

Date: 2001-04-09

TEST REPORT

Page 1 of 9

No.: HM104374

APPLICANT: (Code : MAI016)
MAXBRIGHT INDUSTRIAL CO., LTD.
172, Kunming Road, Tao Yuan City, Taiwan.

DATE OF SAMPLE(S) RECEIVED: 2001-03-22

SUBMITTED SAMPLE(S): 2 samples

DATE OF TESTING: 2001-03-22 to 2001-04-02

DESCRIPTION OF SAMPLE(S):

A sample of product said to be:

Product: WALKIE TALKIE
Manufacturer: SHENGFEI ELECTRONIC FACTORY
Model Number: AK-2
Brand Name: MIKONA
Rating: 9Vd.c. ("6F22" size battery × 1)
Origin: CHINA

INVESTIGATIONS REQUESTED:

Measurement to the relevant clauses of F.C.C. Rules and Regulations Part 15 Subpart B - Unintentional Radiator and Subpart C - Intentional Radiator.

RESULT/ REMARK: Please see attached sheet(s).

CONCLUSION:

From the measurement data obtained, the tested sample (sample 1 of 2) was considered to have COMPLIED with the clause 15.109(a) and ANSI C63.4-1992 Section 12.1.1.1-2 for the Receiver Section and for the Transmitter Section with the clause 15.235 of Federal Communications Commission Rules and Regulations Part 15.

TEST EQUIPMENT AUDIT: Please see Appendix A.

Testing Engineer

Verify by

Patrick Wong
for Managing Director

Date: 2001-04-09

TEST REPORT

Page 2 of 9

No.: HM104374

TEST SUMMARY

UNINTENTIONAL RADIATOR

- (A) Measurement of Radiated EmissionsSatisfactory
(B) Line Conducted Voltage TestNot Applicable

*** INTENTIONAL RADIATOR***

- (1) Measurement of Emission of RF energy on the carrier frequency.....Satisfactory
(2) Measurement of the out-of band emissions including harmonics.....Satisfactory
(3) Measurement of Emission Within Band Edges.....Satisfactory
(4) Measurement of Line-Conducted Voltage onto AC Power Line.....Not Applicable

TEST DATA

Please refer to the attached result sheets.

Date: 2001-04-09

TEST REPORT

Page 3 of 9

No.: HM104374

UNINTENTIONAL RADIATOR

(A) Measurement of Radiated Interference

TEST REFERENCE: FCC Rules Part 15 Subpart B section 15.109(a)

TEST CONDITION: Normal

TEST DATE: 2001-04-02

| Freq. to which tuned | Freq. of the emission | Polarization | Meter reading (at 3m) | Antenna factor | Field Strength (at 3m) | | | | FCC Limit @ | |
|----------------------------|-----------------------------|--------------|-----------------------------|-------------------|------------------------|------|------|------|-------------------|-----|
| MHz | MHz | H-V | | dB | dB(μV) | μV/m | μV/m | | | |
| 49.857 | 49.9 | V | 20.1 | + | 15.0 | 35.1 | 56.9 | 100 | | |
| | 99.7 | < | 1.0 | + | 12.2 | < | 13.2 | < | 4.6 | 150 |
| | 149.6 | < | 1.0 | + | 9.8 | < | 10.8 | < | 3.5 | 150 |
| | 199.4 | < | 1.0 | + | 11.5 | < | 12.5 | < | 4.2 | 150 |
| | 249.3 | < | 1.0 | + | 15.9 | < | 16.9 | < | 7.0 | 200 |
| | 299.1 | < | 1.0 | + | 17.0 | < | 18.0 | < | 7.9 | 200 |
| | 349.0 | < | 1.0 | + | 17.2 | < | 18.2 | < | 8.1 | 200 |
| | 398.9 | < | 1.0 | + | 18.8 | < | 19.8 | < | 9.8 | 200 |
| | 448.7 | < | 1.0 | + | 19.7 | < | 20.7 | < | 10.8 | 200 |
| | 498.6 | < | 1.0 | + | 20.6 | < | 21.6 | < | 12.0 | 200 |
| | 548.4 | < | 1.0 | + | 22.2 | < | 23.2 | < | 14.5 | 200 |
| | 598.3 | < | 1.0 | + | 23.4 | < | 24.4 | < | 16.6 | 200 |
| | 648.1 | < | 1.0 | + | 23.5 | < | 24.5 | < | 16.8 | 200 |
| | 698.0 | < | 1.0 | + | 25.0 | < | 26.0 | < | 20.0 | 200 |
| | 747.9 | < | 1.0 | + | 26.3 | < | 27.3 | < | 23.2 | 200 |
| | 797.7 | < | 1.0 | + | 27.2 | < | 28.2 | < | 25.7 | 200 |
| | 847.6 | < | 1.0 | + | 26.6 | < | 27.6 | < | 24.0 | 200 |
| | 897.4 | < | 1.0 | + | 27.1 | < | 28.1 | < | 25.4 | 200 |
| 947.3 | < | 1.0 | + | 28.0 | < | 29.0 | < | 28.2 | 200 | |
| 997.1 | < | 1.0 | + | 28.5 | < | 29.5 | < | 29.9 | 500 | |

SUMMARY

All data is within limits

Broad-band Antennas were used and both polarizations of emissions were measured

Polarizations at highest reading indicated as:

H -- Horizontal

V -- Vertical

NOTES FOR THE RADIATION MEASUREMENT

(1) Test site facility:

Open field test site located at Taipo (Hong Kong) with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC Rules.

(2) Distance between the EUT and measuring antenna:

3 meters.

(3) Measuring instrumentation:

CISPR Quasi-peak type field strength meter (25 MHz - 1000 MHz.). 6 dB bandwidth set at 120 KHz. Also, peak level of the fundamental emissions was measured in order to determine compliance with the 20dB peak to average limit specified in Section 15.35(b) of the FCC new Rules.

(4) Measuring antenna:

Broad band antenna for the frequency range 25-1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable. included in the Antenna Factor for measurement data. The antenna are capable of measuring both horizontal and vertical polarizations.

(5) Frequency range scanned:

The frequency range from 25 MHz to 1000 MHz had been searched. Readings of the highest emissions relating to the limit were reported as above.

(6) Arrangement of EUT:

During the test, the sample was operated at rated supply voltage and arranged for maximum emissions.

(7) Measuring Procedure:

In accordance with the relevant clauses of the FCC Rules Part 15 section 15.109(a) and ANSI C63.4:1992 section 12.1.1.1-2. For superregenerative receivers, an independent signal generator had been used to radiated an unmodulated were (cw) signal to the receiver at its operating frequency in order to “cohere” or resolve the individual components of the characteristic broadband emission from such a receiver. The level of such signal may need to be adjusted in order to accomplish this.

(8) Measuring Uncertainty:

The calculated uncertainty for measurement performed at 3M test distance are:-
30MHz to 300MHz = $\pm 3.7\text{dB}$, 300MHz to 1000MHz = $+ 3.0\text{dB}/-2.7\text{dB}$.

Remark: Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC Equipment Authorization Program. This test itself is not an Approval Test.

Date: 2001-04-09

TEST REPORT

Page 5 of 9

No.: HM104374

** INTENTIONAL RADIATOR ***

(1) Measurement of Radiated Interference

TEST REFERENCE: FCC Rules Part 15 Section 15.235(49.82-49.90 MHz)

TEST CONDITION: Normal

TEST DATE: 2001-03-22

Emission of RF energy on the carrier frequency -- 49.857 MHz (PEAK VALUE)

| Emission Frequency | Meter Reading | Polarization | Antenna Factor | Field Strength (at 3m) | | FCC Limit |
|-----------------------|------------------|--------------|-------------------|---------------------------|------|-----------|
| MHz | dB(μV) | H-V | dB | dB(μV/m) | μV/m | μV/m |
| 49.9 | 59.9 | V | + | 15.0 | 74.9 | 5559.0 |
| | | | | | | 100000.0 |

Emission of RF energy on the carrier frequency -- 49.857 MHz (AVERAGE VALUE)

| Emission Frequency | Meter Reading | Polarization | Antenna Factor | Field Strength (at 3m) | | FCC Limit |
|-----------------------|------------------|--------------|-------------------|---------------------------|------|-----------|
| MHz | dB(μV) | H-V | dB | dB(μV/m) | μV/m | μV/m |
| 49.9 | 40.7 | V | + | 15.0 | 55.7 | 609.5 |
| | | | | | | 10000.0 |

... to be continued

Date: 2001-04-09

TEST REPORT

Page 6 of 9

No.: HM104374

*** INTENTIONAL RADIATOR ***

(1) Measurement of Radiated Interference . . Continued ..

TEST REFERENCE: FCC Rules Part 15 Section 15.235(49.82-49.90 MHz)

TEST CONDITION: Normal

TEST DATE: 2001-03-22

The out-of-band emissions, including harmonics (25-1000 MHz)

(CISPR VALUE)

| Emission Frequency | Polarization | Meter reading (at 3m) | Antenna factor | Field Strength (at 3m) | | | FCC Limit @ |
|-----------------------|--------------|-----------------------------|-------------------|------------------------|--------|--------|-------------------|
| MHz | H-V | | dB | dB(μV) | μV/m | μV/m | |
| 99.7 | H | 20.3 | + | 12.2 | 32.5 | 42.2 | 150 |
| 149.6 | H | 22.4 | + | 9.8 | 32.2 | 40.7 | 150 |
| 199.4 | H | 25.2 | + | 11.5 | 36.7 | 68.4 | 150 |
| 249.3 | H | 17.6 | + | 15.9 | 33.5 | 47.3 | 200 |
| 299.1 | H | 20.3 | + | 17.0 | 37.3 | 73.3 | 200 |
| 349.0 | H | 18.0 | + | 17.2 | 35.2 | 57.5 | 200 |
| 398.9 | H | 16.6 | + | 18.8 | 35.4 | 58.9 | 200 |
| 448.7 | | < 1.0 | + | 19.7 | < 20.7 | < 10.8 | 200 |
| 498.6 | | < 1.0 | + | 20.6 | < 21.6 | < 12.0 | 200 |
| 548.4 | | < 1.0 | + | 22.2 | < 23.2 | < 14.5 | 200 |
| 598.3 | | < 1.0 | + | 23.4 | < 24.4 | < 16.6 | 200 |
| 648.1 | | < 1.0 | + | 23.5 | < 24.5 | < 16.8 | 200 |
| 698.0 | | < 1.0 | + | 25.0 | < 26.0 | < 20.0 | 200 |
| 747.9 | | < 1.0 | + | 26.3 | < 27.3 | < 23.2 | 200 |
| 797.7 | | < 1.0 | + | 27.2 | < 28.2 | < 25.7 | 200 |
| 847.6 | | < 1.0 | + | 26.6 | < 27.6 | < 24.0 | 200 |
| 897.4 | | < 1.0 | + | 27.1 | < 28.1 | < 25.4 | 200 |
| 947.3 | | < 1.0 | + | 28.0 | < 29.0 | < 28.2 | 200 |
| 997.1 | | < 1.0 | + | 28.5 | < 29.5 | < 29.9 | 500 |

=====SUMMARY=====

All data is within limits

Broad-band Antennas were used and both polarizations of emissions were measured.
polarizations at highest reading indicated as:

H -- Horizontal V -- Vertical

Date: 2001-04-09

TEST REPORT

Page 7 of 9

No.: HM104374

*** INTENTIONAL RADIATOR ***

(2) Measurement of Emissions Within Band Edges.

TEST REFERENCE: FCC Rules Part 15 Section 15.235(49.82-49.90 MHz)
TEST CONDITION: Normal
TEST DATE: 2001-03-22

RESULTS AND NOTES

L: FCC Lower Band Edge..... -> 49.820MHz
H: FCC Higher Band Edge..... -> 49.900MHz
C: Unmodulated carrier at frequency..... -> 49.857MHz
D: No. of dB from unmodulated carrier..... -> 56.09dBμV

SPECTRUM ANALYZER SETTINGS

Resolution bandwidth : 1.0KHz
Frequency span : 10.0KHz/div
No. of dB/div : 10.0dB/div

FCC Limit

Minimum No. of dB from unmodulated carrier required : 26.0dB

=====SUMMARY=====

All data is within limits

=====

NOTES FOR THE RADIATION MEASUREMENT

(1) Test site facility:

Open field test site located at Taipo (Hong Kong) with a metal ground plane on filed with the FCC pursuant to section 2.948 of the FCC rules.

(2) Distance between the EUT and measuring antenna:

3 meters.

(3) Measuring instrumentations:

CISPR Quasi-peak type field strength meter (25 MHz - 1000 MHz). 6 dB bandwidth set at 120KHz. Also, peak level of the fundamental emissions was measured in order to determine compliance with the 20dB peak to average limit specified in Section 15.35(b) of the FCC new Rules.

(4) Measuring antenna:

Broad band antenna for the frequency range 25-1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable. included in the Antenna Factor for measurement data. The antenna are capable of measuring both horizontal and vertical polarizations.

(5) Frequency range scanned:

The frequency range from 25 MHz to 1000 MHz had been searched. Readings of the highest emissions relating to the limit were reported as above.

(6) Arrangement of EUT:

During the test, the sample was operated at rated supply voltage and arranged for maximum emissions.

(7) Measuring Procedure:

The procedure used was based on ANSI STANDARD C63.4-1992. The spectrum was scanned from 30MHz to 1000MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical plane and the worse case emissions were reported. The EUT was tested in vertical and cylindrical dimension, thus the orthogonal plane in X, Y and Z axis were covered and in accordance with the relevant clauses of the FCC Rules Part 15 section 15.235.

(8) Measuring Uncertainty:

The calculated uncertainty for measurement performed at 3M test distance are:-
30MHz to 300MHz = $\pm 3.7\text{dB}$, 300MHz to 1000MHz = $+ 3.0\text{dB}/-2.7\text{dB}$.

Remark: Purpose of this test is to provide the Applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under FCC Equipment Authorization Program. This test itself is not an Approval Test.

*** End of document ***

Date: 2001-04-09

TEST REPORT

Page 9 of 9

No.: HM104374

TEST EQUIPMENT AUDIT

Radiated Emission

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL. |
|---------|--|---|--------------------------------|--|-----------|
| EM007 | SPECTRUM ANALYZER | HEWLETT PACKARD | HP85660B | 3144A21192 | 18/07/00 |
| EM008 | SPECTRUM ANALYZER DISPLAY | HEWLETT PACKARD | HP85662A | 3144A20514 | 18/07/00 |
| EM009 | QUASI PEAK ADAPTOR | HEWLETT PACKARD | HP85650A | 3303A01702 | 18/07/00 |
| EM010 | RF PRESELECTOR | HEWLETT PACKARD | HP85685A | 3221A01410 | 18/07/00 |
| EM011 | ATTENUATOR/SWITCH | HEWLETT PACKARD | HP11713A | 2508A10595 | 18/07/00 |
| EM012 | PRE-AMPLIFIER | HEWLETT PACKARD | HP8449B | 3008A00262 | 18/07/00 |
| EM013 | CONTROLLER (COMPUTER), COLOR MONITOR, KEYBOARD & MOUSE FLOPPY DRIVE | HEWLETT PACKARD HEWLETT PACKARD HEWLETT PACKARD | HP9000 HP A1097C HP9133L | 6226A60314 3151J39517 2623A02468 | CM |
| EM131 | PORTABLE SPECTRUM ANALYSER | HEWLETT PACKARD | 8595EM | 3710A00155 | 10/07/00 |
| EM017 | ANTENNA | ARA INC. | LPB-2513/A | 1069 | 17/02/00 |
| EM020 | HORN ANTENNA | EMCO | 3115 | 4032 | 09/08/00 |
| EM072 | SIGNAL GENERATOR | HEWLETT PACKARD | 8640B | 1948A11892 | 30/03/98 |
| EM083 | HKSTC OPEN AREA TEST SITE | HKSTC | N/A | N/A | 15/02/01 |
| EM145 | EMI TEST RECEIVER | R & S | ESCS 30 | 830245/021 | 31/05/00 |

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined