

TEST REPORT

FCC LTE B41(38) Test for SM-S931U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2410-FC044-R1

DATE OF ISSUE
October 31, 2024

Tested by
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TEST REPORT

REPORT NO.

HCT-RF-2410-FC044-R1

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Additional Model

SM-S931U1

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-S931U

Date of Test

August 26, 2024 ~ October 28, 2024

FCC ID

A3LSMS931U

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing

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

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

Test Standard Used

FCC Rule Part: § 27

Test Results

PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	October 22, 2024	Initial Release
1	October 31, 2024	Revised the 31, 56, 57 pages. (31P. R.S.E Low Channel result & 56, 57P High CH Freq.)

Notice

Content

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

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

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

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

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

Information provided by the applicant is marked **.

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

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

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

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMS931U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 27
EUT Type:	Mobile phone
Model(s):	SM-S931U
Additional Model(s)	SM-S931U1
Tx Frequency:	2498.5 – 2687.5 : 5 MHz 2501.0 – 2685.0 : 10 MHz 2503.5 – 2682.5 : 15 MHz 2506.0 – 2680.0 : 20 MHz
Date(s) of Tests:	August 26, 2024 ~ October 28, 2024
Serial number:	Radiated : R3CXA0930NH Conducted : R3CX70H9HRP

1.1. MAXIMUM OUTPUT POWER

Main 2 ANT

	Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
					Max. Power (W)	Max. Power (dBm)
Power Class 3	LTE – Band 41/38 (5)	2498.5 – 2687.5	4M52G7D	QPSK	0.116	20.63
			4M51W7D	16QAM	0.094	19.74
			4M52W7D	64QAM	0.073	18.66
			4M49W7D	256QAM	0.036	15.62
	LTE – Band 41/38 (10)	2501.0 – 2685.0	8M99G7D	QPSK	0.114	20.57
			9M00W7D	16QAM	0.092	19.66
			9M03W7D	64QAM	0.072	18.60
			9M01W7D	256QAM	0.036	15.54
	LTE – Band 41/38 (15)	2503.5 – 2682.5	13M5G7D	QPSK	0.115	20.59
			13M5W7D	16QAM	0.098	19.92
			13M5W7D	64QAM	0.077	18.86
			13M5W7D	256QAM	0.038	15.81
	LTE – Band 41/38 (20)	2506.0 – 2680.0	18M0G7D	QPSK	0.119	20.77
			18M0W7D	16QAM	0.101	20.04
			18M0W7D	64QAM	0.078	18.92
			17M9W7D	256QAM	0.039	15.89

Sub 2 ANT

	Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
					Max. Power (W)	Max. Power (dBm)
Power Class 3	LTE – Band 41/38 (5)	2498.5 – 2687.5	4M51G7D	QPSK	0.232	23.65
			4M51W7D	16QAM	0.191	22.80
			4M52W7D	64QAM	0.151	21.79
			4M50W7D	256QAM	0.074	18.72
	LTE – Band 41/38 (10)	2501.0 – 2685.0	8M99G7D	QPSK	0.238	23.76
			8M98W7D	16QAM	0.191	22.81
			9M00W7D	64QAM	0.150	21.76
			9M01W7D	256QAM	0.074	18.71
	LTE – Band 41/38 (15)	2503.5 – 2682.5	13M5G7D	QPSK	0.230	23.61
			13M5W7D	16QAM	0.192	22.84
			13M5W7D	64QAM	0.152	21.82
			13M4W7D	256QAM	0.075	18.73
	LTE – Band 41/38 (20)	2506.0 – 2680.0	17M9G7D	QPSK	0.239	23.78
			17M9W7D	16QAM	0.193	22.86
			17M9W7D	64QAM	0.153	21.84
			17M9W7D	256QAM	0.074	18.70

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6, mmWave. It also supports IEEE 802.11 a/b/g/n/ac/ax/be (20/40/80/160/320 MHz), Bluetooth(iPA, ePA), BT LE(iPA, ePA), NFC, WPT, WIFI 6E.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

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

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 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 according to ANSI/TIA-603-E-2016.

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. Span = 1.5 times the OBW
4. No. of sweep points $> 2 \times$ span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10th harmonics from 9 kHz.

Test Note

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated. The spurious emissions is calculated by the following formula;

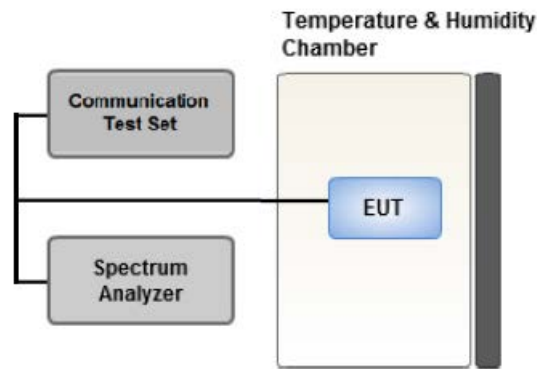
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② Alternate Procedure for PAPR

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

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

Test Settings(Peak Power)

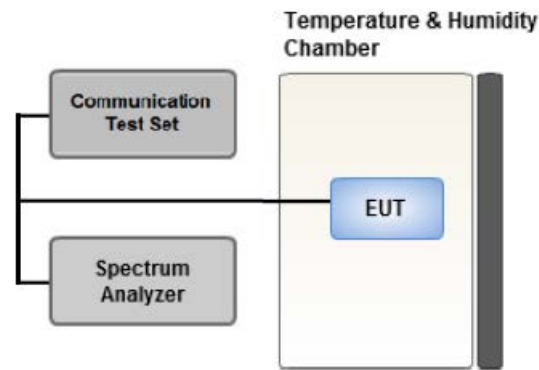
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

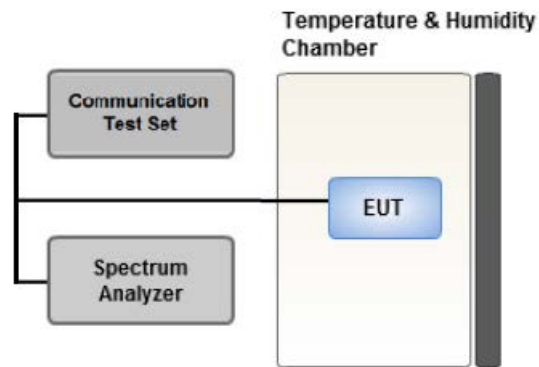
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW $\geq 3 \times$ 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.

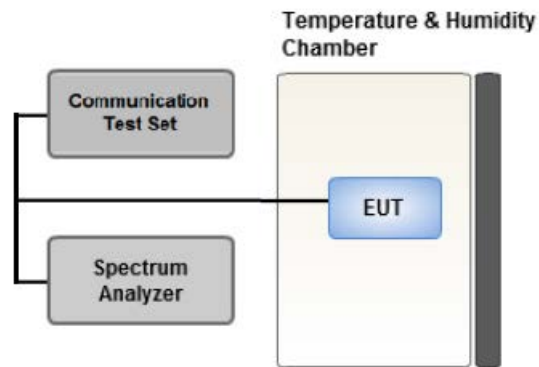
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep $\geq$ 2 x Span / RBW

3.7 CHANNEL 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

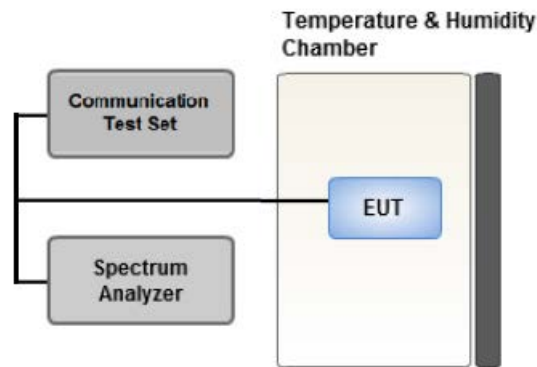
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Within 1 MHz of the channel edge the RBW should be 2 % of EBW, then 1 MHz after that.
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

1. The attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. $55 + 10 \log (P)$ dB at or below 2490.5 MHz.
6. X is the greater of 6 MHz or the actual emission bandwidth
7. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer

Where Margin < 1 dB the emission level is either corrected by $10 \log(1 \text{ MHz} / \text{RB})$ 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.
- 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.
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data
- LTE Band 41 (5 M/10 M/15 M/20 M) overlaps the entire frequency range of LTE Band 38(5 M/10 M/15 M/20 M) and they have the same Tune-up power.
Therefore, test data provided in this report covers Band38 as well as Band 41.
- Please refer to the table below.
- SM-S931U & additional models were tested and the worst case results are reported.
(Worst case : SM-S931U)

[Main 2 ANT Worst case]

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

[Sub 2 ANT Worst case]

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

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
 - LTE Band 41 (5 M/10 M/15 M/20 M) overlaps the entire frequency range of LTE Band 38(5 M/10 M/15 M/20 M) and they have the same Tune-up power.
- Therefore, test data provided in this report covers Band38 as well as Band 41.
- SM-S931U & additional models were tested and the worst case results are reported.
- (Worst case : SM-S931U)

[Worst case]

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

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.,	F1L1	08/21/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.,	F1L2	08/21/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.,	F1L4	08/21/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.,	F1L7	08/21/2025	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	Annual
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/06/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/17/2024	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	12/11/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

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

5. MEASUREMENT UNCERTAINTY

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

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

Parameter	Expanded Uncertainty ($\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, $k=2$)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition: Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 27.53(m)(4)	■ $< 40 + 10\log_{10} (P[\text{Watts}])$ at Channel edges ■ $< 43 + 10\log_{10} (P[\text{Watts}])$ between 5 and X MHz from Channel edges ■ $< 55 + 10\log_{10} (P[\text{Watts}])$ beyond X MHz beyond from Channel edges ■ $< 43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz	PASS
Conducted Output Power	§ 2.1046	N/A	<u>See Note1</u>
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

6.2 Test Condition: Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§ 27.50(h)(2)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 27.53(m)(4)	$< 55 + 10\log_{10} (P[\text{Watts}])$	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

7.2 EIRP Sample Calculation

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

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

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

8. TEST DATA(Main 2 ANT)

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2498.5	LTE B41(38)/ 5 MHz	QPSK	-24.54	12.43	10.70	2.50	H	< 2.00	0.116	20.63	1	0
		16-QAM	-25.43	11.54	10.70	2.50	H		0.094	19.74		
		64-QAM	-26.51	10.46	10.70	2.50	H		0.073	18.66		
		256-QAM	-29.55	7.42	10.70	2.50	H		0.036	15.62		
QPSK		-24.46	12.38	10.53	2.57	H	0.108		20.34	1	0	
16-QAM		-25.39	11.45	10.53	2.57	H	0.087		19.41			
64-QAM		-26.48	10.36	10.53	2.57	H	0.068		18.32			
256-QAM		-29.49	7.35	10.53	2.57	H	0.034		15.31			
2593.0		QPSK	-25.00	12.43	10.61	2.55	H		0.112	20.49	1	0
		16-QAM	-25.80	11.63	10.61	2.55	H		0.093	19.69		
		64-QAM	-26.88	10.55	10.61	2.55	H		0.073	18.61		
		256-QAM	-30.05	7.38	10.61	2.55	H		0.035	15.44		
2687.5		QPSK	-26.87	11.06	10.78	2.60	V		0.084	19.24	1	0
		16-QAM	-27.77	10.16	10.78	2.60	V		0.068	18.34		
		64-QAM	-28.86	9.07	10.78	2.60	V		0.053	17.25		
		256-QAM	-31.93	6.00	10.78	2.60	V		0.026	14.18		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2501.0	LTE B41(38)/ 10 MHz	QPSK	-24.60	12.37	10.70	2.50	H	< 2.00	0.114	20.57	1	0
		16-QAM	-25.60	11.37	10.70	2.50	H		0.091	19.57		
		64-QAM	-26.57	10.40	10.70	2.50	H		0.072	18.60		
		256-QAM	-29.63	7.34	10.70	2.50	H		0.036	15.54		
2505.0		QPSK	-24.53	12.33	10.55	2.57	H		0.107	20.31	1	0
		16-QAM	-25.44	11.42	10.55	2.57	H		0.087	19.40		
		64-QAM	-26.48	10.38	10.55	2.57	H		0.069	18.36		
		256-QAM	-29.54	7.32	10.55	2.57	H		0.034	15.30		
2593.0		QPSK	-25.00	12.43	10.61	2.55	H		0.112	20.49	1	0
		16-QAM	-25.83	11.60	10.61	2.55	H		0.092	19.66		
		64-QAM	-30.88	6.55	10.61	2.55	H		0.029	14.61		
		256-QAM	-29.95	7.48	10.61	2.55	H		0.036	15.54		
2685.0		QPSK	-26.61	11.35	10.77	2.61	V		0.089	19.51	1	0
		16-QAM	-27.61	10.35	10.77	2.61	V		0.071	18.51		
		64-QAM	-28.58	9.38	10.77	2.61	V		0.057	17.54		
		256-QAM	-31.64	6.32	10.77	2.61	V		0.028	14.48		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2503.5	LTE B41(38)/ 15 MHz	QPSK	-24.62	12.40	10.70	2.51	H	< 2.00	0.115	20.59	1	0
		16-QAM	-25.62	11.40	10.70	2.51	H		0.091	19.59		
		64-QAM	-26.59	10.43	10.70	2.51	H		0.073	18.62		
		256-QAM	-29.67	7.35	10.70	2.51	H		0.036	15.54		
2507.5		QPSK	-24.55	12.33	10.57	2.57	H		0.108	20.33	1	0
		16-QAM	-25.40	11.48	10.57	2.57	H		0.089	19.48		
		64-QAM	-26.43	10.45	10.57	2.57	H		0.070	18.45		
		256-QAM	-29.54	7.33	10.57	2.57	H		0.034	15.34		
2593.0		QPSK	-24.91	12.52	10.61	2.55	H		0.114	20.58	1	0
		16-QAM	-25.57	11.86	10.61	2.55	H		0.098	19.92		
		64-QAM	-26.63	10.80	10.61	2.55	H		0.077	18.86		
		256-QAM	-29.68	7.75	10.61	2.55	H		0.038	15.81		
2682.5		QPSK	-26.17	11.79	10.77	2.61	V		0.099	19.95	1	0
		16-QAM	-27.04	10.92	10.77	2.61	V		0.081	19.08		
		64-QAM	-28.10	9.86	10.77	2.61	V		0.063	18.02		
		256-QAM	-31.17	6.79	10.77	2.61	V		0.031	14.95		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2506.0	LTE B41(38)/ 20 MHz	QPSK	-24.75	12.27	10.70	2.51	H	< 2.00	0.111	20.46	1	0
		16-QAM	-25.63	11.39	10.70	2.51	H		0.091	19.58		
		64-QAM	-26.56	10.46	10.70	2.51	H		0.073	18.65		
		256-QAM	-29.74	7.28	10.70	2.51	H		0.035	15.47		
2510.0		QPSK	-24.40	12.49	10.59	2.57	H		0.112	20.51	1	0
		16-QAM	-25.43	11.46	10.59	2.57	H		0.089	19.48		
		64-QAM	-26.44	10.45	10.59	2.57	H		0.070	18.47		
		256-QAM	-29.57	7.32	10.59	2.57	H		0.034	15.34		
2593.0		QPSK	-24.72	12.71	10.61	2.55	H		0.119	20.77	1	0
		16-QAM	-25.45	11.98	10.61	2.55	H		0.101	20.04		
		64-QAM	-26.57	10.86	10.61	2.55	H		0.078	18.92		
		256-QAM	-29.60	7.83	10.61	2.55	H		0.039	15.89		
2680.0		QPSK	-26.36	11.62	10.76	2.61	V		0.095	19.77	1	0
		16-QAM	-27.11	10.87	10.76	2.61	V		0.080	19.02		
		64-QAM	-28.21	9.77	10.76	2.61	V		0.062	17.92		
		256-QAM	-31.26	6.72	10.76	2.61	V		0.031	14.87		

8.2 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENCY :	<u>2593.0 MHz</u>
▣ MEASURED OUTPUT POWER:	<u>20.63 dBm = 0.116 W</u>
▣ MODE:	<u>LTE B41(38)</u>
▣ MODULATION SIGNAL:	<u>5 MHz QPSK</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT: $55 + 10 \log_{10} (W) =$	<u>- 25 dBm</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39675 (2498.5)	4 997.00	-49.79	12.61	-67.77	3.70	V	-58.86	1	0
	7 495.50	-51.81	10.80	-59.93	4.61	V	-53.74		
	9 994.00	-51.93	11.19	-55.92	5.47	V	-50.20		
39715 (2502.5)	5 005.00	-50.65	12.56	-67.90	3.85	V	-59.19	1	0
	7 507.50	-51.48	10.78	-60.03	4.71	V	-53.96		
	10 010.00	-50.47	11.23	-54.47	5.52	V	-48.76		
40620 (2593.0)	5 186.00	-51.09	12.44	-69.90	3.80	V	-61.26	1	0
	7 779.00	-49.19	11.40	-57.03	4.70	V	-50.33		
	10 372.00	-51.00	11.40	-54.92	5.55	V	-49.07		
41565 (2687.5)	5 375.00	-51.03	13.00	-69.42	3.91	V	-60.33	1	0
	8 062.50	-50.97	10.80	-57.61	4.82	V	-51.63		
	10 750.00	-50.70	11.20	-54.72	5.64	V	-49.16		

▣ OPERATING FREQUENCY :	<u>2593.0 MHz</u>
▣ MEASURED OUTPUT POWER:	<u>20.57 dBm = 0.114W</u>
▣ MODE:	<u>LTE B41(38)</u>
▣ MODULATION SIGNAL:	<u>10 MHz QPSK</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT: $55 + 10 \log_{10}(W) =$	<u>- 25 dBm</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39700 (2501.0)	5 002.00	-51.06	12.60	-68.71	3.71	V	-59.82	1	0
	7 503.00	-51.91	10.81	-60.45	4.60	V	-54.24		
	10 004.00	-50.59	11.21	-54.53	5.47	V	-48.79		
39740 (2505.0)	5 010.00	-51.09	12.55	-68.08	3.88	V	-59.41	1	0
	7 515.00	-50.98	10.80	-59.53	4.71	V	-53.44		
	10 020.00	-51.58	11.27	-56.19	5.54	V	-50.46		
40620 (2593.0)	5 186.00	-52.10	12.44	-70.91	3.80	V	-62.27	1	0
	7 779.00	-49.19	11.40	-57.03	4.70	V	-50.33		
	10 372.00	-51.39	11.40	-55.31	5.55	V	-49.46		
41540 (2685.0)	5 370.00	-51.39	13.00	-69.68	3.92	V	-60.60	1	0
	8 055.00	-50.87	10.80	-57.45	4.81	V	-51.46		
	10 740.00	-50.62	11.22	-54.46	5.64	V	-48.88		

■ OPERATING FREQUENCY : 2593.0 MHz
 ■ MEASURED OUTPUT POWER: 20.59 dBm = 0.115 W
 ■ MODE: LTE B41(38)
 ■ MODULATION SIGNAL: 15 MHz QPSK
 ■ DISTANCE: 1 meters
 ■ LIMIT: $55 + 10 \log_{10}(W) =$ - 25 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39765 (2507.5)	5 015.00	-50.58	12.54	-67.32	3.90	V	-58.68	1	0
	7 522.50	-50.23	10.82	-58.77	4.71	V	-52.66		
	10 030.00	-50.76	11.31	-56.08	5.53	V	-50.30		
39725 (2503.5)	5 007.00	-51.94	12.59	-69.36	3.71	V	-60.48	1	0
	7 510.50	-51.83	10.82	-60.53	4.60	V	-54.31		
	10 014.00	-51.80	11.23	-56.14	5.47	V	-50.38		
40620 (2593.0)	5 186.00	-51.63	12.44	-70.44	3.80	V	-61.80	1	0
	7 779.00	-50.61	11.40	-58.45	4.70	V	-51.75		
	10 372.00	-51.35	11.40	-55.27	5.55	V	-49.42		
41515 (2682.5)	5 365.00	-52.38	13.00	-70.57	3.91	V	-61.48	1	0
	8 047.50	-51.22	10.80	-57.77	4.81	V	-51.78		
	10 730.00	-49.32	11.24	-52.92	5.65	V	-47.33		

■ OPERATING FREQUENCY : 2593.0 MHz
 ■ MEASURED OUTPUT POWER: 20.77 dBm = 0.119 W
 ■ MODE: LTE B41(38)
 ■ MODULATION SIGNAL: 20 MHz QPSK
 ■ DISTANCE: 1 meters
 ■ LIMIT: $55 + 10 \log_{10}(W) =$ - 25 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39750 (2506.0)	5 012.00	-51.84	12.58	-69.02	3.72	V	-60.16	1	0
	7 518.00	-51.92	10.84	-60.58	4.61	H	-54.35		
	10 024.00	-51.64	11.25	-56.63	5.47	H	-50.85		
39790 (2510.0)	5 020.00	-51.06	12.52	-67.55	3.91	V	-58.94	1	0
	7 530.00	-49.63	10.85	-57.90	4.72	V	-51.77		
	10 040.00	-48.68	11.34	-54.48	5.51	V	-48.65		
40620 (2593.0)	5 186.00	-50.57	12.44	-69.38	3.80	H	-60.74	1	0
	7 779.00	-50.14	11.40	-57.98	4.70	V	-51.28		
	10 372.00	-51.33	11.40	-55.25	5.55	H	-49.40		
41490 (2680.0)	5 360.00	-50.82	13.00	-68.90	3.90	V	-59.80	1	0
	8 040.00	-51.04	10.82	-57.55	4.80	H	-51.53		
	10 720.00	-51.48	11.26	-54.96	5.64	H	-49.34		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
41	5 MHz	2593.0	QPSK	25	0	5.04
			16-QAM			6.39
			64-QAM			6.71
			256-QAM			6.83
	10 MHz		QPSK	50		4.99
			16-QAM			6.23
			64-QAM			6.93
			256-QAM			6.81
	15 MHz		QPSK	75		4.93
			16-QAM			6.13
			64-QAM			6.85
			256-QAM			6.79
	20 MHz		QPSK	100		4.94
			16-QAM			6.00
			64-QAM			6.58
			256-QAM			6.78

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 84 ~ 99.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
41	5 MHz	2593.0	QPSK	25	0	4.5244
			16-QAM			4.5123
			64-QAM			4.5244
			256-QAM			4.4938
	10 MHz		QPSK	50		8.9895
			16-QAM			8.9996
			64-QAM			9.0254
			256-QAM			9.0066
	15 MHz		QPSK	75		13.459
			16-QAM			13.483
			64-QAM			13.502
			256-QAM			13.470
	20 MHz		QPSK	100		17.947
			16-QAM			17.970
			64-QAM			18.026
			256-QAM			17.907

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 100 ~ 115.

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)
41	5	2502.5	26.1211	34.110	-76.907	-42.797	-25.00
		2498.5	26.1521	34.110	-76.960	-42.850	
		2593.0	26.1772	34.110	-77.054	-42.944	
		2687.5	26.1381	34.110	-77.055	-42.945	
	10	2505.0	26.1453	34.110	-76.590	-42.480	
		2501.0	26.1398	34.110	-76.969	-42.859	
		2593.0	26.0828	34.110	-77.024	-42.914	
		2685.0	26.1156	34.110	-77.047	-42.937	
	15	2507.5	26.1245	34.110	-76.747	-42.637	
		2503.5	25.7968	34.110	-76.732	-42.622	
		2593.0	25.8639	34.110	-76.910	-42.800	
		2682.5	26.1462	34.110	-76.694	-42.584	
	20	2510.0	25.7466	34.110	-76.947	-42.837	
		2506.0	26.1419	34.110	-77.031	-42.921	
		2593.0	26.1453	34.110	-76.542	-42.432	
		2680.0	26.4058	34.110	-76.795	-42.685	

Note:

- Plots of the EUT's Conducted Spurious Emissions are shown Page 116 ~ 147.
- Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
- Duty Cycle factor already applied on the factor.
 - Duty Cycle factor(dB) = 3.979
 - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
 - Result(dBm) = Reading + Factor

Frequency Range (GHz)	Factor [dB]
0.03 – 1	29.249
1 – 5	31.955
5 – 10	32.570
10 – 15	33.095
15 – 20	33.468
Above 20	34.110

8.6 CHANNEL EDGE

Band Width	Frequency (MHz)	Modulation	RB (Size/Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1 MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
5 MHz	2502.5	QPSK	25/0	-23.01	-22.97	-30.60	-24.60	-43.35	-36.00	-38.85
10 MHz	2505.0	QPSK	50/0	-24.92	-26.77	-29.47	-26.23	-40.05	-32.22	-40.38
15 MHz	2507.5	QPSK	75/0	-26.82	-28.53	-30.75	-27.71	-35.15	-33.30	-42.32
20 MHz	2510.0	QPSK	100/0	-27.67	-29.47	-31.45	-28.75	-35.28	-34.08	-43.49
Limit(dBm)				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	RB (Size/Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1 MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
5 MHz	2498.5	QPSK	25/0	-23.30	-22.75	-24.48	-26.44	-37.10	-36.41	-38.77
10 MHz	2501.0	QPSK	50/0	-26.34	-26.60	-24.83	-26.27	-30.82	-32.28	-40.52
15 MHz	2503.5	QPSK	75/0	-27.55	-28.51	-26.50	-27.70	-31.84	-33.36	-42.23
20 MHz	2506.0	QPSK	100/0	-28.67	-29.27	-27.59	-28.83	-32.71	-34.10	-43.38
Limit(dBm)				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	C.E ~ (C.E ± 1 MHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-23.84	-23.27	-25.45	-27.00
	2687.5	QPSK	25	0	-22.40	-23.06	-20.22	-22.60
10 MHz	2593.0	QPSK	50	0	-27.14	-27.23	-26.62	-28.18
	2685.0	QPSK	50	0	-24.99	-25.92	-21.62	-23.52
15 MHz	2593.0	QPSK	75	0	-28.67	-29.15	-28.19	-29.40
	2682.5	QPSK	75	0	-25.77	-27.25	-23.12	-25.41
20 MHz	2593.0	QPSK	100	0	-29.53	-29.83	-28.80	-29.50
	2680.0	QPSK	100	0	-25.21	-27.64	-23.64	-26.11
Limit(dBm)					-10.0		-10.0	

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	(C.E ± 5 MHz) ~ (C.E ± X MHz)		Above (C.E ± X MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-37.88	-38.65	-38.98	-39.60
	2687.5	QPSK	25	0	-38.17	-40.53	-39.99	-41.17
10 MHz	2593.0	QPSK	50	0	-33.48	-35.82	-41.88	-42.44
	2685.0	QPSK	50	0	-27.40	-29.63	-43.22	-45.10
15 MHz	2593.0	QPSK	75	0	-34.08	-36.37	-44.17	-44.55
	2682.5	QPSK	75	0	-26.81	-29.87	-45.79	-47.46
20 MHz	2593.0	QPSK	100	0	-34.61	-36.54	-45.67	-45.57
	2680.0	QPSK	100	0	-27.58	-30.58	-46.77	-47.94
Limit(dBm)					-13.0		-25.0	

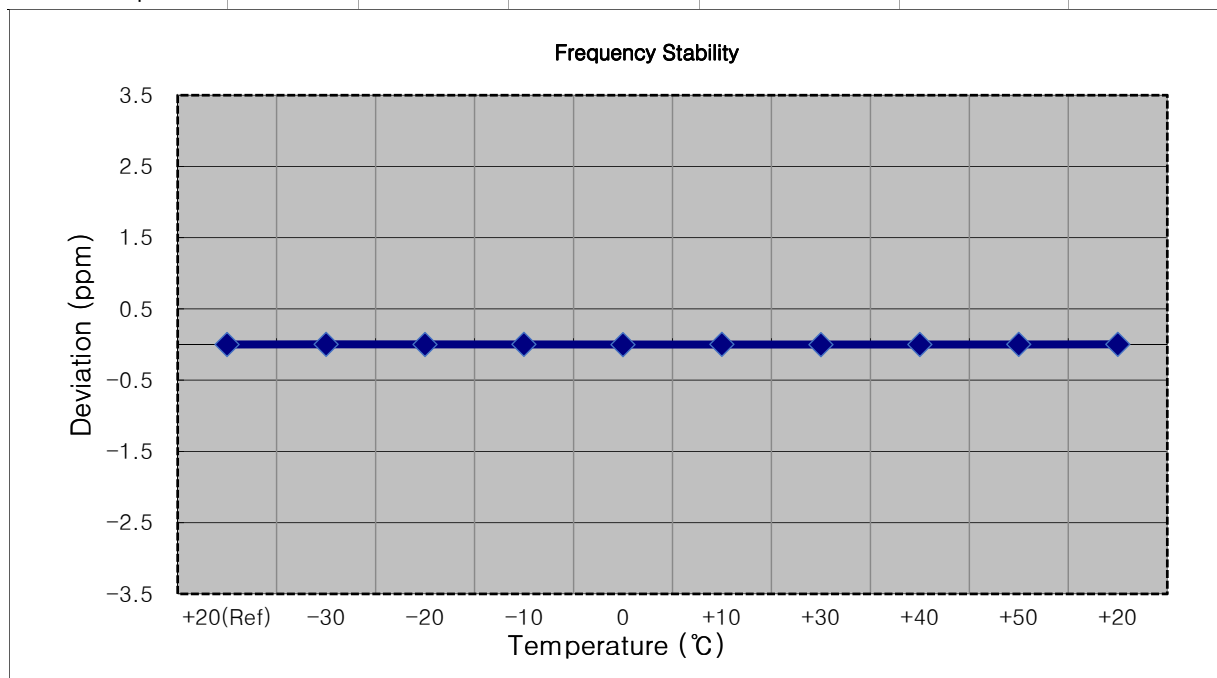
Note:

1. C.E = Channel Edge
2. X = X is the greater of 6 MHz or the actual emission bandwidth.
3. X = 6 MHz(5 MHz Bandwidth), 10 MHz(10 MHz Bandwidth), 15 MHz(15 MHz Bandwidth), 20 MHz(20 MHz Bandwidth)
4. RB = Resource Block
5. Duty Cycle factor already applied on the factor.
 - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
 - Result(dBm) = Reading + Factor
 - Duty Cycle Factor(dB) = 3.979
6. Plots of the EUT's Channel Edge are shown Page 148 ~ 191. (1RB & Full RB)

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

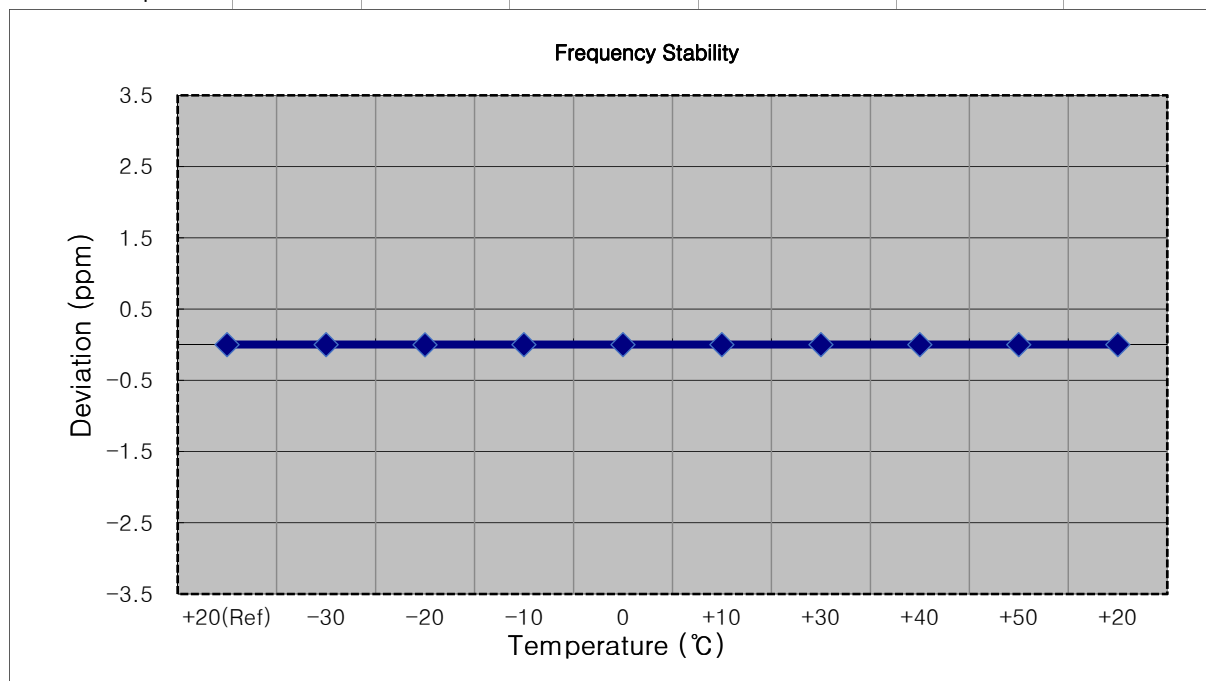
MODE:	<u>LTE 41</u>
OPERATING FREQUENCY:	<u>2502,500,000 Hz</u>
BANDWIDTH:	<u>39675 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.880 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2502 499 996	0.0	0.000 000	0.000
100 %		-30	2502 499 999	2.5	0.000 000	0.001
100 %		-20	2502 499 994	-2.3	0.000 000	-0.001
100 %		-10	2502 499 999	3.1	0.000 000	0.001
100 %		0	2502 499 991	-5.1	0.000 000	-0.002
100 %		+10	2502 499 999	3.4	0.000 000	0.001
100 %		+30	2502 499 992	-4.0	0.000 000	-0.002
100 %		+40	2502 499 994	-1.6	0.000 000	-0.001
100 %		+50	2502 500 000	3.7	0.000 000	0.001
Batt. Endpoint	3.300	+20	2502 499 998	1.8	0.000 000	0.001



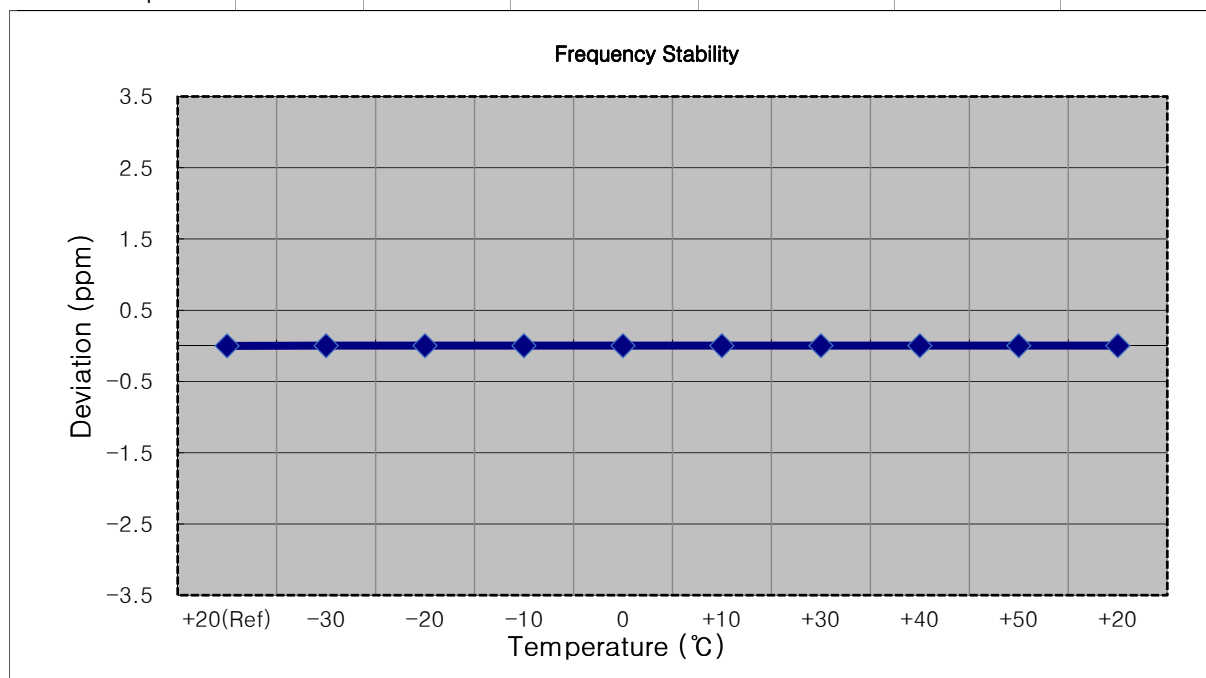
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2505,000,000 Hz
- ▣ BANDWIDTH: 39700 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2505 000 003	0.0	0.000 000	0.000
100 %		-30	2505 000 006	3.2	0.000 000	0.001
100 %		-20	2505 000 001	-2.6	0.000 000	-0.001
100 %		-10	2505 000 007	4.2	0.000 000	0.002
100 %		0	2505 000 008	4.3	0.000 000	0.002
100 %		+10	2505 000 007	3.9	0.000 000	0.002
100 %		+30	2505 000 006	2.9	0.000 000	0.001
100 %		+40	2505 000 006	3.1	0.000 000	0.001
100 %		+50	2505 000 008	4.8	0.000 000	0.002
Batt. Endpoint	3.300	+20	2505 000 008	4.9	0.000 000	0.002



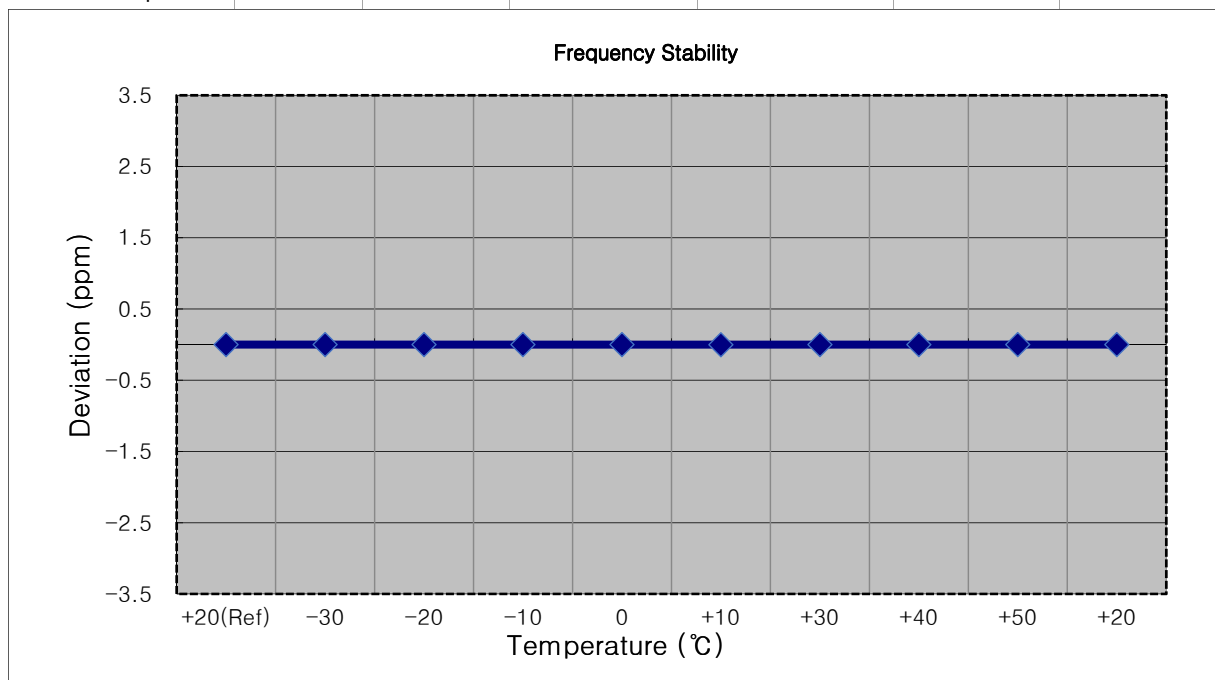
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2507,500,000 Hz
- ▣ BANDWIDTH: 39725 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2507 500 005	0.0	0.000 000	0.000
100 %		-30	2507 500 010	5.6	0.000 000	0.002
100 %		-20	2507 500 010	4.9	0.000 000	0.002
100 %		-10	2507 500 011	6.5	0.000 000	0.003
100 %		0	2507 500 008	3.6	0.000 000	0.001
100 %		+10	2507 500 008	3.4	0.000 000	0.001
100 %		+30	2507 500 008	3.6	0.000 000	0.001
100 %		+40	2507 500 009	4.7	0.000 000	0.002
100 %		+50	2507 500 010	5.2	0.000 000	0.002
Batt. Endpoint	3.300	+20	2507 500 009	3.9	0.000 000	0.002



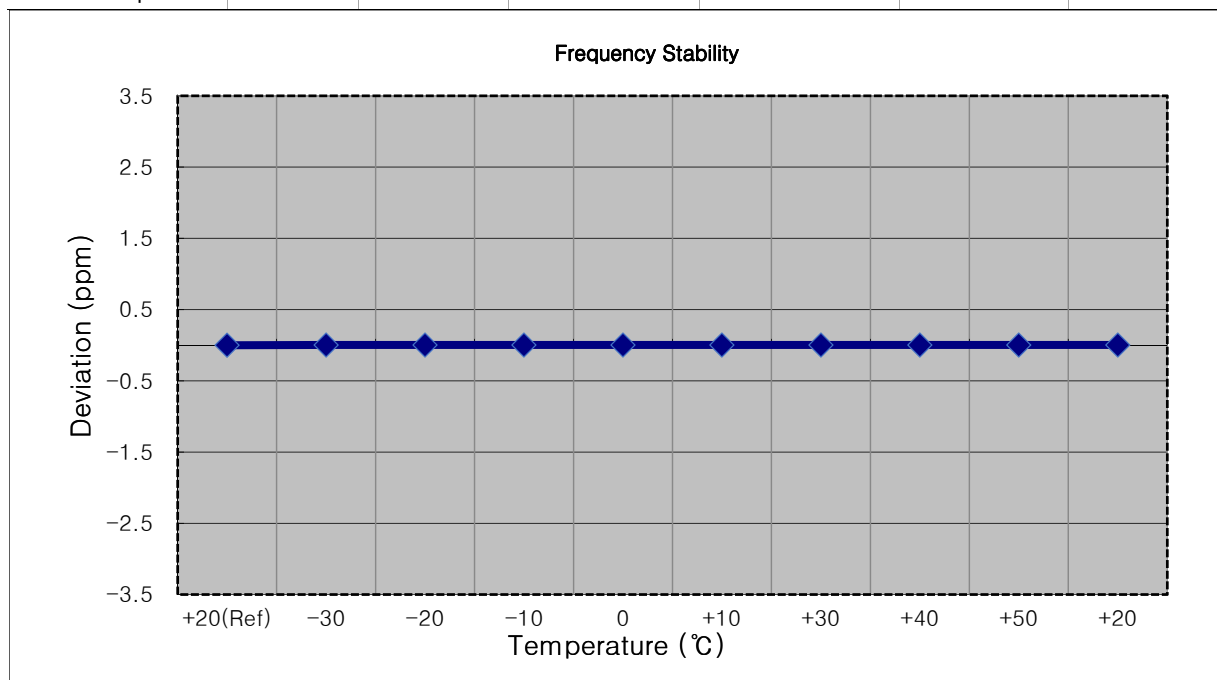
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2510,000,000 Hz
- ▣ BANDWIDTH: 39750 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2510 000 002	0.0	0.000 000	0.000
100 %		-30	2509 999 998	-3.9	0.000 000	-0.002
100 %		-20	2509 999 999	-3.2	0.000 000	-0.001
100 %		-10	2509 999 999	-2.4	0.000 000	-0.001
100 %		0	2510 000 000	-2.3	0.000 000	-0.001
100 %		+10	2509 999 997	-4.4	0.000 000	-0.002
100 %		+30	2509 999 998	-3.9	0.000 000	-0.002
100 %		+40	2509 999 998	-4.2	0.000 000	-0.002
100 %		+50	2509 999 998	-3.9	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2510 000 000	-2.0	0.000 000	-0.001



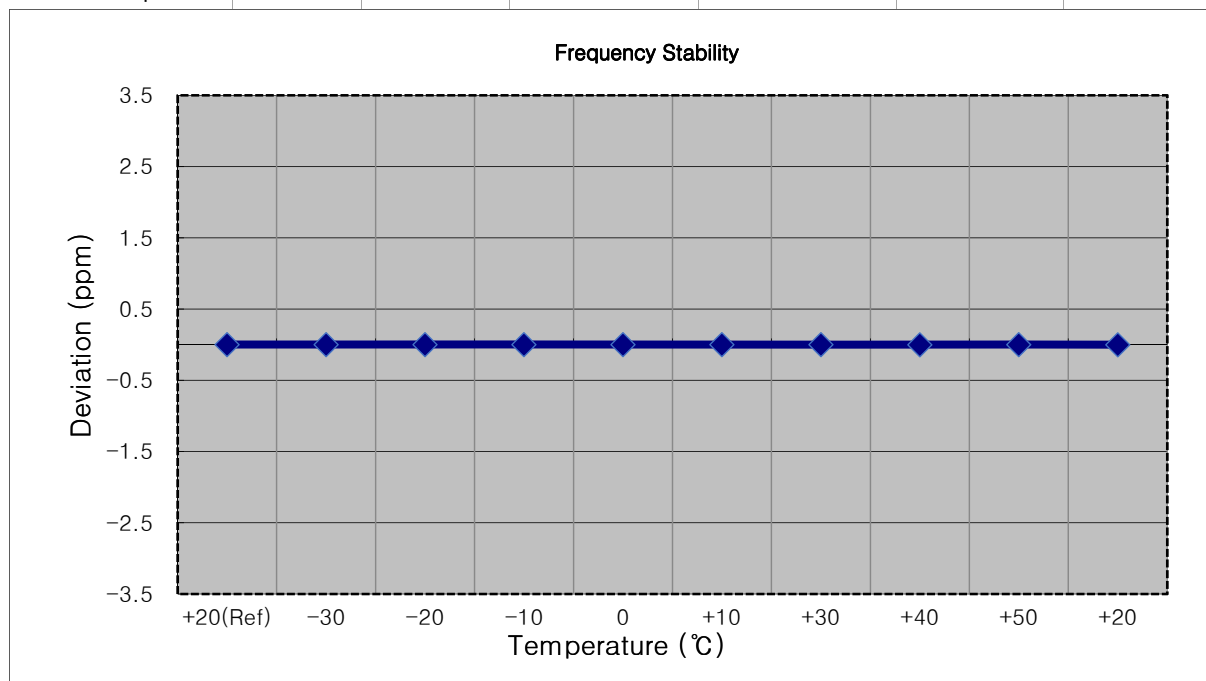
■ MODE: LTE 41
 ■ OPERATING FREQUENCY: 2498,500,000 Hz
 ■ BANDWIDTH: 39675 (5 MHz)
 ■ REFERENCE VOLTAGE: 3.880 VDC
 ■ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2498 500 005	0.0	0.000 000	0.000
100 %		-30	2498 500 011	5.4	0.000 000	0.002
100 %		-20	2498 500 013	7.9	0.000 000	0.003
100 %		-10	2498 500 012	6.5	0.000 000	0.003
100 %		0	2498 500 010	4.5	0.000 000	0.002
100 %		+10	2498 500 010	4.7	0.000 000	0.002
100 %		+30	2498 500 012	7.1	0.000 000	0.003
100 %		+40	2498 500 010	5.1	0.000 000	0.002
100 %		+50	2498 500 011	6.1	0.000 000	0.002
Batt. Endpoint	3.300	+20	2498 500 009	4.0	0.000 000	0.002



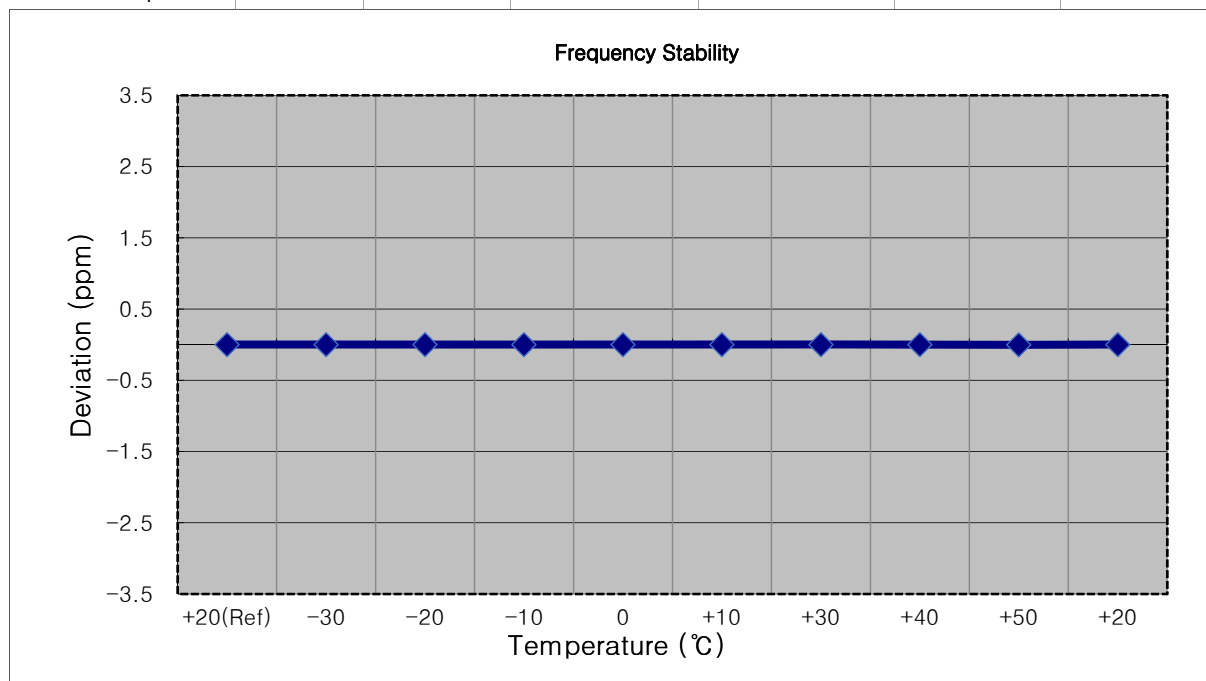
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2501,000,000 Hz
- ▣ BANDWIDTH: 39700 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2500 999 998	0.0	0.000 000	0.000
100 %		-30	2501 000 000	2.3	0.000 000	0.001
100 %		-20	2501 000 000	2.5	0.000 000	0.001
100 %		-10	2501 000 000	2.1	0.000 000	0.001
100 %		0	2501 000 000	2.3	0.000 000	0.001
100 %		+10	2501 000 000	2.5	0.000 000	0.001
100 %		+30	2501 000 000	2.4	0.000 000	0.001
100 %		+40	2500 999 994	-3.5	0.000 000	-0.001
100 %		+50	2501 000 001	3.2	0.000 000	0.001
Batt. Endpoint	3.300	+20	2500 999 994	-3.4	0.000 000	-0.001



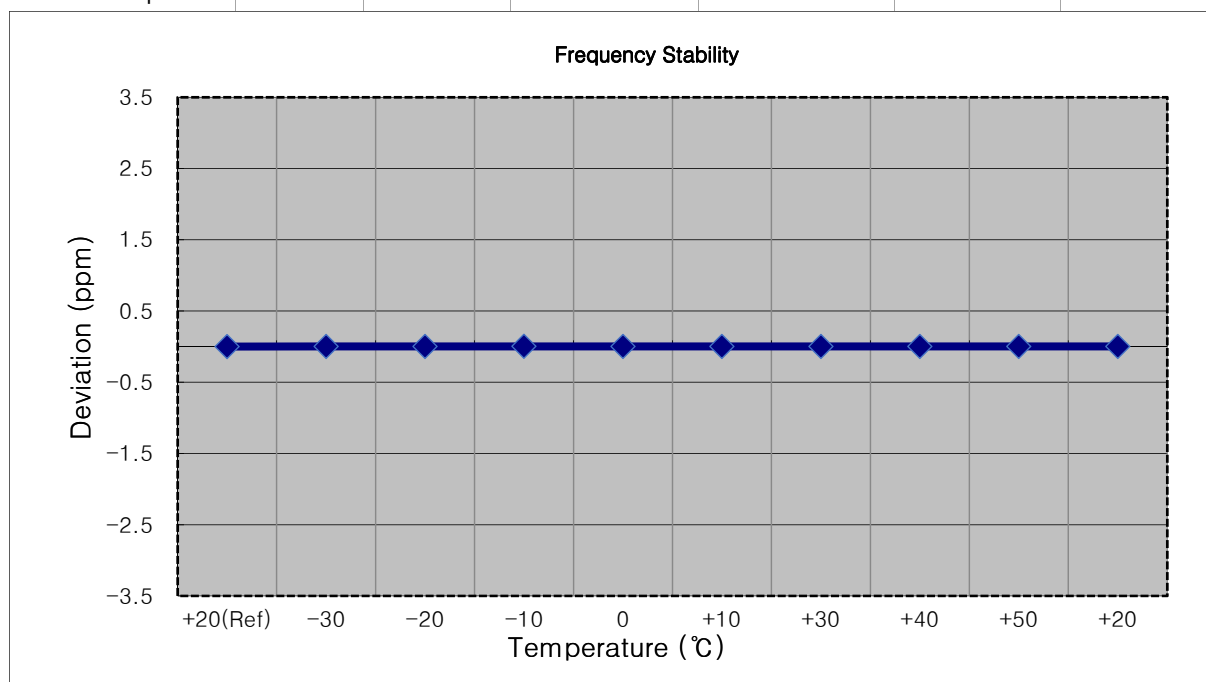
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2503,500,000 Hz
- ▣ BANDWIDTH: 39725 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2503 500 005	0.0	0.000 000	0.000
100 %		-30	2503 500 008	2.8	0.000 000	0.001
100 %		-20	2503 500 008	2.9	0.000 000	0.001
100 %		-10	2503 500 006	1.3	0.000 000	0.001
100 %		0	2503 500 007	1.8	0.000 000	0.001
100 %		+10	2503 500 008	2.8	0.000 000	0.001
100 %		+30	2503 500 009	4.3	0.000 000	0.002
100 %		+40	2503 500 008	3.1	0.000 000	0.001
100 %		+50	2503 500 001	-3.4	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2503 500 007	2.2	0.000 000	0.001



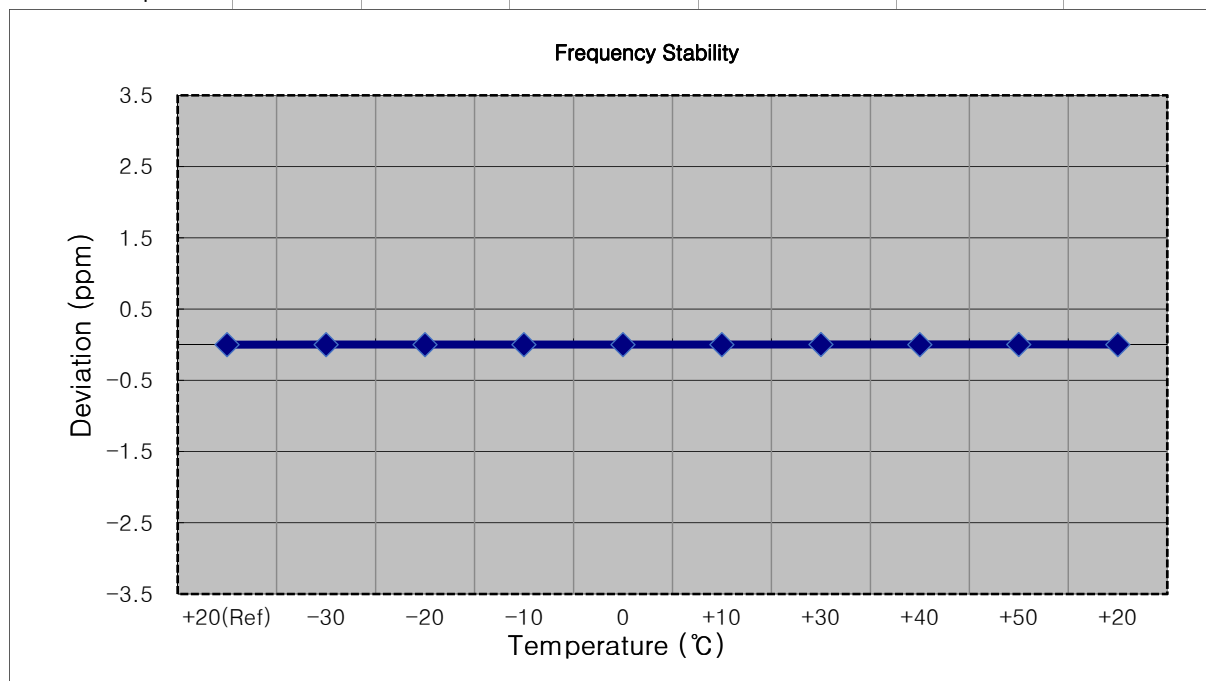
- ☐ MODE: LTE 41
☐ OPERATING FREQUENCY: 2506,000,000 Hz
☐ BANDWIDTH: 39750 (20 MHz)
☐ REFERENCE VOLTAGE: 3.880 VDC
☐ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2506 000 006	0.0	0.000 000	0.000
100 %		-30	2506 000 009	2.7	0.000 000	0.001
100 %		-20	2506 000 009	2.6	0.000 000	0.001
100 %		-10	2506 000 014	7.5	0.000 000	0.003
100 %		0	2506 000 010	4.3	0.000 000	0.002
100 %		+10	2506 000 011	4.6	0.000 000	0.002
100 %		+30	2506 000 011	4.4	0.000 000	0.002
100 %		+40	2506 000 012	5.8	0.000 000	0.002
100 %		+50	2506 000 011	5.2	0.000 000	0.002
Batt. Endpoint	3.300	+20	2506 000 010	4.0	0.000 000	0.002



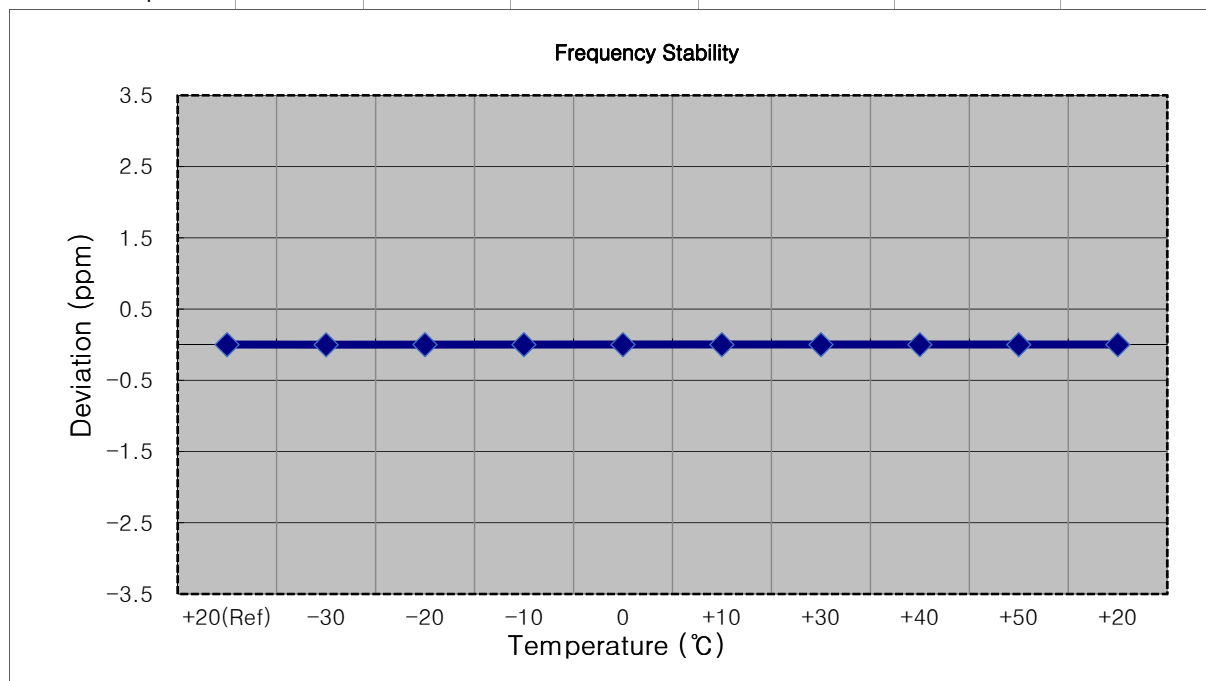
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2593 000 002	0.0	0.000 000	0.000
100 %		-30	2593 000 005	3.1	0.000 000	0.001
100 %		-20	2593 000 006	4.7	0.000 000	0.002
100 %		-10	2593 000 007	4.9	0.000 000	0.002
100 %		0	2593 000 005	3.0	0.000 000	0.001
100 %		+10	2593 000 006	4.6	0.000 000	0.002
100 %		+30	2593 000 009	6.8	0.000 000	0.003
100 %		+40	2593 000 006	3.9	0.000 000	0.002
100 %		+50	2593 000 008	5.8	0.000 000	0.002
Batt. Endpoint	3.300	+20	2593 000 004	2.7	0.000 000	0.001



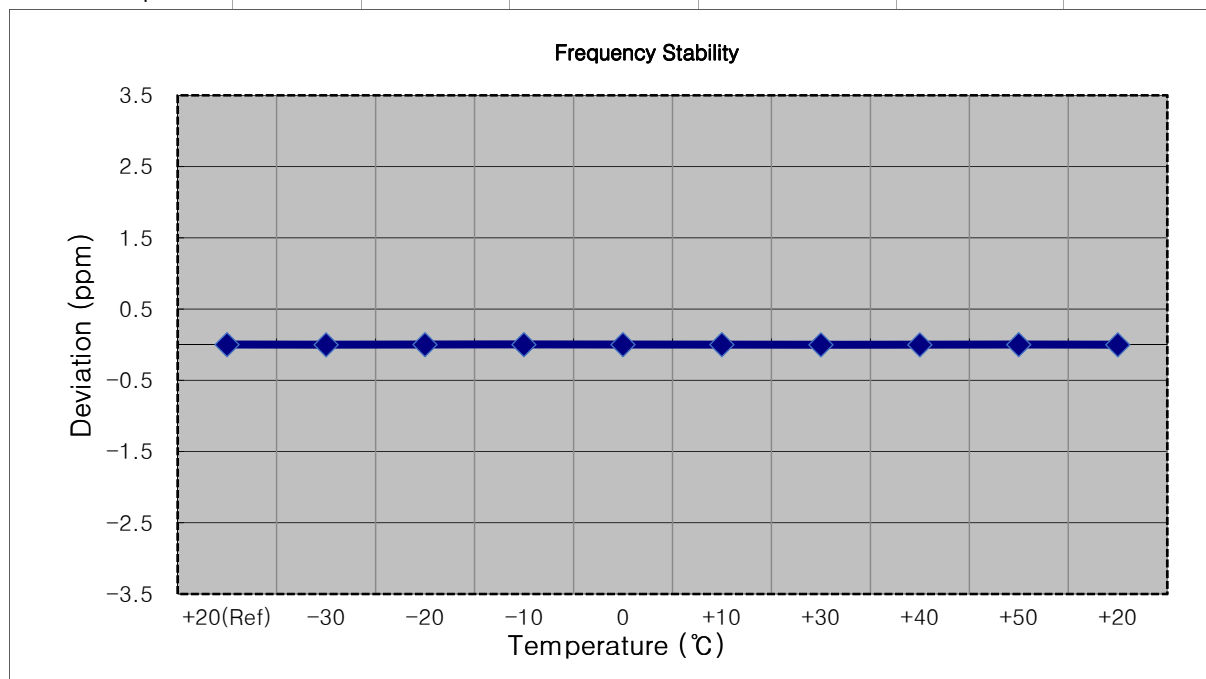
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2593 000 002	0.0	0.000 000	0.000
100 %		-30	2593 000 000	-2.4	0.000 000	-0.001
100 %		-20	2593 000 006	3.7	0.000 000	0.001
100 %		-10	2593 000 007	5.1	0.000 000	0.002
100 %		0	2593 000 004	1.7	0.000 000	0.001
100 %		+10	2593 000 004	1.6	0.000 000	0.001
100 %		+30	2593 000 004	1.8	0.000 000	0.001
100 %		+40	2593 000 005	2.8	0.000 000	0.001
100 %		+50	2593 000 007	4.4	0.000 000	0.002
Batt. Endpoint	3.300	+20	2593 000 006	3.2	0.000 000	0.001



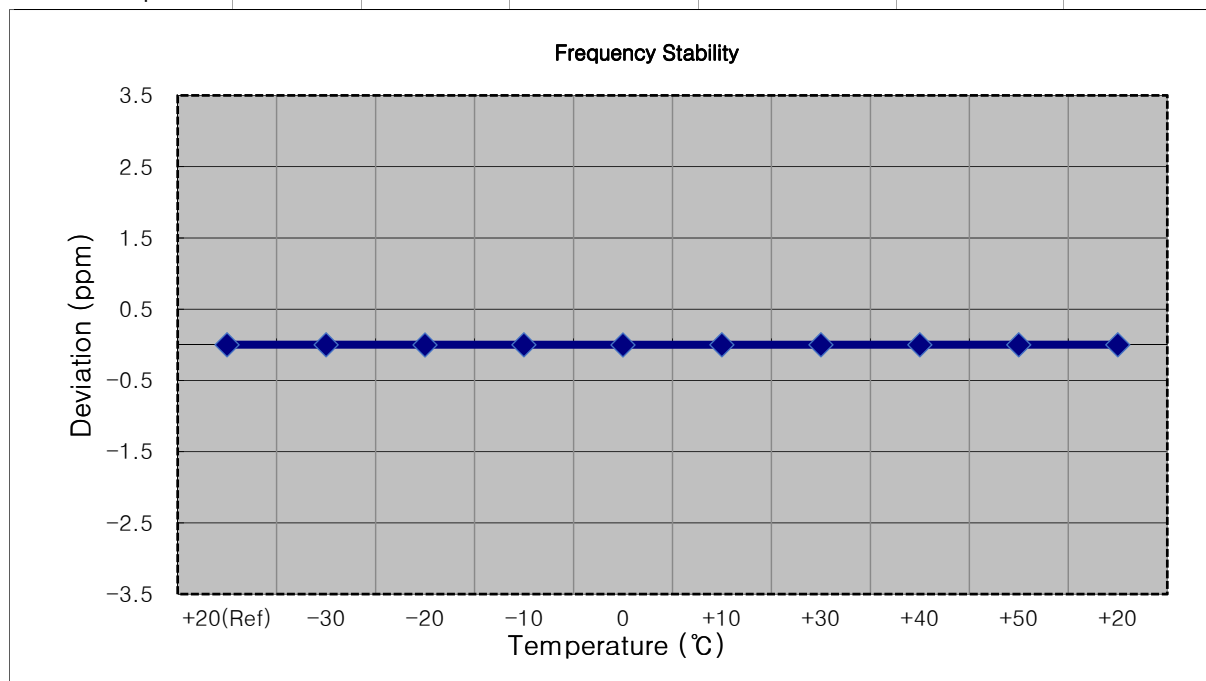
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2593 000 001	0.0	0.000 000	0.000
100 %		-30	2592 999 999	-2.1	0.000 000	-0.001
100 %		-20	2593 000 002	1.3	0.000 000	0.001
100 %		-10	2593 000 002	1.2	0.000 000	0.000
100 %		0	2593 000 003	2.1	0.000 000	0.001
100 %		+10	2593 000 004	2.5	0.000 000	0.001
100 %		+30	2592 999 999	-1.8	0.000 000	-0.001
100 %		+40	2592 999 997	-4.4	0.000 000	-0.002
100 %		+50	2593 000 004	3.2	0.000 000	0.001
Batt. Endpoint	3.300	+20	2592 999 999	-2.4	0.000 000	-0.001



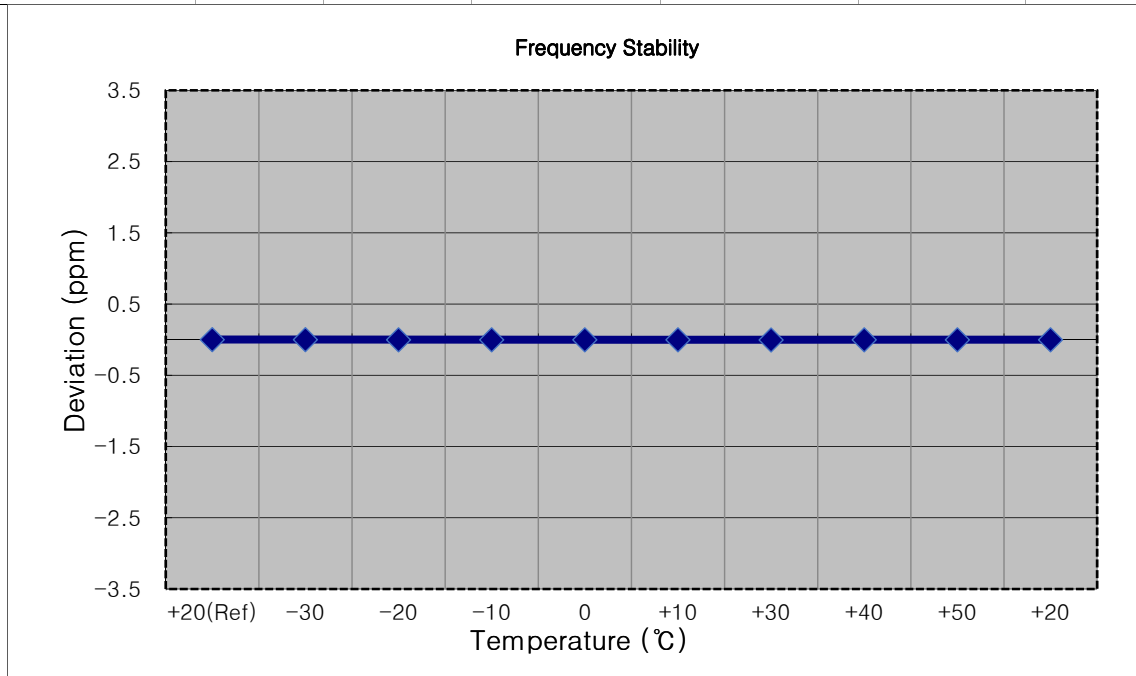
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2593 000 003	0.0	0.000 000	0.000
100 %		-30	2593 000 006	2.7	0.000 000	0.001
100 %		-20	2593 000 001	-2.3	0.000 000	-0.001
100 %		-10	2593 000 006	3.1	0.000 000	0.001
100 %		0	2593 000 002	-1.3	0.000 000	-0.001
100 %		+10	2593 000 005	2.0	0.000 000	0.001
100 %		+30	2593 000 006	3.0	0.000 000	0.001
100 %		+40	2593 000 007	3.7	0.000 000	0.001
100 %		+50	2593 000 006	2.4	0.000 000	0.001
Batt. Endpoint	3.300	+20	2593 000 006	2.8	0.000 000	0.001



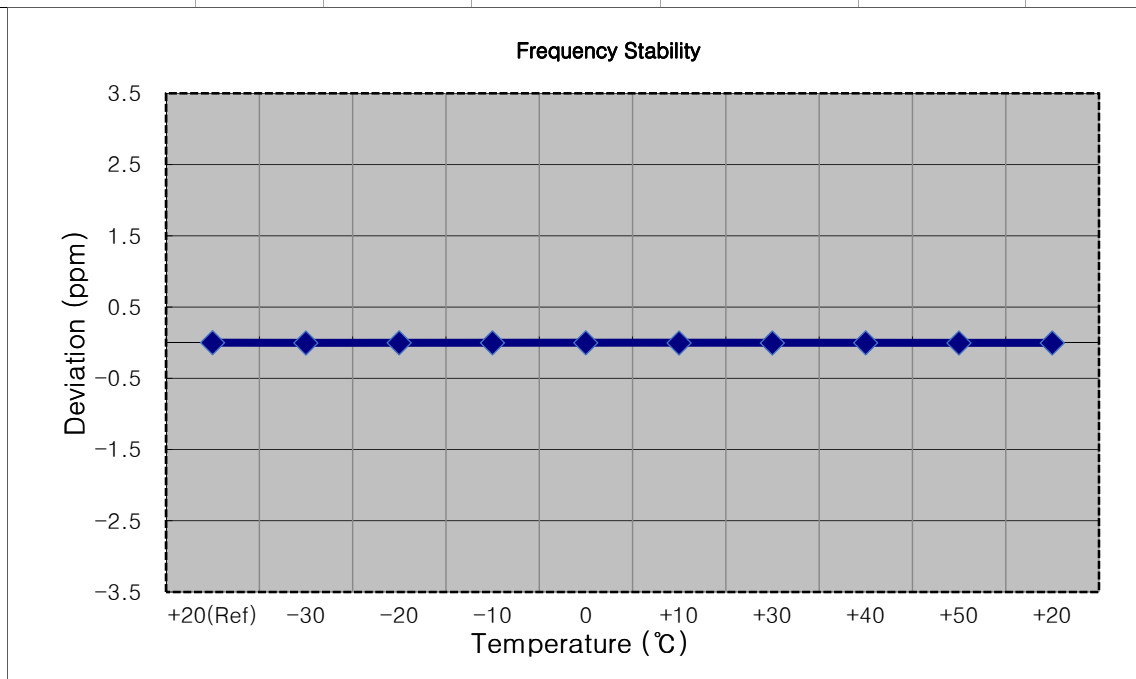
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2687,500,000 Hz
- ▣ BANDWIDTH: 41565 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2687 499 996	0.0	0.000 000	0.000
100 %		-30	2687 500 000	3.9	0.000 000	0.001
100 %		-20	2687 499 992	-4.4	0.000 000	-0.002
100 %		-10	2687 499 990	-5.8	0.000 000	-0.002
100 %		0	2687 499 993	-2.9	0.000 000	-0.001
100 %		+10	2687 499 993	-3.1	0.000 000	-0.001
100 %		+30	2687 499 988	-8.3	0.000 000	-0.003
100 %		+40	2687 499 993	-2.8	0.000 000	-0.001
100 %		+50	2687 499 991	-4.8	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2687 499 993	-3.5	0.000 000	-0.001



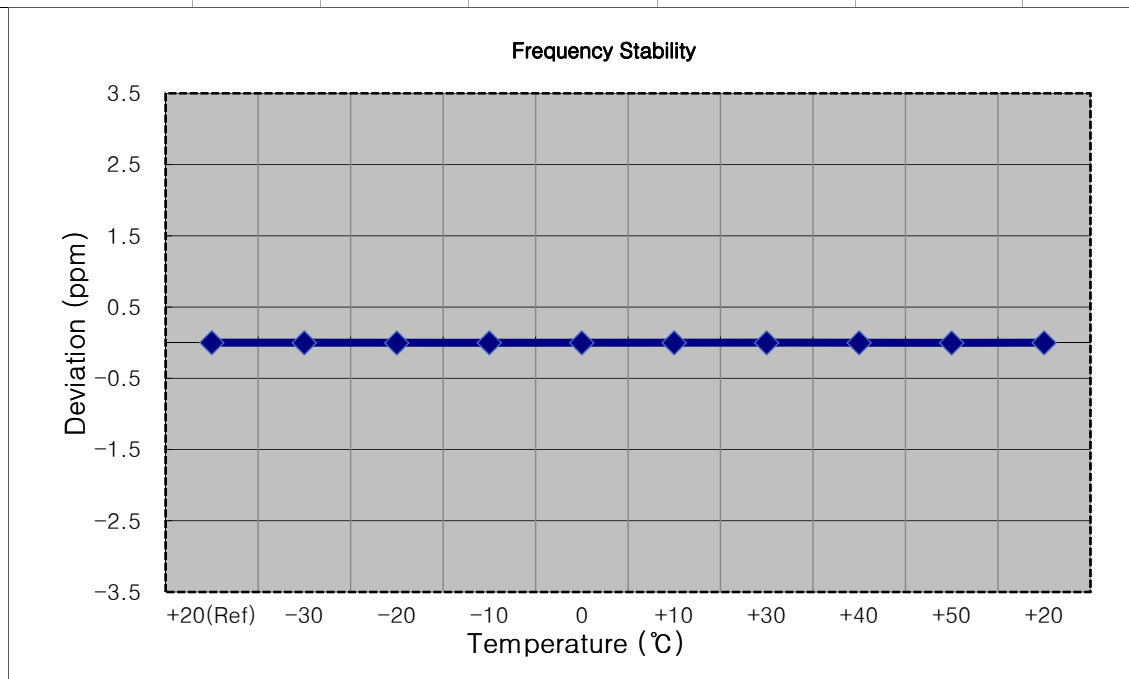
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2685,000,000 Hz
- ▣ BANDWIDTH: 41540 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2684 999 992	0.0	0.000 000	0.000
100 %		-30	2684 999 985	-6.4	0.000 000	-0.002
100 %		-20	2684 999 988	-3.2	0.000 000	-0.001
100 %		-10	2684 999 989	-3.0	0.000 000	-0.001
100 %		0	2684 999 986	-5.8	0.000 000	-0.002
100 %		+10	2684 999 985	-6.3	0.000 000	-0.002
100 %		+30	2684 999 984	-7.5	0.000 000	-0.003
100 %		+40	2684 999 987	-4.9	0.000 000	-0.002
100 %		+50	2684 999 983	-8.9	0.000 000	-0.003
Batt. Endpoint	3.300	+20	2684 999 984	-7.6	0.000 000	-0.003



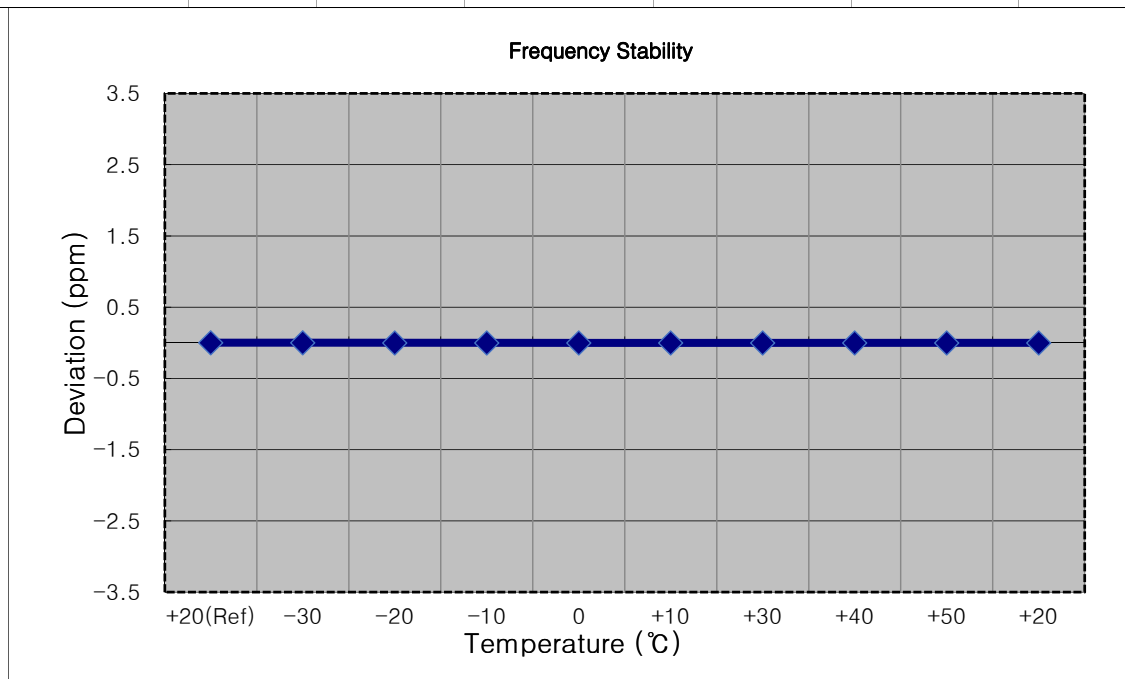
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2682,500,000 Hz
- ▣ BANDWIDTH: 41515 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2682 499 993	0.0	0.000 000	0.000
100 %		-30	2682 499 989	-4.0	0.000 000	-0.001
100 %		-20	2682 499 987	-6.4	0.000 000	-0.002
100 %		-10	2682 499 990	-3.6	0.000 000	-0.001
100 %		0	2682 499 989	-4.7	0.000 000	-0.002
100 %		+10	2682 499 988	-4.9	0.000 000	-0.002
100 %		+30	2682 499 988	-5.0	0.000 000	-0.002
100 %		+40	2682 499 988	-5.3	0.000 000	-0.002
100 %		+50	2682 499 986	-7.0	0.000 000	-0.003
Batt. Endpoint	3.300	+20	2682 499 989	-4.1	0.000 000	-0.002



- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2680,000,000 Hz
- ▣ BANDWIDTH: 41490 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2679 999 995	0.0	0.000 000	0.000
100 %		-30	2679 999 997	2.1	0.000 000	0.001
100 %		-20	2679 999 989	-5.8	0.000 000	-0.002
100 %		-10	2679 999 992	-3.1	0.000 000	-0.001
100 %		0	2679 999 991	-3.9	0.000 000	-0.001
100 %		+10	2679 999 991	-4.1	0.000 000	-0.002
100 %		+30	2679 999 992	-2.9	0.000 000	-0.001
100 %		+40	2679 999 988	-6.3	0.000 000	-0.002
100 %		+50	2679 999 989	-6.1	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2679 999 992	-2.8	0.000 000	-0.001



9. TEST DATA(Sub 2 ANT)

9.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2498.5	LTE B41(38)/ 5 MHz	QPSK	-21.67	15.30	10.70	2.50	V	< 2.00	0.224	23.50	1	0
		16-QAM	-22.61	14.36	10.70	2.50	V		0.180	22.56		
		64-QAM	-23.64	13.33	10.70	2.50	V		0.142	21.53		
		256-QAM	-26.73	10.24	10.70	2.50	V		0.070	18.44		
2502.5		QPSK	-21.52	15.69	10.53	2.57	V		0.232	23.65	1	0
		16-QAM	-22.37	14.84	10.53	2.57	V		0.191	22.80		
		64-QAM	-23.38	13.83	10.53	2.57	V		0.151	21.79		
		256-QAM	-26.45	10.76	10.53	2.57	V		0.074	18.72		
2593.0		QPSK	-23.38	14.05	10.61	2.55	V		0.163	22.11	1	0
		16-QAM	-24.27	13.16	10.61	2.55	V		0.132	21.22		
		64-QAM	-25.31	12.12	10.61	2.55	V		0.104	20.18		
		256-QAM	-28.38	9.05	10.61	2.55	V		0.051	17.11		
2687.5		QPSK	-26.17	11.76	10.78	2.60	V		0.099	19.94	1	0
		16-QAM	-27.10	10.83	10.78	2.60	V		0.080	19.01		
		64-QAM	-28.17	9.76	10.78	2.60	V		0.062	17.94		
		256-QAM	-31.19	6.74	10.78	2.60	V		0.031	14.92		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2501.0	LTE B41(38)/ 10 MHz	QPSK	-21.68	15.29	10.70	2.50	V	< 2.00	0.223	23.49	1	0
		16-QAM	-22.59	14.38	10.70	2.50	V		0.181	22.58		
		64-QAM	-23.66	13.31	10.70	2.50	V		0.142	21.51		
		256-QAM	-26.74	10.23	10.70	2.50	V		0.070	18.43		
2505.0		QPSK	-21.45	15.78	10.55	2.57	V		0.238	23.76	1	0
		16-QAM	-22.40	14.83	10.55	2.57	V		0.191	22.81		
		64-QAM	-23.45	13.78	10.55	2.57	V		0.150	21.76		
		256-QAM	-26.50	10.73	10.55	2.57	V		0.074	18.71		
2593.0		QPSK	-23.30	14.13	10.61	2.55	V		0.166	22.19	1	0
		16-QAM	-24.31	13.12	10.61	2.55	V		0.131	21.18		
		64-QAM	-25.30	12.13	10.61	2.55	V		0.104	20.19		
		256-QAM	-28.29	9.14	10.61	2.55	V		0.052	17.20		
2685.0		QPSK	-26.29	11.67	10.77	2.61	V		0.096	19.83	1	0
		16-QAM	-27.18	10.78	10.77	2.61	V		0.078	18.94		
		64-QAM	-28.19	9.77	10.77	2.61	V		0.062	17.93		
		256-QAM	-31.22	6.74	10.77	2.61	V		0.031	14.90		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2503.5	LTE B41(38)/ 15 MHz	QPSK	-21.88	15.14	10.70	2.51	V	< 2.00	0.215	23.33	1	0
		16-QAM	-22.68	14.34	10.70	2.51	V		0.179	22.53		
		64-QAM	-23.73	13.29	10.70	2.51	V		0.141	21.48		
		256-QAM	-26.79	10.23	10.70	2.51	V		0.070	18.42		
2507.5		QPSK	-21.65	15.61	10.57	2.57	V		0.230	23.61	1	0
		16-QAM	-22.42	14.84	10.57	2.57	V		0.192	22.84		
		64-QAM	-23.44	13.82	10.57	2.57	V		0.152	21.82		
		256-QAM	-26.53	10.73	10.57	2.57	V		0.075	18.73		
2593.0		QPSK	-23.07	14.36	10.61	2.55	V		0.175	22.42	1	0
		16-QAM	-24.03	13.40	10.61	2.55	V		0.140	21.46		
		64-QAM	-25.11	12.32	10.61	2.55	V		0.109	20.38		
		256-QAM	-28.11	9.32	10.61	2.55	V		0.055	17.38		
2682.5		QPSK	-25.85	12.11	10.77	2.61	V		0.106	20.27	1	0
		16-QAM	-26.90	11.06	10.77	2.61	V		0.084	19.22		
		64-QAM	-27.92	10.04	10.77	2.61	V		0.066	18.20		
		256-QAM	-30.95	7.01	10.77	2.61	V		0.033	15.17		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured	Substitute	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
			Level (dBm)	Level (dBm)				W	W	dBm	Size	Offset
2506.0	LTE B41(38)/ 20 MHz	QPSK	-21.85	15.17	10.70	2.51	V	< 2.00	0.217	23.36	1	0
		16-QAM	-22.63	14.39	10.70	2.51	V		0.181	22.58		
		64-QAM	-23.68	13.34	10.70	2.51	V		0.142	21.53		
		256-QAM	-26.82	10.20	10.70	2.51	V		0.069	18.39		
QPSK		-21.48	15.76	10.59	2.57	V	0.239		23.78	1	0	
16-QAM		-22.40	14.84	10.59	2.57	V	0.193		22.86			
64-QAM		-23.42	13.82	10.59	2.57	V	0.153		21.84			
256-QAM		-26.56	10.68	10.59	2.57	V	0.074		18.70			
2593.0		QPSK	-23.26	14.17	10.61	2.55	V		0.167	22.23	1	0
		16-QAM	-24.07	13.36	10.61	2.55	V		0.139	21.42		
		64-QAM	-25.11	12.32	10.61	2.55	V		0.109	20.38		
		256-QAM	-28.13	9.30	10.61	2.55	V		0.054	17.36		
2680.0		QPSK	-26.10	11.88	10.76	2.61	V		0.101	20.03	1	0
		16-QAM	-27.07	10.91	10.76	2.61	V		0.081	19.06		
		64-QAM	-28.09	9.89	10.76	2.61	V		0.064	18.04		
		256-QAM	-31.19	6.79	10.76	2.61	V		0.031	14.94		

9.2 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENCY :	<u>2502.5 MHz</u>
▣ MEASURED OUTPUT POWER:	<u>23.65 dBm = 0.232 W</u>
▣ MODE:	<u>LTE B41(38)</u>
▣ MODULATION SIGNAL:	<u>5 MHz QPSK</u>
▣ DISTANCE:	<u>1 meters</u>
▣ LIMIT: $55 + 10 \log_{10} (W) =$	<u>- 25 dBm</u>

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39675 (2498.5)	4 997.00	-50.34	12.61	-68.32	3.70	V	-59.41	1	0
	7 495.50	-51.82	10.80	-59.94	4.61	H	-53.75		
	9 994.00	-48.34	11.19	-52.33	5.47	H	-46.61		
39715 (2502.5)	5 005.00	-50.42	12.56	-67.67	3.85	V	-58.96	1	0
	7 507.50	-51.68	10.78	-60.23	4.71	V	-54.16		
	10 010.00	-50.24	11.23	-54.24	5.52	V	-48.53		
40620 (2593.0)	5 186.00	-50.71	12.44	-69.52	3.80	H	-60.88	1	0
	7 779.00	-50.24	11.40	-58.08	4.70	V	-51.38		
	10 372.00	-48.85	11.40	-52.77	5.55	V	-46.92		
41565 (2687.5)	5 375.00	-50.78	13.00	-69.17	3.91	H	-60.08	1	0
	8 062.50	-51.80	10.80	-58.44	4.82	V	-52.46		
	10 750.00	-51.10	11.20	-55.12	5.64	H	-49.56		

■ OPERATING FREQUENCY : 2505.0 MHz
 ■ MEASURED OUTPUT POWER: 23.76 dBm = 0.238 W
 ■ MODE: LTE B41(38)
 ■ MODULATION SIGNAL: 10 MHz QPSK
 ■ DISTANCE: 1 meters
 ■ LIMIT: $55 + 10 \log_{10}(W) =$ - 25 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39700 (2501.0)	5 002.00	-49.42	12.60	-67.07	3.71	H	-58.18	1	0
	7 503.00	-51.32	10.81	-59.86	4.60	H	-53.65		
	10 004.00	-49.85	11.21	-53.79	5.47	H	-48.05		
39740 (2505.0)	5 010.00	-50.37	12.55	-67.36	3.88	V	-58.69	1	0
	7 515.00	-50.98	10.80	-59.53	4.71	V	-53.44		
	10 020.00	-50.67	11.27	-55.28	5.54	V	-49.55		
40620 (2593.0)	5 186.00	-49.98	12.44	-68.79	3.80	V	-60.15	1	0
	7 779.00	-50.43	11.40	-58.27	4.70	H	-51.57		
	10 372.00	-49.98	11.40	-53.90	5.55	H	-48.05		
41540 (2685.0)	5 370.00	-49.17	13.00	-67.46	3.92	H	-58.38	1	0
	8 055.00	-50.70	10.80	-57.28	4.81	H	-51.29		
	10 740.00	-49.53	11.22	-53.37	5.64	H	-47.79		

■ OPERATING FREQUENCY : 2507.5 MHz
 ■ MEASURED OUTPUT POWER: 23.61 dBm = 0.229 W
 ■ MODE: LTE B41(38)
 ■ MODULATION SIGNAL: 15 MHz QPSK
 ■ DISTANCE: 1 meters
 ■ LIMIT: $55 + 10 \log_{10}(W) =$ - 25 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39725 (2503.5)	5 007.00	-50.50	12.59	-67.92	3.71	H	-59.04	1	0
	7 510.50	-49.98	10.82	-58.68	4.60	V	-52.46		
	10 014.00	-49.05	11.23	-53.39	5.47	H	-47.63		
39765 (2507.5)	5 015.00	-50.24	12.54	-66.98	3.90	V	-58.34	1	0
	7 522.50	-50.07	10.82	-58.61	4.71	V	-52.50		
	10 030.00	-49.25	11.31	-54.57	5.53	V	-48.79		
40620 (2593.0)	5 186.00	-51.22	12.44	-70.03	3.80	V	-61.39	1	0
	7 779.00	-50.66	11.40	-58.50	4.70	H	-51.80		
	10 372.00	-50.69	11.40	-54.61	5.55	H	-48.76		
41515 (2682.5)	5 365.00	-50.89	13.00	-69.08	3.91	V	-59.99	1	0
	8 047.50	-50.40	10.80	-56.95	4.81	H	-50.96		
	10 730.00	-51.00	11.24	-54.60	5.65	H	-49.01		

■ OPERATING FREQUENCY : 2510.0 MHz
 ■ MEASURED OUTPUT POWER: 23.78 dBm = 0.239 W
 ■ MODE: LTE B41(38)
 ■ MODULATION SIGNAL: 20 MHz QPSK
 ■ DISTANCE: 1 meters
 ■ LIMIT: $55 + 10 \log_{10}(W) =$ - 25 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
39750 (2506.0)	5 012.00	-49.66	12.58	-66.84	3.72	V	-57.98	1	0
	7 518.00	-50.59	10.84	-59.25	4.61	V	-53.02		
	10 024.00	-52.01	11.25	-57.00	5.47	H	-51.22		
39790 (2510.0)	5 020.00	-50.51	12.52	-67.00	3.91	H	-58.39	1	0
	7 530.00	-51.46	10.85	-59.73	4.72	V	-53.60		
	10 040.00	-49.04	11.34	-54.84	5.51	V	-49.01		
40620 (2593.0)	5 186.00	-51.57	12.44	-70.38	3.80	V	-61.74	1	0
	7 779.00	-50.24	11.40	-58.08	4.70	H	-51.38		
	10 372.00	-50.76	11.40	-54.68	5.55	V	-48.83		
41490 (2680.0)	5 360.00	-51.18	13.00	-69.26	3.90	V	-60.16	1	0
	8 040.00	-50.80	10.82	-57.31	4.80	H	-51.29		
	10 720.00	-50.07	11.26	-53.55	5.64	V	-47.93		

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
41	5 MHz	2593.0	QPSK	25	0	4.87
			16-QAM			6.04
			64-QAM			6.78
			256-QAM			6.60
	10 MHz		QPSK	50		4.78
			16-QAM			5.83
			64-QAM			6.76
			256-QAM			6.57
	15 MHz		QPSK	75		4.71
			16-QAM			5.81
			64-QAM			6.47
			256-QAM			6.57
	20 MHz		QPSK	100		4.71
			16-QAM			5.69
			64-QAM			6.30
			256-QAM			6.55

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 193 ~ 208.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
41	5 MHz	2593.0	QPSK	25	0	4.5068
			16-QAM			4.5126
			64-QAM			4.5241
			256-QAM			4.4969
	10 MHz		QPSK	50		8.9876
			16-QAM			8.9834
			64-QAM			8.9987
			256-QAM			9.0107
	15 MHz		QPSK	75		13.466
			16-QAM			13.502
			64-QAM			13.470
			256-QAM			13.442
	20 MHz		QPSK	100		17.929
			16-QAM			17.923
			64-QAM			17.933
			256-QAM			17.930

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 209 ~ 224.

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)
41	5	2502.5	26.1547	34.110	-76.857	-42.747	-25.00
		2498.5	26.1219	34.110	-77.002	-42.892	
		2593.0	26.1483	34.110	-76.971	-42.861	
		2687.5	26.1615	34.110	-76.953	-42.843	
	10	2505.0	25.8015	34.110	-77.057	-42.947	
		2501.0	26.1729	34.110	-76.673	-42.563	
		2593.0	26.1415	34.110	-76.966	-42.856	
		2685.0	26.1381	34.110	-76.642	-42.532	
	15	2507.5	26.4063	34.110	-77.027	-42.917	
		2503.5	26.1258	34.110	-76.755	-42.645	
		2593.0	26.1666	34.110	-76.769	-42.659	
		2682.5	25.8036	34.110	-77.059	-42.949	
	20	2510.0	26.1168	34.110	-76.837	-42.727	
		2506.0	25.8992	34.110	-76.880	-42.770	
		2593.0	26.1126	34.110	-76.857	-42.747	
		2680.0	26.1593	34.110	-76.950	-42.840	

Note:

- Plots of the EUT's Conducted Spurious Emissions are shown Page 225 ~ 256.
- Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
- Duty Cycle factor already applied on the factor.
 - Duty Cycle factor(dB) = 3.979
 - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
 - Result(dBm) = Reading + Factor

Frequency Range (GHz)	Factor [dB]
0.03 – 1	29.249
1 – 5	31.955
5 – 10	32.570
10 – 15	33.095
15 – 20	33.468
Above 20	34.110

9.6 CHANNEL EDGE

Band Width	Frequency (MHz)	Modulation	RB (Size/Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1 MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
5 MHz	2502.5	QPSK	25/0	-18.80	-20.16	-27.97	-18.01	-44.16	-33.98	-35.01
10 MHz	2505.0	QPSK	50/0	-19.99	-22.75	-25.43	-18.39	-40.04	-23.97	-38.59
15 MHz	2507.5	QPSK	75/0	-21.71	-23.02	-25.48	-20.56	-31.18	-24.22	-41.19
20 MHz	2510.0	QPSK	100/0	-22.99	-23.52	-26.55	-20.73	-30.73	-25.37	-42.68
Limit(dBm)				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	RB (Size/Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1 MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
5 MHz	2498.5	QPSK	25/0	-21.84	-20.92	-18.37	-16.78	-35.94	-33.15	-34.21
10 MHz	2501.0	QPSK	50/0	-27.40	-25.87	-24.45	-23.05	-32.09	-28.80	-40.40
15 MHz	2503.5	QPSK	75/0	-30.69	-28.50	-29.25	-27.35	-35.51	-31.76	-44.17
20 MHz	2506.0	QPSK	100/0	-31.42	-29.43	-30.05	-27.97	-36.38	-32.40	-45.58
Limit(dBm)				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	C.E ~ (C.E ± 1 MHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-22.42	-22.75	-22.07	-22.17
	2687.5	QPSK	25	0	-21.34	-22.01	-18.26	-19.84
10 MHz	2593.0	QPSK	50	0	-25.19	-25.57	-22.70	-23.20
	2685.0	QPSK	50	0	-23.76	-24.44	-20.29	-21.33
15 MHz	2593.0	QPSK	75	0	-26.80	-27.16	-24.63	-25.07
	2682.5	QPSK	75	0	-25.03	-25.83	-23.01	-23.84
20 MHz	2593.0	QPSK	100	0	-27.01	-27.11	-24.98	-25.33
	2680.0	QPSK	100	0	-25.56	-25.79	-23.65	-24.10
Limit(dBm)					-10.0		-10.0	

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	(C.E ± 5 MHz) ~ (C.E ± X MHz)		Above (C.E ± X MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-33.78	-35.57	-36.73	-37.97
	2687.5	QPSK	25	0	-34.41	-38.81	-35.70	-39.46
10 MHz	2593.0	QPSK	50	0	-29.27	-29.51	-38.22	-39.47
	2685.0	QPSK	50	0	-26.30	-28.39	-38.73	-43.01
15 MHz	2593.0	QPSK	75	0	-29.82	-30.07	-40.47	-40.75
	2682.5	QPSK	75	0	-27.36	-28.83	-41.02	-45.35
20 MHz	2593.0	QPSK	100	0	-30.12	-30.11	-41.77	-44.02
	2680.0	QPSK	100	0	-27.82	-28.86	-42.28	-46.11
Limit(dBm)					-13.0		-25.0	

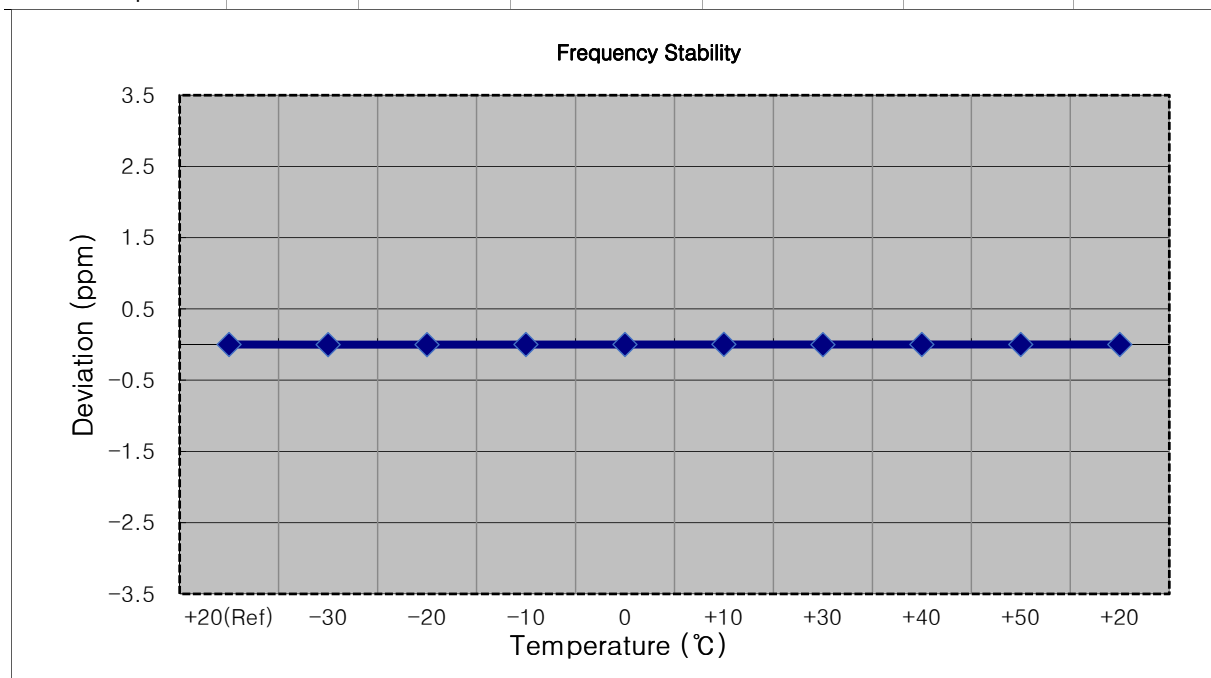
Note:

1. C.E = Channel Edge
2. $X = X$ is the greater of 6 MHz or the actual emission bandwidth.
3. $X = 6 \text{ MHz}(5 \text{ MHz Bandwidth}), 10 \text{ MHz}(10 \text{ MHz Bandwidth}), 15 \text{ MHz}(15 \text{ MHz Bandwidth}), 20 \text{ MHz}(20 \text{ MHz Bandwidth})$
4. RB = Resource Block
5. Duty Cycle factor already applied on the factor.
 - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
 - Result(dBm) = Reading + Factor
 - Duty Cycle Factor(dB) = 3.979
6. Plots of the EUT's Channel Edge are shown Page 257 ~ 300. (1RB & Full RB)

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

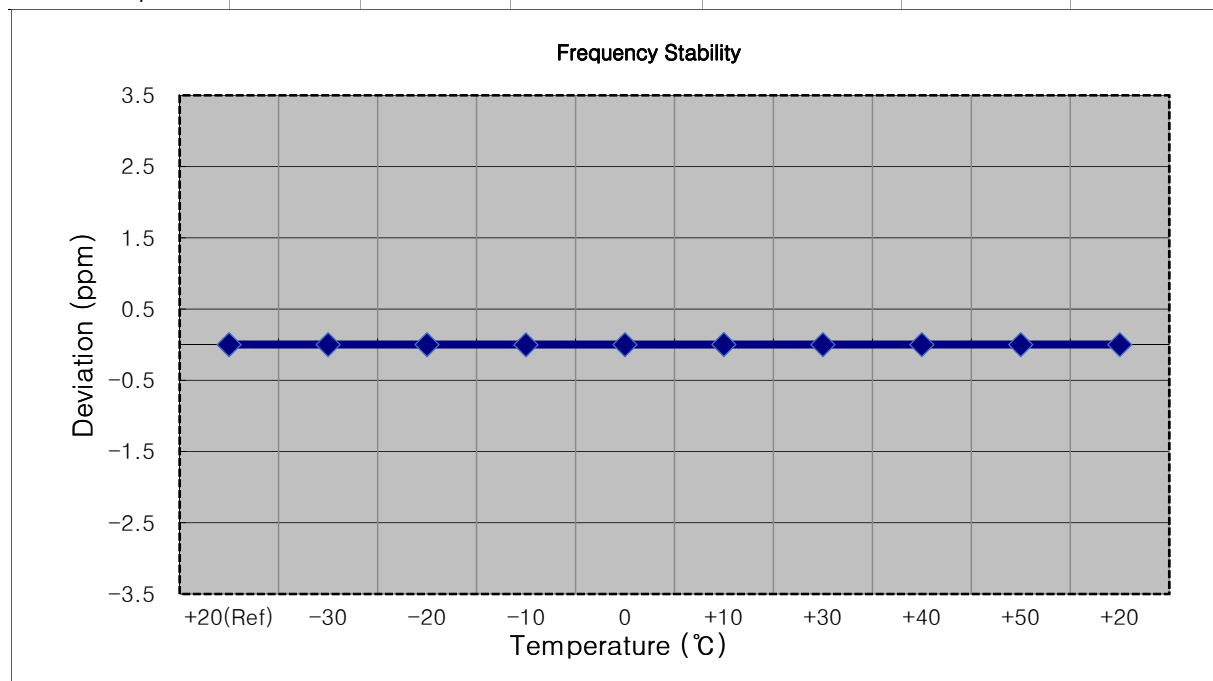
MODE:	<u>LTE 41</u>
OPERATING FREQUENCY:	<u>2502,500,000 Hz</u>
BANDWIDTH:	<u>39675 (5 MHz)</u>
REFERENCE VOLTAGE:	<u>3.880 VDC</u>
DEVIATION LIMIT:	<u>Emission must remain in band</u>

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2502 500 003	0.0	0.000 000	0.000
100 %		-30	2502 499 998	-4.7	0.000 000	-0.002
100 %		-20	2502 499 998	-4.5	0.000 000	-0.002
100 %		-10	2502 500 000	-3.0	0.000 000	-0.001
100 %		0	2502 499 999	-3.3	0.000 000	-0.001
100 %		+10	2502 500 006	3.0	0.000 000	0.001
100 %		+30	2502 499 998	-4.7	0.000 000	-0.002
100 %		+40	2502 500 001	-1.9	0.000 000	-0.001
100 %		+50	2502 500 000	-3.2	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2502 499 999	-3.8	0.000 000	-0.002



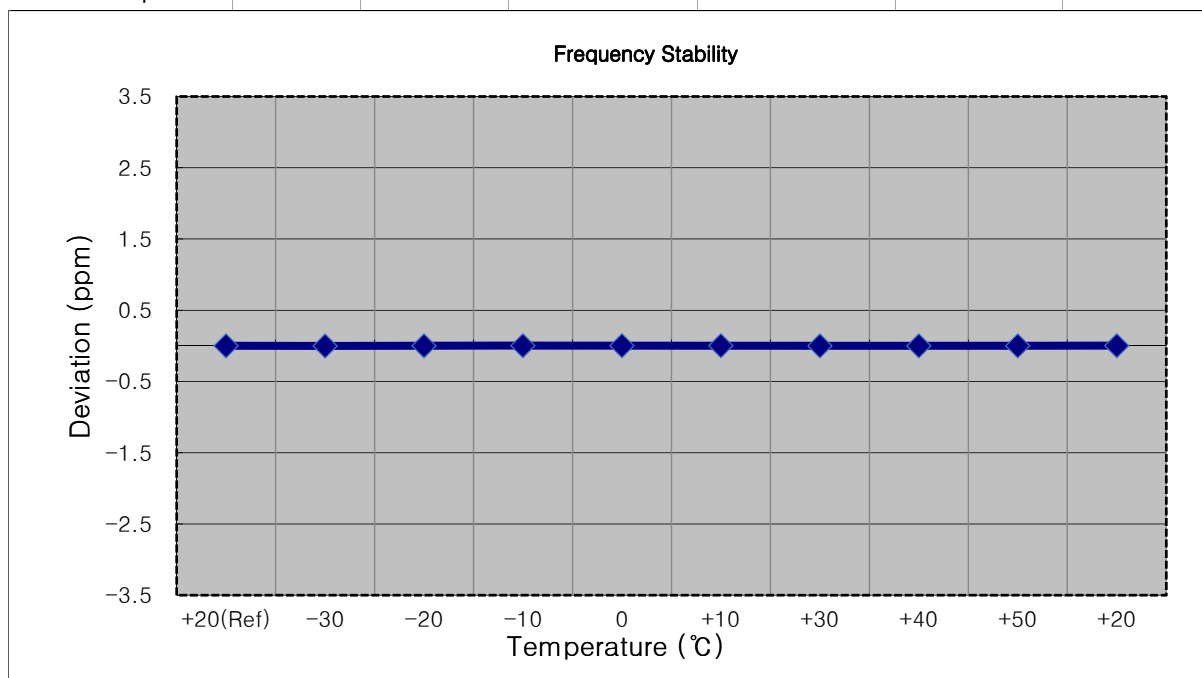
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2505,000,000 Hz
- ▣ BANDWIDTH: 39700 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2504 999 996	0.0	0.000 000	0.000
100 %		-30	2504 999 998	2.5	0.000 000	0.001
100 %		-20	2504 999 999	2.7	0.000 000	0.001
100 %		-10	2504 999 995	-1.4	0.000 000	-0.001
100 %		0	2505 000 000	4.5	0.000 000	0.002
100 %		+10	2505 000 002	6.4	0.000 000	0.003
100 %		+30	2505 000 001	4.9	0.000 000	0.002
100 %		+40	2504 999 999	3.2	0.000 000	0.001
100 %		+50	2504 999 999	3.2	0.000 000	0.001
Batt. Endpoint	3.300	+20	2504 999 998	1.7	0.000 000	0.001



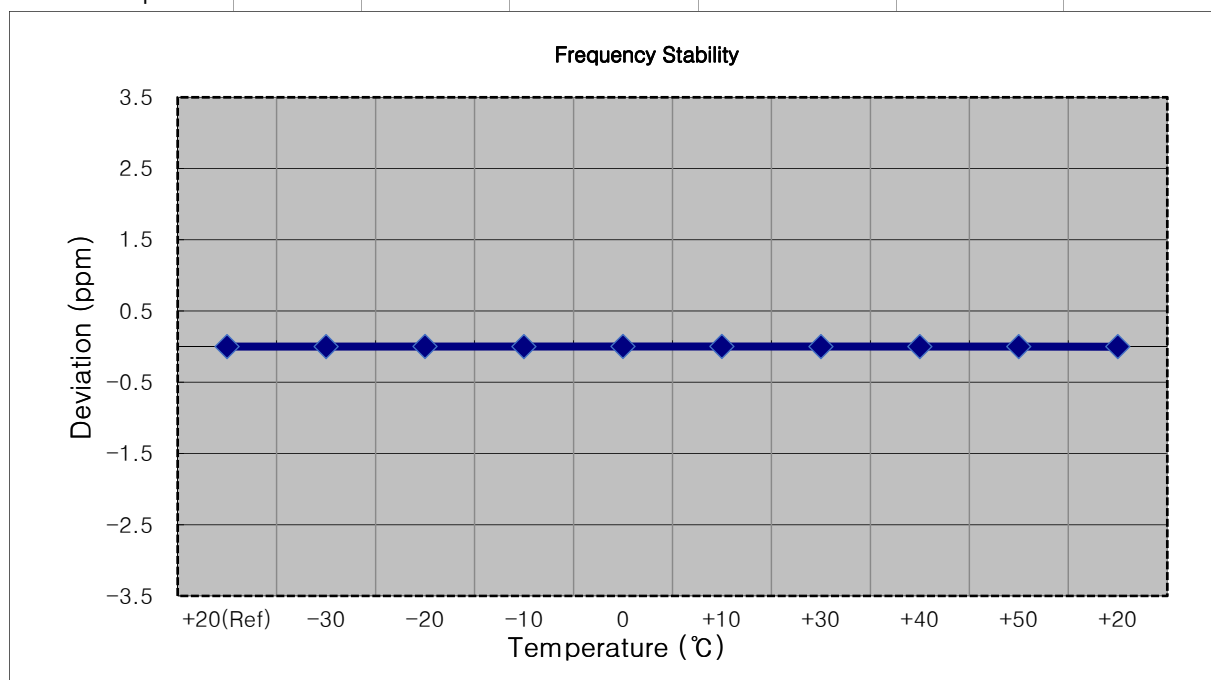
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2507,500,000 Hz
- ▣ BANDWIDTH: 39725 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2507 500 003	0.0	0.000 000	0.000
100 %		-30	2507 500 001	-2.6	0.000 000	-0.001
100 %		-20	2507 500 006	3.0	0.000 000	0.001
100 %		-10	2507 500 008	4.3	0.000 000	0.002
100 %		0	2507 500 007	3.9	0.000 000	0.002
100 %		+10	2507 500 008	4.6	0.000 000	0.002
100 %		+30	2507 500 006	2.7	0.000 000	0.001
100 %		+40	2507 500 006	2.9	0.000 000	0.001
100 %		+50	2507 500 006	2.8	0.000 000	0.001
Batt. Endpoint	3.300	+20	2507 500 007	3.7	0.000 000	0.001



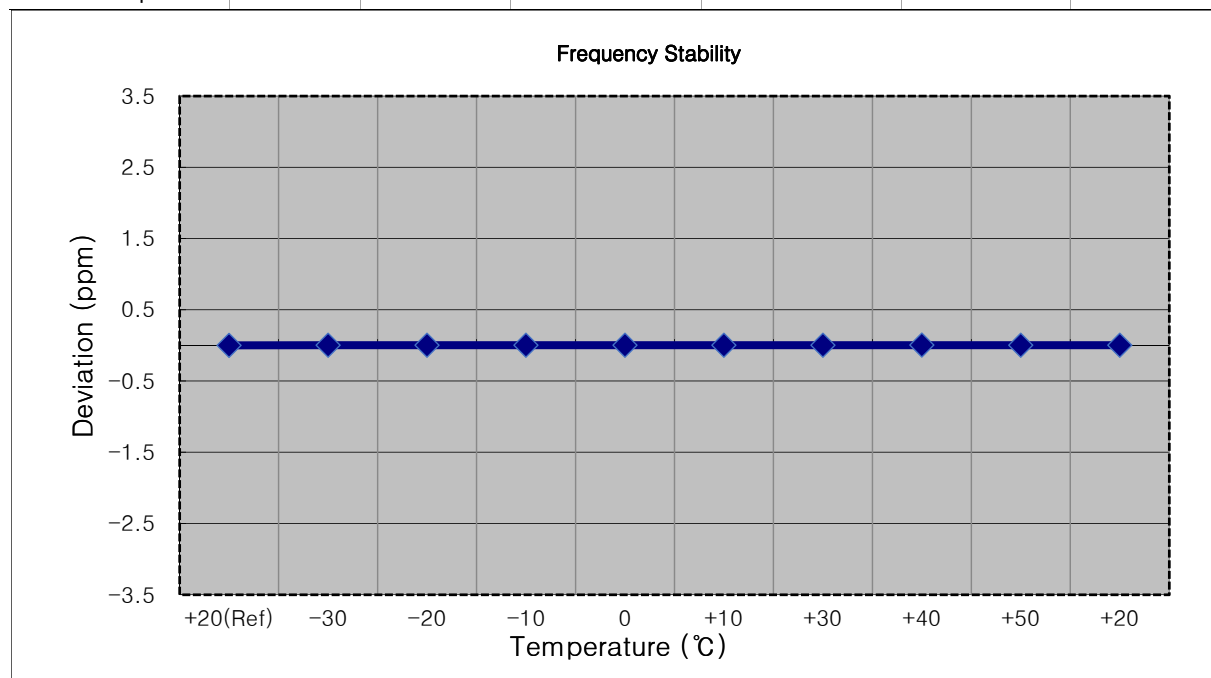
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2510,000,000 Hz
- ▣ BANDWIDTH: 39750 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2510 000 003	0.0	0.000 000	0.000
100 %		-30	2509 999 999	-3.7	0.000 000	-0.001
100 %		-20	2510 000 005	2.0	0.000 000	0.001
100 %		-10	2510 000 004	1.1	0.000 000	0.000
100 %		0	2510 000 005	2.1	0.000 000	0.001
100 %		+10	2510 000 005	2.3	0.000 000	0.001
100 %		+30	2510 000 001	-2.0	0.000 000	-0.001
100 %		+40	2510 000 002	-0.9	0.000 000	0.000
100 %		+50	2509 999 999	-3.6	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2509 999 999	-4.1	0.000 000	-0.002



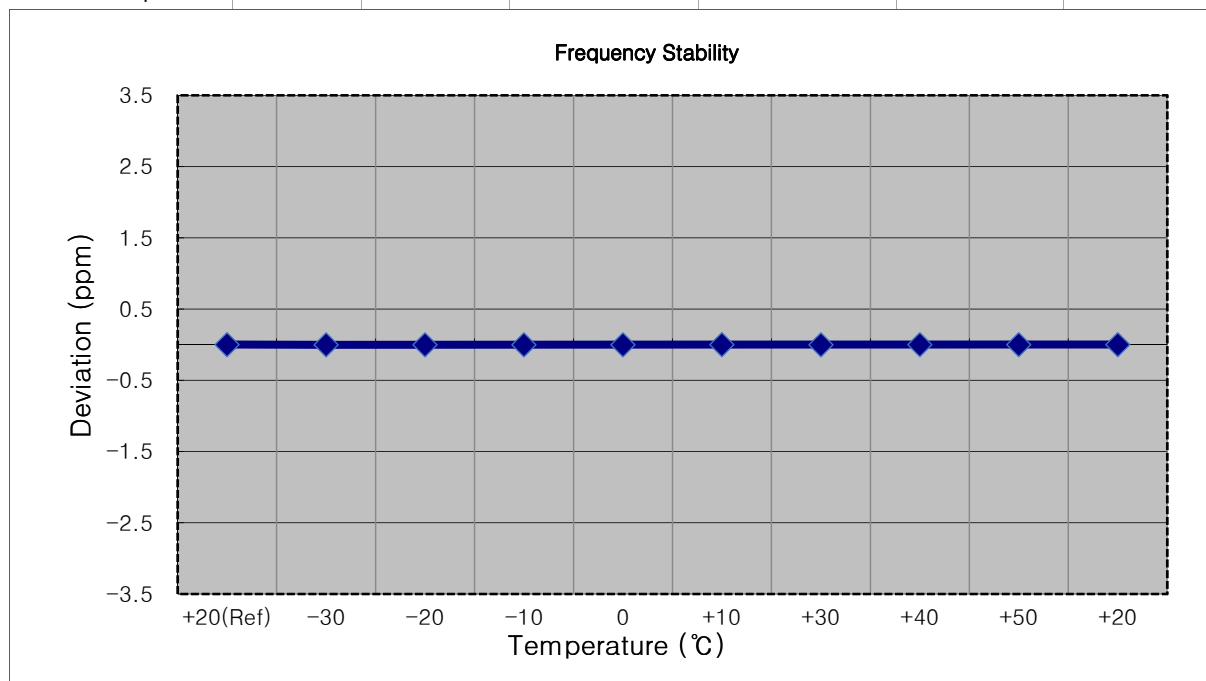
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2498,500,000 Hz
- ▣ BANDWIDTH: 39675 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2498 500 006	0.0	0.000 000	0.000
100 %		-30	2498 500 012	6.0	0.000 000	0.002
100 %		-20	2498 500 012	5.8	0.000 000	0.002
100 %		-10	2498 500 011	5.1	0.000 000	0.002
100 %		0	2498 500 011	5.2	0.000 000	0.002
100 %		+10	2498 500 012	6.2	0.000 000	0.002
100 %		+30	2498 500 012	6.1	0.000 000	0.002
100 %		+40	2498 500 014	7.7	0.000 000	0.003
100 %		+50	2498 500 012	6.1	0.000 000	0.002
Batt. Endpoint	3.300	+20	2498 500 013	6.9	0.000 000	0.003



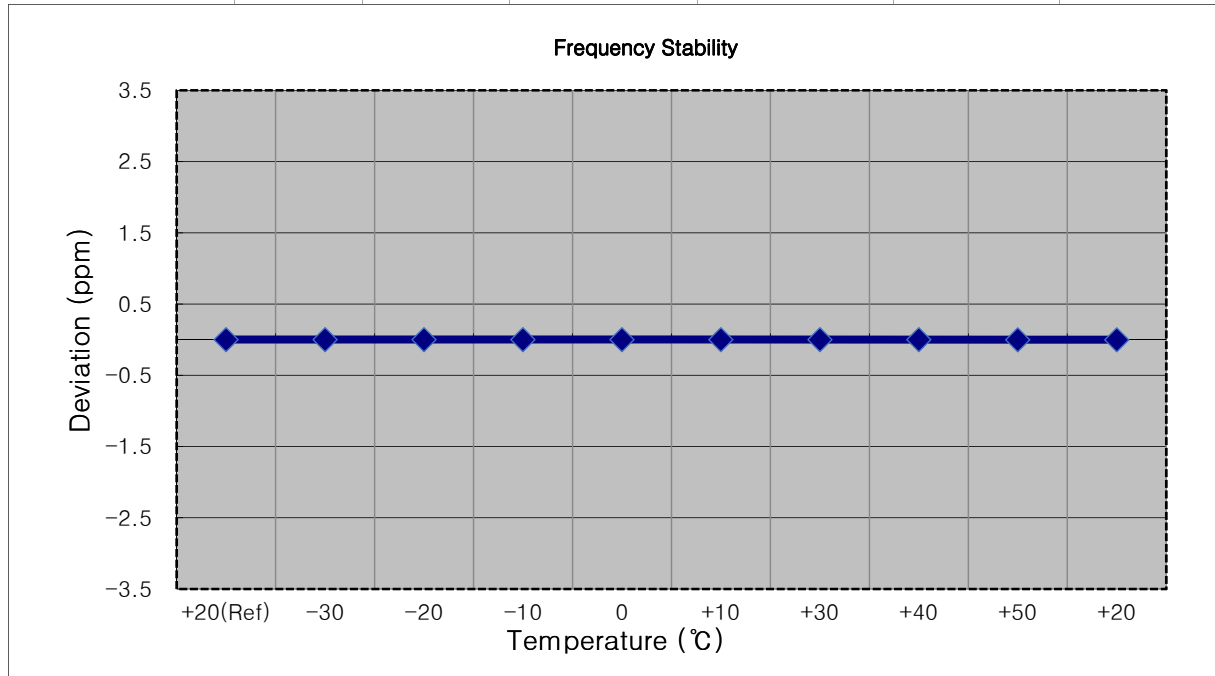
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2501,000,000 Hz
- ▣ BANDWIDTH: 39700 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2500 999 997	0.0	0.000 000	0.000
100 %		-30	2500 999 992	-5.2	0.000 000	-0.002
100 %		-20	2500 999 995	-2.3	0.000 000	-0.001
100 %		-10	2500 999 994	-2.9	0.000 000	-0.001
100 %		0	2500 999 996	-1.7	0.000 000	-0.001
100 %		+10	2501 000 001	3.8	0.000 000	0.002
100 %		+30	2500 999 995	-2.3	0.000 000	-0.001
100 %		+40	2501 000 000	2.2	0.000 000	0.001
100 %		+50	2500 999 999	2.1	0.000 000	0.001
Batt. Endpoint	3.300	+20	2501 000 000	3.0	0.000 000	0.001



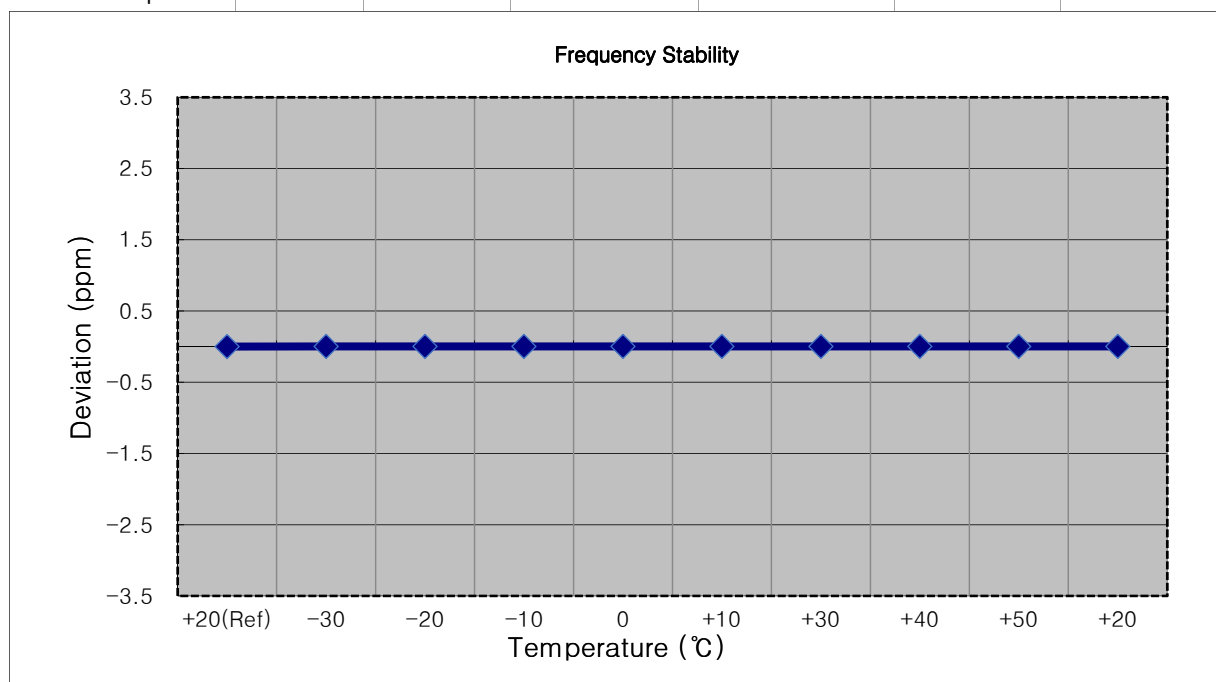
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2503,500,000 Hz
- ▣ BANDWIDTH: 39725 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2503 500 005	0.0	0.000 000	0.000
100 %		-30	2503 500 007	2.8	0.000 000	0.001
100 %		-20	2503 500 007	2.0	0.000 000	0.001
100 %		-10	2503 500 005	0.7	0.000 000	0.000
100 %		0	2503 500 006	1.6	0.000 000	0.001
100 %		+10	2503 500 006	1.6	0.000 000	0.001
100 %		+30	2503 500 006	1.5	0.000 000	0.001
100 %		+40	2503 500 008	3.1	0.000 000	0.001
100 %		+50	2503 500 003	-1.3	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2503 500 003	-1.3	0.000 000	-0.001



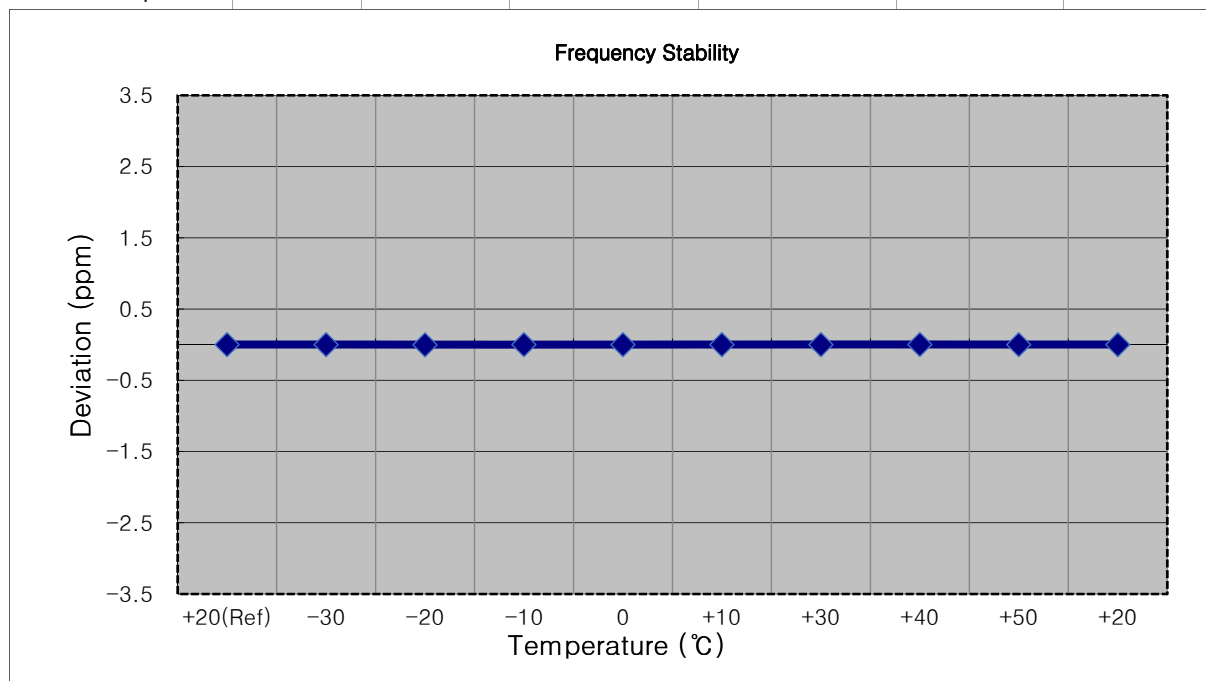
■ MODE: LTE 41
 ■ OPERATING FREQUENCY: 2506,000,000 Hz
 ■ BANDWIDTH: 39750 (20 MHz)
 ■ REFERENCE VOLTAGE: 3.880 VDC
 ■ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2506 000 004	0.0	0.000 000	0.000
100 %		-30	2506 000 010	5.5	0.000 000	0.002
100 %		-20	2506 000 008	3.7	0.000 000	0.001
100 %		-10	2506 000 009	5.0	0.000 000	0.002
100 %		0	2506 000 010	5.9	0.000 000	0.002
100 %		+10	2506 000 008	3.5	0.000 000	0.001
100 %		+30	2506 000 010	5.3	0.000 000	0.002
100 %		+40	2506 000 008	3.2	0.000 000	0.001
100 %		+50	2506 000 009	4.4	0.000 000	0.002
Batt. Endpoint	3.300	+20	2506 000 007	2.9	0.000 000	0.001



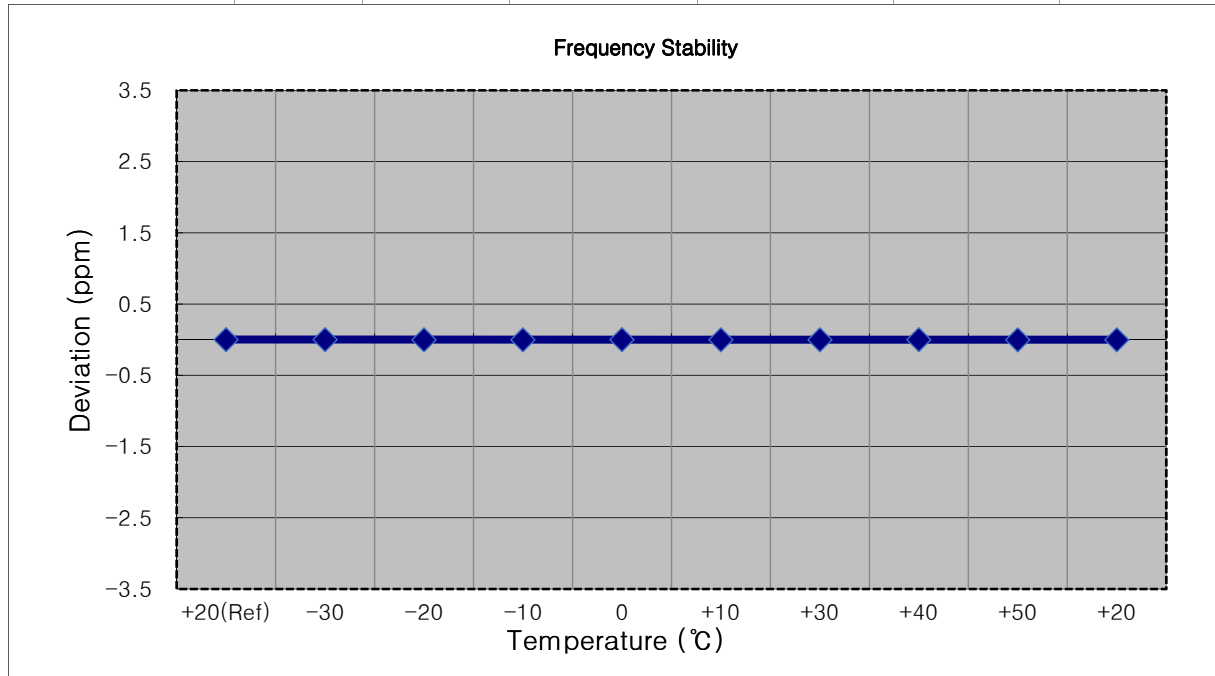
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2593 000 006	0.0	0.000 000	0.000
100 %		-30	2593 000 008	2.0	0.000 000	0.001
100 %		-20	2593 000 002	-4.4	0.000 000	-0.002
100 %		-10	2593 000 011	4.6	0.000 000	0.002
100 %		0	2593 000 011	4.9	0.000 000	0.002
100 %		+10	2593 000 010	4.0	0.000 000	0.002
100 %		+30	2593 000 009	2.8	0.000 000	0.001
100 %		+40	2593 000 013	6.6	0.000 000	0.003
100 %		+50	2593 000 011	4.9	0.000 000	0.002
Batt. Endpoint	3.300	+20	2593 000 009	3.2	0.000 000	0.001



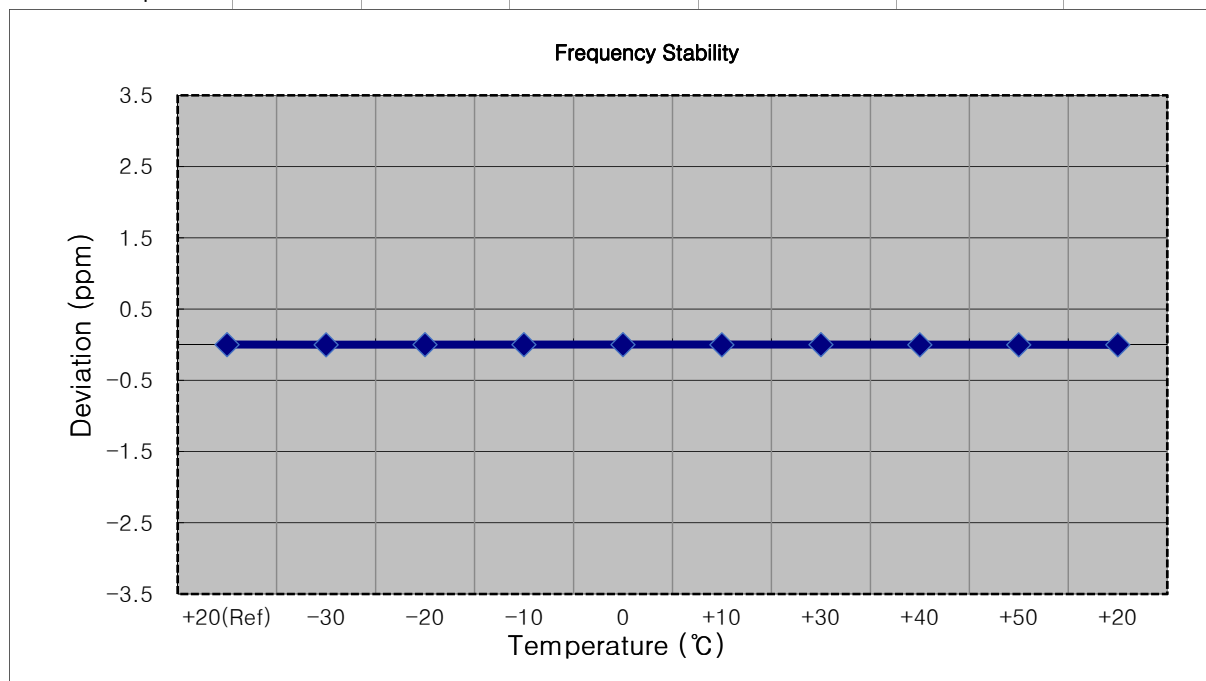
MODE: LTE 41
 OPERATING FREQUENCY: 2593,000,000 Hz
 BANDWIDTH: 40620 (10 MHz)
 REFERENCE VOLTAGE: 3.880 VDC
 DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2592 999 997	0.0	0.000 000	0.000
100 %		-30	2593 000 000	3.2	0.000 000	0.001
100 %		-20	2592 999 994	-2.7	0.000 000	-0.001
100 %		-10	2592 999 995	-2.2	0.000 000	-0.001
100 %		0	2592 999 999	2.1	0.000 000	0.001
100 %		+10	2592 999 996	-1.3	0.000 000	-0.001
100 %		+30	2592 999 993	-4.2	0.000 000	-0.002
100 %		+40	2592 999 998	1.5	0.000 000	0.001
100 %		+50	2592 999 994	-3.4	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2592 999 995	-1.6	0.000 000	-0.001



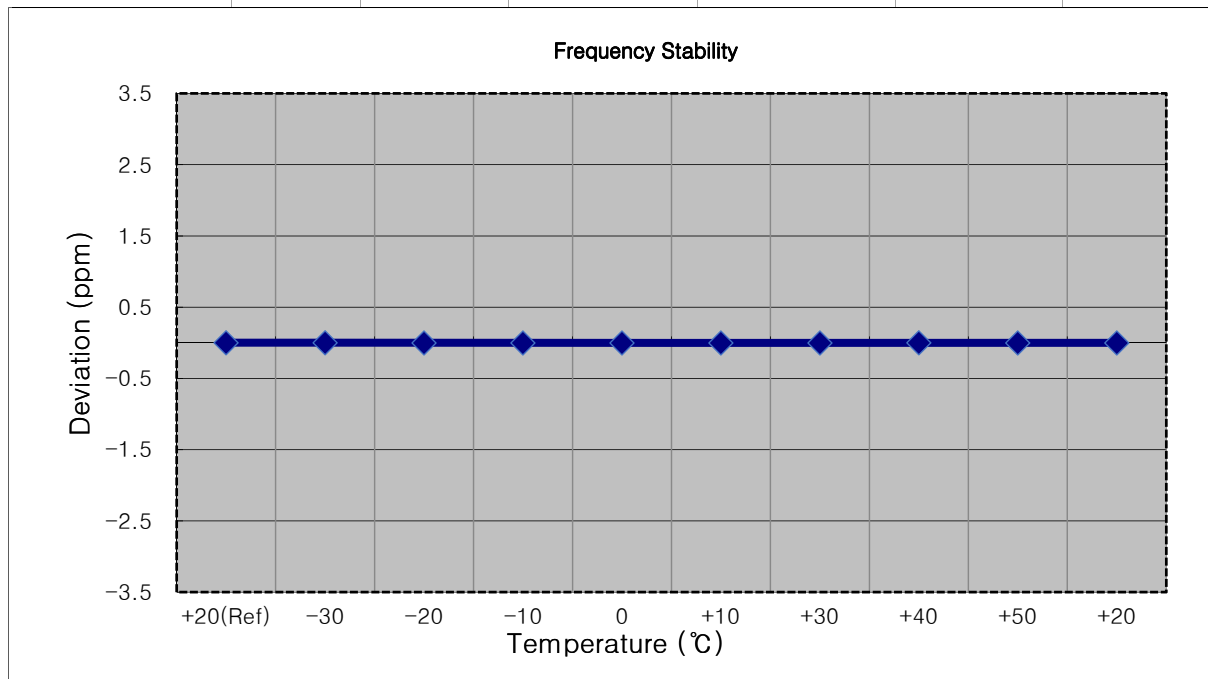
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2592 999 998	0.0	0.000 000	0.000
100 %		-30	2592 999 996	-1.9	0.000 000	-0.001
100 %		-20	2593 000 000	2.4	0.000 000	0.001
100 %		-10	2593 000 000	1.6	0.000 000	0.001
100 %		0	2592 999 999	1.5	0.000 000	0.001
100 %		+10	2592 999 997	-1.3	0.000 000	-0.001
100 %		+30	2593 000 001	2.8	0.000 000	0.001
100 %		+40	2592 999 996	-2.3	0.000 000	-0.001
100 %		+50	2592 999 994	-4.0	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2592 999 993	-4.5	0.000 000	-0.002



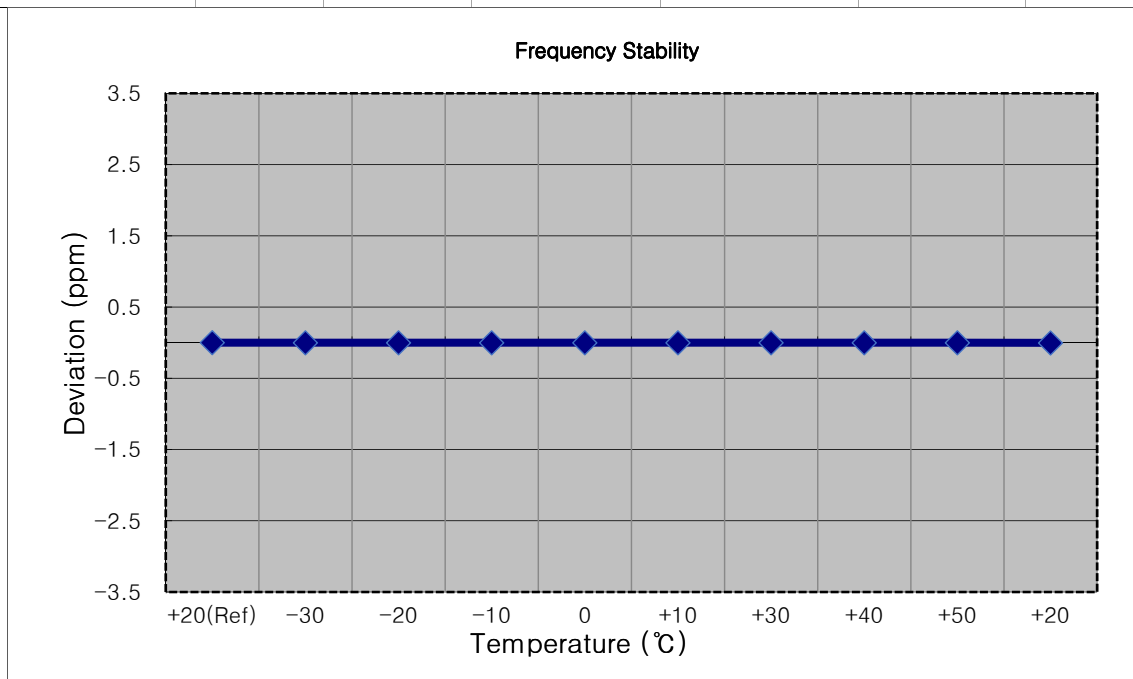
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2593,000,000 Hz
- ▣ BANDWIDTH: 40620 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2592 999 998	0.0	0.000 000	0.000
100 %		-30	2593 000 000	2.0	0.000 000	0.001
100 %		-20	2592 999 995	-2.8	0.000 000	-0.001
100 %		-10	2592 999 996	-2.1	0.000 000	-0.001
100 %		0	2592 999 997	-1.5	0.000 000	-0.001
100 %		+10	2592 999 996	-2.7	0.000 000	-0.001
100 %		+30	2592 999 994	-4.2	0.000 000	-0.002
100 %		+40	2593 000 000	1.8	0.000 000	0.001
100 %		+50	2592 999 996	-2.7	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2592 999 997	-1.7	0.000 000	-0.001



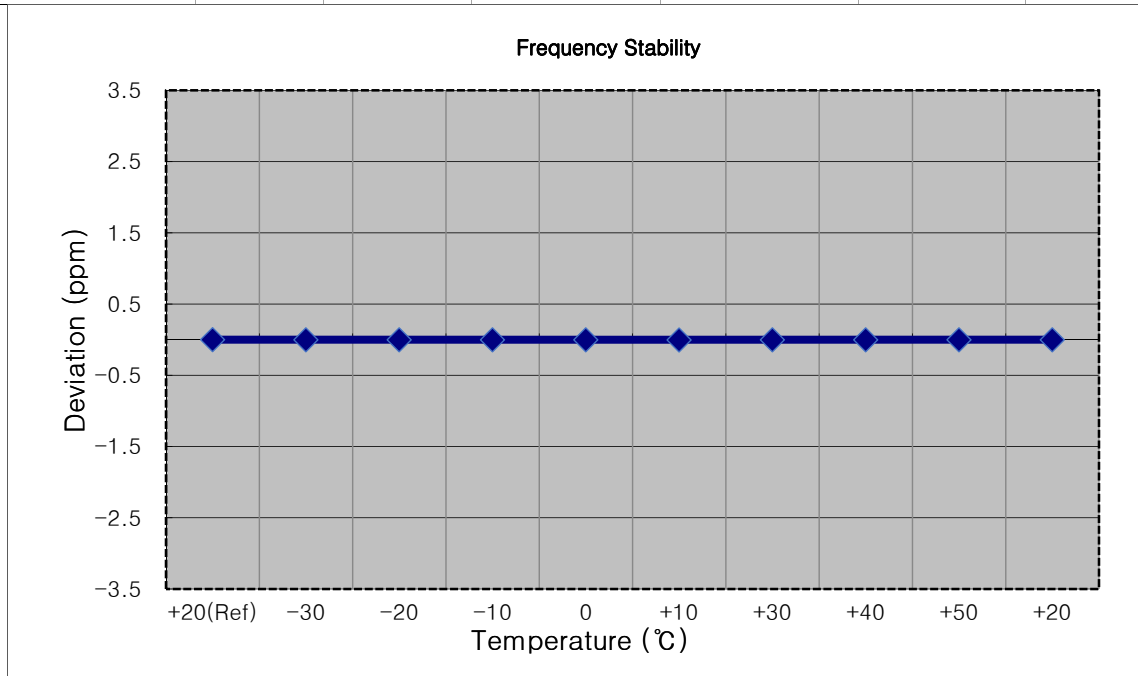
■ MODE: LTE 41
 ■ OPERATING FREQUENCY: 2687,500,000 Hz
 ■ BANDWIDTH: 41565 (5 MHz)
 ■ REFERENCE VOLTAGE: 3.880 VDC
 ■ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2687 499 994	0.0	0.000 000	0.000
100 %		-30	2687 499 991	-3.0	0.000 000	-0.001
100 %		-20	2687 499 991	-3.0	0.000 000	-0.001
100 %		-10	2687 499 989	-4.5	0.000 000	-0.002
100 %		0	2687 499 990	-4.1	0.000 000	-0.002
100 %		+10	2687 499 988	-5.7	0.000 000	-0.002
100 %		+30	2687 499 989	-4.3	0.000 000	-0.002
100 %		+40	2687 499 988	-6.0	0.000 000	-0.002
100 %		+50	2687 499 989	-4.9	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2687 499 987	-6.3	0.000 000	-0.002



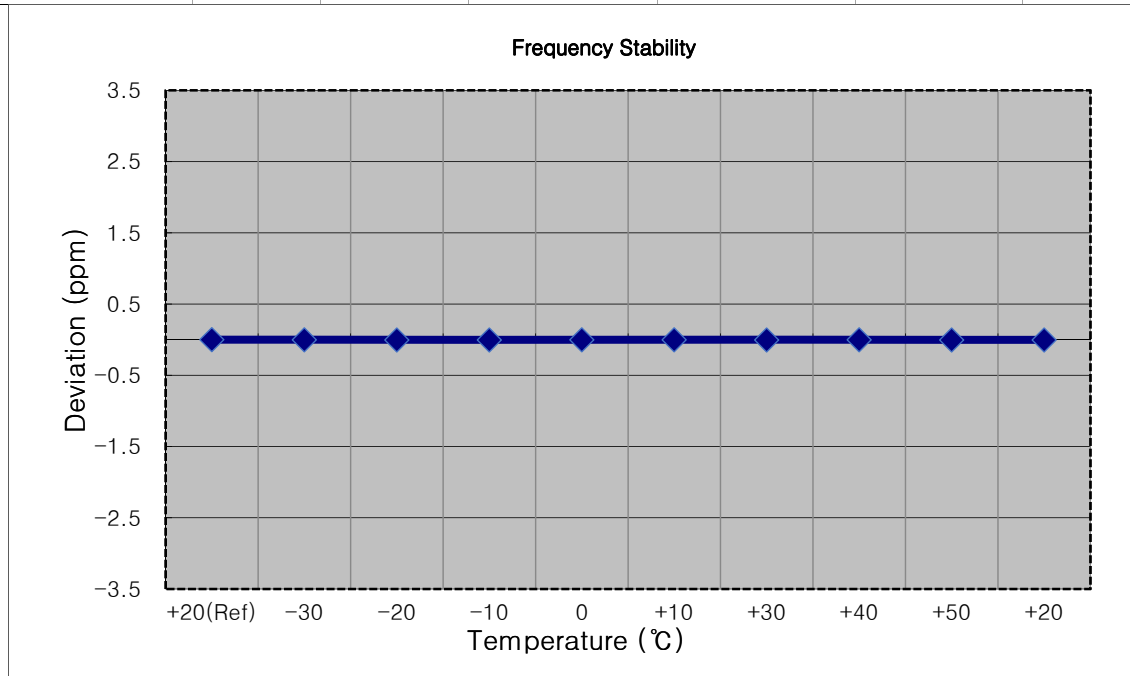
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2685,000,000 Hz
- ▣ BANDWIDTH: 41540 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2684 999 996	0.0	0.000 000	0.000
100 %		-30	2684 999 993	-2.8	0.000 000	-0.001
100 %		-20	2684 999 991	-4.9	0.000 000	-0.002
100 %		-10	2684 999 991	-5.4	0.000 000	-0.002
100 %		0	2684 999 990	-5.9	0.000 000	-0.002
100 %		+10	2684 999 987	-8.6	0.000 000	-0.003
100 %		+30	2684 999 990	-6.0	0.000 000	-0.002
100 %		+40	2684 999 991	-5.3	0.000 000	-0.002
100 %		+50	2684 999 991	-4.9	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2684 999 992	-4.5	0.000 000	-0.002



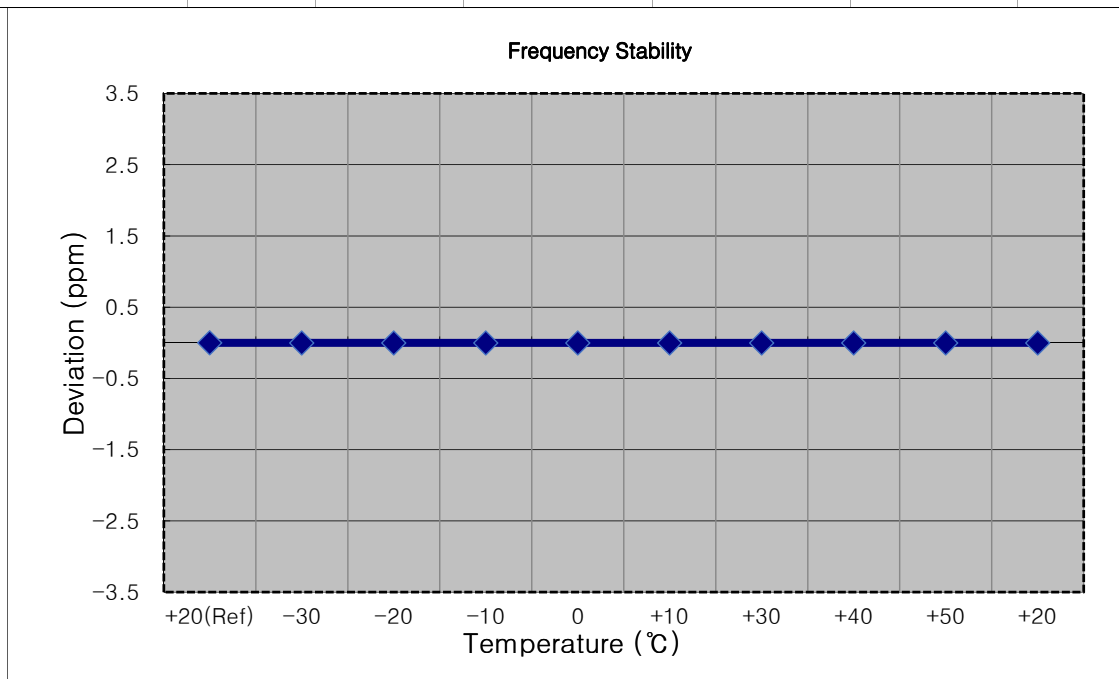
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2682,500,000 Hz
- ▣ BANDWIDTH: 41515 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2682 499 992	0.0	0.000 000	0.000
100 %		-30	2682 499 988	-4.0	0.000 000	-0.001
100 %		-20	2682 499 985	-7.1	0.000 000	-0.003
100 %		-10	2682 499 986	-6.4	0.000 000	-0.002
100 %		0	2682 499 988	-4.4	0.000 000	-0.002
100 %		+10	2682 499 987	-5.1	0.000 000	-0.002
100 %		+30	2682 499 984	-7.5	0.000 000	-0.003
100 %		+40	2682 499 986	-5.6	0.000 000	-0.002
100 %		+50	2682 499 986	-6.3	0.000 000	-0.002
Batt. Endpoint	3.300	+20	2682 499 984	-7.8	0.000 000	-0.003



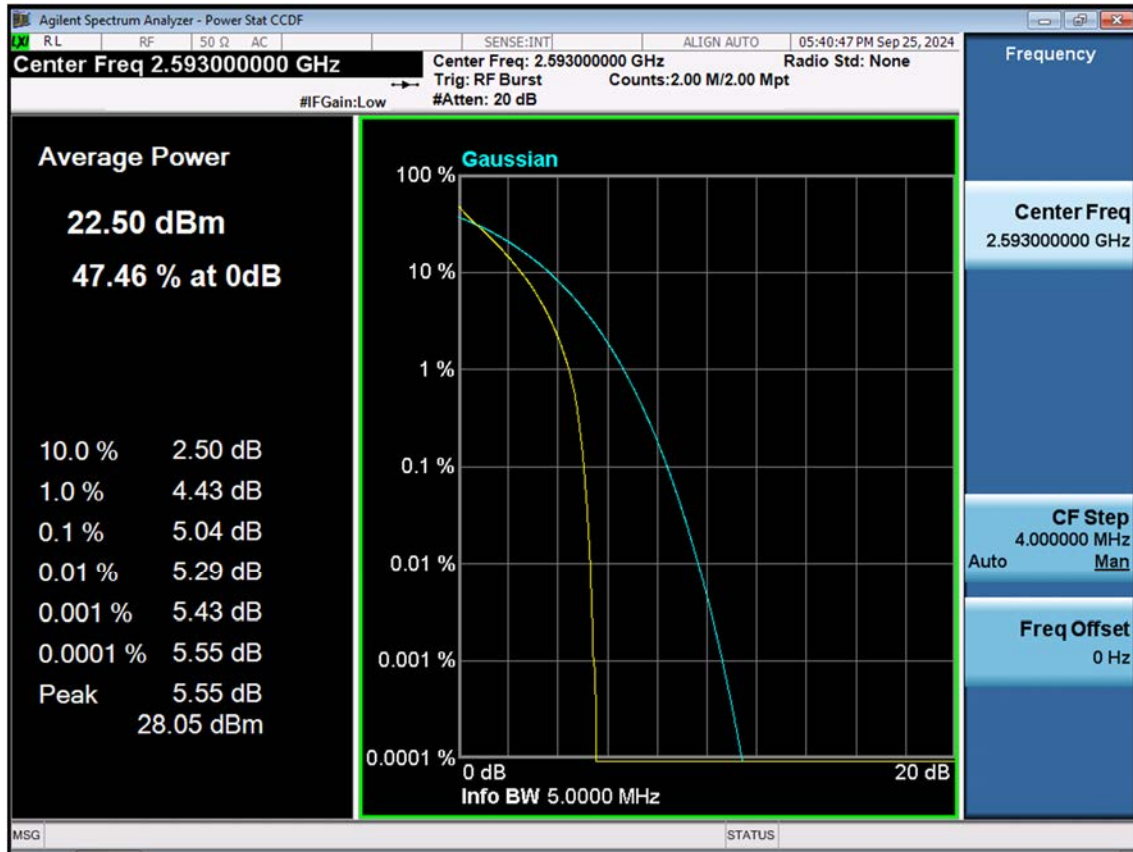
- ▣ MODE: LTE 41
- ▣ OPERATING FREQUENCY: 2680,000,000 Hz
- ▣ BANDWIDTH: 41490 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency Error	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	(Hz)	(%)	
100 %	3.880	+20(Ref)	2679 999 997	0.0	0.000 000	0.000
100 %		-30	2679 999 995	-1.7	0.000 000	-0.001
100 %		-20	2679 999 994	-3.1	0.000 000	-0.001
100 %		-10	2679 999 992	-5.5	0.000 000	-0.002
100 %		0	2679 999 991	-5.9	0.000 000	-0.002
100 %		+10	2679 999 995	-1.9	0.000 000	-0.001
100 %		+30	2679 999 994	-3.3	0.000 000	-0.001
100 %		+40	2679 999 994	-2.8	0.000 000	-0.001
100 %		+50	2679 999 994	-3.2	0.000 000	-0.001
Batt. Endpoint	3.300	+20	2679 999 993	-4.2	0.000 000	-0.002

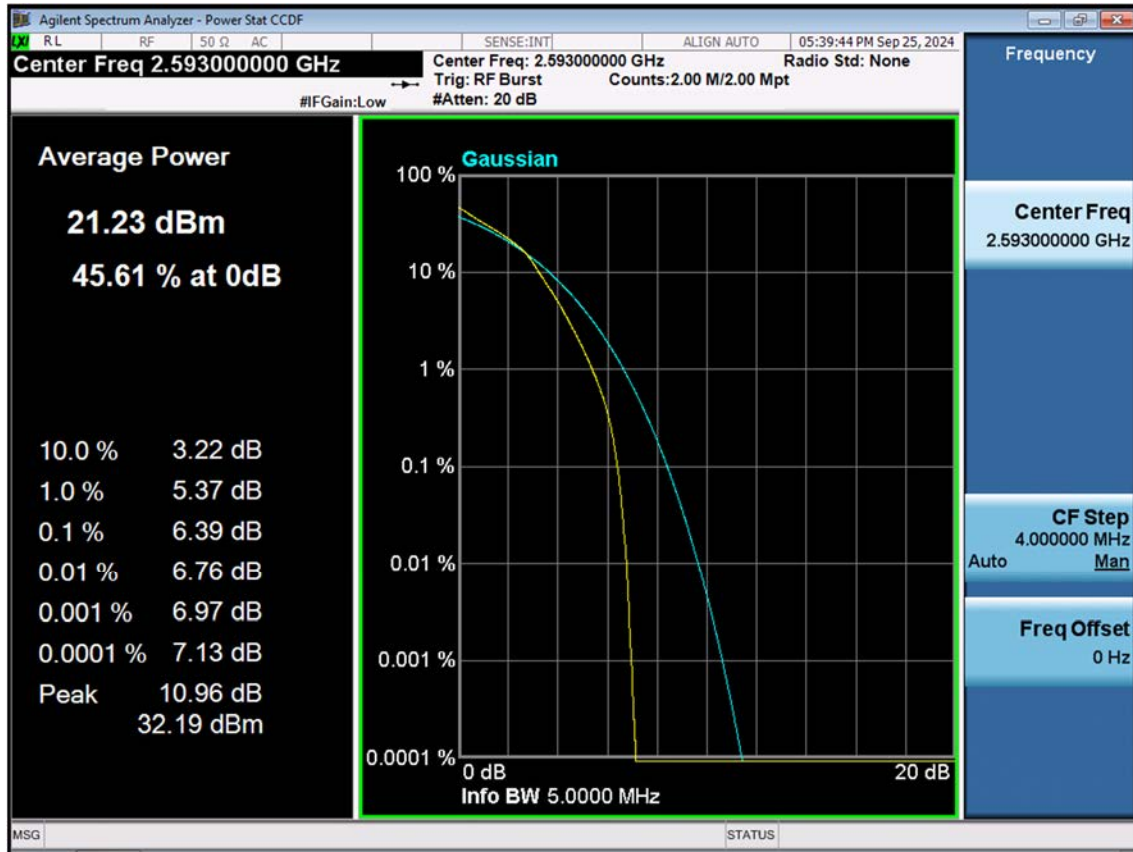


10. TEST PLOTS(Main 2 ANT)

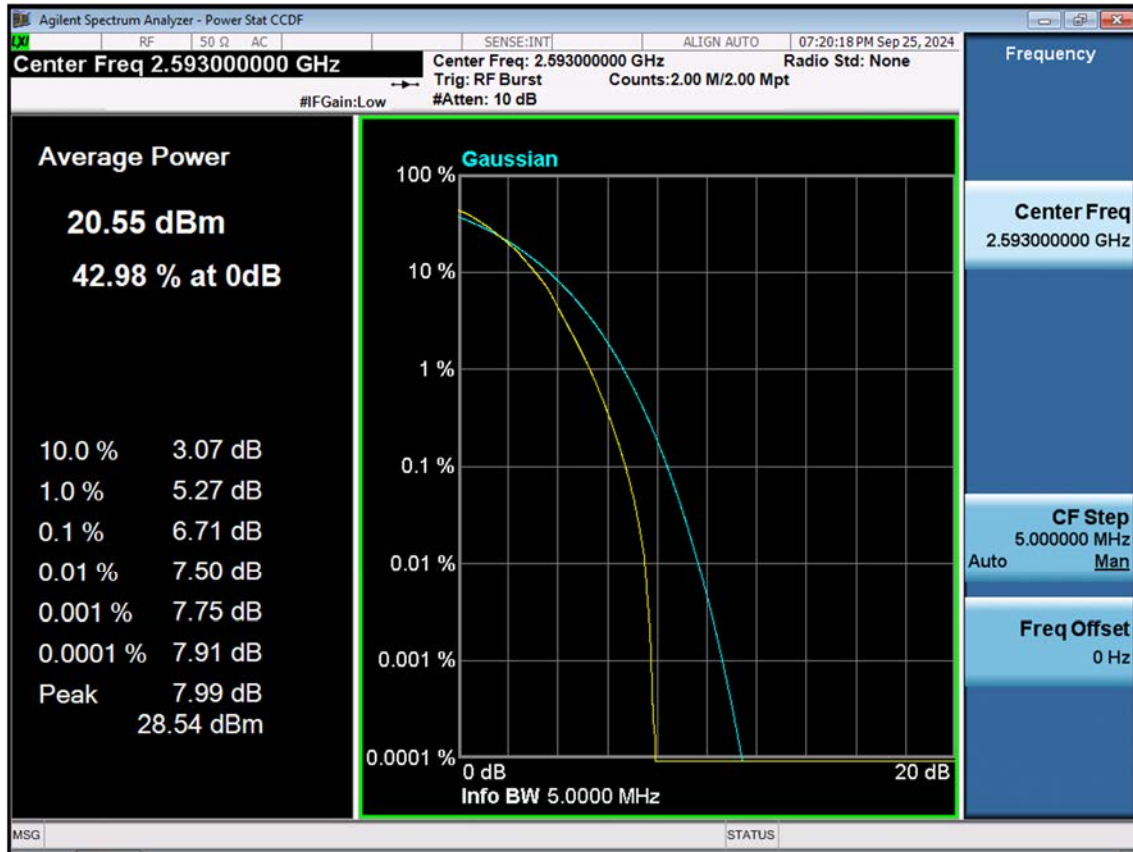
LTE B41_5 M_PAR_Mid_QPSK_FullIRB



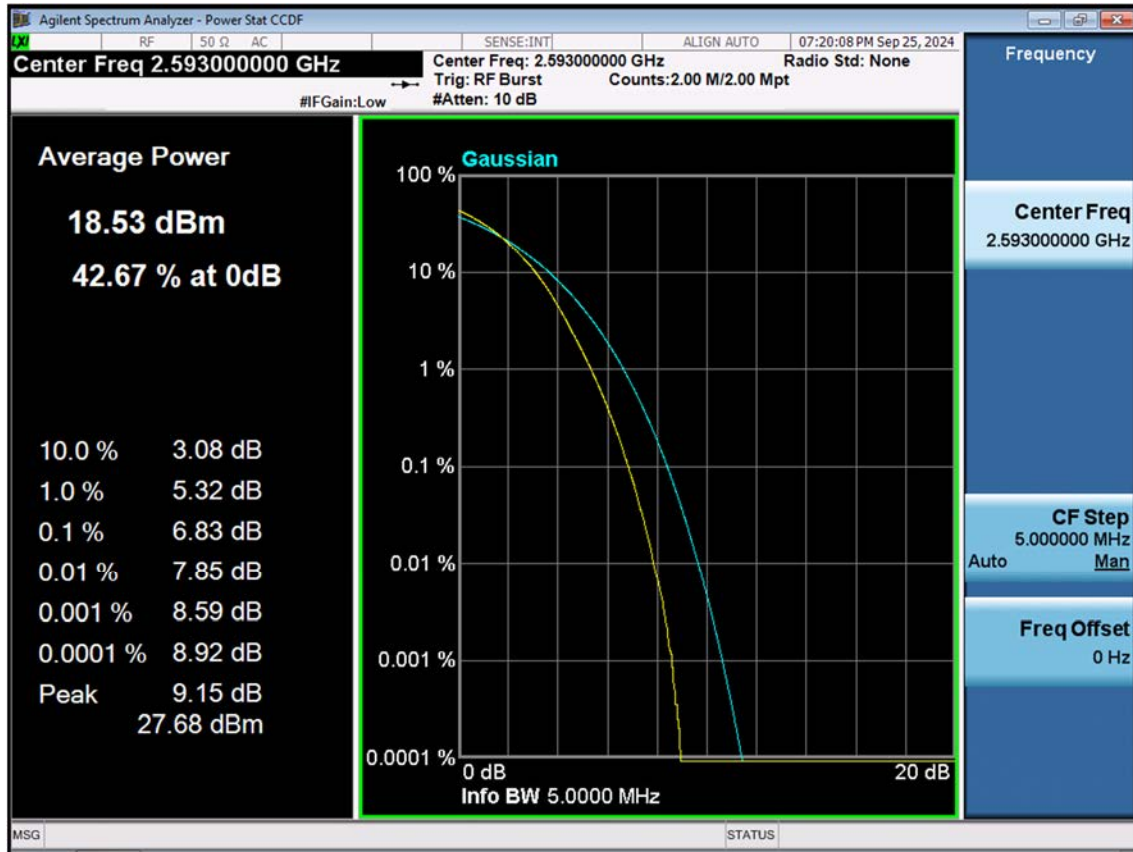
LTE B41_5 M_PAR_Mid_16QAM_FullRB



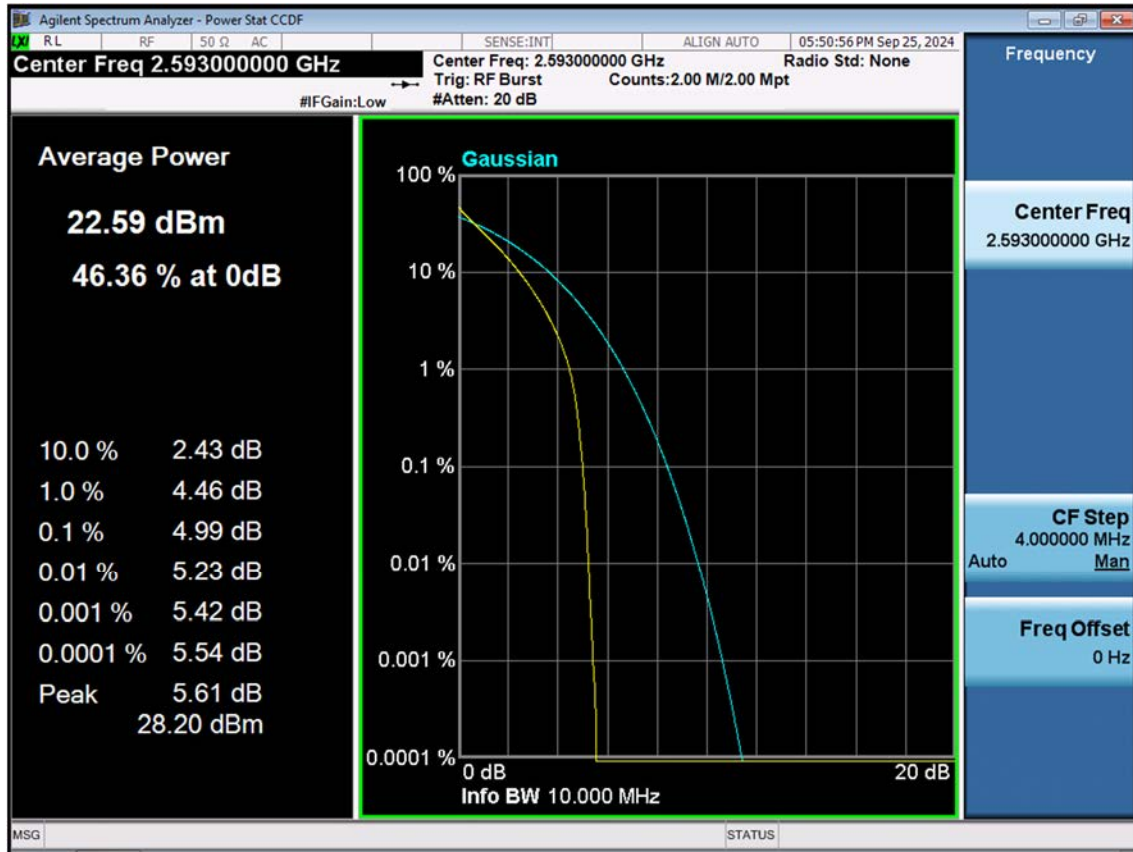
LTE B41_5 M_PAR_Mid_64QAM_FullRB



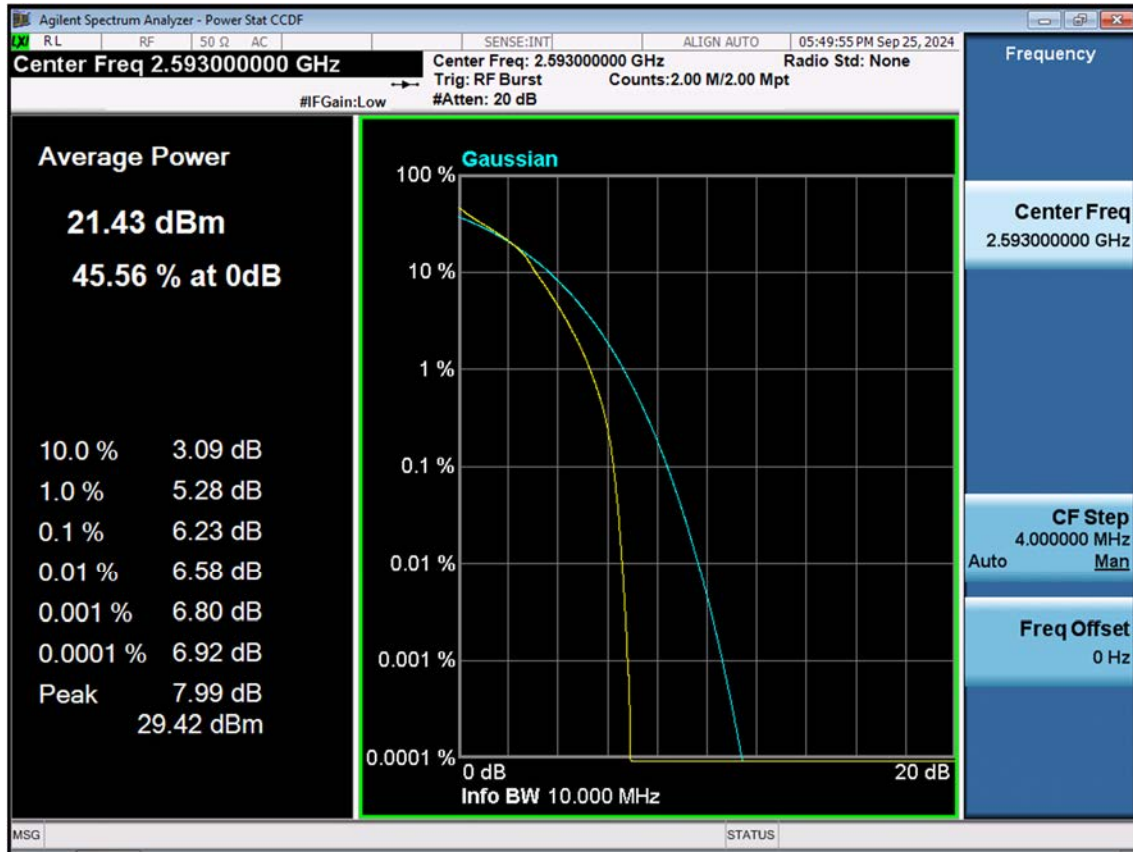
LTE B41_5 M_PAR_Mid_256QAM_FullRB



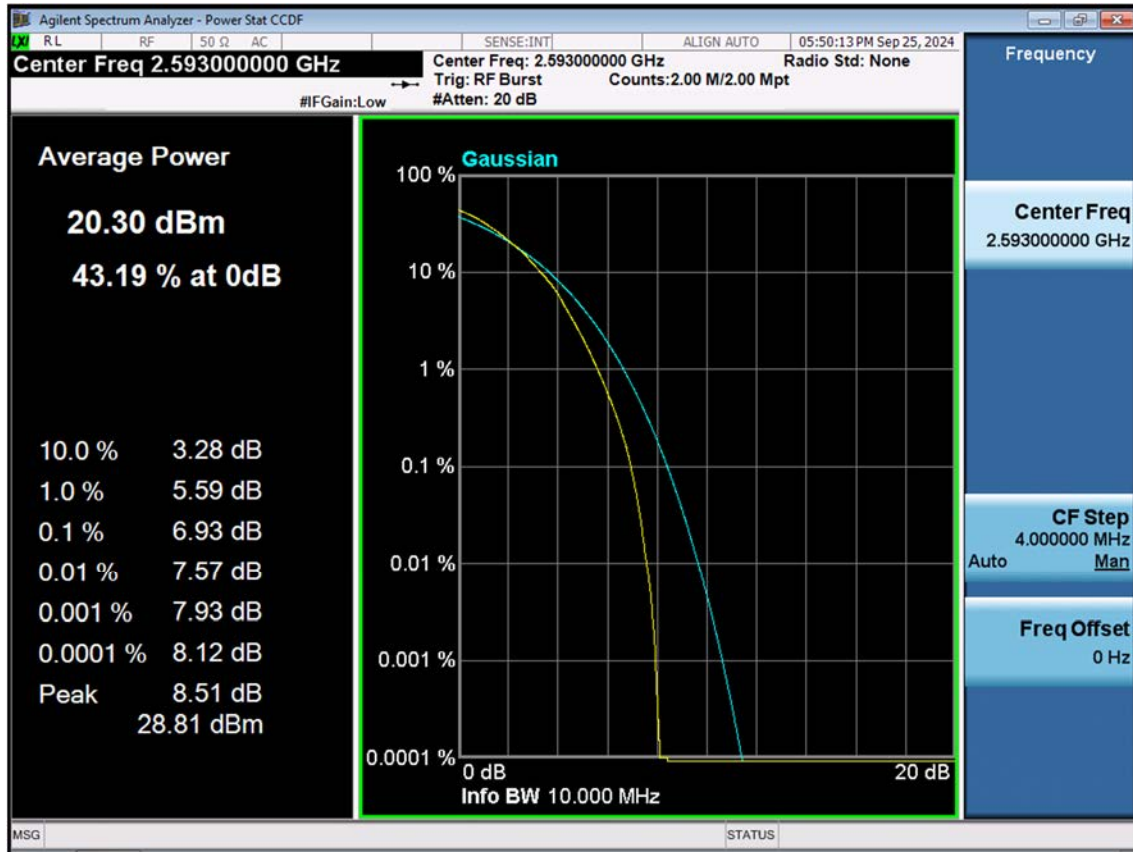
LTE B41_10 M_PAR_Mid_QPSK_FullRB



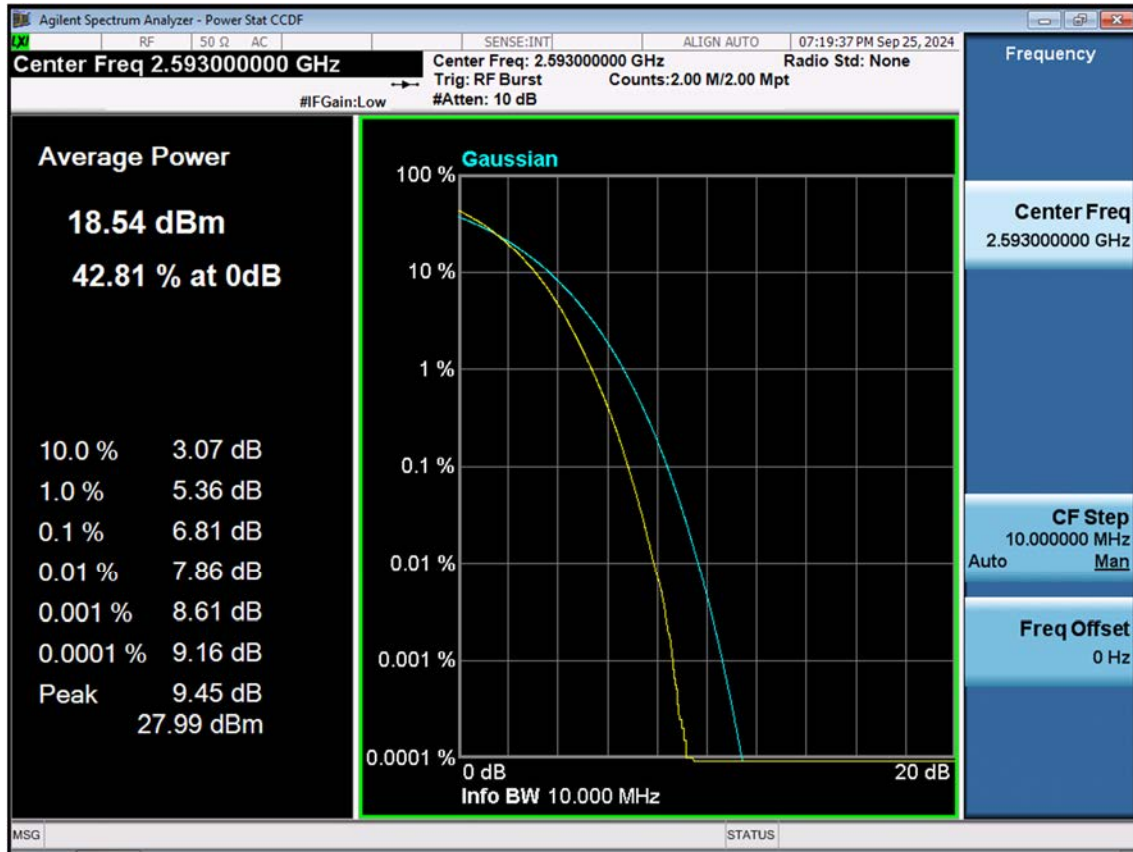
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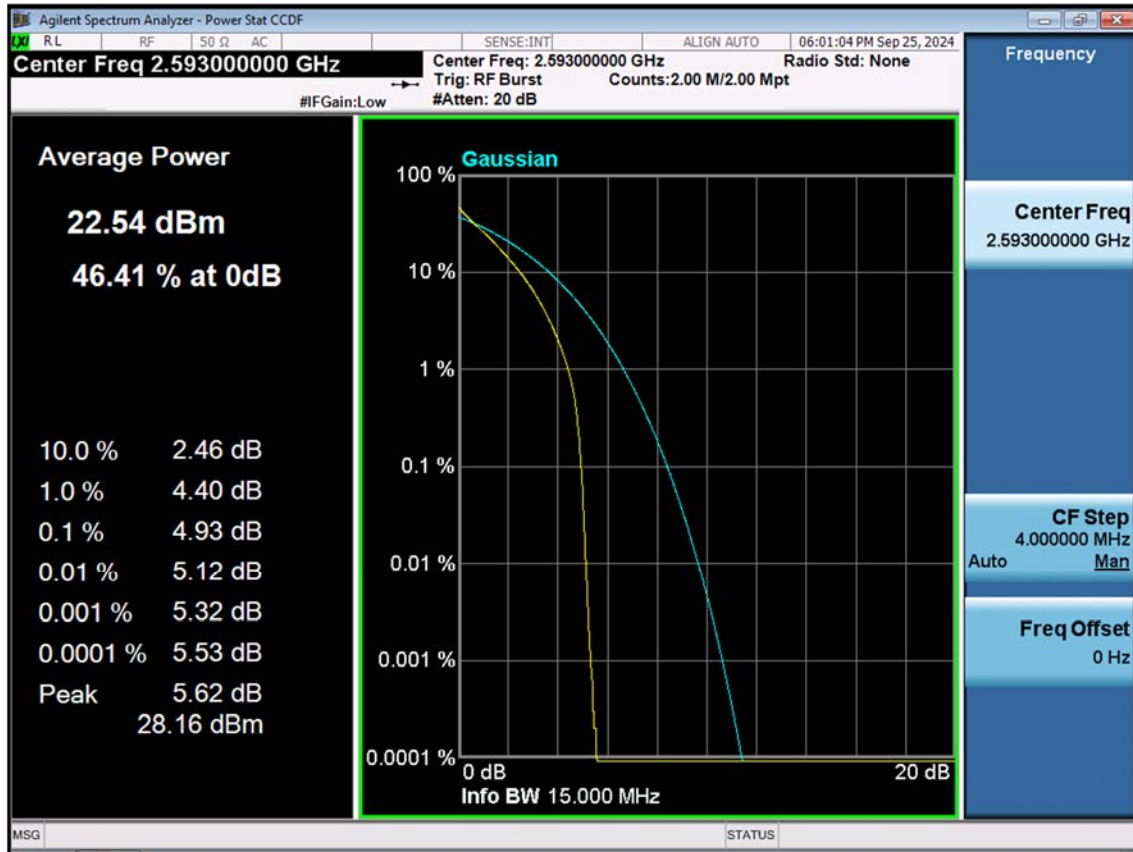
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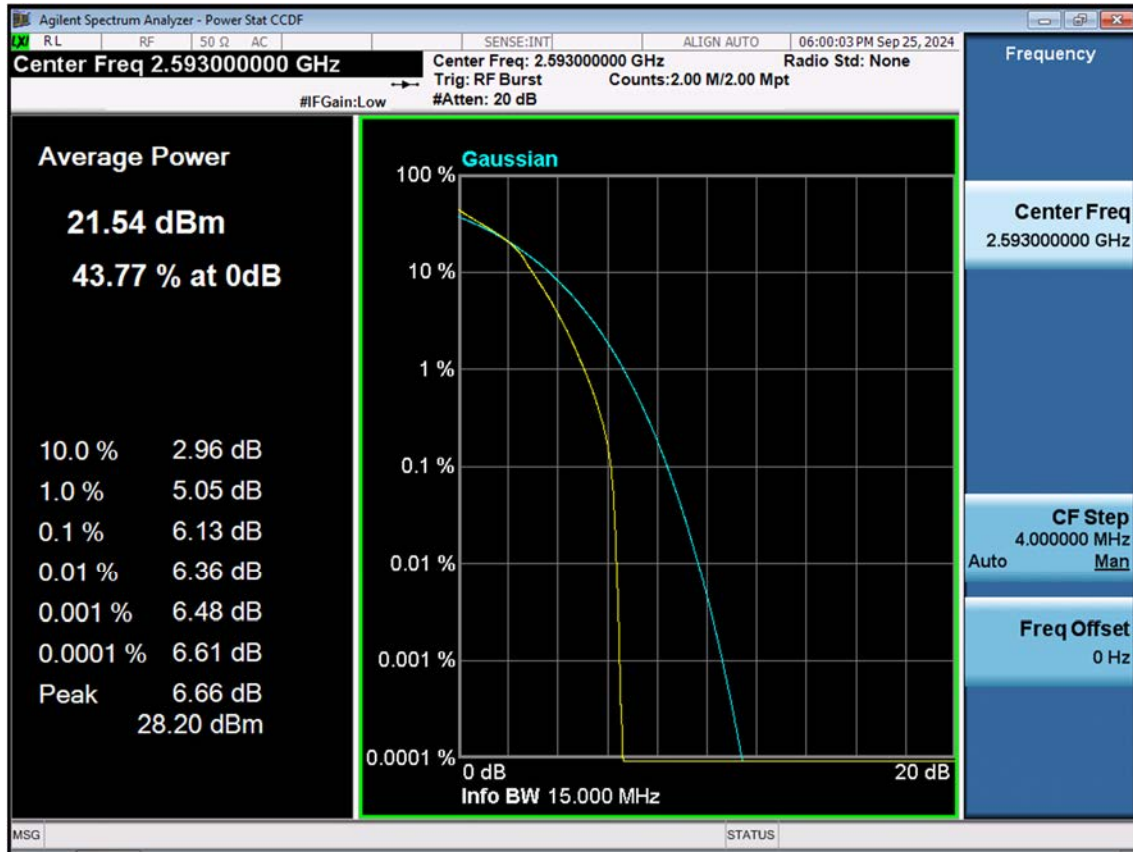
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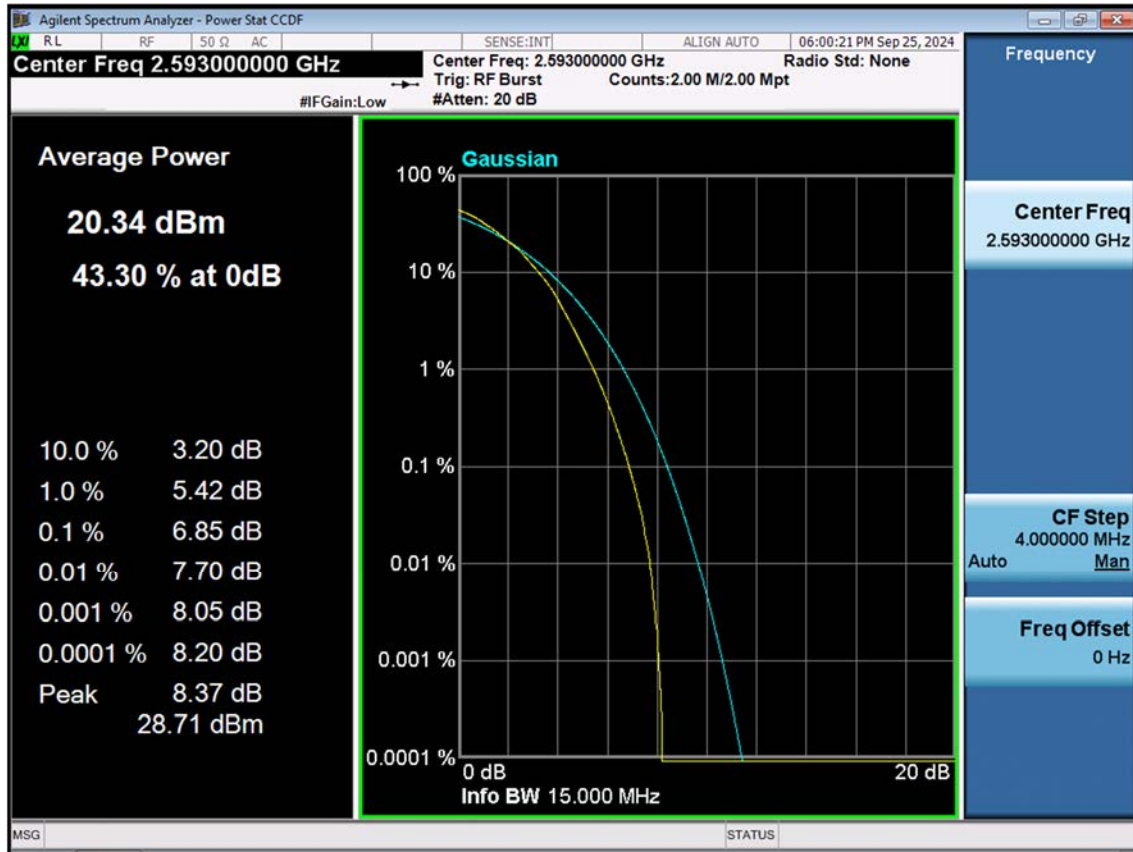
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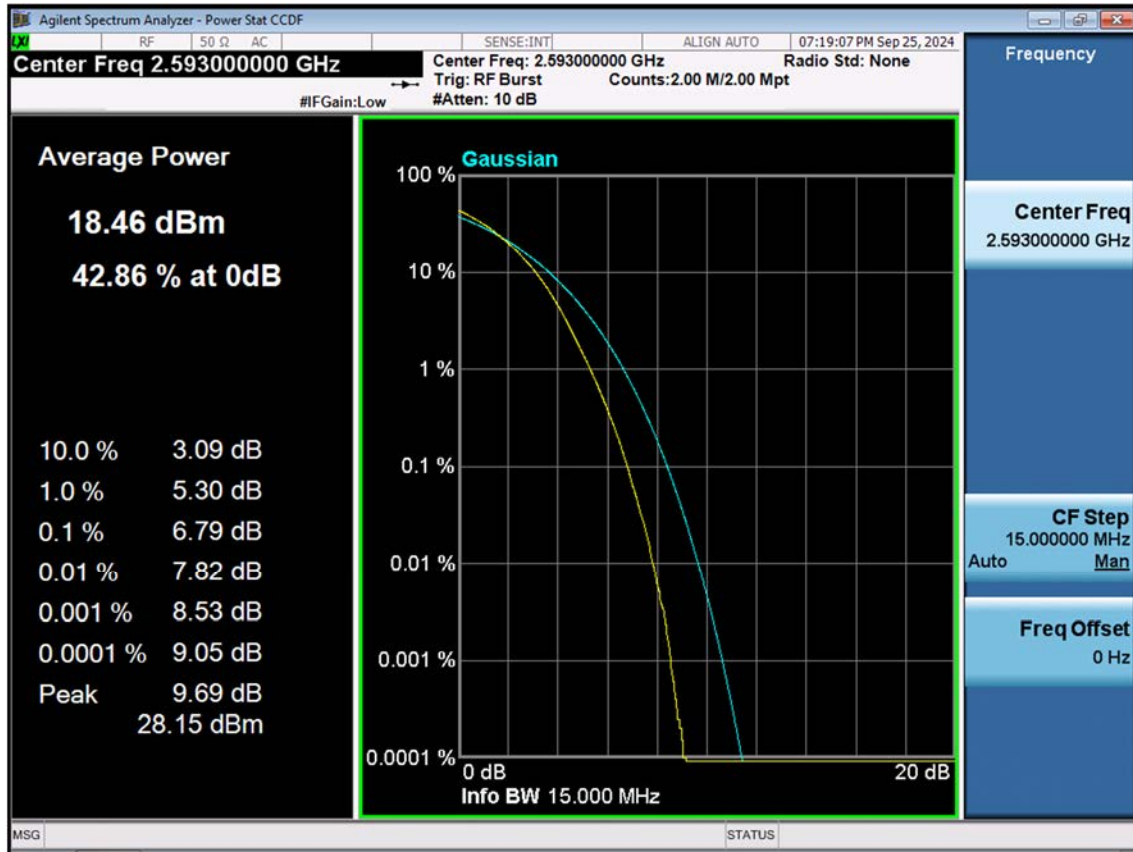
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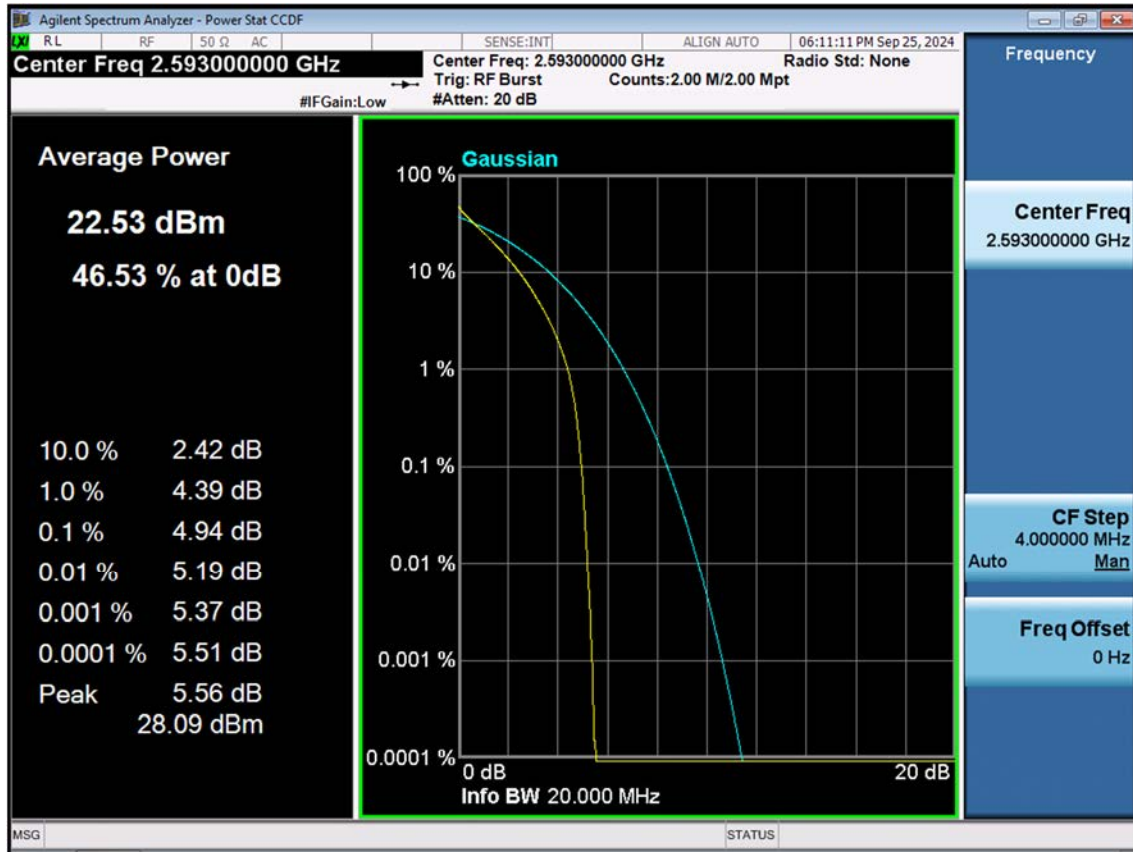
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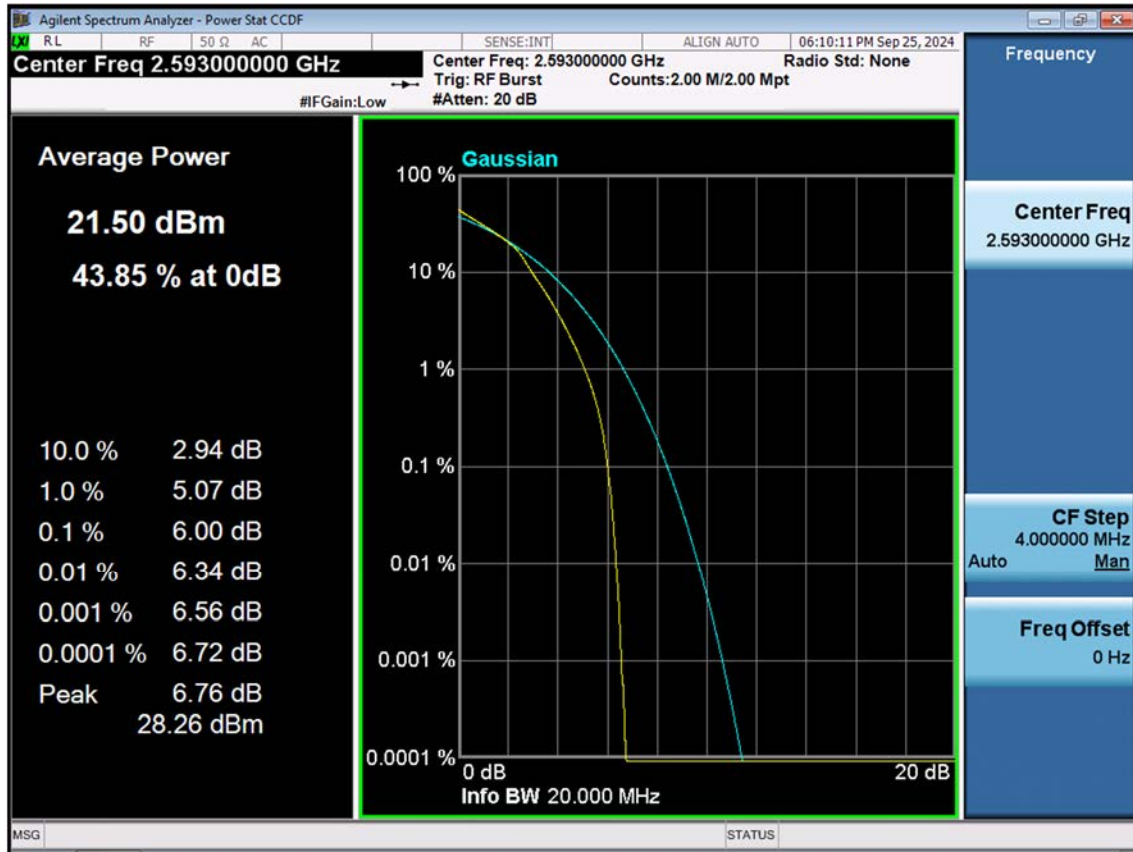
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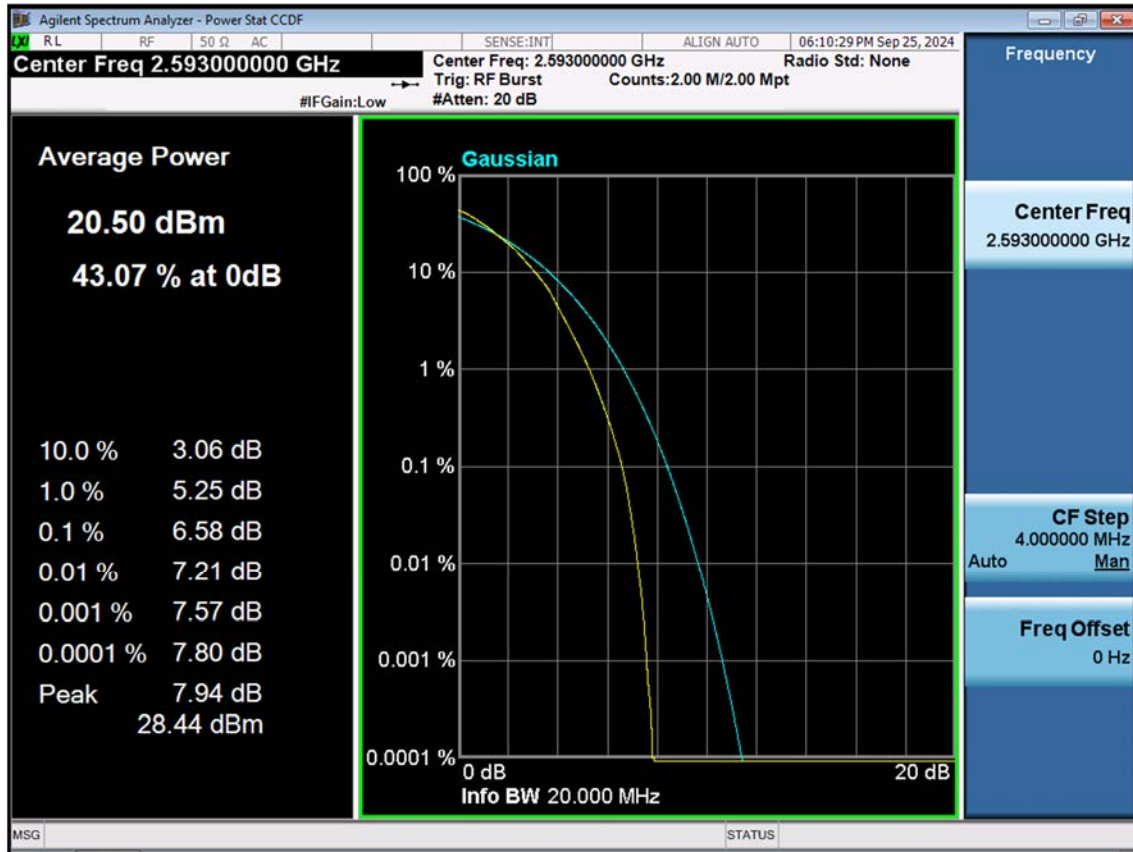
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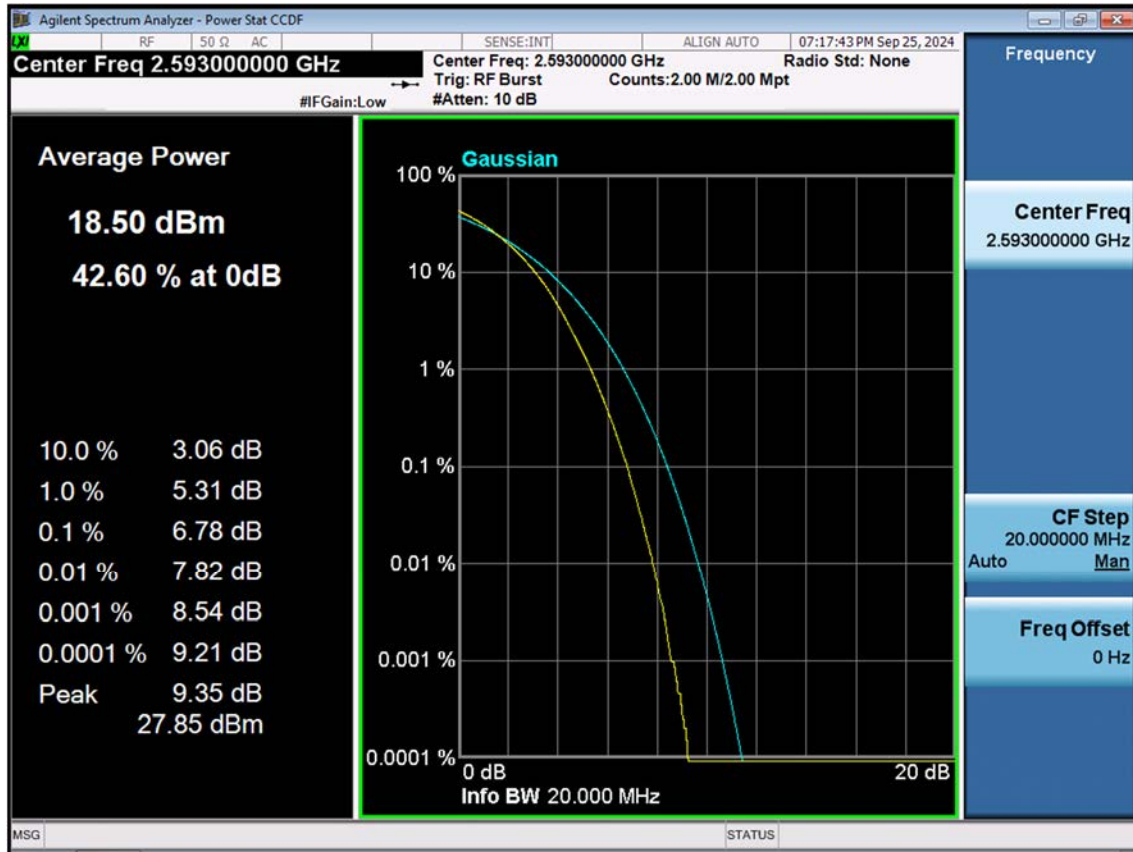
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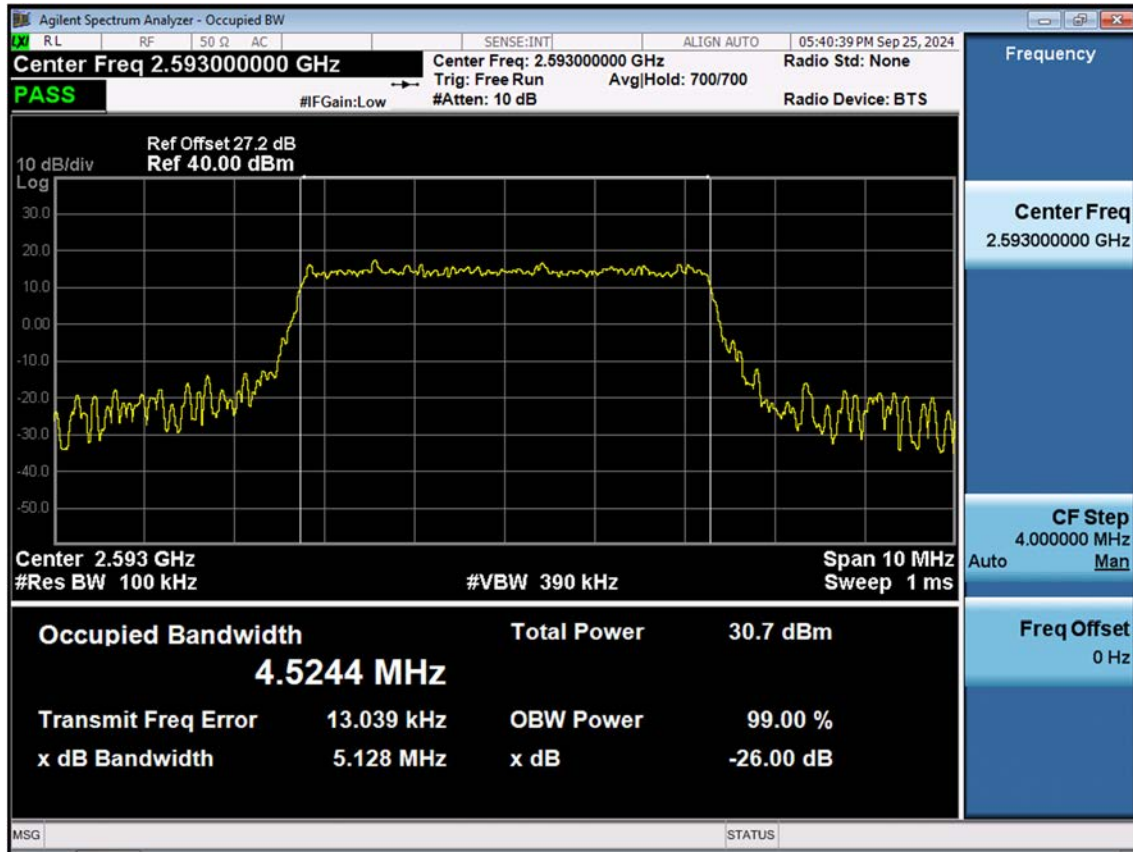
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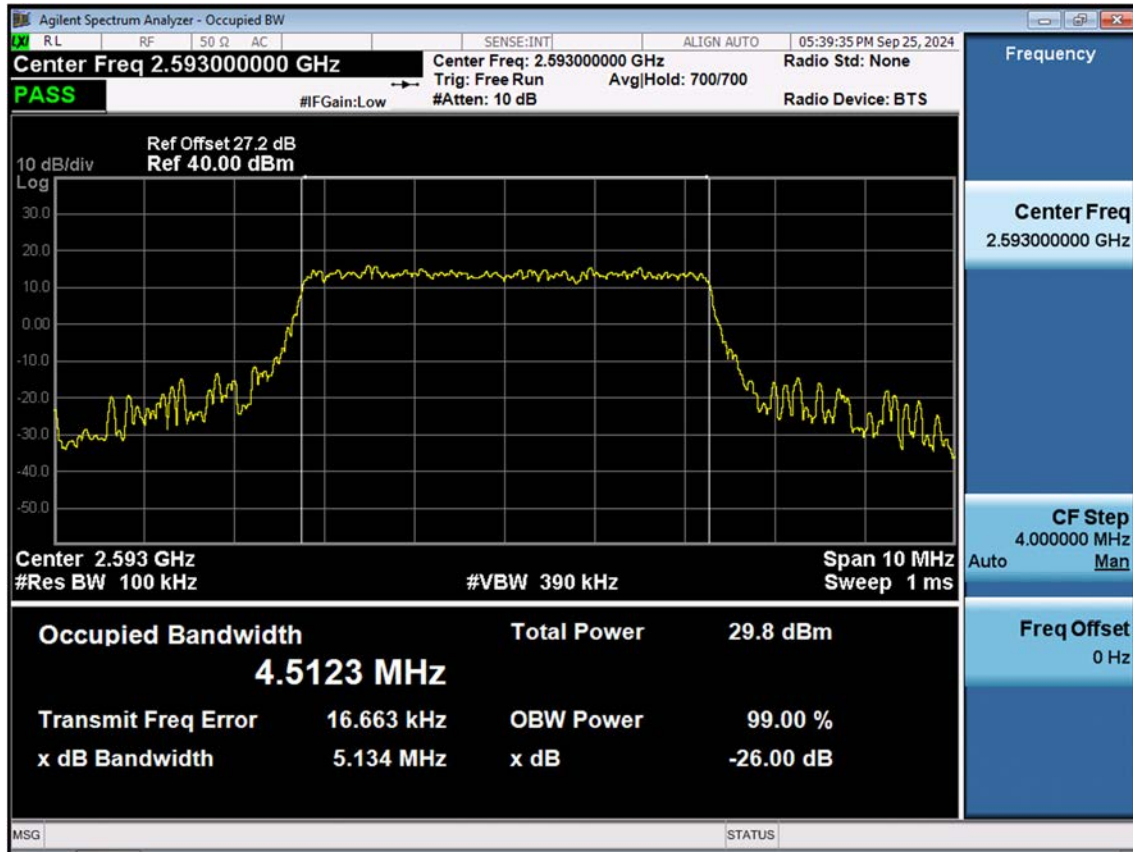
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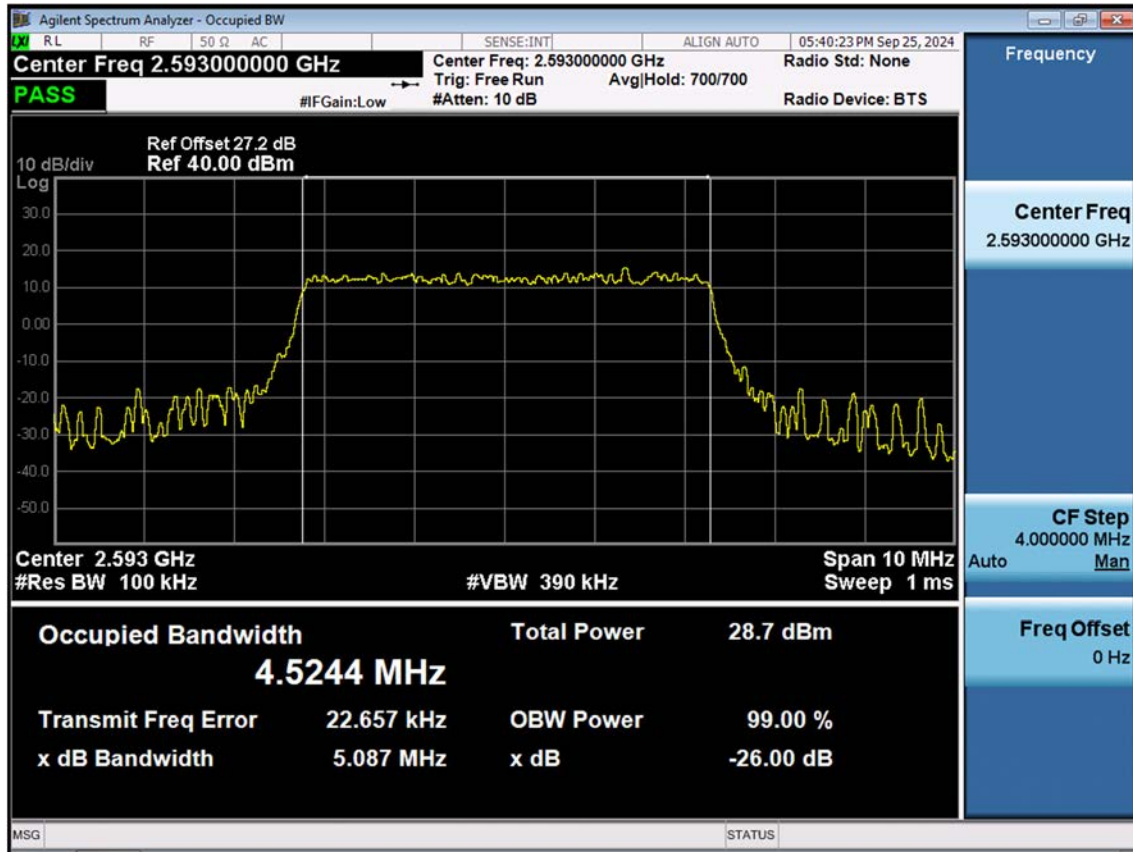
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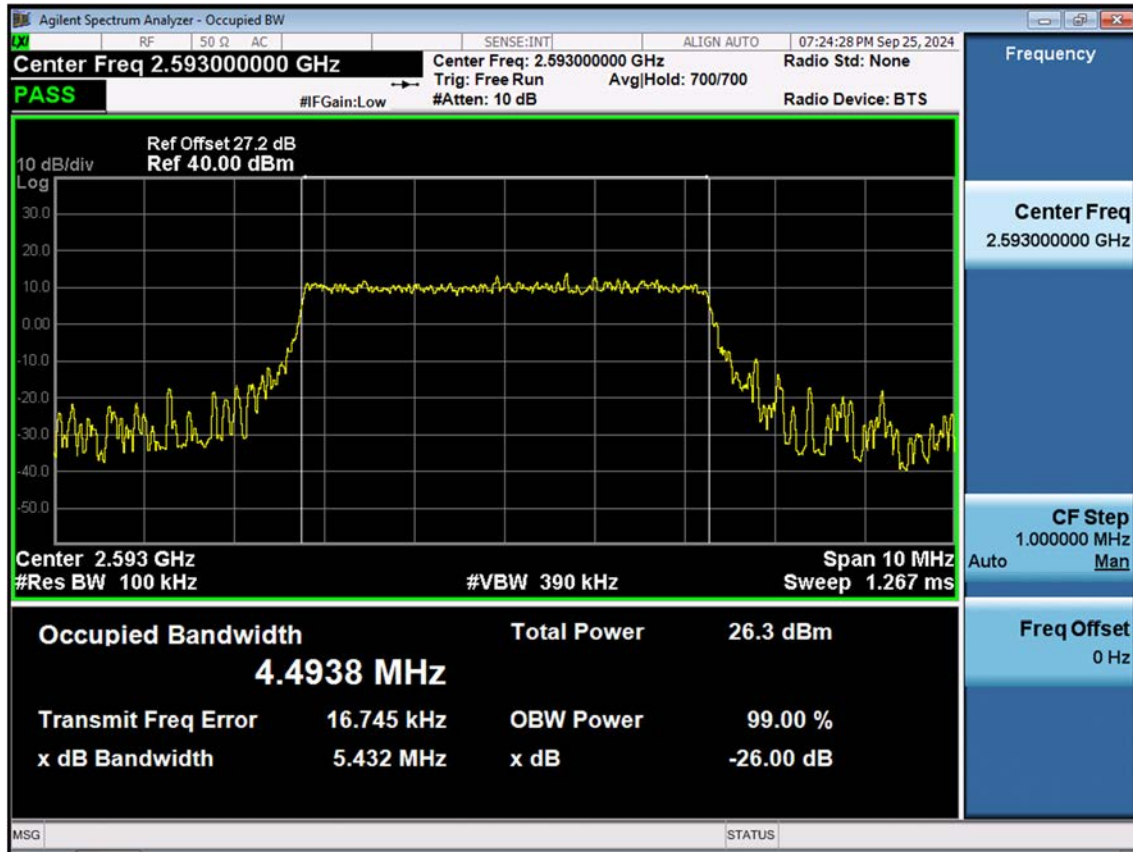
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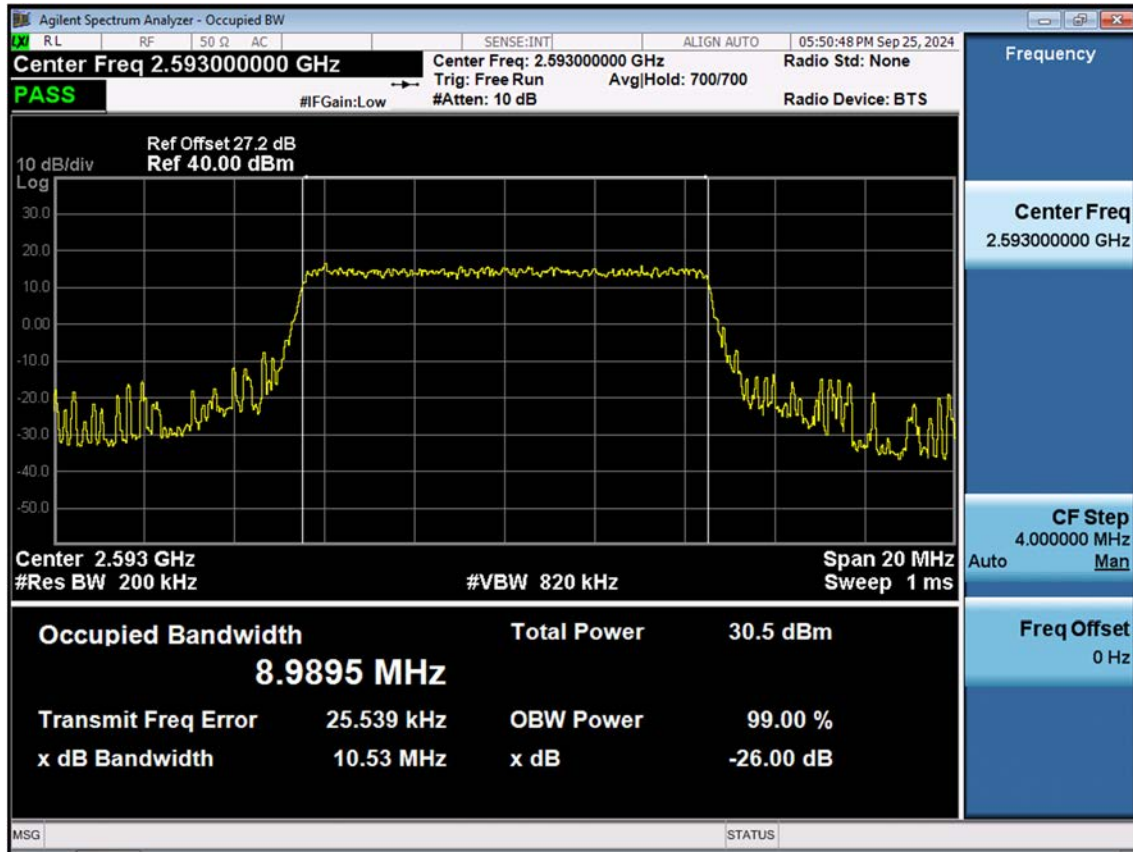
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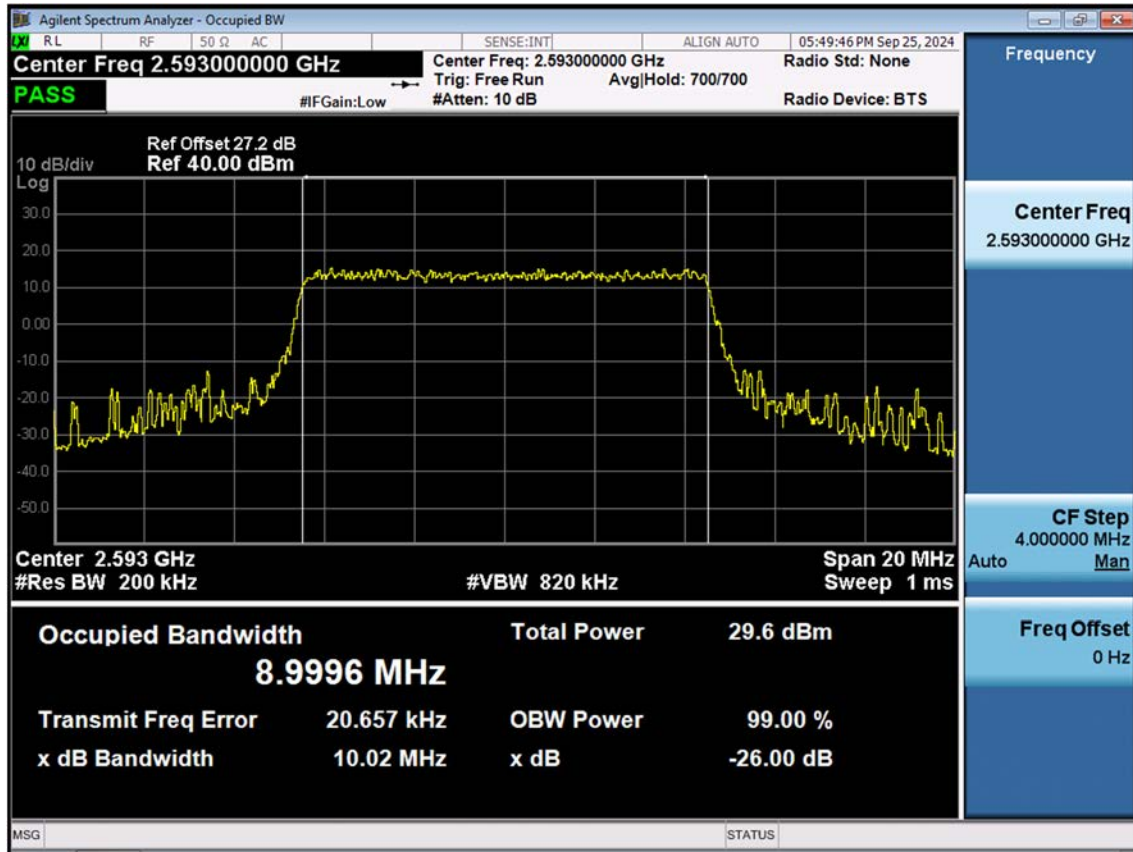
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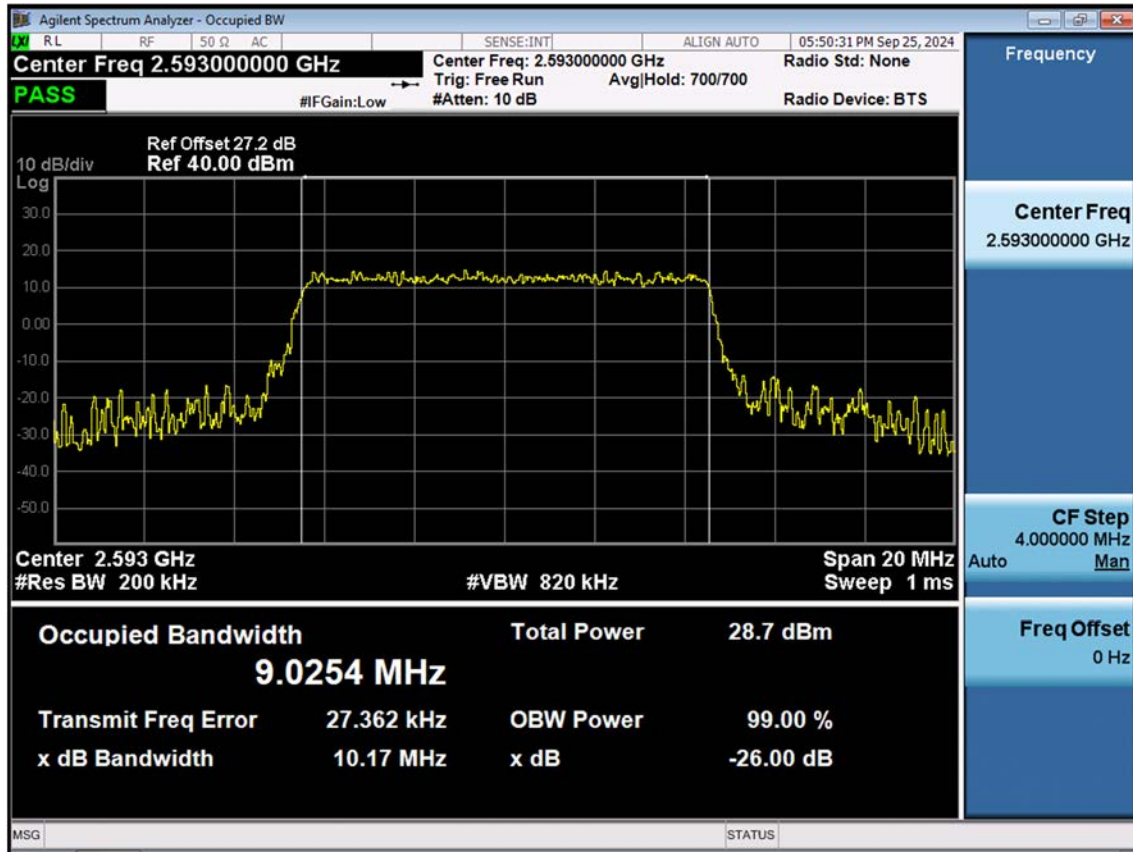
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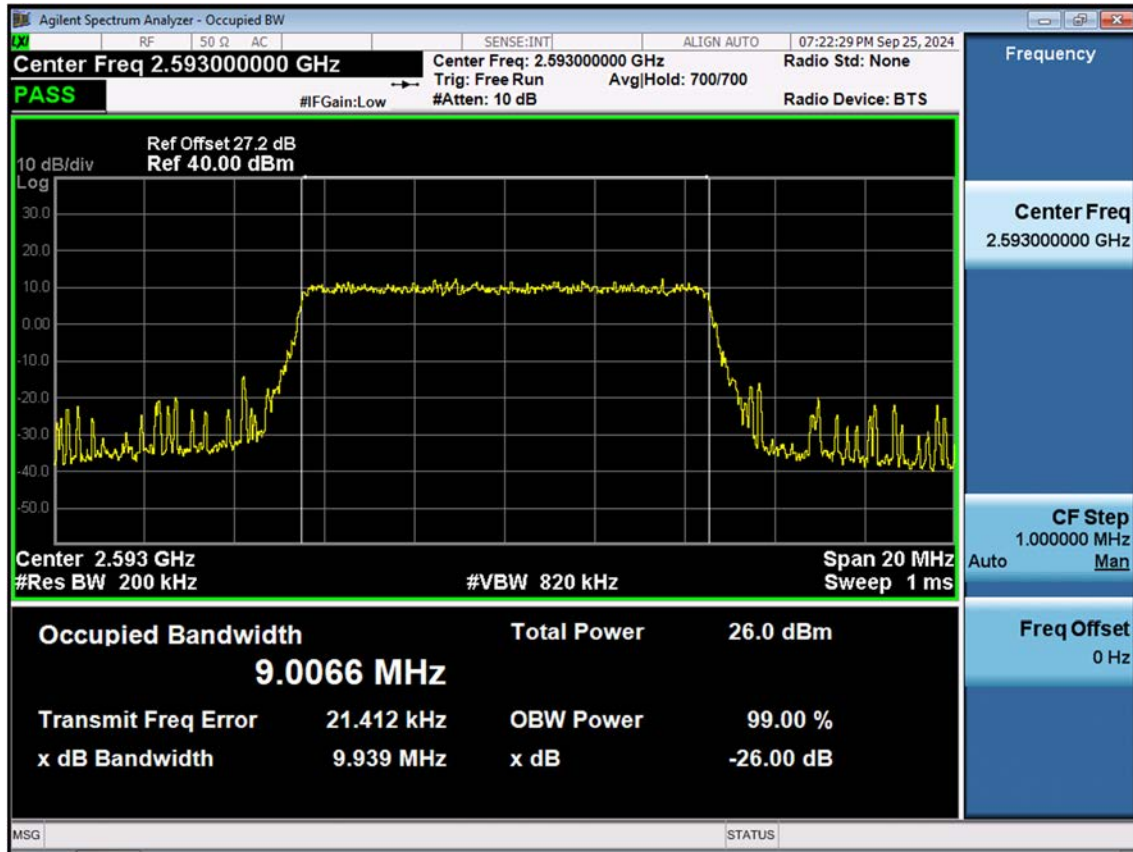
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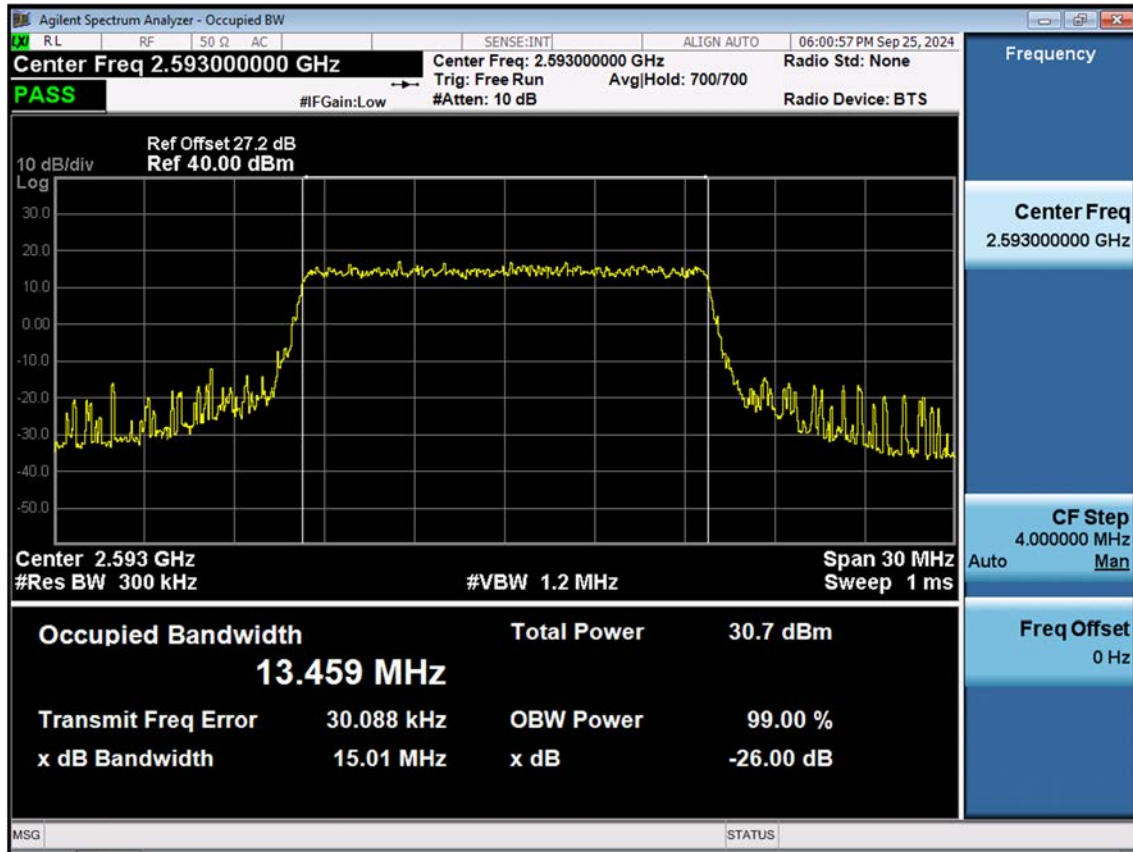
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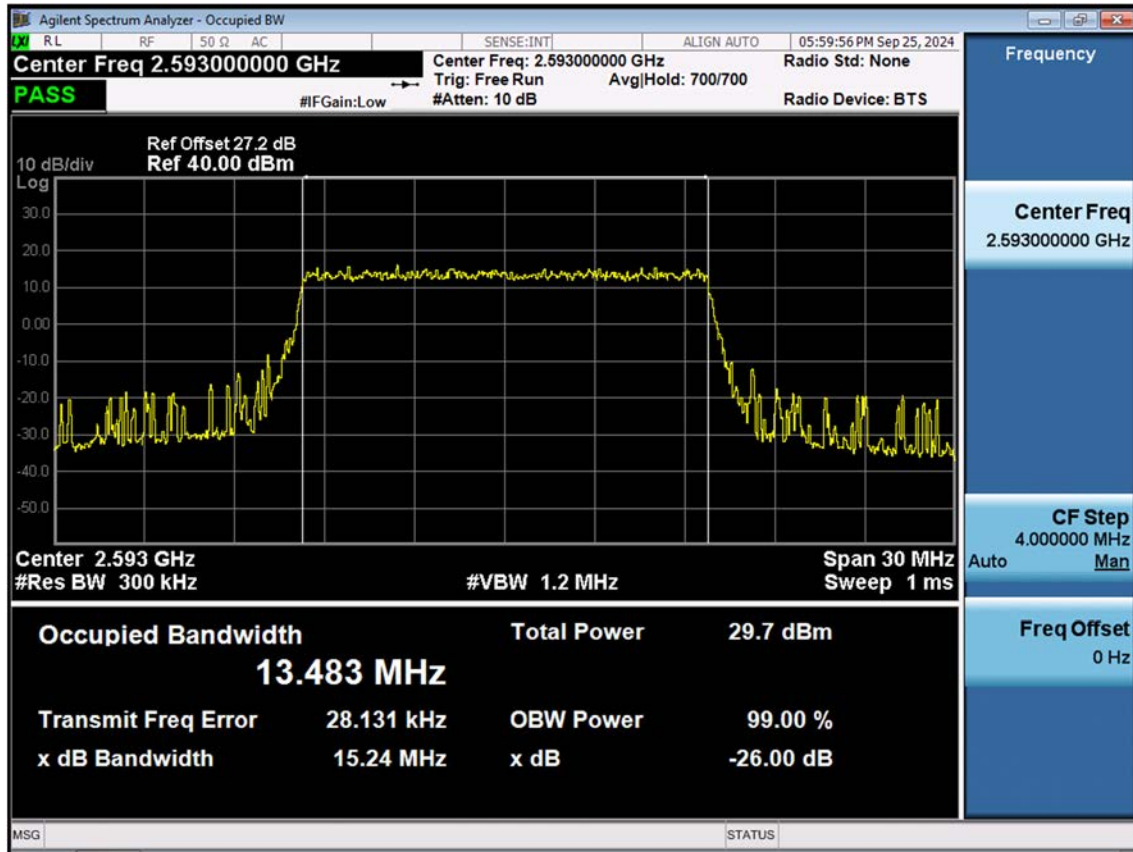
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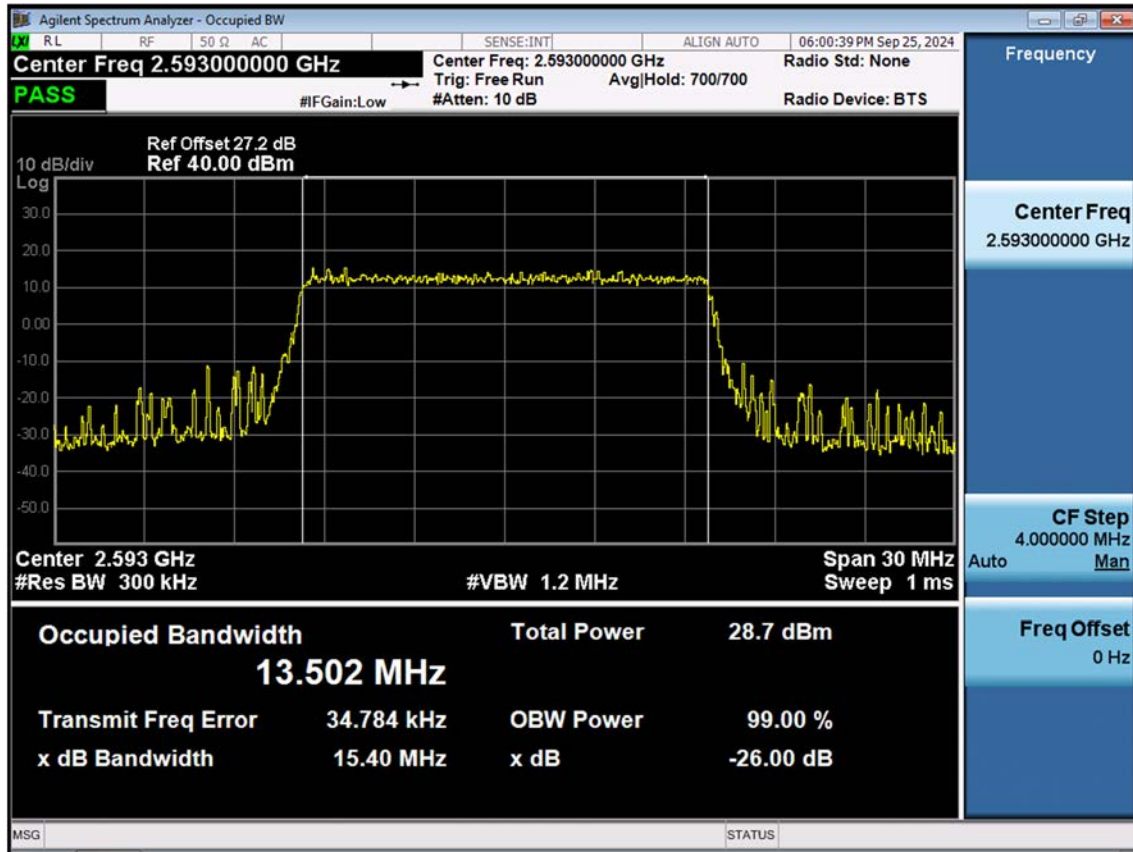
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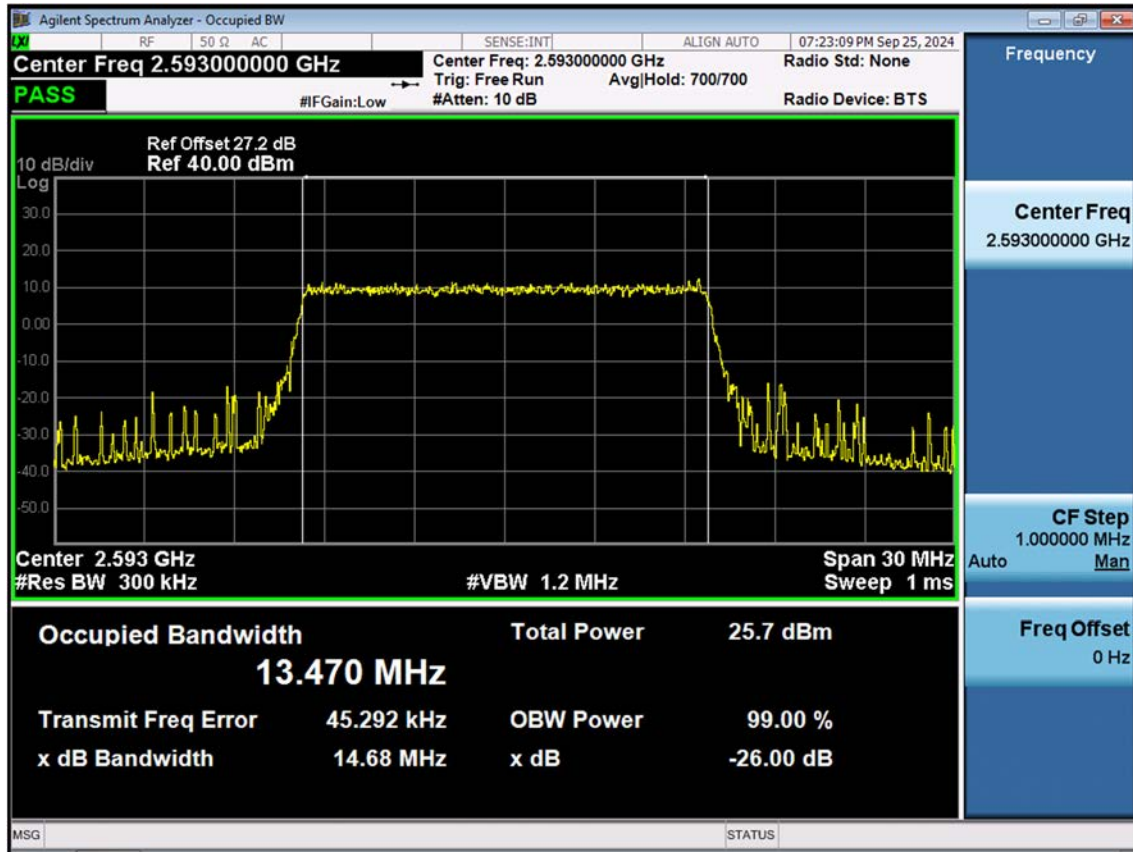
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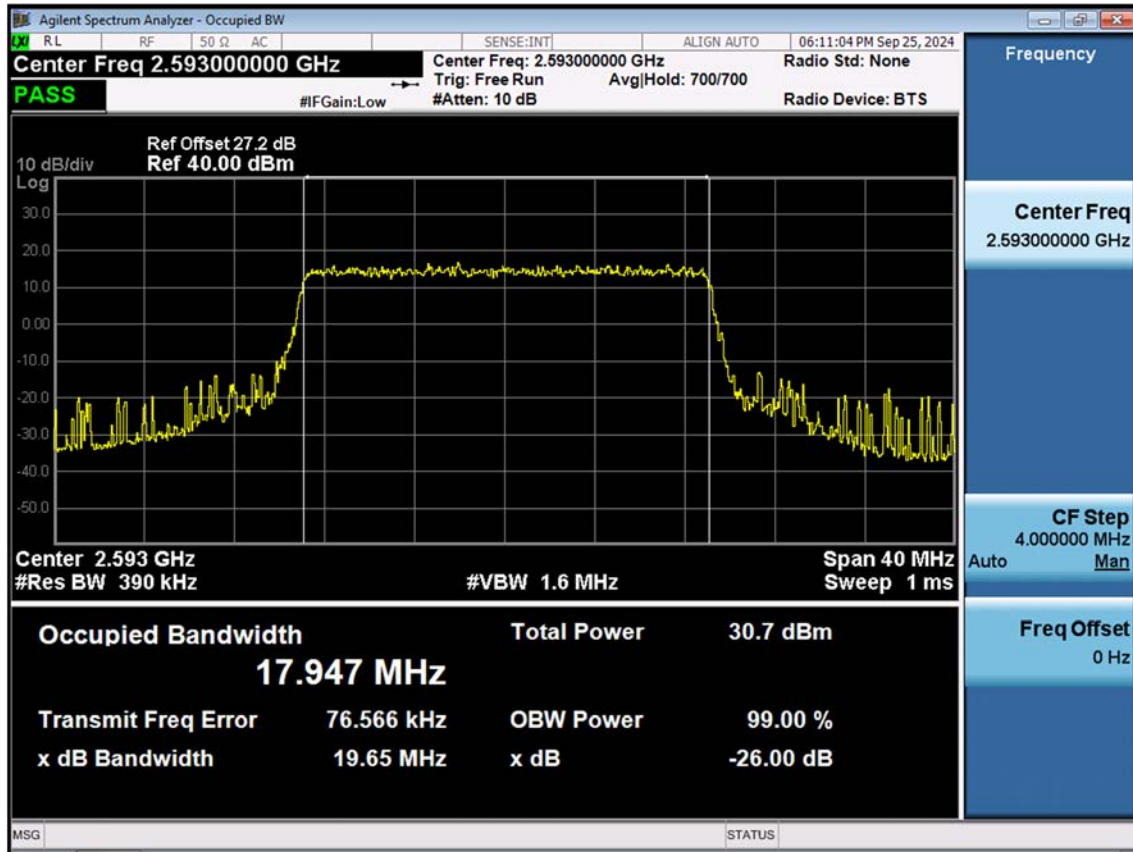
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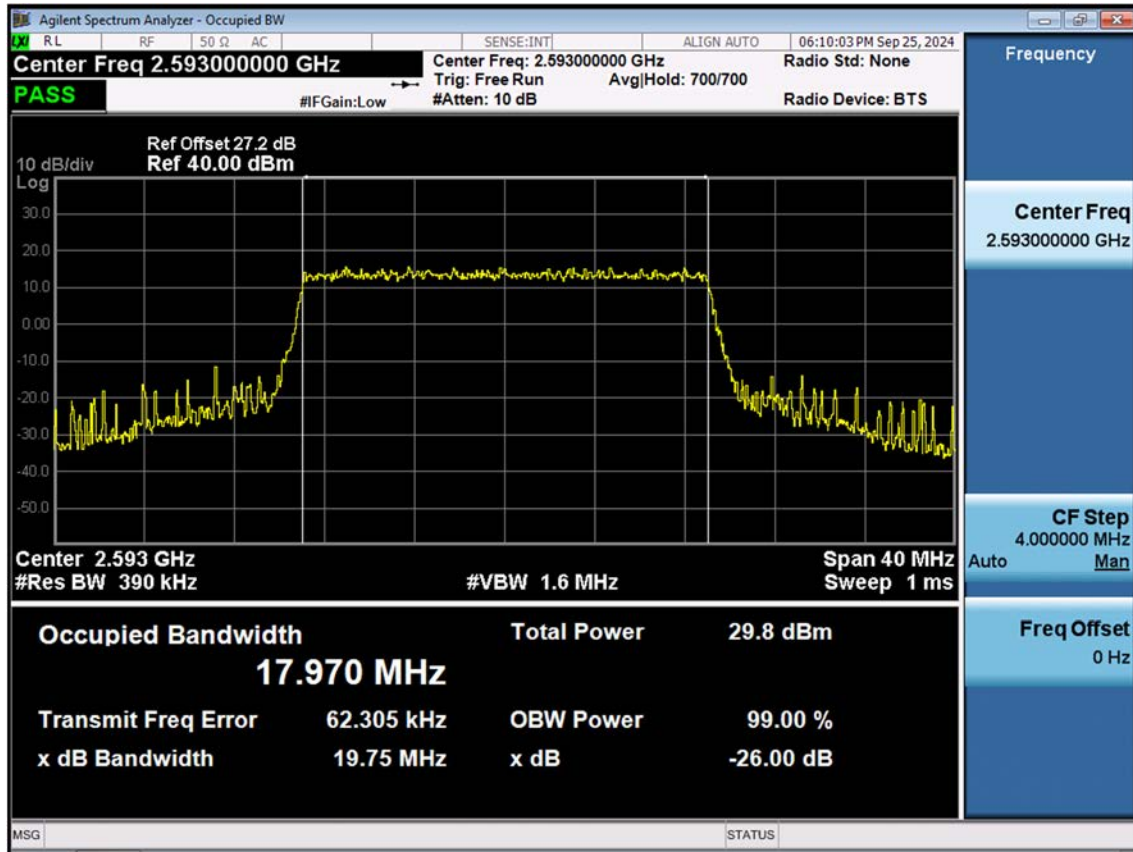
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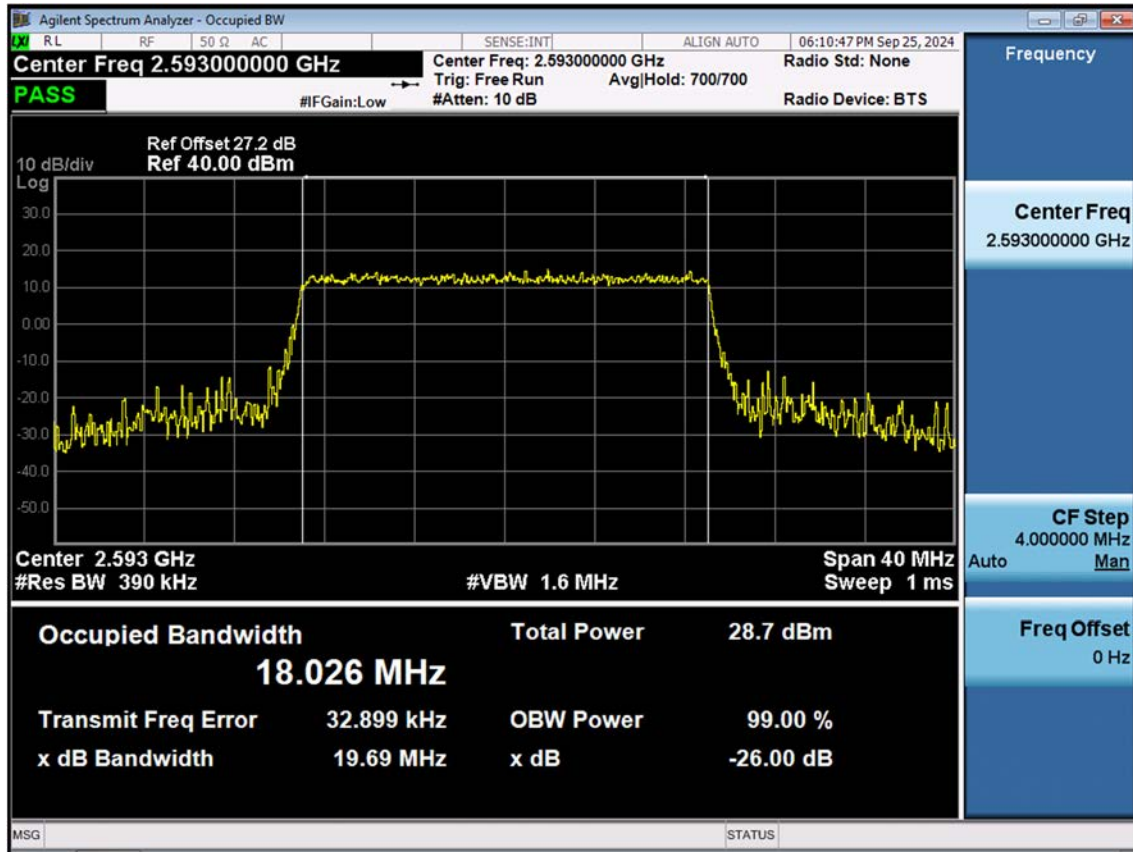
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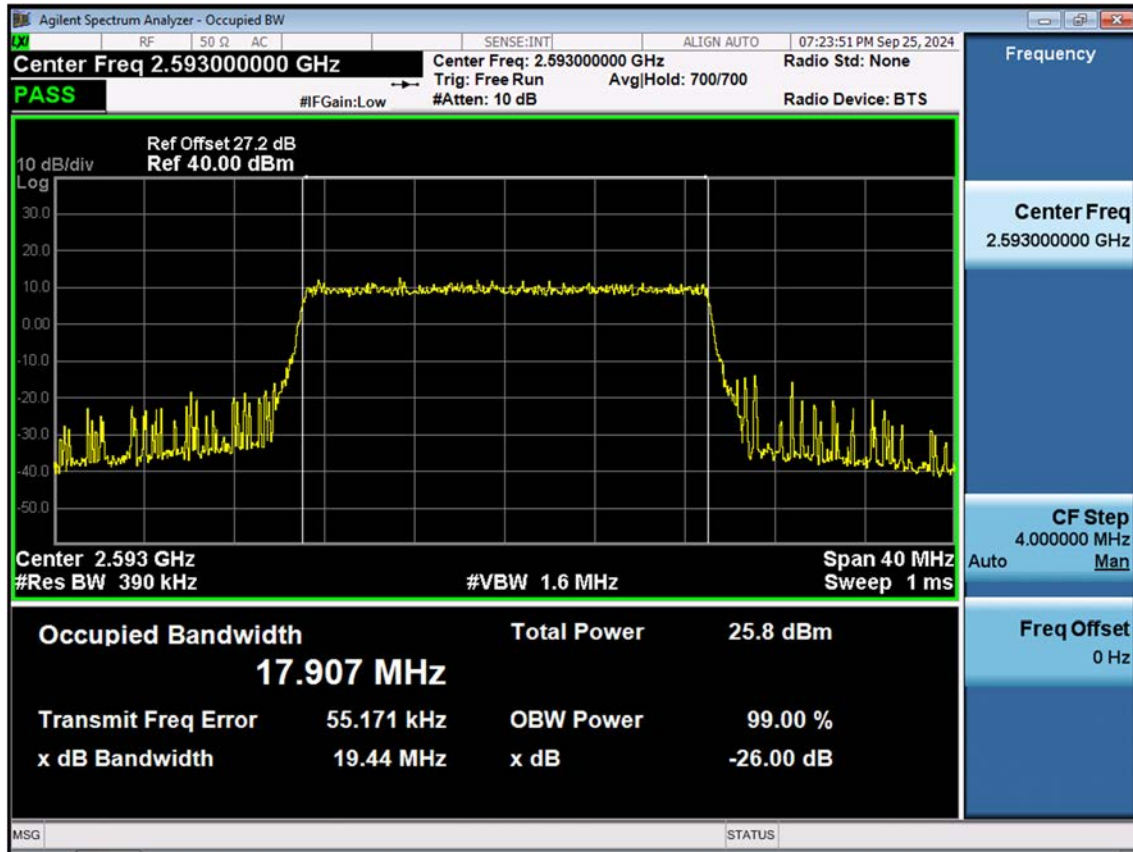
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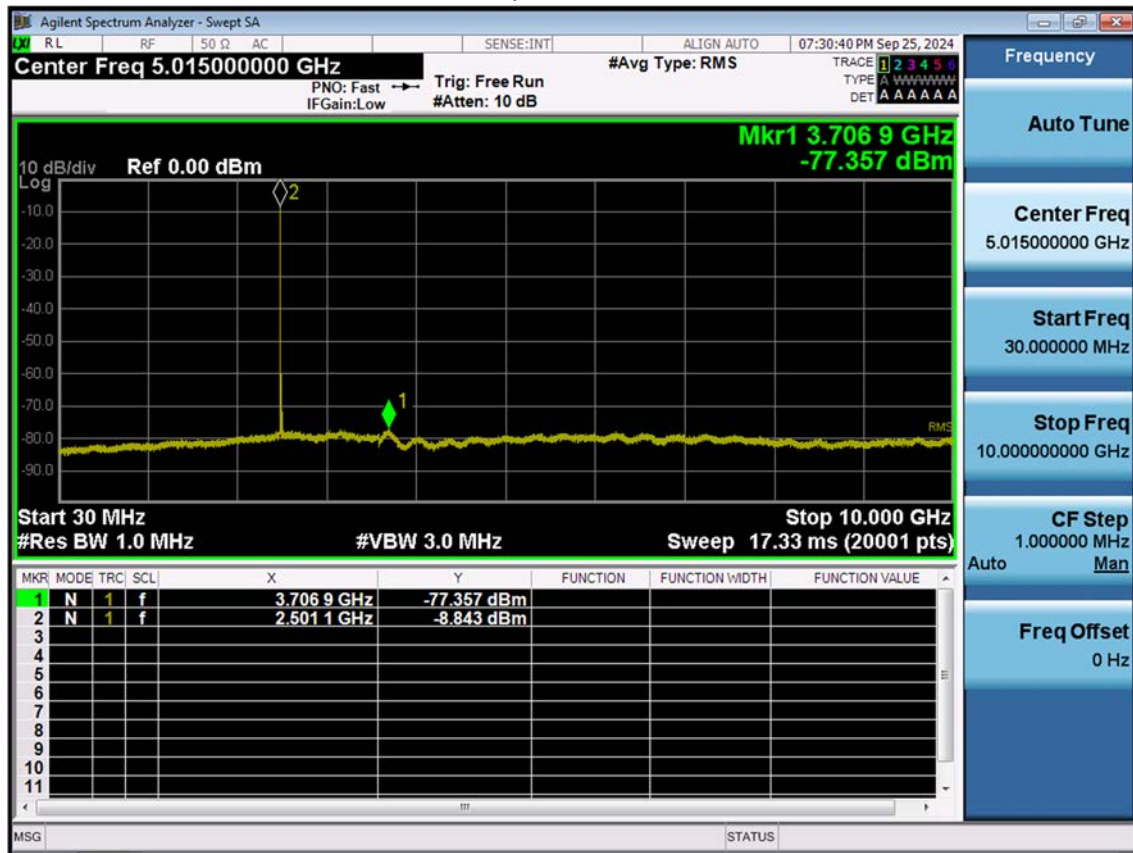
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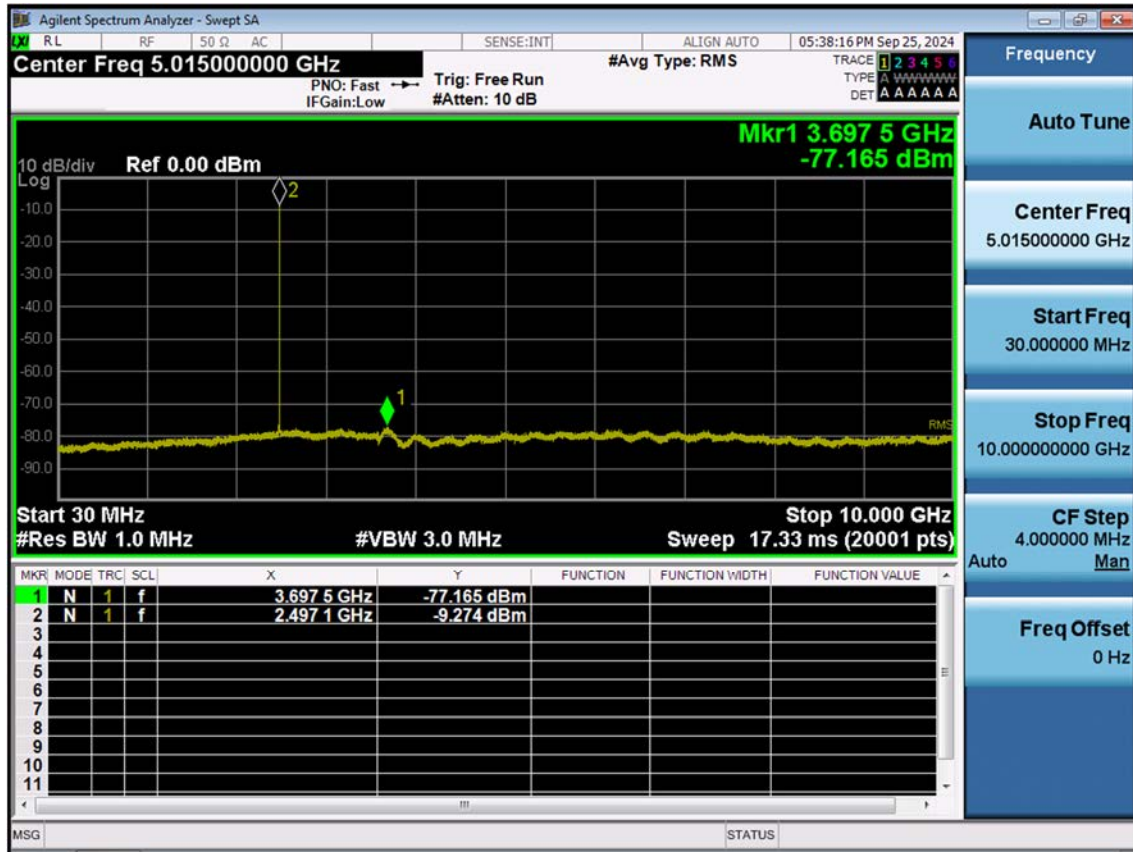
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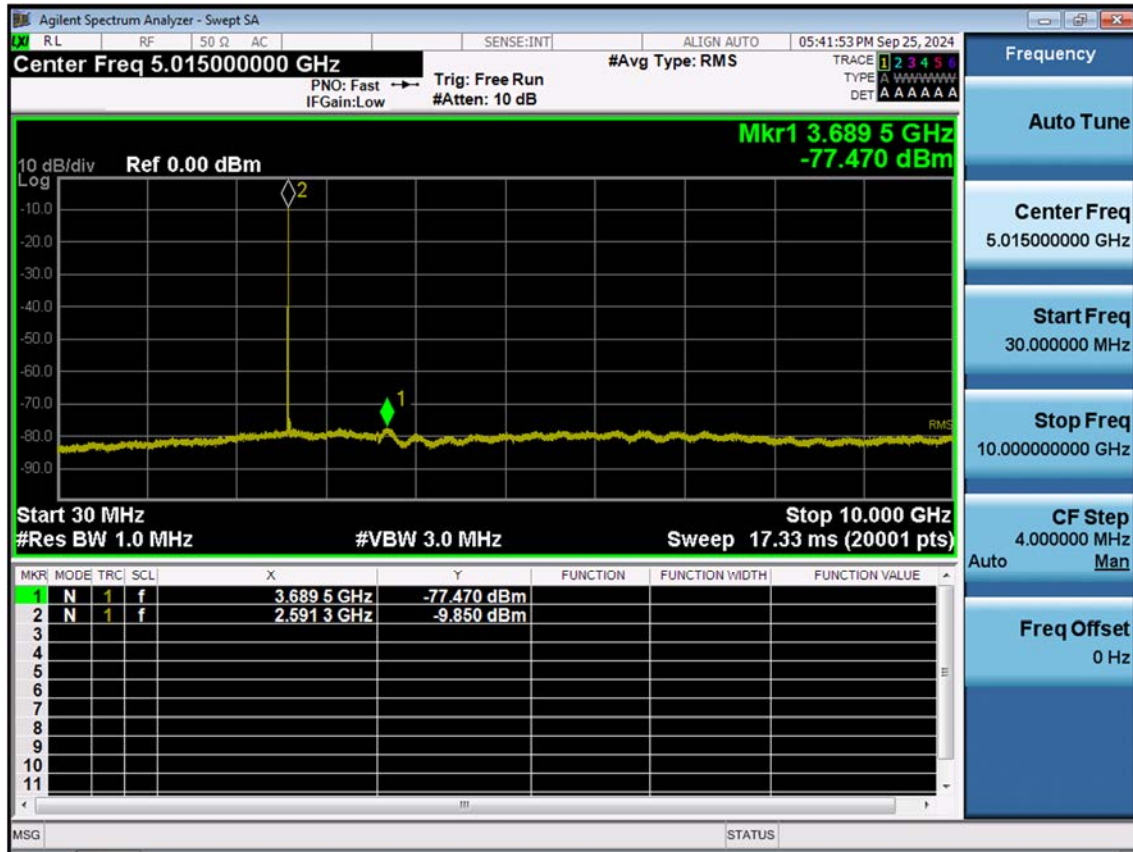
LTE B41_5 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB_1



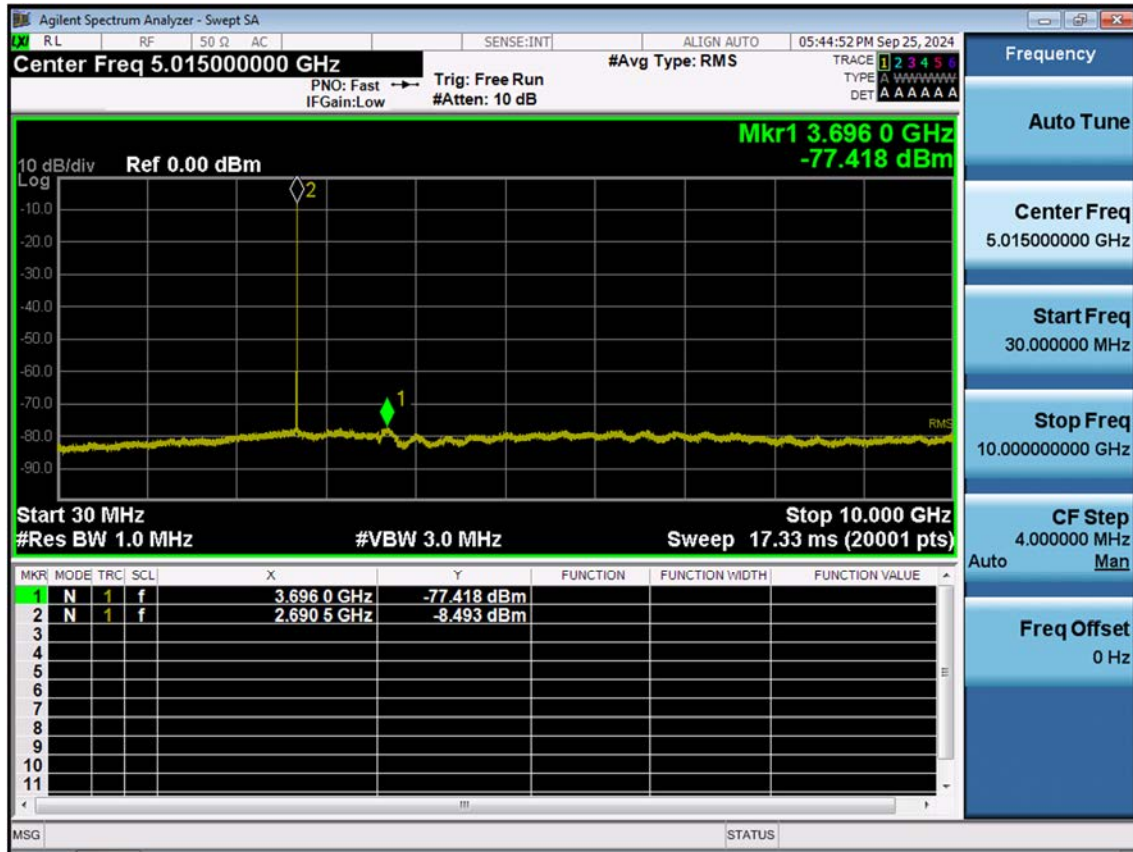
LTE B41_5 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB_2



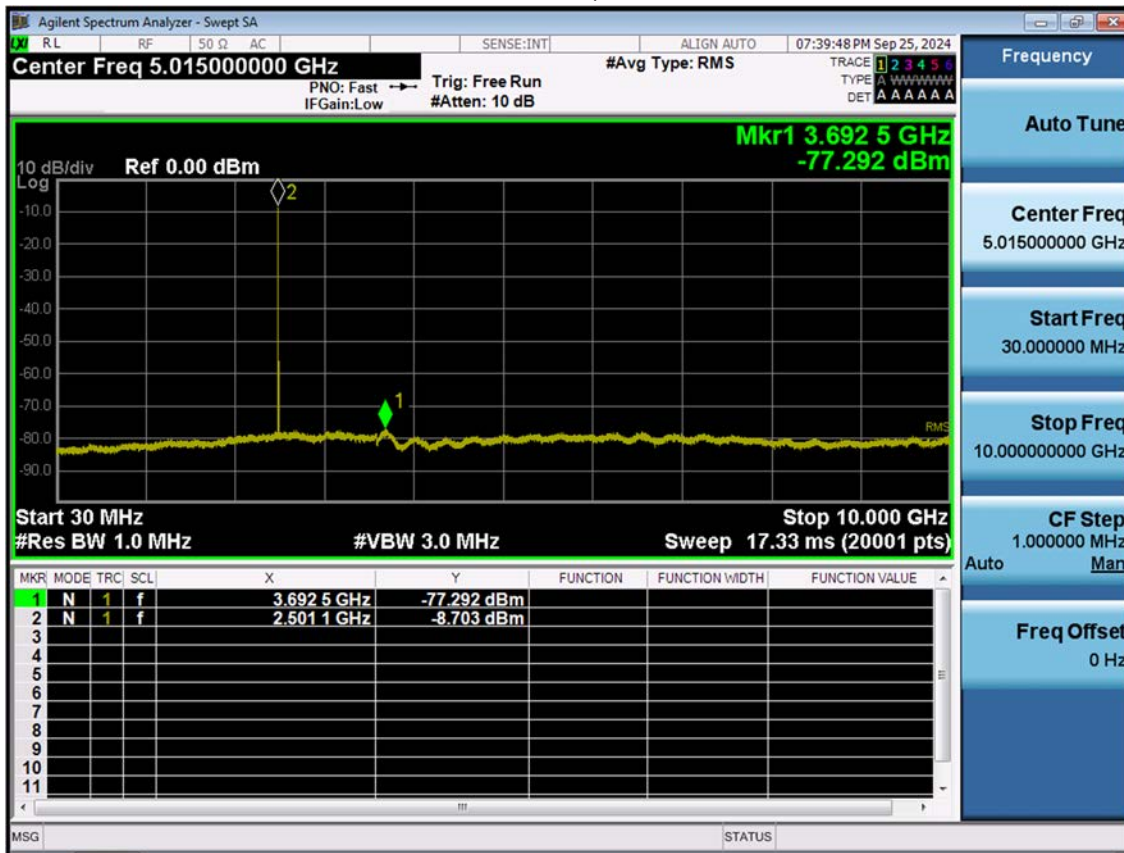
LTE B41_5 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



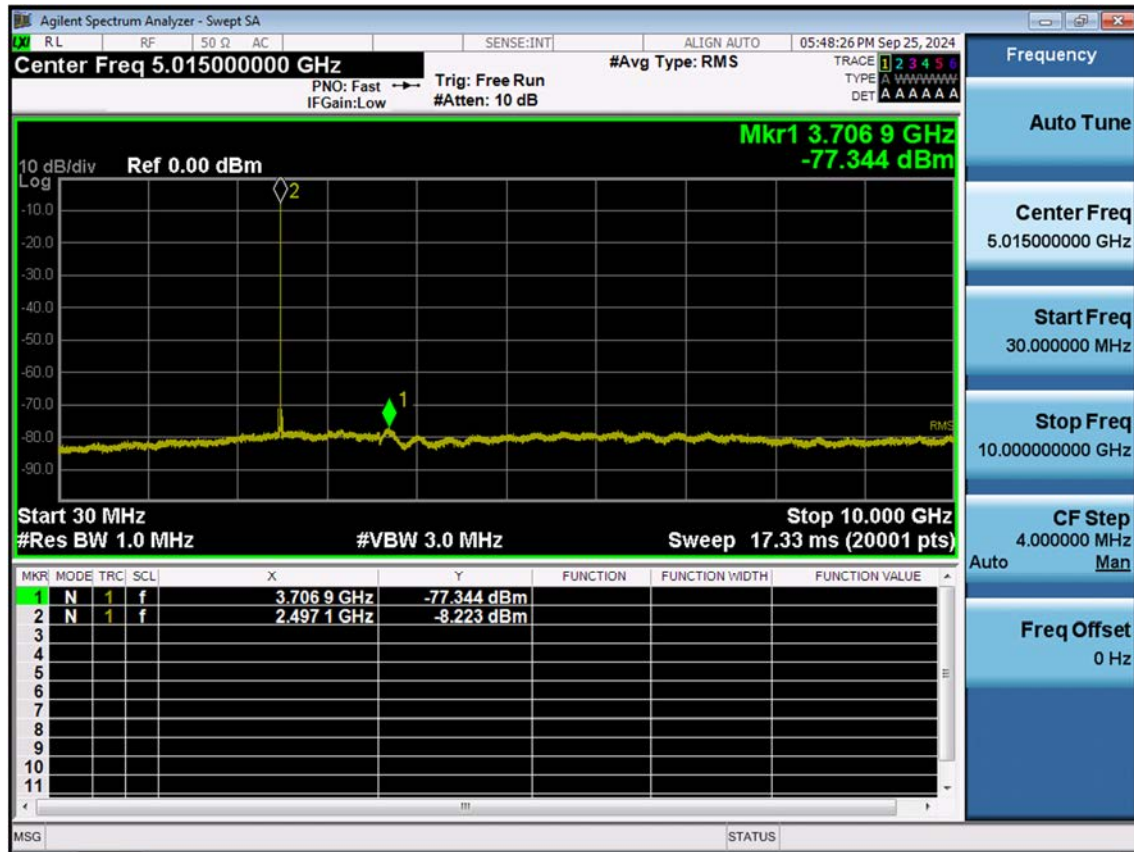
LTE B41_5 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB



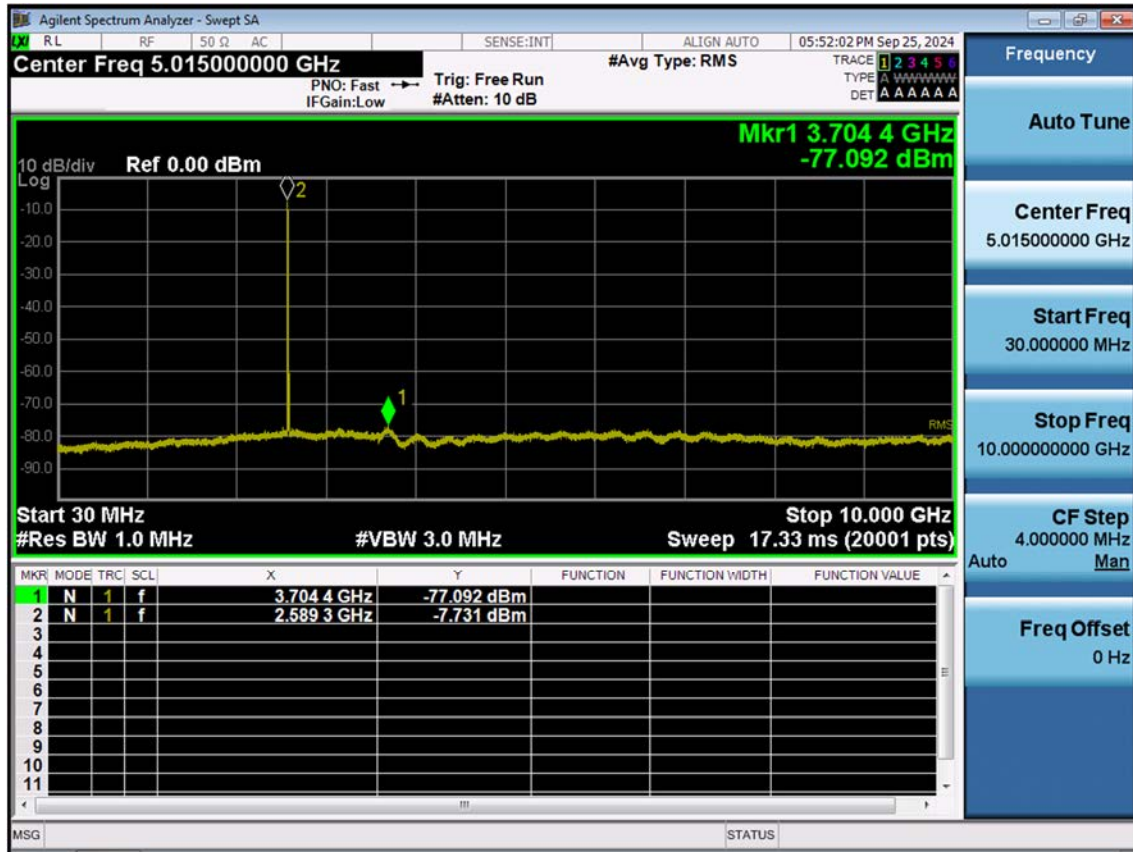
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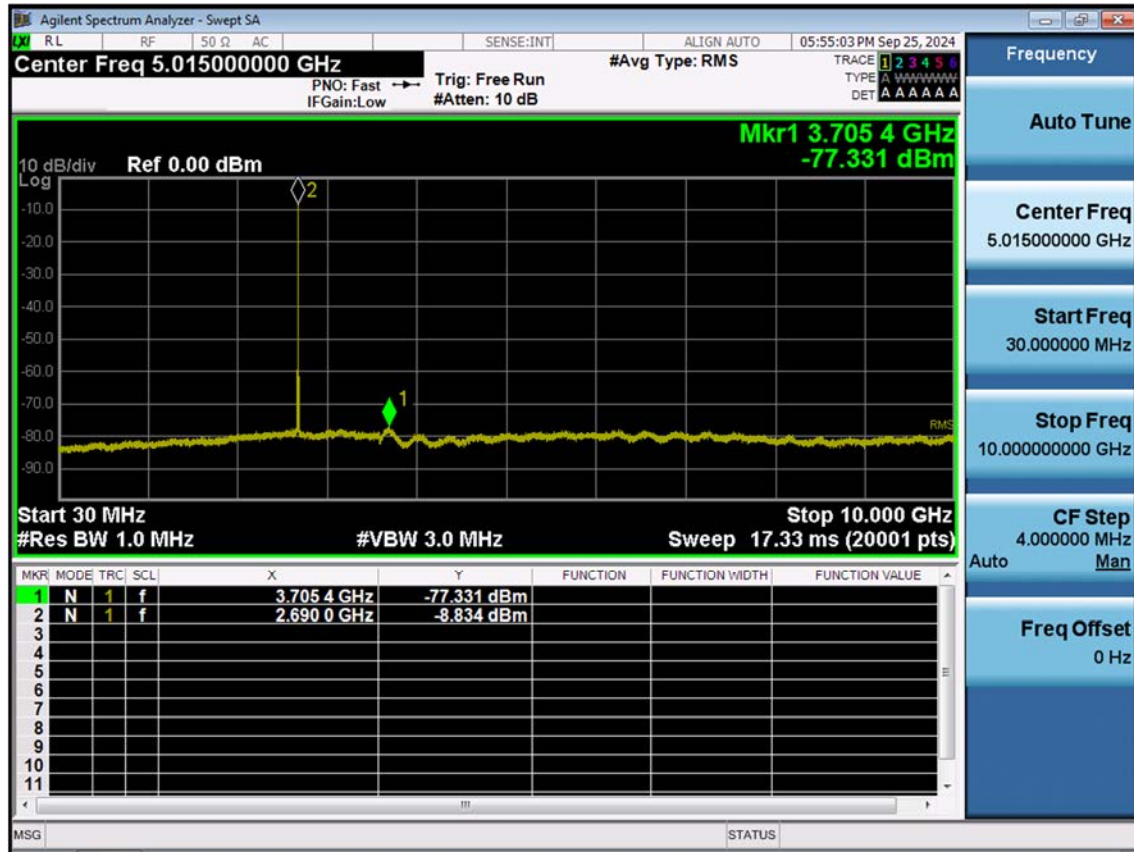
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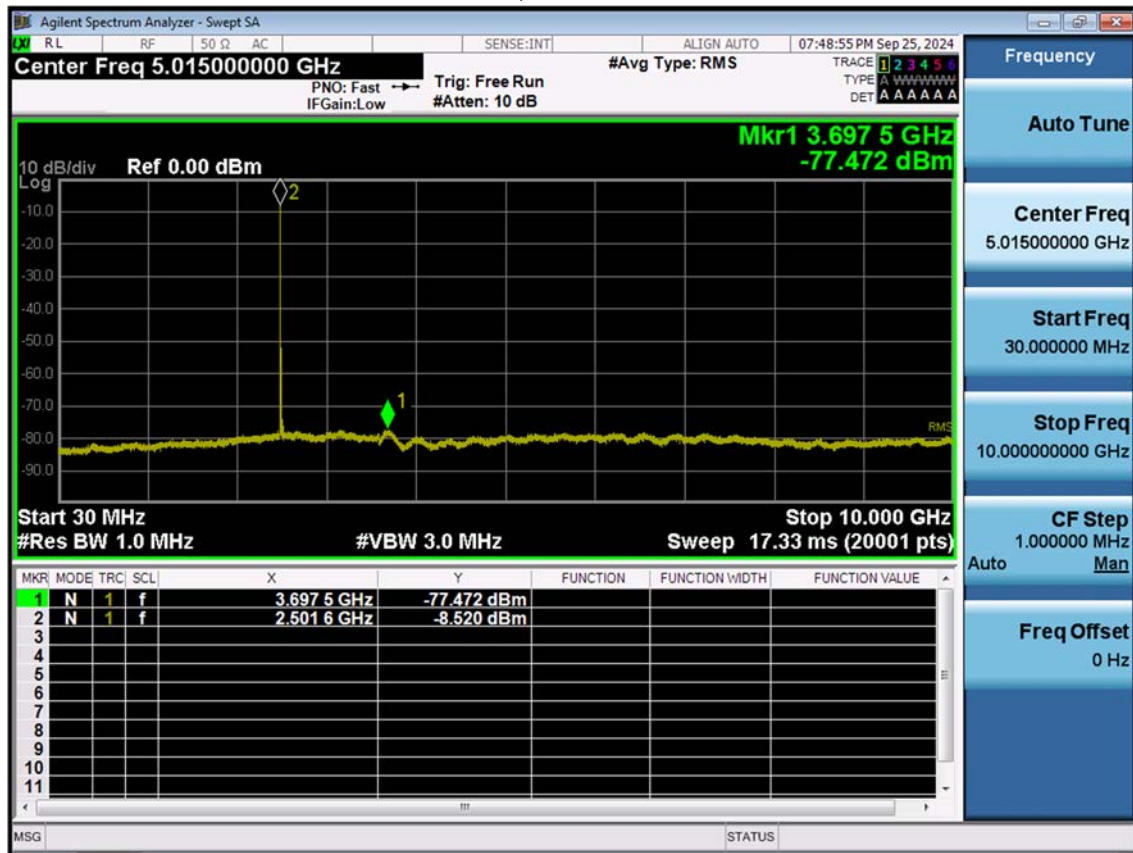
LTE B41_10 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



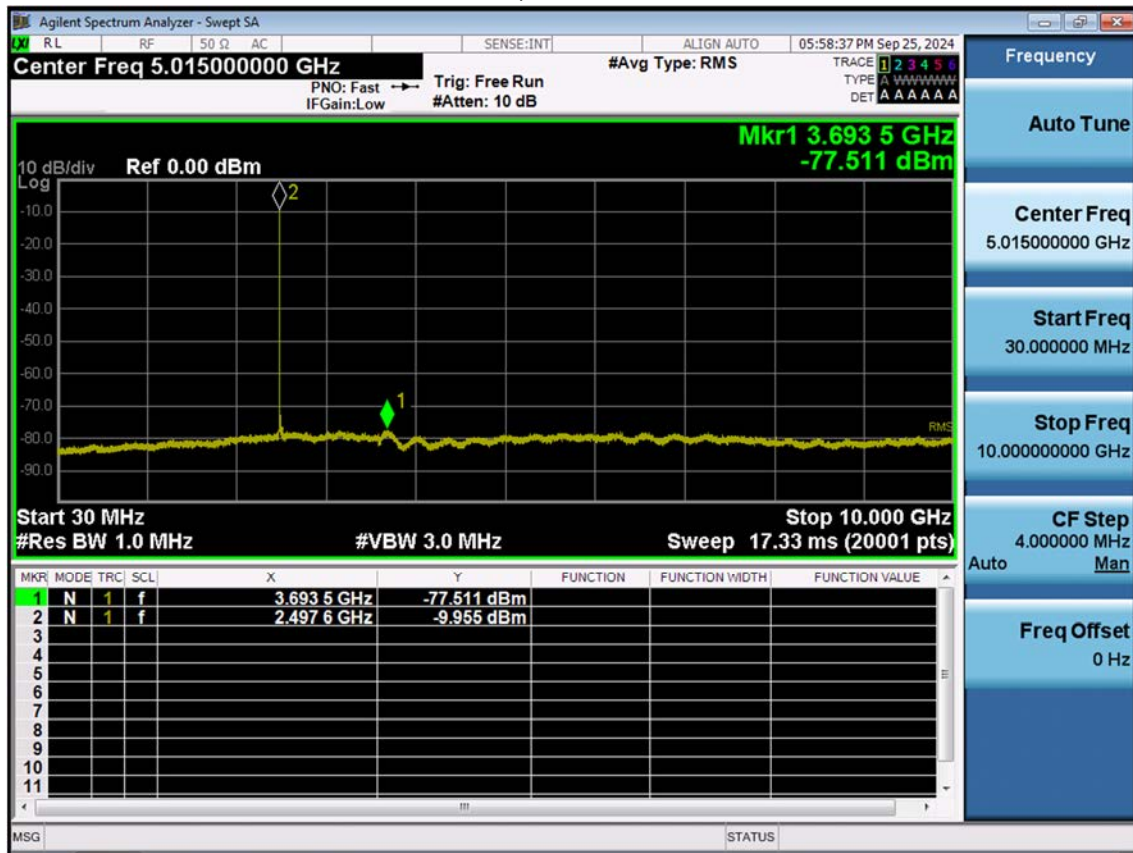
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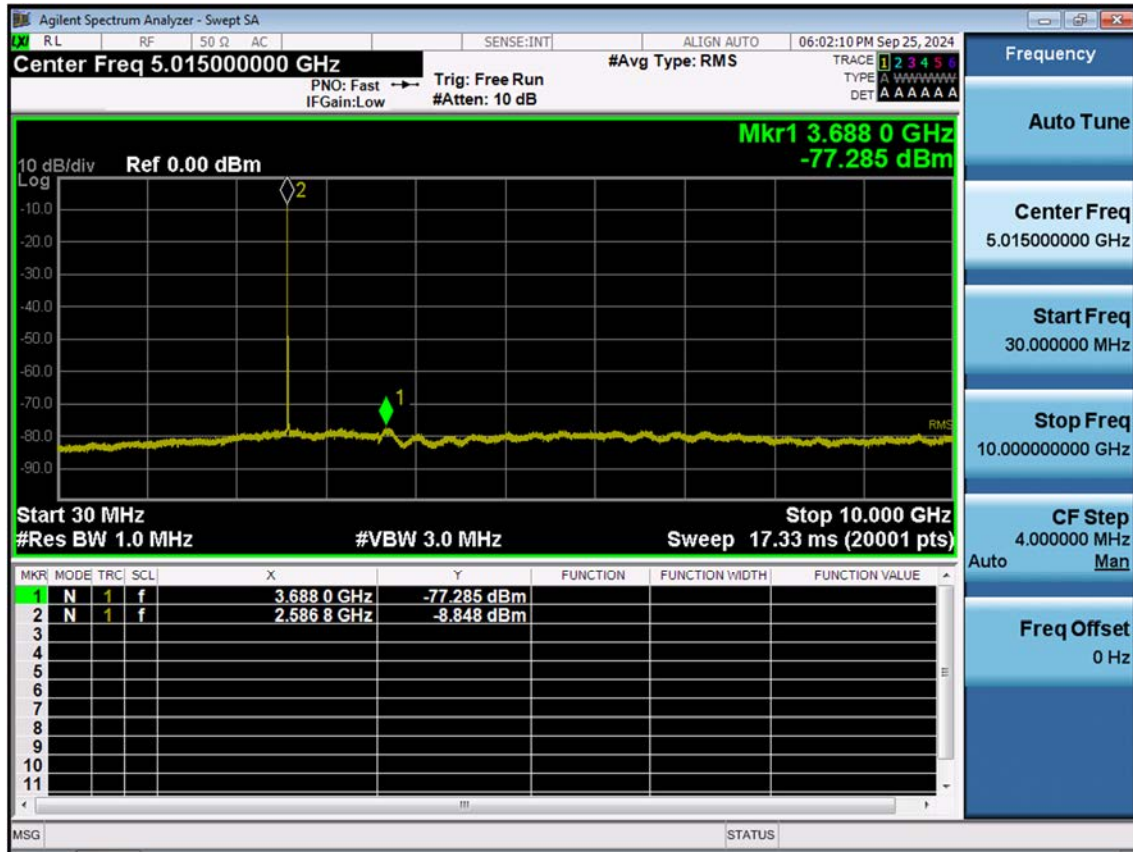
LTE B41_15 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB_1



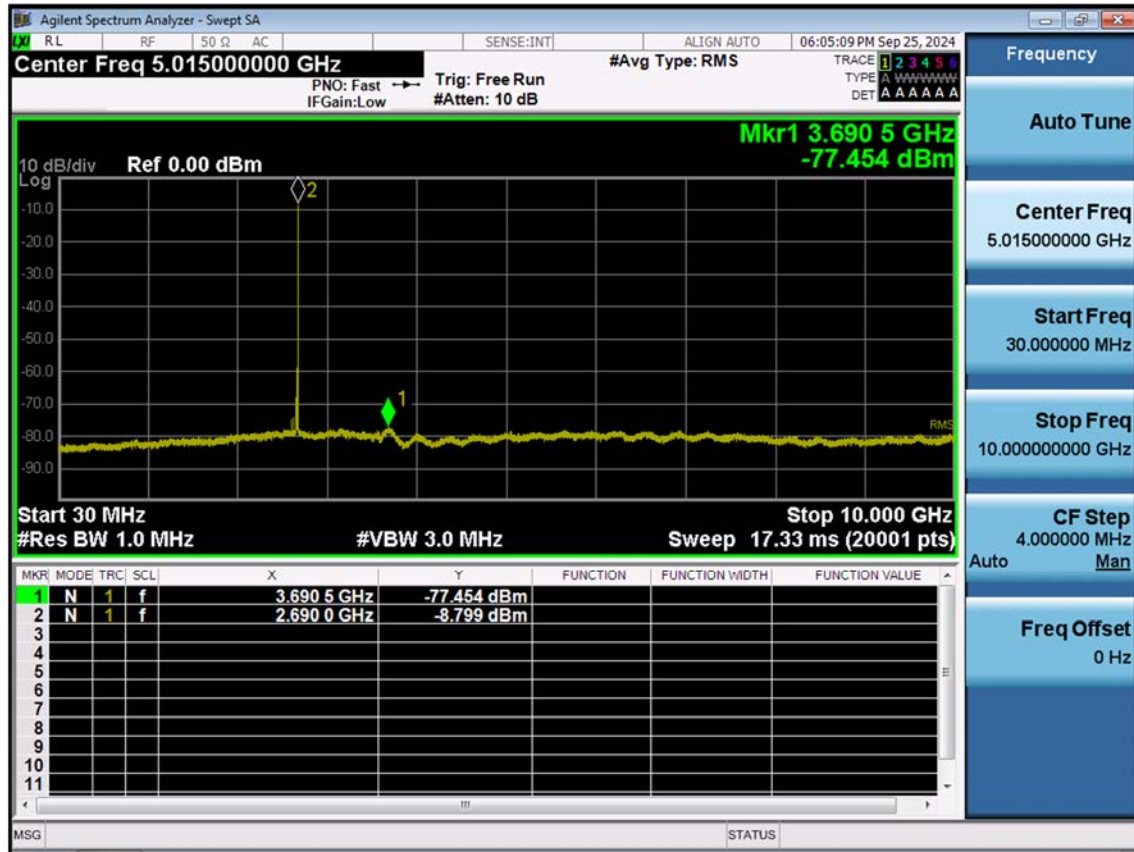
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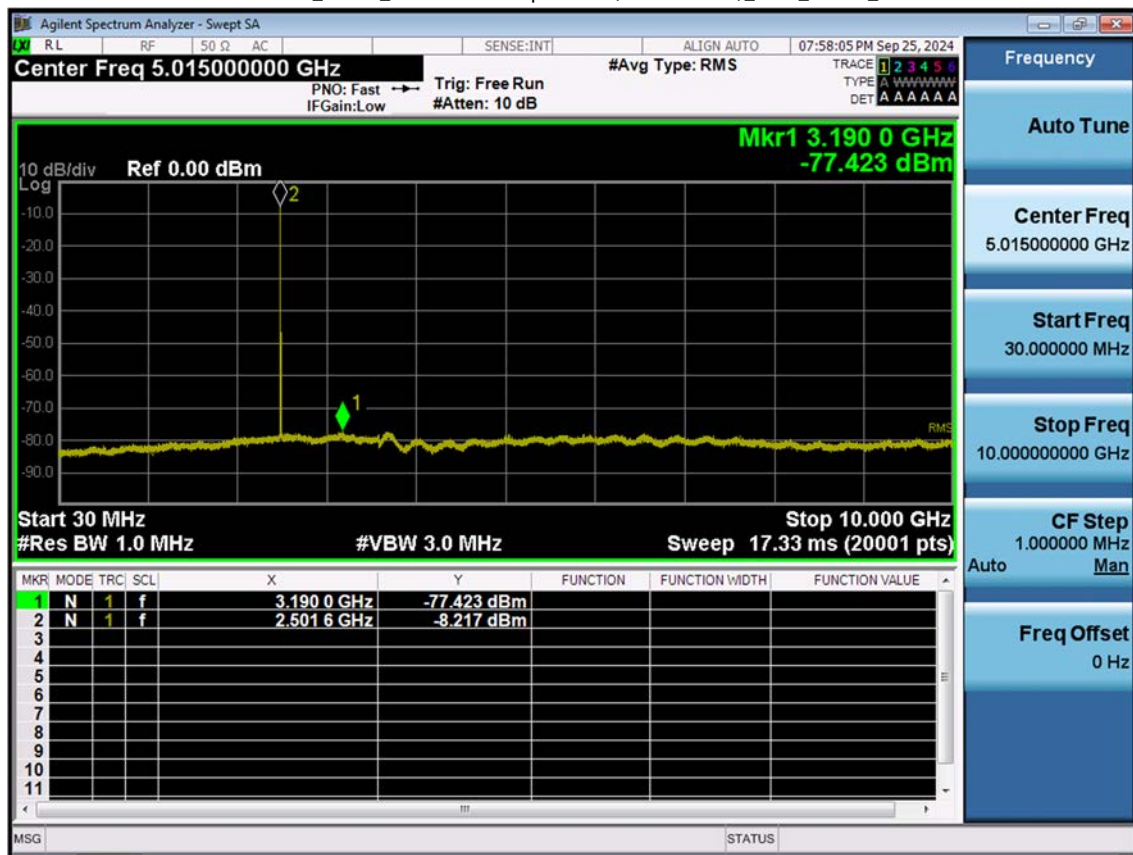
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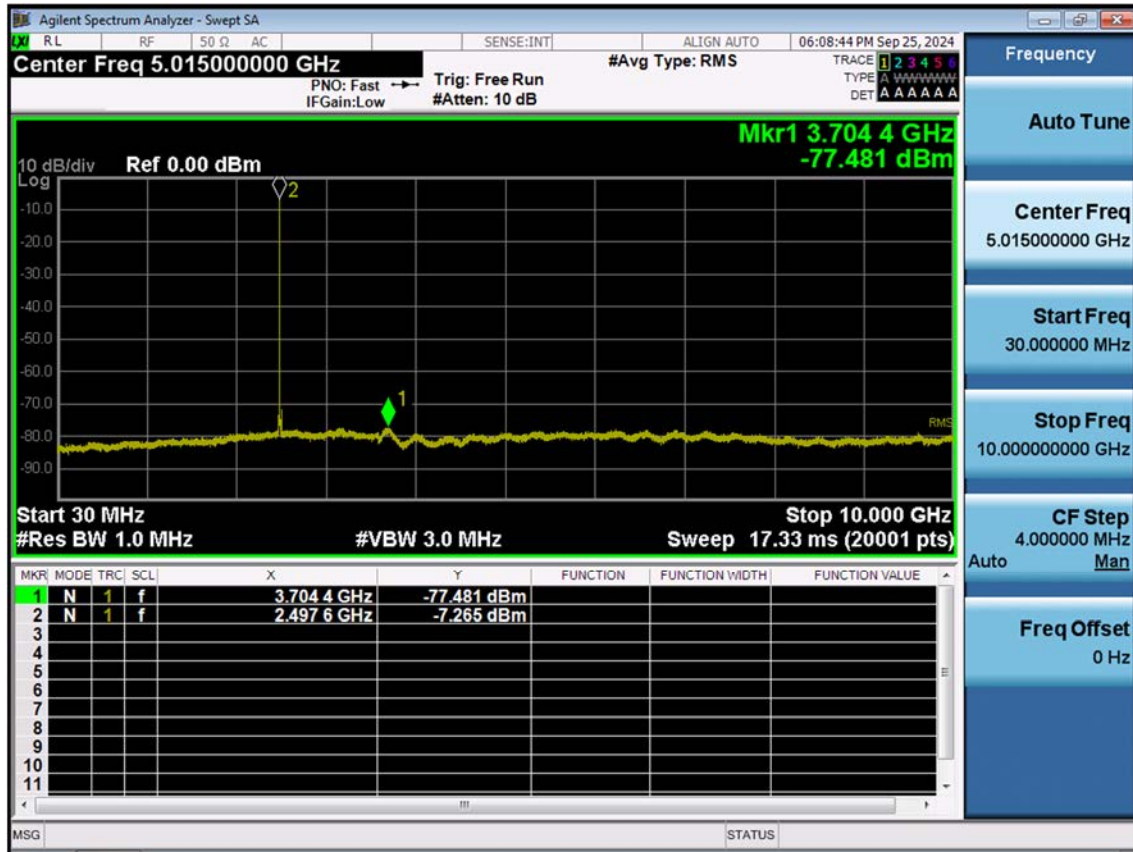
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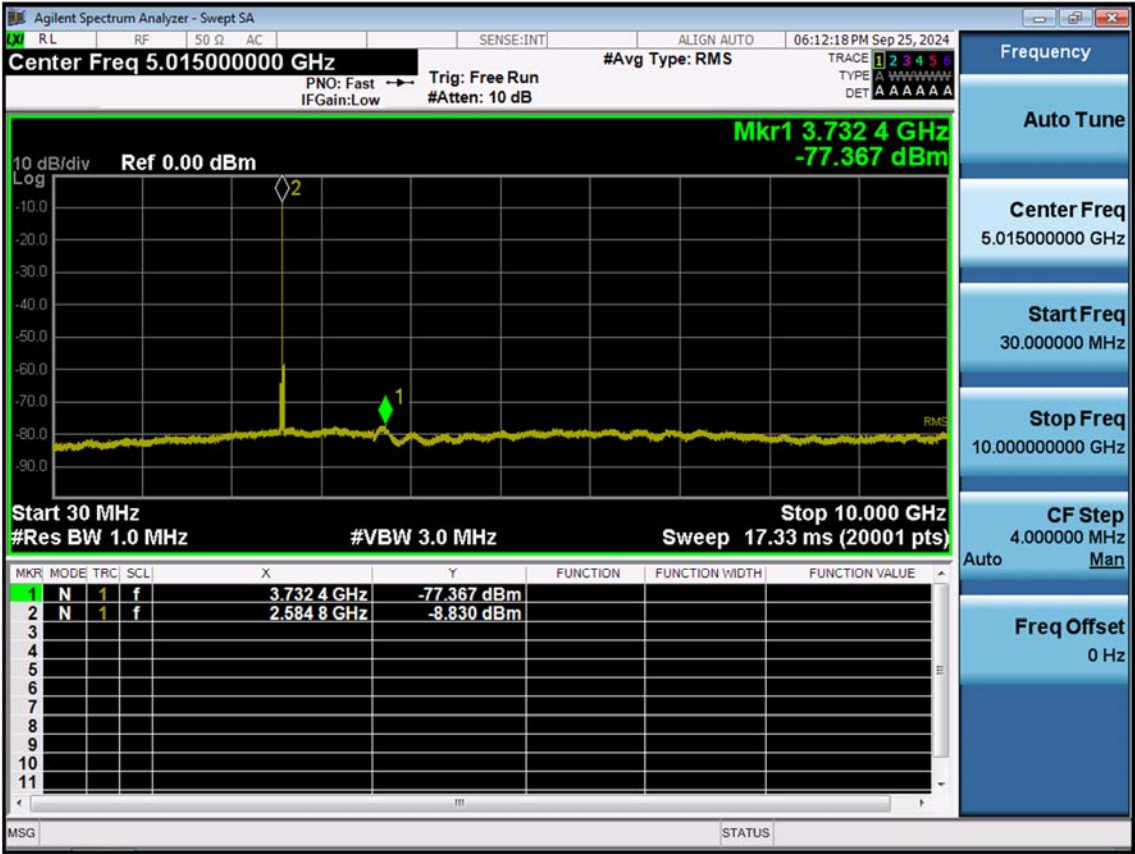
LTE B41_20 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



LTE B41_20 M_Conducted Spurious(30 M-10 G)_Low_QPSK_1RB



LTE B41_20 M_Conducted Spurious(30 M-10 G)_Mid_QPSK_1RB



LTE B41_20 M_Conducted Spurious(30 M-10 G)_High_QPSK_1RB

