Maximum Permissible Exposure Evaluation

FCC ID: *2BHUDAVATTO-SWT60E*

1. Client Information

Applicant	:	Jing Wei Di Chuang (Shenzhen) Smart Co.,Ltd
Address	:	508-510, Building No.36,Yintian Industrial Zone, Yantian Community, Xixiang Street, Baoan District, Shenzhen, China
Manufacturer	:	Jing Wei Di Chuang (Shenzhen) Smart Co.,Ltd
Address	:	508-510, Building No.36,Yintian Industrial Zone, Yantian Community, Xixiang Street, Baoan District, Shenzhen, China

2. General Description of EUT

EUT Name	:	Smart Irrigation Timmer	
Models No.	:	SWT60-US-WIFI, SWT60-EU-WIFI, ZSWT60-US, ZSWT60-EU	
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is that name.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz Bluetooth 5.0(BLE): 2402MHz~2480MHz
Power Rating	:	DC 6V by 1.5V AA battery*4	
Software Version	:	1.0.2	
Hardware Version	:	1.0	
Connecting I/O Port(S)	:	Please refer to the User's Manual	

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MPE Calculations

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

3. **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

4. Test Result:

Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m^2) [S]
802.11b	1	2412	14.21	14±1	15	3	0.2	0.0126
		2437	14.32	14±1	15	3	0.2	0.0126
		2462	14.05	14±1	15	3	0.2	0.0126
802.11g	1	2412	14.47	14±1	15	3	0.2	0.0126
		2437	14.51	15±1	16	3	0.2	0.0158
		2462	14.71	15±1	16	3	0.2	0.0158
802.11 n20	1	2412	14.15	14±1	15	3	0.2	0.0126
		2437	14.53	15±1	16	3	0.2	0.0158
		2462	14.49	14±1	15	3	0.2	0.0126
BLE 1Mbps	1	2402	2.29	2±1	3	3	0.2	0.0008
		2440	2.688	3±1	4	3	0.2	0.0010
		2480	2.188	2±1	3	3	0.2	0.0008
BLE 2Mbps	1	2402	2.295	2±1	3	3	0.2	0.0008
		2440	2.702	3±1	4	3	0.2	0.0010
		2480	2.271	2±1	3	3	0.2	0.0008

Note:
N_{TX}= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Peak Output Power.

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 BLE&WIFI
MPE limit S: 1mW/ cm^2

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.

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