

AFE General Purpose 1 ADC 24bit 3.3V/5V 15-Pin DSBGA T/R



Images are for reference only

[Inquiry](#)

Manufacturer: [Texas Instruments, Inc](#)

Package/Case: DSBGA15

Product Type: Data Conversion ICs

RoHS: RoHS Compliant/Lead free 

Lifecycle: Active

General Description

The AFE4404 is an analog front-end (AFE) for optical bio-sensing applications, such as heart-rate monitoring (HRM) and saturation of peripheral capillary oxygen (SpO₂). The device supports three switching light-emitting diodes (LEDs) and a single photodiode. The current from the photodiode is converted into voltage by the transimpedance amplifier (TIA) and digitized using an analog-to-digital converter (ADC). The ADC code can be read out using an I²C interface. The AFE also has a fully-integrated LED driver with a 6-bit current control. The device has a high dynamic range transmit and receive circuitry that helps with the sensing of very small signal levels.

Key Features

Transmitter:

Supports Common Anode LED Configuration

Dynamic Range: 100 dB

6-Bit Programmable LED Current to 50 mA (Extendable to 100 mA)

Programmable LED On-Time

Simultaneous Support of 3 LEDs for Optimized SPO2, HRM, or Multi-Wavelength HRM

Receiver:

24-Bit Representation of the Current Input from a Photodiode in Twos Complement Format

Individual DC Offset Subtraction DAC at TIA Input for Each LED and Ambient Phase

Digital Ambient Subtraction at ADC Output

Programmable Transimpedance Gain:

10 k Ω to 2 M Ω

Dynamic Range: 100 dB

Average Current Less Than 200 μ A for PPG Signal Acquisition

Pulse Frequency: 10 SPS to 1000 SPS

Flexible Pulse Sequencing and Timing Control

Flexible Clock Options:

External Clocking:

4-MHz to 60-MHz Input Clock

Internal Clocking: 4-MHz Oscillator

I²C Interface

Operating Temperature Range: -20°C to 70°C

2.6-mm \times 1.6-mm DSBGA Package, 0.5-mm Pitch

Supplies: Rx: 2 V to 3.6 V, Tx: 3 V to 5.25 V,

IO: 1.8 V to 3.6 V

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

AFE4400RHAT

Texas Instruments, Inc
VQFN40

AFE4490RHAT

Texas Instruments, Inc
QFN

AFE4405YZR

Texas Instruments, Inc
DSBGA

AFE4404YZPT

Texas Instruments, Inc
DSBGA15

AFE5808AZCF

Texas Instruments, Inc
BGA

AFE5812ZCF

Texas Instruments, Inc
BGA135