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Maximum Permissible Exposure Evaluation

FCC ID: WNA-HP5116

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)

EUT Specification

Product Name:	Set Top Box
Trade Mark:	SKYWORTH, TVUP
Model/Type reference:	HP5116
Listed Model(s):	HPA12
Frequency band (Operating)	☒BT: 2.402GHz ~ 2.480GHz ☒BLE: 2.402GHz ~ 2.480GHz ☒WLAN: 2.412GHz ~ 2.462GHz ☒RLAN: 5.180GHz ~ 5.240GHz ☒RLAN: 5.745GHz ~ 5.825GHz ☐Others
Device category	☐Portable (<20cm separation) ☐Mobile (>20cm separation) ☒fixed (>20cm separation) ☐Others ___
Exposure classification	☐Occupational/Controlled exposure (S=5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☐Single antenna ☒Multiple antennas ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Antenna gain (Max)	4dBi for BT 4dBi for 2.4GHz WIFI Ant 1 3dBi for 2.4GHz WIFI Ant 2 4.5dBi for 5GHz WIFI Ant 1 4.3dBi for 5GHz WIFI Ant 2
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: Pd=(Pout*G)\(4*pi*R^2)
Where
Pd= Power density in mW/cm^2
Pout= output power to antenna in mW
G= gain of antenna in linear scale
Pi= 3.1416
R= distance between observation point and center of the radiator in cm
Pd the limit of MPE 1mW/cm^2. 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

Only show the value of the worst antenna

BLE							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2402	6.00	6±1	7	4	0.00250	1
	2440	6.39	6±1	7	4	0.00250	1
	2480	5.80	6±1	7	4	0.00250	1

BR/ EDR							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
8-DPSK	2402	6.67	6±1	7	4	0.00250	1
	2441	6.83	6±1	7	4	0.00250	1
	2480	6.33	6±1	7	4	0.00250	1

2.4G WIFI							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11 b	2462	17.51	17±1	18	3	0.02505	1
802.11 g	2462	17.02	17±1	18	3	0.02505	1
802.11 n20	2462	19.00	19±1	20	6.52	0.08928	1
802.11 n40	2452	17.70	17±1	18	6.52	0.05633	1

5G WIFI U-NII-1							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11a	5200	16.63	16±1	17	4.5	0.02810	1
802.11 n20	5180	18.10	18±1	19	7.41	0.08704	1
802.11 ac20	5200	18.20	18±1	19	7.41	0.08704	1
802.11 n40	5230	17.10	17±1	18	7.41	0.06914	1
802.11 ac40	5230	17.30	17±1	18	7.41	0.06914	1
802.11 ac80	5210	15.60	15±1	16	7.41	0.04363	1

5G WIFI U-NII-3							
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11a	5745	15.67	15±1	16	4.3	0.02132	1
802.11 n20	5745	17.40	17±1	18	7.41	0.06914	1
802.11 ac20	5745	18.00	18±1	19	7.41	0.08704	1
802.11 n40	5755	18.20	18±1	19	7.41	0.08704	1
802.11 ac40	5755	17.00	17±1	18	7.41	0.06914	1
802.11 ac80	5775	16.30	16±1	17	7.41	0.05492	1

The WLAN or Bluetooth can transmit simultaneously

WLAN Power density at 20cm (mW/cm^2)	BT Power density at 20cm (mW/cm^2)	Total Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
0.08928	0.00250	0.09178	1

Note

For a more detailed features description, please refer to the RF Test Report.

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