Maximum Permissible Exposure Evaluation

FCC ID:2AKL3-NEOSTICK

1. General Information about EUT

1.1 Client Information

Applicant	:	Shenzhen Junuo Electronics Co., Ltd.
Address	:	Factory Building 401, No. 36, Hezhou Road, Hezhou Community, Hangcheng Street, Baoan District, Shenzhen City, China
Manufacturer	:	Shenzhen Junuo Electronics Co., Ltd.
Address	:	Factory Building 401, No. 36, Hezhou Road, Hezhou Community, Hangcheng Street, Baoan District, Shenzhen City, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Android TV Stick	
Models No.	:	NEO STICK	
Model Different	:	N/A	
Brand Name	:	Mediabox	
Sample ID	:	HC-C-202408-0091-01-01	
Product Description	:	Operation Frequency:	Bluetooth&BLE: 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)/n(HT40): 2412MHz~2462MHz
Power Rating	:	Adapter:(SA68-050100U) Input: 100-240V~, 50/60Hz 0.2A Output: 5V⎓1.0A	
Software Version	:	MB.094.A	
Hardware Version	:	1.8G	
Remark	:	N/A	

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1.3 Antenna Information

Band	Antenna Type	Antenna Gain(dBi)	
		Antenna 1	Antenna 2
Bluetooth	Sheet Steel Antenna	/	2.75
2.4G Wi-Fi		3.29	2.75
U-NII-1		2.88	2.72
U-NII-2A		2.34	2.44
U-NII-2C		3.09	2.64
U-NII-3		3.13	3.23
Remark: The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.			

2. Method of Measurement for FCC

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

2. **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:

∑ of MPE ratios ≤ 1.0

3. Test Result:

Worst MPE Result							
Test Mode	Antenna	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	Max. ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm^2) [S]
Bluetooth	/	6.52	6±1	7	2.75	20	0.00188
2.4G b	Ant1	18.75	18±1	19	3.29	20	0.03371
	Ant2	18.67	18±1	19	2.75	20	0.02977
2.4G g	Ant1	19.54	19±1	20	3.29	20	0.04244
	Ant2	17.46	18±1	19	2.75	20	0.02977
2.4G n20	Ant1	14.81	15±1	16	3.29	20	0.01689
	Ant2	14.57	15±1	16	2.75	20	0.01492
2.4G n40	Ant1	14.67	15±1	16	3.29	20	0.01689
	Ant2	14.26	15±1	16	2.75	20	0.01492
5G a	Ant1	19.33	19±1	20	3.13	20	0.04090
	Ant2	19.21	19±1	20	3.23	20	0.04185
5G n20	Ant1	18.21	18±1	19	3.13	20	0.03249
	Ant2	18.22	18±1	19	3.23	20	0.03325
5G n40	Ant1	18.68	18±1	19	3.13	20	0.03249
	Ant2	18.95	18±1	19	3.23	20	0.03325
5G ac20	Ant1	18.22	18±1	19	3.13	20	0.03249
	Ant2	18.52	18±1	19	3.23	20	0.03325
5G ac40	Ant1	18.13	18±1	19	3.13	20	0.03249
	Ant2	17.80	18±1	19	3.23	20	0.03325
5G ac80	Ant1	18.05	18±1	19	3.13	20	0.03249
	Ant2	17.26	18±1	19	3.23	20	0.03325
Note: The antenna gain used max. antenna gain							

4. 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: $1mW/ cm^2$
The MPE is calculated as ***$0.04185mW / cm^2$ < limit $1mW / cm^2$***.

5. 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 802.11n HT40	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

6. Summary simultaneous transmission results

Antenna 1 and Antenna 2 for 2.4GWLAN& 5GWLAN

Worst Modulation Type	MPE Antenna 1 (mW/cm^2)	MPE Antenna 2 (mW/cm^2)	∑MPE ratios	Limit	Results
IEEE 802.11n HT20	0.01689	0.01492	0.03181	1.0	PASS
IEEE 802.11ac VHT80	0.04090	0.04185	0.08275	1.0	PASS

Bluetooth and WiFi support Synchronization transmitther

Maximum MPE ratio Bluetooth	Maximum MPE ratio WiFi	∑MPE ratios	Limit	Results
0.00188	0.08275	0.08463	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.