

Prima Ricerca & Sviluppo Srl soggetta a direzione e coordinamento da parte della Giovanni Maspero & C. S.p.A. – C.I. 02634780130
Sede legale : 22100 Tavernola (CO) Via Conciliazione, 1 Cod. FISC. e N. R.I. CO 02635860139
Sede operativa : Laboratori Via Campagna, 92 22020 Faloppio fraz. Gaggino (CO) Tel. +39 03135000.11 Fax +39 031991309

EQUIPMENT UNDER TEST :
APPARECCHIO IN PROVA :

TRANSMITTER at 295 MHz
ERONE
Model SETW295AM2

REFERENCE STANDARDS :
NORME DI RIFERIMENTO :

FCC 47 CFR Part 15

CUSTOMER:

RICHIEDENTE:

- **Dept. / Firm :** ELPRO INNOTEK S.P.A.
Ente / Società:
- **Mr.:** ING. G. MASSIMO DALLE CARBONARE
Sig.:
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Indirizzo:
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Telefono : *Fax :*

Site of test execution: Via Campagna, 92 - 22020 Gaggino Faloppio (CO) - Italy
Località esecuzione prove:

Date of test samples receipt: 06/04/05 **Date of start test:** 06/04/05
Data ricevimento campioni: *Data inizio prove:*

Date of end test: 06/04/05
Data fine prove:

Witness to the test:
Presenti alle prove:

Nobody / Nessuno
.....

Signature of the engineers:
Firma esecutore prove:



.....
F. Barbierato

Signature of the Laboratory Director:
Firma Direttore Laboratori:



.....
R. Furfari

The test results recorded in this Test Report are exclusively referred to the tested samples.

I risultati del presente rapporto di prova si riferiscono esclusivamente al campione sottoposto a prova.

Reproduction of this EMC-Test Report in whole or in part is prohibited without the written authorization of the Laboratory Director

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1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification

Brand name:	ERONE
Equipment :	Transmitter at 295 MHz
Model name or No. :	SETW295AM2
Serial number :	Not present
FCC ID :	PWJ W295
Country of manufacturer:	ITALY

1.2 Technical data

FCC class:	Intentional Radiators
Supply voltage:	6 Vdc (no. 2 lithium batteries type CR2016)
Typical usage :	Programmable telephone entry systems, anti-burglar systems and access control systems
EUT single or system:	Single
EUT dimensions :	61 x 36 x 16 mm

1.3 Transmitter technical data

TRANSMITTER	
• Working Frequency :	295 MHz
• Frequency Range of Operation :	No section dedicated to a range comprehensive of 295MHz specified in FCC 47 CFR Part 15
• Antenna type :	Integrated

1.4 Modifications incorporated in E.U.T.

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

- None

1.5 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output 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	Connection
1	Enclosure	Plastic surface	By pressure
2	AC power input/output ports	Line not present	*****
3	DC power input/output ports	Internal Lithium Batteries no. 2 x 3Vdc type CR2016	Internal Battery support
4	Signals ports	Line not present	*****

Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

1.6 Auxiliary equipment

No auxiliary equipment

2. TEST CONDITIONS

2.1 Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference Standard:

FCC Part 15, Subpart C, Section 15.209 and 15.249

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” of all technical sheets of the tests (see Section 4)

Operating condition	Description
#1	<i>Continuous transmission</i>

2.2 Test overview

Sample tested is the main model of a complete set of 295 MHz RF transmitters.

The appliance is classified as “*intentional radiator*” in conformity to FCC Part 15 Sub. A §15.201, and it is subject to “*Certification*” procedure.

The application is mainly used for programmable telephone entry systems, anti-burglar systems and access control systems.

It is possible to declare that the appliance it is subject to additional requirements stated in §15.209, §15.231

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3. REFERENCE STANDARD FOR PERFORMED TESTS

<i>Reference standard :</i>	<i>Title :</i>
FCC Part 15 part A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)
FCC Part 15 part C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (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

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4. SUMMARY OF TEST RESULTS

4.1 Tests

Port		Phenomena	Operating condition ¹	Result
1	Enclosure	Radiated emission	#1	Within the limit
		Frequency stability	Not applicable	
2	AC mains Input ports	RF Disturbance voltage: • continuous	Not applicable ²	
		Bandwidth of emission	Not applicable ²	
3	DC Power supply and Battery	Bandwidth of emission	#1	Within the limit

¹ Ref. Tab. of Section 2

² Not applicable: port not present in acc. To §15.207 (d)

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4.2 Emission limits

Acc. to §15.231 for intentional radiator operated within the frequency 925 MHz

Frequency (MHz)	Field Strength of fundamental at a distance of 3m	Field Strength of spurious emission at a distance of 3m
295	5208.34 $\mu\text{V/m}$ 74.33 dB $\mu\text{V/m}$	520.83 $\mu\text{V/m}$ 54.33 dB $\mu\text{V/m}$

According to §15.209 all the other emission of the appliance shall not exceed the following levels:

Frequency (MHz)	Field Strength at a distance of 3m ($\mu\text{V/m}$)
30 - 88	100 **
88 - 216	150 **
216 - 960	200 **
Above 960	500

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

5. TEST RESULTS

TX – RADIATED FIELD 30 - 1000 MHZ	11
TX – SPURIOUS EMISSION 1 - 10 GHZ	14
TX – RANGE OF MODULATION BANDWIDTH	17

**TEST
1.****TX – RADIATED FIELD 30 - 1000 MHZ****REFERENCE
DOCUMENT**

FCC PART 15 subpart C

- **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. ESMI
Chase Antenna Mod. CBL 6111 A
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.209 + 15.231
of reference document
- **UNCERTAINTY OF MEASURE:** Combined uncertainty = ± 1.75 dB
Total uncertainty = $(k=2) \pm 3.5$ dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity :	25 - 75 %rH	40 $\pm$ 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 $\pm$ 50 mbar
Voltage :	internal lithium battery	6.0 Vdc

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

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SCAN TABLE : “Radiated Emission”

Unit: dB μ V/m

Detector : Mode:

Curve1: Max Peak ClearWrite

Curve2: Avg ClearWrite

Subrange:

Start Frequency: 30.0 MHz

Step Size: 80 kHz

Stop Frequency: 1000.0 MHz

IF Bandwidth: 120 kHz

Measure Time: 10 ms

Receiver: ESXI

Probe Transducer: CHASE_6111_PRC

Signal Path: Path 4

System Transducer: RFin2-CP1/X11

Scan Mode: Lin

Add. Transducer: W71.01

Tracking Gen.: Off

Input: 2 DC

Preamplifier: 10 dB

Demodulation: FM Broad

RF att.: Coupled

Volume: 0.0%

Ref. Level: -50 dBm

Squelch: --

Min. RF att.: 0 dBm

Option: None

Autorange: On

Curve 1: On

Repetition: Single

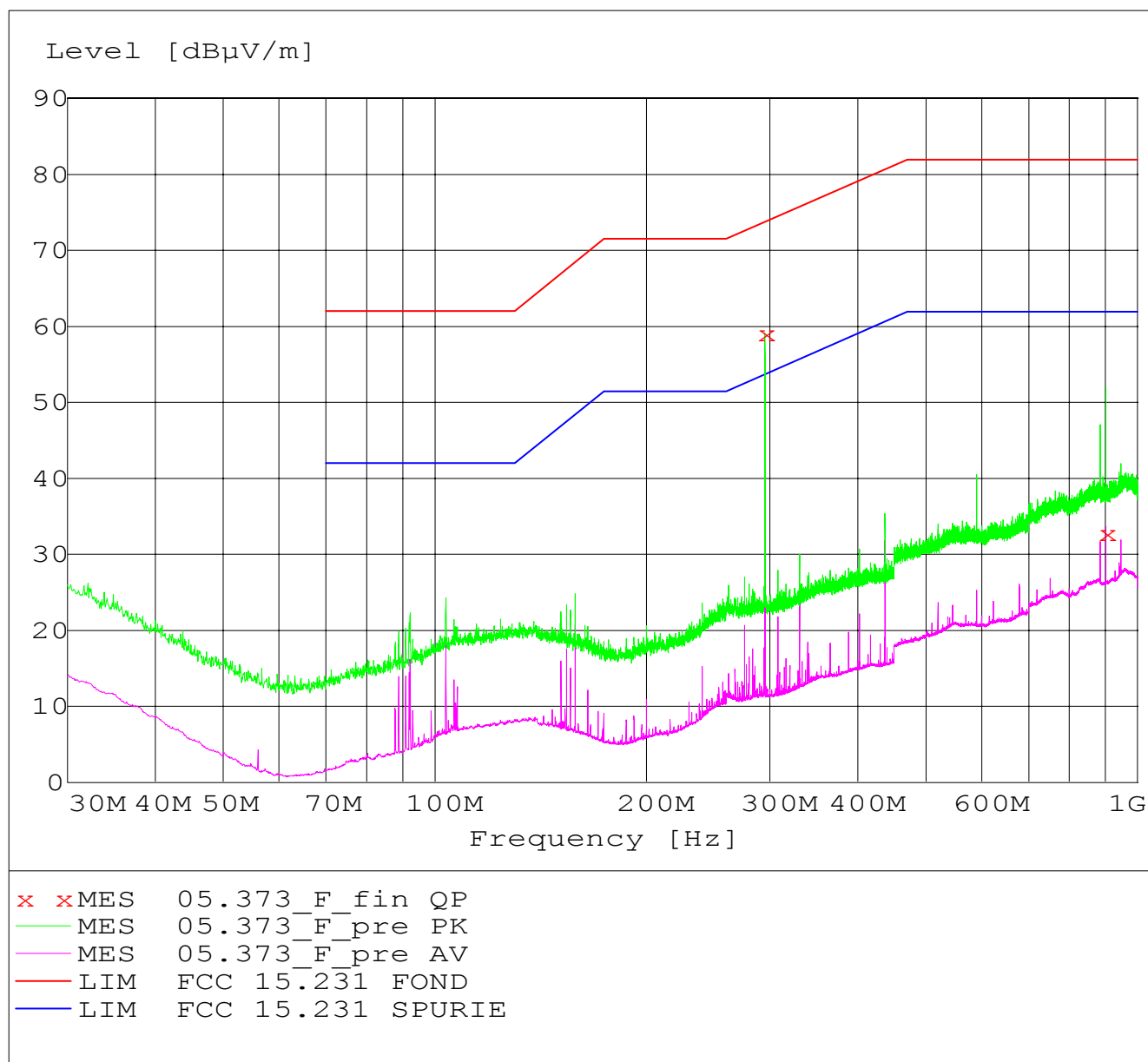
Curve 2: On

Stop Mark: On

Stop Message: On

Text: Connect antenna

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Measurement Results

Frequency MHz	Remark	Limits dB μ V/m	Measured QP level dB μ V/m	Measured level - Antenna Polarisation
295.04	Fundamental	74.33	59.10	HORIZONTAL
901.28	Spurious	54.33	32.80	HORIZONTAL

**TEST
2.****TX – SPURIOUS EMISSION 1 - 3 GHz****REFERENCE
DOCUMENT**

FCC PART 15 subpart C

- **TEST LOCATION:** Semi-anechoic chamber (CISPR 16-1 :1993)
Siemens+Matsushita type B84117-D6019-T232
Measure distance 3 meters
- **TEST EQUIPMENT USED FOR TEST:** Spectrum Analyzer Rohde & Schwarz Mod. FSP (9kHz-40GHz)
Log-periodica Broadband Antenna mod. HL025
- **TESTED PORT:** Enclosure
- **EMISSION LIMITS:** Acc. to Section 15.209 of reference document
- **FREQUENCY BAND :** Fundamental Frequency to 10th harmonics acc. to §15.33 (a)
- **UNCERTAINTY OF MEASURE:** Combined uncertainty = ± 1.75 dB
Total uncertainty = (k=2) ± 3.5 dB

TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 $\pm$ 3 °C
Ambient humidity :	25 - 75 %rH	40 $\pm$ 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 $\pm$ 50 mbar
Voltage :	internal lithium battery	6.0 Vdc

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

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SCAN TABLE : “Radiated Emission”

Unit: dB μ V/m

Detector : Mode:

Curve1: Max Peak ClearWrite

Curve2: -- ClearWrite

Subrange:

Start Frequency: 1000.0 MHz

Step Size: 600 kHz

Stop Frequency: 10000.0 MHz

Probe Transducer: HL025

Measure Time: 100 ms

IF Bandwidth: 1 MHz

Receiver: FSP

Signal Path: Path 4

System Transducer: RFin2-CP1/X11

Scan Mode: Lin

Add. Transducer: W71.01

Tracking Gen.: Off

Input: 1

Preamplifier: 0 dB

Demodulation: FM Broad

RF att.: Coupled

Volume: 0.0%

Ref. Level: -50 dBm

Squelch: --

Min. RF att.: 0 dBm

Option: None

Autorange: On

Curve 1: On

Repetition: Single

Curve 2: Off

Stop Mark: On

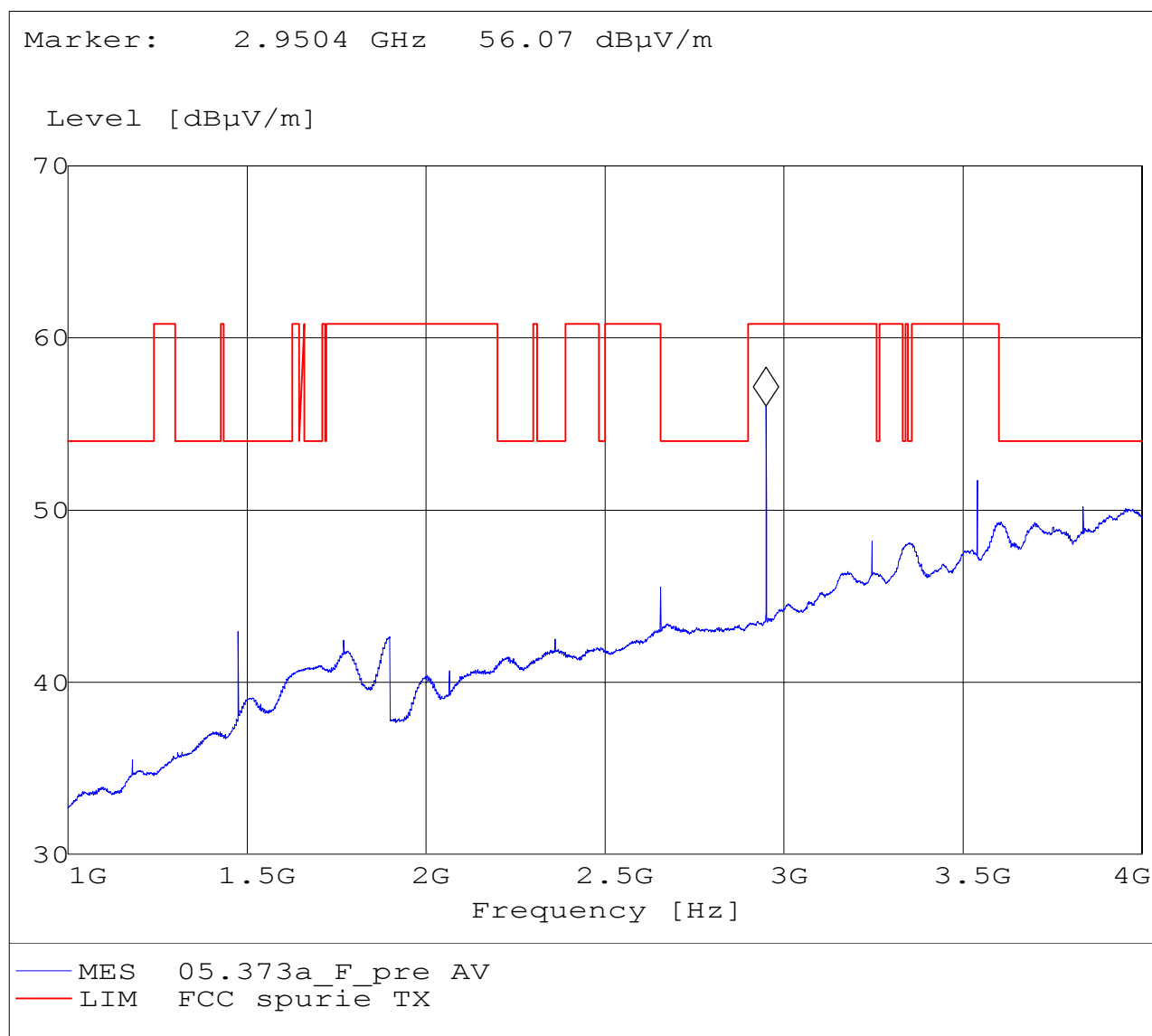
Stop Message: On

Text: Connect antenna

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Limit in acc. to provisions of §15.231 for frequency 295 MHz related to field strength of spurious emissions.
In addition to the limits over mentioned, in according to Section 15.205 for restricted bands, the limit applied is 54 dBµV/m

detector Trace : Average



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**TEST
3.****TX – RANGE OF MODULATION BANDWIDTH****REFERENCE
DOCUMENT**

FCC PART 15 subpart C

- **TEST LOCATION:** Control room
- **TEST EQUIPMENT USED FOR TEST:** Spectrum Analyzer Rohde & Schwarz Mod. FSP
- **TESTED PORT:** AC Mains, DC Port and Battery
- **EMISSION LIMITS:** Acc. to Section 15.215 c) of reference document

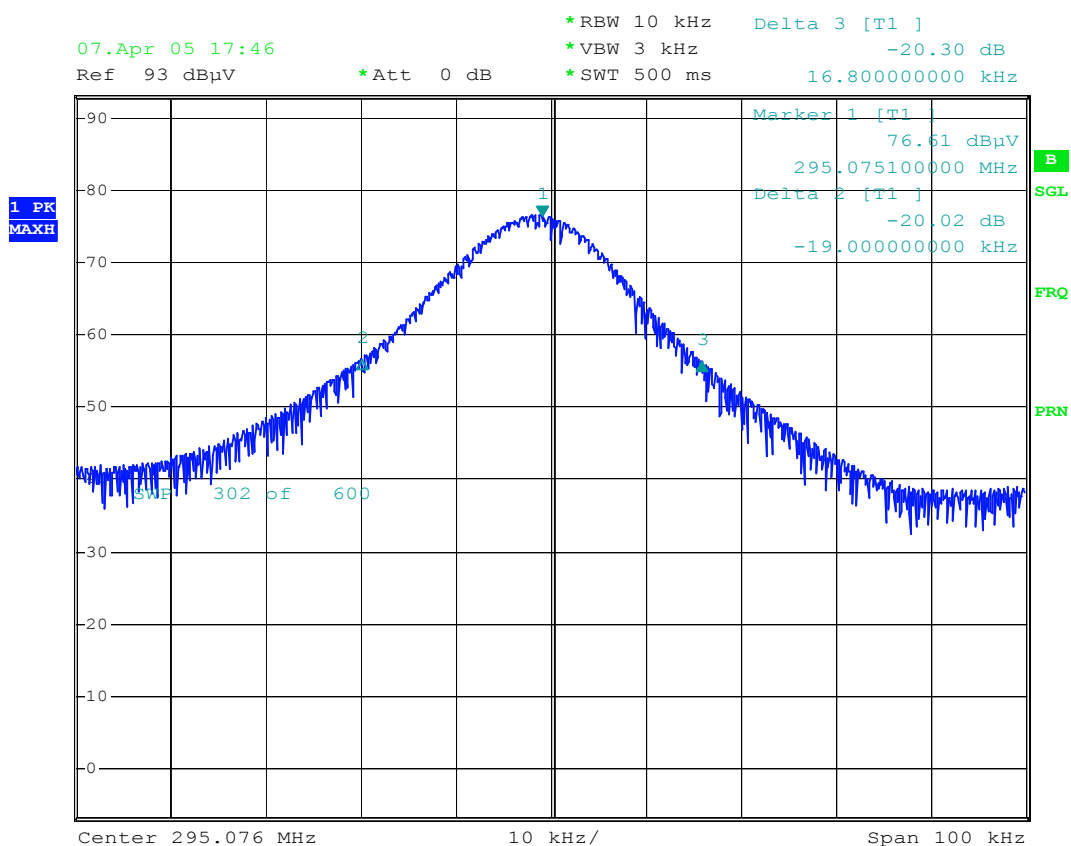
TEST CONDITIONS:		MEASURED
Ambient temperature :	15 - 35 °C	24 ± 3 °C
Ambient humidity :	25 - 75 %rH	40 ± 5 %rH
Pressure :	85 - 106 kPa (860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage :	internal lithium battery	6.0 Vdc

OPERATING CONDITION (Rif. Section. 2) : #1**RESULT: WITHIN THE LIMIT**

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MEASUREMENT RESULTS

TEST CONDITIONS		Occupied frequency range (at 20 dB point)		
		f _L [MHz]	F _C [MHz]	f _H [MHz]
T _{amb} : + 24 °C	V _{nom} : 6.0 Vdc	295.0919	295.0751	295.0561
Bandwidth =		35.8 kHz		
Incertezza di misura / Measurement Uncertainty : ± 0.1 kHz				
Legenda / Abbreviations : f _L : Lowest frequency at 20dB point F _C : Central frequency f _H : Highest frequency at 20dB point				



Date: 7.APR.2005 17:46:55

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LIMITS
<i>Permitted operating frequency range</i>
• For device operating above 70 MHz and below 900 MHz = 0.25% of the center frequency • For device operating above 900 MHz = 0.5% of the center frequency

6. EUT TECHNICAL DOCUMENTATION

6.1 Wiring diagrams

	<i>Document reference (n., edition, date, ...)</i>
WIRING DIAGRAM	See page 9 of Ref. Doc. TCF-085 issued on 22/04/2005
PART LIST	See page 11 of Ref. Doc. TCF-085 issued on 22/04/2005
TECHNICAL CONSTRUCTION FILE	TCF-085 issued on 24/04/2005 Rev.0

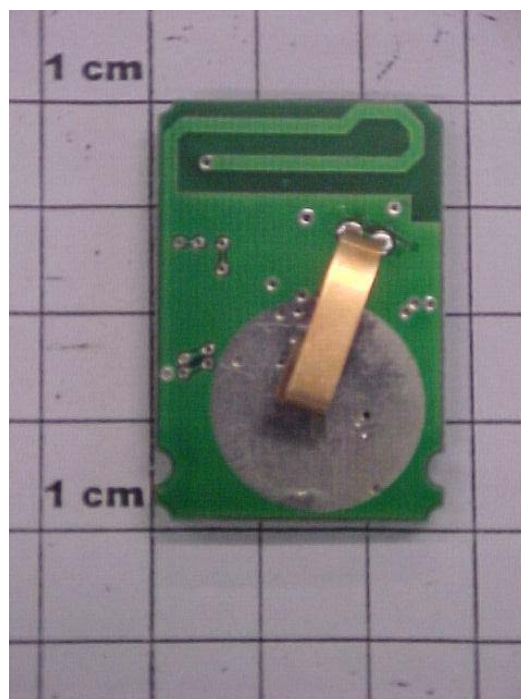
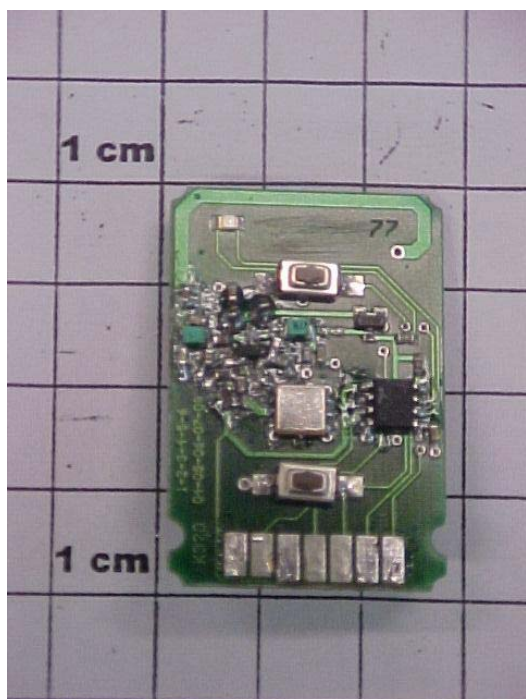
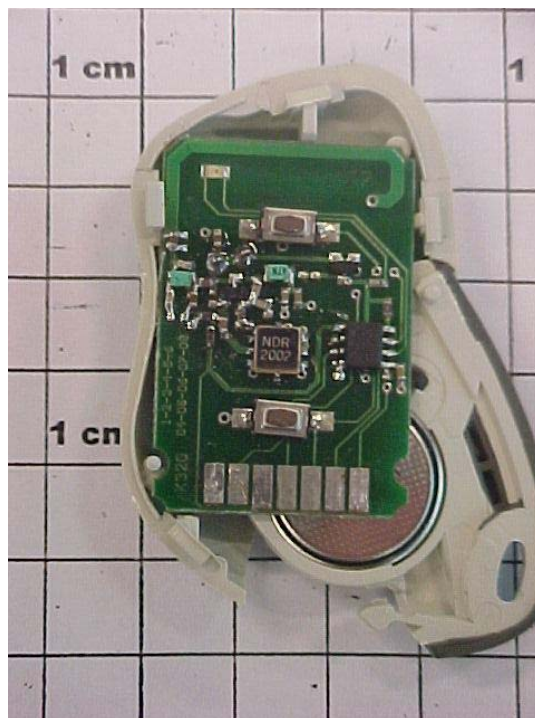
6.2 Technical manual

	<i>Document reference (n., edition, date, ...)</i>
Technical manual	TCF-085 issued on 24/04/2005 Rev.0 sheet no. 16

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6.3 Photographic documentation

PHOTO N° 1 – EQUIPMENT UNDER TEST IDENTIFICATION



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PHOTO N° 2 – SET-UP FOR EMISSION RADIATED TEST

