



CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel: +86-755- 27521059 Fax: +86-755- 27521011 Http://www.sz-ctc.org.cn

Maximum Permissible Exposure Evaluation

FCC ID: 2A9TGHV50A

IC: 29850-HV50A

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	Android Hybrid TV Box
Trade Mark	Hilton
FCC, IC Model/Type reference:	V5.0A
IC Listed Model(s):	/
FCC Listed Model(s):	V5.1A, V5.2A, V5.3A, V5.4A, V5.5A, V5.6A, V5.7A, V5.8A, V5.9A
Model Different:	All these models are identical in the same PCB, layout and electrical circuit, The difference is model name and appearance color.
Frequency band (Operating)	BT: 2402 MHz ~ 2480MHz WLAN: 2412MHz ~ 2462MHz RLAN: 5180MHz ~ 5240MHz 5260MHz ~ 5320MHz 5500MHz ~ 5700MHz 5745MHz ~ 5825MHz
Device category	☐ Portable (<5mm separation) ☐ Mobile (>20cm separation) ☒ Fixed (>20cm separation) ☐ Others ____
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Antenna gain (Max)	BT: 3.25dBi WLAN Antenna 1, 2 gain: 3.25dBi WLAN Antenna 1 and 2 directional gain: 6.26dBi RLAN Antenna 1, 2 gain: 4.17dBi RLAN Antenna 1 and 2 directional gain: 7.15dBi
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

CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

Http://www.sz-ctc.org.cn



For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn



(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	30
1500-100000	--	--	1	30

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

Where

P_d = Power density in mW/cm^2

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 $1mW/cm^2$. 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.

RF exposure evaluation Limits for IC

RSS-102 Section 5.3.2

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m^2)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000 / f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000 / f^{1.2}$

Note: f is frequency in MHz.



Only show the value of the worst antenna

FCC Measurement Result

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Verdict
BLE	2480	3.25	5.61	6±1	7	0.00211	1.000	PASS
GFSK	2402	3.25	7.76	7±1	8	0.00265	1.000	PASS
802.11b	2412	3.25	17.61	17±1	18	0.02653	1.000	PASS
802.11g	2412	3.25	16.84	17±1	18	0.02653	1.000	PASS
802.11n(HT20)	2412	6.26	15.99	16±1	17	0.04214	1.000	PASS
802.11a	5580	17.16	4.17	17±1	18	0.03279	1.000	PASS
802.11n(HT20)	5700	16.88	7.15	17±1	18	0.06512	1.000	PASS
802.11ac(VHT20)	5180	16.77	7.15	17±1	18	0.06512	1.000	PASS
802.11n(HT40)	5190	17.15	7.15	17±1	18	0.06512	1.000	PASS
802.11ac(VHT40)	5755	16.20	7.15	16±1	17	0.05173	1.000	PASS
802.11ac(VHT80)	5775	16.09	7.15	16±1	17	0.05173	1.000	PASS

The RLAN and BT can transmit simultaneously

RLAN Power density at 20cm (mW/cm ²)	BT Power density at 20cm (mW/cm ²)	Total Power density at 20cm	Limit (mW/cm ²)	Verdict
0.06512	0.00265	0.06777	1	PASS

IC Measurement Result

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power E.I.R.P (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	E.I.R.P (mW) 20cm	Limit (W)	Verdict
BLE	2480	3.25	8.86	9±1	10	10.00	5.35	PASS
GFSK	2402	3.25	11.01	11±1	12	15.85	5.35	PASS
802.11b	2412	3.25	20.86	21±1	22	158.49	5.35	PASS
802.11g	2412	3.25	20.09	20±1	21	125.89	5.35	PASS
802.11n(HT20)	2412	6.26	22.25	22±1	23	199.53	5.35	PASS
802.11a	5580	4.17	21.33	21±1	22	158.49	9.05	PASS
802.11n(HT20)	5700	7.15	24.03	24±1	25	316.23	9.05	PASS
802.11ac(VHT20)	5180	7.15	23.92	24±1	25	316.23	9.05	PASS
802.11n(HT40)	5190	7.15	24.30	24±1	25	316.23	9.05	PASS
802.11ac(VHT40)	5755	7.15	23.35	24±1	25	316.23	9.05	PASS
802.11ac(VHT80)	5775	7.15	23.24	24±1	25	316.23	9.05	PASS



The RLAN and BT can transmit simultaneously

WLAN Power density at 20cm (mW)	BT Power density at 20cm (mW)	Total Power density at 20cm(mW)	Limit	Verdict
316.23	15.85	0.0049	1	PASS

Total E-field strength = ((E-field strength)/ (Limit) + (E-field strength)/ (Limit)...) ≤ 1

Note:

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

*****THE END*****