ENGINEERING TEST REPORT

Scanning Receiver
Model Nos.: IC-91A & IC-91AD

FCC ID: AFJ288800

Applicant:

ICOM Incorporated
1-1-32, Kamiminami, Hirano-ku
Osaka, Japan, 547-0003

Tested in Accordance With

Federal Communications Commission (FCC)
47 CFR, Part 15, Subpart B
Scanning Receivers Operating in the Frequency Band 0.500 to 999.990 MHz
(excluding cellular bands)

UltraTech's File No.: ICOM-130FCC15B

This Test report is Issued under the Authority of Tri M. Luu, Professional Engineer, Vice President of Engineering UltraTech Group of Labs Date: April 14, 2006	
Report Prepared by: Dharmajit Solanki Issued Date: April 14, 2006	Tested by: William Truong, EMI/RFI Technician Test Dates: March 30 - Apr.07, 2006

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

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ANSI	FC	VCI	Canada	NVLAP	BSMI
0685	31040/SIT	C-1376	46390-2049	200093-0	SL2-IN-E-1119R

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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	OK
1	Test Setup Photos	Radiated Emissions Test Setup Photos	OK
2	External Photos of EUT	External EUT Photos	OK
3	Internal Photos of EUT	Internal EUT Photos	OK
4	Cover Letters	Cover Letter for Certification Request. Letter from the Applicant to appoint Ultratech to act as an agent Letter from the Applicant to request for Confidentiality Filing	OK
5	Attestation Statements	Manufacturer Attestation Letter Part 2.1033(b)(10) for Scanning Receiver	OK
6	ID Label/Location Info	ID Label Location of ID Label	OK
7	Block Diagrams	Block Diagram	OK
8	Schematic Diagrams	Schematics	OK
9	Operational Description	IC-91A & IC-91AD Circuit Description	OK
10	RF Exposure Info	N/A	N/A
11	Users Manual	IC-91A & IC-91AD Instruction Manual	OK

EXHIBIT 2. INTRODUCTION

2.1. SCOPE

Reference:	FCC Part 15, Subpart B, Sections 15.107, 15.109, 15.111 & 15.121
Title:	Code of Federal Regulations (CFR), Title 47, Telecommunication, Part 15
Purpose of Test:	To gain FCC Certification Authorization for Scanning Receivers Operating in 0.500 to 999.990 MHz (excluding cellular bands)
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.
Environmental Classification:	Commercial, industrial or business environment.

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

None.

2.3. NORMATIVE REFERENCES

Publication	YEAR	Title
FCC CFR 47 Parts 0-19, 80-End	2005	Code of Federal Regulations – Telecommunication
ANSI C63.4	2003	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 +A1 EN 55022	2003-04-10 2004-10-14 2003	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-1: Conducted disturbance measurement
CISPR 16-2-3	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-3: Radiated disturbance measurement

EXHIBIT 3. PERFORMANCE ASSESSMENT

3.1. CLIENT INFORMATION

APPLICANT	
Name:	ICOM Incorporated
Address:	1-1-32, Kamiminami Hirano-ku, Osaka Japan, 547-003
Contact Person:	Mr. Kenji Asano Phone #: +81-66-793-5302 Fax #: +81-66-793-0013 Email Address: export@icom.co.jp

MANUFACTURER	
Name:	ICOM Incorporated
Address:	1-1-32, Kamiminami Hirano-ku, Osaka Japan, 547-0003
Contact Person:	Mr. Kenji Asano Phone #: +81-66-793-5302 Fax #: +81-66-793-0013 Email Address: export@icom.co.jp

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:	ICOM Incorporated
Product Name:	Scanning Receiver
Model Name or Number:	IC-91AD
Serial Number:	0000003
Type of Equipment:	Scanning Receiver
Accessories:	Icom AC/DC Power Supply, Model: RH41-1200500RU, IN: 120VAC 60Hz, 11W, OUT: 12 VDC, 0.5A, ICOM Li-on Battery pack, Model: BP-217, 7.4V, 1300mAh
Power input source:	12 VDC Adapter

3.3. EUT'S TECHNICAL SPECIFICATIONS

RECEIVER	
Equipment Type:	Portable
Power Supply Requirement:	12 VDC Adapter
Operating Frequency Range:	0.500 to 999.990 MHz (excluding cellular bands)
RF Input Impedance:	50 Ohms

3.4. LIST OF EUT'S PORTS

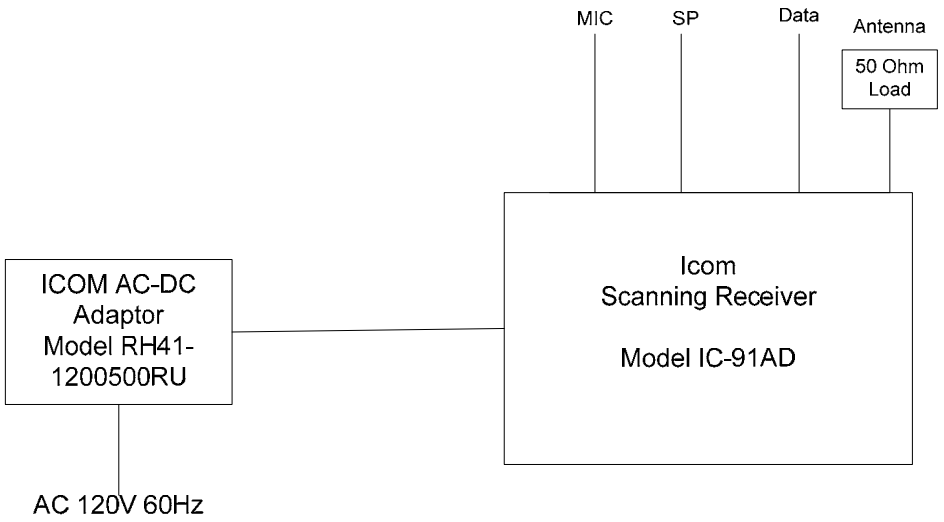
Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Antenna Connector	1	SMA	N/A
2	External Speaker Jack	1	SP jack	Non-Shielded
3	DC IN	1	Single Pin male	Non-Shielded
4	Microphone	1	Single Pin Female	Shielded
5	Data	1	Single Pin Female	Non-Shielded

3.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

Ancillary Equipment # 1	
Description:	AC/DC Power Supply
Brand name:	ICOM
Model Name or Number:	RH41-1200500RU
Serial Number:	BC-167A
Cable Type:	Non-Shielded

3.6. DRAWING OF TEST SETUP



All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

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:	12.0 VDC

4.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	The receiver was operated in the normal intended mode during testing
Special Test Software:	None
Special Hardware Used:	None
Receiver Test Antenna:	The EUT's was tested with its antenna port terminated with 50 Ohm load

Receiver Test Signals	
Frequency Band(s):	0.500 to 999.990 MHz (excluding cellular bands)
Test Frequency(ies): (Near lowest, near middle & near highest frequencies in the frequency range of operation.)	0.5, 500.245 and 999.990 MHz

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 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site 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 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049-1). Last Date of Site Calibration: June. 20, 2005.

5.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Part 15, Subpart B	Test Requirements	Compliance (Yes/No)
15.107(a), Class B	AC Power Line Conducted Emissions Measurements	Yes
15.111(a)	Receiver Antenna Power Conducted Emissions for Non-Integral Antenna Port	Yes
15.109(a)	Radiated Emissions from Scanning Receivers & Class B Digital Device	Yes
15.121	Requirements for Scanning Receivers	Yes

5.3. MODIFICATIONS REQUIRED FOR COMPLIANCE

None.

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

6.1. TEST PROCEDURES

Please refer to Ultratech Test Procedures, File# ULTR-P001-2004 and for Test Procedures.

6.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document LAB 34 with a confidence level of 95%. Please refer to Exhibit 6 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 and CIPSR 16-1-1.

6.4. AC POWER LINE CONDUCTED EMISSIONS [§ 15.107(a)]

6.4.1. Limits

The equipment shall meet the limits of the following table:

Frequency of emissions (MHz)	Class B Conducted Limit (dBμV)		Measuring Bandwidth
	Quasi-Peak	Average	
0.15 to 0.5 0.5 to 5 5 to 30	66 to 56* 56 60	56 to 46* 46 50	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average

* Decreasing linearly with logarithm of frequency

6.4.2. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-200 & ANSI C63.4 for method of measurements.

6.4.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
EMI Receiver System/Spectrum Analyzer with built-in Amplifier	Hewlett Packard	HP 8546A	3520A00248	9KHz-5.6GHz, 50 Ohms
Transient Limiter	Hewlett Packard	11947A	--	9 kHz – 200 MHz 10 dB attenuation
L.I.S.N.	EMCO	3825/2	--	9 kHz – 200 MHz 50 Ohms / 50 μH
12'x16'x12' RF Shielded Chamber	RF Shielding	--	--	--

6.4.4. Photos of test Setup

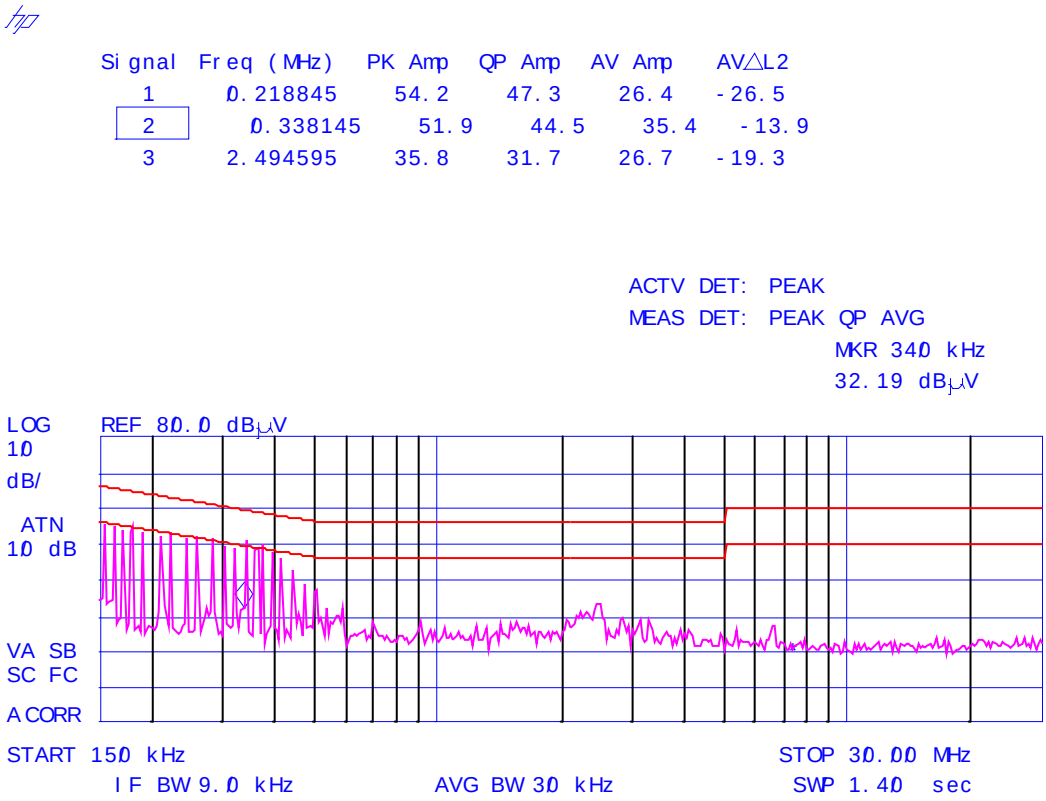
Please refer to Photos #1 and 2 in Annex 1 for details of test setup.

6.4.5. Test Data

Conforms, Please refer to the Plots# 1 & 2 below for test results.

UltraTech Group of Labs		AC POWER LINE CONDUCTED EMISSIONS MEASUREMENT PLOT			
Applicant:	ICOM AMERICA	Detector: [X] PEAK [X] QUASI-PEAK [X] AVERAGE		Temp: 20°C	Humidity: 29%
Product:	Scanning RX	Line Tested:1	Line Voltage :120VAC	Test Tech: Will	Test Date: Apr 3/2006
Model:	IC-91AD	Standard : FCC Part 15 Class B		Comments: : AF Max Output	

Plot # 1:

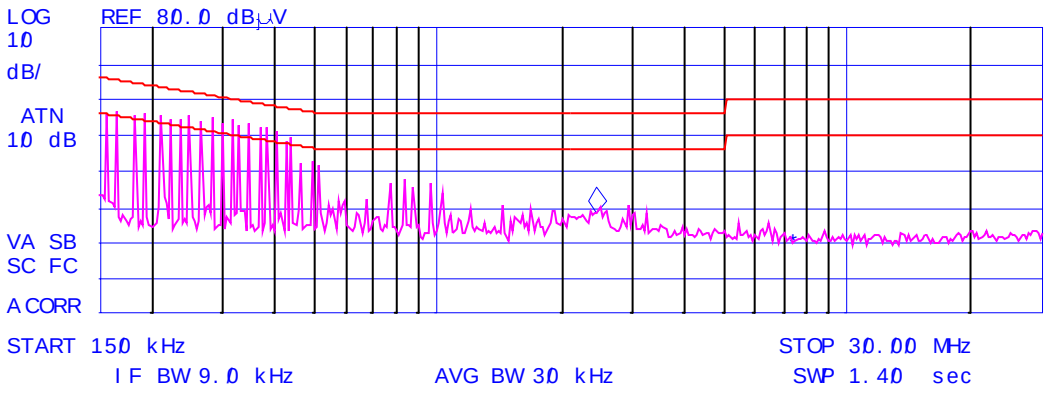


All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

UltraTech Group of Labs		AC POWER LINE CONDUCTED EMISSIONS MEASUREMENT PLOT			
Applicant:	ICOM AMERICA	Detector: [X] PEAK [X] QUASI-PEAK [X] AVERAGE		Temp: 20°C	Humidity: 29%
Product:	Scanning RX	Line Tested:2	Line Voltage :120VAC	Test Tech: Will	Test Date: Apr 3/2006
Model:	IC-91AD	Standard : FCC Part 15 Class B		Comments: : AF Max Output	

Plot # 2:

Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	AV△L2
1	0.218080	55.9	49.3	25.5	-27.5
2	0.591665	35.1	26.0	16.8	-29.2
3	2.487945	33.1	27.6	22.0	-24.0



6.5. RECEIVER ANTENNA POWER SPURIOUS/HARMONIC CONDUCTED EMISSIONS [§15.111(a)]

6.5.1. Limits

Receivers that operate (tune) in the frequency range 30 to 960 Mhz and CB receivers that provides terminals for the connection of an external antenna may be tested to demonstrate compliance with the provisions of @ 15.109 with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following:- ***With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at frequency within the range from 30 Mhz to 5th harmonic of the highest frequency shall not exceed 2.0 nanowatts (or -57 dBm @ 50 Ohm).***

6.5.2. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-200 & ANSI C63.4 for method of measurements.

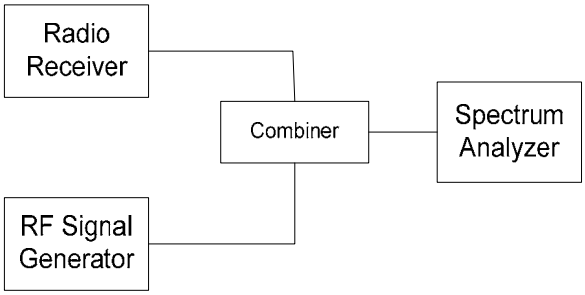
The spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 – 500	2000
500 -1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

6.5.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 kHz – 40 GHz with external mixer
RF Signal Generator	Hewlett Packard	HP 83752B	3610A00457	0.01 – 20 GHz

6.5.4. Test Arrangement



All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

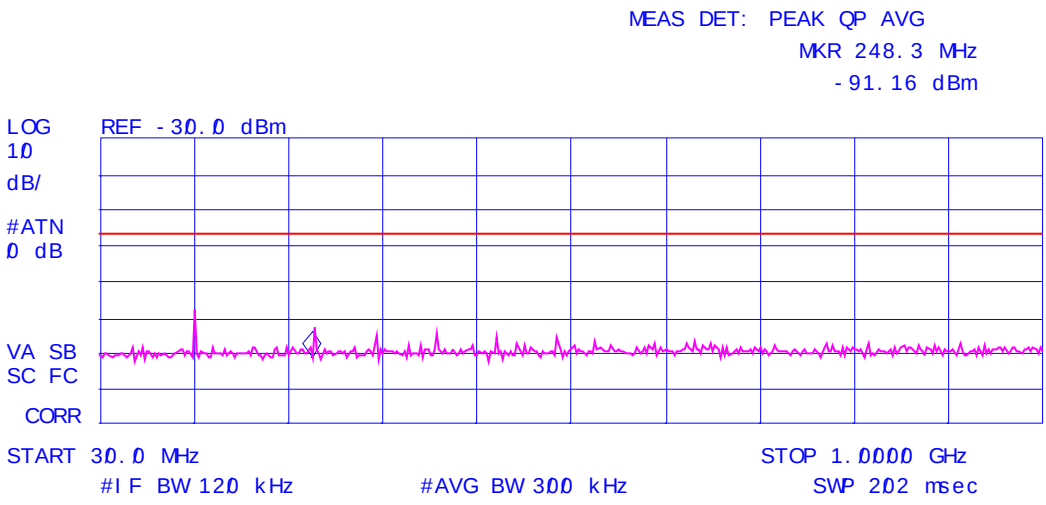
6.5.5. Test Data

Conforms. Please refer to Plot # 3 through # 5 for detailed measurement data.

6.5.5.1. Plot # 3 – Receiver Conducted Emissions @ 0.500 MHz

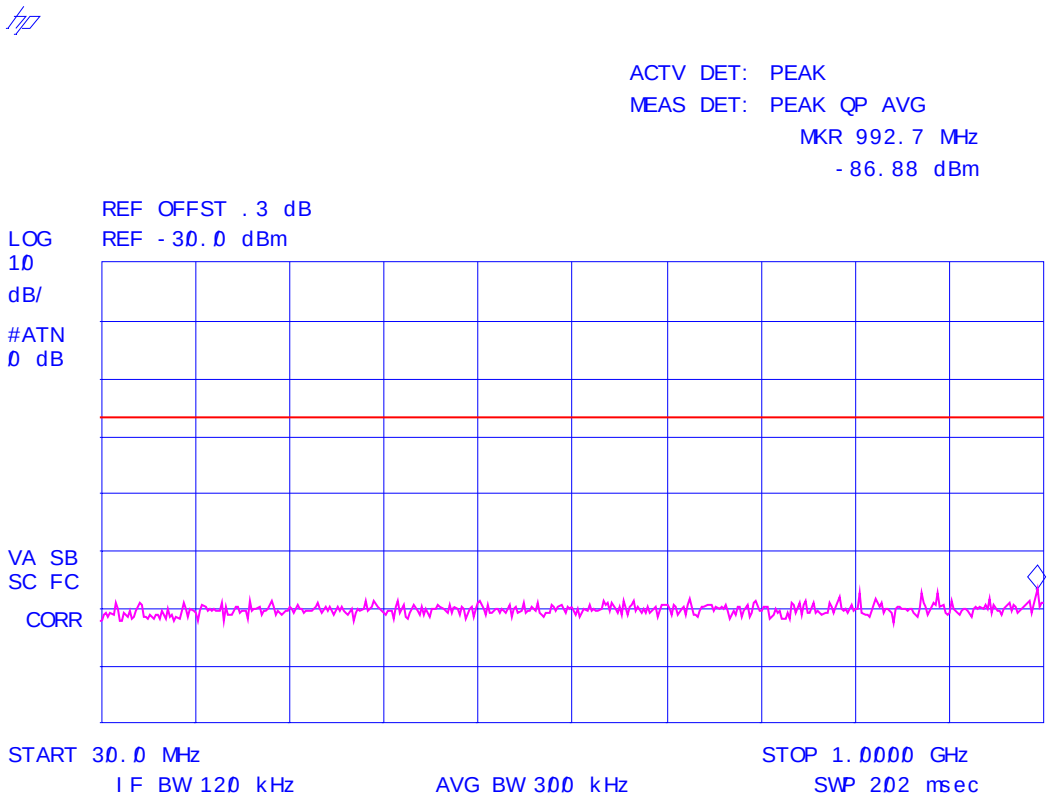
The emissions were scanned from 30 MHz to 1.0 GHz and all emissions found were more than 20 dB below the limits.

Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	PK△L1
1	124.308000	-76.6	-78.4	-79.1	-19.6
2	248.596000	-80.8	-83.1	-84.7	-23.8

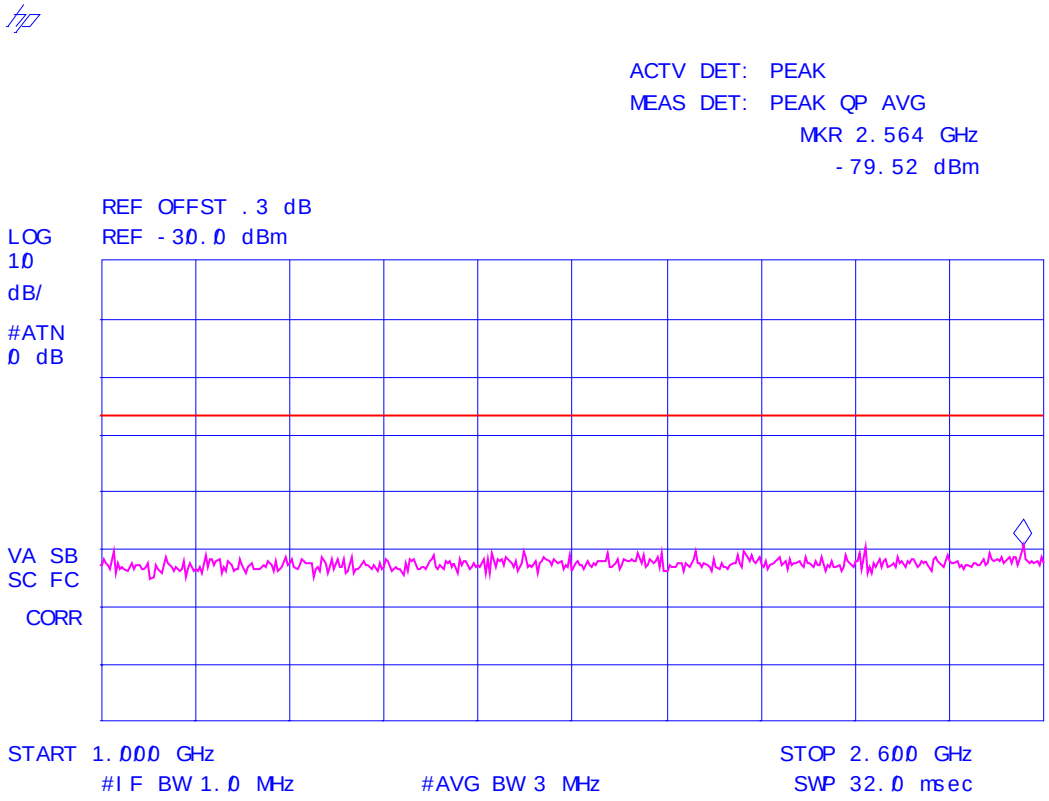


6.5.5.2. Plot # 4 – Receiver Conducted Emissions @ 500.245 MHz

The emissions were scanned from 30 MHz to 2.5 GHz and all emissions found were more than 20 dB below the limits.

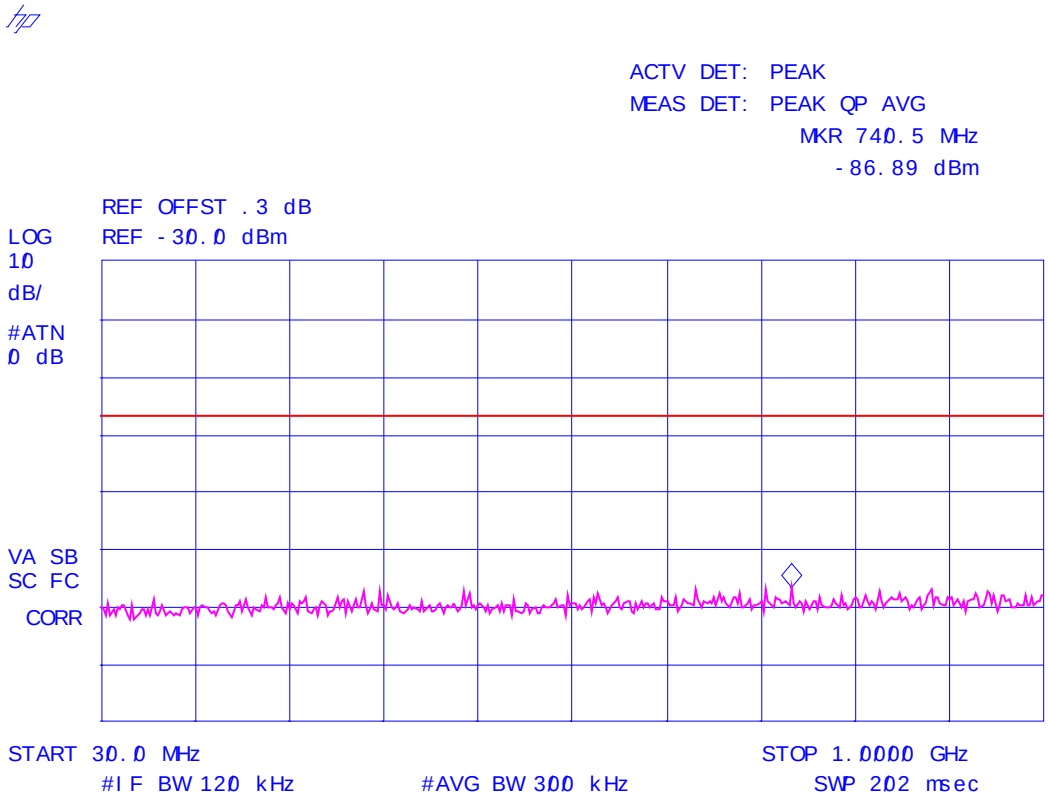


All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)


ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.564 GHz
-79.52 dBm
REF OFFST .3 dB
LOG
10
dB/
REF -30.0 dBm
#ATN
0 dB
VA SB
SC FC
CORR
START 1.000 GHz
STOP 2.600 GHz
#IF BW 1.0 MHz
#AVG BW 3 MHz
SWP 32.0 msec

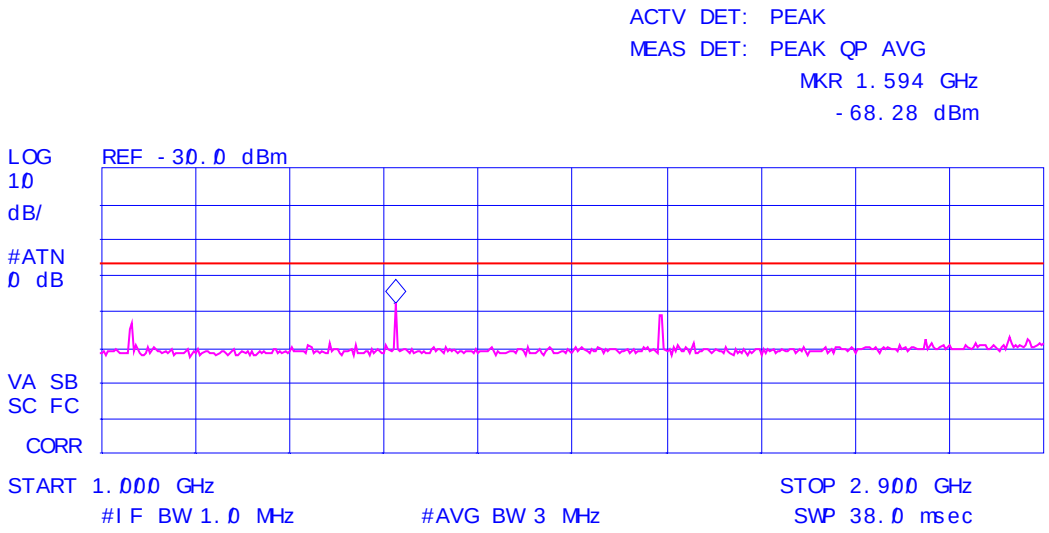
6.5.5.3. Plot # 5 – Receiver Conducted Emissions @ 999.990 MHz

The emissions were scanned from 30 MHz to 2.5 GHz and all emissions found were more than 20 dB below the limits.

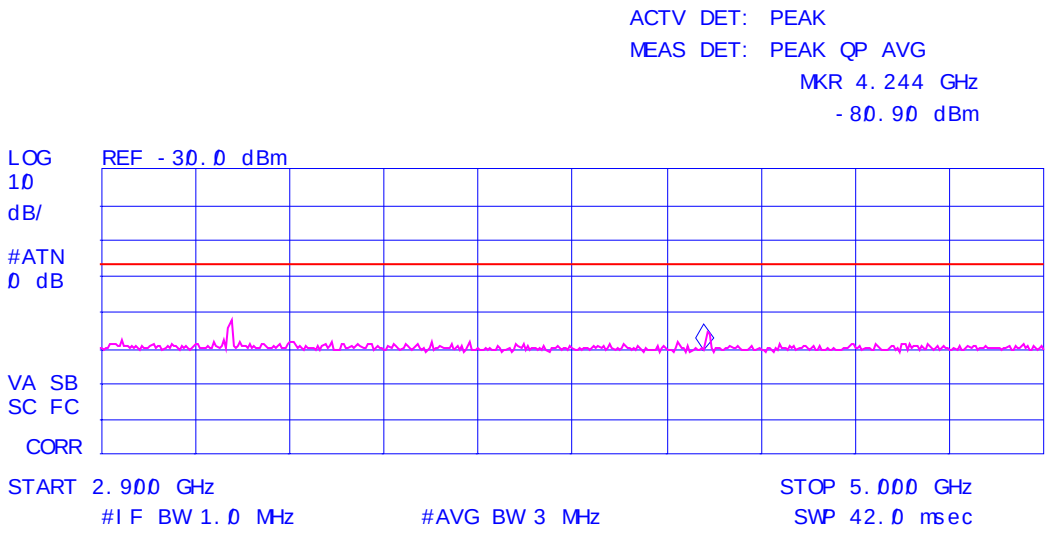


All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	PK△L1
1	1061.502500	-70.1	-75.8	-94.8	-13.1
2	1592.597500	-67.7	-80.4	-96.7	-10.7
3	2123.342500	-69.3	-80.0	-94.3	-12.3



Signal	Freq (MHz)	PK Amp	QP Amp	AV Amp	PK△L1
1	1061.612500	-68.9	-71.6	-71.8	-11.9
2	4246.535000	-73.4	-78.6	-79.7	-16.4



6.6. RECEIVER SPURIOUS/HARMONIC RADIATED EMISSIONS [§ 15.109(a)]

6.6.1. Limits

The equipment shall meet the limits of the following table:

Test Frequency Range (MHz)	Class B Limits @ 3 m (dBμV/m)	EMI Detector Used	Measuring Bandwidth (kHz)
30 – 88	40.0	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
88 – 216	43.5	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
216 – 960	46.0	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
Above 960	54.0	Average	RBW = 1 MHz, VBW ≥ 1 Hz

6.6.2. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-200 & ANSI C63.4 for method of measurements.

The spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 – 500	2000
500 -1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

6.6.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 kHz – 40 GHz with external mixer
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.5 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz

6.6.4. Photos of test Setup

Please refer to Photos # 3 and 4 in Annex 1 for details of test setup

6.6.5. Test Data

6.6.5.1. Near Lowest Frequency (0.500 MHz)

The emissions were scanned from 30 MHz to 1 GHz and all emissions found were more than 20 dB below the limits.

6.6.5.2. Near Middle Frequency (500.245 MHz)

The emissions were scanned from 30 MHz to 2.5 GHz and all emissions found were more than 20 dB below the limits.

6.6.5.3. Near Highest Frequency (999.990 MHz)

The emissions were scanned from 30 MHz to 5 GHz and all emissions found were more than 20 dB below the limits.

6.7. RADIATED EMISSIONS FROM CLASS B UNINTENTIONAL RADIATORS (DIGITAL DEVICES) [§ 15.109(a)]

6.7.1. Limits

The equipment shall meet the limits of the following table:

Test Frequency Range (MHz)	Class B Limits @3m (dBμV/m)	EMI Detector Used	Measuring Bandwidth (kHz)
30 – 88	40.0	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
88 – 216	43.5	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
216 – 960	46.0	Quasi-Peak	RBW = 120 kHz, VBW ≥ 120 kHz
Above 960	54.0	Average	RBW = 1 MHz, VBW ≥ 1 Hz

6.7.2. Method of Measurements

Refer to Ultratech Test Procedures ULTR-P001-200 & ANSI C63.4 for method of measurements.

The spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 – 500	2000
500 -1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

6.7.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 kHz – 40 GHz with external mixer
Microwave Amplifier	Hewlett Packard	HP 83017A		1 GHz to 26.5 GHz
Biconilog Antenna	EMCO	3143	1029	20 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz

6.7.4. Photos of test Setup

Please refer to Photos # 3 and 4 in Annex 1 for details of test setup

6.7.5. Test Data

FREQUENCY (MHz)	E-FIELD @3m (dBuV/m)	DETECTOR USED (PEAK/QP)	ANTENNA PLANE (H/V)	LIMIT @3m (dBuV/m)	MARGIN (dB)	PASS/ FAIL
76.3	27.9	PEAK	V	40.0	-12.1	PASS
76.3	16.7	PEAK	H	40.0	-23.3	PASS
The emissions were scanned from 30 MHz to 5000 MHz at 3 Meters distance and all emissions within 20 dB below the limits were recorded.						

6.8. REQUIREMENTS FOR SCANNING RECEIVERS [47 CFR 15.121]

6.8.1. FCC Rules

a. Except as provided in paragraph (c) of this section, scanning receivers and frequency converters designed or marketed for use with scanning receivers, shall:

(1) Be incapable of operating (tuning), or readily being altered by the user to operate, within the frequency bands allocated to the Cellular Radiotelephone Service in part 22 of this chapter (cellular telephone bands). Scanning receivers capable of ``readily being altered by the user'' include, but are not limited to, those for which the ability to receive transmissions in the cellular telephone bands can be added by clipping the leads of, or installing, a simple component such as a diode, resistor or jumper wire; replacing a plug-in semiconductor chip; or programming a semiconductor chip using special access codes or an external device, such as a personal computer. Scanning receivers, and frequency converters designed for use with scanning receivers, also shall be incapable of converting digital cellular communication transmissions to analog voice audio.

(2) Be designed so that the tuning, control and filtering circuitry is inaccessible. The design must be such that any attempts to modify the equipment to receive transmissions from the Cellular Radiotelephone Service likely will render the receiver inoperable.

b. Except as provided in paragraph (c) of this section, scanning receivers shall reject any signals from the Cellular Radiotelephone Service frequency bands that are 38 dB or lower based upon a 12 dB SINAD measurement, which is considered the threshold where a signal can be clearly discerned from any interference that may be present.

c. Scanning receivers and frequency converters designed or marketed for use with scanning receivers, are not subject to the requirements of paragraphs (a) and (b) of this section provided that they are manufactured exclusively for, and marketed exclusively to, entities described in 18 U.S.C. 2512(2), or are marketed exclusively as test equipment pursuant to Sec. 15.3(dd)

d. Modification of a scanning receiver to receive transmissions from Cellular Radiotelephone Service frequency bands will be considered to constitute manufacture of such equipment. This includes any individual, individuals, entity or organization that modifies one or more scanners. Any modification to a scanning receiver to receive transmissions from the Cellular Radiotelephone Service frequency bands voids the certification of the scanning receiver, regardless of the date of manufacture of the original unit. In addition, the provisions of Sec. 15.23 shall not be interpreted as permitting modification of a scanning receiver to receiver Cellular Radiotelephone Service transmissions.

e. Scanning receivers and frequency converters designed for use with scanning receivers shall not be assembled from kits or marketed in kit form unless they comply with the requirements in paragraph (a) through (c) of this section.

f. Scanning receivers shall have a label permanently affixed to the product, and this label shall be readily visible to the purchaser at the time of purchase. The label shall read as follows: WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.

(1) ``Permanently affixed'' means that the label is etched, engraved, stamped, silkscreened, indelible printed or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic or other material fastened to the equipment by welding, riveting, or permanent adhesive. The label shall be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable. The label shall not be a stick-on, paper label.

(2) When the device is so small that it is not practicable to place the warning label on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user and shall also be placed on the container in which the device is marketed. However, the FCC identifier must be displayed on the device.

6.8.2. Declaration for Compliance with FCC §15.121

- Comply with FCC 121(a)(1) – This Scanning Receiver is incapable of operating (tuning), or readily being altered by the user to operate, within the frequency bands allocated to the Cellular Radiotelephone Service in part 22 of this chapter (cellular telephone bands).

  Please refer to manufacturer's declaration for compliance with this Rule.

- Comply with FCC 121(a)(2) – This Scanning Receiver is designed so that the tuning, control and filtering circuitry is inaccessible. The design is such that any attempts to modify the equipment to receive transmissions from the Cellular Radiotelephone Service likely will render the receiver inoperable.

  Please refer to manufacturer's declaration for compliance with this Rule.

- Comply with FCC 121(b) – Please refer to the following Section of this Test Report for Scanning Receivers Cellular Band Rejection test.

- Comply with FCC 121(c) – Not applicable.

- Comply with FCC 121(d) – The Users Manual of this Scanning Receiver is provided with the Warning statement as below:

Warning: Changes or modifications to this device, not expressly approved by Icom Inc., could void your authority to operate this device under FCC regulations.

- Comply with FCC 121(e) – This Scanning Receiver will not be assembled from kits or marketed in kit form.

- Comply with FCC 121(f)(2) – This Scanning Receiver has a label placed at prominent location (Cover Page) of the instruction manual and this label is readily visible to the purchaser at the time of purchase. The label reads as follows: WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.

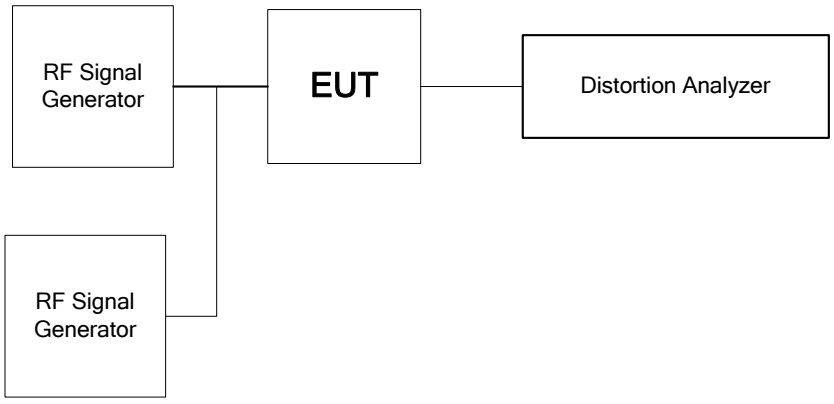
6.9. SCANNING RECEIVERS CELLULAR BAND REJECTION [47 CFR 15.121(b)]

6.9.1. Limits

Except as provided in paragraph (c) of this section, scanning receivers shall reject any signals from the Cellular Radiotelephone Service frequency bands that are 38 dB or lower based upon a 12 dB SINAD measurement, which is considered the threshold where a signal can be clearly discerned from any interference that may be present.

6.9.2. Method of Measurements

(1) Connected the EUT as shown in the following block diagram
(2) Apply a standard RF signal to the receiver input port
(3) Adjust the audio output signal of the receiver to it's rated value with the distortion less than 10%
(4) Adjust the RF Signal Generator Output Power to produce 12 dB SINAD without the audio output power dropping by more than 3 dB
(5) Repeat step (4) at lowest, middle and highest channel frequencies across all cellular base station band to establish a reference sensitivity level. The reference sensitivity taken was the lowest or worse-case sensitivity for all of the bands.
(6) Adjust the RF Signal Generator output to a level of +60 dB above the reference sensitivity obtained in step (5)
(7) Set the Receiver squelch threshold (the signal required to open the squelch) no greater than +20 dB above the reference sensitivity level.
(8) Put the receiver in a scanning mode and allow it to scan across it's complete receive range
(9) If the receiver unsquelched or stopped on any frequency, the display frequency is recorded. The signal generator output level was then adjusted until 12 dB SINAD from the receiver was produced. The signal generator level associated with this response was also noted.
(10) Repeat this procedure for 3 frequencies in the cellular base station transmit band.
(11) The difference between the signal generator output for any response recorded and reference sensitivity is the rejection ratio



All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

6.9.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Distortion analyzer	Hewlett-Packard	8903E	3514A01460	20-100K Hz
RF Signal Generator	Fluke	6061A	4770301	10 kHz – 1050 MHz
RF Signal Generator	Fluke	6061A	5130586	10 kHz – 1050 MHz

6.9.4. Test Data

6.9.4.1. EUT's Operating Mode: FM

EUT's Scanning Frequency Band (MHz)	Cellular Transmitter Test Frequencies (MHz)	RF Input Signal Level @ Cellular Frequencies for 12 dB SINAD (dBm)	Reference Sensitivity dBm	Rejection Ratio (dB)	Maximum Rejection Ratio Limit (dB)
1.625 – 999.99	824.04, 836.40, 848.97, 869.04, 880.62, 893.97	-40.0	-94 to -124	<-54	-38.0
There is no spurious response detected within the above frequency band with the Rejection Ratio of at least -54 dB.					

6.9.4.2. EUT's Operating Mode: AM

EUT's Scanning Frequency Band (MHz)	Cellular Transmitter Test Frequencies (MHz)	RF Input Signal Level @ Cellular Frequencies for 12 dB SINAD (dBm)	Reference Sensitivity dBm	Rejection Ratio (dB)	Maximum Rejection Ratio Limit (dB)
0.495 – 329.995	824.04, 836.40, 848.97, 869.04, 880.62, 893.97	-40.0	-94 to -131	<-54	-38.0
There is no spurious response detected within the above frequency band with the Rejection Ratio of at least -54 dB.					

6.9.4.3. EUT's Operating Mode: WFM

EUT's Scanning Frequency Band (MHz)	Cellular Transmitter Test Frequencies (MHz)	RF Input Signal Level @ Cellular Frequencies for 12 dB SINAD (dBm)	Highest Reference Sensitivity dBm	Rejection Ratio (dB)	Maximum Rejection Ratio Limit (dB)
76 – 221.995	824.04, 836.40, 848.97, 869.04, 880.62, 893.97	-40.0	-91 to -102	<-51	-38.0
There is no spurious response detected within the above frequency band with the Rejection Ratio of at least -51 dB.					

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and LAB 34

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB)	
		9-150 kHz	0.15-30 MHz
EMI Receiver specification	Rectangular	±1.5	±1.5
LISN coupling specification	Rectangular	±1.5	±1.5
Cable and Input Transient Limiter calibration	Normal (k=2)	±0.3	±0.5
Mismatch: Receiver VRC Γ_1 = 0.03 LISN VRC Γ_R = 0.8(9 kHz) 0.2 (30 MHz) Uncertainty limits 20Log(1±$\Gamma_1\Gamma_R$)	U-Shaped	±0.2	±0.3
System repeatability	Std. deviation	±0.2	±0.05
Repeatability of EUT	--	--	--
Combined standard uncertainty	Normal	±1.25	±1.30
Expanded uncertainty U	Normal (k=2)	±2.50	±2.60

Sample Calculation for Measurement Accuracy in 150 kHz to 30 MHz Band:

$u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30$ dB

$U = 2u_c(y) = \pm 2.6$ dB

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

7.2. 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 Directivity	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 Γ_1 = 0.2 Antenna VRC Γ_R = 0.67(Bi) 0.3 (Lp) Uncertainty limits 20Log(1±$\Gamma_1\Gamma_R$)	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

All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)