RF EXPOSURE EVALUATION

EUT Specification

EUT	Photoelectric Smoke Alarm
Model Number	S1-M
FCC ID	2AK7XS1-M
Antenna gain (Max)	0 dBi
Operation Frequency	Matter: 2405 MHz to 2480 MHz BLE: 2402 MHz to 2480 MHz
Input Rating	DC 3 V
Max. output power	BLE: 8.97dBm Matter: 8.98dBm

Test Requirement:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

11.1 Friis transmission formula: Pd= (Pout*G)\ (4*pi*R^2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm=20cm

Pd the limit of MPE, 1mW/cm^2. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

11.2 Measurement Result

Antenna gain: 0dBi

BLE:

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain （Numeric）	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
GFSK	2402	8.78	9±1	10	1	0.001989	1
GFSK	2440	8.89	9±1	10	1	0.001989	1
GFSK	2480	8.97	9±1	10	1	0.001989	1

Matter:

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain （Numeric）	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
O-QPSK	2405	8.71	9±1	10	1	0.001989	1
	2440	8.89	9±1	10	1	0.001989	1
	2480	8.98	9±1	10	1	0.001989	1

Signature:

Tiger Xu

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