



CE MARKING

**ELECTROMAGNETIC COMPATIBILITY
ELECTRICAL SAFETY
LASER SPECTROSCOPY
ENVIRONMENTAL PHYSIC**



Organizzazione con Sistema
di Gestione certificato
Company with Management
System certified

ISO 9001:2008



G.S.D. Srl PISA - Italy	Test Report n. FCC-14414	Rev. 00
Manufacturer	CAEN RFID s.r.l.	
Address	Via Vetraia, 11 55049 Viareggio (LU) Italy	
Test Family Name	R1170IU	
Testing Laboratory Name	G.S.D. S.r.l.	
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	FCC Listed: Registration Number: 424037	
Location and Date of Issue	Pisa, 2014 July 25	

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1. MANUFACTURER AND EUT IDENTIFICATION¹

Manufacturer	CAEN RFID s.r.l..
Address	Via Vetraia, 11 55049 Viareggio (LU) Italy
Test Family Name	R1170IU
Date of reception	2014 January 23
Sampling	Laboratory sample for certification
Test Item Description	RFID Device
Nominal Input Voltage	5 Vdc (USB)
FCC ID	UVECAENRFID008

¹A detailed documentation is preserved in the internal fascicle.

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*Fig. 1.1
Equipment Photo*

2. REFERENCE STANDARDS

Tests and measurements are performed accordingly to the reference standards given in the table below:

TEST	STANDARD
Emissions: Radiated – Section 15.109	FCC Rules ad Regulations, Title 47 (2008) Part 15 – Sub part B ANSI C63.4 (2009) – 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
Emissions: Conducted – Section 15.107	FCC Rules ad Regulations, Title 47 (2008) Part 15 – Sub part B ANSI C63.4 (2009) – 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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3. TEST GENERALITY, RESULT, CONDITION, MEASUREMENT UNCERTAINTY

Sub-part 2.1033(b)

Test And Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts: 15.109; Unintentional Radiators

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing: In accordance with ANSI C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures.

All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

Summary of Test Results

TEST	RESULT
<i>Emissions: conducted Section 15.107</i>	<i>Pass</i>
<i>Emissions: radiated Section 15.109</i>	<i>Pass</i>

Measurement uncertainty

TEST	EXPANDED UNCERTAINTY
Conducted Emission – 50Ω/50µH (150 kHz - 30 MHz)	± 3.5 dB
Radiated Emission – (Semianechoic Room) (30 MHz - 18 GHz)	± 4.7 dB

Climatic Conditions

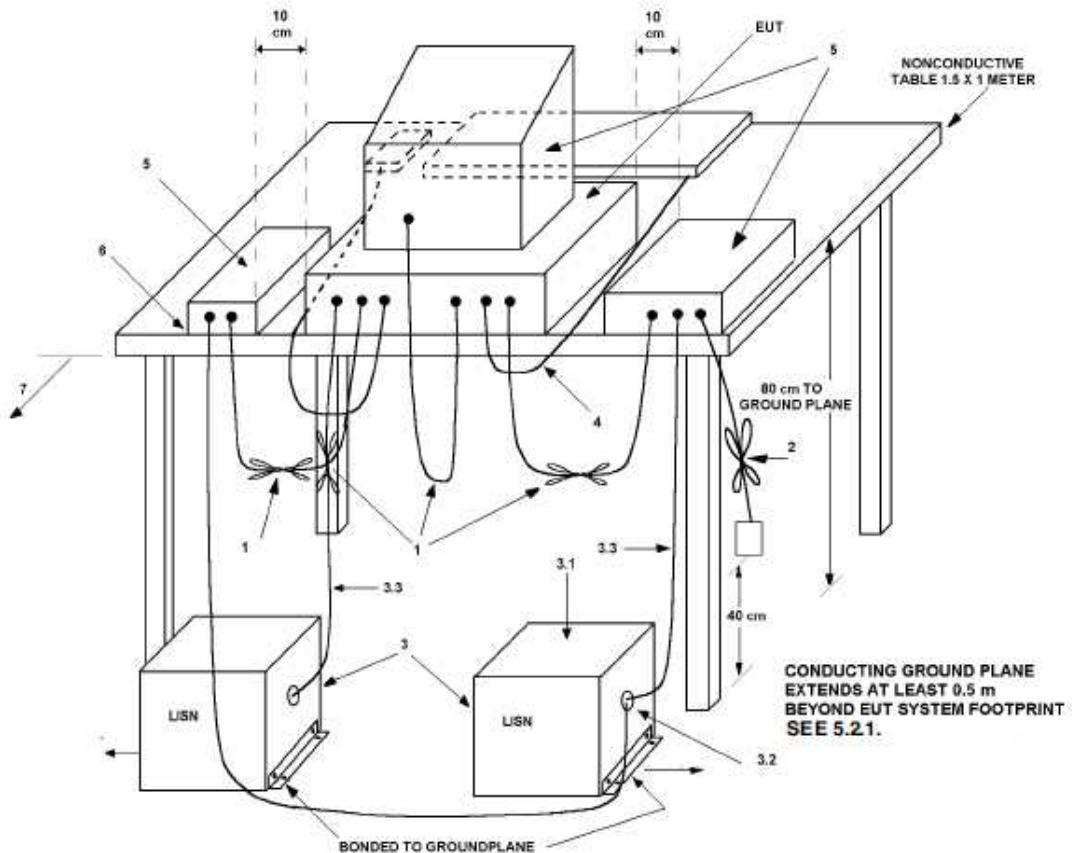
PARAMETER	VALUE
Temperature	(293 ± 3) K
Relative humidity	(50 ± 5) %

Extensions

The results refer only to the sampled EUT and under the specified conditions.

Modulations:

PR_ASK 40 kHz



Conducted and Radiated EUT Test Set-up example (ANSI C63.4 2009)

4. RADIATED EMISSIONS

In the following table you can find the limits established by the reference standard:

FREQUENCY RANGE (MHz)	Field Strength QUASI-PEAK LIMITS [dB (μ V/m)]
30 ÷ 88	40
88 ÷ 216	43,5
216 ÷ 960	46
Above 960	54

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
EMI Receiver	HP	HP8546A	01/2015
EMI Receiver Filter Section	HP	HP85460A	01/2015
Anechoic Chamber	Comtest	CSA01	01/2015
Bilog Antenna	Schaffner	CBL6112B	01/2015
Horn Antenna	EMCO	3115	01/2015
Controller	Deisel	HD100	01/2015
Turn Table	Deisel	MA240	01/2015
LISN	GSD	NTW06	01/2015

Test procedure: RE22R02

Notes

Azimuth position EUT-Antenna corresponding to 0° identifies the rotating table orientation (TT) in which the instrument to be tested shows the front part turned towards the antenna. Positive grades individuate clockwise rotations of TT when this one is observed from the top. For negative degrees, TT rotation is anticlockwise.

Antenna height respect to the mass plane is conventionally individuated with: MA=XXX where XXX indicates the height (always positive for e>100) expressed in cm.

Antenna horizontal polarisation is indicated by POL=H.

Antenna vertical polarisation is indicated by POL=V.

EUT was tested in the three orthogonal planes.

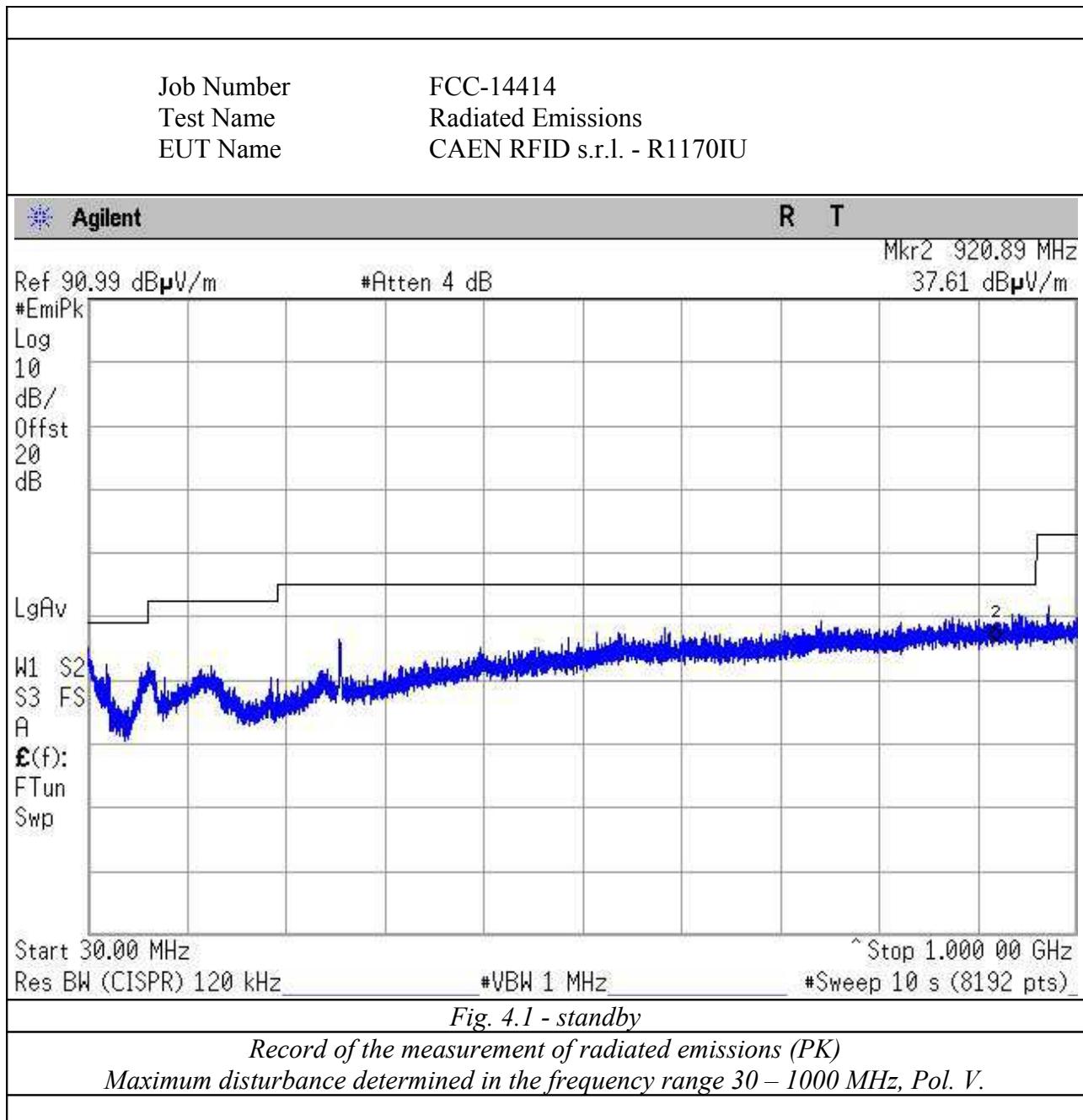
Results and conclusions

In all the operative conditions, equipment complied with the standard limits. Graphics in following figures show the most significant registrations of the performed measurements.

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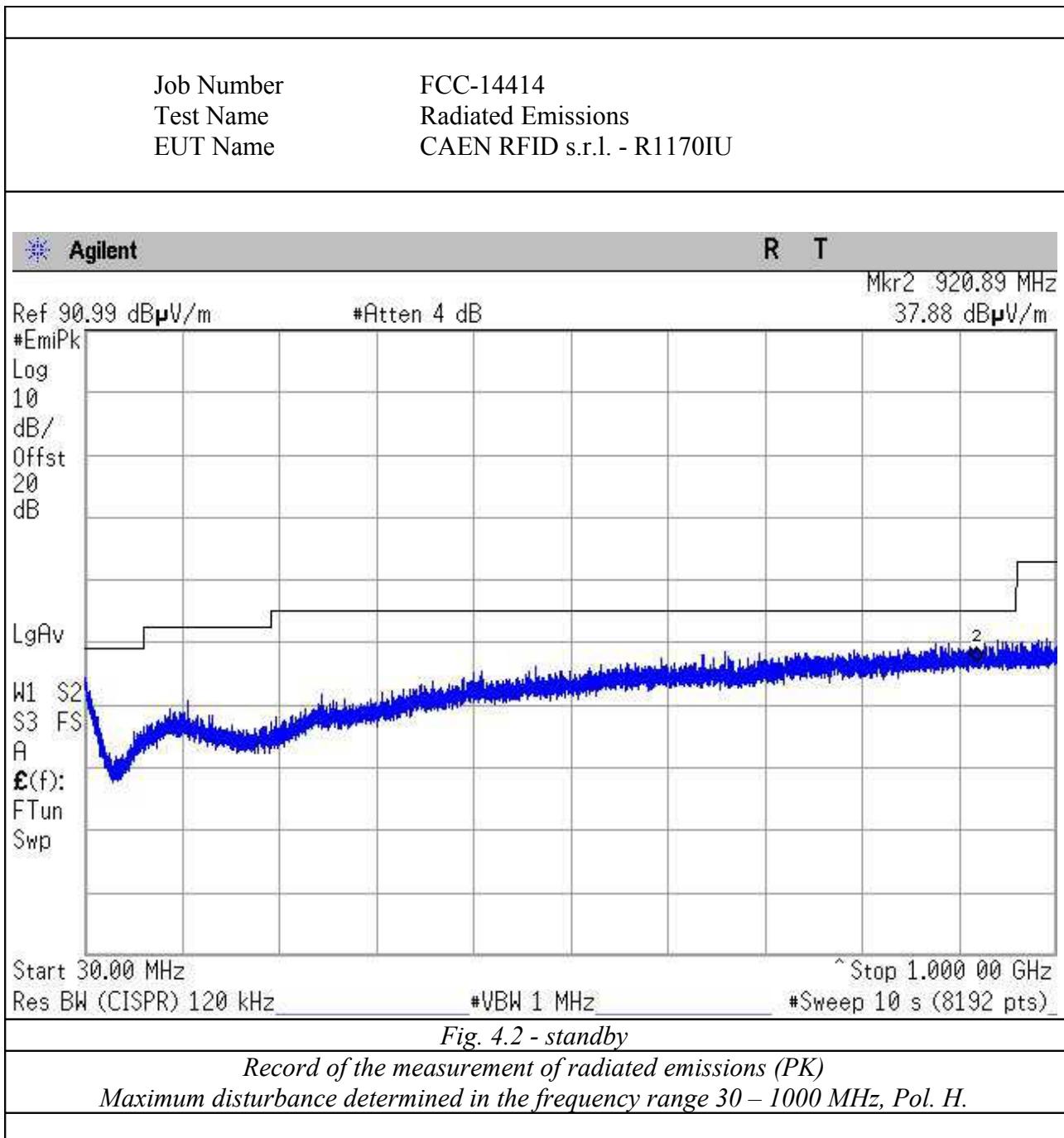
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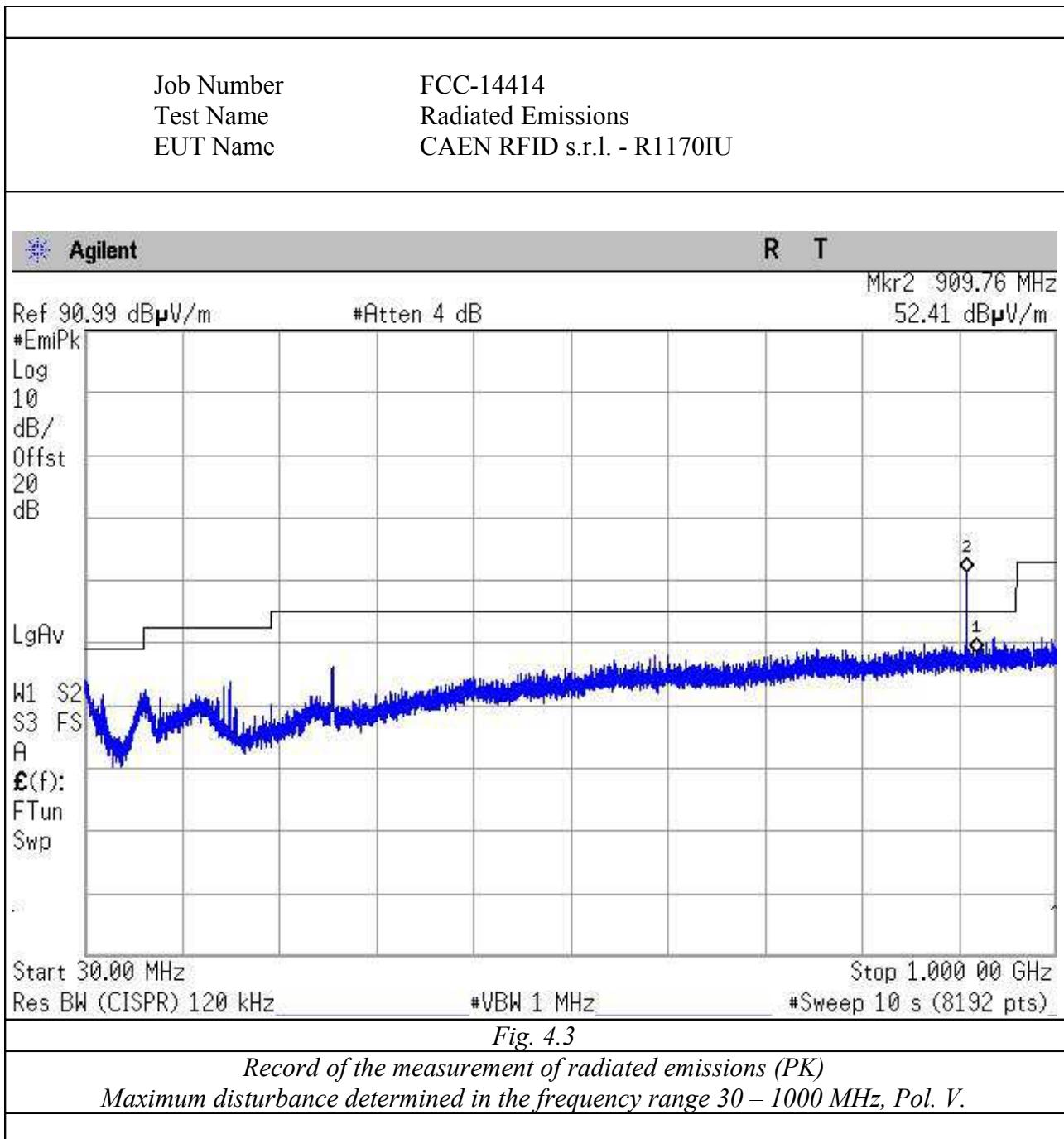
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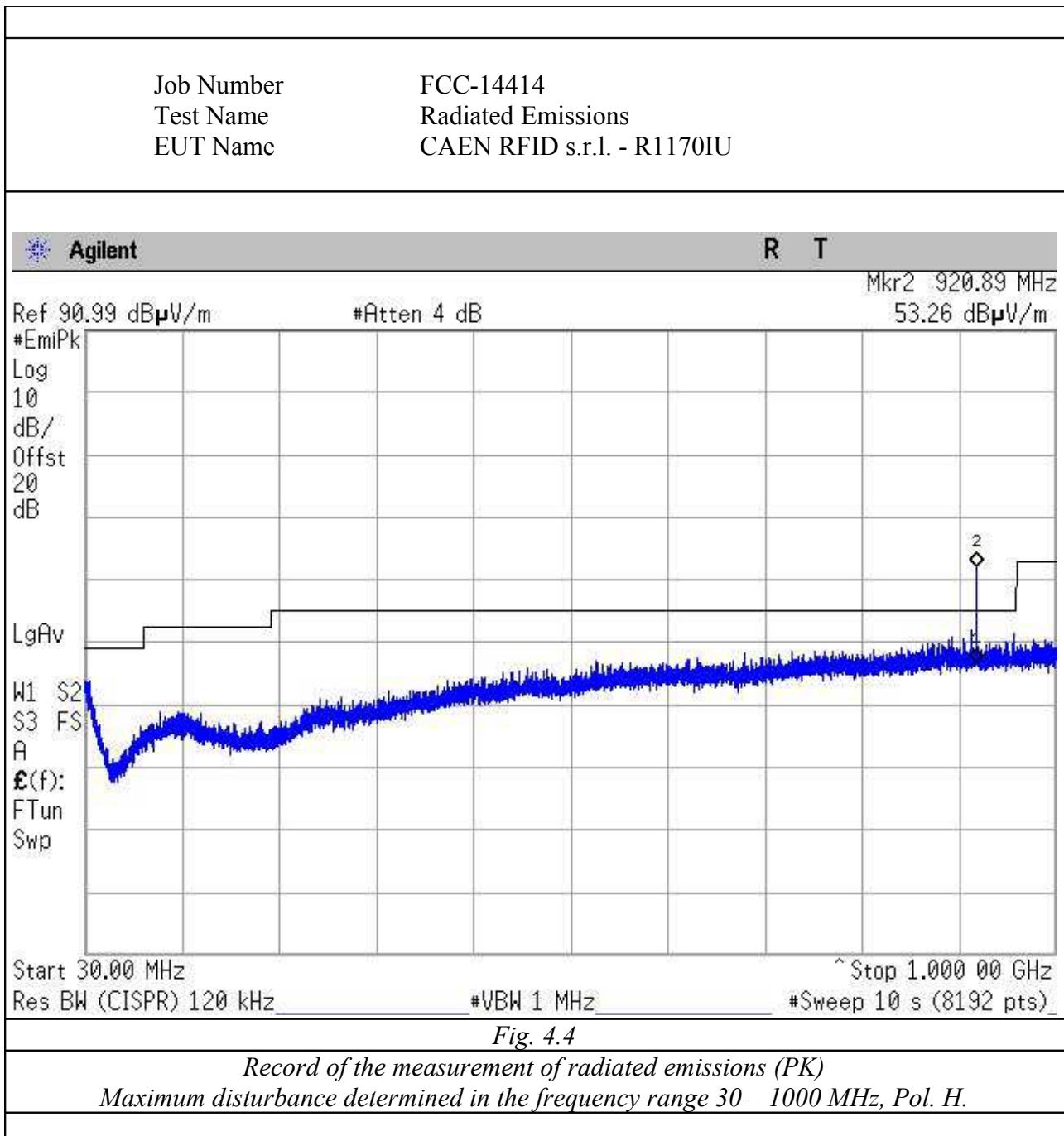
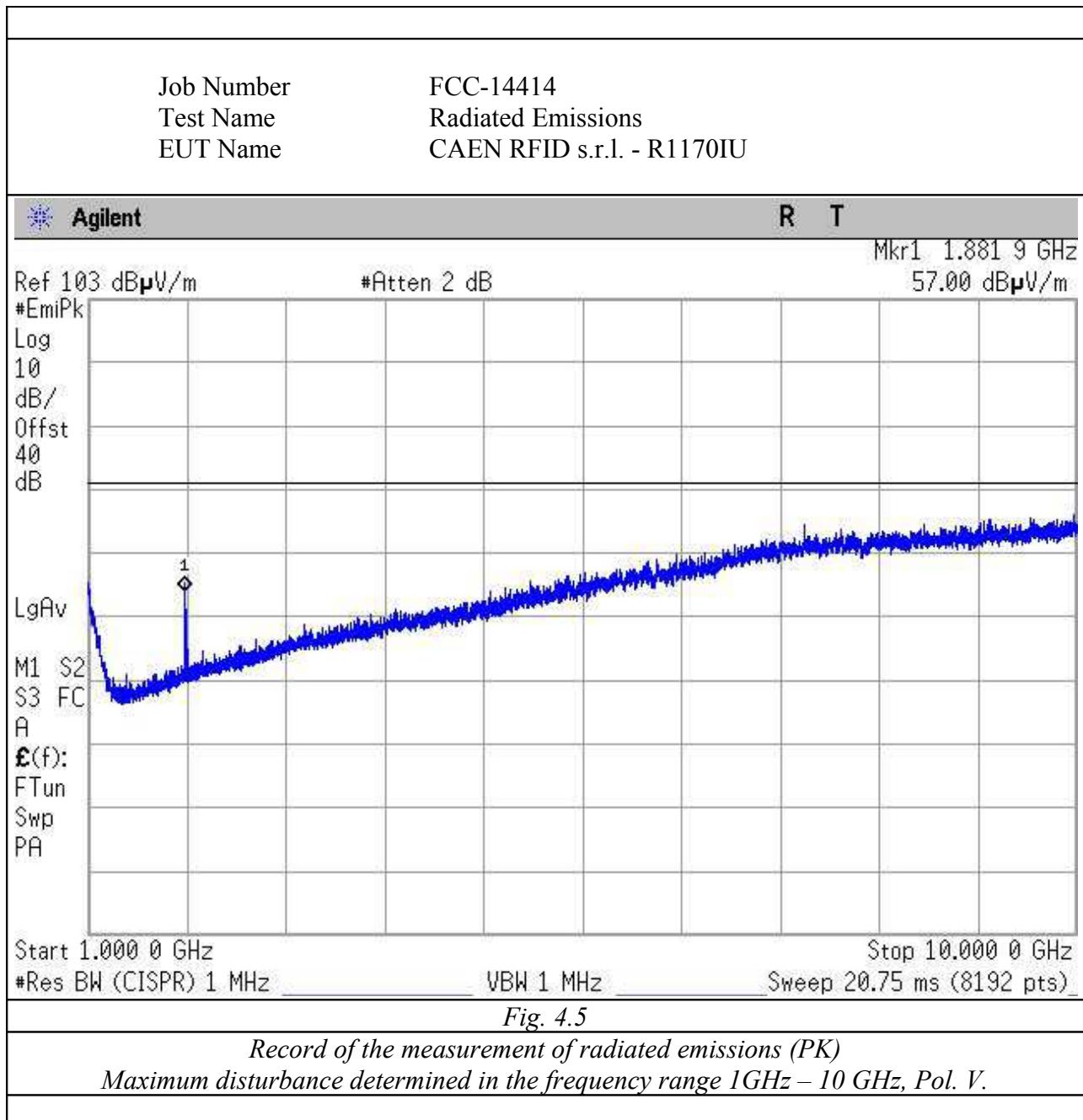
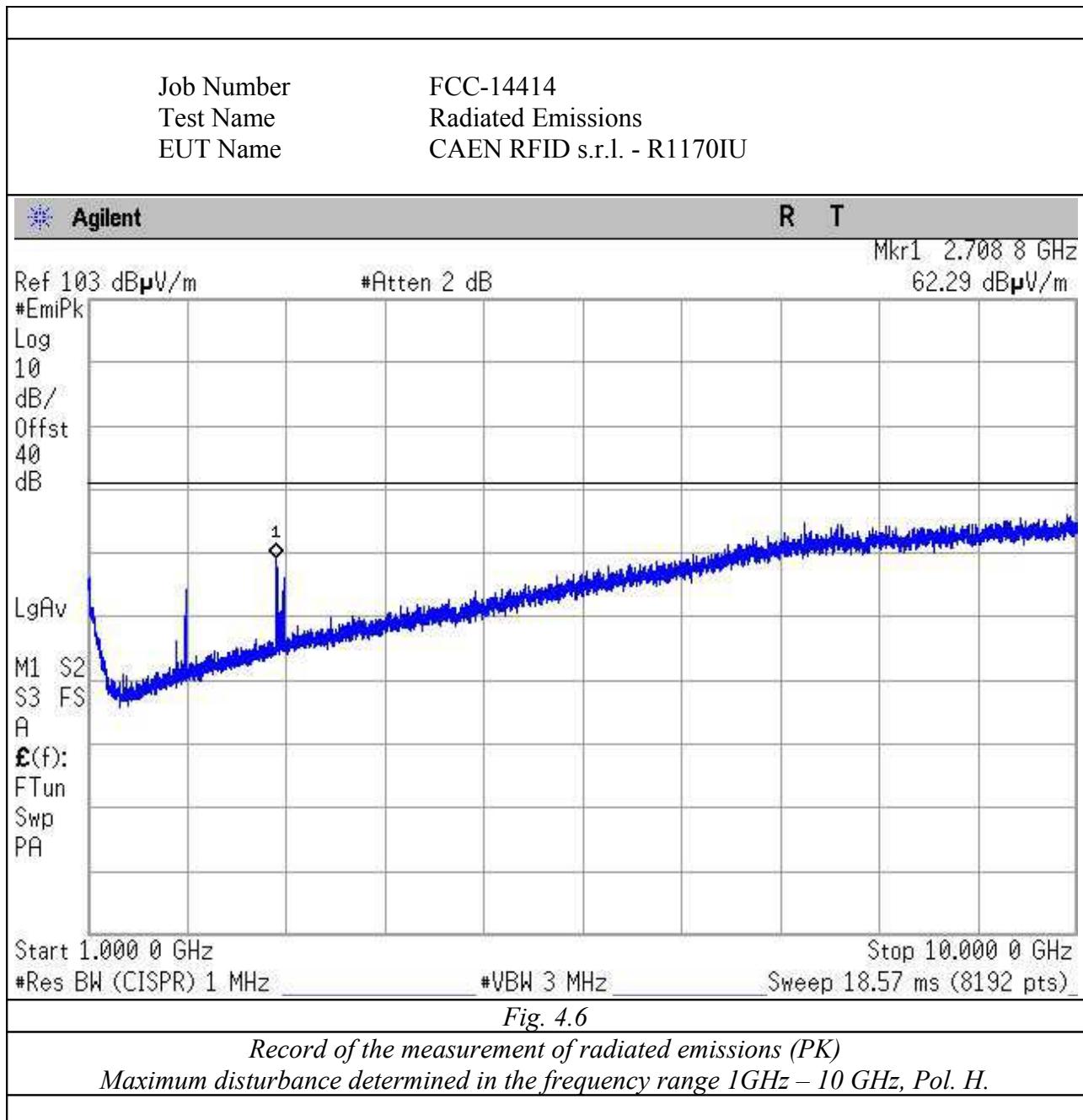
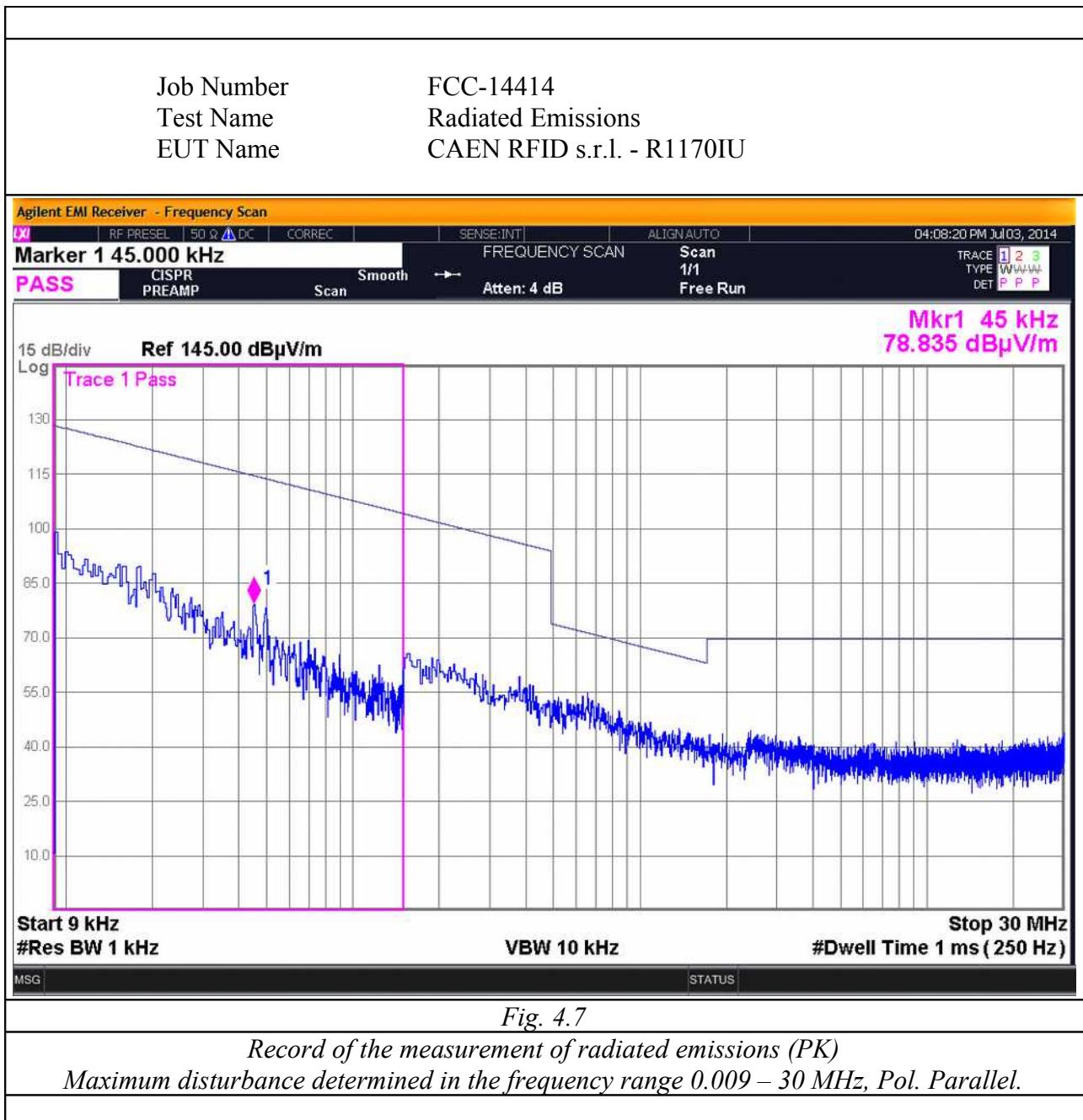


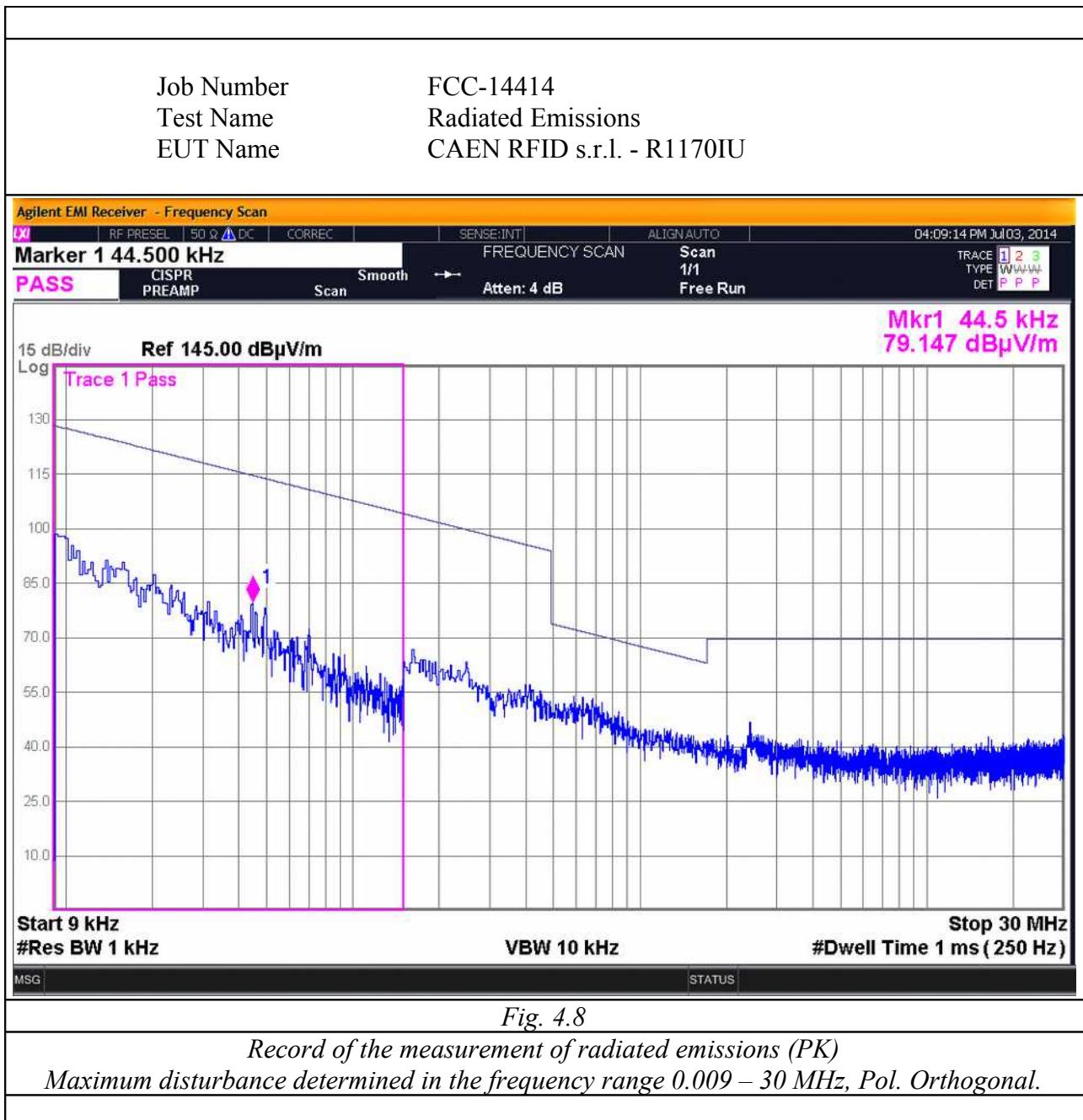
Fig. 4.4

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. H.









5. POWER LINES CONDUCTED EMISSIONS

Equipment shall meet the limits below when using a CISPR16 quasi-peak and average detector receivers.

FCC, 15.107

FREQUENCY RANGE (MHz)	QUASI-PEAK LIMIT [dB (μV)]	AVERAGE LIMIT [dB (μV)]
0.15 ÷ 0.50	66 ÷ 56 ^(*)	56 ÷ 46 ^(*)
0.50 ÷ 5	56	46
5 ÷ 30	60	50

^(*) Limit decreasing linearly with logarithm of frequency

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
EMI Receiver	HP	HP8546A	01/2015
EMI Receiver Filter Section	HP	HP85460A	01/2015
Screened Room	GSD	CSC01	01/2015
Transient Limiter	HP	11947A	01/2015
LISN	GSD	GSDA01	01/2015

Test procedure: CE22R01

The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a spectrum analyzer by a transient limiter. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits

Test method

Test method was in accordance with the reference standard.

EUT modes of operations were tested in order to achieve the maximum level of emission.

Results

Equipment complied with the test specification limits.

Graphics in following figures show some registrations of the frequency spectrum of the conducted emissions.

Job Number FCC-14414
 Test Name Powerline Conducted Emissions
 FCC 15.207
 EUT Name R1170IU

Agilent EMI Receiver - Frequency Scan

RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 11:32:29 AM Apr 05, 2014

Select Signal 2 FREQUENCY SCAN Scan 1/1 Free Run

FAIL CISPR Smooth Scan-Search-Meas Atten: 10 dB

TRACE 1 2 3 TYPE W W W W DET P P P

10 dB/div Log Ref 80.00 dB μ V Mkr1 168 kHz 52.026 dB μ V

Trace 1 Fail

Start 150 kHz Res BW 9 kHz VBW 90 kHz Stop 30 MHz #Dwell Time 100 μs (# 1 kHz)

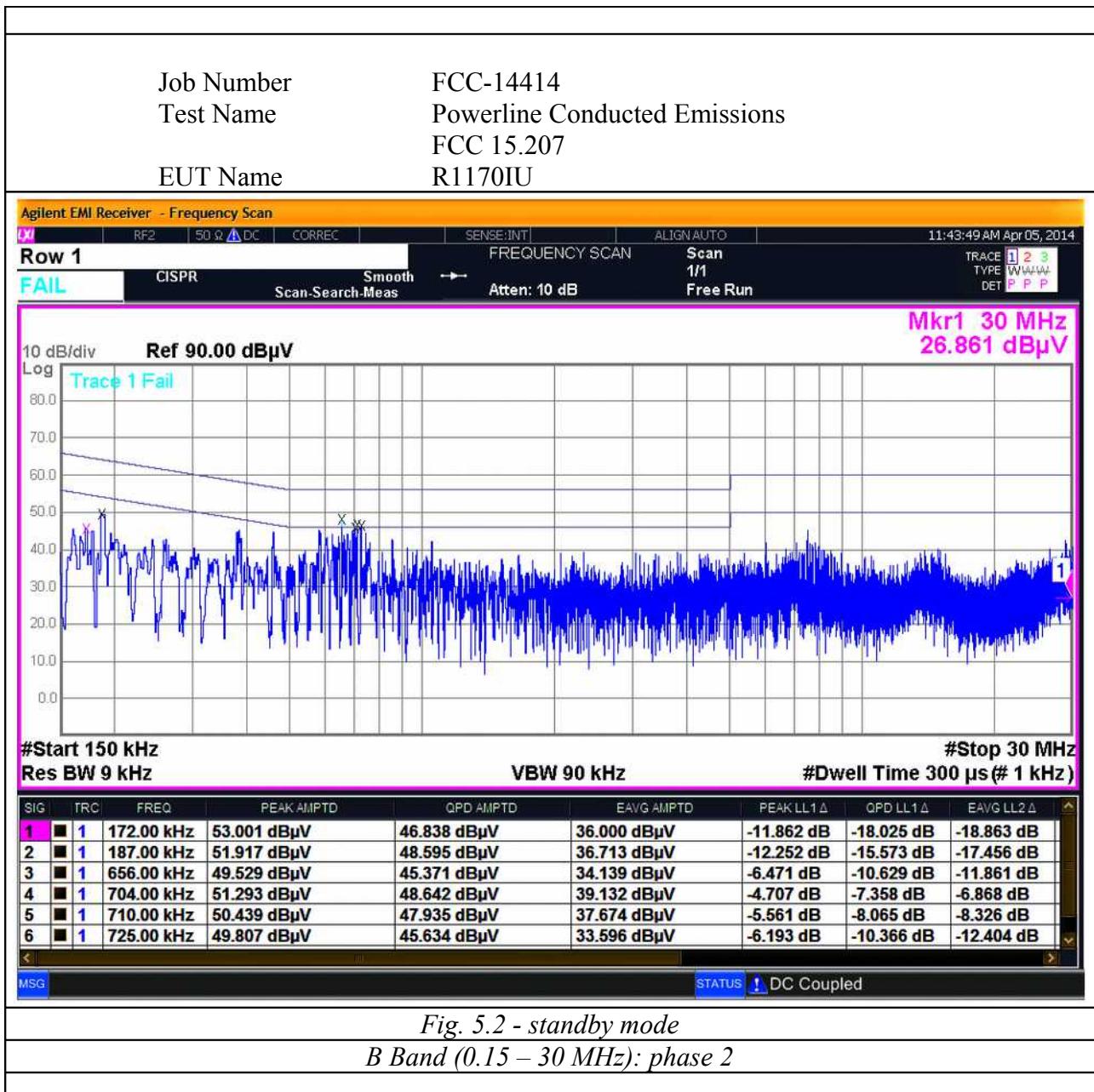
SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1Δ	QPD LL1Δ	EAVG LL1Δ
1	■ 1	641.00 kHz	52.519 dB μ V	49.392 dB μ V	34.159 dB μ V	-3.481 dB	-6.608 dB	-21.841 dB
2	■ 1	695.00 kHz	52.701 dB μ V	49.666 dB μ V	29.373 dB μ V	-3.299 dB	-6.334 dB	-26.627 dB
3	■ 1	889.00 kHz	49.462 dB μ V	45.315 dB μ V	28.047 dB μ V	-6.538 dB	-10.685 dB	-27.953 dB
4	■ 1	7.8730 MHz	53.811 dB μ V	47.650 dB μ V	32.302 dB μ V	-6.189 dB	-12.350 dB	-27.698 dB
5	■ 1	7.8810 MHz	53.944 dB μ V	47.436 dB μ V	32.054 dB μ V	-6.056 dB	-12.564 dB	-27.946 dB
6	■ 1	8.0690 MHz	52.959 dB μ V	46.213 dB μ V	31.024 dB μ V	-7.041 dB	-13.787 dB	-28.976 dB

MSG STATUS DC Coupled

Fig. 5.1
 B Band (0.15 – 30 MHz): phase 1

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6. PHOTO



*Fig. 6.1
Conducted Emissions Test Set-up*



*Fig. 6.2
Radiated Emissions Test Set-up (Electric Field)*



*Fig. 6.3
Radiated Emissions Test Set-up (Magnetic Field)*