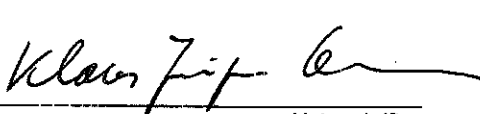


Prüfbericht - Nr.: 17001641 003		Seite 1 von 12 Page 1 of 12			
Test Report No.					
Auftraggeber: <i>Client:</i>	Upright Manufacturers (Shenzhen) Ltd. 16FL, Xinbaohui Building, 1007 W, Nanyou Rd, Nanshan Zone Shenzhen, Guangdong 518054 P.R. China				
Gegenstand der Prüfung: <i>Test item:</i>	Receiver				
Bezeichnung: <i>Identification:</i>	X0001-528	Serien-Nr.: <i>Serial No.</i>	Pre-production model		
Wareneingangs-Nr.: <i>Receipt No.:</i>	63008913		Eingangsdatum: <i>Date of receipt:</i> 21.11.2003		
Prüfört: <i>Testing location:</i>	Shenzhen Academy of Metrology and Quality Inspection Bldg. of Academy of Metrology and Quality Inspection Longzhu Road, Nanshan District Shenzhen, P.R. China				
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15, Subpart C				
Prüfergebnis: <i>Test Result</i>	Der vorstehend beschriebene Prüfgegenstand wurde geprüft und entspricht oben genannter Prüfgrundlage. The a. m. test item passed.				
geprüft / tested by: K.J.Herrmann		kontrolliert / reviewed by T.Berns			
19.04.2004 <i>Datum</i> Date	 <i>Unterschrift</i> Signature	26.04.2004 <i>Datum</i> Date	 <i>Unterschrift</i> Signature		
Sonstiges / Other Aspects:					
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> Abkürzungen: OK, Pass = entspricht Prüfgrundlage Fail = entspricht nicht Prüfgrundlage N/A = nicht anwendbar </td> <td style="width: 50%; vertical-align: top;"> Abbreviations: OK, Pass = passed Fail = failed N/A = not applicable </td> </tr> </table>				Abkürzungen: OK, Pass = entspricht Prüfgrundlage Fail = entspricht nicht Prüfgrundlage N/A = nicht anwendbar	Abbreviations: OK, Pass = passed Fail = failed N/A = not applicable
Abkürzungen: OK, Pass = entspricht Prüfgrundlage Fail = entspricht nicht Prüfgrundlage N/A = nicht anwendbar	Abbreviations: OK, Pass = passed Fail = failed N/A = not applicable				
Dieser Prüfbericht bezieht sich nur auf den o.g. Prüfgegenstand 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 item. 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 test mark on this or similar products.					
TUV Rheinland Product Safety GmbH Am Grauen Stein D - 51105 Köln Tel.: +49 221 806-1371 Fax: +49 221 806-3909 Mail: trps-certification@de.tuv.com Web: www.tuv.com					

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TEST SUMMARY

7.1.1 SPURIOUS RADIATED EMISSIONS

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 Results

1.2 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

1.3 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

1.4 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is $\pm 3\text{dB}$.

1.5 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 (Shenzhen) file for certification follow-up purposes.

2. Test Sites

2.1 Test Facilities

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

Shenzhen Academy of Metrology and Quality Inspection is listed under FCC test firms and can be found on FCC website.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

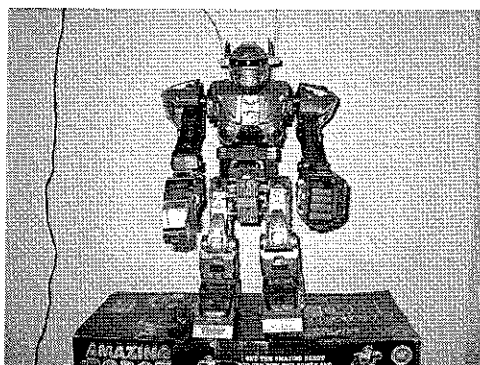
Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Spurious Emission				
EMI test receiver	Rhode & Schwarz	ESI26	SB3336	2005-02-01
Bilog Antenna	Chase	CBL6112B	SB3440	2005-02-01
Anechoic Chamber	Albatross	3m Site	N/A	2004-06-07

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3. General Product Information



3.1 Product Function and Intended Use

The equipment under test (EUT) is a RC toy, operating at 27.1450MHz and 40.685MHz. The associated transmitter controls the forward, backward, left, right and some special movements.

	FCC ID
X0001-528 Amazing Robot	RZKX0001-528

3.2 Circuit Description

- 1) Q1 and the associated circuit act as a RF-receiver.
- 2) IC1 and the associated circuit act as an RF demodulator and AF amplifier.
- 3) Q2-Q10 and the associated circuit act as a power amplifier for DC motors.

3.3 Ratings and System Details

	Receiver
Frequency range	: 27.1450MHz and 40.685MHz
Number of channels	: 1 for each frequency band
Type of antenna	: Permanently attached receiving antenna.
Power supply	: Battery operated
Protection Class	: III

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3.4 The basic operation modes are:

- Power: On and off
- Motor movement: left, right, forward, backward, turn body, move arms, turn hands.

For further information refer to User Manual

3.5 Submitted Documents

The submitted documents are listed as follow:

- Circuit diagram
- Rating label
- User manual

3.6 Related Submittal(s) Grants

This is a single application for certification of the receiver; the transmitter for this receiver is authorized by the Certification procedure.

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

Test operation should refer to Section 5 and 7.

- There was no special software to exercise the device.

4.3 Special Accessories and Auxiliary Equipment

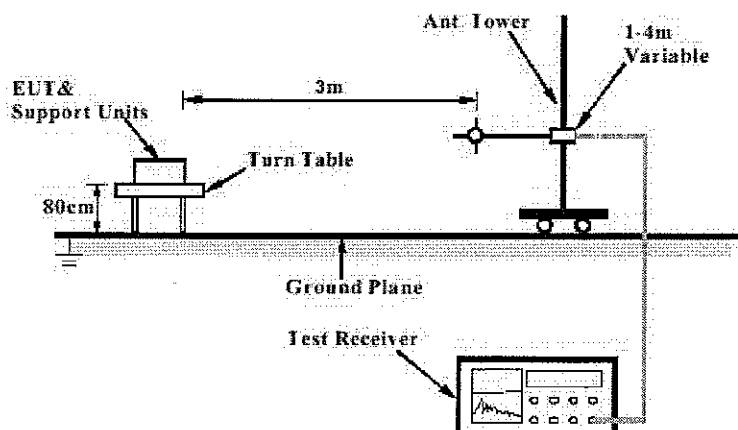
The product has been tested together with the following additional accessories:

-none

4.4 Countermeasures to achieve EMC Compliance

The test samples, which have been tested, contain the noise suppression parts as described in the Circuit Diagram or the Technical Construction File. No additional measures were employed to achieve compliance.

Diagram 1 Measurement Equipment Configuration for Radiation Test



5. Test Methodology

5.1 Radiated Emission

The radiated emission measurements were performed according to the procedures in ANSI C63 4-2001.

The equipment under test (EUT) was placed at the middle of a 80cm height turntable, and the turntable is 3 meters far from the measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

The frequency range scanned is from the lowest radio frequency signal generated in the device which greater than 9 KHz to the tenth harmonic of the highest fundamental frequency or 40GHz, whichever is lower.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in section 7.1.1 of this test report.

6. Field Strength Calculation

The field strength at 3m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.
R = Reading of Spectrum Analyzer in dBuV.
AF = Antenna Factor in dB.
CF = Cable Attenuation Factor in dB.
FA = Filter Attenuation Factor in dB.
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

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7. Test Results

7.1 Spurious Radiated Emissions

RESULT:

ok

Test Specification : FCC Part 15 section 15.109
 Test Method : ANSI C63.4-2001
 Measurement Location : Semi Anechoic Chamber
 Measurement Distance : 3m
 Detector Function : Quasi Peak
 Measurement BW : 100KHz
 Supply Voltage : DC by internal battery
 Measuring Frequency Range : 30-1000MHz
 :

Polarization: Horizontal

Frequency	Reading	Antenna Factor	Attenuation of cable	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
150.00				43.30	43.5	0.2
188.46				31.70	43.5	12.8
940.74				26.60	46.0	19.4

According to section 15.31 (o), no measurement result needs to be recorded when the amplitude of the measured signal is 20 dB below the limit.

Reading on page 3 is done with transmitter operated and shows harmonics of the transmitter and noise created by the motors in the receiver.

For test results refer to Appendix 1, page 1-4

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Polarization: Vertical

Frequency	Reading	Antenna Factor	Attenuation of cable	Field strength at 3m	Limit at 3m	Delta to Limit
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)
42.54				39.70	40.0	0.3
150.24				35.90	43.5	7.6
188.10				39.90	43.5	3.6

According to section 15.31 (o), no measurement result needs to be recorded when the amplitude of the measured signal is 20 dB below the limit.

Reading on page 3 is done with transmitter operated and shows harmonics of the transmitter and noise created by the motors in the receiver.

For test results refer to Appendix 1, page 1-4

Limit

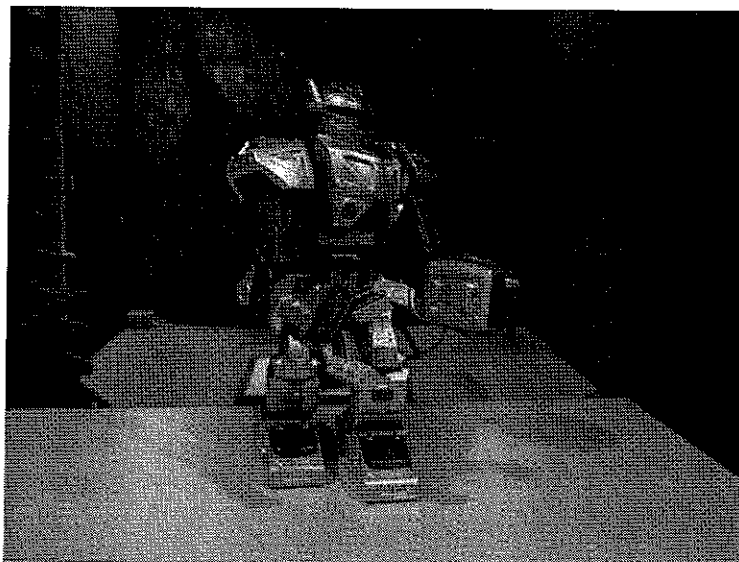
Subclause 15.109

The field strength of radiated emissions from unintentional radiators at a distance of 3 meters :

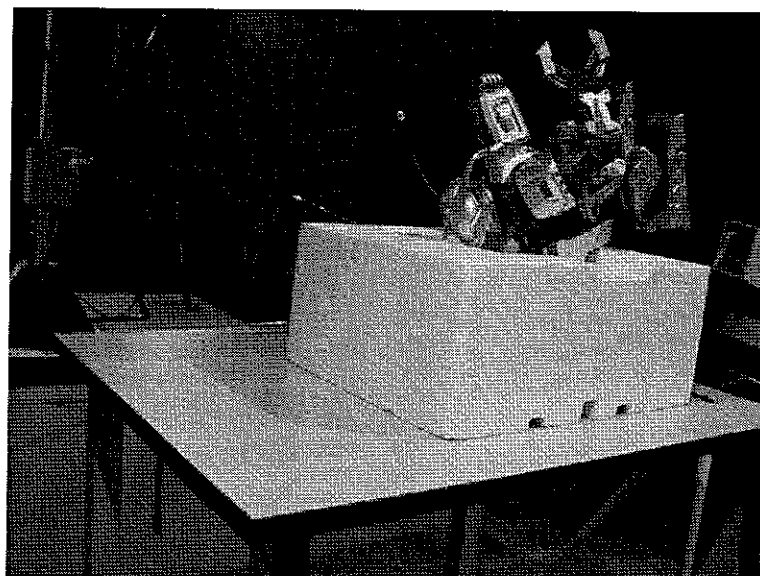
Frequency (MHz)	Field strength (micro volts/meter)	Field strength (dB μ V/m)	Measurement distance (meters)
30-88	100	$20 \cdot \log(100) = 40.0$	3
88-216	150	$20 \cdot \log(150) = 43.5$	3
216-960	200	$20 \cdot \log(200) = 46.0$	3
Above 960	500	$20 \cdot \log(500) = 54.0$	3

8. Photograph of the Test Set-Up

Photograph 1: Set-up for radiated emission, standby



Photograph 2: Set-up for radiated emission, operated



9. List of Tables and Diagrams

Table 1:	List of Test and Measurement Equipment	5
Diagram 1:	Measurement Equipment Configuration for Radiation Test	8

10. List of Photographs

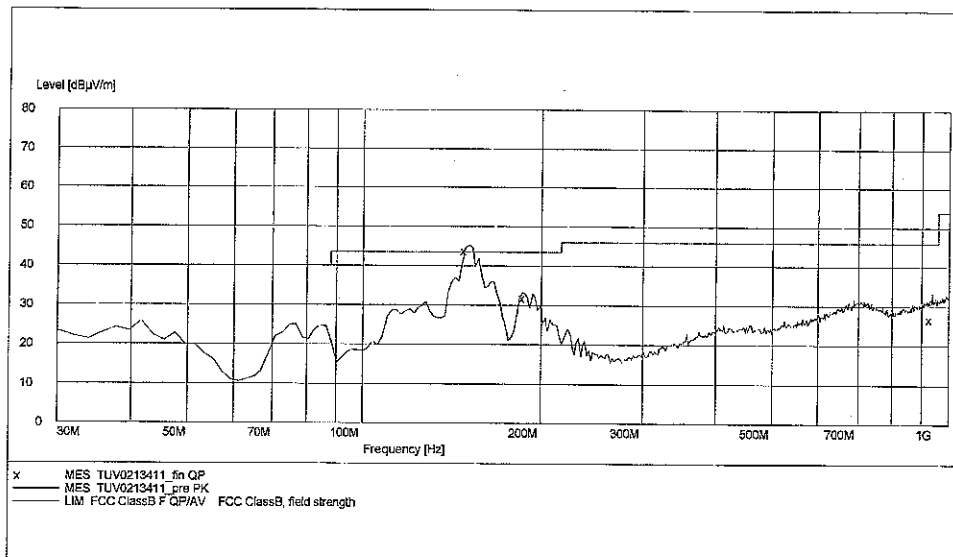
Photograph 1:	Set-up for radiated emission, standby	12
Photograph 2:	Set-up for radiated emission, operated	12

Radiated Emission Test

EUI: AMAZING ROBOT RECEIVER
Manufacturer:
Operating Condition: STANDBY(27+40MHz)
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: Polarisation:H(STAND)
Comment:
Start of Test: 2/13/04 / 11:33:06PM

SCAN TABLE: "test Field(30M-1G)"

Short Description: Field Strength(30M-1G)
Start Stop Step Detector Meas. IF Transducer
Frequency Frequency Width Time Bandw.
30.0 MHz 1.0 GHz 60.0 kHz QuasiPeak 500.0 ms 120 kHz HI562new



MEASUREMENT RESULT: "TUV0213411_fin QP"

2/13/04 11:40PM

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Height cm	Azimuth deg	Polarisation
150.000000	43.30	10.8	43.5	0.2	150.0	217.00	HORIZONTAL
188.460000	31.70	10.7	43.5	12.8	100.0	304.00	HORIZONTAL
940.740000	26.60	26.2	46.0	19.4	100.0	105.00	HORIZONTAL

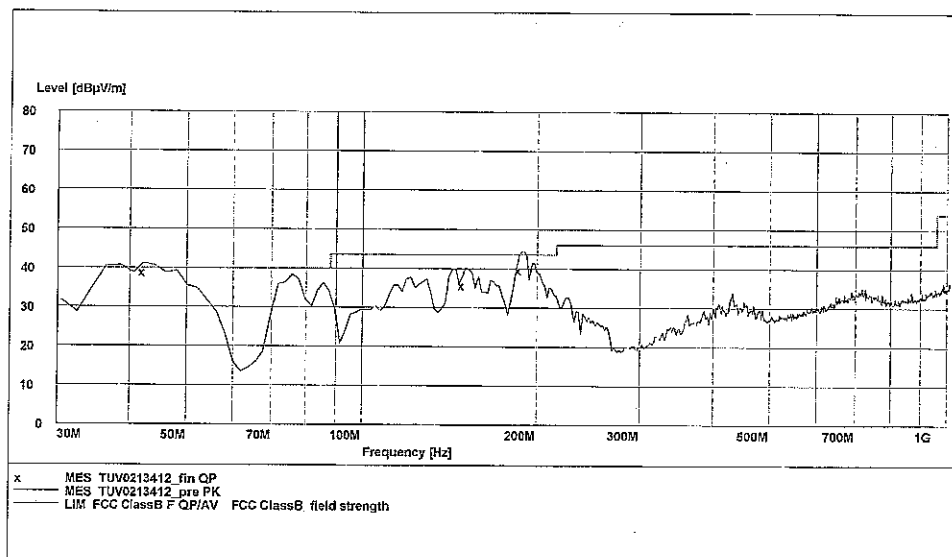
2/14/04 12:22AM IUV0213411

Radiated Emission Test

EUI: AMAZING ROBOT RECEIVER
Manufacturer:
Operating Condition: STANDBY (27+40MHz)
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: Polarisation: V (SIAND)
Comment:
Start of Test: 2/13/04 / 11:41:26PM

SCAN TABLE: "test Field(30M-1G)"

Short Description:		Field Strength(30M-1G)				
Start	Stop	Step	Detector	Meas	IF	Transducer
Frequency	Frequency	Width		Time	Bandw	
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	500.0 ms	120 kHz	HI562new



MEASUREMENT RESULT: "TUV0213412_fin QP"

2/13/04 11:48PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
42.540000	39.70	14.3	40.0	0.3	100.0	289.00	VERTICAL
150.240000	35.90	10.9	43.5	7.6	100.0	109.00	VERTICAL
188.100000	39.90	10.7	43.5	3.6	100.0	299.00	VERTICAL

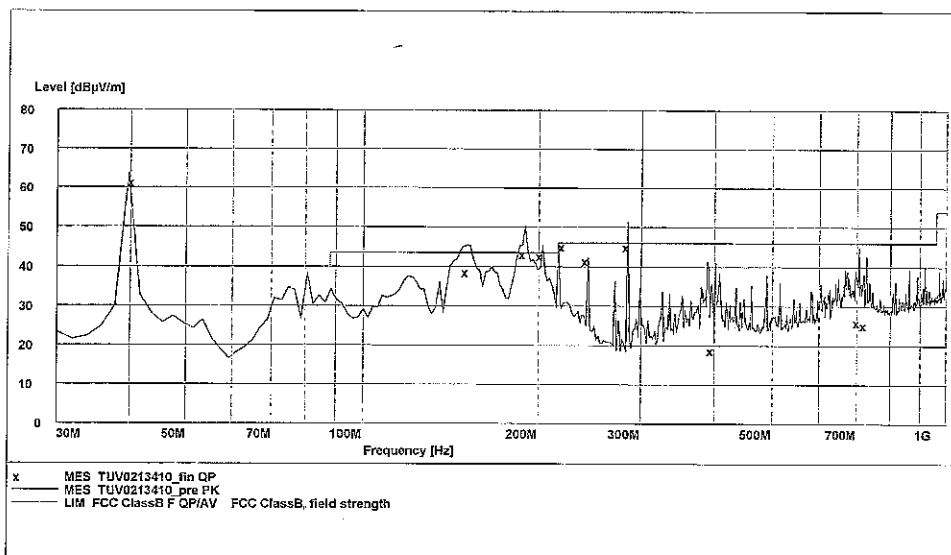
2/14/04 12:22AM TUV0213412

Radiated Emission Test

EUI: AMAZING ROBOI RECEIVER Rx
Manufacturer:
Operating Condition: OPERAIED 27.145 MHz + 40.685 MHz
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: Polarisation:H
Comment:
Start of Test: 2/13/04 / 11:09:24PM

SCAN TABLE: "test Field(30M-1G)"

Short Description:		Field Strength(30M-1G)				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
30 0 MHz	1 0 GHz	60.0 kHz	QuasiPeak	500.0 ms	120 kHz	HI562new



MEASUREMENT RESULT: "TUV0213410_fin_QP"

2/13/04 11:25PM

Frequency MHz	Level dBpV/m	Transd dB	Limit dBpV/m	Margin dB	Height cm	Azimuth deg	Polarisation
40.680000	61.40	15.0	71.0	9.6	150.0	93.00	HORIZONTAL
151.320000	38.70	10.9	43.5	4.8	150.0	198.00	HORIZONTAL
190.020000	42.80	10.7	43.5	0.9	134.0	84.00	HORIZONTAL
203.400000	42.90	10.8	43.5	0.7	100.0	99.00	HORIZONTAL
217.140000	45.90	11.2	46.0	0.1	100.0	90.00	HORIZONTAL
244.080000	41.50	12.3	46.0	4.5	100.0	107.00	HORIZONTAL
284.760000	45.40	13.5	46.0	0.6	100.0	97.00	HORIZONTAL
399.600000	18.90	20.2	46.0	27.1	150.0	234.00	HORIZONTAL
709.440000	26.00	26.6	46.0	20.0	150.0	283.00	HORIZONTAL
729.480000	25.30	25.8	46.0	20.7	100.0	295.00	HORIZONTAL

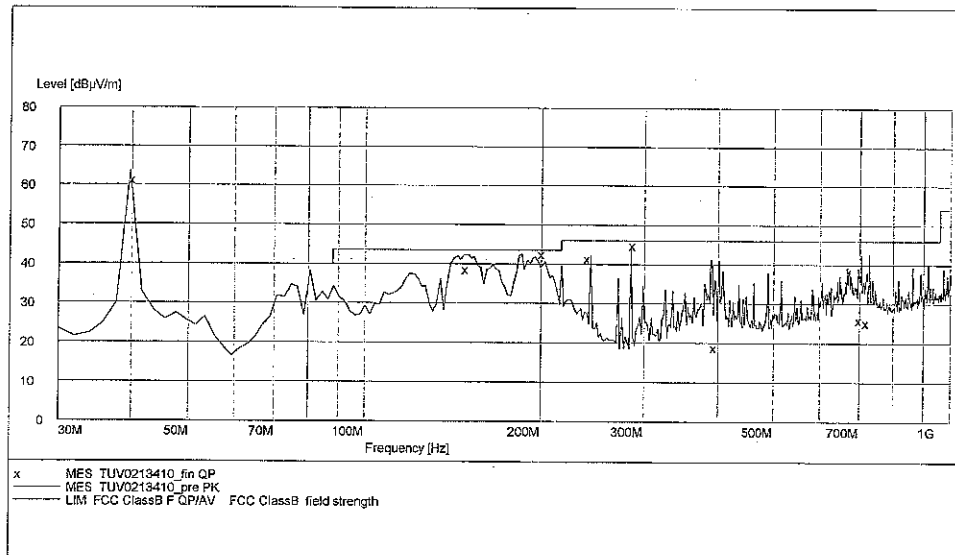
2/14/04 12:22AM IUV0213410

Radiated Emission Test

EUI: AMAZING ROBOT RECEIVER Rx
Manufacturer:
Operating Condition: OPERATED 27.145 MHz + 40.685 MHz
Test Site: 3m CHAMBER
Operator: Jimmy
Test Specification: Polarisation: V
Comment:
Start of Test: 2/13/04 / 11:09:24PM

SCAN TABLE: "test Field(30M-1G)"

Short Description: Field Strength(30M-1G)
Start Stop Step Detector Meas. IF Transducer
Frequency Frequency Width Time Bandw.
30.0 MHz 1.0 GHz 60.0 kHz QuasiPeak 500.0 ms 120 kHz HI562new



MEASUREMENT RESULT: "TUV0213410_fin.QP"

2/13/04 11:25PM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
40.680000	61.40	15.0	71.0	9.6	150.0	93.00	VERTICAL
151.320000	38.70	10.9	43.5	4.8	150.0	198.00	VERTICAL
190.020000	42.10	10.7	43.5	1.4	134.0	84.00	VERTICAL
244.080000	41.50	12.3	46.0	4.5	100.0	107.00	VERTICAL
284.760000	46.40	13.5	46.0	0.1	100.0	97.00	VERTICAL
399.600000	18.90	20.2	46.0	27.1	150.0	234.00	VERTICAL
709.440000	26.00	26.6	46.0	20.0	150.0	283.00	VERTICAL
729.480000	25.30	25.8	46.0	20.7	100.0	295.00	VERTICAL

2/14/04 12:22AM TUV0213410