Prediction of MPE Limit

1. Description of EUT

- FCC ID : STESPAPE030M
- Model No. : RSP-APE-030M
- Freq. Range :
  - Downlink: 1930 ~ 1995MHz
  - Uplink: 1850 ~ 1915MHz
- Power Rating : Input: 110VAC(85 ~ 145VAC), Output: DC 7V
- EUT Type : RF Repeater(CDMA), 1900MHz PCS Block A ~ G

2. Friis Formula

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

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

S = power density in mW/cm^2

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

Pd is the limit of MPE, $1mW/cm^2$. 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.

4. Test Results

4.1 Antenna Gain

The maximum Gain measured in Fully Anechoic Chamber is 12dBi or 15.849 (numeric).

4.2 Output Power into Antenna & RF Exposure value at distance 20cm:

MODE: Downlink

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
600	1960.00	31.951	0.101	1.0

MODE: Uplink

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
600	1880.00	31.696	0.100	1.0