eurofins | Product Service

EMC TEST REPORT

Title 47 CFR Part 15B, ISED ICES-003 Issue 7

Report Reference No	G0M-2108-9942-EF0115B-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	A2LA - Registration number: 1983.01 (ISED) ISED wireless device testing laboratory: CN 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 Standard(s)	Title 47 CFR Part 15 Subpart B ISED ICES-003 Issue 7 ANSI C63.4:2014+A1:2017
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	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2022-01-06	
Report:		
Compiled by	Stephan Liebich	
Tested by (+ signature) (Responsible for Test)	Matthias Handrik	.....
Approved by (+ signature) (Test Lab Technician)	Andreas Pflug	.....
Date of Issue	2022-04-29	
Total number of pages	50	
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:		
EUT can be powered by a 3.7 V internal backup Lithium battery. EUT was not tested with support battery only.		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T_{NOM}	Nominal operating temperature
V_{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-04-29	Initial Release	-

REPORT INDEX

1 Equipment (Test Item) Under Test

Description	Telematic Device with GSM+LTE+GNSS+OBD connector	
Intended Use	The Model L0245 is a GPRS/LTE based telematics device with internal GSM/LTE and GNSS antennas and an integrated acceleration sensor to detect driving events. The device is designed and dedicated to be plugged onto the OBD connector of the vehicle. It's powered by the vehicles OBD connector, it can also be powered by the internal LiPo battery for a limited time. Vehicle information as odometer, RPM and fuel information can be read from the OBD port. It is always providing the vehicle's information and current position to a database via GPRS/LTE.	
Model	L0245	
Additional Model(s)	None	
Brand Name(s)	webfleet Link 245	
Serial Number(s)	WY4481I00006	
Sample ID	38032	
Hardware Version(s)	15/2021	
Software Version(s)	3.11	
EUT Dimensions [cm]	5.7 x 4.8 x 2.7	
FCC-ID	2AGPAL0245	
IC	20911-L0245	
Class	Class B	
Equipment type	Table top	
Highest internal frequency [MHz]	2480 (radio frequency)	
Protective Earth	No	
Radio Module 1	Type	GSM / LTE eMTC / Cat M1
	Model	EXS82
	Manufacturer	Gemalto (Thales)
	FCC-ID	QIPEXS82-W
	IC	7830A-EXS82W
Radio 2	Type	Bluetooth
	Model	Chip CSR8811
	Manufacturer	CSR
	FCC-ID	Unspecified
	IC	Unspecified
Radio 3	Type	GNSS
	Model	Chip u-blox UBX-M8030-KT
	Manufacturer	u-blox
	FCC-ID	Unspecified
	IC	Unspecified
Supply Voltage	V_{NOM}	12 V DC 24 V DC 3.7 V internal backup Lithium battery
Manufacturer	Bridgestone Mobility Solutions B.V. Beethovenstraat 503 1083 HK Amsterdam Netherlands	
Factory	Tech-Com (Shanghai) Computer Co.Ltd F1, No 68, Sanzhuang Road 201613 Shanghai PR China	

1.1 Equipment Ports

Name	Type	Attributes	Comment
DC Mains	DC	Count: 1 Cable length [m]: 0.4 Direction: In Service only: No Shielded: No	Multiport
CAN bus	IO	Count: 4 Direction: IO Max. cable length [m]: 2 Shielded: No Service only: No	Multiport
ISO 9141 (K-Line)	IO	Count: 1 Direction: In Max. cable length [m]: 2 Shielded: No Service only: No	Multiport; Without communication
CAN bus single wire	IO	Count: 1 Direction: IO Max. cable length [m]: 2 Shielded: No Service only: No	Multiport

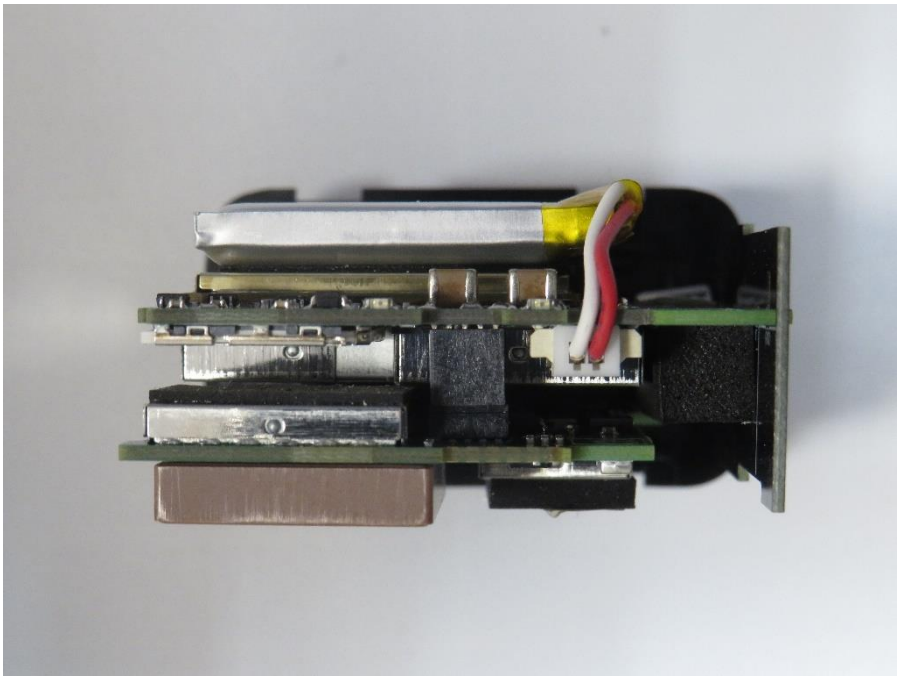
Description:	
AC	AC mains power input/output port
DC	DC power input/output port
BAT	DC power input port connected to external battery
IO	Input/Output port
TP	Telecommunication port
NE	Non-electrical port

1.2 Equipment Photos - Internal

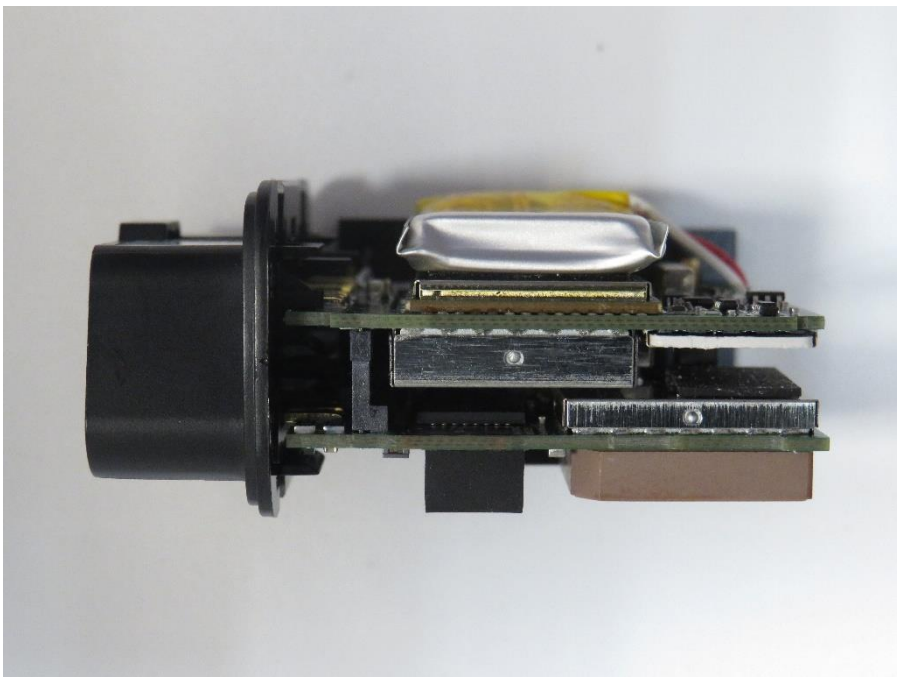
L0245 PCB TOP SIDE


L0245 PCB BOTTOM SIDE


L0245 PCB FRONT SIDE



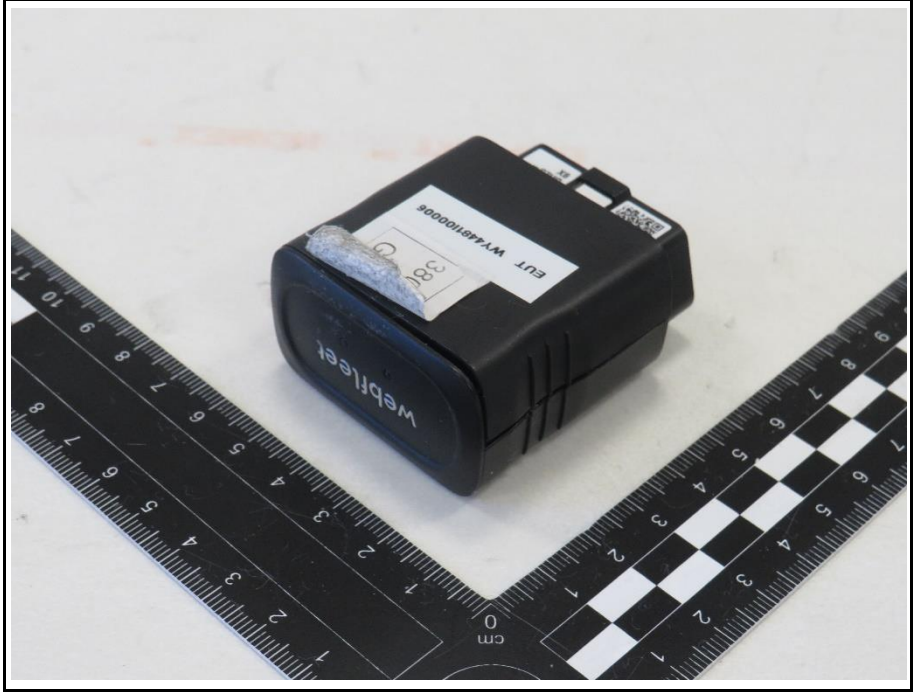
L0245 PCB LEFT SIDE



L0245 PCB RIGHT SIDE


1.3 Equipment Photos - External

L0245 IN PERSPECTIVE I


L0245 IN PERSPECTIVE II


L0245 BOTTOM SIDE


L0245 FRONT SIDE


L0245 TOP SIDE

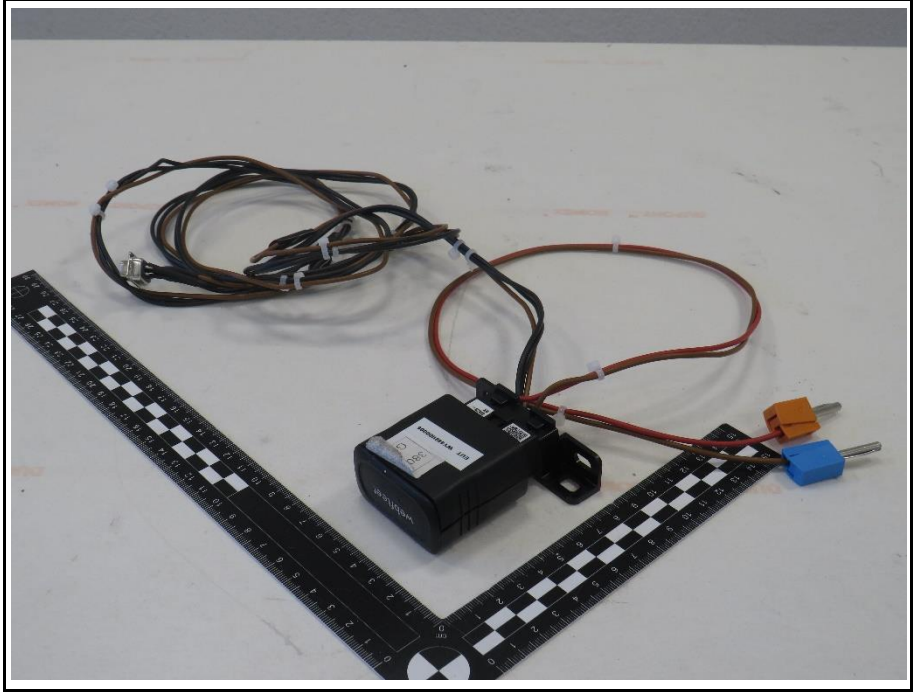

L0245 LEFT SIDE


L0245 REAR SIDE


L0245 RIGHT SIDE


L0245 LABEL

L0245 TEST SETUP WITH SUPPORT EQUIPMENT

L0245 TEST SETUP


1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	ThinkPad X250	--
AE	CAN-USB Adapter	IXXAT	IXXAT USB-to-CAN Converter	Customer Support Equipment
MON/AE	Software	Webfleet Solution	DeviceCommunication Tool	Customer Support Equipment
CBL	Harness	Pan-I	--	Customer Support Equipment; OBD extension cable
AE	Bluetooth Tester	Rohde&Schwarz	CBT	EF00358
AE	Functional Radio Communication Tester	Rohde&Schwarz	CMW290	EF01367
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	CAN active, GSM modem active and connected (GSM850: GPRS 1 slots, Gamm 3, Ch.: 189), GNSS active, BT active and connected (BT DUT mode), Battery charger active
2	CAN active, LTE modem active and connected (TPC „Max Power", Ch.: 23060), GNSS active, BT active and connected (BT DUT mode), Battery charger active
Comment: EUT operates in mobile communication band: GSM850; GSM1900; LTE FDD 2; 4; 12; 13. After evaluation of worst case, measurements were performed in mobile communication band GSM 850 and LTE FDD 12.	

1.6 EUT Configuration

Configuration #	Description
1	EUT is powered by external laboratory power supply unit. CAN connection via CAN-USB Adapter, "Type: CAN; Interface: HW404741; Bitrate: 500000". Laptop controlled EUT via software application: "Device Communication Tool." Functional Radio Communication Tester provides the mobile communication connection. Local external GNSS antenna provide the GNSS position for the EUT Bluetooth Tester provides the Bluetooth connection. EUT operates in Bluetooth test mode (BT DUT). TX-Test, basic rate, Channel 78, DH5, Static PRBS, max power
Comment: --	

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 analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser 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 analyser. 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 Analyser (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

Title 47 CFR Part 15B, ISED ICES-003 Issue 7				
Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
Emission				
FCC 15.109 ICES-003, 3.2.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	--
FCC 15.107 ICES-003, 3.2.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	N/R	EUT intended for vehicular use
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

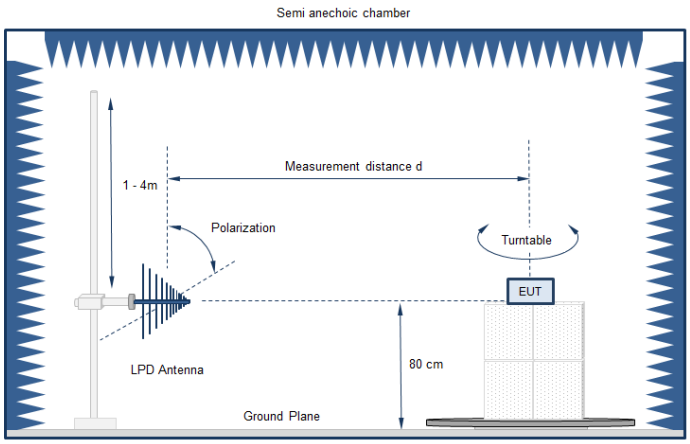
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

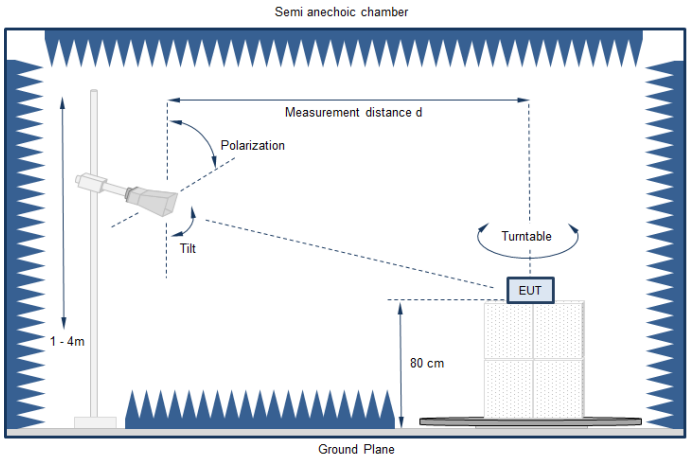
Test Information	
Reference	FCC 15.109, ICES-003, 3.2.2
Reference method	ANSI C63.4:2014+A1:2017 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	2480
Measurement range	30 MHz to 13000 MHz
Temperature [°C]	21 – 23
Humidity [%]	23 – 28
Operator	Stephan Liebich
Date	2022-03-05

2.1.2 Setup

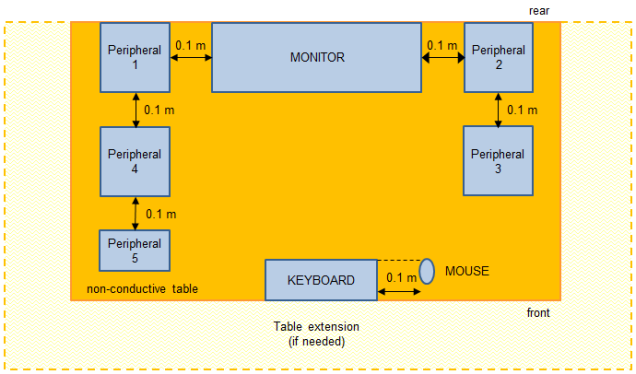
Measurement up to 1 GHz



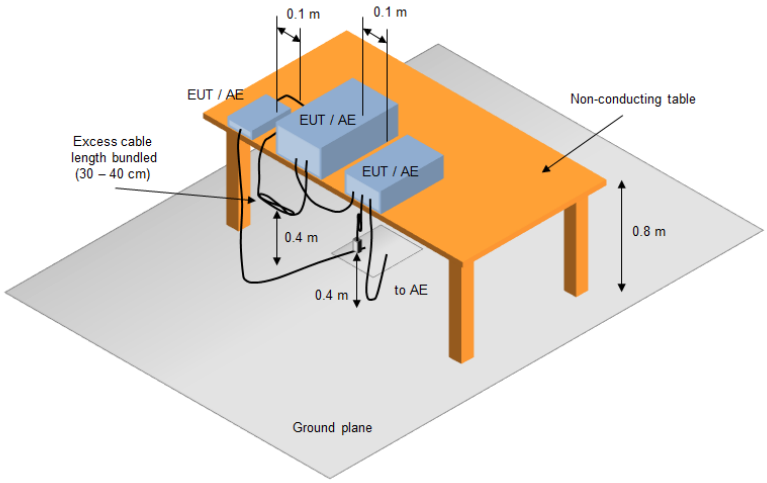
Measurement above 1 GHz



Equipment placement - Table top



Test Setup



2.1.3 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
Anechoic chamber (NSA)	Frankonia	AC1	EF00062	2021-02	2024-02
Anechoic chamber (SVSWR)	Frankonia	AC 1	EF01011	2019-06	2022-06
Programmable AC Source	Chroma ATE Inc.	61604	EF01068	2021-07	2022-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2021-07	2022-07
Biconical Antenna	R&S	HK 116	EF00030	2021-05	2024-05
LPD Antenna	R&S	HL 223	EF00187	2019-05	2022-05
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2019-10	2022-10
Band rejection filter	Wainwright Instruments GmbH	WRCT824/849	EF00343	fucntional test	fucntional test
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2021-03	2022-03

2.1.4 Procedure

Exploratory measurement
1. The EUT was placed on a non-conductive table at a height of 0.8m. 2. The EUT and support equipment, if needed, were set up to simulate typical usage. 3. Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage. 4. The antenna was placed at a distance of 3 or 10 m. 5. The received signal was monitored at the measurement receiver. 6. This procedure has to be performed in both antenna polarizations, horizontal and vertical. 7. The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 2.1.2

Final measurement
1. The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver. 2. A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast. 3. The EUT and cable arrangement were based on the exploratory measurement results. 4. Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded. 5. The test data of the worst-case conditions were recorded and shown on the next pages.

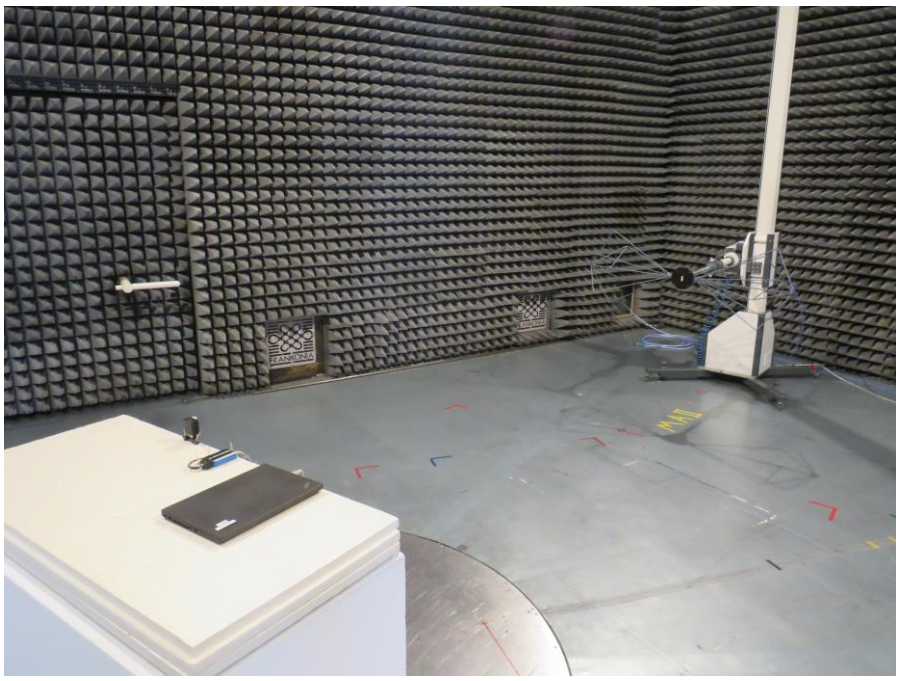
2.1.5 Limits

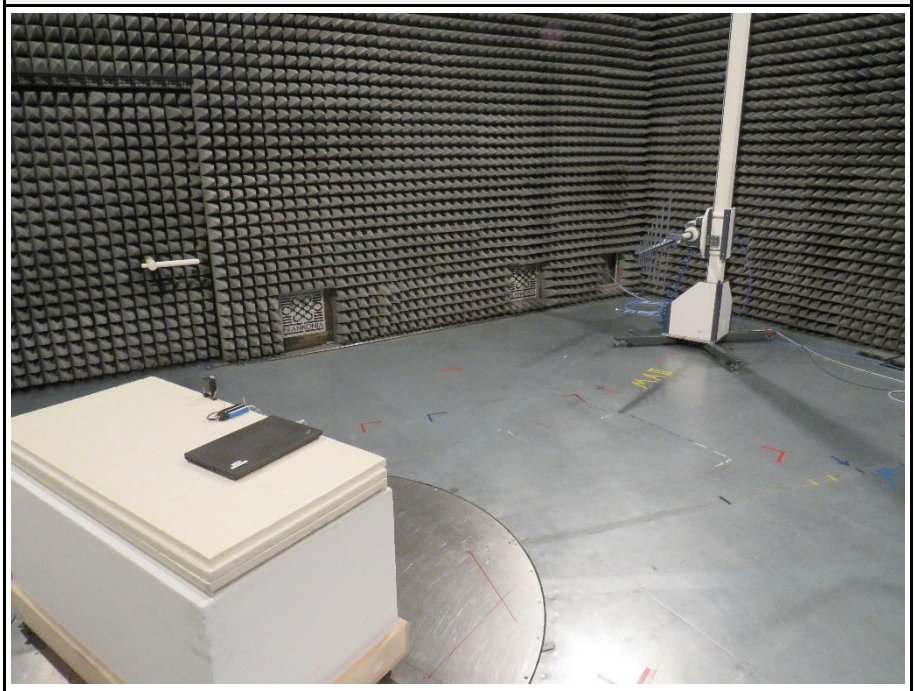
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak Average	74 54

2.1.6 Results

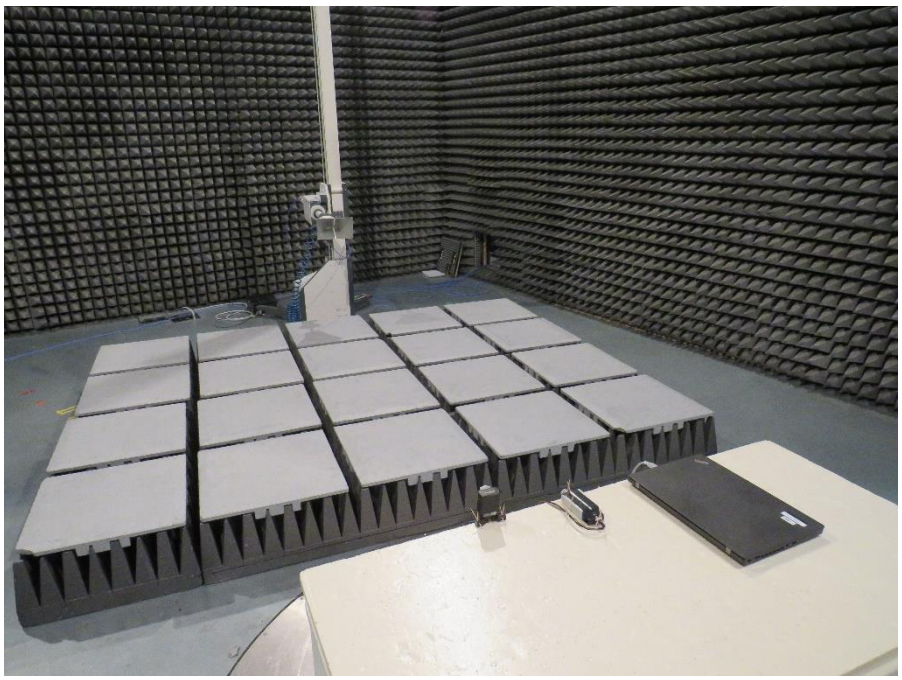
Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	12 V DC
2	1	PASS	12 V DC
1	1	PASS	24 V DC
2	1	PASS	24 V DC

2.1.7 Setup Photos

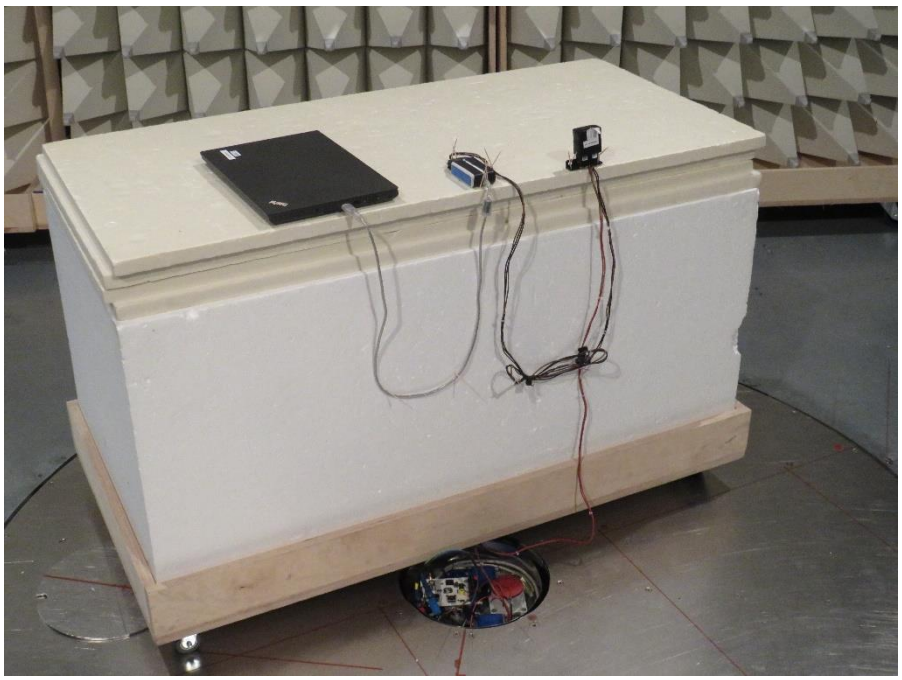
TEST SETUP - 30 MHz to 200 MHz


TEST SETUP - 200 MHz to 1 GHz


TEST SETUP - 1 GHz to 13 GHz



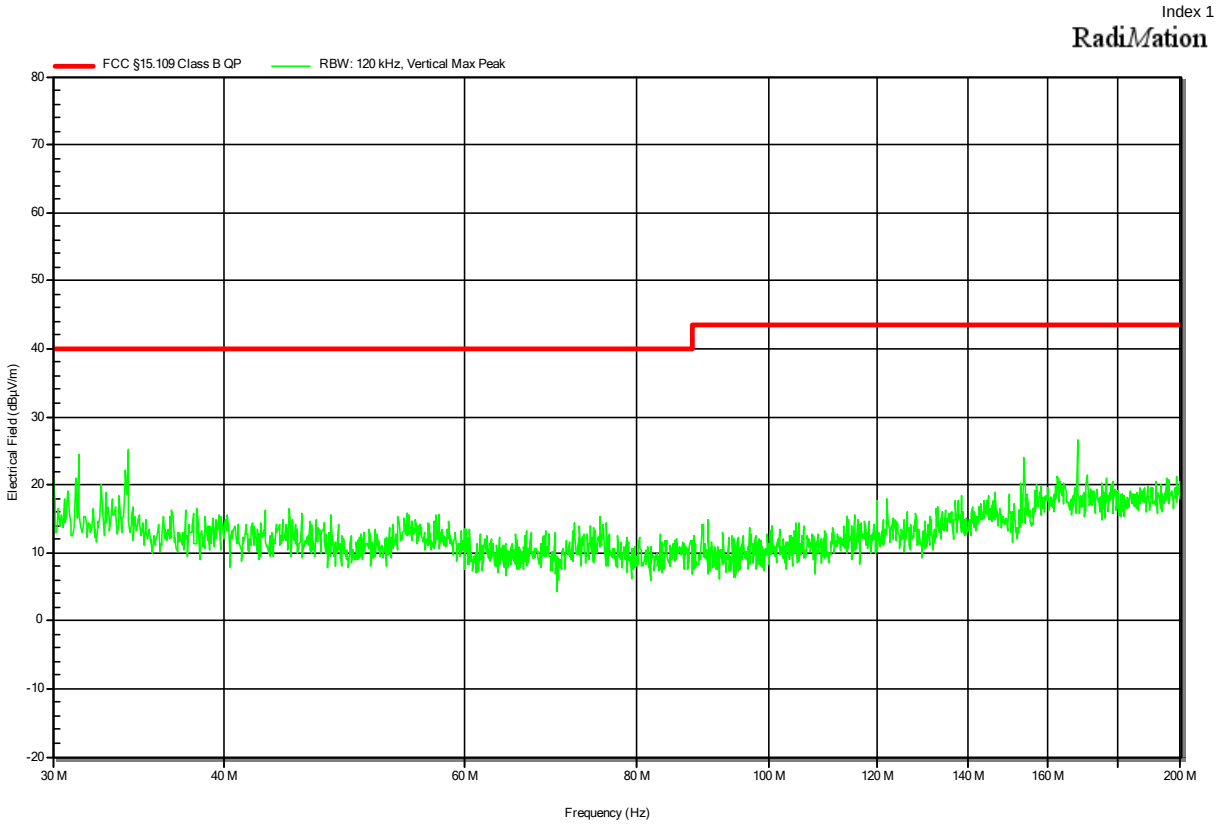
TEST SETUP - FOCUS



2.1.8 Records

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
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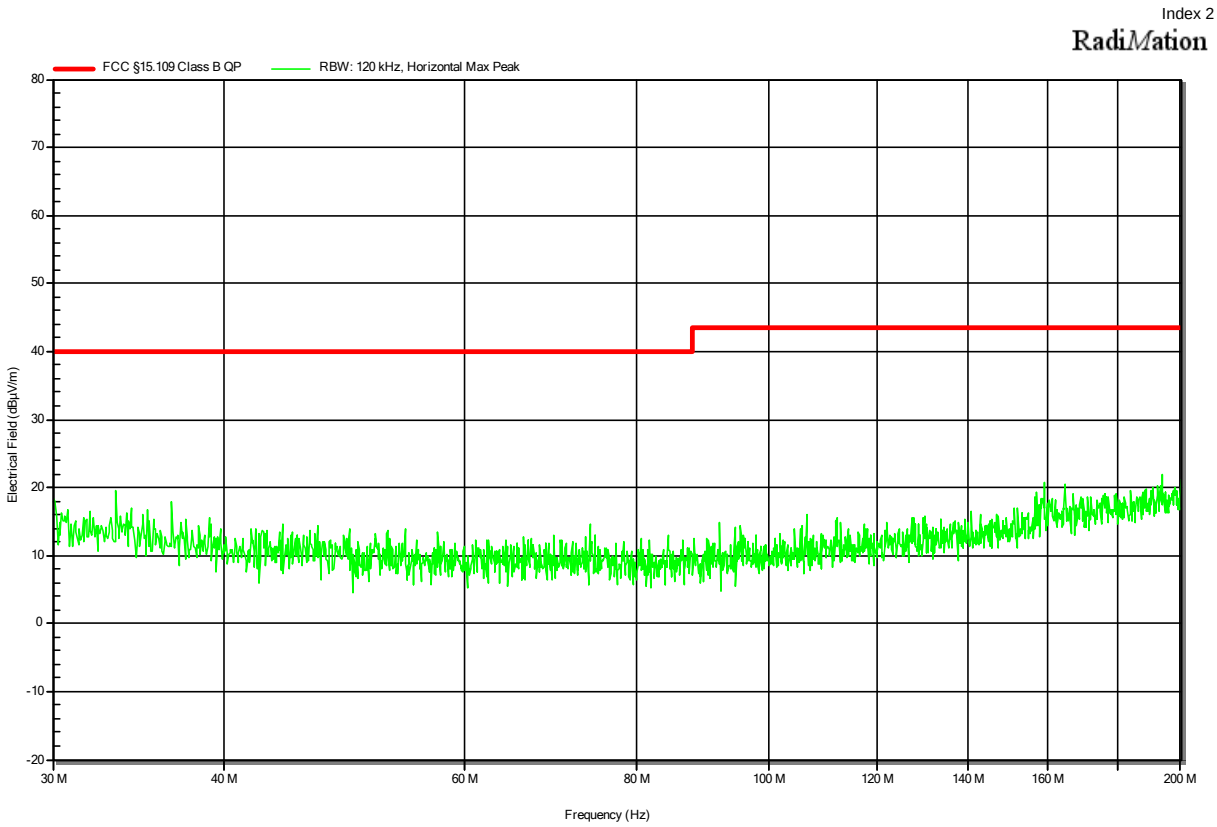
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
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Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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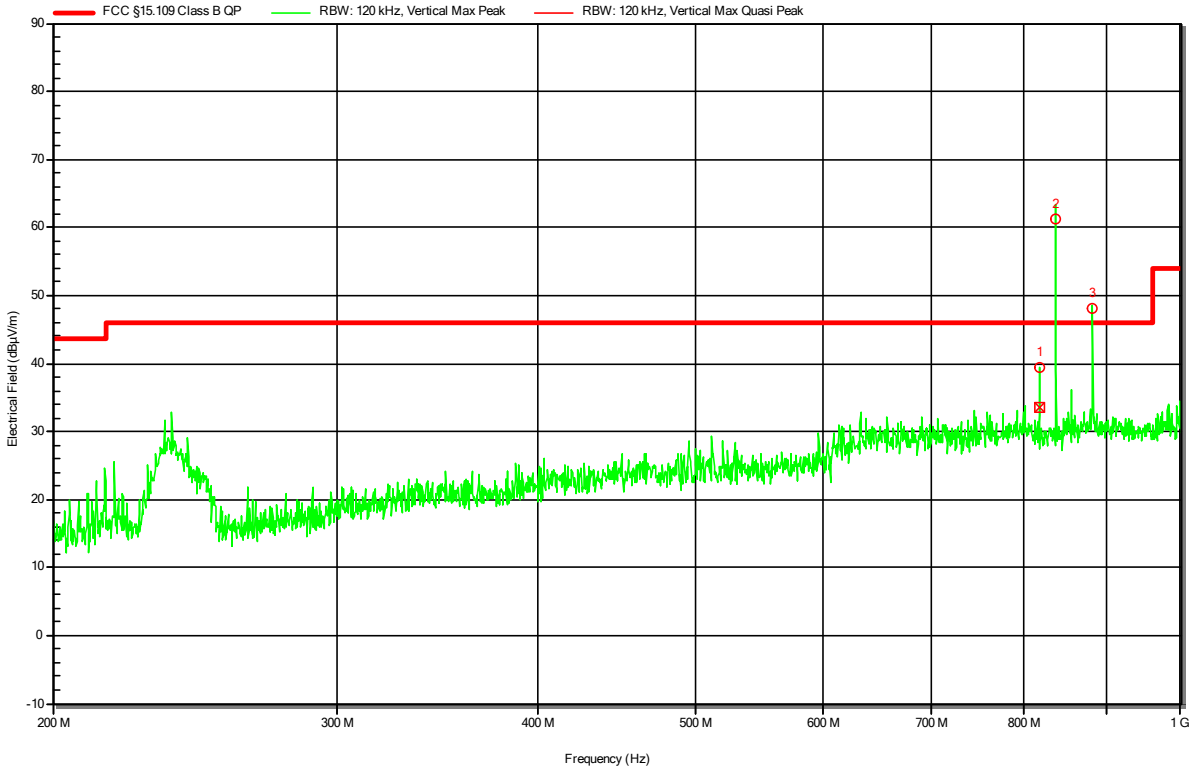
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	817.037 MHz	33.52 dBµV/m	46.02 dBµV/m	-12.5 dB	Pass	0 degrees	1 m
2	836.196 MHz	GSM850-Channel Uplink					
3	881.317 MHz	GSM850-Channel Downlink					

Radiated emissions
according to FCC part 15B

Project Number:	G0M-2108-9942
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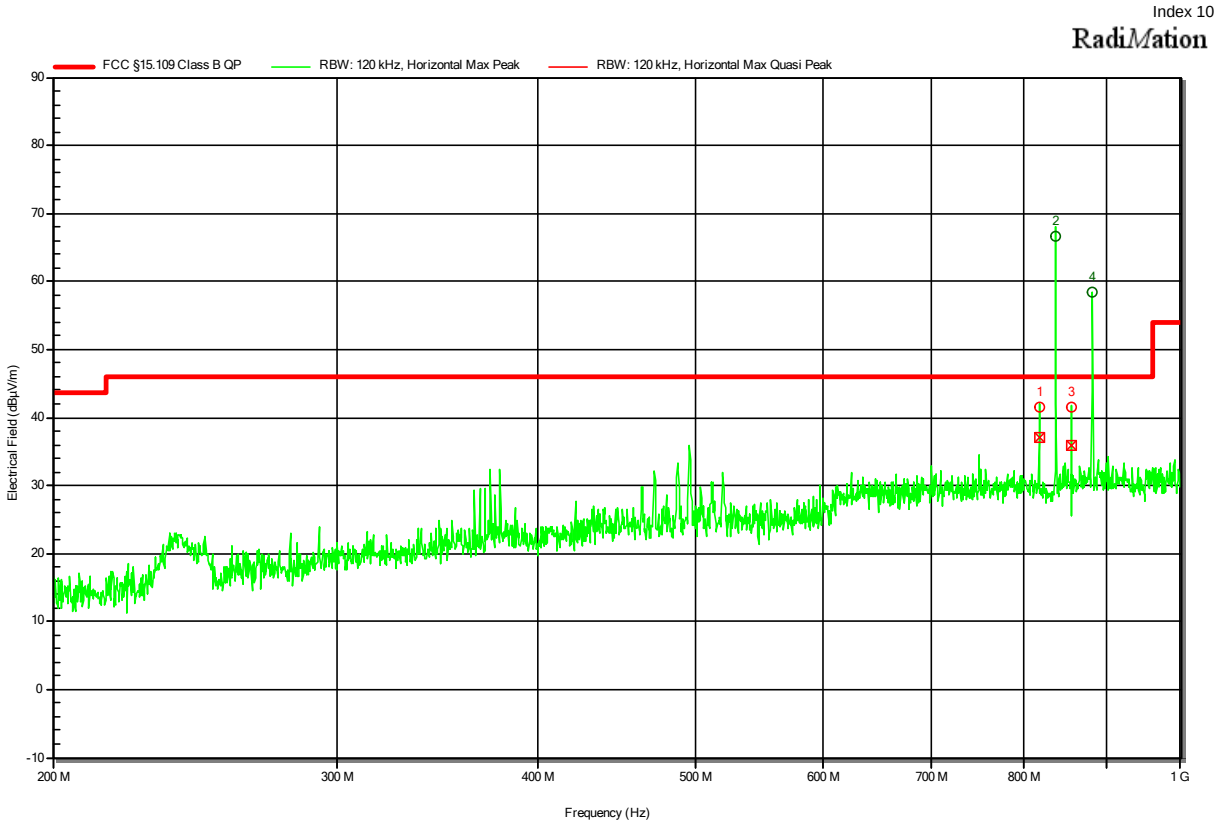
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	817.073 MHz	37.12 dBµV/m	46.02 dBµV/m	-8.9 dB	Pass	0 degrees	1 m
2	836.196 MHz	GSM850-Channel Uplink					
3	855.354 MHz	36 dBµV/m	46.02 dBµV/m	-10.02 dB	Pass	0 degrees	1 m
4	881.317 MHz	GSM850-Channel Downlink					

Radiated emissions
according to FCC part 15B

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Operator:	Mr. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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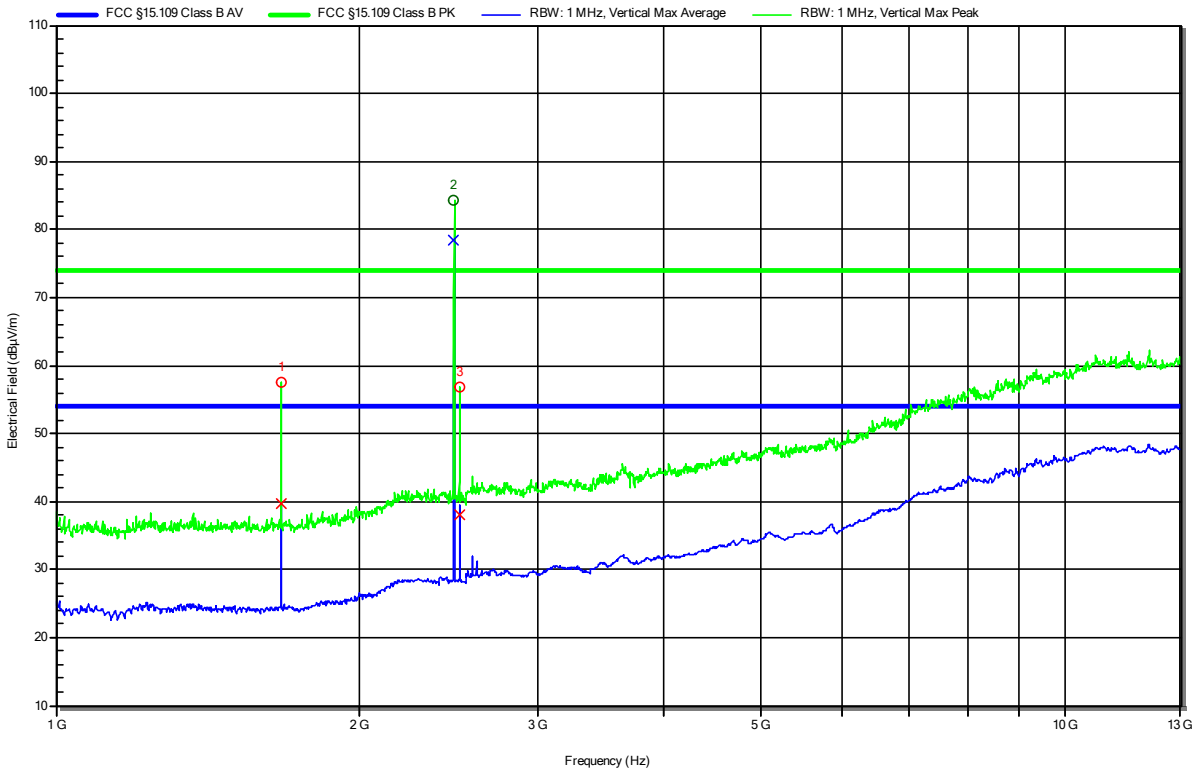

Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.672 GHz	57.58 dBµV/m	73.98 dBµV/m	-16.4 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.509 GHz	56.74 dBµV/m	73.98 dBµV/m	-17.24 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.672 GHz	39.65 dBµV/m	53.98 dBµV/m	-14.33 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.509 GHz	37.98 dBµV/m	53.98 dBµV/m	-16 dB	Pass	0 degrees	1 m

Radiated emissions
according to FCC part 15B

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Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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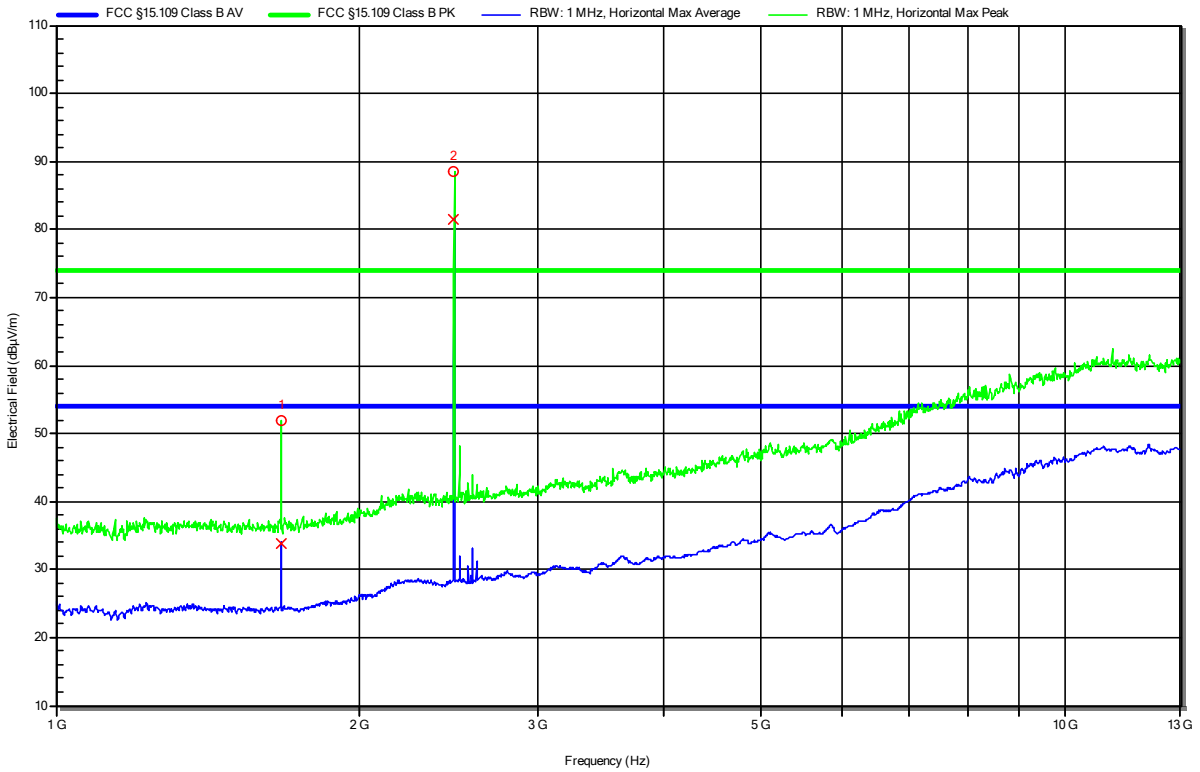
RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.672 GHz	51.81 dBµV/m	73.98 dBµV/m	-22.17 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.672 GHz	33.81 dBµV/m	53.98 dBµV/m	-20.17 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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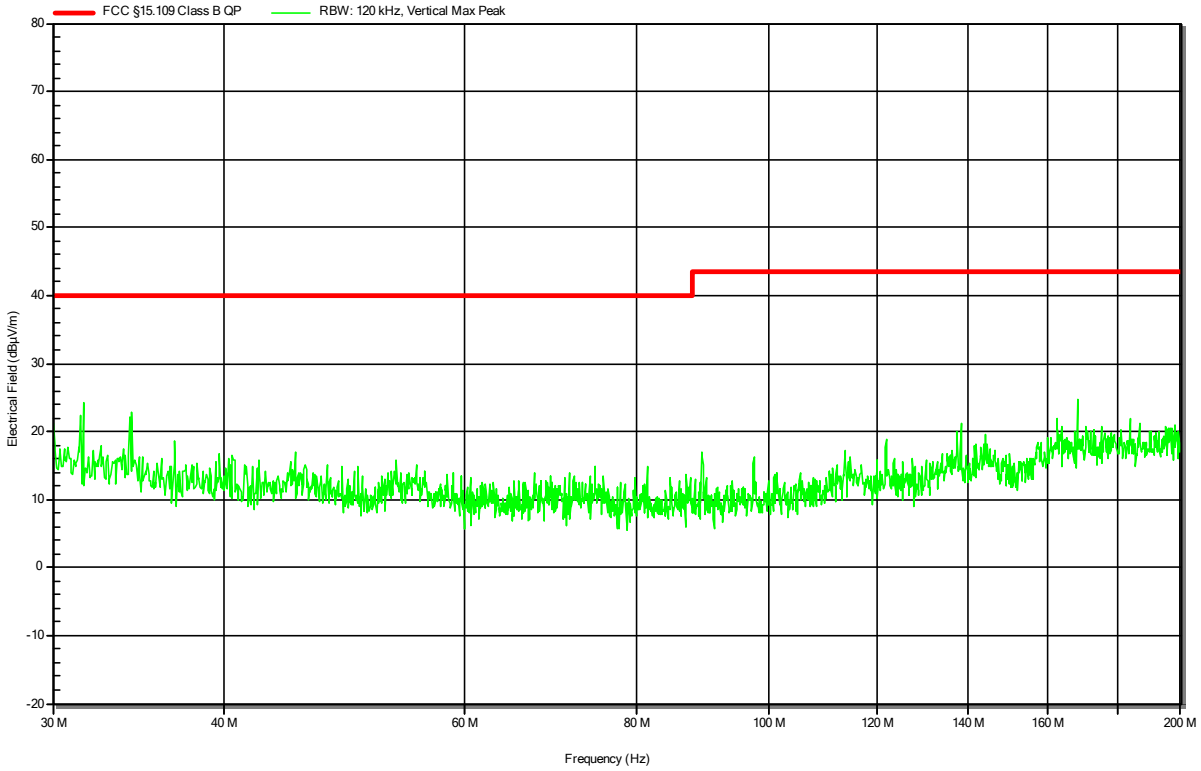
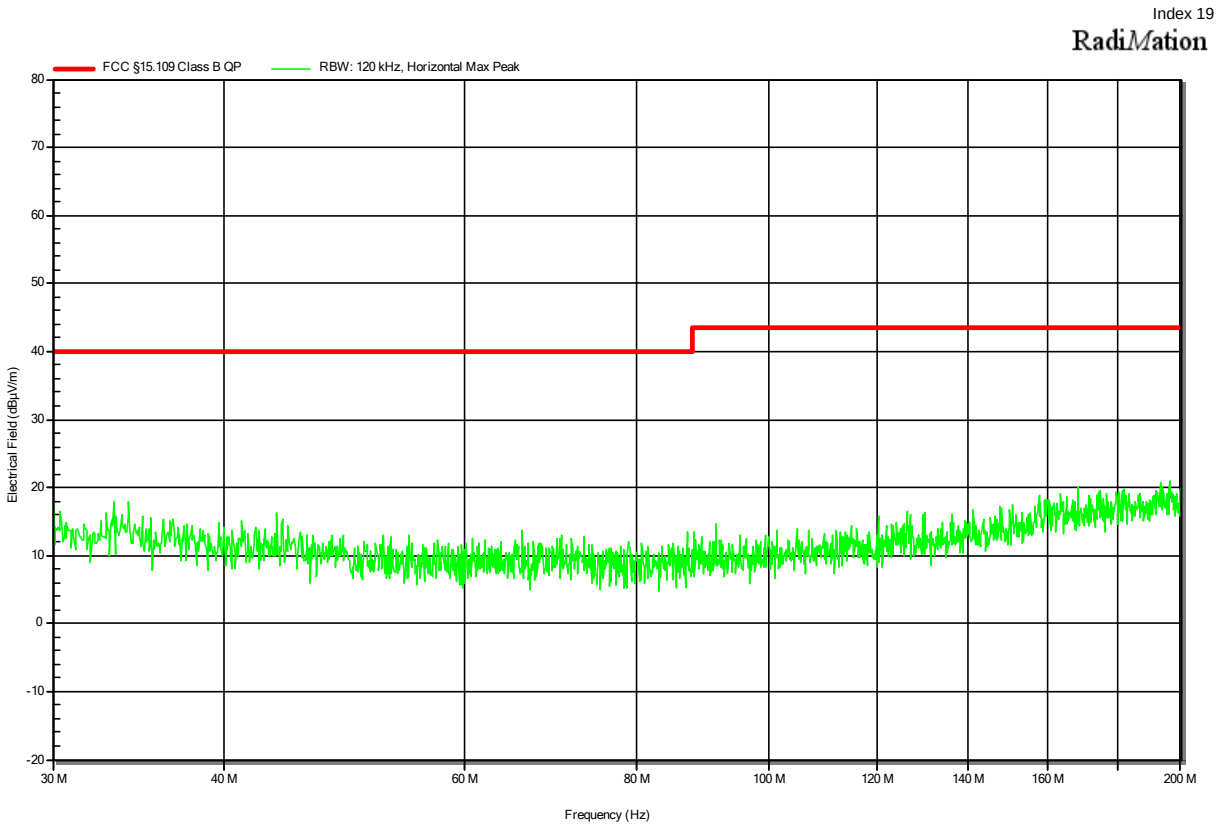
RadiMation



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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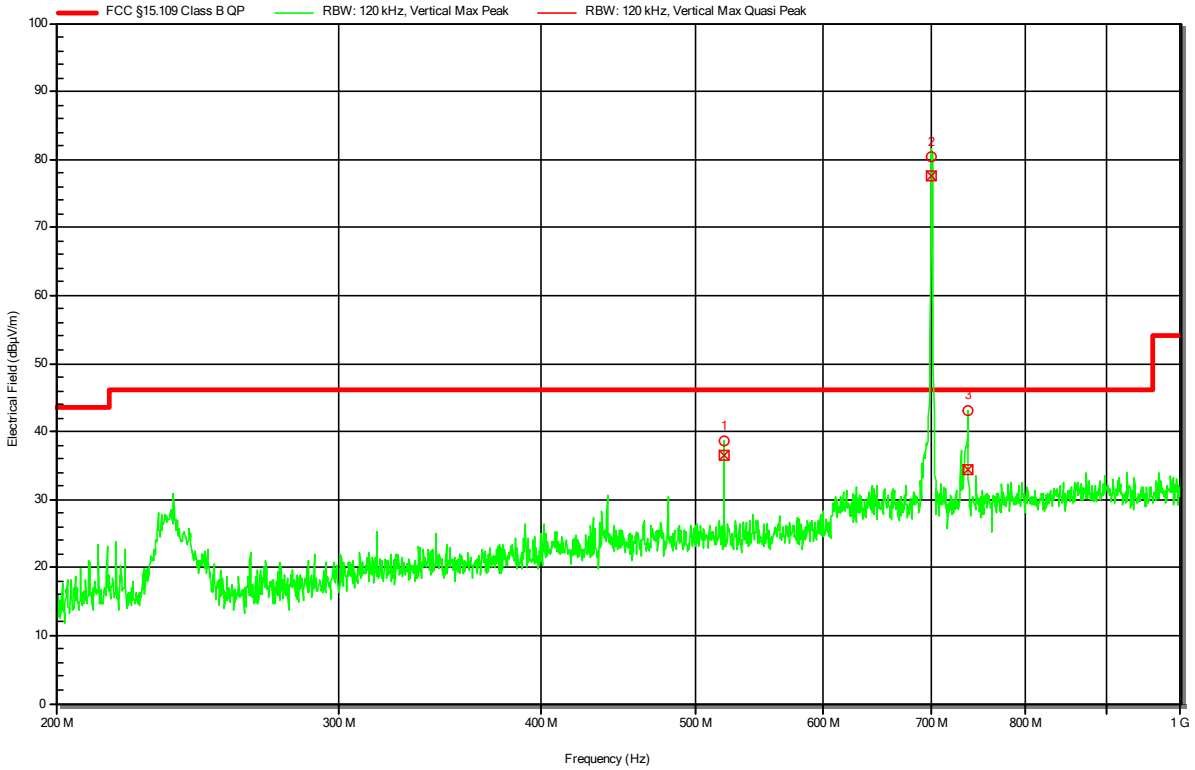
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	520.006 MHz	36.43 dBµV/m	46.02 dBµV/m	-9.59 dB	Pass	0 degrees	1 m
2	699.932 MHz	LTE-Carrier-Channel Uplink					
3	737.06 MHz	LTE-Carrier-Channel Downlink					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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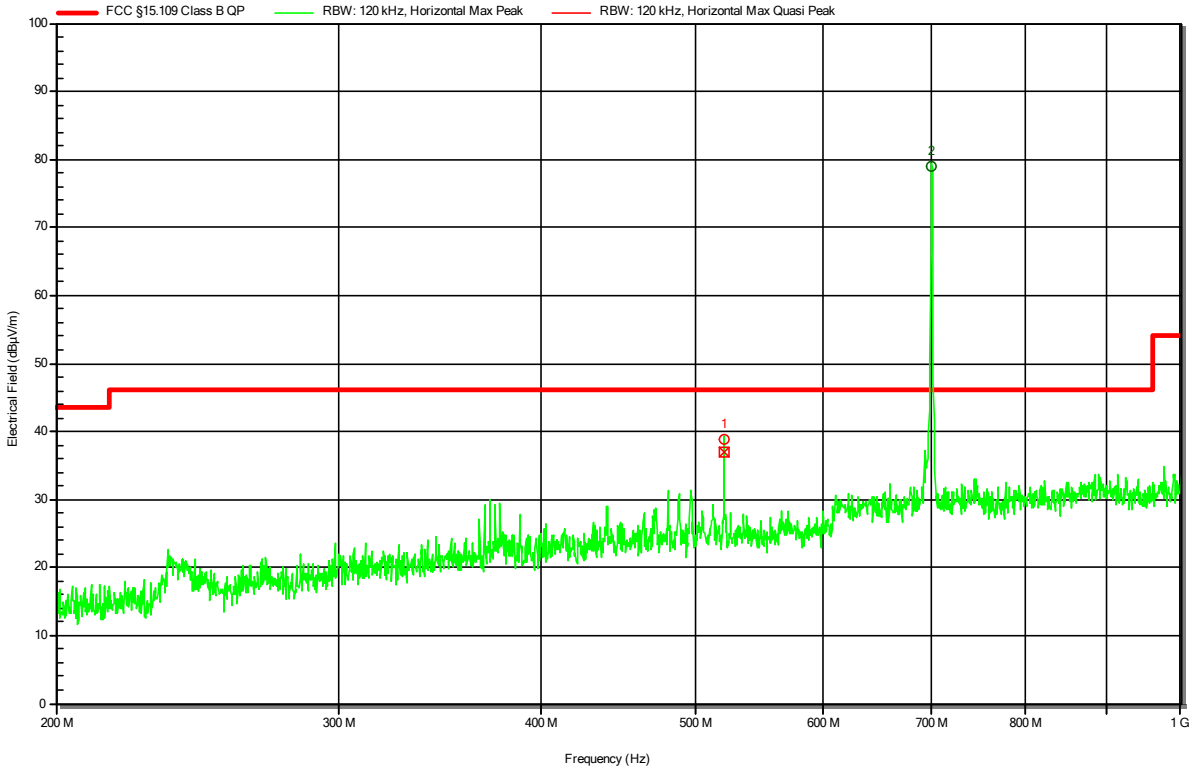
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	520 MHz	36.9 dBµV/m	46.02 dBµV/m	-9.12 dB	Pass	0 degrees	1 m
2	699.932 MHz	LTE-Carrier-Channel Uplink					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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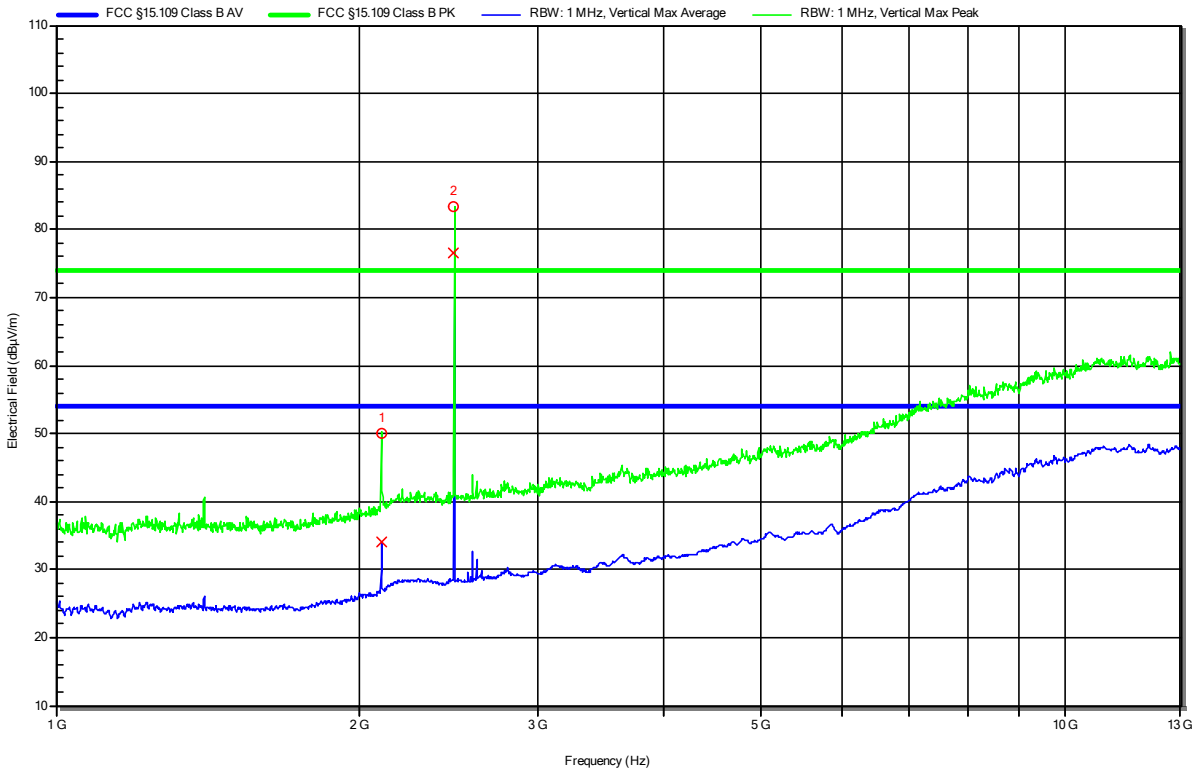
RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.101 GHz	50.13 dBµV/m	73.98 dBµV/m	-23.85 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.101 GHz	34.02 dBµV/m	53.98 dBµV/m	-19.96 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 12 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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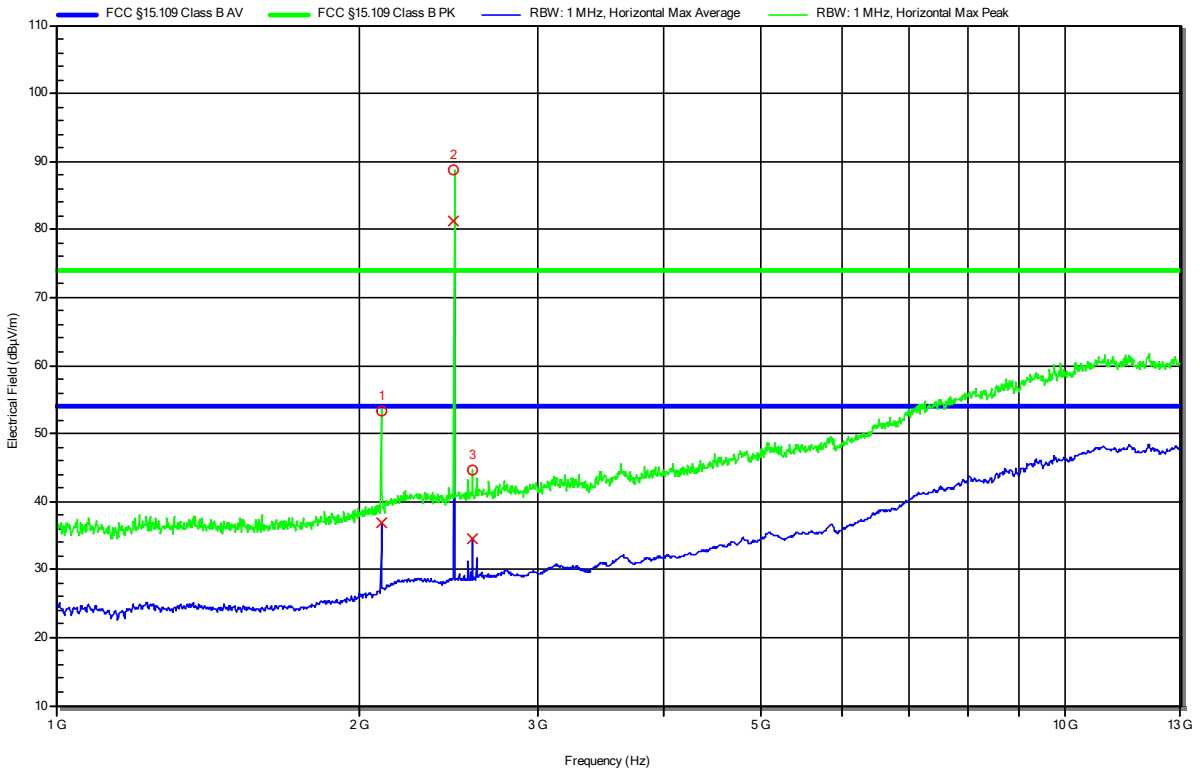
RadiMation

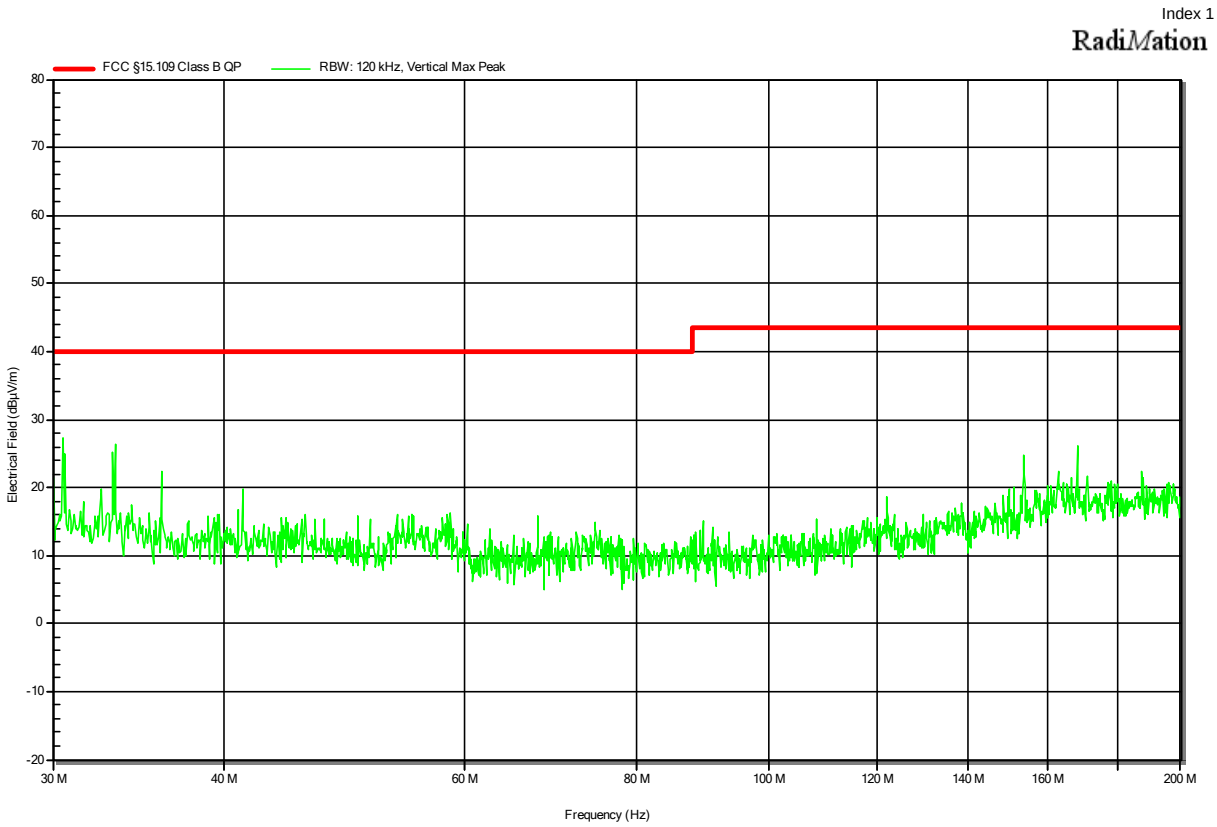


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.101 GHz	53.35 dBµV/m	73.98 dBµV/m	-20.63 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.584 GHz	44.64 dBµV/m	73.98 dBµV/m	-29.34 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.101 GHz	36.83 dBµV/m	53.98 dBµV/m	-17.15 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.584 GHz	34.46 dBµV/m	53.98 dBµV/m	-19.52 dB	Pass	0 degrees	1 m

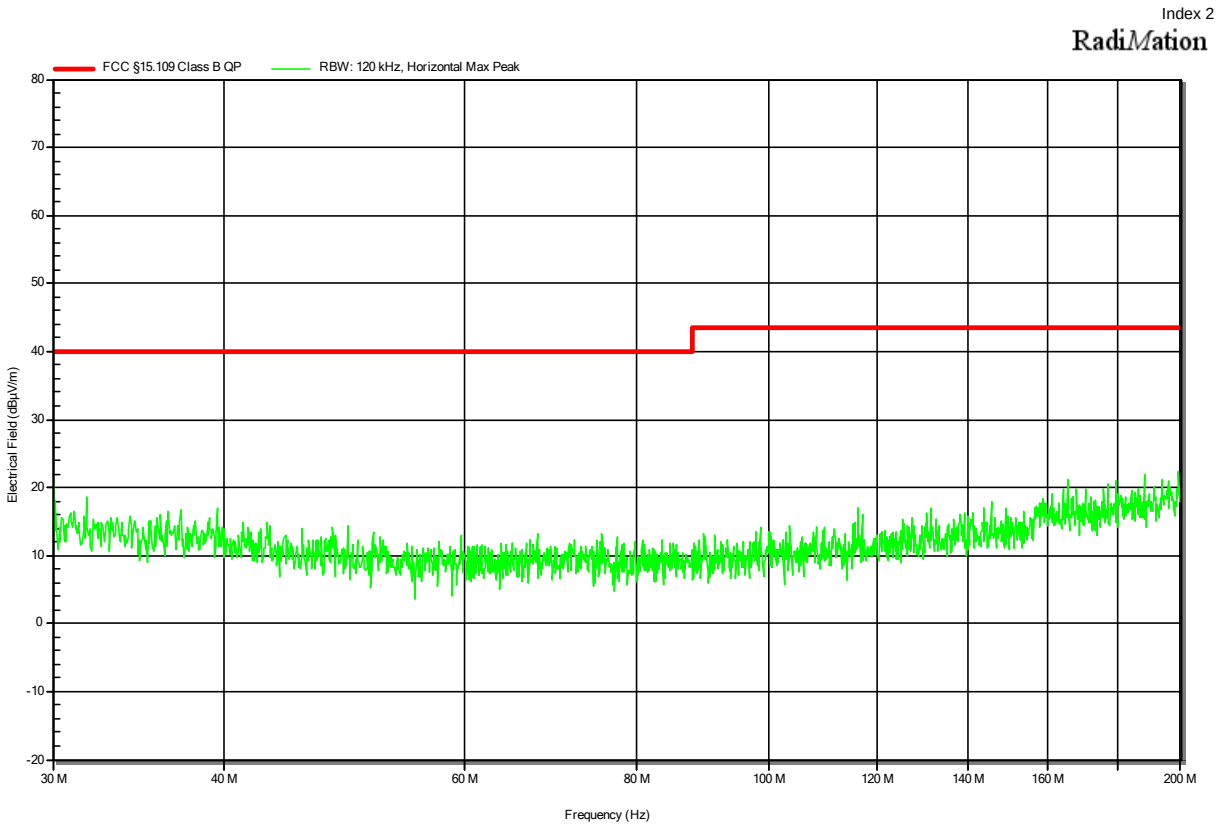
Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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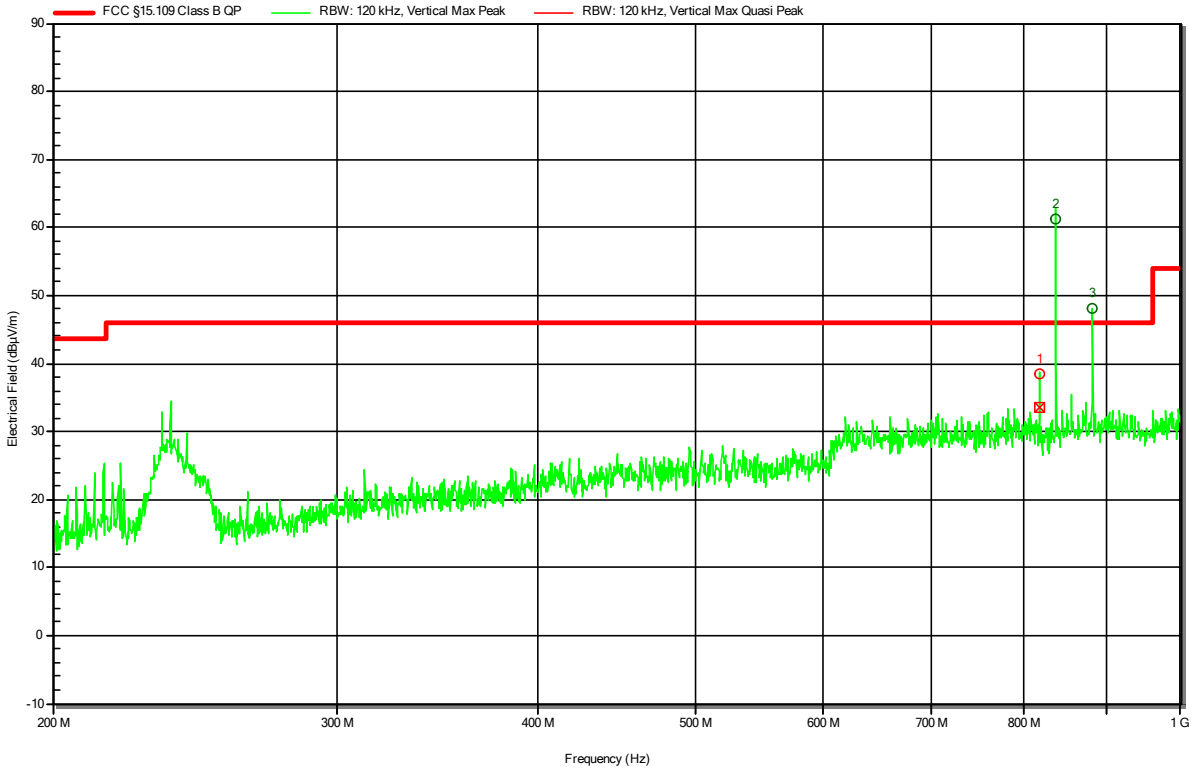
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	817.019 MHz	33.58 dBµV/m	46.02 dBµV/m	-12.44 dB	Pass	0 degrees	1 m
2	836.196 MHz	GSM850-Channel Uplink					
3	881.317 MHz	GSM850-Channel Downlink					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

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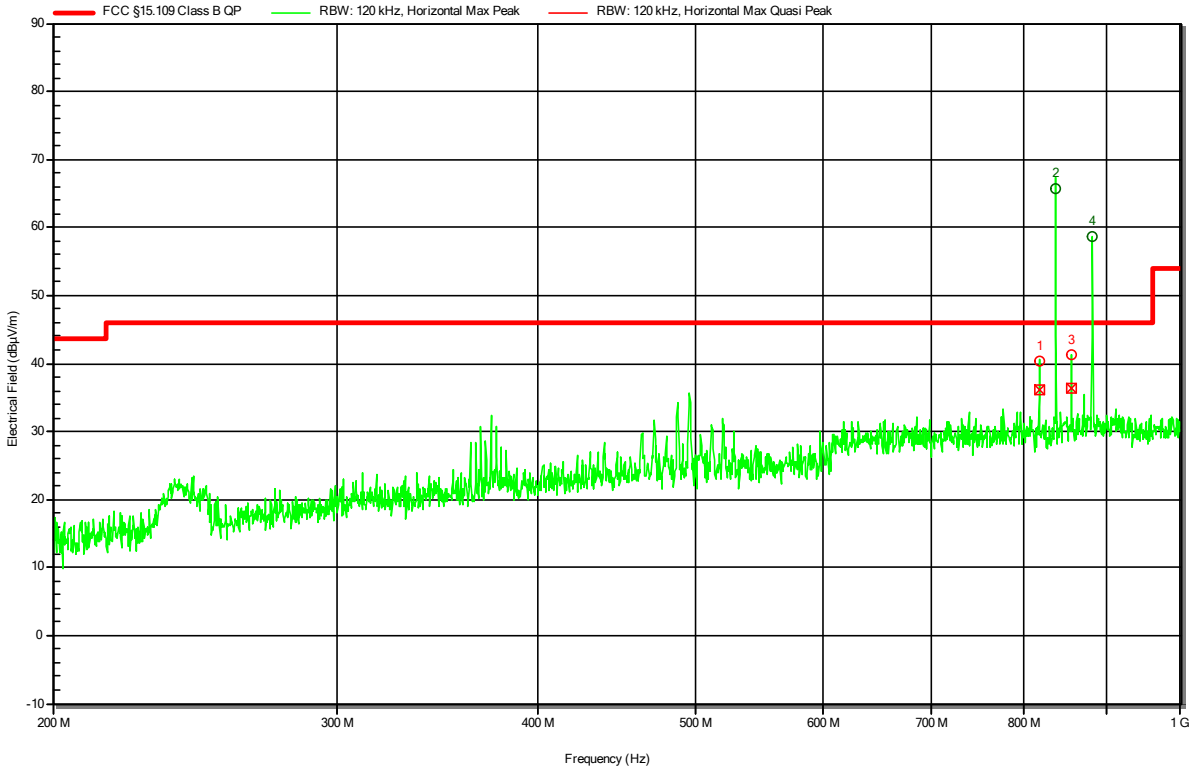
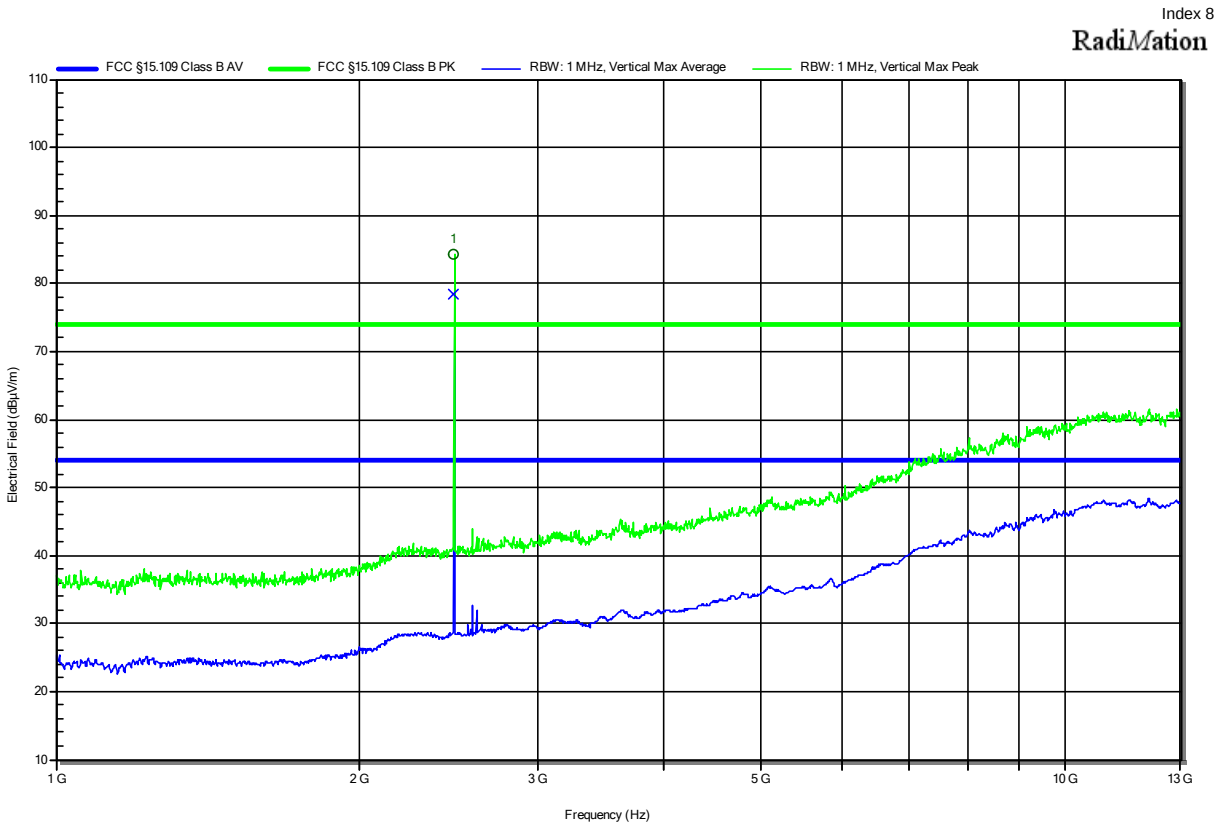
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	817.067 MHz	36.12 dBµV/m	46.02 dBµV/m	-9.9 dB	Pass	0 degrees	1 m
2	836.196 MHz	GSM850-Channel Uplink					
3	855.384 MHz	36.41 dBµV/m	46.02 dBµV/m	-9.61 dB	Pass	0 degrees	1 m
4	881.317 MHz	GSM850-Channel Downlink					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

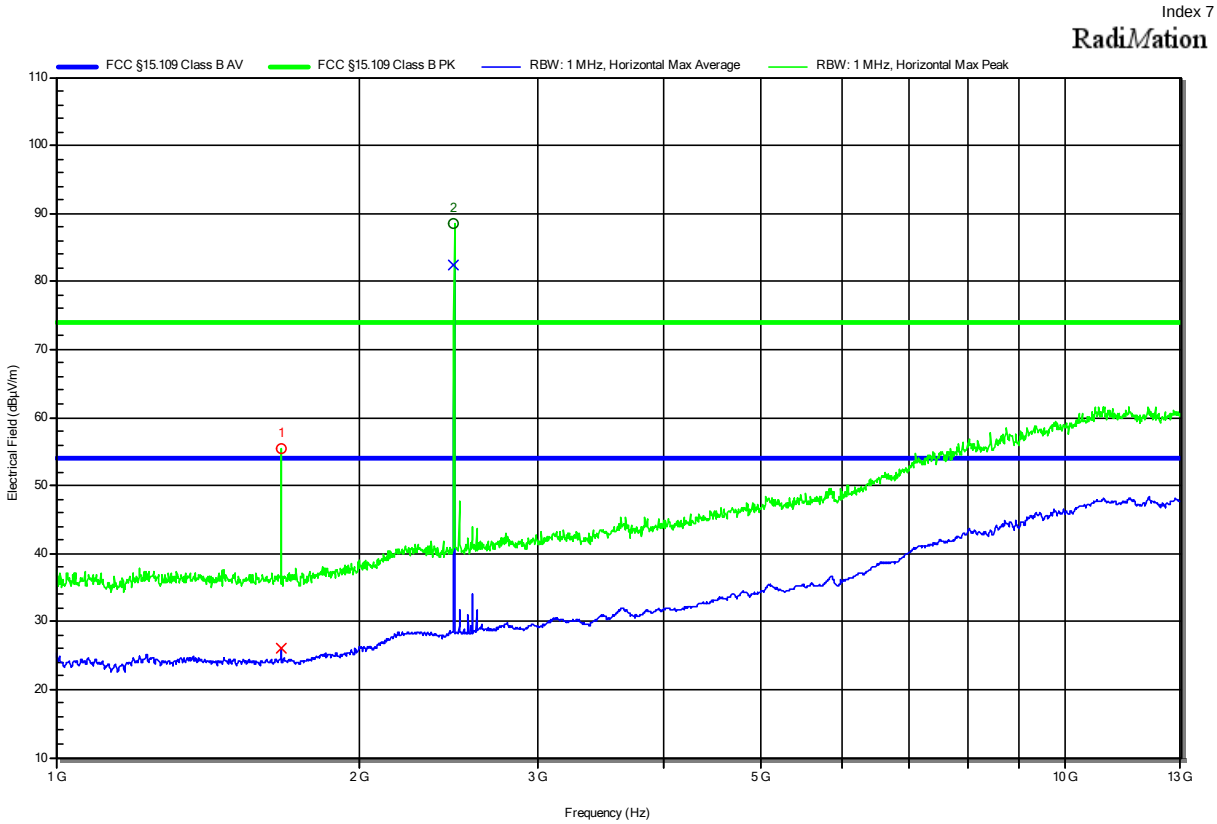


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.48 GHz	Bluetooth-Carrier					

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.48 GHz	Bluetooth-Carrier					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	--

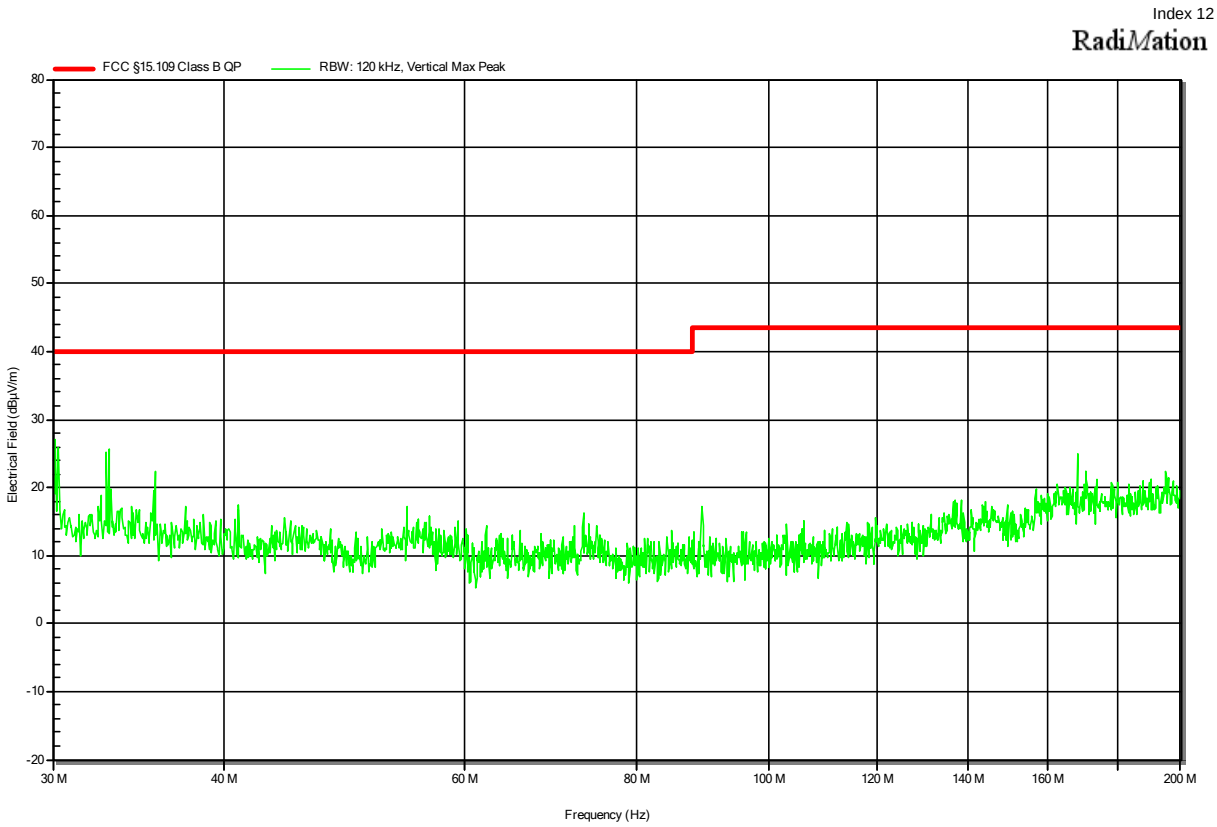


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.673 GHz	55.37 dBµV/m	73.98 dBµV/m	-18.61 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.673 GHz	26.01 dBµV/m	53.98 dBµV/m	-27.97 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

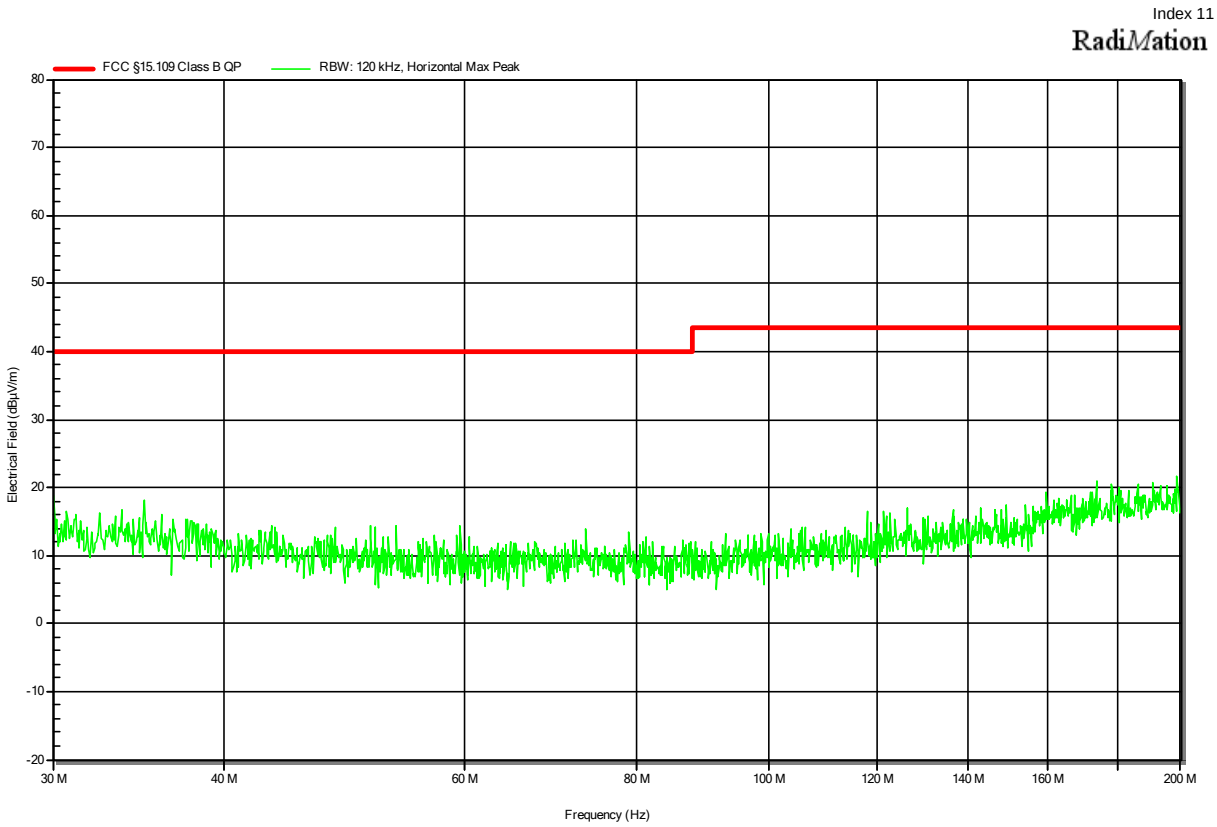
Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--



Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

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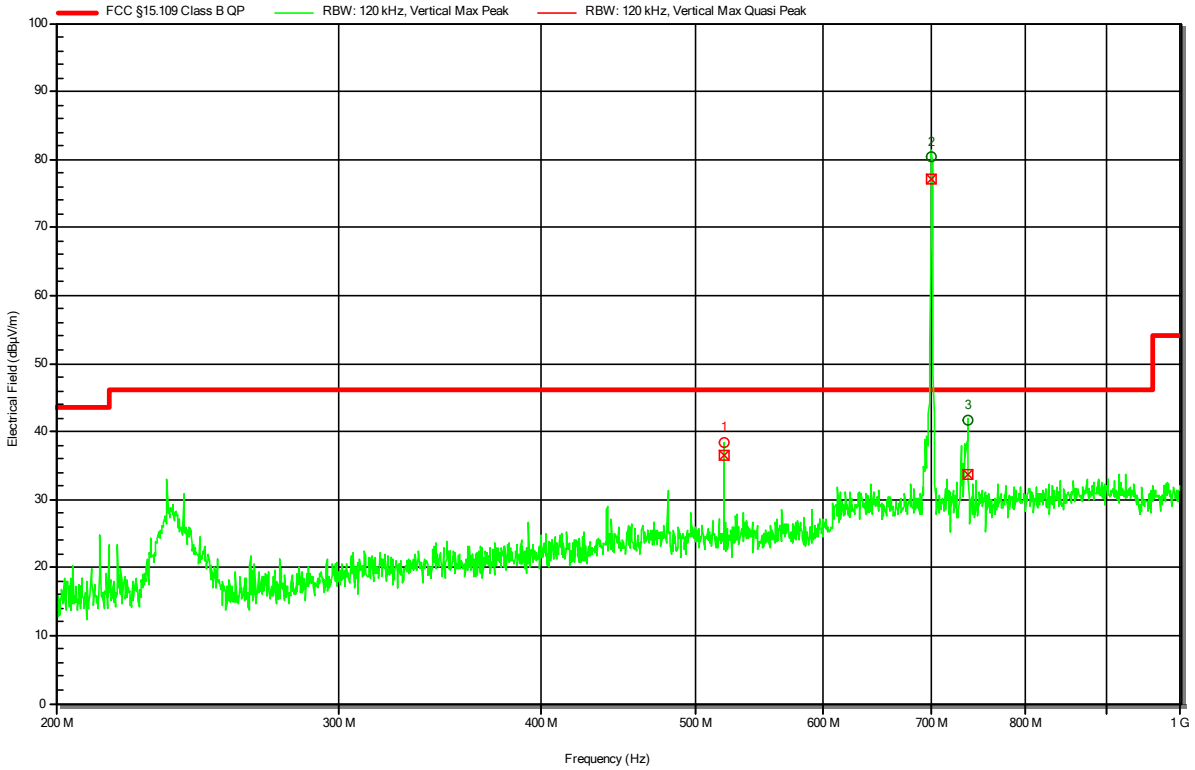
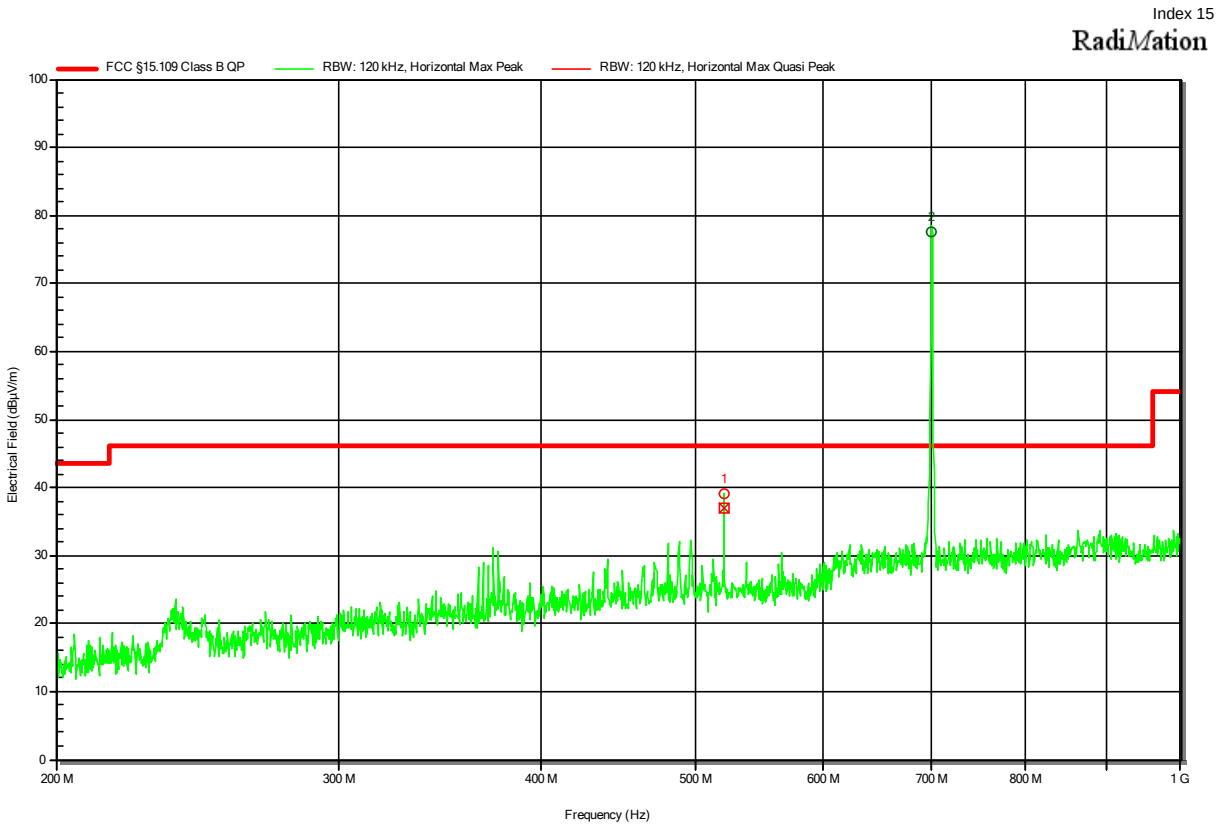
RadiMation



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	520 MHz	36.55 dBµV/m	46.02 dBµV/m	-9.47 dB	Pass	0 degrees	1 m
2	699.932 MHz	LTE-Carrier-Channel Uplink					
3	737.094 MHz	LTE-Carrier-Channel Downlink					

Radiated emissions
according to FCC part 15B

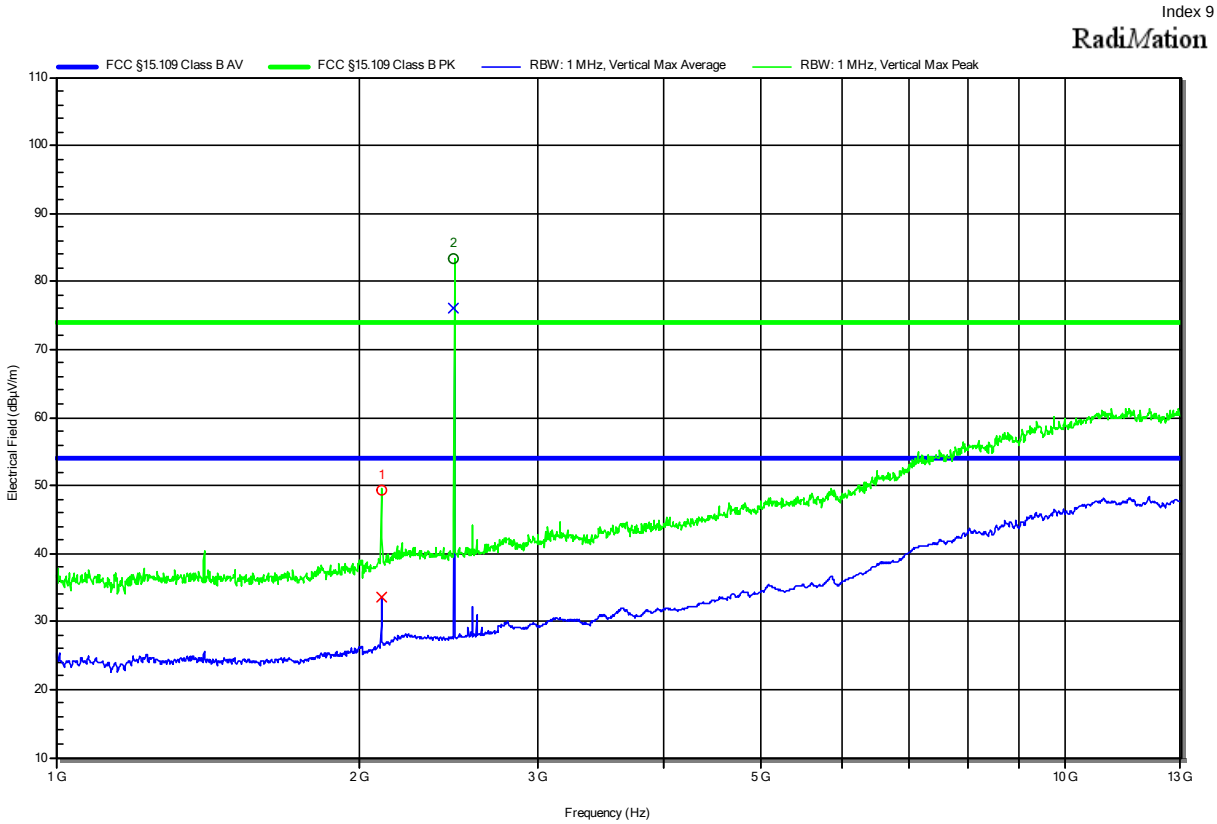
Project Number:	G0M-2108-9942
Applicant:	Bridgestone Mobility Solutions B.V.
Model Description:	Telematic Device with GSM+LTE+GNSS+OBD connector
Model:	L0245
Test Sample ID:	38032
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	520 MHz	36.95 dBµV/m	46.02 dBµV/m	-9.07 dB	Pass	0 degrees	1 m
2	699.932 MHz	LTE-Carrier-Channel Uplink					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--

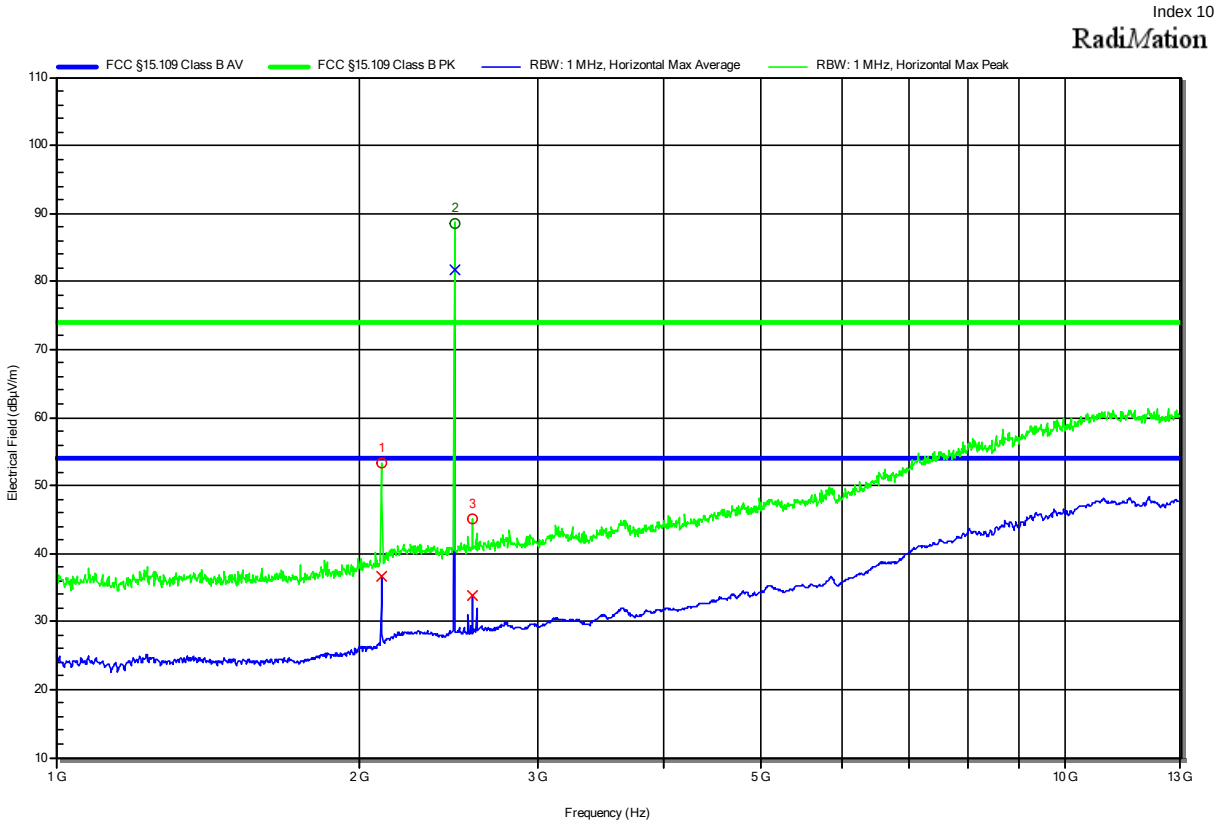


Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.101 GHz	49.35 dBµV/m	73.98 dBµV/m	-24.63 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.101 GHz	33.55 dBµV/m	53.98 dBµV/m	-20.43 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					

Radiated emissions
according to FCC part 15B

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. Liebich
Test Date:	2022-03-05
Operating Conditions:	ambient temperature: 22 °Celsius power input: 24 V DC
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 2
EUT Configuration:	Configuration 1
Note 1:	--



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.101 GHz	53.3 dBµV/m	73.98 dBµV/m	-20.68 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.584 GHz	45.18 dBµV/m	73.98 dBµV/m	-28.8 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.101 GHz	36.7 dBµV/m	53.98 dBµV/m	-17.28 dB	Pass	0 degrees	1 m
2	2.48 GHz	Bluetooth-Carrier					
3	2.584 GHz	33.86 dBµV/m	53.98 dBµV/m	-20.12 dB	Pass	0 degrees	1 m

3 Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2.

Test Name	Measurement Uncertainty
Conducted emissions at the mains power port	150kHz to 30MHz, 3.35dB
Radiated Emission	30MHz to 200MHz @ 3m, 5.1dB 200MHz to 1GHz @ 3m, 5.3dB >1GHz to 6GHz @3m, 5.95dB