



Test Report - FCC Part 1.1310/ MPE

Applicant: Abbott Rapid Diagnostics, Informatics, Inc.

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 4/24/2023

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Customer Information

Applicant: Abbott Rapid Diagnostics, Informatics, Inc.
Address: 2000 Holiday Drive
Charlottesville, Virginia, 22901, United States

Location of Testing

1.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at Timco's permanent laboratory located at 849 NW State Road 45, Newberry, Florida 32669

FCC test firm # 578780
FCC Designation # US1070
FCC site registration is under A2LA certificate # 0955.01
ISED Canada test site registration # 2056A
EU Notified Body # 1177
For all designations see A2LA scope # 0955.01



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1.2 Testing was performed, reviewed by

Dates of Testing: 4/5/2023 – 4/7/2023

Signature:

Sr. EMC Engineer
EMC-003838-NE



Name & Title:

Tim Royer, EMC Engineer

Date of Signature

4/24/2023

Signature:

Name & Title:

Kristoffer Costa, EMC Technician

Date of Signature

4/24/2023



Test Sample(s) (EUT/DUT)

The test sample was received: 3/29/2023

1.3 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID::	2BAKJ-ACR2G01
Brief Description	4G LTE Router
Model(s) #	ACR2-G-01
Firmware version	N/A
Software version	N/A
Serial Number	a601e134e5998547

Technical Characteristics	
Frequency Range	2400 MHz- 2483.5 MHz
RF O/P Power (Max.)	12.90 dBm/ 0.019 W
Module FCC ID	FCC ID: XMR201903EG25G
Duty Cycle	100%
Antenna Connector	SMA
Voltage Rating (AC or Batt.)	100-240 VAC/ 50-60 Hz

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	n/a	n/a	0 dBi

- Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.



1. Test methods & Applicable Regulatory Limits

1.1 Test methods/Standards/Guidance:

The following guidance FCC KDB 447498 D01 General RF Exposure Guidance v06 was used for RF exposure evaluation as per FCC Part 1.1310 and FCC Part 2.1091 and part 2.1093. Full test results are available in this report.

1.1.1 FCC 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



1.2 Equations

POWER DENSITY

$$E(V/m) = \text{SQRT} (30 * P * G) / d$$

$$Pd(W/m^2) = E^2 / 377$$

$$S = \text{EIRP} / (4 * \text{Pi} * D^2v)$$

Where:

S = Power density, in mW/cm²

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm² to units of W/m² by multiplying by 10.

DISTANCE

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

Where:

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power, in mW

S = Power density in mW/cm²

SOURCE-BASED DUTY CYCLE (When applicable (for example, multi-slot mobile phone applications) A duty cycle factor may be applied.)

$$\text{Source-based time-average EIRP} = (\text{DC} / 100) * \text{EIRP}$$

Where:

DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW



1.3 Exposure calculations for multiple sources

The following guidance FCC KDB 447498 D01 General RF Exposure Guidance v06 Appendix C was used for RF exposure evaluation as per FCC Part 1.1310 and FCC Part 2.1091 and part 2.1093.

1.3.1 Equations

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

Simultaneous Tx Combination	Configuration
1	2.4GHz BT module
2	LTE Module FCC ID: XMR201903EG25G
3	2.4GHz BT module + LTE Module FCC ID: XMR201903EG25G



1.1 Calculation of Transmitters MPE

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
2412-2462 MHz	20	12.90	0.00	100%	0.02	0.004 mW/cm ²	1 mW/cm ²	5 mW/cm ²	20.00

Data from FCC ID: XMR201903EG25G

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Average Output Power (dBm)	Output Power to Antenna (dBm)	EIRP(ERP) Limit (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Gain according to EIRP (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM850	824.2	2.29	25.81	25.95	38.45	381.0658	0.1284	0.5495	14.79	8.60	8.60	Pass
GSM1900	1850.2	1.59	22.81	24.40	33.00	190.9853	0.0548	1.0000	10.19	14.20	10.19	Pass
WCDMA B2	1852.4	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
WCDMA B4	1712.4	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
WCDMA B5	826.4	2.29	25.00	25.14	38.45	316.2278	0.1066	0.5509	15.60	9.42	9.42	Pass
LTE B2	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B4	1710.7	2.00	25.00	27.00	30.00	316.2278	0.0997	1.0000	5.00	12.01	5.00	Pass
LTE B5	824.70	2.29	25.00	25.14	38.45	316.2278	0.1066	0.5498	15.60	9.41	9.41	Pass
LTE B7	2502.50	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass
LTE B12	699.70	3.26	25.00	26.11	34.77	316.2278	0.1333	0.4665	11.92	8.70	8.70	Pass
LTE B13	779.50	4.45	25.00	27.30	34.77	316.2278	0.1753	0.5197	11.92	9.16	9.16	Pass
LTE B25	1850.7	1.59	25.00	26.59	33.00	316.2278	0.0907	1.0000	8.00	12.01	8.00	Pass
LTE B26(814-824)	814.7	2.53	25.00	25.38	50.00	316.2278	0.1126	0.5431	27.15	9.36	9.36	Pass
LTE B26(824-849)	824.7	2.53	25.00	25.38	38.45	316.2278	0.1126	0.5498	15.60	9.41	9.41	Pass
LTE B38	2572.5	2.06	25.00	27.06	33.00	316.2278	0.1011	1.0000	8.00	12.01	8.00	Pass
LTE B41	2498.5	3.00	25.00	28.00	33.00	316.2278	0.1255	1.0000	8.00	12.01	8.00	Pass



1.2 Calculation of Transmitters

Mode	EIRP (mW)	R (cm)	S (mw/cm ²)	Limit (mw/cm ²)	% of limit	Total Exposure ratio (<1)
2.4GHz BT	19.5	20	0.004	1	0.04%	0.04%
LTE Module	316.2278	20	0.1255	1	12.5%	12.5%

1.1 Calculation of Co-Located Transmitters

Simultaneous Conditions	Mode/Band	% of limit)	Total Exposure ratio (<1)
2.4GHz BT + LTE Module	2.4GHz BT	0.4%	12.54
	LTE Module	12.5%	

Conclusion: According to the Table above, it can be concluded that the TER calculating result of all simultaneous transmission possibilities is less than 1.

Therefore, the product also meets the requirements under multiple source condition.



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History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_7260-23_MPE Evaluation_	1	Initial release	4/24/2023



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END OF TEST REPORT
