FCC RF Exposure

FCC ID: 2ADKG-CW-601-3G
Applicant: Shenzhen Chainway ITS Co,. Ltd.
Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: OBD Telematics Dongle
Refer Standard: FCC Part 2.1091: Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)

FCC MPE Limited:

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

2.4G WLAN Antenna Gain information
Antenna Gain: 0dBi

Note 1：According to KDB 662911, all transmit signals are completely uncorrelated with each other. Directional gain = G_{ANT}
WWAN Antenna Gain:
WCDMA Band 5: 0dBi
WCDMA Band 2: 0dBi

Maximum Conducted Output Power Results for 2.4G WIFI

Test mode	Channel	Frequency (MHz)	RF Power(dBm)	Tolerance ±(dB)
802.11b	1	2412	17.42	17.5±1
	6	2437	17.72	17.5±1
	11	2462	17.91	17.5±1
802.11g	1	2412	19.86	20±1
	6	2437	20.25	20±1
	11	2462	19.56	20±1
802.11n20	1	2412	18.83	19±1
	6	2437	19.48	19±1
	11	2462	19.65	19±1

Calculation results (for 2.4G WIFI): pass

Mode	Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
802.11b	2412	18.5	20	0.014	
	2437	18.5	20	0.014	
	2462	18.5	20	0.014	
802.11g	2412	21	20	0.025	
	2437	21	20	0.025	1.0
	2462	21	20	0.025	
802.11n20	2412	20	20	0.020	
	2437	20	20	0.020	
	2462	20	20	0.020	

Maximum Conducted Output Power Results for WCDMA

Band	Channel	Frequency (MHz)	Output Power(dBm)	Tolerance ±(dB)	Max Tune up power(mW)
WCDMA850	Low	826.4	23.23	23±1	251.2
	Mid	836.6	23.17	23±1	251.2
	High	846.4	23.09	23±1	251.2
WCDMA1900	Low	1852.4	22.53	22±1	199.5
	Mid	1880	22.47	22±1	199.5
	High	1907.6	22.37	22±1	199.5

Calculation results (for WCDMA): pass

Band	Channel	Frequency (MHz)	Result (mW/cm2)	Limit (mW/cm2)	Ratio
WCDMA850	Low	826.4	0.05	0.55	0.09
	Mid	836.6	0.05	0.56	0.09
	High	846.4	0.05	0.57	0.09
WCDMA1900	Low	1852.4	0.04	1.0	0.04
	Mid	1880	0.04	1.0	0.04
	High	1907.6	0.04	1.0	0.04

Simultaneous Transmission Calculation (Worst-case mode)

Antenna	Mode/Channel	Frequency (MHz)	Calculation results(mW/cm2)	Limit (mW/cm2)	Ratio
WLAN	802.11g/middle	2437	0.025	1.0	0.025
WWAN	WCDMA850/low	824.2	0.050	0.55	0.090
WLAN=0.025+0.09=0.115<1.0, pass					