

FCC RF EXPOSURE REPORT

FCC ID: TVE-24100012

Project No. : 1504C174
Equipment : Wireless Access Point
Model : FORTIAP-C220Cxxxxxx, FAP-C220Cxxxxxx,
FORTIAP-C225Cxxxxxx, FAP-C225Cxxxxxx
Applicant : Fortinet, Inc.
Address : 899 Kifer Road, Sunnyvale, CA 94086 USA
According: : FCC Guidelines for Human Exposure IEEE
C95.1

B T L I N C .

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MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

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

R = distance to the center of radiation of the antenna



Table for Filed Antenna

2.4G

Internal antenna



Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1		RFPCA3806 17NNAB301	PCB	N/A	3.00	2.4G
2		RFPCA3806 20NNAB301	PCB	N/A	4.16	2.4G

External antenna



Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1		RF21S00081A	Dipole	R-SMA	4.30	2.4G
2		RF21S00081A	Dipole	R-SMA	4.30	2.4G

5G

Internal antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
3		RFPCA1610 06NN5B301	PCB	N/A	3.38	5G
4		RFPCA1610 13NN5B301	PCB	N/A	3.08	5G

External antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
3		RF21S00081A	Dipole	R-SMA	4.64	5G
4		RF21S00081A	Dipole	R-SMA	4.64	5G

TEST RESULTS

2.4G Internal antenna

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MODE /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.16	2.6062	17.02	50.3501	0.02611863	1	Complies
4.16	2.6062	17.82	60.5341	0.03140150	1	Complies
4.16	2.6062	17.99	62.9506	0.03265505	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.16	2.6062	21.98	157.7611	0.08183713	1	Complies
4.16	2.6062	21.91	155.2387	0.08052864	1	Complies
4.16	2.6062	22.31	170.2159	0.08829790	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.16	2.6062	22.9	194.9845	0.10114639	1	Complies
4.16	2.6062	23.02	200.4472	0.10398013	1	Complies
4.16	2.6062	22.9	194.9845	0.10114639	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH03, CH06, CH09		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.16	2.6062	23.53	225.4239	0.11693657	1	Complies
4.16	2.6062	23.45	221.3095	0.11480224	1	Complies
4.16	2.6062	23.48	222.8435	0.11559801	1	Complies

2.4G External antenna

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX B MODE /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.3	2.6915	17.97	62.6614	0.03356992	1	Complies
4.3	2.6915	17.89	61.5177	0.03295720	1	Complies
4.3	2.6915	17.69	58.7489	0.03147389	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature :	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX G MODE /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.3	2.6915	22.29	169.4338	0.09077168	1	Complies
4.3	2.6915	22.15	164.0590	0.08789221	1	Complies
4.3	2.6915	22.31	170.2159	0.09119066	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH01, CH06, CH11		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.3	2.6915	22.83	191.8669	0.10278988	1	Complies
4.3	2.6915	22.96	197.6970	0.10591327	1	Complies
4.3	2.6915	20.88	122.4616	0.06560703	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	25 °C	Relative Humidity:	55 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH03, CH06, CH09		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.3	2.6915	23.4	218.7762	0.11720614	1	Complies
4.3	2.6915	23.58	228.0342	0.12216600	1	Complies
4.3	2.6915	23.58	228.0342	0.12216600	1	Complies

Band 1 Internal antenna

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	14.97	31.4051	0.01361289	1	Complies
3.38	2.1777	14.95	31.2608	0.01355035	1	Complies
3.38	2.1777	15.02	31.7687	0.01377052	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.2	33.1131	0.01435325	1	Complies
3.38	2.1777	15.23	33.3426	0.01445275	1	Complies
3.38	2.1777	15.27	33.6512	0.01458648	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.71	37.2392	0.01614174	1	Complies
3.38	2.1777	15.68	36.9828	0.01603062	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	16.18	41.4954	0.01798665	1	Complies
3.38	2.1777	16.16	41.3048	0.01790401	1	Complies
3.38	2.1777	16.12	40.9261	0.01773987	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_ Total /CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	17.24	52.9663	0.02295886	1	Complies
3.38	2.1777	17.3	53.7032	0.02327825	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_ Total /CH42		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.89	38.8150	0.01682482	1	Complies

Band 1 External antenna

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.03	31.8420	0.01844805	1	Complies
4.64	2.9107	15.1	32.3594	0.01874780	1	Complies
4.64	2.9107	15.1	32.3594	0.01874780	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	14.9	30.9030	0.01790401	1	Complies
4.64	2.9107	15.03	31.8420	0.01844805	1	Complies
4.64	2.9107	15.09	32.2849	0.01870468	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.76	37.6704	0.02182480	1	Complies
4.64	2.9107	15.76	37.6704	0.02182480	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE /CH36, CH40, CH48		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	16.85	48.4172	0.02805113	1	Complies
4.64	2.9107	16.82	48.0839	0.02785803	1	Complies
4.64	2.9107	16.75	47.3151	0.02741261	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_ Total /CH38, CH46		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	17.75	59.5662	0.03451043	1	Complies
4.64	2.9107	17.63	57.9429	0.03356992	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_ Total /CH42		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.56	35.9749	0.02084253	1	Complies

Band 4 Internal antenna

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	14.94	31.1889	0.01351918	1	Complies
3.38	2.1777	14.92	31.0456	0.01345707	1	Complies
3.38	2.1777	15.05	31.9890	0.01386597	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.24	33.4195	0.01448606	1	Complies
3.38	2.1777	15.11	32.4340	0.01405887	1	Complies
3.38	2.1777	15.22	33.2660	0.01441951	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.71	37.2392	0.01614174	1	Complies
3.38	2.1777	15.66	36.8129	0.01595697	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	16.11	40.8319	0.01769907	1	Complies
3.38	2.1777	16.06	40.3645	0.01749647	1	Complies
3.38	2.1777	16.11	40.8319	0.01769907	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_ Total /CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	17.14	51.7607	0.02243626	1	Complies
3.38	2.1777	17.32	53.9511	0.02338570	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C220C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_ Total /CH155		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.38	2.1777	15.91	38.9942	0.01690248	1	Complies

Band 4 External antenna

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX A MODE /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.07	32.1366	0.01861874	1	Complies
4.64	2.9107	14.92	31.0456	0.01798665	1	Complies
4.64	2.9107	15.06	32.0627	0.01857592	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-20M MODE_ Total /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.03	31.8420	0.01844805	1	Complies
4.64	2.9107	15.07	32.1366	0.01861874	1	Complies
4.64	2.9107	14.97	31.4051	0.01819493	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX N-40M MODE_ Total /CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.72	37.3250	0.02162471	1	Complies
4.64	2.9107	15.72	37.3250	0.02162471	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC20 MODE /CH149, CH157, CH165		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	16.78	47.6431	0.02760262	1	Complies
4.64	2.9107	16.8	47.8630	0.02773003	1	Complies
4.64	2.9107	16.7	46.7735	0.02709882	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC40 MODE_ Total /CH151, CH159		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	17.69	58.7489	0.03403693	1	Complies
4.64	2.9107	17.73	59.2925	0.03435187	1	Complies

EUT :	Wireless Access Point	Model Name :	FAP-C225C
Temperature:	28 °C	Relative Humidity:	60 %
Test Voltage :	AC 120V/60Hz		
Test Mode :	TX AC80 MODE_ Total /CH155		

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	15.54	35.8096	0.02074676	1	Complies

Note: the calculated distance is 20 cm.

FOR MAXIMUM EIRP

2.4G Only MPE

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.3	2.6915	23.58	228.0342	0.12216600	1	Complies

5G Only MPE

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.64	2.9107	17.73	59.2925	0.03435187	1	Complies

so for 2.4G+5G simultaneous transmission MPE

$$0.1222/1+0.0344/1=0.1566<1$$