

RF EXPOSURE Test Report

Product: LED COLORFUL SOUND
ATMOSPHERE CLOCK

Trade Mark: -

Model Number: S528

FCC ID: 2BDRX-S528

Prepared for

Dongguan Shuangjun Electronics Co., Ltd

No. 18 Zongdui Road, Dalingshan Town, Dongguan, Guangdong, China

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd

Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan
Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen,
China

Tel.: +86-755-2998 9321 Fax.: +86-755-2998 5110

Website: <http://www.sz-hongbiao.com>

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	DESCRIPTION OF EUT.....	5
1.2	TEST MODE.....	5
1.3	TEST SETUP.....	5
1.4	ANCILLARY EQUIPMENT	6
2	TEST FACILITIES AND ACCREDITATIONS	7
2.1	TEST LABORATORY	7
2.2	ENVIRONMENTAL CONDITIONS.....	7
2.3	MEASUREMENT UNCERTAINTY	7
2.4	TEST SOFTWARE	7
3	LIST OF TEST EQUIPMENT	8
4	RF EXPOSURE	9
4.1	STANDALONE SAR TEST EXCLUSION CONSIDERATIONS.....	9
4.1.1	<i>Limit.....</i>	<i>9</i>
4.1.2	<i>Test Procedures.....</i>	<i>9</i>
4.1.3	<i>Test Result</i>	<i>9</i>

TEST RESULT CERTIFICATION

Applicant's Name..... : Dongguan Shuangjun Electronics Co., Ltd
Address : No. 18 Zongdui Road, Dalingshan Town, Dongguan,
Guangdong, China
Manufacturer's Name : Dongguan Shuangjun Electronics Co., Ltd
Address : No. 18 Zongdui Road, Dalingshan Town, Dongguan,
Guangdong, China

Product description

Product name : LED COLORFUL SOUND ATMOSPHERE CLOCK
Model Number : S528

Standards : FCC CFR 47 PART 1, 1.1310

Test procedure..... : KDB 447498 D01 General RF Exposure Guidance v06

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co.,Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test..... :

Date (s) of performance of tests..... : October 08, 2023~November 23, 2023

Test Result..... : **Pass**

Testing Engineer :

Zoe su
(Z o e S u)

Technical Manager :

Gary Lu
(G a r y L u)

Authorized Signatory :

Leo

(L e o S)



[illegible]

1 General Description

1.1 Description of EUT

Product name:	LED COLORFUL SOUND ATMOSPHERE CLOCK
Model name:	S528
Series Model:	-
Different of series model:	-
Operation frequency:	2402-2480MHz
Modulation type:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Bit Rate of transmitter:	1 Mbps, 2Mbps, 3Mbps
Antenna type:	PCB Antenna
Antenna gain:	0dBi
Max. output power:	-1.75dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	-
Power supply:	DC 12V by adapter
Adapter information:	Model: QL024-1202000U Input: AC 100-240V~50/60Hz, 0.8A Output: DC 12V/2A Model: XY24U30-QC2 Input: AC 100-240V~50/60Hz, 0.6A Output: DC 5V/3A, DC 9V/2.66A, DC 12V/2A

1.2 Test Mode

Pretest Test Mode	Description of Mode
1	TX
2	/
3	/

1.3 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.4 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
/	/	/	/

2 Test Facilities and Accreditations

2.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

2.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

2.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Measurement Frequency Range	U , (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Temperature	± 1 degree	
Humidity	± 5 %	

2.4 Test Software

Software name	Manufacturer	Model	Version
Conducted test system	MWRF-test	MTS 8310	V2.0.0

3 List of Test Equipment

RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaio Signal Generator	Agilent	N5181A	MY47070421	2023-05-11	2024-05-10
2	HB-E042	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW500	132108	2023-05-11	2024-05-10
3	HB-E043	MXG Anaio Signal Generator	Agilent	N5182A	US46240335	2023-05-11	2024-05-10
4	HB-E044	Signal & spectrum Analyzer	R&S	FSV3044	101264	2023-05-11	2024-05-10
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	/	/
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	/	/
7	HB-E077	PXA Signal Analyzer	Agilent	N9030A	N/A	2023-05-11	2024-05-10

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

4 RF Exposure

4.1 Standalone SAR test exclusion considerations

4.1.1 Limit

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).

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

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

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm (20cm)

P_d the limit of MPE, 1mW/cm².

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.

4.1.2 Test Procedures

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

4.1.3 Test Result

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(0/10)}=1$

Chann el Freq. (MHz)	modulatio n	conduce d power	Tune -up powe r (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	(dBi)	Nume ric		
2402	GFSK	-4.44	-4±1	-3	0.50	0.00	1.00	0.0001	1
2441		-4.03	-4±1	-3	0.50	0.00	1.00	0.0001	1
2480		-3	-4±1	-3	0.50	0.00	1.00	0.0001	1
2402	π/4-DQP SK	-3.59	-3±1	-2	0.63	0.00	1.00	0.0001	1
2441		-3.21	-3±1	-2	0.63	0.00	1.00	0.0001	1
2480		-2.19	-3±1	-2	0.63	0.00	1.00	0.0001	1
2402	8DPSK	-3.19	-2±1	-1	0.79	0.00	1.00	0.0002	1
2441		-2.74	-2±1	-1	0.79	0.00	1.00	0.0002	1
2480		-1.75	-2±1	-1	0.79	0.00	1.00	0.0002	1

Conclusion:

For the max result: $0.0002 \leq 1g$ SAR, No SAR is required.

***** END OF REPORT *****