PRIMA
RICERCA & SVILUPPO

RAPPORTO DI PROVA / *TEST REPORT*

Rif./*Ref*.No. FCCTR_140342-1	**Data / *Date:* 16/04/2014**	Pagine / *Pages* **: 21**
Scopo delle prove /*Test object :*	Prove di tipo in accordo a / *Type test acccording to* **FCC Cfr 47 part 15 - Subpart C** **§15.203; §15.205; §15.207; §15.209; §15.231**	
Richiedente / *Applicant* **:**	ELPRO INNOTEK S.p.a. Via Piave, 23 – 31020 S.Pietro di Feletto – TV – ITALY Tel. +39 0438 450860	
Persona di riferimento / *Applicant's referee :*	Ing. Dalle Carbonare (d.carbonare@erone.com)	
Marchio commerciale / *Trade mark* **:**	CDVI	
Fabbricante / *Manufacturer :*	ELPRO INNOTEK S.p.a.	
Prodotto / *Product :*	**Transmitter 433MHz RADIUM series**	
Modello / *Model* **:**	**R4**	
Data ricevimento campioni / *Date of test sample receipt:*	21/03/2014	
Campioni verificati / *No. of tested samples*	1	
Data verifiche / *Testing date* :	21/03/2014	
Sito di prova / *Testing site :*	Prima Ricerca & Sviluppo Via Campagna - 92 I-22020 FALOPPIO (CO)	
Esito delle valutazioni / *Assessment results :*	**CONFORME / COMPLIANT**	
Verifiche effettuate da / *Verifications carried out by :*	Andrea Bortolotti Tecnico laboratorio / *Laboratory technician*	
Approvato / *Approved by* **:**	Giacomo ARMELLINI Responsabile Laboratorio EMC e RADIO/ *EMC and RADIO Laboratory Manager*	

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati./*The test results reported in this test report shall refer only to the samples tested*

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1 RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
FCCTR_140342-0	Original release	21/03/2014
FCCTR_140342-1	Added FCC ID	16/04/2014

2 TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

2.1 EUT Identification EUT Identification

DESCRIPTION :	Transmitter 433MHz RADIUM series
TRADEMARK:	CDVI
MODEL:	R4
S/N:	Not present (prototype)
MANUFACTURER:	ELPRO INNOTEK S.p.a.
COUNTRY OF MANUFACTURER:	Italy
COMPOSED BY:	Single
EUT DIMENSIONS :	See photographic documentation
EUT STANDING:	Hand held use
FCC ID:	PWJS3RT

2.2 EUT Technical Data

POWER SOURCE :	Internal battery
POWER SUPPLY NOMINAL VOLTAGE:	6Vdc (2x3Vdc CR2016 battery)
NOMINAL POWER OR ABSORBING CURRENT :	Not declared
FCC CLASS:	47 CFR FCC Part 15 Subpart C § 15.231
ANTENNA :	Integral
MODULATION :	AM/ASK
TYPICAL USAGE :	Transmitter for automatical door
TYPE:	Intentional radiator

2.3 EUT ports identification

This section contains descriptions of all ports, the length and the type of the cable provided by manufacturer needed for the tests. Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connector	Max cable length
1	**Enclosure**	Plastic	Pressure	---
2	**AC mains input/output ports**	Port not present	---	---
3	**DC mains input/output ports**	Port not present (battery powered)	---	---
4	**Signals / Control Ports**	Port not present	---	---
5	**Telecommunication port**	Port not present	---	---
Note: During the test all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.				

2.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- None

2.5 Auxiliary equipment

- None

3 REFERENCE STANDARD

CODE OF FEDERAL REGULATIONS	
Title 47 Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)
Title 47 Part 15 Subpart C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Intentional Radiators) of the Federal Communication Commission (FCC)
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz

In the following table there are the operating conditions adopted during tests identified by an indicator (#) at which has been referred the item “Operating condition of the equipment under test”

3.1 Test overview

The appliance is classified as “I*ntentional radiator”* in conformity to FCC Part 15 Sub. C §15.203, §15.205, §15.207, §15.209, §15.231.
The application is mainly used as open/close automatic doors.

4 OPERATING TEST MODES AND CONDITIONS

OPERATING CONDITION	DESCRIPTION
#1	EUT on continuous transmission mode

5 SUMMARY OF TEST RESULTS

Requirements	CFR Section	Test result
Antenna Requirements	15.203	Within the limit
Radiated Spurious Emission	15.209, 15.205(b)	Within the limit
Conducted Emission	15.207	Not applicable The EUT is battery powered
Periodic Operation Characteristics	15.231(a)	Within the limit
Field Strength Limits (Fundamental)	15.231(b)	Within the limit
20 dB Bandwidth	15.231(c)	Within the limit

6 TEST RESULTS

TEST 1.

ANTENNA REQUIREMENTS

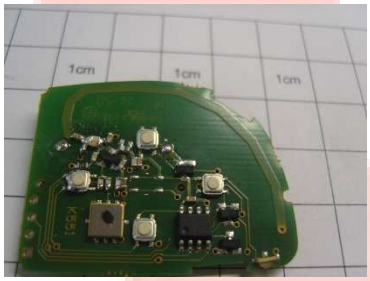
REFERENCE DOCUMENT FCC47CFR Part 15 C

- **REGULATION:**

15.203 an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

- **RESULT:**

Integral antenna printed on the PCB.



RESULT: COMPLIED

TEST 2.

RADIATED EMISSION 30 - 5000 MHz

REFERENCE DOCUMENT: FCC CFR47,PART 15 subpart C
ANSI C 63.4

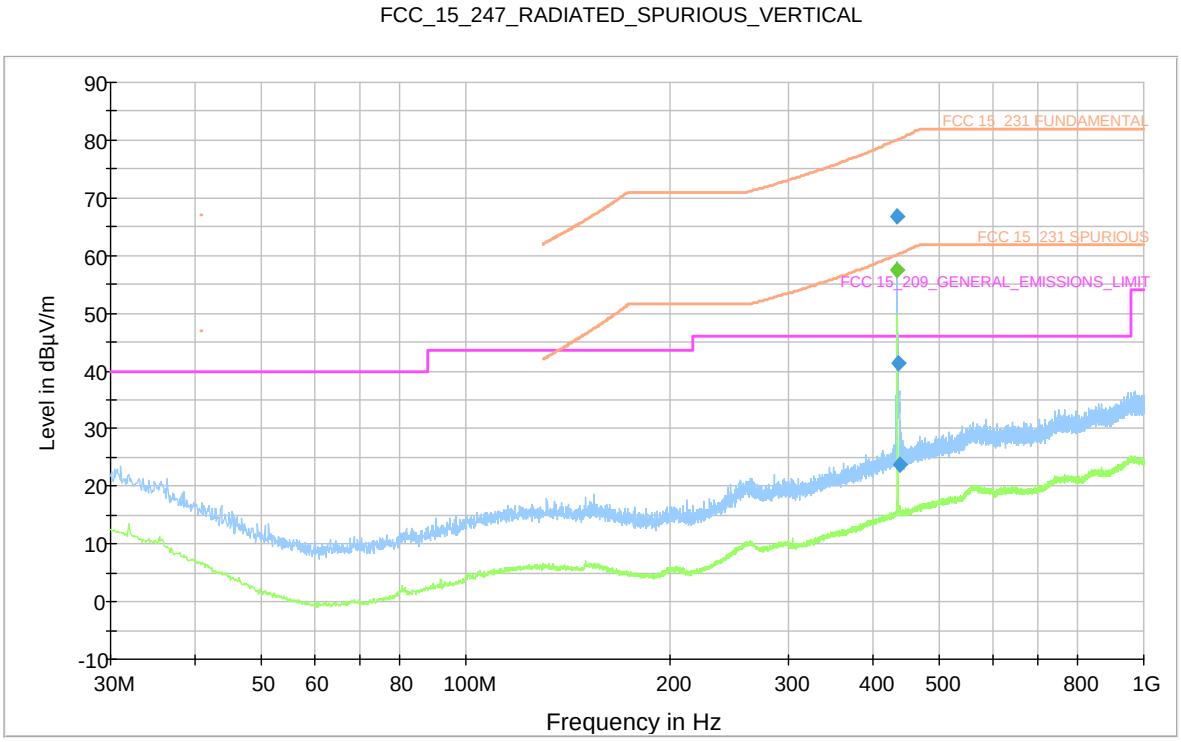
- TEST SETUP: In according to manufacturer specifications
- TEST LOCATION: Semi-anechoic chamber (CISPR 16-1 :1993) Siemens+Matsushita type B84117-D6019-T232 Measure distance 3 meters
- TEST EQUIPMENT USED FOR TEST: EMI receiver Rohde & Schwarz Mod. ESU40
  Chase Antenna Mod. CBL 6111
  Rohde & Schwarz Antenna Mod. HBL050
- TESTED PORT: Enclosure
- FREQUENCY RANGE: 30 - 5000 MHz
- MEASUREMENT DISTANCE : 3mt
- EMISSION LIMITS: Acc. to Section 15.231(b) , 15.205, 15.209
- UNCERTAINTY OF MEASURE: Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty = 4,49 dB

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :			6Vdc

OPERATING CONDITION ***: #1***

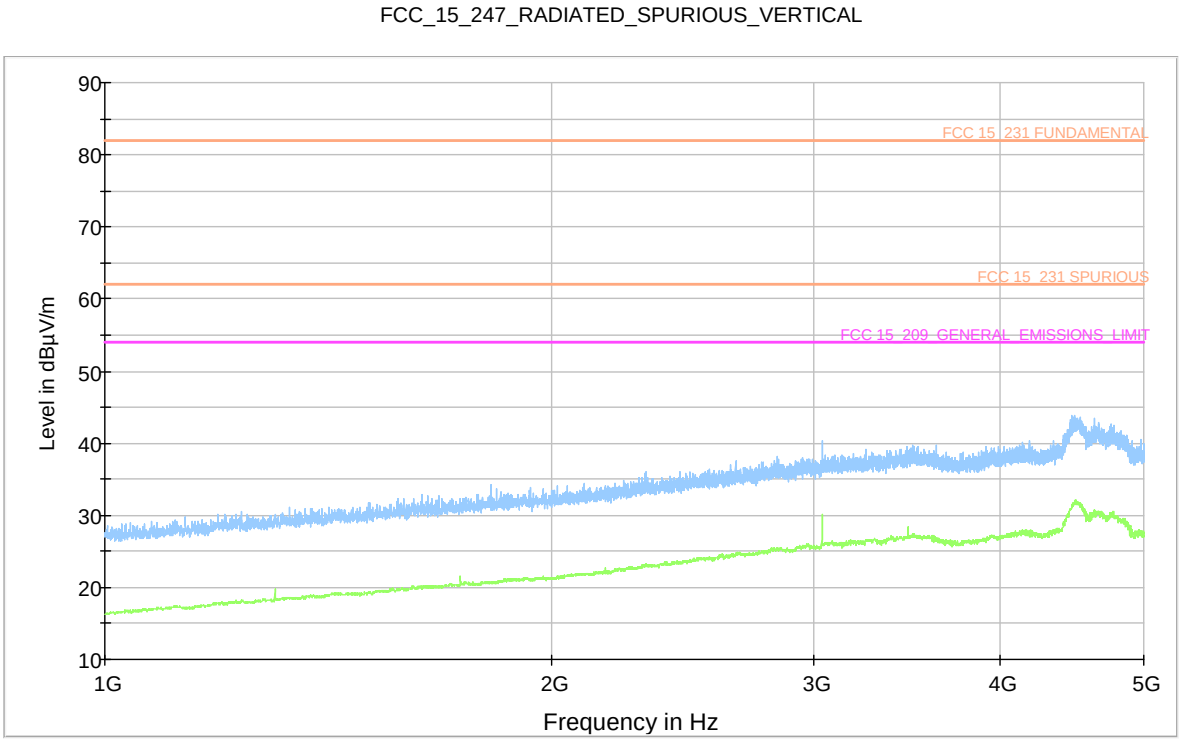
RESULT: **COMPLIED**

Vertical polarization 30MHz – 1GHz



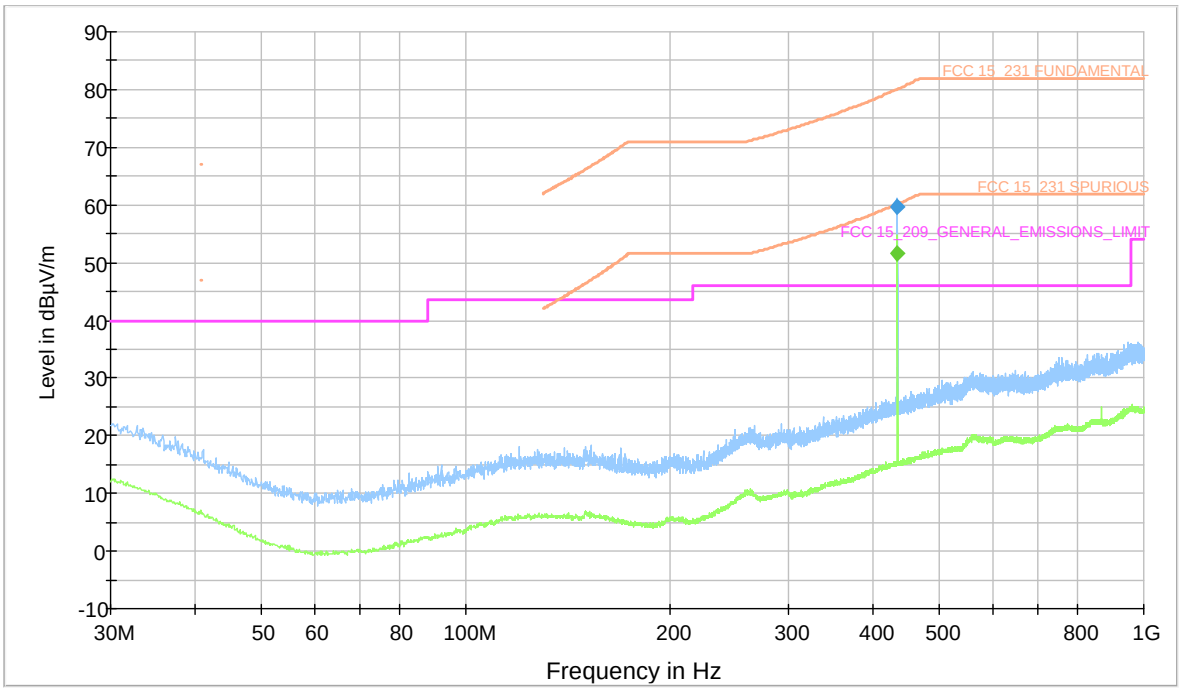
Frequency (MHz)	QuasiPeak (dBµV/m)	Azimuth (deg)
433.811000	66.9	160.0
434.393000	41.3	116.0
437.982000	23.6	112.0
Frequency (MHz)	**Average (dBµV/m)**	**Azimuth (deg)**
433.811000	57.5	-15.0

Vertical polarization 1GHz – 5GHz



Horizontal polarization 30MHz – 1GHz

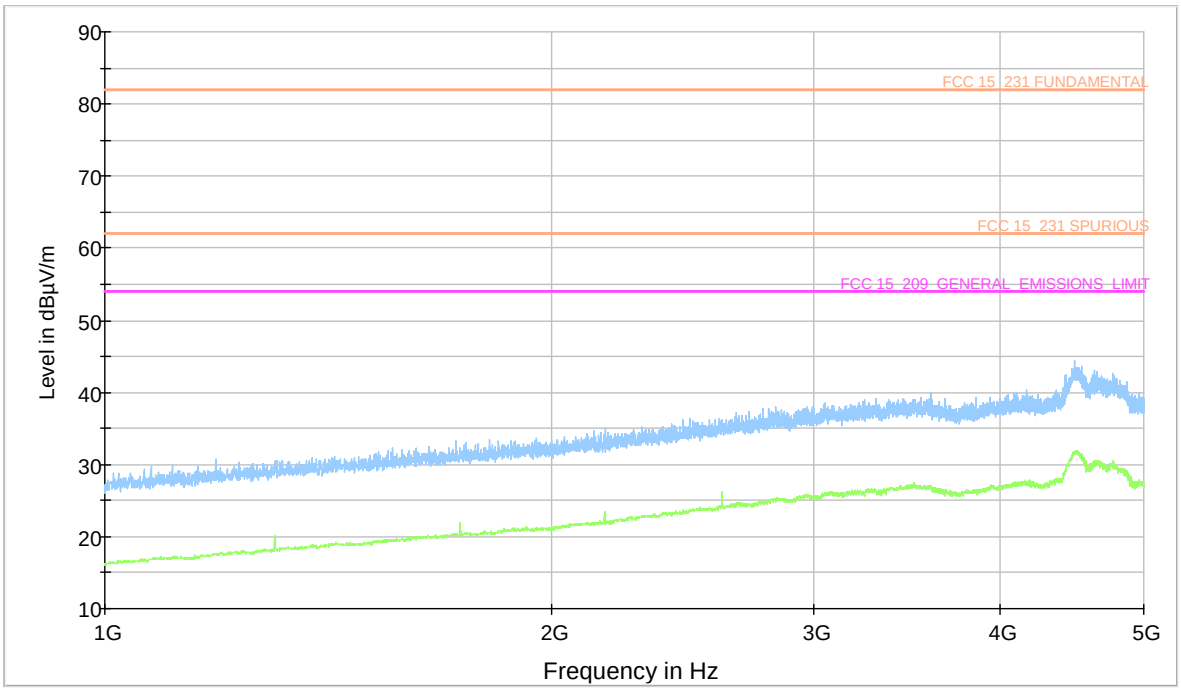
FCC_15_247_RADIATED_SPURIOUS_HORIZONTAL



Frequency (MHz)	QuasiPeak (dBµV/m)	Azimuth (deg)
433.811000	59.8	181.0
Frequency (MHz)	**Average (dBµV/m)**	**Azimuth (deg)**
433.811000	51.5	191.0

Horizontal polarization 1GHz – 5GHz

FCC_15_247_RADIATED_SPURIOUS_HORIZONTAL



TEST 3.

CONDUCTED EMISSIONS TESTS

REFERENCE DOCUMENT: FCC CFR47,PART 15 subpart C
ANSI C 63.4

- **REGULATION:**

15.207(a) For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

15.207(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

- **RESULT:**

EUT powered by internal battery

RESULT: TEST NOT APPLICABLE

TEST 4.

PERIODIC OPERATION CHARACTERISTICS

REFERENCE DOCUMENT: FCC CFR47,PART 15 subpart C
ANSI C 63.4

- **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. Continuous transmissions, voice, video and the radio control of toys are not permitted. The prohibition against data transmission 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 complied with this section

- **REGULATION:**

15.231(a)(1)
A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Eut deactivate transmitter immediately after the release of push button
RESULT: The EUT is complied with this section

- **REGULATION:**

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

The EUT does not have automatic activation.
RESULT: This section is not applicable for the EUT

- **REGULATION:**

15.231(a) (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

The EUT does not have periodic transmission
RESULT: This section is not applicable for the EUT

- **REGULATION:**

15.231(a) (4) 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 for the EUT

TEST 5.

BANDWIDTH

REFERENCE DOCUMENT: FCC CFR47,PART 15 subpart C
ANSI C63.4

- **TEST LOCATION:** Radio test area
- **TEST EQUIPMENT USED FOR TEST:**
  - Spectrum Analyzer Rohde&Schwarz mod. FSP40
  - Test Fixture Prima Ricerca&Sviluppo
- **TESTED PORT:** Enclosure

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 °C		24 ± 3 °C
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal battery		6Vdc

OPERATING CONDITION ***: #1***

RESULT: **COMPLIED**

- **REGULATION:**

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.

- **LIMITS:**

The 20 dB bandwidth limit = 0.0025 x 433.92MHz = 1084.8kHz

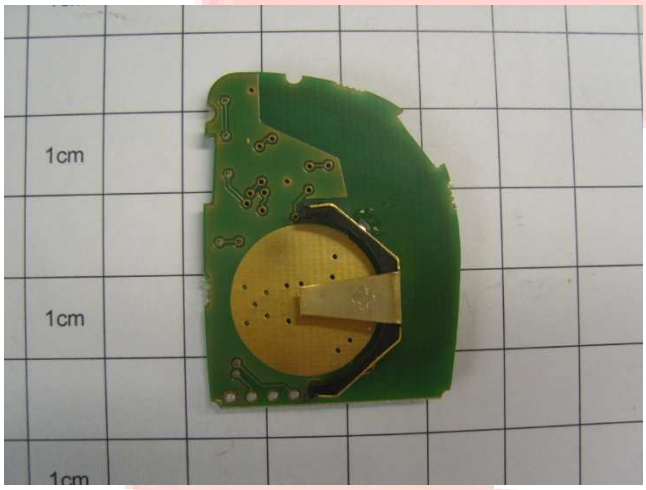
The measured 20 dB bandwidth is : 300kHz **RESULT: Compiled**

7 LIST OF EQUIPMENT USED

EQUIPMENT	IDENTIFICATION NUMBER	CAL. DUE
EMI TEST RECEIVER	EMC.359	APR.2014
ARTIFICIAL MAINS NETWORK	EMC.173	MAR.2015
RF SEMI-ANECHOIC CHAMBER (CSSA)	EMC.191	AUG 2014
BILOG ANTENNA	EMC.023	MAY 2014
LOG PERIODICA ANTENNA	EMC.391	APR 2014
VOLTAGE GENERATOR	EMC.397	MAR.2015
SPECTRUM ANALYZER	EMC.332	APR.2014

8 PHOTOGRAPHIC DOCUMENTATION

PHOTO 1 – EUT IDENTIFICATON



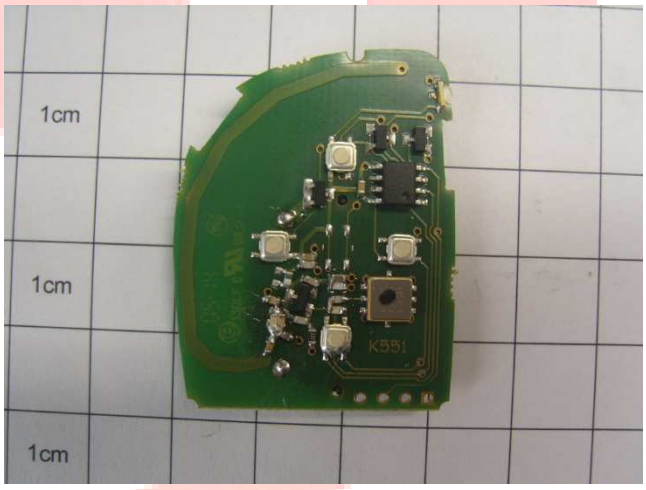


PHOTO N° 2 – RADIATED EMISSION SETUP