UltraTech
Group of Labs

Jan. 08, 2002

TIMCO ENGINEERING INC.
P O BOX 370
849 N.W. STATE ROAD 45
NEWBERRY, FLORIDA
USA 32669

Subject: **Type Acceptance Application under FCC CFR 47, Parts 2 and 27 (Subpart C) - Wireless Communications Services Operating in the frequency bands 2305-2320 MHz and 2345-2360 MHz.**

Applicant: **Moseley Associated Incorporated**
Product: **NXE1 Digital Radio**
Model: **NXE1-20**
FCC ID: **CSU-NXE1-20**

Dear Sir/Madam,

As appointed agent for **Moseley Associated Incorporated**, we would like to submit the application for FCC certification of the above product. Please review all necessary files uploaded to TIMCO UPLOAD web site.

If you have any queries, please do not hesitate to contact us by our TOLL FREE number:

OUR TELEPHONE NO.: 1-877-765-4173

Yours truly,

Tri Minh Luu, P. Eng.,
V.P., Engineering

TML/DH

Encl.

3000 Bristol Circle,
Oakville, Ontario, Canada
L6H 6G4

Telephone (905) 829-1570

UltraTech
Group of Labs

Jan. 08, 2002

Moseley Associated Incorporated
111 Castilian Drive
Santa Barbara, California
USA, 93117-3093

Attn.: Mr. Sunil Naik, Engineering Director

Subject: **Certification Testing in accordance with FCC CFR 47, Parts 2 and 27 (Subpart C) - Wireless Communications Services Operating in the frequency bands 2305-2320 MHz and 2345-2360 MHz.**

Product: **NXE1 Digital Radio**
Model: **NXE1-20**

Dear Mr. Naik,

The product sample has been tested in accordance with **FCC CFR 47, Parts 2 and 27 (Subpart C) - Wireless Communications Services Operating in the frequency bands 2305-2320 MHz and 2345-2360 MHz ,** and the results and observation were recorded in the engineering report, Our File No.: MSA-003FCCTX

Enclosed you will find copy of the engineering report. If you have any queries, please do not hesitate to contact us.

Yours truly,

Tri Minh Luu, P.Eng
Vice President - Engineering

Encl.

3000 Bristol Circle,
Oakville, Ontario, Canada
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ENGINEERING TEST REPORT

NXE1 Digital Radio
Model No.: NXE1-20
FCC ID: CSU-NXE1-20

Applicant: **Moseley Associated Incorporated**
111 Castilian Drive
Santa Barbara, California
USA, 93117-3093

Tested in Accordance With

Federal Communications Commission (FCC)
CFR 47, PARTS 2 and 27 (Subpart C)
DOMESTIC FIXED RADIO SERVICES

UltraTech's File No.: MSA-003FCCTX

This Test report is Issued under the Authority of
Tri M. Luu, Professional Engineer,
Vice President of Engineering
UltraTech Group of Labs

Date: Dec. 10, 2001

Report Prepared by: Tri M. Luu	Tested by:
Issued Date: Jan. 08, 2002	Test Dates: Dec. 01 - Dec. 05, 2001

The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.

UltraTech

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TABLE OF CONTENTS

EXHIBIT 1. SUBMITTAL CHECK LIST

Annex No.	Exhibit Type	Description of Contents	Quality Check (OK)
--	Test Report	• Exhibit 1: Submittal check lists • Exhibit 2: Introduction • Exhibit 3: Performance Assessment • Exhibit 4: EUT Operation and Configuration during Tests • Exhibit 5: Summary of test Results • Exhibit 6: Measurement Data • Exhibit 7: Measurement Uncertainty • Exhibit 8: Measurement Methods	OK
1	Test Report - Plots of Measurement Data	Plots # 1 to 40	OK
2	Test Setup Photos	Photos # 1 to 2	OK
3	External Photos of EUT	Photos # 1 to 2	OK
4	Internal Photos of EUT	Photos # 1 to 34	OK
5	Cover Letters	• Letter from Ultratech for Certification Request	OK
6	Attestation Statements	• Letter from the Applicant to appoint Ultratech to act as an agent • Letter from the Applicant to request for Confidentiality Filing	OK
7	ID Label/Location Info	ID Label Location of ID Label	OK
8	Block Diagrams		OK
9	Schematic Diagrams		OK
10	Parts List/Tune Up Info	Parts list	OK
11	Operational Description	Operation Description	OK
12	RF Exposure Info	RF Exposure Info extracted from the User Manual	OK
13	Users Manual		OK

EXHIBIT 2. INTRODUCTION

2.1. SCOPE

Reference:	FCC Parts 2 and 27
Title:	Telecommunication - Code of Federal Regulations, CFR 47, Parts 2 & 27
Purpose of Test:	To gain FCC Certification Authorization for Radio operating in the frequency bands 2305-2320 MHz and 2345-2360 MHz .
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2.2. RELATED SUBMITAL(S)/GRANT(S)

None

2.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19 and 27	1999	Code of Federal Regulations – Telecommunication
ANSI C63.4	1992	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 22 & EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1		Specification for Radio Disturbance and Immunity measuring apparatus and methods

EXHIBIT 3. PERFORMANCE ASSESSMENT

3.1. CLIENT INFORMATION

APPLICANT	
Name:	Moseley Associated Incorporated
Address:	111 Castilian Drive Santa Barbara, California USA, 93117-3093
Contact Person:	Mr. Sunil Naik Engineering Director Phone #: 1-805-968-9621 (210) Fax #: 1-805-685-9638 Email Address: snaik@moseleysb.com

MANUFACTURER	
Name:	Moseley Associated Incorporated
Address:	111 Casttilian Drive Santa Barbara, California USA, 93117-3093
Contact Person:	Mr. Sunil Naik Engineering Director Phone #: 1-805-968-9621 (210) Fax #: 1-805-685-9638 Email Address: snaik@moseleysb.com

3.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Moseley Associated Incorporated
Product Name:	NXE1 Digital Radio
Model Name or Number:	NXE1-20
Serial Number:	Pre-production sample
Type of Equipment:	Wireless Communications Services
External Power Supply:	N/A
Transmitting/Receiving Antenna Type:	Non-integral antenna (N female connector) with antenna gain limit of 30 dBi (36 dBi antenna gain - 6 dB minimum cable loss)

3.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	[x] Base station (fixed use)
Intended Operating Environment:	[x] Commercial [x] Light Industry & Heavy Industry
Power Supply Requirement:	120 V 60Hz
RF Output Power Rating:	▪ 1.3 Watts maximum (16QAM) - conducted ▪ 1.0 Watt maximum (QPSK) - coducted
Operating Frequency Range:	▪ 2305-2312 MHz (16QAM) ▪ 2353-2358 MHz (16QAM) ▪ 2305-2308 MHz (QPSK) ▪ 2356-2358 MHz (QPSK)
RF Output Impedance:	50 Ohms
Occupied Bandwidth (99%):	▪ 2.4 MHz (16QAM) ▪ 4.7 MHz (QPSK)
Data Rate	8448 kbps maximum
Modulation Scheme	QPSK & 16QAM
Emission Designation*:	2M4FXW and 4M7FXW
Antenna Gain Limit	Non-integral antenna (N female connector) with antenna gain limit of 30 dBi (36 dBi antenna gain - 6 dB minimum cable loss)

3.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	NMS Module - NMS Port	1	DB9	Shielded
2	NMS Module - XFER Port	1	RJ-45	Non-shielded
3	NMS Module - EXT I/O Port	1	DB26	Shielded
4	QAM Modem Module - Trunk Port	1	DB15	Shielded
5	QAM Modem Module - 70MHz OUT Port	1	SMA - F	Shielded
6	QAM Modem Module - 70 MHz IN Port	1	SMA - F	Shielded
7	UP/DOWN Converter Module - TO PA Port	1	SMA - F	Shielded
8	UP/DOWN Converter Module - 70 MHz IN Port	1	SMA - F	Shielded
9	UP/DOWN Converter Module - RF IN Port	1	SMA - F	Shielded
10	UP/DOWN Converter Module - 70 MHz OUT Port	1	SMA - F	Shielded
11	RF I/O Module - High/PA IN Port	1	SMA - F	Shielded
12	RF I/O Module - Low/RX OUT Port	1	SMA - F	Shielded
13	RF I/O Module - PA OUT Port	1	SMA - F	Shielded
14	PWR AMP Module - PA IN Port	1	SMA - F	Shielded
15	PWR AMP Module - ANTENNA Port	1	N - F	Shielded

3.5. ANCILLARY EQUIPMENT

None.

3.6. TEST SETUP - BLOCK DIAGRAM

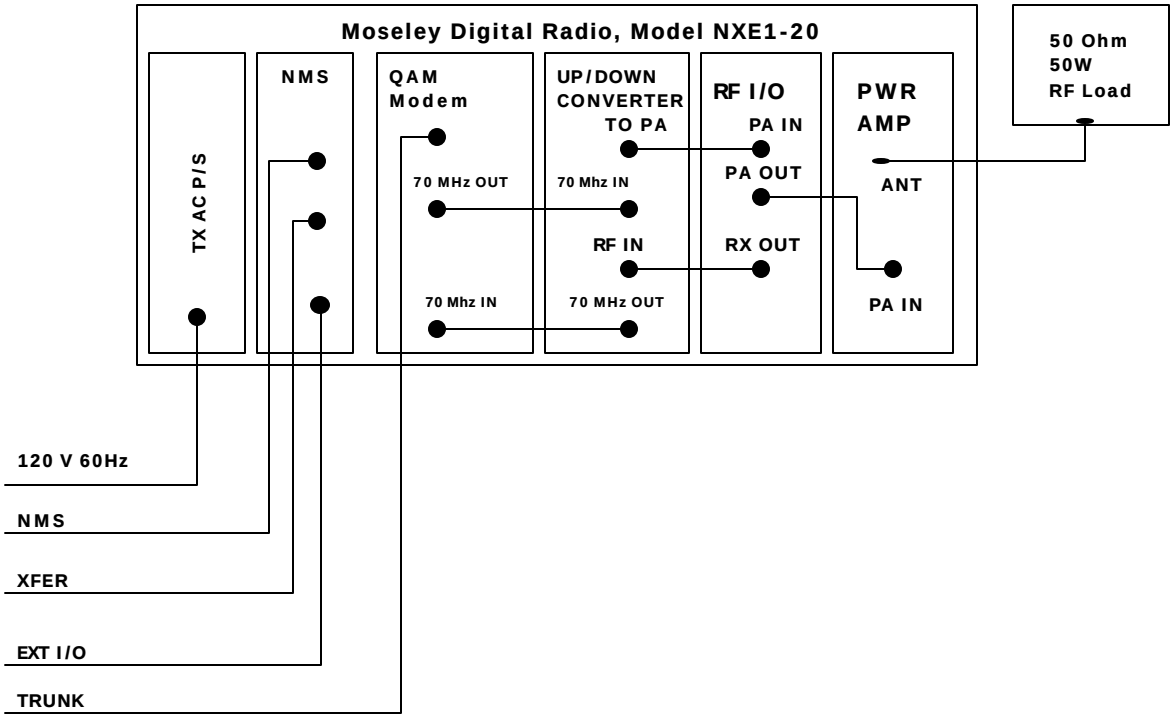


EXHIBIT 4. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

4.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	120 V 60Hz

4.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.
Special Test Software:	N/A
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the transmitter antenna port terminated to a 50 Ohms RF Load.

Transmitter Test Signals	
Frequency Band(s):	Near lowest, near middle & near highest frequencies in each frequency bands that the transmitter covers:
▪ 2305-2312 MHz (16QAM) ▪ 2353-2358 MHz (16QAM) ▪ 2305-2308 MHz (QPSK) ▪ 2356-2358 MHz (QPSK)	▪ 2305 & 2312 MHz ▪ 2353 & 2358 MHz ▪ 2305 & 2308 MHz ▪ 2356 & 2358 MHz
Transmitter Wanted Output Test Signals:	
▪ RF Power Output (measured maximum output power): ▪ Normal Test Modulation ▪ Modulating signal source:	▪ 1.3 Watts maximum for 16QAM & 1.0 Watt maximum for QPSK ▪ QPSK and 16QAM with data signal at maximum data rate of 8448 kbps ▪ Internal

EXHIBIT 5. SUMMARY OF TEST RESULTS

5.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Powerline Conducted Emissions were performed in UltraTech's shielded room, 16'(L) by 12'(W) by 12'(H).

- Radiated Emissions were performed at the Ultratech's 3 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario.

  The above sites have been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville Open Field Test Site has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049). Last Date of Site Calibration: Aug. 08, 2001.

5.2. APPLICABILITY & SUMMARY OF EMISSION TEST RESULTS

FCC PARAGRAPH.	TEST REQUIREMENTS	APPLICABILITY (YES/NO)
27.50 & 2.1046	RF Power Output	Yes
27.52, 1.1307, 1.1310, 2.1091 & 2.1093	RF Exposure Limit	Yes
27.54 & 2.1055	Frequency Tolerance	Yes
2.1047(b)	Modulation Limiting	N/A
27.53 & 2.1049	Emission Limits	Yes
2.1057 & 2.1051	Emission Limits - Spurious Emissions at Antenna Terminal	Yes
2.1057 & 2.1053	Emission Limits - Field Strength of Spurious Emissions	Yes
NXE1 Digital Radio, **Model No.: NXE1-20**, by **Moseley Associated Incorporated** has also been tested and found to comply with **FCC Part 15, Subpart B - Radio Receivers and Class A Digital Devices**. The engineering test report has been documented and kept in file and it is available anytime upon FCC request.		

5.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

5.4. DEVIATION OF STANDARD TEST PROCEDURES

None

EXHIBIT 6. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

6.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in Exhibit 8 of this report

6.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document NIS 81 with a confidence level of 95%. Please refer to Exhibit 7 for Measurement Uncertainties.

6.3. MEASUREMENT EQUIPMENT USED:

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4:1992 and CISPR 16-1.

6.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUFACTURER:

The essential function of the EUT is to correctly communicate data to and from radios over RF link.

6.5. RF POWER OUTPUT @ FCC 2.1046 & 27.50

6.5.1. Limit

Please refer to FCC CFR 47, Part 27, Subpart C, Para. 27.50 for specification details.

Frequency Range (MHz)	Maximum allowable Peak EIRP for a fixed station (Watts)	Maximum allowable Peak EIRP for a mobile station (Watts)
2305 to 2320	2000	20
2345 to 2360	2000	20

6.5.2. Method of Measurements

Refer to Exhibit 8, § 8.1 (Conducted) and 8.2 (Radiated) and ETSI 300 328 of this report for measurement details.

Note: The conducted peak power measurement method was performed in accordance with ETSI 300 328 since it was proven to be independent with the peak power meter characteristics.

6.5.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Attenuator(s)	Bird	…	…	DC – 22 GHz
EMI Receiver/ EMI Receiver	Advantest	R3271	15050203	100 Hz – 26.27 GHz
Attenuator(s)	Weinschel Corp	24-20-34	BJ2357	DC – 8.27 GHz
Peak Power Meter	Hewlett Packard	HP 8900D		

6.5.4. Test Data

6.5.4.1. RF Conducted Power at the Antenna Port

6.5.4.1.1. Operation in 2305 - 2312 MHz Band, Modulation: 16QAM, data rate: 8448 kbps maximum

Modulation: 16QAM with random data modulating signal at 8448 kbps				
Transmitter Channel Output	**Fundamental Frequency (MHz)**	*** Measured (Peak) Conducted Power (Watts)**	**Calculated EIRP with maximum 30 dBi Antenna Gain (Watts)**	**EIRP Power Limit for Base Station (Watts)**
Lowest	2305.0	1.23	1230	2000.0
Highest	2312.0	1.32	1320	2000.0
Note: The EIRP will be always less than 2000 watts with the maximum allowable antenna gain of 30 dBi recommended by the manufacturer.				

6.5.4.1.2. Operation in 2353 - 2358 MHz Band, Modulation: 16QAM, data rate: 8448 kbps maximum

Modulation: 16QAM with random data modulating signal at 8448 kbps				
Transmitter Channel Output	**Fundamental Frequency (MHz)**	*** Measured (Peak) Conducted Power (Watts)**	**Calculated EIRP with maximum 30 dBi Antenna Gain (Watts)**	**EIRP Power Limit for Base Station (Watts)**
Lowest	2353	1.1	1100	2000.0
Highest	2358	1.0	1000	2000.0
Note: The EIRP will be always less than 2000 watts with the maximum allowable antenna gain of 30 dBi recommended by the manufacturer.				

6.5.4.1.3. Operation in 2305 - 2308 MHz Band, Modulation: QPSK, data rate: 8448 kbps maximum

Modulation: QPSK with random data modulating signal at 8448 kbps				
Transmitter Channel Output	**Fundamental Frequency (MHz)**	*** Measured (Peak) Conducted Power (Watts)**	**Calculated EIRP with maximum 30 dBi Antenna Gain (Watts)**	**EIRP Power Limit for Base Station (Watts)**
Lowest	2305	0.79	790	2000.0
Highest	2308	0.98	980	2000.0
Note: The EIRP will be always less than 2000 watts with the maximum allowable antenna gain of 30 dBi recommended by the manufacturer.				

6.5.4.1.4. Operation in 2353 - 2358 MHz Band, Modulation: QPSK, data rate: 8448 kbps maximum

Modulation: QPSK with random data modulating signal at 8448 kbps				
Transmitter Channel Output	**Fundamental Frequency (MHz)**	*** Measured (Peak) Conducted Power (Watts)**	**Calculated EIRP with maximum 30 dBi Antenna Gain (Watts)**	**EIRP Power Limit for Base Station (Watts)**
Lowest	2356	0.93	930	2000.0
Highest	2358	0.89	890	2000.0
Note: The EIRP will be always less than 2000 watts with the maximum allowable antenna gain of 30 dBi recommended by the manufacturer.				

6.6. RF EXPOSURE / RF SAFETY REQUIRMENTS @ 1.1310, 2.1091 & 25.52

6.6.1. Limits

- **FCC 1.1310:**- The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A) Limits for Occupational/Control Exposures				
1500-100,000	...	...	5	6
(B) Limits for General Population/Uncontrolled Exposure				
1500-100,000	...	...	1.0	30

F = Frequency in MHz

6.6.2. Method of Measurements

Refer to FCC @ 1.1310, 2.1091 and Public Notice DA 00-705 (March 30, 2000)

- In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

(1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
(2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
(3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
(4) Any other RF exposure related issues that may affect MPE compliance

Calculation Method of RF Safety Distance:

$S = PG/4\Pi r^2 = EIRP/4\Pi r^2$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm^2
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device

$r = \sqrt{PG/4\Pi S}$

FCC radio frequency exposure limits may not be exceeded at distances closer than r cm from the antenna of this device

- For portable transmitters (see Section 2.1093), or devices designed to operate next to a person's body, compliance is determined with respect to the SAR limit (define in the body tissues) for near-field exposure conditions. If the maximum average output power, operating condition configurations and exposure conditions are comparable to those of existing cellular and PCS phones., an SAR evaluation may be required in order to determine if such a device complies with SAR limit. When SAR evaluation data is not available, and the additional supporting information cannot assure compliance, the Commission may request that an SAR evaluation be performed, as provided for in Section 1.1307(d)

6.6.3. Test Data

Antenna Gain Limit specified by Manufactuer: 30 dBi

Frequency (MHz)	Measured Maximum RF Conducted (dBm)	Calculated Maximum EIRP with G=30 dBi (dBm)	Laboratory's Recommended Minimum RF Safety Distance r (meters)	Manufacturer Specified RF Safety Distance r (meters)
2312	31.2	61.2	3.2	3.5

Note 1: RF EXPOSURE DISTANCE LIMITS: $r = (PG/4\pi S)^{1/2} = (EIRP/4\pi S)^{1/2}$
$S = 1.0\ mW/cm^2$

Evaluation of RF Exposure Compliance Requirements	
RF Exposure Requirements	**Compliance with FCC Rules**
Minimum calculated separation distance between antenna and persons required: 105 meters 3.2 meters	The antenna is required to be located outdoor on the roof top of a building or antenna tower with the separation distance of 3.5 meters or more.
Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement	Professionally installation
Caution statements and/or warning labels that are necessary in order to comply with the exposure limits	Yes
Any other RF exposure related issues that may affect MPE compliance	None

6.7. FREQUENCY TOLERANCE @ FCC 2.1055 & 27.54

6.7.1. Limits

Please refer to FCC CFR 47, Part 27, Subpart C, Para. 27.54 for specification details.

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

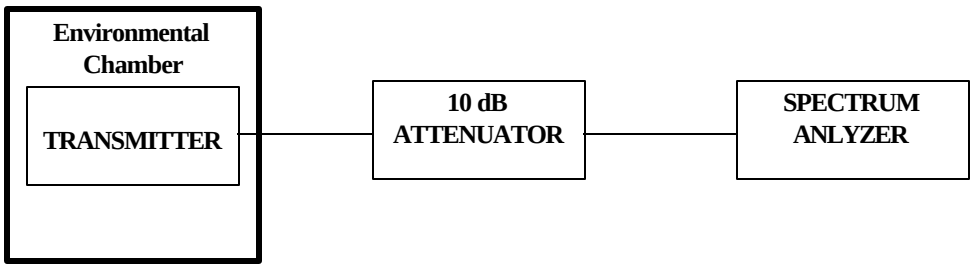
6.7.2. Method of Measurements

Refer to Exhibit 8, § 8.3 of this report for measurement details

6.7.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
EMI Receiver/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.27 GHz
Attenuator(s)	Bird	..	…	DC – 22 GHz
Temperature & Humidity Chamber	Tenney	T5	9723B	-40° to +60 ° C range

6.7.4. Test Arrangement



6.7.5. Test Data

Conforms.

6.7.6. Test Data

Center Frequency:	2305 MHz
Full Power Level:	1.3 Watts
Frequency Tolerance Limit (Worst Case):	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.
Max. Frequency Tolerance Measured:	-250 Hz or -0.11 ppm +217 Hz or +0.09 ppm
Input Voltage Rating:	120 V, 60 Hz

CENTER FREQUENCY & RF POWER OUTPUT VARIATION			
Ambient Temperature (^{o}C)	**Supply Voltage (Nominal) 120V, 60Hz**	**Supply Voltage (85% of Nominal) 102 V, 60Hz**	**Supply Voltage (115% of Nominal) 138 V, 60Hz**
	Hz	**Hz**	**Hz**
-30	+217	N/A	N/A
-20	+190	N/A	N/A
-10	+134	N/A	N/A
0	+68	N/A	N/A
+10	+8	N/A	N/A
+20	+8	N/A	N/A
+30	-70	-12	-17
+40	-170	N/A	N/A
+50	-250	N/A	N/A

The frequency tolerance of from -0.11 ppm to +0.09 ppm shows the compliance with FCC CFR 47, Part 27, Subpart C, Para. 27.54

6.8. 99% OBW, BAND-EDGE EMISSION & EMISSION LIMITS @ FCC 2.1049, 90.208 & 27.53

6.8.1. Limits @ FCC 90.209 & 27.53

Emissions shall be attenuated below the mean output power of the transmitter as follows:

- **LIMIT FOR OPERATION IN 2305 - 2320 MHz Band**

	Emission Limit		
Measuring Frequency Bands	(dBc)	(dBm)	Measuring Bandwidth (RBW)
10 MHz to 2305 MHz	70 + 10*log(P)	-40	100 kHz for frequency ≤ 1 GHz 1 MHz for frequency > 1 GHz
2305 to 2320 MHz	0 dBc	--	Aprox. 1% of 99% OBW
2320 to 2345 MHz	70 + 10*log(P)	-50	1 MHz
2345 - 2370 MHz	43 + 10*log(P)	-13 dBm	1 MHz
2370 to 24 GHz	70 + 10*log(P)	-40	1 GHz

P is power in Watts

- **LIMIT FOR OPERATION IN 2345 - 2370 MHz Band**

	Emission Limit		
Measuring Frequency Bands	(dBc)	(dBm)	Measuring Bandwidth (RBW)
10 MHz to 2305 MHz	70 + 10*log(P)	-40	100 kHz for frequency ≤ 1 GHz 1 MHz for frequency > 1 GHz
2305 to 2320 MHz	43 + 10*log(P)	-23.0	1 MHz
2320 to 2345 MHz	70 + 10*log(P)	-50	1 MHz
2345 - 2370 MHz	0 dBc	--	Aprox. 1% of 99% OBW
2370 to 24 GHz	70 + 10*log(P)	-40	1 GHz

P is power in Watts

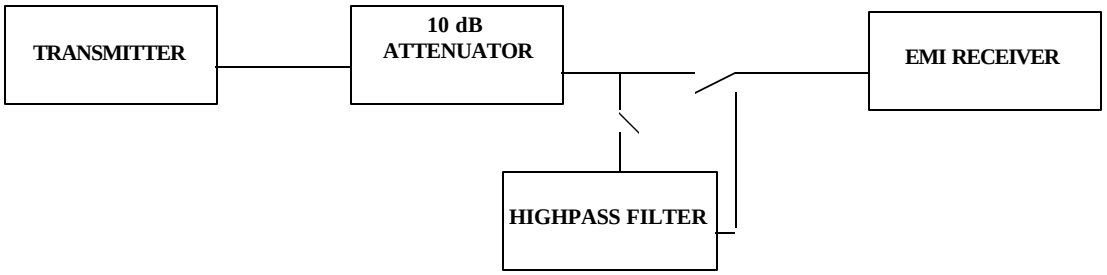
6.8.2. Method of Measurements

Refer to Exhibit 8, § 8.4 & § 8.5 of this report for measurement details

6.8.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
EMI Receiver/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.27 GHz
Attenuator(s)	Bird	..	…	DC – 22 GHz
Audio Oscillator	Hewlett Packard	HP 204C	0989A08798	DC to 1.2 MHz
Highpass Filter, Microphase	Microphase	CR220HID	IITI11000AC	Cut-off Frequency at 600 MHz, 1.3 GHz or 4 GHz

6.8.4. Test Arrangement



6.8.5. Test Data

6.8.5.1. 99% Occupied Bandwidth

Please refer to Plots # 1 through # 4 in Annex 1 for Details of measurements

Frequency (MHz)	Modulation	Measured 99% OBW (kHz)	Recommended 99% OBW
2305	16QAM	2.24	N/A
2312	16QAM	2.36	N/A
2353	16QAM	2.40	N/A
2358	16QAM	2.33	N/A

Please refer to Plots # 5 through # 8 in Annex 1 for Details of measurements

Frequency (MHz)	Modulation	Measured 99% OBW (kHz)	Recommended 99% OBW
2305	QPSK	4.01	N/A
2312	QPSK	4.67	N/A
2353	QPSK	4.73	N/A
2358	QPSK	4.54	N/A

6.8.5.2. Band Edge Emission & Emission Masks

Conform. Please refer to Plots # 9 to 12 in Annex 1 for Details of Band Edge Emission / Emission Limit Measurements for 16QAM Modulation.

Conform. Please refer to Plots # 13 to 16 in Annex 1 for Details of Band Edge Emission / Emission Limit Measurements for QPSK Modulation.

6.8.5.3. Spurious and Harmonic Emissions

6.8.5.4. Tx Freq = 2305 MHz (Lowest in 2305-2312 MHz Band, Modulation: 16QAM)

Fundamental Frequency: 2305 MHz
RF Output Power: 30.9 dBm (conducted)
Modulation: 16QAM with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT	MARGIN	PASS/
	(dBm)	(dBc)	(dBc)	(dB)	FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 9 & 17 to 19 for detailed measurements

6.8.5.5. Tx Freq = 2312 MHz (Highest in 2305-2312 MHz Band, Modulation: 16QAM)

Fundamental Frequency: 2312 MHz
RF Output Power: 31.2 dBm (conducted)
Modulation: 16QAM with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT	MARGIN	PASS/
	(dBm)	(dBc)	(dBc)	(dB)	FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 10 & 20 to 22 for detailed measurements

6.8.5.6. Tx Freq = 2353 MHz (Lowest in 2345-2370 MHz Band, Modulation: 16QAM)

Fundamental Frequency:	2353 MHz				
RF Output Power:	30.4 dBm (conducted)				
Modulation:	16QAM with 8448 kbps random data				
FREQUENCY (MHz)	**TRANSMITTER CONDUCTED ANTENNA EMISSIONS**		**LIMIT**	**MARGIN**	**PASS/**
	(dBm)	**(dBc)**	**(dBc)**	**(dB)**	**FAIL**
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 11 & 23 to 25 for detailed measurements

6.8.5.7. Tx Freq = 2358 MHz (Highest in 2345-2370 MHz Band, Modulation: 16QAM)

Fundamental Frequency:	2358 MHz				
RF Output Power:	30.0 dBm (conducted)				
Modulation:	16QAM with 8448 kbps random data				
FREQUENCY (MHz)	**TRANSMITTER CONDUCTED ANTENNA EMISSIONS**		**LIMIT**	**MARGIN**	**PASS/**
	(dBm)	**(dBc)**	**(dBc)**	**(dB)**	**FAIL**
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 12 & 26 to 28 for detailed measurements

6.8.5.8. Tx Freq = 2305 MHz (Lowest in 2305-2308 MHz Band, Modulation: QPSK)

Fundamental Frequency:	2305 MHz
RF Output Power:	29.0 dBm (conducted)
Modulation:	QPSK with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS (dBm)	(dBc)	LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 13 & 29 to 31 for detailed measurements

6.8.5.9. Tx Freq = 2308 MHz (Highest in 2305-2308 MHz Band, Modulation: QPSK)

Fundamental Frequency:	2308 MHz
RF Output Power:	29.9 dBm (conducted)
Modulation:	QPSK with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS (dBm)	(dBc)	LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 14 & 32 to 34 for detailed measurements

6.8.5.10. Tx Freq = 2356 MHz (Lowest in 2345-2370 MHz Band, Modulation: QPSK)

Fundamental Frequency:	2356 MHz
RF Output Power:	29.7 dBm (conducted)
Modulation:	QPSK with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS (dBm)	(dBc)	LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 15 & 35 to 37 for detailed measurements

6.8.5.11. Tx Freq = 2358 MHz (Highest in 2345-2370 MHz Band, Modulation: QPSK)

Fundamental Frequency:	2358 MHz
RF Output Power:	29.5 dBm (conducted)
Modulation:	QPSK with 8448 kbps random data

FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS (dBm)	(dBc)	LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
*	*	*	*	*	PASS

- No significant emissions were found when the rf emissions were scanned from 10 MHz to 24 GHz
- Please refer to Plots # 16 & 38 to 40 for detailed measurements

6.9. TRANSMITTER SPURIOUS/HARMONIC RADIATED EMISSIONS @ FCC 2.1057, 2.1053 & 27.53

6.9.1. Limits

Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Frequency Range	Attenuation Limit (dBc)
27.53	10 MHz to Lowest frequency of the radio to 10th harmonic of the highest frequency of the radio	43+10*log(P) or 80 dBc whichever is lesser attenuation

6.9.2. Method of Measurements

The spurious/harmonic ERP measurements are using substitution method specified in Exhibit 8, § 8.2 of this report and its value in dBc is calculated as follows:

(1) If the transmitter's antenna is an integral part of the EUT, the ERP is measured using substitution method.
(2) If the transmitter's antenna is non-integral and diverse, the lowest ERP of the carrier with 0 dBi antenna gain is used for calculation of the spurious/harmonic emissions in dBc:
Lowest ERP of the carrier = EIRP – 2.15 dB = Pc + G - 2.15 dB = xxx dBm (conducted) + 0 dBi – 2.15 dB
(3) Spurious /harmonic emissions levels expressed in dBc (dB below carrier) are as follows:

ERP of spurious/harmonic (dBc) = ERP of carrier (dBm) – ERP of spurious/harmonic emission (dBm)

6.9.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Hewlett Packard	HP 8546A	…	9 kHz to 5.6 GHz with built-in 30 dB Gain Pre-selector, QP, Average & Peak Detectors.
RF Amplifier	Com-Power	PA-102		1 MHz to 1 GHz, 30 dB gain nomimal
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.27 GHz, 30 dB nominal
Biconilog Antenna	EMCO	3142	10005	30 MHz to 2 GHz
Dipole Antenna	EMCO	3121C	8907-434	30 GHz – 1 GHz
Dipole Antenna	EMCO	3121C	8907-440	30 GHz – 1 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Horn Antenna	EMCO	3155	9911-5955	1 GHz – 18 GHz
Horn Antenna	EMCO	3160-09	..	18 GHz – 26.5 GHz
RF Signal Generator	Hewlett Packard	HP 83752B	3610A00457	0.01 – 20 GHz

6.9.4. Test Setup

Please refer to Photos # 1 to 2 in Annex 2 for detailed of test setup.

6.9.5. Test Data

Remarks: It appears on the RF output power and conducted emission test results that operation with 16QAM modulation yields the higher power than those with QPSK modulation in 1 MHz RBW; therefore the radiated emissions will be conducted with 16QAM modulation for worst case.

6.9.5.1. Tx Freq = 2305 MHz (Lowest in 2305-2312 MHz Band, Modulation: 16QAM)

Fundamental Frequency: 2305 MHz
RF Output Power: 30.9 dBm (conducted)
Modulation: 16QAM with 8448 kbps random data

FREQUENCY (MHz)	E-FIELD Level @3m (dBuV/m)	ERP Substitution measured by Method (dBm)	ERP Substitution measured by Method (dBc)	EMI Receiver Detector (Peak/QP)	ANTENNA PLANE (H/V)	ANTENNA LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
4610.00	51.5	-50.9	-81.8	PEAK	V	-70.9	-10.9	PASS
4610.00	50.3	-52.8	-83.7	PEAK	H	-70.9	-12.8	PASS

- The rf emissions were scanned from 10 MHz to 24 Ghz and all rf emissions less than 20 dB below the limit were recorded.

6.9.5.2. Tx Freq = 2312 MHz (Highest in 2305-2312 MHz Band, Modulation: 16QAM)

Fundamental Frequency: 2312 MHz
RF Output Power: 31.2 dBm (conducted)
Modulation: 16QAM with 8448 kbps random data

FREQUENCY (MHz)	E-FIELD Level @3m (dBuV/m)	ERP Substitution measured by Method (dBm)	ERP Substitution measured by Method (dBc)	EMI Receiver Detector (Peak/QP)	ANTENNA PLANE (H/V)	ANTENNA LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
4624.00	53.3	-49.4	-80.6	PEAK	V	-72.1	-8.5	PASS
4624.00	49.3	-53.6	-84.8	PEAK	H	-72.1	-12.7	PASS

- The rf emissions were scanned from 10 MHz to 24 Ghz and all rf emissions less than 20 dB below the limit were recorded.

6.9.5.3. Tx Freq = 2353 MHz (Lowest in 2345-2370 MHz Band, Modulation: 16QAM)

Fundamental Frequency:	2353 MHz
RF Output Power:	30.4 dBm (conducted)
Modulation:	16QAM with 8448 kbps random data

FREQUENCY (MHz)	E-FIELD Level @3m (dBuV/m)	ERP Substitution measured by Method (dBm)	ERP Substitution measured by Method (dBc)	EMI Receiver Detector (Peak/QP)	ANTENNA PLANE (H/V)	ANTENNA LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
4706.00	56.8	-45.9	-76.3	PEAK	V	-70.4	-5.9	PASS
4706.00	56.8	-46.4	-76.8	PEAK	H	-70.4	-6.4	PASS

- The rf emissions were scanned from 10 MHz to 24 Ghz and all rf emissions less than 20 dB below the limit were recorded.

6.9.5.4. Tx Freq = 2358 MHz (Highest in 2345-2370 MHz Band, Modulation: 16QAM)

Fundamental Frequency:	2358 MHz
RF Output Power:	30.0 dBm (conducted)
Modulation:	16QAM with 8448 kbps random data

FREQUENCY (MHz)	E-FIELD Level @3m (dBuV/m)	ERP Substitution measured by Method (dBm)	ERP Substitution measured by Method (dBc)	EMI Receiver Detector (Peak/QP)	ANTENNA PLANE (H/V)	ANTENNA LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
4716.00	59.5	-43.2	-73.2	PEAK	V	-70.0	-3.2	PASS
4716.00	60.5	-42.9	-72.9	PEAK	H	-70.0	-2.9	PASS

- The rf emissions were scanned from 10 MHz to 24 Ghz and all rf emissions less than 20 dB below the limit were recorded.

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994)

7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (± dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	±1.0	±1.0
Cable Loss Calibration	Normal (k=2)	±0.3	±0.5
EMI Receiver specification	Rectangular	±1.5	±1.5
Antenna Directivit	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	±2.0	±0.5
Antenna phase center variation	Rectangular	0.0	±0.2
Antenna factor frequency interpolation	Rectangular	±0.25	±0.25
Measurement distance variation	Rectangular	±0.6	±0.4
Site imperfections	Rectangular	±2.0	±2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67$(Bi) 0.3 (Lp) Uncertainty limits $20\text{Log}(1\pm\Gamma_1\Gamma_R)$	U-Shaped	+1.1 -1.25	±0.5
System repeatability	Std. Deviation	±0.5	±0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k=2 is used:

$U = 2u_c(y) = 2x(+2.19) = +4.38$ dB And $U = 2u_c(y) = 2x(-2.21) = -4.42$ dB

EXHIBIT 8. MEASUREMENT METHODS

8.1. PEAK CONDUCTED POWER

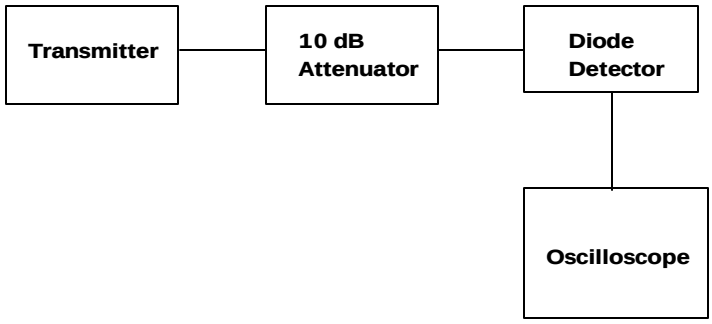
Measurements of Transmitter Parameters (Duty Cycle & Peak Power):

- The following shall be applied to the combination(s) of the radio device and its intended antenna(e).
- I f the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
- The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
- The measurement shall be performed using normal operation of the equipment with modulation.

Test procedure shall be as follows:

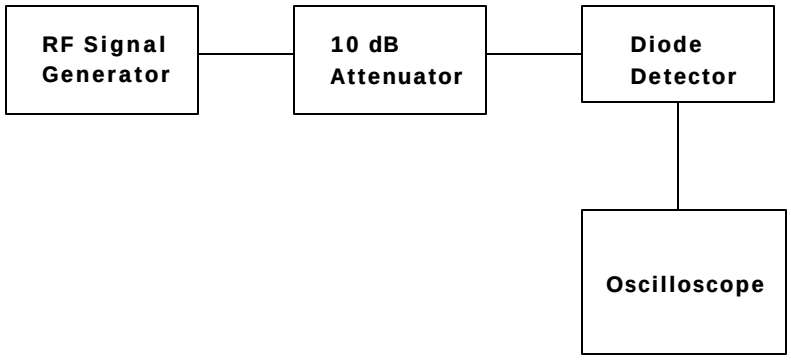
Step 1: Duty Cycle (x) and Peak Power (y) parameters measurements

- Connect the transmitter output to a diode detector through an attenuator
- Connect the diode detector to the vertical channel of an oscilloscope.
- The observed duty cycle of the transmitter, x = Tx on / (Tx on + Tx off) with $0<x<1$, is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.
- Observe and record the y parameter of the DC level on the oscilloscope.



Step 2: Peak Power Measurements

- Replace the transmitter by a RF signal generator
- Set the signal generator frequency be the same as the transmitter frequency
- Adjust the rf output level of the RF signal generator until the DC level on the oscilloscope is same as that (y) recorded in step 1.
- Measure the RF signal generator output level using a power meter
- Calculate the total peak power (Pp) by adding the signal generator level with the attenuator value and the cable loss.



8.2. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

8.2.1. Maximizing RF Emission Level (E-Field)

(a) The measurements was performed with full rf output power and modulation.
(b) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
(c) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
(d) The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
(e) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(f) Set the EMI Receiver #1 and #2 as follows:

Center Frequency:	test frequency
Resolution BW:	100 kHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(g) The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
(h) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(i) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
(j) The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
(k) The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
(l) Repeat for all different test signal frequencies

8.2.2. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

(a) Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

Center Frequency:	equal to the signal source
Resolution BW:	10 kHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(b) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(c) Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.
(d) Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):

- DIPOLE antenna for frequency from 30-1000 MHz or
- HORN antenna for frequency above 1 GHz }.

(e) Mount the transmitting antenna at 1.5 meter high from the ground plane.
(f) Use one of the following antenna as a receiving antenna:

- DIPOLE antenna for frequency from 30-1000 MHz or
- HORN antenna for frequency above 1 GHz }.

(g) If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.
(h) Adjust both transmitting and receiving antenna in a VERTICAL polarization.
(i) Tune the EMI Receivers to the test frequency.
(j) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(k) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(l) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(m) Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.
(n) Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

P = P1 - L1 = (P2 + L2) – L1 = P3 + A + L2 - L1
EIRP = P + G1 = P3 + L2 - L1 + A + G1
ERP = EIRP – 2.15 dB
Total Correction factor in EMI Receiver # 2 = L2 – L1 + G1

Where: P: Actual RF Power fed into the substitution antenna port after corrected.
P1: Power output from the signal generator
P2: Power measured at attenuator A input
P3: Power reading on the Average Power Meter
EIRP: EIRP after correction
ERP: ERP after correction

(o) Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)
(p) Repeat step (d) to (o) for different test frequency
(q) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
(r) Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.:

Figure 2

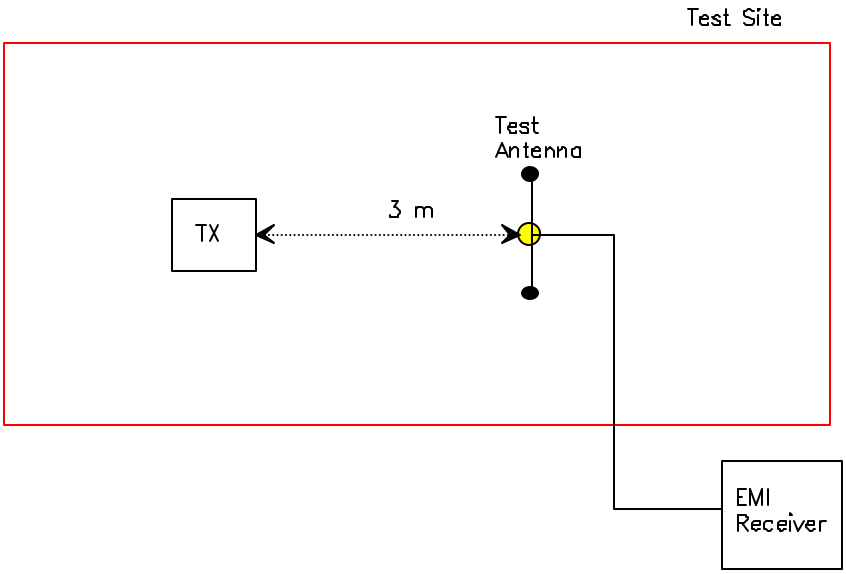
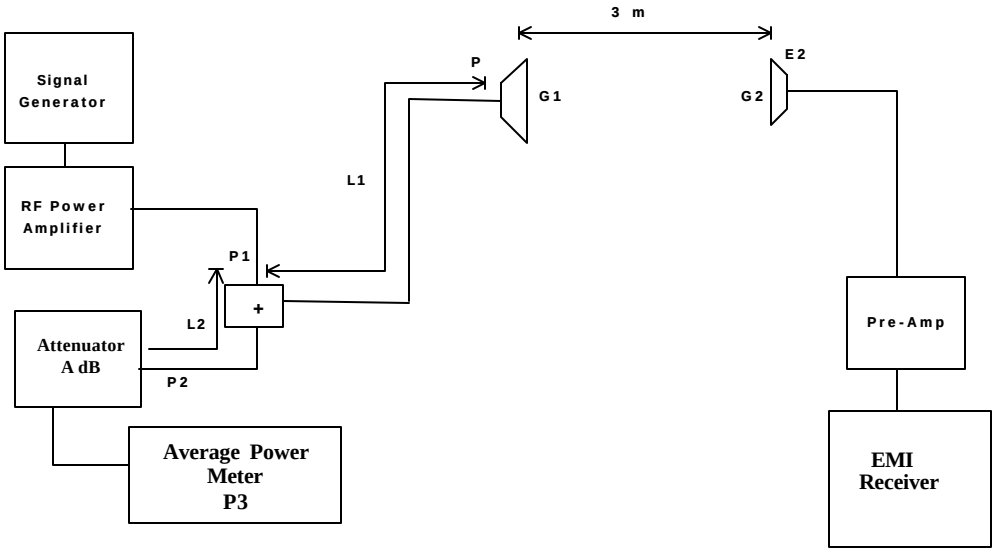


Figure 3



8.3. FREQUENCY STABILITY

Refer to FCC @ 2.1055.

(a) The frequency stability shall be measured with variation of ambient temperature as follows: From -30 to +50 centigrade except that specified in subparagraph (2) & (3) of this paragraph.

(b) Frequency measurements shall be made at extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stability circuitry need be subjected to the temperature variation test.

(d) The frequency stability supply shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provide with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment).

8.4. EMISSION MASK

Digital Modulation Through a Data Input Port @ 2.1049(h):- Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the Emission Masks shall be shown for operation with any devices used for modifying the spectrum when such devices are operational at the discretion of the user.

The following EMI Receiver bandwidth shall be used for measurement of Emission Mask/Out-of-Band Emission Measurements: RBW $\geq$ 1% of the 99% OBW, VBW $\geq$ RBW

8.5. SPURIOUS EMISSIONS (CONDUCTED)

With transmitter modulation characteristics described in Out-of-Band Emissions measurements @ 2.1049, the transmitter spurious and harmonic emissions were scanned. The spurious and harmonic emissions were measured with the EMI Receiver controls set as RBW = 30 kHz minimum , VBW $\geq$ RBW and SWEEP TIME = AUTO). The transmitter was operated at a full rated power output, and modulated as follows:

FCC CFR 47, Para. 2.1057 - Frequency spectrum to be investigated:- The spectrum was investigated from the lowest radio generated in the equipment up to at least the 10^{th} harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

FCC CFR 47, Para. 2.1051 - Spurious Emissions at Antenna Terminal:- The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of the harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.