

Radio test report 20082595301 - rev 1.0

based on:
FCC part 15 subpart C, section 15.245
FCC part 15 subpart B, section 15.109
(10-1-07 edition)

Automotive intrusion sensor
VOLVO
MMS

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This report comprises of four modules. The total number of pages is: 14

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication B.V.
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:2005. 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 test 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.

Ordering party:

Company name	:	Cobra AT
Address	:	Via Astico 41
Zipcode	:	21100
City/town	:	Varese
Country	:	Italy
Date of order	:	23 May 2008

2 Product

A sample of the following product was submitted for testing:

Product description	: Automotive intrusion sensor
Manufacturer	: Cobra AT
Trade mark	: VOLVO
Type designation	: MMS
FCC ID	: NWD5481
Hardware version	: 6-1-004
Serial number	: 195674
Software release	: TO1D

3 Test schedule

Tests are carried out in accordance with the specification detailed in section 7 “Summary” of this report.

Tests are carried out at the following location:

- Telefication, Zevenaar

The samples of the product were received on:

- 11 April 2008

Tests are carried out between:

- 14 April and 18 July 2008

4 Product documentation

For production of this report the following product documentation was used:

Description:	Date:	Identification:
Spec tender, V 0, rev. 1	17-03-2008	MW sensor 5481

The above-mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this test report.

5 Observations and comments

The sample operates according to the Doppler principle for motion detection in a vehicle compartment.

Following this principle, emissions of both the transmitter and receiver parts are not separately measurable.

6 Modifications to the sample

No modifications were made to the sample.

7 Summary

The product is intended for use in the following application area(s):

INTENTIONAL RADIATOR IN THE FREQUENCY BAND 5785 - 5815 MHz (FIELD DISTURBANCE SENSOR)

The sample is tested according to the following specification(s):

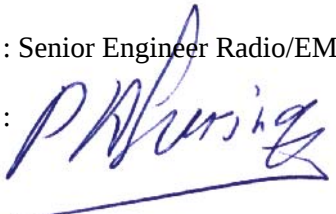
FCC part 15 subpart C, section 15.245
FCC part 15 subpart B, section 15.109
(10-1-07 edition)

8 Conclusions

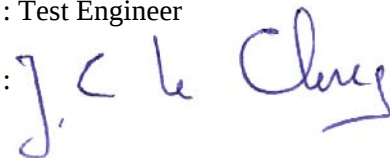
The sample of the product showed **NO NON-COMPLIANCES** to the specifications stated in section 7 of this report.

The results of the tests as stated in this report, are exclusively applicable to the product item as identified in this report. Telefication accepts no responsibility for any stated properties of product items in this test report, which are not supported by the tests as specified in section 7 “Summary”.

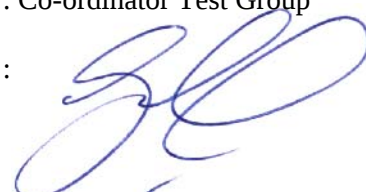
All tests are performed by:

name : ing. P.A. Suringa
function : Senior Engineer Radio/EMC
signature : 

Review of test report by:

name : ing. J.C. le Clercq
function : Test Engineer
signature : 

The above conclusions have been verified by the following signatory:

date : 23 September 2008
name : J.P. van de Poll
function : Co-ordinator Test Group
signature : 

Test results module

1 Emission tests

1.1 Field strength of intentional signal

Compliance standard : FCC part 15, subpart C, section 15.245 (b)

Method of test : ANSI C63.4-2003, section 13.2

Test result :

Test conditions				Transmitter output power (μW) eirp		
				-- MHz	5800 MHz	-- MHz
T nom.	25 °C	V nom.	12 V	--	21.4	--
Measurement uncertainty				+1.6 / -1.9 dB		

Note: Only peak power was measured. The formula for conversion from power to field strength is:
 $FS \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} + 95.2 \text{ dB.}$

The field strength FS is $10 \log (0.0214) + 95.2 = 78.5 \text{ dB}\mu\text{V/m.}$

Limit	114 dBμV/m @ 3 meter distance
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Test equipment:

Test equipment used: (Item numbers)	4, 5, 41, 43, 46
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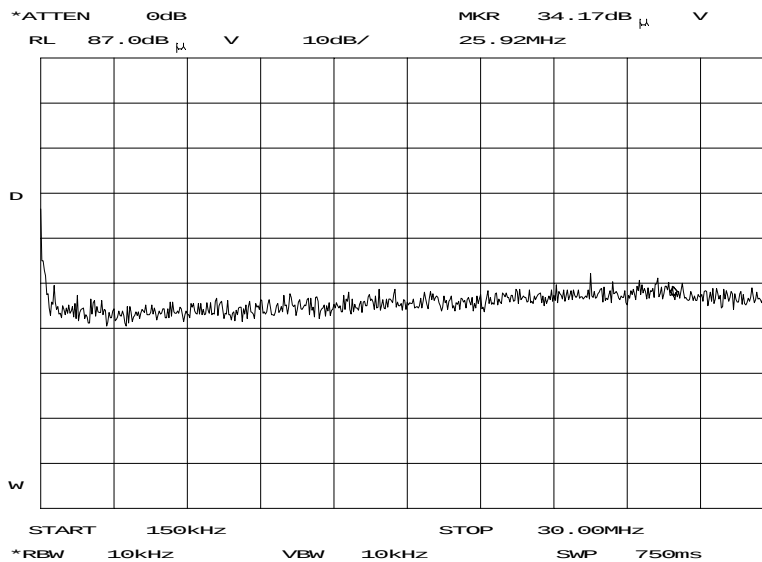
1.2 Field strength of unwanted emissions 150 kHz – 30 MHz

Compliance standard : FCC part 15, subpart C, section 15.245 (b) (1) (iii)

Method of test : ANSI C63.4-2003, sections 8.2.2, & 8.3.1.1;
FCC part 15, subpart A, sections 15.33, 15.35.

Test results :

Exploratory measurements of unwanted emissions 150 kHz - 30 MHz



pre-scan data 150 kHz - 30 MHz (note that the level units correspond to a measuring distance of 3 metres)

No unwanted emissions in the frequency range 150 - 30 MHz were detected during the exploratory measurements. Accordingly, final measurements were judged unnecessary.

Measurement uncertainty: N/A

Test equipment:

Test equipment used: (Item numbers)	1, 3, 41, 45, 46, 47, 48, 49
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No unwanted emissions in the frequency range 30 - 1000 MHz were detected during the exploratory measurements. Accordingly, measurements on an Open Area Test Site were judged unnecessary.

Measurement uncertainty: N/A

Test equipment:

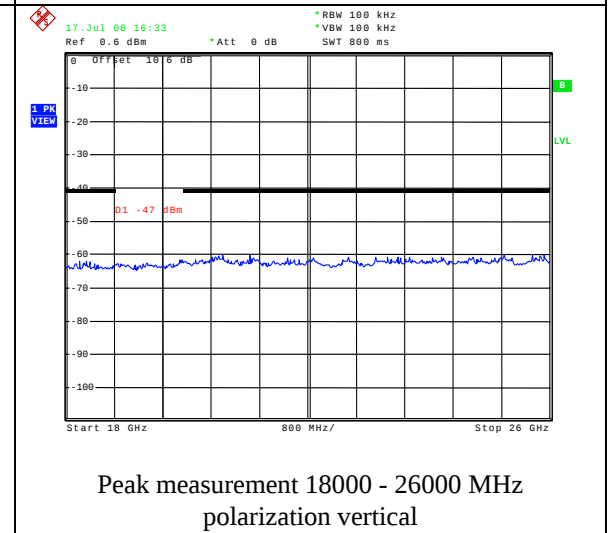
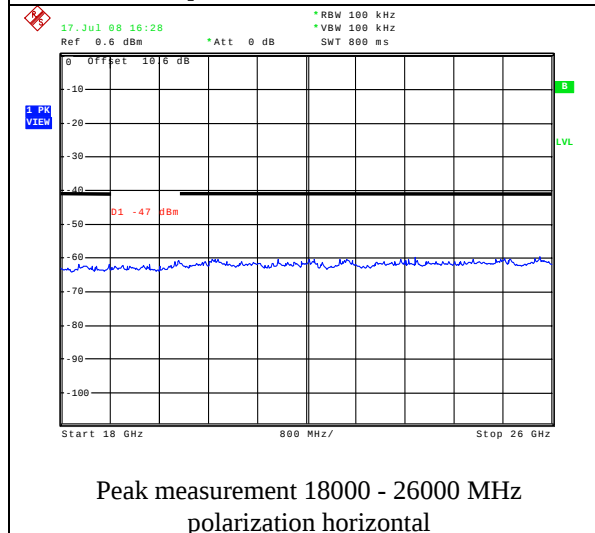
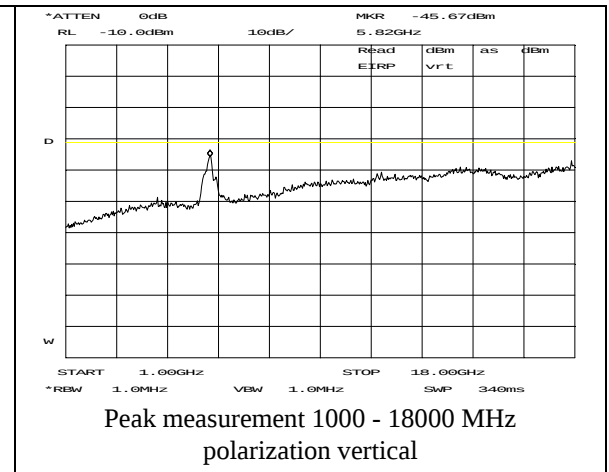
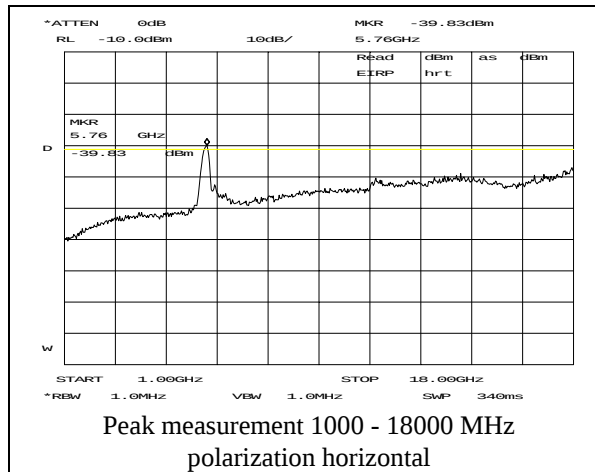
Test equipment used: (Item numbers)	1, 3, 41, 45, 46, 47, 48, 49
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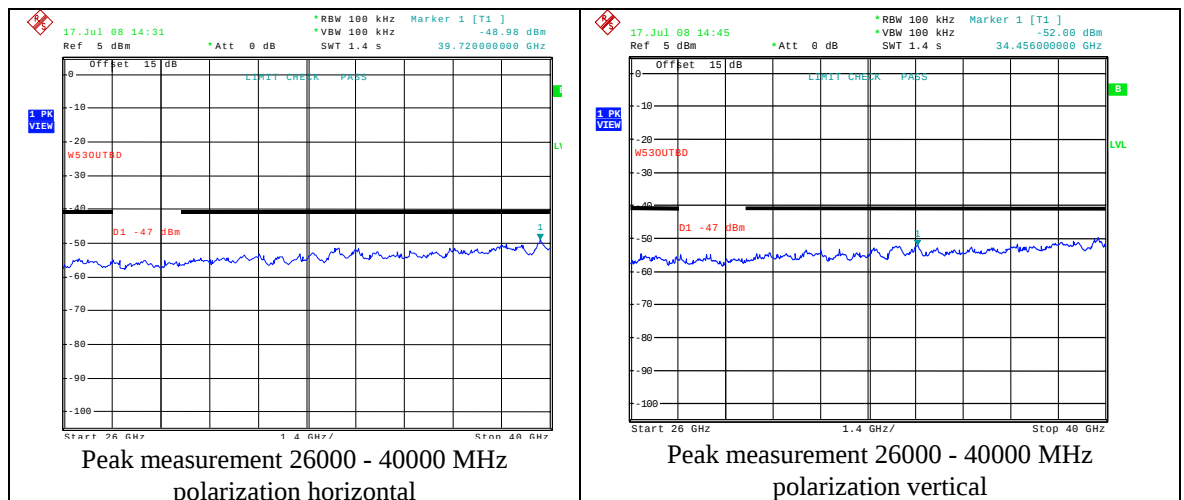
1.4 Field strength of unwanted emissions > 1000 MHz

Compliance standard : FCC part 15, subpart C, section 15.245 (b) (1) (iii)
FCC part 15, subpart B, section 15.109

Method of test : ANSI C63.4-2003, sections 5.5, 8.2.4, & 8.3.1.2;
FCC part 15, subpart A, sections 15.33, 15.35.

Test results :





Measurement uncertainty	+4.5/-6.1 dB
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Note: the plots show the limit of sections 15.109 and 15.209 after conversion to radiated power by the formula: EIRP (dBm) = FS (dBμV/m) – 95.2 dB.

Test equipment:

Test equipment used: (Item numbers)	1, 2, 3, 6, 7, 41, 44, 45, 46, 47, 48, 49, 50, 51
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Used test equipment module

Item	Test equipment	Manufacturer	Type	ID
RF Measurement Equipment				
1	Spectrum Analyzer	Hewlett Packard	HP8563E	TE 00481
2	RF Preamplifier 1 – 26.5 GHz	Hewlett Packard	HP8449B	TE 00092
3	Pre-amplifier 10 dB	Rohde & Schwarz	ESV-Z3	TE 00097
4	Power meter	Hewlett Packard	437B	TE 00354
5	Power sensor	Hewlett Packard	8481A	TE 00355
6	Spectrum Analyzer	Rohde & Schwarz	FSP	TE 11125
7	Pre-amplifier	Miteq	JS4-18004000	TE 11131
8				
9				
10				
11				
12				
General Measurement Equipment				
21	Digital Multimeter	Hewlett Packard	HP3438A	TE 00215
22	Digital Thermometer	Fluke	Fluke 51	TE 00388
23				
24				
25				
26				
27				
28				
29				
30				
Auxiliaries				
41	Power supply	Delta	E030-10	TE 00550
42	Climate chamber	CTS	C-40/350	TE 00741
43	Standard gain horn antenna	Scientific Atlanta	12A – 3.9	TE 00613
44	Horn antenna	EMCO	3115	TE 00531
45	Biconilog antenna	EMCO	3143	TE 00700
46	Anechoic chamber	Euroshield	RFD-F-100	--
47	Antenna tower	HD	AS 620p	--
48	Turntable	HD	DS 412	--
49	Turntable controller	HD	HD 050	-
50	Standard gain horn antenna	Scientific Atlanta	12A – 26	TE 00609
51	Standard gain horn antenna	Flann microwave	20240-25	TE 00818
52	Horn antenna	EMCO	3116	TE 00533

Revision history

REVISION	DATE	REMARKS
1.0	23 September 2008	- Added section 150 kHz – 30 MHz; - Removed reference to 15.109 from section “<i>Field strength of intentional signal</i>”; - Corrected reference to ANSI 63.4 in section “<i>Field strength of unwanted emissions 30 – 1000 MHz</i>”.