RF Exposure Evaluation
in co-locating with other transmitters

1. Conditions

As shown in the separate exhibits "WLAN Antenna Info – CL1_A" and "WLAN Antenna Info – CL1_W", the applying host PC device incorporates the four kinds of transmitters listed below.

WLAN/WiMAX:		FCC ID: **TX2-RTL8191SE-L**	IC: **6317A-RTL8191SE**
Bluetooth:		FCC ID: QDS-BRCM1033	IC: 4324A-BRCM1033
UWB:		FCC ID: TX2RTU7305BG13HMC	N/A
WWAN		FCC ID: J9CUNDP-1L	IC: 2723A-UNDP1
	or	FCC ID: VV7-MBMF3507G-L	IC: 287AG-MBMF3507G

The minimum separation distance between human body and the WLAN Tx antenna of the host PC device is **30.5mm** (in Figure-2). Therefore the applying WLAN transmitter module (FCC ID: **TX2-RTL8191SE-L,** IC: **6317A-RTL8191SE)** and the antenna system is subjected to SAR testing pursuant to FCC CFR 47 Section 2.1093 and IC RSS-102e clause 2.5.1.

The applying WLAN transmitter module has been tested and found to comply with the SAR limits as shown by the separate SAR report.

1.1 RF exposure justification regarding WLAN & WWAN co-location

The WLAN Tx antenna locates very close to WWAN Tx (main) antenna. However both transmitter modules do not establish network link connections simultaneously, but switch the operation each other within 11 seconds of handover time if one of them is in active. See "Hand-over logic" exhibit.
Therefore, no RF Exposure evaluation in co-locating with WLAN/WiMAX and any WWAN transmitter is required.

1.2 RF exposure justification regarding WLAN & Bluetooth co-location

The Bluetooth antenna separation distance from human body in Figure-2 is 30.5mm. And the antenna separation distance between the WLAN **Aux** antenna and Bluetooth antenna is 35.5mm. Therefore, the **Aux** antenna requires a RF Exposure evaluation for co-location with Bluetooth. The Bluetooth device installed in the host PC device is as follows.

Bluetooth Model name	FCC ID, IC Cert. Number	Grantee Name	Granted Date	Conducted Tx power
BCM92046MD_GEN	FCC ID: QDS-BRCM1033	Broadcom Corporation	Dec./ 14 / 2007	4.1 mW
	IC: 4324A-BRCM1033		Dec./ 19 / 2007	

The separate SAR report indicates the evaluation of co-location of the applying WLAN transmitter and the subjected Bluetooth device, and then found to comply with the SAR limits.

1.3 RF exposure justification regarding WLAN/WiMAX & UWB co-location (US only)

UWB transmitter is not mentioned in FCC CFR 47 Section 2.1091 and 2.1093, so it does not subject to RF exposure requirement. Therefore, no additional SAR testing or RF Exposure evaluation is required for any combination with UWB transmitter.

2. Configuration of EUT

Figure-1: Notebook mode

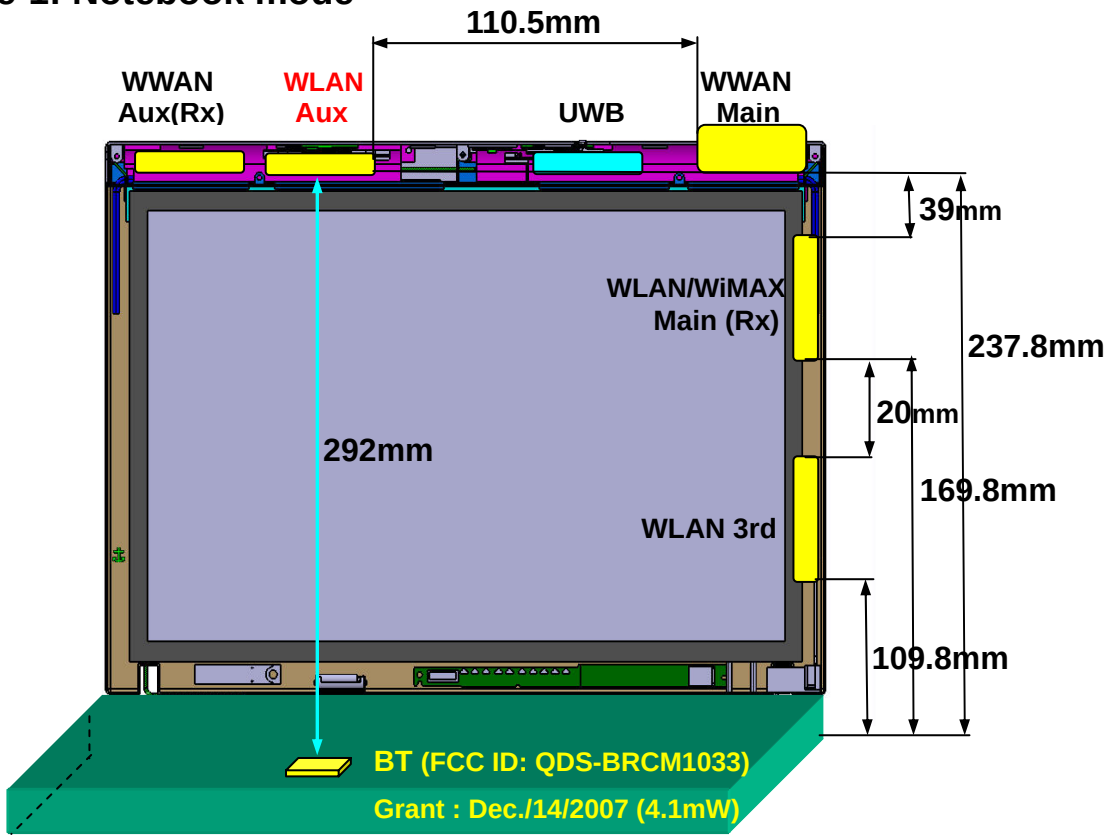


Figure-2: Lap Held

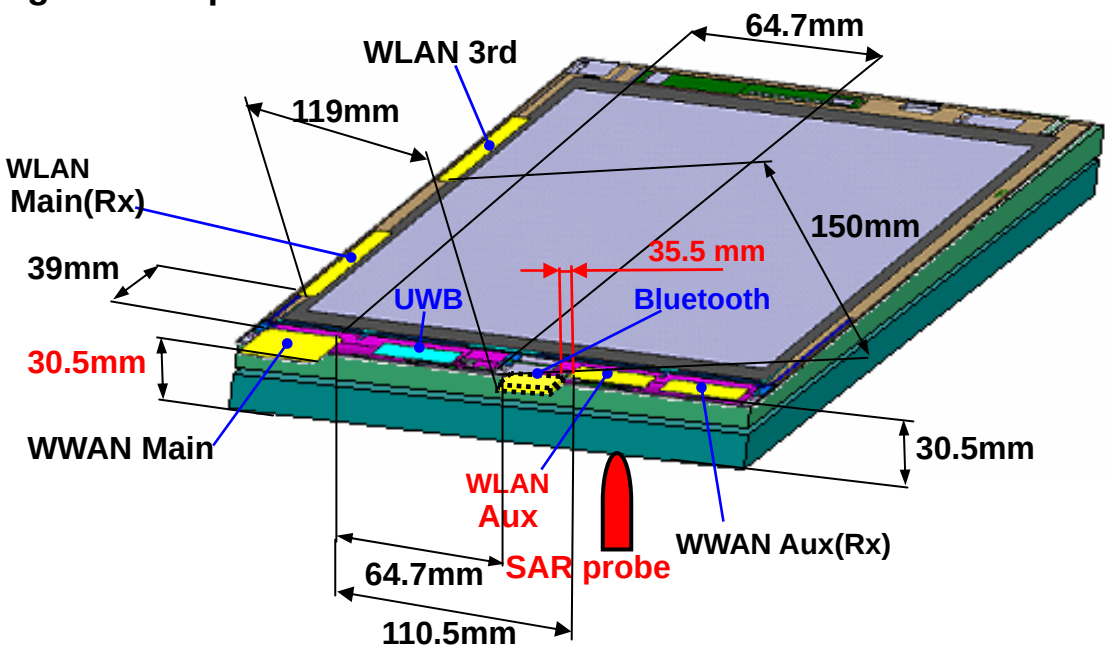


Figure-3:
Tablet PL (Primary Landscape)

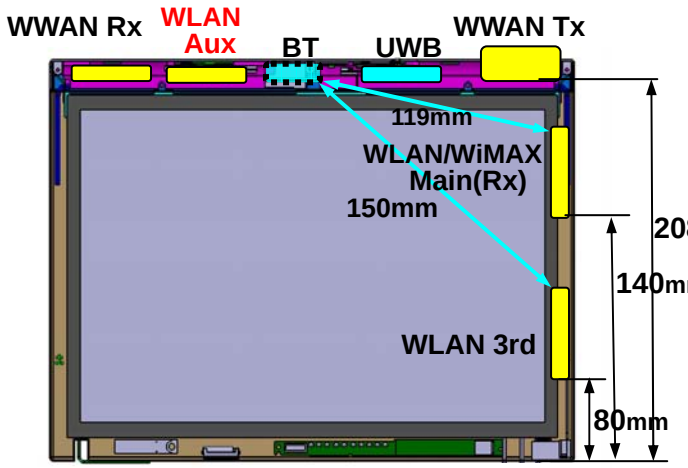


Figure-4:
Tablet PP (Primary Portrait)

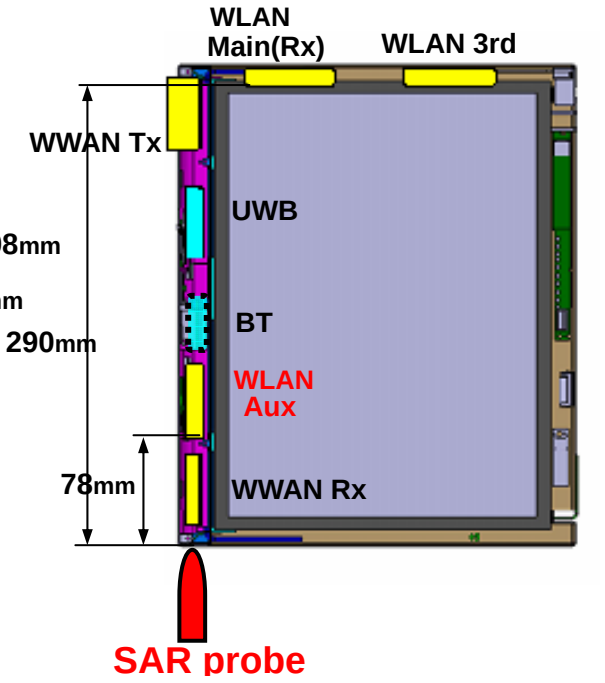


Figure-5:
Tablet SL (Secondary Landscape)

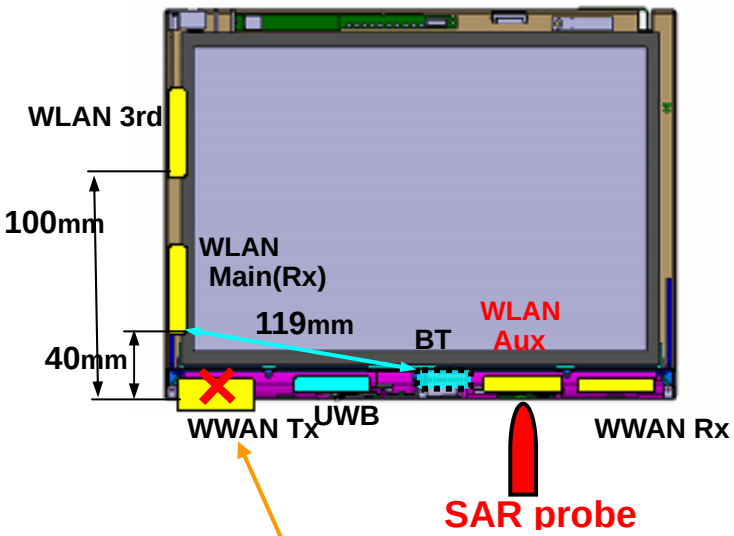
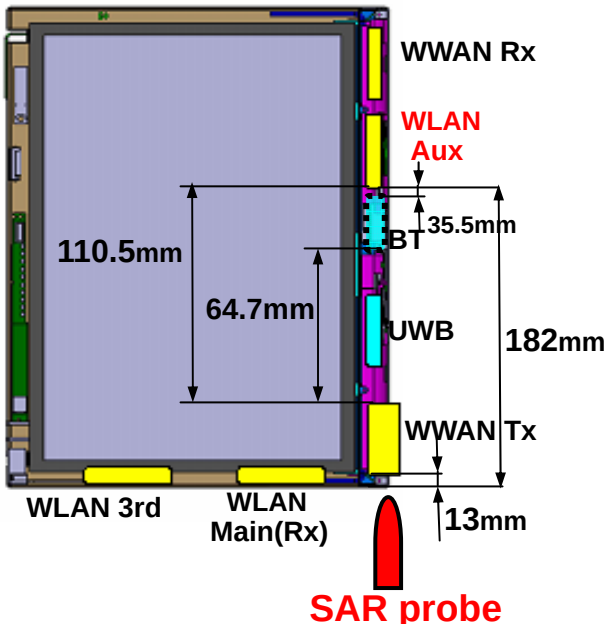


Figure-6:
Tablet SP (Secondary Portrait)



✖ **Tx antenna in thid rotary screen position does not transmit RF.**

See separate exhibit “Tablet Tx control logic” in more details.

3. RF Exposure evaluation result

3.1 MPE configuration

Operation mode	Bluetooth co-location	Evaluation method	Result	limit	Pass or fail
Notebook mode (Figure-1)	not required (antenna separation dist.= 292mm)	MPE (See Table-1)	**0.0180** mW/cm^2	1.0	Pass
Primary Landscape (Figure-3)	required (antenna separation dist.= 35.5mm)	Sum of MPE (See Table-1)	**0.0198** mW/cm^2	1.0	Pass

Table-1: MPE info.

	Max. Conducted power (**P**)	Max. Host PC antenna gain (**G**)	MPE *1 (mW/cm^2)
WWAN	0.0667 W	1.32 dBi	**0.0180**
Bluetooth	0.0041 W	3.5 dBi	**0.0018**

*1: MPE= $(1000x\mathbf{P})x(10^{\mathbf{G}/10}) / (4 \times \pi \times 20^2)$

3.2 SAR configuration

Table-2: SAR measurement results

Operation mode	SAR Result (W/Kg)	SAR to peak location separation ratio regarding KDB 447498 *2	limit	Pass or fail
Lap held mode (Figure-2)	**0.013**	0.0037	0.3	Pass
Primary Portrait (Figure-4)	**0.254**	0.0716	0.3	Pass
Secondary Landscape (Figure-5)	**0.199**	0.0561	0.3	Pass
Secondary Portrait (Figure-6)	**0.085**	0.0240	0.3	Pass
Bluetooth	**0.000113**			

*2: The antenna separation distance between the WLAN Tx and Bluetooth antennas is 3.55cm (< 5cm), therefore " SAR to peak location separation ratio" is required pursuant to FCC KDB 447498.
It's calculated as (WLAN SAR + Bluetooth SAR) / antenna separation distance (in cm).