



FCC TEST REPORT

(PART 22)

REPORT NO.: RF110303C19D-4

MODEL NO.: SC900 (Refer to item 3.1 for more details)

FCC ID: TQ2-SC900PDT-BWG

RECEIVED: Jan. 31, 2012

TESTED: Aug. 14 ~ Aug. 15, 2012

ISSUED: Aug. 21, 2012

APPLICANT: Shin Chuan Computer Co., Ltd.

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

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Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110303C19D-4	Original release	Aug. 21, 2012



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1 CERTIFICATION

PRODUCT: Portable Data Terminal

MODEL: SC900 (Refer to item 3.1 for more details)

BRAND: SCC

APPLICANT: Shin Chuan Computer Co., Ltd.

TESTED: Aug. 14 ~ Aug. 15, 2012

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC PART 22, Subpart H

This report is issued as a supplementary report of BV ADT report no.: **RF110303C19A-4** for adding model, barcode readers and data pin changing from 6pin to 10 pin. This report shall be used combining with its original report.

PREPARED BY : Ivy Lin, DATE : Aug. 21, 2012
Ivy Lin / Specialist

APPROVED BY : Gary Chang, DATE : Aug. 21, 2012
Gary Chang / Technical Manager

NOTE: Only e.r.p. power and RSE were performed for this addendum. Refer to original report for other test data.



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2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 22.913 (a)	Effective radiated power	PASS	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	NA	Refer to Note
2.1049	Occupied Bandwidth	NA	Refer to Note
22.917	Band Edge Measurements	NA	Refer to Note
2.1051 22.917	Conducted Spurious Emissions	NA	Refer to Note
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -19.5dB at 1697.00MHz.

NOTE: Only e.r.p. power and RSE were performed for this addendum. Refer to original report for other test data.

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	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	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 $k=2$.



2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2011	Aug. 24, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 30, 2011	Aug. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 30, 2011	Aug. 29, 2012
Software ADT.	ADT_Radiated_V7.6.15.9.2	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 ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	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 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.
4. The IC Site Registration No. is IC 7450F-3.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Portable Data Terminal
MODEL NO.	SC900 (Refer to NOTE for more details)
POWER SUPPLY	3.7Vdc (Li-ion battery) 5.0Vdc (Adapter) 5.0Vdc (Host equipment)
MODULATION TYPE	GPRS: GMSK E-GPRS: 8PSK
FREQUENCY RANGE	GPRS, E-GPRS: 824.2MHz ~ 848.8MHz
MAX. ERP POWER	0.543Watts
MULTI-SLOTS CLASS	12
ANTENNA TYPE	PIFAantenna with -2.84dBi gain
I/O PORTS	1.3m non-shielded USB cable with 2 cores
DATA CABLE	Refer to user's manual
ACCESSORY DEVICES	Battery, Adapter, Earphone (1.2m non-shielded cable)

NOTE:

1. This is a supplementary report of RF110303C19A-4. This report shall be combined together with its original report.
2. This report is prepared for FCC class II permissive change. Differences compared with the original report are adding model, barcode readers and data pin changing from 6pin to 10 pin.
3. The following models are provided to the EUT. (New models are marked in boldface.)

BRAND NAME	MODEL NO.	DIFFERENCE	
		USB PORT	EARPHONE PORT
SCC	SC900	With	Without
	M1000	Without	With
SCC	H25	Based on model: SC900	
SCC	CX3	Marketing purpose	

4. The following barcode readers are provided to EUT.

For model: SC900			For model: M1000		
Brand	Model	Barcode Reader	Brand	Model	Barcode Reader
MDI	MDI2350	2D image	Motorola	SE4500	2D image

*After pre-testing, model: SC900 is the worst case for final test.



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5. The EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11a	1TX

6. The EUT uses following adapter and battery.

ADAPTER	
Brand	Powertron Electronics Corp.
Model	PA1008-050SI100
Input Power	100-240Vac, 50-60Hz, 0.3A
Output Power	5Vdc, 1.0A, 5W Max.

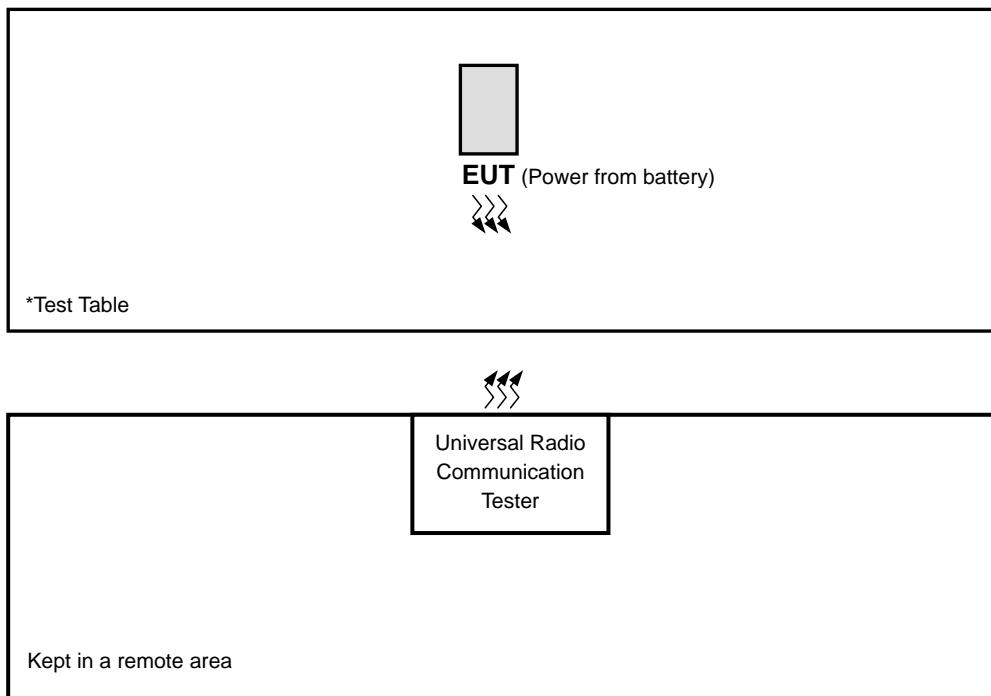
Li-ion Battery	
Brand	ETI CA
Power Rating	3.7Vdc, 1840mAh/ 6.8Wh

7. 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.



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3.2 CONFIGURATION OF SYSTEM UNDER TEST



3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	104484	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE:

1. All power cords of the above support units are non-shielded (1.8 m).
2. Item 1 acted as a communication partner to transfer data.



3.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on X-plane for ERP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	ERP	128 to 251	190	GPRS
-	RADIATED EMISSION	128 to 251	190	GPRS

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	25deg. C, 65%RH	3.7Vdc	Aska Huang
RADIATED EMISSION	25deg. C, 65%RH	3.7Vdc	Aska Huang



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3.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-C 2004

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

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile / Portable station are limited to 7 watts e.r.p.

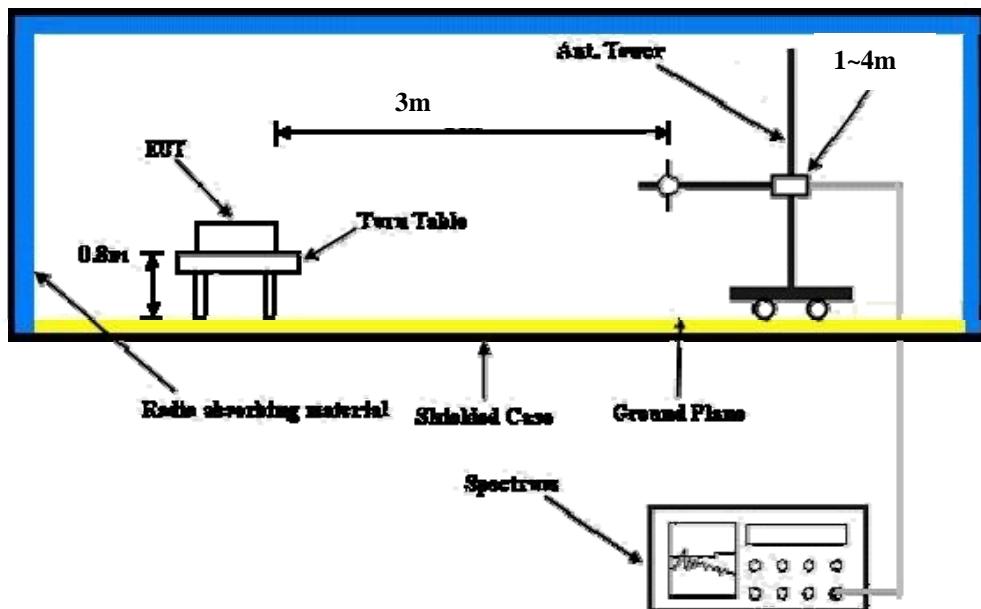
4.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE and 5MHz for WCDMA mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G
- d.
$$\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$$
$$\text{E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi.}$$

4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



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



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4.1.4 TEST RESULTS

ERP POWER (dBm)

MODE		GPRS 850					
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.6	-3.3	29.5	0.0	27.35	38.5	-11.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	836.6	-14.7	17.6	0.0	15.45	38.5	-23.05

NOTE: Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB) -2.15dB.



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4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm .

4.2.2 TEST PROCEDURES

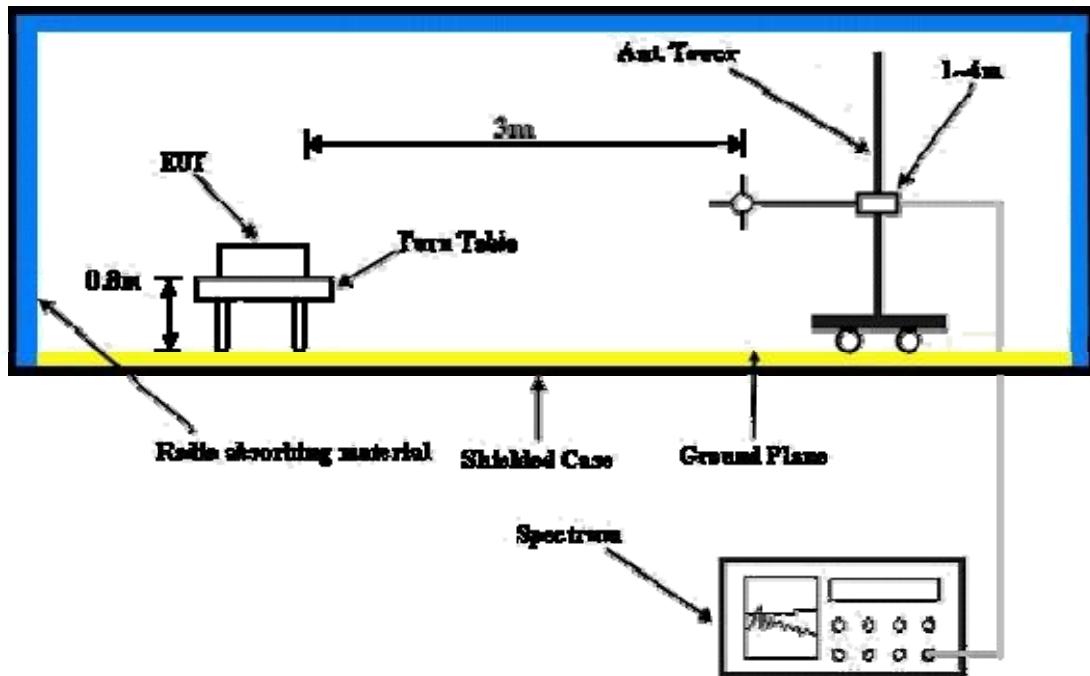
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

4.2.4 TEST SETUP



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



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4.2.5 TEST RESULTS

Below 1GHz

GPRS:

MODE	Channel 190	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH
TESTED BY	Aska Huang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-56.1	-40.6	-11.4	-54.1	-13.0	-41.1
2	47.49	-61.6	-49.2	-10.2	-61.5	-13.0	-48.5
3	74.71	-58.5	-62.5	-3.4	-68.1	-13.0	-55.1
4	158.3	-66.7	-70.5	0.0	-72.7	-13.0	-59.7
5	409.06	-58.6	-63.6	5.2	-60.5	-13.0	-47.5
6	449.88	-58.5	-63.2	5.1	-60.3	-13.0	-47.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	33.89	-50.1	-44.7	-12.1	-58.9	-13.0	-45.9
2	68.88	-54.2	-55.5	-5.3	-63.0	-13.0	-50.0
3	158.3	-64.7	-63.0	0.0	-65.2	-13.0	-52.2
4	370.18	-60.0	-65.2	5.2	-62.2	-13.0	-49.2
5	409.06	-57.3	-61.5	5.2	-58.4	-13.0	-45.4
6	821.16	-57.9	-54.3	4.0	-52.5	-13.0	-39.5

REMARKS:

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).



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Above 1GHz**GSM:**

MODE	Channel 190	FREQUENCY RANGE	Above 1000MHz
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH
TESTED BY	Aska Huang		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1697.60	-35.1	-35.9	5.6	-32.5	-13.0	-19.5
2	2546.40	-48.7	-46.0	6.4	-41.8	-13.0	-28.8
3	3395.20	-60.3	-56.7	7.0	-51.8	-13.0	-38.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1697.60	-43.6	-46.1	5.6	-42.6	-13.0	-29.6
2	2546.40	-49.9	-47.6	6.4	-43.3	-13.0	-30.3
3	3395.20	-54.8	-51.4	7.0	-46.5	-13.0	-33.5

REMARKS:

1. ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor = gain of substitution antenna + cable loss



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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:

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



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

No any modifications are made to the EUT by the lab during the test.

---END---