# GLF73910 / GLF73911

## Ultra-Efficient, $I_Q$Smart™ Battery Protection IC

**Product Specification**

## DESCRIPTION

The GLF73910 / GLF73911 is an $I_Q$Smart™ ultra-efficient, full battery protection switch with an accurate over charge voltage, over discharge voltage, and short circuit protection for lithium-Ion/Polymer battery safety.

The over charge and discharge voltage protections keep a rechargeable battery working within the desired safe operating condition. When the battery is charged past the over voltage detection level, the GLF73910 / GLF73911 switch opens in a preset delay time.

As the battery voltage decreases below the over discharge detection voltage level, the GLF73910 / GLF73911 switch is turned off immediately to cut off the battery power rail, consuming an ultra-low leakage current ($I_{SD}$) to save the battery. In addition, when the load current reaches the $I_{SC}$ short circuit protection level, the GLF73910 / GLF73911 switch is turned off and will maintain the off state to avoid any serious damage to system. The short circuit delay time avoids any false trigger which might open the switch.

When a charged battery cell is connected, the GLF73910 / GLF73911 remains in the off state and consumes an ultra-low leakage current ($I_{SD}$) until the $V_{ON}$ voltage is applied to VOUT pin. Note that the GLF73910 / GLF73911 is activated only by a $V_{ON}$ voltage from a charger output.

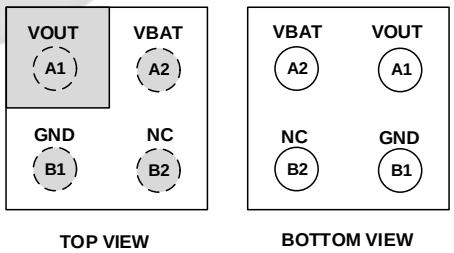
## FEATURES

- Over Charge Detection Voltage, $V_{OC}$
  - 4.35 $V_{BAT}$ : GLF73910-AD01, GLF73911-AD01
  - 4.50 $V_{BAT}$ : GLF73910-BD01
  - Monitor VBAT to release Voc : GLF73910
  - Monitor VOUT to release Voc : GLF73911
- Over Discharge Detection Voltage, $V_{OD}$ : 2.80 $V_{BAT}$
- Load Short Circuit Protection with Delay Time to avoid a false trigger
- Activated by Applying $V_{ON}$ to the VOUT Pin from Charger
- 1.5 A Continuous Charging Current Capability from VOUT to VBAT Pin
- Low $R_{ON}$ : 36 mΩ Typ. @ 3.6 $V_{BAT}$
- Quiescent Current, $I_Q$ = 720 nA Typ @ 3.6 $V_{BAT}$
- Shutdown Current, $I_{SD}$
  - GLF73910: 70 nA Typ @ $V_{BAT}$ < $V_{OD}$
  - GLF73911: 35 nA Typ @ $V_{BAT}$ < $V_{OD}$
- Latch-off at Over Discharge Detection and Short Circuit Protection. Apply $V_{ON}$ to VOUT pin to turn on again
- Near 0 V Battery Charging
  - 0.4 V Minimum Battery Voltage for Charging
- Patent Pending Circuit Architecture
- HBM: 8 kV, CDM: 2 kV
- 0.97 mm x 0.97 mm x 0.55 mm Chip Scale Package 4 Bumps, 0.5 mm Pitch

## APPLICATIONS

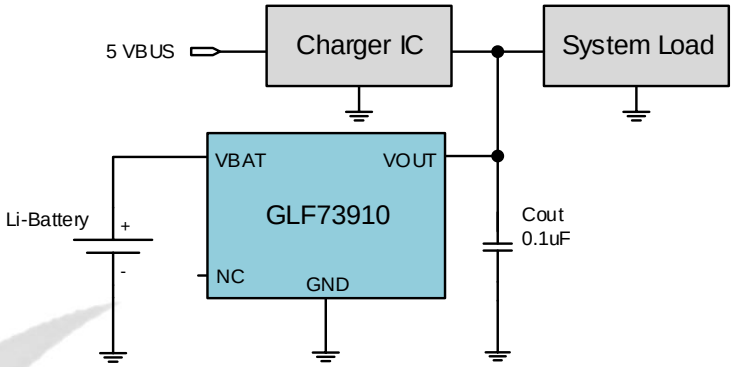
- BLE Wireless Earphone
- Wearables / IoT Devices

## PACKAGE




0.97 mm x 0.97 mm x 0.55 mm WLCSP

## APPLICATION DIAGRAM




Note: The GLF73910 is activated by applying the $V_{ON}$ to the VOUT pin.

## FUNCTIONAL BLOCK DIAGRAM

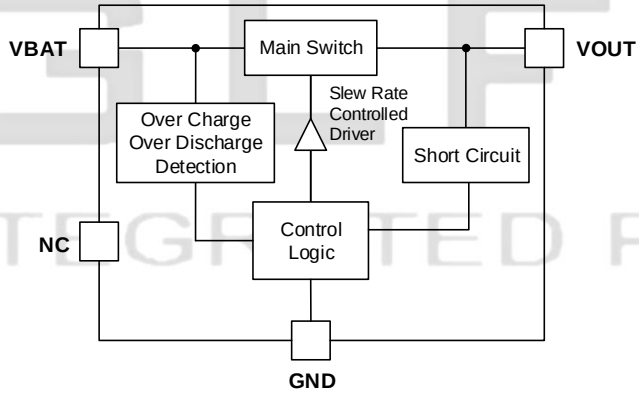
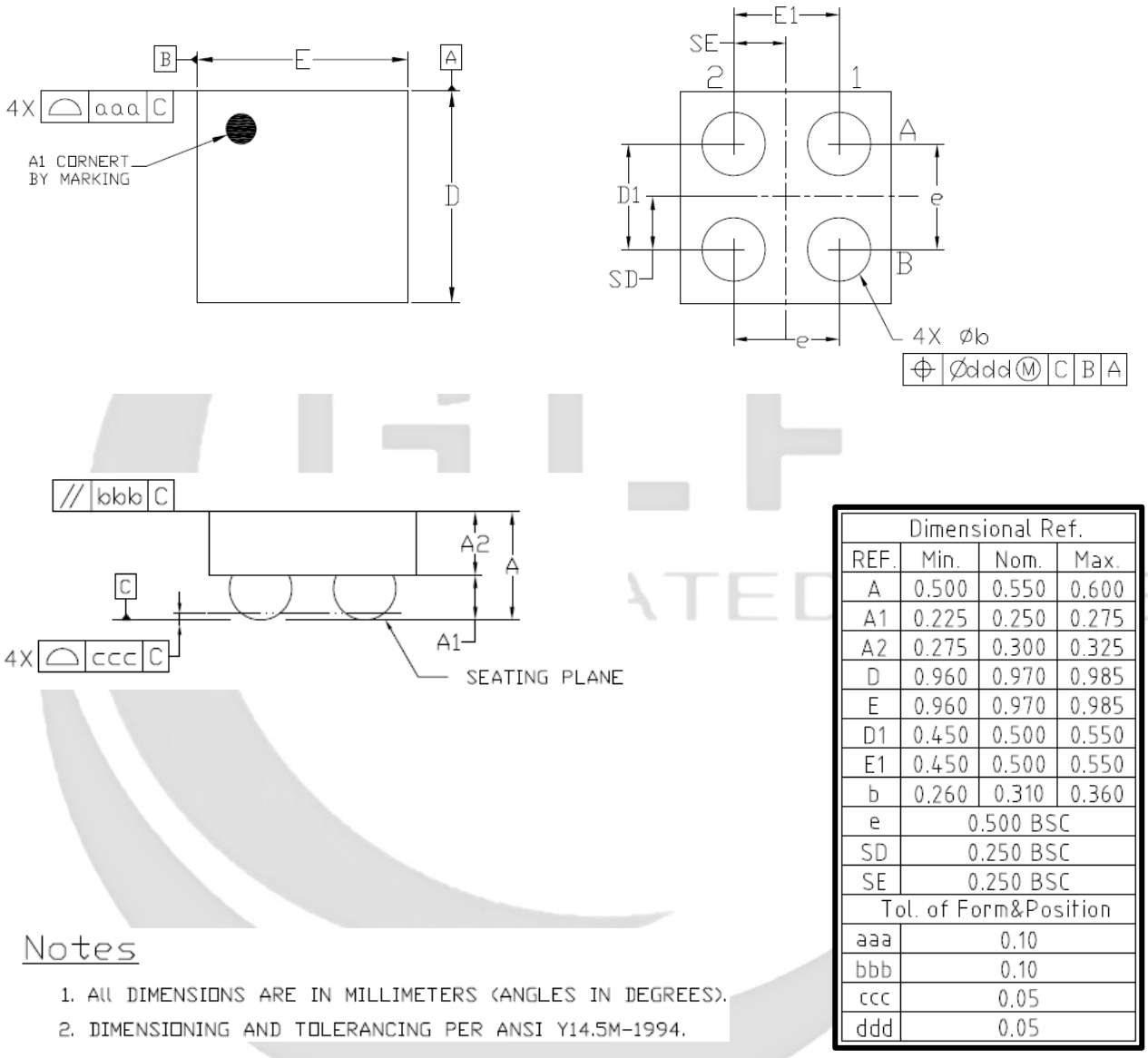



**Figure 1. Functional Block Diagram**

## PACKAGE OUTLINE




| Dimensional Ref. | | | |
|---|---|---|---|
| REF. | Min. | Nom. | Max. |
| A | 0.500 | 0.550 | 0.600 |
| A1 | 0.225 | 0.250 | 0.275 |
| A2 | 0.275 | 0.300 | 0.325 |
| D | 0.960 | 0.970 | 0.985 |
| E | 0.960 | 0.970 | 0.985 |
| D1 | 0.450 | 0.500 | 0.550 |
| E1 | 0.450 | 0.500 | 0.550 |
| b | 0.260 | 0.310 | 0.360 |
| e | 0.500 BSC | | |
| SD | 0.250 BSC | | |
| SE | 0.250 BSC | | |
| Tol. of Form&Position | | | |
| aaa | 0.10 | | |
| bbb | 0.10 | | |
| ccc | 0.05 | | |
| ddd | 0.05 | | |

Notes

1. All DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1994.