

TEST REPORT

Product : Electric Bicycles
Trade mark : ARIV
Model/Type reference : Merge (folding), Meld (non-folding)
ACT Job Number : 1028.0001.002 (Merge),
1028.0002.001 (Meld)
Report Number : EED32K000244302
Date of Issue : Jul. 28, 2019
Test Standards : 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
Test result : PASS

Prepared for:

General Motors LLC
300 Renaissance Center Detroit, MI 48243 UNITED STATES

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:

Jay Zheng

Jay Zheng

Compiled by:

Alex Wu

Alex Wu

Reviewed by:

Ware Xin

Ware Xin

Approved by:

Kevin Yang

Kevin Yang

Date:

Jul. 28, 2019

Check No.: 3336881454



2 Version

Version No.	Date	Description
00	Jul. 28, 2019	Original

3 Test Summary

GSM 850, WCDMA(Band V)			
Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a)/Part 22.913(a)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(ERP)	Part 2.1046(a)/Part 22.913(a)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
99%&26dB Occupied Bandwidth	Part 2.1049(h)	Part 22.917(b) &KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/Part 22.917(a)	Part 22.917(b) &KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/ Part 22.355	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
GSM 1900,WCDMA(Band II)			
Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a) /Part 24.232(c)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 24.232(c)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
peak-to-average ratio	Part 24.232(d)	KDB 971168 D01v03r01	PASS
99% &26dBOccupied Bandwidth	Part 2.1049(h)	Part 24.238(b) &KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 24.238(a)	Part 24.238(b) &KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 24.238(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	Part 2.1053 /Part 2.1057 / Part 24.238(a)(b)	TIA-603-E-2016&KDB 971168 D01v03r01	PASS
Frequency stability	Part 2.1055/Part 24.235	TIA-603-E-2016&KDB 971168 D01v03r01	PASS

Remark:

The tested samples and the sample information are provided by the client.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

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N/A: In this whole report not application

Model No.: Merge (folding), Meld (non-folding)

both produced by General Motors share the same electrical circuit design, layout, components, internal wiring, shell material and shape except the following points:

- 1) The Meld (non-folding) (1028.0002.001) has a non-folding frame. The frame profile looks like the Merge (folding) (1028.0001.002), but does not have the hinges allowing the frame to fold.
- 2) The Meld (non-Folding) (1028.0002.001) has a chain drive instead of the belt drive that is on Merge (folding) (1028.0001.002) so there are a few different drivetrain components:
 - a. The crankset (part that the pedals attach to) is designed for a chain instead of a belt
 - b. The rear wheel has a cog that is designed for a chain instead of a belt
 - c. instead of a belt it has a chain connecting those parts

The test model is Merge (folding) and the test results are applicable to the others.

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5 Test Requirement

5.1 Test setup

5.1.1 For Radiated Emissions test setup

Radiated Emissions setup:

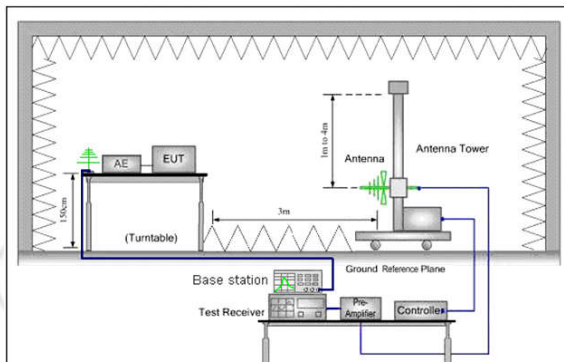


Figure 1.30MHz to 1GHz

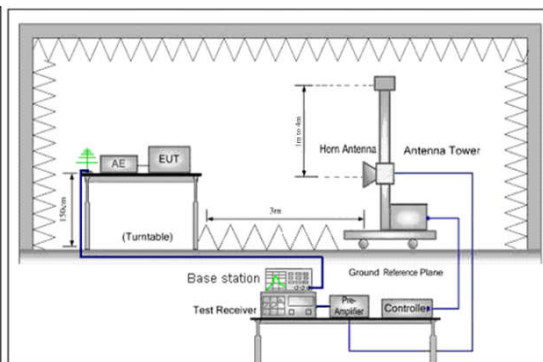


Figure 2. above 1GHz

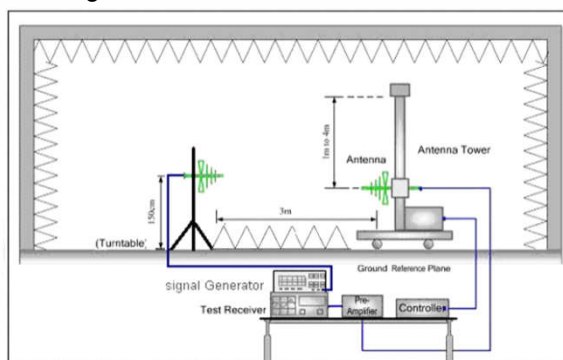


Figure 1. 30MHz to 1GHz

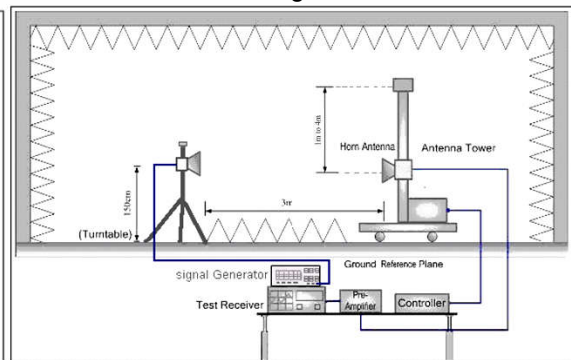


Figure 2. above 1GHz

5.2 Test Environment

Operating Environment:	
Temperature:	21°C
Humidity:	59% RH
Atmospheric Pressure:	101kPa

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
		869.2 MHz	881.6 MHz	893.8 MHz
WCDMA band V	Tx (824 MHz ~849 MHz)	Channel 4132	Channel 4182	Channel 4233
		826.4 MHz	836.4 MHz	846.6 MHz
	Rx (869 MHz ~894 MHz)	Channel 4357	Channel 4407	Channel 4458
		871.4 MHz	881.4 MHz	891.6 MHz
WCDMA Band II	Tx (1850 MHz ~1910 MHz)	Channel 9262	Channel 9400	Channel 9538
		1852.4 MHz	1880.0 MHz	1907.6 MHz
	Rx (1930 MHz ~1990 MHz)	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz
		1932.44 MHz	1960.0 MHz	1987.6 MHz

Test mode:

band	Radiated	Conducted
WCDMA Band V	1)RMC 12.2Kbps Link 2)HSDPA 3)HSUPA	1)RMC 12.2Kbps Link 1)HSDPA 3)HSUPA
WCDMA Band II	1)RMC 12.2Kbps Link 2)HSDPA 3)HSUPA	1)RMC 12.2Kbps Link 2)HSDPA 3)HSUPA

Test mode:

Test Mode	Test Modes description
UMTS/TM1	WCDMA system, QPSK modulation
UMTS/TM2	HSDPA system, QPSK modulation
UMTS/TM3	HSUPA system, QPSK modulation

6 General Information

6.1 Client Information

Applicant:	General Motors LLC
Address of Applicant:	300 Renaissance Center Detroit, MI 48243 UNITED STATES
Manufacturer:	G-ONE TECH (VIETNAM) COMPANY LIMITED
Address of Manufacturer:	No. 8B VSIP IIA, Street. 30, Vietnam-Singapore Industrial Park IIA, Vinh Tan Commune, Tan Uyen Town, Binh Duong Province, Vietnam
Factory:	G-ONE TECH (VIETNAM) COMPANY LIMITED
Address of Factory:	No. 8B VSIP IIA, Street. 30, Vietnam-Singapore Industrial Park IIA, Vinh Tan Commune, Tan Uyen Town, Binh Duong Province, Vietnam

6.2 General Description of EUT

Product Name:	Electric Bicycles	
Model No.(EUT):	Merge (folding), Meld (non-folding)	
Test Model No.:	Merge (folding)	
Trade mark:	ARIV	
EUT Supports Radios application:	3G Band2, Band5; 4G Band2, Band4 Band5, Band17 BT 4.1 BT Single mode, 2402MHz to 2480MHz GPS L1:1559MHz to 1610MHz	
Power Supply:	Adapter	Model: BC1315 1.01 Input: 100-240VAC, 50/60Hz, 2.0A Output: +49.2V --- 1.75A
	Battery	Battery 43V DC
Firmware version:	GMD-4513001; GMT-5303202(manufacturer declare)	
Hardware version:	GMD-V5.1; GMT-V3.0(manufacturer declare)	
Sample Received Date:	Sep. 06, 2018	
Sample tested Date:	Sep. 20, 2018 to Jul. 28, 2019	

6.3 Product Specification subjective to this standard

Frequency Band:	WCDMA Band 2: Tx: 1850-1910MHz, Rx: 1930-1990MHz WCDMA Band 5: Tx: 824- 849MHz, Rx: 869 -894MHz
Modulation Type:	QPSK for WCDMA, QPSK for HSDPA, QPSK for HSUPA
Antenna Type:	SMD Antenna
Antenna Gain:	WCDMA Band 2: 1.66dBi WCDMA Band 5: -6.61dBi
Test Voltage:	AC 120V,60Hz

6.4 Description of Support Units

The EUT has been tested independently.

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

7 Equipment List

Communication RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Agilent	E4440A	MY46185649	11-13-2017 11-14-2018	11-14-2018 11-13-2019
Signal Generator	Agilent	E4438C	MY45095744	03-13-2018 03-01-2019	03-12-2019 02-28-2020
Signal Generator	Keysight	E8257D	MY53401106	03-13-2018 03-01-2019	03-12-2019 02-28-2020
Communication test set	R&S	CMW500	152394	03-16-2018 03-01-2019	03-15-2019 02-28-2020
High-pass filter	Sinoscite	FL3CX03WG18NM 12-0398-002	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
band rejection filter	Sinoscite	FL5CX01CA09CL1 2-0395-001	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
band rejection filter	Sinoscite	FL5CX01CA08CL1 2-0393-001	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
band rejection filter	Sinoscite	FL5CX02CA04CL1 2-0396-002	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
band rejection filter	Sinoscite	FL5CX02CA03CL1 2-0394-001	---	01-10-2018 01-07-2019	01-09-2019 01-06-2020
DC Power	Keysight	E3642A	MY54426112	03-13-2018 03-01-2019	03-12-2019 02-28-2020
DC Power	Keysight	E3642A	MY54426115	03-13-2018 03-01-2019	03-12-2019 02-28-2020
RF control unit	JS Tonscend	JS0806-1	158060004	03-13-2018 03-01-2019	03-12-2019 02-28-2020
DC power Box	JS Tonscend	JS0806-4	158060007	03-13-2018 03-01-2019	03-12-2019 02-28-2020
LTE Automatic test software	JS Tonscend	JS1120-1	---	03-30-2018 03-01-2019	03-29-2019 02-28-2020
WCDMA Automatic test software	JS Tonscend	JS1120-3	---	03-30-2018 03-01-2019	03-29-2019 02-28-2020
GSM Automatic test software	JS Tonscend	JS1120-3	---	03-30-2018 03-01-2019	03-29-2019 02-28-2020
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	10-11-2017 10-12-2018	10-12-2018 10-11-2019

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-04-2016 05-04-2019	06-03-2019 05-22-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-401	12-21-2018	12-20-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-30-2018	07-29-2019
Microwave Preamplifier	Agilent	8449B	3008A02425	08-21-2018	08-20-2019
Microwave Preamplifier	Tonscend	EMC051845SE	980380	01-17-2018 01-16-2019	01-16-2019 01-15-2020
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-25-2018	04-23-2021
Horn Antenna	ETS-LINDGREN	3117	00057410	06-05-2018	06-03-2021
Double ridge horn antenna	A.H.SYSTEMS	SAS-574	374	06-05-2018	06-04-2021
Pre-amplifier	A.H.SYSTEMS	PAP-1840-60	6041.6041	08-08-2018	08-07-2019
Preamplifier	EMCI	EMC001330	980563	06-20-2018 05-08-2019	06-19-2019 05-06-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-075	04-25-2018	04-23-2021
Spectrum Analyzer	R&S	FSP40	100416	05-11-2018 04-28-2019	05-10-2019 04-26-2020
Receiver	R&S	ESCI	100435	05-25-2018 05-20-2019	05-24-2019 05-18-2020
Receiver	R&S	ESCI7	100938-003	11-23-2018	11-22-2019
Multi device Controller	maturo	NCD/070/10711 112	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
LISN	schwarzbeck	NNBM8125	81251547	05-11-2018 05-08-2019	05-10-2019 05-06-2020
LISN	schwarzbeck	NNBM8125	81251548	05-11-2018 05-08-2019	05-10-2019 05-06-2020
Signal Generator	Agilent	E4438C	MY45095744	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Signal Generator	Keysight	E8257D	MY53401106	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	10-12-2018	10-11-2019
Communication test set	Agilent	E5515C	GB47050534	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Communication test set	R&S	CMW500	104466	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	PART 22	PART 22 – PUBLIC MOBILE SERVICES Subpart H – Cellular Radiotelephone Service
2	PART 24	PART 24 – PERSONAL COMMUNICATIONS SERVICES Subpart E – Broadband PCS
3	PART 2	Frequency allocations and radio treaty matters; general rules and regulations
4	TIA-603-E-2016	Land Mobile FM or PM -Communications Equipment -Measurement and Performance Standards
5	KDB971168 D01	KDB971168 D01 Power Meas License Digital Systems v03r01

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part 2.1046(a)/Part 22.913(a)/ part 24.232(c)	TIA-603-E-2016& KDB 971168 D01v03r01	Conducted output power	PASS	Appendix A)
Part 24.232(d)	KDB 971168 D01v03r01	peak-to-average ratio	PASS	Appendix B)
Part 2.1049(h)	Part 22.917(b)/ Part 24.238(b)/ Part 27.53(h) &KDB 971168 D01v03r01	99% &26dB Occupied Bandwidth	PASS	Appendix C)
Part 2.1051/Part 22.917(a)/ Part 24.238(a)	Part 22.917(b)/ Part 24.238(b)/ Part 27.53(h) &KDB 971168 D01v03r01	Band Edge at antenna terminals	PASS	Appendix D)
Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	TIA-603-E-2016& KDB 971168 D01v03r01	Spurious emissions at antenna terminals	PASS	Appendix E)
Part 2.1055/ Part 22.355/ Part 24.235	TIA-603-E-2016& KDB 971168 D01v03r01	Frequency stability	PASS	Appendix F)
Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)/ Part 24.238(a)(b)	TIA-603-E-2016& KDB 971168 D01v03r01	Field strength of spurious radiation	PASS	Appendix H)
Part 2.1046(a)/Part 22.913(a)/ Part 24.232(c)	TIA-603-E-2016& KDB 971168 D01v03r01	Effective Radiated Power of Transmitter(ERP)	PASS	Appendix G)
Remark: Test data please refer to Appendix I.				