Variant FCC RF Test Report

APPLICANT	:	**Hewlett-Packard Co., Ltd.**
EQUIPMENT	:	**Tablet PC**
BRAND NAME	:	**HP**
MODEL NAME	:	**HSTNH-B17C**
MARKETING NAME	:	**HP SLATE 10 HD**
FCC ID	:	**B94HHB17C**
STANDARD	:	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	:	**(DSS) Spread Spectrum Transmitter**

This is a variant report which is only valid together with the original test report. The product was received on Jul. 17, 2013 and testing was completed on Sep. 29, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR362701-01A	Rev. 01	This is a variant report for HSTNH-B17C. The product equality declaration could be referred to Appendix B. Based on the similarity between current and original models, only the worst case of Radiated Spurious Emissions from original test report (Sporton Report Number FR362701A, FCC ID: B94HHB17CM) was verified.	Oct. 21, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 9.50 dB at 150.280 MHz

1 General Description

1.1 Applicant

Hewlett-Packard Co., Ltd.
1501 Page Mill Road Palo Alto, CA 94304 United States

1.2 Manufacturer

BYD Precision Manufacture Co., Ltd.
No.3001, Baohe Road, Baolong Industrial, Longgang, Shenzhen, 518116, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Brand Name	HP
Model Name	HSTNH-B17C
Marketing Name	HP SLATE 10 HD
FCC ID	B94HHB17C
EUT supports Radios application	WLAN 802.11abgn / Bluetooth v3.0+EDR
HW Version	DVT
SW Version	W101HM_10_WIFI_V01.97_20130925
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Antenna Type	Fixed Internal Antenna
Type of Modulation	Bluetooth BR (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	**Sporton Site No.**	**FCC/IC Registration No.**
	03CH01-KS	149928/4086E-1

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3
- NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

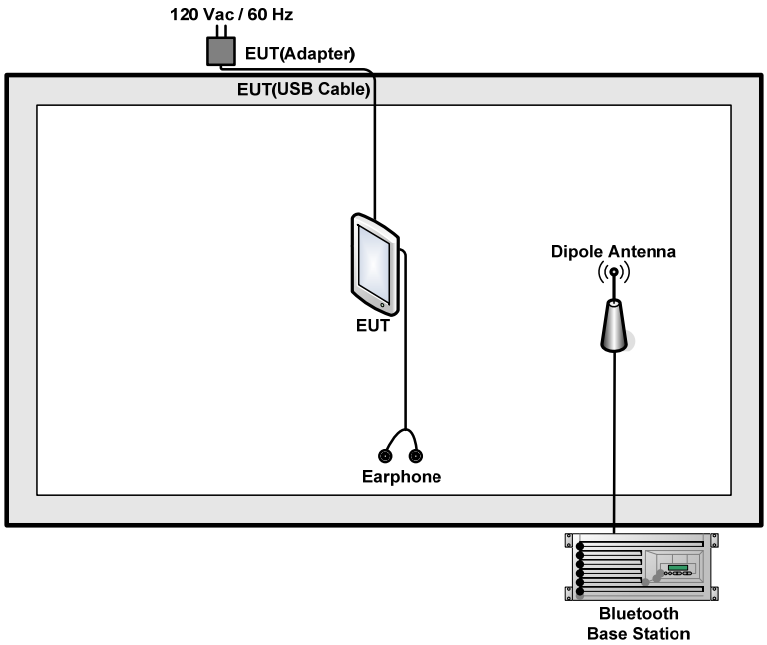
2 Test Configuration of Equipment Under Test

2.1 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth EDR 3Mbps 8-DPSK
Radiated Test Cases	Mode 1: CH78_2480 MHz
Remark: For Radiated Test Cases, The tests were performance with Adapter 1, Earphone.	

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Base Station	R&S	CBT	FCC DoC	N/A	Unshielded, 1.8 m
2.	Earphone	Lenovo	SH100	N/A	N/A	N/A

2.4 EUT Operation Test Setup

For Bluetooth function, the engineering test program was provided and enabled to make EUT connect with Bluetooth base station to continuous transmit/receive.

3 Test Result

3.1 Radiated Band Edges and Spurious Emission Measurement

3.1.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (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

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

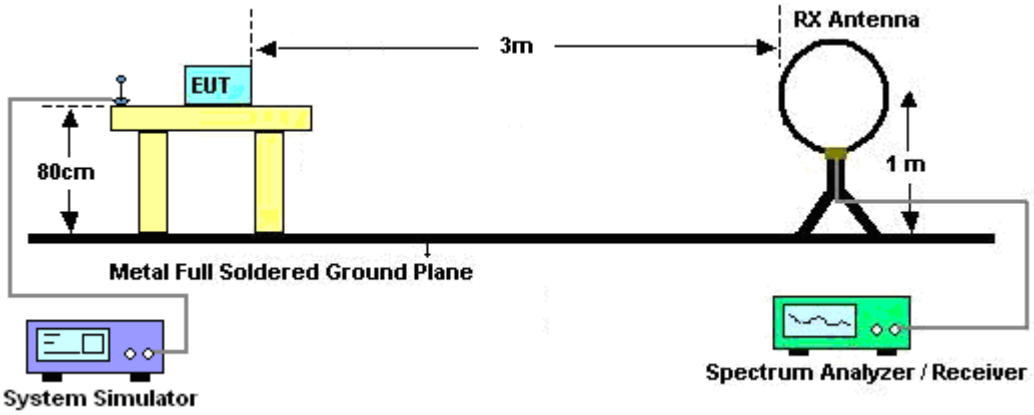
3.1.3 Test Procedures

1. The testing follows the guidelines in Spurious Radiated Emissions of FCC Public Notice DA 00-705 Measurement Guidelines.
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
   (3) For average measurement: use duty cycle correction factor method per 15.35(c).
   Duty cycle = On time/100 milliseconds
   On time = $N_1*L_1+N_2*L_2+...+N_{n-1}*LN_{n-1}+N_n*L_n$
   Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
   Average Emission Level = Peak Emission Level + 20*log(Duty cycle)
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

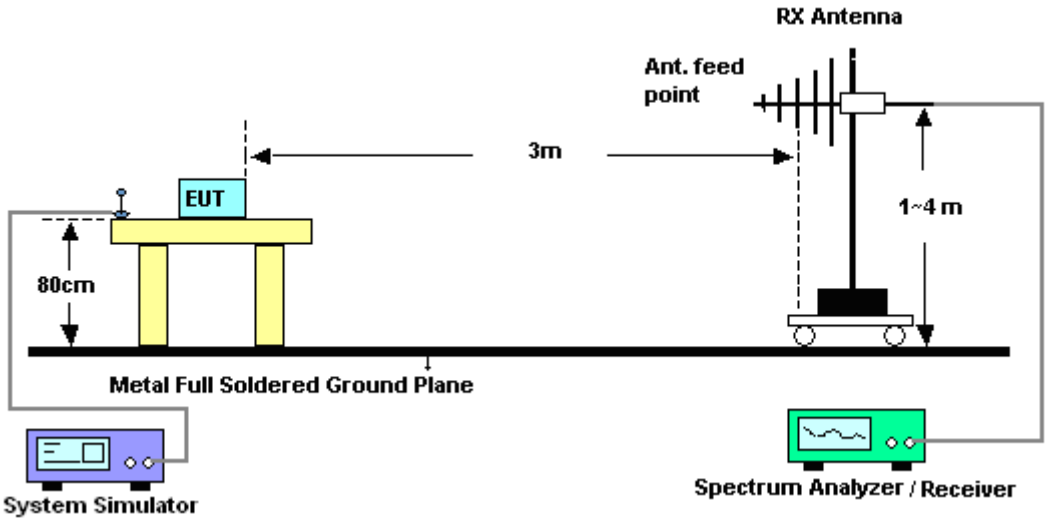
Note: The average levels were calculated from the peak level corrected with duty cycle correction factor (-24.79dB) derived from 20log (dwell time/100ms). This correction is only for signals that hop with the fundamental signal, such as band-edge and harmonic. Other spurious signals that are independent of the hopping signal would not use this correction.

3.1.4 Test Setup

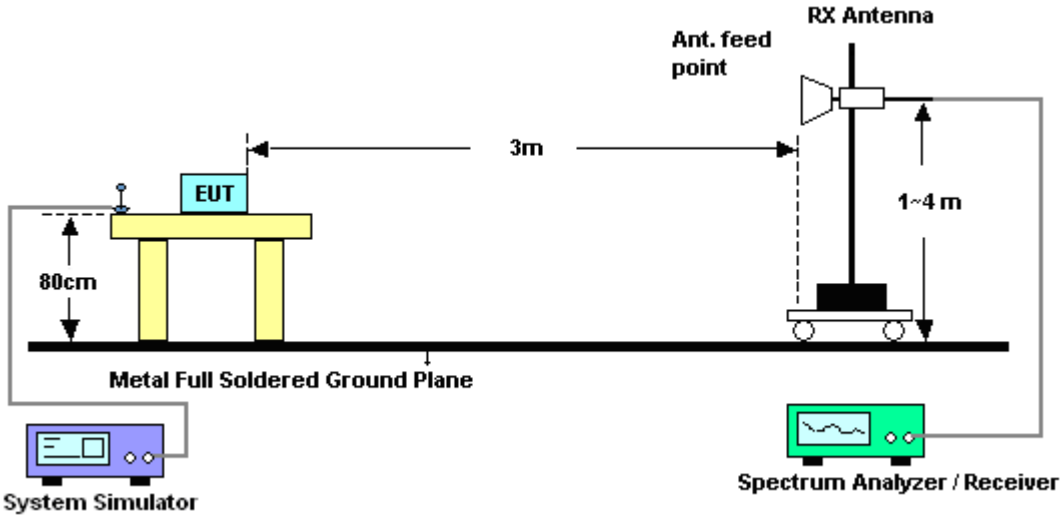
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

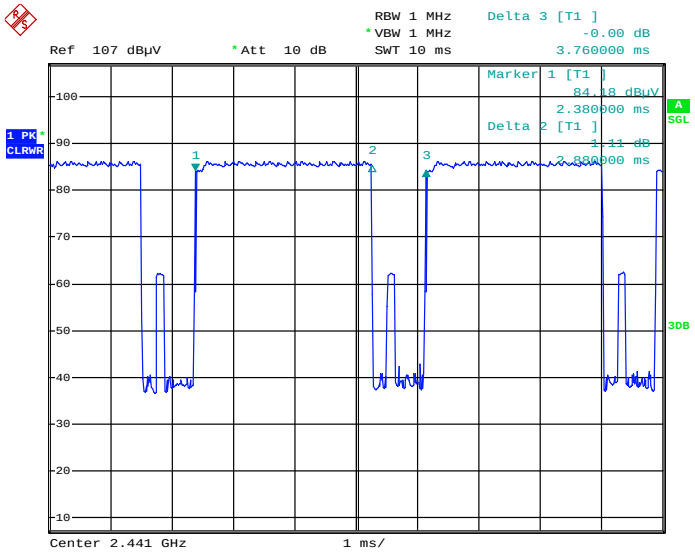


3.1.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

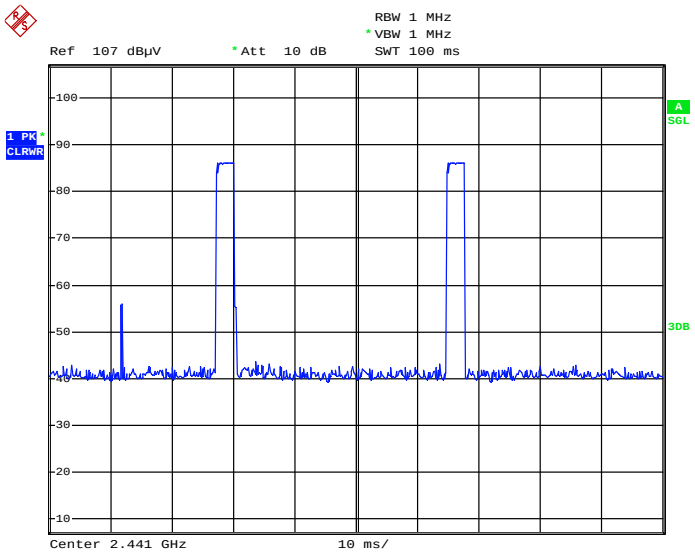
3.1.6 Duty cycle correction factor for average measurement

3DH5 on time (One Pulse) Plot on Channel 39



Date: 29.SEP.2013 22:53:08

3DH5 on time (Count Pulses) Plot on Channel 39



Date: 29.SEP.2013 22:53:59

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. 3DH5 has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100ms / 57.6ms] = 2 hops

Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100ms) = -24.79 dB

3.1.7 Test Result of Radiated Spurious at Band Edges

Test Mode :	Mode 1	**Temperature :**	22~23°C
Test Channel :	78	**Relative Humidity :**	42~43%
		Test Engineer :	Star Wei

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.53	57.99	-16.01	74	52.36	33.01	3.22	30.6	127	161	Peak
2483.53	33.20	-20.80	54	-	-	-	-	-	-	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2483.5	52.63	-21.37	74	47	33.01	3.22	30.6	103	250	Peak
2483.5	27.84	-26.16	54	-	-	-	-	-	-	Average

3.1.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	Mode 1	**Temperature :**	22~23°C
Test Channel :	78	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.61	27.96	-12.04	40	50.49	10.48	0.62	33.63	-	-	Peak
150.28	34	-9.5	43.5	56.46	10	1.12	33.58	100	41	Peak
215.27	33.23	-10.27	43.5	55.64	9.77	1.35	33.53	-	-	Peak
302.57	29.61	-16.39	46	48.31	13.06	1.61	33.37	-	-	Peak
682.81	24.09	-21.91	46	35.45	19.18	2.36	32.9	-	-	Peak
948.59	29.97	-16.03	46	38.87	20.73	2.81	32.44	-	-	Peak
2480	97.78	-	-	92.15	33.01	3.22	30.6	127	161	Peak
2480	72.99	-	-	-	-	-	-	127	161	Average
4960	49.67	-24.33	74	39.16	35.2	4.62	29.31	100	16	Peak
7440	51.25	-22.75	74	39.55	36.27	5.67	30.24	100	263	Peak

Note: Other harmonics are lower than background noise.

Test Mode :	Mode 1	**Temperature :**	22~23°C
Test Channel :	78	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
43.58	29.26	-10.74	40	52.23	10.03	0.62	33.62	100	26	Peak
94.99	32.71	-10.79	43.5	55.63	9.8	0.9	33.62	-	-	Peak
148.34	31.96	-11.54	43.5	54.29	10.14	1.11	33.58	-	-	Peak
222.06	30.1	-15.9	46	51.99	10.25	1.37	33.51	-	-	Peak
518.88	28.29	-17.71	46	41.71	17.64	2.03	33.09	-	-	Peak
957.32	30.36	-15.64	46	39.21	20.77	2.82	32.44	-	-	Peak
2480	90.07	-	-	84.44	33.01	3.22	30.6	103	250	Peak
2480	65.28	-	-	-	-	-	-	103	250	Average
4960	49.73	-24.27	74	39.22	35.2	4.62	29.31	100	41	Peak
7440	50.68	-23.32	74	38.98	36.27	5.67	30.24	100	59	Peak

Note: Other harmonics are lower than background noise.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Oct. 01, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	Oct. 01, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Oct. 01, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz-30MHz	Oct. 22, 2012	Oct. 01, 2013	Oct. 21, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	75959	1GHz~18GHz	Dec. 07, 2012	Oct. 01, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Oct. 01, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Oct. 01, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Oct. 01, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Nov. 23, 2012	Oct. 01, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0 ~ 360 degree	N/A	Oct. 01, 2013	N/A	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m - 4 m	N/A	Oct. 01, 2013	N/A	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**

Appendix B. Product Equality Declaration

Hewlett-Packard Co., Ltd

1501 Page Mill Road Palo Alto, CA 94304 United States

Date: October 10, 2013

Product Equality Declaration

We, Hewlett-Packard Co., Ltd declare on our sole responsibility for the product of HSTNH-B17C as below:

The differences between HSTNH-B17C and HSTNH-B17CM are:

1. Main Antenna and 2G/3G functions:
   a) HSTNH-B17C has no 2G/3G Antenna and 2G/3G functions.
2. EMMC and DDR
   a) Both HSTNH-B17C and HSTNH-B17CM have 2 kinds of EMMC and DDR (Toshiba/Hynix EMMC and Micron/Hynix DDR). .
3. SAR sensor
   a) HSTNH-B17C has no SAR sensor and SAR sensor FPC.

Except listings above, the others are all the same.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,

Roger Zeng

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