Design Guide: TIDA-010288

AI-Enabled, Wireless ECG Holter Monitor Reference Design for Real-Time Arrhythmia Classification

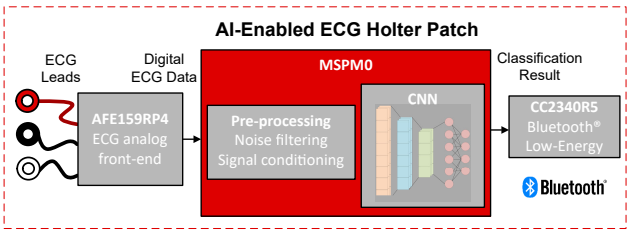
Description

The Edge-AI ready wearable biosensing Holter reference design provides an evaluation platform for TI's latest offerings in continuous monitoring of vital signs such as electrocardiography (ECG), heart rate, respiration, pace pulse, temperature, and motion. The design utilizes the AFE159RP4 for low-power, high-resolution, and highly-integrated ECG signal acquisition with up to 6 leads (4 channels) and the TMP119 for body temperature monitoring. The measured data is processed by the MSPM0 MCU with hardware acceleration for real-time arrhythmia classification, then transferred by the CC2340R5 (with Bluetooth® Low Energy 5.3 support) to a remote terminal such as a smartphone or medical monitoring system for real-time display. The full system can be powered by 2 × CR2032 batteries (3V input) or 1 × AAA battery (1.5V input).

Resources

TIDA-010288	Design Folder
AFE159RP4, MSPM0	Product Folder
CC2340R5, TMP119, TPD1E01B04	Product Folder
TPS62843, TPS61299	Product Folder

Ask the TI E2E™ support experts



Features

- On-device AI hardware accelerator delivers immediate and precise detection of cardiac events
- Advanced, low-power features along with high-resolution recording and transmission only when necessary, enabling extended wear times
- Small, multiparameter, single-chip ECG Holter monitor design for synchronized ECG, respiration, and pace pulse detection
- Ultra-low-power 2.4G Bluetooth® Low Energy 5.3, Arm® Cortex®-M0+ processor supports wireless data transfer
- Highly efficient DC/DC converters support both 2 × CR2032 (3V, 210mAh) coin-cell batteries and 1 × AAA battery (1.5V, 500mAh)
- SimpleLink™ Connect mobile application for real-time ECG, arrhythmia classification, respiration, pace pulse, and temperature display

Applications

- Medical sensor patches
- Electrocardiogram (ECG)
- Wearable fitness and activity monitor

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265