# RF Exposure Evaluation
## in co-locating with other transmitters

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

| | | |
|---|---|---|
| WLAN/WiMAX: | | FCC ID: **PD9533ANXMU** |
| Bluetooth: | | FCC ID: QDS-BRCM1033 |
| UWB: | | FCC ID: V4EUWB3480MPE |
| WWAN | | FCC ID: J9CUNDP-1L |
| | or | FCC ID: VV7-MBMF3507G-L |

The minimum separation distance between human body and the WiMAX Tx antenna of the host PC device is **30.5mm** (in Figure-2). Therefore the applying WiMAX transmitter module (FCC ID: **PD9533ANXMU**) and the antenna system is subjected to SAR testing pursuant to FCC CFR 47 Section 2.1093.

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

### RF exposure justification regarding WiMAX & WWAN co-location

The WiMAX 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 WiMAX and any WWAN transmitter is required.

### RF exposure justification regarding WiMAX & Bluetooth co-location

The minimum antenna separation distance between the WiMAX and Bluetooth antennas is 119mm (>5cm), and the transmission power of the Bluetooth device installed in the host PC devices is 4.1mW (< 60/ f GHz) as below.
So the Bluetooth device is not considered as a co-located transmitter.

| 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 | |

Therefore, no RF Exposure evaluation in co-locating with the Bluetooth transmitter is required pursuant to the FCC document KDB 447498 section 3), issued on July 27, 2008.

### RF exposure justification regarding 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.

## Summary of RF Exposure evaluation

| Category | Operation mode | Antenna separation distance from human body | Measurement result | Pass or Fail | limits |
|---|---|---|---|---|---|
| SAR | Notebook | 17.0 cm | 0.019 W/Kg | Pass | 1.6 W/Kg |
| | Primary Landscape | 14.0 cm | 0.050 W/Kg | Pass | |
| | Secondary Landscape | 4.0 cm | 0.161 W/Kg | Pass | |
| | Secondary Portrait | Not used. | – | – | |
| | Lap Held | 3.1 cm | 0.016 W/Kg | Pass | |
| MPE | Primary Portrait | 29.0 cm | 0.021 $mW/cm^2$ *1 | Pass | 1.0 $mW/cm^2$ |

*1: MPE= $(1000x\mathbf{P})x(10^{\mathbf{G}/10}) / (4 \times \pi \times 29^2)$

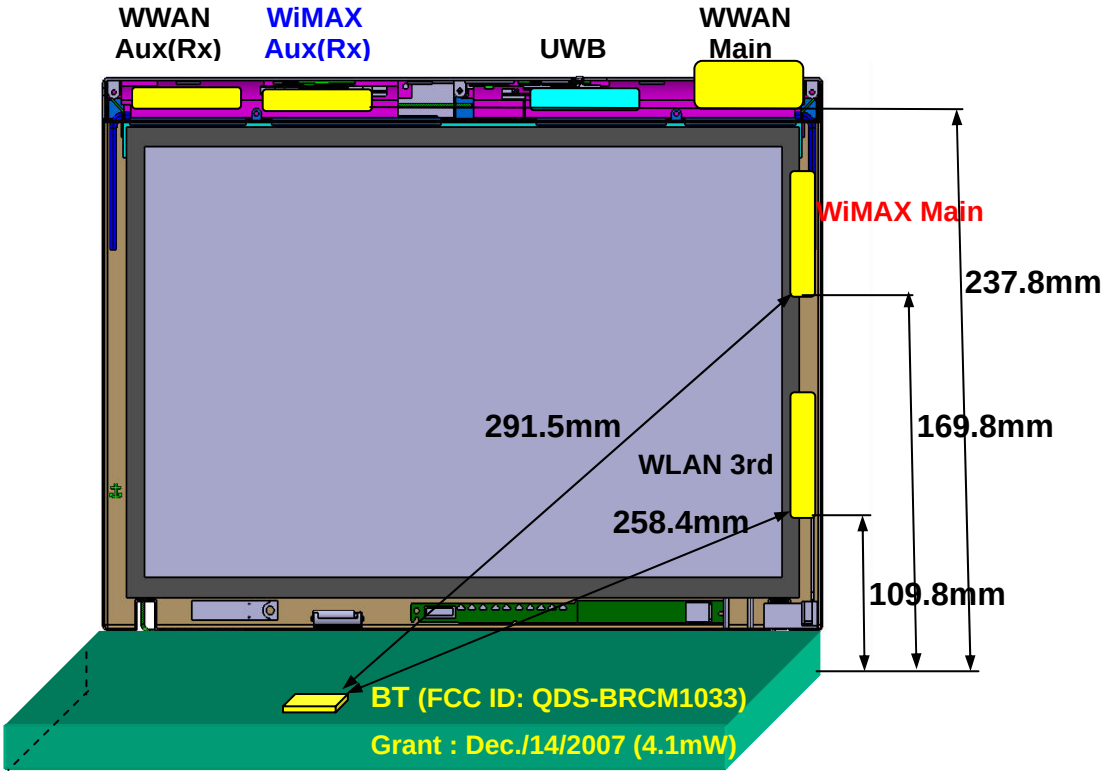
P=0.211W

G=0.16 dBi in 2.496–2.690GHz

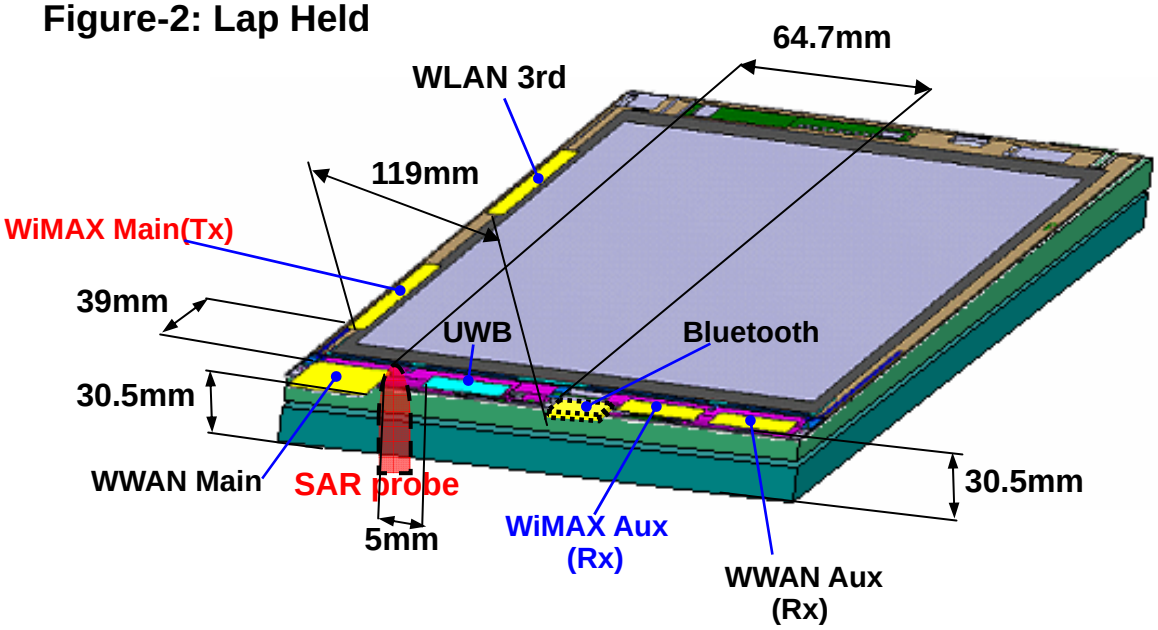
## Configuration of EUT

Note) Only the WiMAX Main antenna is used for Tx antenna for the applying WLAN/WiMAX modular device (Model: 533ANXMMW).

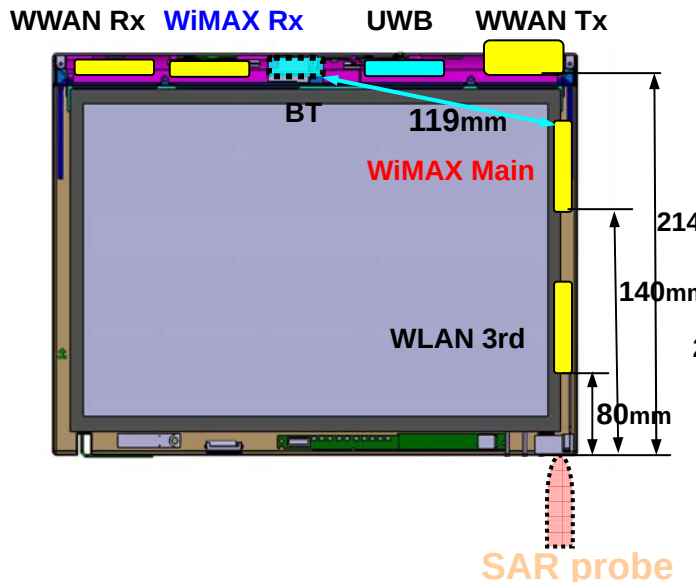
### Figure-1: Notebook mode



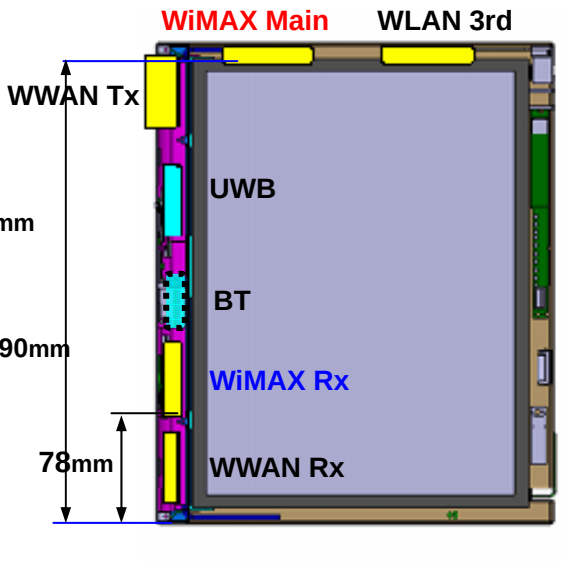

### Figure-2: Lap Held



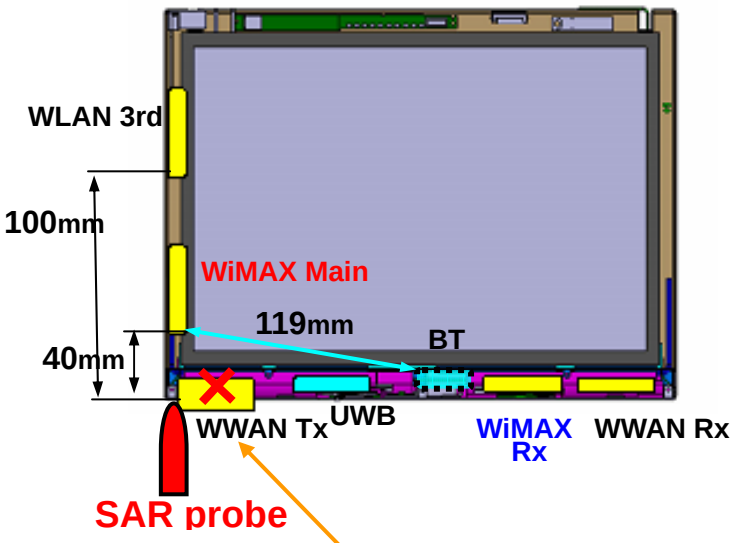
## Figure-3:
## Tablet PL (Primary Landscape)



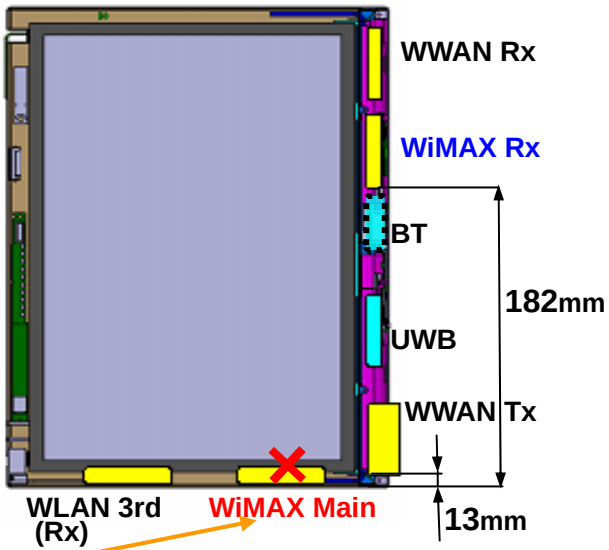

## Figure-4:
## Tablet PP (Primary Portrait)




## Figure-5:
## Tablet SL (Secondary Landscape)




## Figure-6:
## Tablet SP (Secondary Portrait)




**✕ Tx antennas in these rotary screen positions do not transmit RF.**

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