

Radio Test Report: 99601930

Applicant: RFC Technology & Norms
5, rue du Chant des Oiseaux
78360 Montesson
France

Equipment Under Test: Remote Control for keyless entry of vehicles

FCC ID: N5FS0084A

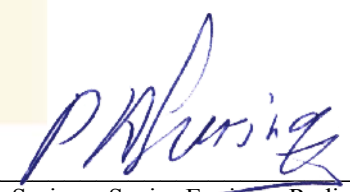
In Accordance With:

FCC Part 15, Subpart C, 15.231 (10-01-04 edition)
For low power transmitters operating periodically in the band
40.66 - 40.77 MHz and above 70 MHz

RSS-210, issue 5 (November 2001 edition)

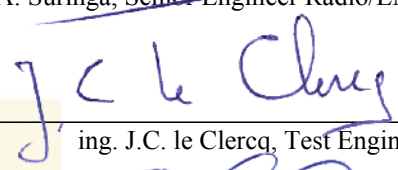
Tested By: Telefication bv
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

Test Engineer:



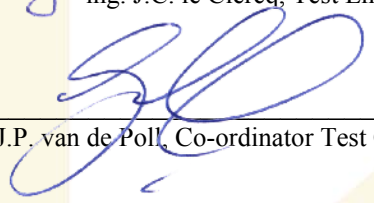
ing. P.A. Suringa, Senior Engineer Radio/EMC

Reviewed by:



ing. J.C. le Clercq, Test Engineer

Authorized by:



J.P. van de Poll, Co-ordinator Test Group

Date: 24 May 2005

Total Number of Pages: 21

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Table of Contents

Section 1. Summary of Test Results

- General
- Summary of Test Data

Section 2. Equipment Under Test

- General equipment information
- Description of E.U.T.
- Modifications incorporated in E.U.T.
- Theory of operation

Section 3. Transmission requirements

- Test results
- Test data
- Rationale for compliance

Section 4. RF on time in 100 msec.

- Graph

Section 5. Radiated emissions

- Test results
- Test data - radiated emissions
- Pre-scan data

Section 6. Occupied bandwidth

- Test results
- Test data
- Graphs

Section 7. Block diagrams

- Conducted emissions
- Radiated pre-scan
- Outdoor test site for radiated emissions
- Occupied bandwidth

Section 8 Test equipment list

Annex A - Restricted bands

Annex B- IC – FCC cross reference table

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 1. Summary of Test Results

Manufacturer: Valeo Securite Habitable

Model No.: S0084-A

Serial No.: --

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart B Paragraphs 15.107, 15.109 and Subpart C, Paragraph 15.231. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated emissions are made on an open area test site.

A description of the test facility is on file with the FCC (FCC listed 90828, IC listed 3501).



New Submission



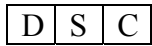
Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".



Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:1999. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie). The contents of this report, if reproduced, shall be copied in full, unless special consent in writing for reproduction in part is granted by Telefication. Copyright of this test report is reserved to Telefication.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Summary of Test Data

Name of test	Paragraph number	Results
Antenna requirement	15.203	N/A
External radio frequency power amplifiers and antenna modifications	15.204	N/A
Conducted emissions	15.207	N/A
Transmission requirements	15.231(a)	Complies
Radiated emissions	15.231(b)	Complies
Occupied bandwidth	15.231(c)	Complies
Frequency tolerance	15.231(d)	N/A
Periodic alternate field strength requirements	15.231(e)	N/A

Footnotes for N/A's:

§ 15.203 is not applicable because the transmitter is provided with an integral antenna.

§ 15.204 is not applicable because the transmitter is provided with an integral antenna.

§ 15.207 is not applicable because the transmitter is wireless.

§ 15.111 is not applicable because no terminals for external receiving antennas exist.

§ 15.231(d) has not been tested, because the Equipment Under Test does not operate within the frequency band 40.66-40.70 MHz.

§ 15.231(e) has not been tested, because the Equipment Under Test complies with § 15.231(a)

Test Conditions:

Indoor Temperature: 22 °C
 Humidity: 45 %

Outdoor Temperature: 17 °C
 Humidity: 24 %

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 2. Equipment under Test (E.U.T.)

General Equipment Information

Frequency range:	313.85 MHz
Operating frequency of sample:	313.85 MHz
Type of emission:	FSK
Emission designator:	130KF1DAN
Supply power:	Battery: 3.0 V _{dc}
Duty cycle calculation:	$\{(5 * 106.7 \mu\text{sec}) * 100 \text{ msec}\} / 100 \text{ msec} = 53.3 \%$

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Description of E.U.T.

The E.U.T. is a battery powered remote control transmitter for keyless entry of vehicles.

Modifications incorporated in E.U.T.

None.

Theory of operation

The E.U.T's antenna is integral; the modulation used is FSK and the operating frequency is 313.85 MHz.

The E.U.T. uses a combination of crystal and PLL for frequency generation.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 3. Transmission requirements

NAME OF TEST: Transmission requirements	PARA. NO.: 15.231(a)
TESTED BY: P.A. Suringa	DATE: 4 May 2005

- Minimum Standard:** 15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.
- 15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds after being released.
- 15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.
- 15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory 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.
- 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.

Test Results: Complies

Test Data: Compliance was determined by verification of technical specifications and a functional test on the equipment.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Rationale for compliance with transmission requirements

15.231(a) : complies

15.231(a)(1) : complies, deactivation within 5 seconds after release

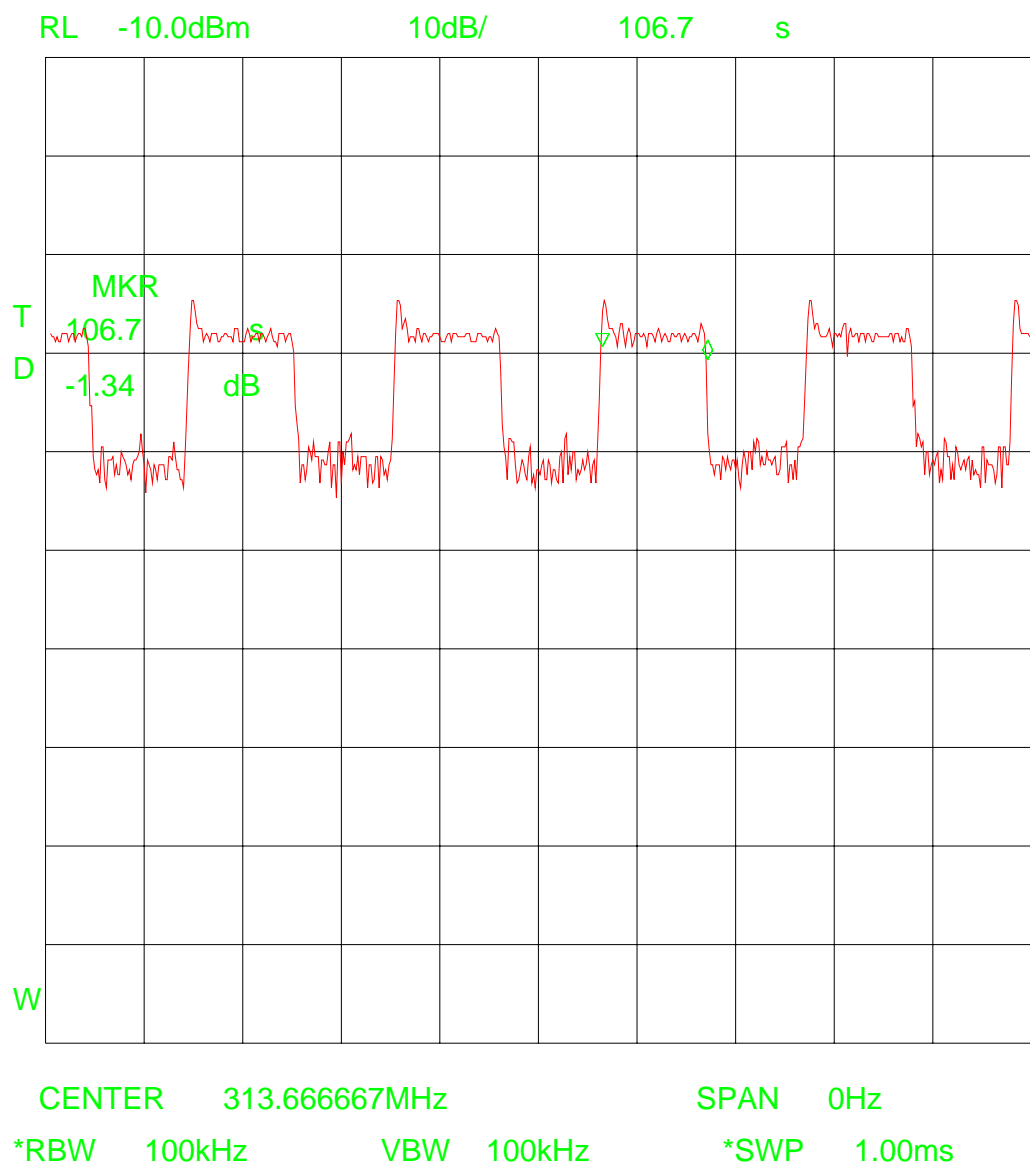
15.231(a)(2) : not applicable

15.231(a)(3) : not applicable

15.231(a)(4) : not applicable

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 4. RF on time in 100 msec



The RF on time in 100 msec. is: $5 \times 0.1067 \text{ msec} \times 100 \text{ msec} = 53.35 \text{ msec}$.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 5. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.231(b)
TESTED BY: P.A. Suringa	DATE: 4 May 2005

Minimum standard:

Permissible field strength limits (Momentarily operated devices)

Fundamental Frequency (MHz)	Field Strength of Fundamental Microvolts/Meter at 3 meters	Field Strength of Unwanted Emissions Microvolts/Meter at 3 meters
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750 [#]	125 to 375
174-260	3,750	375
260-470	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Notes:

Use quasi-peak or averaging meter.

[#]For 130 - 174 MHz: FS (microvolts/m) = (56.82 x F) - 6136

Linear interpolation with frequency F in MHz

*For 260 - 470 MHz: FS (microvolts/m) = (41.67 x F) - 7083

Any emissions that fall within the restricted bands of 15.205 shall not exceed the following limits:

Frequency (MHz)	Field Strength (μV/m @ 3m)	Field Strength (dBμV/m @ 3m)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test Data:

See attached graphs and table.

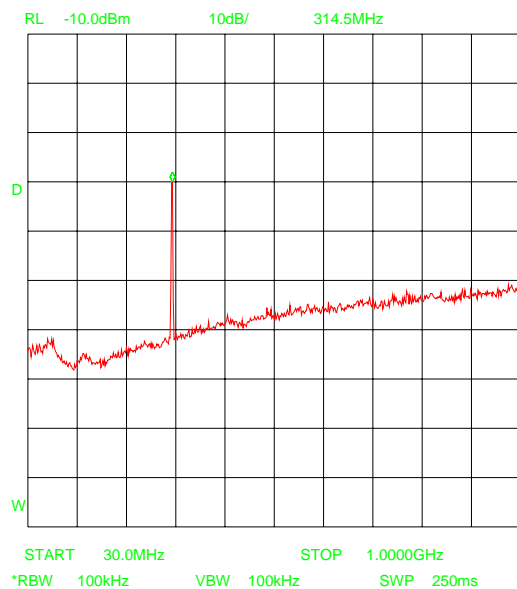
Above 1 GHz a spectrum analyzer and low noise amplifier are used to measure emission levels. The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidth was 1 MHz.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Test Data – Radiated Emissions

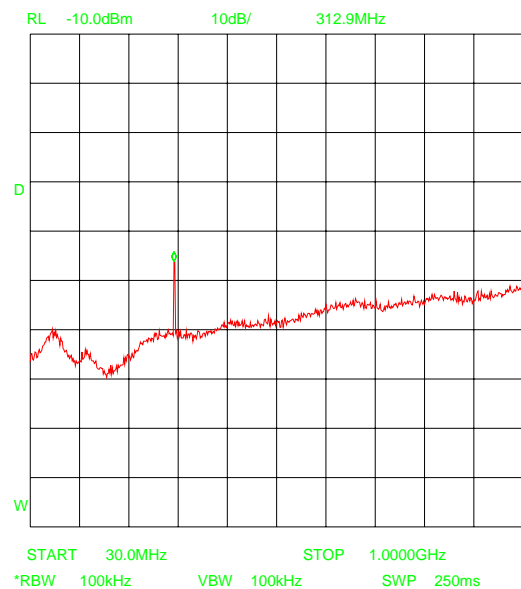
Pre scan graphs 30 MHz to 1 GHz

Horizontal polarization



Limit line: -55.5 dBm

Vertical polarization



Limit line: -55.5 dBm

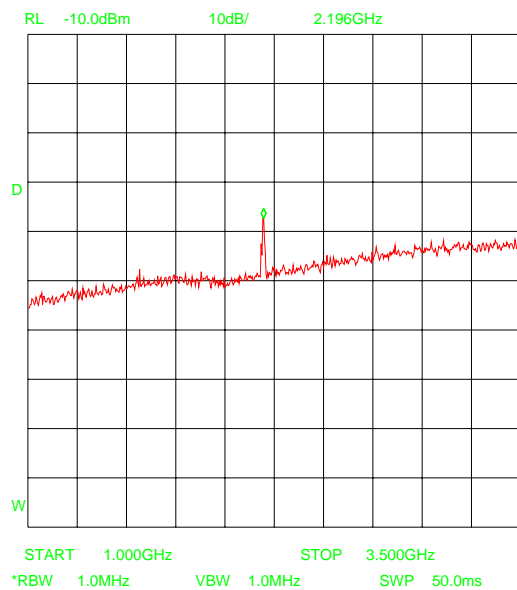
Note: units in dBm E.R.P.

The (worst case) limit in dB μ V/m at 3 meters has been converted to E.R.P., in terms of dBm, by subtracting 97.4 dB.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

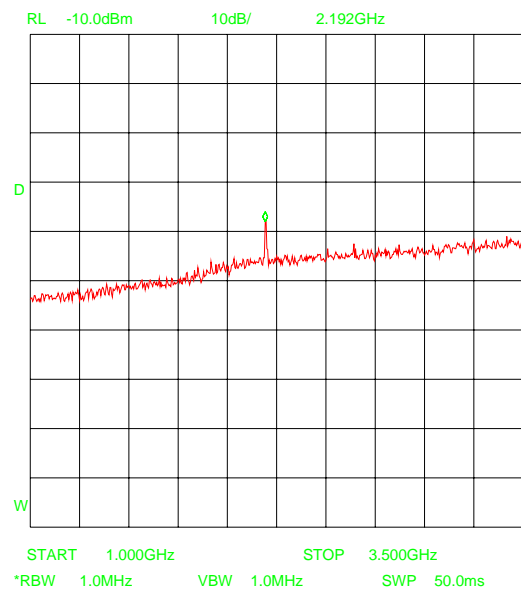
Graphs 1 GHz and above

Horizontal polarization



Limit line: -33.5 dBm

Vertical polarization



Limit line: -33.5 dBm

Note: units in dBm E.I.R.P.

The limit in dB μ V/m at 3 meters has been converted to E.I.R.P., in terms of dBm, by subtracting 95.4 dB.

Note: The sample was in continuous modulated transmitting mode.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Test Distance (meters) : 3		Range: 1-4 m		Receiver: R&S ESCS 30		RBW (kHz): 120		Detector: Quasi peak			
Freq. (MHz)	Ant.	Pol. (V/H)	Ant. HGT. (m)	Table (deg.)	RCVD Signal (dBμV)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
313.8	B/L	V	1-4	--			--	0	35.9	75.6	39.7
313.8	B/L	H	1-4	--			--	0	52.5	75.6	23.1
627.6	B/L	V	1-4					0	≤ 18.9	61.9	≥ 43.0
627.6	B/L	H	1-4					0	18.9	61.9	43.0
				Spectrum analyzer: HP 8563E		RBW (kHz): 1000			Field Strength (dBm)	Limit (dBm)	
1567	H	H	1.5					0	-59.5	-33.5	26.0
1567	H	V	1.5					0	≤ -62.8	-33.5	≥ 29.3
2192	H	H	1.5					0	-50.5	-33.5	17.0
2192	H	V	1.5					0	-50.8	-33.5	17.3
Notes: B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole * Re-measured using dipole antenna. ** Includes cable loss when amplifier is not used. *** Includes cable loss. () Denotes failing emission level.											

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 6. Occupied bandwidth

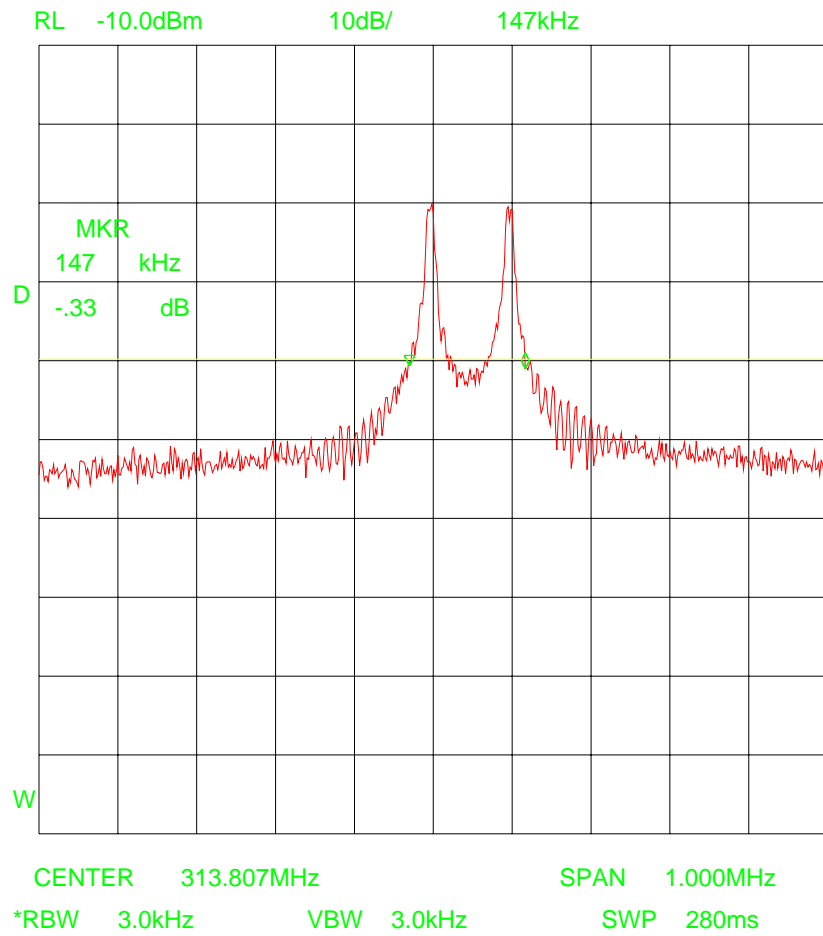
NAME OF TEST: Occupied bandwidth	PARA. NO.: 15.231(c)
TESTED BY: P.A. Suringa	DATE: 4 May 2005

Minimum Standard: 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.

Test Results: Complies.

Test Data: See graph.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

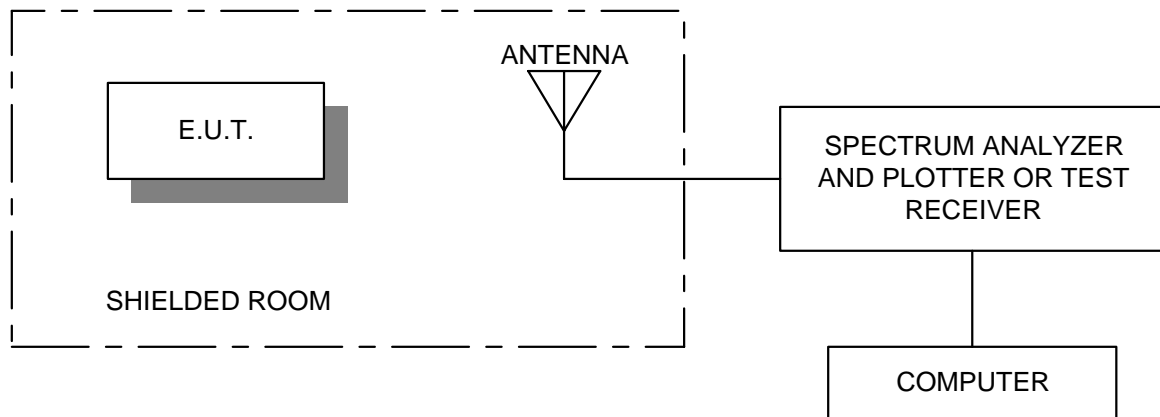


Measured bandwidth: 147 kHz

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

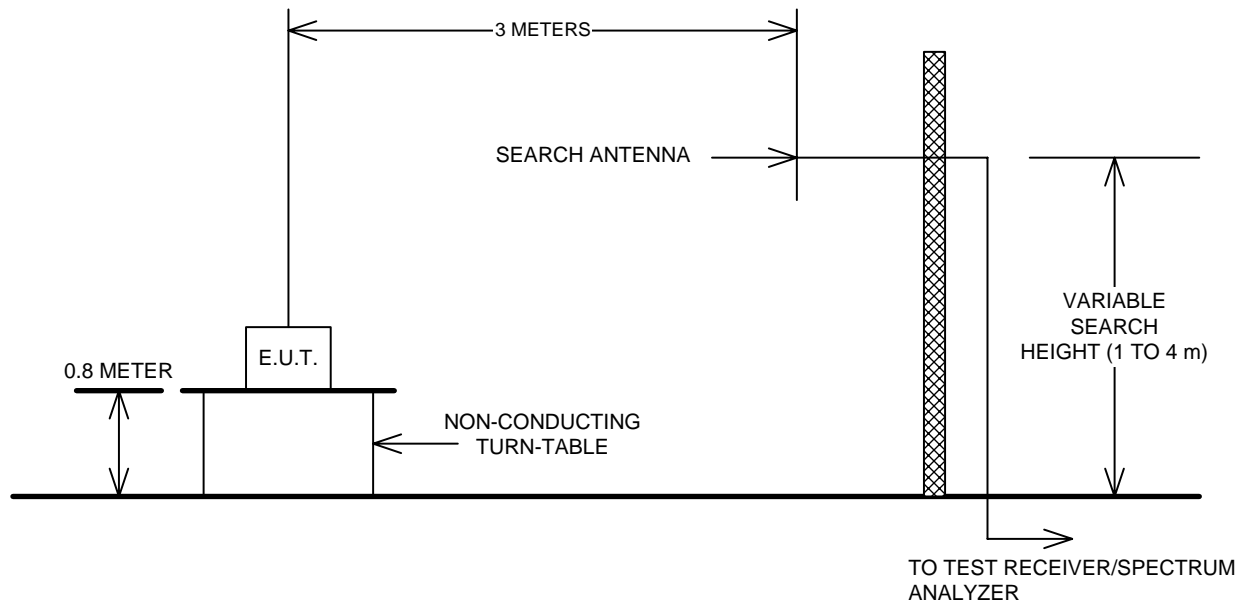
Section 7. Block Diagrams

Radiated Prescan



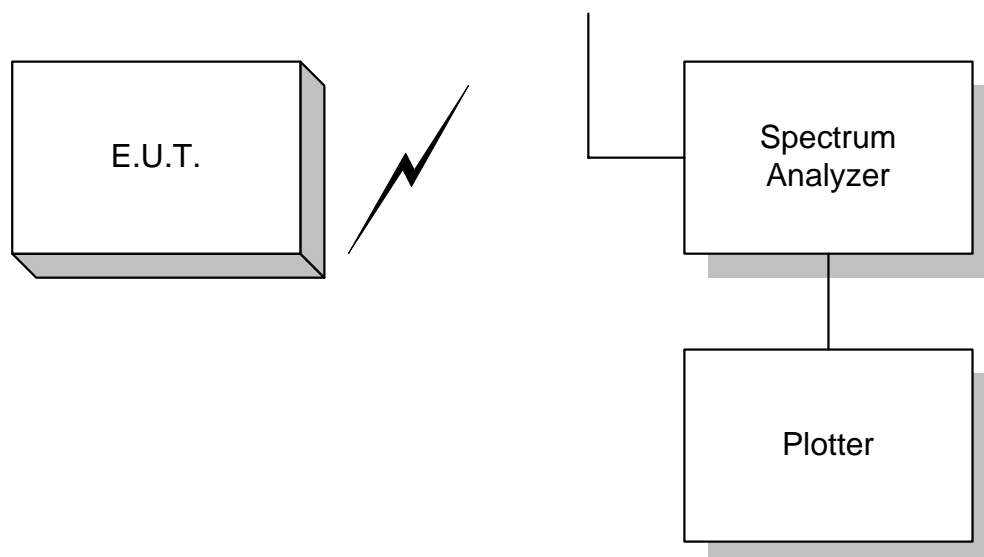
EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Outdoor Test Site For Radiated Emissions



The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

Occupied Bandwidth



EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section 9. Test Equipment List

Description	Manufacturer	Model	Identification	Used at
Anechoic chamber	Euroshield	RFD-F-100	--	15.205, 15.231
Open Area Test Site	Comtest	TNO EPS	13886	15.205, 15.231
Spectrum analyzer	Hewlett Packard	8563E	TE 00481	15.111, 15.205, 15.231
Test receiver	Rohde & Schwarz	ESVP	TE 00091	15.231
Test receiver	Rohde & Schwarz	ESCS 30	S/n 15667	15.205, 15.231
Biconilog antenna	EMCO	3143	TE 00744	15.205, 15.231
Biconilog antenna	Chase	CBL6111B	S/n 15633	15.205, 15.231
Double ridged guide horn antenna	EMCO	3115	TE 00531	15.205, 15.231
Pre-amplifier	Hewlett Packard	8449B	TE 00092	15.111, 15.205, 15.231
Pre-amplifier	Rohde & Schwarz	ESV-Z3	TE 00098	15.111, 15.205, 15.231

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

ANNEX A

RESTRICTED BANDS

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section A Restricted bands of operation

NAME OF TEST: restricted bands of operation	PARA. NO.: 15.205
TESTED BY: P.A. Suringa	DATE: 4 May 2005

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.49 - 0.51	16.69475-16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425-16.80475	960-1240	7.25-7.75
3.020 - 3.026	25.5-25.67	1300-1427	8.025-8.5
4.125 - 4.128	37.5-38.25	1435-1626.6	9.0-9.2
4.17725 - 4.17775	73-74.6	1645.5-1646.5	9.3-9.5
4.20725 - 4.20775	74.8-75.2	1660-1710	10.6-12.7
6.215 - 6.218	108-121.94	1718.8-1722.2	13.25-13.4
6.31175 - 6.31225	123-138	2220-2300	14.47-14.5
8.291 - 8.294	149.9-150.05	2310-2390	15.35-16.2
8.362 - 8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625 - 8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425 - 8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29 - 12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975 - 12.52025	240-285	3345.8-3358	36.43-36.5
12.57675 - 12.57725	322-335.4	3600-4400	Above 38.6
13.36 - 13.41			

No signals in the restricted bands emitted by the transmitter have been found.

No signals in the restricted bands emitted by the receiver have been found.

EQUIPMENT: Remote Control for keyless entry of vehicles
FCC ID: N5FS0084A

Section B IC - FCC cross reference table

Cross reference table

Transmitter		
CNR RSS-210 Issue 5		FCC 47 CFR Ch. 1 part 15, subpart C (10-1-04 Edition)
par. 6.1.1 (a)		§ 15.231 (a)
Par. 6.1.1 (b)		§ 15.231 (b)
par. 6.1.1 (c)		§ 15.231 (c)
par. 6.1.1 (d)		§ 15.231 (d)
Par. 6.1.1 (e)		§ 15.231 (e)
Par. 6.1.1 (f)	Par. 6.3	§ 15.205
	Par. 6.4	§ 15.231 (d)
	Par. 6.5	§ 15.35 (b), (c)
	Par. 6.6	§ 15.207

Category I non - scanning receiver		
CNR RSS-210 Issue 5		FCC 47 CFR Ch. 1 part 15 subpart B (10-1-04 Edition)
Par. 7.2		§ 15.111 (a)
Par. 7.3		§ 15.109
Par. 7.4		§ 15.107