

MPE

FCC ID: ZYAWONDERPLUS

Applicant: XTREAMER LIMITED

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: Mobile Device

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/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	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)

Conducted Output Power Results

Test mode	Channel	Frequency (MHz)	RF Power(dBm)
802.11b	1	2412	16.21
	6	2437	16.27
	11	2462	16.03
802.11g	1	2412	14.57
	6	2437	14.22
	11	2462	14.09
802.11n20	1	2412	13.74
	6	2437	13.52
	11	2462	12.93
GFSK	0	2402	6.80
	39	2441	6.38
	78	2480	6.53
$\pi/4$ -DQPSK	0	2402	7.28
	39	2441	7.14
	78	2480	6.82
8- DPSK	0	2402	7.45
	39	2441	7.34
	78	2480	7.11
BLE	0	2402	5.68
	20	2442	5.67
	39	2480	5.42

Manufacturing tolerance

Test mode	Channel	Frequency (MHz)	Target (dBm)	Tolerance $\pm$ (dB)
802.11b	1	2412	16	1
	6	2437	16	1
	11	2462	16	1
802.11g	1	2412	14	1
	6	2437	14	1
	11	2462	14	1
802.11n20	1	2412	13	1
	6	2437	13	1
	11	2462	13	1
GFSK	0	2402	7	1
	39	2441	7	1
	78	2480	7	1
$\pi/4$ -DQPSK	0	2402	7	1
	39	2441	7	1

Test mode	Channel	Frequency (MHz)	Target (dBm)	Tolerance $\pm$ (dB)
	78	2480	7	1
8- DPSK	0	2402	7	1
	39	2441	7	1
	78	2480	7	1
BLE	0	2402	6	1
	20	2442	6	1
	39	2480	6	1

Calculation results (for FCC): pass

Test mode	Channel	Frequency (MHz)	Maximum tune up power(dBm)	RF distance(cm)	Result (mW/cm2)	Limit (mW/cm2)
802.11b	1	2412	17	20	0.0315	1.0
	6	2437	17	20	0.0315	
	11	2462	17	20	0.0315	
802.11g	1	2412	15	20	0.0199	
	6	2437	15	20	0.0199	
	11	2462	15	20	0.0199	
802.11n20	1	2412	14	20	0.0158	
	6	2437	14	20	0.0158	
	11	2462	14	20	0.0158	
GFSK	0	2402	8	20	0.0040	
	39	2441	8	20	0.0040	
	78	2480	8	20	0.0040	
$\pi/4$ -DQPSK	0	2402	8	20	0.0040	
	39	2441	8	20	0.0040	
	78	2480	8	20	0.0040	
8- DPSK	0	2402	8	20	0.0040	
	39	2441	8	20	0.0040	
	78	2480	8	20	0.0040	
BLE	0	2402	7	20	0.0032	
	20	2442	7	20	0.0032	
	39	2480	7	20	0.0032	

NOTE:

Antenna Gain 5dBi=3.16