

# FCC TEST REPORT (WLAN)

**REPORT NO.:** RF140319C32B

MODEL NO.: A1402 MARKETING NAME: B1-730xx (x = 0~9, A~Z, . , / , - or Blank) FCC ID: HLZA1402 RECEIVED: Apr. 25, 2014 TESTED: May 02, 2014 ISSUED: May 13, 2014

**APPLICANT:** Acer Incorporated

ADDRESS: 8F., No.88, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



# TABLE OF CONTENTS

RELE	ASE CONTROL RECORD	3
1.	CERTIFICATION	4
2.	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY	5
3.	GENERAL INFORMATION	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	10
3.2.1	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	11
3.3	DESCRIPTION OF SUPPORT UNITS	12
3.3.1	CONFIGURATION OF SYSTEM UNDER TEST	12
3.4	GENERAL DESCRIPTION OF APPLIED STANDARDS	13
4.	TEST TYPES AND RESULTS	14
4.1	RADIATED EMISSION AND BANDEDGE MEASUREMENT	14
4.1.1	LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	14
4.1.2	TEST INSTRUMENTS	15
4.1.3	TEST PROCEDURES	16
4.1.4	DEVIATION FROM TEST STANDARD	16
4.1.5	TEST SETUP	17
4.1.6	EUT OPERATING CONDITIONS	17
4.1.7	TEST RESULTS	18
4.2	CONDUCTED EMISSION MEASUREMENT	19
4.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	19
4.2.2	TEST INSTRUMENTS	19
4.2.3	TEST PROCEDURES	20
4.2.4	DEVIATION FROM TEST STANDARD	20
4.2.5	TEST SETUP	20
4.2.6	EUT OPERATING CONDITIONS	20
4.2.7	TEST RESULTS	21
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION	23
6.	INFORMATION ON THE TESTING LABORATORIES	24
7.	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES	S
	TO THE EUT BY THE LAB	25



## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140319C32B	Original release	May 13, 2014



# **1. CERTIFICATION PRODUCT:** Tablet Computer **MODEL NO.:** A1402 MARKETING NAME: B1-730xx (x = 0~9, A~Z, . , / , - or Blank) BRAND: Acer **APPLICANT:** Acer Incorporated **TESTED:** May 02, 2014 **TEST SAMPLE:** ENGINEERING SAMPLE STANDARDS: FCC Part 15, Subpart C (Section 15.247) ANSI C63.10-2009 This report is issued as a supplementary report of RF140319C32. This report shall be used combined together with its original report. / **, DATE :** May 13, 2014 **PREPARED BY :** Maggie Wu / Specialist **APPROVED BY**: , DATE : May 13, 2014 Ken Liu / Senior Manager NOTE: Test items for radiated emission below 1GHz and conducted emission test were performed for this addendum. Other testing data refer to original report.



# 2. SUMMARY OF TEST RESULTS

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)				
STANDARD SECTION	TEST TYPE	RESULT	REMARK	
15.207	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.63dB at 0.18508MHz.	
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.1dB at 340.99MHz.	
15.247(d)	Band Edge Measurement	PASS	Refer to NOTE below	
15.247(a)(2)	6dB bandwidth	PASS	Refer to NOTE below	
15.247(b)	Conducted power	PASS	Refer to NOTE below	
15.247(e)	Power Spectral Density	PASS	Refer to NOTE below	
15.203	Antenna Requirement	PASS	No antenna connector is used.	

The EUT has been tested according to the following specifications:

**NOTE:** Test items for radiated emission below 1GHz and conducted emission test were performed for this addendum. Other testing data refer to original report.

#### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
	30MHz ~ 200MHz	3.34 dB
Radiated emissions	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.



## 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

EUT	Tablet Computer
MODEL NO.	A1402
MARKETING NAME	B1-730xx (x = 0~9, A~Z, . , / , - or Blank)
POWER SUPPLY	5.35Vdc (Adapter) 5Vdc (Host equipment) 3.8Vdc (Battery)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 72.2Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	189.234mW
ANTENNA TYPE	Refer to NOTE as below
ANTENNA CONNECTOR	N/A
DATA CABLE	<ul> <li>(1) 1.15m USB cable without core (Original, Brand: MEC IMEX INC.)</li> <li>(2) 1.15m USB cable without core (New, Brand: Component User Industry Co., Ltd.)</li> </ul>
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, Battery

#### NOTE:

- 1. This is a supplementary report of RF140319C32. This report shall be combined together with its original report.
- 2. This report is prepared for FCC class II permissive change. The differences compared with the original report are:
  - a. The internal frame of original sample is changed.
  - b. Added components (LCM, Touch, adapter and USB cable).
  - c. The TN samples' antenna gain is lower than IPS sample's (original sample), but the antenna location and type are the same.

SAMPLE	ANTENNA TYPE	ANTENNA GAIN (dBi)	
IPS	PCB	-2.6	
TN	PCB	-3.3	

Therefore, test items for radiated emission below 1GHz and conducted emissions had been re-tested and presented in this report.

3. The EUT has WLAN and Bluetooth functions, which cannot operate simultaneously.



#### 4. The EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802,11n (20MHz)	1TX

5. The EUT consumes power from the following battery & adapters.

BATTERY		
BRAND:	Mcnair	
MODEL:	L83-5178-552-00-4	
RATING:	14Wh, 3680mAh, 3.8Vdc	

ADAPTER 1 (ORIGINAL APPROVED)		
BRAND:	DELTA Electronics, INC.	
MODEL:	ADP-10HW A	
INPUT:	100-240Vac, 50-60Hz, 0.4A	
OUTPUT:	5.35Vdc, 2A	
POWER LINE:	DC 1.15m USB cable without core	

ADAPTER 2 (NEW)		
BRAND:	Chicony	
MODEL:	W12-010N3A	
INPUT:	100-240Vac, 50/60Hz, 0.3A	
OUTPUT:	5.35Vdc, 2A	
POWER LINE:	DC 1.15m USB cable without core	



				(	Config	
Part	Descriptions	Part number	Supplier	1 (IPS)	2 (TN)	3 (TN)
	Clovertrail 1.6GHz	Intel Z2560 1.6GHz	Intel	v	v	v
Ducati PCBA	16GB EMMC	H26M52003EQR	Hynix	v	v	v
	1GB KPDDR2	EDB8164B3PD-1D-F(FCBGA)	Elpida	v	v	v
	7" 800x1280 IPS	KD070D21-39NA-A15	KingDisplay	v		
	7" TN 600x1024	KD070D27-39NB-A13	KingDisplay		v	v
		CFF3325-7	HLT	v		
Touch	GG Touch	M070QF08-V1	Gtronics		v	
		CTP070588-01	AVD			v
Battery	14Wh, 3680mAh, 3.8Vdc	3165142P	Oceansun	v	v	v
Speaker	0.5wattx2	XHB160902B08-11	Jiashan Haosheng Electronic Co.,LTD	v	v	v
		KEEH1544WBL-40L	Kingstate	v		
Microphone	Microphone+cable	HSC-0092	Tianjin BSE Electronics Co.,Ltd		v	v
Camera	2MP	GNDF130958R	Guangdong Lite Array Co.,Ltd.	v	v	v
Camera	VGA	GNBF130959R	Guangdong Lite Array Co.,Ltd.	v	v	v
Antenna	WiFi-GPS antenna	QTNKVWIPB01+A	Well Green Technology	v	v	v
Casing	Hosuing	ТВС	Shen Long / Da Ding	v	v	v
FPC	PCBA to LCM	JD3767A0	J&T FLEX TECHNOLOGY CO.,LTD.	v	v	v

#### 6. The configurations of the EUT are defined as below.



7. Radiated emission 30 ~ 1000MHz test has been pre-tested under the following test modes. **Test mode 1** was the worst case for final test and recorded in the report.

Test Mode	Test Condition
1	Config. 1 + USB cable (1) + Adapter 1
2	Config. 1 + USB cable (1) + Adapter 2
3	Config. 2 + USB cable (1) + Adapter 1
4	Config. 2 + USB cable (1) + Adapter 2
5	Config. 3 + USB cable (1) + Adapter 1
6	Config. 3 + USB cable (1) + Adapter 2

8. Conducted emission test has been pre-tested under the following test modes. **Test mode 5** was the worst case for final test and recorded in the report.

Test Mode	Test Condition			
1	Config. 1 + USB cable (1) + Adapter 1			
2	Config. 1 + USB cable (1) + Adapter 2			
3	Config. 2 + USB cable (1) + Adapter 1			
4	Config. 2 + USB cable (1) + Adapter 2			
5	Config. 3 + USB cable (1) + Adapter 1			
6	Config. 3 + USB cable (1) + Adapter 2			
7	Config. 3 + USB cable (2) + Adapter 1			

9. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



## 3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		



#### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT	APPLIC	ABLE TO	DESCRIPTION	
MODE	RE<1G	PLC	DESCRIPTION	
А	$\checkmark$	-	Config. 1, USB cable (1), powered by adapter 1	
В	-	$\checkmark$	Config. 3, USB cable (1), powered by adapter 1	
Where R	E<1G: Radiated E	mission below 1G	Hz PLC: Power Line Conducted Emission	

Where RE<1G: Radiated Emission below 1GHz

#### NOTE:

The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Y-plane. NOTE: "-" means no effect.

#### **RADIATED EMISSION TEST (BELOW 1GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
А	802.11g	1 to 11	6	OFDM	BPSK	6.0

#### **POWER LINE CONDUCTED EMISSION TEST:**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

EI CONF MC	UT FIGURE DDE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
E	В	802.11g	1 to 11	6	OFDM	BPSK	6.0

#### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Ted Chang
PLC	25deg. C, 65%RH	120Vac, 60Hz	Jones Chang



## 3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

## 3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





## 3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

# FCC Part 15, Subpart C (15.247) 558074 D01 DTS Meas Guidance v03r01

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



# 4. TEST TYPES AND RESULTS

#### 4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

#### NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



## 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 3.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

- 4. The FCC Site Registration No. is 988962.
- 5. The IC Site Registration No. is IC 7450F-3.



## 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, guasi-peak or average method as specified and then reported in a data sheet.

#### NOTE:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is
   ≥ 1/T(Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency
   above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.

## 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.



## 4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the test table.
- b. Set the EUT in transmission condition continuously at specific channel frequency.



#### 4.1.7 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA: 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz	
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak	
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH	TESTED BY	Jones Chang	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M									
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	Correction Factor (dB/m)		
1	138.78	36.9 QP	43.5	-6.6	1.99 H	92	51.40	-14.50		
2	208.77	38.9 QP	43.5	-4.6	1.00 H	100	55.40	-16.50		
3	272.94	42.5 QP	46.0	-3.5	1.00 H	135	55.40	-12.90		
4	340.99	44.9 QP	46.0	-1.1	1.00 H	204	56.40	-11.50		
5	418.76	39.4 QP	46.0	-6.6	1.49 H	143	49.30	-9.90		
6	488.75	40.3 QP	46.0	-5.7	1.49 H	195	48.90	-8.60		
		ANTENNA		/ & TEST DI	STANCE: V	ERTICAL A	Т 3 М			
NO.	NO. FREQ. (MHz) EMISSION LEVEL (dBuV/m) (dBuV/m) MARGIN (dB) ANTENNA HEIGHT (m) (Degree) RAW VALUE (dBuV) (dBuV)						Correction Factor (dB/m)			
1	70.73	36.7 QP	40.0	-3.3	1.00 V	192	52.90	-16.20		
2	272.94	40.2 QP	46.0	-5.8	1.50 V	33	53.10	-12.90		
3	344.87	42.3 QP	46.0	-3.7	1.00 V	125	53.80	-11.50		
4	418.76	37.6 QP	46.0	-8.4	1.50 V	339	47.50	-9.90		
5	486.81	38.2 QP	46.0	-7.8	1.00 V	292	46.80	-8.60		
6	564.58	34.6 QP	46.0	-11.4	1.00 V	354	41.90	-7.30		

**REMARKS**:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)

– Pre-Amplifier Factor (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission Level – Limit value



## 4.2 CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)		
	Quasi-peak	Average	
0.15 ~ 0.5	66 to 56	56 to 46	
0.5 ~ 5	56	46	
5 ~ 30	60	50	

#### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

**NOTE**: 1. The lower limit shall apply at the transition frequencies.

- 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
- 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.



## 4.2.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emissions levels under (Limit 20dB) were not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

## 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

## 4.2.5 TEST SETUP



from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.



## 4.2.7 TEST RESULTS

#### CONDUCTED WORST-CASE DATA: 802.11g

PHASE		Line 1	6d	6dB BANDWIDTH			9kHz				
No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin		
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)		
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15760	0.11	59.54	45.18	59.65	45.29	65.59	55.59	-5.94	-10.30	
2	0.18508	0.10	61.53	47.23	61.63	47.33	64.25	54.25	-2.63	-6.93	
3	0.22791	0.09	57.24	43.94	57.33	44.03	62.53	52.53	-5.19	-8.49	
4	0.27120	0.10	54.17	41.40	54.27	41.50	61.08	51.08	-6.81	-9.58	
5	0.32187	0.10	50.29	36.68	50.39	36.78	59.66	49.66	-9.27	-12.88	
6	0.36896	0.11	45.44	30.84	45.55	30.95	58.52	48.52	-12.98	-17.58	
7	0.50000	0.13	36.59	24.21	36.72	24.34	56.00	46.00	-19.28	-21.66	
8	0.63856	0.15	38.66	31.71	38.81	31.86	56.00	46.00	-17.19	-14.14	
9	15.23869	0.84	34.32	26.96	35.16	27.80	60.00	50.00	-24.84	-22.20	

#### **REMARKS:**

- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
- 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value





PHASE		Line 2			6dB BANDWIDTH			9kHz	9kHz		
										ain	
No	Freq.	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)		
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15000	0.05	55.62	42.08	55.67	42.13	66.00	56.00	-10.33	-13.87	
2	0.18508	0.08	57.51	42.47	57.59	42.55	64.25	54.25	-6.67	-11.71	
3	0.22820	0.10	54.63	40.89	54.73	40.99	62.51	52.51	-7.78	-11.52	
4	0.27120	0.12	51.85	38.95	51.97	39.07	61.08	51.08	-9.11	-12.01	
5	0.32017	0.14	47.93	33.52	48.07	33.66	59.70	49.70	-11.63	-16.04	
6	0.36913	0.16	43.71	28.34	43.87	28.50	58.52	48.52	-14.65	-20.02	
7	0.63862	0.19	36.73	24.66	36.92	24.85	56.00	46.00	-19.08	-21.15	
8	15.12530	0.79	31.27	23.54	32.06	24.33	60.00	50.00	-27.94	-25.67	

#### **REMARKS:**

- 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
- 2. The emission levels of other frequencies were very low against the limit.
- 3. Margin value = Emission level Limit value
- 4. Correction factor = Insertion loss + Cable loss
- 5. Emission Level = Correction Factor + Reading Value





# 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab Tel: 886-2-26052180 Fax: 886-2-26051924 Hsin Chu EMC/RF Lab Tel: 886-3-5935343 Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab Tel: 886-3-3183232 Fax: 886-3-3270892

Email: <u>service.adt@tw.bureauveritas.com</u> Web Site: <u>www.bureauveritas-adt.com</u>

The address and road map of all our labs can be found in our web site also.



## 7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END----