



Maximum Permissible Exposure Evaluation

FCC ID: XVG500106RTBT

IC: 6800A-500106RTBT

1. Client Information

Applicant	:	Amino Communications Ltd
Address	:	1010 Cambourne Business Park, Cambourne, Cambridge, CB23 6DP, United Kingdom.
Manufacturer	:	Shenzhen SDMC Technology Co., Ltd.
Address	:	Room 1022, Floor 10, Building A, Customs Building, No. 2, Xin'an 3rd Road, Dalang Community, Xin'an Street, Bao'an District, Shenzhen, China

2. General Description of EUT

EUT Name	:	IPTV Receiver	
For IC	Model No.	:	AMIGO 7Y
For FCC	Models No.	:	Amigo 7Y, Amigo 7Yzzzzzzzz, AMIGO 7Yzzzzzzzz (zzzzzzzz can be combination of A-Z, a-z, 0-9, "-", "/", "blank" for marketing purpose)
	Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is model name for marketing purpose.
Brand Name	:	AMINO	
Sample ID	:	202302-0069-5-1#&202302-0069-5-2#	
Product Description	:	Operation Frequency:	Bluetooth: 2402MHz~2480MHz U-NII-1: 5180MHz~5240MHz U-NII-2A: 5260MHz~5320MHz U-NII-2C: 5500MHz~5720MHz U-NII-3: 5745MHz~5825MHz 802.11b/g/n(HT20)/ax(HE20)/ n(HT40)/ax(HE40): 2412MHz~2462MHz
Power Rating	:	AC Adapter 1# (Model: SA12BV-120100U SUNUN): Input: 100-240V~50/60Hz, 0.4A Output: 12.0V=1.0A 12W AC Adapter 2# (Model: DCT12W120100US-A0 DACHUAN): Input: 100-240V~50/60Hz, 0.3A Max. Output: 12.0V=1.0A 12W	
Software Version	:	Android 12	
Hardware Version	:	MB.024.B	
Remark	:	The antenna gain provided by the manufacturer, the verified for the RF conduction test provided by TOBY test lab.	

Method of Measurement for FCC

1. Max. Antenna Gain:

Band	Antenna Type	Antenna Gain	
		Antenna 1	Antenna 2
Bluetooth	PCB	0.85	/
2.4G WiFi	PIFA	1.92	2.20
U-NII-1		3.35	3.06
U-NII-2A		3.11	2.33
U-NII-2C		1.97	2.24
U-NII-3		2.26	2.22

2. EUT Operation Condition:

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

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = (PG) / 4\pi R^2$$

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

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



4. Test Result:

Worst MPE Result							
Test Mode	Antenna	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
Bluetooth	/	3.77	3±1	4	0.85	20	0.0006
2.4G b	Ant1	20.69	20±1	21	1.92	20	0.0390
	Ant2	19.24	20±1	21	2.20	20	0.0416
2.4G g	Ant1	18.63	18±1	19	1.92	20	0.0246
	Ant2	16.82	16±1	17	2.20	20	0.0165
2.4G n20	Ant1& Ant2	13.71	14±1	15	5.07	20	0.0202
2.4G n40	Ant1& Ant2	14.29	14±1	15	5.07	20	0.0202
2.4G ax20	Ant1& Ant2	13.80	14±1	15	5.07	20	0.0202
2.4G ax40	Ant1& Ant2	14.12	14±1	15	5.07	20	0.0202
5G a	Ant1	16.73	16±1	17	2.26	20	0.0168
	Ant2	16.17	16±1	17	2.22	20	0.0166
5G n20	Ant1& Ant2	12.65	12±1	13	6.22	20	0.0166
5G n40	Ant1& Ant2	12.35	12±1	13	6.22	20	0.0166
5G ac20	Ant1& Ant2	12.65	12±1	13	6.22	20	0.0166
5G ac40	Ant1& Ant2	12.35	12±1	13	6.22	20	0.0166
5G ac80	Ant1& Ant2	12.72	12±1	13	6.22	20	0.0166
5G ax20	Ant1& Ant2	12.56	12±1	13	6.22	20	0.0166
5G ax40	Ant1& Ant2	12.84	12±1	13	6.22	20	0.0166
5G ax80	Ant1& Ant2	12.93	12±1	13	6.22	20	0.0166

Note: The antenna gain used max. antenna gain



5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For: 2402~2480MHz&2412~2462MHz&5180~5825MHz

MPE limit S: 1mW/ cm²

The MPE is calculated as *0.0416mW / cm² < limit 1mW / cm²*.

6. Summary simultaneous transmission information

Modulation Type	Work Frequency Band	Transmit Antenna		MIMO
		Antenna 1	Antenna 2	
Bluetooth	2.4GHz	Yes	/	/
Bluetooth LE	2.4GHz	Yes	/	/
IEEE 802.11a	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	No
IEEE 802.11b	2.4GHz	Yes	Yes	No
IEEE 802.11g	2.4GHz	Yes	Yes	No
IEEE 802.11n HT20	2.4GHz	Yes	Yes	Yes
IEEE 802.11ax HE20	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT40	2.4GHz	Yes	Yes	Yes
IEEE 802.11ax HE40	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11n HT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT80	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE80	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes



7. Summary simultaneous transmission results

Antenna 1 and Antenna 2 for 2.4G WLAN

Modulation Type	MPE Antenna 1 (mW/cm ²)	MPE Antenna 2 (mW/cm ²)	ΣMPE ratios	Limit	Results
IEEE 802.11b	0.0390	0.0416	/	1.0	PASS
IEEE 802.11g	0.0246	0.0165	/	1.0	PASS
IEEE 802.11n HT20	/	/	0.0202	1.0	PASS
IEEE 802.11n HT40	/	/	0.0202	1.0	PASS
IEEE 802.11ax HE20	/	/	0.0202	1.0	PASS
IEEE 802.11ax HE40	/	/	0.0202	1.0	PASS

Antenna 1 and Antenna 2 for 5G WLAN

Modulation Type	MPE Antenna 1 (mW/cm ²)	MPE Antenna 2 (mW/cm ²)	ΣMPE ratios	Limit	Results
IEEE 802.11a	0.0168	0.0168	/	1.0	PASS
IEEE 802.11n HT20	/	/	0.0166	1.0	PASS
IEEE 802.11n HT40	/	/	0.0166	1.0	PASS
IEEE 802.11ac VHT20	/	/	0.0166	1.0	PASS
IEEE 802.11ac VHT40	/	/	0.0166	1.0	PASS
IEEE 802.11ac VHT80	/	/	0.0166	1.0	PASS
IEEE 802.11ax HE20	/	/	0.0166	1.0	PASS
IEEE 802.11ax HE40	/	/	0.0166	1.0	PASS
IEEE 802.11ax HE80	/	/	0.0166	1.0	PASS

Bluetooth and WiFi support Synchronization transmitter

Maximum MPE ratio	Maximum MPE ratio	ΣMPE ratios	Limit	Results
Bluetooth	WiFi			
0.0006	0.0416	0.0422	1	PASS

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.



Method Of Measurement for IC

1. Applicable Standard

[Radio Standards Specification 102](#), Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body.

[ANSI C95.1-1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

2. Evaluation Method and Limit

According to RSS-102 §4 Table 4, RF Filed Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

Frequency Band	<i>f</i> (MHz)	Limit of Power Density (W/m ²)
2.4G WLAN	2402	5.35
5G WLAN	5180	9.05

Note: Limit=0.02619*f*^{0.6834} (where *f* is in MHz).
The *f* in the limit is the frequency of the lowest Channel.



3. Calculation Formula

Prediction of power density at the distance of the applicable MPE limit:

$$S = \frac{PG}{4\pi R^2} = \text{Power density (in appropriate units, e.g. W/m}^2\text{)}$$

P=power input to antenna (in appropriate units, e.g. W)

G=power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R=distance to the center of radiation of the antenna (in appropriate units, e.g. m)

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



4. Evaluation Results

Worst MPE Result							
Test Mode	Antenna	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ cm ²) [S]
Bluetooth	/	3.77	3±1	4	0.85	0.2	0.006
2.4G b	Ant1	20.69	20±1	21	1.92	0.2	0.390
	Ant2	19.24	20±1	21	2.20	0.2	0.416
2.4G g	Ant1	18.63	18±1	19	1.92	0.2	0.246
	Ant2	16.82	16±1	17	2.20	0.2	0.165
2.4G n20	Ant1& Ant2	13.71	14±1	15	5.07	0.2	0.202
2.4G n40	Ant1& Ant2	14.29	14±1	15	5.07	0.2	0.202
2.4G ax20	Ant1& Ant2	13.80	14±1	15	5.07	0.2	0.202
2.4G ax40	Ant1& Ant2	14.12	14±1	15	5.07	0.2	0.202
5G a	Ant1	16.73	16±1	17	2.26	0.2	0.168
	Ant2	16.17	16±1	17	2.22	0.2	0.166
5G n20	Ant1& Ant2	12.65	12±1	13	6.22	0.2	0.166
5G n40	Ant1& Ant2	12.35	12±1	13	6.22	0.2	0.166
5G ac20	Ant1& Ant2	12.65	12±1	13	6.22	0.2	0.166
5G ac40	Ant1& Ant2	12.35	12±1	13	6.22	0.2	0.166
5G ac80	Ant1& Ant2	12.72	12±1	13	6.22	0.2	0.166
5G ax20	Ant1& Ant2	12.56	12±1	13	6.22	0.2	0.166
5G ax40	Ant1& Ant2	12.84	12±1	13	6.22	0.2	0.166
5G ax80	Ant1& Ant2	12.93	12±1	13	6.22	0.2	0.166

Note: The antenna gain used max. antenna gain



6. Summary simultaneous transmission information

Modulation Type	Work Frequency Band	Transmit Antenna		Antenna 1 Antenna 2 Synchronization Transmit
		Antenna 1	Antenna 2	
Bluetooth	2.4GHz	Yes	/	/
Bluetooth LE	2.4GHz	Yes	/	/
IEEE 802.11a	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	No
IEEE 802.11b	2.4GHz	Yes	Yes	No
IEEE 802.11g	2.4GHz	Yes	Yes	No
IEEE 802.11n HT20	2.4GHz	Yes	Yes	Yes
IEEE 802.11ax HE20	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT40	2.4GHz	Yes	Yes	Yes
IEEE 802.11ax HE40	2.4GHz	Yes	Yes	Yes
IEEE 802.11n HT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11n HT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ac VHT80	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE20	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE40	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes
IEEE 802.11ax HE80	U-NII-1/ U-NII-2A U-NII-2C/ U-NII-3	Yes	Yes	Yes



7. Summary simultaneous transmission results

Antenna 1 and Antenna 2 for 2.4GWLAN

Modulation Type	MPE Antenna 1 (W/m ²)	MPE Antenna 2 (W/m ²)	MPE Antenna 1+2 (W/m ²)	Limit (W/m ²)	ΣMPE Ratios	Results
IEEE 802.11b	0.390	0.416	/	5.35	0.0777	PASS
IEEE 802.11g	0.246	0.165	/	5.35	0.0460	PASS
IEEE 802.11n HT20	/	/	0.202	5.35	0.0378	PASS
IEEE 802.11n HT40	/	/	0.202	5.35	0.0378	PASS
IEEE 802.11ax HE20	/	/	0.202	5.35	0.0378	PASS
IEEE 802.11ax HE40	/	/	0.202	5.35	0.0378	PASS

Antenna 1 and Antenna 2 for 5GWLAN

Modulation Type	MPE Antenna 1 (W/m ²)	MPE Antenna 2 (W/m ²)	MPE Antenna 1+2 (W/m ²)	Limit (W/m ²)	ΣMPE Ratios	Results
IEEE 802.11a	0.168	0.168	/	9.05	0.0186	PASS
IEEE 802.11n HT20	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11n HT40	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ac VHT20	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ac VHT40	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ac VHT80	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ax HE20	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ax HE40	/	/	0.166	9.05	0.0183	PASS
IEEE 802.11ax HE80	/	/	0.166	9.05	0.0183	PASS

Bluetooth and WiFi support Synchronization transmitthe

Maximum MPE ratio Bluetooth	Maximum MPE ratio WiFi	ΣMPE ratios	Limit	Results
0.0011	0.0777	0.0788	1	PASS

Remark:

1. Output power including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

Note

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

-----END OF REPORT-----

