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RF EXPOSURE EVALUATION

Applicant	**: JAVA INFORMATION TECHNOLOGY CO.,LTD.**
Applicant Address	**: #6 Susung B/D 558-14, Samdo1-Dong, Jeju-Si, Jeju-Do, Korea**
Kind of Product	**: CARU-M**
Equipment model name	**: SMRF900-II**
Antenna type	**: Patch antenna Gain 6.39dBi**
Frequency Range	**: 902.5MHz ~ 927.0 MHz**
Number of channels	**: 50 CH**
Channel Spacing	**: 0.5 MHz**

** MPE Calculations **

The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user. The MPE calculation for this exposure is shown below.

The peak radiated output power (EIRP) is calculated as follows:

EIRP = P + G EIRP = 35.91 dBm	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)

The numeric gain(G) of the antenna with a gain specified in dB is determined by:

$G = Log^{-1}$ (dB antenna gain / 10)

$G = Log^{-1}$ (6.39/ 10)

G = 4.36

Power density at the specific separation:

$S = PG/(4R^2\pi)$ $S = (895.36* 4.36)/(4 * 20^2 * \pi)$ $S = 0.78\ mW/cm^2$	Where, S = Maximum power density (mW/cm^2) P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

The Maximum permissible exposure (MPE) for the general population is 1 mW/cm^2 .
The power density at 20cm does not exceed the 1 mW/cm^2 limit.

Estimated safe separation:

$R = \sqrt{(PG / 4\pi)}$ $R = \sqrt{(895.36* 4.36/ 4\pi)}$ R = 17.63 cm	Where, P = Power input to the antenna (mW) G = Numeric power gain of the antenna R = Distance to the center of the radiation of the antenna (20cm = limit for MPE)

** CO-LOCATED MPE CALCULATIONS **

For multiple co-located transmitters operating simultaneously the total power density can be calculated by summing the Power * Gain product (in linear units) of each transmitter.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

RESULTS

Mode	Band	Output Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Power Density (mW/cm^2)	Results
RFID	914.5 MHz	29.52	6.39			
WLAN	2.4 GHz	10.50	4.00			
Combined				20	0.781	Complies

S = (P1*G1 + P2*G2) / (4R$^2\pi$)
= (3899.42 + 28.18) / (4 * 20^2 * π) = 0.781

S = Power Density in mW/cm^2
Px = Power of transmitter x in mW
Gx = Numeric gain of antenna x
R = distance in cm