# DESIGN OF AUDIO COMMUNICATION USING POWER OVER ETHERNET

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**ABSTRACT:** Power over Ethernet or POE described by any of the electronic systems. The POE transmits data along with electric power on twisted pair Ethernet cabling. Both data connection and electric power are connected in a single cable such as IP cameras and wireless access points. There are many common techniques available for transmitting power to Ethernet. Two of them have been authorized by IEEE. We use only two of the four cables; the power might be passed on the two pairs which is unused. It separates power conductor and data and makes the solution easier. Power might be transferred easily by applying common mode gain voltage. Because it uses differential signaling, this does not interfere with data transmission.

## INTRODUCTION

POE is used for high speed and noise free audio signals. The POE standard is supported by many suppliers of computers and its parts. The major advantage of POE is that easily we can avoid overloading faults, which means a audio voice can be interfered because of noise, we can avoid this fault here. It allows large amounts of data

To transmitted up to 10 times faster than previous one used. It is the one which is more related to many applications, which do not require more data's to be transferred. It is very important to consider that in order to take advantage of the increased bandwidth POE should have enough transmitting signals, otherwise the bandwidth might be reduced.

## WORKING PRINCIPLE

In audio communication there is a problem occurred called cyclic overloading fault, which means due to noise in audio signals the overloading fault occurred in audio communication to avoid this power over Ethernet is used. In broadcast and audio, power over Ethernet is used to distribute real time digital. POE provides the suitable backbone for many audio applications, such as home security solutions, aircraft management through audio and access control panel. POE is popular for its voice and audio internet protocol and also it is famous for high fidelity and low latency which does not use data compression in audio. A POE system uses advanced bit rate and very low latency than voice internet protocol. Power over Ethernet needs a more performance. Performance analysis can be done through the

Local area network and power cables in it, Some POE systems use strict protocols, which reduce overhead and also give more efficiency.

## BLOCK DIAGRAM
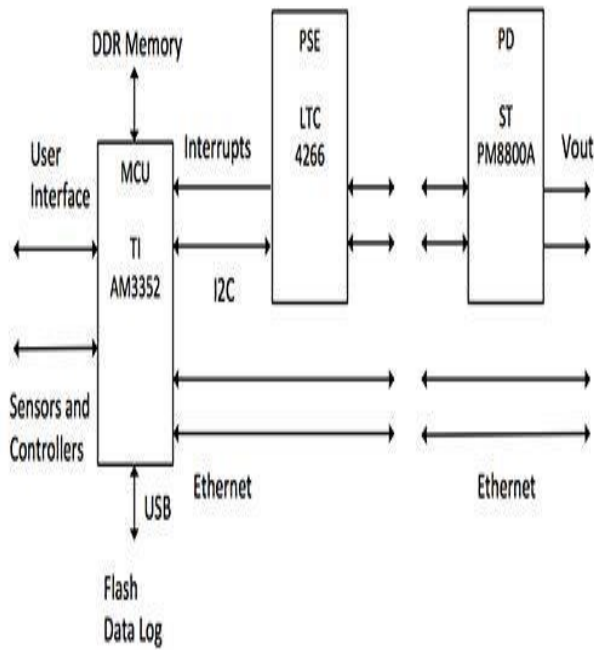


## DESCRIPTION

### TM4C129ENC

The TM4C129ENC is a 120-MHz, high performance MCU with 1MB of on chip flash and 256KB of on-chip SRAM. The MCU features an integrated Ethernet MAC+PHY for connected applications and cryptographic modules of advance encryptions, decryption and authentication. The device has high bandwidth interfaces like a memory controller and a high-speed USB2.0 digital interface. With the integration of many serial communication peripherals, a 12 bit ADC capable of up to 4 MSPS, and motion control peripherals, the device provides a unique solution for a variety of applications ranging from industrial communication equipment to smart energy and smart grid applications.

### TUSB4020BI-Q1

TUSB4020BI-Q1 is another part present in POE. It gives high speed connections to the ports, and during sleep mode the regulator's current is around 40 µA, which is suitable for battery with powered systems. In shutdown mode an ultra low 1µA current, is present, it can increase battery life. This huge adjustable switching frequency range allows either efficiency or external component size to be more efficient. Internal loop compensation helps the user in the difficult task of loop compensation design and it helps more.

The UP is connected to the electrical component that supports only full and low speed connections, then at that situation high speed connectivity is disabled on the DPs.

## LMR14030-Q1

The LMR14030-Q1 is commonly used as a 40V, 3.5A step down regulator with an integrated high side metal oxide semiconductor field effect transistor. Because of its large input range from 4 V to 40 V, the LMR14030-Q1 is applicable for many applications from automotive to industries. It is also used for power management from unregulated power sources. During sleep-mode the regulator's current is around 40 μA, which is suitable for battery with powered systems. In shutdown mode an ultra low 1μA current, is present, it can increase battery life. This huge adjustable switching frequency range allows either efficiency or external component size to be more efficient. Internal loop compensation helps the user in the difficult task of loop compensation design. This feature minimizes the external components of the device also. An accuracy enable input allows generalization of regulator control and also system power sequencing.

## TPD1E05U06

The TPD1E05U06 used here is a unidirectional temporary voltage suppressor based ESD protection diode with ultra low capacitance. It can dissipate ESD strikes above the maximum level as specified by the international standard. This TPD1E05U06's with ultra low loading

Capacitance makes it perfect for shielding any high speed signal pins which used in various applications.

## TPS7A4533

The TPS7A4533 is a 120-MHz, high performance MCU with 1MB of on chip flash and 256KB of on-chip SRAM. The MCU features an integrated Ethernet MAC+PHY for connected applications and cryptographic modules of advance encryptions, decryption and authentication. The device has high bandwidth interfaces like a memory controller and a high-speed USB2.0 digital interface. With the integration of many serial communication peripherals, a 12 bit ADC capable of up to 4 MSPS, and motion control peripherals, the device provides a unique solution for a variety of applications ranging from industrial communication equipment to smart energy and smart grid applications. It can dissipate ESD strikes above the maximum level as specified by the international standard.

### TPS74801-Q1

The TPS74801-Q1 linear regulator provide the ability of easy to use, healthy, power management solution for a large variety of automotive applications. The user programmable starts which used in this circuit to minimize stress on the input power source by dropping the capacitive inrush current on start up. The supple start is monotonic and it is well suited for powering many different types of processors and normally used ASICS. Here they enable input and power good output used, allow easy sequencing with external regulators. This complete flexibility allows the user to bring out a solution that meets the sequencing requirements of applications especially with special start up requirements.

An accuracy reference and an error amplifier used here to deliver about 2% accuracy. The device is even with any type of capacitor whose value is greater than or equal to 2.2 micro farad, and is fully specified. The TPS74801-Q1 is offered in a small dimension of 3-mm × 3-mm SON 10 package, thereby compliant a highly compact, total solution size. It is also available in a dimension of 5 × 5 QFN-20 for compatibility with the TPS74401.

## TPD1E05U06

The TPD1E05U06 is on one occasion of unidirectional transient voltage suppressor based ESD protection diode with ultra low capacitance .separate feature of this TPD1E05U06 is it can dissipate ESD strike above the maximum level specified by the IEC Level 4 international standard. This TPD1E05U06's ultra low loading capacitance is well known property.

## ADVANTAGES

* It has very low electronic noise

* It is easy to repair and diagnose

* Very low in Size

* No complex wirings

* Minimal concern on short circuits and wrong wirings

* No need for further inspection

* Inexpensive

* Reduced overloading fault

* Widely Available

## APPLICATIONS

* Access control panel
* Audio subsystem for cameras
* Home security solutions

## CONCLUSION

This project represents an example for online and offline audio communication. Which avoid the noise and overloading fault and provide the audio efficiently? Thus, it serves as a major concern for audio communication.

## FUTURE WORK

In existing it provides the advantages of cycling-overload fault protection without the constant block diagram of audio communication with the Power over Ethernet solution. We reduce this cyclic-overload fault in our proposed system using power over ethernet.In future we simulate this project for better exchange and playback audioefficiently.

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