over Ethernet

802.3af Compliant
Powered Device

MCZ34670

Target Applications

> Access Points
> IP Phones
> IP Cameras

Overview

Power over Ethernet

Power over Ethernet (PoE) is defined by a standard set forth by the Institute of Electrical and Electronics Engineers (IEEE) 802.3af Task Force. The IEEE® standard defines the functional and electrical characteristics of two optional power (non-data) entities, a powered device (PD) and power sourcing equipment (PSE). These entities allow devices to supply or draw power using the same generic cabling as is used for data transmission.

PoE technology is engineered to safely and reliably transmit data and operating power (15W, 48V) over existing Cat5/Cat5e/Cat6 LAN cables. This technology is designed to allow wireless LAN access points, IP phones and IP cameras to safely receive power over standard category 5 LAN cabling without modification to existing infrastructure.

MCZ34670EG Powered Device Solution

Freescale Semiconductor's MCZ34670 is a fully integrated solution that has a powered device interface as well as a pulse width modulator controller. The MCZ34670 is designed for IEEE 802.3af-compliant PoE implementation. The MCZ34670 combines a power interface port for an IEEE 802.3af PD and a high-performance current mode switching regulator needed for implementing end devices.

The MCZ34670 device on the PD side provides comprehensive signature and power classification functions. It controls inrush current limiting and incorporates adjustable under voltage lockout. The switching regulator provides excellent line and load regulation and it drives an external power MOSFET with sense resistor.

The MCZ34670 device is one of many PoE solutions offered by Freescale, where networking equipment manufacturers are able to directly integrate PSE functionality.

Features and Benefits

Powered Device Interface

> IEEE 802.3af compliant and UNH-IOL tested
> Signature detection and classification functionality
> Integrated isolation switch
> Programmable inrush current control
> Adjustable under voltage lockout
> Input voltage range up to 80 volts

Pulse Width Modulator Controller

> Current mode control
> Adjustable oscillator—100 kHz to 400 kHz (default 250 kHz)
> Input overvoltage protection
> Extensive protection circuitry
> Offers an open-drain reset output
> Internal slope compensation circuitry
> 50 percent duty cycle limitation

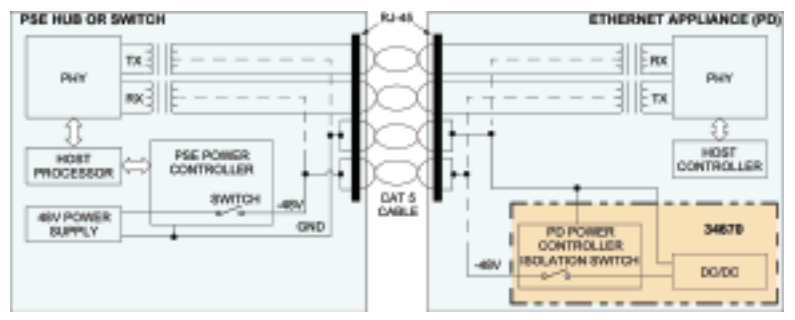
Other Features

> Wide operating temp range from -40°C to +85°C
> SOIC-20 Wide Body
> Restriction of hazardous substances (RoHS) compliant
> Environmentally Preferable Purchasing (EPP)

Power over Ethernet Benefits

> Terminals can be managed, shut down or reset remotely in a centralized matter—no need for a reset button or power switch
> Simplifies installation while saving space
> Saves time and money
> Minimal disruption when positioning to LAN cables
> Designed to safely receive power over standard cables
> Uninterruptible power supply (UPS) guarantees power even during power failures
> In addition to using the data transfer, one can use the SNMP network management infrastructure for monitoring and control
> Simplifies RF survey tasks in wireless LAN systems since the access point can easily be moved

34670 SIMPLIFIED APPLICATION DIAGRAM



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Selector Guide

Orderable Part Number	Function	Temp. Range	Operating Voltage	Regulator Current	Package
MCZ34670EG	IEEE 802.3af, DC-DC	-40°C to +85°C	30V to 60V	5.0V @ 2.1A 3.3V @ 3.5A	SOIC-20 Wide Body

Development Tools

Part Number	Description	Pricing*
KIT34670EGEVBE	Evaluation board to demonstrate the key features of MCZ34670EG > IEEE 802.3af-compliant PD interface > 5V isolated output voltage > Inrush current is adjustable > UVLO adjustable	$115
M52235EVB	ColdFire® microprocessors MCF5223x family showing high-performance embedded design with 10/100 Base-T Ethernet connectivity	$299

*Manufacturer Suggested Resale Price

Documentation

Freescale Document Number	Title	Description
AN3279	MC34670 Usage and Configuration	This application note shows how to configure the MCZ34670 to comply to the IEEE 802.3af standard and how to set up the DC/DC converter part of the IC.

Design Challenges/Development Support

The highly integrated MC34670 powered device, with its combined power interface port and the high-performance pulse width modulator controller, allows use with a minimum of external components. The integration of this powered device contains all of the required IEEE 802.3af functions, as well as all of the functions necessary to build a high-efficiency DC/DC converter.

The setup of the MCZ34670 allows for flexible configuration options. Power sourcing equipment benefits from the powered device signature detection and classification that provides a method for more efficient power allocation. Please see Application Note 3279 for a more detailed explanation along with a table showing required power ranges during normal operation.

Freescale offers many Power over Ethernet solutions in addition to the MCZ34670 powered device. Freescale continues its participation with the IEEE in developing the next IEEE 802.3af standard known as Power over Ethernet Plus.

Learn More: For more information about Freescale products, please visit **www.freescale.com/powermanagement**.

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