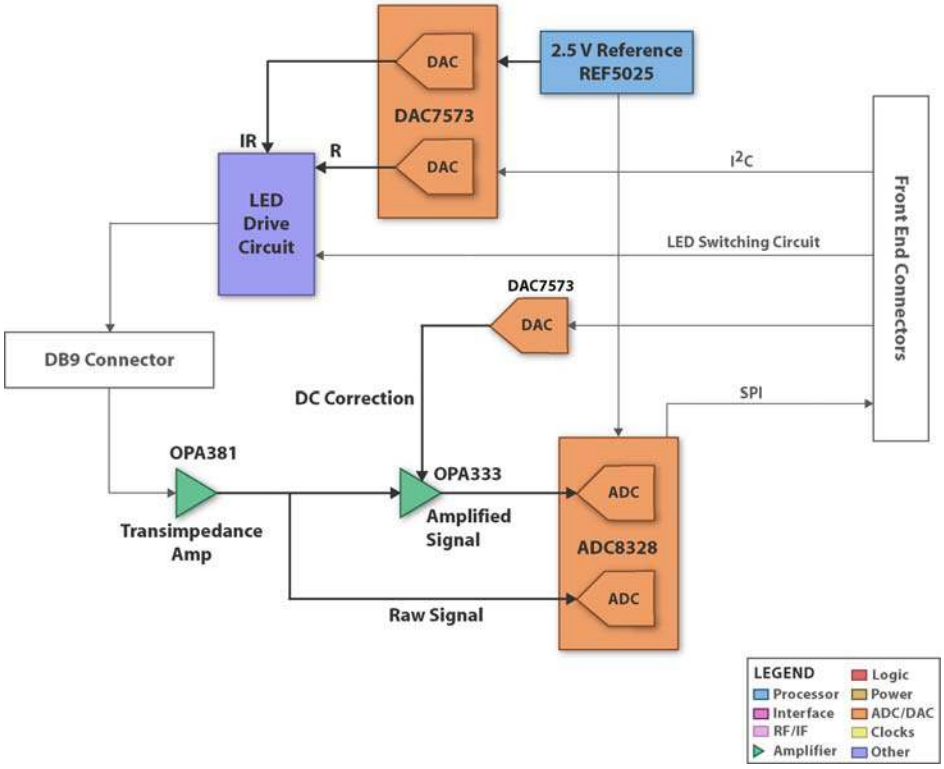
Pulse oximeter (PO or SpO2) analog front end module for the C5505 PO or SpO2 medical development kit

The TMDXMDKPO8328 pulse oximeter (PO or SpO2) analog front end (AFE) module is part of the **PO medical development kit (MDK),** which consists of the PO AFE module, a processor board (C5505 DSP evaluation module), and a set of collateral and application software source code to implement the PO application. The PO MDK delivers a complete signal chain solution to enable PO developers to build a complete PO system quickly for evaluation and get to production faster.



PO MDK features

- Display of oxygen level percentage ranging from zero to 100 percent
- Display of pulse rate, ranging from 20 to 300 pulses per minute
- Real-time display of plethysmogram on PC
- Sensor-off detection
- Common signal conditioning path for red and infrared signal

PO AFE module key components

- ADS8328 low power, 16 bit, 500-ksps, analog-to-digital converter (ADC)
- DAC7573 quad, 12 bit, low power, voltage output digital-to-analog converter (DAC)
- OPA381 precision, low-power, transimpedance amplifier (current to voltage converter)
- REF5025 low-noise, very low-drift, precision voltage reference

The TMDXMDKPO8328 PO AFE module consists of eight TI components including amplification and feedback networks, to process the signal captured from the PO sensor and to control the LED intensity. The ADS8328 is used for data acquisition and to synchronize with the timer to achieve 500 samples per second

per channel. It includes a 2-to-1 input mux with programmable option of TAG bit output and a 16-bit, capacitor-based SAR ADC with inherent sample and hold.

The LED current drive is controlled via the DAC7573 with micropower operation of 600 uA at 5 V Vdd, which meets the needs of portable applications.

To meet the application's high-precision I/V conversion and low-noise signal processing requirements, the OPA381 handles the front end amplification of the nA range input signals, providing a full five decades of dynamic range.

A high-quality reference voltage is essential for achieving the best performance from the ADS8328 and DAC7573. Noise and drift can degrade overall system performance. The REF5025 precision voltage reference provides excellent temperature drift (3ppm/°C), low noise of 3uVpp/V, and 0.05% accuracy.

The PO AFE module can seamlessly connect through standard interface to various processor platforms, such as the C550x EVM or the OMAP35xx Zoom Development Kit.