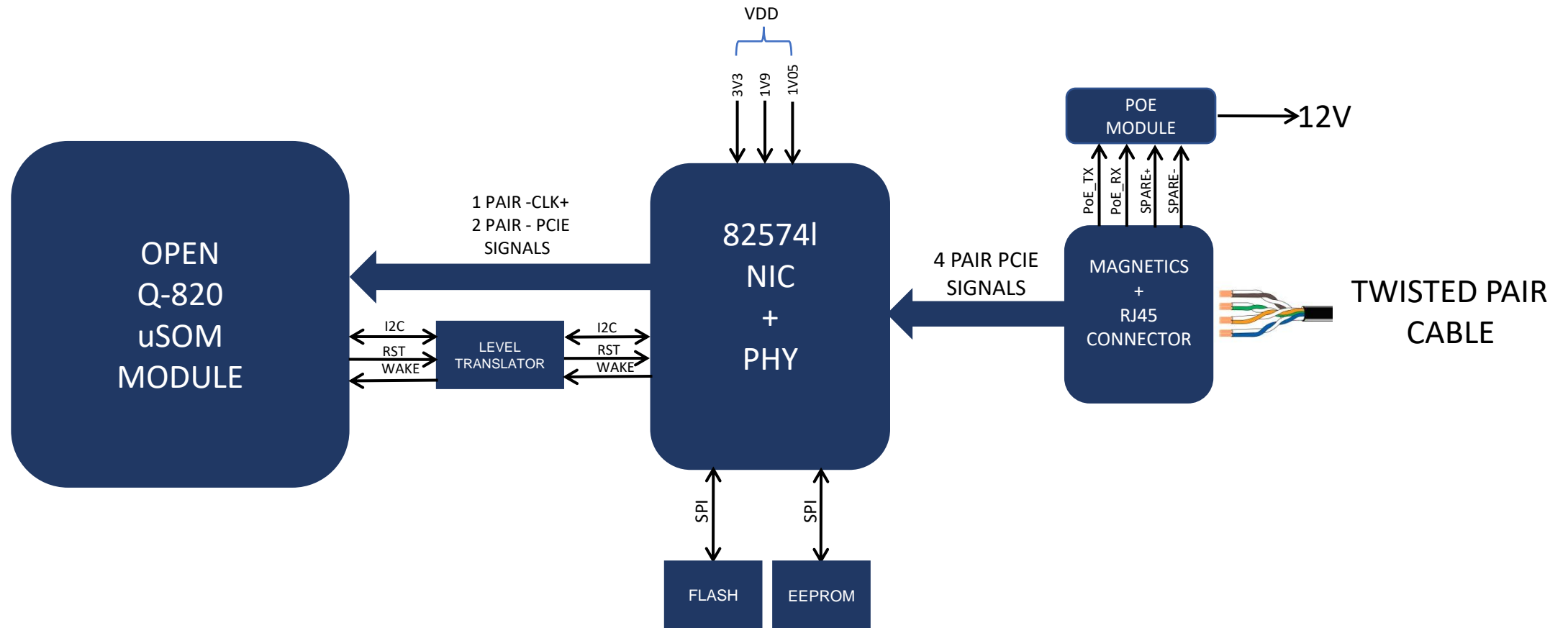




# 82574L NIC CONTROLLER

# BLOCK DIAGRAM



## OPEN Q-820 uSOM

Operating System : Debian GNU/Linux

Kernel release : 3.18.20-g40ad06f-00059-gb9b2e17

Kernel version : #5 SMP PREEMPT Tue Apr 24 15:31:22 CDT 2018

# MAJOR COMPONENTS

- Intel 82574L Gigabit Ethernet controller
- Phy Interface
- Flash Memory

## BRIEF DESCRIPTION

- The carrier board has a SOC Module OPEN Q - 820  $\mu$ SOM that runs on Linux operating system.
- It has a LAN Interface using Intel 82574L Gigabit Ethernet as a Network Controller.
- The Board schematics were implemented based on the Intel's Gigabit CT Desktop Adapter and OPEN -Q 820  $\mu$ SOM development Kit.
- We used the flash IC from Gigabit CT Desktop Adapter as it contained Valuable Data like MAC address for Internet Connectivity.
- CAT5 cable is being used for Connectivity.

## ISSUE FACED

- When running on Linux, We were able to detect the Ethernet chip and Upto 10/100Mbps Speed the Controller was working Well.
- when we tried Pinging 1Gbps from the local host , the Ethernet controller reduced its speed to 10/100 Mbps forcing the SOC to a limited access speed.

## TEST RESULTS

```
amm@AMM:~$ sudo ethtool eth1
Settings for eth1:
    Supported ports: [ TP ]
    Supported link modes:   10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Full
    Supported pause frame use: No
    Supports auto-negotiation: Yes
    Advertised link modes:  10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Full
    Advertised pause frame use: No
    Advertised auto-negotiation: Yes
    Speed: 100Mb/s
    Duplex: Full
    Port: Twisted Pair
    PHYAD: 1
    Transceiver: internal
    Auto-negotiation: on
    MDI-X: on (auto)
    Supports Wake-on: pumbg
    Wake-on: g
    Current message level: 0x00000007 (<?>
                        drv probe link
    Link detected: yes
```

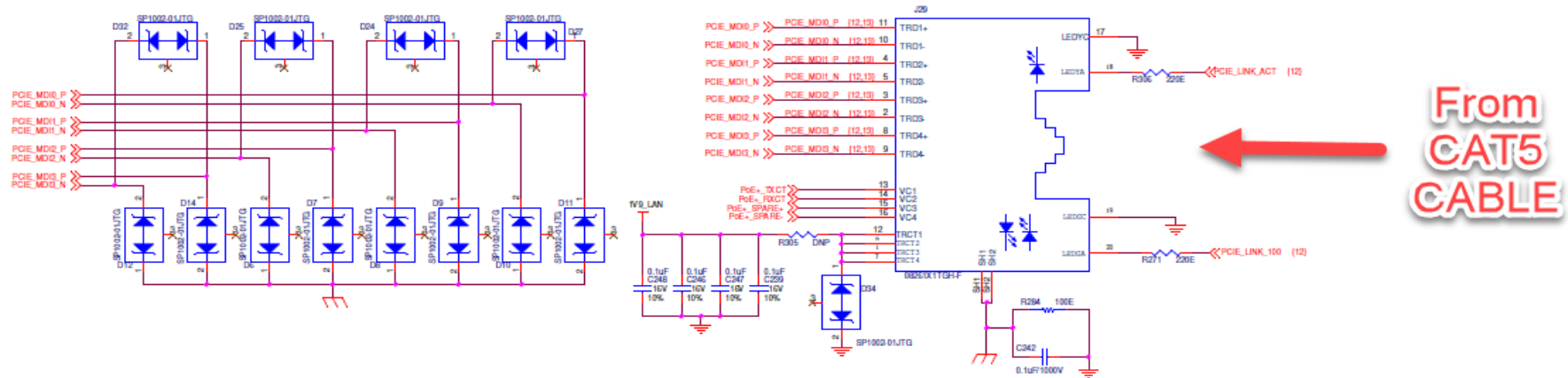
```
amm@AMM:~$ sudo ethtool -s eth1 speed 1000
Cannot advertise speed 1000
```

### NOTE :

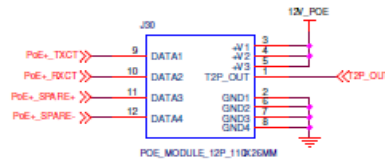
- The speed is reduced to 100Mb/s under Full duplex.  
Command : sudo ethtool eth1
- Command : sudo ethtool -s eth1 speed 1000  
forces the controller to switch to 1Gbps

# NIC to uSOM Schematics

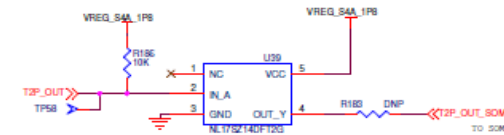
## PHY INTERFACE



## POE MODULE



## LOGIC INVERTER

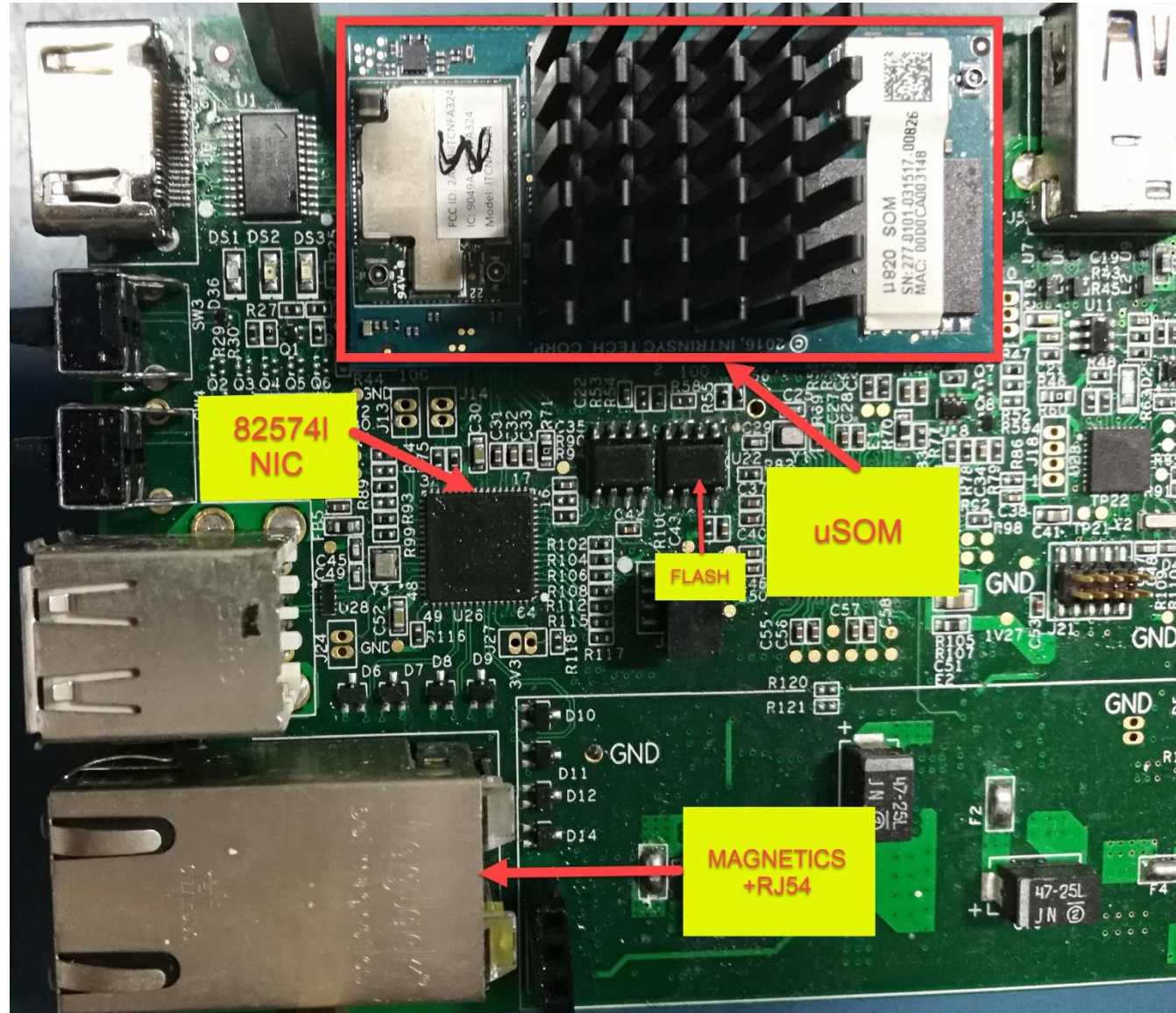




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# PCIE SECTION



# PCIE COMPONENTS

- **Intel 82574I gbe controller**
- Flash IC - SST25VF040B-50-4I-SAF
- EEPROM IC - CAT25320VI-GT3
- PHY CONNECTOR - 08261X1TGH-F
- CAT5 CABLE