


TEST REPORT N°: WHM-08OCH1929HTHFB

## TEST REPORT

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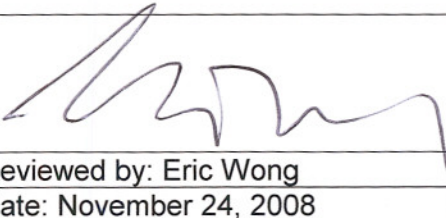
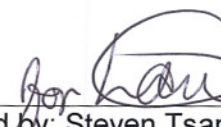
  

Factory name:	--	Offer:	WHM-08OC22-01HTHHFS	
Location:	--	Sample No:	81022015	
	Start date:			November 1, 2008
	Finish date:			November 5, 2008
	Test Requested:			FCC Part 15 Certification Procedure
	Test Method:			ANSI C63.4 – 2003
	Re-testing:			NONE
Remote Control Transmitter, MODEL: TR211		FCC ID: PLJTR211		

The results given in this report are related to the tested specimen of the described electrical apparatus.

**CONCLUSION:** The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:

 Reviewed by: Eric Wong Date: November 24, 2008	 Approved by: Steven Tsang Date: November 24, 2008
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BUREAU VERITAS HONG KONG LIMITED –  
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## TEST REPORT N°: WHM-08OCH1929HTHFB

### Location of the test site

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) are set up for investigation and located at :

### BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE

No. 2106-2107, 21/F., Westin Centre,  
26 Hung To Road,  
Kwun Tong, Kowloon,  
Hong Kong

### List of measuring equipment

#### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE
M0008	EMI TEST RECEIVER	R&S	ESCI	100379	13-APR-2009
M0012	HF LOOP ANTENNA	SCHAFFNER	HLA 6120	21728	31-AUG-2008
M0011	BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	31-JAN-2009
M0027	OPEN AREA TEST SITE	BVCPS	N/A	N/A	05-JULY-2009
M0028	ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	09-JULY-2009
M0036	HORN ANTENNA	SCHWARZBECK	BBHA9120D	9120D-692	29-JULY-2009
M0037	PREAMPLIFIER	SCHWARZBECK	BBV9718	9718-152	22-JULY-2009
M0050	COAXIAL CABLE 1-18GHz	SUHNER	N/A	N/A	23-JULY-2009

#### Remarks:-

N/A : Not Applicable or Not Available

The measurement instrumentation uncertainty would be taking into consideration on each of the test result

## TEST REPORT N°: WHM-08OCH1929HTHFB

### Equipment Under Test [EUT]

#### Description of Sample:

Model Name: Remote Control Transmitter  
Model Number: TR211  
Rating: 3Vd.c ("AAA" size battery x 2)

#### Description of EUT Operation:

The Equipment Under Test (EUT) is a **W.H. MANDOLYN** of Remote Control Transmitter. The transmitter is 11 buttons transmitter and operating at 915MHz. The EUT continues to transmit while buttons is being pressed, Modulation by IC, and type is pulse modulation.

The transmitter has different control:

1. On button – on control
2. Off button – off control
3. 1-9 button – number control
4. CH button – channel control
5. GRP button – group control
6. Up button – menu control
7. Down button – menu control
8. Set button – set control
9. PROG button – programming control
10. LEV button – brightness level control
11. Function – function control

#### Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. It is soldered on the PCB. The antenna is not replaceable or user serviceable. The requirement of S15.203 are met. There are no deviations or exceptions to the specifications.



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### Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.249

Test Method: ANSI C63.4

Test Date(s): 2008-11-05

Mode of Operation: Transmission continuously with modulation

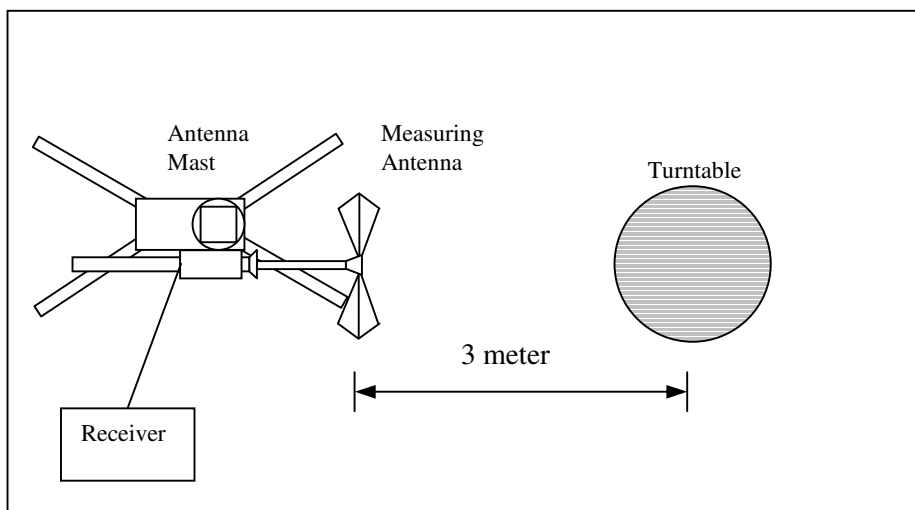
### Test Procedure:

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

### Test Setup: Open Area Test Site





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### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental  [MHz]	Field Strength of Fundamental Emission (Quasi-Peak) [mV/m]	Field Strength of Harmonics Emission (Average) [μV/m]
902-928	50	500

### Measurement Data

### Test Result of (Transmission Continuously with modulation): PASS

#### Detection mode: Peak

Frequency (MHz)	Polarity (H/V) and degree	EUT Orientation	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
915.0	V	Front side	35.8	86.1	94.0	-7.9

Note: EUT Orientation is shown as Set up photo.  
Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



## TEST REPORT N°: WHM-08OCH1929HTHFB

### Radiated Emissions (Spurious Emission)

Test Requirement: FCC Part 15 Section 15.249

Test Method: ANSI C63.4

Test Date(s): 2008-11-05

Mode of Operation: Transmission continuously with modulation

### Measurement Data

**Test Result of (Transmission continuously with modulation): PASS**

**Detection mode: Peak**

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
1829.80	V	25.52	58.7	74.0	-15.3
2745.10	V	28.26	50.0	74.0	-24.0
3660.00	V	29.21	29.6	74.0	-44.4
4575.00	V	31.04	31.1	74.0	-42.9
5490.00	V	32.04	30.4	74.0	-43.6
6405.00	V	33.92	31.2	74.0	-42.8
7320.00	V	36.48	34.4	74.0	-39.6
8235.00	V	36.58	33.6	74.0	-40.4
9150.00	V	37.46	33.5	74.0	-40.5



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### Measurement Data

**Test Result of (Transmission continuously with modulation): PASS**

**Detection mode: Average**

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
1829.80	V	25.52	47.2	54.0	-6.8
2745.10	V	28.26	38.5	54.0	-15.5
3660.00	V	29.21	18.1	54.0	-35.9
4575.00	V	31.04	19.6	54.0	-34.4
5490.00	V	32.04	18.9	54.0	-35.1
6405.00	V	33.92	19.7	54.0	-34.3
7320.00	V	36.48	22.9	54.0	-31.1
8235.00	V	36.58	22.1	54.0	-31.9
9150.00	V	37.46	22.0	54.0	-32.0

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.266) = -11.5\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 1MHz  
VBW = 1MHz



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### Radiated Emissions (30MHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209

Test Method: ANSI C63.4

Test Date(s): 2008-11-05

Mode of Operation: Transmission continuously with modulation and Standby mode

#### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/m]
1.705-30	300
30-88	100
88-216	150
216-960	200
Above960	500

### Measurement Data

Test Result of (Transmission continuously with modulation and Standby mode): **PASS**

#### Detection mode: Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Emissions detected are more than 20dB below the limit line(s).				

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
VBW = 120KHz





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### Frequency range of Fundamental Emission

Test Requirement: FCC 47 CFR 15.249  
Test Method: ANSI C63.4:2003 (Section 13.1.7)  
Test Date: 2008-11-01  
Mode of Operation: Transmission continuously with modulation

### Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

### Limits for Frequency range of Fundamental Emission:

Frequency [MHz]	FCC Limits [MHz]
915	902-928

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## Measurement Data :

### Test Result of Frequency Range of Fundamental Emission: PASS



01.Nov 08 16:31

Ref 92 dBμV/m

\*Att 20 dB

RBW 1 MHz

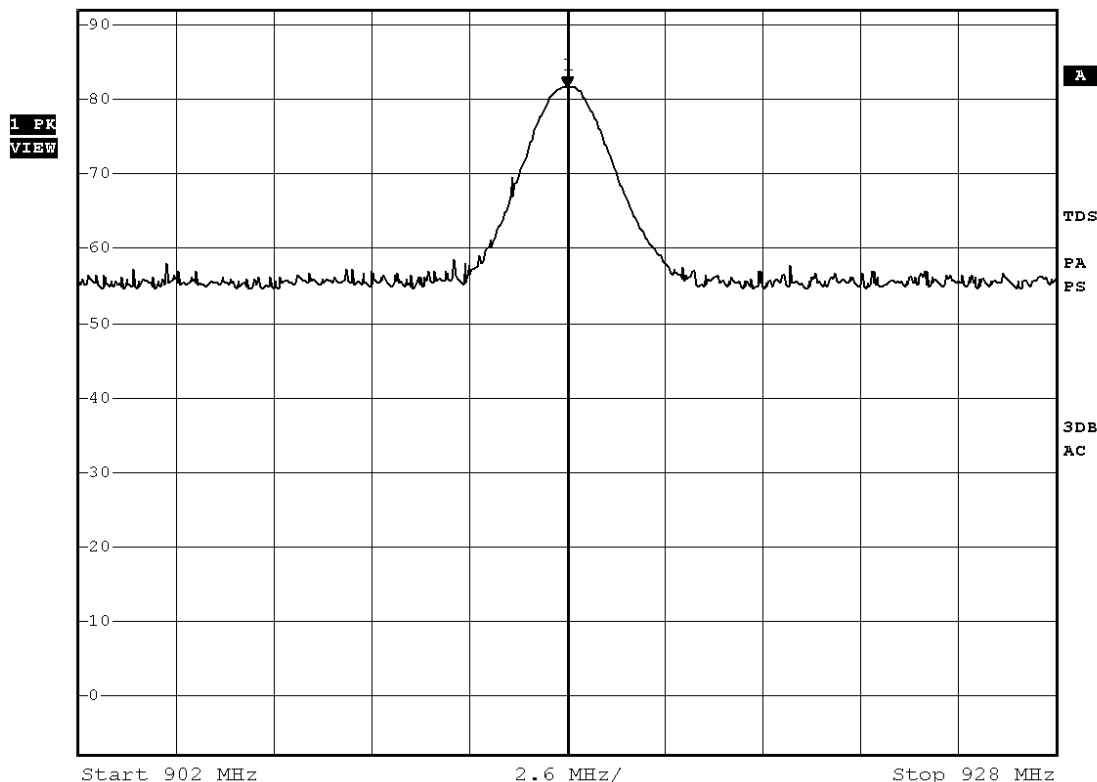
VBW 3 MHz

SWT 2.5 ms

Marker 1 [T1 ]

81.69 dBμV/m

915.000000000 MHz



Date: 1.NOV.2008 16:31:13



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### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (100msec) never exceeds a series of 2 pulses. Assuming any combination of short or long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $11.6\text{msec per } 43.6\text{msec} = 26.6\%$  duty cycle. Figure A and C show the characteristics of the pulse train for one of these functions.

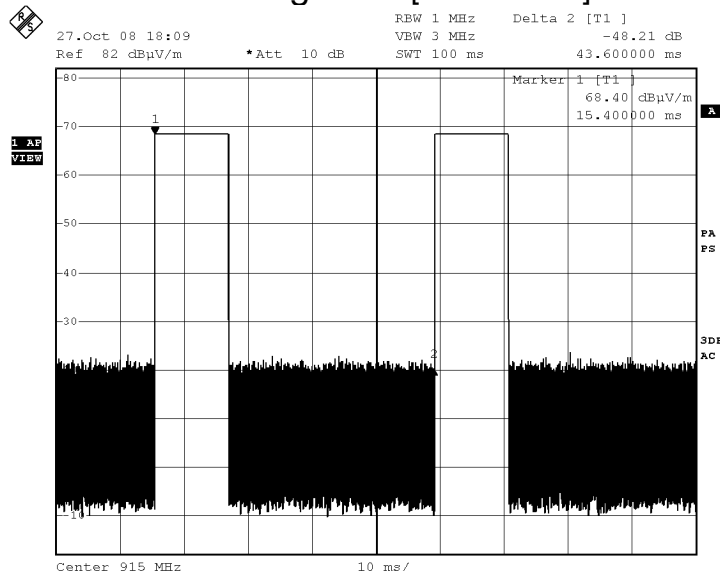
Remarks:

Duty Cycle Correction =  $20\text{Log}(0.266) = -11.5\text{dB}$

The following figures [Figure A to Figure B] show the characteristics of the pulse train for one of these functions.

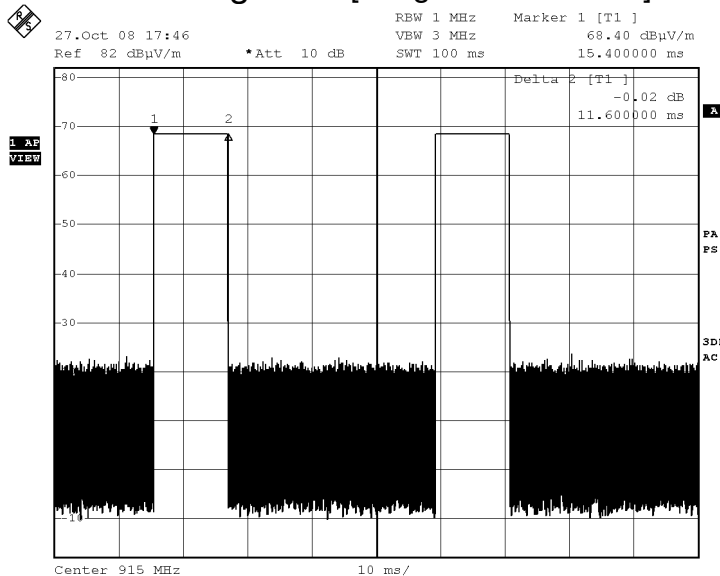
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### Figure A [Pulse Train]



Date: 27.OCT.2008 18:09:10

### Figure B [Long or Short Pulse]



Date: 27.OCT.2008 17:46:33

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### Photographs of EUT

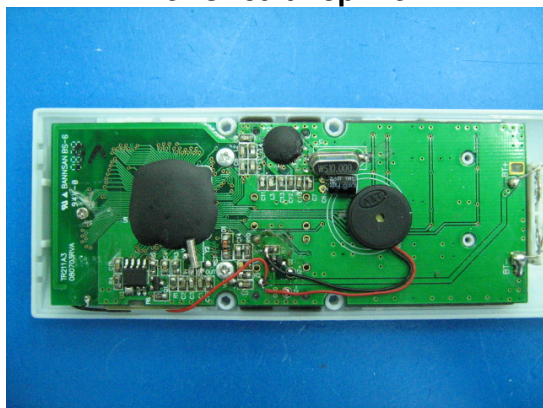
**Front View of the product**



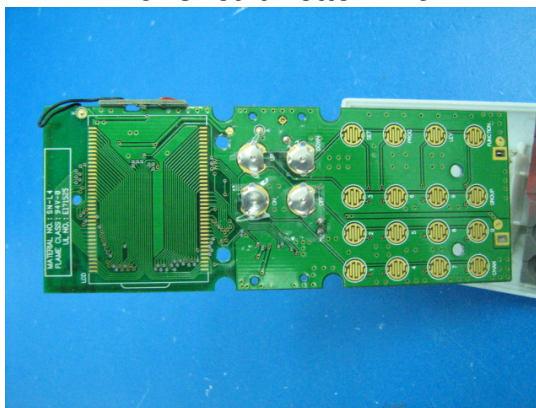
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**





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### Photographs of EUT

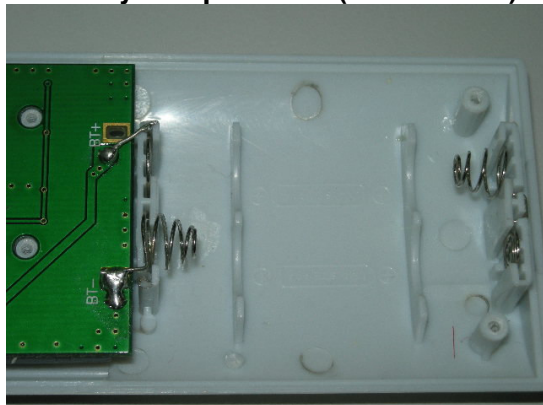
**Battery compartment**



**Battery compartment (With Battery)**



**Battery compartment (Connection)**



**Battery compartment (Cover)**



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**Measurement of Radiated Emission Test Set Up**



**\*\*\*\*\* End of Report \*\*\*\*\***