

Component Failure Analysis Request Form

Description of Component and Product:

Component P/N:	002.02753.005
Description:	IC PER 1.8/3.3V SMD FCBGA393 GP ARM
Vendor:	AMLOGIC/ MFR# S905X2-B
Model Name:	T99X171T00/T99X171.00
MO No:	2154001661 & 2151011592
Location:	U1

Description of Failure Rate:

Return from:	FT1
Total fail Qty:	4pcs
Assembly Qty:	1000pcs
Defect rate:	4000ppm
Sample Qty for FA:	4pcs

Description of Failure:

1. Error code:	CRC test fail
2. Failure symptom	Ethernet Ping interrupt and CRC test fail
3. Detail failure description on ATE screen	Ethernet Ping interrupt and CRC test fail

Component for detail Information:

Sample	Lot ID1	Lot ID2	Returned From	Q'ty	Description
#1	PKPM93.00	B0LNUN010A0	FT1	1	CRC fail
#2	PKPM93.00	B0LNUN010B0	FT1	1	CRC fail
#3	PKPM93.00	B0LNUN010B0	FT1	1	CRC fail
#4	PKPM93.00	B0LNUN010B0	FT1	1	CRC fail

Failure Analysis: (Board Level)

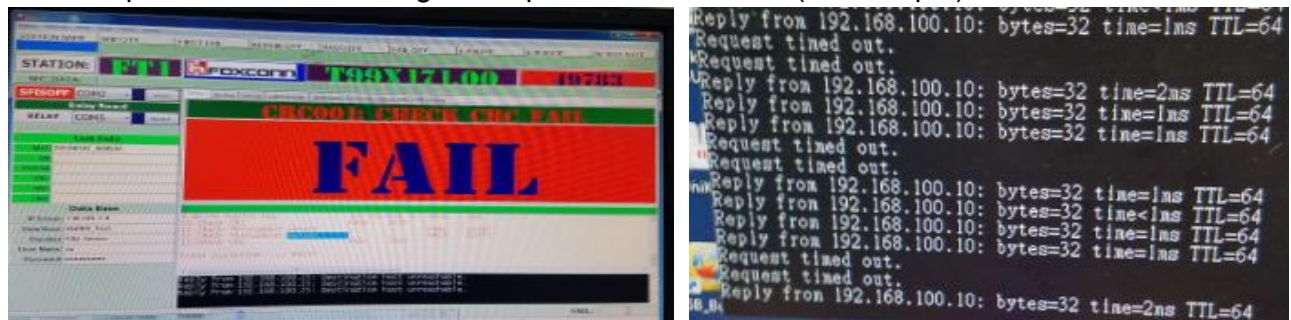
1 Identify the Problem

There was about 4000ppm failure S905X2 on T99X171.00 model since mass product in June to now. The fail symptom is Ethernet Ping interrupt and CRC test fail. Based on failure analysis, it can be conclude that this failure caused by S905X2.

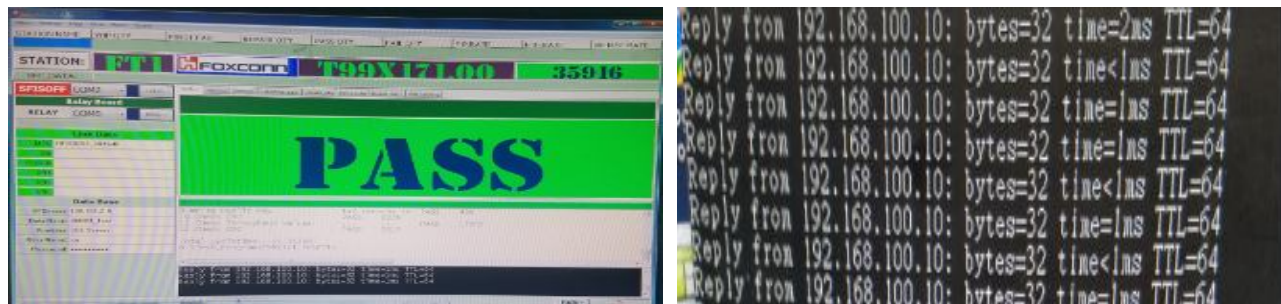
2 Duplicate Failure (Re-ATE test at different ATE tester)

Retest at FT1 test station, the same fail symptom showed on the ATE screen, detail as below:

ATE picture1: Ethernet Ping interrupt and CRC test fail (NG sample)



ATE picture2: Ethernet Ping stable and CRC test PASS (OK sample)



3 Analysis & Result

3.1 Visual inspection: check if anything wrong at board.

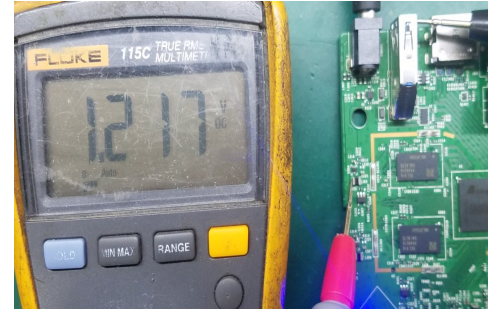
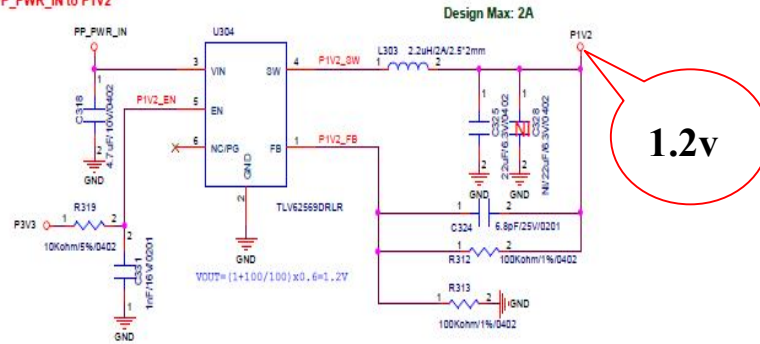
No abnormal found.

3.2 Electric Analysis:

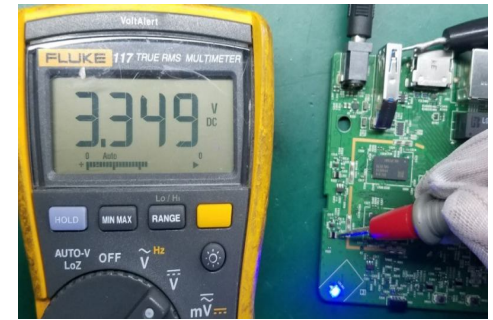
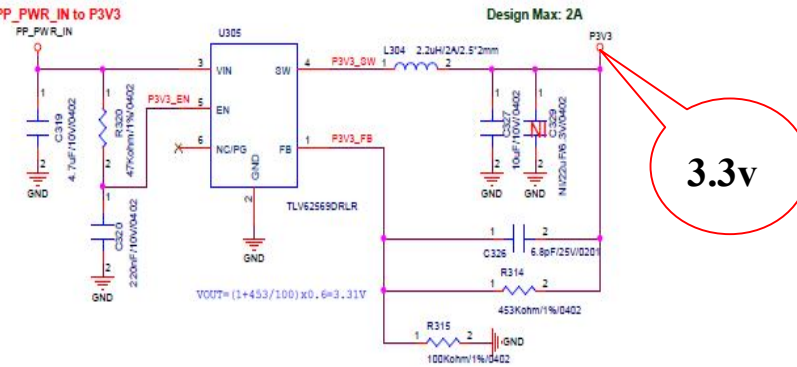
3.2.1 Check all power rails and system clock:

1. No issue was found with power rail:

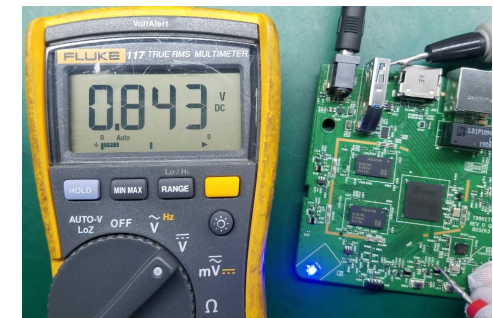
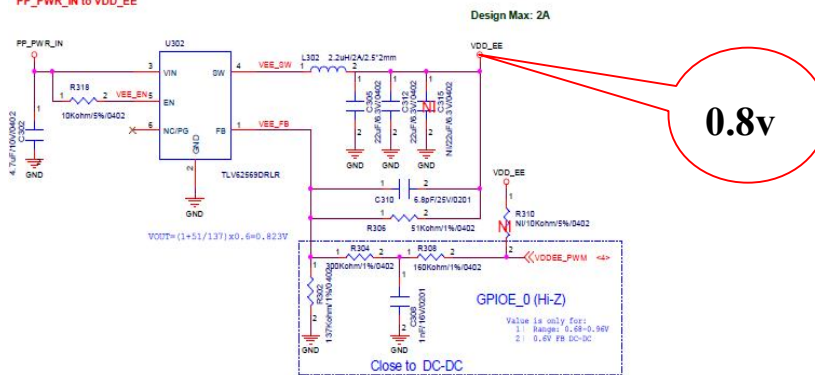
PP_PWR_IN to P1V2



PP_PWR_IN to P3V3

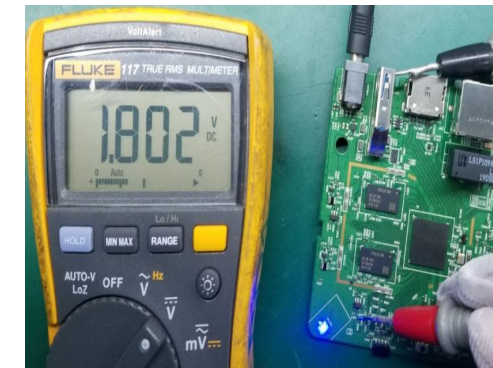
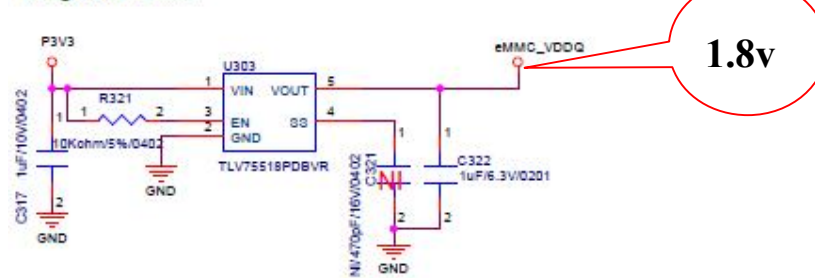


PP_PWR_IN to VDD_EE



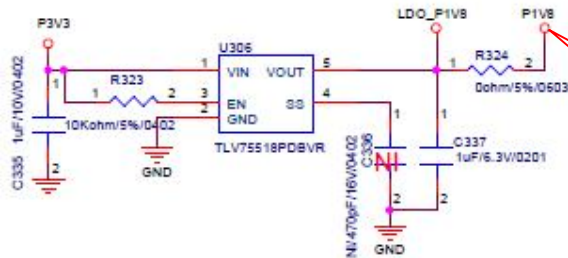
P3V3 to eMMC_VDDQ

Design Max: 500mA

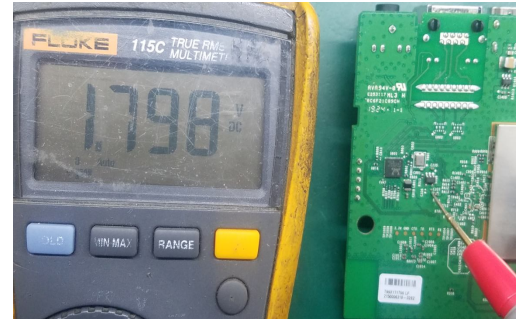


P3V3 to P1V8

Design Max: 500mA

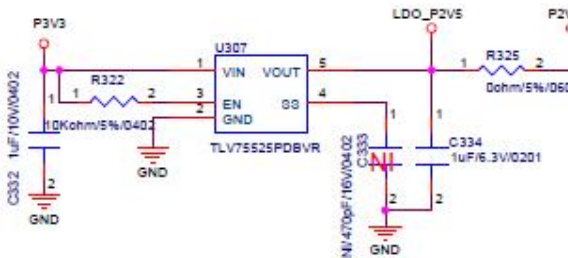


1.8v

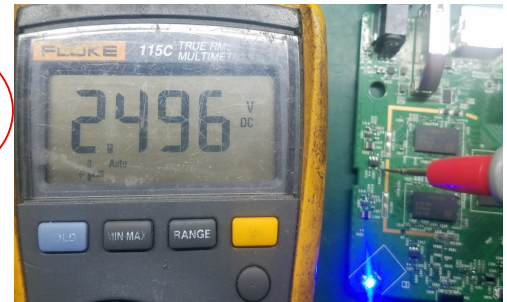


P3V3 to P2V5

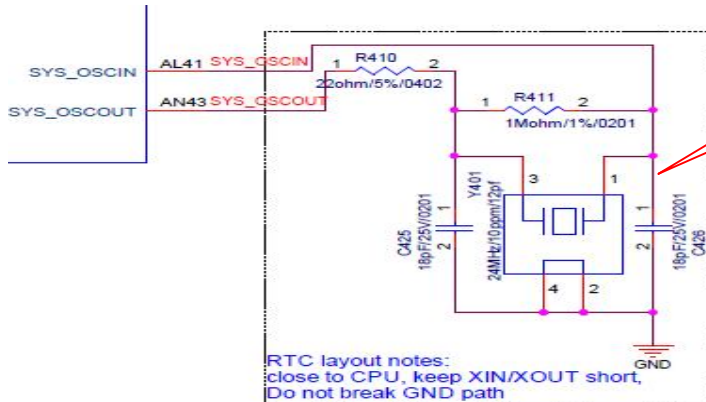
Design Max: 500mA



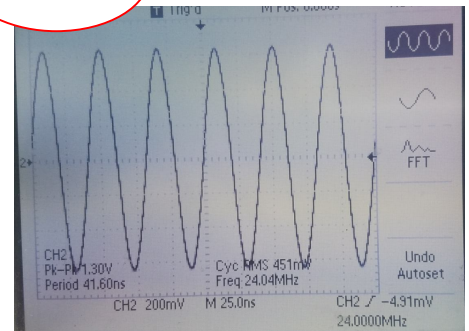
2.5v



2. No issue was found with system clock:

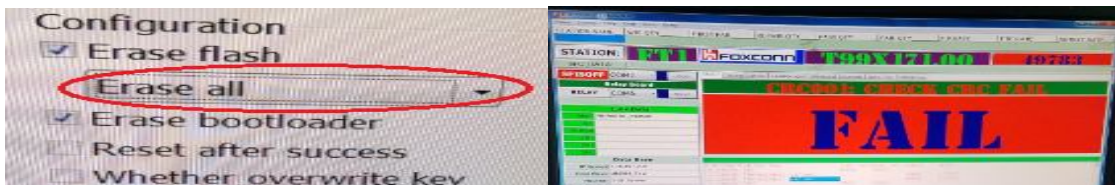


24MHz



3.2.2 Run ATE program if need.

Erase all eMMC data and retest at FT1 → Result: Fail the same (check CRC fail).



3.2.3 Confirm which pin have abnormal signal and function is ok or not.

We cannot find any pin abnormal

3.3 Component Solder ability verification (Before swap)

3.3.1 Visual inspection: check pin leg solder joint.

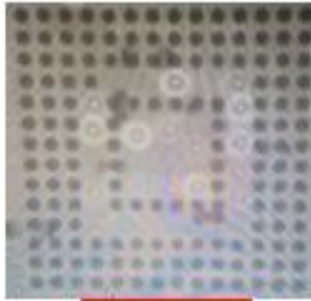
Not pin leg solder joint issue can be found.

3.3.2 Do X-Ray analysis (BGA or any no leg IC)

Nothing abnormal found



SOC



FLASH



RAM

3.3.3 Do re-solder process if possible, pin leg re-solder by solder iron or hot air gun. BGA solder ball do Reflow process.

After do reflow process, fail symptoms cannot change.

3.4 Component swap verification

3.4.1 Replace the defect component. (Instead of defect component with good component.)

The board performances showed normality on all test station after instead of defect component with good component.

3.4.2 Installed the defect component on the other unit (ok sample).

The good units showed the same symptoms as the original unit at FT1 test station after installed the defect component on it.

3.5 Analysis Summary (board level)

The symptom always follows the suspect IC (PN: 002.02753.005; IC PER 1.8/3.3V SMD FCBGA393 GP ARM), it seems the defect caused by IC.

4 Conclusion

This failure is related to defect component (PN: 002.02753.005; IC PER 1.8/3.3V SMD FCBGA393 GP ARM)

5 Further Actions

Propose to send the defected sample to *AMLOGIC* vendor for further analysis.

6 Attachment

NA