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

Certification

Applicant Name:
Infomark Co.,Ltd.

Address:
3rd Floor, Humaxvillage, 216, Hwangsaeul-ro Bundang-gu Seongnam-Si, Gyonggi-Do, 463-875 South Korea

Date of Issue:
April 08, 2019

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

Report No.: HCT-RF-1903-FC050-R1

FCC ID:	**YCOIFW522T**
APPLICANT:	**Infomark Co.,Ltd.**

Model(s):	IF-W522T
EUT Type:	Kids Watch
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§27, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M10G7D	QPSK	0.048	16.85
		1M09W7D	16QAM	0.034	15.25
LTE – Band4 (3)	1711.5 – 1753.5	2M71G7D	QPSK	0.048	16.80
		2M70W7D	16QAM	0.034	15.34
LTE – Band4 (5)	1712.5 – 1752.5	4M50G7D	QPSK	0.047	16.74
		4M50W7D	16QAM	0.039	15.88
LTE – Band4 (10)	1715.0 – 1750.0	8M97G7D	QPSK	0.050	16.96
		8M98W7D	16QAM	0.039	15.96
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.050	17.00
		13M4W7D	16QAM	0.040	16.01
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.050	16.96
		18M0W7D	16QAM	0.038	15.77

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)

Report prepared by : Jae Ryang Do
Engineer of Telecommunication Testing Center

Report approved by : Kwon Jeong
Manager of Telecommunication Testing Center

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1903-FC050	March 26, 2019	- First Approval Report
HCT-RF-1903-FC050-R1	April 08, 2019	- Added the Accessory Infromation on page 5. - Added the note on pages 15, 16.

Table of Contents

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Infomark Co.,Ltd.
Address:	3rd Floor, Humaxvillage, 216, Hwangsaeul-ro Bundang-gu Seongnam-Si, Gyonggi-Do, 463-875 South Korea
FCC ID:	YCOIFW522T
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§27, §2
EUT Type:	Kids Watch
Model(s):	W522T
Tx Frequency:	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
Date(s) of Tests:	March 06, 2019 ~ March 21, 2019

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Kids Watch with LTE.

It also supports IEEE 802.11 b/g/n, Bluetooth.

The EUT was a Watch with Cradle.

(Cradle - Model : IF-A522T, Manufacture : Infomark)

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- 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 C63.26-2015 – Section 5.2 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

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

Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

   The power is calculated by the following formula;

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

   Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.
3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.

   These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 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.

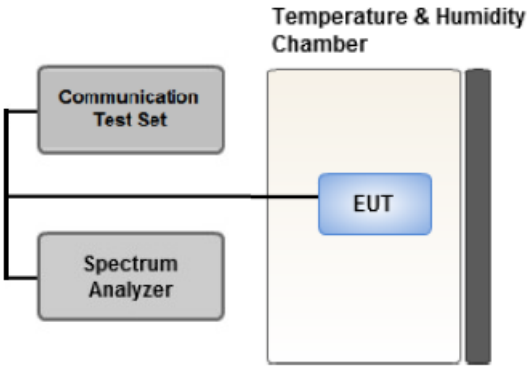
Test Settings

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

Test Note

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
   The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test 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:

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

Test Settings(Peak Power)

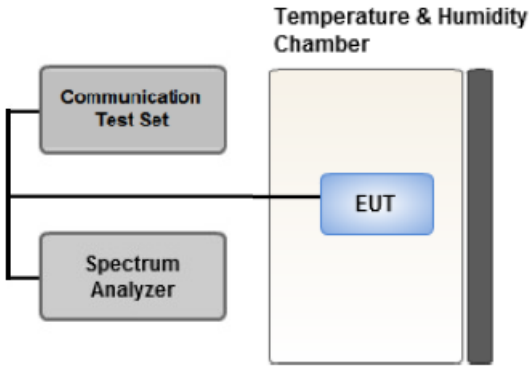
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

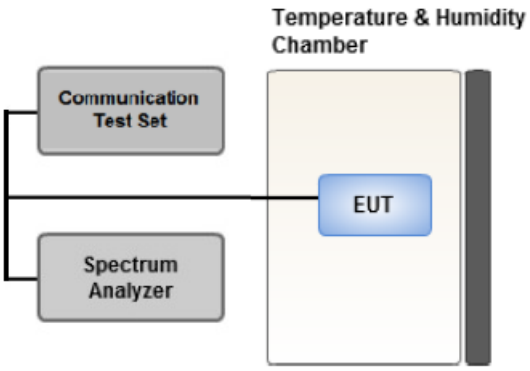
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

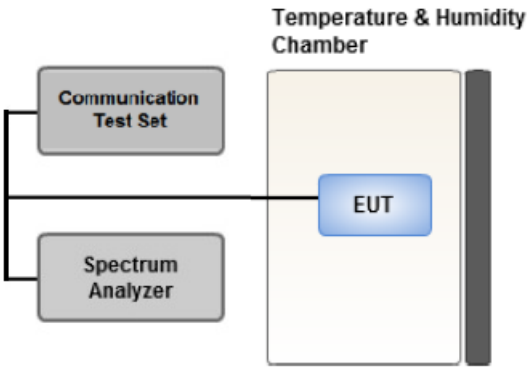
Test Overview

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 = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 * Span / RBW

3.7 BAND EDGE



Test setup

Test Overview

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

Test Settings

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

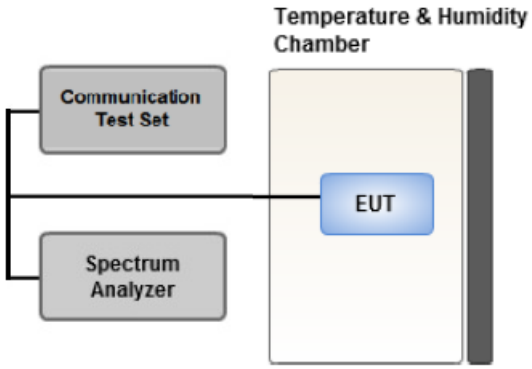
Test Notes

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

All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

3.8 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.

3.8 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.

[Worst case]

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

Note:

- W522T Stand alone &with Cradle were tested and the worst case results are reported.

(Worst case : Stand alone)

3.9 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.

[Worst case]

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

Note:

- W522T Stand alone &with Cradle were tested and the worst case results are reported.
(Worst case : Stand alone)

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/17/2018	Annual	04/17/2019
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/04/2018	Annual	04/04/2019
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/04/2018	Annual	04/04/2019
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	5001	06/07/2018	Annual	06/07/2019
Agilent	E3632A/DC Power Supply	KR75303243	05/09/2018	Annual	05/09/2019
Schwarzbeck	UHAP/ Dipole Antenna	557	03/31/2017	Biennial	03/31/2019
Schwarzbeck	UHAP/ Dipole Antenna	558	03/31/2017	Biennial	03/31/2019
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	04/25/2017	Biennial	04/25/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	04/25/2017	Biennial	04/25/2019
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY52090906	06/08/2018	Annual	06/08/2019
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/21/2018	Annual	06/21/2019
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	04/06/2017	Biennial	04/06/2019
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)	5.71

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

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

Note:

1. See SAR Report
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(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(h)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

7.3. Emission 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

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1710.7	LTE B4/ 1.4 MHz	QPSK	-23.94	7.85	9.92	1.29	H	< 1.00	0.044	16.48
		16-QAM	-25.62	6.17	9.92	1.29	H		0.030	14.80
1732.5		QPSK	-23.69	8.13	10.00	1.28	H		0.048	16.85
		16-QAM	-25.29	6.53	10.00	1.28	H		0.034	15.25
1754.3		QPSK	-24.16	7.63	10.11	1.30	H		0.044	16.44
		16-QAM	-25.73	6.06	10.11	1.30	H		0.031	14.87

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1711.5	LTE B4/ 3 MHz	QPSK	-23.83	7.96	9.92	1.29	H	< 1.00	0.046	16.59
		16-QAM	-25.08	6.71	9.92	1.29	H		0.034	15.34
1732.5		QPSK	-23.74	8.08	10.00	1.28	H		0.048	16.80
		16-QAM	-25.41	6.41	10.00	1.28	H		0.033	15.13
1753.5		QPSK	-24.07	7.72	10.11	1.30	H		0.045	16.53
		16-QAM	-25.75	6.04	10.11	1.30	H		0.031	14.85

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1712.5	LTE B4/ 5 MHz	QPSK	-24.17	7.62	9.92	1.29	H	< 1.00	0.042	16.25
		16-QAM	-25.46	6.33	9.92	1.29	H		0.031	14.96
1732.5		QPSK	-23.80	8.02	10.00	1.28	H		0.047	16.74
		16-QAM	-24.66	7.16	10.00	1.28	H		0.039	15.88
1752.5		QPSK	-23.96	7.86	10.10	1.29	H		0.046	16.67
		16-QAM	-25.66	6.16	10.10	1.29	H		0.031	14.97

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	LTE B4/ 10 MHz	QPSK	-23.92	7.86	9.93	1.29	H	< 1.00	0.045	16.50
		16-QAM	-25.44	6.34	9.93	1.29	H		0.032	14.98
1732.5		QPSK	-23.58	8.24	10.00	1.28	H		0.050	16.96
		16-QAM	-25.41	6.41	10.00	1.28	H		0.033	15.13
1750.0		QPSK	-23.67	8.15	10.10	1.29	H		0.050	16.96
		16-QAM	-24.67	7.15	10.10	1.29	H		0.039	15.96

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1717.5	LTE B4/ 15 MHz	QPSK	-23.96	7.81	9.94	1.28	H	< 1.00	0.044	16.47
		16-QAM	-25.57	6.20	9.94	1.28	H		0.031	14.86
1732.5		QPSK	-23.61	8.21	10.00	1.28	H		0.049	16.93
		16-QAM	-24.53	7.29	10.00	1.28	H		0.040	16.01
1747.5		QPSK	-23.63	8.19	10.10	1.29	H		0.050	17.00
		16-QAM	-25.07	6.75	10.10	1.29	H		0.036	15.56

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1720.0	LTE B4/ 20 MHz	QPSK	-23.96	7.81	9.94	1.28	H	< 1.00	0.044	16.47
		16-QAM	-25.70	6.07	9.94	1.28	H		0.030	14.73
1732.5		QPSK	-23.73	8.09	10.00	1.28	H		0.048	16.81
		16-QAM	-24.77	7.05	10.00	1.28	H		0.038	15.77
1745.0		QPSK	-23.65	8.23	10.03	1.29	H		0.050	16.96
		16-QAM	-25.65	6.23	10.03	1.29	H		0.031	14.96

8.2 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENTY: 1732.5 MHz

▣ MEASURED OUTPUT POWER: 16.85 dBm = 0.048 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 1.4 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 29.85 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
19957 (1710.7)	3,421.40	-47.01	12.70	-54.88	1.91	V	-44.09	60.94
	5,132.10	-47.59	12.68	-49.17	2.52	H	-39.01	55.86
	6,842.80	-51.96	12.58	-49.30	2.84	V	-39.56	56.42
20175 (1732.5)	3,465.00	-52.80	12.60	-60.39	1.97	H	-49.75	66.61
	5,197.50	-42.62	13.17	-44.53	2.54	V	-33.90	50.75
	6,930.00	-52.27	12.46	-48.94	2.83	V	-39.31	56.16
20393 (1754.3)	3,508.60	-50.42	12.43	-57.60	1.93	H	-47.10	63.95
	5,262.90	-42.58	13.48	-45.39	2.59	V	-34.50	51.35
	7,017.20	-53.54	12.16	-50.06	2.83	V	-40.73	57.58

▣ OPERATING FREQUENTY: 1732.5 MHz

▣ MEASURED OUTPUT POWER: 16.80 dBm = 0.048 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log_{10} (W) = 29.80 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
19965 (1711.5)	3,423.00	-47.45	12.70	-55.32	1.91	V	-44.53	61.33
	5,134.50	-47.08	12.72	-48.72	2.52	V	-38.53	55.33
	6,846.00	-53.21	12.55	-50.50	2.83	V	-40.78	57.58
20175 (1732.5)	3,465.00	-52.90	12.60	-60.49	1.97	V	-49.85	66.66
	5,197.50	-42.47	13.17	-44.38	2.54	V	-33.75	50.55
	6,930.00	-56.47	12.46	-53.14	2.83	V	-43.51	60.31
20385 (1753.5)	3,507.00	-49.58	12.43	-56.76	1.93	V	-46.26	63.06
	5,260.50	-41.84	13.48	-44.65	2.59	V	-33.76	50.56
	7,014.00	-53.44	12.16	-49.96	2.83	V	-40.63	57.43

▣ OPERATING FREQUENTY: 1732.5 MHz

▣ MEASURED OUTPUT POWER: 16.74 dBm = 0.047 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log_{10} (W) = 29.74 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
19975 (1712.5)	3,425.00	-47.69	12.69	-55.69	1.90	V	-44.90	61.64
	5,137.50	-47.57	12.75	-49.28	2.52	V	-39.05	55.79
	6,850.00	-53.82	12.52	-51.06	2.81	V	-41.35	58.09
20175 (1732.5)	3,465.00	-52.82	12.60	-60.41	1.97	V	-49.77	66.52
	5,197.50	-42.84	13.17	-44.75	2.54	V	-34.12	50.86
	6,930.00	-54.57	12.46	-51.24	2.83	V	-41.61	58.35
20375 (1752.5)	3,505.00	-49.75	12.44	-57.01	1.92	V	-46.48	63.23
	5,257.50	-41.08	13.48	-43.89	2.59	V	-33.00	49.74
	7,010.00	-54.55	12.21	-51.51	2.84	V	-42.14	58.88

▣ OPERATING FREQUENTY: 1732.5 MHz

▣ MEASURED OUTPUT POWER: 16.96 dBm = 0.050 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log_{10} (W) = 29.96 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
20000 (1715.0)	3,430.00	-48.59	12.68	-56.72	1.88	V	-45.92	62.89
	5,145.00	-47.45	12.79	-49.00	2.54	V	-38.74	55.70
	6,860.00	-53.32	12.54	-50.34	2.86	V	-40.66	57.63
20175 (1732.5)	3,465.00	-53.72	12.60	-61.31	1.97	V	-50.67	67.64
	5,197.50	-44.63	13.17	-46.54	2.54	V	-35.91	52.87
	6,930.00	-52.92	12.46	-49.59	2.83	V	-39.96	56.92
20350 (1750.0)	3,500.00	-49.01	12.45	-56.35	1.90	V	-45.80	62.76
	5,250.00	-40.06	13.47	-42.78	2.62	V	-31.93	48.90
	7,000.00	-55.64	12.27	-52.73	2.84	V	-43.30	60.26

▣ OPERATING FREQUENTY: 1747.5 MHz

▣ MEASURED OUTPUT POWER: 17.00 dBm = 0.050 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 30.00 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
20025 (1717.5)	3,435.00	-48.96	12.67	-56.93	1.89	V	-46.16	63.16
	5,152.50	-47.95	12.83	-49.33	2.55	V	-39.05	56.05
	6,870.00	-52.89	12.56	-50.25	2.82	V	-40.51	57.51
20175 (1732.5)	3,465.00	-54.26	12.60	-61.85	1.97	V	-51.21	68.21
	5,197.50	-44.64	13.17	-46.55	2.54	V	-35.92	52.92
	6,930.00	-54.05	12.46	-50.72	2.83	V	-41.09	58.09
20325 (1747.5)	3,495.00	-51.01	12.48	-58.32	1.91	V	-47.75	64.75
	5,242.50	-40.91	13.40	-43.41	2.61	V	-32.62	49.62
	6,990.00	-54.55	12.26	-50.48	2.84	V	-41.06	58.06

▣ OPERATING FREQUENTY: 1745.00 MHz

▣ MEASURED OUTPUT POWER: 16.96 dBm = 0.050 W

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 29.96 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
20050 (1720.0)	3,440.00	-46.09	12.65	-53.90	1.90	V	-43.15	60.11
	5,160.00	-47.28	12.87	-49.12	2.58	V	-38.83	55.80
	6,880.00	-50.45	12.60	-47.76	2.79	V	-37.95	54.91
20175 (1732.5)	3,465.00	-52.87	12.60	-60.46	1.97	V	-49.82	66.79
	5,197.50	-46.25	13.17	-48.16	2.54	V	-37.53	54.49
	6,930.00	-56.74	12.46	-53.41	2.83	V	-43.78	60.74
20300 (1745.0)	3,490.00	-51.59	12.50	-58.86	1.91	V	-48.27	65.23
	5,235.00	-40.67	13.36	-43.23	2.61	V	-32.48	49.44
	6,980.00	-54.08	12.25	-50.10	2.85	V	-40.70	57.66

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.43
			16-QAM			6.20
	3 MHz		QPSK	15		5.41
			16-QAM			6.24
	5 MHz		QPSK	25		5.31
			16-QAM			6.19
	10 MHz		QPSK	50		5.38
			16-QAM			6.17
	15 MHz		QPSK	75		5.28
			16-QAM			6.13
	20 MHz		QPSK	100		5.38
			16-QAM			6.14

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 65 ~ 76.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.0953
			16-QAM			1.0936
	3 MHz		QPSK	15		2.7094
			16-QAM			2.6976
	5 MHz		QPSK	25		4.5026
			16-QAM			4.5031
	10 MHz		QPSK	50		8.9704
			16-QAM			8.9807
	15 MHz		QPSK	75		13.449
			16-QAM			13.438
	20 MHz		QPSK	100		17.990
			16-QAM			17.959

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 53 ~ 64.

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
4	1.4	1710.7	5.1316	28.591	-64.467	-35.876	-13.00
		1732.5	5.1970	28.591	-57.570	-28.979	
		1754.3	5.2647	28.591	-60.441	-31.850	
	3	1711.5	5.1312	28.591	-63.538	-34.947	
		1732.5	5.1945	28.591	-57.126	-28.535	
		1753.5	5.2647	28.591	-58.821	-30.230	
	5	1712.5	5.1316	28.591	-63.526	-34.935	
		1732.5	5.1915	28.591	-57.901	-29.310	
		1752.5	5.2647	28.591	-59.447	-30.856	
	10	1715.0	5.1326	28.591	-64.108	-35.517	
		1732.5	5.1850	28.591	-57.588	-28.997	
		1750.0	5.2638	28.591	-58.787	-30.196	
	15	1717.5	5.1331	28.591	-63.699	-35.108	
		1732.5	5.1780	28.591	-58.440	-29.849	
		1747.5	5.2633	28.591	-59.458	-30.867	
	20	1720.0	5.1341	28.591	-64.104	-35.513	
		1732.5	5.1715	28.591	-59.222	-30.631	
		1745.0	5.2623	28.591	-59.122	-30.531	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 113 ~ 148.
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 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 77 ~ 112.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 4

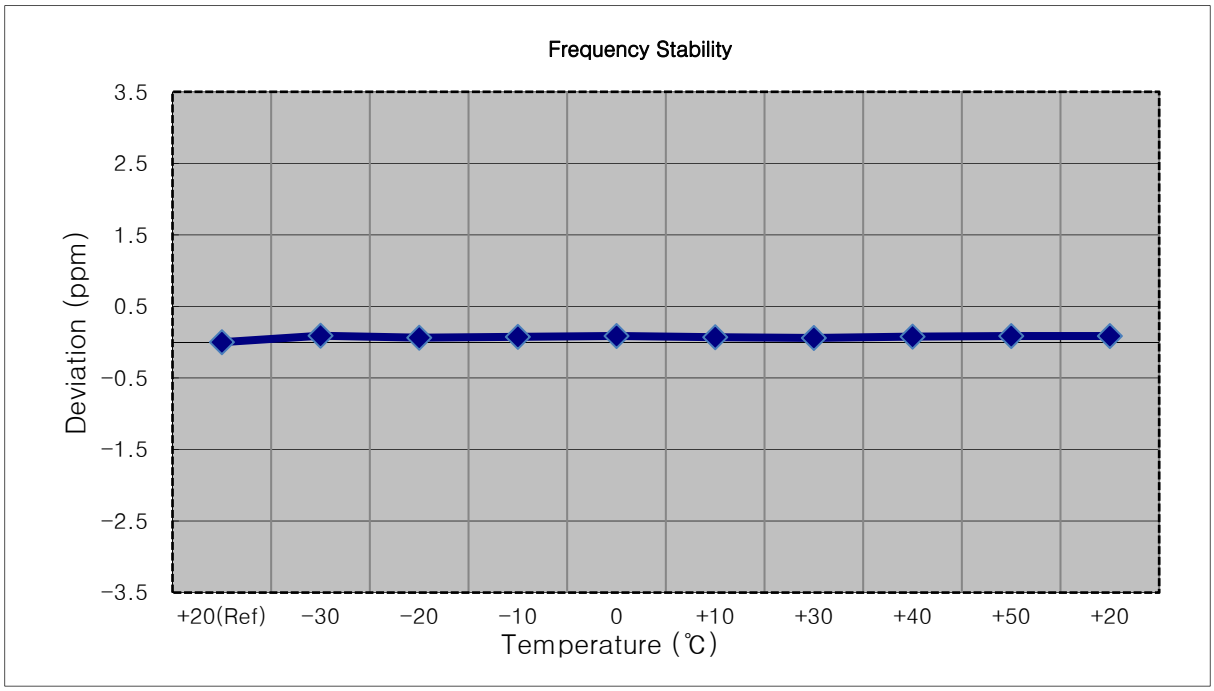
▣ OPERATING FREQUENCY: 1710,700,000 Hz

▣ CHANNEL: 19957 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1710 700 147	0.0	0.000 000	0.000
100%		-30	1710 700 302	155.0	0.000 009	0.091
100%		-20	1710 700 254	107.3	0.000 006	0.063
100%		-10	1710 700 275	128.2	0.000 007	0.075
100%		0	1710 700 295	148.9	0.000 009	0.087
100%		+10	1710 700 266	119.3	0.000 007	0.070
100%		+30	1710 700 248	101.1	0.000 006	0.059
100%		+40	1710 700 280	133.6	0.000 008	0.078
100%		+50	1710 700 294	147.3	0.000 009	0.086
Batt. Endpoint	3.400	+20	1710 700 293	146.9	0.000 009	0.086



▣ MODE: LTE 4

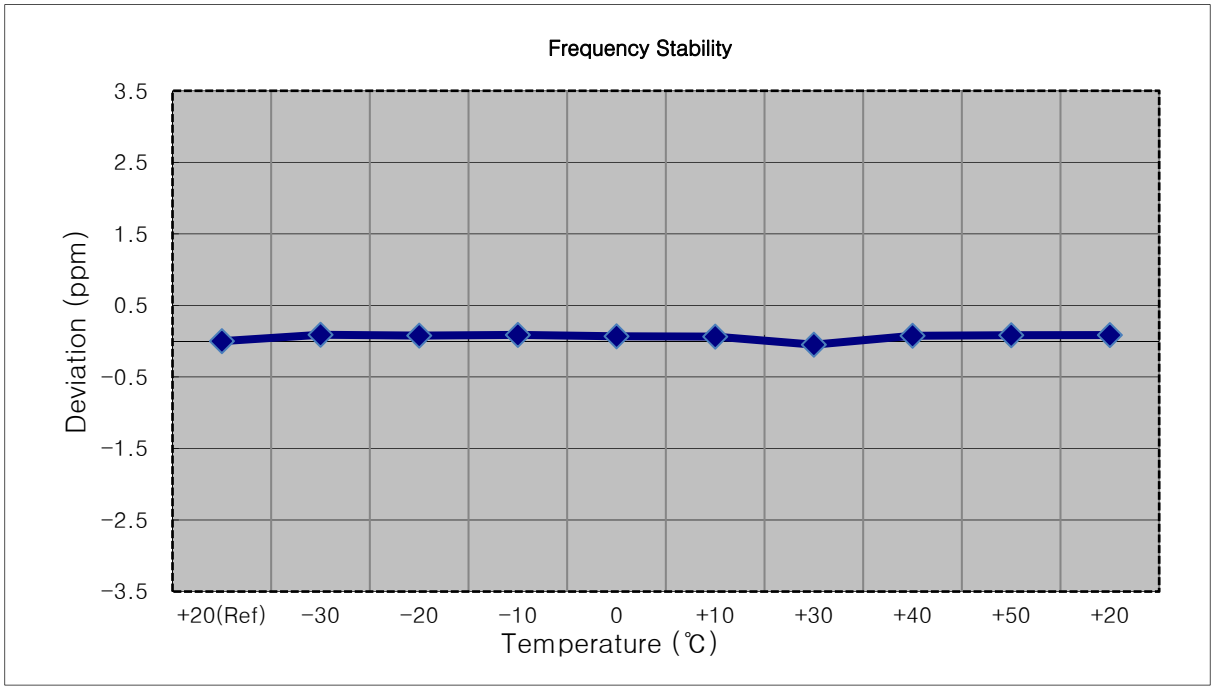
▣ OPERATING FREQUENCY: 1711,500,000 Hz

▣ CHANNEL: 19965 (3 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1711 500 100	0.0	0.000 000	0.000
100%		-30	1711 500 253	153.2	0.000 009	0.090
100%		-20	1711 500 234	133.9	0.000 008	0.078
100%		-10	1711 500 250	150.2	0.000 009	0.088
100%		0	1711 500 217	116.9	0.000 007	0.068
100%		+10	1711 500 210	109.4	0.000 006	0.064
100%		+30	1711 500 016	-83.9	-0.000 005	-0.049
100%		+40	1711 500 230	129.5	0.000 008	0.076
100%		+50	1711 500 243	142.9	0.000 008	0.083
Batt. Endpoint	3.400	+20	1711 500 247	146.6	0.000 009	0.086



▣ MODE: LTE 4

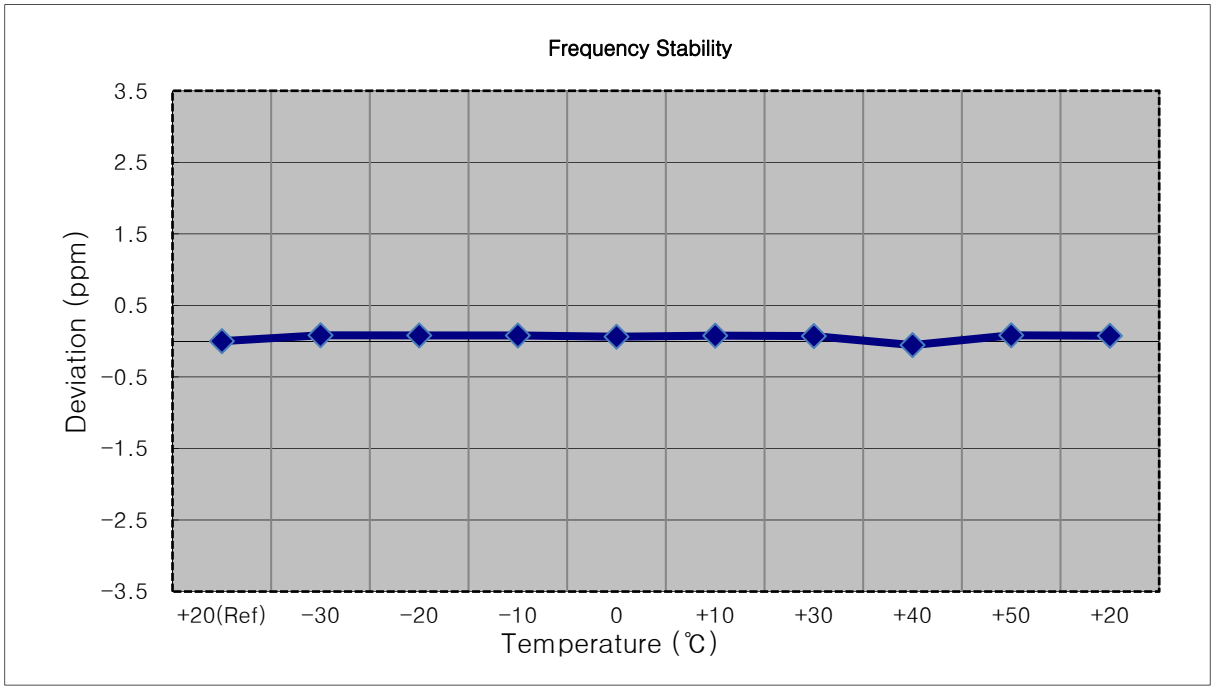
▣ OPERATING FREQUENCY: 1712,500,000 Hz

▣ CHANNEL: 19975 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1712 500 112	0.0	0.000 000	0.000
100%		-30	1712 500 253	140.9	0.000 008	0.082
100%		-20	1712 500 250	137.3	0.000 008	0.080
100%		-10	1712 500 248	135.6	0.000 008	0.079
100%		0	1712 500 219	106.7	0.000 006	0.062
100%		+10	1712 500 244	132.0	0.000 008	0.077
100%		+30	1712 500 234	121.8	0.000 007	0.071
100%		+40	1712 500 019	-93.8	-0.000 005	-0.055
100%		+50	1712 500 253	140.5	0.000 008	0.082
Batt. Endpoint	3.400	+20	1712 500 242	129.4	0.000 008	0.076



▣ MODE: LTE 4

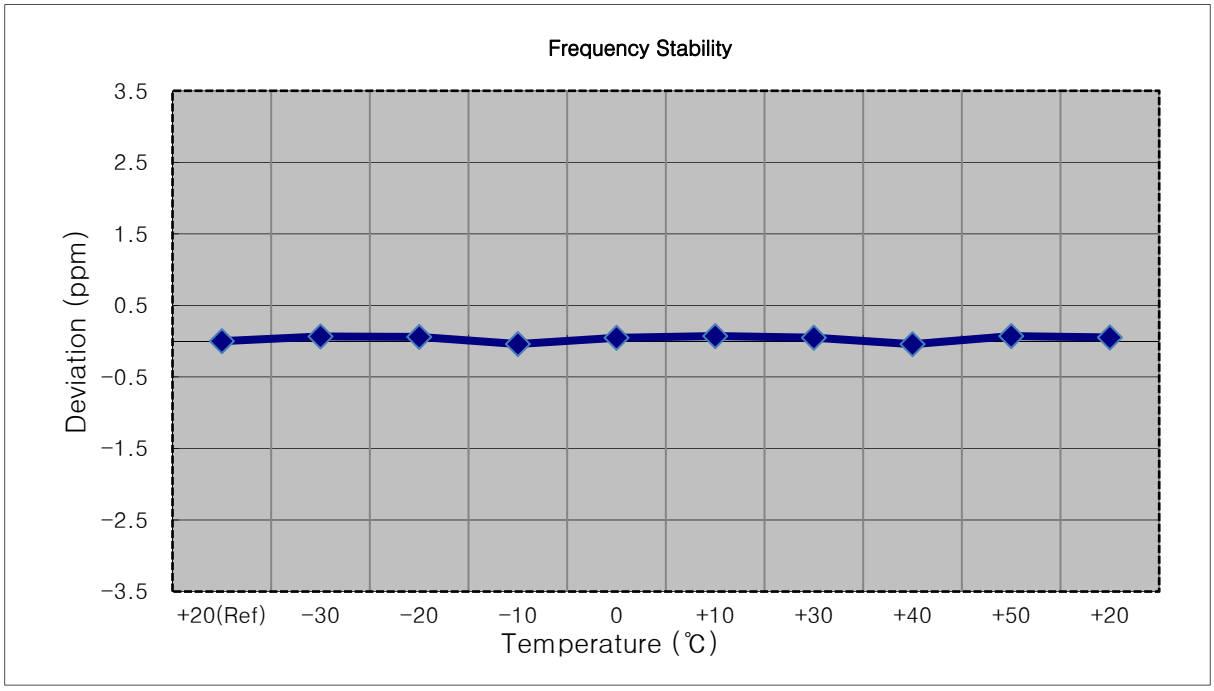
▣ OPERATING FREQUENCY: 1715,000,000 Hz

▣ CHANNEL: 20000 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1715 000 115	0.0	0.000 000	0.000
100%		-30	1715 000 228	113.2	0.000 007	0.066
100%		-20	1715 000 216	101.0	0.000 006	0.059
100%		-10	1715 000 047	-68.2	-0.000 004	-0.040
100%		0	1715 000 196	81.1	0.000 005	0.047
100%		+10	1715 000 238	122.6	0.000 007	0.071
100%		+30	1715 000 199	83.8	0.000 005	0.049
100%		+40	1715 000 043	-72.4	-0.000 004	-0.042
100%		+50	1715 000 237	122.4	0.000 007	0.071
Batt. Endpoint	3.400	+20	1715 000 204	88.9	0.000 005	0.052



▣ MODE: LTE 4

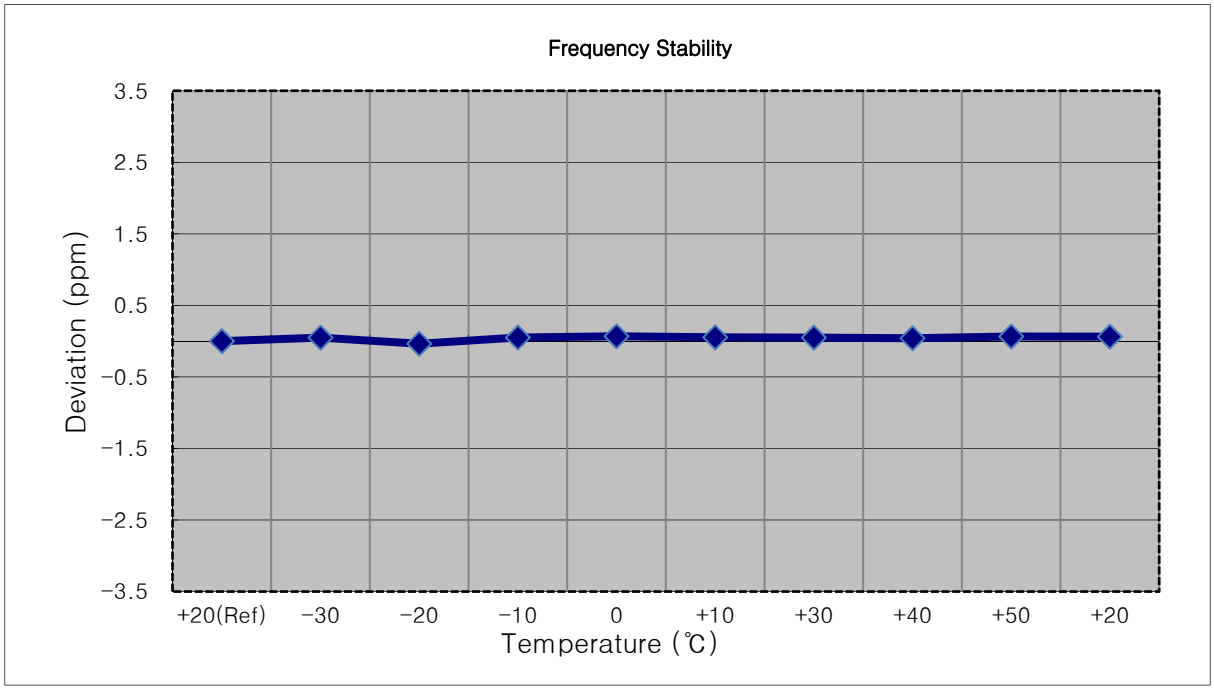
▣ OPERATING FREQUENCY: 1717,500,000 Hz

▣ CHANNEL: 20025 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1717 499 932	0.0	0.000 000	0.000
100%		-30	1717 500 017	84.9	0.000 005	0.049
100%		-20	1717 499 871	-60.7	-0.000 004	-0.035
100%		-10	1717 500 020	87.9	0.000 005	0.051
100%		0	1717 500 049	117.3	0.000 007	0.068
100%		+10	1717 500 026	93.4	0.000 005	0.054
100%		+30	1717 500 017	85.3	0.000 005	0.050
100%		+40	1717 500 002	69.7	0.000 004	0.041
100%		+50	1717 500 044	111.4	0.000 006	0.065
Batt. Endpoint	3.400	+20	1717 500 040	108.1	0.000 006	0.063



▣ MODE: LTE 4

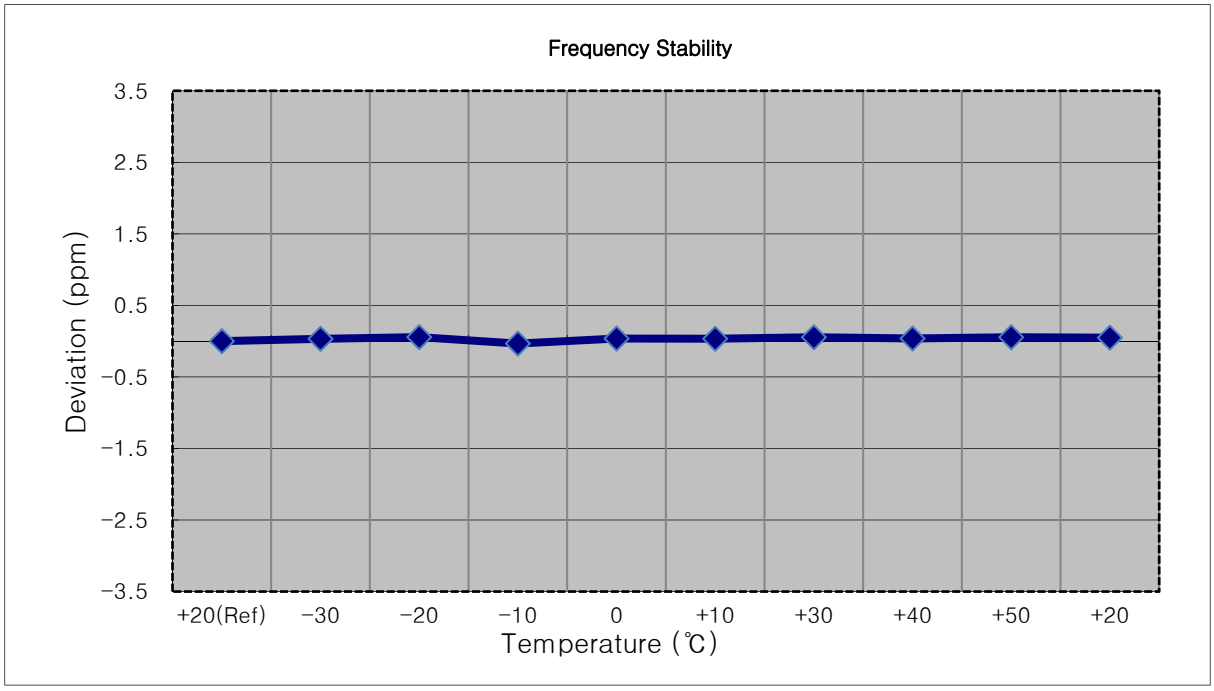
▣ OPERATING FREQUENCY: 1720,000,000 Hz

▣ CHANNEL: 20050 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1720 000 074	0.0	0.000 000	0.000
100%		-30	1720 000 130	55.5	0.000 003	0.032
100%		-20	1720 000 171	96.3	0.000 006	0.056
100%		-10	1720 000 018	-56.7	-0.000 003	-0.033
100%		0	1720 000 137	63.0	0.000 004	0.037
100%		+10	1720 000 133	58.8	0.000 003	0.034
100%		+30	1720 000 168	93.6	0.000 005	0.054
100%		+40	1720 000 139	65.2	0.000 004	0.038
100%		+50	1720 000 169	94.7	0.000 006	0.055
Batt. Endpoint	3.400	+20	1720 000 158	84.2	0.000 005	0.049



▣ MODE: LTE 4

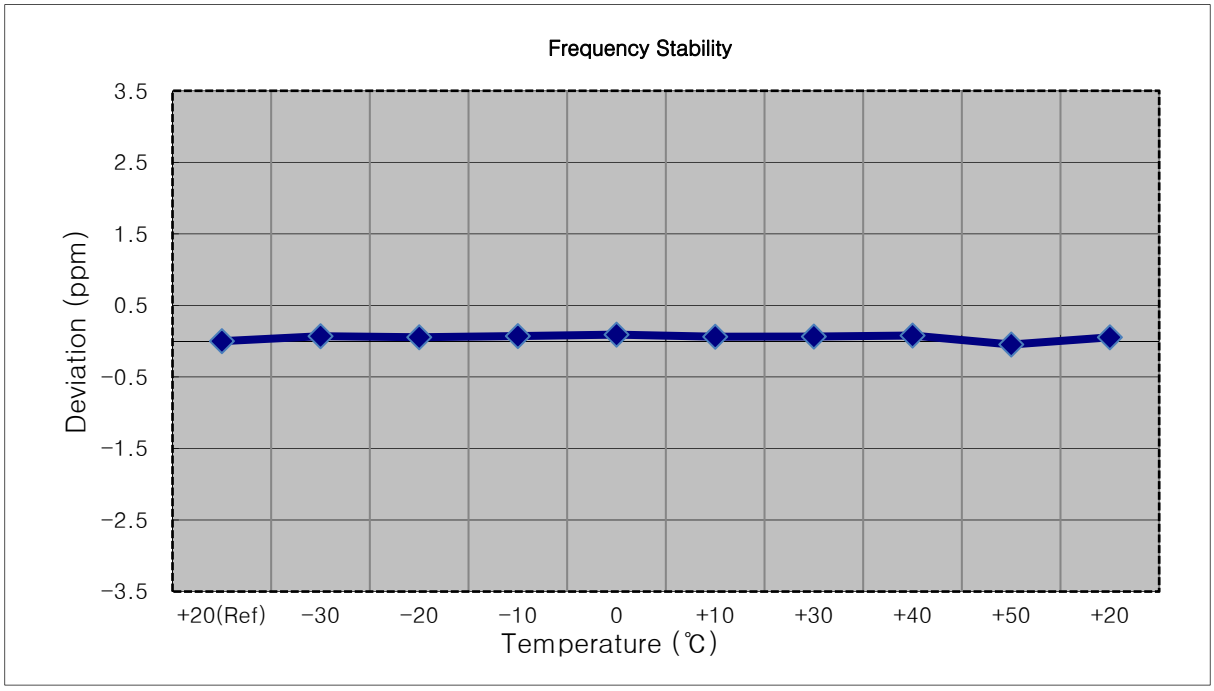
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 499 907	0.0	0.000 000	0.000
100%		-30	1732 500 028	120.6	0.000 007	0.070
100%		-20	1732 500 002	95.1	0.000 005	0.055
100%		-10	1732 500 031	123.9	0.000 007	0.072
100%		0	1732 500 065	157.8	0.000 009	0.091
100%		+10	1732 500 014	107.4	0.000 006	0.062
100%		+30	1732 500 018	111.4	0.000 006	0.064
100%		+40	1732 500 043	136.4	0.000 008	0.079
100%		+50	1732 499 827	-80.2	-0.000 005	-0.046
Batt. Endpoint	3.400	+20	1732 500 000	93.2	0.000 005	0.054



▣ MODE: LTE 4

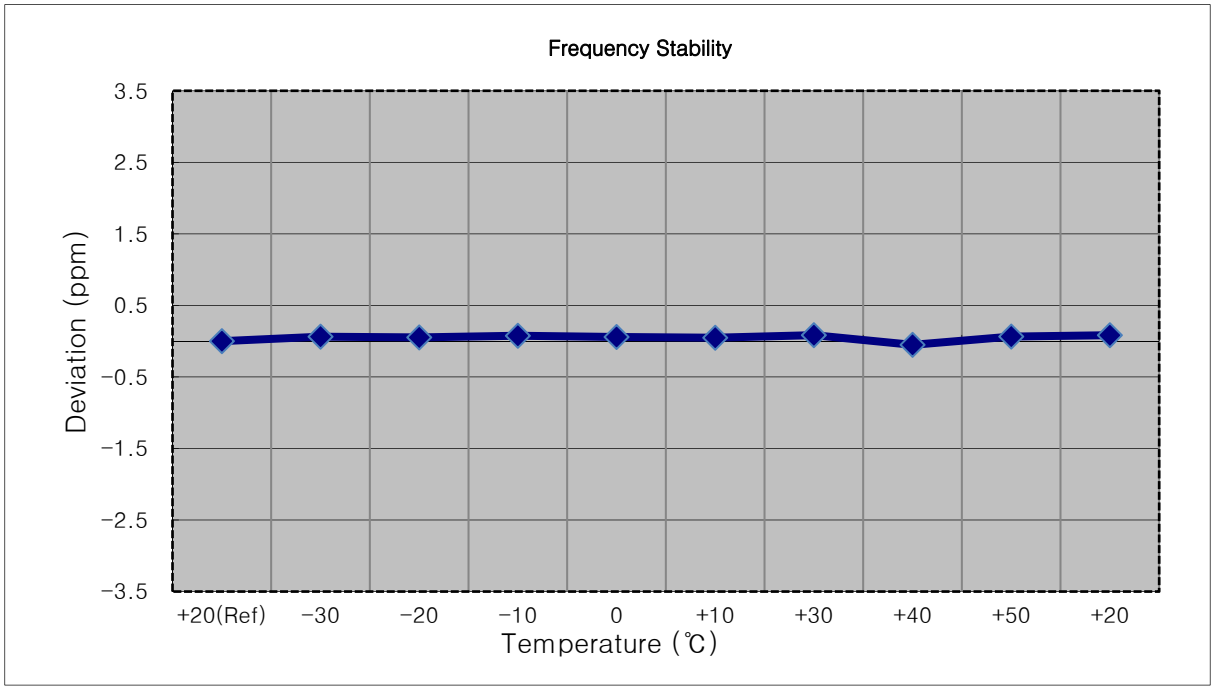
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (3 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 500 127	0.0	0.000 000	0.000
100%		-30	1732 500 236	109.5	0.000 006	0.063
100%		-20	1732 500 218	90.7	0.000 005	0.052
100%		-10	1732 500 258	131.1	0.000 008	0.076
100%		0	1732 500 228	100.8	0.000 006	0.058
100%		+10	1732 500 210	83.3	0.000 005	0.048
100%		+30	1732 500 273	145.9	0.000 008	0.084
100%		+40	1732 500 038	-89.1	-0.000 005	-0.051
100%		+50	1732 500 238	111.1	0.000 006	0.064
Batt. Endpoint	3.400	+20	1732 500 271	144.5	0.000 008	0.083



▣ MODE: LTE 4

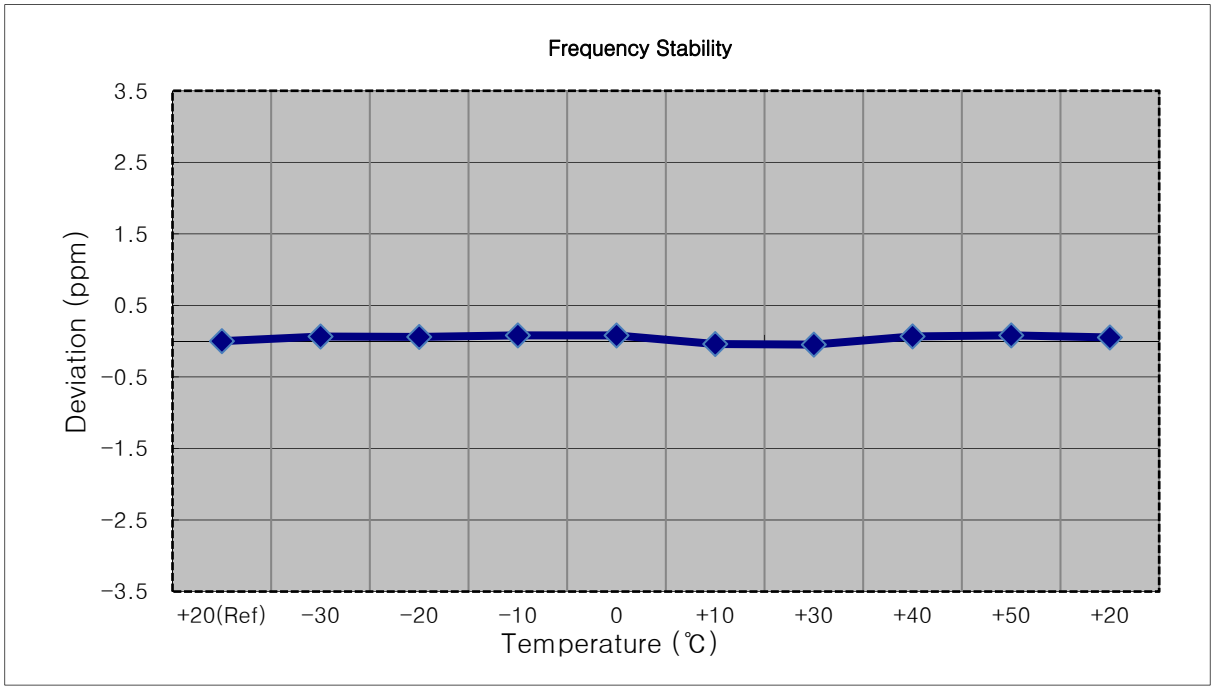
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 499 911	0.0	0.000 000	0.000
100%		-30	1732 500 025	113.4	0.000 007	0.065
100%		-20	1732 500 015	103.3	0.000 006	0.060
100%		-10	1732 500 052	140.1	0.000 008	0.081
100%		0	1732 500 050	139.0	0.000 008	0.080
100%		+10	1732 499 842	-69.4	-0.000 004	-0.040
100%		+30	1732 499 828	-83.0	-0.000 005	-0.048
100%		+40	1732 500 027	116.0	0.000 007	0.067
100%		+50	1732 500 052	140.5	0.000 008	0.081
Batt. Endpoint	3.400	+20	1732 500 002	90.2	0.000 005	0.052



▣ MODE: LTE 4

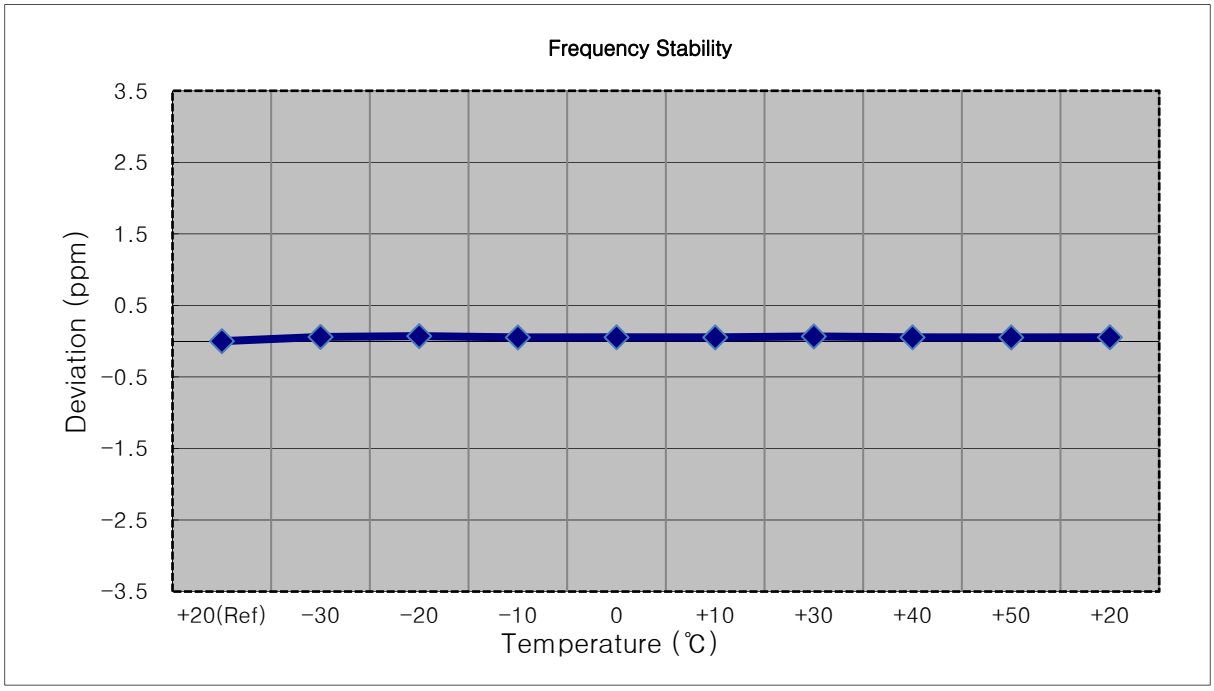
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 500 114	0.0	0.000 000	0.000
100%		-30	1732 500 216	102.1	0.000 006	0.059
100%		-20	1732 500 236	121.7	0.000 007	0.070
100%		-10	1732 500 204	90.4	0.000 005	0.052
100%		0	1732 500 207	93.3	0.000 005	0.054
100%		+10	1732 500 206	91.8	0.000 005	0.053
100%		+30	1732 500 228	114.5	0.000 007	0.066
100%		+40	1732 500 206	91.7	0.000 005	0.053
100%		+50	1732 500 205	90.6	0.000 005	0.052
Batt. Endpoint	3.400	+20	1732 500 207	93.1	0.000 005	0.054



▣ MODE: LTE 4

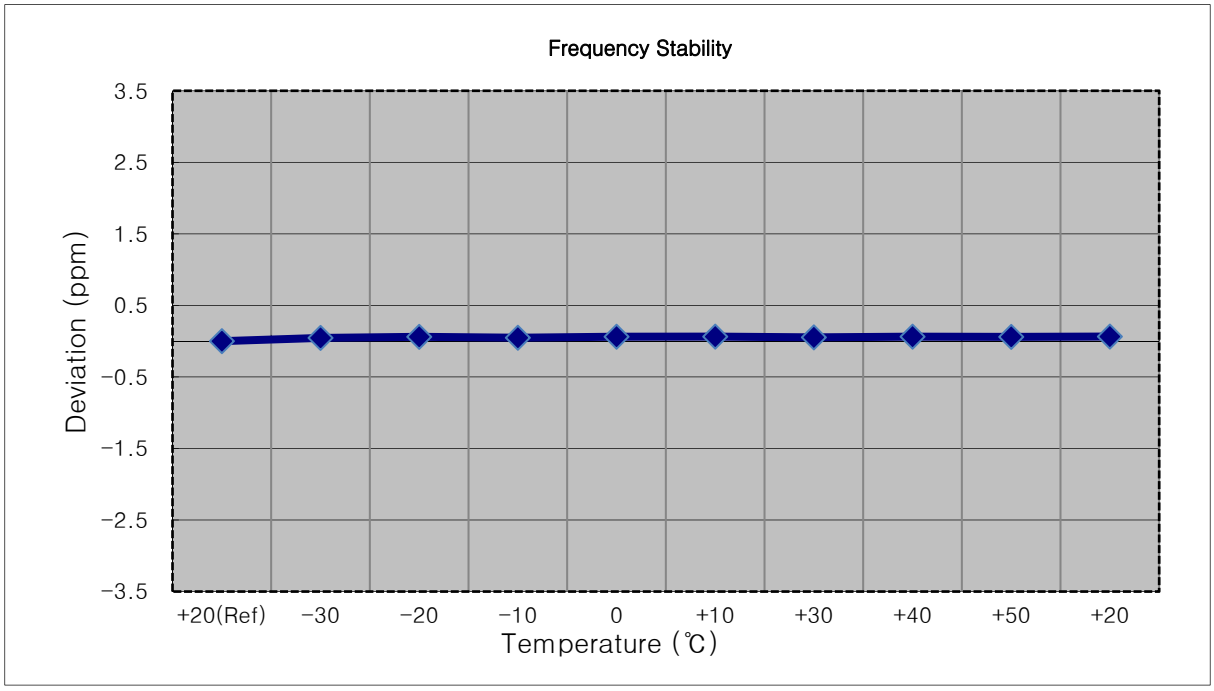
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 500 089	0.0	0.000 000	0.000
100%		-30	1732 500 168	78.9	0.000 005	0.046
100%		-20	1732 500 193	104.7	0.000 006	0.060
100%		-10	1732 500 172	83.2	0.000 005	0.048
100%		0	1732 500 197	108.2	0.000 006	0.062
100%		+10	1732 500 199	110.7	0.000 006	0.064
100%		+30	1732 500 181	91.8	0.000 005	0.053
100%		+40	1732 500 198	109.4	0.000 006	0.063
100%		+50	1732 500 193	104.0	0.000 006	0.060
Batt. Endpoint	3.400	+20	1732 500 200	111.1	0.000 006	0.064



▣ MODE: LTE 4

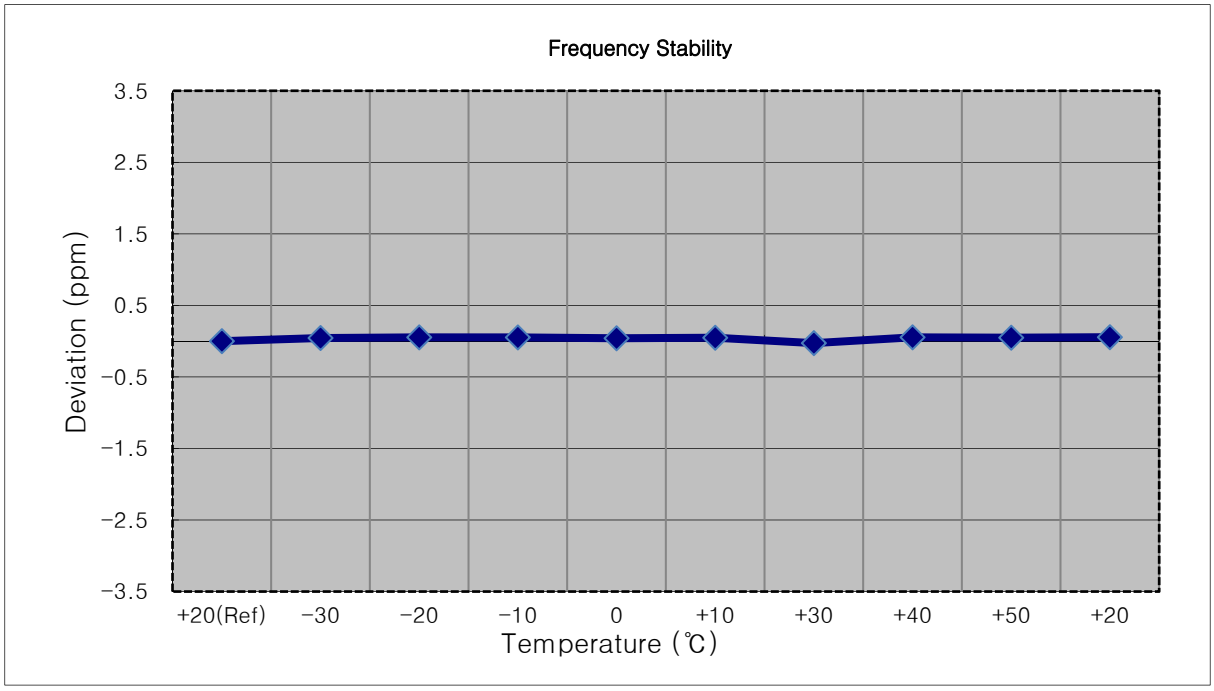
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1732 500 089	0.0	0.000 000	0.000
100%		-30	1732 500 165	76.2	0.000 004	0.044
100%		-20	1732 500 181	91.9	0.000 005	0.053
100%		-10	1732 500 180	90.8	0.000 005	0.052
100%		0	1732 500 160	70.4	0.000 004	0.041
100%		+10	1732 500 172	82.7	0.000 005	0.048
100%		+30	1732 500 041	-47.7	-0.000 003	-0.028
100%		+40	1732 500 182	93.3	0.000 005	0.054
100%		+50	1732 500 174	84.9	0.000 005	0.049
Batt. Endpoint	3.400	+20	1732 500 186	96.5	0.000 006	0.056



▣ MODE: LTE 4

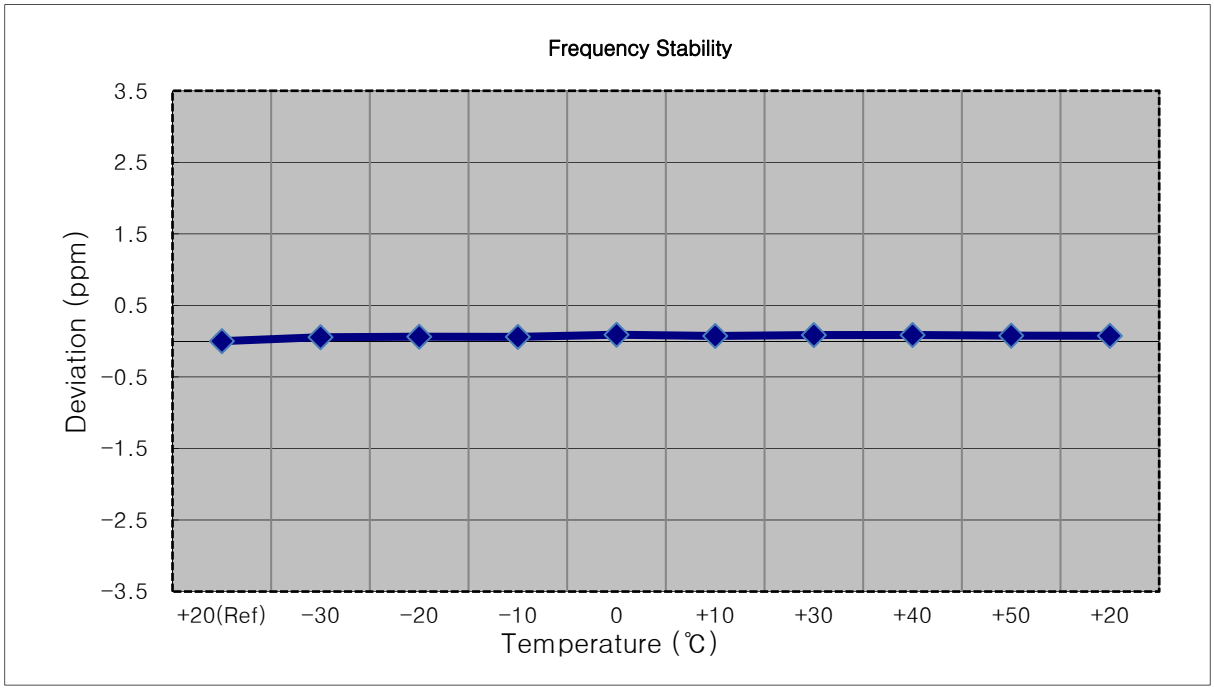
▣ OPERATING FREQUENCY: 1754,300,000 Hz

▣ CHANNEL: 20393 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1754 300 140	0.0	0.000 000	0.000
100%		-30	1754 300 238	97.6	0.000 006	0.056
100%		-20	1754 300 250	109.6	0.000 006	0.062
100%		-10	1754 300 245	105.0	0.000 006	0.060
100%		0	1754 300 298	157.9	0.000 009	0.090
100%		+10	1754 300 267	126.9	0.000 007	0.072
100%		+30	1754 300 290	149.4	0.000 009	0.085
100%		+40	1754 300 292	151.3	0.000 009	0.086
100%		+50	1754 300 275	135.0	0.000 008	0.077
Batt. Endpoint	3.400	+20	1754 300 272	131.9	0.000 008	0.075



▣ MODE: LTE 4

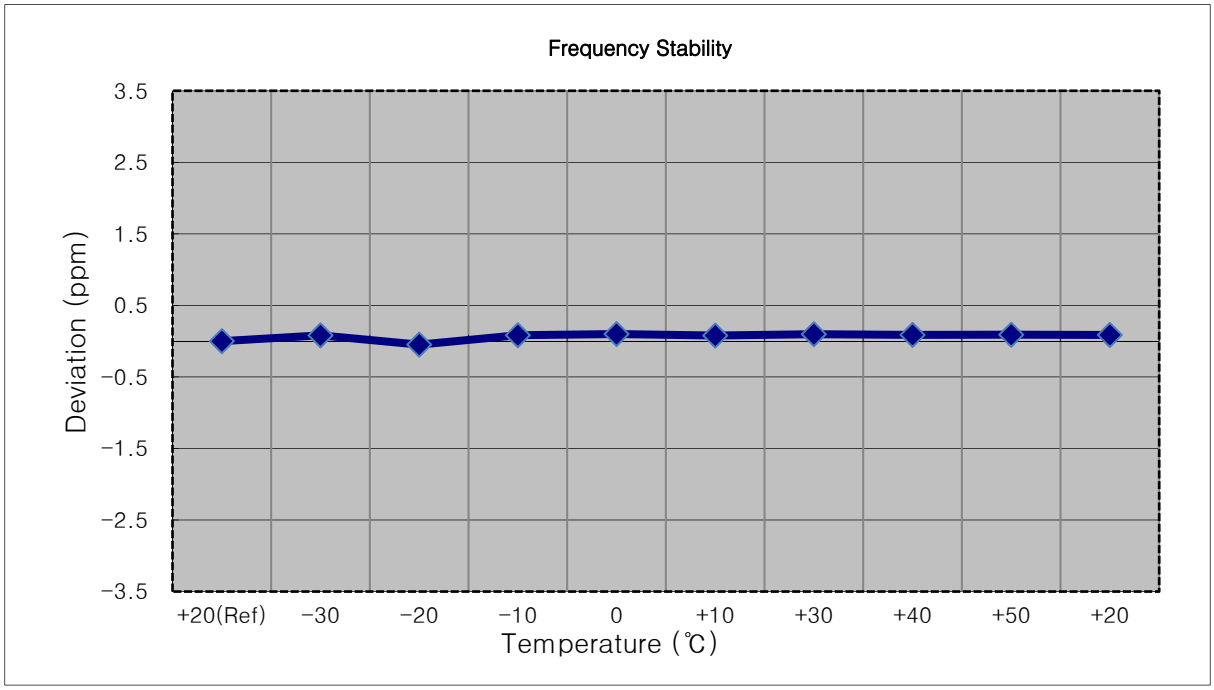
▣ OPERATING FREQUENCY: 1753,500,000 Hz

▣ CHANNEL: 20385 (3 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1753 500 146	0.0	0.000 000	0.000
100%		-30	1753 500 289	143.1	0.000 008	0.082
100%		-20	1753 500 062	-84.1	-0.000 005	-0.048
100%		-10	1753 500 292	145.7	0.000 008	0.083
100%		0	1753 500 320	174.2	0.000 010	0.099
100%		+10	1753 500 285	138.4	0.000 008	0.079
100%		+30	1753 500 317	171.0	0.000 010	0.098
100%		+40	1753 500 300	154.2	0.000 009	0.088
100%		+50	1753 500 305	159.0	0.000 009	0.091
Batt. Endpoint	3.400	+20	1753 500 299	152.9	0.000 009	0.087



▣ MODE: LTE 4

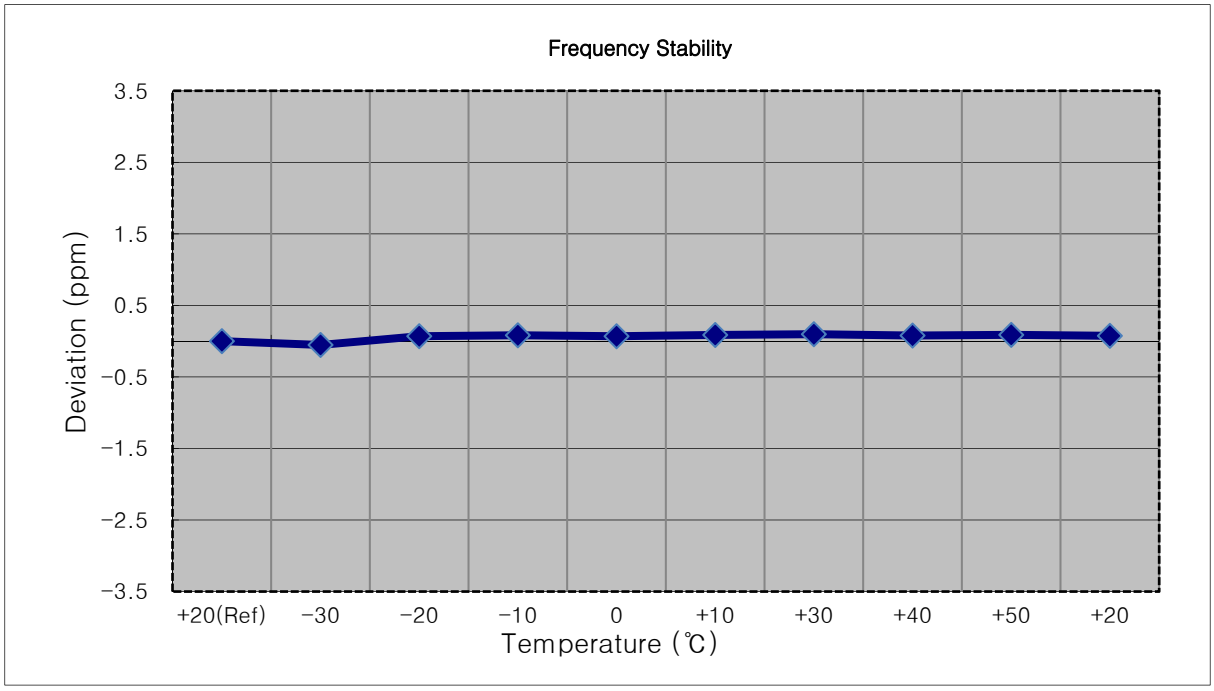
▣ OPERATING FREQUENCY: 1752,500,000 Hz

▣ CHANNEL: 20375 (5 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1752 500 132	0.0	0.000 000	0.000
100%		-30	1752 500 040	-92.5	-0.000 005	-0.053
100%		-20	1752 500 255	122.6	0.000 007	0.070
100%		-10	1752 500 277	145.0	0.000 008	0.083
100%		0	1752 500 253	120.9	0.000 007	0.069
100%		+10	1752 500 284	151.9	0.000 009	0.087
100%		+30	1752 500 302	170.1	0.000 010	0.097
100%		+40	1752 500 270	137.9	0.000 008	0.079
100%		+50	1752 500 288	155.4	0.000 009	0.089
Batt. Endpoint	3.400	+20	1752 500 264	131.4	0.000 007	0.075



▣ MODE: LTE 4

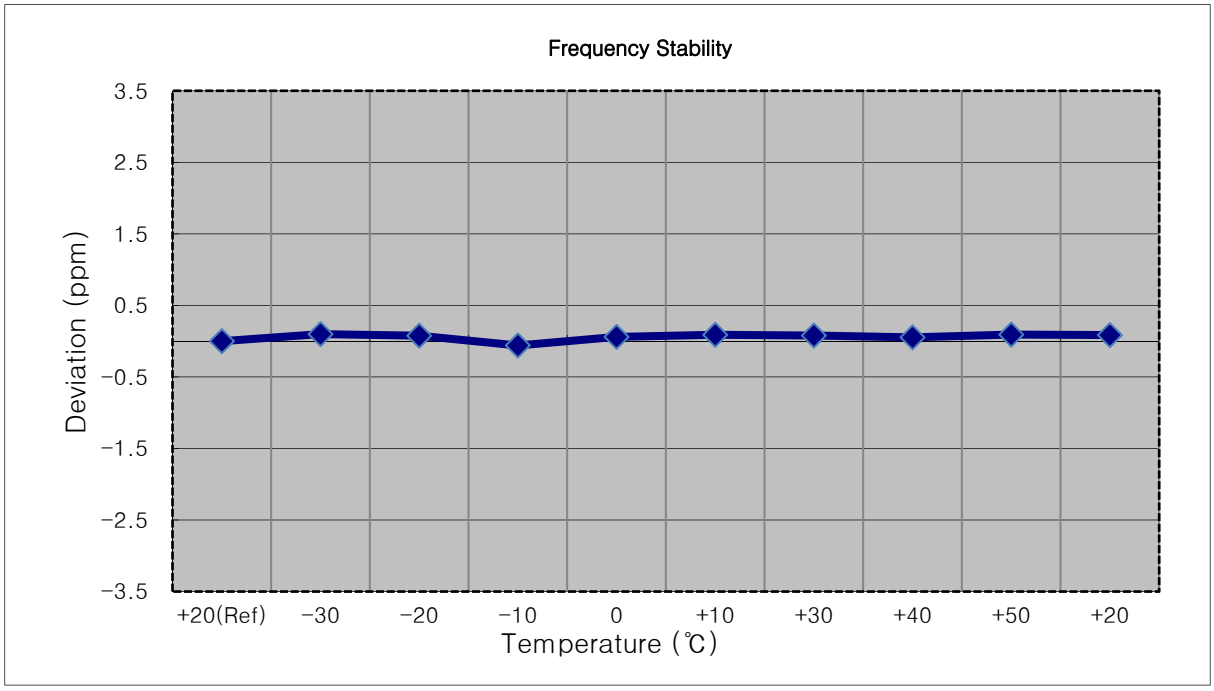
▣ OPERATING FREQUENCY: 1750,000,000 Hz

▣ CHANNEL: 20350 (10 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1750 000 140	0.0	0.000 000	0.000
100%		-30	1750 000 313	172.7	0.000 010	0.099
100%		-20	1750 000 274	133.4	0.000 008	0.076
100%		-10	1750 000 035	-105.7	-0.000 006	-0.060
100%		0	1750 000 246	105.6	0.000 006	0.060
100%		+10	1750 000 296	155.3	0.000 009	0.089
100%		+30	1750 000 277	137.1	0.000 008	0.078
100%		+40	1750 000 234	93.3	0.000 005	0.053
100%		+50	1750 000 301	160.5	0.000 009	0.092
Batt. Endpoint	3.400	+20	1750 000 290	149.9	0.000 009	0.086



▣ MODE: LTE 4

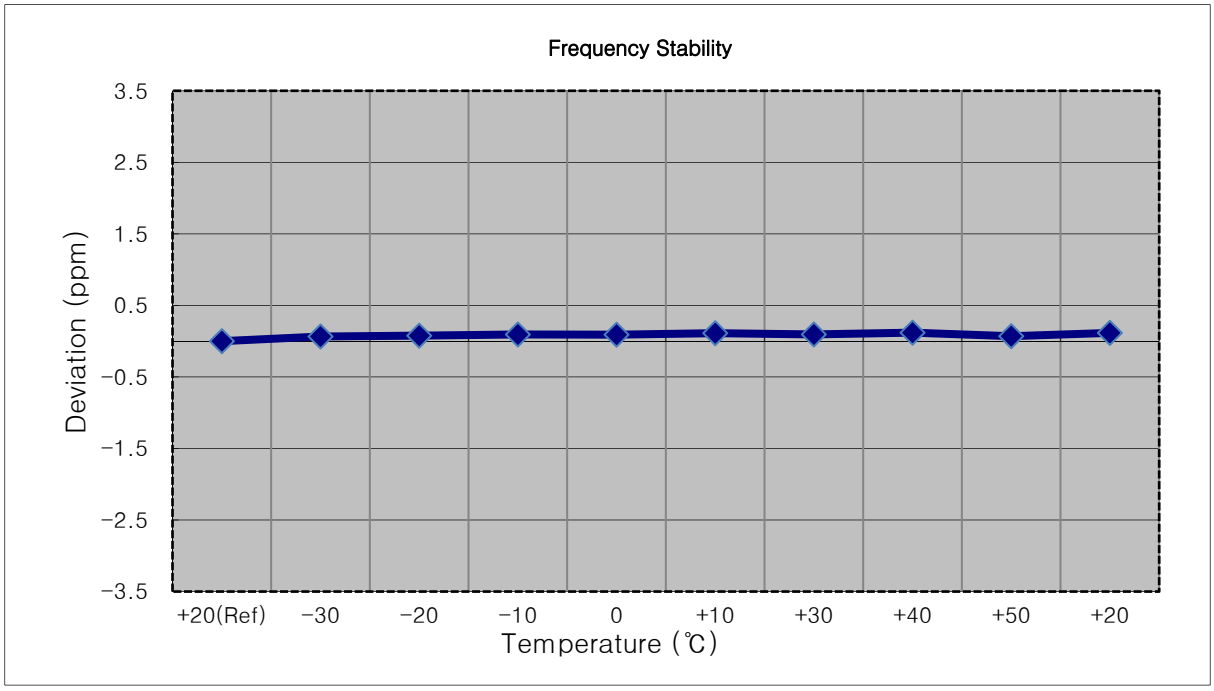
▣ OPERATING FREQUENCY: 1747,500,000 Hz

▣ CHANNEL: 20325 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1747 500 180	0.0	0.000 000	0.000
100%		-30	1747 500 294	114.3	0.000 007	0.065
100%		-20	1747 500 315	135.3	0.000 008	0.077
100%		-10	1747 500 344	163.9	0.000 009	0.094
100%		0	1747 500 338	158.4	0.000 009	0.091
100%		+10	1747 500 375	195.4	0.000 011	0.112
100%		+30	1747 500 344	164.4	0.000 009	0.094
100%		+40	1747 500 388	207.7	0.000 012	0.119
100%		+50	1747 500 302	122.1	0.000 007	0.070
Batt. Endpoint	3.400	+20	1747 500 383	202.7	0.000 012	0.116



▣ MODE: LTE 4

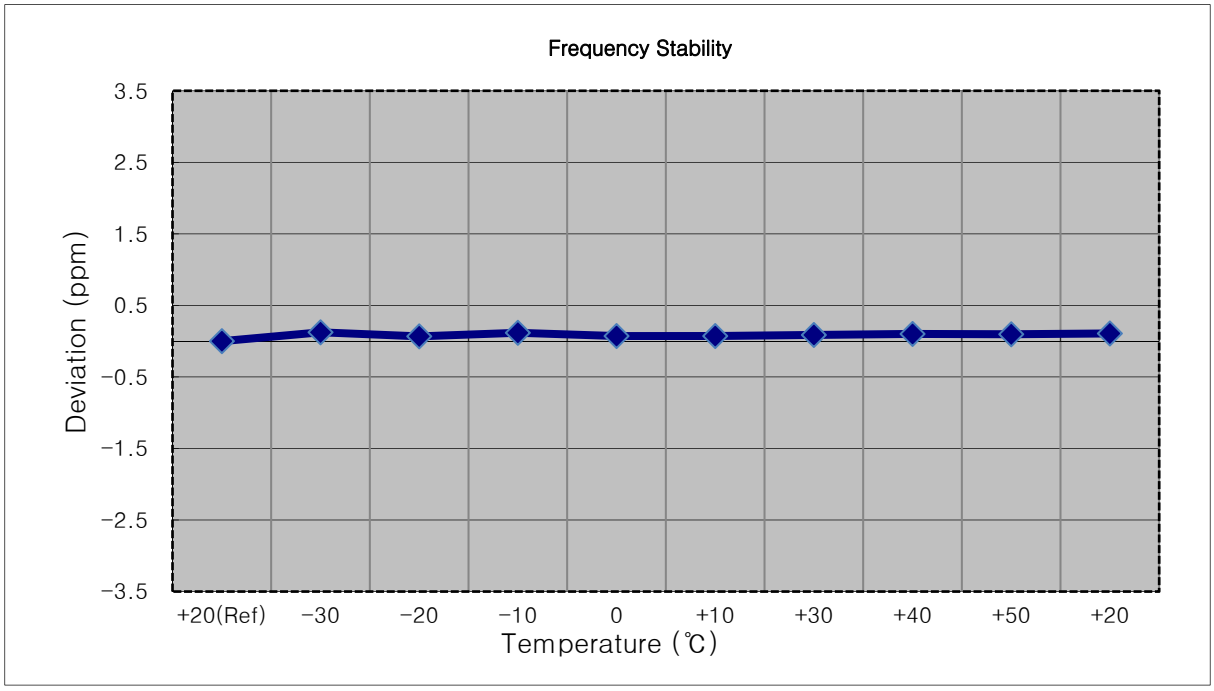
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 20300 (20 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

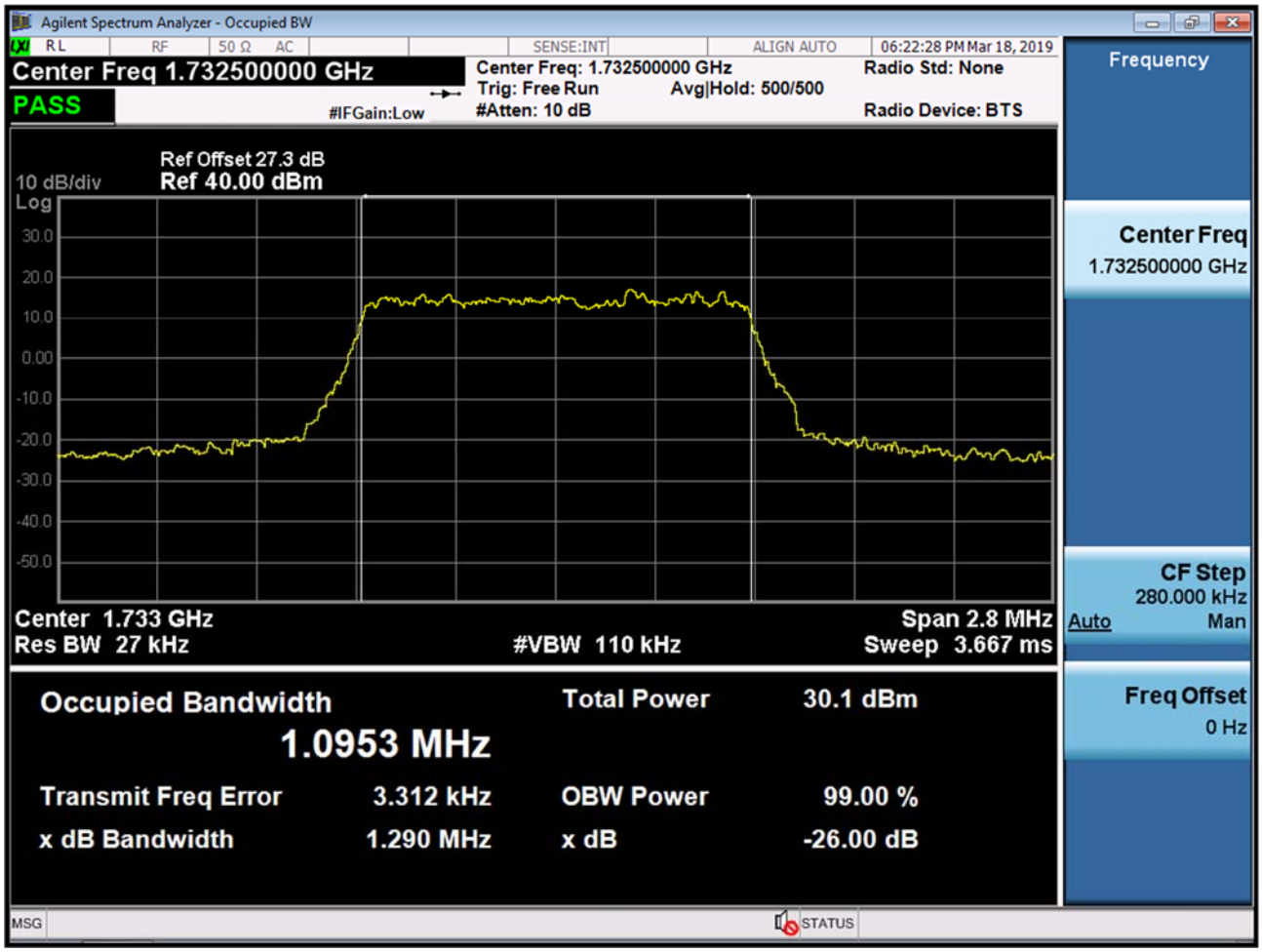
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1745 000 219	0.0	0.000 000	0.000
100%		-30	1745 000 435	216.0	0.000 012	0.124
100%		-20	1745 000 337	118.0	0.000 007	0.068
100%		-10	1745 000 424	204.9	0.000 012	0.117
100%		0	1745 000 345	125.9	0.000 007	0.072
100%		+10	1745 000 345	126.1	0.000 007	0.072
100%		+30	1745 000 370	151.1	0.000 009	0.087
100%		+40	1745 000 395	176.3	0.000 010	0.101
100%		+50	1745 000 388	169.1	0.000 010	0.097
Batt. Endpoint	3.400	+20	1745 000 407	187.9	0.000 011	0.108

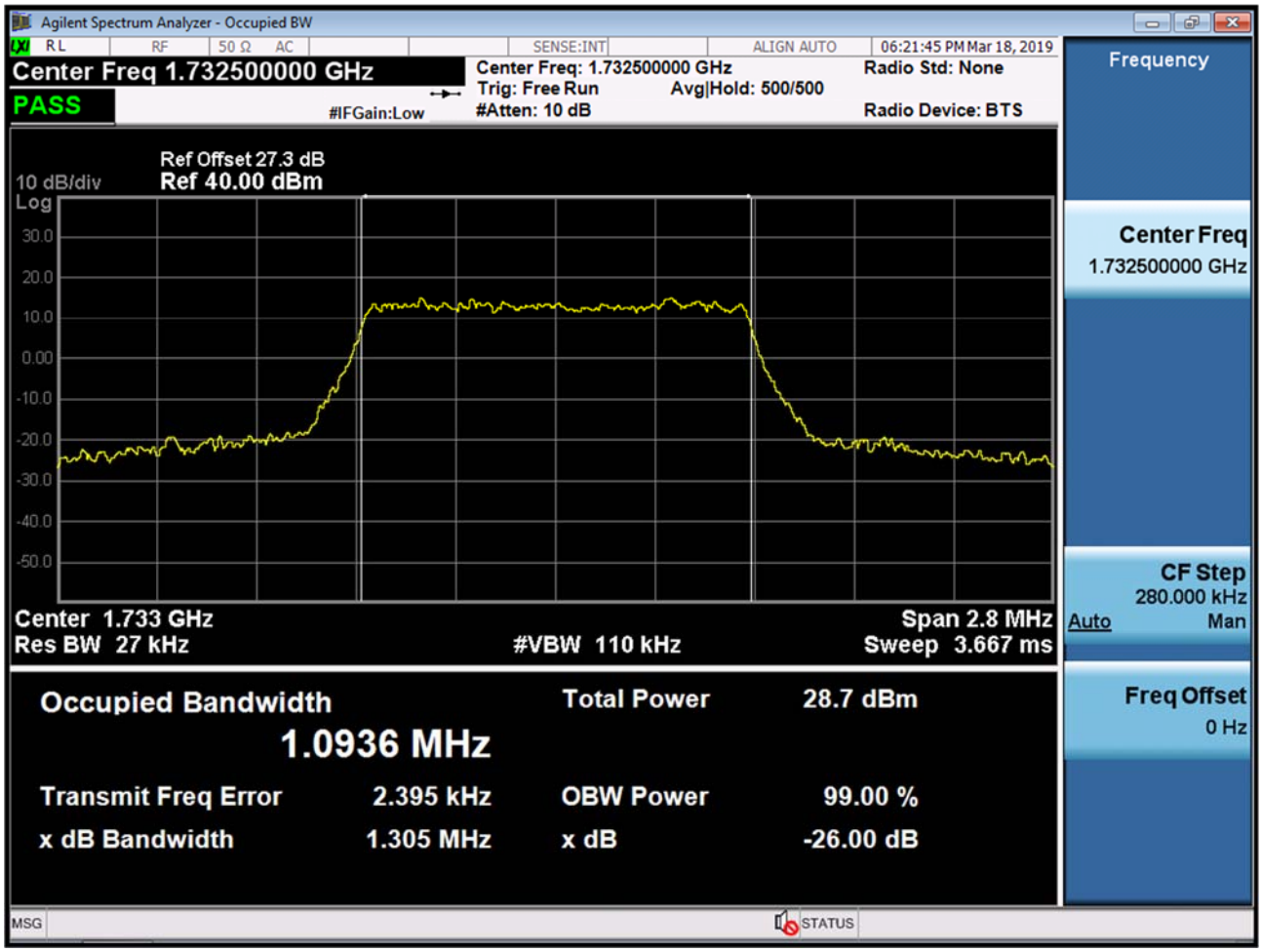


9. TEST PLOTS

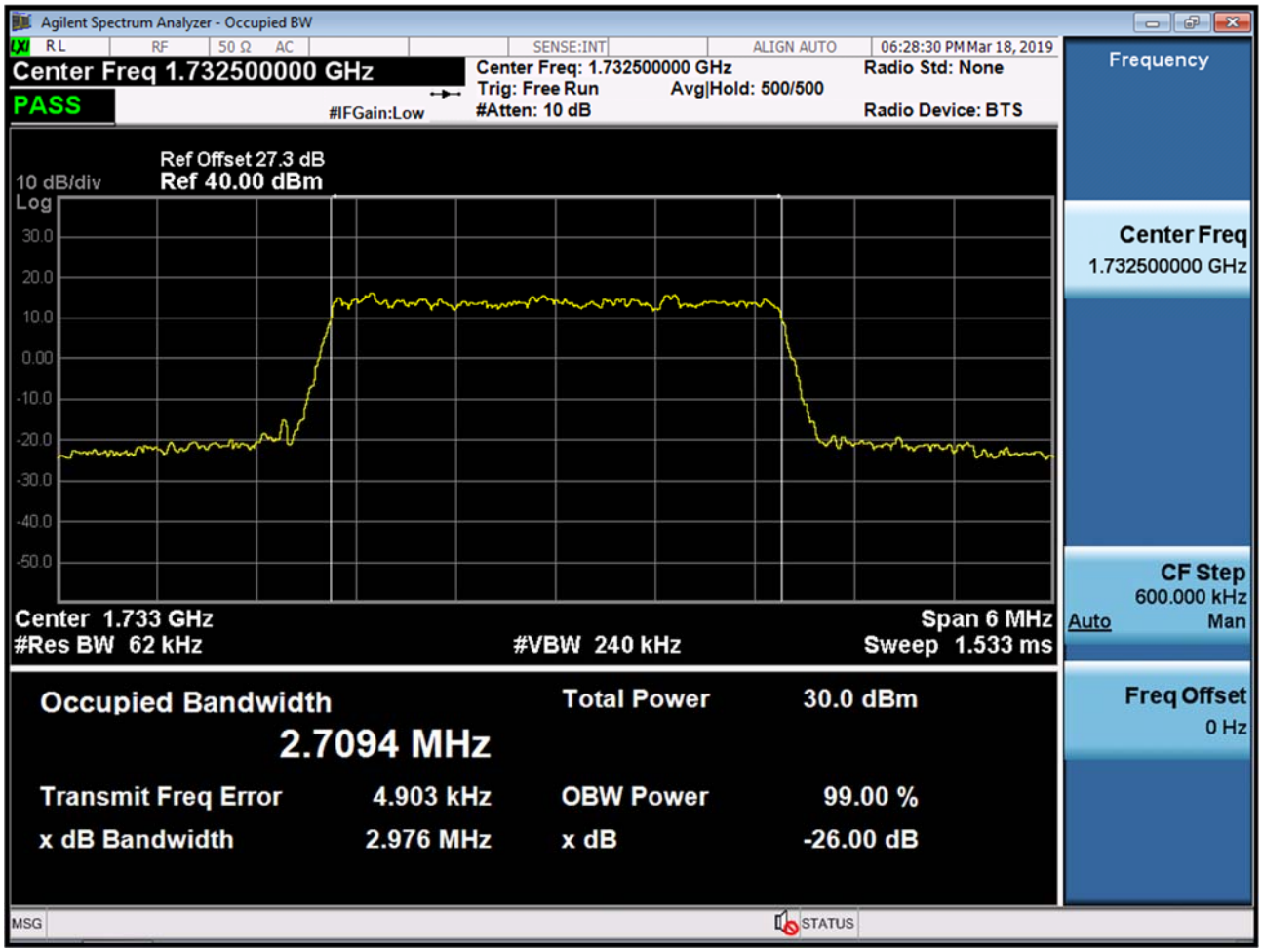
BAND 4. Occupied Bandwidth Plot (1.4M BW Ch.20175 QPSK RB 6)



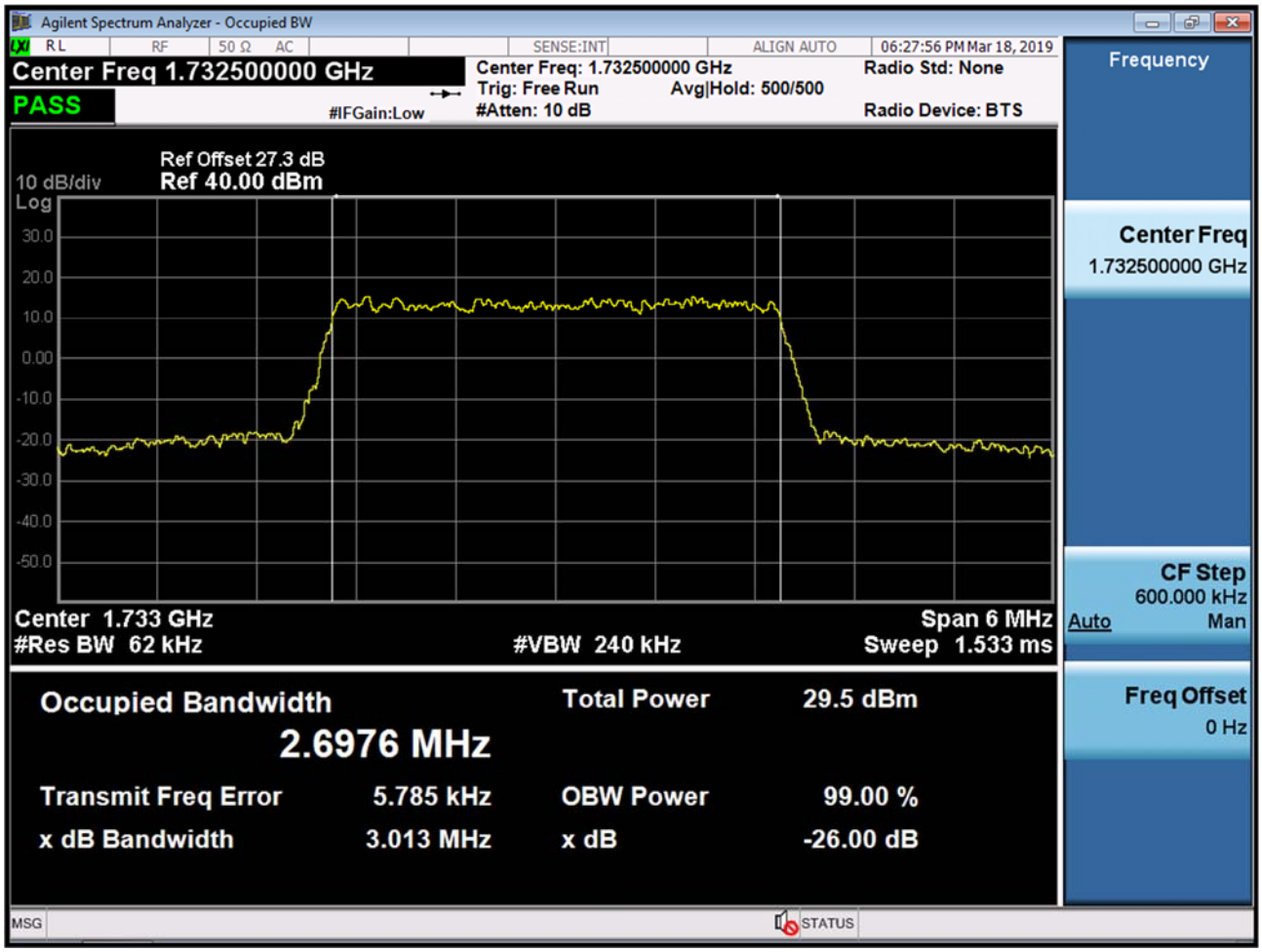
BAND 4. Occupied Bandwidth Plot (1.4M BW Ch.20175 16QAM RB 6)



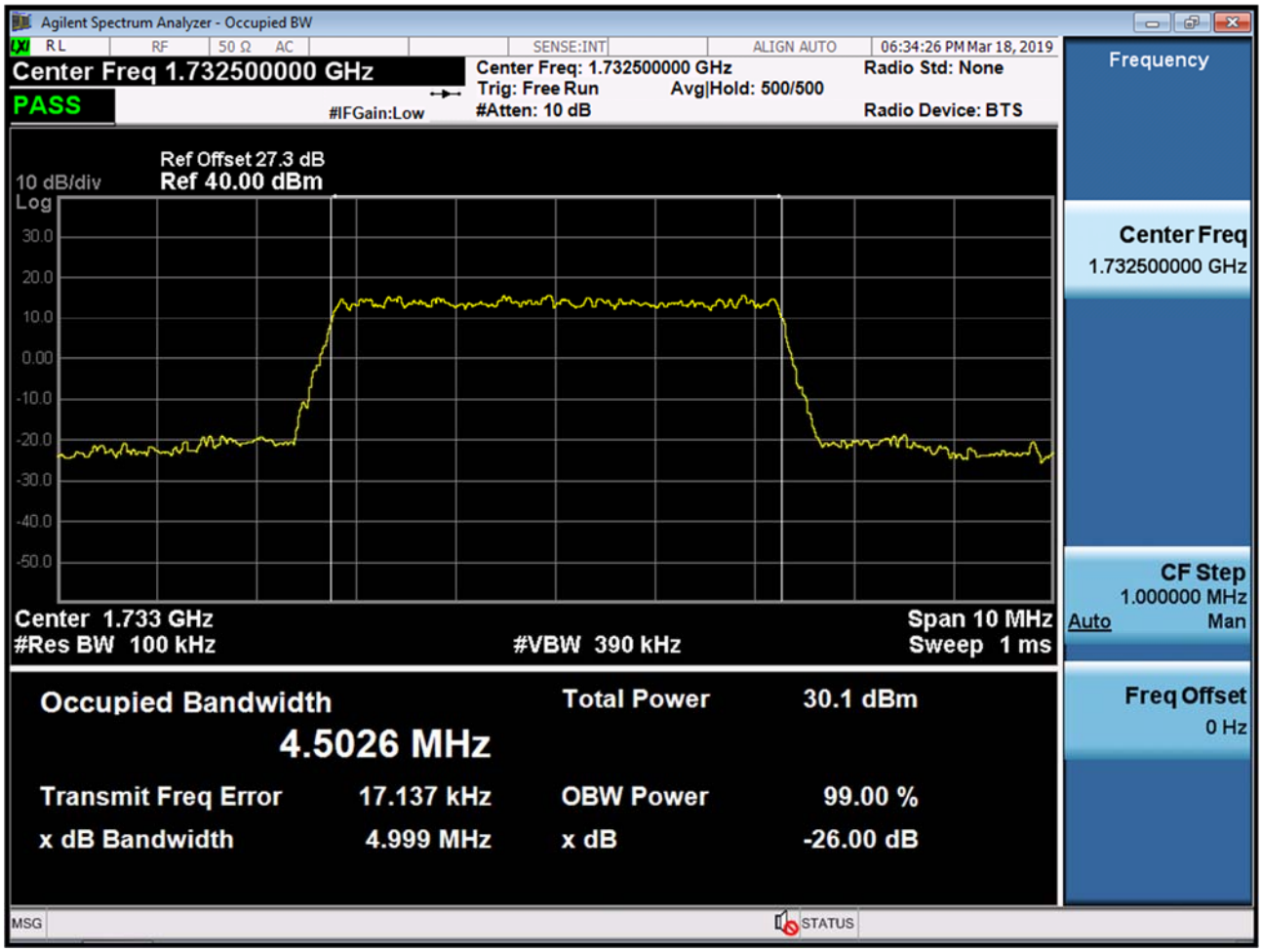
BAND 4. Occupied Bandwidth Plot (3M BW Ch.20175 QPSK RB 15)



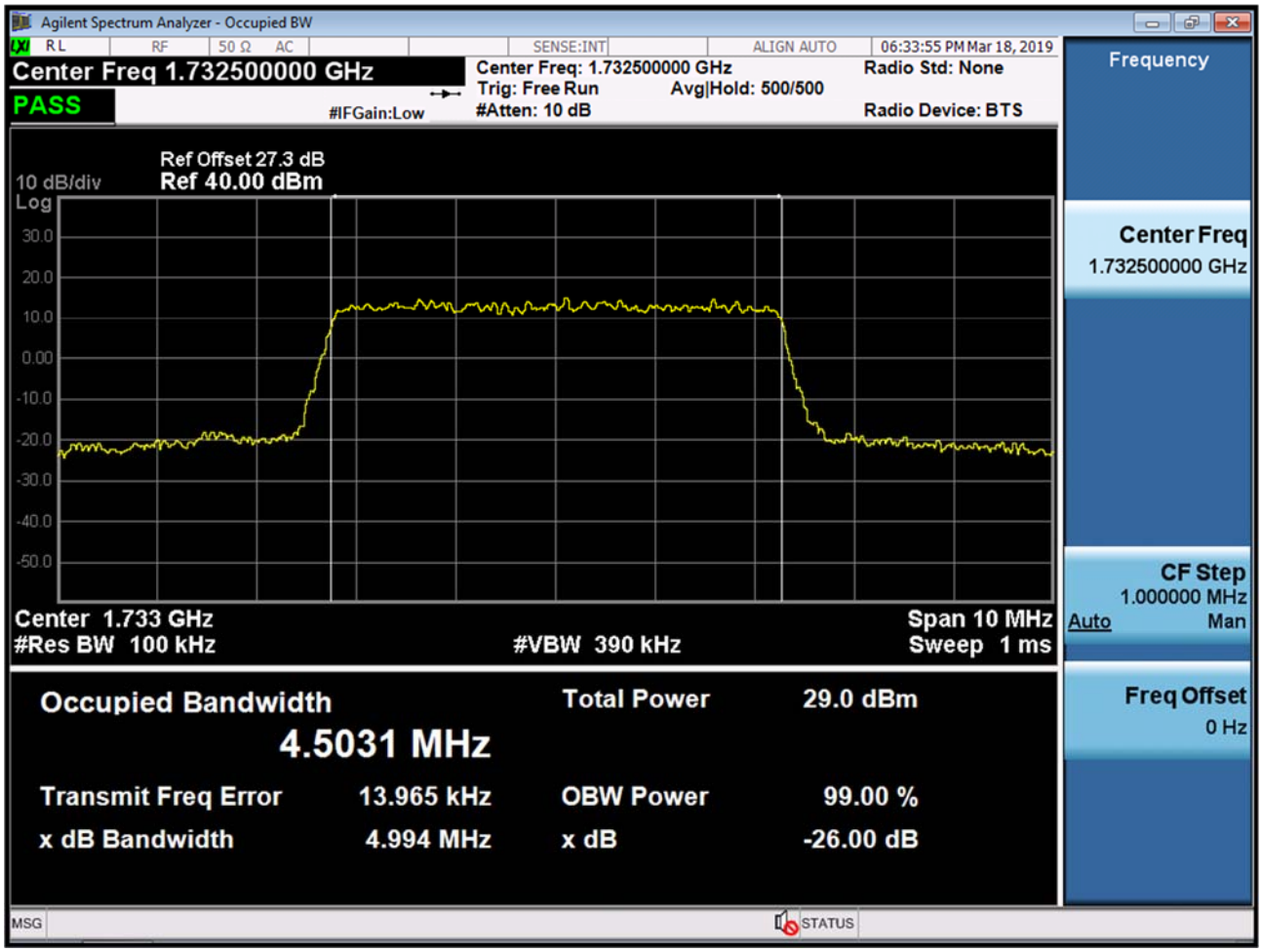
BAND 4. Occupied Bandwidth Plot (3M BW Ch.20175 16QAM RB 15)



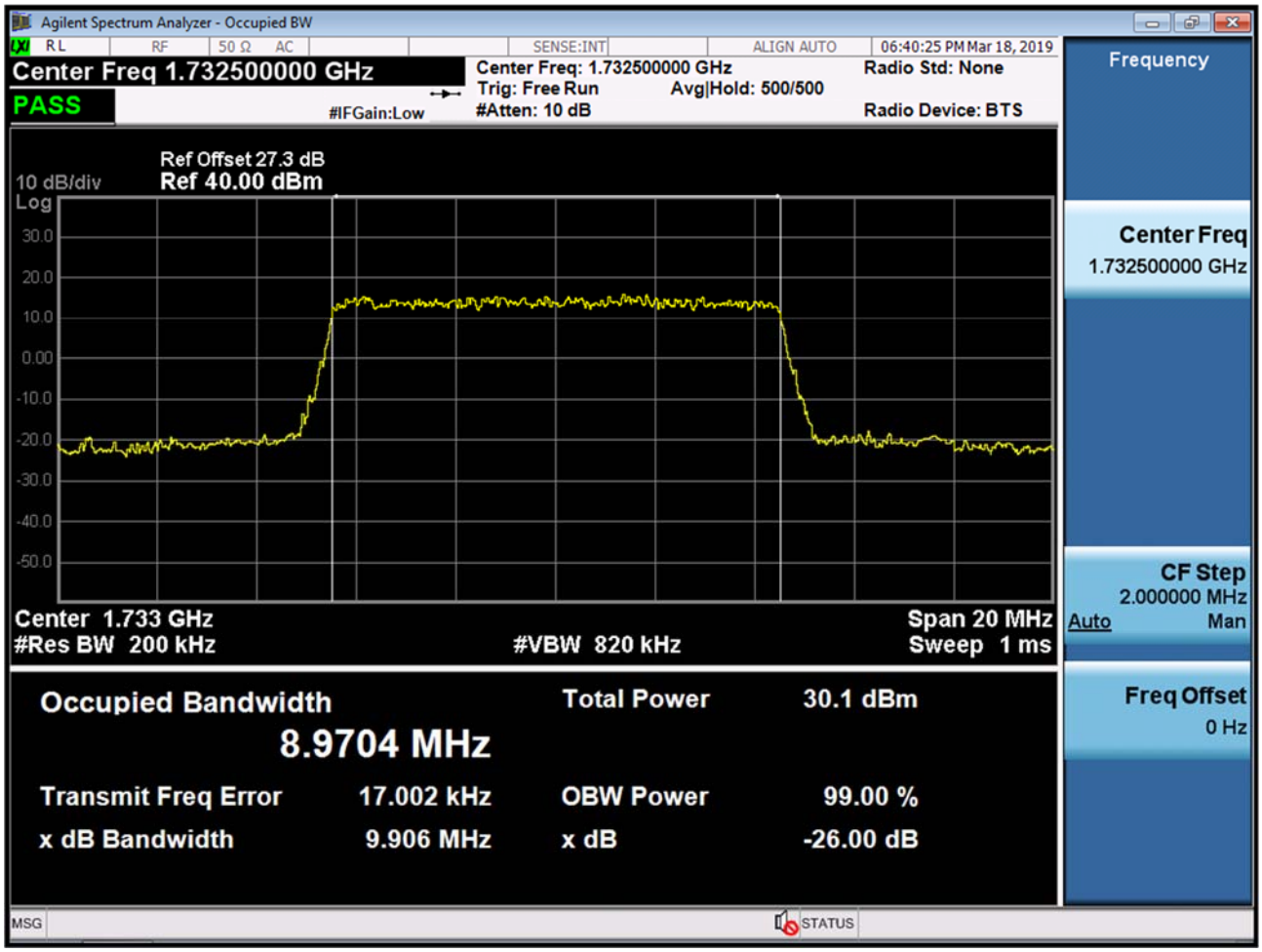
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 QPSK RB 25)



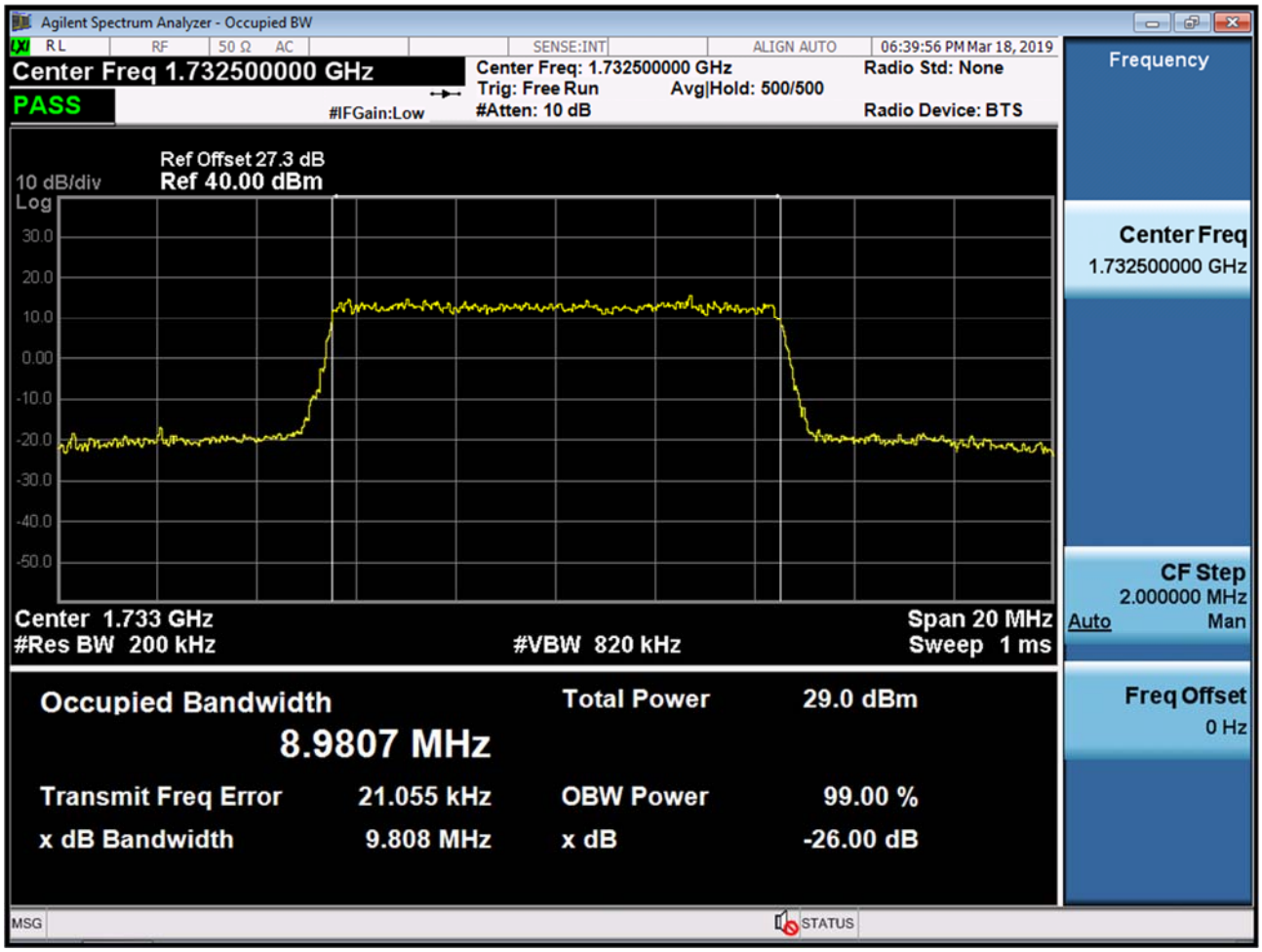
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 16QAM RB 25)



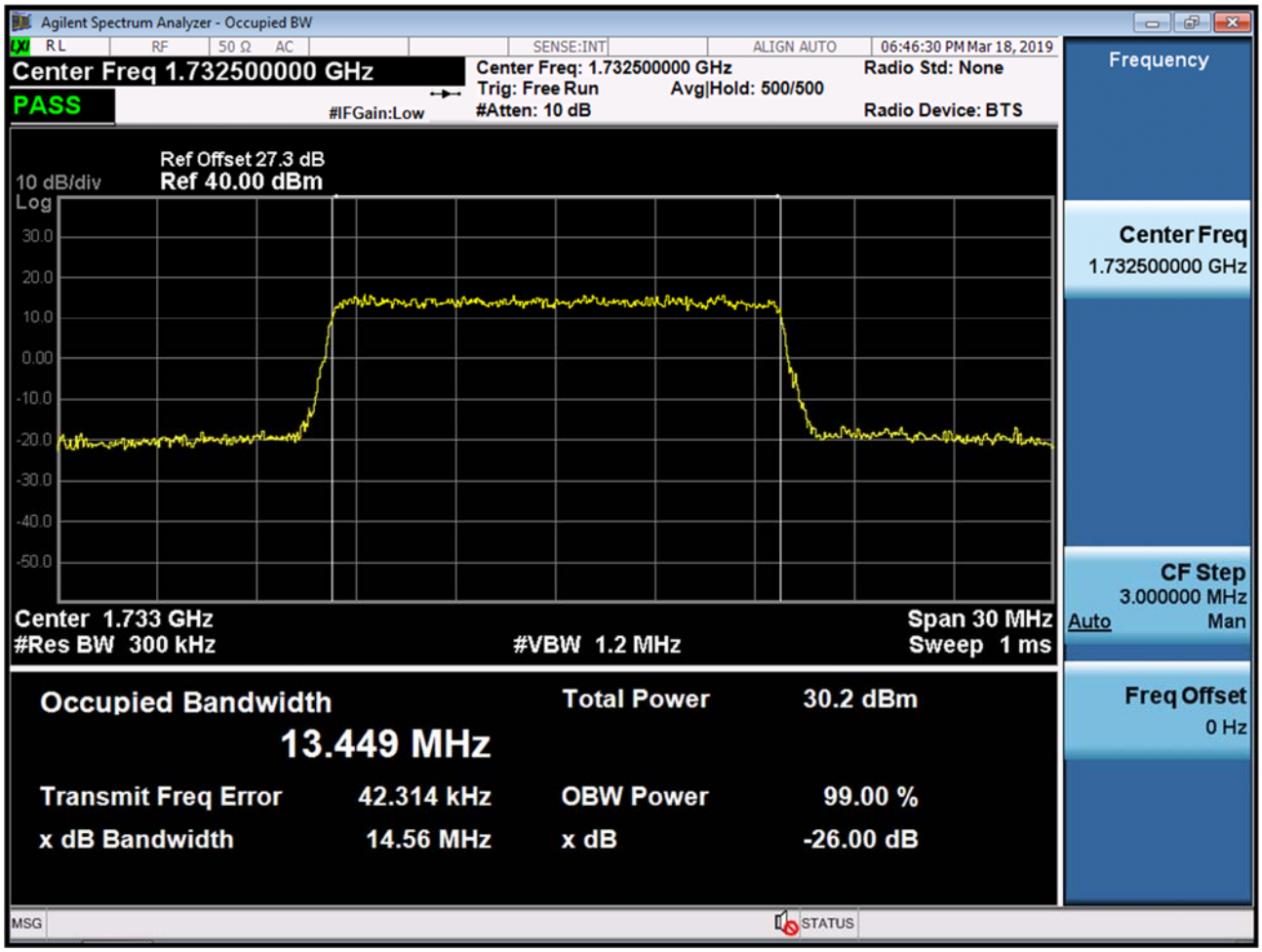
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 QPSK RB 50)



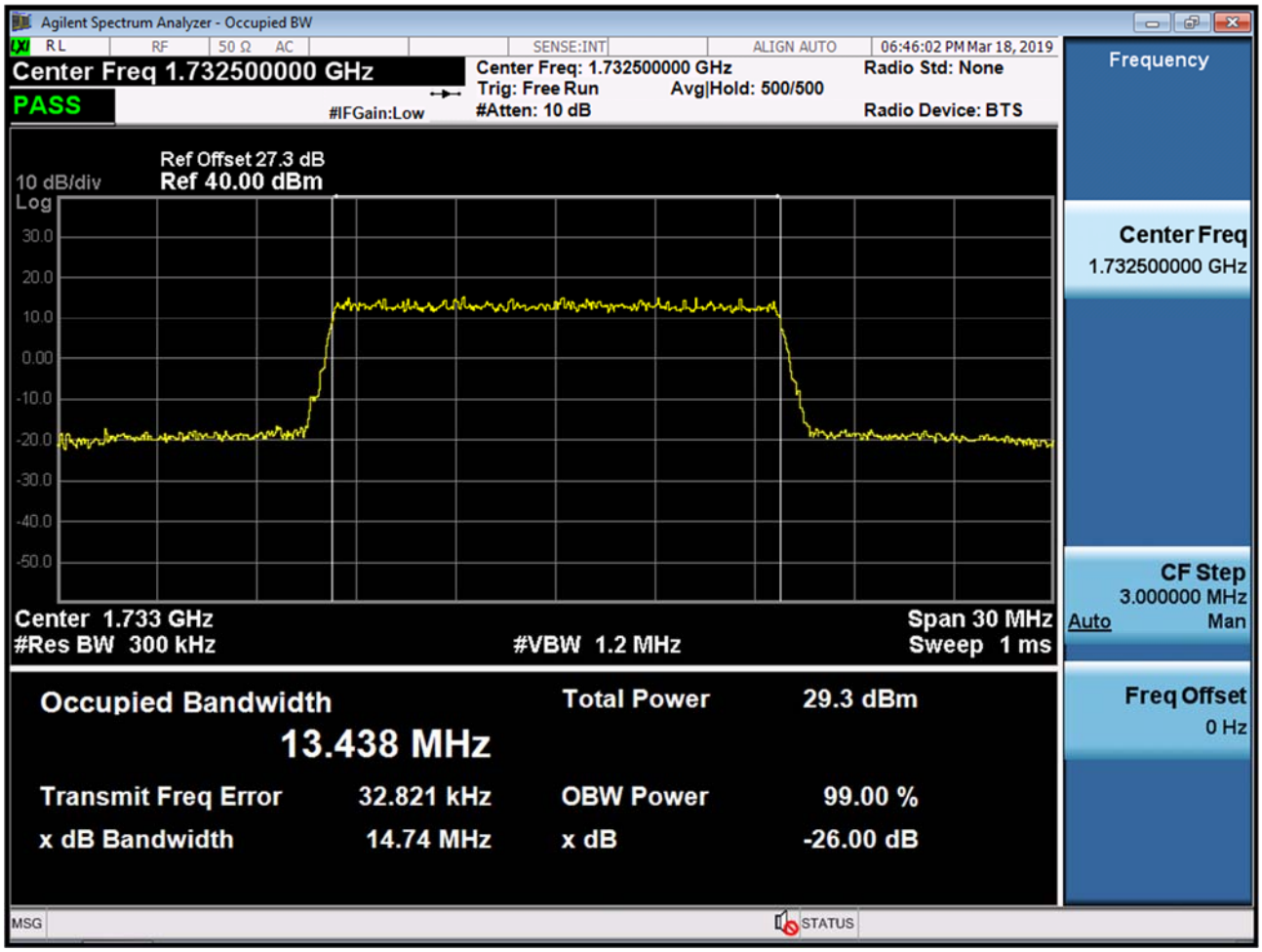
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 16QAM RB 50)



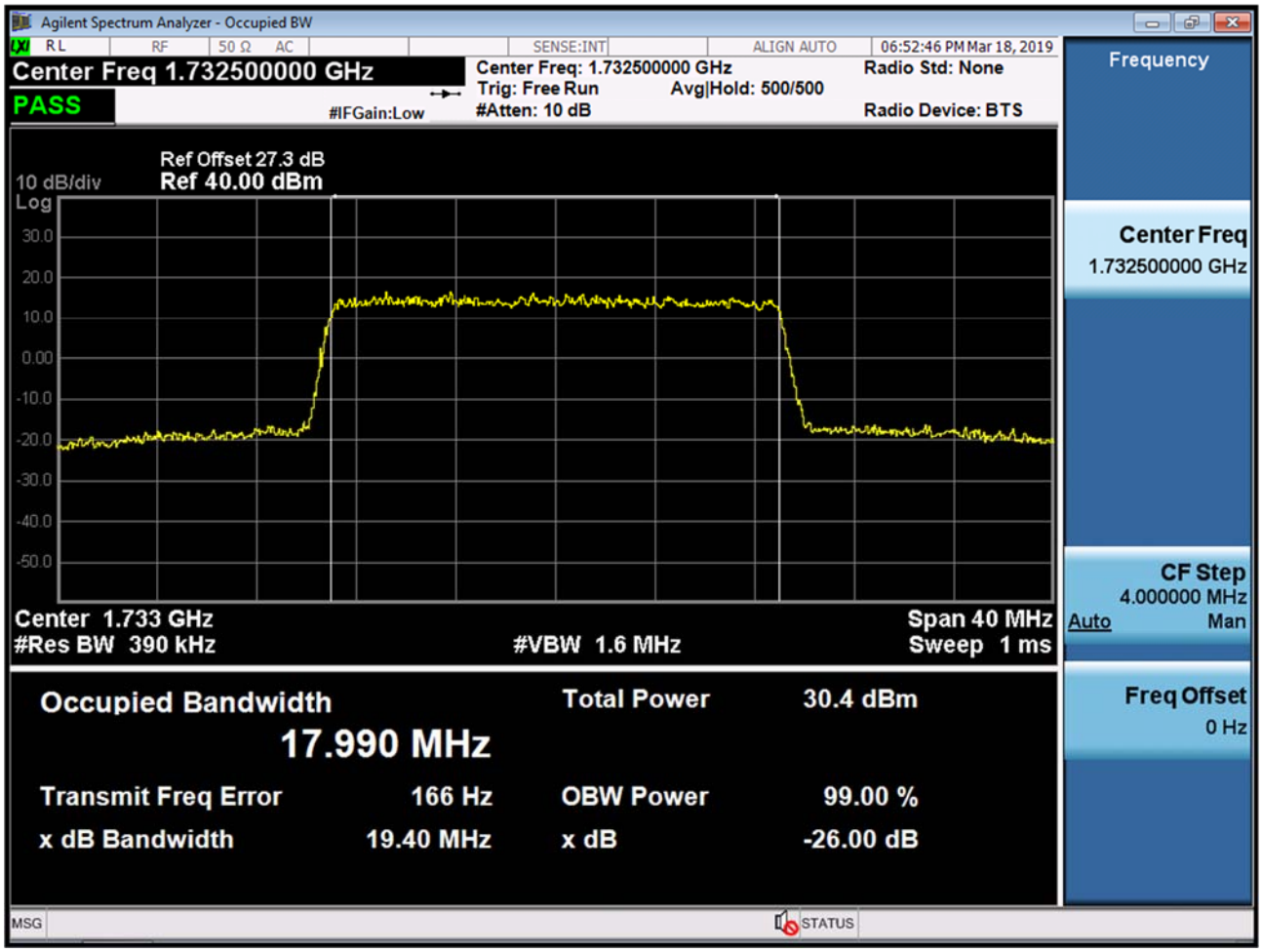
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 QPSK RB 75)



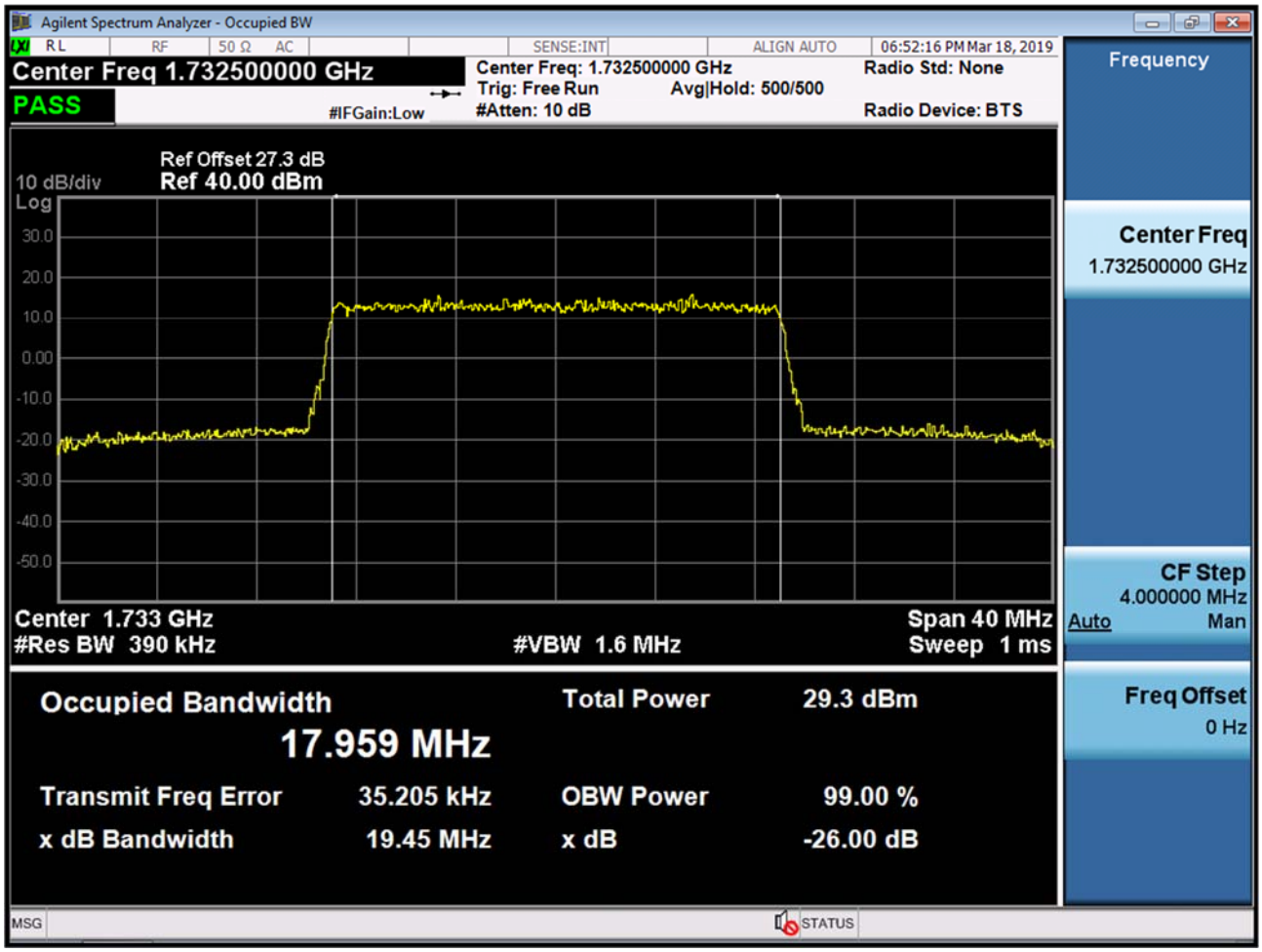
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 16QAM RB 75)



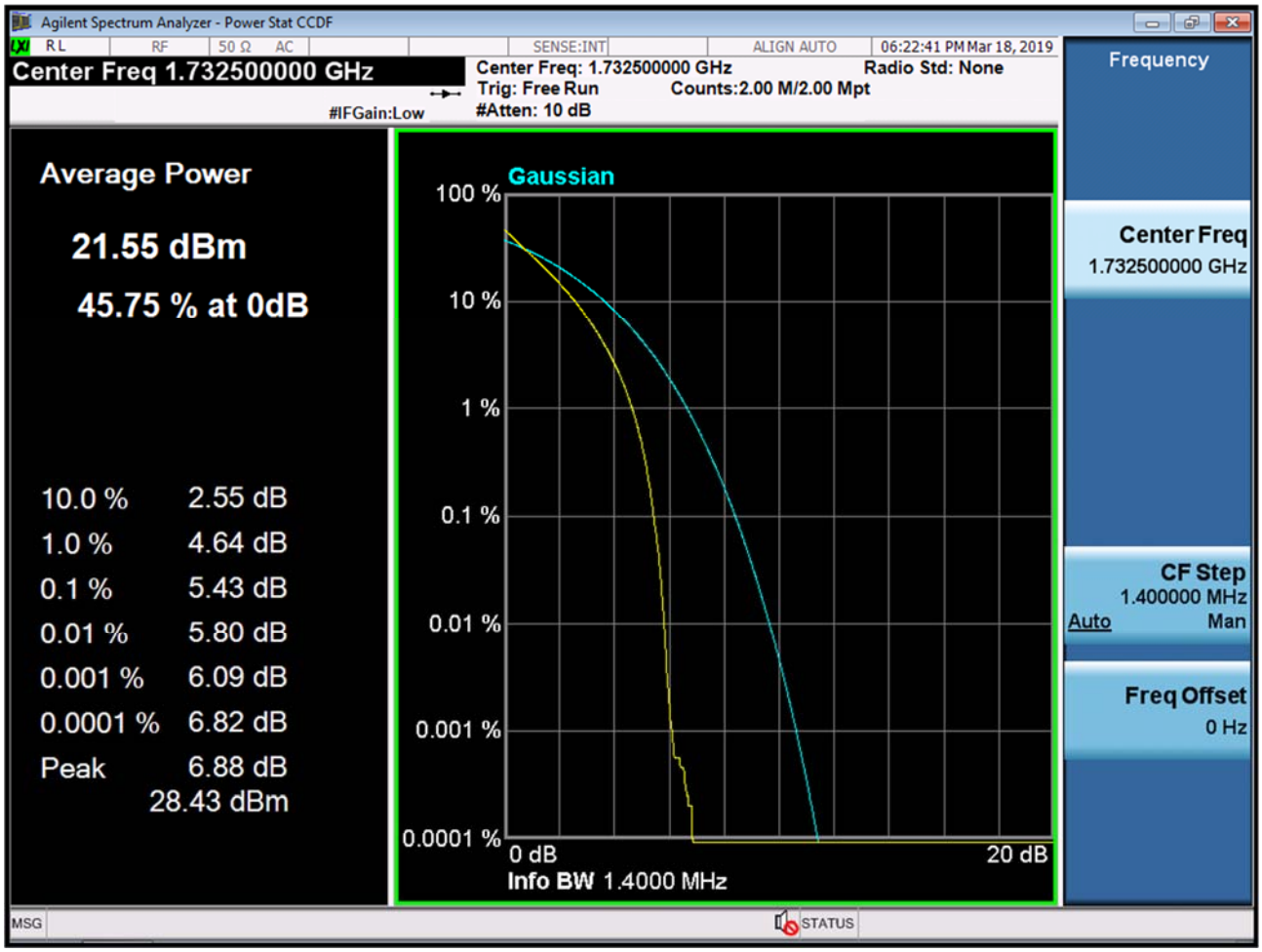
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 QPSK RB 100)



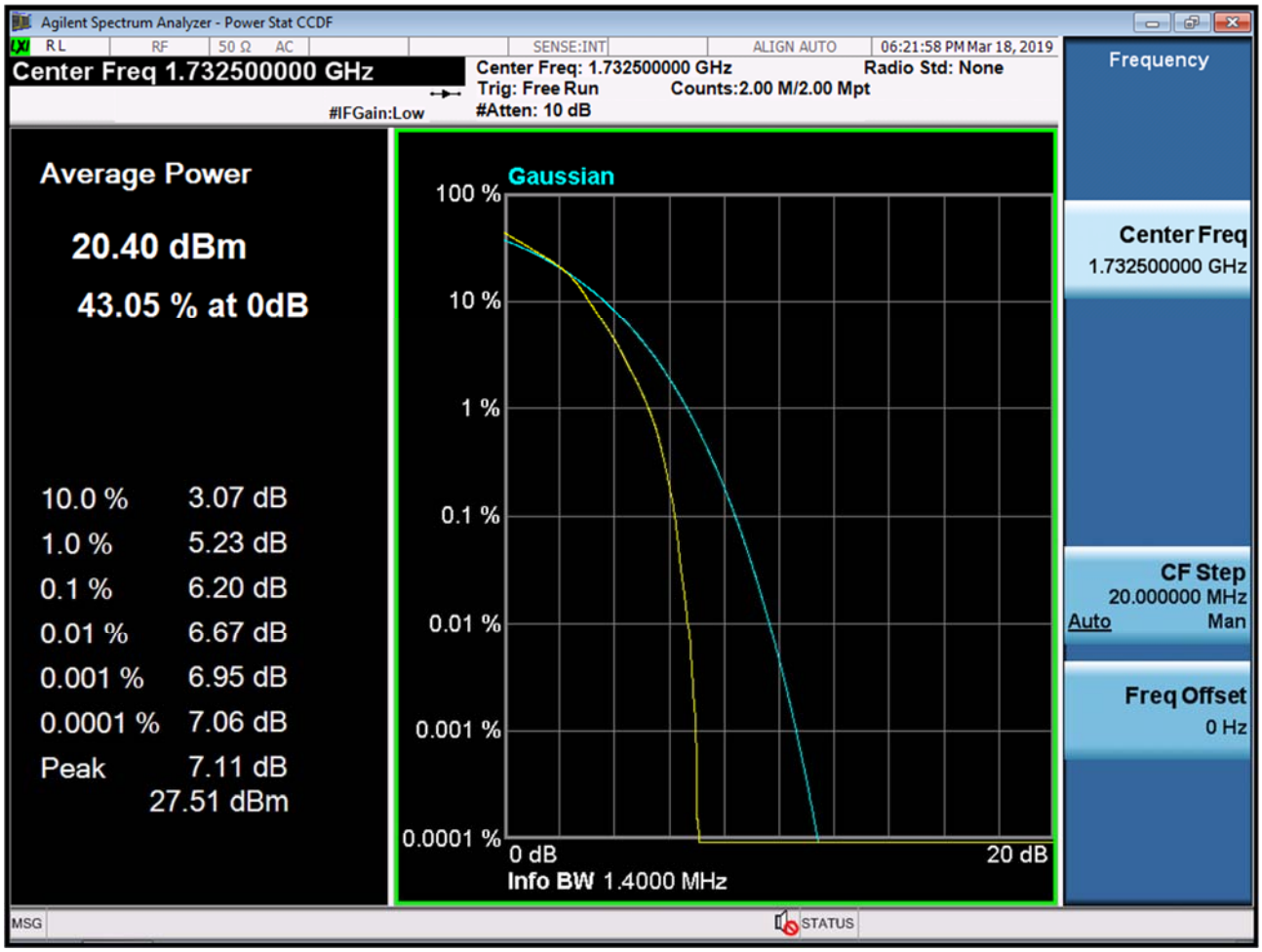
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 16QAM RB 100)



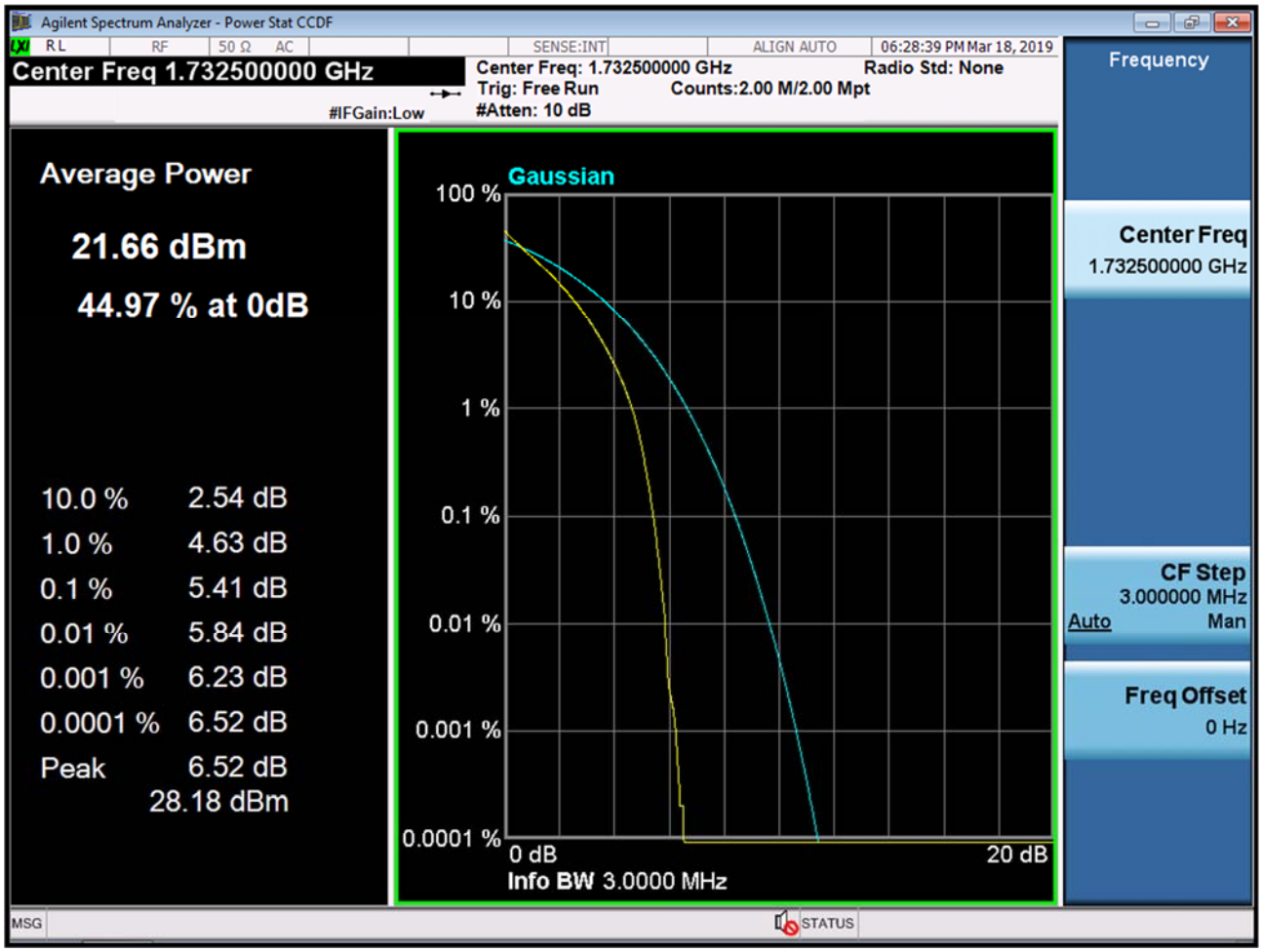
BAND 4. PAR Plot (1.4M BW_Ch.20175_QPSK_RB6_0)



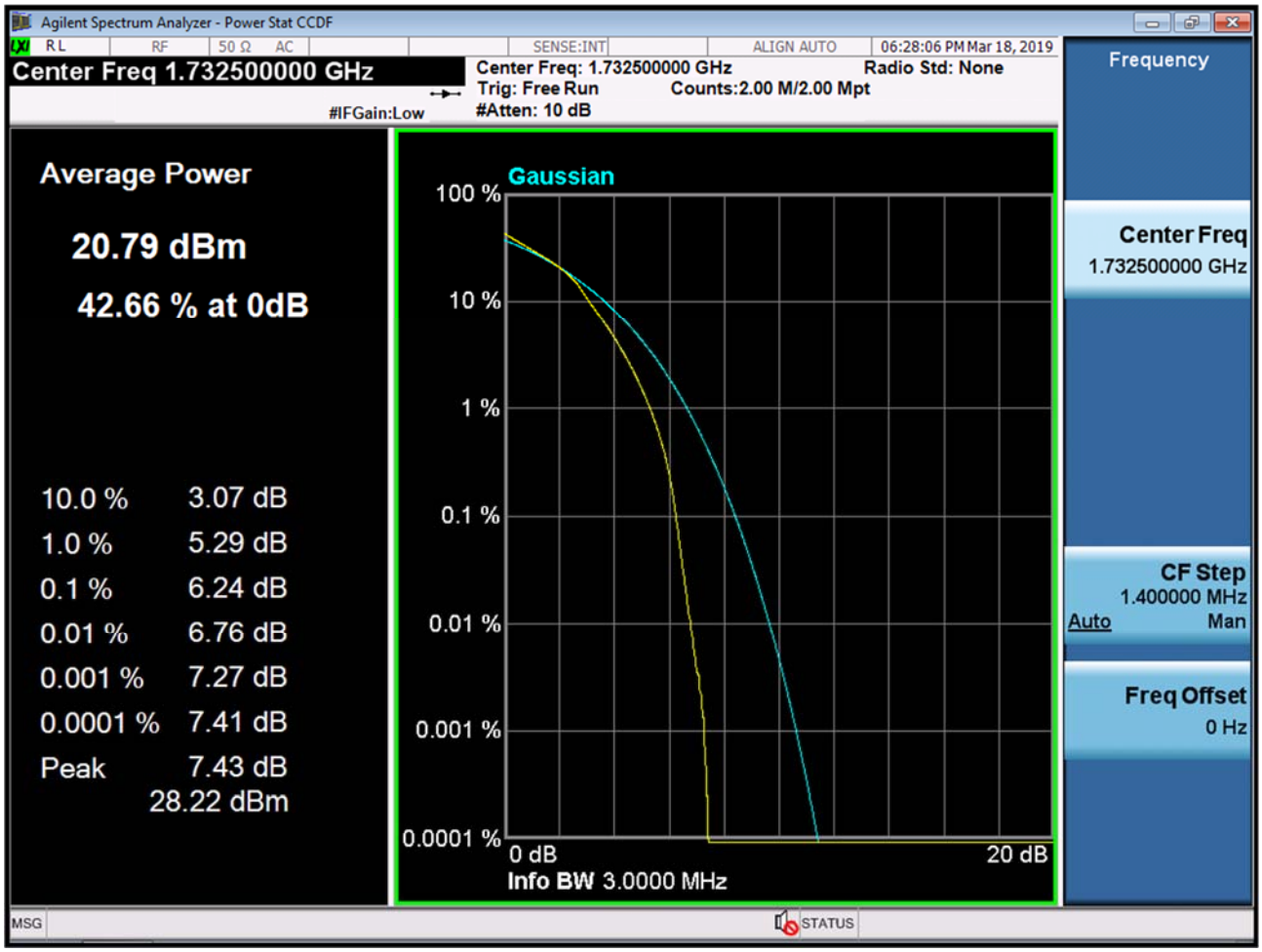
BAND 4. PAR Plot (1.4M BW_Ch.20175_16QAM_RB6_0)



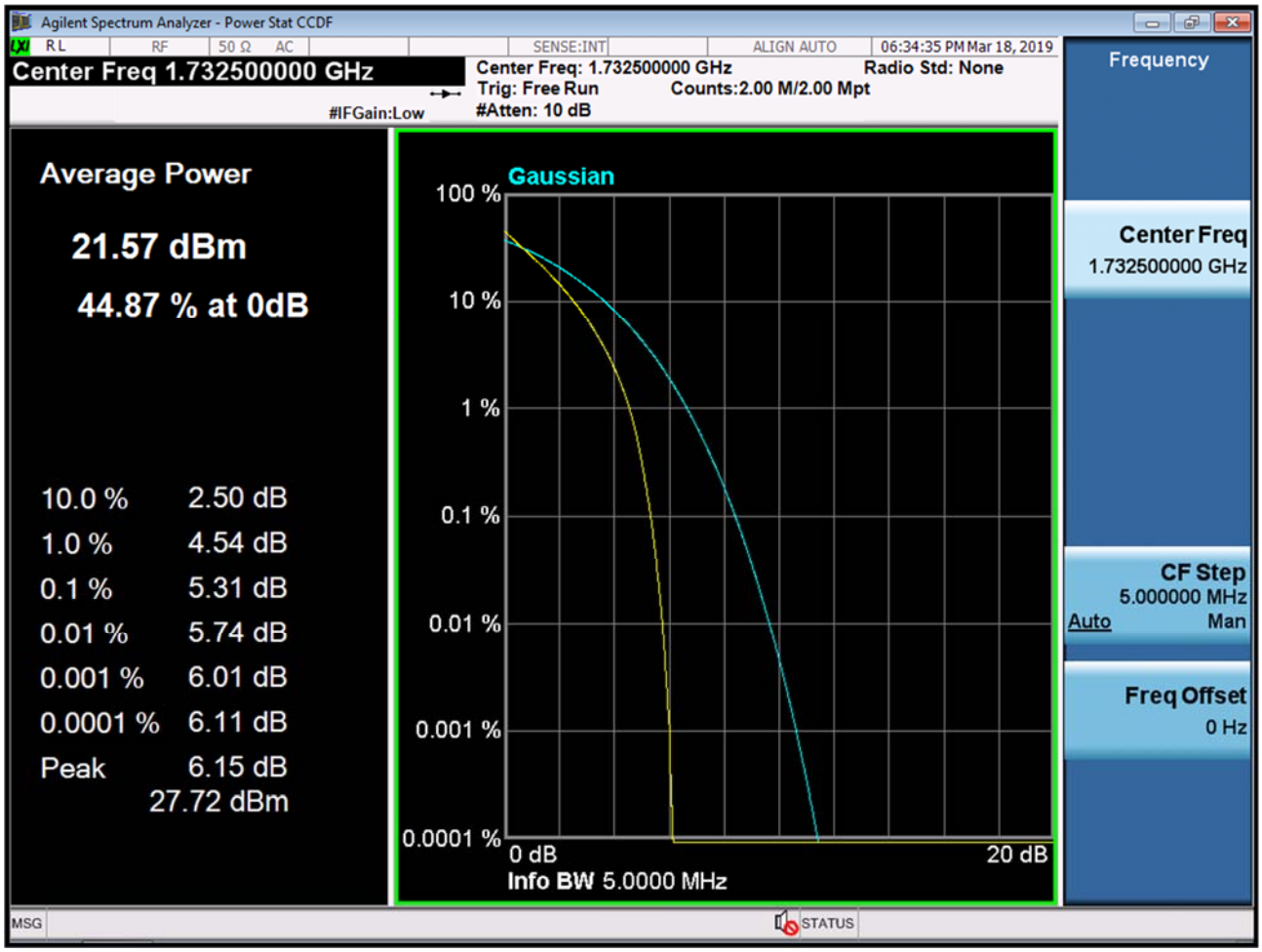
BAND 4. PAR Plot (3M BW_Ch.20175_QPSK_RB15_0)



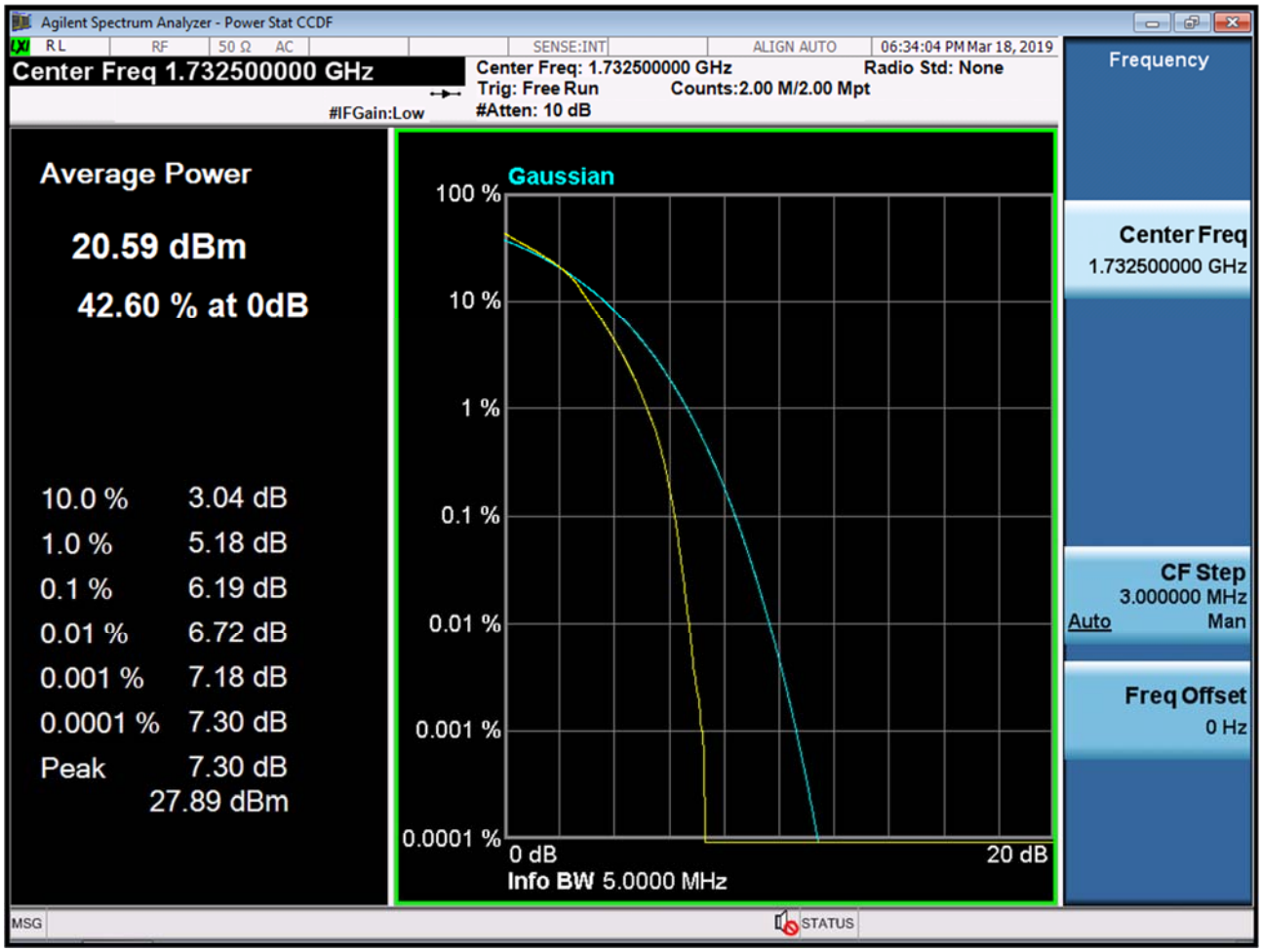
BAND 4. PAR Plot (3M BW_Ch.20175_16QAM_RB15_0)



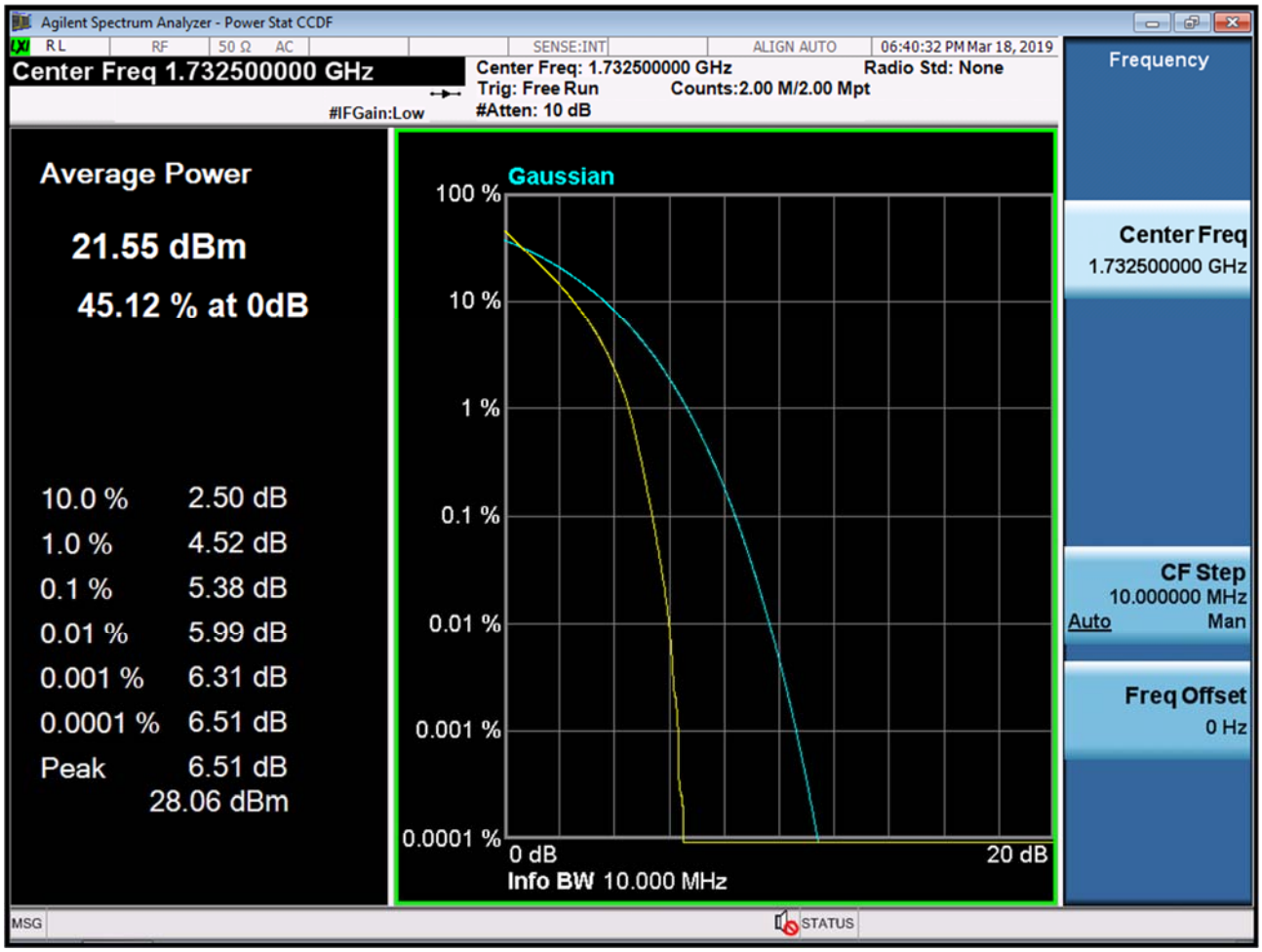
BAND 4. PAR Plot (5M BW_Ch.20175_QPSK_RB25_0)



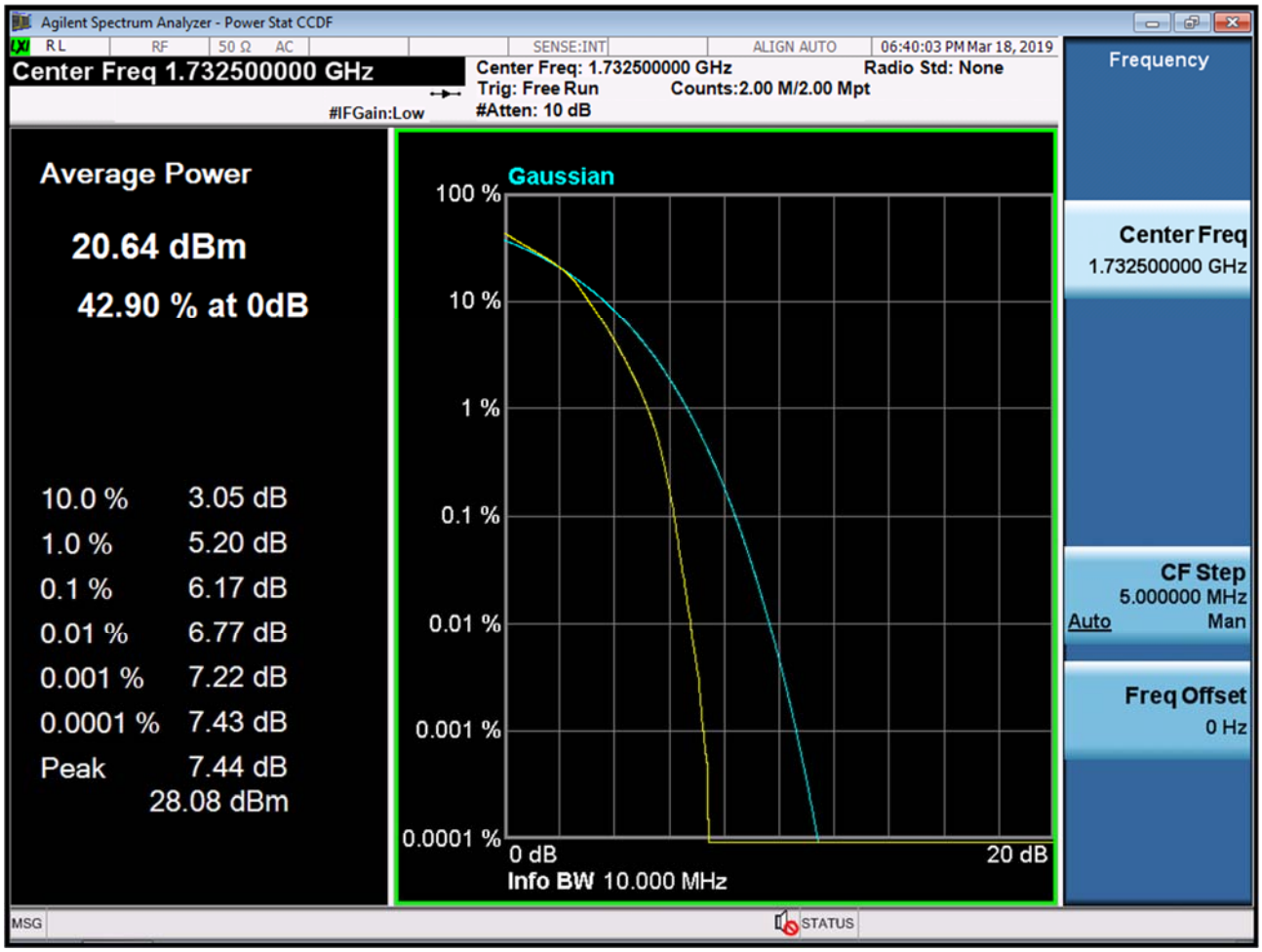
BAND 4. PAR Plot (5M BW_Ch.20175_16QAM_RB25_0)



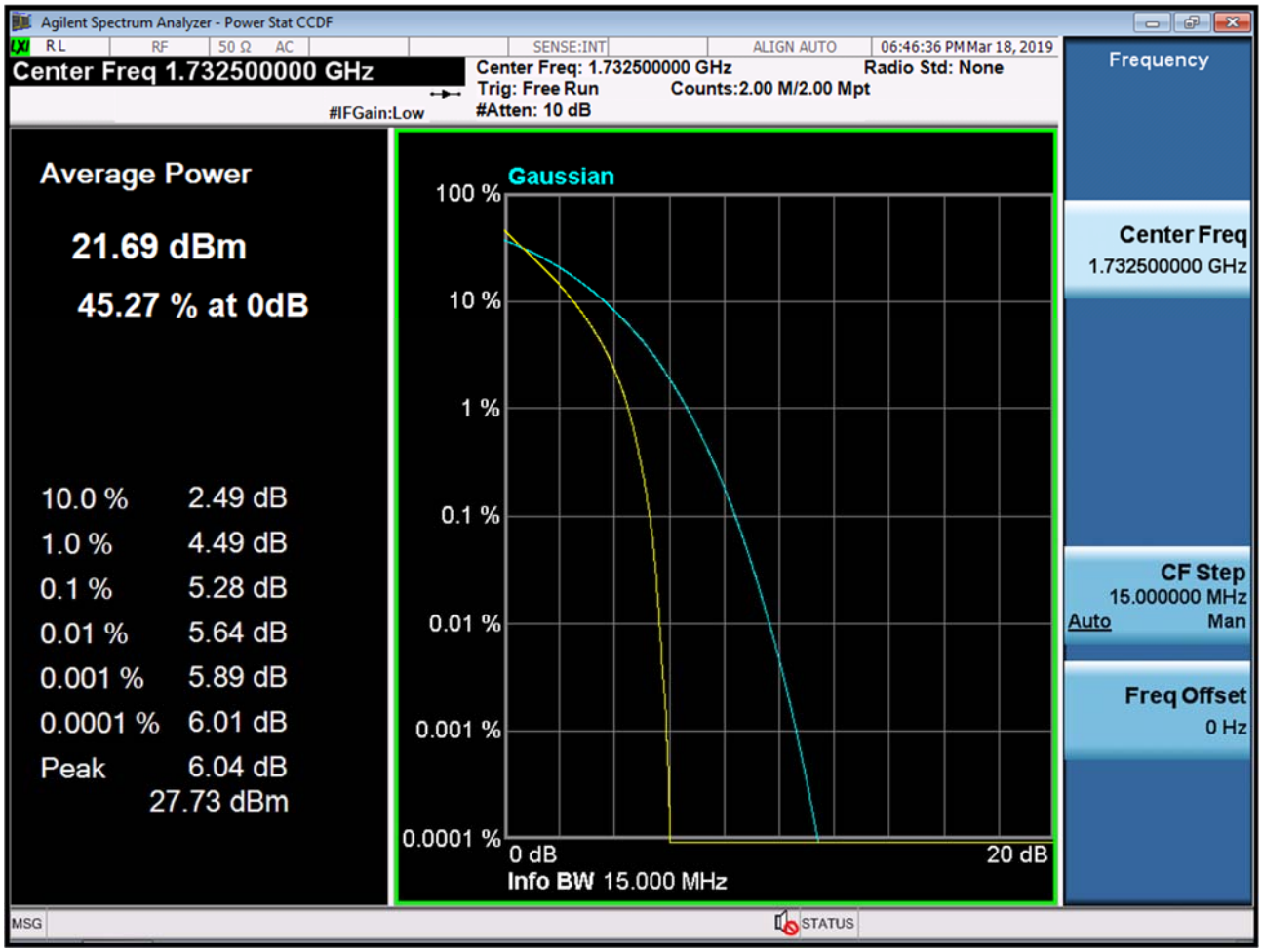
BAND 4. PAR Plot (10M BW_Ch.20175_QPSK_RB50_0)



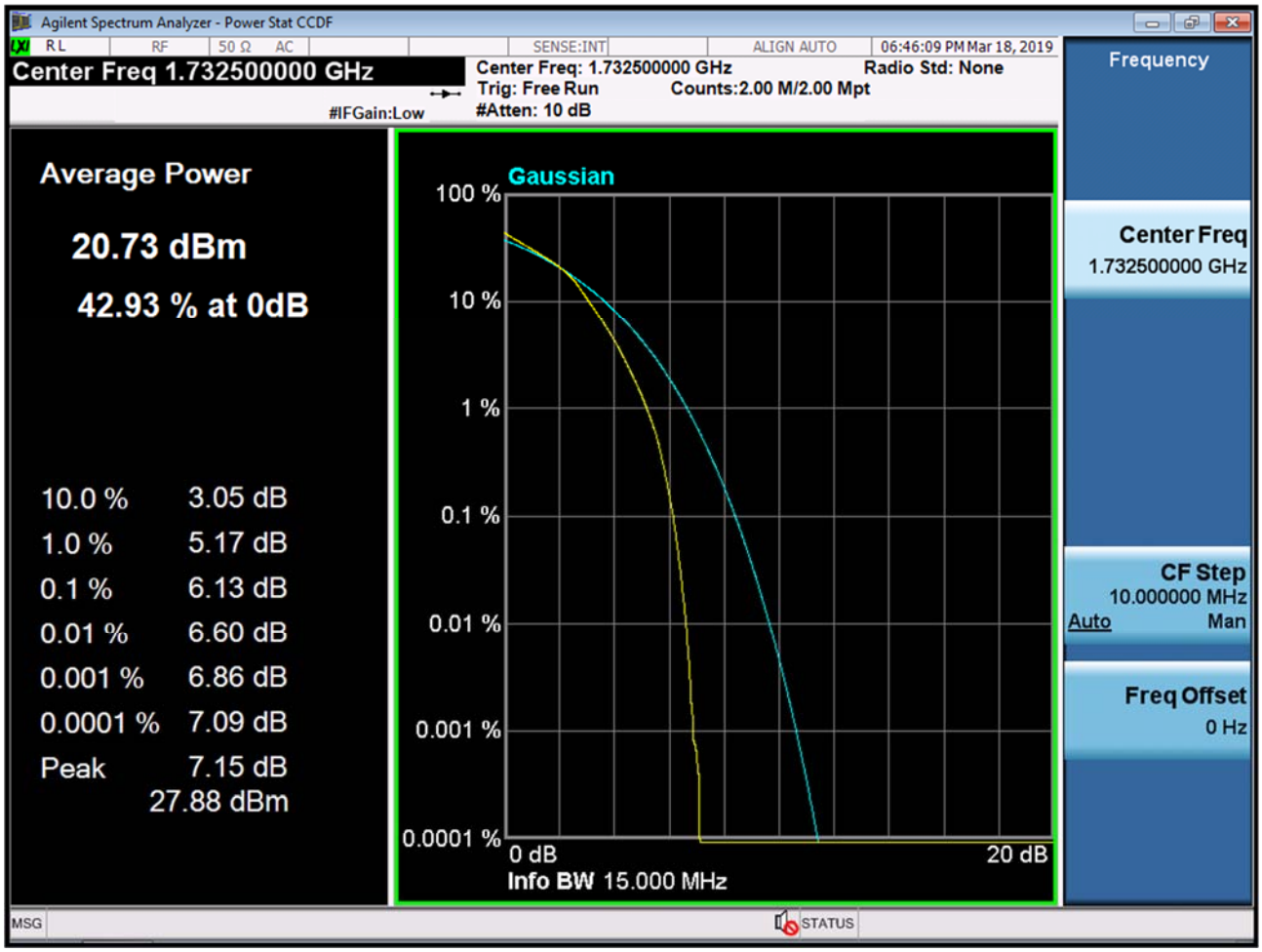
BAND 4. PAR Plot (10M BW_Ch.20175_16QAM_RB50_0)



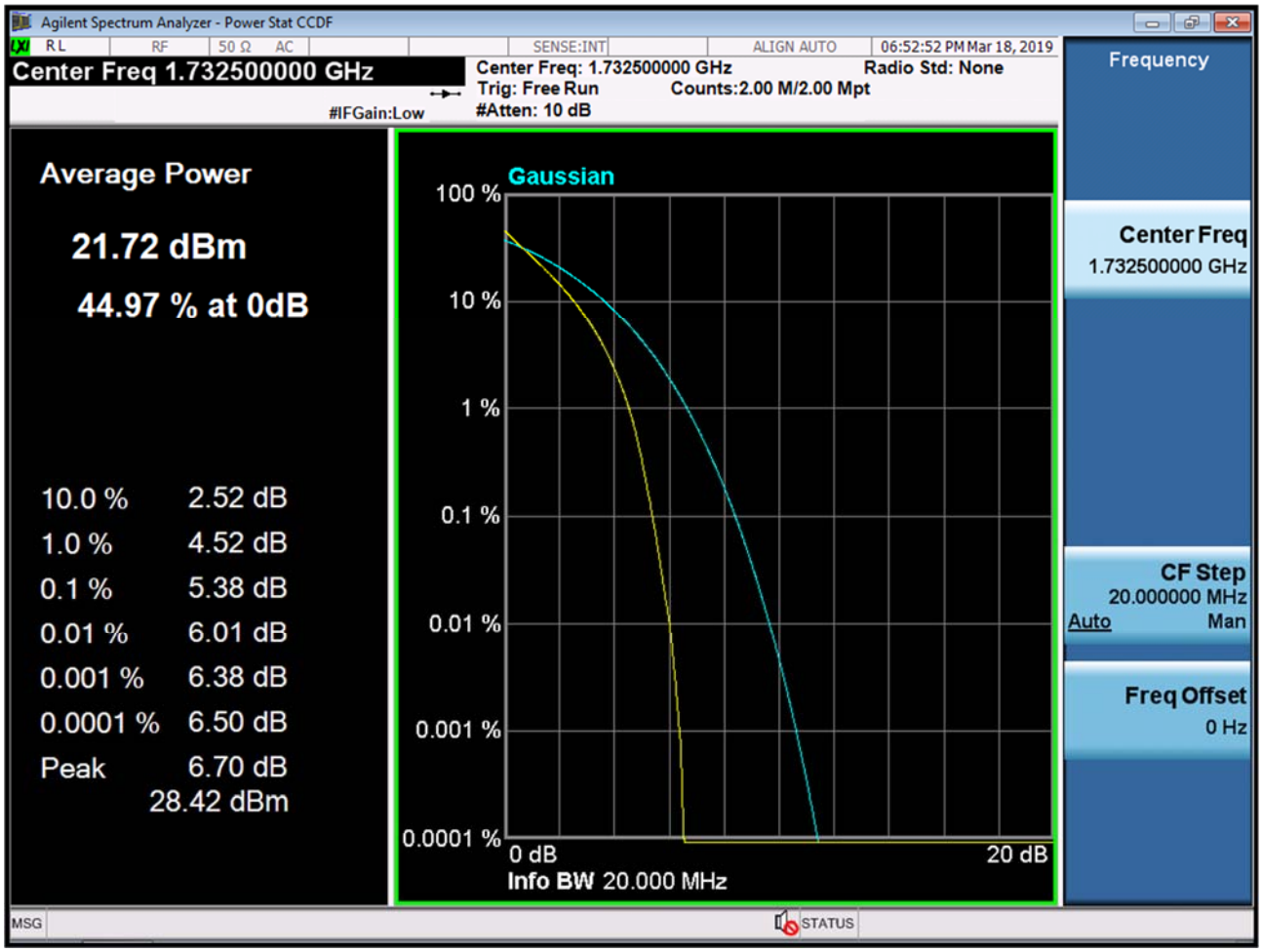
BAND 4. PAR Plot (15M BW_Ch.20175_QPSK_RB75_0)



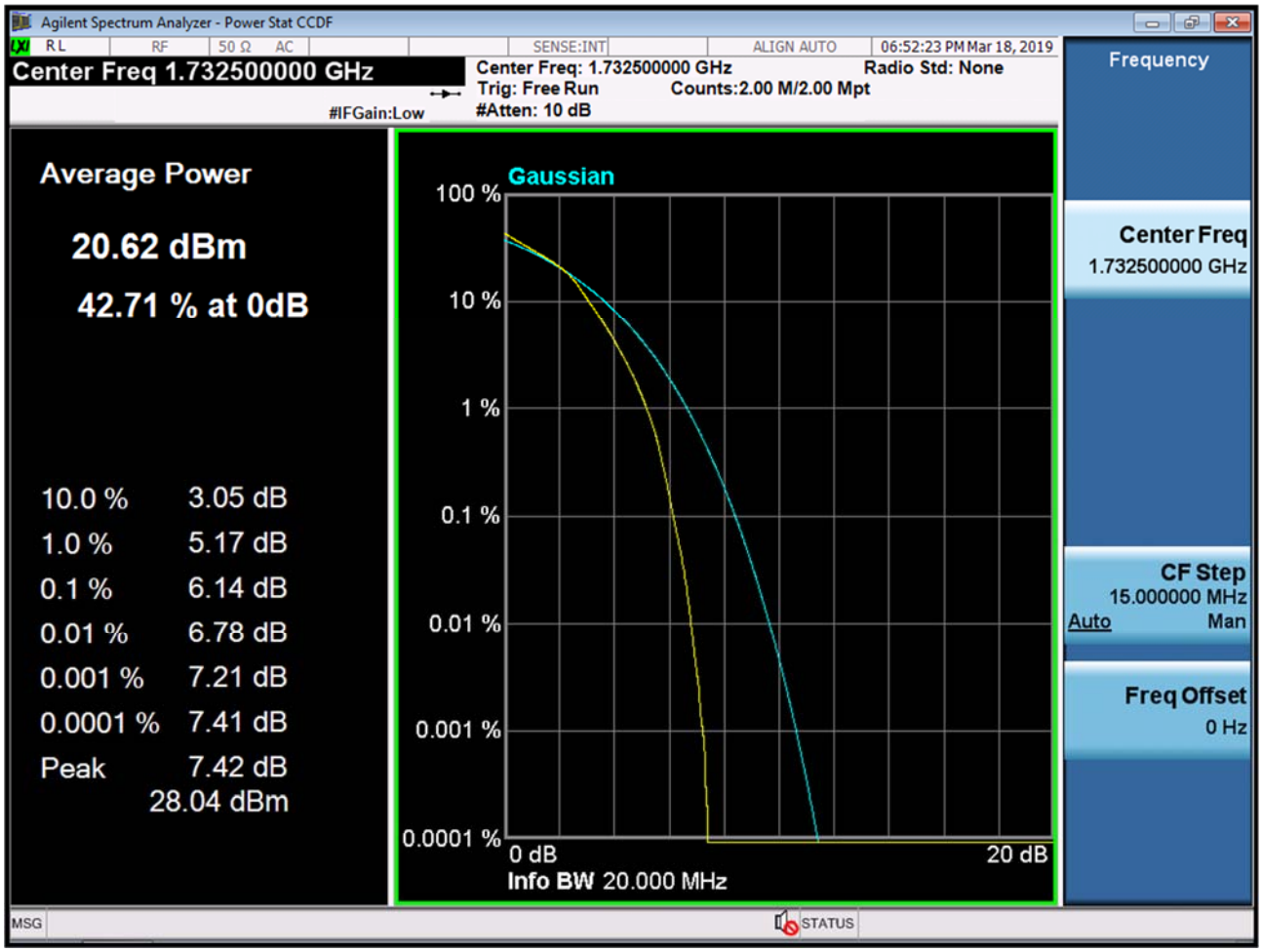
BAND 4. PAR Plot (15M BW_Ch.20175_16QAM_RB75_0)



BAND 4. PAR Plot (20M BW_Ch.20175_QPSK_RB100_0)



BAND 4. PAR Plot (20M BW_Ch.20175_16QAM_RB100_0)



BAND 4. Lower Band Edge Plot (1.4M BW Ch.19957 QPSK RB 1, Offset 0) -1

BAND 4. Lower Band Edge Plot (1.4M BW Ch.19957 QPSK RB 6) -2

BAND 4. Lower Extended Band Edge Plot (1.4M BW Ch.19957 QPSK_RB6_0) -3