

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-EMC177840 Page: 1 of 24

EMC Test Report

Certificate No. :	TB201227165
Applicant :	Shenzhen Bliston Co., Limited
Equipment Under Test (I	EUT)
EUT Name :	Outdoor Siren
Model No. :	BS-OS359
Series Model No. :	Please see the general description of EUT
Brand Name :	Bliston
Receipt Date :	2020-12-15
Test Date :	2020-12-16 to 2020-12-21
Issue Date :	2020-12-21
Standards :	EN 55032:2015 EN 50130-4:2011+A1:2014
Conclusions :	PASS
	In the configuration tested, the EUT complied with the standards specified above. The EUT technically complies with the 2014/30/EU directive requirements
Test/Witness Engineer	: Reheer Repeca
Engineer Supervisor	- WAN SHE PROV
Approved & Authorized	: fory da' Rawlai*

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-075-3.0



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Revision History

Report No.	Version	Description	Issued Date
TB-EMC177840	Rev.01	Initial issue of report	2020-12-21
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1. General Information

1.1. Client Information

Applicant	:	Shenzhen Bliston Co., Limited
Address	:	4/F, Building 2, Baoke Industrial Park, Langkou, Dalang South Road, Dalang, Longhua, Shenzhen, China (PRC) 518109
Manufacturer	:	Shenzhen Bliston Co., Limited
Address	•	4/F, Building 2, Baoke Industrial Park, Langkou, Dalang South Road, Dalang, Longhua, Shenzhen, China (PRC) 518109

1.2. General Description of EUT (Equipment Under Test)

EUT Name	:	Outdoor Siren
Model(s)	3	BS-OS359, BS-OS357, BS-OS358, BS-OS360, BS-OS361, BS-OS362, BS-OS363, BS-OS364, BS-OS365, BS-OS366, BS-OS367, BS-OS368, BS-OS369, BS-OS370, BS-OS371, BS-OS372, BS-OS373, BS-OS374.
Model Difference	:	All above models are identical in schematic, structure and critical components except for different model number, therefore, EMI and EMS testing was performed with BS-OS359 only.
Brand Name	:	Bliston
Class of EUT		Class A 🛛 Class B
EUT Type	-	Table top Floor standing Combination
Fx		≤108 MHz
Power Supply		DC 12V
Fx: Highest intern	al fr	equency.



1.3. Description of Operating Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Normal Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

	For EMI Test
Final Test Mode	Description
Mode 1	Normal Mode
	For EMS Test
Final Test Mode	Description
Mode 1	Normal Mode

1.4. Block Diagram Showing The Configuration of System Tested

AL OF	DC Power		EUT	OBY	2
	BI				
					B
					au
					TOB
and a	C VO	<u>R</u>		DBJ	

1.5. Description of Support Units

	Ec	quipment Information	n	
Name	Model	S/N	Manufacturer	Used "√"
		<u> </u>	(J)	
			(1)	
	Ca	able Information		
Number	Shielded Type	Ferrite Core	Length	Note
	BU			Frank

1.6. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

1.7. 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 %.

Test	Parameters	Expanded Uncertainty (U _{Lab})	Expanded Uncertainty (U _{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.50 dB ±3.10 dB	$\pm4.0~\mathrm{dB}$ $\pm3.6~\mathrm{dB}$
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	\pm 4.50 dB	\pm 5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB	N/A
Mains Harmonic	Voltage	±3.11%	N/A
Voltage Fluctuations & Flicker	Voltage	±3.25%	N/A

1.8. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation (A2LA) to ISO/IEC 17025 : 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

2. TEST Results Summary

TOBY TOP	EMISSION Image: EMISSION EN 55032:2015)		
Description of test items	Standards	Class	Results
Conducted disturbance at mains terminals	EN 55032: 2015	Class A	- N/A (1)
Conducted disturbance for asymmetric mode	EN 55032: 2015	Class A	– N/A(2)
Conducted differential voltage emission	EN 55032: 2015	Class B	N/A(2)
Radiated Disturbance	EN 55032: 2015	Class A	- Pass
Harmonic current emissions	EN 61000-3-2: 2014	Class A	- N/A (4)
Voltage fluctuation and flicker	EN 61000-3-3: 2013		N/A

(2) Class A: Applicable to wired network ports, optical fibre ports with metallic shield or tension members and antenna ports. Class B: Applicable to wired network ports, optical fibre ports with metallic shield or tension members, broadcast receiver tuner ports and antenna ports. Applicable to ports listed above and intended to connect to cables longer than 3 m.
(3) Class B: Applicable to TV broadcast receiver tuner ports with an accessible connector, RF modulator output ports and FM broadcast receiver tuner ports with an accessible connector.
(4) Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment,

equipment not specified in one of the three other classes. Class D: Equipment having a specified power less than or equal to600 W of the following types: Personal computers and personal computer monitors and television receivers.



IMMUNITY (⊠EN 50130-4: 2011+A1: 2014)				
Description of test items	Standards	Results		
Electrostatic Discharge (ESD)	EN 61000-4-2: 2009	Pass		
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A2:2008+ A2: 2010	Pass		
EFT/B Immunity	EN 61000-4-4: 2012	N/A		
Surge Immunity	EN 61000-4-5: 2014	N/A		
Conducted RF Immunity	EN 61000-4-6: 2014	N/A		
Power frequency magnetic field	EN 61000-4-8: 2010	N/A(1)		
Voltage dips, >95% reduction		1		
Voltage dips, 30% reduction	EN 61000-4-11: 2004	N/A		
Voltage interruptions				

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

4. Test Equipment Used

Radiation Emission Test								
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date			
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 06, 2020	Jul. 05, 2021			
EMI Test Receiver	Rohde & Schwarz	ESCI	100010/007	Jul. 06, 2020	Jul. 05, 2021			
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 01, 2020	Feb. 28, 2022			
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 01, 2020	Feb. 28, 2022			
Pre-amplifier	Sonoma	310N	185903	Mar. 01, 2020	Feb. 28, 2021			
Pre-amplifier	HP	8449B	3008A00849	Mar. 01, 2020	Feb. 28, 2021			
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 01, 2020	Feb. 28, 2021			
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A			
Discharge Ir	nmunity Test	-	-		-			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date			
ESD Tester	TESEQ	NSG437	304	Jul. 07, 2020	Jul. 06, 2021			
Radiated Im	munity Test	-	-	-	-			
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date			
Vector Signal Generator	Agilent	E4438C	US44271917	Jul. 06, 2020	Jul. 05, 2021			
Power meter	Agilent	E4419B	GB40202122	Jul. 06, 2020	Jul. 05, 2021			
Power Sensor	Agilent	E9300A	MY41496625	Jul. 06, 2020	Jul. 05, 2021			
Power Sensor	Agilent	E9300A	MY41496628	Jul. 06, 2020	Jul. 05, 2021			
RF power Amplifier	OPHIR	5225R	1045	Jul. 06, 2020	Jul. 05, 2021			
RF power Amplifier	OPHIR	5273R	1018	Jul. 06, 2020	Jul. 05, 2021			
RF power Amplifier	SKET	HAP_0306G-5 0W	SK20140456	Jul. 06, 2020	Jul. 05, 2021			
Antenna	SCHWARZBECK	STLP9128E-sp ecial	STLP9128E s#139	Jul. 06, 2020	Jul. 05, 2021			
Antenna	SCHWARZBECK	STLP 9149	STLP 9149 #456	Jul. 06, 2020	Jul. 05, 2021			



5. Radiated Emission Test

- 5.1 Test Standard and Limit
- 5.1.1. Test Standard

EN 55032: 2015

5.1.2. Test Limit

	Limit (dBµV	//m) (3m)
Frequency	Quasi-pea	ik Level
-	Class A	Class B
30MHz~230MHz	50	40
230MHz~1000MHz	57	47
Remark: 1. The lower limit shall apply at 2. The test distance is 3m.	the transition frequency.	MOBL - P

Above 1GHz

	Limit (dBµV/m) (3m)						
Frequency (GHz)	Class	s A	Class B				
(0.12)	Peak	Average	Peak	Average			
1~3	76	56	70	50			
3~6	80	60	74	54			
Remark: 1. The lower limit shall apply at 2. The test distance is 3m.	the transition freq	uency.		0032			

5.2. Test Setup

For table top equipment





For floor standing equipment



For combination equipment





5.3. Test Procedure

Measurement was performed according to clause 7.3 of CISPR 16-2-3.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

Highest internal frequency	Highest measured frequency	Measured				
(Fx)	for radiated measurement	Bandwidth				
Fx ≤ 108 MHz	1 GHz	120kHz				
108 MHz < Fx ≤ 500 MHz	2 GHz	1MHz				
500 MHz < Fx ≤ 1 GHz	5 GHz	1MHz				
Fx > 1 GHz	5*Fx up to a maximum of 6 GHz	1MHz				
NOTE 1: For FM and TV broadcast receivers, Fx is determined from the highest frequency generated orused						

excluding the local oscillator and tuned frequencies. **NOTE 2:** For outdoor units of home satell Equipment receiving systems highest measured frequency shall be 18GHz.

5.4. Deviation From Test Standard

No deviation

5.5. Test Data

Please refer to the Attachment A.



6. Electrostatic Discharge Immunity Test

6.1 Test Requirements

6.1.1. Test Standard

EN 50130-4: 2011+A1: 2014 (EN 61000-4-2:2009)

6.1.2. Test Level

Test voltages ^a : Air discharges Contact discharges	2 kV; 4 kV & 8 kV 6 kV
Polarity	+ & -
Number of discharges per point for each voltage and polarity	10
Interval between discharges	≥ 1 s
^a The test voltages specified are the open-circuit voltages. Where the test voltages for the low shall also be satisfied.	ver severity levels are included, they

6.2. Test Setup



INDIRECT DISCHARGE SETUP



6.3. Test Procedure

6.3.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

6.3.2. Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.3.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

6.3.4. Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

6.4. Deviation From Test Standard No deviation

6.5. Test Data

Please refer to the Attachment B.



7. Radiated Electromagnetic Field Immunity Test

- 7.1.Test Requirements
- 7.1.1. Test Standard

EN 50130-4: 2011+A1: 2014 (EN 61000-4-3:2006+A1:2008+A2:2010)

7.1.2. Test Level

Level			Field Strength V/m		
Can	1101	00	1		
	2	0039	3		
	3		10	12	
60	Х	20	Special		

7.2.Test Setup



7.3. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a camera is used to monitor its screen.

All the scanning conditions are as following:



Fr	equency range		80 MHz to 2 700 MHz			
Fi	eld strength ^a		10 V/m			
Modulation: A P		Amplitude modulation ^b Pulse modulation ^{b c}	80 %, 1 kHz, sinusoidal 1 Hz (0,5 s ON : 0,5 s OFF)			
NOTE The upper frequency limit will be reviewed again at the next maintenance cycle due to the development and expected proliferation of higher frequency transmitters. Frequencies up to 6 GHz may be considered.						
а	^a The field strength quoted is the r.m.s. value for the continuous wave, before modulation.					
b	^b See Figure 1.					
٥	For devices defined in 10.2 only.					

7.4. Deviation From Test Standard No deviation

7.5. Test Data

Please refer to the Attachment C.



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8. Photographs - Constructional Details

Photo 1 Appearance of EUT



Photo 2 Appearance of EUT





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9. Photographs - Test Setup

Radiated Emission Test Setup—Below 1G



Electrostatic Discharge Test Setup



TOBY

Attachment A--Radiated Emission Test Data (Below 1G)

Temper	ature:	24.1℃	2		Relative Hu	umidity:	46%	AUS
Pressur	e:	1010	hPa				ARIA .	
Test Vo	Itage:	DC 12	2V	GRI I			y and	A.
Ant. Pol	l	Horizo	ontal		-	39	1	100
Test Mo	de:	Mode	1				21 6	6
Remark	:	51						
80.0 dBu\	//m							
30 1 MA			2	3		EN55032 C	lassB-3M Radiation Margin - E	i dB
-20	40 50	60 70	80	(MHz)		300 400	500 600 700	1000.000
No. I	Mk. Fre	eq.	Reading Level	Correc Factor	t Measure r ment	e- Limit	Over	
	MH	Ηz	dBuV	dB/m	dBuV/m	dBuV/	m dB	Detector
1 *	32.1	795	35.18	-14.57	20.61	40.0	0 -19.39	peak
2	95.42	270	34.22	-21.90	12.32	40.0	0 -27.68	peak
3	178.1	327	34.31	-20.20	14.11	40.0	-25.89	peak
4	291.0	360	33.40	-16.45	16.95	47.0	0 -30.05	peak
5	443.2	943	34.47	-11.99	22.48	47.0	0 -24.52	peak
6	679.9	600	33.73	-7.25	26.48	47.0	0 -20.52	peak

Emission Level= Read Level+ Correct Factor

TOBY

60.44			1								
Temperature	:	24.1	°C		R	elative Hu	umidity	: 46	5%	2	
Pressure:		1010) hPa	-		e	181			5	
Test Voltage	:	DC ²	12V	NU		all	y or	1	117		6
Ant. Pol.		Verti	ical	1				E.F.	1 Prov		1
Test Mode:		Mod	e 1	631		-	16			1	Left.
Remark:			GI	103		ALC A		-			C
80.0 dBuV/m											
30 1 2 X X X X X X X X X X X X X X X X X X	3		4 *******		MMMM	5	EN55	6 Mm X	B-3M Rad Mary	iation gin -6	dB
-20 30.000 40	50	60 70)		(MHz)	:	300 4	00 50	0 600	700	1000.000
No. Mk.	Fre	eq.	Rea Lev	ding /el	Correct Factor	Measure ment	e- Lir	nit	Ove	er	
	MH	Z	dB	uV	dB/m	dBuV/m	ı dB	uV/m	dB		Detector
1 * ;	32.17	795	43.	28	-14.57	28.71	40	0.00	-11.	29	peak
2	37.28	355	39.	25	-17.74	21.51	40	0.00	-18.	49	peak
3	51.12	209	39.	42	-23.17	16.25	40	0.00	-23.	75	peak
4	76.24	42	37.	59	-22.82	14.77	40	0.00	-25.	23	peak
5 2	267.5	455	33.	58	-16.90	16.68	4	7.00	-30.	32	peak
6 5	517.2	480	33.	90	-9.95	23.95	4	7.00	-23.	05	peak

Emission Level= Read Level+ Correct Factor



Attachment B--Electrostatic Discharge Test Data

Temperature : 23.1℃	Humidity	: 41%	
Power supply : DC 12	/ Test Moc	le : Mode 1	BI
Air Discharge: ±2/±4/±8k	V Contact Discharge:±6kV	3 MU	
Location	Test Level (kV)	Judgment	Result
A1	$\pm 2i\lambda(\pm 4i\lambda(\pm 9i\lambda))$	A	
A2	±2KV±4KV±0KV	А	RUDD
C1	±6kV	А	PASS
НСР	±4kV	A	050
			611





Attachment C--RF Field Strength Susceptibility Test Data

Temperature	: 22 °C	TOBY	Humidity	50%	a turn
Power supply	: DC 12V		Test Mode	Mode 1	MOBY
	N IERO		BI C	nob	
Modulation: AM Pulse: 1 kHz	80%	BI	3 TOB	RON	TUSS TOBI
	Ac	tual Perfor	mance Criteri	a	
EUT Position	Frequency 80~270	Range 1: 0MHz	Frequency /	Range 2:	Result
(DB)	Horizontal	Vertical	Horizontal	Vertical	
Front	Α	A			PASS
Right	A	A	1	1	PASS
Rear	Α	A	/		PASS
Left	Α	A		1	PASS
		9 A.			

Note:

There was no change operated with initial operating during the test.

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