

RF Exposure Justification in co-locating with other transmitters

As shown in the separate exhibits "WWAN Antenna Info - xxx", the separation distance between human body and the WWAN Tx/Rx antennas of the host PC devices is 20cm or mote. Therefore the applying WWAN transmitter module (Model: **F3507g**) and the antenna systems are subjected to "Mobile device" pursuant to FCC CFR 47 Section 2.1091.

[MPE Evaluation]

The following table shows the highest conducted peak output power values of the applying modular transmitter device, and the maximum peak antenna gains of the new host PC devices.

Transmission mode	P : conducted peak output power	G : peak antenna gain *1
Part 22H Cellular	2.0 W (33.0 dBm)	-0.04 dBi
Part 24E PCS	0.871 W (29.4 dBm)	3.92 dBi

*1: See Table-1 in more details.

Thus, EIRP and the maximum power density at 20cm distance are calculated as follows.

Transmission mode	EIRP = P + G (dBm)	EIRP (mW)	MPE Max. power density $S = \text{EIRP} / (4 \times \pi \times 20^2)$
Part 22H Cellular	32.96	1977	0.394 mW/ cm ²
Part 24E PCS	33.32	2148	0.428 mW/ cm ²

With those results, the applying modular transmitter has found to comply with the FCC MPE limit (1.0 mW/cm²) according to FCC CFR 47 section 2.1091 for general Population/Uncontrolled exposure.

Table-1: Antenna Gains of new host PC devices

Host Unit short name	Antenna Manufacturer	LCD size	Main Antenna				
			Antenna P/N	Cable length (mm)	LCD Material	Frequency band (MHz)	
						EVDO/GSA/UMTS (US)	
MP1	ACON	12.1"	25.90600.001	535	Magnesium+	824	1850
	Wistron		25.90589.001	551	Aluminum+AB	-849	-1910
KD1	NISSEI	13.3"W	3209996	486	CFRP+GFRP	-1.86	1.34
KD2						-1.17	-1.09
BX3	ACON	13.3"W	AMP8P-700054	564	ABS	-4.12	-1.56
	Amphenol		14G152168431LV	599		-1.97	0.12
	ACON	14.1"W	AMP8P-700052	788	ABS	-1.08	-1.71
	Tyco		C-2023943-1			-4.87	-1.16
	ACON	15.4"W	AMP8P-700053	974	ABS	-3.25	-2.38
	Tyco		C-2023949-1			-0.52	2.10

HEPC: High Elasticity PolyCarbonate

As shown in the separate exhibits "WWAN Antenna Info - xxx", the applying host PC devices incorporate the four kinds of transmitters. i.e. WWAN, WLAN, UWB and Bluetooth.

RF exposure justification regarding WWAN & WLAN (or WiMAX) co-location

The WLAN (or WiMAX) antennas locate 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 "Handover logic" exhibit.

Therefore, no RF Exposure evaluation in co-locating with any WWAN transmitter is required.

RF exposure justification regarding WWAN & Bluetooth co-location

The antenna separation distance between the WWAN and Bluetooth antennas is 186mm or more, so the Bluetooth device is not considered as a co-located transmitter. And the transmission power of the Bluetooth device installed in the host PC devices is within 5.0mW as below.

Bluetooth Model name	FCC ID, IC Cert. Number	Grantee Name	Granted Date	Conducted Tx power
J07H081	FCC ID: MCLJ07H081	HON HAI Precision Ind. Co., Ltd.	June/ 23 / 2005	3.0 mW
	IC: 2878D-J07H081		Sep. / 02/ 2005	
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 "616217 D01 SAR for Laptop v01", issued on December 7,2007.

RF exposure justification regarding WLAN (or WiMAX) & UWB co-location

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.