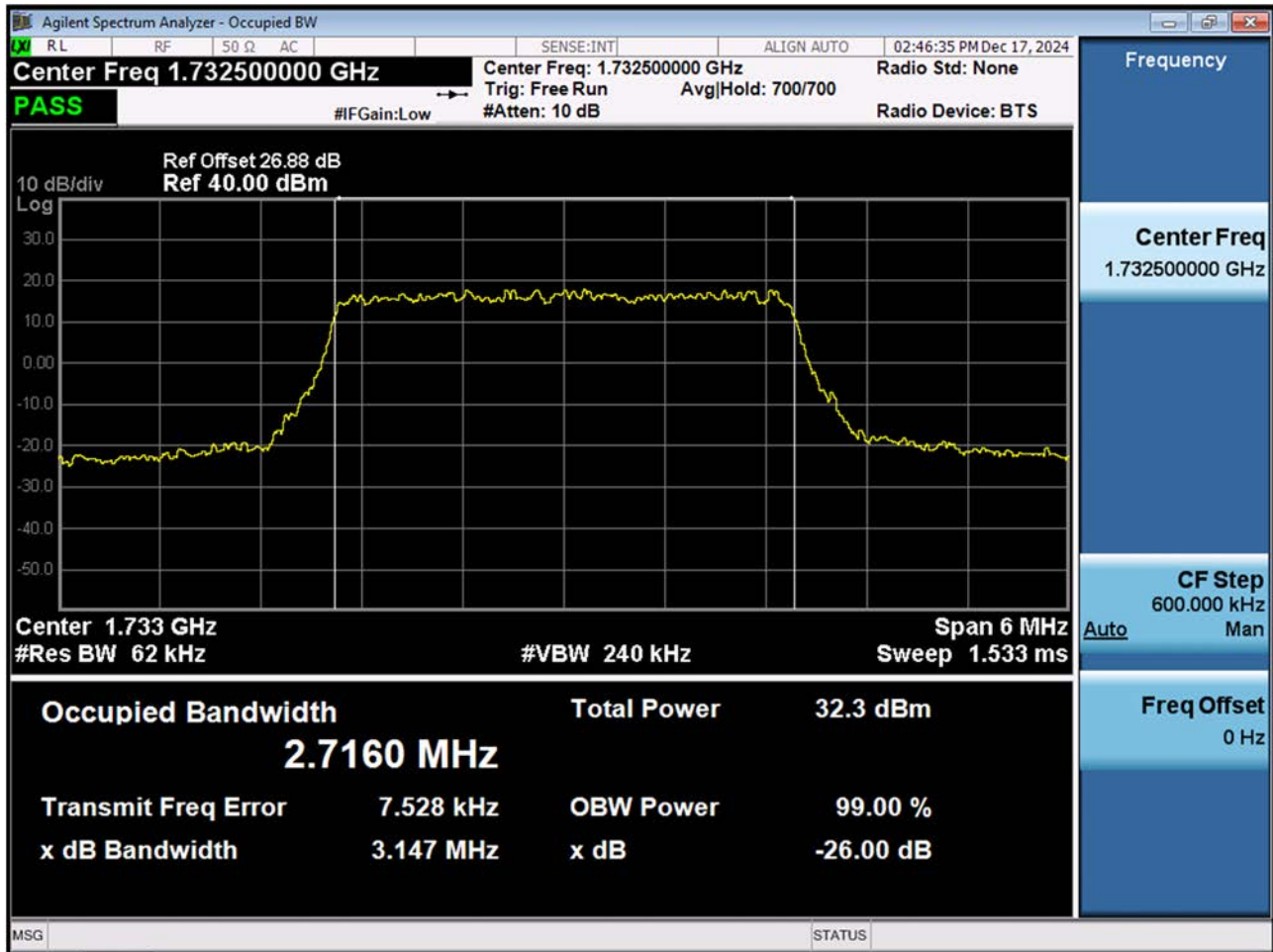
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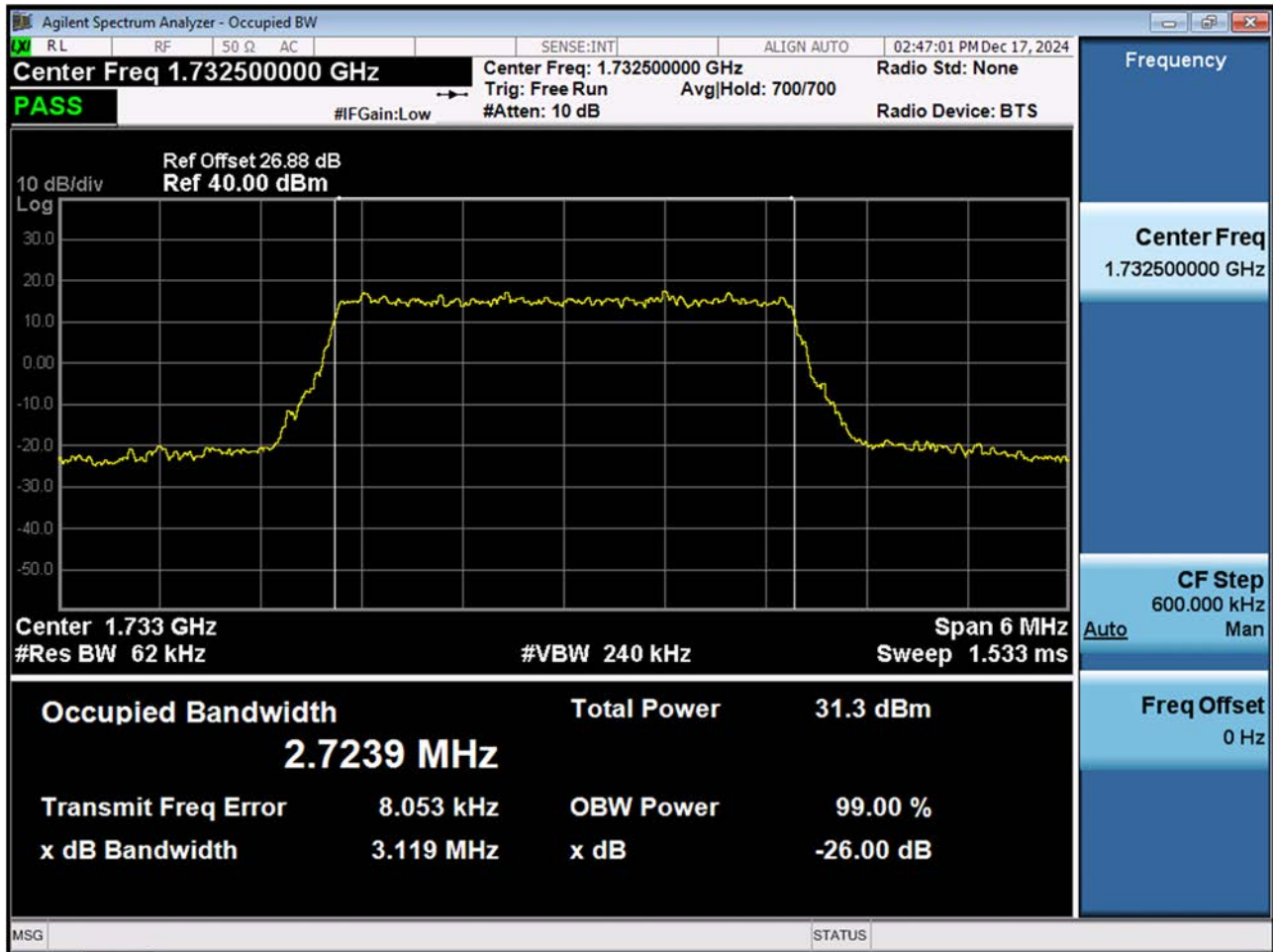
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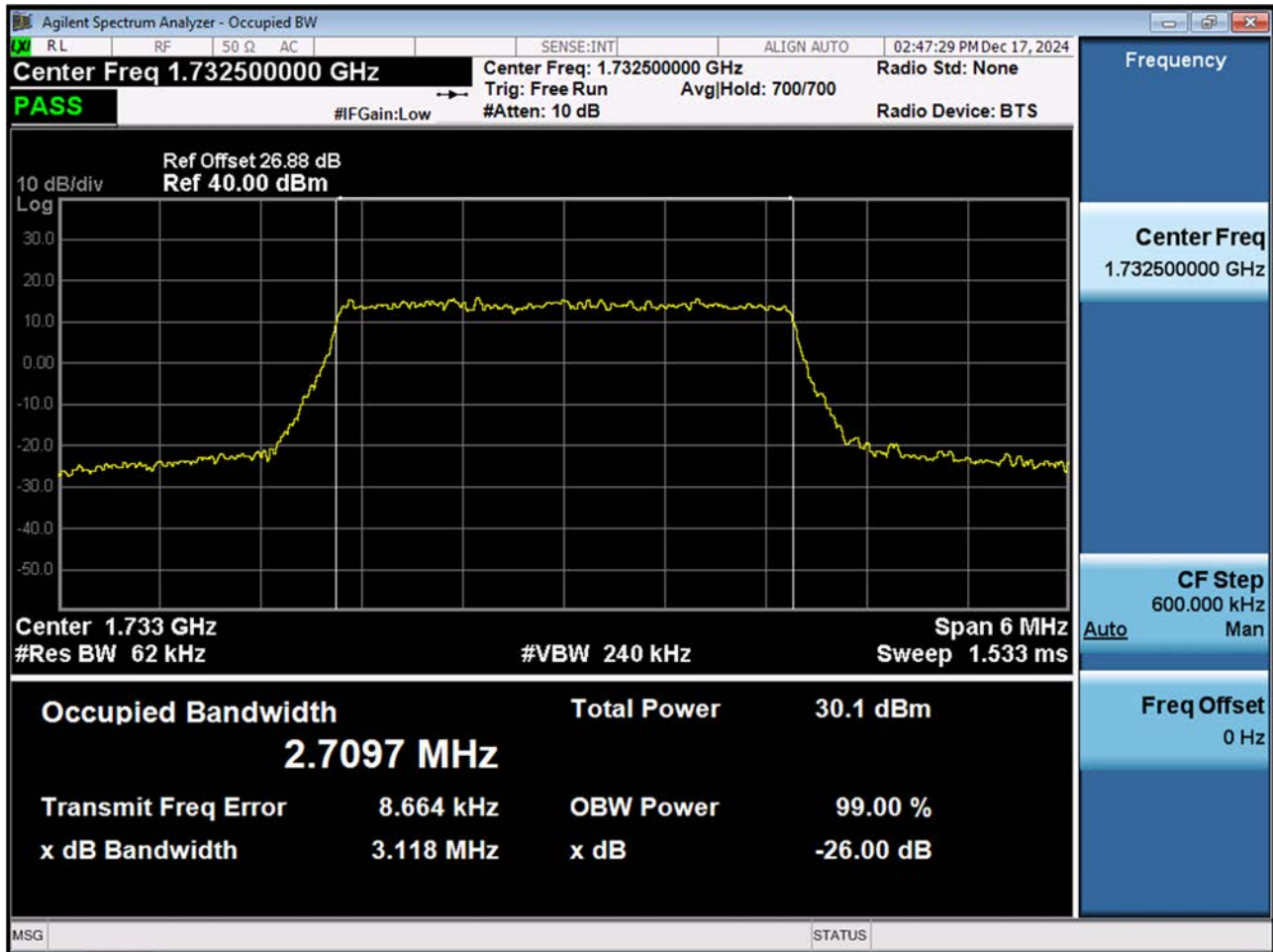
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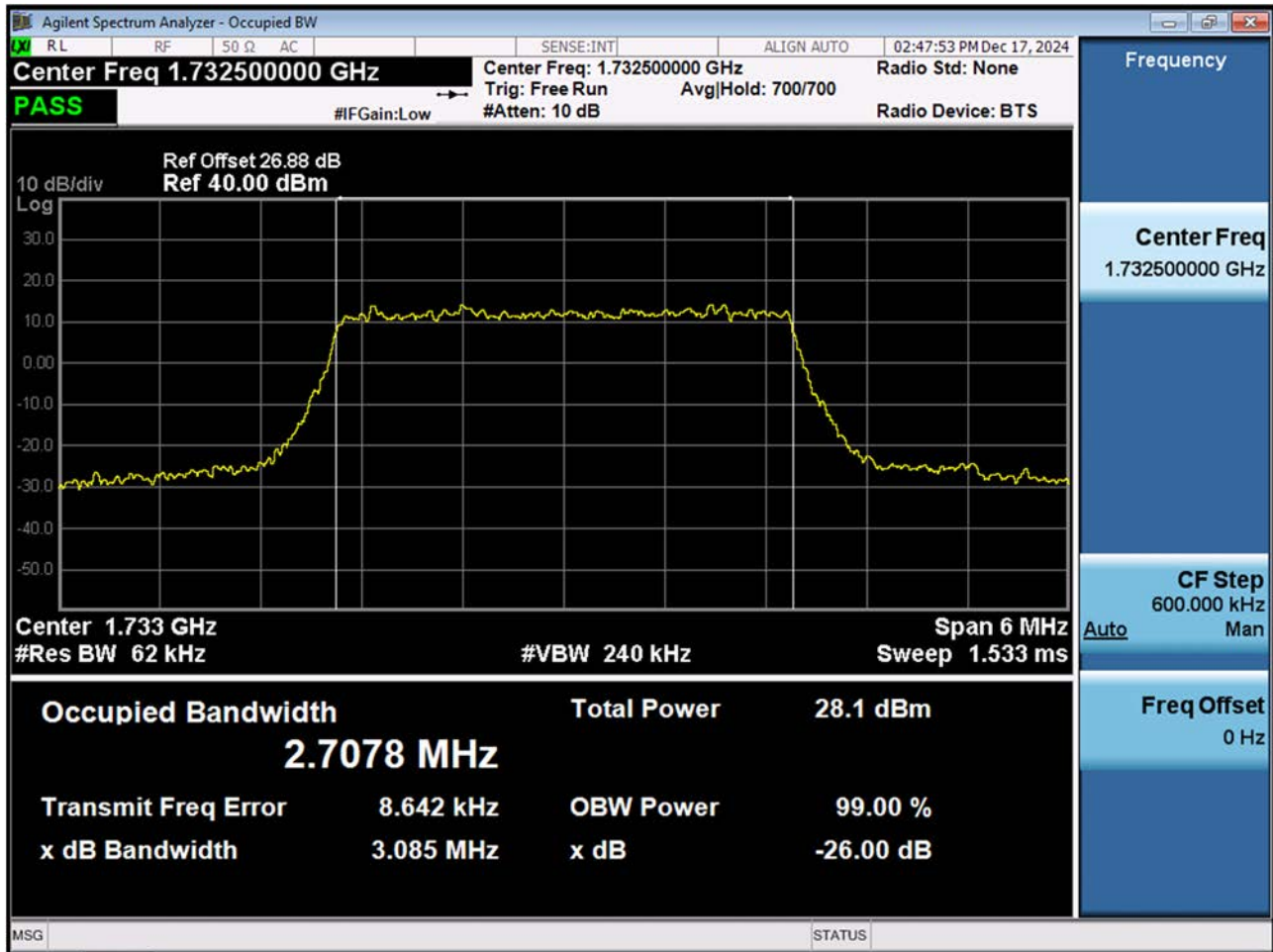
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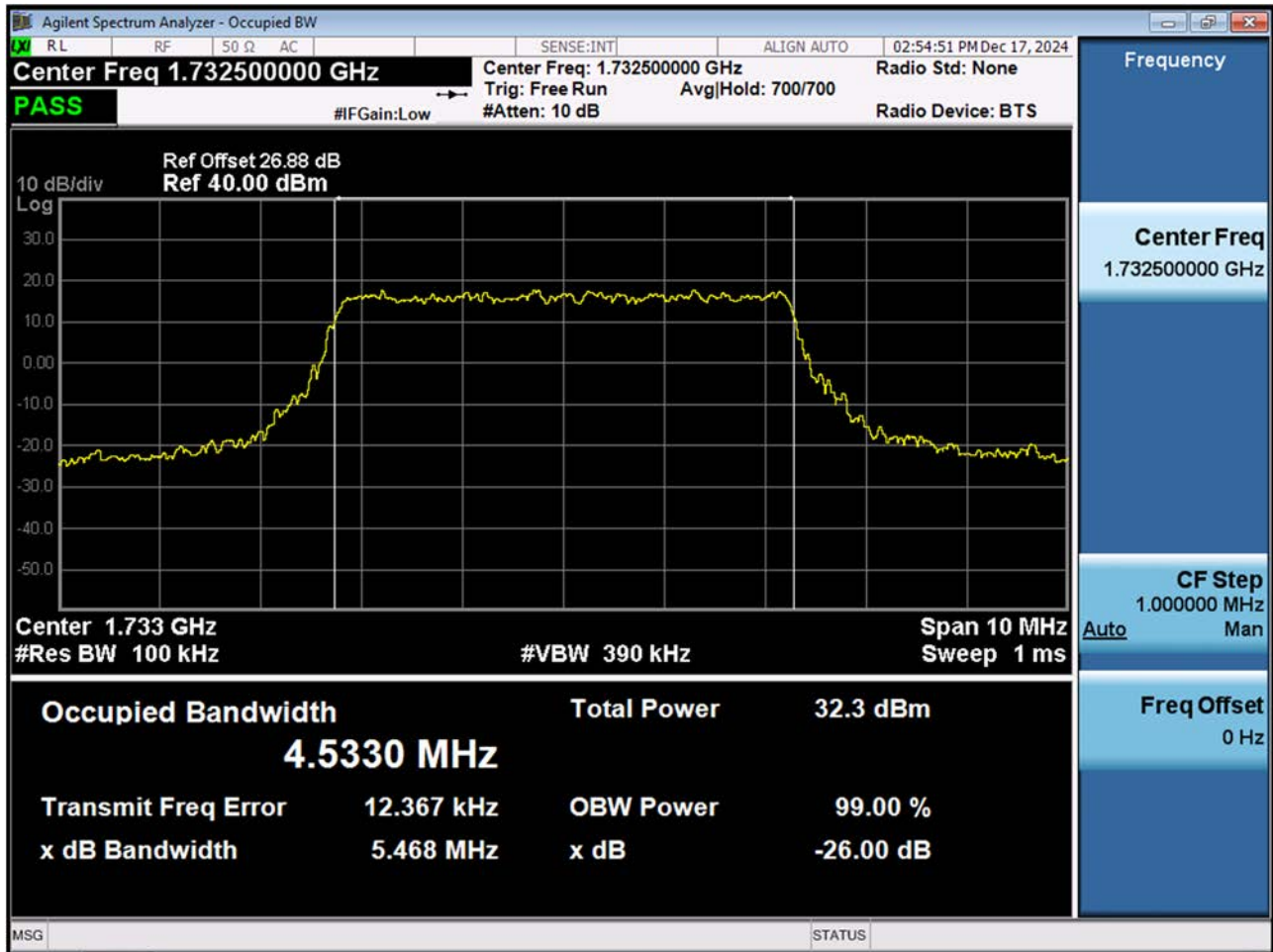
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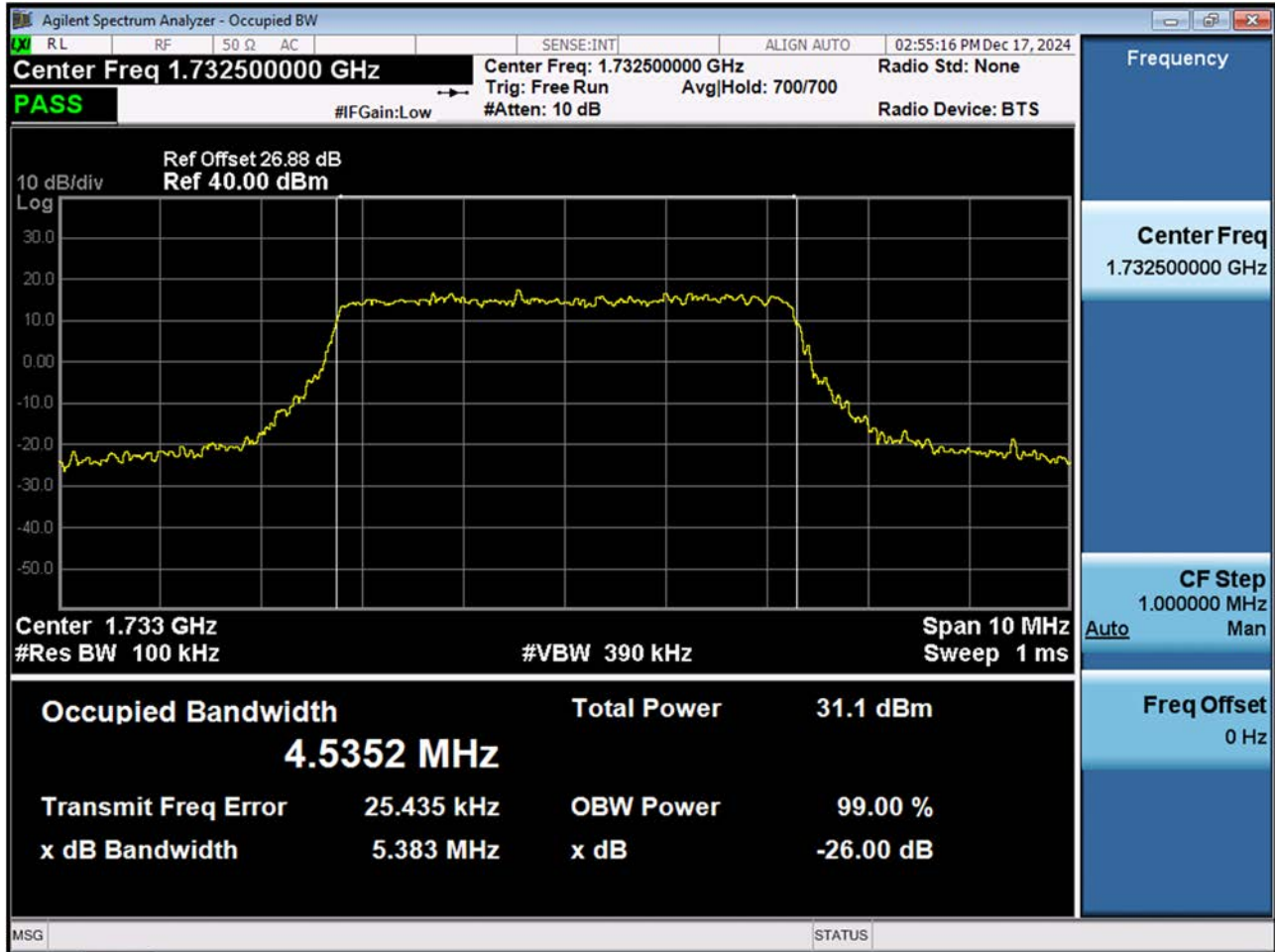
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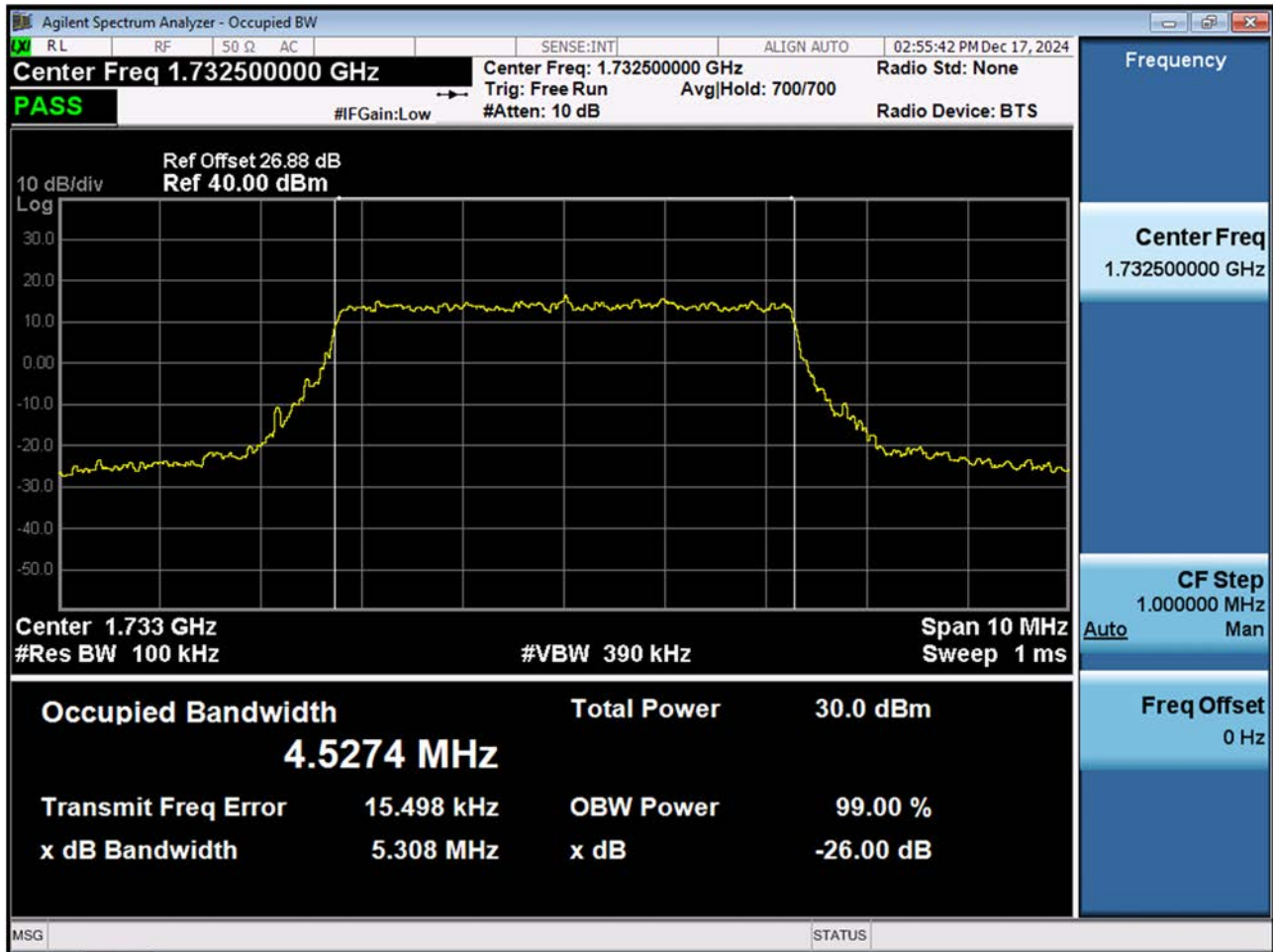
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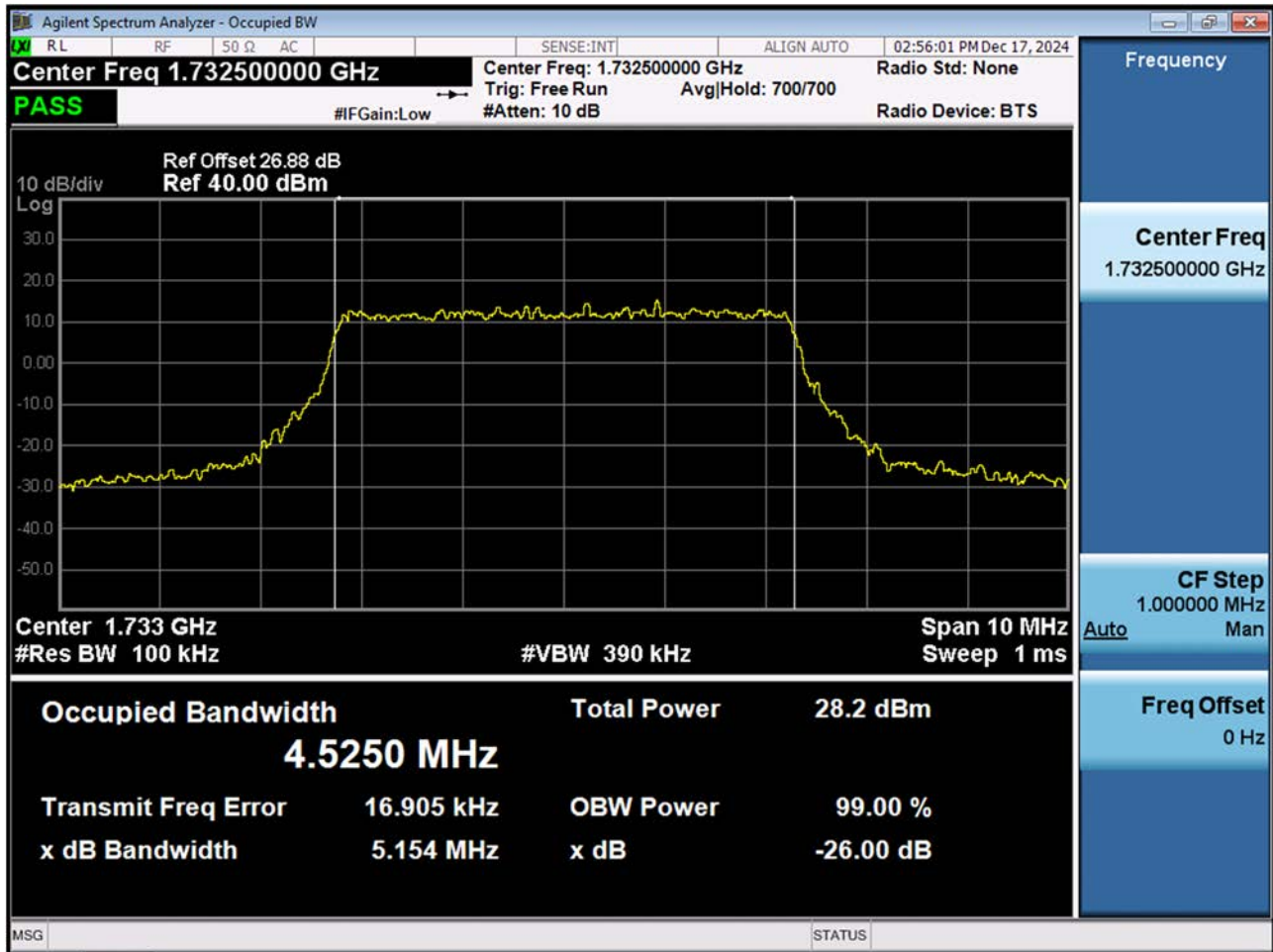
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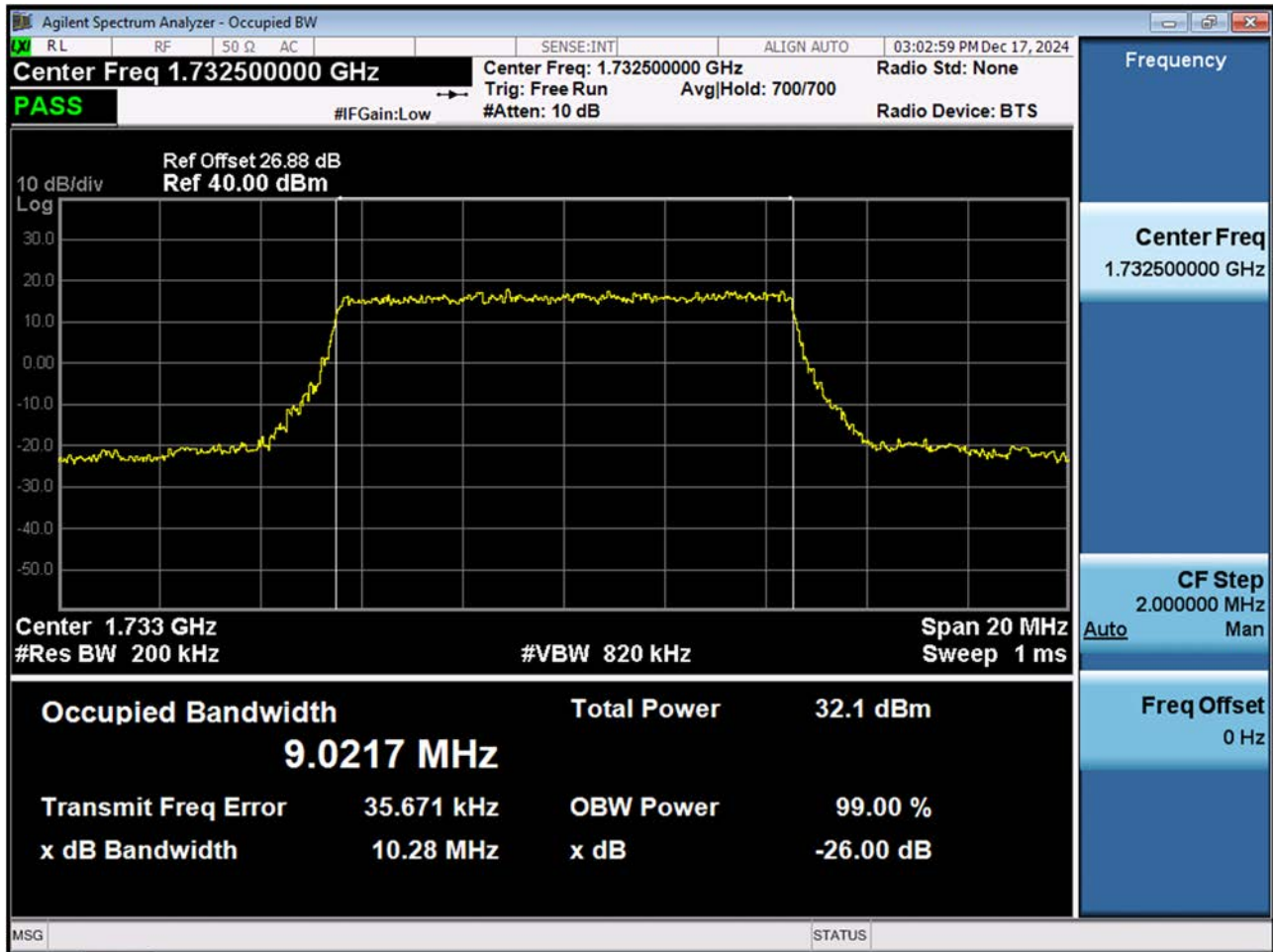
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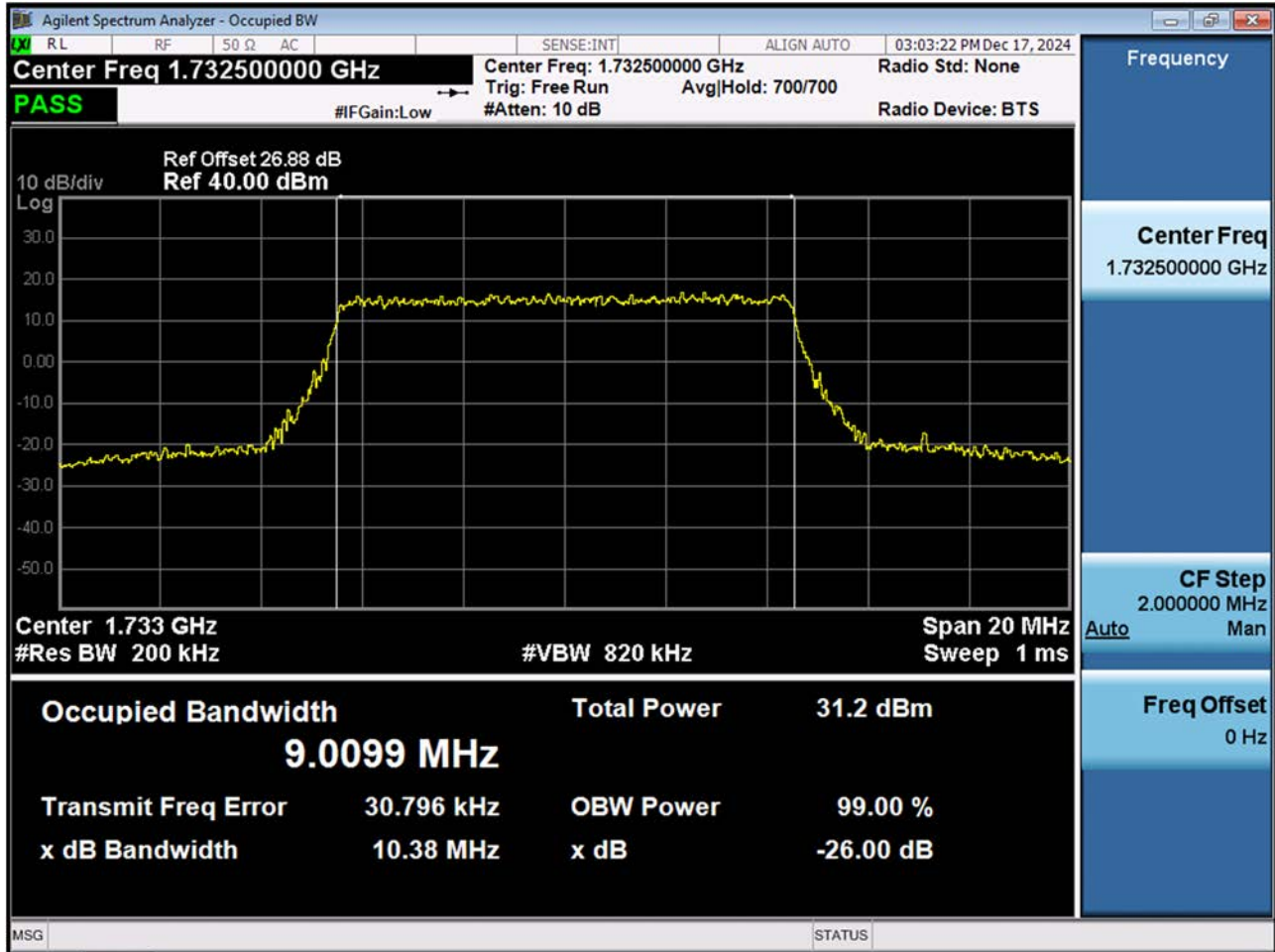
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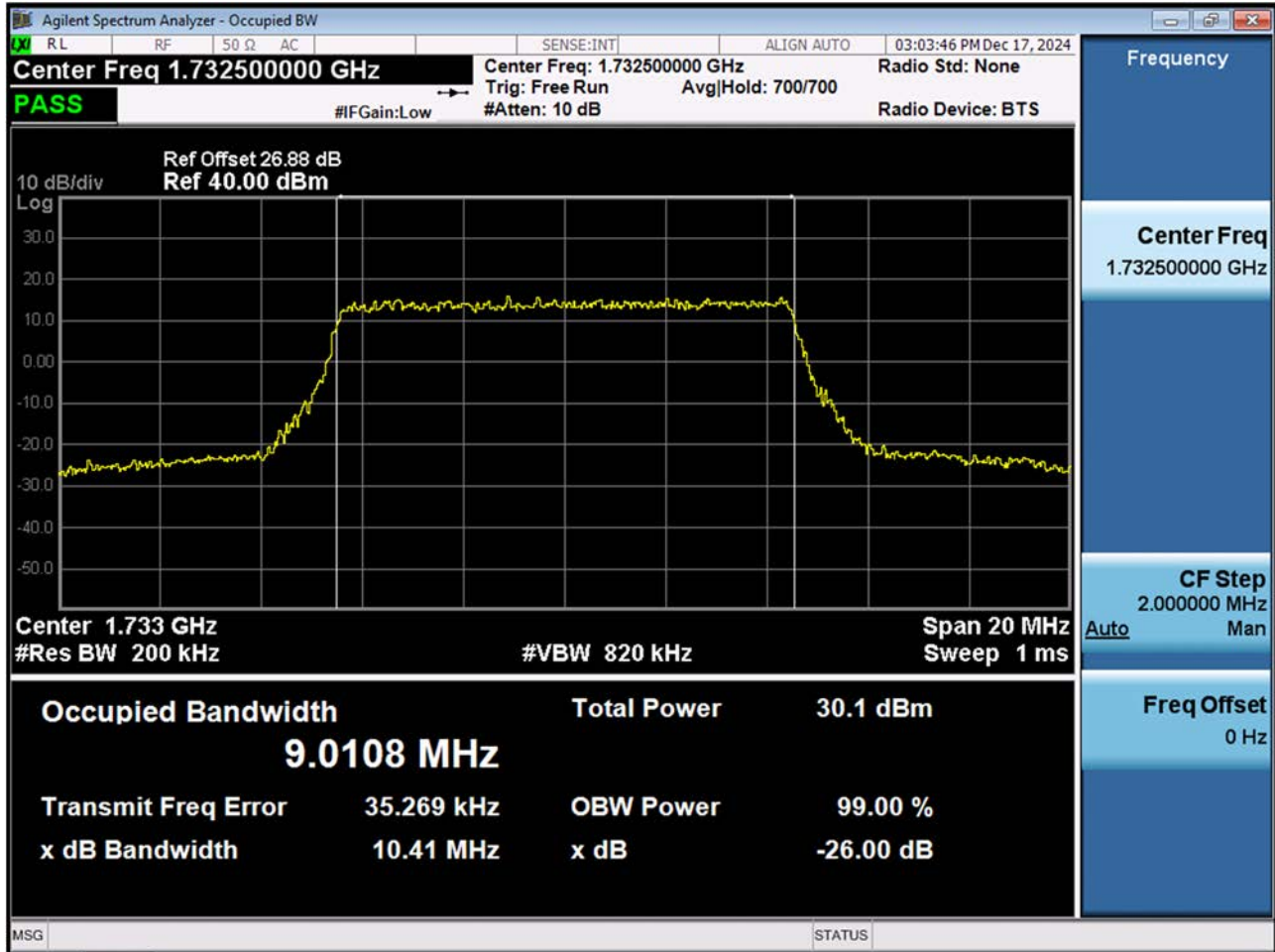
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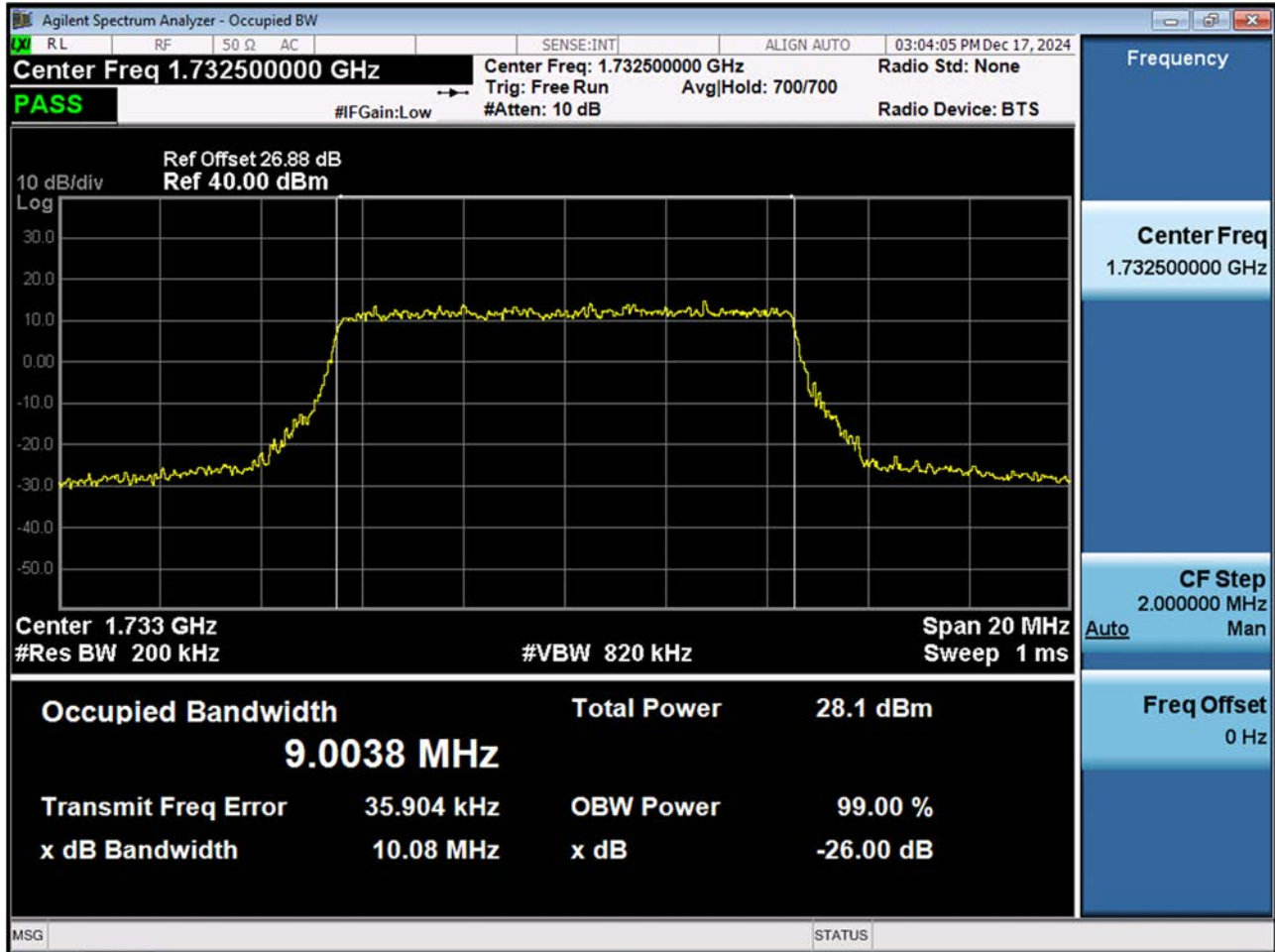
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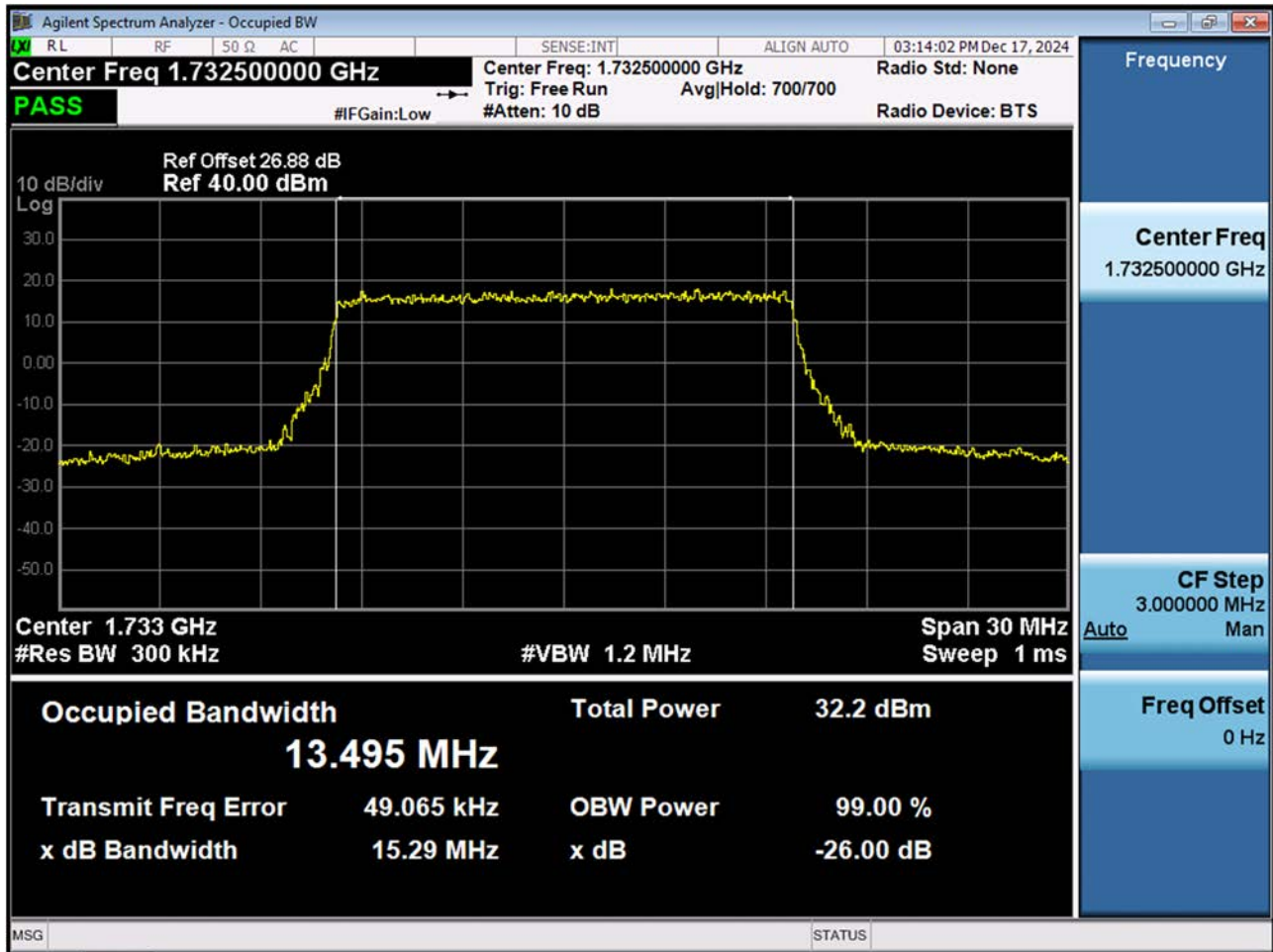
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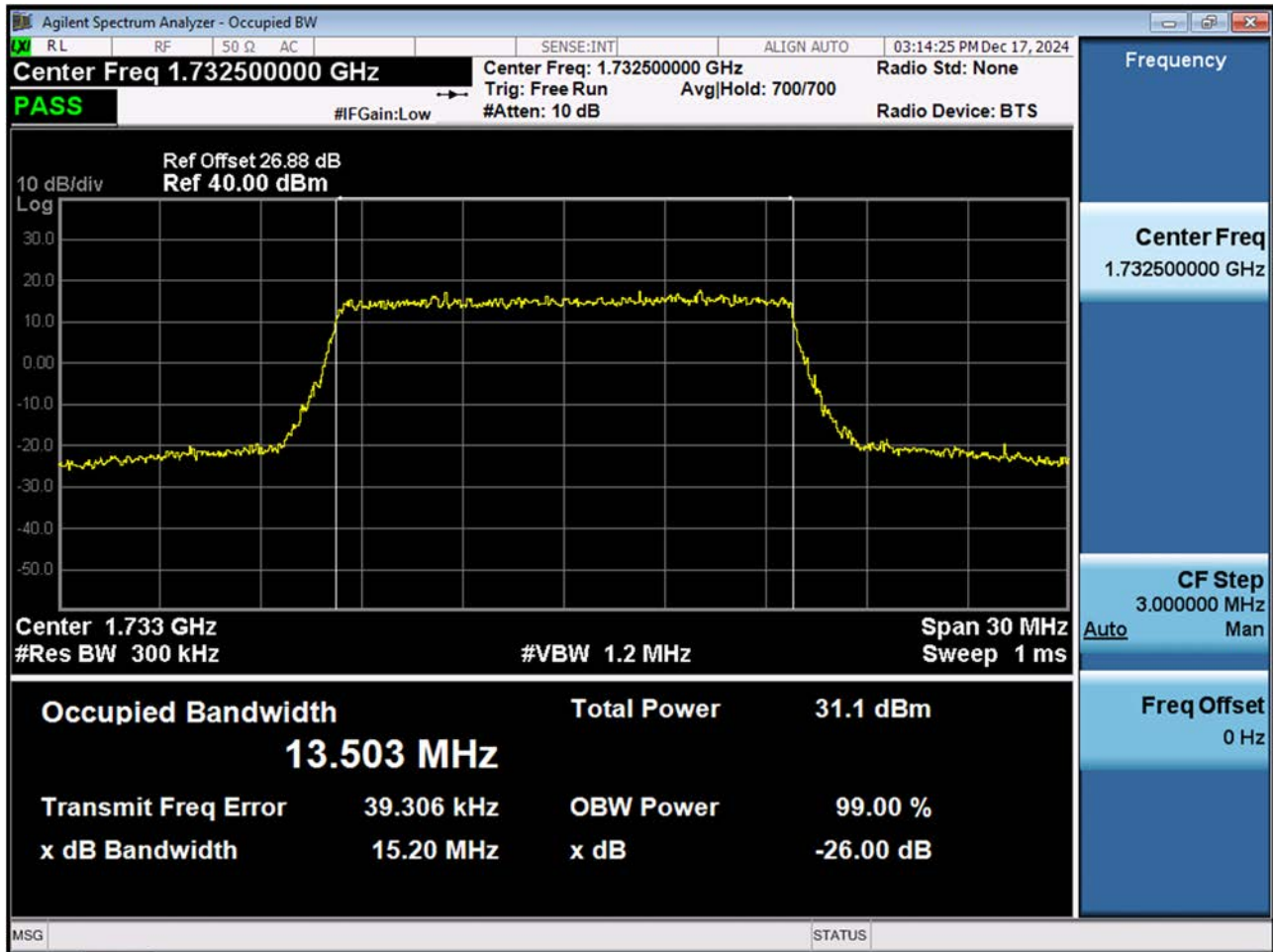
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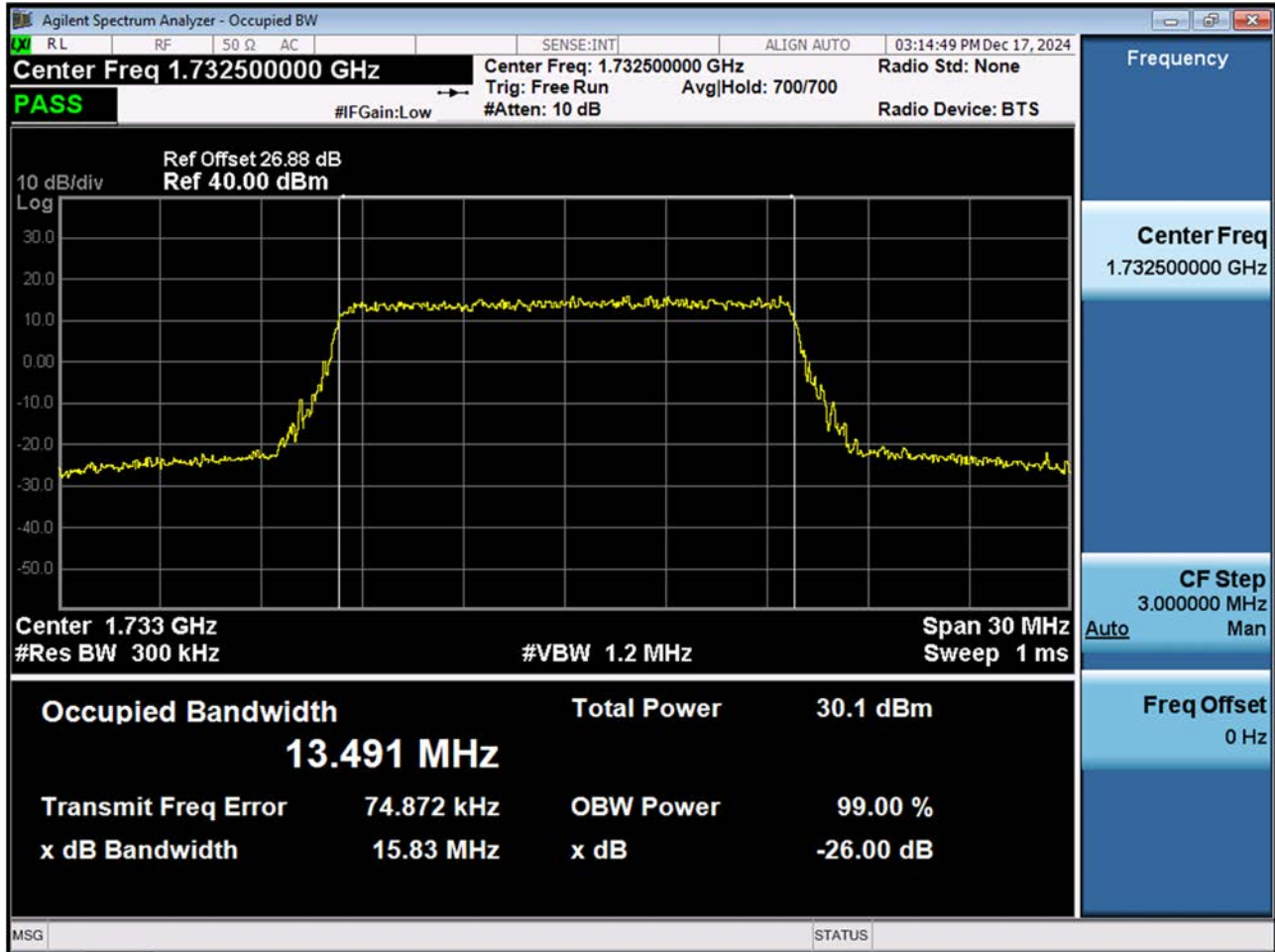
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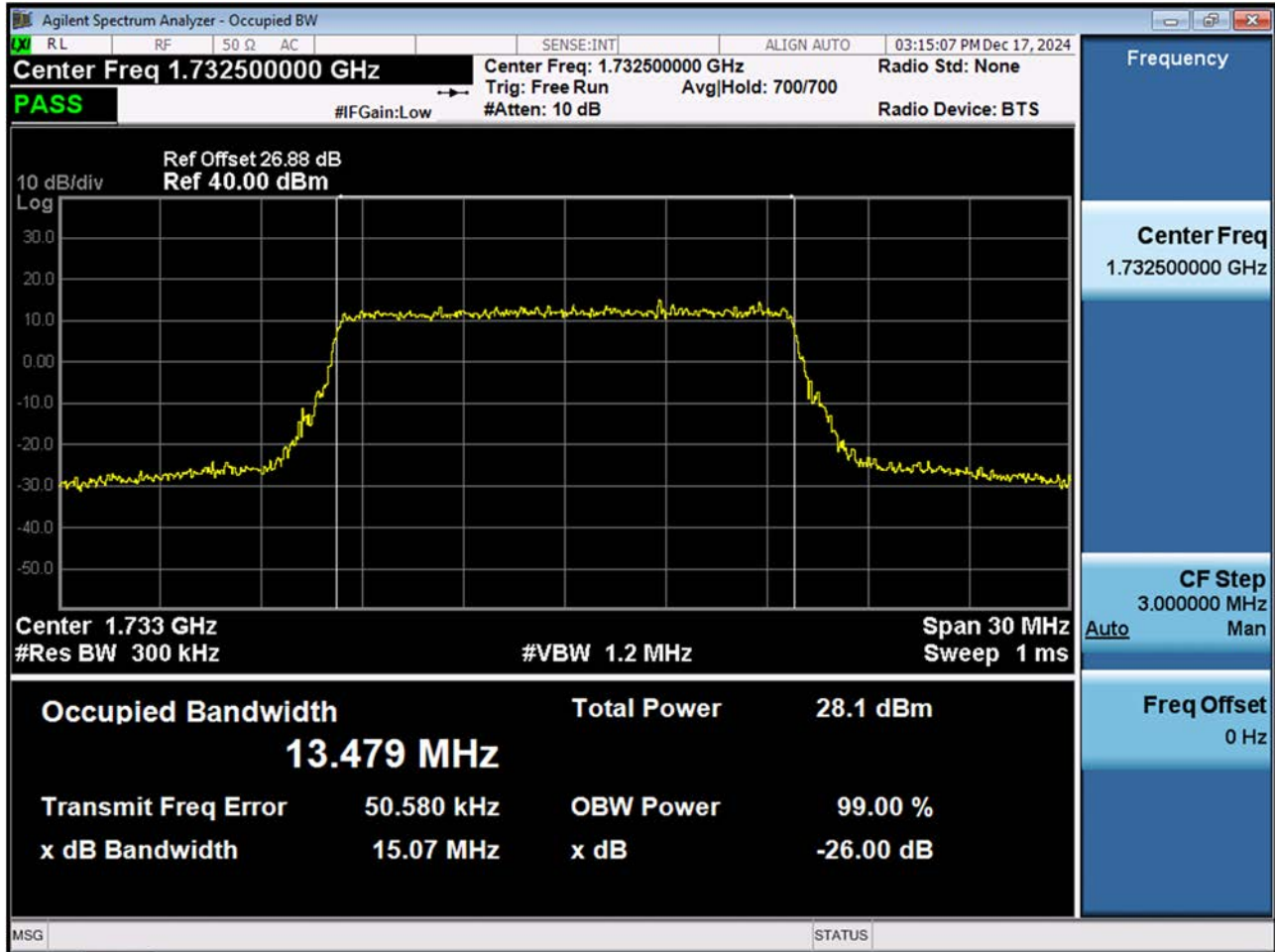
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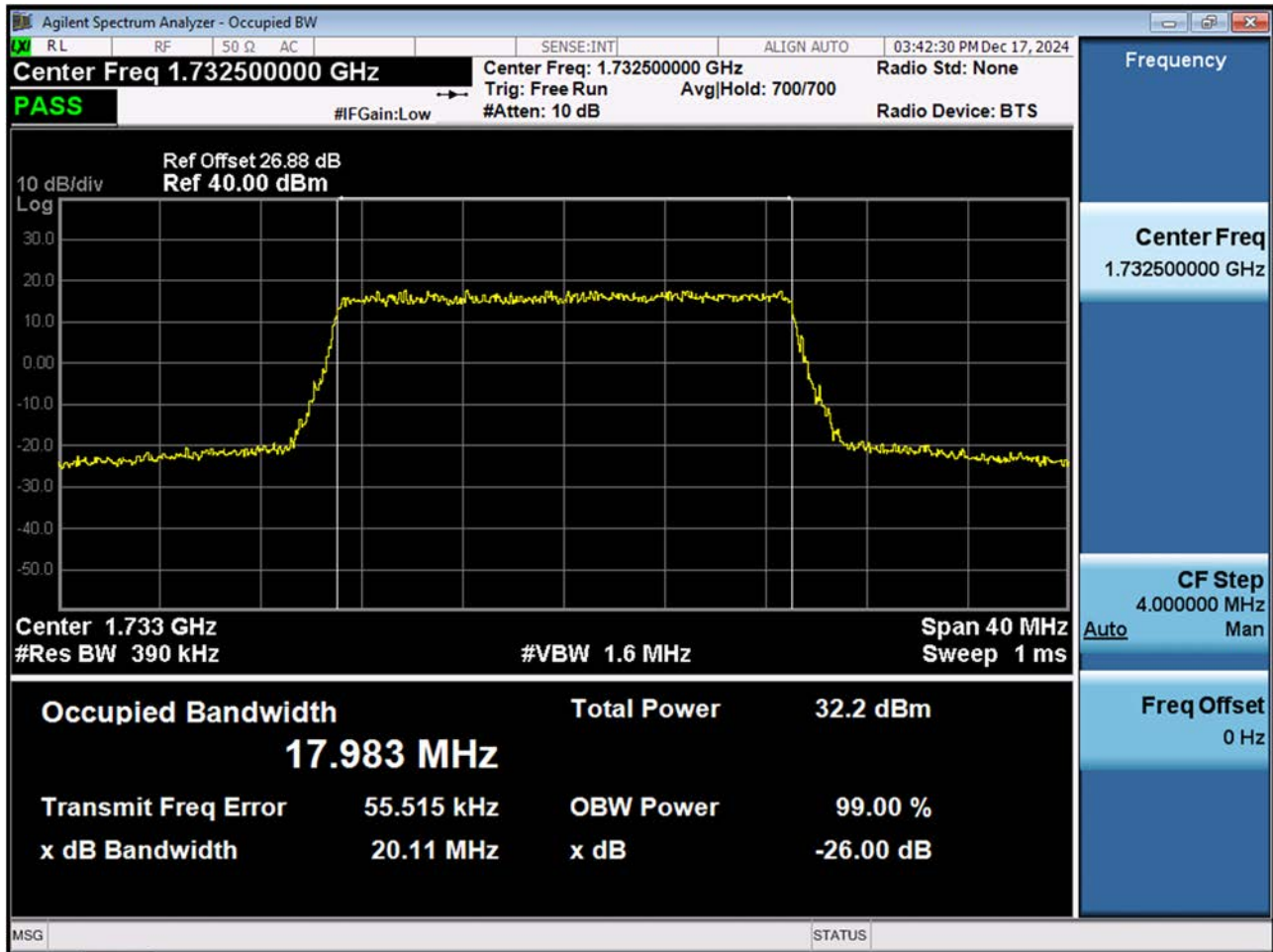
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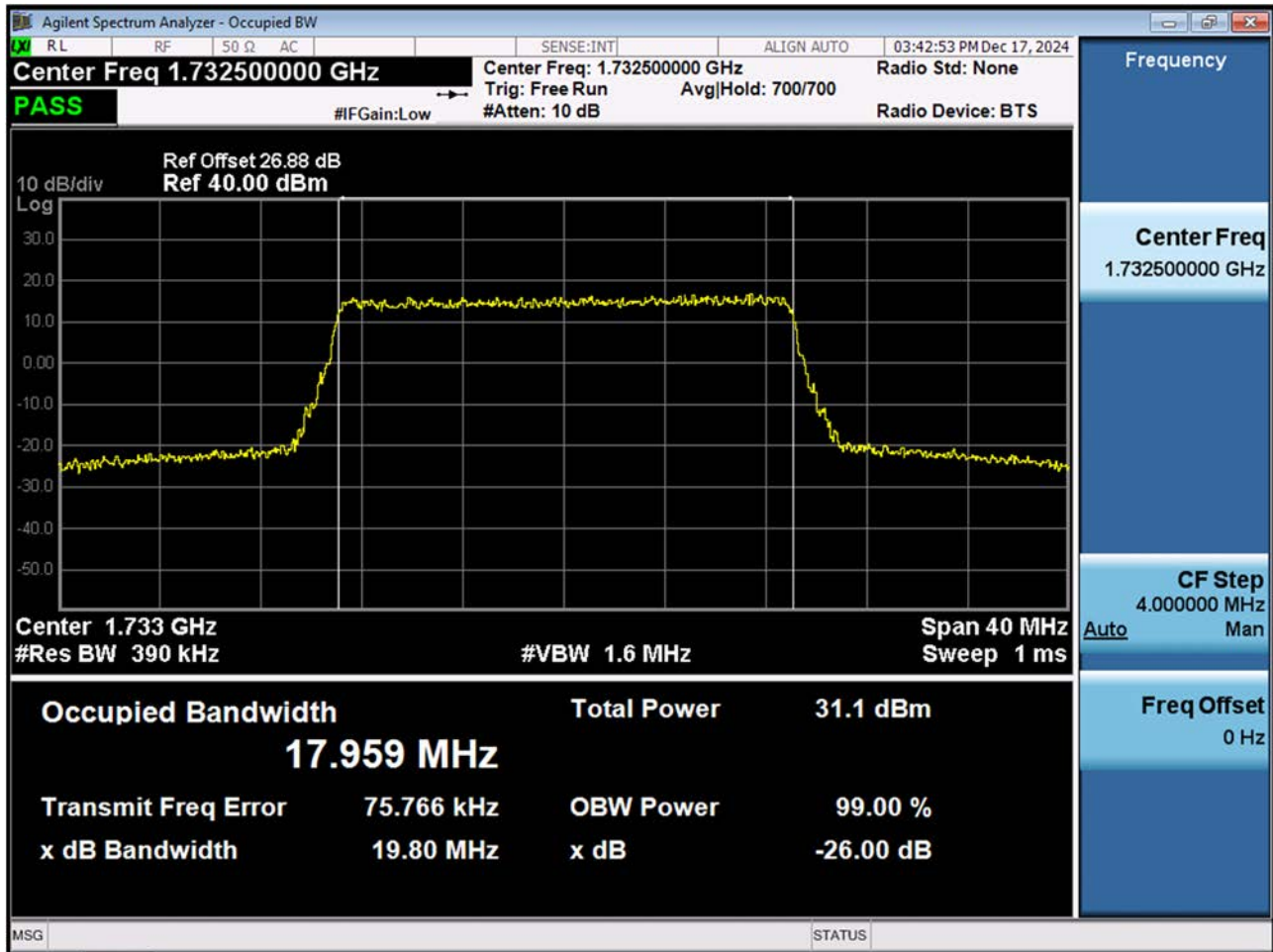
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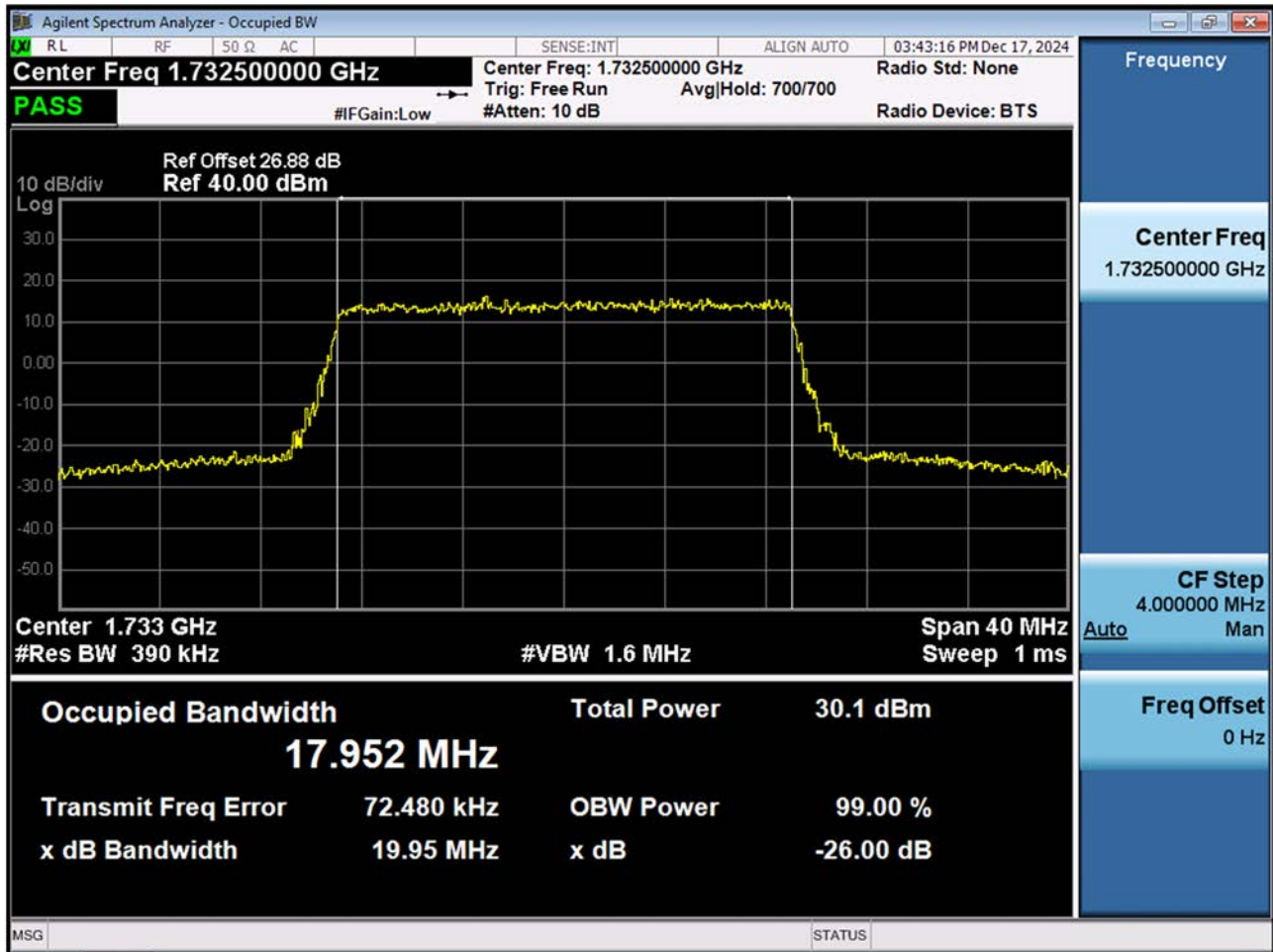
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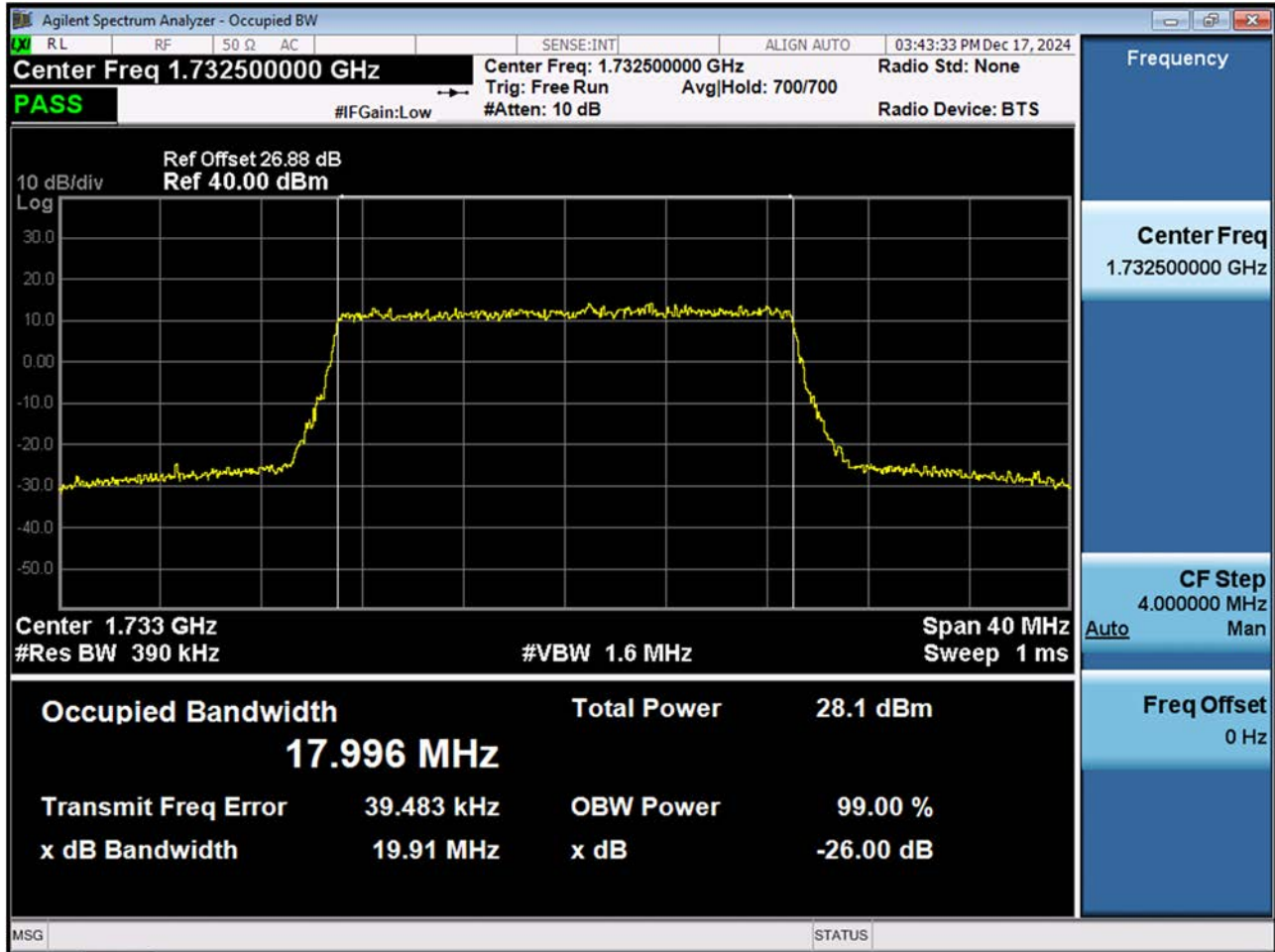
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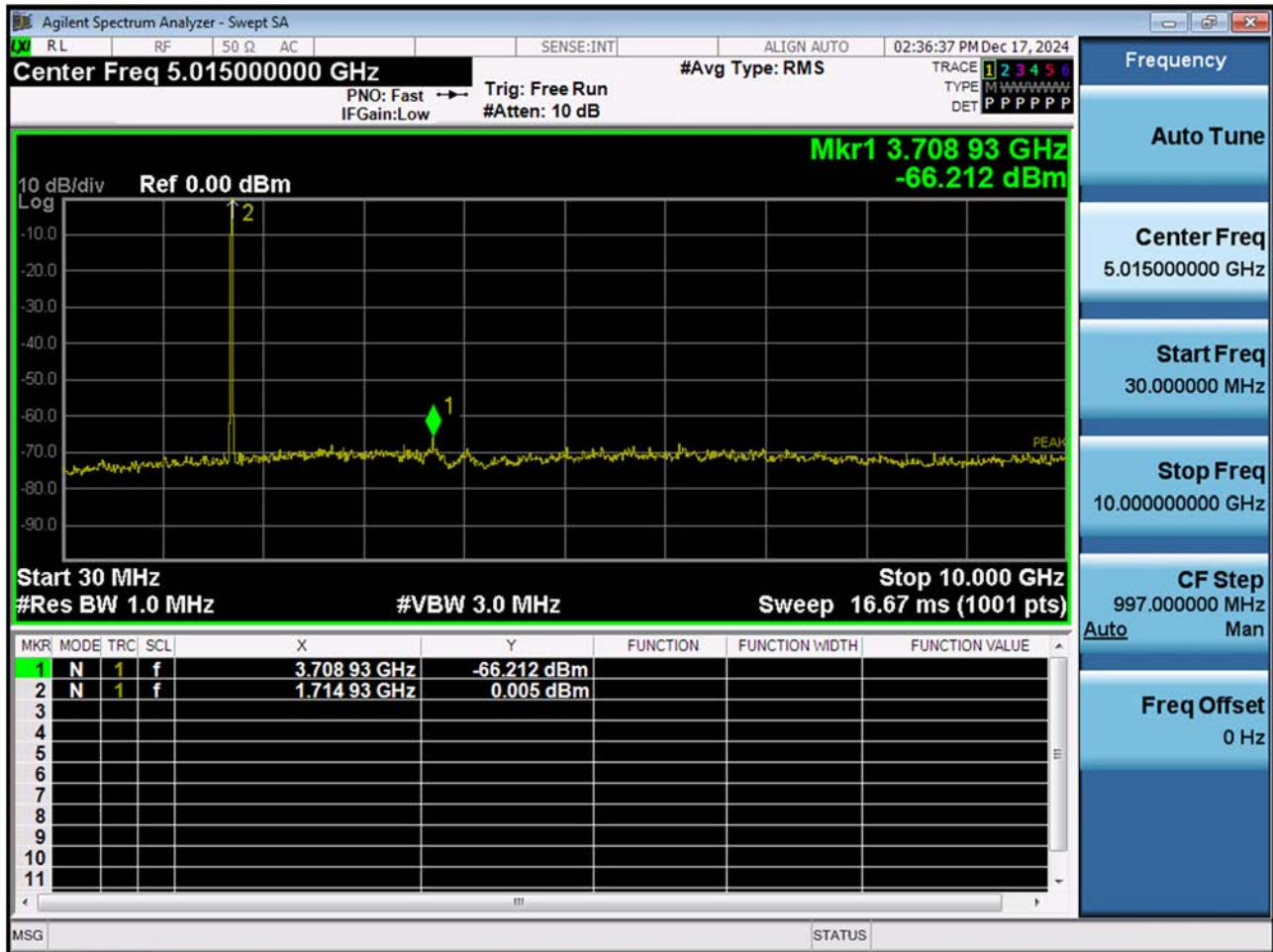
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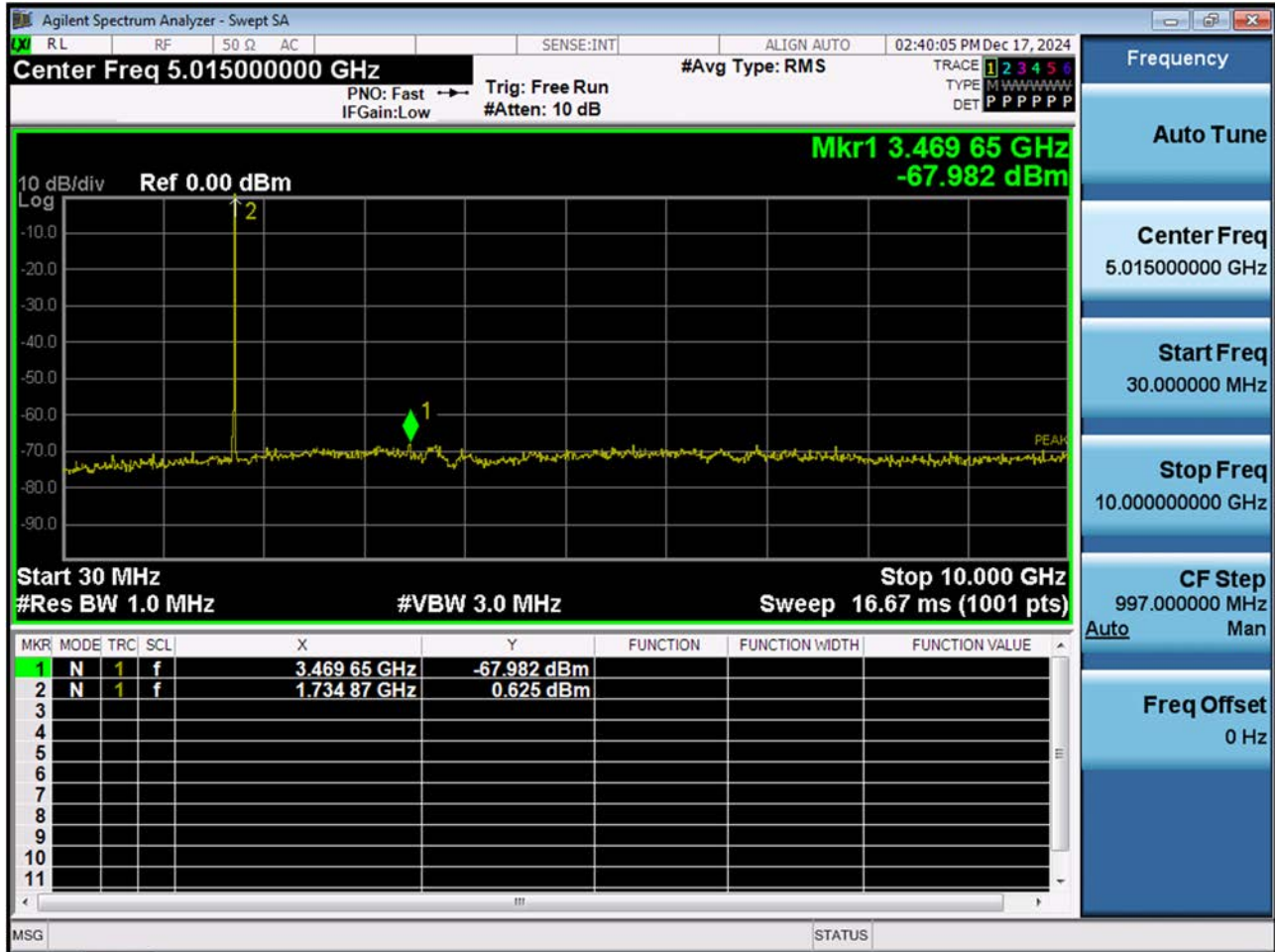
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LTE B4_1.4M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



LTE B4_1.4M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



LTE B4_1.4M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB

