

RF EXPOSURE EVALUATION

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)

FCC ID: 2AN7N-XPACQ1

EUT Specification

EUT	Q1 Bluetooth Speaker
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☒ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	1.85 dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

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

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

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in Mw

G= gain of antenna in linear scale

π =3.1416

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

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

BT:

Channel Frequency (MHz)	Measurement Peak Output Power(dBm)		
	GFSK	$\pi/4$ -DQPSK	8DPSK
2402	-2.852	-5.665	-5.179
2441	-0.201	-2.004	-1.610
2480	0.585	-0.946	-0.534

Channel Frequency (MHz)	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
2402	-3±1	-2	0.63	1.85	1.531	0.000192	1
2441	0±1	1	1.26	1.85	1.531	0.000383	1
2480	0±1	1	1.26	1.85	1.531	0.000383	1
2402	-5±1	-4	0.40	1.85	1.531	0.000121	1
2441	-2±1	-1	0.79	1.85	1.531	0.000242	1
2480	0±1	1	1.26	1.85	1.531	0.000383	1
2402	-5±1	-4	0.40	1.85	1.531	0.000121	1
2441	-2±1	-1	0.79	1.85	1.531	0.000242	1
2480	0±1	1	1.26	1.85	1.531	0.000383	1

BLE:

Modulation	Channel Number	Channel Frequency(MHz)	Measurement Peak Output Power (dBm)
GFSK	0	2402	-1.44
	19	2440	-0.39
	39	2480	0.11

Channel Frequency (MHz)	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
2402	-1±1	0	1.00	1.85	1.531	0.000305	1
2440	0±1	1	1.26	1.85	1.531	0.000383	1
2480	0±1	1	1.26	1.85	1.531	0.000383	1

Signature



Date: 2018-03-23