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No.: MH192027

Applicant: Winspeed Co., Ltd.

14F-1, No.2, Jian-Ba Rd., Chung-Ho District, New Taipei

City, Taiwan

Manufacturer: Winspeed Co., Ltd.

14F-1, No.2, Jian-Ba Rd., Chung-Ho District, New Taipei

City, Taiwan

Description of Sample(s): Submitted sample(s) said to be

Product: SNAPPY Mouse-Wireless

Brand Name: SPEEDLINK
Model Number: SL-630003-TE
FCC ID: 2AEDNA10

Date Sample(s) Received: 2015-10-21

Date Tested: 2015-10-23 to 2015-10-26

Investigation Requested: Perform ElectroMagnetic Interference measurement in

accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 and ANSI C63.10: 2013 for FCC Certification.

Conclusion(s): The submitted product <u>COMPLIED</u> with the requirements of

Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this

Test Report.

Remark(s): For additional model(s) details, please page 3

Dr. LEE Kam Chuen

Authorized Signatory
ElectroMagnetic Compatibility Department

For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.



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1.0 General Details

1.1 Equipment Under Test [EUT] Description of Sample(s)

Product: SNAPPY Mouse-Wireless

Manufacturer: Winspeed Co., Ltd.

14F-1, No.2, Jian-Ba Rd., Chung-Ho District, New Taipei

City, Taiwan

Brand Name: SPEEDLINK Model Number: SL-630003-TE

Additional Model Number: SL-630003-RD, SL-630003-BE SVd.c. (Power by USB port)

1.2 Description of EUT Operation

The Equipment Under Test (EUT) is a SNAPPY Mouse-Wireless of Winspeed Co., Ltd.. The transceiver operating in the 2.4GHz ISM frequency band. The RF signal is modulated by IC, the type of modulation used is FSK.

1.3 Date of Order

2015-10-21

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2015-10-23 to 2015-10-26

1.6 Country of Origin

China



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2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 Regulations and ANSI C63.10: 2013 for FCC Certification.

The device was realized by test software.

2.2 Test Standards and Results Summary Tables

	EMISSION Results Summary									
Test Condition	Test Requirement	Test Method	Class /	Te	est Resu	ılt				
			Severity	Pass	Fail	N/A				
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.10: 2013	N/A							
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	\boxtimes						

Note: N/A - Not Applicable



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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Test Requirement: FCC 47CFR 15.249 & FCC 47CFR 15.209

Test Method: ANSI C63.10: 2013

Test Date: 2015-10-26 Mode of Operation: TX mode

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: Semi-anechoic chamber located on the STC (Dongguan) Company Ltd. 68 Fumin Nan Road, Dalang, Dongguan, Guangdong, PRC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.



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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av) RBW: 10kHz

VBW: 30kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

30MHz – 1GHz (QP) RBW: 120kHz

VBW: 120kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

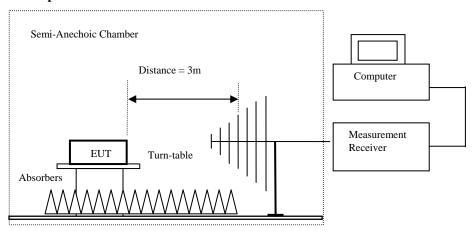
Above 1GHz (Pk & Av) RBW: 1MHz

VBW: 1MHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30 MHz to 1000 MHz made with Bi-log antennas, above 1000 MHz horn antennas are used, 9 kHz to 30 MHz loop antennas are used.

Ground Plane



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

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission
[MHz]	[microvolts/meter]	[microvolts/meter]
902-928	50,000 [Quasi-Peak]	500 [Average]
2400-2483.5	50,000 [Average]	500 [Average]

Results of Tx mode (Lowest Frequency Channel-2408 MHz) (Above 1GHz): Pass

Field Strength of Fundamental Emissions									
			Peak Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
2408.00	44.6	36.4	81.0	11,207.3	500,000	Horizontal			
2408.00	46.9	36.8	83.7	15,223.0	500,000	Vertical			

Field Strength of Fundamental Emissions									
		A	Average Valu	e					
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
2408.00	42.3	36.4	78.7	8,590.1	50,000	Horizontal			
2408.00	33.0	36.8	69.8	3,093.9	50,000	Vertical			

	Field Strength of Harmonics Emission										
Frequency	Frequency Measured Correction Field Field Limit @3m E-Field										
requeriey	Level @3m	Factor	Strength	Strength	Limit @ 3m	Polarity					
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m	1 0141119					
4816.0	3.7	42.7	46.4	208.7	5,000	Horizontal					
4816.0	6.0	41.6	47.6	239.3	5,000	Vertical					
7224.0	-2.8	48.5	45.7	193.0	5,000	Horizontal					
7224.0	-1.5	47.4	46.0	198.4	5,000	Vertical					
9632.0	0.2	50.6	50.8	344.7	5,000	Horizontal					
9632.0	1.7	49.5	51.2	364.8	5,000	Vertical					
12040.0	-1.7	51.7	50.0	317.3	5,000	Horizontal					
12040.0	-1.1	51.8	50.7	342.4	5,000	Vertical					



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	Field Strength of Harmonics Emission Average Value										
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field					
	Level @3m	Factor	Strength	Strength		Polarity					
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m						
4816.0	-7.2	42.7	35.5	59.4	500	Horizontal					
4816.0	-8.8	41.6	32.8	43.5	500	Vertical					
7224.0	-11.9	48.5	36.6	67.9	500	Horizontal					
7224.0	-11.6	47.4	35.8	61.6	500	Vertical					
9632.0	-10.9	50.6	39.7	96.4	500	Horizontal					
9632.0	-11.4	49.5	38.2	80.8	500	Vertical					
12040.0	-12.4	51.7	39.4	92.8	500	Horizontal					
12040.0	-12.4	51.8	39.4	93.4	500	Vertical					

Results of Tx mode (Middle Frequency Channel- 2440MHz) (Above 1GHz): Pass

Field Strength of Fundamental Emissions									
			Peak Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
2440.00	43.7	36.5	80.2	10,174.2	500,000	Horizontal			
2440.00	47.2	36.8	84.0	15,758.0	500,000	Vertical			

Field Strength of Fundamental Emissions									
		A	Average Valu	e					
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
2440.00	41.5	36.5	78.0	7,906.8	50,000	Horizontal			
2440.00	32.3	36.8	69.1	2,841.2	50,000	Vertical			

	Field Strength of Harmonics Emission								
			Peak Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
4880.0	4.1	42.8	46.9	220.8	5,000	Horizontal			
4880.0	5.4	41.7	47.1	225.2	5,000	Vertical			
7320.0	1.0	48.7	49.7	304.8	5,000	Horizontal			
7320.0	2.7	47.5	50.2	322.5	5,000	Vertical			
9760.0	0.8	50.7	51.5	373.7	5,000	Horizontal			
9760.0	2.2	49.6	51.8	389.9	5,000	Vertical			
12200.0	-1.1	51.9	50.8	346.3	5,000	Horizontal			
12200.0	The Hone	Kong Stand	S1.2	sting 363.5	5,000	Vertical			



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Field Strength of Harmonics Emission											
Avarage Value											
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field					
	Level @ 3m	Factor	Strength	Strength		Polarity					
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m						
4880.0	-3.2	42.8	39.6	95.6	500	Horizontal					
4880.0	-9.6	41.7	32.1	40.3	500	Vertical					
7320.0	-8.5	48.7	40.2	102.3	500	Horizontal					
7320.0	-6.7	47.5	40.9	110.3	500	Vertical					
9760.0	-8.0	50.7	42.7	135.8	500	Horizontal					
9760.0	-9.6	49.6	40.0	100.1	500	Vertical					
12200.0	-10.2	51.9	41.8	122.3	500	Horizontal					
12200.0	-9.8	51.8	42.0	125.6	500	Vertical					

Results of Tx mode (Highest Frequency Channel – 2474MHz) (Above 1GHz): Pass

	Field Strength of Fundamental Emissions									
			Peak Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field				
	Level @3m	Factor	Strength	Strength		Polarity				
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m					
2474.00	40.8	36.6	77.4	7,421.6	500,000	Horizontal				
2474.00	45.3	36.8	82.1	12,793.8	500,000	Vertical				

Field Strength of Fundamental Emissions						
Average Value						
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m	
2474.00	38.6	36.6	75.2	5,767.7	50,000	Horizontal
2474.00	31.1	36.8	67.9	2,494.6	50,000	Vertical

	Field Strength of Harmonics Emission					
			Peak Value			
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m	
4948.0	3.7	42.9	46.6	214.0	5,000	Horizontal
4948.0	5.0	41.8	46.8	218.8	5,000	Vertical
7422.0	1.4	48.9	50.3	328.5	5,000	Horizontal
7422.0	2.9	47.8	50.7	344.3	5,000	Vertical
9896.0	0.3	50.8	51.1	357.3	5,000	Horizontal
9896.0	1.6	49.8	51.4	370.3	5,000	Vertical
12370.0	-0.9	52.1	51.3	365.2	5,000	Horizontal
12370.0	-0.2	51.8	51.6	381.5	5,000	Vertical



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	Field Strength of Harmonics Emission					
Eraguanav	Measured	Correction	Avarage Valu Field	<u>e</u> Field	Limit @3m	E-Field
Frequency		Correction			Lillill @5iii	
	Level @3m	Factor	Strength	Strength		Polarity
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m	
4948.0	-7.0	42.9	36.0	62.7	500	Horizontal
4948.0	-12.1	41.8	29.7	30.4	500	Vertical
7422.0	-7.7	48.9	41.2	115.2	500	Horizontal
7422.0	-6.2	47.8	41.6	119.9	500	Vertical
9896.0	-8.2	50.8	42.6	135.2	500	Horizontal
9896.0	-8.2	49.8	41.6	119.8	500	Vertical
12370.0	-9.8	52.1	42.3	130.3	500	Horizontal
12370.0	-9.1	51.8	42.7	136.8	500	Vertical

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Calculated measurement uncertainty (9kHz - 30MHz): 2.0dB

(30MHz – 1GHz): 4.9dB (1GHz - 26GHz): 4.0dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of TX mode (9kHz - 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

Results of TX mode (30MHz - 1GHz): PASS

Radiated Emissions Quasi-Peak							
		Quasi	-Peak				
Emission	E-Field	Level	Limit	Level	Limit		
Frequency	Polarity	@3m	@3m	@3m	@3m		
MHz	·	dBμV/m	dBμV/m	μV/m	μV/m		
36.1	Vertical	32.7	40.0	43.2	100		
42.0	Vertical	31.4	40.0	37.2	100		
521.7	Vertical	36.1	46.0	63.8	200		
30.1	Horizontal	31.1	40.0	35.9	100		
48.1	Horizontal	26.4	40.0	20.9	100		
701.9	Horizontal	38.2	46.0	81.3	200		

Remarks:

Calculated measurement uncertainty (9kHz - 30MHz): 2.0dB

(30MHz – 1GHz): 4.9dB (1GHz - 26GHz): 4.0dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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RF Radiated Emissions Measurement:

Limit:

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Result: RF Radiated Emissions(1GHz-26GHz)(worse data) (Lowest)

Field Strength of Band-edge Compliance						
	Peak Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dBμV/m	
2395.5	17.1	36.2	53.3	74.0	20.7	Horizontal
2395.5	17.6	36.7	54.3	74.0	19.7	Vertical

Field Strength of Band-edge Compliance						
	Average Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dBμV/m	
2395.5	9.4	36.2	45.6	54.0	8.4	Horizontal
2395.5	10.4	36.7	47.1	54.0	7.0	Vertical

Result: RF Radiated Emissions(1GHz-26GHz)(worse data) (Highest)

Field Strength of Band-edge Compliance						
Peak Value						
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	dBμV/m	dBμV/m	dBμV/m	
2487.5	11.0	36.6	47.6	74.0	26.4	Horizontal
2487.5	12.0	36.8	48.8	74.0	25.2	Vertical

Field Strength of Band-edge Compliance						
	Average Value					
Frequency	Measured	Correction	Field	Limit	Margin	E-Field
	Level @3m	Factor	Strength	@3m		Polarity
MHz	dΒμV	dB/m	$dB\mu V/m$	dBμV/m	dBμV/m	
2487.5	3.6	36.6	40.2	54.0	13.9	Horizontal
2487.5	4.5	36.8	41.3	54.0	12.7	Vertical



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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.249 Test Method: ANSI C63.10: 2013

Test Date: 2015-10-22 Mode of Operation: Tx mode

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.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

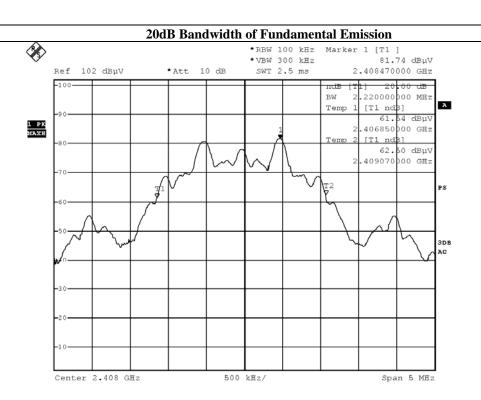


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Limits for 20dB Bandwidth of Fundamental Emission (Low Frequency Channel):

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2408	2.22



BMP

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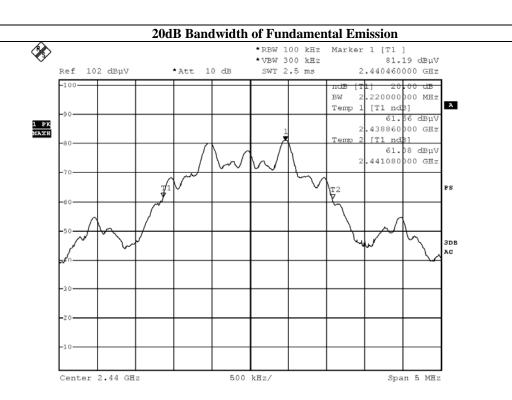


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Limits for 20dB Bandwidth of Fundamental Emission (Middle Frequency Channel):

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2440	2.22



BMP

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Limits for 20dB Bandwidth of Fundamental Emission (High Frequency Channel):

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
2474	2.24

20dB Bandwidth of Fundamental Emission *RBW 100 kHz Marker 1 [T1] *VBW 300 kHz 82.21 dBuV Ref 102 dBµV *Att 10 dB SWT 2.5 ms 2.474460000 GHz 20.00 dB ndB 2400000000 MHz BW λ [T1 nd3] 62.51 dBµV 472840 000 GHz ndB1 61.37 dBμV .475080000 GHz ЗDВ Center 2.474 GHz 500 kHz/ Span 5 MHz

BMP

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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM299	DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA	ETS-LINDGREN	3115	00114120	2014/01/15	2016/01/25
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2014/01/23	2016/01/23
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3		2014/09/29	2016/09/29
EM320	BICONILOG ANTENNA	ETS-LINDGREN	3142D	00094856	2014/08/06	2016/08/06
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2014/01/15	2016/01/15
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2015/06/01	2016/06/01
RE01	RF CABLE	N/A	N/A	N/A	2014-9-28	2016-9-27
RE02	RF CABLE	N/A	N/A	N/A	2014-9-28	2016-9-27

Remarks:-

N/A Not Applicable or Not Available



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Appendix B

Photographs of EUT

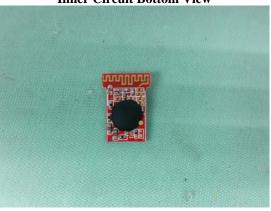
Front View of the product



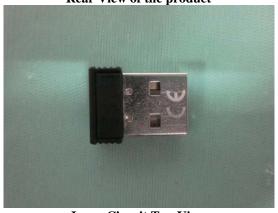
Inside View of the product



Inner Circuit Bottom View



Rear View of the product



Inner Circuit Top View



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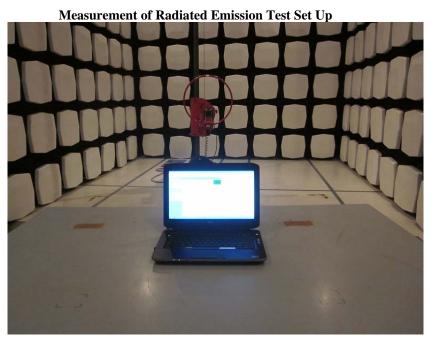
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 E-mail: hkstc@hkstc.org Homepage: www.stc-group.org

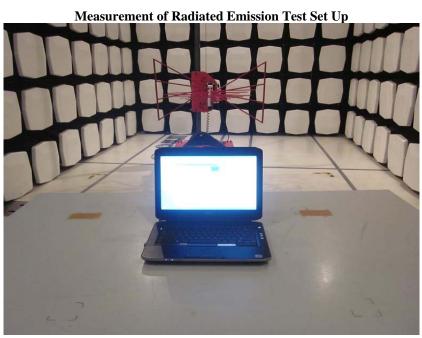


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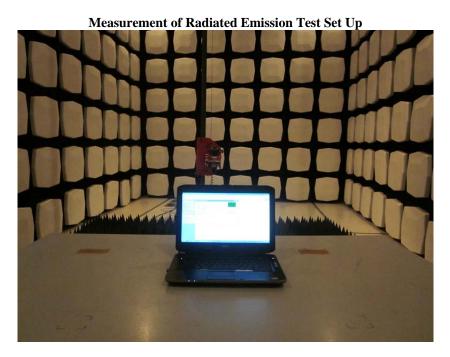
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 E-mail: hkstc@hkstc.org Homepage: www.stc-group.org



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***** End of Test Report *****