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Registration number: 282399

Report No.: GLEMR070601768RFT
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FCC ID: ONFT20TX-OXNKL

TEST REPORT

Application No. : GLEMR070601768RF

Applicant: Tele Radio AB

FCC ID: ONFT20TX-OXNKL

Fundamental Frequency : 433.92MHz

Equipment Under Test (EUT):

Name: T20TX

Model No.: T20TX-01NKL, T20TX-02NKL, T20TX-03NKL♣

Serial No.: 574946

♣

Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.

Standards: FCC PART 15, SUBPART C : 2006
Section 15.231

Date of Receipt: 20 June 2007

Date of Test: 20 June and 06 July 2007

Date of Issue: 09 July 2007

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jerry Chen
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.



2 Test Summary

The customer requested FCC tests for a 433.92MHz transmitter.			
Test	Test Requirement	Standard Paragraph	Result
Radiated Emission (30MHz to 1000MHz)	FCC PART 15 :2006	Section 15.231	PASS
Occupied Bandwidth	FCC PART 15 :2006	Section 15.231	PASS
Dwell Time	FCC PART 15 :2006	Section 15.231	PASS

Remark:

♣Item No.: T20TX-01NKL, T20TX-02NKL, T20TX-03NKL♣

Only the Item T20TX-03NKL was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above items, only the outer decoration. color and item numbers were different according to the conformation from the applicant (manufacturer).



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4 General Information

4.1 Client Information

Applicant Name: Tele Radio AB
Applicant Address: Datavagen 21,SE-43632 Askim,Sweden.

4.2 Details of E.U.T.

Name: T20TX
Model No.: T20TX-01NKL, T20TX-02NKL, T20TX-03NKL
Power Supply: 3V DC Button Battery (CR2032)
Power Cord: N/A-
Modulation type: FSK

4.3 Description of Support Units

The EUT was tested as an independent unit: a 433.926MHz radio transmitter with 3 buttons for transferring three control information.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory, No.198
Kezhu Road, Science Town Economic& Technology Development District Guangzhou, China
510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.5 Other Information Requested by the Customer

None.



4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC (Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP's accreditation, SGS-CSTC is an authorized test laboratory for the DoC process.

- **Industry Canada (Registration No.: 4620B-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620B-1.

Date of Registration: Jan 15, 2007. Valid until Jan 15, 2009



5 Test Results

5.1 Test Instruments

RE in Chamber/OATS						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	06-03-2007	06-03-2008
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	05-12-2006	05-12-2007
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2006	04-12-2007
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	31-10-2006	31-10-2007
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	31-07-2006	31-07-2007
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	29-07-2006	29-07-2007
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2006	05-12-2007
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	28-03-2007	28-03-2008
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	28-03-2007	28-03-2008
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	22-08-2006	22-08-2007

General used equipment						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0050-EMC0053	Temperature, & Humidity	ZHENGZHOU BO YANG	WSB	N/A	05-12-2006	05-12-2007
EMC0054	Temperature, & Humidity	Shenzhen Tai Kong	THG-1	N/A	04-01-2007	04-01-2008
EMC0006	DMM	Fluke	73	70681569	27-09-2006	27-09-2007
EMC0007	DMM	Fluke	73	70671122	27-09-2006	27-09-2007



5.2 E.U.T. Operation

Input voltage: 3V DC Button Battery (CR2032)
 Operating Environment:
 Temperature: 25.0 °C
 Humidity: 56 % RH
 Atmospheric Pressure: 1011 mbar
 EUT Operation: Test the EUT in transmitting mode.

5.3 Test Procedure & Measurement Data

5.3.1 Radiated Emissions

Test Requirement: FCC Part15 C 15.231(b)
Test Method: ANSI C63.4 section 8 & 13
Test Date: 11 June 2007
Measurement Distance: 3m (Semi-Anechoic Chamber)
Requirements: the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency MHz	Field Strength of Fundamental (dBµV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBµV/m @ 3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
Above 470	81.94	61.94

Detector: Peak for pre-scan
 Peak and Average:
 30-1000MHz:120kHz resolution bandwidth
 1GHz-5GHz: 1MHz resolution bandwidth

** 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 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.92MHz

The limit for average field strength dBuV/m for the fundamental emission= 80.8 dBµV/m

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the spurious emission=60.8 dBuV/m.Spurious in the restricted bands must be less than 60.8 dBuV/m or 15.209



Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receive was scanned from 30MHz to 5.0GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier . The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities and Horn antenna.

The following test results were performed on the EUT on 27 June 2007



1. Fundamental emission & Spurious Emissions

(a) Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
433.920	86.3	16.5	1.5	25.3	79.0	100.8	-21.8	PEAK
433.920	81.3	16.5	1.5	25.3	74.0	80.8	-6.8	AVERAG
867.840	46.7	20.5	2.2	25.2	44.2	80.8	-36.6	PEAK
867.840	43.5	20.5	2.2	25.2	41.0	60.8	-19.8	AVERAG
1301.760	63.4	24.8	3.1	35.6	55.7	80.8	-25.1	PEAK
1301.760	59.4	24.8	3.1	35.6	51.7	60.8	-9.1	AVERAG
1735.680	57.2	26.4	3.5	35.2	51.9	80.8	-28.9	PEAK
1735.680	53.4	26.4	3.5	35.2	48.1	60.8	-12.7	AVERAG
3907.000	45.5	32.1	4.9	33.6	48.9	80.8	-31.9	PEAK
3907.000	40.9	32.1	4.9	33.6	44.3	60.8	-16.5	AVERAG

(b) Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
433.920	74.6	16.4	1.5	25.3	67.2	100.8	-33.6	PEAK
433.920	70.6	16.4	1.5	25.3	63.2	80.8	-17.6	AVERAG
867.840	49.1	21.0	2.2	25.2	47.1	80.8	-33.7	PEAK
867.840	44.5	21.0	2.2	25.2	42.5	60.8	-18.3	AVERAG
1301.700	59.8	24.8	3.1	35.6	52.1	80.8	-28.7	PEAK
1301.700	56.8	24.8	3.1	35.6	49.1	60.8	-11.7	AVERAG
1735.680	53.0	26.4	3.5	35.2	47.7	80.8	-33.1	PEAK
1735.680	49.6	26.4	3.5	35.2	44.3	60.8	-16.5	AVERAG
4383.000	44.1	32.7	6.3	33.3	49.8	80.8	-31.0	PEAK
4383.000	41.5	32.7	6.3	33.3	47.2	60.8	-13.6	AVERAG

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC Part 15 C Section 15.231 requirements.



5.3.2 Occupied Bandwidth

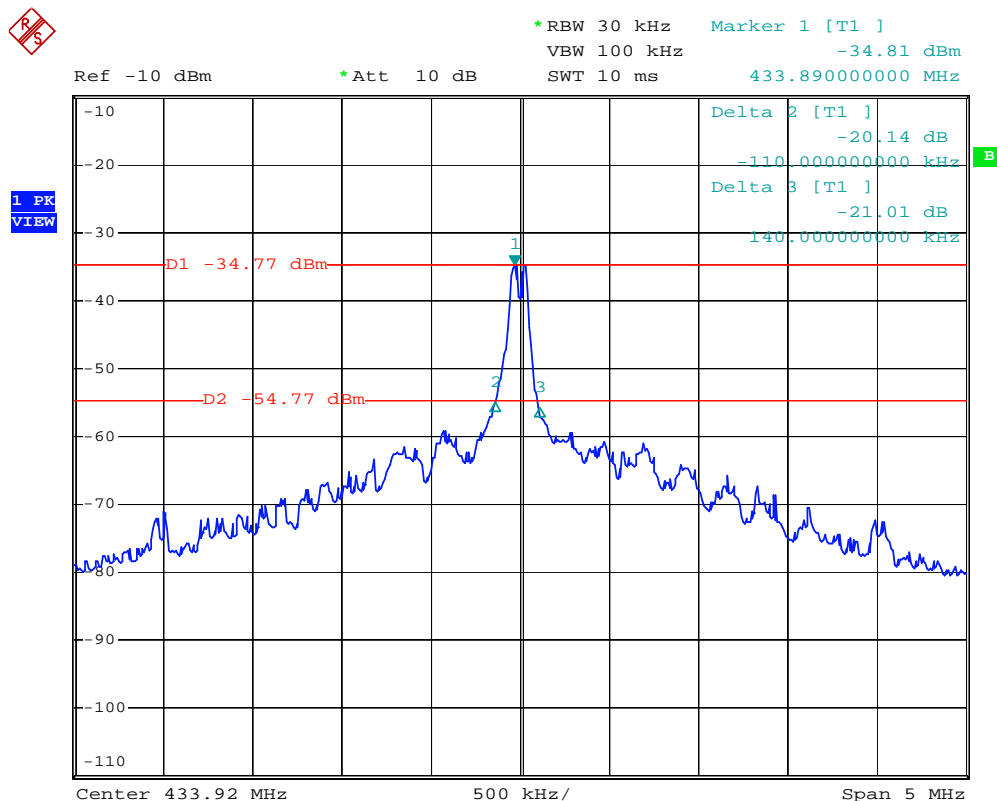
Test Requirement: FCC Part 15 C Section 15.231(c)
Test Method: ANSI C63.4 section 13 & FCC Part 2.1049
Test Date: 25 June 2007

Requirements: 15.231 (c) 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. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Method of measurement: The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 500KHz per division.

20dB Bandwidth: 250KHz

The graph as below, represents the emissions take for this device.



Date: 25.JUN.2007 14:37:44

The results: The unit does meet the FCC Part 15 C Section 15.231 requirements.



5.3.3 Dwell Time:

Test Requirement: FCC Part 15 C Section 15.231(a)
Test Method: FCC Part15 C Section 15.231(a)
Test Date: 27 June 2007

Requirements:

1. Regulation 15.231 (a) The provisions of this Section are restricted to periodic operation within the band 40.66 40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

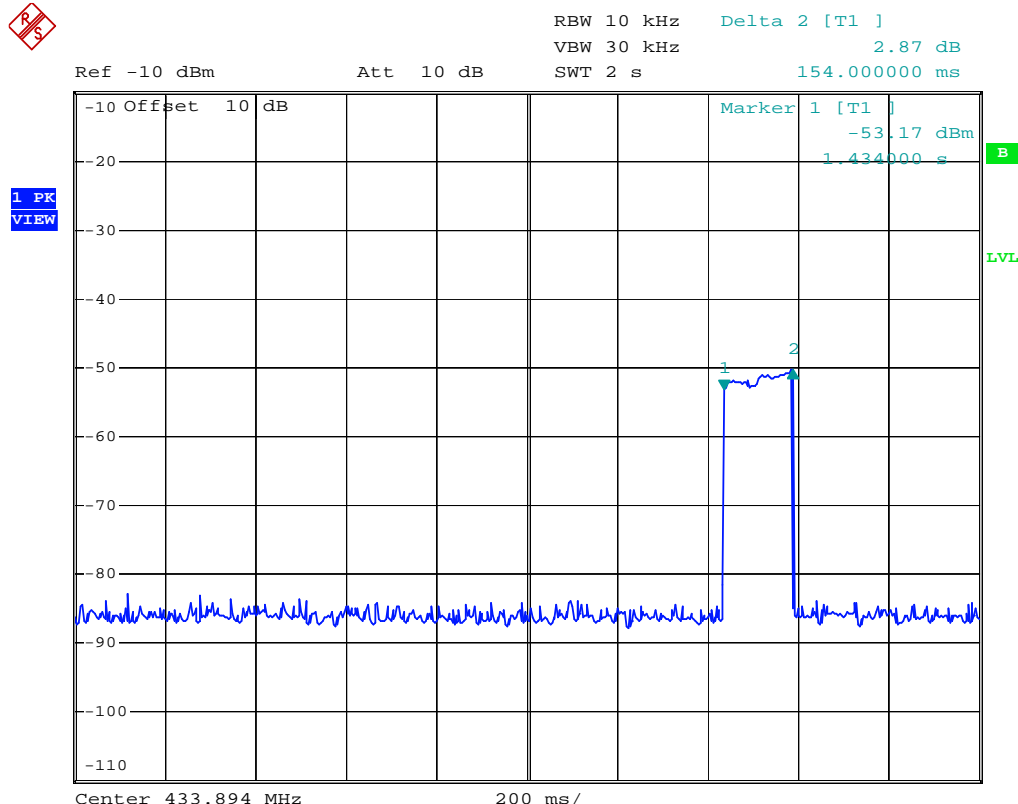
Result:

The EUT is a remote switch without audio or video transmitted.

The EUT meets the requirements of this section.

2. Regulation 15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result:



The EUT meets the requirements of this section.



3. Regulation 15.231 (a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Result:

The EUT does not have automatic transmission.

4. Regulation 15.231 (a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

Result:

The EUT does not employ periodic transmission.

5. Regulation 15.231 (a4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result:

This section is not applicable to the EUT.

The results: The unit does meet the FCC Part 15 C Section 15.231 requirements.