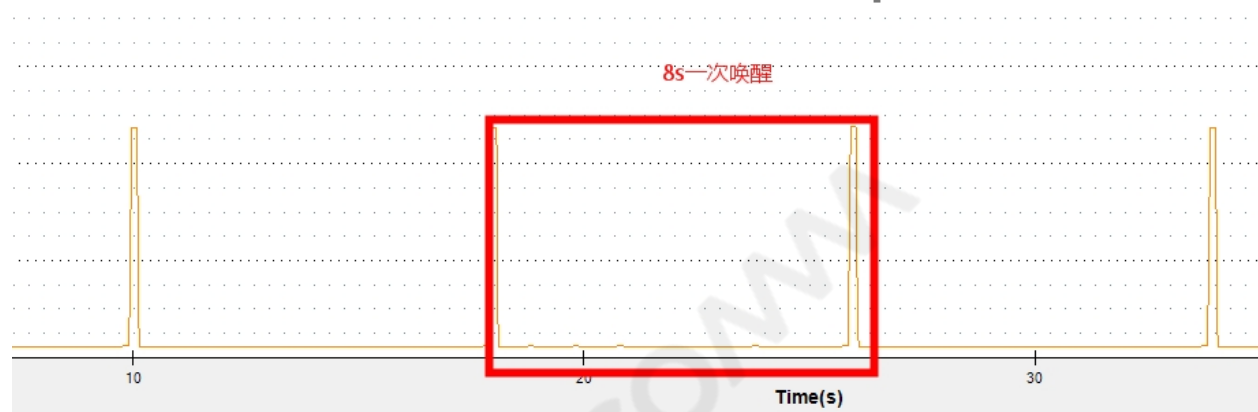


Applicable platform:

SM6150/SM7150/SM8150/SDM660/SDM630/SDM636/SDM632

Issue Description:

After the first time the system boot up, there are many periodical wakeup during standby.

**Issue Analysis:**

This wakeup is caused by fuel gauge ESR sampling. About ESR feature, please refer to DCN80-PF777-74, chapter4.3 Battery ESR.

To guarantee an accurate SoC estimation, the algorithm must rely on a real estimate of the actual ESR. The FG monitors the ESR variation by sampling valid synchronous readings of the battery voltage and current. The data collected is postprocessed to achieve the best estimation of the actual ESR. These pulses are generated every 90 sec and the entire procedure is run exceptionally, not actually affecting the battery lifetime.

The FG algorithm also issues an ESR estimating current pulse each time the battery temperature changes by at least $\pm 6^{\circ}\text{C}$ and in the absence of valid readings. The ESR strongly varies with the cell's temperature.

And in device tree, there is a node to define the ESR sampling rate

```
qcom,fg-esr-timer-chg-fast = <0 7>;  
qcom,fg-esr-timer-dischg-fast = <0 7>;  
qcom,fg-esr-timer-chg-slow = <0 96>;  
qcom,fg-esr-timer-dischg-slow = <0 96>;
```

Here is the description for each configuration, you can tune the sampling interval to reduce the power impact.

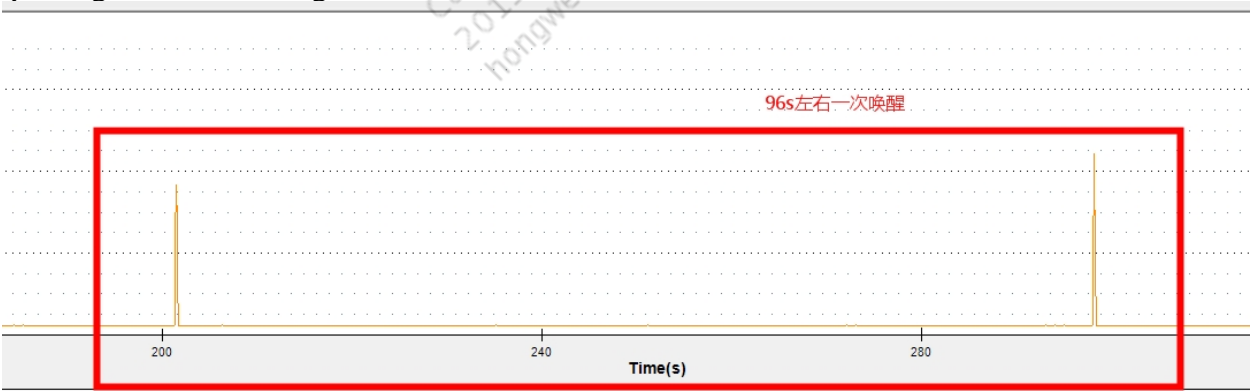
ESR timers

To prevent ESR pulses from consuming power during sleep states, the FG allows the following device tree configurations:

- ESR timing during charging
- Discharging while awake
- Discharging while asleep

<code>qcom,fg-esr-timer-chg-fast = <10 0>;</code>	Number of cycles between ESR pulses when software is in rapid ESR acquisition while the battery is charging.
<code>qcom,fg-esr-timer-dischg-fast = <10 0>;</code>	Number of cycles between ESR pulses when software is in rapid ESR acquisition while the battery is discharging.
<code>qcom,fg-esr-timer-chg-slow</code>	Number of cycles between ESR pulses while the battery is discharging for default calibration. Array of 2 elements if specified.
<code>qcom,fg-esr-timer-dischg-slow</code>	Number of cycles between ESR pulses while the battery is charging for default calibration. Array of 2 elements if specified.

In the first boot up scenario, it's rapid ESR acquisition stage. For example, after tune the interval like `qcom,fg-esr-timer-dischg-fast = <0 96>;`,



Please be cautious, enlarger the sampling interval will impact fuel gauge performance, it's better confirm with PMIC team which value is suitable for your chipset.