

# Prediction of MPE Limit

## 1. Description of EUT

- FCC ID : STENRPCS20B
- Model No. : RTNR 1900CB-20S
- Freq. Range :
  - Downlink: 1950 ~ 1965MHz
  - Uplink: 1870 ~ 1885MHz
- Power Rating : AC110V, 50/60Hz
- EUT Type : RF Repeater(CDMA), 1900MHz PCS Block B

## 2. Friis Formula

Friis transmission formula :  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

$$R = \sqrt{\frac{PG}{4 \pi S}}$$

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

## 3. EUT Operating condition

The software provided by Manufacturer enabled the EUT to Maximum Output Power with downlink and uplink mode.

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## 4. Test Results

### 4.1 Antenna Gain

The maximum Gain measured in Fully Anechoic Chamber is 20.15dBi or 103.514 (numeric).

### 4.2 Output Power into Antenna & Distance at RF Exposure value(1mW/cm<sup>2</sup>) :

MODE: Downlink

Channel	Channel Frequency (MHz)	Maximum Output Power to Antenna (mW)	R (m)
550	1957.50	20276.827	4.087

MODE: Uplink

Channel	Channel Frequency (MHz)	Maximum Output Power to Antenna (mW)	R (m)
550	1877.50	630.957	0.721

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