

MPE ESTIMATION
FCC ID: 2AJQOQIT1475

1,Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/ cm ²)	Averaging time(minutes)
300MHz----1.5GHz	F/1500	30
1.5GHz---100GHz	1.0	30

Note: F= Frequency in MHz

2 Estimation Result

For ZK-7662 MODULE

2.4G WIFI ANT. 1:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	19.62	19±1(20)	100.00	1	1.2589	0.02506
11g	19.73	19±1(20)	100.00	1	1.2589	0.02506
11n/HT20	18.68	18±1(19)	79.43	1	1.2589	0.01990
11n/HT40	18.86	18±1(19)	79.43	1	1.2589	0.01990

$$Pd = \frac{Pout * G}{4\pi r^2} ;$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	CH1	19.62	91.62	1	1.2589	0.02296
	CH6	19.57	90.57	1	1.2589	0.02270
	CH11	19.51	89.33	1	1.2589	0.02238
11g	CH1	19.73	93.97	1	1.2589	0.02355
	CH6	19.53	89.74	1	1.2589	0.02249
	CH11	19.16	82.41	1	1.2589	0.02065
11n/HT20	CH1	18.68	73.79	1	1.2589	0.01849
	CH6	18.49	70.63	1	1.2589	0.01770
	CH11	18.17	65.61	1	1.2589	0.01644
11n/HT40	CH1	18.66	73.45	1	1.2589	0.01841
	CH4	18.86	76.91	1	1.2589	0.01927
	CH7	18.62	72.78	1	1.2589	0.01824

$$Pd = \frac{Pout * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

For ZK-7662 MODULE

2.4G WIFI ANT. 2:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	19.07	19±1(20)	100.00	1	1.2589	0.02506
11g	18.98	18±1(19)	79.43	1	1.2589	0.01990
11n/HT20	17.72	17±1(18)	63.10	1	1.2589	0.01581
11n/HT40	17.78	17±1(18)	63.10	1	1.2589	0.01581

$$Pd = \frac{P_{out} * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	CH1	18.75	74.99	1	1.2589	0.01879
	CH6	18.92	77.98	1	1.2589	0.01954
	CH11	19.07	80.72	1	1.2589	0.02023
11g	CH1	18.90	77.62	1	1.2589	0.01945
	CH6	18.98	79.07	1	1.2589	0.01981
	CH11	18.73	74.64	1	1.2589	0.01870
11n/HT20	CH1	17.72	59.16	1	1.2589	0.01482
	CH6	17.69	58.75	1	1.2589	0.01472
	CH11	17.48	55.98	1	1.2589	0.01403
11n/HT40	CH1	17.78	59.98	1	1.2589	0.01503
	CH4	17.72	59.16	1	1.2589	0.01482
	CH7	17.30	53.70	1	1.2589	0.01346

$$Pd = \frac{P_{out} * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

For MIMO:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	--	--	--	--	--	--
11g	--	--	--	--	--	--
11n/HT20	21.24	21±1(22)	158.49	4.01	2.518	0.07943
11n/HT40	21.34	21±1(22)	158.49	4.01	2.518	0.07943

$$Pd = \frac{Pout * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	CH1	--	--	--	--	--
	CH6	--	--	--	--	--
	CH11	--	--	--	--	--
11g	CH1	--	--	--	--	--
	CH6	--	--	--	--	--
	CH11	--	--	--	--	--
11n/HT20	CH1	21.24	133.05	4.01	2.518	0.06668
	CH6	21.12	129.42	4.01	2.518	0.06486
	CH11	20.85	121.62	4.01	2.518	0.06095
11n/HT40	CH1	21.25	133.35	4.01	2.518	0.06684
	CH4	21.34	136.14	4.01	2.518	0.06823
	CH7	21.02	126.47	4.01	2.518	0.06339

$$Pd = \frac{Pout * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

For RTL8188 MODULE 2.4G WIFI:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	16.51	16±1(17)	50.12	1	1.2589	0.01256
11g	16.23	16±1(17)	50.12	1	1.2589	0.01256
11n/HT20	15.55	15±1(16)	39.81	1	1.2589	0.00998
11n/HT40	14.86	14±1(15)	31.62	1	1.2589	0.00792

$$Pd = \frac{P_{out} * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note: PK Output power= conducted power.

Conducted power see the test report HK1902200283-4E, antenna gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11b	CH1	16.51	44.77	1	1.2589	0.01122
	CH6	16.35	43.15	1	1.2589	0.01081
	CH11	16.24	42.07	1	1.2589	0.01054
11g	CH1	16.23	41.98	1	1.2589	0.01052
	CH6	16.12	40.93	1	1.2589	0.01026
	CH11	16.05	40.27	1	1.2589	0.01009
11n/HT20	CH1	15.55	35.89	1	1.2589	0.00899
	CH6	15.28	33.73	1	1.2589	0.00845
	CH11	15.33	34.12	1	1.2589	0.00855
11n/HT40	CH1	14.86	30.62	1	1.2589	0.00767
	CH4	14.64	29.11	1	1.2589	0.00729
	CH7	14.66	29.24	1	1.2589	0.00733

$$Pd = \frac{P_{out} * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note: PK Output power= conducted power.

Conducted power see the test report HK1902200283-4E, antenna gain=1dBi.

For 5.2G WIFI ANT. 1::

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11a	16.38	16 ± 1(17)	50.12	1	1.2589	0.01256
11n/HT20	15.44	15 ± 1(16)	39.81	1	1.2589	0.00998
11n/HT40	15.83	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT20	15.07	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT40	15.88	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT80	15.90	15 ± 1(16)	39.81	1	1.2589	0.00998

$$Pd = \frac{P_{out} * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	CH36	16.11	40.83	1	1.2589	0.01023
	CH40	15.76	37.67	1	1.2589	0.00944
	CH48	16.38	43.45	1	1.2589	0.01089
11n/HT20	CH36	15.28	33.73	1	1.2589	0.00845
	CH40	14.93	31.12	1	1.2589	0.00780
	CH48	15.44	34.99	1	1.2589	0.00877
11n/HT40	CH38	15.83	38.28	1	1.2589	0.00959
	CH46	15.37	34.43	1	1.2589	0.00863
11ac/HT20	CH36	14.65	29.17	1	1.2589	0.00731
	CH40	14.93	31.12	1	1.2589	0.00780
	CH48	15.07	32.14	1	1.2589	0.00805
11ac/HT40	CH38	15.51	35.56	1	1.2589	0.00891
	CH46	15.75	37.58	1	1.2589	0.00942
11ac/HT80	CH42	14.92	31.05	1	1.2589	0.00778
$Pd = \frac{P_{out} * G}{4\pi r^2} ;$						
Note:						
Note: The estimation distance is 20cm						
Note:						
PK Output power= conducted power.						
Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.						

For 5.2G WIFI ANT. 2:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11a	15.65	15 ± 1(17)	50.12	1	1.2589	0.01256
11n/HT20	15.89	15 ± 1(16)	39.81	1	1.2589	0.00998
11n/HT40	14.34	14 ± 1(15)	31.62	1	1.2589	0.00792
11ac/HT20	14.58	14 ± 1(15)	31.62	1	1.2589	0.00792
11ac/HT40	15.83	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT80	14.77	14 ± 1(15)	31.62	1	1.2589	0.00792

$$Pd = \frac{Pout * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

For MIMO:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11a	--	--	--	--	--	--
11n/HT20	18.61	18±1(19)	79.43	4.01	2.518	0.03981
11n/HT40	18.11	18±1(19)	79.43	4.01	2.518	0.03981
11ac/HT20	17.84	17±1(18)	63.10	4.01	2.518	0.03162
11ac/HT40	18.68	18±1(19)	79.43	4.01	2.518	0.03981
11ac/HT80	17.86	17±1(18)	63.10	4.01	2.518	0.03162

$$Pd = \frac{P_{out} * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	CH36	--	--	--	--	--
	CH40	--	--	--	--	--
	CH48	--	--	--	--	--
11n/HT20	CH36	18.61	72.61	4.01	2.518	0.03639
	CH40	17.99	62.95	4.01	2.518	0.03155
	CH48	18.10	64.57	4.01	2.518	0.03236
11n/HT40	CH38	18.11	64.71	4.01	2.518	0.03243
	CH46	17.90	61.66	4.01	2.518	0.03090
11ac/HT20	CH36	17.58	57.28	4.01	2.518	0.02871
	CH40	17.69	58.75	4.01	2.518	0.02944
	CH48	17.84	60.81	4.01	2.518	0.03048
11ac/HT40	CH38	18.68	73.79	4.01	2.518	0.03698
	CH46	18.47	70.31	4.01	2.518	0.03524
11ac/HT80	CH42	17.86	61.09	4.01	2.518	0.03062
$Pd = \frac{P_{out} * G}{4\pi r^2} ;$						
Note:						
Note: The estimation distance is 20cm						
Note:						
PK Output power= conducted power.						
Conducted power see the test report HK1902200283-1E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.						

For 5.8G WIFI ANT. 1:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	16.69	16 ± 1(17)	50.12	1	1.2589	0.01256
11n/HT20	16.57	16 ± 1(17)	50.12	1	1.2589	0.01256
11n/HT40	15.44	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT20	16.66	16 ± 1(17)	50.12	1	1.2589	0.01256
11ac/HT40	15.96	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT80	15.90	15 ± 1(16)	39.81	1	1.2589	0.00998

$$Pd = \frac{Pout * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	CH149	16.63	46.03	1	1.2589	0.01153
	CH157	16.26	42.27	1	1.2589	0.01059
	CH165	16.69	46.67	1	1.2589	0.01169
11n/HT20	CH149	16.34	43.05	1	1.2589	0.01079
	CH157	16.57	45.39	1	1.2589	0.01137
	CH165	16.47	44.36	1	1.2589	0.01112
11n/HT40	CH151	15.44	34.99	1	1.2589	0.00877
	CH159	15.25	33.50	1	1.2589	0.00839
11ac/HT20	CH149	15.93	39.17	1	1.2589	0.00982
	CH157	15.82	38.19	1	1.2589	0.00957
	CH165	15.66	36.81	1	1.2589	0.00922
11ac/HT40	CH151	15.88	38.73	1	1.2589	0.00970
	CH159	15.96	39.45	1	1.2589	0.00988
11ac/HT80	CH155	15.90	38.90	1	1.2589	0.00975
$Pd = \frac{P_{out} * G}{4\pi r^2} ;$						
Note:						
Note: The estimation distance is 20cm						
Note:						
PK Output power= conducted power.						
Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.						

For 5.8G WIFI ANT. 2:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11a	16.67	16 ± 1(17)	50.12	1	1.2589	0.01256
11n/HT20	15.89	15 ± 1(16)	39.81	1	1.2589	0.00998
11n/HT40	14.23	14 ± 1(15)	31.62	1	1.2589	0.00792
11ac/HT20	15.43	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT40	15.81	15 ± 1(16)	39.81	1	1.2589	0.00998
11ac/HT80	14.98	14 ± 1(15)	31.62	1	1.2589	0.00792

$$Pd = \frac{P_{out} * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	CH149	16.44	44.06	1	1.2589	0.01104
	CH157	16.25	42.17	1	1.2589	0.01057
	CH165	16.67	46.45	1	1.2589	0.01164
11n/HT20	CH149	15.62	36.48	1	1.2589	0.00914
	CH157	15.40	34.67	1	1.2589	0.00869
	CH165	15.89	38.82	1	1.2589	0.00973
11n/HT40	CH151	14.12	25.82	1	1.2589	0.00647
	CH159	14.23	26.49	1	1.2589	0.00664
11ac/HT20	CH149	15.43	34.91	1	1.2589	0.00875
	CH157	15.42	34.83	1	1.2589	0.00873
	CH165	15.12	32.51	1	1.2589	0.00815
11ac/HT40	CH151	15.81	38.11	1	1.2589	0.00955
	CH159	15.51	35.56	1	1.2589	0.00891
11ac/HT80	CH155	14.98	31.48	1	1.2589	0.00789
$Pd = \frac{P_{out} * G}{4\pi r^2} ;$						
Note:						
Note: The estimation distance is 20cm						
Note:						
PK Output power= conducted power.						
Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.						

For MIMO:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
11a	--	--	--	--	--	--
11n/HT20	19.20	19 ± 1(20)	100.00	4.01	2.518	0.05012
11n/HT40	17.84	17 ± 1(18)	63.10	4.01	2.518	0.03162
11ac/HT20	18.97	18 ± 1(19)	79.43	4.01	2.518	0.03981
11ac/HT40	18.86	18 ± 1(19)	79.43	4.01	2.518	0.03981
11ac/HT80	18.47	18 ± 1(19)	79.43	4.01	2.518	0.03981

$$Pd = \frac{P_{out} * G}{4\pi r^2} :$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power.

Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
11a	CH36	--	--	--	--	--
	CH40	--	--	--	--	--
	CH48	--	--	--	--	--
11n/HT20	CH36	19.01	79.62	4.01	2.518	0.03990
	CH40	19.03	79.98	4.01	2.518	0.04009
	CH48	19.20	83.18	4.01	2.518	0.04169
11n/HT40	CH38	17.84	60.81	4.01	2.518	0.03048
	CH46	17.78	59.98	4.01	2.518	0.03006
11ac/HT20	CH36	18.70	74.13	4.01	2.518	0.03715
	CH40	18.63	72.95	4.01	2.518	0.03656
	CH48	18.97	78.89	4.01	2.518	0.03954
11ac/HT40	CH38	18.86	76.91	4.01	2.518	0.03855
	CH46	18.75	74.99	4.01	2.518	0.03758
11ac/HT80	CH42	18.47	70.31	4.01	2.518	0.03524
$Pd = \frac{P_{out} * G}{4\pi r^2} ;$						
Note:						
Note: The estimation distance is 20cm						
Note:						
PK Output power= conducted power.						
Conducted power see the test report HK1902200283-3E, The MIMO mode power is max, so only calculate max power mode and antenna port 1 gain=1dBi, antenna port 2 gain=1dBi.						

For ZK-7662 MODULE BT:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
GFSK	3.699	3±1(4)	2.51	1	1.2589	0.00063
π/4DQPSK	2.953	2±1(3)	2.00	1	1.2589	0.00050
8DPSK	3.123	3±1(4)	2.51	1	1.2589	0.00063
$Pd = \frac{P_{out} * G}{4\pi r^2};$						
Note:						
Note: The estimation distance is 20cm						
Note: PK Output power= conducted power. Conducted power see the test report HK1902200283-2E, antenna gain=1dBi.						

Mode	CH	PK Output power(dBm)	Output power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
GFSK	CH00	3.699	2.34	1	1.2589	0.00059
	CH39	3.611	2.30	1	1.2589	0.00058
	CH78	3.880	2.44	1	1.2589	0.00061
π/4DQPSK	CH00	2.734	1.88	1	1.2589	0.00047
	CH39	2.649	1.84	1	1.2589	0.00046
	CH78	2.953	1.97	1	1.2589	0.00049
8DPSK	CH00	2.852	1.93	1	1.2589	0.00048
	CH39	2.803	1.91	1	1.2589	0.00048
	CH78	3.123	2.05	1	1.2589	0.00051
$Pd = \frac{P_{out} * G}{4\pi r^2};$						
Note:						
Note: The estimation distance is 20cm						
Note: PK Output power= conducted power. Conducted power see the test report HK1902200283-2E, antenna gain=1dBi.						

-----The End-----