# DP83848J debug Status

Gary

2022-0823

Background

- product : Ethernet controller
module for camera 。fast Ethernet 100M。
- We design DP83848J and mass production
 since 2021 Aug。 Total shipping > 8K pcs。
- But problem happens from 2022 May, the failure rate is around 10% (shipping 1500 with 150 pcs failure)，2022 May Lot。
- We don't change design since mass production 2021 AUG。
- The error symptom is when cable Plug in , LED wrong light， PC can not PING it 。(we use computer to test it)
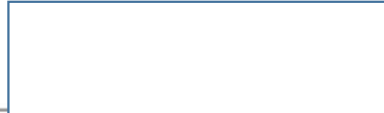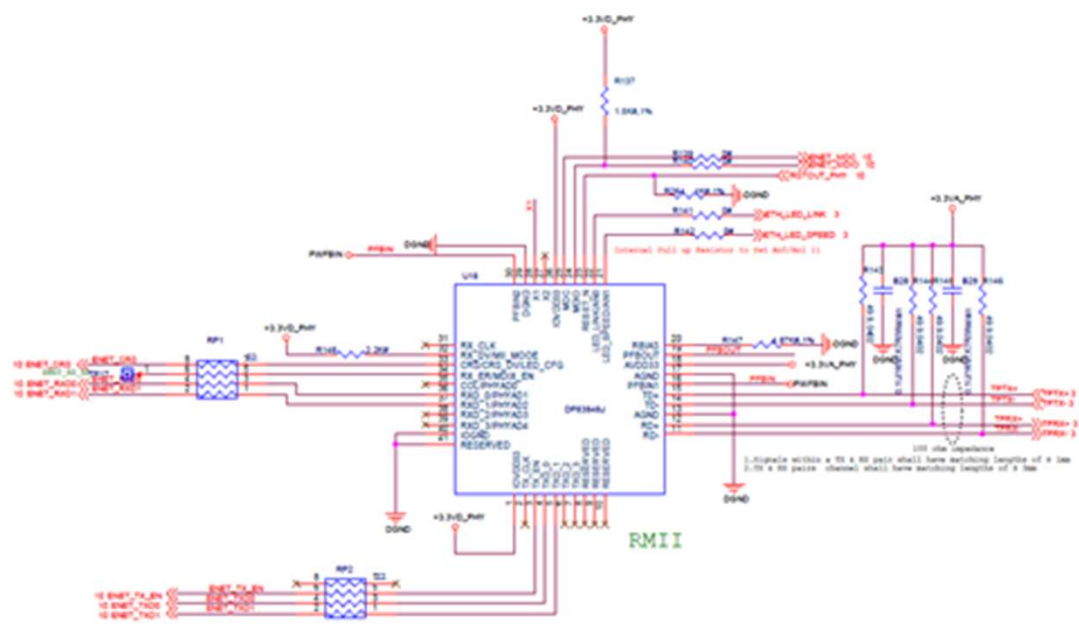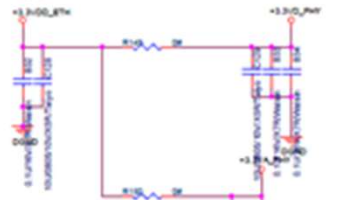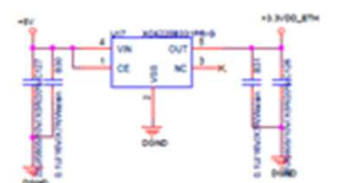- Schematics in Page 5, 6
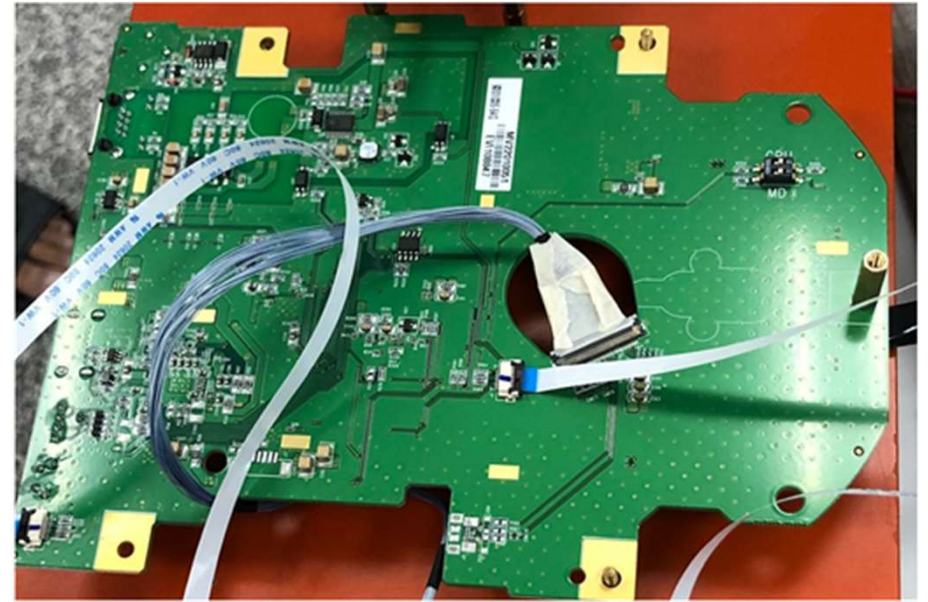
Some observations

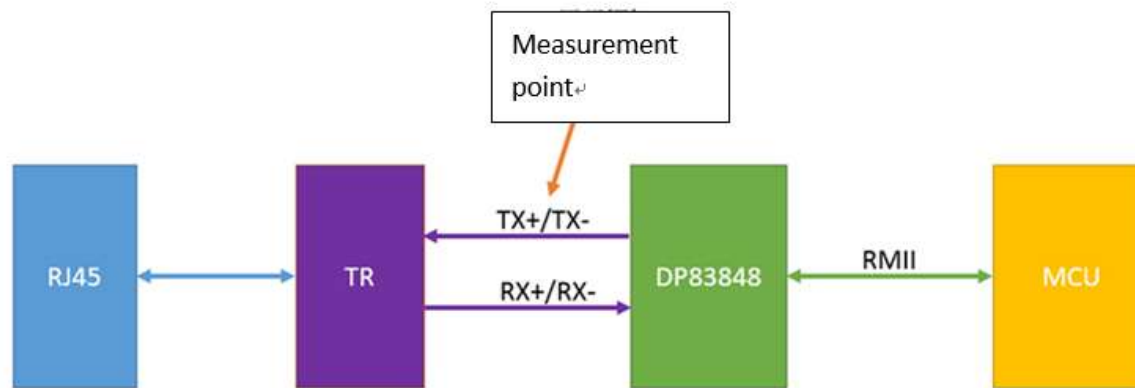- Same computer but different POE switch, NG board can become OK。

- We read the OK and NG board PHY registers and find most likely problem happens in auto negotiation。See page 9,10

- We test NG PHY with BIST function and find it is OK no problem。It seems the digital portion circuit is OK in PHY。

- OK board waveform swing > 1000mv, NG board waveform swing ~950mv

    see page 8

- Auto negotiation fails, the PHY TX signal becomes unipolar not differential and the pulse frequency is around 1 sec。 What does it mean ? See page 7

- We test the same board 6 times, sometimes 1-2 times OK, 4-5 times NG。It seems a unstable system。

Questions

- Auto negotiation failure, what will be the possible   cause ? TX, RX signal quality or swing ?
- Does DP83848J have register to adjust the TX signal level or by external resistor ?
- Auto negotiation fails, the PHY TX signal becomes unipolar not differential and the pulse frequency is around 1 sec。 What is it in which state ?
- The unstable behavior, is it most possible problem in analog side ? TX RX signal。
- Is it possible SOC characteristic issue ?
- Is it possible the clock ppm issue ? We use OSC Frequence:50.00Mhz

 Frequency Tolerence:35.4ppm

RMII

New Part

Slow Start Circuit

PoE+ Dummy Load

NG board signal (not differential)

Measurement point↵

TX+/TX-

RX+/RX-

RJ45 — TR — DP83848 — MCU

RMII

After Link Fails, the pulse output 1sec period

0.5V /div

100ns
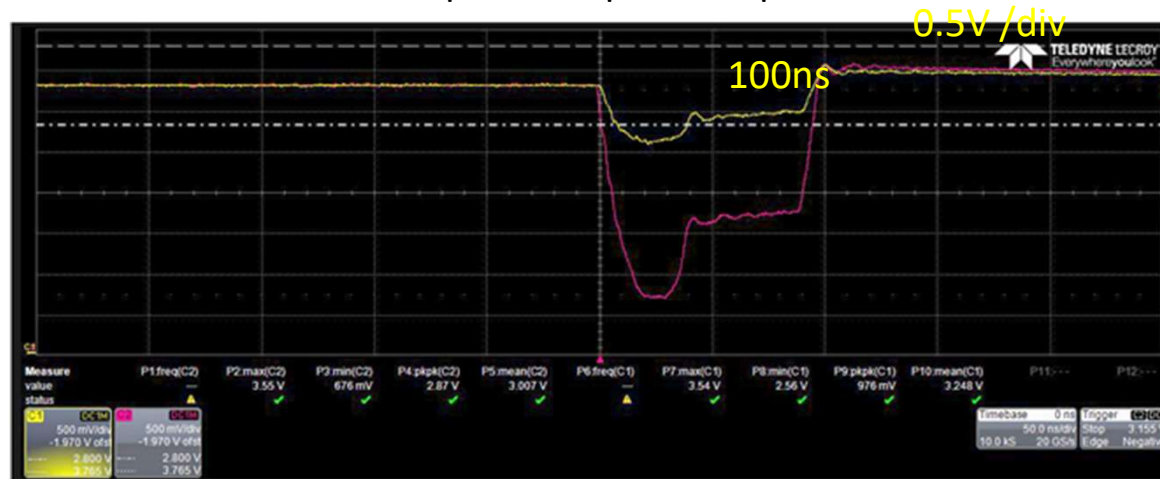
OK , NG waveform swing
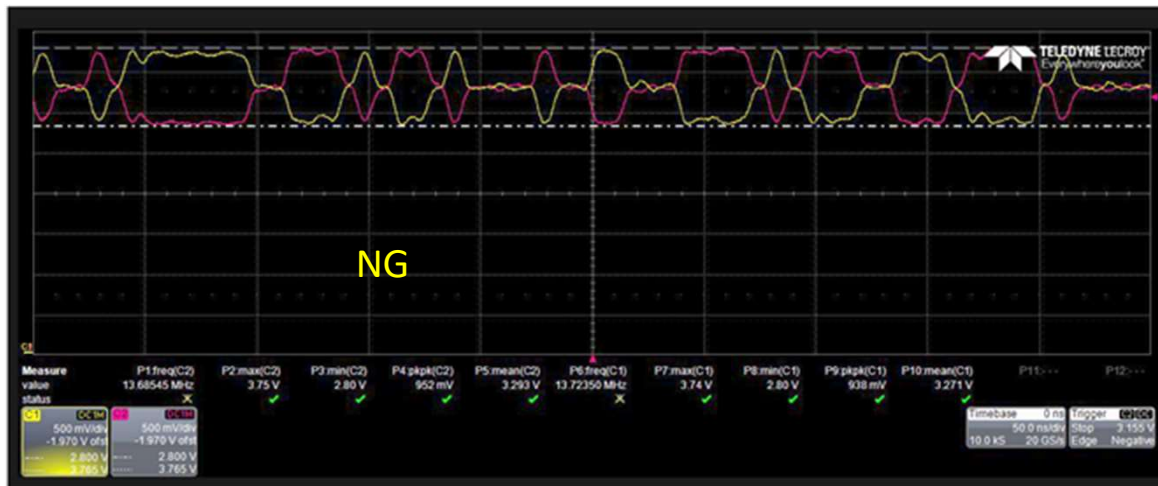
Swing 2.8-3.75V

Swing 2.67-3.8V
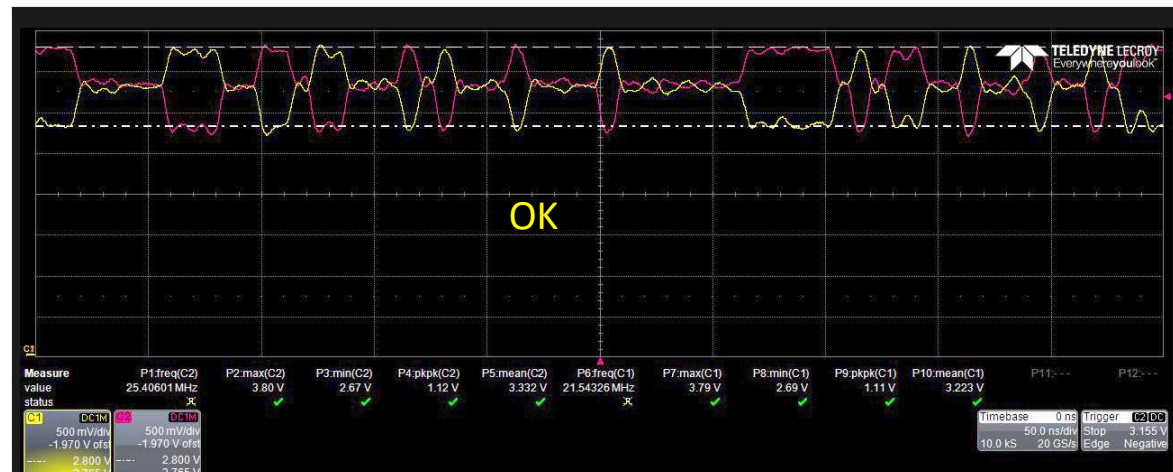
OK . NG registers comparison

	OK		NG		
Register					
1	786D		7849	7869	
10	4615		4800	4000	0015
14	0000		0070	0010	
REG1	786D		7849	auto neg NG	Valid Link NG
REG1	786D		7869	Valid Link NG	
REG10	4615		4800	false carrier decet	signal no detect
	4615		4000		
	4615		0015	MDIX normal	auto NEG not complete
REG 14	0000		0070	false carrier event count	
	0000		0010	false carrier event count	

Auto negotiation fails

Registers dump for OK NG board

OK

```
3100 786d 2000 5c90 05e1 c5e1 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 3c00 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000

3100 786d 2000 5c90 05e1 c5e1 000d 2801 0000 0000 0000 0000 0000 0000 0000 0000
4615 0000 0000 0000 0000 0000 0100 0021 0000 b001 0904 0000 0000 6011 083e 0000
```

NG , Status: LINK <--> UNLINK

```
3100 7849 2000 5c90 05e1 0000 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 3c00 0000 0070 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7849 2000 5c90 05e1 0000 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 2c00 0000 0010 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7849 2000 5c90 05e1 0000 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4000 0000 0800 0000 0000 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7869 2000 5c90 05e1 c5e1 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
0015 0000 2c00 0000 0000 0000 0100 0021 0024 b001 0904 0000 0000 6011 083e 0000

3100 7849 2000 5c90 05e1 c5e1 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 2800 0000 0010 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7849 2000 5c90 05e1 0000 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 2c00 0000 0010 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7849 2000 5c90 05e1 0000 0006 2001 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 2c00 0000 0010 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000

3100 7849 2000 5c90 05e1 0000 000f 2801 0000 0000 0000 0000 0000 0000 0000 0000
4800 0000 2c00 0000 0010 0000 0100 0021 0024 8001 0904 0000 0000 6011 003f 0000
```