



FCC Test Report

FOR:

Model Name: GT83000

FCC ID: Q6KGT83000A

47 CFR Part 90

RSS-119 Issue 10

TEST REPORT #: EMC_3SISE_003_10001_FCC90

DATE: 2011-05-10



FCC listed:
A2LA Accredited

IC recognized #
3462B-1

CETECOM Inc.

411 Dixon Landing Road ♦ Milpitas, CA 95035 ♦ U.S.A.

Phone: + 1 (408) 586 6200 ♦ Fax: + 1 (408) 586 6299 ♦ E-mail: info@cetecomusa.com ♦ <http://www.cetecom.com>

CETECOM Inc. is a Delaware Corporation with Corporation number: 2113686

Board of Directors: Dr. Harald Ansorge, Dr. Klaus Matkey, Hans Peter May



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1 Assessment

The following device was tested against the applicable criteria specified in FCC rules Parts 90 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS 119 Issue 10 and no deviations were ascertained during the course of the tests performed.

Company	Description	Model #
3SI Security Systems	Asset tracking and alert devices	GT83000

This report is reviewed by:

		Sajay Jose	
2011-05-10	Compliance	(Test Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

		Christopher Torio	
2011-05-10	Compliance	(EMC Test Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.



2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Heiko Strehlow
Responsible Project Leader:	David Ahn

2.2 Identification of the Client

Applicant's Name:	3SI Security Systems
Street Address:	118 Preston Ct.
City/Zip Code	Macon, GA 31210
Country	USA
Contact Person:	Tommy Bennett
Phone No.	478-471-5603
Fax:	478-476-0669
e-mail:	tbennett@3sittracking.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as above
Manufacturers Address:	
City/Zip Code	
Country	



3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name / Model No:	Xgen GT83000 Cash Tracker / GT83000
HW / SW Revision :	20100713 / 9.08
FCC-ID / IC-ID:	Q6KGT83000A / 5043A-GT83000A
Product Description:	Asset tracking and alert device which contains a pre-certified GSM Telit GE865-QUAD with a FCC ID: RI7GE865.
Frequency Range / number of channels:	GSM 850: 824.2-848.8MHz / 125; PCS 1900: 1850.2-1909.8MHz / 300; 219.6 MHz Beacon Transmitter
Type(s) of Modulation:	2G: GMSK, Beacon: No Modulation
Modes of Operation:	GPRS/EGPRS MS Class 10, GPRS Capability Class B, Data only
Antenna Type / gain / position / min. distance to other antenna (if appl):	GSM: Internal F / 2.5 dB GPS: Cavity type (0 dBi peak gain) RF Beacon: Loop
Output Powers:	GSM850 GMSK Conducted: 31.8dBm GSM850 GMSK Radiated: 34.8dBm GSM1900 GMSK Conducted: 29.4dBm GSM1900 GMSK Radiated: 32.2dBm conducted values are from module test reports Beacon Conducted: 13.97 dBm
power supply	AA lithium battery pack (dedicated), 3.7V DC;
operating temperature range	-40°C to 85°C
Prototype / Production unit	Prototype



3.2 Identification of the Equipment Under Test (EUT)

EUT #	Serial Number	HW Version	SW Version	Notes	Cetecom ID
1	IMEI: 357460037753808	20100713	9.08		C009602

3.3 Identification of Accessory equipment

AE #	Type	Cetecom ID
1	Battery	C009603



4 Subject Of Investigation

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Part 90 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS 119 Issue 10

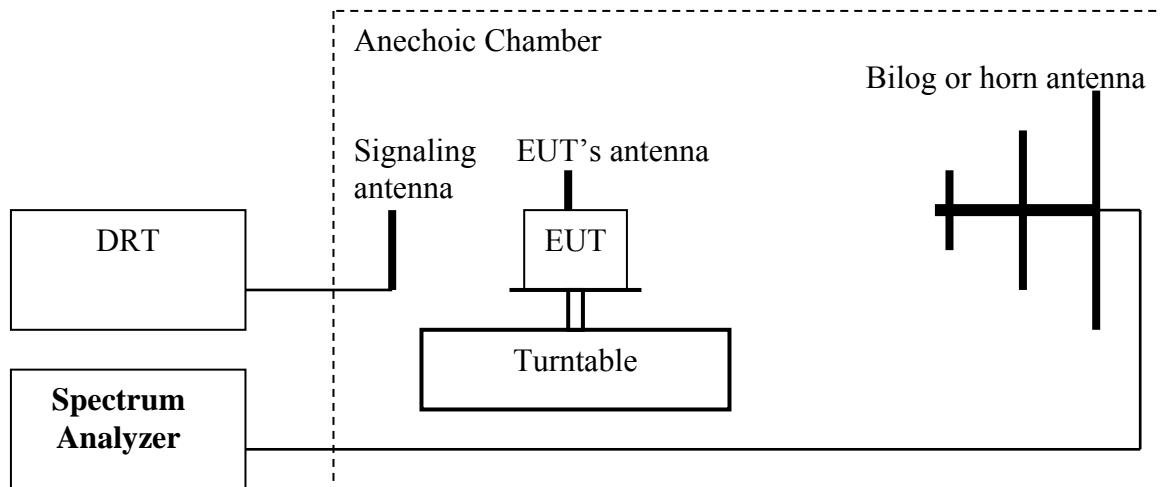
This test report is to support a request for new equipment authorization under the FCC ID: Q6KGT83000A.

All testing was performed on the product referred to in Section 3 as EUT.

5 Measurements

5.1 Radiated Measurement Procedure

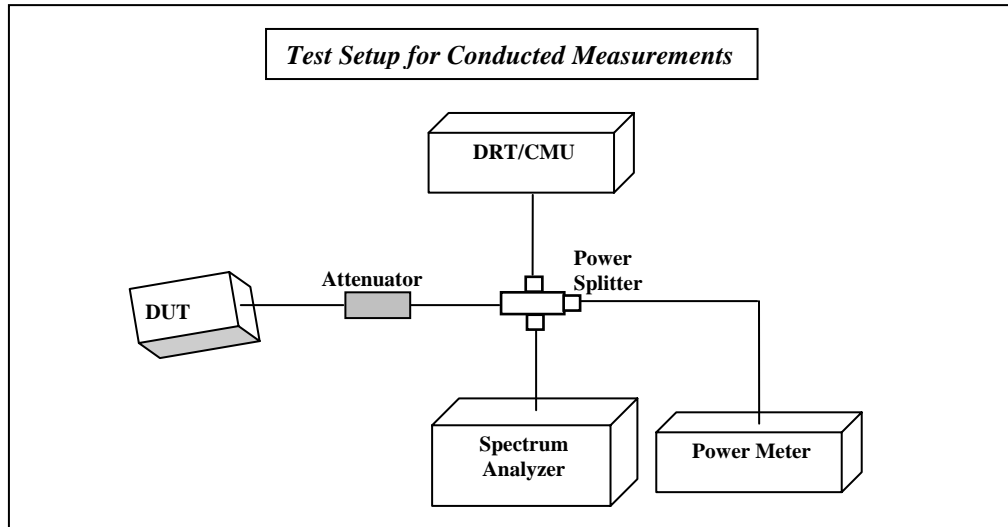
Ref: TIA-603C 2004 -2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Digital Radio Communication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS**). **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
ERP (dBm) = **LVL** (dBm) + **LOSS** (dB)
8. Determine the EIRP using the following equation:
EIRP (dBm) = **ERP** (dBm) + 2.14 (dB)
9. Measurements are to be performed with the EUT set to the low, middle and high channels.
Spectrum analyzer settings: RBW=VBW=3MHz

5.1.1 Conducted Output Power Measurement procedure

Ref: TIA-603C 2004 2.2.1 Conducted Carrier Output Power Rating



1. Connect the equipment as shown in the above diagram. A Digital Radio Communication Tester (DRT- CMU200 here) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the DRT to set the EUT to its maximum power at the required channel.
3. Record the output power level measured by the DRT.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

Spectrum Analyzer Settings:

RBW=VBW=100kHz; Span=200kHz; Detector: Peak- Max Hold;
Sweep time: Auto.

Average measurements performed using RMS detector functionality of the Spectrum Analyzer.



5.2 Maximum Peak Output Power

5.2.1 References:

FCC: Part 90.205; 90.259

RSS 119: 5.4

5.2.2 Limits

FCC CFR 90.259(a): 2W, Class C

RSS 119: Less than 5 Watts.

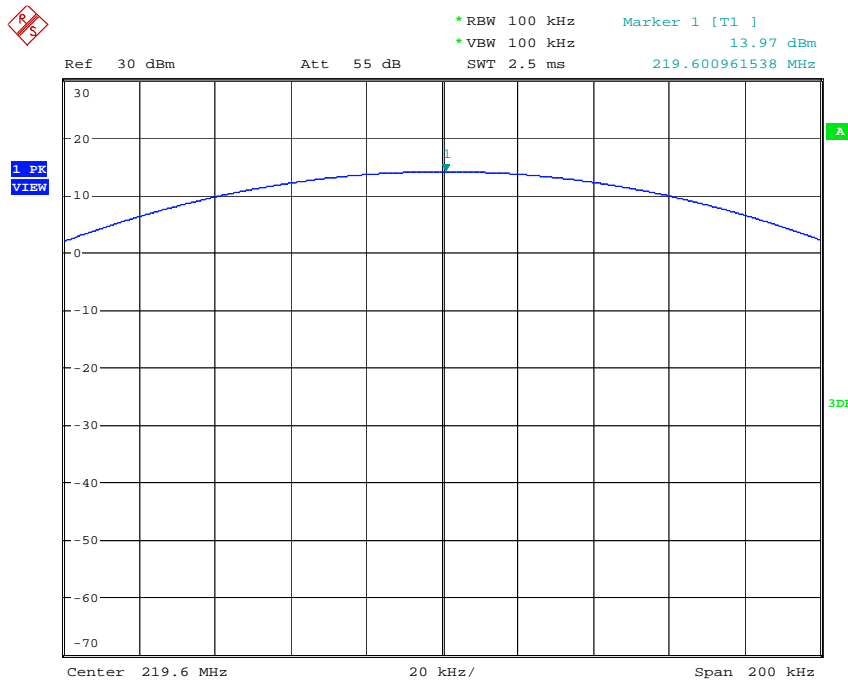
5.2.3 Test Conditions:

Tnom: 23°C; Vnom

5.2.4 Test Result:

Frequency (MHz)	Max Peak Output Power- Conducted (dBm)	Radiated EIRP
219.6	13.97	-38.65
Measurement Uncertainty: ±3dB		

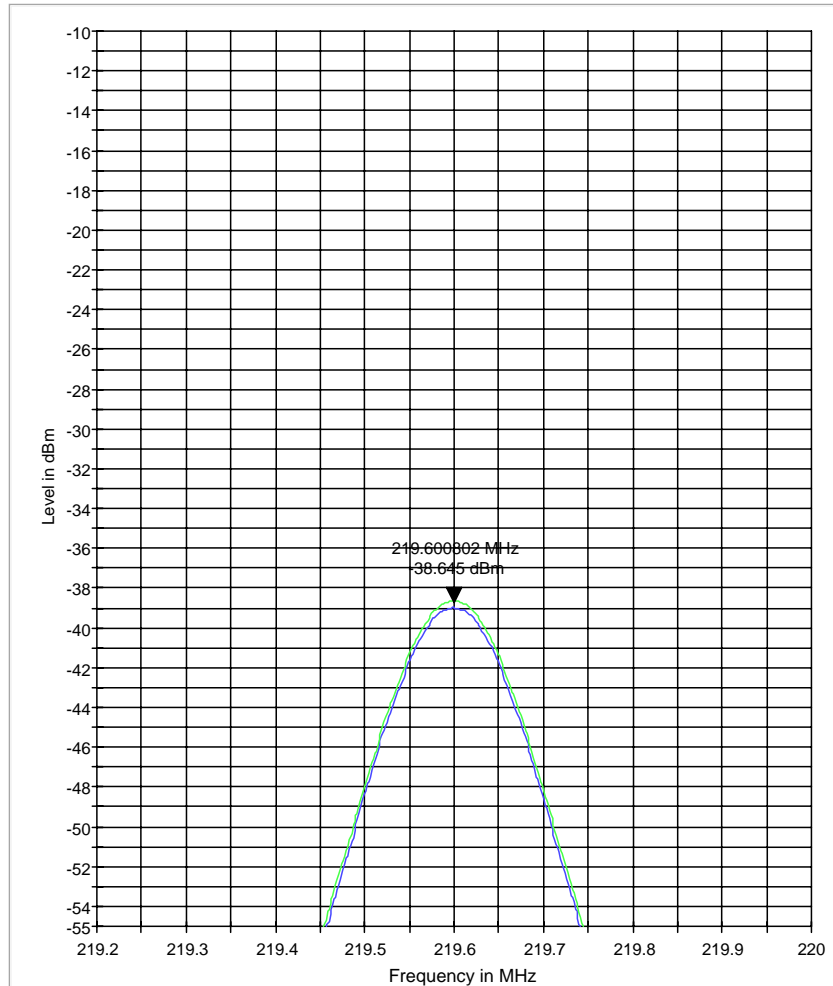
5.2.5 Test Plot





5.2.6 Test Plot

ERP 219.6 MHz



MaxPeak-ClearWrite MaxPeak-MaxHold



5.3 99% Occupied Bandwidth

5.3.1 References:

FCC: 2.1049, 90.209,90.259(8)

RSS 119: 5.5

5.3.2 Limits:

According to CFR 47 section 90.209, operations using equipment designed to operate with a 6.25 kHz channel bandwidth, the authorized bandwidth is 6 kHz.

According to CFR 47 section 90.259(8), assignable 6.25 kHz channels will occur in increment of 6.25kHz from 217.00625 MHz to 219.99375MHz.

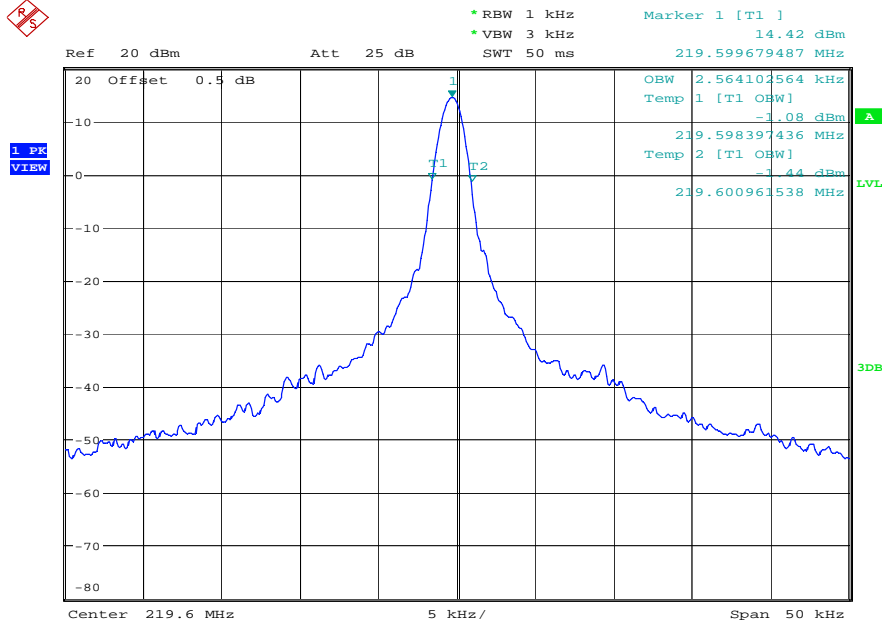
RSS 119: 5.5: Authorized Bandwidth: 11.25kHz

5.3.3 Test Result:

Channel	Frequency (MHz)	99% Occupied Bandwidth	26 dB Emission Bandwidth
1	219.6	2.564 kHz	3.44 kHz

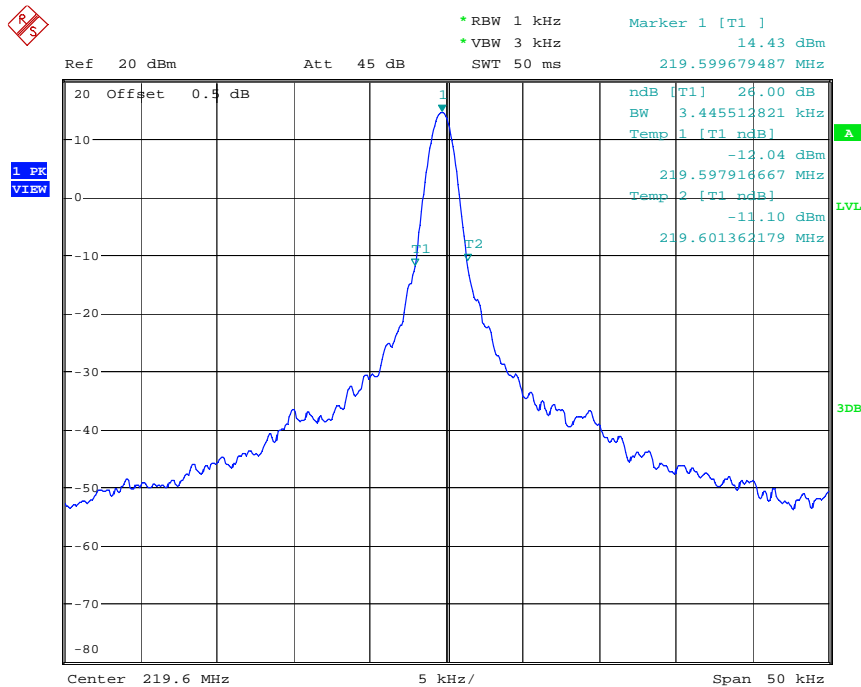


5.3.4 Test Data/plots: Occupied Bandwidth



Date: 25.JAN.2011 11:29:32

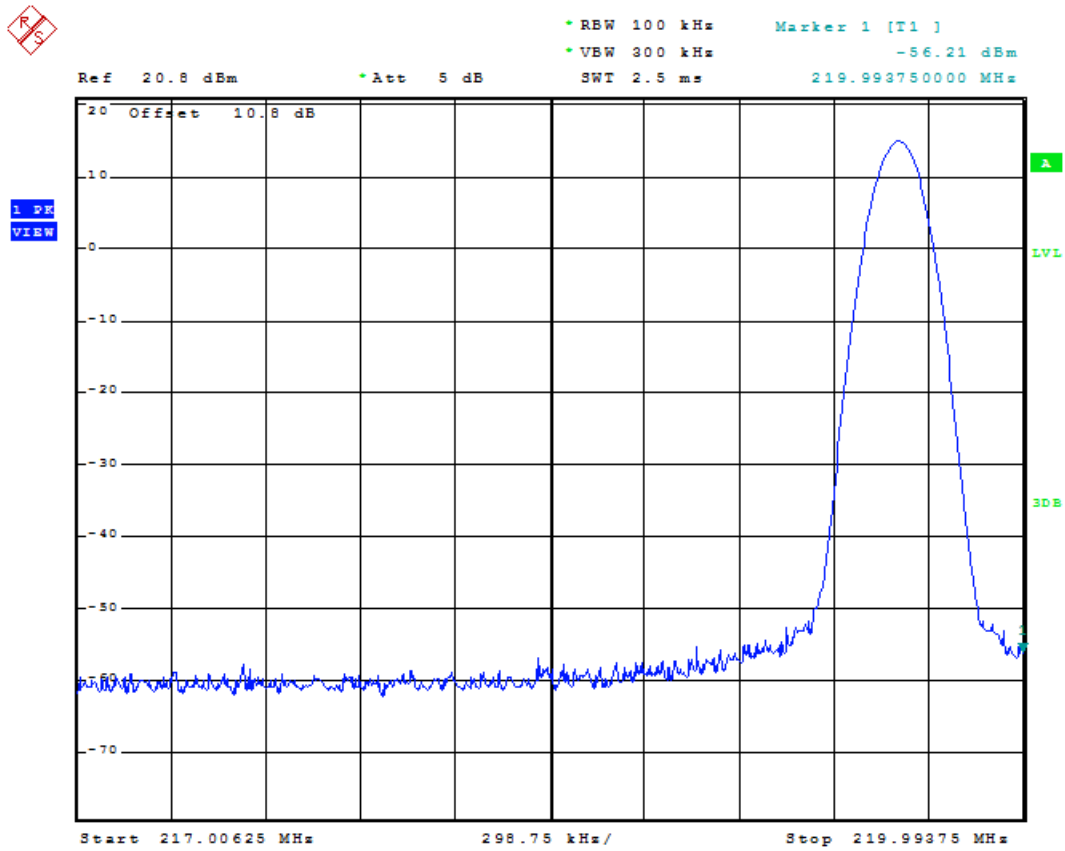
Emission Bandwidth



Date: 25.JAN.2011 11:28:02



Spectrum in accordance to 90.259(8)



Date: 9.MAY.2011 15:29:38



5.4 Modulation Characteristics

The manufacturer has intended that the signal has no modulation.

5.5 Transmit Spectrum Mask

5.5.1 References:

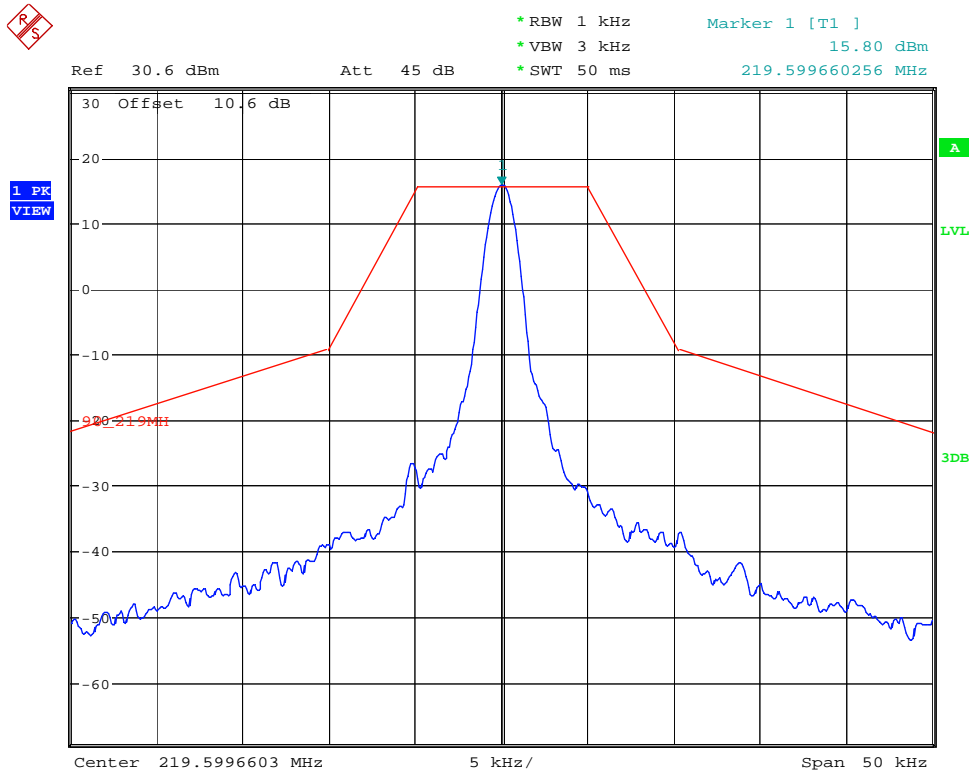
FCC: 90.210, 90.379, ASTM 8.9.2
 RSS 119: 5.5

5.5.2 Limits:

According to CFR 47 section 90.210©, the power of each unwanted emission shall be less than Transmitted Power as specified below:

- 1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in KHz) of more than 5 KHz, but not more than 10KHz: At least $83 \log(f_d/5)$ dB.
- 2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in KHz) by more than 10KHz, but not more than 250 percent of the authorized bandwidth: At least $29 \log(f_d^2/11)$ dB or 50dB, which is the lesser attenuation;
- 3) At least $43+10 \log_{10}(TP)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250 percent.

5.5.3 Test Plot





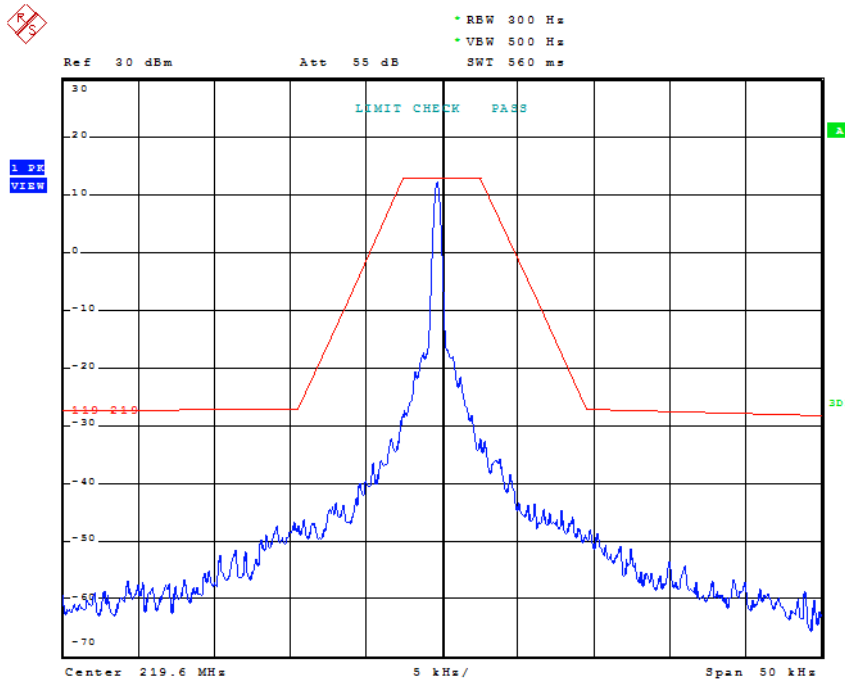
5.5.4 Limits:

According to RSS119 Section 5.8.8 for Emission Mask J for Transmitters not Equipped with an Audio Low-Pass Filter:

The power of any emission shall be attenuated below the transmitter output power P (dBw) as specified in Table 11.

Table 11 – Emission Mask J		
Displacement frequency, f_d (kHz)	Minimum Attenuation (dB)	Resolution Bandwidth (Hz)
$2.5 < f_d \leq 6.25$	$53 \log_{10}(f_d/2.5)$	300
$6.25 < f_d \leq 9.5$	$103 \log_{10}(f_d/3.9)$	300
$f_d > 9.5$	Whichever is the lesser attenuation: 70 or $157 \log_{10}(f_d/5.3)$ or $50 + 10 \log_{10}(p)$	300 for emissions at $f_d \leq 250\%$ of the authorized bandwidth, Specified in Section 4.2.1 for emissions at $f_d > 250\%$ of the authorized bandwidth.

5.5.5 Plot:





5.6 Frequency Tolerance

5.6.1 References:

FCC: 2.1055, 90.213

RSS 119: 5.3

5.6.2 Limits:

+/- 5 ppm

5.6.3 Results:

Expected Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (MHz)	Frequency Error (ppm)
219.6	219.5997	0	0

Temperature °C	Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)
55	219.5997	0	0
50	219.5997	0	0
40	219.5997	0	0
30	219.5997	0	0
20	219.5997	0	0
10	219.5997	0	0
0	219.5997	0	0
-10	219.5997	0	0
-20	219.5996	100	0.455
-30	219.5995	100	0.910



5.7 Transmitter Spurious Emissions- Conducted

5.7.1 References:

FCC: 2.1051, 90.215

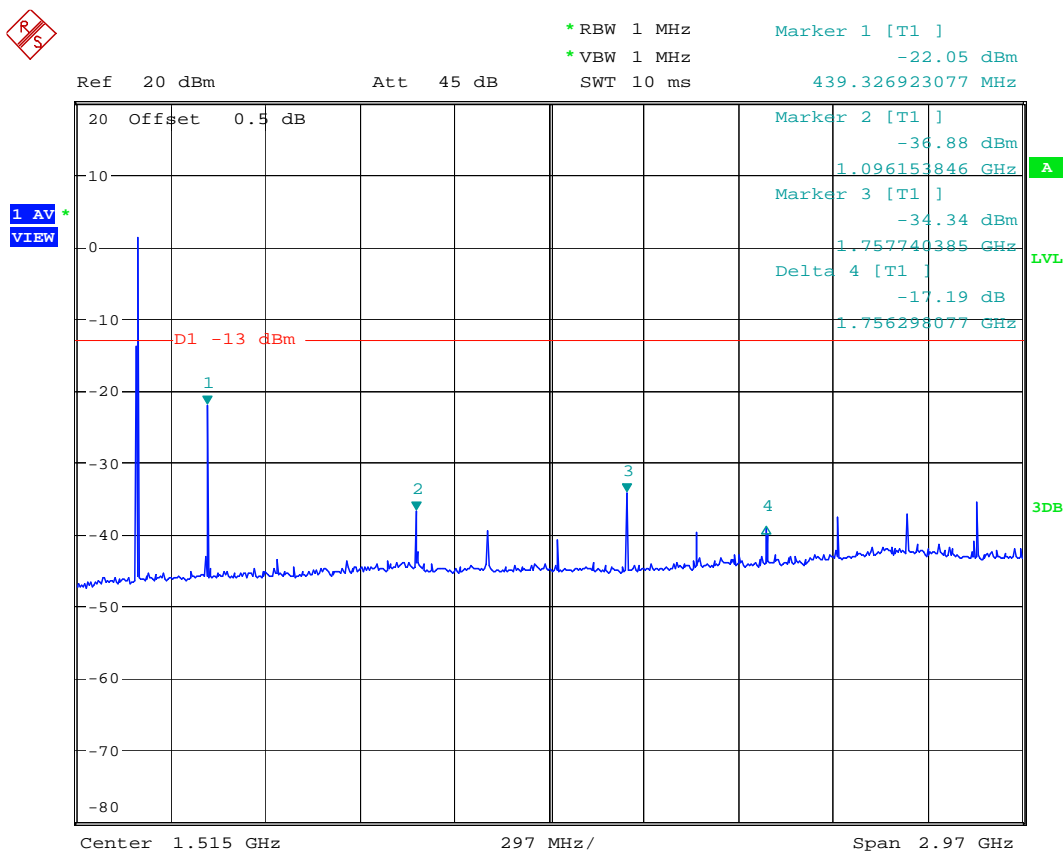
RSS 119: 5.8

5.7.2 Limits

-13 dBm

5.7.3 Test data/ plots:

Note: First peak is the Tx signal





5.8 Transmitter Spurious Emissions- Radiated

5.8.1 References

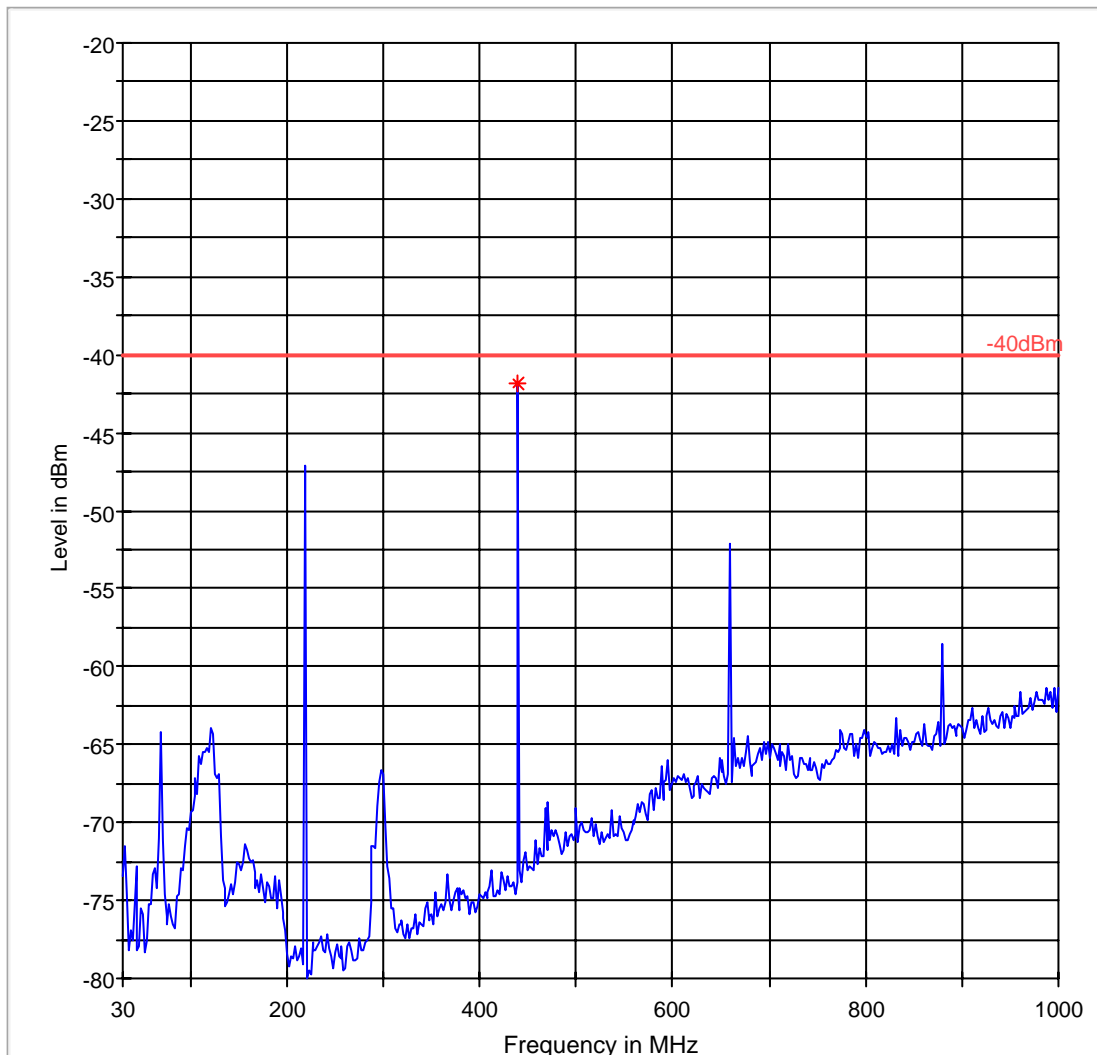
FCC: CFR Part 2.1053, 90.215

RSS 119: 5.8

5.8.2 Test Result:

Horizontal and Vertical Polarizations, Worst case for all channels

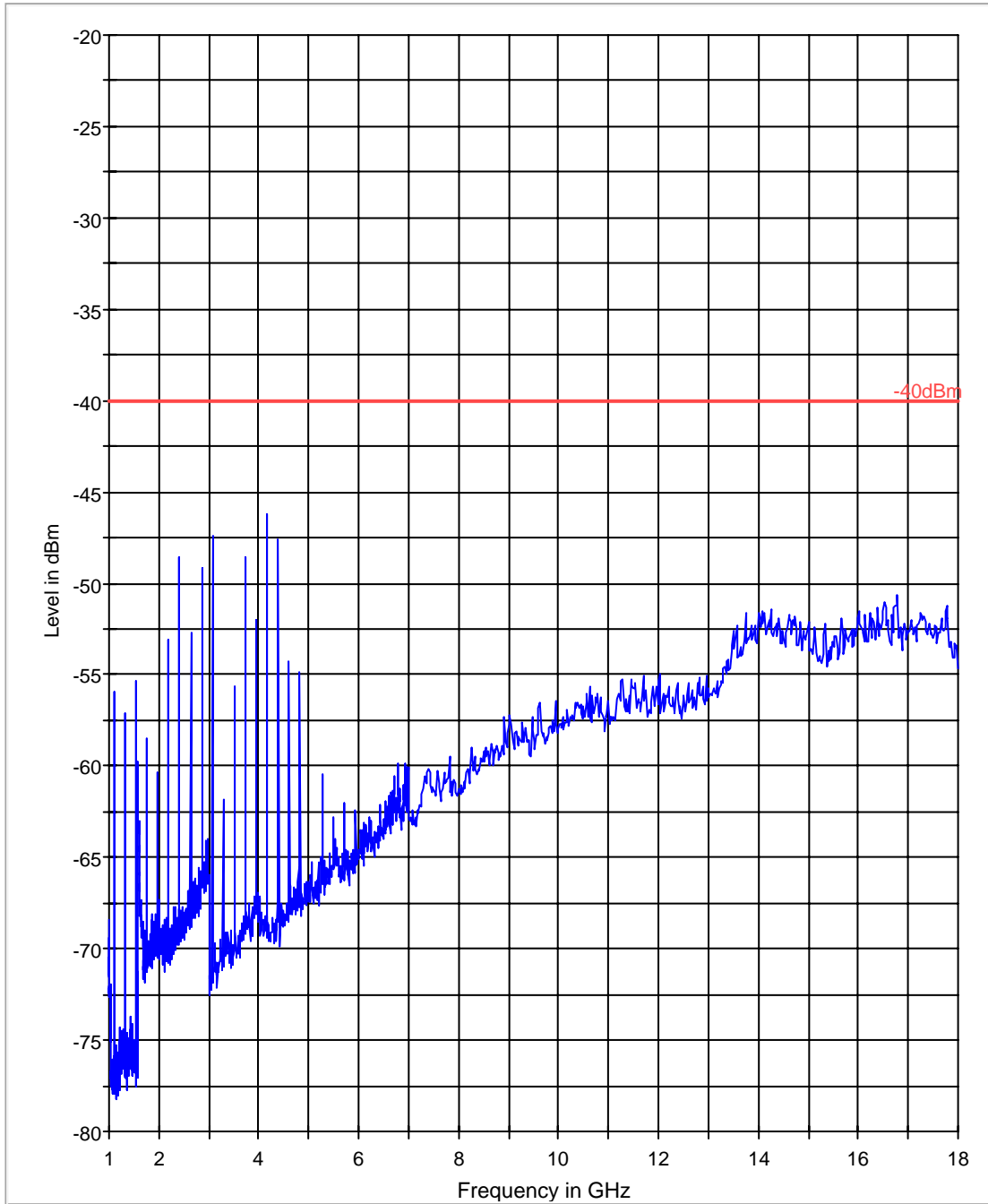
FCC 90 30-1GHz



— -40dBm.LimitLine — Preview Result 1 * Data Reduction Result 1 [2]



FCC 90 1-18GHz



— -40dBm.LimitLine — Preview Result 1



5.9 Reciever Spurious Emissions- Radiated

5.9.1 References

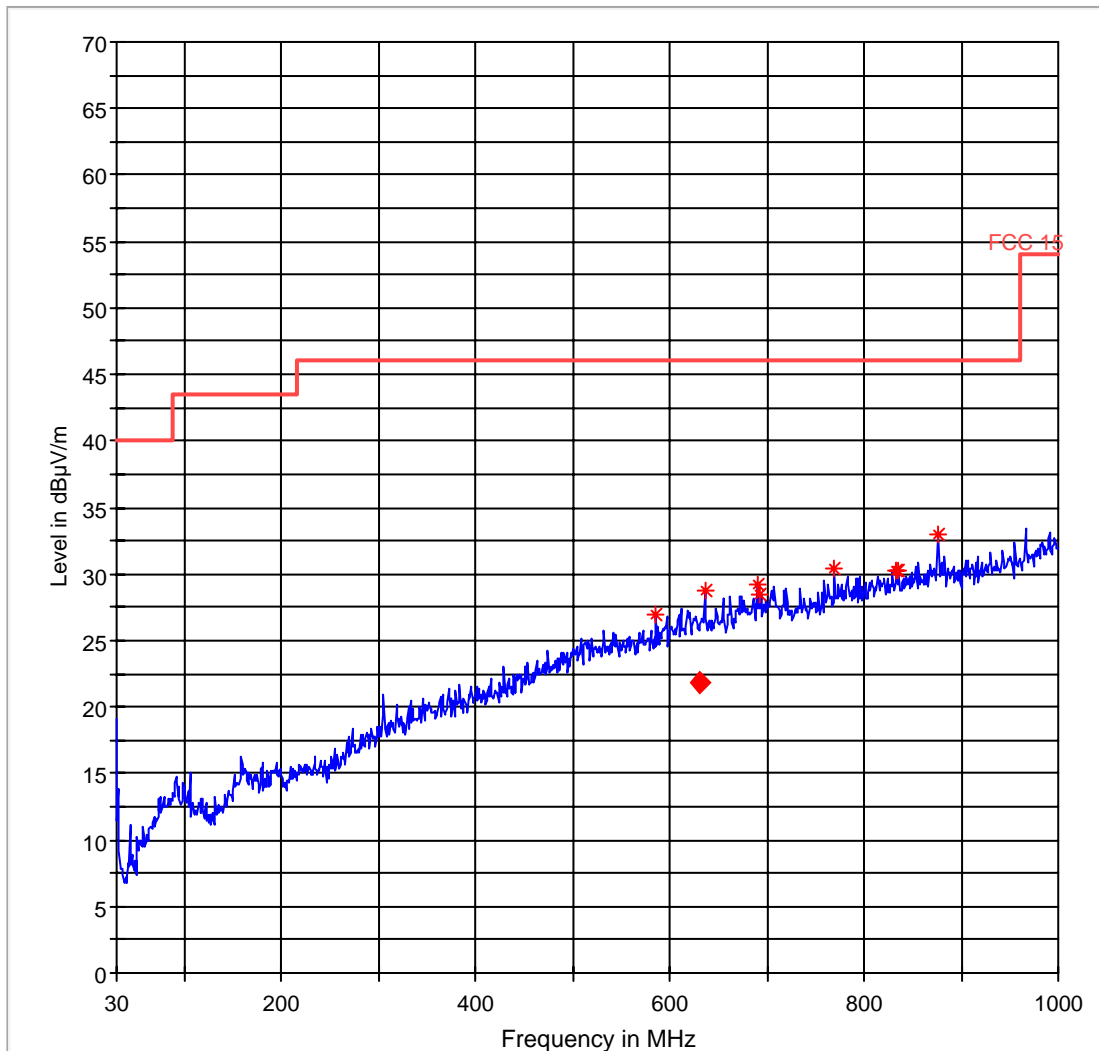
FCC: CFR Part 2.1053, 90.215

RSS 119: 5.8

5.9.2 Test Result:

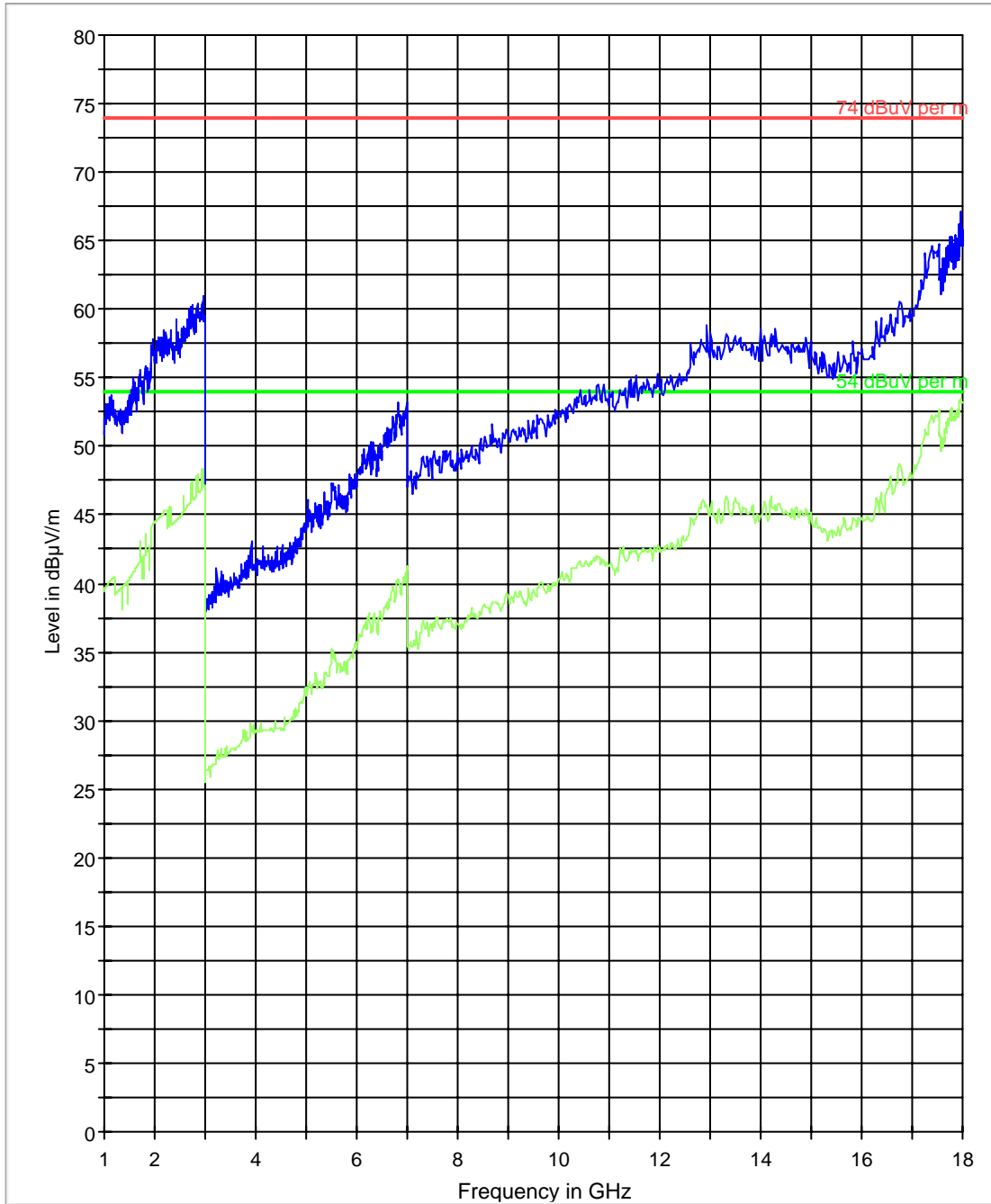
Horizontal and Vertical Polarizations, Worst case for all channels

FCC 15 30-1000MHz





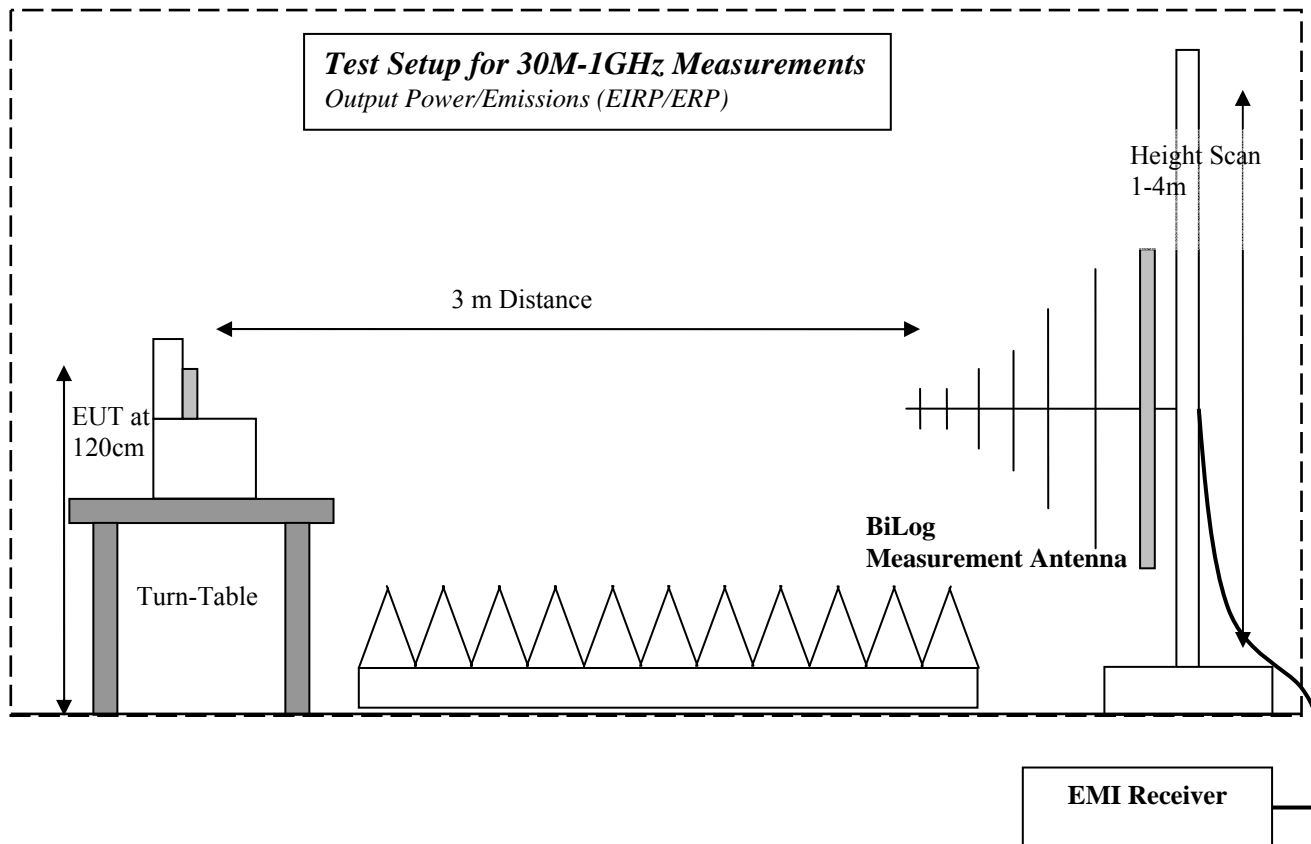
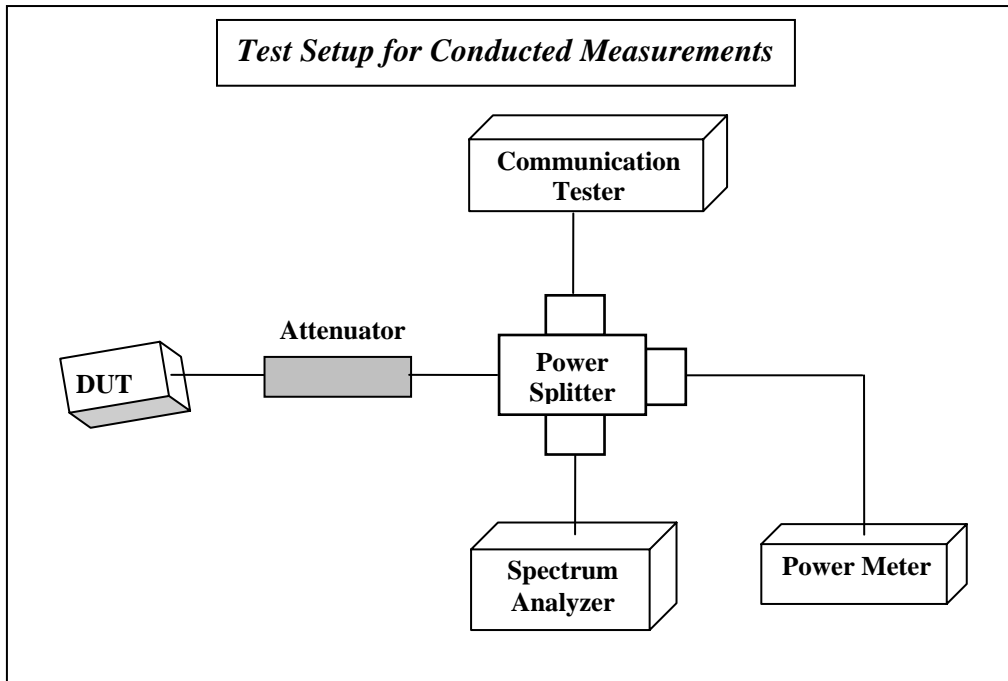
FCC 15 1-18GHz

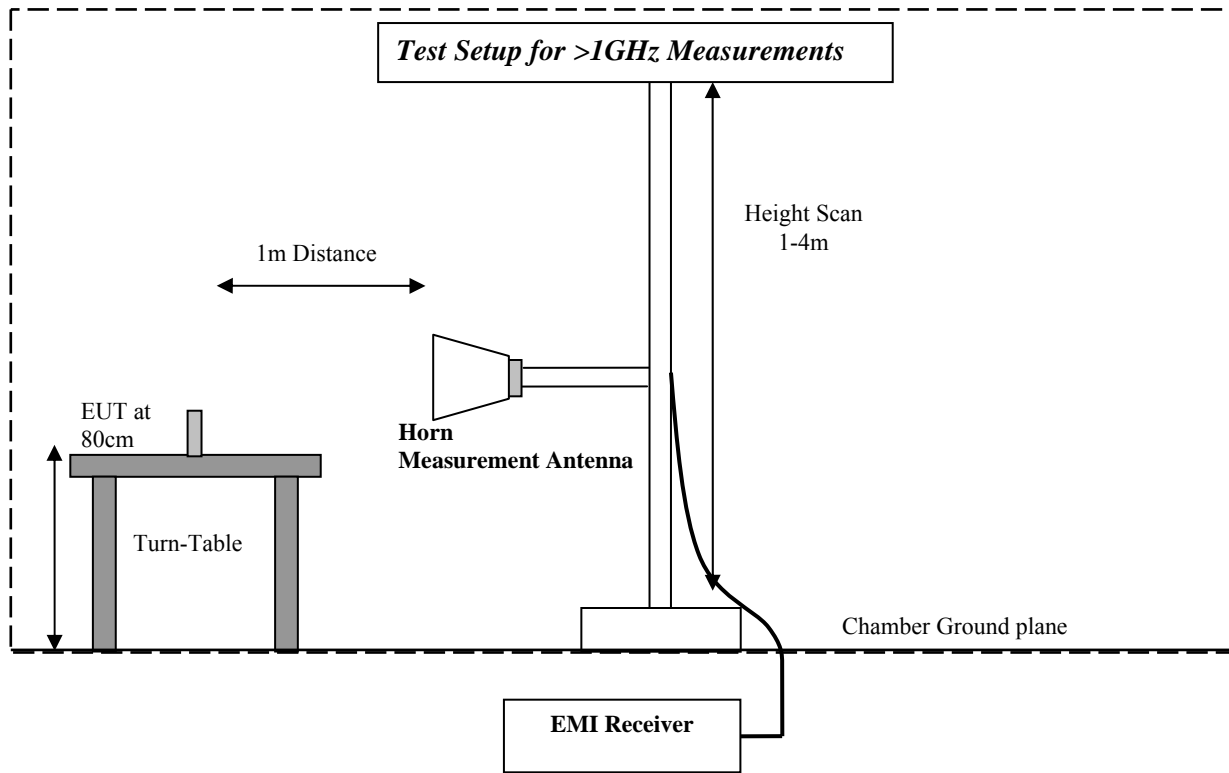


6 Test Equipment and Ancillaries used for tests

Instrument/Ancillary	Model	Manufacturer	Serial No.	Cal Date	Cal Interval
EMI Receiver/Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2010	1 year
Spectrum Analyzer	FSU	Rohde & Schwarz	200302	Jul 2010	1 year
Loop Antenna	6512	EMCO	00049838	April 2009	2 years
Biconilog Antenna	3141	EMCO	0005-1186	June 2009	2 years
Horn Antenna (1-18GHz)	3115	ETS	00035111	Jan 2009	3 years
Horn Antenna (18-40GHz)	3116	ETS	00070497	Jan 2009	3 years
Communication Antenna	IBP5-900/1940	Kathrein	n/a	n/a	n/a
High Pass Filter	5HC2700	Trilithic Inc.	9926013	Part of system calibration	
High Pass Filter	4HC1600	Trilithic Inc.	9922307	Part of system calibration	
6GHz High Pass Filter	HPM50106	Microtronics	001	Part of system calibration	
Pre-Amplifier	JS4-00102600	Miteq	00616	Part of system calibration	
Power Smart Sensor	R&S	NRP-Z81	100161	June 2010	1 Year
DC Power Supply	E3610A	Hewlett Packard	KR83021224	n/a	n/a
Multimeter	179	Fluke	N/A	Feb 2010	1 Year
Temp Hum Logger	TM320	Dickson	03280063	Feb 2010	1 Year
Temp Hum Logger	TM325	Dickson	5285354	Feb 2010	1 Year

7 BLOCK DIAGRAMS







8 Revision History

Date	Report Name	Changes to report	Report prepared by
2011-02-04	EMC_3SISE_003_10001_FCC90	Original	Christopher Torio
2011-03-30	EMC_3SISE_003_10001_FCC90_Rev1	Included References to RSS-170 Issue 10	Christopher Torio
2011-03-31	EMC_3SISE_003_10001_FCC90_Rev2	Corrected References to RSS 119 Issue 10	Christopher Torio
2011-05-10	EMC_3SISE_003_10001_FCC90_Rev3	Included more measurements, references and limits to: Section 5.22, Section 5.3, Section 5.5, Section 5.6.3, Section 5.8	Christopher Torio