



# Variant FCC SAR Test Report

APPLICANT : Hewlett Packard Company  
EQUIPMENT : HP iPAQ KB1  
BRAND NAME : HP  
MODEL NAME : HSTNH-P21C  
FCC ID : B94HHP21C  
STANDARD : FCC 47 CFR Part 2 (2.1093)  
IEEE C95.1-1999  
IEEE 1528-2003  
FCC OET Bulletin 65 Supplement C (Edition 01-01)

This is a variant report which is only valid combined with the original report. The product was received on Aug. 10, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:

Roy Wu / Manager



## SPORTON INTERNATIONAL INC.

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**1. Administration Data**

**1.1 Applicant**

Company Name	Hewlett Packard Company
Address	3000 over Street, Palo Alto, CA 94304

**1.2 Manufacturer**

Company Name	Pegatron Corporation
Address	5F., No. 76, Ligong St., Beitou Dist., Taipei City 112, Taiwan (R.O.C.)

**1.3 Application Details**

Date of Receipt of Application	Aug. 10, 2009
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**1.4 Description of Device Under Test (DUT)**

Product Feature & Specification	
DUT Type	HP iPAQ KB1
Brand Name	HP
Model Name	HSTNH-P21C
FCC ID	B94HHP21C
Tx Frequency	802.11b/g : 2400 MHz ~ 2483.5 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz
Rx Frequency	802.11b/g : 2400 MHz ~ 2483.5 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz
Maximum Output Power to Antenna	802.11b : 22.28 dBm 802.11g : 21.91 dBm Bluetooth : -1.62 dBm
Antenna Type	PIFA Antenna
HW Version	DVT2
SW Version	Obsidian_0.30.88.03
Type of Modulation	802.11b : DSSS 802.11g : OFDM Bluetooth : GFSK
DUT Stage	Identical Prototype

**List of Accessory:**

Specification of Accessory		
<b>AC Adapter 1</b>	<b>Manufacturer</b>	Flextronics
	<b>Brand Name</b>	HP
	<b>Part Number</b>	538745-001
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
<b>AC Adapter 2</b>	<b>Manufacturer</b>	Phihong
	<b>Brand Name</b>	HP
	<b>Model Name</b>	PSAA05A-050 (for US) PSAA05N-050 (for Argentina)
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
	<b>AC Power Cord Type</b>	1.8 meter shielded cable without ferrite core
<b>Battery 1</b>	<b>Brand Name</b>	HP
	<b>Model Name</b>	HSTNH-T21C-H
	<b>Power Rating</b>	3.7Vdc, 11.3Wh
	<b>Type</b>	Li-ion
<b>Battery 2</b>	<b>Brand Name</b>	HP
	<b>Model Name</b>	HSTNH-T21C-S
	<b>Power Rating</b>	3.7Vdc, 5.7Wh
	<b>Type</b>	Li-ion
<b>Earphone</b>	<b>Brand Name</b>	foster
	<b>Model Name</b>	492854
	<b>Signal Line Type</b>	1.3 meter non-shielded cable without ferrite core
<b>USB Cable</b>	<b>Brand Name</b>	Foxconn
	<b>Model Name</b>	486113-001
	<b>Signal Line Type</b>	1.2 meter shielded cable without ferrite core
<b>LCD Panel</b>	<b>Brand Name</b>	Samsung Mobile Display
	<b>Model Name</b>	AMS250CU01

**Remark:**

1. The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. PSAA05A-050 and PSAA05N-050 have the same circuit design. The difference between these models is plug, only PSAA05A-050 (for US) was used for the test.

**1.5 Product Photos**

Please refer to Appendix C.



## **2. Method for Compliance**

The DUT was changed HW and SW for WCDMA Band V. Because this HW and SW change are not related to FCC WLAN SAR test, the DUT is compliant with FCC WLAN SAR based on the original report which was shown in Appendix B.



**Appendix A. Hardware Release Notes**

# Hardware Release Notes

**Hewlett Packard**

**Codename: Obsidian**

EVT2 to DVT2 build

<July 20, 2009>

**Note: This Hardware Release Note Template is not providing a mandatory format for release notes. Vendors are free to use whatever format they fill is suitable for their release notes. However, in any case all the information requested in this document shall appear as well in the vendor's release notes.**

## 1. Purpose

The purpose of this document is to outline the HW changes from EVT2 to DVT2. It includes the reason for change and solution implemented in each phase of development build phase.

## 2. Electrical Changes from EVT2 to DVT2

<b>Electrical Changes</b>
<b>For Halogen-free request</b> 1. Change CON1401, CON1901, D1401, D2004, D801, D802, D2001, D2003, D2005, D2101, U1802 and U1803 to Halogen-free component.
<b>To improve the Headset mode sending Distortion</b> 1. Change C708 to NM (no mount).
<b>To improve the Headset mode sending Distortion</b> 1. Change C1838 from 0.1uF/6.3V(0201) to 0 ohm 2. Change R1834 from 0 ohm(0201) to 0.1uF/6.3V(0201) 3. Change C1839 from NM to 0 ohm(0201) 4. Change R1826 from 0 ohm(0201) to NM 5. Change C1842 from 0 ohm(0201) to 0.1uF/6.3V(0201)
<b>To improve the luminance of EL lamp</b> 1. Change R2043 to 150ohm
<b>To improve the RF D-sense performance.</b> 1. Change the L1401 from BLM15BA100SN1D to BLM15BA220SN1D 2. Change RP1401 to 0201 10K Ohm (R1412/R1414/R1415/R1419) 3. Add 0402 0 Ohm(R1421~R1425) at SD IF
<b>To fix the LCM Flicker issue</b> 1. Change the C1628/C1629/C1630 from 0603 4.7uF to 0805 10uF 2. Change the C1610/C1612 from 0402 1uF to 0603 4.7uF 3. Change the L1601/L1603 from 6.8uH to 4.7uH
<b>To ensure the working stability of U1803</b> 1. Add R1817 to ensure the voltage level of GPIO85.
<b>To find tune the saturation point of light sensor</b> 1. Change R1404 from 1M to 300K
<b>To improve the efficiency of status LED</b> 1. Change R2005 to 300Ohm, R2026 to 120Ohm
<b>To ensure the USB_VBUS don't damage capacitor</b> 1. Change C802 from 0402/6.3V to 0603/10V
<b>Can differentiate the HW version between EVT2 and DVT2</b> 1. Change R1003 to 845K



**RF**

**No store for WALSIN 0 ohm Jumper**

- 1. Change R1505 and R1514 from WALSIN/WR04X000PTL to TA-I/RM04JTN0  
(DVT1 0ohms-> DNT2 0 ohms)

**Modified WCMA BC1 current consumption**

- 1. Change C2715 => MURATA/LQW15AN10NH00  
(DVT1 N.M.-> DNT2 10nH)
- 2. Change C2712 => 1A20-01PC600  
(DVT1 33pF -> DNT2 3.6pF)

**Modified WCMA BC5 current consumption**

- 1. Change C2810 => MURATA/LQW15AN5N6C10D  
(DVT1 8.2nH -> DNT2 5.6nH)
- 2. Change C2806 => 11G23207R074360 MLCC TAIYO/UMK105CH070DW-F  
(DVT1 10pF -> DNT2 7pF)



Obsidian\_SW\_Release\_Notice\_V0 30 75 03P

Enable feature FEATURE\_MMGSDDI\_MCC\_VERIFICATION again, this feature will automatically detect and sets NV\_GPRS\_ANITE\_GCF\_I (947) to 1 for a "Test SIM" and 0 for a commercial SIM. Some NV items' setting will be ignored if a Test SIM is inserted, hard code will be used, like scan time
Report 0x380 to FTM application if NV\_BAND\_PREF\_I is 0x180, to fix FTM Radio Access Technology and Band Selection display blank issue

Obsidian\_SW\_Release\_Notice\_V0.21.59.03

[OB864]
1. Revert luxiao's change in sdmemory driver.
2. Try to fix the issue caused by SD initialization issue when resuming from suspend.
[TD864] don't register sdbus driver as power-managed devices
[SAP]ObsidianTD2458. Recommit SAP pin issue.
1. When TAI get PinstatusCb() from modem, it will change the phone ready state immediately.
2. In sap profile, when SAP disconnect, delay 5s and then open the phone.
Change FOTA server time out registry key setting from default 7 Days to 1 Hour
[USSD] Obsidian TD1647. Add code to parse an USSD cause value and translate to unsupported command.
[OB1139]UIM\_USIM\_MBDN is not read and go into default, so that SendRefreshCompleted(TRUE) not called
[Wifi] fix Obsidian TD 2172: WI-FI connecton is turned off after turning off power and then on in Phone and BT connection off state.
Enable USB2PC
[OB2470]Fix the issue that BT icon will disapeared when WiFi button is pressed.
[AT&T UE]Add some png files for some folder
show nothing on shudown aniscreen title bar
[ModemLink]Fixed Macro ATT\_SPECIFIC define issue.
Disable VCP for charging timeout function.
Fix sometimes the touch will lose function issue after the call in very tricky condition.(20090610)
Rootcause: the GPIOIst thread and Sensor service is not sync during the phone call state change
revert Group tag index fix for SIM Manager according to the disscussion with BLStream. Now group tag index will start from 1
remove EF\_GAS/EF\_AAS checking before reading/writing group/ANR tag
fix a memory leak issue
TD1318,2126 - Possible workaround for Aircomm testing where CMU unable to read 1900 power class of the device.
[Application] BLStream Update 6/10's drop
disable Adaptxt
[Westtek]Update to 5.3.1142
remove adaptxt from CTO, otherwise the CTO would not be installed successful.

Obsidian\_SW\_Release\_Notice\_V0.21.60.03

HP\_IzbLimit NITZ handler under CM\_SS\_EVENT\_SRV\_CHANGED evnet condition
[AMSS][Phonebook]Fix TD1823- Error Handler of SIM Reading
[audio][TD1772]Remove some video type file from ringtone support list.
[HP Theme]Update to 1.3.0.11
[FLO DRM]Add FLO DRM for AT&T
[ObTD#1844]Clean boot will reset RTC to 2009/01/01 12:00PM
[OB2695]: Disable auto-close-camera-when-inactive function to avoid OB2695 issue.



[LockScreen]Add this cab for test
[SAP] Revert commit 3733. Need further study.
close media player when shut down
[OB2326][New Fn Feature] Support FN key for multi key press function. Fix TD#2326 (0615)
[HP Theme]Currently we need add this jpg because it seems Theme monitor dll is not workable.
[OB2126] - Removing workaround and adding actual fix for PowerClass 1900 bug in Aircomm testing. Qualcomm has accepted HP solution and they will release it later date.

Obsidian\_SW\_Release\_Notice\_V0.21.63.03

FTM - Fixing up Obsidian TD 2311 and 2165 to display GSM 2/3 screen and Call drop list.
[AT&T]Update AT&T Music icon and IM icon
Update code base to Qualcomm SBA526005
But I did not include NV and RIL/TAI related code change in SBA526005, the reason is there is a big change in NV and RIL/TAI, most of fix in RIL/TAI is double fix with our code base and there is no any open bugs in our database related to those changes so far.
This merge will not impact the check in of r3909, r3910, r3913, r3916 of main trunk
We will review the remaining changes and update code later to align with Qualcomm code base for any of potential risk and next merge.
revert Qualcomm SBA526005 BT registry change to previously version, because driver engineer told me the change is useless and will have big side effect. We will continue to check with Qualcomm
[APPS]Update HP_DataConnect_XML_v1.75ppc_IPAQ.
According to Marketing requirements, change all occurrences of "Mobile Phone" in network connection names to "iPAQ"
[NV] Change comments only
Remove the USB Mass Storage support from platforms
Change the device string from "HP iPAQ USB Device" to "HP iPAQ USB".

Obsidian\_SW\_Release\_Notice\_V0.21.65.03

[MusicID2]Update to 1.1.0.0 version
[AT&T Update]Add AT&T Update application
[Pocket Express]Update to 4.70.32 LR
[audio]add headset irq as wakeup source
update memory layout. this change has been verified in both retail build and ship build.
[OB2430, OB2448, OB 2837] Fix display issue.
merge ril devel branch, update to 5.2.6005
[OB2246][SR00166171]1.time.c: add some debug message for tracing the time information when issue happens.
2.time_tod.c: add a potential fix for time
[OB 2710]Add space after "Master reset done.", change "software" to "softwares" and change "Click <strong>Start</strong>" to "Click<b>&nbsp;Start</b>" in CustEngnScr1_0409.html.
[Modem Link]Change device name to HP iPAQ USB Modem
[Application]Update to BLStream 6/22 drop.
[APPS]Update SJWC_201106_20090622_OBS
[Java] Modify Java UAProfile
[FLO DRM]Merge Sly registry to obsidian for some related issues
show complete aniscreen



[OB1831] Make a workaround for [Defect #512 - GSM-BTR-1-1830 ] TU fails to receive Push SI message with blank fields.
Correct POP3 port to 110
[OB2469]: DUT would auto reboot when suspend/resume repeatedly.
[Java] Change default connection profile name to "iPAQ WAP" first, before Stephan release new xml drop; in future, Stephan will set corresponding value in xml files
Fix an error, the range of bank3 should be 69-94
[RIL] Increase Packet count function's performance
[APPS]Update Arcsoft MMS_Dshow_Camera_Streaming Player
Change transport type from 1 (IMAP4) to 0 (POP3) for earthlink and BellSouth by ATT specification
<b>Obsidian_SW_Release_Notice_V0.21.67.03</b>
TD 2811 - Added missing case for Registration Denied during PIN1 locking.
[AT&T Update]Update to 1.0.0.2
merge code for DVT HW
[Lockscreen]Remove Lockscreen.cab
[BT][OPP/FTP] fix Obsidian TD1790 [Defect #488 - GSM-BTR-1-1992] Bluetooth: when a BT transaction such as OPP or FTP, there is no user confirmation present
root cause: MSFT UI don't match the requirement.
fix: make a shadow to add a confirm UI.
[BT][OPP/FTP] fix message error
[AT&T UE]1,Modify the name of the folder from "Microsoft Service" to "Microsoft Services"; 2,Remove the Microsoft My phone cpl from the setting directory
revert SD driver to to r3183
merge change for Obsidian DVT build
[jIM Plug in]Update the jIM plug from Chris to solve Camera LTK rotation issue
[Modem] Workaround to avoid "can't attach to EDGE" issue because MMR_CELL_SERVICE_IND event is lost, and mm_serving_plmn.egprs_supported is not set to 0
Bug fixed for the GPIO key function abnormal
FN/SHIFT/SYM key not work after resume device
SEND/END key could not wake up device.
Copied the MS sample code for USB Mass storage class function driver and modified for our use.
1. Added a thread to call SystemIdleTimerReset every 30 seconds, if the USB Mass Storage Class driver is in use and the USB cable is connected. So when USB Mass Storage is being used by PC user, the device will not suspend.
2. Allow the device to show up in PC side even when there is no SD card in the slot. However, on PC side, it will prompt you to insert card if you try to open that device.
[jIM]Add CIRType registry to TD2830
[Application]Update to BLStream's 6/24 drop
[User Agent] Change User Agent "HP-KB1" to "HP_KB1" based on Bryan's confirm
[BT][OPP/FTP]set the confirm UI timeout from 5s to 10s
[AT&T UE]1, Change the MusicID from binary to stub; 2, Change the name of link file: "JETCET PRINT.Ink" to "Jet Cet Print.Ink", "MusicID 2.Ink" to "Music ID.Ink".
[Battery]Revert 3895 commit, enable charging over temperature notification



[OB2895]Fix the TD 2895
[HP Theme]Update HP Theme to 1.3.0.12
speedup anisreen when startup
[AT&T UE]Change the "ShopApplication.Ink" to "Shop Applications.Ink"
[AT&T Certificate]Follow the document 13340_36.pdf to add certificates for AT&T
<b>Obsidian_SW_Release_Notice_V0.30.69.03</b>
Update the driver date and version in USB Modem INFO, for WHQL test requirement.
Factory BootStrap
Temp solution for Display DIM issue.
[FLO DRM]Revert to 1.0-20081217-0039 because 1.0-20090625-0146 does not work normally.
[audio]acoustic parameters update to V13B
[keyboard]Revert to previously version to lower the risk of the side effect of new code
<b>Obsidian_SW_Release_Notice_V0.30.71.03</b>
[Application]Update to BLStream 6/29's drop
[BT][OPP/FTP] fix Obsidian TD1790 [Defect #488 - GSM-BTR-1-1992]
Bluetooth: when a BT transaction such as OPP or FTP there is no user confirmation present
root cause: There is %5 failure that cannot pop up msg box when user send multi vcard to DUT at the same time and choice "NO" or timeout.
reason: there is no enough time to destroy msg box, which cause the new msg box cannot be created if DUT receive mult vcard at the same time. so we delay 50ms if we don't receive this OPP.
[USB]Remove it for side effect for the J/K and receiver sensitivity performance
[Modem] Disable Fatal Err Message in ship ROM, give modem a chance to try if error can be recover, and try if QXDM log will not be broken by FATAL Error. it will not affect exception FATAL ERR function
<b>Obsidian_SW_Release_Notice_V0.30.80.03</b>
fix HPQ 817 - [6.5] - ATT Power Up / Down Animation Performance
Change the position of ADC Calibration related items in NV table and also update sensor driver for BT cases
[Music]Use small size Confess to Impress.wma(2M) to replace the Familiar Places.wma(8M) for saving flash
TD 1272 - Wrong RSSI indicator count..Changed preferred method for RSSI display to use raw dBm value from RIL to allow 1-1 match to ATT requirement.
[HP Theme]Update BLStream's STK Titanium plug in
Change the charging current, by EE's requirement.
[audio]codec tx gain 0xca62 to 0x1a00
<b>Obsidian_SW_Release_Notice_V0.30.82.03</b>
[Sensor] Update to 20090707_Sensor.rar:
1. Bug fixed for TD#3036
- Config GPIO 76 to input/pull-down in suspend mode.
- Turn off VREG_WLAN in suspend mode
- control MPP17 in order to save power.



Fix the bug that some sd card have special partition table
[Keypad] Update to 20090707_keypad driver;
1. Bug fixed for the GPIO keys function abnormal.
2. Implement the multi key press with CAP key.
[Sprite Backup][TD3098]Use right registry for pbf file to fix TD3098
[APPS]Add Arcsoft localization resources(0416, 0C0A)
[Audio]modify notification in call setting registry setting
Try to fix the TD bug 2355 : USB can not be recognized if device is rebooted automatically with USB connected.
add notification when clean bootup
[audio]acoustic parameters update to V15
[LockScreen]Use Microsoft new lockscreen cab for wipe issue in retail build
Revert to old version for cleartype issue
<b>Obsidian_SW_Release_Notice_V0.30.84.03</b>
[jIM]Update to 2.0.0.B69
Update to BLStream 7/13's drop
[cvc]update to 2.5.3-907131
change clean boot message "clean boot" to "Factory Restore is Done"
[HP Theme]Update to 1.3.0.21
[Notification] 1, set "Play Sound" to ON under Sounds & Notifications – SMS/MMS/Email;
2. Disable all pop up notifications under Sounds & Notifications (Notifications tab)
<b>Obsidian_SW_Release_Notice_V0.30.85.03</b>
[APPS]Update localization resources for Westtek
[OB TD3215]Use sign fakecpl.cpl to avoid the pop up issue
[FactoryRestore]Fix the loc issue for FactoryRestore
[java]update to 2.0.1.1.08
Fix GPIO key related bugs.
1. Hardware key can not work after HOME key down without key up message.
2. Send windows virtual key by sending VK_LWIN directly not by customized VK code.
[OB3065]Override IDS_DENIED="No service" to "SOS call only"
[AT&T UE][OB TD 3222]Change the order for some directories
[LockScreen]Update the cab per Microsoft requirement for Wipe issue.
[APPS]Update localization for Arcsoft Camera
[DataConnect XML]Update to DataConnect XML 1.76
[Charging]Change the timeout from 1 hour to 3 hours for CC charging period.
[OB TD 3226]Disables WMP RAM caching
<b>Obsidian_SW_Release_Notice_V0.30.87.03</b>
[jIM]Update to 2.0.0.B70
ODM_SIMLOCK_DATA_LEN==512 bytes only can store 13 plmns, change to 1000 in order to meet new PRD 14 plmns



[Audio]modify power up control
[bug:Unknown window on front of today screen]Remove WS_POPUP and try if this bug is fixed.
Change WiFi Button Behavior to consistence with the definition of PRD
[BT][HCI] add a workaround for passing BQP testing( PTS V3.200)
[Obsidian TD3088] [Defect #939 - GSM-BTR-1-0736] EONS: Fail: TU Constantly Displays "AT&T MicroCell" Even when registered to 3G Micro Network
[BT][BPP/BIP] remove BPP and BIP profiles
[Audio]add Qualcomm workaround solution for obsidian TD3063 keep sample rate 48K in voice call
[Application]Update to BLStream 7/20 drop.
[TD3345]Increase Obsidian font size by one notch higher per AT&T and HP marketing requirement
<b>Obsidian_SW_Release_Notice_V0.30.88.03</b>
[Audio]eliminate the pop noise when device sleep then wake up
[USBFN]Try to fix the TD bug 3351 : When disable "Use USB Charging" than insert USB cable,battery still charging.
[TWC]Update to new version
[StarWars]Update to 1.1.7.5
[Reminder][TD:3344]Per Marketing requirement, set the "repeat" box of reminder default to enable
[AT&T UE]Fix Jetcet Print icon display issue.
[HP Theme]Update STK and CB 's latest cpr
[ATTWifi][TD:3363]Replace the icon per AT&T LE ROM requirement.(This icon is 90*90 size, actually we need 45*45 for better effect.)
[Audio]fix headset key irq bug when sleep and wakeup
[VoiceCommander]We don't need this item because Obsidian dose not have a dedicated key for the VoiceCommander.
[BT][SAP] modify for passing BQB test case: TC_SERVER_RPS_BV_01_I, disable this workaround when SAP connected.
[TD3360][AT&T CDR-CON-3074] device requirement - CLIR (calling line identification restriction) control through ATD command does not work.Added parser for #31#,*31#,*82,*67.
[BSP] Update BSP version to 5.2.6008
[TD1831] [Defect #512 - GSM-BTR-1-1830 ] TU fails to receive Push SI message with blank fields. Make a workaround to handle the case that the SI-ID flag is present even if its contents is NULL.
[java]update it to 2.0.1.1.09
[audio]modify headset mic gain as device mic gain setting in 3pole headset MMA mode
[09platform][Obsidian][Keypad] Update to 20090722_Keypad.rar
1. Bug Fix for TD#3348
2. Remove APP5 key for Camera function, call CreateProcess() directly in keypad driver.
[09platform][Obsidian][Backlight/Sensor/Display] Update to 20090722_DisplayBacklightSensor.rar
1. Bug Fix for TD#3208, 3216
[Obsidian] Fix Backlight issue



**Appendix B. Original Report**

Please refer to Sporton Report Number FA961307B as below.