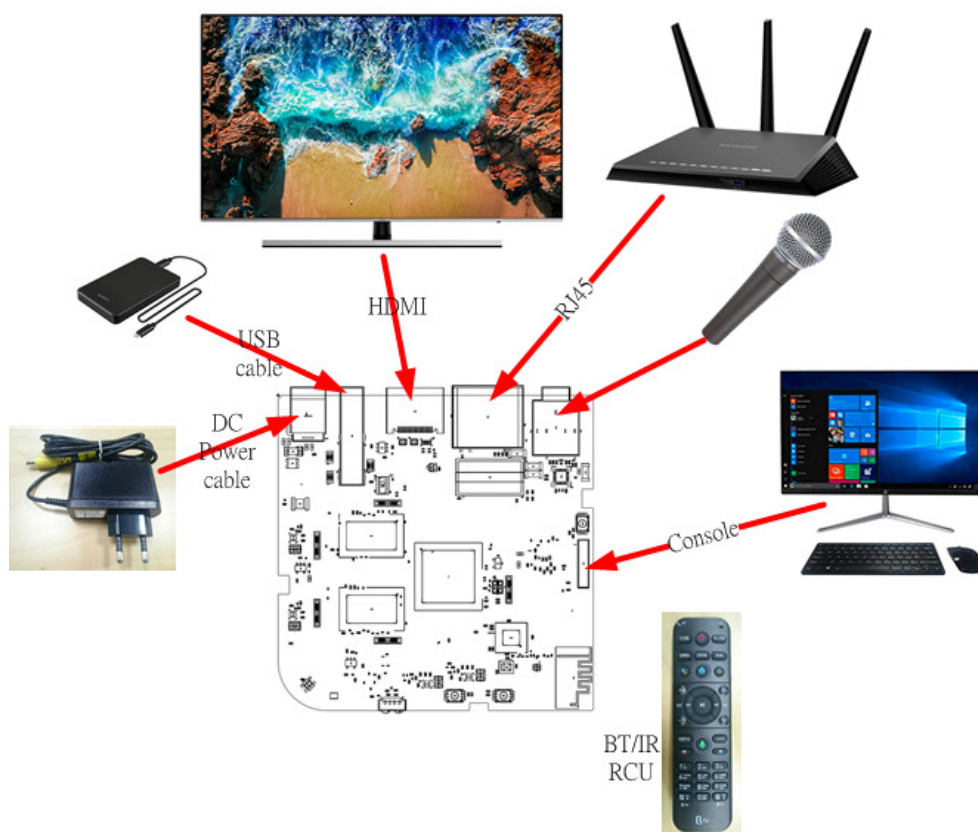


Hardware Unit Test Report

Power Consumption Test

Hardware version	FW version	Sample No.	eMMC Flash P/N
V005	4.9.113 #1MonFeb 1122:40:43 CST 2019	S/N:	KLM8G1GETF-B041

1. Power Test Setup



2. Test Command

ADC function command:

ADC for MIC function is required by command as below:

```
tinycap /data/test.wav -D 0 -d 1 -r 48000
```

eMMC function command:

Because of playing 4K HDR video from Smart YouTube, the eMMC function does not read or write. We can use command to do read/write eMMC function while playing 4K HDR video on Smart YouTube through console. The command is as below:

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eMMC Read/Writet Test command

(1)write 1G

```
time sh -c "dd if=/dev/zero of=/data/tmp.dd bs=1000k count=1000; sync"
```

(2)read 1G

```
time sh -c "dd if=/dev/block/data of=/dev/zero bs=1000k count=1000; sync"
```

(3)read 8G

```
time sh -c "dd if=/dev/block/data of=/dev/zero bs=1000k count=8000; sync"
```

3. Test Condition

Content setup:

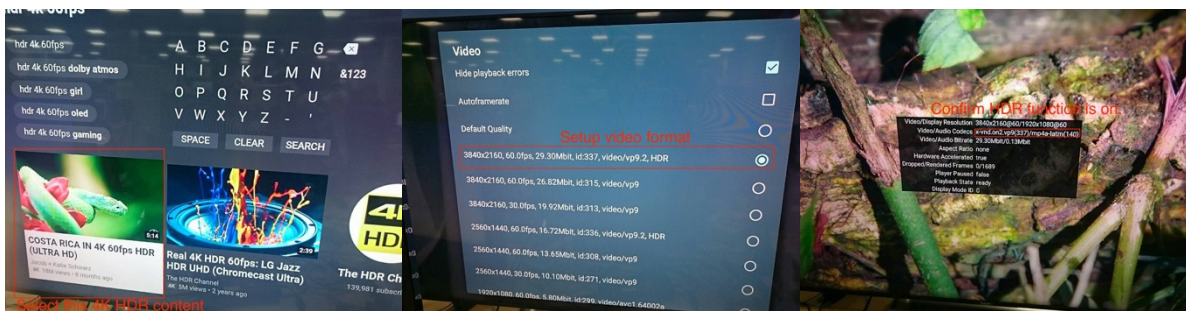
Ethernet: 1Gb.

BOX plays4Kp60HDR video from Smart YouTube.

USB port:Mounted 2.5 inch USB HDD.

BT RCU: connected.

Playing video: COSTA RICA IN 4K 60fps HDR(ULTRA HD), see below example pictures.



For USB HDD issue:

While testing, the USB HDD is plugged first then plugged-in power final. The boot is ok. The mean value of DC power instantly is 5.1W while plugging DC power cable onto DC jack. The test repeats are 10 times, the boot test with USB HDD is ok to boot up.

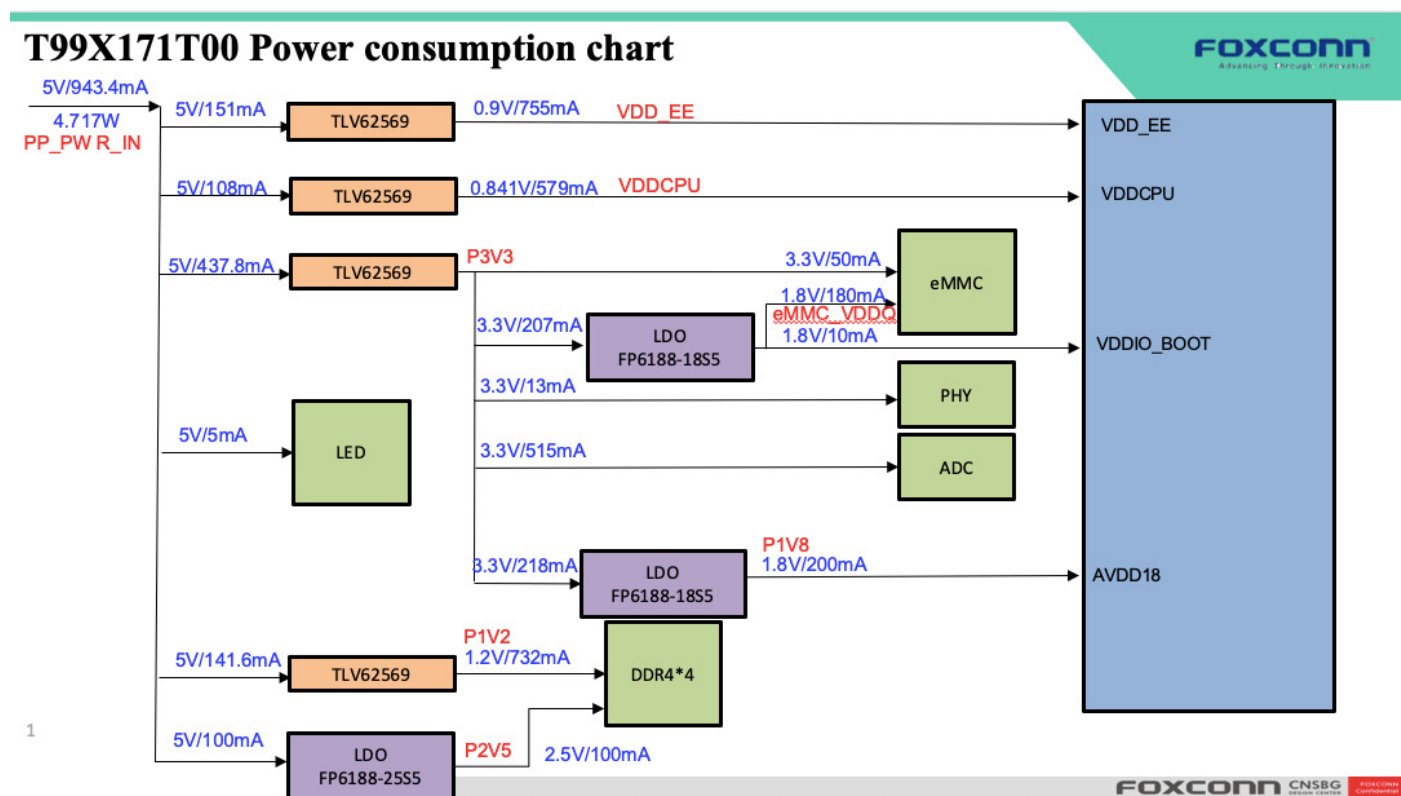
Plugged-in and plugged-out USB HDD repeats for 10 times, the Eagle board is ok and does not cause re-boot.

USB_5V booting test:

Here the test procedure is plugged-in HDMI/Ethernet/USB_HDD cables first, then plugging DC jack 5Vdc to Eagle board. This purpose is to measure the booting period for dip and voltage drop measurement. The minimum voltage is **4.92V** which meets to 5% voltage drop spec during booting period.

For USB_5V has 1V before plugged-in 5Vdc DC jack phenomenon, it is caused by TV HDMI 5V and IIC pins to reverse output back to Eagle board. The new design will be changed to next HW version since this version is V005.

4. Power Architecture



5. Result and Picture

Power Rail	Power IC / MOSFET P/N	Spec	Measurement point	Result (A)	Picture	Result Pass/Fail
PP_PWR_IN	BSY012U050200U 5V/2A	2A	F301	1008mA	Fig. 1	Pass
VDD_EE*	TLV62569DRLR	2.5A	L302	688.8mA	Fig. 2	Pass
VDDCPU	TLV62569DRLR	2.5A	L301	368.5mA	Fig. 3	Pass
P1V2	TLV62569DRLR	2.5A	L303	553.4mA	Fig. 4	Pass
P3V3	TLV62569DRLR	2.5A	L304	280.5mA	Fig. 5	Pass
eMMC_VDDQ	FP6188-18S5	600mA	R606	83.74mA	Fig. 6	Pass
P1V8	FP6188-18S5	600mA	R324	77.61mA	Fig. 7	Pass
P2V5	FP6188-25S5	600mA	R325	7.988mA	Fig. 8	Pass
USB_5V Booting	FP6861E-A1S6CTR	1A	J901_5V pin	800mA(Max)	Fig. 9	Pass

*: Maximum current 2.08A peak is under limit 2.5A of spec. Current peak value is normal and may be caused by MOSFET in IC, also the current probe can affect magnetic current when inducing test.

T99X171T00 V005 Power Consumption Test

$V_{IN} = 5.0\text{ V}$, $T_j = 25^\circ\text{C}$, unless otherwise noted

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
$R_{DS(on)}$	High-side FET on resistance			100		m Ω
	Low-side FET on resistance			60		
I_{LIM}	High-side FET current limit	TLV62569DBV, TLV62569PDDC	3			A
		TLV62569DRL, TLV62569PDRL	2.5			
f_{SW}	Switching frequency	$V_{OUT} = 2.5\text{ V}$		1.5		MHz



Fig. 1: PP_PWR_IN

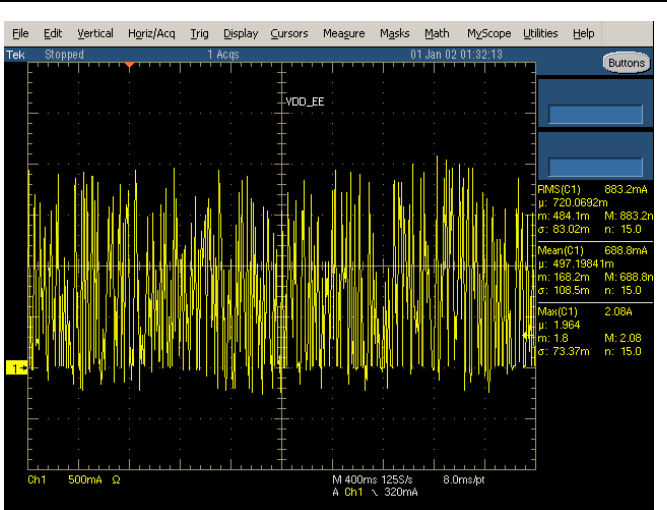


Fig. 2: VDD_EE

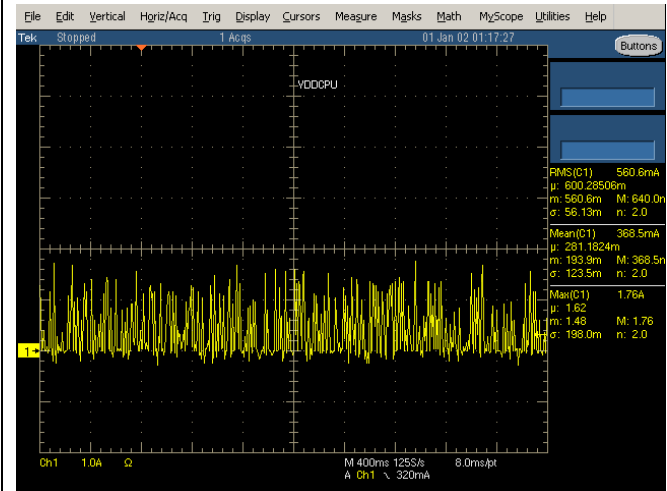


Fig. 3: VDDCPU

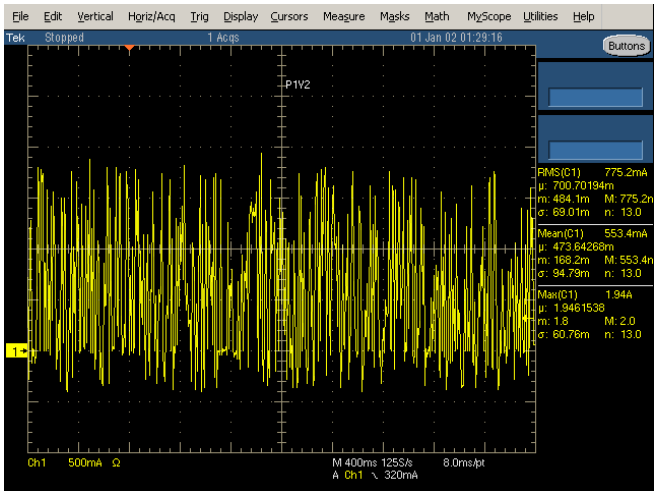


Fig. 4: P1V2

T99X171T00 V005 Power Consumption Test

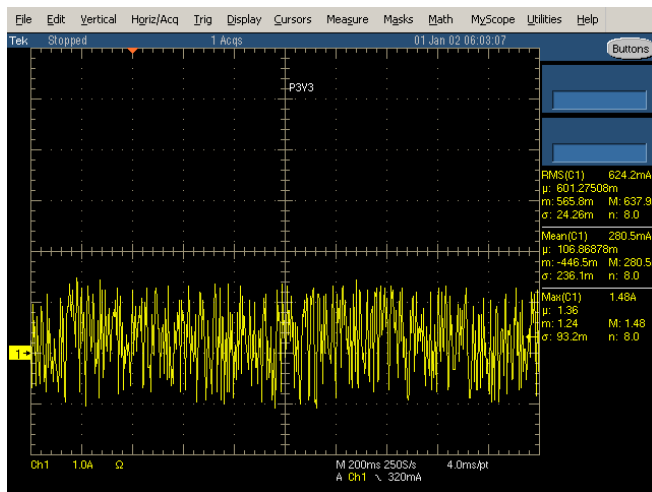


Fig. 5: P3V3

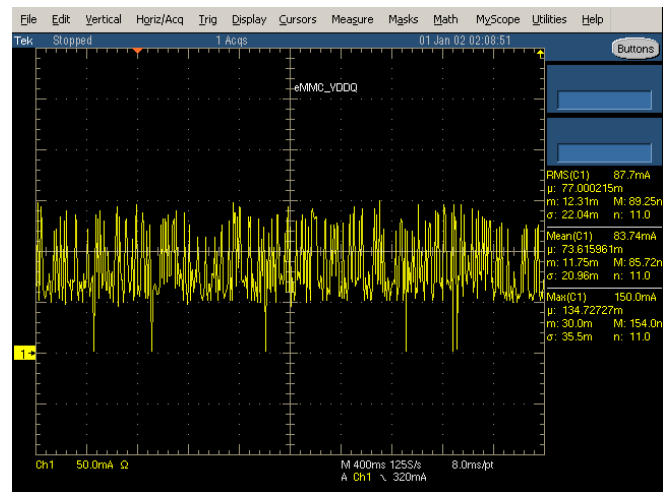


Fig. 6: eMMC_VDDQ



Fig. 7: P1V8

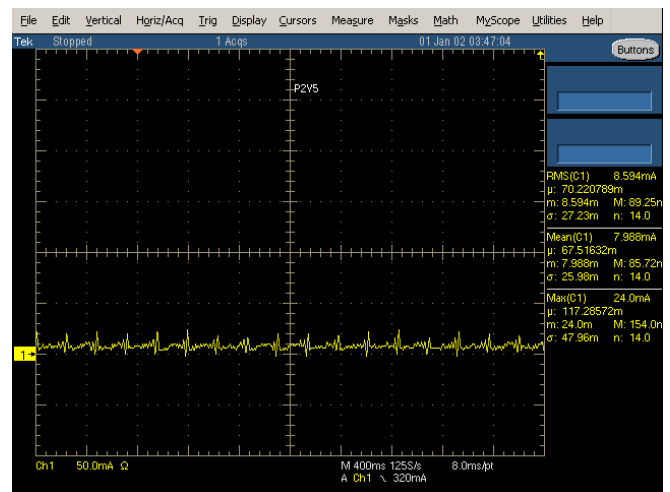


Fig. 8: P2V5

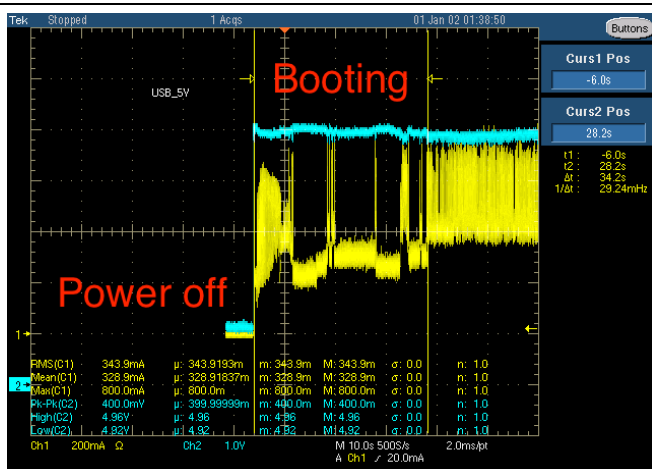


Fig. 9: USB_5V Booting