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RADIO REPORT

FCC 47 CFR Part 15C
ISED Canada RSS-247

Frequency hopping systems operating within the 2400.0 MHz - 2483.5 MHz MHz band

Report Reference No	G0M-2108-9942-TFC247BT-V01
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	Bridgestone Mobility Solutions B.V.
Address	Beethovenstraat 503 1083 HK Amsterdam Netherlands
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	Telematic Device with GSM+LTE+GNSS+OBD connector
Model(s)	L0245
Additional Model(s)	None
Brand Name(s)	webfleet Link 245
Hardware Version(s)	15/2021
Software Version(s)	3.11
FCC ID	2AGPAL0245
IC	20911-L0245
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	2022-01-06
Report:	
Compiled by	Odai Qawasmeh
Tested by (+ signature)	Odai Qawasmeh
Supervised by (+ signature) (Responsible for Test)	Wilfried Treffke
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn
Date of Issue	2022-03-22
Total number of pages	90
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:	

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-03-22	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
BR	Basic Rate (Bluetooth)
EDR	Enhanced Data Rate (Bluetooth)
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

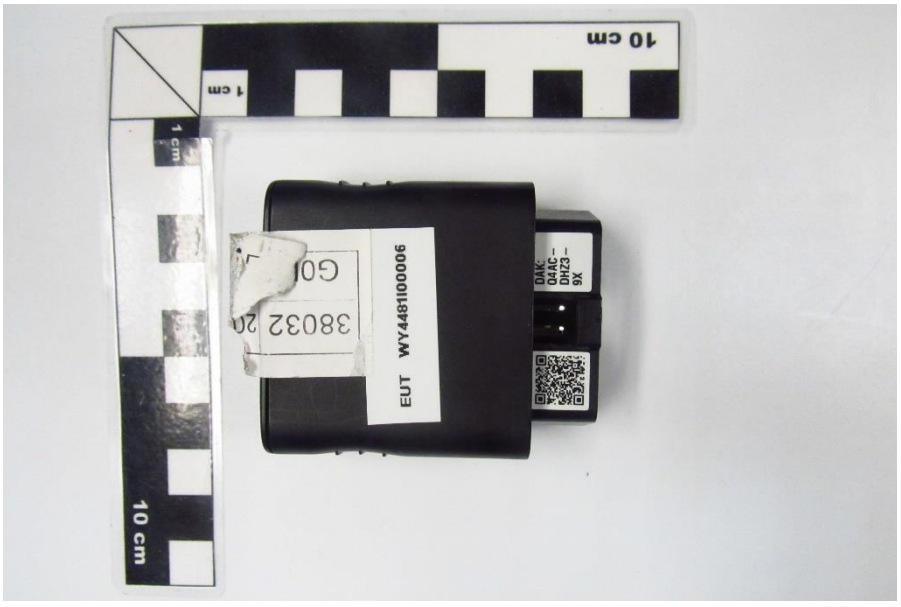
REPORT INDEX

1 Equipment (Test Item) Under Test

Description	Telematic Device with GSM+LTE+GNSS+OBD connector	
Model	L0245	
Additional Model(s)	None	
Brand Name(s)	webfleet Link 245	
Serial Number(s)	WY4481I00007 Radiated Test Sample ID 38032 WY4481I00009 Conducted Test Sample ID 38035	
Hardware Version(s)	15/2021	
Software Version(s)	3.11	
PMN	LINK 245	
HVIN	L0245	
FVIN	3.11	
HMN	N/A	
FCC ID	2AGPAL0245	
IC	20911-L0245	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400.0 MHz - 2483.5 MHz	
Radio technology	Bluetooth	
Modulation	GFSK	
Number of antenna ports	1	
Antenna	Type	Integrated
	Model	ALA621C4
	Manufacturer	Amotech
	Gain	0 dBi
Supply Voltage	V_{NOM}	12 VDC
Operating Temperature	T_{NOM}	25 °C
Manufacturer	Bridgestone Mobility Solutions B.V. Beethovenstraat 503 1083 HK Amsterdam Netherlands	

1.1 Photos – Equipment External

EUT Top View


EUT Back View


EUT Front View

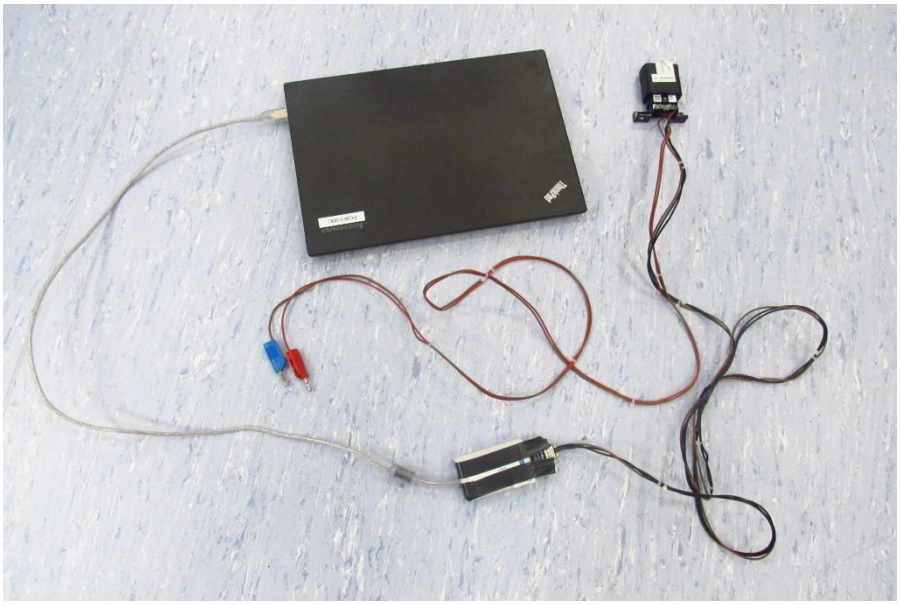
EUT Interface

EUT Side View (left)


EUT Side View (right)


EUT conducted Sample

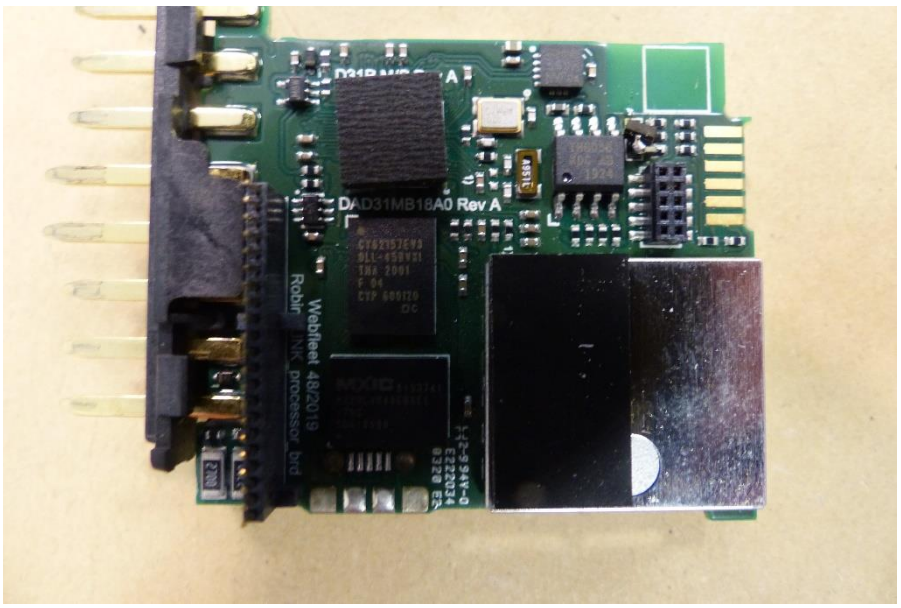

USB to CAN Adapter

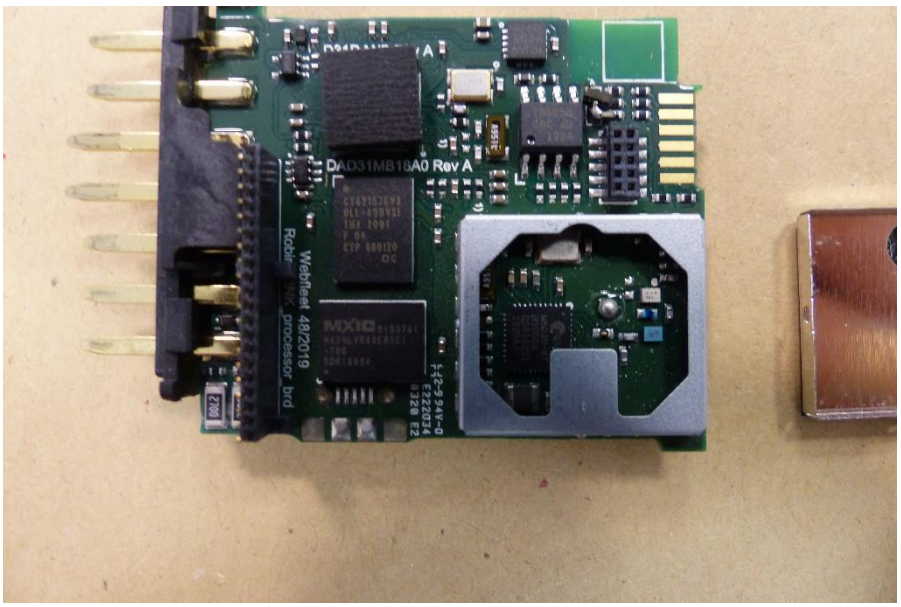

EUT with auxiliary equipment


1.2 Photos – Equipment Internal

Interior view A


Interior view B


Interior view C


Interior view D


Cellular Antenna


1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
SIM	Communication Tester	R&S	CBT	Base Station Simulator
SFT	Remote Control	Quectel	QCOM v1.6	Control unit
AE	USB to CAN bridge	IXXAT	USB to CAN V2	Control unit
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test Modes

Mode	Description
DH5 Single	Mode = Transmit Modulation = GFSK Spreading = None Packet type = DH5 Duty cycle = 78%
DH5 Hopping	Mode = Transmit Modulation = GFSK Spreading = FHSS Packet type = DH5 Duty cycle = 78%
Receive	Mode = Receive Scan
Comment:	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx / Rx	0	2402
F2	Tx / Rx	39	2441
F3	Tx / Rx	40	2442
F4	Tx / Rx	78	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:

Reading on Analyzer (dBµV) + A.F. (dB/m) = Net field strength (dBµV/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:

Limit (dBµV/m) = 20*log (µV/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)(1) ISED RSS-247 § 5.1 Issue 2	20 dB Bandwidth	ANSI C63.10-2013	PASS	
FCC § 15.247(a)(1)(iii) ISED RSS-247, Issue 2 (section 5.1)	Number of hopping frequencies	ANSI C63.10-2013	PASS	
FCC § 15.247(a)(1) ISED RSS-247, Issue 2 (section 5.1)	Frequency hopping channel separation	ANSI C63.10-2013	PASS	
FCC § 15.247(a)(1)(iii) ISED RSS-247, Issue 2 (section 5.1)	Time of occupancy (Dwell time)	ANSI C63.10-2013	PASS	
FCC § 15.247(b) ISED RSS-247, Issue 2 (section 5.4)	Maximum peak conducted power	ANSI C63.10-2013	PASS	
FCC § 15.207 ISED RSS-247, Issue 2 (section 3.1)	AC power line conducted emissions	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Band edge compliance	ANSI C63.10-2013	PASS	
FCC § 15.247(d) ISED RSS-247, Issue 2 (section 5.5)	Conducted spurious emissions	ANSI C63.10-2013	PASS	
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	
ISED RSS-247, Issue 2 (section 3.1)	Receiver radiated spurious emissions	ANSI C63.4-2014	PASS	
Comment:				

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

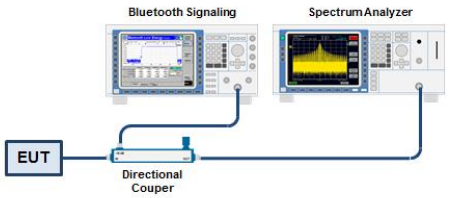
3.1.1 Information

Test Information	
Reference	ISED RSS-Gen, Issue 5 A2 (section 6.7)
Measurement Method	ANSI C63.10 6.9.3
Measurement Uncertainty	± 1.26 %
Test Sample ID	38035
Operator	Odai Qawasmeh
Date	2022-02-25

3.1.2 Limits

Limits
None (Informational only)

3.1.3 Setup

Test Setup


3.1.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.1.5 Procedure

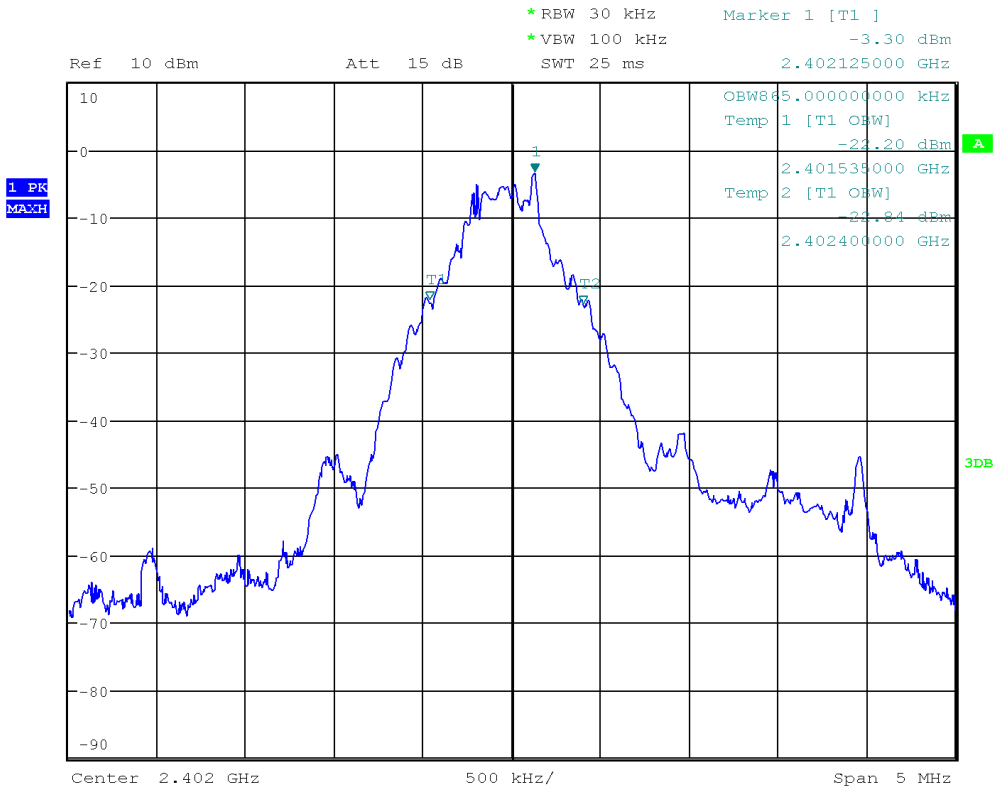
Test Procedure
1. EUT transmitter is activated in test mode under normal conditions 2. The spectrum analyzer is set to peak detection and maximum hold with a span twice the emission spectrum 3. The resolution bandwidth is set to the range of 1 % to 5 % of the occupied bandwidth 4. The occupied bandwidth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

3.1.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
DH5	2402	0.865
DH5	2441	0.870
DH5	2480	0.870

Occupied Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Occupied Bandwidth [MHz]:	0.865



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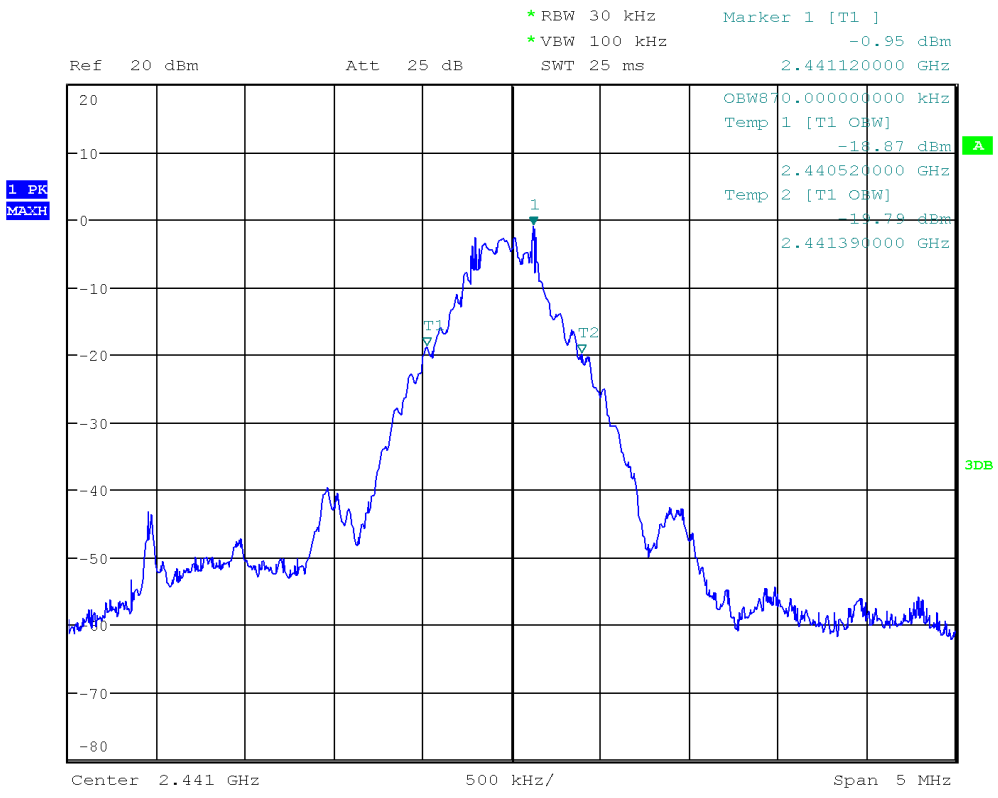
Occupied Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Occupied Bandwidth [MHz]:	0.870



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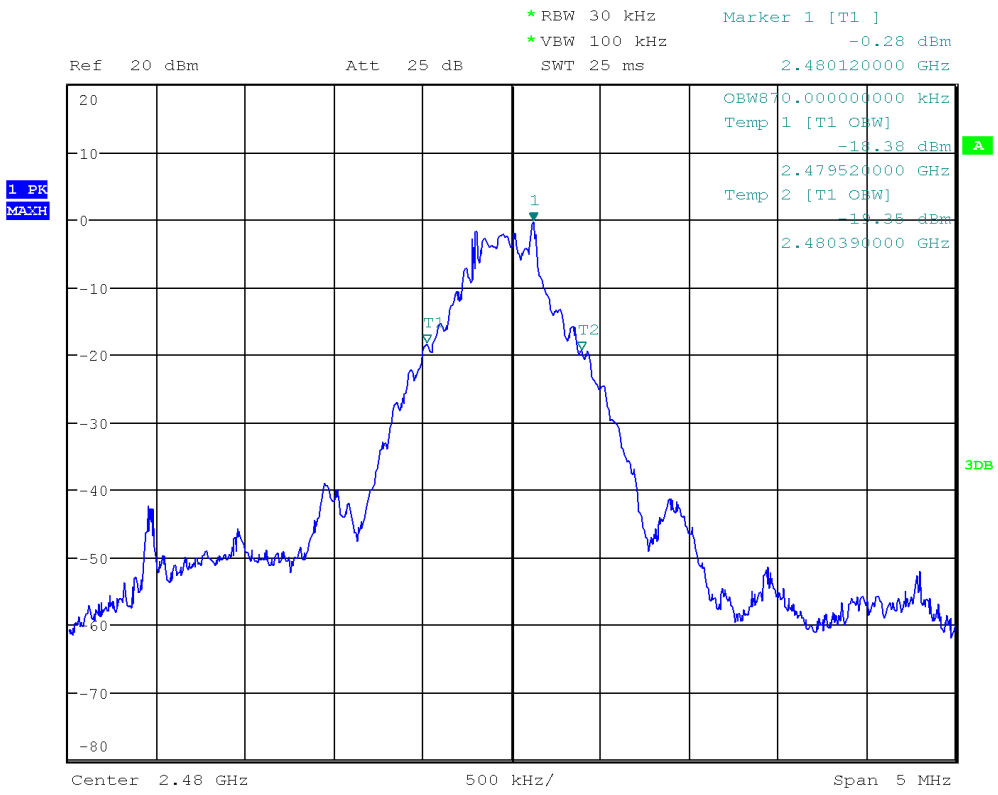
Occupied Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.3
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Occupied Bandwidth [MHz]:	0.870



Date: 25.FEB.2022 10:29:57

3.2 Test Conditions and Results - 20 dB bandwidth

3.2.1 Information

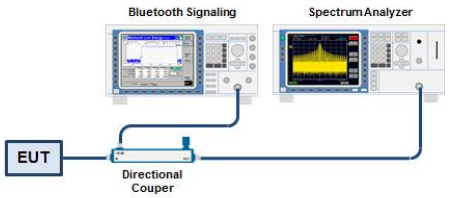
Test Information	
Reference	FCC 15.247(a)(1) / ISED RSS-247 5.1
Measurement Method	ANSI C63.10 6.9.2
Measurement Uncertainty	± 1.26 %
Test Sample ID	38035
Operator	Odai Qawasmeh
Date	2022-02-25

3.2.2 Limits

Limits
None (Informational only)

3.2.3 Setup

Test Setup



3.2.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.2.5 Procedure

Test Procedure

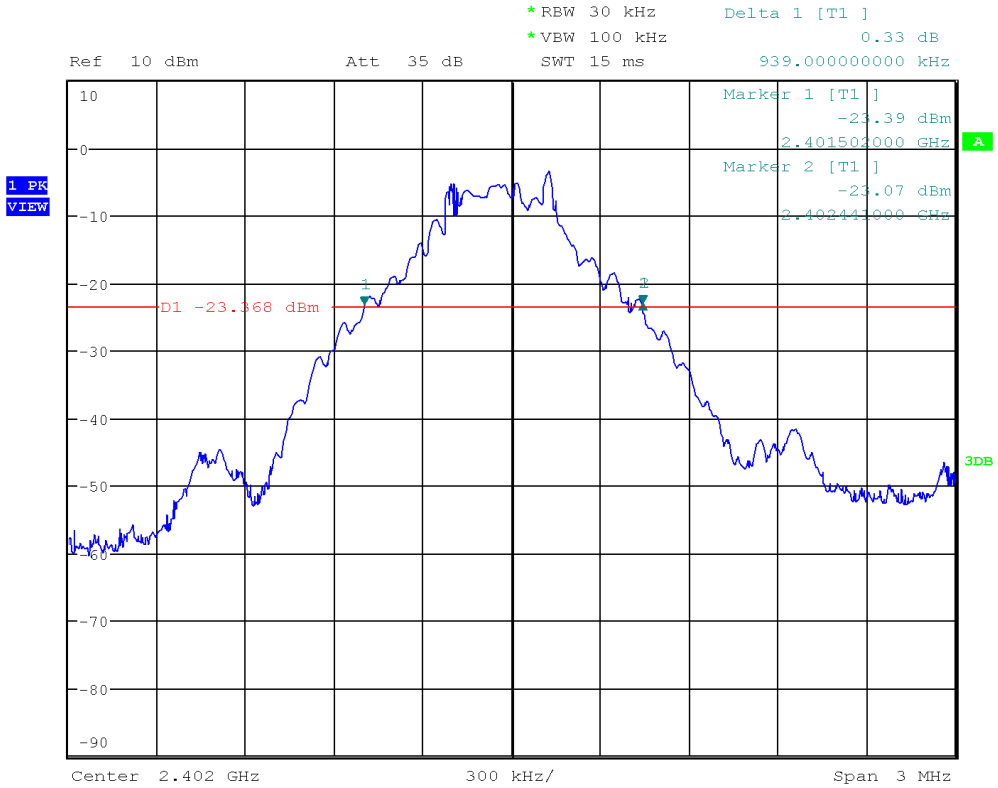
1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Detector set to peak and max hold
4. Envelope peak value of emission spectrum is selected
5. Marker on envelope of spectrum is set to level of -20 dB to the left of the peak
6. Marker on envelope of spectrum is set to level of -20 dB to the right of the peak
7. 20dB Bandwidth is determined by marker frequency separation

3.2.6 Results

Test Results		
Mode	Frequency [MHz]	Bandwidth [MHz]
DH5	2402	0.939
DH5	2441	0.942
DH5	2480	0.966

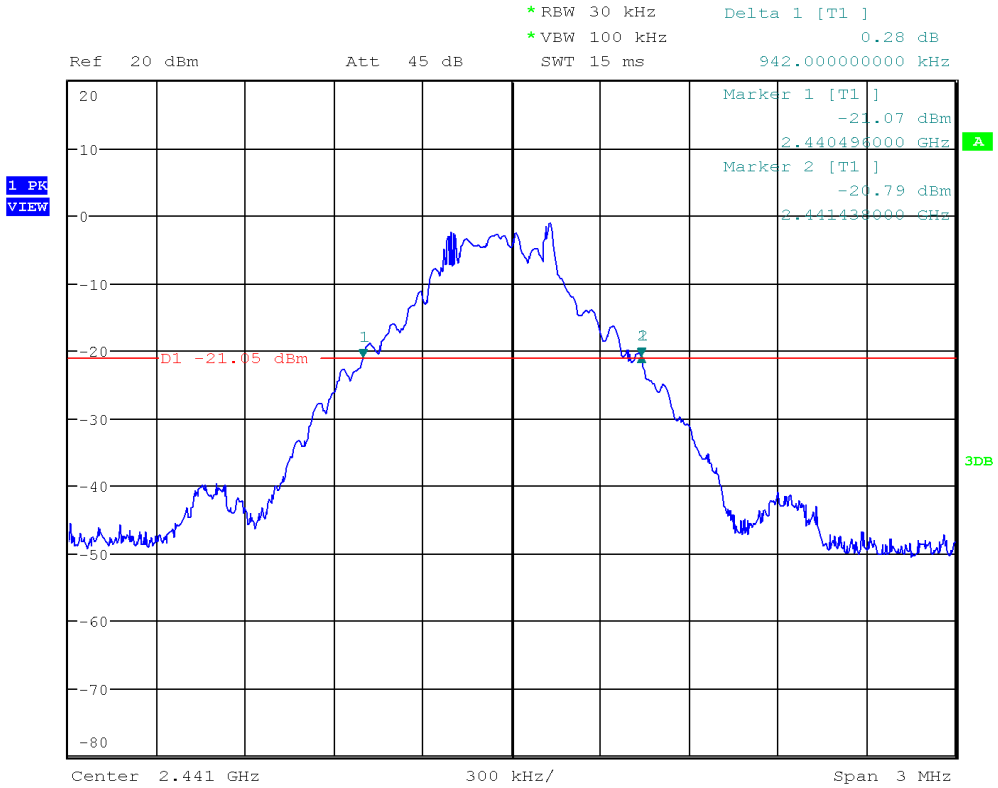
20 dB Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.2
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Lower Frequency [MHz]:	2401.502
Upper Frequency [MHz]:	2402.441
20 dB Bandwidth [MHz]:	0.939



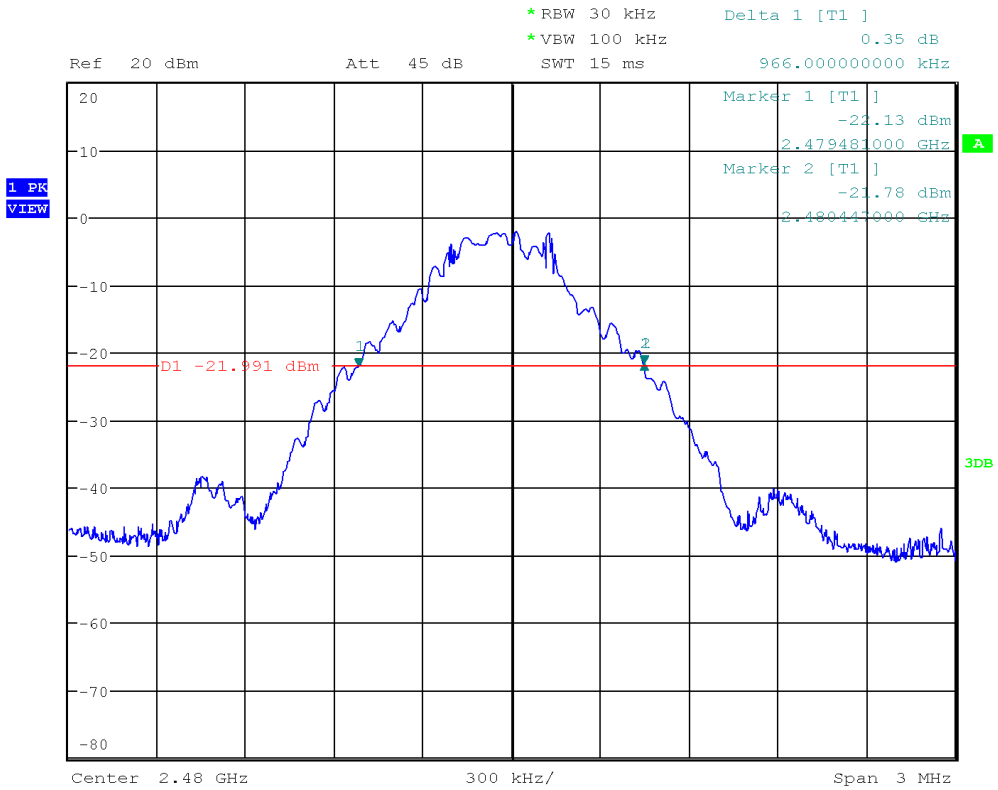
20 dB Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.2
Operational Mode:	DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Lower Frequency [MHz]:	2440.496
Upper Frequency [MHz]:	2441.438
20 dB Bandwidth [MHz]:	0.942



20 dB Bandwidth

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 6.9.2
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Lower Frequency [MHz]:	2479.481
Upper Frequency [MHz]:	2480.447
20 dB Bandwidth [MHz]:	0.966



3.3 Test Conditions and Results - Number of hopping frequencies

3.3.1 Information

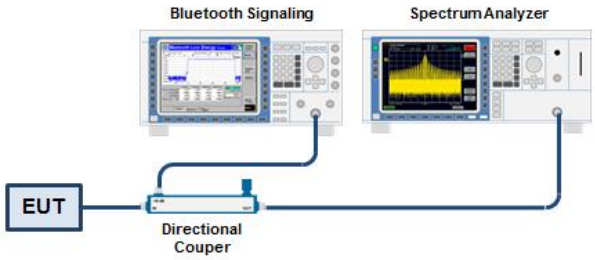
Test Information	
Reference	FCC § 15.247(a)(1)(iii); ISED RSS-247, Issue 2 (section 5.1)
Measurement Method	ANSI C63.10 7.8.3
Operator	Odai Qawasmeh
Date	2022-02-25

3.3.2 Limits

Limits
≥ 15

3.3.3 Setup

Test Setup



3.3.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.3.5 Procedure

Test Procedure

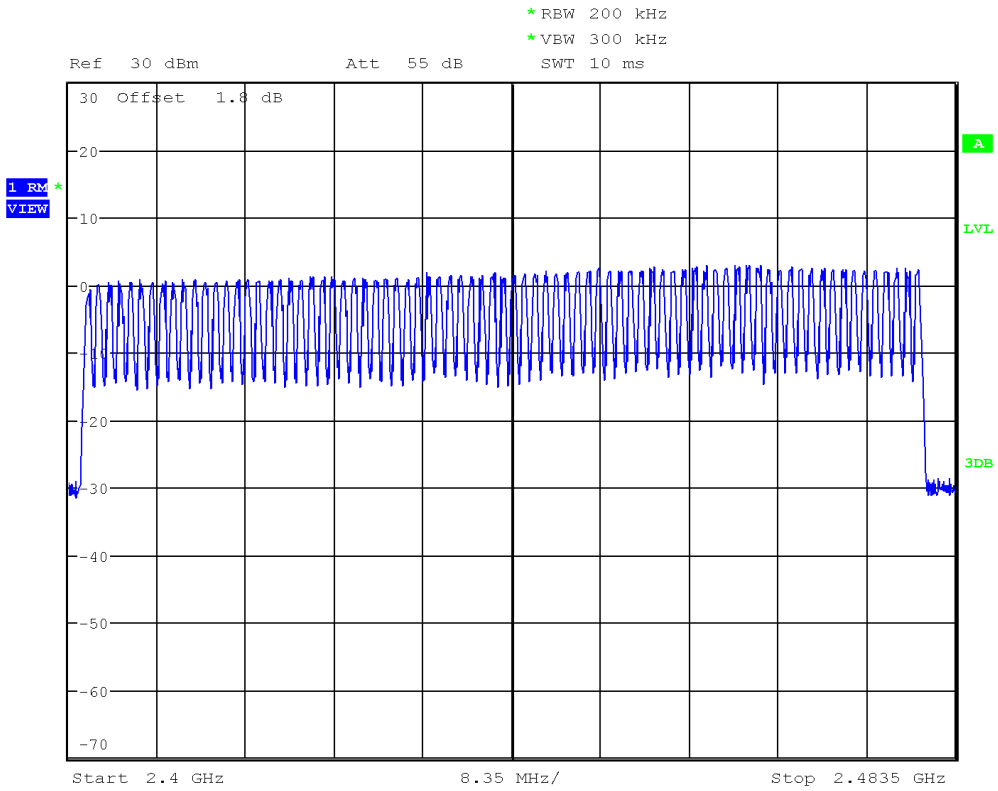
1. EUT set to test mode (Communication tester is used if needed)
2. Span set to measurement frequency range
3. Detector set to peak and max hold
4. Resolution bandwidth is set small enough to resolve hopping channel emission spectra
5. The number of peaks is counted to determine number of hopping frequencies

3.3.6 Results

Test Results		
Number of hopping frequencies	Limit	Verdict
79	10	PASS

Number of hopping frequencies

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.27 (a)(1)(iii)
Reference Method:	ANSI C63.10:2013 7.8.3
Operational Mode:	Bluetooth, DH5, Hopping Mode
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Number of Hopping Channels:	79



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3.4 Test Conditions and Results - Frequency hopping channel separation

3.4.1 Information

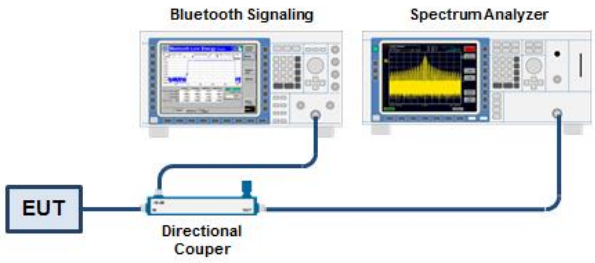
Test Information	
Reference	FCC § 15.247(a)(1); ISED RSS-247, Issue 2 (section 5.1)
Measurement Method	ANSI C63.10 7.8.4
Measurement Uncertainty	± 3.14 %
Operator	Odai Qawasmeh
Date	2022-02-25

3.4.2 Limits

Limit
≥ 25 kHz or ⅔ of 20 dB bandwidth

3.4.3 Setup

Test Setup



3.4.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.4.5 Procedure

Test Procedure

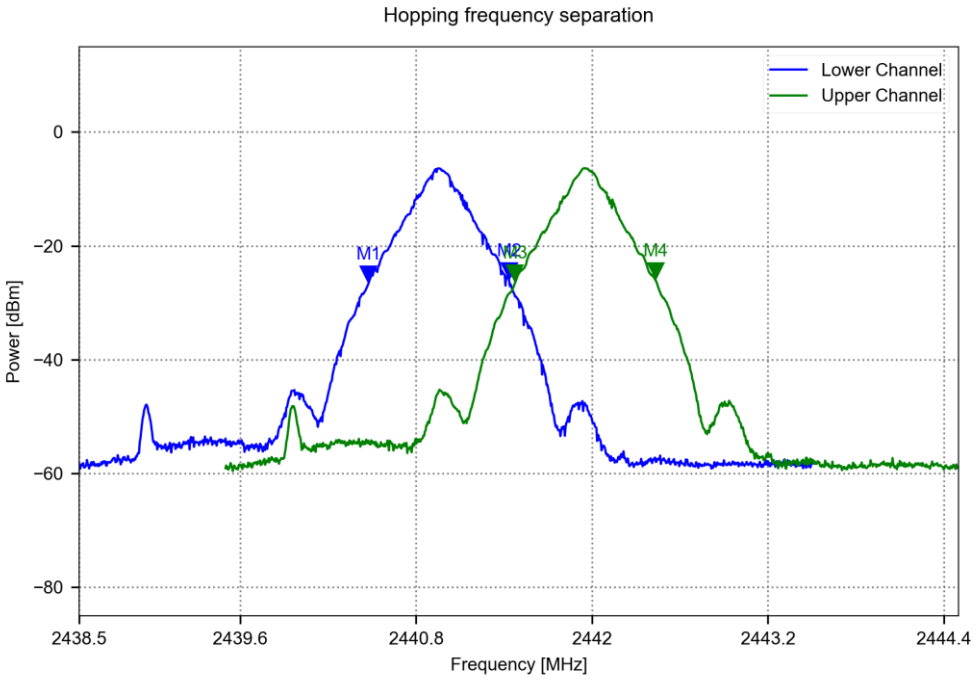
1. EUT set to test mode (Communication tester is used if needed)
2. Span set to measurement frequency range
3. Detector set to peak and max hold
4. Resolution bandwidth is set small enough to resolve hopping channel emission spectra
5. The two adjacent channel peaks are marked
6. Channel separation is determined from frequency separation of markers

3.4.6 Results

Test Results		
Channel separation [kHz]	Limit [kHz]	Verdict
1000	≥ ⅔ · 921.80 = 614.53	PASS

Hopping frequency separation

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247(a)(1)
Reference Method:	ANSI C63.10:2013 7.8.2
Operational Mode:	Bluetooth, DH5, Channels: 2441 + 2442 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Lower Frequency (M1) [MHz]:	2440.475
Upper Frequency (M2) [MHz]:	2441.435
Lower Frequency (M3) [MHz]:	2441.475
Upper Frequency (M4) [MHz]:	2442.435
Lower center Frequency [MHz]:	2440.955
Upper center Frequency [MHz]:	2441.955
Hopping Frequency Separation [MHz]:	1.000



3.5 Test Conditions and Results - Time of occupancy (Dwell time)

3.5.1 Information

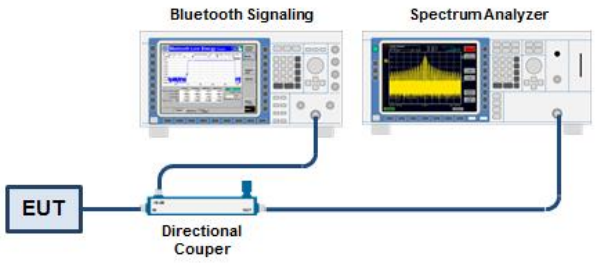
Test Information	
Reference	FCC § 15.247(a)(1)(iii); ISED RSS-247, Issue 2 (section 5.1)
Measurement Method	ANSI C63.10 7.8.2
Measurement Uncertainty	± 78.53 %
Operator	Odai Qawasmeh
Date	2022-02-25

3.5.2 Limits

Limits
≤ 0.4 s within 0.4 s · Number of hopping channels

3.5.3 Setup

Test Setup



3.5.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.5.5 Procedure

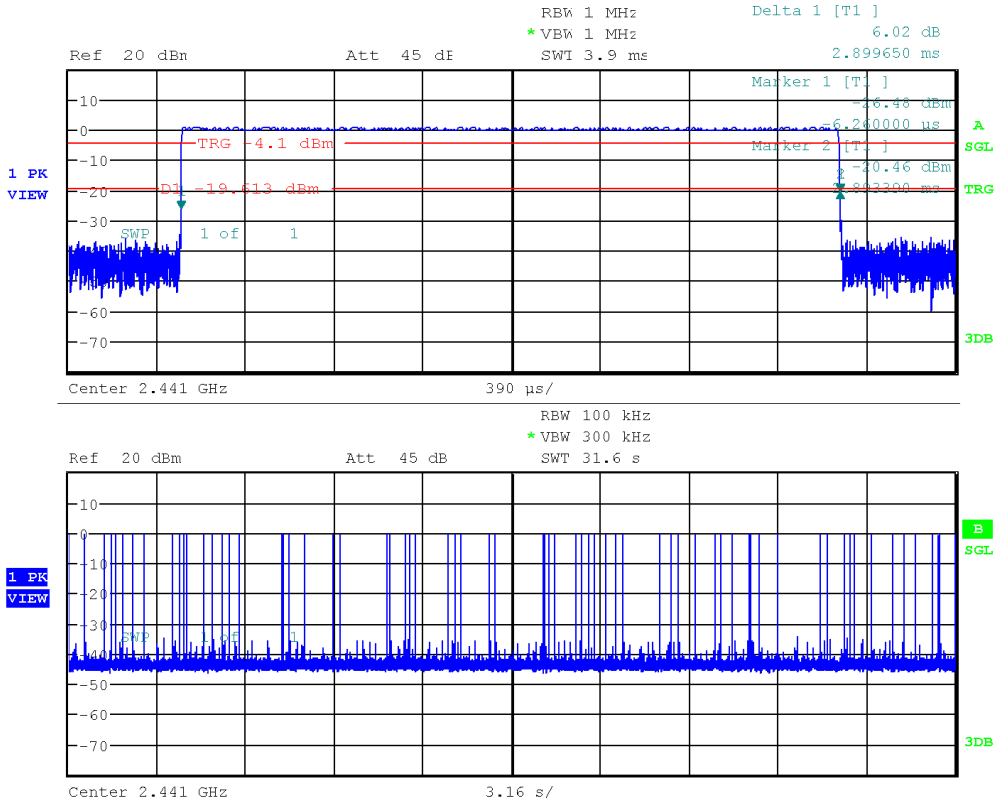
Test Procedure
1. EUT set to test hopping mode (Communication tester is used if needed)
2. Analyzer span is set to zero span
3. Detector set to peak and max hold
4. RBW is set to 100 kHz and VBW to 300 kHz
5. The sweep time is set to capture one single dwell time
6. Trigger is set to video trigger
7. A marker is set to the start and end positions of the burst
8. The dwell time is determined from the marker difference
9. Another sweep is initiated without trigger and sweep time set to the observation time
10. The number of hops is counted
11. The total time of occupancy is calculated from the dwell time per hop multiplied by the number of hops

3.5.6 Results

Test Results (DH5)					
Observation Period [s]	Number of Hops	Dwell time per Hop [s]	Time of occupancy [s]	Limit [s]	Margin [s]
31.6	65	2.9	0.188	0.4	-0.212

Time of occupancy

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Method:	ANSI C63.10:2013 7.8.4
Operational Mode:	DH5, Hopping mode
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Dwell Time per Hop [ms]:	2.900
Number of Hops:	65
Time of occupancy [s]:	0.188



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3.6 Test Conditions and Results - Maximum peak conducted output power

3.6.1 Information

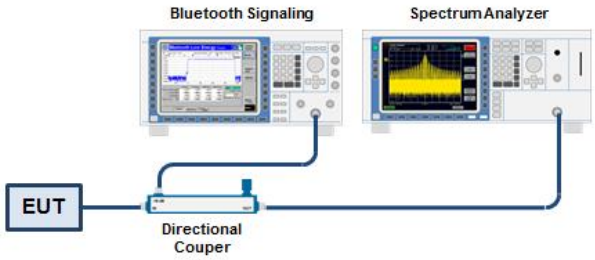
Test Information	
Reference	FCC § 15.247(b); ISED RSS-247, Issue 2 (section 5.4)
Measurement Method	ANSI C63.10 7.8.5
Measurement Uncertainty	± 2.86 dB
Operator	Odai Qawasmeh
Date	2022-02-25

3.6.2 Limits

Limits	
Condition	Power
Number of hopping channels ≥ 75	1 W (30 dBm)
75 > Number of hopping channels ≥ 15	0.125 W (21 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.	

3.6.3 Setup

Test Setup



3.6.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.6.5 Procedure

Test Procedure

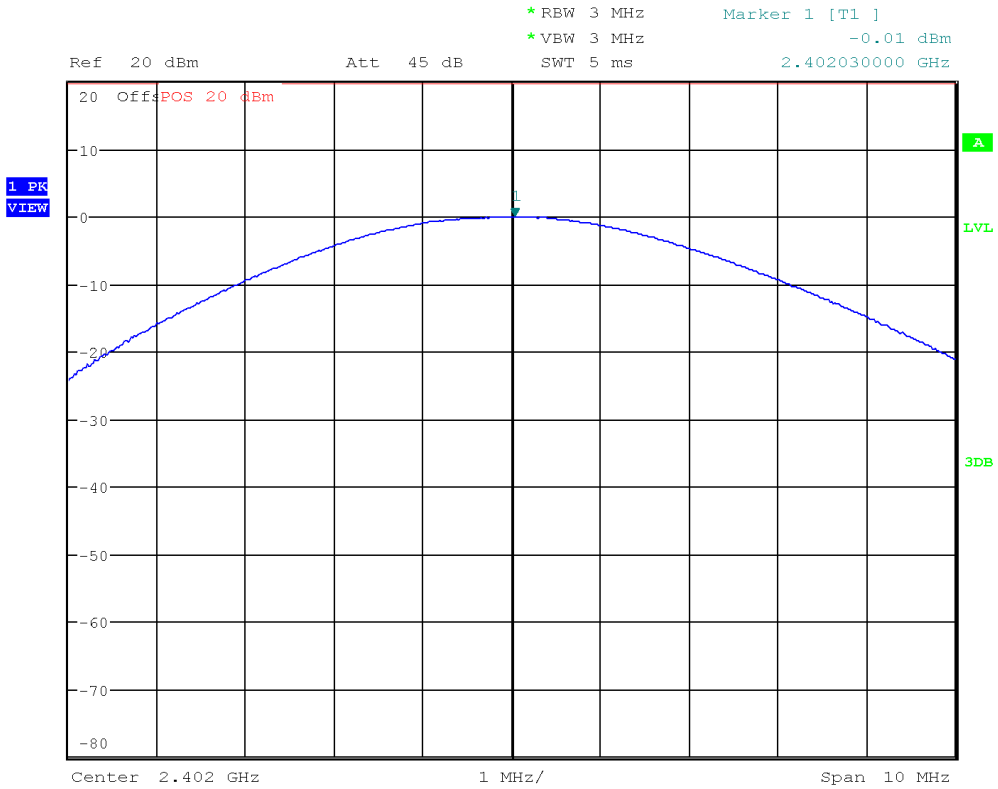
1. EUT set to test mode (Communication tester is used if needed)
2. Analyzer resolution bandwidth is set ≥ DTS bandwidth
3. Detector set to peak and max hold
4. Sweep time is set to auto
5. After the trace has stabilized a marker is set to peak of envelope

3.6.6 Results

Test Results - DH5				
Channel [MHz]	Power [dBm]	Power [W]	Limit [W]	Verdict
2402	-0.012	0.0010	1.0	PASS
2441	2.461	0.0018	1.0	PASS
2480	3.025	0.0020	1.0	PASS

Peak Conducted Output Power

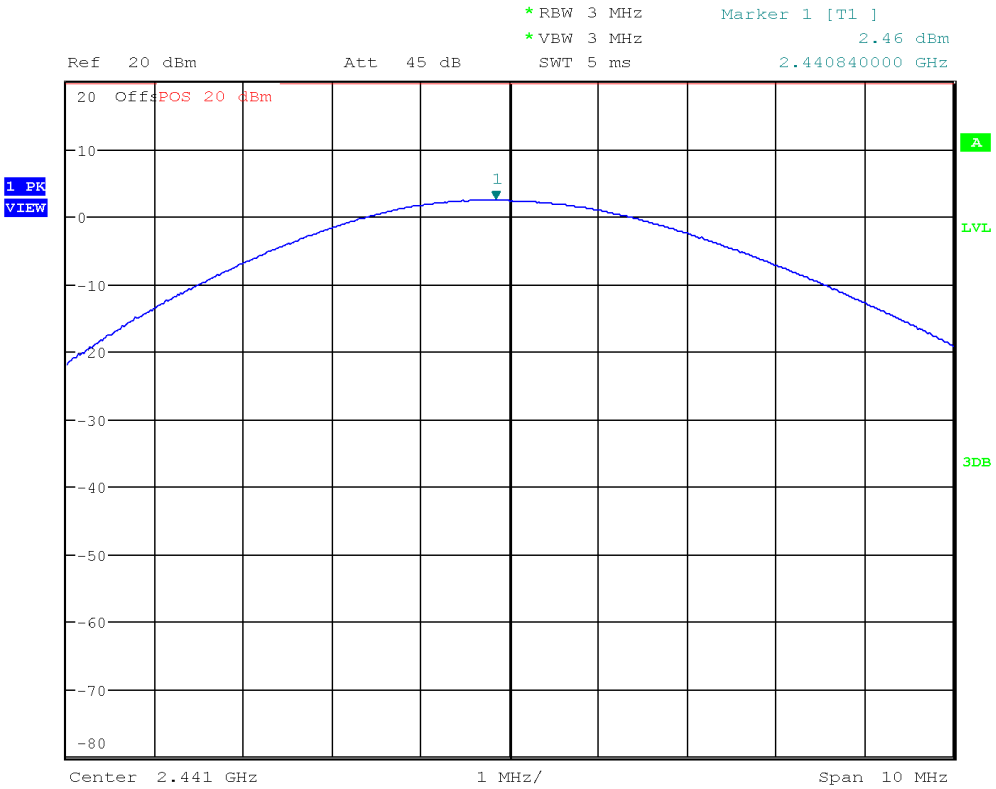
Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Peak Power [dBm]:	-0.012
Peak Power [W]:	0.0010



Date: 25.FEB.2022 11:49:19

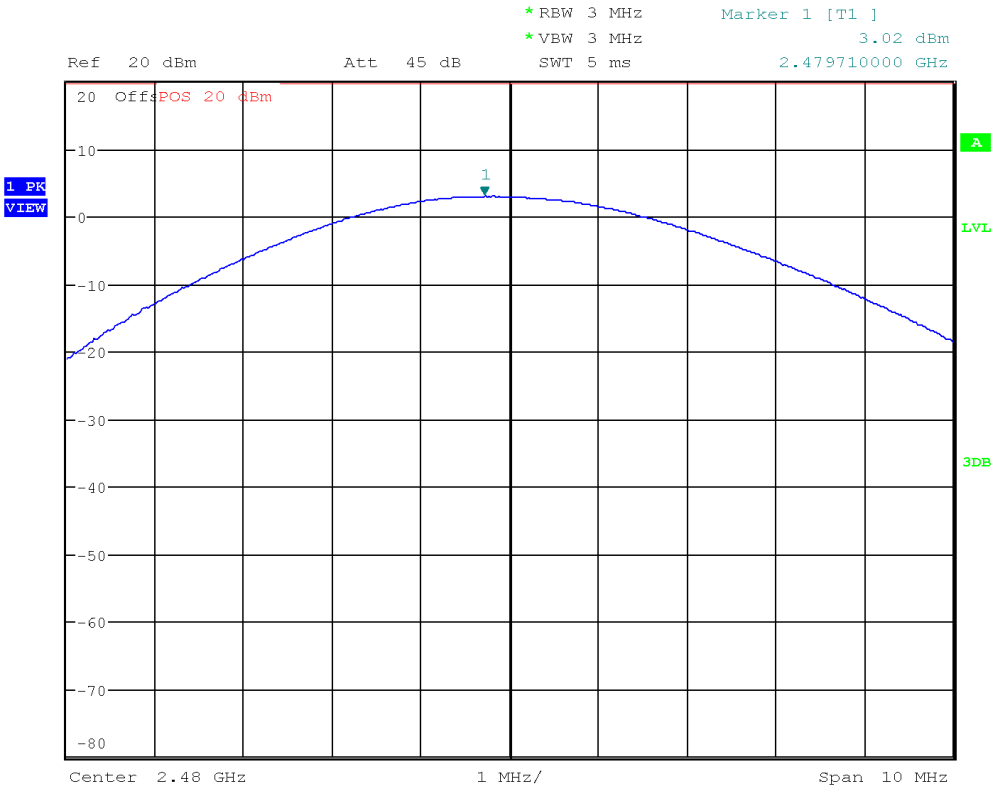
Peak Conducted Output Power

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Peak Power [dBm]:	2.461
Peak Power [W]:	0.0018



Peak Conducted Output Power

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.5
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Peak Power [dBm]:	3.025
Peak Power [W]:	0.0020



3.7 Test Conditions and Results - AC powerline conducted emissions

3.7.1 Information

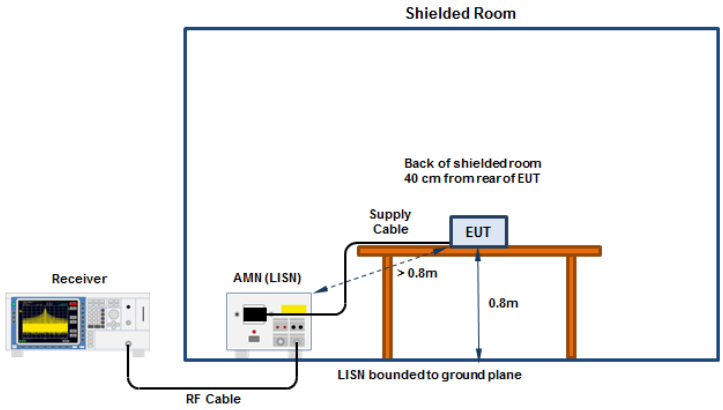
Test Information	
Reference	FCC § 15.207; ISED RSS-247, Issue 2 (section 3.1)
Measurement Method	ANSI C63.10 6.2
Measurement Uncertainty	± 3.82 dB
Operator	Odai Qawasmeh
Date	2022-02-24

3.7.2 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		

3.7.3 Setup

Test Setup



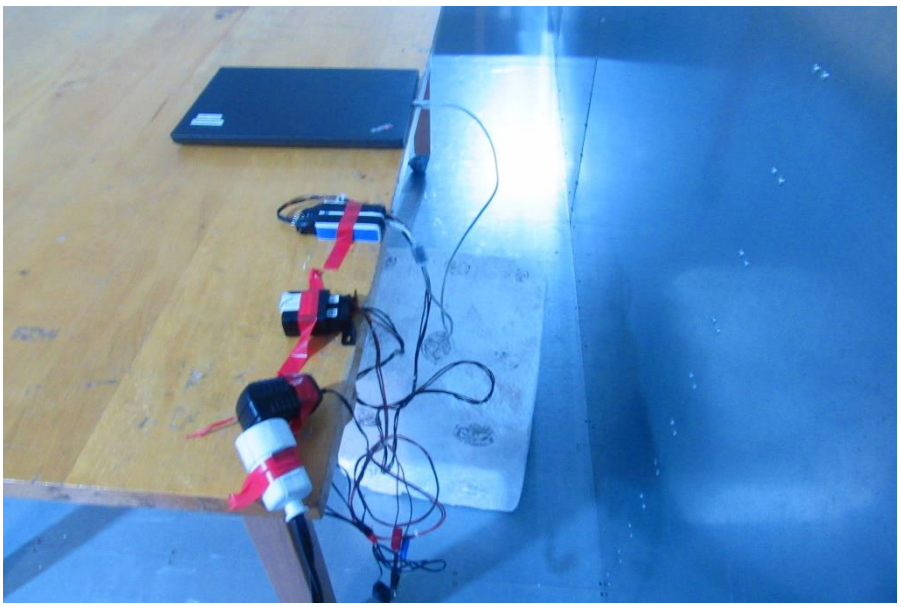
3.7.4 Equipment

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

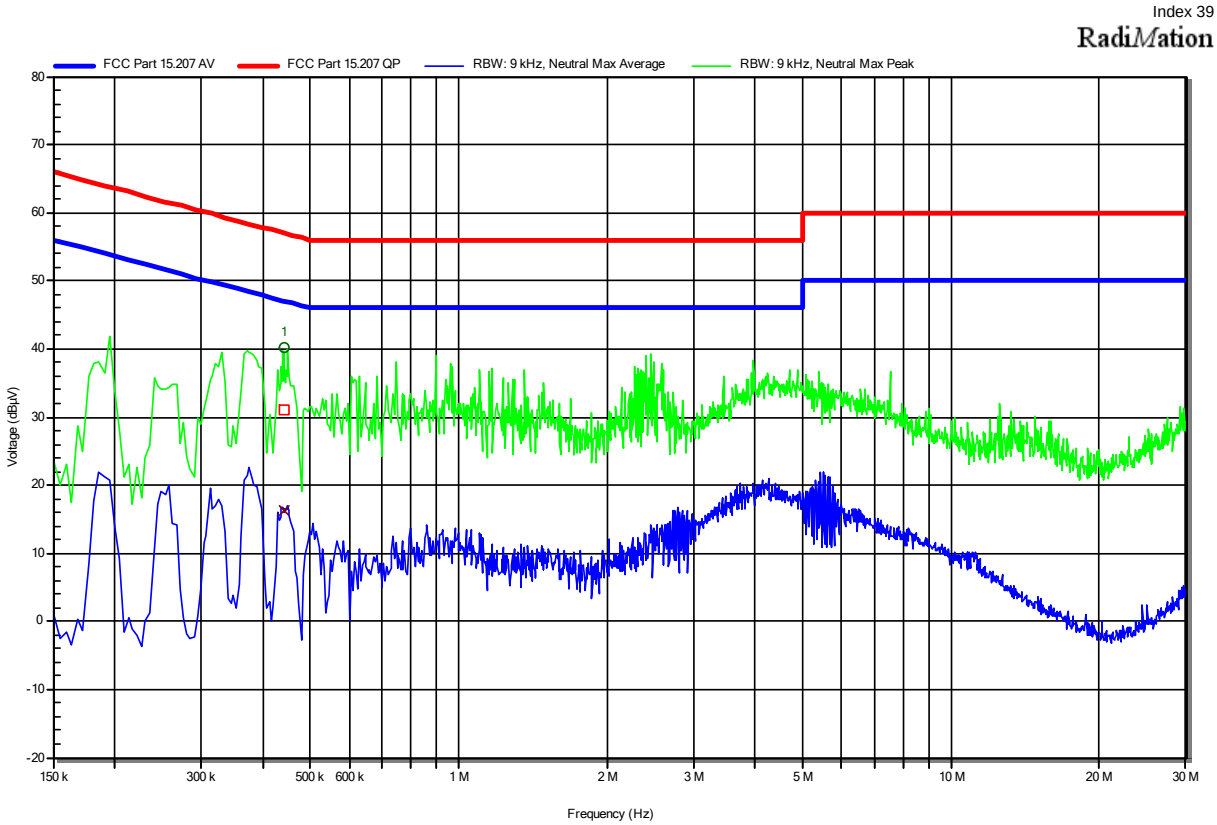
3.7.5 Setup Photos

Setup 150 kHz - 30 Mhz


Setup 150 kHz - 30 Mhz


Conducted emissions at the mains power port according to Part 15.247, FCC Part 22H, ISED RSS-247, Issue 2, ISED RSS-132, Issue 3

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Test Date:	2022-02-24
Operating Conditions:	ambient temperature: 24 °Celsius power input: 12 VDC
LISN:	Schwarzbeck NSLK 8127 RC N
Operational Mode & EUT Configuration:	BT; DH5; 2480 MHz + GNSS + GSM 850 CH 189 Tx
Applied to Port:	Mains
Note 1:	

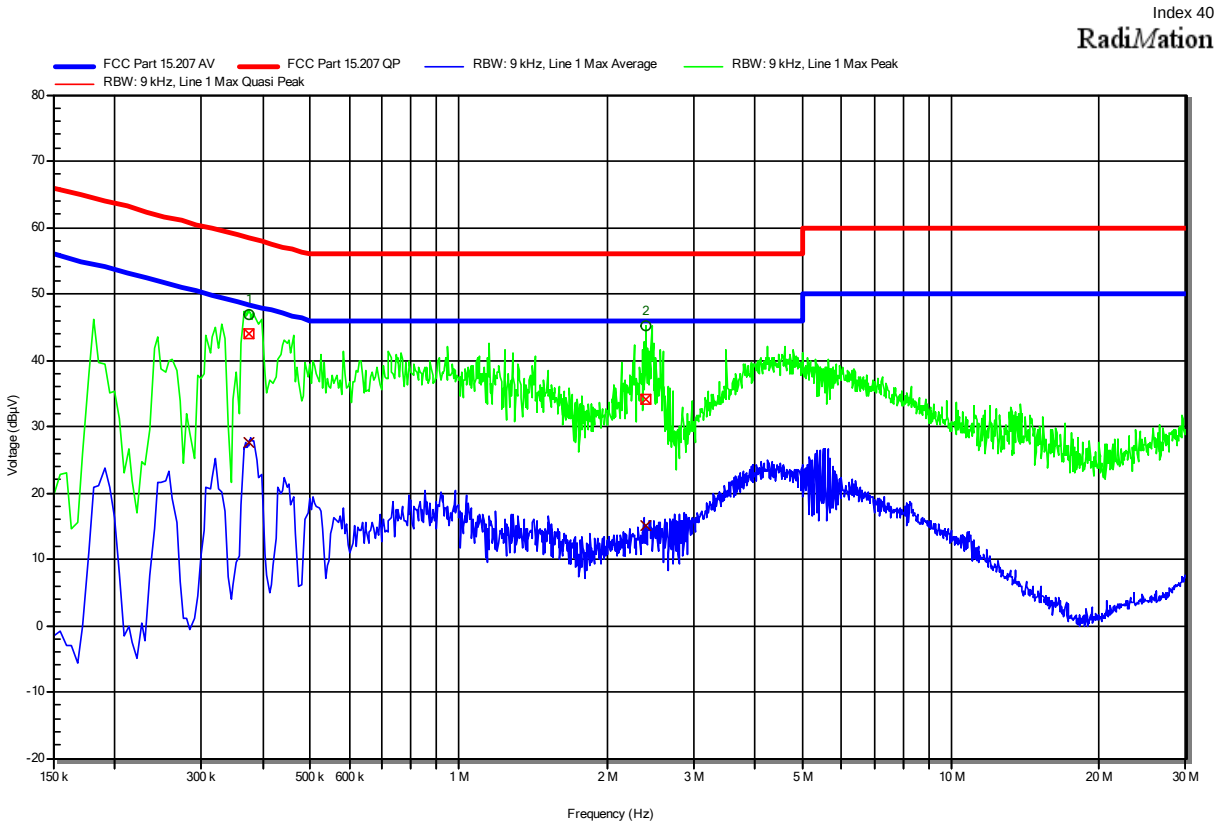


Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	442.5 kHz	31.06 dBµV	57.01 dBµV	-25.96 dB	Pass	Neutral

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	442.5 kHz	16.3 dBµV	47.01 dBµV	-30.71 dB	Pass	Neutral

Conducted emissions at the mains power port according to Part 15.247, FCC Part 22H, ISED RSS-247, Issue 2, ISED RSS-132, Issue 3

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Test Date:	2022-02-24
Operating Conditions:	ambient temperature: 24 °Celsius power input: 12 VDC
LISN:	Schwarzbeck NSLK 8127 RC L
Operational Mode & EUT Configuration:	BT; DH5; 2480 MHz + GNSS + GSM 850 CH 189 Tx
Applied to Port:	Mains
Note 1:	



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	LISN
1	375 kHz	44.07 dBµV	58.39 dBµV	-14.32 dB	Pass	Line 1
2	2.4 MHz	33.98 dBµV	56 dBµV	-22.02 dB	Pass	Line 1

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	375 kHz	27.6 dBµV	48.39 dBµV	-20.79 dB	Pass	Line 1
2	2.4 MHz	15.15 dBµV	46 dBµV	-30.85 dB	Pass	Line 1

3.8 Test Conditions and Results - Band-edge compliance

3.8.1 Information

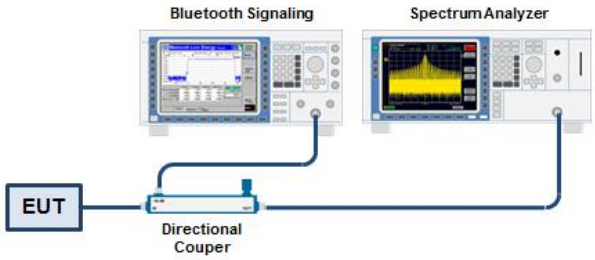
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 3.64 dB
Measurement Method	ANSI C63.10 6.10
Operator	Odai Qawasmeh
Date	2022-02-25

3.8.2 Limits

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

3.8.3 Setup

Test Setup



3.8.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.8.5 Procedure

Test Procedure

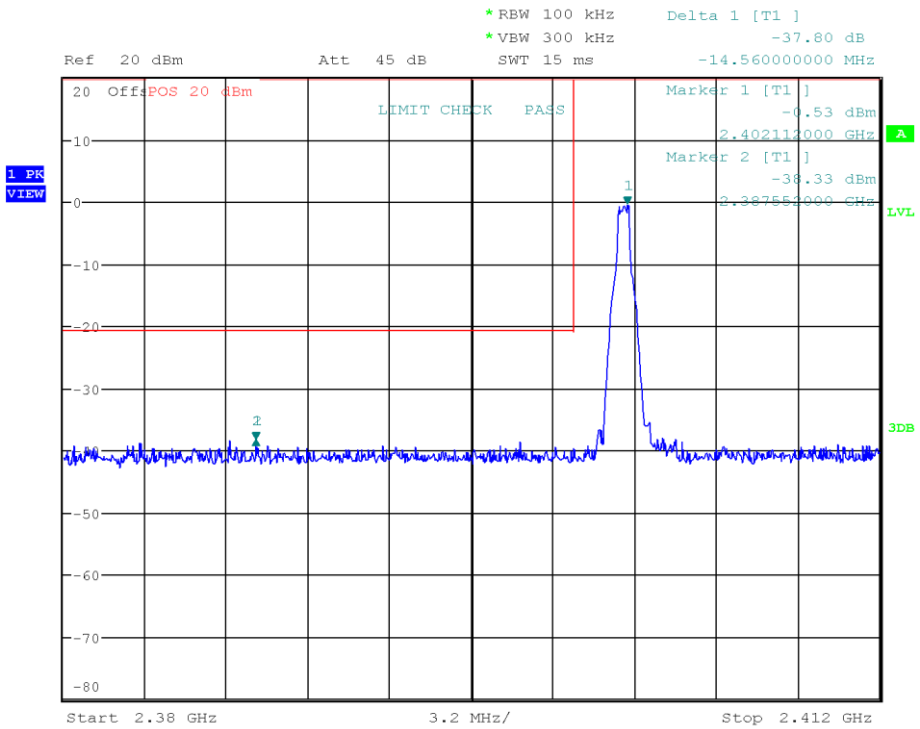
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is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

3.8.6 Results

Test Results				
Mode	Channel [MHz]	Out-of-band Attenuation [dB]	Limit [dB]	Verdict
DH5 single	2402	-38.328	-20	PASS
DH5 single	2480	-37.946	-20	PASS
DH5 hopping	2402	-37.529	-20	PASS
DH5 hopping	2480	-37.453	-20	PASS

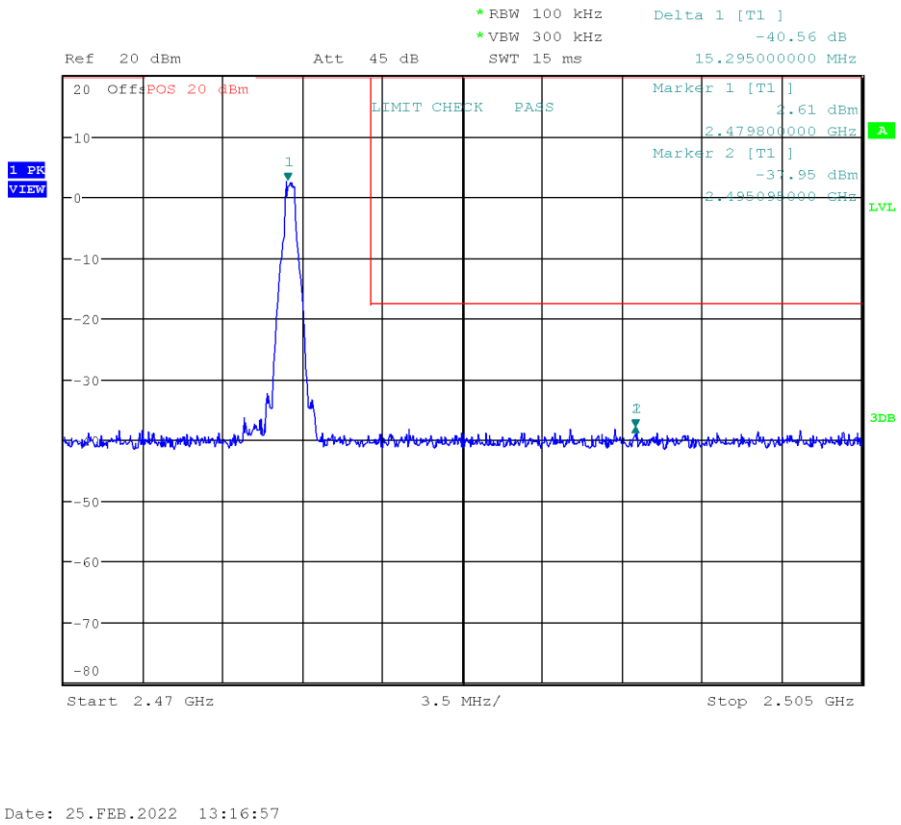
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Band-edge	Lower
In-band Frequency [MHz]:	2402.112
Max. in-band Level [dBm/100 kHz]:	-0.53
Out-of-band Frequency [MHz]:	2387.552
Max. out-of-band Level [dBm/100 kHz]:	-38.328
Attenuation [dB]:	-37.8



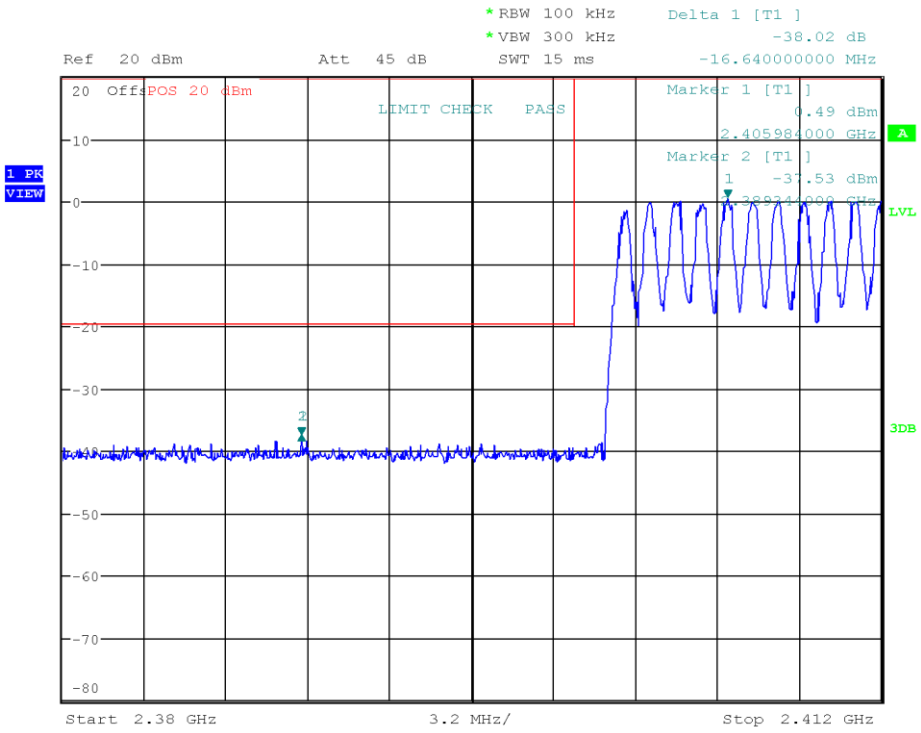
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Band-edge	Upper
In-band Frequency [MHz]:	2479.8
Max. in-band Level [dBm/100 kHz]:	2.609
Out-of-band Frequency [MHz]:	2495.095
Max. out-of-band Level [dBm/100 kHz]:	-37.946
Attenuation [dB]:	-40.55



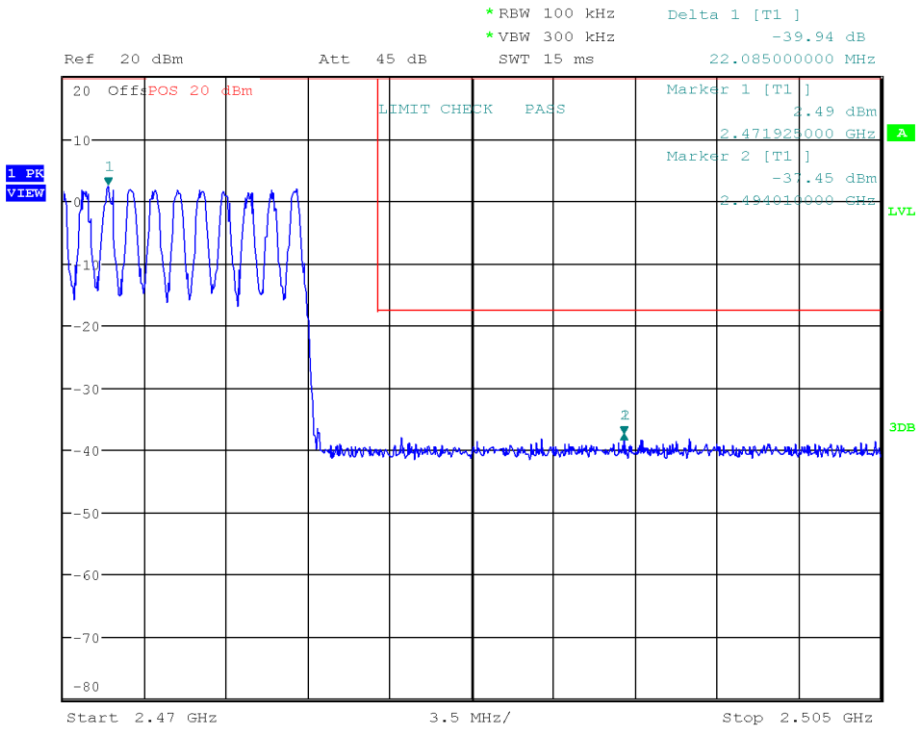
Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Band-edge	Lower
In-band Frequency [MHz]:	2405.984
Max. in-band Level [dBm/100 kHz]:	0.489
Out-of-band Frequency [MHz]:	2389.344
Max. out-of-band Level [dBm/100 kHz]:	-37.529
Attenuation [dB]:	-38.02



Emissions in nonrestricted frequency bands at the Band-edge

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.6, 6.10.4
Operational Mode:	DH5, Hopping
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Band-edge	Upper
In-band Frequency [MHz]:	2471.925
Max. in-band Level [dBm/100 kHz]:	2.485
Out-of-band Frequency [MHz]:	2494.01
Max. out-of-band Level [dBm/100 kHz]:	-37.453
Attenuation [dB]:	-39.94



3.9 Test Conditions and Results - Conducted spurious emissions

3.9.1 Information

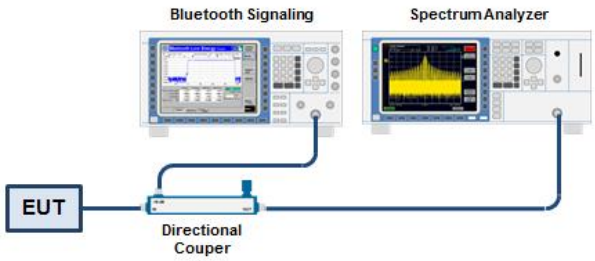
Test Information	
Reference	FCC § 15.247(d); ISED RSS-247, Issue 2 (section 5.5)
Measurement Uncertainty	± 4.25 dB
Measurement Method	ANSI C63.10 6.10
Operator	Odai Qawasmeh
Date	2022-02-25

3.9.2 Limits

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

3.9.3 Setup

Test Setup



3.9.4 Equipment

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyser	R&S	FSU 26	EF01407	2021-08	2022-08
Cable	Huber+Suhner	Sucoflex	EF00779 CAABQ	2022-02	2023-02
Cable (only signaling)	Gigalane	1730	EF00779 CAABB	2022-02	2023-02
Dual directional coupler	Krytar	SMA, 1850	EF01539	2021-07	2022-07

3.9.5 Procedure

Test Procedure

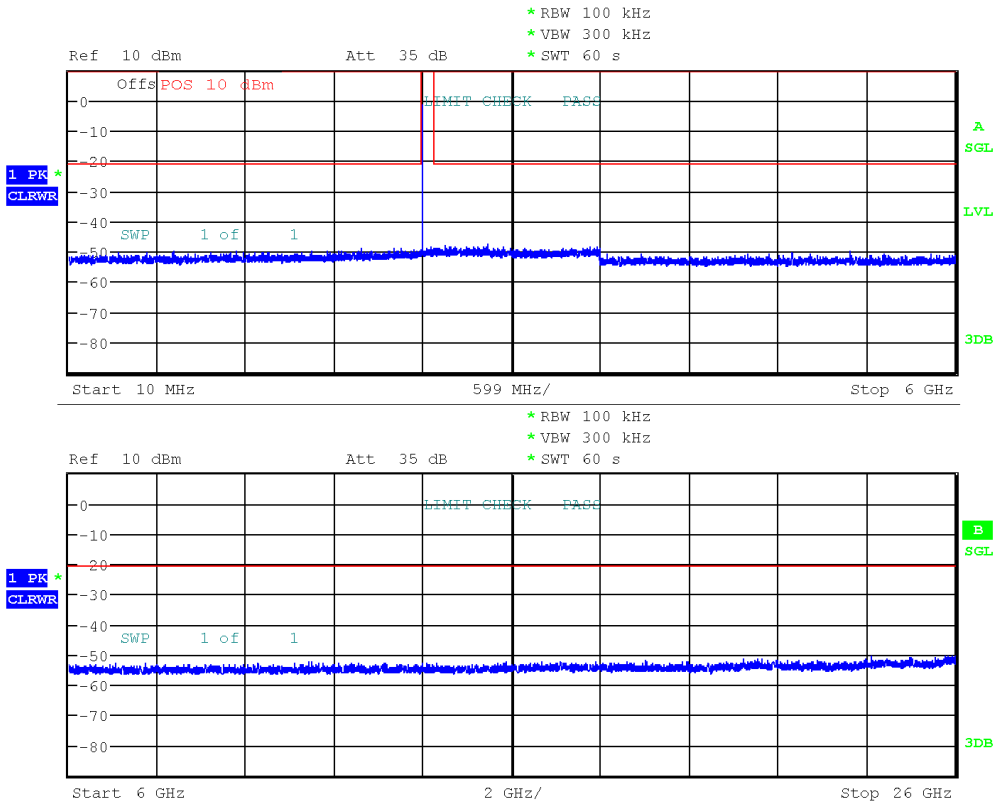
1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels outside frequency band

3.9.6 Results

Test Results		
Mode	Channel [MHz]	Verdict
DH5	2402	PASS
DH5	2441	PASS
DH5	2480	PASS

Conducted Spurious Emissions

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 0, 2402 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Max. in-band Frequency [MHz]:	2401.9
Max. in-band Level [dBm/100 kHz]:	-0.8
Out-of-band Limit [dBm/100 kHz]:	-20.8



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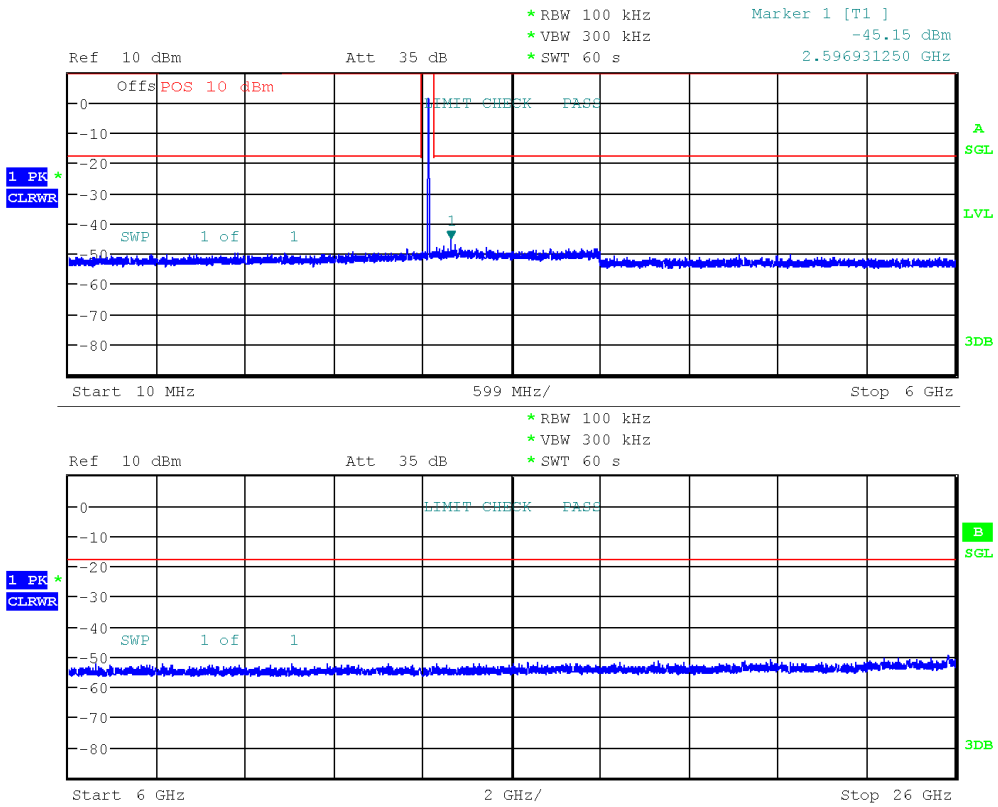
Conducted Spurious Emissions

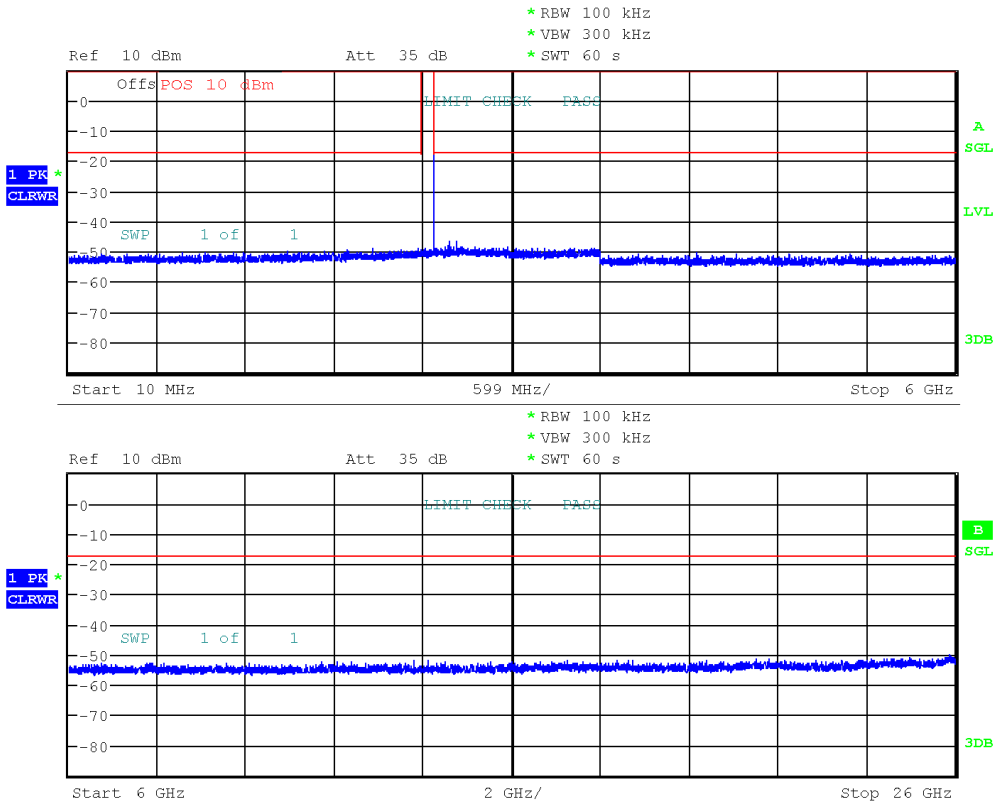
Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 39, 2441 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Max. in-band Frequency [MHz]:	2441.1
Max. in-band Level [dBm/100 kHz]:	2.0
Out-of-band Limit [dBm/100 kHz]:	-18.0



Date: 25.FEB.2022 13:59:16

Conducted Spurious Emissions

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38035
Reference Standards:	FCC 15.247, RSS-247
Reference Method:	ANSI C63.10:2013, Section 7.8.8
Operational Mode:	DH5, Channel: 78, 2480 MHz
Operating Conditions:	Tnom/Vnom
Operator:	Odai Qawasmeh
Test Site:	Eurofins Product Service GmbH
Test Date:	2022-02-25
Max. in-band Frequency [MHz]:	2480.1
Max. in-band Level [dBm/100 kHz]:	2.7
Out-of-band Limit [dBm/100 kHz]:	-17.3



Date: 25.FEB.2022 14:02:25

3.10 Test Conditions and Results - Transmitter radiated emissions

3.10.1 Information

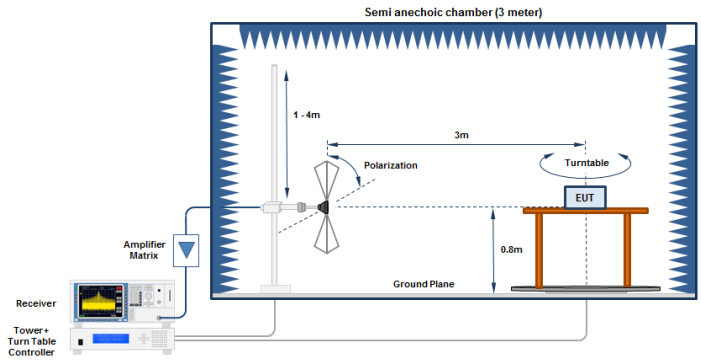
Test Information	
Reference	FCC § 15.247(d); FCC § 15.209; ISED RSS-Gen, Issue 5 A2 (section 6.13)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.10 6.4, 6.5, 6.6
Operator	Odai Qawasmeh
Date	2022-02-14

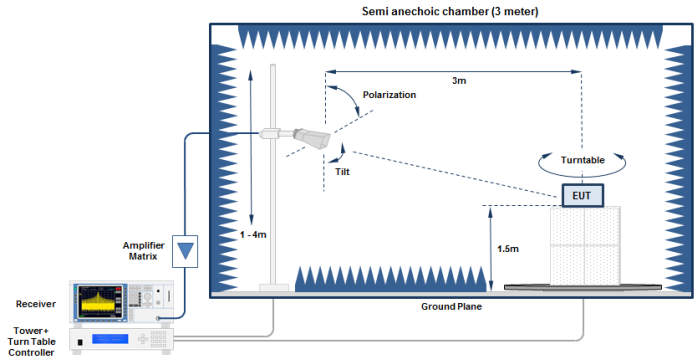
3.10.2 Limits

Limits			
Frequency range [MHz]	Detector	Field strength [µV/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

3.10.3 Setup

Test Setup 30 MHz - 1000 MHz



Test Setup > 1 GHz


3.10.4 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	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 2	EF01616	2021-09	2022-09
Spectrum analyzer	R&S	FSU43	EF01631	2021-07	2022-07
Horn antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2022-03
Horn Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03
Antenna	Amplifier Research	AT4560	EF00302	2021-06	2023-06

3.10.5 Procedure

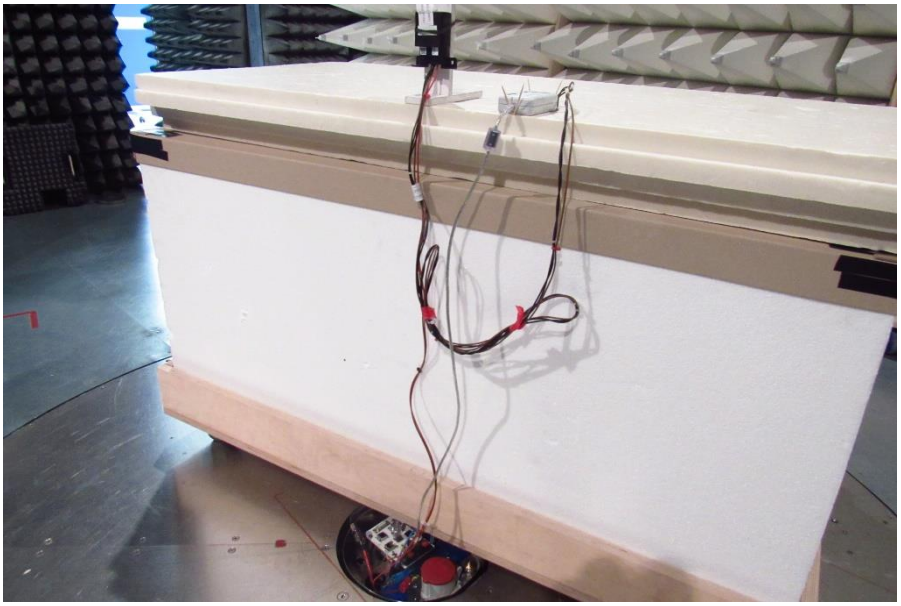
Test Procedure 30 MHz - 1000 MHz
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m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

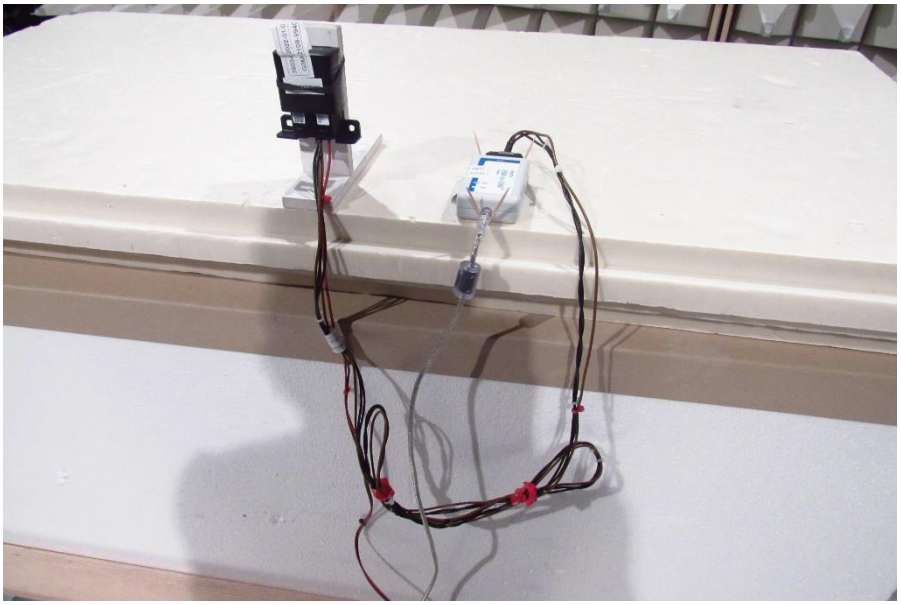
Test Procedure > 1 GHz
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to test mode 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m 5. All significant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

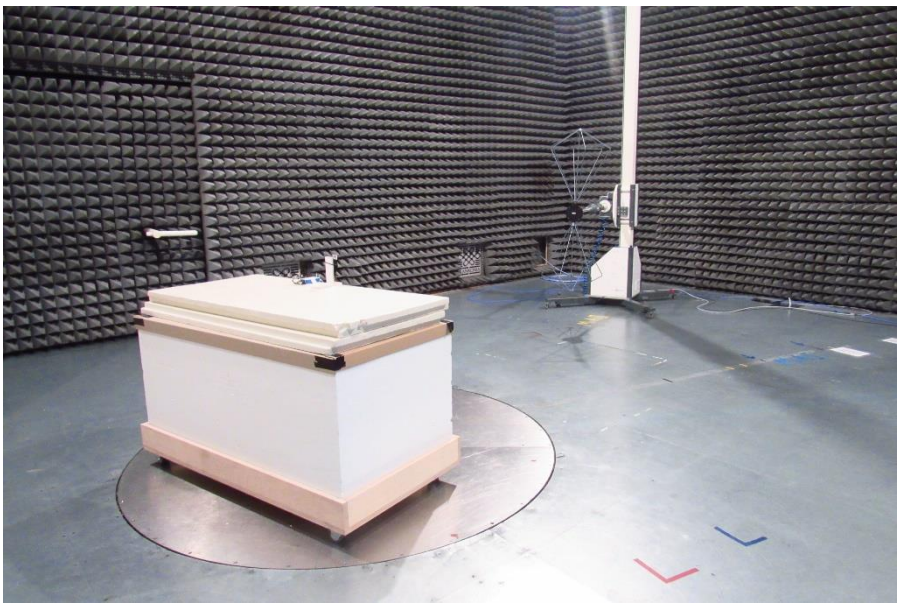
3.10.6 Results

Test Results - DH5						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2402	73.724	22.30	pk	ver	40.00	-17.69
2402	115.4462	28.00	pk	ver	43.50	-15.54
2402	2330.2	57.81	pk	ver	74.00	-16.19
2402	2330.2	45.04	avg	ver	54.00	-08.96
2402	7613.2	43.87	pk	ver	74.00	-30.13
2402	7613.2	31.59	avg	ver	54.00	-22.41
2402	17765	43.53	pk	ver	74.00	-30.47
2402	17765	33.51	avg	ver	54.00	-20.49
2402	18366	47.66	pk	ver	74.00	-26.34
2402	18366	35.89	avg	ver	54.00	-18.11
2441	73.588	22.70	pk	ver	40.00	-17.28
2441	114.983	27.40	pk	ver	43.50	-16.09
2441	4882.1	40.45	pk	ver	74.00	-33.55
2441	4882.1	33.04	avg	ver	54.00	-20.96
2441	19574	48.21	pk	ver	74.00	-25.79
2441	19574	35.66	avg	ver	54.00	-18.34
2480	74.0342	22.30	pk	ver	40.00	-17.71
2480	121.8807	29.40	pk	ver	43.50	-14.15
2480	4959.9	39.77	pk	ver	74.00	-34.23
2480	4959.9	34.84	avg	ver	54.00	-19.16
2480	18365	47.60	pk	ver	74.00	-26.40
2480	18365	37.07	avg	ver	54.00	-16.93

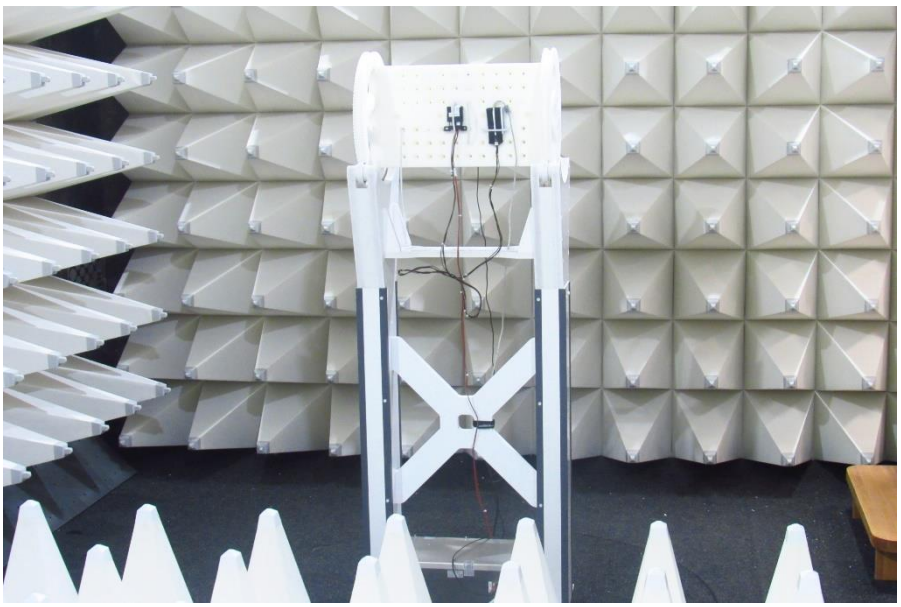
3.10.7 Setup Photos

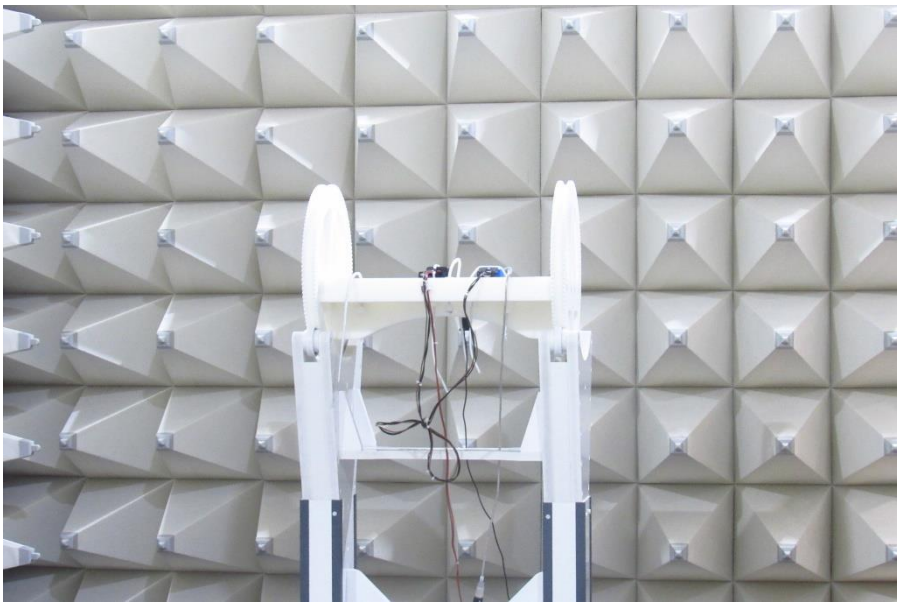
EUT Setup below 1 GHz


EUT Setup below 1 GHz


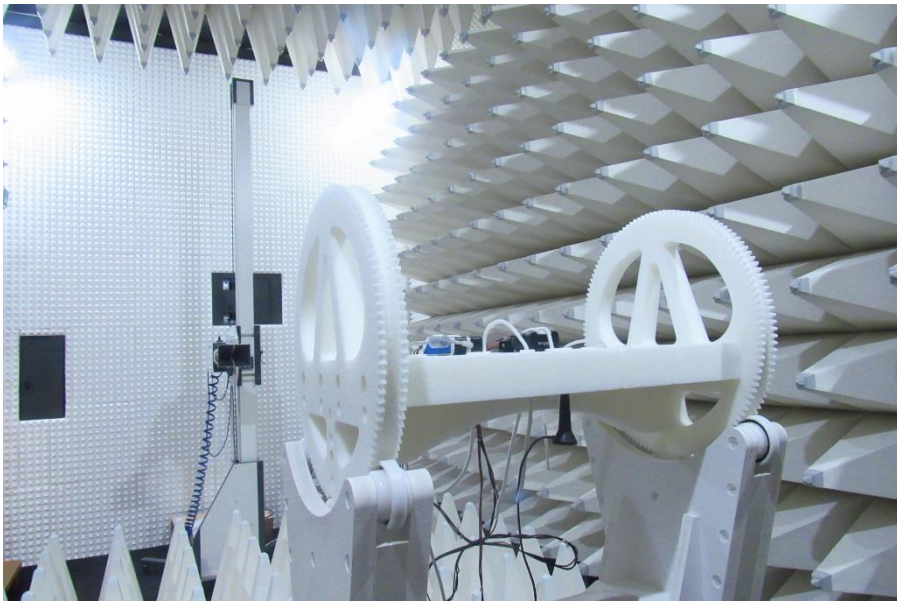
Tx below 1 GHz


Tx below 1 GHz

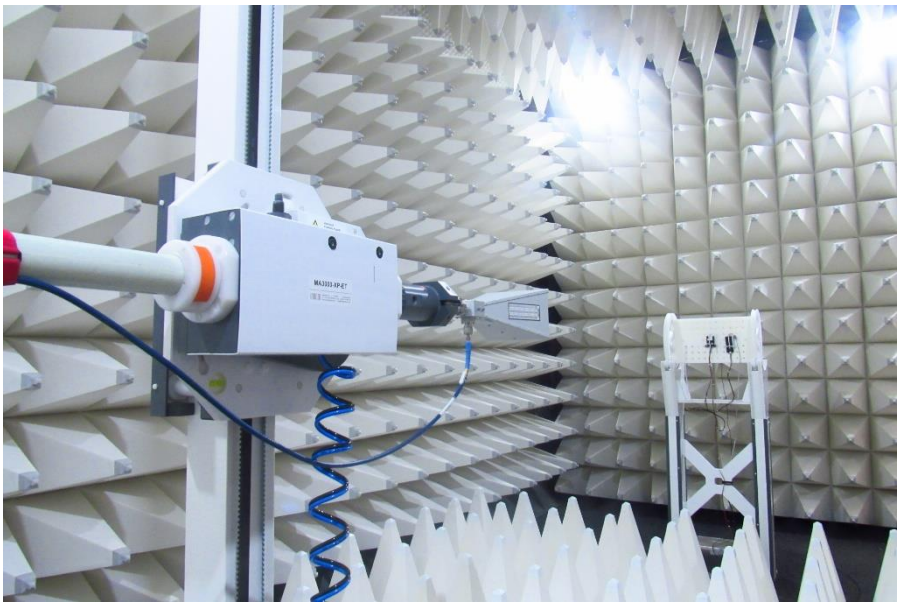

EUT Setup above 1 GHz


EUT Setup above 1 GHz


EUT Setup above 1 GHz



Tx above 1 GHz



3.11 Test Conditions and Results - Receiver radiated emissions

3.11.1 Information

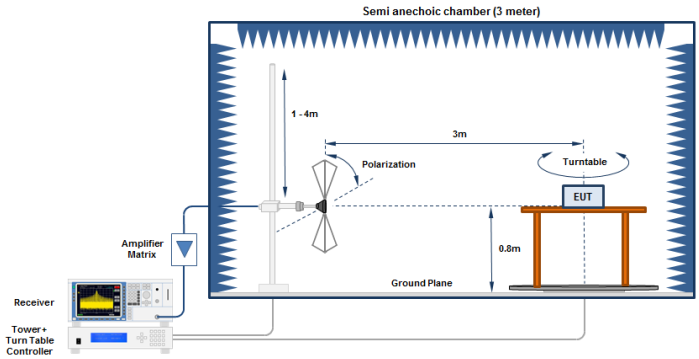
Test Information	
Reference	ISED RSS-247, Issue 2 (section 3.1)
Measurement Uncertainty	± 5.95 dB
Measurement Method	ANSI C63.4-2014 8.1-8.3
Operator	Odai Qawasmeh
Date	2022-02-25

3.11.2 Limits

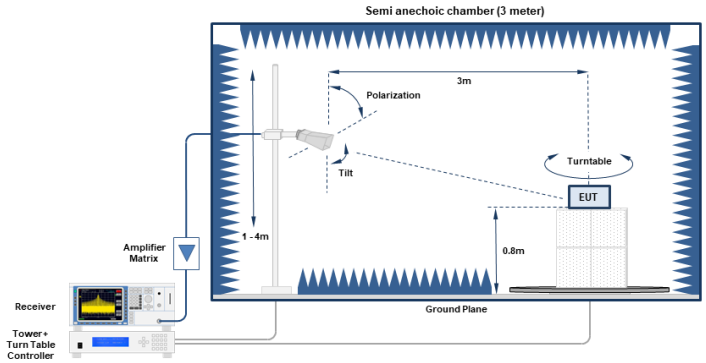
Limits			
Frequency range [MHz]	Detector	Field strength [µV/m]	Measurement distance [m]
30 - 88	Quasi-Peak	100	3
88 - 216	Quasi-Peak	150	3
216 - 960	Quasi-Peak	200	3
960 - 1000	Quasi-Peak	500	3
>1000	Average	500	3

3.11.3 Setup

Test Setup 30 MHz - 1000 MHz



Test Setup > 1 GHz



3.11.4 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	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Antenna	R&S	HK 116	EF00030	2021-05	2024-05
Antenna	R&S	HL 223	EF00212	2019-05	2022-05

Test Equipment > 1 GHz					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic Chamber	Frankonia	AC1	EF00062	2021-02	2024-02
Measurement Receiver	Agilent	N9038A-526/WXP	EF01070	2021-07	2022-07
Horn antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2022-03
Horn Antenna	Schwarzbeck	HWRD 650	EF01679	2021-03	2022-03

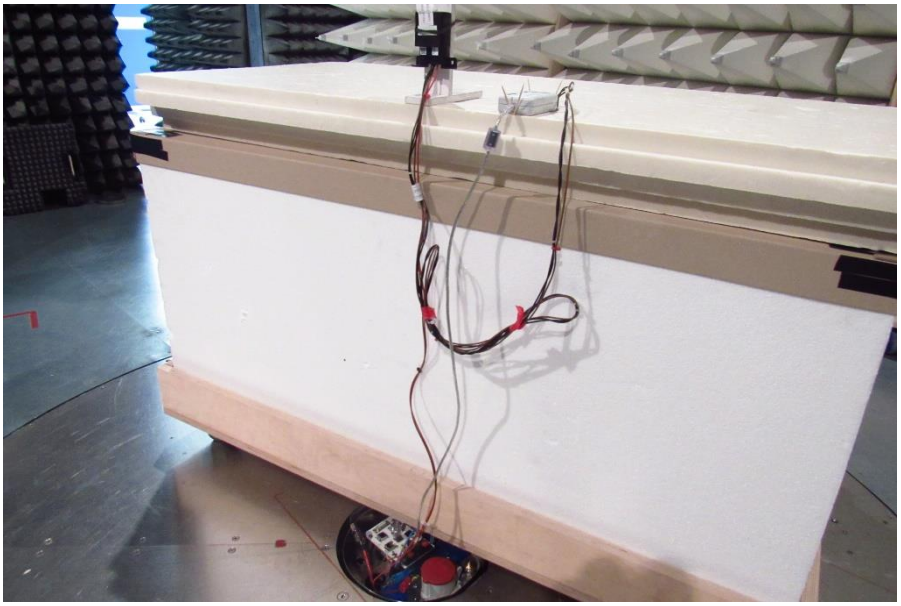
3.11.5 Procedure

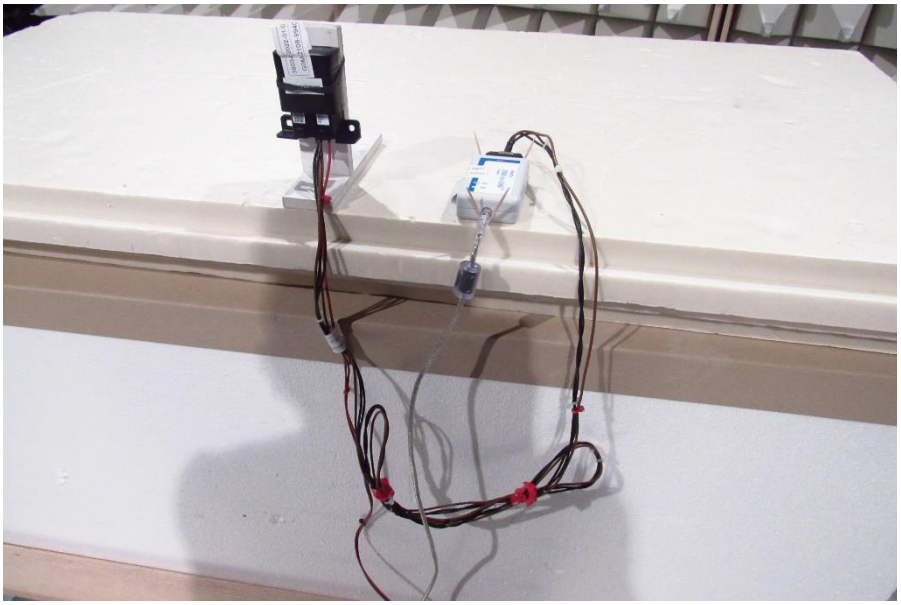
Test Procedure
1. EUT is placed on a non conducting support at the center of a turn table 0.8 m above the ground
2. EUT is set to test mode
3. The receiver is set to peak detection with max hold
4. The EUT is rotated through 360° and the height of the antenna is varied from 1 m to 4 m
5. All significant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

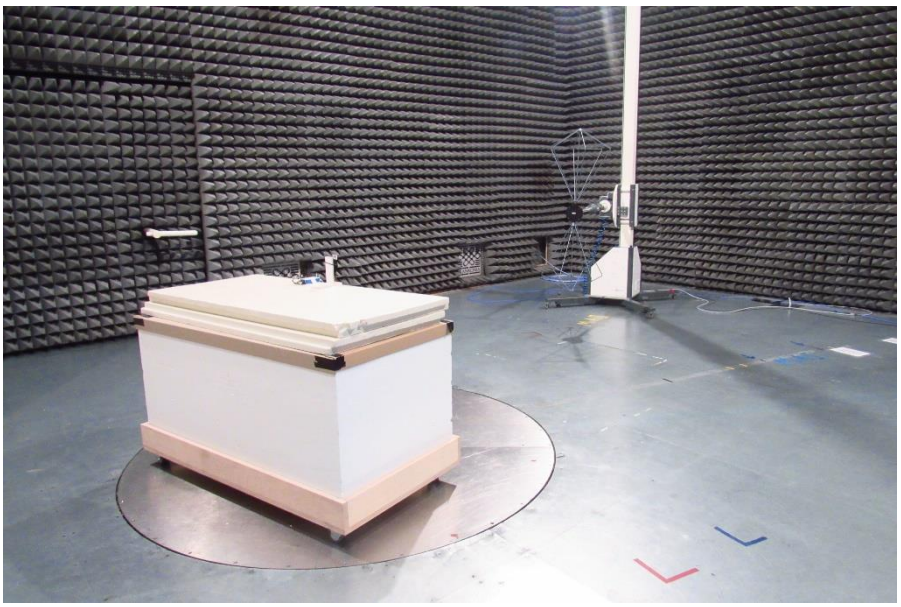
3.11.6 Results

Test Results						
Channel [MHz]	Emission [MHz]	Level [dBµV/m]	Det.	Pol.	Limit [dBµV/m]	Margin [dB]
2441	45.1682	30.00	pk	ver	40.00	-10.02
2441	55.6445	29.00	pk	ver	40.00	-11.02
2441	64.6205	28.70	pk	ver	40.00	-11.30
2441	296.28	28.10	pk	ver	46.00	-17.90

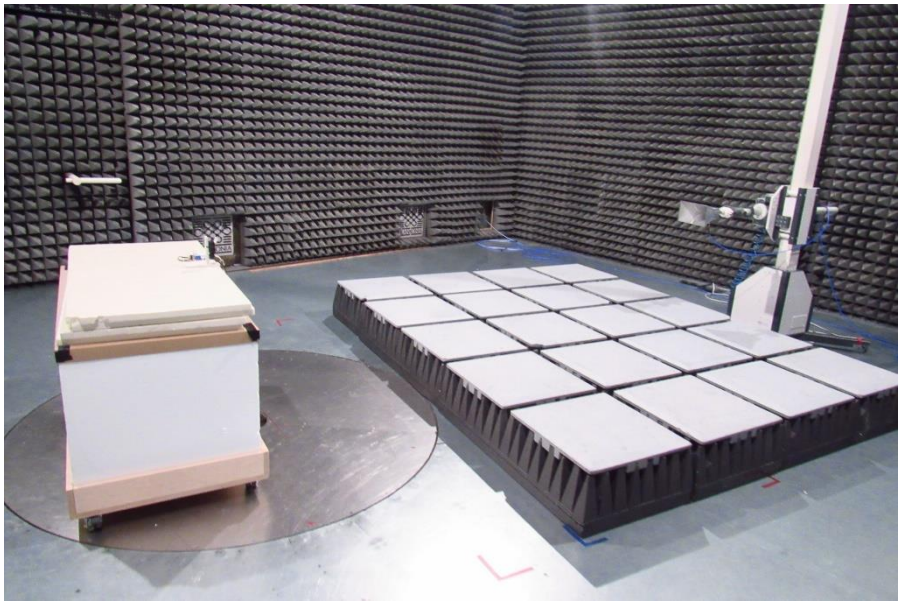
3.11.7 Setup Photos

EUT Setup below 1 GHz


EUT Setup below 1 GHz


Tx below 1 GHz


Tx below 1 GHz

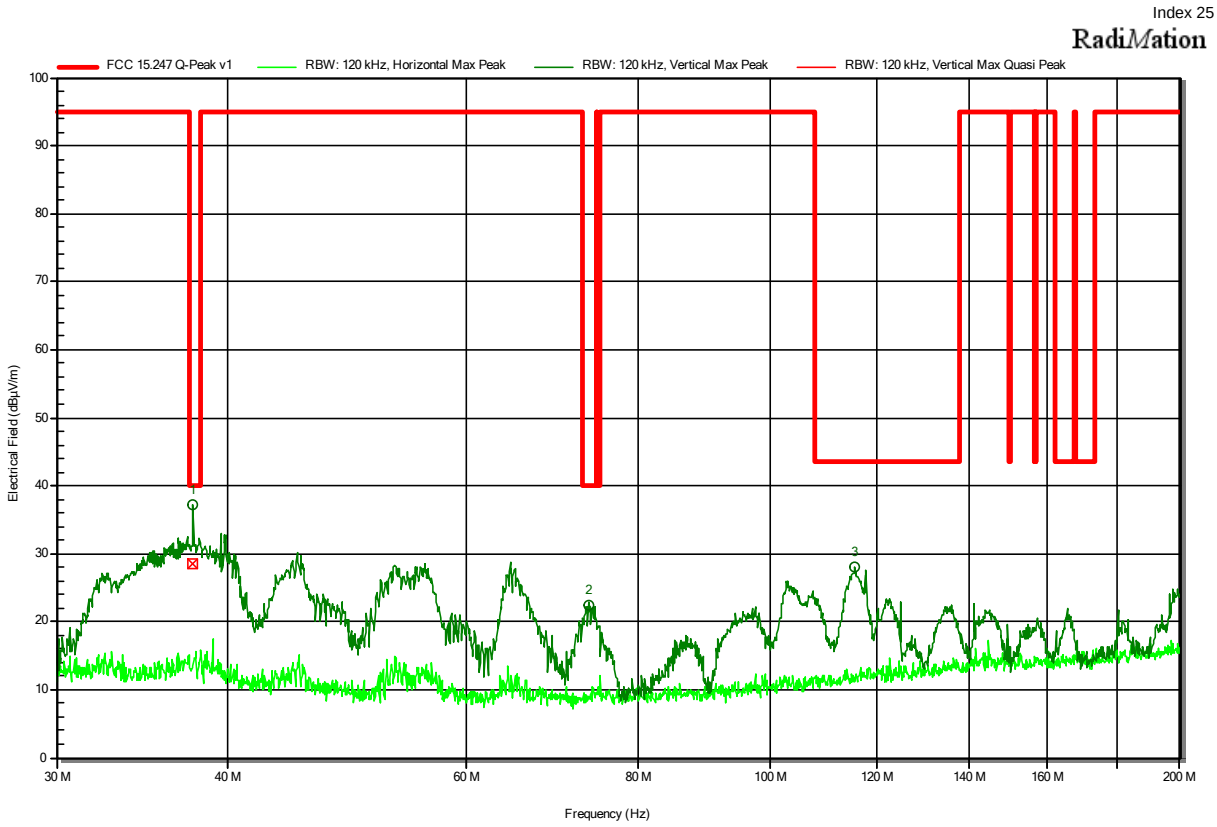

Rx above 1 GHz


Rx above 1 GHz


ANNEX A Transmitter spurious emissions

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
73.724 MHz	22.3 dBµV/m	40 dBµV/m	-17.69 dB	Pass	Vertical
115.4462 MHz	28 dBµV/m	43.5 dBµV/m	-15.54 dB	Pass	Vertical

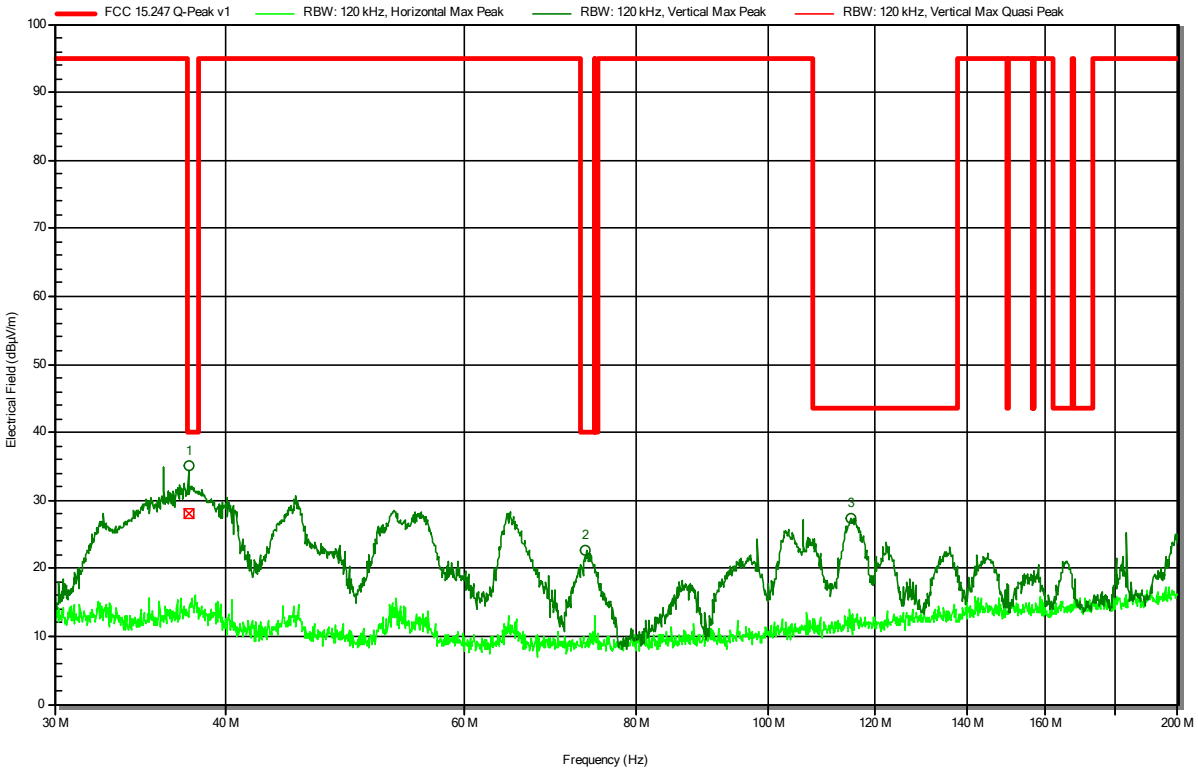
Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
37.7775 MHz	28.4 dBµV/m	40 dBµV/m	-11.56 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2441 MHz
Test Date:	2022-02-14
Note:	

Index 22

RadiMation



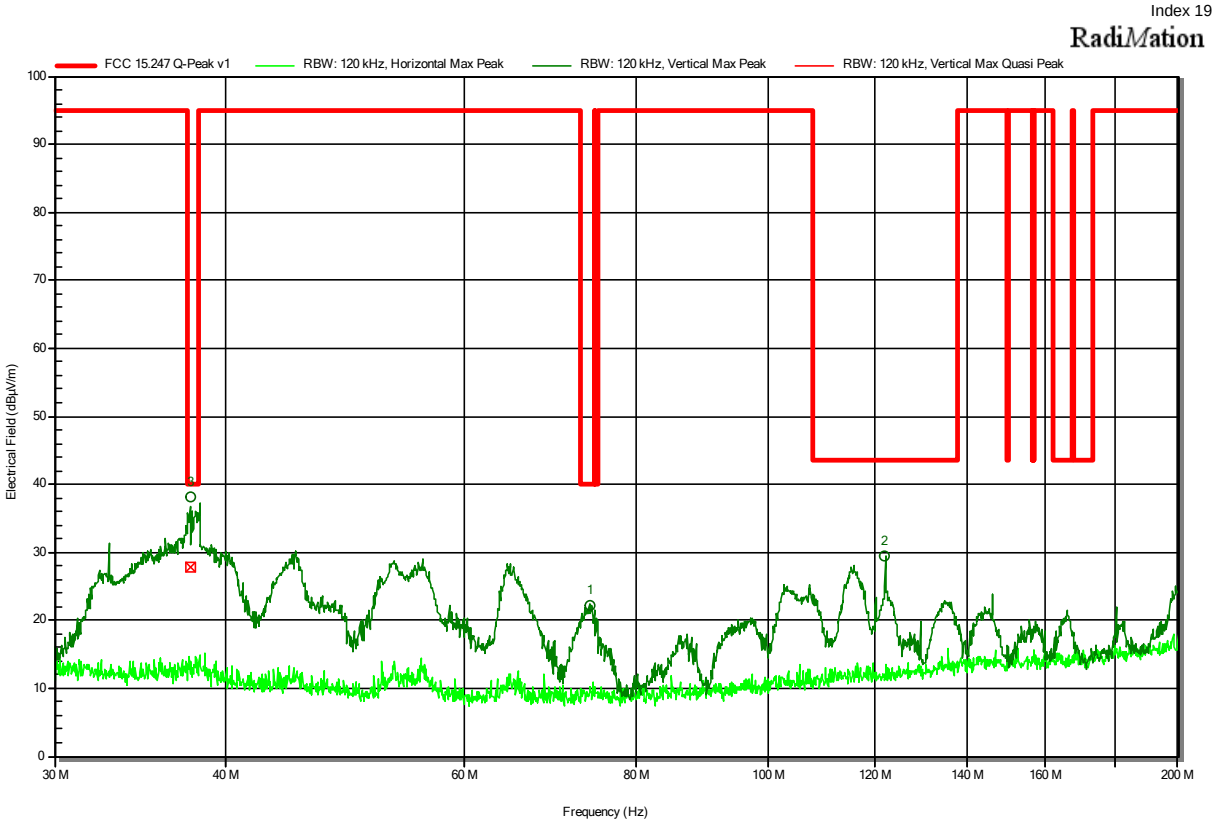
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
73.588 MHz	22.7 dBµV/m	40 dBµV/m	-17.28 dB	Pass	Vertical
114.983 MHz	27.4 dBµV/m	43.5 dBµV/m	-16.09 dB	Pass	Vertical

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
37.616 MHz	28.2 dBµV/m	40 dBµV/m	-11.84 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	

Index 19

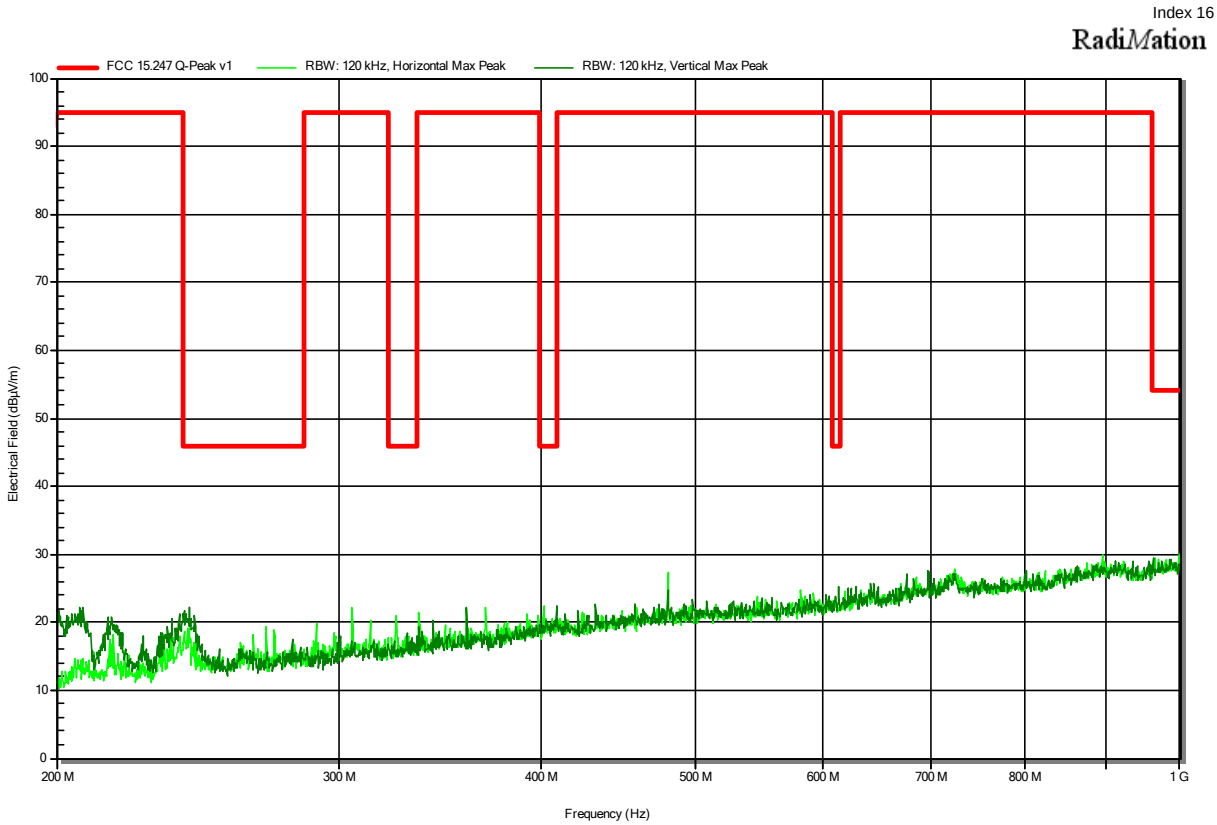


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
74.0342 MHz	22.3 dBµV/m	40 dBµV/m	-17.71 dB	Pass	Vertical
121.8807 MHz	29.4 dBµV/m	43.5 dBµV/m	-14.15 dB	Pass	Vertical

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
37.7933 MHz	27.8 dBµV/m	40 dBµV/m	-12.23 dB	Pass	Vertical

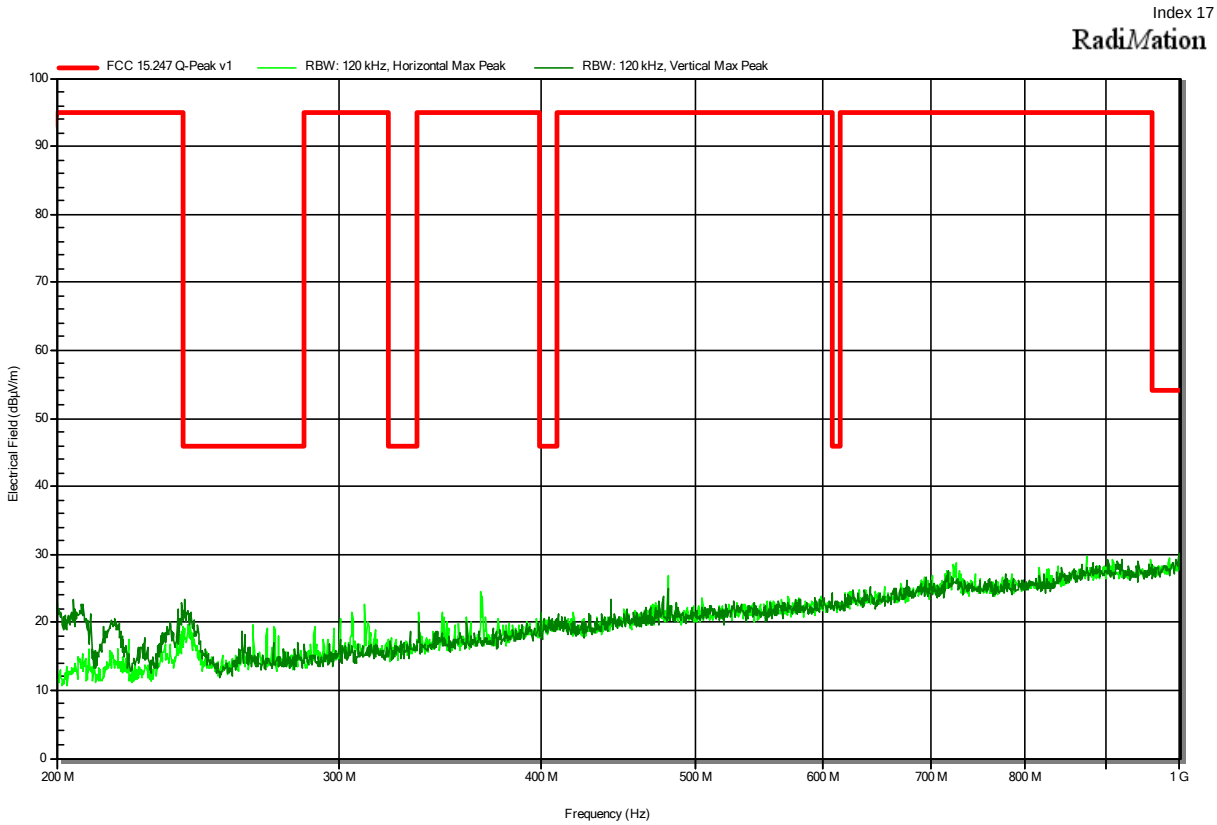
Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	



Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2441 MHz
Test Date:	2022-02-14
Note:	

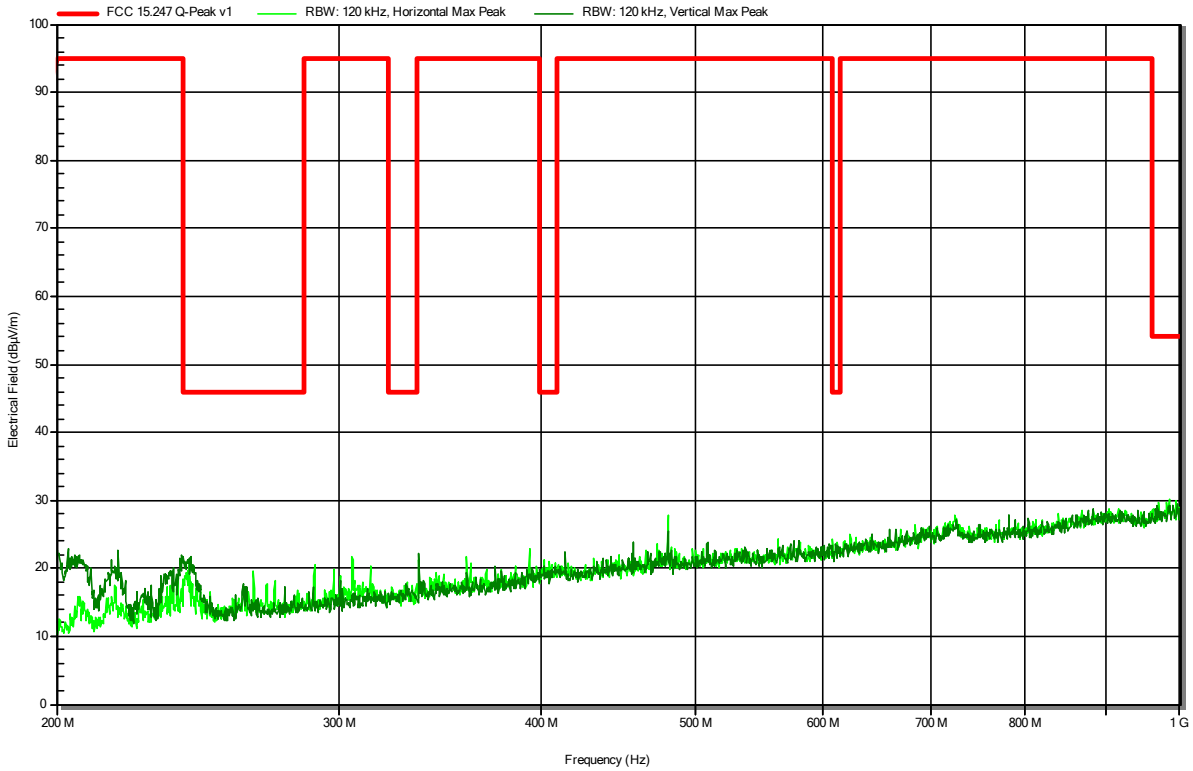


Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	

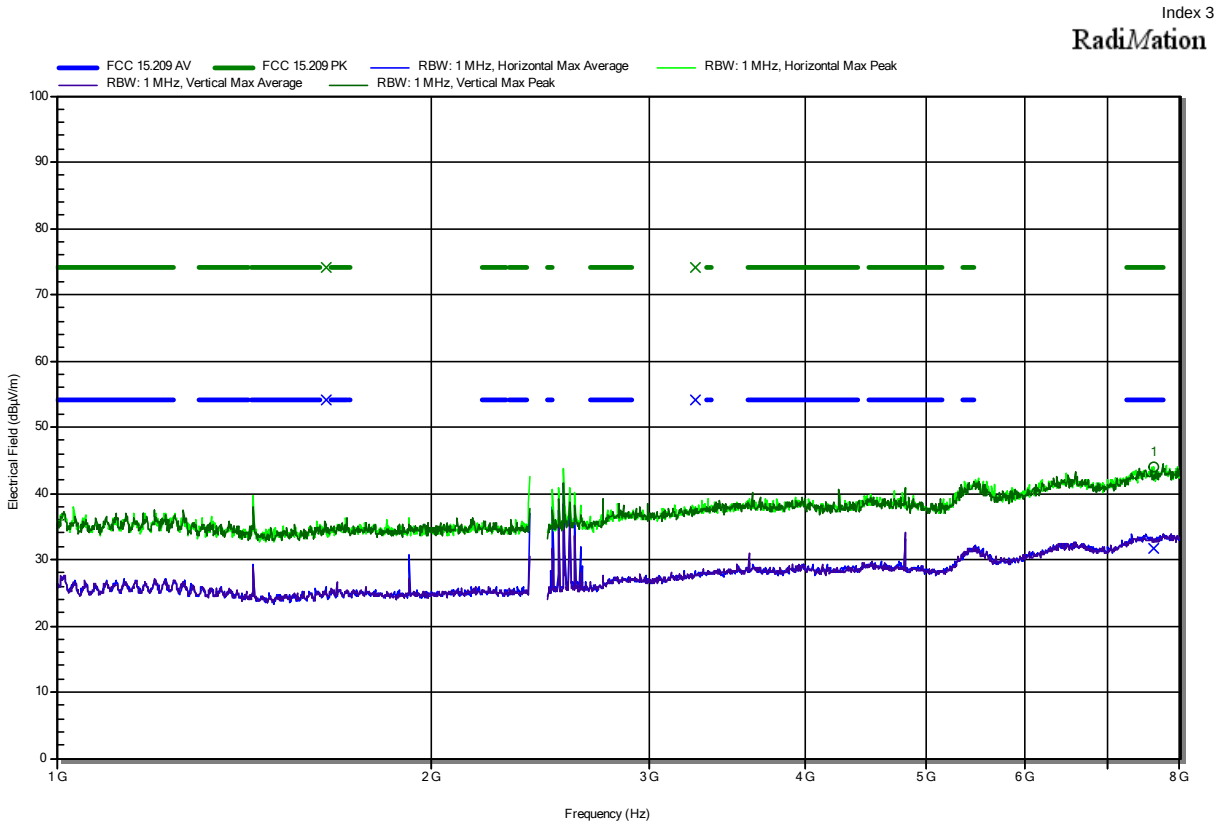
Index 18

RadiMation



Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
7.6132 GHz	43.87 dBµV/m	74 dBµV/m	-30.13 dB	Pass	Horizontal

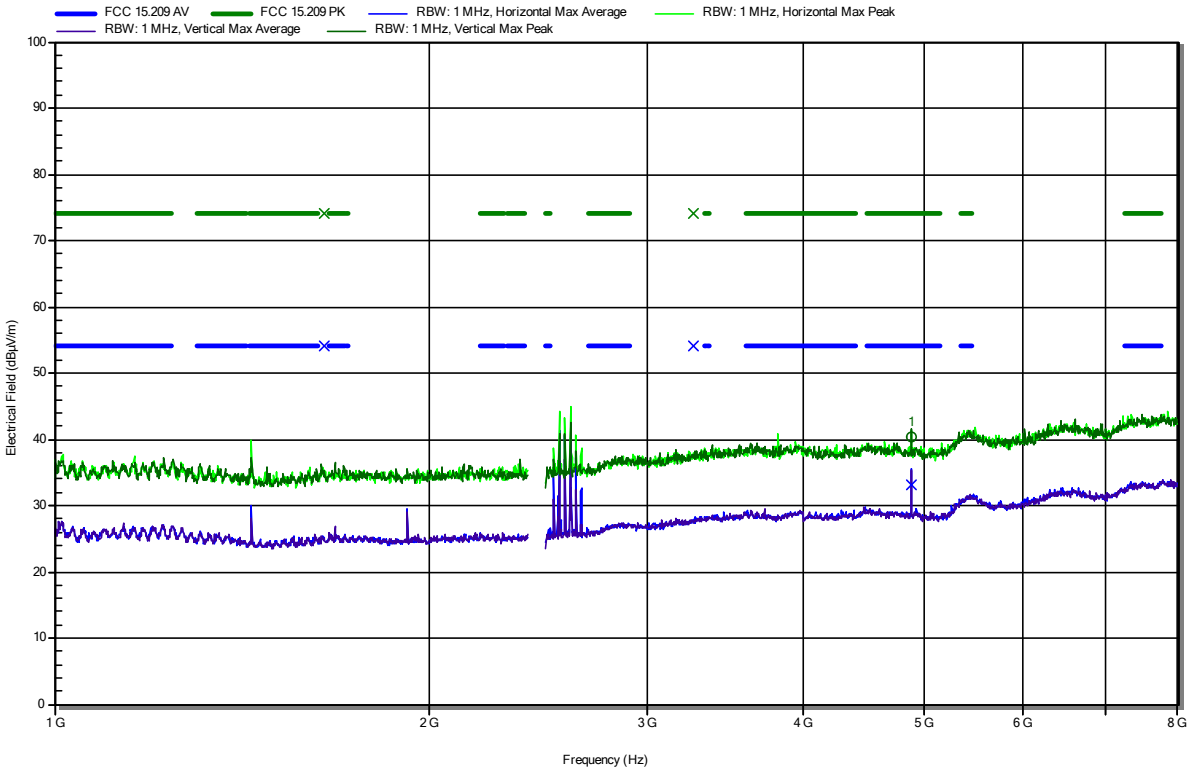
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
7.6132 GHz	31.59 dBµV/m	54 dBµV/m	-22.41 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2441 MHz
Test Date:	2022-02-14
Note:	

Index 4

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.8821 GHz	40.45 dBµV/m	74 dBµV/m	-33.55 dB	Pass	Vertical

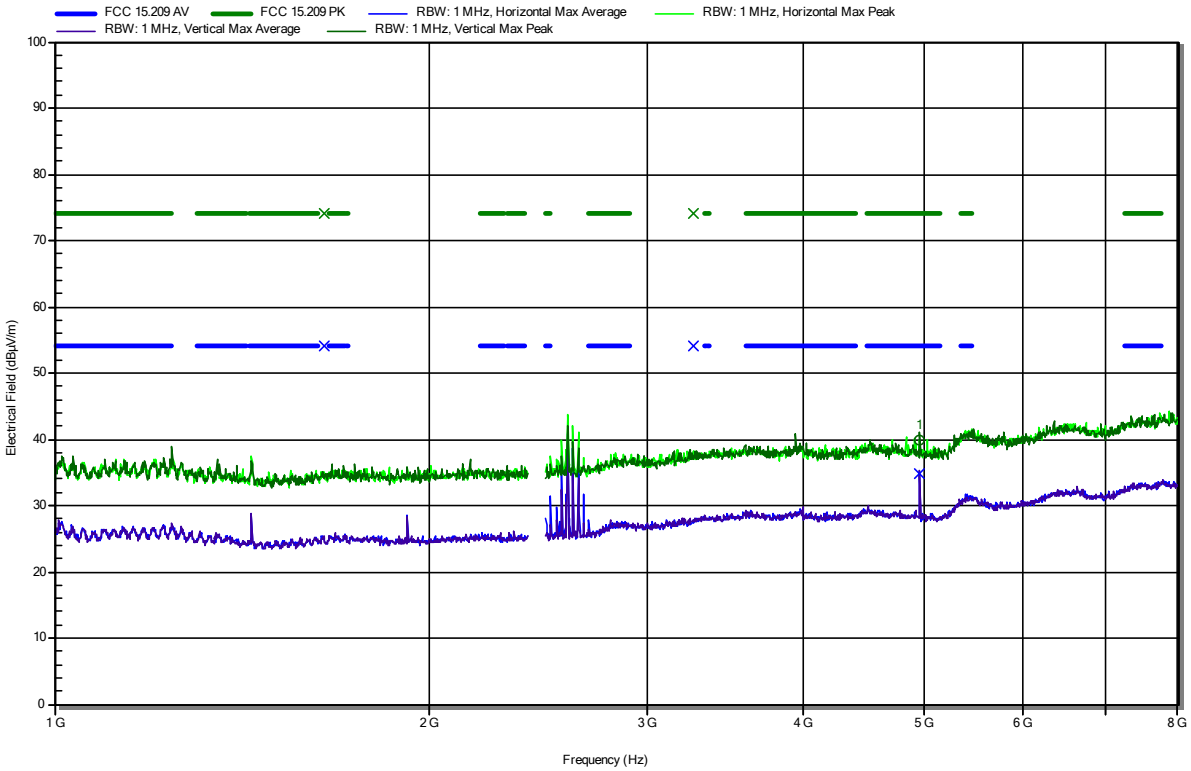
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
4.8821 GHz	33.04 dBµV/m	54 dBµV/m	-20.96 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	

Index 5

RadiMation

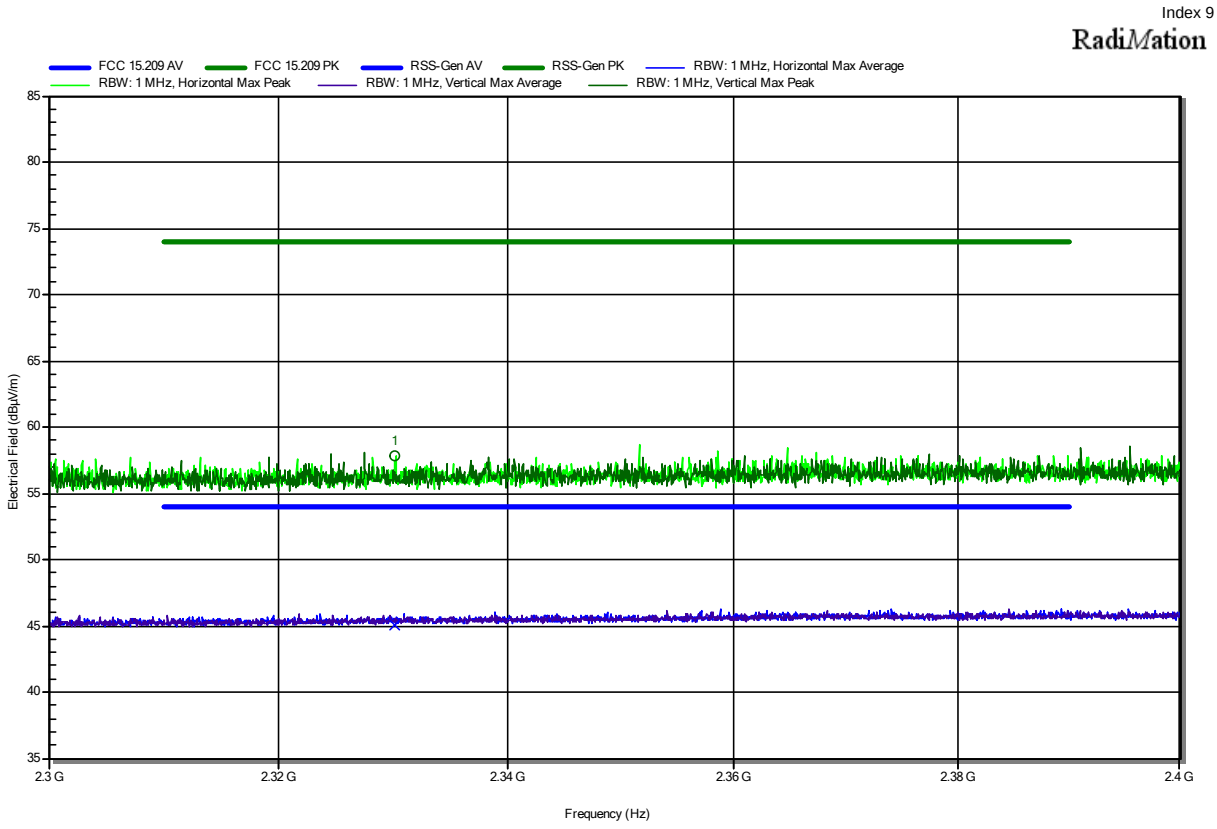


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
4.9599 GHz	39.77 dBµV/m	74 dBµV/m	-34.23 dB	Pass	Horizontal

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
4.9599 GHz	34.84 dBµV/m	54 dBµV/m	-19.16 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	lower bandedge



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
2.3302 GHz	57.81 dBµV/m	74 dBµV/m	-16.19 dB	Pass	Horizontal

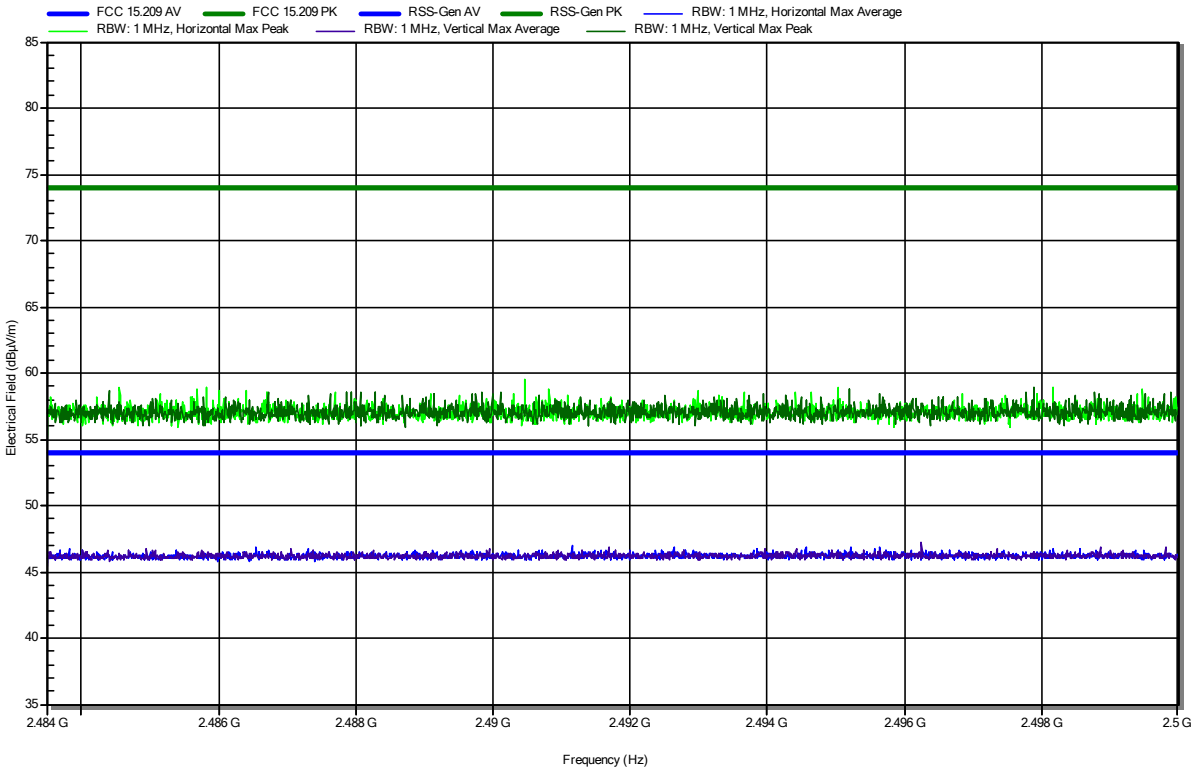
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
2.3302 GHz	45.04 dBµV/m	54 dBµV/m	-8.96 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120B
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	upper bandedge

Index 10

RadiMation

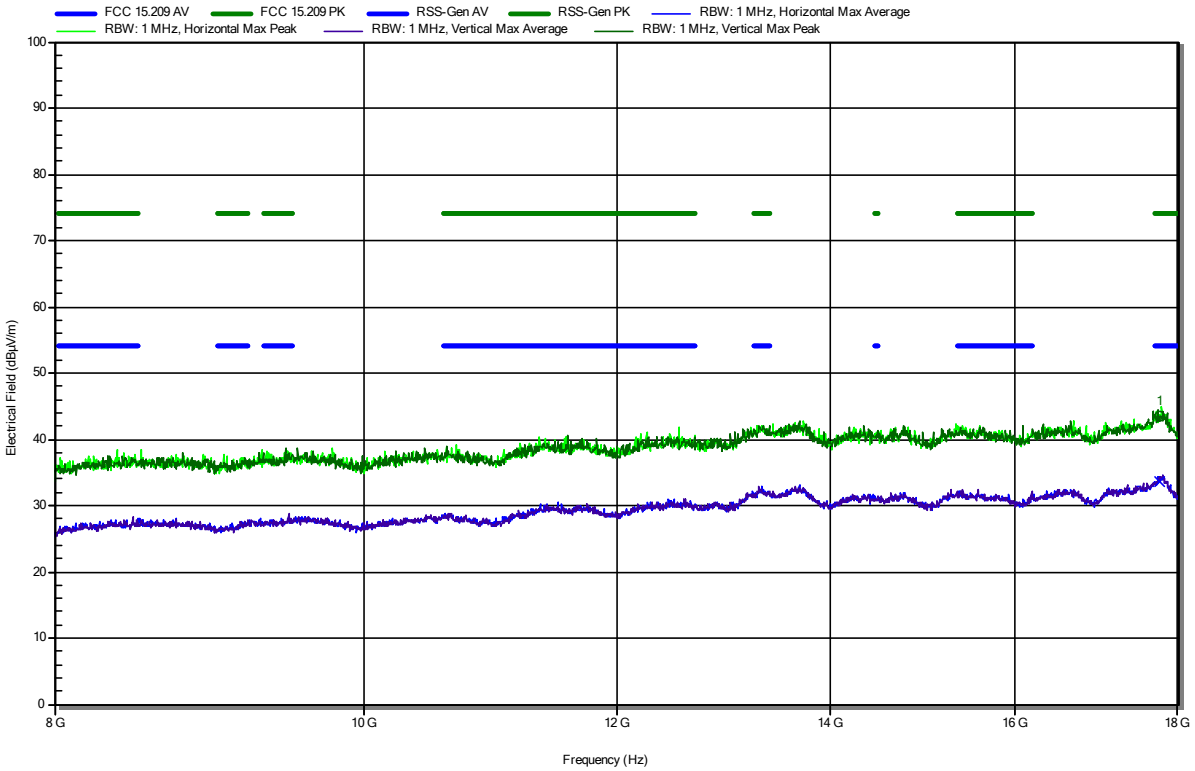


Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	

Index 6

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
17.765 GHz	43.53 dBµV/m	74 dBµV/m	-30.47 dB	Pass	Horizontal

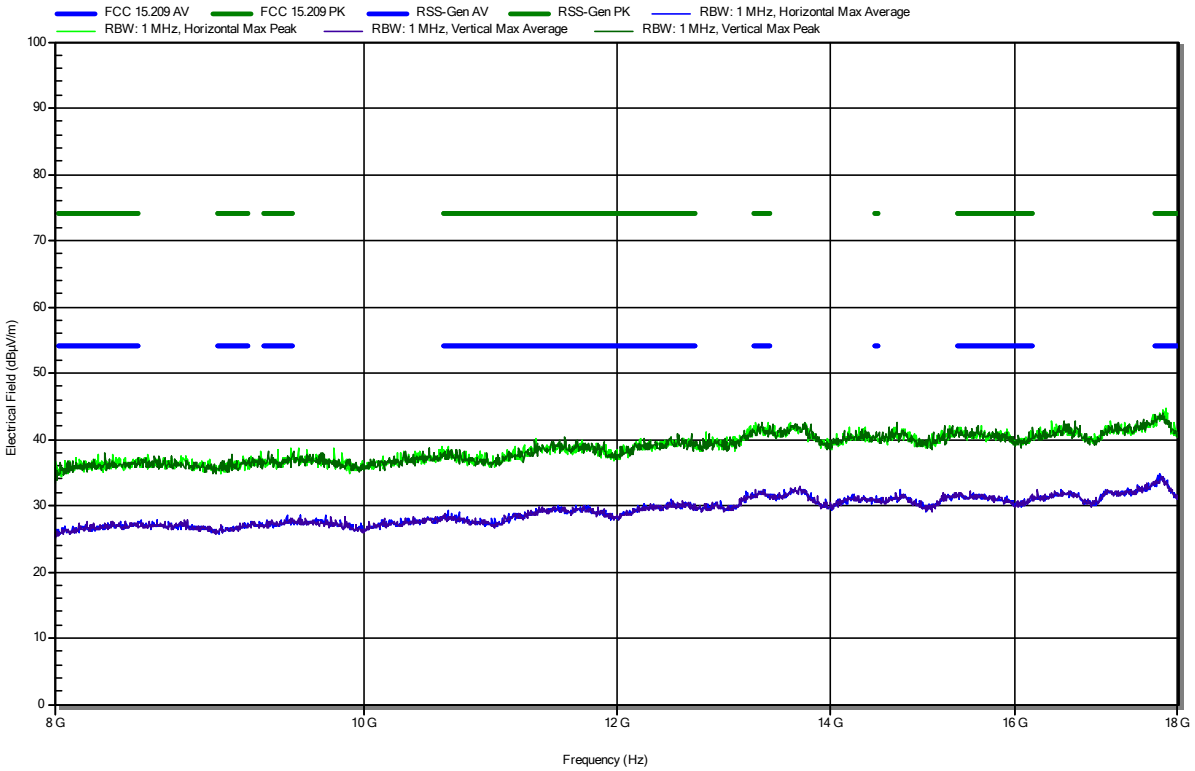
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
17.765 GHz	33.51 dBµV/m	54 dBµV/m	-20.49 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2441 MHz
Test Date:	2022-02-14
Note:	

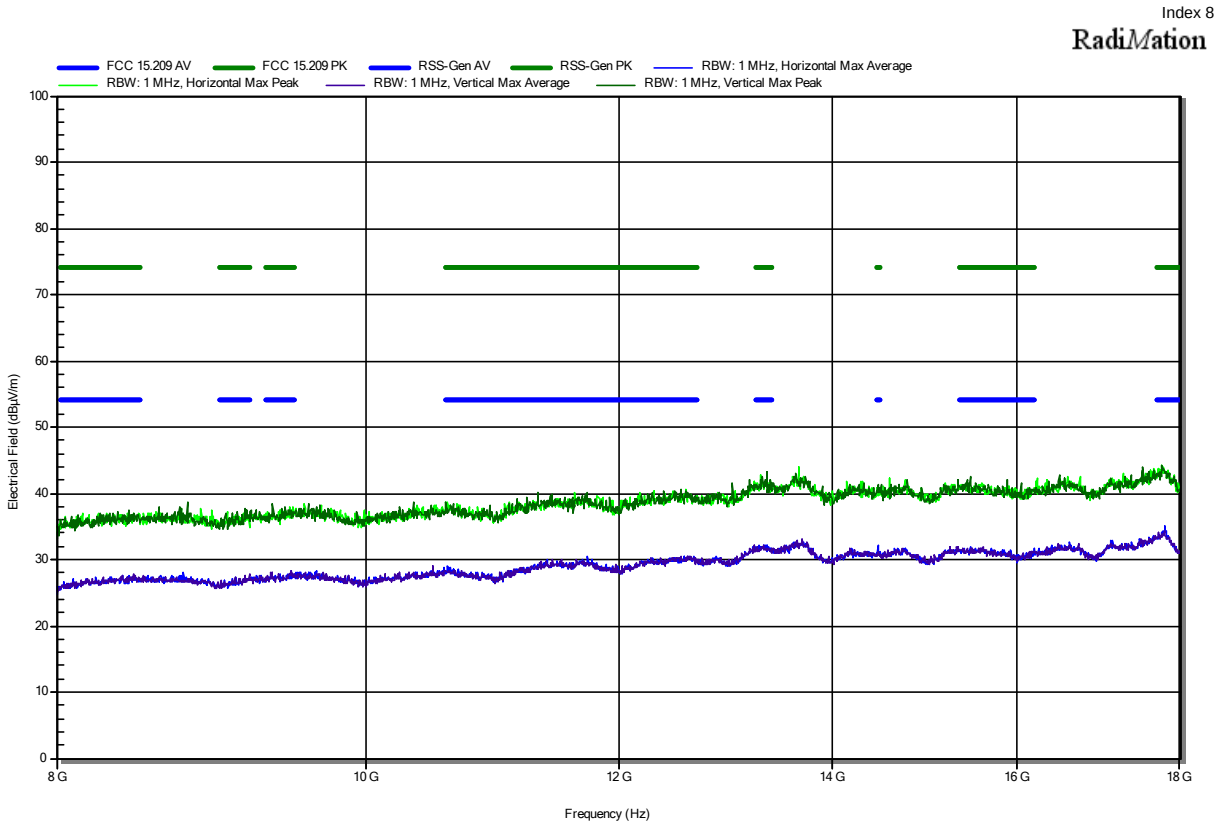
Index 7

RadiMation



Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	

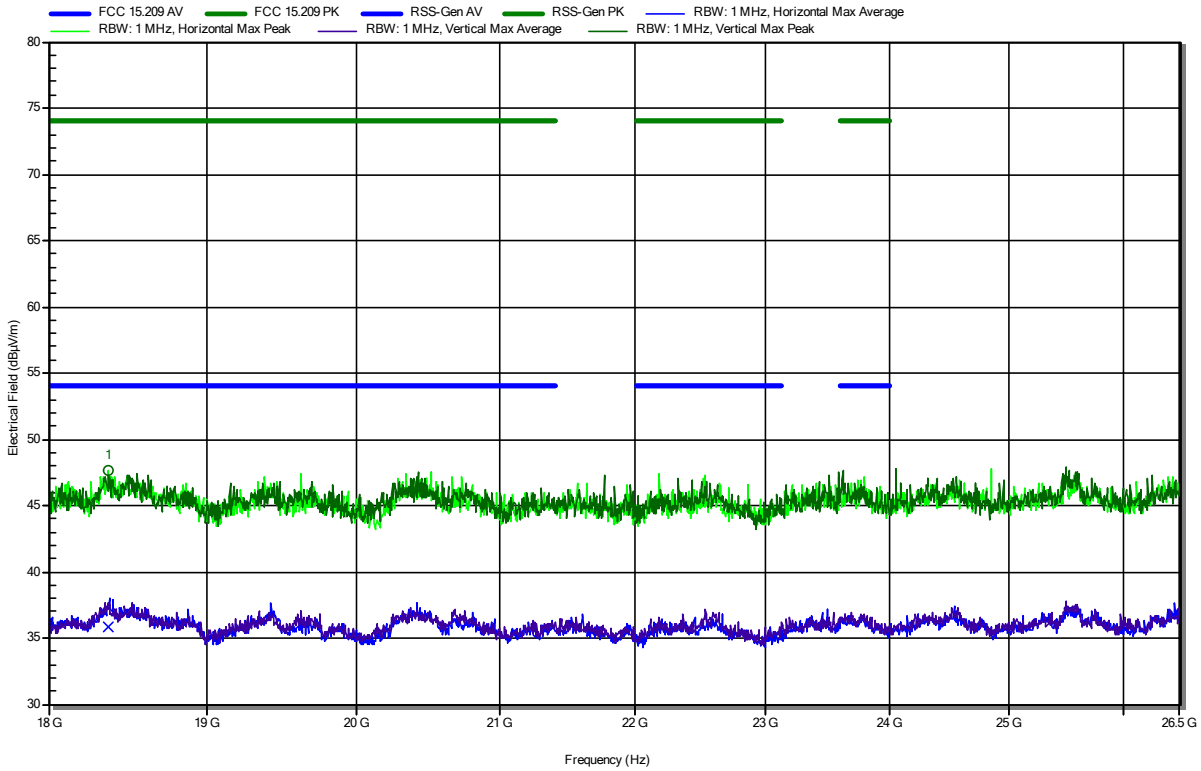


Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2402 MHz
Test Date:	2022-02-14
Note:	

Index 11

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.366 GHz	47.66 dBµV/m	74 dBµV/m	-26.34 dB	Pass	Horizontal

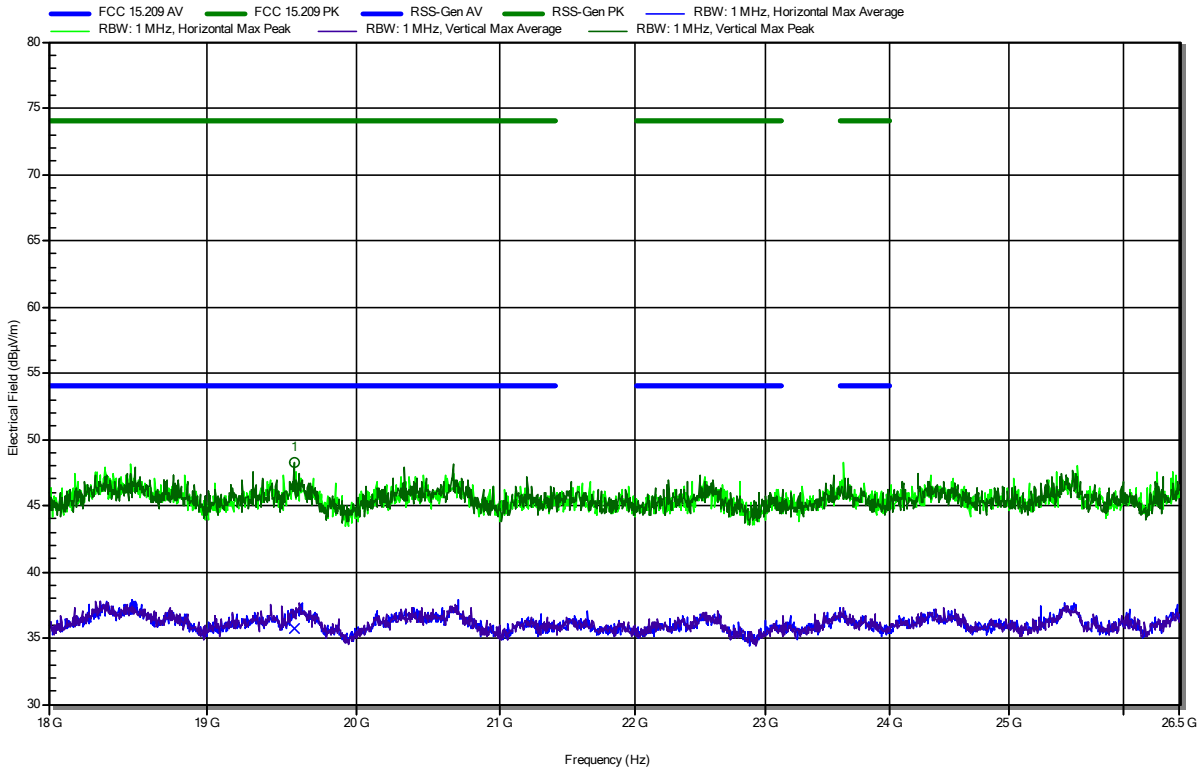
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.366 GHz	35.89 dBµV/m	54 dBµV/m	-18.11 dB	Pass	Horizontal

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2441 MHz
Test Date:	2022-02-14
Note:	

Index 13

RadiMation



Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
19.574 GHz	48.21 dBµV/m	74 dBµV/m	-25.79 dB	Pass	Vertical

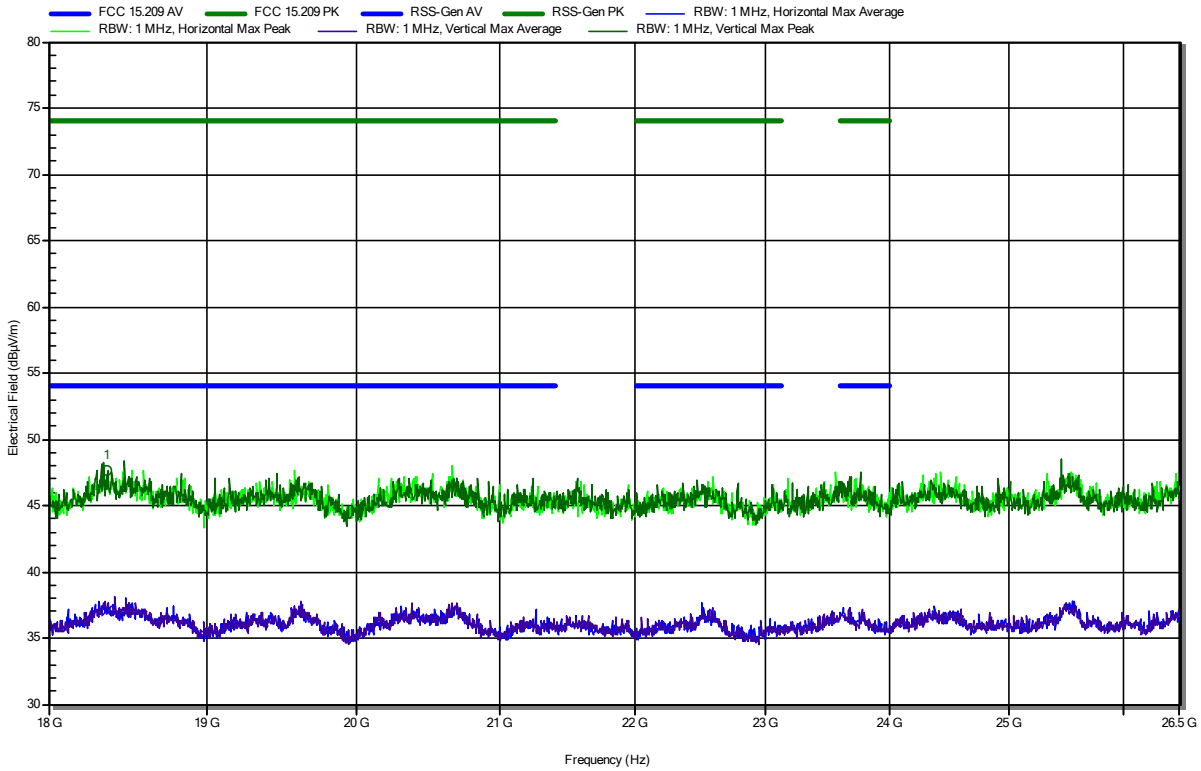
Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
19.574 GHz	35.66 dBµV/m	54 dBµV/m	-18.34 dB	Pass	Vertical

Radiated Spurious Emissions according to 47 CFR Part 15.247; RSS-247, Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mrs. Hoang
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Amplifier Research AT4560
Measurement distance:	3 m
Mode:	Tx; BT; DH5; 2480 MHz
Test Date:	2022-02-14
Note:	

Index 12

RadiMation



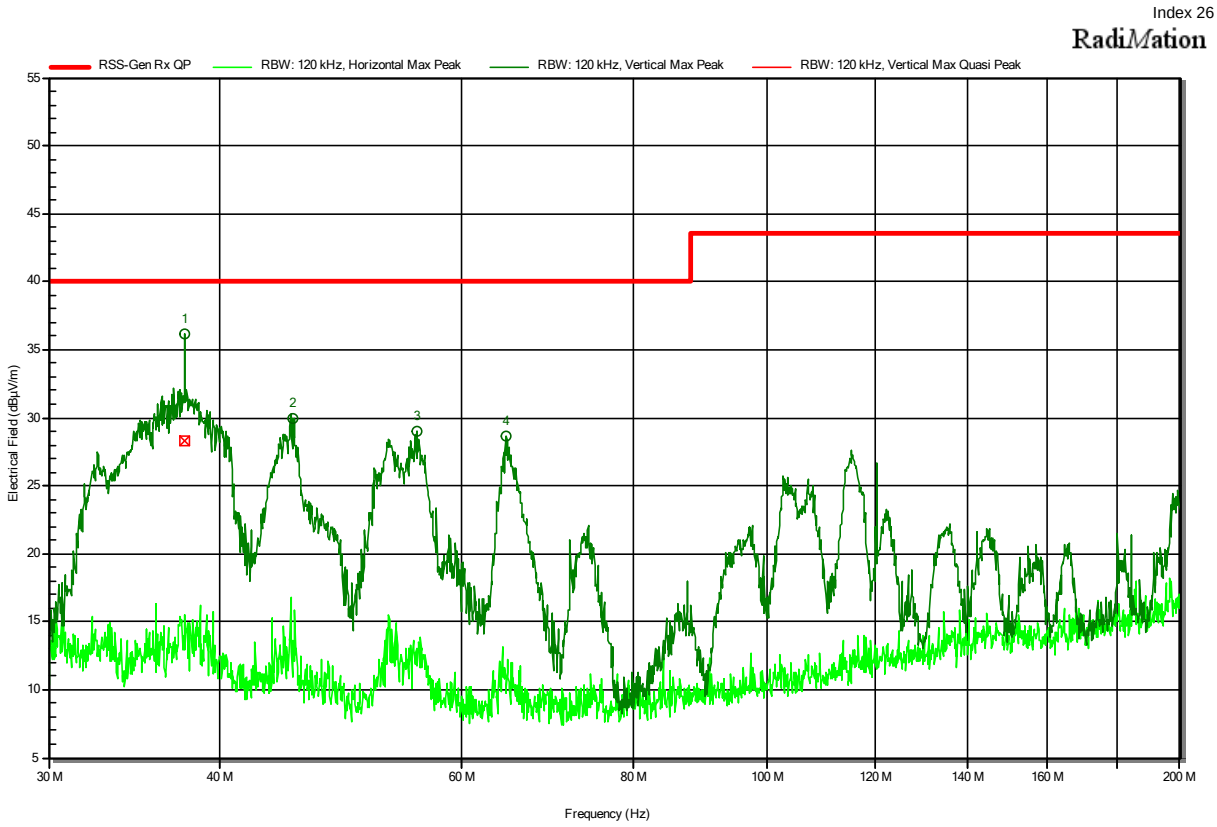
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
18.365 GHz	47.6 dBµV/m	74 dBµV/m	-26.4 dB	Pass	Vertical

Frequency	Average	Average Limit	Average Difference	Average Status	Polarization
18.365 GHz	37.07 dBµV/m	54 dBµV/m	-16.93 dB	Pass	Vertical

ANNEX B Receiver spurious emissions

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HK 116
Measurement distance:	3 m
Mode:	Rx; BT; Scan Mode
Test Date:	2022-02-14
Note:	

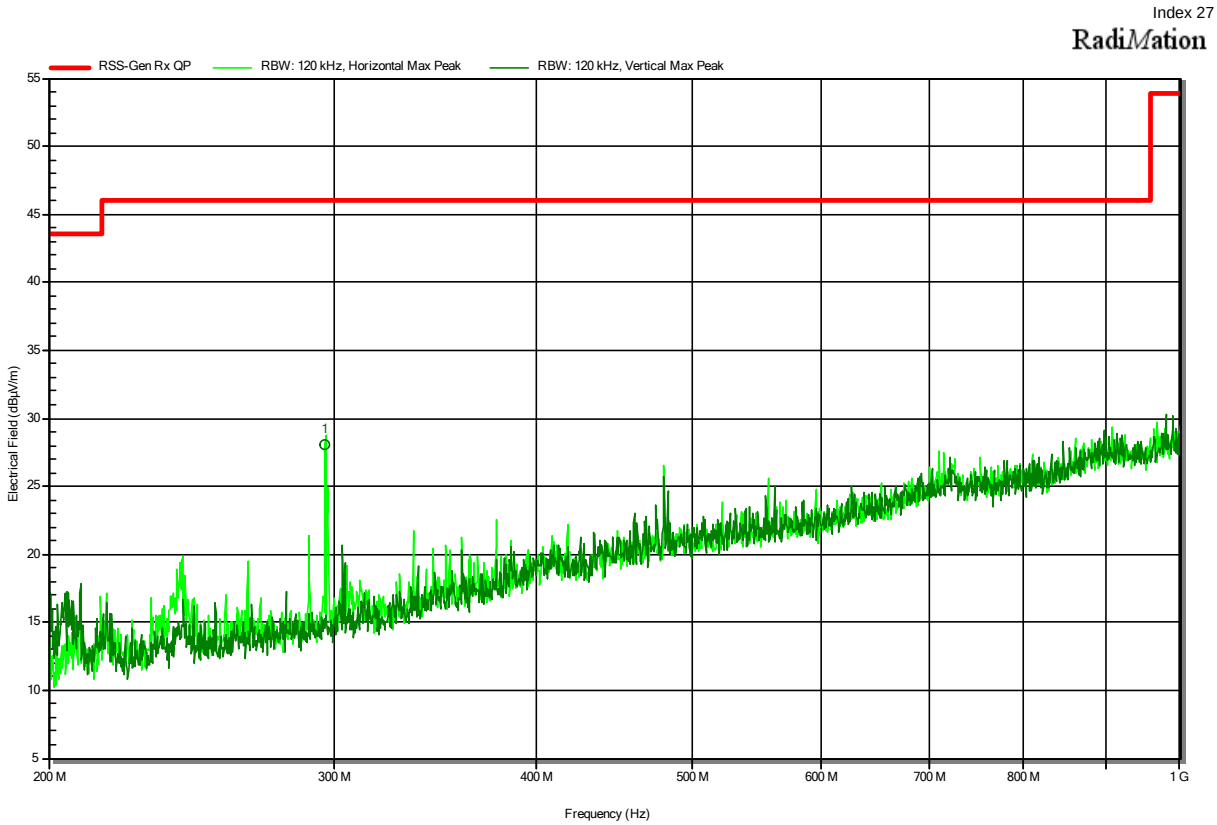


Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
45.1682 MHz	30 dBµV/m	40 dBµV/m	-10.02 dB	Pass	Vertical
55.6445 MHz	29 dBµV/m	40 dBµV/m	-11.02 dB	Pass	Vertical
64.6205 MHz	28.7 dBµV/m	40 dBµV/m	-11.3 dB	Pass	Vertical

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Polarization
37.684 MHz	28.3 dBµV/m	40 dBµV/m	-11.68 dB	Pass	Vertical

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Rohde & Schwarz HL 223
Measurement distance:	3 m
Mode:	Rx; BT; Scan Mode
Test Date:	2022-02-14
Note:	



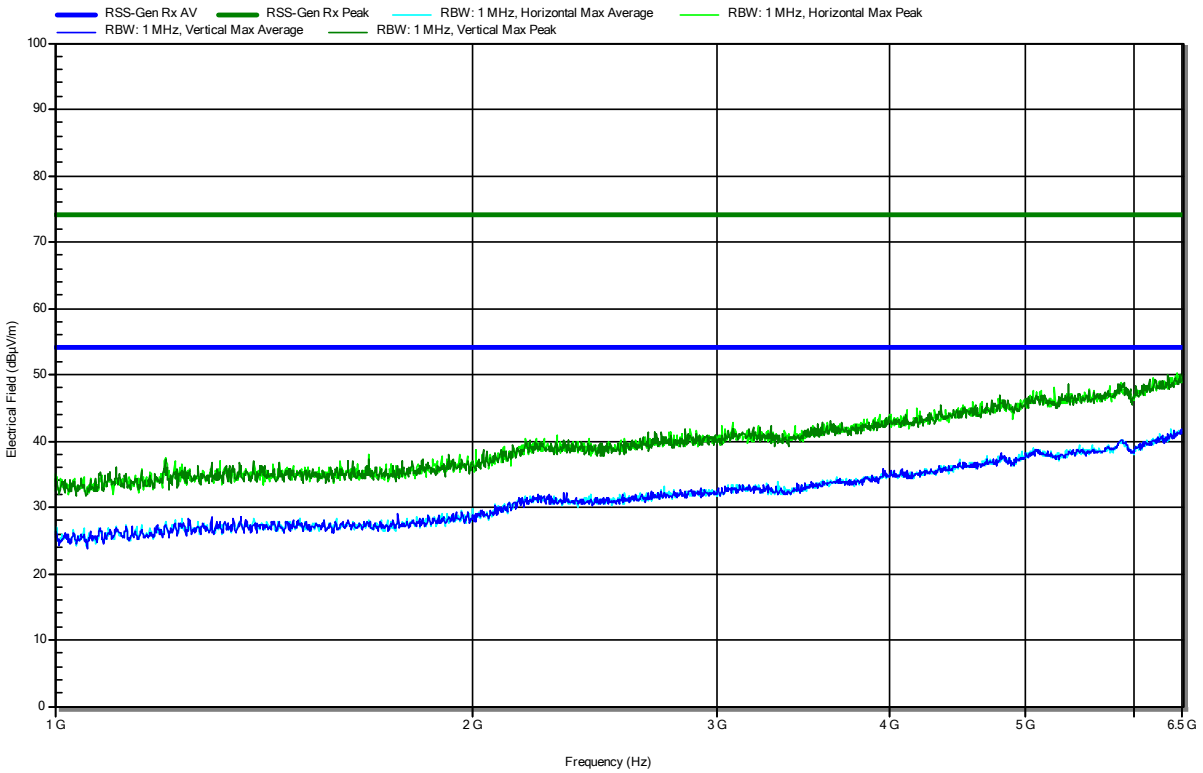
Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Polarization
296.28 MHz	28.1 dBµV/m	46 dBµV/m	-17.9 dB	Pass	Horizontal

Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck BBHA 9120D
Measurement distance:	3 m
Mode:	Rx; BT; Scan Mode
Test Date:	2022-02-15
Note:	

Index 29

RadiMation

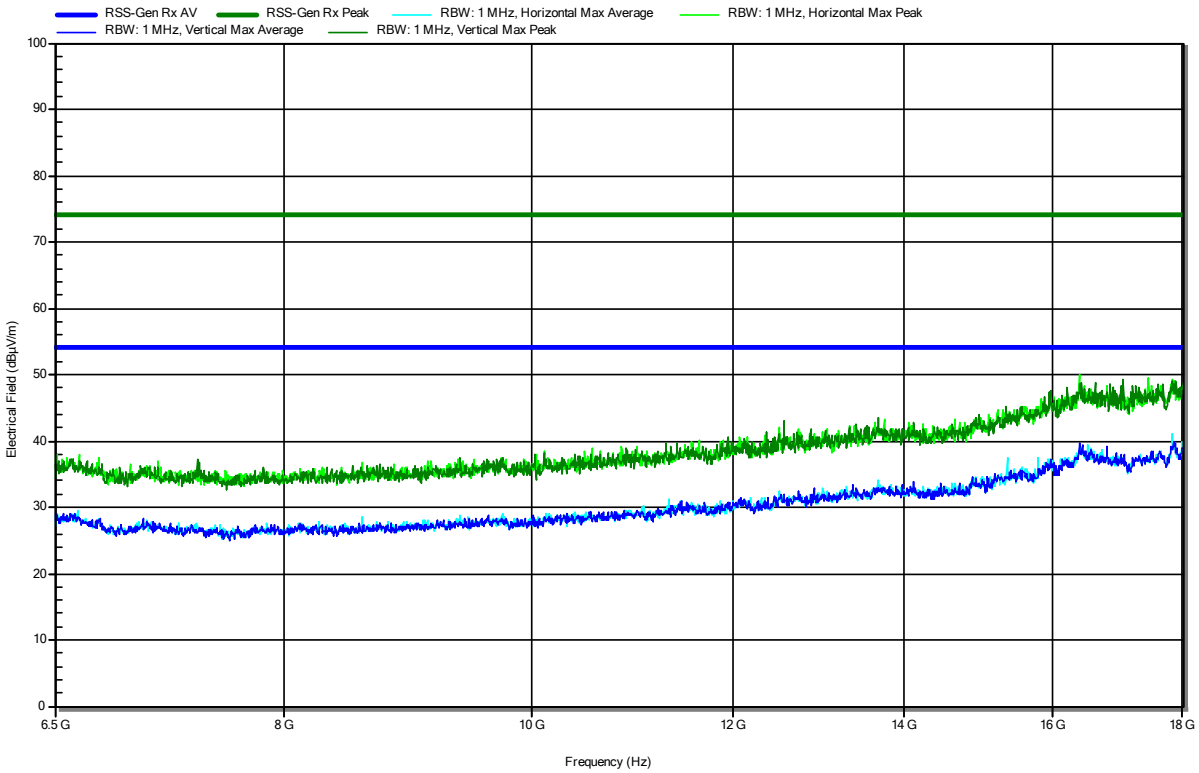


Radiated Spurious Emissions according to RSS-247 Issue 2

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Qawasmeh
Measurement software:	RadiMation, version 2020.1.8
Test Conditions:	Tnom: 24 °Celsius, Vnom: 12 VDC
Antenna:	Schwarzbeck HWRD 650
Measurement distance:	3 m
Mode:	Rx; BT; Scan Mode
Test Date:	2022-02-23
Note:	

Index 31

RadiMation



= = = END OF TEST REPORT = = =