



Product Service

Choose certainty.  
Add value.

May 15, 2017

Page 1 of 19

## Prüfbericht / *Test Report*

**Nr. / No. 20351-94952-3 (Edition 3)**

Applicant: Endress + Hauser GmbH + Co. KG  
Type of equipment: Level Probing Radar  
Type designation: FMR 6x  
Order No.: N/A  
Test standards: Industry Canada Radio Standards Specifications  
RSS-GEN Issue 4, Section 3.2 (RF Exposure)  
RSS-102 Issue 5, Radio Frequency (RF) Exposure Compliance of Radiocommunication  
Apparatus (All Frequency Bands)  
  
ICNIRP GUIDELINES FOR LIMITING EXPOSURE TO TIME-VARYING ELECTRIC  
AND MAGNETIC FIELDS (1Hz – 100 kHz)  
Published in: HEALTH PHYSICS 99(6):818-836; 2010  
  
CFR 47 Part 1, section 1.1307(b)(1)  
OET Bulletin 65

### **Note:**

The test data of this report is related only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.



---

## Table of Contents

1	Description of the Equipment Under Test (EUT).....	3
2	Administrative Data .....	5
3	Identification of the Test Laboratory.....	6
4	Summary.....	7
5	Operation Mode and Configuration of EUT .....	8
6	RF Exposure Limits.....	9
6.1	RF Exposure Limits according to RS-102, Issue 5.....	9
6.2	RF Exposure Limits according to Directive 2004/40/EG .....	10
7	Test Results .....	11
7.1	Exposure of Humans to RF Fields .....	12
7.2	RF exposure requirement .....	16
8	Referenced Regulations.....	17
9	Revision History .....	19



## 1 Description of the Equipment Under Test (EUT)

General data of EUT	
Type designation <sup>1</sup> :	FMR 6x
Variants covered by this report	
Serial number(s):	Prototype
Manufacturer:	Endress + Hauser GmbH + Co. KG
Type of equipment:	Level Probing Radar
Version:	As delivered
Additional parts/accessories:	N/A

Technical data of EUT	
Application frequency range:	75 - 85 GHz
Frequency range:	
Operating frequency:	79 - 83 GHz
Type of modulation:	FMCW
Number of RF-channels:	1
Channel spacing:	N/A
Designation of emissions <sup>2</sup> :	
Type of antenna:	Integrated
Size/length of antenna:	N/A
Connection of antenna:	<input type="checkbox"/> detachable <input checked="" type="checkbox"/> not detachable
Type of power supply:	DC supply
Specifications for power supply:	nominal voltage: 24 V minimum voltage: 10 V maximum voltage: 36 V  nominal frequency: DC Hz

<sup>1</sup> Type designation of the system if EUT consists of more than one part.

<sup>2</sup> Also known as "Class of Emission".



Test Sample	FMR 6x_26	FMR 6x_27	FMR 6x_29	FMR 6x_25	FMR 6x_28	FMR 6x_30
<b>Model</b>	<b>FMR62</b>	<b>FMR62</b>	<b>FMR 62</b>	<b>FMR60</b>	<b>FMR60F</b>	<b>FMR67</b>
Antenna	¾" Thread PEEK	PTFE plated, DN50	PTFE plated, DN80	PTFE Thread 1.5"	1.5" Thread, PEEK	Flange
Enclosure	Plastic	Plastic	Plastic	Plastic	Alu	Alu
<b>Test Overview</b>						
Bandwidth of Emission					X	
Fundamental Emission Limits (boresight)			X	X	X	X
Frequency Stability					X	
Antenna beamwidth			X	X	X	X
Antenna side lobe gain			X	X	X	X
Radiated emissions					X	
Conducted AC powerline emissions					X	
FCC ID	LCGFMR6XE	LCGFMR6XE	LCGFMR6XE	LCGFMR6XEF	LCGFMR6XEF	LCGFMR6XEF
IC ID	2519A-6E	2519A-6E	2519A-6E	2519A-6EF	2519A-6EF	2519A-6EF



## 2 Administrative Data

### Application details

Applicant (full address):	Endress + Hauser GmbH + Co. KG Hauptstrasse 1, 79690 Maulburg / Germany
Contact person:	Ralf Reimelt
Order number:	N/A
Receipt of EUT:	06 April 2016
Date(s) of test:	19 April 2016
Note(s):	

### Report details

Report number:	20351-94952-3
Edition:	3
Issue date:	2017-05-15



### 3 Identification of the Test Laboratory

#### Details of the Test Laboratory

Company name:	TÜV SÜD Product Service GmbH
Address:	Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany
Laboratory accreditation:	DAkkS Registration No. D-PL-11321-11-01
FCC test site registration number	90926
Industry Canada test site registration:	3050A-2
Contact person:	Mr. Markus Biberger
	Phone: +49 9421 5522-0 Fax: +49 9421 5522-99



## 4 Summary

### Summary of test results


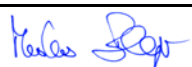
The tested sample complies with the requirements set forth in the

**Radio Standards Specifications  
 RSS-GEN Issue 4, Section 3.2 (RF Exposure)**

of Industry Canada (IC) and

**CFR 47 Part 1, section 1.1307(b)(1)  
 OET Bulletin 65.**

Die Prüfergebnisse beziehen sich ausschließlich auf das zur Prüfung vorgestellte Prüfmuster. Ohne schriftliche Genehmigung des Prüflabors darf der Prüfbericht auszugsweise nicht vervielfältigt werden. *The test results relate only to the individual item which has been tested. Without the written approval of the test laboratory this report may not be reproduced in extracts.*

Datum / Date	Geprüft von / Tested by	Freigabe durch / Checked by
2017-05-15	 Martin Steindl Responsible for testing	 Markus Biberger Reviewer

Prüfergebnis / Test Result
<input checked="" type="checkbox"/> Erfüllt / Passed
<input type="checkbox"/> Nicht erfüllt / Not passed



## 5 Operation Mode and Configuration of EUT

### Operation Mode(s)

Normal operation, after power up

### Configuration(s) of EUT

Test samples mounted in test tank for all tests

### List of ports and cables

<i>Port</i>	<i>Description</i>	<i>Classification<sup>3</sup></i>	<i>Cable type</i>	<i>Cable length</i>
1	DC input & measured signal	dc power	Unshielded	2 m
		signal/control port	Unshielded	

### List of devices connected to EUT

<i>Item</i>	<i>Description</i>	<i>Type Designation</i>	<i>Serial no. or ID</i>	<i>Manufacturer</i>
1	Laboratory power Supply	EA-PS-3150-04 B	2275	EA

### List of support devices

<i>Item</i>	<i>Description</i>	<i>Type Designation</i>	<i>Serial no. or ID</i>	<i>Manufacturer</i>
1	None			

<sup>3</sup> Ports shall be classified as ac power, dc power or signal/control port



## 6 RF Exposure Limits

### 6.1 RF Exposure Limits according to RS-102, Issue 5

**Table 4: RF Field Strength Limits for Devices Used by the General Public  
 (Uncontrolled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> <sup>0.25</sup>	0.1540/ <i>f</i> <sup>0.25</sup>	8.944/ <i>f</i> <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> <sup>0.3417</sup>	0.008335 <i>f</i> <sup>0.3417</sup>	0.02619 <i>f</i> <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>

**Note:** *f* is frequency in MHz.  
 \*Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

**Table 6: RF Field Strength Limits for Controlled Use Devices (Controlled Environment)**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>23</sup>	170	180	-	Instantaneous*
1-10	-	1.6/ <i>f</i>	-	6**
1.29-10	193/ <i>f</i> <sup>0.5</sup>	-	-	6**
10-20	61.4	0.163	10	6
20-48	129.8/ <i>f</i> <sup>0.25</sup>	0.3444/ <i>f</i> <sup>0.25</sup>	44.72/ <i>f</i> <sup>0.5</sup>	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 <i>f</i> <sup>0.25</sup>	0.04138 <i>f</i> <sup>0.25</sup>	0.6455 <i>f</i> <sup>0.5</sup>	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.354 <i>f</i> <sup>0.5</sup>	9.40 x 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	3.33 x 10 <sup>-4</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>

**Note:** *f* is frequency in MHz.  
 \*Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

## 6.2 RF Exposure Limits according to Directive 2004/40/EG

Table 2

Action values (Article 3(2)) (unperturbed rms values)

Frequency range	Electric field strength, E (V/m)	Magnetic field strength, H (A/m)	Magnetic flux density, B (µT)	Equivalent plane wave power density, $S_{eq}$ (W/m <sup>2</sup> )	Contact current, $I_c$ (mA)	Limb induced current, $I_l$ (mA)
0 — 1Hz	—	$1,63 \times 10^5$	$2 \times 10^5$	—	1,0	—
1 — 8 Hz	20 000	$1,63 \times 10^5 / f^2$	$2 \times 10^5 / f^2$	—	1,0	—
8 — 25 Hz	20 000	$2 \times 10^4 / f$	$2,5 \times 10^4 / f$	—	1,0	—
0,025 — 0,82kHz	$500 / f$	$20 / f$	$25 / f$	—	1,0	—
0,82 — 2,5 kHz	610	24,4	30,7	—	1,0	—
2,5 — 65 kHz	610	24,4	30,7	—	$0,4 f$	—
65 — 100 kHz	610	$1\ 600 / f$	$2\ 000 / f$	—	$0,4 f$	—
0,1 — 1 MHz	610	$1,6 / f$	$2 / f$	—	40	—
1 — 10 MHz	$610 / f$	$1,6 / f$	$2 / f$	—	40	—
10 — 110 MHz	61	0,16	0,2	10	40	100
110 — 400 MHz	61	0,16	0,2	10	—	—
400 — 2 000 MHz	$3 f^{0,5}$	$0,008 f^{0,5}$	$0,01 f^{0,5}$	$f / 40$	—	—
2 — 300 GHz	137	0,36	0,45	50	—	—



## 7 Test Results

### IC RSS-GEN Issue 4

<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
3.2	Exposure of Humans to RF Fields	9	Exempted from SAR and RF evaluation

## 7.1 Exposure of Humans to RF Fields

Rules and specifications:	IC RSS-Gen Issue 4, section 3.2
Guide:	IC RSS-102 Issue 5, section 2.5

Exposure of Humans to RF Fields	Applicable	Declared by applicant	Measured	Exemption																														
The antenna is																																		
<input type="checkbox"/> detachable																																		
<p>The conducted output power (CP in watts) is measured at the antenna connector:  <math>CP = \dots\dots\dots W</math></p> <p>The effective isotropic radiated power (EIRP in watts) is calculated using</p> <p><input type="checkbox"/> the numerical antenna gain: <math>G = \dots\dots\dots</math>  <math>EIRP = G \cdot CP \Rightarrow EIRP = \dots\dots\dots W</math></p> <p><input type="checkbox"/> the field strength<sup>4</sup> in V/m: <math>FS = \dots\dots\dots V/m</math>  <math>EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP = \dots\dots\dots W</math></p> <p>with:            Distance between the antennas in m: <math>D = \dots\dots\dots m</math></p>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																														
<input checked="" type="checkbox"/> not detachable																																		
<p>A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Variant</th> <th style="text-align: left;">Antenna</th> <th style="text-align: left;">EIRP (dBm)</th> <th style="text-align: left;">EIRP (W)</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>FMR 6x_25</td> <td>PTFE Thread 1.5</td> <td>26.43</td> <td>0.440</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>FMR 6x_28</td> <td>1.4 Thread PEEK</td> <td>26.82</td> <td>0.481</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>FMR 6x_29</td> <td>PTFE plated, DN 80</td> <td>31.25</td> <td>1.334</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>FMR 6x_30</td> <td>Flange</td> <td>31.25</td> <td>1.334</td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> </tbody> </table>	Variant	Antenna	EIRP (dBm)	EIRP (W)			FMR 6x_25	PTFE Thread 1.5	26.43	0.440	<input checked="" type="checkbox"/>		FMR 6x_28	1.4 Thread PEEK	26.82	0.481	<input checked="" type="checkbox"/>		FMR 6x_29	PTFE plated, DN 80	31.25	1.334	<input checked="" type="checkbox"/>		FMR 6x_30	Flange	31.25	1.334	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Variant	Antenna	EIRP (dBm)	EIRP (W)																															
FMR 6x_25	PTFE Thread 1.5	26.43	0.440	<input checked="" type="checkbox"/>																														
FMR 6x_28	1.4 Thread PEEK	26.82	0.481	<input checked="" type="checkbox"/>																														
FMR 6x_29	PTFE plated, DN 80	31.25	1.334	<input checked="" type="checkbox"/>																														
FMR 6x_30	Flange	31.25	1.334	<input checked="" type="checkbox"/>																														
Selection of output power																																		
<p>The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.):</p> <p style="text-align: center;"><math>TP = 1.334 W</math></p>																																		



Exposure of Humans to RF Fields (continued)	Applicable	Declared by applicant	Measured	Exemption
Separation distance between the user and the transmitting device is				
<input type="checkbox"/> less than or equal to 20 cm			<input checked="" type="checkbox"/>	
Transmitting device is				
<input type="checkbox"/> in the vicinity of the human head			<input type="checkbox"/>	

SAR evaluation																																																																																																												
<p>SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the table.</p> <p>For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in the table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.</p> <p>For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.</p>																																																																																																												
<table border="1"> <thead> <tr> <th rowspan="2">Frequency (MHz)</th> <th colspan="10">Exemption limits (mW)<sup>5</sup> at separation distance of</th> </tr> <tr> <th>≤5 mm</th> <th>10 mm</th> <th>15 mm</th> <th>20 mm</th> <th>25 mm</th> <th>30 mm</th> <th>35 mm</th> <th>40 mm</th> <th>45 mm</th> <th>≥50 mm</th> </tr> </thead> <tbody> <tr> <td>≤300<sup>6</sup></td> <td>71</td> <td>101</td> <td>132</td> <td>162</td> <td>193</td> <td>223</td> <td>254</td> <td>284</td> <td>315</td> <td>345</td> </tr> <tr> <td>450</td> <td>52</td> <td>70</td> <td>88</td> <td>106</td> <td>123</td> <td>141</td> <td>159</td> <td>177</td> <td>195</td> <td>213</td> </tr> <tr> <td>835</td> <td>17</td> <td>30</td> <td>42</td> <td>55</td> <td>67</td> <td>80</td> <td>92</td> <td>105</td> <td>117</td> <td>130</td> </tr> <tr> <td>1900</td> <td>7</td> <td>10</td> <td>18</td> <td>34</td> <td>60</td> <td>99</td> <td>153</td> <td>225</td> <td>316</td> <td>431</td> </tr> <tr> <td>2450</td> <td>4</td> <td>7</td> <td>15</td> <td>30</td> <td>52</td> <td>83</td> <td>123</td> <td>173</td> <td>235</td> <td>309</td> </tr> <tr> <td>3500</td> <td>2</td> <td>6</td> <td>16</td> <td>32</td> <td>55</td> <td>86</td> <td>124</td> <td>170</td> <td>225</td> <td>290</td> </tr> <tr> <td>5800</td> <td>1</td> <td>6</td> <td>15</td> <td>27</td> <td>41</td> <td>56</td> <td>71</td> <td>85</td> <td>97</td> <td>106</td> </tr> </tbody> </table>											Frequency (MHz)	Exemption limits (mW) <sup>5</sup> at separation distance of										≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm	≤300 <sup>6</sup>	71	101	132	162	193	223	254	284	315	345	450	52	70	88	106	123	141	159	177	195	213	835	17	30	42	55	67	80	92	105	117	130	1900	7	10	18	34	60	99	153	225	316	431	2450	4	7	15	30	52	83	123	173	235	309	3500	2	6	16	32	55	86	124	170	225	290	5800	1	6	15	27	41	56	71	85	97	106
Frequency (MHz)	Exemption limits (mW) <sup>5</sup> at separation distance of																																																																																																											
	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm																																																																																																		
≤300 <sup>6</sup>	71	101	132	162	193	223	254	284	315	345																																																																																																		
450	52	70	88	106	123	141	159	177	195	213																																																																																																		
835	17	30	42	55	67	80	92	105	117	130																																																																																																		
1900	7	10	18	34	60	99	153	225	316	431																																																																																																		
2450	4	7	15	30	52	83	123	173	235	309																																																																																																		
3500	2	6	16	32	55	86	124	170	225	290																																																																																																		
5800	1	6	15	27	41	56	71	85	97	106																																																																																																		
<p>Carrier frequency: <math>f</math> = ..... MHz</p> <p>Distance: <math>d</math> = ..... mm</p> <p>Transmitter output power: <math>TP</math> = ..... mW</p> <p>Limit: <math>TP_{limit}</math> = ..... mW</p>																																																																																																												
										☒																																																																																																		

<sup>5</sup> The exemption limit in the table are based on measurements and simulations on half-wave dipole antennas at separation distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from alinear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from athird order polynomial fit.

<sup>6</sup> Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine SAR evaluation, shall demonstrate compliance to the instantaneous limits in IC RSS-102, issue 5, section 4.

Exposure of Humans to RF Fields (continued)	Applicable	Declared by applicant	Measured	Exemption
RF exposure evaluation				
<p>RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:</p> <p><input type="checkbox"/> below 20 MHz<sup>7</sup> and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance).</p> <p><input type="checkbox"/> between 3 kHz and 10 MHz exposure limits apply as following:</p> <p style="margin-left: 20px;"><input type="checkbox"/> In a uncontrolled environment the basic restriction for the instantaneous internal electric field strength is equal to or less than <math>2.7 \cdot 10^{-4} f \text{ V/m}_{\text{rms}}</math> at any part of the body where <math>f</math> is in Hz. The instantaneous RF field strength is equal or less than <math>83 \text{ V/m}_{\text{rms}}</math> and equal or less than <math>90 \text{ A/m}_{\text{rms}}</math>.</p> <p style="margin-left: 20px;"><input type="checkbox"/> In a controlled environment the basic restriction for the instantaneous internal electric field strength is equal to or less than <math>1.35 \cdot 10^{-4} f \text{ V/m}_{\text{rms}}</math> at any part of the body where <math>f</math> is in Hz. The instantaneous RF field strength is equal or less than <math>170 \text{ V/m}_{\text{rms}}</math> and equal or less than <math>180 \text{ A/m}_{\text{rms}}</math>.</p> <p><input type="checkbox"/> at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than <math>4,49/f^{0.5} \text{ W}</math> (adjusted for tune-up tolerance, where <math>f</math> is in MHz).</p> <p><input type="checkbox"/> at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance).</p> <p><input type="checkbox"/> at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than <math>1.31 \cdot 10^{-2} f^{0.6834} \text{ W}</math> (adjusted for tune-up tolerance), where <math>f</math> is in MHz.</p> <p><input checked="" type="checkbox"/> at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).</p> <p>In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Carrier frequency: <math>f = 79 \text{ GHz} - 83 \text{ GHz}</math></p> <p>Transmitter output power: <math>TP = 1.334 \text{ W}</math></p> <p>Limit: <math>TP_{\text{limit}} = 5 \text{ W}</math></p>				<input checked="" type="checkbox"/>

<sup>7</sup> Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine RF Exposure evaluation, shall demonstrate compliance to the instantaneous limits in IC RSS-102, issue 5, section 4.

## 7.2 RF exposure requirement

Rules and specifications:	CFR 47 Part 1, section 1.1307(b)(1)				
Guide:	OET Bulletin 65, Edition 97-01				
Limits:	Limits for general population / uncontrolled exposure				
	Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time (minutes)
	0.3 - 1.34	614	1.63	(100)*	30
	1.34 - 30	824 / f	2.19 / f	(180 / f <sup>2</sup> )*	30
	30 - 300	27.5	0.073	0.2	30
	300 - 1500	---	---	f/1500	30
	1500 - 100000	---	---	1.0	30
	f = frequency in MHz				
	* Plane-wave equivalent power density				

Spectral power density		Declared by applicant	Measured
Prediction <sup>8</sup> :	$S = P G / 4 \pi R^2$		
Where:	S = Power density P = Power input of antenna G = Power gain of the antenna relativ to an isotropic radiator R = Distance to the center of radiation of the antenna		
Maximum output power:	P = 1.334 W e.i.r.p.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Antenna gain:	G = <i>Not applicable</i>	<input type="checkbox"/>	
Prediction distance:	R = 20 cm		
Power density at 20 cm:	<b>S = 0.265 mW/cm<sup>2</sup></b>		
Limit	<b>S<sub>lim</sub> = 1.0 mW/cm<sup>2</sup></b>		

Test Result:	Test passed
--------------	-------------

<sup>8</sup> MPE Prediction of MPE according to equation from page 19 of OET Bulletin 65, Ed. 97-01



## 8 Referenced Regulations

All tests were performed with reference to the following regulations and standards:

<input checked="" type="checkbox"/>	CFR 47 Part 2	Code of Federal Regulations Part 2 (Frequency allocation and radio treaty matters; General rules and regulations) of the Federal Communication Commission (FCC)	October 1, 2014
<input checked="" type="checkbox"/>	CFR 47 Part 15	Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)	October 1, 2014
<input type="checkbox"/>	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	June 13, 2014 (published on June 20, 2014)
<input checked="" type="checkbox"/>	ANSI C63.10	American national Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	June 27, 2013 (published on September 13, 2013)
<input checked="" type="checkbox"/>	RSS-Gen	Radio Standards Specification RSS-Gen Issue 4 containing General Requirements for Compliance of Radio Apparatus, published by Industry Canada	November 2014
<input checked="" type="checkbox"/>	RSS-210	Radio Standards Specification RSS-210 Issue 8 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, published by Industry Canada	December 2010
<input type="checkbox"/>	RSS-310	Radio Standards Specification RSS-310 Issue 3 for Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category II Equipment, published by Industry Canada	December 2010
<input checked="" type="checkbox"/>	RSS-102	Radio Standards Specification RSS-102 Issue 5: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), published by Industry Canada	March 2015
<input type="checkbox"/>	ICES-003	Interference-Causing Equipment Standard ICES-003 Issue 6: Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement, published by Industry Canada	January 2016
<input checked="" type="checkbox"/>	CISPR 22	Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement"	1997



---

<input type="checkbox"/>	CAN/CSA CISPR 22-10	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (Adopted IEC CISPR 22:2008, sixth edition, 2008-09)	2010
<input checked="" type="checkbox"/>	TRC-43	Designation of Emissions, Class of Station and Na- ture of Service, published by Industry Canada	November 2012



## 9 Revision History

Revision History			
<i>Edition</i>	<i>Date</i>	<i>Issued by</i>	<i>Modifications</i>
1	18 Nov 2016	J. Roidt	First Edition
2	2017-03-27	M. Steindl	Information about board of management and technical manager and updated. Inserted table of tested samples. Technical update of summary page. Re-evaluation of RF exposure.
3	2017-05-15	M. Steindl (lc)	Added estimation for human exposure to electromagnetic fields acc. to OET Bulletin 65.