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# RF Exposure Evaluation Report

**Report No.:** CQASZ20210901690E-02  
**Applicant:** Halo Properties Ltd.  
**Address of Applicant:** M/F, 19 Gough Street, Central, HK  
**Equipment Under Test (EUT):**  
**Product:** BRIXTON S.T W/BLUETH.SPK-SPL.JET&ACRY  
**Test Model No.:** T-BXN-TS-0001  
**Model No.:** T-BXN-TS-0001  
**Brand Name:** Timothy Oulton  
**FCC ID:** 2A253-TBXNTS0001  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-09-24  
**Date of Test:** 2021-09-24 to 2021-11-23  
**Date of Issue:** 2021-12-23  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:**

*Lewis Zhou*

( Lewis Zhou )

**Reviewed By:**

*Rock Huang*

( Rock Huang )

**Approved By:**

*Jack ai*

( Jack ai )



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20210901690E-02 | Rev.01  | Initial report | 2021-12-23 |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                                                |
|--------------------------|------------------------------------------------------------------------------------------------|
| Applicant:               | Halo Properties Ltd.                                                                           |
| Address of Applicant:    | M/F, 19 Gough Street, Central, HK                                                              |
| Manufacturer:            | DG BLUEMAN TECHNOLOGY CO., LTD                                                                 |
| Address of Manufacturer: | Room 101, No.5, Shunxing Five Road, Dajingtou, Dalang Town, Dongguan City, Guangdong Province  |
| Factory:                 | DG BLUEMAN TECHNOLOGY CO., LTD                                                                 |
| Address of Factory:      | Room 101, No.5, Shunxing Five Road, Dajingtou , Dalang Town, Dongguan City, Guangdong Province |

#### 3.2 General Description of EUT

|                       |                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| Product Name:         | BRIXTON S.T W/BLUETH.SPK-SPL.JET&ACRY                                                                              |
| Test Model No.:       | T-BXN-TS-0001                                                                                                      |
| Model No.:            | T-BXN-TS-0001                                                                                                      |
| Trade Mark:           | Timothy Oulton                                                                                                     |
| EUT Supports Radios : | Bluetooth mode<br>2402-2480MHz                                                                                     |
| Software Version:     | V2.0                                                                                                               |
| Hardware Version:     | V1.0                                                                                                               |
| Sample Type:          | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable <input type="checkbox"/> Fix Location |
| Power Supply:         | INPUT: AC100-240V~50-60HZ / OUTPUT: DC18V 3.5A                                                                     |

#### 3.3 General Description of BT

|                       |                                         |
|-----------------------|-----------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                         |
| Bluetooth Version:    | V5.0                                    |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) |
| Modulation Type:      | GFSK, $\pi$ /4DQPSK, 8DPSK              |
| Number of Channel:    | 79                                      |
| Transfer Rate:        | 1Mbps/2Mbps/3Mbps                       |
| Hopping Channel Type: | Adaptive Frequency Hopping systems      |
| Test Software of EUT: | FCC Tool V2.24                          |
| Antenna Type:         | PCB antenna                             |
| Antenna Gain:         | 0dBi                                    |

### 3.4 Test Environment

| Operating Environment: |           |
|------------------------|-----------|
| Temperature:           | 25.5 °C   |
| Humidity:              | 53 % RH   |
| Atmospheric Pressure:  | 1009 mbar |

## 4 MPE Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Limits

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3–3.0 .....                                                  | 614                           | 1.63                          | *(100)                              | 6                        |
| 3.0–30 .....                                                   | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                        |
| 30–300 .....                                                   | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300–1500 .....                                                 | .....                         | .....                         | f/300                               | 6                        |
| 1500–100,000 .....                                             | .....                         | .....                         | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3–1.34 .....                                                 | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34–30 .....                                                  | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30–300 .....                                                   | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300–1500 .....                                                 | .....                         | .....                         | f/1500                              | 30                       |
| 1500–100,000 .....                                             | .....                         | .....                         | 1.0                                 | 30                       |

F= Frequency in MHz

Friis Formula

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

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$R$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

#### 4.1.2 Test Procedure

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

#### 4.1.3 EUT RF Exposure Evaluation standalone operations

##### 1) For BT Classic

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

##### Measurement Data

| GFSK mode        |                            |                            |                       |      |
|------------------|----------------------------|----------------------------|-----------------------|------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |      |
|                  |                            |                            | (dBm)                 | (mW) |
| Lowest(2402MHz)  | -1.930                     | -2.0±1                     | -1                    | 0.79 |
| Middle(2441MHz)  | -1.070                     | -1.5±1                     | -0.5                  | 0.89 |
| Highest(2480MHz) | -0.670                     | -1.0±1                     | 0                     | 1.0  |
| π/4DQPSK mode    |                            |                            |                       |      |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |      |
|                  |                            |                            | (dBm)                 | (mW) |
| Lowest(2402MHz)  | -1.680                     | -2.0±1                     | -1.0                  | 0.79 |
| Middle(2441MHz)  | -0.930                     | -1.0±1                     | 0                     | 1.0  |
| Highest(2480MHz) | -0.450                     | -0.5±1                     | 0.5                   | 1.12 |
| 8DPSK mode       |                            |                            |                       |      |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |      |
|                  |                            |                            | (dBm)                 | (mW) |
| Lowest(2402MHz)  | -1.390                     | -1.5±1                     | -0.5                  | 0.89 |
| Middle(2441MHz)  | -0.530                     | -0.5±1                     | 0.5                   | 1.12 |
| Highest(2480MHz) | -0.100                     | -0.5±1                     | 0.5                   | 1.12 |

The worst case:

| Maximum tune-up Power<br>(mW) | Antenna Gain<br>(dBi) | Power Density<br>at R = 20 cm<br>(mW/cm <sup>2</sup> ) | Limit | Result |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 1.12                          | 0                     | 0.00022                                                | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20210901690E-01 for EUT test Max Conducted Peak Output Power value.

$$^2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (1.12 * 1) / (4 * 3.1416 * 20^2) = 0.00022 \text{ mW/cm}^2$$

\*\*\* End of Report \*\*\*