

EMF ASSESSMENT REPORT

FCC Rules: Code of Federal Regulations (CFR) no. 47
RF Exposure

Report Number.	AR24-0101409-01	Rev.1 - Modified FCC ID number on page 1 Rev.2 - Modified date of issue
Date of issue	2024-12-11	
Total number of pages	8	
Name of Testing Laboratory preparing the Report	IMQ S.p.A.	
Applicant's name	Intermodal Telematics BV	
Address	Korte Huifakkerstraat 8 – 4815 PS Breda – NL	
Test specification:		
Standards	47 CFR Part 15 and 447498 D01 V06	
Test Report Form No.	TRF 3609/6	
Test Report Form(s) Originator	IMQ S.p.A.	
Master TRF	Dated 2024-01-19	
Test item description	Dual-mode IEEE 802.15.4 and Low Energy (LE) Bluetooth® radio module mounted on dedicated board employed for collecting data of wireless sensors	
Trademark or brand name	IMT - Intermodal Telematics BV	
Manufacturer	Intermodal Telematics BV	
Model/Type reference(s)	CLT20-Ex	
FCC ID	2BG2S-CLT20EX1	
General disclaimer:		
The results of tests and checks reported in this Test Report refer exclusively to the samples tested and described in the Report itself. This Report shall not be reproduced partially the written approval of IMQ S.p.A. The authenticity of this Test Report and its contents can be verified by contacting IMQ S.p.A., responsible for this Test Report.		

Responsible Assessment Laboratory and testing location(s):	
☒ Assessment Laboratory:	IMQ S.p.A.
Assessment location/ address..... :	Viale Lombardia, 20 – IT-20021 Bollate (MI)
Assessed by (name, function, signature) .. :	Robertino Torri <i>[Laboratory technician]</i>
On behalf of Robertino Torri signed by:	Roberto Colombo <i>[Laboratory manager]</i>
Approved by (name, function, signature):	Roberto Colombo <i>[Laboratory manager]</i>

List of Attachments (including a total number of pages in each attachment):
/

Summary of testing	
Tests performed (name of test and test clause)	Testing location:
3.1 RF exposure evaluation (MPE)	Viale Lombardia, 20 – 20021 Bollate (MI) - Italy

Possible test case verdicts:								
- test case does not apply to the test item. : N/A (Not Applicable) - test item does meet the requirement : P (Pass) - test item does not meet the requirement. : F (Fail)								
IMQ reference samples		BEM 116412 (Item(s) sampled and sent by applicant)						
Date of receipt of test item		2024-02-28						
Date of acceptance of test item		2024-02-28						
Date (s) of performance of tests		2024-03-11						
General remarks:								
Throughout this report a ☐ comma / ☒ point is used as the decimal separator. Throughout this report, the term "Test item" is used over terms such as Test object, EUT or DUT.								
Name and address of factory (ies)		Intermodal Telematics BV Korte Huifakkerstraat 8 – 4815 PS Breda – NL						
General product information (GPI) and other remarks: The ability or reliability of this product to perform its intended function in a particular application has not been investigated. The test results apply to the sample as received. All information relating to the details of the equipment under test at the § 1 of this document was provided by the applicant. IMQ declines any responsibility derived from missing or wrong information provided aside by the applicant.								
Environmental reference conditions		The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits: <table border="1" data-bbox="805 1630 1516 1720"> <tr> <th>Temperature</th> <th>Humidity</th> <th>Atmospheric pressure</th> </tr> <tr> <td>15 °C – 35 °C</td> <td>30 % - 60 %</td> <td>86 kPa – 106 kPa</td> </tr> </table> If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report. The laboratory is monitored by a continuous environmental conditions measurements system. Temperature, humidity and pressure data are recorded on a weekly basis and stored in local archive.	Temperature	Humidity	Atmospheric pressure	15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa
Temperature	Humidity	Atmospheric pressure						
15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa						

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1 General description of test item

Note: The information in this section has been provided by the applicant.

1.1 Test item(s)

No.	Item	Unique identification / type / description	Extent of test
1	CLT20-Ex	Dual-mode IEEE 802.15.4 and Low Energy (LE) Bluetooth® radio module mounted on dedicated board employed for collecting data of wireless sensors	Tested in full
Engineering statement for untested variants / product family:			
/			
Supplementary information: The EUT contains below radio as following table:			
Radio		FCC / IC ID	
2G/3G Pentaband modem		XPY1CGM5NNN / 8595A-1CGM5NNN	
4G/5G LTE-M (CAT M1) & NB-IOT		KPY2AGQN4NNN / 8595A-2AGQN4NNN	
According to manufacturer declaration no simultaneous transmissions are allowed			

1.2 Radio parameters

Radio module model	/		
Operating frequencies	2400-2483.5MHz (IEEE 802.15.4 and BLE)		
Antenna parameters.....	Type	☐ Integral	☒ Dedicated ☐ External
	Model	/	
	Gain	4.9 dBi	
Transmission protocol	/		

2 Verdict summary section

Rationale for verdicts, including N/A (Not Applicable), are listed on each test sheet.

Requirements			
Clause	Requirement – Test case	Basic standard	Verdict
3.1	RF exposure evaluation (MPE)	47 CFR § 1.1307 and Table 1 to §1.1310(e)(1) KBD 447498 D01 v06	P
Supplementary information: /			

3 Conformity assessment

3.1 RF exposure evaluation (MPE)

TEST REQUIREMENT				
Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines § 1.1310.				
EUT classification (fixed, mobile or portable devices)	Fixed according to § 1.1307 of this Chapter			
LIMITS	According to Table 1 to §1.1310(e)(1) — Limits for Maximum Permissible Exposure (MPE)			
Testing dates	2024-04-09			
TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	* 100	6
3.0–30	1842/f	4.89/f	* 900/f ²	6
30–300	61.4	0.163	1.0	6
300–1,500			f/300	6
1,500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	* 100	30
1.34–30	824/f	2.19/f	* 180/f ²	30
30–300	27.5	0.073	0.2	30
300–1,500			f/1500	30
1,500–100,000			1.0	30
f = frequency in MHz * = Plane-wave equivalent power density				
The power density at any given distance in any direction can be calculated in the far field using the following equation:				
S = PG_i / (4πr²)				
where:				
S : power density (W/m ²) in a given direction.				
P : power (W) supplied to the radiation source, assuming a lossless system;				
G_i : gain factor of the radiation source in the relevant direction, relative to an isotropic radiator;				
r : distance (m) from the radiation source.				
The product PG_i in equation is known as the e.i.r.p. which represents the power that a fictitious isotropic radiator would have to emit in order to produce the same field intensity at the receiving point.				

CALCULATION FOR SINGLE TRASMISSION - MPE

Operating band (MHz)	Max power (dBm)	Max E.I.R.P. (mW)	Equivalent plane wave power density @ 20 cm S (mW/cm ²)	Limits (mW/cm ²)
2400 IEEE 802.15.4	17.86	61.0942	0.0122	1.0
2400 BLE	17.88	61.3762	0.0122	1.0
Supplementary information: No simultaneous transmission				

TEST RESULT

This value is less than the low threshold limit for Maximum Permissible Exposure.

END OF ASSESSMENT REPORT