



MPE/RF EXPOSURE EVALUATION

FCC CFR 47 Part 1.1310

Report No.: HPEN155-U5_FCC_MPE Rev A

Company: Hewlett Packard Enterprise Company

Evaluation of: ASIN0304



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FROM



Company: Hewlett Packard Enterprise Company

Evaluation of: ASIN0304

To: FCC CFR 47 Part 1.1310

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Calculations for RF Exposure Evaluation

$$\text{Power Density} = P_d (\text{W/m}^2) = \text{EIRP} / (4 \cdot \pi \cdot d^2)$$

$$\text{EIRP} = P \cdot G$$

P = Peak output power (W)

G = Antenna numeric gain (numeric)

d = Separation distance (m)

$$\text{Numeric Gain} = 10^{(G (\text{dBi})/10)}$$

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm²

The calculations in the table below use the highest conducted power values together with the antenna gain specified for the EUT. These calculations represent worst case in terms of the exposure levels.

Antenna gains used in this assessment include Beam Forming Gain (where applicable).

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm ²) @ 20cm	Power Density Limit (mW/cm ²)	Min Calculated safe distance for Limit (cm)
2400.0 - 2483.5 (BLE)	1.9	1.55	6.98	4.99	0.002	1.00	0.78
2400.0 - 2483.5 (Wi-Fi)	5.00	3.16	21.42	138.68	0.087	1.00	5.9
5150.0 - 5250.0	7.30	5.37	21.86	153.46	0.164	1.00	8.1
5250.0 - 5350.0	7.30	5.37	21.92	155.60	0.166	1.00	8.2
5470.0 - 5725.0	7.30	5.37	22.31	170.22	0.182	1.00	8.6
5725.0 - 5850.0	7.30	5.37	21.61	144.88	0.155	1.00	7.9

The ASIN0304 model contains a pre certified LTE radio module FCC ID XMR201906EG21G

Licensed Frequency Bands

MPE measurement results for licensed bands was provided through 3rd Party

Test Report: SGS-CSTC HR/2019/10016E-0102 Date: 7th May 2019

Simultaneous Operation LTE + BLE + Wi-Fi Assessment

Assessment of worst case exposure conditions with the 3 radios transmitting simultaneously.

Freq. Band (MHz)	Ant Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²)	E _i /E _{ref}
2400.0 - 2483.5 (BLE)	1.9	1.55	6.98	4.99	1.00	0.002	0.002
5470.0 - 5725.0	7.30	5.37	22.31	170.22	1.00	0.182	0.182
LTE B13 779.5	4.45	2.79	27.30	537.03	0.520	0.298	0.573
Summation of Ratio:							0.757

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit

Minimum Safe Distance = 0.20 m

Note: for mobile or fixed location transmitters the minimum separation distance is 0.20m, even if calculations indicate the MPE distance to be less.

Specification - RF Exposure Evaluation Limits

The Limit is defined in Table 1 of FCC §1.1310.

Specification - Maximum Permissible Exposure Limits

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500	--	--	f/1500	30
1,500-100,000	--	--	1.0	30

f = frequency in MHz * = Plane-wave equivalent power density



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