FCC TEST REPORT

(PART 24)

REPORT NO.:	RF150508C06-1
MODEL:	WT1
FCC ID:	A4R-WT1
RECEIVED:	May 08, 2015
TESTED:	May 25, 2015
ISSUED:	Jun. 17, 2015

COMPANY NAME:	Google Inc.
ADDRESS:	1600 Amphitheatre Parkway Mountain View California United States 94043
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47-2, 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 Vil., Kwei Shan Dist., Taoyuan City 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.

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150508C06-1	Original release	Jun. 17, 2015

1 CERTIFICATION

PRODUCT NAME/DESCRIPTION:	Connectivity Bridge
MODEL:	WT1
BRAND:	Google
COMPANY NAME:	Google Inc.
TESTED:	May 25, 2015
TEST SAMPLE:	Identical Prototype
STANDARDS:	**FCC Part 24, Subpart E**

The above equipment (model: WT1) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Gina Liu **, DATE :** Jun. 17, 2015

Gina Liu / Specialist

APPROVED BY : Sam chen **, DATE :** Jun. 17, 2015

Sam Chen / Senior Project Engineer

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
2.1046 24.232	Equivalent Isotropic Radiated Power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.232(d)	Peak to average ratio	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -20.07dB at 5640MHz.

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
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 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	N9038A	MY51210203	Jan.21, 2015	Jan.21, 2016
Spectrum Analyzer ROHDE & SCHWARZ	N9010A	MY52220314	Sep.03, 2014	Sep.02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 04, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 12, 2014	Dec. 11, 2015
Preamplifier EMCI	EMC 184045	980116	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2014	Dec. 26, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF signal cable Worken	RG-213	NA	Nov. 07, 2014	Nov. 06, 2015
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201300640	Aug. 01, 2013	Jul. 31, 2015

NOTE: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.
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 690701.
5. The IC Site Registration No. is IC 7450F-10.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT NAME/DESCRIPTION	Connectivity Bridge	
MODEL	WT1	
POWER SUPPLY	5Vdc (Adapter)	
MODULATION TYPE	**GSM/GPRS**	GMSK
	EDGE	GMSK, 8PSK
	WCDMA	BPSK
FREQUENCY RANGE	**GSM/GPRS/EDGE**	1850.2MHz ~ 1909.8MHz
	WCDMA	1852.4MHz ~ 1907.6MHz
MAX. EIRP POWER	**GSM**	1911.17mW
	EDGE	1397.33mW
	WCDMA	869.56mW
ANTENNA TYPE	Fixed Internal Antenna	
I/O PORTS	Refer to users' manual	
DATA CABLE	Refer to NOTE as below	
ACCESSORY DEVICES	Refer to NOTE as below	

NOTE:

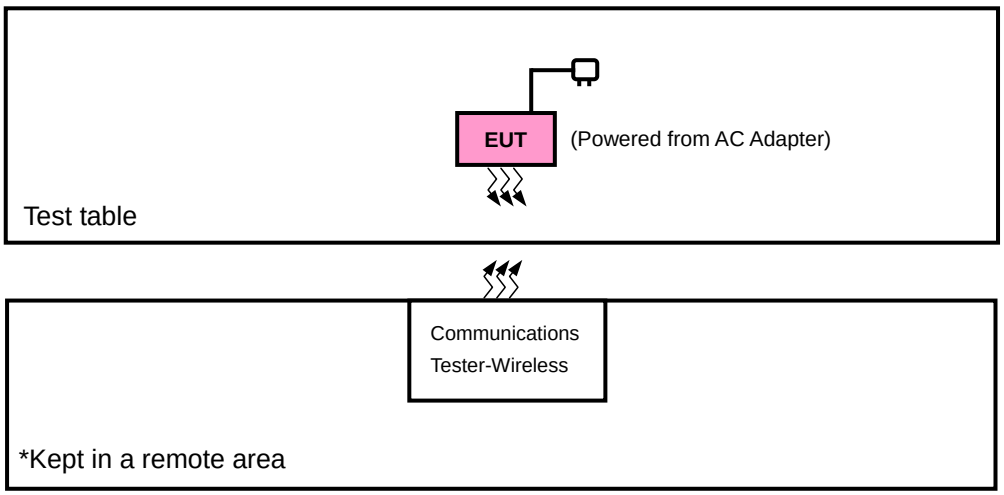
1. The EUT contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter	TPT	MII050200	I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A
WWAN Module	Telit	HE910D	
WLAN Module	BCM4354	AW-CM195NF	

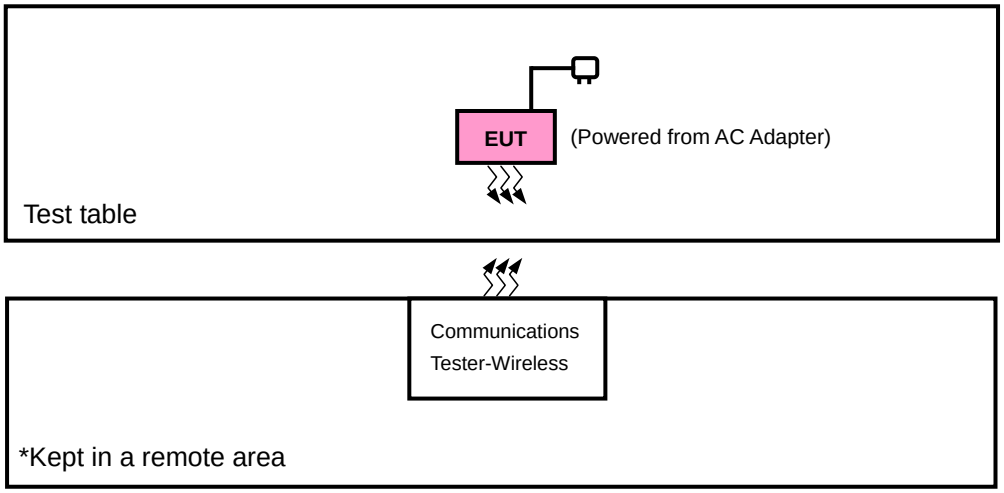
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR E.I.R.P. 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	Communications Tester-Wireless	Agilent	8960 Series 10	MY53201073	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 (1.8m).
2. Item 1acted as communication partners 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 EIRP and radiated emission. Following channel(s) was (were) selected for the final test as listed below:

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	EIRP	512 to 810	512, 661, 810	GSM, EDGE
-	RADIATED EMISSION	512 to 810	661	GSM, EDGE

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
-	RADIATED EMISSION	9262 to 9538	9400	WCDMA

TEST CONDITION:

Test Item	Environmental Conditions	Input Power	Tested by
ERP	26deg. C, 58%RH	120Vac, 60Hz	Howard Kao
RADIATED EMISSION	25deg. C, 65%RH	120Vac, 60Hz	Hwa Chiang

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 24
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 and portable stations are limited to 2 watts EIRP.

4.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

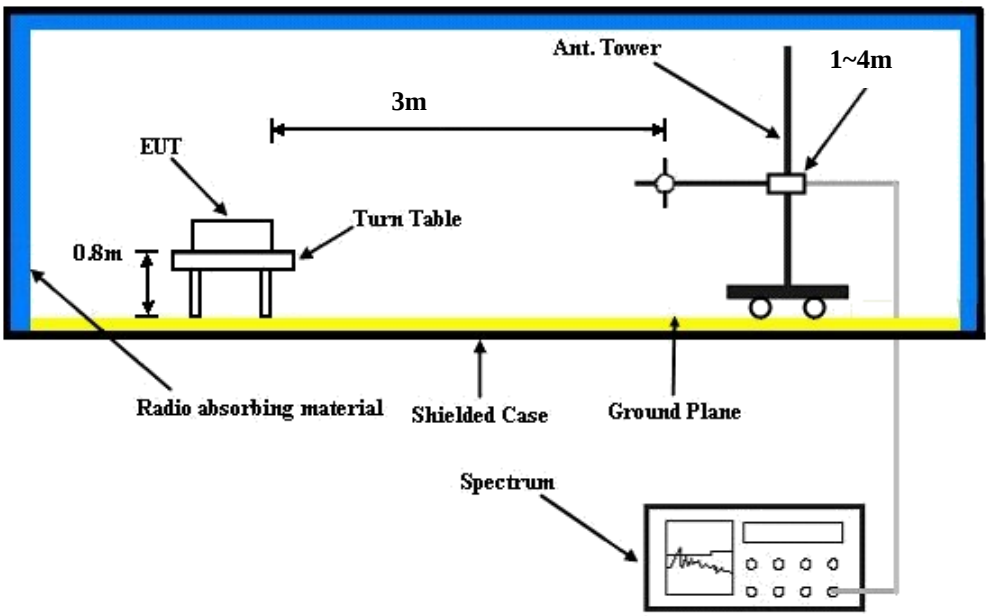
a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS & EDGE, 5MHz for CDMA & WCDMA, and 10MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, 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. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

CONDUCTED POWER MEASUREMENT:

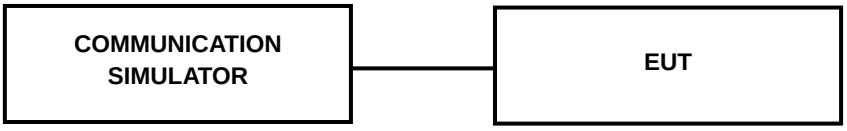
The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA & LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 TEST SETUP

EIRP / ERP MEASUREMENT:



CONDUCTED POWER MEASUREMENT:



4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM (1 Uplink)	29.70	29.60	29.30
GPRS 8 (GMSK, 1 slot)	**29.90**	29.80	29.50
GPRS 10 (GMSK, 2 slot)	29.40	29.40	29.20
GPRS 11 (GMSK, 3 slot)	29.00	28.80	28.60
GPRS 12 (GMSK, 4 slot)	27.80	27.50	27.30
EDGE 8 (GMSK, 1 Uplink)	28.60	28.40	28.30
EDGE 10 (GMSK, 2 Uplink)	28.40	28.10	28.10
EDGE 11 (GMSK, 3 Uplink)	27.50	27.40	27.20
EDGE 12 (GMSK, 4 Uplink)	27.20	27.00	27.00

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	**26.39**	25.93	25.59

EIRP POWER (dBm)

GSM							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	512	1850.2	-12.01	44.70	32.69	1857.80	H
	661	1880.0	-12.13	44.70	32.57	1807.17	H
	810	1909.8	-11.76	44.57	32.81	1911.17	H
	512	1850.2	-14.13	44.27	30.14	1032.76	V
	661	1880.0	-14.61	44.87	30.26	1061.70	V
	810	1909.8	-14.22	44.61	30.39	1094.71	V

EDGE							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	512	1850.2	-13.43	44.70	31.27	1339.68	H
	661	1880.0	-13.52	44.70	31.18	1312.20	H
	810	1909.8	-13.12	44.57	31.45	1397.33	H
	512	1850.2	-15.20	44.27	29.07	807.24	V
	661	1880.0	-15.87	44.87	29.00	794.33	V
	810	1909.8	-15.72	44.61	28.89	775.00	V

WCDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
X	9262	1852.4	-15.93	44.70	28.77	753.36	H
	9400	1880.0	-15.62	44.70	29.08	809.10	H
	9538	1907.6	-15.18	44.57	29.39	869.56	H
	9262	1852.4	-18.23	44.27	26.04	401.79	V
	9400	1880.0	-18.39	44.87	26.48	444.63	V
	9538	1907.6	-18.07	44.61	26.54	451.13	V

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 is equal to -13dBm.

4.2.2 TEST PROCEDURES

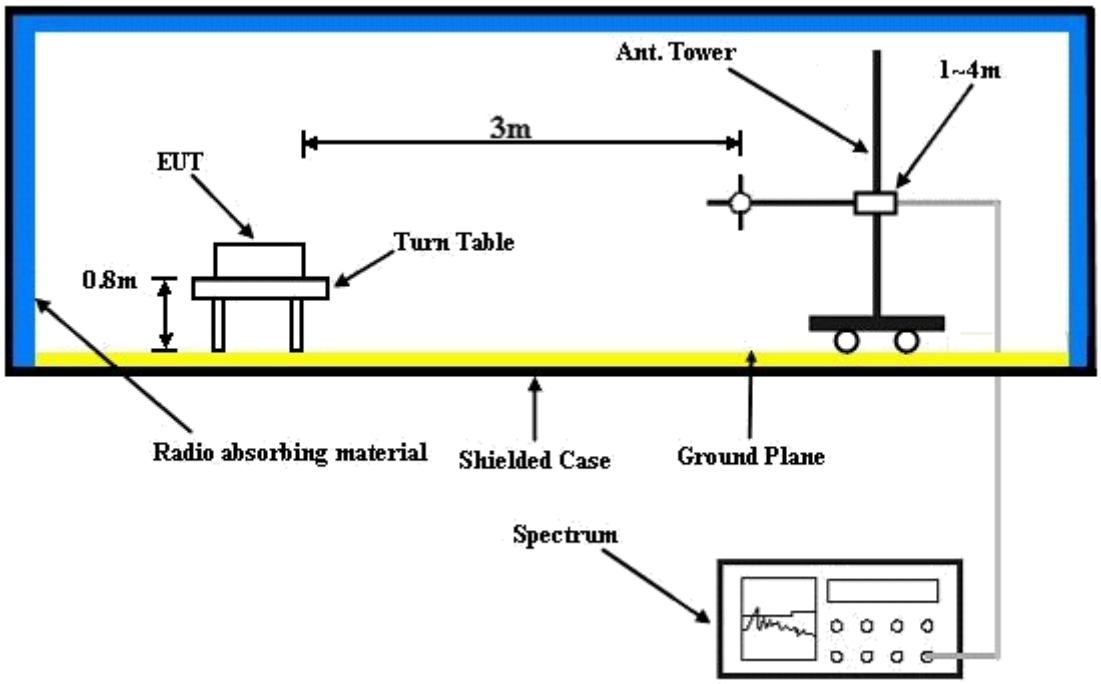
a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.R.P 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).

4.2.5 TEST RESULTS

GSM:

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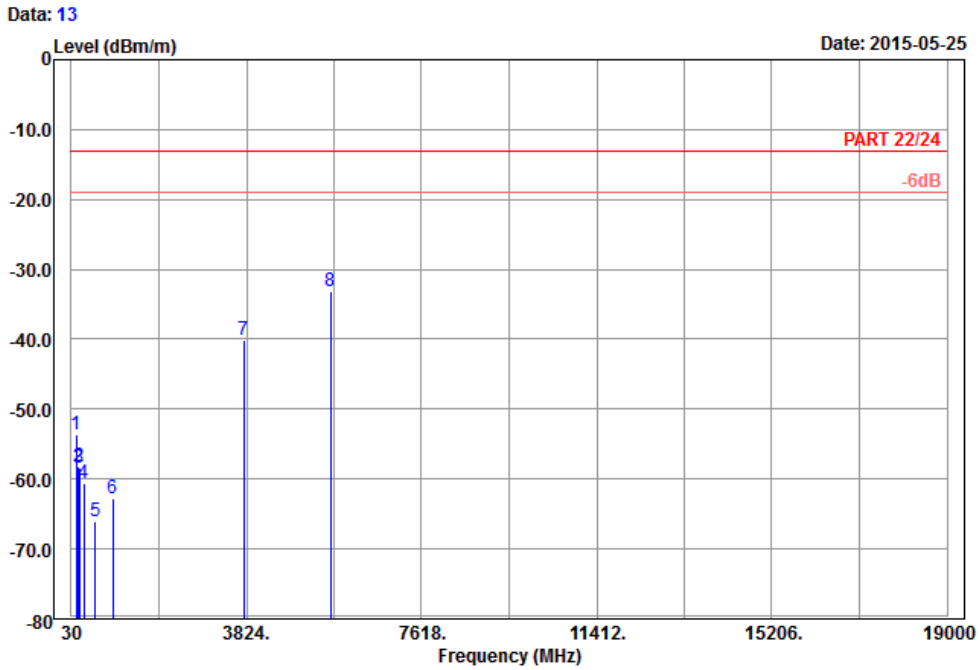
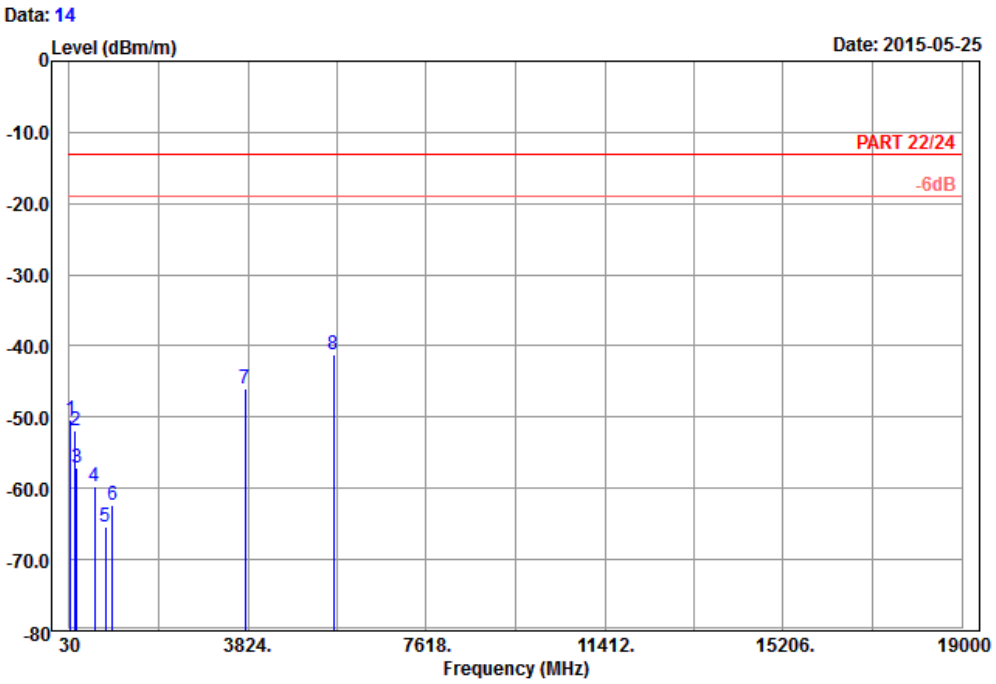


Site : 966 chamber 1
Condition: PART 22/24 3m Horizontal
Remark : GPRS 1900_Link_CH661
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	139.62	-53.70	-46.01	-13.00	-40.70	-7.69	Peak
2	190.11	-58.22	-52.49	-13.00	-45.22	-5.73	Peak
3	209.01	-58.39	-52.34	-13.00	-45.39	-6.05	Peak
4	300.00	-60.53	-54.57	-13.00	-47.53	-5.96	Peak
5	549.20	-66.14	-64.41	-13.00	-53.14	-1.73	Peak
6	930.00	-62.82	-67.06	-13.00	-49.82	4.24	Peak
7	3760.00	-40.20	-56.34	-13.00	-27.20	16.14	Peak
8 pp	5640.00	-33.07	-53.54	-13.00	-20.07	20.47	Peak

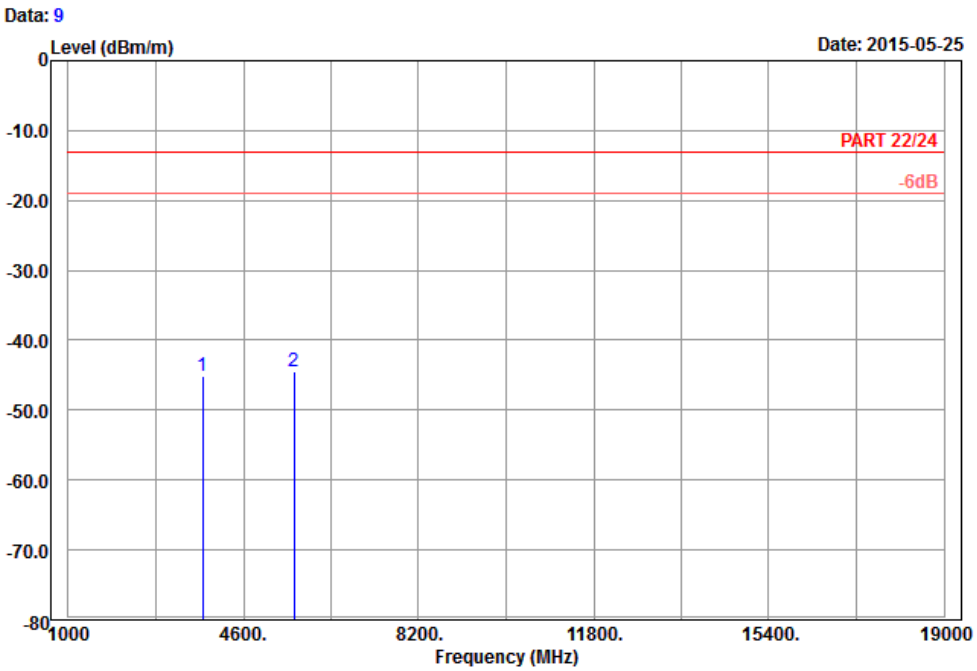


Site : 966 chamber 1
Condition: PART 22/24 3m Vertical
Remark : GPRS 1900_Link_CH661
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	52.41	-50.25	-36.19	-13.00	-37.25	-14.06	Peak
2	146.10	-51.97	-44.11	-13.00	-38.97	-7.86	Peak
3	193.35	-57.21	-51.34	-13.00	-44.21	-5.87	Peak
4	563.20	-59.81	-58.71	-13.00	-46.81	-1.10	Peak
5	803.30	-65.49	-67.47	-13.00	-52.49	1.98	Peak
6	941.20	-62.31	-67.02	-13.00	-49.31	4.71	Peak
7	3760.00	-46.07	-62.21	-13.00	-33.07	16.14	Peak
8 pp	5640.00	-41.20	-61.67	-13.00	-28.20	20.47	Peak

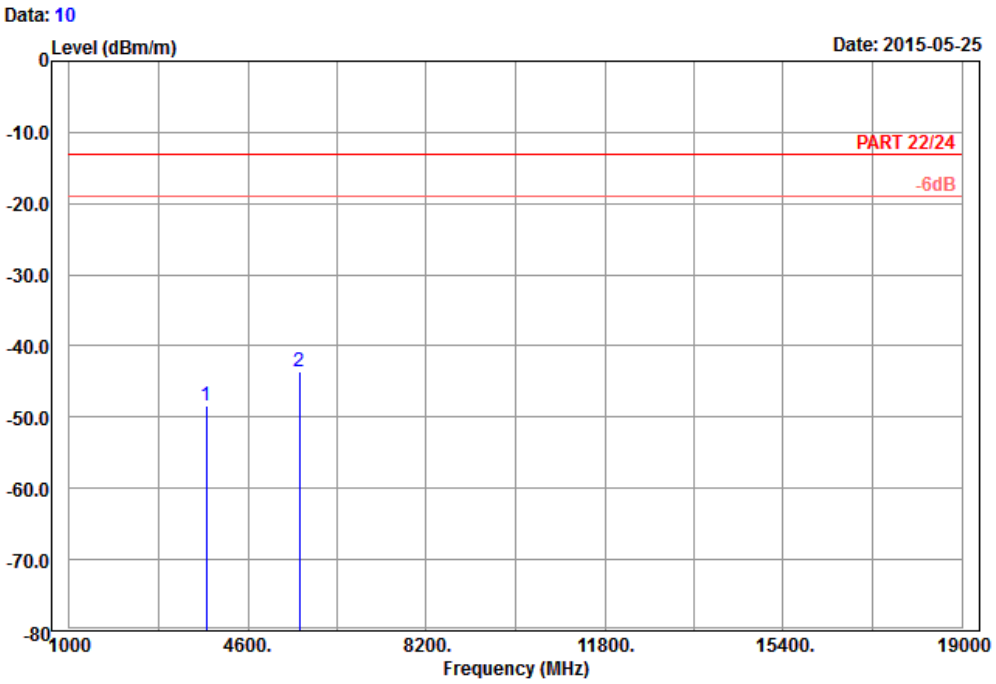
EDGE:

Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch



Site : 966 chamber 1
Condition: PART 22/24 3m Horizontal
Remark : EDGE 1900_Link_CH661
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	3760.00	-45.08	-61.22	-13.00	-32.08	16.14	Peak
2 pp	5640.00	-44.47	-64.94	-13.00	-31.47	20.47	Peak



Site : 966 chamber 1
Condition: PART 22/24 3m Vertical
Remark : EDGE 1900_Link_CH661
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	3760.00	-48.41	-64.55	-13.00	-35.41	16.14	Peak
2 pp	5640.00	-43.51	-63.98	-13.00	-30.51	20.47	Peak

WCDMA:

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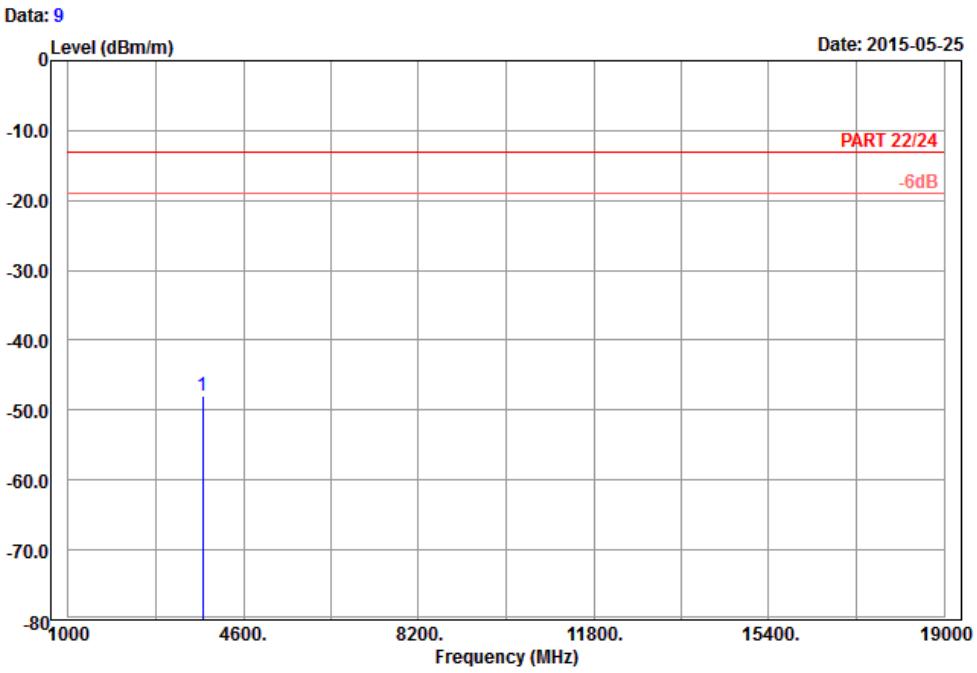
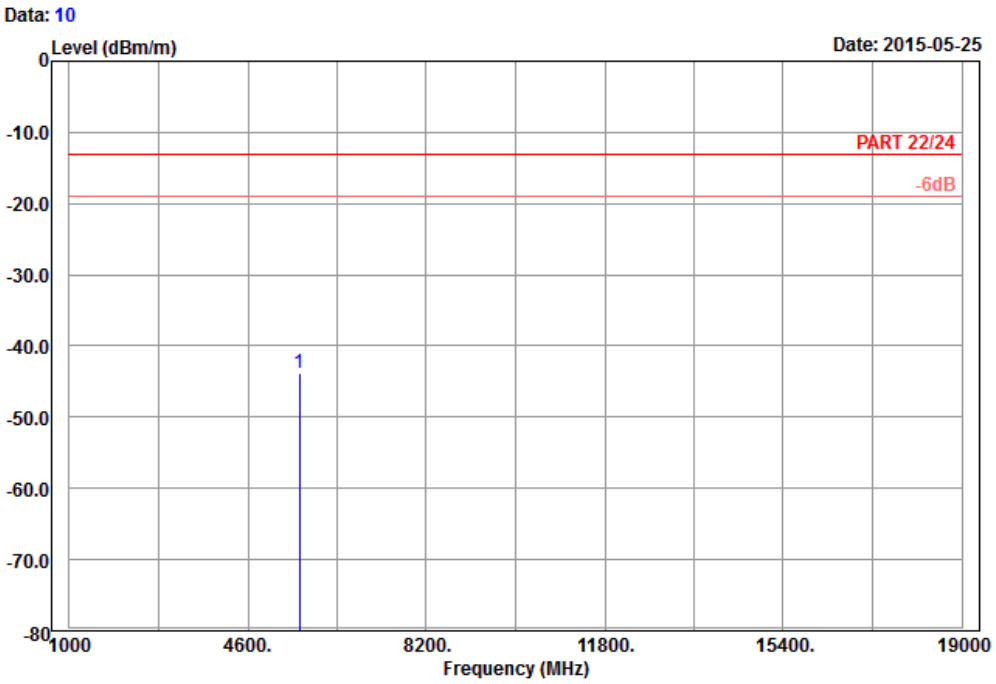


Site : 966 chamber 1
Condition: PART 22/24 3m Horizontal
Remark : Band II_Link_CH9400
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	3760.00	-48.03	-64.17	-13.00	-35.03	16.14	Peak



Site : 966 chamber 1
Condition: PART 22/24 3m Vertical
Remark : Band II_Link_CH9400
Tested by: Hwa Chiang

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 pp	5640.00	-43.82	-64.29	-13.00	-30.82	20.47	Peak

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/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

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

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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 any modifications were made to the EUT by the lab during the test.

---END---