FCC TEST REPORT
No. 161100607SHA-001

Applicant	:	Shanghai Putao Technology Co., Ltd. Building 10 Shanghai Business Park, No. 1016 Tian Lin Road, Min Hang District, Shanghai, 200233, China
Manufacturer	:	Shanghai Putao Technology Co., Ltd. Building 10 Shanghai Business Park, No. 1016 Tian Lin Road, Min Hang District, Shanghai, 200233, China
Product Name	:	PaiBand
Type/Model	:	Pi0004
TEST RESULT	**:**	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2015): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Date of issue: Nov. 02, 2016

Prepared by:

Nemo Li (Project Engineer)

Reviewed by:

Daniel Zhao (Reviewer)

Description of Test Facility

Name: Compliance Certification Services (Shenzhen) Inc.
Address: No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town, Baoan Distr, Shenzhen, Guangdong, China.

Compliance Certification Services (Shenzhen) Inc. has been accepted by the FCC, the FCC Registration Number is 441872.

Content

1 GENERAL INFORMATION

1.1 Description of Client

Applicant	:	Shanghai Putao Technology Co., Ltd. Building 10 Shanghai Business Park, No. 1016 Tian Lin Road, Min Hang District, Shanghai, 200233, China
Name of contact	:	Haixin Zhu
Tel	:	+86-1363627153
Fax	:	N/A
Email	:	Zhuhaixin@putao
Manufacturer	:	Shanghai Putao Technology Co., Ltd. Building 10 Shanghai Business Park, No. 1016 Tian Lin Road, Min Hang District, Shanghai, 200233, China

1.2 Identification of the EUT

Product Name	:	PaiBand
Type/model	:	Pi0004
FCC ID	:	2AJ96-PI0004

1.3 Technical Specification

Operation Frequency Band	:	2400 MHz ~ 2483.5 MHz
Modulation	:	GFSK
EUT Modes of Modulation	:	Bluetooth LE
Channel Number	:	40
Description of EUT	:	N/A
Antenna		Type: FPC Antenna; Gain: -8.35dBi
Rating		Battery: 3.7Vdc, 70mAh lithium battery USB: 5.0Vdc
Declared Temperature range	:	N/A
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Sample received date	:	Oct. 17, 2016
Date of test	:	Nov. 02, 2016

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2015)
ANSI C63.10 (2013)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	EZ-EMC	FARAO	LZ-RF / CCS-SZ-3A2
Radiated emission	EZ-EMC	FARAO	LZ-RF / CCS-SZ-3A2

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Notebook	Lenovo/E450	N/A
2	Mouse	Dell/MS111-P	N/A

2.5 Instrument list

3m (Semi-Anechoic Chamber)					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Due date (mm-dd-yyyy)	Cal. Interval
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02-20-2017	1 Year
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Bilog Antenna	SCHAFFNER	CBL6143	5063	02-21-2017	1 Year
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02-20-2017	1 Year
High Noise Amplifier	Agilent	8449B	3008A01838	02-21-2017	1 Year
Horn Antenna	Schwarzbeck	BBHA9120	D286	02-21-2017	1 Year
Temp. / Humidity Meter	Anymetre	JR913	N/A	02-21-2017	1 Year
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAO	LZ-RF / CCS-SZ-3A2			

Conducted Emission test					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Due date (mm-dd-yyyy)	Cal. Interval
EMI Test Receiver	R&S	ESCI	100783	02-21-2017	1 Year
L.I.S.N	R&S	ENV216	101543-WX	02-21-2017	N.C.R

2.6 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
Radiated emission	15.249 & 15.209	Pass
Assigned bandwidth (20dB bandwidth)	15.215(c)	Pass
Power line conducted emission	15.207	Pass

Notes: 1: NA =Not Applicable

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3 Radiated emission

Test result: **Pass**

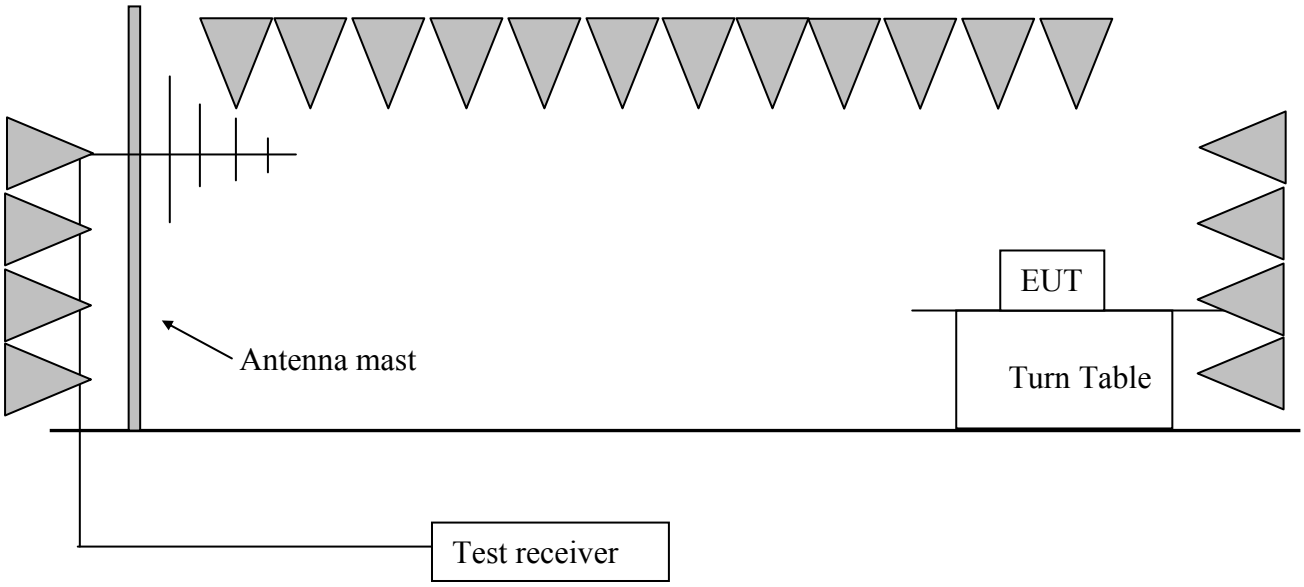
3.1 Test limit

Fundamental Frequency (MHz)	Fundamental limit (dBuV/m)	Harmonic limit (dBuV/m)
☐ 902 - 928	94	54
☒ 2400 - 2483.5	94	54
☐ 5725 - 5875	94	54
☐ 24000 - 24250	108	68

The radiated emissions which fall outside allocated band (2400-2483.5MHz), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

3.2 Test Configuration



3.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);
RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

3.4 Test protocol

Temperature : 26.5°C
Relative Humidity : 54%

CH	Antenna	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	37.7600	-15.48	21.77	40.00	-18.23	QP
	H	175.5000	-22.94	32.16	43.50	-11.34	QP
	H	185.2000	-22.90	30.07	43.50	-13.43	QP
	H	1540.000	-6.81	47.37	74.00	-26.63	Peak
	H	2390.000	-2.79	44.32	74.00	-29.68	Peak
	H	2402.000	-2.79	77.05	114.00	-36.95	Peak
	H	8083.000	9.60	51.99	74.00	-22.01	Peak
	V	185.2000	-22.90	24.61	43.50	-18.89	QP
	V	435.4600	-15.64	22.65	46.00	-23.35	QP
	V	511.1200	-14.23	18.05	46.00	-27.95	QP
	V	1540.000	-6.81	47.22	74.00	-26.78	Peak
	V	1765.000	-6.35	43.38	74.00	-30.62	Peak
	V	2402.000	-2.79	78.55	114.00	-35.45	Peak
	V	2390.000	-2.79	41.45	74.00	-32.55	Peak
	V	2402.000	-2.79	78.55	114.00	-35.45	Peak
M	H	176.4700	-22.94	30.14	43.50	-13.36	QP
	H	186.1700	-22.89	33.35	43.50	-10.15	QP
	H	423.8200	-15.48	21.81	46.00	-24.19	QP
	H	1540.000	-6.81	46.67	74.00	-27.33	Peak
	H	1720.000	-6.44	48.57	74.00	-25.43	Peak
	H	2440.000	-2.59	78.82	114.00	-35.18	Peak
	V	39.7000	-16.11	25.37	40.00	-14.63	QP
	V	185.2000	-22.90	25.20	43.50	-18.30	QP
	V	434.4900	-15.63	23.22	46.00	-22.78	QP
	V	1909.000	-5.58	47.09	74.00	-26.91	Peak
	V	2440.000	-2.59	79.51	114.00	-34.49	Peak
	V	2602.000	-2.08	47.23	74.00	-26.77	Peak
H	H	37.7600	-15.48	22.13	40.00	-17.87	QP
	H	176.4700	-22.94	32.54	43.50	-10.96	QP
	H	186.1700	-22.89	32.64	43.50	-10.86	QP
	H	1540.000	-6.81	46.89	74.00	-27.11	Peak
	H	1747.000	-6.38	46.26	74.00	-27.74	Peak
	H	2480.000	-2.34	79.33	114.00	-34.67	Peak
	H	2483.500	-2.34	42.18	74.00	-31.82	Peak
	V	37.7600	-15.48	23.59	40.00	-16.41	QP
	V	175.5000	-22.94	24.92	43.50	-18.58	QP
	V	186.1700	-22.89	25.70	43.50	-17.80	QP
	V	1540.000	-6.81	46.81	74.00	-27.19	Peak

	V	2395.000	-2.84	47.65	74.00	-26.35	Peak
	V	2480.000	-2.34	80.08	114.00	-33.92	Peak
	V	2483.500	-2.34	42.98	74.00	-31.02	Peak

Remark:

1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed);
2. Corrected Reading = Original Receiver Reading + Correct Factor;
3. Margin = Limit – Corrected Reading;
4. If the PK Corrected reading is lower than AV limit, the AV test can be elided;

Example:

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV,
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m,
Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m,
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m,
Then Margin = 54 -10.20 = 43.80dBuV/m.

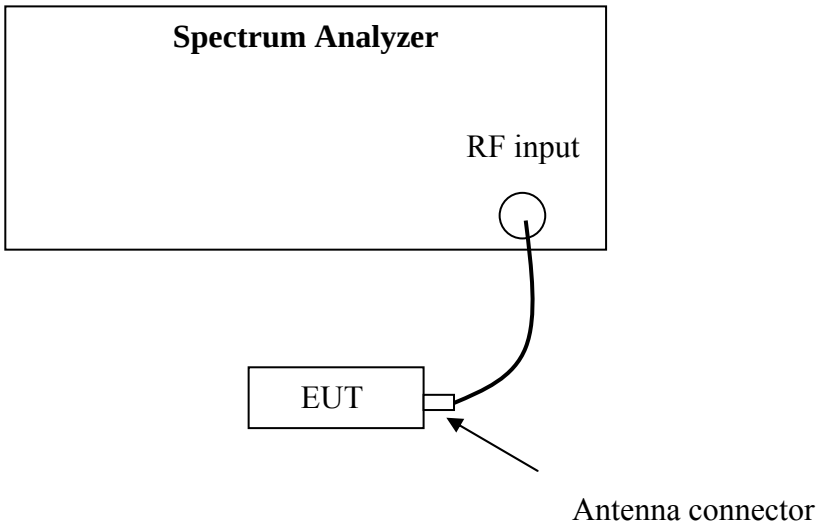
4 Assigned bandwidth (20dB bandwidth)

Test result: **Pass**

4.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band.

4.2 Test Configuration



4.3 Test procedure and test setup

The 20dB Bandwidth per FCC § 15.215(c) is measured using the Spectrum Analyzer. Set Span = 2 to 3 times the 20 dB bandwidth, RBW = approximately 1% of the 20 dB bandwidth, VBW>RBW, Sweep = auto, Detector = peak, Trace = max hold.
The test was performed at 3 channels (lowest, middle and highest channel).

4.4 Test protocol

Temperature : 26.5 °C
Relative Humidity : 54 %

Mode	Channel	20dB Bandwidth (kHz)	F_L (MHz)	F_H (MHz)
GFSK	L	1.215	2401.38	-
	M	1.212	-	-
	H	1.255	-	2480.61

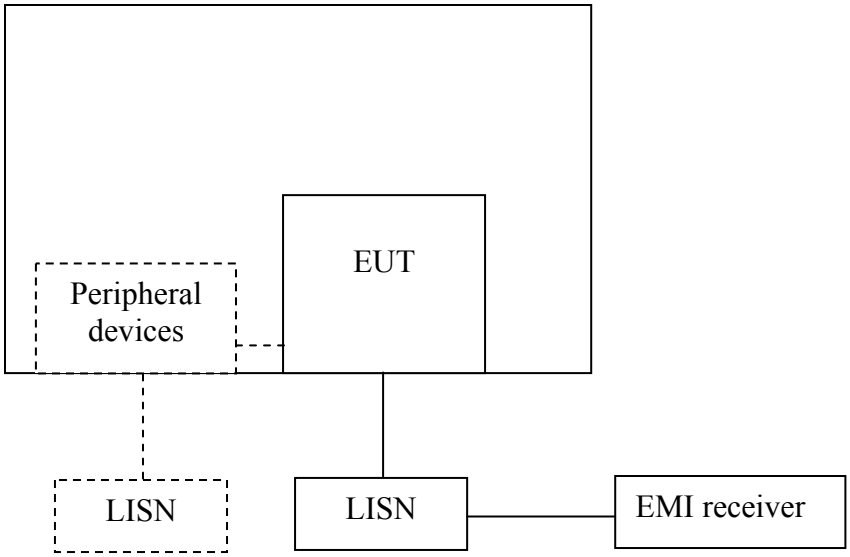
5 Power line conducted emission

Test result: **Pass**

5.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

5.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

5.3 Test procedure and test set up

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

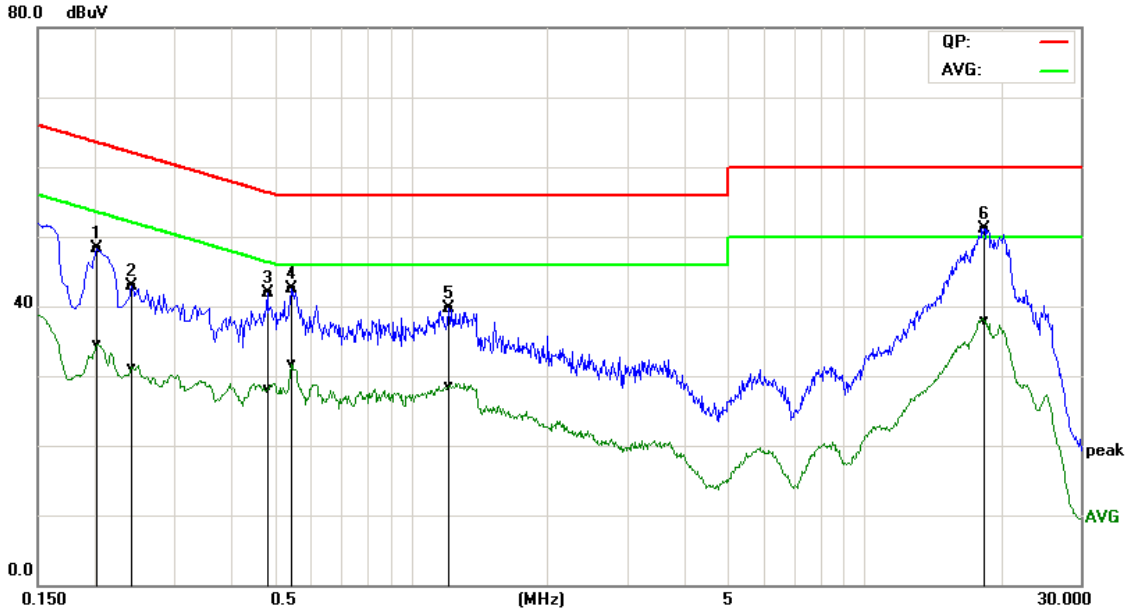
Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

5.4 Test protocol

Temperature : 26.5 °C
Relative Humidity : 54 %

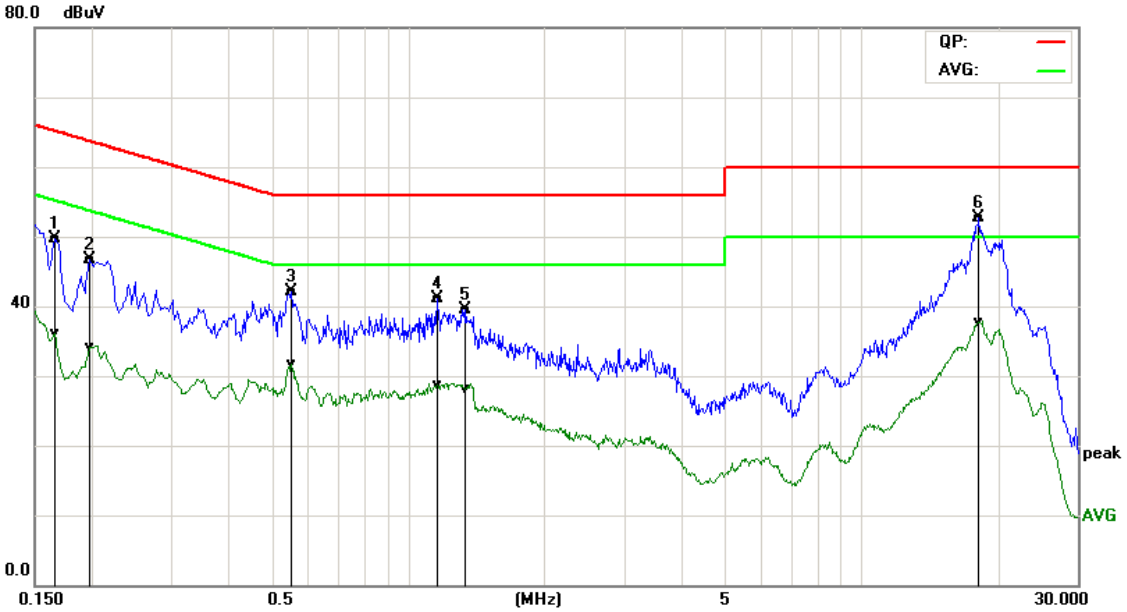
L line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.2020	48.21	63.52	-15.31	34.52	53.53	-19.01
0.2420	42.93	62.02	-19.09	31.20	52.03	-20.83
0.4820	42.00	56.30	-14.30	28.01	46.30	-18.29
0.5460	42.41	56.00	-13.59	31.65	46.00	-14.35
1.2100	39.79	56.00	-16.21	28.60	46.00	-17.40
18.4020	51.09	60.00	-8.91	37.93	50.00	-12.07

N line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(μV)	Limit dB(μV)	Margin (dB)	level dB(μV)	limit dB(μV)	Margin (dB)
0.1660	49.64	65.15	-15.51	36.03	55.16	-19.13
0.1980	46.76	63.69	-16.93	34.12	53.69	-19.57
0.5540	42.03	56.00	-13.97	31.61	46.00	-14.39
1.1620	41.16	56.00	-14.84	28.70	46.00	-17.30
1.3380	39.41	56.00	-16.59	28.04	46.00	-17.96
18.1860	52.70	60.00	-7.30	37.65	50.00	-12.35