BFM mode using TP3606

Steps we follow :

battery freshness seal

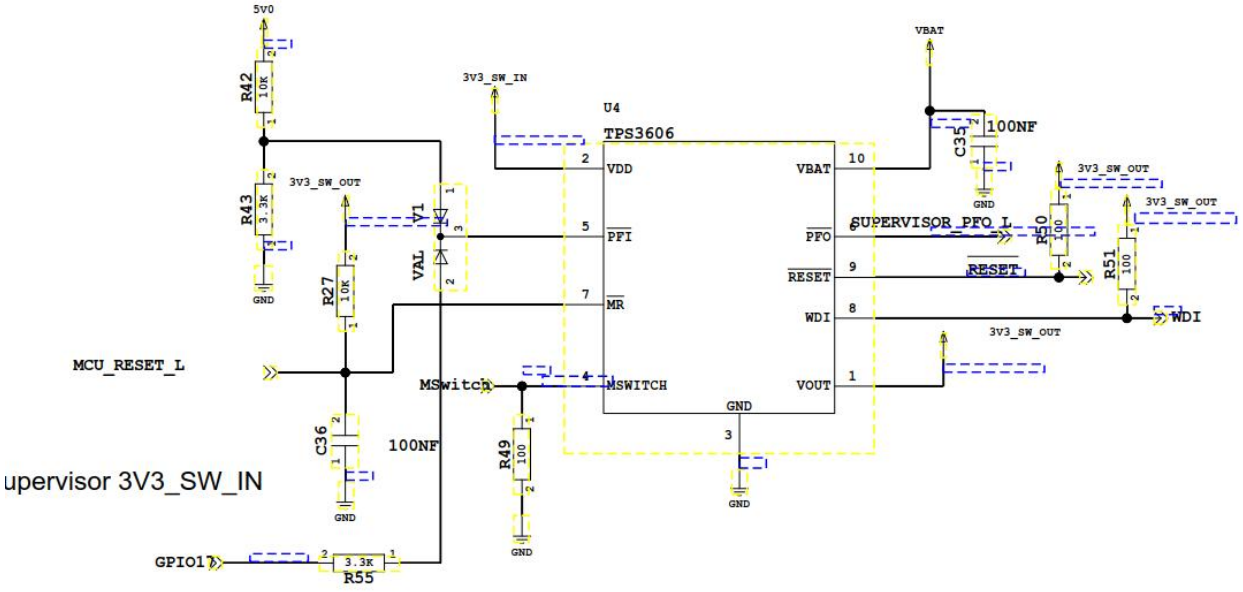
The battery freshness seal of the TPS3606 family disconnects the backup battery from the internal circuitry until it is needed. This ensures that the backup battery connected to V_{BAT} is fresh when the final product is put to use. The following steps explain how to enable the freshness seal mode:

1. Connect V_{BAT} ($V_{BAT} > V_{BAT(min)}$)
2. Ground $\overline{PFO}$
3. Connect PFI to V_{DD} or PFI > $V_{(PFI)}$
4. Connect V_{DD} to power supply ($V_{DD} > V_{IT}$)
5. Ground $\overline{MR}$
6. Power down V_{DD}
7. The freshness seal mode is entered and pins $\overline{PFO}$ and $\overline{MR}$ can be disconnected.

Vbat = 3.6V

Vdd = 3.3V

Schematic :



Details :

The Aux supply is the 5V0.

When this fails PFI signal goes low.

Thus generating the PFO signal.

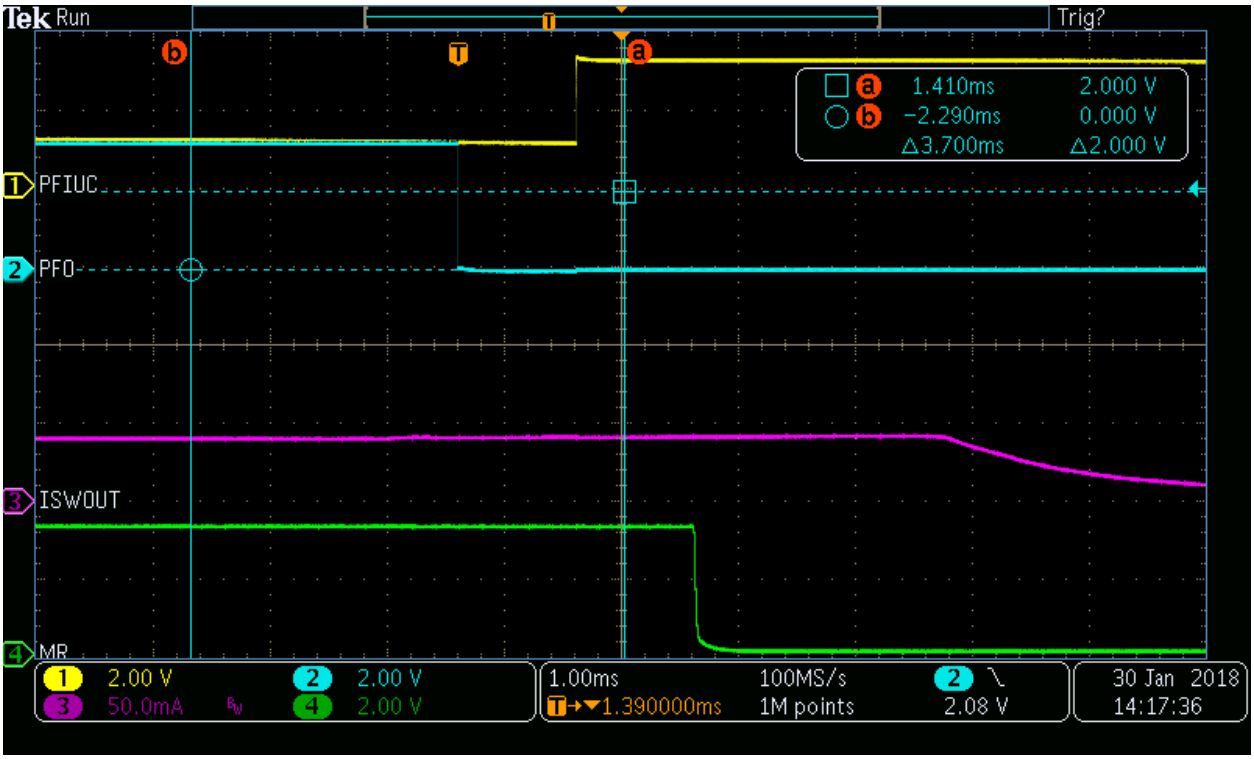
The uC makes PFO pin as output and grounds it.

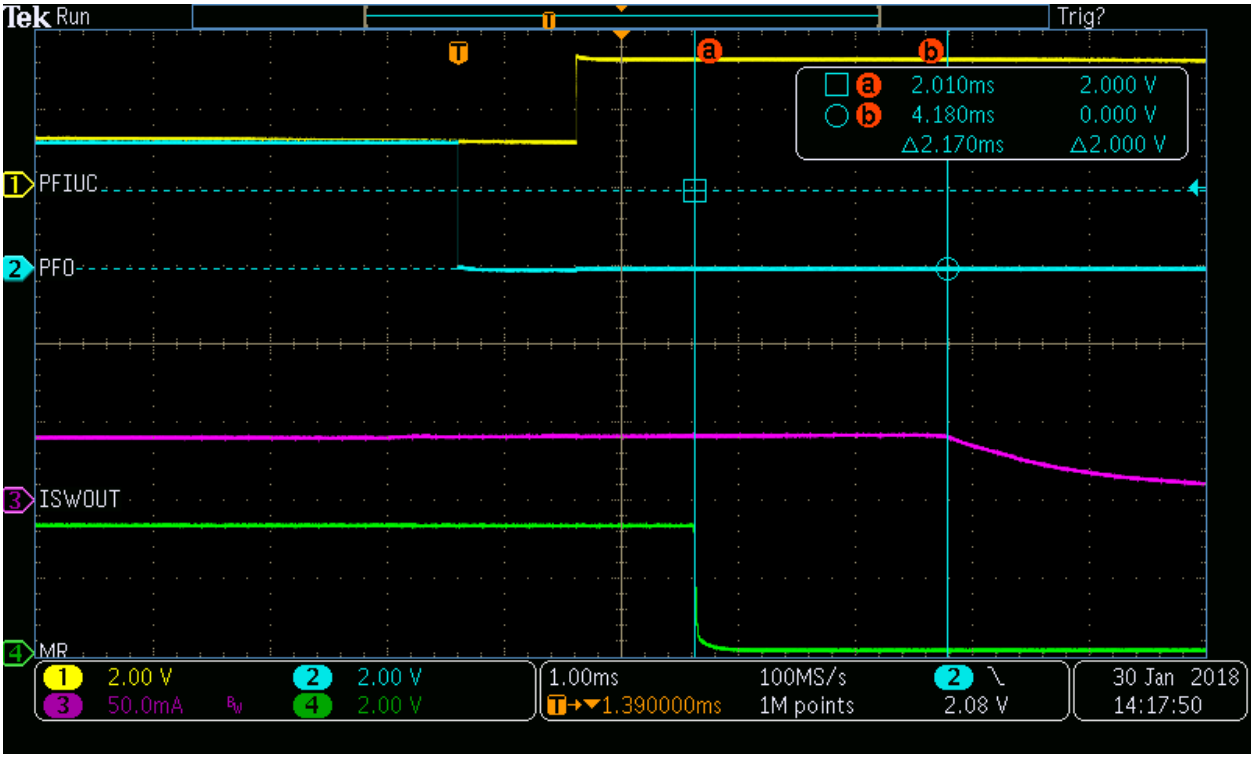
After 1 msec delay the uC generats the GPIO17 to raise PFI to 3.3V.

After 1 msec delay the uC grounds the MR pin.

Results :

With these steps the device goes into BFM mode. To know BFM mode entry we monitor the current on the Vout pin 3v3_SW_out current. We observe elow waveforms.



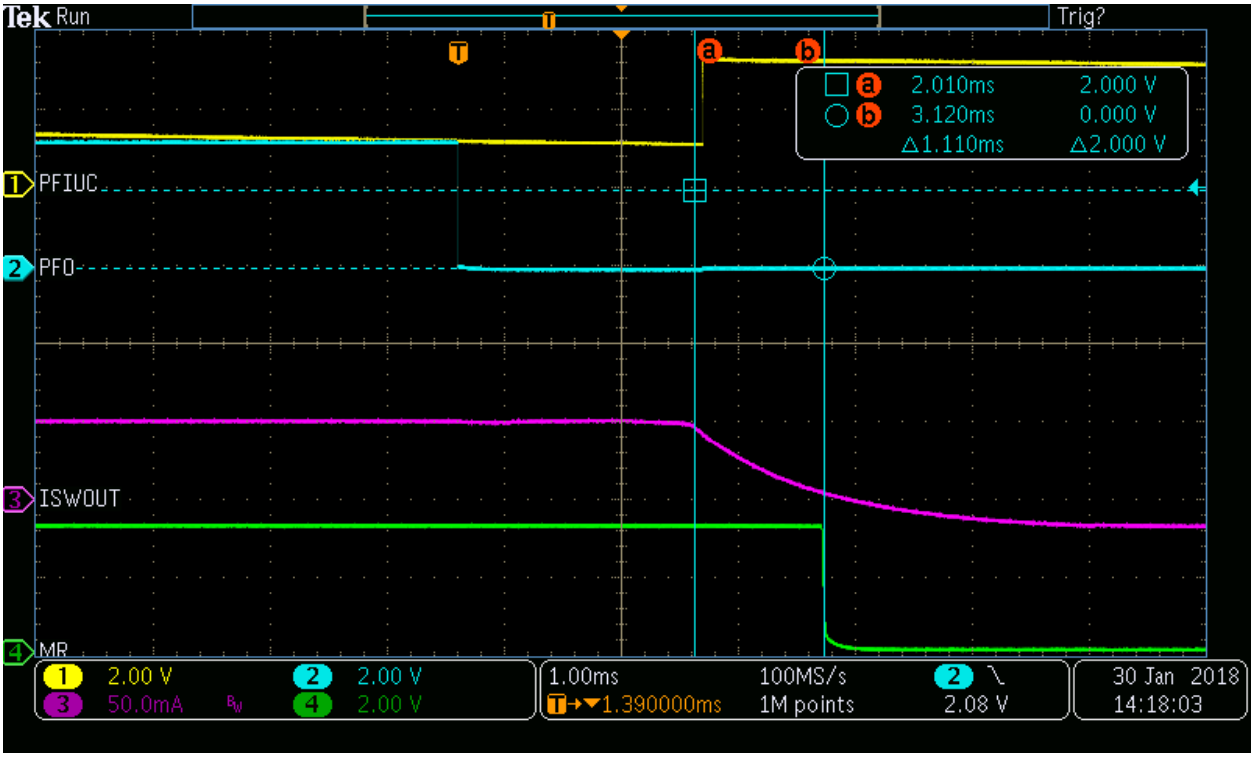


See above wf.

ISWOUT shows a DIP after the last step in which MR goes low.

This is ideal condition.

Query :



See the above wf.

Here the ISWOUT dips below the steady level before the MR goes low. Does this mean the BFM mode is triggered before the MR goes low ?

What is the reason for this?

At what point is the BFM mode actually entered ?

Some more waveforms for your reference :