

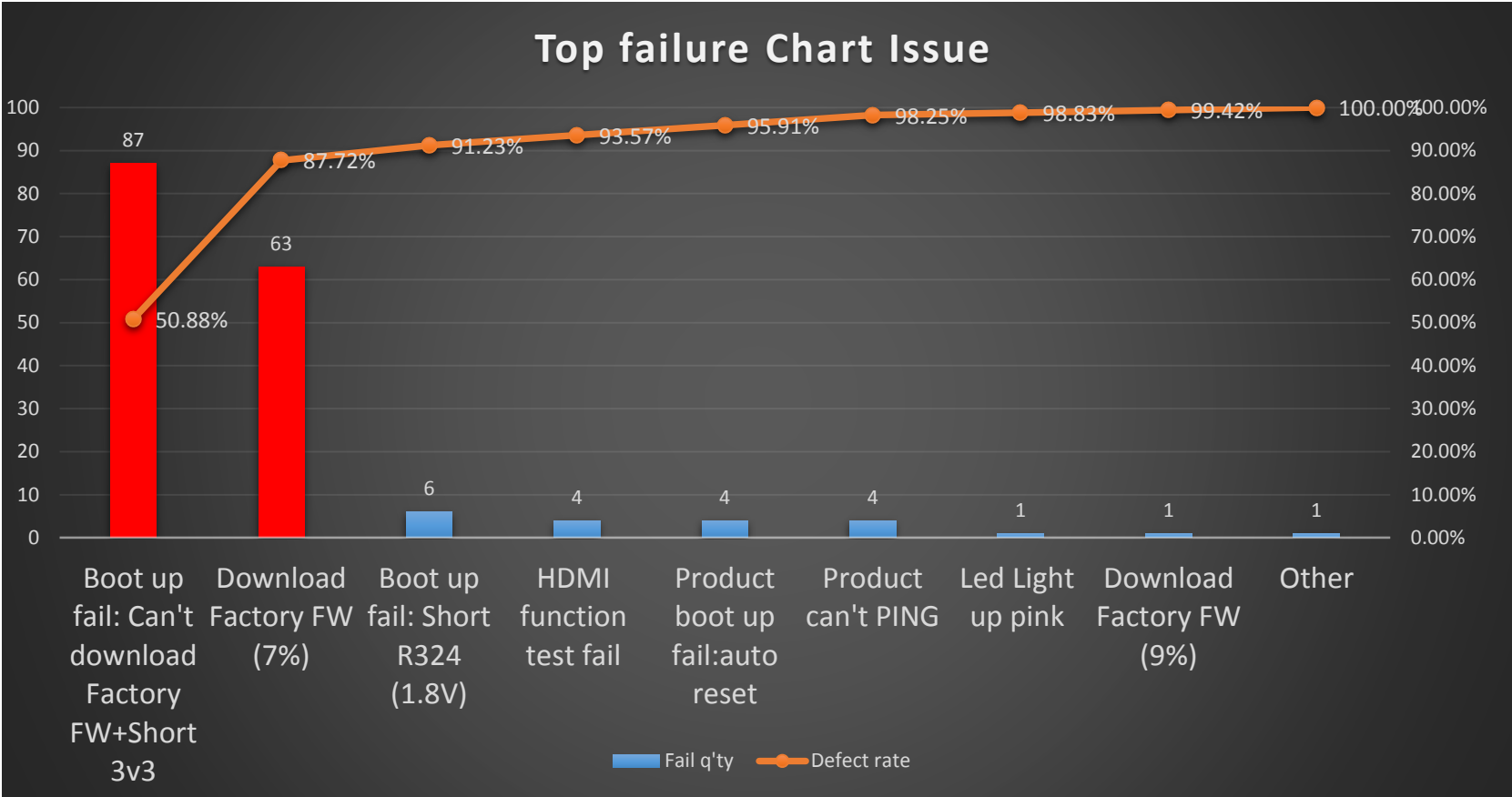
BFX AT-100 RMA TOP FAILURE REPORT

Model Name	BFX AT-100
Quantity	1728pcs
Date	11/04/2024
MO	2645000324

Prepare by: PE – Luc

Date: 2024/05/06

BFX AT-100 RMA Top Issue Overview



Failure Symptom	Failure Q'TY	D/R
Boot up fail: Can't download Factory FW + short 3.3V	87	4.46%
Download Factory FW stop (7%)	63	3.65%
Boot up fail: Short R324 (1.8V)	6	0.35%
HDMI functions test fail	4	0.23%
Product boot up fail: auto reset	4	0.23%
Product can't PING	4	0.23%
Led Light up pink	1	0.06%
Download Factory FW stop (9%)	1	0.06%
Product can't PING	1	0.06%
Total D/R	171	9.90%

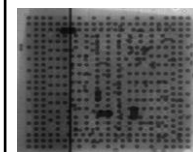
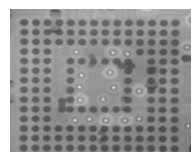
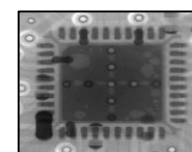
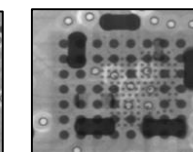
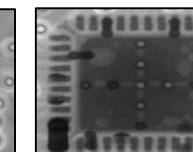
- 1. The D/R of this model is 9.90% (171/1728pcs RMA-T99X171.00)
- 2. TOP 1&2 failure symptom = 87.72% of total FR of this model

TOP1: Can't download Factory FW .D/R: 5.03%

Issue Description (5W2H)		Root Cause	Action	Owner	Status
When	2024/April	Fail status: Product boot up fail. Root cause: Case1: Voltage measurement did not detect abnormalities. ➤ Follow SoC (U1), Emmc (U602), Re-test PASS Case2: 3.3V/ VDDCPU short to GND ➤ Follow SoC (U1), Emmc (U602), U1101, U1001, U801,U305 no short to GND.  	Repair Action: - RE receive material for repair Emmc U602 and SoC U1 on the board. Improve action: Send FA report + NG material to SQE sent to AMLOGIC vendor further analysis Material name: U1-SoC P/N: 002.02753.005 DC:2214,2212,,2206,2313,... Vendor: AMLOGIC	- PE:Luc - RD: Jerry/ Rex Huang - Customer: ALT	Monitor
Who	ALT customer				
Where	SK networks warehouse, Anseong, Korea.				
What	ALT customer feedback that they found out 87/1728pcs~5.03% RMA has boot up fail.				
Why	Case1: Boot up fail, Voltage measurement did not detect abnormalities*4.46% Case 2: Boot up fail due to 3.3V/ VDDCPU short to GND*0.58%				
How much /many	D/R: 87/1728 = 5.03%~50347DDM				
How Often	This issue follow U1-SoC (P/N: 002.02753.005. Vendor: AMLOGIC).				

System Level Checking

Board level -1

No#	Item check	Image reference	Result	Remark																																																																																																																																																																																
1	Recheck Boot up at OBA station	 Boot Up Fail	Fail	NG units boot up fail																																																																																																																																																																																
2	Recheck record production data	<table><tr><th>SERIAL</th><th>NI_SECTION</th><th>MO_NUMBER</th><th>GROUP_NAME</th><th>IN_STATION</th><th>TIME</th><th>BCF4D4F86A45</th><th>2645000324</th><th>UK</th><th>3/28/2024</th><th>7:45</th></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>ASSY</td><td></td><td>3/27/2023</td><td>2:00</td><td>BCF4D4F86A45</td><td>2645000324</td><td>FT</td><td>3/28/2024</td><td>7:55</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>UK</td><td></td><td>3/27/2023</td><td>2:02</td><td>BCF4D4F86A45</td><td>2645000324</td><td>FT1</td><td>3/28/2024</td><td>7:58</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>FT</td><td></td><td>3/27/2023</td><td>2:10</td><td>BCF4D4F86A45</td><td>2645000324</td><td>BURN_IN</td><td>3/28/2024</td><td>16:14</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>FT1</td><td></td><td>3/27/2023</td><td>2:20</td><td>BCF4D4F86A45</td><td>2645000324</td><td>FT3</td><td>3/28/2024</td><td>16:23</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>RC</td><td></td><td>3/27/2023</td><td>2:24</td><td>BCF4D4F86A45</td><td>2645000324</td><td>RC</td><td>3/28/2024</td><td>16:44</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>RC1</td><td></td><td>3/27/2023</td><td>2:44</td><td>BCF4D4F86A45</td><td>2645000324</td><td>RC1</td><td>3/28/2024</td><td>16:54</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>VI</td><td></td><td>3/27/2023</td><td>3:11</td><td>BCF4D4F86A45</td><td>2645000324</td><td>VI</td><td>3/28/2024</td><td>19:34</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>RC2</td><td></td><td>3/27/2023</td><td>3:16</td><td>BCF4D4F86A45</td><td>2645000324</td><td>RC2</td><td>3/28/2024</td><td>19:37</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>VI1</td><td></td><td>3/27/2023</td><td>3:17</td><td>BCF4D4F86A45</td><td>2645000324</td><td>VI1</td><td>3/28/2024</td><td>19:46</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>PACK_BOX</td><td></td><td>3/27/2023</td><td>3:21</td><td>BCF4D4F86A45</td><td>2645000324</td><td>PACK_PALT</td><td>3/28/2024</td><td>19:46</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>CHECK_WEIGHT</td><td></td><td>3/27/2023</td><td>3:22</td><td>BCF4D4F86A45</td><td>2645000324</td><td>CHK_PALT</td><td>3/28/2024</td><td>19:46</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>PACK_CTN</td><td></td><td>3/27/2023</td><td>3:32</td><td>BCF4D4F86A45</td><td>2645000324</td><td>STOCKIN</td><td>3/29/2024</td><td>15:24</td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>PACK_PALT</td><td></td><td>3/27/2023</td><td>6:06</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>PQA</td><td></td><td>3/27/2023</td><td>10:50</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>BCF4D4F86A45</td><td>2639006638</td><td>STOCKIN</td><td></td><td>3/29/2023</td><td>21:21</td><td></td><td></td><td></td><td></td><td></td></tr></table>	SERIAL	NI_SECTION	MO_NUMBER	GROUP_NAME	IN_STATION	TIME	BCF4D4F86A45	2645000324	UK	3/28/2024	7:45	BCF4D4F86A45	2639006638	ASSY		3/27/2023	2:00	BCF4D4F86A45	2645000324	FT	3/28/2024	7:55	BCF4D4F86A45	2639006638	UK		3/27/2023	2:02	BCF4D4F86A45	2645000324	FT1	3/28/2024	7:58	BCF4D4F86A45	2639006638	FT		3/27/2023	2:10	BCF4D4F86A45	2645000324	BURN_IN	3/28/2024	16:14	BCF4D4F86A45	2639006638	FT1		3/27/2023	2:20	BCF4D4F86A45	2645000324	FT3	3/28/2024	16:23	BCF4D4F86A45	2639006638	RC		3/27/2023	2:24	BCF4D4F86A45	2645000324	RC	3/28/2024	16:44	BCF4D4F86A45	2639006638	RC1		3/27/2023	2:44	BCF4D4F86A45	2645000324	RC1	3/28/2024	16:54	BCF4D4F86A45	2639006638	VI		3/27/2023	3:11	BCF4D4F86A45	2645000324	VI	3/28/2024	19:34	BCF4D4F86A45	2639006638	RC2		3/27/2023	3:16	BCF4D4F86A45	2645000324	RC2	3/28/2024	19:37	BCF4D4F86A45	2639006638	VI1		3/27/2023	3:17	BCF4D4F86A45	2645000324	VI1	3/28/2024	19:46	BCF4D4F86A45	2639006638	PACK_BOX		3/27/2023	3:21	BCF4D4F86A45	2645000324	PACK_PALT	3/28/2024	19:46	BCF4D4F86A45	2639006638	CHECK_WEIGHT		3/27/2023	3:22	BCF4D4F86A45	2645000324	CHK_PALT	3/28/2024	19:46	BCF4D4F86A45	2639006638	PACK_CTN		3/27/2023	3:32	BCF4D4F86A45	2645000324	STOCKIN	3/29/2024	15:24	BCF4D4F86A45	2639006638	PACK_PALT		3/27/2023	6:06						BCF4D4F86A45	2639006638	PQA		3/27/2023	10:50						BCF4D4F86A45	2639006638	STOCKIN		3/29/2023	21:21						Normal	Normal FATP Pass check Function
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3	Visual inspection		Normal	No process effecting to failure																																																																																																																																																																																
4	X-Ray focus on SoC, U801, U1101, U1001, eMMC location	 SoC  eMMC  U1101  U1001  U801	Normal																																																																																																																																																																																	

- **Summary:** - Recheck Boot up 5/5pcs NG → **Boot up fail**
 - Recheck production data, VI, X-ray are OK

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TOP 1 Issue: Measurement

Case 1: Boot up fail, Voltage measurement did not detect

Board level -2

- Measure impedance and VF NG1 + NG2 +NG3 units, received result as table below:

Measure impedance & VF voltage NG1 + NG2 Units									
Location	Description	NG1 sample		NG2 sample		NG3 sample		OK sample	
		Impedance	VF	Impedance	VF	Impedance	VF	Impedance	VF
R328	PP_PWR_IN	3.33K	0.503	3.313K	0.506	3.046k	0.5	3.260K	0.504
L303	P1V2	169.5	0.084	169.9	0.084	191.1	0.092	182	0.089
R325	P2V5	21.37K	0.390	21.69K	0.393	18.45K	0.363	21.61K	0.392
L304	P3V3	2.723k	0.33	2.741K	0.346	2.73K	0.348	19.59K	0.348
C322	eMMC_VDDQ	22.53k	0.432	23.25K	0.41	23.14K	0.416	23.14K	0.416
L301	VDDCPU	61.9	0.071	56.3	0.061	88.7	0.085	66.1	0.075
L302	VDD_EE	16.3	0.015	21.2	0.020	25.2	0.023	35.5	0.037
L801	ETH_DVDD10	1.823k	0.311	1.821K	0.294	1.952K	0.287	1.952K	0.299

➤ Summary:

- Measure impedance and VF NG1 + NG2 +NG3 units → Found out impedance abnormal on L304 (P3V3).

TOP 1 Issue: Measurement

Component level -3

➤ **Measure impedance:** Remove U602 and measure impedance result as table below:

Pin#	Description	NG 1	NG 2	NG 3	OK Sample
		Impedance	Impedance	Impedance	Impedance
A3	DAT0	NA	NA	NA	NA
A4	DAT1	NA	NA	NA	NA
A5	DAT2	NA	NA	NA	NA
B2	DAT3	1.357M	1.408M	1.342M	1.405M
B3	DAT4	18.28K	20.34K	19.45K	20.61K
B4	DAT5	NA	NA	NA	NA
B5	DAT6	NA	NA	NA	NA
B6	DAT7	NA	NA	NA	NA
K5	RSTN	1.702M	1.711M	1.668M	1.53M
C6	VDD	NA	NA	NA	NA
M4	VDD	NA	NA	NA	NA
N4	VDD	NA	NA	NA	NA
P3	VDD	NA	NA	NA	NA
P5	VDD	NA	NA	NA	NA
E6	VDDF	27.37M	26.25M	25.6M	26.25M
F5	VDDF	27.73	28.4	26.95	25.5M
J10	VDDF	28.4	27.8	26.6	20.8M
K9	VDDF	26.2	26.6	26.8	25.3M
C2	VDDI	1.081M	1.413M	1.371M	1.391M
M5	CMD	NA	NA	NA	NA

Pin#	Description	NG 1	NG2	NG3	OK Sample
		Impedance	Impedance	Impedance	Impedance
H5	Data Strobe	NA	NA	NA	NA
M6	CLK	NA	NA	NA	NA
J5	VSS	NA	NA	NA	NA
A6	VSS	NA	NA	NA	NA
C4	VSS	NA	NA	NA	NA
E7	VSS	93.6	99.6	97.7	117
G5	VSS	94.2	99.6	98.2	114
H10	VSS	91.5	96.1	92.2	109.8
K8	VSS	NA	NA	NA	NA
N2	VSS	NA	NA	NA	NA
N5	VSS	NA	NA	NA	NA
P4	VSS	NA	NA	NA	NA
P6	VSS	NA	NA	NA	NA

➤ **Summary:** After measure impedance U602, no found out abnormal.

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TOP1 Issue: Measurement

Component level -4

➤ **Measure impedance:** Remove U1 and measure impedance result as table below:

NO#	Pin#	Description	NG 1	NG 2	NG 3	OK Sample
			Impedance	Impedance	Impedance	Impedance
1	J32	AVDD18_PCl e	196.3M	230K	228K	225K
2	L29	AVDD33_USB	89.2K	7.83	0.942M	0.931M
3	L31	VDDIO_H	30	32	27	38
4	L33	AVDD18_ENET	1.495M	1.62M	1.495M	1.525M
5	L35	AVDD18_USB	346.5	10.73K	1345M	1.353M
6	G14	VDDQ	1.7M	1.94M	58.7K	32.3K
7	G29	VDDIO_AO	40.1K	42.2K	40.6K	37.3K
8	N31	AVDD18_AUDIO	0.967M	1.075M	0.853M	0.908M
9	N33	AVDD18_HDMI	1.592M	1.471M	1.466M	1.426M
10	P13	VDDQ	11.25K	11.12K	10.82K	10.11K
11	P15	VDDQ	11.25K	11.12K	10.82K	10.10K
12	J14	VDDQ	11.28K	11.85K	9.88K	10.26K
13	J29	VDDIO_C	41.1	40.3	41.3	40.4
14	R26	AVDD0V8_USB_PCl e	21.2	0.941K	5.901K	3.972K
15	R28	AVDD0V8_HDM	1.046K	28.87K	29.54K	28.84K
16	R31	AVDD18_AO	1.252M	1.17M	1.076M	1.14M
17	R33	AVDD18_CVBS	0.679M	1.42M	1.323M	1.379M
18	AA23	AVDD18_AO	0.781M	1.158M	1.065M	1.167M
19	AG20	VDDCPU	44.4	42.8	50.2	48.5
20	AG26	VDD_EE	11	29	29.9	27.2
21	U15	VDDQ	58.5K	56k	74.2K	69K
22	U17	VDD_EE	11.1	28	29.6	25
23	AC15	AVDD_DDRPLL	0.785M	0.703M	0.696M	0.656M
24	AJ15	VDDQ	11.72K	11.09K	10.76K	10.49K

NO#	Pin#	Description	NG 1	NG2	NG3	OK Sample
			Impedance	Impedance	Impedance	Impedance
25	U26	VDD_EE	11.2	34.7	34.9	31.5
39	AJ20	VDDCPU	45.3	47.8	49.4	43.5
27	AJ23	VDDCPU	45.3	47.6	49.5	43.5
28	AJ26	VDD_EE	10.8	27.1	28.3	25.7
29	AJ29	VDD_EE	10.8	28.4	28.9	26.2
30	AJ31	VDDAO_0V8	0.823M	1.17K	1.366K	0.953K
31	AJ39	AVDD18_AO	0.988M	1.11M	1.013M	1.082M
32	AE26	VDD_EE	10.9	29	29.2	26.7
33	AL20	VDDCPU	45.1	47.9	50.3	44.7
34	AL23	VDDCPU	45	48	50.2	44.8
35	Y15	VDDQ	54.8K	72.1K	55.5K	70.4K
36	AF15	VDDQ	54.2K	70.6K	54.4K	69.4K
37	AF17	VDD_EE	10.7	27.7	28.4	25.9
38	AF29	VDD_EE	10.9	27.7	28.4	25.8
39	AF31	VDD_EE	10.7	27.5	28.3	25.8
40	AM31	VDD_EE	26.8	13.3	37.8	40.7
41	AU26	VDDCPU	48.6	49.4	50.3	44.7
42	AV37	VDDIO_X	2.63M	2.51M	2.668M	2.54M
43	AV39	VDDIO_Z	3.41M	3.45M	3.520M	3.47M
44	AN23	VDDCPU	2.8M	3.17M	3.09M	3.16M
45	AW20	VDDIO_BOOT	3.540M	3.18M	3.108M	3.03M
46	AW26	VDDCPU	54.8	61	64.8	58.2
47	AR26	VDDCPU	55.8	60.8	64.9	53.4

➤ **Summary:** After measure impedance U1, found out some pins abnormal which highlighted by red letter.

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TOP1 Issue: Swap verification

Component level -5

➤ Swap verification between OK and NG U1+U602 material and retest all functions + OBA test, result as table below:

Swap verification	NG1	NG2	NG3
NG board + OK (U1+ U602)	OK	OK	OK
NG board + NG (U1+U602)	NG	NG	NG
OK board + NG (U1+U602)	NG	NG	NG
NG board + OK (U1+U602)	OK	OK	OK

➤ Summary:

❖ As analysis above this issue follow **U1 (P/N: 002.02753.005)** component.

Because SoC(U1) and Emmc(U602) need the same group, when the construction of secure is completed<Download FW success>. Some SoC-related information will be written into the special configuration area of Emmc to prevent it from being changed.

For example the RPMB region in Emmc

❖ So when replace U1, you must replace **U602 (P/N: 067.00140.005)** component.

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TOP1 Issue: Measurement

Case 2: Boot up fail due to 3.3V/ VDDCPU short to GND

Board level -1

➤ Measure impedance and VF NG4 + NG5 + NG6 units, received result as table below:

Measure impedance & VF voltage NG1 + NG2 + NG3 Units									
Location	Description	NG1 sample		NG2 sample		NG3 sample		OK sample	
		Impedance	VF	Impedance	VF	Impedance	VF	Impedance	VF
R328	PP_PWR_IN	3.33K	0.503	3.313K	0.506	3.046k	0.5	3.260K	0.504
L303	P1V2	169.5	0.084	169.9	0.084	191.1	0.092	182	0.089
R325	P2V5	21.37K	0.390	21.69K	0.393	18.45K	0.363	21.61K	0.392
L304	P3V3	0.6	0.001	1.0	0.001	0.5	0.001	19.59K	0.348
C322	eMMC_VDDQ	3.5	0.003	2.5	0.003	8.2	0.007	23.14K	0.416
L301	VDDCPU	61.9	0.071	56.3	0.061	88.7	0.085	66.1	0.075
L302	VDD_EE	16.3	0.015	21.2	0.020	25.2	0.023	35.5	0.037
L801	ETH_DVDD10	0.8	0.001	0.8	0.001	0.7	0.001	1.952K	0.299

➤ Summary:

- Measure impedance and VF NG4 + NG5 + NG6 units → Found out abnormal on C322 (eMMC_VDDQ), L304 (P3V3) and L801 (ETH_DVDD10) – short with GND

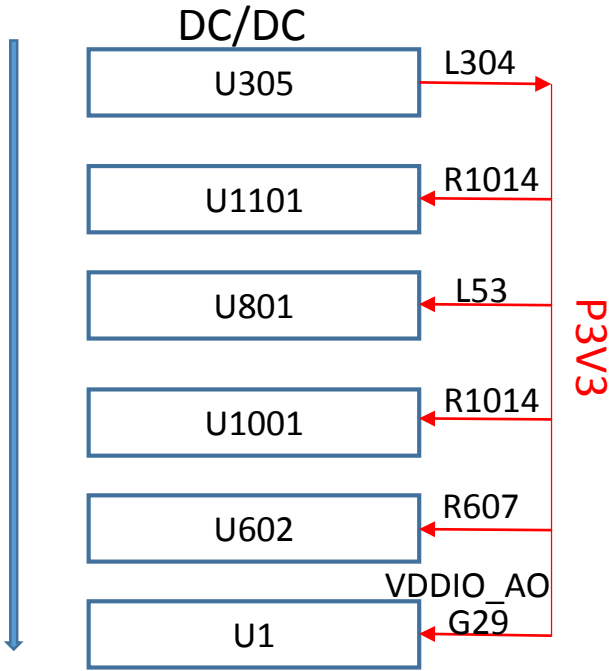
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TOP1 Issue: Remove IC chip and measure impedance

Board level -2

❖ Remove IC chip U1-SoC and measure impedance P3V3 on board:

Step	Remove location	Measure P3V3	Result
1	L304	0.6 ohm	Still Short GND
2	U801	0.6 ohm	Still Short GND
3	U1101	0.6 ohm	Still Short GND
4	U1001	0.6 ohm	Still Short GND
5	U602	3.5 ohm	Still Short GND
6	U1(SoC)	2.597M ohm	OK <No short>



➤ Summary:

- This issue follow U1-SoC (Boot up fail due to 3.3V/ VDDCPU short to GND follow U1 (P/N: 002.02753.005) component.)

TOP1 Issue: Measurement

Component level -1

➤ **Measure impedance:** Remove U801 and measure impedance result as table below:

Pin#	Description	NG 4	NG 5	NG 6	OK Sample
		Impedance	Impedance	Impedance	Impedance
1	MDIP0	16.4	90.2	2.2	1.050m
2	MDIP0	2.6	1.2	36.3	1.050m
3	AVDD10	12.5K	5.6	3.3	13.2k
4	MDIP1	1.050M	1.282M	1.246M	1.036m
5	MDIP1	1.049M	1.282M	1.246M	1.04m
6	MDIP2	1.036M	1.313M	1.250M	1.041m
7	MDIP2	1.037M	1.329M	1.250M	1.043m
8	AVDD10	12.5K	5.3	3.0	13.22k
9	MDIP3	3.162K	1.313M	0.837K	1.035m
10	MDIP3	464.8	1.313M	1.0	1.034m
11	AVDD33	2.4	2.8	1.2	117.8k
12	PHYRSTB	2.672M	2.748M	154.6	2.58m
13	MDC	2.647M	2.732M	2.709M	2.55m
14	MDIO	2.652M	2.732M	2.715M	2.55m
15	TXD3	2.637M	2.746M	2.718M	2.55m
16	TXD2	2.691M	2.718M	2.715M	2.56m
17	TXD1	2.680M	2.737M	2.727M	2.56m
18	TXD0	2.675M	2.726M	2.723M	2.57m
19	TXCTL	2.692M	2.740M	2.718M	2.57m
20	TXC	2.673M	2.754M	2.722M	2.56m

Pin#	Description	NG 4	NG5	NG6	OK Sample
		Impedance	Impedance	Impedance	Impedance
21	AVDD10	14.7	9.7	187.3	2.29k
22	RXD3/PHYAD0	2.567M	2.670M	2.632M	2.46m
23	RXD2/PLLOFF	2.568M	2.667M	2.633M	2.47m
24	RXD1/RXDLY	2.567M	2.675M	2.623M	2.48m
25	RXD0/RAXDLY	2.565M	2.665M	2.613M	2.46m
26	RXCTL/PHYAD2	2.575M	2.672M	2.616M	2.49m
27	RXC/PHYAD1	2.579M	2.665M	2.639M	2.48m
28	DVDD_RG	8.1	79.2	50.8	238.6k
29	AVDD33	5.6	4.3	3.2	168.3k
30	REG_OUT/LDO_OUT	0.8	0.7	0.7	0.899m
31	INTB/PMEB	2.645M	2.712M	2.695M	2.56m
32	U8010/CFG_EXT	2.674M	2.753M	2.713M	2.56m
33	U8011/CFG_LDO0	2.696M	2.729M	2.705M	2.58m
34	U8012/CFG_LDO1	2.475M	2.742M	2.706M	2.58m
35	CLKOUT	2.675M	2.777M	2.754M	2.57m
36	XTAL_IN	2.584M	2.682M	2.658M	2.5m
37	XTAL_OUT/EXT_CLK	2.591M	2.677M	2.671M	2.51m
38	AVDD10	17.02K	19.27K	17.66K	18.03k
39	RSET	2.805M	2.832M	2.780M	2.65m
40	AVDD33	2.6	3.1	1.0	117.6k

➤ **Summary:** Measure impedance and VF U801, found out some pins abnormal, which highlighted by red letter.

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TOP1 Issue: Measurement

Component level -2

➤ **Measure impedance:** Remove U602 and measure impedance result as table below:

Pin#	Description	NG 4	NG 5	NG 6	OK Sample
		Impedance	Impedance	Impedance	Impedance
A3	DAT0	NA	NA	NA	NA
A4	DAT1	NA	NA	NA	NA
A5	DAT2	NA	NA	NA	NA
B2	DAT3	1.205M	1.658M	1.599M	1.117M
B3	DAT4	20.05K	19.6K	19.89K	26.3K
B4	DAT5	NA	NA	NA	NA
B5	DAT6	NA	NA	NA	NA
B6	DAT7	NA	NA	NA	NA
K5	RSTN	1.702M	1.711M	1.668M	1.53M
C6	VDD	NA	NA	NA	NA
M4	VDD	NA	NA	NA	NA
N4	VDD	NA	NA	NA	NA
P3	VDD	NA	NA	NA	NA
P5	VDD	NA	NA	NA	NA
E6	VDDF	9.2	11.3	25.6	2.292M
F5	VDDF	8.8	11.2	25.1	2.299M
J10	VDDF	8.7	11.2	24.5	2.3M
K9	VDDF	8.8	11.2	24.6	2.299M
C2	VDDI	1.656M	1.668M	1.601M	1.468M
M5	CMD	NA	NA	NA	NA

Pin#	Description	NG 4	NG5	NG6	OK Sample
		Impedance	Impedance	Impedance	Impedance
H5	Data Strobe	NA	NA	NA	NA
M6	CLK	NA	NA	NA	NA
J5	VSS	NA	NA	NA	NA
A6	VSS	NA	NA	NA	NA
C4	VSS	NA	NA	NA	NA
E7	VSS	0.4	0.3	0.6	NA
G5	VSS	0.4	0.4	0.5	NA
H10	VSS	0.6	0.3	0.3	NA
K8	VSS	NA	NA	NA	NA
N2	VSS	NA	NA	NA	NA
N5	VSS	NA	NA	NA	NA
P4	VSS	NA	NA	NA	NA
P6	VSS	NA	NA	NA	NA

➤ **Summary:** Measure impedance U602, found out some pins abnormal, which highlighted by red letter.

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TOP1 Issue : Measurement

Component level -3

➤ **Measure impedance:** Remove U1 and measure impedance result as table below:

NO#	Pin#	Description	NG 4	NG 5	NG 6	OK Sample
			Impedance	Impedance	Impedance	Impedance
1	J32	AVDD18_PCl e	199K	0.559M	187.3K	188.2K
2	L29	AVDD33_USB	1.5	6.6	1.070K	0.889M
3	L31	VDDIO_H	5.1	34.5	5.0	6.37M
4	L33	AVDD18_ENET	1.340M	1.443M	1.208M	1.255M
5	L35	AVDD18_USB	1.390M	3.335K	2.0	1.293M
6	G14	VDDQ	11.24K	9.88K	11.25K	10.22K
7	G29	VDDIO_AO	1.0	2.0	2.4	2.597M
8	N31	AVDD18_AUDIO	0.967M	1.075M	0.853M	0.908M
9	N33	AVDD18_HDMI	1.492M	1.613M	1.368M	1.429M
10	P13	VDDQ	11.25K	11.82K	9.89K	10.24K
11	P15	VDDQ	11.25K	11.82K	9.89K	10.24K
12	J14	VDDQ	11.28K	11.85K	9.88K	10.26K
13	J29	VDDIO_C	4.8	4.5	3.9	5.99M
14	R26	AVDD0V8_USB_PCl e	0.982K	0.972K	6.6	1.160K
15	R28	AVDD0V8_HDM	17.16K	13.56K	109.7K	107.4K
16	R31	AVDD18_AO	0.806M	65.4	10.4	0.797M
17	R33	AVDD18_CVBS	0.679M	0.773M	0.557M	0.609M
18	AA23	AVDD18_AO	0.801M	65.0	10.3	0.801M
19	AG20	VDDCPU	56.2	49.9	77.6	78.5
20	AG26	VDD_EE	26.7	13.5	38.2	39.7
21	U15	VDDQ	11.29K	11.82k	9.9k	10.26K
22	U17	VDD_EE	26.3	35.6	38.4	39.3
23	AC15	AVDD_DDRPLL	0.743M	0.8M	0.621M	0.656M
24	AJ15	VDDQ	11.26K	11.84K	9.90K	10.23K

NO#	Pin#	Description	NG 4	NG5	NG6	OK Sample
			Impedance	Impedance	Impedance	Impedance
25	U26	VDD_EE	26.3	14.3	29.2	39.2
39	AJ20	VDDCPU	55.7	50.1	77.4	77.7
27	AJ23	VDDCPU	55.6	50.2	77.8	76.9
28	AJ26	VDD_EE	26.3	13.6	0.2	38.7
29	AJ29	VDD_EE	26.3	13.8	38.2	38.6
30	AJ31	VDDAO_0V8	39.1	0.977K	1.816K	1.968K
31	AJ39	AVDD18_AO	0.799M	64.9	10.2	0.791M
32	AE26	VDD_EE	26	12.6	38.2	38.7
33	AL20	VDDCPU	57.1	49.7	77.4	79.7
34	AL23	VDDCPU	57.6	49.9	77.2	80.2
35	Y15	VDDQ	1.682M	11.79K	9.88K	1.975M
36	AF15	VDDQ	1.706M	11.76K	9.87K	2.011M
37	AF17	VDD_EE	1.682M	13.9	38.5	1.983M
38	AF29	VDD_EE	27.1	13.7	38.4	40.3
39	AF31	VDD_EE	27.0	13.5	38.4	40.2
40	AM31	VDD_EE	26.8	13.3	37.8	40.7
41	AU26	VDDCPU	57.1	55.6	55.8	80.3
42	AV37	VDDIO_X	1.0	2.5	2.2	1.845M
43	AV39	VDDIO_Z	3.592M	2.189M	3.610M	3.094M
44	AN23	VDDCPU	3.530M	3.128M	3.208M	3.23M
45	AW20	VDDIO_BOOT	3.540M	3.637M	2.106M	2.886M
46	AW26	VDDCPU	56.7	58.6	60.8	65.2
47	AR26	VDDCPU	56.8	55.5	65.8	72.4

➤ **Summary:** Measure impedance U1, found out some pins abnormal, which highlighted by red letter.

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TOP1 Issue: Swap verification

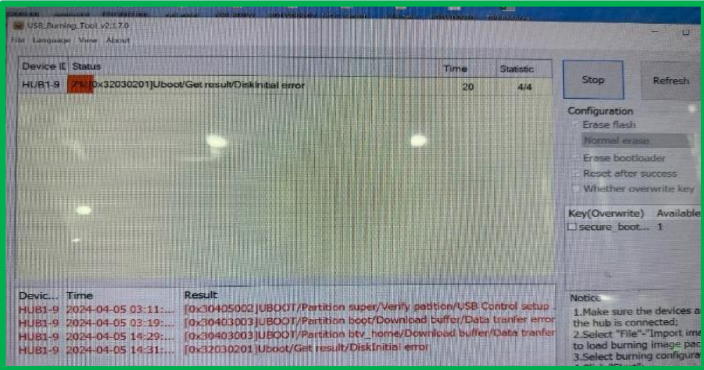
Component level -4

- Swap verification between OK and NG U1, U602 material and retest all functions + OBA test, result as table below:

Swap verification	NG4	NG5	NG6
OK board + OK (U1+U602)	OK	OK	OK
NG board + NG (U1+U602)	NG	NG	NG
OK board + NG (U1+U602)	NG	NG	NG
NG board + OK (U1+U602)	OK	OK	OK

- **Summary:** As analysis above boot up fail due to 3.3V/ VDDCPU short to GND follow U1 (P/N: 002.02753.005) component. So when replace U1, you must replace **U602 (P/N: 067.00140.005)** component.

TOP 2 Issue: Download Factory FW stop 7%.D/R: 3.70%

Issue Description (5W2H)		Root Cause	Action	Owner	Status
When	2024/April	Fail status: Download FW stop 7%. Root cause: This issue follow material: EMMC-U602  Download FW Stop 7%	Repair action: Change new EMMC <U602> cant cover issue. Improve action: - Send FA report and NG material to vendor SAMSUNG for future analyzing. Material name: U602-eMMC P/N: 067.00140.005, Vendor: SAMSUNG.Duedate:20/05.	-PE: Luc/SQE: Naomi - RD: Jerry Rex Huang -Vendor: Samsung - Customer: ALT	Monitor
Who	ALT customer				
Where	SK networks warehouse, Anseong, Korea.				
What	ALT customer feedback that they found out 63/1728pcs pcs RMA has boot up fail.				
Why	Product boot up fail and can't download Factory FW stop 7%				
How much /many	- UK 63/1728 = 3.65%~36458DDM				
How Often	- This issue follow eMMC U602 (P/N: 067.00140.005, Vendor: SAMSUNG) material fail.				

TOP2 Issue: Measurement

Component level -1

➤ **Measure impedance and VF** NG1 + NG2 +NG3 units, received result as table below:

Measure impedance & VF voltage NG1 + NG2 Units									
Location	Description	NG1 sample		NG2 sample		NG3 sample		OK sample	
		Impedance	VF	Impedance	VF	Impedance	VF	Impedance	VF
R328	PP_PWR_IN	3.33K	0.503	3.313K	0.506	3.046k	0.5	3.260K	0.504
L303	P1V2	169.5	0.084	169.9	0.084	191.1	0.092	182	0.089
R325	P2V5	21.37K	0.390	21.69K	0.393	18.45K	0.363	21.61K	0.392
L304	P3V3	2.723k	0.33	2.741K	0.346	19.59K	0.348	19.59K	0.348
C322	eMMC_VDDQ	22.53k	0.432	23.25K	0.41	23.14K	0.416	23.14K	0.416
L301	VDDCPU	61.9	0.071	56.3	0.061	88.7	0.085	66.1	0.075
L302	VDD_EE	16.3	0.015	21.2	0.020	25.2	0.023	35.5	0.037
L801	ETH_DVDD10	1.823k	0.311	1.821K	0.294	1.952K	0.287	1.952K	0.299

➤ Summary:

- Measure impedance and VF NG1 + NG2 +NG3 units → No found out abnormal

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TOP 2 Issue: Measurement

Component level -2

➤ **Measure impedance:** Remove U1 and measure impedance result as table below:

NO#	Pin#	Description	NG 1	NG 2	NG 3	OK Sample
			Impedance	Impedance	Impedance	Impedance
1	J32	AVDD18_PCl e	196.3M	230K	228K	225K
2	L29	AVDD33_USB	0.922M	0.912M	0.942M	0.931M
3	L31	VDDIO_H	30	32	27	38
4	L33	AVDD18_ENET	1.495M	1.62M	1.495M	1.525M
5	L35	AVDD18_USB	1.321M	1.345K	1.345M	1.353M
6	G14	VDDQ	1.7M	1.94M	58.7K	32.3K
7	G29	VDDIO_AO	40.1K	42.2K	40.6K	37.3K
8	N31	AVDD18_AUDIO	0.967M	1.075M	0.853M	0.908M
9	N33	AVDD18_HDMI	1.592M	1.471M	1.466M	1.426M
10	P13	VDDQ	11.25K	11.12K	10.82K	10.11K
11	P15	VDDQ	11.25K	11.12K	10.82K	10.10K
12	J14	VDDQ	11.28K	11.85K	9.88K	10.26K
13	J29	VDDIO_C	41.1	40.3	41.3	40.4
14	R26	AVDD0V8_USB_PCl e	4.232K	3.941K	4.301K	3.972K
15	R28	AVDD0V8_HDM	28.56K	28.87K	29.54K	28.84K
16	R31	AVDD18_AO	1.252M	1.17M	1.076M	1.14M
17	R33	AVDD18_CVBS	1.413M	1.42M	1.323M	1.379M
18	AA23	AVDD18_AO	0.781M	1.158M	1.065M	1.167M
19	AG20	VDDCPU	44.4	42.8	50.2	48.5
20	AG26	VDD_EE	11	29	29.9	27.2
21	U15	VDDQ	58.5K	56k	74.2K	69K
22	U17	VDD_EE	11.1	28	29.6	25
23	AC15	AVDD_DDRPLL	0.785M	0.703M	0.696M	0.656M
24	AJ15	VDDQ	11.72K	11.09K	10.76K	10.49K

NO#	Pin#	Description	NG 1	NG2	NG3	OK Sample
			Impedance	Impedance	Impedance	Impedance
25	U26	VDD_EE	34.2	34.7	34.9	31.5
39	AJ20	VDDCPU	45.3	47.8	49.4	43.5
27	AJ23	VDDCPU	45.3	47.6	49.5	43.5
28	AJ26	VDD_EE	27.8	27.1	28.3	25.7
29	AJ29	VDD_EE	28.8	28.4	28.9	26.2
30	AJ31	VDDAO_0V8	0.823M	1.17K	1.366K	0.953K
31	AJ39	AVDD18_AO	0.988M	1.11M	1.013M	1.082M
32	AE26	VDD_EE	10.9	29	29.2	26.7
33	AL20	VDDCPU	45.1	47.9	50.3	44.7
34	AL23	VDDCPU	45	48	50.2	44.8
35	Y15	VDDQ	54.8K	72.1K	55.5K	70.4K
36	AF15	VDDQ	54.2K	70.6K	54.4K	69.4K
37	AF17	VDD_EE	27.7	27.7	28.4	25.9
38	AF29	VDD_EE	10.9	27.7	28.4	25.8
39	AF31	VDD_EE	10.7	27.5	28.3	25.8
40	AM31	VDD_EE	26.8	13.3	37.8	40.7
41	AU26	VDDCPU	48.6	49.4	50.3	44.7
42	AV37	VDDIO_X	2.63M	2.51M	2.668M	2.54M
43	AV39	VDDIO_Z	3.41M	3.45M	3.520M	3.47M
44	AN23	VDDCPU	2.8M	3.17M	3.09M	3.16M
45	AW20	VDDIO_BOOT	3.540M	3.18M	3.108M	3.03M
46	AW26	VDDCPU	54.8	61	64.8	58.2
47	AR26	VDDCPU	55.8	60.8	64.9	53.4

➤ **Summary:** Measure impedance U1 no found out abnormal.

➤ ,

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TOP 2 Issue: Measurement

Component level -3

➤ **Measure impedance:** Remove U602 and measure impedance result as table below:

Pin#	Description	NG 1	NG 2	NG 3	OK Sample
		Impedance	Impedance	Impedance	Impedance
A3	DAT0	NA	NA	NA	NA
A4	DAT1	NA	NA	NA	NA
A5	DAT2	NA	NA	NA	NA
B2	DAT3	1.635M	1.607M	1.522M	1.433M
B3	DAT4	18.74K	17.80K	16.31K	25.78K
B4	DAT5	NA	NA	NA	NA
B5	DAT6	NA	NA	NA	NA
B6	DAT7	NA	NA	NA	NA
K5	RSTN	1.637M	1.606M	1.512M	1.516M
C6	VDD	NA	NA	NA	NA
M4	VDD	NA	NA	NA	NA
N4	VDD	NA	NA	NA	NA
P3	VDD	NA	NA	NA	NA
P5	VDD	NA	NA	NA	NA
E6	VDDF	2.339M	2.326M	2.327M	2.266M
F5	VDDF	2.340M	2.326M	2.328M	2.262M
J10	VDDF	2.335M	2.224M	2.294M	2.261M
K9	VDDF	2.323M	2.328M	2.328M	2.299M
C2	VDDI	1.615M	1.608M	1.521M	1.460M
M5	CMD	NA	NA	NA	NA

Pin#	Description	NG 1	NG2	NG3	OK Sample
		Impedance	Impedance	Impedance	Impedance
H5	Data Strobe	NA	NA	NA	NA
M6	CLK	NA	NA	NA	NA
J5	VSS	NA	NA	NA	NA
A6	VSS	NA	NA	NA	NA
C4	VSS	NA	NA	NA	NA
E7	VSS	0.3	0.2	0.2	0.2
G5	VSS	0.2	0.42	0.3	0.2
H10	VSS	0.2	0.3	0.3	0.3
K8	VSS	NA	NA	NA	NA
N2	VSS	NA	NA	NA	NA
N5	VSS	NA	NA	NA	NA
P4	VSS	NA	NA	NA	NA
P6	VSS	NA	NA	NA	NA

➤ **Summary:** Measure impedance U602 no found out abnormal.

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TOP 2 Issue: Swap verification

Component level -4

- Swap verification between OK and NG U602 material and retest all functions + OBA test, result as table below:

Swap verification	NG1	NG2	NG3
OK board + OK U602	OK	OK	OK
NG board + NG U602	NG	NG	NG
OK board + NG U602	NG	NG	NG
NG board + OK U602	OK	OK	OK

- **Summary:** As analysis above this issue follow flash: U602 (P/N: 002.02152.005, vendor: SAMSUNG) component.

Conclusion

1. The RMA-BFT AT100 Customer return 1728pcs failure include:

- Top 1 failure: Boot up fail: Can't download Factory FW + 3.3V/VDDCPU short to GND is 87/1728pcs ~ 5.03%
- Top 2 failure : Download Factory FW stop (7%) is 63/1728pcs ~ 3.65%

2. Repair Action:

Top 1 issue:

- Change SoC: U1 P/N: 002.02753.005 Vendor: AMLOGIC, 87pcs~5.03%
- Flash eMMC: U602, PN: P/N: 067.00140.005, Vendor: SAMSUNG, 87pcs~5.03%

Top 2 issue:

- Change Flash: U602, PN: P/N: 067.00140.005, Vendor: SAMSUNG, 63pcs~3.65%