



Gobi2000™ HP HSTNN-Q44C Collocated RF Analysis

80-VP948-5 Rev. A

July 23, 2009

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Gobi2000™ HP HSTNN-Q44C Collocated RF Analysis
80-VP948-5 Rev. A

Revision history

Revision	Date	Description
A	July 2009	Initial release

1 Overview

This document provides collocated SAR analysis of the notebook model HSTNN-Q44C in reference to KDB 616217.

The change filed under this application is adding notebook model HSTNN-Q44C collocated with
 The analysis shows that notebook model HSTNN-Q44C is compliant for all combinations of WWAN and WLAN modules based on the SAR summation of individual SAR measurement results.

1.1 Definitions

$$N_x = \frac{P_x}{60/f} - 1$$

P= average power

f= frequency in MHz

1.2 Collocation Calculations

Table 1-1 Antenna Separation Distances

Antenna	Distance (cm)
WLAN Main-to-user	18
WLAN Aux-to-user	18
WWAN main-to-user	18
WLAN Aux-to-WWAN main	16.1
WLAN main-to-WWAN main	8.4

Table 1-2 Individual Transmitter SAR Evaluation (Worst Case)

Technology	Freq (MHz)	Measured Burst Avg Pwr (GPRS only) (dBm)	Average Power (dBm)	Measured Average Power (mW)	60/F _(GHz) (mW)	n = (P / (60/f) - 1) cm	1/2*n (cm) per FCC Procedure	Minimum Antenna-User Separation Requirement (cm)	Actual Antenna-User Distance (cm)	Highest Measured SAR (mW/g 1g)
GPRS 850 MHz	824.2	31.4	25.38	345.1	72.8	3.7	2	7.0	18	0.046
UMTS 1900 MHz	1908.75		24.87	306.9	31.4	8.8	4	9	18	0.068
WLAN (PPD-AR5B95-H)	2412		25.28	337.0	24.9	13	6	11	18	0.00792
WLAN (QDS-BRCM1030)	2480		23.1	202.0	24.2	7	4.0	9	18	0.299
WLAN (QDS-BRCM1044)	2412		23.1	389.0	24.9	15	7.0	12	18	0
WLAN (QDS BRCM1041)	5600		25.47	352.0	10.7	32	16	21	18	0.037

Table 1-3 Simultaneous Transmitter SAR Requirements

Mode	Simultaneous Transmitting Antenna Distance Calculation Requirement (5 + 1/2 Nx + 1/2 Ny) cm	Actual Separation (cm)	Result
GPRS 850 MHz + WLAN Aux	11.0	16.1	SAR not required since actual separation distances exceed minimum required antenna-to-antenna and antenna-to-user distances.
UMTS 1900 MHz + WLAN Main	13.0	8.4	Evaluation required since actual antenna-to-antenna distance is less than calculated required minimum. WLAN to WWAN >5cm: Sum SAR

1.3 Summation of WWAN and WLAN SAR values

1.3.1 PPD-AR5B95-H

Table 1-4 Simultaneous SAR Summation PPD-AR5B95-H

Mode	Highest Measured SAR (mW/g (1g))
WWAN 850 Max SAR (GPRS 850MHz)	0.046
WWAN 1900 MHz SAR (UMTS 1900MHz)	0.068
WLAN MAX SAR from QDS-BRCM1041 SAR report	0.00792

WWAN 850 MHz +WLAN (PPD-AR5B95-H)

WWAN 850 + WLAN SAR = 0.046 mW/g +0.00792mW/g = 0.05392 mW/g (1g)

WWAN 1900 MHz +WLAN (PPD-AR5B95-H)

WWAN 1900 + WLAN SAR = 0.068 mW/g +0.00792mW/g = 0.07592 mW/g (1g)

1.3.2 QDS-BRCM1030

Table 1-5 Simultaneous SAR Summation QDS-BRCM1030

Mode	Highest Measured SAR (mW/g (1g))
WWAN 850 Max SAR (GPRS 850MHz)	0.046
WWAN 1900 MHz SAR (UMTS 1900MHz)	0.068
WLAN MAX SAR from QDS-BRCM1041 SAR report	0.299

WWAN 850 MHz +WLAN (QDS-BRCM1030)

WWAN 850 + WLAN SAR = 0.046 mW/g +0.299mW/g =0.345 mW/g (1g)

WWAN 1900 MHz +WLAN (QDS-BRCM1030)

WWAN 1900 + WLAN SAR = 0.068 mW/g +0.299mW/g =0.367 mW/g (1g)

1.3.3 QDS-BRCM1044

Table 1-6 Simultaneous SAR Summation QDS-BRCM1044

Mode	Highest Measured SAR (mW/g (1g))
WWAN 850 Max SAR (GPRS 850MHz)	0.046
WWAN 1900 MHz SAR (UMTS 1900MHz)	0.068
WLAN MAX SAR from QDS-BRCM1041 SAR report	0.000

WWAN 850 MHz +WLAN (QDS-BRCM1041)

WWAN 850 + WLAN SAR = 0.046 mW/g +0.000 mW/g =0.046 mW/g (1g)

WWAN 1900 MHz +WLAN (QDS-BRCM1044)

WWAN 1900 + WLAN SAR = 0.068 mW/g +0.000 mW/g =0.068 mW/g (1g)

1.3.4 QDS-BRCM1041

Table 1-7 Simultaneous SAR Summation QDS-BRCM1041

Mode	Highest Measured SAR (mW/g (1g))
WWAN 850 Max SAR (GPRS 850MHz)	0.046
WWAN 1900 MHz SAR (UMTS 1900MHz)	0.068
WLAN MAX SAR from QDS-BRCM1041 SAR report	0.037

WWAN 850 MHz +WLAN (QDS-BRCM1041)

WWAN 850 + WLAN SAR = 0.046 mW/g +0.037mW/g =0.083 mW/g (1g)

WWAN 1900 MHz +WLAN (QDS-BRCM1041)

WWAN 1900 + WLAN SAR = 0.068 mW/g +0.037mW/g =0.105 mW/g (1g)

2 Permissive Change History

Table 2-1 summarizes the FCC permissive change history for FCC ID J9CGOBI2000-H.

Table 2-1 FCC Permissive Change history, J9CGOBI2000-H

Grant Date	Change Description	Hosts	WWAN FCC Category	WLAN FCC IDs
Pending	Add Portable Host + collocation	HSTNN-Q44C	Portable	PPD-AR5B95-H QDS-BRCM1030 QDS-BRCM1041 QDS-BRCM1044