

TEST REPORT

FCC LTE B2 Test for SM-A376B/DS
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2512-FC042

DATE OF ISSUE
December 17, 2025

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TEST REPORT

REPORT NO.
HCT-RF-2512-FC042

DATE OF ISSUE
December 17, 2025

Additional Model
SM-A376B

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-A376B/DS

Date of Test November 13, 2025 ~ December 15, 2025

FCC ID A3LSMA376B

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: § 24

Test Results PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	December 17, 2025	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

Model(s):	SM-A376B/DS
Additional Model(s)	SM-A376B
Tx Frequency:	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))
Serial number:	Radiated : R37YA004DCT Conducted : R37YA004D2X Uplink Carrier Aggregation : R37YA004DCT
Antenna Information	Please refer to the Antenna Specification document.

1.1 MAXIMUM OUTPUT POWER

Ant B

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M10G7D	QPSK	0.182	22.61
		1M10W7D	16QAM	0.153	21.84
		1M10W7D	64QAM	0.121	20.83
		1M10W7D	256QAM	0.060	17.75
LTE – Band2 (3)	1851.5 - 1908.5	2M72G7D	QPSK	0.180	22.56
		2M71W7D	16QAM	0.155	21.91
		2M70W7D	64QAM	0.119	20.77
		2M71W7D	256QAM	0.057	17.59
LTE – Band2 (5)	1852.5 - 1907.5	4M54G7D	QPSK	0.179	22.54
		4M51W7D	16QAM	0.149	21.74
		4M53W7D	64QAM	0.120	20.79
		4M54W7D	256QAM	0.061	17.87
LTE – Band2 (10)	1855.0 - 1905.0	9M01G7D	QPSK	0.182	22.60
		9M01W7D	16QAM	0.144	21.59
		8M99W7D	64QAM	0.115	20.59
		8M99W7D	256QAM	0.059	17.70
LTE – Band2 (15)	1857.5 - 1902.5	13M4G7D	QPSK	0.175	22.43
		13M5W7D	16QAM	0.143	21.56
		13M5W7D	64QAM	0.117	20.67
		13M5W7D	256QAM	0.057	17.59
LTE – Band2 (20)	1860.0 - 1900.0	18M0G7D	QPSK	0.166	22.20
		17M9W7D	16QAM	0.141	21.50
		17M9W7D	64QAM	0.109	20.38
		17M9W7D	256QAM	0.056	17.52

Ant F

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M10G7D	QPSK	0.213	23.29
		1M09W7D	16QAM	0.182	22.60
		1M10W7D	64QAM	0.139	21.42
		1M10W7D	256QAM	0.069	18.37
LTE – Band2 (3)	1851.5 - 1908.5	2M72G7D	QPSK	0.230	23.61
		2M71W7D	16QAM	0.195	22.90
		2M70W7D	64QAM	0.153	21.85
		2M71W7D	256QAM	0.075	18.75
LTE – Band2 (5)	1852.5 - 1907.5	4M53G7D	QPSK	0.240	23.81
		4M50W7D	16QAM	0.196	22.92
		4M53W7D	64QAM	0.153	21.86
		4M55W7D	256QAM	0.075	18.77
LTE – Band2 (10)	1855.0 - 1905.0	9M01G7D	QPSK	0.234	23.69
		9M03W7D	16QAM	0.191	22.81
		9M04W7D	64QAM	0.150	21.75
		9M04W7D	256QAM	0.076	18.79
LTE – Band2 (15)	1857.5 - 1902.5	13M5G7D	QPSK	0.241	23.82
		13M5W7D	16QAM	0.195	22.91
		13M5W7D	64QAM	0.152	21.83
		13M5W7D	256QAM	0.076	18.80
LTE – Band2 (20)	1860.0 - 1900.0	18M0G7D	QPSK	0.222	23.46
		18M0W7D	16QAM	0.182	22.61
		17M9W7D	64QAM	0.142	21.52
		18M0W7D	256QAM	0.069	18.38

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

Please refer to the [2G3G] Test Report.

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. Detailed description of test facility was submitted to the Commission and accepted dated March 11, 2024 (Registration Number: KR0032).

2.4. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to ANSI/USEMCSC C63.2-2023, "American National Standard for Specifications of Electromagnetic Interference and Field Strength Measuring Instrumentation in the Frequency Range 9 kHz to 40 GHz".

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
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 $\geq 3 \times$ RBW
3. No. of sweep points $> 2 \times$ span / RBW
4. Detector = Peak
5. Trace mode = Max Hold
6. The trace was allowed to stabilize
7. Test channel : Low/ Middle/ High
8. 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;

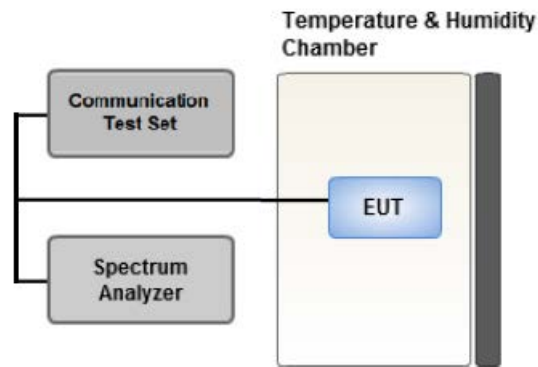
$$\text{Result}_{(\text{dBm})} = P_{g(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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

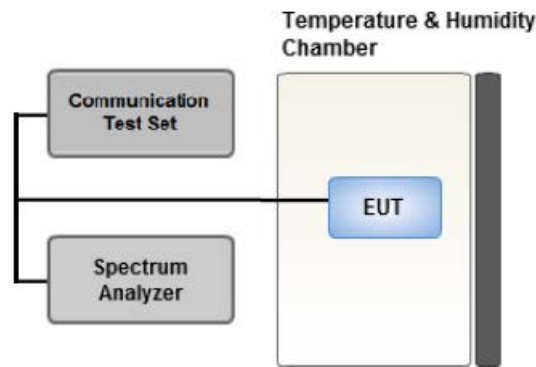


Test setup

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 %.

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.

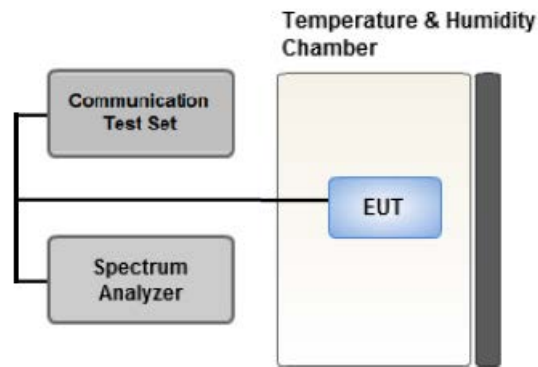
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

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

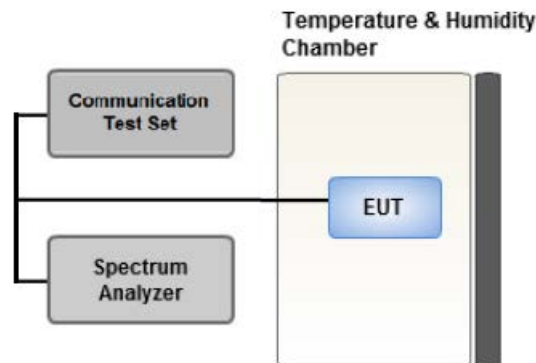
Test Overview

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 = 1001

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 $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time > (Number of Points) $\times$ (Symbol Period)
9. The trace was allowed to stabilize

Test Notes

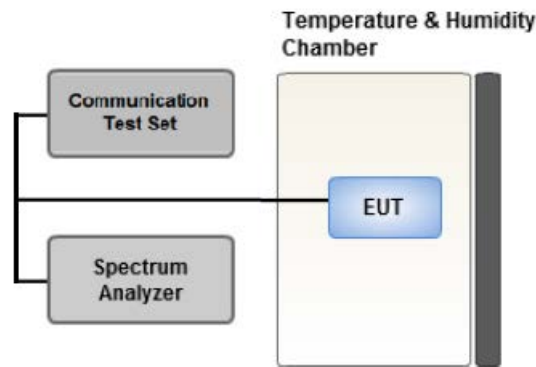
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block 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 $\text{Margin} < 1$ dB the emission level is either corrected by $10 \log(1 \text{ MHz} / \text{RB})$ 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.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 1.4 MHz(Ant B), 15 MHz(Ant F))
- 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.
- 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.
- SM-A376B/DS & additional models were tested and the worst case results are reported.
(Worst case : SM-A376B/DS)

[Ant B Worst case]

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

[Ant F Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 9.1		Z
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-A376B/DS & additional models were tested and the worst case results are reported.
- (Worst case : SM-A376B/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	Manufacture	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.	F1L1	12/18/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.	F1L2	12/18/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.	F1L4	12/18/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.	F1L7	12/18/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	10/21/2026	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/19/2026	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/10/2026	Annual
DC Power Supply	E3632A	Agilent	MY40010147	07/29/2026	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/11/2026	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/07/2026	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	08/27/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/23/2027	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/14/2026	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/10/2026	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	07/28/2026	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	07/29/2026	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.	6262287701	05/14/2026	Annual
Radio Communication Test Station	MT8000A	Anritsu Corp.	6272613402	08/18/2026	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/22/2026	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/14/2026	Annual
Signal & Spectrum Analyzer (2 Hz~67 GHz)	FSW67	REOHDE & SCHWARZ	101736	05/27/2026	Annual
Automation Software	FCC 2G/3G/4G Conducted	HCT CO., LTD	-	-	-
Automation Software	FCC NR Conducted	HCT CO., LTD	-	-	-
Automation Software	FCC LTE Radiated	HCT CO., LTD	-	-	-
Automation Software	FCC NR Radiated	HCT CO., LTD	-	-	-

Note:

1. Equipment whose calibration due date was updated during the test period was not used between the previous due date and the update.

All reported measurements were performed using equipment within valid calibration.

2. Especially, all antenna for measurement is calibrated in accordance with the requirements of ANSI C63.5-2017.

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 ($\pm$ kHz)
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)	5.68 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.75 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

6. SUMMARY OF TEST RESULTS

- The decision rule applies 'simple acceptance'

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, § 24.238(a)	$< 43 + 10\log_{10} (P[\text{Watts}])$ at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	PASS <u>Note1</u>
Peak- to- Average Ratio	§ 24.232(d)	$< 13 \text{ dB}$	PASS
Frequency stability /variation of ambient temperature	§ 24.235	Emission must remain in band	PASS

Note:

1. Refer to the SAR report.

6.2 Test Condition: Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§ 24.232(c)	$< 2 \text{ Watts max. EIRP}$	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 24.238(a)	$< 43 + 10\log_{10} (P[\text{Watts}])$ 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(Ant B)

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
1850.7	LTE B2 (1.4 MHz)	QPSK	-20.97	13.55	10.40	2.07	H	< 2.00	0.154	21.88	1	0
		16-QAM	-21.82	12.70	10.40	2.07	H		0.127	21.03		
		64-QAM	-22.78	11.74	10.40	2.07	H		0.102	20.07		
		256-QAM	-25.94	8.58	10.40	2.07	H		0.049	16.91		
1880		QPSK	-20.53	14.42	10.40	2.21	H		0.182	22.61	1	5
		16-QAM	-21.30	13.65	10.40	2.21	H		0.153	21.84		
		64-QAM	-22.31	12.64	10.40	2.21	H		0.121	20.83		
		256-QAM	-25.39	9.56	10.40	2.21	H		0.060	17.75		
1909.3		QPSK	-20.79	14.15	10.40	2.17	H		0.173	22.38	1	3
		16-QAM	-21.75	13.19	10.40	2.17	H		0.139	21.42		
		64-QAM	-22.83	12.11	10.40	2.17	H		0.108	20.34		
		256-QAM	-25.74	9.20	10.40	2.17	H		0.055	17.43		

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
1851.5	LTE B2 (3 MHz)	QPSK	-21.20	13.32	10.40	2.07	H	< 2.00	0.146	21.65	1	0
		16-QAM	-21.73	12.79	10.40	2.07	H		0.129	21.12		
		64-QAM	-22.71	11.81	10.40	2.07	H		0.103	20.14		
		256-QAM	-25.80	8.72	10.40	2.07	H		0.051	17.05		
1880		QPSK	-20.58	14.37	10.40	2.21	H		0.180	22.56	1	14
		16-QAM	-21.23	13.72	10.40	2.21	H		0.155	21.91		
		64-QAM	-22.37	12.58	10.40	2.21	H		0.119	20.77		
		256-QAM	-25.55	9.40	10.40	2.21	H		0.057	17.59		
1908.5		QPSK	-20.93	14.01	10.40	2.17	H		0.167	22.24	1	14
		16-QAM	-21.55	13.39	10.40	2.17	H		0.145	21.62		
		64-QAM	-22.59	12.35	10.40	2.17	H		0.114	20.58		
		256-QAM	-25.78	9.16	10.40	2.17	H		0.055	17.39		

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
1852.5	LTE B2 (5 MHz)	QPSK	-20.89	13.68	10.40	2.08	H	< 2.00	0.158	22.00	1	24
		16-QAM	-21.54	13.03	10.40	2.08	H		0.136	21.35		
		64-QAM	-22.78	11.79	10.40	2.08	H		0.103	20.11		
		256-QAM	-25.78	8.79	10.40	2.08	H		0.051	17.11		
1880		QPSK	-20.91	14.04	10.40	2.21	H		0.167	22.23	1	24
		16-QAM	-21.40	13.55	10.40	2.21	H		0.149	21.74		
		64-QAM	-22.35	12.60	10.40	2.21	H		0.120	20.79		
		256-QAM	-25.27	9.68	10.40	2.21	H		0.061	17.87		
1907.5		QPSK	-20.63	14.31	10.40	2.17	H		0.179	22.54	1	0
		16-QAM	-21.51	13.43	10.40	2.17	H		0.147	21.66		
		64-QAM	-22.54	12.40	10.40	2.17	H		0.116	20.63		
		256-QAM	-25.65	9.29	10.40	2.17	H		0.056	17.52		

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
1855	LTE B2 (10 MHz)	QPSK	-21.13	13.44	10.40	2.08	H	< 2.00	0.150	21.76	1	0
		16-QAM	-21.89	12.68	10.40	2.08	H		0.126	21.00		
		64-QAM	-22.90	11.67	10.40	2.08	H		0.100	19.99		
		256-QAM	-26.02	8.55	10.40	2.08	H		0.049	16.87		
1880		QPSK	-20.54	14.41	10.40	2.21	H		0.182	22.60	1	0
		16-QAM	-21.55	13.40	10.40	2.21	H		0.144	21.59		
		64-QAM	-22.55	12.40	10.40	2.21	H		0.115	20.59		
		256-QAM	-25.44	9.51	10.40	2.21	H		0.059	17.70		
1905		QPSK	-20.89	14.03	10.40	2.19	H		0.167	22.24	1	0
		16-QAM	-21.76	13.16	10.40	2.19	H		0.137	21.37		
		64-QAM	-22.86	12.06	10.40	2.19	H		0.106	20.27		
		256-QAM	-25.58	9.34	10.40	2.19	H		0.057	17.55		

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
1857.5	LTE B2 (15 MHz)	QPSK	-20.79	13.85	10.40	2.10	H	< 2.00	0.164	22.15	1	74
		16-QAM	-21.60	13.04	10.40	2.10	H		0.136	21.34		
		64-QAM	-22.53	12.11	10.40	2.10	H		0.110	20.41		
		256-QAM	-25.56	9.08	10.40	2.10	H		0.055	17.38		
1880		QPSK	-20.71	14.24	10.40	2.21	H		0.175	22.43	1	74
		16-QAM	-21.58	13.37	10.40	2.21	H		0.143	21.56		
		64-QAM	-22.47	12.48	10.40	2.21	H		0.117	20.67		
		256-QAM	-25.55	9.40	10.40	2.21	H		0.057	17.59		
1902.5		QPSK	-20.87	14.05	10.40	2.19	H		0.168	22.26	1	0
		16-QAM	-21.64	13.28	10.40	2.19	H		0.141	21.49		
		64-QAM	-22.82	12.10	10.40	2.19	H		0.107	20.31		
		256-QAM	-25.76	9.16	10.40	2.19	H		0.055	17.37		

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
1860	LTE B2 (20 MHz)	QPSK	-20.88	13.76	10.40	2.10	H	< 2.00	0.161	22.06	1	99
		16-QAM	-21.76	12.88	10.40	2.10	H		0.131	21.18		
		64-QAM	-22.71	11.93	10.40	2.10	H		0.105	20.23		
		256-QAM	-25.62	9.02	10.40	2.10	H		0.054	17.32		
1880		QPSK	-20.94	14.01	10.40	2.21	H		0.166	22.20	1	99
		16-QAM	-21.64	13.31	10.40	2.21	H		0.141	21.50		
		64-QAM	-22.76	12.19	10.40	2.21	H		0.109	20.38		
		256-QAM	-25.62	9.33	10.40	2.21	H		0.056	17.52		
1900		QPSK	-20.91	13.97	10.40	2.20	H		0.165	22.17	1	0
		16-QAM	-21.59	13.29	10.40	2.20	H		0.141	21.49		
		64-QAM	-22.78	12.10	10.40	2.20	H		0.107	20.30		
		256-QAM	-25.76	9.12	10.40	2.20	H		0.054	17.32		

8.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE B2
 MODULATION SIGNAL: 1.4 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
18607 (1850.7)	3 701.40	-44.78	12.29	-61.89	3.07	H	-52.67	1	0
	5 552.10	-40.79	13.03	-53.01	3.89	V	-43.87		
	7 402.80	-45.06	10.79	-47.91	4.57	H	-41.69		
18900 (1880.0)	3 760.00	-44.47	12.22	-60.08	3.12	H	-50.98	1	5
	5 640.00	-36.51	13.12	-48.95	3.92	V	-39.75		
	7 520.00	-44.80	10.82	-47.45	4.61	H	-41.24		
19193 (1909.3)	3 818.60	-44.21	12.16	-60.86	3.19	H	-51.89	1	3
	5 727.90	-38.21	13.04	-50.48	4.00	V	-41.44		
	7 637.20	-45.52	11.19	-48.33	4.67	H	-41.81		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)	Limit (dB)
2	1.4 MHz	1880.0	QPSK	6	0	5.67	13.00
			16-QAM			6.39	
			64-QAM			6.62	
			256-QAM			6.63	
	3 MHz		QPSK	15		5.69	
			16-QAM			6.33	
			64-QAM			6.55	
			256-QAM			6.71	
	5 MHz		QPSK	25		5.63	
			16-QAM			6.33	
			64-QAM			6.54	
			256-QAM			6.72	
	10 MHz		QPSK	50		5.72	
			16-QAM			6.33	
			64-QAM			6.55	
			256-QAM			6.70	
	15 MHz		QPSK	75		5.53	
			16-QAM			6.26	
			64-QAM			6.47	
			256-QAM			6.68	
	20 MHz		QPSK	100		5.52	
			16-QAM			6.28	
			64-QAM			6.50	
			256-QAM			6.70	

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 78 ~ 101.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
2	1.4 MHz	1880.0	QPSK	6	0	1.0980
			16-QAM			1.0968
			64-QAM			1.0965
			256-QAM			1.0964
	3 MHz		QPSK	15		2.7147
			16-QAM			2.7089
			64-QAM			2.7036
			256-QAM			2.7122
	5 MHz		QPSK	25		4.5346
			16-QAM			4.5054
			64-QAM			4.5264
			256-QAM			4.5426
	10 MHz		QPSK	50		9.0142
			16-QAM			9.0081
			64-QAM			8.9888
			256-QAM			8.9908
	15 MHz		QPSK	75		13.444
			16-QAM			13.454
			64-QAM			13.465
			256-QAM			13.451
	20 MHz		QPSK	100		18.009
			16-QAM			17.908
			64-QAM			17.928
			256-QAM			17.936

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 102 ~ 125.

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)
2	1.4	1850.7	6.2114	28.591	-67.785	-39.194	-13.00
		1880.0	2.3331	27.976	-68.044	-40.068	
		1909.3	3.1805	27.976	-68.245	-40.269	
	3	1851.5	3.6591	27.976	-68.006	-40.030	
		1880.0	2.7119	27.976	-67.639	-39.663	
		1908.5	3.6890	27.976	-68.497	-40.521	
	5	1852.5	3.6990	27.976	-68.145	-40.169	
		1880.0	3.1606	27.976	-67.347	-39.371	
		1907.5	3.1307	27.976	-68.144	-40.168	
	10	1855.0	3.3002	27.976	-67.621	-39.645	
		1880.0	3.6990	27.976	-68.048	-40.072	
		1905.0	5.5833	28.591	-67.767	-39.176	
	15	1857.5	3.6890	27.976	-68.028	-40.052	
		1880.0	3.6890	27.976	-67.702	-39.726	
		1902.5	3.2005	27.976	-67.486	-39.510	
	20	1860.0	3.6691	27.976	-68.315	-40.339	
		1880.0	3.6990	27.976	-68.271	-40.295	
		1900.0	3.7089	27.976	-67.779	-39.803	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 126 ~ 161.
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

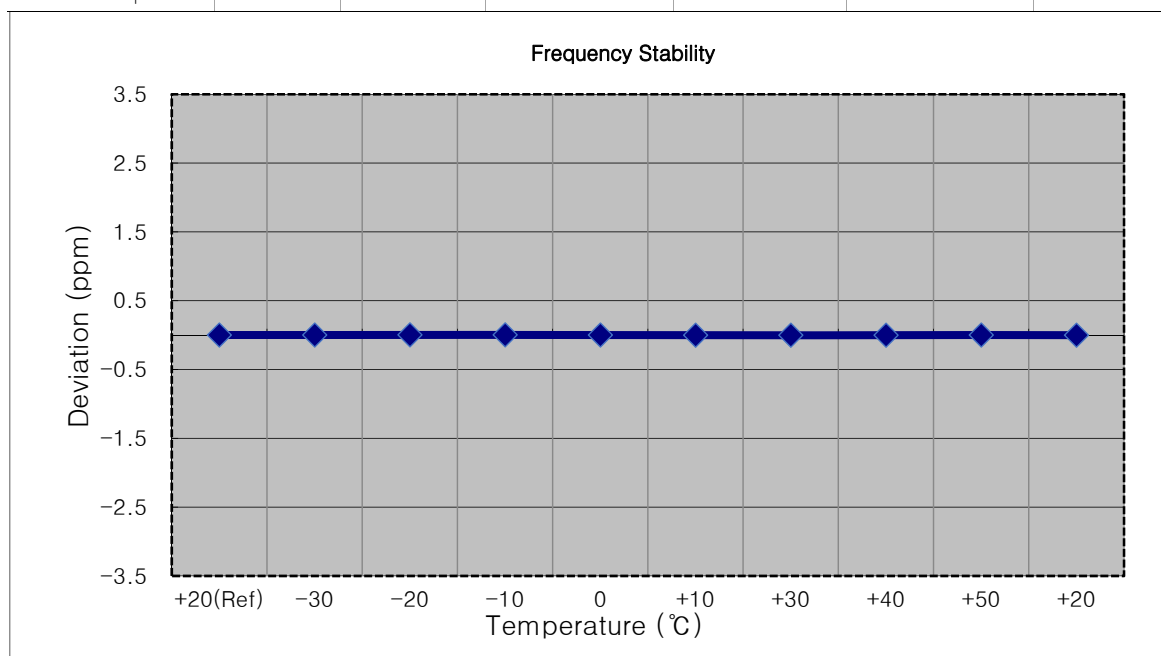
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 162 ~ 197.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

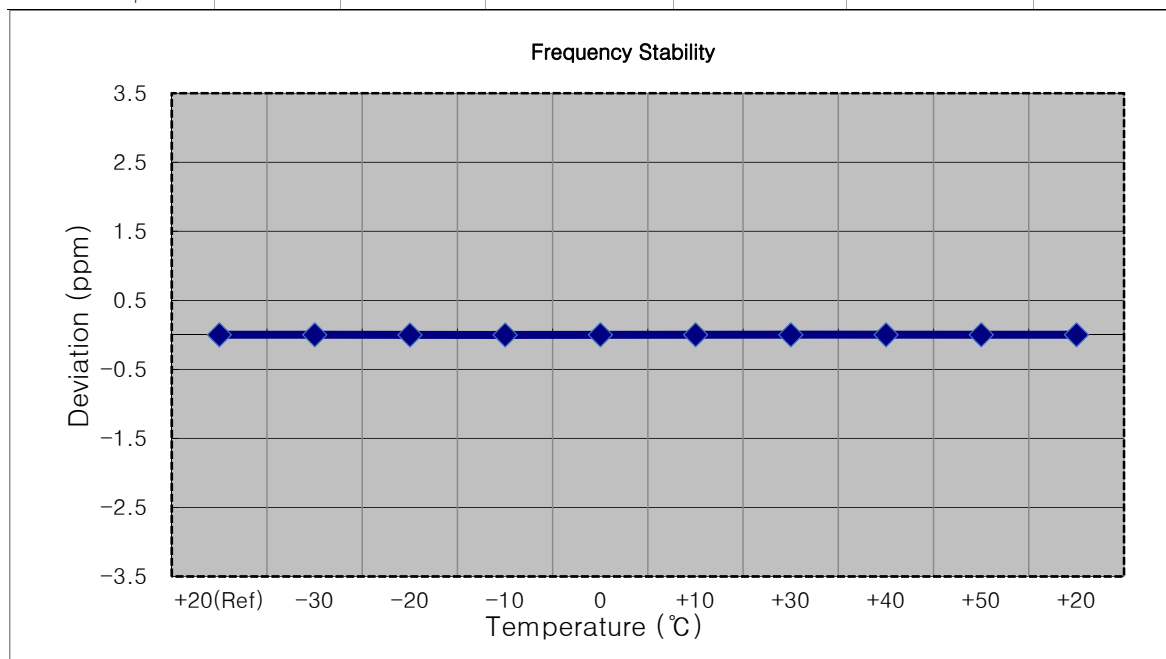
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1850,700,000 Hz</u>
CHANNEL:	<u>18607 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1850 700 003	0.0	0.000 000	0.000
100 %		-30	1850 700 001	-1.5	0.000 000	-0.001
100 %		-20	1850 700 005	2.9	0.000 000	0.002
100 %		-10	1850 700 005	2.8	0.000 000	0.002
100 %		0	1850 700 004	1.8	0.000 000	0.001
100 %		+10	1850 699 998	-4.2	0.000 000	-0.002
100 %		+30	1850 700 000	-2.5	0.000 000	-0.001
100 %		+40	1850 700 000	-2.2	0.000 000	-0.001
100 %		+50	1850 700 004	1.4	0.000 000	0.001
Batt. Endpoint	3.400	+20	1850 700 001	-1.7	0.000 000	-0.001



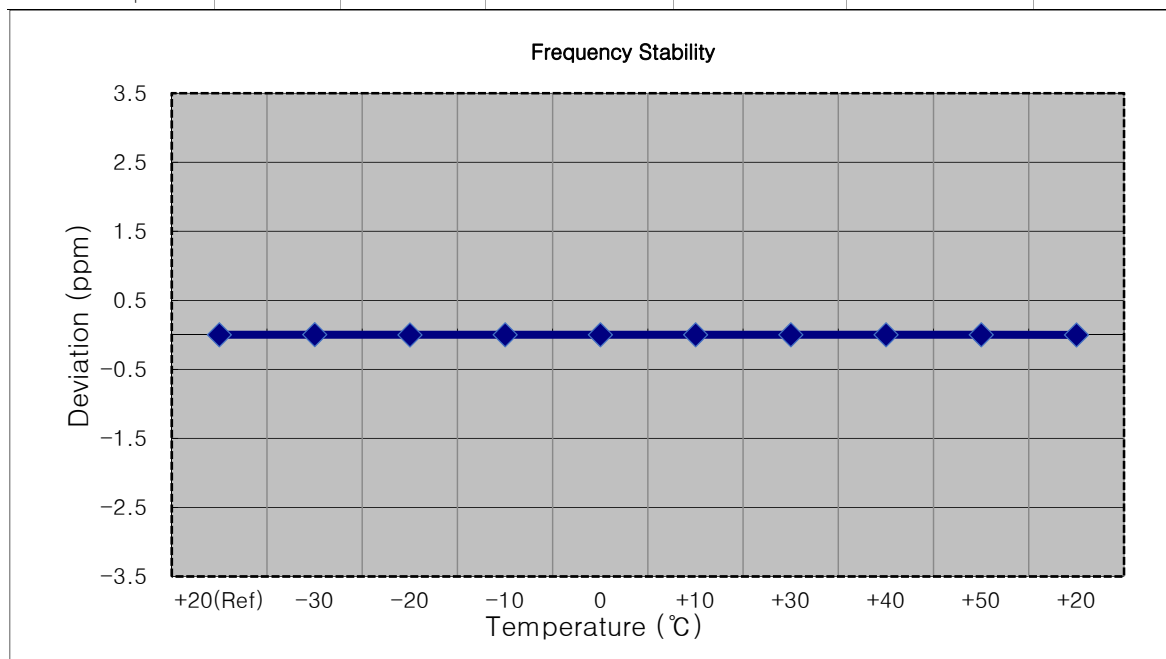
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1851,500,000 Hz</u>
CHANNEL:	<u>18615 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1851 500 004	0.0	0.000 000	0.000
100 %		-30	1851 500 007	3.0	0.000 000	0.002
100 %		-20	1851 500 001	-3.0	0.000 000	-0.002
100 %		-10	1851 500 003	-1.3	0.000 000	-0.001
100 %		0	1851 500 007	3.3	0.000 000	0.002
100 %		+10	1851 500 006	2.3	0.000 000	0.001
100 %		+30	1851 500 007	3.2	0.000 000	0.002
100 %		+40	1851 500 006	2.3	0.000 000	0.001
100 %		+50	1851 500 007	2.7	0.000 000	0.001
Batt. Endpoint	3.400	+20	1851 500 006	2.1	0.000 000	0.001



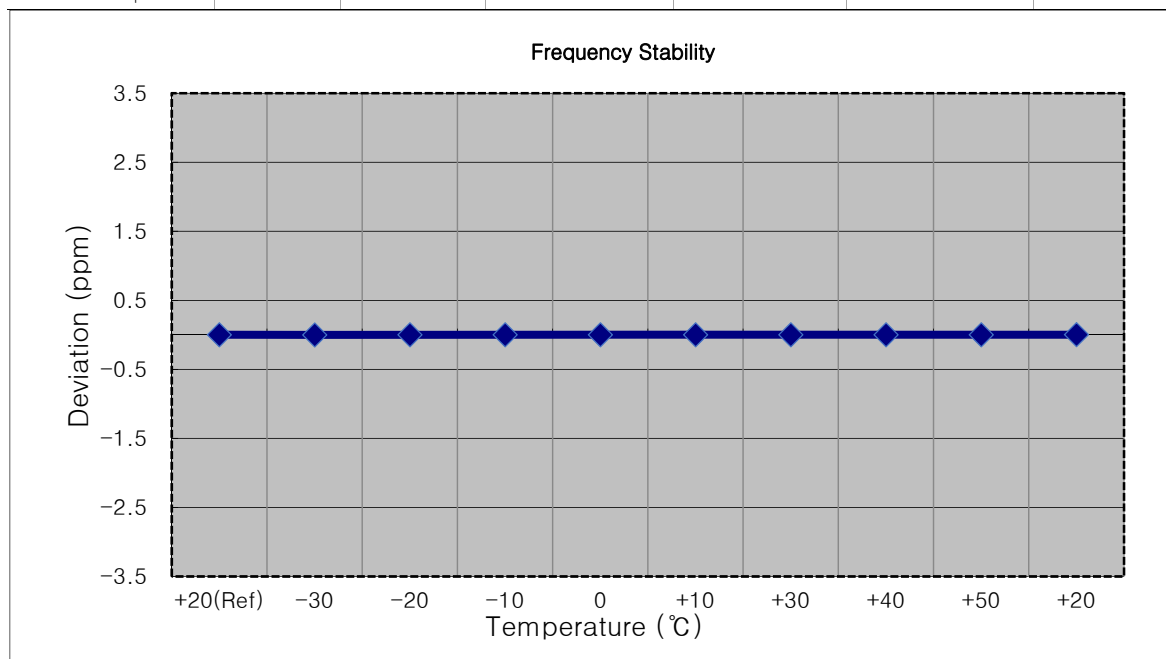
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1852,500,000 Hz</u>
CHANNEL:	<u>18625 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1852 500 003	0.0	0.000 000	0.000
100 %		-30	1852 500 007	4.6	0.000 000	0.002
100 %		-20	1852 500 001	-1.7	0.000 000	-0.001
100 %		-10	1852 500 006	3.5	0.000 000	0.002
100 %		0	1852 500 006	3.2	0.000 000	0.002
100 %		+10	1852 500 005	2.6	0.000 000	0.001
100 %		+30	1852 500 005	2.3	0.000 000	0.001
100 %		+40	1852 500 005	2.9	0.000 000	0.002
100 %		+50	1852 500 004	1.7	0.000 000	0.001
Batt. Endpoint	3.400	+20	1852 500 001	-1.7	0.000 000	-0.001



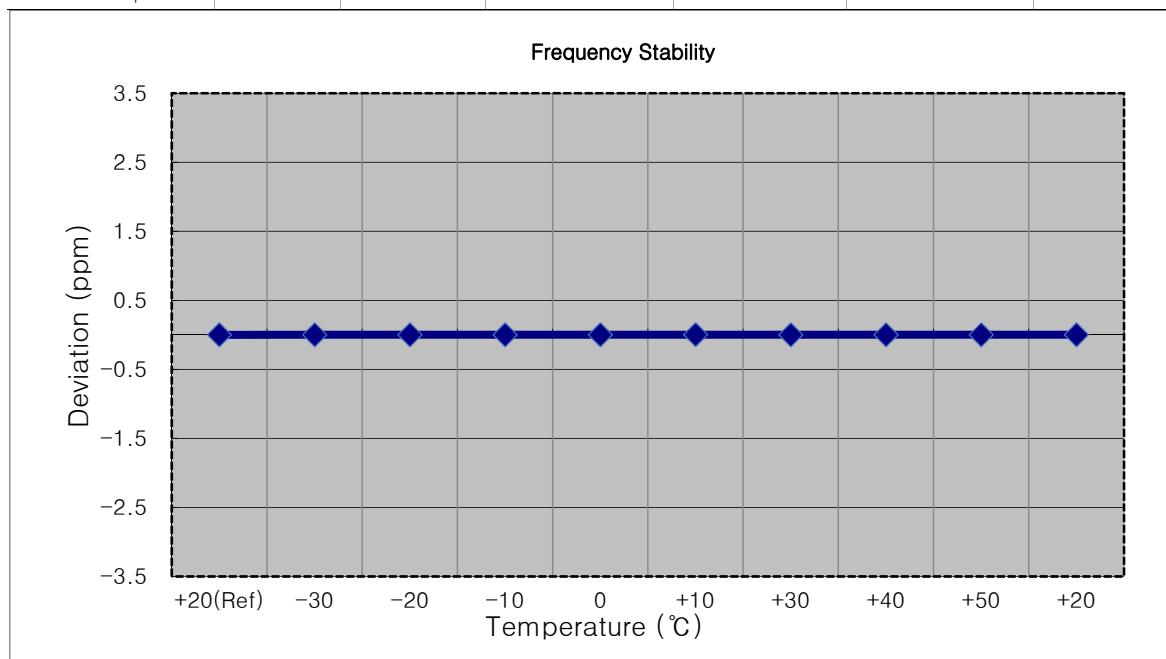
MODE: LTE B2
 OPERATING FREQUENCY: 1855,000,000 Hz
 CHANNEL: 18650 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1855 000 004	0.0	0.000 000	0.000
100 %		-30	1855 000 002	-1.5	0.000 000	-0.001
100 %		-20	1855 000 006	2.7	0.000 000	0.001
100 %		-10	1855 000 006	2.0	0.000 000	0.001
100 %		0	1855 000 006	2.2	0.000 000	0.001
100 %		+10	1855 000 007	3.4	0.000 000	0.002
100 %		+30	1855 000 008	3.8	0.000 000	0.002
100 %		+40	1855 000 006	2.3	0.000 000	0.001
100 %		+50	1855 000 007	2.8	0.000 000	0.002
Batt. Endpoint	3.400	+20	1855 000 008	4.7	0.000 000	0.003



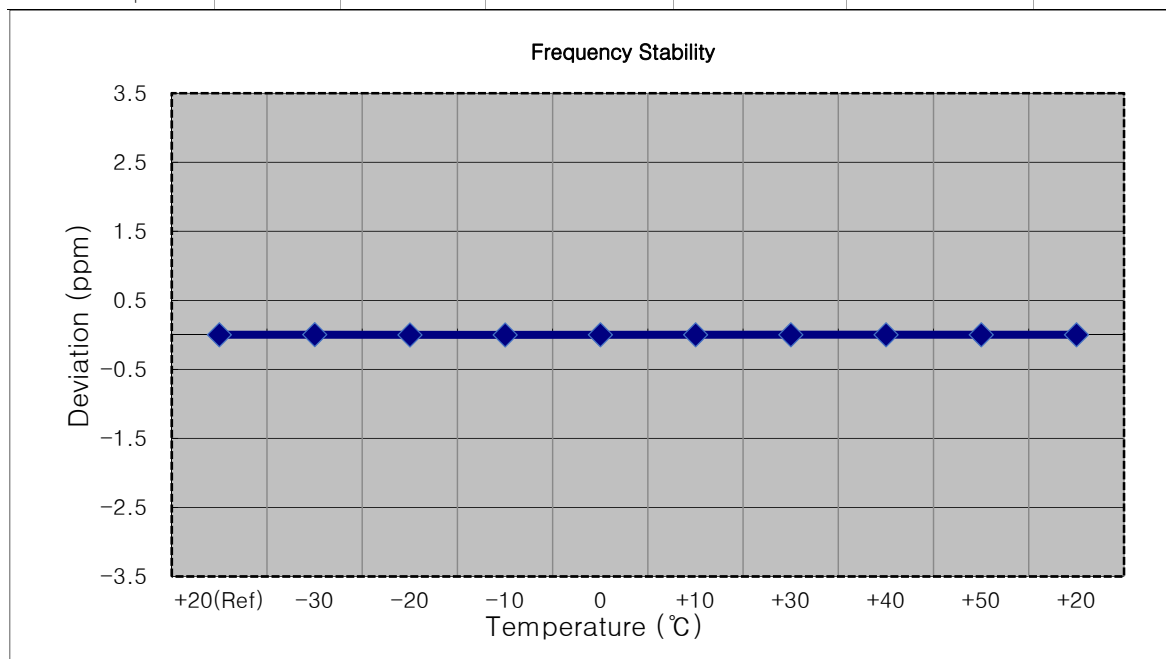
MODE: LTE B2
 OPERATING FREQUENCY: 1857,500,000 Hz
 CHANNEL: 18675 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1857 500 002	0.0	0.000 000	0.000
100 %		-30	1857 500 004	2.0	0.000 000	0.001
100 %		-20	1857 500 004	2.0	0.000 000	0.001
100 %		-10	1857 500 004	2.0	0.000 000	0.001
100 %		0	1857 500 005	3.3	0.000 000	0.002
100 %		+10	1857 500 006	4.3	0.000 000	0.002
100 %		+30	1857 500 004	1.8	0.000 000	0.001
100 %		+40	1857 500 004	2.5	0.000 000	0.001
100 %		+50	1857 500 005	3.3	0.000 000	0.002
Batt. Endpoint	3.400	+20	1857 500 004	2.0	0.000 000	0.001



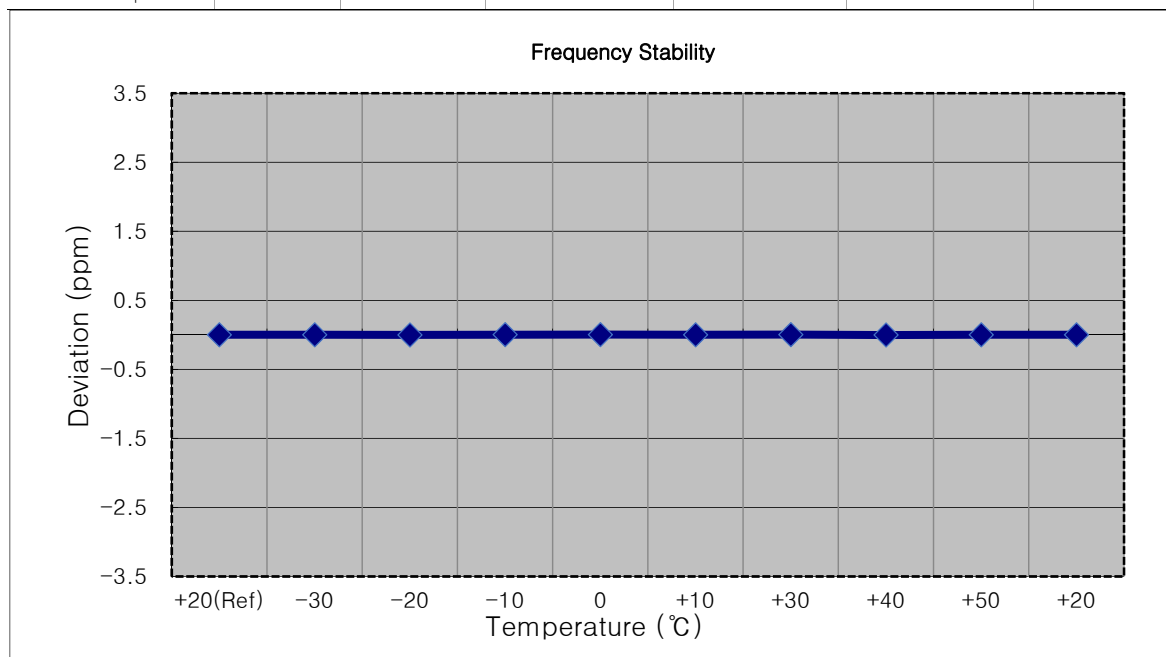
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1860,000,000 Hz</u>
CHANNEL:	<u>18700 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1860 000 003	0.0	0.000 000	0.000
100 %		-30	1860 000 007	4.1	0.000 000	0.002
100 %		-20	1860 000 001	-1.8	0.000 000	-0.001
100 %		-10	1860 000 000	-2.5	0.000 000	-0.001
100 %		0	1860 000 006	3.0	0.000 000	0.002
100 %		+10	1860 000 004	1.5	0.000 000	0.001
100 %		+30	1860 000 005	2.5	0.000 000	0.001
100 %		+40	1860 000 005	2.2	0.000 000	0.001
100 %		+50	1860 000 005	2.2	0.000 000	0.001
Batt. Endpoint	3.400	+20	1860 000 004	1.1	0.000 000	0.001



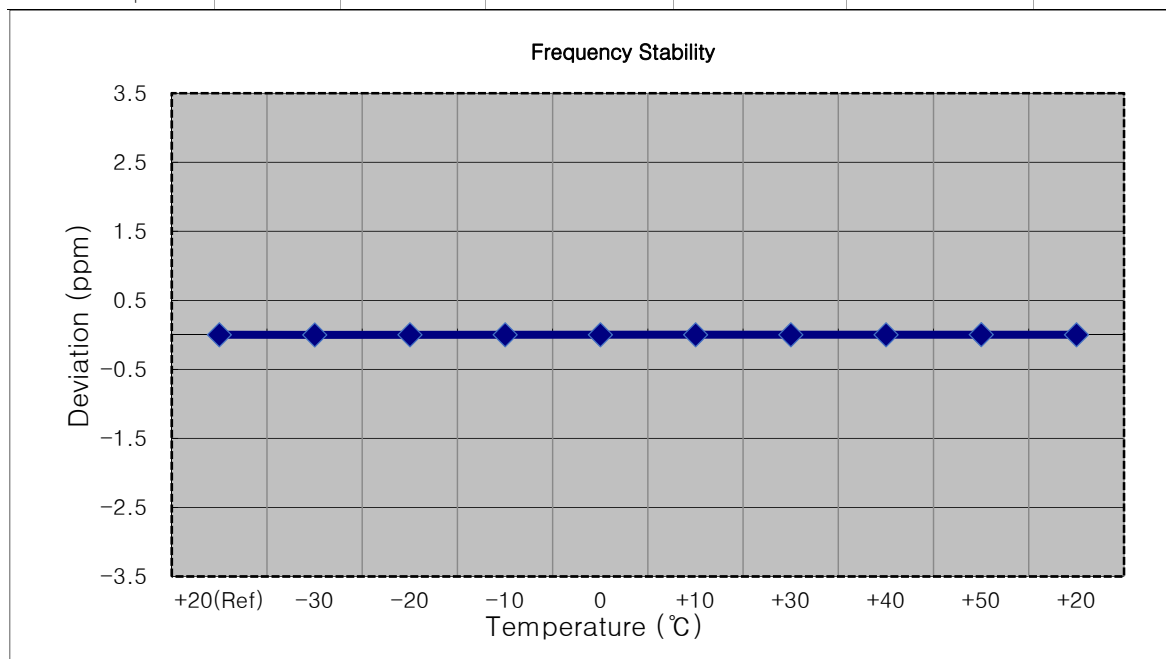
MODE: LTE B2
 OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (1.4 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1879 999 998	0.0	0.000 000	0.000
100 %		-30	1880 000 001	2.7	0.000 000	0.001
100 %		-20	1879 999 995	-2.9	0.000 000	-0.002
100 %		-10	1880 000 004	5.9	0.000 000	0.003
100 %		0	1880 000 002	4.6	0.000 000	0.002
100 %		+10	1880 000 001	3.5	0.000 000	0.002
100 %		+30	1880 000 002	4.1	0.000 000	0.002
100 %		+40	1879 999 994	-3.9	0.000 000	-0.002
100 %		+50	1880 000 002	3.8	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 000	2.5	0.000 000	0.001



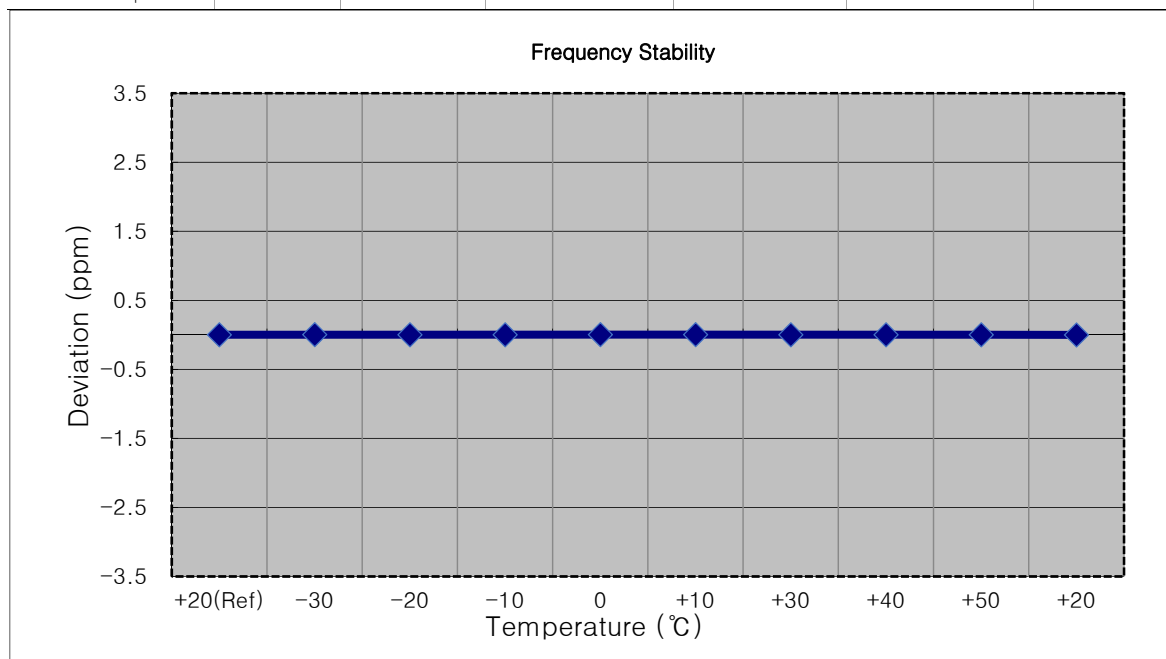
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1880 000 003	0.0	0.000 000	0.000
100 %		-30	1880 000 001	-1.7	0.000 000	-0.001
100 %		-20	1880 000 005	2.5	0.000 000	0.001
100 %		-10	1880 000 006	3.7	0.000 000	0.002
100 %		0	1880 000 005	2.1	0.000 000	0.001
100 %		+10	1880 000 006	3.2	0.000 000	0.002
100 %		+30	1880 000 006	3.2	0.000 000	0.002
100 %		+40	1880 000 005	2.8	0.000 000	0.001
100 %		+50	1880 000 007	4.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 005	2.7	0.000 000	0.001



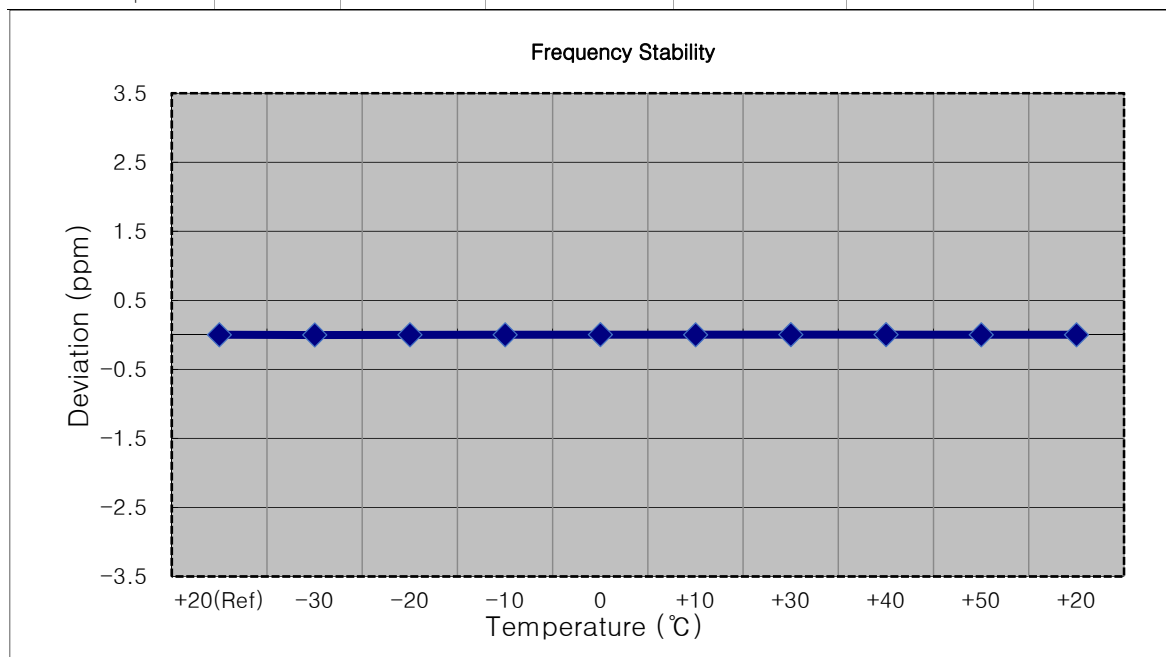
MODE: LTE B2
 OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (5 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1880 000 004	0.0	0.000 000	0.000
100 %		-30	1880 000 009	4.3	0.000 000	0.002
100 %		-20	1880 000 007	2.7	0.000 000	0.001
100 %		-10	1880 000 008	3.7	0.000 000	0.002
100 %		0	1880 000 008	4.2	0.000 000	0.002
100 %		+10	1880 000 008	4.0	0.000 000	0.002
100 %		+30	1880 000 008	3.5	0.000 000	0.002
100 %		+40	1880 000 008	3.3	0.000 000	0.002
100 %		+50	1880 000 008	3.6	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 002	-2.5	0.000 000	-0.001



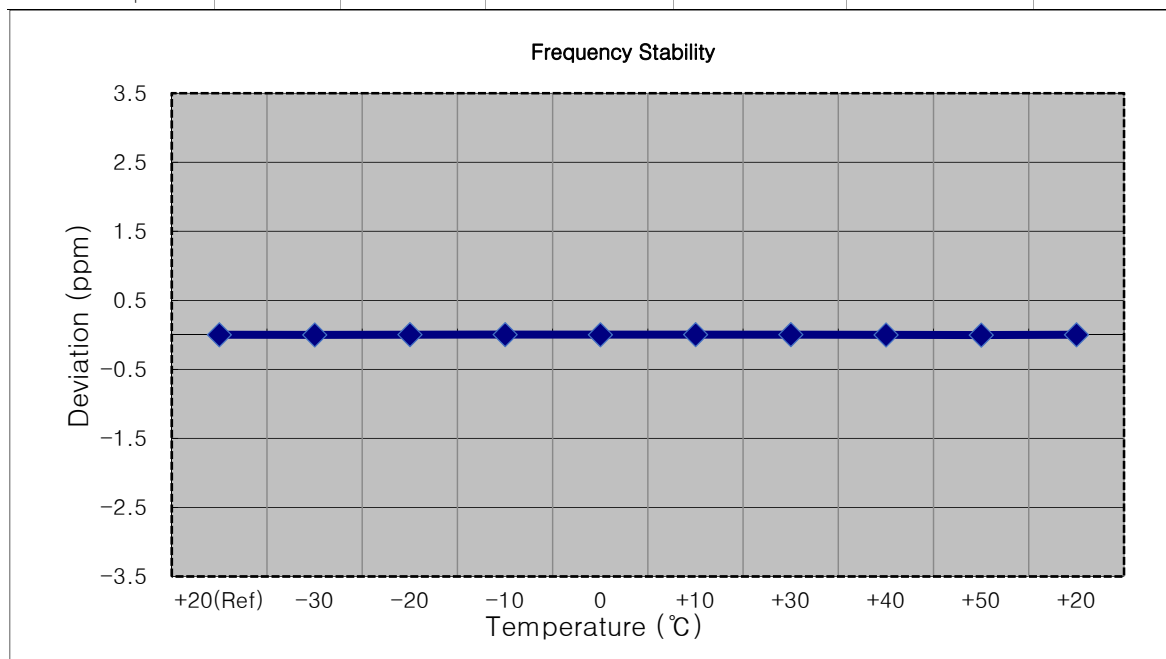
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1880 000 004	0.0	0.000 000	0.000
100 %		-30	1880 000 000	-3.5	0.000 000	-0.002
100 %		-20	1880 000 008	3.7	0.000 000	0.002
100 %		-10	1880 000 007	2.8	0.000 000	0.001
100 %		0	1880 000 010	5.7	0.000 000	0.003
100 %		+10	1880 000 007	3.5	0.000 000	0.002
100 %		+30	1880 000 008	4.3	0.000 000	0.002
100 %		+40	1880 000 009	5.2	0.000 000	0.003
100 %		+50	1880 000 006	2.4	0.000 000	0.001
Batt. Endpoint	3.400	+20	1880 000 007	3.1	0.000 000	0.002



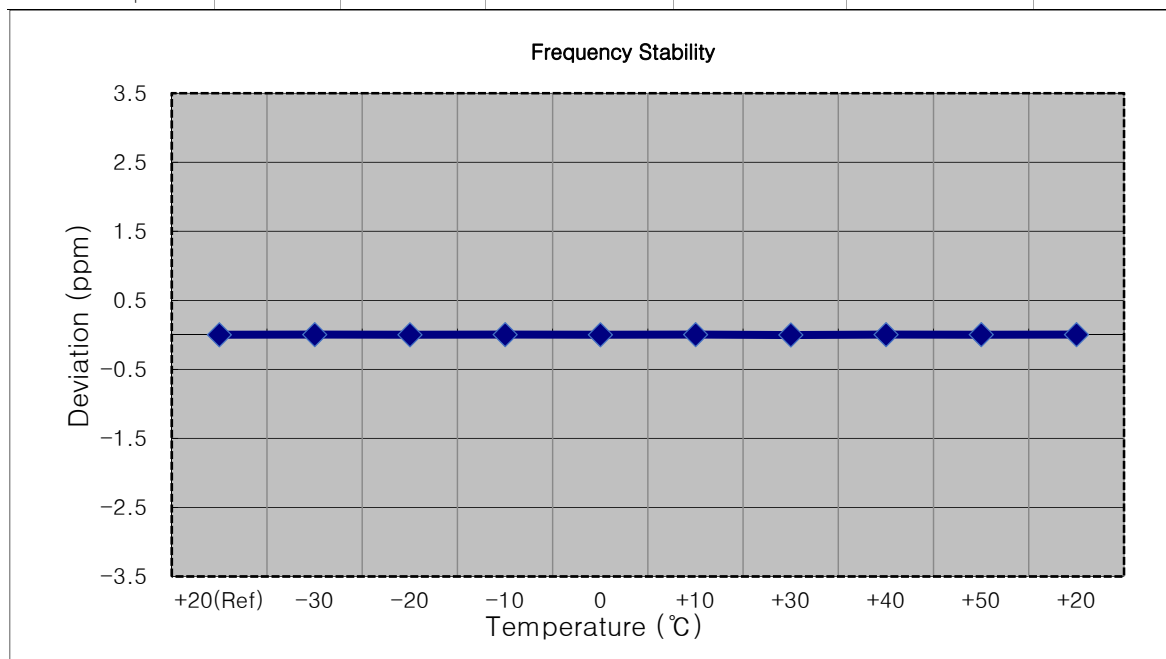
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1880 000 004	0.0	0.000 000	0.000
100 %		-30	1880 000 002	-2.5	0.000 000	-0.001
100 %		-20	1880 000 008	4.3	0.000 000	0.002
100 %		-10	1880 000 009	4.8	0.000 000	0.003
100 %		0	1880 000 007	2.6	0.000 000	0.001
100 %		+10	1880 000 008	4.3	0.000 000	0.002
100 %		+30	1880 000 011	6.6	0.000 000	0.004
100 %		+40	1880 000 000	-3.7	0.000 000	-0.002
100 %		+50	1879 999 998	-5.8	0.000 000	-0.003
Batt. Endpoint	3.400	+20	1880 000 007	3.2	0.000 000	0.002



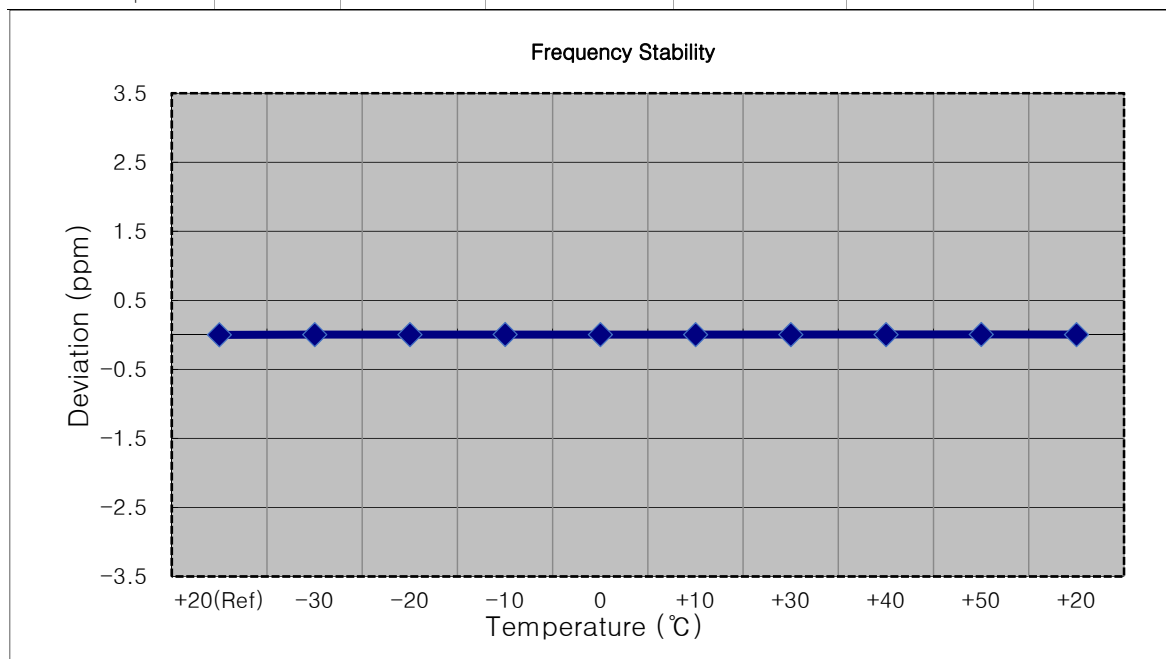
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1880 000 004	0.0	0.000 000	0.000
100 %		-30	1880 000 009	4.8	0.000 000	0.003
100 %		-20	1880 000 008	3.9	0.000 000	0.002
100 %		-10	1880 000 008	4.0	0.000 000	0.002
100 %		0	1880 000 007	2.8	0.000 000	0.001
100 %		+10	1880 000 008	4.3	0.000 000	0.002
100 %		+30	1879 999 999	-4.5	0.000 000	-0.002
100 %		+40	1880 000 009	4.8	0.000 000	0.003
100 %		+50	1880 000 009	5.1	0.000 000	0.003
Batt. Endpoint	3.400	+20	1880 000 009	4.8	0.000 000	0.003



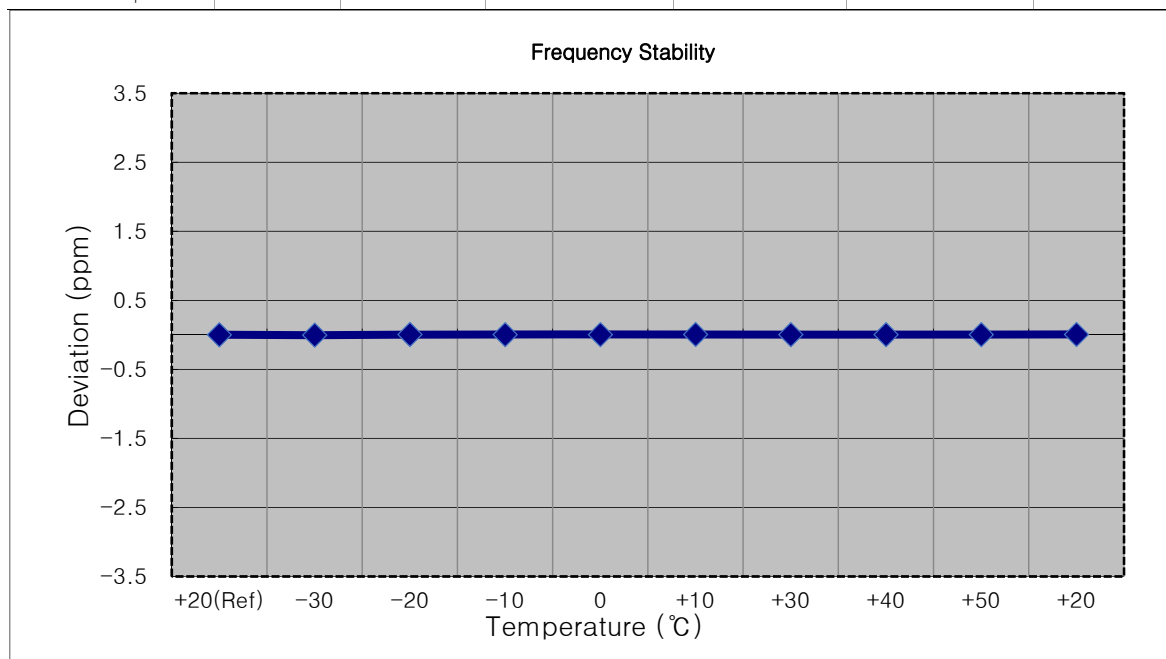
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1909,300,000 Hz</u>
CHANNEL:	<u>19193 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1909 300 008	0.0	0.000 000	0.000
100 %		-30	1909 300 013	5.3	0.000 000	0.003
100 %		-20	1909 300 014	6.1	0.000 000	0.003
100 %		-10	1909 300 017	9.4	0.000 000	0.005
100 %		0	1909 300 013	5.0	0.000 000	0.003
100 %		+10	1909 300 016	7.8	0.000 000	0.004
100 %		+30	1909 300 015	6.5	0.000 000	0.003
100 %		+40	1909 300 012	4.2	0.000 000	0.002
100 %		+50	1909 300 017	8.8	0.000 000	0.005
Batt. Endpoint	3.400	+20	1909 300 016	7.8	0.000 000	0.004



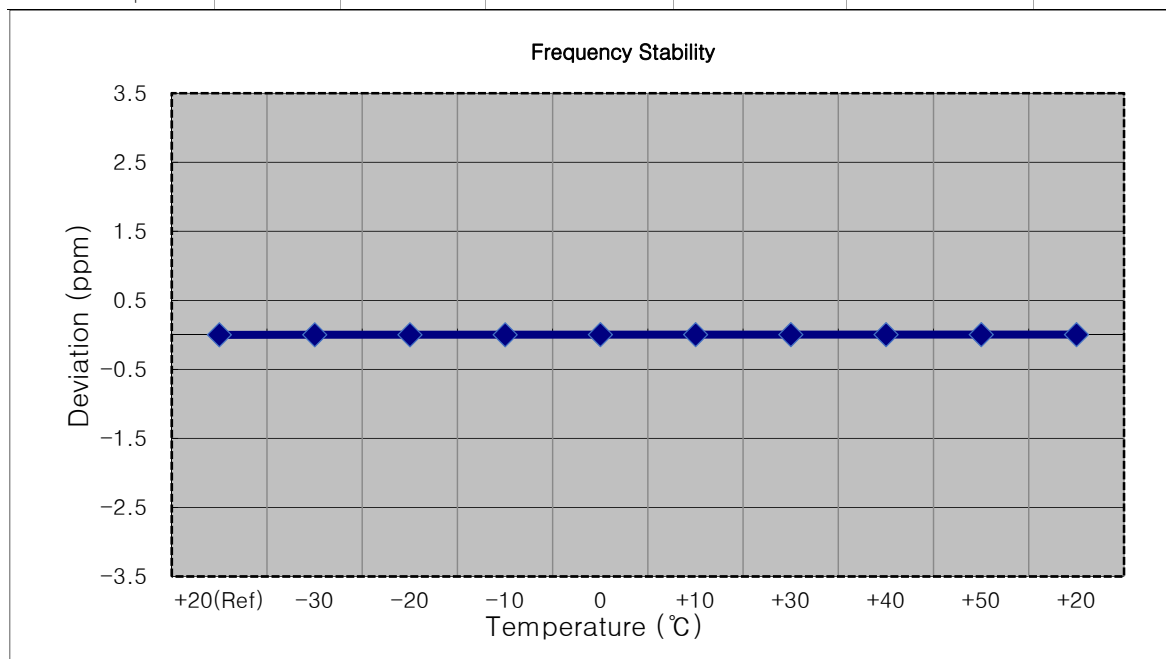
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1908,500,000 Hz</u>
CHANNEL:	<u>19185 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1908 500 010	0.0	0.000 000	0.000
100 %		-30	1908 500 003	-7.2	0.000 000	-0.004
100 %		-20	1908 500 023	12.3	0.000 001	0.006
100 %		-10	1908 500 019	8.2	0.000 000	0.004
100 %		0	1908 500 019	8.3	0.000 000	0.004
100 %		+10	1908 500 022	11.9	0.000 001	0.006
100 %		+30	1908 500 019	8.4	0.000 000	0.004
100 %		+40	1908 500 017	6.6	0.000 000	0.003
100 %		+50	1908 500 018	7.5	0.000 000	0.004
Batt. Endpoint	3.400	+20	1908 500 021	10.5	0.000 001	0.006



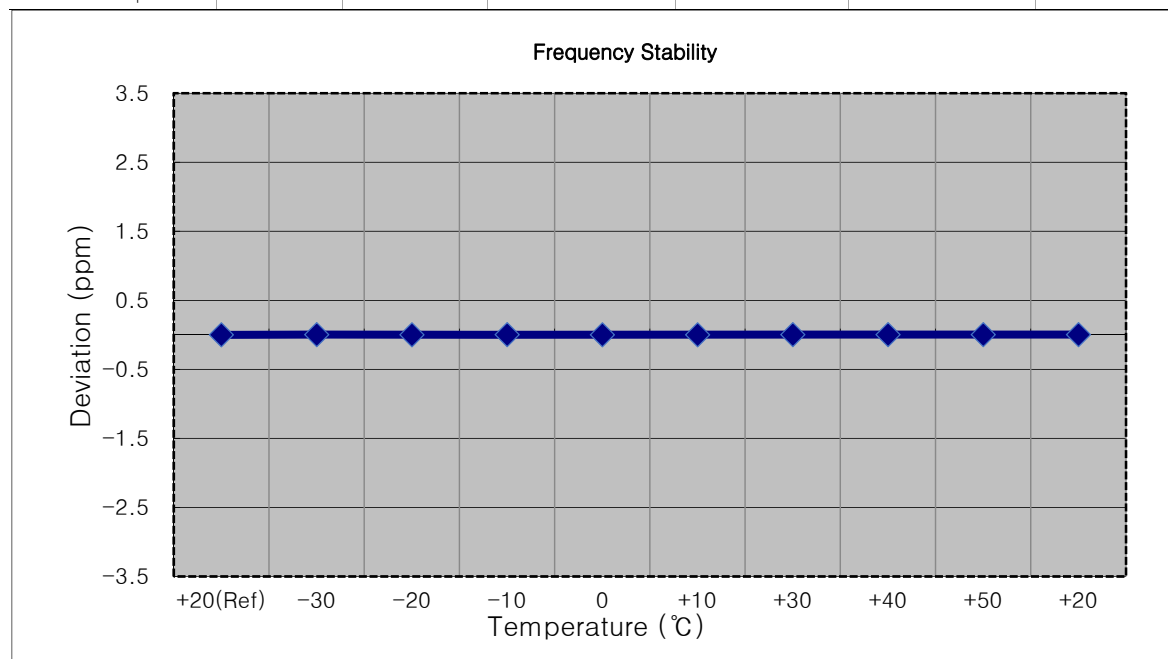
MODE: LTE B2
 OPERATING FREQUENCY: 1907,500,000 Hz
 CHANNEL: 19175 (5 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1907 500 006	0.0	0.000 000	0.000
100 %		-30	1907 500 010	3.7	0.000 000	0.002
100 %		-20	1907 500 009	3.4	0.000 000	0.002
100 %		-10	1907 500 010	3.8	0.000 000	0.002
100 %		0	1907 500 010	4.5	0.000 000	0.002
100 %		+10	1907 500 010	4.2	0.000 000	0.002
100 %		+30	1907 500 011	5.4	0.000 000	0.003
100 %		+40	1907 500 011	5.3	0.000 000	0.003
100 %		+50	1907 500 010	4.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1907 500 011	5.0	0.000 000	0.003



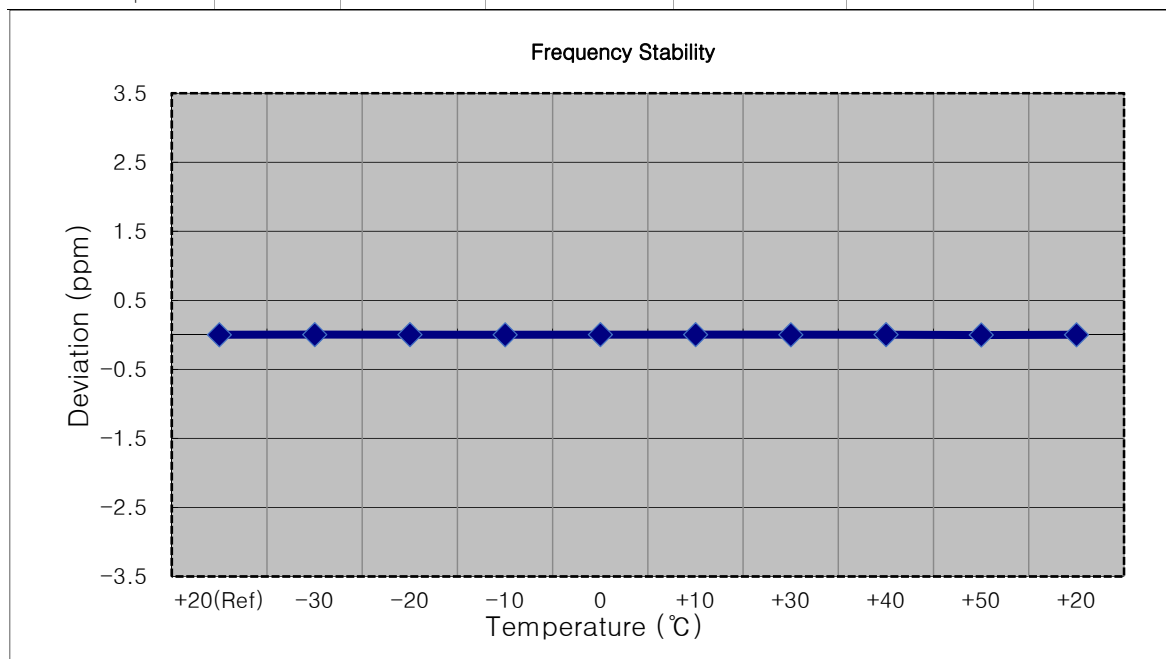
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1905,000,000 Hz</u>
CHANNEL:	<u>19150 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1904 999 996	0.0	0.000 000	0.000
100 %		-30	1905 000 001	4.2	0.000 000	0.002
100 %		-20	1905 000 000	3.8	0.000 000	0.002
100 %		-10	1905 000 002	5.4	0.000 000	0.003
100 %		0	1905 000 000	3.4	0.000 000	0.002
100 %		+10	1905 000 000	3.5	0.000 000	0.002
100 %		+30	1905 000 001	5.0	0.000 000	0.003
100 %		+40	1905 000 002	5.3	0.000 000	0.003
100 %		+50	1905 000 001	4.2	0.000 000	0.002
Batt. Endpoint	3.400	+20	1905 000 001	5.0	0.000 000	0.003



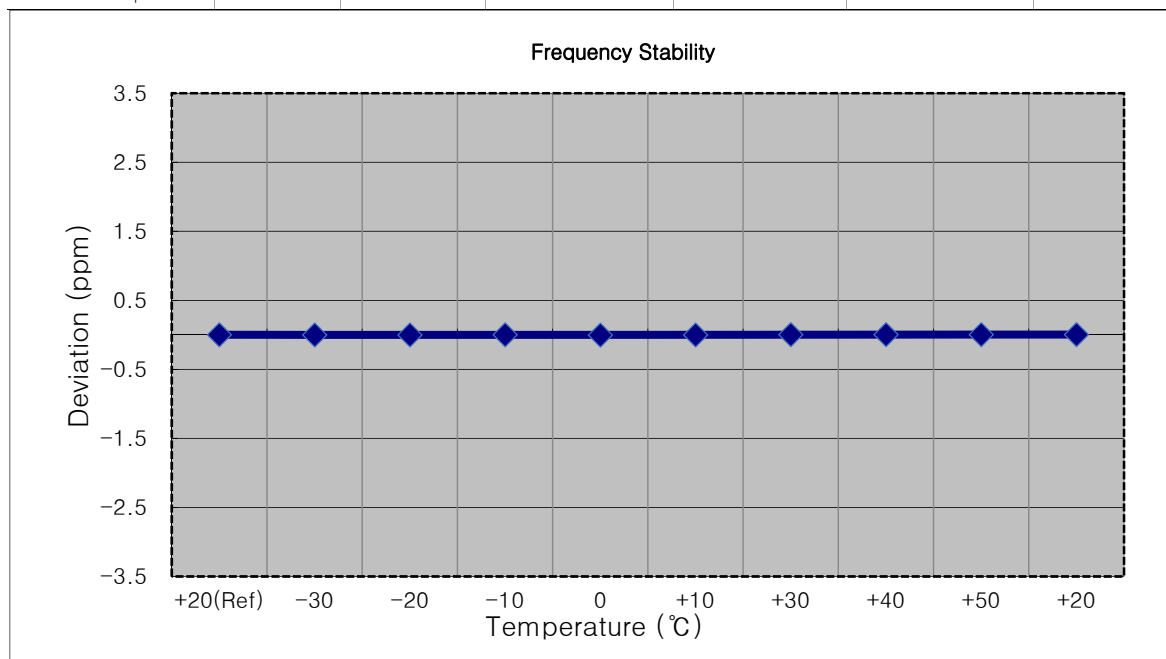
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1902,500,000 Hz</u>
CHANNEL:	<u>19125 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1902 500 006	0.0	0.000 000	0.000
100 %		-30	1902 500 010	4.7	0.000 000	0.002
100 %		-20	1902 500 010	4.7	0.000 000	0.002
100 %		-10	1902 500 009	3.6	0.000 000	0.002
100 %		0	1902 500 011	5.6	0.000 000	0.003
100 %		+10	1902 500 011	5.1	0.000 000	0.003
100 %		+30	1902 500 008	2.2	0.000 000	0.001
100 %		+40	1902 500 010	4.4	0.000 000	0.002
100 %		+50	1902 500 003	-2.8	0.000 000	-0.001
Batt. Endpoint	3.400	+20	1902 500 010	4.0	0.000 000	0.002



MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1900,000,000 Hz</u>
CHANNEL:	<u>19100 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1900 000 006	0.0	0.000 000	0.000
100 %		-30	1900 000 002	-3.2	0.000 000	-0.002
100 %		-20	1900 000 003	-2.4	0.000 000	-0.001
100 %		-10	1900 000 009	3.7	0.000 000	0.002
100 %		0	1900 000 000	-5.4	0.000 000	-0.003
100 %		+10	1900 000 002	-3.3	0.000 000	-0.002
100 %		+30	1900 000 010	4.9	0.000 000	0.003
100 %		+40	1900 000 010	4.0	0.000 000	0.002
100 %		+50	1900 000 012	6.1	0.000 000	0.003
Batt. Endpoint	3.400	+20	1900 000 011	5.5	0.000 000	0.003



8.8 UPLINK CARRIER AGGREGATION

Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. All modes of operation were investigated and the worst case configuration results are reported in this section.

Please refer to the table below.

3. The worst case is reported with the modulations, RB sizes and offsets.

- 4A (Ant F) - 2A (Ant B)

(PCC - Modulation: QPSK, RB: 1, RB Offset: 24, SCC - Modulation: QPSK, RB: 1, RB Offset: 5)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
4A (Ant F)	2A (Ant B)	5	20375	1.4	18900

8.1.1 RADIATED SPURIOUS EMISSIONS

4A (Ant F) (PCC) - 2A (Ant B) (SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 505.00	-43.94	12.34	-61.90	3.05	H	-52.61	-13.00
5 257.50	-36.36	12.99	-48.73	3.79	H	-39.53	-13.00
7 010.00	-44.21	11.26	-49.46	4.42	H	-42.62	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 760.00	-43.45	12.22	-59.06	3.12	H	-49.96	-13.00
5 640.00	-43.76	13.12	-56.20	3.92	H	-47.00	-13.00
7 520.00	-44.81	10.82	-47.46	4.61	H	-41.25	-13.00

9. TEST DATA(Ant F)

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
1850.7	LTE B2 (1.4 MHz)	QPSK	-19.56	14.96	10.40	2.07	V	< 2.00	0.213	23.29	1	0
		16-QAM	-20.25	14.27	10.40	2.07	V		0.182	22.60		
		64-QAM	-21.43	13.09	10.40	2.07	V		0.139	21.42		
		256-QAM	-24.48	10.04	10.40	2.07	V		0.069	18.37		
1880		QPSK	-20.53	14.42	10.40	2.21	V		0.182	22.61	1	0
		16-QAM	-21.24	13.71	10.40	2.21	V		0.155	21.90		
		64-QAM	-22.30	12.65	10.40	2.21	V		0.121	20.84		
		256-QAM	-25.40	9.55	10.40	2.21	V		0.059	17.74		
1909.3		QPSK	-21.16	13.78	10.40	2.17	V		0.159	22.01	1	0
		16-QAM	-21.91	13.03	10.40	2.17	V		0.134	21.26		
		64-QAM	-22.95	11.99	10.40	2.17	V		0.105	20.22		
		256-QAM	-26.02	8.92	10.40	2.17	V		0.052	17.15		

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
1851.5	LTE B2 (3 MHz)	QPSK	-19.24	15.28	10.40	2.07	V	< 2.00	0.230	23.61	1	0
		16-QAM	-19.95	14.57	10.40	2.07	V		0.195	22.90		
		64-QAM	-21.00	13.52	10.40	2.07	V		0.153	21.85		
		256-QAM	-24.10	10.42	10.40	2.07	V		0.075	18.75		
1880		QPSK	-20.25	14.70	10.40	2.21	V		0.195	22.89	1	0
		16-QAM	-20.95	14.00	10.40	2.21	V		0.166	22.19		
		64-QAM	-22.02	12.93	10.40	2.21	V		0.129	21.12		
		256-QAM	-25.13	9.82	10.40	2.21	V		0.063	18.01		
1908.5		QPSK	-20.67	14.27	10.40	2.17	V		0.178	22.50	1	0
		16-QAM	-21.37	13.57	10.40	2.17	V		0.151	21.80		
		64-QAM	-22.40	12.54	10.40	2.17	V		0.119	20.77		
		256-QAM	-25.50	9.44	10.40	2.17	V		0.058	17.67		

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
1852.5	LTE B2 (5 MHz)	QPSK	-19.08	15.49	10.40	2.08	V	< 2.00	0.240	23.81	1	0
		16-QAM	-19.97	14.60	10.40	2.08	V		0.196	22.92		
		64-QAM	-21.03	13.54	10.40	2.08	V		0.153	21.86		
		256-QAM	-24.12	10.45	10.40	2.08	V		0.075	18.77		
1880		QPSK	-20.33	14.62	10.40	2.21	V		0.191	22.81	1	0
		16-QAM	-21.05	13.90	10.40	2.21	V		0.162	22.09		
		64-QAM	-22.11	12.84	10.40	2.21	V		0.127	21.03		
		256-QAM	-25.20	9.75	10.40	2.21	V		0.062	17.94		
1907.5		QPSK	-20.49	14.45	10.40	2.17	V		0.185	22.68	1	0
		16-QAM	-21.23	13.71	10.40	2.17	V		0.156	21.94		
		64-QAM	-22.30	12.64	10.40	2.17	V		0.122	20.87		
		256-QAM	-25.40	9.54	10.40	2.17	V		0.060	17.77		

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
1855	LTE B2 (10 MHz)	QPSK	-19.20	15.37	10.40	2.08	V	< 2.00	0.234	23.69	1	0
		16-QAM	-20.08	14.49	10.40	2.08	V		0.191	22.81		
		64-QAM	-21.14	13.43	10.40	2.08	V		0.150	21.75		
		256-QAM	-24.10	10.47	10.40	2.08	V		0.076	18.79		
1880		QPSK	-20.15	14.80	10.40	2.21	V		0.199	22.99	1	0
		16-QAM	-21.00	13.95	10.40	2.21	V		0.164	22.14		
		64-QAM	-22.05	12.90	10.40	2.21	V		0.129	21.09		
		256-QAM	-24.99	9.96	10.40	2.21	V		0.065	18.15		
1905		QPSK	-20.39	14.53	10.40	2.19	V		0.188	22.74	1	0
		16-QAM	-21.22	13.70	10.40	2.19	V		0.155	21.91		
		64-QAM	-22.28	12.64	10.40	2.19	V		0.122	20.85		
		256-QAM	-25.24	9.68	10.40	2.19	V		0.062	17.89		

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
1857.5	LTE B2 (15 MHz)	QPSK	-19.12	15.52	10.40	2.10	V	< 2.00	0.241	23.82	1	0
		16-QAM	-20.03	14.61	10.40	2.10	V		0.195	22.91		
		64-QAM	-21.11	13.53	10.40	2.10	V		0.152	21.83		
		256-QAM	-24.14	10.50	10.40	2.10	V		0.076	18.80		
1880		QPSK	-19.97	14.98	10.40	2.21	V		0.207	23.17	1	0
		16-QAM	-20.76	14.19	10.40	2.21	V		0.173	22.38		
		64-QAM	-21.82	13.13	10.40	2.21	V		0.136	21.32		
		256-QAM	-24.85	10.10	10.40	2.21	V		0.067	18.29		
1902.5		QPSK	-20.58	14.34	10.40	2.19	V		0.180	22.55	1	0
		16-QAM	-21.41	13.51	10.40	2.19	V		0.149	21.72		
		64-QAM	-22.47	12.45	10.40	2.19	V		0.116	20.66		
		256-QAM	-25.50	9.42	10.40	2.19	V		0.058	17.63		

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
1860	LTE B2 (20 MHz)	QPSK	-19.48	15.16	10.40	2.10	V	< 2.00	0.222	23.46	1	0
		16-QAM	-20.33	14.31	10.40	2.10	V		0.182	22.61		
		64-QAM	-21.42	13.22	10.40	2.10	V		0.142	21.52		
		256-QAM	-24.56	10.08	10.40	2.10	V		0.069	18.38		
1880		QPSK	-20.49	14.46	10.40	2.21	V		0.184	22.65	1	0
		16-QAM	-21.30	13.65	10.40	2.21	V		0.153	21.84		
		64-QAM	-22.37	12.58	10.40	2.21	V		0.119	20.77		
		256-QAM	-25.31	9.64	10.40	2.21	V		0.061	17.83		
1900		QPSK	-20.93	13.95	10.40	2.20	V		0.164	22.15	1	0
		16-QAM	-21.81	13.07	10.40	2.20	V		0.134	21.27		
		64-QAM	-22.88	12.00	10.40	2.20	V		0.105	20.20		
		256-QAM	-25.86	9.02	10.40	2.20	V		0.053	17.22		

9.2 RADIATED SPURIOUS EMISSIONS

MODE: LTE B2
 MODULATION SIGNAL: 15 MHz QPSK
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
18675 (1857.5)	3 715.00	-41.33	12.28	-58.42	3.11	H	-49.25	1	0
	5 572.50	-41.20	13.06	-53.35	3.89	H	-44.18		
	7 430.00	-45.08	10.78	-48.09	4.56	H	-41.87		
18900 (1880.0)	3 760.00	-43.07	12.22	-58.68	3.12	H	-49.58	1	0
	5 640.00	-40.10	13.12	-52.54	3.92	H	-43.34		
	7 520.00	-45.39	10.82	-48.04	4.61	H	-41.83		
19125 (1902.5)	3 805.00	-43.13	12.16	-59.41	3.21	H	-50.46	1	0
	5 707.50	-41.14	13.09	-53.53	4.02	H	-44.46		
	7 610.00	-45.51	11.11	-48.49	4.64	H	-42.02		

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)	Limit (dB)
2	1.4 MHz	1880.0	QPSK	6	0	5.50	13.00
			16-QAM			6.29	
			64-QAM			6.59	
			256-QAM			6.69	
	3 MHz		QPSK	15		5.59	
			16-QAM			6.25	
			64-QAM			6.55	
			256-QAM			6.74	
	5 MHz		QPSK	25		5.59	
			16-QAM			6.32	
			64-QAM			6.57	
			256-QAM			6.81	
	10 MHz		QPSK	50		5.69	
			16-QAM			6.35	
			64-QAM			6.60	
			256-QAM			6.80	
	15 MHz		QPSK	75		5.61	
			16-QAM			6.34	
			64-QAM			6.57	
			256-QAM			6.80	
	20 MHz		QPSK	100		5.56	
			16-QAM			6.32	
			64-QAM			6.54	
			256-QAM			6.83	

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 199 ~ 222.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
2	1.4 MHz	1880.0	QPSK	6	0	1.0989
			16-QAM			1.0944
			64-QAM			1.0972
			256-QAM			1.0958
	3 MHz		QPSK	15		2.7202
			16-QAM			2.7076
			64-QAM			2.7036
			256-QAM			2.7137
	5 MHz		QPSK	25		4.5286
			16-QAM			4.5042
			64-QAM			4.5264
			256-QAM			4.5462
	10 MHz		QPSK	50		9.0074
			16-QAM			9.0249
			64-QAM			9.0355
			256-QAM			9.0360
	15 MHz		QPSK	75		13.490
			16-QAM			13.490
			64-QAM			13.472
			256-QAM			13.498
	20 MHz		QPSK	100		18.003
			16-QAM			17.956
			64-QAM			17.944
			256-QAM			17.968

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 223 ~ 246.

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)
2	1.4	1850.7	3.1307	27.976	-68.226	-40.250	-13.00
		1880.0	5.3839	28.591	-67.596	-39.005	
		1909.3	2.5325	27.976	-68.121	-40.145	
	3	1851.5	6.2313	28.591	-68.059	-39.468	
		1880.0	3.6990	27.976	-67.474	-39.498	
		1908.5	2.5225	27.976	-67.653	-39.677	
	5	1852.5	2.4826	27.976	-67.994	-40.018	
		1880.0	5.9921	28.591	-68.065	-39.474	
		1907.5	3.3201	27.976	-67.839	-39.863	
	10	1855.0	3.7089	27.976	-67.924	-39.948	
		1880.0	3.6890	27.976	-66.144	-38.168	
		1905.0	2.5724	27.976	-68.155	-40.179	
	15	1857.5	6.8794	28.591	-67.735	-39.144	
		1880.0	3.7289	27.976	-67.271	-39.295	
		1902.5	5.6431	28.591	-67.168	-38.577	
	20	1860.0	3.6890	27.976	-68.083	-40.107	
		1880.0	3.6990	27.976	-68.101	-40.125	
		1900.0	6.5205	28.591	-68.084	-39.493	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 247 ~ 282.
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

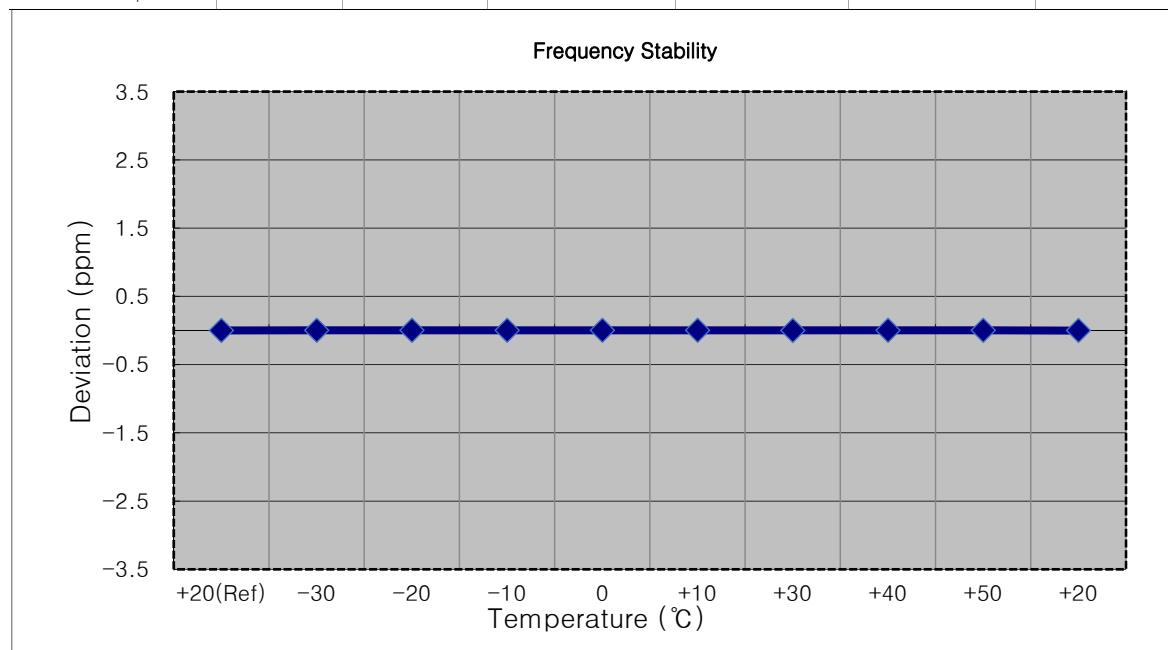
9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 283 ~ 318.

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

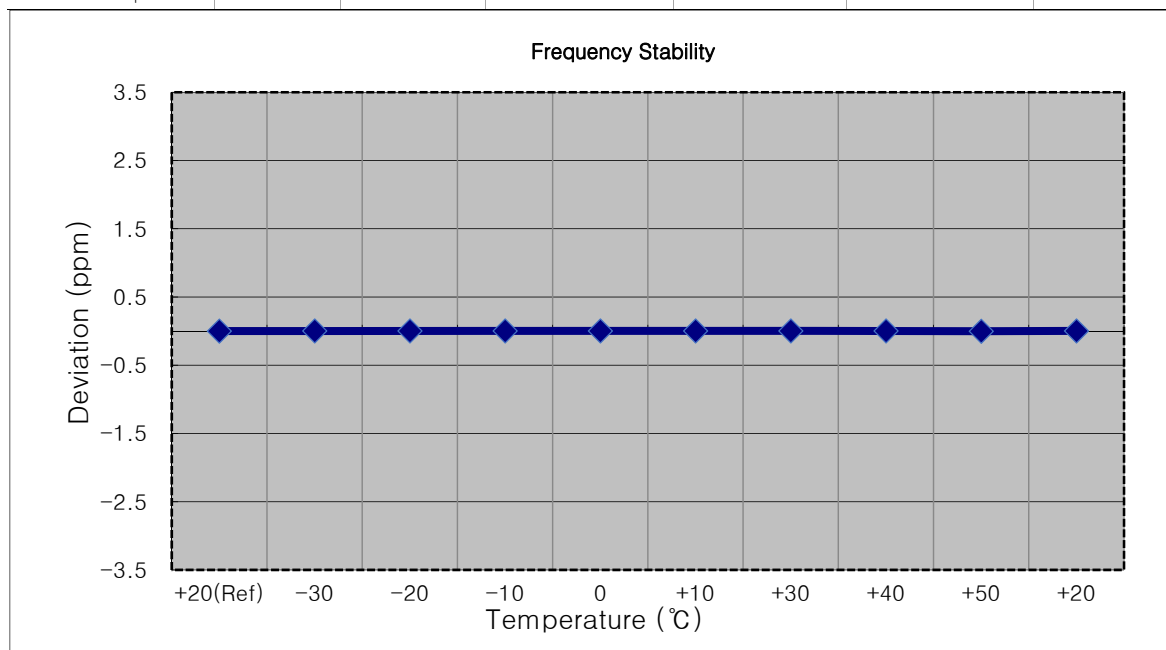
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1850,700,000 Hz</u>
CHANNEL:	<u>18607 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1850 700 003	0.0	0.000 000	0.000
100 %		-30	1850 700 004	1.6	0.000 000	0.001
100 %		-20	1850 700 006	2.9	0.000 000	0.002
100 %		-10	1850 700 005	1.9	0.000 000	0.001
100 %		0	1850 700 006	2.8	0.000 000	0.002
100 %		+10	1850 700 005	2.1	0.000 000	0.001
100 %		+30	1850 700 001	-1.4	0.000 000	-0.001
100 %		+40	1850 700 005	2.5	0.000 000	0.001
100 %		+50	1850 700 008	4.8	0.000 000	0.003
Batt. Endpoint	3.400	+20	1850 700 000	-2.4	0.000 000	-0.001



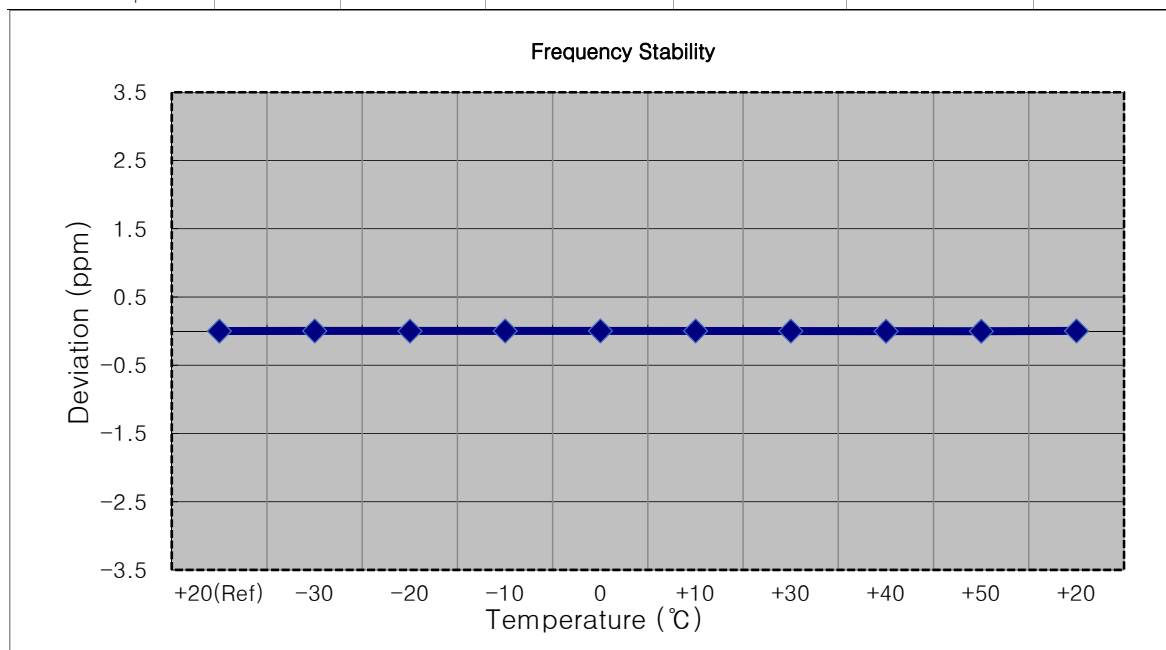
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1851,500,000 Hz</u>
CHANNEL:	<u>18615 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1851 500 004	0.0	0.000 000	0.000
100 %		-30	1851 500 007	3.5	0.000 000	0.002
100 %		-20	1851 500 006	2.4	0.000 000	0.001
100 %		-10	1851 500 007	3.1	0.000 000	0.002
100 %		0	1851 500 007	2.9	0.000 000	0.002
100 %		+10	1851 500 007	3.4	0.000 000	0.002
100 %		+30	1851 500 006	2.6	0.000 000	0.001
100 %		+40	1851 500 006	2.8	0.000 000	0.002
100 %		+50	1851 500 001	-3.0	0.000 000	-0.002
Batt. Endpoint	3.400	+20	1851 500 007	3.2	0.000 000	0.002



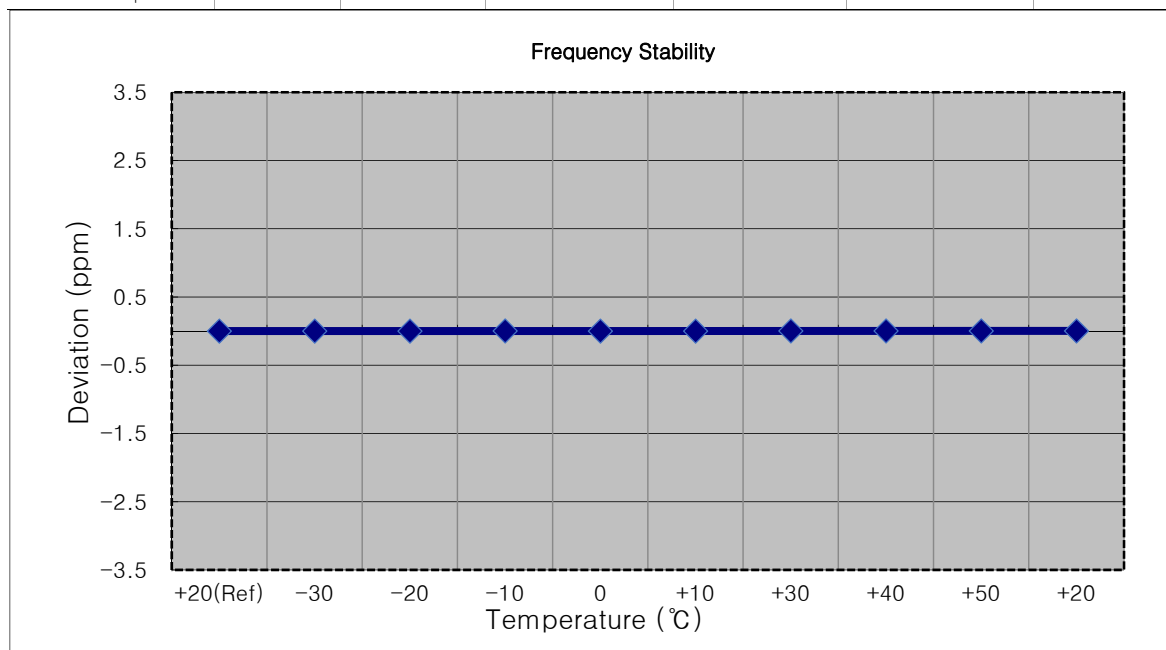
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1852,500,000 Hz</u>
CHANNEL:	<u>18625 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1852 500 003	0.0	0.000 000	0.000
100 %		-30	1852 500 007	3.8	0.000 000	0.002
100 %		-20	1852 500 001	-2.0	0.000 000	-0.001
100 %		-10	1852 500 007	3.5	0.000 000	0.002
100 %		0	1852 500 007	4.0	0.000 000	0.002
100 %		+10	1852 500 006	2.6	0.000 000	0.001
100 %		+30	1852 500 005	1.8	0.000 000	0.001
100 %		+40	1852 500 000	-2.8	0.000 000	-0.002
100 %		+50	1852 500 000	-3.0	0.000 000	-0.002
Batt. Endpoint	3.400	+20	1852 500 007	3.8	0.000 000	0.002



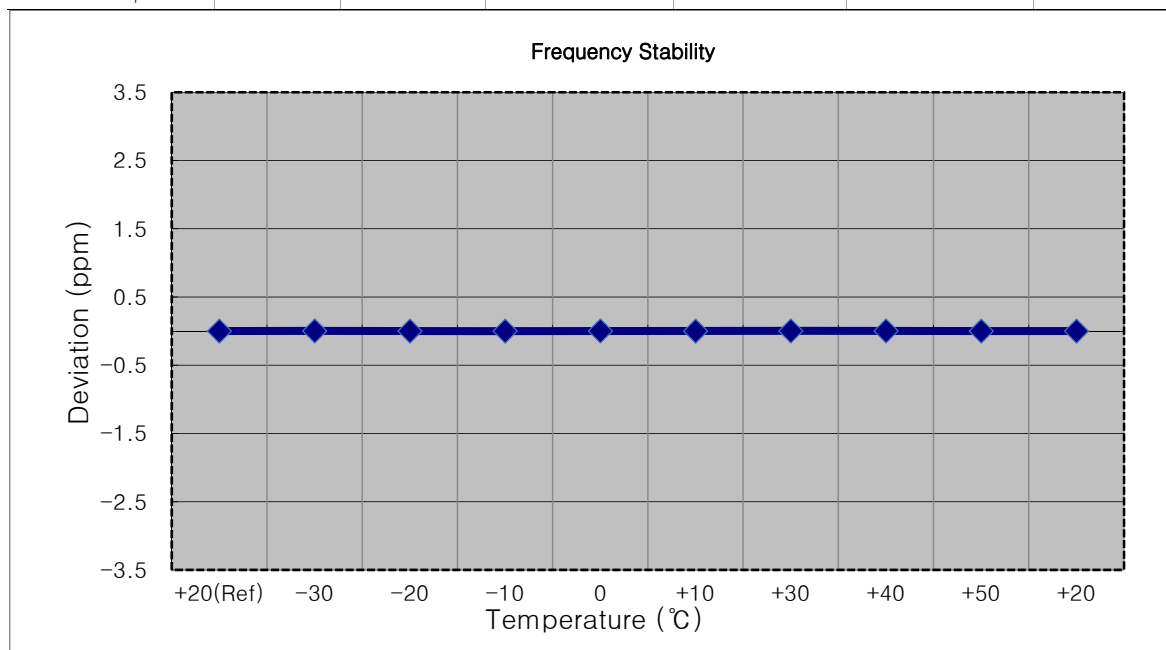
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1855,000,000 Hz</u>
CHANNEL:	<u>18650 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1854 999 998	0.0	0.000 000	0.000
100 %		-30	1855 000 000	1.7	0.000 000	0.001
100 %		-20	1854 999 999	1.5	0.000 000	0.001
100 %		-10	1855 000 000	2.4	0.000 000	0.001
100 %		0	1855 000 000	1.8	0.000 000	0.001
100 %		+10	1854 999 996	-1.8	0.000 000	-0.001
100 %		+30	1855 000 000	2.2	0.000 000	0.001
100 %		+40	1855 000 001	3.2	0.000 000	0.002
100 %		+50	1855 000 002	4.0	0.000 000	0.002
Batt. Endpoint	3.400	+20	1855 000 001	2.8	0.000 000	0.002



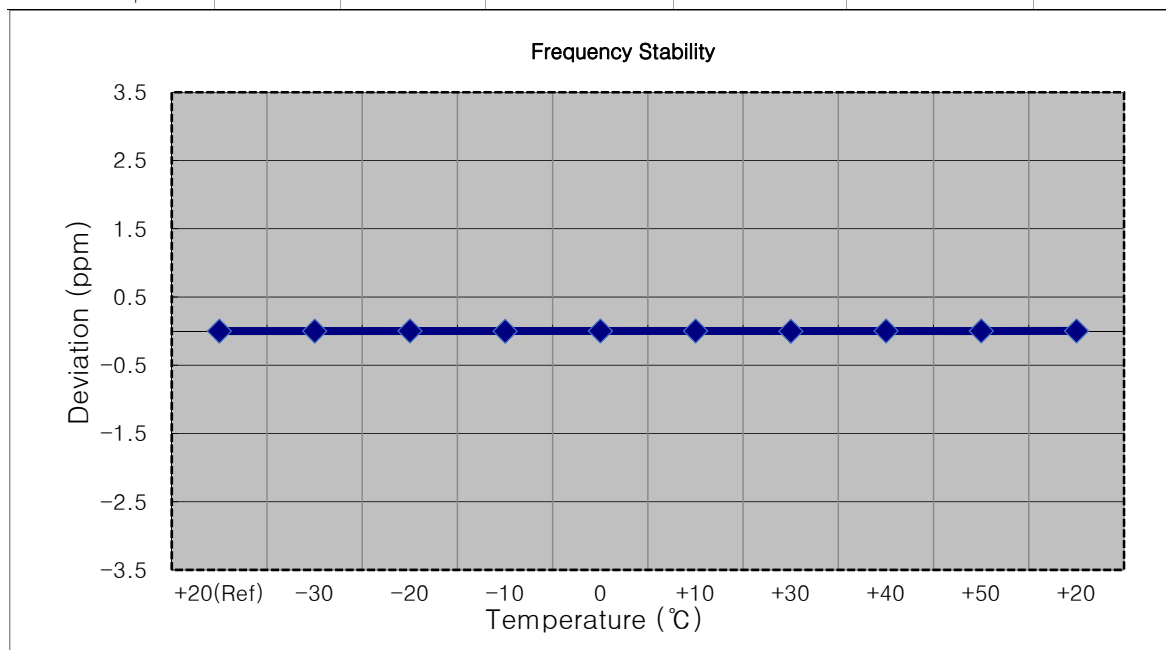
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1857,500,000 Hz</u>
CHANNEL:	<u>18675 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1857 499 997	0.0	0.000 000	0.000
100 %		-30	1857 500 001	3.9	0.000 000	0.002
100 %		-20	1857 499 995	-2.3	0.000 000	-0.001
100 %		-10	1857 499 999	1.6	0.000 000	0.001
100 %		0	1857 500 000	3.3	0.000 000	0.002
100 %		+10	1857 499 998	1.4	0.000 000	0.001
100 %		+30	1857 500 000	2.6	0.000 000	0.001
100 %		+40	1857 500 000	3.1	0.000 000	0.002
100 %		+50	1857 499 996	-1.2	0.000 000	-0.001
Batt. Endpoint	3.400	+20	1857 499 995	-2.1	0.000 000	-0.001



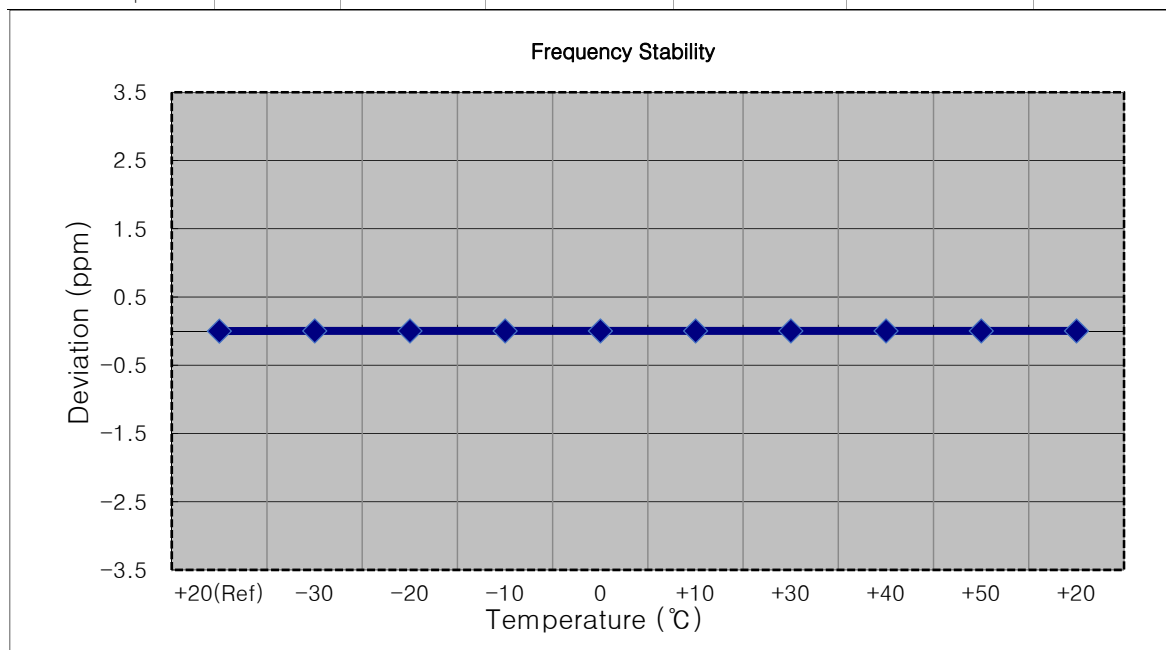
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1860,000,000 Hz</u>
CHANNEL:	<u>18700 (20 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1860 000 004	0.0	0.000 000	0.000
100 %		-30	1860 000 002	-1.5	0.000 000	-0.001
100 %		-20	1860 000 006	2.0	0.000 000	0.001
100 %		-10	1860 000 001	-2.8	0.000 000	-0.002
100 %		0	1860 000 006	2.6	0.000 000	0.001
100 %		+10	1860 000 007	3.1	0.000 000	0.002
100 %		+30	1860 000 001	-2.7	0.000 000	-0.001
100 %		+40	1860 000 006	2.4	0.000 000	0.001
100 %		+50	1860 000 007	3.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1860 000 007	3.4	0.000 000	0.002



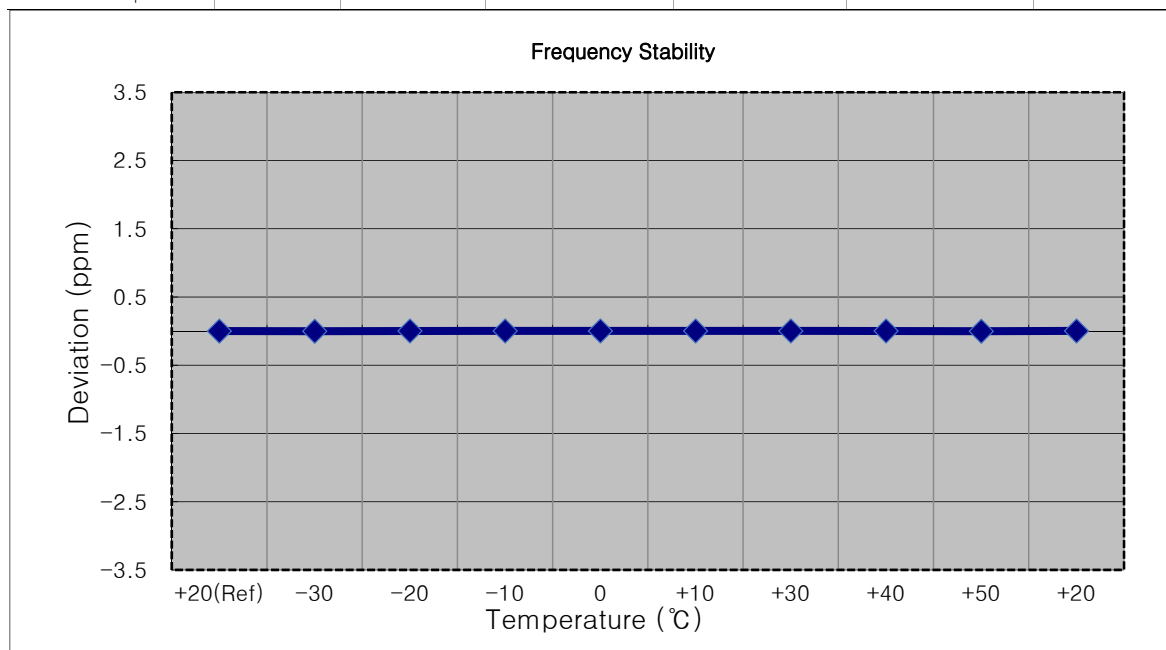
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1880 000 003	0.0	0.000 000	0.000
100 %		-30	1880 000 007	3.5	0.000 000	0.002
100 %		-20	1880 000 008	4.8	0.000 000	0.003
100 %		-10	1880 000 006	3.1	0.000 000	0.002
100 %		0	1880 000 007	3.2	0.000 000	0.002
100 %		+10	1880 000 006	2.4	0.000 000	0.001
100 %		+30	1880 000 007	3.8	0.000 000	0.002
100 %		+40	1880 000 007	3.3	0.000 000	0.002
100 %		+50	1880 000 009	5.3	0.000 000	0.003
Batt. Endpoint	3.400	+20	1880 000 007	4.1	0.000 000	0.002



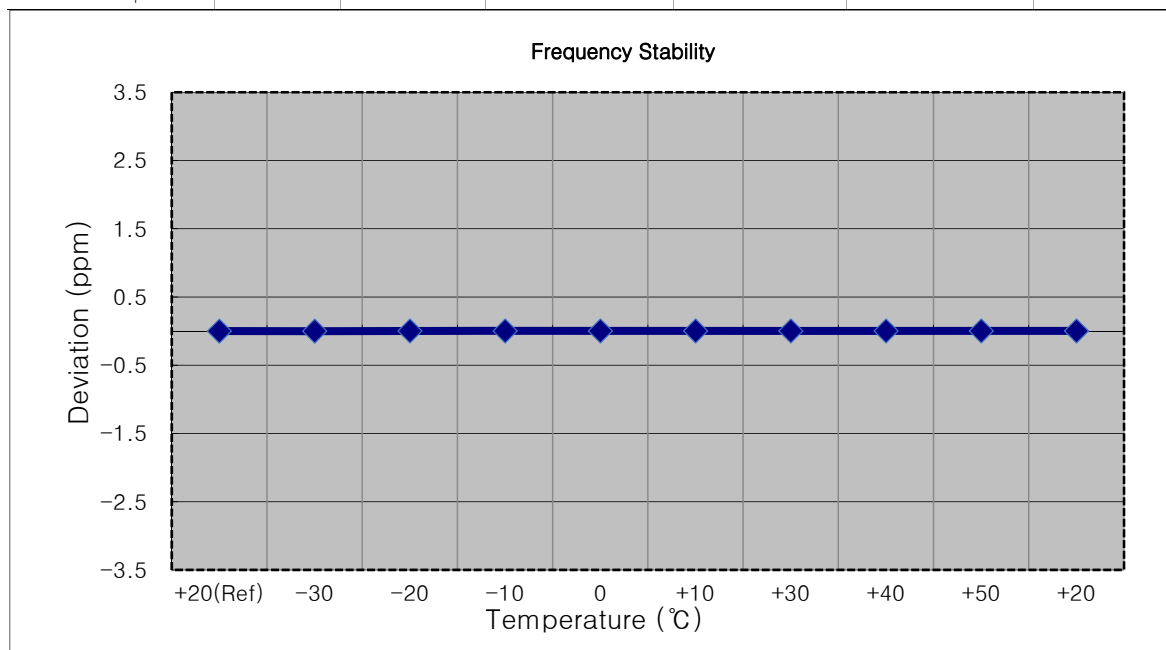
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1879 999 996	0.0	0.000 000	0.000
100 %		-30	1879 999 993	-3.0	0.000 000	-0.002
100 %		-20	1880 000 000	3.7	0.000 000	0.002
100 %		-10	1880 000 000	3.5	0.000 000	0.002
100 %		0	1879 999 999	2.7	0.000 000	0.001
100 %		+10	1880 000 002	5.5	0.000 000	0.003
100 %		+30	1879 999 999	3.3	0.000 000	0.002
100 %		+40	1879 999 999	3.0	0.000 000	0.002
100 %		+50	1879 999 993	-2.6	0.000 000	-0.001
Batt. Endpoint	3.400	+20	1880 000 000	3.7	0.000 000	0.002



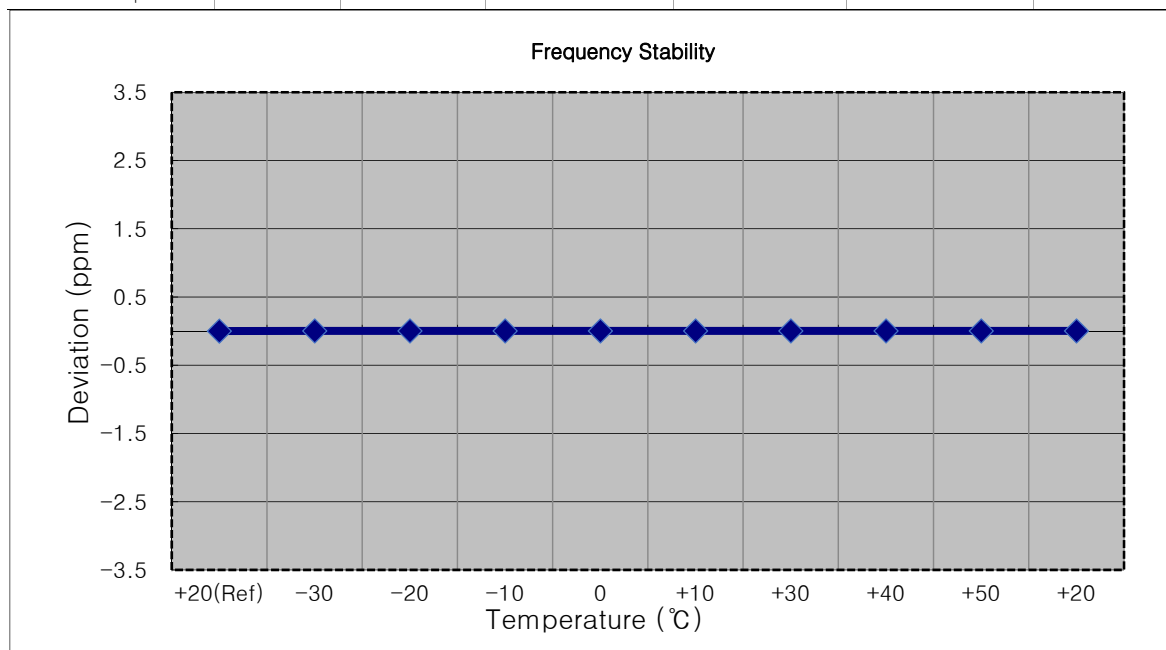
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1880 000 005	0.0	0.000 000	0.000
100 %		-30	1880 000 004	-1.9	0.000 000	-0.001
100 %		-20	1880 000 009	3.1	0.000 000	0.002
100 %		-10	1880 000 010	4.3	0.000 000	0.002
100 %		0	1880 000 009	3.5	0.000 000	0.002
100 %		+10	1880 000 011	5.7	0.000 000	0.003
100 %		+30	1880 000 009	3.5	0.000 000	0.002
100 %		+40	1880 000 009	3.7	0.000 000	0.002
100 %		+50	1880 000 008	2.6	0.000 000	0.001
Batt. Endpoint	3.400	+20	1880 000 010	4.3	0.000 000	0.002



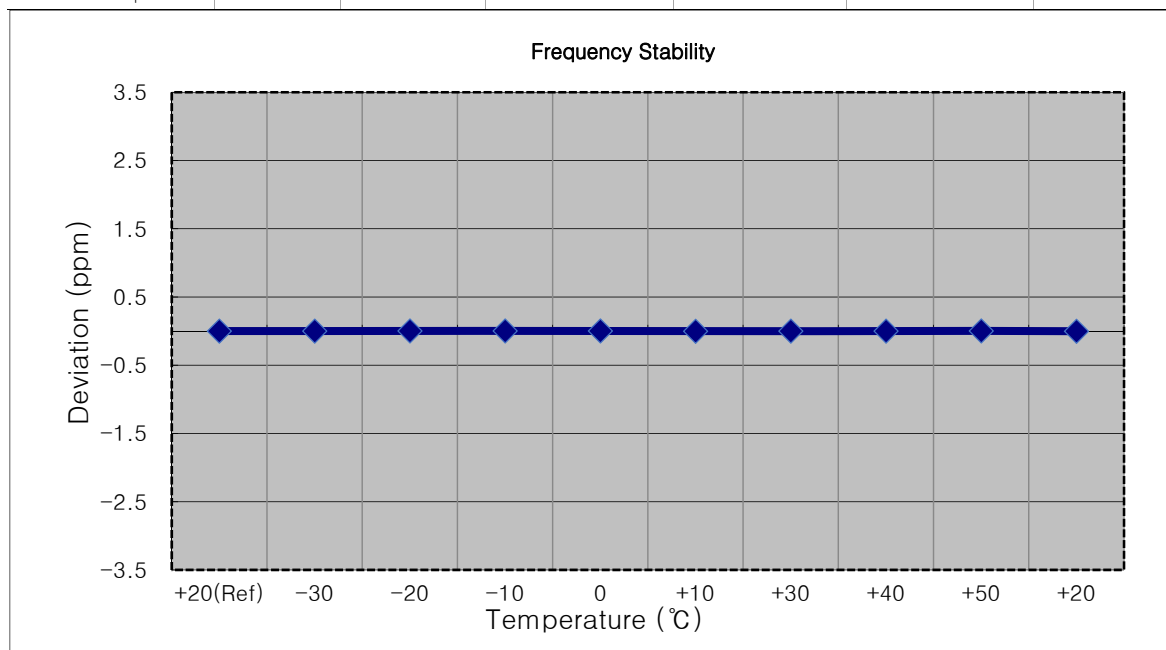
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1880,000,000 Hz</u>
CHANNEL:	<u>18900 (10 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1880 000 004	0.0	0.000 000	0.000
100 %		-30	1880 000 007	3.3	0.000 000	0.002
100 %		-20	1880 000 007	3.4	0.000 000	0.002
100 %		-10	1880 000 007	3.1	0.000 000	0.002
100 %		0	1880 000 007	3.2	0.000 000	0.002
100 %		+10	1880 000 007	2.9	0.000 000	0.002
100 %		+30	1880 000 008	4.1	0.000 000	0.002
100 %		+40	1880 000 007	3.2	0.000 000	0.002
100 %		+50	1880 000 008	4.0	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 006	2.4	0.000 000	0.001



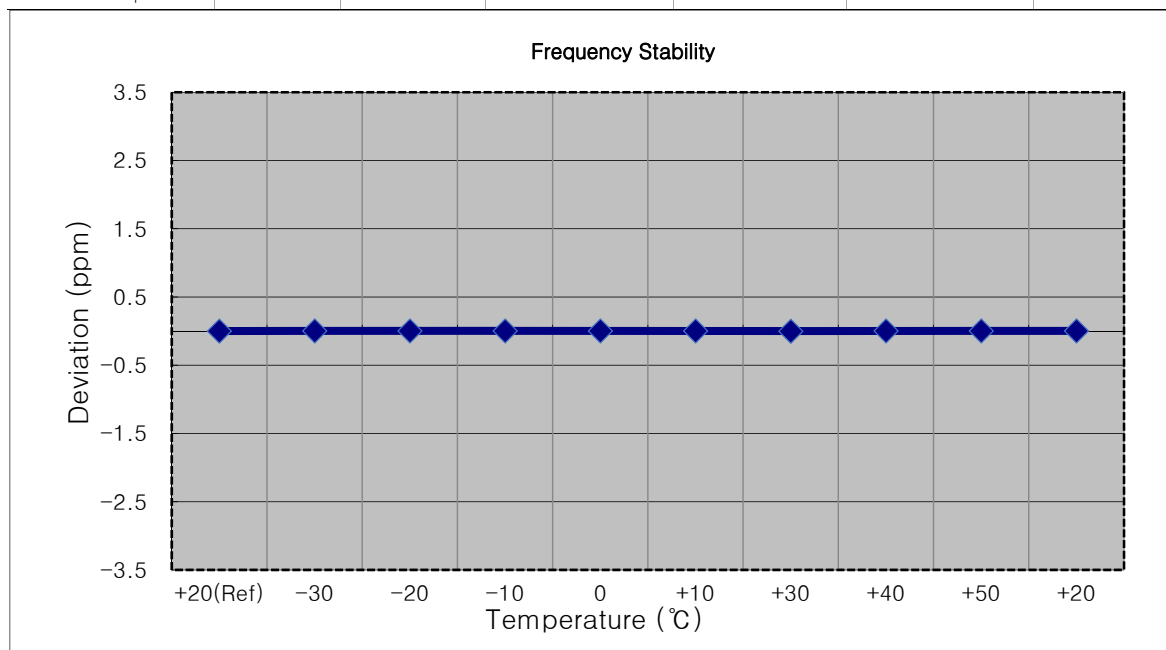
MODE: LTE B2
 OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (15 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1879 999 997	0.0	0.000 000	0.000
100 %		-30	1879 999 995	-2.2	0.000 000	-0.001
100 %		-20	1879 999 999	2.3	0.000 000	0.001
100 %		-10	1879 999 999	2.3	0.000 000	0.001
100 %		0	1880 000 000	3.1	0.000 000	0.002
100 %		+10	1879 999 994	-3.4	0.000 000	-0.002
100 %		+30	1879 999 999	1.8	0.000 000	0.001
100 %		+40	1879 999 995	-1.8	0.000 000	-0.001
100 %		+50	1879 999 999	2.5	0.000 000	0.001
Batt. Endpoint	3.400	+20	1879 999 994	-2.8	0.000 000	-0.001



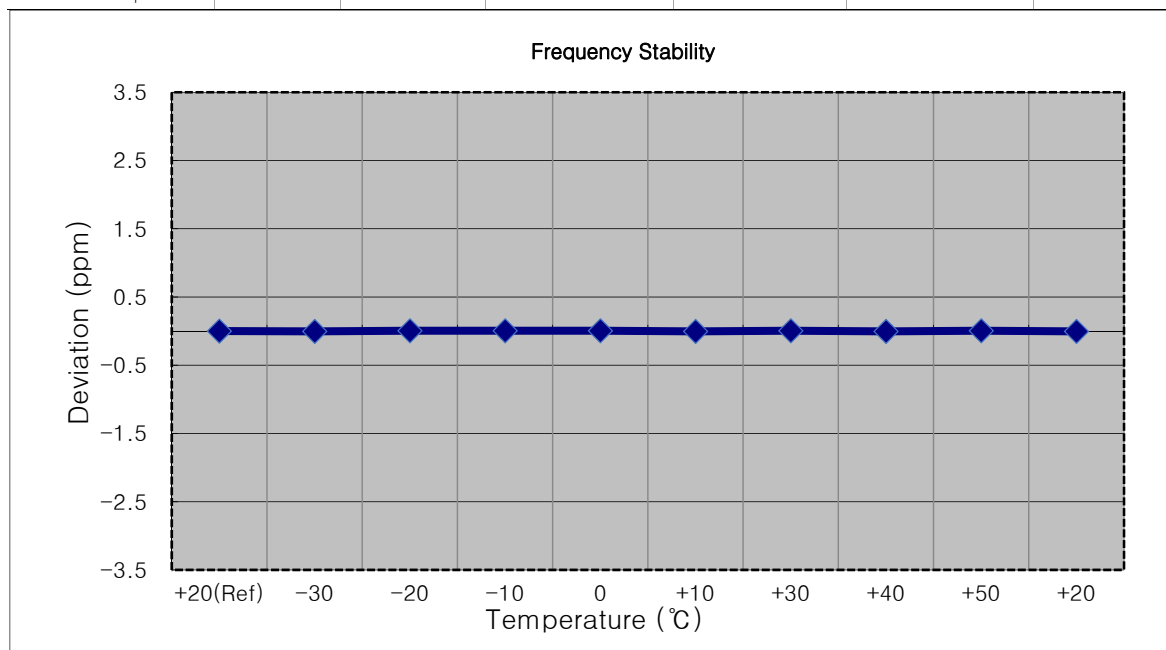
MODE: LTE B2
 OPERATING FREQUENCY: 1880,000,000 Hz
 CHANNEL: 18900 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1879 999 998	0.0	0.000 000	0.000
100 %		-30	1880 000 000	2.4	0.000 000	0.001
100 %		-20	1880 000 003	5.0	0.000 000	0.003
100 %		-10	1880 000 003	5.0	0.000 000	0.003
100 %		0	1880 000 001	2.8	0.000 000	0.001
100 %		+10	1880 000 002	4.0	0.000 000	0.002
100 %		+30	1879 999 995	-3.3	0.000 000	-0.002
100 %		+40	1880 000 001	2.7	0.000 000	0.001
100 %		+50	1880 000 002	4.4	0.000 000	0.002
Batt. Endpoint	3.400	+20	1880 000 002	4.2	0.000 000	0.002



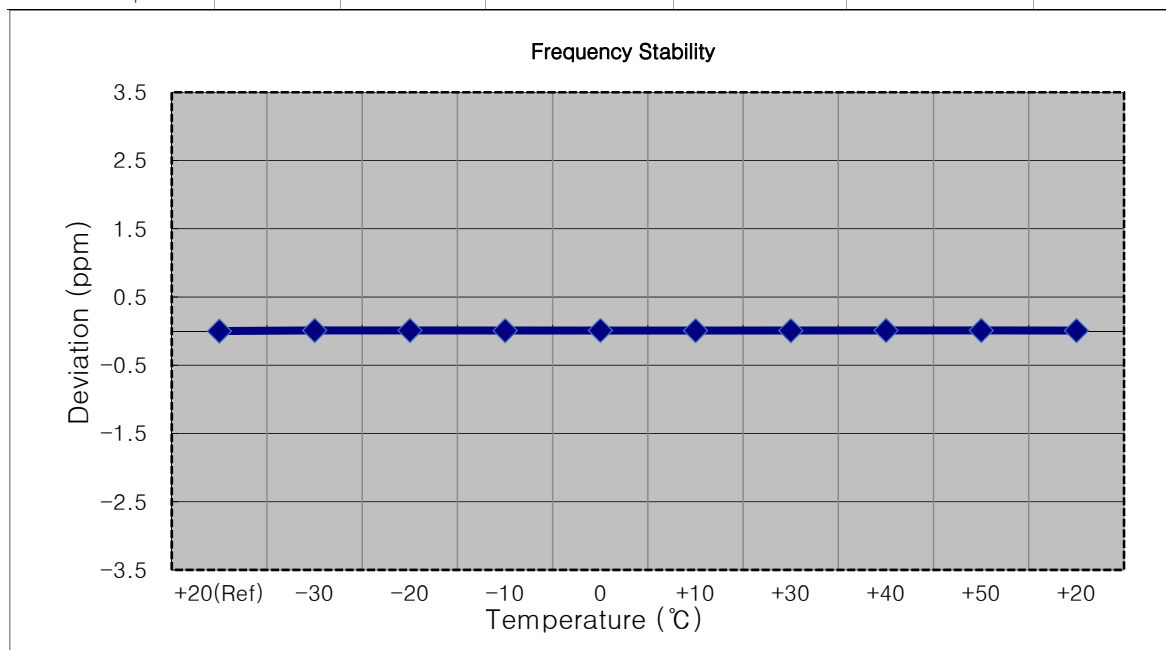
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1909,300,000 Hz</u>
CHANNEL:	<u>19193 (1.4 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1909 300 007	0.0	0.000 000	0.000
100 %		-30	1909 299 999	-7.2	0.000 000	-0.004
100 %		-20	1909 300 014	7.2	0.000 000	0.004
100 %		-10	1909 300 016	9.3	0.000 000	0.005
100 %		0	1909 300 016	9.5	0.000 000	0.005
100 %		+10	1909 299 997	-9.3	0.000 000	-0.005
100 %		+30	1909 300 015	8.4	0.000 000	0.004
100 %		+40	1909 299 997	-9.4	0.000 000	-0.005
100 %		+50	1909 300 015	8.1	0.000 000	0.004
Batt. Endpoint	3.400	+20	1909 299 999	-7.4	0.000 000	-0.004



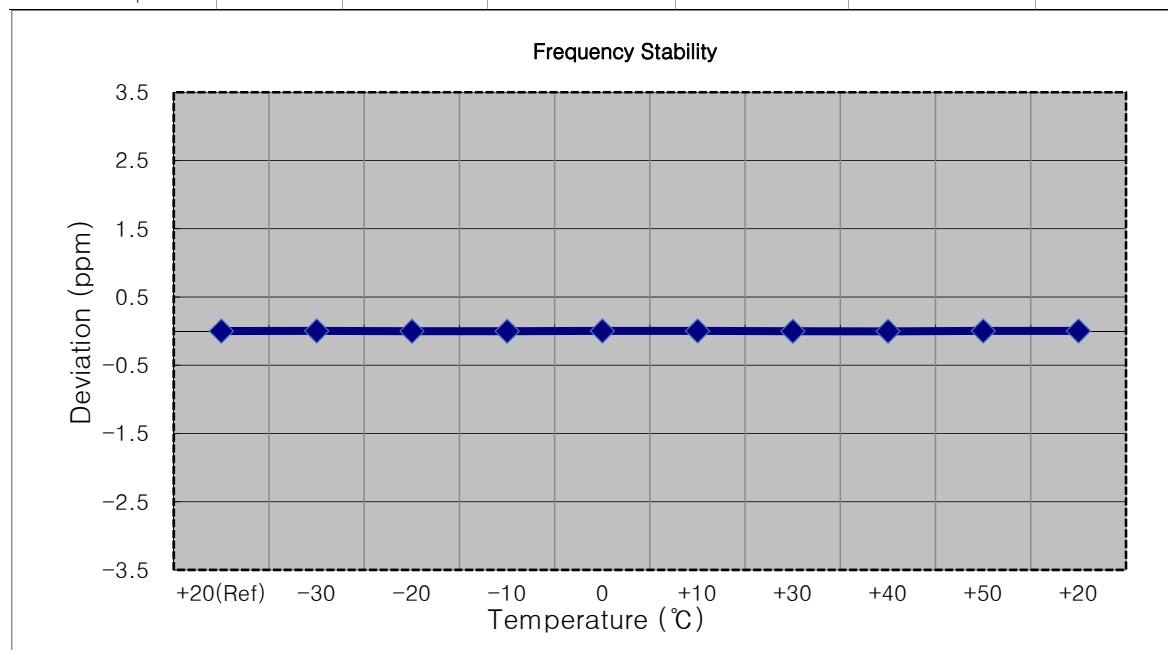
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1908,500,000 Hz</u>
CHANNEL:	<u>19185 (3 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1908 500 011	0.0	0.000 000	0.000
100 %		-30	1908 500 026	15.6	0.000 001	0.008
100 %		-20	1908 500 027	16.2	0.000 001	0.008
100 %		-10	1908 500 023	11.9	0.000 001	0.006
100 %		0	1908 500 029	18.4	0.000 001	0.010
100 %		+10	1908 500 023	12.2	0.000 001	0.006
100 %		+30	1908 500 023	12.0	0.000 001	0.006
100 %		+40	1908 500 026	15.4	0.000 001	0.008
100 %		+50	1908 500 027	16.4	0.000 001	0.009
Batt. Endpoint	3.400	+20	1908 500 022	11.5	0.000 001	0.006



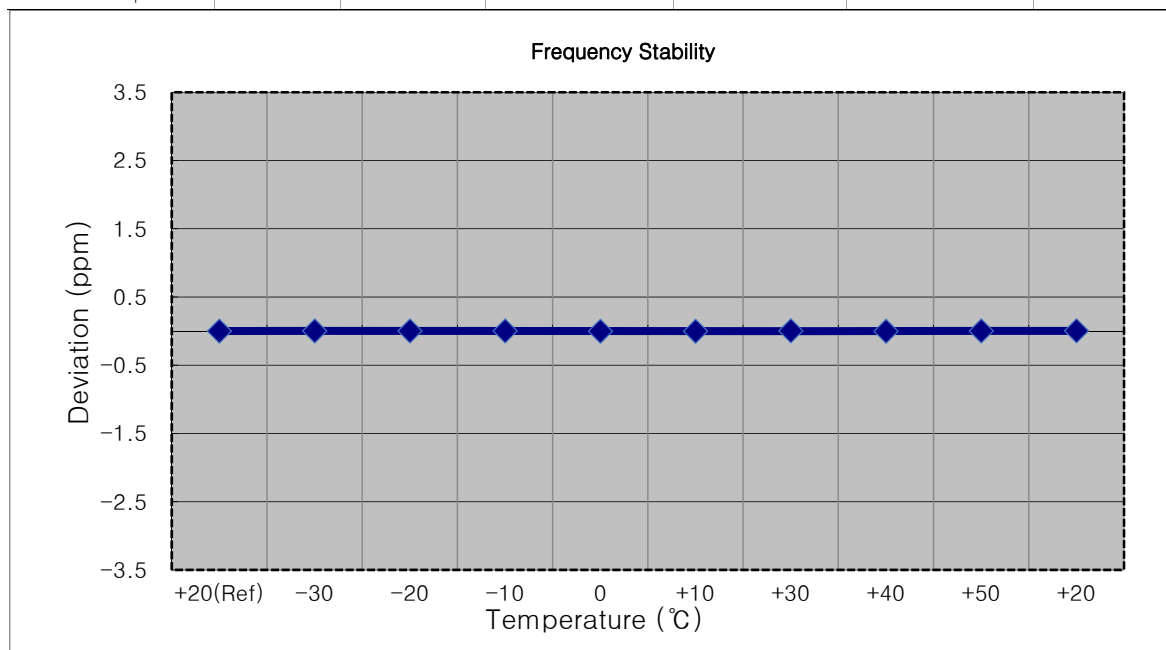
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1907,500,000 Hz</u>
CHANNEL:	<u>19175 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1907 500 005	0.0	0.000 000	0.000
100 %		-30	1907 500 010	4.8	0.000 000	0.003
100 %		-20	1907 500 000	-4.8	0.000 000	-0.003
100 %		-10	1907 500 000	-4.8	0.000 000	-0.003
100 %		0	1907 500 011	6.2	0.000 000	0.003
100 %		+10	1907 500 009	4.6	0.000 000	0.002
100 %		+30	1907 500 000	-4.4	0.000 000	-0.002
100 %		+40	1907 499 999	-6.2	0.000 000	-0.003
100 %		+50	1907 500 009	4.0	0.000 000	0.002
Batt. Endpoint	3.400	+20	1907 500 011	6.0	0.000 000	0.003



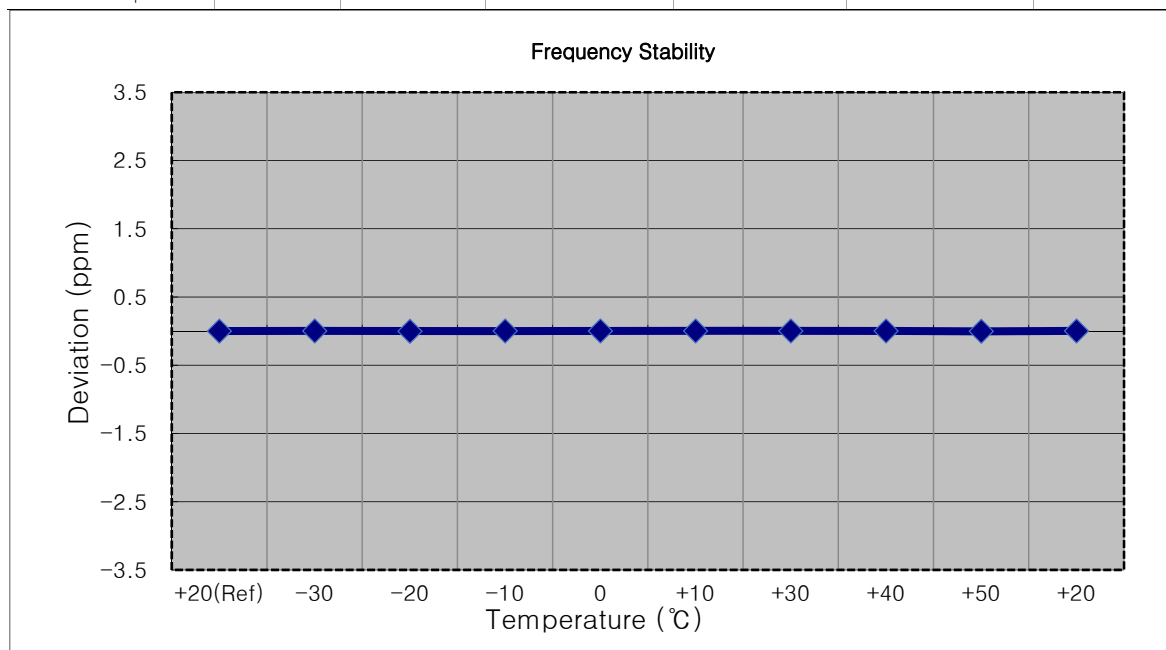
MODE: LTE B2
 OPERATING FREQUENCY: 1905,000,000 Hz
 CHANNEL: 19150 (10 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1905 000 005	0.0	0.000 000	0.000
100 %		-30	1905 000 010	4.4	0.000 000	0.002
100 %		-20	1905 000 010	4.7	0.000 000	0.002
100 %		-10	1905 000 011	6.0	0.000 000	0.003
100 %		0	1905 000 001	-4.2	0.000 000	-0.002
100 %		+10	1905 000 001	-4.0	0.000 000	-0.002
100 %		+30	1905 000 012	7.1	0.000 000	0.004
100 %		+40	1905 000 002	-3.3	0.000 000	-0.002
100 %		+50	1905 000 009	3.6	0.000 000	0.002
Batt. Endpoint	3.400	+20	1905 000 012	7.1	0.000 000	0.004



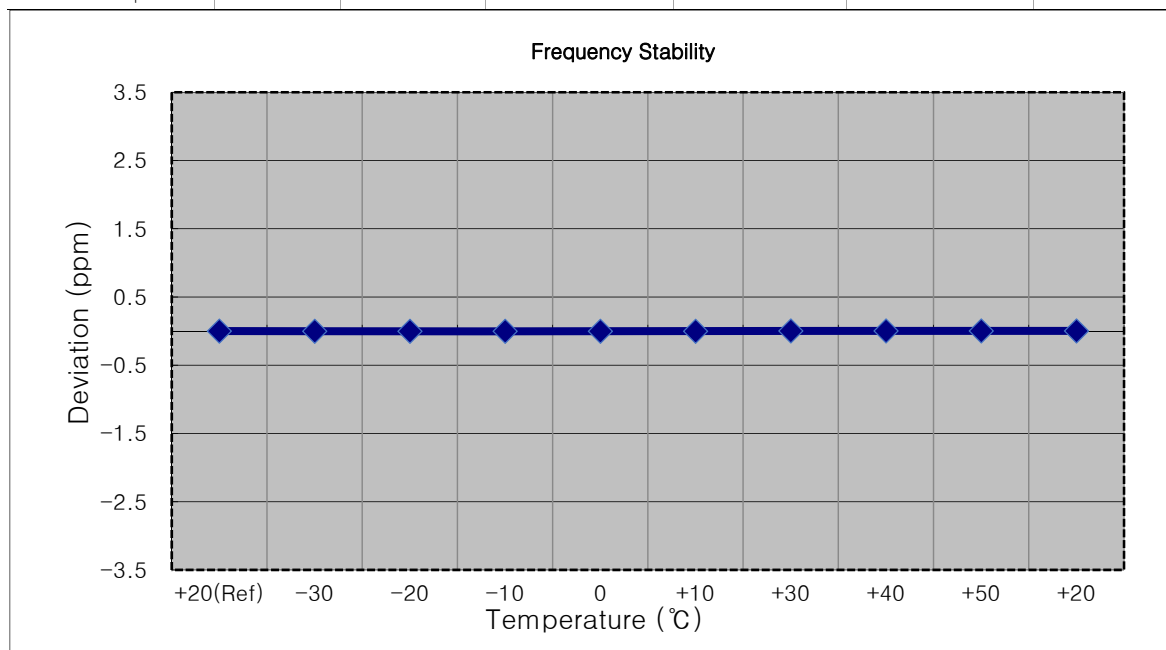
MODE:	<u>LTE B2</u>
OPERATING FREQUENCY:	<u>1902,500,000 Hz</u>
CHANNEL:	<u>19125 (15 MHz)</u>
REFERENCE VOLTAGE:	<u>3.900 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.900	+20(Ref)	1902 500 005	0.0	0.000 000	0.000
100 %		-30	1902 500 011	6.0	0.000 000	0.003
100 %		-20	1902 500 001	-4.2	0.000 000	-0.002
100 %		-10	1902 500 010	5.7	0.000 000	0.003
100 %		0	1902 500 009	4.1	0.000 000	0.002
100 %		+10	1902 500 010	5.7	0.000 000	0.003
100 %		+30	1902 500 009	4.1	0.000 000	0.002
100 %		+40	1902 500 008	3.7	0.000 000	0.002
100 %		+50	1902 500 000	-5.0	0.000 000	-0.003
Batt. Endpoint	3.400	+20	1902 500 011	6.0	0.000 000	0.003



MODE: LTE B2
 OPERATING FREQUENCY: 1900,000,000 Hz
 CHANNEL: 19100 (20 MHz)
 REFERENCE VOLTAGE: 3.900 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	3.900	+20(Ref)	1899 999 995	0.0	0.000 000	0.000
100 %		-30	1899 999 990	-4.9	0.000 000	-0.003
100 %		-20	1899 999 989	-5.9	0.000 000	-0.003
100 %		-10	1899 999 991	-3.9	0.000 000	-0.002
100 %		0	1899 999 990	-4.8	0.000 000	-0.003
100 %		+10	1899 999 991	-3.8	0.000 000	-0.002
100 %		+30	1900 000 001	5.4	0.000 000	0.003
100 %		+40	1900 000 001	6.2	0.000 000	0.003
100 %		+50	1900 000 000	4.7	0.000 000	0.002
Batt. Endpoint	3.400	+20	1900 000 000	5.2	0.000 000	0.003



9.8 UPLINK CARRIER AGGREGATION

Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. All modes of operation were investigated and the worst case configuration results are reported in this section.

Please refer to the table below.

3. The worst case is reported with the modulations, RB sizes and offsets.

- 2A (Ant F) - 4A (Ant B)

(PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 24)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
2A (Ant F)	4A (Ant B)	15	18675	5	20375

9.1.1 RADIATED SPURIOUS EMISSIONS

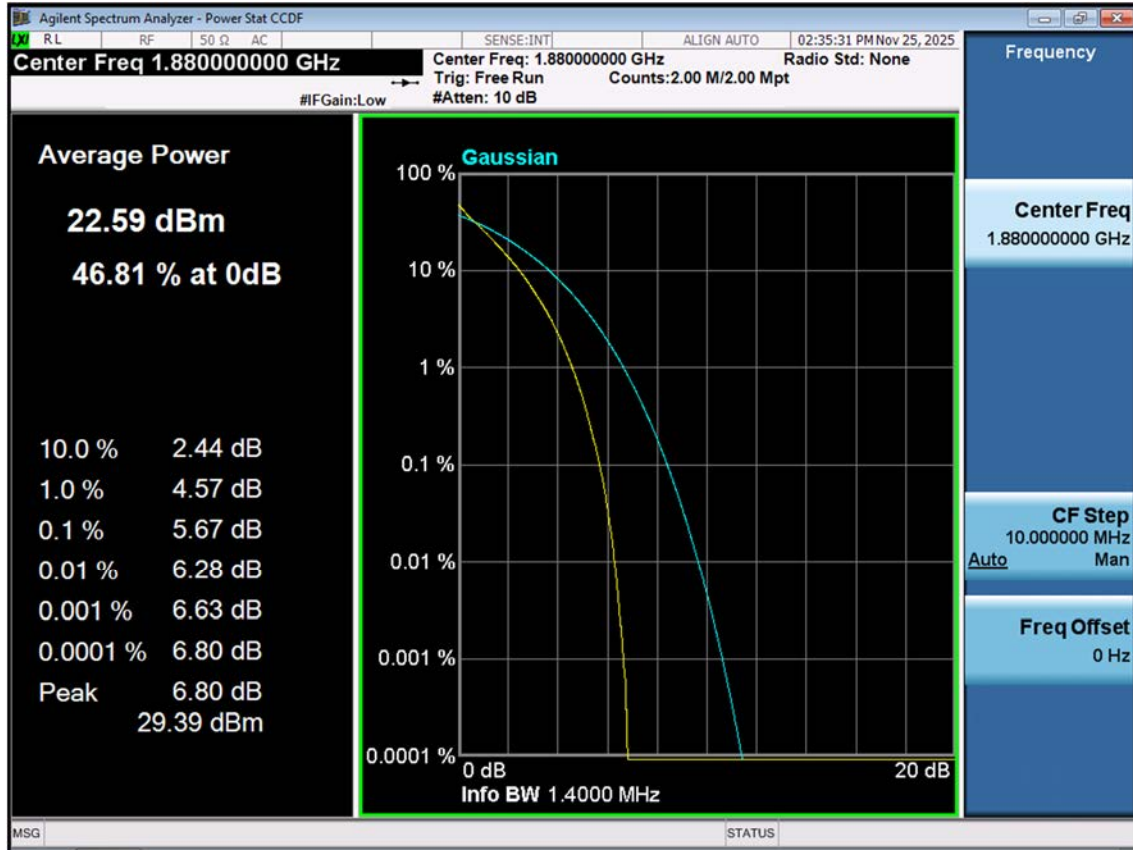
2A (Ant F) (PCC) - 4A (Ant B) (SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 715.00	-43.87	12.28	-60.96	3.11	H	-51.79	-13.00
5 572.50	-42.87	13.06	-55.02	3.89	H	-45.85	-13.00
7 430.00	-44.80	10.78	-47.81	4.56	H	-41.59	-13.00

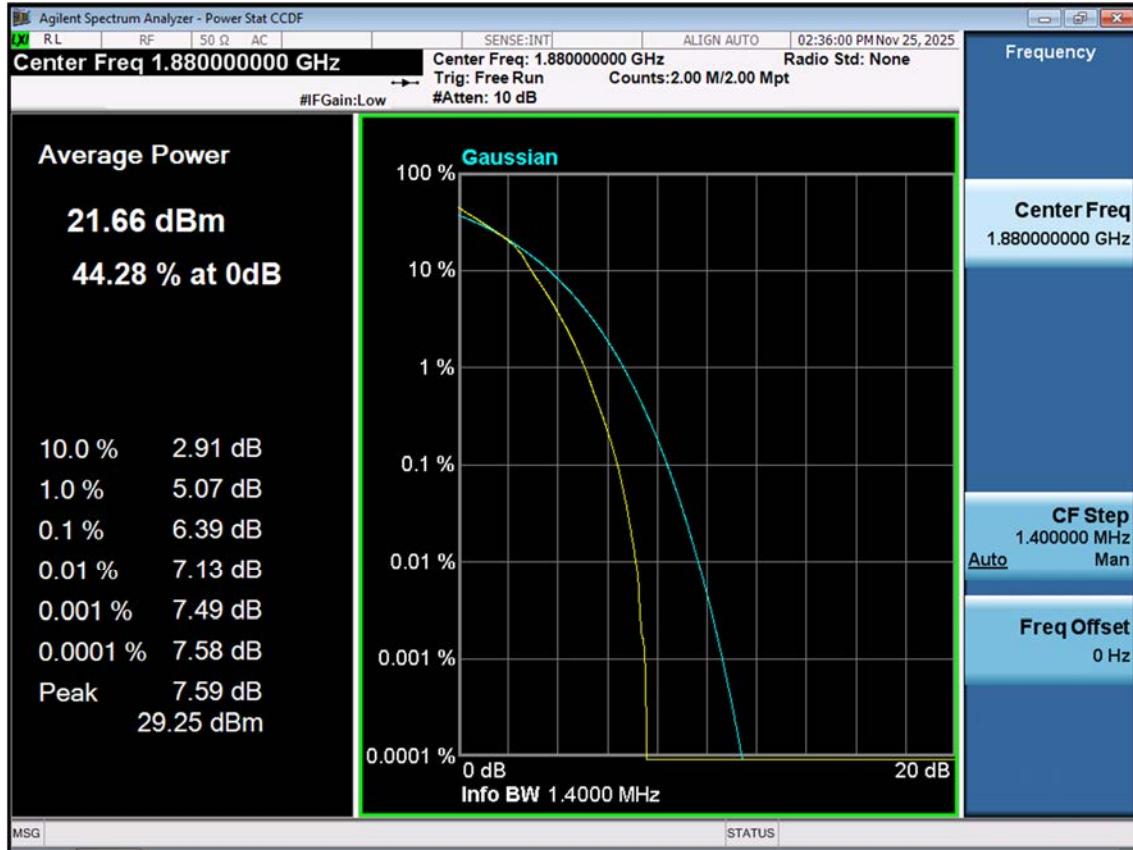
Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 505.00	-43.50	12.34	-61.46	3.05	H	-52.17	-13.00
5 257.50	-43.64	12.99	-56.01	3.79	H	-46.81	-13.00
7 010.00	-45.19	11.26	-50.44	4.42	H	-43.60	-13.00

10. TEST PLOTS(Ant B)

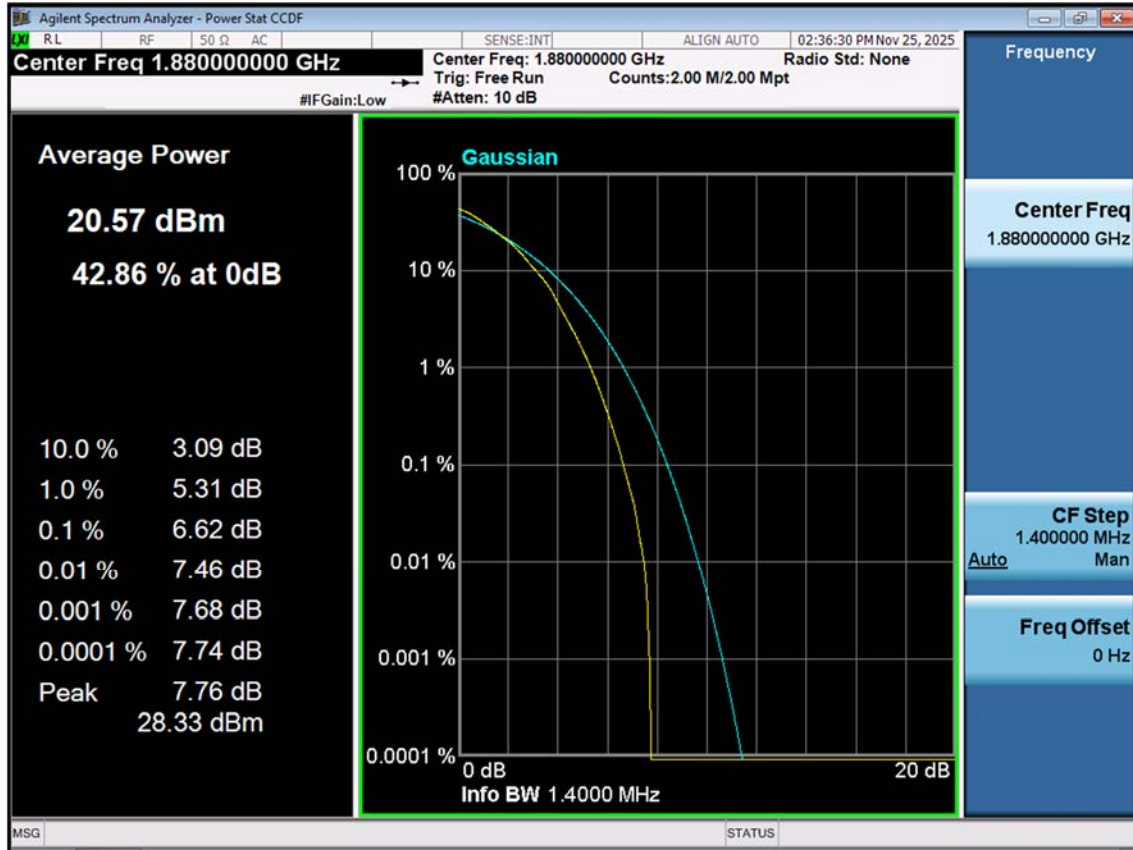
LTE B2_1.4 M_PAR_Mid_QPSK_FullRB



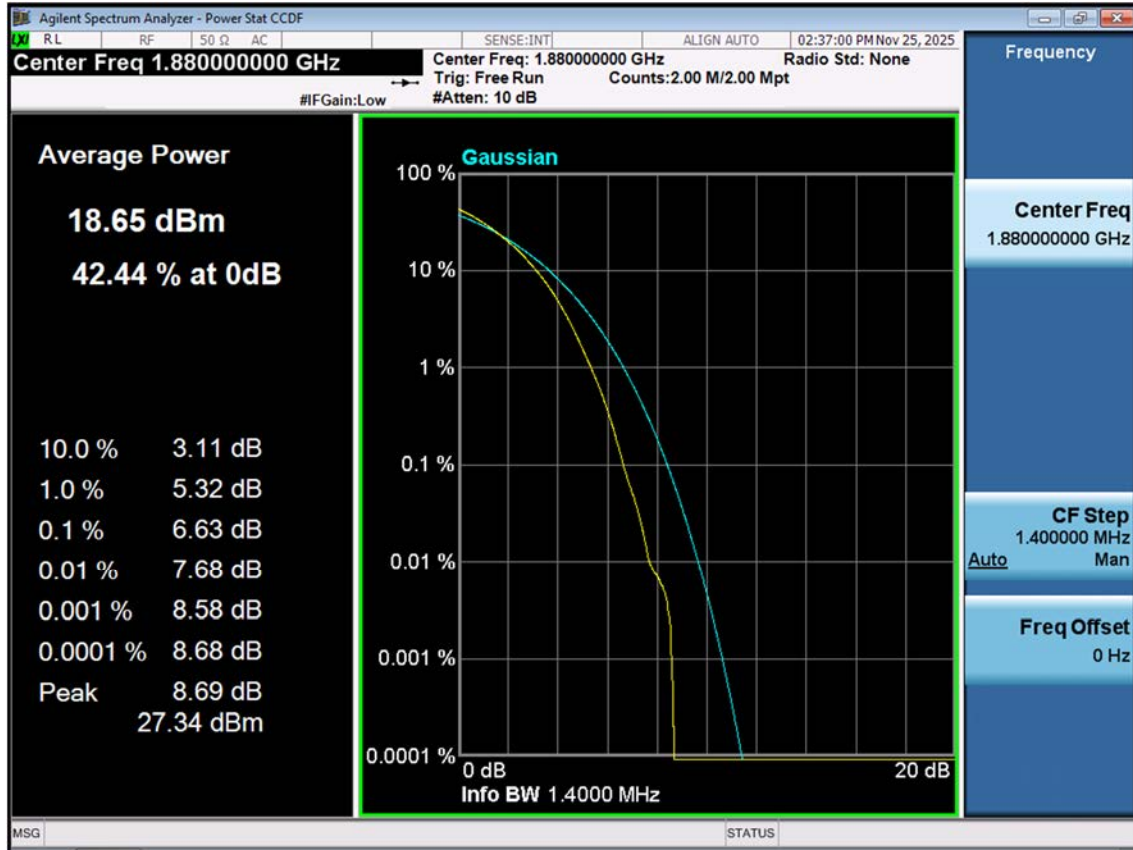
LTE B2_1.4 M_PAR_Mid_16QAM_FullRB



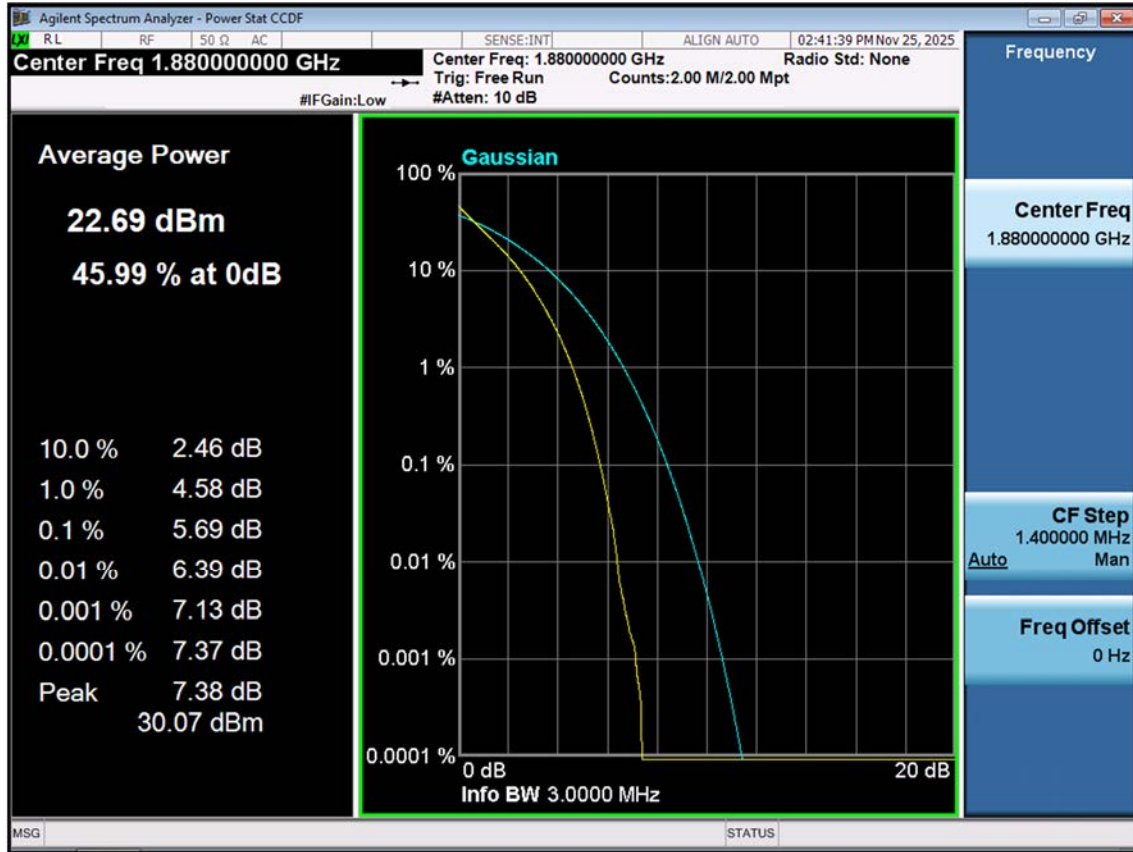
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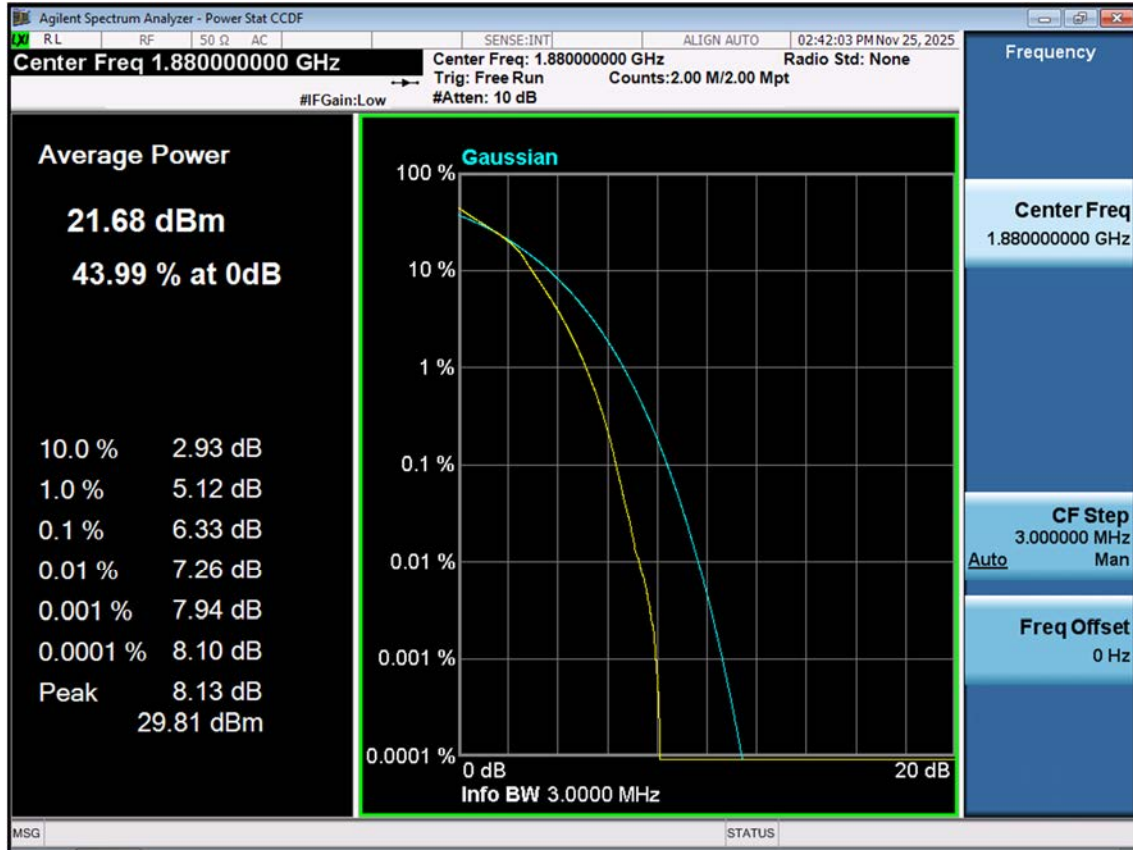
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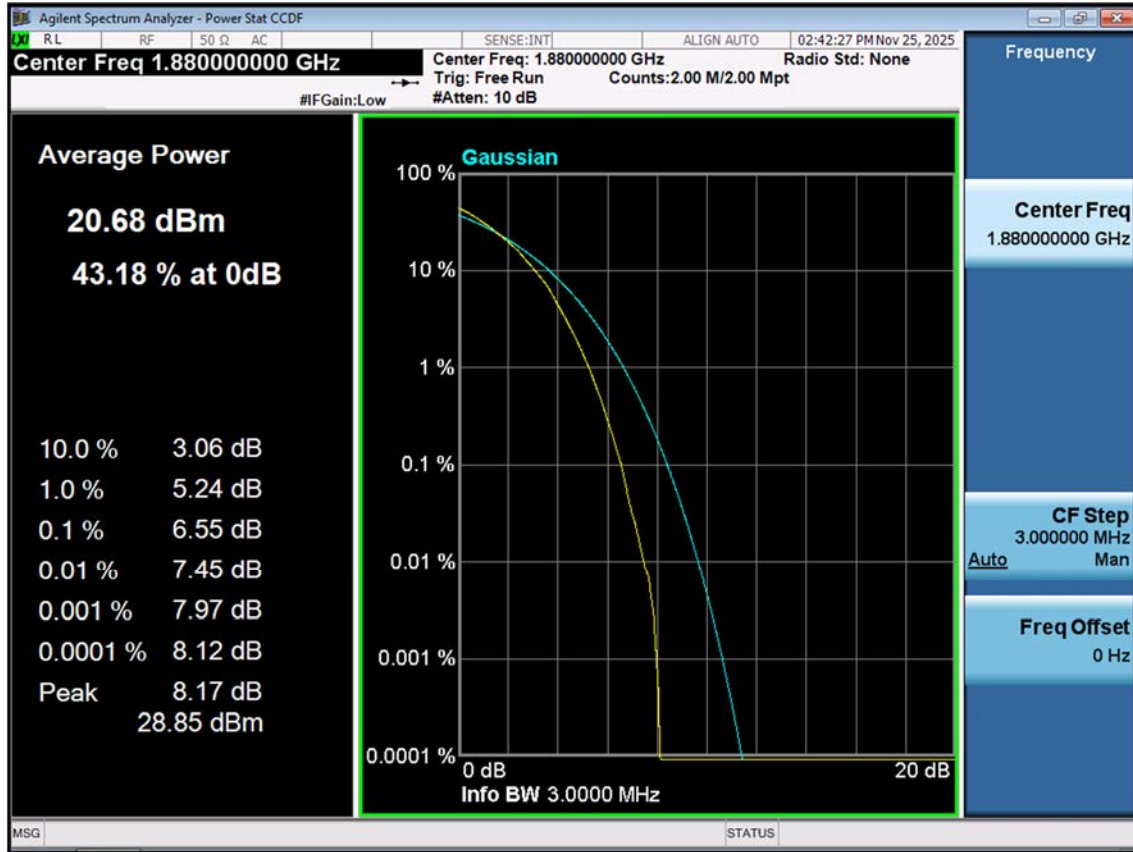
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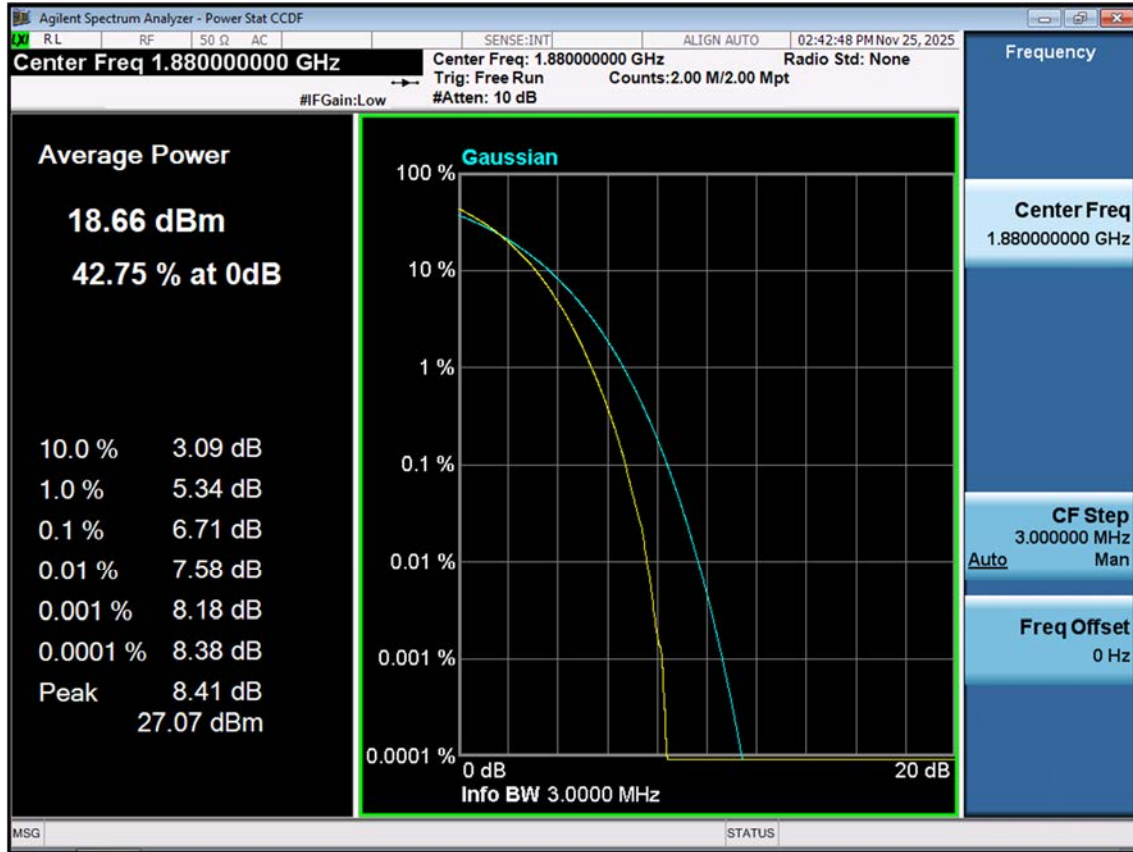
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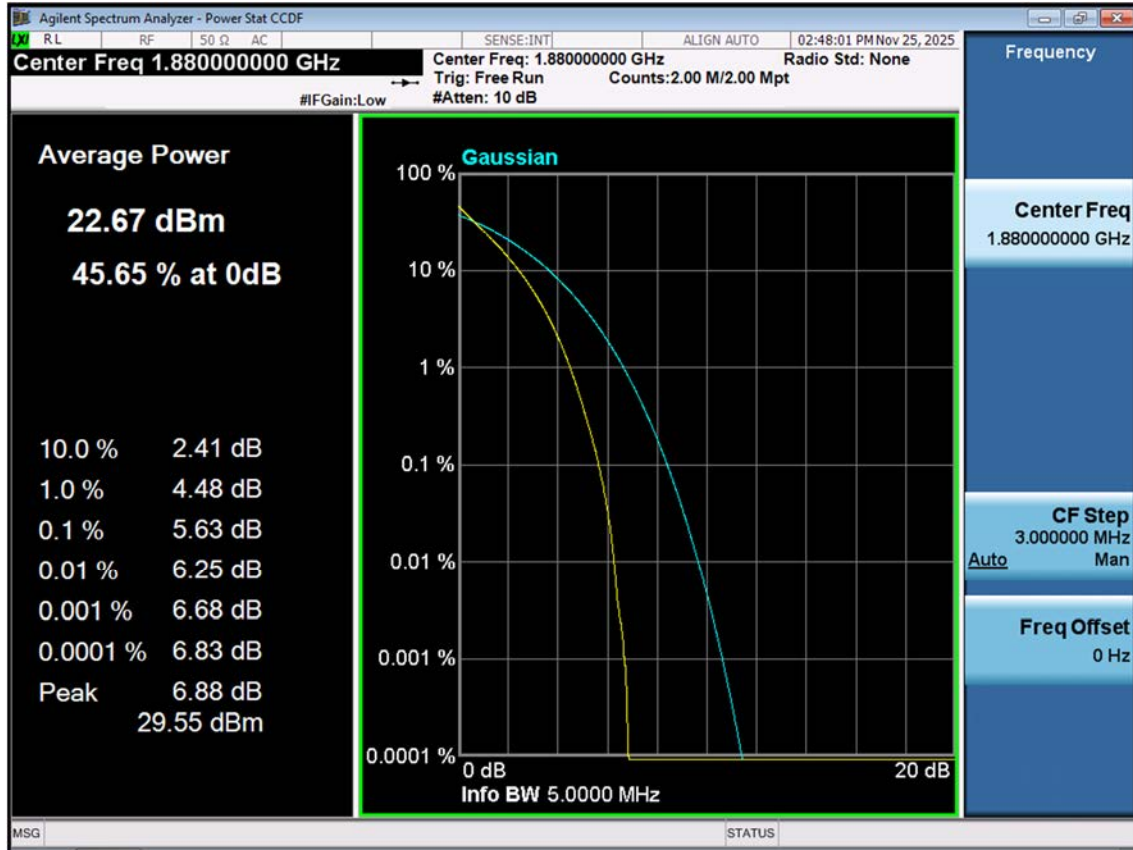
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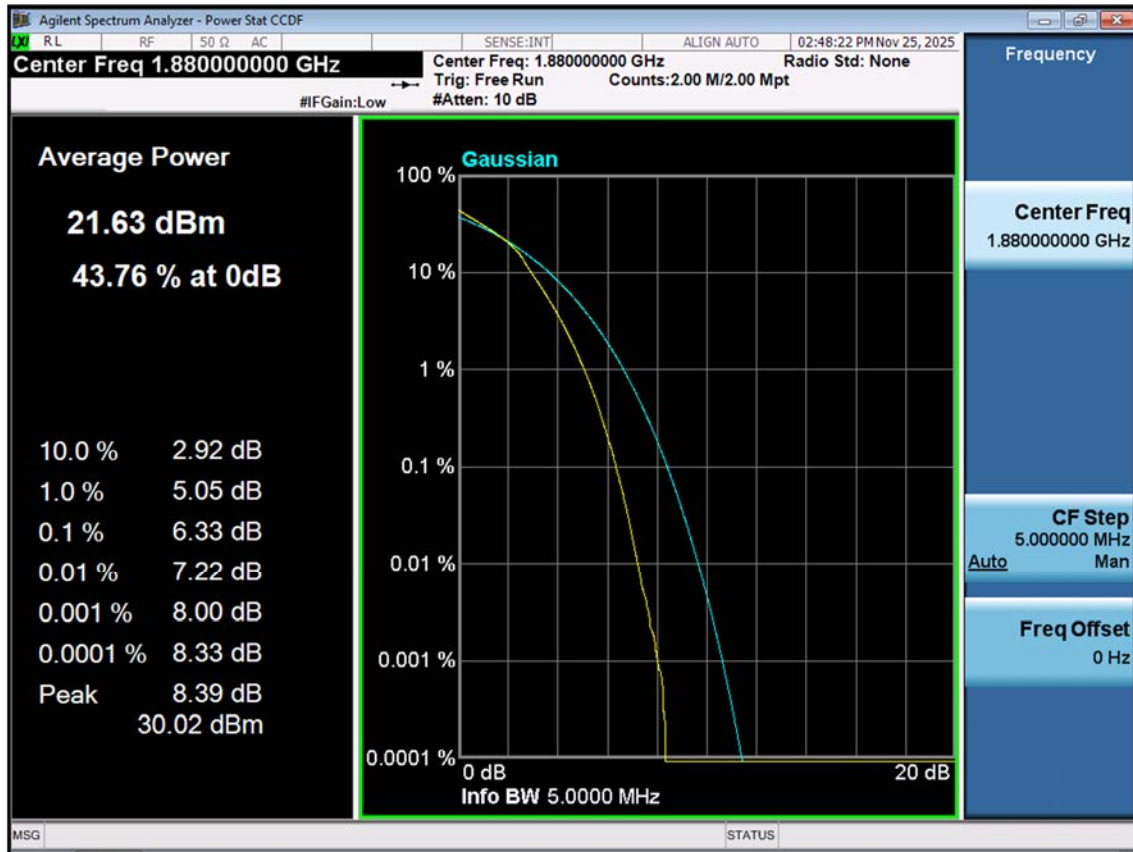
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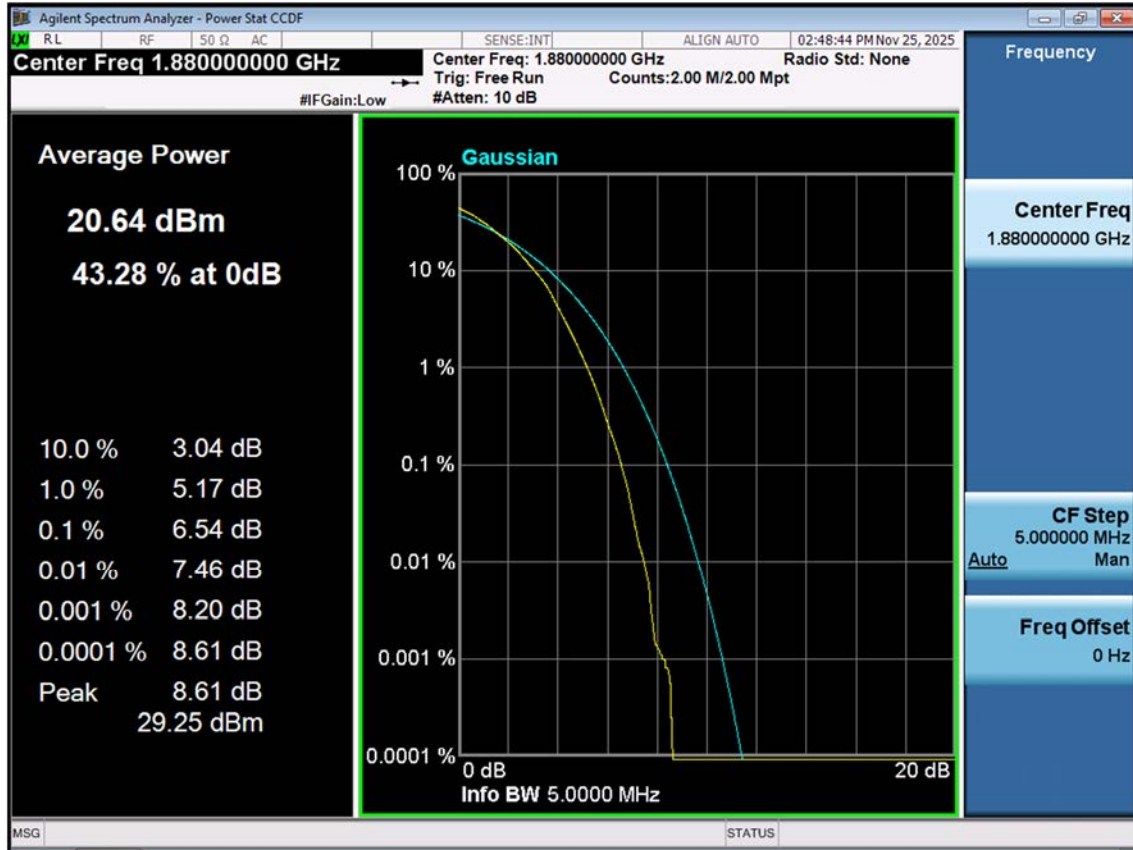
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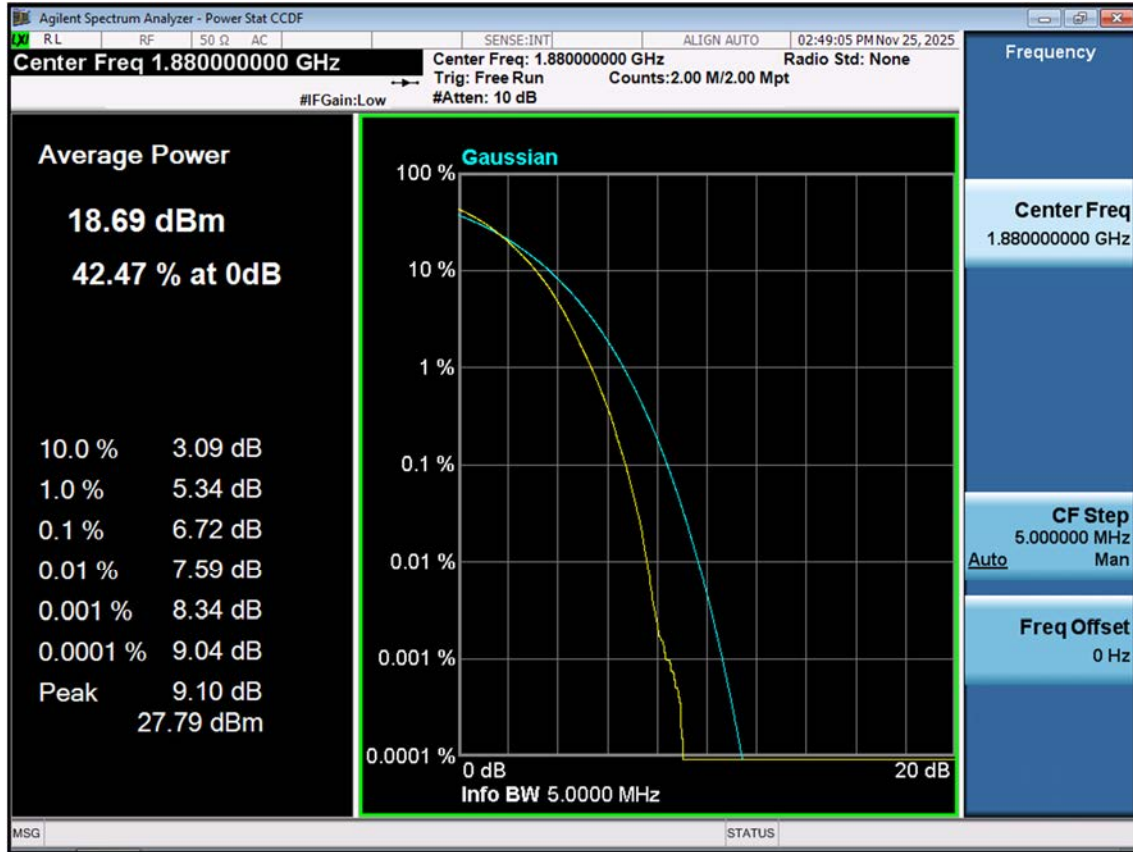
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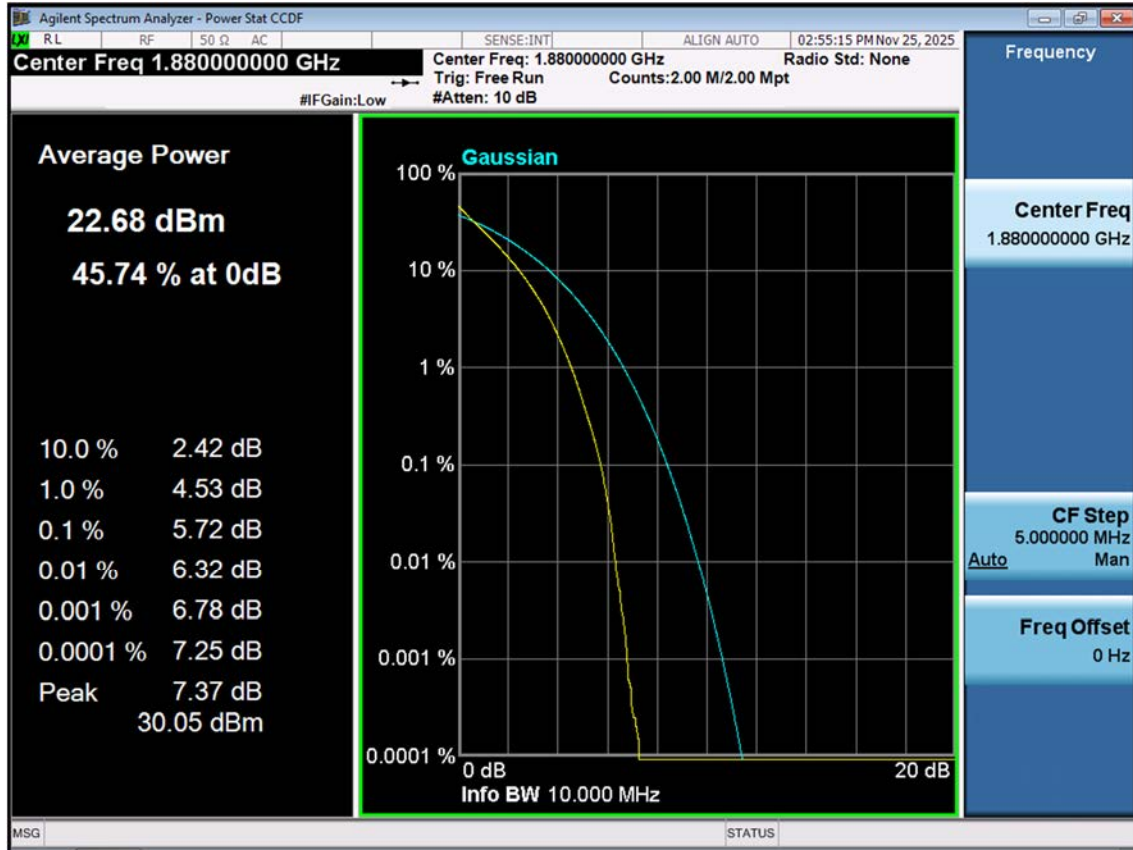
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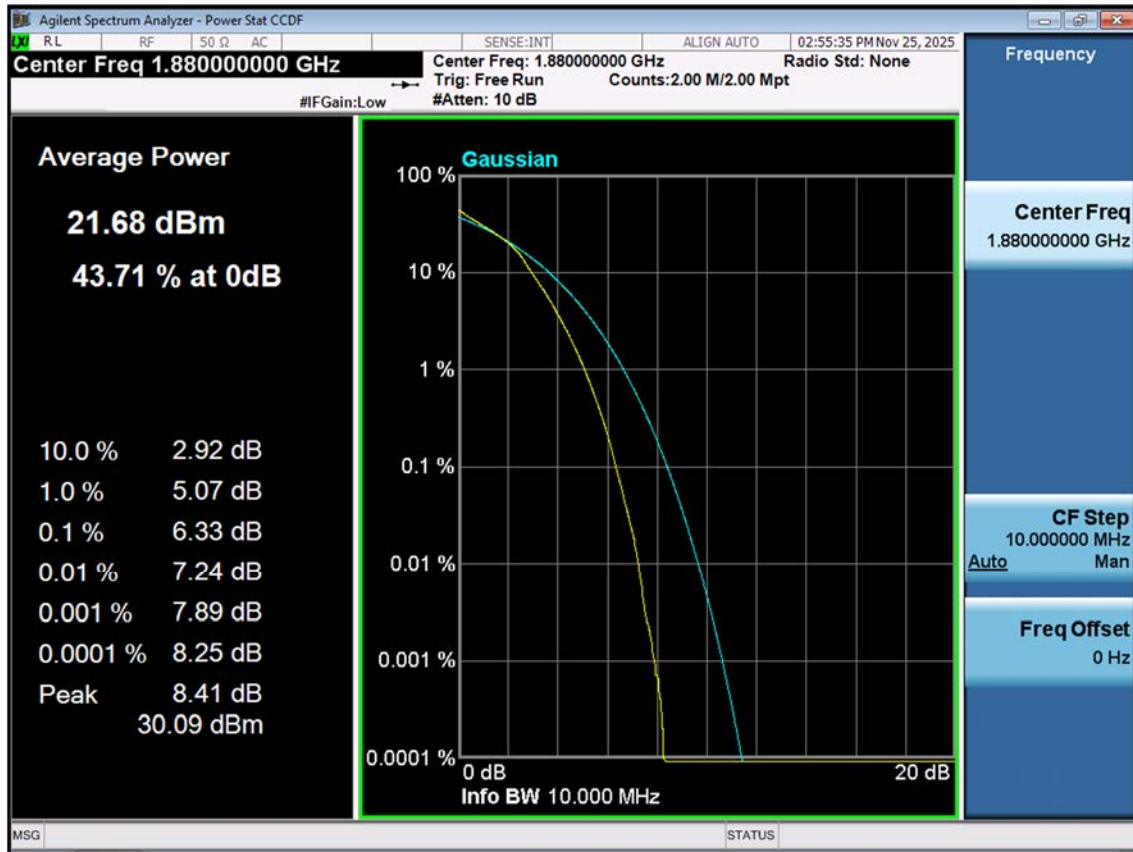
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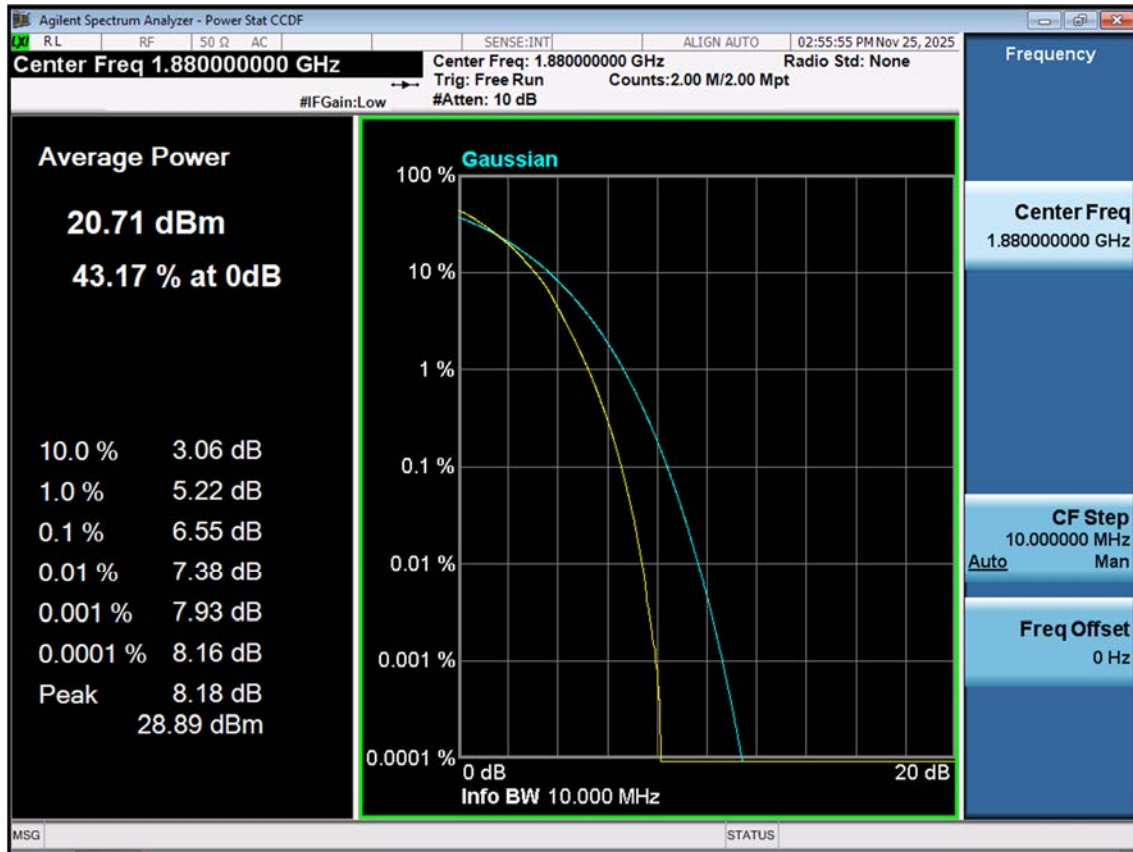
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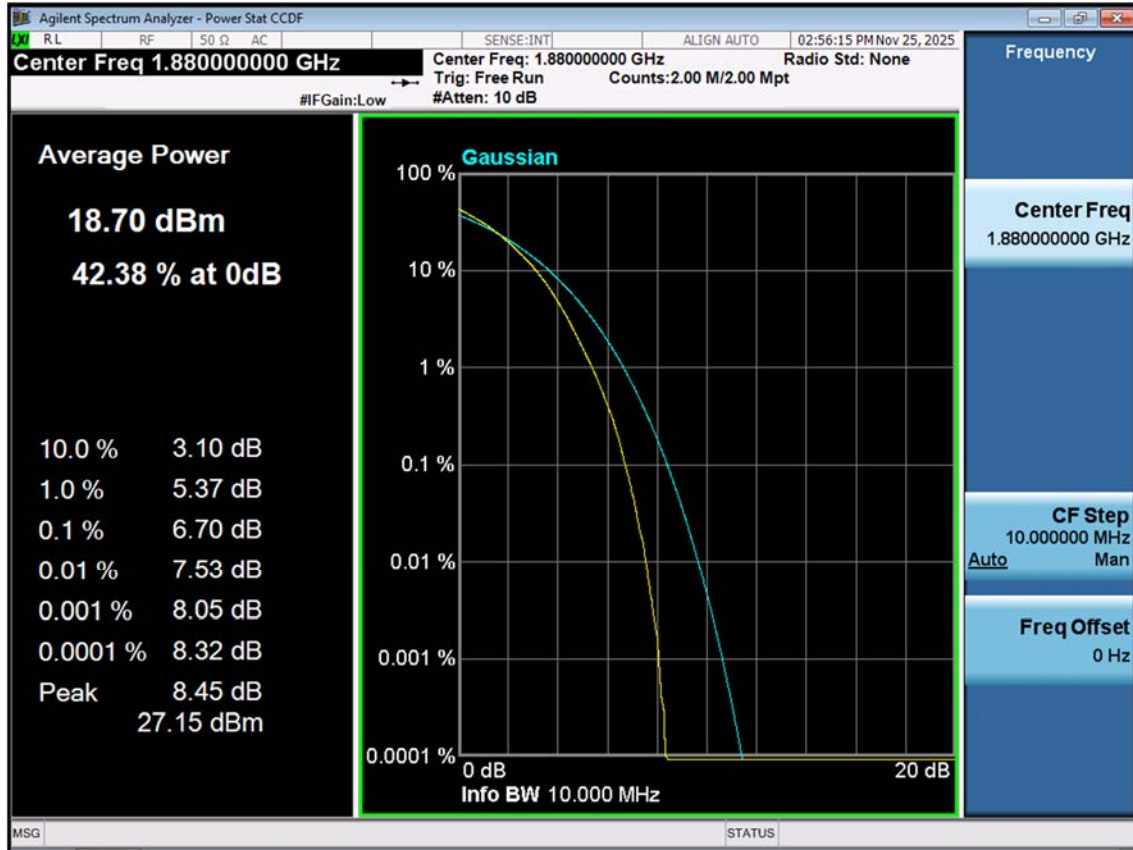
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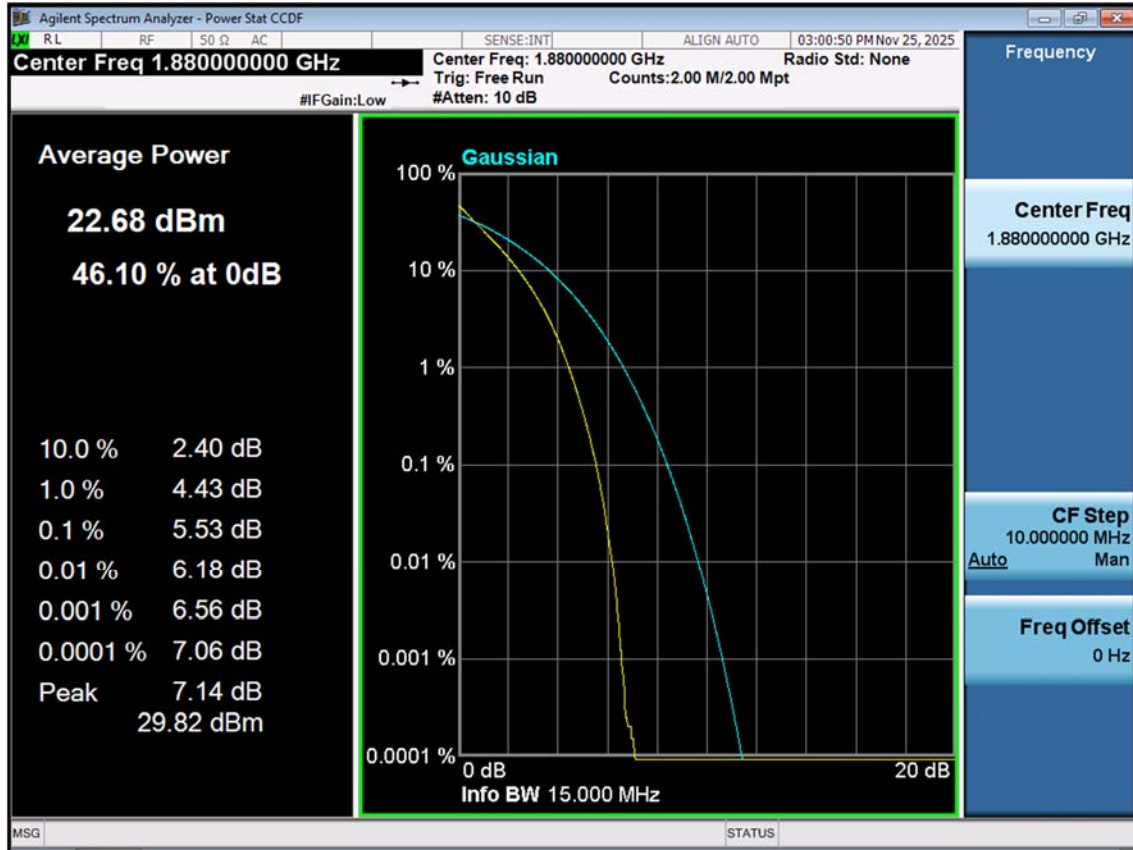
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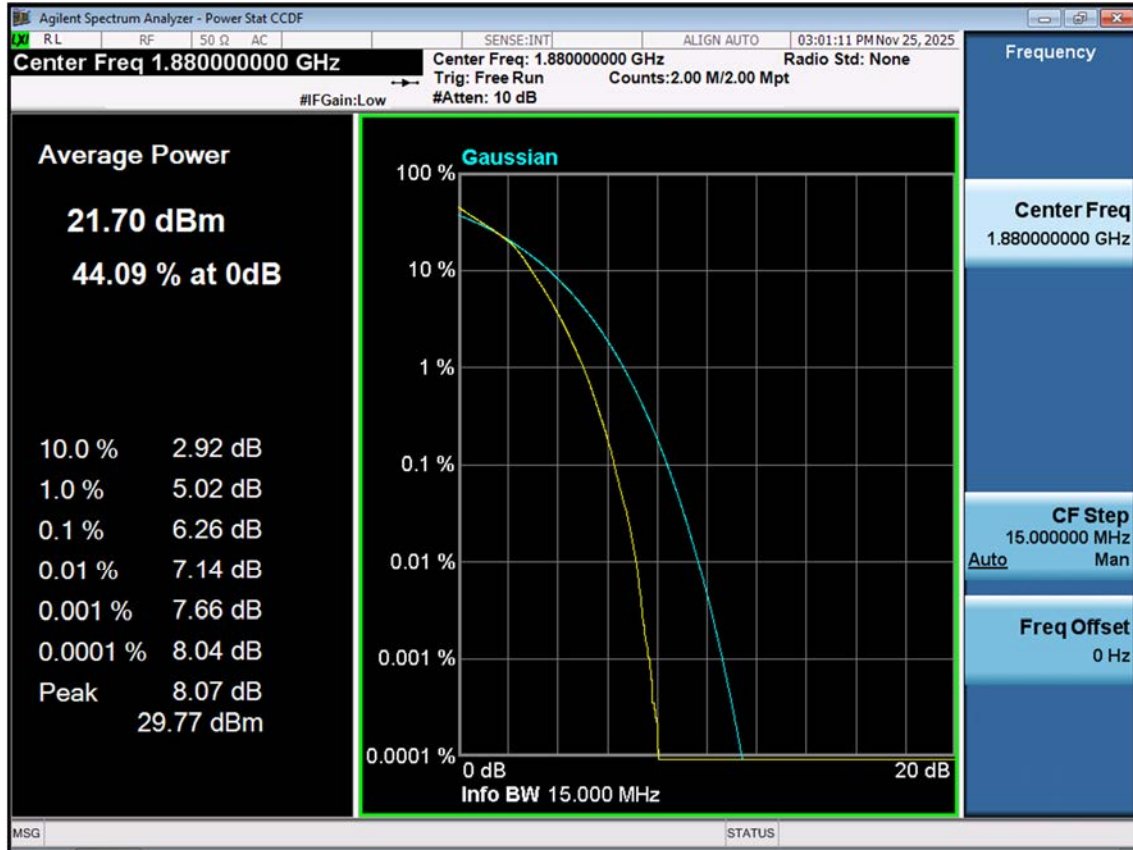
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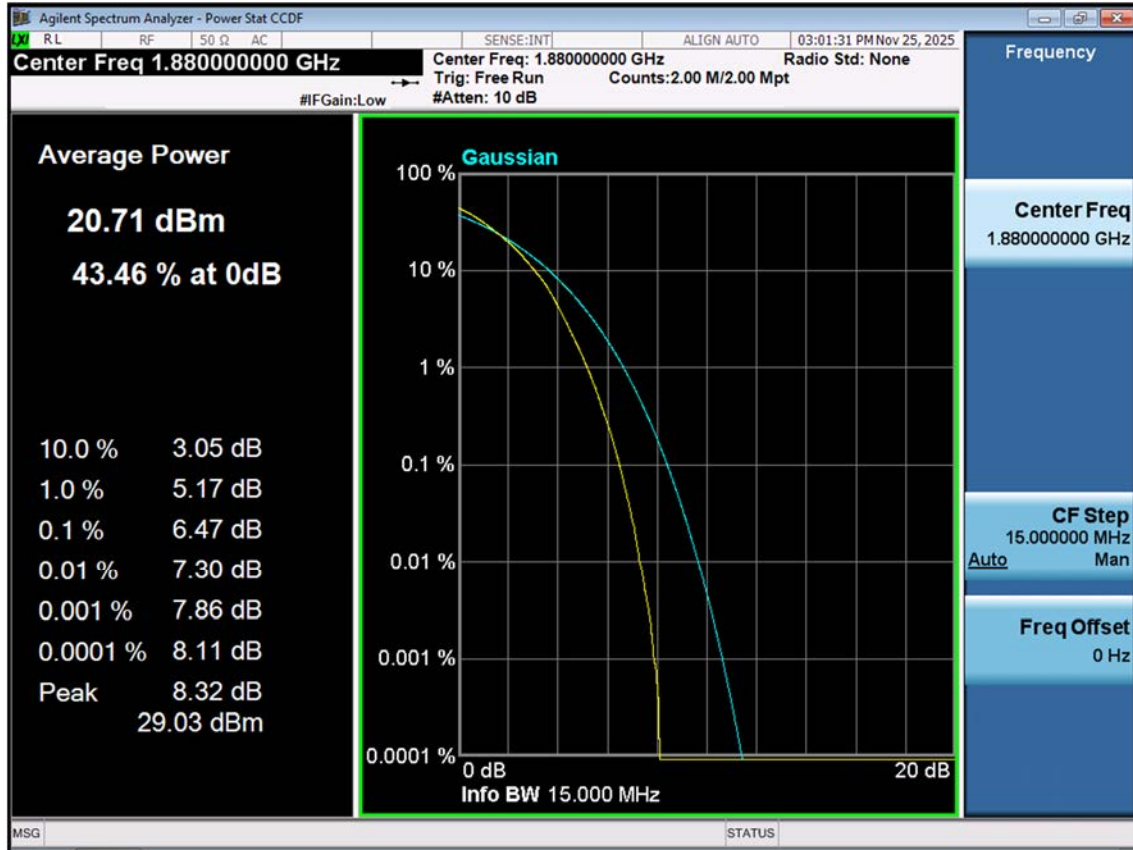
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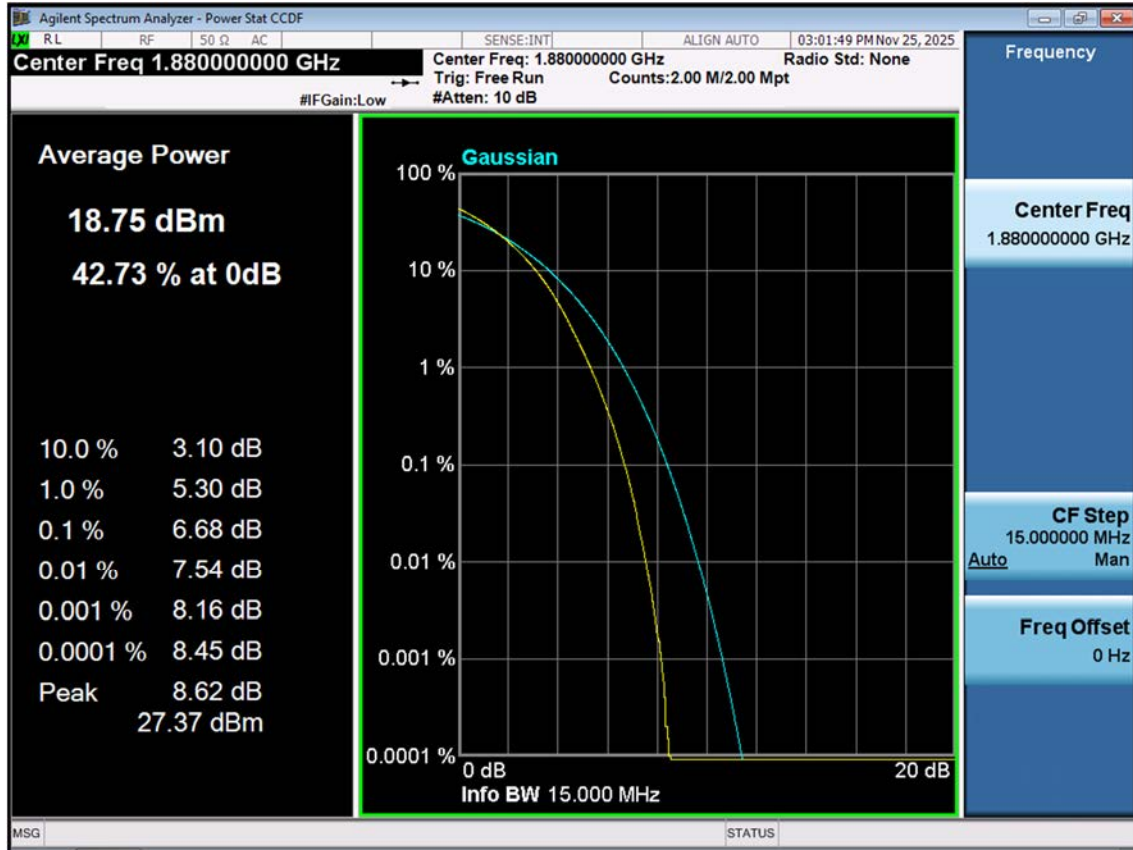
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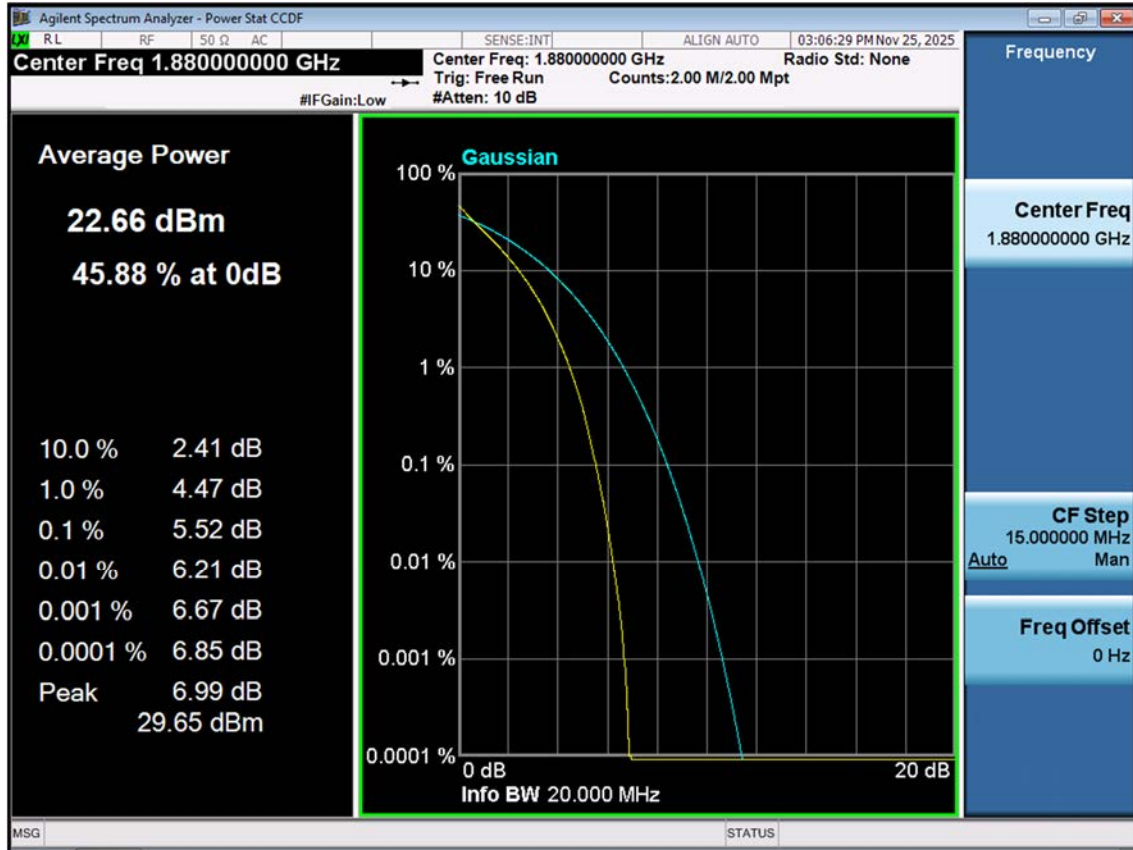
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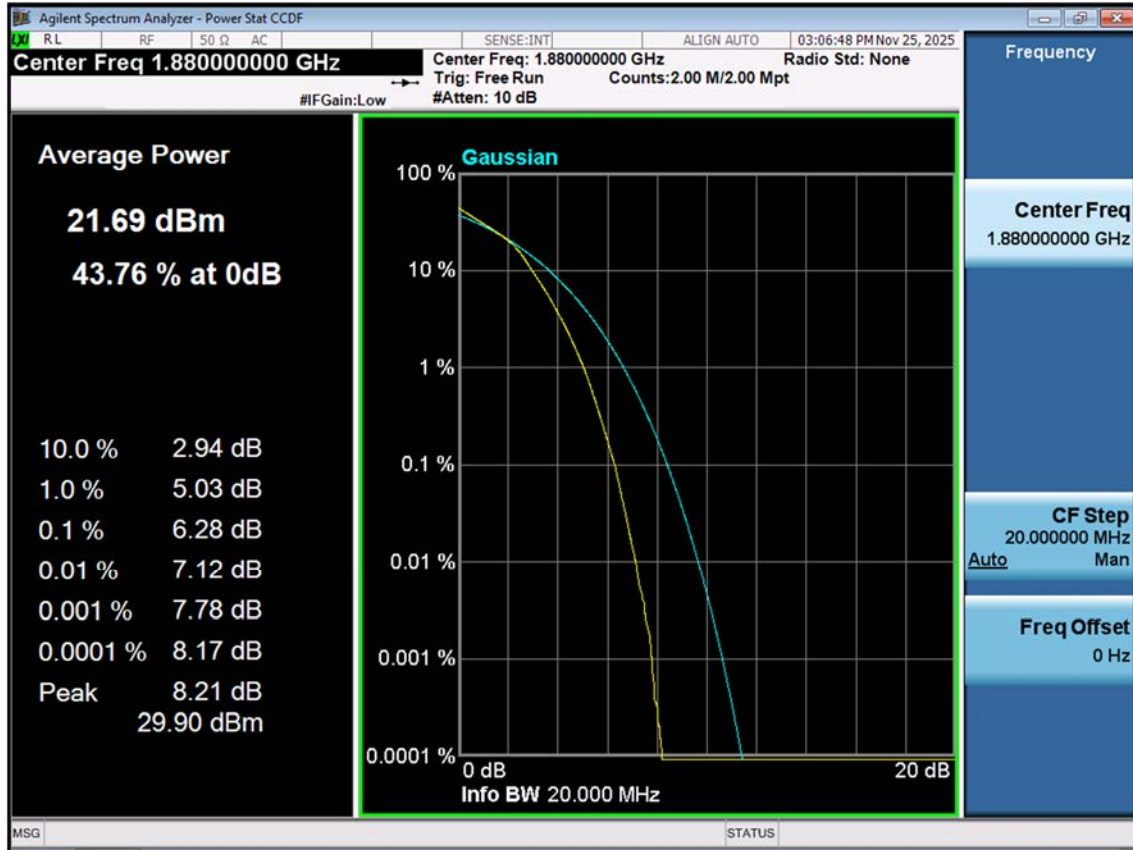
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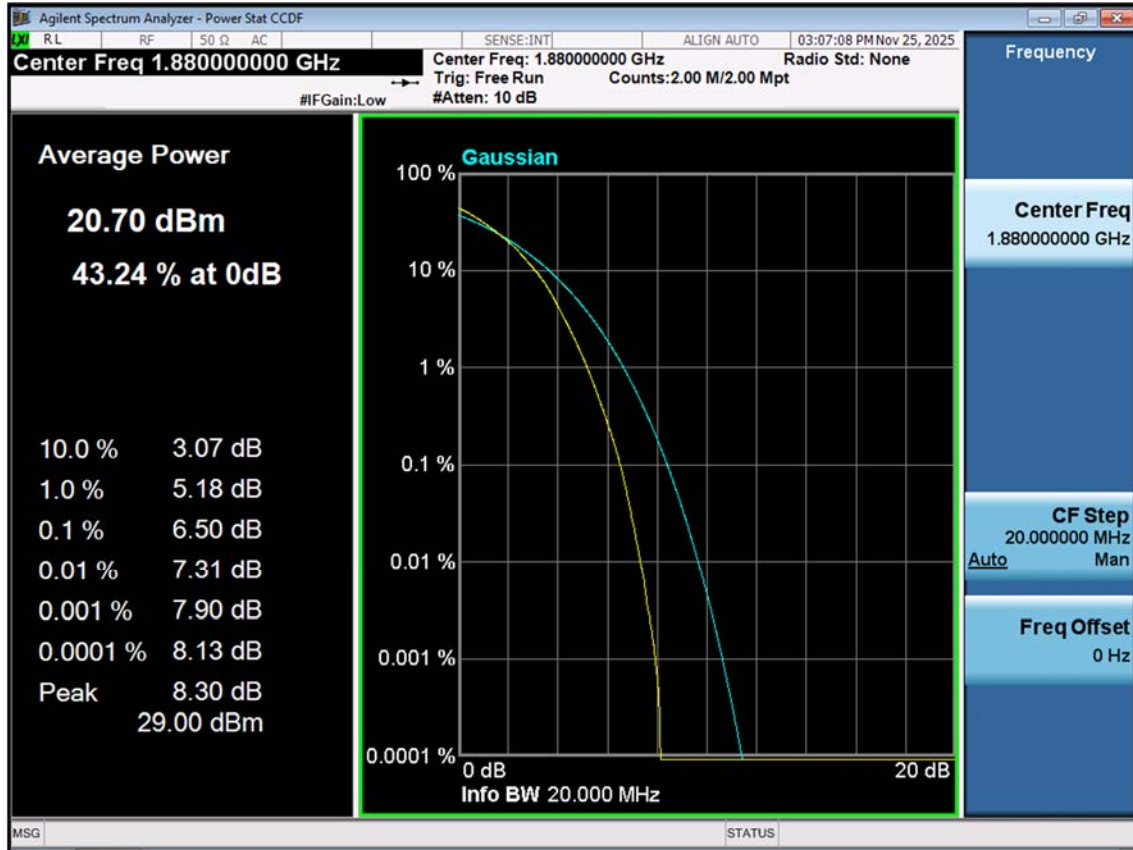
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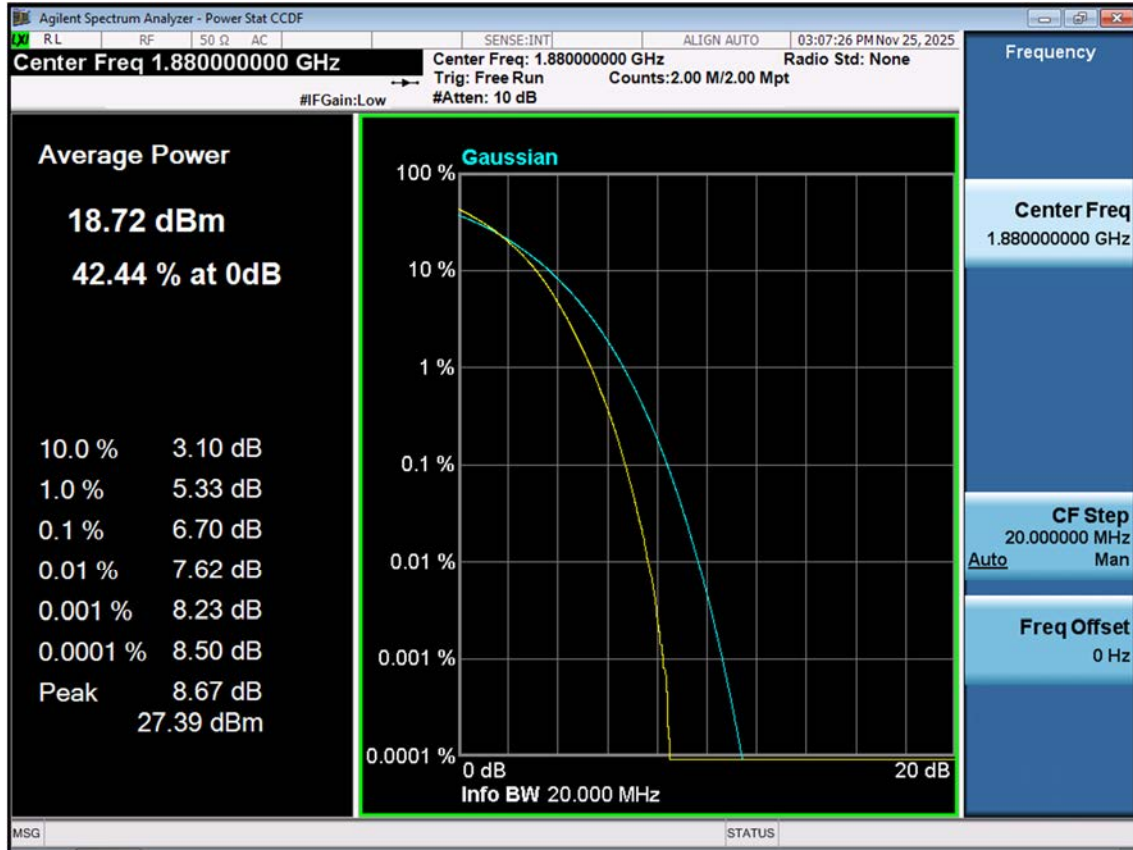
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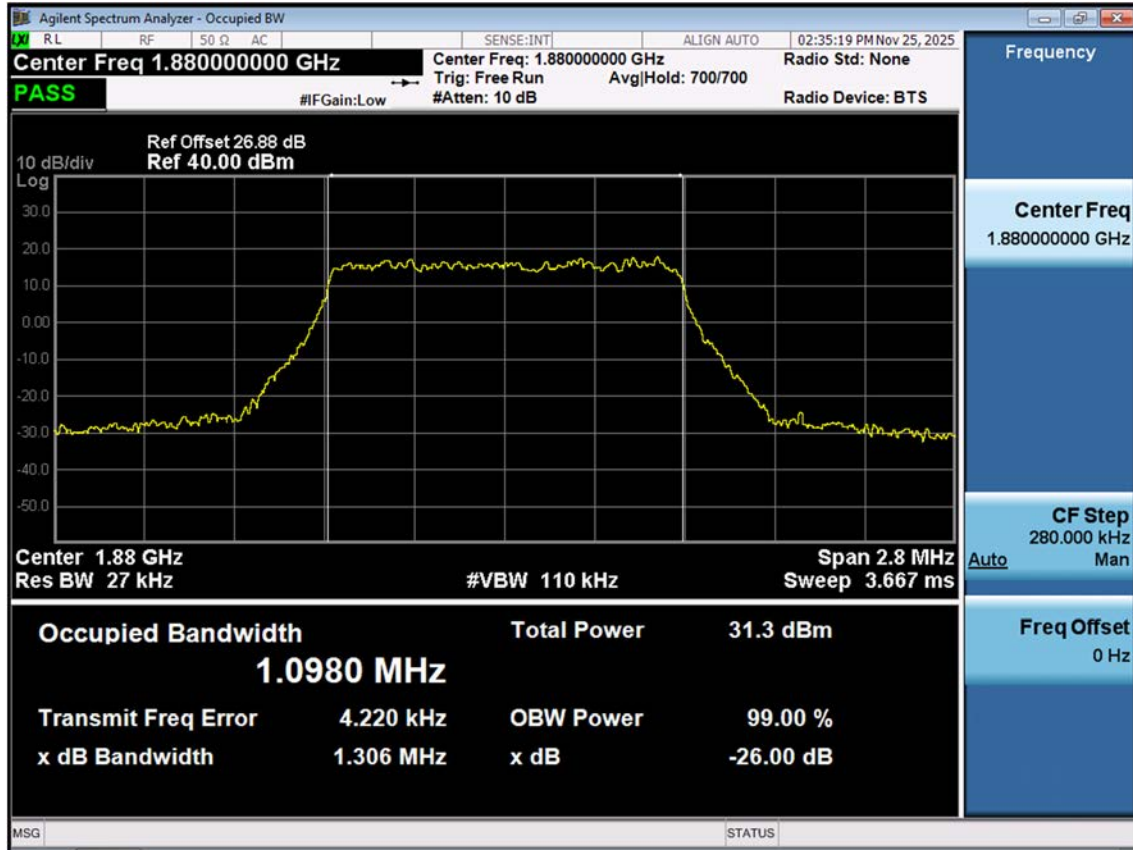
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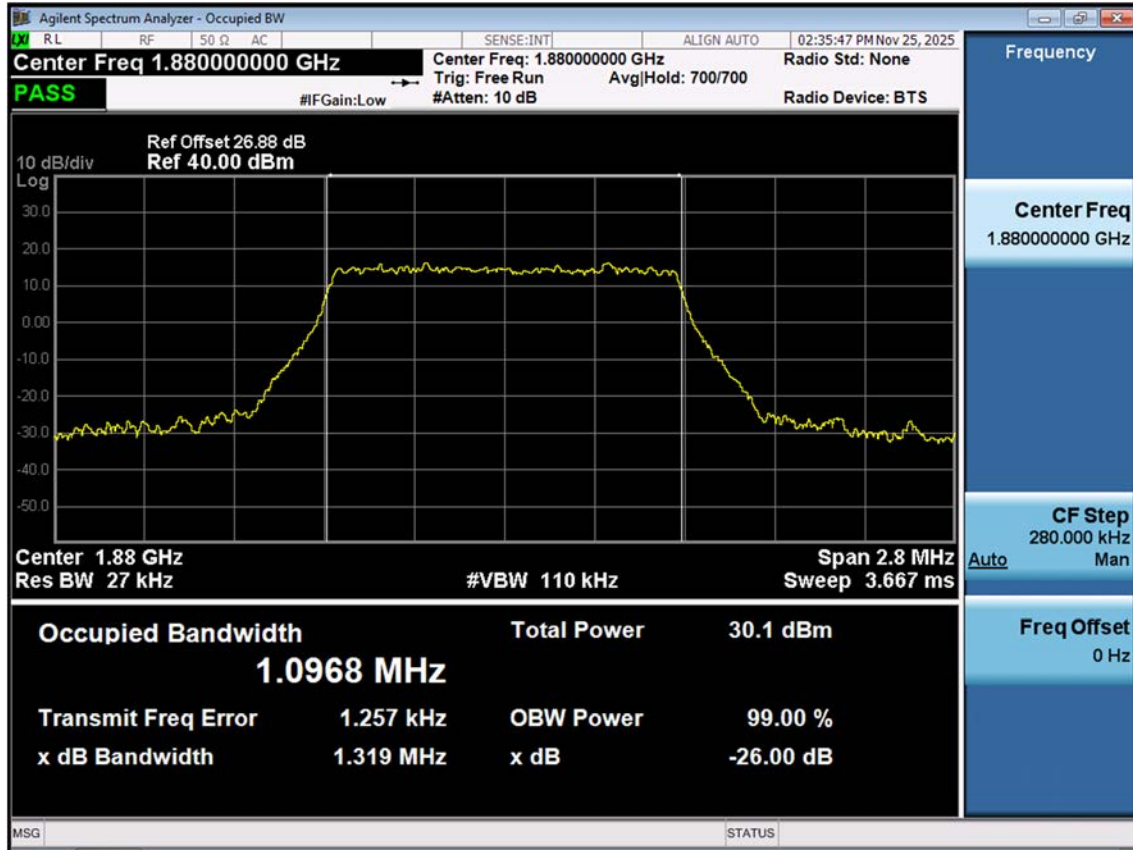
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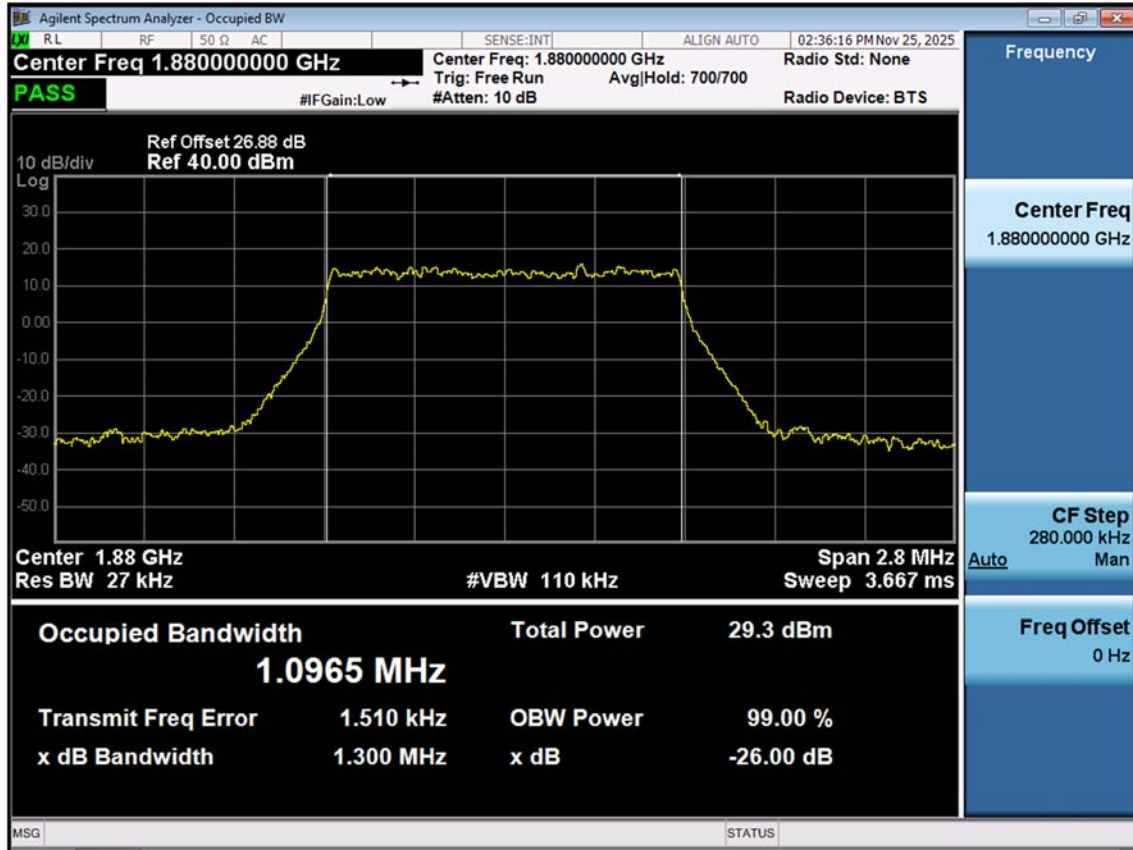
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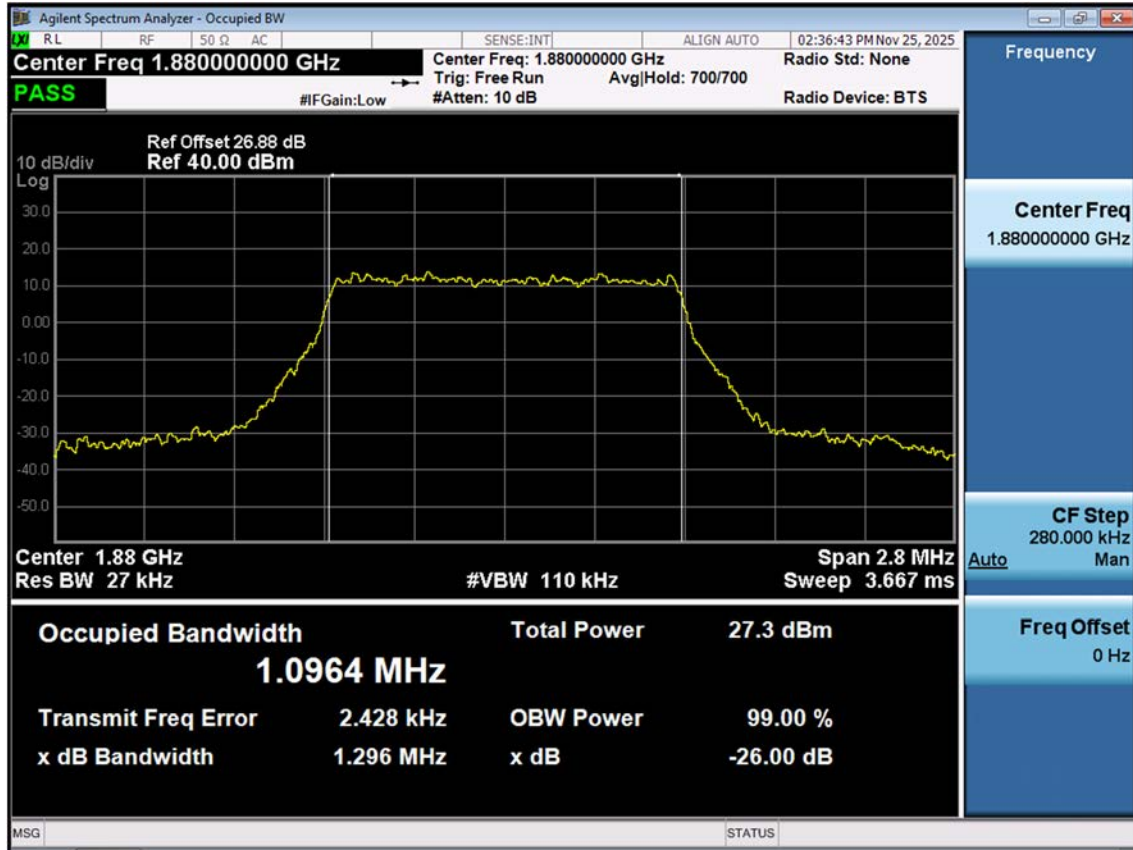
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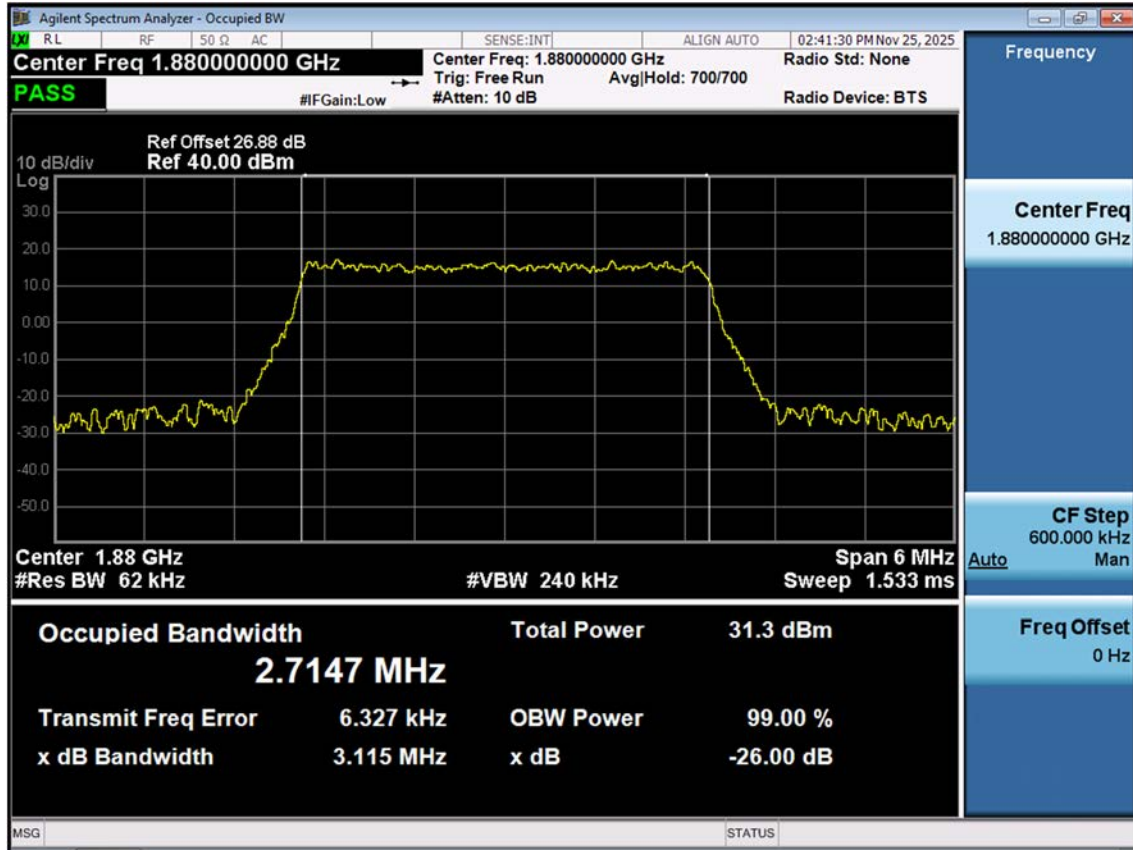
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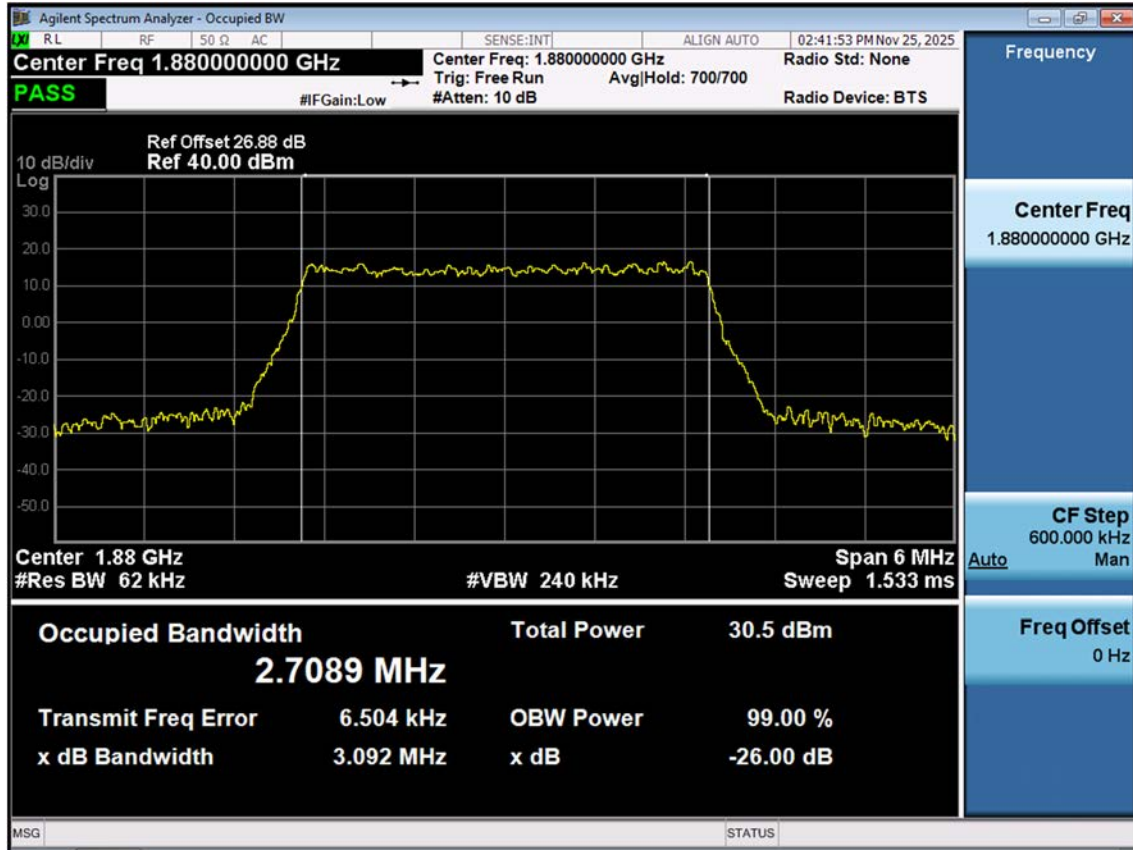
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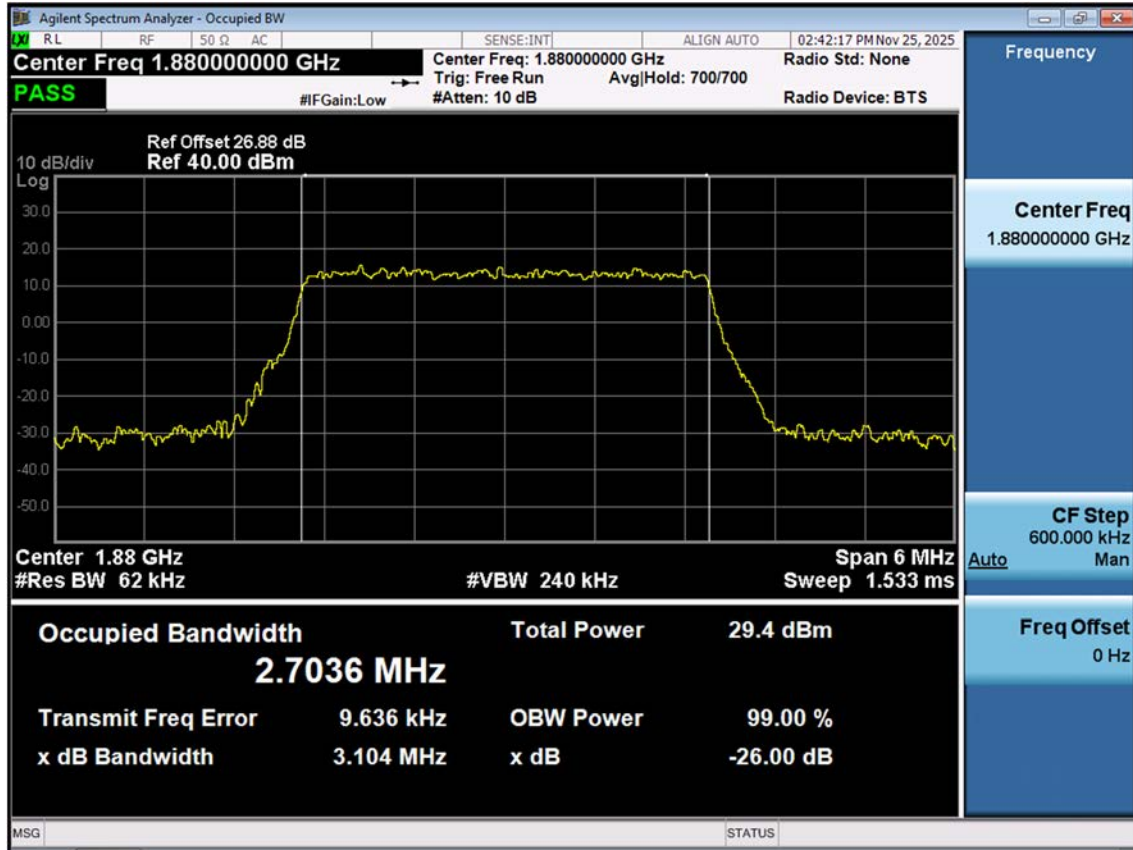
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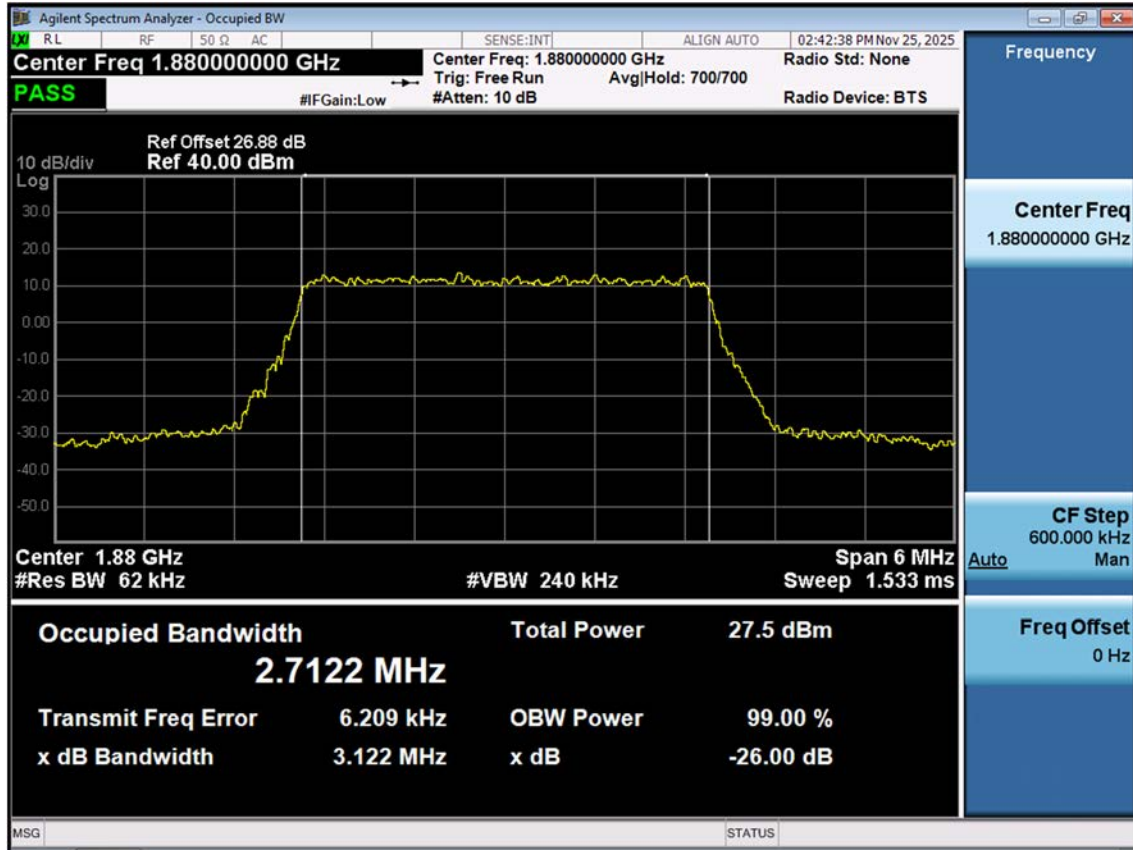
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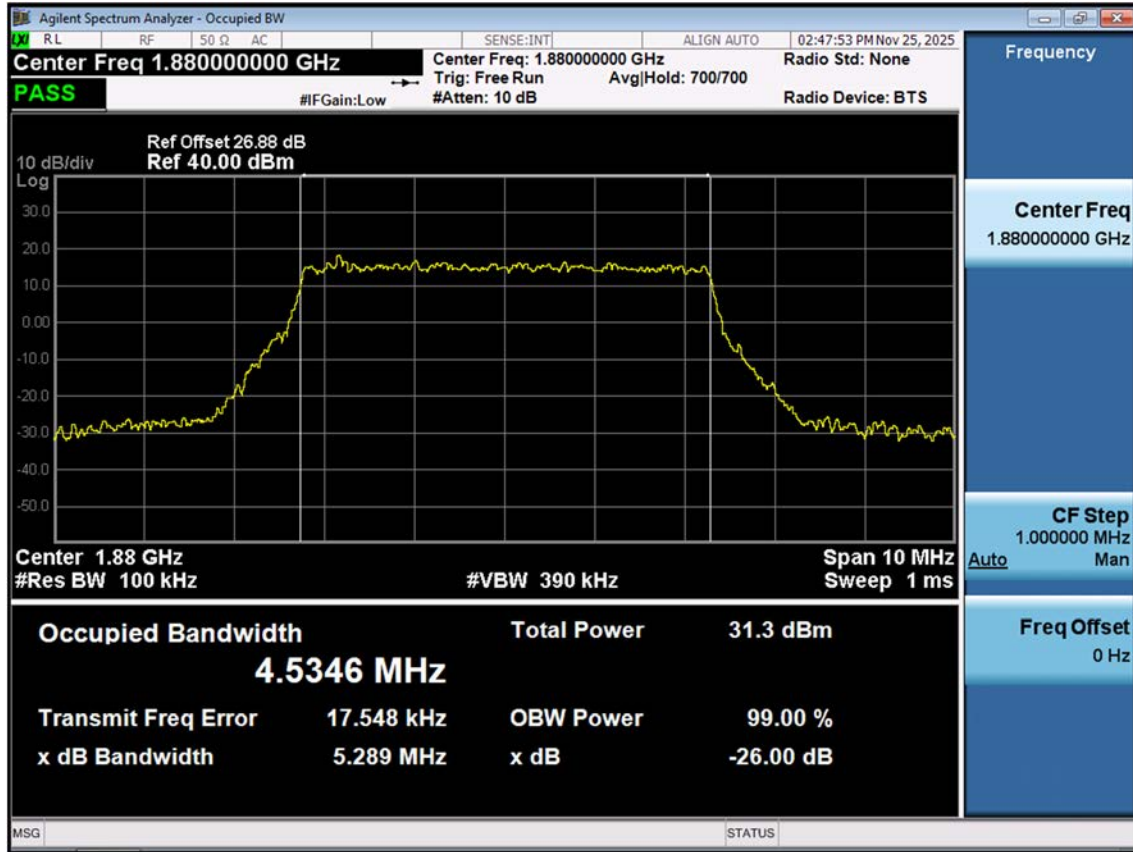
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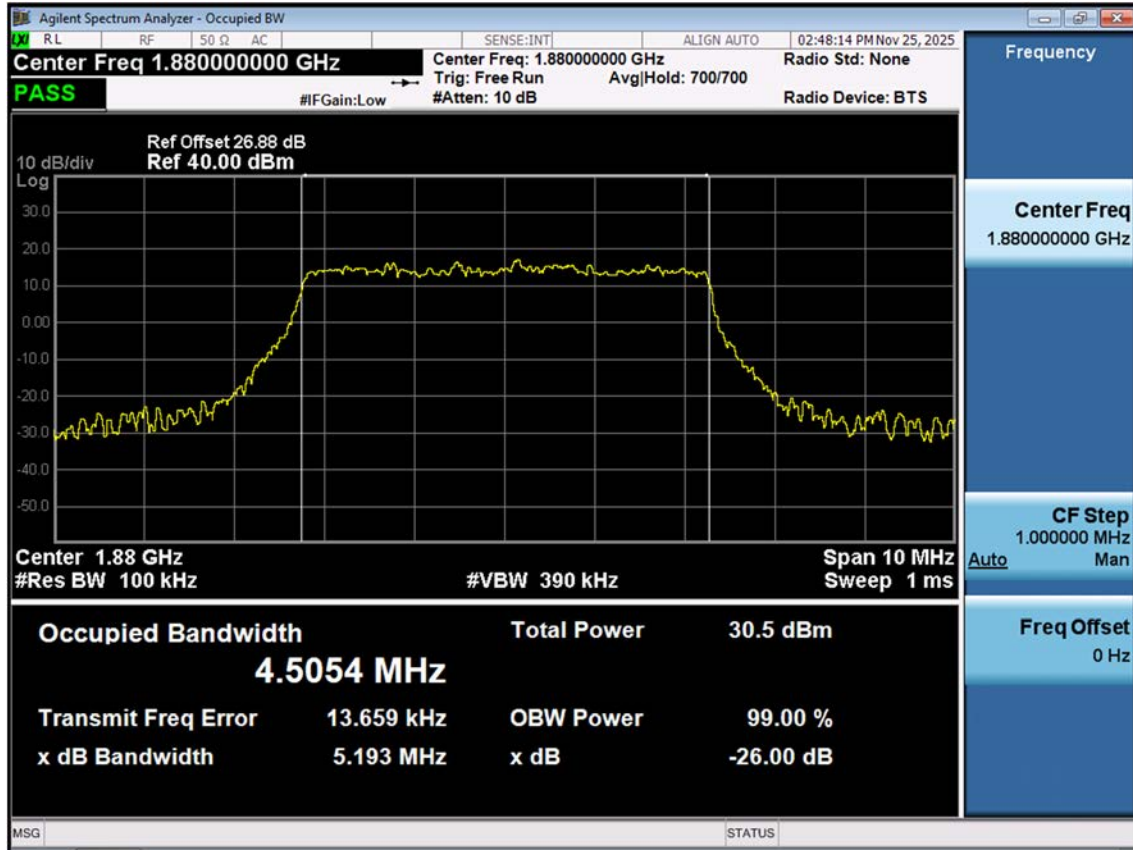
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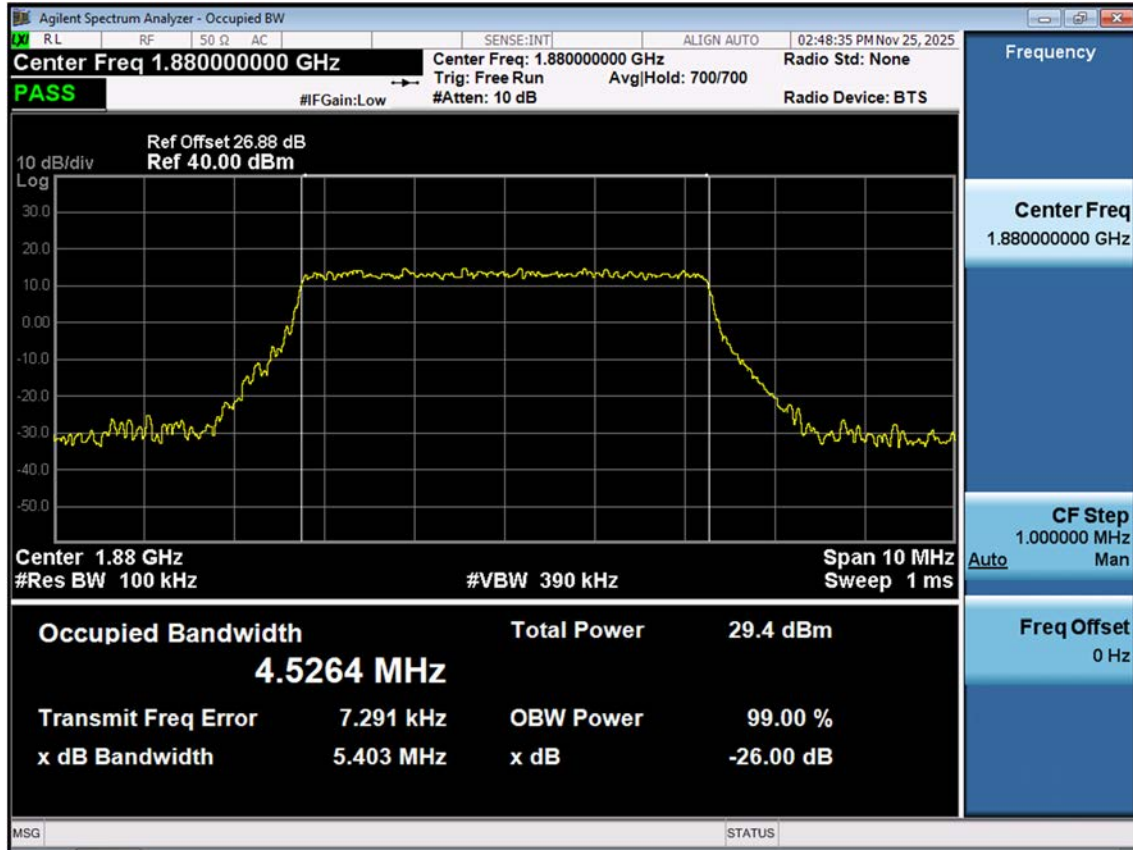
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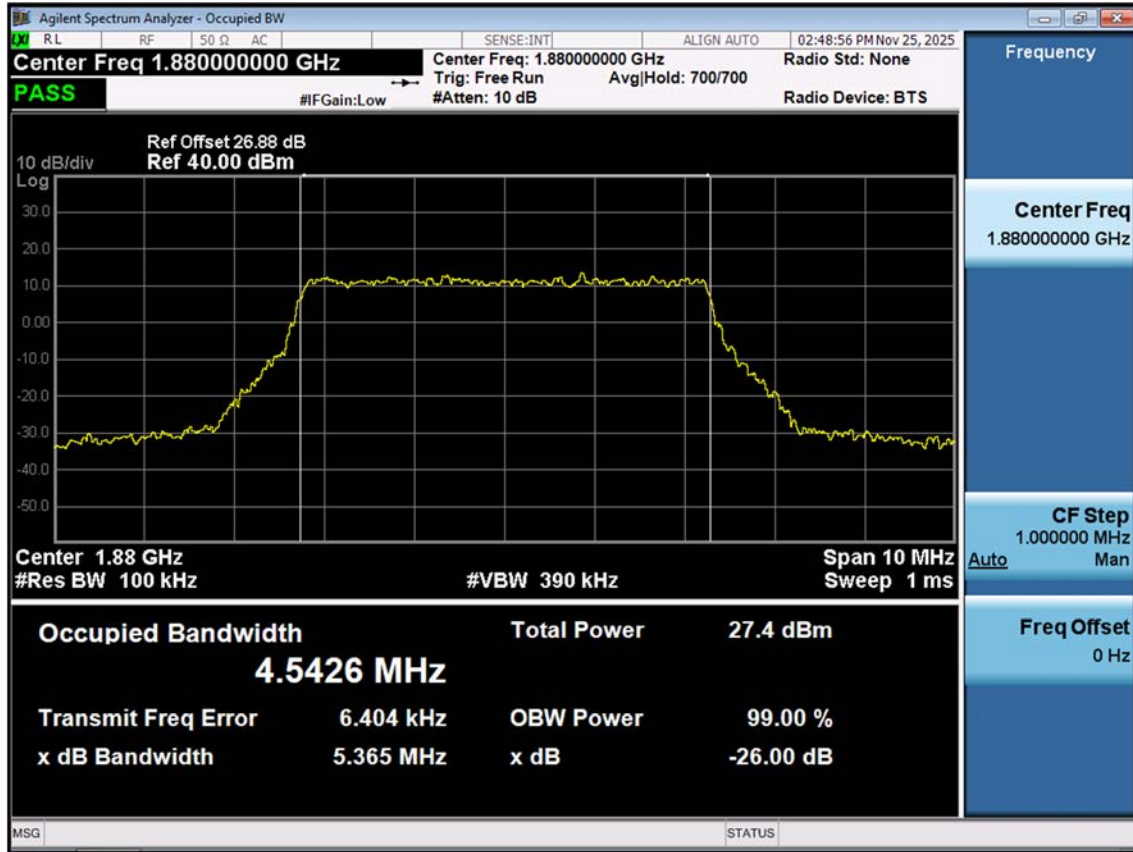
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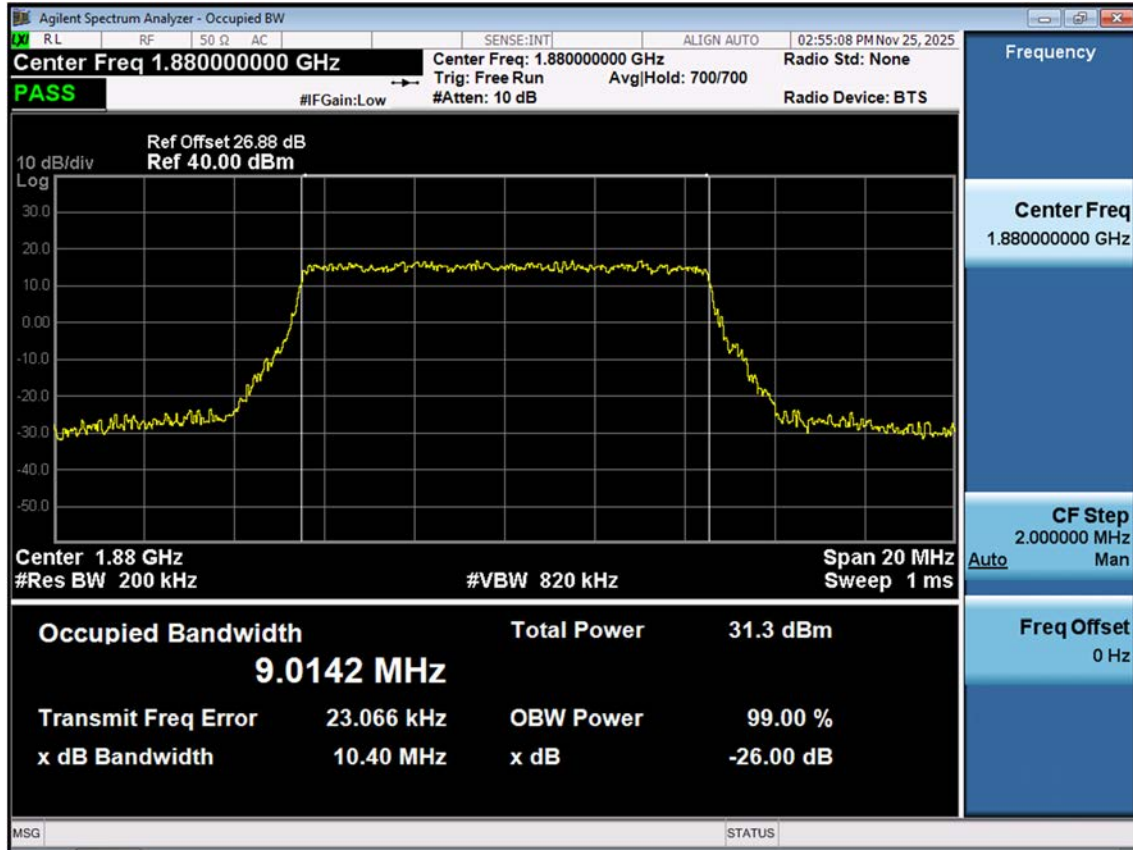
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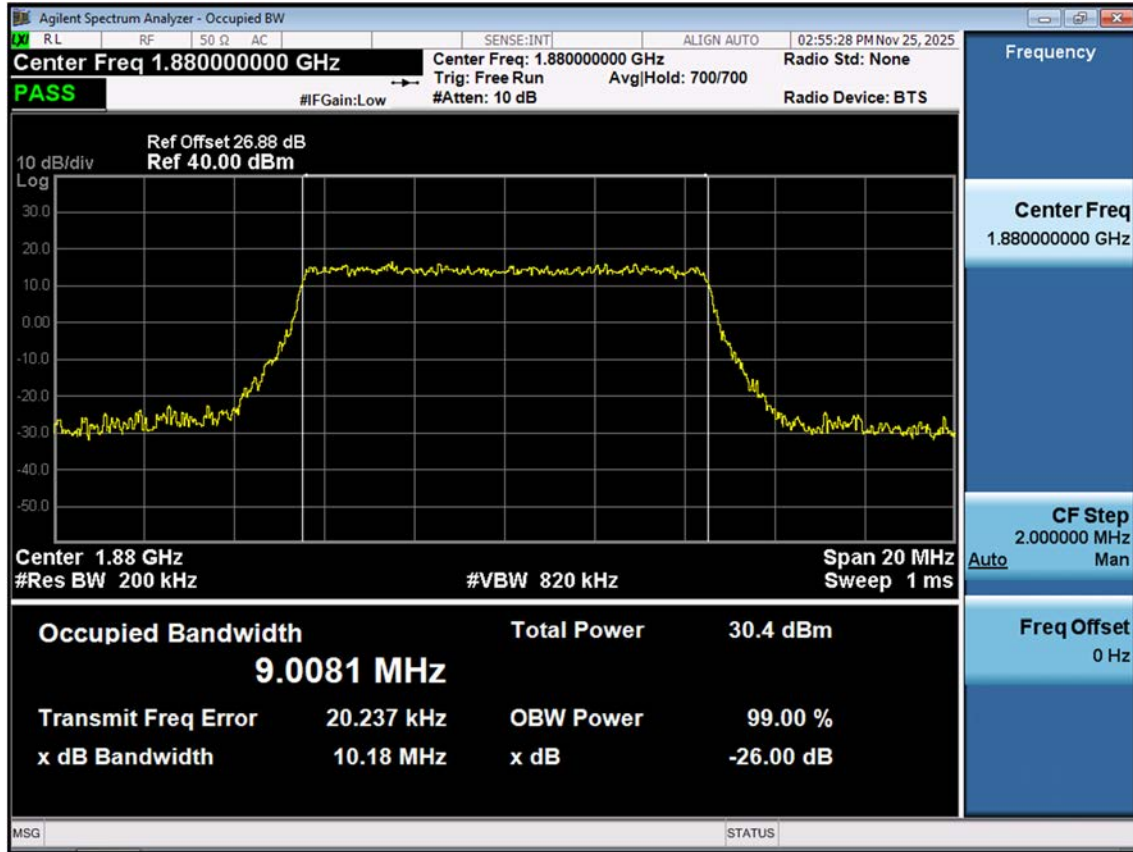
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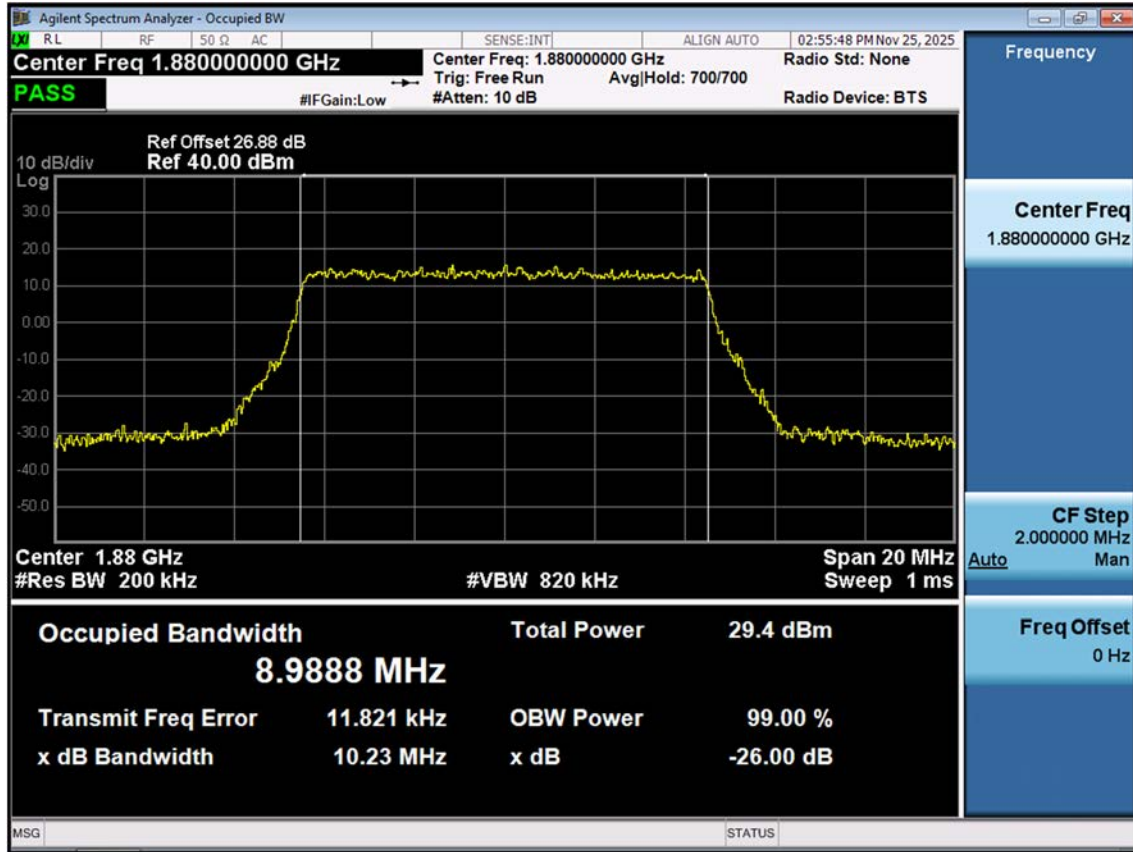
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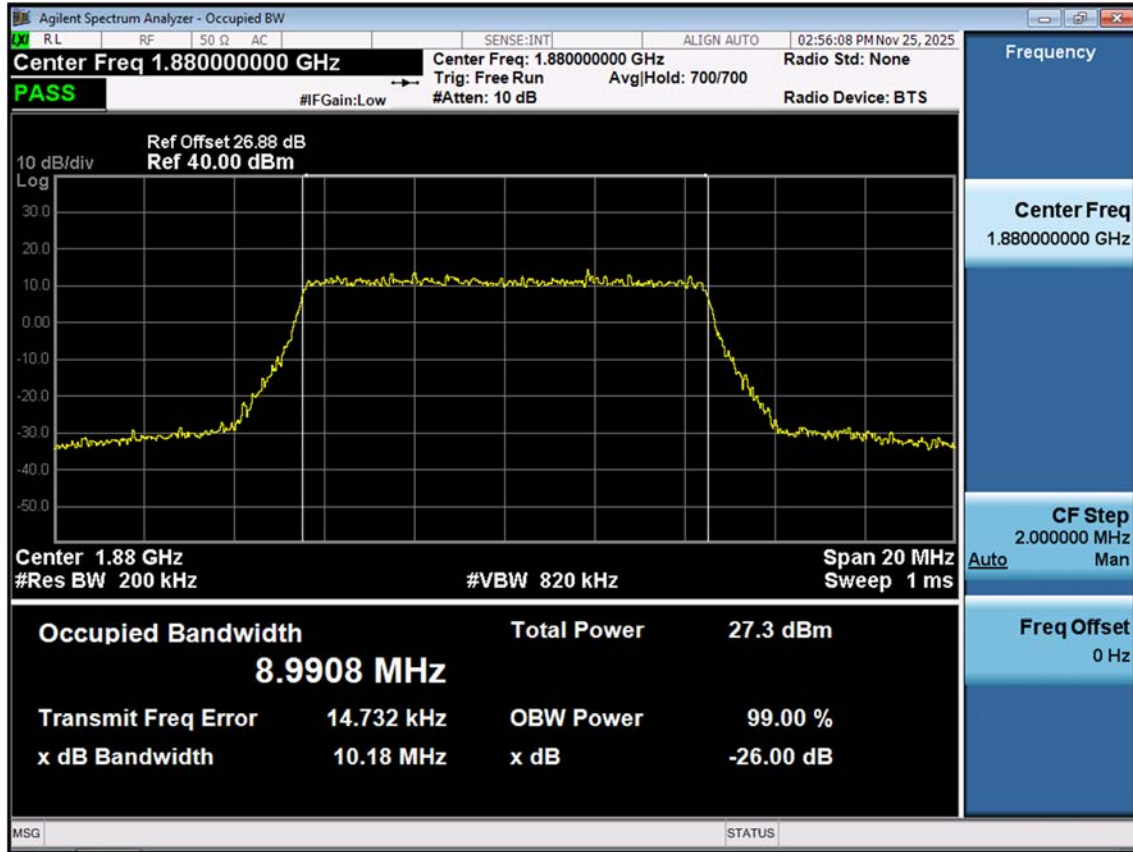
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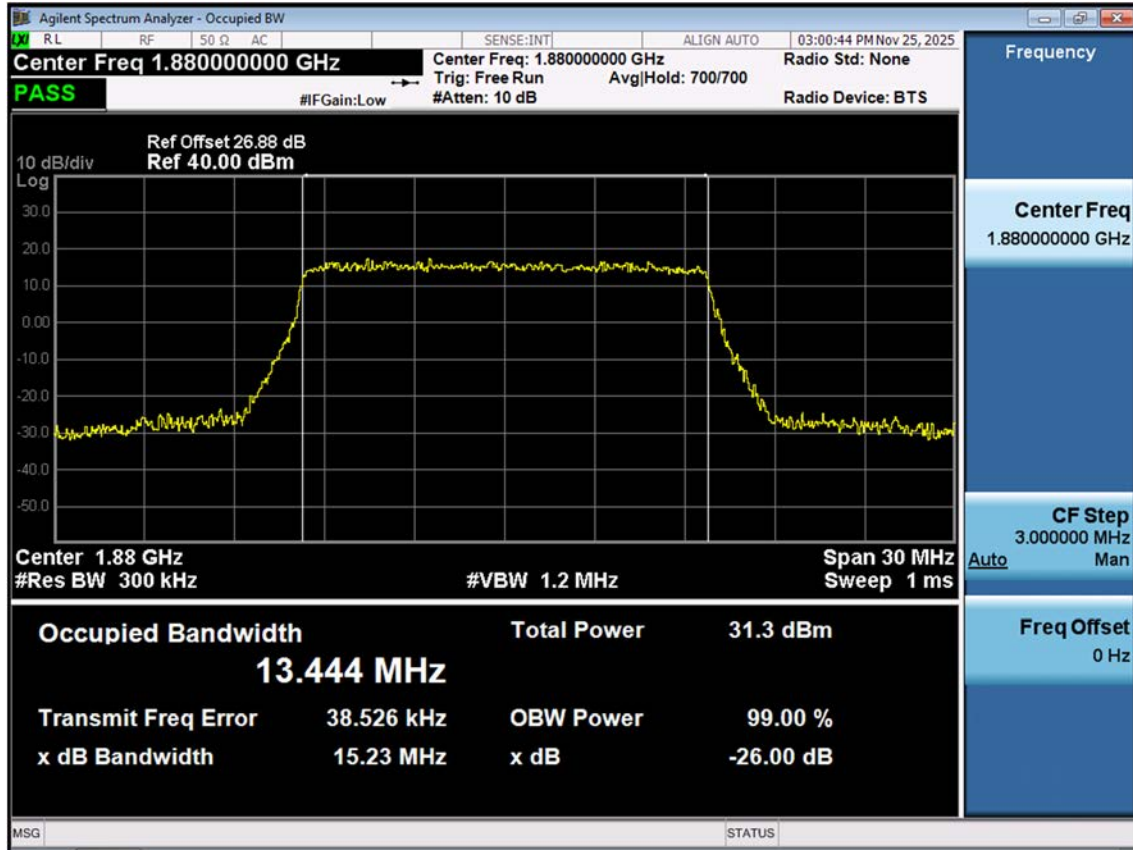
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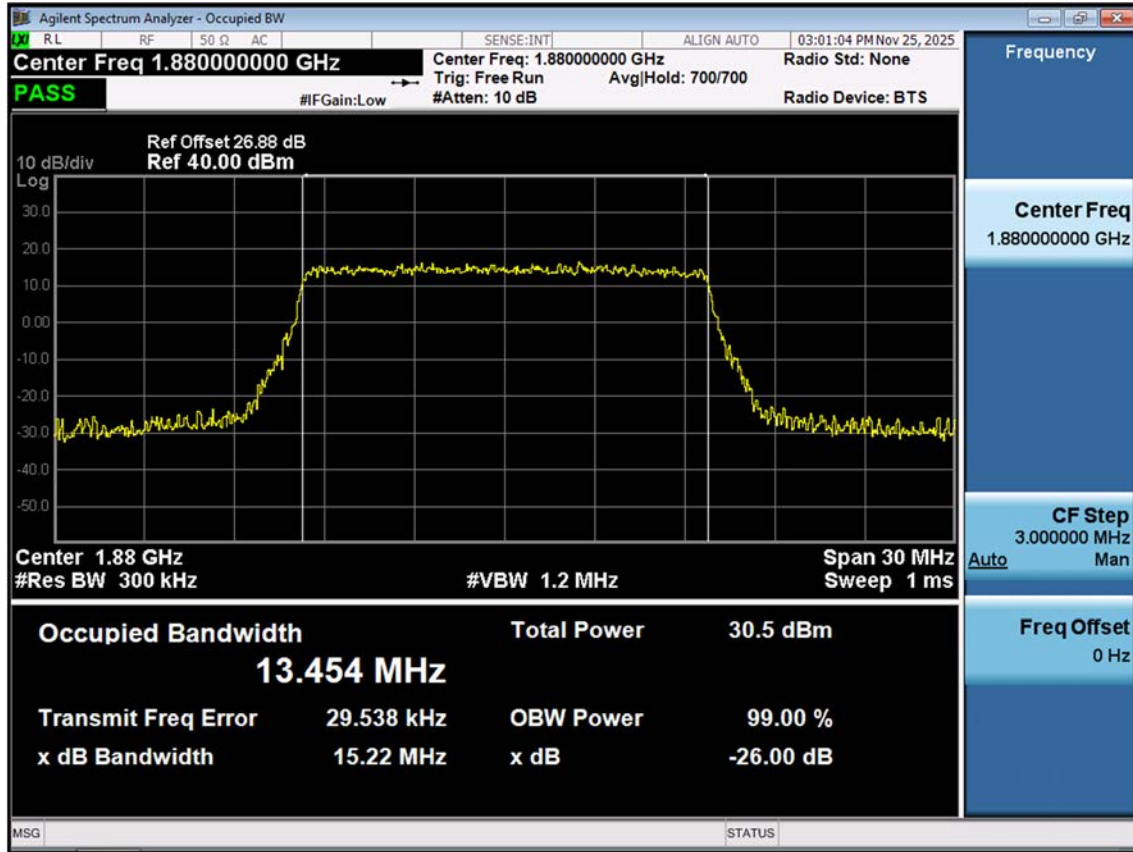
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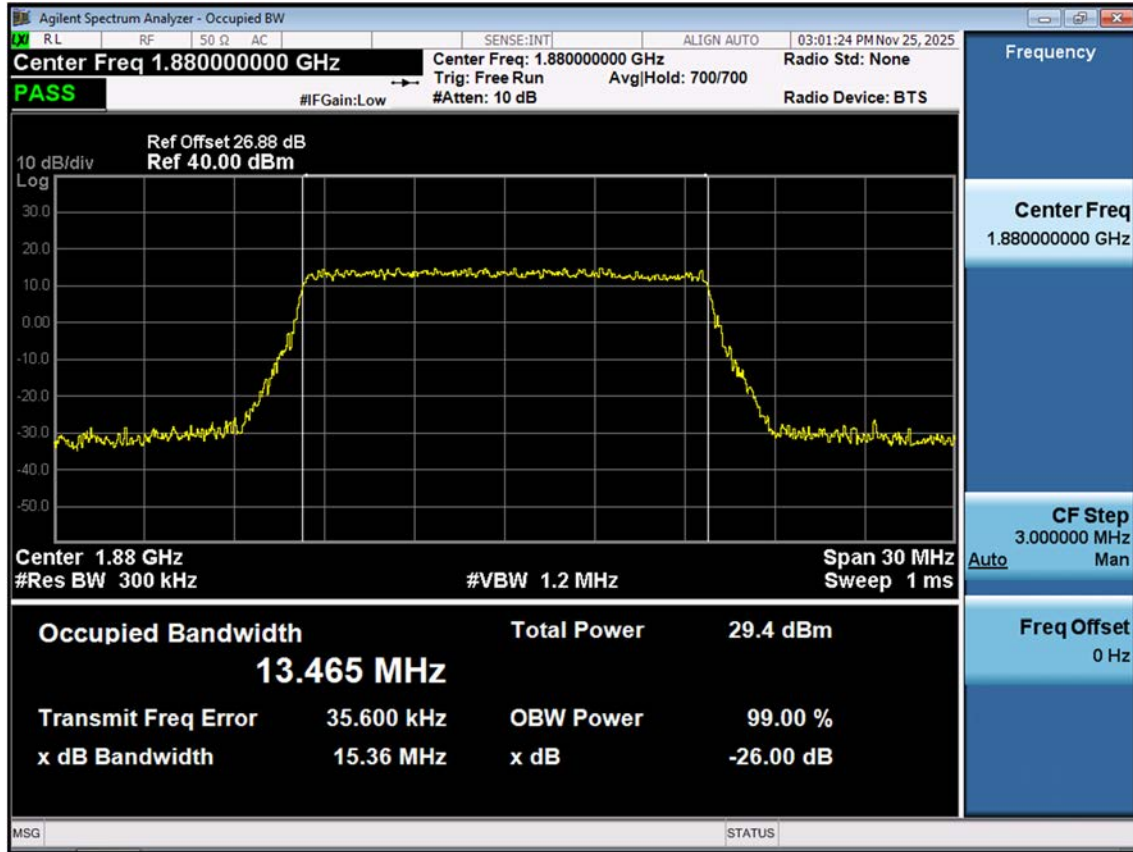
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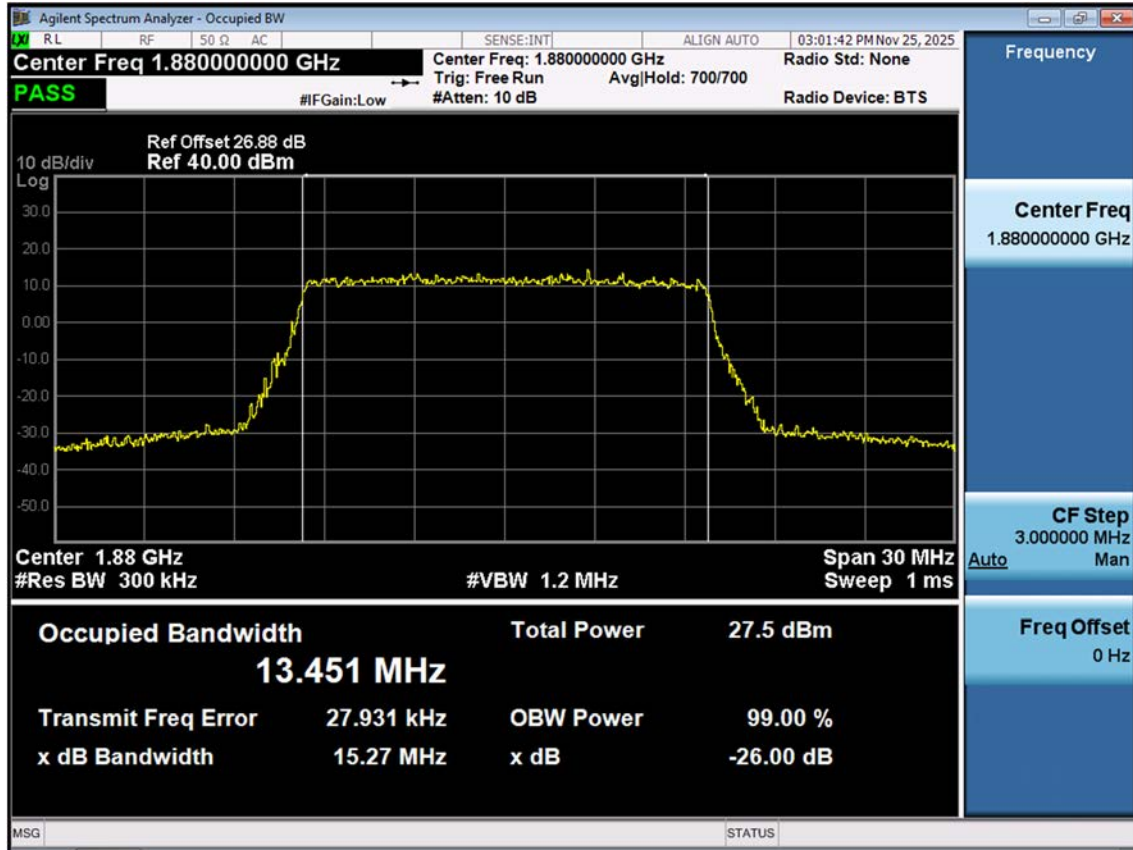
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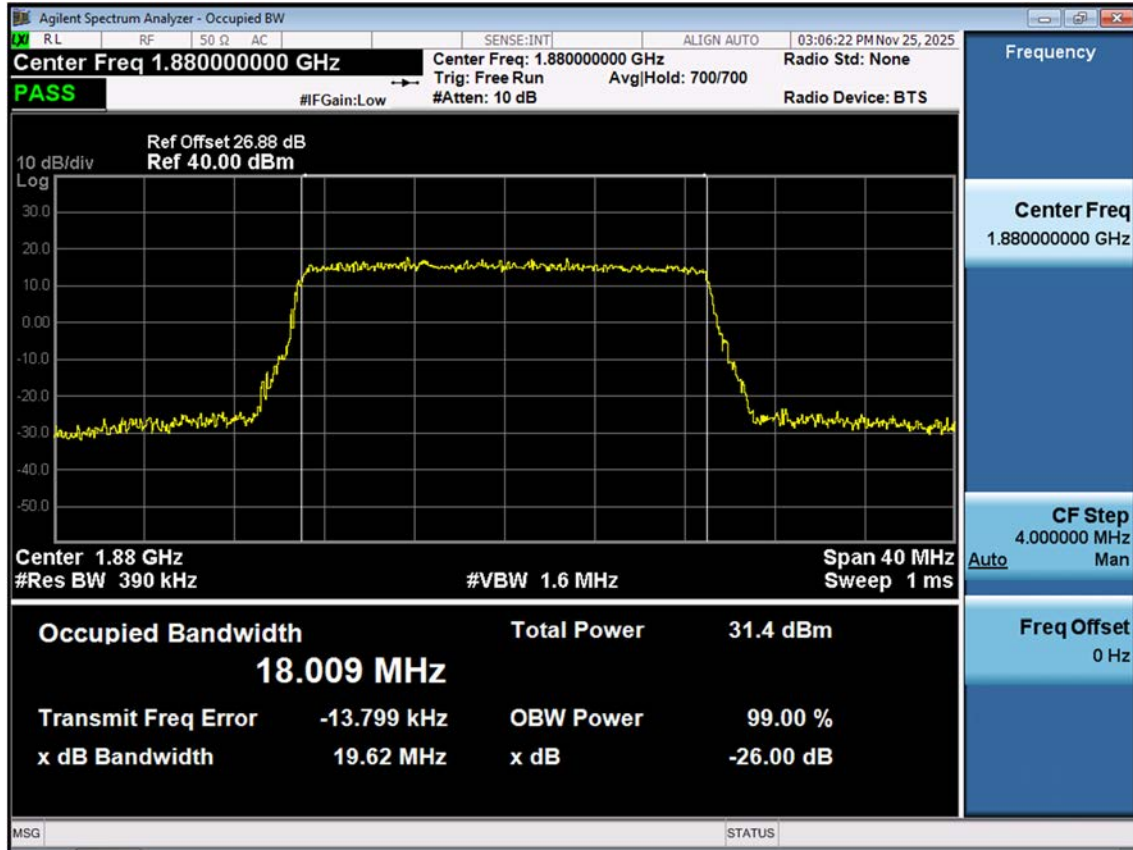
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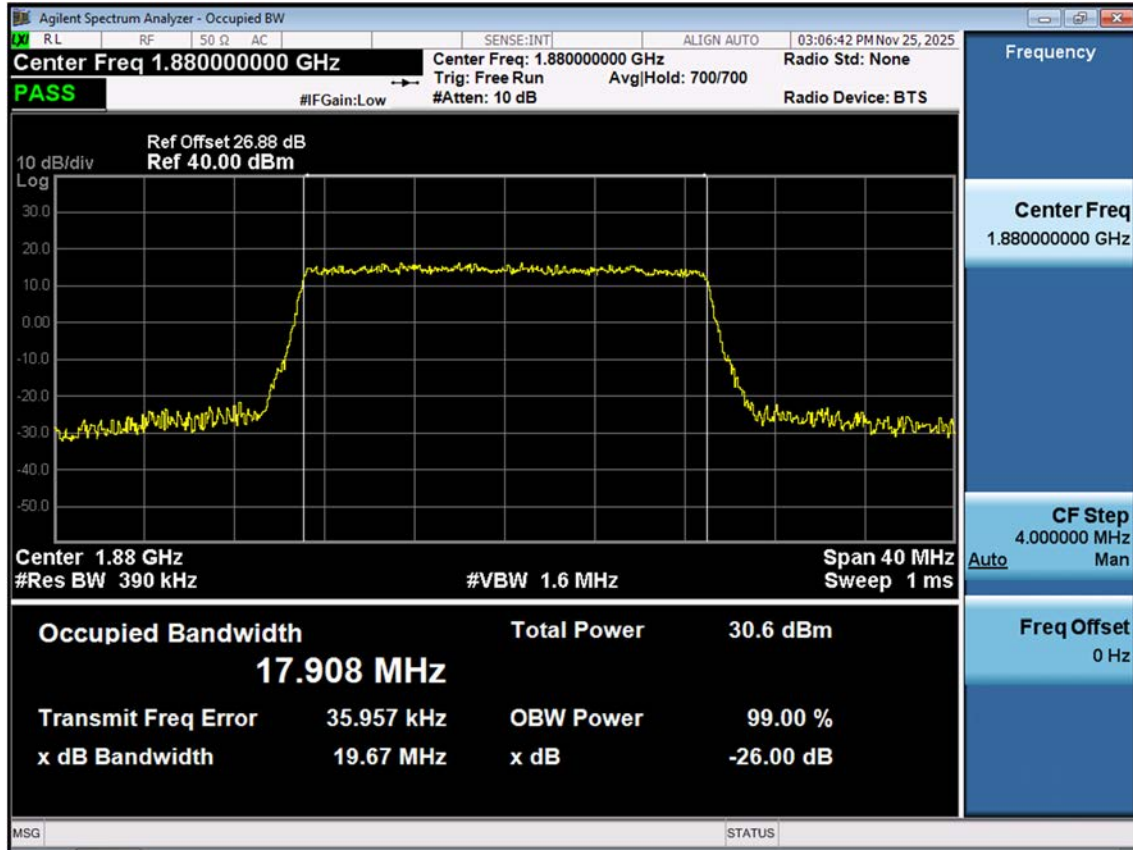
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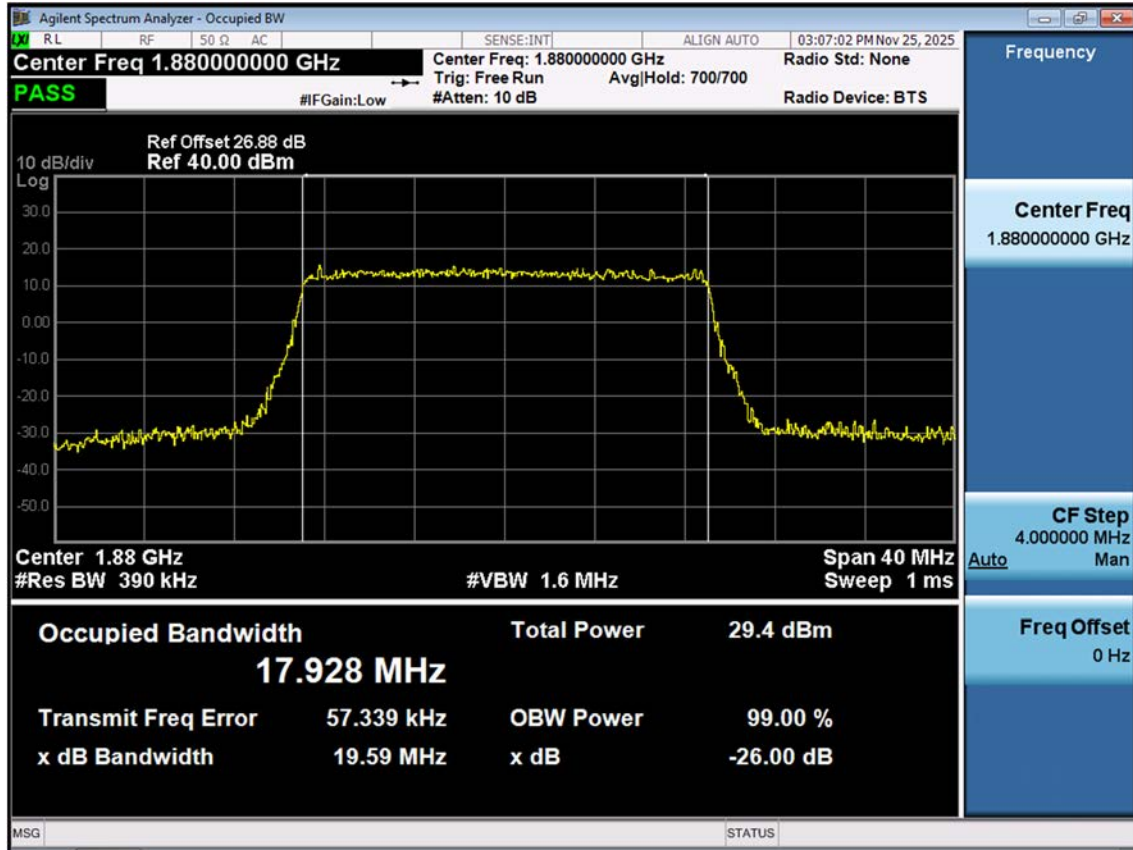
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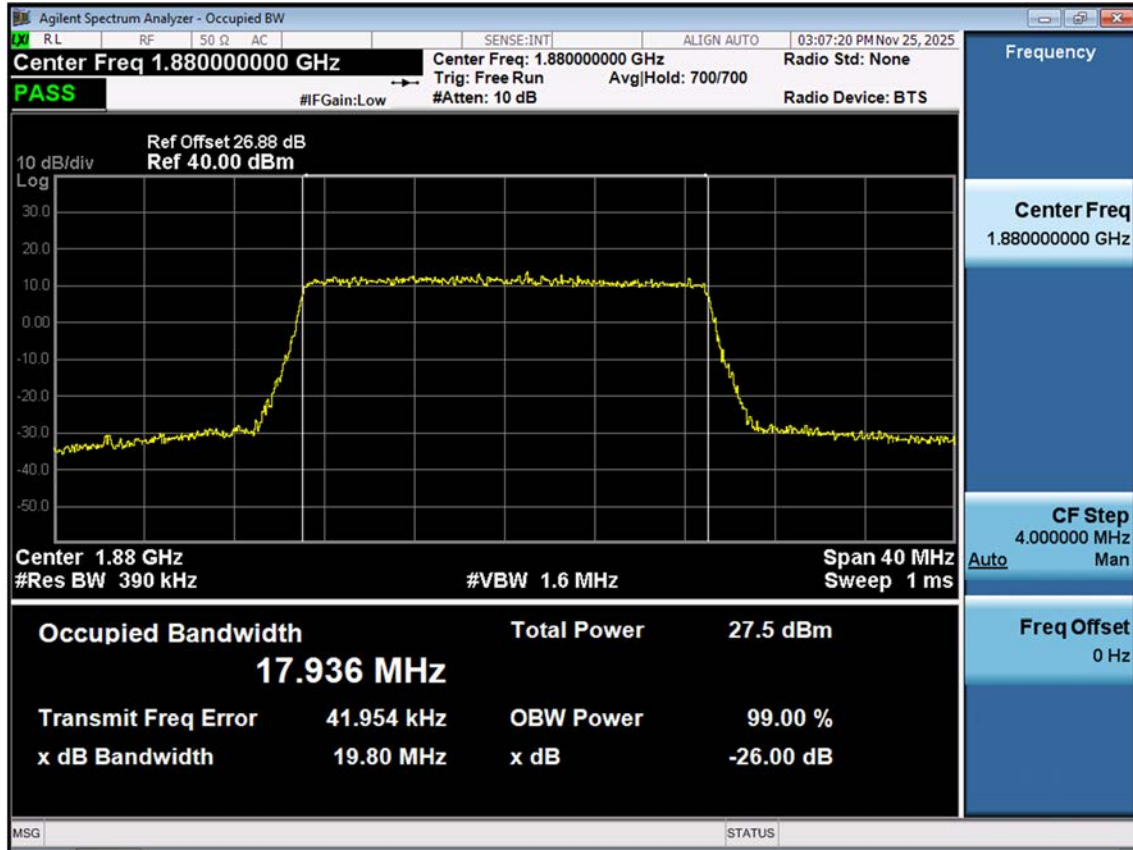
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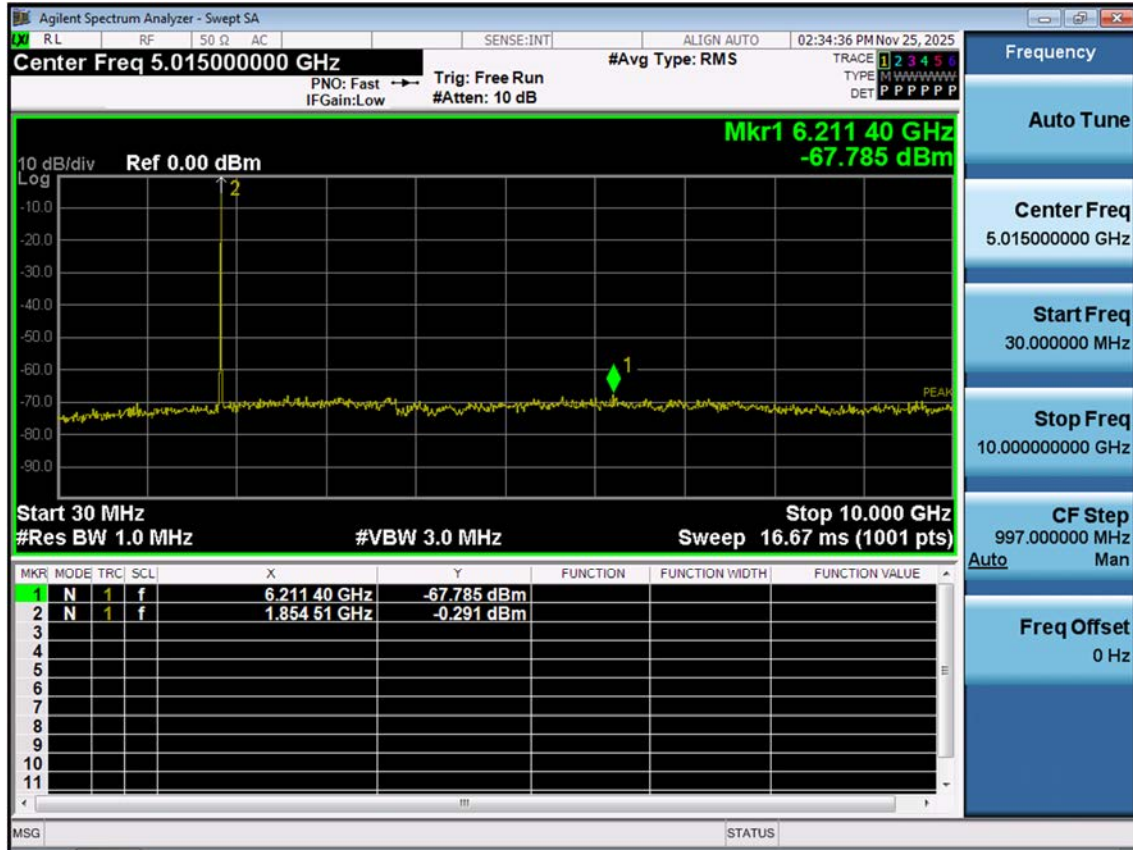
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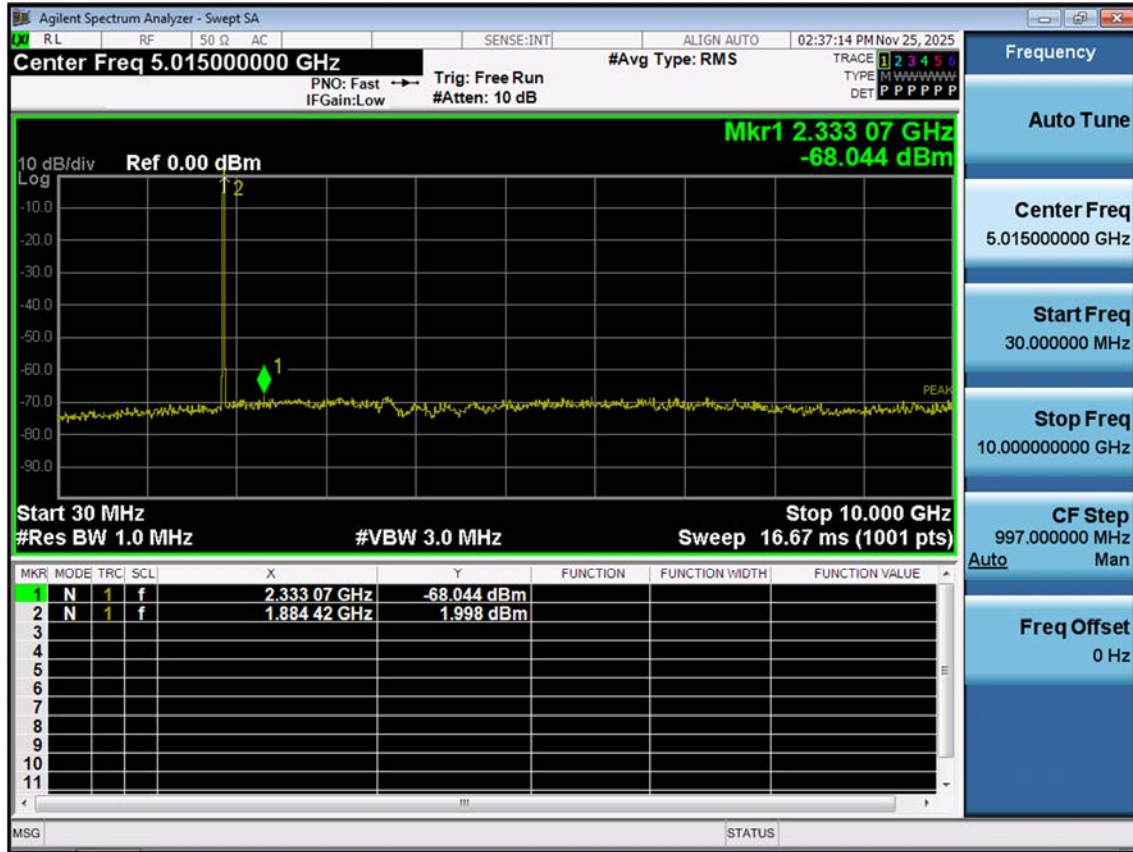
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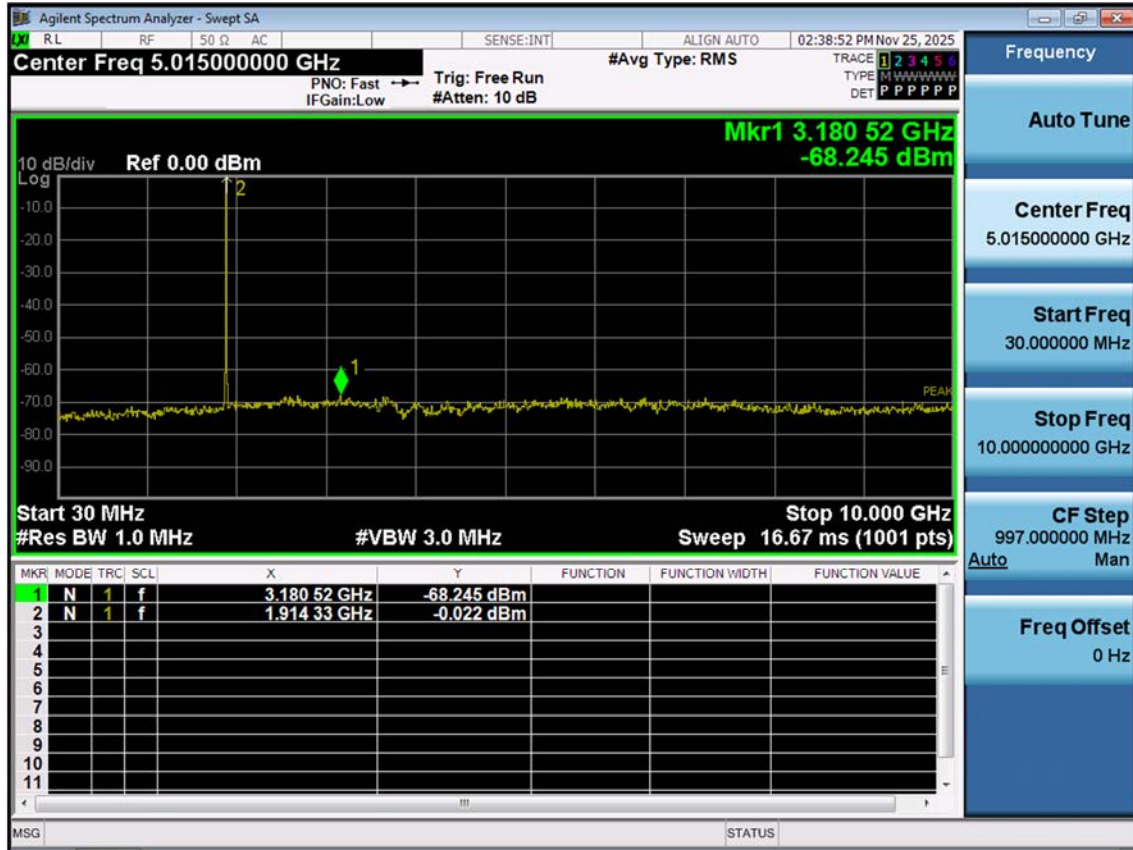
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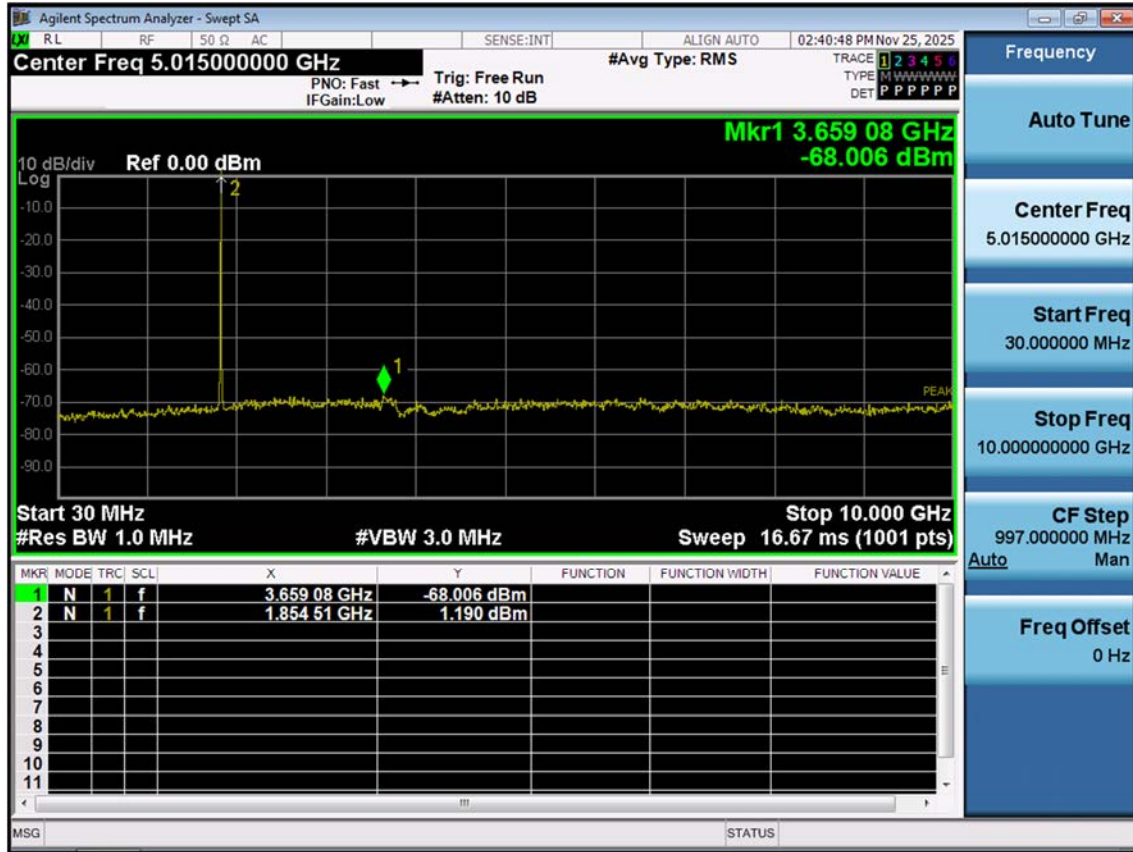
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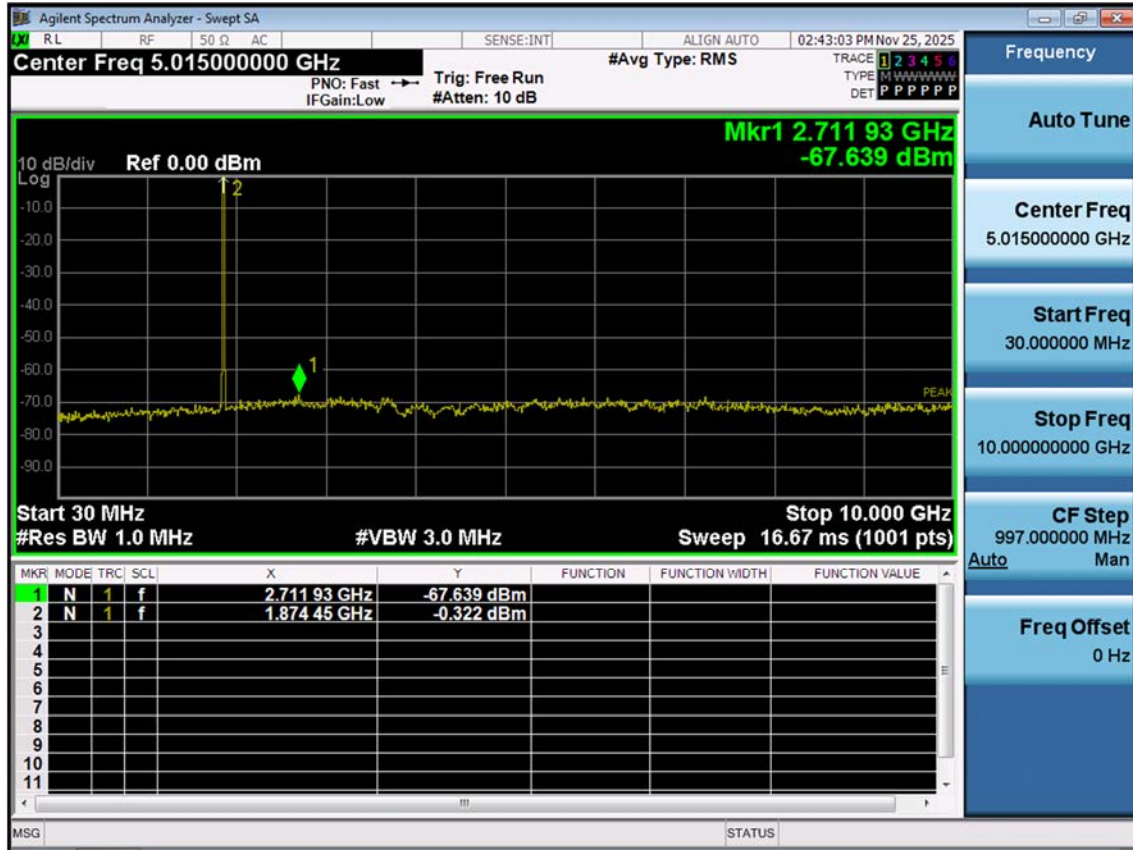
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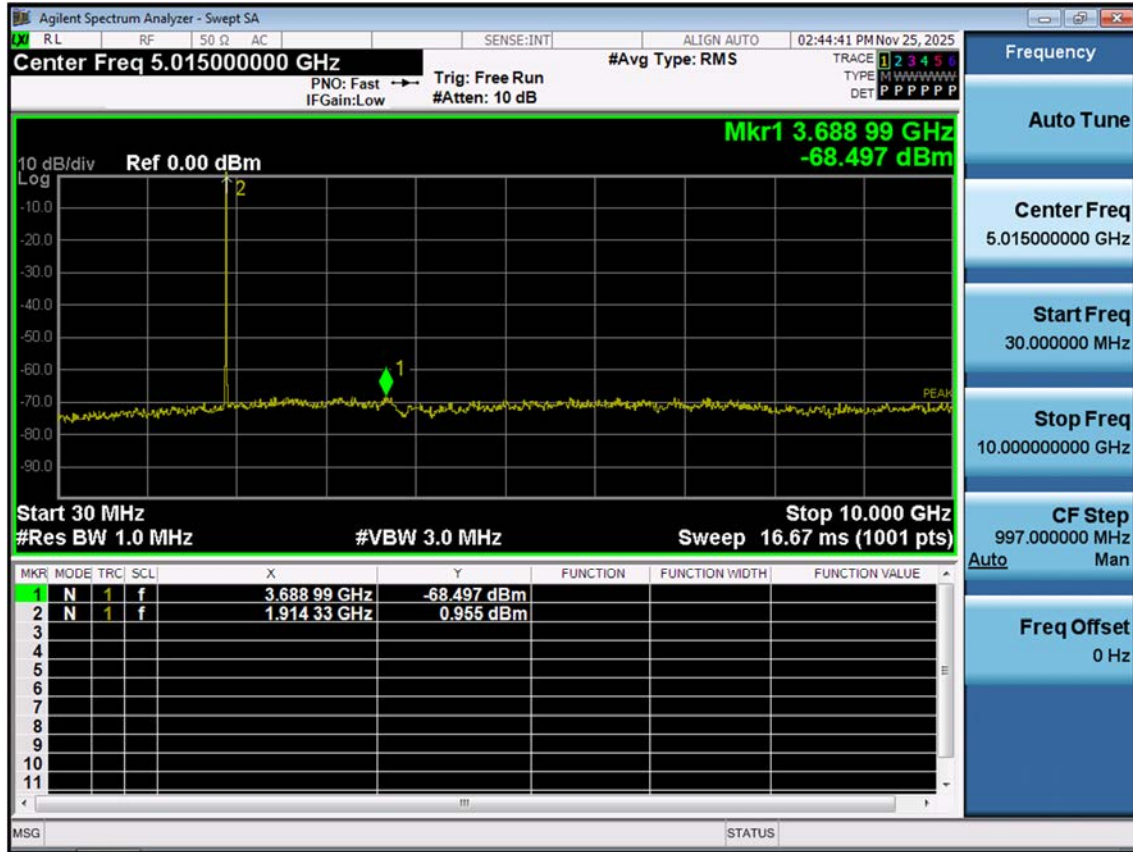
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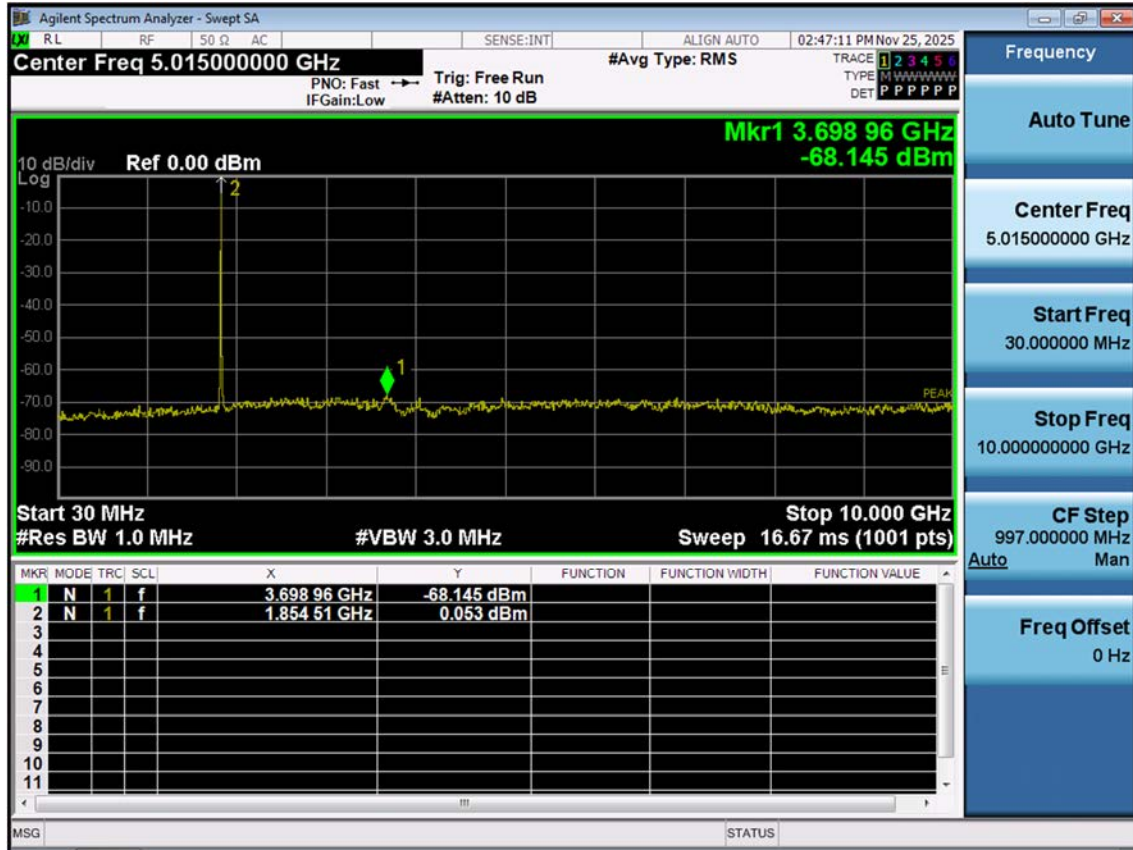
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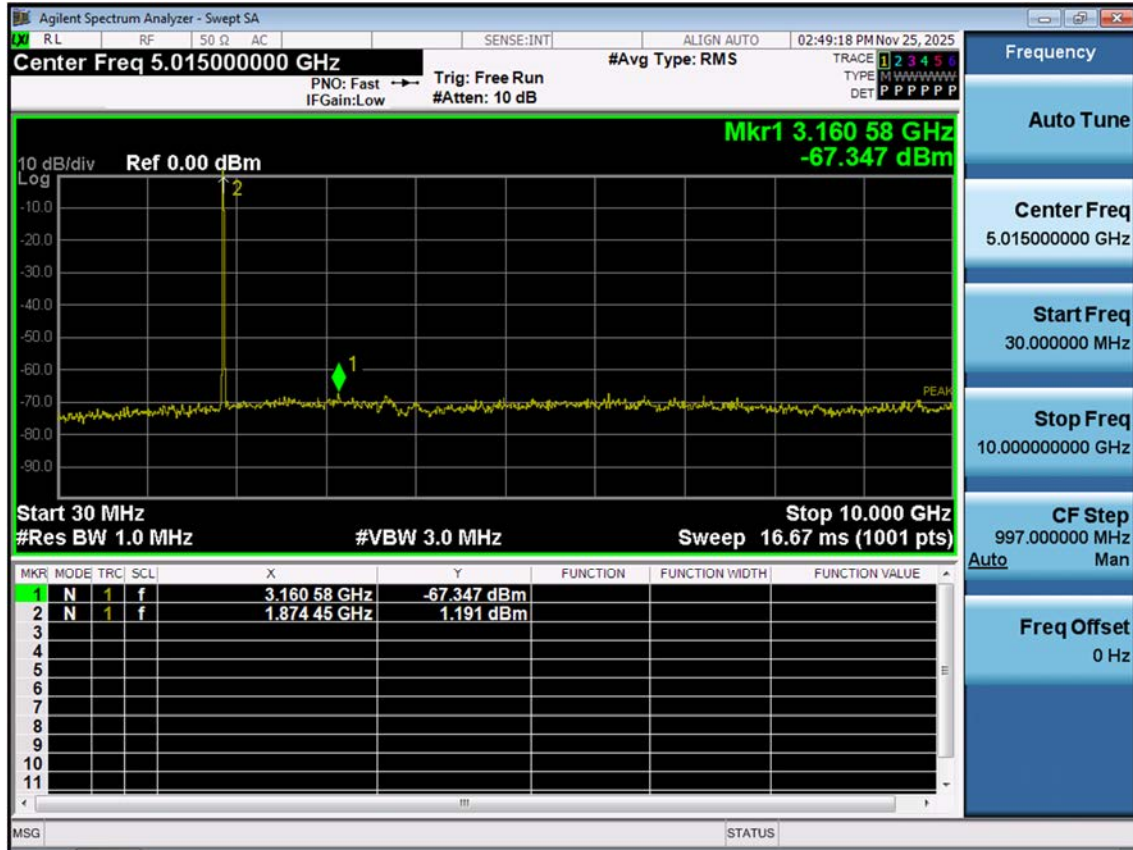
LTE B2_3 M_Conducted Spurious Emissions(30 M-10 G)_High_QPSK_1RB



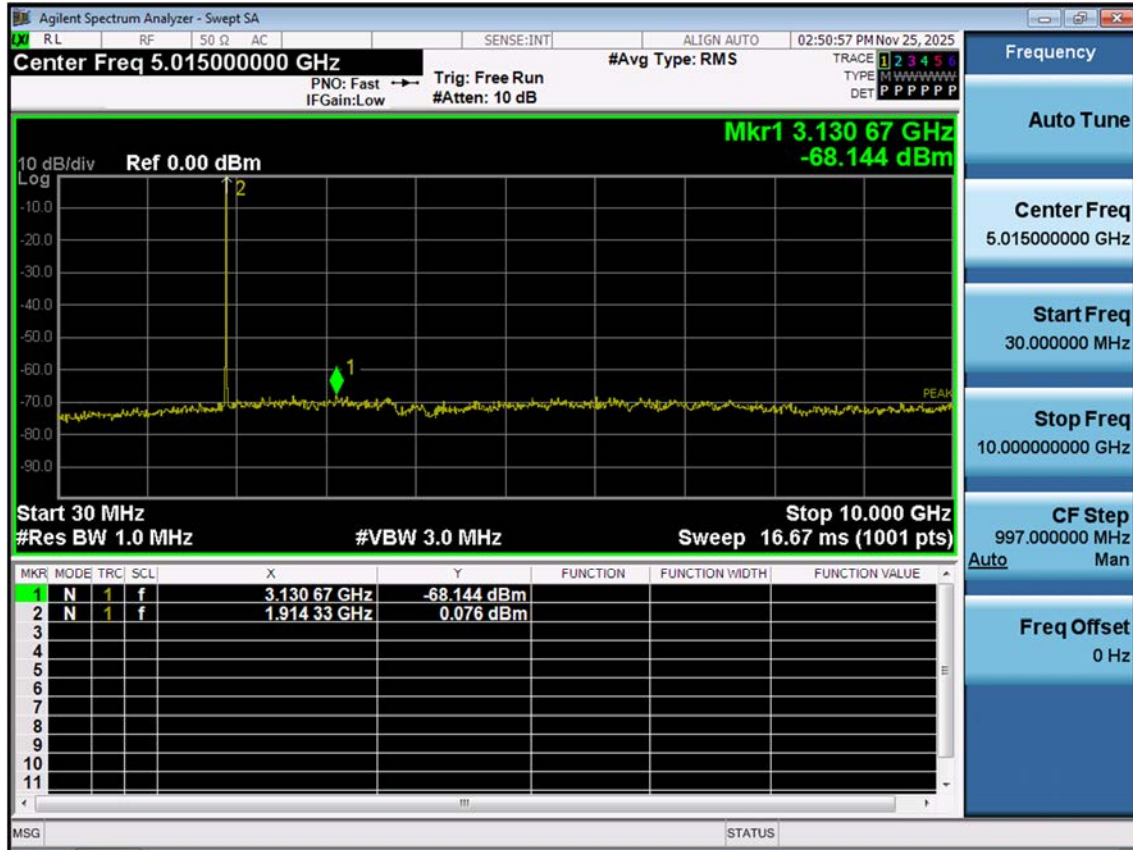
LTE B2_5 M_Conducted Spurious Emissions(30 M-10 G)_Low_QPSK_1RB



LTE B2_5 M_Conducted Spurious Emissions(30 M-10 G)_Mid_QPSK_1RB



LTE B2_5 M_Conducted Spurious Emissions(30 M-10 G)_High_QPSK_1RB



LTE B2_10 M_Conducted Spurious Emissions(30 M-10 G)_Low_QPSK_1RB

