HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC LTE REPORT

Certification

Applicant Name:
Franklin Technology Inc.

Address:
906 JEI Platz, 186, Gasan digital 1-ro, Gumcheon-gu
Seoul, 08502 South Korea

Date of Issue:
December 28, 2018

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

Report No.: HCT-RF-1812-FC017-R1

FCC ID:	**XHG-F800HPVL**
APPLICANT:	**Franklin Technology Inc.**

Model(s): F800HPVL
EUT Type: VoLTE Home Phone Connect
FCC Classification: TNB-Licensed Non-Broadcast Station Transmitter
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	0.537	27.30
		1M10W7D	16QAM	0.458	26.61
LTE – Band4 (3)	1711.5 – 1753.5	2M71G7D	QPSK	0.523	27.19
		2M70W7D	16QAM	0.461	26.64
LTE – Band4 (5)	1712.5 – 1752.5	4M52G7D	QPSK	0.524	27.20
		4M50W7D	16QAM	0.452	26.55
LTE – Band4 (10)	1715.0 – 1750.0	8M98G7D	QPSK	0.528	27.23
		9M00W7D	16QAM	0.455	26.58
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.523	27.19
		13M5W7D	16QAM	0.449	26.53
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.523	27.19
		18M0W7D	16QAM	0.447	26.51

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-1812-FC017	December 11, 2018	- First Approval Report
HCT-RF-1812-FC017-R1	December 28, 2018	- Revised the E.I.R.P

Table of Contents

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Franklin Technology Inc.
Address:	906 JEI Platz, 186, Gasan digital 1-ro, Gumcheon-gu Seoul, 08502 South Korea
FCC ID:	XHG-F800HPVL
Application Type:	Certification
FCC Classification:	TNB-Licensed Non-Broadcast Station Transmitter
FCC Rule Part(s):	§27, §2
EUT Type:	VoLTE Home Phone Connect
Model(s):	F800HPVL
Tx Frequency:	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
Date(s) of Tests:	November 26, 2018 ~ December 03, 2018
Peak. Ant gain:	4.247 dBi

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a VoLTE Home Phone Connect with LTE.

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

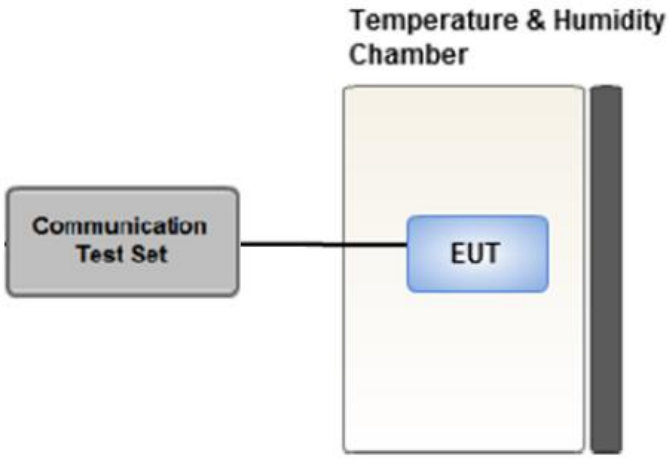
The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**.**

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
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 & 5.6 - ANSI C63.26-2015 – Section 5.2.4.2 & 5.2.5.5
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 EQUIVALENT ISOTROPIC RADIATED POWER



Test setup

Test Overview

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies.

Conducted Output Power was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v03r01, Section 5.2.

Test Note

1. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided is:

$$ERP \text{ or } EIRP = P_{Meas} + G_T$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm)

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

.

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.

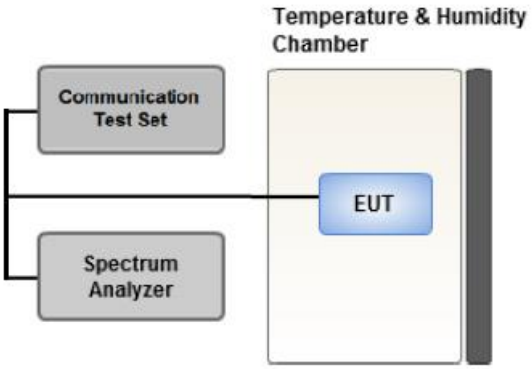
Test Settings

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)

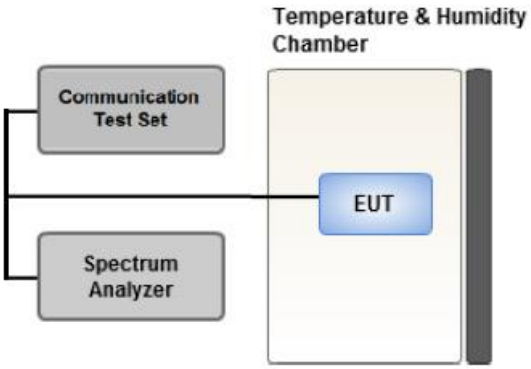
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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.

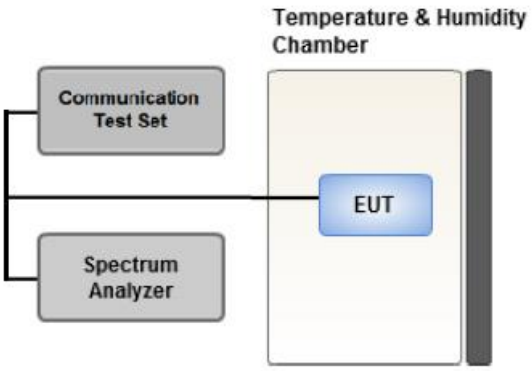
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

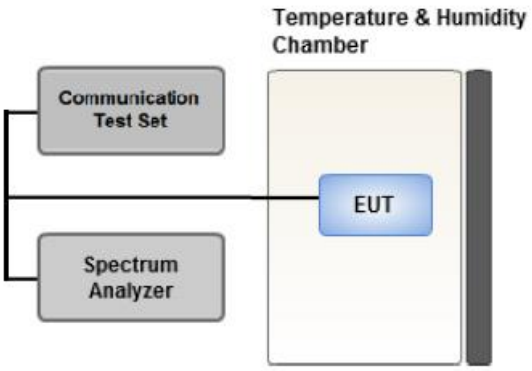
Test Overview

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

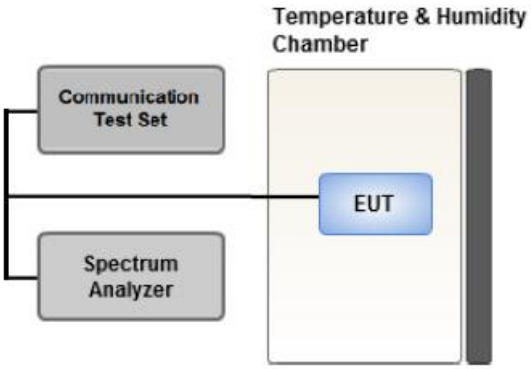
Test Notes

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.

3.9 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.

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z

3.10 WORST CASE(CONDUCTED TEST)

[Worst case]

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

* Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.

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
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
Equivalent Isotropic Radiated Power	27.50(d)(4)	< 1 Watts max. EIRP	PASS
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

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(h)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. 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

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1710.7	19957	1	0	22.95	22.36	27.20	26.61
		1	3	22.96	22.36	27.21	26.61
		1	5	22.97	22.35	27.22	26.60
		3	0	23.03	22.22	27.28	26.47
		3	1	22.91	22.10	27.16	26.35
		3	3	23.05	22.18	27.30	26.43
		6	0	22.29	21.38	26.54	25.63
1732.5	20175	1	0	22.25	21.66	26.50	25.91
		1	3	22.17	21.54	26.42	25.79
		1	5	22.48	21.83	26.73	26.08
		3	0	22.20	21.31	26.45	25.56
		3	1	22.12	21.24	26.37	25.49
		3	3	22.41	21.52	26.66	25.77
		6	0	21.40	20.38	25.65	24.63
1754.3	20393	1	0	22.25	21.59	26.50	25.84
		1	3	22.09	21.37	26.34	25.62
		1	5	22.19	21.53	26.44	25.78
		3	0	22.21	21.34	26.46	25.59
		3	1	22.24	21.28	26.49	25.53
		3	3	22.21	21.33	26.46	25.58
		6	0	21.29	20.37	25.54	24.62

LTE Conducted Average Output Powers (1.4 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1711.5	19965	1	0	22.89	22.21	27.14	26.46
		1	7	22.94	22.39	27.19	26.64
		1	14	22.94	22.27	27.19	26.52
		8	0	21.93	21.07	26.18	25.32
		8	3	22.18	21.34	26.43	25.59
		8	7	22.20	21.37	26.45	25.62
		15	0	22.19	21.33	26.44	25.58
1732.5	20175	1	0	22.29	21.68	26.54	25.93
		1	7	22.28	21.58	26.53	25.83
		1	14	22.50	21.82	26.75	26.07
		8	0	21.03	20.01	25.28	24.26
		8	3	21.37	20.34	25.62	24.59
		8	7	21.46	20.44	25.71	24.69
		15	0	21.36	20.31	25.61	24.56
1753.5	20385	1	0	22.27	21.53	26.52	25.78
		1	7	22.18	21.43	26.43	25.68
		1	14	22.16	21.51	26.41	25.76
		8	0	21.03	20.14	25.28	24.39
		8	3	21.30	20.40	25.55	24.65
		8	7	21.19	20.29	25.44	24.54
		15	0	21.21	20.41	25.46	24.66

LTE Conducted Average Output Powers (3 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1712.5	19975	1	0	22.90	22.26	27.15	26.51
		1	12	22.95	22.30	27.20	26.55
		1	24	22.77	22.11	27.02	26.36
		12	0	22.00	21.03	26.25	25.28
		12	6	22.10	21.23	26.35	25.48
		12	11	22.10	21.23	26.35	25.48
		25	0	22.23	21.37	26.48	25.62
1732.5	20175	1	0	22.14	21.41	26.39	25.66
		1	12	22.21	21.49	26.46	25.74
		1	24	22.44	21.74	26.69	25.99
		12	0	21.22	20.14	25.47	24.39
		12	6	21.40	20.35	25.65	24.60
		12	11	21.55	20.48	25.80	24.73
		25	0	21.52	20.34	25.77	24.59
1752.5	20375	1	0	22.27	21.57	26.52	25.82
		1	12	22.20	21.52	26.45	25.77
		1	24	22.11	21.41	26.36	25.66
		12	0	21.09	20.18	25.34	24.43
		12	6	21.20	20.27	25.45	24.52
		12	11	21.14	20.22	25.39	24.47
		25	0	21.40	20.49	25.65	24.74

LTE Conducted Average Output Powers (5 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1715.0	20000	1	0	22.98	22.33	27.23	26.58
		1	24	22.96	22.25	27.21	26.50
		1	49	22.47	21.77	26.72	26.02
		25	0	22.22	21.35	26.47	25.60
		25	12	22.13	21.26	26.38	25.51
		25	24	22.01	21.06	26.26	25.31
		50	0	22.10	21.25	26.35	25.50
1732.5	20175	1	0	22.23	21.55	26.48	25.80
		1	24	22.32	21.43	26.57	25.68
		1	49	22.70	21.99	26.95	26.24
		25	0	21.37	20.39	25.62	24.64
		25	12	21.38	20.31	25.63	24.56
		25	24	21.61	20.64	25.86	24.89
		50	0	21.50	20.44	25.75	24.69
1750.0	20350	1	0	22.56	21.90	26.81	26.15
		1	24	22.37	21.74	26.62	25.99
		1	49	22.15	21.44	26.40	25.69
		25	0	21.74	20.85	25.99	25.10
		25	12	21.45	20.56	25.70	24.81
		25	24	21.42	20.50	25.67	24.75
		50	0	21.58	20.70	25.83	24.95

LTE Conducted Average Output Powers (10 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1717.5	20025	1	0	22.94	22.28	27.19	26.53
		1	36	22.75	22.04	27.00	26.29
		1	74	22.09	21.40	26.34	25.65
		36	0	22.01	21.12	26.26	25.37
		36	18	21.92	20.95	26.17	25.20
		36	39	21.47	20.56	25.72	24.81
		75	0	21.89	20.94	26.14	25.19
1732.5	20175	1	0	22.16	21.40	26.41	25.65
		1	36	22.14	21.47	26.39	25.72
		1	74	22.56	21.77	26.81	26.02
		36	0	21.05	20.14	25.30	24.39
		36	18	21.43	20.34	25.68	24.59
		36	39	21.64	20.73	25.89	24.98
		75	0	21.26	20.21	25.51	24.46
1747.5	20325	1	0	22.73	21.98	26.98	26.23
		1	36	22.57	21.90	26.82	26.15
		1	74	22.05	21.31	26.30	25.56
		36	0	21.50	20.60	25.75	24.85
		36	18	21.73	20.77	25.98	25.02
		36	39	21.31	20.36	25.56	24.61
		75	0	21.70	20.81	25.95	25.06

LTE Conducted Average Output Powers (15 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

Frequency (MHz)	Channel	Resource Block Size	Resource Block Offset	Conducted Power [dBm]		E.I.R.P [dBm]	
				QPSK	16QAM	QPSK	16QAM
1720.0	20050	1	0	22.94	22.26	27.19	26.51
		1	49	22.42	21.76	26.67	26.01
		1	99	21.95	21.31	26.20	25.56
		50	0	22.07	21.19	26.32	25.44
		50	25	21.52	20.62	25.77	24.87
		50	49	21.25	20.34	25.50	24.59
		100	0	21.70	20.74	25.95	24.99
1732.5	20175	1	0	22.21	21.51	26.46	25.76
		1	49	22.09	21.37	26.34	25.62
		1	99	22.52	21.86	26.77	26.11
		50	0	21.28	20.39	25.53	24.64
		50	25	21.30	20.24	25.55	24.49
		50	49	21.59	20.70	25.84	24.95
		100	0	21.27	20.23	25.52	24.48
1745.0	20300	1	0	22.60	21.81	26.85	26.06
		1	49	22.55	21.82	26.80	26.07
		1	99	21.95	21.24	26.20	25.49
		50	0	21.80	20.90	26.05	25.15
		50	25	21.58	20.62	25.83	24.87
		50	49	21.59	20.72	25.84	24.97
		100	0	21.73	20.73	25.98	24.98

LTE Conducted Average Output Powers (20 MHz Band 4 LTE)

Note:

1. E.I.R.P = Conducted Power + Peak. Ant Gain(dBi)
2. Peak. Ant Gain = 4.247 dBi
3. Limit = 1 Watts(=30dBm)

8.2 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 1.4 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
19957 (1710.7)	3,421.40	-50.13	12.70	-58.00	1.91	V	-47.21	34.21
	5,132.10	-31.76	12.68	-33.34	2.52	V	-23.18	10.18
	6,842.80	-44.11	12.58	-41.45	2.84	V	-31.71	18.71
	8,553.50	-47.07	11.99	-40.41	3.20	V	-31.62	18.62
	11,974.90	-46.77	13.12	-35.31	3.86	V	-26.05	13.05
20175 (1732.5)	3,465.00	-46.87	12.60	-54.46	1.97	V	-43.82	30.82
	5,197.50	-33.39	13.17	-35.30	2.54	V	-24.67	11.67
	6,930.00	-48.09	12.46	-44.76	2.83	V	-35.13	22.13
	8,662.50	-51.89	11.99	-45.22	3.21	V	-36.45	23.45
	12,127.50	-51.71	12.99	-40.00	3.98	V	-30.99	17.99
20393 (1754.3)	3,508.60	-45.81	12.43	-52.99	1.93	V	-42.49	29.49
	5,262.90	-33.99	13.48	-36.80	2.59	V	-25.91	12.91
	7,017.20	-48.67	12.16	-45.19	2.83	V	-35.86	22.86
	8,771.50	-45.99	11.79	-38.07	3.23	V	-29.51	16.51
	12,280.10	-52.70	13.41	-40.80	4.01	V	-31.40	18.40

Note:

1. Limit = 43 + 10 $\log_{10}$ (W) = -13.0 dBm

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
19965 (1711.5)	3,423.00	-50.41	12.70	-58.28	1.91	V	-47.49	34.49
	5,134.50	-33.16	12.72	-34.80	2.52	V	-24.61	11.61
	6,846.00	-43.36	12.55	-40.65	2.83	V	-30.93	17.93
	8,557.50	-47.48	11.98	-40.81	3.22	V	-32.05	19.05
	11,980.50	-48.11	13.10	-36.76	3.80	V	-27.46	14.46
20175 (1732.5)	3,465.00	-48.03	12.60	-55.62	1.97	V	-44.98	31.98
	5,197.50	-34.05	13.17	-35.96	2.54	V	-25.33	12.33
	6,930.00	-45.86	12.46	-42.53	2.83	V	-32.90	19.90
	8,662.50	-48.34	11.99	-41.67	3.21	V	-32.90	19.90
	12,127.50	-50.59	12.99	-38.88	3.98	V	-29.87	16.87
20385 (1753.5)	3,507.00	-47.37	12.43	-54.55	1.93	V	-44.05	31.05
	5,260.50	-36.55	13.48	-39.36	2.59	V	-28.47	15.47
	7,014.00	-48.20	12.16	-44.72	2.83	V	-35.39	22.39
	8,767.50	-47.32	11.79	-39.40	3.23	V	-30.84	17.84
	12,274.50	-53.45	13.38	-41.13	4.04	V	-31.79	18.79

Note:

1. Limit = 43 + 10 log_{10} (W) = -13.0 dBm

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
19975 (1712.5)	3,425.00	-51.06	12.69	-59.06	1.90	V	-48.27	35.27
	5,137.50	-32.69	12.75	-34.40	2.52	V	-24.17	11.17
	6,850.00	-43.35	12.52	-40.59	2.81	V	-30.88	17.88
	8,562.50	-46.07	11.98	-39.40	3.22	V	-30.64	17.64
	11,987.50	-44.57	13.06	-33.15	3.83	V	-23.92	10.92
20175 (1732.5)	3,465.00	-48.43	12.60	-56.02	1.97	V	-45.38	32.38
	5,197.50	-34.34	13.17	-36.25	2.54	V	-25.62	12.62
	6,930.00	-44.88	12.46	-41.55	2.83	V	-31.92	18.92
	8,662.50	-48.47	11.99	-41.80	3.21	V	-33.03	20.03
	12,127.50	-48.70	12.99	-36.99	3.98	V	-27.98	14.98
20375 (1752.5)	3,505.00	-46.87	12.44	-54.13	1.92	V	-43.60	30.60
	5,257.50	-35.48	13.48	-38.29	2.59	V	-27.40	14.40
	7,010.00	-49.49	12.21	-46.45	2.84	V	-37.08	24.08
	8,762.50	-49.21	11.80	-41.28	3.24	V	-32.72	19.72
	12,267.50	-50.75	13.35	-38.01	4.07	V	-28.73	15.73

Note:

1. Limit = 43 + 10 $\log_{10}$ (W) = -13.0 dBm

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
20000 (1715.0)	3,430.00	-50.55	12.68	-58.68	1.88	V	-47.88	34.88
	5,145.00	-32.89	12.79	-34.44	2.54	V	-24.18	11.18
	6,860.00	-43.58	12.54	-40.60	2.86	V	-30.92	17.92
	8,575.00	-47.22	11.95	-40.52	3.13	V	-31.70	18.70
	12,005.00	-44.54	13.03	-32.67	3.88	V	-23.52	10.52
20175 (1732.5)	3,465.00	-48.22	12.60	-55.81	1.97	V	-45.17	32.17
	5,197.50	-34.60	13.17	-36.51	2.54	V	-25.88	12.88
	6,930.00	-43.59	12.46	-40.26	2.83	V	-30.63	17.63
	8,662.50	-49.37	11.99	-42.70	3.21	V	-33.93	20.93
	12,127.50	-51.46	12.99	-39.75	3.98	V	-30.74	17.74
20350 (1750.0)	3,500.00	-48.77	12.45	-56.11	1.90	V	-45.56	32.56
	5,250.00	-33.35	13.47	-36.07	2.62	V	-25.22	12.22
	7,000.00	-47.63	12.27	-44.72	2.84	V	-35.29	22.29
	8,750.00	-47.04	11.82	-39.01	3.28	V	-30.47	17.47
	12,250.00	-50.54	13.29	-37.31	4.15	V	-28.17	15.17

Note:

1. Limit = 43 + 10 $\log_{10}$ (W) = -13.0 dBm

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
20025 (1717.5)	3,435.00	-50.73	12.67	-58.70	1.89	V	-47.93	34.93
	5,152.50	-34.02	12.83	-35.40	2.55	V	-25.12	12.12
	6,870.00	-44.32	12.56	-41.68	2.82	V	-31.94	18.94
	8,587.50	-48.28	11.91	-41.39	3.16	V	-32.64	19.64
	12,022.50	-47.16	13.03	-34.41	3.94	V	-25.32	12.32
20175 (1732.5)	3,465.00	-48.22	12.60	-55.81	1.97	V	-45.17	32.17
	5,197.50	-35.27	13.17	-37.18	2.54	V	-26.55	13.55
	6,930.00	-43.59	12.46	-40.26	2.83	V	-30.63	17.63
	8,662.50	-48.58	11.99	-41.91	3.21	V	-33.14	20.14
	12,127.50	-53.78	12.99	-42.07	3.98	V	-33.06	20.06
20325 (1747.5)	3,495.00	-50.20	12.48	-57.51	1.91	V	-46.94	33.94
	5,242.50	-32.25	13.40	-34.75	2.61	V	-23.96	10.96
	6,990.00	-46.70	12.26	-42.63	2.84	V	-33.21	20.21
	8,737.50	-47.55	11.83	-39.18	3.24	V	-30.59	17.59
	12,232.50	-51.58	13.23	-38.99	4.00	V	-29.76	16.76

Note:

1. Limit = 43 + 10 $\log_{10}$ (W) = -13.0 dBm

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Margin (dB)
20050 (1720.0)	3,440.00	-51.08	12.65	-58.89	1.90	V	-48.14	35.14
	5,160.00	-33.34	12.87	-35.18	2.58	V	-24.89	11.89
	6,880.00	-44.28	12.60	-41.59	2.79	V	-31.78	18.78
	8,600.00	-44.84	11.88	-37.51	3.26	V	-28.89	15.89
	12,040.00	-46.59	13.02	-34.10	3.95	V	-25.03	12.03
20175 (1732.5)	3,465.00	-48.99	12.60	-56.58	1.97	V	-45.94	32.94
	5,197.50	-33.85	13.17	-35.76	2.54	V	-25.13	12.13
	6,930.00	-43.94	12.46	-40.61	2.83	V	-30.98	17.98
	8,662.50	-47.73	11.99	-41.06	3.21	V	-32.29	19.29
	12,127.50	-54.16	12.99	-42.45	3.98	V	-33.44	20.44
20300 (1745.0)	3,490.00	-49.34	12.50	-56.61	1.91	V	-46.02	33.02
	5,235.00	-32.87	13.36	-35.43	2.61	V	-24.68	11.68
	6,980.00	-47.08	12.25	-43.10	2.85	V	-33.70	20.70
	8,725.00	-49.80	11.84	-41.54	3.16	H	-32.86	19.86
	12,215.00	-50.61	13.19	-38.65	3.92	V	-29.38	16.38

Note:

1. Limit = 43 + 10 $\log_{10}$ (W) = -13.0 dBm

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	5.53
			16-QAM	6		6.18
	3 MHz		QPSK	15		5.64
			16-QAM	15		6.18
	5 MHz		QPSK	25		5.56
			16-QAM	25		6.22
	10 MHz		QPSK	50		5.58
			16-QAM	50		6.19
	15 MHz		QPSK	75		5.54
			16-QAM	75		6.19
	20 MHz		QPSK	100		5.48
			16-QAM	100		6.21

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 72 ~ 83.

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	1.0954
			16-QAM	6		1.0966
	3 MHz		QPSK	15		2.7109
			16-QAM	15		2.6971
	5 MHz		QPSK	25		4.5238
			16-QAM	25		4.5016
	10 MHz		QPSK	50		8.9798
			16-QAM	50		8.9967
	15 MHz		QPSK	75		13.454
			16-QAM	75		13.458
	20 MHz		QPSK	100		17.984
			16-QAM	100		17.957

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 60 ~ 71.

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	5.1312	28.591	-67.974	-39.383	-13.00
		1732.5	5.1970	28.591	-65.512	-36.921	
		1754.3	5.2647	28.591	-66.213	-37.622	
	3	1711.5	5.1312	28.591	-69.125	-40.534	
		1732.5	5.1945	28.591	-65.299	-36.708	
		1753.5	5.2647	28.591	-66.649	-38.058	
	5	1712.5	5.1316	28.591	-69.987	-41.396	
		1732.5	5.1915	28.591	-65.907	-37.316	
		1752.5	5.2647	28.591	-66.352	-37.761	
	10	1715.0	5.1326	28.591	-69.911	-41.320	
		1732.5	5.1850	28.591	-66.107	-37.516	
		1750.0	5.2638	28.591	-66.277	-37.686	
	15	1717.5	5.1331	28.591	-69.472	-40.881	
		1732.5	5.1780	28.591	-66.718	-38.127	
		1747.5	5.2633	28.591	-66.539	-37.948	
	20	1720.0	5.1336	28.591	-70.184	-41.593	
		1732.5	5.1715	28.591	-66.842	-38.251	
		1745.0	5.2623	28.591	-66.493	-37.902	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 120 ~ 155.
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 84 ~ 119.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 4

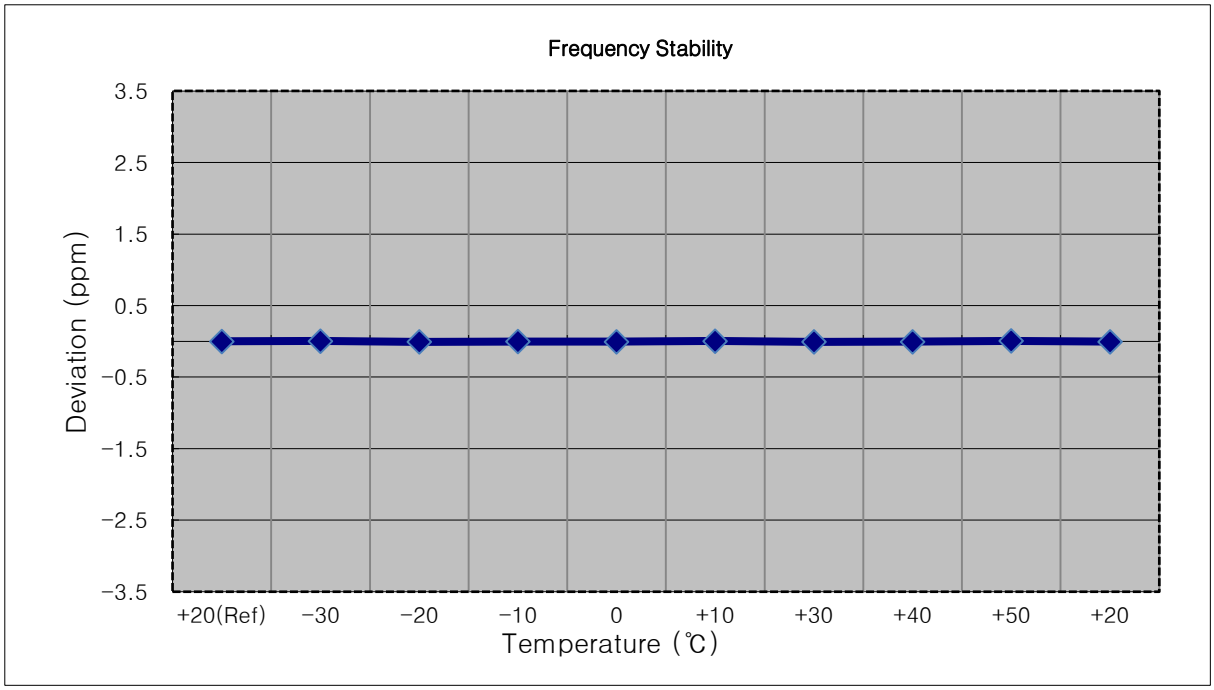
▣ OPERATING FREQUENCY: 1710,700,000 Hz

▣ CHANNEL: 19957 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1710 699 994	0.0	0.000 000	0.000
100%		-30	1710 700 002	8.0	0.000 000	0.005
100%		-20	1710 699 984	-10.3	-0.000 001	-0.006
100%		-10	1710 699 989	-5.2	0.000 000	-0.003
100%		0	1710 699 987	-6.9	0.000 000	-0.004
100%		+10	1710 700 002	8.5	0.000 000	0.005
100%		+30	1710 699 981	-13.3	-0.000 001	-0.008
100%		+40	1710 699 985	-9.3	-0.000 001	-0.005
100%		+50	1710 700 005	11.4	0.000 001	0.007
Batt. Endpoint	3.40	+20	1710 699 988	-6.4	0.000 000	-0.004



▣ MODE: LTE 4

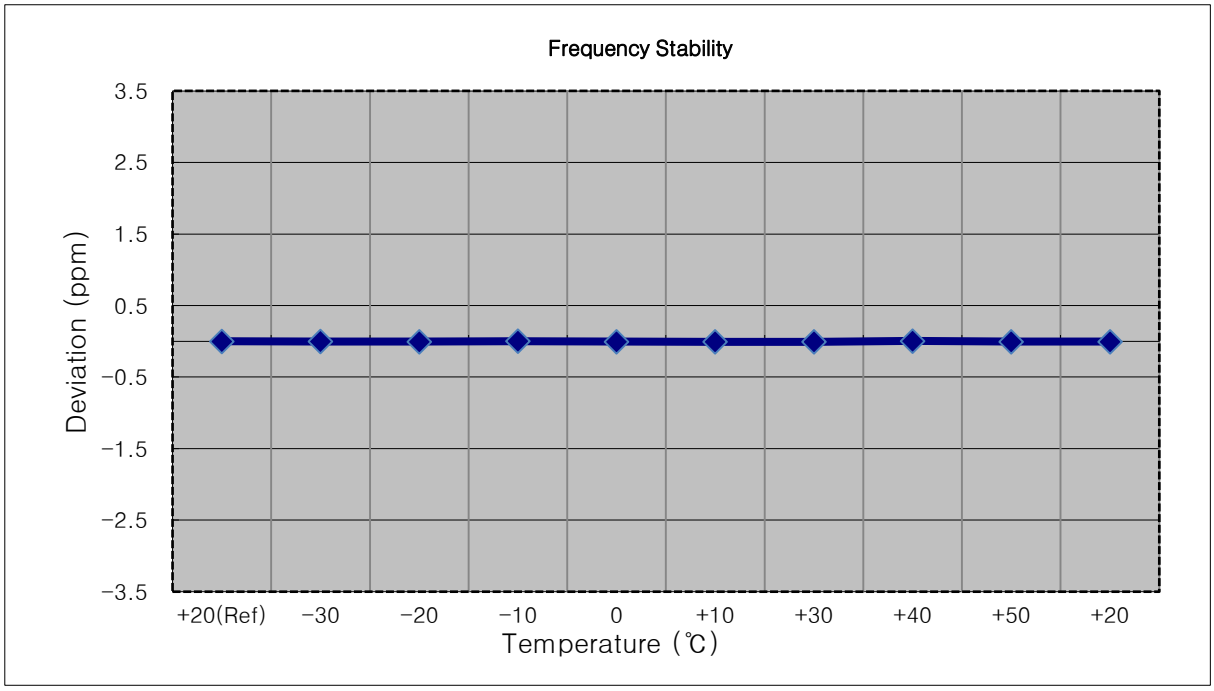
▣ OPERATING FREQUENCY: 1711,500,000 Hz

▣ CHANNEL: 19965 (3 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1711 499 992	0.0	0.000 000	0.000
100%		-30	1711 499 988	-3.2	0.000 000	-0.002
100%		-20	1711 499 985	-6.9	0.000 000	-0.004
100%		-10	1711 499 996	3.9	0.000 000	0.002
100%		0	1711 499 983	-8.2	0.000 000	-0.005
100%		+10	1711 499 979	-13.1	-0.000 001	-0.008
100%		+30	1711 499 980	-11.4	-0.000 001	-0.007
100%		+40	1711 500 000	8.2	0.000 000	0.005
100%		+50	1711 499 985	-6.3	0.000 000	-0.004
Batt. Endpoint	3.40	+20	1711 499 983	-8.9	-0.000 001	-0.005



▣ MODE: LTE 4

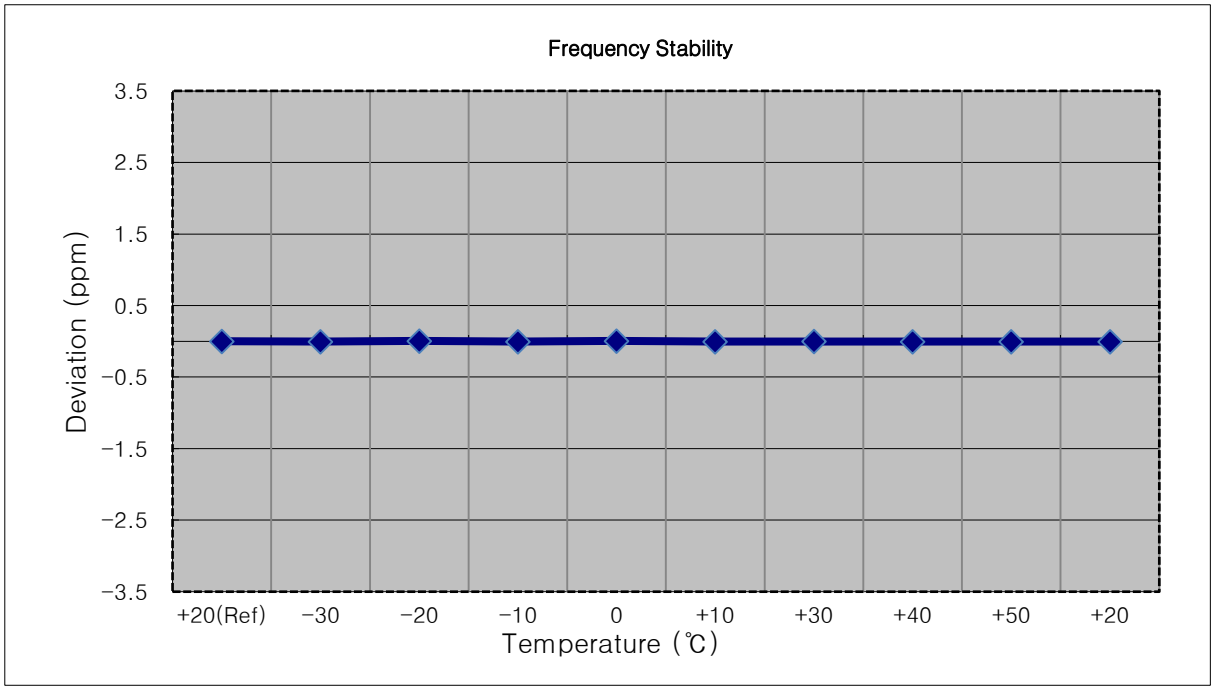
▣ OPERATING FREQUENCY: 1712,500,000 Hz

▣ CHANNEL: 19975 (5 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1712 500 005	0.0	0.000 000	0.000
100%		-30	1712 499 998	-6.9	0.000 000	-0.004
100%		-20	1712 500 013	7.4	0.000 000	0.004
100%		-10	1712 499 999	-6.1	0.000 000	-0.004
100%		0	1712 500 015	9.2	0.000 001	0.005
100%		+10	1712 499 997	-8.8	-0.000 001	-0.005
100%		+30	1712 500 000	-5.7	0.000 000	-0.003
100%		+40	1712 499 998	-7.5	0.000 000	-0.004
100%		+50	1712 499 998	-6.9	0.000 000	-0.004
Batt. Endpoint	3.40	+20	1712 499 997	-8.6	-0.000 001	-0.005



▣ MODE: LTE 4

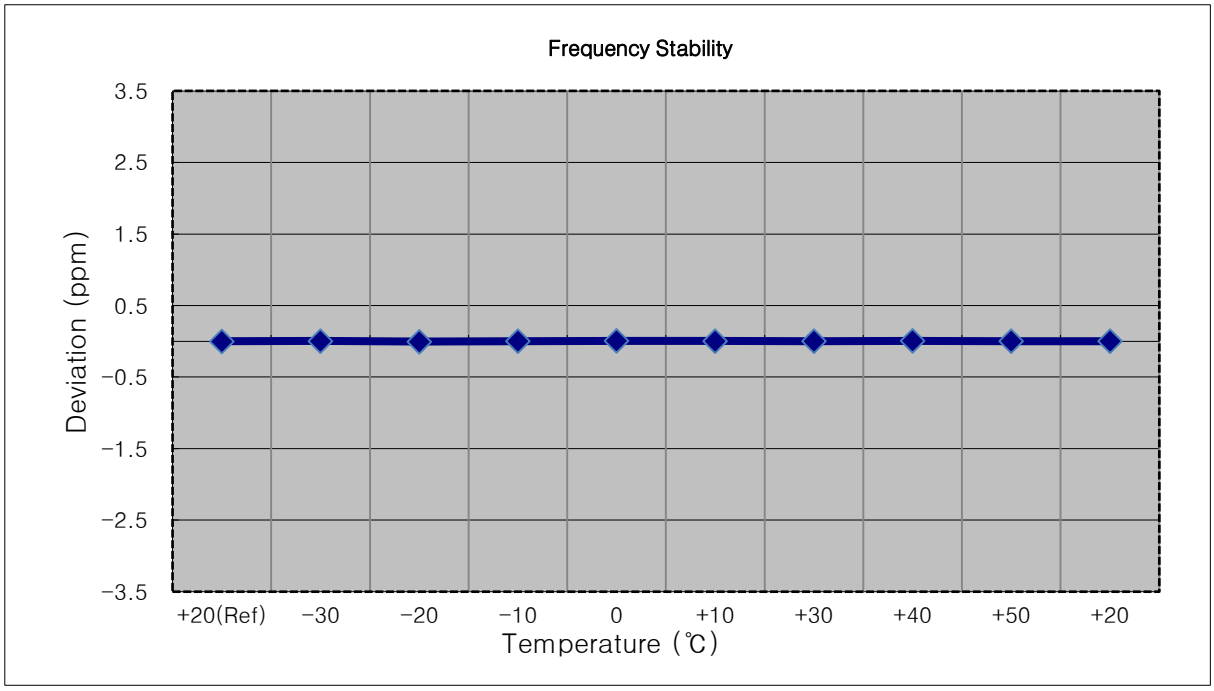
▣ OPERATING FREQUENCY: 1715,000,000 Hz

▣ CHANNEL: 20000 (10 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1715 000 004	0.0	0.000 000	0.000
100%		-30	1715 000 010	6.3	0.000 000	0.004
100%		-20	1714 999 996	-7.3	0.000 000	-0.004
100%		-10	1715 000 008	4.4	0.000 000	0.003
100%		0	1715 000 017	13.3	0.000 001	0.008
100%		+10	1715 000 012	7.9	0.000 000	0.005
100%		+30	1715 000 009	5.6	0.000 000	0.003
100%		+40	1715 000 014	9.8	0.000 001	0.006
100%		+50	1715 000 009	5.0	0.000 000	0.003
Batt. Endpoint	3.40	+20	1715 000 009	5.7	0.000 000	0.003



▣ MODE: LTE 4

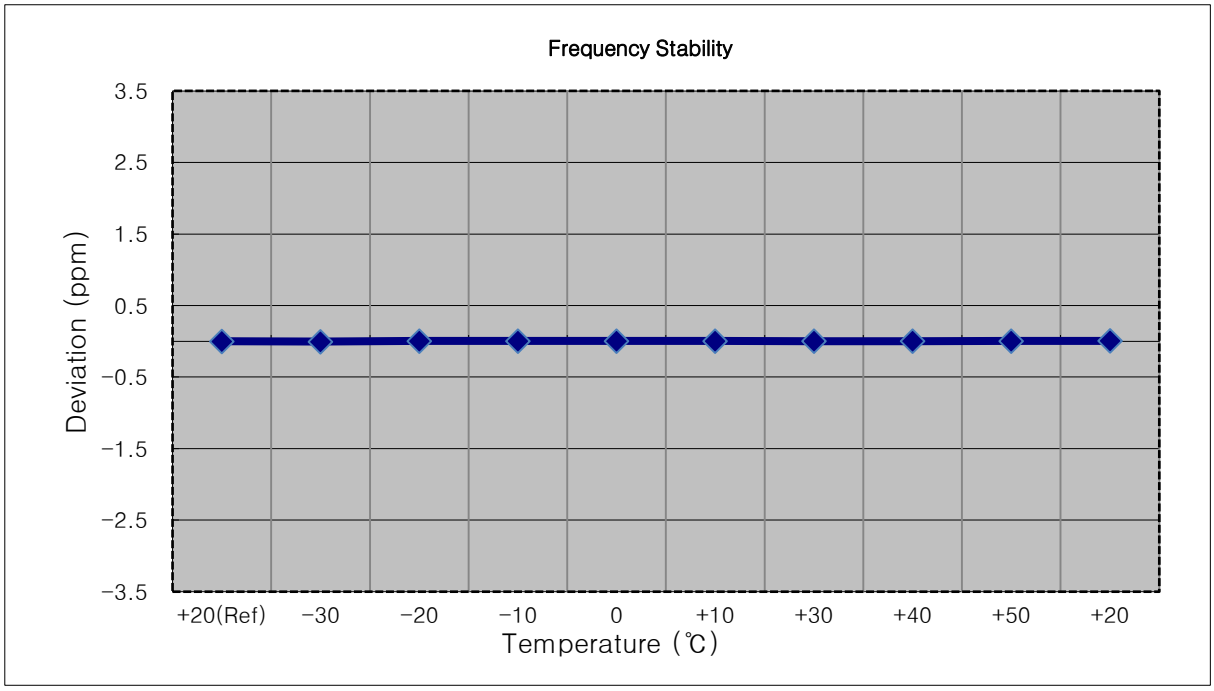
▣ OPERATING FREQUENCY: 1717,500,000 Hz

▣ CHANNEL: 20025 (15 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1717 500 005	0.0	0.000 000	0.000
100%		-30	1717 499 998	-7.8	0.000 000	-0.005
100%		-20	1717 500 013	7.8	0.000 000	0.005
100%		-10	1717 500 014	8.2	0.000 000	0.005
100%		0	1717 500 013	7.3	0.000 000	0.004
100%		+10	1717 500 015	9.5	0.000 001	0.006
100%		+30	1717 500 010	4.4	0.000 000	0.003
100%		+40	1717 500 010	4.2	0.000 000	0.002
100%		+50	1717 500 012	7.1	0.000 000	0.004
Batt. Endpoint	3.40	+20	1717 500 015	9.6	0.000 001	0.006



▣ MODE: LTE 4

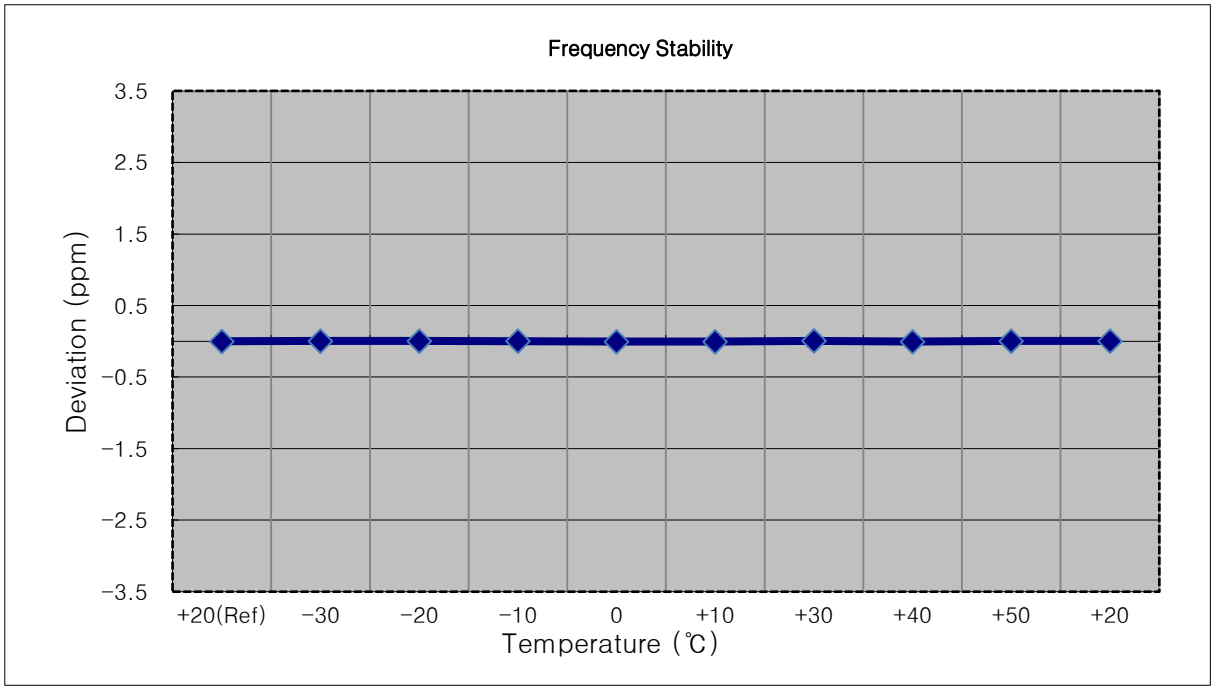
▣ OPERATING FREQUENCY: 1720,000,000 Hz

▣ CHANNEL: 20050 (20 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1720 000 008	0.0	0.000 000	0.000
100%		-30	1720 000 017	9.1	0.000 001	0.005
100%		-20	1720 000 015	7.0	0.000 000	0.004
100%		-10	1720 000 012	3.4	0.000 000	0.002
100%		0	1720 000 002	-6.5	0.000 000	-0.004
100%		+10	1720 000 000	-8.1	0.000 000	-0.005
100%		+30	1720 000 019	11.0	0.000 001	0.006
100%		+40	1720 000 002	-6.3	0.000 000	-0.004
100%		+50	1720 000 014	5.8	0.000 000	0.003
Batt. Endpoint	3.40	+20	1720 000 016	7.5	0.000 000	0.004



▣ MODE: LTE 4

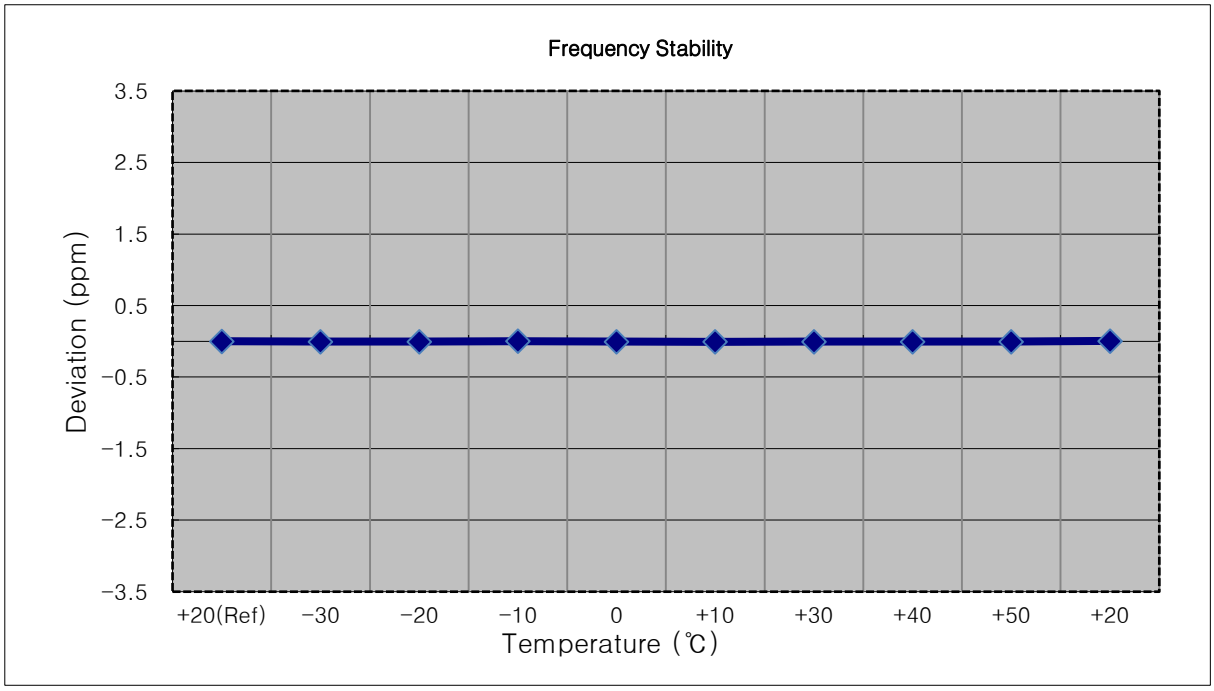
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 996	0.0	0.000 000	0.000
100%		-30	1732 499 989	-6.8	0.000 000	-0.004
100%		-20	1732 499 990	-6.1	0.000 000	-0.004
100%		-10	1732 500 001	5.3	0.000 000	0.003
100%		0	1732 499 989	-6.8	0.000 000	-0.004
100%		+10	1732 499 985	-10.5	-0.000 001	-0.006
100%		+30	1732 499 989	-7.1	0.000 000	-0.004
100%		+40	1732 499 988	-8.2	0.000 000	-0.005
100%		+50	1732 499 987	-8.4	0.000 000	-0.005
Batt. Endpoint	3.40	+20	1732 500 004	7.7	0.000 000	0.004



▣ MODE: LTE 4

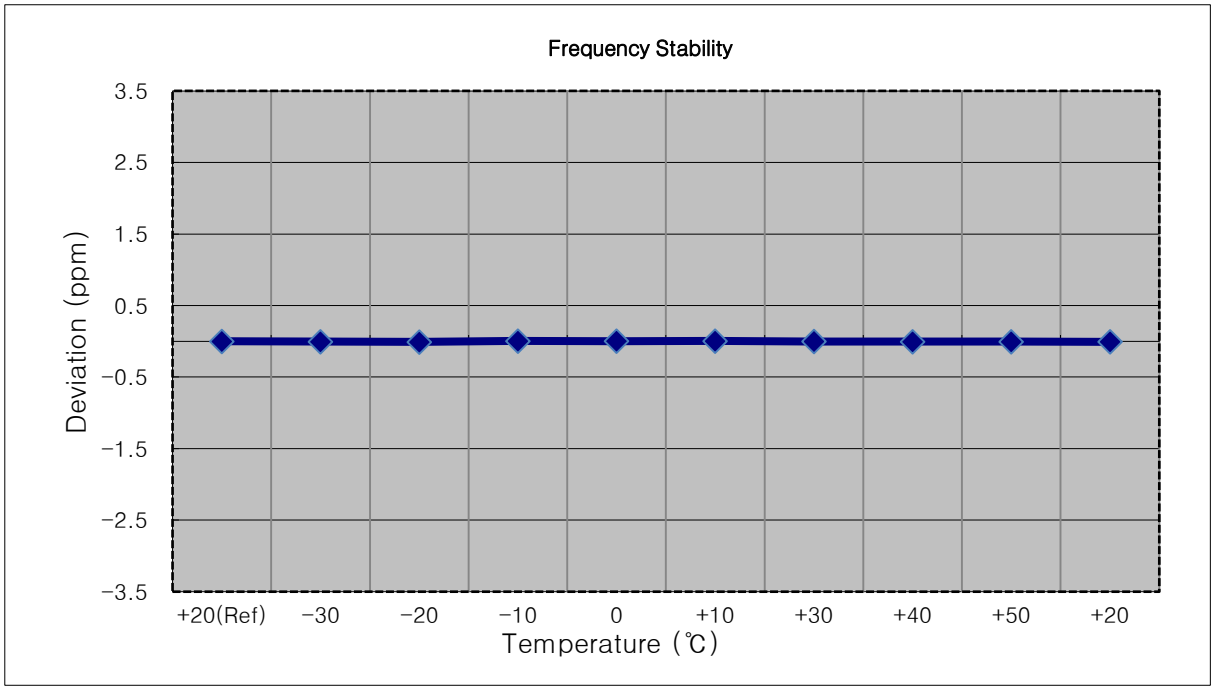
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (3 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 007	0.0	0.000 000	0.000
100%		-30	1732 499 999	-7.6	0.000 000	-0.004
100%		-20	1732 499 992	-14.9	-0.000 001	-0.009
100%		-10	1732 500 015	7.6	0.000 000	0.004
100%		0	1732 500 010	3.4	0.000 000	0.002
100%		+10	1732 500 016	8.8	0.000 001	0.005
100%		+30	1732 500 002	-5.0	0.000 000	-0.003
100%		+40	1732 499 999	-7.6	0.000 000	-0.004
100%		+50	1732 499 999	-8.0	0.000 000	-0.005
Batt. Endpoint	3.40	+20	1732 499 995	-12.2	-0.000 001	-0.007



▣ MODE: LTE 4

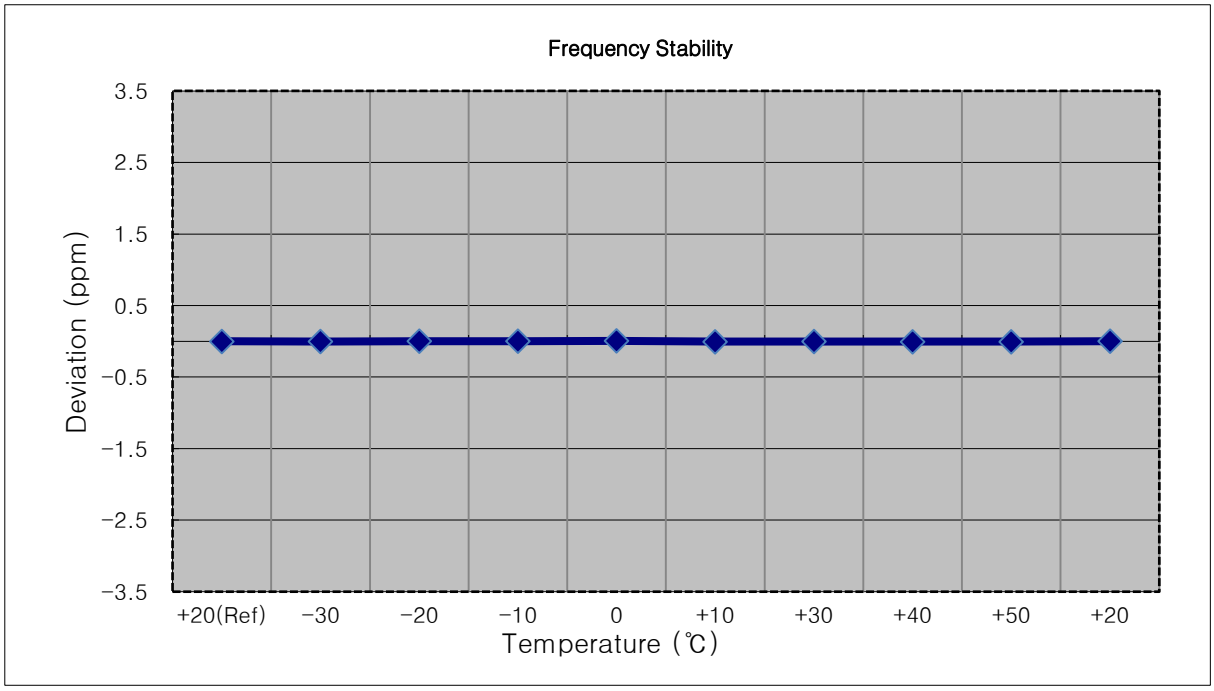
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (5 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 005	0.0	0.000 000	0.000
100%		-30	1732 500 000	-4.4	0.000 000	-0.003
100%		-20	1732 500 008	3.5	0.000 000	0.002
100%		-10	1732 500 008	3.1	0.000 000	0.002
100%		0	1732 500 015	10.1	0.000 001	0.006
100%		+10	1732 499 996	-8.3	0.000 000	-0.005
100%		+30	1732 499 999	-5.6	0.000 000	-0.003
100%		+40	1732 499 995	-9.3	-0.000 001	-0.005
100%		+50	1732 499 998	-6.7	0.000 000	-0.004
Batt. Endpoint	3.40	+20	1732 500 009	4.1	0.000 000	0.002



▣ MODE: LTE 4

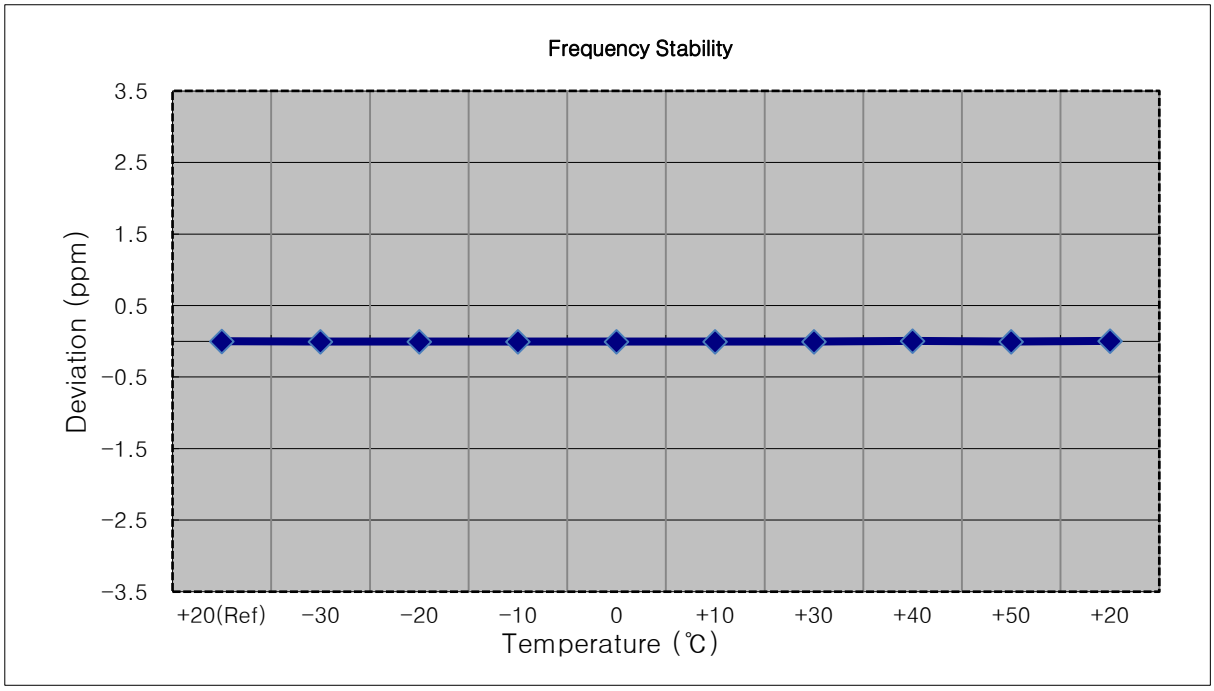
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (10 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 993	0.0	0.000 000	0.000
100%		-30	1732 499 984	-8.6	0.000 000	-0.005
100%		-20	1732 499 985	-7.7	0.000 000	-0.004
100%		-10	1732 499 986	-6.3	0.000 000	-0.004
100%		0	1732 499 985	-7.6	0.000 000	-0.004
100%		+10	1732 499 986	-6.8	0.000 000	-0.004
100%		+30	1732 499 985	-7.3	0.000 000	-0.004
100%		+40	1732 499 999	6.7	0.000 000	0.004
100%		+50	1732 499 986	-6.4	0.000 000	-0.004
Batt. Endpoint	3.40	+20	1732 499 999	6.2	0.000 000	0.004



▣ MODE: LTE 4

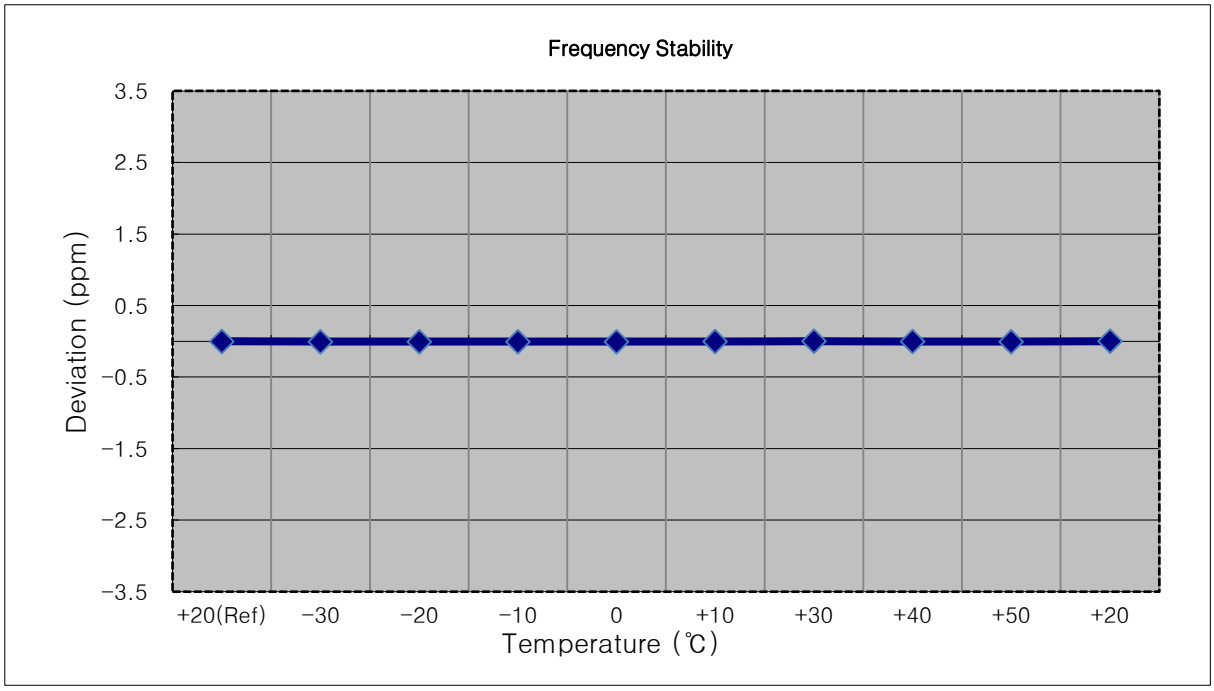
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (15 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 994	0.0	0.000 000	0.000
100%		-30	1732 499 986	-7.6	0.000 000	-0.004
100%		-20	1732 499 986	-7.3	0.000 000	-0.004
100%		-10	1732 499 986	-7.7	0.000 000	-0.004
100%		0	1732 499 986	-7.8	0.000 000	-0.005
100%		+10	1732 499 988	-5.5	0.000 000	-0.003
100%		+30	1732 499 998	4.1	0.000 000	0.002
100%		+40	1732 499 989	-5.1	0.000 000	-0.003
100%		+50	1732 499 986	-7.7	0.000 000	-0.004
Batt. Endpoint	3.40	+20	1732 499 999	5.1	0.000 000	0.003



▣ MODE: LTE 4

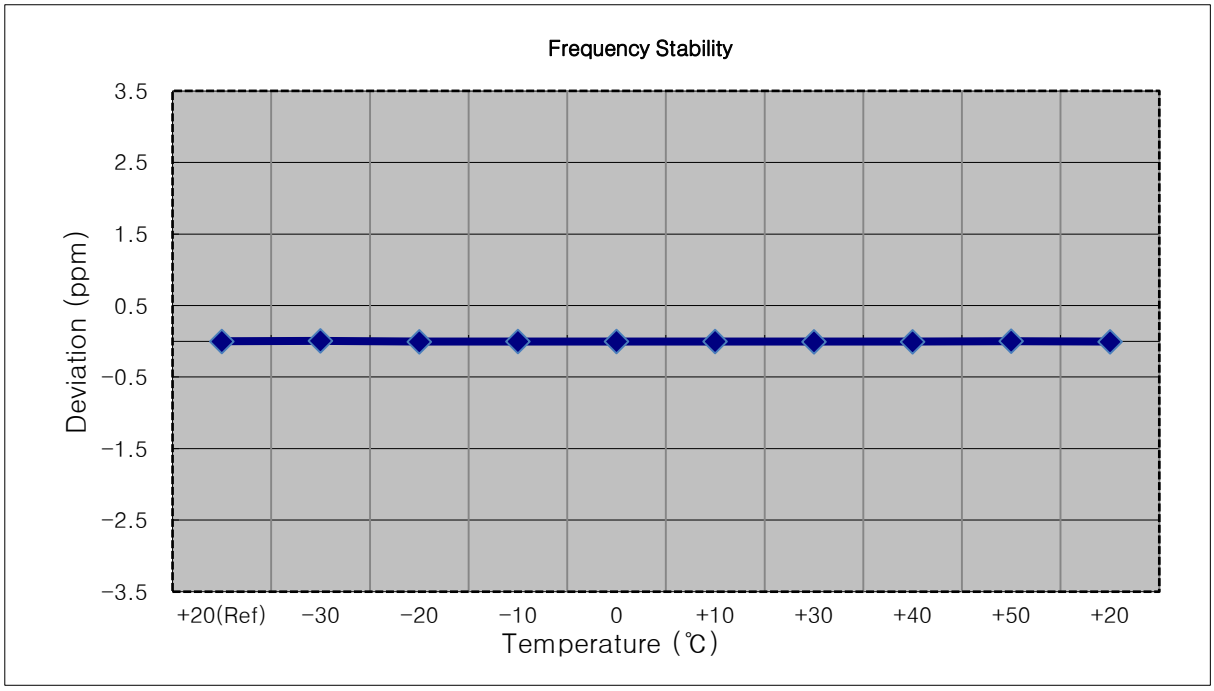
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (20 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 005	0.0	0.000 000	0.000
100%		-30	1732 500 016	10.6	0.000 001	0.006
100%		-20	1732 499 996	-8.7	-0.000 001	-0.005
100%		-10	1732 500 000	-5.2	0.000 000	-0.003
100%		0	1732 500 001	-3.7	0.000 000	-0.002
100%		+10	1732 500 001	-4.3	0.000 000	-0.002
100%		+30	1732 499 997	-7.7	0.000 000	-0.004
100%		+40	1732 499 997	-7.8	0.000 000	-0.005
100%		+50	1732 500 010	5.3	0.000 000	0.003
Batt. Endpoint	3.40	+20	1732 499 996	-9.4	-0.000 001	-0.005



▣ MODE: LTE 4

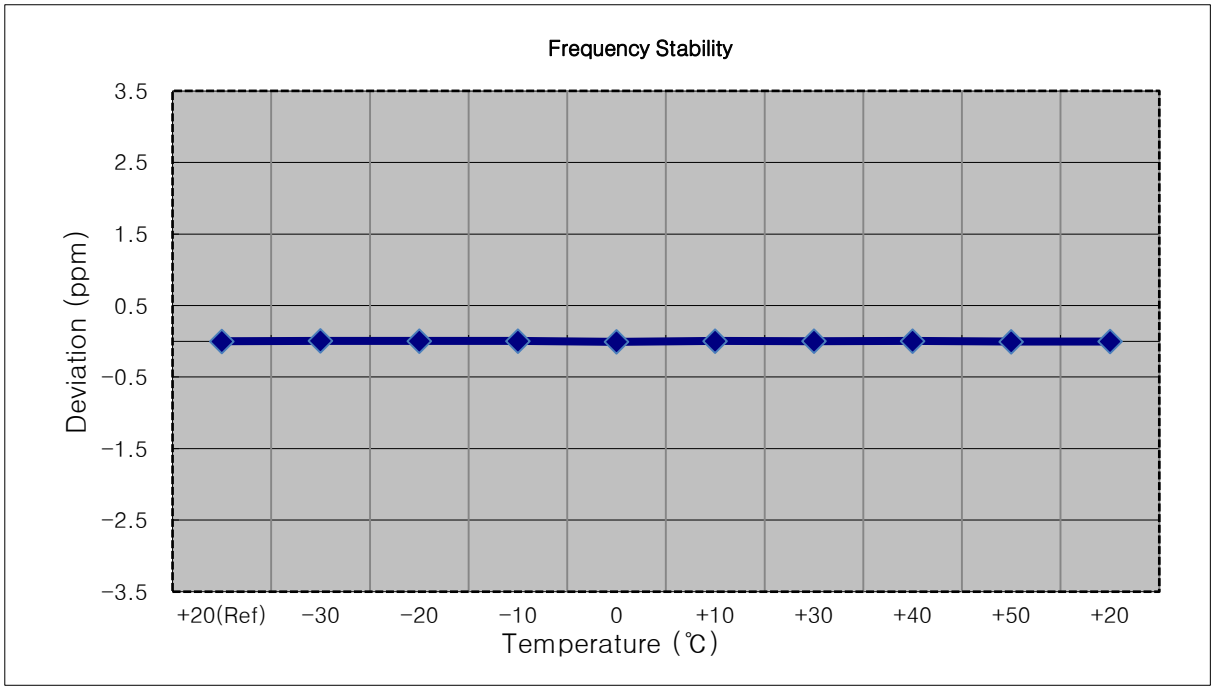
▣ OPERATING FREQUENCY: 1754,300,000 Hz

▣ CHANNEL: 20393 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1754 299 993	0.0	0.000 000	0.000
100%		-30	1754 300 004	11.2	0.000 001	0.006
100%		-20	1754 300 000	6.3	0.000 000	0.004
100%		-10	1754 300 002	9.0	0.000 001	0.005
100%		0	1754 299 982	-11.0	-0.000 001	-0.006
100%		+10	1754 299 999	6.2	0.000 000	0.004
100%		+30	1754 299 998	4.5	0.000 000	0.003
100%		+40	1754 300 000	6.9	0.000 000	0.004
100%		+50	1754 299 985	-8.7	0.000 000	-0.005
Batt. Endpoint	3.40	+20	1754 299 989	-4.2	0.000 000	-0.002



▣ MODE: LTE 4

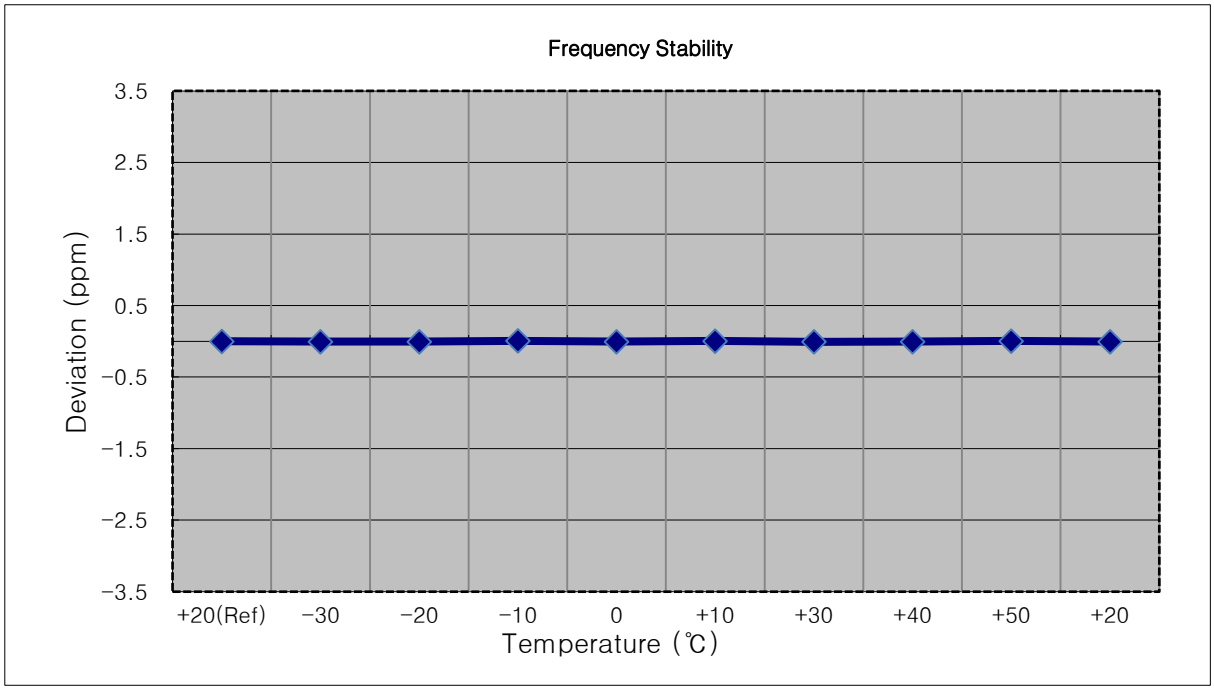
▣ OPERATING FREQUENCY: 1753,500,000 Hz

▣ CHANNEL: 20385 (3 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1753 500 011	0.0	0.000 000	0.000
100%		-30	1753 500 003	-7.8	0.000 000	-0.004
100%		-20	1753 500 003	-8.0	0.000 000	-0.005
100%		-10	1753 500 023	12.4	0.000 001	0.007
100%		0	1753 500 001	-9.6	-0.000 001	-0.005
100%		+10	1753 500 017	6.4	0.000 000	0.004
100%		+30	1753 499 998	-12.8	-0.000 001	-0.007
100%		+40	1753 500 002	-8.7	0.000 000	-0.005
100%		+50	1753 500 020	8.7	0.000 000	0.005
Batt. Endpoint	3.40	+20	1753 500 002	-9.0	-0.000 001	-0.005



▣ MODE: LTE 4

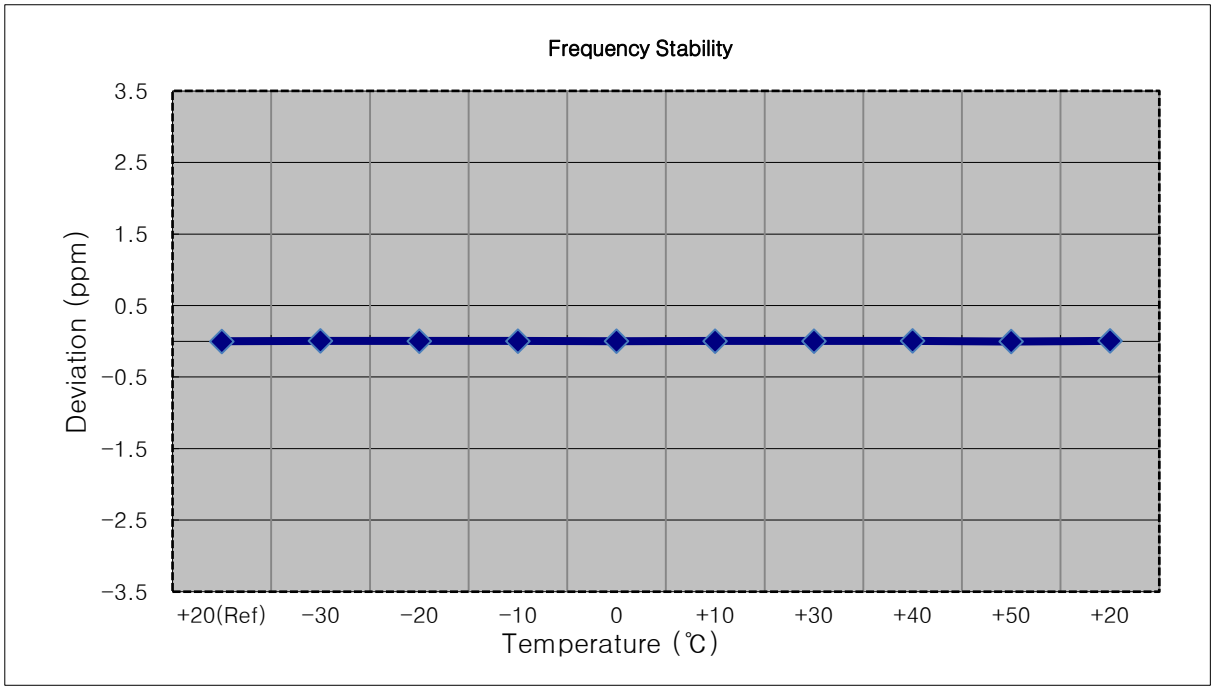
▣ OPERATING FREQUENCY: 1752,500,000 Hz

▣ CHANNEL: 20375 (5 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1752 500 009	0.0	0.000 000	0.000
100%		-30	1752 500 018	9.9	0.000 001	0.006
100%		-20	1752 500 015	6.7	0.000 000	0.004
100%		-10	1752 500 016	7.8	0.000 000	0.004
100%		0	1752 500 013	4.9	0.000 000	0.003
100%		+10	1752 500 017	8.6	0.000 000	0.005
100%		+30	1752 500 017	8.2	0.000 000	0.005
100%		+40	1752 500 022	13.1	0.000 001	0.007
100%		+50	1752 500 003	-5.6	0.000 000	-0.003
Batt. Endpoint	3.40	+20	1752 500 019	10.1	0.000 001	0.006



▣ MODE: LTE 4

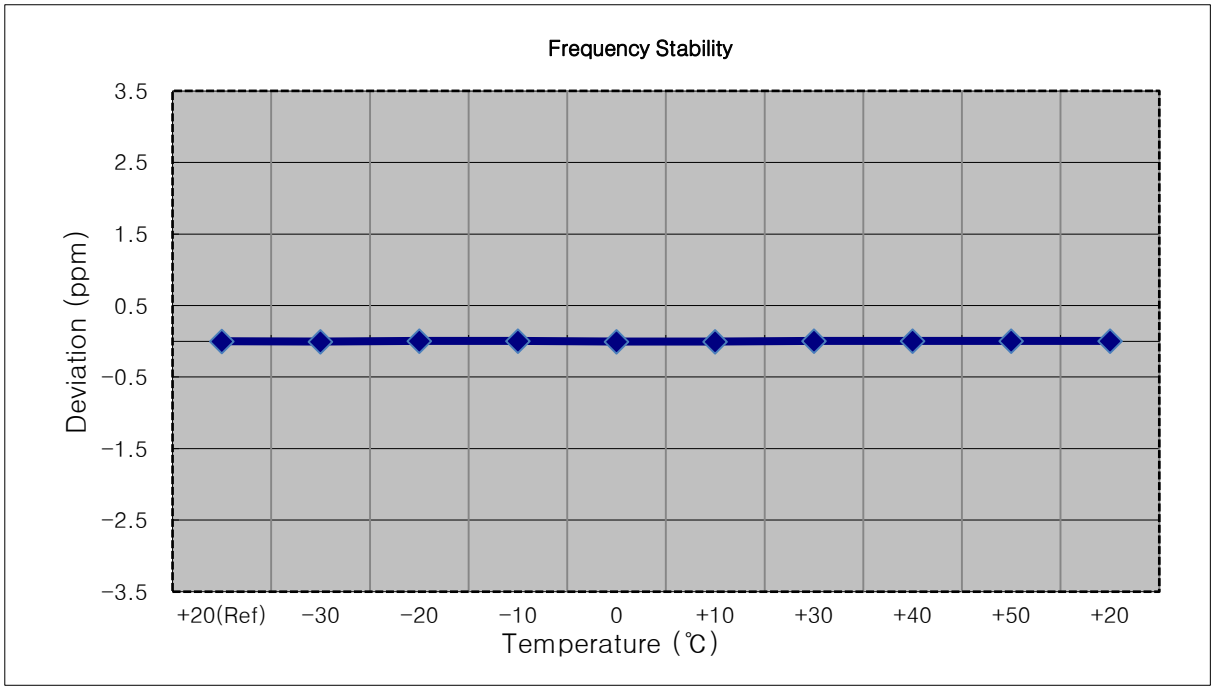
▣ OPERATING FREQUENCY: 1750,000,000 Hz

▣ CHANNEL: 20350 (10 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1750 000 012	0.0	0.000 000	0.000
100%		-30	1750 000 003	-8.6	0.000 000	-0.005
100%		-20	1750 000 018	6.4	0.000 000	0.004
100%		-10	1750 000 018	6.3	0.000 000	0.004
100%		0	1750 000 003	-9.0	-0.000 001	-0.005
100%		+10	1750 000 004	-7.5	0.000 000	-0.004
100%		+30	1750 000 021	9.4	0.000 001	0.005
100%		+40	1750 000 020	8.0	0.000 000	0.005
100%		+50	1750 000 020	8.4	0.000 000	0.005
Batt. Endpoint	3.40	+20	1750 000 020	7.6	0.000 000	0.004



▣ MODE: LTE 4

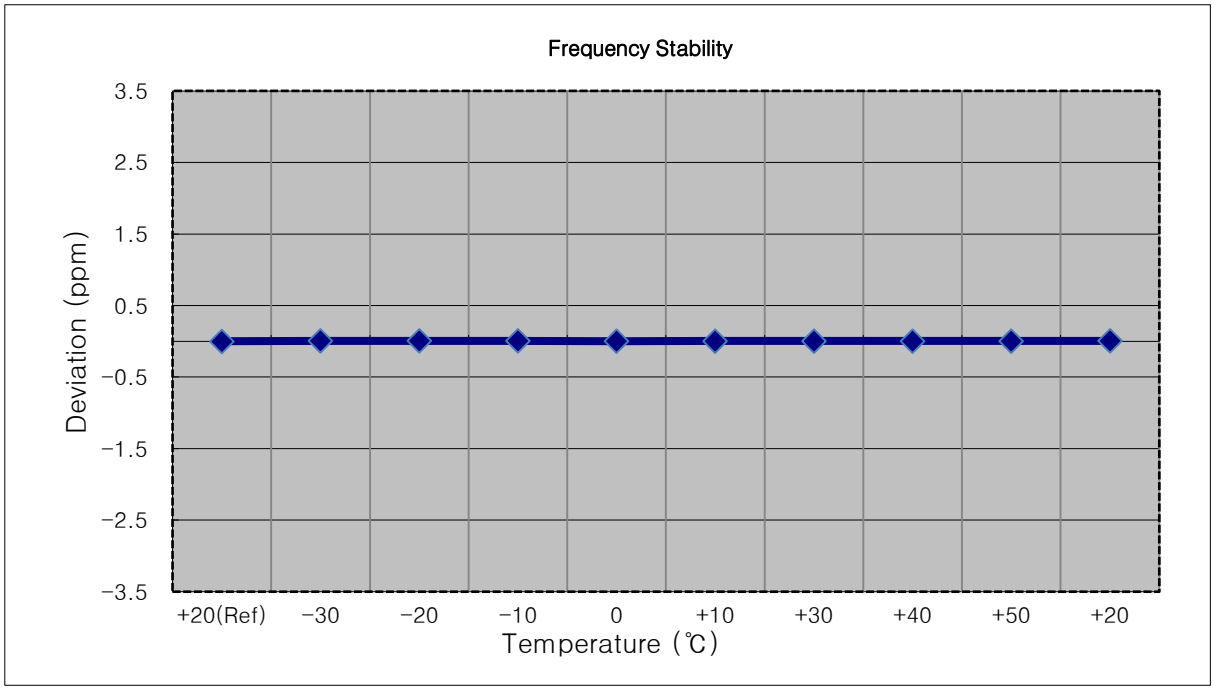
▣ OPERATING FREQUENCY: 1747,500,000 Hz

▣ CHANNEL: 20325 (15 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1747 499 994	0.0	0.000 000	0.000
100%		-30	1747 500 005	10.9	0.000 001	0.006
100%		-20	1747 500 005	10.6	0.000 001	0.006
100%		-10	1747 500 004	9.8	0.000 001	0.006
100%		0	1747 499 999	4.9	0.000 000	0.003
100%		+10	1747 500 001	7.1	0.000 000	0.004
100%		+30	1747 500 002	8.0	0.000 000	0.005
100%		+40	1747 500 003	8.8	0.000 001	0.005
100%		+50	1747 500 000	6.4	0.000 000	0.004
Batt. Endpoint	3.40	+20	1747 500 004	9.8	0.000 001	0.006



▣ MODE: LTE 4

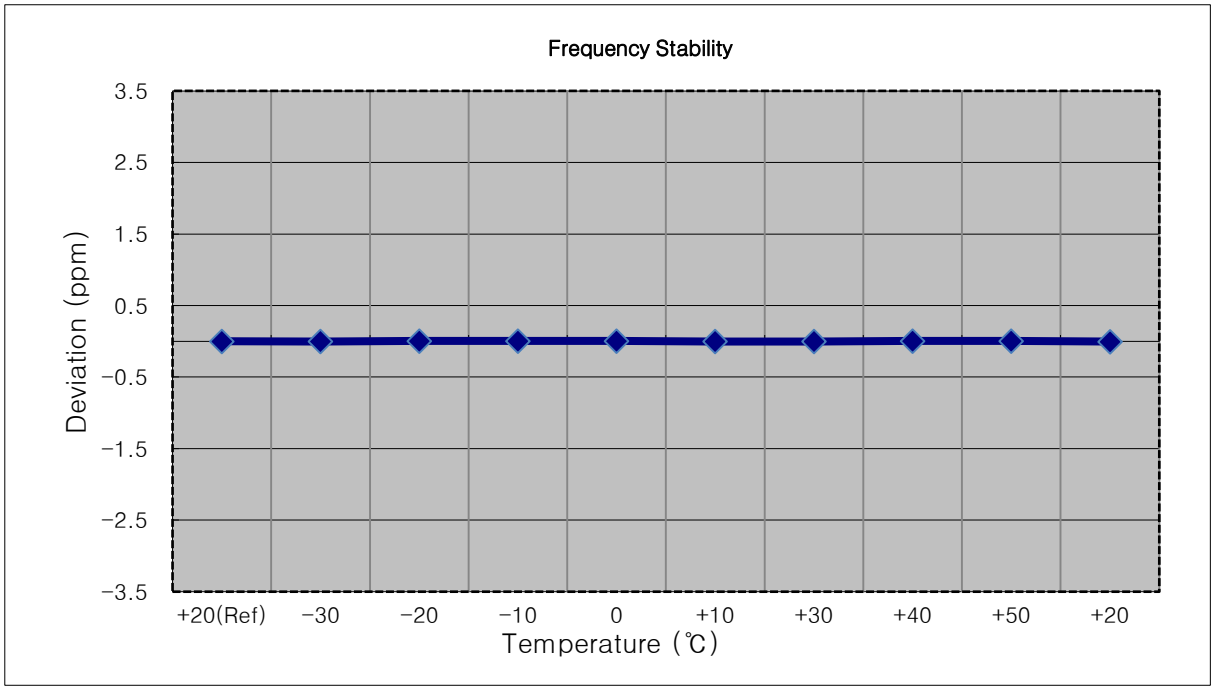
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 20300 (20 MHz)

▣ REFERENCE VOLTAGE: 3.80 VDC

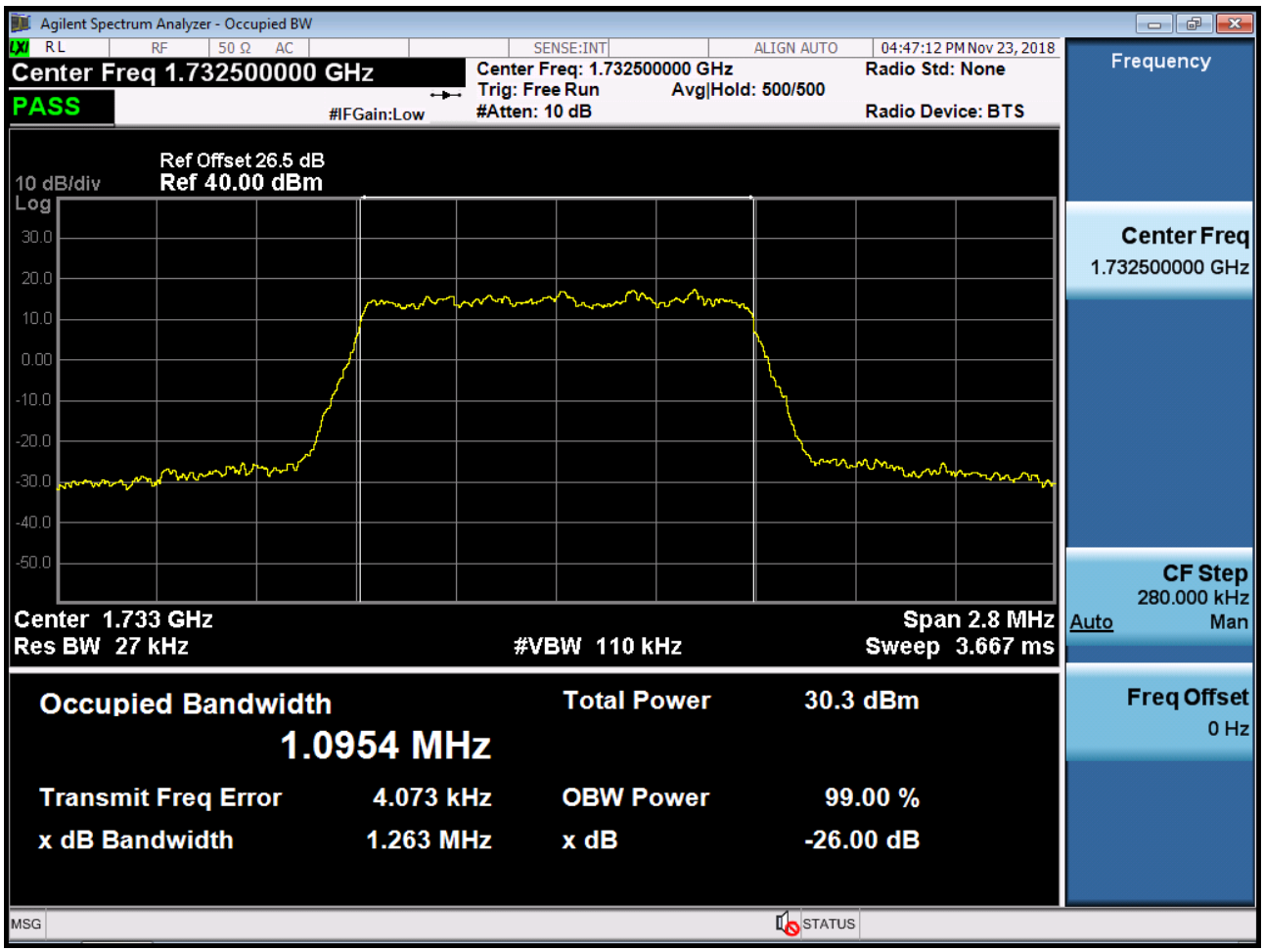
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1745 000 008	0.0	0.000 000	0.000
100%		-30	1745 000 003	-5.7	0.000 000	-0.003
100%		-20	1745 000 015	7.2	0.000 000	0.004
100%		-10	1745 000 015	6.6	0.000 000	0.004
100%		0	1745 000 015	6.7	0.000 000	0.004
100%		+10	1745 000 003	-5.2	0.000 000	-0.003
100%		+30	1745 000 004	-4.6	0.000 000	-0.003
100%		+40	1745 000 017	9.0	0.000 001	0.005
100%		+50	1745 000 016	7.9	0.000 000	0.005
Batt. Endpoint	3.40	+20	1745 000 000	-7.9	0.000 000	-0.005

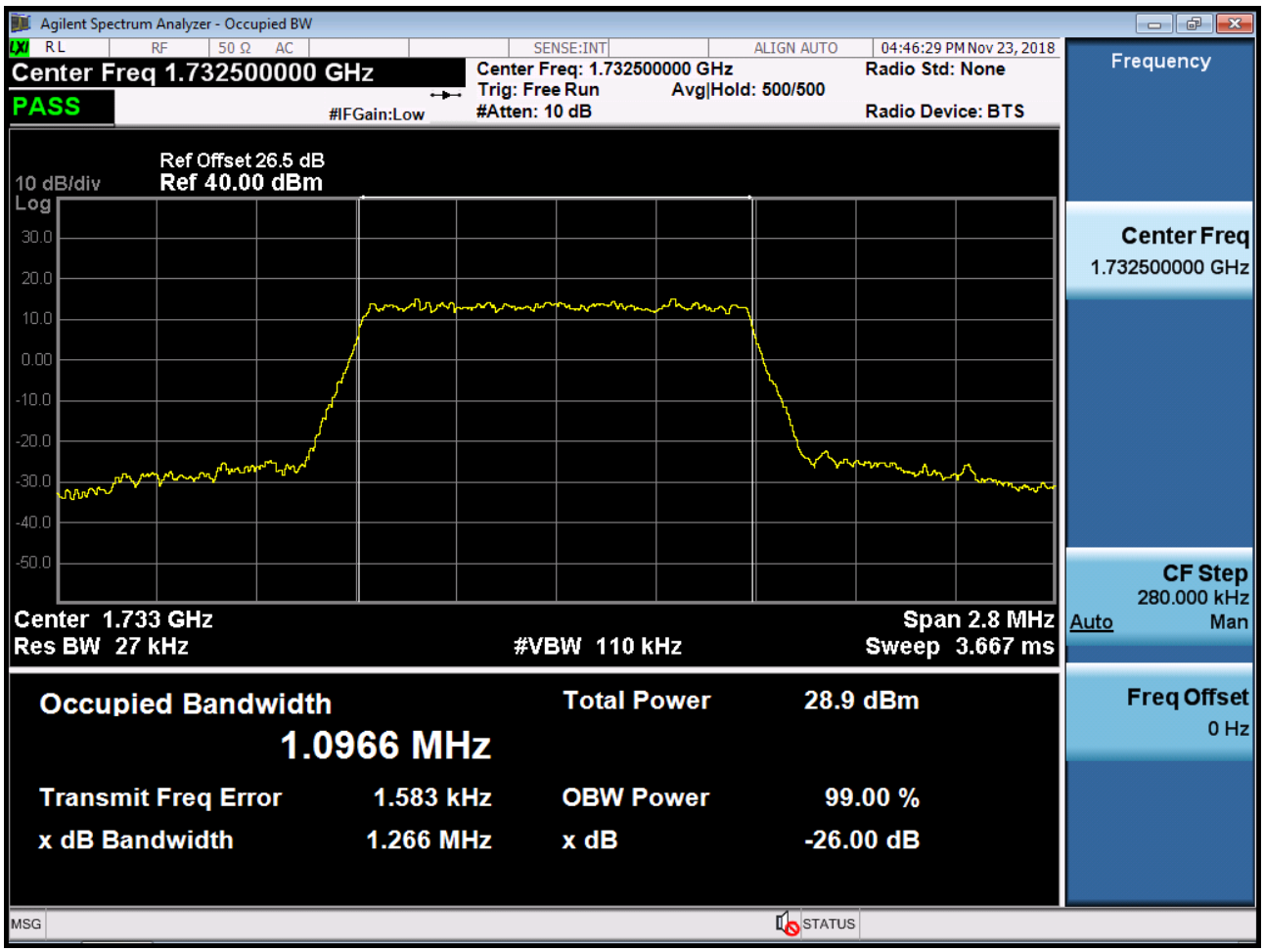


9. TEST PLOTS

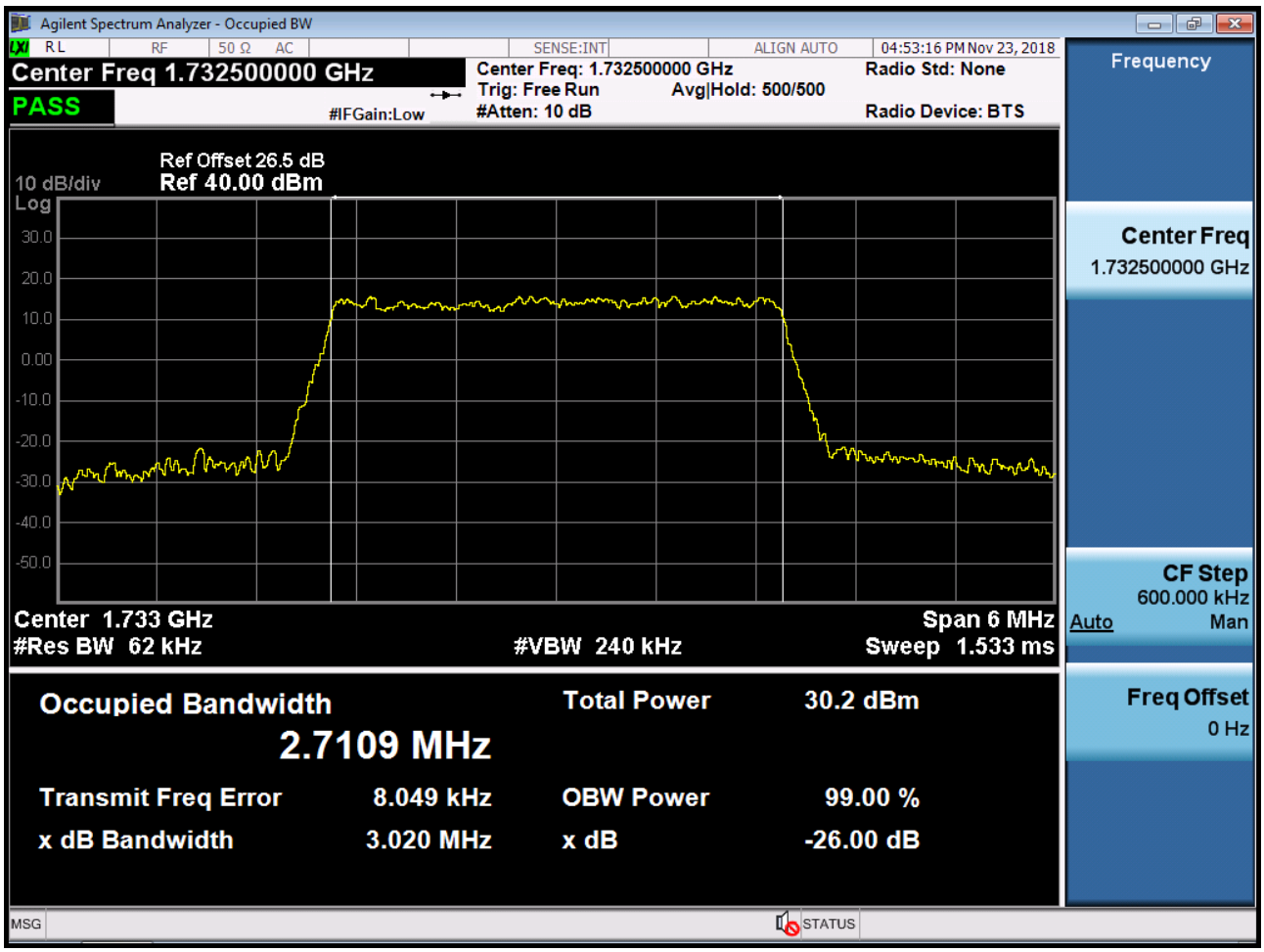
BAND 4. Occupied Bandwidth Plot (1.4M BW Ch.20175 QPSK RB 6)



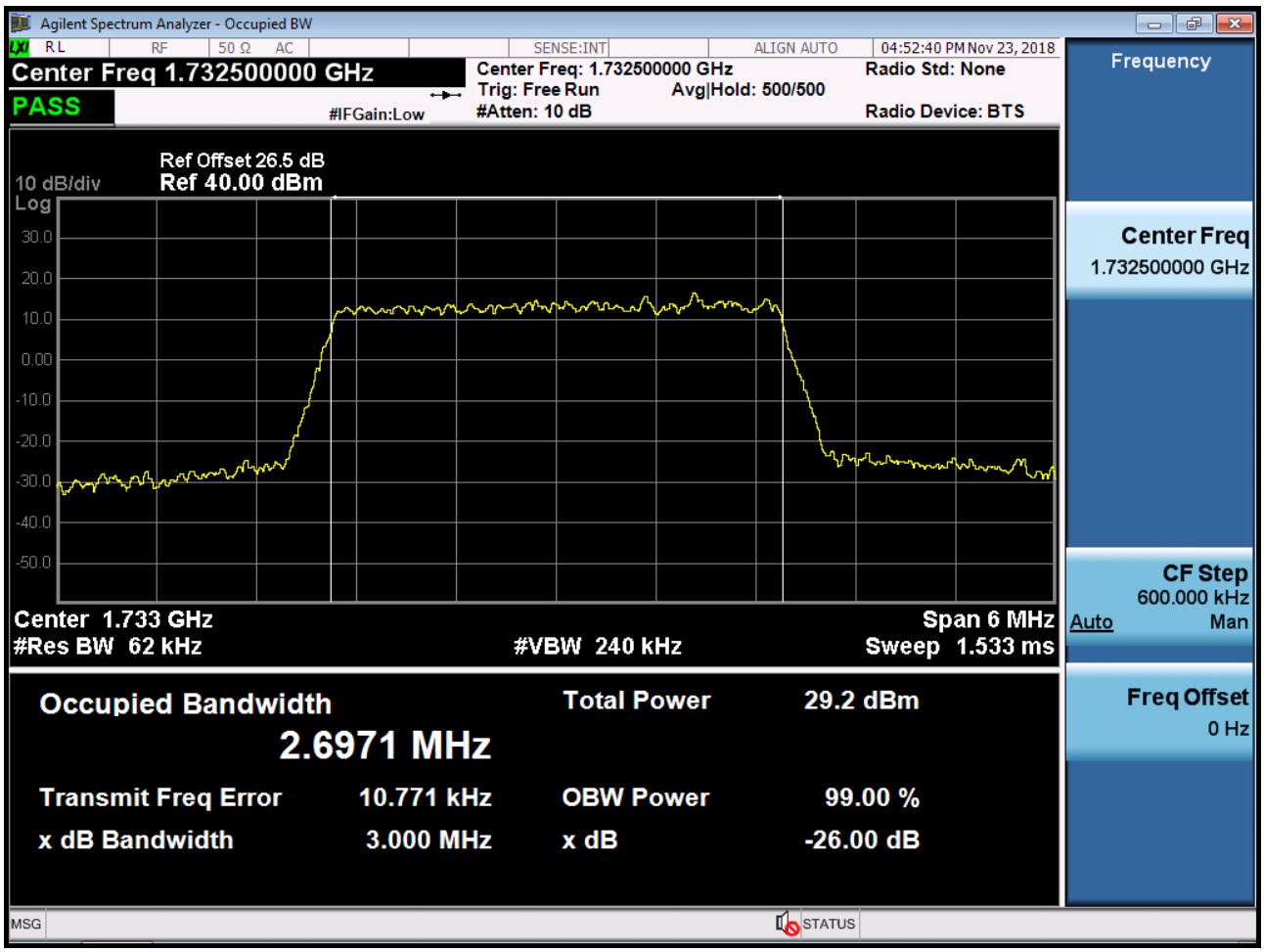
BAND 4. Occupied Bandwidth Plot (1.4M BW Ch.20175 16QAM RB 6)



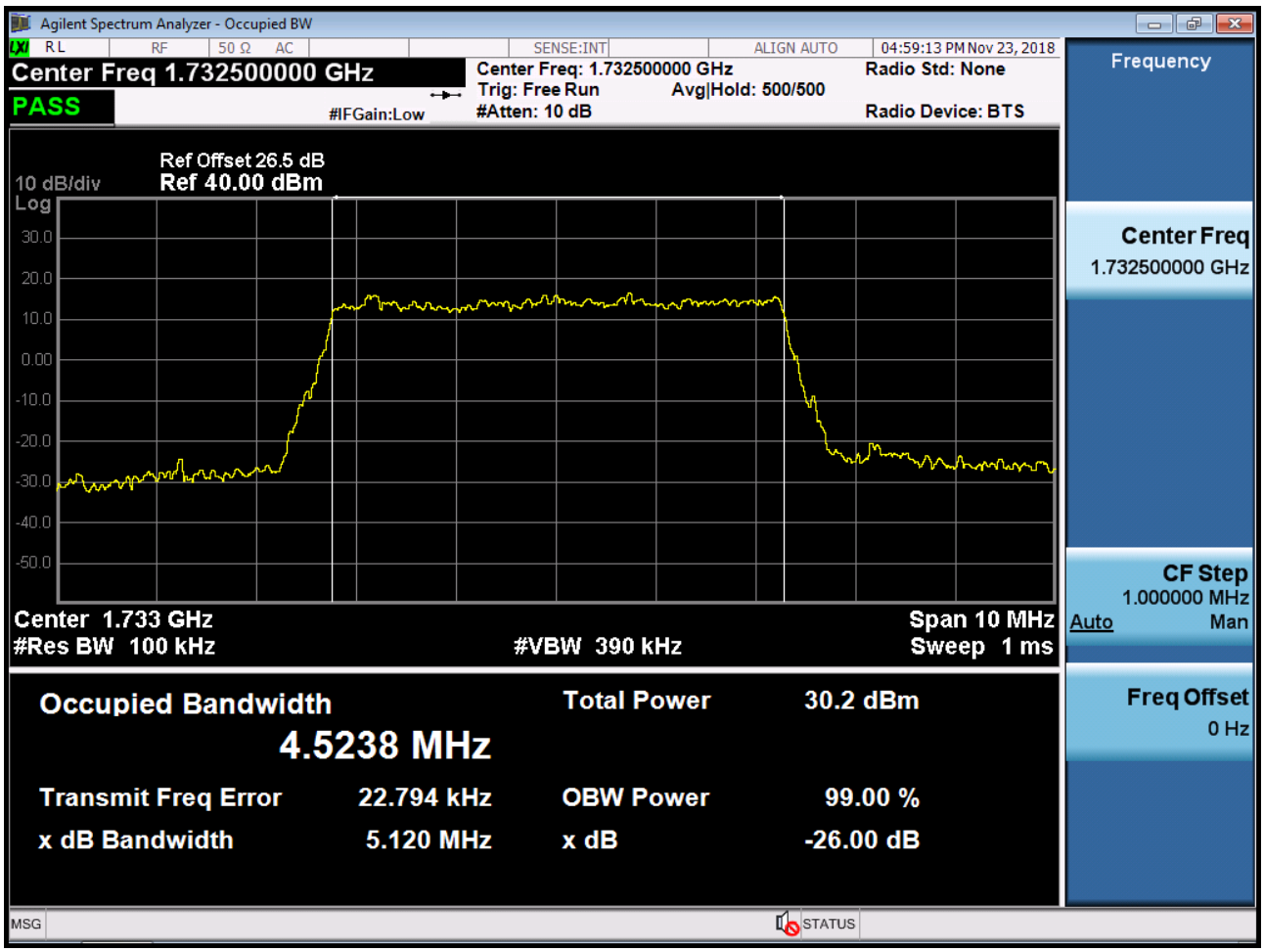
BAND 4. Occupied Bandwidth Plot (3M BW Ch.20175 QPSK RB 15)



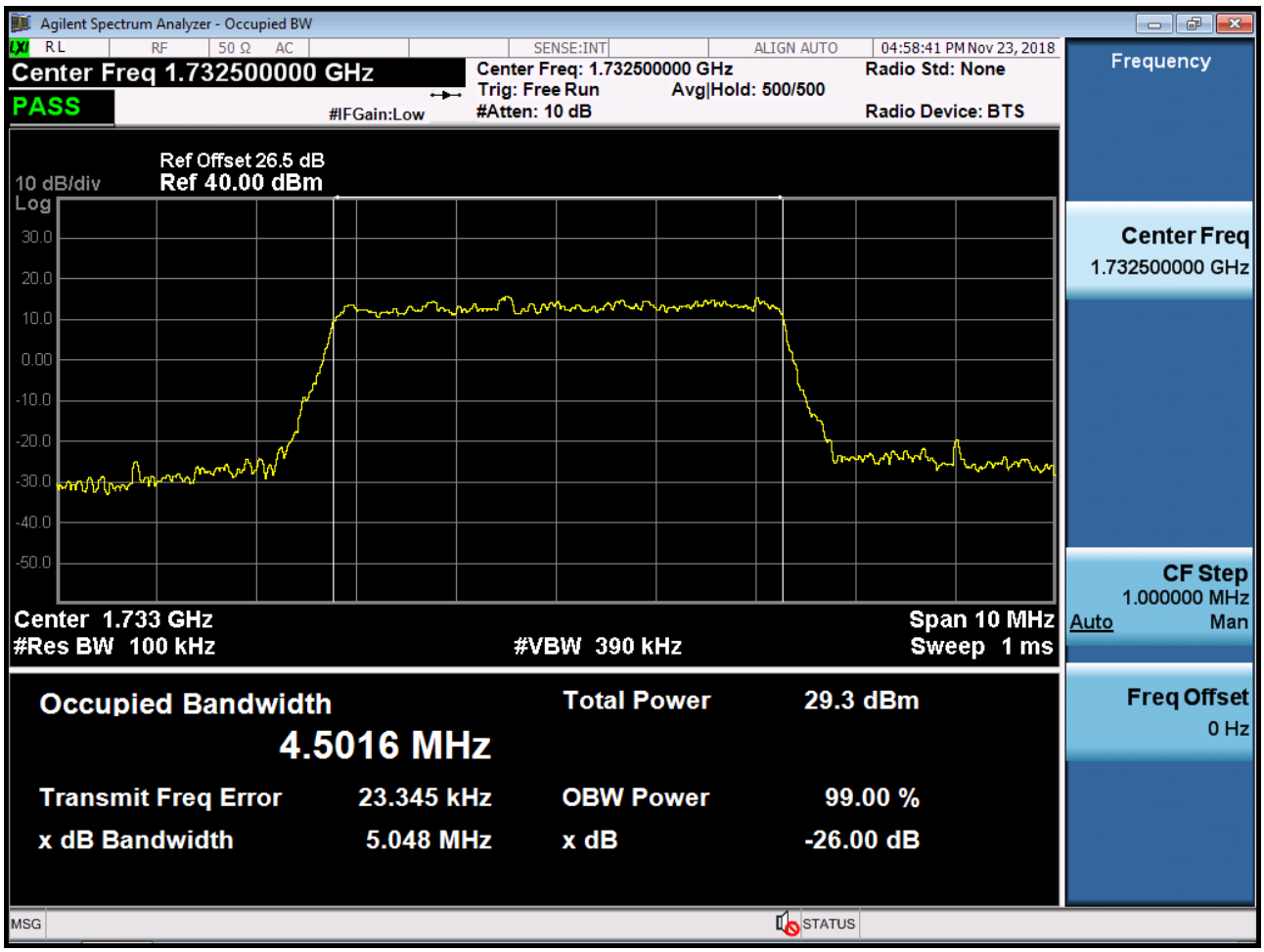
BAND 4. Occupied Bandwidth Plot (3M BW Ch.20175 16QAM RB 15)



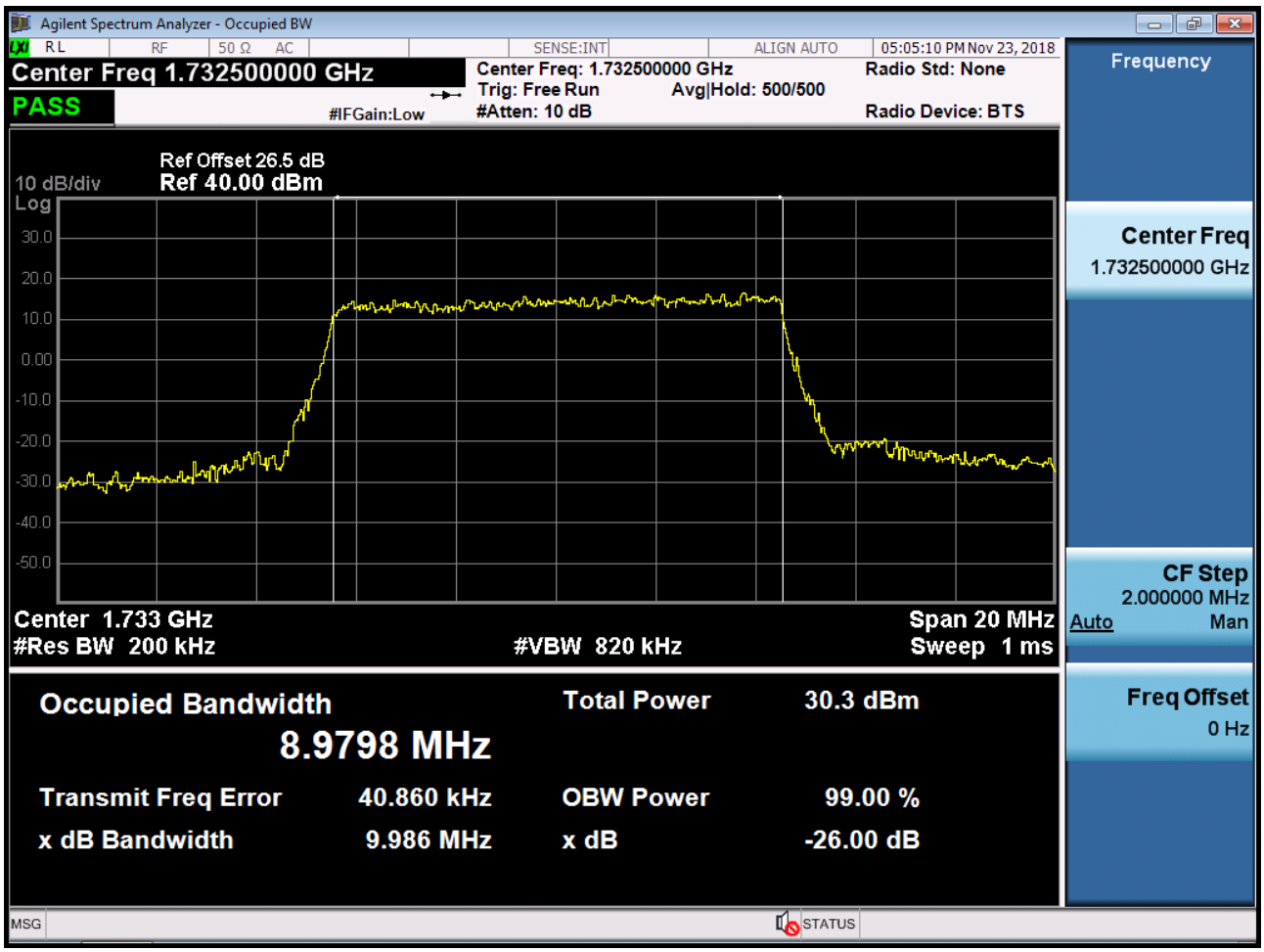
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 QPSK RB 25)



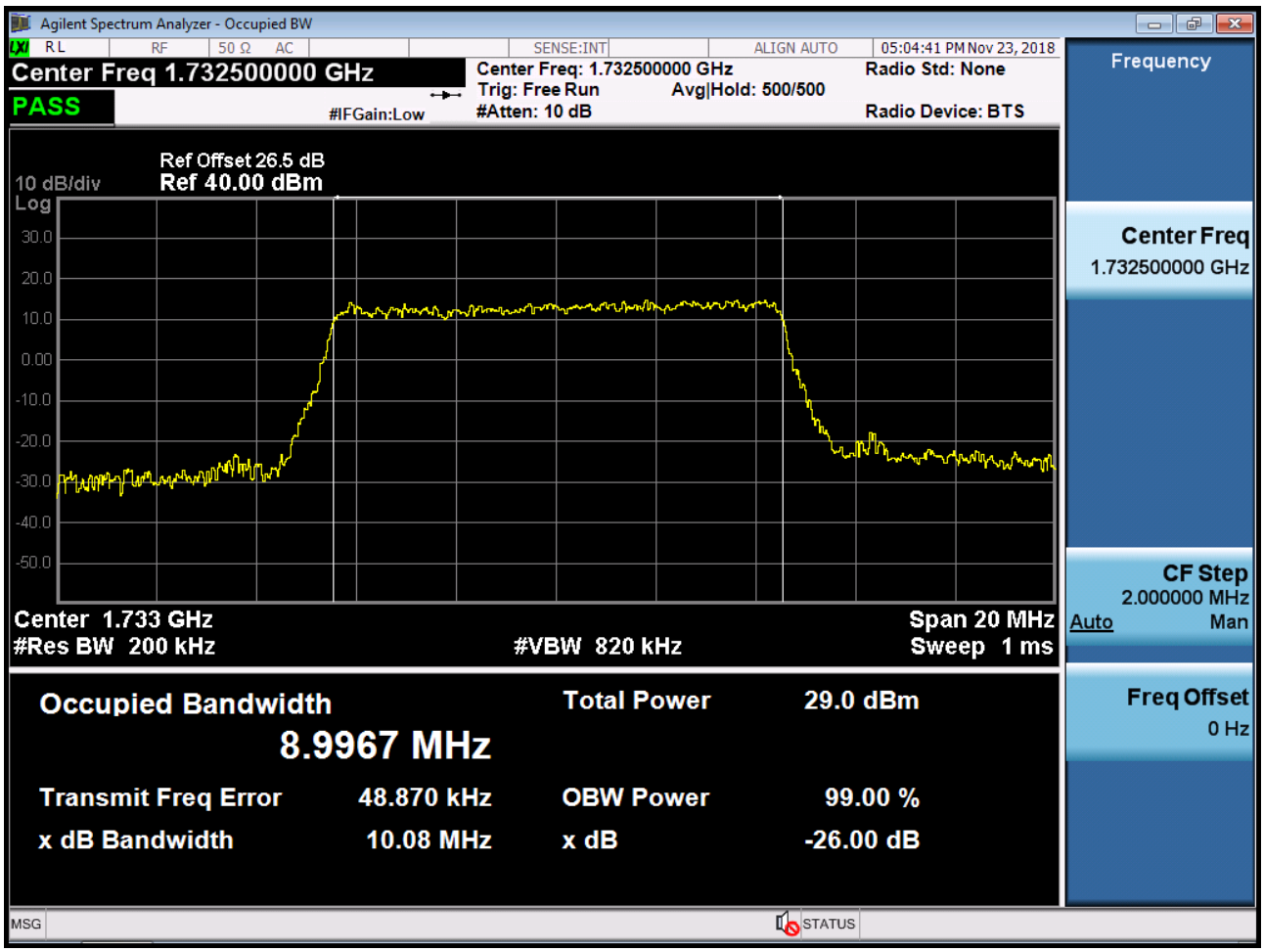
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 16QAM RB 25)



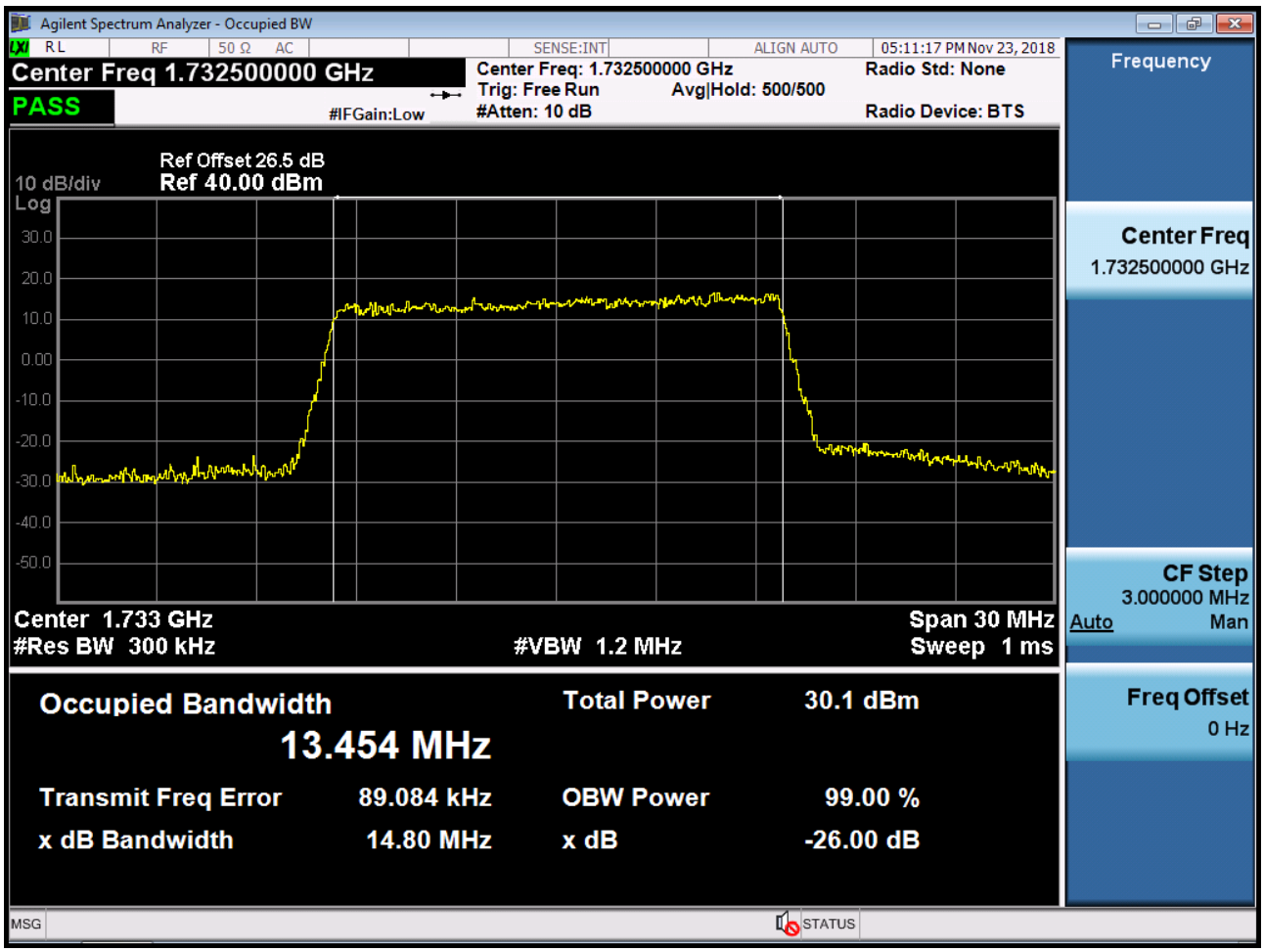
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 QPSK RB 50)



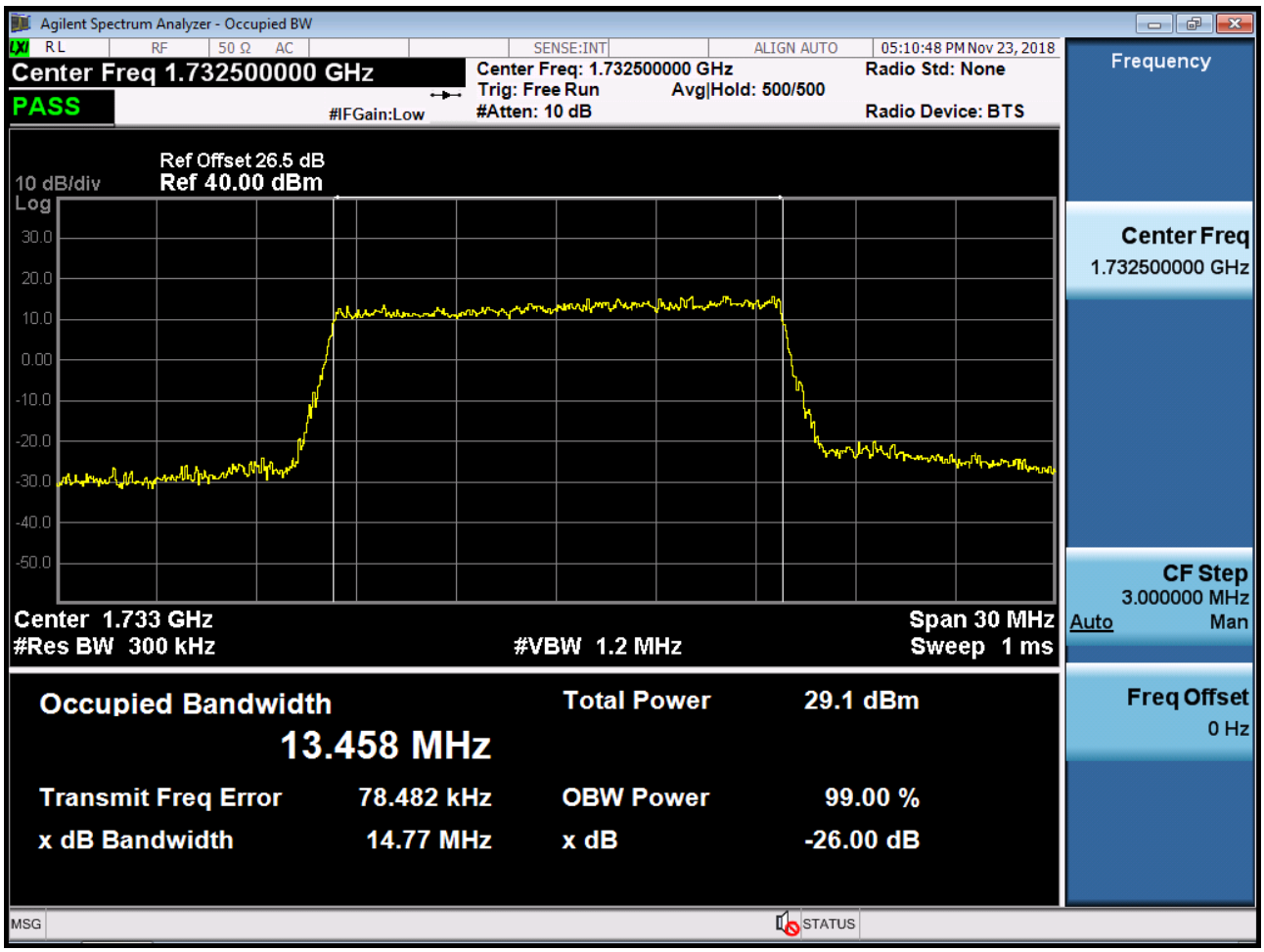
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 16QAM RB 50)



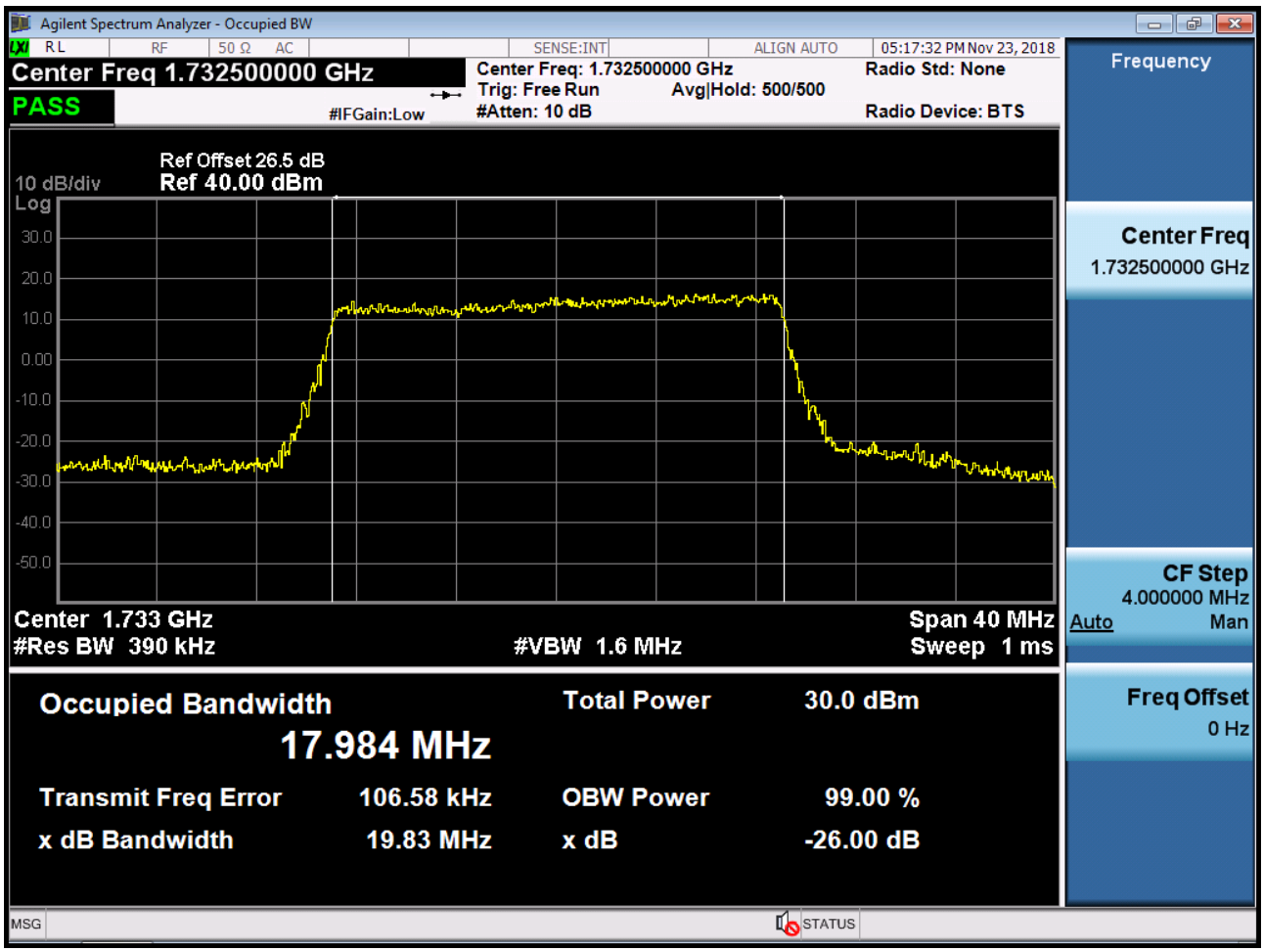
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 QPSK RB 75)



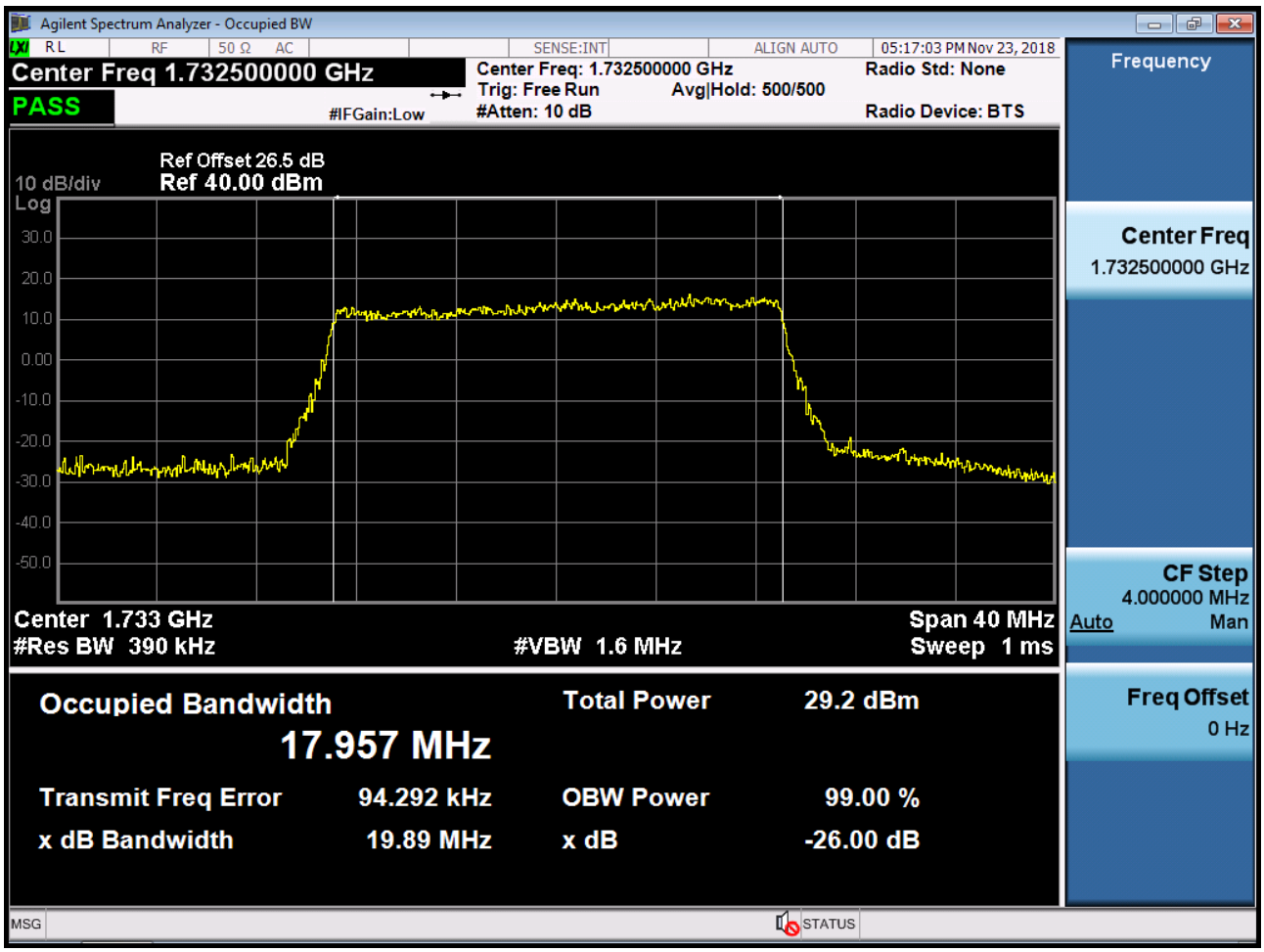
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 16QAM RB 75)



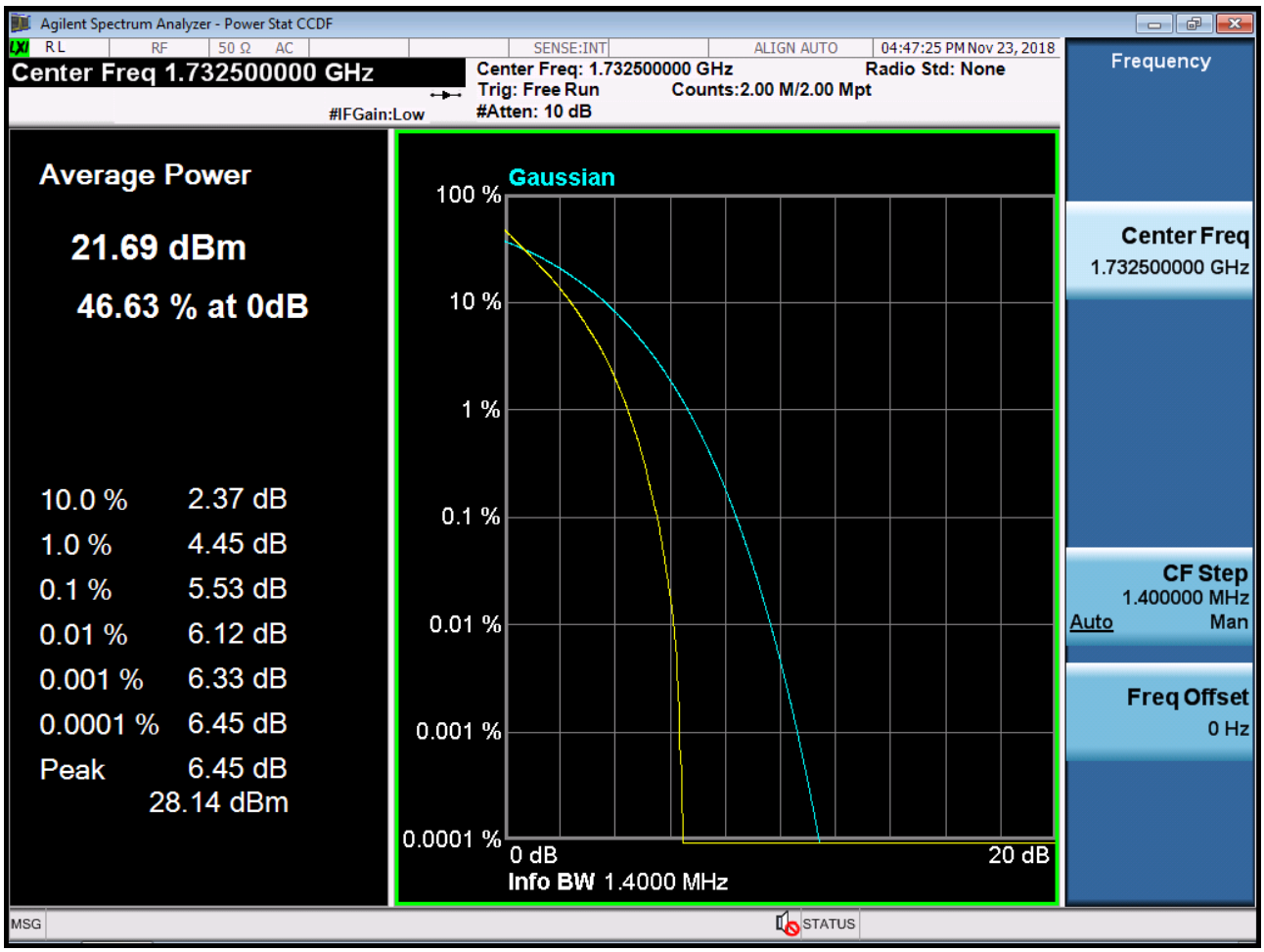
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 QPSK RB 100)



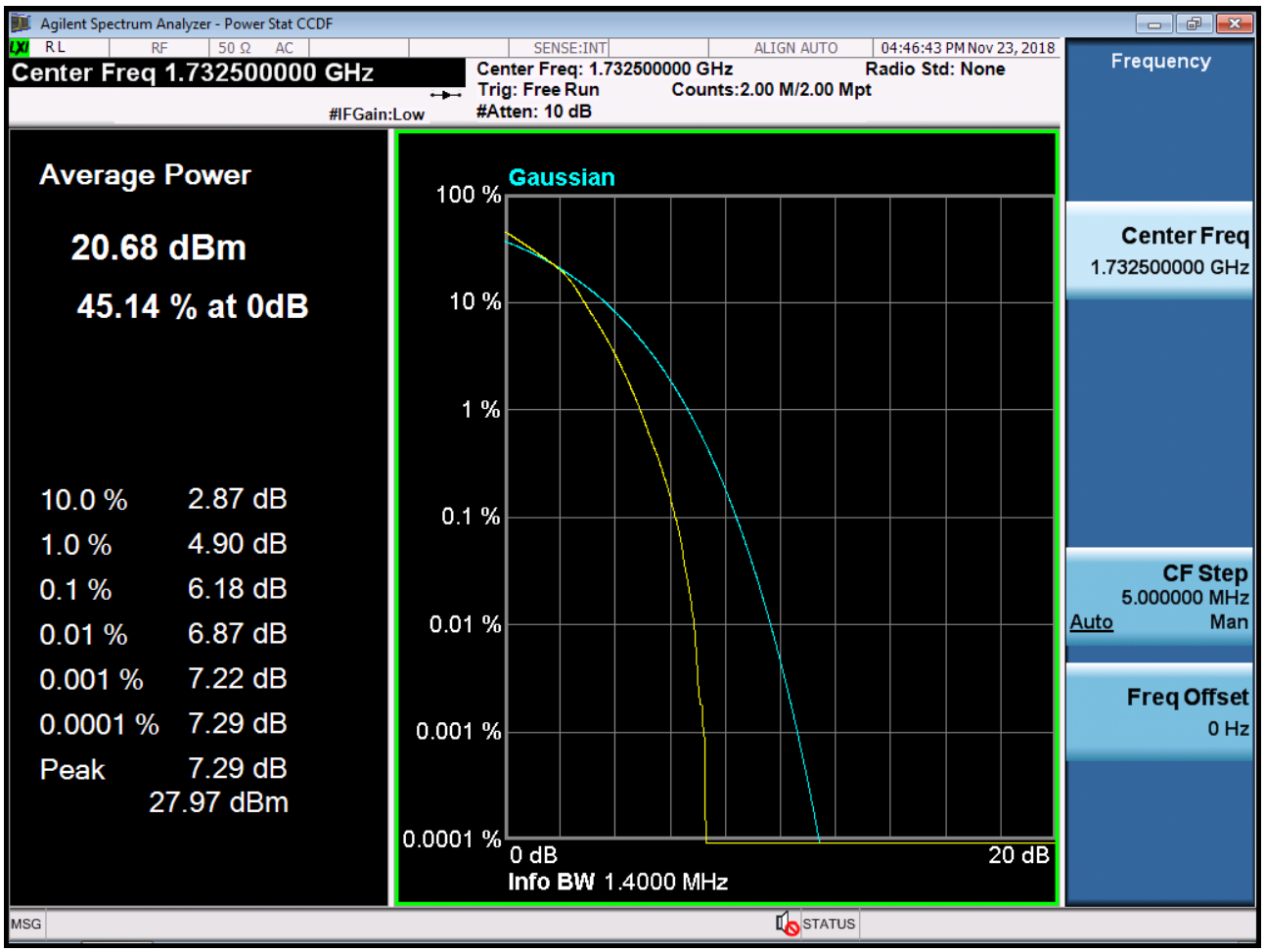
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 16QAM RB 100)



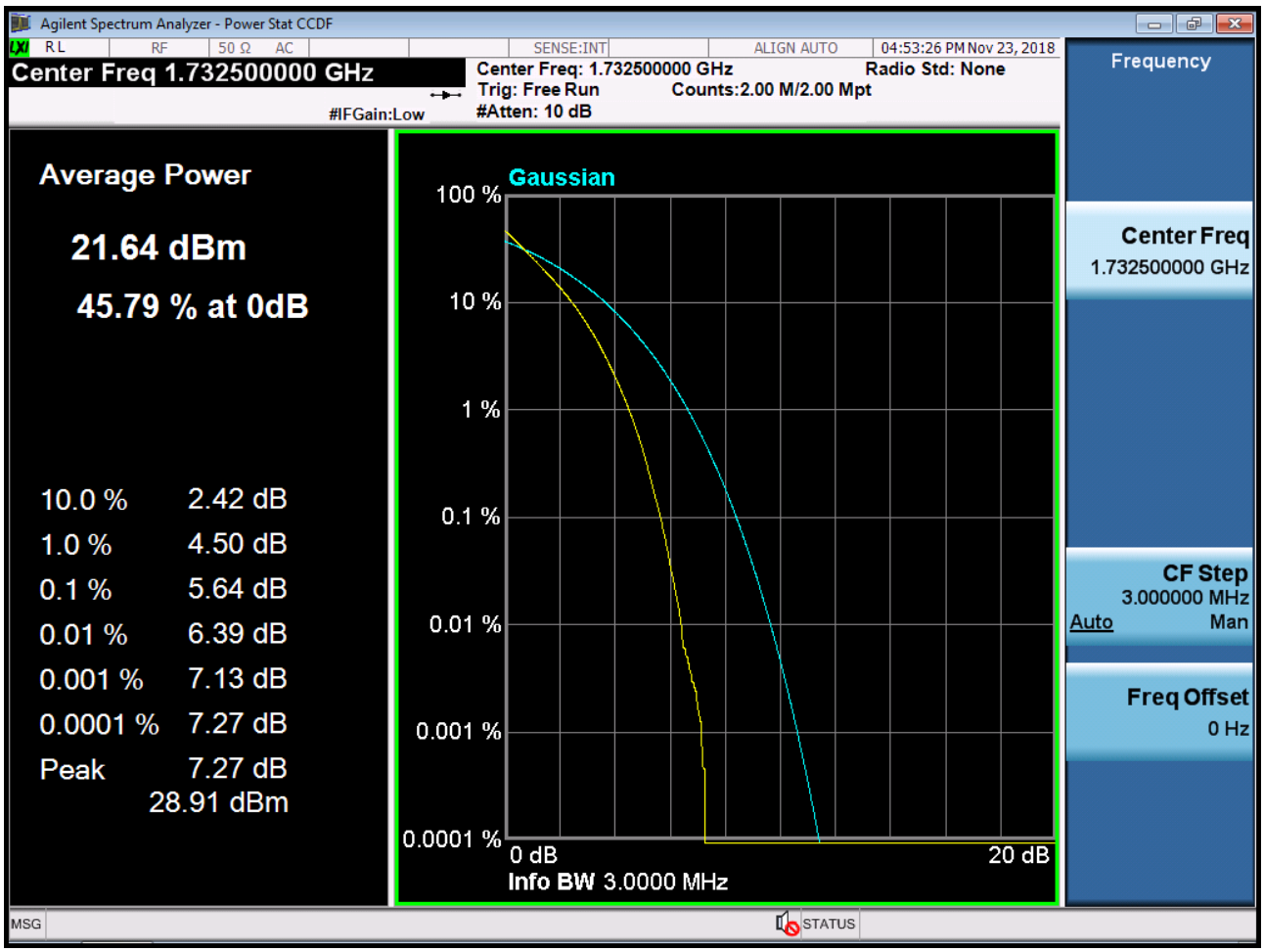
BAND 4. PAR Plot (1.4M BW_Ch.20175_QPSK_RB6_0)



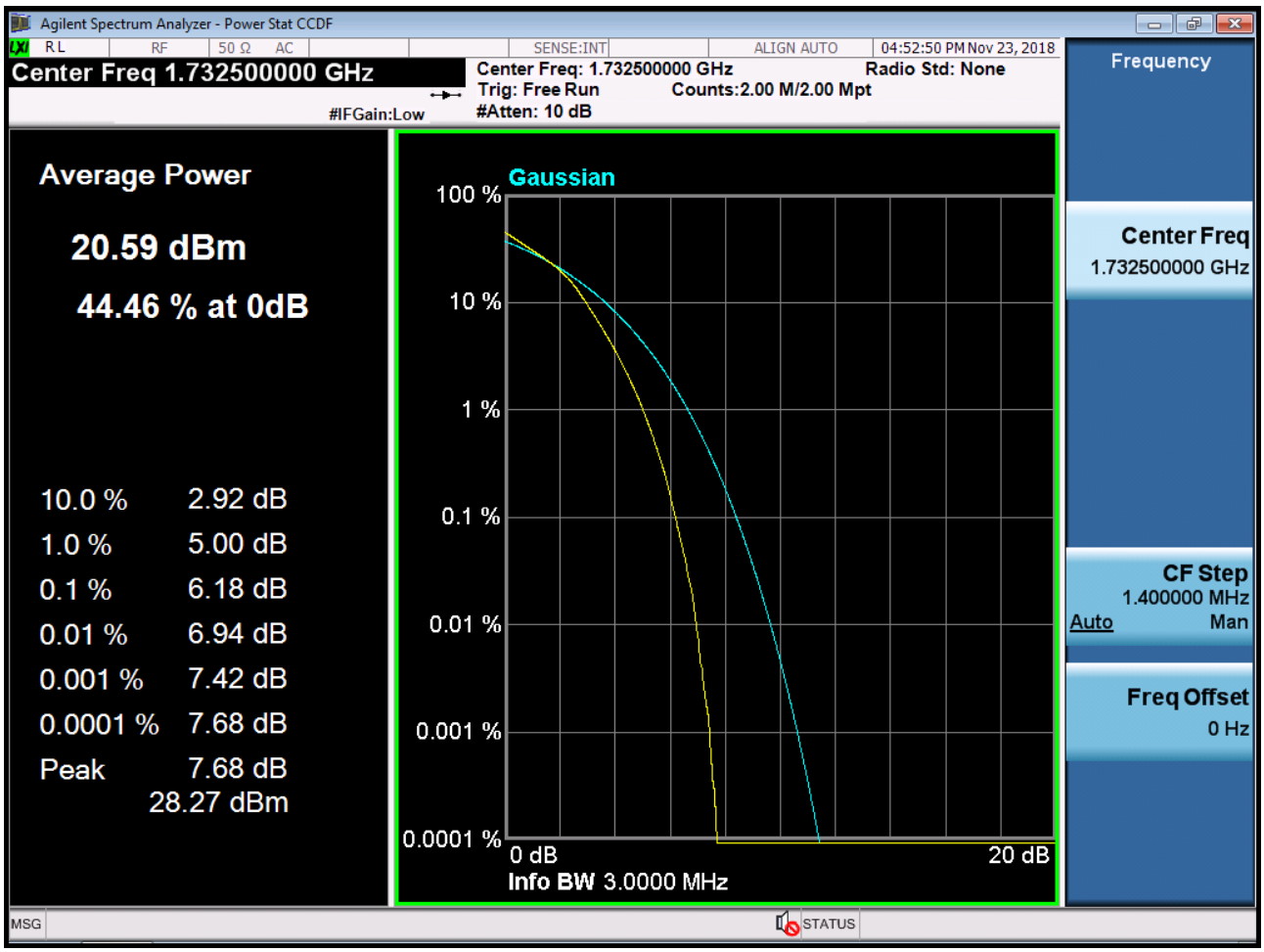
BAND 4. PAR Plot (1.4M BW_Ch.20175_16QAM_RB6_0)



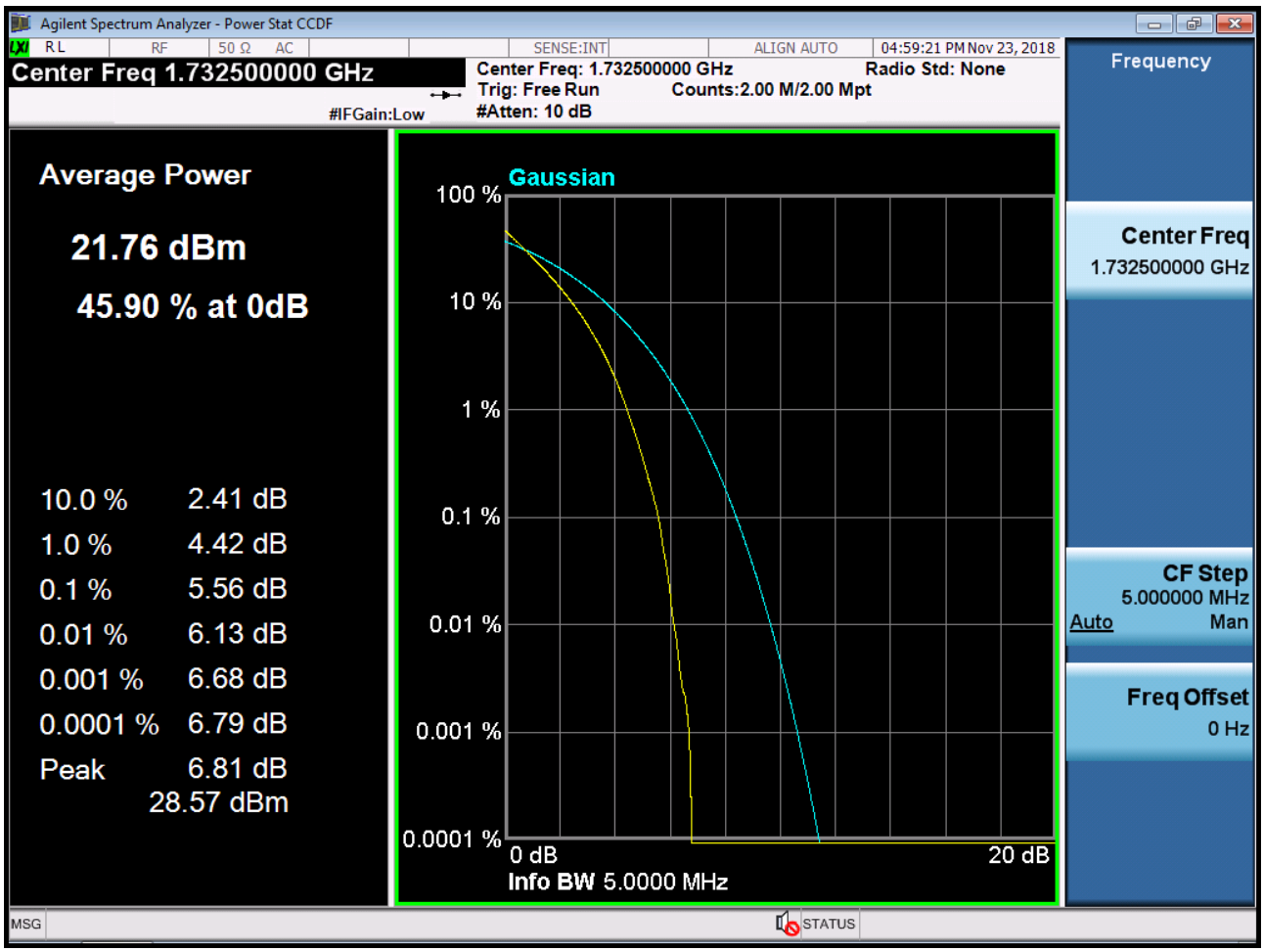
BAND 4. PAR Plot (3M BW_Ch.20175_QPSK_RB15_0)



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



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

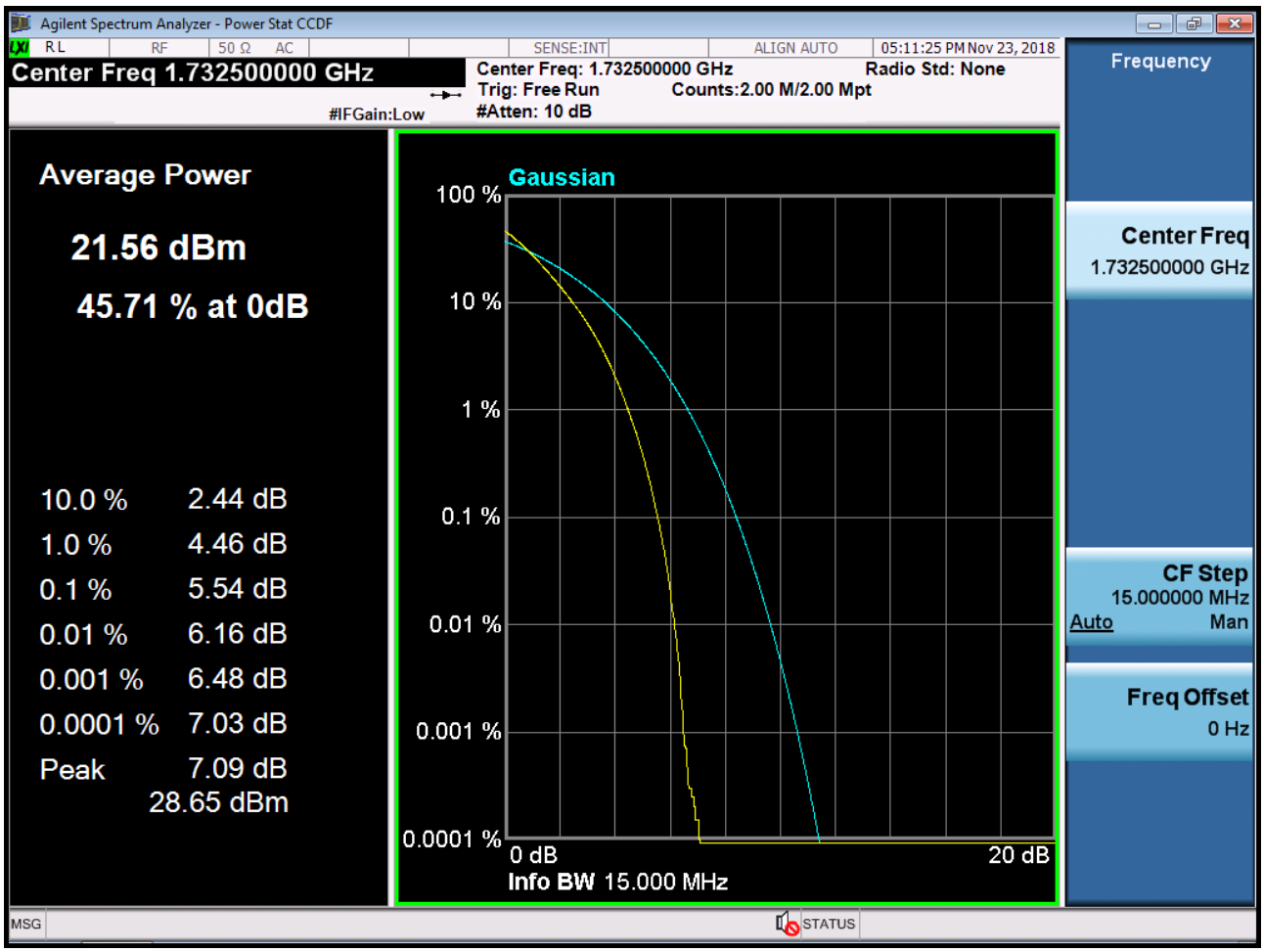


BAND 4. PAR Plot (5M BW_Ch.20175_16QAM_RB25_0)

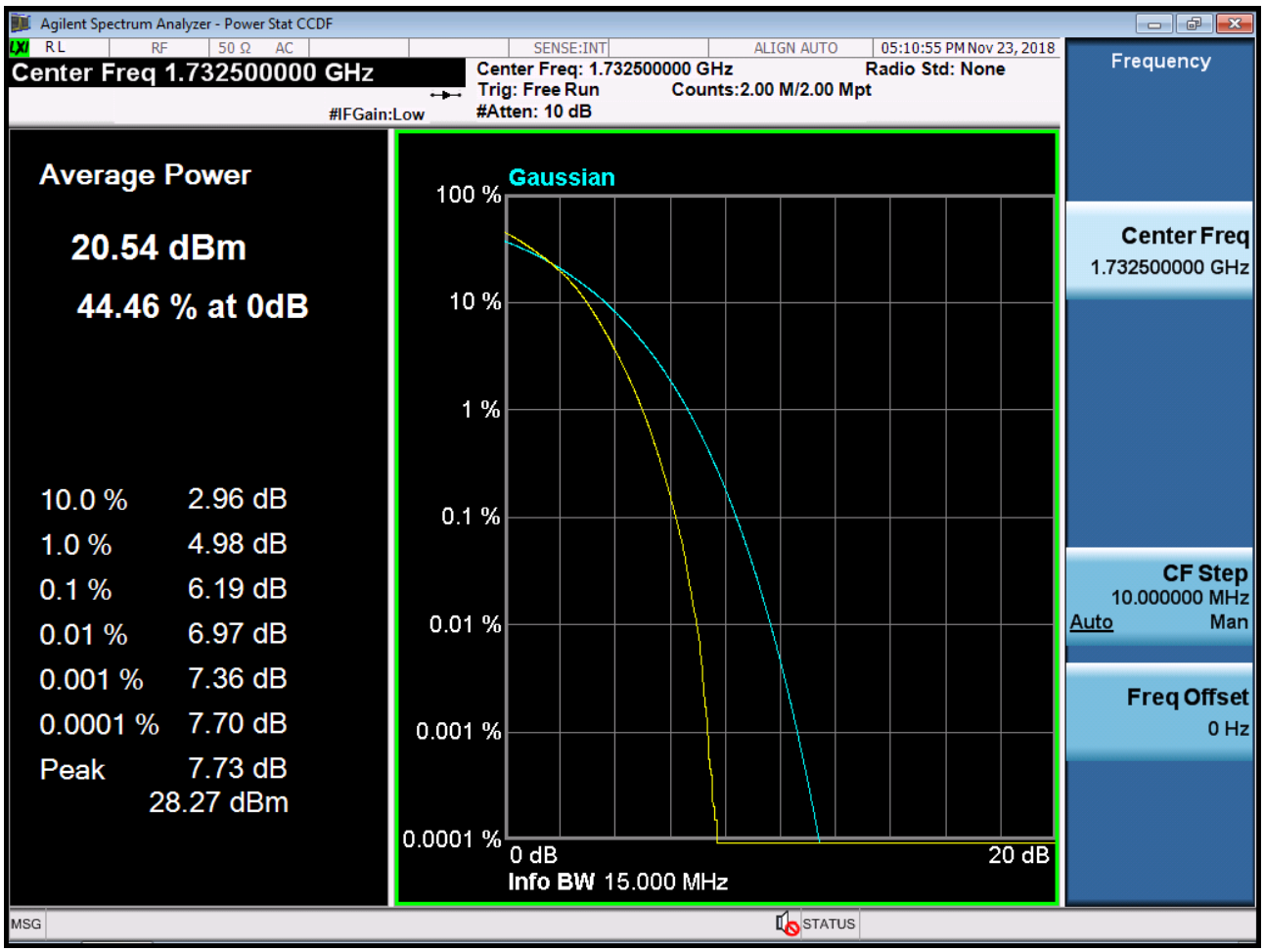
BAND 4. PAR Plot (10M BW_Ch.20175_QPSK_RB50_0)

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

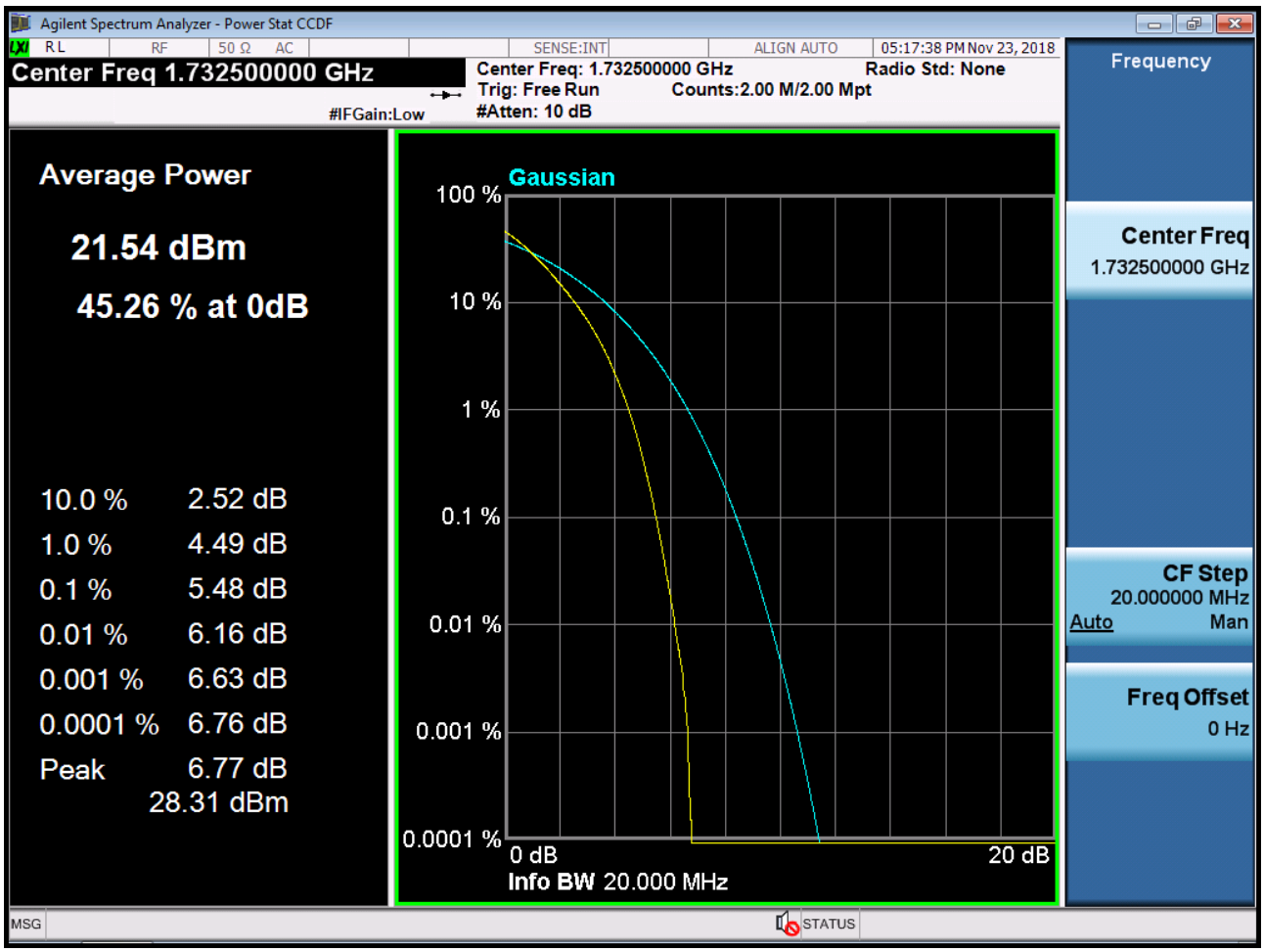
BAND 4. PAR Plot (15M BW_Ch.20175_QPSK_RB75_0)



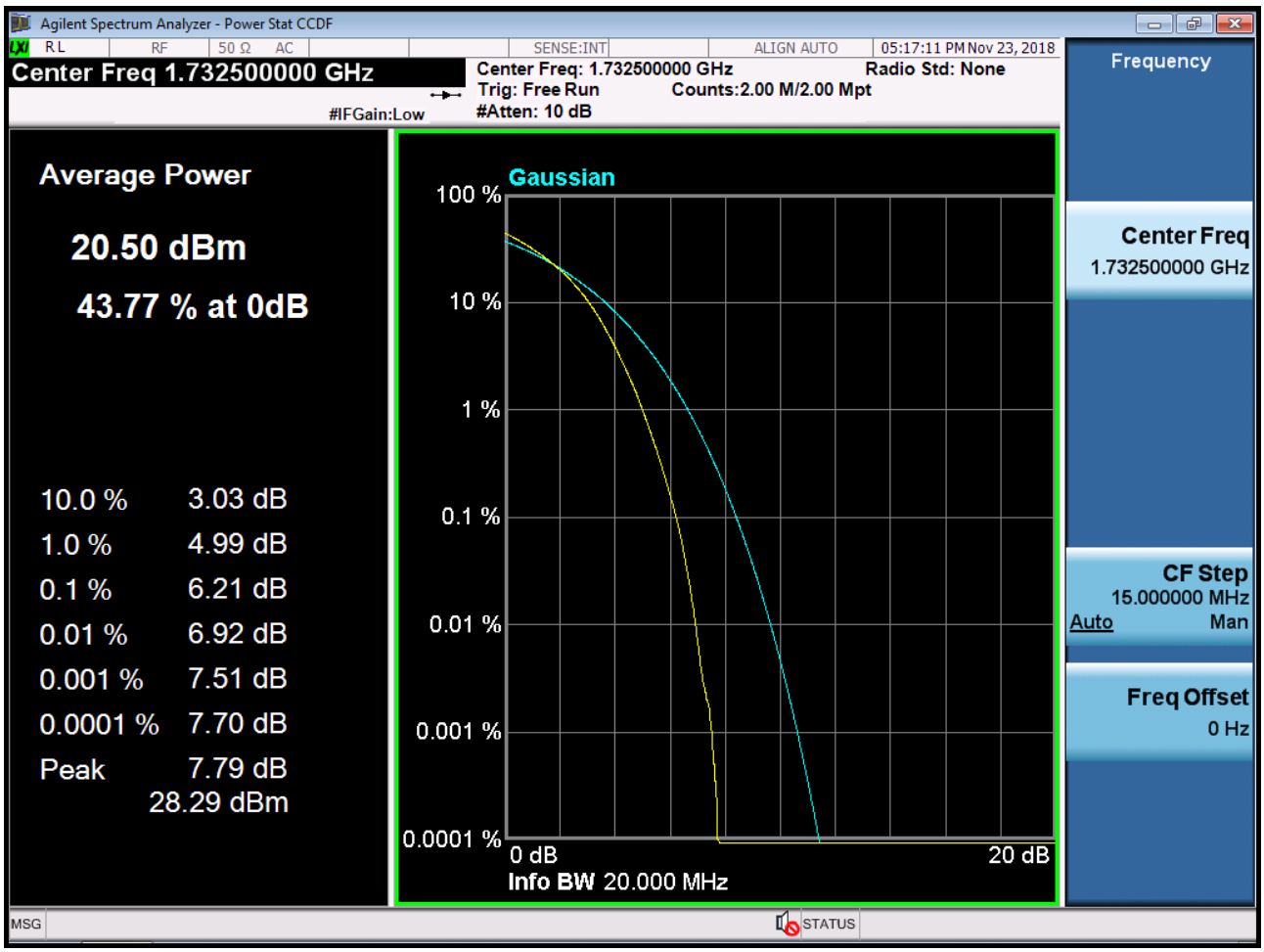
BAND 4. PAR Plot (15M BW_Ch.20175_16QAM_RB75_0)



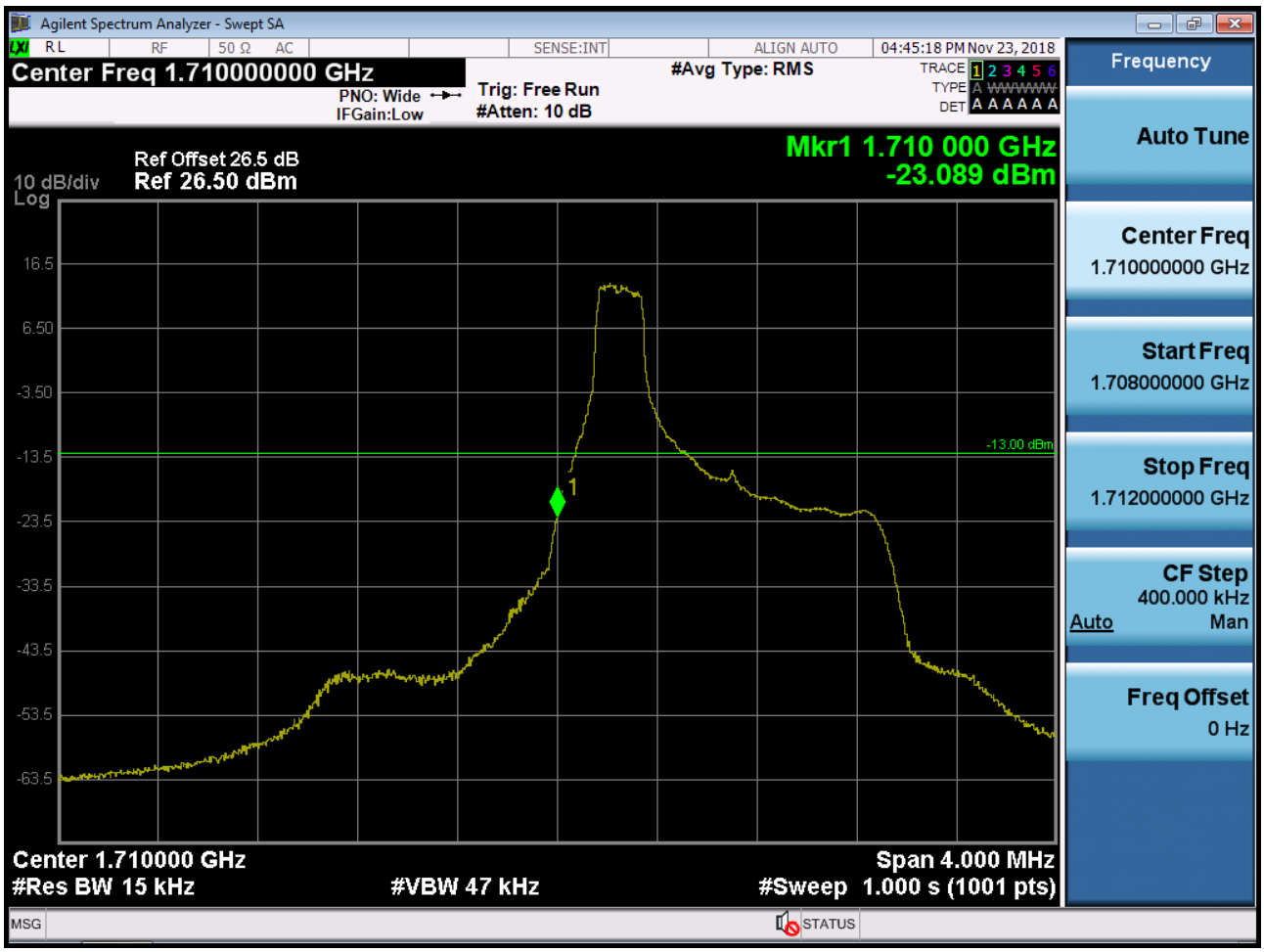
BAND 4. PAR Plot (20M BW_Ch.20175_QPSK_RB100_0)



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