FCC ID:WTL032

Test Report

Product Name:	Play RGB Controller
Model No.:	Play RGB I , Play RGB II , Play RGB III, Play RGB IV
Brand Name:	
FCC ID:	WTL032
Applicant:	Keytec technology co ltd
Address:	Rm711-713 sunnyshine building NO.26 hongshan road, new xiangzhou zhuhai city, Guangdong, China 519000
Date of Receipt:	Sep 12, 2008
Date of Test:	October 7, 2008 to October 9, 2008
Investigation Requested:	FCC Part 15 Subpart C (Section 15.207, 15.209 and 15.231)
Conclusions:	The submitted product COMPLIED with the requirements of FCC Part 15: 2006, Subpart C. The EMC tests were performed in accordance with the standards described above.

Test engineer: Huang Xiangyun

Reviewed by: Yan Dao

Issued Date: 2008-10-09

Contents

1.General Information

1.1. EUT Description

Model name:	Play RGB Controller
Model number:	Play RGB I, Play RGB II, Play RGB III, Play RGB IV
Brand name:	
FCC ID:	WTL032
Power Supply:	TX: 3.7V DC, 850mAH RX: input:12-32V DC;
Manufacturer:	Keytec technology co ltd
Address:	Rm711-713 sunnyshine building NO.26 hongshan road, new xiangzhou zhuhai city, Guangdong, China 519000
EUT photos:	Refer to Clause 7 in this report

1.2. Applicant Details

Applicant:	Keytec technology co ltd
Address:	Rm711-713 sunnyshine building NO.26 hongshan road, new xiangzhou zhuhai city Guangdong China 519000

1.3. Test Laboratory

Guangdong Electronic & Electrical Products Inspection and Supervision Institute. [CGEL]
45 South Street Shayongnan village Sanyuanli Guangzhou China.
Telephone: 020-36377897
Fax: 020-36377049

FCC Registration No.: 597719.
Industry Canada (IC) Assigned No.: 6664A.

2. Test Information and Result Summary

2.1. Test Statement

The test results in the report apply only to the unit tested by CGEL.

There was no deviation from the requirements of test standards during the test.

Fully charged battery (DC4.2V) was used during this test.

2.2. EUT Modification No modification.

2.3. Investigations Requested

Perform Electromagnetic interference measurement in accordance with FCC Part 15: 2006, Subpart C and ANSI C63.4:2003 for FCC Certification.

2.4. Test Standard and Results Summary

Part 15	Test description	Test requirement	Result or Comments
15.31(e)	Variation of Power source	N	Battery power
15.203	Antenna requirement	Y	PASS: Hardwired to the PCB
15.205	Radiated Emissions within Restricted Bands	N/A	Fundamental not in restricted bands
15.207(a)	Power line Conducted Emissions	N	
15.209	Radiated emission limits, general requirements	Y	PASS
15.231(a)(1)	Manually operated transmitter	Y	PASS
15.231(a)(2)	Automatically activated transmitter	N	The EUT is not automatically operated.
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	The EUT does not periodically transmit.
15.231(a)(4)	Radiators used in cases of emergency	N	The EUT is not a security system.
15.231(a)(5)	Set-up information for security systems	N	The EUT is not a security system.
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20dB Bandwidth	Y	PASS
15.231(d)	Devices operating within the frequency band 40.66-40.70 MHz	N	
15.231(e)	Radiated emissions for Periodic radiators	N	

Note: N/A - Not Applicable.

N - Not applicable / not relevant.

Y - Mandatory i.e. the apparatus shall conform to these tests.

3. Conduct Emissions

Test requirement:	FCC 47CFR 15.207
Test method:	ANSI C63.4:2003
Class/Severity:	Table 15.207
Test result:	N/A

The EUT is operated by a 3.7V DC battery power. Therefore power line conducted emission was deemed unnecessary.

4. Radiated Emissions

Test requirement:	FCC 47CFR 15.209 and 15.231(b)
Test method:	ANSI C63.4:2003
Test date:	2008-10-08
Environment condition:	Temperature:22.0 °C, Humidity: 58.0 %RH, Pressure: 101.0kPa
Conclusion::	Pass

4.1. Test equipment and test site

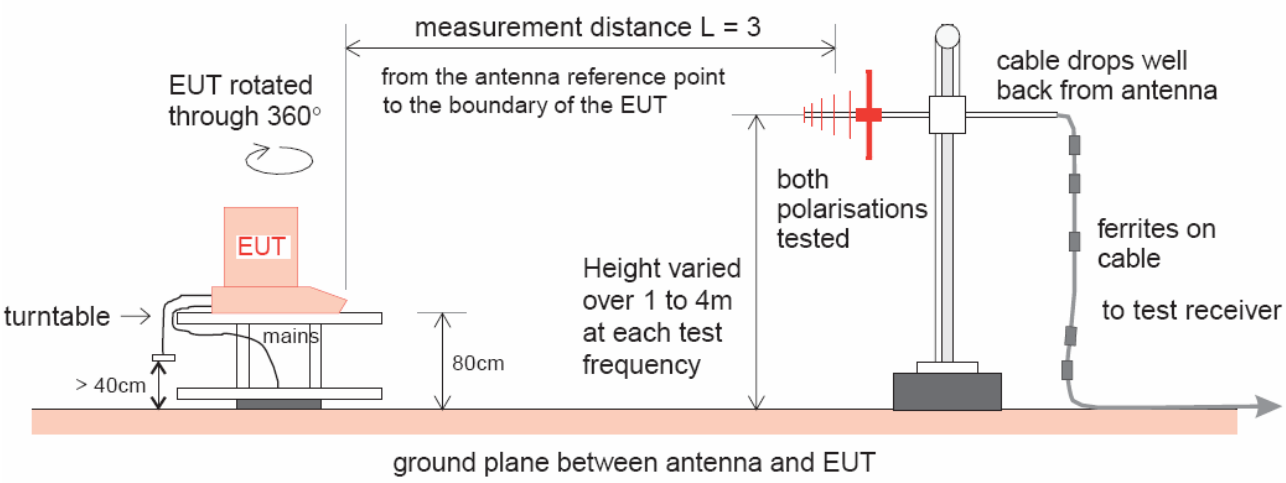
Frequency rang: 30~1000MHz

Item	Equipment	Manufacturer	Model No.	SN	Last Cal.	Cal. Due date
1	EMI Receiver	R&S	ESIB7	100192	2008/03/29	2009/03/28
2	Antenna	R&S	HL-562	100172	2008/08/14	2009/08/13
3	RF Cable	R&S	/	/	2008/08/14	2009/08/13
4	RF Cable	R&S	/	/	2008/08/14	2009/08/13
5	RF Cable	R&S	/	/	2008/08/14	2009/08/13
6	3m anechoic chamber	ETS	RFD-F-100	/	2008/05/24	2009/05/23
7	Shielding Room	ETS	RFD-100	/	2008/05/24	2009/05/23

Frequency rang: 1GHz~7GHz

Item	Equipment	Manufacturer	Model No.	SN	Last Cal.	Cal. Due date
1	EMI Receiver	R&S	ESIB7	100192	2008/03/29	2009/03/28
2	Antenna	Xibao	GH18H	061101#	2008/05/24	2009/05/23
3	HF Cable	Xibao	/	/	2008/05/24	2009/05/23
4	3m anechoic chamber	ETS	RFD-F-100	/	2008/05/24	2009/05/23
5	Shielding Room	ETS	RFD-100	/	2008/05/24	2009/05/23

4.2. Test setup



Note: The EUT system was put on a wooden table with 0.8m heights above a ground plane.

4.3. Test Procedure

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

This test was performed with EUT in X, Y, Z position and the worse case was reported.

The bandwidth of the EMI test receiver (R&S ESIB7) is set at 120kHz. Frequency range is from 30MHz to 1000 MHz.

The bandwidth of the VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW 10Hz VBW for average emission above 1GHz

The frequency range from 30MHz to 10th harmonic are checked.

4.4. Limits and Test Result

4.4.1.Limits and Test Result of [FCC 47CFR 15.231]:

Limits for field strength of emissions from intentional radiators [FCC 47CFR 15.231]:

Fundamental Frequency MHz	Field Strength of Fundamental μV/m	Field Strength of Spurious Emissions μV/m
260-470	3,750 to 12,500*	375 to 1,250*

Remark: * Linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 260-470 MHz, uV/m at 3 meters = 16.6667(F) - 2833.3333.]

Limits for field strength of fundamental emissions from intentional radiators [FCC 47CFR 15.231]:

Fundamental Frequency MHz	Field Strength of Fundamental		Field Strength of Spurious Emissions
	μV/m	dBμV/m	dBμV/m
434.3	10,965	80.8(Average) 100.8(Peak)	60.8(Average) 80.8(Peak)

(1) The above field strength limits are specified at a distance of 3 meters.

(2) According to FCC 15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

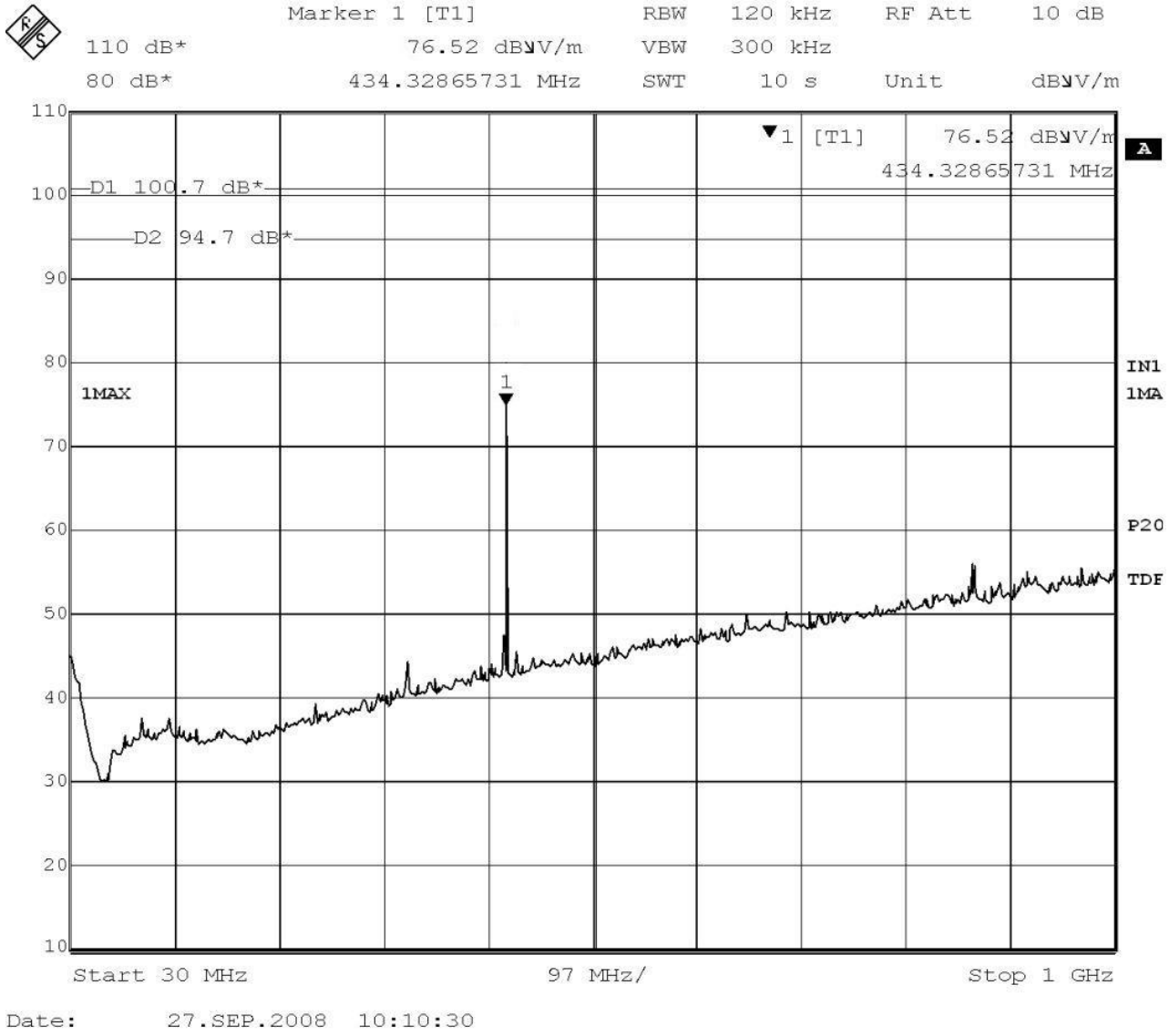
(3) The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level

(4) Spurious emissions are average limits shown in table 15.231 or to the general limits shown in FCC 47 CFR 15.209, whichever limit permits a higher field strength.

Test Results of Fundamental Emissions:

Vertical:

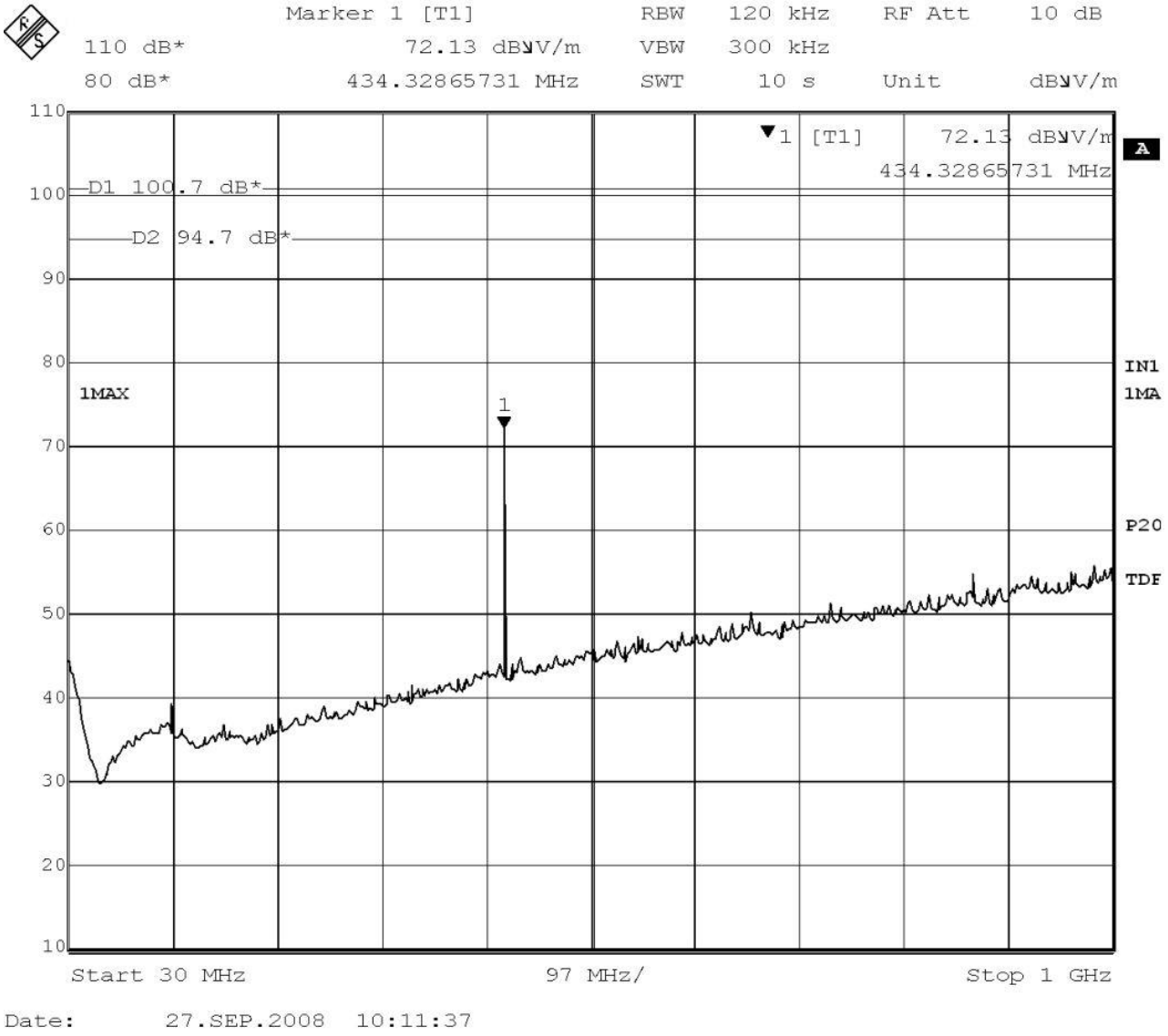
Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
434.3	76.5	100.8	24.3	Peak



Test Results of Fundamental Emissions:

Horizontal:

Field Strength of Fundamental Emissions				
Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
434.3	72.1	100.8	28.7	Peak



Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

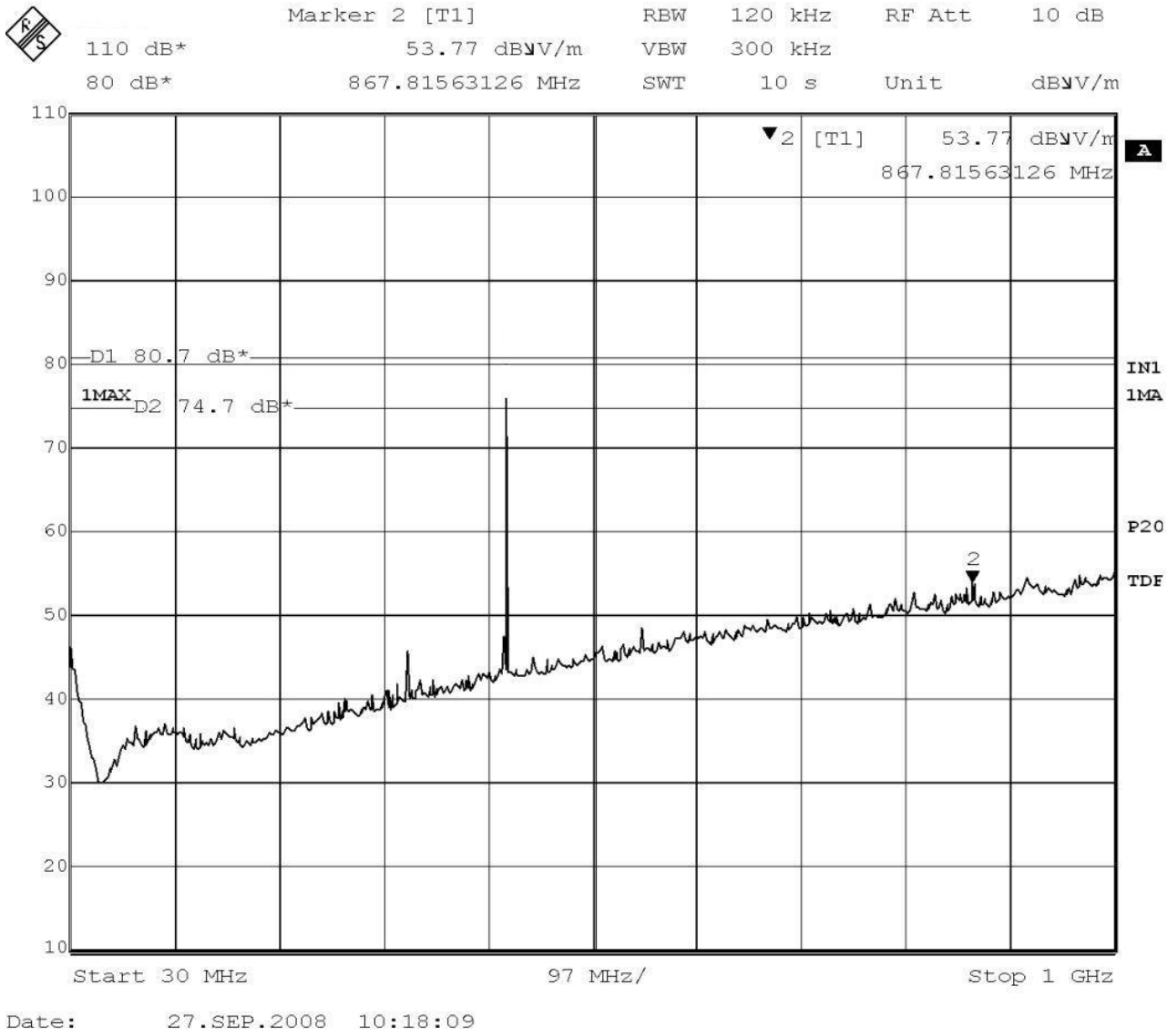
Calculated measurement uncertainty :±3.7dB

Test Results of Field Strength of Spurious Emissions:

Operation frequency: 434.3MHz

Frequency Range: 30MHz-1000MHz (Vertical)

Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
867.8	53.8	80.8	27	Peak

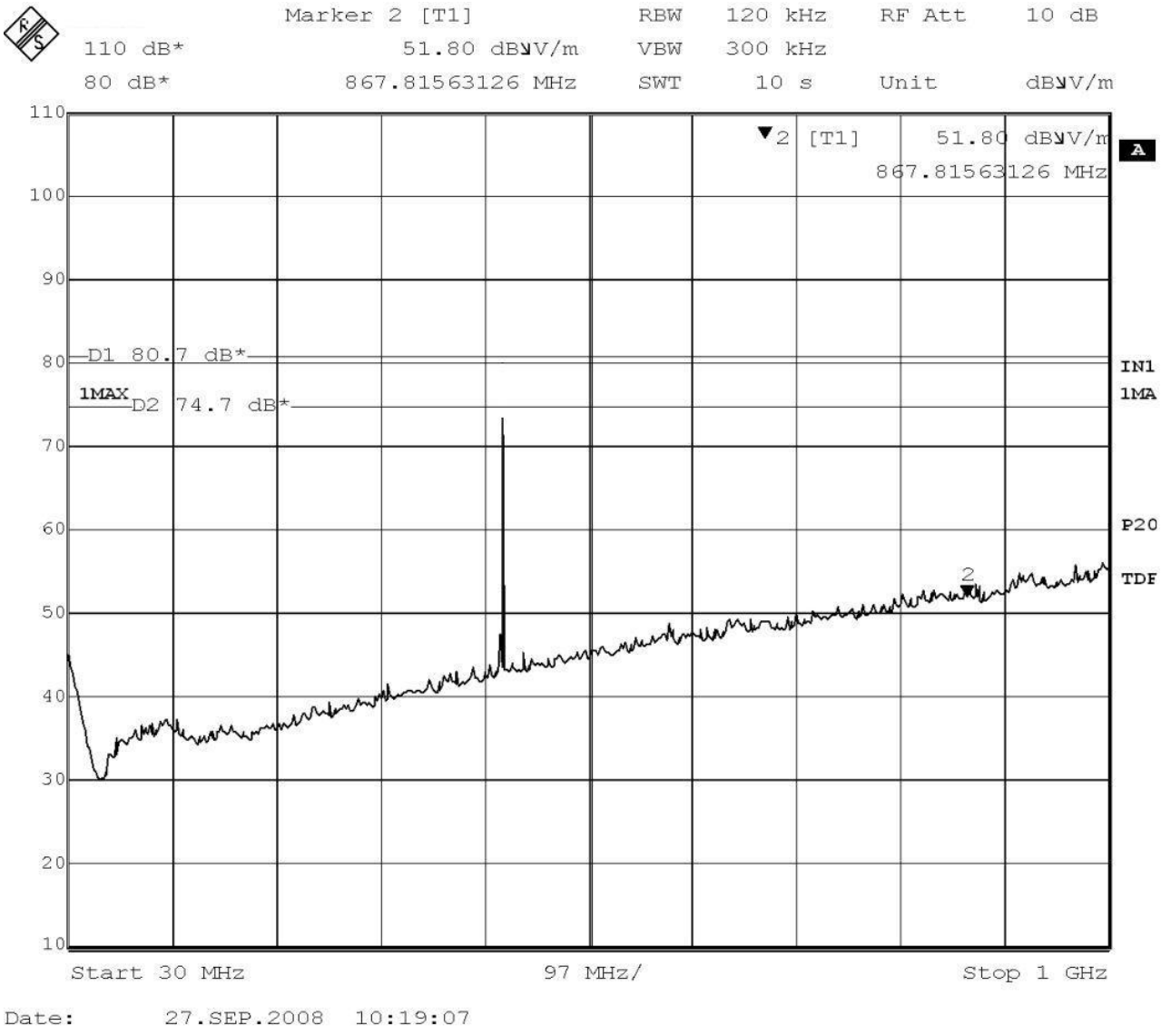


Test Results of Field Strength of Spurious Emissions:

Operation frequency: 434.3MHz

Frequency Range: 30MHz-1000MHz (Horizontal)

Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
867.8	51.8	80.8	29	Peak



Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

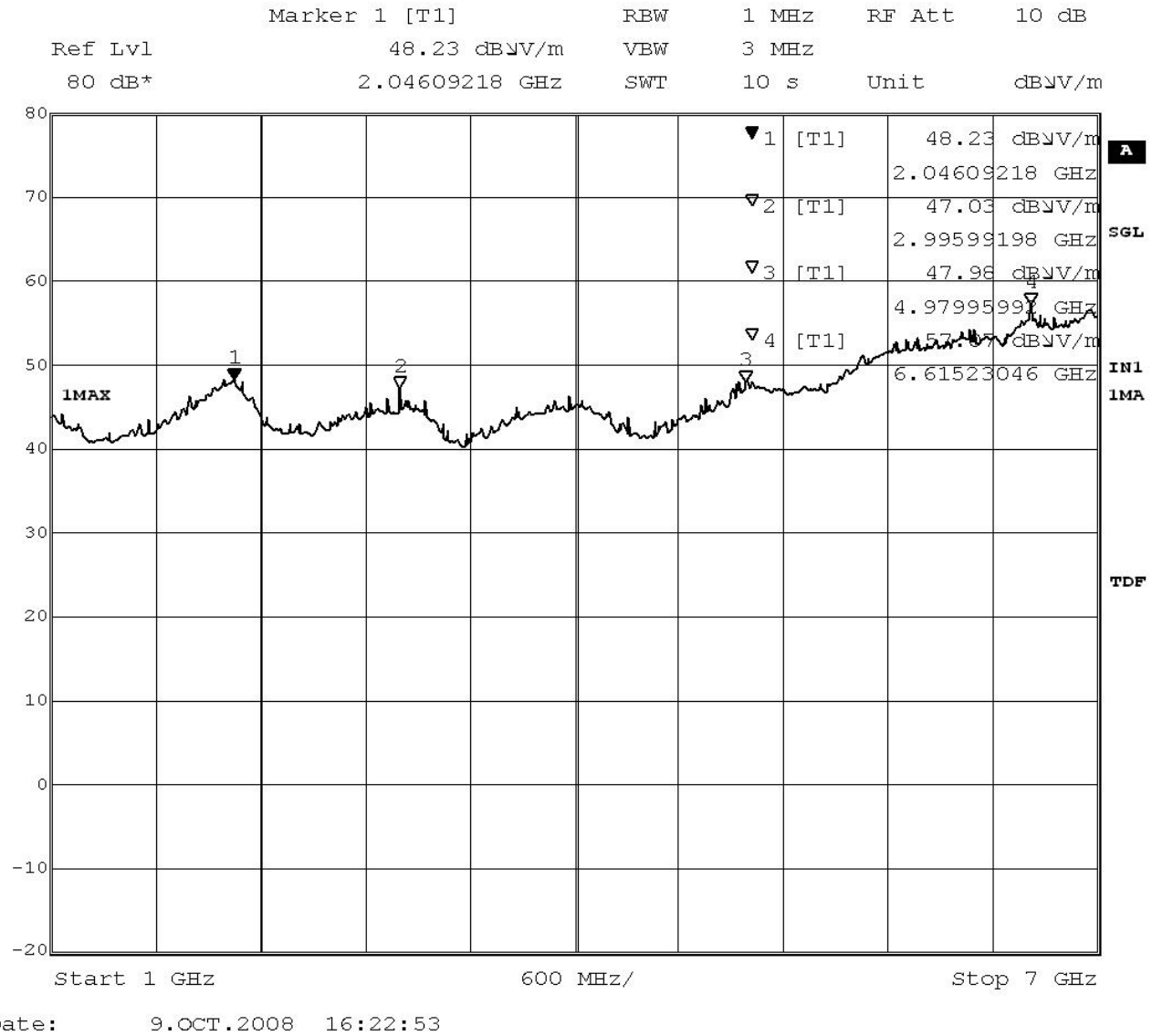
Calculated measurement uncertainty :±3.7dB

Test Results of Field Strength of Spurious Emissions:

Operation frequency: 434.3MHz

Frequency Range: 1GHz-7GHz (Vertical)

Frequency GHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
2.046	48.23	80.8	32.57	Peak
2.996	47.03	80.8	33.77	Peak
4.980	47.96	80.8	32.84	Peak
6.615	57.05	80.8	23.75	Peak



Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

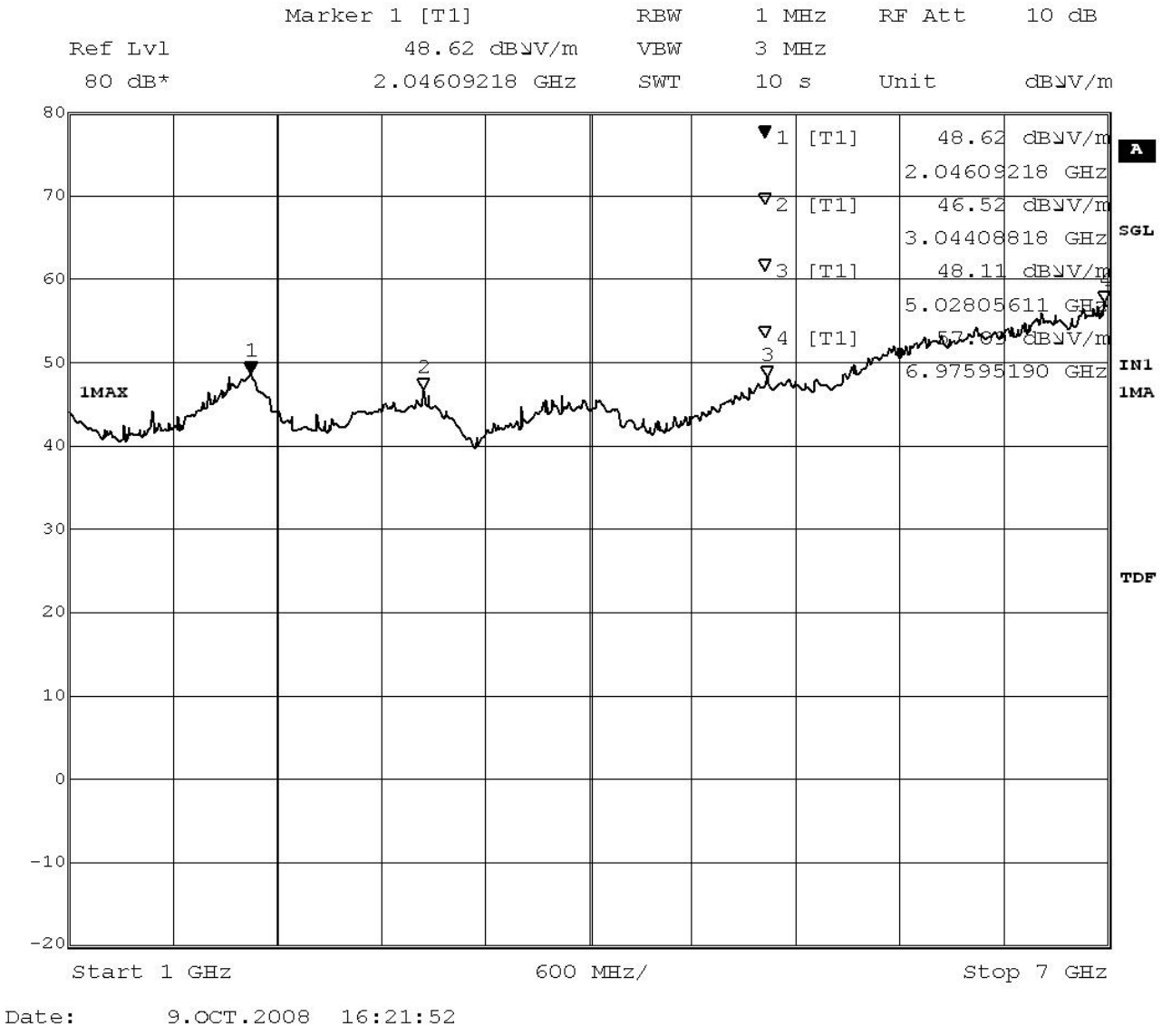
Calculated measurement uncertainty : ±3.7dB

Test Results of Field Strength of Spurious Emissions:

Operation frequency: 434.3MHz

Frequency Range: 1GHz-7GHz (Horizontal)

Frequency GHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
2.046	48.62	80.8	32.18	Peak
3.044	46.52	80.8	34.28	Peak
5.028	48.11	80.8	32.69	Peak
6.976	57.09	80.8	23.71	Peak



Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : ±3.7dB

4.4.2.Limits and Test Result of [FCC 47CFR 15.209]:

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range	Limits		Measurement Distance
MHz	μV/m	dBμV/m	m
30-88	100	40	3
88-216	150	43	3
216-960	200	46	3
Above960	500	54	3

Remark:

(1) The emission limits shown in the above table are based on measurement employing a CISPR quasi –peak detector and above 1000MHz are based on measurements employing an average detector.

(2) Measurement Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(3) The frequency range from 30MHz to 10th harmonic are checked.

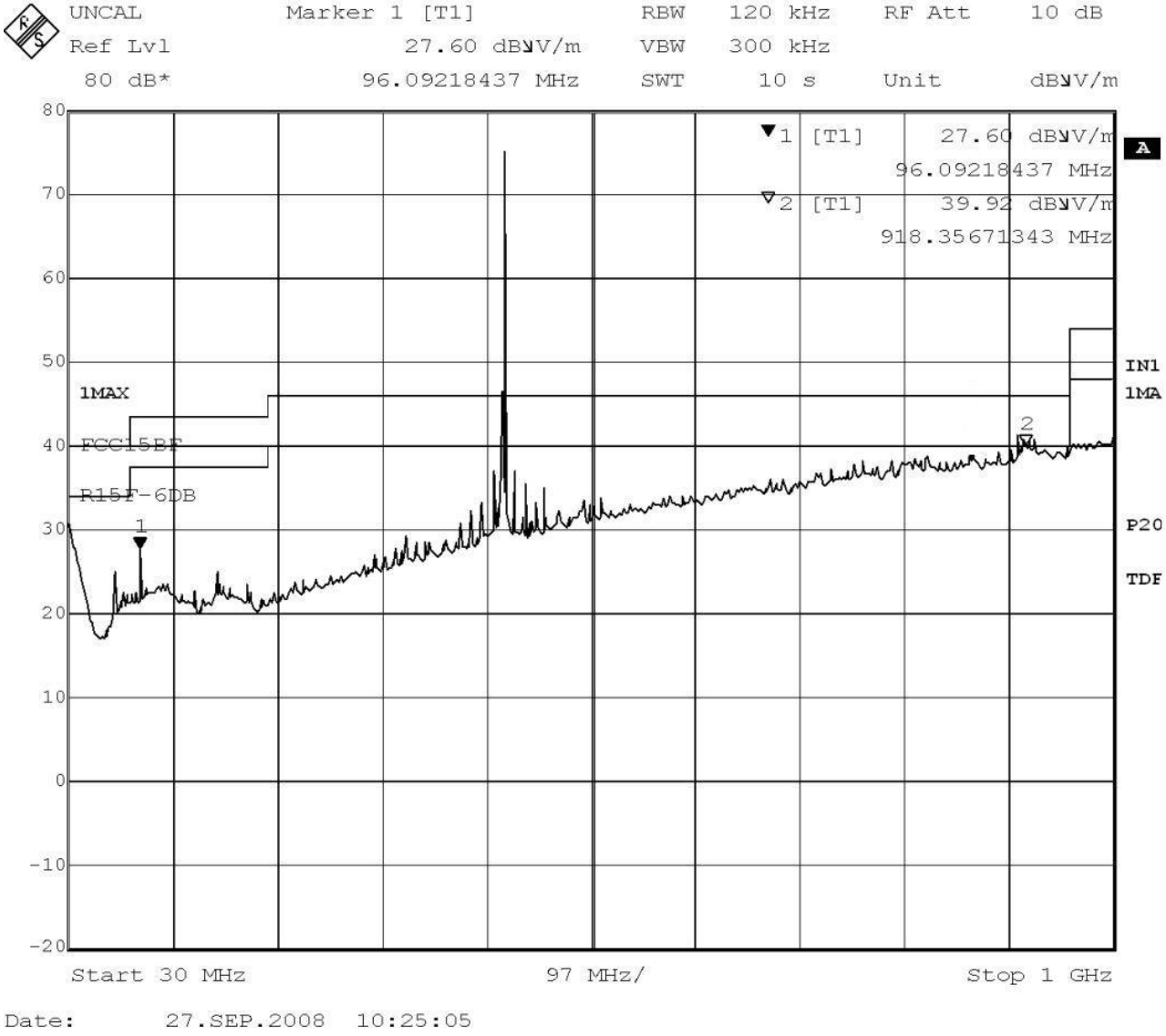
(4) Except fundamental emissions from intentional radiators.

(5) Reading of the receiver has included antenna factor and cable loss, this has set to receiver's transducer table. It means the final test result of field strength.

Test Results of Radiated Emissions:

Frequency Range: 30MHz-1000MHz (Vertical)

Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
96.09	27.6	43	15.4	QP
918.35	39.9	46	6.1	QP

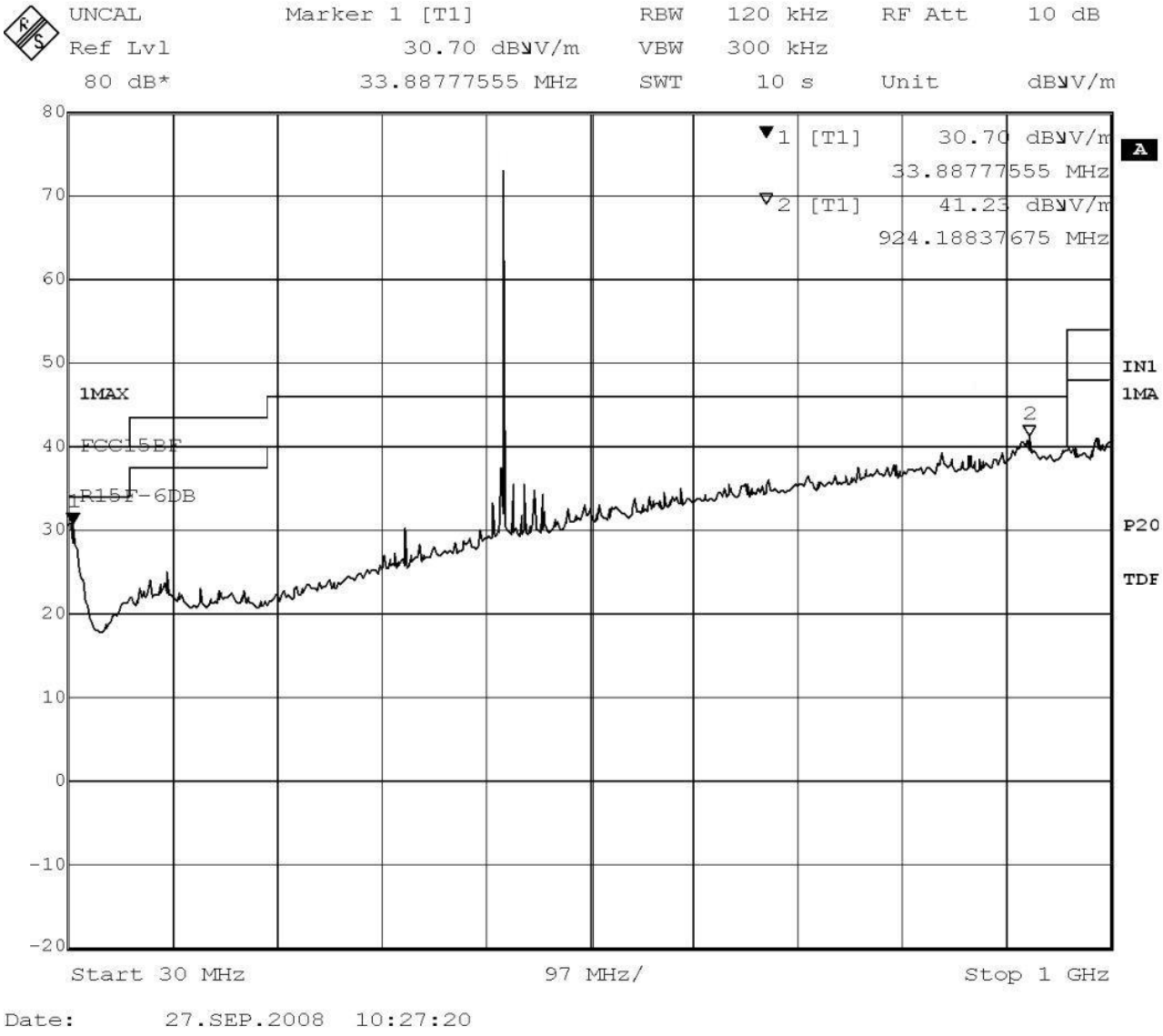


Remark: Emission Level=Reading.

Test Results of Radiated Emissions:

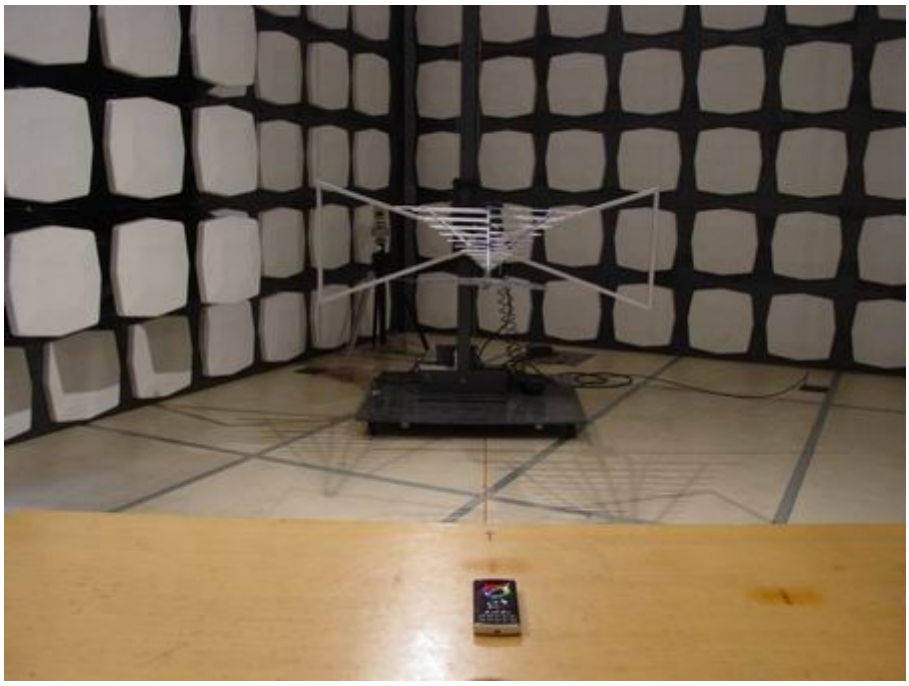
Frequency Range: 30MHz-1000MHz (Horizontal)

Frequency MHz	Emission Level dBμV/m	Limits dBμV/m	Margin dB	Remark
33.89	30.7	40	9.3	QP
924.19	41.2	46	4.8	QP

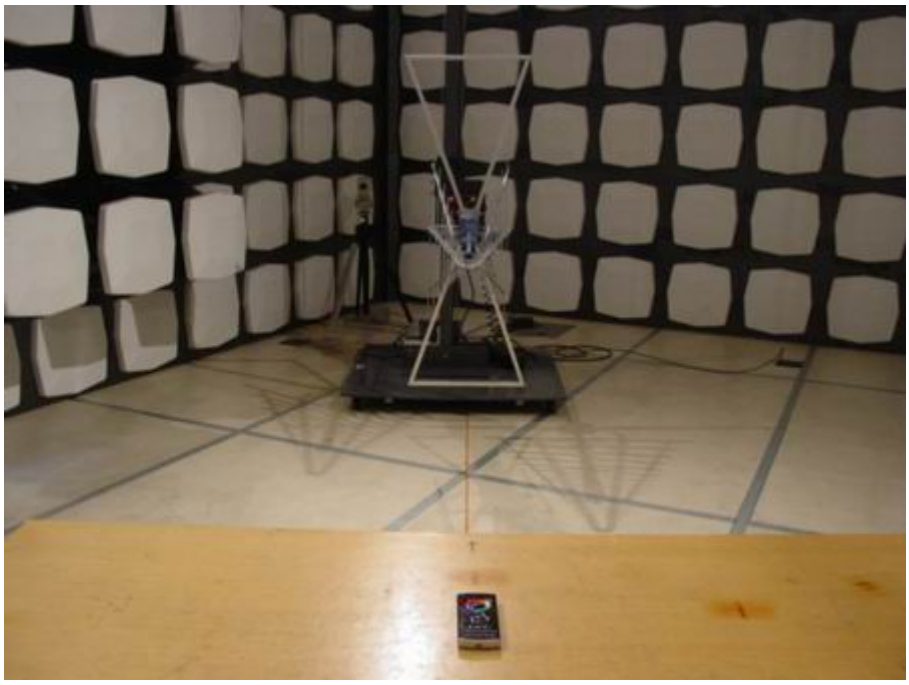


Remark: Emission Level=Reading.

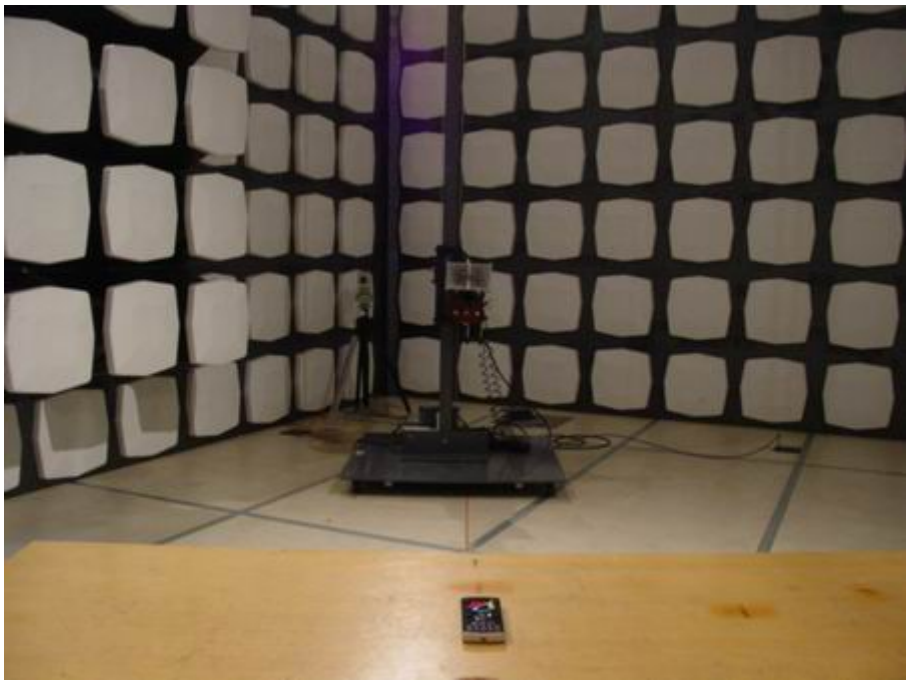
4.5. Test photos



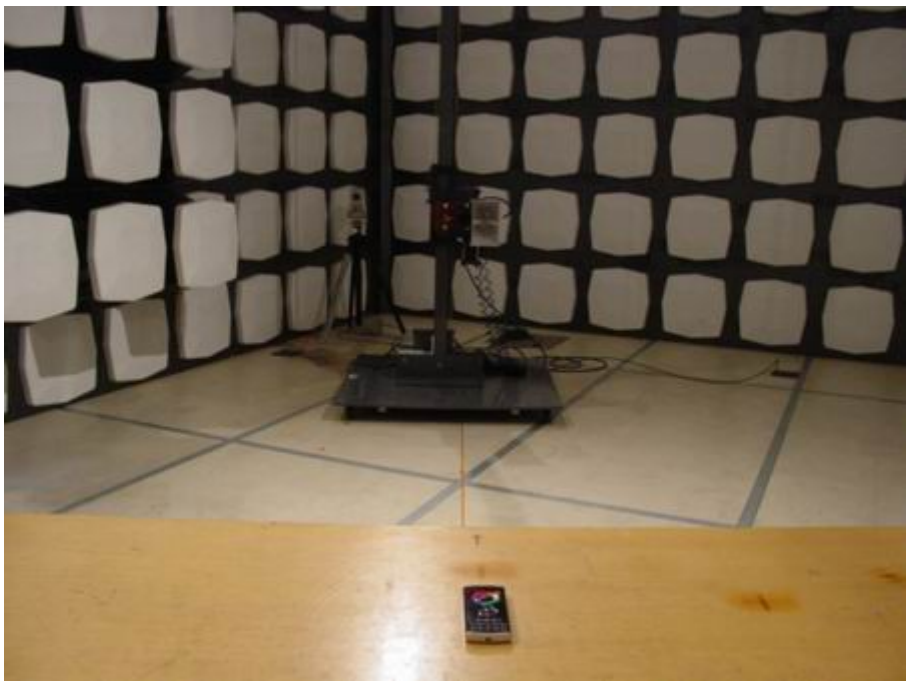
Fundamental Emissions & Spurious Emissions (horizontal,30MHz~1GHz)



Fundamental Emissions & Spurious Emissions (vertical,30MHz~1GHz)



Fundamental Emissions & Spurious Emissions (horizontal,1GHz~7GHz)



Fundamental Emissions & Spurious Emissions (vertical,1GHz~7GHz)

5. 20B Bandwidth of Fundamental Emission

Test requirement:	FCC 47CFR 15.231
Test method:	ANSI C63.4:2003
Test date:	2008-10-08
Environment condition:	Temperature:22.0 °C, Humidity: 58.0 %RH, Pressure: 101.0kPa
Conclusion:	Pass

5.1. Test Equipment and test site

As Test equipment of clause 4.1 in this test report.

5.2. Test setup

As Test Setup of clause 4.2 in this test report.

5.3. Test Procedure

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

5.4. Limits and Test Result

Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range MHz	Limits kHz
434.3	1082

Remark:

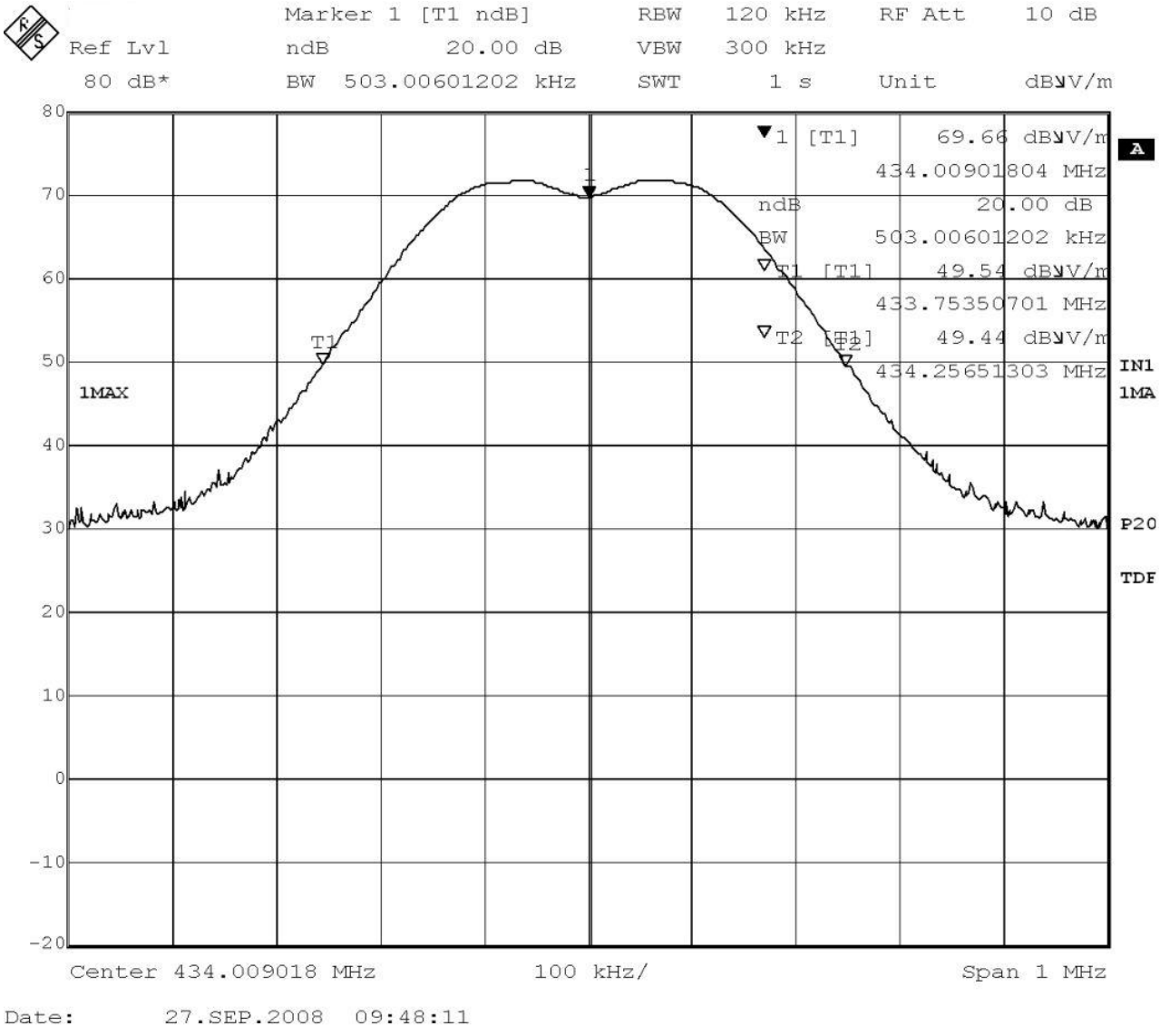
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

Test Results of 20dB Bandwidth of Fundamental Emission:

Test Frequency MHz	Bandwidth kHz	Limit kHz
434.3	503	1082

The following figure is the measured bandwidth of Fundamental Emission:

Test Frequency: 434.3MHz



6. Duration of Transmission

Test requirement:	FCC 47CFR 15.231(a)
Test method:	ANSI C63.4:2003
Test date:	2008-10-09
Environment condition:	Temperature:22.0 °C, Humidity: 58.0 %RH, Pressure: 101.0kPa
Conclusion:	Pass

6.1. Test Equipment and test site

As Test equipment of clause 4.1 in this test report.

6.2. Test setup

As Test Setup of clause 4.2 in this test report.

6.3. Test Procedure

1 The EUT was placed on the turning table.

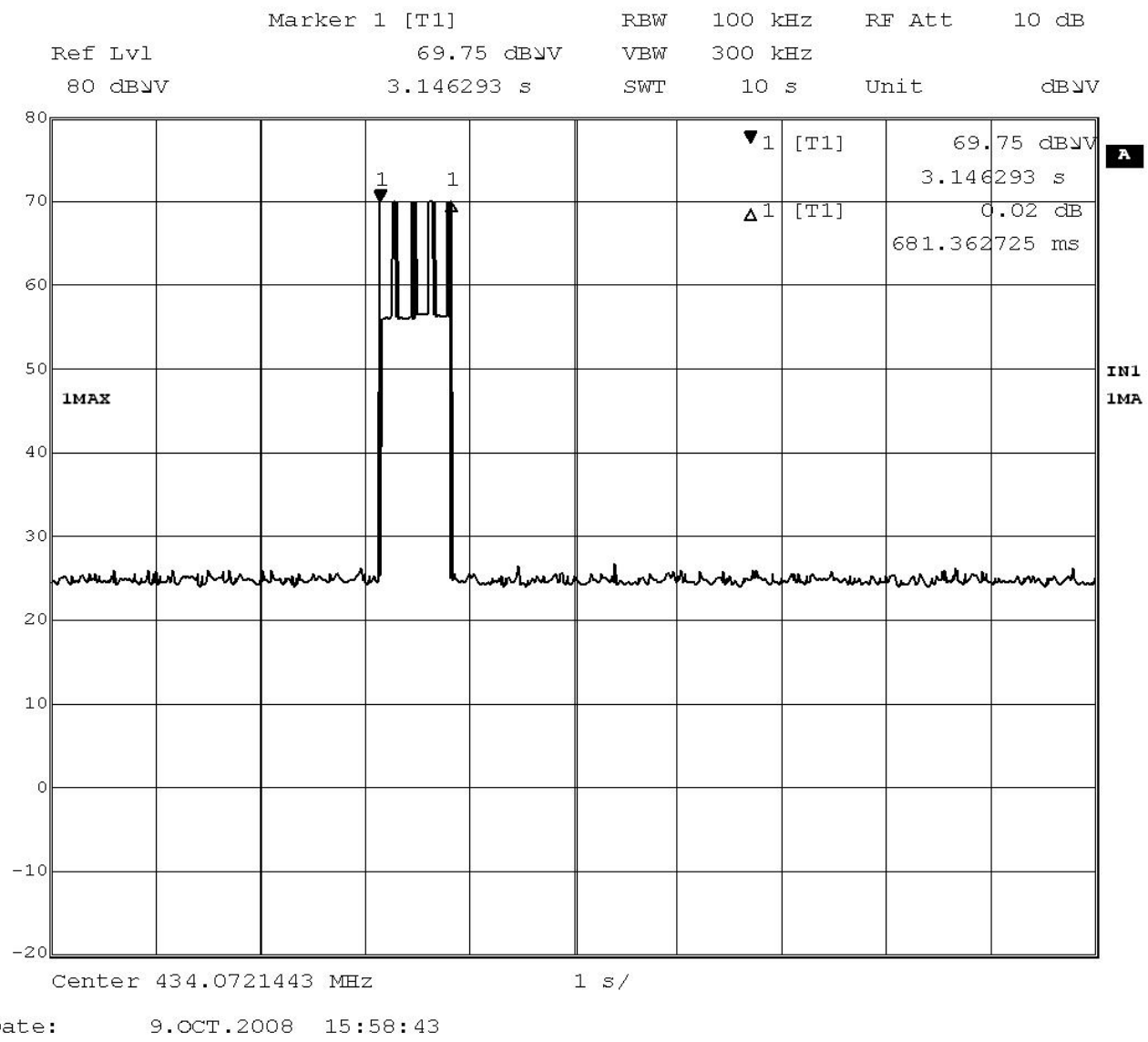
2 The signal was coupled to the spectrum analyzer through an antenna.

3 The transmission duration was measured and recorded.

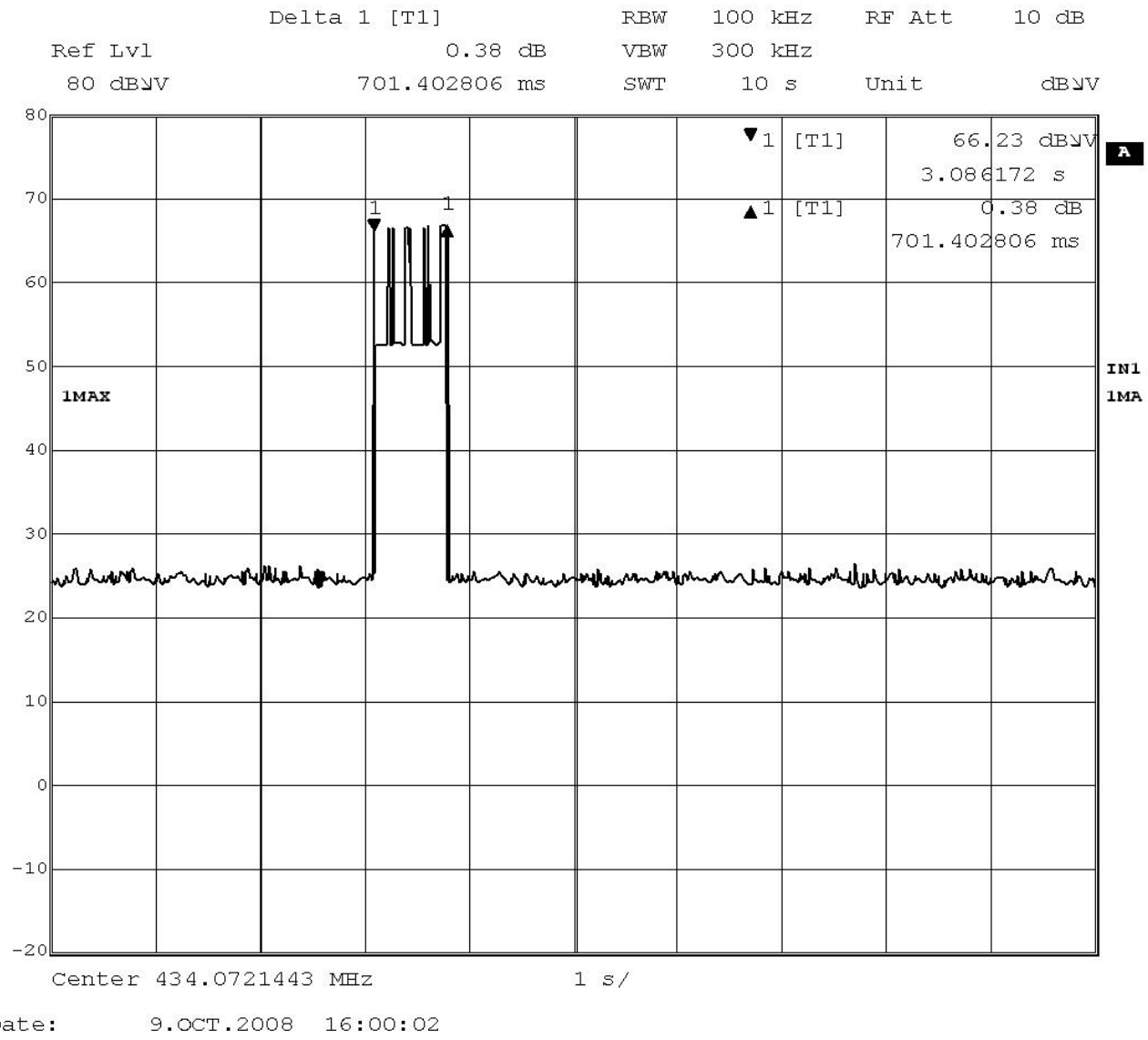
6.4. Limits and Test Result

Push button	Frequency (MHz)	Transmission duration (sec)	Maximum limit (sec)	Pass / Fail
Power on	434.3	0.681	5	Pass
Power off	434.3	0.701	5	Pass
+	434.3	0.701	5	Pass
-	434.3	0.681	5	Pass
M	434.3	0.681	5	Pass
<	434.3	0.681	5	Pass
>	434.3	0.701	5	Pass
Touch	434.3	0.541	5	Pass

Power on button

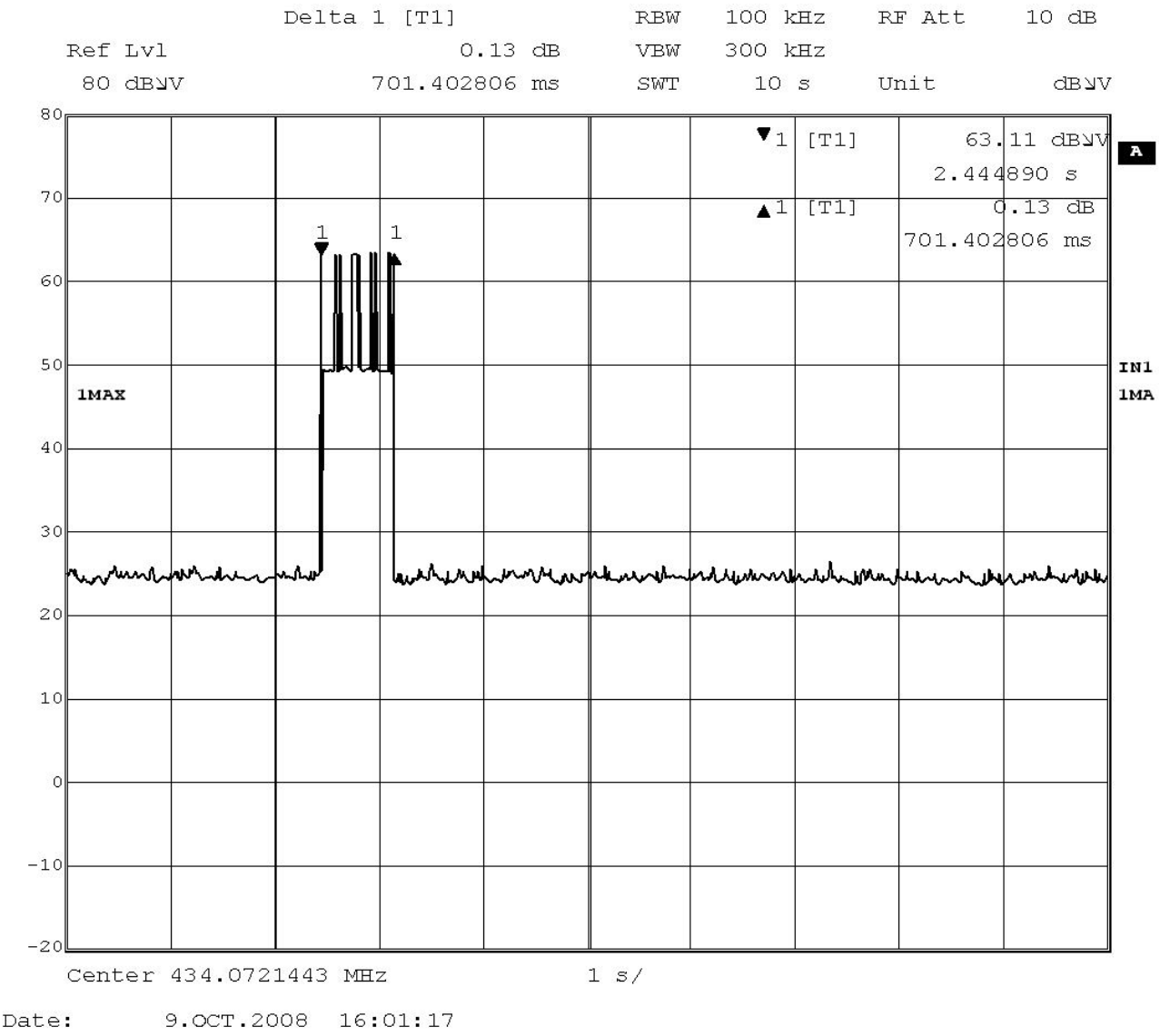


Power off button



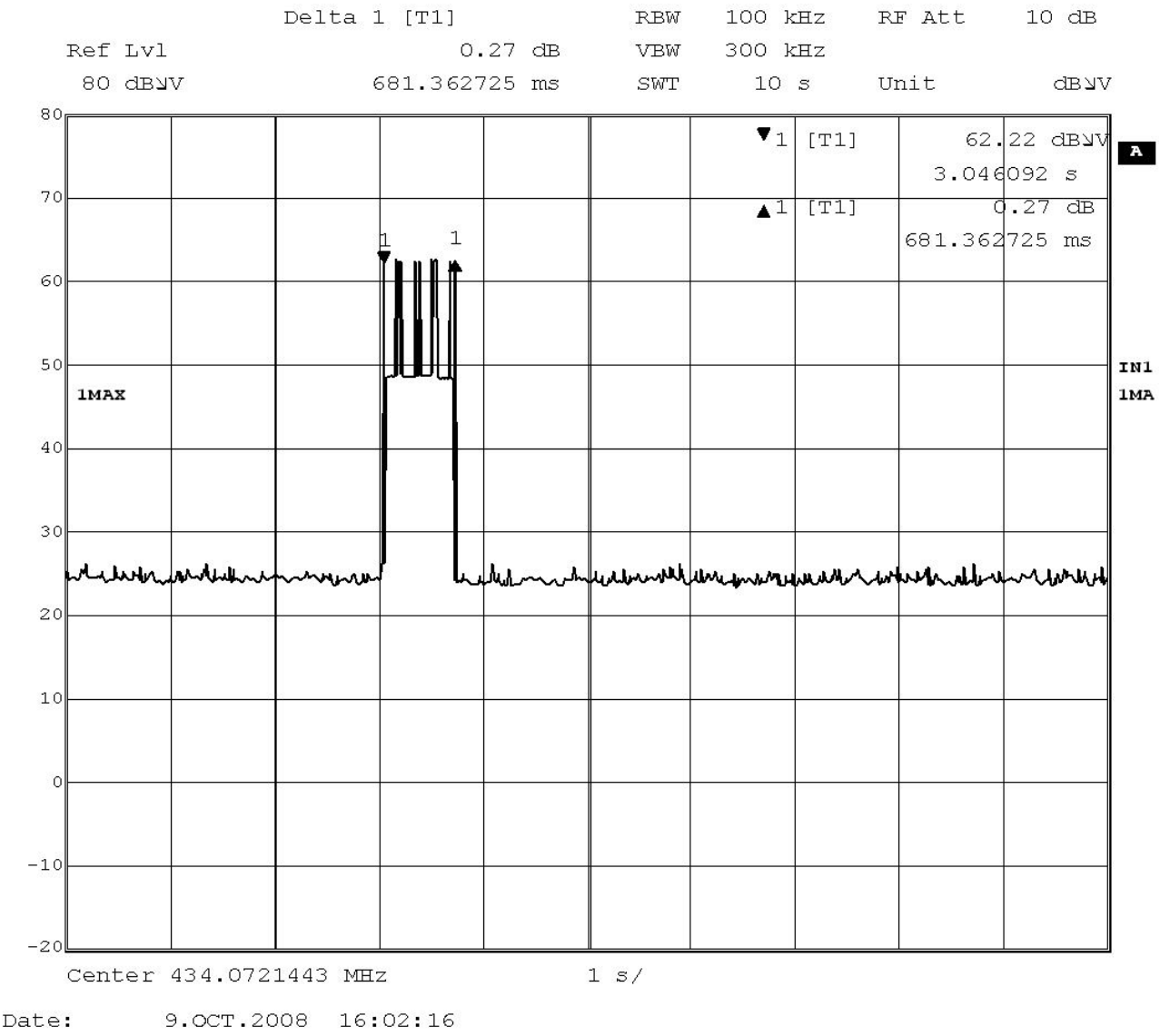
Date: 9.OCT.2008 16:00:02

“+” button

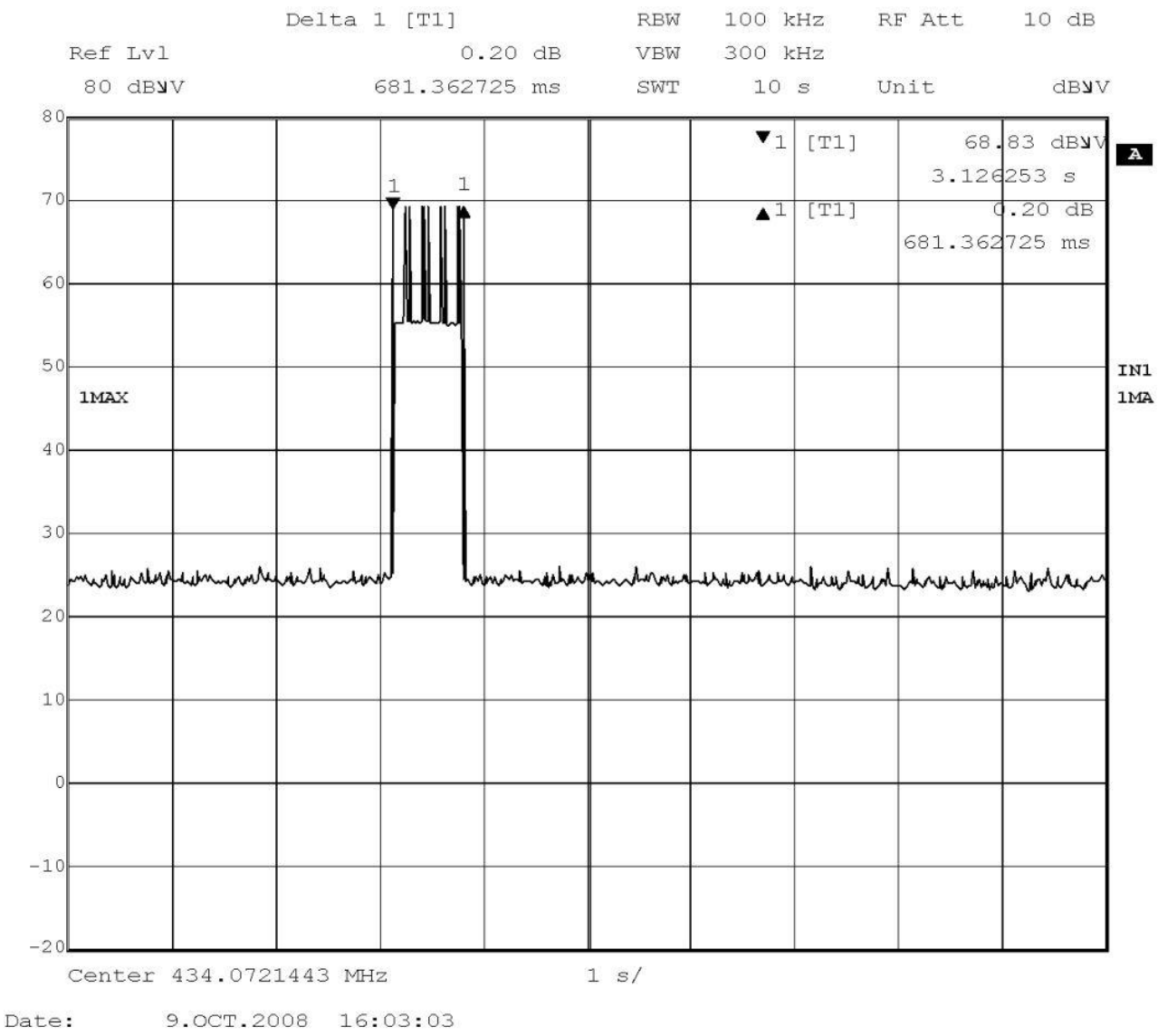


Date: 9.OCT.2008 16:01:17

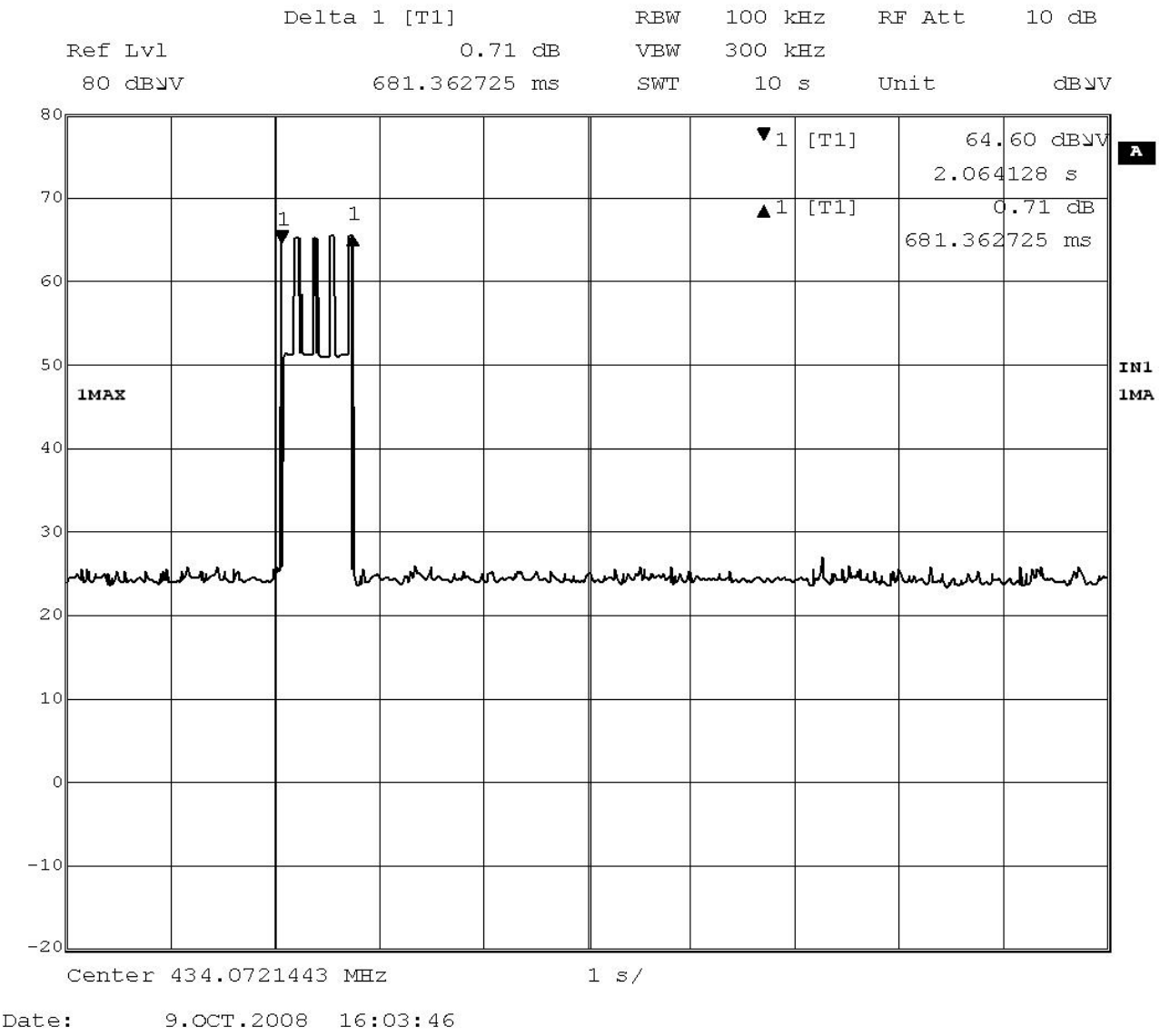
"-" button


Delta 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
0.27 dB
VBW 300 kHz
80 dBµV
681.362725 ms
SWT 10 s
Unit dBµV
1 [T1]
62.22 dBµV
3.046092 s
1 [T1]
0.27 dB
681.362725 ms
1MAX
IN1
1MA
Center 434.0721443 MHz
1 s/
Date: 9.OCT.2008 16:02:16

"M" button

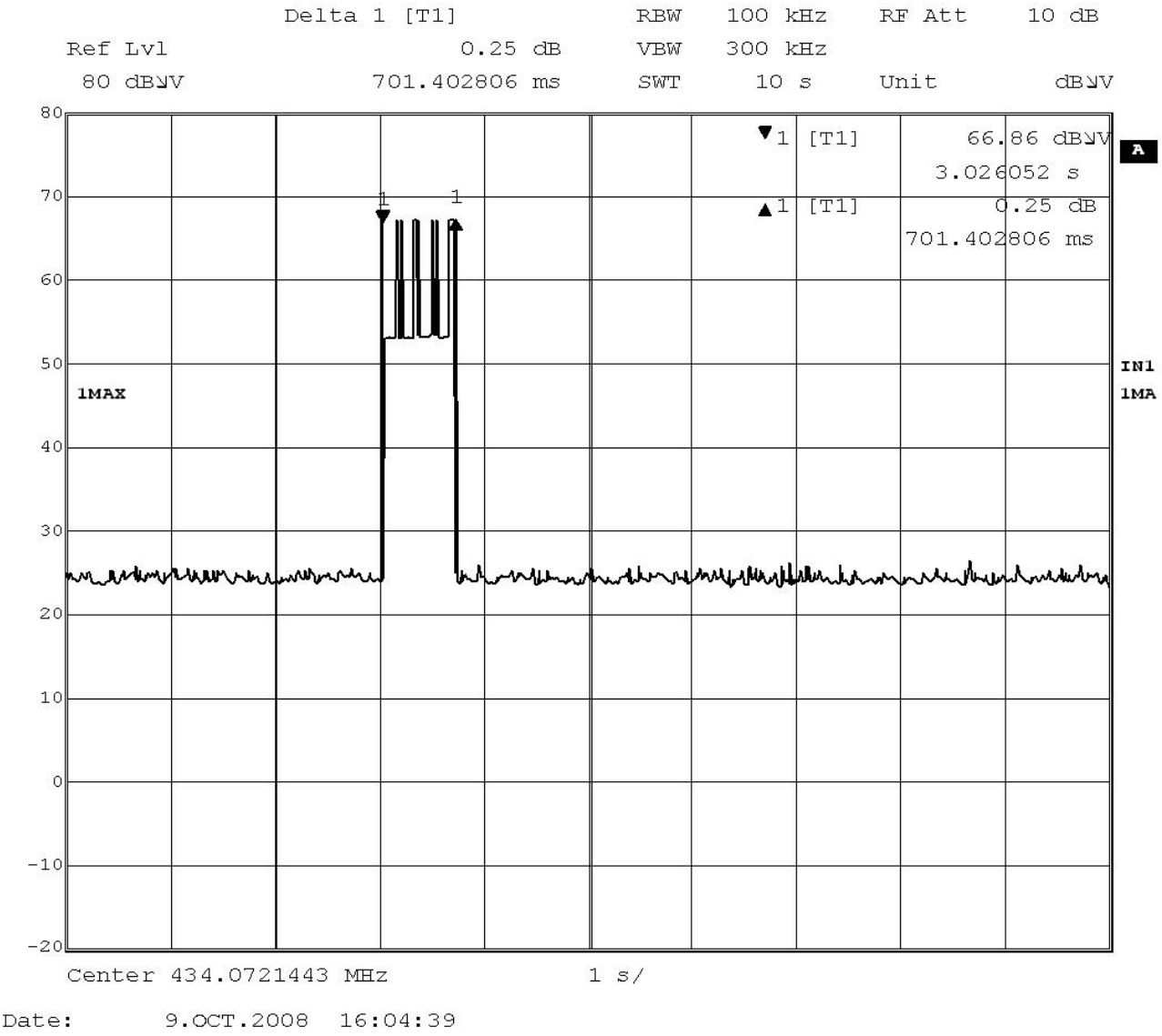

Delta 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
0.20 dB
VBW 300 kHz
80 dBµV
681.362725 ms
SWT 10 s
Unit dBµV
1 [T1]
68.83 dBµV
3.126253 s
1 [T1]
0.20 dB
681.362725 ms
1MAX
IN1
1MA
Center 434.0721443 MHz
1 s/
Date: 9.OCT.2008 16:03:03

"<" button

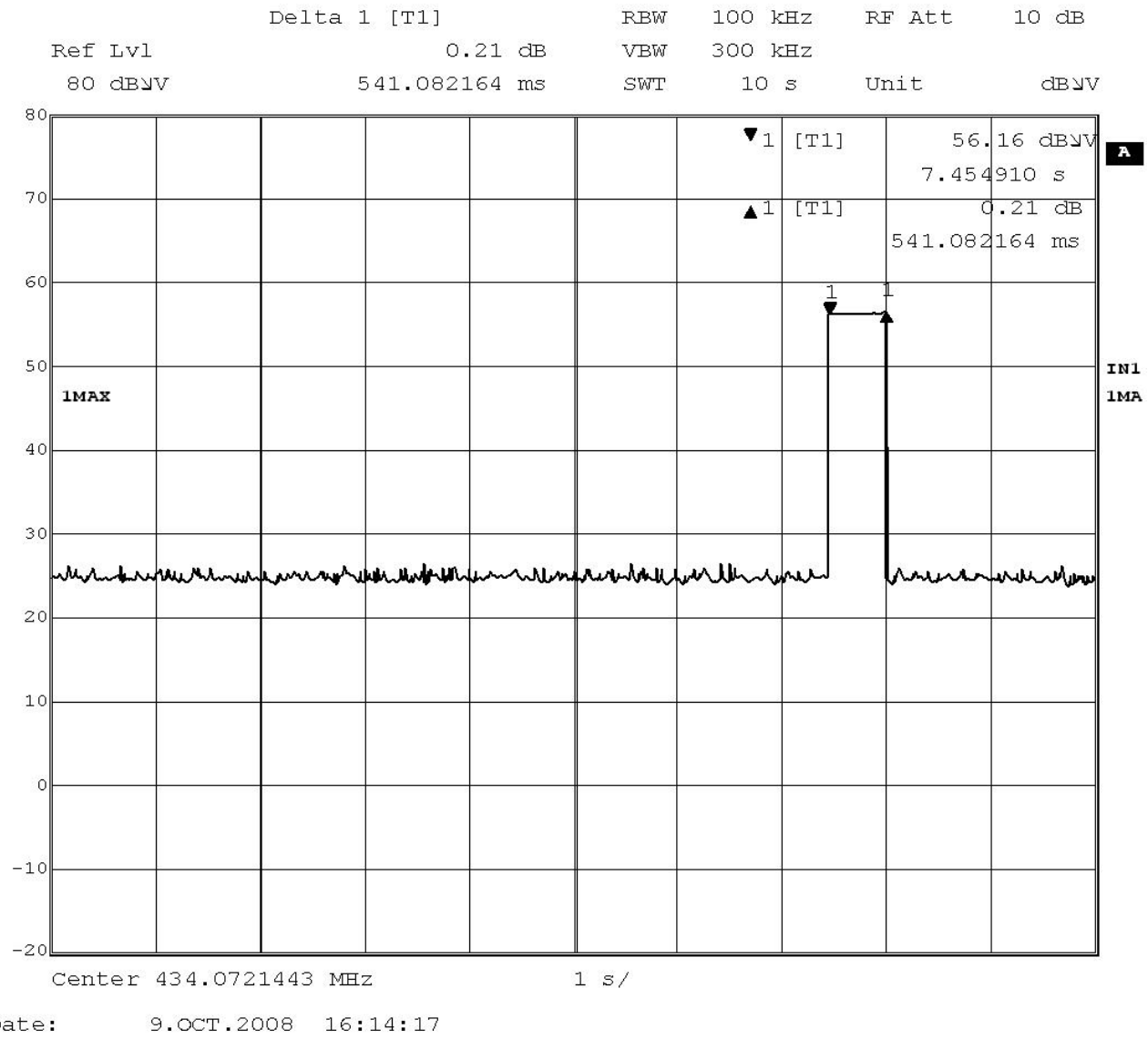


Date: 9.OCT.2008 16:03:46

“>” button


Delta 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
0.25 dB
VBW 300 kHz
80 dBµV
701.402806 ms
SWT 10 s
Unit dBµV
1 [T1]
66.86 dBµV
3.026052 s
1 [T1]
0.25 dB
701.402806 ms
1MAX
IN1
1MA
Center 434.0721443 MHz
1 s/
Date: 9.OCT.2008 16:04:39

touch button



7.Photographs

Figure 1:General Appearance (front)

Figure 2:General Appearance (back)

Figure 3: internal construction detail

Figure 4: internal construction detail (front)

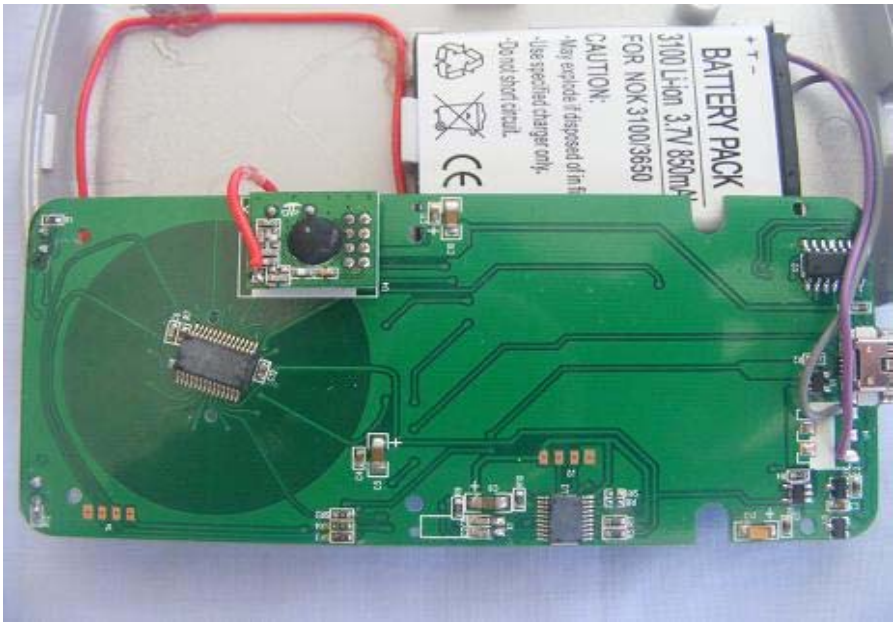


Figure 5: internal construction detail (back)

*******End of Test Report*******