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# Test Report

Report Number:

**F191944E1**

Equipment under Test (EUT):

**FM transmitter 70TX-D2**  
**FM receiver 70RX-S2**

Applicant:

**Gutermann Technology GmbH**

Manufacturer:

**HM-Funktechnik GmbH**

## References

- [1] **Public Notice 88: 2004; Annex 06:** Test method for radio equipment listed in Article 2.1.11 of the Certification Regulations
- [2] **Ordinance Regulation Radio Equipment**, article 1 to 26 and article 58

## Test result

The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test. The complete test results are presented in the following.

Tested and written by:	Wolfgang KASALOWSKY Name	<i>W. Kasalowsky</i> Signature	11.02.2020 Date
Reviewed and approved by:	Bernd STEINER Name	<i>B. Steiner</i> Signature	11.02.2020 Date

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# 1 Identification

## 1.1 Applicant

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eMail Address:	erwin.glashauser@gutermann-water.com
Applicant represented during the test by the following person:	-

## 1.2 Manufacturer

Name:	HM-Funktechnik GmbH
Address:	Zum Handenberg 3 66620 Primstal
Country:	Germany
Name for contact purposes:	Mr. Thomas STÖHR
Phone:	+49 6875 9105 0
Fax:	+49 6875 9105 10
eMail Address:	info@hmradio.de
Manufacturer represented during the test by the following person:	-

## 1.3 Test laboratory

The tests were carried out at:

**PHOENIX TESTLAB GmbH**  
**Königswinkel 10**  
**32825 Blomberg**  
**Germany**

## 1.4 EUT (Equipment Under Test)

Test object:	FM transmitter	FM receiver
Model:	70TX-D2	70RX-S2
Serial number:	TX: 1948051 (364.700 MHz) 1948055 (365.150 MHz) 1948053 (365.600 MHz)	1948057 (364.700 MHz / 365.150 MHz) 1948058 (365.600 MHz)
Hardware version:	Rev. 1	Rev. 2

Note: Phoenix Testlab GmbH does not take samples. The samples used for tests are provided exclusively by the applicant.

## 1.5 Technical data of equipment

Transmitter:	
Power supply:	DC
Supply voltage:	U <sub>nom</sub> = 6.0 V <sub>DC</sub> U <sub>min</sub> = 5.4 V <sub>DC</sub> U <sub>max</sub> = 8.0 V <sub>DC</sub>
Temperature range:	-40 °C to +80 °C
Operating Frequency Range: *	364.7 MHz to 365.6 MHz
Channel spacing: *	12.5 kHz
Operating Frequency: *	One channel in the operating channel range
Rated RF output power: *	typ. 400 mW
Modulation: *	FM
Frequency deviation: *	± 1.5 kHz
Antenna connector: *	SMB

Receiver	
Power supply:	DC
Supply voltage:	U <sub>nom</sub> = 3.6 V <sub>DC</sub> U <sub>min</sub> = 3.2 V <sub>DC</sub> U <sub>max</sub> = 5.5 V <sub>DC</sub>
Temperature range:	-40 °C to +80 °C
Operating Frequency Range: *	364.7 MHz to 365.6 MHz
Channel spacing: *	12.5 kHz
Operating Frequency: *	One channel in the operating channel range
Modulation: *	FM
Antenna connector: *	SMB

\*: Declared by the applicant.

## 1.6 Dates

Date of receipt of test sample:	02.12.2019
Start of test:	03.12.2019
End of test:	16.12.2019

## 2 Operational states

There are two kinds of EUTs. One is a FM transmitter. The other is a FM receiver.  
The EUTs are mounted on an evaluation board.

The evaluation board for TX is equipped with a connector for applying the modulation and screw terminals for applying the operating voltage. The RF output connector is located at the metal housing of the EUT. Three EUTs for TX are available, for the lowest, middle and highest TX frequency.

The evaluation board for RX is equipped with a connector for the demodulated signal and screw terminals for applying the operating voltage. The RF input connector is located at the metal housing of the EUT. Three evaluation boards for RX are available. By resistors at the evaluation boards the lowest, middle and highest RX frequency is defined.

## 3 Additional information

None

## 4 Overview

Subclause	Test Parameter	Remarks
Item 11 of article 2 (1) of certification ordinance	Vibration test	Passed
Item 11 of article 2 (1) of certification ordinance	Temperature-humidity test	Passed
Item 11 of article 2 (1) of certification ordinance	Frequency tolerance	Passed
Item 11 of article 2 (1) of certification ordinance	Occupied bandwidth	Passed
Item 11 of article 2 (1) of certification ordinance	Spurious emission of transmitter	Passed
Item 11 of article 2 (1) of certification ordinance	Antenna power	Passed
Item 11 of article 2 (1) of certification ordinance	Frequency deviation	Passed
Item 11 of article 2 (1) of certification ordinance	Adjacent channel leakage power	Passed
Item 11 of article 2 (1) of certification ordinance	Radio waves which are secondarily emitted	Passed

## 5 Results

### 5.1 Vibration test

Ambient temperature	22 °C	Relative humidity	47 %
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#### Test procedure:

1. Fix the EUT on the vibration plate of the vibration machine.
2. The EUT has to be switched off.
3. Add the following vibrations: Vibration amplitude: 3 mm, Vibration frequency: Lowest possible frequency to 500 times per minute, Vibration time: 15 minutes for each direction (up and down, left and right, front and rear).
4. After vibration the EUT has to be powered on and the frequency tolerance measurement as described in clause **Fehler! Verweisquelle konnte nicht gefunden werden.** shall be carried out.
5. The EUT has to be switched off again.
6. Add the following vibrations: Vibration amplitude: 3 mm, Vibration frequency: 500 times per minute to 1800 times per minute, Vibration time: 15 minutes for each direction (up and down, left and right, front and rear).
7. After vibration the EUT has to be powered on and the frequency tolerance measurement as described in clause **Fehler! Verweisquelle konnte nicht gefunden werden.** shall be carried out.

#### Test setup:



#### Test result:

Nominal frequency:	365.150000 MHz	
Voltage:	5.4 V	8.0 V
	Measured frequency [MHz]	
Item 4 of test procedure:	365.149810	365.149810
Item 7 of test procedure:	365.149810	365.149810
	Frequency tolerance [MHz]	
Item 4 of test procedure:	-0.000190	-0.000190
Item 7 of test procedure:	-0.000190	-0.000190
	Frequency tolerance [ppm]	
Item 4 of test procedure:	-0.52	-0.52
Item 7 of test procedure:	-0.52	-0.52
Measurement uncertainty:	$\pm 9.5 \cdot 10^{-8}$ (frequency)	

**Limit:** The frequency tolerance should be less than 4 ppm.

Test equipment used (see chapter 6 for details)

3, 5, 11, 15
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## 5.2 Temperature and humidity test

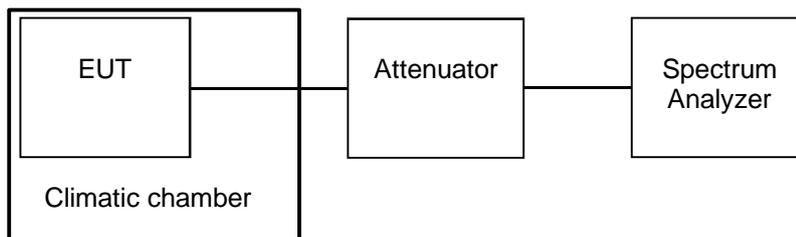
Ambient temperature	22 °C
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Relative humidity	47 %
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### Test procedure:

1. Place the EUT in the climatic chamber.
2. The EUT has to be switched off.
3. Set the temperature inside the climatic chamber to 35 °C and relative humidity of 95 %.
4. Leave the EUT in this condition for 4 hours.
5. After the duration of 4 hours return the setting of temperature and humidity to normal temperature and humidity.
6. The EUT has to be powered on and the frequency tolerance measurement as described in clause **Fehler! Verweisquelle konnte nicht gefunden werden.** shall be carried out.

### Test setup:



### Test result:

Nominal frequency:	365.150000 MHz	
Voltage:	5.4 V	8.0 V
	Measured frequency [MHz]	
Item 6 of test procedure:	365.149810	365.149810
	Frequency tolerance [MHz]	
Item 6 of test procedure:	-0.000190	-0.000190
	Frequency tolerance [ppm]	
Item 6 of test procedure:	-0.52	-0.52
Measurement uncertainty:	$\pm 9.5 \cdot 10^{-8}$ (frequency)	

**Limit:** The frequency tolerance should be less than 4 ppm.

Test equipment used (see chapter 6 for details)

3, 5, 11, 15

### 5.3 Frequency tolerance

Ambient temperature	22 °C
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Relative humidity	47 %
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**Test procedure:**

EUT is set to the test frequency and transmits continuously. No modulation is applied.

**Test setup:**



**Test result:**

Nominal frequency:	364.700000 MHz		365.150000 MHz		365.600000 MHz	
Voltage:	5.4 V	8.0 V	5.4 V	8.0 V	5.4 V	8.0 V
Temperature	Measured frequency [MHz]					
-40 °C	364.699790	364.699770	365.149870	365.149830	365.599970	365.599950
+22 °C	364.699890	364.699870	365.149810	365.149810	365.599970	365.599970
+80 °C	364.699910	364.699930	365.149750	365.149770	365.599950	365.599950
	Frequency tolerance [MHz]					
-40 °C	-0.000210	-0.000230	-0.000130	-0.000170	-0.000030	-0.000050
+22 °C	-0.000110	-0.000130	-0.000190	-0.000190	-0.000030	-0.000030
+80 °C	-0.000090	-0.000070	-0.000250	-0.000230	-0.000050	-0.000050
	Frequency tolerance [ppm]					
-40 °C	-0.58	-0.63	-0.36	-0.47	-0.08	-0.14
+22 °C	-0.30	-0.36	-0.52	-0.52	-0.08	-0.08
+80 °C	-0.25	-0.19	-0.68	-0.63	-0.14	-0.14
Measurement uncertainty:	±9.5*10 <sup>-8</sup> (frequency)					

**Limit:**

The frequency tolerance should be less than 4 ppm.

Test equipment used (see chapter 6 for details)

3, 5, 11, 12, 15
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## 5.4 Occupied frequency bandwidth

Ambient temperature	22 °C	Relative humidity	47 %
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### Test procedure:

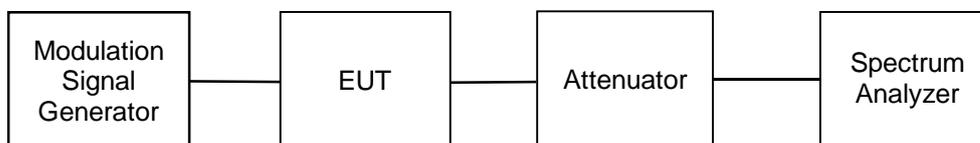
The EUT is modulated by simulated voice signal. Modulation level should be 10 dB higher than the level needed for 70% of the maximum frequency deviation when modulated with 1 kHz sine wave.

All of the power spectrum distribution shall be measured using a spectrum analyzer with an appropriate RF connector. The measurements shall be performed at the bandwidth, of which the sum of the power of the spectrum distribution's upper limit and that of the lower limit each account for 0.5% of the entire power.

Set the spectrum analyzer as follows:

Center frequency:	Carrier frequency
Sweep frequency width:	Approx. 2 to 3.5 times the permissible value
Resolution bandwidth:	Lower than 3 % of permissible value
Video bandwidth:	Same as resolution bandwidth
Y scale:	10 dB/Div
Input level:	Carrier is higher than the spectrum analyzer noise level by at least 50 dB
Data points:	Higher than 400 points
Amplitude averaging process:	5 to 10 times when modulated by simulated voice
Detection mode:	Sample

### Test setup:



**Test result:**

Nominal frequency: [MHz]	364.700000		365.150000		365.600000	
Voltage: [V]	5.4	8.0	5.4	8.0	5.4	8.0
Lower frequency: [MHz]	364.697255	364.697214	365.147134	365.147134	365.597375	365.597335
Upper frequency: [MHz]	364.702545	364.702505	365.152465	365.152505	365.602705	365.602665
OBW: [kHz]	5.291	5.291	5.331	5.371	5.331	5.331
Measurement uncertainty:	$\pm 9.5 \cdot 10^{-8}$					

**Limit:**

The OBW shall be less than 8.5 kHz.

Test equipment used (see chapter 6 for details)

3, 5, 8, 11, 15

## 5.5 Spurious emission level

Ambient temperature	22 °C	Relative humidity	47 %
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### Test procedure:

EUT is set to the test frequency and transmits continuously. No modulation is applied.

When searching the spurious, set the spectrum analyzer as follows:

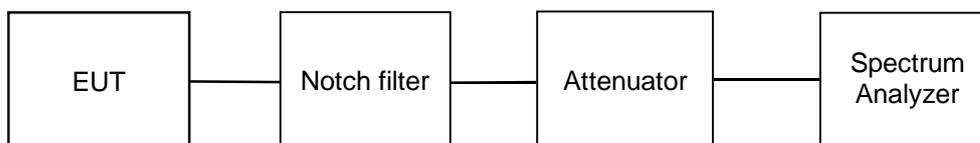
Frequency range:	Lowest possible frequency to the frequency at least 3 times higher than the carrier
Resolution bandwidth:	1 kHz for lower than 150 kHz 10 kHz for 150 kHz to 30 MHz 100 kHz for 30 MHz to 1 GHz 1 MHz for higher than 1 GHz
Video bandwidth:	Same as resolution bandwidth
Sweep time:	Minimum time in which accuracy is ensured
Y scale:	10 dB/Div
Input level range:	Value that is the maximum dynamic
Data points:	More than 400 points
Sweep mode:	Single sweep
Detection mode:	Positive peak

When measuring the spurious amplitude, set the spectrum analyzer as follows:

Centre frequency:	Detected spurious frequency
Span:	Zero span
Resolution bandwidth:	1 kHz for lower than 150 kHz 10 kHz for 150 kHz to 30 MHz 100 kHz for 30 MHz to 1 GHz 1 MHz for higher than 1 GHz
Video bandwidth:	Same as resolution bandwidth
Sweep time:	Minimum time in which accuracy is ensured
Y scale:	10 dB/Div
Input level range:	Value that is the maximum dynamic
Data points:	More than 400 points
Sweep mode:	Single sweep
Detection mode:	Sample

If the spurious amplitude value detected in the first step meets the standard, measuring the spurious amplitude in the second step can be omitted.

### Test setup:



**Test results:**

Operation Mode: Continuous transmission without modulation @ 364.70 MHz /  $U_B = 5.4$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-59.1	0.00123	25
168.891	100	-56.2	0.00240	25
195.799	100	-53.4	0.00457	25
261.087	100	-56.7	0.00214	25
299.427	100	-56.9	0.00204	25
729.374	100	-52.4	0.00575	25
1093.732	100	-47.3	0.01862	25
Measurement uncertainty:		$\pm 0.7$ dB		

Operation Mode: Continuous transmission without modulation @ 364.70 MHz /  $U_B = 8.0$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-63.0	0.00050	25
168.891	100	-56.2	0.00240	25
195.799	100	-53.3	0.00468	25
261.087	100	-58.9	0.00129	25
299.427	100	-58.2	0.00151	25
729.374	100	-52.3	0.00589	25
1093.732	100	-47.0	0.02000	25
Measurement uncertainty:		$\pm 0.7$ dB		

Operation Mode: Continuous transmission without modulation @ 365.15 MHz /  $U_B = 5.4$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-58.2	0.00151	25
166.708	100	-56.0	0.00251	25
198.300	100	-53.1	0.00490	25
299.030	100	-56.0	0.00251	25
730.287	100	-51.5	0.00708	25
Measurement uncertainty:		$\pm 0.7$ dB		

Operation Mode: Continuous transmission without modulation @ 365.15 MHz /  $U_B = 8.0$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-62.5	0.00056	25
167.224	100	-55.6	0.00275	25
198.101	100	-53.4	0.00457	25
263.746	100	-58.8	0.00131	25
299.188	100	-57.1	0.00195	25
730.287	100	-51.5	0.00707	25
Measurement uncertainty:		$\pm 0.7$ dB		

Operation Mode: Continuous transmission without modulation @ 365.6 MHz /  $U_B = 5.4$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-62.5	0.00056	25
167.224	100	-55.6	0.00275	25
198.101	100	-53.4	0.00457	25
263.746	100	-58.8	0.00131	25
299.188	100	-57.1	0.00195	25
730.287	100	-51.5	0.00707	25
Measurement uncertainty:		$\pm 0.7$ dB		

Operation Mode: Continuous transmission without modulation @ 365.6 MHz /  $U_B = 8.0$  V

SPURIOUS and HARMONICS				
Frequency	Bandwidth of the receiver	Level		Limit
[MHz]	[kHz]	[dBm]	[ $\mu$ W]	[ $\mu$ W]
0.100	1	-62.5	0.00056	25
167.224	100	-55.6	0.00275	25
198.101	100	-53.4	0.00457	25
263.746	100	-58.8	0.00131	25
299.188	100	-57.1	0.00195	25
730.287	100	-51.5	0.00707	25
Measurement uncertainty:		$\pm 0.7$ dB		

Test equipment used (see chapter 6 for details)

1, 4, 5, 6, 11, 13, 14, 15

## 5.6 Antenna power deflection

Ambient temperature	22 °C	Relative humidity	47 %
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### Test procedure:

EUT is set to the test frequency and transmits continuously. No modulation is applied.

### Test setup:



### Test results:

Rated output power level: 0.4 W (conducted)

TEST CONDITION			
Frequency [MHz]	Voltage [V]	Transmitting power (conducted) [W]	Relative to rated power [%]
364.700	5.4	0.372	-25.6
	8.0	0.424	-15.2
365.150	5.4	0.396	-20.8
	8.0	0.449	-10.2
365.600	5.4	0.395	-21.0
	8.0	0.467	-6.6
Measurement uncertainty:		± 17 %	

### Limit:

Maximum permissible power: 50 W

Permissible deviation: lower limit: - 50 %  
upper limit: +50 %

Test equipment used (see chapter 6 for details)

5, 9, 10, 11, 15

## 5.7 FM deviation

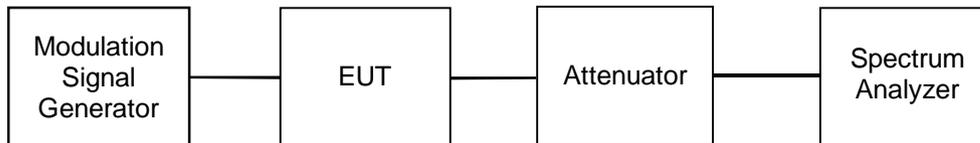
Ambient temperature	22 °C	Relative humidity	47 %
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### Test procedure:

EUT is set to the test frequency and transmits continuously.

1. Modulation is set to 1 kHz sine wave. Modulation input is changed from -10 dB to 20 dB in relation to the standard modulation level.
2. Modulation is set to 1 kHz sine wave. Level is increased to maximum deviation at 1 kHz. With this level the deviation from 3 kHz to 15 kHz is measured and the attenuation is reported.

### Test setup:



### Test results:

AF Level * [dB]	FM deviation [kHz]			Limit [kHz]
	f <sub>TX</sub> = 364.7 MHz	f <sub>TX</sub> = 365.15 MHz	f <sub>TX</sub> = 365.6 MHz	
-10	-0.29 / +0.30	-0.28 / +0.30	-0.30 / +0.30	±2.5 kHz
0	-0.77 / +0.78	-0.77 / +0.76	-0.78 / +0.77	
+10	-1.48 / +1.45	-1.49 / +1.40	-1.49 / +1.43	
+20	-1.59 / + 1.51	-1.60 / + 1.50	-1.58 / + 1.52	
Measurement uncertainty:	± 3,9%			

\* relative to AF level, which causes 60% of FM deviation, at 1 kHz and AF level at 1000 mV.

AF frequency [kHz]	Attenuation [dB]			Limit [dB]
	f <sub>TX</sub> = 364.7 MHz	f <sub>TX</sub> = 365.15 MHz	f <sub>TX</sub> = 365.6 MHz	
3	5.3	5.3	4.8	0
5	26.2	25.1	24.6	17.7
10	50.9	51.1	48.2	41.8
15	56.1	56.1	56.0	55.9
Measurement uncertainty:	± 3,9%			

Test equipment used (see chapter 6 for details)

3, 5, 7, 8, 11, 15

## 5.8 Adjacent channel leakage power

Ambient temperature	22 °C
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Relative humidity	48 %
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### Test procedure:

EUT is set to the test frequency and transmits continuously.

Modulation is set to 1.25 kHz sine wave.

Modulation input is set to a level, which is 10 dB higher than that needed for a FM deviation of 60 % of maximum FM deviation.

### Test results:

Center frequency [MHz]	Bandwidth [kHz]	Voltage [V]	Adjacent channel				Limit [dB]
			Bandwidth [kHz]	Offset [kHz]	Power ratio [dB]		
					Lower CH	Upper CH	
364.70	8.5	5.4	8.5	12.5	61.4	61.7	60
		8.0			62.2	62.3	
365.15		5.4			63.1	63.8	
		8.0			63.7	64.1	
365.60		5.4			62.3	63.4	
		8.0			62.2	63.2	
Measurement uncertainty:					± 1.7 dB		

Test equipment used (see chapter 6 for details)

2, 5, 8, 11, 15
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## 5.9 Radio waves which are secondarily emitted

Ambient temperature	22 °C	Relative humidity	47 %
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### Test procedure:

EUT is set to the test frequency and receives continuously.

When searching the spurious, set the spectrum analyzer as follows:

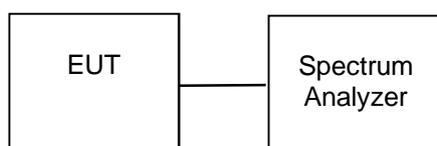
Frequency range:	Lowest possible frequency to the frequency at least 3 times higher than the carrier
Resolution bandwidth:	1 kHz for lower than 150 kHz 10 kHz for 150 kHz to 30 MHz 100 kHz for 30 MHz to 1 GHz 1 MHz for higher than 1 GHz
Video bandwidth:	Same as resolution bandwidth
Sweep time:	Minimum time in which accuracy is ensured
Y scale:	10 dB/Div
Input level range:	Value that is the maximum dynamic
Data points:	More than 400 points
Sweep mode:	Single sweep
Detection mode:	Positive peak

When measuring the spurious amplitude, set the spectrum analyzer as follows:

Centre frequency:	Detected spurious frequency
Span:	Zero span
Resolution bandwidth:	1 kHz for lower than 150 kHz 10 kHz for 150 kHz to 30 MHz 100 kHz for 30 MHz to 1 GHz 1 MHz for higher than 1 GHz
Video bandwidth:	Same as resolution bandwidth
Sweep time:	Minimum time in which accuracy is ensured
Y scale:	10 dB/Div
Input level range:	Value that is the maximum dynamic
Data points:	More than 400 points
Sweep mode:	Single sweep
Detection mode:	Sample

If the spurious amplitude value detected in the first step meets the standard, measuring the spurious amplitude in the second step can be omitted.

### Test setup:



**Test results:**

Operation Mode: Continuous receiving @ 364.70 MHz /  $U_B = 3.2\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [μW]
		[dBm]	[μW]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		± 0.7 dB		

Operation Mode: Continuous receiving @ 364.70 MHz /  $U_B = 5.5\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [μW]
		[dBm]	[μW]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		± 0.7 dB		

Operation Mode: Continuous receiving @ 365.15 MHz /  $U_B = 3.2\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [μW]
		[dBm]	[μW]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		± 0.7 dB		

Operation Mode: Continuous transmission without modulation @ 365.15 MHz /  $U_B = 5.5\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [μW]
		[dBm]	[μW]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		± 0.7 dB		

Operation Mode: Continuous transmission without modulation @ 365.6 MHz /  $U_B = 3.2\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [ $\mu\text{W}$ ]
		[dBm]	[ $\mu\text{W}$ ]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		$\pm 0.7\text{ dB}$		

Operation Mode: Continuous transmission without modulation @ 365.6 MHz /  $U_B = 5.5\text{ V}$

Frequency [MHz]	Bandwidth of the receiver [kHz]	Level		Limit [ $\mu\text{W}$ ]
		[dBm]	[ $\mu\text{W}$ ]	
No spurious exceeding the noise floor found.				
Measurement uncertainty:		$\pm 0.7\text{ dB}$		

**Limit:**

Frequency lower than 1 GHz: 4 nW  
 Frequency higher than 1 GHz: 20 nW

Test equipment used (see chapter 6 for details)

3, 11, 15

## 6 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal. Inst.
1	EMI Receiver / Spectrum Analyser	ESW44	Rohde & Schwarz	101819	483149	21.02.2019	Rohde & Schwarz GmbH & Co. KG
2	EMI Receiver / Spectrum Analyser	ESR7	Rohde & Schwarz	101733	482330	22.11.2019	Rohde & Schwarz GmbH & Co. KG
3	EMI Receiver / Spectrum Analyser	ESI 40	Rohde & Schwarz	100064/040	480355	03.04.2019	Rohde & Schwarz GmbH & Co. KG
4	Notch Filter	TTR 375-3EE	Telonic Berkeley Inc.	375-3EE	480330	Calibration not necessary	
5	Attenuator 10 dB	WA8 / 18-10-34	Weinschel	-	481448	Calibration not necessary	
6	Attenuator 10 dB	WA8 / 18-10-34	Weinschel	-	481449	Calibration not necessary	
7	Radiocommunication Analyzer	CMTA54	Rohde & Schwarz	841904/011	480169	01.03.2018	Rohde & Schwarz GmbH & Co. KG
8	Audio Analyzer	UPL 05	Rohde & Schwarz	845646/026	480957	01.03.2018	Rohde & Schwarz GmbH & Co. KG
9	Power probe thermal	NRV-Z51	Rohde & Schwarz	825948/004	480247	04.04.2019	Rohde & Schwarz GmbH & Co. KG
10	Power Meter	NRVD	Rohde & Schwarz	833697/030	480589	03.04.2019	Rohde & Schwarz GmbH & Co. KG
11	DC power supply	TOE8952-40	Toellner	87700	482590	Calibration not necessary	
12	Dynamic temperature chamber	MK 240	WTB Binder Labortechnik GmbH	05-79022	480462	10.07.2019	Thermo TEC Weilberg GmbH & Co. KG
13	High pass 800 MHz	WHF800-6HH/1000	Wainwright Instruments GmbH	3	480954	Calibration not necessary	
14	Low pass 250 MHz	HP-350	Dirk Fischer Elektronik	-	410151	Calibration not necessary	
15	Multimeter	971A	Hewlett Packard	JP39009358	480721	19.02.2019	Phoenix Contact, Blomberg

## 7 Report History

Report Number	Date	Comment
F191944E1	11.02.2020	Initial test report
-	-	-
-	-	-

## 8 List of Annexes

Annex A	Test Setup Photos	1 page
Annex B	Photos of the EUT	8 pages
Annex C	Measurement Results	32 pages