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CNASL1225

MPE TEST REPORT

FCC Per 47 CFR 2.1091(b)

Report Reference No.....	**WE11080014**
FCC ID .....:	**ZB4-810TR**
Compiled by (position+printed name+signature)..:	File administrators Eric Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Wenliang Li
Approved by (position+printed name+signature)..:	Manager Jeffrey Lu
Date of issue.....:	Aug 26, 2011
Testing Laboratory Name .....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address.....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**frank communications**
Address.....:	115 w. 35th, Hays, Kansas 67601
Test specification:	
Standard .....:	**FCC Per 47 CFR 2.1091(b)** **OET Bulletin 65 Supplement C[June 2001]**
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

Test item description ..... :	Hot Shot Wireless Controller
Trade Mark .....:	/
Manufacturer .....:	**Hot Shot Systems**
Model/Type reference.....:	810-t rev 2
Listed Models .....:	/
Channel Separation.....	25KHz
Modulation	FM
Ratings.....:	AC 120V/60Hz
Operation Frequency.....:	154.6000 MHz
Rated Power .....:	2Watt(33.01dBm)
Result.....:	**Positive**

MPE T E S T R E P O R T

Test Report No. :	WE11080014	Aug 26, 2011 Date of issue

Equipment under Test	:	Hot Shot Wireless Controller
Model /Type	:	810-t rev 2
Listed Models	:	/
Applicant	:	**frank communications**
Address	:	115 w. 35th, Hays, Kansas 67601
Manufacturer	:	**Hot Shot Systems**
Address	:	1005 e. 17th, Hays, Kansas 67601

Contents

1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

1.2. Product Description

The **frank communications**'s Model: **810-t rev 2** or the "EUT" as referred to in this report; more general information as follows:

Name of EUT	Hot Shot Wireless Controller	
Model Number	810-t rev 2	
FCC ID	ZB4-810TR	
Rated Output Power	2 Watts(33.01dBm)	
Modilation Type	FM for Analog Voice	
	Analog	16K0F3E for 25KHz Channel Separation
Channel Separation	Analog Voice	25KHz
Antenna Type	External	
Frequency	154.6000 MHz	
Maximum Output Power	Analog	1.99 W for 25 KHz Channel Separation

1.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	●	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

Test frequency list

Modulation Type	Test Frequency
FM	154.6000 MHz

1.4. Note

1. The EUT is a 154.6000 MHz frequency band Hot Shot Wireless Controller (810-t rev 2),The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 95 Subpart J	WE11080013
MPE	FCC OET 65	WE11080014

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.30 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this 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.
According to §1.1310 and §2.1091 RF exposure is calculated.

OET Bulletin 65 Supplement C [June 2001]: Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

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

3.3. MPE 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 peak EUT RF output power, the minimum mobile separation distance, R=50 cm, as well as the maximum gain of the used antenna is 4.5 dBi, the RF power density can be obtained.

TEST RESULTS

For FM Modulation @ 25 KHz Channel Separation

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm^2)	Power Density At 50 cm (mW/cm^2)	Test Results
156.4000	50.00	32.98	1986.10	2.8184	0.2	0.1782	Compliance

4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 (b) for the uncontrolled RF Exposure.

.....End of Report.....