

CLAIMS

What is claimed is:

1. A method for operating a medical device comprising:

activating a processor in the medical device in a low-power operating mode, the processor receiving electrical power from a battery electrically connected to the medical device;

measuring, with the processor, a first voltage level of the battery;

applying, with the processor, at least one discharge pulse to the battery in response to the first voltage level of the battery being greater than a predetermined passivation minimum voltage threshold and less than a predetermined passivation maximum voltage threshold;

measuring, with the processor, a second voltage level of the battery after the at least one discharge pulse; and

operating the processor in the medical device in an increased-power operating mode to continue operation of the medical device only in response to the second voltage level being greater than or equal to a predetermined operating voltage threshold, the predetermined operating voltage threshold being greater than the predetermined passivation minimum voltage threshold and less than or equal to the predetermined passivation maximum voltage threshold.

2. The method of claim 1 further comprising:

continuing to operate the processor in the low-power mode to generate an error code that is stored in a memory in response to the second voltage level of the battery being less than the predetermined operating voltage threshold and greater than a predetermined minimum voltage threshold, the predetermined minimum voltage threshold being greater than or equal to the passivation minimum voltage threshold; and
deactivating, with the processor, the medical device.

3. The method of claim 2 further comprising:

deactivating, with the processor, the medical device in response to the second voltage level of the battery being less than the predetermined minimum voltage threshold.

4. The method of claim 2 further comprising:

deactivating, with the processor, the medical device in response to the first voltage level of the battery being less than the predetermined passivation minimum voltage threshold.

5. The method of claim 1, the applying of the at least one discharge pulse further comprising:

increasing a clock speed of the processor to operate the processor in the increased-power operating mode for a predetermined period of time to draw electrical current from the battery; and

reducing the clock speed of the processor to operate the processor in the low-power operating mode after the predetermined period of time.

6. The method of claim 1, the applying of the at least one discharge pulse further comprising:

activating, with the processor, at least one peripheral device in the medical device for a predetermined period of time to draw electrical current from the battery; and

deactivating, with the processor, the at least one peripheral device after the predetermined period of time.

7. The method of claim 6, wherein the at least one peripheral device is one or more of a wireless data transceiver, a display screen, and an electromechanical actuator.

8. The method of claim 1, wherein the processor measures the second voltage level of the battery after two discharge pulses.

9. The method of claim 1 further comprising:

operating the processor in the medical device in the increased-power operating mode to continue operation of the medical device to generate a blood glucose measurement.

10. A method for operating a medical device comprising:

activating a processor in the medical device in a low-power operating mode, the processing receiving electrical power from a primary battery electrically connected to the medical device;

measuring, with the processor, a first voltage level of the primary battery;

receiving, with the processor, a second voltage level of a secondary battery electrically connected to the medical device that provides electrical power to at least one peripheral device in the medical device;

increasing a clock speed of the processor to apply at least one discharge pulse to the primary battery in response to the first voltage level of the primary battery being greater than a predetermined passivation minimum voltage threshold and less than a predetermined passivation maximum threshold;

activating, with the processor, the at least one peripheral device in the medical device to apply at least one discharge pulse to the secondary battery in response to the second voltage level of the secondary battery being greater than the predetermined passivation minimum voltage threshold and less than the predetermined passivation maximum threshold;

measuring, with the processor, a third voltage level of the primary battery after the at least one discharge pulse applied to the primary battery;

measuring, with the processor, a fourth voltage level of the secondary battery after the at least one discharge pulse applied to the secondary battery; and

operating the processor in the medical device in the increased-power operating mode and activating the at least one peripheral to continue operation of the medical device only in response to the third voltage level being greater than or equal to a first predetermined operating voltage threshold, the first predetermined operating voltage

threshold being greater than the predetermined passivation minimum voltage threshold and less than or equal to the predetermined passivation maximum voltage threshold, and the fourth voltage level being greater than or equal to a second predetermined operating voltage threshold, the second predetermined operating voltage threshold being greater than the predetermined passivation minimum voltage threshold and less than or equal to the predetermined passivation maximum voltage threshold.

11. The method of claim 10 further comprising:

continuing to operate the processor in the low-power mode to generate an error code that is stored in a memory in response to the third voltage level of the primary battery being less than the first predetermined operating voltage threshold and greater than a first predetermined minimum voltage threshold and the fourth voltage level of the secondary battery being less than the second predetermined operating voltage threshold and greater than a second predetermined minimum voltage threshold; and
deactivating, with the processor, the medical device.

12. The method of claim 10, wherein the applying of the at least one discharge pulse to the primary battery occurs prior to the applying of the at least one discharge pulse to the secondary battery.

13. The method of claim 10, wherein the applying of the at least one discharge pulse to the primary battery occurs concurrently to the applying of the at least one discharge pulse to the secondary battery.

14. The method of claim 11, wherein the first predetermined minimum voltage threshold is equal to the second predetermined minimum voltage threshold and the first predetermined operating voltage threshold is equal to the second predetermined operating voltage.

15. The method of claim 10, wherein a power management integrated circuit (PMIC) measures the second voltage level of the secondary battery and provides the second voltage level to the processor.
16. The method of claim 10, wherein the at least one peripheral device is a wireless data transceiver.
17. The method of claim 10 wherein the at least one peripheral device is a display device.
18. The method of claim 10, wherein the processor measures the third voltage level of the primary battery after applying two discharge pulses to the primary battery.
19. The method of claim 10, wherein the processor measures the fourth voltage level of the secondary battery after applying three discharge pulses to the secondary battery.
20. The method of claim 10 further comprising:
operating the processor in the medical device in the increased-power operating mode and activating the at least one peripheral in the medical device to continue operation of the medical device to generate a blood glucose measurement.