

Applicant: Covidien LLC  
Manufacturer: Covidien LLC  
15 Hampshire Street  
Mansfield  
Massachusetts 02048  
USA

Model No: M2-JODY-W377  
FCC ID: P7G-173269

## **RF Exposure and Transmitter Power Considerations for the device which contains: FCC ID: P7G-173269**

### **FCC ID: P7G-173269**

The FCC ID: P7G-173269 operates in the 2.4 GHz and 5 GHz frequency bands using WLAN 802.11b/g/n/ax (2412-2462MHz), and WLAN 802.11a/n/ac/ax (5180-5825MHz) technologies. Bluetooth LE (2402-2480MHz) functions have been disabled.

The 2.4GHz/ 5GHz WLAN transmitters can transmit simultaneously.

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The following FCC Rule Parts and procedures are applicable:

Part 1.1310 – Radiofrequency radiation exposure limits

Part 2.1091 – Radiofrequency radiation exposure evaluation: mobile devices

KDB447498 D01 v06

Mobile and Portable Devices RF Exposure Procedures and Equipment Authorisation Policies

### **MAXIMUM TRANSMITTER POWER CONSIDERATIONS**

#### **FCC ID: P7G-173269**

Conducted power values are maximum average tune up with tolerance (from Change of ID FCC ID: P7G-173269 and original module grant Tune Up – FCC ID: XPYJODYW377)

#### **WLAN 2.4GHz:**

Power conducted: 23.0dBm

Antenna Gain: 4.3 dBi

EIRP = 27.3dBm = 537 mW

#### **WLAN 5GHz:**

Power conducted: 20.0dBm

Antenna Gain: 4.3 dBi

EIRP = 24.3dBm = 269 mW

## MPE CALCULATIONS

The MPE calculation to calculate the safe operating distance for the user is.

$$S = \text{EIRP} / 4 \pi R^2$$

**Where**

- S = Power density
- EIRP = Effective Isotropic Radiated Power (EIRP = P x G)
- P = Conducted Transmitter Power
- G = Antenna Gain (relative to an isotropic radiator)
- R = distance to the centre of radiation of the antenna (safe operating distance)

### Power Density Requirement

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC §1.1310 (e) for  $f > 1500\text{MHz}$ ,  $S_{\text{req1}} = 1.0 \text{ mW/cm}^2$

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC §1.1310 (e) for  $f = 300 - 1500\text{MHz}$ ,  $S_{\text{req2}} = f/1500 \text{ mW/cm}^2$

From table 1 (b) - Limits for General Population/ Uncontrolled Exposure of FCC §1.1310 (e) for  $f = 1.34 - 30\text{MHz}$ ,  $S_{\text{req3}} = 180/f^2 \text{ mW/cm}^2$

(f = operating frequency)

## VALUES

| Frequency Range (MHz) | Operating Band | TX Conducted Power Average (dBm) | Antenna Gain (dBi) | EIRP (mW) | Calculated Distance R @ $S_{\text{req}}$ (cm) | Power Density S (mw/ cm <sup>2</sup> ) |                         |                      |
|-----------------------|----------------|----------------------------------|--------------------|-----------|-----------------------------------------------|----------------------------------------|-------------------------|----------------------|
|                       |                |                                  |                    |           |                                               | Limit $S_{\text{req}}$                 | Calculated $S_n$ @ 20cm | $S_n/S_{\text{req}}$ |
| 2412 - 2462           | WLAN           | 23.0                             | +4.3               | 537       | 6.5                                           | 1.0                                    | 0.11                    | 0.11                 |
| 5180 - 5825           | WLAN           | 20.0                             | +4.3               | 269       | 4.6                                           | 1.0                                    | 0.05                    | 0.05                 |

**KDB447498 D01 v06 Section 7.2 SIMULTANEOUS TRANSMISSION CONSIDERATIONS**

For 2.4G WIFI and 5G WIFI simultaneous transmission:

As per KDB, summation of calculated MPE ratios (worst case):

$$\Sigma \text{MPE}_{\text{ratios}} = (S_1 / S_{\text{req1}}) + (S_2 / S_{\text{req2}})$$

$$= 0.11 + 0.05$$

$$= \mathbf{0.16}$$

$\Sigma$  of MPE ratios < 1.0, so in accordance with KDB447498 D01 V06 Section 7.2, simultaneous transmission test exclusion applies for the transmitters.

**Conclusion**

The required 20cm RF exposure limits for General Population/ Uncontrolled Exposure will not be exceeded for the above-mentioned device using the specified antennas

Certification Body

UL International (UK) Ltd