CTK Co., Ltd.

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RF EXPOSURE EVALUATION

Product Description

Applicant	S-winnus Co., Ltd
Applicant Address	CVT bldg.3F306, 41, Centum dong-ro, Haeundae-Gu, Busan, Korea (ZIP 48059)
Kind of Product	Container Tracer Device
Equipment model name	CTD-S100
Antenna type	PIFA
Antenna Gain	Band 850 : -0.69 dBi Band 1900 : 2.84 dBi
Frequency Range	824 MHz - 849 MHz 1710 MHz - 1755 MHz 1850 MHz - 1910 MHz
Conducted Output Power (Module Grant reference)	GSM Band 850 : 1.995 W (33 dBm) GSM Band 1900 : 0.993 W (29.97 dBm) WCDMA Band II : 0.243 W (23.86 dBm) WCDMA Band V : 0.446 W (26.49 dBm) WCDMA Band IV :0.226 W (23.54 dBm)

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** Band 850 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 = 33 - 0.69 = 32.31 dBm	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)

Power density at the specific separation:

$S = PG/(4R^2\pi)$
 	
$S = 1702 / (4 * 20^2 * \pi)$
 	
$S = 0.34$ 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:

$R = \sqrt{(PG / 4\pi)}$
 	
$R = \sqrt{(1702 / 4\pi)}$
 	
$R = 11.64$ 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)

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** Band 1900 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 = 29.97 + 2.84 = 32.81dBm	Where, P = Power input to the antenna (mW) G = Power gain of the antenna (dBi)

Power density at the specific separation:

$S = PG/(4R^2\pi)$
 	
$S = 1909.9 / (4 * 20^2 * \pi)$
 	
$S = 0.38$ 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:

$R = \sqrt{(PG / 4\pi)}$
 	
$R = \sqrt{(1909.9/ 4\pi)}$
 	
$R = 12.33$ 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)