TEST REPORT

Verified code: 076104

Report No.:	E201911123807-3	**Application No.:**	E201911123807
Client:	K-Mark Industrial LTD		
Address:	Flat A,7/F.,Mai On Ind.Bldg., 17-21, Kung Yip St.,Kwai Chung, Hongkong		
Sample Description:	Feeder meter with antenna		
Model:	AH-FMTR-ANT		
FCC ID:	VEPGL-AHFMTRANT		
Test Location:	**Guangzhou GRG Metrology and Test Co., Ltd.**		
Test Specification:	KDB 447498 D01 General RF Exposure Guidance v06 FCC Part 2 §2.1091		
Issue Date:	2020/04/14		
Test Result:	**PASS**		

Prepared By:	**Reviewed By:**	**Approved By:**
Test Engineer	Technical Manager	Manager
Wu Haoting	Wu Chengrong	GUANGZHOU GRG METROLOGY & TEST CO.,LTD. GRGTEST APPROVED(03)

Other Aspects:

Note:/

Abbreviations: *ok / P = passed; fail / F = failed; n.a. / N = not applicable;*

The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.

DIRECTIONS OF TEST

1. **This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**

2. **The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**

3. **If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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1. TEST RESULT SUMMARY

1.1. APPLICANT

Name:	K-Mark Industrial LTD
Address:	Flat A,7/F.,Mai On lnd.Bldg.,17-21,Kung Yip St.,Kwai Chung,Hong Kong

1.2. MANUFACTURER

Name:	K-Mark Industrial LTD
Address:	Flat A,7/F.,Mai On lnd.Bldg.,17-21,Kung Yip St.,Kwai Chung,Hong Kong

1.3. FACTORY

Factory 1

Name :	K-Mark Industrial (Shenzhen) LTD
Address :	43 Jinshi Road, niuhu Guangpei community, Guanlan street, Longhua District, Shenzhen

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Feeder meter with antenna
Model No.:	AH-FMTR-ANT
Adding Model:	/
Model Discrepancy:	/
Trade Name:	GSM LLC
Power supply:	DC3V power from the battery
Frequency Range:	2402 ~ 2480 MHz
Transmit Power:	0.57dBm
Type of Modulation:	GFSK for 1Mbps
Antenna Specification:	External Antenna with 2dBi gain(Max)
Temperature Range:	-20℃~+60℃
Hardware Version:	V2.0
Software Version:	V5.0
Note:	Feeder Meter with Antenna suport one PCB antenna and one external antenna, break PCB antenna from BT modular RF output port, connect external antenna from break port, only external antenna can work.

2. LABORATORY AND ACCREDITATIONS

2.1. LABORATORY

The tests and measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology and Test Co,. Ltd.

Add. : No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China

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2.2. ACCREDITATIONS

A2LA	Certificate Number 2861.01

3. Evaluation method

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Mobile Device

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3.1 LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

4.1 CALCULATION METHOD

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
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
From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used 0dBi for BT, the RF power density can be obtained.

Frequency Band	Antenna type and antenna number	Maximum antenna gain
2.4GHz	BT Antenna	2dBi

5.1 ESTIMATION RESULT

5.1.1Conducted Power Results

Bluetooth

Mode	Channel	Frequency(MHz)	Peak Conducted Output Power (dBm)
GFSK-BLE	00	2402	0.57
	19	2440	0.46
	39	2480	0.28

5.1.2Manufacturing tolerance

GFSK			
Frequency (MHz)	2402	2440	2480
Target (dBm)	0	0	0
Tolerance ±(dB)	1.0	1.0	1.0

5.1.3Measurement Results

7.3.1. Standalone MPE

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
GFSK-BLE	1.0	1.2589	2	1.5489	100%	0.0004	1.0000

Remark:

1. Maximum power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

Conclusion
The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.