

Test Report

Report Number:

F181673E4

Equipment under Test (EUT):

RFU610-10601

Applicant:

SICK AG

Manufacturer:

SICK AG



Deutsche
Akkreditierungsstelle
D-PL-17186-01-01
D-PL-17186-01-02
D-PL-17186-01-03

References

- [1] **ANSI C63.4:2014** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- [2] **FCC 47 CFR Part 2:** General Rules and Regulations
- [3] **FCC 47 CFR Part 15:** Radio Frequency Devices (Subpart B)
- [4] **ICES-003 Issue 6: (January 2016)** Spectrum Management and Telecommunications. Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) —Limits and Methods of Measurement

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:	Thomas KÜHN Name	 Signature	18.03.2019 Date
Reviewed and approved by:	Michael DINTER Name	 Signature	18.03.2019 Date

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1 Identification

1.1 Applicant

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Applicant represented during the test by the following person:	-

1.2 Manufacturer

Name:	SICK AG
Address:	Merkurring 20 22143 Hamburg
Country:	Germany
Name for contact purposes:	Mr. Christian MÜNTER
Phone:	+49 40 61 16 80 - 243
Fax:	+49 40 61 16 80 - 201
eMail address:	Christian.Muenter@sick.de
Manufacturer represented during the test by the following person:	-

1.3 Test Laboratory

The tests were carried out by: **PHOENIX TESTLAB GmbH**
Königswinkel 10
32825 Blomberg
Germany

Accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) in compliance with DIN EN ISO/IEC 17025 under Reg. No. D-PL-17186-01-02 and D-PL-17186-01-05, FCC Test Firm Designation Number DE0004, FCC Test Firm Registration Number 469623, CAB Identifier DE0003 and ISED# 3469A.

1.4 EUT (Equipment under Test)

Test object: *	UHF RFID read/write device
Model name / HVIN: *	RFU610-10601
PMN: *	RFU610
FCC ID:*	WRMRFU610
IC: *	10066A-RFU610
Serial number: *	19099024
PCB identifier: *	EK-Frontend 2104880/EK-Digital 2100953/EK-Connector 2100952
Hardware version: *	Prototype
Software version / FVIN: *	T2.06RC03
Lowest internal frequency: *	18.432 MHz

* declared by the applicant.

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

Channel 1	RX:	902.75 MHz	TX:	902.75 MHz
Channel 25	RX:	914.75 MHz	TX:	914.75 MHz
Channel 50	RX:	927.25 MHz	TX:	927.25 MHz

Rated RF output power: *	15.5 dBm (e.i.r.p.)				
Antenna type: *	Internal				
Antenna gain: *	-4.5 dBi				
Antenna connector: *	Yes (internal only)				
Adaptive frequency agility: *	Yes				
Modulation: *	FHSS (PR-ASK / DSB-ASK)				
Supply Voltage (DC-Port): *	U _{nom} =	24.0 V DC	U _{min} =	18.0 V DC	U _{max} = 30.0 V DC
Supply Voltage (PoE): *	U _{nom} =	48.0 V DC	U _{min} =	36.0 V DC	U _{max} = 57.0 V DC
Temperature range: *	-25 °C to +50 °C				

* declared by the applicant.

Identification	Connector		Length *
	EUT	Ancillary	
Ethernet	8-pin M12-connector	RJ45	2.0 m
DC-Power-Port	4-pin M12-connector	-	2.0 m
Digital I/O	4-pin M8-connector	4-pin M8-connector	2.0 m

*: Length during the test if no other specified.

Ancillary equipment used for tests	
Light barrier SICK WTB4S-3P2262 (provided by the applicant)	
PoE power injector PHIHONG POE31U-1AT (provided by the applicant)	

1.6 Dates

Date of receipt of test sample:	06.03.2019
Start of test:	07.03.2019
End of test:	12.03.2019

2 Operational States

Description of function of the EUT:

The EUT is a UHF RFID reader with a digital I/O and an Ethernet port, which also can be used for power supply (PoE).

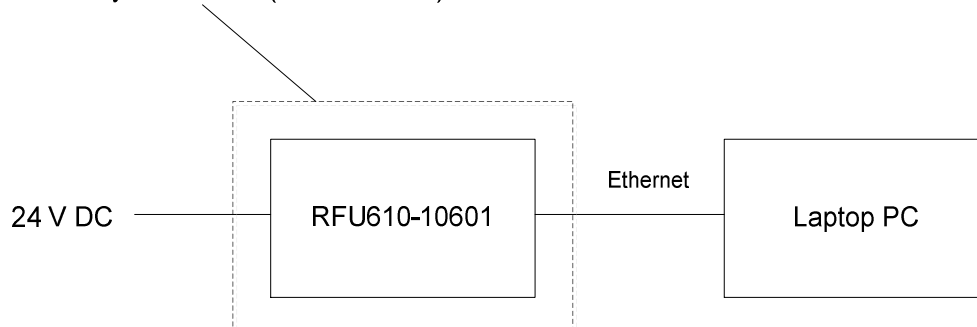
The following states were defined as the operating conditions:

During all tests the EUT was connected to a laptop PC with a operation software (SOPAS, provided by the applicant) and a light barrier. With a special part of the software, which will be not available for the final customer, the intentional part of the EUT could be set to continuous receiving mode on a fixed channel. During this mode the EUT transmits the several receiving parameters (level, RSSI...) via Ethernet to the PC and these values were displayed. Furthermore the light barrier was active.

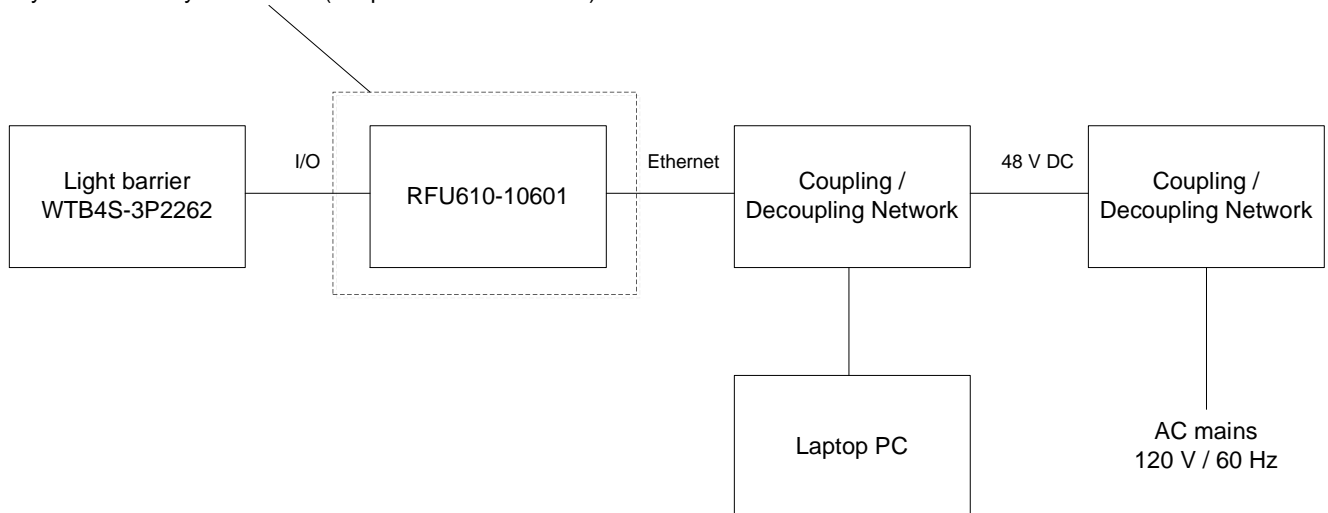
Because the EUT could be also supplied via PoE, the AC powerline conducted measurement was carried out while the EUT was supplied by an PoE-injector.

The system was setup as follows:

Physical boundary of the EUT (radiated tests)



Physical boundary of the EUT (AC powerline conducted)



3 Additional Information

This test report documents the results of the measurements of the digital part of the EUT. The results of the intentional radiator part of the EUT were documented under PHOENIX TESTLAB GmbH test report reference F181673E3.

During the tests the EUT was not labelled as required by FCC / IC.

4 Overview

Conducted emissions FCC 47 CFR Part 15 section 15.107 (b) [3] / ICES-003 Issue 6 section 6.1 [4]					
Application	Frequency range	Limits	Reference standard	Remark	Status
AC supply line	0.15 to 0.5 MHz	66 to 56 dBμV (QP)* 56 to 46 dBμV (AV)*	ANSI C63.4	Class B	Passed
	0.5 to 5 MHz	56 dBμV (QP) 46 dBμV (AV)			
	5 to 30 MHz	60 dBμV (QP) 50 dBμV (AV)			
*: Decreases with the logarithm of the frequency					
Radiated emissions FCC 47 CFR Part 15 section 15.109 (b) [3] / ICES-003 Issue 6 section 6.2 [4]					
Application	Frequency range	Limits	Reference standard	Remark	Status
Radiated Emission	30 to 88 MHz 88 to 216 MHz 216 to 960 MHz 960 to 1000 MHz	40.0 dBμV/m QP at 3 m 43.5 dBμV/m QP at 3 m 46.0 dBμV/m QP at 3 m 54.0 dBμV/m QP at 3 m	ANSI C63.4	Class B	Passed
	above 1000 MHz	54.0 dBμV/m AV at 3 m and 74.0 dBμV/m PK at 3 m			

Remark: As declared by the applicant the highest frequency is the wanted signal of the intentional radiator part of the EUT (927.250 MHz). Therefore the radiated emission measurement must be carried out up to 5th of the highest internal frequency in this case 5 GHz.

The EUT was classified by the applicant as CLASS A equipment.

5 Results

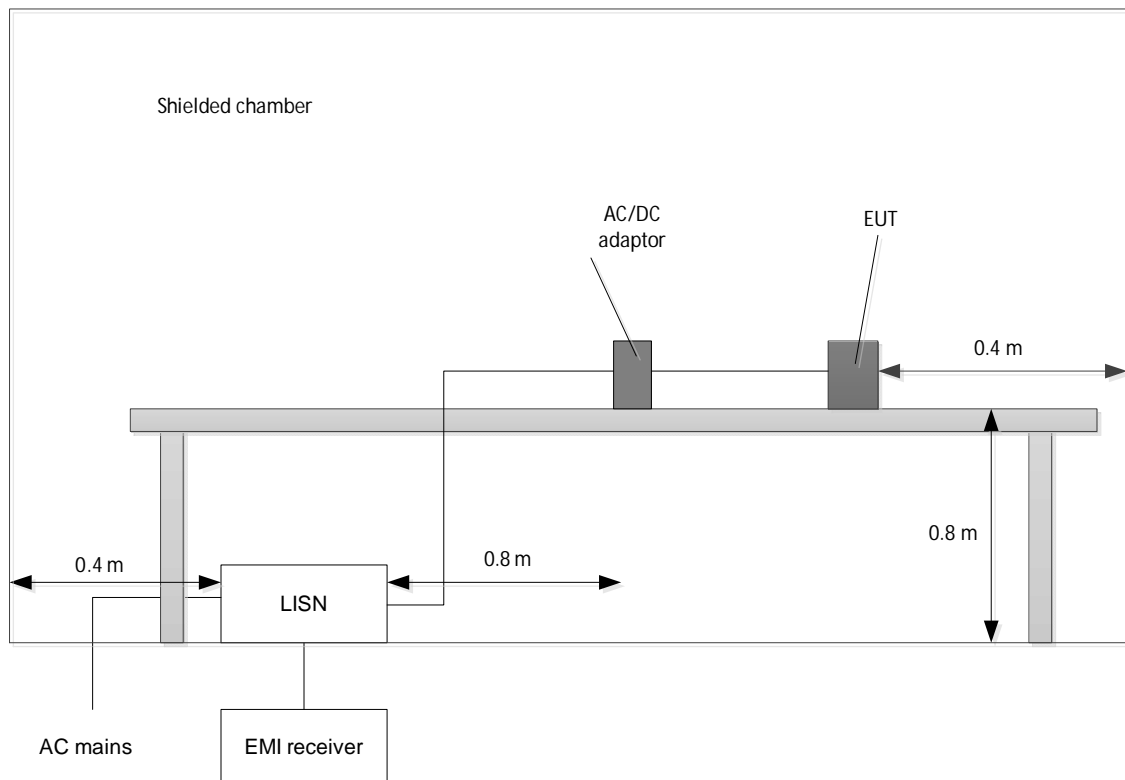
5.1 Conducted emissions on power supply lines

5.1.1 Test method

This test will be carried out in a shielded chamber. Table top devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm above the ground plane. Floor-standing devices will be placed directly on the ground plane. The setup of the Equipment under test will be in accordance to [1].

The frequency range 150 kHz to 30 MHz will be measured with an EMI Receiver set to MAX Hold mode with peak and average detector and a resolution bandwidth of 9 kHz. A scan will be carried out on the phase (or plus pole in case of DC powered devices) of the AC mains network. If levels detected 10 dB below the appropriate limit, this emission will be measured with the average and quasi-peak detector on all lines.

Frequency range	Resolution bandwidth
150 kHz to 30 MHz	9 kHz

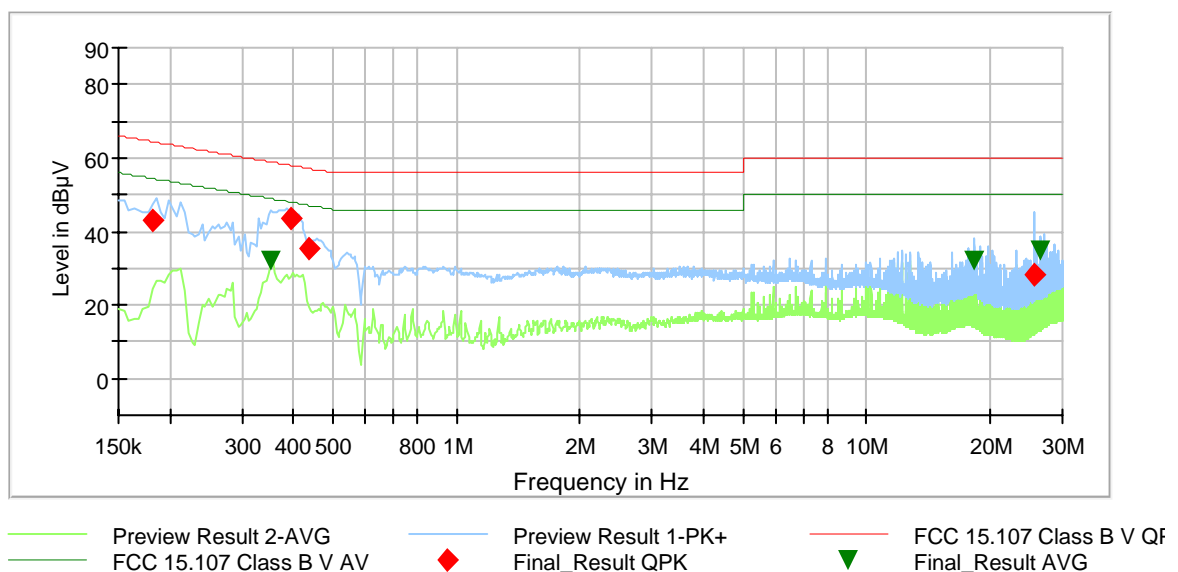


5.1.2 Results conducted emission measurement on AC mains

Ambient temperature	20 °C	Relative humidity	30 %
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Test description:	Conducted emission measurement
EUT:	RFU610
Manufacturer:	SICK AG
Operating conditions:	Receive on mid channel, light barrier active
Test site:	Phoenix TESTLAB GmbH, shielded room M4
Operator:	Th. KÜHN
Comment:	Supplied by PHIHONG PoE injector POE31U-1AT with 120 VAC/60 Hz

The curves in the diagrams below only represent for each frequency point the maximum measured value of all preliminary measurements which were made for each power supply line. The top measured curve represents the peak measurement and the bottom measured curve the average measurement. The quasi-peak measured points are marked by and the average ◆ measured points by ▼.



Final_Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.180600	43.1	---	64.5	21.4	5000.0	9.000	N	FLO	9.8
0.353400	---	32.3	48.9	16.6	5000.0	9.000	N	FLO	9.9
0.393900	43.7	---	58.0	14.3	5000.0	9.000	N	GND	9.9
0.436200	35.3	---	57.1	21.8	5000.0	9.000	N	FLO	9.9
18.366000	---	31.8	50.0	18.2	5000.0	9.000	L1	FLO	10.9
25.569600	28.5	---	60.0	31.5	5000.0	9.000	L1	FLO	11.1
26.609100	---	34.5	50.0	15.5	5000.0	9.000	L1	FLO	11.1
Measurement uncertainty		±2.8 dB							

Test result Passed

Test equipment used (refer clause 6):

1 - 7

5.2 Radiated emissions

5.2.1 Test method

The radiated emission measurement is subdivided into four stages.

- A preliminary measurement carried out in a fully anechoic chamber with a fixed antenna height in the frequency range 30 MHz to 1 GHz.
- A final measurement carried out on an open area test site with reflecting ground plane and various antenna heights in the frequency range 30 MHz to 1 GHz.
- A preliminary measurement carried out in a fully anechoic chamber with a various antenna height of 100 to 250 cm at a distance of 1.90 m to the EUT position in the frequency range 1 GHz to 40 GHz.
- A final measurement carried out in a fully anechoic chamber and various antenna height of 100 to 250 cm at a distance of 1.90 m to the EUT position in the frequency range 1 GHz to 40 GHz.

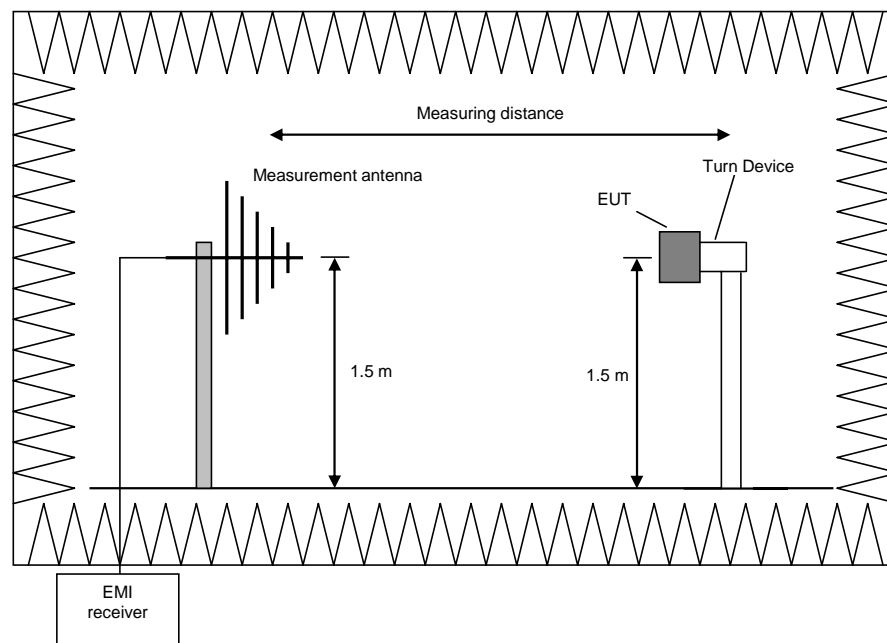
Preliminary measurement (30 MHz to 1 GHz)

This measurement will be performed in a fully anechoic chamber. Table top devices will be set up on a non-conducting turn device on the height of 1.5 m. The set-up of the Equipment under test will be in accordance to [1].

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The spectrum analyser set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 °. This measurement is repeated after raising the EUT in 30 ° steps according to [1].

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
30 MHz to 1 GHz	120 kHz



Procedure preliminary measurement:

Prescans were performed in the frequency range 30 MHz to 1 GHz.

The following procedure will be used:

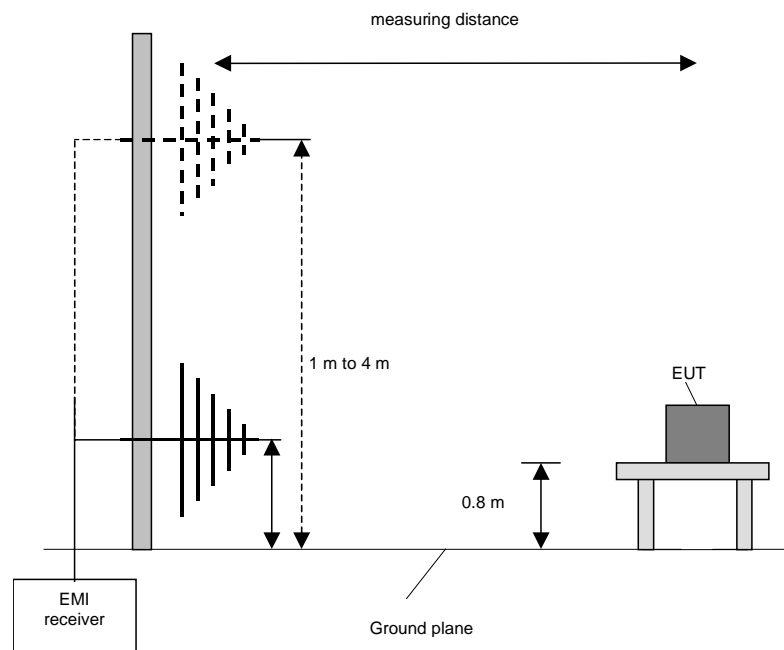
1. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2. Rotate the EUT by 360° to maximize the detected signals.
3. Repeat 1) to 2) with the vertical polarisation of the measuring antenna.
4. Make a hardcopy of the spectrum.
5. Repeat 1) to 4) with the EUT raised by an angle of 30° (60°, 90°, 120° and 150°) [1].
6. Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
7. The measurement antenna polarisation, with the according EUT position (Turntable and Turn device) which produces the highest emission for each frequency will be used for the final measurement. The six closest values to the applicable limit will be used for the final measurement.

Final measurement (30 MHz to 1 GHz)

A final measurement on an open area test site will be performed on selected frequencies found in the preliminary measurement. During this test the EUT will be rotated in the range of 0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarization and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
30 MHz to 1 GHz	120 kHz



Procedure final measurement:

The following procedure will be used:

Measure on the selected frequencies at an antenna height of 1 m and a EUT azimuth of 23 °.
Move the antenna from 1 m to 4 m and note the maximum value at each frequency.
Rotate the EUT by 45 ° and repeat 2) until an azimuth of 337 ° is reached.
Repeat 1) to 3) for the other orthogonal antenna polarization.
Move the antenna and the turntable to the position where the maximum value is detected.
Measure while moving the antenna slowly +/- 1 m.
Set the antenna to the position where the maximum value is found.
Measure while moving the turntable +/- 45 °.
Set the turntable to the azimuth where the maximum value is found.
Measure with Final detector (QP and AV) and note the value.
Repeat 5) to 10) for each frequency.
Repeat 1) to 11) for each orthogonal axes of the EUT if handheld equipment.

Preliminary and final measurement (1 GHz to 40 GHz)

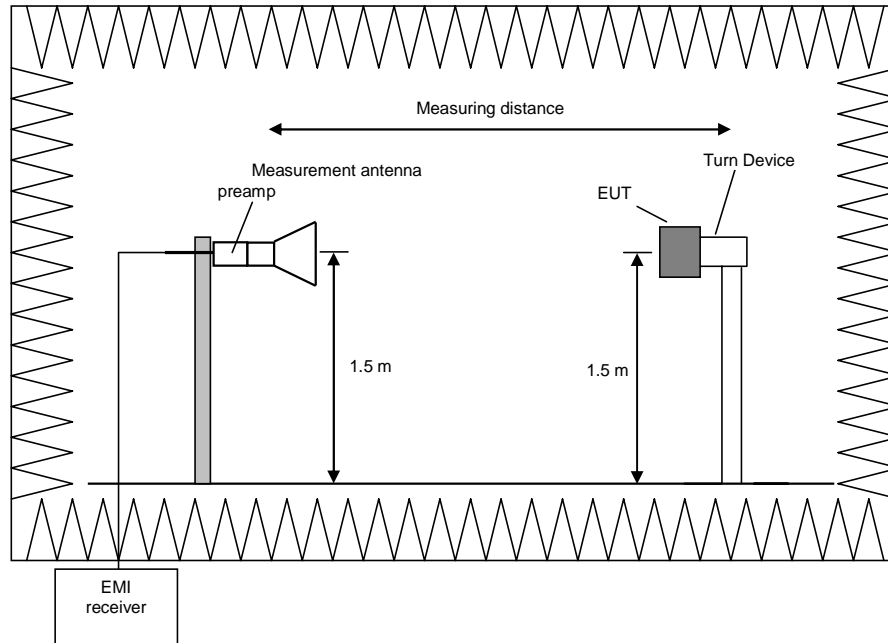
This measurement will be performed in a fully anechoic chamber. Table top devices will set up on a non-conducting turn device on the height of 1.5 m. The set-up of the Equipment under test will be in accordance to [1].

Preliminary measurement (1 GHz to 40 GHz)

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The spectrum analyser set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 °. This measurement is repeated after raising the EUT in 30 ° steps according to [1].

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	1 MHz
4 GHz to 12 GHz	1 MHz
12 GHz to 18 GHz	1 MHz
18 GHz to 26.5 GHz	1 MHz
26.5 GHz to 40 GHz	1 MHz



Procedure preliminary measurement:

Prescans were performed in the frequency range 1 to 40 GHz.

The following procedure will be used:

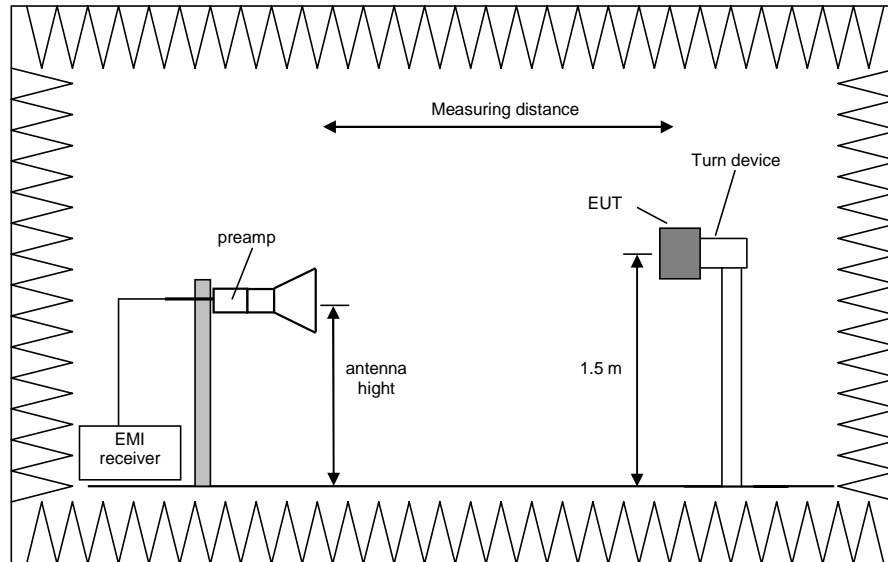
8. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
9. Rotate the EUT by 360° to maximize the detected signals.
10. Repeat 1) to 2) with the vertical polarisation of the measuring antenna.
11. Make a hardcopy of the spectrum.
12. Repeat 1) to 4) with the EUT raised by an angle of 30° (60°, 90°, 120° and 150°) .
13. Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
14. The measurement antenna polarisation, with the according EUT position (Turntable and Turn device) which produces the highest emission for each frequency will be used for the final measurement. The six closest values to the applicable limit will be used for the final measurement.

Final measurement (1 GHz to 40 GHz)

The frequency range will be divided into different sub ranges depending of the frequency range of the used antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1 MHz. The measurement will be performed by rotating the turntable through 0 to 360° in the worst-case EUT orientation which was obtained during the preliminary measurements.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	1 MHz
4 GHz to 12 GHz	1 MHz
12 GHz to 18 GHz	1 MHz
18 GHz to 26.5 GHz	1 MHz
26.5 GHz to 40 GHz	1 MHz



Procedure of measurement:

The measurements were performed in the frequency range 1 GHz to 40 GHz.

The following procedure will be used:

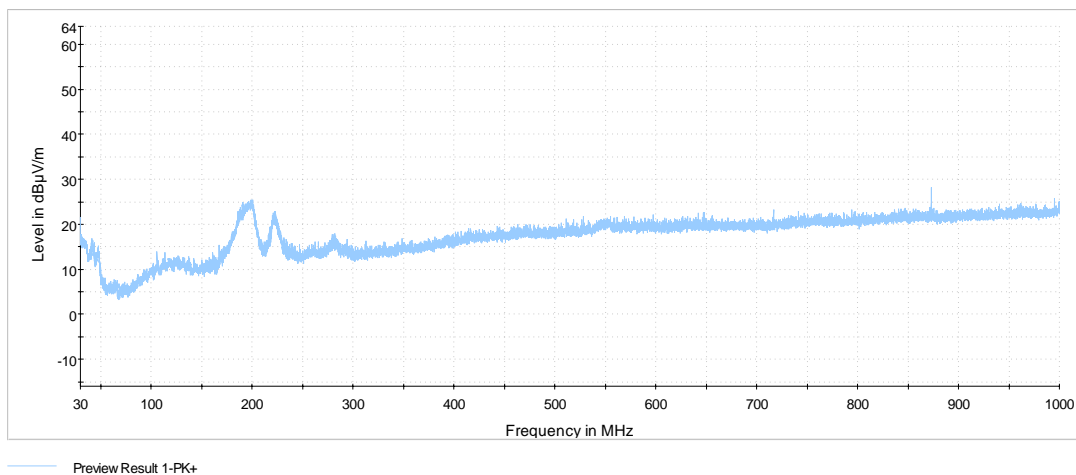
- 1) Set the turntable and the turn device to obtain the worst-case emission for the first frequency identified in the preliminary measurements.
- 2) Set the measurement antenna polarisation to the orientation with the highest emission for the first frequency identified in the preliminary measurements.
- 3) Set the spectrum analyser to EMI mode with peak and average detector activated.
- 4) Rotate the turntable from 0° to 360° to find the EUT angle that produces the highest emissions.
- 5) Note the highest displayed peak and average values
- 6) Repeat the steps 1) to 5) for each frequency detected during the preliminary measurements.

5.2.2 Results preliminary measurement 30 MHz to 1 GHz

Ambient temperature	21 °C	Relative humidity	37 %
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Test description: Radiated emission measurement according to FCC PART 15
 EUT: RFU610
 Manufacturer: SICK AG
 Operating conditions: Receive on mid channel, light barrier active
 Test site: Phoenix TESTLAB GmbH, fully anechoic chamber M20
 Operator: Th. KÜHN

The curve in the diagram only represents the maximum measured value for each frequency point of all preliminary measurements, which were carried out with the EUT in various positions.



The following frequencies were found during the preliminary radiated emission test:

- 35.723 MHz, 41.446 MHz, 41.592 MHz, 47.703 MHz, 190.923 MHz, 199.362 MHz, 648.278 MHz, 716.712 MHz, 872.930 MHz and 995.053 MHz.

Test equipment used (refer clause 6):

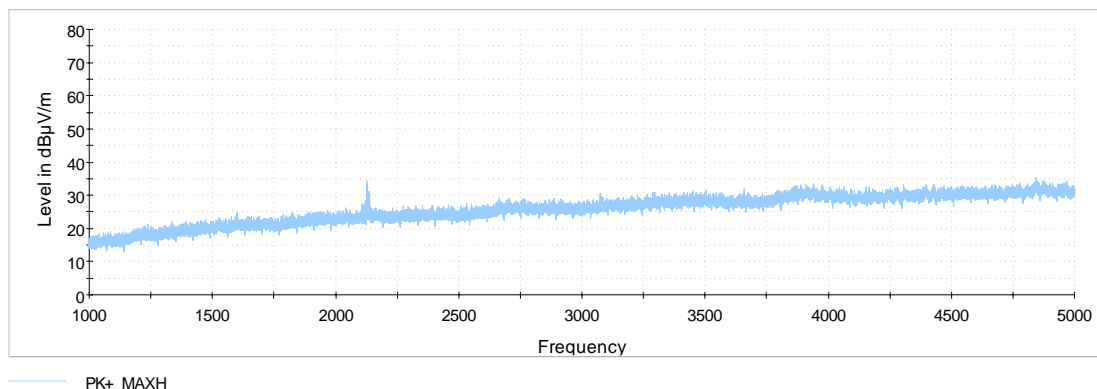
8 - 15

5.2.3 Results preliminary measurement above 1 GHz

Ambient temperature	21 °C	Relative humidity	37 %
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Test description: Radiated emission measurement according to FCC PART 15
 EUT: RFU610
 Manufacturer: SICK AG
 Operating conditions: Receive on mid channel, light barrier active
 Test site: Phoenix TESTLAB GmbH, fully anechoic chamber M20
 Operator: Th. KÜHN

The curve in the diagram only represents the maximum measured value for each frequency point of all preliminary measurements, which were carried out with the EUT in various positions.



The following frequencies were found during the preliminary radiated emission test:

- 2128.360 MHz, 2133.200 MHz, 2666.020 MHz, 3074.020 MHz, 3658.900 MHz, 3912.000 MHz and 4846.400 MHz.

Test equipment used (refer clause 6):

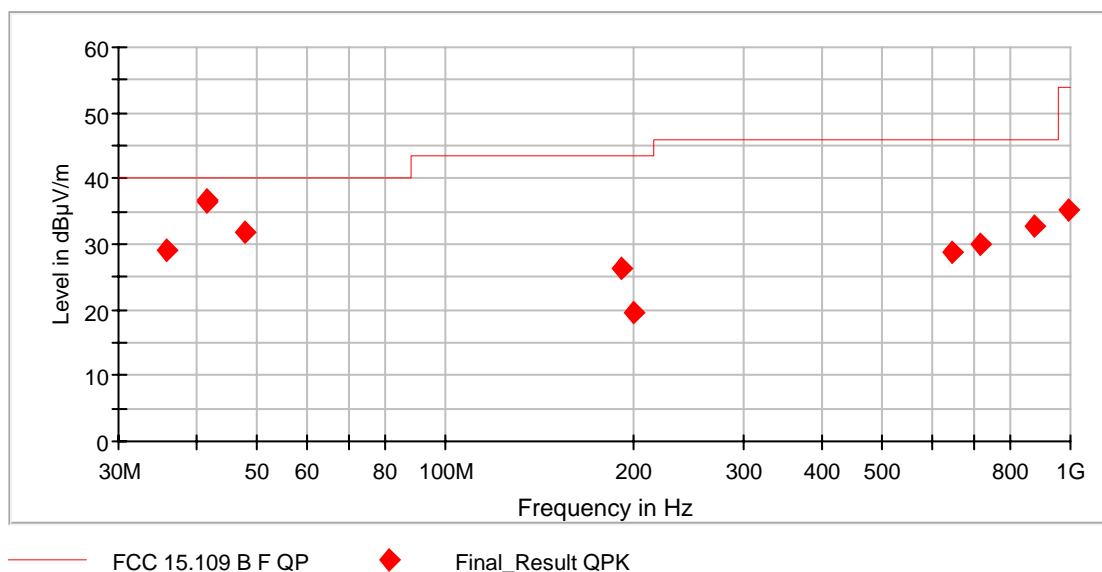
8 - 9, 11 - 12, 14 - 20

5.2.4 Result final measurement from 30 MHz to 1 GHz

Ambient temperature	20 °C	Relative humidity	30 %
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Test description: Radiated emission measurement according to FCC PART 15
 EUT: RFU610
 Manufacturer: SICK AG
 Operating conditions: Receive on mid channel, light barrier active
 Test site: Phoenix TESTLAB GmbH, OATS M6
 Operator: Th. KÜHN

The measured points and the limit line in the following diagram refer to the standard measurement of the emitted interference in compliance with the above mentioned standard. The measured points marked with "◆" are the measured results of the standard subsequent measurement on the open area test site.



The results of the standard subsequent measurement on the open area test site are indicated in the table below. The limits as well as the measured results (levels) refer to the above mentioned standard while taking account of the specified requirements for a 3 m measuring distance.

The correction factor was calculated as follows.

Corr. (dB) = cable attenuation (dB) + 6 dB attenuator (dB) + antenna factor (dB)

Therefore the reading can be calculated as follows:

Reading (dBµV/m) = result QuasiPeak (dBµV/m) - Corr. (dB)

Final result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.723	29.0	40.0	11.0	1000.0	120.000	100.0	V	198.0	24.8
41.446	36.6	40.0	3.4	1000.0	120.000	104.0	V	10.0	22.0
41.592	36.4	40.0	3.6	1000.0	120.000	104.0	V	36.0	21.9
47.703	31.7	40.0	8.3	1000.0	120.000	100.0	V	320.0	18.3
190.923	26.5	43.5	17.0	1000.0	120.000	255.0	H	325.0	16.6
199.362	19.6	43.5	23.9	1000.0	120.000	150.0	H	277.0	16.9
648.278	28.7	46.0	17.3	1000.0	120.000	150.0	V	30.0	30.5
716.712	29.9	46.0	16.1	1000.0	120.000	322.0	H	46.0	31.6
872.930	32.7	46.0	13.3	1000.0	120.000	142.0	V	26.0	33.8
995.053	35.2	54.0	18.8	1000.0	120.000	207.0	H	316.0	35.9
Measurement uncertainty				+2.2 dB / -3.6 dB					

Test: Passed

Test equipment used (refer clause 6):

3, 5, 21 - 26

5.2.5 Result final measurement above 1 GHz

Ambient temperature	21 °C	Relative humidity	37 %
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Test description: Radiated emission measurement according to FCC PART 15
 EUT: RFU610
 Manufacturer: SICK AG
 Operating conditions: Receive on mid channel, light barrier active
 Test site: Phoenix TESTLAB GmbH, fully anechoic chamber M20
 Operator: Th. KÜHN

The results of the standard subsequent measurement above 1 GHz in an anechoic chamber are indicated in the table below. The limits as well as the measured results (levels) refer to the above mentioned standard while taking account of the specified requirements for a 3 m measuring distance.

Final_Result

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Azimuth (deg)	Elevation (deg)	Corr. (dB/m)
2128.360	---	28.3	54.0	25.7	Hor.	0.0	30.0	-11
2128.360	44.4	---	74.0	29.6	Hor.	0.0	30.0	-11
2133.200	---	24.5	54.0	29.5	Hor.	0.0	30.0	-11
2133.200	41.9	---	74.0	32.1	Hor.	0.0	30.0	-11
2666.020	---	24.7	54.0	29.3	Vert.	10.0	0.0	-9
2666.020	39.6	---	74.0	34.4	Vert.	10.0	0.0	-9
3074.020	---	25.9	54.0	28.1	Hor.	58.0	60.0	-7
3074.020	38.1	---	74.0	35.9	Hor.	58.0	60.0	-7
3658.900	---	31.4	54.0	22.6	Hor.	232.0	0.0	-6
3658.900	40.7	---	74.0	33.3	Hor.	232.0	0.0	-6
3912.000	---	29.8	54.0	24.2	Vert.	159.0	30.0	-3
3912.000	42.5	---	74.0	31.5	Vert.	159.0	30.0	-3
4846.400	---	30.1	54.0	23.9	Vert.	219.0	60.0	-2
4846.400	42.4	---	74.0	31.6	Vert.	219.0	60.0	-2
Measurement uncertainty				+2.2 dB / -3.6 dB				

The correction factor was calculated as follows.

Corr. (dB) = cable attenuation (dB) + preamplifier (dB) + antenna factor (dB)

Therefore the reading can be calculated as follows:

Reading (dBμV/m) = result Peak or Average (dBμV/m) - Corr. (dB)

Test result: Passed

Test equipment used (refer clause 6):

8 - 9, 11 - 12, 14 - 20

6 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Transient Filter Limiter	CFL 9206A	Teseq GmbH	38268	481982	14.03.2018	03.2020
2	Artificial Network	NSLK8128	Schwarzbeck	8128161	480138	13.03.2018	03.2020
3	Software	EMC32	Rohde & Schwarz	100061	481022	Calibration not necessary	
4	Shielded chamber M4	B83117-S1-X158	Siemens	190075	480088	Calibration not necessary	
5	EMI Receiver / Spectrum Analyser	ESIB 26	Rohde & Schwarz	100292	481182	28.02.2018	02.2020
6	Coupling / Decoupling network	CDN EMV-ETH S A	PHOENIX TESTLAB	-	480448	Calibration not necessary	
7	AC power supply	AC6803A AC source 2000VA	Keysight	JPVJ002509	482350	Calibration not necessary	
8	Antenna mast	AS615P	Deisel	615/310	480187	Calibration not necessary	
9	Turntable	DS420 HE	Deisel	420/620/00	480315	Calibration not necessary	
10	Antenna (Bilog)	CBL6112B	Schaffner (Chase)	2688	480328	19.06.2017	06.2020
11	Multiple Control Unit	MCU	Maturo	MCU/043/971107	480832	Calibration not necessary	
12	Software	WMS32	Rohde & Schwarz		481800	Calibration not necessary	
13	RF-cable No.36	Sucoflex 106B	Suhner	0587/6B	480865	Calibration not necessary	
14	Turn device	TDF 1.5- 10Kg	Maturo	15920215	482034	Calibration not necessary	
15	EMI Receiver / Spectrum Analyser	ESW44	Rohde & Schwarz	101635	482467	29.03.2018	03.2019
16	Fully anechoic chamber M20	B83117-E2439-T232	Albatross Projects	103	480303	Calibration not necessary	
17	Antenna (Log.Per.)	HL050	Rohde & Schwarz	100438	481170	09.10.2017	10.2020
18	RF-Cable No. 40	Sucoflex 106B	Suhner	0708/6B	481330	Calibration not necessary	
19	RF-cable No.3	Sucoflex 106B	Suhner	0563/6B	480670	Calibration not necessary	
20	Preamplifier 100 MHz - 16 GHz	AFS6-00101600-23-10P-6-R	Narda MITEQ	2011215	482333	10.07.2018	07.2020
21	Open area test site M6	-	Phoenix Contact	-	480085	Calibration not necessary	
22	Antenna mast	MA240-0	Inn-Co	MA240-0/030/6600603	480086	Calibration not necessary	
23	Turntable	DS412	Deisel	412/316	480087	Calibration not necessary	
24	Controller	HD100	Deisel	100/349	480139	Calibration not necessary	
25	Antenna (Bilog)	CBL6111D	Schaffner / Teseq	25761	480894	19.10.2017	10.2020
26	Attenuator 6 dB	WA2-6	Weinschel	8254	410119	Calibration not necessary	

7 Test site Validation

Test equipment	PM. No.	Frequency range	Type of validation	According to	Val. Date	Val Due
OATS M6	480085	30 – 1000 MHz	NSA	ANSI C63.4-2014	25.10.2018	24.10.2020
Fully anechoic chamber M20	480303	1 -18 GHz	SVSWR	CISPR 16-1-4 Amd. 1	13.07.2018	12.07.2020
Shielded chamber M4	480088	9 kHz – 30 MHz	GND-Plane	ANSI C63.4-2014	06.11.2018	05.11.2020

8 Report History

Report Number	Date	Comment
F181673E4	18.03.2019	Initial Test Report

9 List of Annexes

Annex A Test set-up Photographs

5 pages