

Hardware Unit Test Report

Accuracy and Ripple of AMP board Power Test

Hardware version	FW version	Sample No.	eMMC Flash P/N
V125	BFX-UA300-userdebug 10 QT 19.524.24	S/N: TBD	DDR: 1. K4A8G165WC-BCTD 2. K4A4G165WF-BCTD eMMC: KLM8G1GETF-B041

1. Test Setup

Equipment:

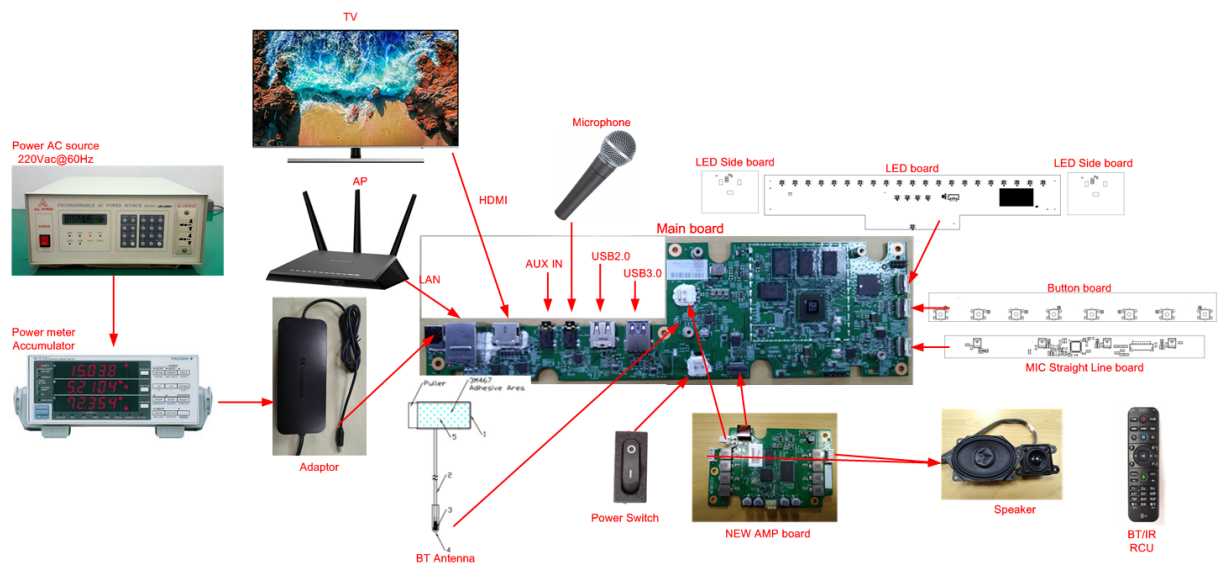
1. BFX-UA300 DVT board V125.
2. AC POWER: APG-1005N: 220Vac @60Hz
3. AC Adapter: LA-A271KS 24V/4A
4. 4K TV: ENVISION P2271WHL
5. Power meter with accumulator: Yokogawa WT210
6. Current probe: TCPA300
7. NETGEAR R7000 1Gbps

Test Environment:

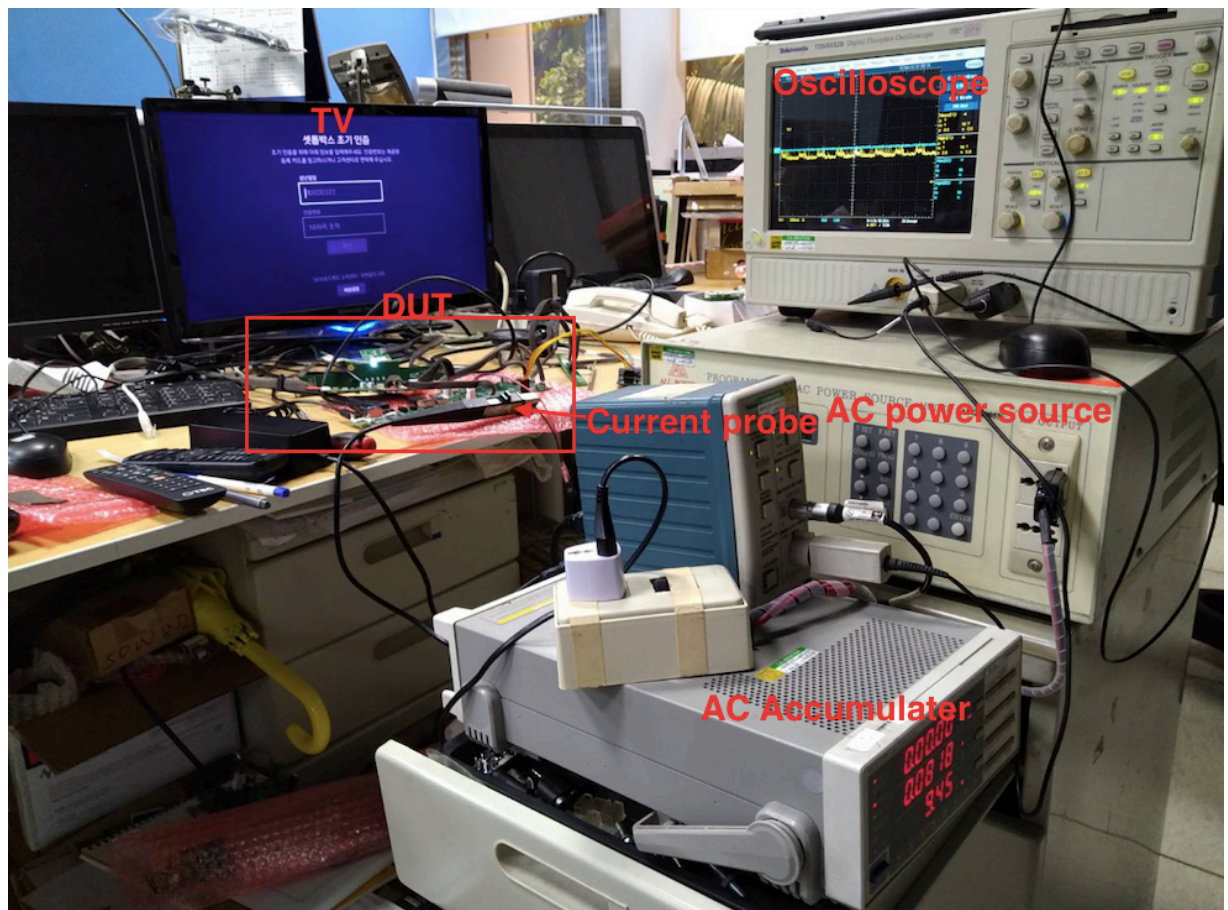
1. Test place: FXN CNSBG Building 1F office
2. Test DUT name: BFX-UA300 DVT V125 board
3. Test environment condition: temperature: 25 deg-C, humidity: 65
4. Test date: 2021/06/15
5. Test result: See section 3 for test results.
6. Test setup picture (block diagram and real test environment picture)

BFX-UA300 V125 AC AMP board Power sequence test

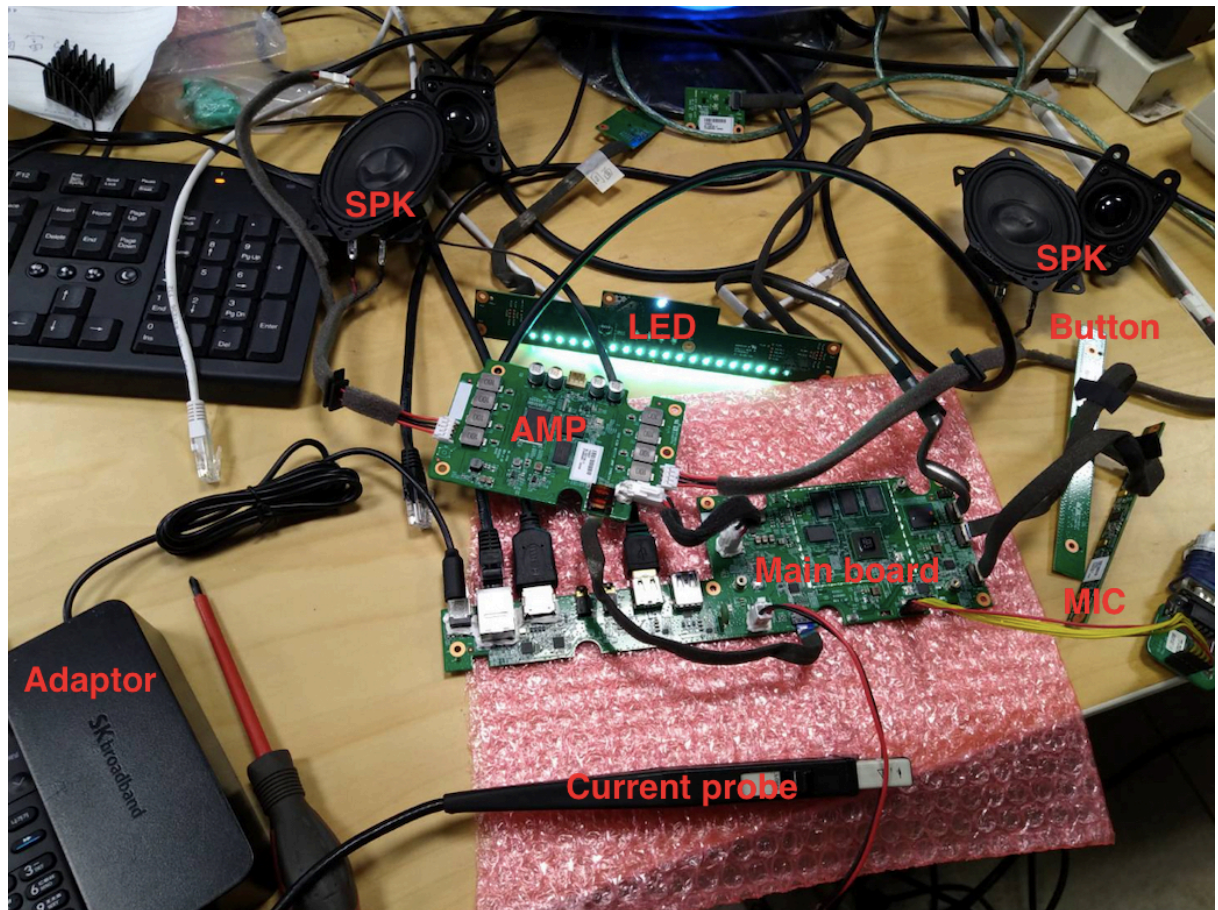
Block Diagram:



Test setup picture:



BFX-UA300 V125 AC AMP board Power sequence test



2. Test Condition

AC power: 220V@60Hz

DC power: 24V/4A

Play 4Kp60 local video with 70% volume for test.

3. Power on specification

As SOC A113X of AMP board, the voltage and ripple just follow as spec.

4.2 Recommended Operating Conditions

Symbol	Parameter	Measure Min	Design Min	Typ.	Design Max	Measure Max	Unit
VDDCPU	Voltage for Cortex A53 CPU	0.77 ¹	0.8		1.1 ²	1.13	V
VDD_EE VDDAO_0V9	Voltage for core logic Voltage for AO domain core logic	0.77 ¹	0.8	0.95	1.05 ³	1.08	V
VDDQ	DDR3/DDR4 IO Supply Voltage	1.16	1.2		1.55	1.6	V
AVDD18	Analog 1.8V VDD (All 1.8V VDD except VDDIO)	1.74		1.80		1.89	V
AVDD33_USB	3.3V AVDD for USB	3.15		3.3		3.45	V
VDDIO	LV mode	1.71		1.80		1.89	V
	HV mode	2.9/3.2 ⁴	3.0/3.3 ⁴	3.3		3.45	V

4.5.3 DDR3/DDR4 SDRAM Specifications

Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
VDDQ	IO supply voltage(DDR3)	1.46	1.50	1.57	V
VDDQ	IO supply voltage(DDR3L)	1.31	1.35	1.42	V
VDDQ	IO supply voltage(DDR3U)	1.21	1.25	1.31	V
Vref	Input reference supply voltage	0.49*VDDQ	0.5*VDDQ	0.51*VDDQ	V

4.3 Ripple Voltage Specifications

Parameter	Max Ripple	Unit
VDDCPU	50	+/-mV
VDD_EE VDDAO_0V9	40	+/-mV
VDDQ	40	+/-mV
AVDD18	20	+/-mV
AVDD33_USB	50	+/-mV
VDDIO LV mode	50	+/-mV
VDDIO HV mode	50	+/-mV

4. AC Power on Result and Picture

Accuracy spec

Power Rail	Specification(V)			Measurement point	Result (V)	Pass/ Fail	Picture
	Minimum	Typical	Maximum				
VDDCPU	0.77		1.13	L51	1.109	PASS	Fig. 1
VDDEE	0.77	0.95	1.08	L52	0.9749	PASS	Fig. 2
VDDQ1.35V	1.31	1.35	1.42	L53	1.374	PASS	Fig. 3
VDDIO_AO18	1.74	1.8	1.89	Pin 1, C76	1.809	PASS	Fig. 4

Note:

*: Ask Amlogic SOC vendor, they said the VDDIO_AO18 is no timing limit. So the sequence is ok as currently setup.

Ripple spec

Power Rail	Specification(mV)			Measurement point	Result (mV)	Pass/ Fail	Picture
	Minimum	Typical	Maximum				
VDDCPU*	-50		50	L51	22.4	PASS	Fig. 5
VDDEE	-40		40	L52	28.4	PASS	Fig. 6
VDDQ1.35V	-40		40	L53	25.6	PASS	Fig. 7
VDDIO_AO18	-20		20	Pin 1, C76	18.0	PASS	Fig. 8

Note:

*: Due to Power IC DVFS(Dynamic Voltage Frequency Scaling), the voltage and ripple may have a pulse every fixed seconds. So we remove VDDCPU_PWM signal(R55) from SOC A113X to skip this mode. After testing, we will replace this signal.

Waveform of Accuracy



Fig. 1: VDDCPU



Fig. 3: VDDQ1.35V



Fig. 2: VDDEE



Fig. 4: VDDIO_A018

Waveform of Ripple

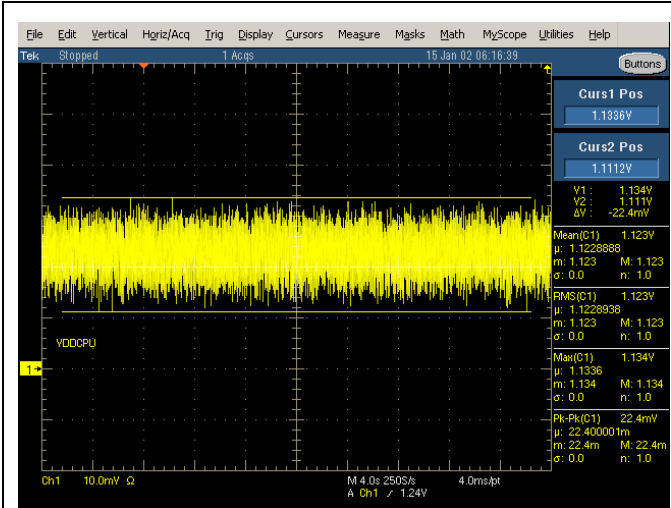


Fig. 5: VDDCPU

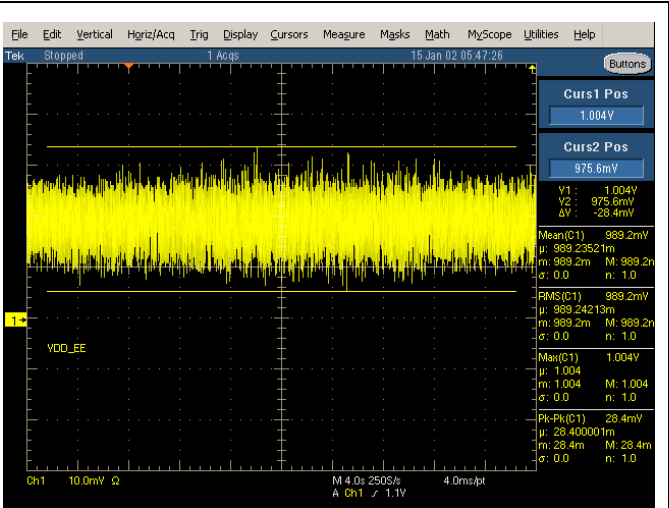


Fig. 6: VDDEE

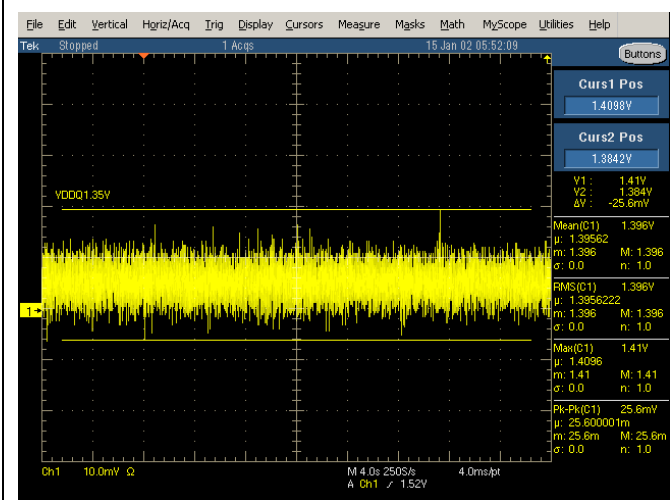


Fig. 7: VDDQ1.35V

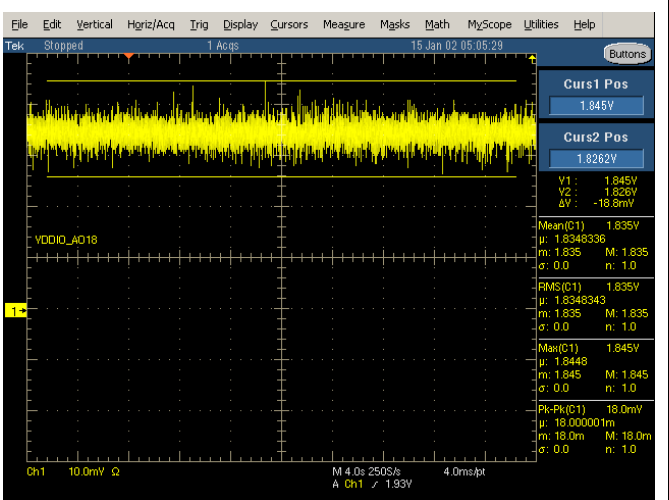


Fig. 8: VDDIO_A018