

### 11.MPE ESTIMATION

# 11.1.Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/cm <sup>2</sup> )	Averaging time(minutes)			
300MHz1.5GHz	F/1500	30			
1.5GHz100GHz	1.0	30			

Frequency(MHz)	Power density (mW/cm <sup>2</sup> )	Averaging time(minutes)
2412	1	30
2437	1	30
2462	1	30

Note: F= Frequency in MHz

# 11.2. Estimation Result

EUT: 3G Wireless N Nano Router						
M/N: ARNPE154U1						
Test date: 2013-05-25	Pressure:	101.4±1.0 kpa	Humidity: 55.6±3.0%			
Tested by: Leo-Li	Test site:	RF Site	Temperature: 22.4±0.6 °C			

Cable loss: 1 dB		Attenuator le	oss: 20 dE	Antenna Gain: 0 dBi			
Test Mode	СН	Frequency (MHz)	Peak Output Power (dBm)	Output Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	МРЕ
	CH1		18.69	73.96	0	1.00	0.0147
11b	CH6	2437	19.58	90.78	0	1.00	0.0181
	CH11	2462	19.5	89.13	0	1.00	0.0177
11g CH1 CH6 CH11	CH1	2412	21.7	147.91	0	1.00	0.0294
	CH6	2437	24.52	283.14	0	1.00	0.0564
	CH11	2462	22.14	163.68	0	1.00	0.0326
CH1		2412	20.6	114.82	0	1.00	0.0229
11n HT20	CH6	2437	23.96	248.89	0	1.00	0.0495
	CH11	2462	24.19	262.42	0	1.00	0.0522
11n HT40	CH1	2422	20.08	101.86	0	1.00	0.0203
	CH4	2437	24.95	312.61	0	1.00	0.0622
	CH7	2452	20.84	121.34	0	1.00	0.0242

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11.3. This device have a SUB interface and it tends to be used for 3G USB dongle, so need MPE Evaluation that this device working along with the 3G USB dongle.

### 11.4.RF exposure limit

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Average Time (minutes)				
(A) Limits for Occupational / Control Exposures								
30-300	61.4	0.163	1.0	6				
300-1500	-	-	F/300	6				
1500-100,000	-	-	5	6				
(B)	(B) Limits for General Population / Uncontrolled Exposure							
30-300	27.5	0.073	0.2	30				
300-1500	-	-	F/1500	30				
1500-100,000	-	-	1.0	30				

F= Frequency in MHz

## 11.5. RF exposure calculations

Power density (S) is calculated by the following formula:

$$S = (P * G)/4\pi R^2$$

where,  $S = Power density (mW/cm^2)$ 

P = Output power to antenna (mW)

R = Distance between radiating structure and observation point (cm)

G = Gain of antenna in numeric

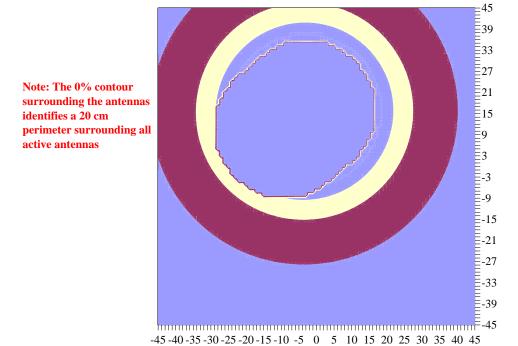
 $\pi = 3.1416$ 

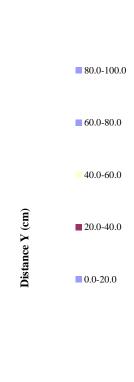
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#### 11.6.Test result

Antenna No.		Total	1	2	3	4	5	6
Tx Status			On	On	Off	Off	Off	Off
Frequency	MHz		850	2450	1900	2450	2450	5800
MPE Limit	mW/cm <sup>2</sup>		0.57	1.00	0.00	0.00	0.00	0.00
Max % MPE	%	94.0	88.4	6.2	0.0	0.0	0.0	0.0
Power	(W)	2.313	2.000	0.313	0.000	0.000	0.000	0.000
Antenna Gain	dBi		1.00	0.00	3.00	1.50	0.50	1.00
EIRP	(W)	2.83	2.518	0.313	0.000	0.000	0.000	0.000
X	(cm)		-3.0	-9.0	9.0	4.0	-8.0	8.0
Υ	(cm)		16.0	11.0	11.0	0.0	0.0	0.0
Sector			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Arc			FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
$\theta_1$	degs input actual	innut	-120	-120	-120	-120	-120	-120
$\theta_{2}$		iriput	60	60	60	60	60	60
$\Theta_1$		actual	-120	-120	-120	-120	-120	-120
$\theta_2$		aciuai	60	60	60	60	60	60

#### % MPE Contour





Distance X (cm)