Radio Frequency Exposure Evaluation Report

FOR:

Magnetti Marelli

Model Name:

FTM

Product Description:

Fleet Telematics Module

FCC ID: RX2FTM
IC ID: 4983A-FTM

Applied Rules and Standards:

CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091),
ISEDC RSS-102 Issue 5

Report number: EMC_MAGNE_004_FCC_ISED_MPE
DATE: 2018-05-21

A2LA Accredited

IC recognized #
3462B-1

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Contents

1. Assessment

This RF Exposure evaluation report provides information about compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 &1.1310), Part 2 (2.1091), and ISEDC standard RSS-102, under given conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant). In addition, maximum antenna gain or minimum distance towards the human body is calculated, respectively, where relevant.

The device meets the limits as stipulated by the above given FCC/ISEDC rule parts based on available specifications.

Company Name	Product Description	Model #
Magneti Marelli	Fleet Telematics Module	FTM

Responsible for Testing Laboratory:

Date	Section	Name	Signature
2018-05-21	Compliance	James Donnellan (Lab Manager - EMC)	James Donnellan

Responsible for the Report:

Date	Section	Name	Signature
2018-05-212018-05-30	Compliance	Kevin Wang (Senior EMC Engineer)	Kevin Wang Digitally signed by Kevin Wang DN: cn=Kevin Wang, o=CETECOM Inc., ou=EMC, email=Kevin.Wang@cetecom.com, c=US Date: 2018.05.30 15:52:26 -07'00'

2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
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Country	USA
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Compliance Manager:	James Donnellan
Responsible Project Leader:	Kevin Wang

2.2. Identification of the Client / Manufacturer

Applicant's Name:	Magnetti Marelli
Street Address:	900 North Squirrel Road, Suite 205
City/Zip Code	Auburn Hills (MI) /48326
Country	USA

3. Equipment under Assessment

Model No	FTM
HW Version	Serie
SW Version	5.0
FCC-ID	RX2FTM
IC-ID	4983A-FTM
Product Description	Fleet Telematics Module
Transceiver Technology / Type(s) of Modulation	Telit LE910 NA1; HW Rev. LE910NA1002T701, SW Rev. 20.00.522 FCC ID: RI7LE910NAV2; IC ID: 5131A-LE910NAV2 •FDD II / FDD V •FDD LTE 2 / FDD LTE 4 / FDD LTE 5 / FDD LTE 12 / FDD LTE 13
Frequency Range	FDD II: 1850 – 1910; FDD V: 824 – 849; LTE Band 2: 1850 – 1910; LTE Band 4: 1710 – 1755; LTE Band 5: 824 - 849; LTE Band 12: 699 – 716; LTE Band 13: 777 – 787;
Max. declared antenna gain	Max gain: 3dBi
Co-located Transmitters/ Antennas?	No
Power Supply/ Rated Operating Voltage Range	9V (Low) / 12V (Nominal) / 16V (Max), DC
Operating Temperature Range	–40°C ~ +85°C
Sample Revision	☐Prototype ☐Production ■ Pre-Production
Device Category	■Fixed Installation ☐Mobile ❑ Portable
Exposure Category	☐ Occupational/ Controlled ■ General Population/ Uncontrolled

4. RF Exposure Limits

For the specific described radio apparatus the following basic limits and rules apply

4.1. Power Density Limits acc. to FCC 1.1310(e)

Frequency Range (MHz)	Power density (mW/cm²)	Averaging time (minutes)
1500 – 100,000	1.0	30

4.2. Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c)

- Operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm;

Per KDB 447498 D01 FCC allows calculative estimation of RF exposure for mobile applications when routine environmental evaluation categorical exclusion applies and also for fixed applications. When categorical exclusion cannot be claimed for mobile applications MPE measurement is required for TCB approval.

4.3. Exemption Limits for Routine Evaluation to RSS-102 2.5.2

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
- Operating frequency > 300MHz < 6GHz: excluded if ERP < 2.7W / 34.3dBm;

4.4. Exposure Limits RSS-102 4

For the purpose of this standard, ISEDC has adopted the SAR and RF field strength limits established in Health Canada's RF exposure guideline, Safety Code 6

Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m2)	Reference Period (minutes)
300-6000	3.142 f 0.3417	0.008335 f 0.3417	0.02619 f 0.6834	6

4.5. RF Exposure Estimation (MPE Estimation)

Having available the source based average output power and peak antenna gain or the ERP/EIRP of the specified device and for a known minimum distance of its radiating structures from the body of persons according to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (mW/cm² or W/m²)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

5. Evaluations

5.1. Routine Environmental Evaluation Applicability Stand Alone transmission

Transmission Mode	EIRP dBm	Duty Cycle %	Limits for Routine Environmental Evaluation Applicability, EIRP dBm	Exempt from Routine evaluation (Yes/No)
FDD II	26.65	100	< 33.59	Yes
FDD V	26.60	100	< 31.19	Yes
FDD LTE 2	26.40	100	< 33.59	Yes
FDD LTE 4	26.12	100	<33.34	Yes
FDD LTE 5	25.81	100	< 31.19	Yes
FDD LTE 12	25.81	100	<30.68	Yes
FDD LTE 13	25.87	100	<30.96	Yes

Note: EIRP power calculation is based on the Stated RF output power and tune-up tolerance provided by the manufacturer

Conclusion:

- Since the EIRP is less than the FCC limit, this device is exempt from Routine evaluation.

5.2. Compliance with MPE (Power Density) limits

Power Density Calculation						
Band of Operation MHz	EIRP dBm	Maximum Duty Cycle %	Distance cm	Power Density mW/cm^2	Limit mW/cm^2	Verdict
FDD II	26.65	100	20	0.09214	< 0.566	Pass
FDD V	26.60	100	20	0.09095	< 1.000	Pass
FDD LTE 2	26.40	100	20	0.08698	< 0.566	Pass
FDD LTE 4	26.12	100	20	0.08141	< 1.000	Pass
FDD LTE 5	25.81	100	20	0.07585	< 0.566	Pass
FDD LTE 12	25.81	100	20	0.07585	< 0.477	Pass
FDD LTE 13	25.87	100	20	0.07705	< 0.525	Pass

Conclusion:

- The equipment fulfills the MPE limits for the minimum 20cm distance between the antenna and the human body

6. Revision History

Date	Report Name	Changes to report	Report prepared by
2018-05-21	EMC_MAGNE_004_FCC_ISED_MPE	Initial Version	Kevin Wang