Co-Located Exposure Condition

Compliance with 47 CFR 15.247(i)

"Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter."

The EUT will only be used with a separation distance of 20 centimeters or greater between the antenna and the body of the user or nearby persons and can therefore be considered a mobile transmitter per 47 CFR 2.1091 (b). Calculations are provided for each radio transmitting through its own internal antenna and optional external antenna.

The total transmit power is less than 1.5 W (ERP), therefore the EUT is categorically excluded from routine environmental evaluation per 47 CFR 2.1091(c).

The MPE estimates are as follows:

Table 1 in 47 CFR 1.1310 defines the maximum permissible exposure (MPE) for the general population. The exposure level at a 20 cm distance from the EUT's transmitting antenna is calculated using the general equation:

$$\begin{split} & S = (PG)/4\pi R^2 \\ & \text{Where: } S = \text{power density (mW/cm}^2) \\ & P = \text{power input to the antenna (mW)} \\ & G = \text{numeric power gain relative to an isotropic radiator} \\ & R = \text{distance to the center of the radiation of the antenna (20 cm = limit for MPE estimates)} \\ & PG = EIRP \end{split}$$

Solving for S, the maximum power densities 20 cm from the transmitting antennas are summarized in the tables on the following pages:

MPE Estimates for Self Located Device

FCC ID: KBCIX-	MC5725							
In the IX270 Ho								
CDMA								
Antenna Type Antenna Part No.		Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit
IX270		(MHz)	(mW)	(dBi)	(dB)	(mW/cm ²)	(mW/cm ²)	
PRIMARY WAN ANTENNA	59-0521-001R	1851.25 - 1908.75	304.8	-1.50	0.89	0.035	1	0.035
PRIMARY WAN ANTENNA	59-0521-001R	824.7 – 848.31	325.8	1.50	1.50	0.065	0.55	0.118
External MaxRad	BMLPVDB800/1900	1851.25 - 1908.75	304.8	3	2.77	0.064	1	0.064
External MaxRad	BMLPVDB800/1900	824.7 – 848.31	325.8	3	3.33	0.060	0.55	0.109
Worst Case Ratio of Pov Exposure Limit = 0.118								

Excerpts from TCB Training, April 3, 2002, "Mobile Transmitters", Slide 6:

"Devices operating in multiple frequency bands

- U When RF exposure evaluation is required for TCB approval
 - <u>Separate antennas</u> estimated minimum separation distances may be considered for the frequency bands that do not require evaluation or TCB approval, however, the estimated distance should take into account the effect of co-located transmitters. (Note 24)

<u>Note 24</u> According to multiple frequency exposure criteria, the ratio of field strength or power density to the applicable exposure limit at the exposure location should be determined for each transmitter and the sum of these ratios must not exceed 1.0 for the location to be compliant."

The sum of the ratio(s) (power density to the exposure limit) does not exceed 1.0; therefore, the exposure condition is compliant with FCC rules.

MPE Estimates for Self Located Device

FCC ID:	KBCIX270-WL3	945								
WLAN, I	EEE 802.11 (a) (l	o) & (g)								
Antenna Type	Antenna Part No.	Transmit Frequency	Max Peak Conducted Output Power	Antenna Gain	Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit		
		(GHz)	(mW)	(dBi)	(dB)	(mW/cm²)	(mW/cm ²)			
PiFa MAIN	TWR12WIPI02A	5	100	-2.56	6.5	0.002	1	0.002		
PiFa MAIN	TWR12WIPI02A	2.4	318	-2.72	3.5	0.015	1	0.015		
External MaxRad	MAXC24503	2.4	318	3	4.6	0.044	1	0.044		
External MaxRad	BMAXC24505	2.4	318	5	4.6	0.069	1	0.069		
Worst C	Worst Case Ratio of Power Density to the Exposure Limit = 0.069									

MPE Estimates for Self Co-located Device

FCC ID: KBCIX270-BT2022										
Bluetooth Radio										
Antenna Type	Antenna Part No.	Transmit Frequency	mit Max Peak Conducted Output Power		Minimum Antenna Cable Loss	Power Density @ 20 cm	General Population Exposure Limit from 1.1310	Ratio of Power Density to the Exposure Limit		
		(MHz)	(mW)	(dBi)	(dB)	(mW/cm ²)	(mW/cm²)			
Well Green Technology Co. Ltd. IX270-B/T or R12Y-B/T	TWR12BLPI01A	2441	36.22	-2.56	0.69	0.0032	1	0.0032		
Worst Case Ratio of Power Density to the Exposure Limit = 0.0032										

Worst Case	e Co-loca	ted	Expos	ure C	ondi	tion			-				
FCC ID: KB FCC ID: KB FCC ID: KB	CIX-MC5 CIX270-V CIX270-E	725 VL3 8T2(945 022										
Per Note 24 s	hown belov	v, the	e Sum of	Worst	Case Power Ratios cannot exceed 1.0								
	1		Γ		1		1						
CDMA Radio Worst Case Ratio of Power Density to the Exposure Limit	802.11ab Radio W Case Ratic Power Den to the Expos Limit	g orst o of sity sure	Blueto Rad Worst 0 Ratio of Density Exposure	ooth io Case Power to the e Limit	Sum of Worst Case Ratios (Power Density to the Exposure Limit)		FCC Limit for Sum of Worst Case Ratios						
0.118	0.069	0.069 0.0032		32	0.1902		1.0			PASS			
The results shown in the above table are equivalent to the Sum of the EIRP of the Two Co-located Transmitters (EIRP TX1 + EIRP TX2) compared to the exposure limit. The benefit of this method, is that accounts for transmitters operating at different frequencies against different exposure limits.													