

Application CJ6PA3171WL

This evaluation has been made in order to proof that this transmitter and its antennas meet the MPE limit of $1 \frac{mW}{cm^2}$ even in case of co-location in TOSHIBA notebooks with the Bluetooth module covered by the FCC ID CJ6PA3121BT.

The WLAN module will be installed either in conjunction with DUAL FILM antenna type 'HTL-008' (max. gain: -3,34 dBi) or in conjunction with FILM antenna type 'HTL-004' (max. gain: -6,92 dBi).

The Bluetooth module will be only installed in conjunction with FILM antenna type HTL-004 with a maximum antenna gain of -6,92 dBi.

Therefore the following prediction is made for the antenna combination having the highest gain: DUAL FILM antenna type 'HTL-008' used for WLAN and FILM antenna type 'HTL-004' used for Bluetooth.

For antenna gain measurements please refer to Exhibit 6 Antenna Test Report of this application. Other antenna types mentioned in the before named antenna test report will not be used in any notebook covered by the conditions of this application.

Prediction of MPE limit at given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P_{WLAN} * G_{WLAN} + P_{BT} * G_{BT}}{4\pi R^2}$$

where: S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Prediction

Antenna Types: Dual Film Antenna 'HTL-008' used for WLAN and
Film Antenna 'HTL-004' used for Bluetooth

Location of Antenna: behind Display of Notebook, upper border, see picture on 2nd page

WLAN: Maximum peak output power at antenna terminal:	<u>20.00</u>	dBm
WLAN: Maximum peak output power at antenna terminal:	<u>100.00</u>	mW
WLAN: Maximum antenna gain (measured):	<u>-3.34</u>	dBi
WLAN: Maximum antenna gain:	<u>0.46</u>	numeric
BT: Maximum peak output power at antenna terminal:	<u>0.00</u>	dBm
BT: Maximum peak output power at antenna terminal:	<u>1.00</u>	mW
BT: Maximum antenna gain (measured):	<u>-6.92</u>	dBi
BT: Maximum antenna gain:	<u>0.20</u>	numeric
Prediction distance:	<u>20</u>	cm
Prediction frequency:	<u>2447</u>	MHz
MPE limit for uncontrolled exposure at prediction frequency:	<u>1</u>	$\frac{mW}{cm^2}$
Power density at prediction frequency:	<u>0.00919</u>	$\frac{mW}{cm^2}$

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This prediction, along with the following photographs, demonstrate the following:

- 1) The power density levels at a distance of 20 cm are far below the maximum levels allowed by the FCC regulations.
- 2) A minimum separation distance of 20 cm can practically be maintained during normal use of the equipment as shown in picture below.

