MPE TEST REPORT

Applicant	Flextronics (Shanghai) Co., Ltd
FCC ID	2AP3PAPOC
Product	AT100 series (AT100, AT130) – Wired asset tracker TT400 series (TT400, TT401) – Wired trailer tracker FT500 series (FT500) – In-cab telematics tracker
Model	AT100-LM0Q-GL,AT130-LM0Q-GL, TT400-LM0Q-GL,FT500-LM0Q-GL TT401-LM0Q-GL
Report No.	R1908A0461-M1
Issue Date	November 22, 2019

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Yu Wang

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Table of Contents

1 Test Laboratory

1.1 Notes of the Test Report

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1.2 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
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1.3 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment under Test

Client Information

Applicant	Flextronics (Shanghai) Co., Ltd
Applicant address	4F, Bldg. 10, No. 3000 Longdong Ave., Pudong New District, Shanghai, China, 201203
Manufacturer	Flex Industrial, Ltd.
Manufacturer address	Level 3, Alexander House, 35 Cybercity, Ebene, Mauritius

General Technologies

Model	AT100-LM0Q-GL, AT130-LM0Q-GL, TT400-LM0Q-GL, FT500-LM0Q-GL, TT401-LM0Q-GL
IMEI	866425038986982
Hardware Version	P2.1
Software Version	2.1.29
Date of Testing:	August 26, 2019 ~ October 31, 2019

The difference between AT100-LM0Q-GL, AT130-LM0Q-GL, TT400-LM0Q-GL, FT500-LM0Q-GL, TT401-LM0Q-GL please refer to *APOC Difference Information.*
However, only the worst model FT500-LM0Q-GL will be recorded in this report.

3 Maximum conducted output power (measured) and antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by
Numeric gain (G)=10^(antenna gain/10)

Band	Burst Turn up Power(dBm)	Division Factors (dB)	Time-Averaged Tune up Power (dBm)
GSM 850	33.00	-3.01	29.99
GSM 1900	30.00	-3.01	26.99

Note:
Division Factors
To average the power, the division factor is as follows:
1Txslot = 1 transmit time slot out of 8 time slots
=> conducted power divided by (8/1) => -9.03 dB
2Txslots = 2 transmit time slots out of 8 time slots
=> conducted power divided by (8/2) => -6.02 dB
3Txslots = 3 transmit time slots out of 8 time slots
=> conducted power divided by (8/3) => -4.26 dB
4Txslots = 4 transmit time slots out of 8 time slots
=> conducted power divided by (8/4) => -3.01 dB

Band	Maximum Conducted Output Power (dBm)		Antenna Gain (dBi)	Numeric gain
	(dBm)	(mW)		
GSM 850	29.99	997.700	0	1.000
GSM 1900	26.99	500.035	1	1.259
LTE Band 2	24.00	251.189	1	1.259
LTE Band 4	23.00	199.526	1	1.259
LTE Band 5	24.00	251.189	0	1.000
LTE Band 12	24.00	251.189	-1	0.794
LTE Band 13	24.00	251.189	-1	0.794
LTE Band 26	24.00	251.189	0	1.000
NB-IOT Band 2	24.00	251.189	0	1.000
NB-IOT Band 4	23.00	199.526	1	1.259
NB-IOT Band 5	24.00	251.189	1	1.259
NB-IOT Band 12	24.00	251.189	1	1.259
NB-IOT Band 13	24.00	251.189	0	1.000
NB-IOT Band 26	24.00	251.189	-1	0.794
Bluetooth (Low Energy)	6.97	4.977	1	1.259

4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following

TABLE 1 – LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			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/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 300~1500 MHz is f/1500, for 1500~100,000MHz is 1.0.So

Band	The maximum permissible exposure
GSM850	0.55mW/cm^2
GSM1900	1.0mW/cm^2
LTE Band 2	1.0mW/cm^2
LTE Band 4	1.0mW/cm^2
LTE Band 5	0.55mW/cm^2
LTE Band 12	0.47mW/cm^2
LTE Band 13	0.52mW/cm^2
LTE Band 26	0.55mW/cm^2
NB-IOT Band 2	1.0mW/cm^2
NB-IOT Band 4	1.0mW/cm^2
NB-IOT Band 5	0.55mW/cm^2
NB-IOT Band 12	0.47mW/cm^2
NB-IOT Band 13	0.52mW/cm^2
NB-IOT Band 26	0.55mW/cm^2
Bluetooth (Low Energy)	1.00mW/cm^2

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\prod R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	PG (mW)	Test Result (mW/cm^2)	Limit Value (mW/cm^2)	The MPE ratio	Conclusion
GSM 850	997.700	1.000	0.550	0.361	Pass
GSM 1900	500.035	1.259	1.000	0.125	Pass
LTE Band 2	251.189	1.259	1.000	0.063	Pass
LTE Band 4	199.526	1.259	1.000	0.050	Pass
LTE Band 5	251.189	1.000	0.550	0.091	Pass
LTE Band 12	251.189	0.794	0.470	0.084	Pass
LTE Band 13	251.189	0.794	0.520	0.076	Pass
LTE Band 26	251.189	1.000	0.550	0.091	Pass
NB-IOT Band 2	251.189	1.000	1.000	0.050	Pass
NB-IOT Band 4	199.526	1.259	1.000	0.050	Pass
NB-IOT Band 5	251.189	1.259	0.550	0.114	Pass
NB-IOT Band 12	251.189	1.259	0.470	0.134	Pass
NB-IOT Band 13	251.189	1.000	0.520	0.096	Pass
NB-IOT Band 26	251.189	0.794	0.550	0.072	Pass
Bluetooth (Low Energy)	4.977	1.259	1.000	0.001	Pass

Note: **R** = 20cm

$\prod$= 3.1416

The MPE ratio = Mac Test Result÷Limit Value

So the simultaneous transmitting antenna pairs as below:

∑of MPE ratios= Main Antenna + BLE =0.361+0.001 =0.362 <1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.