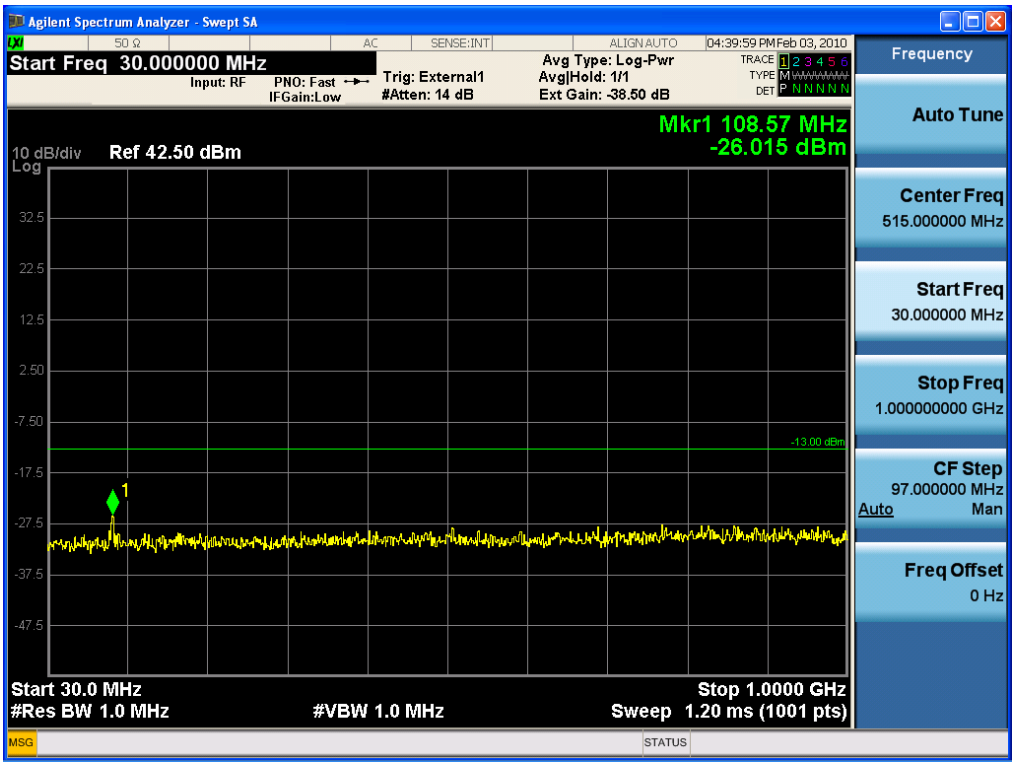
(QPSK High Channel)



(30 MHz ~ 1 GHz)

(QPSK Low Channel)

(1 GHz ~ 26.5 GHz)

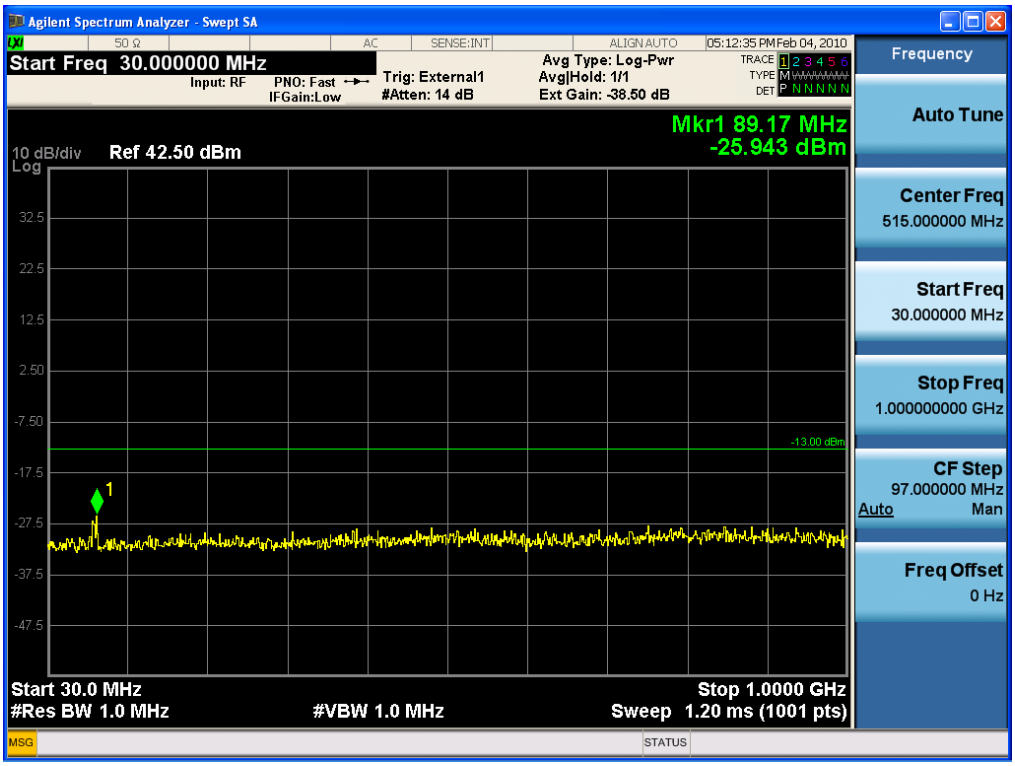
(QPSK Middle Channel)

(1 GHz ~ 26.5 GHz)

(QPSK High Channel)

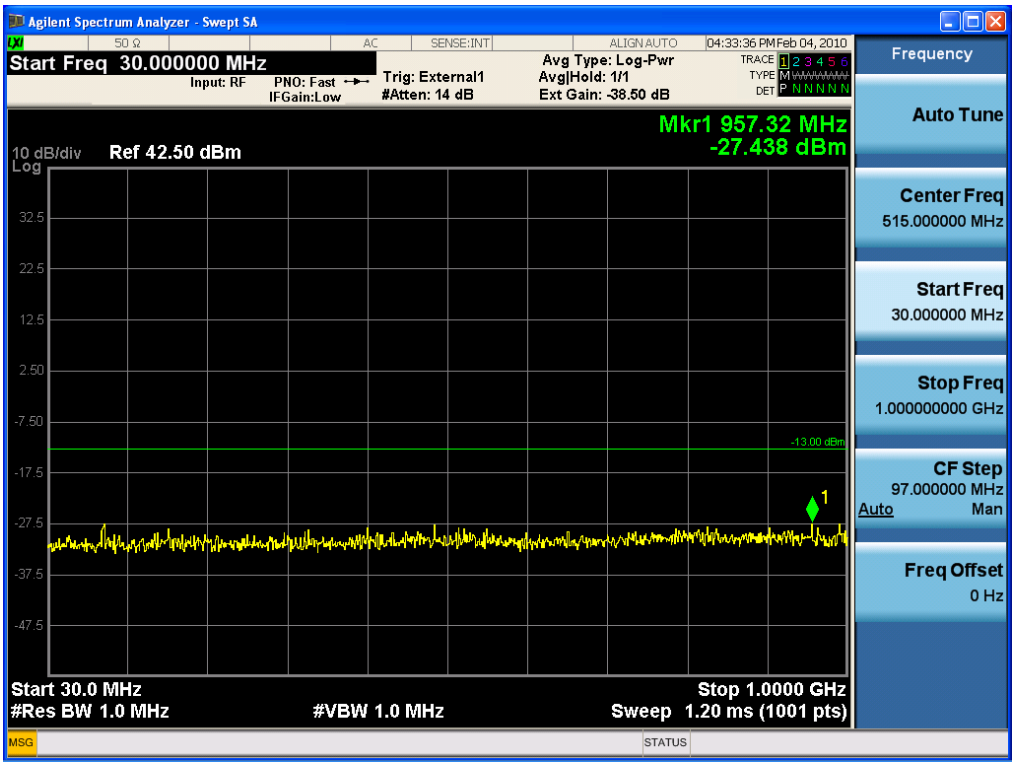
(1 GHz ~ 26.5 GHz)

(16QAM LOW Channel)



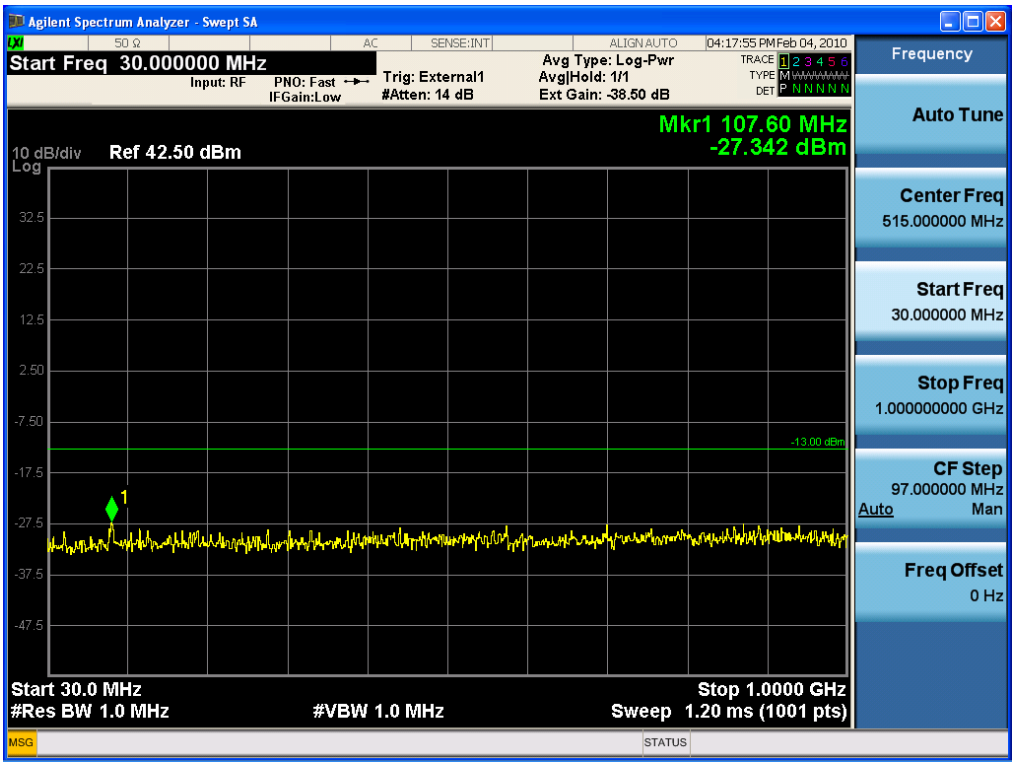
(30 MHz ~ 1 GHz)

(16QAM Middle Channel)



(30 MHz ~ 1 GHz)

(16QAM High Channel)



(30 MHz ~ 1 GHz)

(16QAM LOW Channel)

(1 GHz ~ 26.5 GHz)

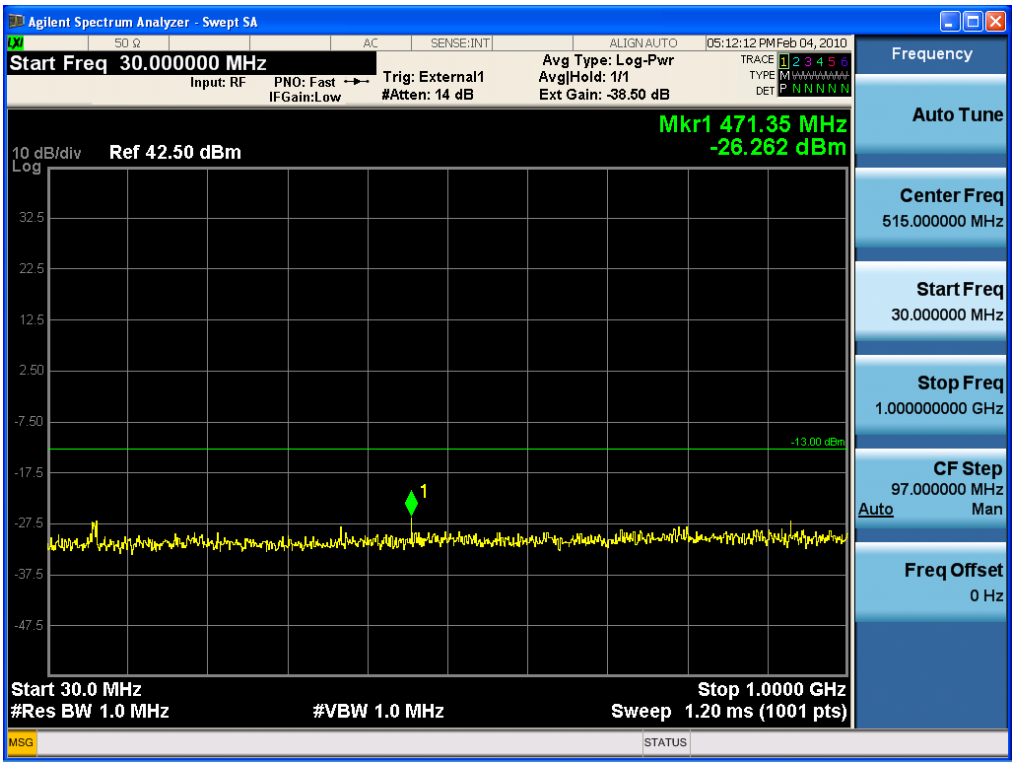
(16QAM Middle Channel)

(1 GHz ~ 26.5 GHz)

(16QAM High Channel)

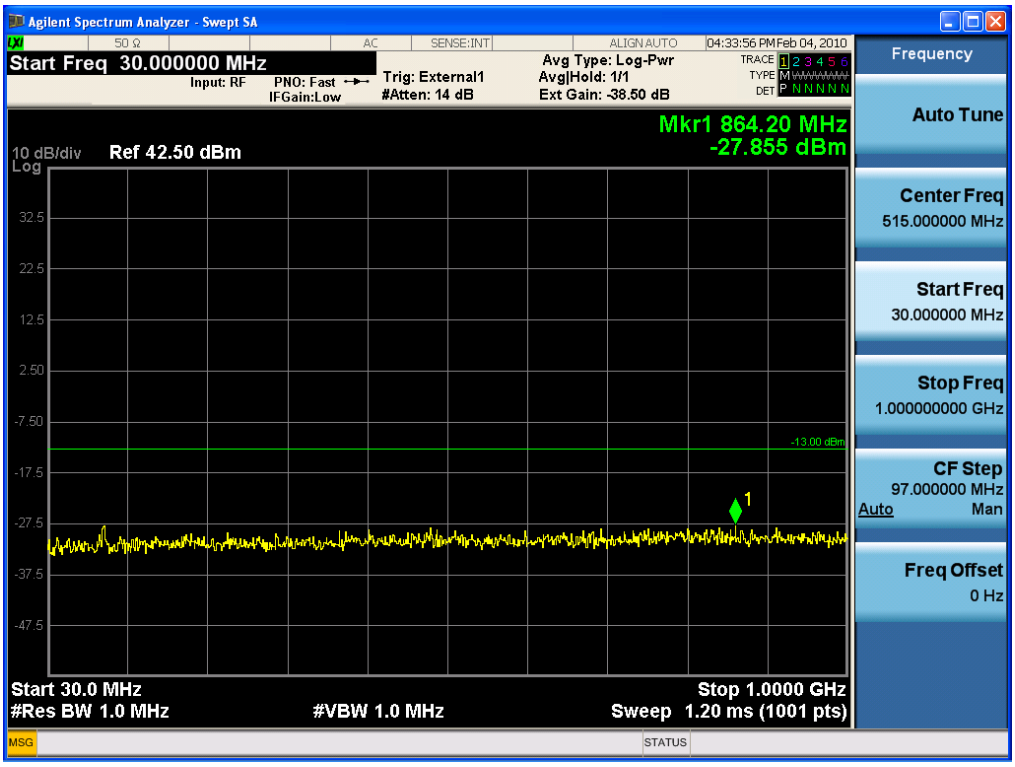
(1 GHz ~ 26.5 GHz)

(64QAM Low Channel)



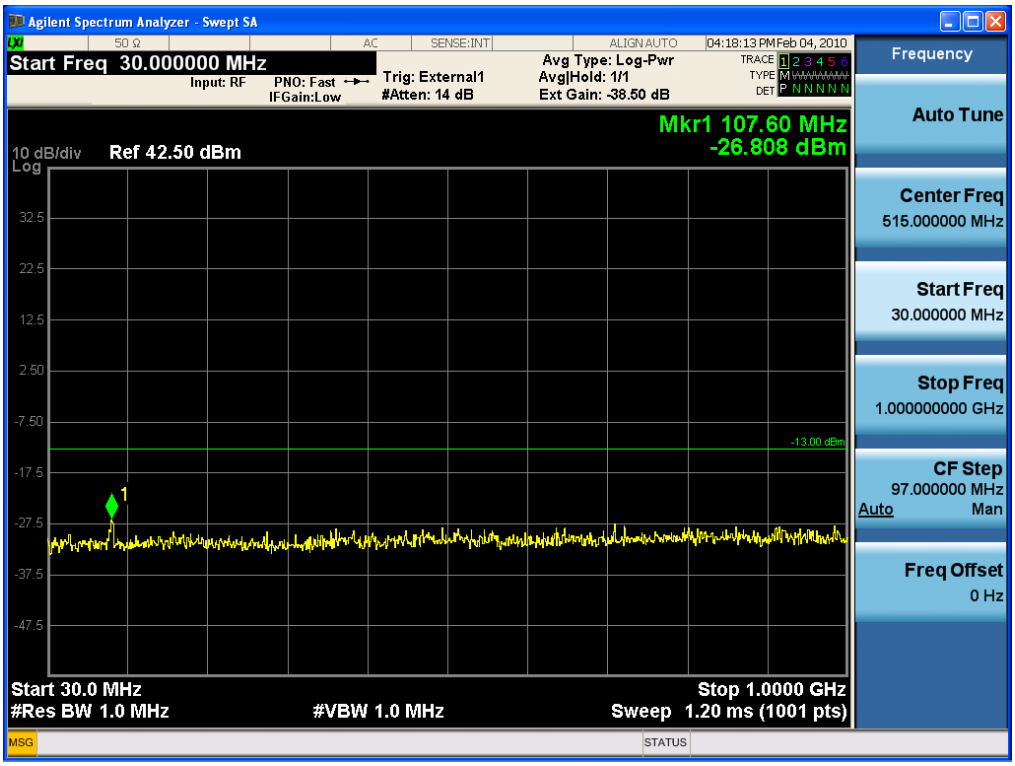
(30 MHz ~ 1 GHz)

(64QAM Middle Channel)



(30 MHz ~ 1 GHz)

(64QAM High Channel)



(30 MHz ~ 1 GHz)

(64QAM Low Channel)

(1 GHz ~ 26.5 GHz)

(64QAM Middle Channel)

(1 GHz ~ 26.5 GHz)

(64QAM High Channel)

(1 GHz ~ 26.5 GHz)

9. RADIATED SPURIOUS EMISSION

9.1 Applicable Standard

Requirements: CFR 47, §2.1053 (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

9.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Schwarzbeck	BBHA 9120D /Double Ridged Horn Antenna	296	09/23/2010
Schwarzbeck	BBHA 9120D /Double Ridged Horn Antenna	147	03/26/2010
Schwarzbeck	VULB 9160/ TRILOG Antenna	9160-3150	12/18/2010
Schwarzbeck	VULB 9160/ TRILOG Antenna	3125	05/06/2011
HD	MA240/ Antenna Position Tower	556	N/A
EMCO	1050/ Turn Table	114	N/A
HD GmbH	HD 100/ Controller	13	N/A
HD GmbH	KMS 560/ SlideBar	12	N/A
MITEQ	AMF-60-0010 1800-35-20P	1200937	05/20/2010
Schwarzbeck	BBHA9170/ SHF-EHF Horn Antenna	BBHA9170342	03/20/2011
R&S	ESI40 / EMI TEST Receiver	831564/003	10/30/2010

9.3 Test Procedure

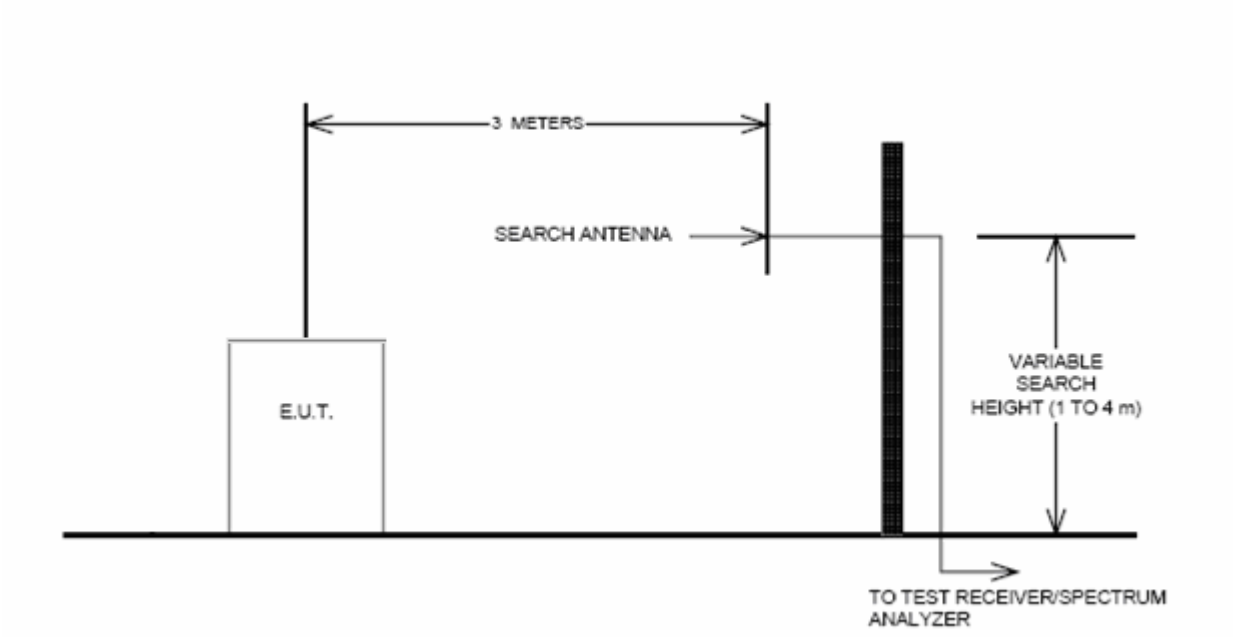
Radiated emission measurements were performed at an open Site.

The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. 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 scanned from 1-4m in order to capture the maximum emission.

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.

9.3.1 Radiated Spurious Emissions Test Setup



9.3.2 Environmental Conditions:

Temperature:	23 °C
Relative Humidity:	40 %

9.4 Test Result

: PASS (There were no emissions detected above the noise floor which was at least 20 dB below the limit.)

10. FREQUECNY STABILITY

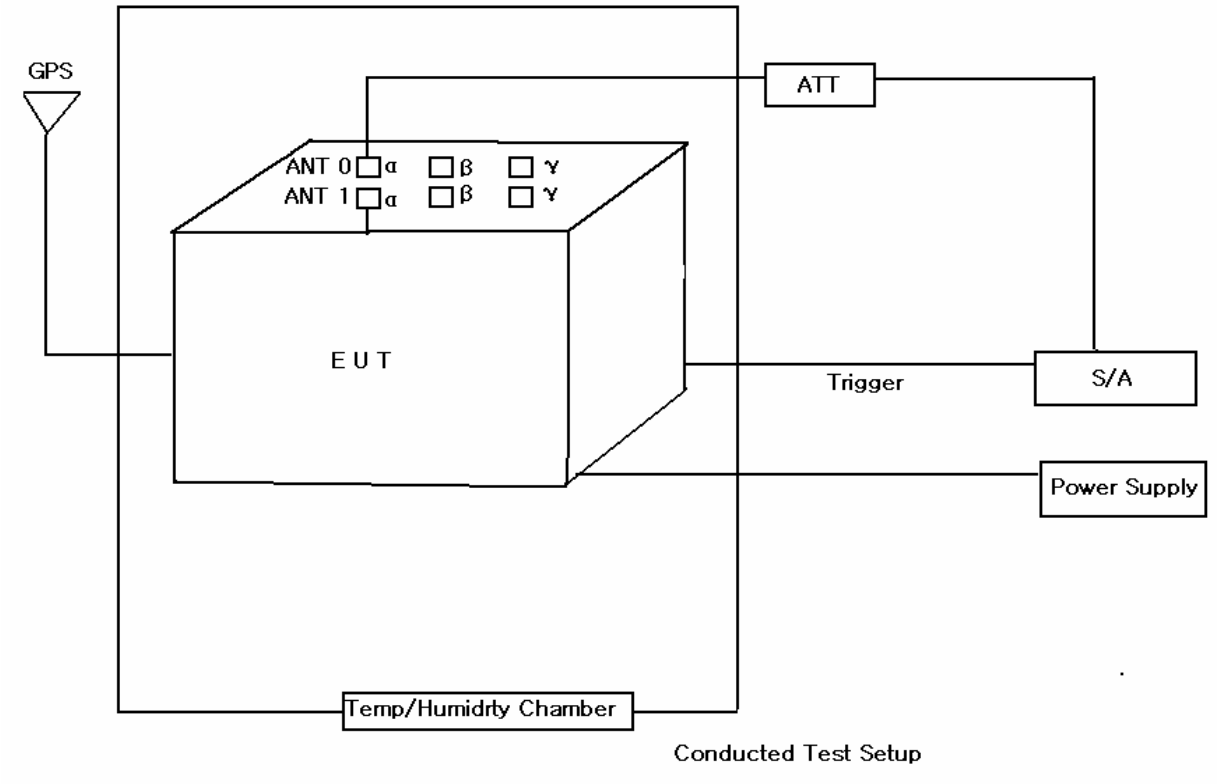
10.1 Applicable Standard

Requirements: FCC § 2.1055 (a), Part27.54 following: The frequency stability shall be sufficient to ensure that the fundamental emissions stay

10.2 Test Equipment List and Details

Manufacturer	Model / Equipment	Serial No.	Calibration Due
Agilent	6674A / DC Power Supply	3501A00901	05/14/2010
WEINSCHEL	67-30-33 / Attenuator	BR0530	01/14/2011
WEINSCHEL	AF117A-69-43 / STEP ATTENUATOR	20623	01/14/2011
Agilent	N9020A / MXA Signal Analyzer	US46220219	02/19/2010
Nang-Yeul	NY-THR18750 / Temp	NY-200912201A	12/28/2010

10.3 Test Procedure



Conducted Test Setup

Frequency Stability over Temperature variation:
The equipment under test was connected to an external AC-DC power supply 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-DC power supply Source. The voltage was set to 85% and 115% of the nominal value. The output frequency was recorded for each voltage.

10.3.1. Environmental conditions

Temperature:	24 ° C
Relative Humidity:	57 %

10.4. Test Result

: Pass

10.4.1. Frequency Stability over Temperature and Voltage variation

Modulation: QPSK

Reference: - 48 Vdc at 20°C **Freq.** = 2551.5 MHz

Temperature (Celsius)	Measured Freq (Hz)	Drift (ppm)
50	-53	0.0015
40	-55	0.0007
30	-55	0.0007
20	-57 **Reference**	
10	-60	-0.0011
0	-62	-0.0019
-10	-64	0.0027
-20	-58	0.0003
-30	-55	0.0007

Reference: - 48 Vdc at 20°C **Freq.** = 2551.5 MHz

Voltage(dc) +/-15% Ref	Measured Freq (Hz)	Drift (ppm)
40.8	-54	0.0011
55.2	-52	0.0019

(LBS Middle CH)

Modulation: 16QAM

Reference: - 48 Vdc at 20°C **Freq.** = 2650.5 MHz

Temperature (Celsius)	Measured Freq (Hz)	Drift (ppm)
50	-55	0.0007
40	-59	-0.0007
30	-61	-0.0015
20	-57 **Reference**	
10	-55	0.0007
0	-58	-0.0003
-10	-60	-0.0011
-20	-55	0.0007
-30	-61	-0.0015

Reference: - 48 Vdc at 20°C **Freq.** = 2650.5 MHz

Voltage(dc) +/-15% Ref	Measured Freq (MHz)	Drift (ppm)
40.8	-57	0.0000
55.2	-58	-0.0003

(UBS Middle CH)

Modulation: 64QAM

Reference: - 48 Vdc at 20°c **Freq. =** 2657 MHz

Temperature (Celsius)	Measured Freq (Hz)	Drift (ppm)
50	-59	-0.0003
40	-57	0.0003
30	-61	-0.0011
20	-58	**Reference**
10	-55	0.0011
0	-59	-0.0003
-10	-58	0.0000
-20	-61	-0.0011
-30	-56	0.0007

Reference: - 48 Vdc at 20°c **Freq. =** 2657 MHz

Voltage(dc) +/-15% Ref	Measured Freq (Hz)	Drift (ppm)
40.8	-58	0.0000
55.2	-55	0.0011

(FH Middle CH)

11. 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

Max Peak output Power at antenna input terminal	43.37000	dBm
Max Peak output Power at antenna input terminal	21727.01179	mW
Prediction distance	300.00000	cm
Prediction frequency	2647.00000	MHz
Antenna Gain(typical)	17.00000	dBi
Antenna Gain(numeric)	50.11872	-
Power density at prediction frequency (S)	0.96283	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	1.00000	mW/cm^2

3. RESULTS

The power density level at 300 cm is 0.96283 mW/cm², which is below the uncontrolled exposure limit of 1.0 mW/cm² at 2647 MHz.