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TEST REPORT

FCC LTE Test for SM-T727U

Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-1906-FC054

DATE OF ISSUE
24 June 2019

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FCC LTE Test for SM-T727U

REPORT NO.
HCT-RF-1906-FC054

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ID
FCC: A3LSMT727U

Applicant	**SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Eut Type Model Name Additional Model(s)	Tablet SM-T727U SM-T727P
Date of Receipt	May 22, 2019
FCC Rule Part(s)	§ 27, § 2
FCC Classification	PCS Licensed Transmitter (PCB)
Manufacturer	SAMSUNG Electronics Co., Ltd.

Tested by
Kwon Jeong (signature)

Technical Manager
Jong Seok Lee (signature)

HCT CO., LTD.
Soo Chan Lee
SooChan Lee / CEO

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	June 24, 2019	Initial Release

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

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

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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:	A3LSMT727U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 27, § 2
EUT Type:	Tablet
Model(s):	SM-T727U
Additional Model(s)	SM-T727P
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:	June 04, 2019~ June 24, 2019

1.1. MAXIMUM OUTPUT POWER

Power Class 3

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band 41 (5)	2498.5 – 2687.5	4M50G7D	QPSK	0.409	26.11
		4M51W7D	16QAM	0.337	25.28
		4M50W7D	64QAM	0.269	24.29
LTE – Band 41 (10)	2501.0 – 2685.0	8M96G7D	QPSK	0.422	26.25
		8M95W7D	16QAM	0.345	25.38
		8M98W7D	64QAM	0.272	24.35
LTE – Band 41 (15)	2503.5 – 2682.5	13M5G7D	QPSK	0.440	26.43
		13M4W7D	16QAM	0.358	25.54
		13M4W7D	64QAM	0.287	24.58
LTE – Band 41 (20)	2506.0 – 2680.0	17M9G7D	QPSK	0.402	26.04
		17M9W7D	16QAM	0.328	25.15
		17M9W7D	64QAM	0.261	24.16

Power Class 2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band 41 (5)	2498.5 – 2687.5	4M50G7D	QPSK	0.581	27.64
		4M50W7D	16QAM	0.470	26.72
		4M52W7D	64QAM	0.376	25.75
LTE – Band 41 (10)	2501.0 – 2685.0	8M97G7D	QPSK	0.582	27.65
		8M97W7D	16QAM	0.480	26.81
		8M96W7D	64QAM	0.380	25.80
LTE – Band 41 (15)	2503.5 – 2682.5	13M4G7D	QPSK	0.613	27.87
		13M4W7D	16QAM	0.500	26.99
		13M4W7D	64QAM	0.395	25.96
LTE – Band 41 (20)	2506.0 – 2680.0	17M9G7D	QPSK	0.547	27.38
		17M9W7D	16QAM	0.453	26.56
		17M9W7D	64QAM	0.359	25.55

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Tablet with UMTS and LTE.

It also supports IEEE 802.11 a/b/g/n/ac (HT20/40/80), ANT+, Bluetooth, BT LE.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/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 NormalHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
   The power is calculated by the following formula;
   $$P_{d(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$
   Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.
3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.
   These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 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.

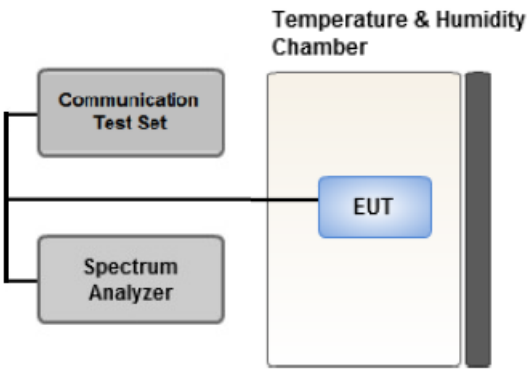
Test Settings

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

2. Set the number of counts to a value that stabilizes the measured CCDF curve;

3. Set the measurement interval as follows:

.- for continuous transmissions, set to 1 ms,

.- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1%.

② Alternate Procedure for PAPR

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

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

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

Test Settings(Peak Power)

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

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

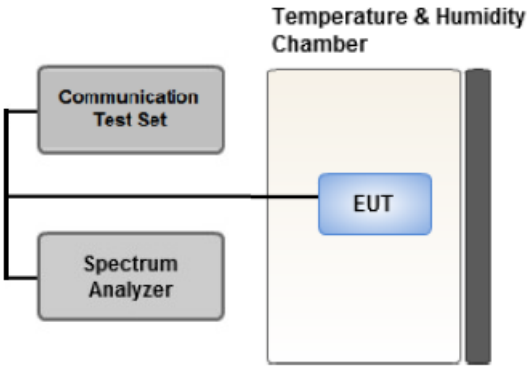
Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time:

   Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep

   (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/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 dB if the duty cycle is a constant 25%.

3.5 OCCUPIED BANDWIDTH.



Test setup

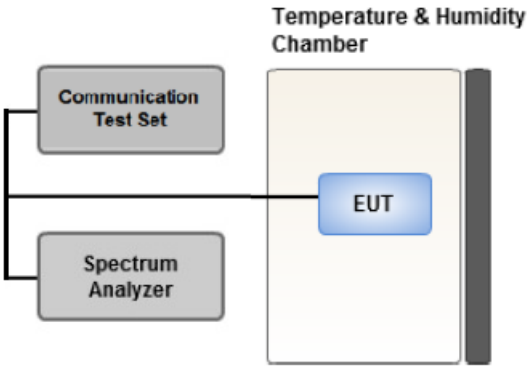
The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

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

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

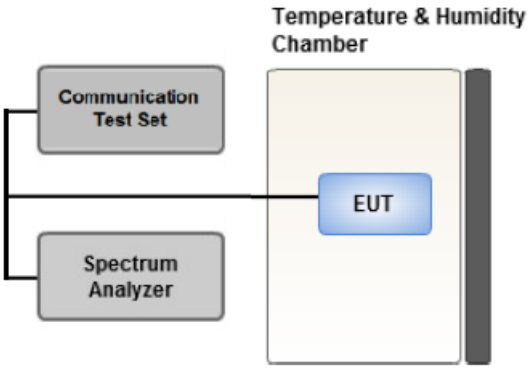
Test Overview

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 ≥ 3 MHz
3. Detector = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 * 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.

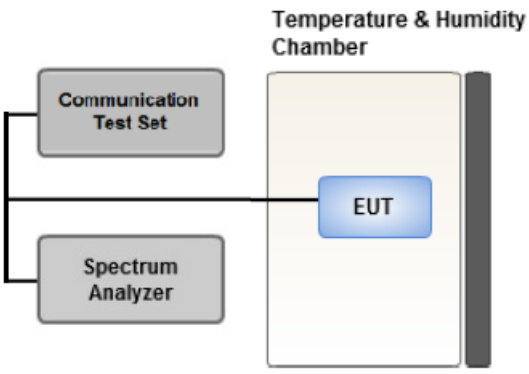
Test Settings

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 1MHz 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 ≥ 2 x 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 that 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 6MHz 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

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.
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.
- All modes of operation were investigated and the worst case configuration results are reported.
- Of models SM-T727U and SM-T727P, we tested on SM-T727U model. And SM-T727U result is reported.
- This report covers the models SM-T727U and SM-T727P.
  These models are identical in hardware and the only difference is that the model SM-T727P does not support operations in all frequency bands and the some bands are disabled by software.
- SM-T727U with Stand alone, Keyboard, Ear-jack and Charging pad were tested and the worst case results are reported.
  (Worst case : Stand alone)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM	1	0	X
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z

3.10 WORST CASE(CONDUCTED TEST)

- Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.
  Conducted Output Power value can be confirmed on the SAR report.
- Of models SM-T727U and SM-T727P, we tested on SM-T727U model. And SM-T727U result is reported.
- This report covers the models SM-T727U and SM-T727P.
  These models are identical in hardware and the only difference is that the model SM-T727P does not support operations in all frequency bands and the some bands are disabled by software.

[Worst case]

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

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/16/2019	Annual	04/16/2020
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/02/2019	Annual	04/02/2020
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/02/2019	Annual	04/02/2020
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	05/03/2019	Annual	05/03/2020
Agilent	E3632A/DC Power Supply	MY40004326	07/05/2018	Annual	07/05/2019
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93000718	08/07/2018	Annual	08/07/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	09/14/2018	Annual	09/14/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	10/04/2018	Annual	10/04/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	01/28/2019	Biennial	01/28/2021
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	05/08/2019	Annual	05/08/2020
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2019	Annual	06/04/2020
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/22/2018	Annual	10/22/2019
Agilent	8960 (E5515C)/ Base Station	MY48360800	09/27/2018	Annual	09/27/2019
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	08/23/2018	Biennial	08/23/2020
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6201502997	08/13/2018	Annual	08/13/2019
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/30/2019	Annual	01/30/2020
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/19/2018	Annual	07/19/2019
REOHDE & SCHWARZ	ESU40 / EMI TEST RECEIVER	100524	07/27/2018	Annual	07/27/2019
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

5. MEASUREMENT UNCERTAINTY

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

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

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 27.53(m)(4)	■ < 40 + 10log10 (P[Watts]) at Channel edges ■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges ■ < 55 + 10log10 (P[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	See Note1
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	Emission must remain in band	PASS

Note:

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

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
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 + 10log10 (P[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

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
40620	2593.0	-15.75	18.45	9.90	1.76	H	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission 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

16QAM Modulation

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

64QAM Modulation

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

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

8.1.1 Power Class 3

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2498.5	LTE B41/ 5 MHz	QPSK	-18.56	16.08	10.98	1.60	H	< 2.00	0.352	25.46
		16-QAM	-19.38	15.26	10.98	1.60	H		0.291	24.64
		64-QAM	-20.41	14.23	10.98	1.60	H		0.230	23.61
2593.0		QPSK	-18.07	16.68	11.06	1.63	H		0.409	26.11
		16-QAM	-18.90	15.85	11.06	1.63	H		0.337	25.28
		64-QAM	-19.89	14.86	11.06	1.63	H		0.269	24.29
2687.5		QPSK	-19.49	15.79	11.15	1.65	H		0.338	25.29
		16-QAM	-20.38	14.90	11.15	1.65	H		0.276	24.40
		64-QAM	-21.34	13.94	11.15	1.65	H		0.221	23.44

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2501.0	LTE B41/ 10 MHz	QPSK	-18.54	16.10	10.98	1.60	H	< 2.00	0.353	25.48
		16-QAM	-19.37	15.27	10.98	1.60	H		0.292	24.65
		64-QAM	-20.37	14.27	10.98	1.60	H		0.232	23.65
2593.0		QPSK	-17.93	16.82	11.06	1.63	H		0.422	26.25
		16-QAM	-18.80	15.95	11.06	1.63	H		0.345	25.38
		64-QAM	-19.83	14.92	11.06	1.63	H		0.272	24.35
2685.0		QPSK	-19.23	15.93	11.15	1.65	H		0.349	25.43
		16-QAM	-20.03	15.13	11.15	1.65	H		0.290	24.63
		64-QAM	-21.04	14.12	11.15	1.65	H		0.230	23.62

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2503.5	LTE B41/ 15 MHz	QPSK	-18.44	16.13	10.98	1.61	H	< 2.00	0.355	25.50
		16-QAM	-19.31	15.26	10.98	1.61	H		0.290	24.63
		64-QAM	-20.33	14.24	10.98	1.61	H		0.230	23.61
2593.0		QPSK	-17.75	17.00	11.06	1.63	H		0.440	26.43
		16-QAM	-18.64	16.11	11.06	1.63	H		0.358	25.54
		64-QAM	-19.60	15.15	11.06	1.63	H		0.287	24.58
2682.5		QPSK	-19.46	15.57	11.15	1.64	H		0.322	25.08
		16-QAM	-20.34	14.69	11.15	1.64	H		0.263	24.20
		64-QAM	-21.31	13.72	11.15	1.64	H		0.210	23.23

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2506.0	LTE B41/ 20 MHz	QPSK	-18.45	16.12	10.98	1.61	H	< 2.00	0.354	25.49
		16-QAM	-19.30	15.27	10.98	1.61	H		0.291	24.64
		64-QAM	-20.31	14.26	10.98	1.61	H		0.231	23.63
2593.0		QPSK	-18.14	16.61	11.06	1.63	H		0.402	26.04
		16-QAM	-19.03	15.72	11.06	1.63	H		0.328	25.15
		64-QAM	-20.02	14.73	11.06	1.63	H		0.261	24.16
2680.0		QPSK	-18.93	16.10	11.15	1.64	H		0.364	25.61
		16-QAM	-19.76	15.27	11.15	1.64	H		0.300	24.78
		64-QAM	-20.78	14.25	11.15	1.64	H		0.238	23.76

8.1.2 Power Class 2

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2498.5	LTE B41/ 5 MHz	QPSK	-17.09	17.55	10.98	1.60	H	< 2.00	0.493	26.93
		16-QAM	-17.96	16.68	10.98	1.60	H		0.404	26.06
		64-QAM	-18.96	15.68	10.98	1.60	H		0.321	25.06
2593.0		QPSK	-16.54	18.21	11.06	1.63	H		0.581	27.64
		16-QAM	-17.46	17.29	11.06	1.63	H		0.470	26.72
		64-QAM	-18.43	16.32	11.06	1.63	H		0.376	25.75
2687.5		QPSK	-18.02	17.26	11.15	1.65	H		0.475	26.76
		16-QAM	-18.91	16.37	11.15	1.65	H		0.387	25.87
		64-QAM	-19.86	15.42	11.15	1.65	H		0.311	24.92

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2501.0	LTE B41/ 10 MHz	QPSK	-17.15	17.49	10.98	1.60	H	< 2.00	0.487	26.87
		16-QAM	-17.93	16.71	10.98	1.60	H		0.407	26.09
		64-QAM	-18.96	15.68	10.98	1.60	H		0.321	25.06
2593.0		QPSK	-16.53	18.22	11.06	1.63	H		0.582	27.65
		16-QAM	-17.37	17.38	11.06	1.63	H		0.480	26.81
		64-QAM	-18.38	16.37	11.06	1.63	H		0.380	25.80
2685.0		QPSK	-17.76	17.40	11.15	1.65	H		0.490	26.90
		16-QAM	-18.65	16.51	11.15	1.65	H		0.399	26.01
		64-QAM	-19.63	15.53	11.15	1.65	H		0.318	25.03

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2503.5	LTE B41/ 15 MHz	QPSK	-17.05	17.52	10.98	1.61	H	< 2.00	0.488	26.89
		16-QAM	-17.89	16.68	10.98	1.61	H		0.403	26.05
		64-QAM	-18.90	15.67	10.98	1.61	H		0.319	25.04
2593.0		QPSK	-16.31	18.44	11.06	1.63	H		0.613	27.87
		16-QAM	-17.19	17.56	11.06	1.63	H		0.500	26.99
		64-QAM	-18.22	16.53	11.06	1.63	H		0.395	25.96
2682.5		QPSK	-18.04	16.99	11.15	1.64	H		0.446	26.50
		16-QAM	-18.98	16.05	11.15	1.64	H		0.360	25.56
		64-QAM	-19.90	15.13	11.15	1.64	H		0.291	24.64

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2506.0	LTE B41/ 20 MHz	QPSK	-17.05	17.52	10.98	1.61	H	< 2.00	0.488	26.89
		16-QAM	-17.91	16.66	10.98	1.61	H		0.401	26.03
		64-QAM	-18.91	15.66	10.98	1.61	H		0.318	25.03
2593.0		QPSK	-16.80	17.95	11.06	1.63	H		0.547	27.38
		16-QAM	-17.62	17.13	11.06	1.63	H		0.453	26.56
		64-QAM	-18.63	16.12	11.06	1.63	H		0.359	25.55
2680.0		QPSK	-18.10	16.93	11.15	1.64	H		0.440	26.44
		16-QAM	-18.98	16.05	11.15	1.64	H		0.360	25.56
		64-QAM	-19.96	15.07	11.15	1.64	H		0.287	24.58

8.2 RADIATED SPURIOUS EMISSIONS

8.2.1 Power Class 3

- ▣ OPERATING FREQUENCY : 2593.0 MHz
- ▣ MEASURED OUTPUT POWER: 26.11 dBm = 0.409 W
- ▣ MODE: LTE B41
- ▣ MODULATION SIGNAL: 5 MHz QPSK
- ▣ DISTANCE: 1 meters
- ▣ LIMIT: 55 + 10 log10 (W) = 51.11 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39675 (2498.5)	4,997.00	-47.74	12.89	-61.43	2.47	H	-51.01	77.13
	7,495.50	-46.89	11.51	-53.63	2.97	H	-45.09	71.20
	9,994.00	-56.18	11.21	-58.63	3.48	V	-50.90	77.01
	12,492.50	-43.19	14.20	-47.77	4.17	V	-37.74	63.86
	14,991.00	-50.49	13.20	-53.33	4.34	H	-44.47	70.59
40620 (2593.0)	5,186.00	-54.54	13.05	-67.14	2.58	H	-56.67	82.78
	7,779.00	-45.66	11.98	-53.18	2.93	H	-44.13	70.25
	10,372.00	-53.43	10.96	-56.42	3.62	H	-49.08	75.19
	12,965.00	-50.02	13.61	-52.62	4.08	H	-43.09	69.20
41565 (2687.5)	5,375.00	-57.32	13.49	-70.60	2.65	H	-59.76	85.88
	8,062.50	-45.05	11.46	-49.87	3.05	H	-41.46	67.57
	10,750.00	-48.96	10.99	-51.86	3.67	V	-44.54	70.65
	13,437.50	-47.79	13.01	-49.26	4.09	H	-40.34	66.45

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.25 dBm = 0.422 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.25 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39700 (2501.0)	5,002.00	-58.19	12.89	-71.88	2.47	H	-61.46	87.72
	7,503.00	-46.79	11.53	-53.22	2.92	H	-44.62	70.87
	10,004.00	-56.36	11.25	-59.20	3.41	H	-51.36	77.61
	12,505.00	-44.69	14.24	-49.27	3.99	V	-39.02	65.27
	15,006.00	-53.19	13.27	-55.95	4.36	H	-47.05	73.30
40620 (2593.0)	5,186.00	-58.15	13.05	-70.75	2.58	H	-60.28	86.53
	7,779.00	-46.21	11.98	-53.73	2.93	H	-44.68	70.94
	10,372.00	-56.49	10.96	-59.48	3.62	V	-52.14	78.39
	12,965.00	-49.72	13.61	-52.32	4.08	H	-42.79	69.04
41540 (2685.0)	5,370.00	-57.27	13.50	-70.85	2.65	V	-60.00	86.25
	8,055.00	-43.11	11.46	-48.00	3.05	H	-39.60	65.85
	10,740.00	-51.03	10.98	-53.84	3.62	V	-46.48	72.73
	13,425.00	-44.17	13.07	-45.76	4.18	H	-36.87	63.13

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.43 dBm = 0.440 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.43 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39725 (2503.5)	5,007.00	-56.74	12.86	-70.87	2.49	V	-60.50	86.93
	7,510.50	-46.24	11.54	-52.38	2.90	H	-43.74	70.17
	10,014.00	-59.27	11.27	-62.43	3.40	V	-54.57	81.00
	12,517.50	-43.50	14.23	-47.81	4.05	V	-37.63	64.06
	15,021.00	-53.85	13.31	-56.49	4.34	H	-47.52	73.95
40620 (2593.0)	5,186.00	-58.17	13.05	-70.77	2.58	V	-60.30	86.73
	7,779.00	-45.35	11.98	-52.87	2.93	V	-43.82	70.26
	10,372.00	-56.32	10.96	-59.31	3.62	V	-51.97	78.40
	12,965.00	-51.18	13.61	-53.78	4.08	H	-44.25	70.68
41515 (2682.5)	5,365.00	-56.82	13.51	-70.47	2.64	H	-59.60	86.04
	8,047.50	-42.06	11.45	-47.03	3.05	H	-38.63	65.06
	10,730.00	-51.24	10.98	-54.05	3.60	H	-46.67	73.10
	13,412.50	-42.43	13.09	-44.42	4.17	H	-35.50	61.93

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.04 dBm = 0.402 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.04 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39750 (2506.0)	5,012.00	-55.73	12.86	-69.86	2.49	V	-59.49	85.53
	7,518.00	-46.53	11.57	-51.84	2.93	H	-43.20	69.25
	10,024.00	-58.04	11.29	-60.87	3.48	H	-53.05	79.10
	12,530.00	-43.70	14.22	-48.35	4.17	V	-38.30	64.34
	15,036.00	-53.89	13.39	-56.66	4.30	H	-47.57	73.61
40620 (2593.0)	5,186.00	-58.16	13.05	-70.76	2.58	H	-60.29	86.33
	7,779.00	-45.93	11.98	-53.45	2.93	H	-44.40	70.45
	10,372.00	-58.29	10.96	-61.28	3.62	V	-53.94	79.98
	12,965.00	-51.43	13.61	-54.03	4.08	H	-44.50	70.54
41490 (2680.0)	5,360.00	-55.24	13.51	-68.96	2.63	V	-58.08	84.12
	8,040.00	-41.05	11.46	-45.95	3.06	H	-37.55	63.59
	10,720.00	-48.01	10.97	-50.64	3.66	V	-43.33	69.37
	13,400.00	-40.92	13.11	-42.44	4.16	H	-33.49	59.53

8.2.2 Power Class 2

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 27.64 dBm = 0.581 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 52.64 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39675 (2498.5)	4,997.00	-57.84	12.89	-71.53	2.47	V	-61.11	88.76
	7,495.50	-45.19	11.51	-51.93	2.97	V	-43.39	71.03
	9,994.00	-54.83	11.21	-57.28	3.48	H	-49.55	77.19
	12,492.50	-41.47	14.20	-46.05	4.17	V	-36.02	63.67
	14,991.00	-50.39	13.20	-53.23	4.34	H	-44.37	72.02
40620 (2593.0)	5,186.00	-54.18	13.05	-66.78	2.58	V	-56.31	83.95
	7,779.00	-44.03	11.98	-51.55	2.93	H	-42.50	70.15
	10,372.00	-51.14	10.96	-54.13	3.62	H	-46.79	74.43
	12,965.00	-47.71	13.61	-50.31	4.08	V	-40.78	68.42
41565 (2687.5)	5,375.00	-55.75	13.49	-69.03	2.65	H	-58.19	85.84
	8,062.50	-42.60	11.46	-47.42	3.05	H	-39.01	66.65
	10,750.00	-49.87	10.99	-52.77	3.67	V	-45.45	73.09
	13,437.50	-49.16	13.01	-50.63	4.09	H	-41.71	69.35

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 27.65 dBm = 0.582 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 52.65 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39700 (2501.0)	5,002.00	-57.16	12.89	-70.85	2.47	V	-60.43	88.09
	7,503.00	-46.87	11.53	-53.30	2.92	V	-44.70	72.35
	10,004.00	-58.16	11.25	-61.00	3.41	V	-53.16	80.81
	12,505.00	-42.74	14.24	-47.32	3.99	V	-37.07	64.72
	15,006.00	-52.84	13.27	-55.60	4.36	V	-46.70	74.35
40620 (2593.0)	5,186.00	-56.87	13.05	-69.47	2.58	V	-59.00	86.65
	7,779.00	-46.12	11.98	-53.64	2.93	V	-44.59	72.25
	10,372.00	-55.78	10.96	-58.77	3.62	V	-51.43	79.08
	12,965.00	-48.72	13.61	-51.32	4.08	V	-41.79	69.44
41540 (2685.0)	5,370.00	-57.61	13.50	-71.19	2.65	V	-60.34	87.99
	8,055.00	-42.64	11.46	-47.53	3.05	V	-39.13	66.78
	10,740.00	-48.07	10.98	-50.88	3.62	V	-43.52	71.17
	13,425.00	-44.86	13.07	-46.45	4.18	V	-37.56	65.22

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 27.87 dBm = 0.613 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 52.87 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39725 (2503.5)	5,007.00	-57.43	12.86	-71.56	2.49	V	-61.19	89.06
	7,510.50	-45.84	11.54	-51.98	2.90	V	-43.34	71.21
	10,014.00	-58.72	11.27	-61.88	3.40	V	-54.02	81.89
	12,517.50	-40.48	14.23	-44.79	4.05	V	-34.61	62.48
	15,021.00	-53.53	13.31	-56.17	4.34	V	-47.20	75.07
40620 (2593.0)	5,186.00	-55.68	13.05	-68.28	2.58	V	-57.81	85.68
	7,779.00	-46.40	11.98	-53.92	2.93	V	-44.87	72.75
	10,372.00	-55.08	10.96	-58.07	3.62	V	-50.73	78.60
	12,965.00	-47.80	13.61	-50.40	4.08	V	-40.87	68.74
41515 (2682.5)	5,365.00	-56.76	13.51	-70.41	2.64	V	-59.54	87.42
	8,047.50	-40.64	11.45	-45.61	3.05	V	-37.21	65.08
	10,730.00	-46.97	10.98	-49.78	3.60	V	-42.40	70.27
	13,412.50	-42.75	13.09	-44.74	4.17	V	-35.82	63.69

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 27.38 dBm = 0.547 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 52.38 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
39750 (2506.0)	5,012.00	-56.68	12.86	-70.81	2.49	V	-60.44	87.82
	7,518.00	-46.00	11.57	-51.31	2.93	V	-42.67	70.06
	10,024.00	-59.18	11.29	-62.01	3.48	V	-54.19	81.58
	12,530.00	-41.50	14.22	-46.15	4.17	V	-36.10	63.48
	15,036.00	-56.59	13.39	-59.36	4.30	V	-50.27	77.65
40620 (2593.0)	5,186.00	-57.87	13.05	-70.47	2.58	V	-60.00	87.38
	7,779.00	-44.19	11.98	-51.71	2.93	V	-42.66	70.05
	10,372.00	-54.51	10.96	-57.50	3.62	V	-50.16	77.54
	12,965.00	-48.56	13.61	-51.16	4.08	V	-41.63	69.01
41490 (2680.0)	5,360.00	-57.24	13.51	-70.96	2.63	V	-60.08	87.46
	8,040.00	-39.68	11.46	-44.58	3.06	V	-36.18	63.56
	10,720.00	-47.43	10.97	-50.06	3.66	V	-42.75	70.13
	13,400.00	-41.46	13.11	-42.98	4.16	V	-34.03	61.41

8.3 PEAK-TO-AVERAGE RATIO

8.3.1 Power Class 3

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
41	5 MHz	2593.0	QPSK	25	0	4.86
			16-QAM			5.97
			64-QAM			6.46
	10 MHz		QPSK	50		4.92
			16-QAM			6.02
			64-QAM			6.54
	15 MHz		QPSK	75		4.77
			16-QAM			5.96
			64-QAM			6.56
	20 MHz		QPSK	100		4.76
			16-QAM			5.90
			64-QAM			6.52

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 95 ~ 106.

8.3.2 Power Class 2

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
41	5 MHz	2593.0	QPSK	25	0	4.84
			16-QAM			6.01
			64-QAM			6.46
	10 MHz		QPSK	50		4.93
			16-QAM			6.04
			64-QAM			6.55
	15 MHz		QPSK	75		4.76
			16-QAM			6.01
			64-QAM			6.50
	20 MHz		QPSK	100		4.76
			16-QAM			5.94
			64-QAM			6.48

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 107 ~ 118.

8.4 OCCUPIED BANDWIDTH

8.4.1 Power Class 3

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
41	5 MHz	2593.0	QPSK	25	0	4.4948
			16-QAM			4.5066
			64-QAM			4.5008
	10 MHz		QPSK	50		8.9605
			16-QAM			8.9515
			64-QAM			8.9830
	15 MHz		QPSK	75		13.446
			16-QAM			13.417
			64-QAM			13.385
	20 MHz		QPSK	100		17.909
			16-QAM			17.868
			64-QAM			17.894

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 71 ~ 82.

8.4.2 Power Class 2

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
41	5 MHz	2593.0	QPSK	25	0	4.4980
			16-QAM			4.4968
			64-QAM			4.5150
	10 MHz		QPSK	50		8.9664
			16-QAM			8.9646
			64-QAM			8.9578
	15 MHz		QPSK	75		13.440
			16-QAM			13.413
			64-QAM			13.433
	20 MHz		QPSK	100		17.941
			16-QAM			17.873
			64-QAM			17.901

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 83 ~ 94.

8.5 CONDUCTED SPURIOUS EMISSIONS

8.5.1 Power Class 3

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
41	5	2498.5	25.2959	30.131	-66.740	-36.609	-25.00
		2593.0	26.1844	30.131	-66.498	-36.367	
		2687.5	26.1304	30.131	-65.814	-35.683	
	10	2501.0	26.1358	30.131	-66.611	-36.480	
		2593.0	7.7662	28.591	-66.388	-37.797	
		2685.0	25.7818	30.131	-67.176	-37.045	
	15	2503.5	25.8255	30.131	-67.115	-36.984	
		2593.0	25.8338	30.131	-66.582	-36.451	
		2682.5	26.1774	30.131	-66.848	-36.717	
	20	2506.0	26.4406	30.131	-66.707	-36.576	
		2593.0	25.8107	30.131	-66.829	-36.698	
		2680.0	26.1065	30.131	-66.967	-36.836	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 175 ~ 202.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

8.5.2 Power Class 2

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
41	5	2498.5	26.1197	30.131	-66.485	-36.354	-25.00
		2593.0	26.1576	30.131	-65.578	-35.447	
		2687.5	25.8173	30.131	-66.956	-36.825	
	10	2501.0	26.1234	30.131	-67.003	-36.872	
		2593.0	25.9831	30.131	-66.659	-36.528	
		2685.0	25.8074	30.131	-66.417	-36.286	
	15	2503.5	26.1605	30.131	-66.407	-36.276	
		2593.0	26.1374	30.131	-66.552	-36.421	
		2682.5	25.8792	30.131	-67.232	-37.101	
	20	2506.0	25.8123	30.131	-65.428	-35.297	
		2593.0	25.8123	30.131	-67.296	-37.165	
		2680.0	26.4641	30.131	-67.181	-37.050	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 203 ~ 230.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

8.6 CHANNEL EDGE

8.6.1 Power Class 3

Band Width	Frequency (MHz)	Modulation	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +NormalHz)	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	-23.93	-24.82	-24.01	-24.41	-34.82	-34.81	-34.62
10 MHz	2501.0	QPSK	50/0	-24.63	-24.78	-26.67	-28.45	-31.43	-31.06	-36.21
15 MHz	2503.5	QPSK	75/0	-26.47	-26.94	-28.70	-30.58	-32.00	-34.02	-38.85
20 MHz	2506.0	QPSK	100/0	-26.27	-26.78	-27.83	-28.48	-31.41	-30.63	-38.74
Limit				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure Block Offset	C.E ~ (C.E ± NormalHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-24.88	-25.25	-31.75	-33.15
	2687.5	QPSK	25	0	-23.73	-24.36	-22.98	-23.41
10 MHz	2593.0	QPSK	50	0	-27.32	-27.12	-32.11	-34.06
	2685.0	QPSK	50	0	-25.83	-26.07	-24.99	-25.63
15 MHz	2593.0	QPSK	75	0	-28.29	-27.83	-32.23	-34.08
	2682.5	QPSK	75	0	-26.74	-26.12	-27.59	-24.28
20 MHz	2593.0	QPSK	100	0	-28.16	-28.57	-30.91	-32.88
	2680.0	QPSK	100	0	-28.05	-27.83	-28.28	-26.70
Limit					-10.0		-10.0	

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure 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	-35.68	-37.56	-34.71	-36.76
	2687.5	QPSK	25	0	-33.99	-34.38	-33.87	-34.39
10 MHz	2593.0	QPSK	50	0	-35.90	-39.48	-36.06	-41.65
	2685.0	QPSK	50	0	-29.61	-29.70	-36.75	-39.34
15 MHz	2593.0	QPSK	75	0	-35.89	-36.78	-37.98	-43.12
	2682.5	QPSK	75	0	-30.80	-28.16	-36.87	-40.15
20 MHz	2593.0	QPSK	100	0	-34.69	-35.16	-36.14	-41.43
	2680.0	QPSK	100	0	-30.18	-28.17	-37.70	-44.65
Limit					-13.0		-25.0	

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6MHz or the actual emission bandwidth.
3. X = 6MHz(5MHz Bandwidth), 10MHz(10MHz Bandwidth), 15MHz(15MHz Bandwidth), 20MHz(20MHz Bandwidth)
4. Plots of the EUT's Channel Edge are shown Page 119 ~ 146. (1RB & Full RB)

8.6.2 Power Class 2

Band Width	Frequency (MHz)	Modulation	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +NormalHz)	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	-23.08	-23.48	-21.78	-22.44	-31.38	-30.39	-30.03
10 MHz	2501.0	QPSK	50/0	-24.98	-23.85	-23.86	-23.78	-28.89	-29.01	-34.28
15 MHz	2503.5	QPSK	75/0	-25.31	-25.87	-25.95	-27.81	-28.97	-29.60	-34.44
20 MHz	2506.0	QPSK	100/0	-25.80	-27.02	-25.04	-28.20	-29.17	-30.92	-37.04
Limit				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure Block Offset	C.E ~ (C.E ± NormalHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
5 MHz	2593.0	QPSK	25	0	-23.14	-24.36	-26.60	-27.49
	2687.5	QPSK	25	0	-21.96	-22.77	-20.50	-20.84
10 MHz	2593.0	QPSK	50	0	-24.12	-24.35	-27.50	-29.13
	2685.0	QPSK	50	0	-24.21	-24.70	-22.05	-23.23
15 MHz	2593.0	QPSK	75	0	-26.43	-26.68	-28.84	-29.79
	2682.5	QPSK	75	0	-24.80	-24.93	-25.65	-22.62
20 MHz	2593.0	QPSK	100	0	-25.58	-26.00	-27.63	-29.18
	2680.0	QPSK	100	0	-26.45	-26.52	-26.01	-24.56
Limit					-10.0		-10.0	

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure 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	-31.44	-32.34	-31.34	-32.38
	2687.5	QPSK	25	0	-33.63	-33.76	-34.08	-34.44
10 MHz	2593.0	QPSK	50	0	-28.76	-30.47	-32.88	-35.92
	2685.0	QPSK	50	0	-27.69	-26.92	-35.70	-37.62
15 MHz	2593.0	QPSK	75	0	-30.61	-31.00	-34.75	-37.78
	2682.5	QPSK	75	0	-29.13	-26.69	-36.19	-39.61
20 MHz	2593.0	QPSK	100	0	-30.24	-30.68	-33.28	-38.00
	2680.0	QPSK	100	0	-28.99	-27.04	-36.40	-44.03
Limit					-13.0		-25.0	

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6MHz or the actual emission bandwidth.
3. X = 6MHz(5MHz Bandwidth), 10MHz(10MHz Bandwidth), 15MHz(15MHz Bandwidth), 20MHz(20MHz Bandwidth)
4. Plots of the EUT's Channel Edge are shown Page 147 ~ 174. (1RB & Full RB)

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

8.7.1 Power Class 3

▣ MODE: LTE 41

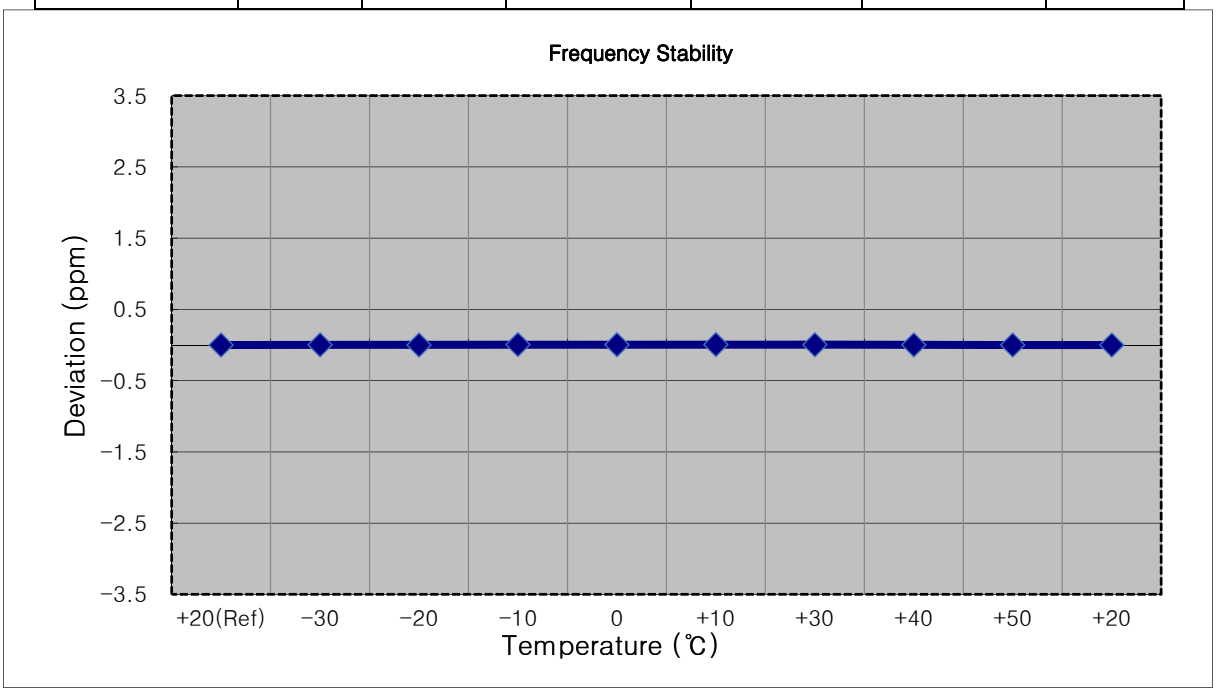
▣ OPERATING FREQUENCY: 2498,500,000 Hz

▣ BANDWIDTH: 39675 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2498 500 006	0.0	0.000 000	0.000
100%		-30	2498 500 010	4.0	0.000 000	0.002
100%		-20	2498 500 004	-2.4	0.000 000	-0.001
100%		-10	2498 500 022	16.2	0.000 001	0.006
100%		0	2498 500 019	13.0	0.000 001	0.005
100%		+10	2498 500 023	16.7	0.000 001	0.007
100%		+30	2498 500 016	10.1	0.000 000	0.004
100%		+40	2498 500 013	6.5	0.000 000	0.003
100%		+50	2498 500 008	1.9	0.000 000	0.001
85%	3.400	+20	2498 500 004	-2.0	0.000 000	-0.001



▣ MODE: LTE 41

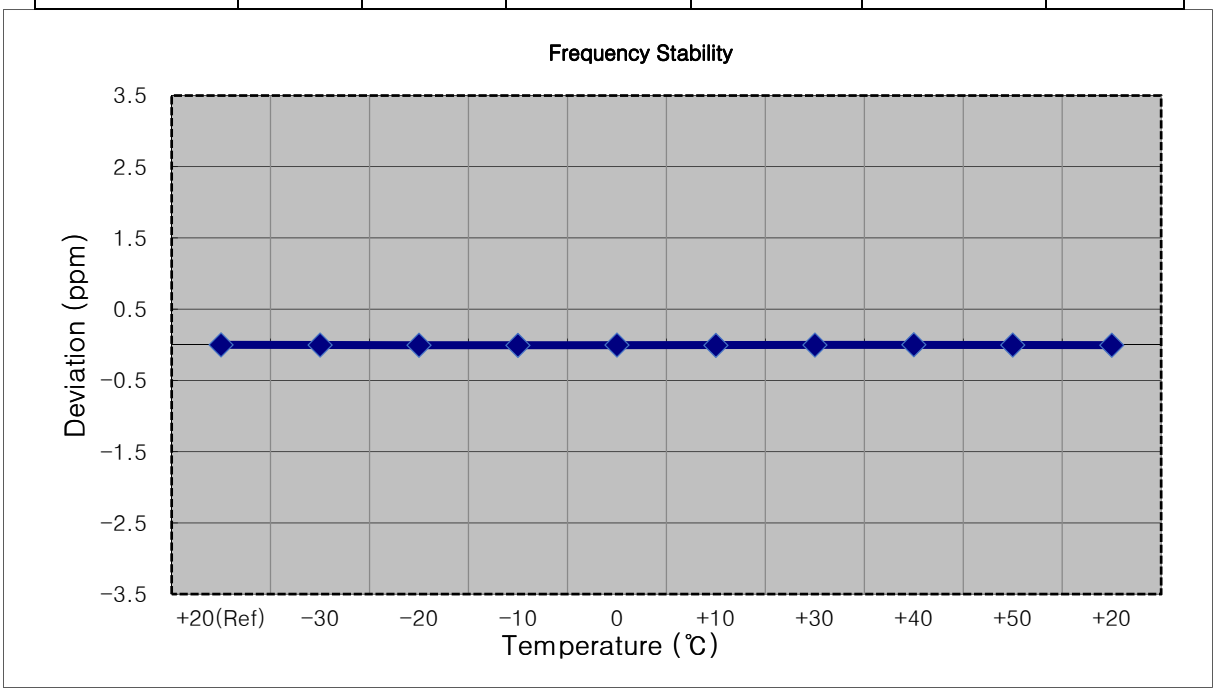
▣ OPERATING FREQUENCY: 2501,000,000 Hz

▣ BANDWIDTH: 39700 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2500 999 996	0.0	0.000 000	0.000
100%		-30	2500 999 994	-2.9	0.000 000	-0.001
100%		-20	2500 999 985	-11.5	0.000 000	-0.005
100%		-10	2500 999 981	-15.4	-0.000 001	-0.006
100%		0	2500 999 993	-3.9	0.000 000	-0.002
100%		+10	2500 999 981	-15.9	-0.000 001	-0.006
100%		+30	2500 999 989	-7.8	0.000 000	-0.003
100%		+40	2501 000 000	3.1	0.000 000	0.001
100%		+50	2500 999 992	-4.6	0.000 000	-0.002
85%	3.400	+20	2500 999 983	-13.7	-0.000 001	-0.005



▣ MODE: LTE 41

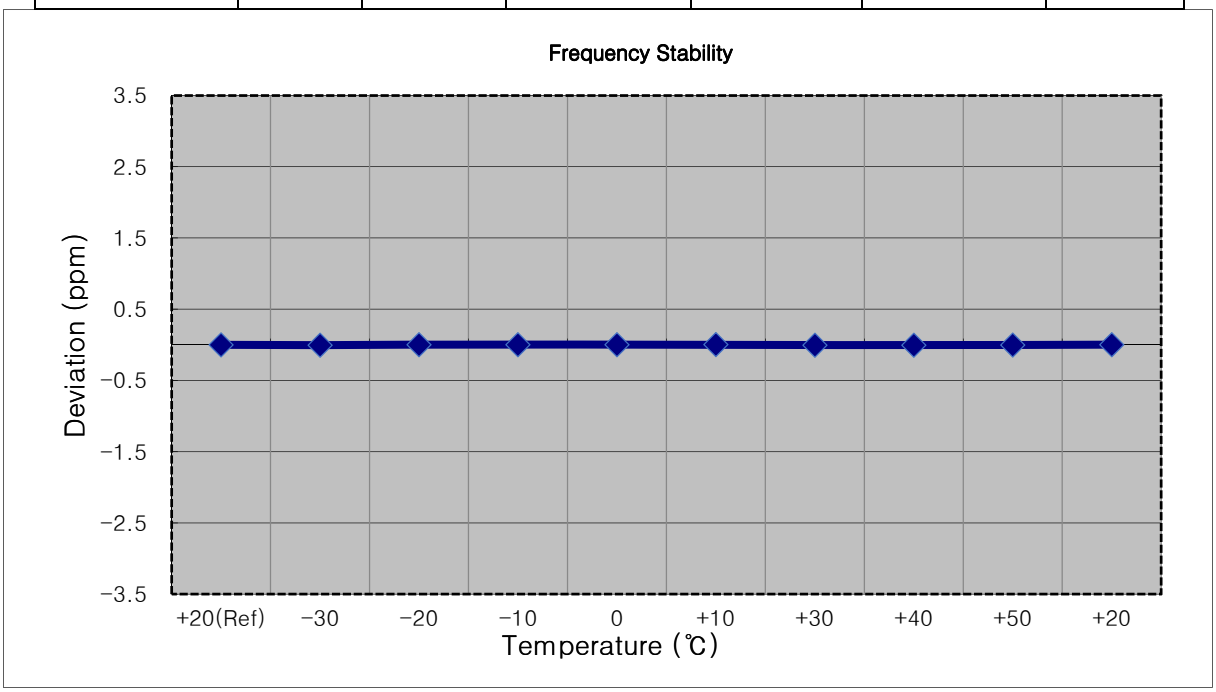
▣ OPERATING FREQUENCY: 2503,500,000 Hz

▣ BANDWIDTH: 39725 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2503 499 993	0.0	0.000 000	0.000
100%		-30	2503 499 983	-9.2	0.000 000	-0.004
100%		-20	2503 499 997	4.5	0.000 000	0.002
100%		-10	2503 500 000	7.5	0.000 000	0.003
100%		0	2503 500 001	8.4	0.000 000	0.003
100%		+10	2503 500 002	9.8	0.000 000	0.004
100%		+30	2503 499 984	-8.5	0.000 000	-0.003
100%		+40	2503 499 982	-10.5	0.000 000	-0.004
100%		+50	2503 499 989	-3.7	0.000 000	-0.001
85%	3.400	+20	2503 499 997	4.4	0.000 000	0.002



▣ MODE: LTE 41

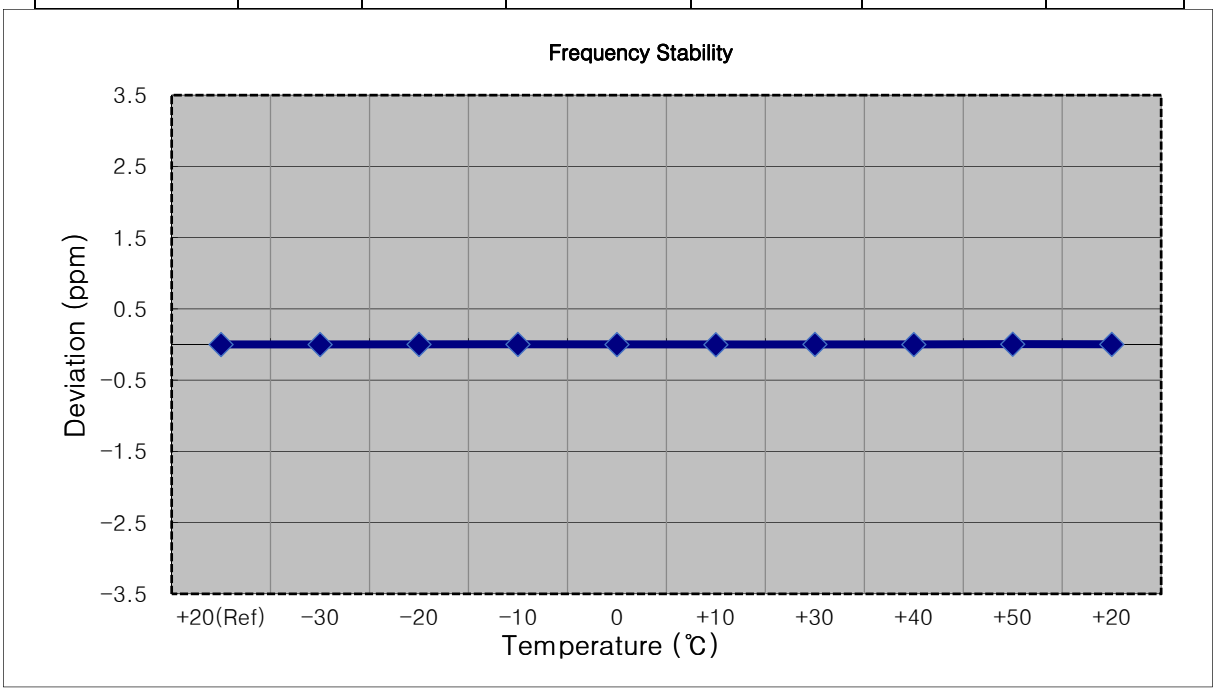
▣ OPERATING FREQUENCY: 2506,000,000 Hz

▣ BANDWIDTH: 39750 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2506 000 012	0.0	0.000 000	0.000
100%		-30	2506 000 017	4.8	0.000 000	0.002
100%		-20	2506 000 022	9.8	0.000 000	0.004
100%		-10	2506 000 018	5.7	0.000 000	0.002
100%		0	2506 000 014	2.0	0.000 000	0.001
100%		+10	2506 000 010	-2.0	0.000 000	-0.001
100%		+30	2506 000 019	7.0	0.000 000	0.003
100%		+40	2506 000 016	3.6	0.000 000	0.001
100%		+50	2506 000 023	10.7	0.000 000	0.004
85%	3.400	+20	2506 000 019	7.2	0.000 000	0.003



▣ MODE: LTE 41

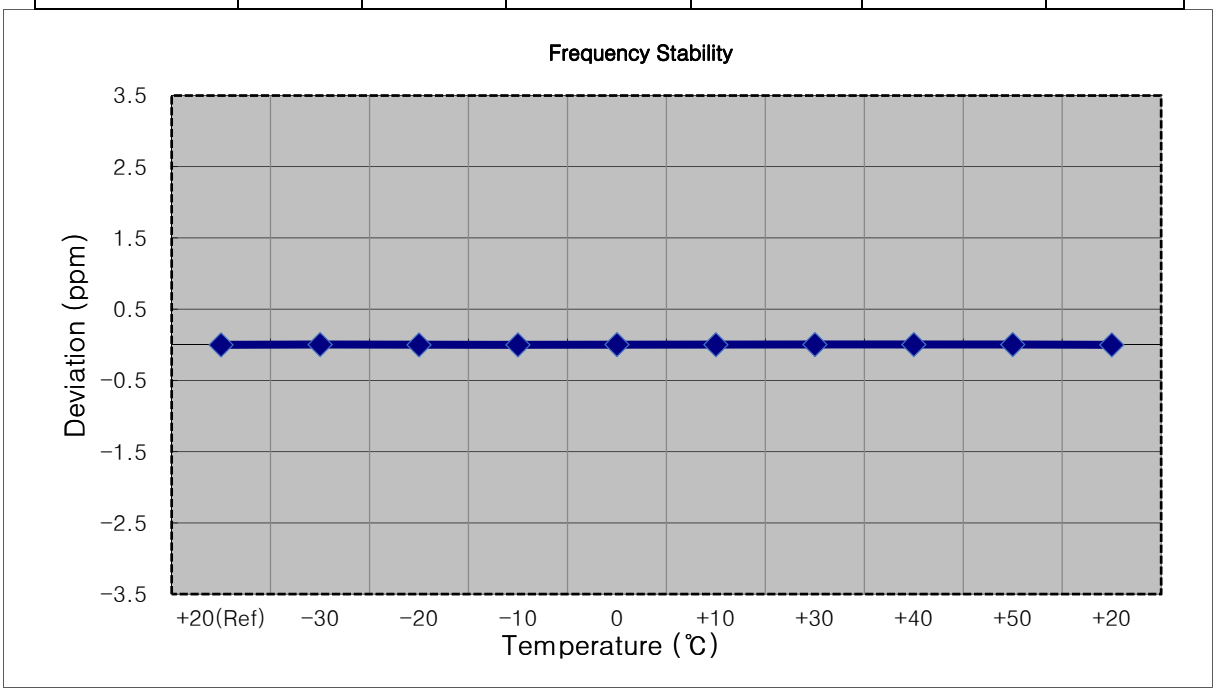
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 005	0.0	0.000 000	0.000
100%		-30	2593 000 016	10.9	0.000 000	0.004
100%		-20	2593 000 007	2.1	0.000 000	0.001
100%		-10	2593 000 007	2.4	0.000 000	0.001
100%		0	2593 000 019	13.9	0.000 001	0.005
100%		+10	2593 000 010	5.3	0.000 000	0.002
100%		+30	2593 000 017	11.7	0.000 000	0.005
100%		+40	2593 000 014	9.2	0.000 000	0.004
100%		+50	2593 000 018	13.3	0.000 001	0.005
85%	3.400	+20	2593 000 007	1.9	0.000 000	0.001



▣ MODE: LTE 41

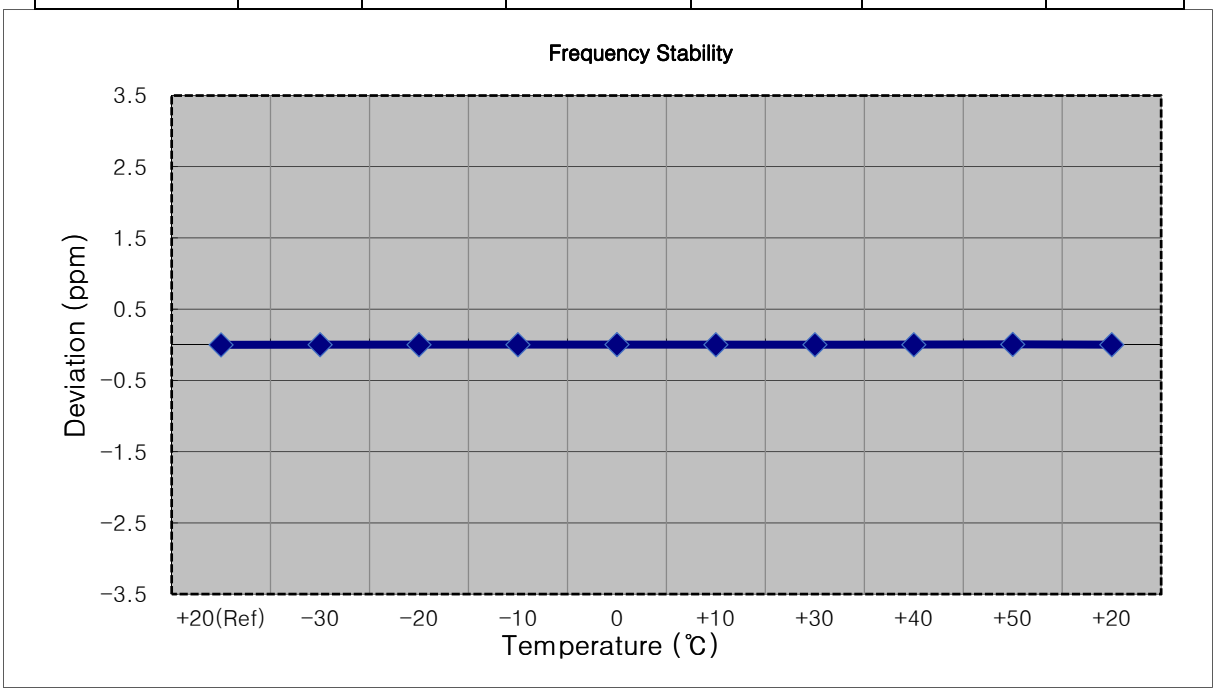
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 015	0.0	0.000 000	0.000
100%		-30	2593 000 019	3.9	0.000 000	0.002
100%		-20	2593 000 019	4.2	0.000 000	0.002
100%		-10	2593 000 019	3.5	0.000 000	0.001
100%		0	2593 000 029	13.3	0.000 001	0.005
100%		+10	2593 000 021	5.5	0.000 000	0.002
100%		+30	2593 000 022	7.0	0.000 000	0.003
100%		+40	2593 000 021	5.3	0.000 000	0.002
100%		+50	2593 000 033	18.2	0.000 001	0.007
85%	3.400	+20	2593 000 023	7.4	0.000 000	0.003



▣ MODE: LTE 41

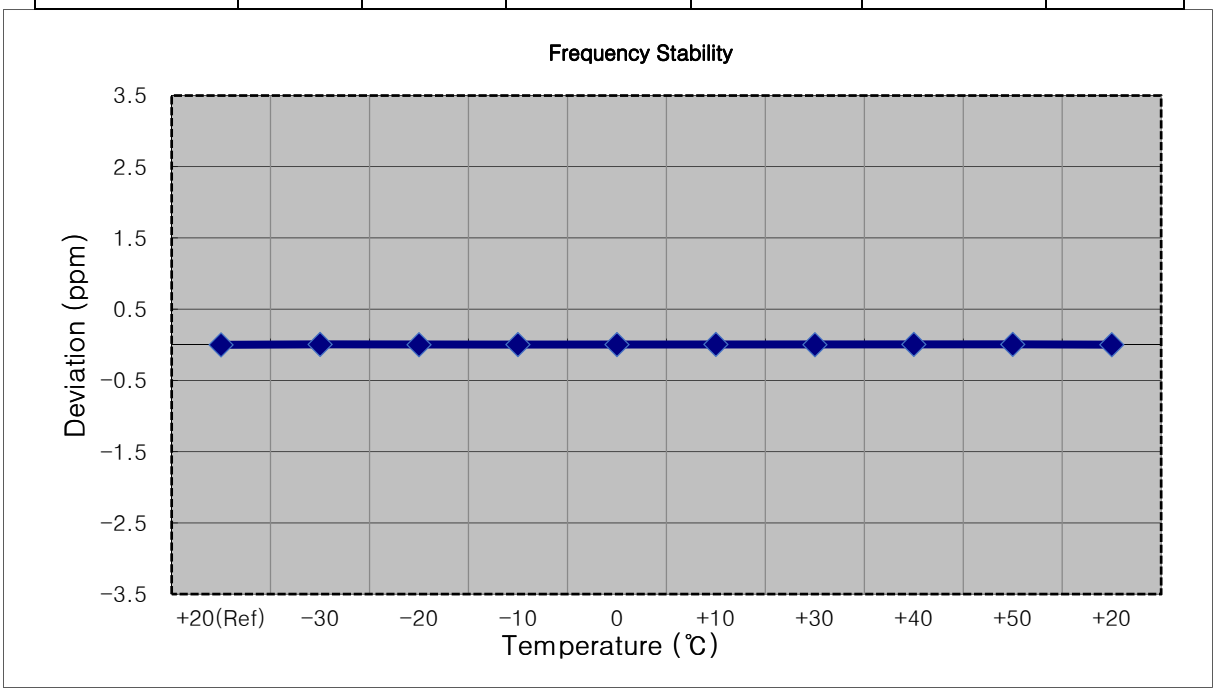
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 003	0.0	0.000 000	0.000
100%		-30	2593 000 018	15.2	0.000 001	0.006
100%		-20	2593 000 011	8.7	0.000 000	0.003
100%		-10	2593 000 017	14.4	0.000 001	0.006
100%		0	2593 000 014	11.0	0.000 000	0.004
100%		+10	2593 000 018	15.7	0.000 001	0.006
100%		+30	2593 000 008	5.8	0.000 000	0.002
100%		+40	2593 000 018	15.0	0.000 001	0.006
100%		+50	2593 000 018	15.3	0.000 001	0.006
85%	3.400	+20	2593 000 011	8.2	0.000 000	0.003



▣ MODE: LTE 41

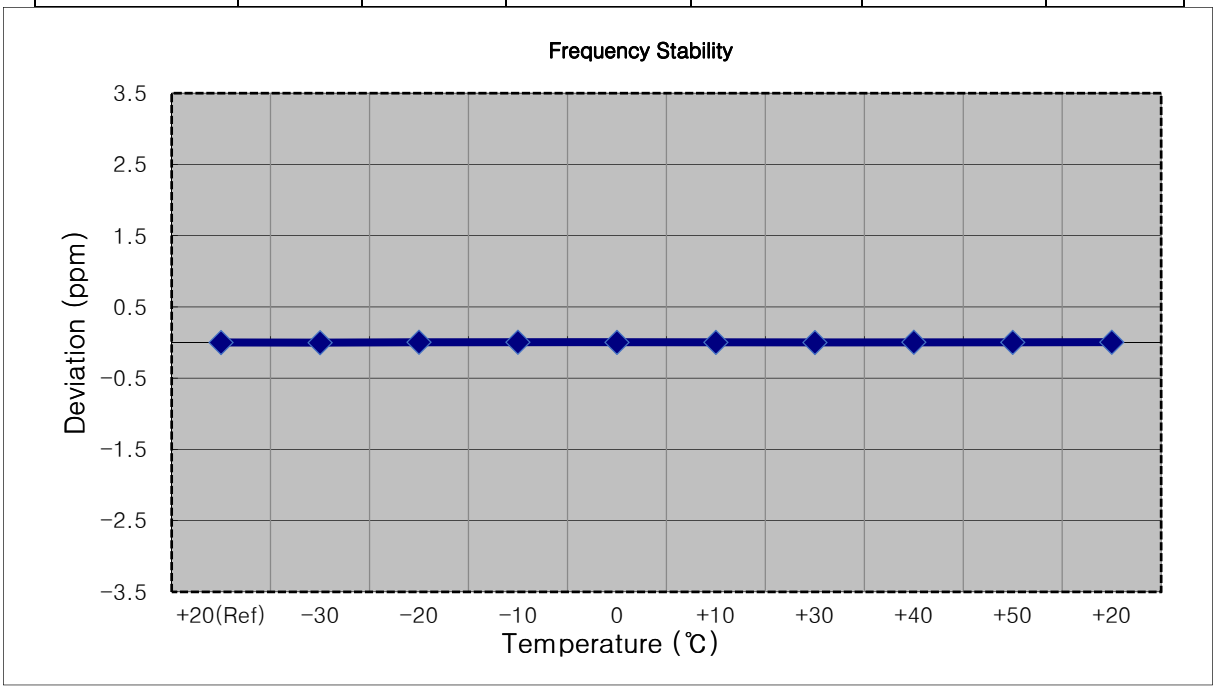
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 014	0.0	0.000 000	0.000
100%		-30	2593 000 010	-4.2	0.000 000	-0.002
100%		-20	2593 000 024	10.2	0.000 000	0.004
100%		-10	2593 000 029	14.4	0.000 001	0.006
100%		0	2593 000 018	3.9	0.000 000	0.002
100%		+10	2593 000 019	4.7	0.000 000	0.002
100%		+30	2593 000 017	3.2	0.000 000	0.001
100%		+40	2593 000 025	10.6	0.000 000	0.004
100%		+50	2593 000 019	4.4	0.000 000	0.002
85%	3.400	+20	2593 000 028	14.1	0.000 001	0.005



▣ MODE: LTE 41

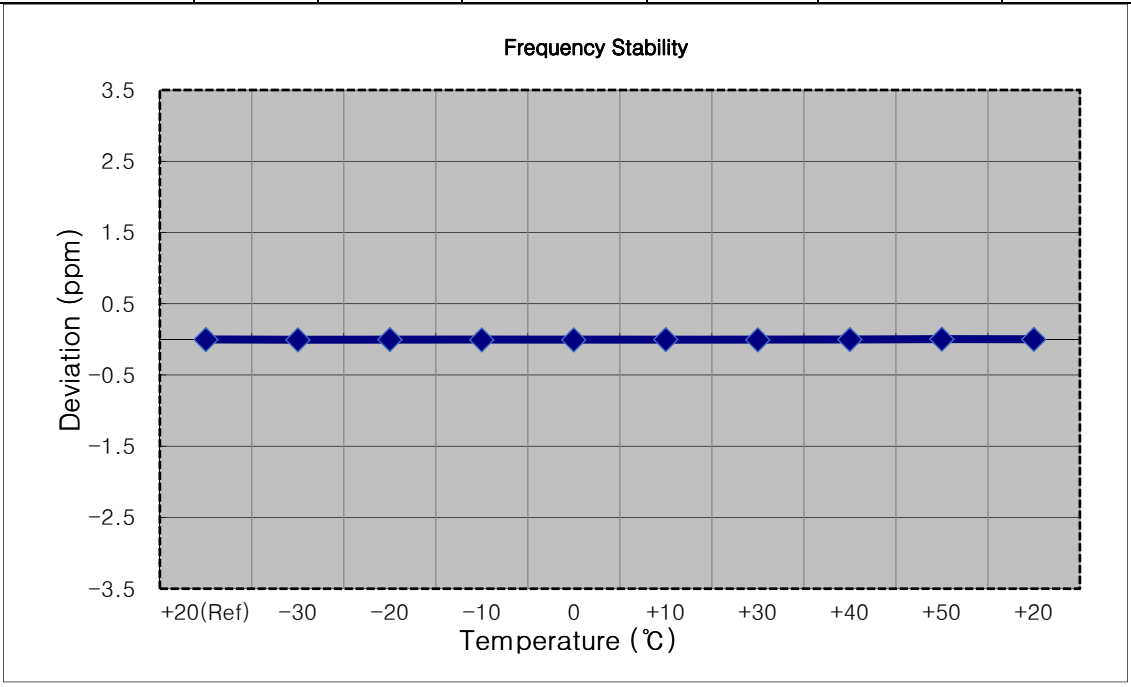
▣ OPERATING FREQUENCY: 2687,500,000 Hz

▣ BANDWIDTH: 41565 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2687 499 987	0.0	0.000 000	0.000
100%		-30	2687 499 972	-14.1	-0.000 001	-0.005
100%		-20	2687 499 983	-3.4	0.000 000	-0.001
100%		-10	2687 499 973	-13.2	0.000 000	-0.005
100%		0	2687 499 974	-12.3	0.000 000	-0.005
100%		+10	2687 499 982	-4.7	0.000 000	-0.002
100%		+30	2687 499 975	-11.9	0.000 000	-0.004
100%		+40	2687 499 981	-5.5	0.000 000	-0.002
100%		+50	2687 499 994	7.2	0.000 000	0.003
85%	3.400	+20	2687 499 990	3.8	0.000 000	0.001



▣ MODE: LTE 41

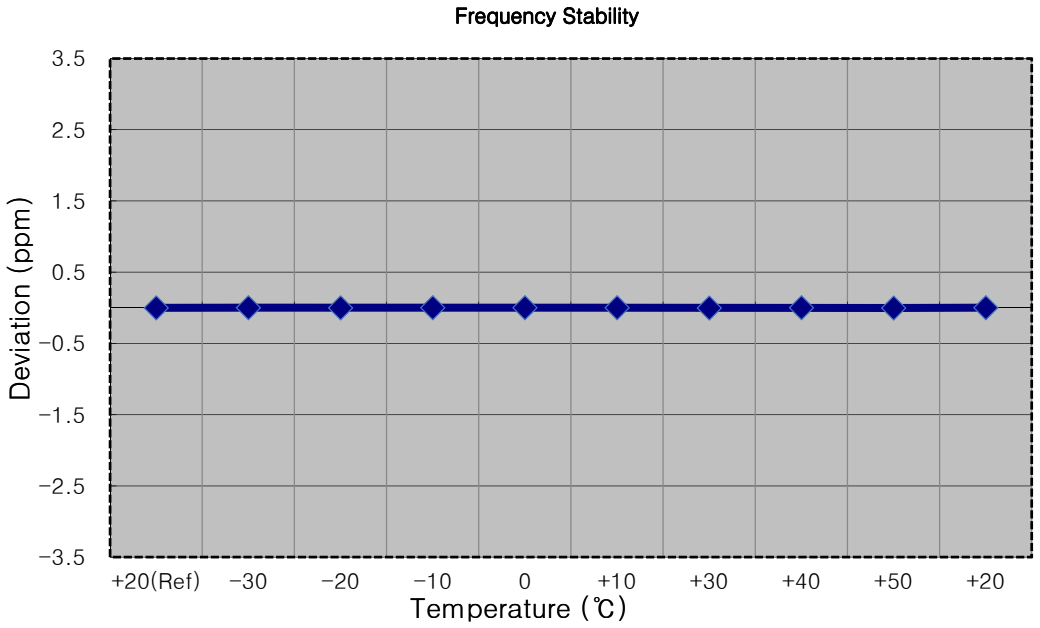
▣ OPERATING FREQUENCY: 2685,000,000 Hz

▣ BANDWIDTH: 41540 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2684 999 993	0.0	0.000 000	0.000
100%		-30	2684 999 996	3.2	0.000 000	0.001
100%		-20	2684 999 990	-2.2	0.000 000	-0.001
100%		-10	2684 999 998	5.1	0.000 000	0.002
100%		0	2684 999 998	5.8	0.000 000	0.002
100%		+10	2684 999 996	3.3	0.000 000	0.001
100%		+30	2684 999 988	-4.4	0.000 000	-0.002
100%		+40	2684 999 996	3.8	0.000 000	0.001
100%		+50	2684 999 984	-8.4	0.000 000	-0.003
85%	3.400	+20	2684 999 999	6.0	0.000 000	0.002



▣ MODE: LTE 41

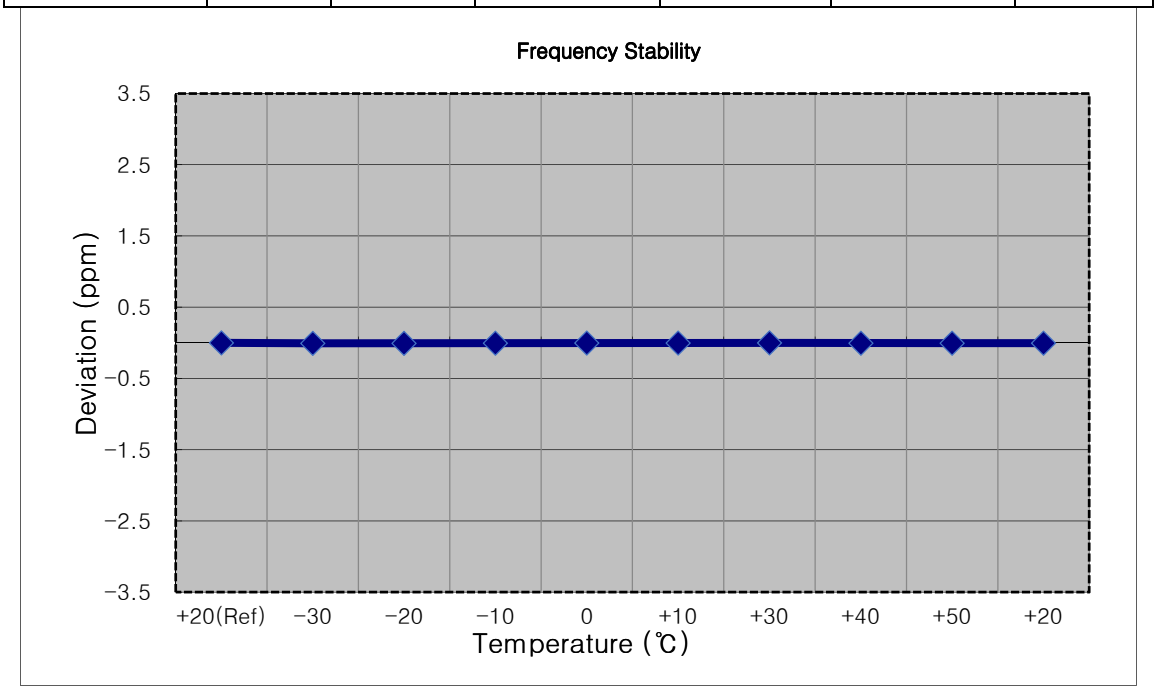
▣ OPERATING FREQUENCY: 2682,500,000 Hz

▣ BANDWIDTH: 41515 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2682 499 985	0.0	0.000 000	0.000
100%		-30	2682 499 968	-16.7	-0.000 001	-0.006
100%		-20	2682 499 970	-15.6	-0.000 001	-0.006
100%		-10	2682 499 974	-11.3	0.000 000	-0.004
100%		0	2682 499 980	-5.5	0.000 000	-0.002
100%		+10	2682 499 979	-5.7	0.000 000	-0.002
100%		+30	2682 499 988	2.6	0.000 000	0.001
100%		+40	2682 499 976	-9.4	0.000 000	-0.004
100%		+50	2682 499 975	-9.7	0.000 000	-0.004
85%	3.400	+20	2682 499 970	-15.0	-0.000 001	-0.006



▣ MODE: LTE 41

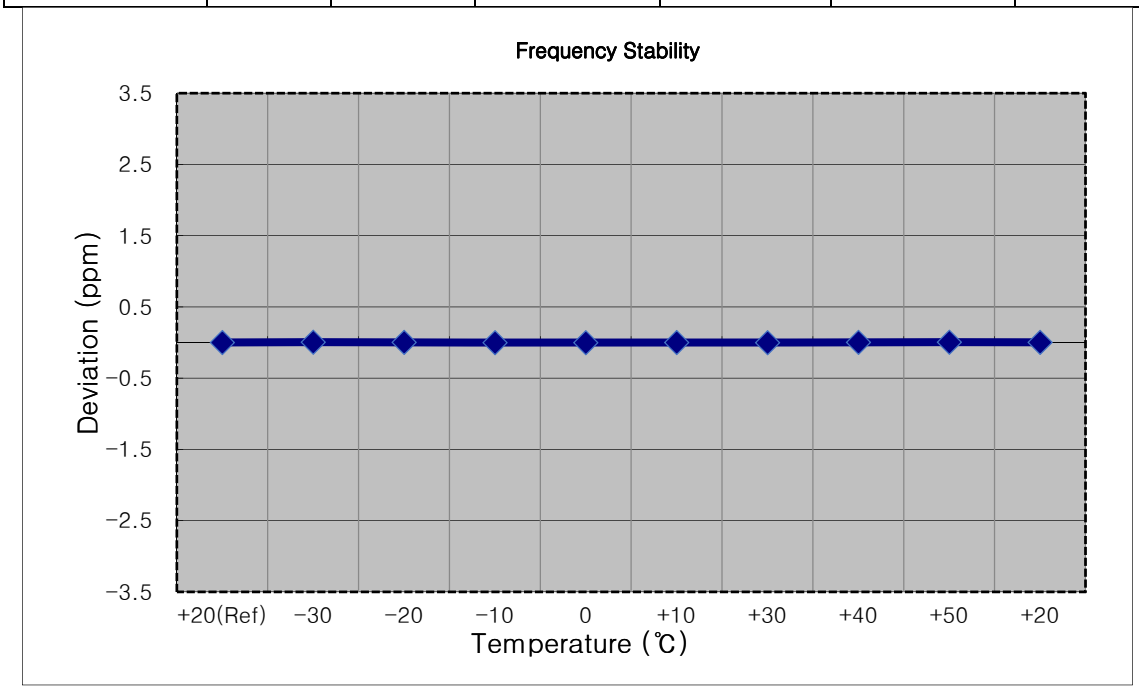
▣ OPERATING FREQUENCY: 2680,000,000 Hz

▣ BANDWIDTH: 41490 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2680 000 003	0.0	0.000 000	0.000
100%		-30	2680 000 014	11.2	0.000 000	0.004
100%		-20	2680 000 007	4.1	0.000 000	0.002
100%		-10	2679 999 999	-4.5	0.000 000	-0.002
100%		0	2679 999 998	-5.7	0.000 000	-0.002
100%		+10	2680 000 007	3.8	0.000 000	0.001
100%		+30	2680 000 000	-3.0	0.000 000	-0.001
100%		+40	2680 000 009	5.6	0.000 000	0.002
100%		+50	2680 000 017	14.0	0.000 001	0.005
85%	3.400	+20	2680 000 013	9.3	0.000 000	0.003



8.7.2 Power Class 2

▣ MODE: LTE 41

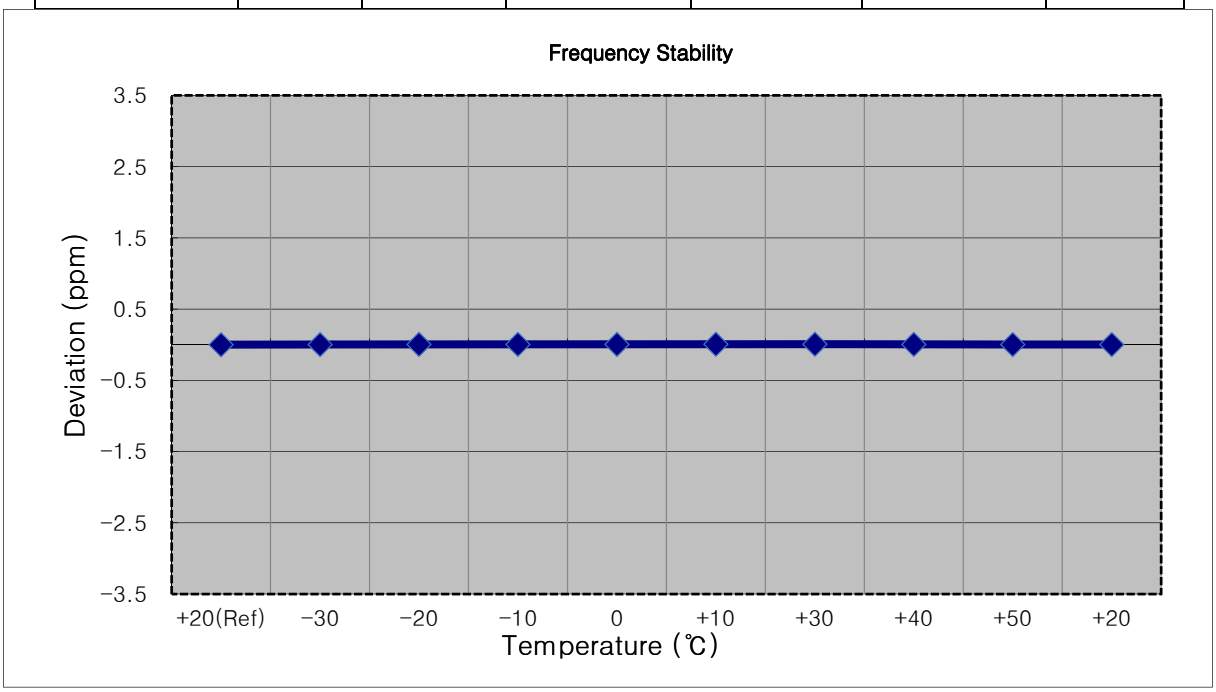
▣ OPERATING FREQUENCY: 2498,500,000 Hz

▣ BANDWIDTH: 39675 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2498 500 018	0.0	0.000 000	0.000
100%		-30	2498 500 025	6.5	0.000 000	0.003
100%		-20	2498 500 030	11.4	0.000 000	0.005
100%		-10	2498 500 032	13.3	0.000 001	0.005
100%		0	2498 500 031	13.0	0.000 001	0.005
100%		+10	2498 500 038	19.8	0.000 001	0.008
100%		+30	2498 500 035	16.6	0.000 001	0.007
100%		+40	2498 500 031	12.4	0.000 000	0.005
100%		+50	2498 500 027	8.5	0.000 000	0.003
85%	3.400	+20	2498 500 025	6.4	0.000 000	0.003



▣ MODE: LTE 41

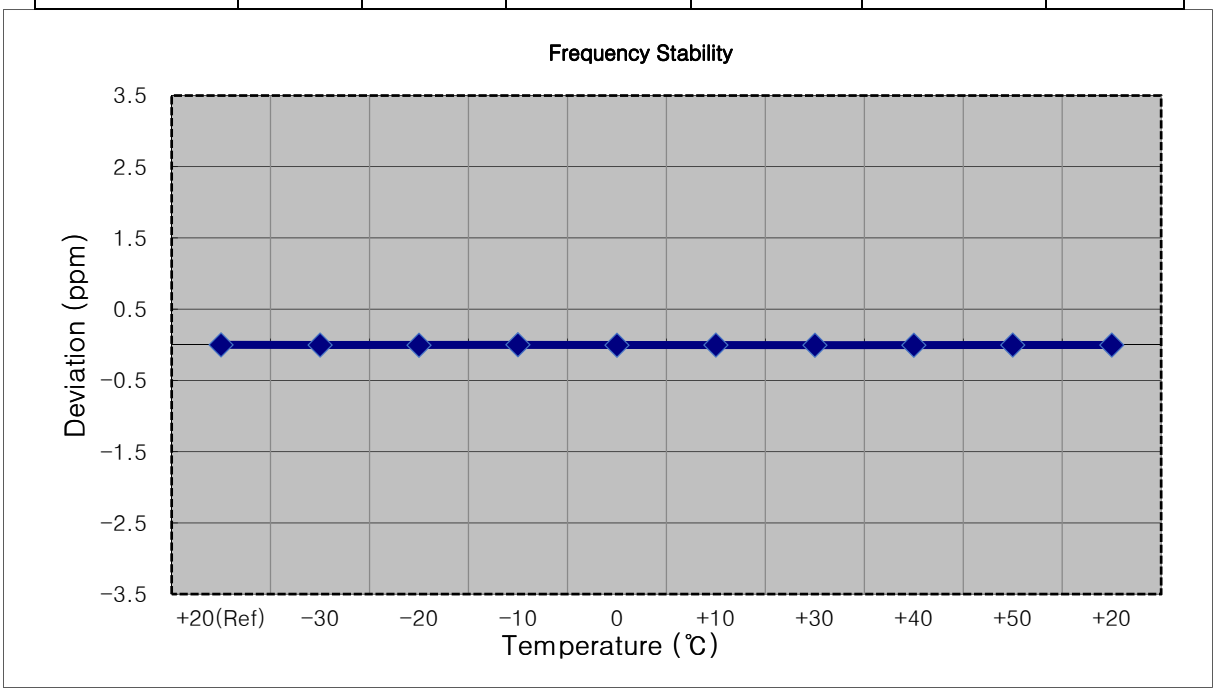
▣ OPERATING FREQUENCY: 2501,000,000 Hz

▣ BANDWIDTH: 39700 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2501 000 003	0.0	0.000 000	0.000
100%		-30	2500 999 999	-3.1	0.000 000	-0.001
100%		-20	2500 999 991	-11.3	0.000 000	-0.005
100%		-10	2501 000 007	4.7	0.000 000	0.002
100%		0	2500 999 989	-13.2	-0.000 001	-0.005
100%		+10	2500 999 998	-4.9	0.000 000	-0.002
100%		+30	2500 999 989	-13.5	-0.000 001	-0.005
100%		+40	2500 999 993	-9.4	0.000 000	-0.004
100%		+50	2500 999 997	-5.9	0.000 000	-0.002
85%	3.400	+20	2500 999 997	-5.5	0.000 000	-0.002



▣ MODE: LTE 41

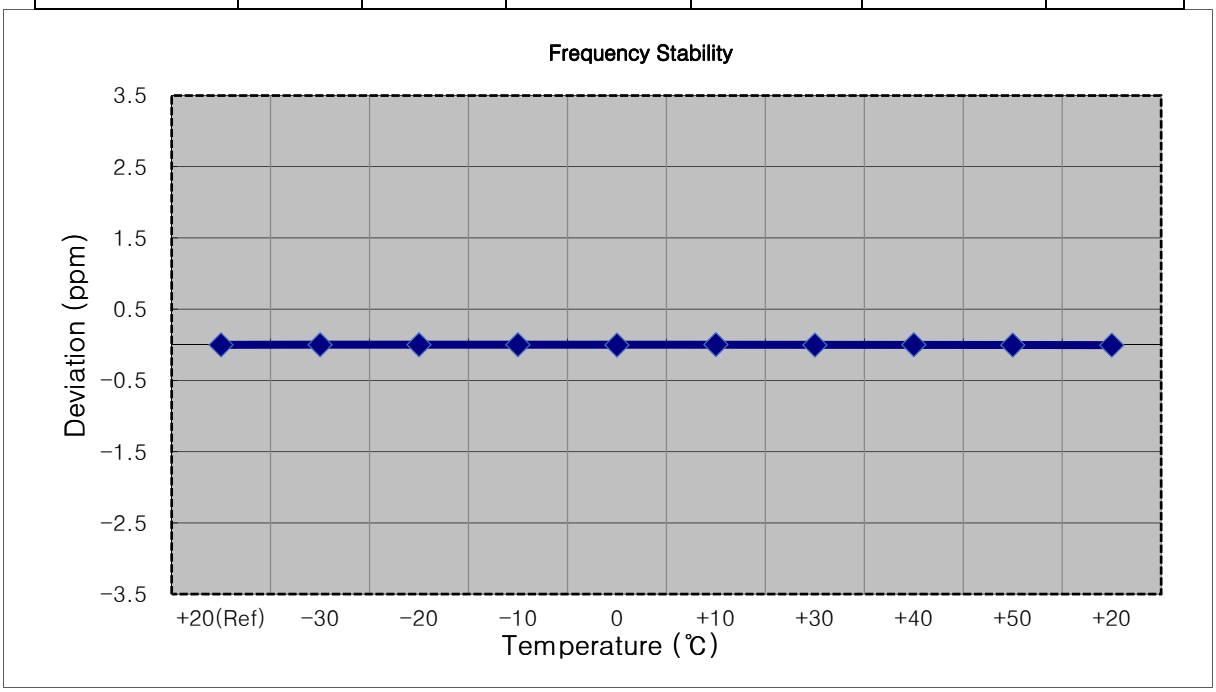
▣ OPERATING FREQUENCY: 2503,500,000 Hz

▣ BANDWIDTH: 39725 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2503 500 009	0.0	0.000 000	0.000
100%		-30	2503 500 017	7.4	0.000 000	0.003
100%		-20	2503 500 013	3.3	0.000 000	0.001
100%		-10	2503 500 013	4.1	0.000 000	0.002
100%		0	2503 500 002	-7.0	0.000 000	-0.003
100%		+10	2503 500 019	9.5	0.000 000	0.004
100%		+30	2503 500 001	-8.2	0.000 000	-0.003
100%		+40	2503 500 016	6.4	0.000 000	0.003
100%		+50	2503 500 005	-4.6	0.000 000	-0.002
85%	3.400	+20	2503 499 998	-10.9	0.000 000	-0.004



▣ MODE: LTE 41

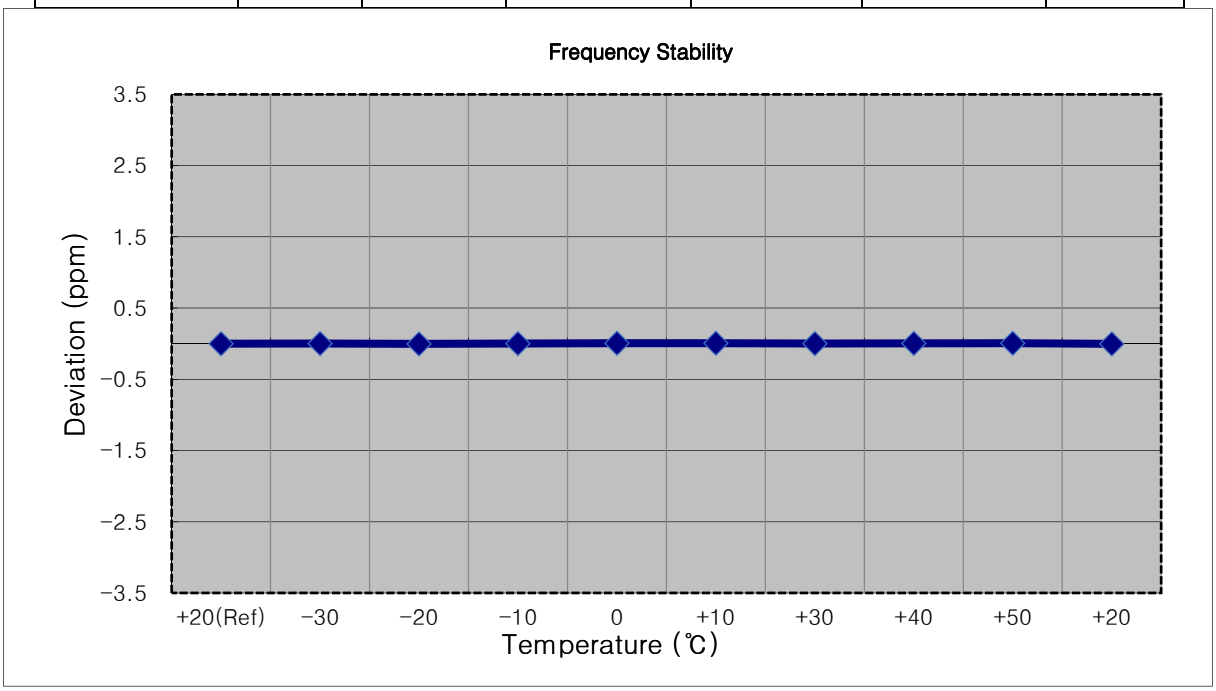
▣ OPERATING FREQUENCY: 2506,000,000 Hz

▣ BANDWIDTH: 39750 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2506 000 010	0.0	0.000 000	0.000
100%		-30	2506 000 018	8.0	0.000 000	0.003
100%		-20	2506 000 007	-3.3	0.000 000	-0.001
100%		-10	2506 000 016	5.7	0.000 000	0.002
100%		0	2506 000 025	14.8	0.000 001	0.006
100%		+10	2506 000 025	14.8	0.000 001	0.006
100%		+30	2506 000 016	6.0	0.000 000	0.002
100%		+40	2506 000 022	11.7	0.000 000	0.005
100%		+50	2506 000 025	15.0	0.000 001	0.006
85%	3.400	+20	2506 000 007	-3.5	0.000 000	-0.001



▣ MODE: LTE 41

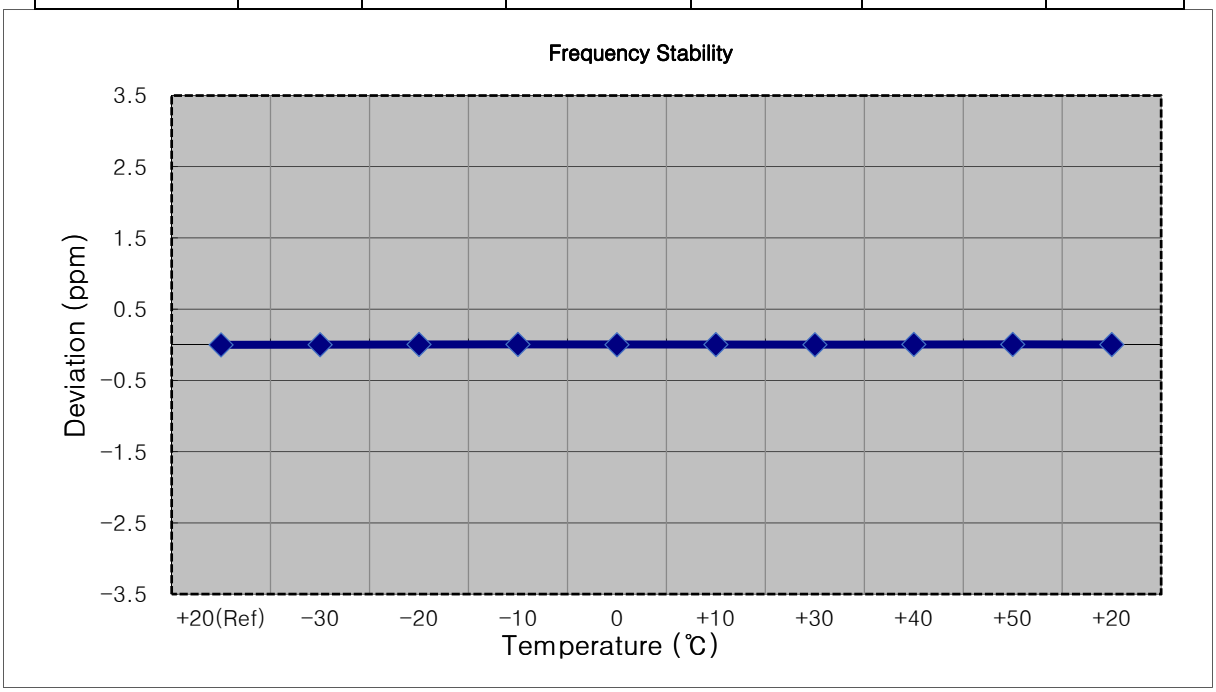
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 004	0.0	0.000 000	0.000
100%		-30	2593 000 010	6.7	0.000 000	0.003
100%		-20	2593 000 019	15.3	0.000 001	0.006
100%		-10	2593 000 020	16.7	0.000 001	0.006
100%		0	2593 000 011	7.7	0.000 000	0.003
100%		+10	2593 000 017	13.6	0.000 001	0.005
100%		+30	2593 000 008	4.3	0.000 000	0.002
100%		+40	2593 000 023	19.4	0.000 001	0.007
100%		+50	2593 000 022	18.0	0.000 001	0.007
85%	3.400	+20	2593 000 013	9.7	0.000 000	0.004



▣ MODE: LTE 41

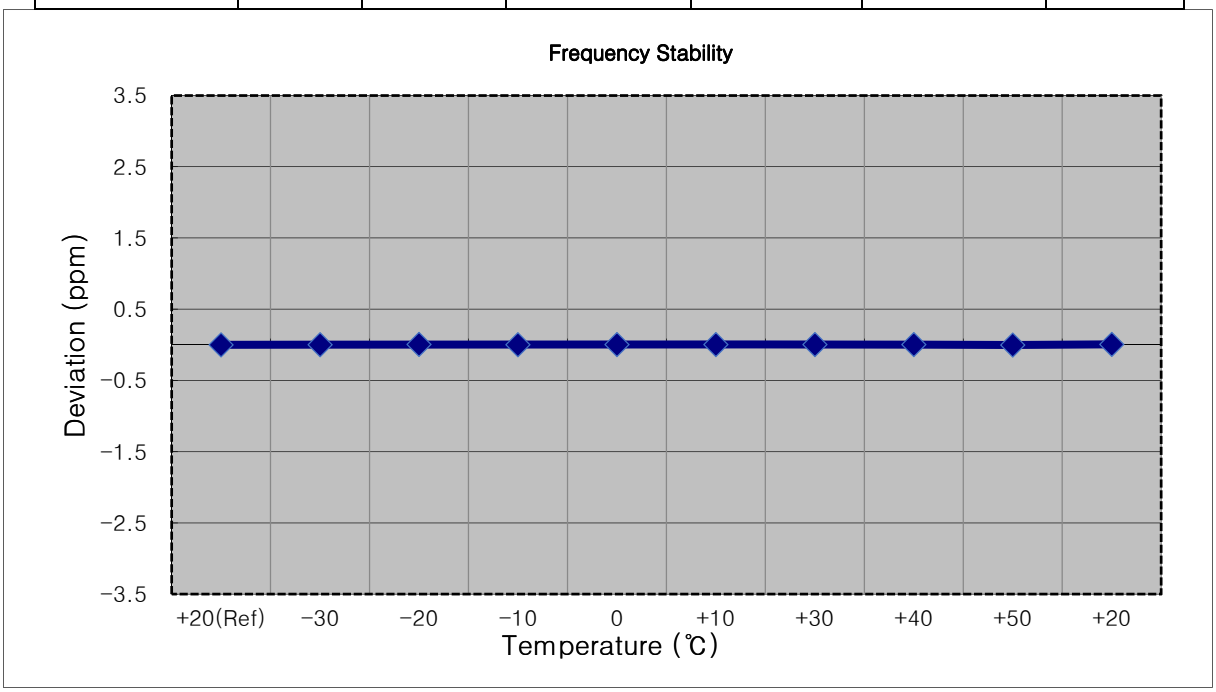
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 004	0.0	0.000 000	0.000
100%		-30	2593 000 012	8.1	0.000 000	0.003
100%		-20	2593 000 021	17.7	0.000 001	0.007
100%		-10	2593 000 007	3.3	0.000 000	0.001
100%		0	2593 000 013	9.7	0.000 000	0.004
100%		+10	2593 000 015	10.9	0.000 000	0.004
100%		+30	2593 000 017	13.7	0.000 001	0.005
100%		+40	2593 000 013	9.4	0.000 000	0.004
100%		+50	2592 999 999	-4.7	0.000 000	-0.002
85%	3.400	+20	2593 000 021	16.9	0.000 001	0.007



▣ MODE: LTE 41

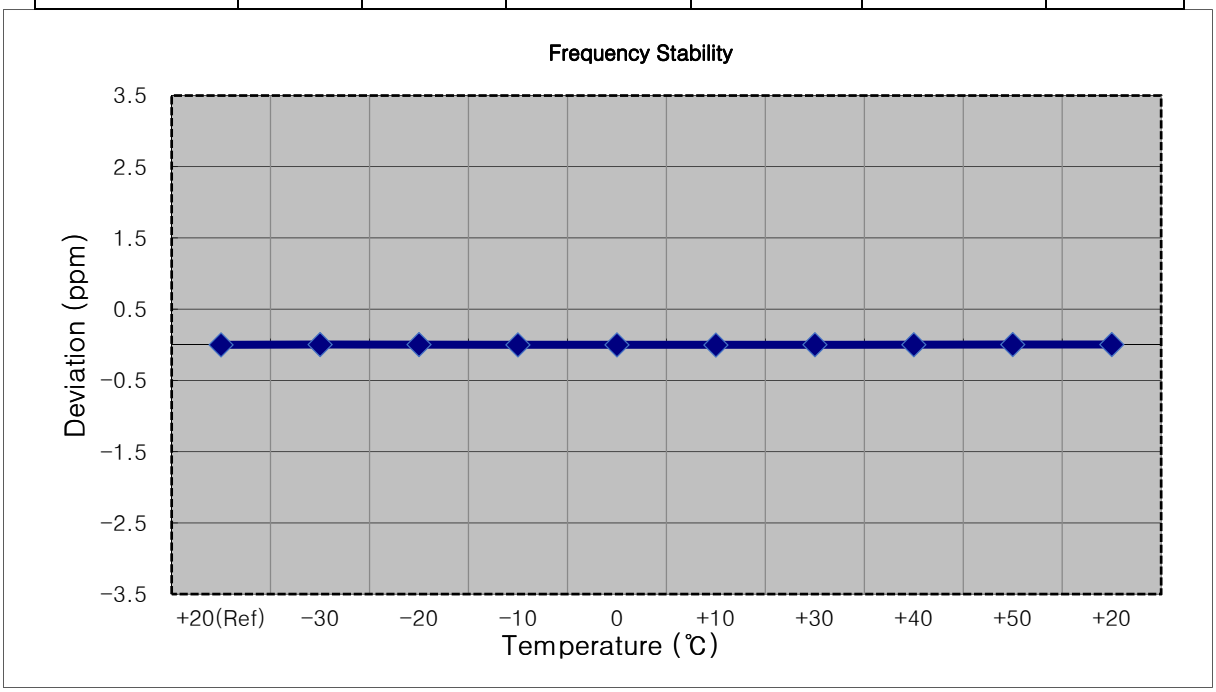
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 013	0.0	0.000 000	0.000
100%		-30	2593 000 025	12.0	0.000 000	0.005
100%		-20	2593 000 027	13.6	0.000 001	0.005
100%		-10	2593 000 011	-2.5	0.000 000	-0.001
100%		0	2593 000 011	-2.2	0.000 000	-0.001
100%		+10	2593 000 009	-4.5	0.000 000	-0.002
100%		+30	2593 000 020	7.3	0.000 000	0.003
100%		+40	2593 000 020	6.9	0.000 000	0.003
100%		+50	2593 000 025	12.0	0.000 000	0.005
85%	3.400	+20	2593 000 026	12.6	0.000 000	0.005



▣ MODE: LTE 41

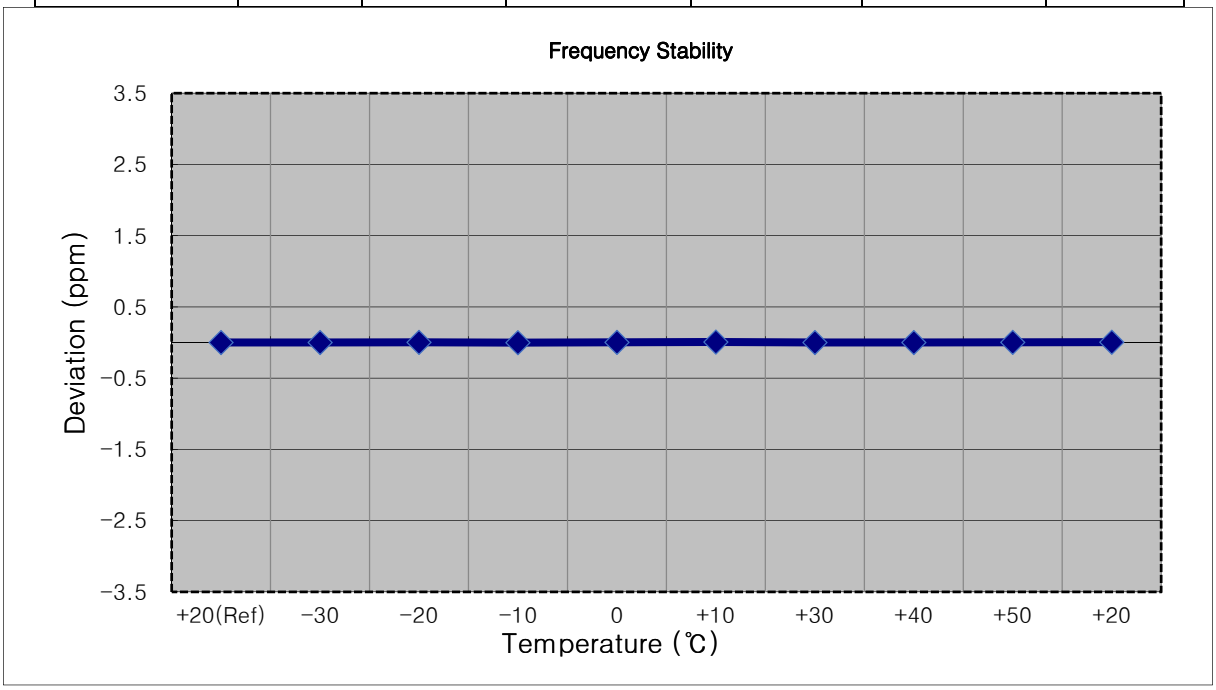
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2593 000 016	0.0	0.000 000	0.000
100%		-30	2593 000 019	3.0	0.000 000	0.001
100%		-20	2593 000 024	8.4	0.000 000	0.003
100%		-10	2593 000 014	-2.5	0.000 000	-0.001
100%		0	2593 000 025	9.4	0.000 000	0.004
100%		+10	2593 000 032	15.6	0.000 001	0.006
100%		+30	2593 000 018	1.6	0.000 000	0.001
100%		+40	2593 000 014	-1.9	0.000 000	-0.001
100%		+50	2593 000 021	5.0	0.000 000	0.002
85%	3.400	+20	2593 000 026	10.3	0.000 000	0.004



▣ MODE: LTE 41

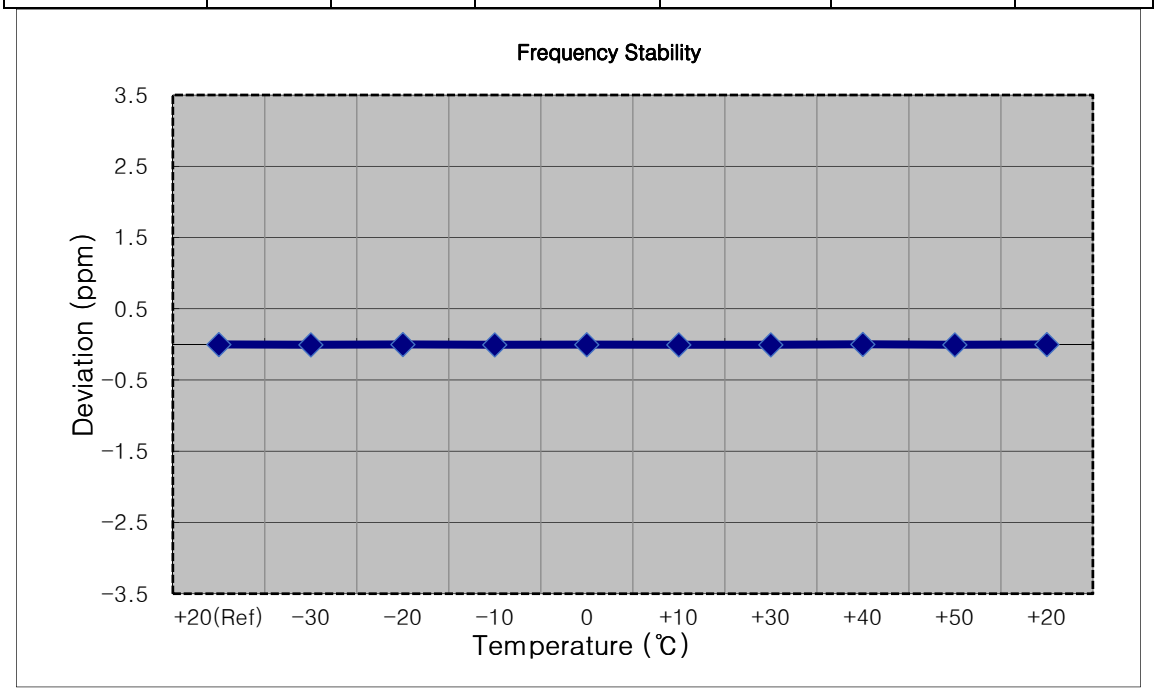
▣ OPERATING FREQUENCY: 2687,500,000 Hz

▣ BANDWIDTH: 41565 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2687 499 993	0.0	0.000 000	0.000
100%		-30	2687 499 978	-14.5	-0.000 001	-0.005
100%		-20	2687 499 988	-4.5	0.000 000	-0.002
100%		-10	2687 499 981	-12.0	0.000 000	-0.004
100%		0	2687 499 986	-7.0	0.000 000	-0.003
100%		+10	2687 499 981	-12.0	0.000 000	-0.004
100%		+30	2687 499 979	-14.3	-0.000 001	-0.005
100%		+40	2687 499 997	3.7	0.000 000	0.001
100%		+50	2687 499 981	-12.3	0.000 000	-0.005
85%	3.400	+20	2687 499 990	-3.1	0.000 000	-0.001



▣ MODE: LTE 41

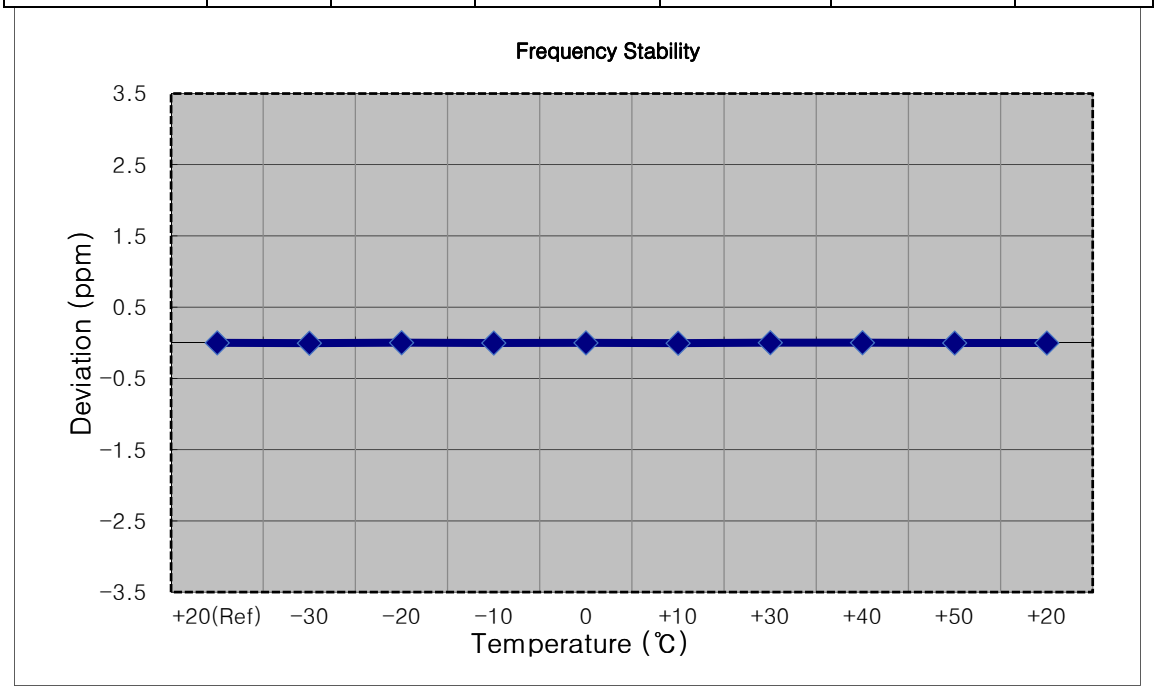
▣ OPERATING FREQUENCY: 2685,000,000 Hz

▣ BANDWIDTH: 41540 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2685 000 008	0.0	0.000 000	0.000
100%		-30	2684 999 997	-11.0	0.000 000	-0.004
100%		-20	2685 000 012	3.7	0.000 000	0.001
100%		-10	2685 000 000	-8.0	0.000 000	-0.003
100%		0	2685 000 011	2.7	0.000 000	0.001
100%		+10	2684 999 997	-11.1	0.000 000	-0.004
100%		+30	2685 000 014	6.3	0.000 000	0.002
100%		+40	2685 000 017	8.5	0.000 000	0.003
100%		+50	2685 000 002	-6.4	0.000 000	-0.002
85%	3.400	+20	2685 000 003	-5.1	0.000 000	-0.002



▣ MODE: LTE 41

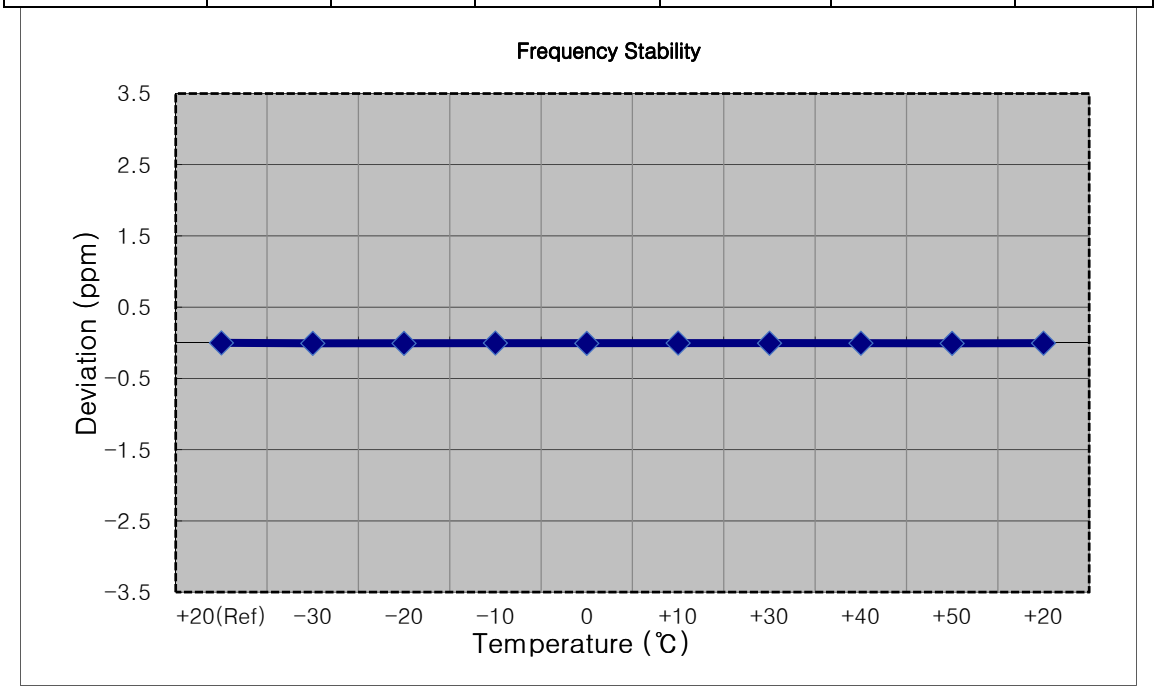
▣ OPERATING FREQUENCY: 2682,500,000 Hz

▣ BANDWIDTH: 41515 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2682 499 991	0.0	0.000 000	0.000
100%		-30	2682 499 973	-17.6	-0.000 001	-0.007
100%		-20	2682 499 974	-16.9	-0.000 001	-0.006
100%		-10	2682 499 982	-8.8	0.000 000	-0.003
100%		0	2682 499 972	-18.7	-0.000 001	-0.007
100%		+10	2682 499 984	-7.2	0.000 000	-0.003
100%		+30	2682 499 978	-13.2	0.000 000	-0.005
100%		+40	2682 499 977	-13.5	-0.000 001	-0.005
100%		+50	2682 499 975	-15.4	-0.000 001	-0.006
85%	3.400	+20	2682 499 980	-10.5	0.000 000	-0.004



▣ MODE: LTE 41

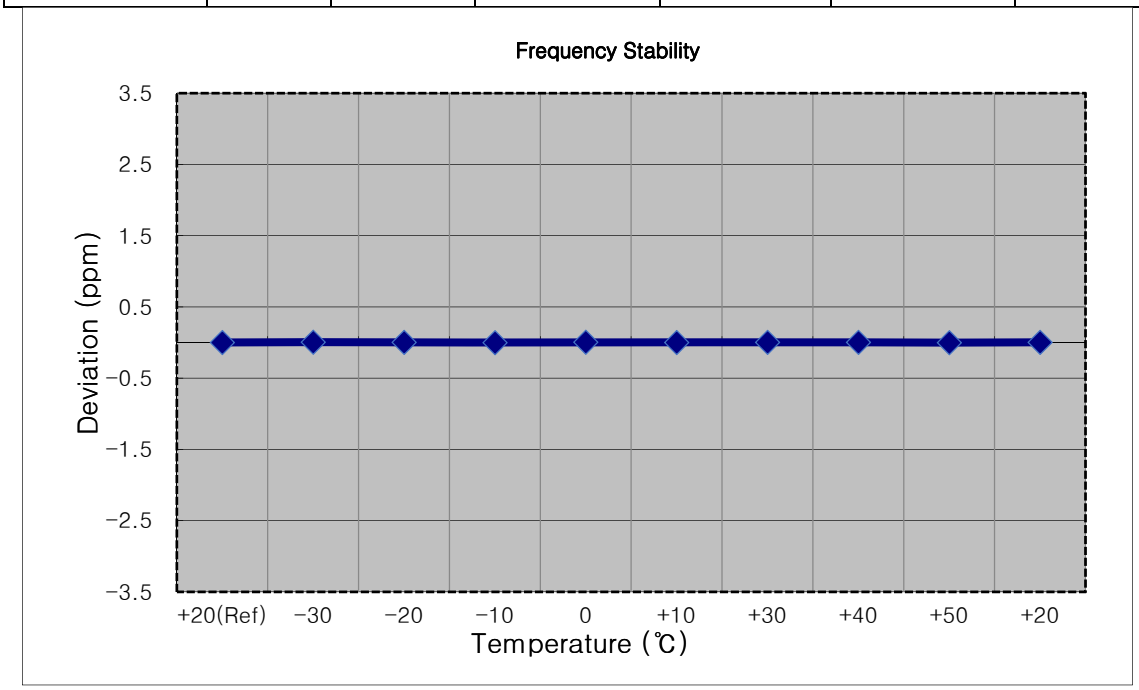
▣ OPERATING FREQUENCY: 2680,000,000 Hz

▣ BANDWIDTH: 41490 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

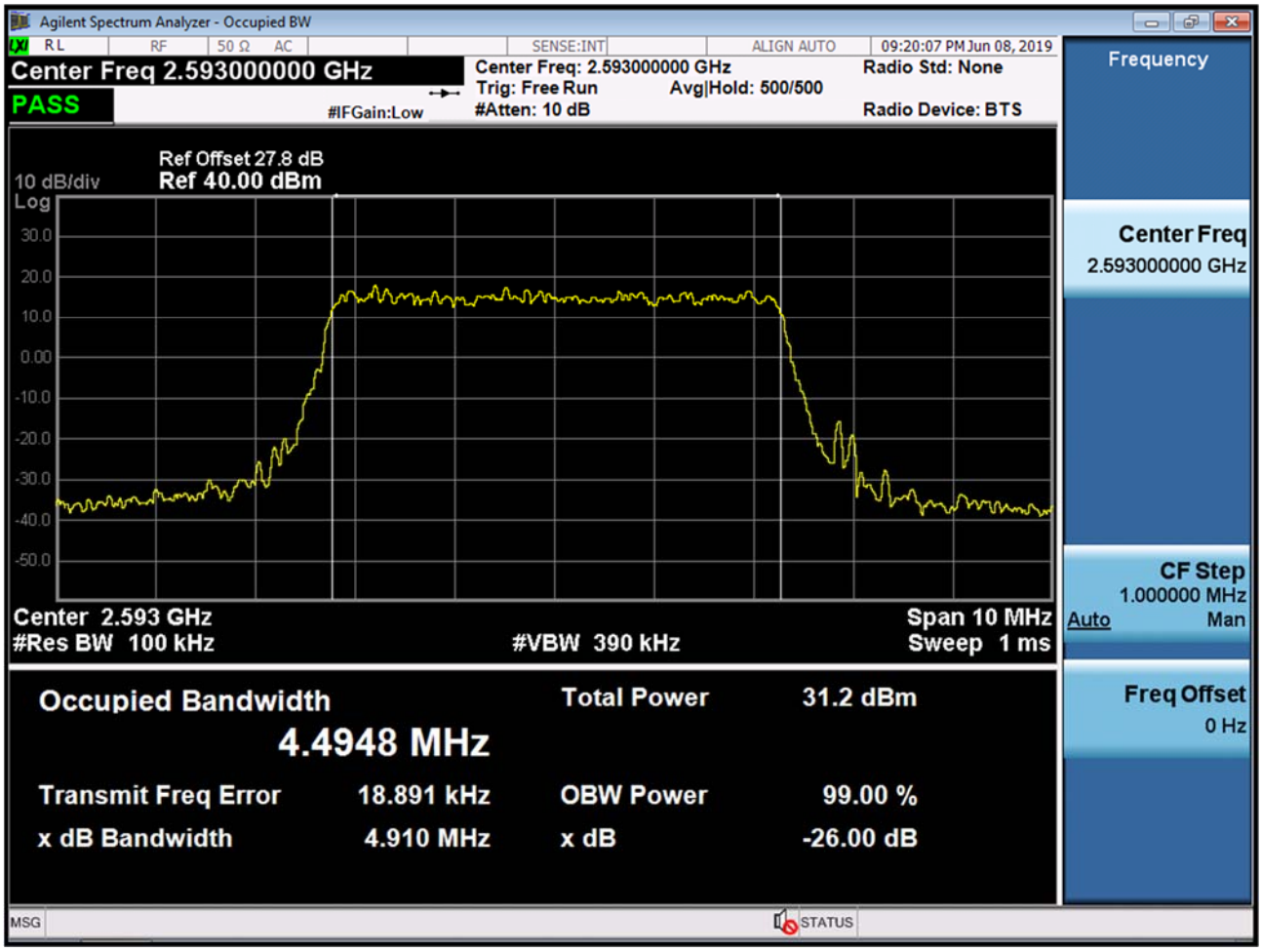
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	2679 999 992	0.0	0.000 000	0.000
100%		-30	2680 000 005	13.7	0.000 001	0.005
100%		-20	2680 000 002	9.8	0.000 000	0.004
100%		-10	2679 999 987	-4.9	0.000 000	-0.002
100%		0	2680 000 003	11.4	0.000 000	0.004
100%		+10	2679 999 995	3.2	0.000 000	0.001
100%		+30	2679 999 998	6.1	0.000 000	0.002
100%		+40	2679 999 997	5.3	0.000 000	0.002
100%		+50	2679 999 987	-4.4	0.000 000	-0.002
85%	3.400	+20	2680 000 001	9.3	0.000 000	0.003

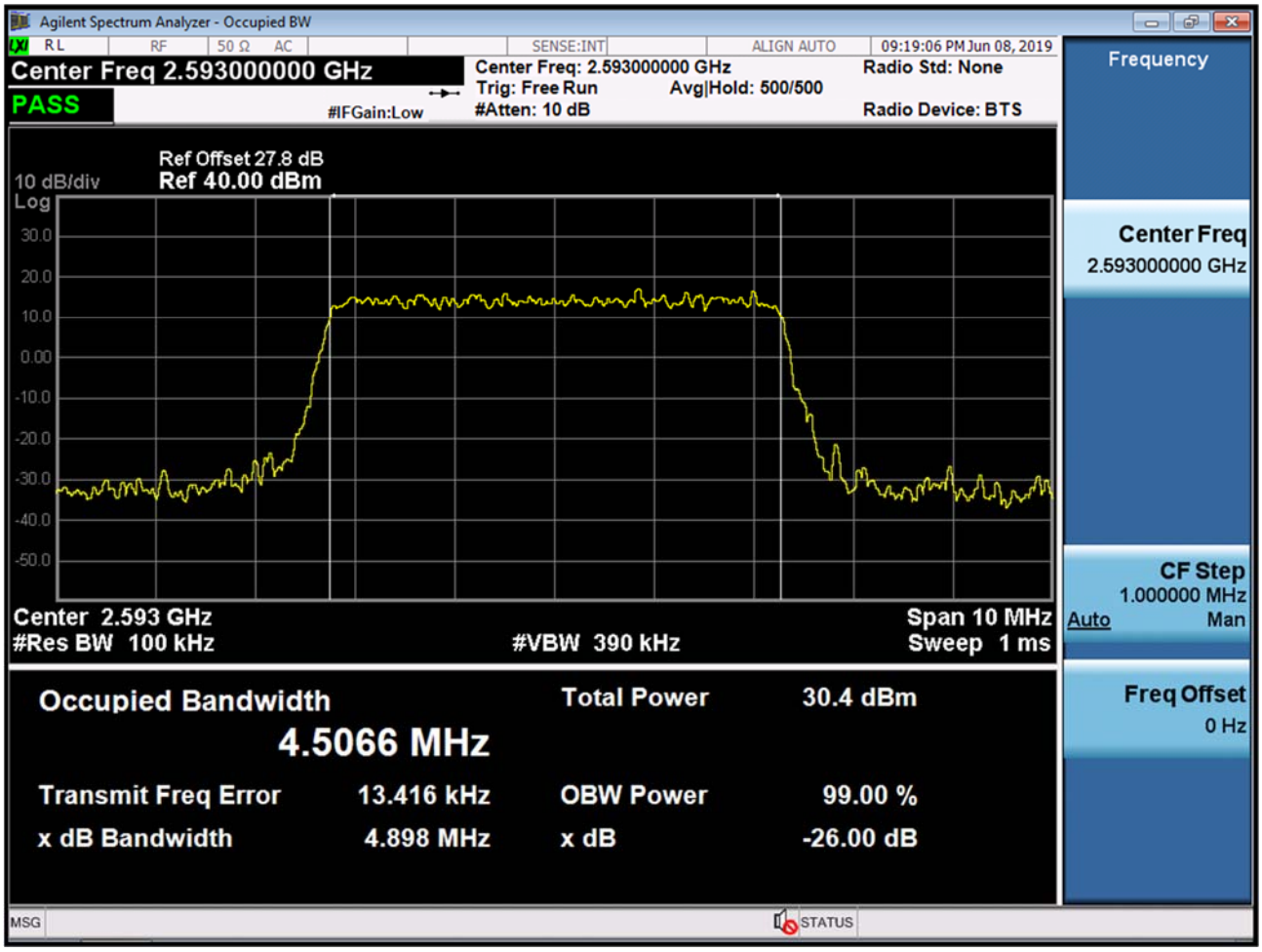


9. TEST PLOTS

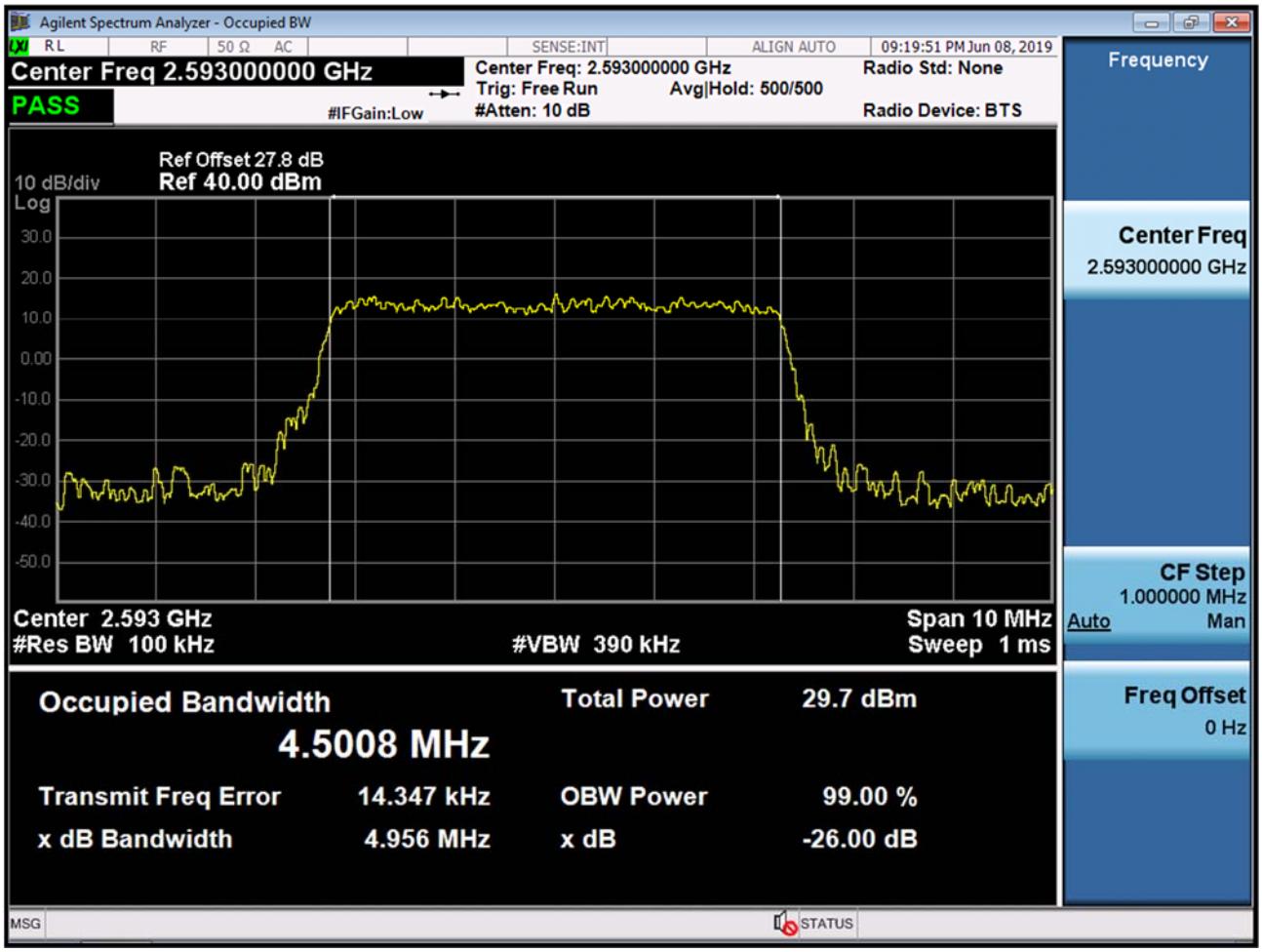
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 QPSK RB 25) (POWER CLASS 3)



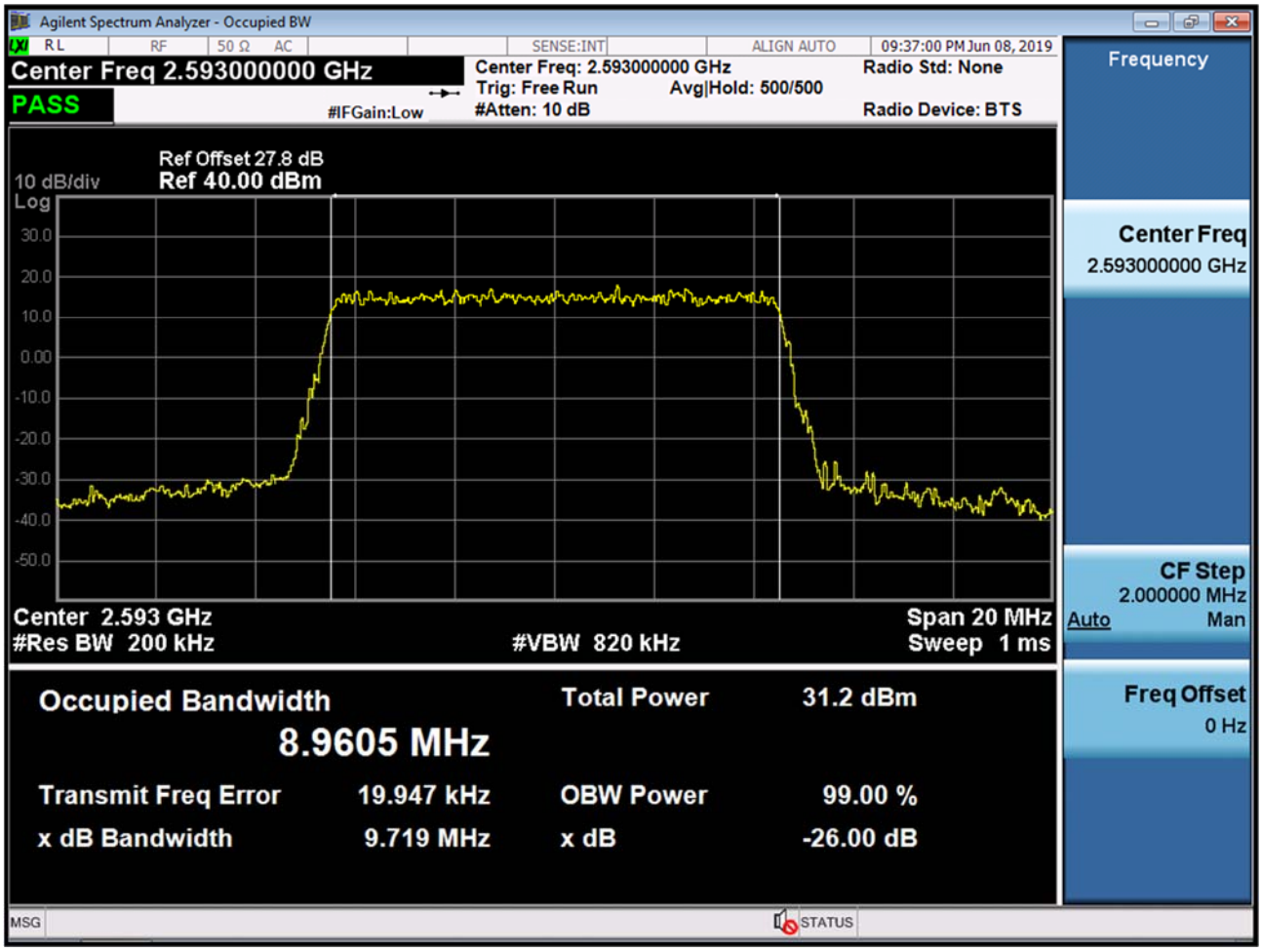
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 3)



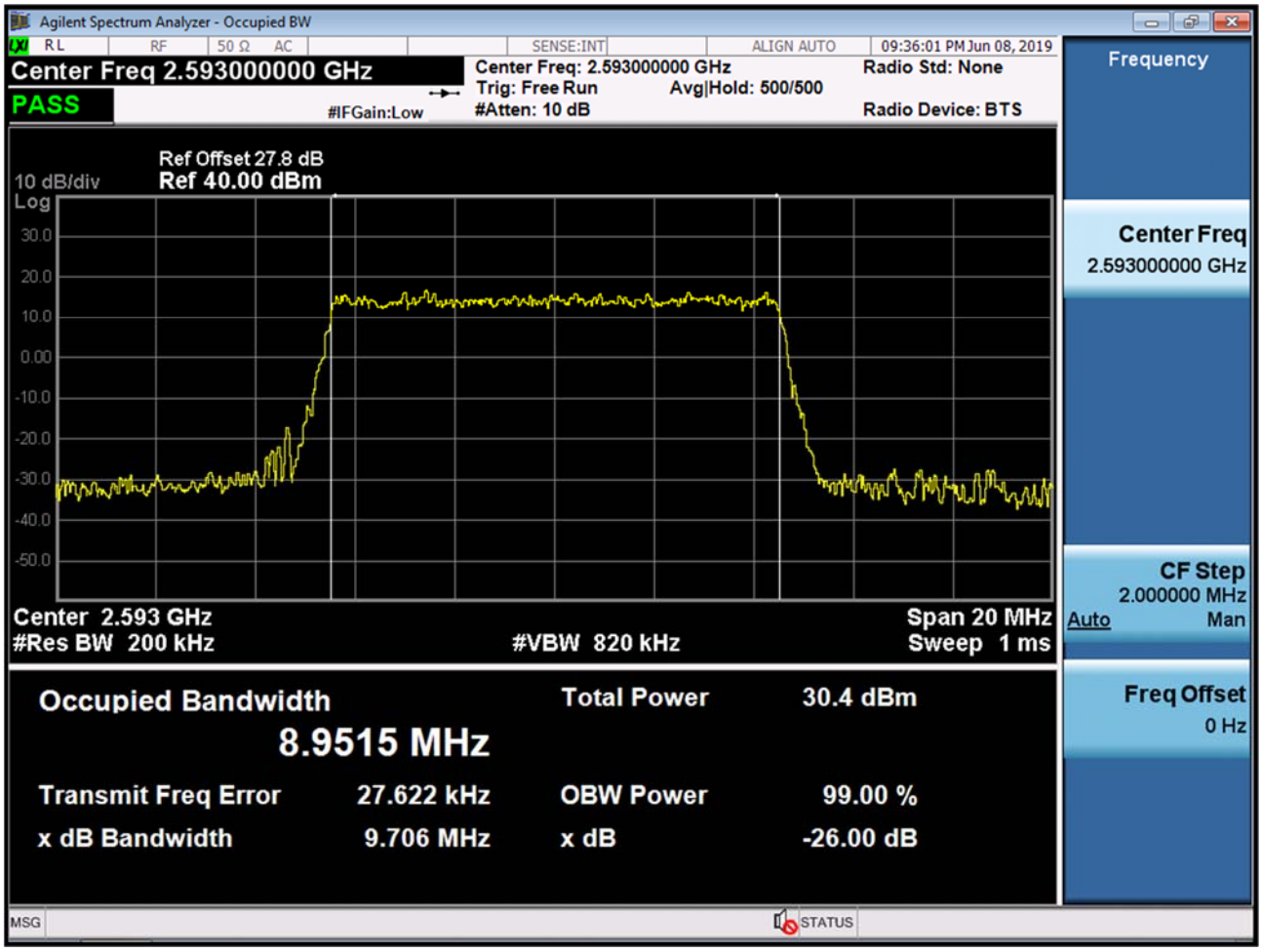
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 64-QAM RB 25) (POWER CLASS 3)



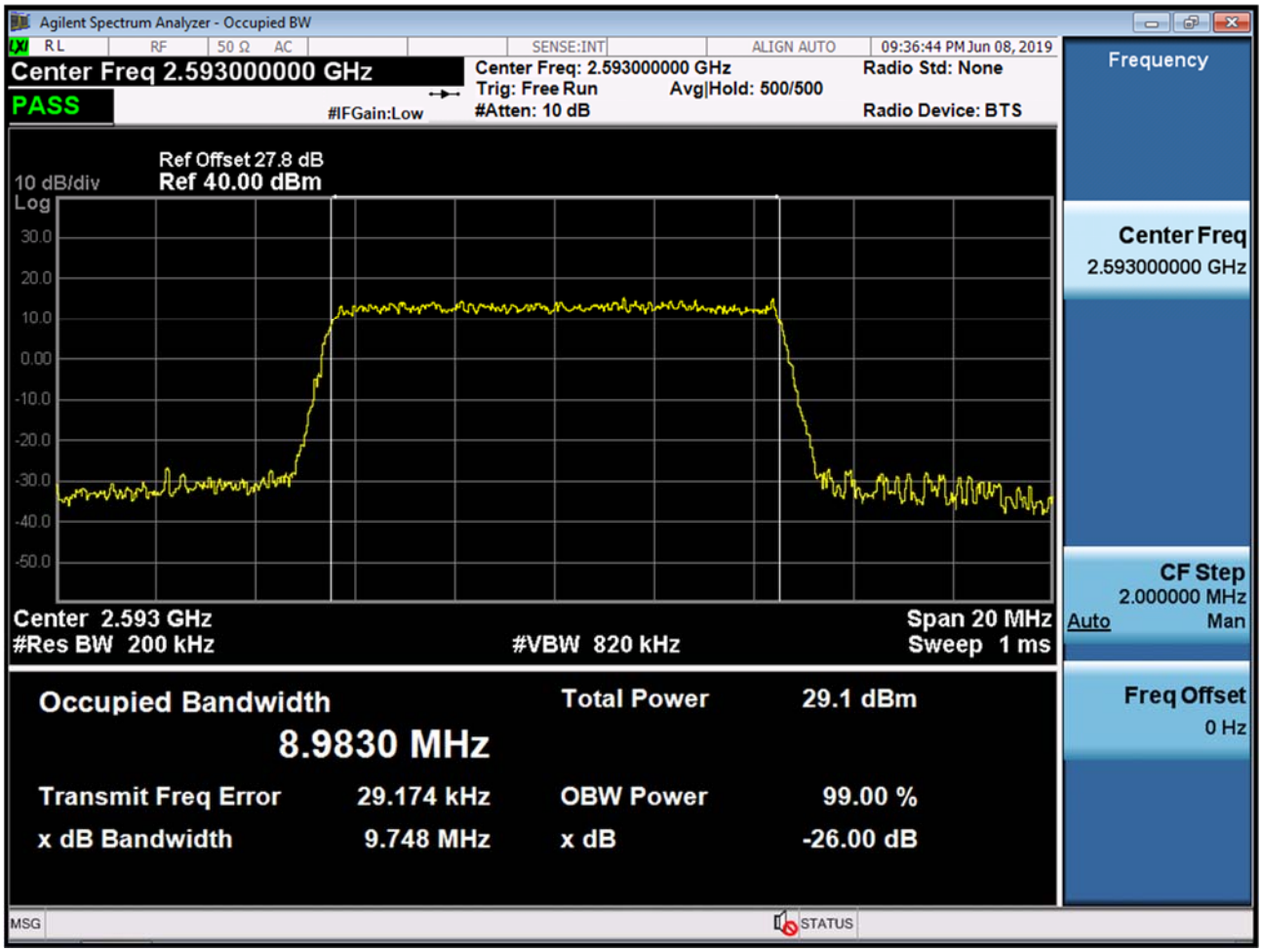
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 QPSK RB 50) (POWER CLASS 3)



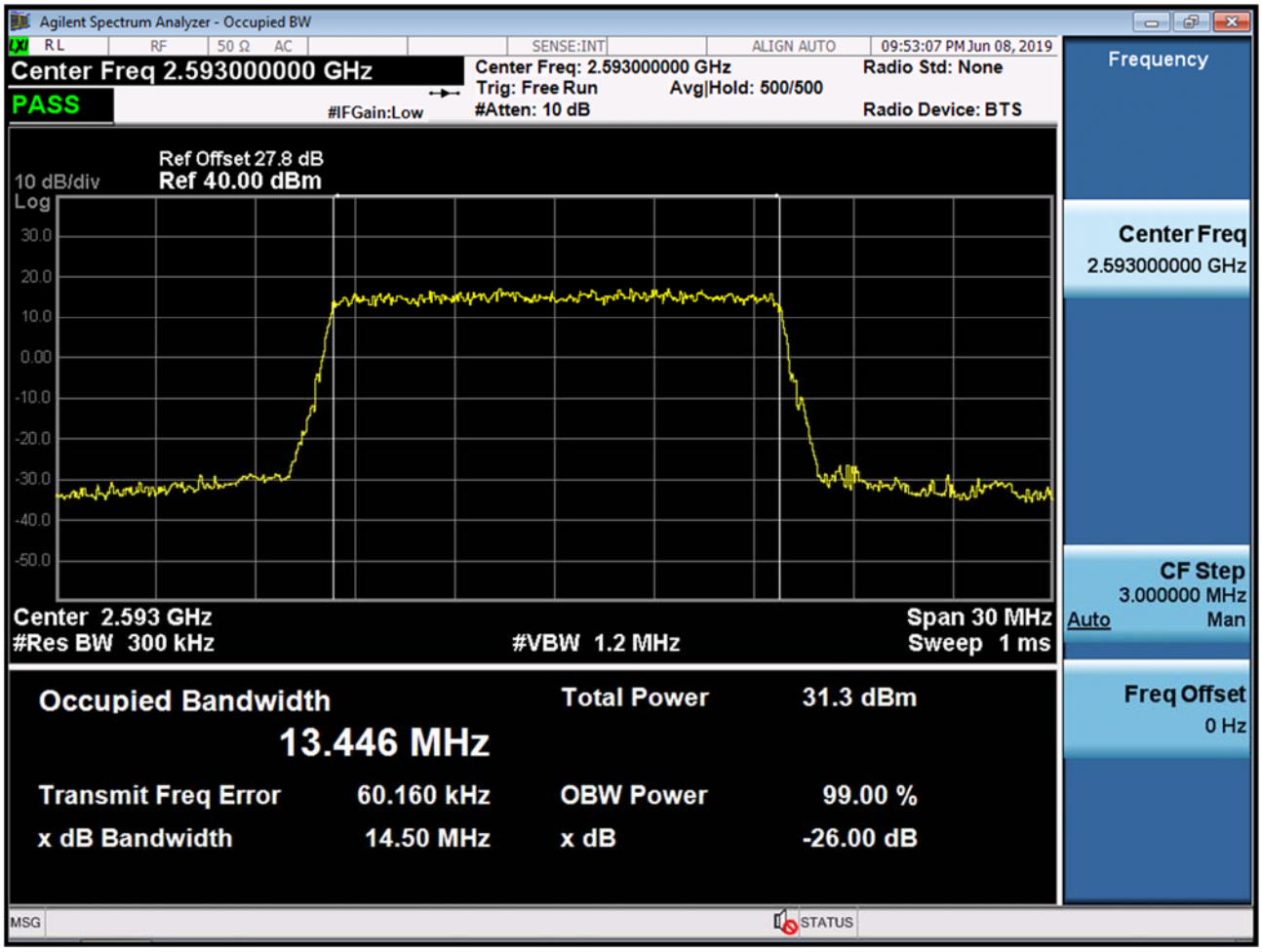
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 16-QAM RB 50) (POWER CLASS 3)



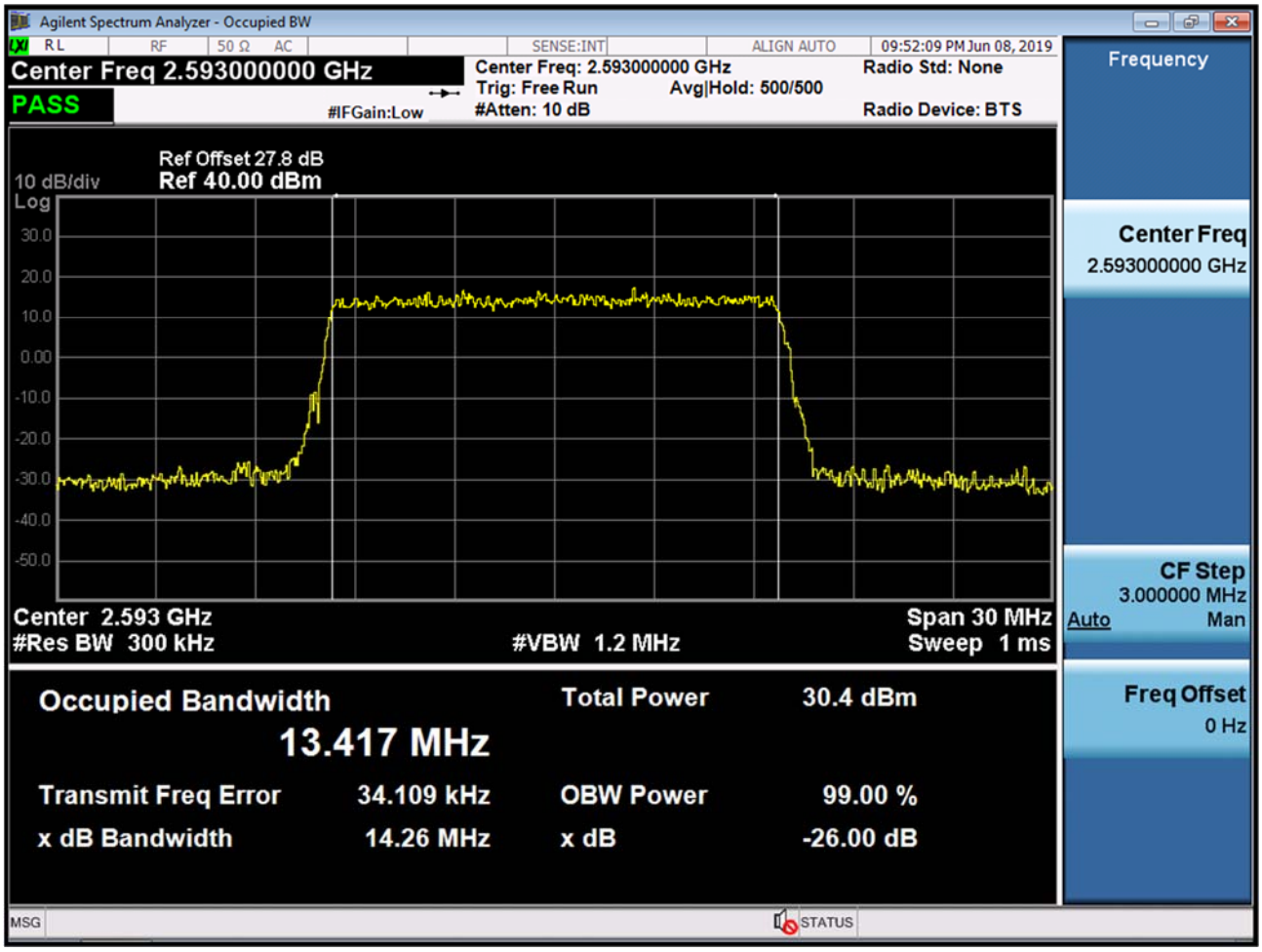
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 64-QAM RB 50) (POWER CLASS 3)



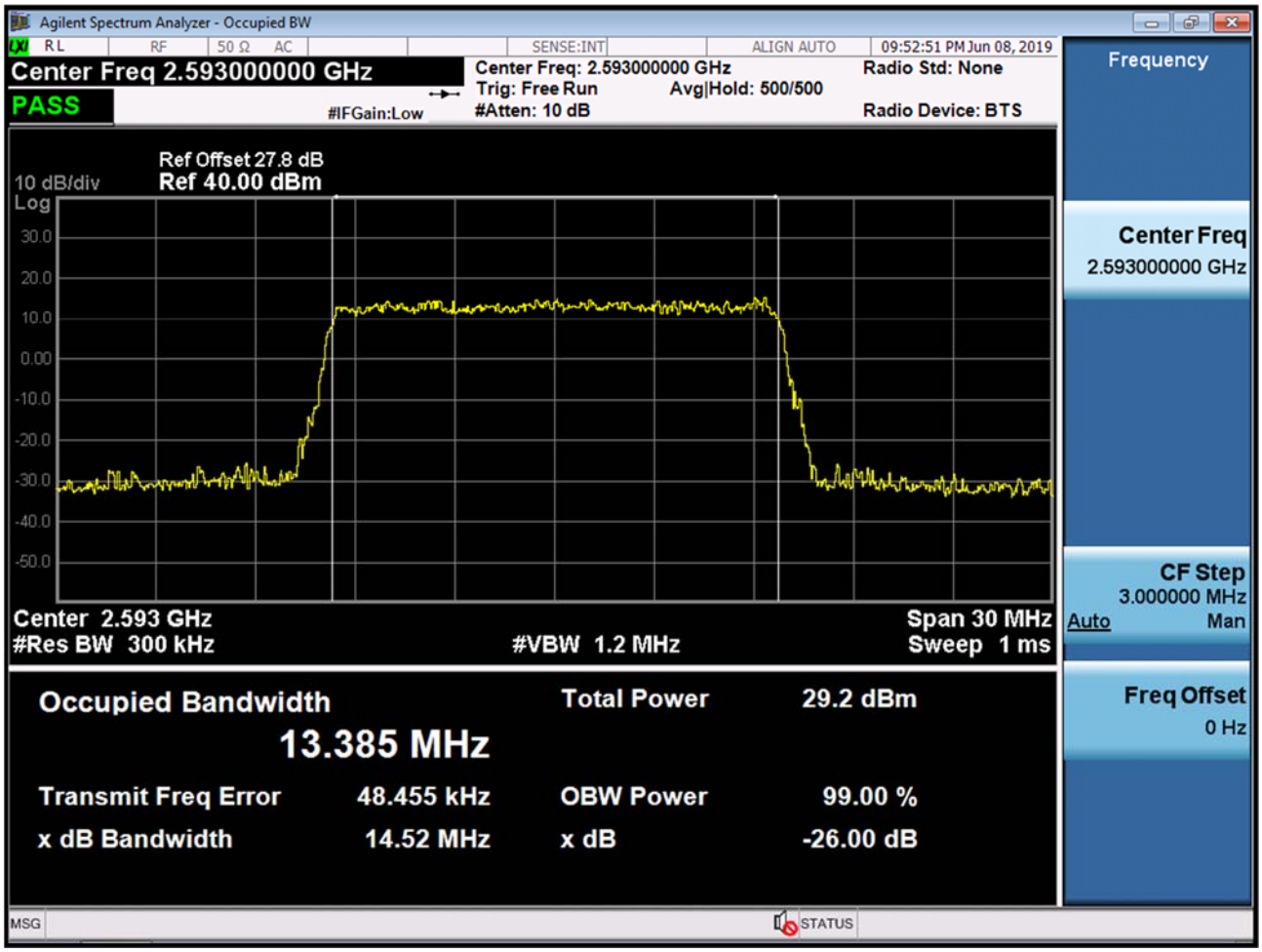
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 QPSK RB 75) (POWER CLASS 3)



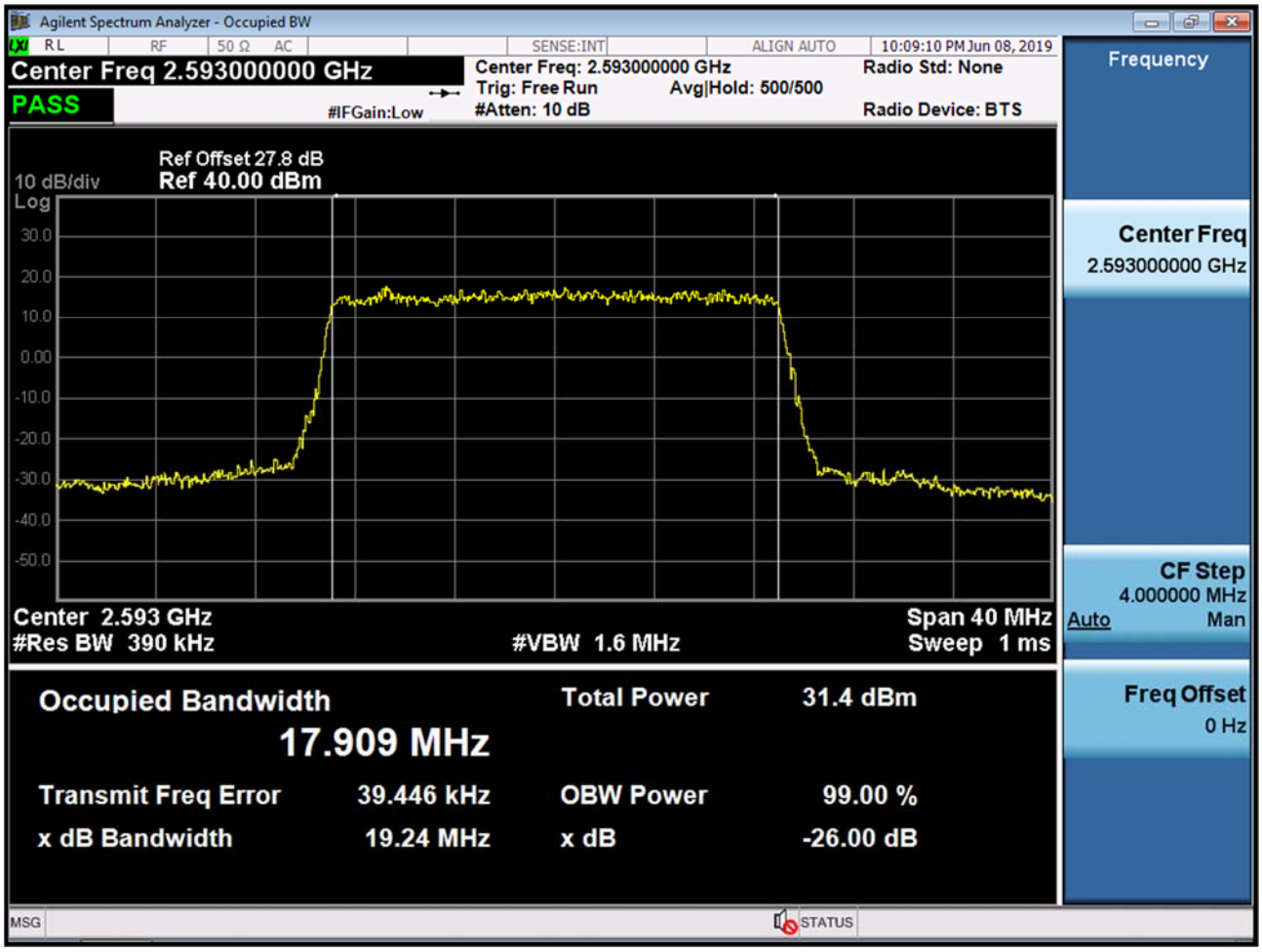
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 16-QAM RB 75) (POWER CLASS 3)



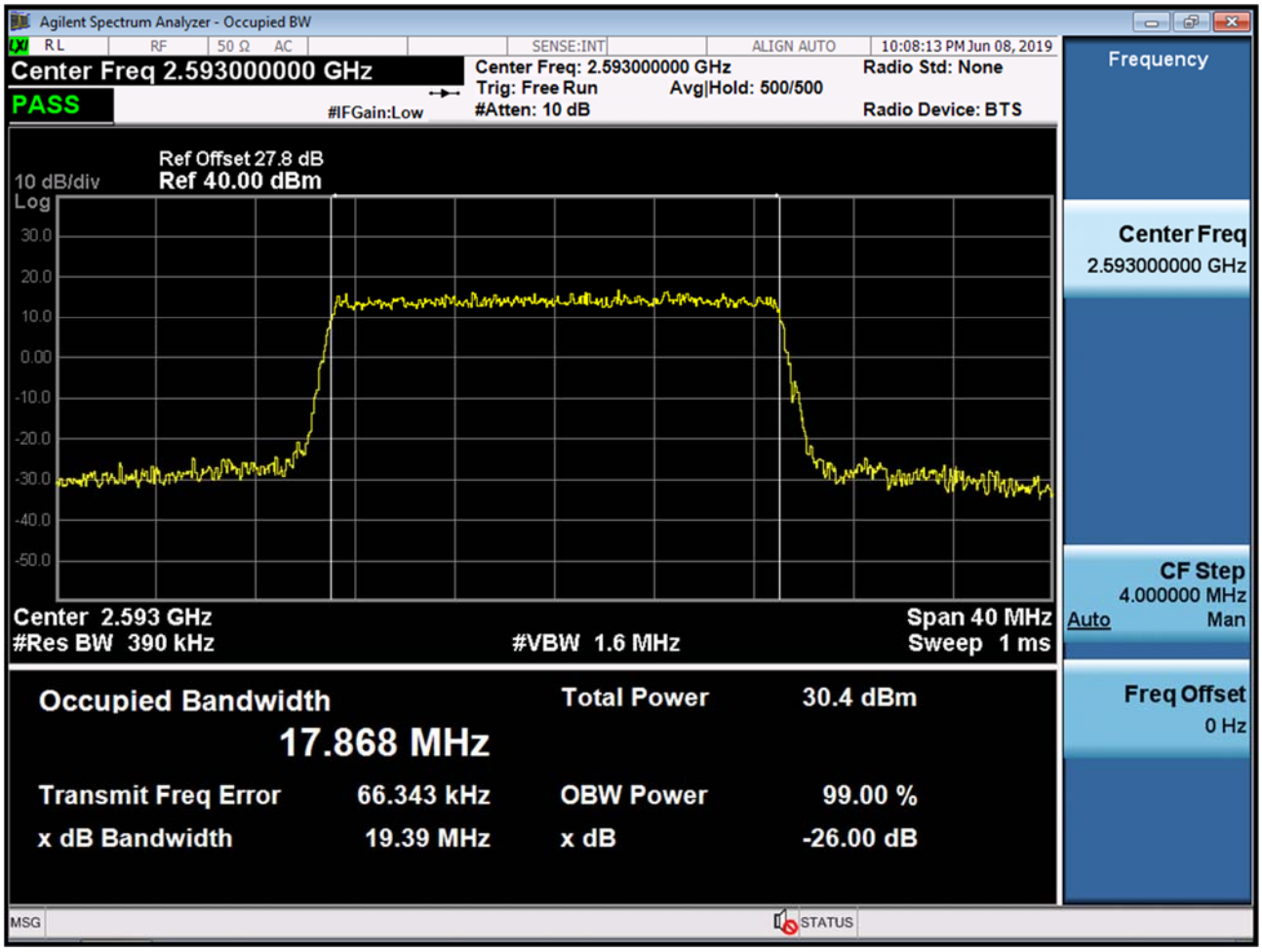
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 64-QAM RB 75) (POWER CLASS 3)



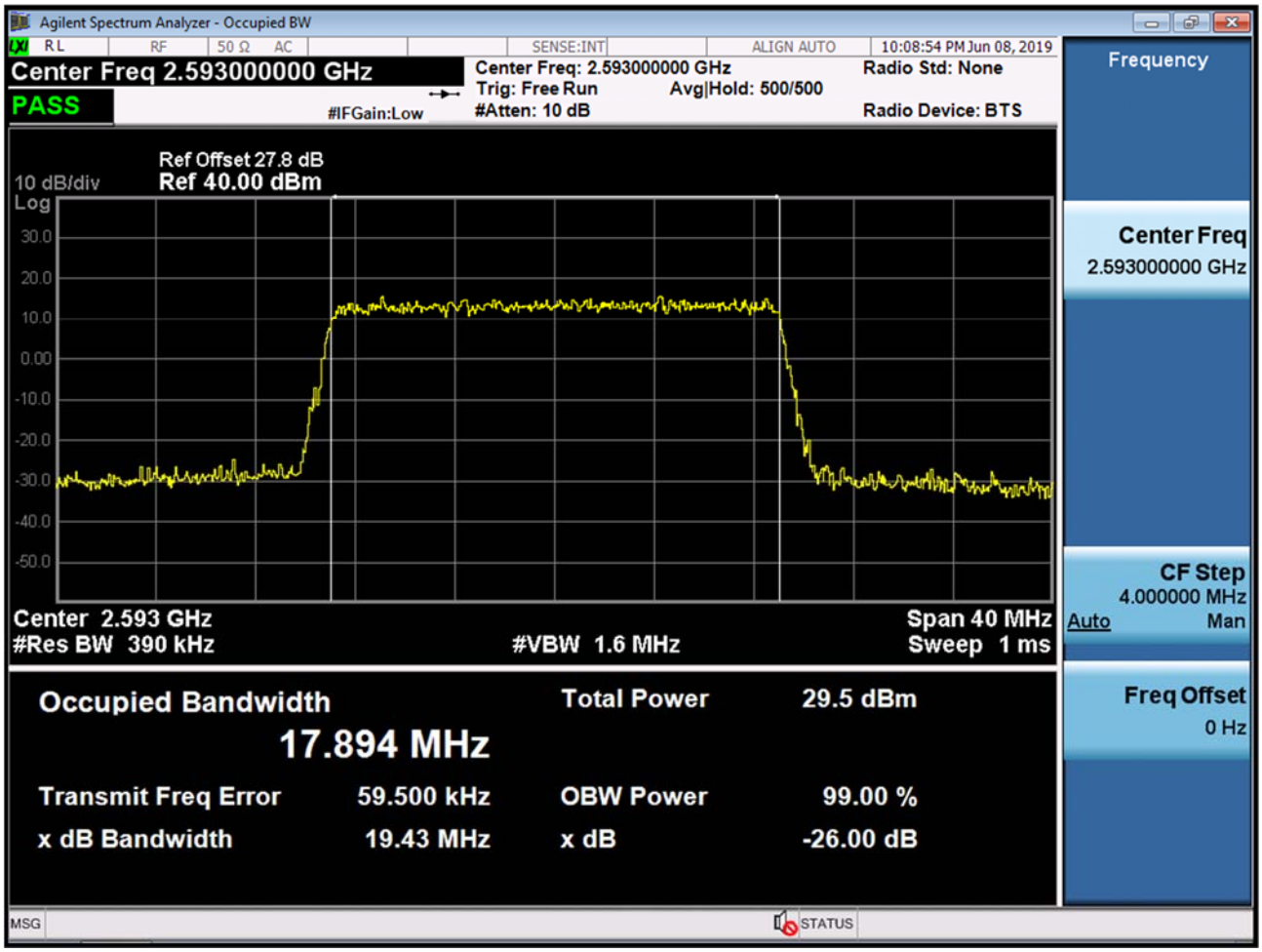
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 QPSK RB 100) (POWER CLASS 3)



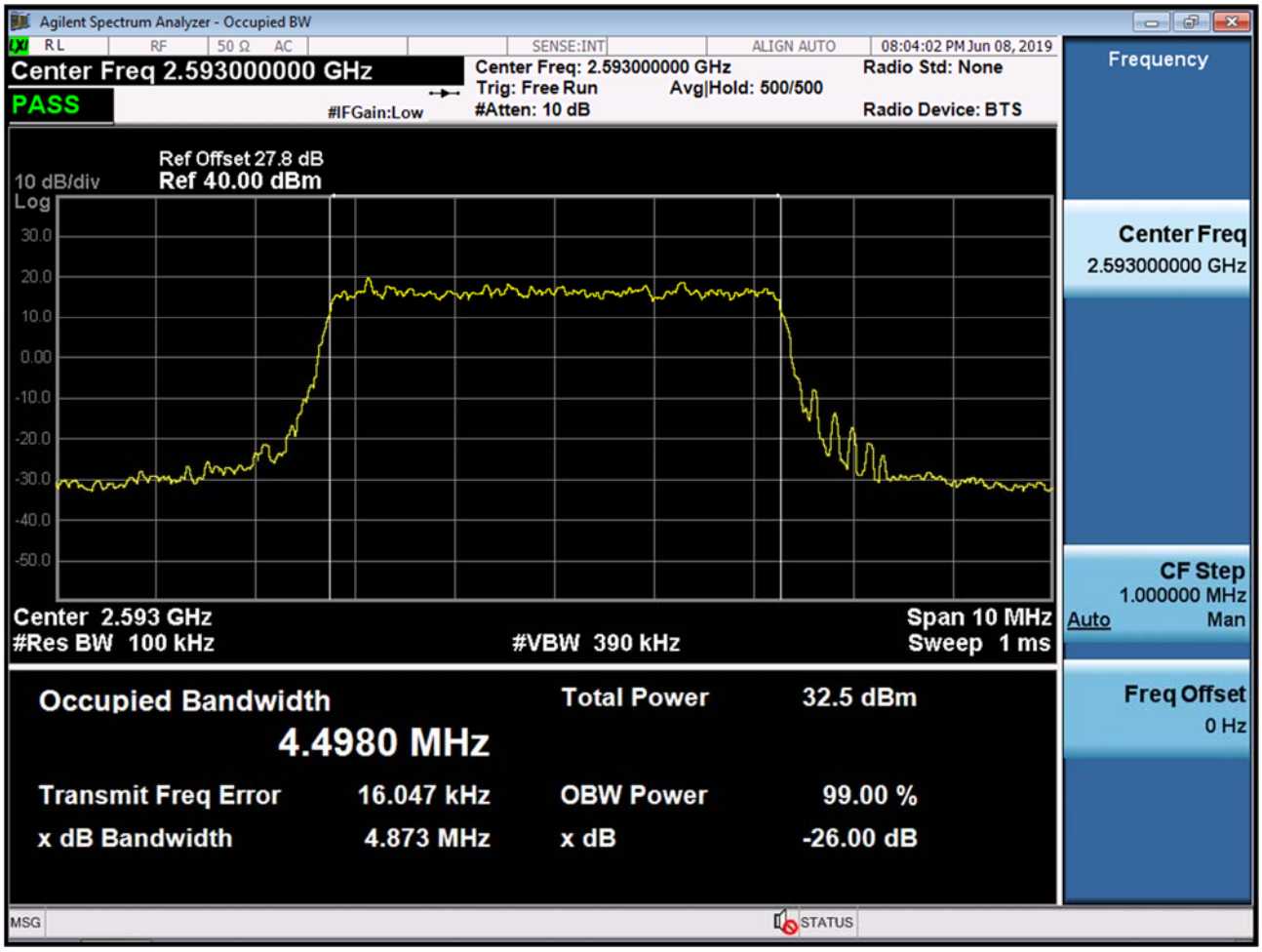
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 16-QAM RB 100) (POWER CLASS 3)



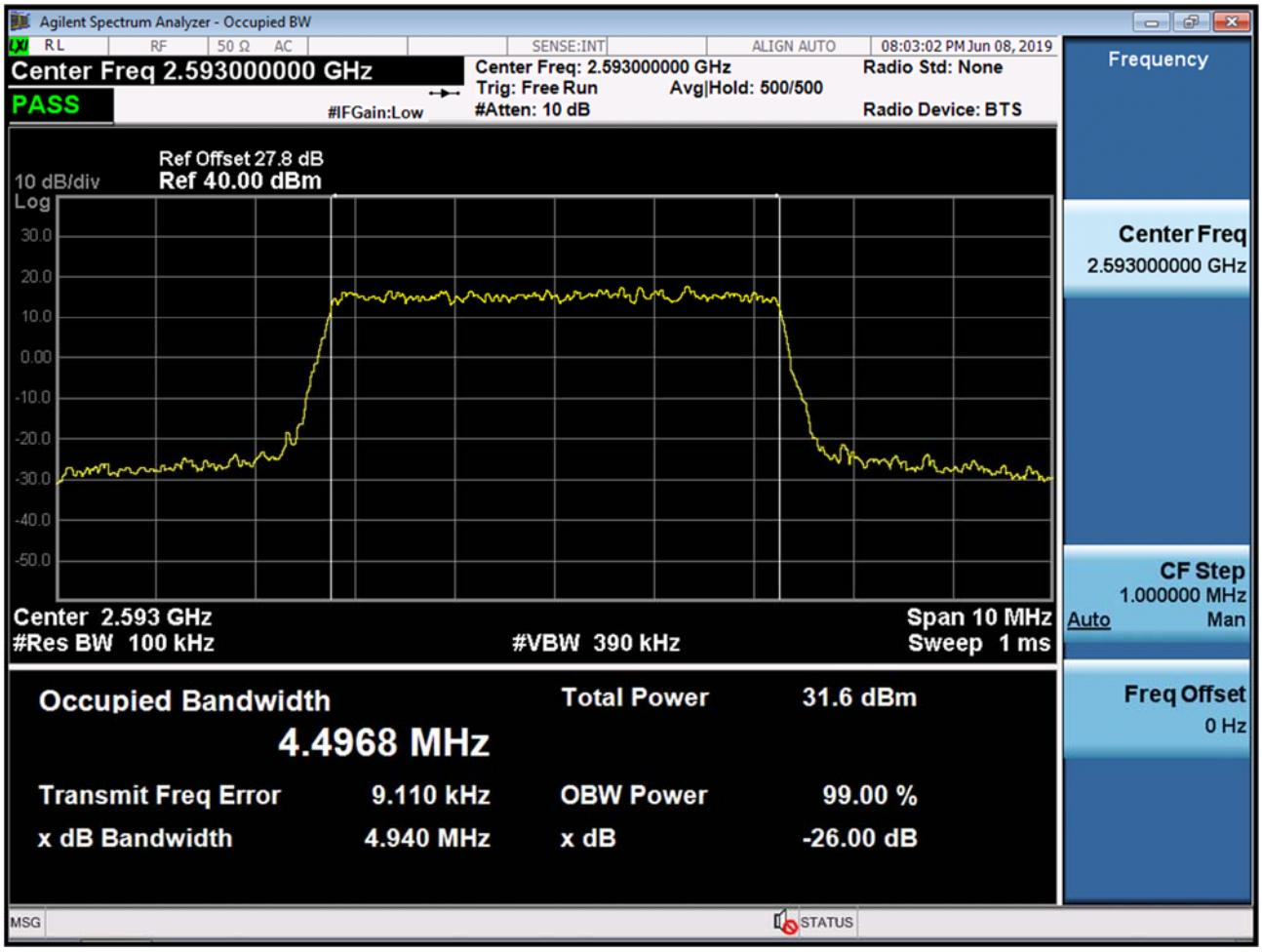
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 64-QAM RB 100) (POWER CLASS 3)



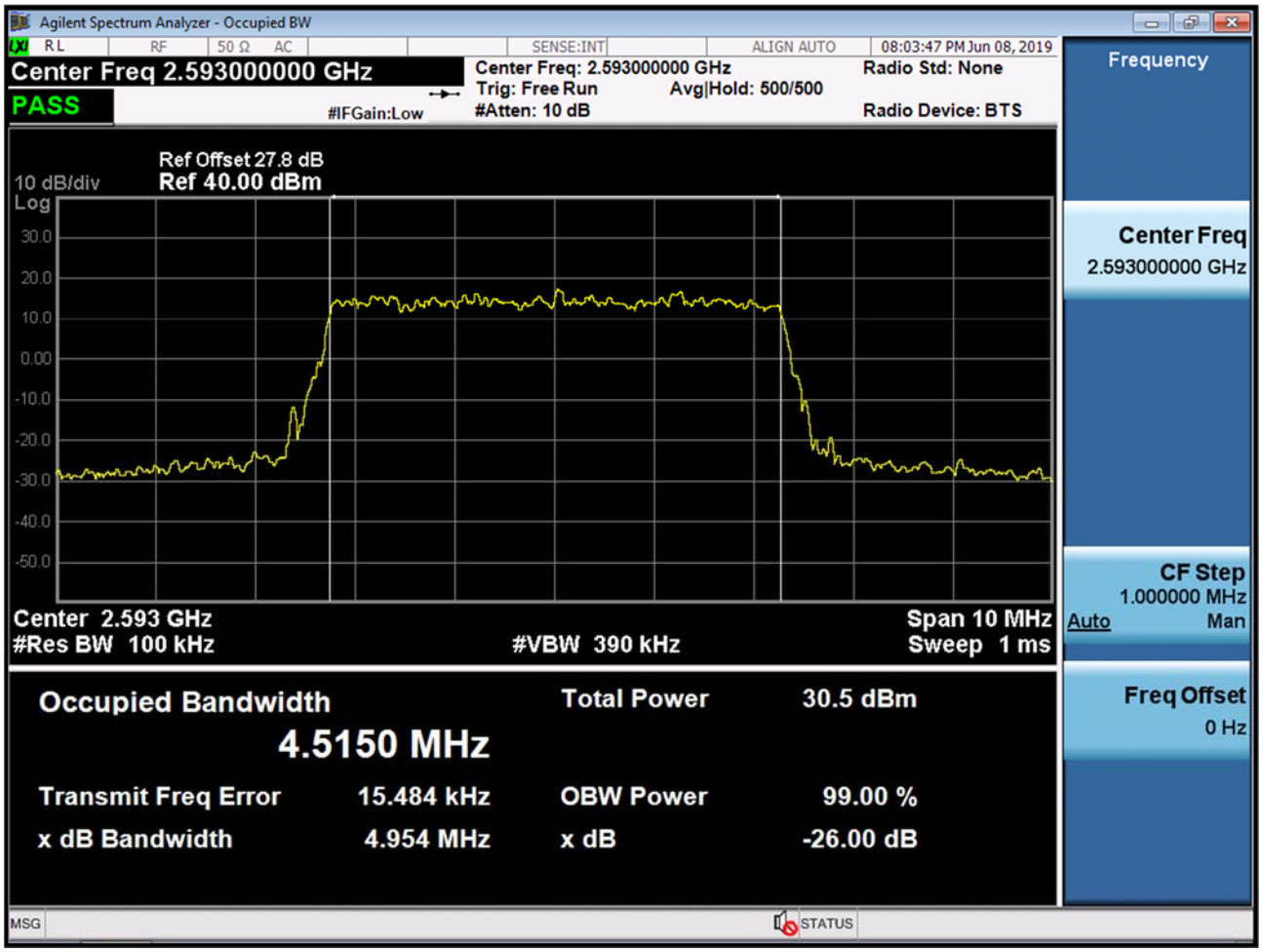
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 QPSK RB 25) (POWER CLASS 2)



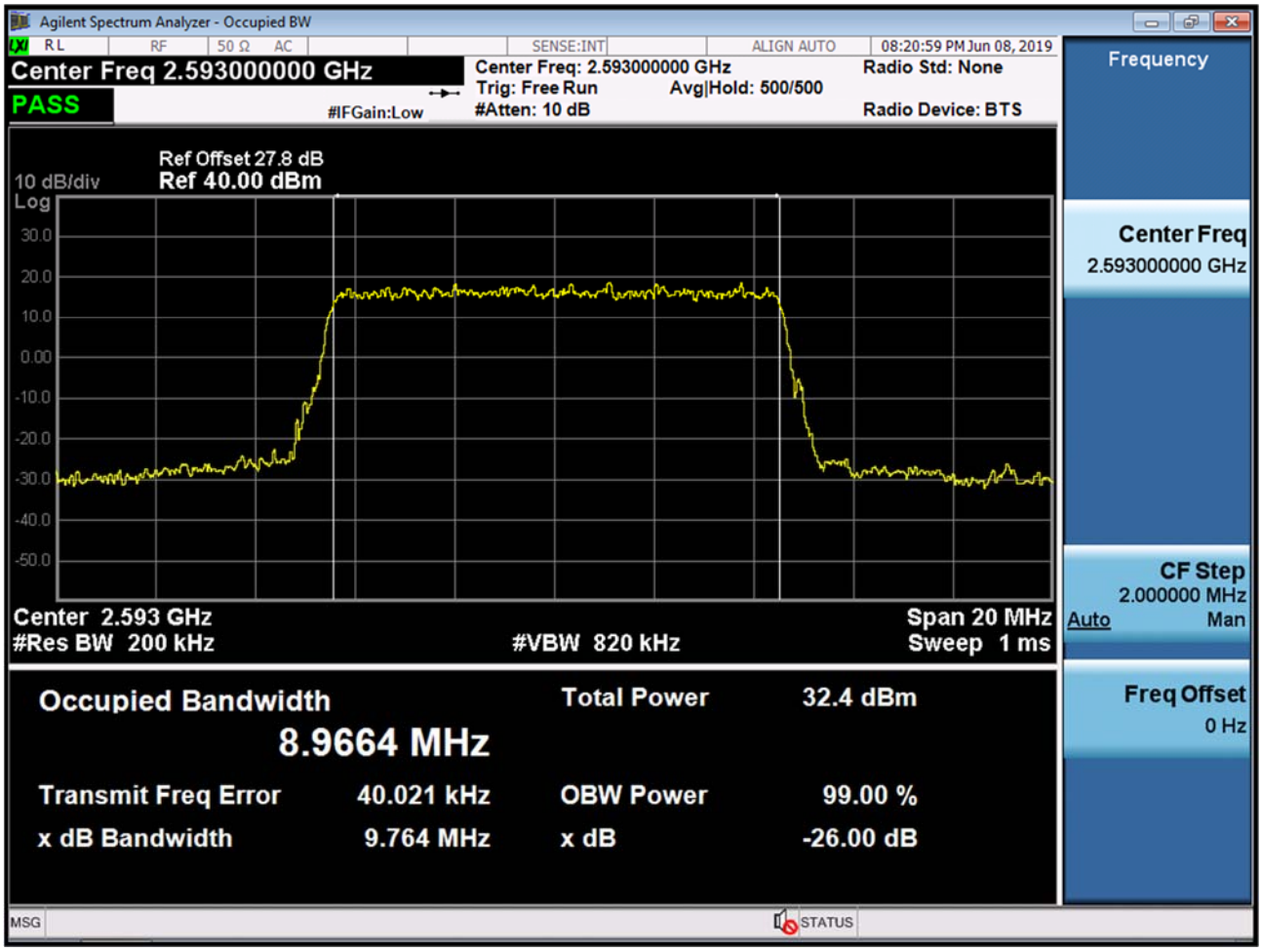
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 2)



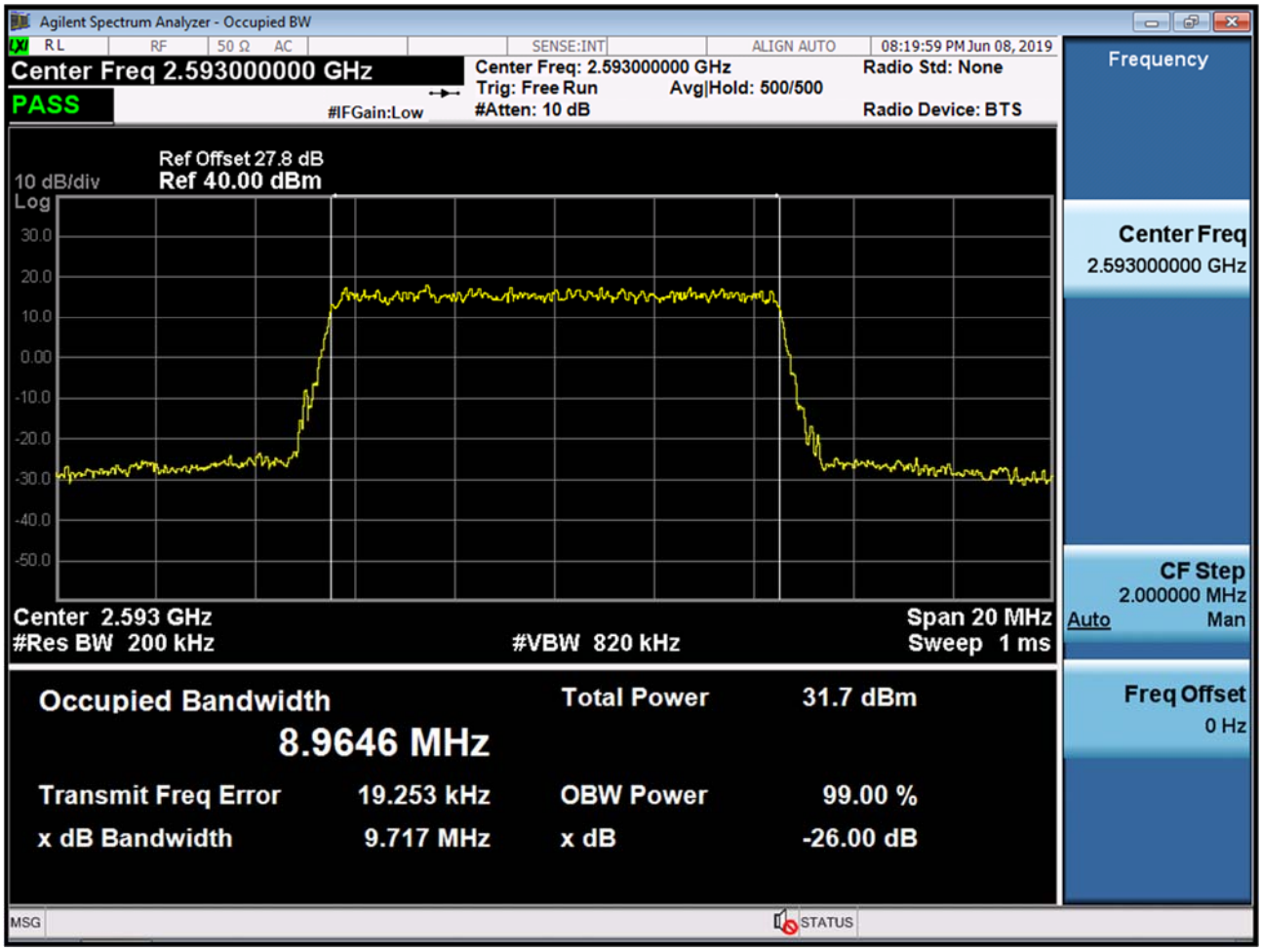
BAND 41. Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 2)



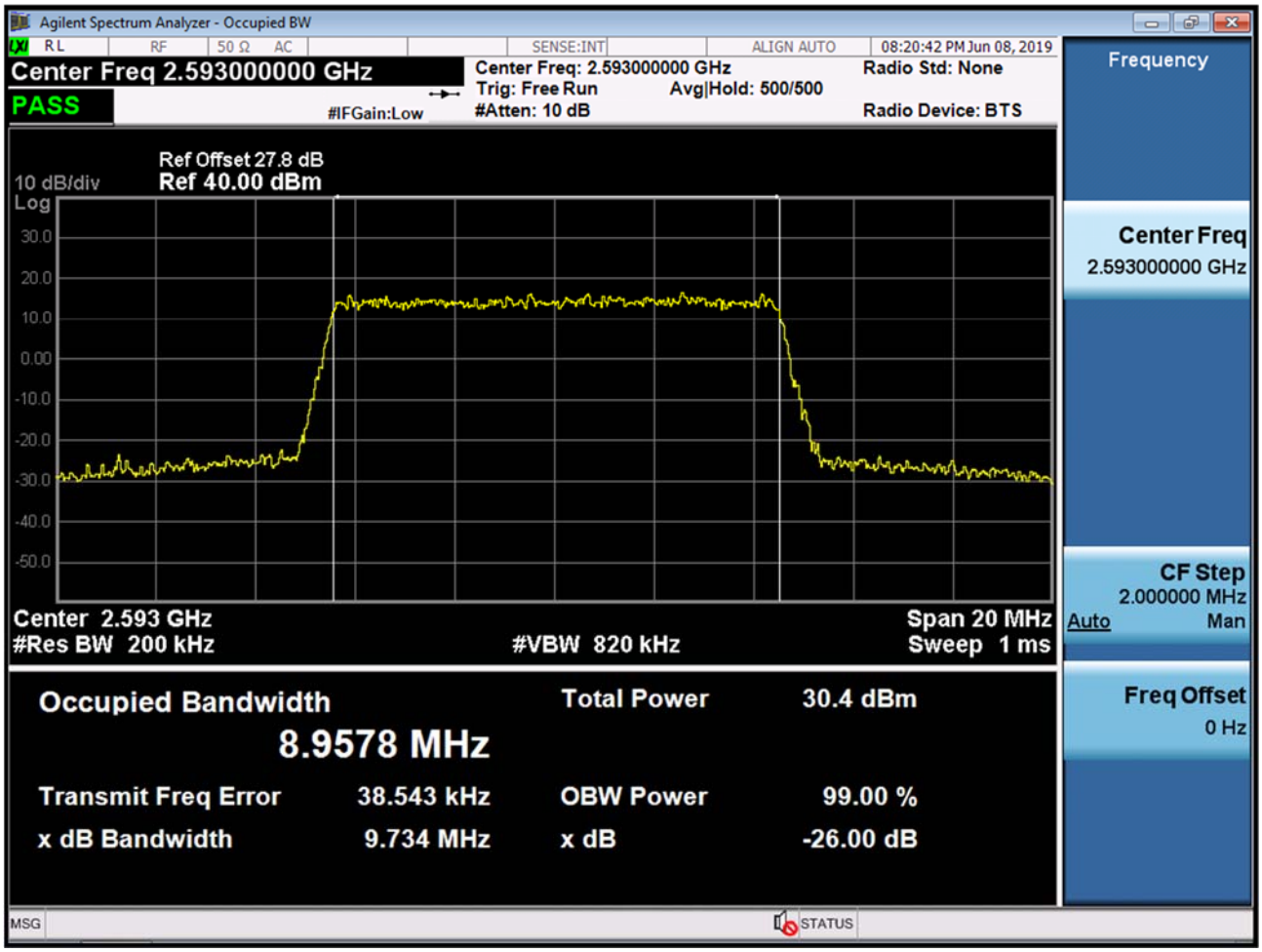
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 QPSK RB 50) (POWER CLASS 2)



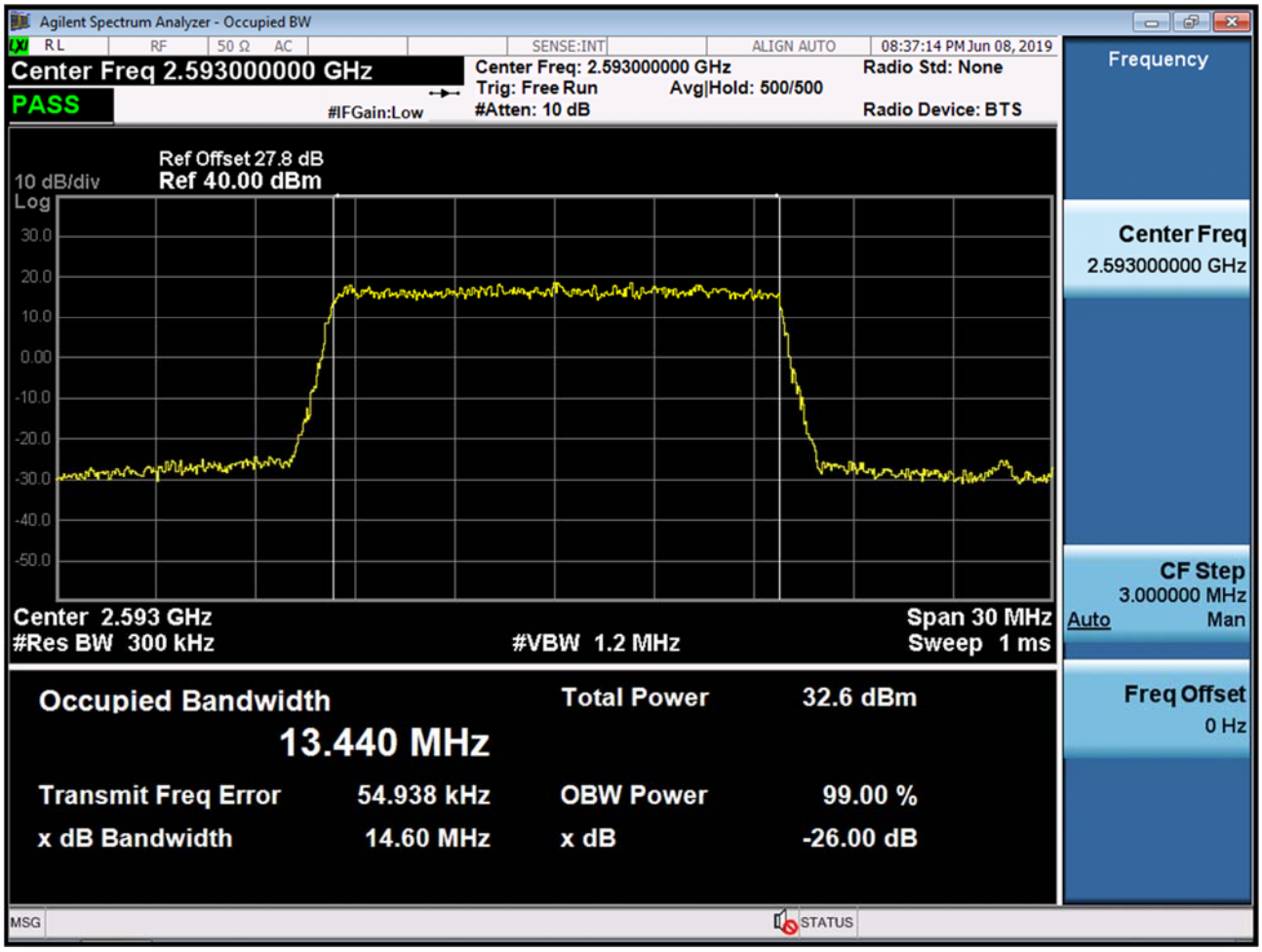
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 16-QAM RB 50) (POWER CLASS 2)



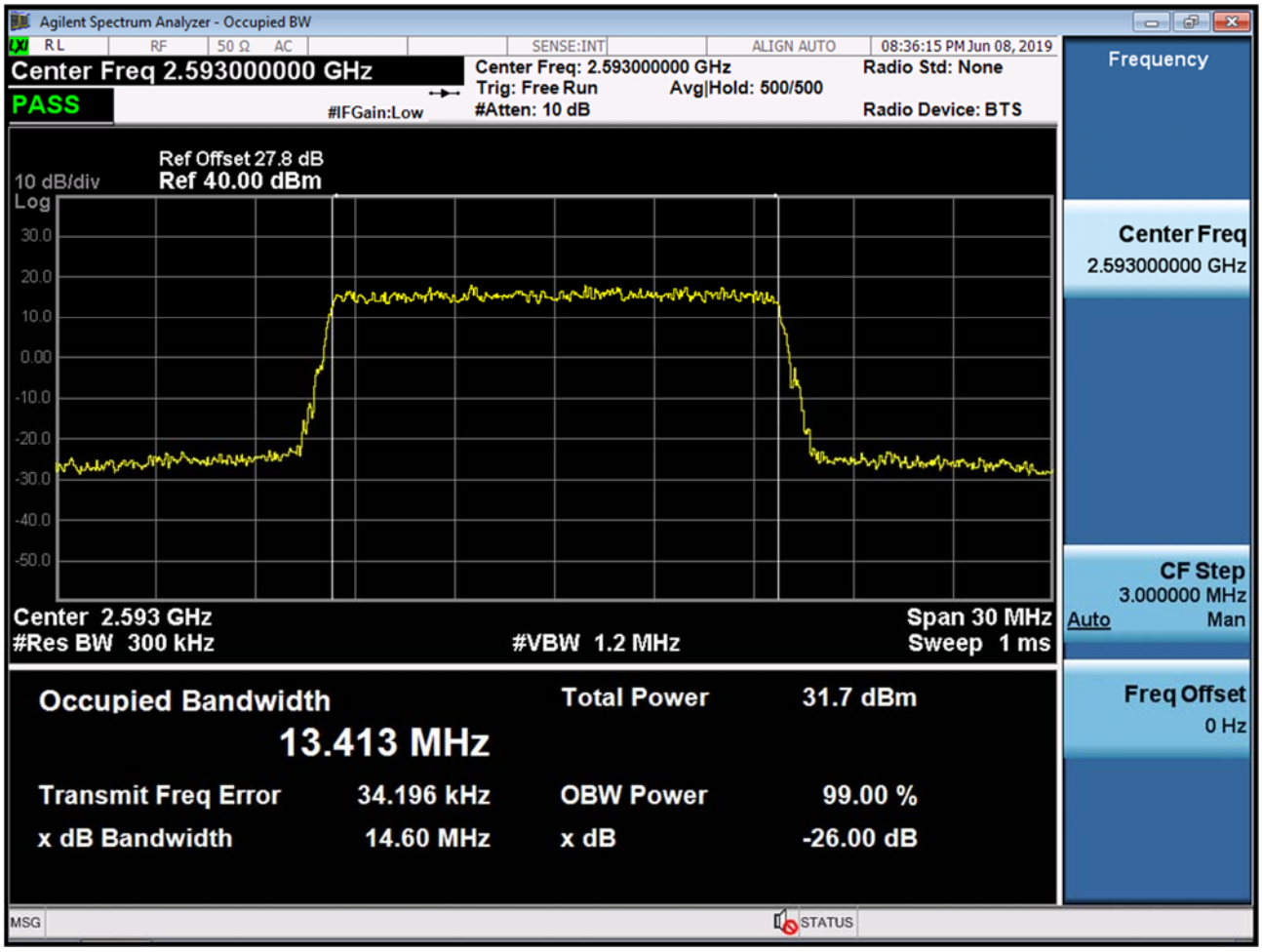
BAND 41. Occupied Bandwidth Plot (10 MHz Ch.40620 64-QAM RB 50) (POWER CLASS 2)



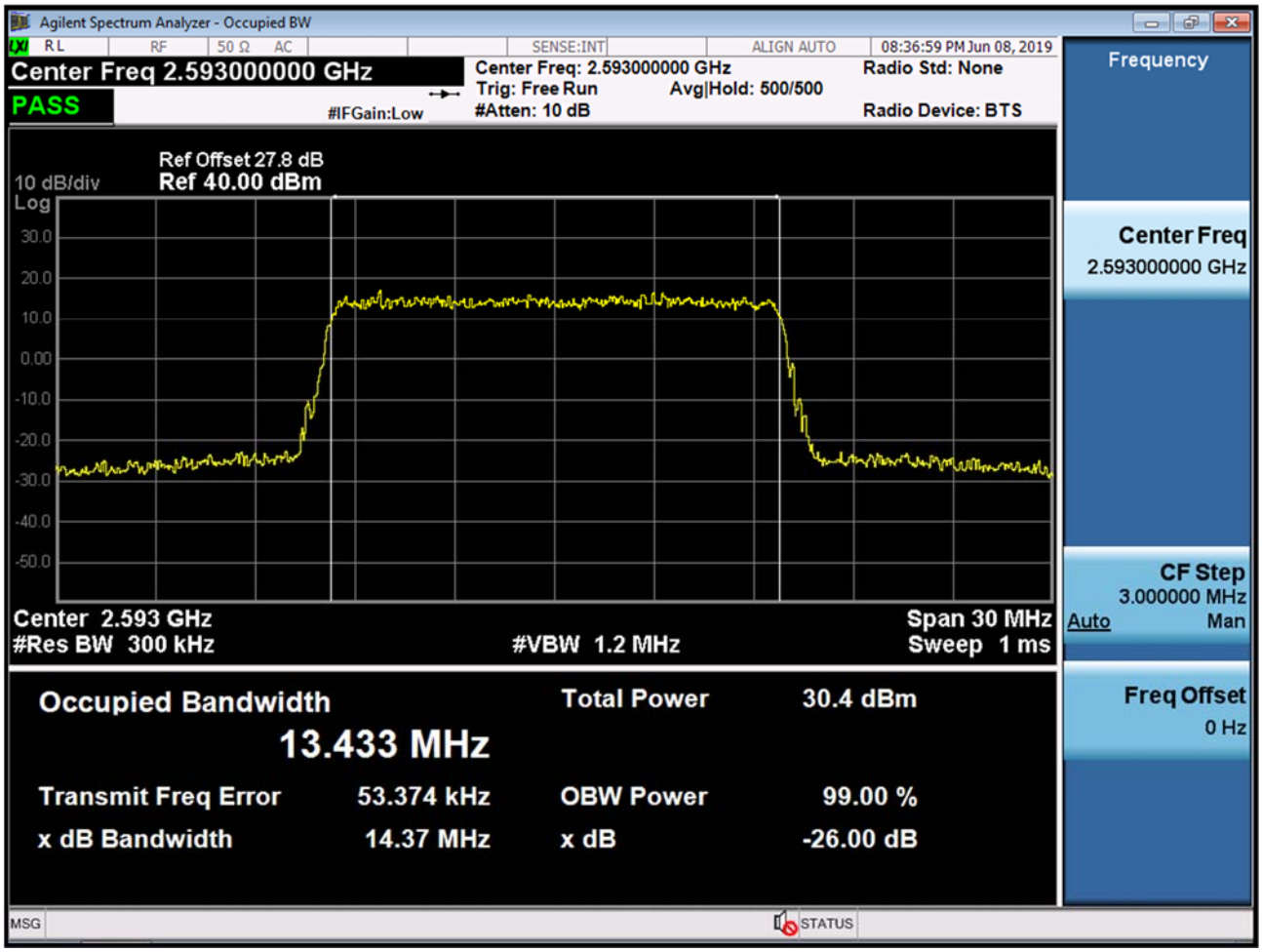
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 QPSK RB 75) (POWER CLASS 2)



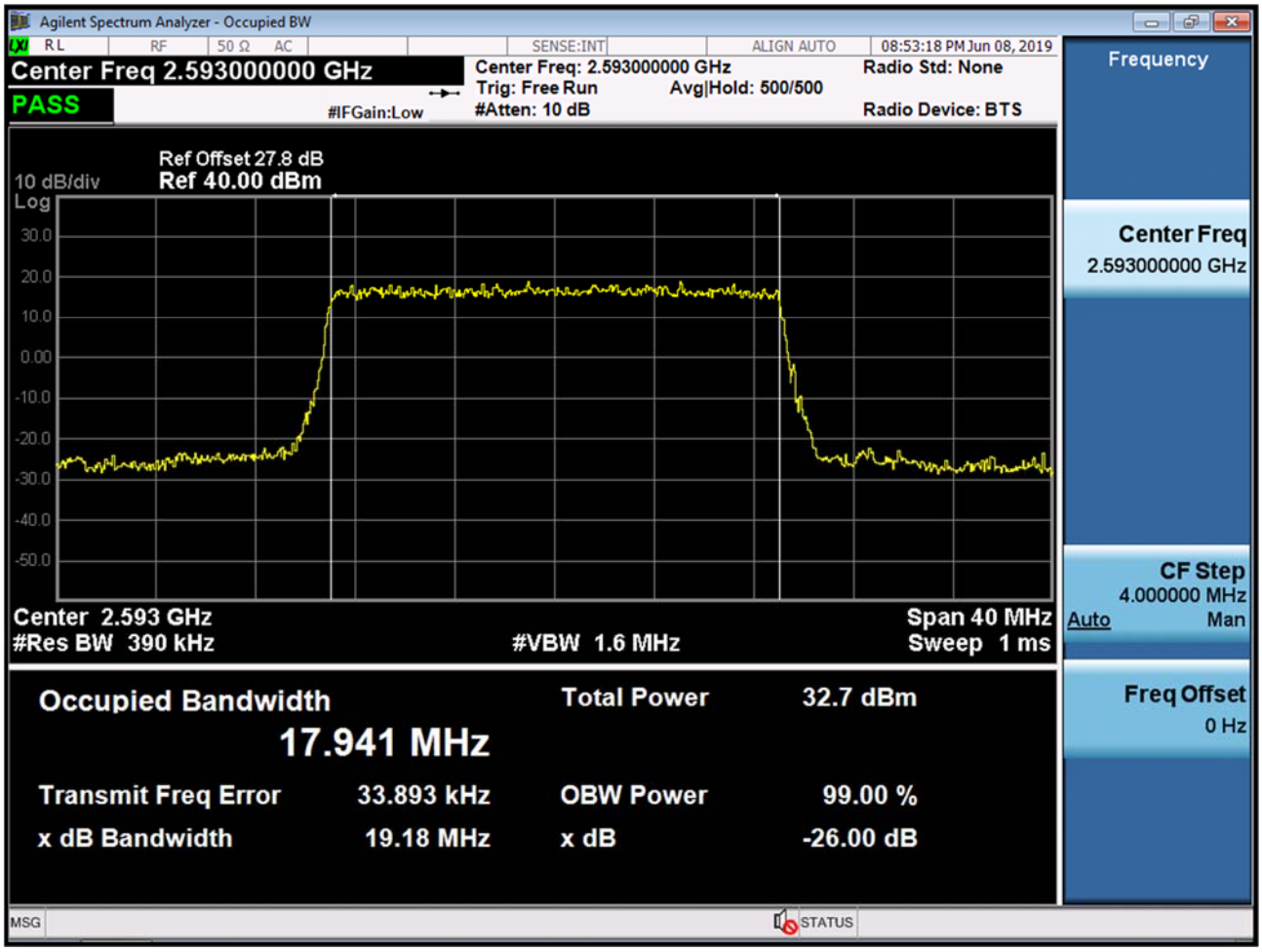
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 16-QAM RB 75) (POWER CLASS 2)



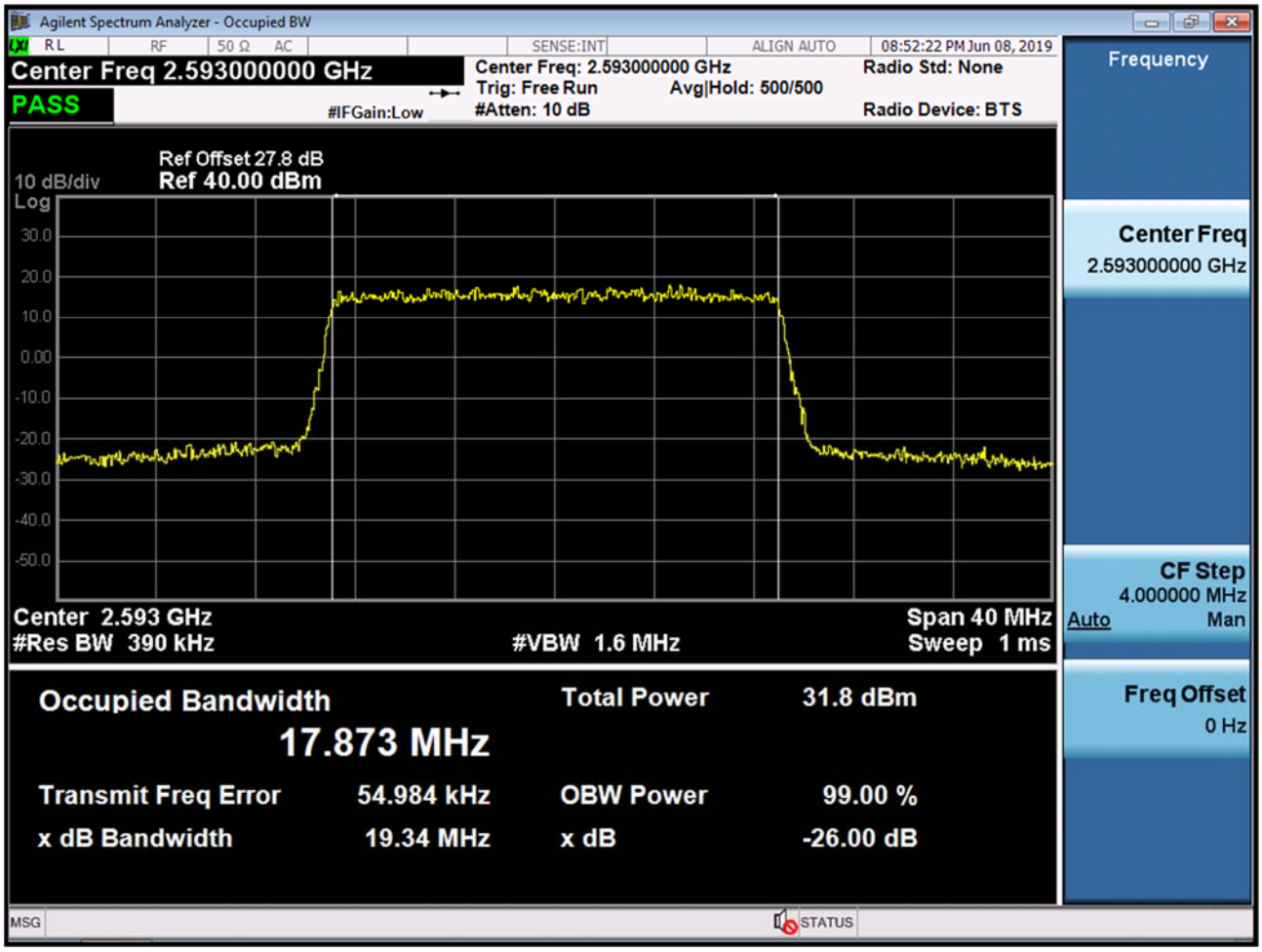
BAND 41. Occupied Bandwidth Plot (15 MHz Ch.40620 64-QAM RB 75) (POWER CLASS 2)



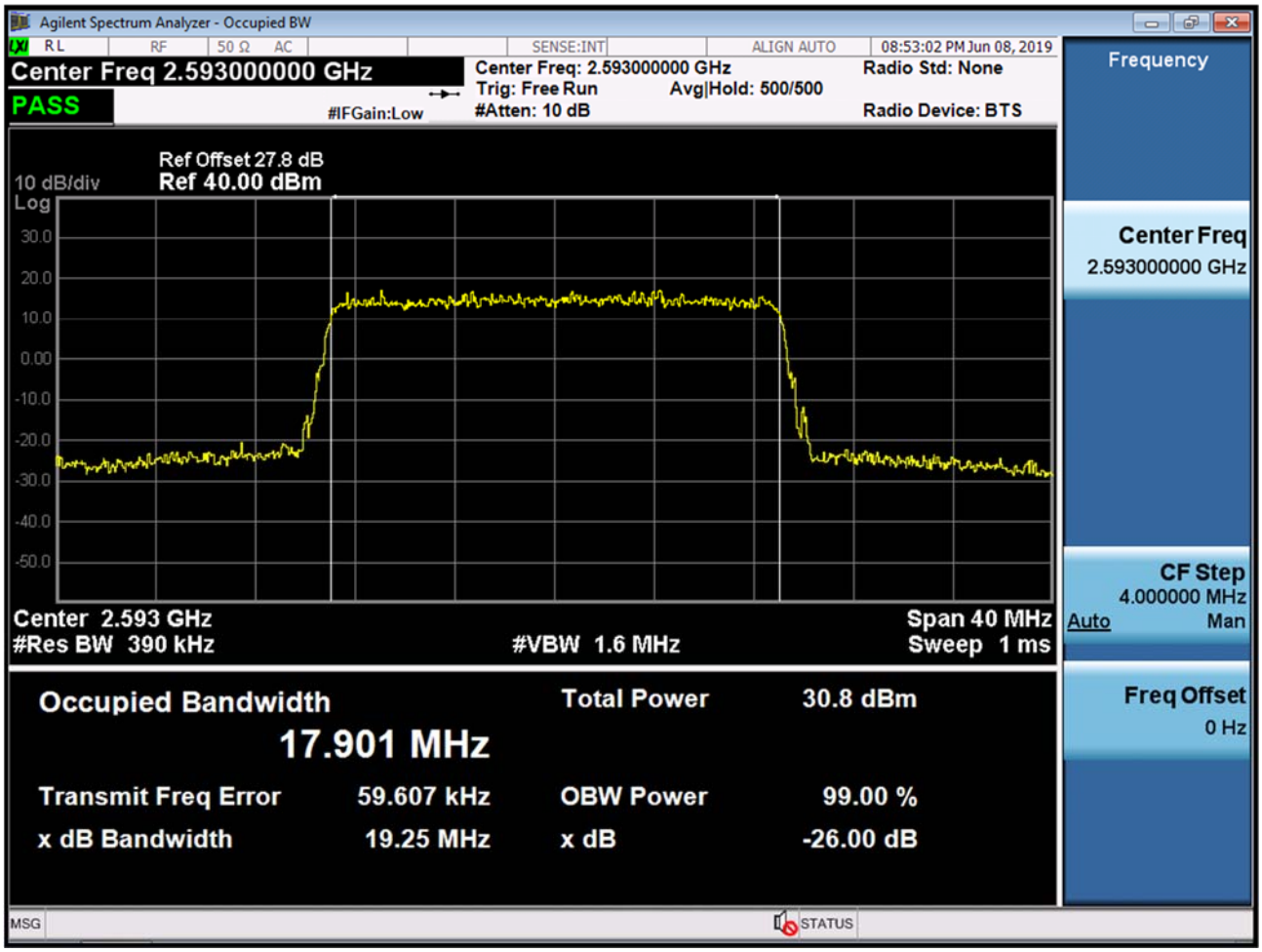
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 QPSK RB 100) (POWER CLASS 2)



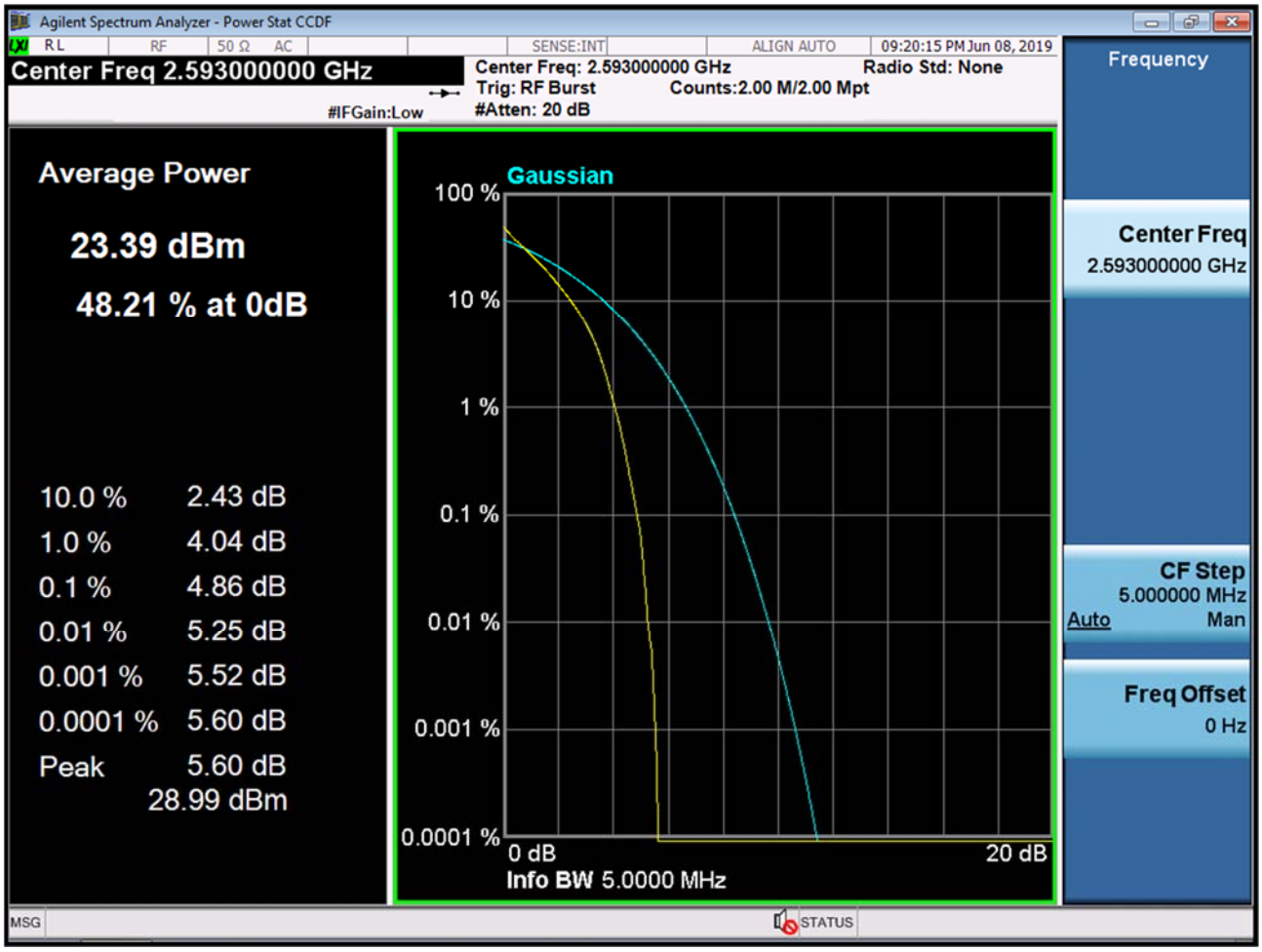
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 16-QAM RB 100) (POWER CLASS 2)



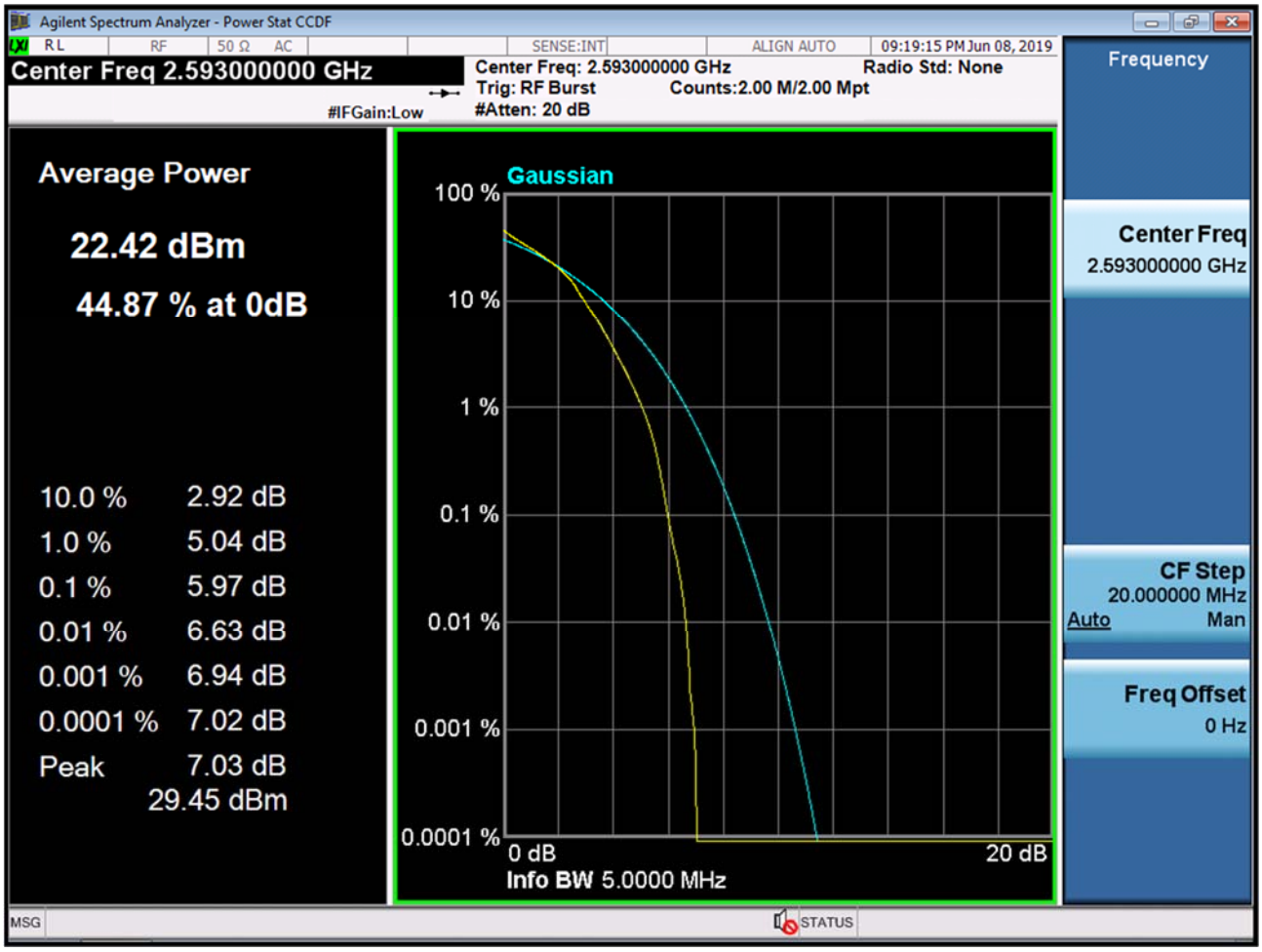
BAND 41. Occupied Bandwidth Plot (20 MHz Ch.40620 16-QAM RB 100) (POWER CLASS 2)



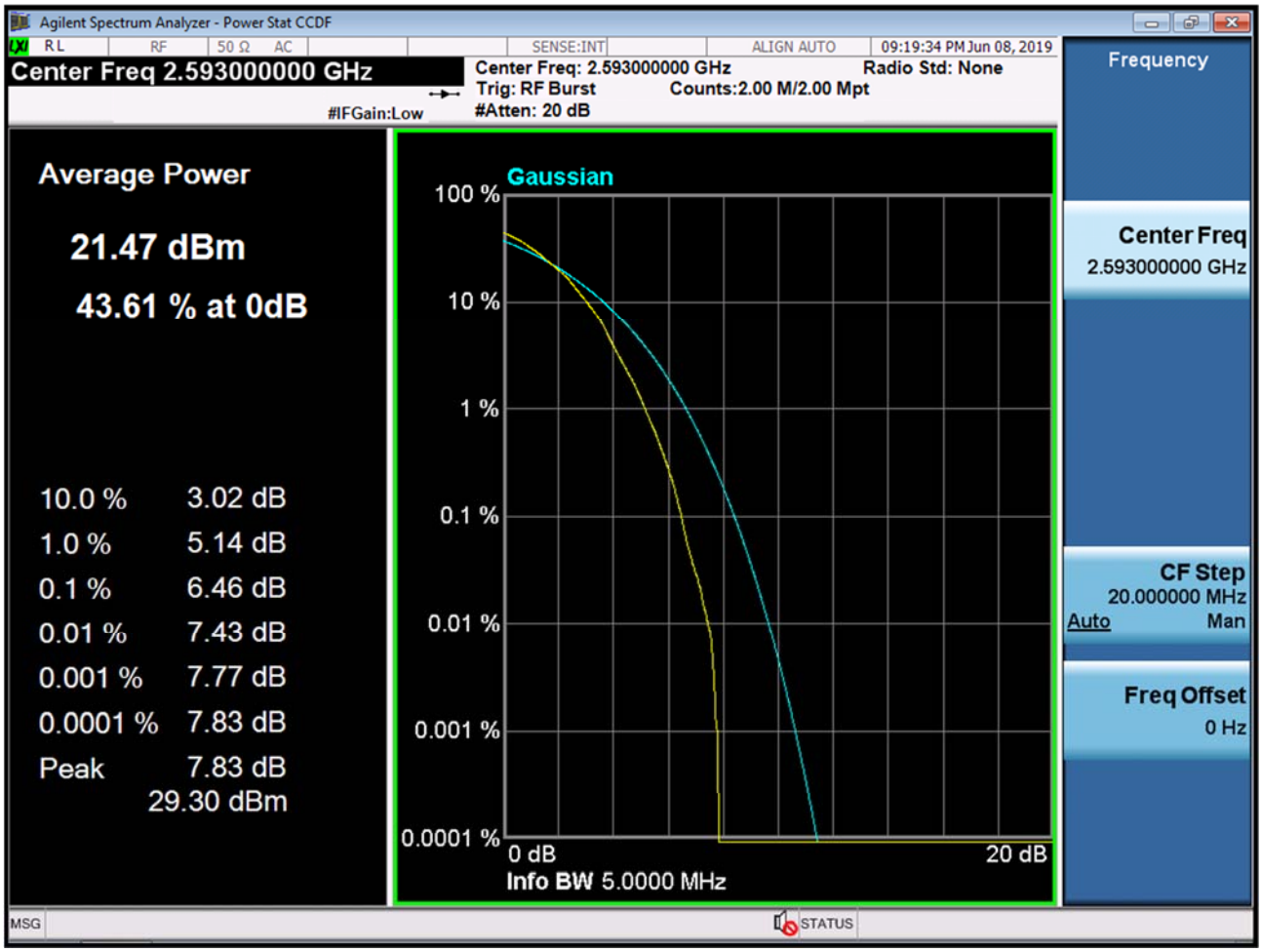
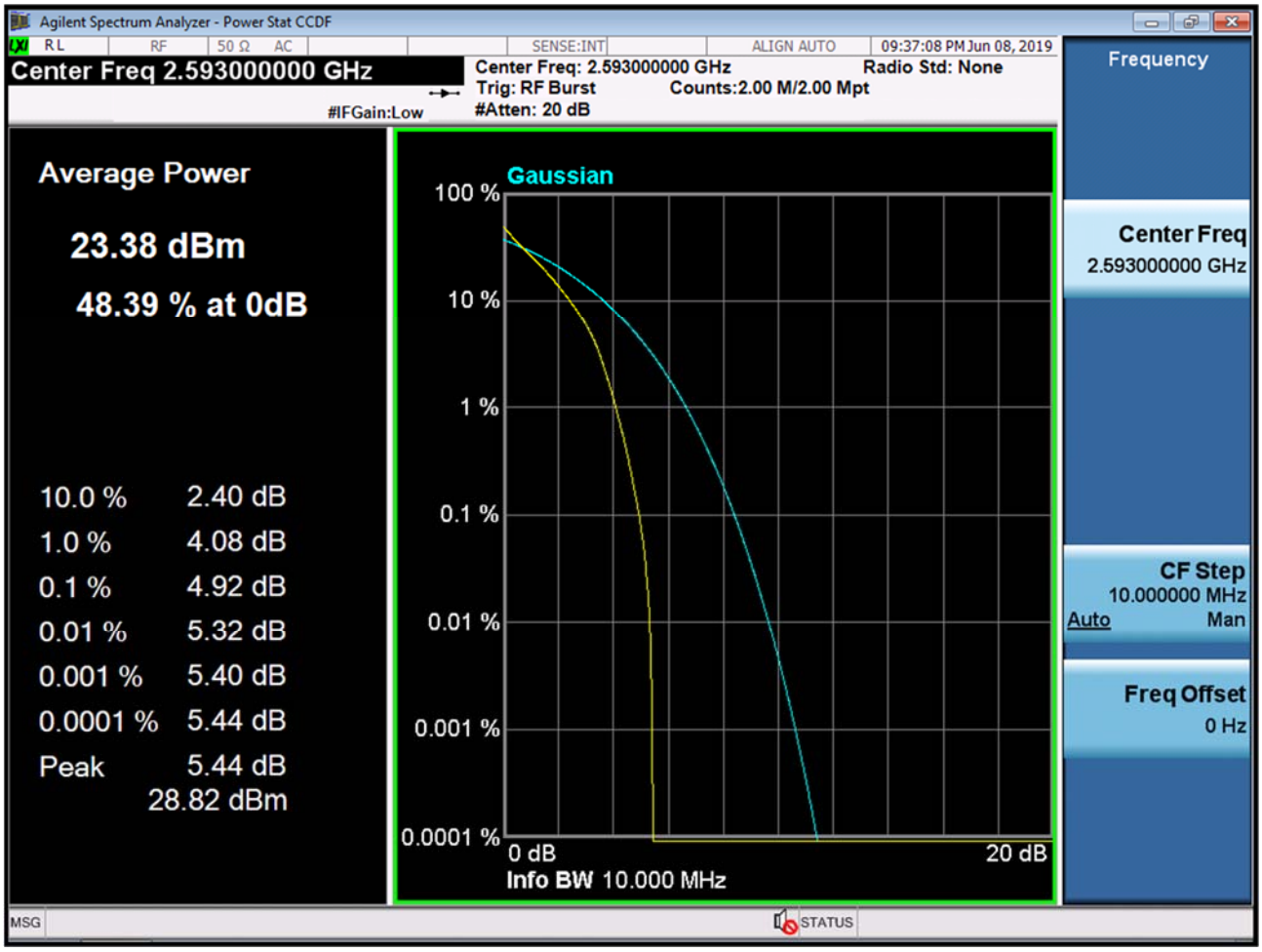
BAND 41. PAR Plot (5M BW_Ch.40620_QPSK_RB25_0) (POWER CLASS 3)



BAND 41. PAR Plot (5M BW_Ch.40620_16QAM_RB25_0) (POWER CLASS 3)



BAND 41. PAR Plot (5M BW_Ch.40620_64QAM_RB25_0) (POWER CLASS 3)



BAND 41. PAR Plot (10M BW_Ch.40620_QPSK_RB50_0) (POWER CLASS 3)