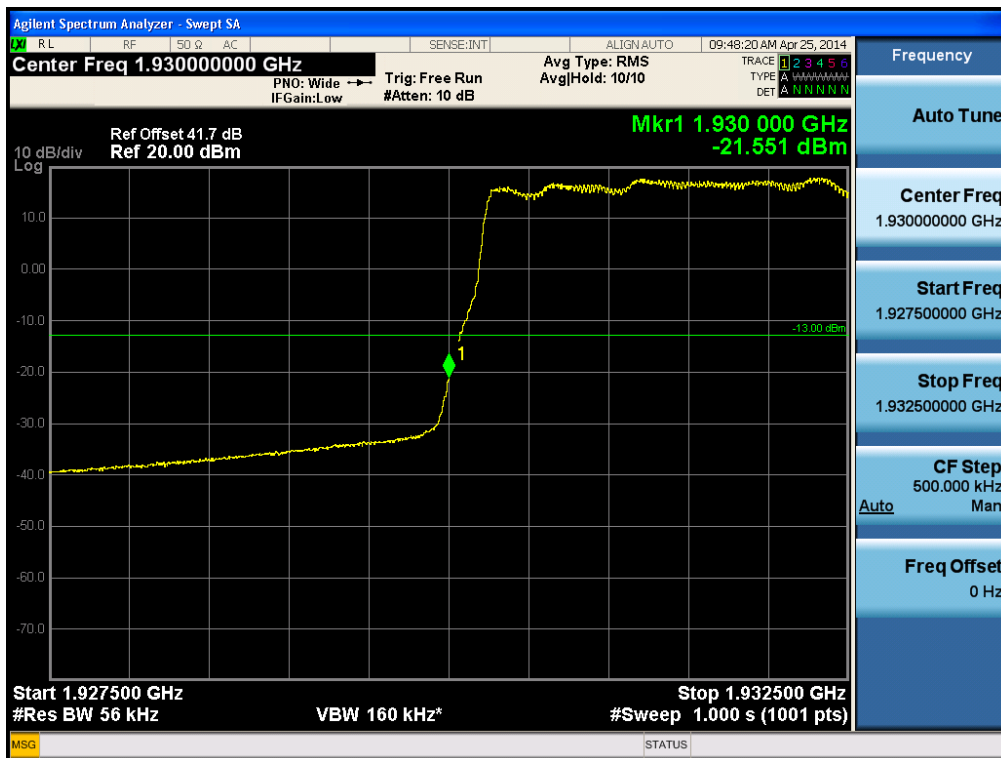


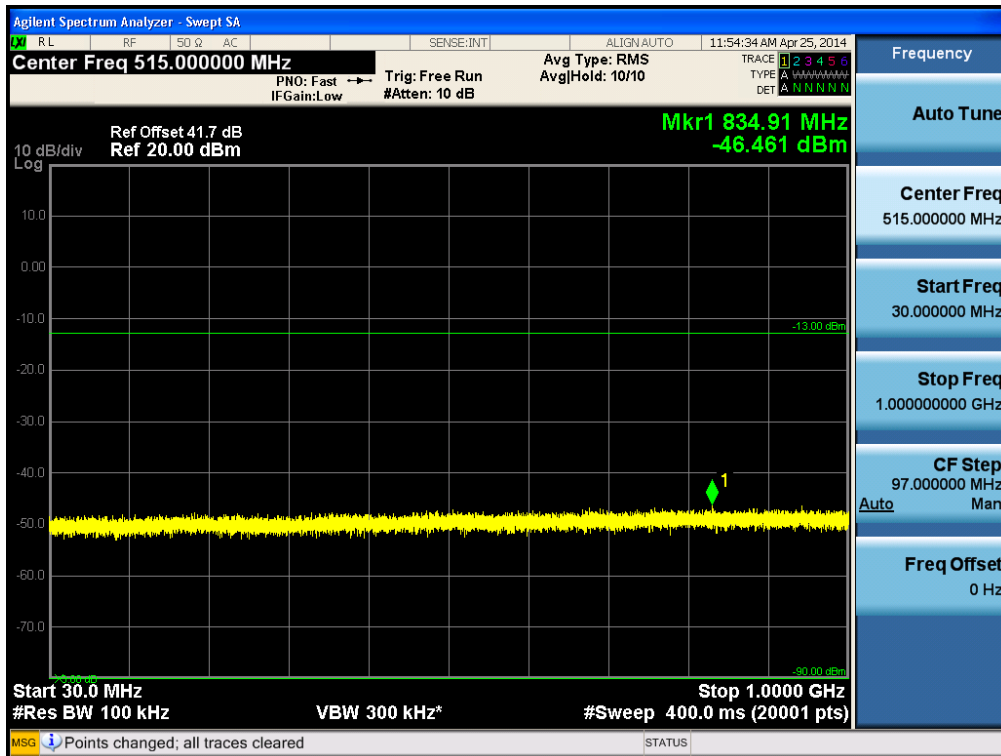
(Band Edge)



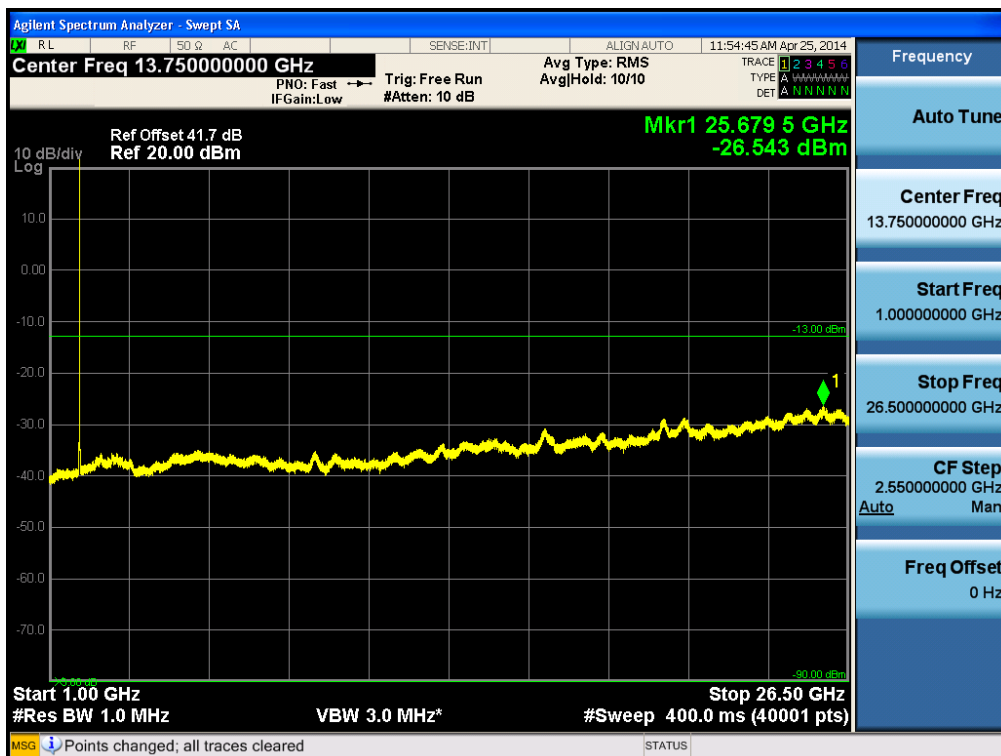
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Middle Channel)

(30 MHz ~ 1 GHz)



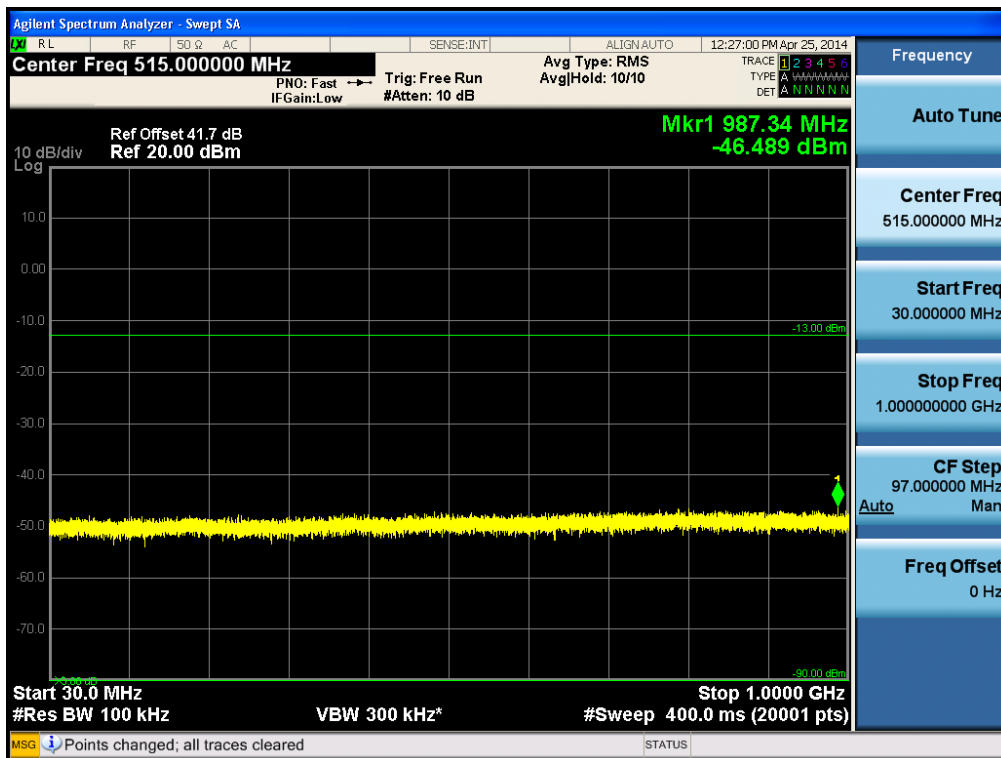
(1 GHz ~ 26.5 GHz)



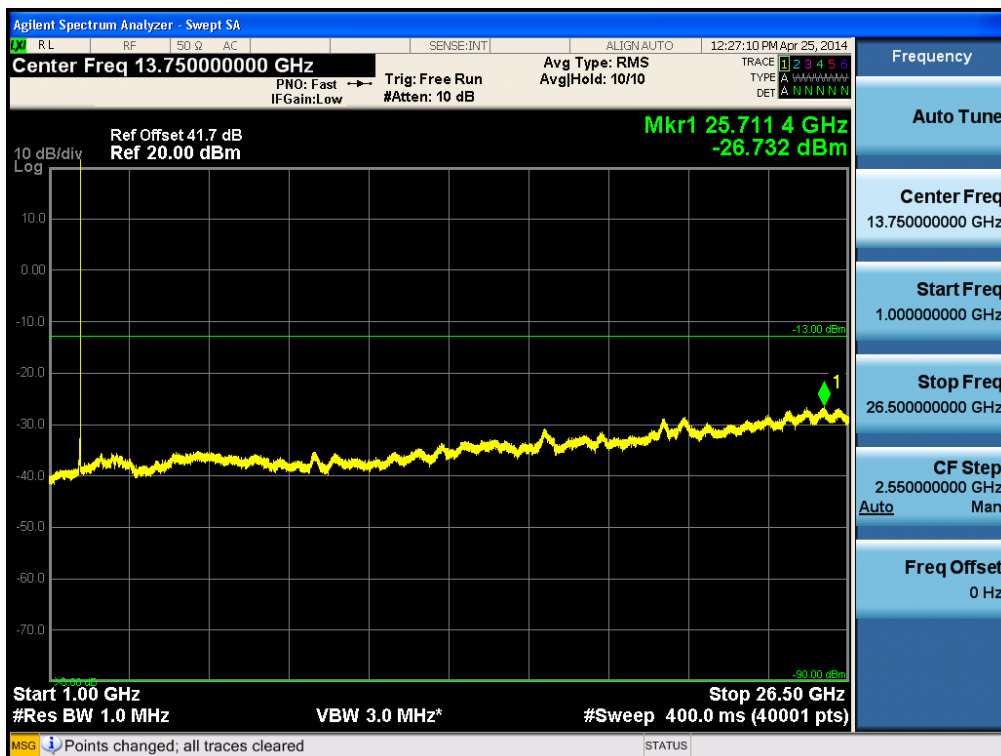
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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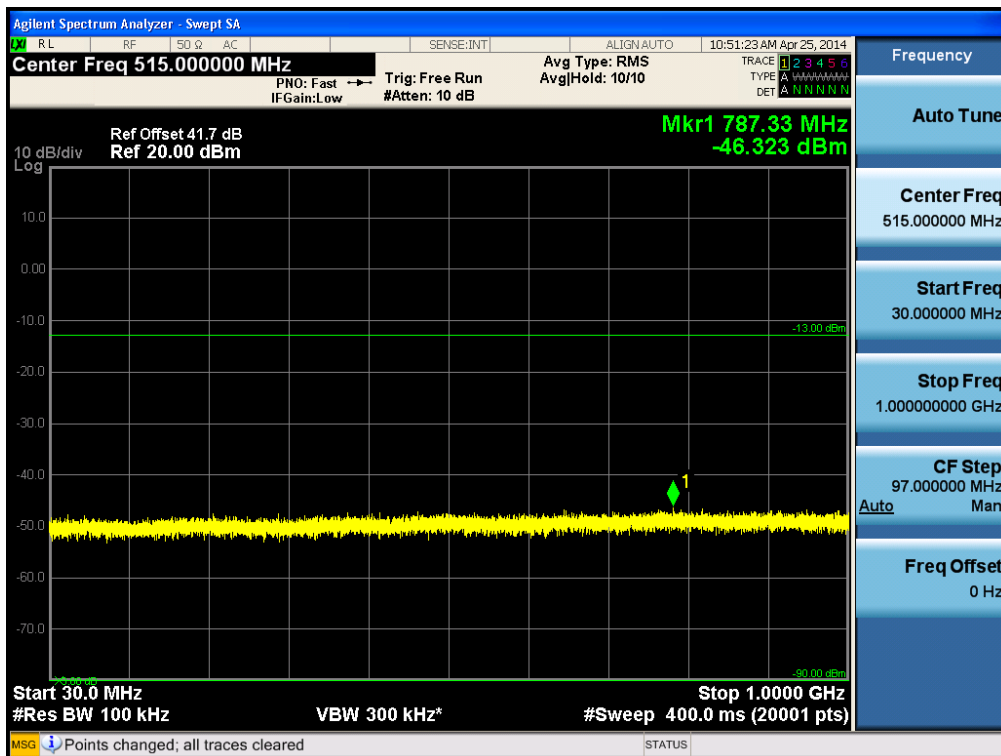
(Band Edge)



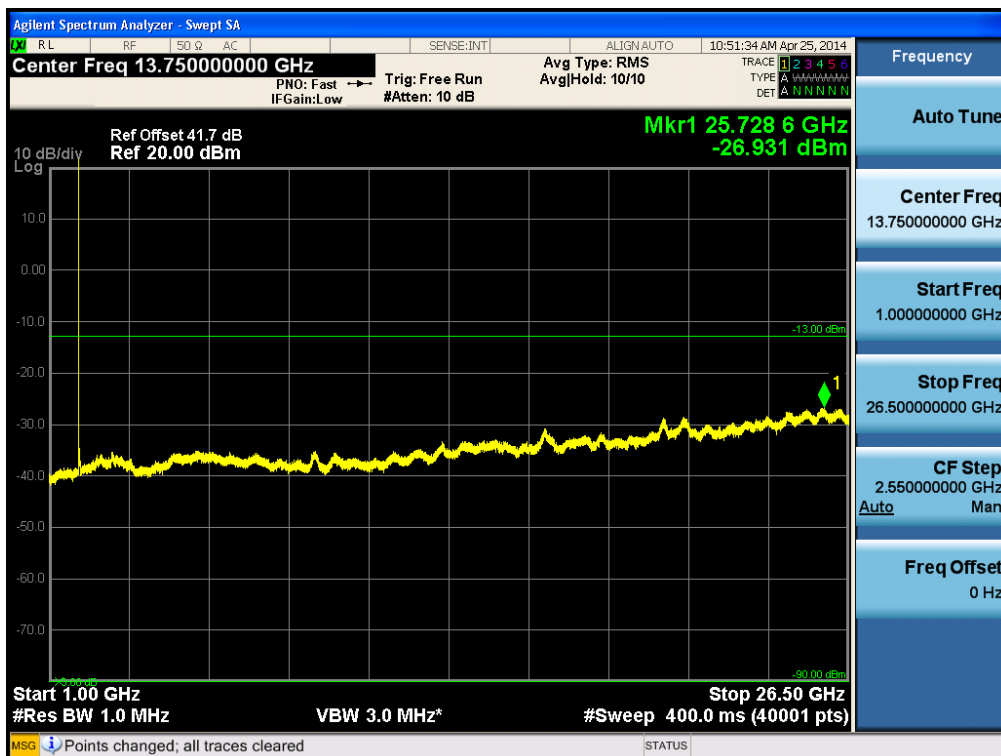
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Low Channel)

(30 MHz ~ 1 GHz)

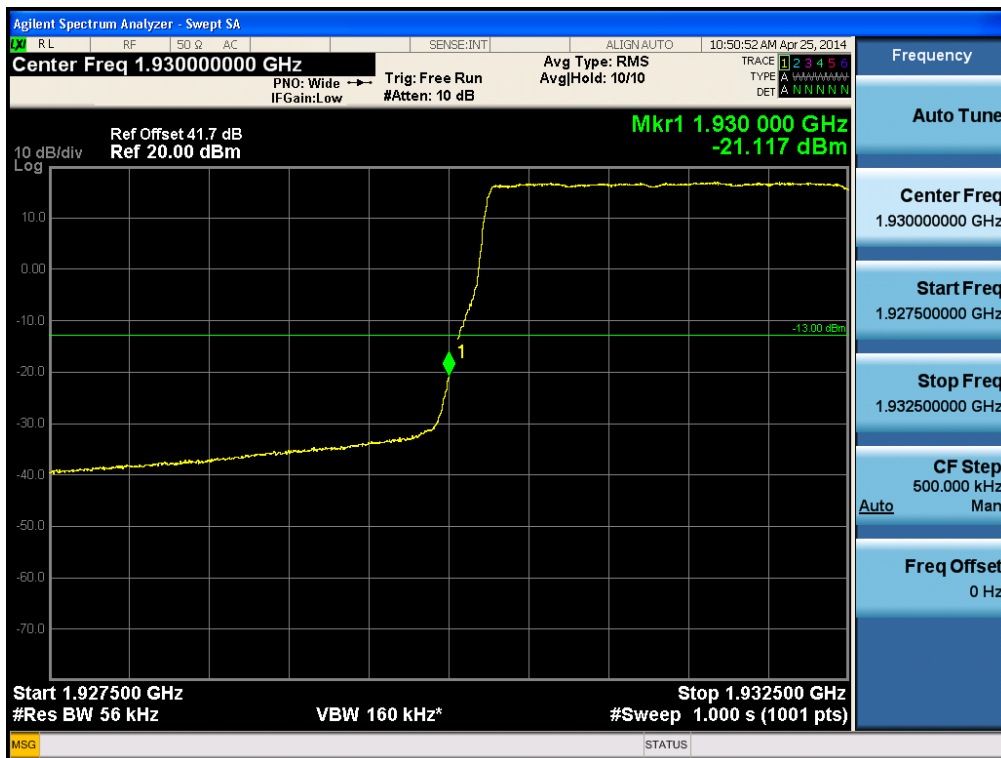


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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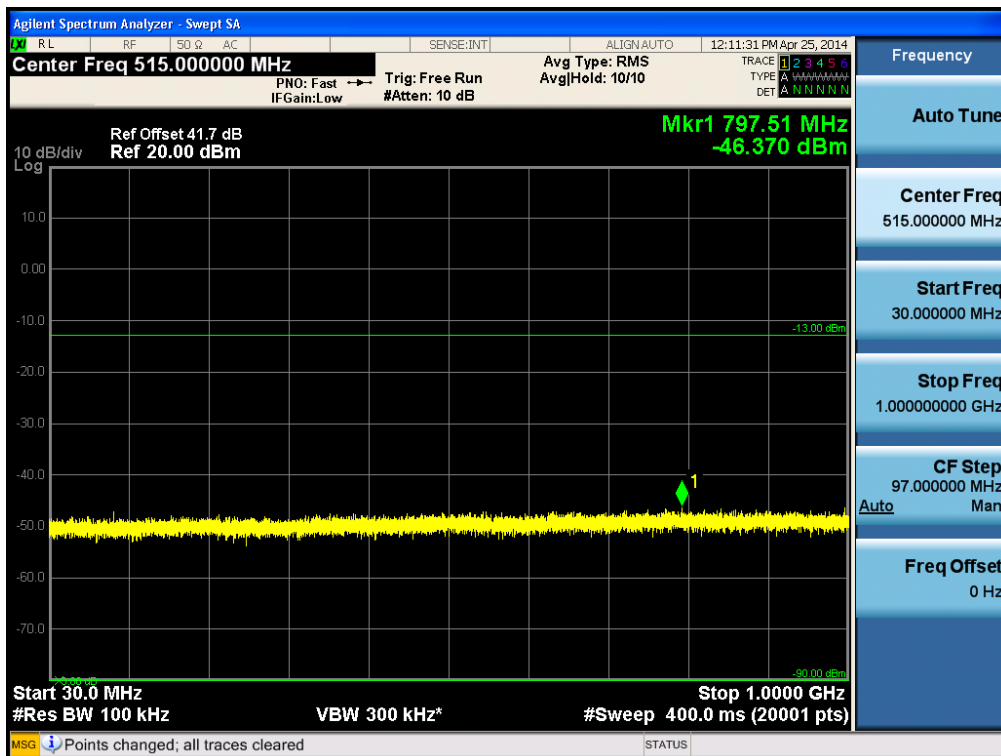
(Band Edge)



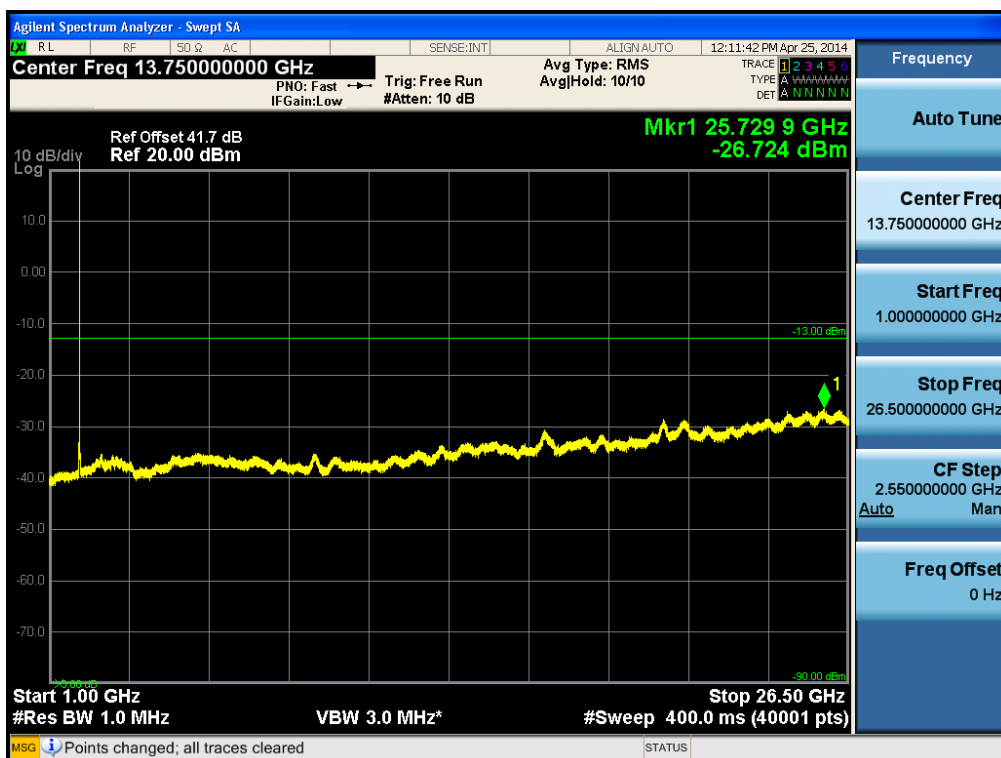
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Middle Channel)

(30 MHz ~ 1 GHz)



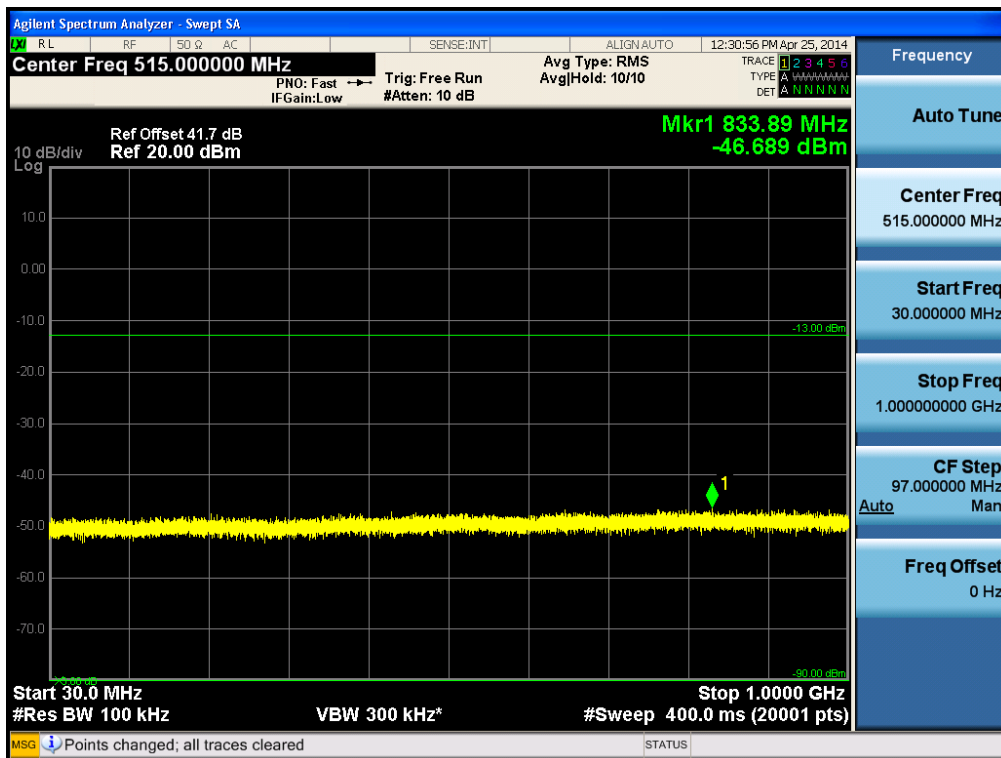
(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM High Channel)

(30 MHz ~ 1 GHz)

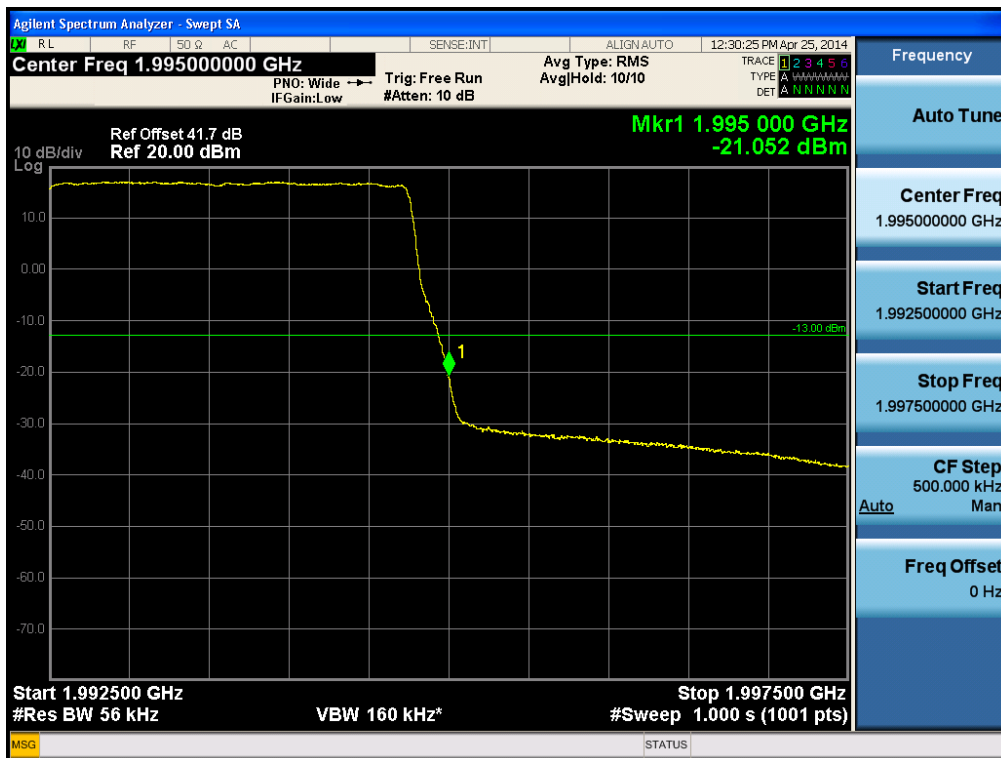


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(Band Edge)

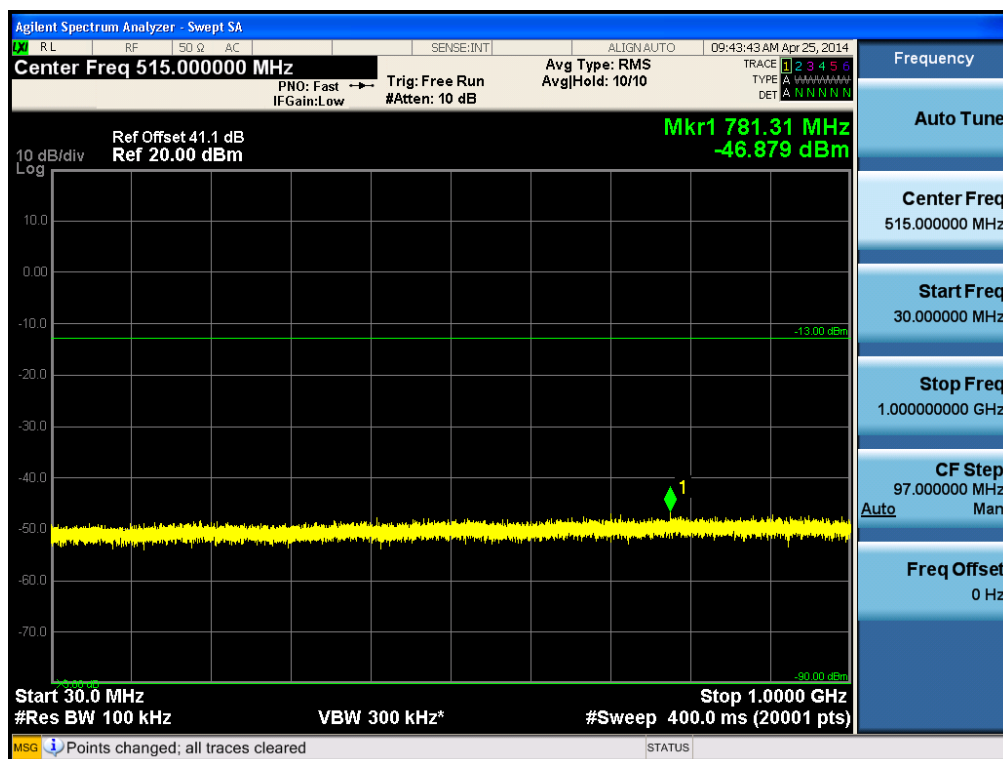


FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1405-F010	Date of Issue: May 20 , 2014	EUT Type: Outdoor Pico eNB	FCC ID: A3LSLS-BP00AK	Page 72 of 126

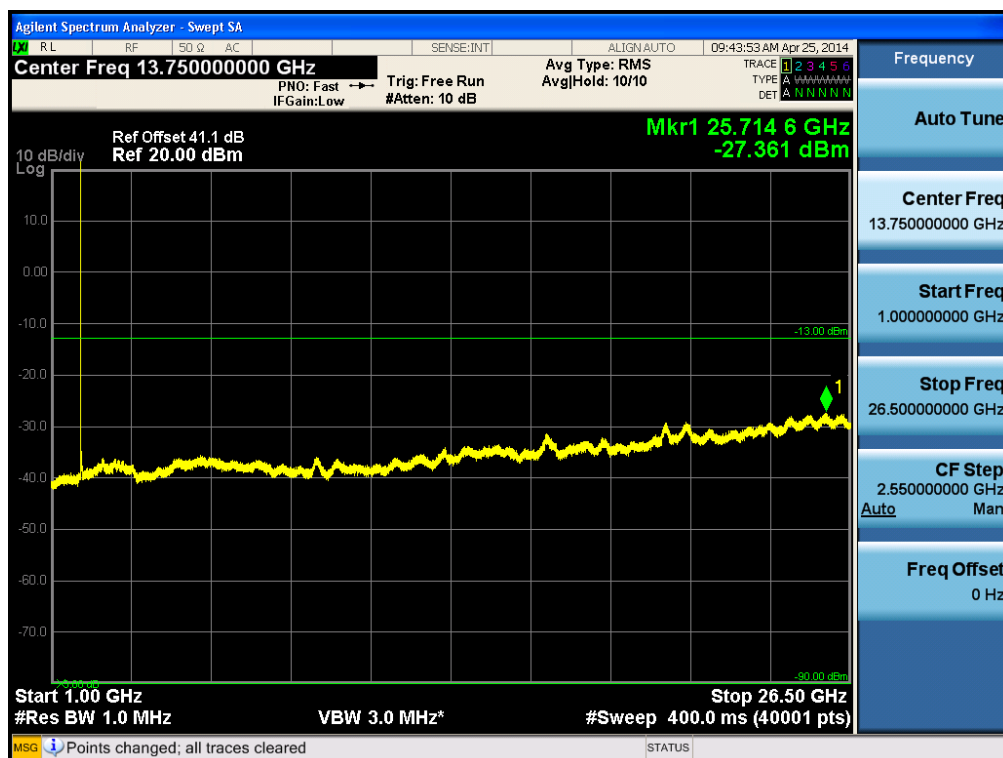
Plot Data for LTE 5 MHz : 1 Carrier , Output Port 1

(QPSK Low Channel)

(30 MHz ~ 1 GHz)

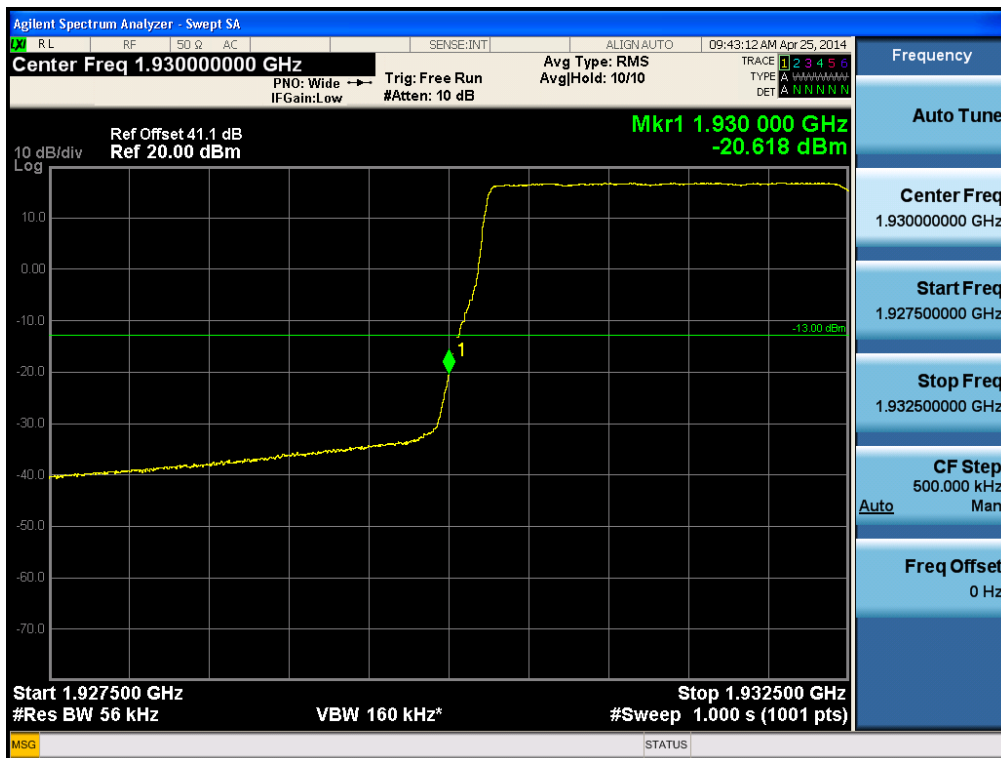


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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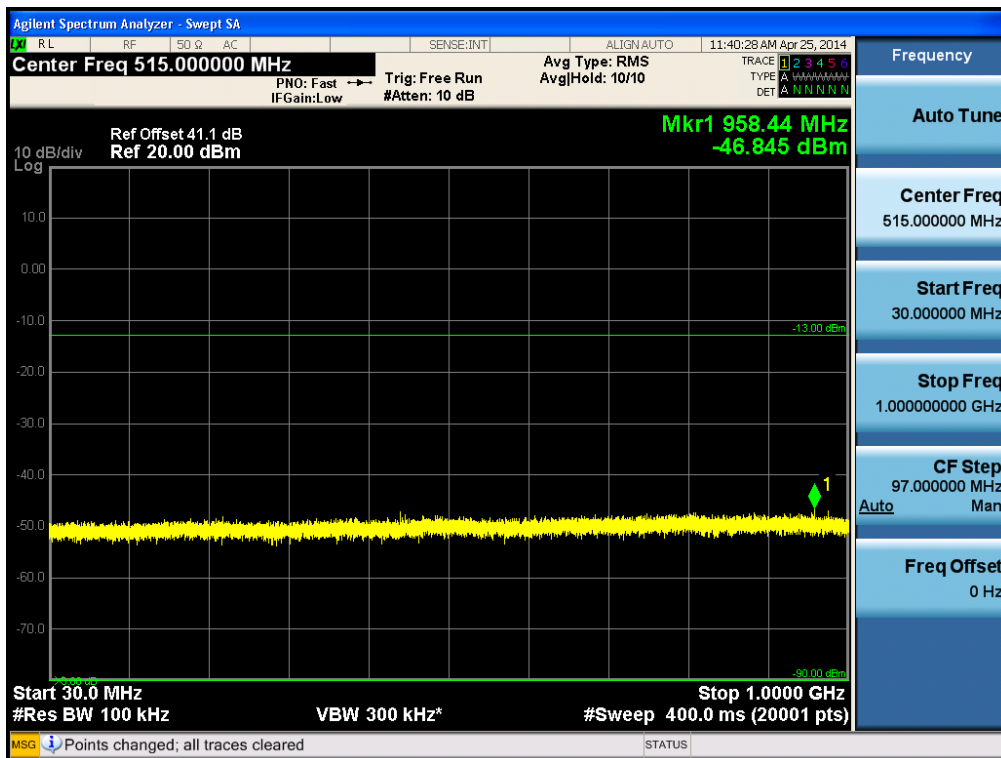
(Band Edge)



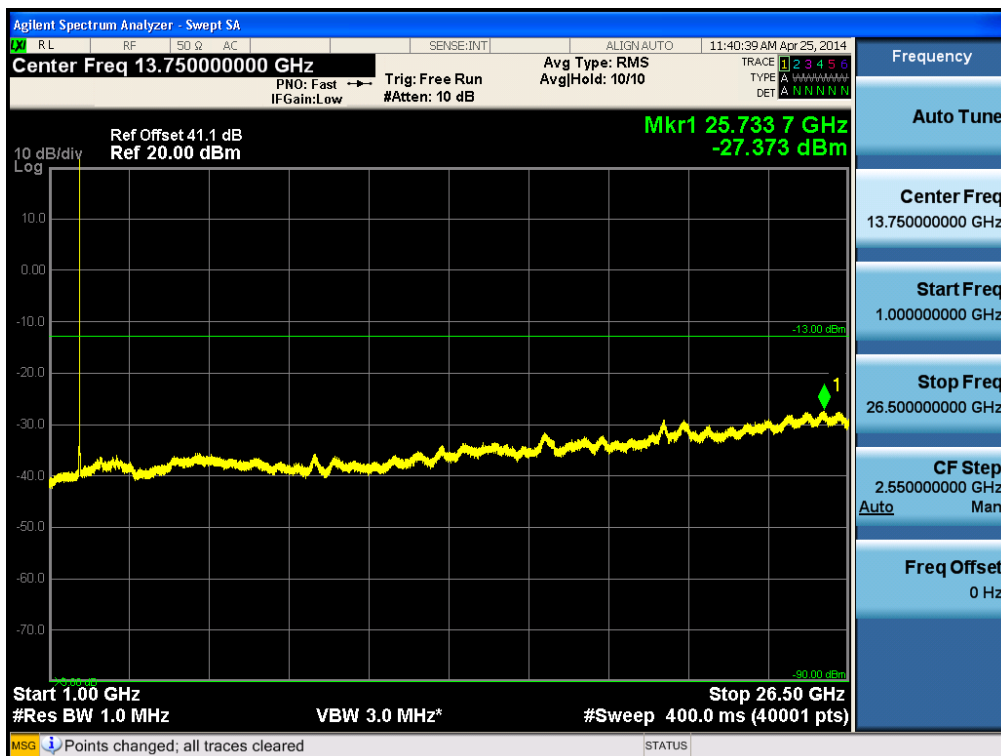
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK Middle Channel)

(30 MHz ~ 1 GHz)



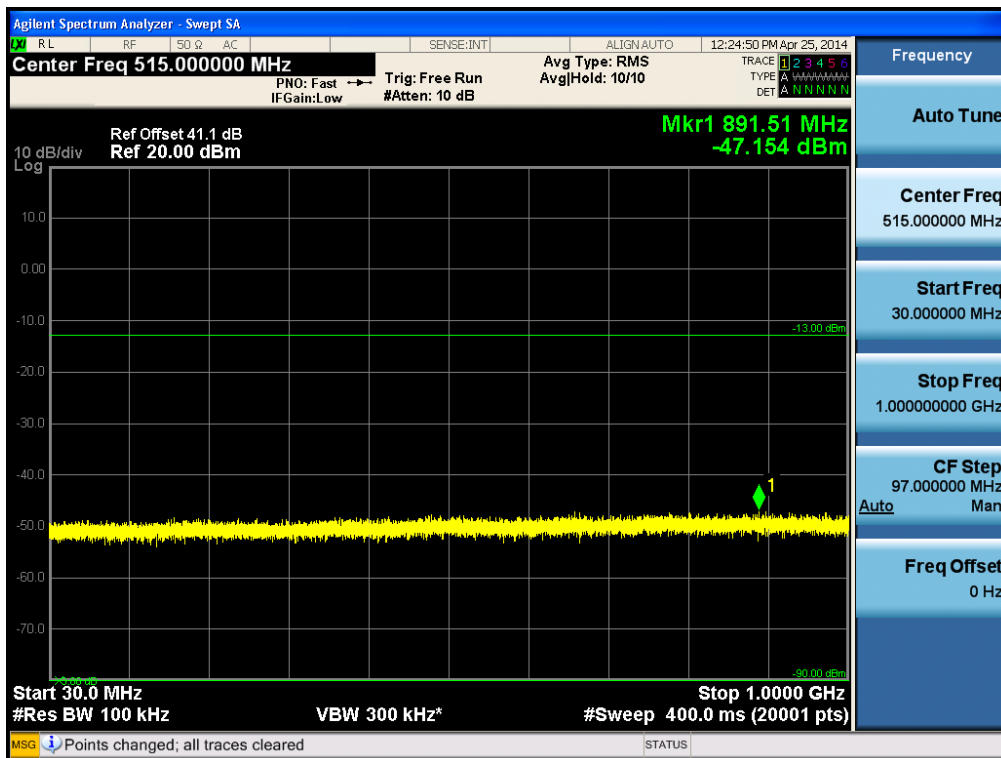
(1 GHz ~ 26.5 GHz)



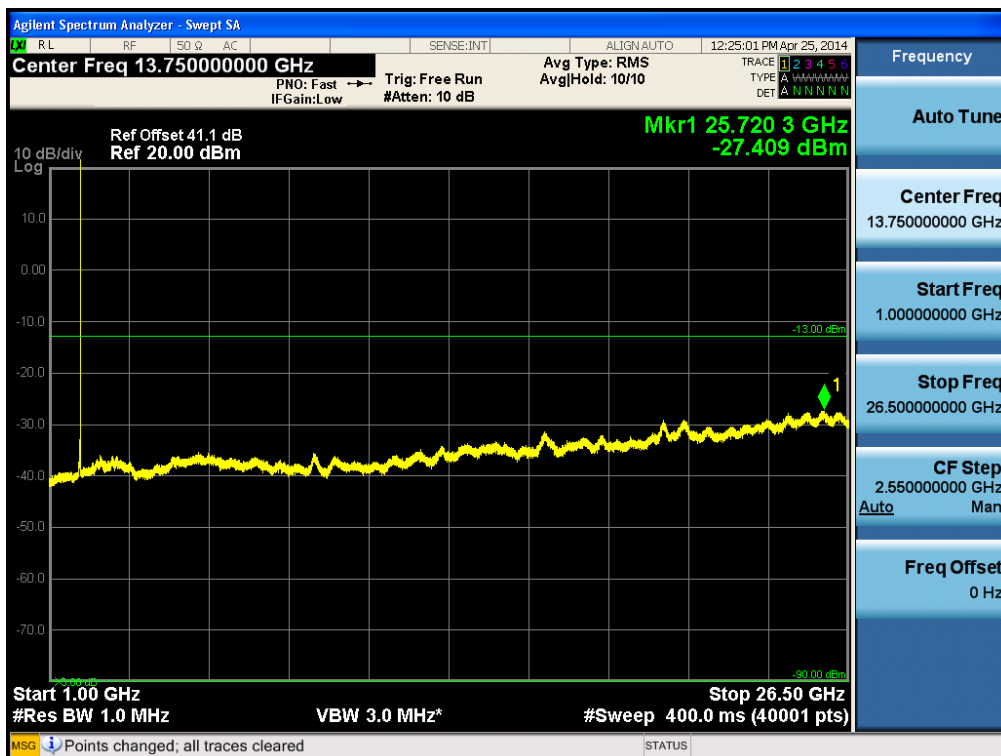
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK High Channel)

(30 MHz ~ 1 GHz)

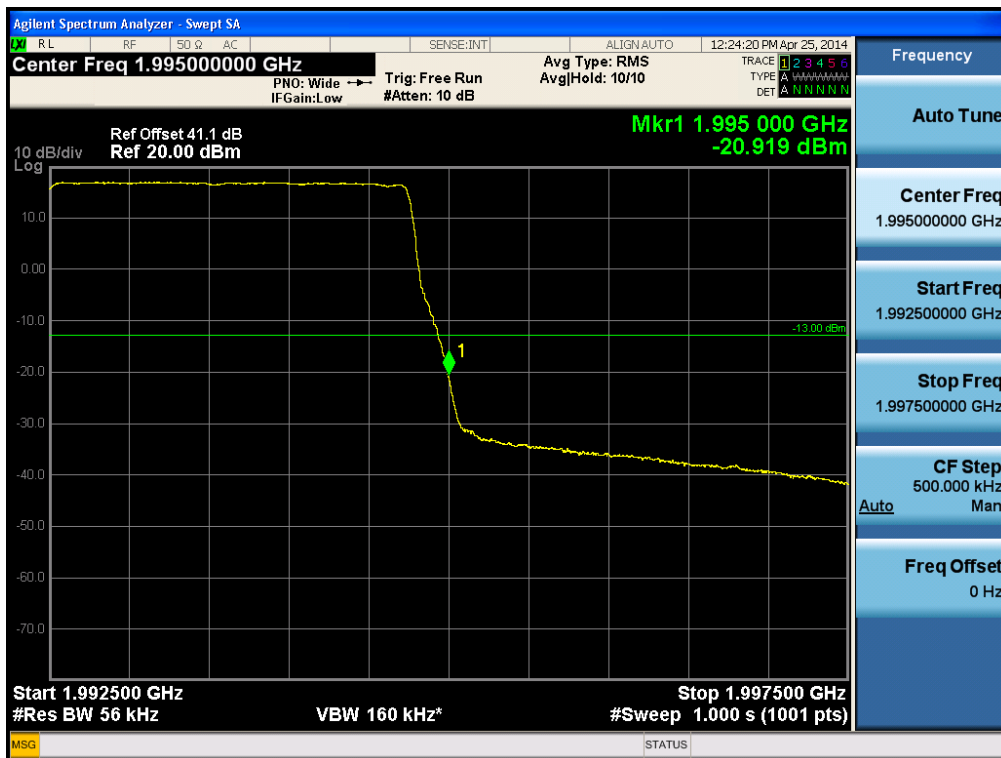


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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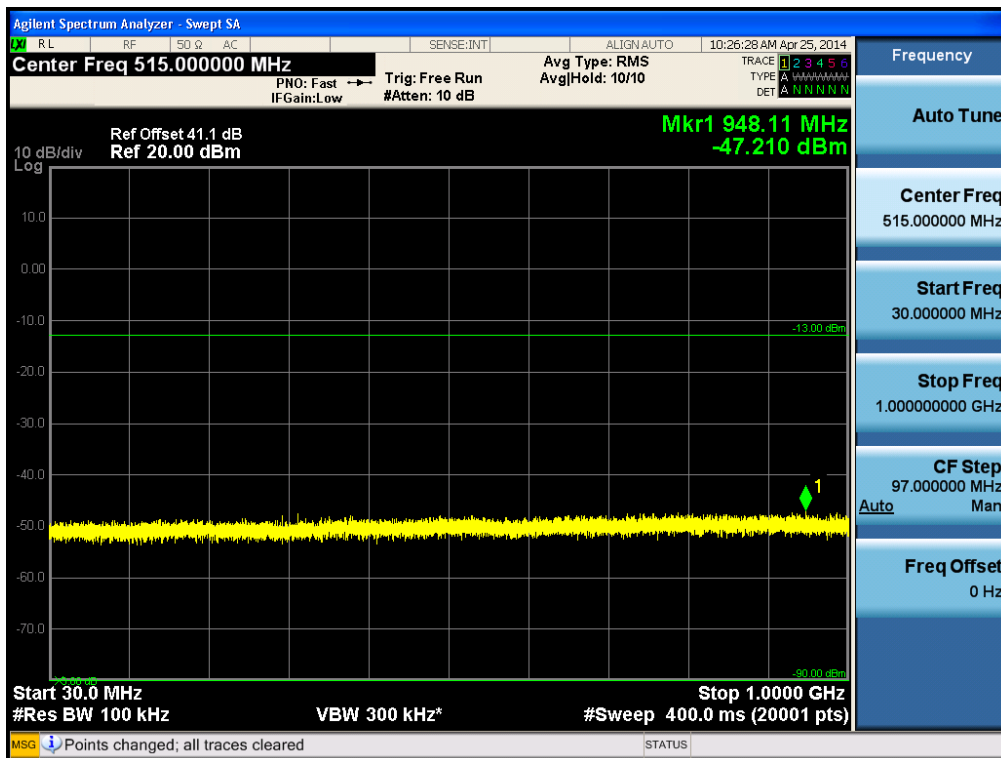
(Band Edge)



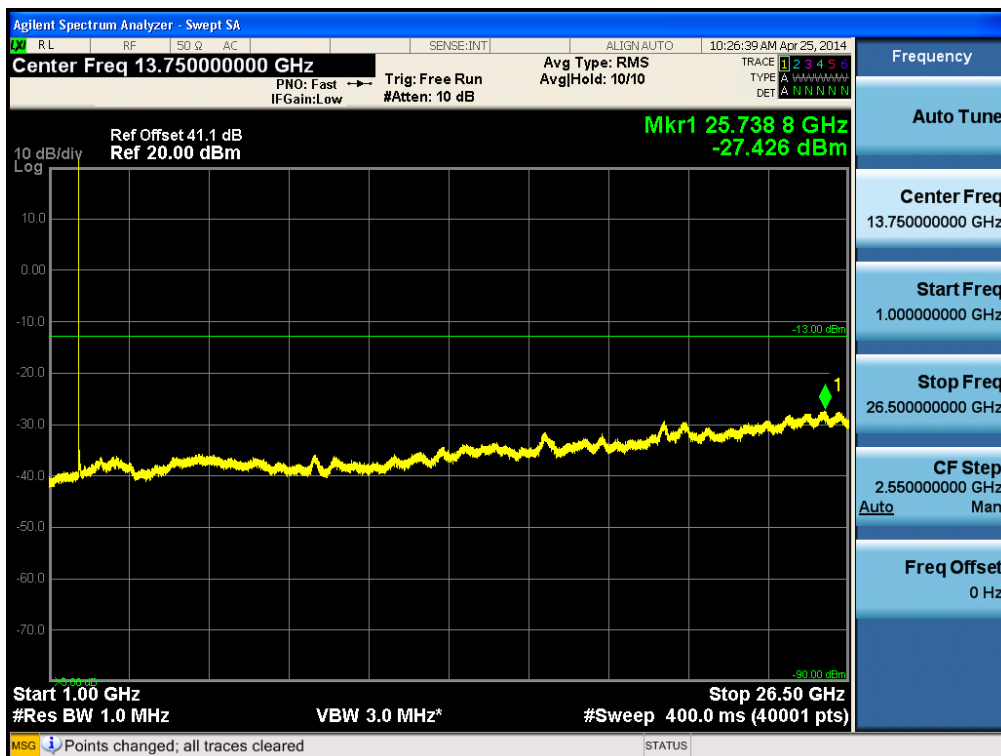
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Low Channel)

(30 MHz ~ 1 GHz)

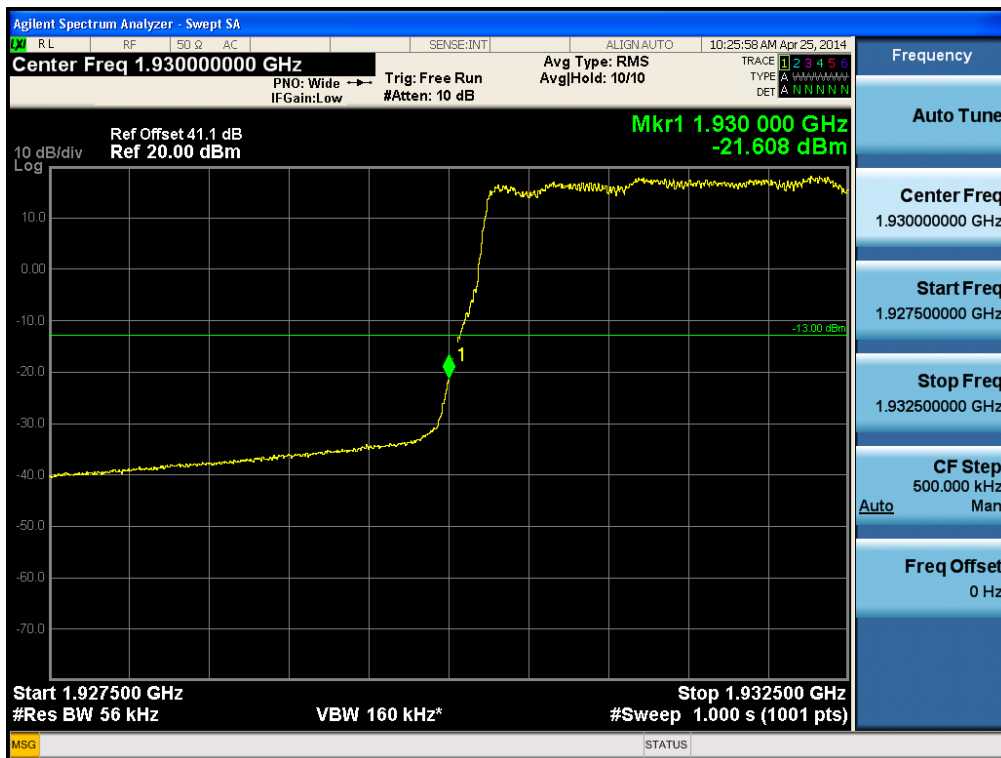


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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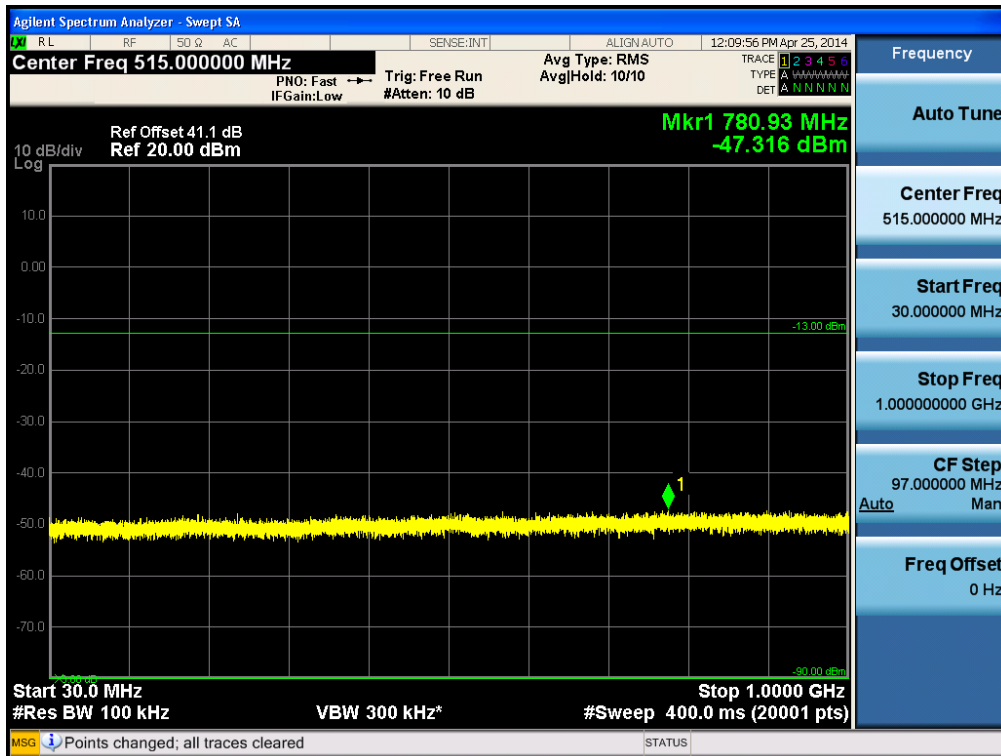
(Band Edge)



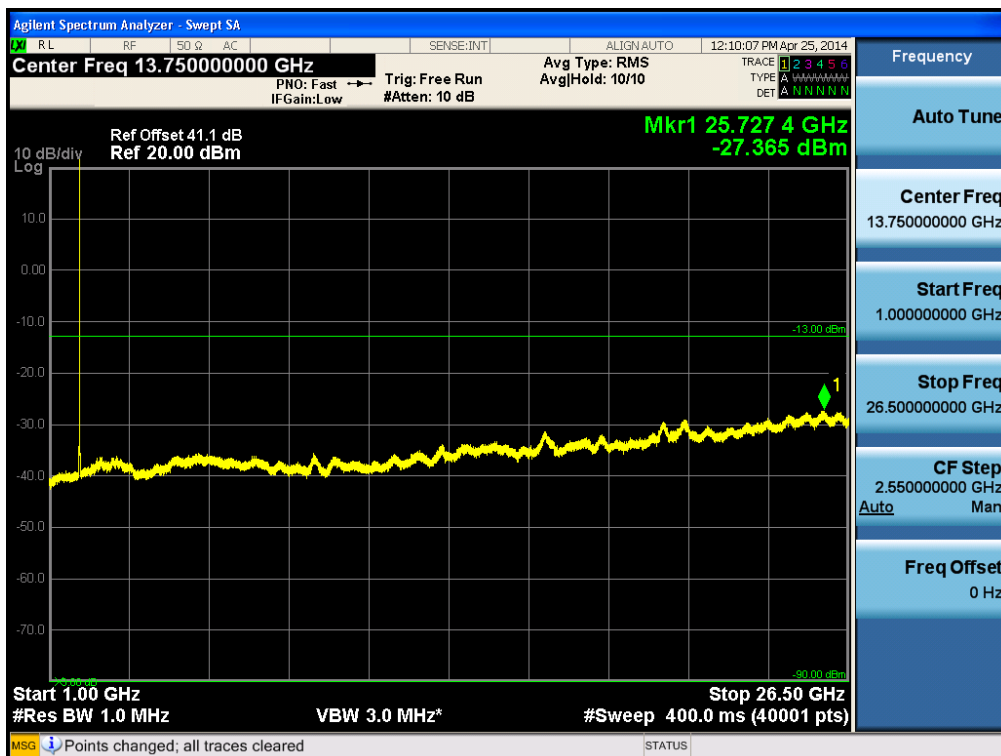
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Middle Channel)

(30 MHz ~ 1 GHz)



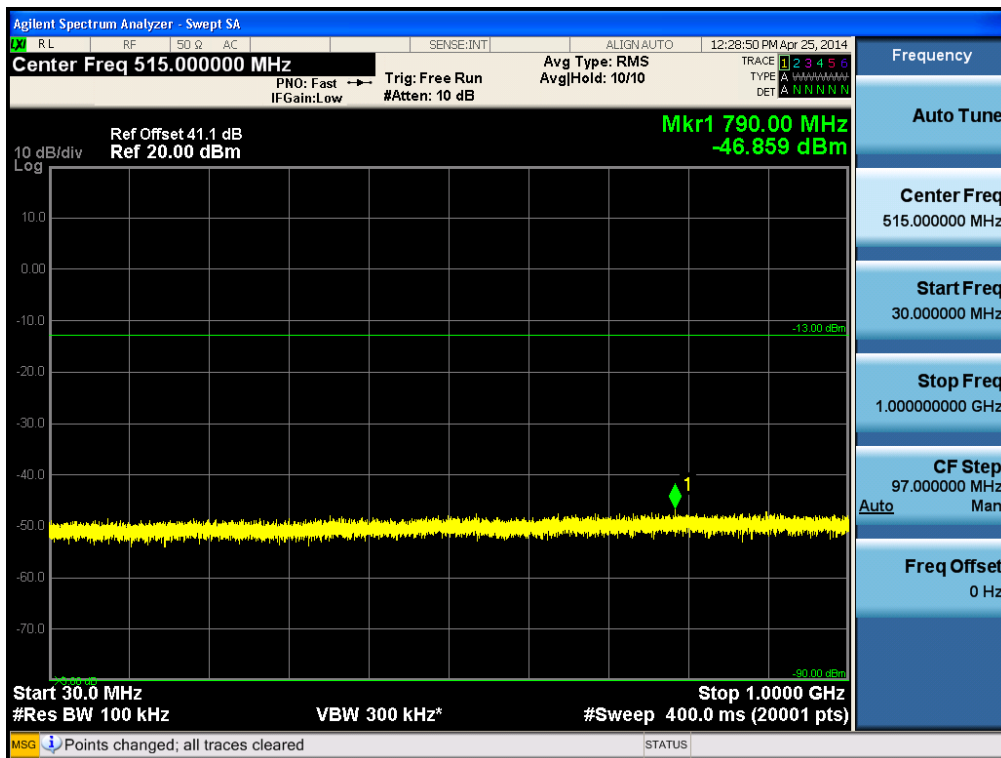
(1 GHz ~ 26.5 GHz)



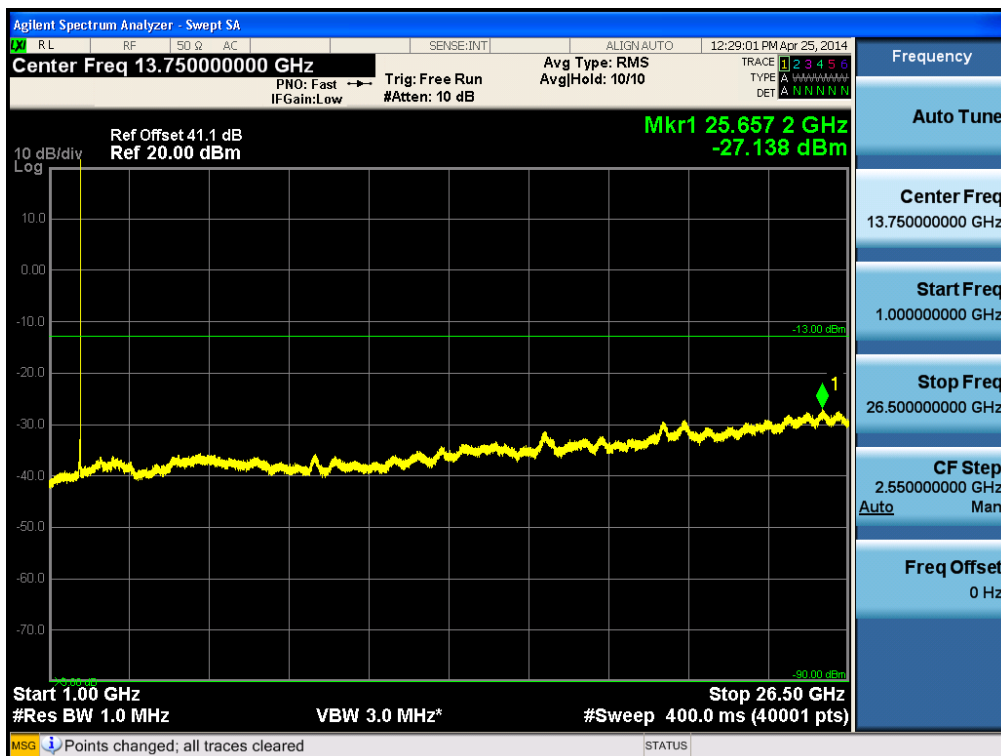
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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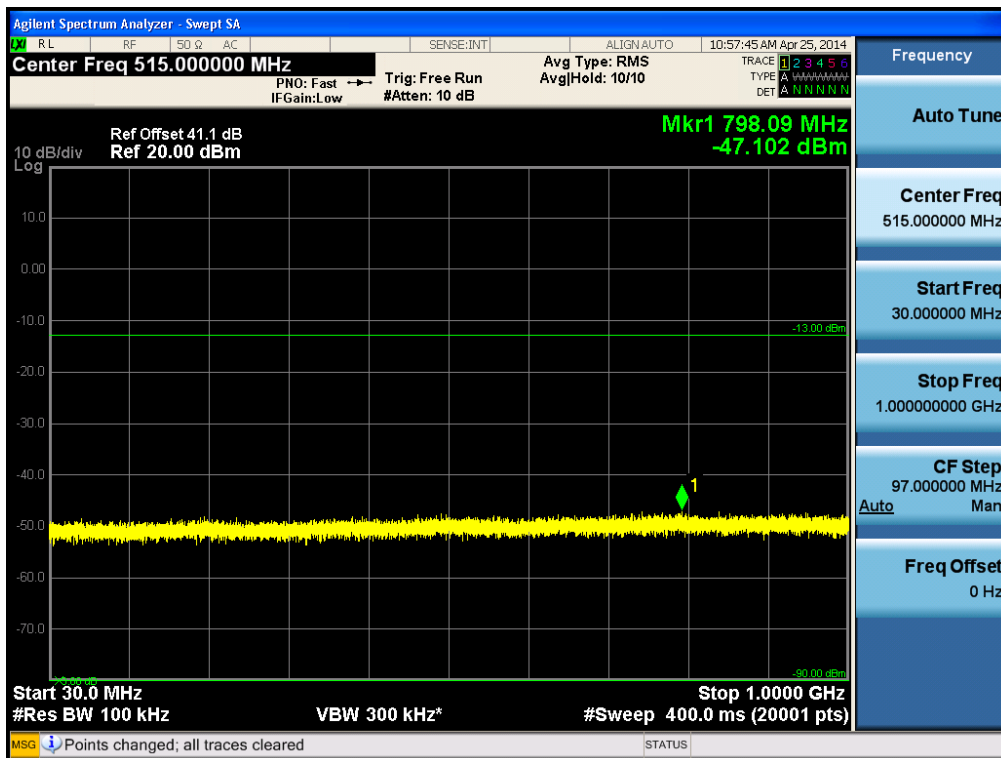
(Band Edge)



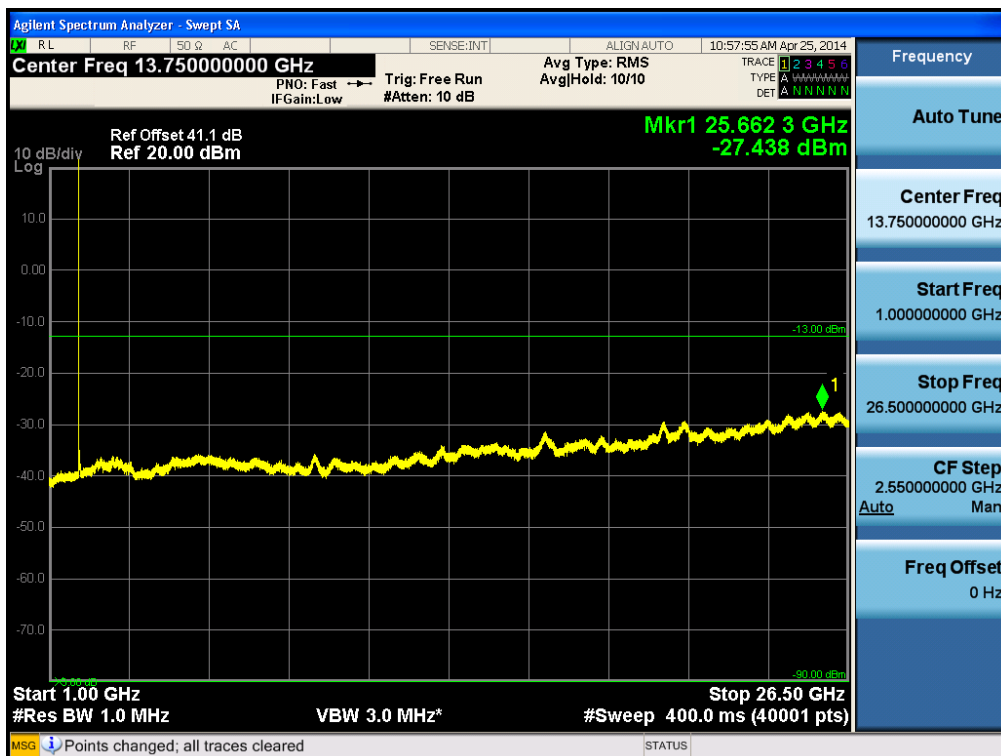
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Low Channel)

(30 MHz ~ 1 GHz)

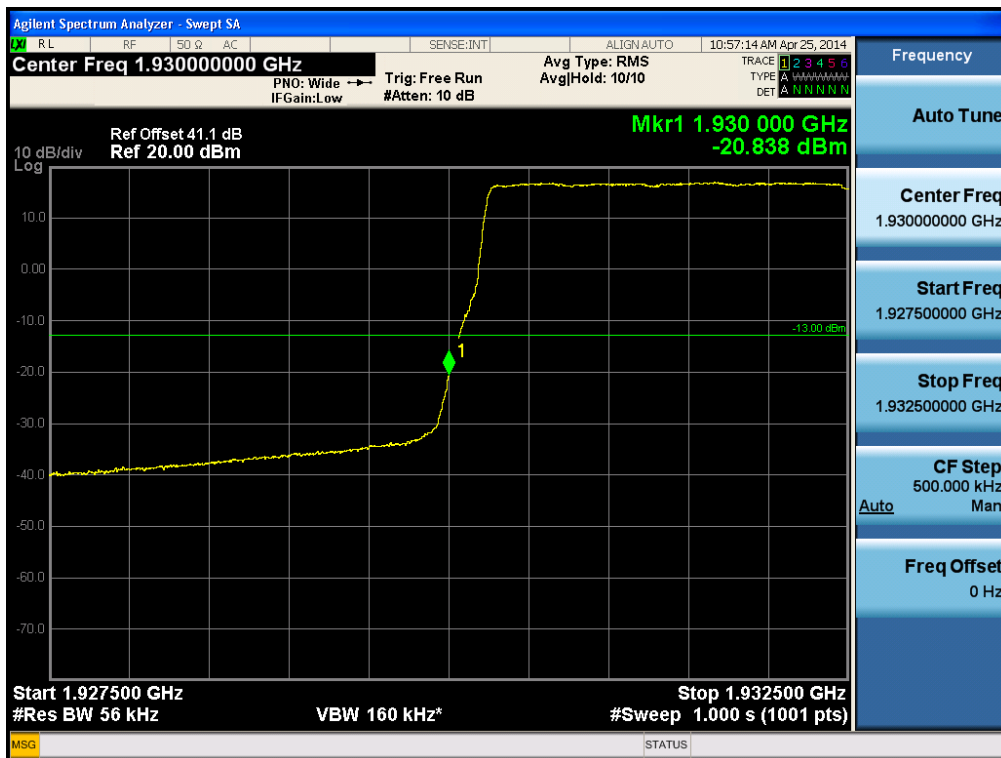


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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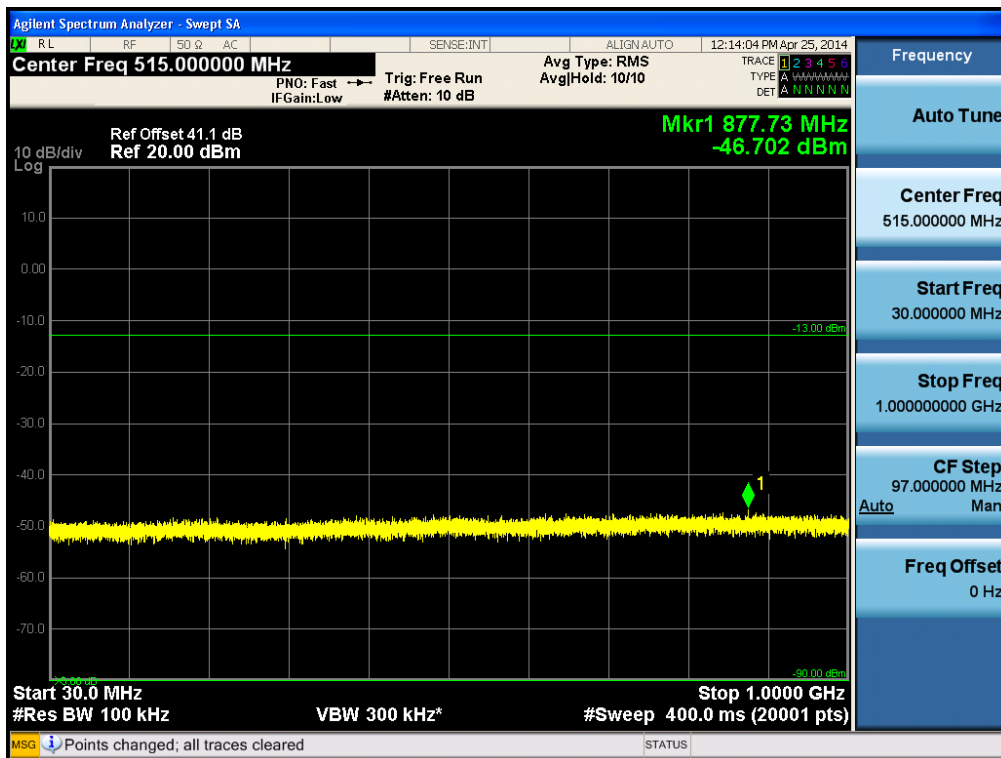
(Band Edge)



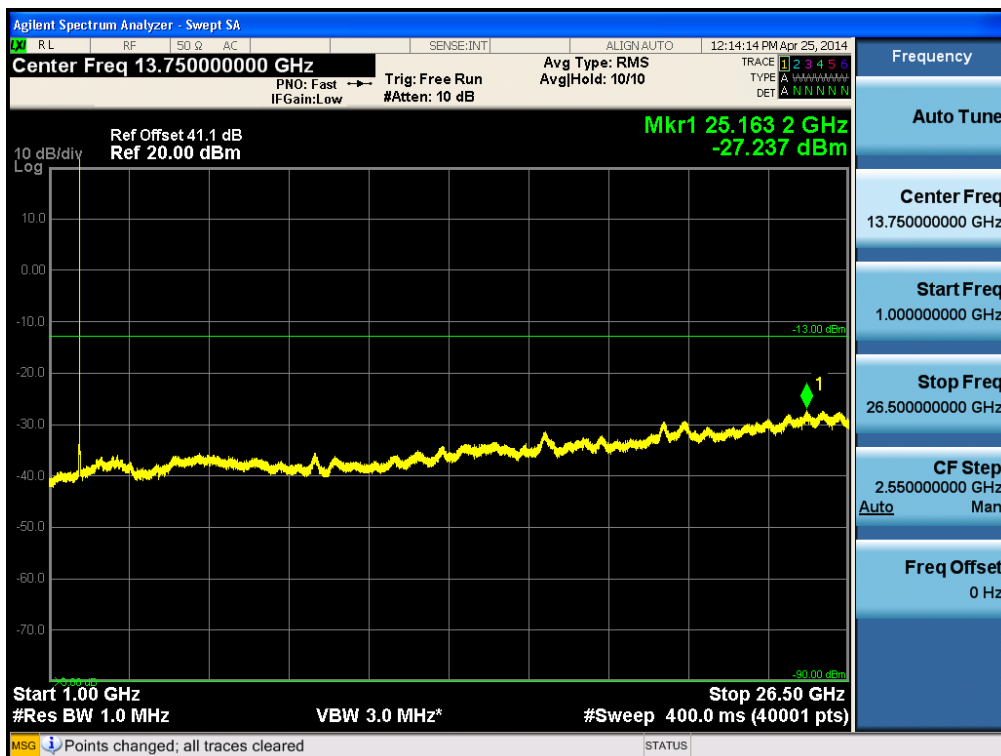
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Middle Channel)

(30 MHz ~ 1 GHz)



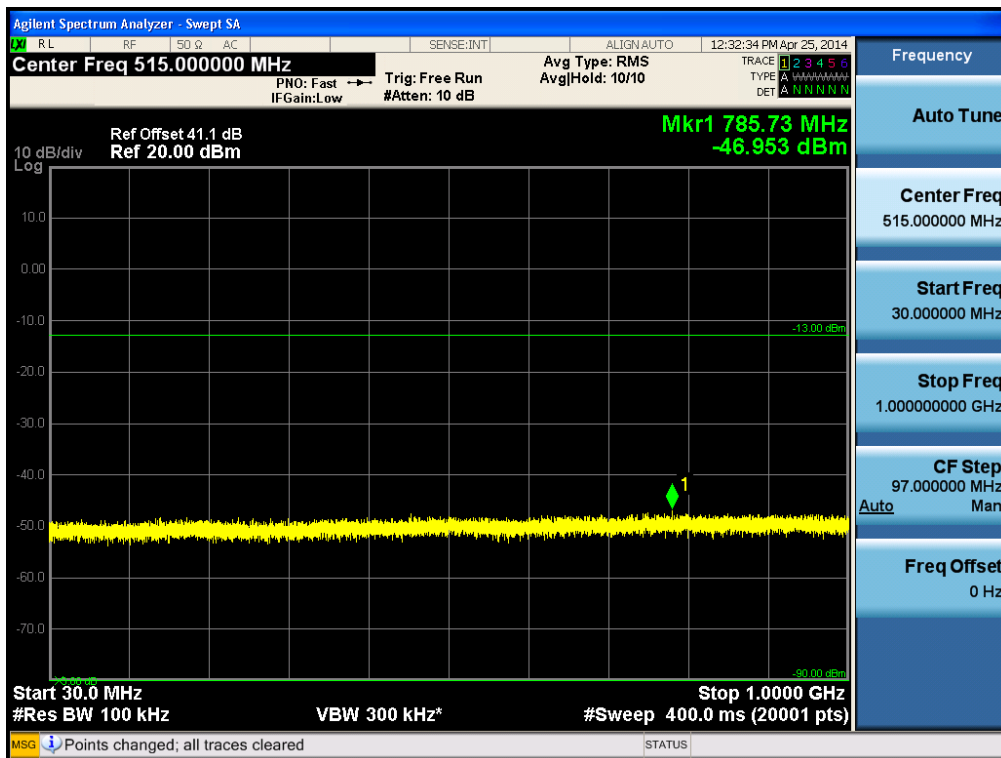
(1 GHz ~ 26.5 GHz)



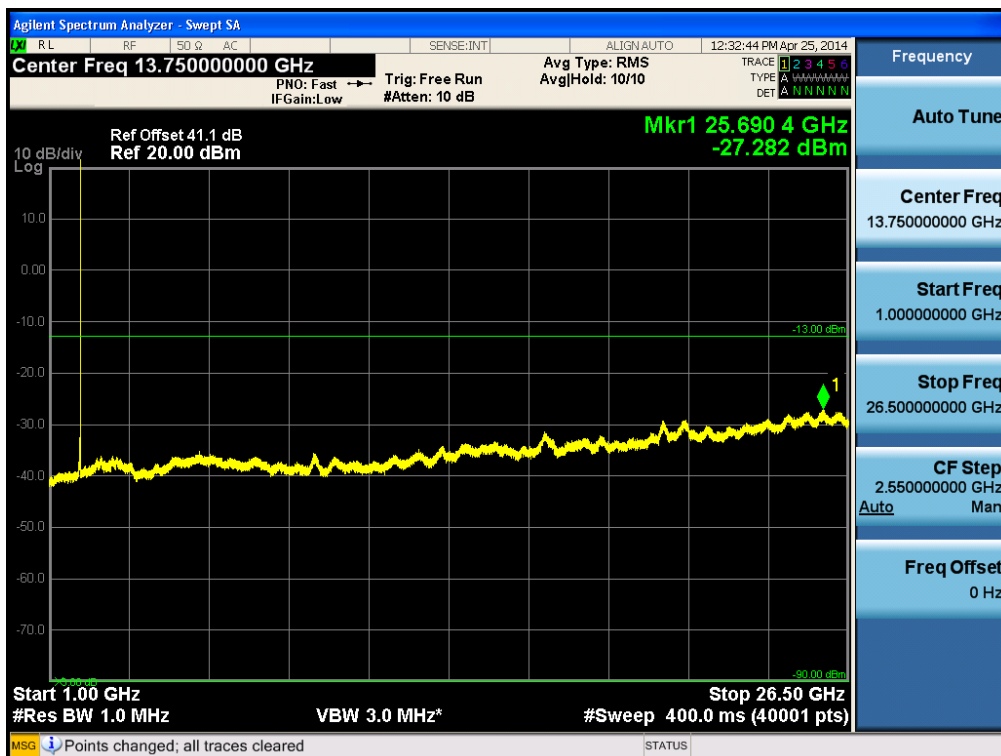
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM High Channel)

(30 MHz ~ 1 GHz)

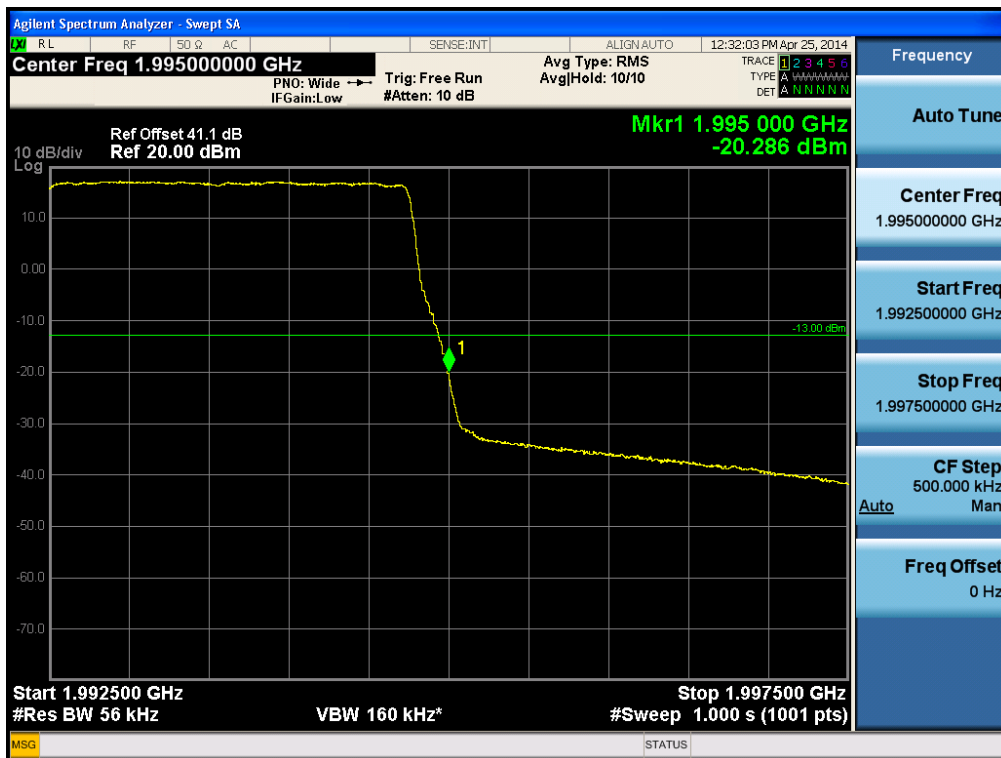


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(Band Edge)

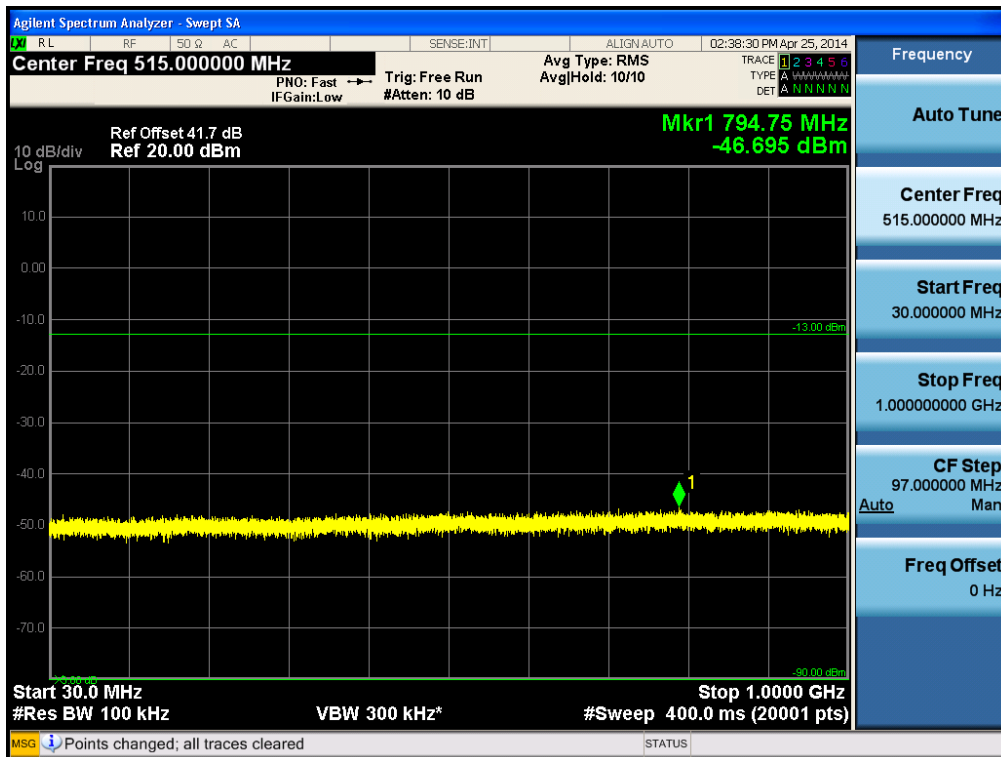


FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1405-F010	Date of Issue: May 20 , 2014	EUT Type: Outdoor Pico eNB	FCC ID: A3LSLS-BP00AK	Page 87 of 126

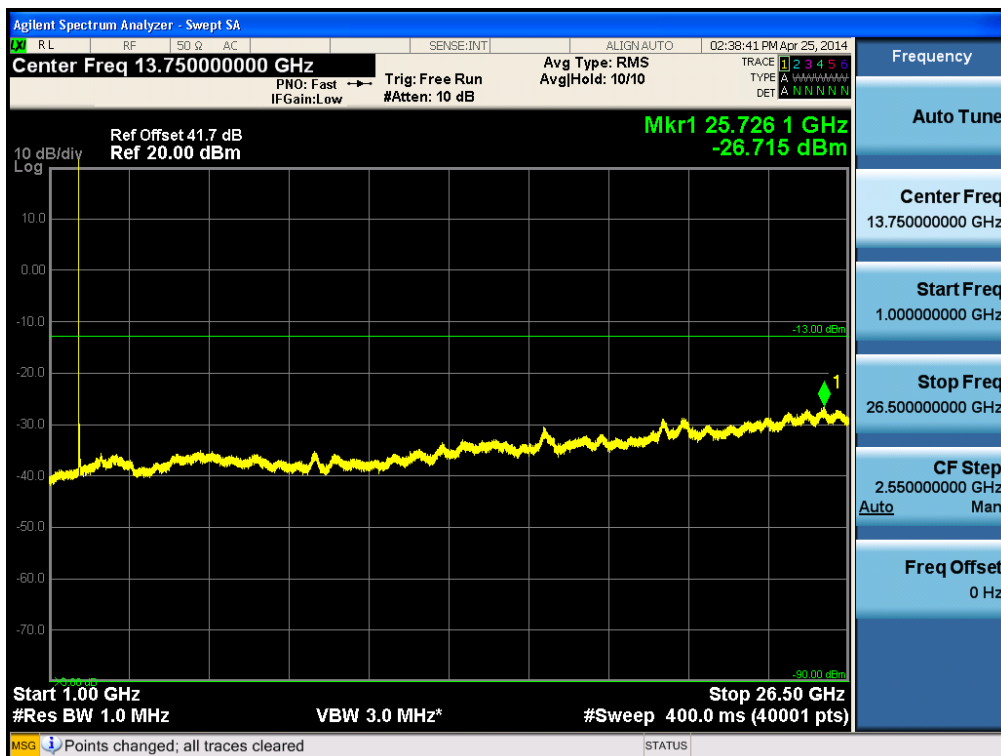
. Plot Data for LTE 10 MHz : 1 Carrier , Output Port 0

(QPSK Low Channel)

(30 MHz ~ 1 GHz)

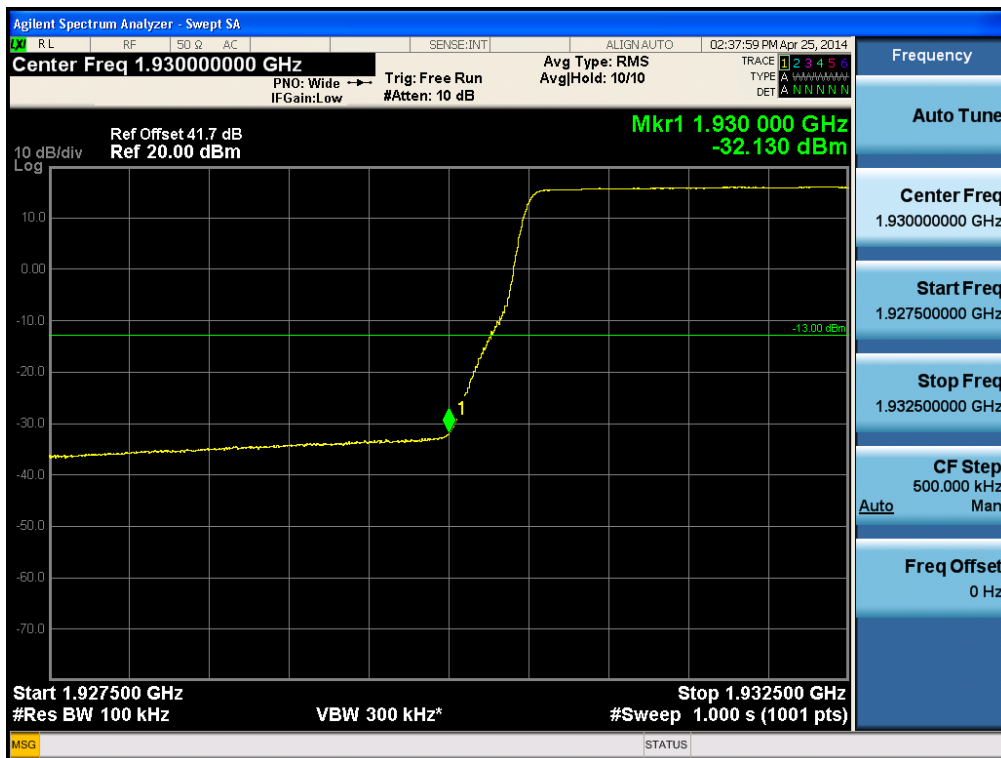


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1405-F010	Date of Issue: May 20 , 2014	EUT Type: Outdoor Pico eNB	FCC ID: A3LSLS-BP00AK	Page 88 of 126

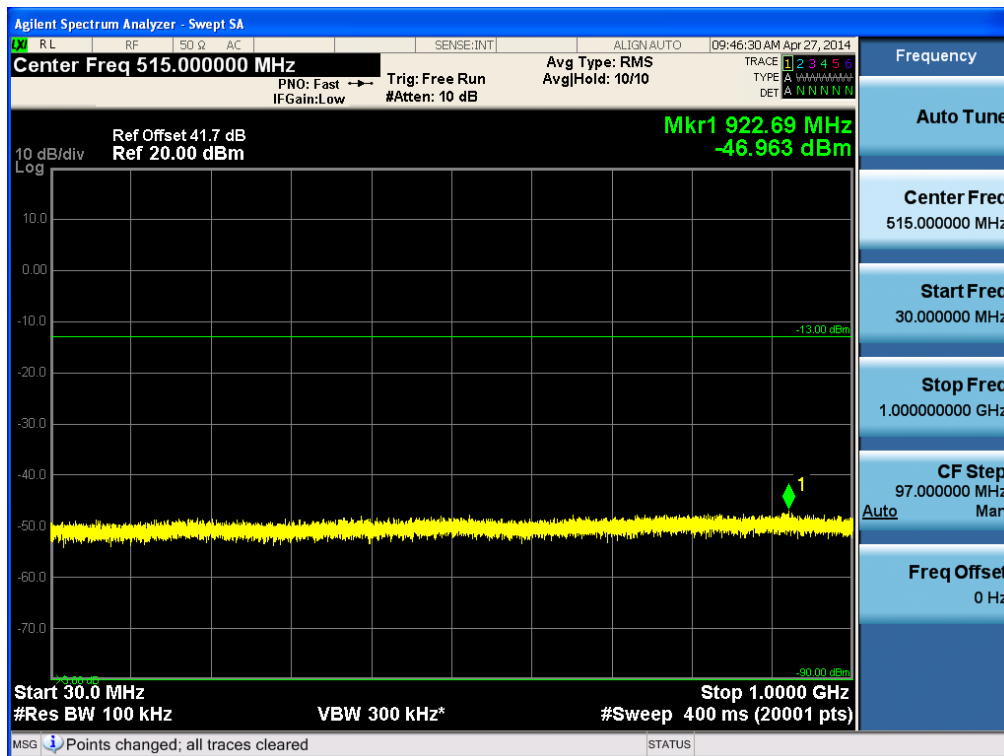
(Band Edge)



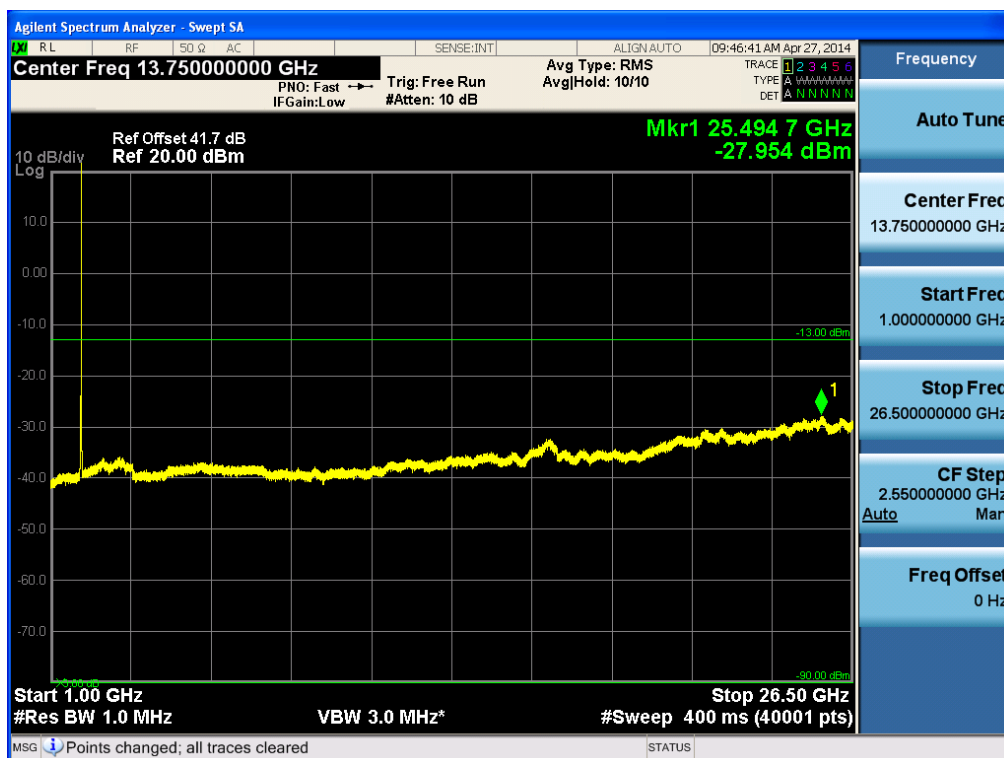
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK Middle Channel)

(30 MHz ~ 1 GHz)



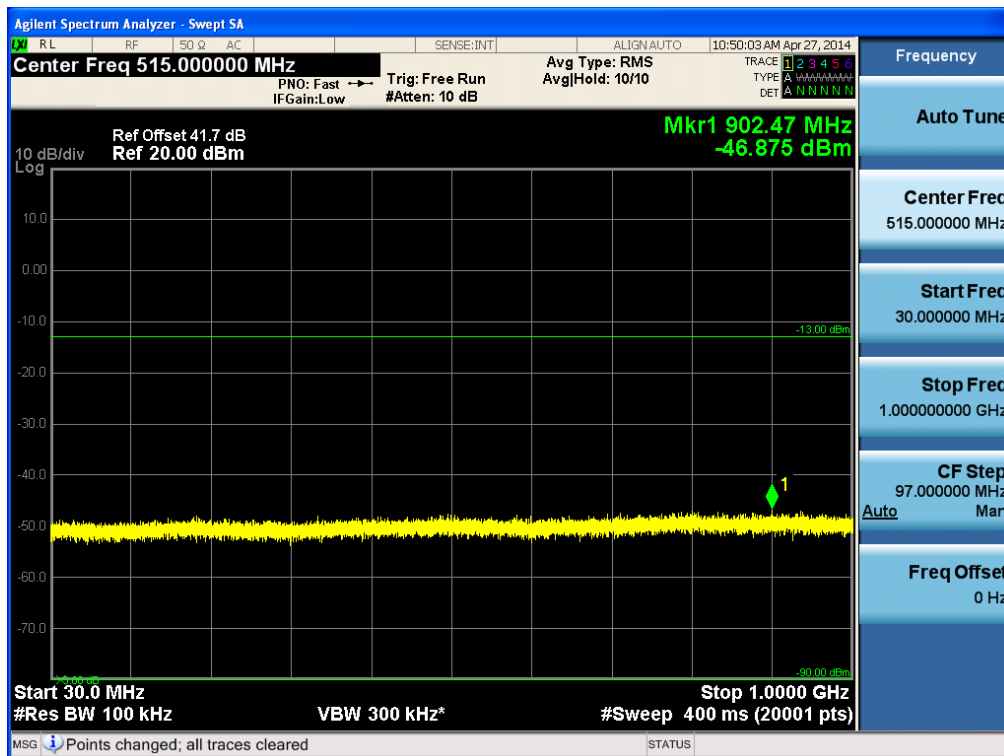
(1 GHz ~ 26.5 GHz)



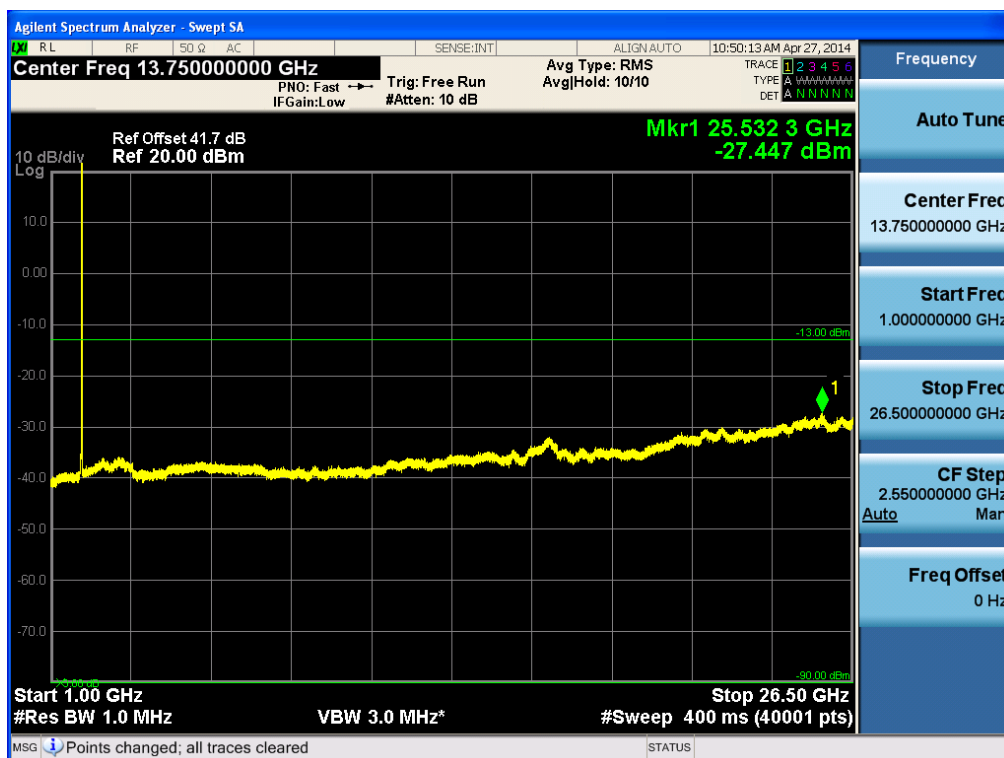
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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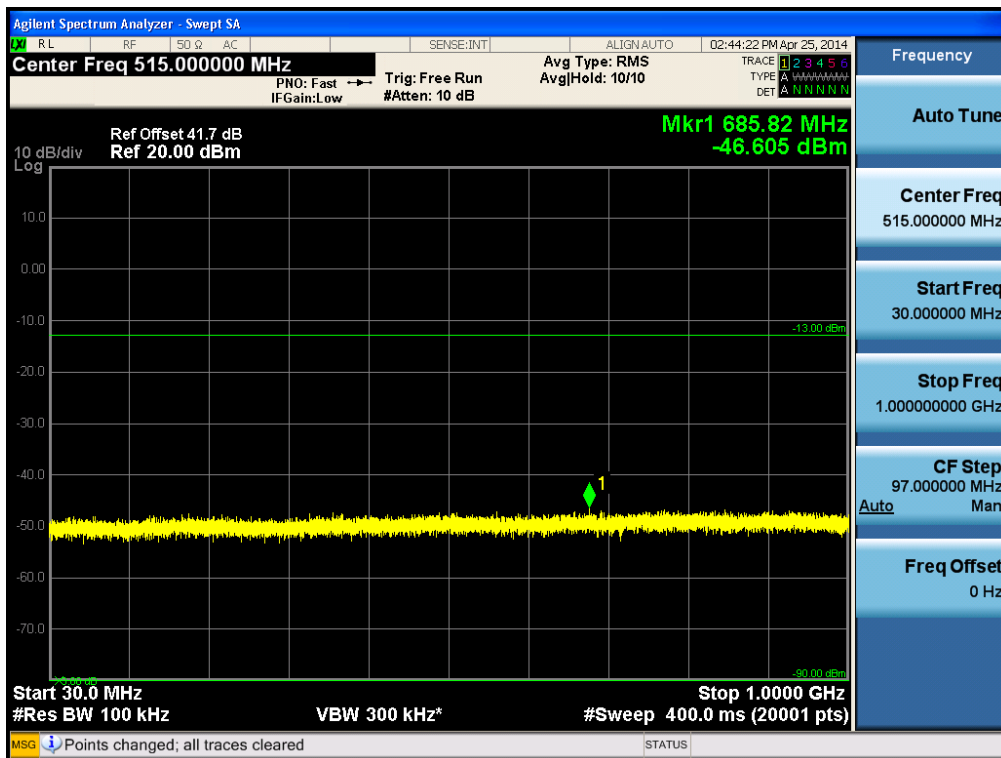
(Band Edge)



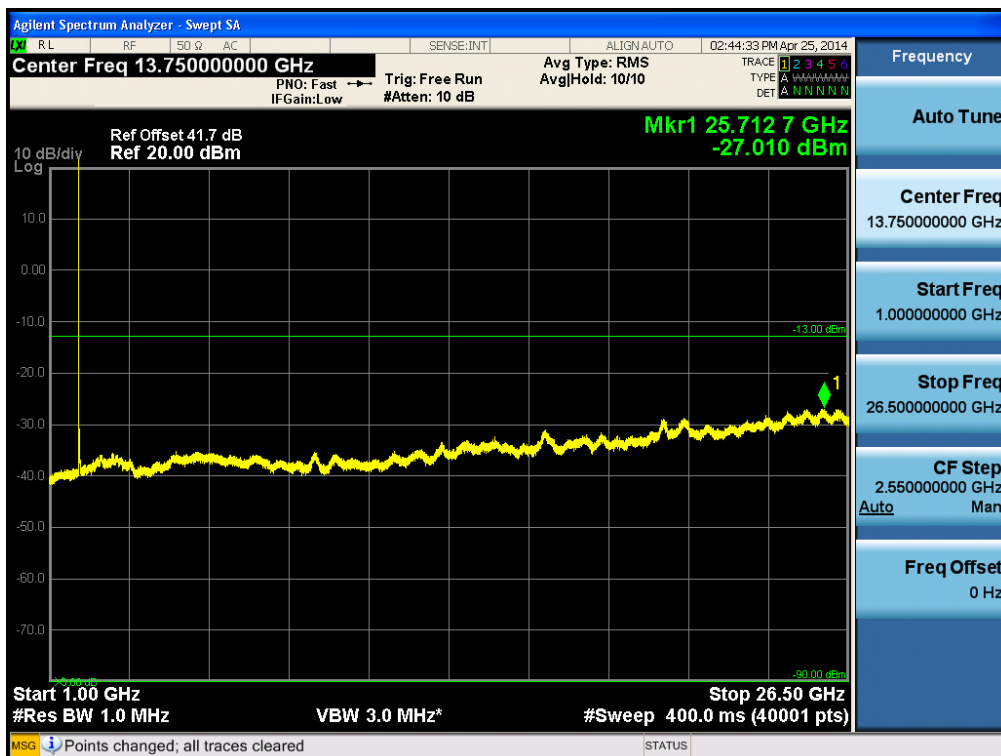
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Low Channel)

(30 MHz ~ 1 GHz)

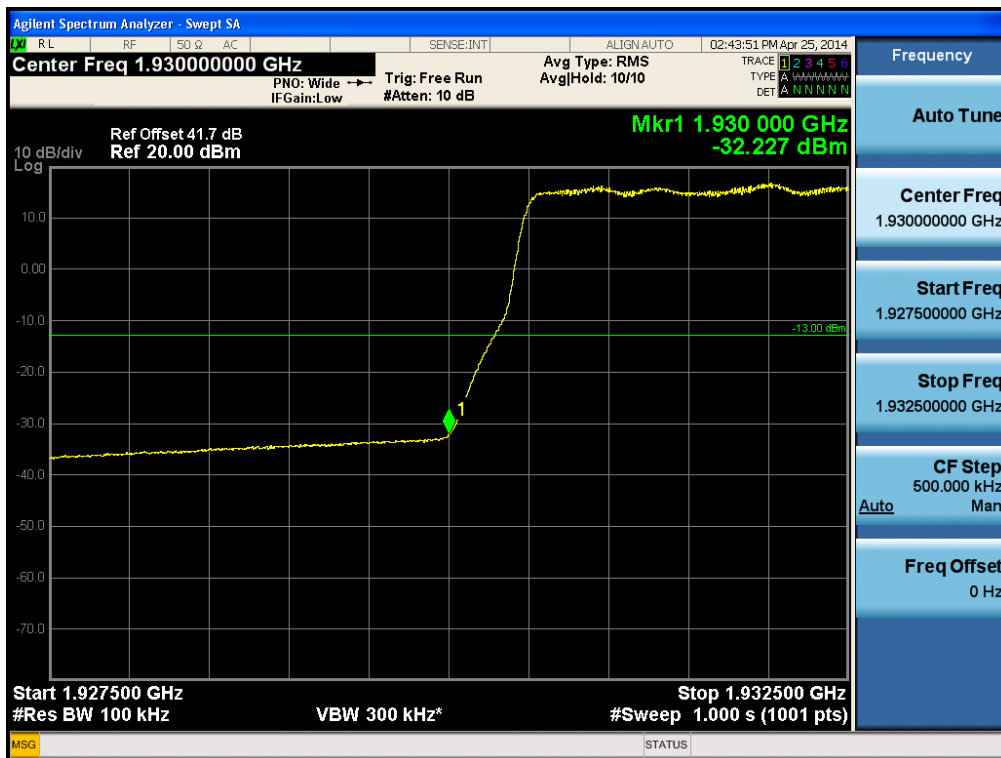


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1405-F010	Date of Issue: May 20 , 2014	EUT Type: Outdoor Pico eNB	FCC ID: A3LSLS-BP00AK	Page 93 of 126

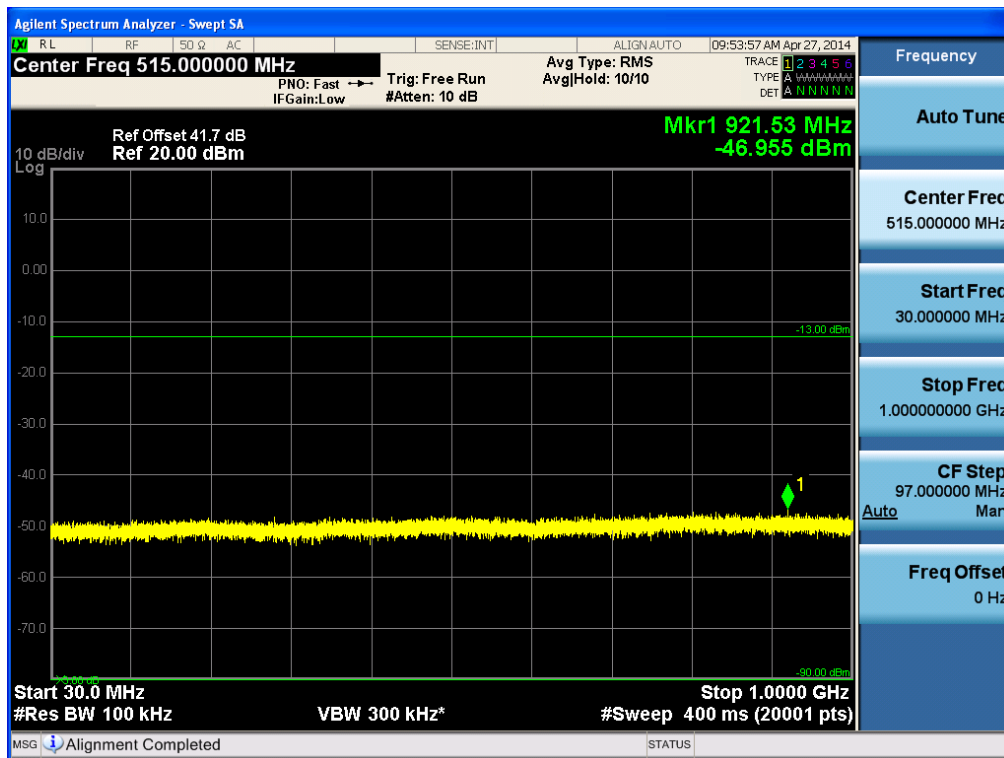
(Band Edge)



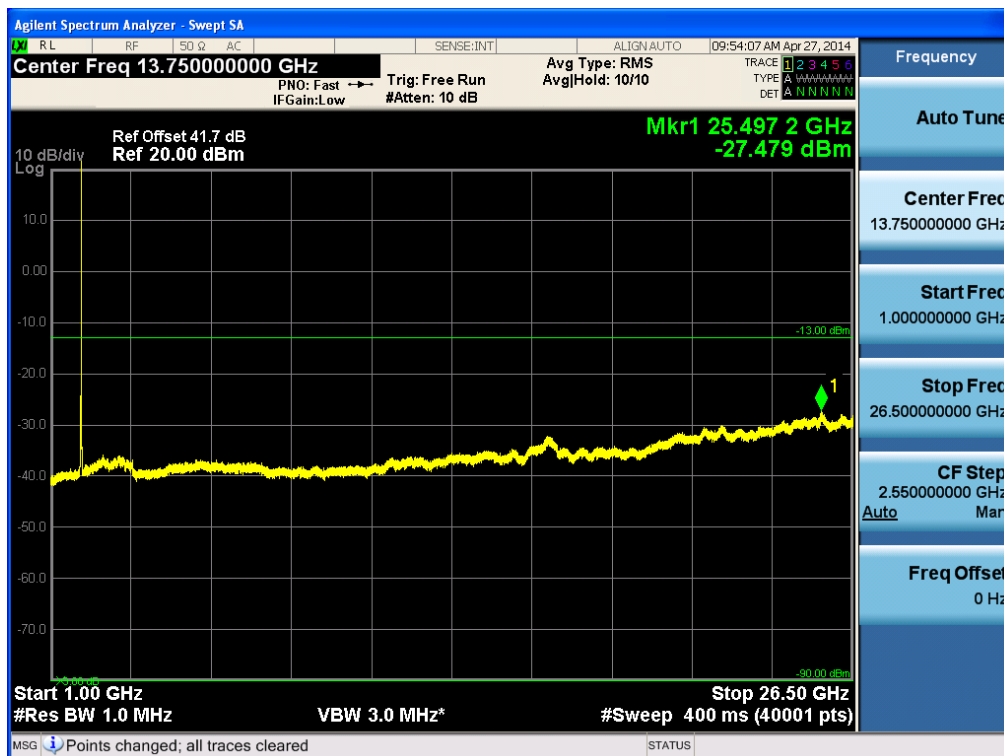
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Middle Channel)

(30 MHz ~ 1 GHz)



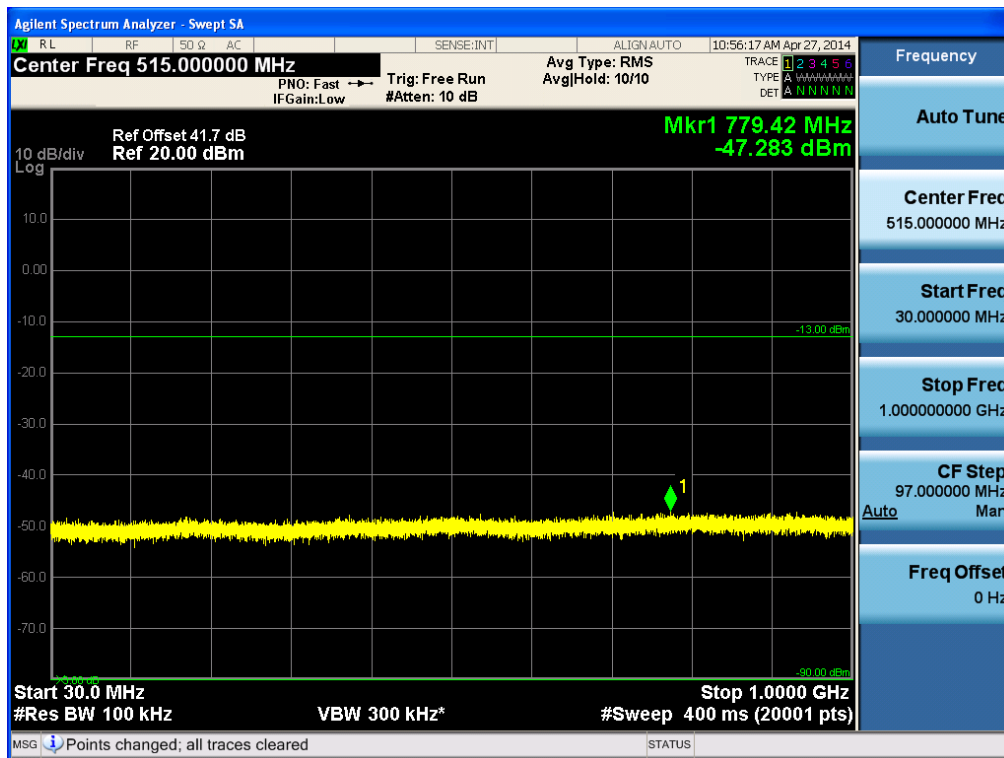
(1 GHz ~ 26.5 GHz)



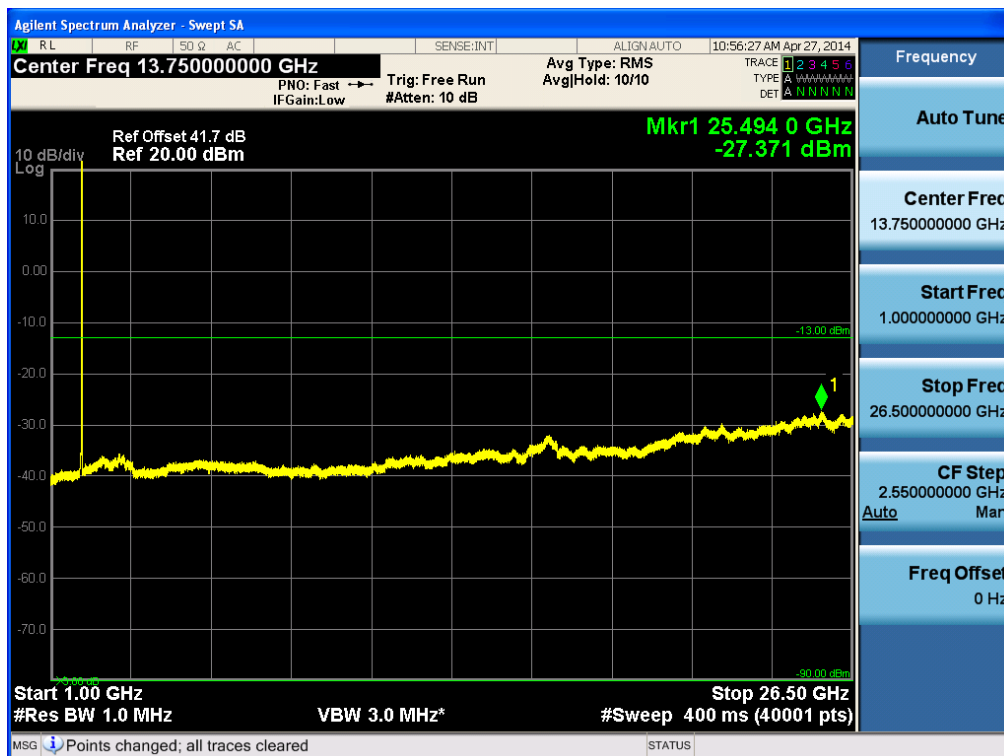
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM High Channel)

(30 MHz ~ 1 GHz)

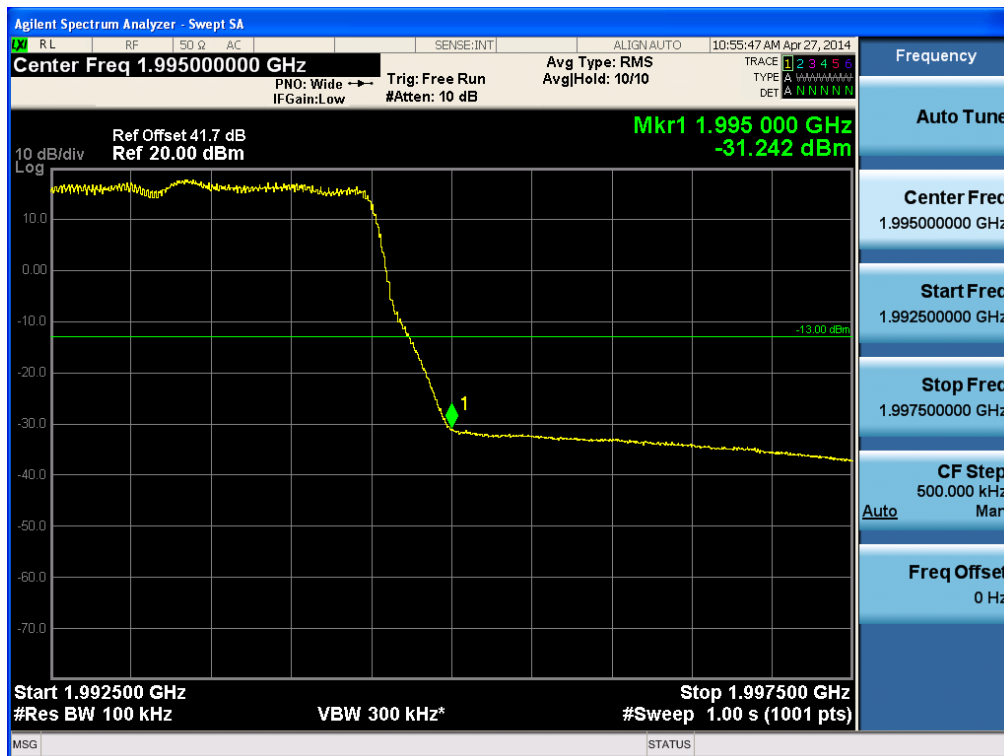


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
Test Report No. HCT-R-1405-F010	Date of Issue: May 20 , 2014	EUT Type: Outdoor Pico eNB	FCC ID: A3LSLS-BP00AK	Page 96 of 126

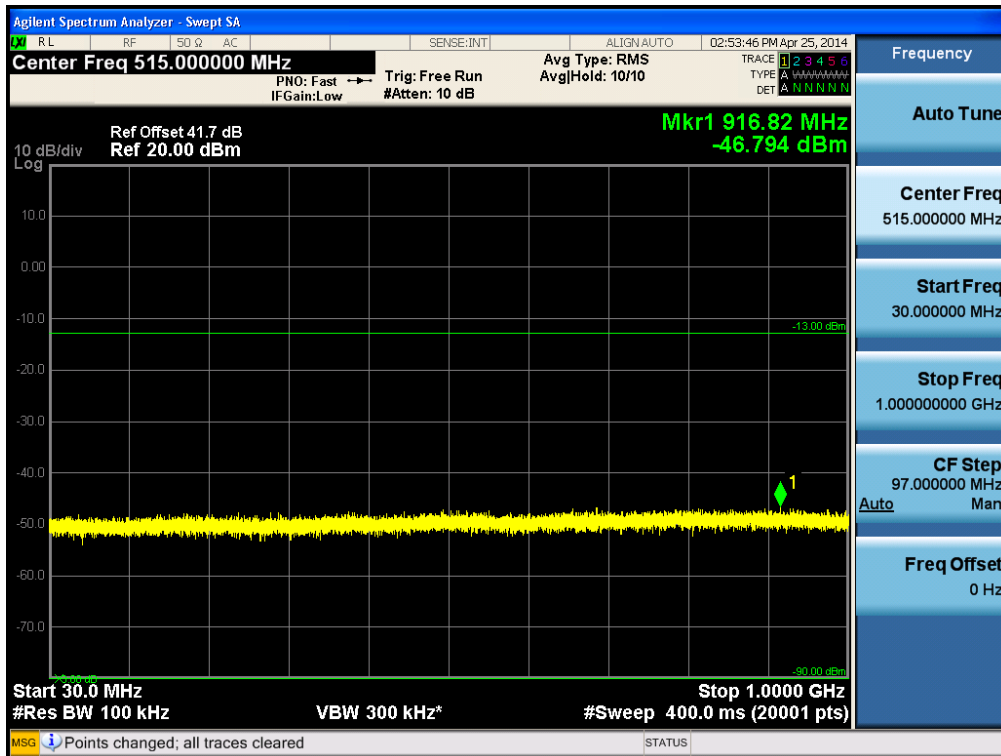
(Band Edge)



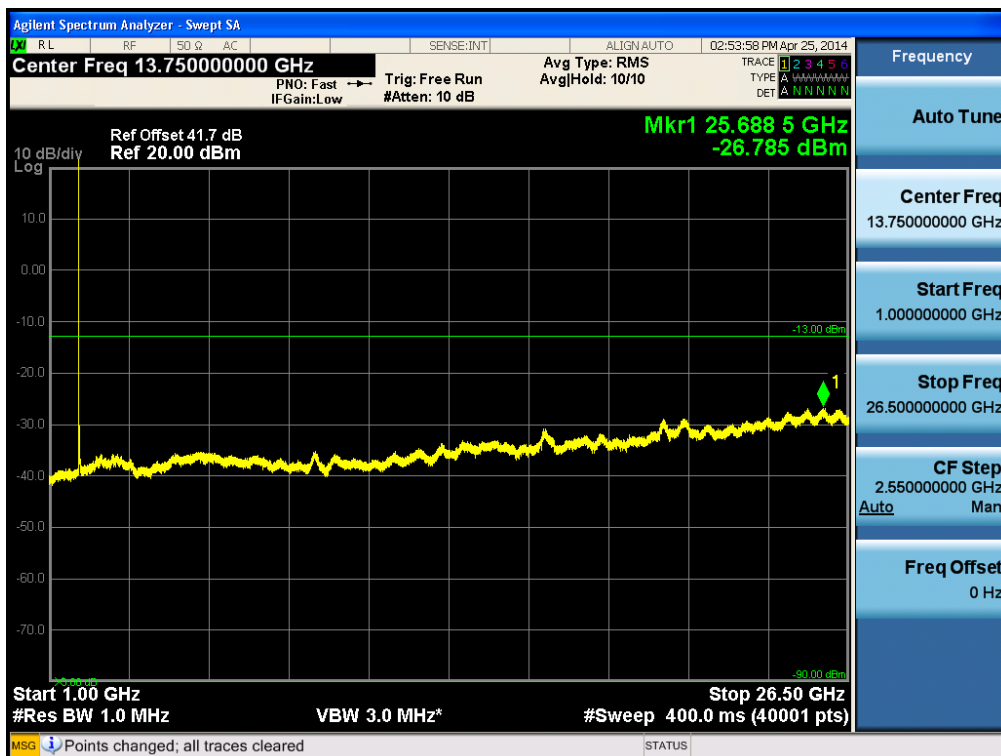
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Low Channel)

(30 MHz ~ 1 GHz)

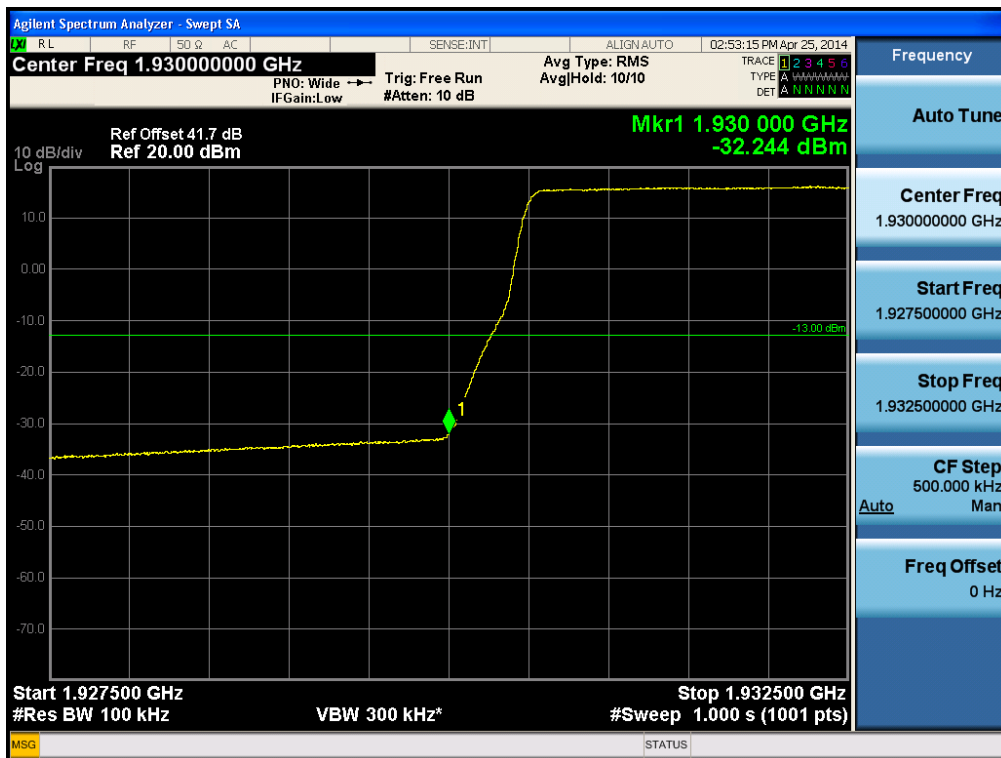


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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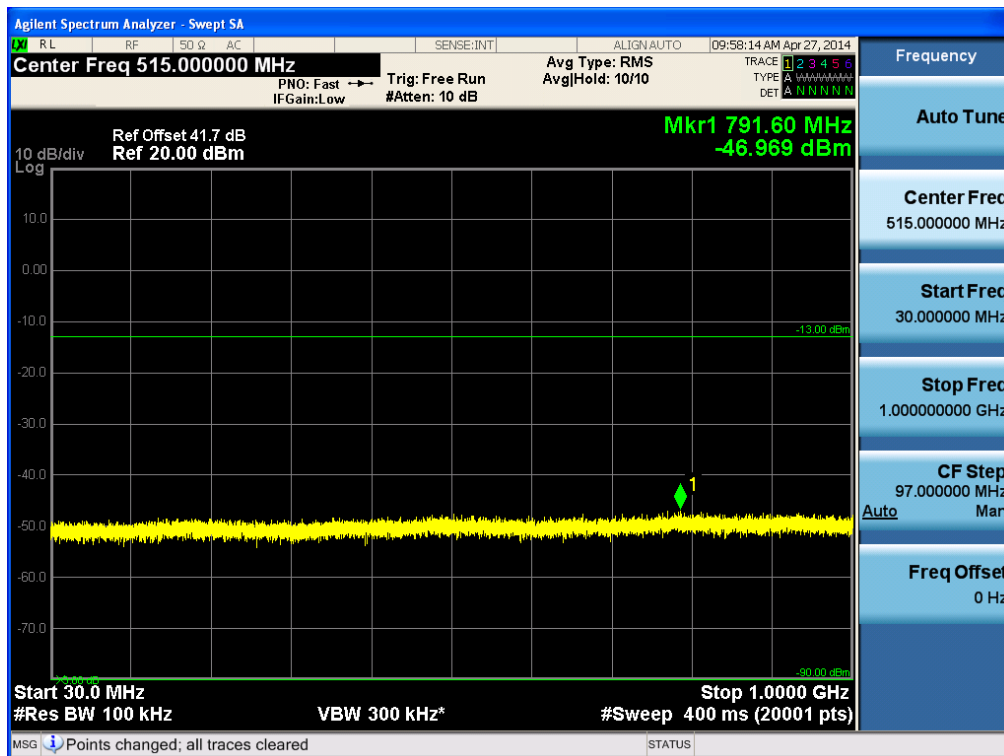
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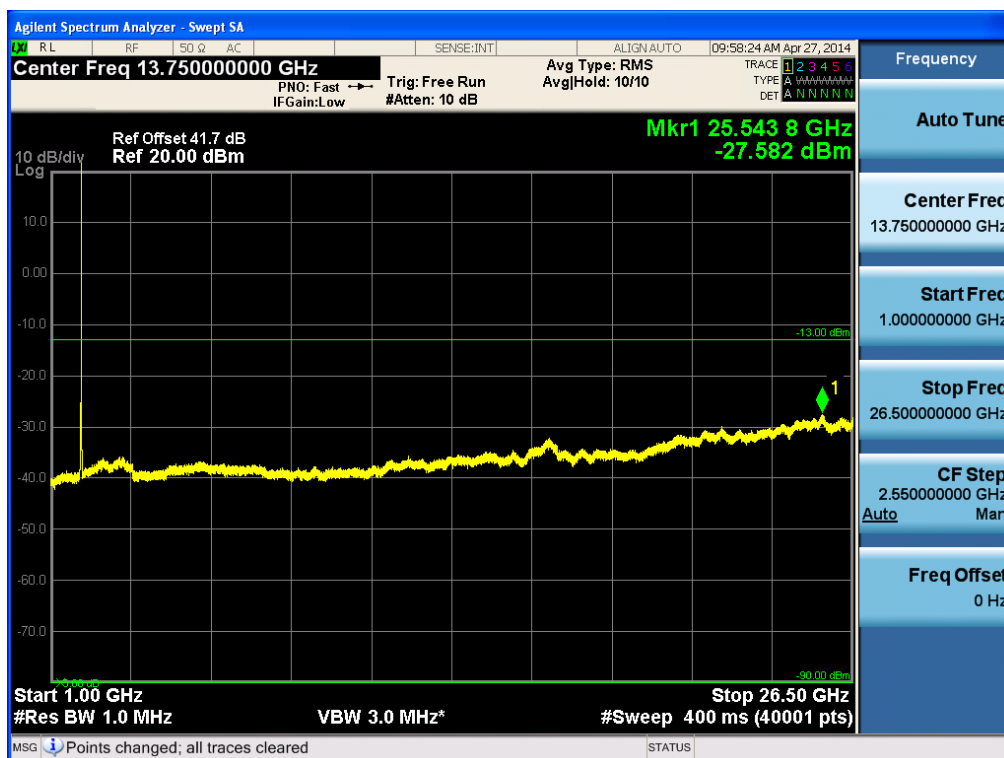
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Middle Channel)

(30 MHz ~ 1 GHz)



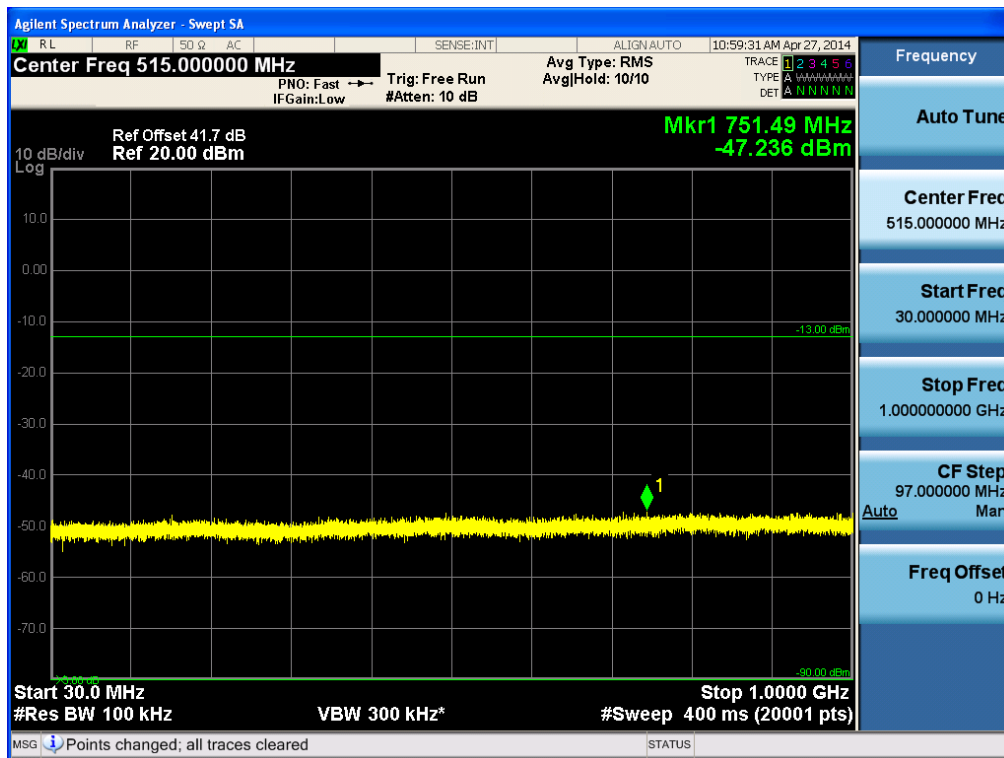
(1 GHz ~ 26.5 GHz)



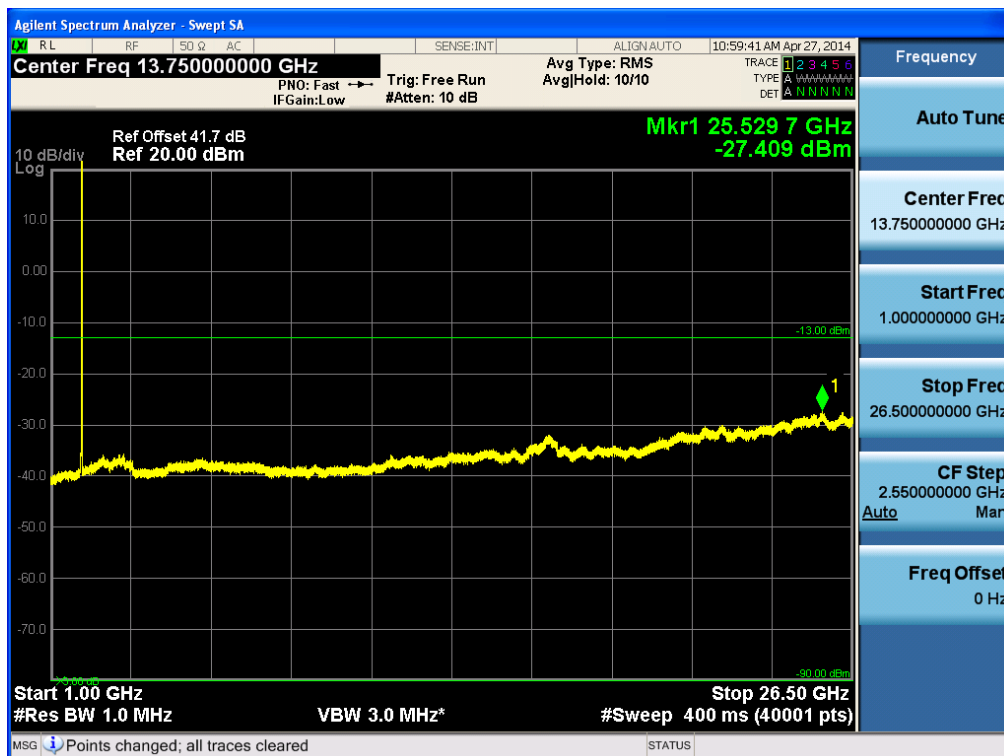
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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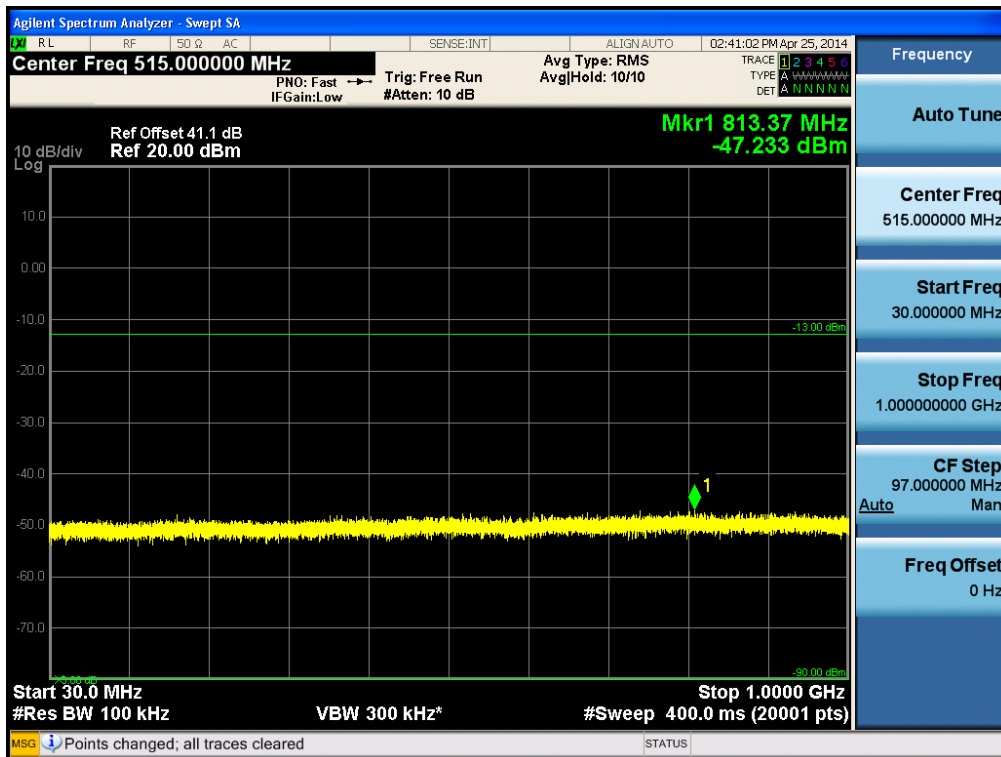
(Band Edge)



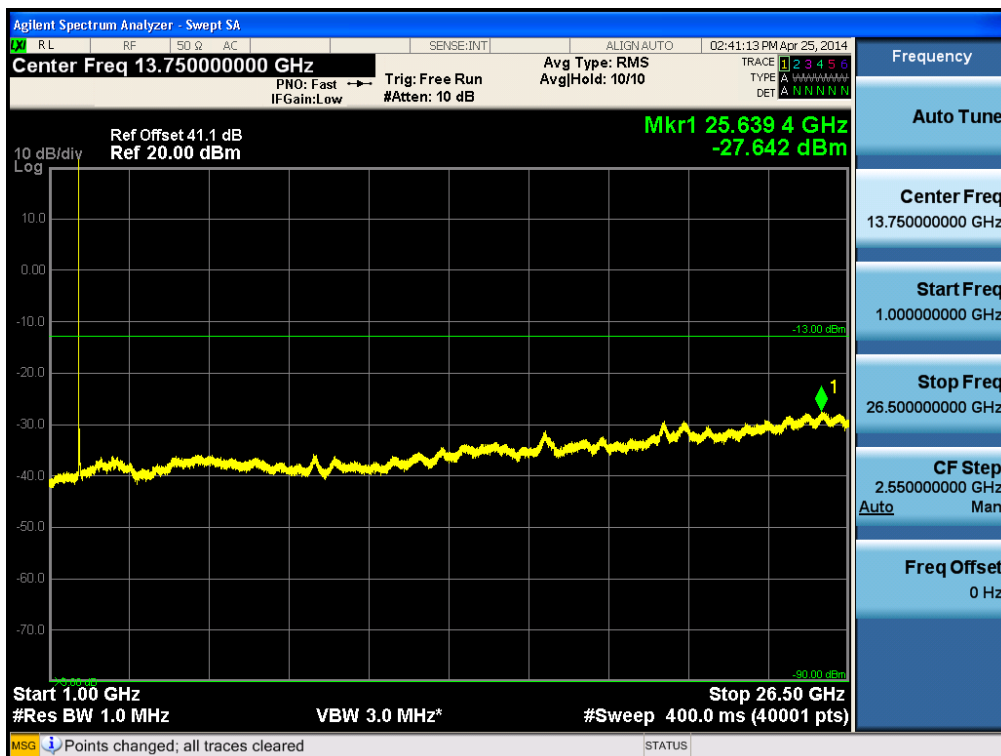
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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. Plot Data for LTE 10 MHz : 1 Carrier , Output Port 1
(QPSK Low Channel)

(30 MHz ~ 1 GHz)

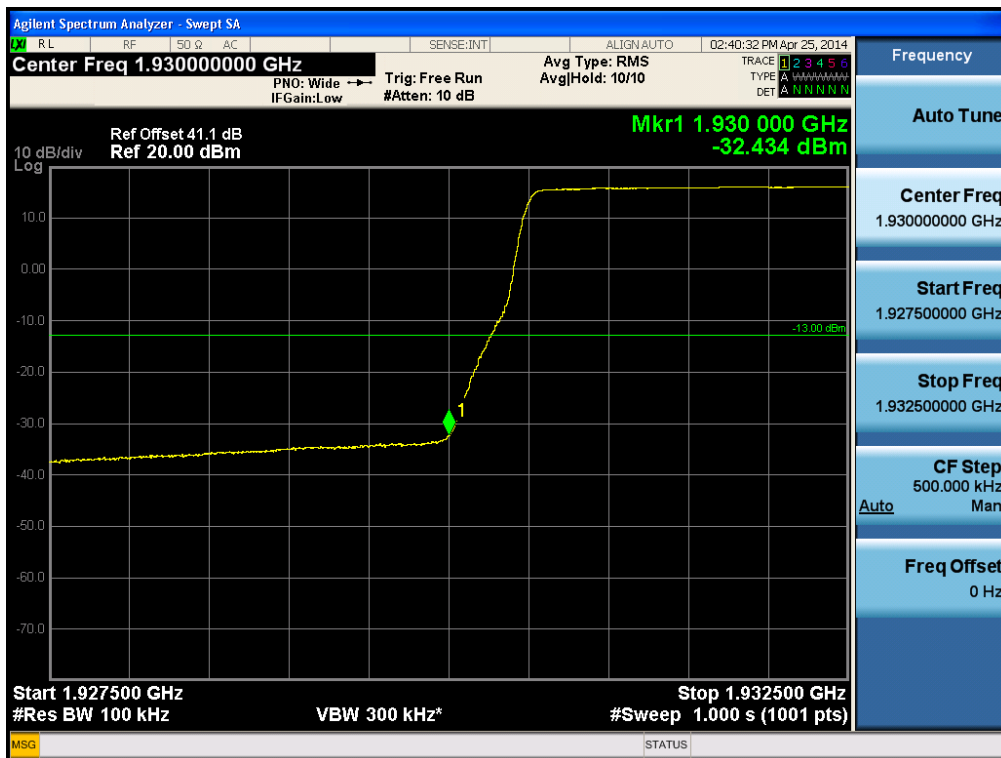


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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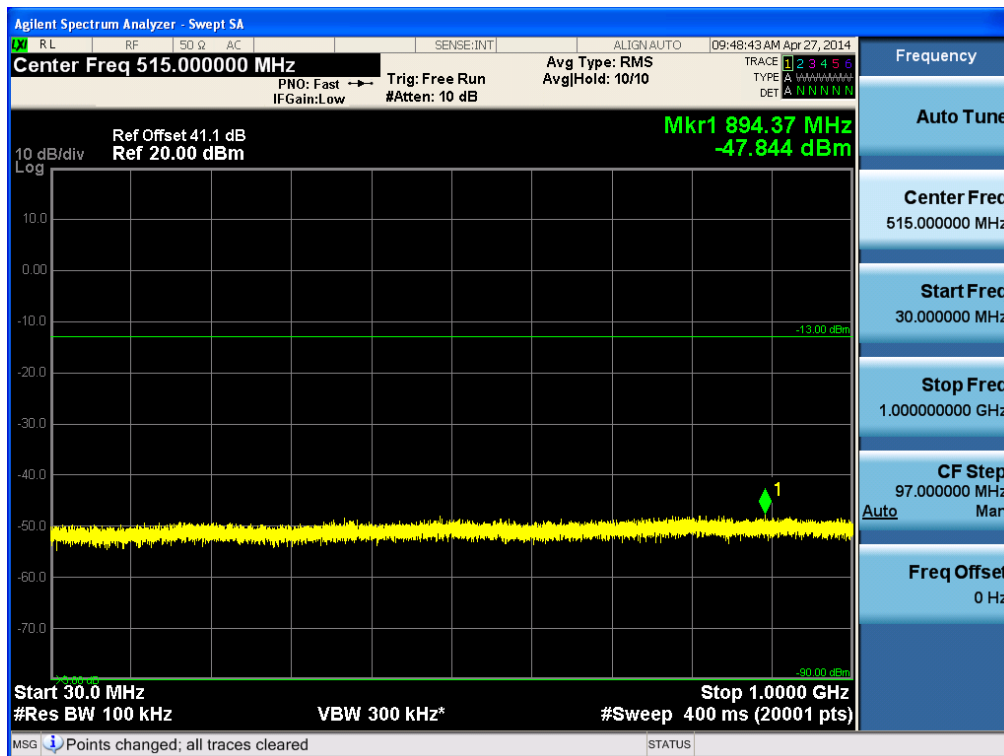
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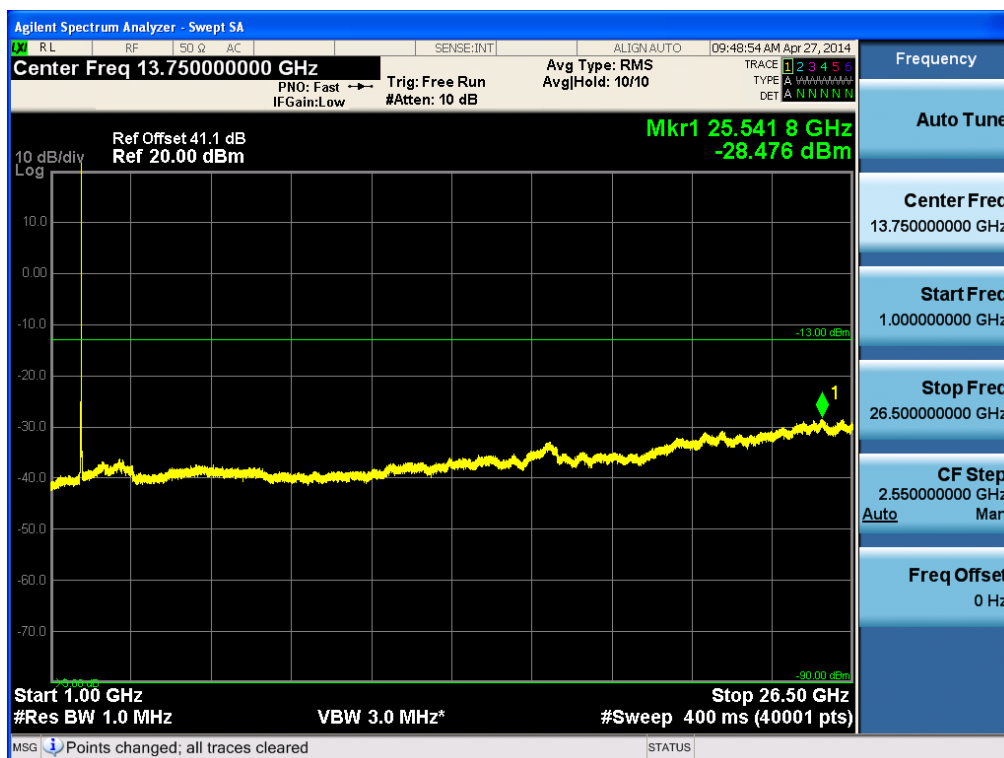
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK Middle Channel)

(30 MHz ~ 1 GHz)



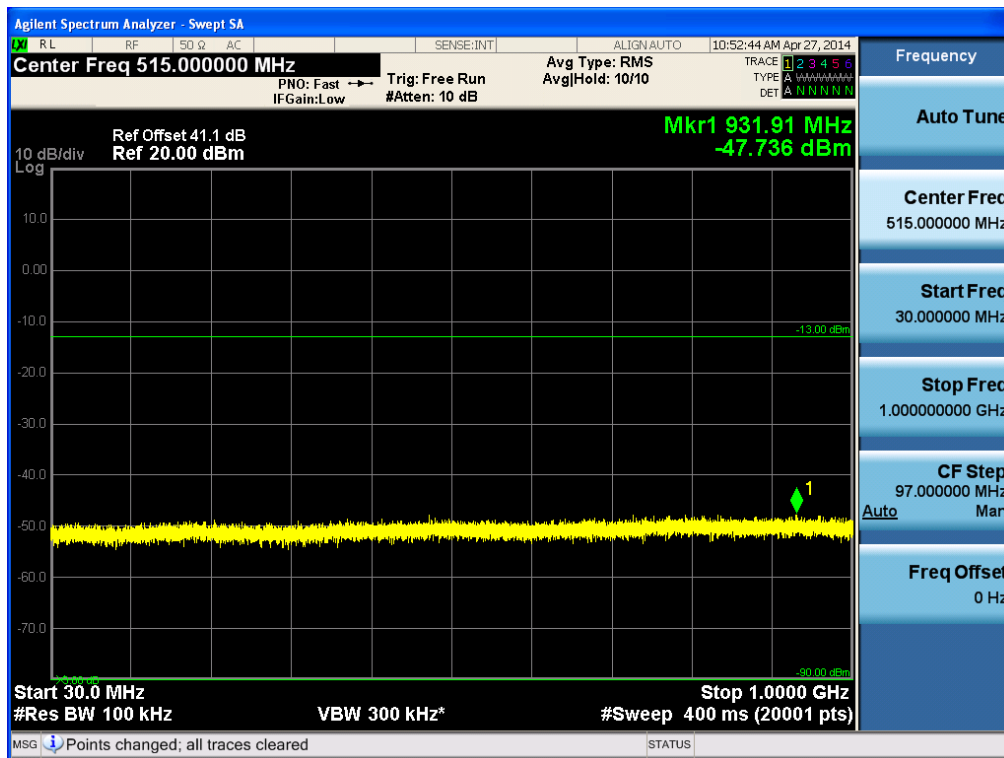
(1 GHz ~ 26.5 GHz)



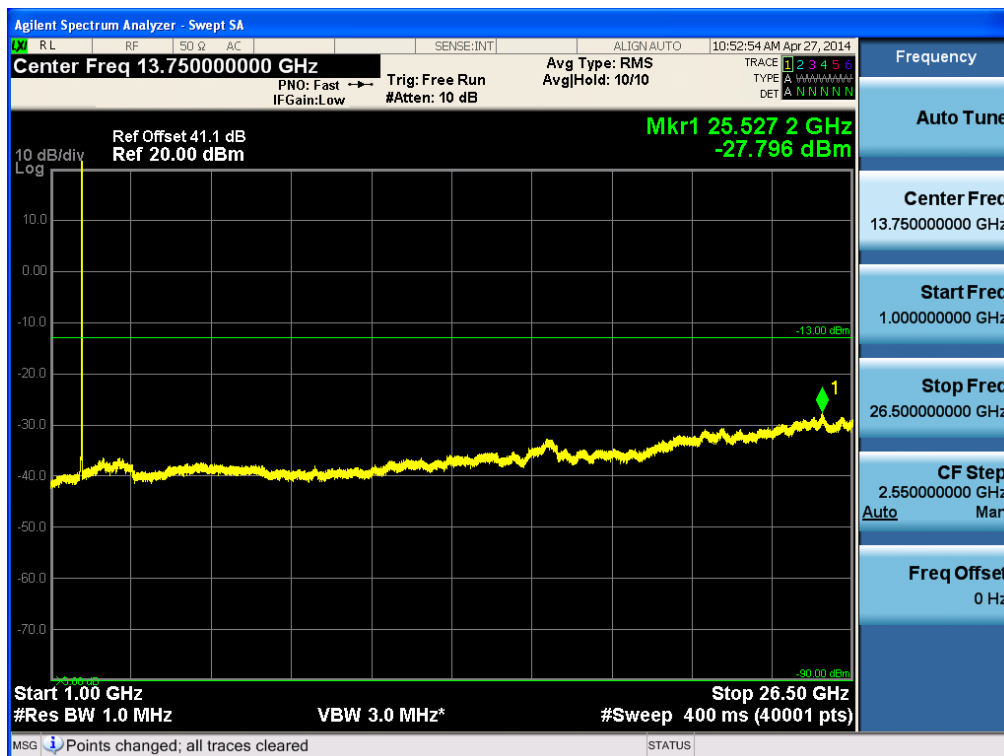
FCC PT.24 TEST REPORT		FCC CERTIFICATION REPORT			www.hct.co.kr
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(QPSK High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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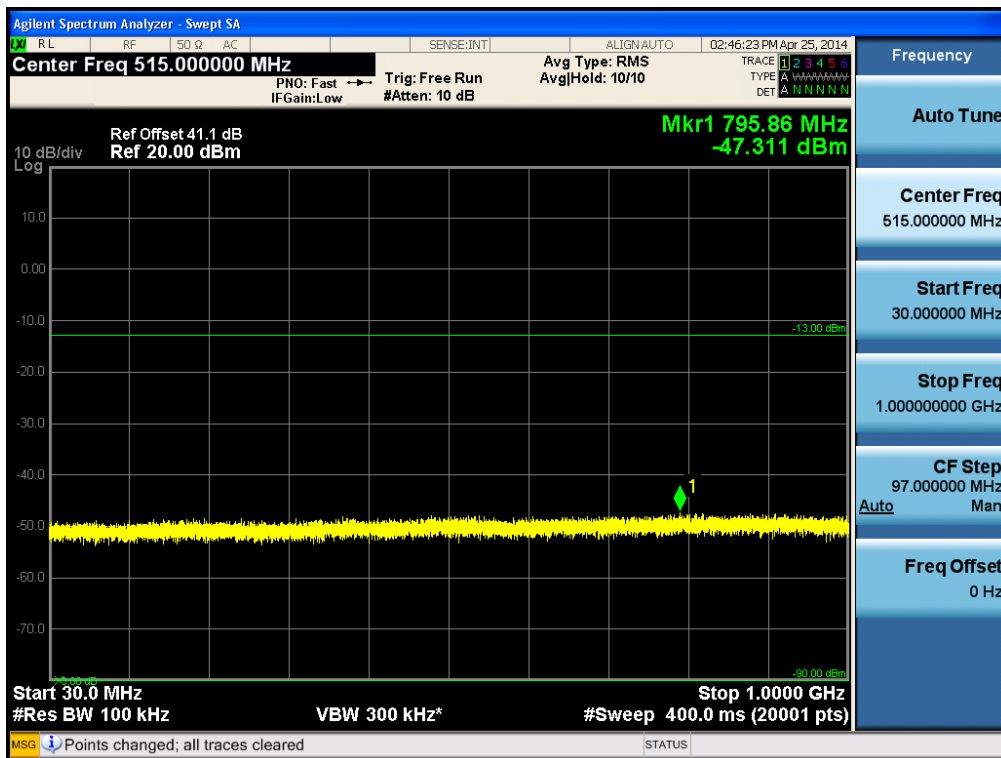
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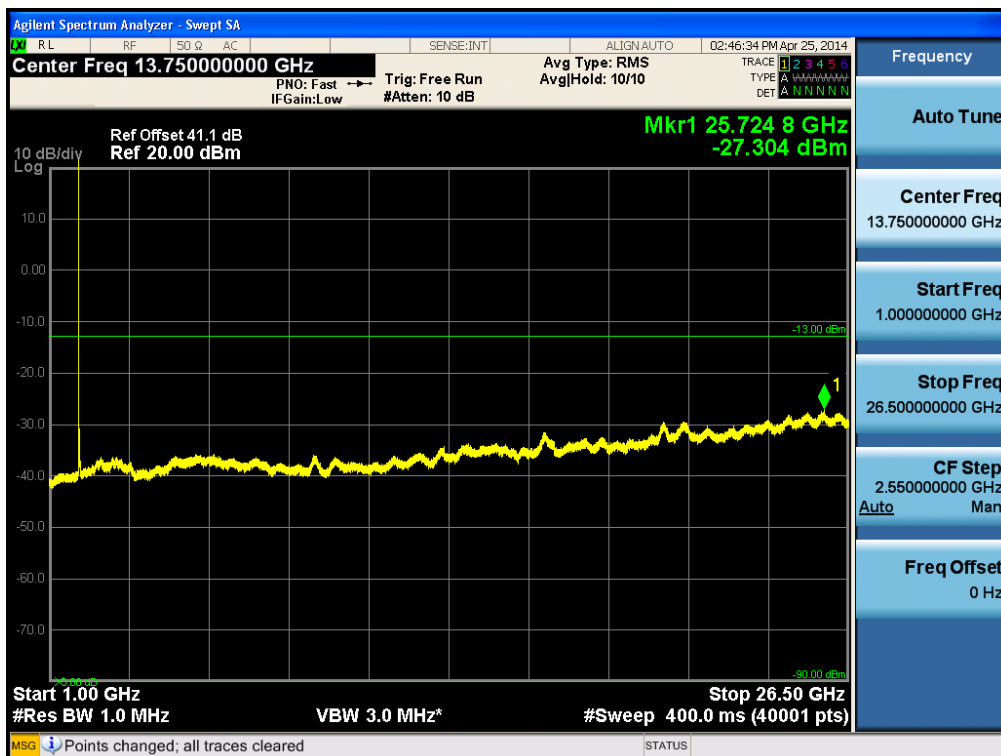
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Low Channel)

(30 MHz ~ 1 GHz)

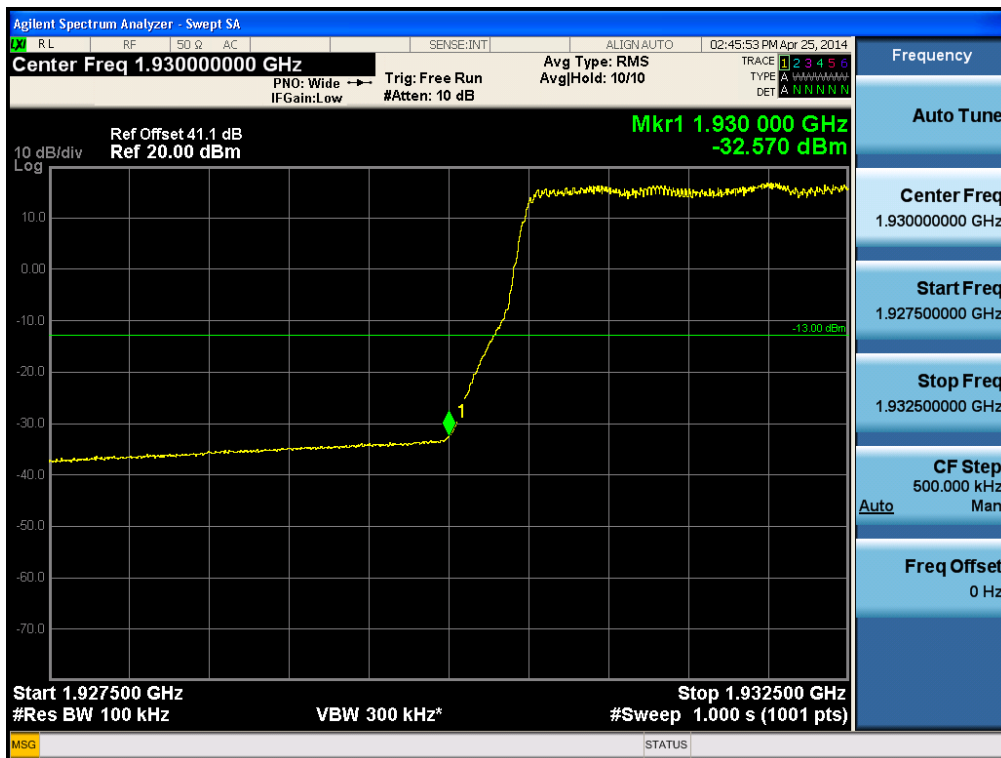


(1 GHz ~ 26.5 GHz)



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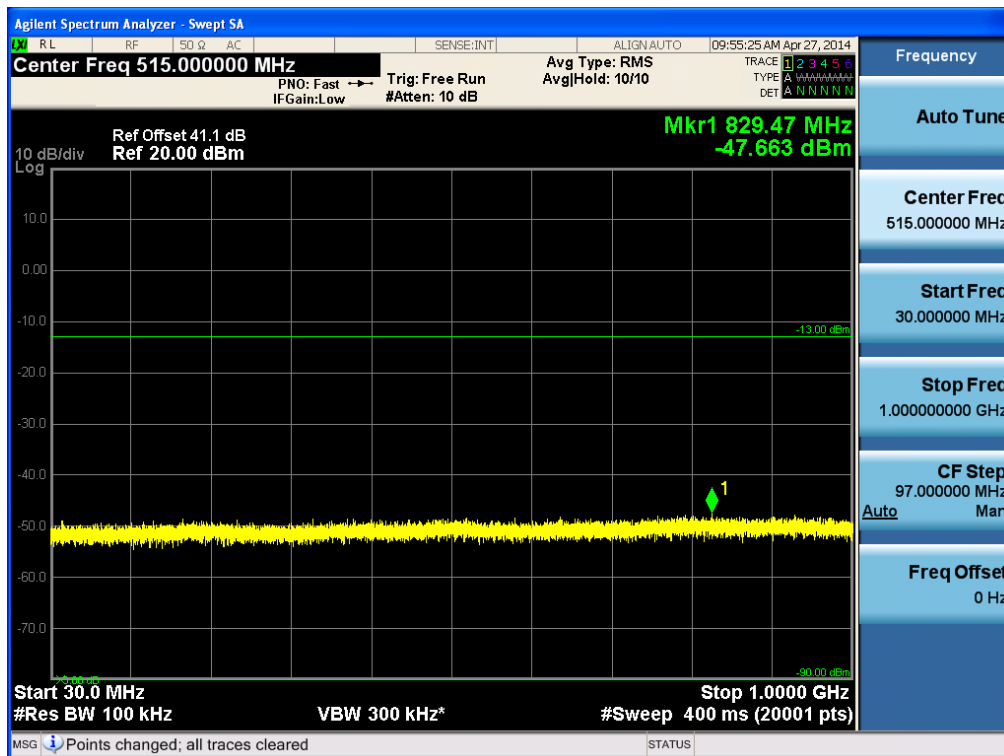
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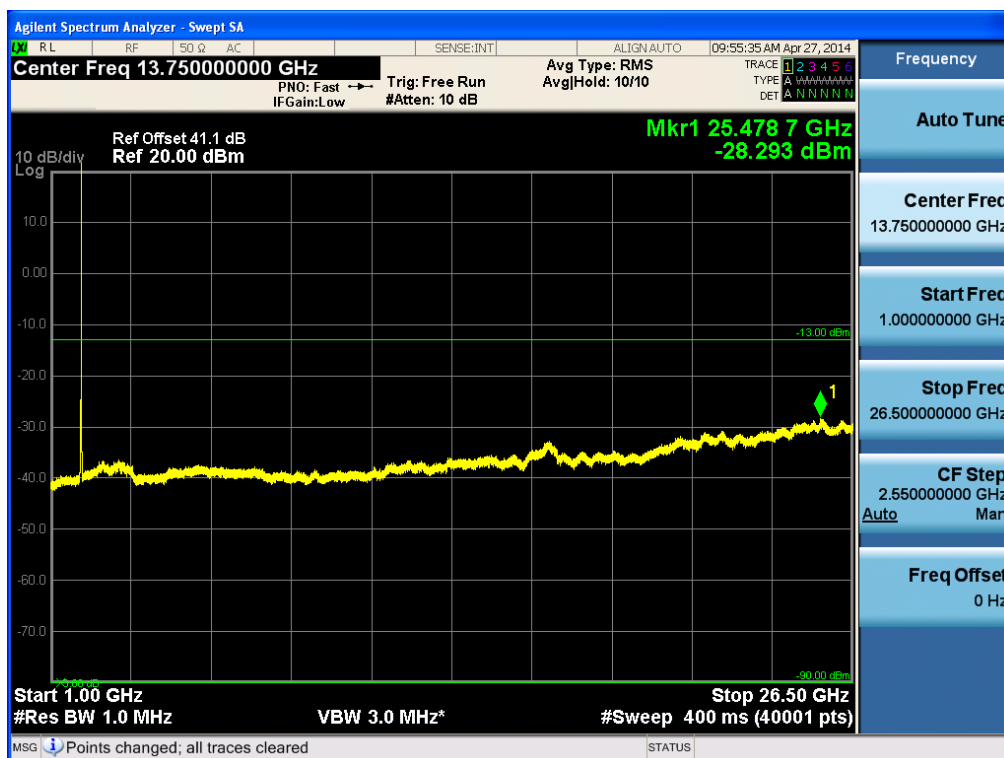
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM Middle Channel)

(30 MHz ~ 1 GHz)



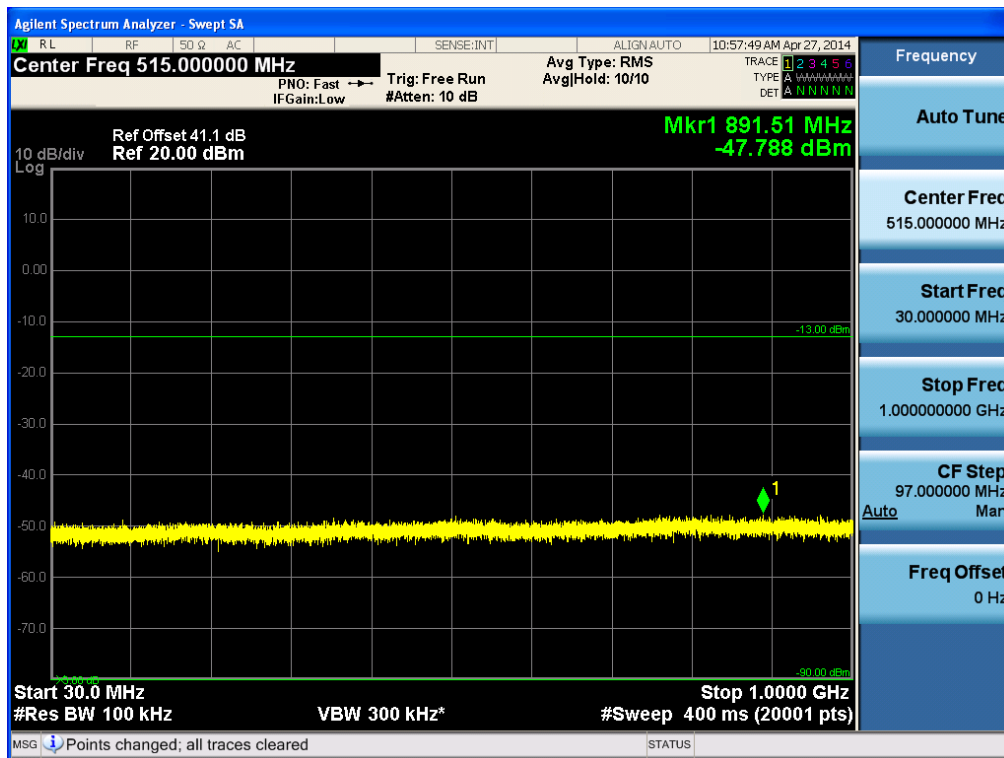
(1 GHz ~ 26.5 GHz)



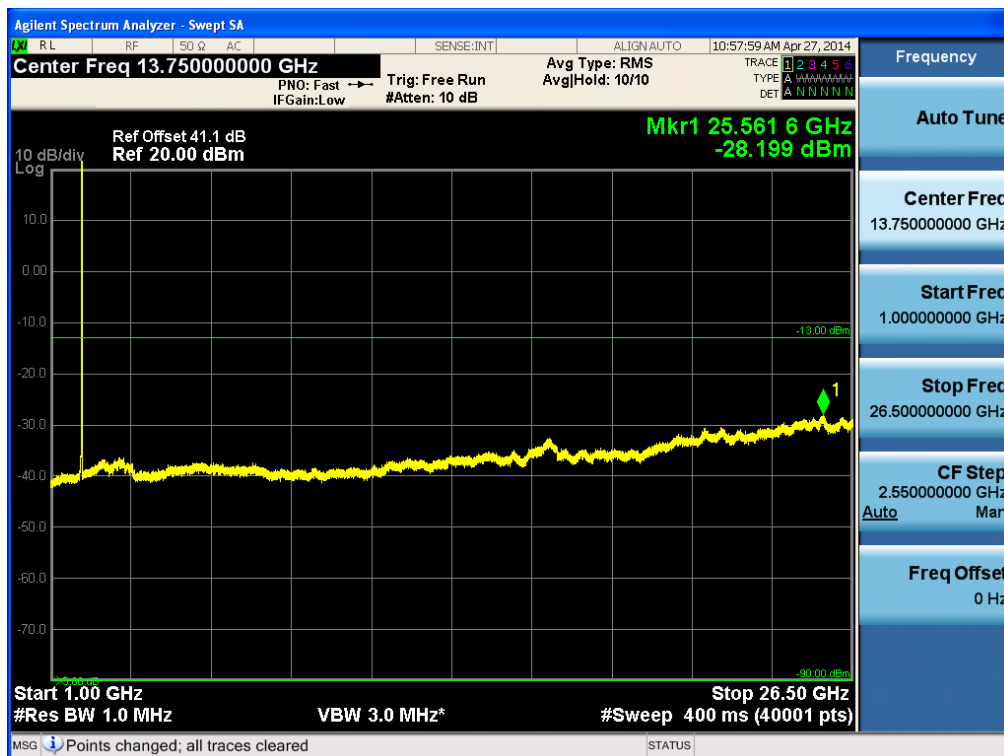
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(16QAM High Channel)

(30 MHz ~ 1 GHz)

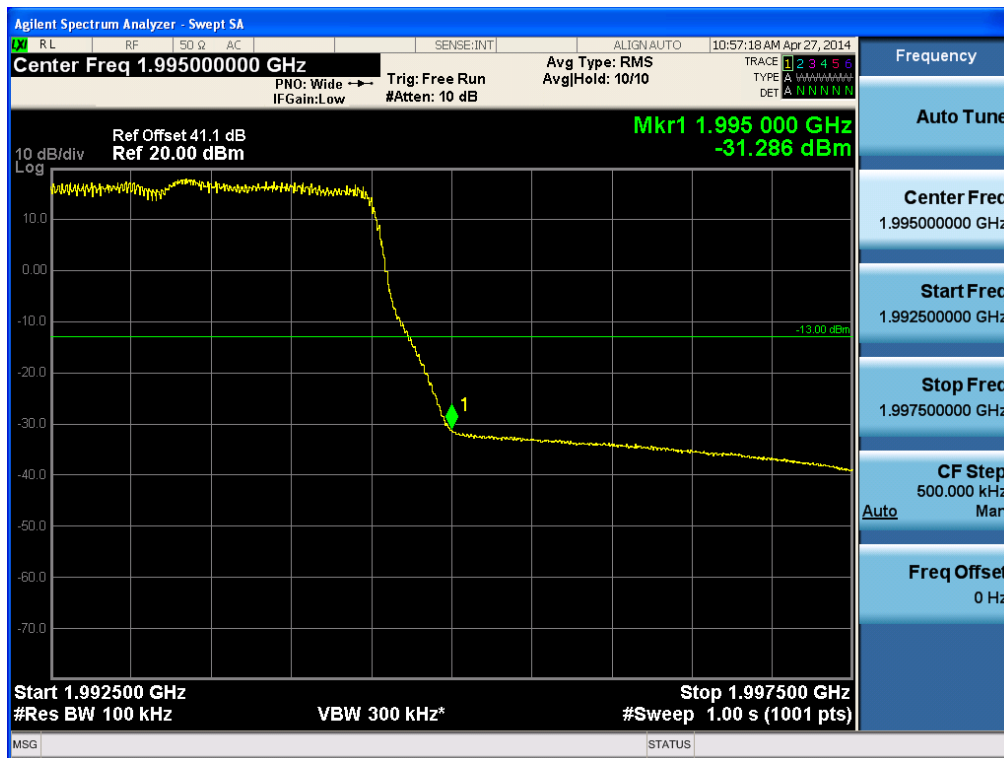


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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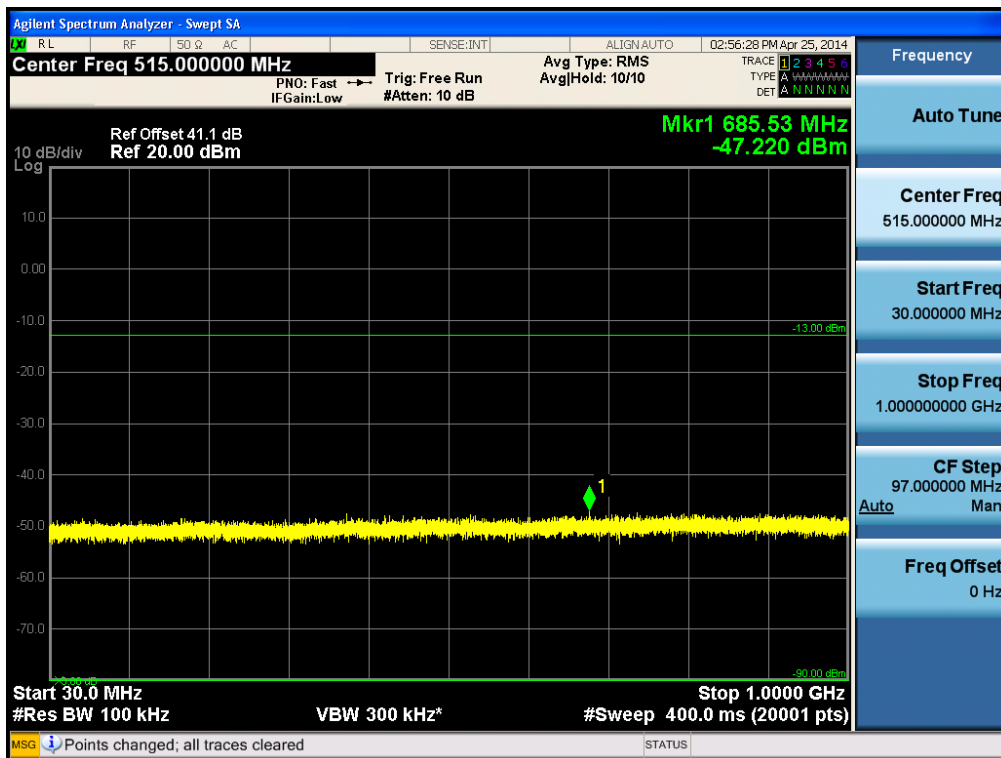
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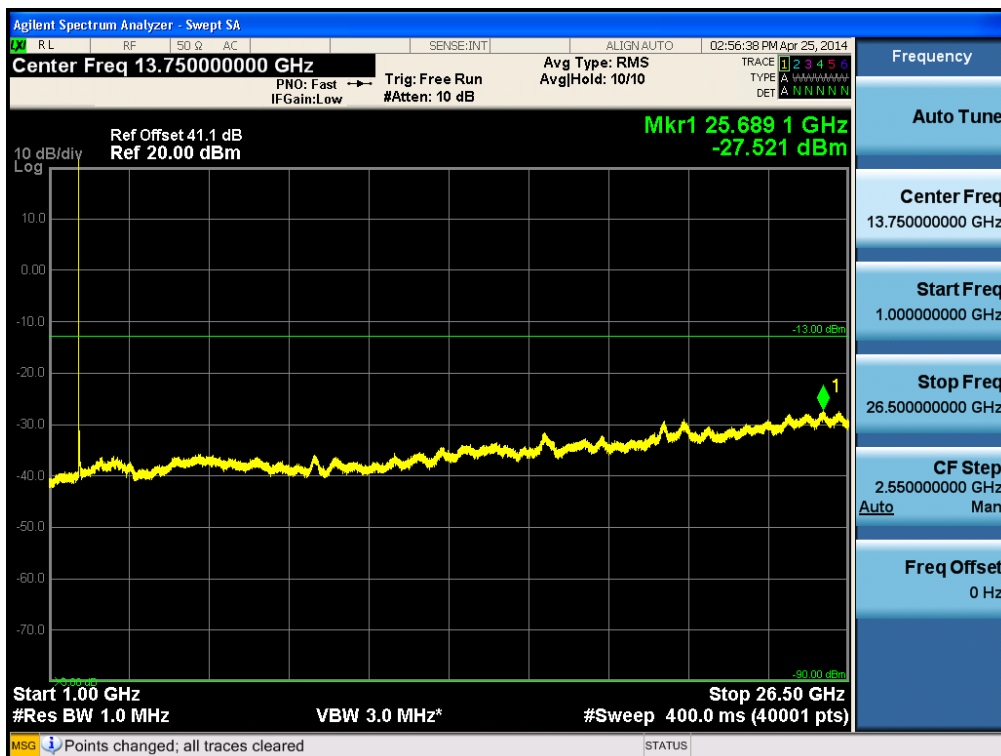
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Low Channel)

(30 MHz ~ 1 GHz)

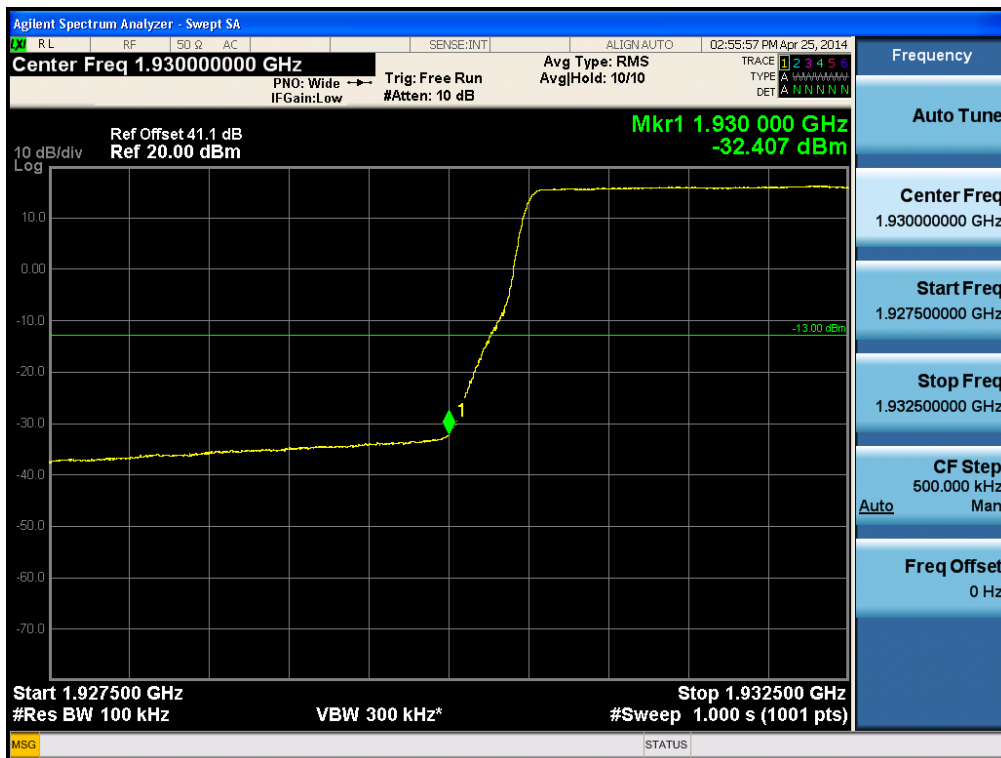


(1 GHz ~ 26.5 GHz)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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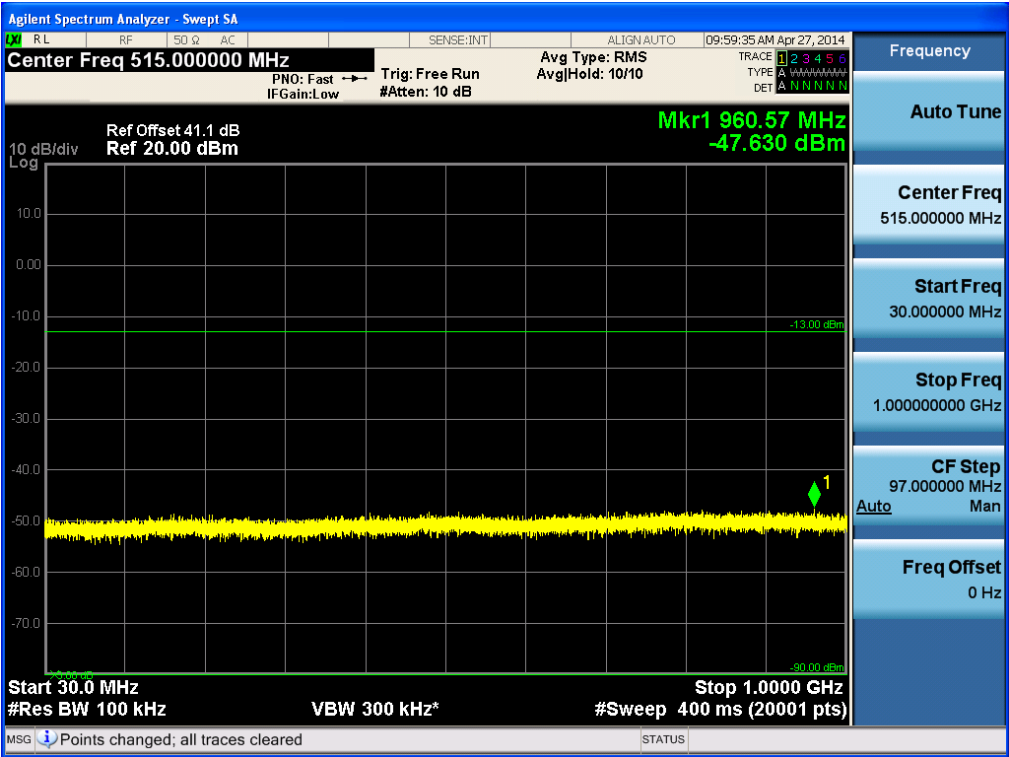
(Band Edge)



FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM Middle Channel)

(30 MHz ~ 1 GHz)



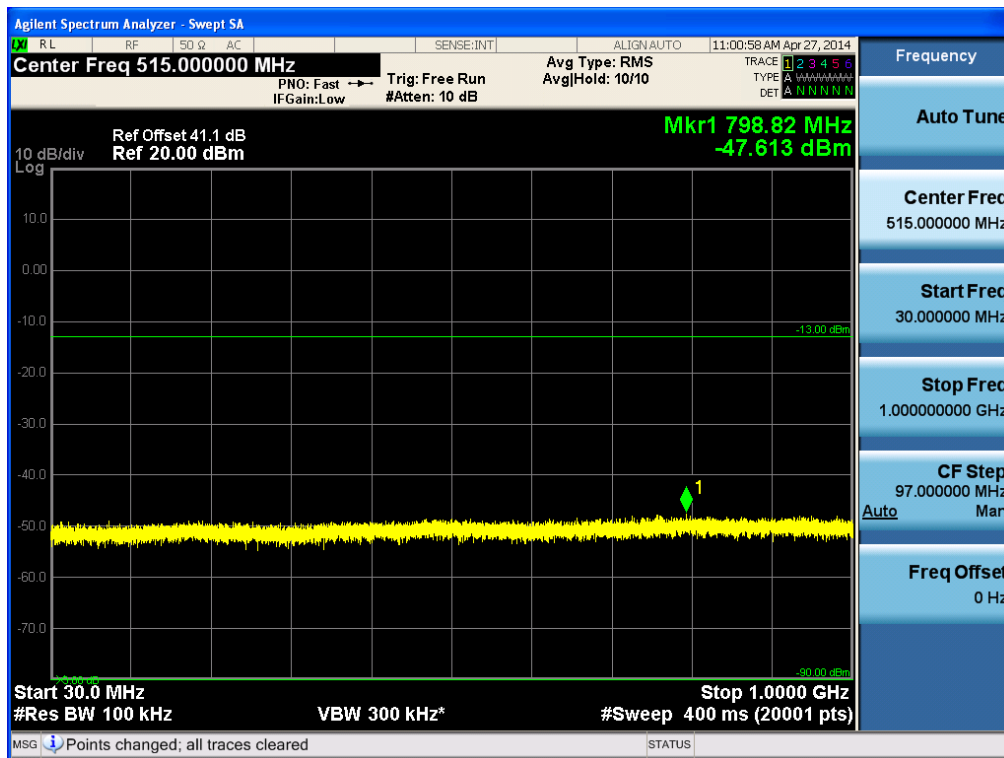
(1 GHz ~ 26.5 GHz)



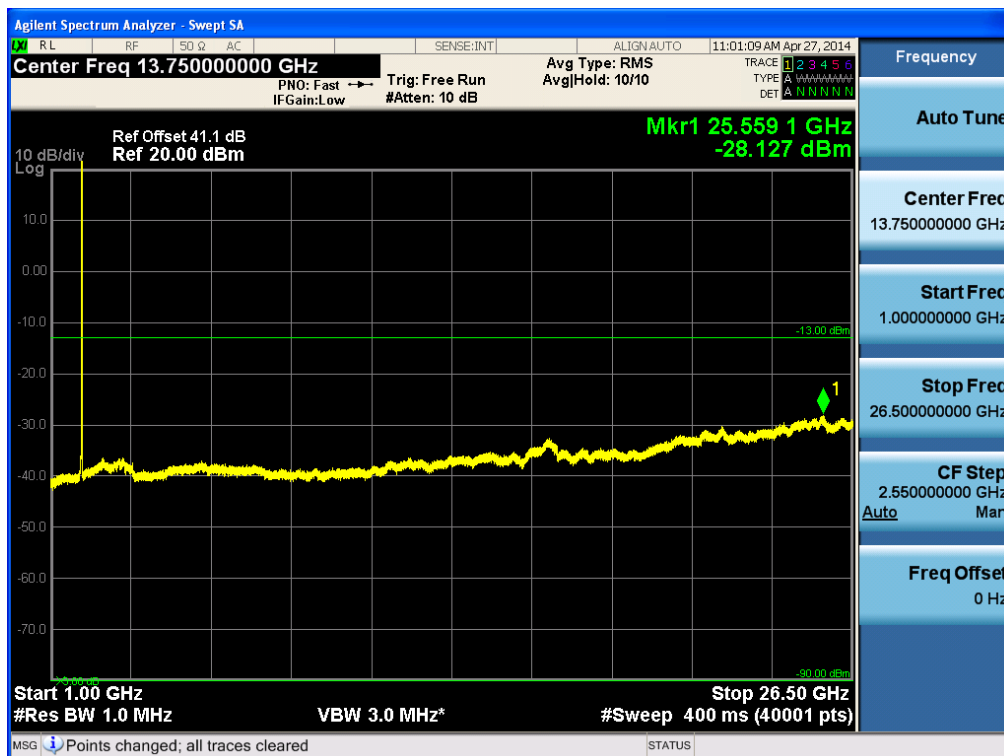
FCC PT.24 TEST REPORT	FCC CERTIFICATION REPORT			www.hct.co.kr
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(64QAM High Channel)

(30 MHz ~ 1 GHz)



(1 GHz ~ 26.5 GHz)



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(Band Edge)



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8. RADIATED SPURIOUS EMISSION

8.1 Applicable Standard

According to FCC § 24.238

(a) *Out of band emissions.* The 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.

8.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Schwarzbeck	BBHA 9120D / Double Ridged Horn Antenna	1151	07/05/2015
Schwarzbeck	VULB 9160 / TRILOG Antenna	3150	12/17/2014
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	06/10/2014
Wainwright	WHK3.3/18G-10EF/H.P.F	2	06/24/2014
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	09/12/2014
EMCO	6502/Loop Antenna	9009-2536	01/27/2016

8.3 Test Procedure

Radiated emission measurements were performed at an Fully-anechoic chamber.

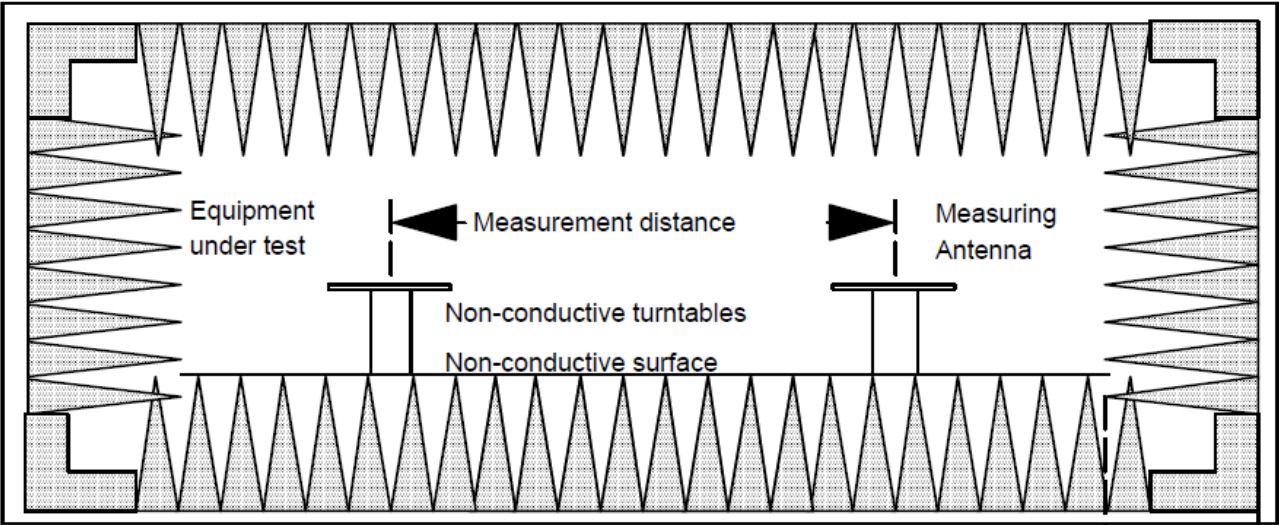
The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were connected to external antenna. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360° and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.

A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated.

The maximum EIRP of the emission was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

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8.3.1 Radiated Spurious Emissions Test Setup



8.4 Test Result

: PASS

TX Freq.(MHz)	Freq.(MHz)	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	Margin (dB)
1932.5	3,865.0	12.62	-43.59	8.43	H	-39.39	26.39
	5,797.5	13.08	-45.47	10.31	H	-42.70	29.70
1962.5	3,925.0	12.67	-43.77	8.57	H	-39.67	26.67
	5,887.5	13.09	-46.56	10.40	H	-43.87	30.87
1992.5	3,985.0	12.72	-42.91	8.71	H	-38.91	25.91
	5,977.5	13.11	-46.68	10.50	H	-44.07	31.07

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9. FREQUENCY STABILITY

9.1 Applicable Standard

Requirements: FCC § 2.1055 (a), §24.235 following: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

9.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	N9020A /Signal Analyzer	US46220219	04/16/2015
DAE YOUNG ELECTRIC & TECHNOLOGY	DFSS60 / AC Power Source	1003030-1	04/01/2015
HEWLETT PACKARD	8394C / Fixed Attenuator	10342	05/19/2015
Korea Engineering	KR-1005L / Chamber	KRAB05063-3CH	10/30/2014

9.3 Test Procedure

Frequency Stability over Temperature variation:

The equipment under test was connected to an external AC Power Source and the RF output was connected to a Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 30 minutes, the frequency output was recorded from the VSA8960 S/W via MXA Signal Analyzer.

Frequency stability over Voltage variation: An external variable AC Power Source Source. The voltage was set to 85% and 115% of the nominal value. The output frequency was recorded for each voltage.

9.4. Test Result

: Pass

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9.4.1. Frequency Stability over Temperature and Voltage variation

(5MHz LTE)

Modulation: QPSK

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1932 499 999	-1.35	0.0	0.0000
	0	1932 499 999	-1.06	0.3	0.0002
	+10	1932 499 996	-4.14	-2.8	-0.0014
	+30	1932 500 001	1.31	2.7	0.0014
	+40	1932 499 998	-1.59	-0.2	-0.0001
	+50	1932 500 001	1.26	2.6	0.0014
115%	+20	1932 500 001	0.80	2.2	0.0011
85%	+20	1932 500 001	0.57	1.9	0.0010

Reference: 120 Vac at 20°C **Freq.** = 1932,500,000 MHz

Modulation: 16QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1932 500 000	-0.44	0.0	0.0000
	0	1932 500 000	-0.40	0.0	0.0000
	+10	1932 499 998	-1.83	-1.4	-0.0007
	+30	1932 500 005	4.95	5.4	0.0028
	+40	1932 499 999	-1.18	-0.7	-0.0004
	+50	1932 499 997	-2.68	-2.2	-0.0012
115%	+20	1932 499 998	-2.21	-1.8	-0.0009
85%	+20	1932 500 001	1.25	1.7	0.0009

Reference: 120 Vac at 20°C **Freq.** = 1962,500,000 MHz

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Modulation: 64QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1932 499 999	-1.46	0.0	0.0000
	0	1932 499 998	-1.58	-0.1	-0.0001
	+10	1932 499 999	-0.62	0.8	0.0004
	+30	1932 500 003	3.25	4.7	0.0024
	+40	1932 499 993	-7.30	-5.8	-0.0030
	+50	1932 499 996	-4.10	-2.6	-0.0014
115%	+20	1932 500 000	0.20	1.7	0.0009
85%	+20	1932 499 999	-1.17	0.3	0.0002

Reference: 120 Vac at 20°C **Freq.** = 1992,500,000 MHz

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(10MHz LTE)**Modulation: QPSK**

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1934 999 999	-0.78	0.0	0.0000
	0	1935 000 000	-0.41	0.4	0.0002
	+10	1934 999 999	-0.51	0.3	0.0001
	+30	1934 999 999	-0.75	0.0	0.0000
	+40	1934 999 999	-0.72	0.1	0.0000
	+50	1934 999 999	-0.81	0.0	0.0000
115%	+20	1934 999 999	-0.80	0.0	0.0000
85%	+20	1934 999 999	-0.90	-0.1	-0.0001

Reference: 120 Vac at 20°C **Freq.** = 1932,500,000 MHz

Modulation: 16QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1935 000 000	-0.17	0.0	0.0000
	0	1934 999 999	-0.53	-0.4	-0.0002
	+10	1934 999 998	-1.83	-1.7	-0.0009
	+30	1934 999 999	-0.60	-0.4	-0.0002
	+40	1934 999 999	-0.70	-0.5	-0.0003
	+50	1934 999 999	-0.63	-0.5	-0.0002
115%	+20	1935 000 000	-0.50	-0.3	-0.0002
85%	+20	1935 000 000	-0.30	-0.1	-0.0001

Reference: 120 Vac at 20°C **Freq.** = 1962,500,000 MHz

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Modulation: 64QAM

Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (Hz)	ppm
100%	+20(Ref)	1934 999 998	-2.01	0.0	0.0000
	0	1934 999 998	-1.77	0.2	0.0001
	+10	1934 999 998	-1.90	0.1	0.0001
	+30	1934 999 998	-1.90	0.1	0.0001
	+40	1934 999 998	-1.96	0.0	0.0000
	+50	1934 999 998	-1.94	0.1	0.0000
115%	+20	1934 999 998	-1.85	0.2	0.0001
85%	+20	1934 999 999	-1.17	0.8	0.0004

Reference: 120 Vac at 20°C **Freq.** = 1992,500,000 MHz

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10. RF EXPOSURE STATEMENT

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f ²)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....			f/1500	30
1500 - 100.000.....			1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

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3. RESULTS

Port 0

Max Peak output Power at antenna input terminal	35.76	dBm
Max Peak output Power at antenna input terminal	3767.038	mW
Prediction distance	100.00	cm
Prediction frequency	1962.5	MHz
Antenna Gain(typical)	10.00	dBi
Antenna Gain(numeric)	10.00	–
Power density at prediction frequency (S)	0.299771	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

Port 1

Max Peak output Power at antenna input terminal	35.91	dBm
Max Peak output Power at antenna input terminal	3810.658	mW
Prediction distance	100.00	cm
Prediction frequency	1962.5	MHz
Antenna Gain(typical)	10.00	dBi
Antenna Gain(numeric)	10.00	–
Power density at prediction frequency (S)	0.303243	mW/cm ²
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm ²

The power density level at 100 cm is 0.299771 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm² at Port 0

The power density level at 100 cm is 0.303243 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm² at Port 1

Simultaneous MPE at 100 cm is $(0.299771/1.0)+(0.303243/1.0) < 1$

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