

Prüfbericht - Nr.: 16006196 001

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Auftraggeber:

Client:

Coligen Corp.

No. 1 bldg. ,Guantang Ind. Park,
Jingding Zhuhai, Guangdong Province,
P.R. China

Gegenstand der Prüfung: Display Part of Wireless Parking Sensor System

Test item:

Bezeichnung:

Identification:

RFDP4841

FCC ID:

FCC ID

TFKRFP4841

Wareneingangs-Nr.:

Receipt No.:

173017482

Eingangsdatum:

Date of receipt:

22.09.2005

Prüfört:

Testing location:

Shenzhen Bureau of Quality Technical
Supervision Shenzhen Academy of
Metrology and Quality Inspection
Bldg, of Shenzhen Academy of Metrology
and Quality Inspection, Longzhu Road,
Nanshan, Shenzhen,
P.R. China

Listed test laboratory
according to FCC rules
section 2.948 for
measuring devices under
Parts 15

Prüfgrundlage:

Test specification:

ANSI C63.4: 2001

Radiated Emissions with limits described at FCC Part 15 Subpart B section 15.109

Radiated Emissions with limits described at FCC Part 15 Subpart C section 15.209 and 15.249

Prüfergebnis:

Test Result:

Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage.

The a. m. test item passed the test specification.

Prüflaboratorium:

Testing Laboratory:

TÜV Rheinland (Guangdong) Ltd.

geprüft/tested by:

kontrolliert/ reviewed by:

21. Dec. 2005

Ricky Liu

Ricky Liu

21. Dec. 2005

Dave Xie

Dave Xie

Datum
Date

Name
Name

Unterschrift
Signature

Datum
Date

Name
Name

Unterschrift
Signature

Sonstiges/ Other Aspects:

Abkürzungen:

ok / P = entspricht Prüfgrundlage
fail / F = entspricht nicht Prüfgrundlage
n.a. / N = nicht anwendbar

Abbreviations:

ok / P = passed
fail / F = failed
n.a. / N = not applicable

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.

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TEST SUMMARY

5.1 RADIATED EMISSION FOR FCC PART 15 PER SECTION 15.109(A)

RESULT: *ok*

5.2 RADIATED EMISSION FOR FCC PART 15 PER SECTION 15.209(A)

RESULT: *ok*

5.3 FUNDAMENTAL AND HARMONICS RADIATED EMISSION FOR FCC PART 15 PER SECTION 15.249(A)

RESULT: *ok*

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

2 Test Sites

2.1 Test Facilities

Shenzhen SMQ

Shenzhen Bureau of Quality Technical Supervision
Shenzhen Academy of Metrology and Quality Inspection
Bldg, of Shenzhen Academy of Metrology and Quality Inspection
Longzhu Road, Nanshan, Shenzhen,
P.R. China

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
BilogAntenna	Chase	CBL6112B	2591	29.01.2006
Horn Antenna	Rohde & Schwarz	HF906	100014	29.01.2006
3m Semi-anechoic chamber	Albatross Projects	9X6X6	----	29.01.2006
EMI Test Receiver	Rohde & Schwarz	ESI26	838786/013	29.01.2006
Communications Test Set	Rohde & Schwarz	CMU200	1100.0008.02	29.01.2006
Communications Test Set	HP	HP8920A	3438A05187	29.01.2006
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	29.01.2006
AMN	Rohde & Schwarz	ESH3-Z5	100002	29.01.2006

2.3 Trace ability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

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2.5 Measurement Uncertainty

The estimated combined standard uncertainty for conducted emissions measurements is ± 3 dB.
The estimated combined standard uncertainty for radiated emissions measurements is ± 3 dB.

2.6 Location of original data

The original copies of all test data taken during actual testing were attached at Appendix 1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Guangzhou) file for certification follow-up purposes.

2.7 Status of facility used for testing

Shenzhen Bureau of Quality Technical Supervision, Shenzhen Academy of Metrology and Quality Inspection, Bldg. of Shenzhen Academy of Metrology and Quality Inspection, Longzhu Road, Nanshan, Shenzhen, P.R.China is listed on the US Federal Communications Commission list of facilities approved to perform measurements

3 General Product Information

Brief description of the test sample:

This product is the display part of a parking sensor system, which is designed with ultrasonic technology to assist the driver to parking or reversing the vehicle. It would be operated with the controller part of the parking sensor system.

It is a 900MHz FSK half-duplex transceiver with 3 channels available. Distance message is received from the controller part of the same system via RF link. The antenna type is integrated.

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3.1 Product Function and Intended Use

For details, refer to technical document and the user manual.

3.2 Ratings and System Details

Frequency range	:	915.11MHz, 915.85 MHz, 916.58 MHz
Modulation Type		2FSK
Number of channels	:	3 channels
Type of antenna	:	Integral antenna
FCC ID	:	TFKRFD4841
Power supply	:	DC power of vehicle
Ports	:	12/24V DC input
RF Power level		<50 mV/m
Protection Class	:	III

Refer to the technical document for further information

3.3 Independent Operation Modes

The basic operation modes are:

Receiving, Transmitting.

For further information refer to User Manual

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3.4 Submitted Documents

Block Diagram
Circuit Diagram
Components List
PCB layout
FCC label
User Manual
Photo document

4 Test Set-up and Operation Mode

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Refer to Test set-up in chapter 5.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with 12V DC lead-acid battery.

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the technical document. No additional measures were employed to achieve compliance.

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4.5 Test set-up

Diagram 1 of Measurement Equipment Configuration for Testing Radiated Emission

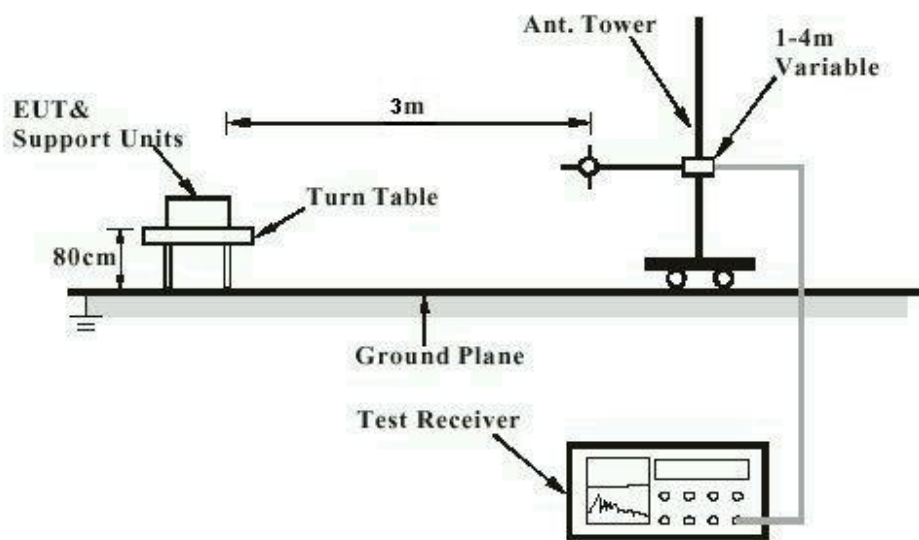
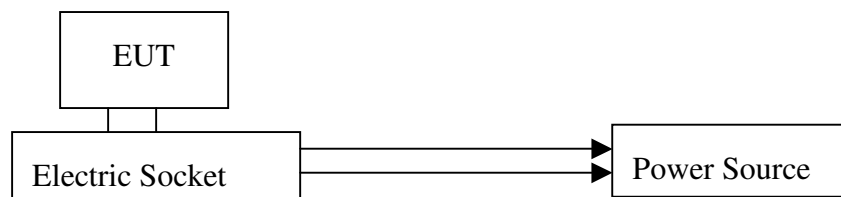


Diagram 2 of Equipment Configuration for Testing Radiated Emission



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5 Test Results EMISSION

5.1 Radiated Emission for FCC Part 15 Per Section 15.109(a)

RESULT:

ok

Date of testing : 27.09.2005
Test specification : FCC Part 15 Per Section 15.109(a)
Limit : FCC Part 15 Per Section 15.109(a)
Operation mode: Receiving
Deviations from Standard Test procedures : None
Test procedure Procedure specified in ANSI C63.4 were followed
Kind of test site : 3m Semi-anechoic chamber
Temperature : 24°C
Humidity : 65%

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector; the final measurement for frequencies above 1000MHz is performed with Average detector.

Disturbances other than those mentioned are small or not detectable.

The spectral diagrams in appendix 1 display the measurement of un-weighted peak values.

Table 2: Radiated Emission

Frequency [MHz]	QP [dB μ V/m]	AV [dB μ V/m]	Polarity	Limit [dB μ V/m]
*	---			

*) The disturbance measured is far below the limit and therefore, no final measurement was performed

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5.2 Radiated Emission for FCC Part 15 Per Section 15.209(a)

RESULT:

ok

Date of testing : 27.09.2005
Test specification : FCC Part 15 Per Section 15.209(a)
Limits : FCC Part 15 Per Section 15.209(a)
Deviations from Standard Test procedures : None
Test procedure : Procedure specified in ANSI C63.4 were followed
Kind of test site : 3m Semi-anechoic chamber
Operation mode : Transmitting at channel 1
Temperature : 24°C
Humidity : 65%

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector; the final measurement for frequencies above 1000MHz is performed with Average detector.

Disturbances other than those mentioned are small or not detectable.

The spectral diagrams in appendix 1 display the measurement of un-weighted peak values.

Table 3: Radiated Emission above 30MHz

Frequency [MHz]	QP [dB μ V/m]	AV [dB μ V/m]	Polarity	Limit [dB μ V/m]
---*				

*) The disturbance measured is far below the limit and therefore, no final measurement was performed

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5.3 Fundamental and harmonics Radiated Emission for FCC Part 15 Per Section 15.249(a)

RESULT:

ok

Date of testing : 27.09.2005
Test specification : FCC Part 15 Per Section 15.249(a)
Limits : FCC Part 15 Per Section 15.249(a)
Deviations from Standard Test procedures : None
Test procedure : Procedure specified in ANSI C63.4 were followed
Kind of test site : 3m Semi-anechoic chamber
Operation mode : Transmitting at channel 1
Temperature : 24°C
Humidity : 65%

Test conditions		Fundamental Frequency		2nd Harmonics		3rd Harmonics	
		Channel 1 (915MHz)		Channel 1 (1830MHz)		Channel 1 (2731MHz)	
T _{nom} (22°C)	Unit	(dBμV/m)	(mV/m)	(dBμV/m)	(μV/m)	(dBμV/m)	(μV/m)
	Horizontal	76.2	6.5	45.0	177.8	27.5	23.7
	Vertical	72.5	4.2	44.8	173.8	27.5	23.7
limit		93.979	50	53.979	500	53.979	500

The final measurement for frequencies below 1000MHz is performed with Quasi Peak detector; the final measurement for frequencies above 1000MHz is performed with Average detector.

Disturbances other than those mentioned are small or not detectable.

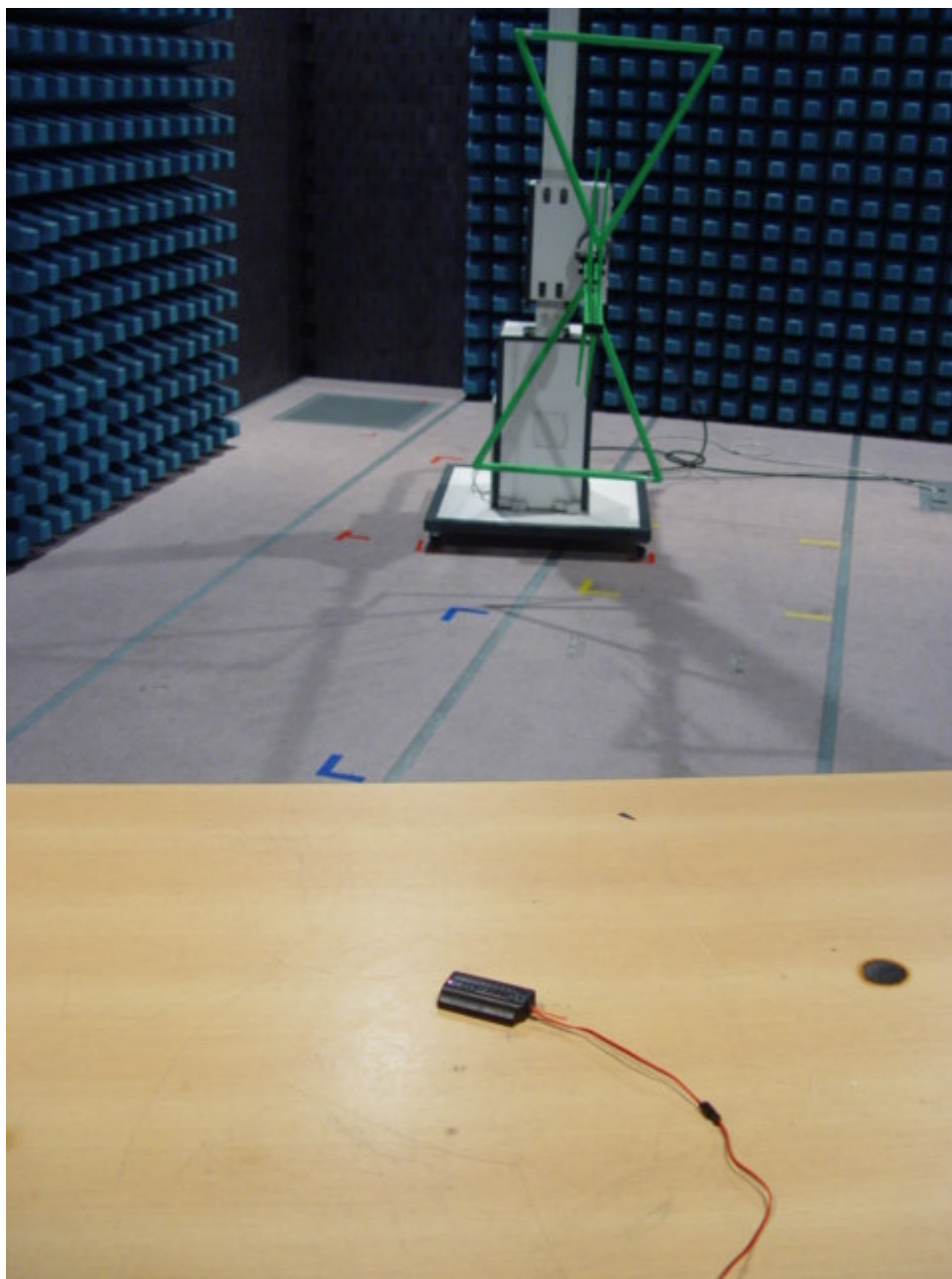
The spectral diagrams in appendix 1 display the measurement of un-weighted peak values.

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6 Photographs of the Test Set-Up

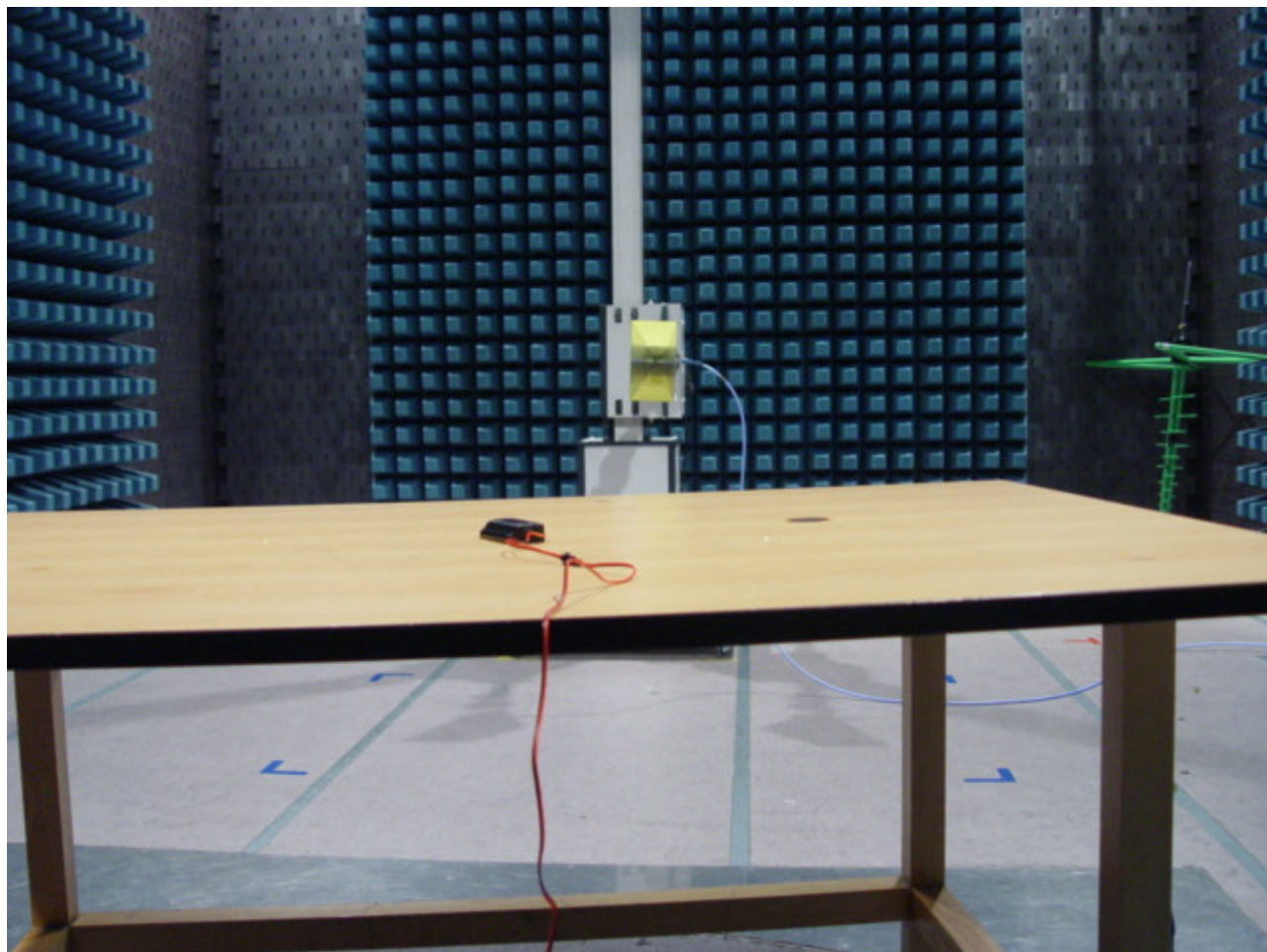
Photograph 1: Set-up for Radiation Measurement Below 1GHz



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Photograph 2: Set-up for Radiation Measurement Above 1GHz



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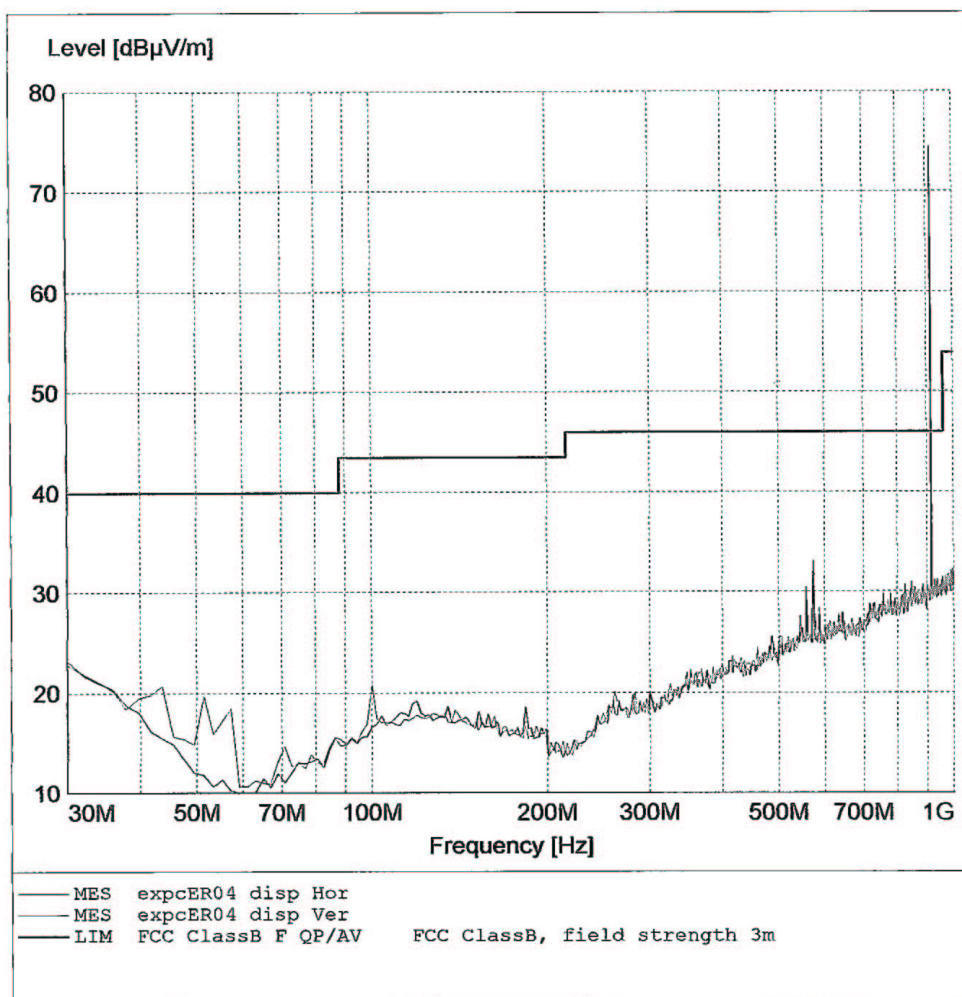
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Radiated Disturbance

FCC Part15

EUT: M/N:expcER04
Manufacturer:
Operating Condition: disp(TX)
Test Site: SMQ EMC Lab.SAC
Operator:
Test Specification: Vertical & Horizontal
Comment: DC 12V
:



NOTE: expcER04 is the temporary system model name of the Parking Sensor System in this report.

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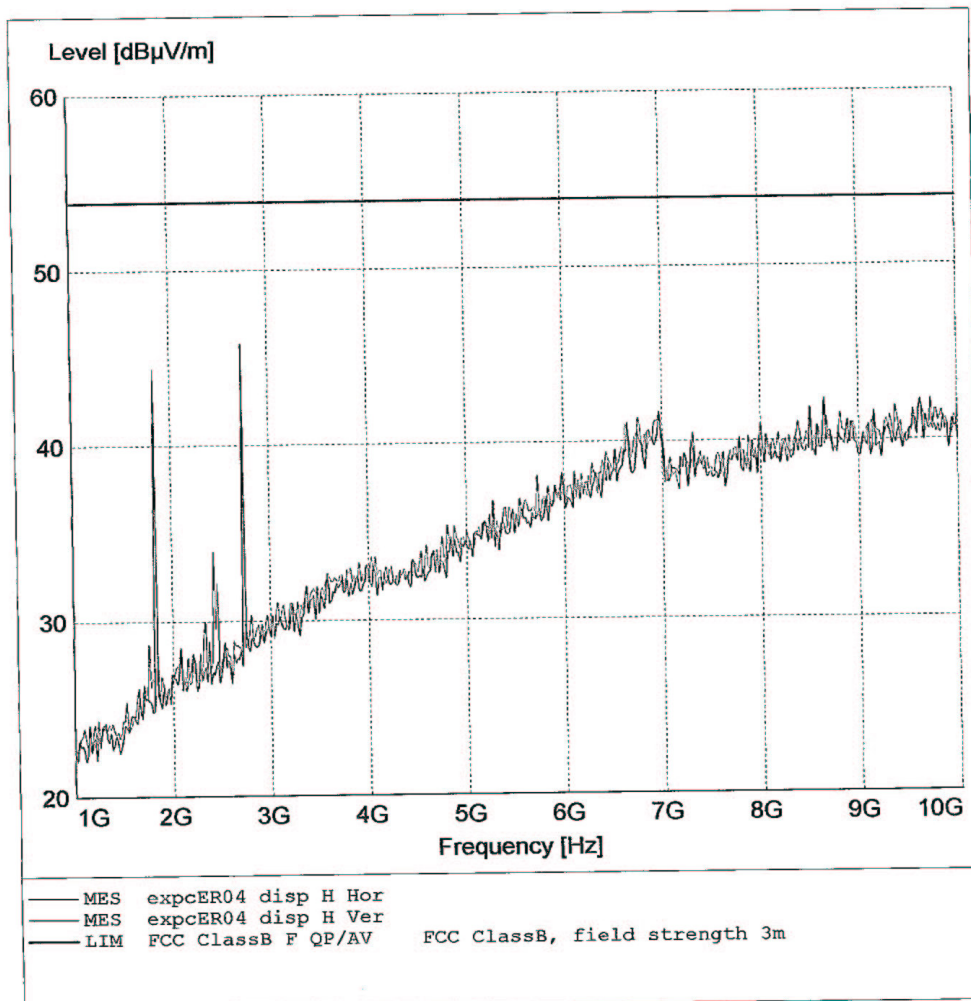
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Radiated Disturbance

FCC Part15

EUT: M/N:expcER04
Manufacturer:
Operating Condition: display
Test Site: SMQ EMC Lab.SAC
Operator:
Test Specification: Vertical & Horizontal
Comment: DC 12V
:



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NOTE: expcER04 is the temporary system model name of the Parking Sensor System in this report.

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Test Report No.:

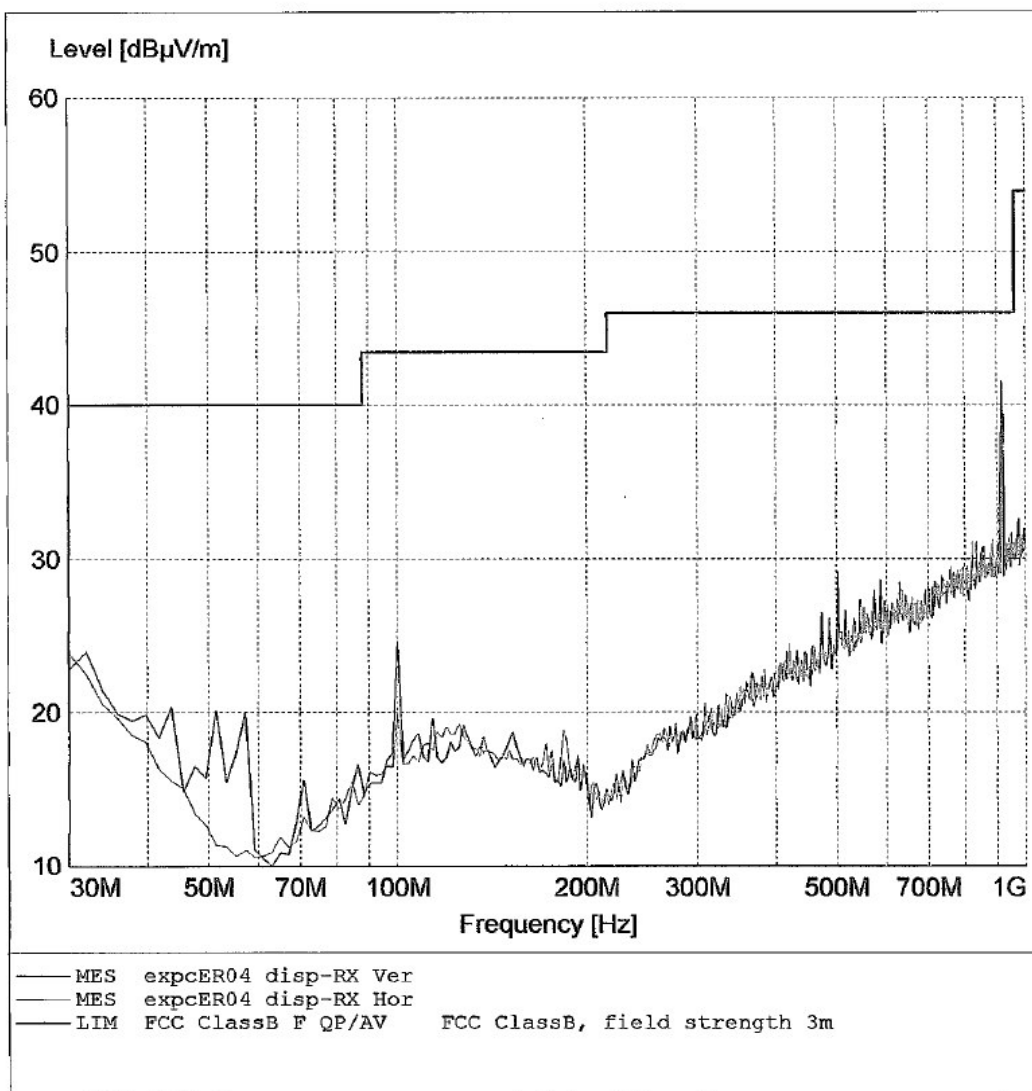
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Radiated Disturbance

FCC Part15

EUT: M/N:expcER04
Manufacturer:
Operating Condition: disp(RX)
Test Site: SMQ EMC Lab.SAC
Operator:
Test Specification: Vertical & Horizontal
Comment: DC 12V
:



NOTE: expcER04 is the temporary system model name of the Parking Sensor System in this report

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Test Report No.:

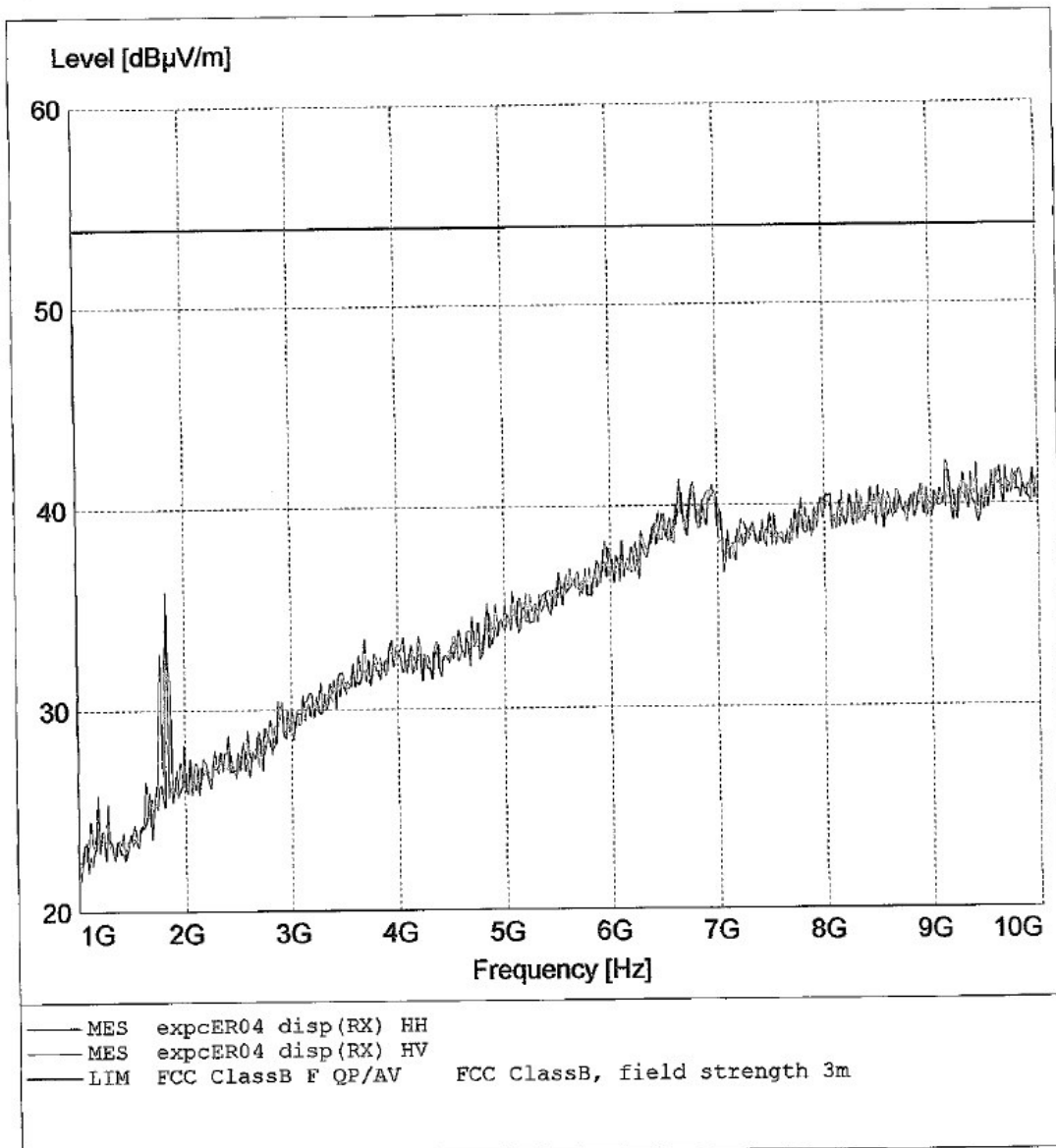
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Radiated Disturbance

FCC Part15

EUT: M/N:expcER04
Manufacturer:
Operating Condition: disp(RX)
Test Site: SMQ EMC Lab.SAC
Operator:
Test Specification: Vertical & Horizontal
Comment: DC 12V
:



NOTE: expcER04 is the temporary system model name of the Parking Sensor System in this report.

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Test Report No.:

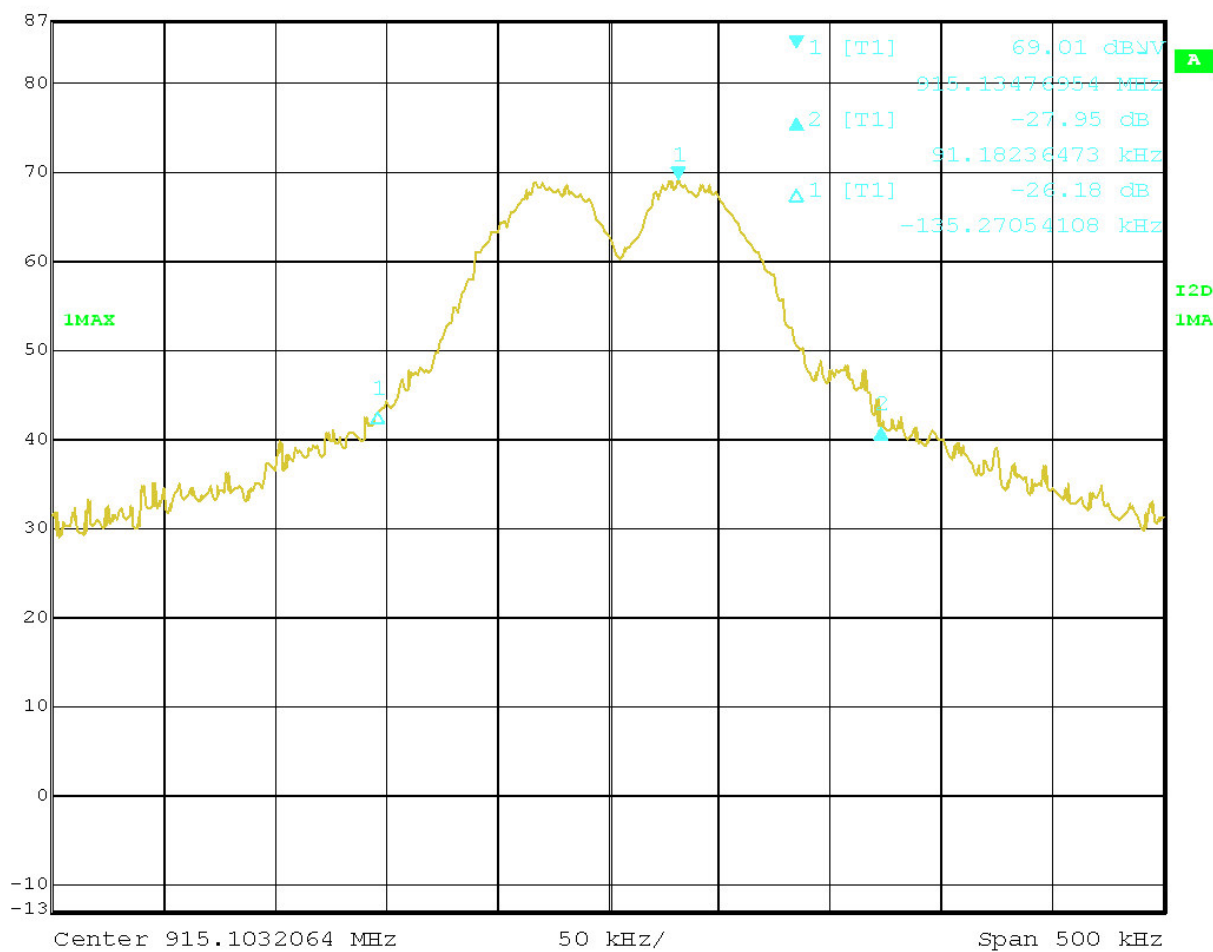
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-26dB bandwidth



Ref Lvl	Delta 2 [T1]	RBW	20 kHz	RF Att	0 dB
87 dBµV	-27.95 dB	VBW	20 kHz		
	91.18236473 kHz	SWT	7.5 ms	Unit	dBµV



Date: 18.NOV.2005 14:51:32