

FCC TEST REPORT

FCC 47 CFR Part 15C Industry Canada RSS-210

Digital transmission systems operating within the 2400 - 2483.5 MHz band

Report Reference No...... G0M-1502-4503-TFC247BL-V01

Testing Laboratory Eurofins Product Service GmbH

Address..... Storkower Str. 38c

15526 Reichenwalde

Germany

Accreditation:



A2LA Accredited Testing Laboratory, Certificate No.: 1983.01

FCC Filed Test Laboratory, Reg.-No.: 96970

IC OATS Filing assigned code: 3470A

Applicant's name...... SMT & Hybrid GmbH

Address..... An der Priessnitzaue 22

01328 Dresden GERMANY

Test specification:

Standard 47 CFR Part 15C

KDB Publication No. 558074 RSS-210, Issue 8, 2010-12 RSS-Gen, Issue 4, 2014-11

ANSI C63.4:2014

Test scope.....: complete Radio compliance test

Equipment under test (EUT):

Product description Datenlogger

Model No. data link sensor

Additional Model(s) None

Brand Name(s) MONI LOG data link sensor

Hardware version R3

Firmware / Software version 0.90

FCC-ID: 2AELT-08MONILOG

Contains IC: 5123A-BGTBLE112

Test result Passed



Poss	ihla	tact	C260	verdicts:
L O22	MUIE.	16.51	Last	veidicis.

- neither assessed nor tested N/N

- required by standard but not appl. to test object......: N/A

- required by standard but not tested.....: N/T

- not required by standard for the test object N/R

- test object does meet the requirement...... P (Pass)

- test object does not meet the requirement..... F (Fail)

Testing:

Test Lab Temperature...... 20 – 23 °C

Test Lab Humidity 32 – 38 %

Date (s) of performance of tests 2015-06-11

Compiled by: Matthias Handrik

Approved by (+ signature) Christian Weber (Head of Lab)

Date of issue: 2015-06-17

Total number of pages: 74

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:

c. loeser



Version History

Version	Issue Date	Remarks	Revised by
01	2015-06-17	Initial Release	



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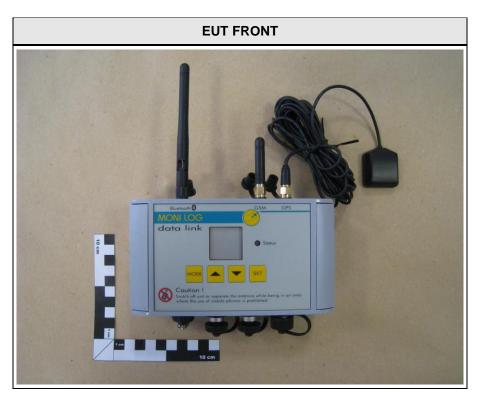


1 Equipment (Test item) Description

Description	Datenlogger			
Model	data link sensor			
Additional Model(s)	None			
Brand Name(s)	MONI LOG data	link sensor		
Serial number	20158xxx			
Hardware version	R3			
Software / Firmware version	0.90			
FCC-ID	2AELT-08MONI	LOG		
Contains IC	5123A-BGTBLE	112		
Equipment type	End product			
Radio type	Transceiver			
Radio technology	Bluetooth 4.0 Lo	ow Energy		
Operating frequency range	2402 - 2480 MH	Z		
Assigned frequency band	2400 - 2483.5 MHz			
	F _{LOW}	2402 MHz		
Main test frequencies	F _{MID}	2442 MHz		
	F _{HIGH} 2480 MHz			
Spreading	Frequency Hopp	ping		
Modulations	GFSK			
Number of channels	40			
Channel spacing	2MHz			
Number of antennas	1			
	Туре	external dedicated		
Antenna	Model	GW.15.2113		
Antenna	Manufacturer	Taoglas		
	Gain	2 dBi (manufacturer declaration)		
	SMT & Hybrid GmbH			
Manufacturer	An der Priessnitzaue 22			
mananacian ci	01328 Dresden			
	GERMANY			
	V _{NOM}	6 or 12 VDC		
Power supply	V _{MIN}	N/R		
	V _{MAX}	N/R		
AC/DC-Adaptor	none			



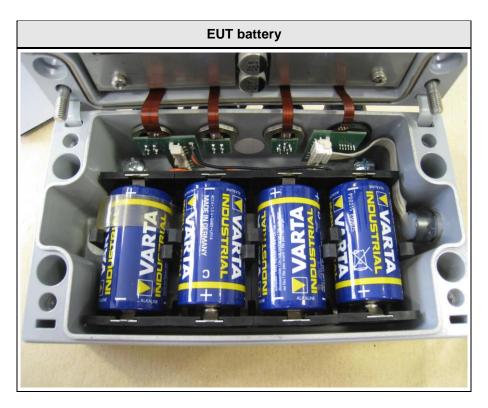
1.1 Photos – Equipment External

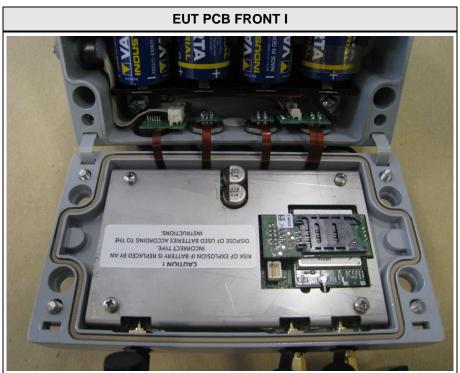






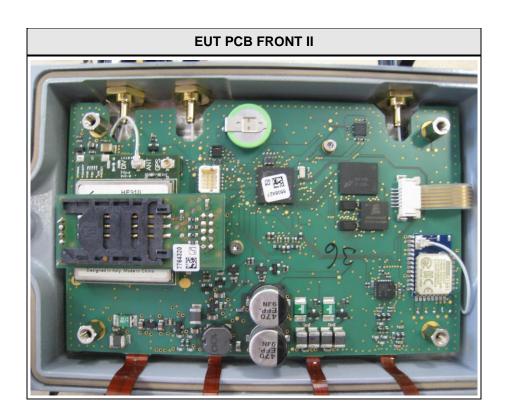
1.2 Photos – Equipment internal

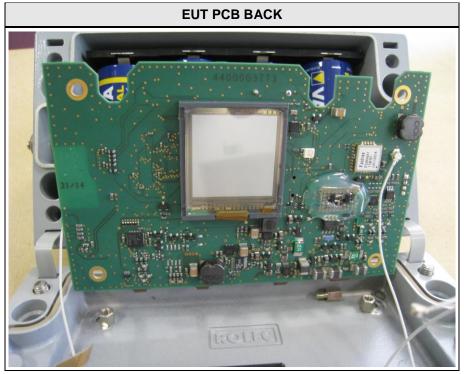






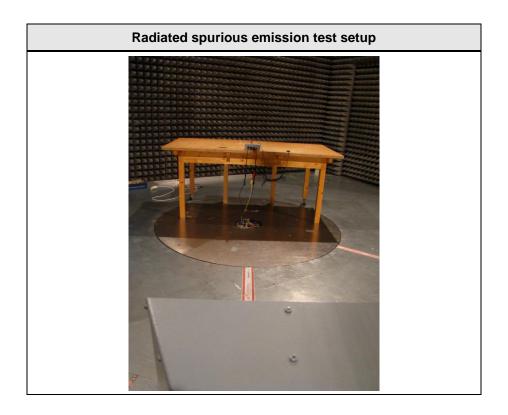
Product Service







1.3 Photos – Test setup





1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments			
AE	Laptop	DELL	E6420				
AE:	AE : Auxiliary/Associated Equipment						



1.5 Test Modes

Mode #	Description			
	General conditions:	EUT powered by laboratory power supply and controlled by test software on laptop.		
Transmit	Radio conditions:	Mode = standalone transmit Spreading = Hopping stopped (single hopping channel) Modulation = GFSK Data rate = 1 Mbps Bandwidth = 2 MHz Duty cycle = 100 % Power level = Maximum		
	General conditions:	EUT powered by laboratory power supply and controlled by test software on laptop.		
Receive	Radio conditions:	Mode = standalone receive (scan mode) Spreading = On Modulation = GFSK		



1.6 Test Equipment Used During Testing

Measurement Software					
Description	Manufacturer	Name	Version		
EMC Test Software	Dare Instruments	Radimation	2014.1.15		

Occupied Bandwidth							
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due		
Spectrum Analyzer	R&S	FSP 30	EF00312	2015-02	2016-02		

	Radiated spurious emissions								
Description Manufacturer Model Identifier Cal. Date Cal. Du									
Semi-anechoic chamber	Frankonia	AC 1	EF00062	-	-				
Spectrum Analyzer	R&S	FSIQ26	EF00242	2015-04	2016-04				
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02				
LPD Antenna	R&S	HL 223	EF00187	2014-03	2017-03				
Horn antenna	Schwarzbeck	BBHA 9120D	EF00018	2013-09	2016-09				



1.7 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:

Reading on Analyzer (dB μ V) + A.F. (dB) = Net field strength (dB μ 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 $dB\mu V/m$). The FCC limits are given in units of $\mu V/m$. The following formula is used to convert the units of $\mu V/m$ to $dB\mu V/m$:

Limit (dB μ V/m) = 20*log (μ 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 dB μ V + 26 dB = 47.5 dB μ V/m : 47.5 dB μ V/m - 57.0 dB μ V/m = -9.5 dB



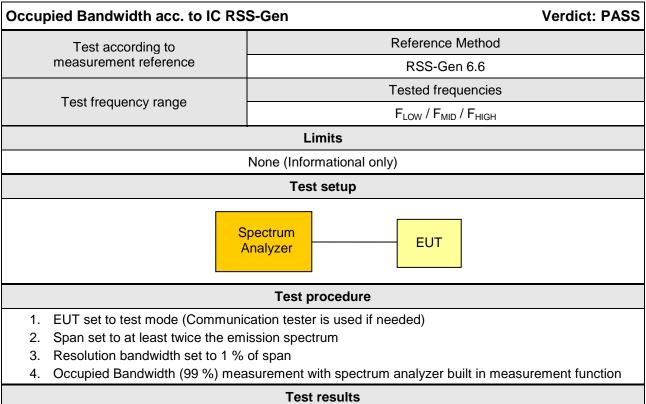
2 Result Summary

	FCC 47 CFR Part 15C, IC RSS-210						
Product Specific Standard Section	Requirement – Test	Reference Method	Result	Remarks			
RSS-Gen 6.6	Occupied Bandwidth	RSS-Gen 6.6	N/R	Informational only			
FCC § 15.247(a)(2) IC RSS-210 § A8.2	6dB Bandwidth	KDB Publication No. 558074	N/R	See Test Report for "BLE112-E" under FCC-ID QOQBLE112			
FCC § 15.247(b)(3) IC RSS-210 § A8.4	Maximum peak conducted power	KDB Publication No. 558074	N/R	See Test Report for "BLE112-E" under FCC-ID QOQBLE112			
FCC § 15.247(e) IC RSS-210 § A8.2	Power spectral density	KDB Publication No. 558074	N/R	See Test Report for "BLE112-E" under FCC-ID QOQBLE112			
47 CFR 15.207 RSS-Gen 8.8	AC power line conducted emissions	KDB Publication No. 558074 / ANSI C63.4	N/R	EUT neither directly nor indirectly powered by acmains			
FCC § 15.247(d) IC RSS-210 § A8.5	Band edge compliance	KDB Publication No. 558074	N/R	See Test Report for "BLE112-E" under FCC-ID QOQBLE112			
FCC § 15.247(d) IC RSS-210 § A8.5	Conducted spurious emissions	KDB Publication No. 558074	N/R	See Test Report for "BLE112-E" under FCC-ID QOQBLE112			
FCC § 15.247(d) FCC § 15.209 IC RSS-210 A8.5 IC RSS-Gen 6.13	Transmitter radiated spurious emissions	KDB Publication No. 558074 / ANSI C 63.4	PASS				
IC RSS-Gen 7.1	Receiver radiated spurious emissions	ANSI C 63.4	PASS				
Remarks:	Remarks:						



3 Test Conditions and Results

3.1 Test Conditions and Results - Occupied Bandwidth



Test results							
Channel Frequency [MHz] Mode Occupied Bandwidth [kHz]							
F _{LOW}	2402	Transmit	1102.2				
F _{MID}	2440	Transmit	1112.2				
F _{HIGH}	2480	Transmit	1092.2				
Comments:							



Occupied Bandwidth - F_{LOW}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Burkhard Pudell Test Conditions: Tnom / Vnom

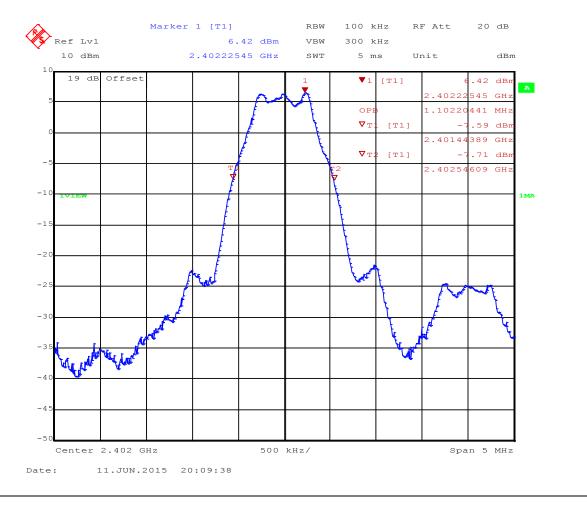
Mode: Tx, BT-LE, CH. 0, 2402 MHz, modulated

Test Date: 2015-06-11

Verdict: NONE (INFORMATION ONLY)

Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

Note 2: OBW= 1.102 MHz





Occupied Bandwidth - F_{MID}

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Burkhard Pudell Test Conditions: Tnom / Vnom

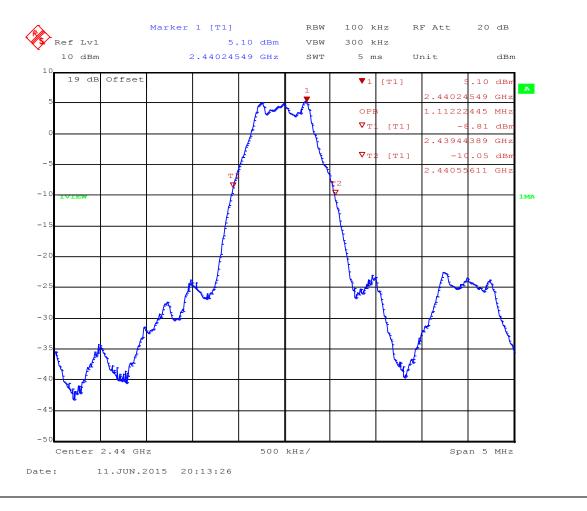
Mode: Tx, BT-LE, CH. 19, 2440 MHz, modulated

Test Date: 2015-06-11

Verdict: NONE (INFORMATION ONLY)

Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

Note 2: OBW= 1.112 MHz





Occupied Bandwidth - FHIGH

Occupied Bandwidth acc. to RSS-Gen

Project Number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Burkhard Pudell Test Conditions: Tnom / Vnom

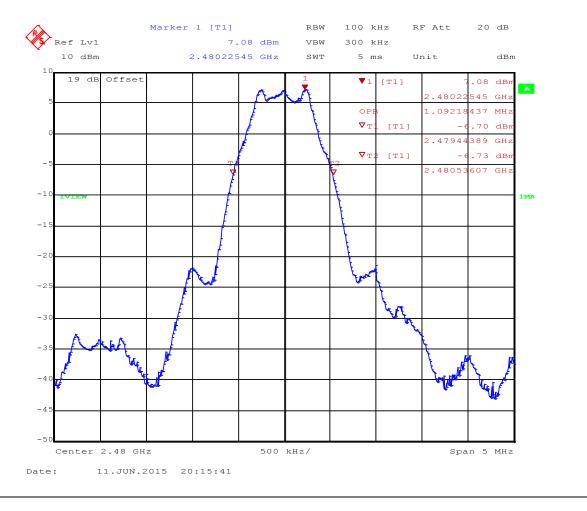
Mode: Tx, BT-LE, CH. 39, 2480 MHz, modulated

Test Date: 2015-06-11

Verdict: NONE (INFORMATION ONLY)

Note 1: A spectrum analyzer with an integrated 99% power bandwidth function is used

Note 2: OBW= 1.092 MHz



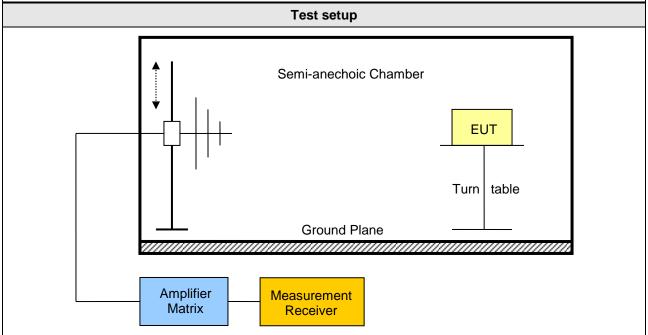


3.3 Test Conditions and Results - Transmitter radiated emissions

Transmitter radiated emissions acc. to FCC 47 CFR 15.247 / IC RSS-210 Verdict: PASS						
Test according refe	renced	Reference Method				
standards		FCC 15.2	47(d) / IC RS	SS-210 A8.5		
Test according	to	R	eference Me	thod		
measurement refe	rence	FCC KDB Public	ation No. 55	8074 / ANSI C63.4		
Took from you are you		Te	sted frequer	ncies		
Test frequency ra	ange	30 MHz – 10 th Harmonic				
		Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]		
30 – 88	Quasi-Peak	100	40	3		
88 – 216	Quasi-Peak	150	43.5	3		
216 – 960	Quasi-Peak	200	46	3		
960 – 1000	Quasi-Peak	500	54	3		
> 1000	Average	500	54	3		

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

When average radiated emission measurements are specified, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.





Test procedure

- 1. EUT set to test mode (Communication tester is used if needed)
- 2. Span it set according to measurement range
- 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
- 4. Markers are set to peak emission levels within restricted bands

Test results										
Channel	Frequency [MHz]	Mode	Emission [MHz]	Level [dbµV/m]	Det.	Pol.	Limit [dbµV/m]	Limit dist. [m]*	Margin [dB]	
F _{LOW}	2402	Transmit	2327	41.97	pk	hor	74.00	3	-32.03	
F _{LOW}	2402	Transmit	2327	27.04	RMS	hor	54.00	3	-26.96	
F _{LOW}	2402	Transmit	2384	44.37	pk	ver	74.00	3	-29.63	
F _{LOW}	2402	Transmit	2384	30.54	RMS	ver	54.00	3	-23.46	
F _{LOW}	2402	Transmit	4800	42.17	pk	ver	74.00	3	-31.83	
F _{LOW}	2402	Transmit	4800	42.29	pk	ver	74.00	3	-31.71	
F _{LOW}	2402	Transmit	7200	48.60	pk	ver	95.00	3	-46.40	
F _{LOW}	2402	Transmit	15960	49.34	pk	ver	74.00	3	-24.66	
F _{MID}	2440	Transmit	2502	43.31	pk	ver	95.00	3	-51.69	
F _{MID}	2440	Transmit	4880	40.53	pk	ver	74.00	3	-33.47	
F _{MID}	2440	Transmit	7320	44.59	pk	ver	74.00	3	-29.41	
F _{HIGH}	2480	Transmit	2484	60.46	pk	ver	74.00	3	-13.54	
F _{HIGH}	2480	Transmit	2484	49.50	RMS	ver	54.00	3	-04.50	
F _{HIGH}	2480	Transmit	2484	47.63	pk	hor	74.00	3	-26.37	
F _{HIGH}	2480	Transmit	2484	36.67	RMS	hor	54.00	3	-17.33	
F _{HIGH}	2480	Transmit	4952	40.46	pk	ver	74.00	3	-33.54	

Comments: * Physical distance between EUT and measurement antenna. after check with 6V DC and 12 V DC spurious measurement with 6 V DC worst case



Matrix

3.4 Test Conditions and Results - Receiver radiated emissions

Receiver radiated emiss	ions acc. to	IC	RSS-210		Verdict: PASS				
Test according refere	nced	Reference Method							
standards		IC RSS-210 A8.5							
Test according to		Reference Method							
measurement refere	ence	ANSI C63.4							
Test frequency ran	00	Tested frequencies							
rest frequency fair	ge	30 MHz – 5 th Harmonic							
EUT test mode				Receive					
Limits									
Frequency range [MHz]	Detector		Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]				
30 – 88	Quasi-Peak		100	40	3				
88 – 216	Quasi-Peak		150	43.5	3				
216 – 960	Quasi-Peak		200	46	3				
960 – 1000	Quasi-Peak		500	54	3				
> 1000 Avera			500	54	3				
			Test setup						
			Semi-anechoic Ch	amber EUT Turn tabl	 e				
Ground Plane									
Amplifier Measurement Measurement									

Receiver



Test procedure

- 1. EUT set to receive mode (Communication tester is used if needed)
- 2. Span it set according to measurement range
- 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz
- 4. Markers are set to peak emission levels

F _{MID} 2440 17544 49.49 hor pk 53.98 -4.49 dB	Test results										
	Channel				Polarisation	Det.		Margin [dbµV/m]			
E 2440 17956 51.00 vor pk 53.09 3.09 dB	F _{MID}	2440	17544	49.49	hor	pk	53.98	-4.49 dB			
FMID 2440 17630 31.00 Vei pk 33.96 -2.98 dB	F _{MID}	2440	17856	51.00	ver	pk	53.98	-2.98 dB			

Comments: after check with 6V DC and 12 V DC spurious measurement with 6 V DC worst case



ANNEX A Transmitter radiated spurious emissions

Spurious emissions according to FCC part 22 Subpart H, IC RSS-132

Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

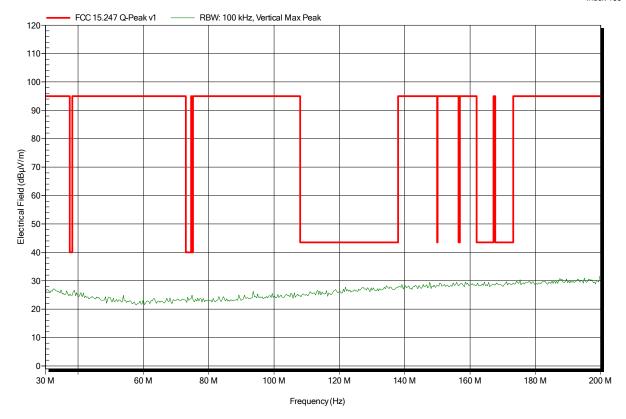
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

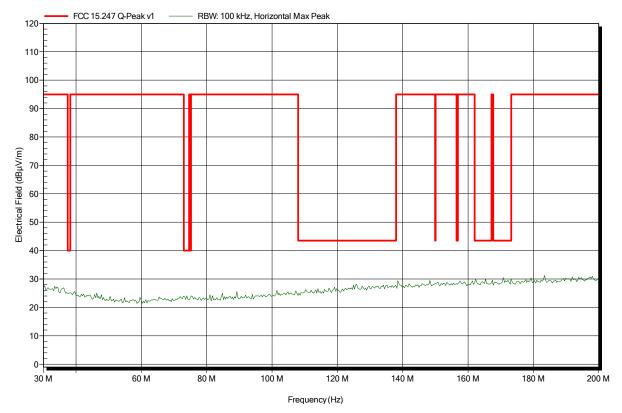
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 r

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

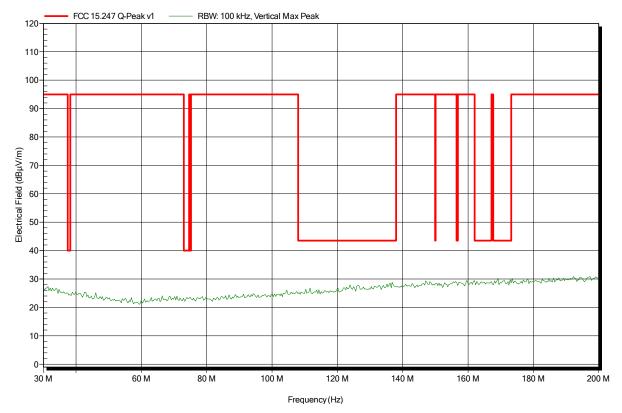
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

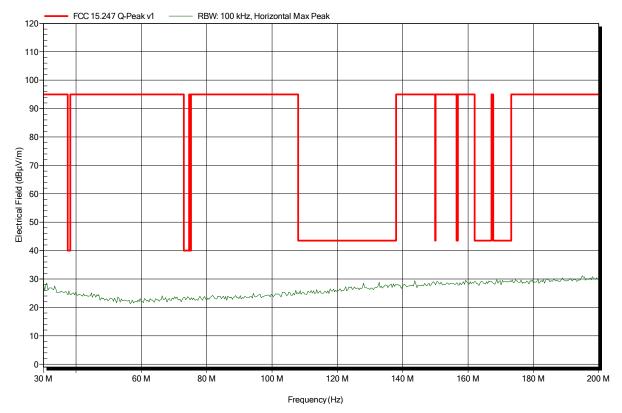
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

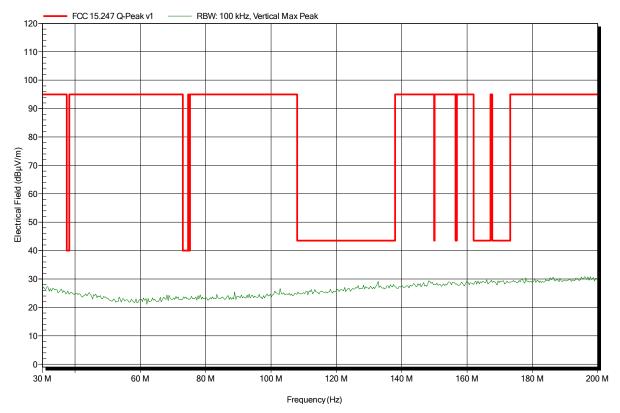
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 r

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

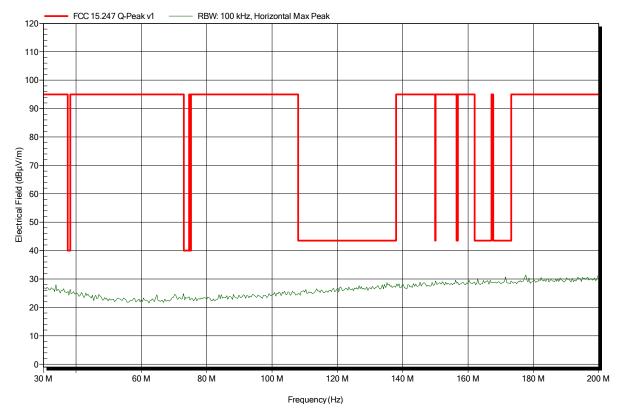
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

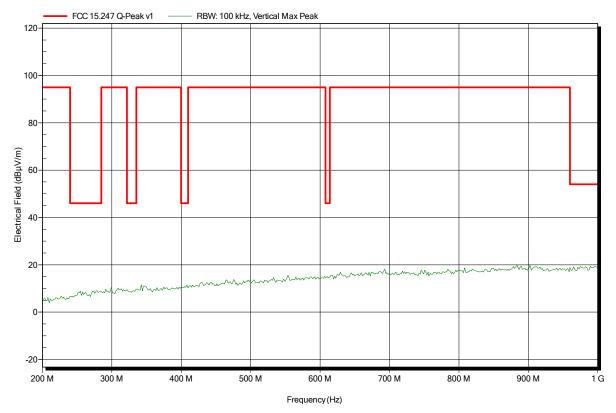
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

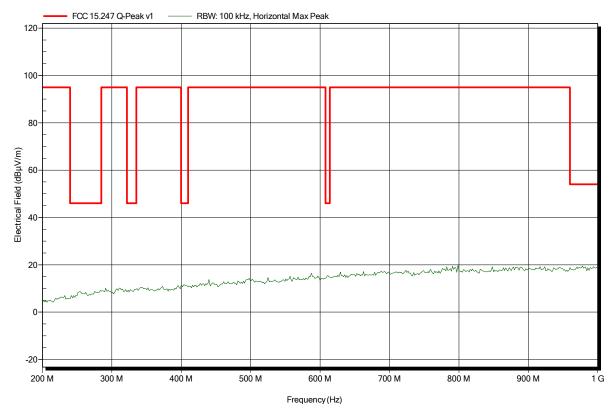
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

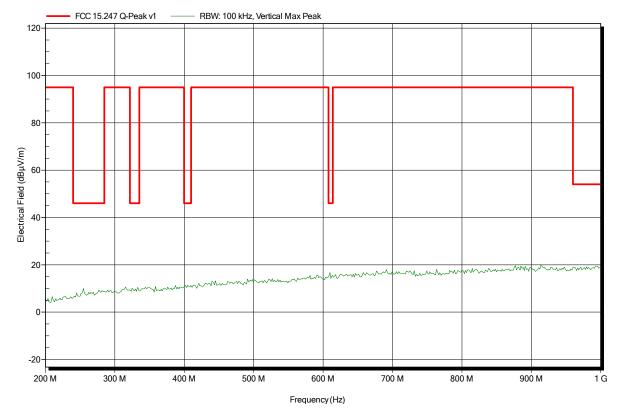
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 n

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

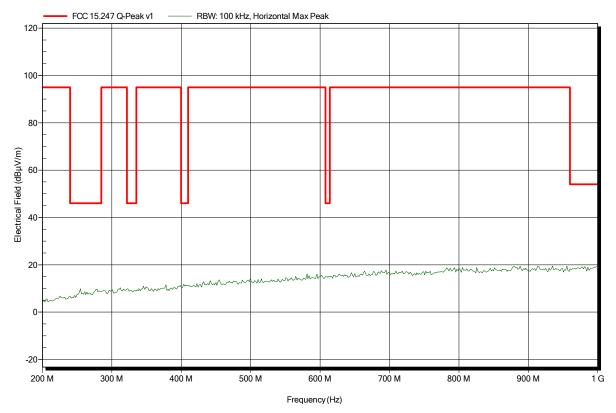
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

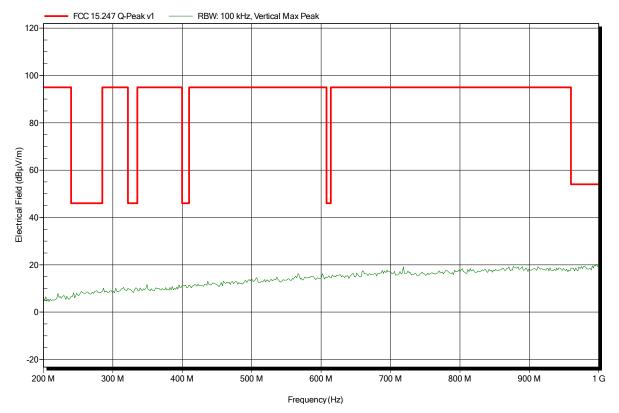
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

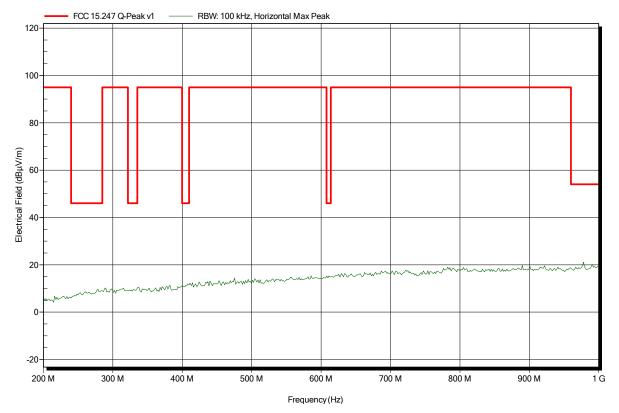
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 r

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

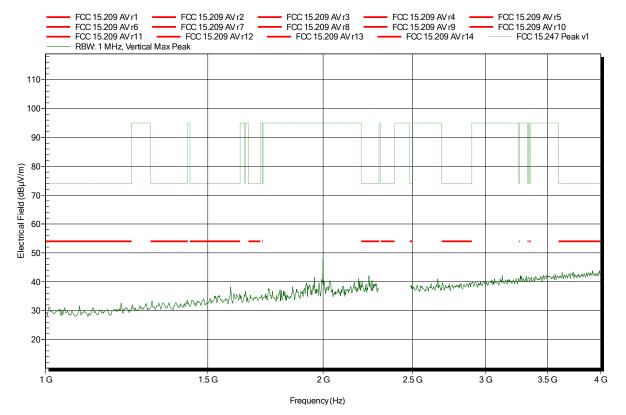
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

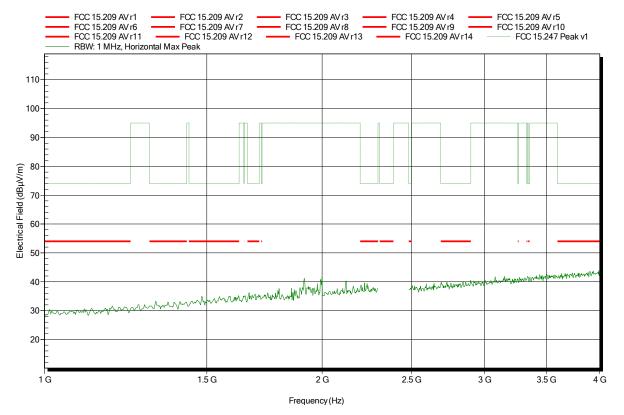
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger data link sensor Model:

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

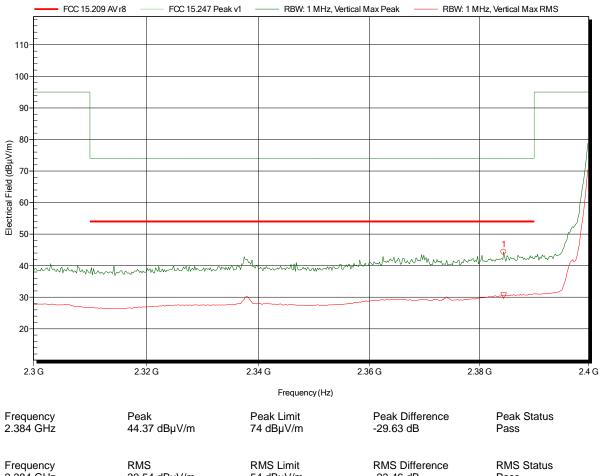
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance:

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

2015-06-11 Test Date:

EUT horizontal; lower bandedge Note:





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

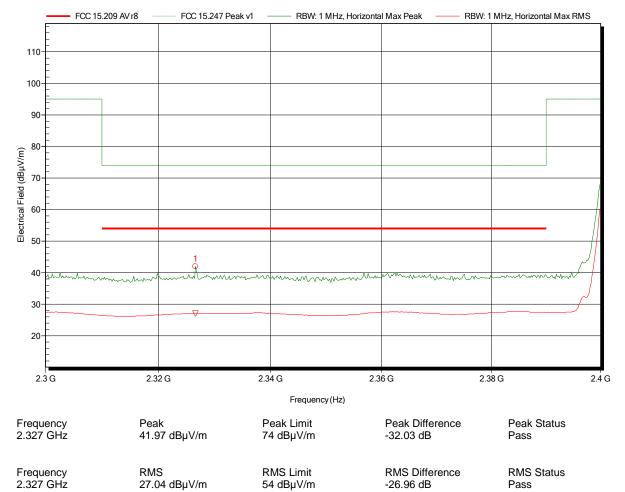
Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; 0; CH. 2402 MHz; TX-Testmode

Test Date: 2015-06-11

Note: EUT horizontal; lower bandedge





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

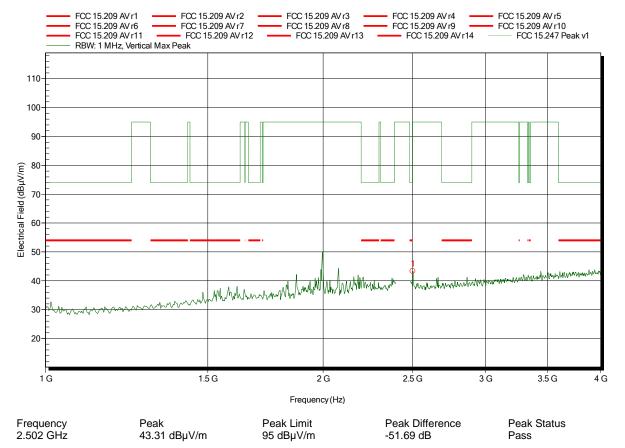
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

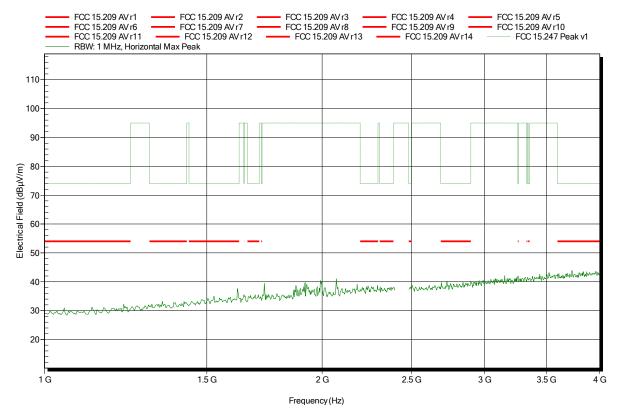
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

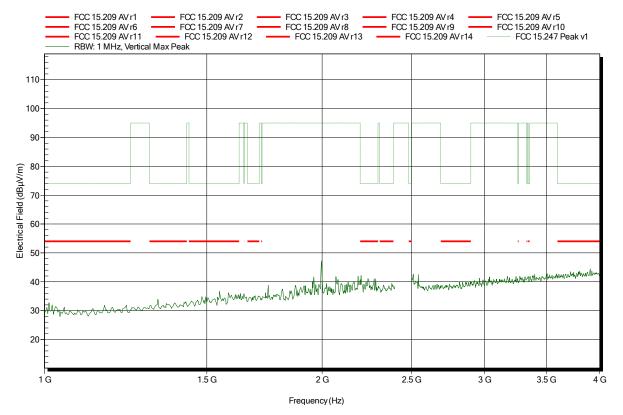
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

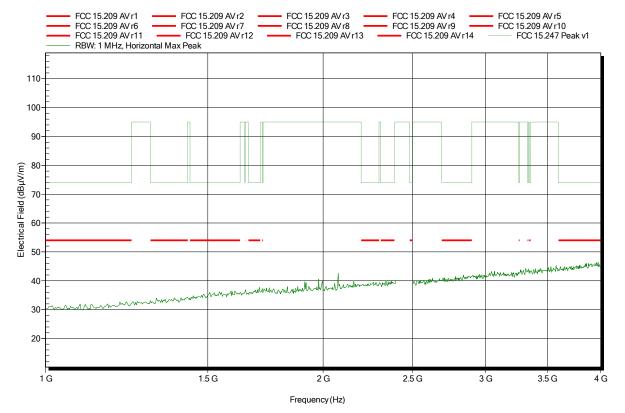
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

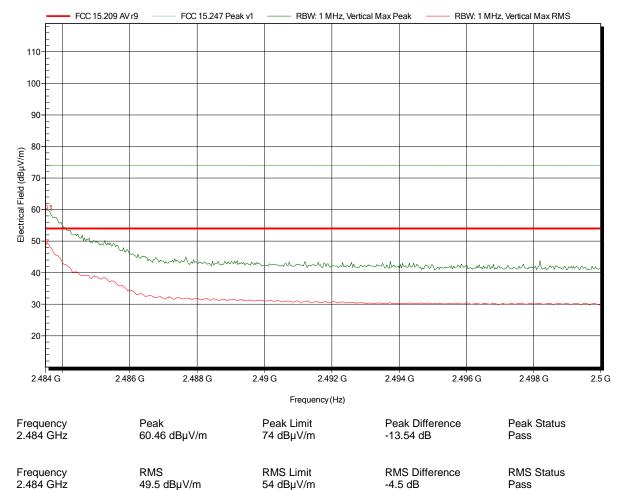
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11

Note: EUT horizontal; higher bandedge





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger data link sensor Model:

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

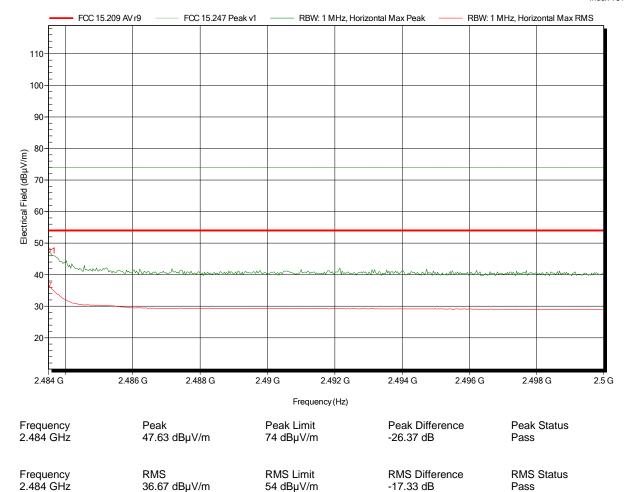
Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance:

TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode Mode:

2015-06-11 Test Date:

EUT horizontal; higher bandedge Note:



 $54 \; dB\mu V/m$

Pass



Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

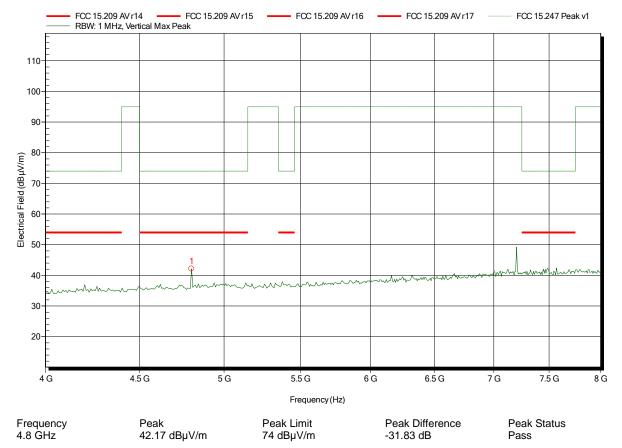
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

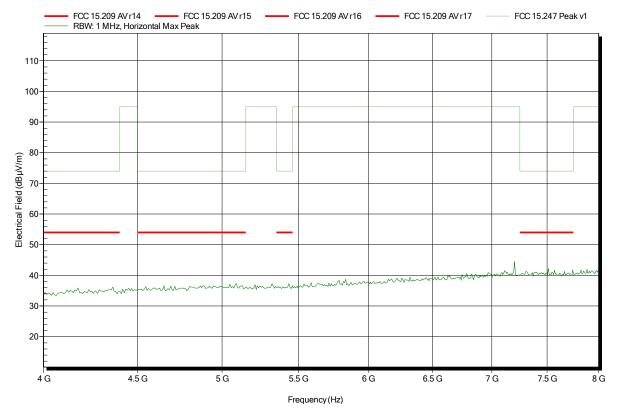
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

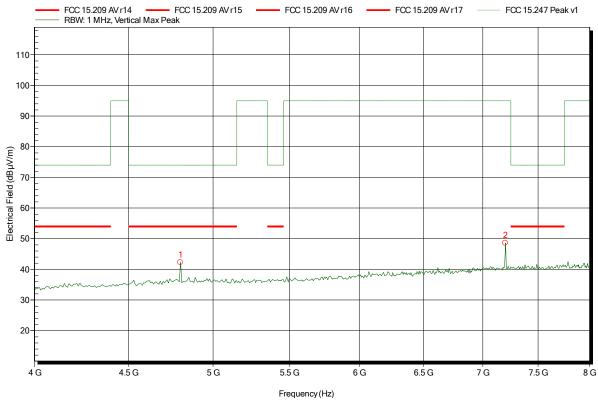
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT vertical

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Frequency 4.8 GHz 7.2 GHz

Peak 42.29 dBµV/m 48.6 dBµV/m Peak Limit 74 dBµV/m 95 dBµV/m Peak Difference -31.71 dB -46.4 dB Peak Status Pass Pass



Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

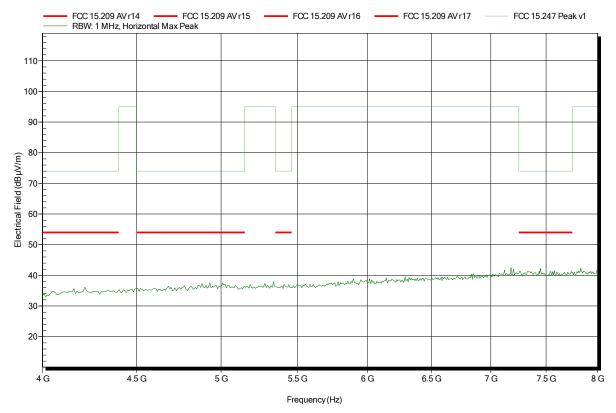
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT vertical





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

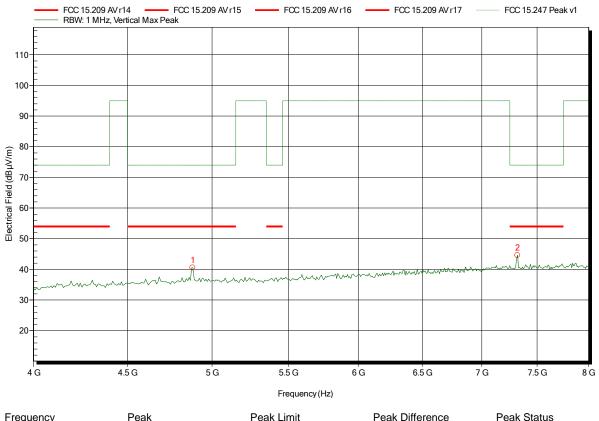
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal

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Frequency 4.88 GHz 7.32 GHz

Peak 40.53 dBμV/m 44.59 dBμV/m Peak Limit 74 dBµV/m 74 dBµV/m Peak Difference -33.47 dB -29.41 dB

Peak Statu Pass Pass



Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

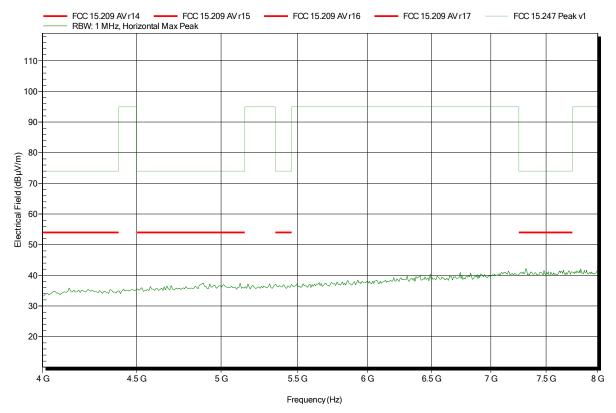
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

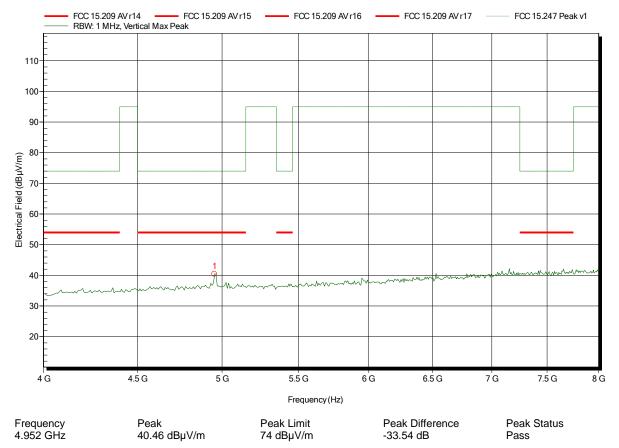
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

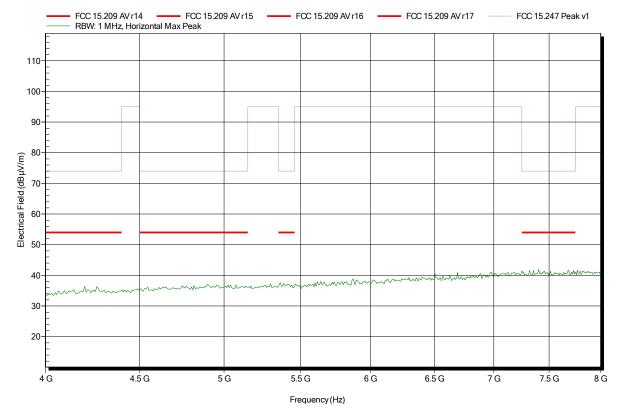
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

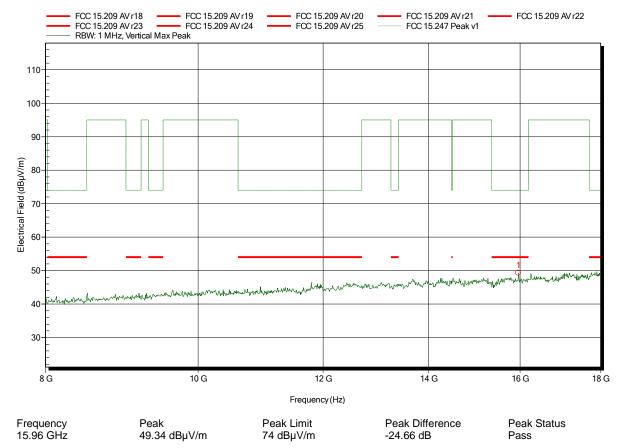
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

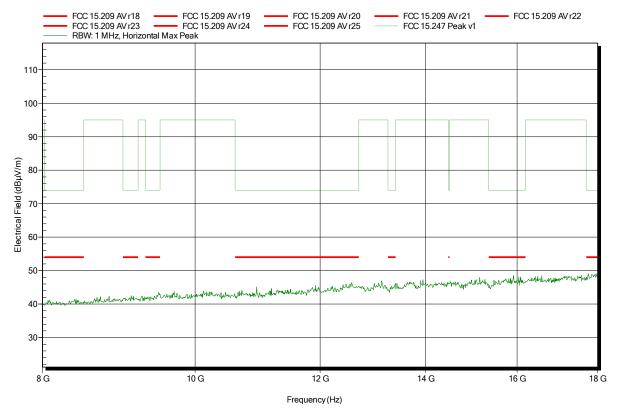
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

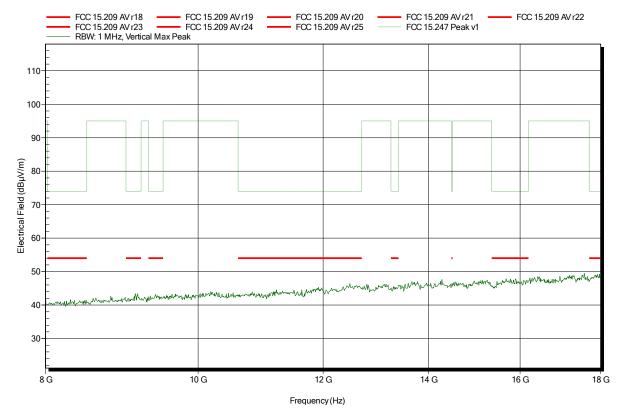
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

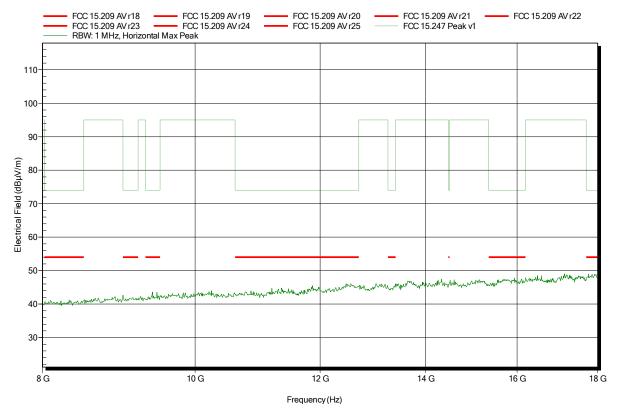
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

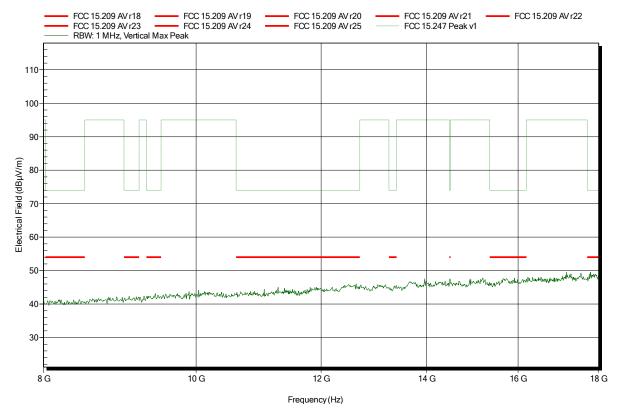
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

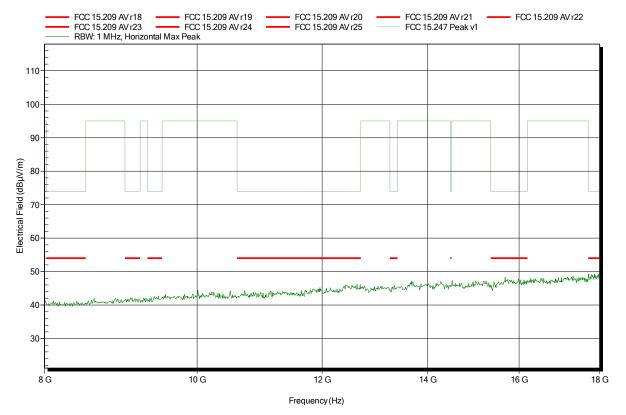
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

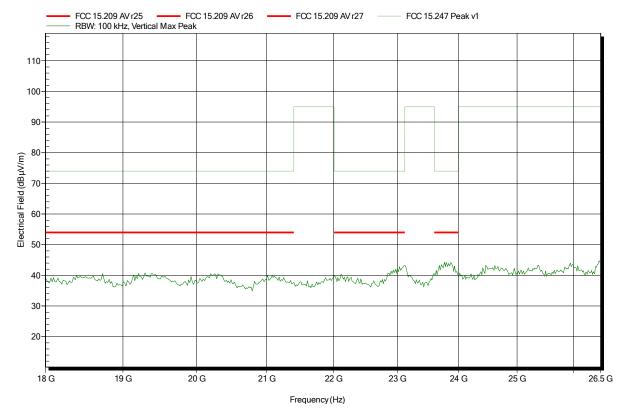
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11 Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

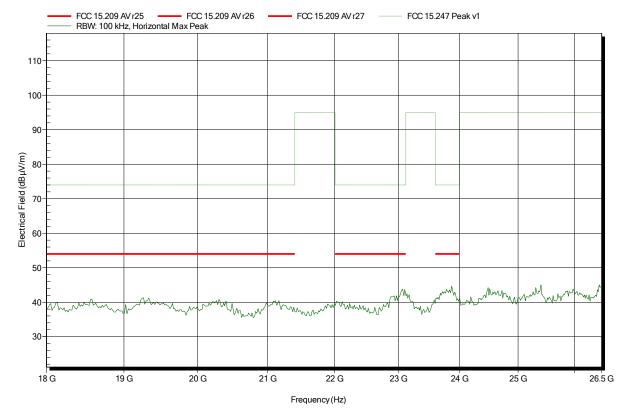
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 0; 2402 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

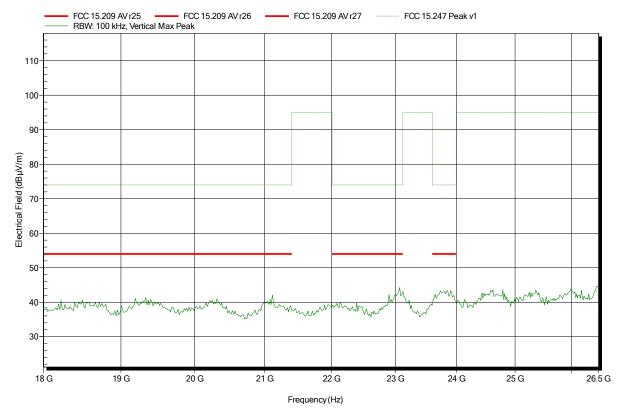
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

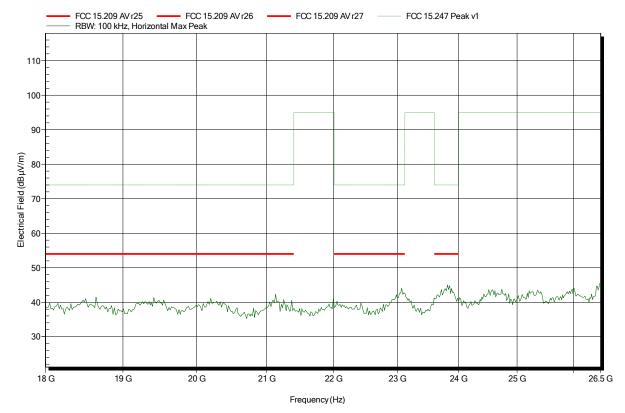
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 19; 2440 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

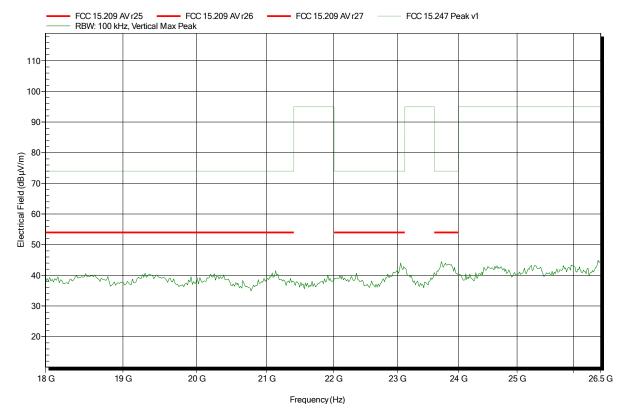
Operator: Mr. Handrik

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11 Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Handrik

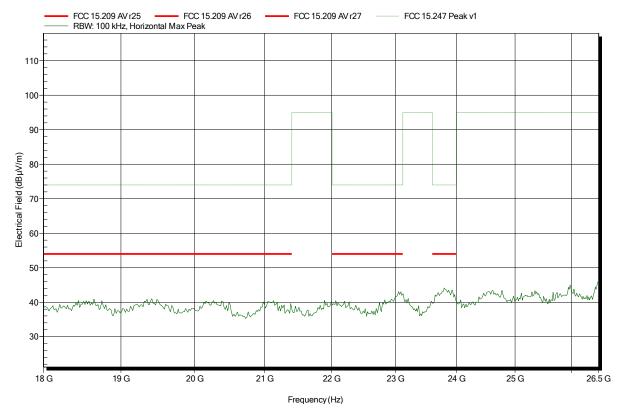
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m converted to 3m

Mode: TX; BT-LE; CH. 39; 2480 MHz; TX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





ANNEX B Receiver radiated spurious emissions

Spurious emissions according to FCC part 15 Subpart C § 15.247, IC RSS-210 I8 A1

Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

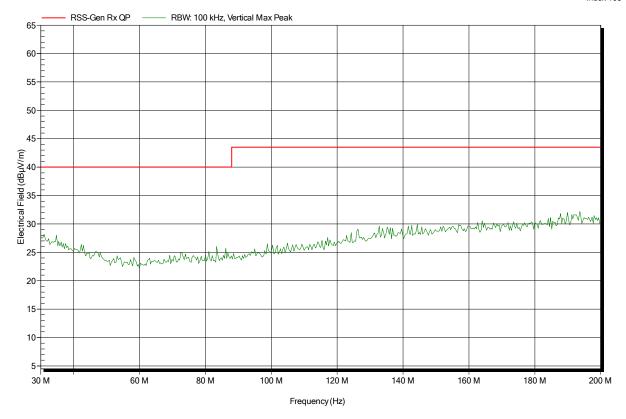
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HK 116, Vertical

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11 Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

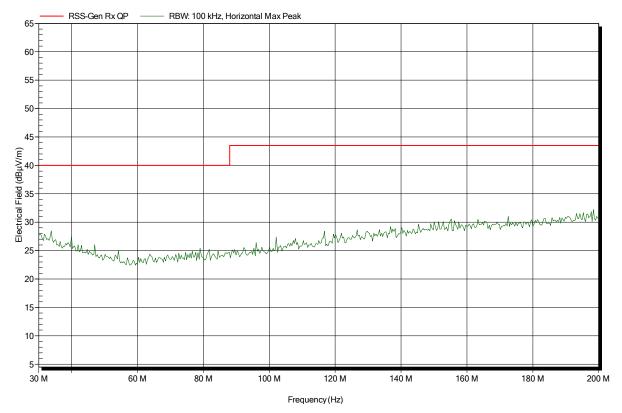
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HK 116, Horizontal

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

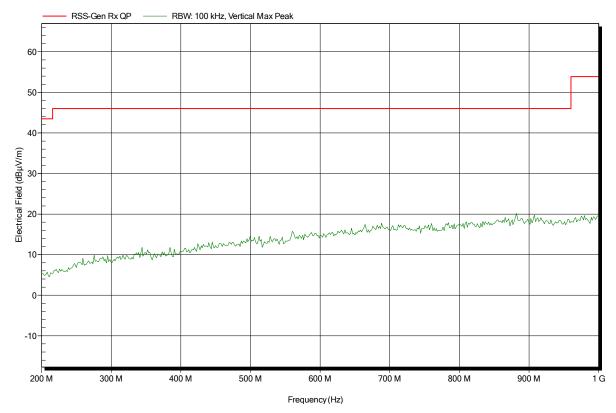
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 223, Vertical

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

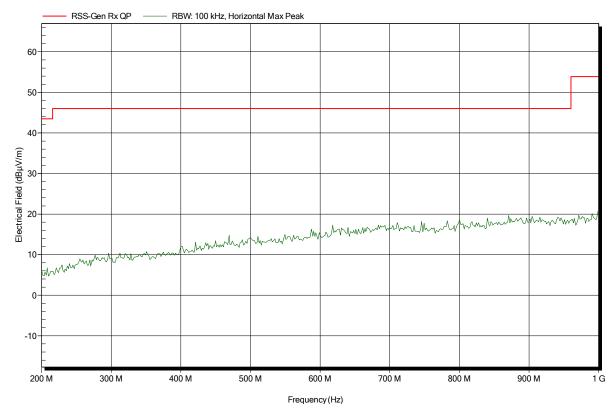
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 223, Horizontal

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

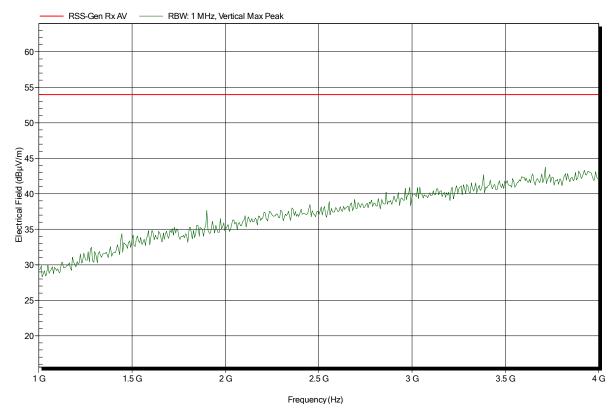
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

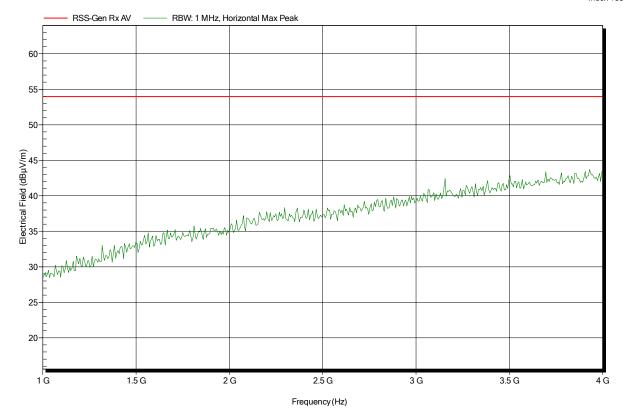
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

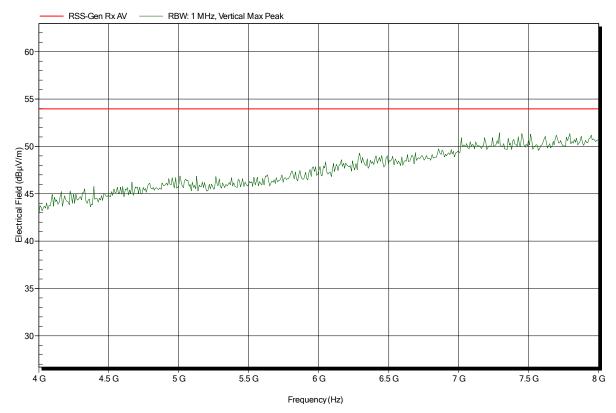
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

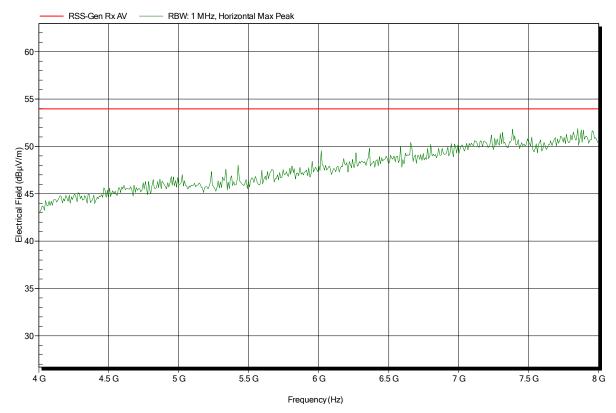
Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 3 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

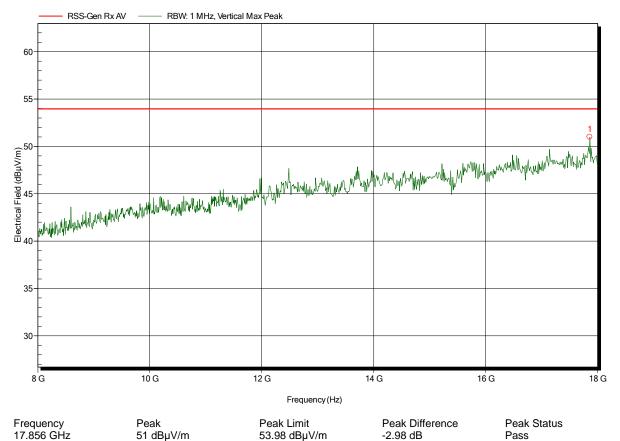
Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC
Antenna: Rohde & Schwarz HL 025, Vertical

Measurement distance: 1 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal





Project number: G0M-1502-4503

Applicant: SMT & Hybrid GmbH

EUT Name: Datenlogger Model: data link sensor

Test Site: Eurofins Product Service GmbH

Operator: Mr. Pudell

Test Conditions: Tnom: 24°C, Vnom: 6.0 VDC

Antenna: Rohde & Schwarz HL 025, Horizontal

Measurement distance: 1 m

Mode: RX; BT-LE; CH. 19; 2440 MHz; RX-Testmode

Test Date: 2015-06-11
Note: EUT horizontal

