

Prüfbericht - Nr.: 02421838 001		Seite 1 von 12 <i>Page 1 of 12</i>	
<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Bosch Termotecnologia SA EN 16 - Km M 3,7 - Cacia 3801 - 856 Aveiro PORTUGAL		
Gegenstand der Prüfung: Low Power Device - Remote Control Transceiver			
<i>Test Item:</i>			
Bezeichnung: <i>Identification / Model No:</i>	8 707 207 341	Serien-Nr.: <i>Serial No.:</i>	Prototype
Wareneingangs-Nr.: <i>Receipt No.:</i>	1403005598	Eingangsdatum: <i>Date of Receipt:</i>	13.10.2008
Prüfört: Refer Section for Testing facilities			
<i>Testing Location:</i>			
Prüfgrundlage: FCC Part 15 Subpart B FCC Part 15 Subpart C			
<i>Test Specification:</i>			
Prüfergebnis: Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).			
<i>Test Result:</i> <i>The test item passed the test specification(s).</i>			
Prüflaboratorium: TÜV Rheinland (India) Pvt. Ltd.			
<i>Testing Laboratory:</i> Alpha Tower, Sigma Soft Tech Park, # 7, White Field Main Road, Varthur Kodi, Bangalore – 560 066. India			
geprüft/ tested by:		kontrolliert/ checked by:	
 29.04.2009 L.N. Charyulu / Project Manager		 29.04.2009 Thomas Berns / Manager	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>
Sonstiges/ Other Aspects: FCC ID : RTG8708300283			
<i>Abkürzungen:</i> P(ass) = entspricht Prüfgrundlage F(all) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet			
<i>Abbreviations:</i> P(ass) = passed F(all) = failed N/A = not applicable N/T = not tested			
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. <i>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.</i>			

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Test Summary

Radiated Spurious Emissions – Receiving mode

Result : Pass

Radiated Emission of Carrier Frequency – Transmitting mode

Result : Pass

Spurious Radiated Emission – Transmitting mode

Result : Pass

20dB Bandwidth Measurement – Transmitting mode

Result : Pass

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List of Test and Measurement Instruments

HCL Technologies, Chennai

List of Test and Measurements

Equipment	Manufacturer	Type	S/N	Calibration Due Date
EMI Receiver	Rohde & Schwarz	ESIB26	100360	21.05.2009
Ultra Broad Band Antenna	Rohde & Schwarz	HL562	100287	19.01.2010
Horn Antenna	Rohde & Schwarz	ETS3115	29269	09.05.2009

SAMEER-Center for Electromagnetics, Chennai

List of Test and Measurements

Equipment	Manufacturer	Type	S/N	Calibration Due Date
EMI Receiver	Rohde & Schwarz	ESIB7	100319	06.03.2010
Loop Antenna	ETS Lingdren	6507	1484	12.10.2009

Testing Facilities

- 1) HCL Technologies Limited
73-74, Ground Floor,
South Phase, Ambattur Estate,
Ambattur
Chennai – 600058
India
- 2) SAMEER-Center for Electromagnetics
C.I.T.Campus, Taramani,
2nd Main Road,
Chennai – 600113
India

Product Information

The EUT is a transceiver of remote control unit which used with Bosch Termotecnologia SA water heaters. The Remote control system enables a user to remotely control the temperature of the water of the water heater by the remote control unit. The user can also view some information about the status of the heater on the remote control unit.

Manufacturer declaration

Operating Frequency	903.092 MHz
Antenna	Monopole on Printed Circuit Board
Modulation	FSK with +/- 40 kHz deviation
Receiver type	Dual conversion superheterodyne
Intermediate Frequency (IF)	First IF: 10.7 MHz, 180 kHz bandwidth Second IF: 700 kHz
Receiver sensitivity	-100dBm
Modulation data	4800 baud, Manchester coded binary data
RF Communication protocol	Half-duplex, Packed Manchester coded binary data with limited collision avoidance.
Power supply	1.5 V AA battery x 2 , nominal voltage : 3.0 V
Different carrier power levels	No
Software Version	TuVTest_me0x.14
Equipment classification	<input type="checkbox"/> Fixed use <input type="checkbox"/> Mobile use <input checked="" type="checkbox"/> Portable use
AC Power port(s)	No
Independent Operation Modes	Transmitter Receiver

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Submitted Documents

Circuit Diagram
Bill of material
User Manual
Rating Label

Remark

Additional accessory used for testing

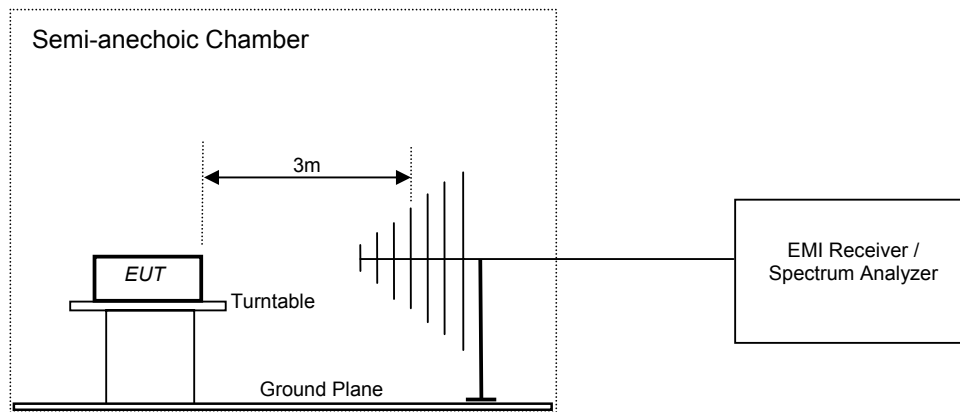
None

Test Methodology

Radiated Emission

The radiated emission measurement was performed according to the procedures in ANSI C63.4-2003. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT is 3 or 10 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas were scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. The measurement above 1000MHz was performed by horn antenna. The measurement below 30MHz was performed by loop antenna, maximum emission was obtained by two antenna polarizations of loop faced and sided to the EUT.

Test Setup :



Radiated Spurious Emission Test - Receiving mode**Section 15.109(a)****RESULT:****Pass**

Test Specification : FCC Part 15 Section 15.109
Test Method : ANSI C63.4-2003
Measurement Location : Semi Anechoic Chamber
Supply Voltage : Battery operated, 3.0V DC
Measuring Frequency Range : 30MHz – 5GHz
Measuring Distance : 3m
Detector : QP for frequency below 1GHz, Average for frequency above 1GHz
Mode of Operation : Receiving

Test Result:

Antenna Polarization	Spurious Emission (MHz)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	1806.4	37.8	54.0	16.2
	6985.2	33.7	54.0	20.3
	11341.6	32.6	54.0	21.4
H	1806.4	48.0	54.0	6.0
	2709.2	29.4	54.0	24.6
	11790.4	19.8	54.0	34.2

Limit:

Frequency of Emission (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)
30-88	100	40.00
88-216	150	43.52
216-960	200	46.00
Above 960	500	54.00

Radiated Emission of Carrier frequency**Section 15.249****Result :****Pass**

Test Specification : FCC Part 15 Section 15.249
Test Method : ANSI C63.4-2003
Measurement Location : Semi Anechoic Chamber
Supply Voltage : Battery operated, 3.0V DC
Measurement Bandwidth : 100 kHz
Detector : Peak
Measuring distance : 3m
Mode of operation : Transmitting

Test Result:

Fundamental Frequency (MHz)	Antenna Polarization	Field strength measured (dBμV/m)	Limit (dBμV/m)	Margin (dB)
903.092	Horizontal	92.70	93.98	1.28
903.092	Vertical	74.90	93.98	19.08

Limit for Radiated Emission under section 15.249:

Fundamental Frequency (MHz)	Field strength, Fundamental (mV/m) at 3m	Field strength, Fundamental (dBμV/m) at 3m
902 - 928	50.0	93.98

Radiated Spurious Emission
Section 15.249
Result :
Pass

Test Specification : FCC Part 15 Section 15.209 and 15.249
 Test Method : ANSI C63.4-2003
 Measurement Location : Semi Anechoic Chamber
 Detector : QP for frequency below 1 GHz, Average for frequency above 1 GHz
 Supply Voltage : Battery operated, 3.0V DC
 Fundamental Frequency : 903.092 MHz
 Measuring frequency range : 15MHz – 10GHz
 Measuring distance : 3m
 Mode of EUT : Transmitting
 Requirement : Emissions radiated outside of the specified frequency bands, except for the harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation. Attenuation below the general limits specified in Sections 15.209(a) is not required.

Test Result:

Fundamental Frequency (MHz)	Spurious Emission (MHz)	Antenna Polarization	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
903.092	*1806.404	Vertical	37.8	54.0	16.2
	6985.2224	Vertical	33.7	42.7	9.0
	11341.612	Vertical	32.6	42.7	9.9
	*1806.423	Horizontal	48.0	54.0	6.0
	*2709.223	Horizontal	29.4	54.0	24.6
	*11790.434	Horizontal	19.8	54.0	34.2

*Harmonic frequencies of the fundamental signal.

Limit for radiated spurious emission of non-harmonic emissions: 92.7dBμV – 50dB = 42. 7dBμV

Limit for radiated emission of section 15.209:

Frequency (MHz)	Field strength (μV/m) at 3m range	Field strength (dBμV/m) at 3m range
1.705-30	30 (30m range)#	29.5(30m range)#
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

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Remark: # the limit shows in the table above of frequency range 1.705-30MHz are at 30 meter range, which corresponds to 49.50 dB μ V/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shows in the table are based on measurements employing a CISPR quasi-peak detector and above 1000 MHz are based on the measurements employing an average detector.

20dB Bandwidth Measurement**Section 15.215(c)****Result :****Pass**

Test Specification : FCC Part 15 Section 15.215 (c)
Test Method : ANSI C63.4-2003
Measurement Location : Semi Anechoic Chamber
Detector : Peak
Supply Voltage : Battery operated, 3.0V DC
Fundamental Frequency : 903.092 MHz
Mode of EUT : Transmitting
RBW/VBW Setting : 100kHz/300kHz
Requirement : 20dB bandwidth of the emission is contained within the frequency band designated in section 15.249

Test Result:

Fundamental Frequency (MHz)	Lower 20dB Frequency (MHz)	Upper 20dB Frequency (MHz)
903.092	902.874	903.310