

RADIO REPORT FCC 47 CFR Part 15C; ISED Canada RSS-247 Digital transmission systems operating within the 2400.0 MHz - 2483.5 MHz band	
Report Reference No	G0M-2205-1489-TFC247BL-V03
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Testo SE & Co. KGaA
Address	Celsiusstr. 2 79822 Titisee-Neustadt Germany
Test Specification	47 CFR Part 15C RSS-247, Issue 2, 2017-02 RSS-Gen, Issue 5, Amendment 2, 2021-02
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Battery powered (6x AA) detector for fluegas with LED and Bluetooth® Low Energy
Model(s)	testo 316i
Additional Model(s)	See page 3
Brand Name(s)	testo
Hardware Version(s)	2.0
Software Version(s)	0.2.3
FCC ID	WAF-TESTO316
IC	6127B-TESTO316
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS)	
Test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2022-06-24	
Report:		
Compiled by	Radwan Jaafar	
Tested by (+ signature) (Responsible for Test)	Radwan Jaafar	
Approved by (+ signature) (Test Lab Engineer)	Toralf Jahn	
Date of Issue	2022-09-19	
Total number of pages	93	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		

ADDITIONAL VARIANTS

Additional Variants (Partially tested)		
Tested Variant	Description	
1	Product Type Description	testo 316-1-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy and ATEX certification./ Order No. 0560 3163
	Sample ID	40290
	Model name	testo 316-1-EX
	Brand name	testo
	Hardware Version	2.0
	Software Version	0.2.9
2	Product Type Description	testo 316-2-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy, changeable sensor head and ATEX certification /. Order No. 0560 3164
	Sample ID	40239
	Model name	testo 316-2-EX
	Brand name	testo
	Hardware Version	2.0
	Software Version	0.2.3
Comment: The additional variants mentioned above were spot-checked.		

Additional Variants (not tested and not evaluated variants)		
Not-tested Variant	Description	
3	Product Type Description	testo 316-1 / Battery powered (6xAA) detector for fluegas with LCD display /Order No. 0560 3162
	Model name	testo 316-1
	Brand name	testo
	Hardware Version	3.0
	Software Version	0.2.9
Comment: Those named additional variants above have not been tested. Those additional variants of the series have been declared by the manufacturer. The test report explicitly states that those variants were neither tested nor assessed nor evaluated.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-08-30	Initial Release	
02	2022-09-07	Replaced document: G0M-2205-1489-TFC247BL-V01 Replaced by: G0M-2205-1489-TFC247BL-V02 Reason: 1. Correction of the declaration of the EUTs supply voltage 2. Add AC powerline conducted emission test results for the additional variants 1 and 2	R. Jaafar
03	2022-09-19	Replaced document: G0M-2205-1489-TFC247BL-V02 Replaced by: G0M-2205-1489-TFC247BL-V03 Reason: 1. Correction of the declared antenna gain.	R. Jaafar

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage

REPORT INDEX

1	Equipment (Test Item) Under Test.....	7
1.1	Photos – Equipment External	8
1.2	Photos – Equipment Internal	12
1.3	Support Equipment.....	14
1.4	Test Modes	15
1.5	Test Frequencies.....	16
1.6	Sample emission level calculation.....	17
2	Result Summary.....	18
3	Test Conditions and Results.....	19
3.1	Test Conditions and Results - Occupied bandwidth.....	19
3.2	Test Conditions and Results - 6 dB bandwidth.....	23
3.3	Test Conditions and Results - Maximum peak conducted output power	28
3.4	Test Conditions and Results - Power spectral density	33
3.5	Test Conditions and Results - AC powerline conducted emissions.....	38
3.6	Test Conditions and Results - Band-edge compliance.....	48
3.7	Test Conditions and Results - Conducted spurious emissions.....	51
3.8	Test Conditions and Results - Transmitter radiated emissions	55
3.9	Test Conditions and Results - Receiver radiated emissions	60
ANNEX A	Transmitter unwanted emissions in the spurious domain (EUT testo 316i).....	63
ANNEX B	Transmitter unwanted emissions in the spurious domain (EUT testo 316-1-EX Additional Variant 1).....	80
ANNEX C	Transmitter unwanted emissions in the spurious domain (EUT testo 316-2-EX Additional Variant 2).....	85
ANNEX D	Receiver spurious emissions (EUT testo 316i)	89

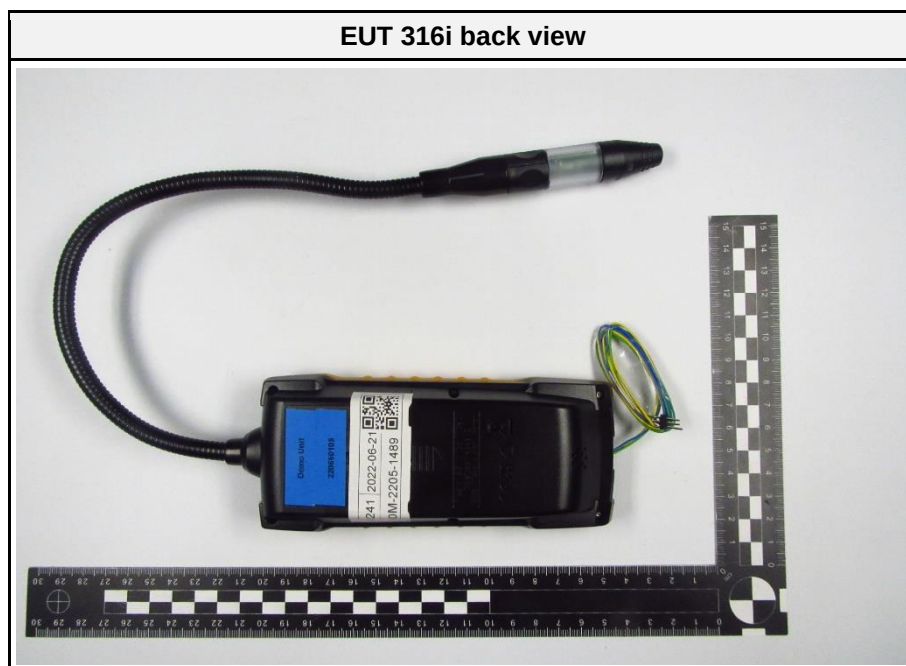
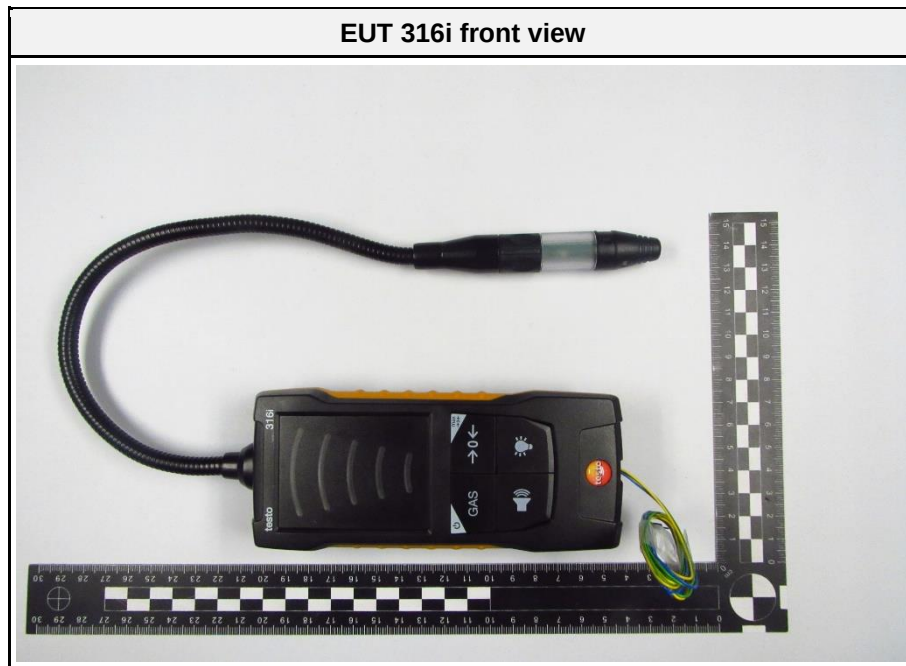
1 Equipment (Test Item) Under Test

Description	Battery powered (6x AA) detector for fluegas with LED and Bluetooth® Low Energy	
Model	testo 316i	
Additional Model(s)	See page 3	
Brand Name(s)	testo	
Serial Number(s)	Prototypes: Conducted test sample: 40289 Radiated test Sample ID: 40241 Radiated test Sample ID: 40290 (Additional variant 1) Radiated test Sample ID: 40239 (Additional variant 2)	
Hardware Version(s)	2.0	
Software Version(s)	0.2.3	
PMN	testo 316i, testo 316-1-EX, testo 316-2-EX	
HVIN	testo 316i, testo 316-1-EX, testo 316-2-EX	
FVIN	0.2.3, 0.2.9, 0.2.3	
HMN	-	
FCC ID	WAF-TESTO316	
IC	6127B-TESTO316	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400.0 MHz - 2483.5 MHz	
Radio technology	Bluetooth LE 4.2	
Bluetooth Specification	LE 1M PHY	Yes
	LE 2M PHY	No
	LE Coded PHY S=8 (125 kbit)	No
	LE Coded PHY S=2 (500 kbit)	No
	Stable Modulation Index - Transmitter	No
	Stable Modulation Index - Receiver	No
Modulation	GFSK	
Number of antenna ports	1	
Radio Module (BLE)	Type	Transceiver
	Model	LSD4BT-S37B
	Manufacturer	Lierda Science & Technology Group Co., Ltd
	HW Version	2
	SW Version	3
Antenna	Type	Integrated
	Model	ARY196-0361-003-00
	Manufacturer	Wieson Technologies Co., LTD
	Gain	2.5 dBi (Applicant declaration)
Supply Voltage	V _{NOM}	Model with 6xAA battery: 9.0 VDC Model with chargeable NiMH battery: 6.0 VDC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adapter 1 (for additional variants only)	Model	ATM012T-W050VU
	Vendor	Elektrosil GmbH
	Input	100-240V AC (50-60Hz) (tested with 120v 60Hz)
	Output	5 V DC
AC/DC-Adapter 2 (for additional variants only)	Model	BI12T-050200-IU
	Vendor	Egston
	Input	100-240V AC (50-60Hz) (tested with 120v 60Hz)
	Output	5 V DC
Manufacturer	Testo SE & Co. KGaA Celsiusstr. 2 79822 Titisee-Neustadt Germany	

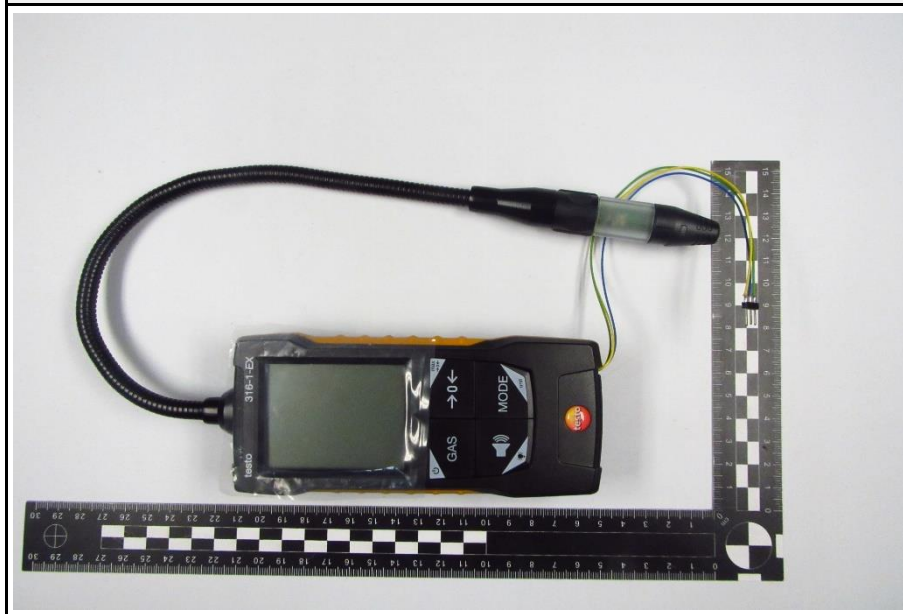
Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

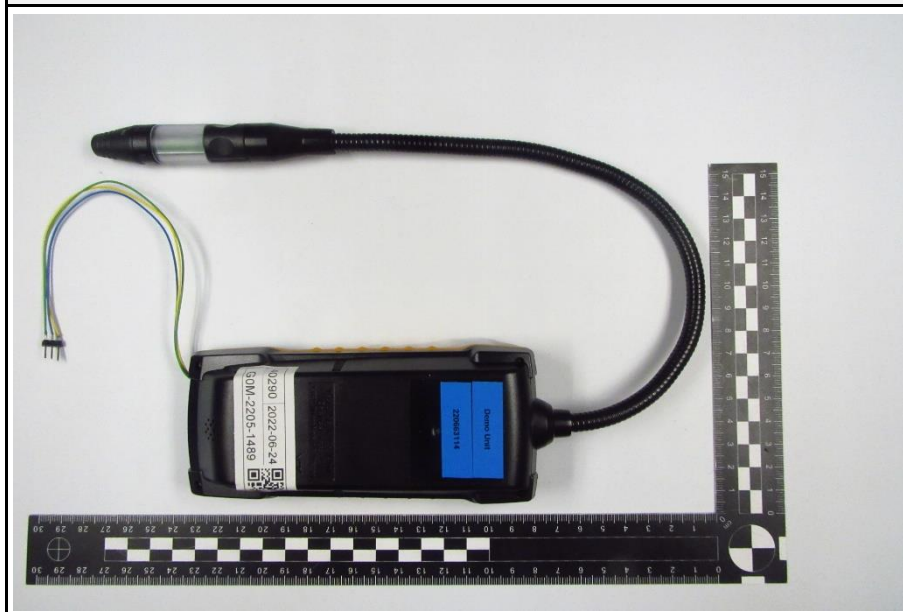
1.1 Photos – Equipment External



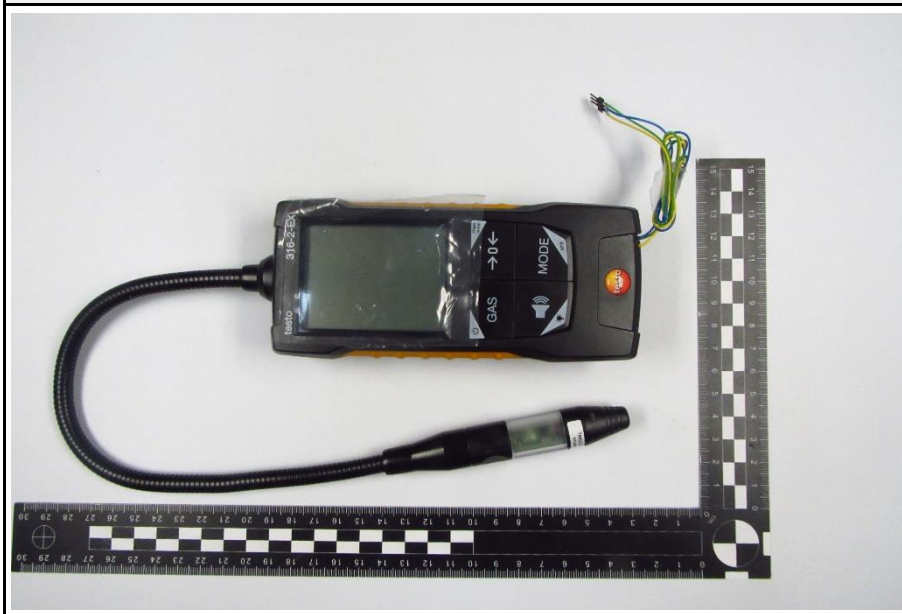
EUT 316-1-EX front view (Additional Variant 1)



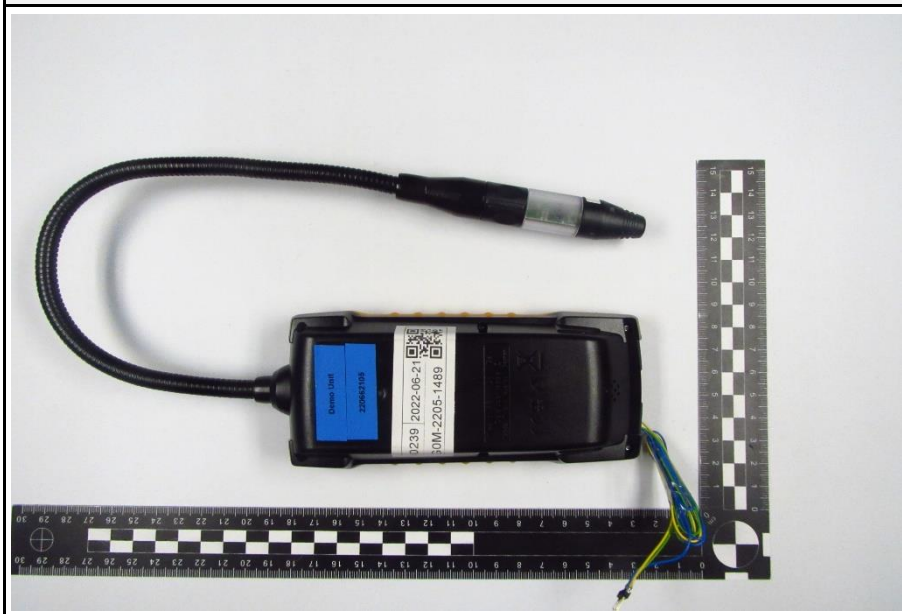
EUT 316-1-EX back view (Additional Variant 1)



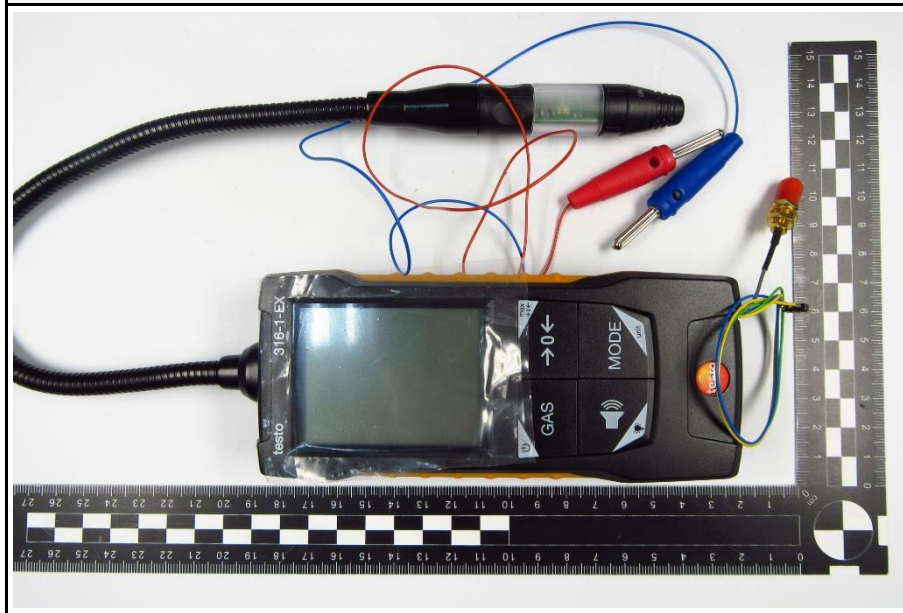
EUT 316-2-EX front view (Additional Variant 2)



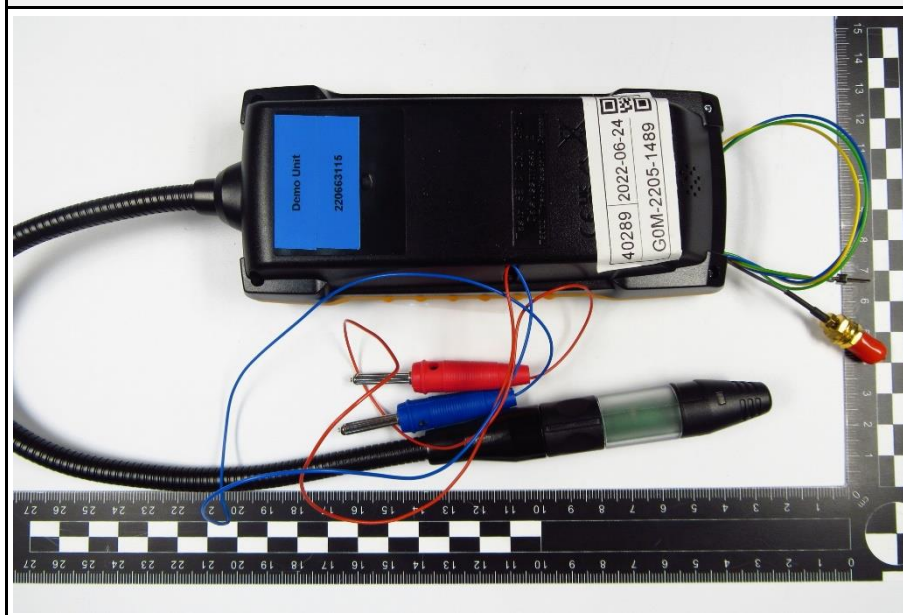
EUT 316-2-EX back view (Additional Variant 2)



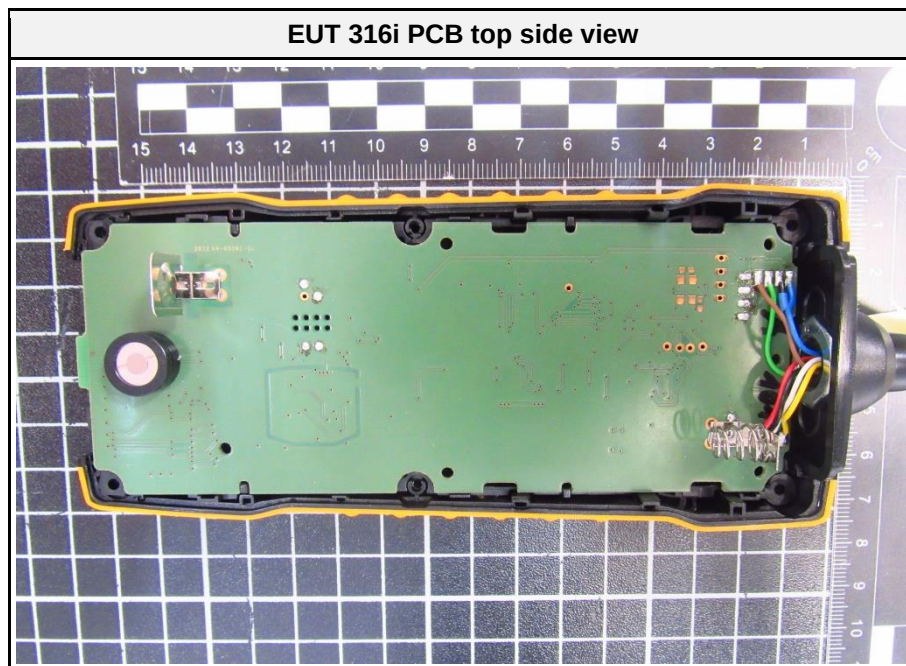
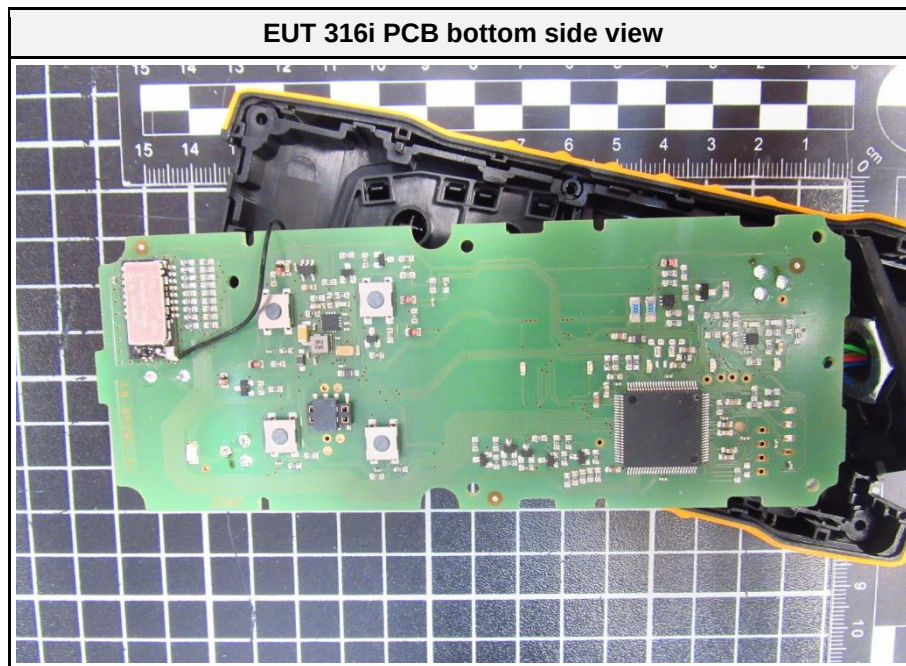
EUT 316-1-EX front view (Conducted)



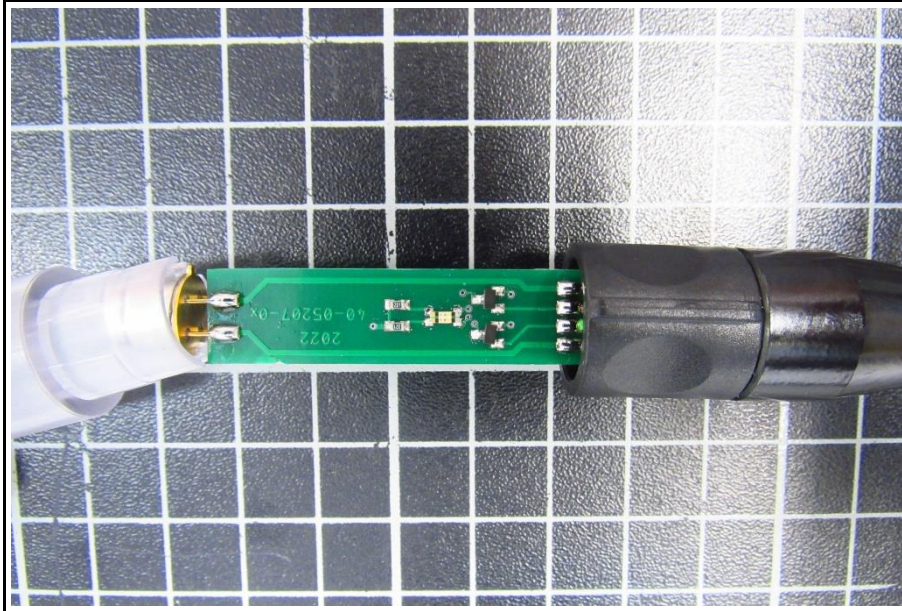
EUT 316-1-EX back view (Conducted)



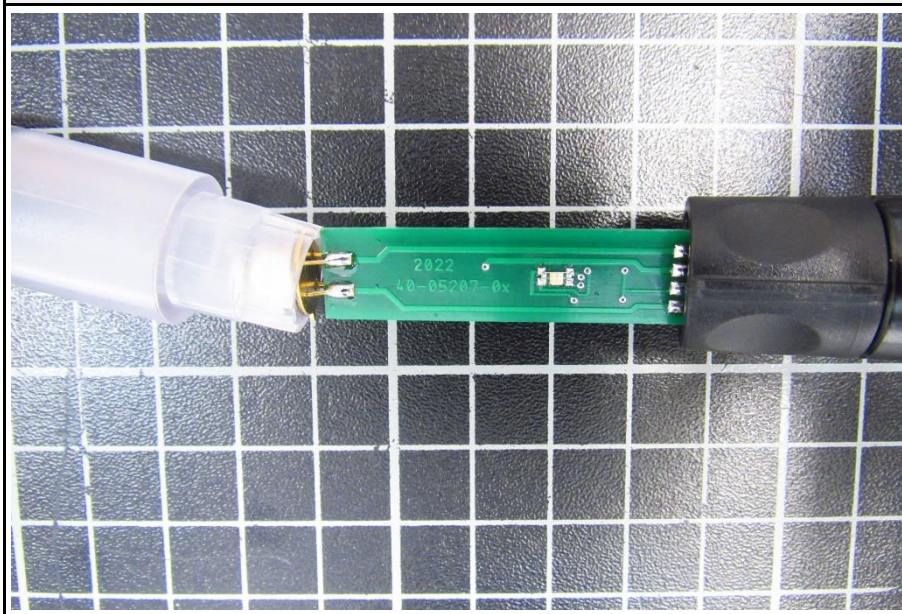
1.2 Photos – Equipment Internal



Sensor PCB bottom side view



Sensor PCB top side view



1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	5V/2A USB PowerPlug with USB wire and MicroUSB socket	Elektrosil GmbH	ATM012T-W050VU	For charging the internal battery
AE	5V/2A USB PowerPlug with USB wire and MicroUSB socket	Egston	BI12T-050200-IU	For charging the internal battery
CBL	USB UART connection cable	-	-	Test mode Configuration
SFT	Bluetooth LE Direct test mode over UART tool	-	-	Test mode Configuration
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
SFT Note: The Equipment Under Test used an operating system with a test firmware. The driver for the tested technology was running in a manufacturer mode.				
Comment:				

1.4 Test Modes

Mode	Description
GFSK	Mode = Transmit Modulation = GFSK Rate = 1 Mbps Packet Length = 193 bytes Packet type = PRBS9 Spreading = None Duty cycle = 89%
Receive	Mode = Receive
Comment:	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	2402
F2	Tx / Rx	19	2440
F3	Tx / Rx	39	2480

1.6 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyzer in dBμV. Any external preamplifiers used are taken into account through internal analyzer settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyzer. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyzer (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBμV/m). The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBμV + 26 dB/m	= 47.5 dBμV/m	:	47.5 dBμV/m - 57.0 dBμV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15C, ISED RSS-247				
Product Standard Reference	Requirement	Reference Method	Result	Remarks
ISED RSS-Gen, Issue 5 A2 (section 6.7)	Occupied Bandwidth	ANSI C63.10-2013	N/R	Informational only
FCC § 15.247(a)(2) ISED RSS-247, Issue 2 (section 5.2)	6 dB Bandwidth	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(e) ISED RSS-247, Issue 2 (section 5.2)	Power spectral density	ANSI C63.10-2013	PASS	Note 1
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	PASS	Note 3
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	Note 1
FCC § 15.247(d) FCC § 15.209 ISED RSS-Gen, Issue 5 A2 (section 6.13)	Transmitter radiated spurious emissions	ANSI C63.10-2013	PASS	Note 2
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.4-2014	PASS	Note 1
Note 1: This test was not performed for the additional variants. Note 2: The additional variants 1 and 2 were only spot-checked. Note 3: This test was performed for the additional variants 1 and 2. This is not required for the main tested EUT (testo 316i).				
Comment: The Decision Rule is applied on the basis of ETSI TR 102 273 and ETSI TR 100 028. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019. Where a result is considered conditional in respect of its proximity to the limit line, the customer would be made aware of situation so that they can make an informed decision on how to proceed.				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied bandwidth

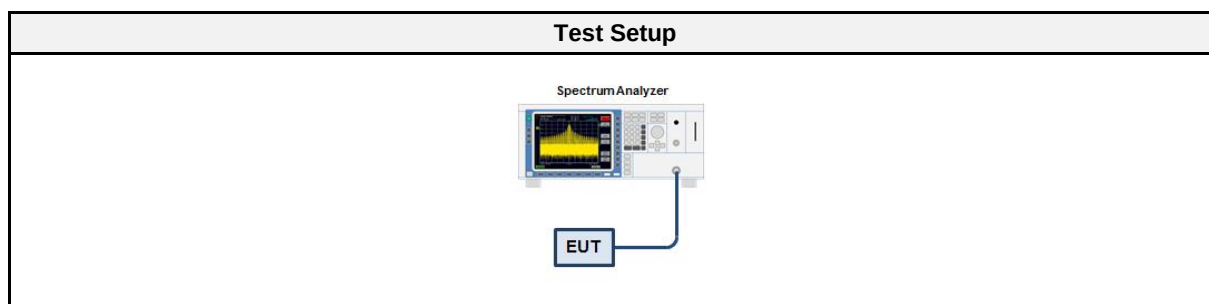
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 A2 (section 6.7)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	$\pm 1.26 \%$
Test Sample ID	40289
Operator	Radwan Jaafar
Date	2022-07-26

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup



3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779	2022-02	2023-02

3.1.5 Procedure

Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth is measured with the build-in analyzer function

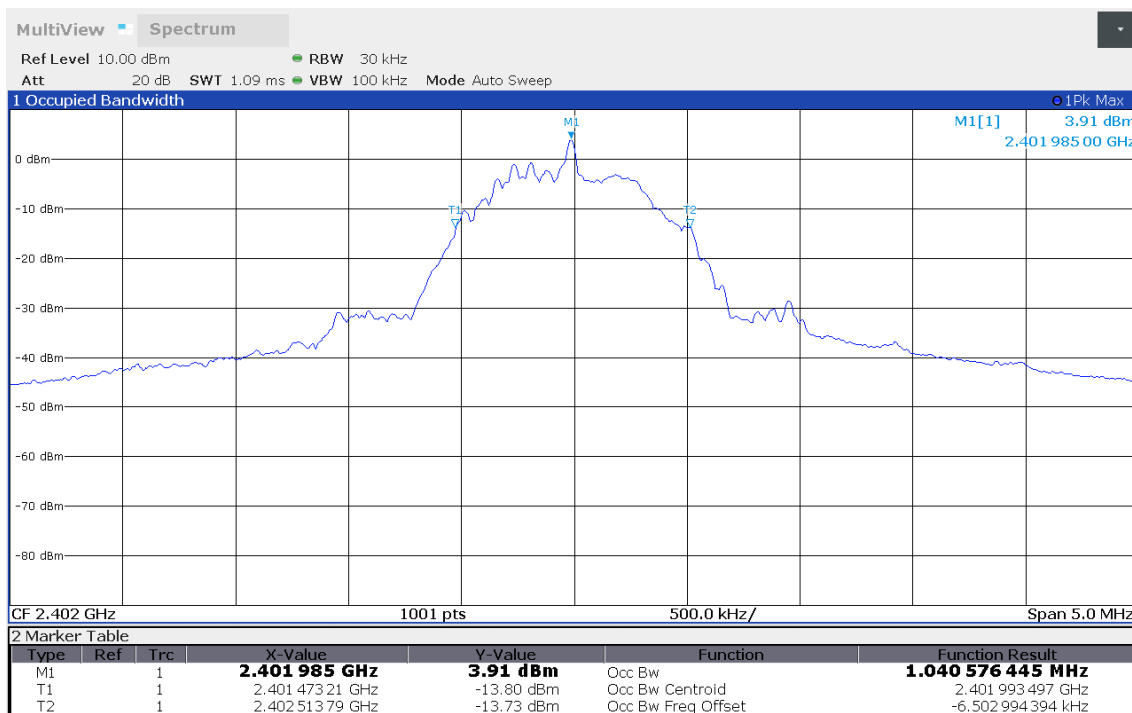
3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
GFSK	2402	1.04
GFSK	2440	1.04
GFSK	2480	1.044

Test Report No.: G0M-2205-1489-TFC247BL-V03

Occupied Bandwidth

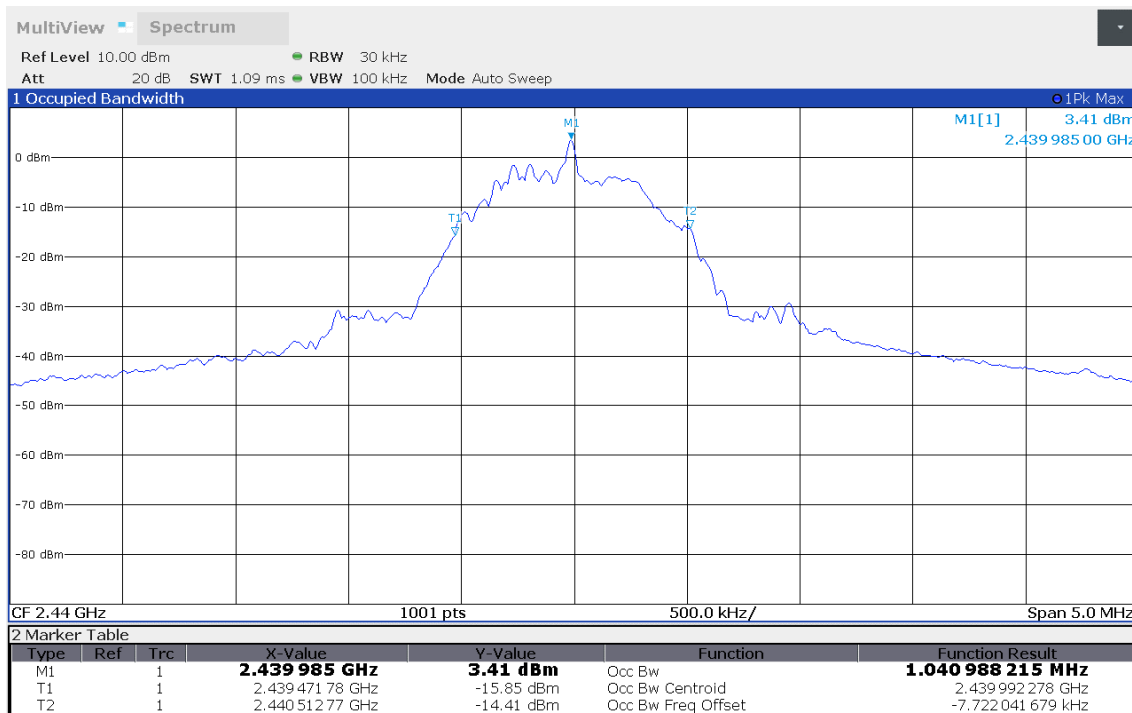
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 3161-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Occupied Bandwidth [MHz]: 1.040



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Occupied Bandwidth

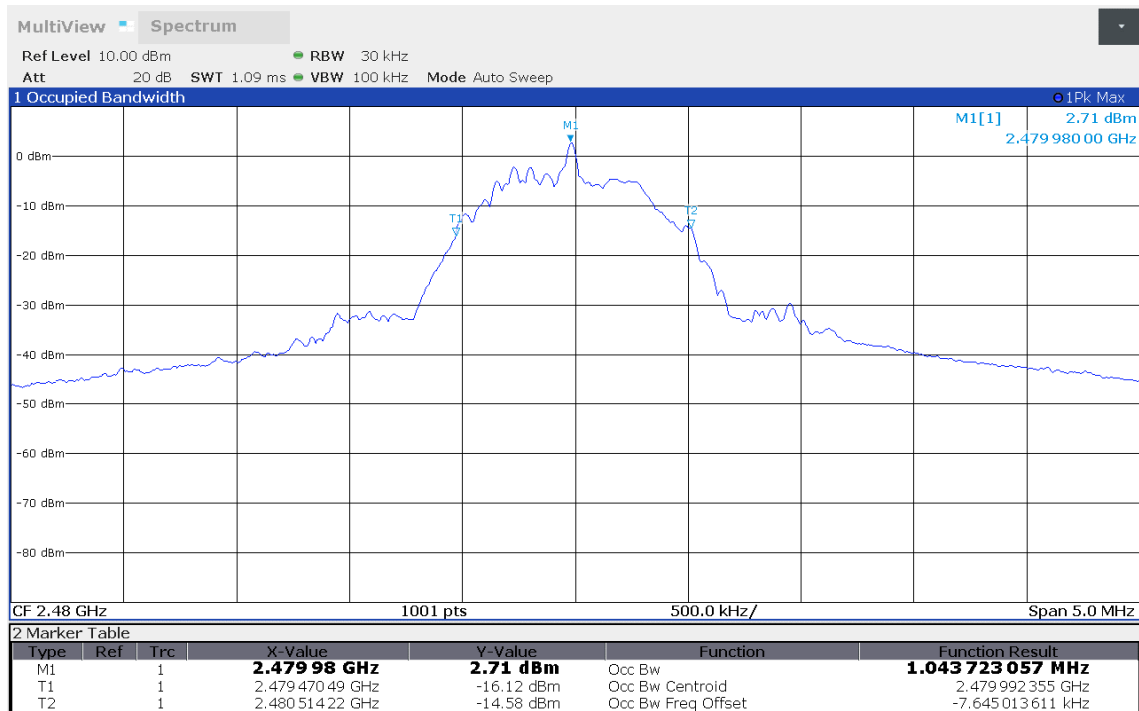
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 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 3161-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Occupied Bandwidth [MHz]: 1.040



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Occupied Bandwidth

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 3161-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 6.9.3
 Operational Mode: GFSK, Channel: 39, 2480 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Occupied Bandwidth [MHz]: 1.044



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3.2 Test Conditions and Results - 6 dB bandwidth

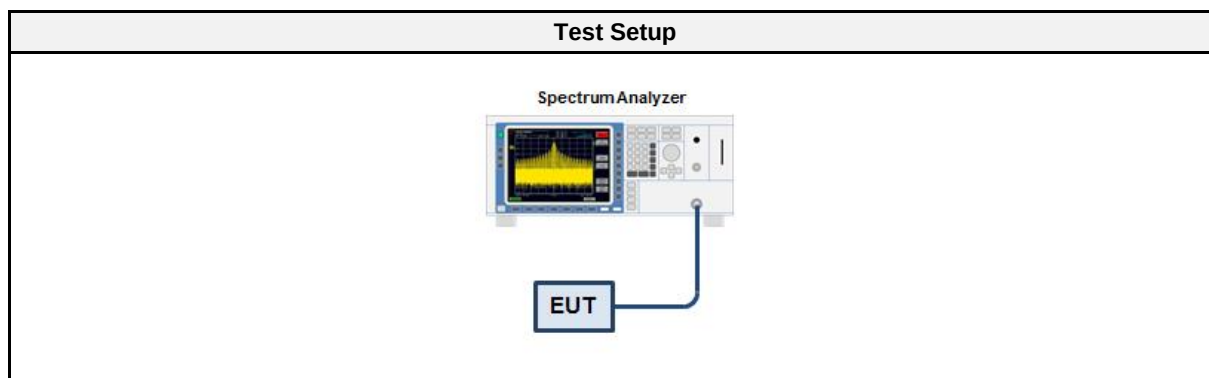
3.2.1 Information

Test Information	
Reference	FCC § 15.247(a)(2); ISED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.8
Measurement Uncertainty	± 1.26 %
Operator	Radwan Jaafar
Date	2022-07-26

3.2.2 Limits

Limits
≥ 500kHz

3.2.3 Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779	2022-02	2023-02

3.2.5 Procedure

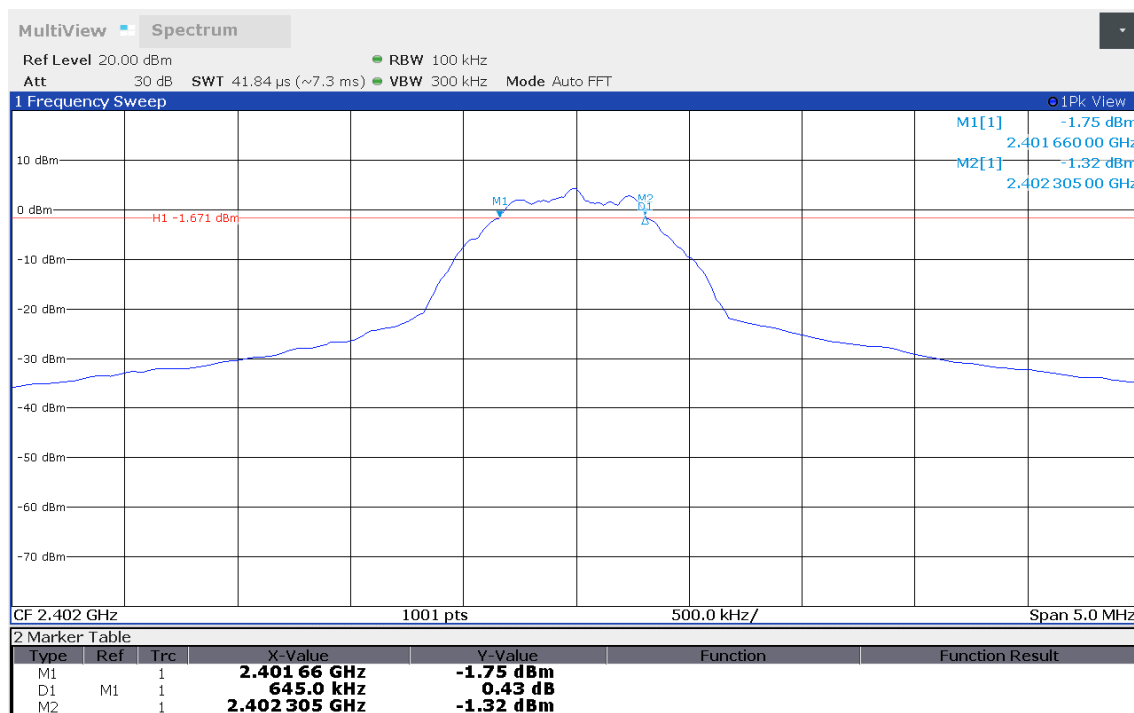
Test Procedure
1. EUT set to test mode 2. Span set to at least twice the emission spectrum 3. Detector set to peak and max hold and RBW is set to 100 kHz 4. Envelope peak value of emission spectrum is selected 5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak 6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak 7. 6 dB Bandwidth is determined by marker frequency separation

3.2.6 Results

Test Results				
Mode	Frequency [MHz]	Bandwidth [kHz]	Limit [kHz]	Verdict
GFSK	2402	645	500	PASS
GFSK	2440	670	500	PASS
GFSK	2480	705	500	PASS

DTS (6 dB) Bandwidth

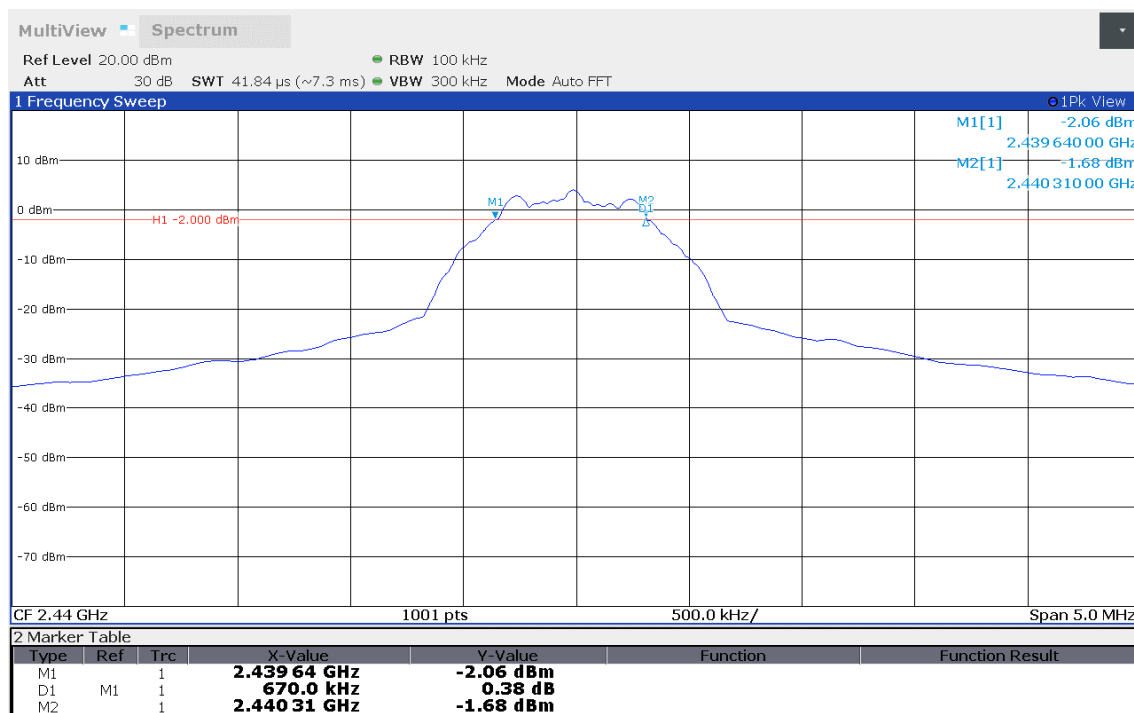
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Lower Frequency [MHz]: 2401.660
 Upper Frequency [MHz]: 2402.305
 6 dB Bandwidth [kHz]: 645



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DTS (6 dB) Bandwidth

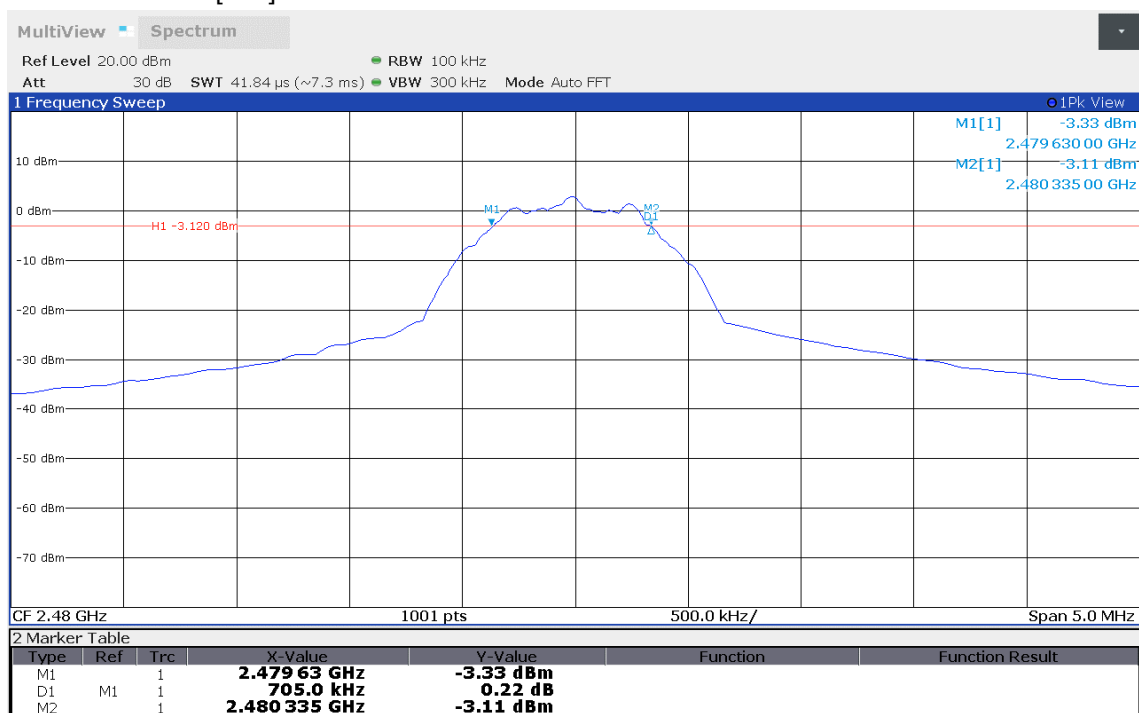
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Lower Frequency [MHz]: 2439.640
 Upper Frequency [MHz]: 2440.310
 6 dB Bandwidth [kHz]: 670



15:27:41 26.07.2022

DTS (6 dB) Bandwidth

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.8.1 Option 1
 Operational Mode: GFSK, Channel: 39, 2480 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Lower Frequency [MHz]: 2479.630
 Upper Frequency [MHz]: 2480.335
 6 dB Bandwidth [kHz]: 705



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3.3 Test Conditions and Results - Maximum peak conducted output power

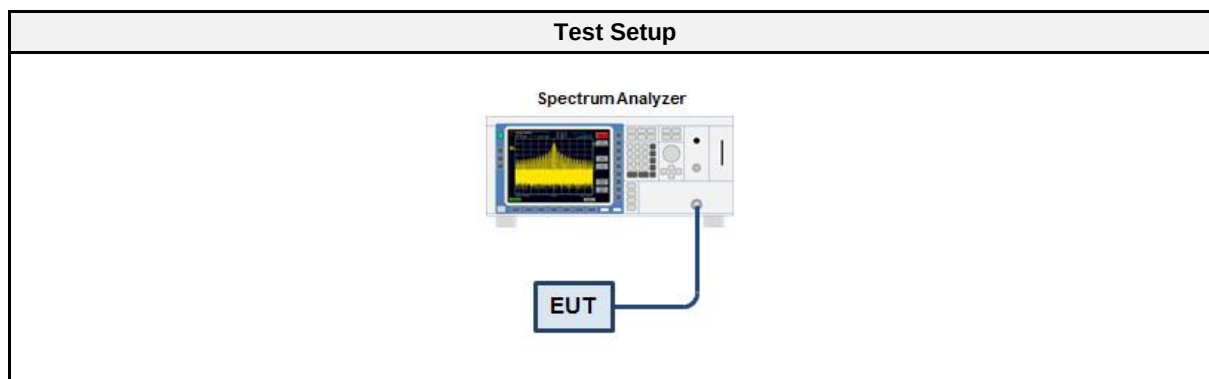
3.3.1 Information

Test Information	
Reference	FCC § 15.247(b); ISSED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 11.9.1
Measurement Uncertainty	± 2.86 dB
Operator	Radwan Jaafar
Date	2022-07-26

3.3.2 Limits

Limits
1 W (30 dBm)
The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3 Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779	2022-02	2023-02

3.3.5 Procedure

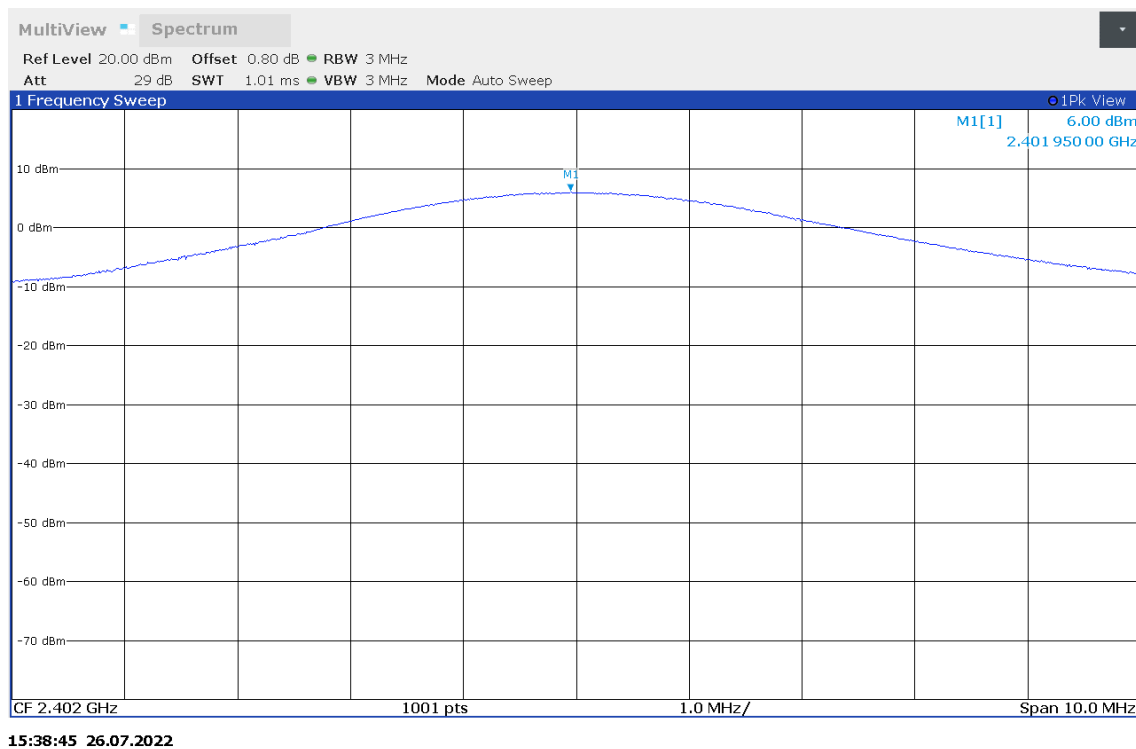
Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Analyzer resolution bandwidth is set ≥ DTS bandwidth 3. Detector set to peak and max hold 4. Sweep time is set to auto 5. After the trace has stabilized a marker is set to peak of envelope

3.3.6 Results

Test Results				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	5.998	0.004	1.0	PASS
2440	5.552	0.0036	1.0	PASS
2480	4.673	0.0029	1.0	PASS

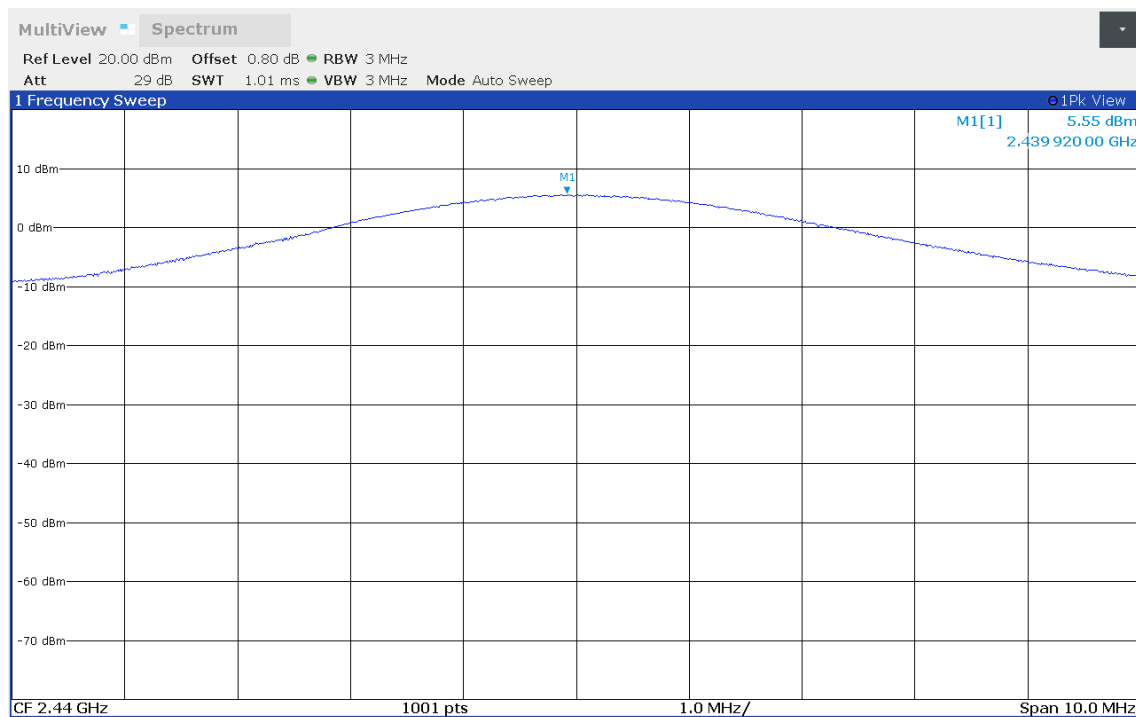
Peak Conducted Output Power

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.9.1.1
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Peak Power [dBm]: 5.998
 Peak Power [W]: 0.0040



Peak Conducted Output Power

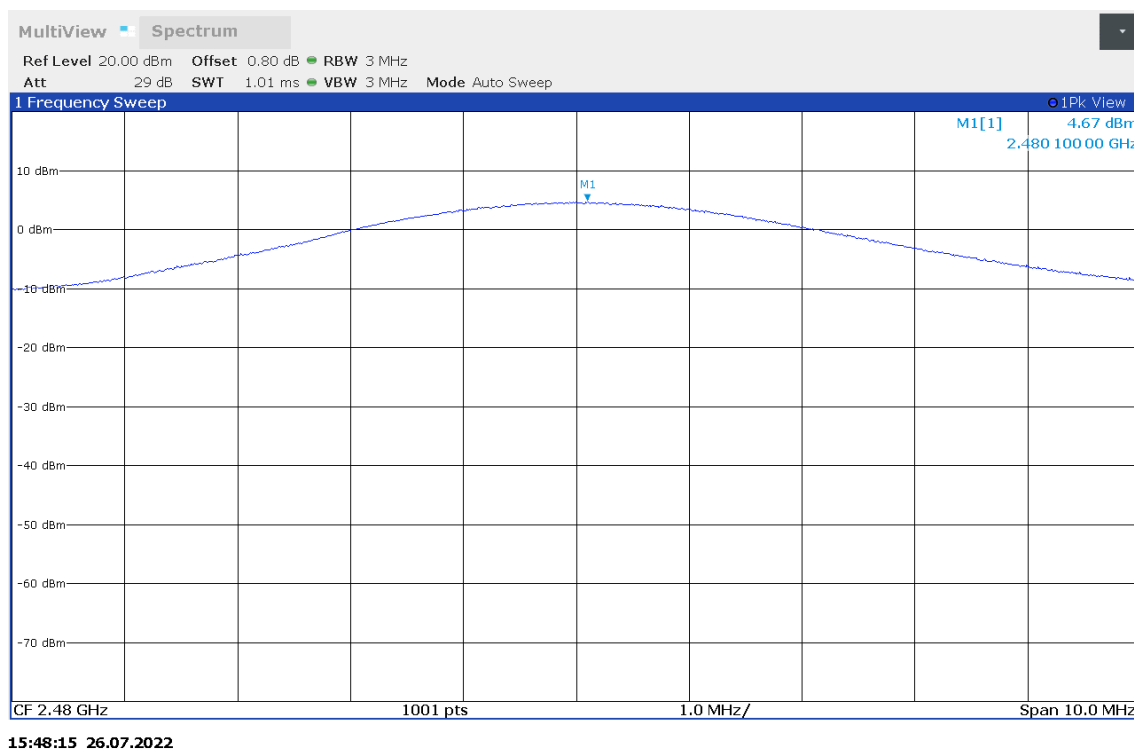
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.9.1.1
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Peak Power [dBm]: 5.552
 Peak Power [W]: 0.0036



15:46:50 26.07.2022

Peak Conducted Output Power

Project Number:	G0M-2205-1489
Applicant:	Testo SE & Co. KGaA
Model Description:	testo 316-1-EX / conducted sample
Model:	testo 316-1-EX
Test Sample ID:	40289
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 11.9.1.1
Operational Mode:	GFSK, Channel: 39, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Radwan Jaafar
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-07-26
Peak Power [dBm]:	4.673
Peak Power [W]:	0.0029



3.4 Test Conditions and Results - Power spectral density

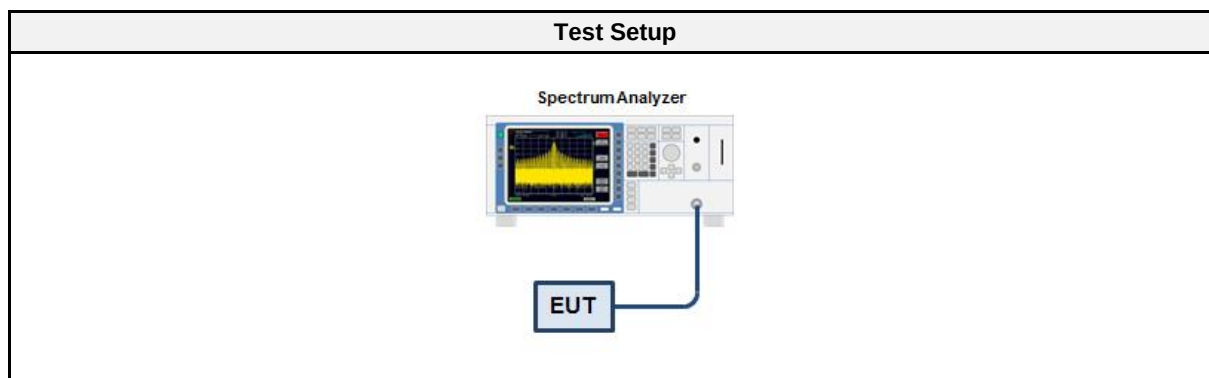
3.4.1 Information

Test Information	
Reference	FCC § 15.247(e); ISSED RSS-247, Issue 2 (section 5.2)
Measurement Method	ANSI C63.10 11.10.2, 14.3.2
Measurement Uncertainty	± 2.86 dB
Operator	Radwan Jaafar
Date	2022-07-26

3.4.2 Limits

Limits
8 dBm / 3 kHz

3.4.3 Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779	2022-02	2023-02

3.4.5 Procedure

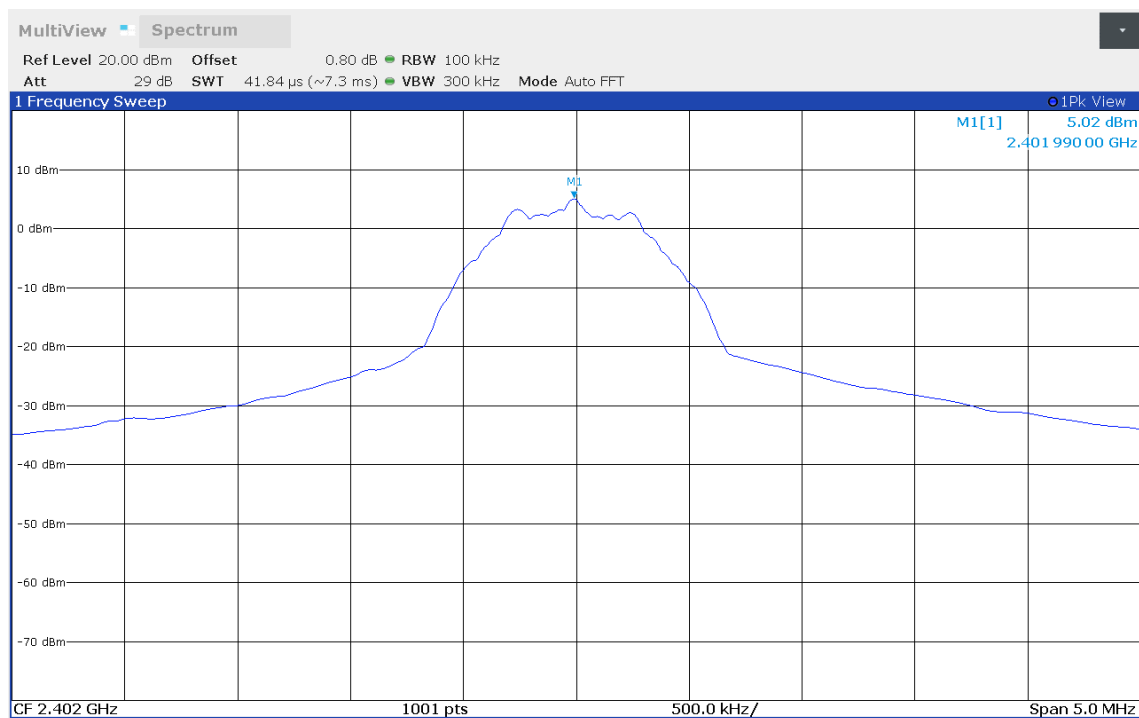
Test Procedure
1. EUT set to test mode 2. The analyzer is set to DTS channel center frequency with a span of 1.5 times the DTS bandwidth 3. The RBW is set to 100 kHz with VBW $\geq$ RBW and the detector is set to peak with max hold 4. After the trace has stabilized a marker is set to the envelope maximum 5. If the power spectral density is above the limit the RBW is reduced (not lower than 3 kHz) and the measurement is repeated 6. If the EUT has more than one transmit chain the procedure is repeated for each transmit chain

3.4.6 Results

Test Results			
Channel [MHz]	PSD [dBm/RBW]	Limit [dBm/3kHz]	Verdict
2402	5.022	8.0	PASS
2440	4.662	8.0	PASS
2480	3.727	8.0	PASS
RBW = 100 kHz			

Peak Power Spectral Density

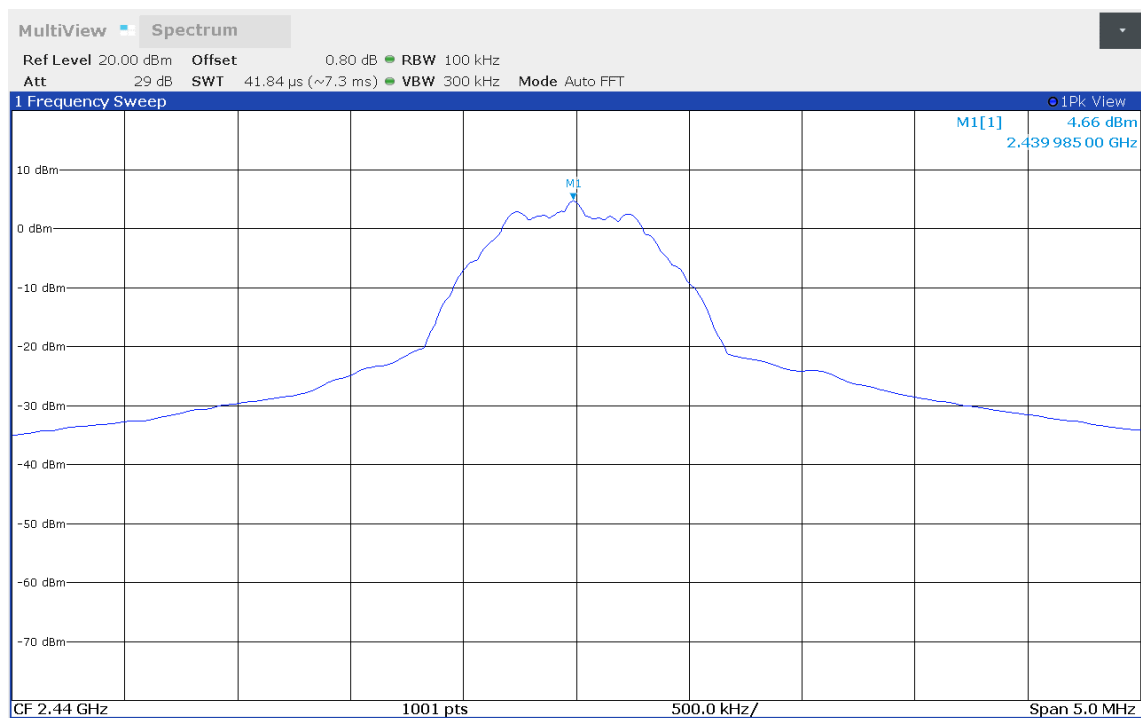
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Peak Frequency [MHz]: 2401.990
 Spectral Density [dBm/RBW]: 5.022
 Resolution Bandwidth [kHz]: 100 kHz



15:54:43 26.07.2022

Peak Power Spectral Density

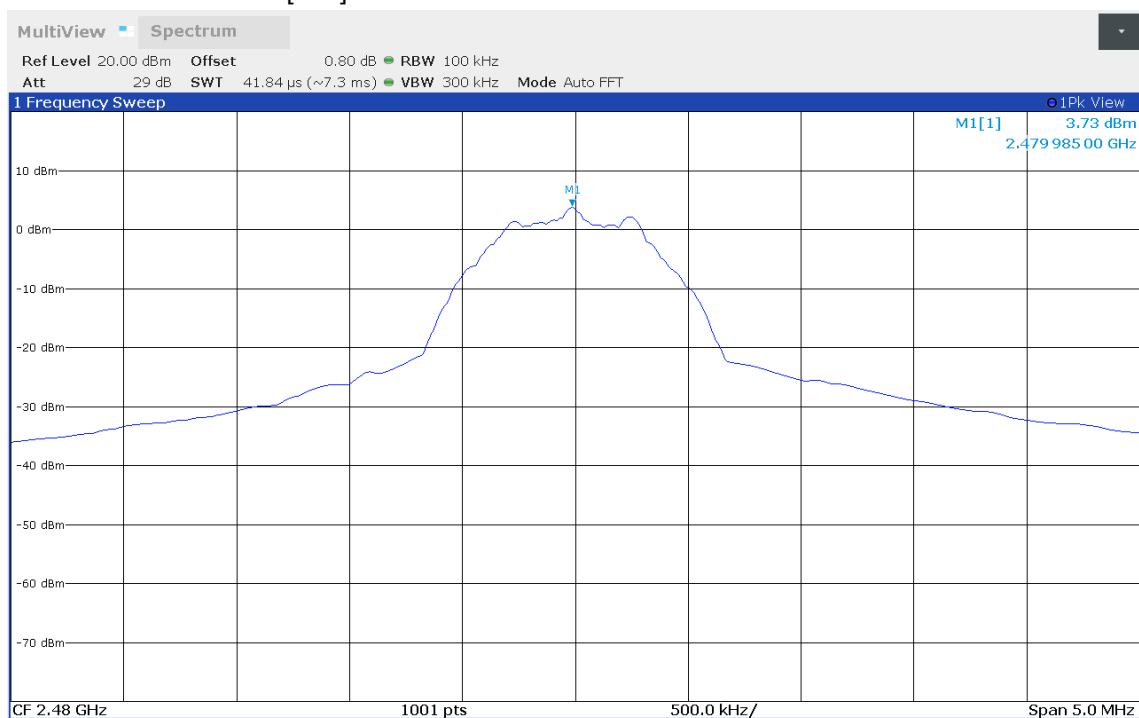
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Peak Frequency [MHz]: 2439.985
 Spectral Density [dBm/RBW]: 4.662
 Resolution Bandwidth [kHz]: 100 kHz



15:59:52 26.07.2022

Peak Power Spectral Density

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.10.2
 Operational Mode: GFSK, Channel: 39, 2480 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Peak Frequency [MHz]: 2479.985
 Spectral Density [dBm/RBW]: 3.727
 Resolution Bandwidth [kHz]: 100 kHz



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3.5 Test Conditions and Results - AC powerline conducted emissions

3.5.1 Information

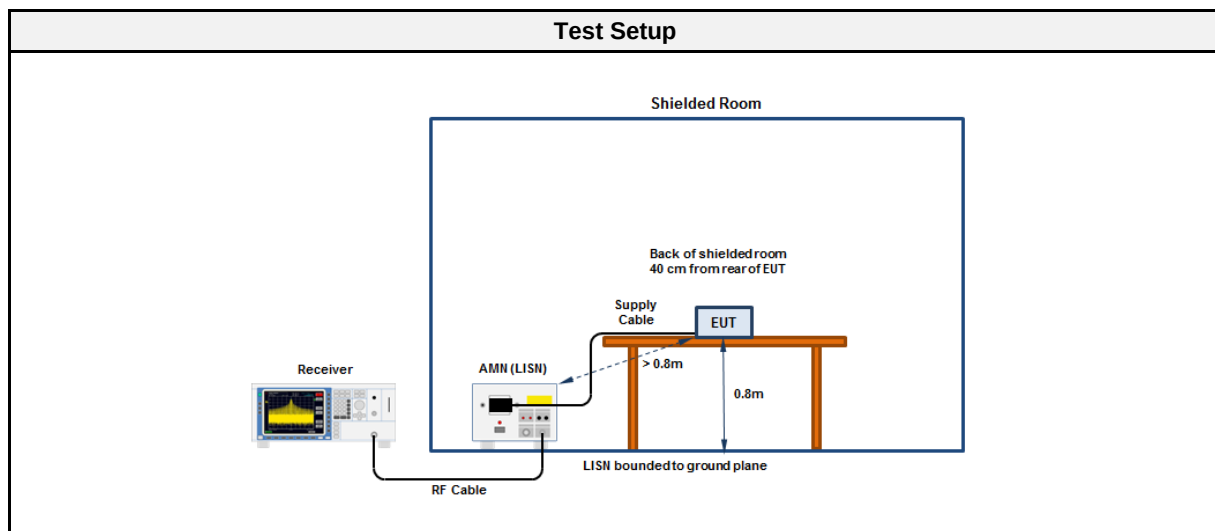
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Odai Qawasmeh
Date	2022-07-28

3.5.2 Limits

Limits		
Frequency [MHz]	Quasi-Peak [dBμV]	Average [dBμV]
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

* Limit decreases linearly with the logarithm of the frequency

3.5.3 Setup

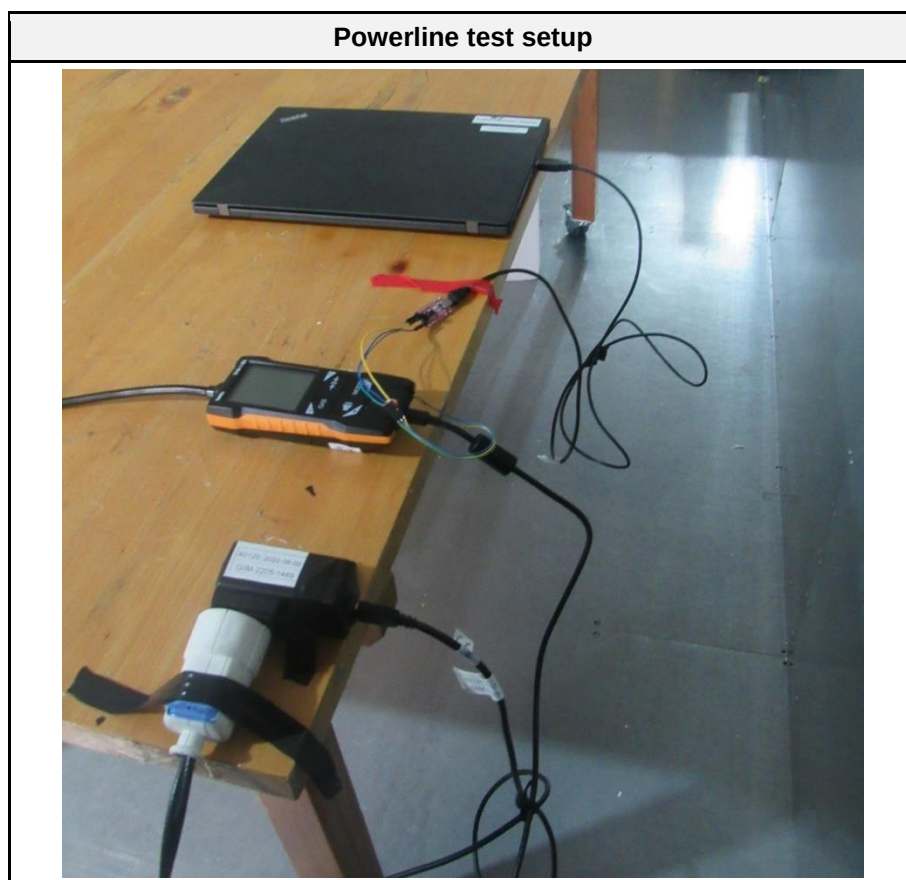
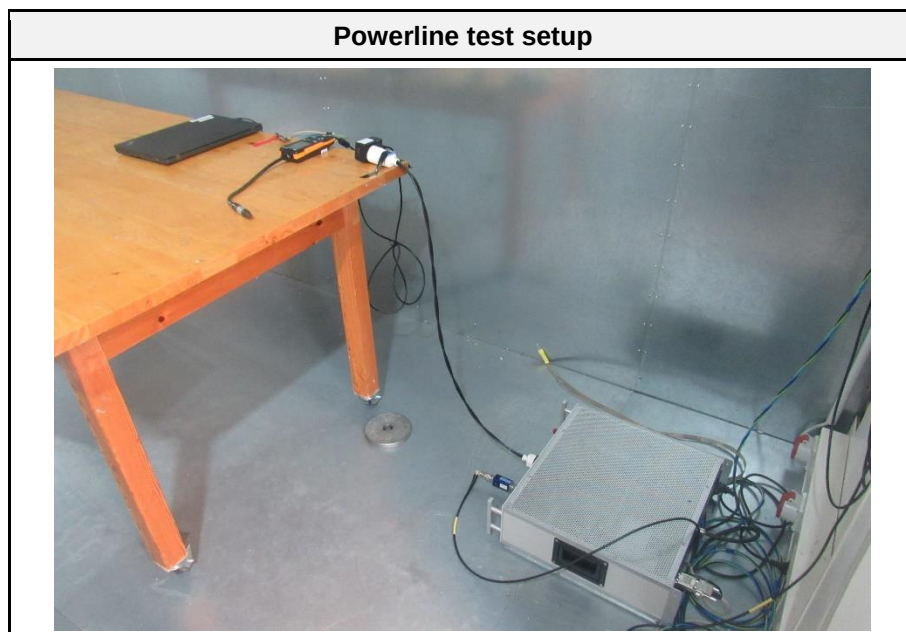


3.5.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Test Receiver	R&S	ESR7	EF00943	2021-08	2022-08
Pulse Limiter	R&S	ESH3-Z2	EF01222	2021-07	2022-07
LISN	Schwarzbeck	NSLK 8127 RC	EF01592	2021-07	2022-07

3.5.5 Setup Photos



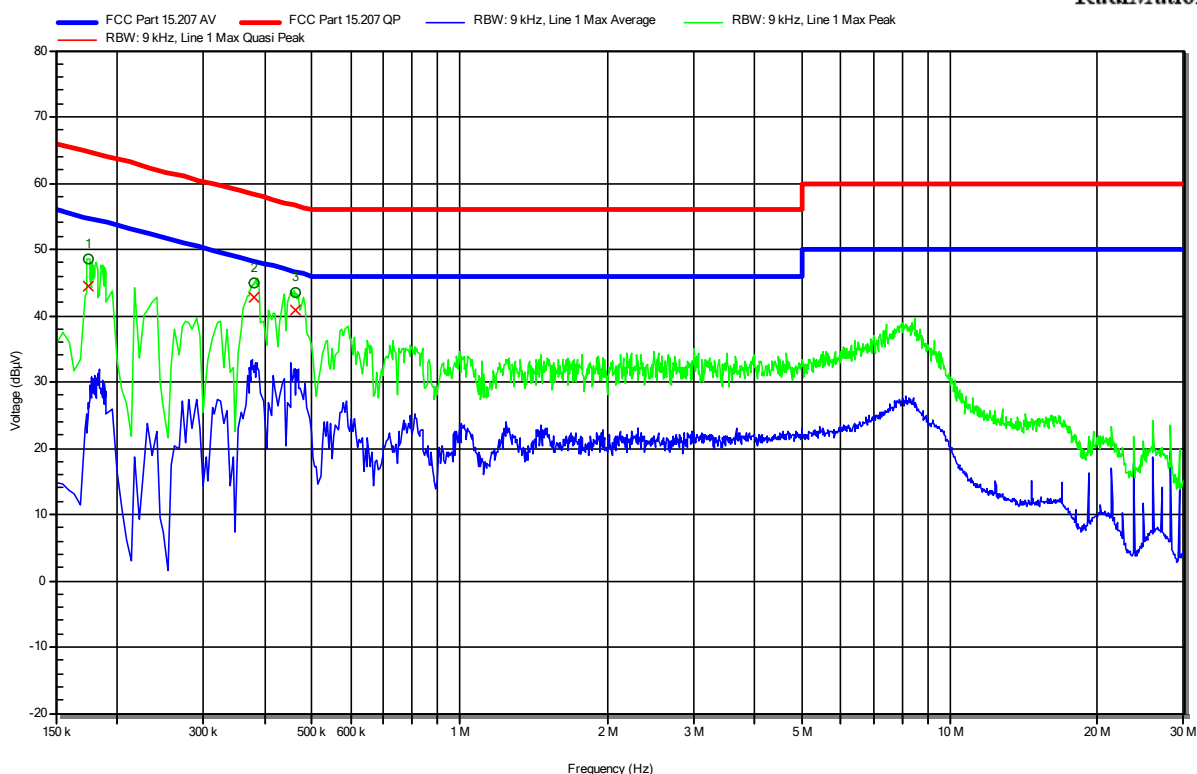
3.5.6 Results

Conducted emissions at the mains power port (EUT testo 316-1-EX Additional Variant 1) according to FCC 15.209

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX/ Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy and ATEX certification / Order No.0560 3163
 Model: testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-07-28
 Operating Conditions: ambient temperature: 23 °Celsius
 power input: 120 V 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC L1
 Operational Mode: BLE, 2402 MHz, 1 Mbps, PRBS9_255
 Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 5

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	174.75 kHz	44.55 dBμV	64.73 dBμV	-20.18 dB	Pass	Line 1
2	382.2 kHz	42.86 dBμV	58.23 dBμV	-15.37 dB	Pass	Line 1
3	461.85 kHz	40.8 dBμV	56.66 dBμV	-15.86 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	174.75 kHz	26.81 dBμV	54.73 dBμV	-27.92 dB	Pass	Line 1
2	382.2 kHz	31.76 dBμV	48.23 dBμV	-16.47 dB	Pass	Line 1
3	461.85 kHz	30.55 dBμV	46.66 dBμV	-16.11 dB	Pass	Line 1

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-1-EX Additional Variant 1) according to FCC 15.209

Project Number: G0M-2205-1489

Applicant: Testo SE & Co. KGaA

Model Description: testo 316-1-EX/ Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy and ATEX certification / Order No.0560 3163

Model: testo 316-1-EX

Test Sample ID: 40290

Test Site: Eurofins Product Service GmbH

Operator: Mr. Qawasmeh

Test Date: 2022-07-28

Operating Conditions: ambient temperature: 23 °Celsius
power input: 120 V 60 Hz

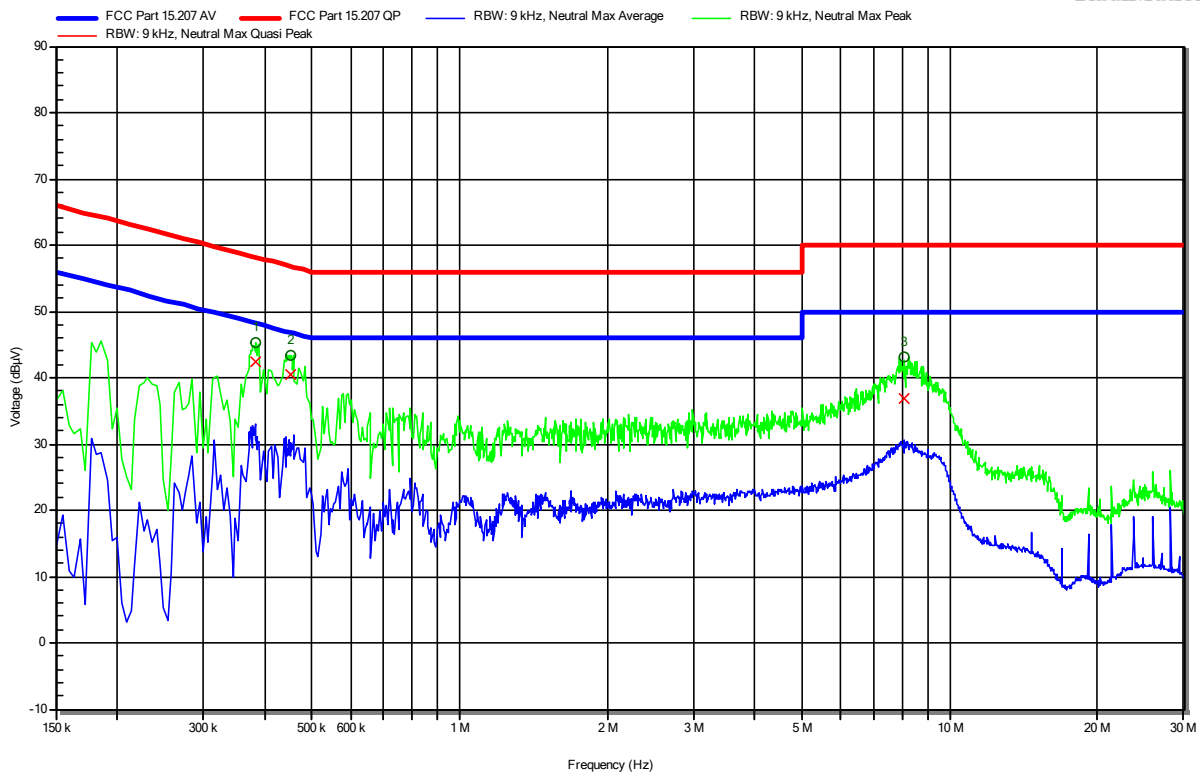
LISN: Schwarzbeck NSLK 8127 RC N

Operational Mode: BLE, 2402 MHz, 1 Mbps, PRBS9_255

Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 6

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	384 kHz	42.36 dBµV	58.19 dBµV	-15.83 dB	Pass	Neutral
2	453.3 kHz	40.43 dBµV	56.81 dBµV	-16.39 dB	Pass	Neutral
3	8.079 MHz	36.79 dBµV	60 dBµV	-23.21 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	384 kHz	30.5 dBµV	48.19 dBµV	-17.7 dB	Pass	Neutral
2	453.3 kHz	28.96 dBµV	46.81 dBµV	-17.86 dB	Pass	Neutral
3	8.079 MHz	29.34 dBµV	50 dBµV	-20.66 dB	Pass	Neutral

Test Report No.: G0M-2205-1489-TFC247BL-V03

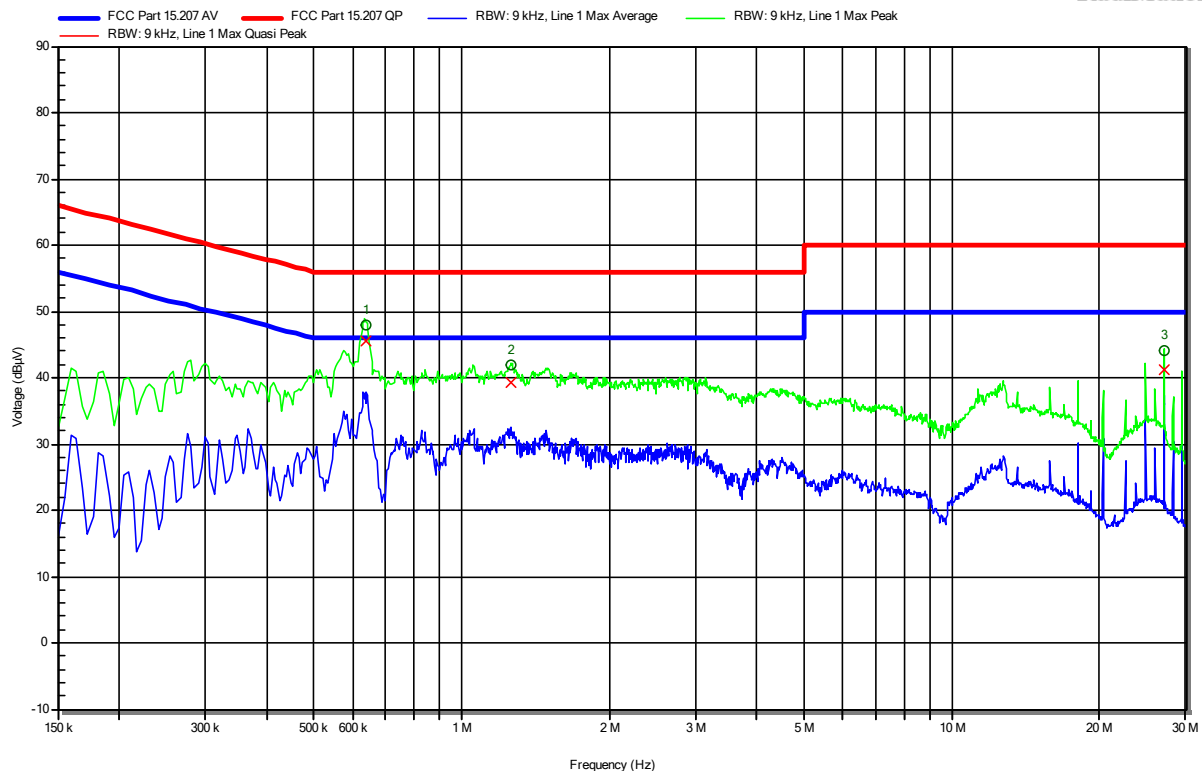
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-1-EX Additional Variant 1) according to FCC 15.209

Project Number: G0M-2205-1489
Applicant: Testo SE & Co. KGaA
Model Description: testo 316-1-EX/ Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy and ATEX certification / Order No.0560 3163
Model: testo 316-1-EX
Test Sample ID: 40290
Test Site: Eurofins Product Service GmbH
Operator: Mr. Qawasmeh
Test Date: 2022-07-28
Operating Conditions: ambient temperature: 23 °Celsius
power input: 120 V 60 Hz
LISN: Schwarzbeck NSLK 8127 RC L1
Operational Mode: BLE, 2402 MHz
Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 3

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	636 kHz	45.61 dBµV	56 dBµV	-10.39 dB	Pass	Line 1
2	1.257 MHz	39.34 dBµV	56 dBµV	-16.66 dB	Pass	Line 1
3	27.105 MHz	41.29 dBµV	60 dBµV	-18.71 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	636 kHz	36.71 dBµV	46 dBµV	-9.29 dB	Pass	Line 1
2	1.257 MHz	31.66 dBµV	46 dBµV	-14.34 dB	Pass	Line 1
3	27.105 MHz	36.31 dBµV	50 dBµV	-13.69 dB	Pass	Line 1

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-1-EX Additional Variant 1) according to FCC 15.209

Project Number: G0M-2205-1489

Applicant: Testo SE & Co. KGaA

Model Description: testo 316-1-EX/ Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy and ATEX certification / Order No.0560 3163

Model: testo 316-1-EX

Test Sample ID: 40290

Test Site: Eurofins Product Service GmbH

Operator: Mr. Qawasmeh

Test Date: 2022-07-28

Operating Conditions: ambient temperature: 23 °Celsius
power input: 120 V 60 Hz

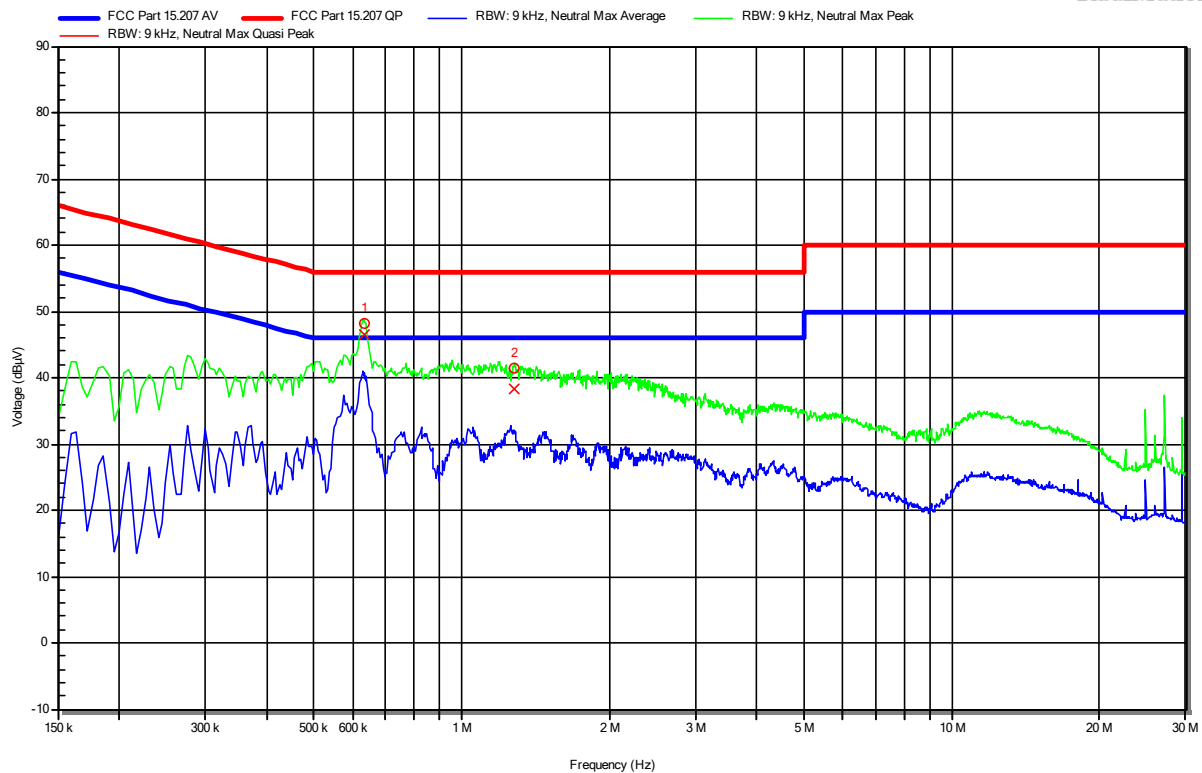
LISN: Schwarzbeck NSLK 8127 RC N

Operational Mode: BLE, 2402 MHz

Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 4

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	631.5 kHz	46.4 dBµV	56 dBµV	-9.6 dB	Pass	Neutral
2	1.279 MHz	38.19 dBµV	56 dBµV	-17.81 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	631.5 kHz	40.26 dBµV	46 dBµV	-5.74 dB	Pass	Neutral
2	1.279 MHz	31.54 dBµV	46 dBµV	-14.46 dB	Pass	Neutral

Test Report No.: G0M-2205-1489-TFC247BL-V03

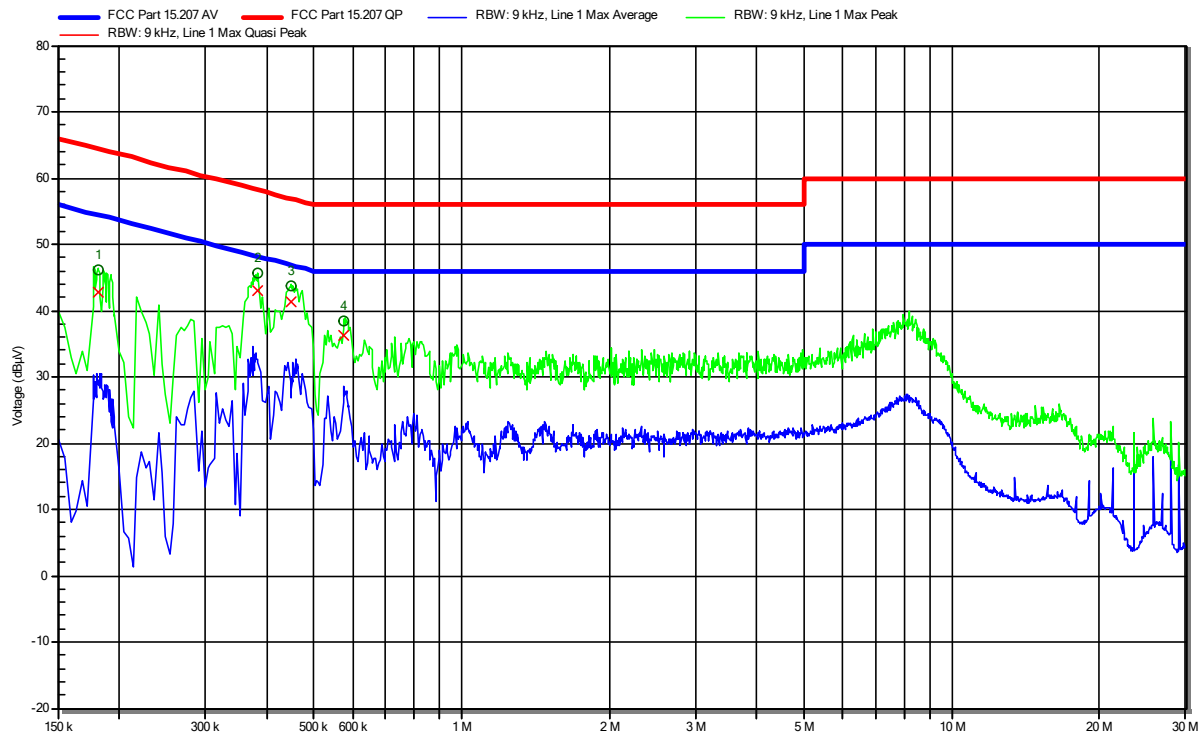
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-2-EX Additional Variant 2) according to FCC 15.209

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: Product Type Description: testo 316-2-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy, changeable sensor head and ATEX
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-07-28
 Operating Conditions: ambient temperature: 25 °Celsius
 power input: 120 V 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC L1
 Operational Mode: BLE, 2402 MHz, 1 Mbps, PRBS9_255
 Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 1
Index 2

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	181.05 kHz	42.74 dBµV	64.44 dBµV	-21.7 dB	Pass	Line 1
2	384 kHz	43.12 dBµV	58.19 dBµV	-15.07 dB	Pass	Line 1
3	447.45 kHz	41.38 dBµV	56.92 dBµV	-15.54 dB	Pass	Line 1
4	576.6 kHz	36.31 dBµV	56 dBµV	-19.69 dB	Pass	Line 1
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	181.05 kHz	28.84 dBµV	54.44 dBµV	-25.6 dB	Pass	Line 1
2	384 kHz	31.75 dBµV	48.19 dBµV	-16.45 dB	Pass	Line 1
3	447.45 kHz	28.99 dBµV	46.92 dBµV	-17.94 dB	Pass	Line 1
4	576.6 kHz	27.19 dBµV	46 dBµV	-18.81 dB	Pass	Line 1

Test Report No.: G0M-2205-1489-TFC247BL-V03

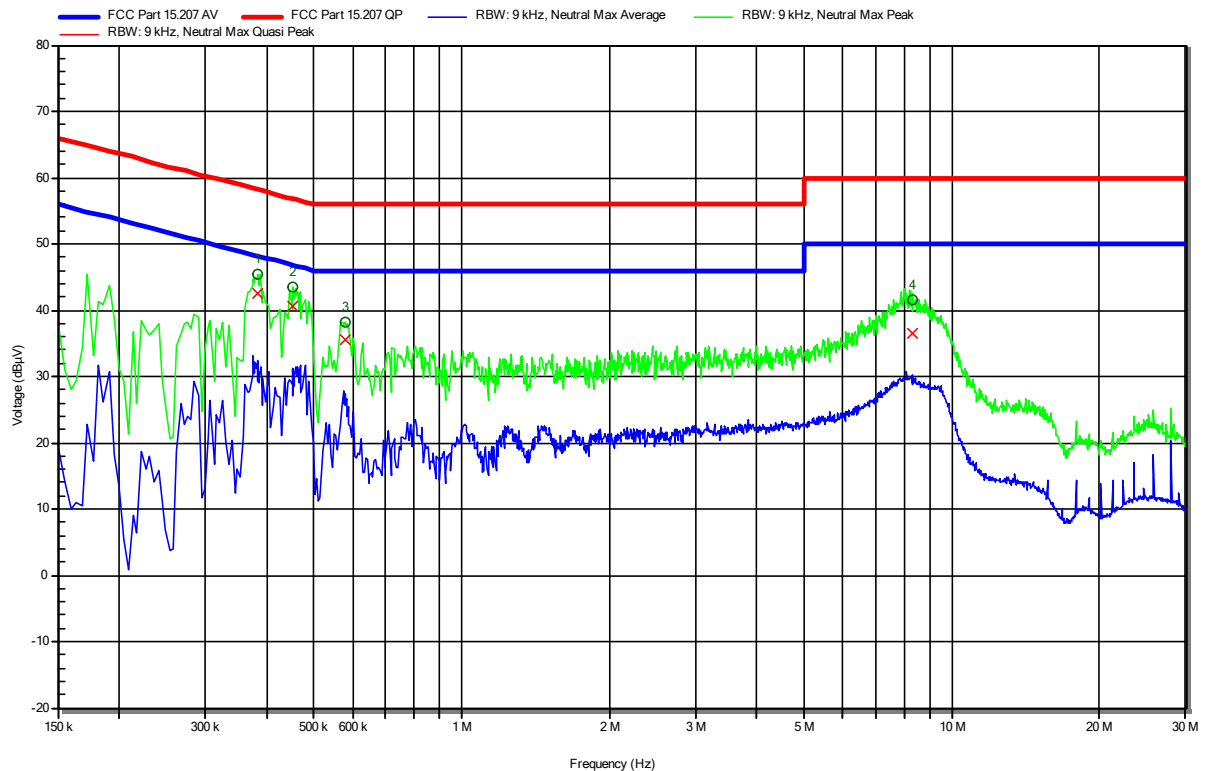
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-2-EX Additional Variant 2) according to FCC 15.209

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: Product Type Description: testo 316-2-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy, changeable sensor head and ATEX
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-07-28
 Operating Conditions: ambient temperature: 25 °Celsius
 power input: 120 V 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode: BLE, 2402 MHz, 1 Mbps, PRBS9_255
 Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 3

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	383.1 kHz	42.54 dBµV	58.21 dBµV	-15.67 dB	Pass	Neutral
2	453.3 kHz	40.53 dBµV	56.81 dBµV	-16.28 dB	Pass	Neutral
3	577.05 kHz	35.5 dBµV	56 dBµV	-20.5 dB	Pass	Neutral
4	8.3 MHz	36.51 dBµV	60 dBµV	-23.49 dB	Pass	Neutral
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	383.1 kHz	30.94 dBµV	48.21 dBµV	-17.28 dB	Pass	Neutral
2	453.3 kHz	28.82 dBµV	46.81 dBµV	-17.99 dB	Pass	Neutral
3	577.05 kHz	25.99 dBµV	46 dBµV	-20.01 dB	Pass	Neutral
4	8.3 MHz	29.11 dBµV	50 dBµV	-20.89 dB	Pass	Neutral

Test Report No.: G0M-2205-1489-TFC247BL-V03

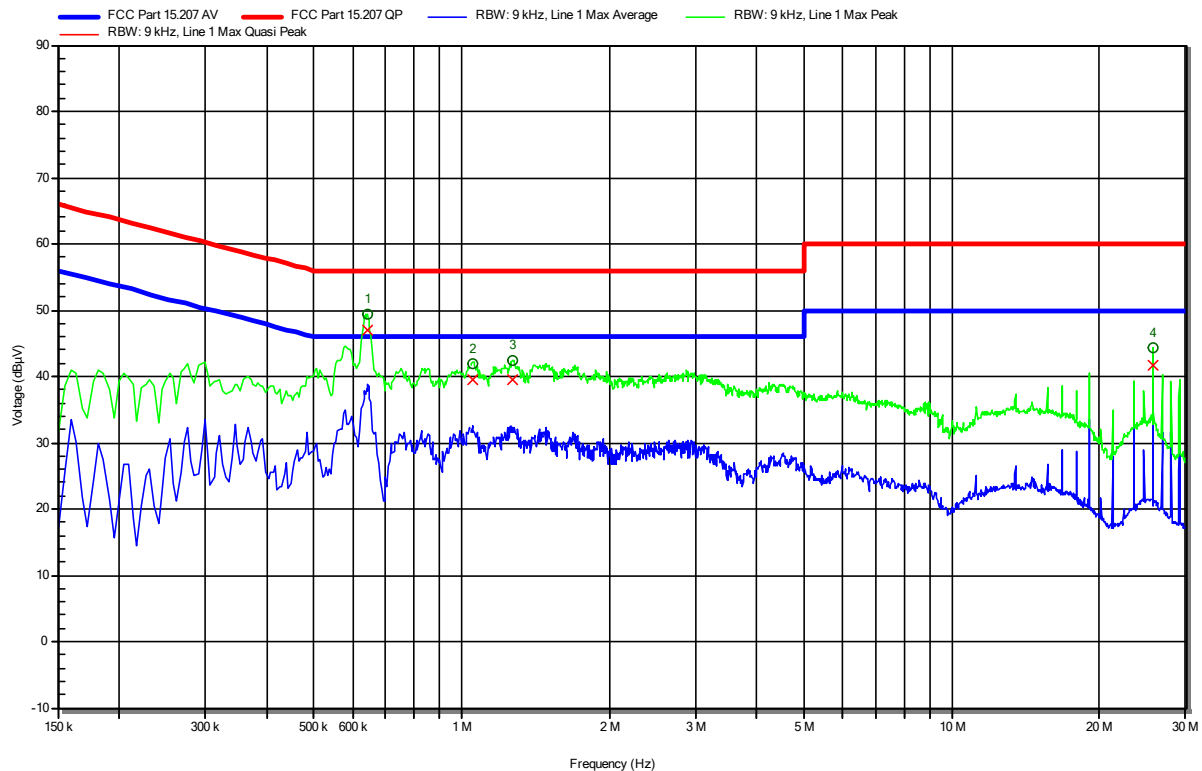
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-2-EX Additional Variant 2) according to FCC 15.209

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: Product Type Description: testo 316-2-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy, changeable sensor head and ATEX
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-07-28
 Operating Conditions: ambient temperature: 25 °Celsius
 power input: 120 V 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC L1
 Operational Mode: BLE, 2402 MHz, 1 Mbps, PRBS9_255
 Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 4

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	641.4 kHz	47.01 dBµV	56 dBµV	-8.99 dB	Pass	Line 1
2	1.054 MHz	39.57 dBµV	56 dBµV	-16.43 dB	Pass	Line 1
3	1.27 MHz	39.57 dBµV	56 dBµV	-16.43 dB	Pass	Line 1
4	25.75 MHz	41.64 dBµV	60 dBµV	-18.36 dB	Pass	Line 1
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	641.4 kHz	38.32 dBµV	46 dBµV	-7.68 dB	Pass	Line 1
2	1.054 MHz	31.6 dBµV	46 dBµV	-14.4 dB	Pass	Line 1
3	1.27 MHz	31.57 dBµV	46 dBµV	-14.43 dB	Pass	Line 1
4	25.75 MHz	35.04 dBµV	50 dBµV	-14.96 dB	Pass	Line 1

Test Report No.: G0M-2205-1489-TFC247BL-V03

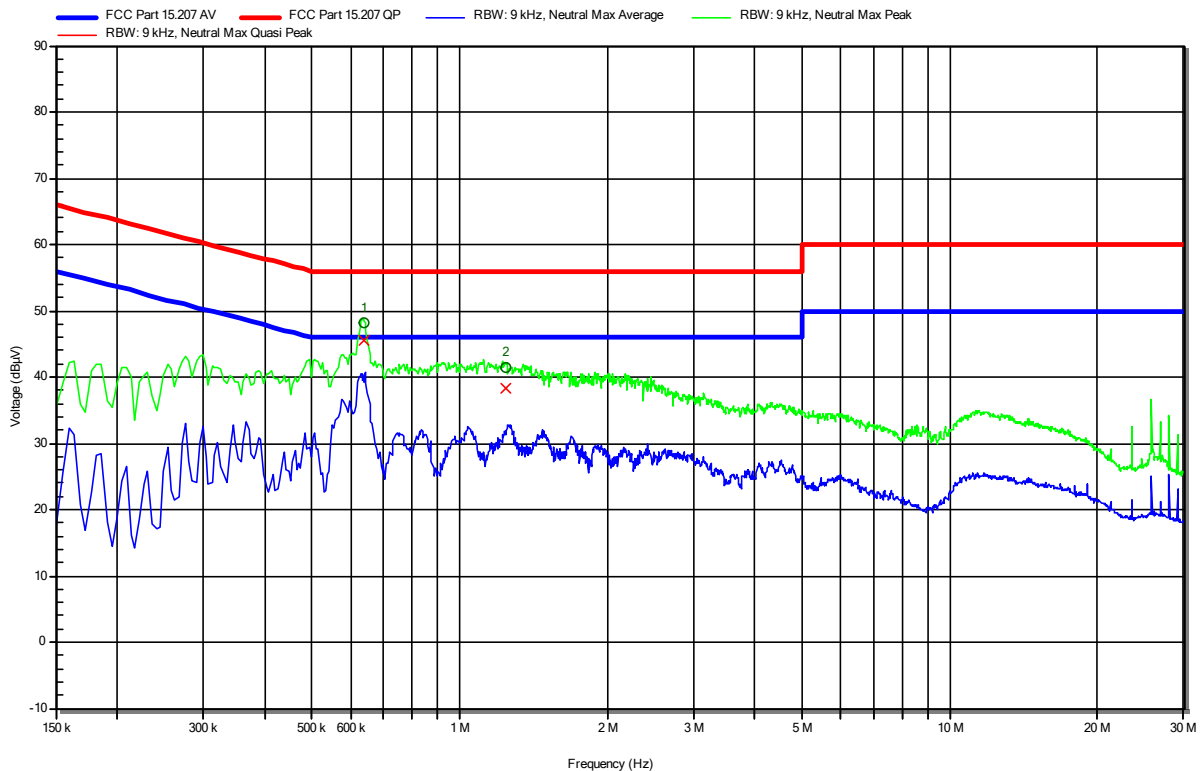
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Conducted emissions at the mains power port (EUT testo 316-2-EX Additional Variant 2) according to FCC 15.209

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: Product Type Description: testo 316-2-EX / Rechargeable battery powered (NiMH) detector for fluegas with LCD display, Bluetooth® Low Energy, changeable sensor head and ATEX
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Qawasmeh
 Test Date: 2022-07-28
 Operating Conditions: ambient temperature: 25 °Celsius
 power input: 120 V 60 Hz
 LISN: Schwarzbeck NSLK 8127 RC N
 Operational Mode: BLE, 2402 MHz
 Applied to Port: AC/DC Adapter to EUT (120V/60Hz to 5VDC)

Index 5

RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	636 kHz	45.56 dBμV	56 dBμV	-10.44 dB	Pass	Neutral
2	1.239 MHz	38.26 dBμV	56 dBμV	-17.74 dB	Pass	Neutral
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	636 kHz	39.53 dBμV	46 dBμV	-6.47 dB	Pass	Neutral
2	1.239 MHz	31.58 dBμV	46 dBμV	-14.42 dB	Pass	Neutral

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

3.6 Test Conditions and Results - Band-edge compliance

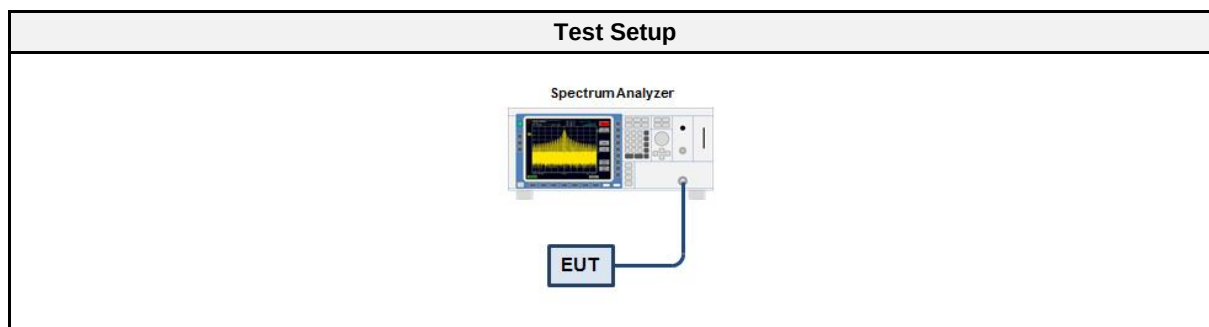
3.6.1 Information

Test Information	
Reference	FCC § 15.247(d); ISSED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 11.13
Operator	Radwan Jaafar
Date	2022-07-26

3.6.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.6.3 Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable	Gigalane	SMS111B	EF00779	2022-02	2023-02

3.6.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span set around lower band edge and detector is set to peak and max hold 3. Resolution bandwidth is set to 100 kHz 4. Markers are set to peak emission levels within frequency band and outside frequency band 5. Band edge attenuation is determined from level difference

3.6.6 Results

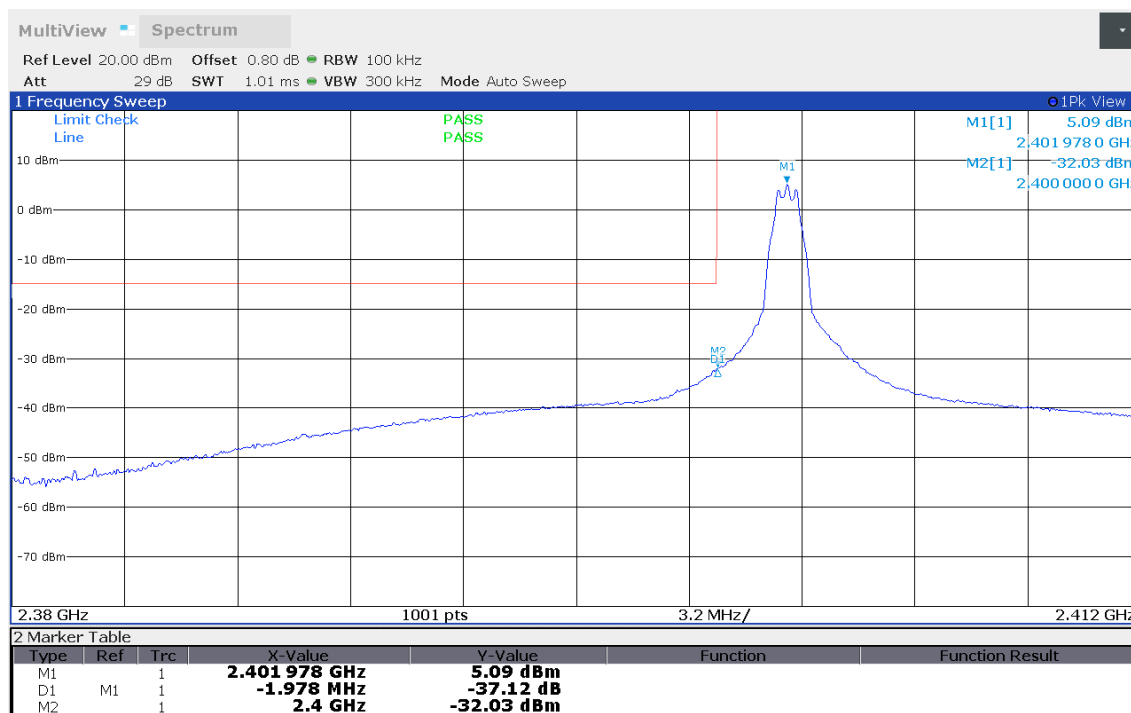
Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
GFSK	2402	-37.12	-20	PASS
GFSK	2480	-41.32	-20	PASS

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Emissions in nonrestricted frequency bands at the Band-edge

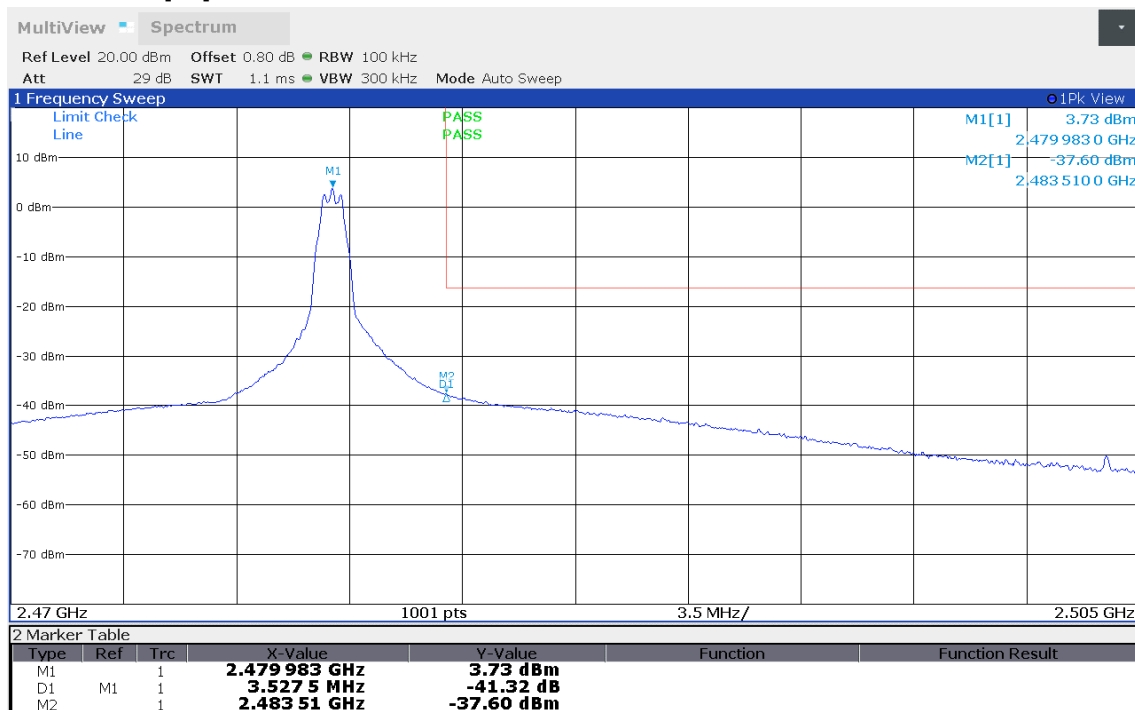
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 7.8.6, 6.10.4
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Band-edge: Lower
 In-band Frequency [MHz]: 2401.978
 Max. in-band Level [dBm/100 kHz]: 5.087
 Out-of-band Frequency [MHz]: 2400.0
 Max. out-of-band Level [dBm/100 kHz]: -32.034
 Attenuation [dB]: -37.12



16:06:03 26.07.2022

Emissions in nonrestricted frequency bands at the Band-edge

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 7.8.6, 6.10.4
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Band-edge: Upper
 In-band Frequency [MHz]: 2479.983
 Max. in-band Level [dBm/100 kHz]: 3.728
 Out-of-band Frequency [MHz]: 2483.51
 Max. out-of-band Level [dBm/100 kHz]: -37.596
 Attenuation [dB]: -41.32



16:08:55 26.07.2022

3.7 Test Conditions and Results - Conducted spurious emissions

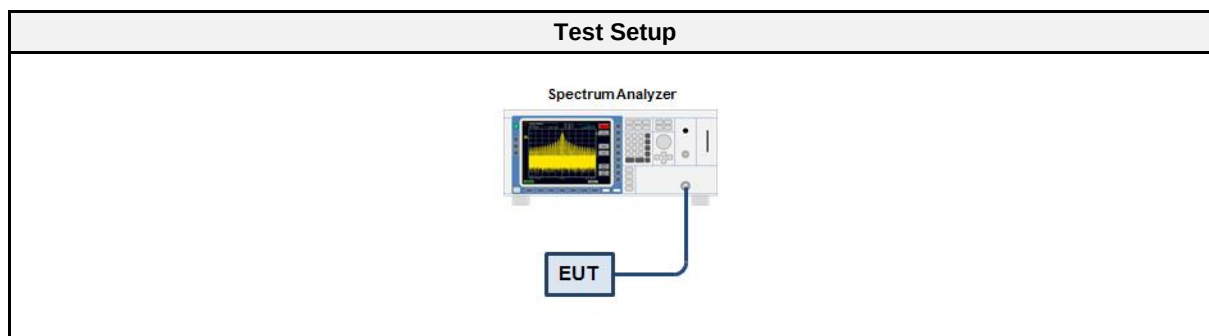
3.7.1 Information

Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 11.11
Operator	Radwan Jaafar
Date	2022-07-26

3.7.2 Limits

Limits	
Power Measurement	Out-of-band attenuation [dB]
Peak	20
RMS	30

3.7.3 Setup



3.7.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSW 43	EF00896	2021-07	2022-07
Cable (diverse)	HUBER+SUHNER	SUCOFLEX 102EA	EF00779 CAABY	2022-02	2023-02

3.7.5 Procedure

Test Procedure
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels outside frequency band

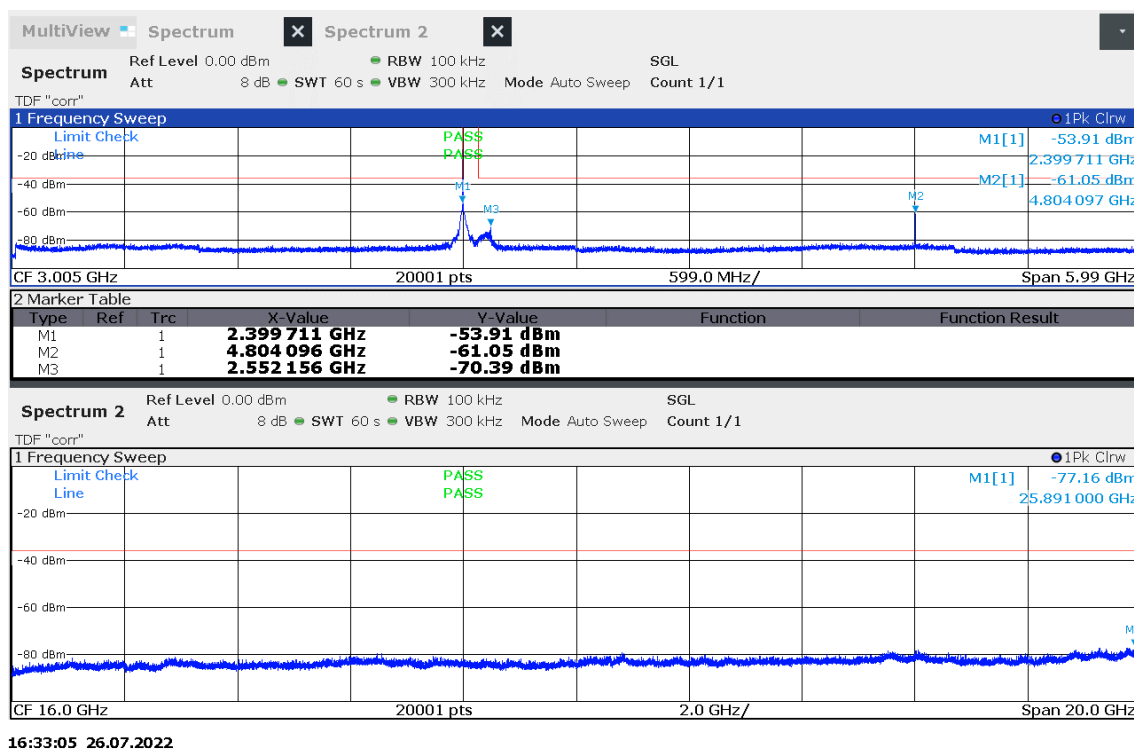
3.7.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
GFSK	2402	PASS
GFSK	2440	PASS
GFSK	2480	PASS

Test Report No.: G0M-2205-1489-TFC247BL-V03

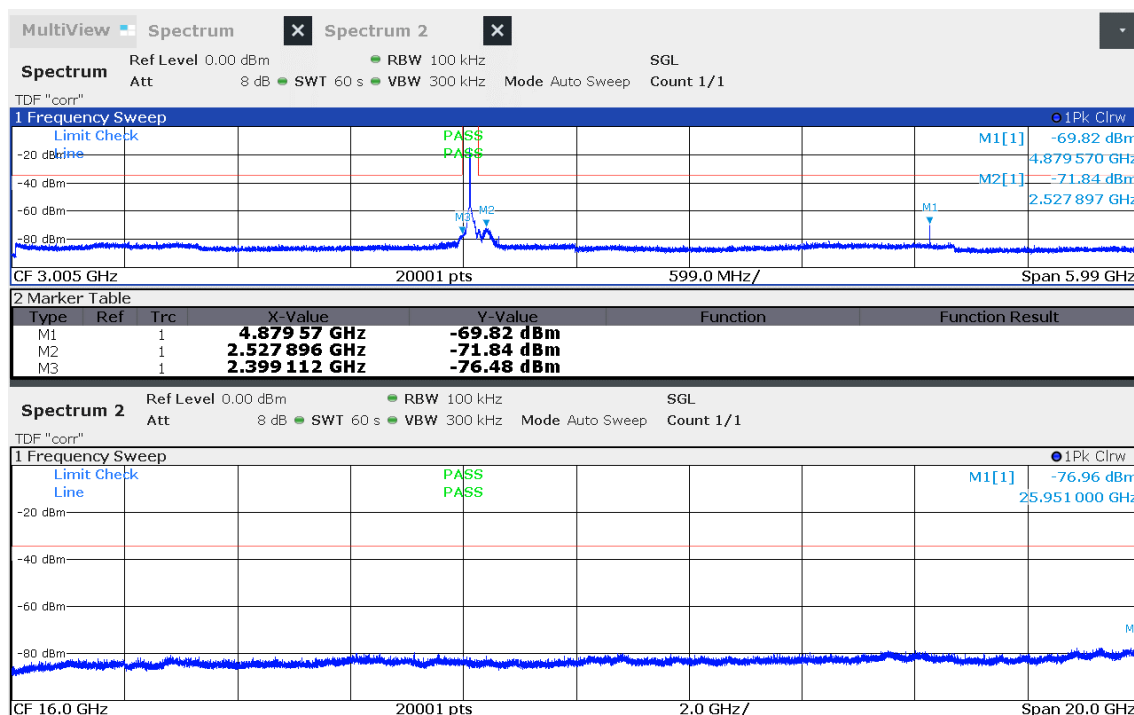
Conducted Spurious Emissions

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 0, 2402 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Max. in-band Frequency [MHz]: 2402.0
 Max. in-band Level [dBm/100 kHz]: -15.7
 Out-of-band Limit [dBm/100 kHz]: -35.7



Conducted Spurious Emissions

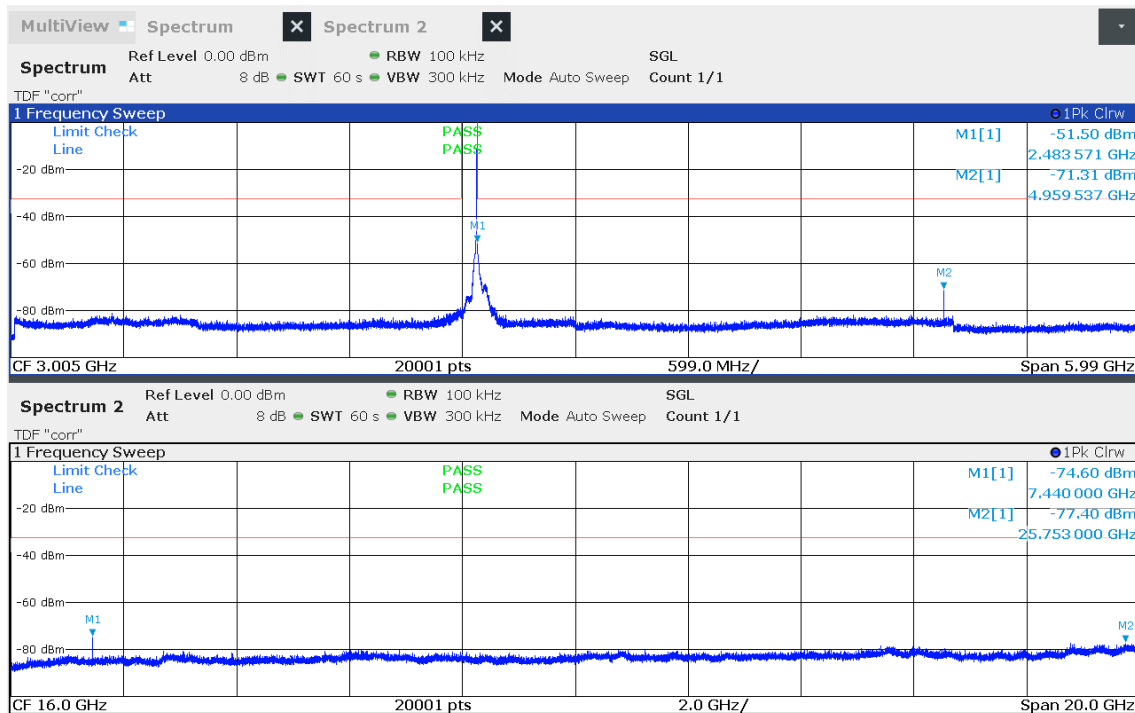
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 19, 2440 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Max. in-band Frequency [MHz]: 2440.0
 Max. in-band Level [dBm/100 kHz]: -14.3
 Out-of-band Limit [dBm/100 kHz]: -34.3



16:36:24 26.07.2022

Conducted Spurious Emissions

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / conducted sample
 Model: testo 316-1-EX
 Test Sample ID: 40289
 Reference Standards: FCC 15.247, RSS-247
 Reference Method: ANSI C63.10:2013, Section 11.11
 Operational Mode: GFSK, Channel: 39, 2480 MHz
 Operating Conditions: Tnom/Vnom
 Operator: Radwan Jaafar
 Test Site: Eurofins Product Service GmbH
 Test Date: 2022-07-26
 Max. in-band Frequency [MHz]: 2480.0
 Max. in-band Level [dBm/100 kHz]: -12.3
 Out-of-band Limit [dBm/100 kHz]: -32.3



17:00:32 26.07.2022

3.8 Test Conditions and Results - Transmitter radiated emissions

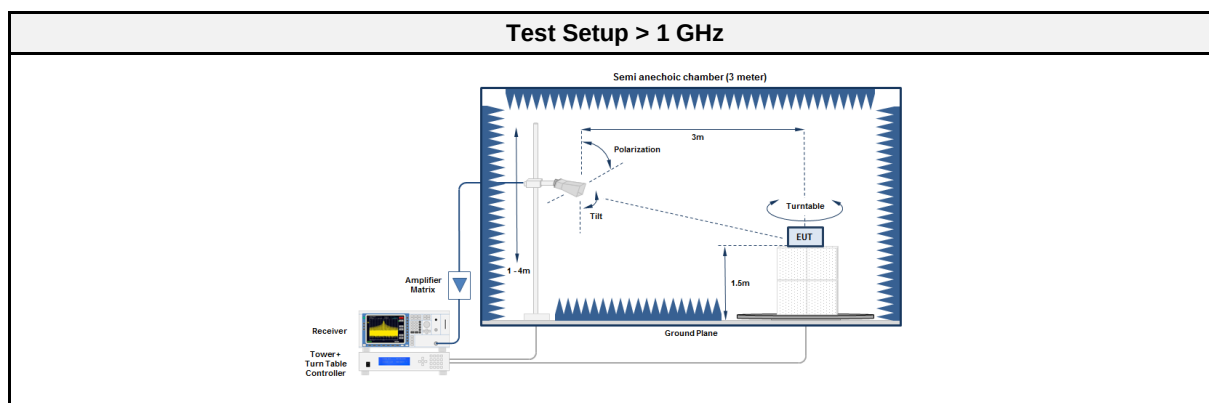
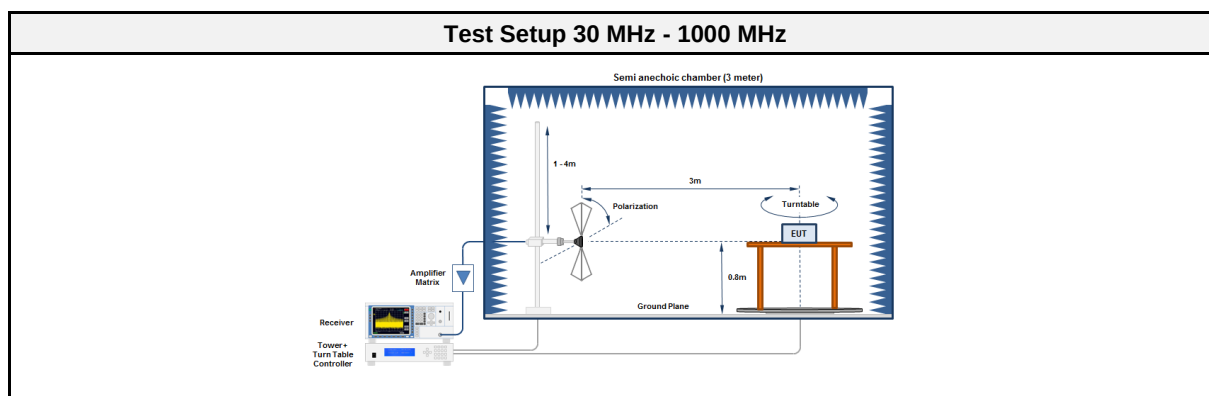
3.8.1 Information

Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISSED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6, 11.12
Operator	Radwan Jaafar
Date	2022-07-28

3.8.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [$\mu\text{V/m}$]	Measurement distance [m]
0.009 - 0.09	Average	2400/F[kHz]	300
0.09 - 0.110	Quasi-Peak	2400/F[kHz]	300
0.110 - 0.490	Average	2400/F[kHz]	300
0.490 - 1.705	Quasi-Peak	24000/F[kHz]	30
1.705 - 30.0	Quasi-Peak	30	30
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.8.3 Setup



3.8.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	R&S	ESU 26	EF00887	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00187	2022-06	2025-06

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC2	EF00200	-	-
Spectrum Analyzer	R&S	FSU 43	EF01631	2021-07	2022-07
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06
Antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2024-03

3.8.5 Procedure

Test Procedure 30 MHz - 1000 MHz	
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector	

Test Procedure > 1 GHz	
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector	

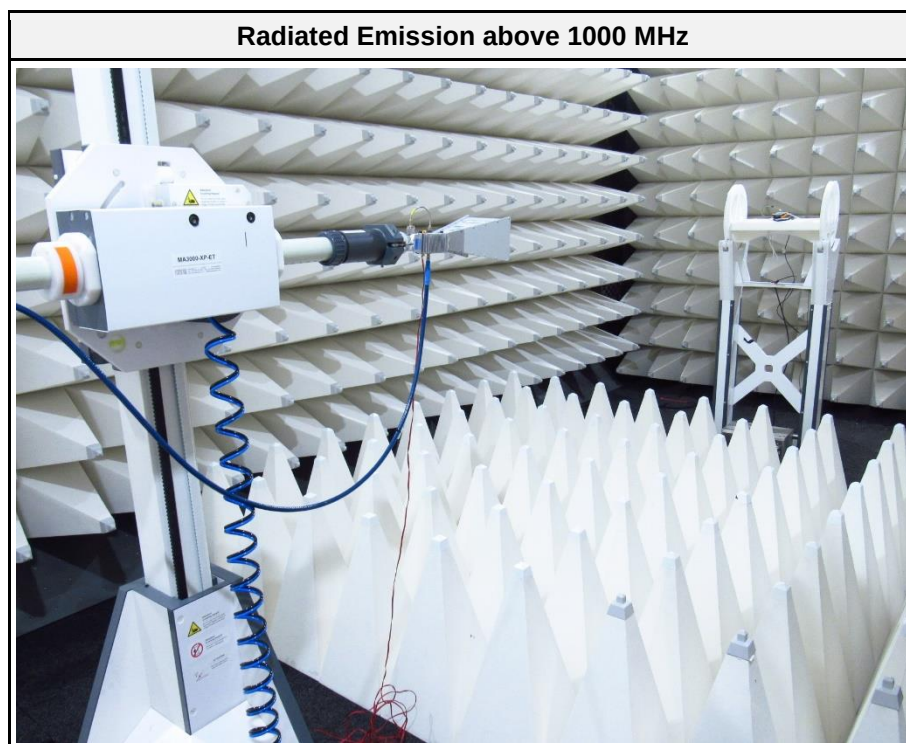
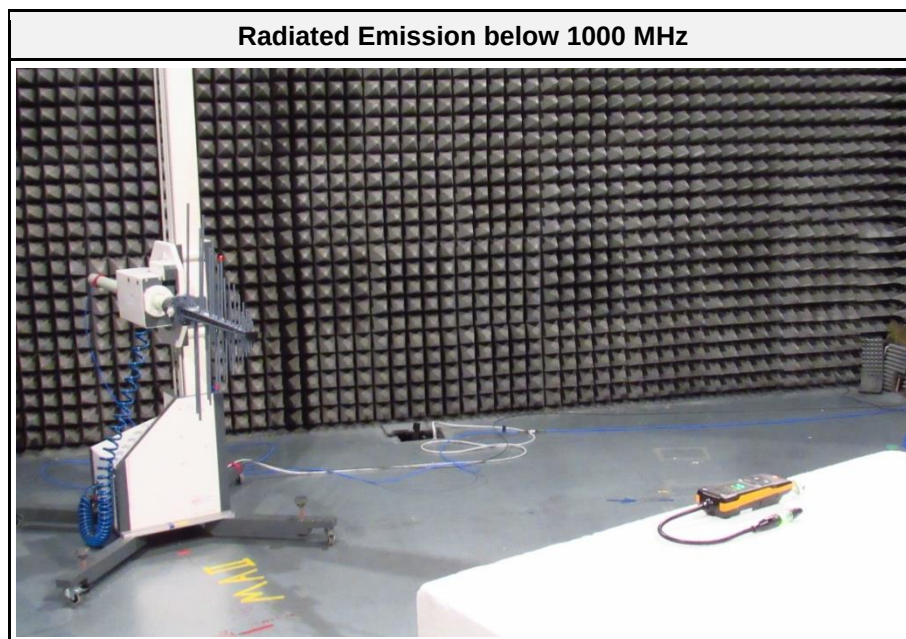
3.8.6 Results

Test Results – EUT testo 316i						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2402	166.0737	27.20	pk	hor	43.50	-16.30
2402	888	35.30	pk	ver	95.00	-59.71
2402	2251.7	45.58	pk	hor	74.00	-28.42
2402	2251.7	28.80	avg	hor	54.00	-25.20
2402	2388.7	64.35	pk	hor	74.00	-09.65
2402	2388.7	44.75	avg	hor	54.00	-09.25
2402	4803.7	50.49	pk	hor	74.00	-23.51
2402	4803.7	45.98	avg	hor	54.00	-08.02
2402	19016	46.35	pk	hor	74.00	-27.65
2402	19016	33.61	avg	hor	54.00	-20.39
2440	166.6857	26.60	pk	hor	43.50	-16.97
2440	2385.9	51.87	pk	hor	74.00	-22.13
2440	2385.9	27.49	avg	hor	54.00	-26.51
2440	2496	51.03	pk	hor	74.00	-22.97
2440	2496	27.61	avg	hor	54.00	-26.39
2440	4879.6	44.06	pk	hor	74.00	-29.94
2440	4879.6	37.53	avg	hor	54.00	-16.47
2440	17786	45.18	pk	ver	74.00	-28.82
2440	17786	32.44	avg	ver	54.00	-21.56
2480	165.9263	26.90	pk	hor	43.50	-16.59
2480	2354	46.90	pk	hor	74.00	-27.10
2480	2354	25.48	avg	hor	54.00	-28.52
2480	2483.5	71.22	pk	hor	74.00	-02.78
2480	2483.5	47.51	avg	hor	54.00	-06.49
2480	2500	54.34	pk	ver	74.00	-19.66
2480	2500	28.71	avg	ver	54.00	-25.29
2480	4960	42.13	pk	hor	74.00	-31.87
2480	4960	32.83	avg	hor	54.00	-21.17

Test Results – EUT testo 316-1-EX (Additional Variant 1)						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2402	2389.3	61.72	pk	hor	74	-12.28
2402	2389.3	45.33	avg	hor	54	-08.67
2440	2485.7	51.63	pk	hor	74	-22.37
2440	2485.7	27.9	avg	hor	54	-26.10
2440	4879.5	41.15	pk	hor	74	-32.85
2440	4879.5	34.02	avg	hor	54	-19.98
2480	2483.6	73.65	pk	hor	74	-00.35
2480	2483.6	50.46	avg	hor	54	-03.54
2480	4960	43.91	pk	ver	74	-30.09
2480	4960	36.98	avg	ver	54	-17.02

Test Results – EUT testo 316-2-EX (Additional Variant 2)						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
2402	2274.2	43.02	pk	hor	74	-30.98
2402	2274.2	24.09	avg	hor	54	-29.91
2402	2389.8	65.39	pk	hor	74	-08.61
2402	2389.8	45.92	avg	hor	54	-08.08
2402	4803.5	45.1	pk	ver	74	-28.90
2402	4803.5	41	avg	ver	54	-13.00

3.8.7 Setup Photos



3.9 Test Conditions and Results - Receiver radiated emissions

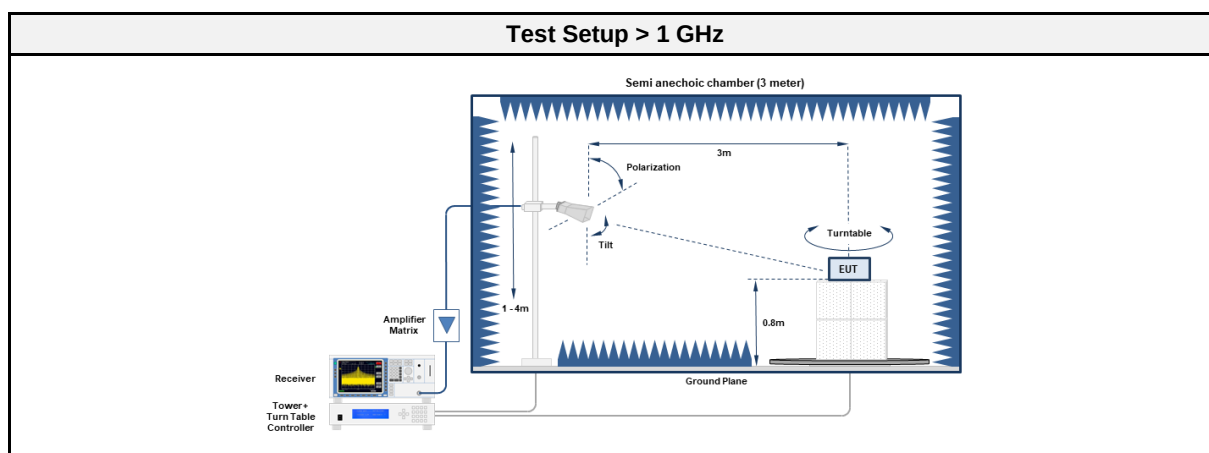
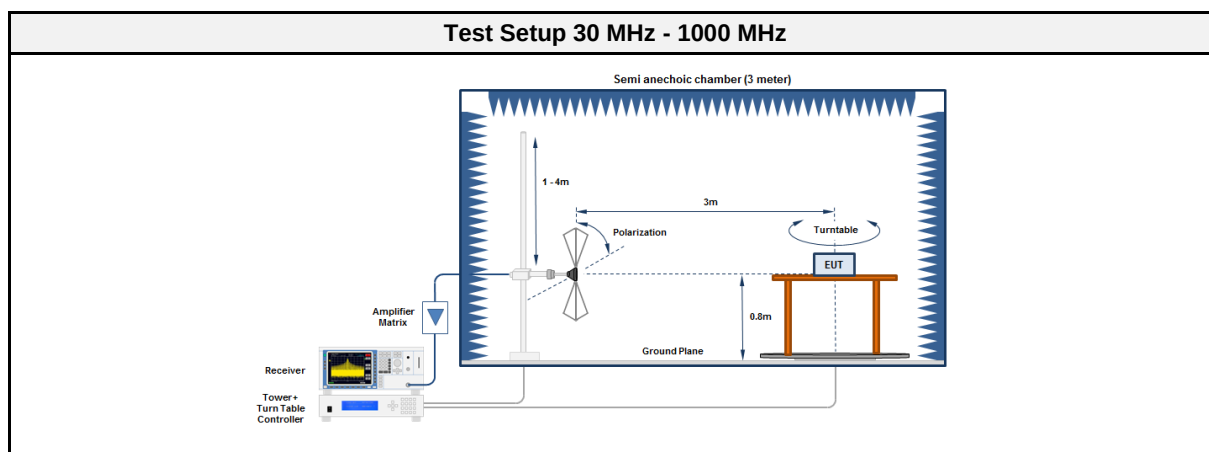
3.9.1 Information

Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.4-2014 8.1-8.3
Operator	Radwan Jaafar
Date	2022-07-28

3.9.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [$\mu\text{V/m}$]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.9.3 Setup



3.9.4 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	RadiMation	2020.1.8

Test Equipment 30 MHz - 1000 MHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00187	2022-06	2025-06
Measurement Receiver	R&S	ESU 26	EF00887	2021-07	2022-07

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Antenna	Schwarzbeck	BBHA 9120D	EF00018	2019-10	2022-10
Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2024-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06
Measurement Receiver	R&S	ESU 26	EF00887	2021-07	2022-07

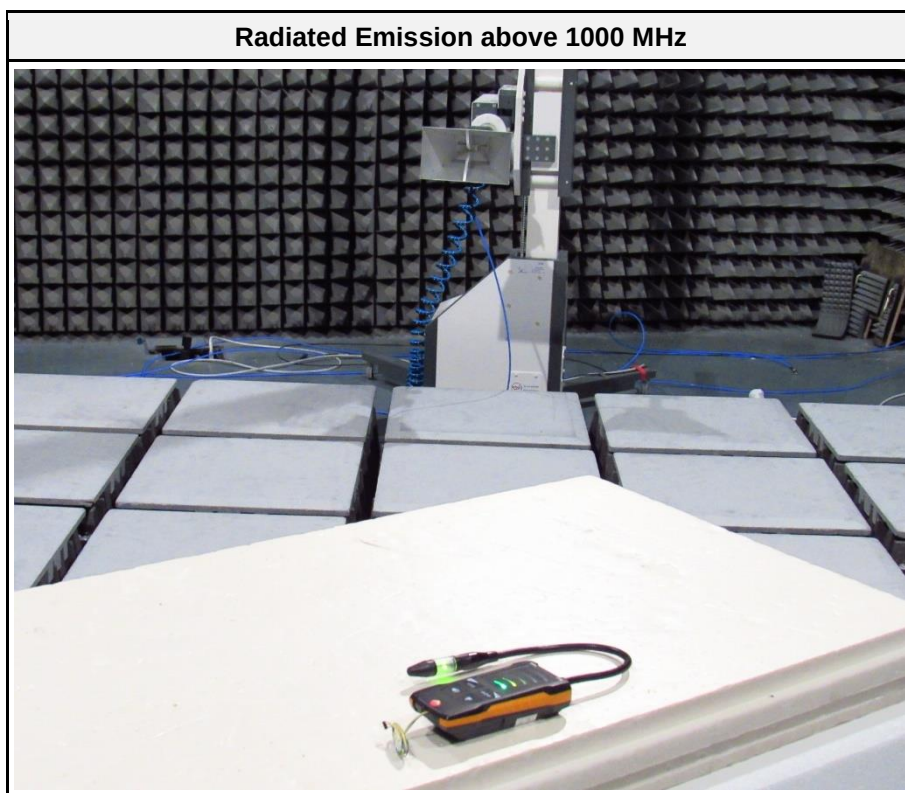
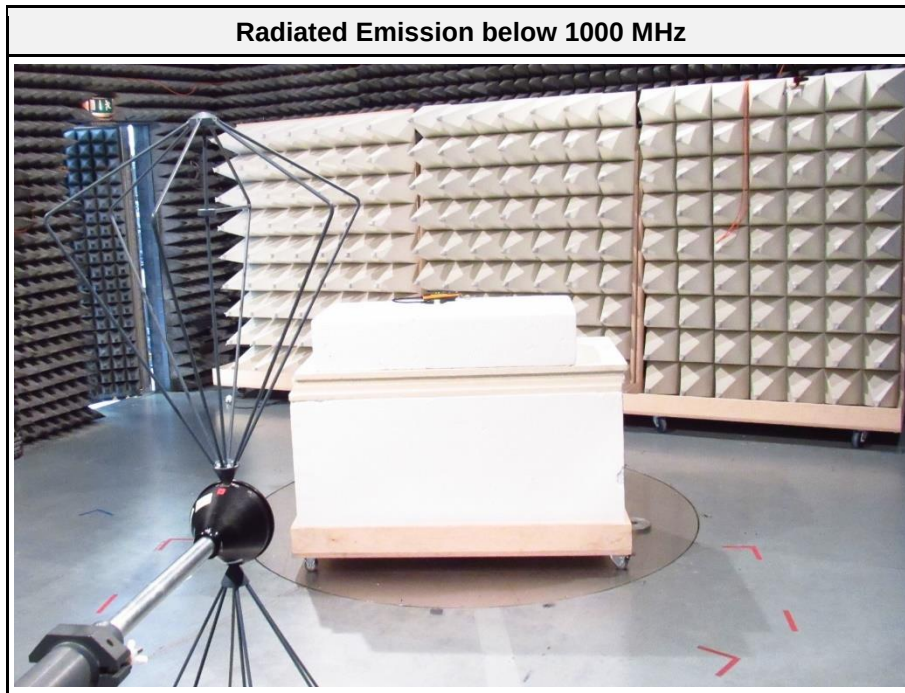
3.9.5 Procedure

Test Procedure	
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT is set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant emissions are measured again using the corresponding final detector	

3.9.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBμV/m]	Det.	Pol.	Limit [dBμV/m]	Margin [dB]
Receive	31.224	17.80	pk	ver	40.00	-22.19
Receive	168.1817	25.80	pk	hor	43.50	-17.67
Receive	858.96	34.80	pk	ver	46.00	-11.17
Receive	863.7436	32.10	pk	ver	46.00	-13.94
Receive	863.7436	26.20	qpk	ver	46.00	-19.85
Receive	25519	50.41	pk	ver	74.00	-23.59

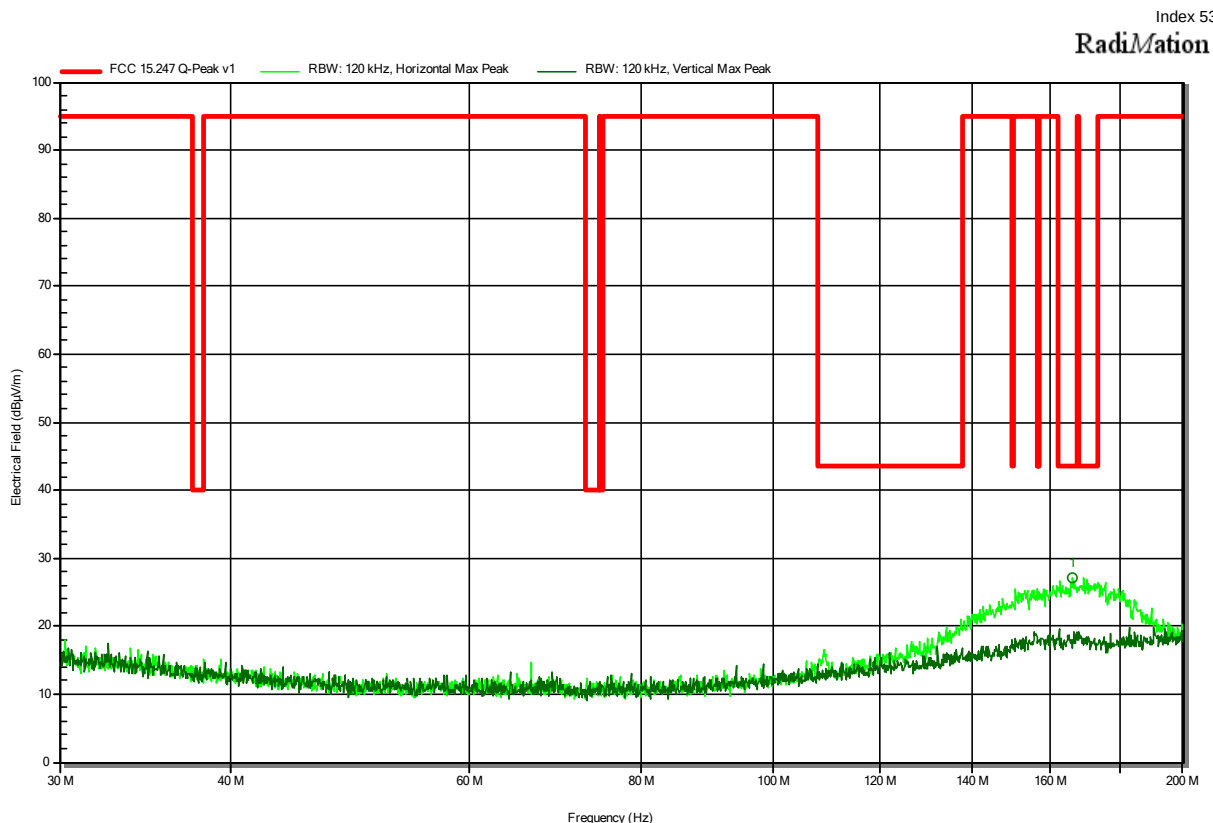
3.9.7 Setup Photos



ANNEX A Transmitter unwanted emissions in the spurious domain (EUT testo 316i)

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
Applicant: Testo SE & Co. KGaA
Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
Model: testo 316i
Test Sample ID: 40241
Test Site: Eurofins Product Service GmbH
Operator: R. Jaafar
Measurement software: RadiMation, version 2020.1.8
Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
Antenna: Rohde & Schwarz HK 116
Measurement distance: 3 m
Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
Test Date: 2022-07-28
Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
166.0737 MHz	27.2 dBµV/m	43.5 dBµV/m	-16.3 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

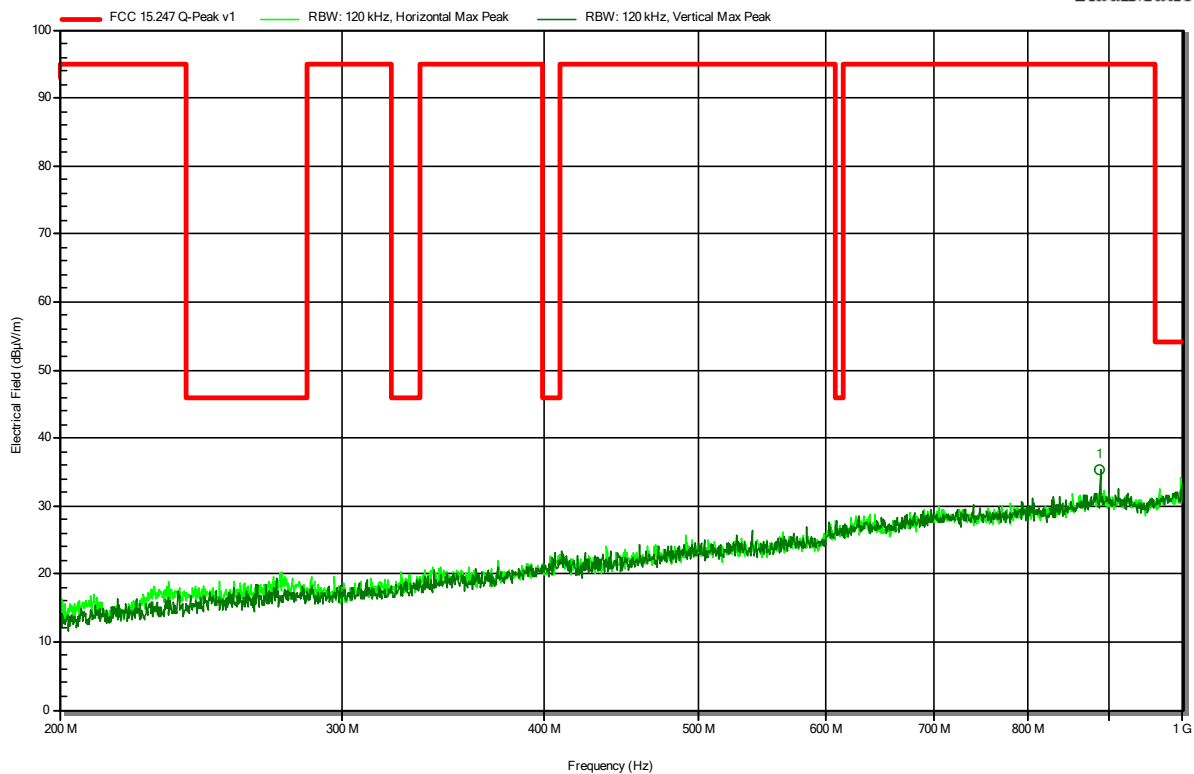
Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HL 223
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

Index 49

RadiMation



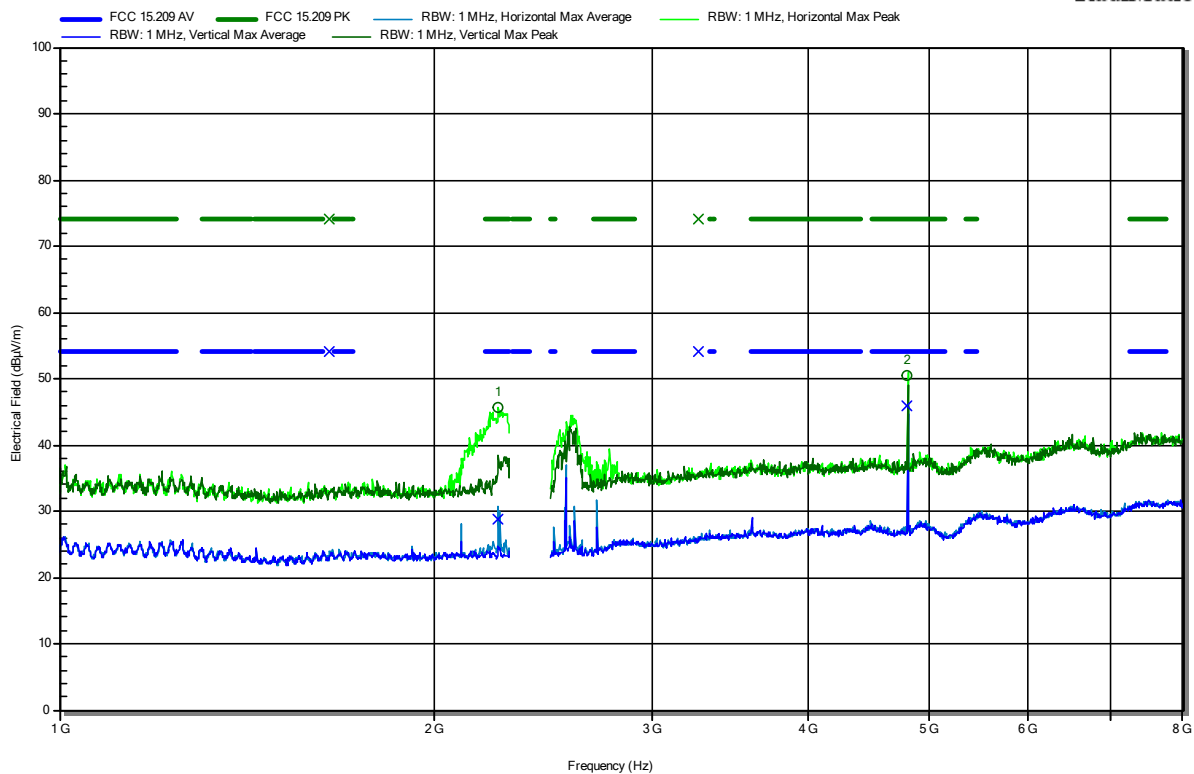
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
888 MHz	35.3 dBμV/m	95 dBμV/m	-59.71 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 37

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.2517 GHz	45.58 dBμV/m	74 dBμV/m	-28.42 dB	Pass	Horizontal
4.8037 GHz	50.49 dBμV/m	74 dBμV/m	-23.51 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.2517 GHz	28.8 dBμV/m	54 dBμV/m	-25.2 dB	Pass	Horizontal
4.8037 GHz	45.98 dBμV/m	54 dBμV/m	-8.02 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

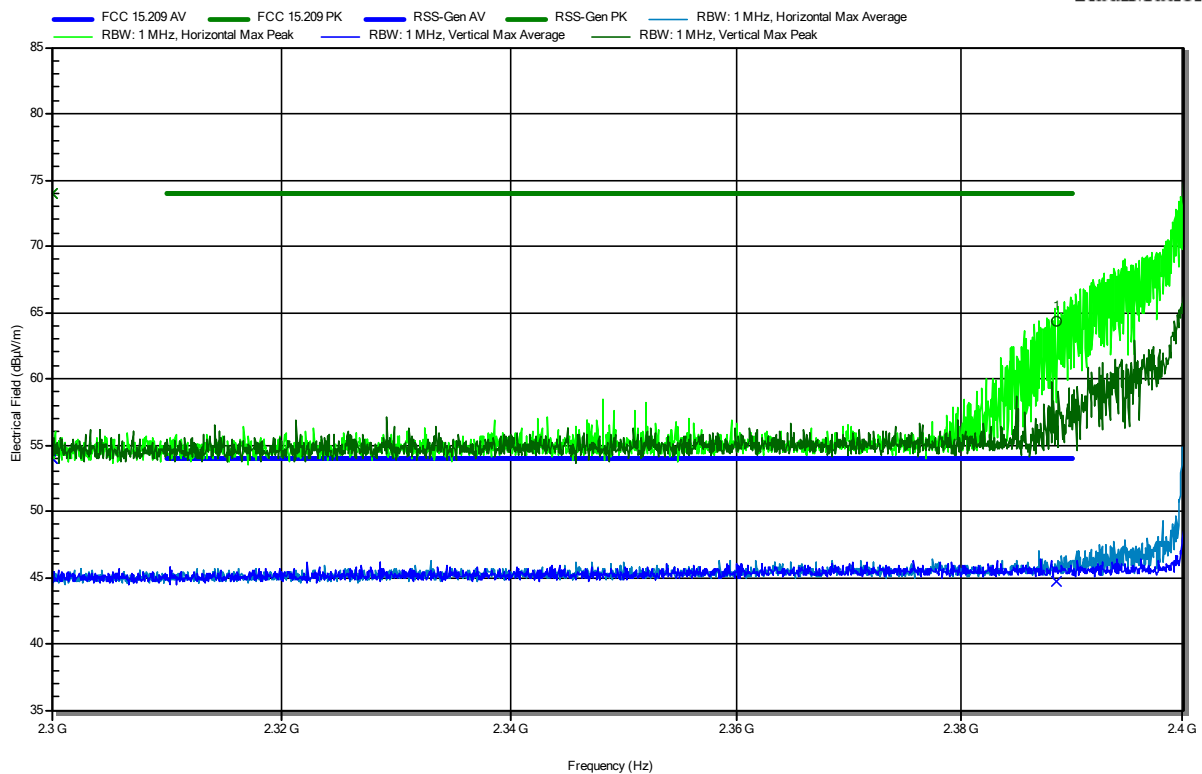
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note: lower bandedge

Index 38

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.3887 GHz	64.35 dBµV/m	74 dBµV/m	-9.65 dB	Pass	Horizontal

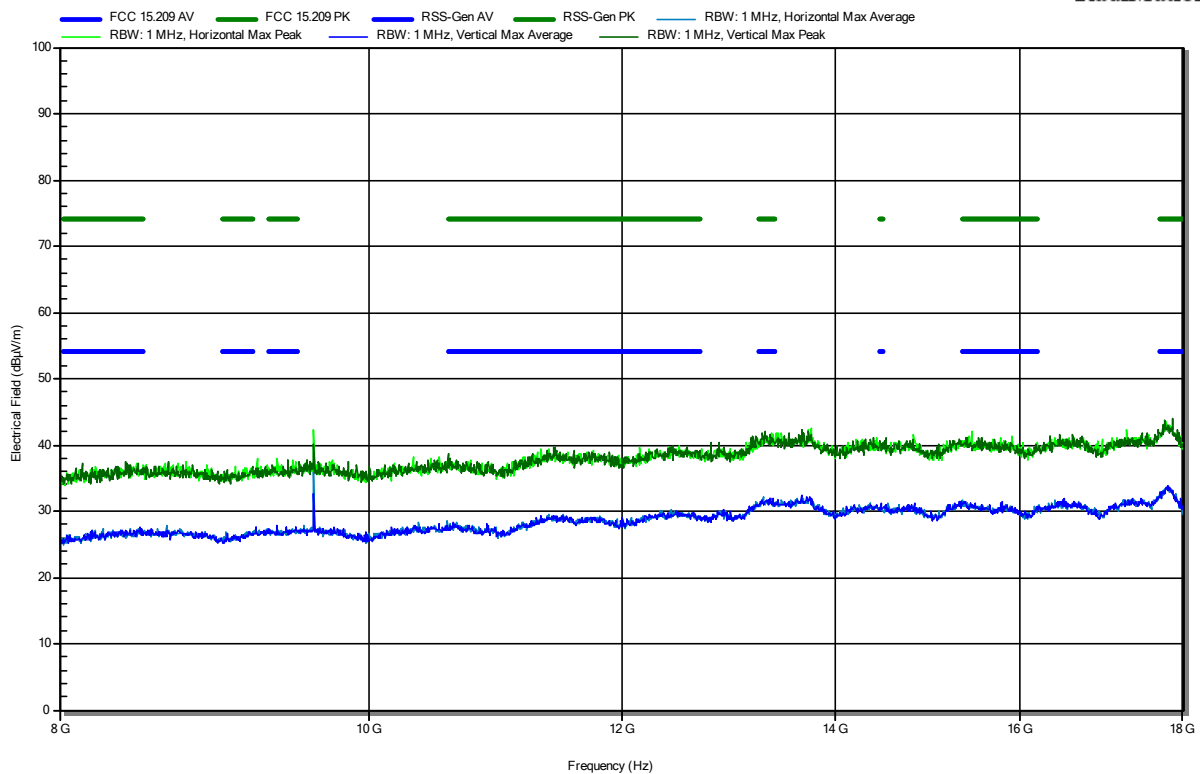
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.3887 GHz	44.75 dBµV/m	54 dBµV/m	-9.25 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 43

RadiMation

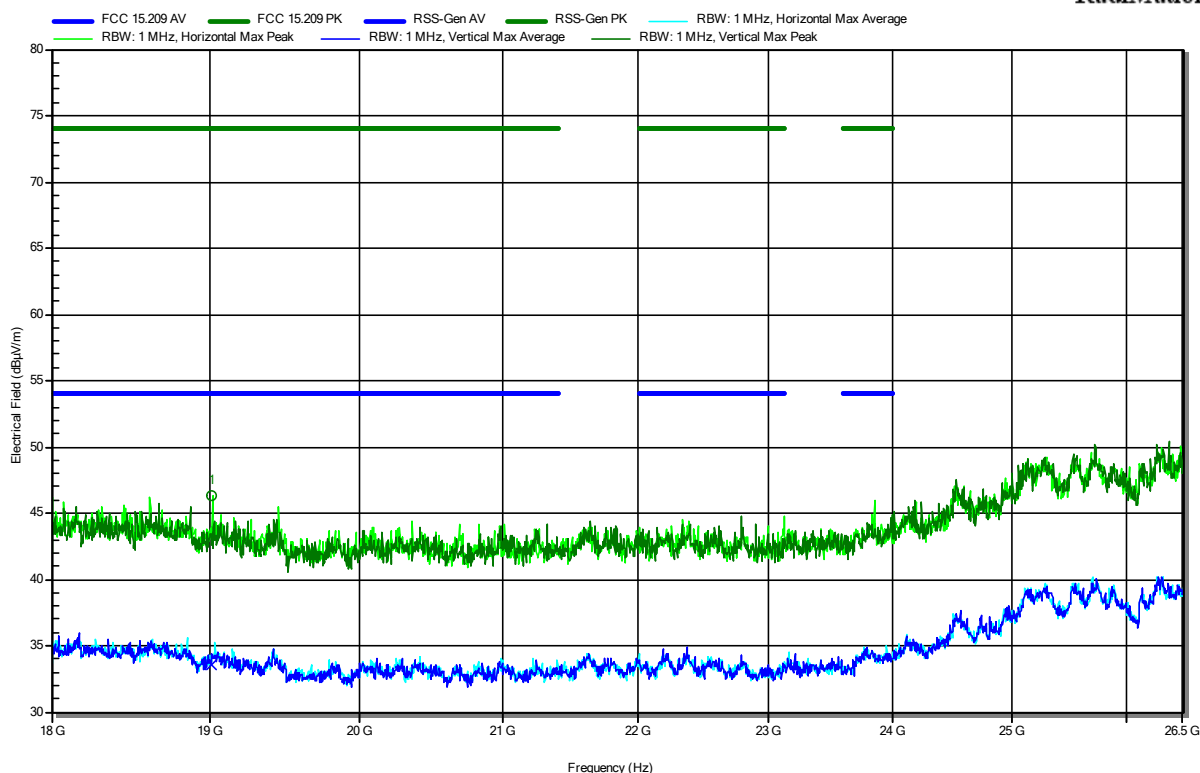


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

Index 56

RadiMation

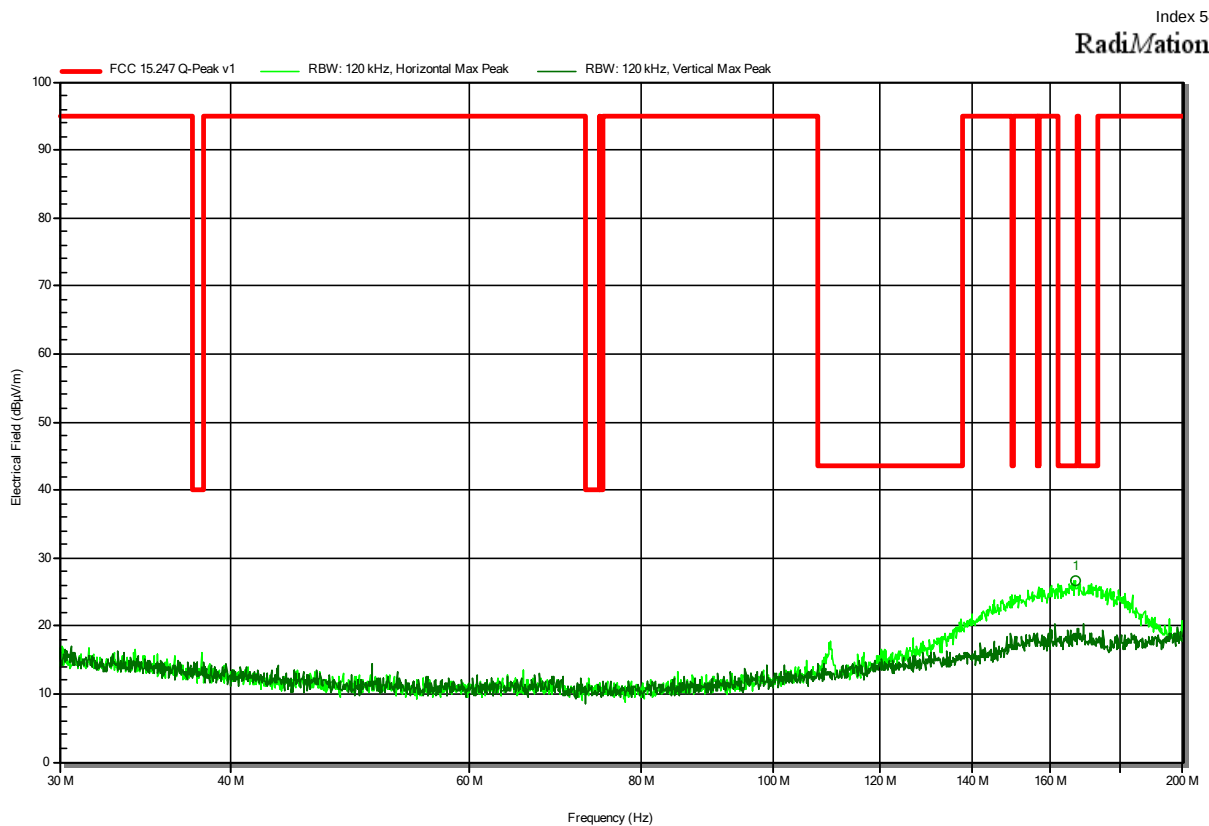


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
19.016 GHz	46.35 dBμV/m	74 dBμV/m	-27.65 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
19.016 GHz	33.61 dBμV/m	54 dBμV/m	-20.39 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

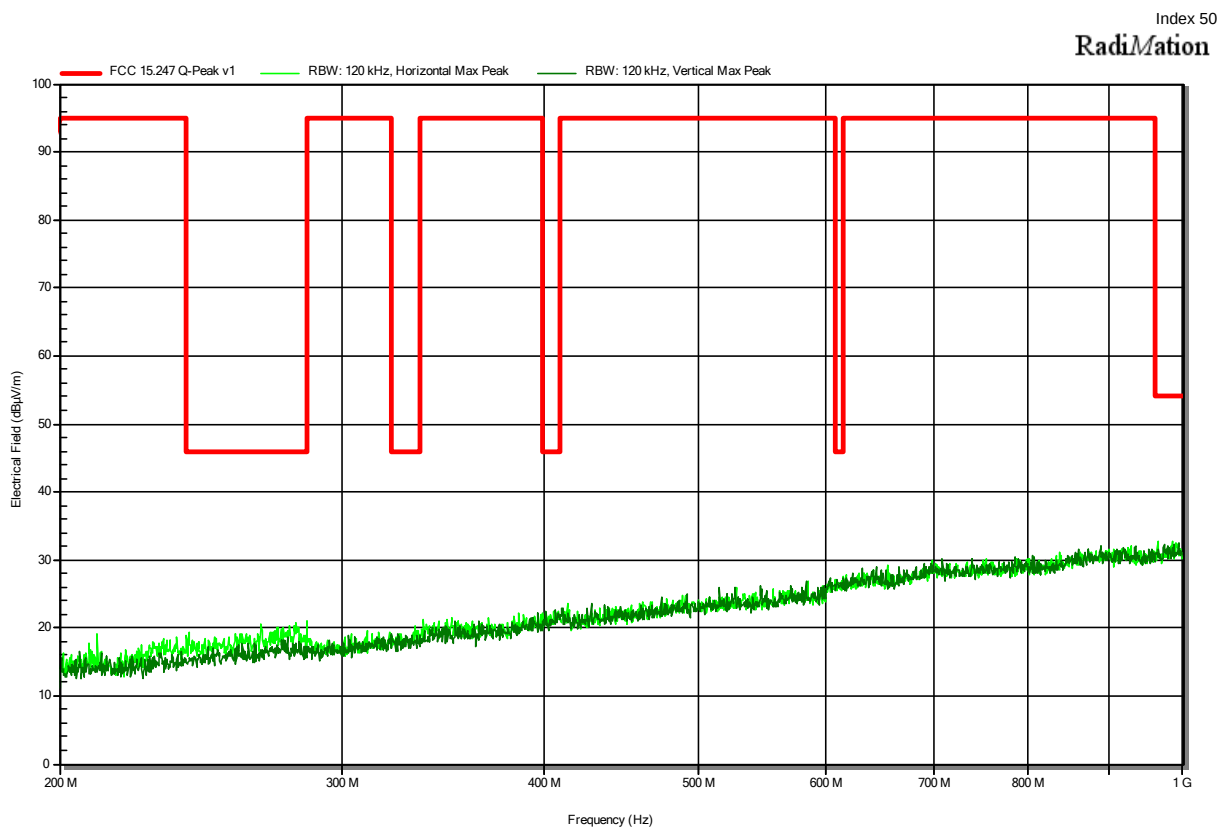
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HK 116
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
166.6857 MHz	26.6 dBμV/m	43.5 dBμV/m	-16.97 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HL 223
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

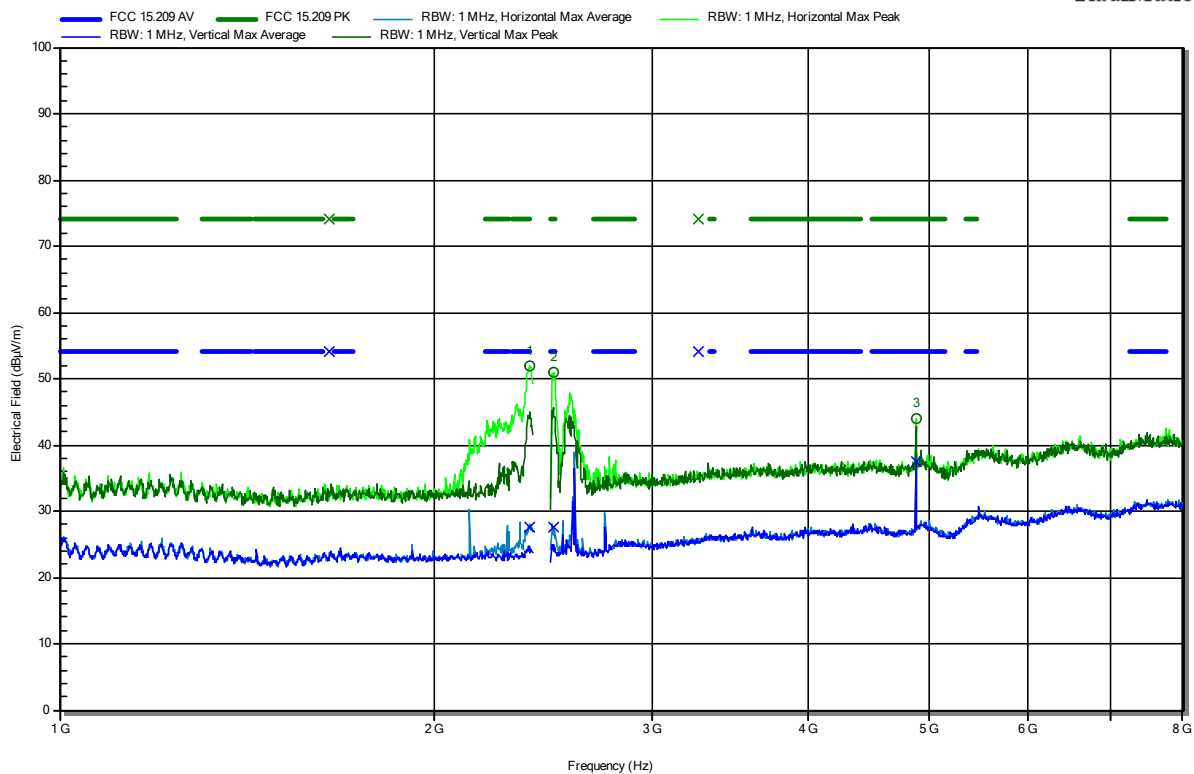


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 41

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.3859 GHz	51.87 dBµV/m	74 dBµV/m	-22.13 dB	Pass	Horizontal
2.496 GHz	51.03 dBµV/m	74 dBµV/m	-22.97 dB	Pass	Horizontal
4.8796 GHz	44.06 dBµV/m	74 dBµV/m	-29.94 dB	Pass	Horizontal

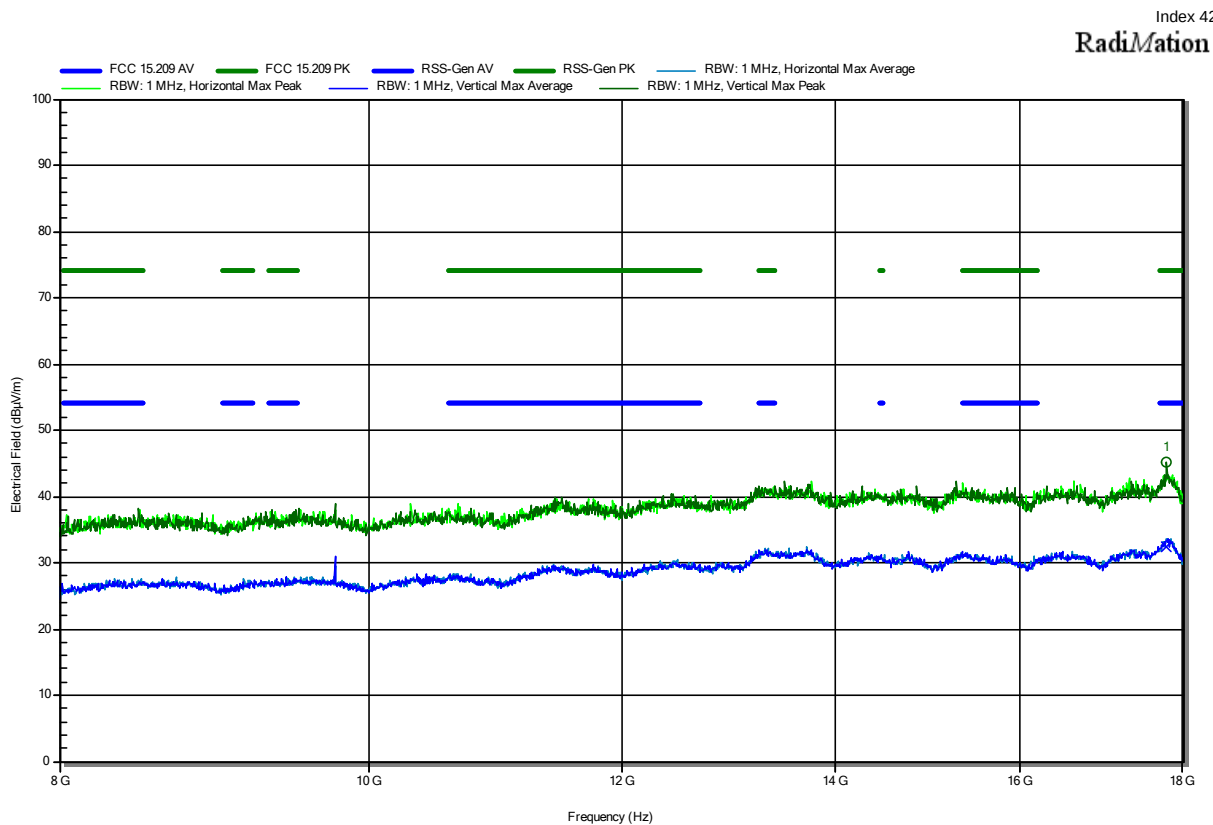
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.3859 GHz	27.49 dBµV/m	54 dBµV/m	-26.51 dB	Pass	Horizontal
2.496 GHz	27.61 dBµV/m	54 dBµV/m	-26.39 dB	Pass	Horizontal
4.8796 GHz	37.53 dBµV/m	54 dBµV/m	-16.47 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:



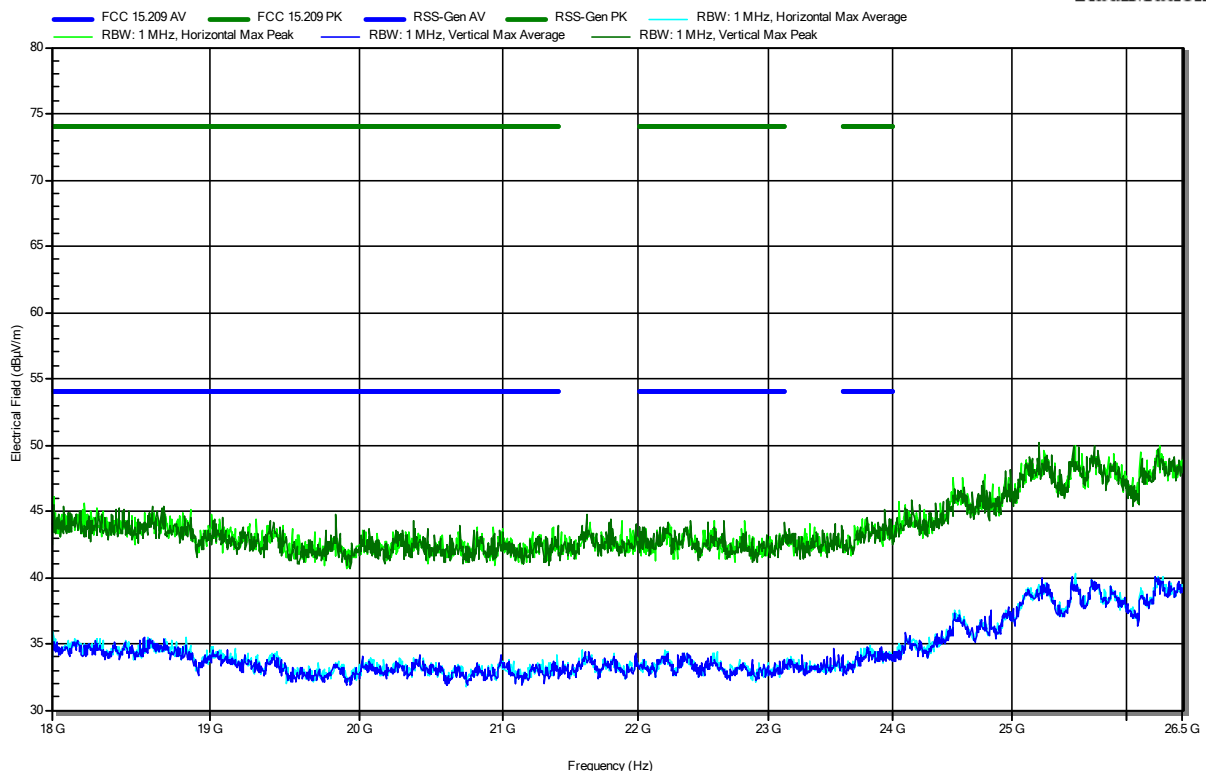
Frequency 17.786 GHz	Peak 45.18 dBμV/m	Peak Limit 74 dBμV/m	Peak Difference -28.82 dB	Peak Status Pass	Polarization Vertical
Frequency 17.786 GHz	Average 32.44 dBμV/m	Average Limit 54 dBμV/m	Average Difference -21.56 dB	Average Status Pass	Polarization Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

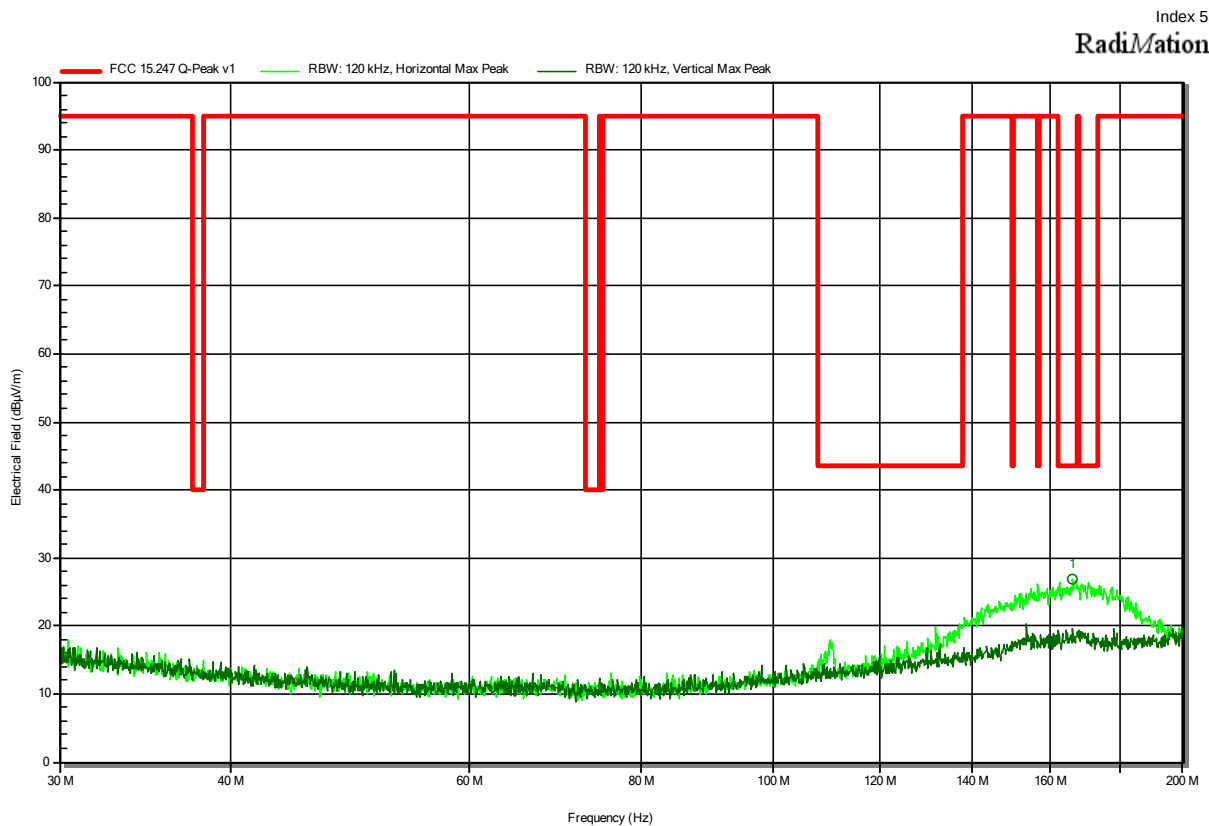
Index 57

RadiMation



Radiated Spurious Emissions according to 47 CFR Part 15.247

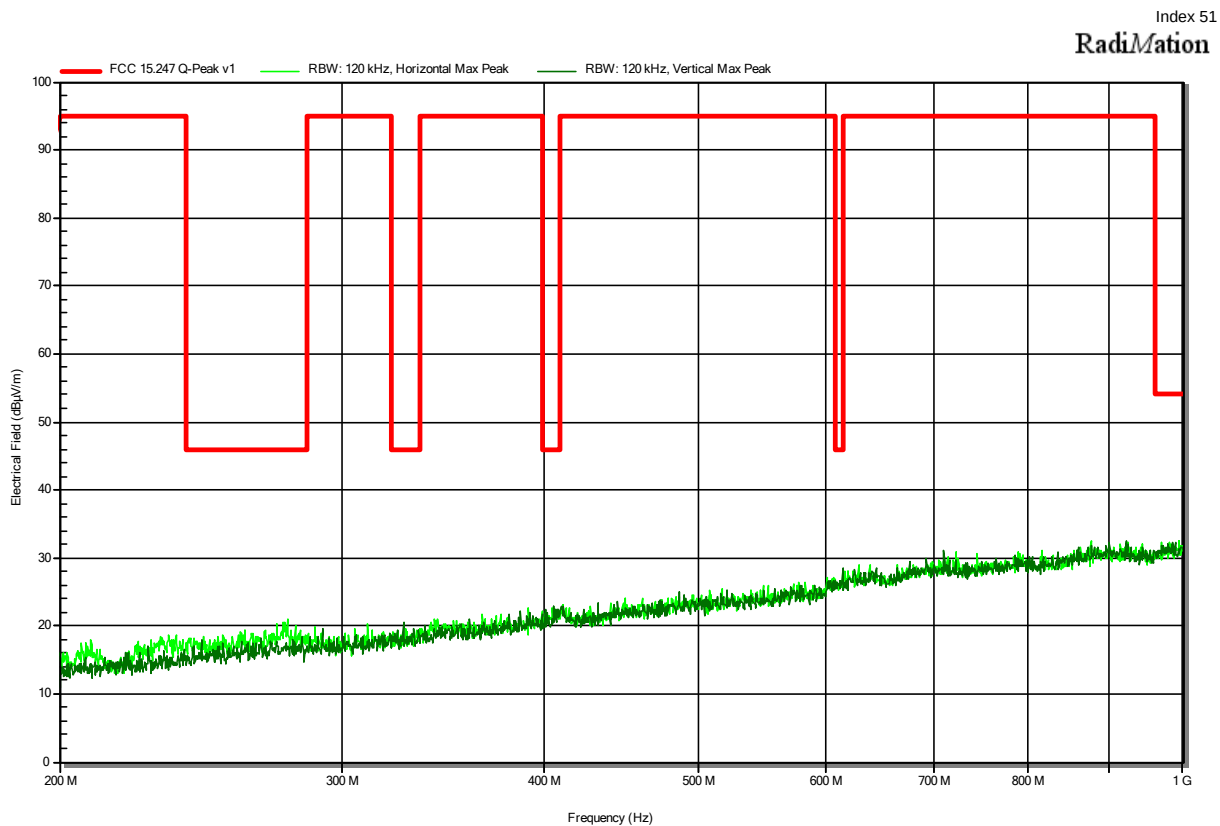
Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HK 116
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
165.9263 MHz	26.9 dBµV/m	43.5 dBµV/m	-16.59 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HL 223
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

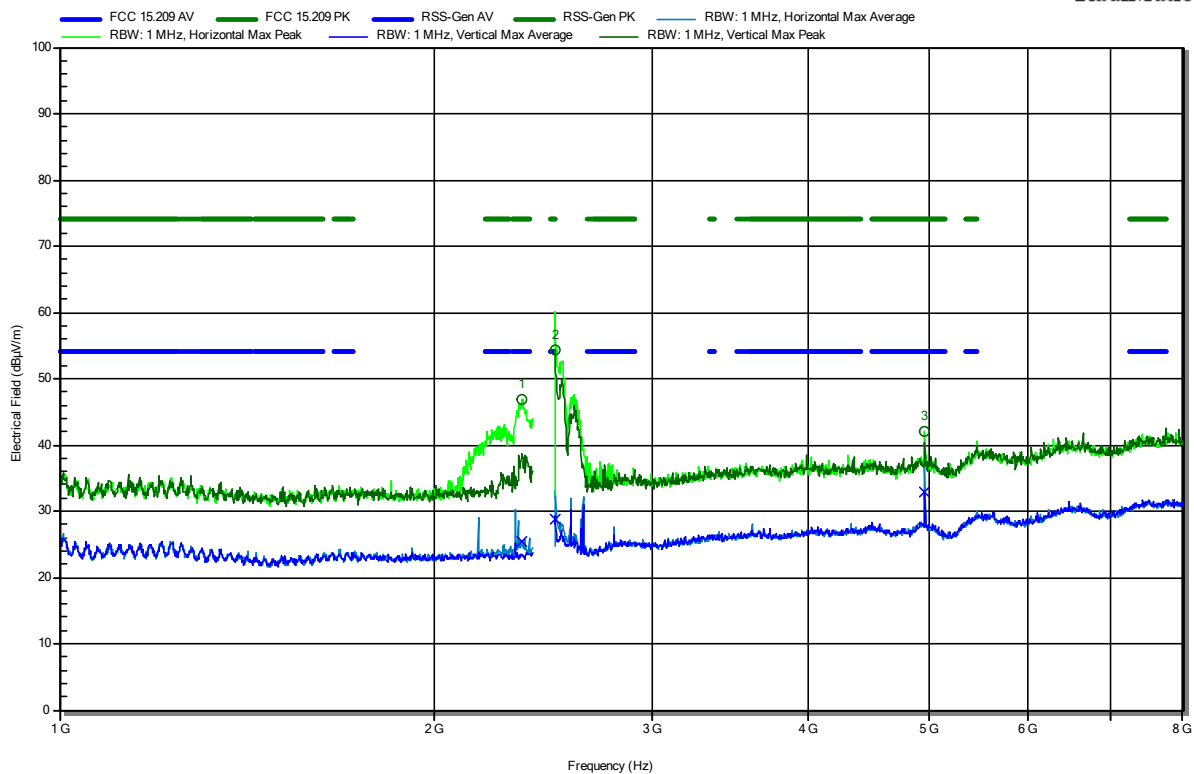


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 39

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.354 GHz	46.9 dBµV/m	74 dBµV/m	-27.1 dB	Pass	Horizontal
2.5 GHz	54.34 dBµV/m	74 dBµV/m	-19.66 dB	Pass	Vertical
4.96 GHz	42.13 dBµV/m	74 dBµV/m	-31.87 dB	Pass	Horizontal

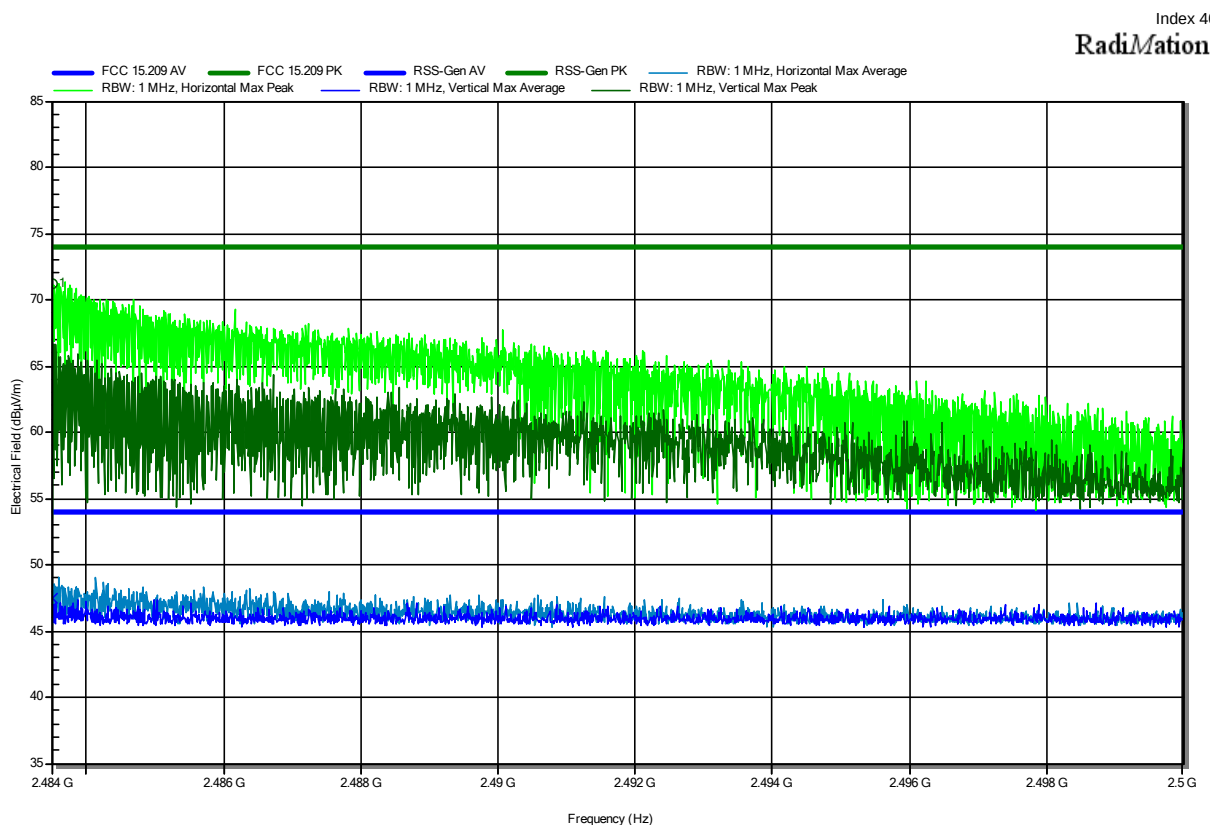
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.354 GHz	25.48 dBµV/m	54 dBµV/m	-28.52 dB	Pass	Horizontal
2.5 GHz	28.71 dBµV/m	54 dBµV/m	-25.29 dB	Pass	Vertical
4.96 GHz	32.83 dBµV/m	54 dBµV/m	-21.17 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note: upper bandedge



Frequency 2.4835 GHz	Peak 71.22 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -2.78 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.4835 GHz	Average 47.51 dBµV/m	Average Limit 54 dBµV/m	Average Difference -6.49 dB	Average Status Pass	Polarization Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

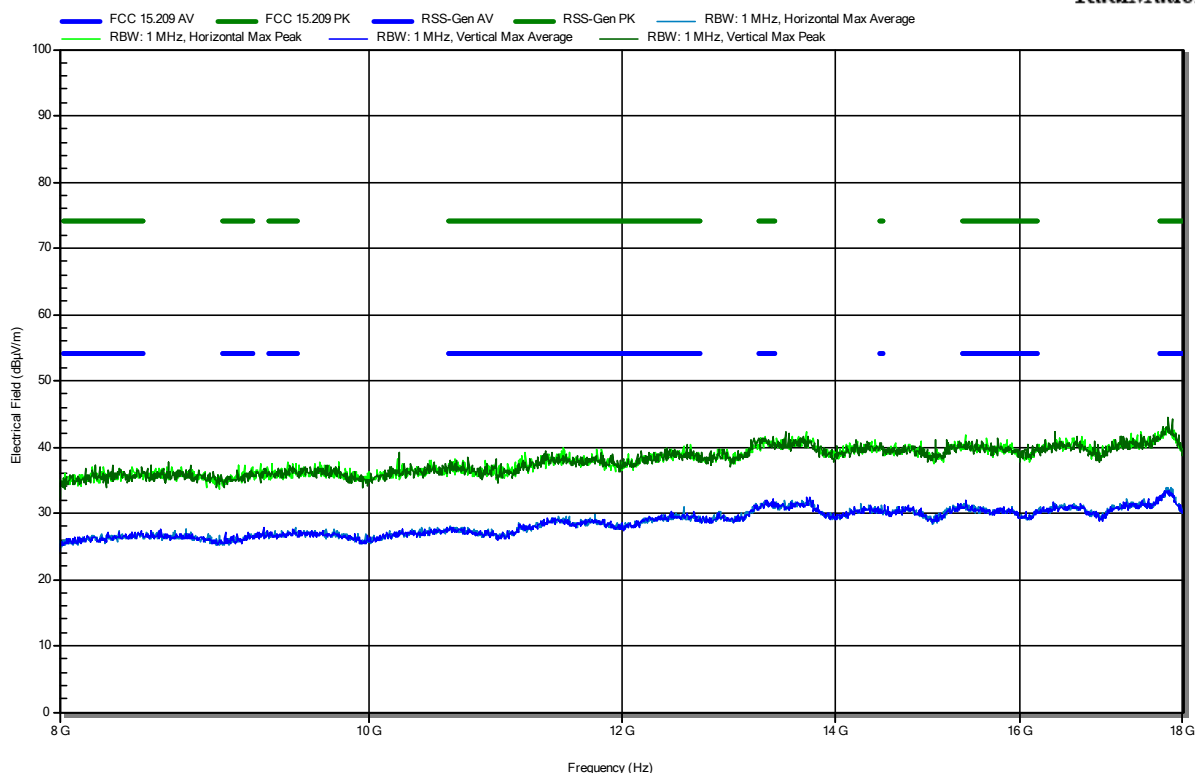
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 44

RadiMation

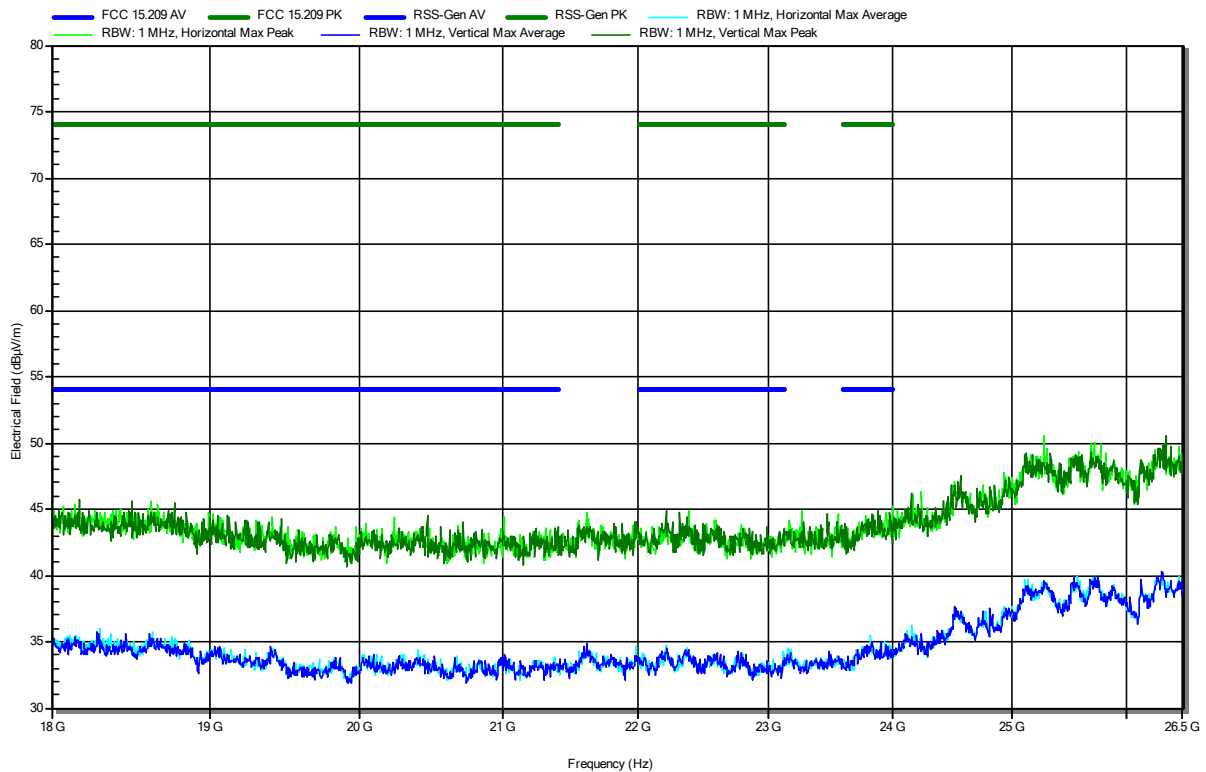


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: Testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

Index 58

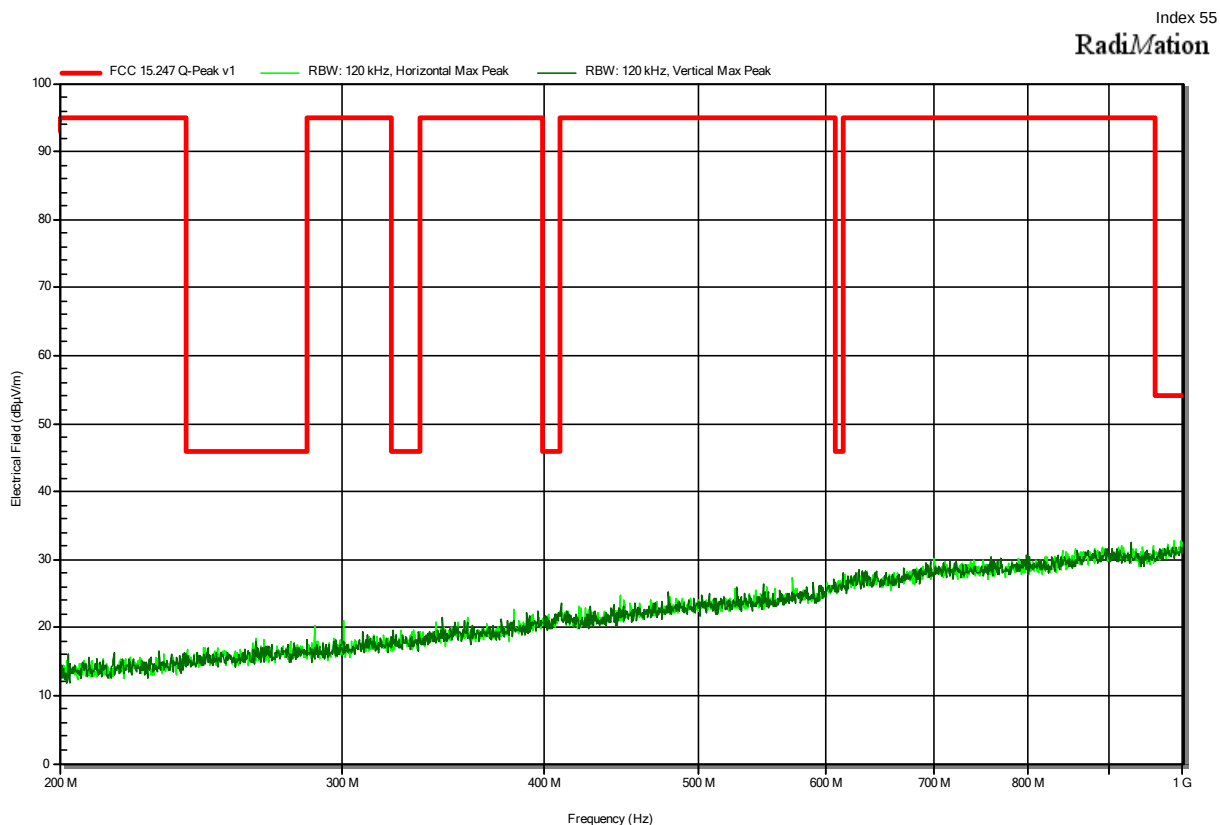
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ANNEX B Transmitter unwanted emissions in the spurious domain (EUT testo 316-1-EX Additional Variant 1)

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / Battery powered (Rechargeable battery NiMH)
 Model: Testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Rohde & Schwarz HL 223
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

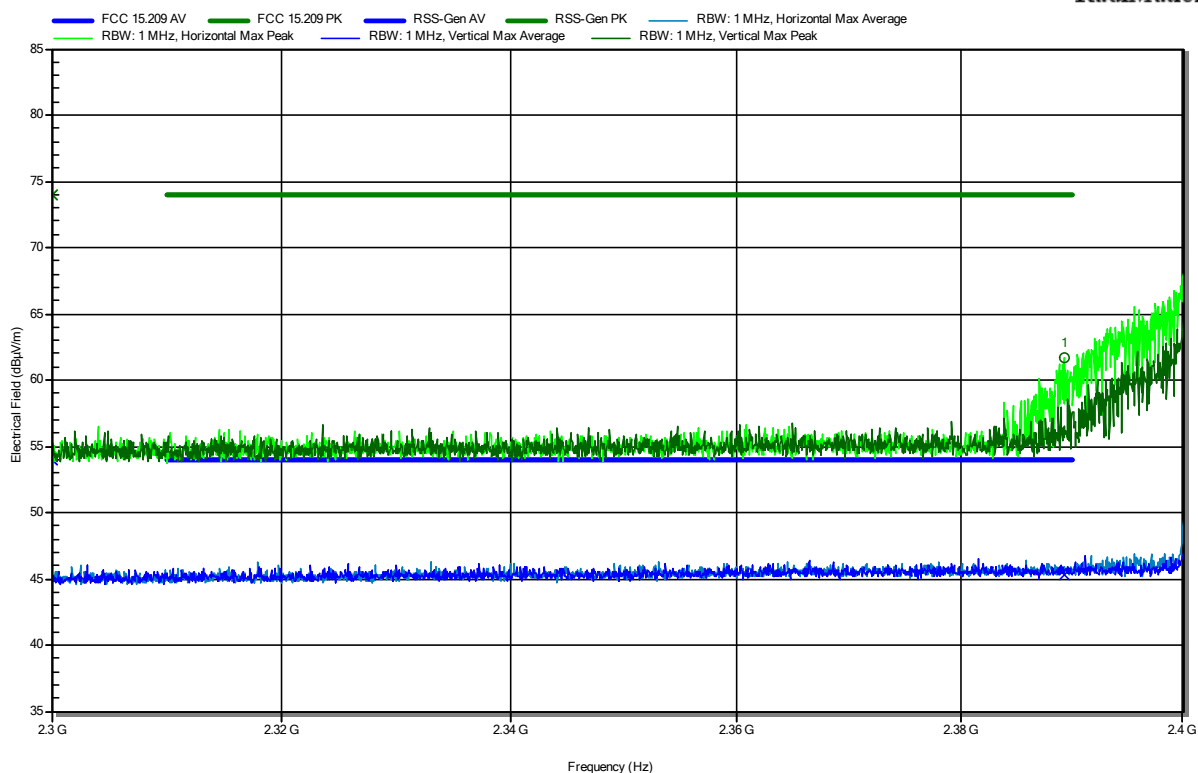


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note: lower bandedge

Index 49

RadiMation



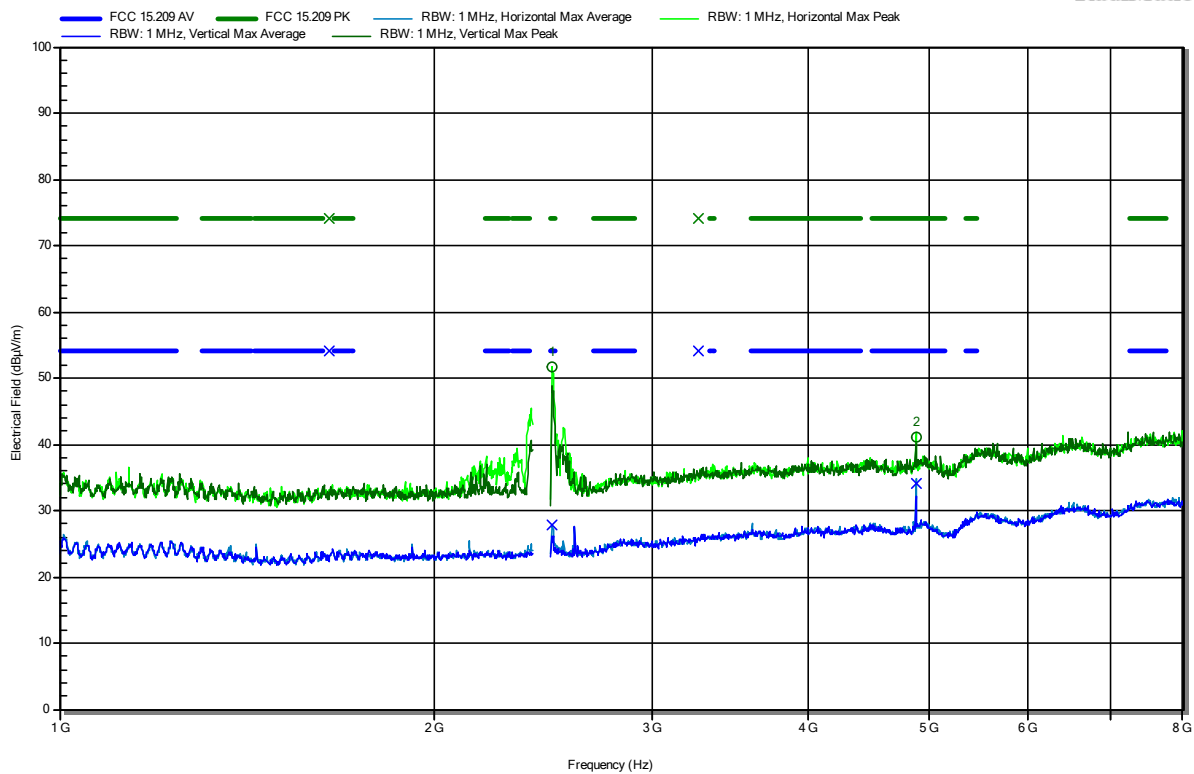
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.3893 GHz	61.72 dBµV/m	74 dBµV/m	-12.28 dB	Pass	Horizontal
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.3893 GHz	45.33 dBµV/m	54 dBµV/m	-8.67 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 19, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 50

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.4857 GHz	51.63 dBμV/m	74 dBμV/m	-22.37 dB	Pass	Horizontal
4.8795 GHz	41.15 dBμV/m	74 dBμV/m	-32.85 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.4857 GHz	27.9 dBμV/m	54 dBμV/m	-26.1 dB	Pass	Horizontal
4.8795 GHz	34.02 dBμV/m	54 dBμV/m	-19.98 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

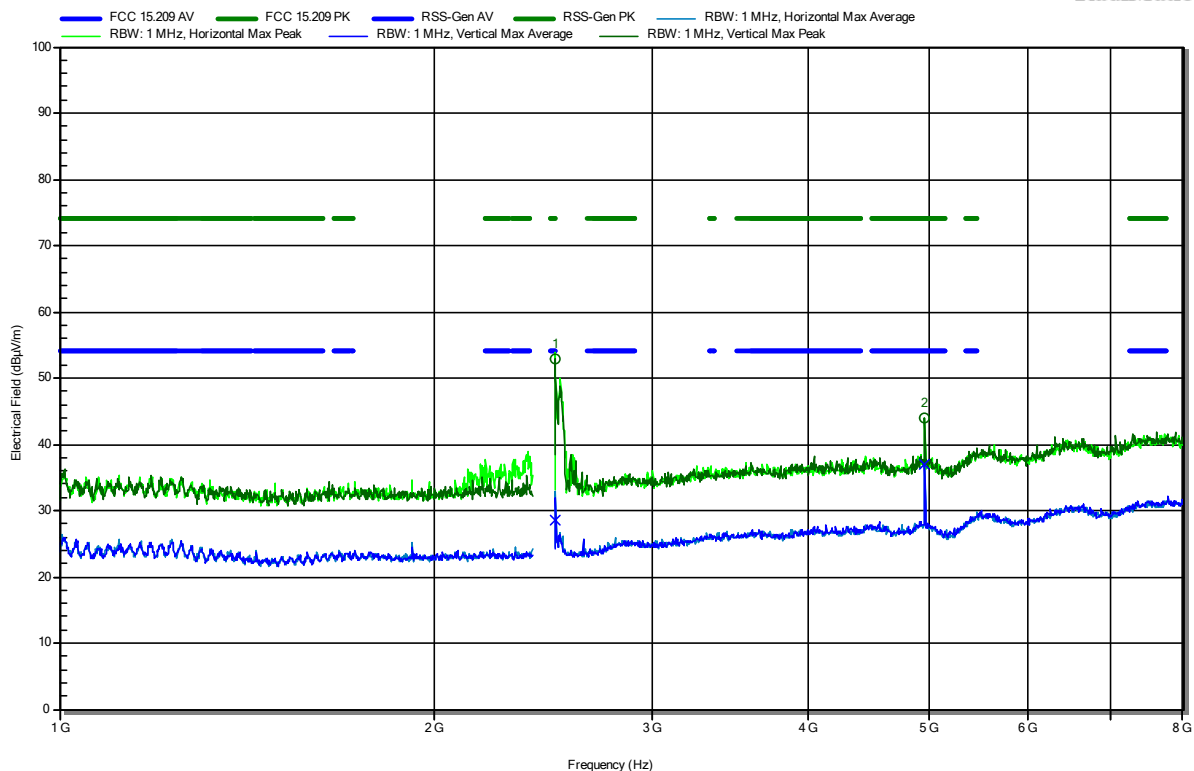
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note:

Index 53

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.501 GHz	52.95 dBμV/m	74 dBμV/m	-30.09 dB	Pass	Vertical
4.96 GHz	43.91 dBμV/m	74 dBμV/m	-30.09 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.501 GHz	28.63 dBμV/m	54 dBμV/m	-17.02 dB	Pass	Vertical
4.96 GHz	36.98 dBμV/m	54 dBμV/m	-17.02 dB	Pass	Vertical

Test Report No.: G0M-2205-1489-TFC247BL-V03

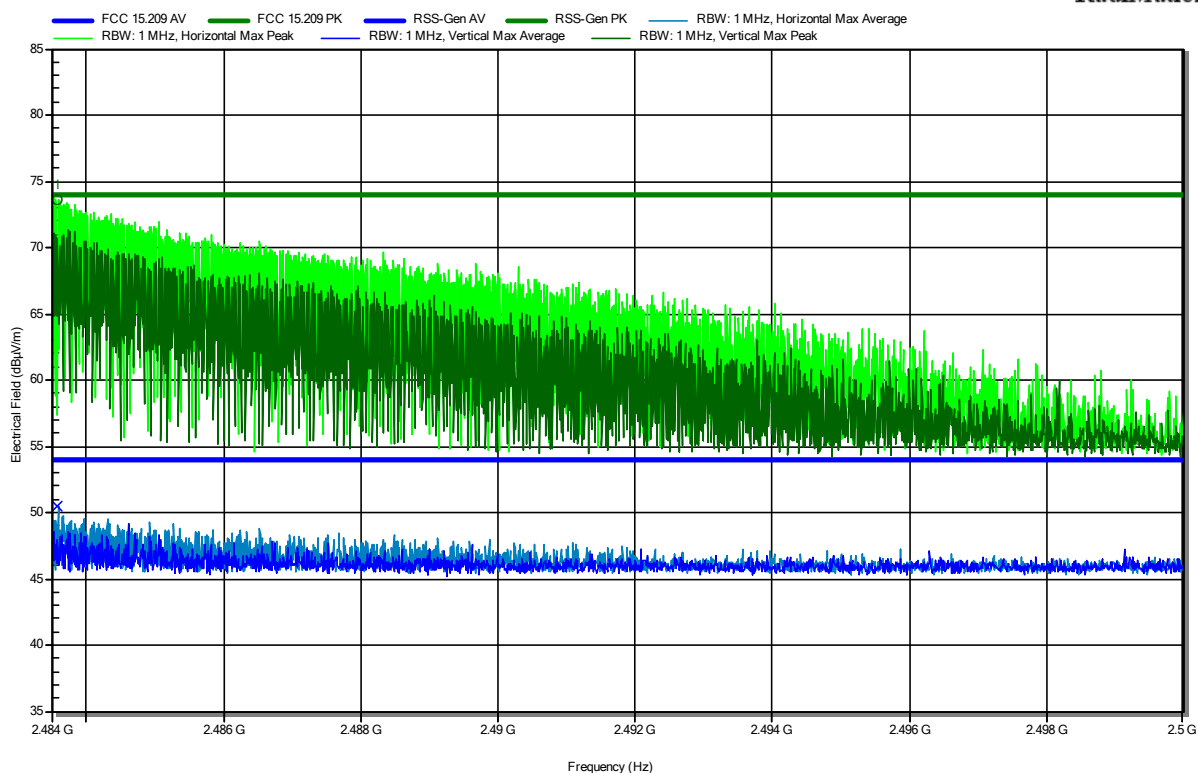
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-1-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-1-EX
 Test Sample ID: 40290
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-27
 Note: upper bandedge

Index 52

RadiMation



Frequency 2.4836 GHz	Peak 73.65 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -0.35 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.4836 GHz	Average 50.46 dBµV/m	Average Limit 54 dBµV/m	Average Difference -3.54 dB	Average Status Pass	Polarization Horizontal

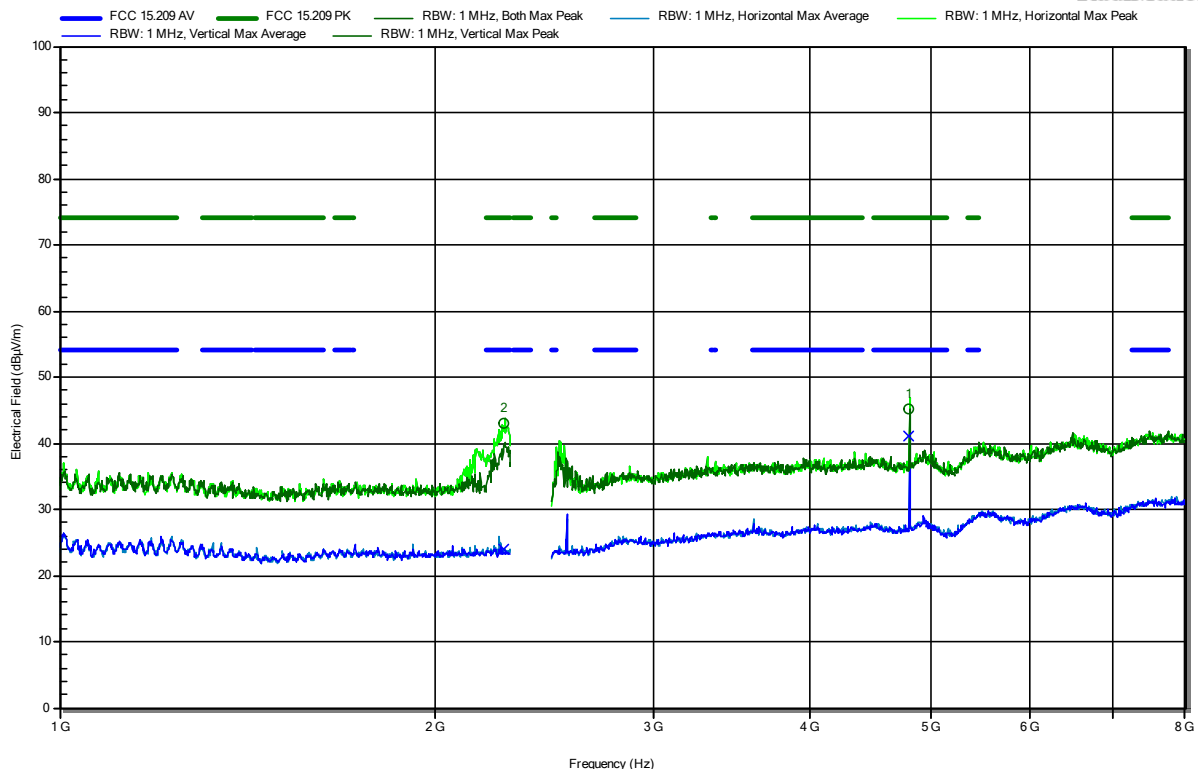
ANNEX C Transmitter unwanted emissions in the spurious domain (EUT testo 316-2-EX Additional Variant 2)

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-2-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

Index 60

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.2742 GHz	43.02 dBµV/m	74 dBµV/m	-30.98 dB	Pass	Horizontal
4.8035 GHz	45.1 dBµV/m	74 dBµV/m	-28.9 dB	Pass	Vertical
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.2742 GHz	24.09 dBµV/m	54 dBµV/m	-29.91 dB	Pass	Horizontal
4.8035 GHz	41 dBµV/m	54 dBµV/m	-13 dB	Pass	Vertical

Test Report No.: G0M-2205-1489-TFC247BL-V03

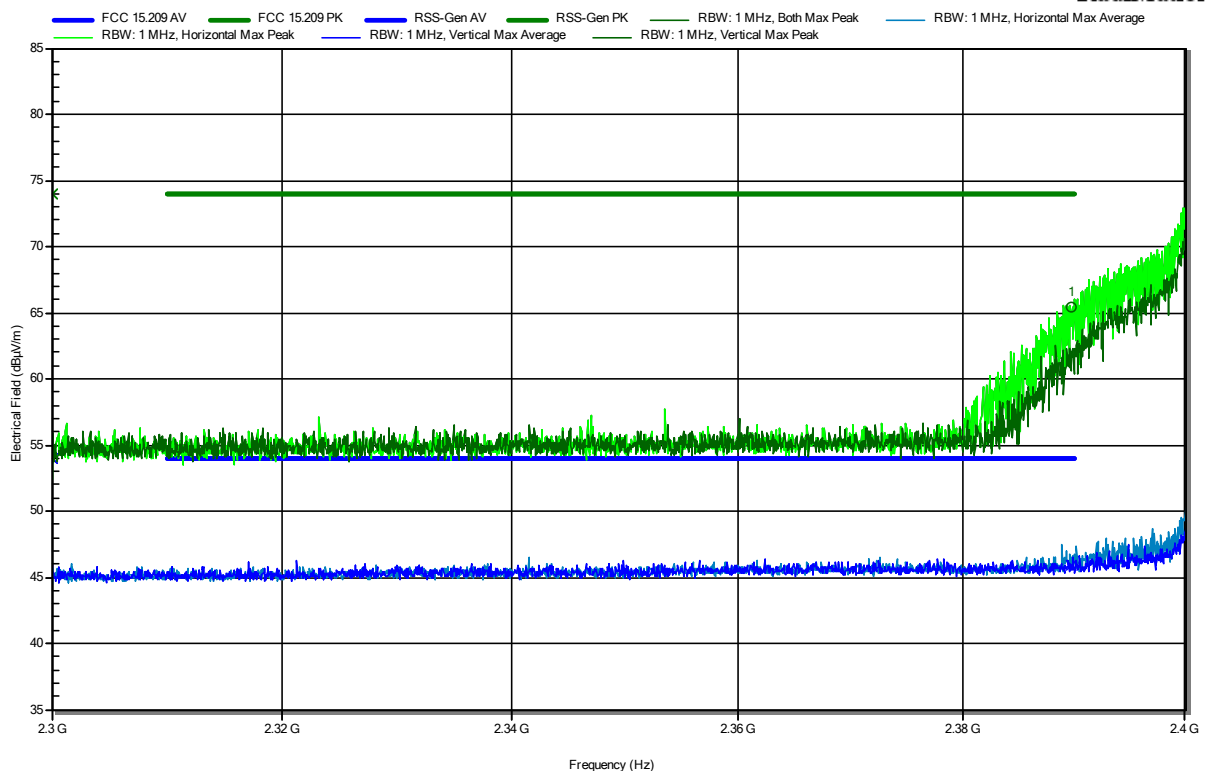
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-2-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 0, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note: lower bandedge

Index 61

RadiMation



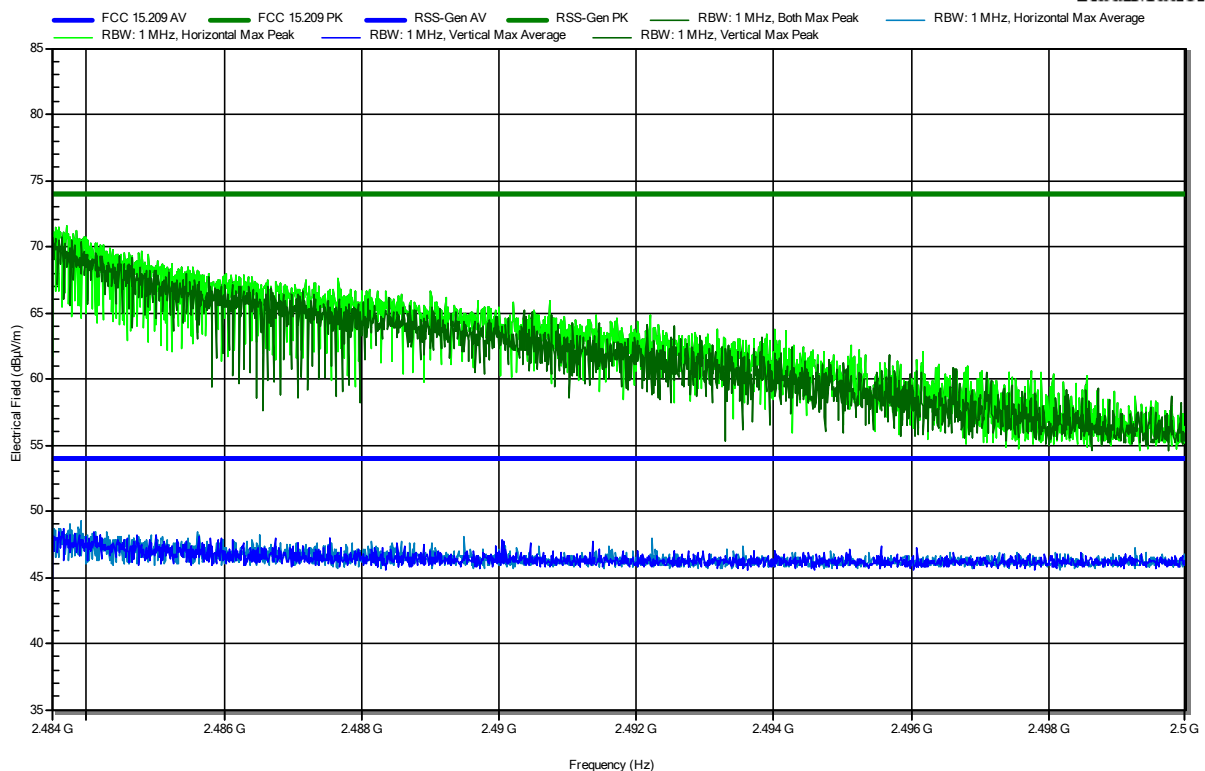
Frequency 2.3898 GHz	Peak 65.39 dBµV/m	Peak Limit 74 dBµV/m	Peak Difference -8.61 dB	Peak Status Pass	Polarization Horizontal
Frequency 2.3898 GHz	Average 45.92 dBµV/m	Average Limit 54 dBµV/m	Average Difference -8.08 dB	Average Status Pass	Polarization Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-2-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck BBHA 9120B
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note: upper bandedge

Index 62

RadiMation

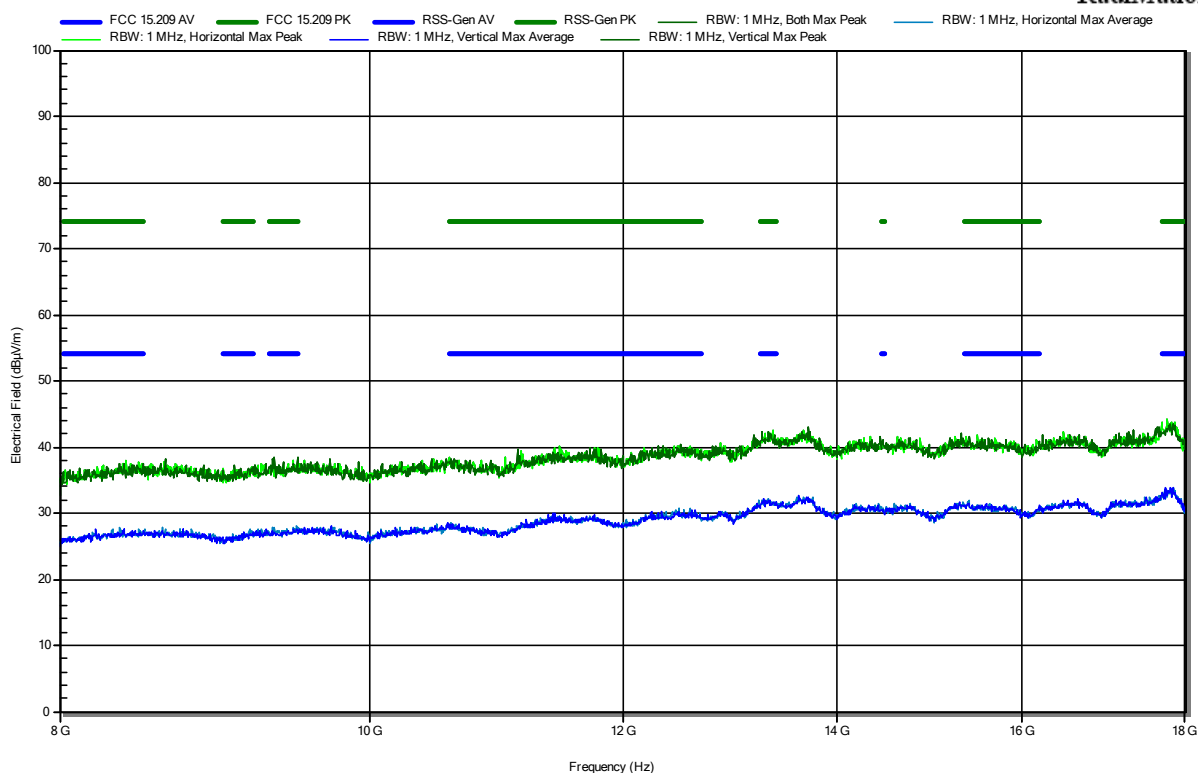


Radiated Spurious Emissions according to 47 CFR Part 15.247

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316-2-EX / Battery powered (Rechargeable battery NiMH)
 Model: testo 316-2-EX
 Test Sample ID: 40239
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 6.0 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Tx; BLE, GFSK, Ch 39, 1 Mbps, PRBS9, 193 Bytes
 Test Date: 2022-07-28
 Note:

Index 63

RadiMation



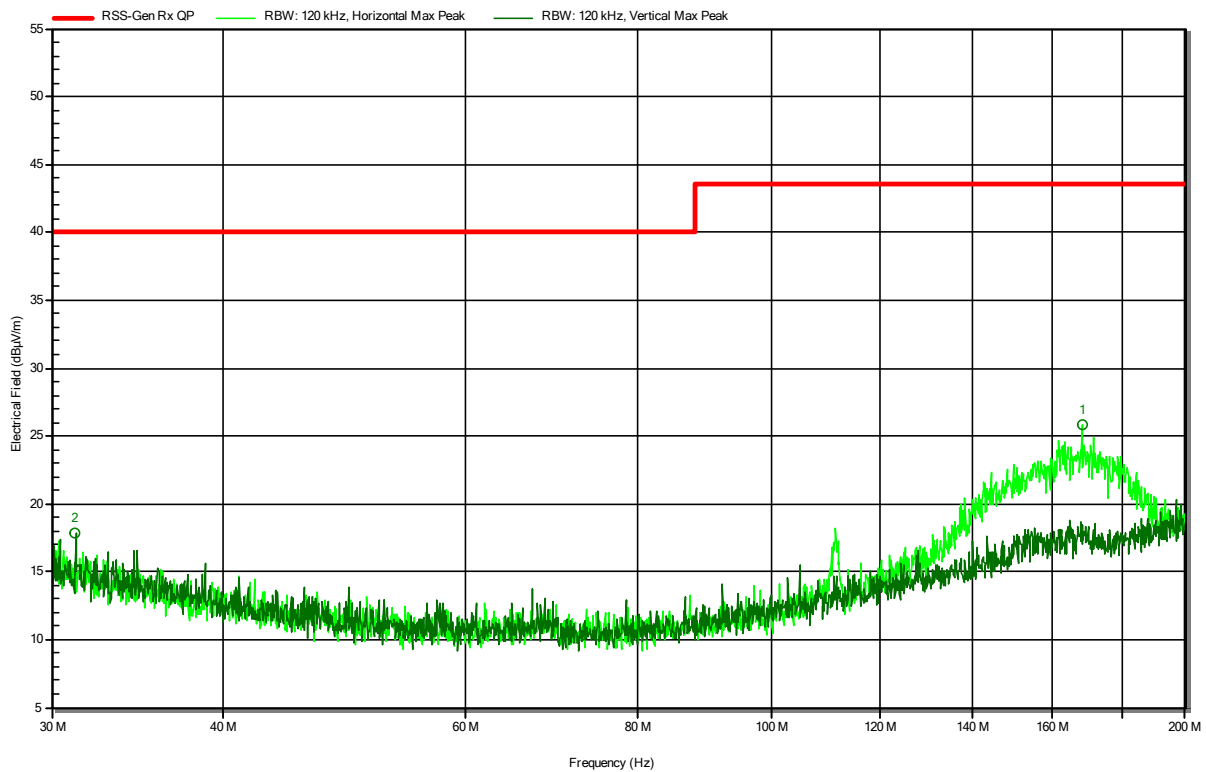
ANNEX D Receiver spurious emissions (EUT testo 316i)

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HK 116
 Measurement distance: 3 m
 Mode: RX; BLE, GFSK, 1 Mbps, RX
 Test Date: 2022-07-28
 Note:

Index 56

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
31.224 MHz	17.8 dBµV/m	40 dBµV/m	-22.19 dB	Pass	Vertical
168.1817 MHz	25.8 dBµV/m	43.5 dBµV/m	-17.67 dB	Pass	Horizontal

Test Report No.: G0M-2205-1489-TFC247BL-V03

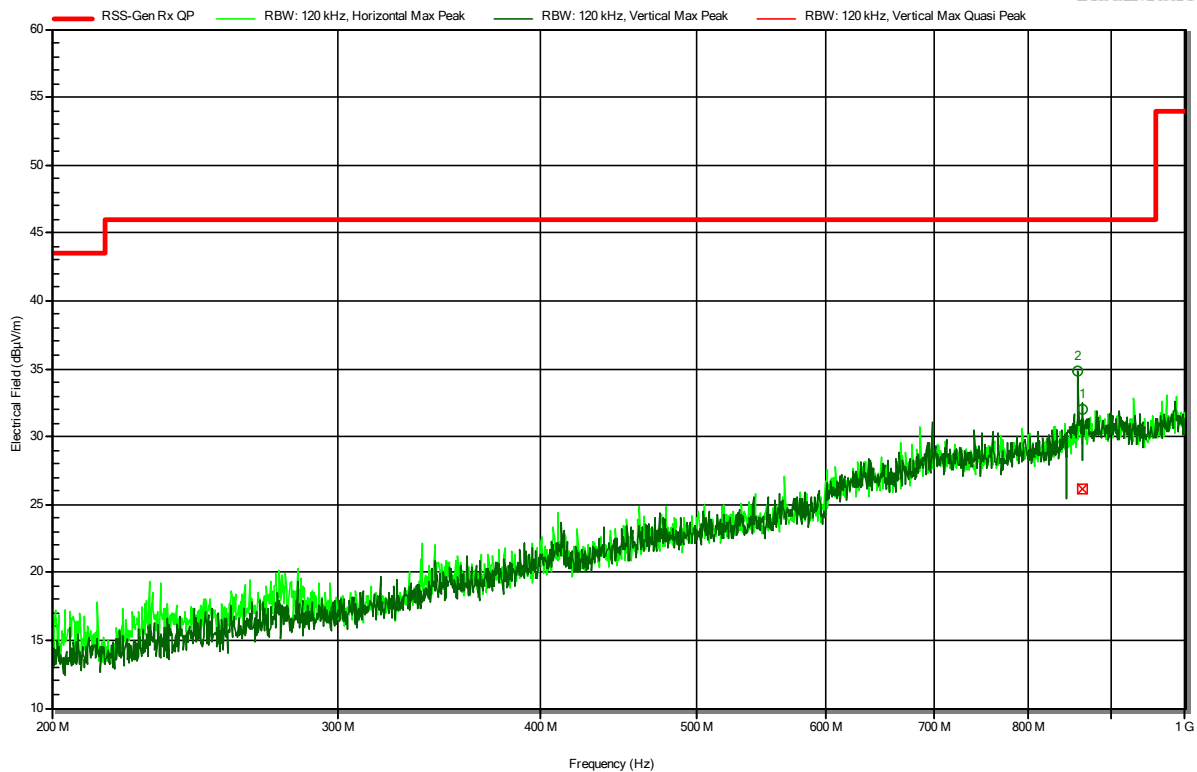
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Rohde & Schwarz HL 223
 Measurement distance: 3 m
 Mode: Rx; BLE, GFSK, 1 Mbps, RX
 Test Date: 2022-07-28
 Note:

Index 59

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
858.96 MHz	34.8 dBµV/m	46 dBµV/m	-11.17 dB	Pass	Vertical
863.7436 MHz	32.1 dBµV/m	46 dBµV/m	-13.94 dB	Pass	Vertical
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
863.7436 MHz	26.2 dBµV/m	46 dBµV/m	-19.85 dB	Pass	Vertical

Test Report No.: G0M-2205-1489-TFC247BL-V03

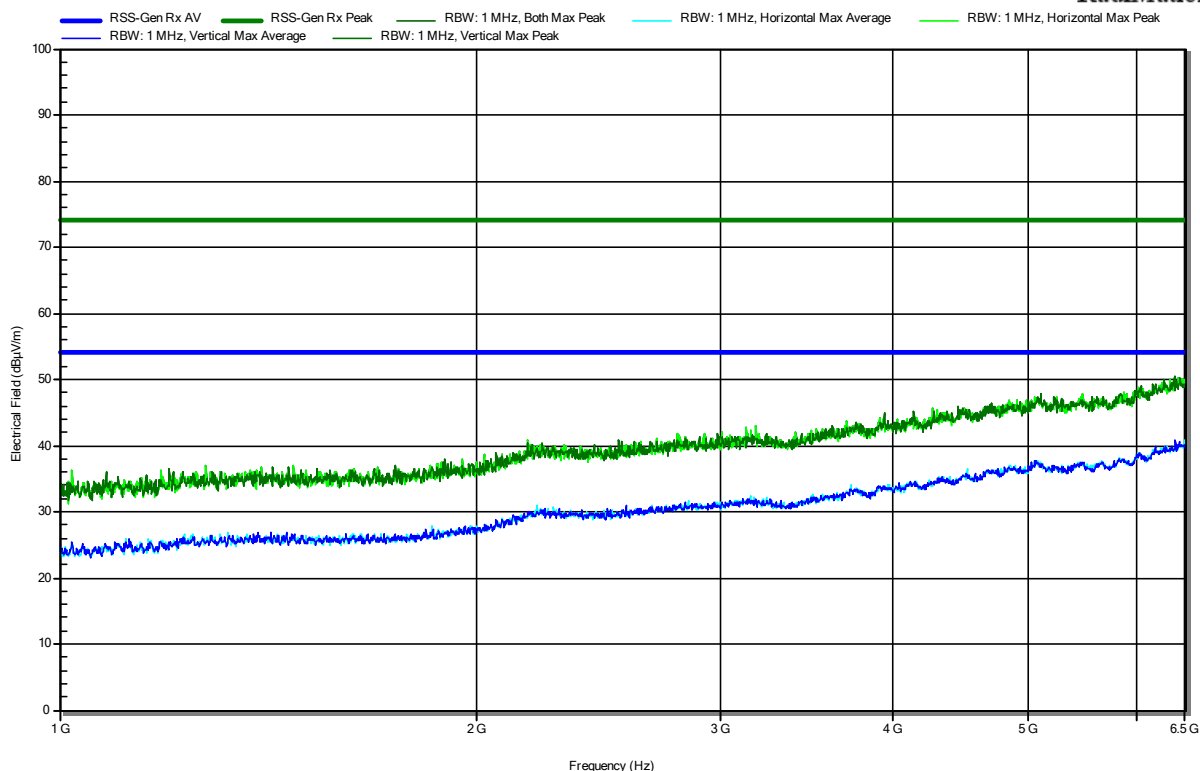
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck BBHA 9120D
 Measurement distance: 3 m
 Mode: Rx; BLE, GFSK, 1 Mbps, RX
 Test Date: 2022-07-28
 Note:

Index 60

RadiMation

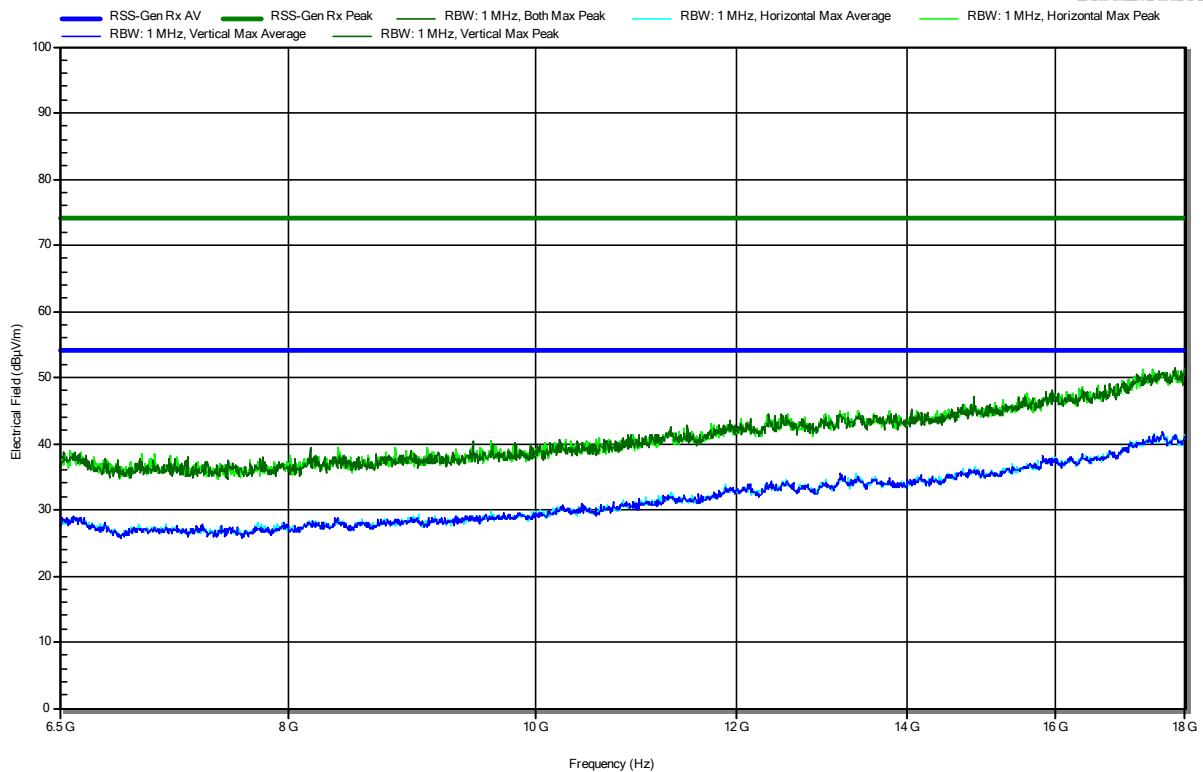


Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Schwarzbeck HWRD 650
 Measurement distance: 3 m
 Mode: Rx; BLE, GFSK, 1 Mbps, RX
 Test Date: 2022-07-28
 Note:

Index 61

RadiMation

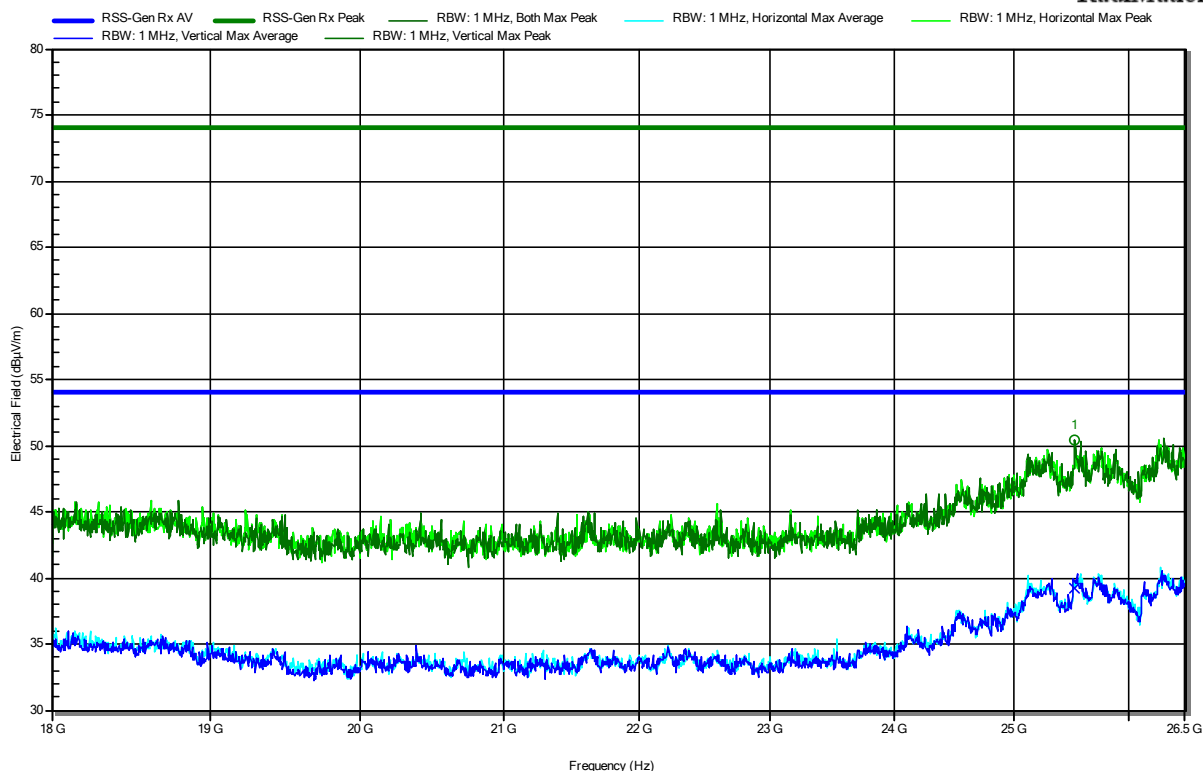


Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number: G0M-2205-1489
 Applicant: Testo SE & Co. KGaA
 Model Description: testo 316i / Battery powered (6x AA) detector for fluegas with LED and Bluetooth Low Energy / Order No. 0560 3161
 Model: testo 316i
 Test Sample ID: 40241
 Test Site: Eurofins Product Service GmbH
 Operator: R. Jaafar
 Measurement software: RadiMation, version 2020.1.8
 Test Conditions: Tnom: 22 °Celsius, Vnom: 9.0 VDC
 Antenna: Amplifier Research AT4560
 Measurement distance: 3 m
 Mode: Rx; BLE, GFSK, 1 Mbps, RX
 Test Date: 2022-07-28
 Note:

Index 62

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
25.519 GHz	50.41 dBµV/m	74 dBµV/m	-23.59 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
25.519 GHz	39.26 dBµV/m	53.98 dBµV/m	-14.72 dB	Pass	Vertical

== END OF TEST REPORT ==

Test Report No.: G0M-2205-1489-TFC247BL-V03

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany