



FCC TCB & IC CB

**Ultratech's
Accreditations:**



0685

FCC
91038



1309



Approved Test Facility

46390-2049



NvLap Lab Code 200093-0



SL2-IN-E-1119R



Korea KCC-RRL
CA2049

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

Tel.: (905) 829-1570
Fax.: (905) 829-8050

Website: www.ultratech-labs.com
Email: vic@ultratech-labs.com

March 02, 2015

To,
Ms. Annette Allender
ATO Spectrum Planning and International
Federal Aviation Administration

Subject: Information for FAA Review for FCC Certification Application for following VHF Radio under FCC 47 CFR, Parts 2 and 87 (Subpart D) - Non-broadcast Aviation Radio Services Operating in the Frequency Band 118-136.9917MHz

Applicant: ICOM Incorporated
Product: VHF Air Band Transceiver
Models: IC-A220
FCC ID: AFJ297410

Dear Ms. Allender,

As appointed agent for **ICOM Incorporated**, we herewith submit the necessary information required for FAA review & approval. This may enable us (FCC TCB, UltraTech Engineering Labs Inc.) to review & grant FCC application for Certification of the above product.

Please find them in following pages and let us know if you may have any question or require further information.

Thanking you.

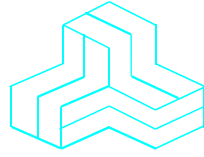
Sincerely,

Dharmajit Solanki

Dharmajit Solanki
Authorized Agent

Email: dharmajit@ultratech-labs.com

ENGINEERING TEST SUMMARY



VHF Air Band Transceiver

Model Nos.: IC-A220

FCC ID: AFJ297410

Applicant:

ICOM Incorporated

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

Tested as Required for FAA Review

**For FCC Certification under
Federal Communications Commission (FCC)
47 CFR, Parts 2 and 87 (Subpart D) – Aviation Services**

UltraTech's File No.: 15ICOM404_FAA

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

Date: March 02, 2015

Report Prepared by: Dharmajit Solanki

Tested by: Wei Wu

Issued Date: March 02, 2015

Test Dates: March 02, 2015

- 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.

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050

Website: www.ultratech-labs.com, Email: vic@ultratech-labs.com, Email: tri@ultratech-labs.com



91038



1309



46390-2049



NVLAP LAB
CODE 200093-0



SL2-IN-E-
1119R



CA2049



TL363_B



TPTDP
DA1300

FAA Requested Information:-

1.) FCC identification number

FCC ID: AFJ297410

2.) Manufacture and Model number

Manufacture: Icom Inc, 1-1-32, Kamiminami, Hirano-ku, Osaka, Japan, 547-0003
Model number: IC-A220

3.) Rated transmitter output power

Rated Output Power: 8 W

4.) Frequency Range (capable of tuning).

Frequency Tuning Range : 118.000 to 136.9917 MHz
Receive Only: 161 to 164 MHz

5.) Method of tuning

Microprocessor controlled phased lock loop (PLL) arrangement

6.) Channeling capability

The Transceiver will operate from
118 MHz -136.975 MHz for 25 kHz Ch Spacing &
118 MHz -136.9917 MHz for 8.33 kHz Ch Spacing

7.) Frequency stability (transmitter).

+/- 5.0 ppm

8.) Emission bandwidth(s)

6.00 kHz

9.) Emission type(s)

Amplitude modulation (AM) A3E
25 kHz: 6K00A3E
8.33 kHz: 5K60A3E

10.) Spectral emission plots:

- (1) One centered on frequency middle of the range and measured across that range.
- (2) Another of frequencies measured out to its corresponding 12th or 13th harmonic.

Test Frequencies & Plots #: Refer to plots for details

- 1. 118.025 MHz – Plots # 1 & 2
- 2. 127.500 MHz – Plots # 3 & 4
- 3. 136.975 MHz – Plots # 5 & 6

11.) Harmonics levels for the (ground) transceiver frequencies listed in Fig.1.

11.1 Transmit Frequency Harmonics (12 & 13)

Transmit Frequency (MHz)	Harmonic	Harmonic Frequency (MHz)	Plot # & Level (dBm)*
130.625	12	1567.500	# 7 & - 68.1
131.275	12	1575.300	# 8 & - 67.4
134.150	12	1609.800	# 9 & - 68.4
120.925	13	1572.025	# 10 & - 68.0
121.175	13	1575.275	# 11 & - 68.7
123.825	13	1609.725	# 12 & - 68.0

* See the plots for details of measurements

12.) Receiver RF characteristics

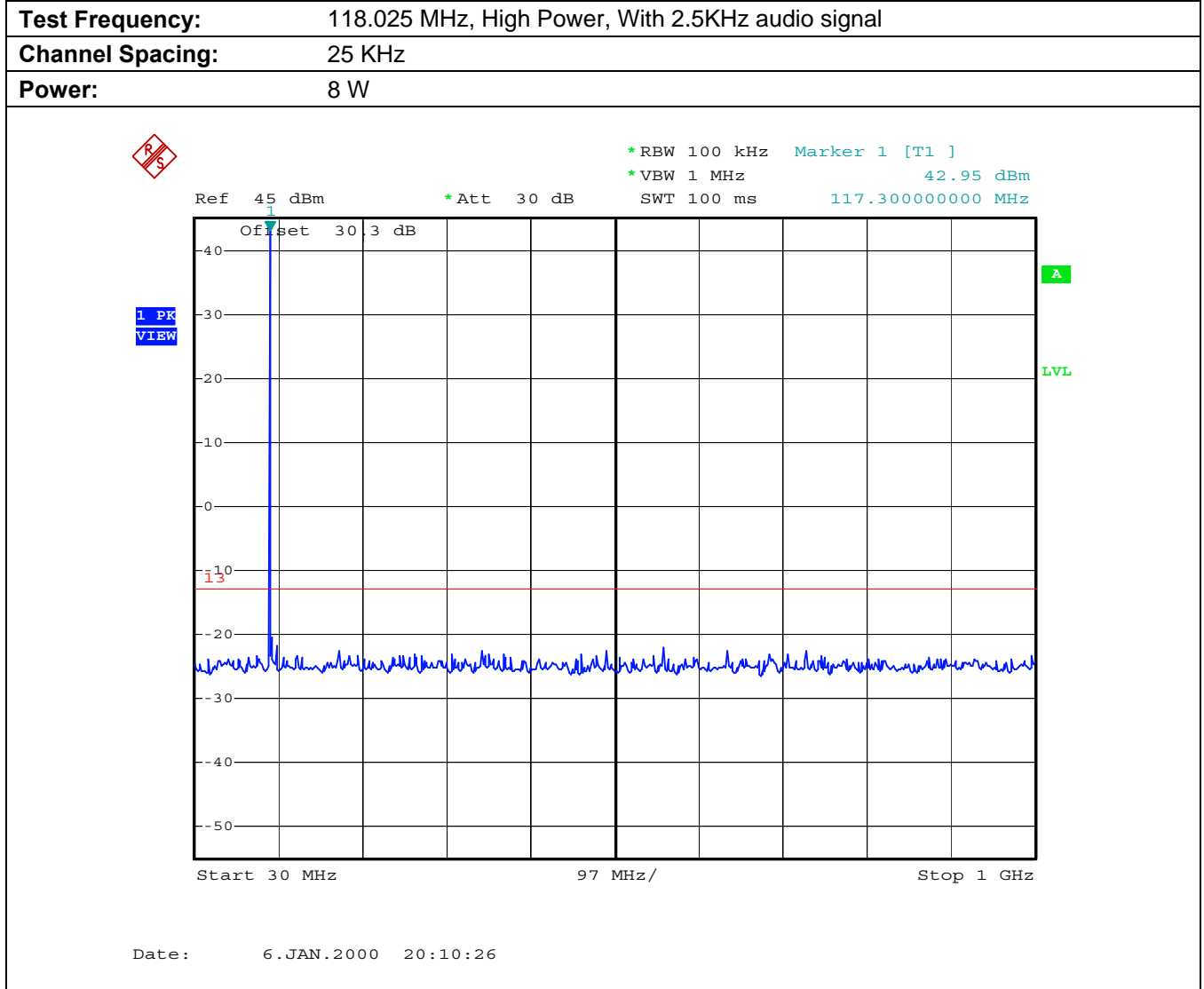
Sensitivity: 6 dB S/N 2 μV
Selectivity: 6 dB ± 3 KHz (Ch Space 25 kHz)
6 dB ± 2.778 KHz (Ch Space 8.33 kHz)
60 dB ± 22 KHz (Ch Space 25 kHz)
60 dB ± 7.37 KHz (Ch Space 8.33 kHz)
Spurious Responses: 74 dB μ
Audio Output Power: 5 W (4 ohms) / 60 mW (500 ohms)
Receive System: Double Conversion Superheterodyne
Intermediate Frequency: 1st 38.85 MHz
2nd 450 KHz

13.) Avionics

Does the transceiver meet the standard for desensitization? (They are specified in Section 2.2.11 of RTCA DO-186 Minimum Operational Performance Standards for Airborne Radio Communications Equipment Operating within the radio frequency Range 117.975-137.000 MHz), which provides immunity from FM broadcast.

No, this is non TSO radio, and does not meet Section 2.2.11 of RTCA DO-186 Minimum Operational Performance Standards

Plot 1 Tx Conducted Emission



ULTRATECH GROUP OF LABS

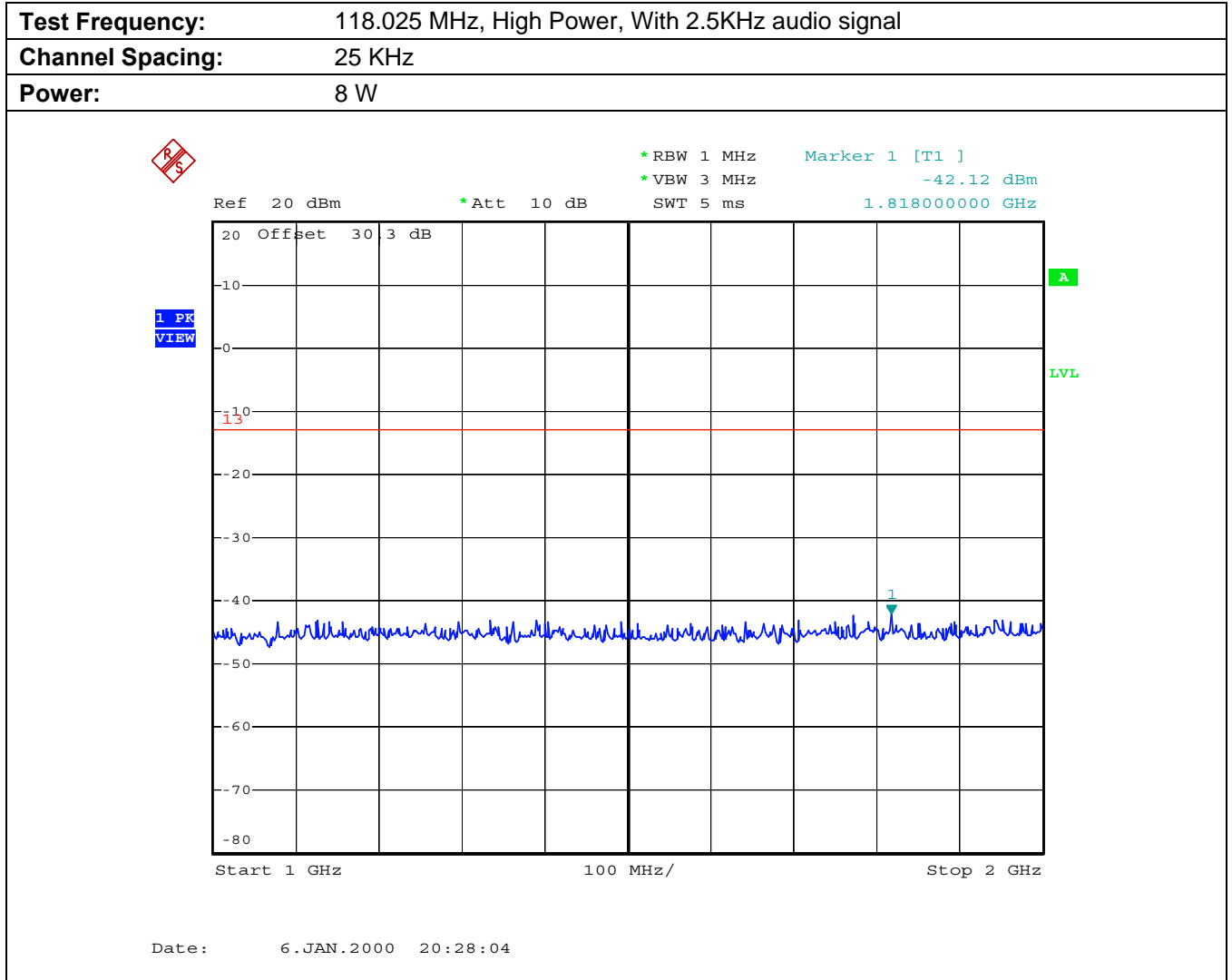
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 2 Tx Conducted Emission



ULTRATECH GROUP OF LABS

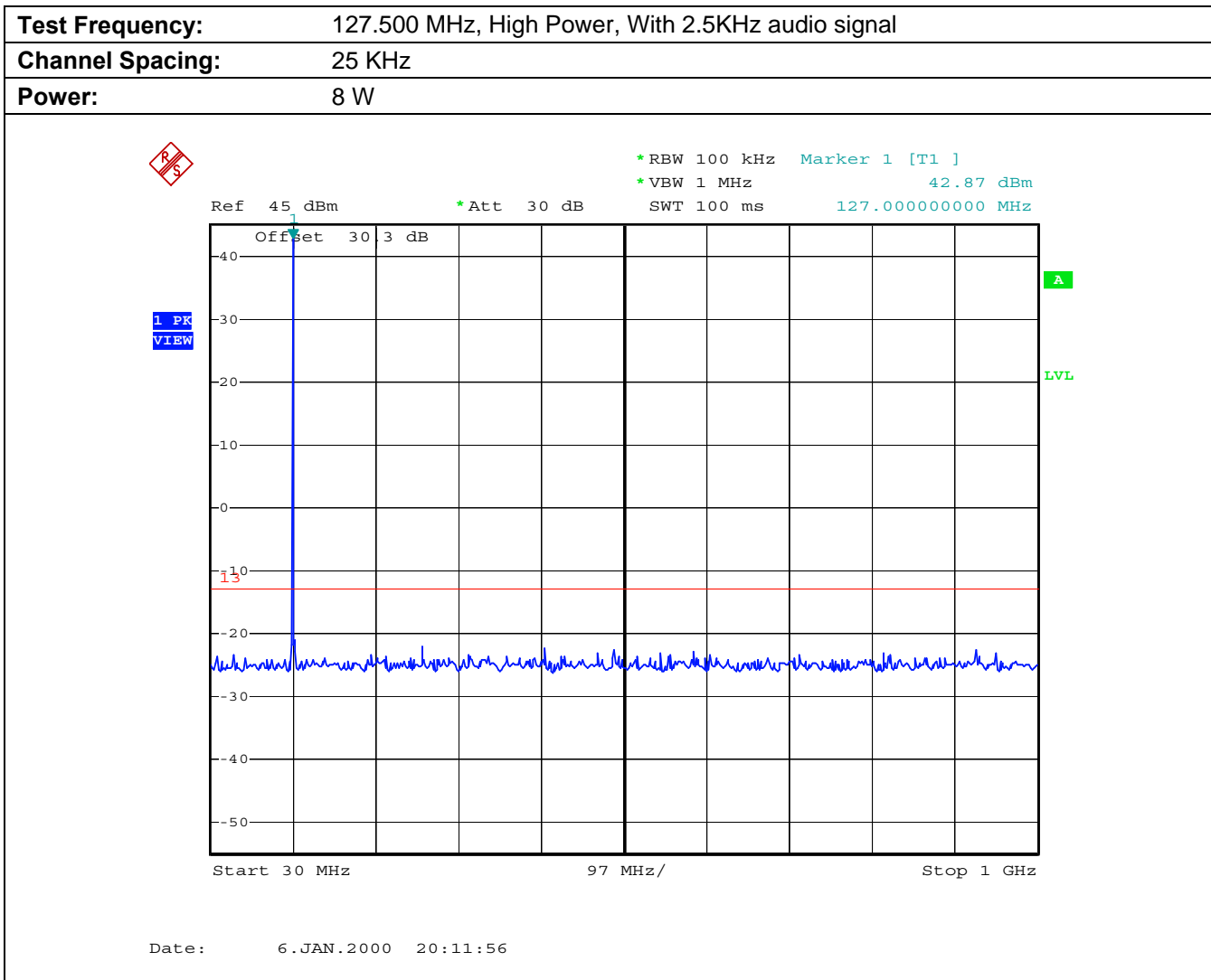
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 3 Tx Conducted Emission



ULTRATECH GROUP OF LABS

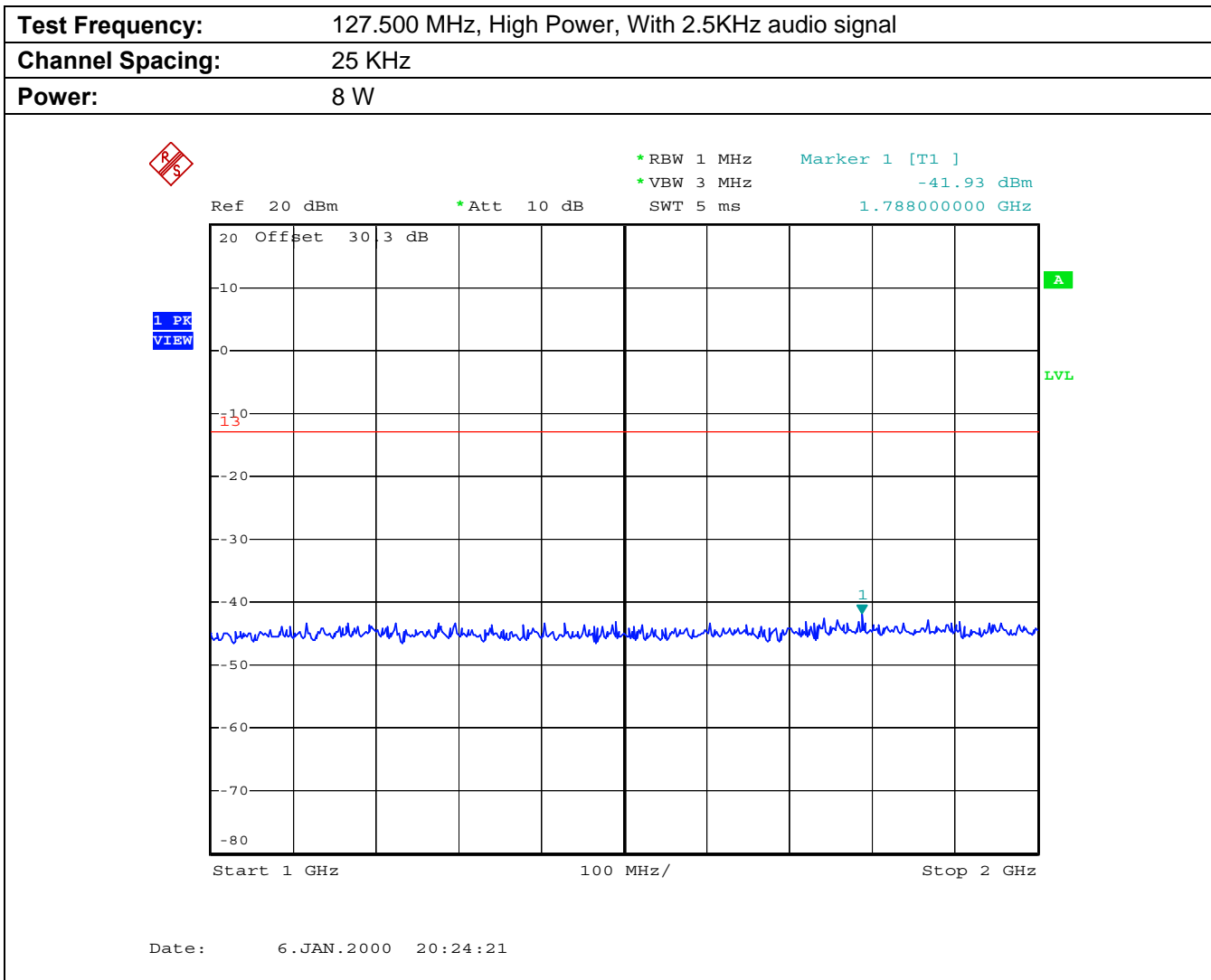
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 151COM404_FAA

March 02, 2015

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

Plot 4 Tx Conducted Emission



ULTRATECH GROUP OF LABS

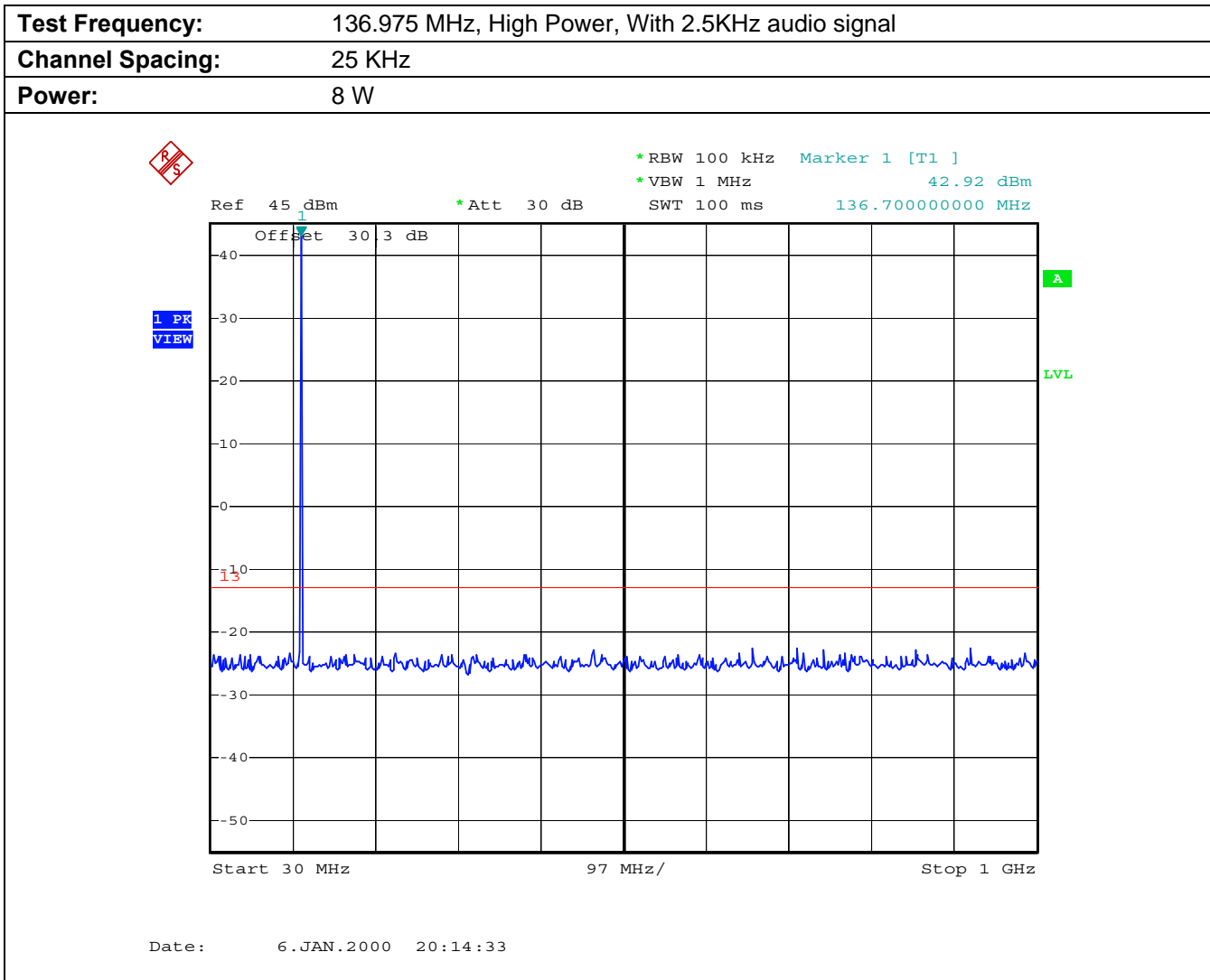
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 5 Tx Conducted Emission



ULTRATECH GROUP OF LABS

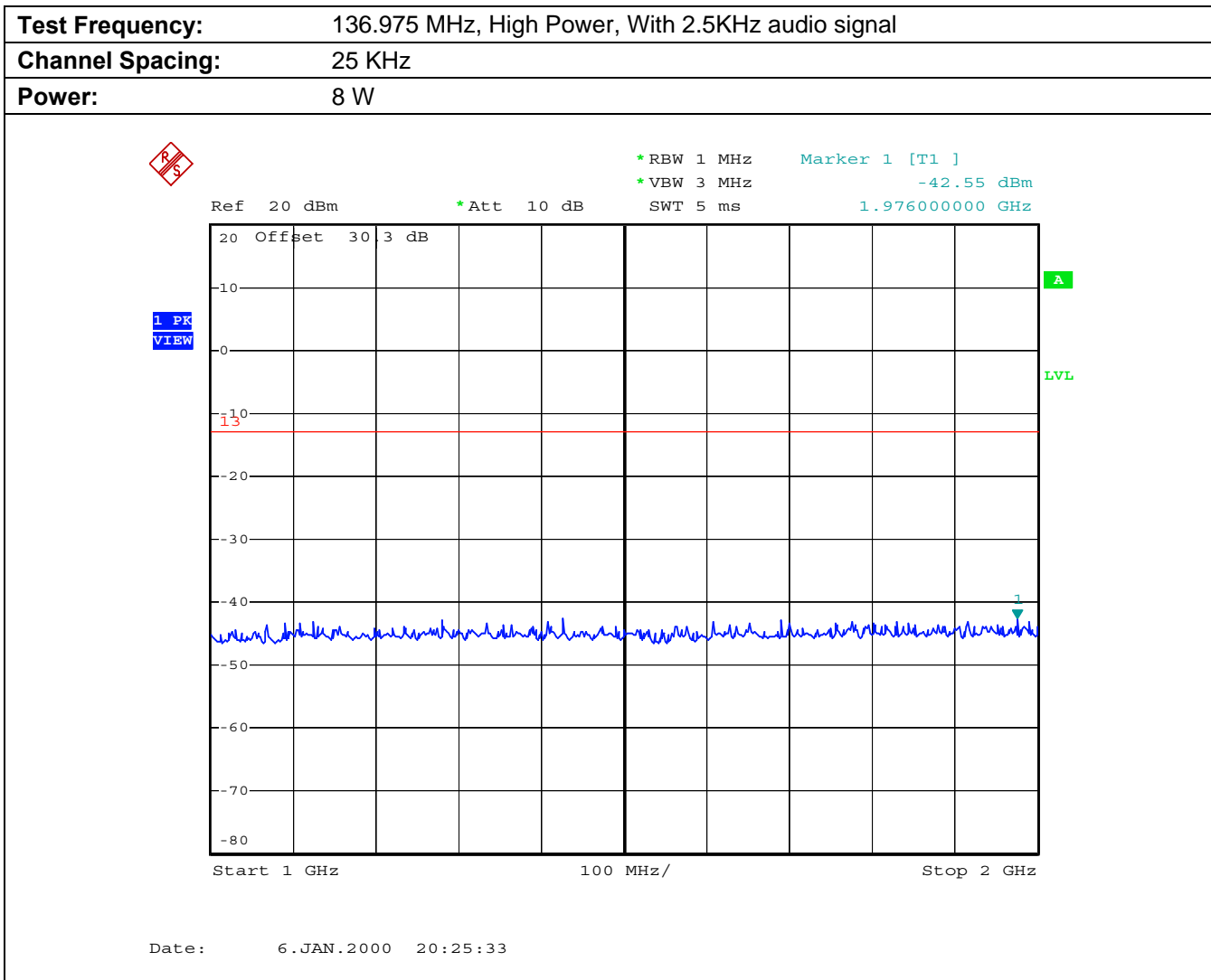
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 6 Tx Conducted Emission



ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

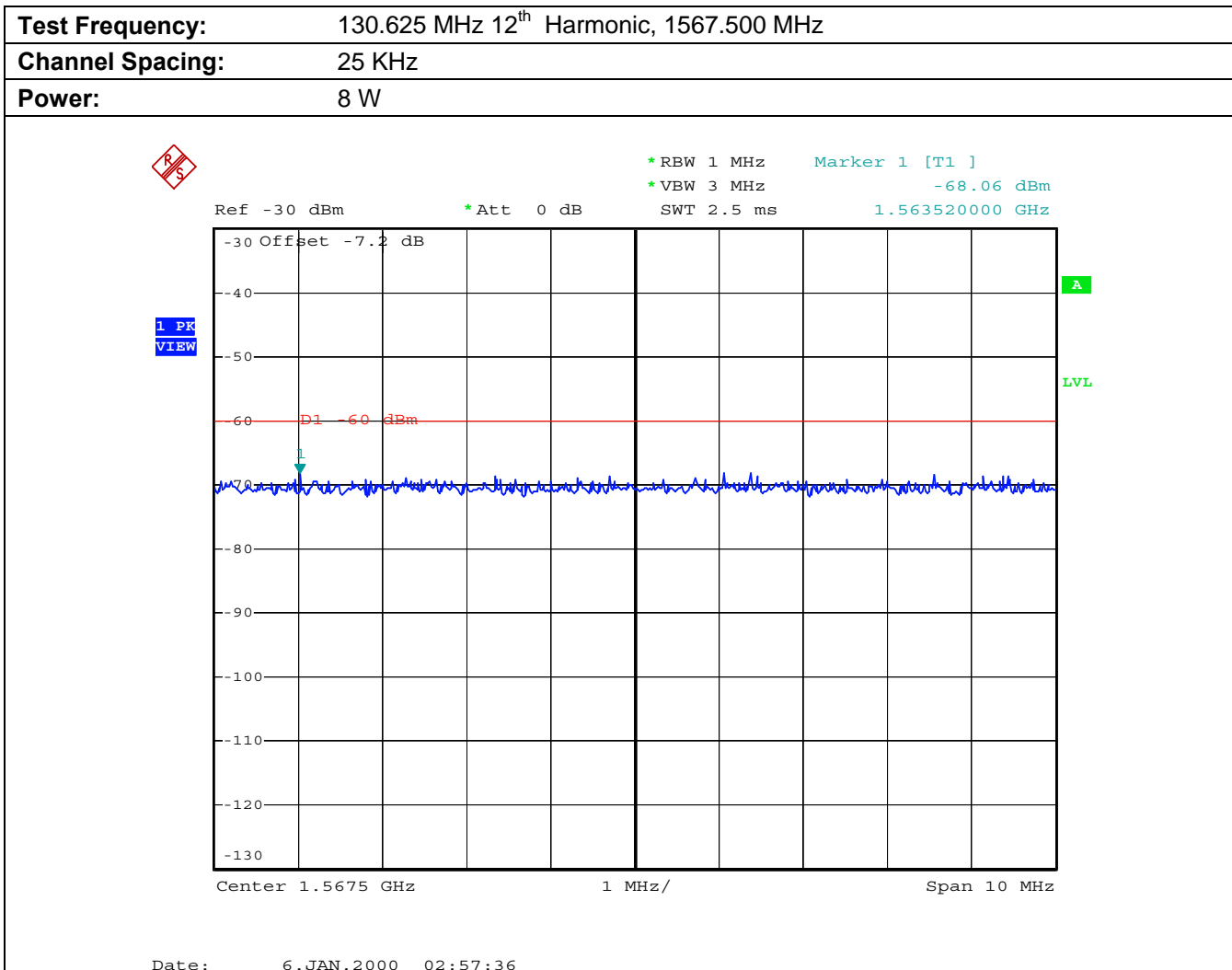
File #: 15ICOM404_FAA

March 02, 2015

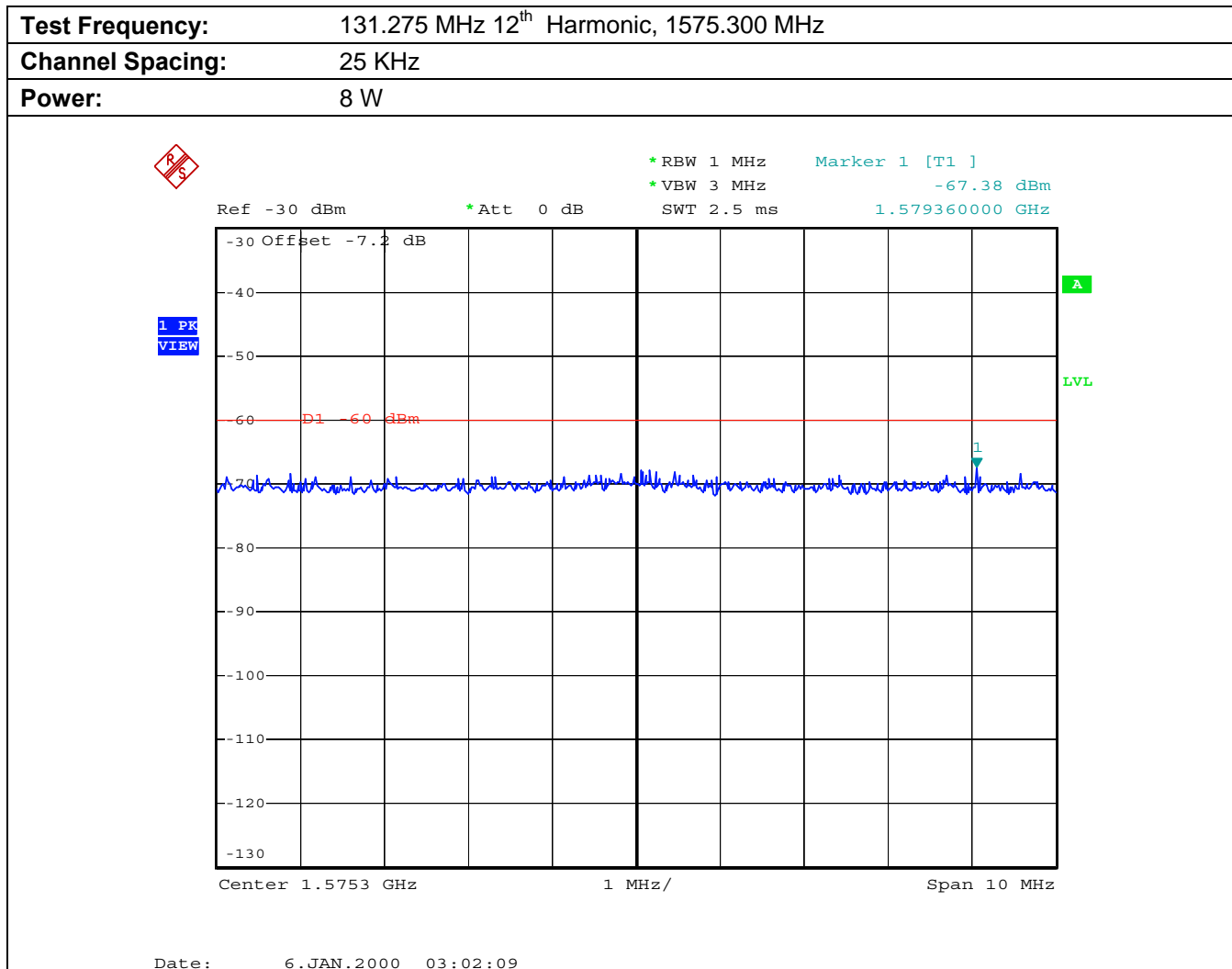
All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Transmit Frequency Harmonics:

Plot 7 Harmonic Level



Plot 8 Harmonic Level



ULTRATECH GROUP OF LABS

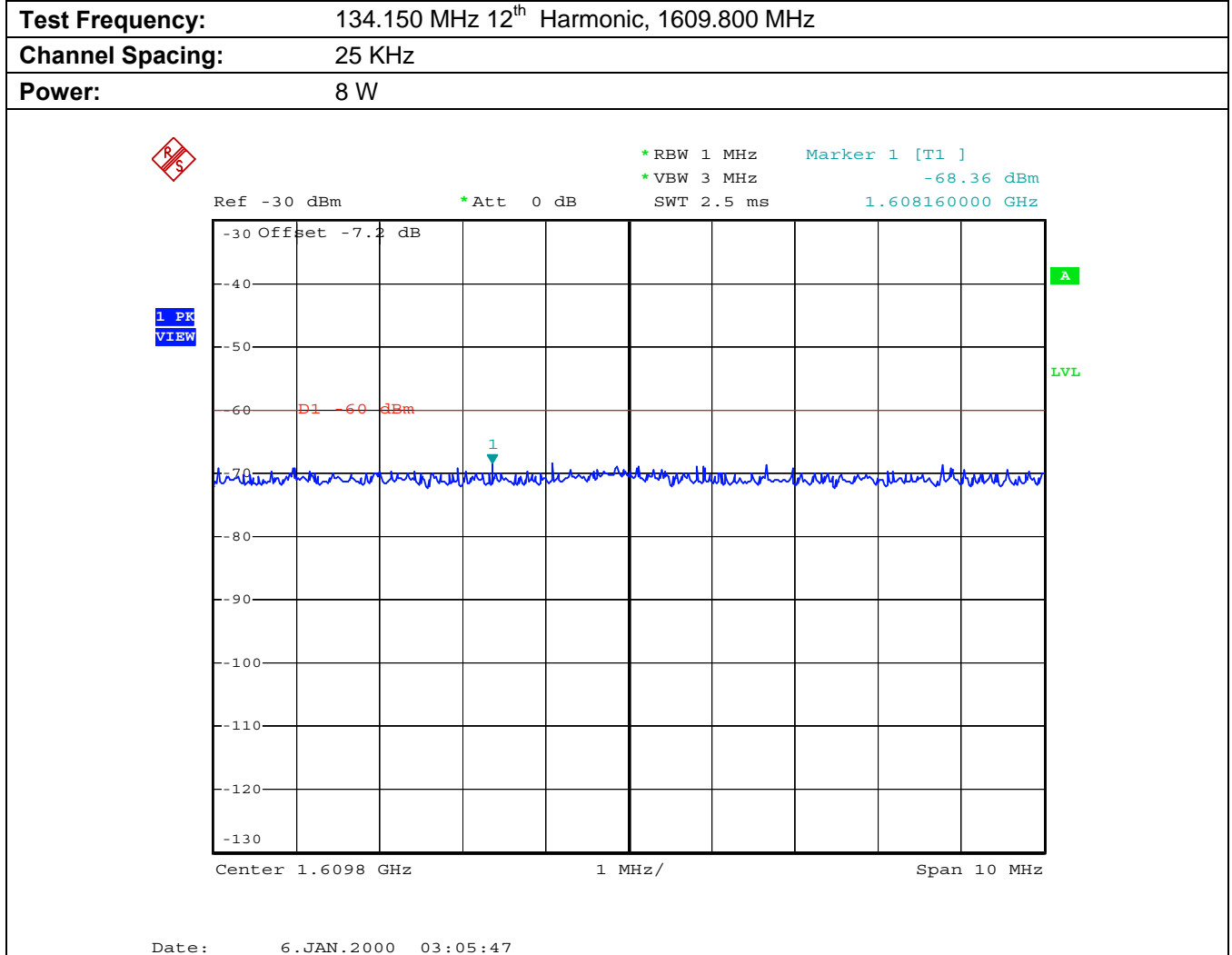
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 9 Harmonic Level



ULTRATECH GROUP OF LABS

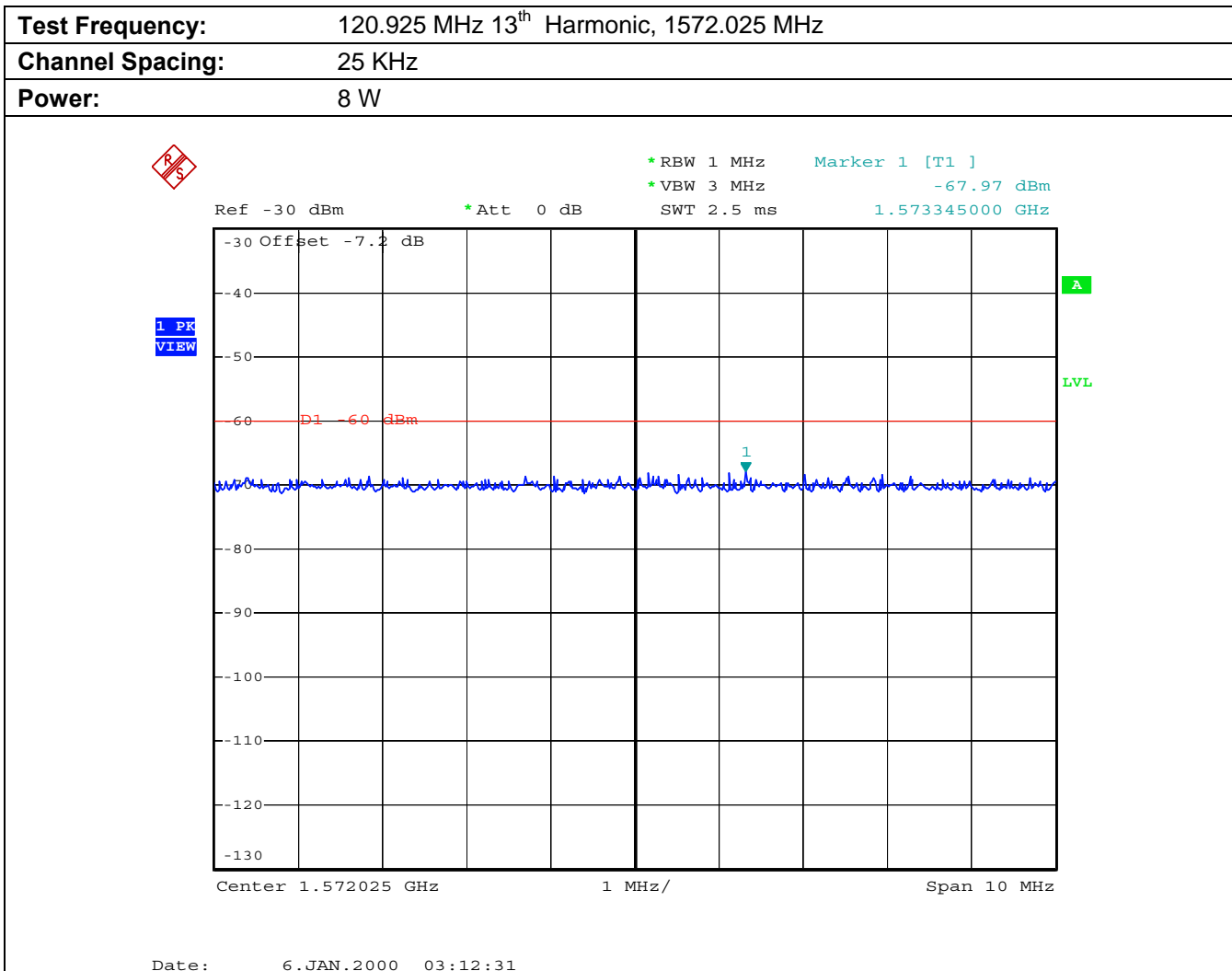
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 10 Harmonic Level



ULTRATECH GROUP OF LABS

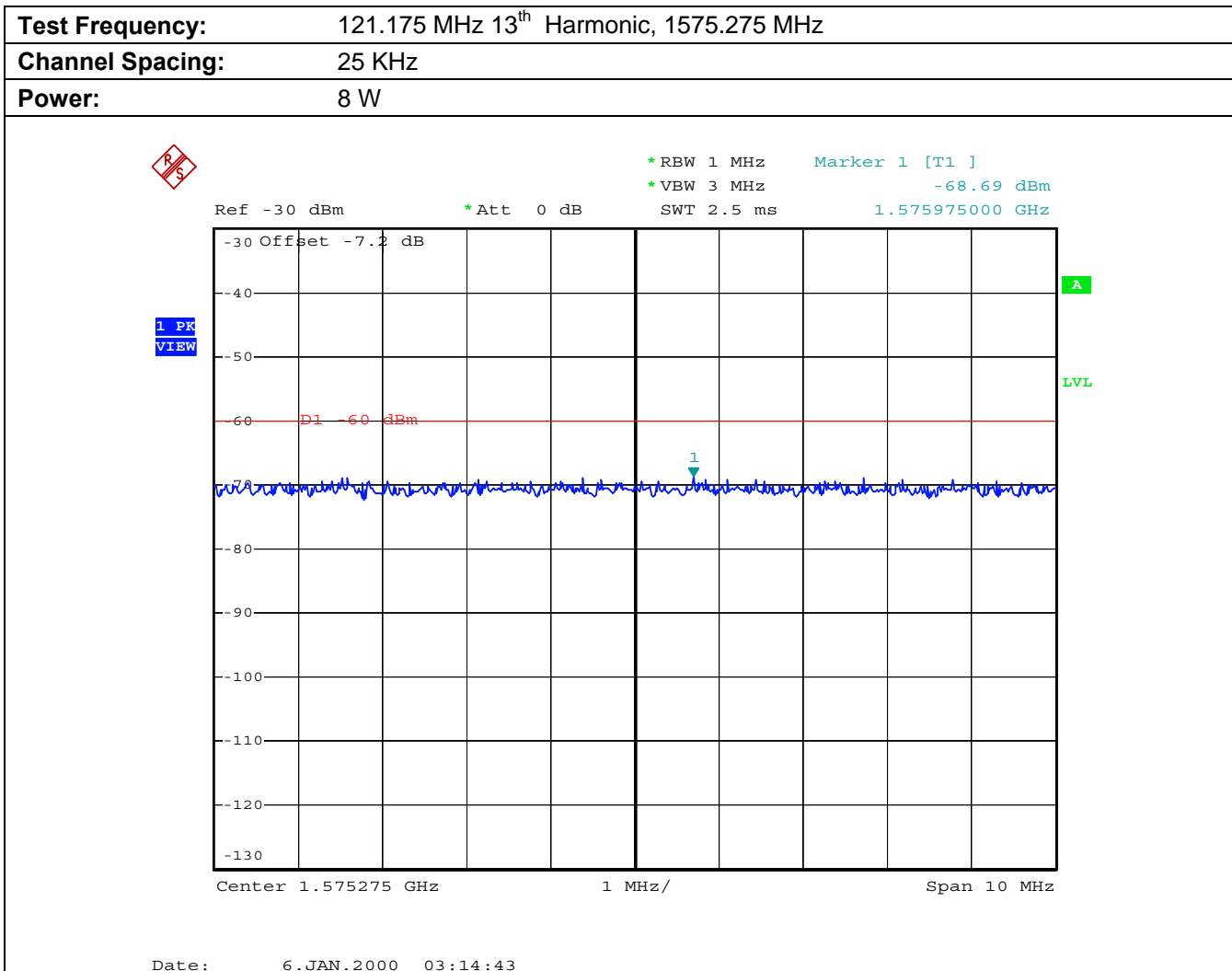
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 11 Harmonic Level



ULTRATECH GROUP OF LABS

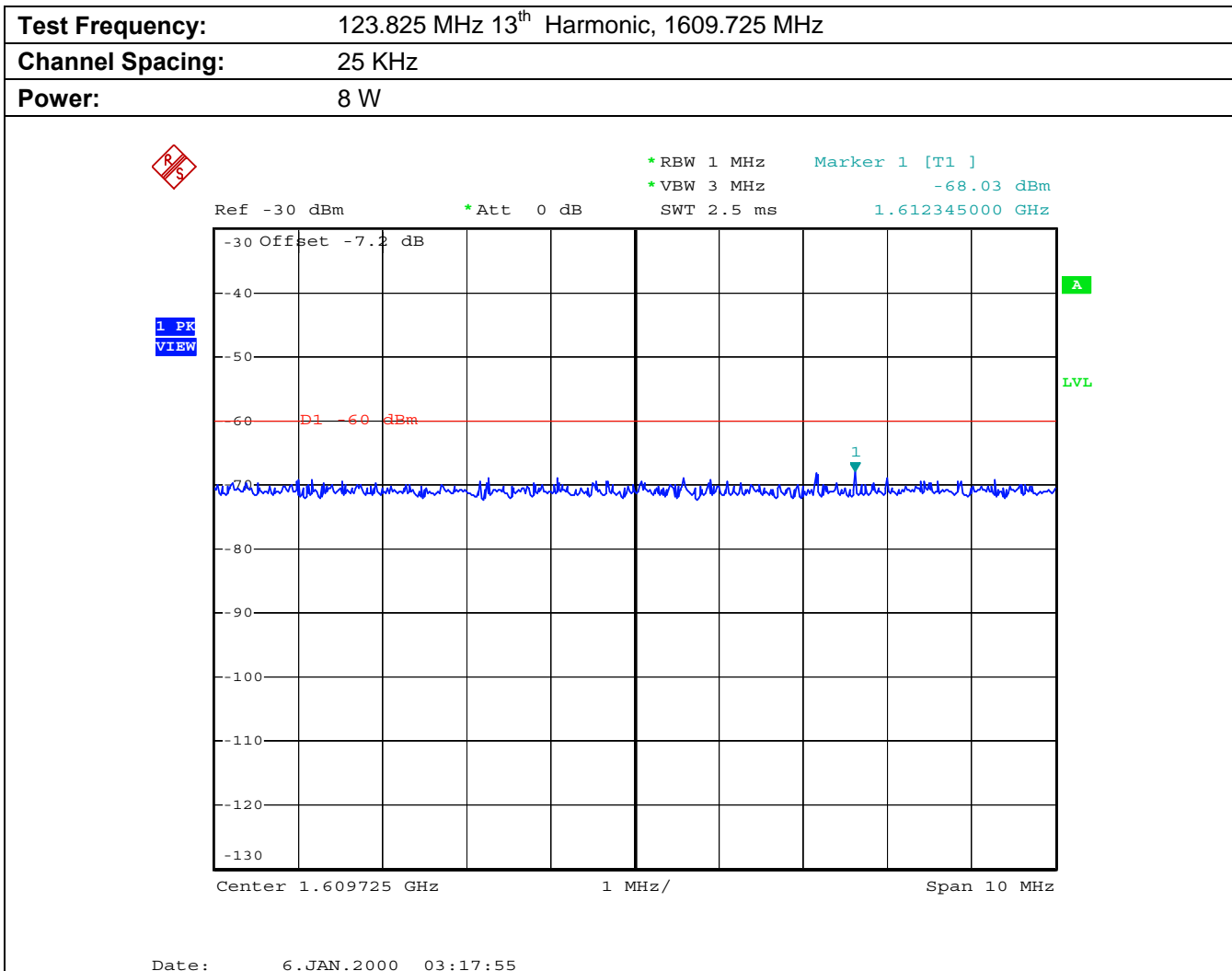
3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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

Plot 12 Harmonic Level



ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: 15ICOM404_FAA

March 02, 2015

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