Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640
Fax: +86-755-26648637
Website: www.cqa-cert.com

Report Template Version: V03
Report Template Revision Date: Mar.1st, 2017

RF Exposure Evaluation Report

Report No. :	CQASZ20181100065E-02
Applicant:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address of Applicant:	No. 01, 2/F, A Plant, Block B, Minsheng Industrial Park, Longmei Road, Gaofeng Community, Dalang Office, Longhua District, Shenzhen, China
Manufacturer:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address of Manufacturer:	No. 01, 2/F, A Plant, Block B, Minsheng Industrial Park, Longmei Road, Gaofeng Community, Dalang Office, Longhua District, Shenzhen, China
Equipment Under Test (EUT):	
Product:	Smart TV BOX
Model No.:	X96 Max
Brand Name:	N/A
FCC ID:	2AI6D-X96MAX
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 KDB447498D01 General RF Exposure Guidance v06
Date of Test:	2018-11-20 to 2018-11-28
Date of Issue:	2018-11-28
Test Result :	**PASS***

Tested By: Daisy Qin

(Daisy Qin)

Reviewed By: Aaron Ma

(Aaron Ma)

Approved By:

(Jack Ai)

SHENZHEN HUAXIA TESTING TECHNOLOGY CO., LTD 华夏准测 APPROVED

* In the configuration tested, the EUT complied with the standards specified above.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20181100065E-02	Rev.01	Initial report	2018-11-28

2 Contents

3 General Information

3.1 Client Information

Applicant:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address of Applicant:	No. 01, 2/F, A Plant, Block B, Minsheng Industrial Park, Longmei Road, Gaofeng Community, Dalang Office, Longhua District, Shenzhen, China
Manufacturer:	SHENZHEN AMEDIATECH TECHNOLOGY CO., LTD
Address of Manufacturer:	No. 01, 2/F, A Plant, Block B, Minsheng Industrial Park, Longmei Road, Gaofeng Community, Dalang Office, Longhua District, Shenzhen, China

3.2 General Description of EUT

Product Name:	Smart TV BOX
Model No.:	X96 Max
Trade Mark:	N/A
Hardware Version:	X96Max_V311
Software Version:	Q5X2 V2.0 / V3.0 / V4.0 / V5.0
Sample Type:	Internal antenna
Power Supply:	Adapater Mode: RSF-DY009-0502000 Input: AC100~240V 50/60Hz 0.4A, Output: DC5V 2A

3.3 General Description of 2.4G WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20/40): OFDM (64QAM, 16QAM,QPSK,BPSK)
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	Internal antenna
Antenna Gain:	ANT1: 1dBi ANT2: 1dBi

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

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 Exposures				
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
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	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
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $Pd = (Pout*G)/(4* Pi * R^2)$

Where

Pd = power density in mW/cm2

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 id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.2 1.1.3 EUT RF Exposure Evaluation

1) For 2.4G WIFI

ANT1:

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.26 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	13.27	13.5±1	14.5	28.184
Middle(2437MHz)	14.28	13.5±1	14.5	28.184
Highest(2462MHz)	13.86	13.5±1	14.5	28.184
802.11g mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	11.83	12±1.0	13	19.953
Middle(2437MHz)	12.85	12±1.0	13	19.953
Highest(2462MHz)	12.44	12±1.0	13	19.953
802.11n(HT20)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	11.79	12±1.0	13	19.953
Middle(2437MHz)	12.95	12±1.0	13	19.953
Highest(2462MHz)	12.28	12±1.0	13	19.953
802.11n(HT40)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	12.25	12±0.5	12.5	17.783
Middle(2437MHz)	12.39	12±0.5	12.5	17.783
Highest(2452MHz)	11.82	12±0.5	12.5	17.783

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
28.184	1	0.0071	1.0	PASS

Note: 1) Refer to report No. CQASZ20181100065E-01 for EUT test Max Conducted average Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(28.184*1.26)/(4*3.1416*20^2)=0.0071$

ANT2:

Antenna Gain: 1dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.26 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	12.03	13±1	14	25.119
Middle(2437MHz)	13.55	13±1	14	25.119
Highest(2462MHz)	13.19	13±1	14	25.119
802.11g mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	10.78	11±1.0	12	15.849
Middle(2437MHz)	11.77	11±1.0	12	15.849
Highest(2462MHz)	11.38	11±1.0	12	15.849
802.11n(HT20)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	10.9	11±1.0	12	15.849
Middle(2437MHz)	11.92	11±1.0	12	15.849
Highest(2462MHz)	11.52	11±1.0	12	15.849
802.11n(HT40)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2422MHz)	10.79	11±1.0	12	15.849
Middle(2437MHz)	10.94	11±1.0	12	15.849
Highest(2452MHz)	11.33	11±1.0	12	15.849

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
25.119	1	0.0063	1.0	PASS

Note: 1) Refer to report No. CQASZ20181100065E-01 for EUT test Max Conducted average Output Power value.

2) $Pd = (Pout*G)/(4* Pi * R^2)=(25.119 *1.26)/(4*3.1416*20^2)=0.0063$