RF EXPOSURE REPORT

REPORT NO.:	SA140116E08
COMPLIANCE ID:	ADBB-GX13004A
PRODUCT NAME* :	DB 6520
**For any other product variant refer to above Compliance ID*	
FCC ID:	MCLDB6520
RECEIVED:	Jan. 16, 2014
TESTED:	Feb. 26 to 27, 2014
ISSUED:	May 14, 2014
APPLICANT:	Hon Hai PRECISION IND.CO.,LTD
ADDRESS:	5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C.
ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA140116E08	Original release	May 14, 2014

1. CERTIFICATION

COMPLIANCE ID:	ADBB-GX13004A
PRODUCT NAME*:	DB 6520
PRODUCT DESCRIPTION:	VDSL/GbE WiFi Data Router

**For any other product variant refer to above Compliance ID*

BRAND NAME:	ADB
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Hon Hai PRECISION IND.CO.,LTD
TESTED:	Feb. 26 to 27, 2014
STANDARDS:	FCC Part 2 (Section 2.1091)
	FCC OET Bulletin 65, Supplement C (01-01)
	IEEE C95.1

The above equipment (Model: DB 6520) 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 : _____ , **DATE:** *May 14, 2014*
(Midoli Peng, Specialist)

APPROVED BY : _____ , **DATE:** *May 14, 2014*
(May Chen, Manager)

2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm^2)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

3. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

r = distance between observation point and center of the radiator in cm

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit (Ant. No.)	Brand	Model	Antenna Type	Gain (dBi) (including cable loss)	Diversity Function	Frequency range (GHz to GHz)	Connecter Type	Cable Length (mm)
Chain (0) A2	Airgain	M2450DL CM-T1-G 100U	PIFA	3.0	Yes	5.15 to 5.35	I-PEX	100
				5.1		5.47 to 5.85		
Chain (1) A3	Airgain	M2450DL CM-T-G8 5CC20R2	PIFA	2.6	Yes	2.4 to 2.49	I-PEX	85
				2.5		5.15 to 5.35		
				3.8		5.47 to 5.85		
Chain (2) A1	Airgain	M2450DL CM-T1-G 190UR2	PIFA	1.8	Yes	2.4 to 2.49	I-PEX	190
				2.1		5.15 to 5.35		
				3.1		5.47 to 5.85		

Note. : 1. For 2.4GHz<1Tx mode>: Chain (1) was chosen for final test.
2. For 5GHz<1Tx mode>: Chain (0) was chosen for final test.
3. For 5GHz<2Tx mode>: Chain (0) & Chain (1) were chosen for final test.

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247 (2.4GHz):

802.11b, 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412 - 2462	211.836	2.6	20	0.07669	1.00

802.11g, 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412 - 2462	171.396	2.6	20	0.06205	1.00

802.11n (HT20), 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412 - 2462	166.725	2.6	20	0.06036	1.00

802.11n (HT40), 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2422 - 2452	118.577	2.6	20	0.04293	1.00

For 15.247 (2.4GHz):

802.11g, 2Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412 - 2462	335.393	5.22	20	0.22196	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.22dBi

802.11n (HT20), 2Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412 - 2462	328.496	5.22	20	0.21740	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.22dBi

802.11n (HT40), 2Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2422 - 2452	200.063	5.22	20	0.13240	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 5.22dBi

For 15.247 (5GHz):

802.11a, 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	174.582	5.1	20	0.11239	1.00

802.11n (HT20), 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	176.604	5.1	20	0.11369	1.00

802.11n (HT40), 1Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5755 - 5795	146.893	5.1	20	0.09456	1.00

802.11n (HT20), 2Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	274.861	5.1	20	0.17695	1.00

802.11n (HT40), 2Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5755 - 5795	280.831	5.1	20	0.18079	1.00

802.11a, 3Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	378.121	8.81	20	0.57195	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.81dBi

802.11n (HT20), 3Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 - 5825	344.956	8.81	20	0.52179	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.81dBi

802.11n (HT40), 3Tx:

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5755 - 5795	221.806	8.81	20	0.33551	1.00

NOTE: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.81dBi

For 15.407 (5GHz):

802.11a, 1Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180 - 5240	44.771	3	20	0.01777	1.00

802.11n (HT20), 1Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180 - 5240	45.814	3	20	0.01819	1.00

802.11n (HT40), 1Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5190 - 5230	49.091	3	20	0.01949	1.00

802.11n (HT20), 2Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180 - 5240	40.235	3	20	0.01597	1.00

802.11n (HT40), 2Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5190 - 5230	45.613	3	20	0.01811	1.00

802.11a, 3Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180 - 5240	42.316	7.31	20	0.04531	1.00

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 7.31dBi

802.11n (HT20), 3Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180 - 5240	40.879	7.31	20	0.04378	1.00

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 7.31dBi

802.11n (HT40), 3Tx:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5190 - 5230	48.168	7.31	20	0.05158	1.00

NOTE: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 7.31dBi

CONCLUSION:

Both of the 2.4GHz and 5GHz can transmit simultaneously, the formula of calculated the MPE is:

CPD_1 / LPD_1 + CPD_2 / LPD_2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

Therefore, the worst-case situation is 0.22196 / 1 + 0.57195 / 1 = 0.794, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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