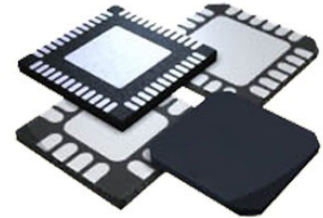


Medical Analog Front-End 40-Pin VQFN EP



Images are for reference only

[Inquiry](#)

Manufacturer: [Texas Instruments, Inc](#)

Package/Case: QFN

Product Type: Data Conversion ICs

RoHS: RoHS Compliant/Lead free 

Lifecycle: Active

General Description

The AFE4490 is a fully-integrated analog front-end (AFE) that is ideally suited for pulse-oximeter applications. The device consists of a low-noise receiver channel with a 22-bit analog-to-digital converter (ADC), an LED transmit section, and diagnostics for sensor and LED fault detection. The device is a very configurable timing controller. This flexibility enables the user to have complete control of the device timing characteristics. To ease clocking requirements and provide a low-jitter clock to the device, an oscillator is also integrated that functions from an external crystal. The device communicates to an external microcontroller or host processor using an SPI interface.

The device is a complete AFE solution packaged in a single, compact VQFN-40 package (6 mm × 6 mm) and is specified over the operating temperature range of -40°C to 85°C.

Key Features

Fully-Integrated Analog Front-End for Pulse Oximeter Applications:
Flexible Pulse Sequencing and Timing Control

Transmit:
Integrated LED Driver (H-Bridge, Push, or Pull)

110-dB Dynamic Range Across Full Range (Enables Low Noise at Low LED Current)

LED Current:
Programmable Ranges of 50 mA, 75 mA, 100 mA, 150 mA, and 200 mA, Each with 8-Bit Current Resolution

Low Power:
100 μ A + Average LED Current

LED On-Time Programmability from (50 μ s + Settle Time) to 4 ms

Independent LED2, LED1 Current Reference

Receive Channel with High Dynamic Range:
Input-Referred Noise: 50 pARMS (at 5- μ A PD Current)

13.5 Noise-Free Bits (at 5- μ A PD Current)

Analog Ambient Cancellation Scheme with Selectable 1- μ A to 10- μ A Ambient Current

Low Power: < 2.3 mW at 3.0-V Supply

Rx Sample Time: 50 μ s to 4 ms

I-V Amplifier with Seven Separate LED2 and LED1 Programmable Feedback R and C Settings

Integrated Digital Ambient Estimation and Subtraction

Integrated Fault Diagnostics:
Photodiode and LED Open and Short Detection

Cable On or Off Detection

Supplies:
Rx = 2.0 V to 3.6 V

Tx = 3.0 V or 5.25 V

Package: Compact VQFN-40 (6 mm \times 6 mm)

Specified Temperature Range: -40°C to 85°C

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Recommended For You

AFE5807ZCF

Texas Instruments, Inc
BGA

AFE1205E

Texas Instruments, Inc
XX

AFE1104E

Texas Instruments, Inc
SSOP

AFE2124E

Texas Instruments, Inc
SSOP48

AFE4300PNR

Texas Instruments, Inc
LQFP80

AFE1103E

Texas Instruments, Inc
SSOP

AFE5818ZBV

Texas Instruments, Inc
BGA

AFE4403YZPT

Texas Instruments, Inc
DSBGA36

AFE4403YZPR

Texas Instruments, Inc
DSBGA36

AFE4404YZPR

Texas Instruments, Inc
DSBGA15

AFE4400RHAT

Texas Instruments, Inc
VQFN40

AFE4405YZR

Texas Instruments, Inc
DSBGA

AFE4404YZPT

Texas Instruments, Inc
DSBGA15

AFE5808AZCF

Texas Instruments, Inc
BGA

AFE5812ZCF

Texas Instruments, Inc
BGA135