

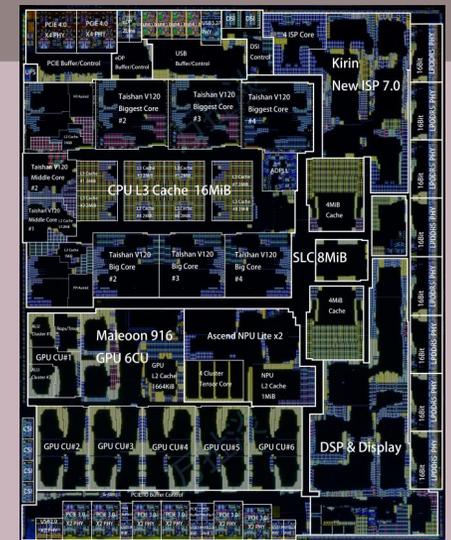
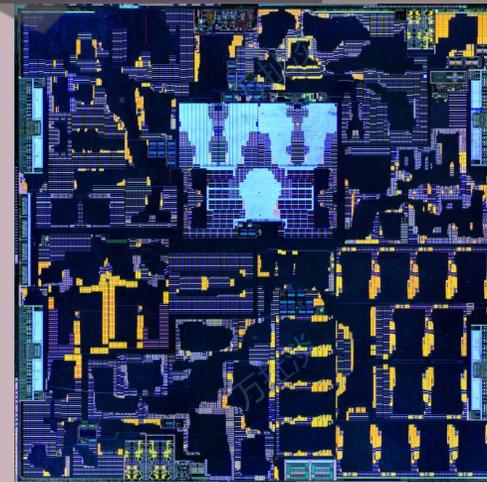
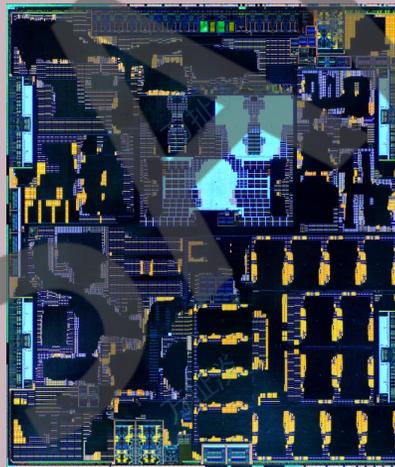
# Huawei Car chip 990A & 9610A

On chip analyze

V0.1



@Kurnal



Version	Date	Updates	Author
V0	2025/07/19 22:17	Working	Kurnal
V0.1	2025/08/05 12:29	Finish?	Kurnal
B站工坊			

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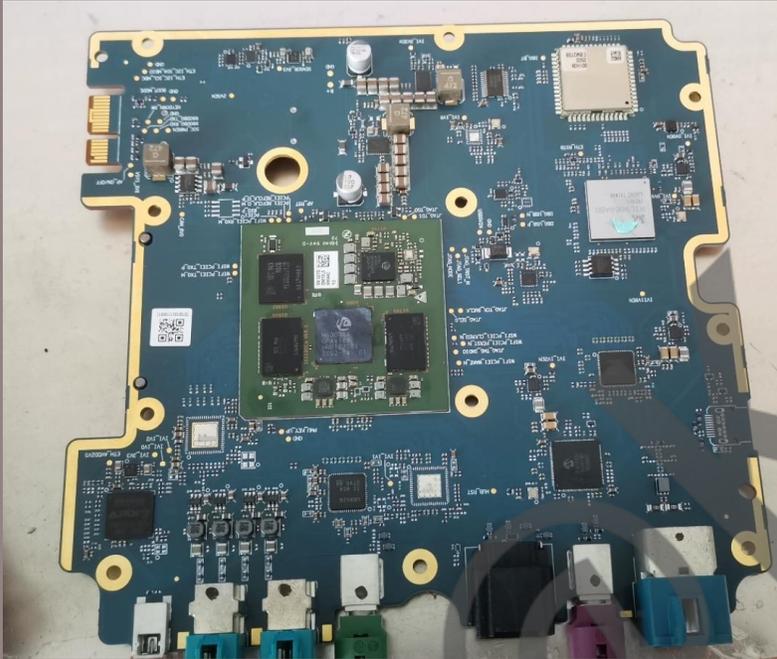
This report is not for commercial use

# Chip analyze

990A-FCBGA

# Kirin 990A-Package

By ?



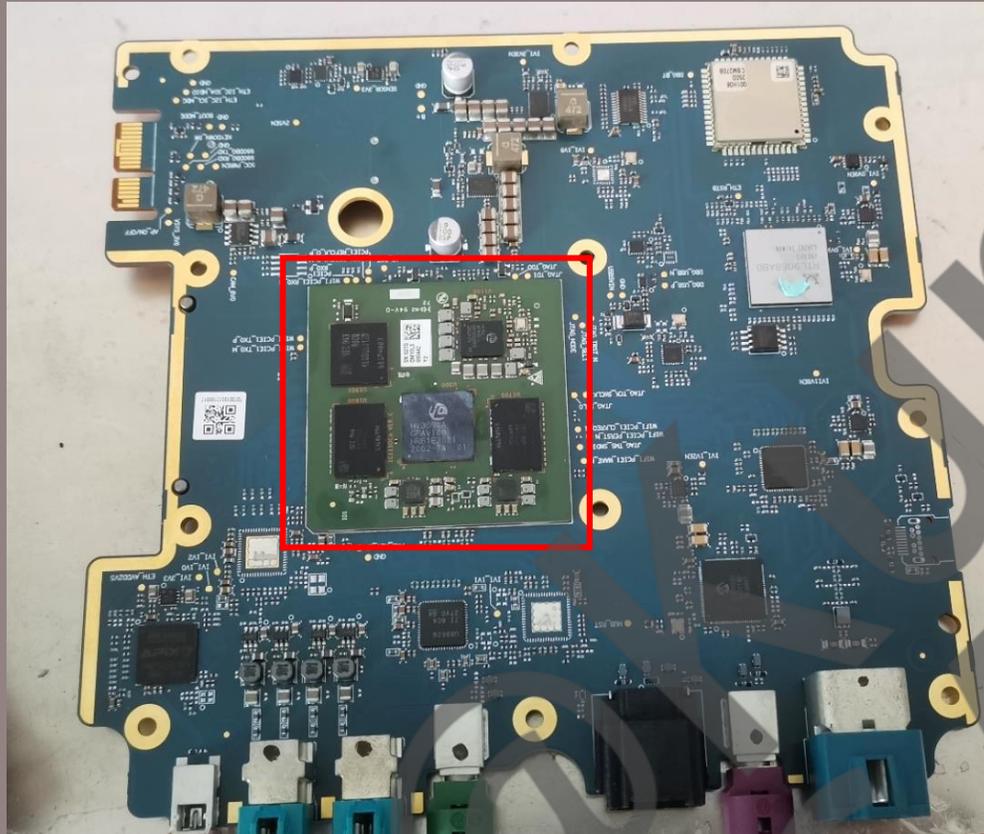
Kirin 990A SoM



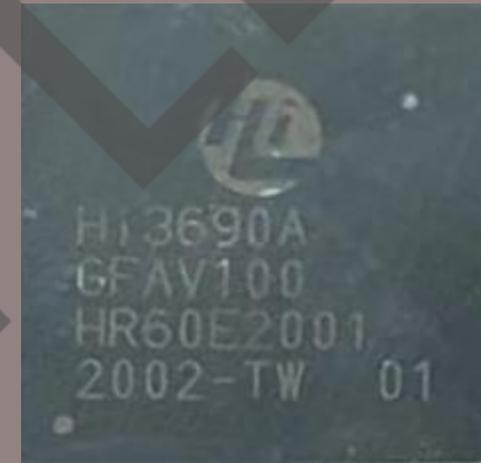
By AITO M9 (TEST Car)



Kirin 990A Socket



Kirin 990A SoM



Kirin 990A FCBGA



Kirin 990A FCBGA

Huawei old Mark Rule

HI 3690 A

A: Car chip

GFAV100

HR60E2001

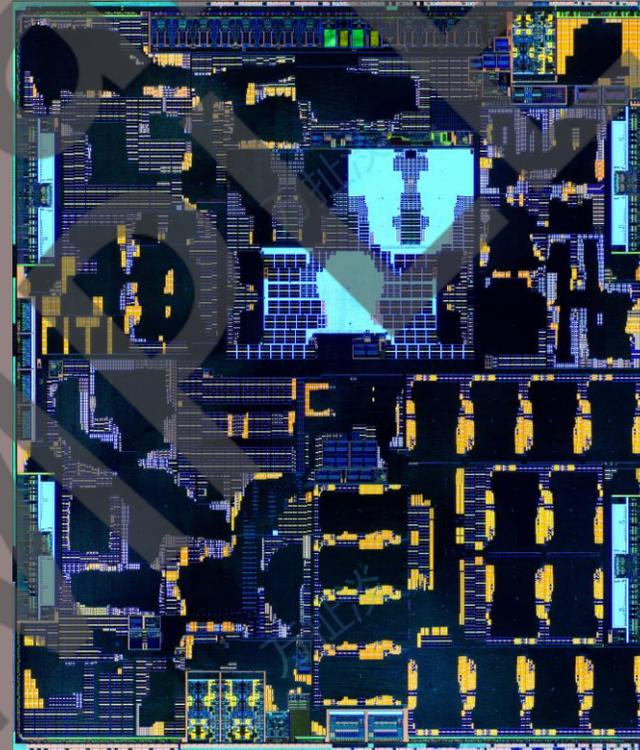
Made in Year 2020, Week 01

2002-TW

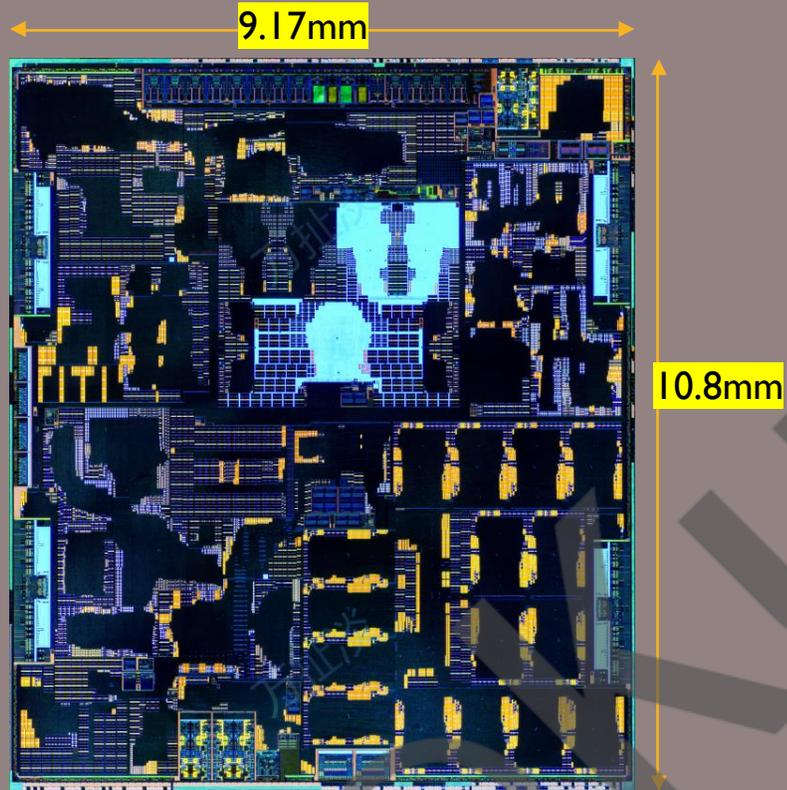
Package in Year 2020, Week 02  
Package on Tai Wan



Kirin 990A FCBGA

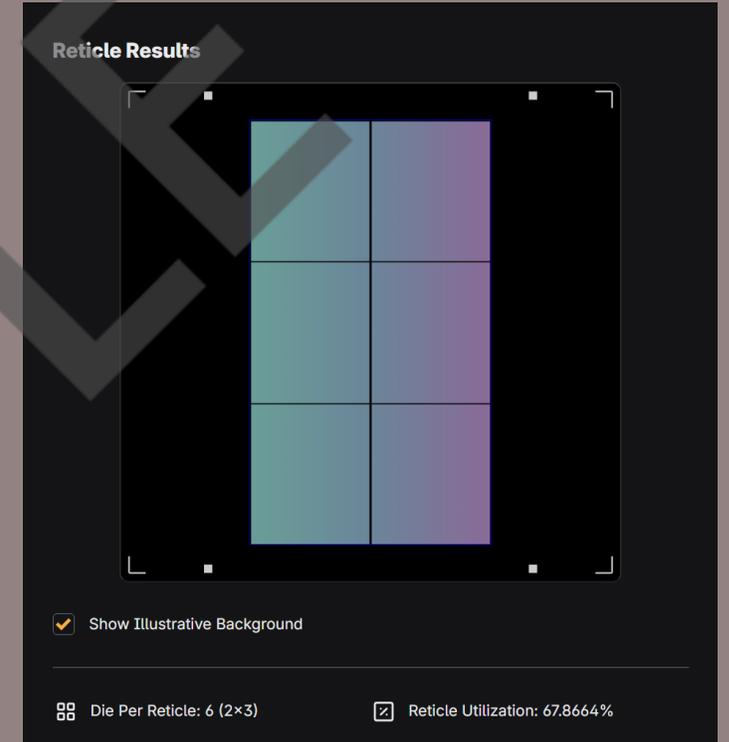
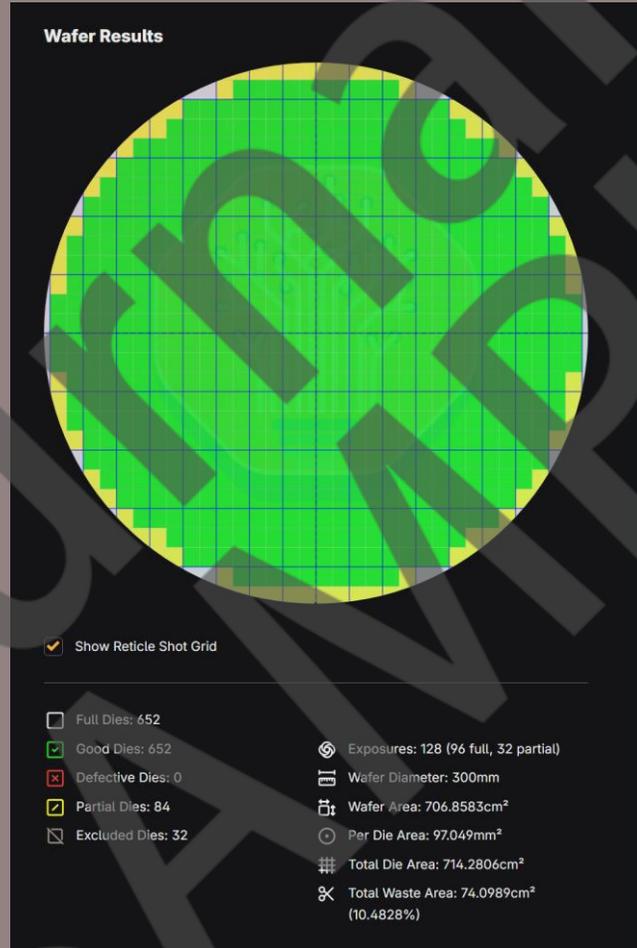


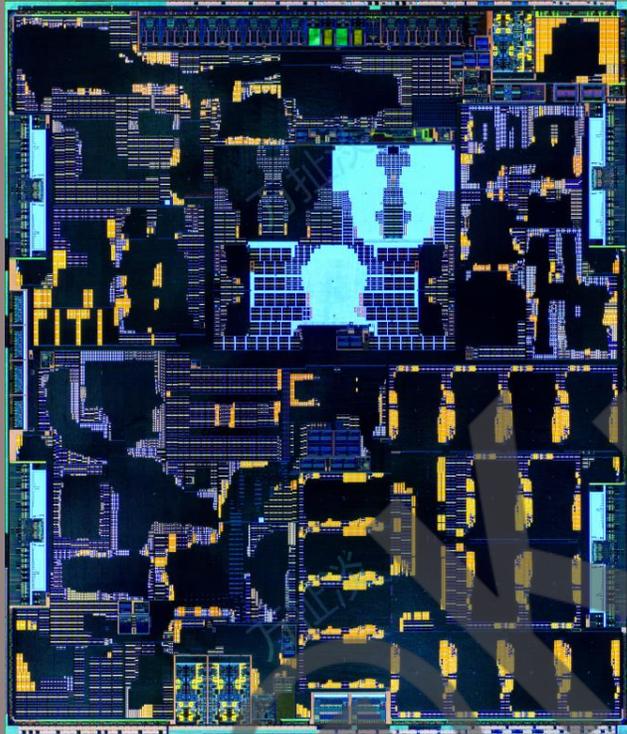
Decap Photo



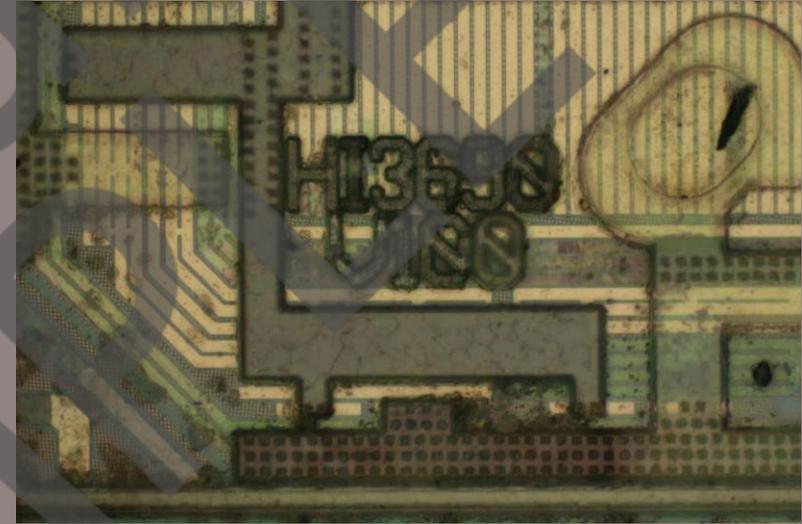
Kirin 990A FCBGA

Die size: 99.036  
Die Per Wafer: 652  
Die Per Mask: 6:1



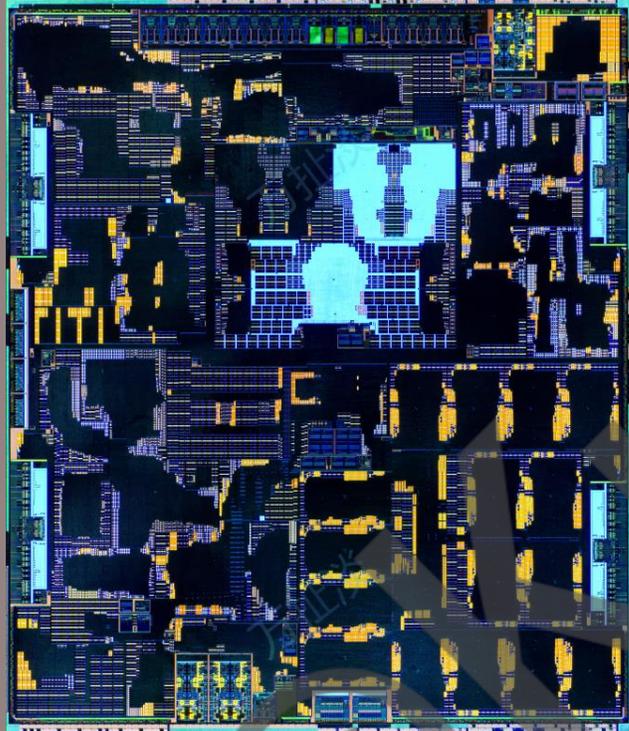


Decap Photo



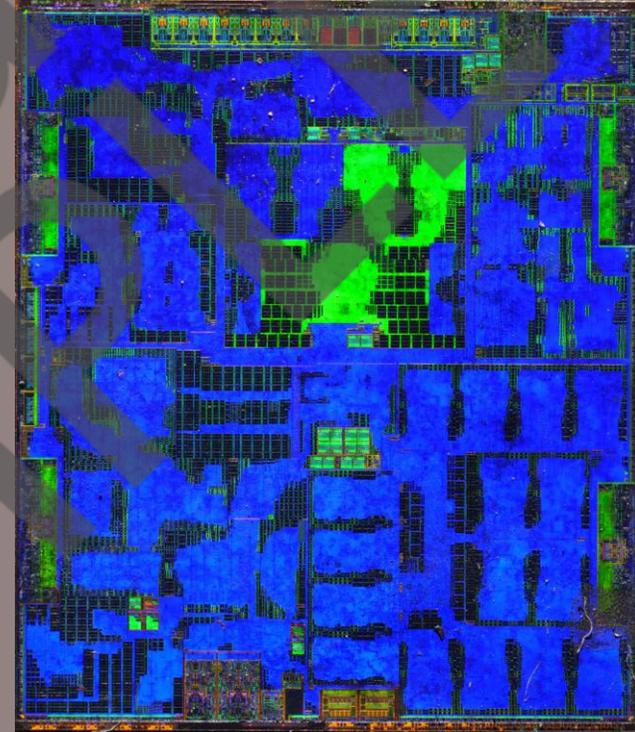
Die mark

Hi3690 V100



Kirin 990A FCBGA

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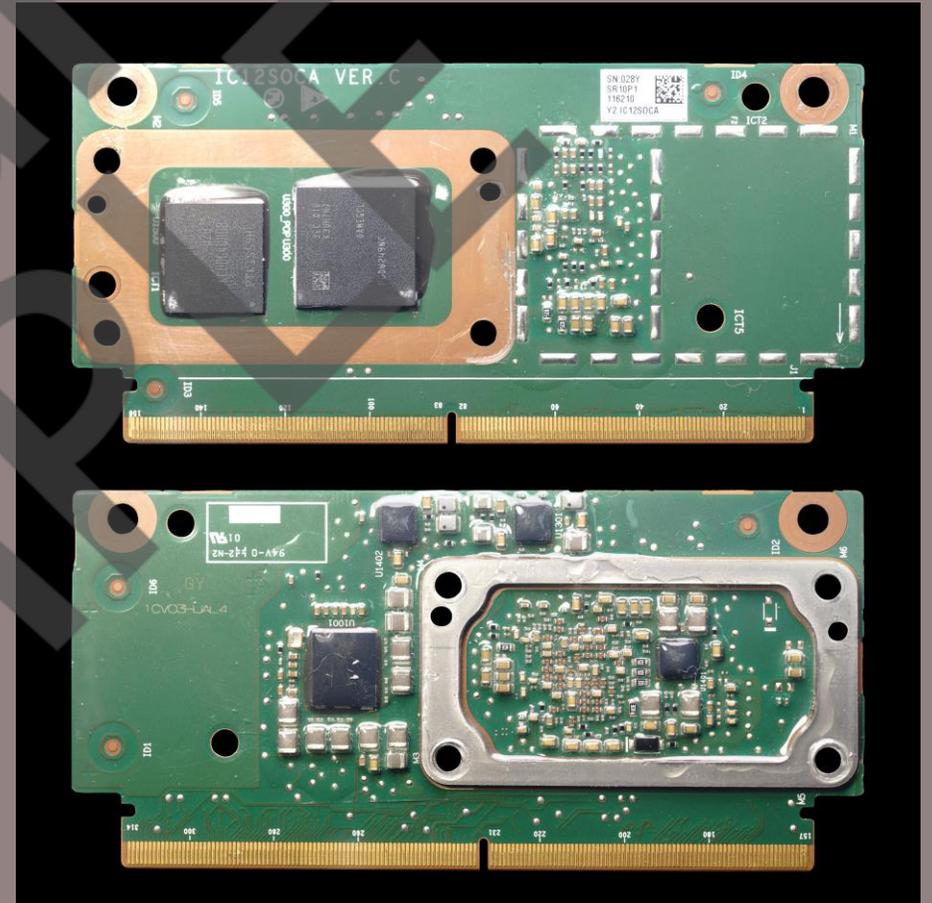
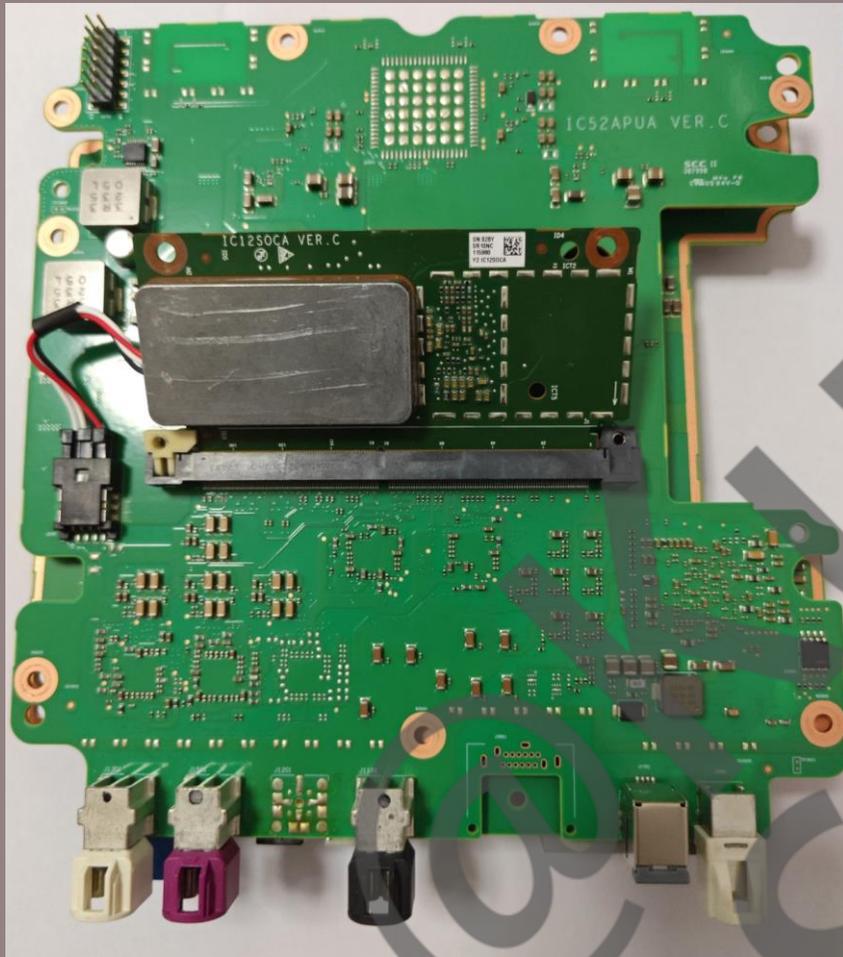
Kirin 990 4G

Hi 3690A V100 = Hi 3690 V100=Kirin990 4G

# Chip analyze

990A-Socket

# Kirin 990A Socket-Package



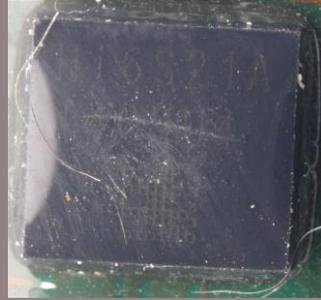
Kirin 990A Socket



# Kirin 990A Socket-Package



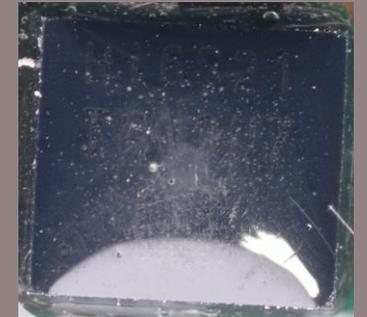
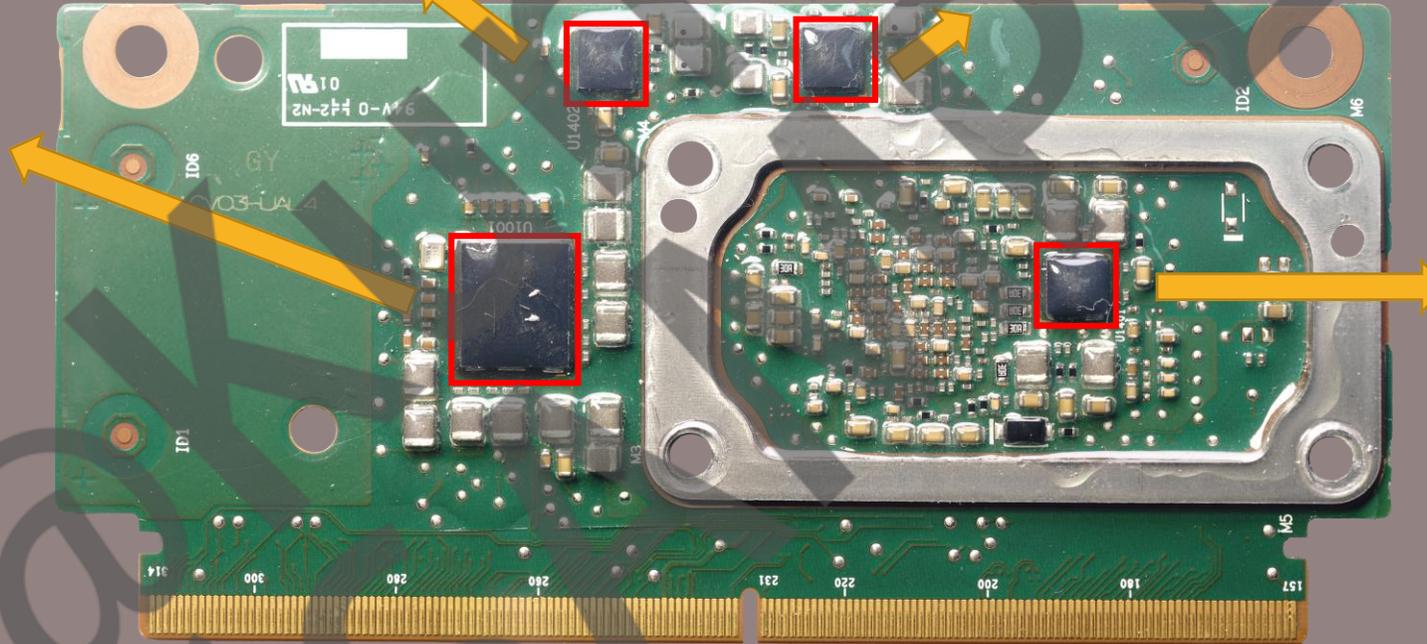
Hi6S21  
AFAV810  
FTQT1U3C6  
2035-CN 01



Hi6S21A  
T409U4



Hi6S22  
T1??U2



Hi 6S21  
T409U7

# Kirin 990A Socket-Package



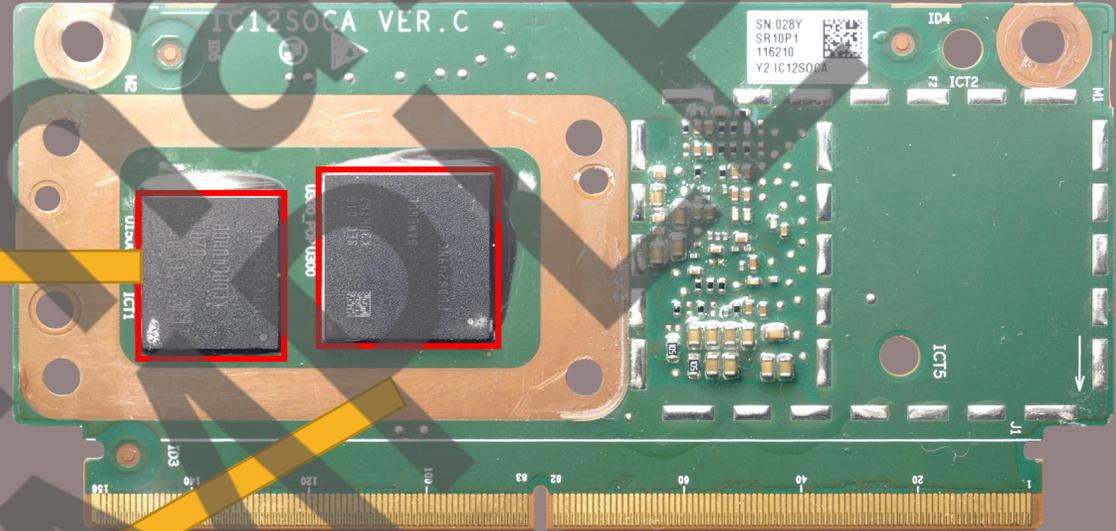
UFS

SEC 010  
B2D1  
KLUDG4UHDB  
PTK1S59HE

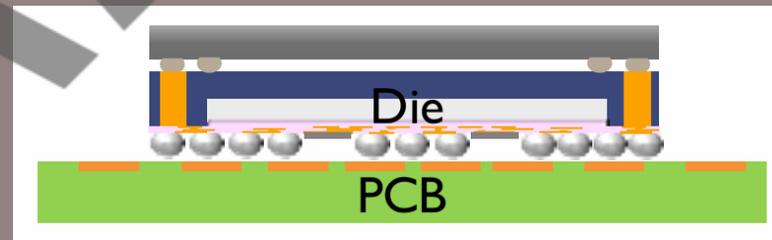


Lpddr

SEC 016  
K3UH7H7  
0AMEGCL  
PGDV249NC



Fan Out Package on Package





UFS 3.0 128GB

SEC **010**  
B2D1  
KLUDG4UHDB  
PTK1S59HE

Year **2020** Week **10**



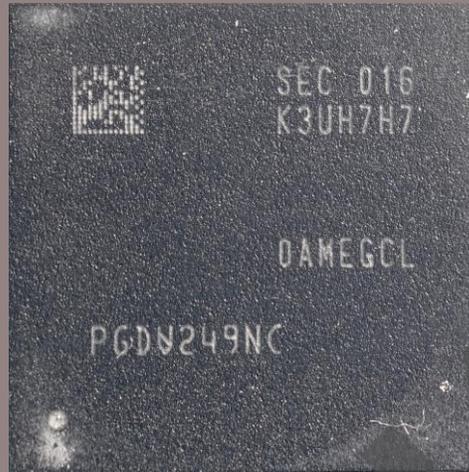
Lpddr4x 8GB 4266Mbps

SEC **016**  
K3UH7H7  
0AMEGCL  
PGDV249NC

Year **2020** Week **16**

Applications <b>Mobile</b>	Voltage 1.2 / 2.5 V	Temperature -25 ~ 85 °C	Product Status DB Only
Interface G4 2Lane	Capacity 128 GB	Package Size 11.5 x 13 x 0.8 mm	

Applications <b>PC &amp; Gaming</b>	Density 64 Gb	Organization x64	Speed 4266 Mbps
Voltage 1.8 / 1.1 / 0.6 V	Temperature -25 ~ 85 °C	Package 556 FBGA	Product Status EOL

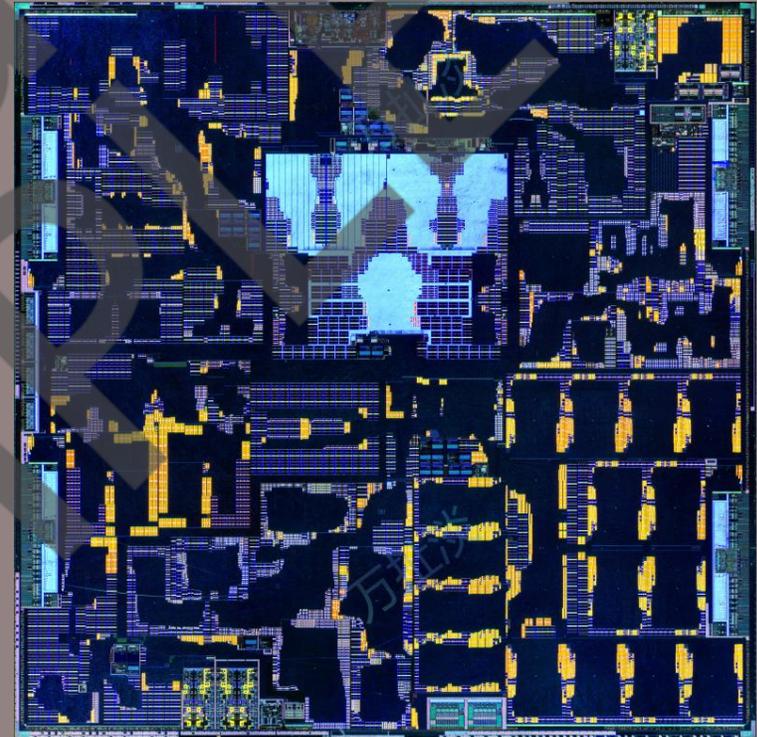
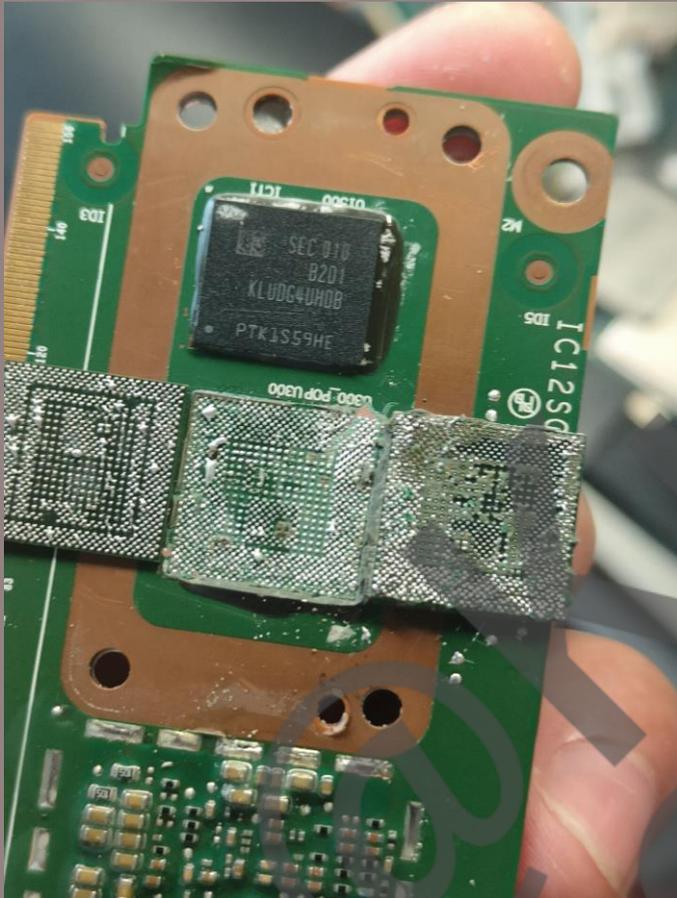


Kirin 990A Socket

Decaped

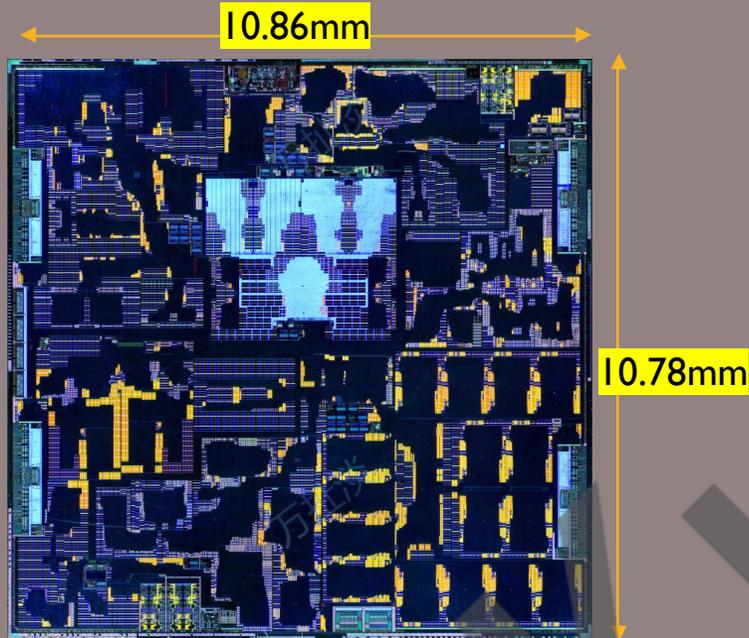


# Kirin 990A Socket-Decaped



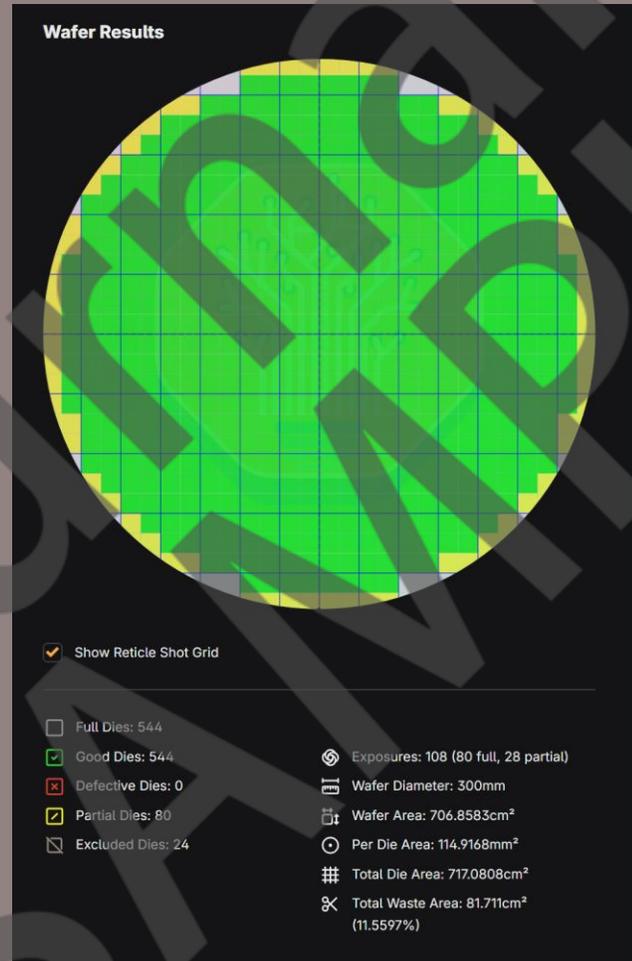
Kirin 990A Socket Dieshot

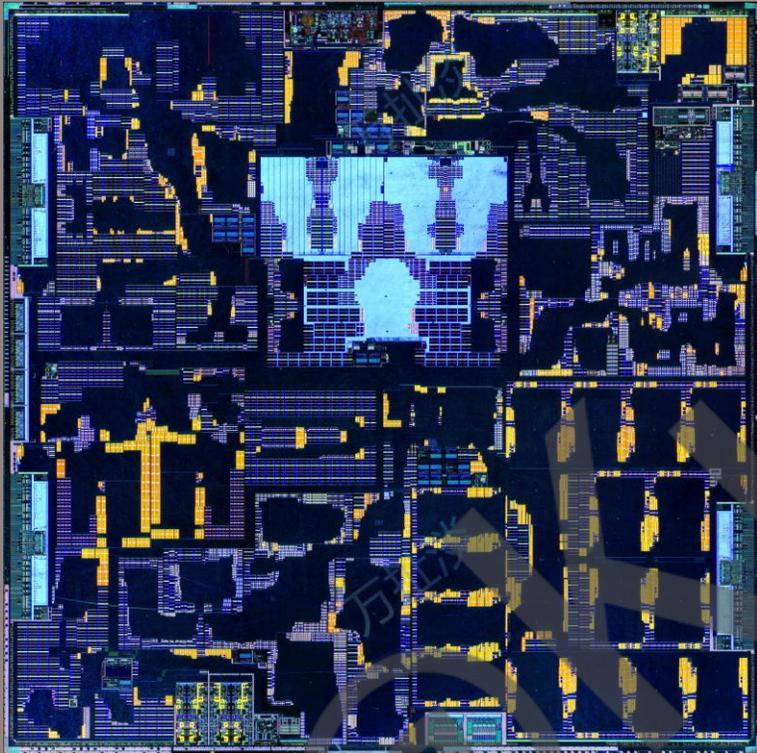
# Kirin 990A Socket-DPW



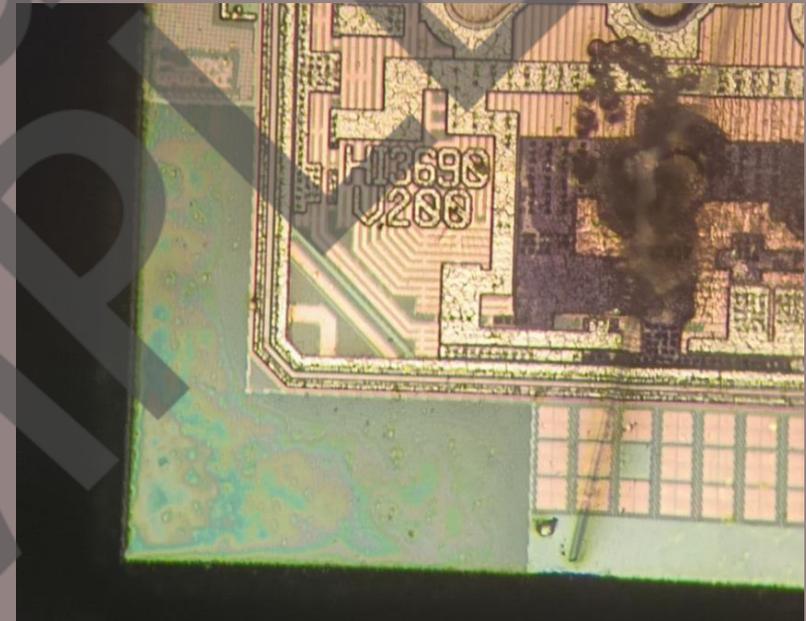
Kirin 990A Socket

Die size: 117.07  
Die Per Wafer: 544  
Die Per Mask: 6:1



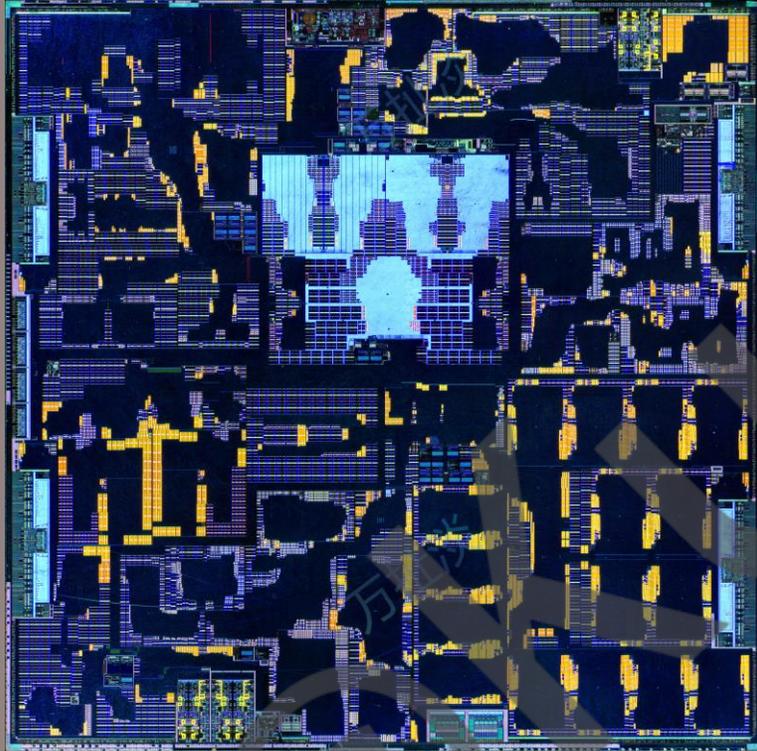


Kirin 990A Socket Dieshot



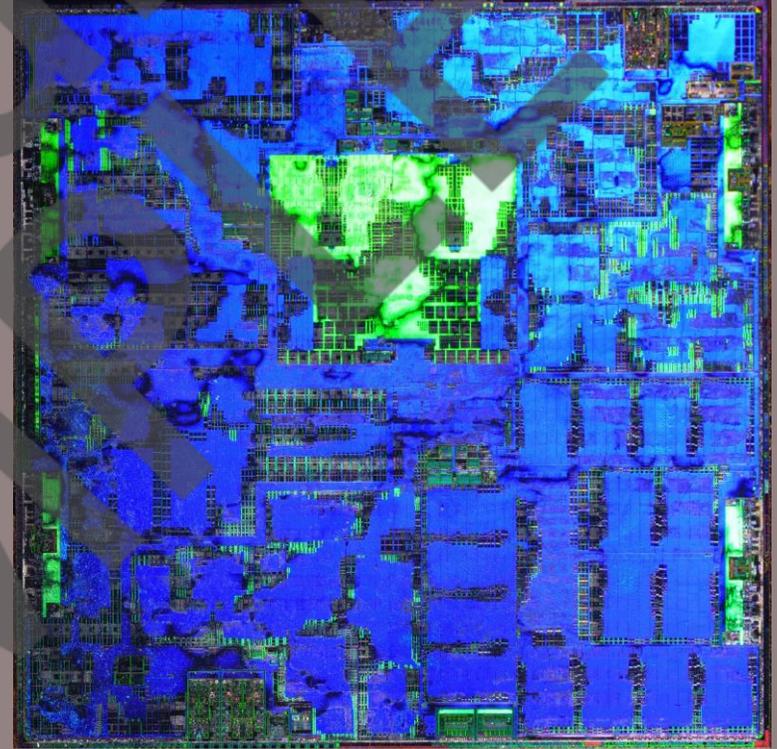
Die mark

Hi3690 V200



Kirin 990A Socket

=

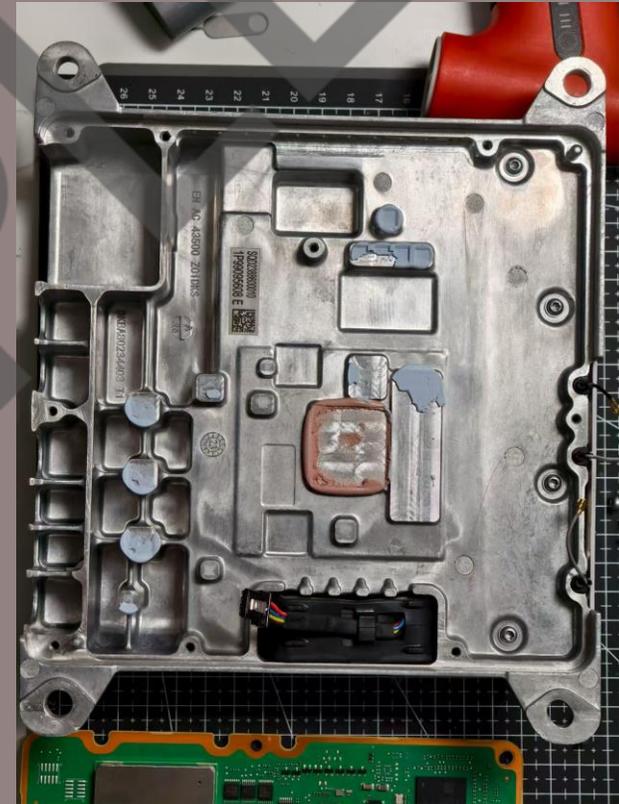


Kirin 990 5G

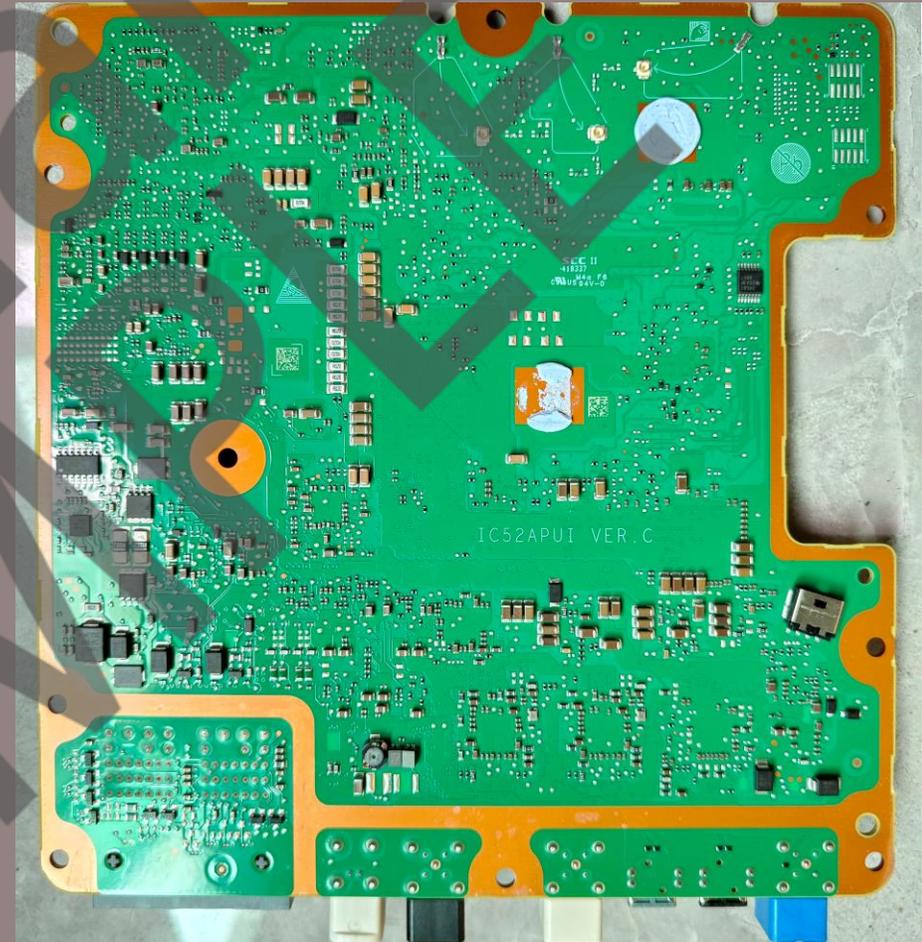
Hi 3690 Socket = Hi 3690 V200=Kirin990 5G

# Package analyze

9610A-AITO M9



# Kirin 9610A Package

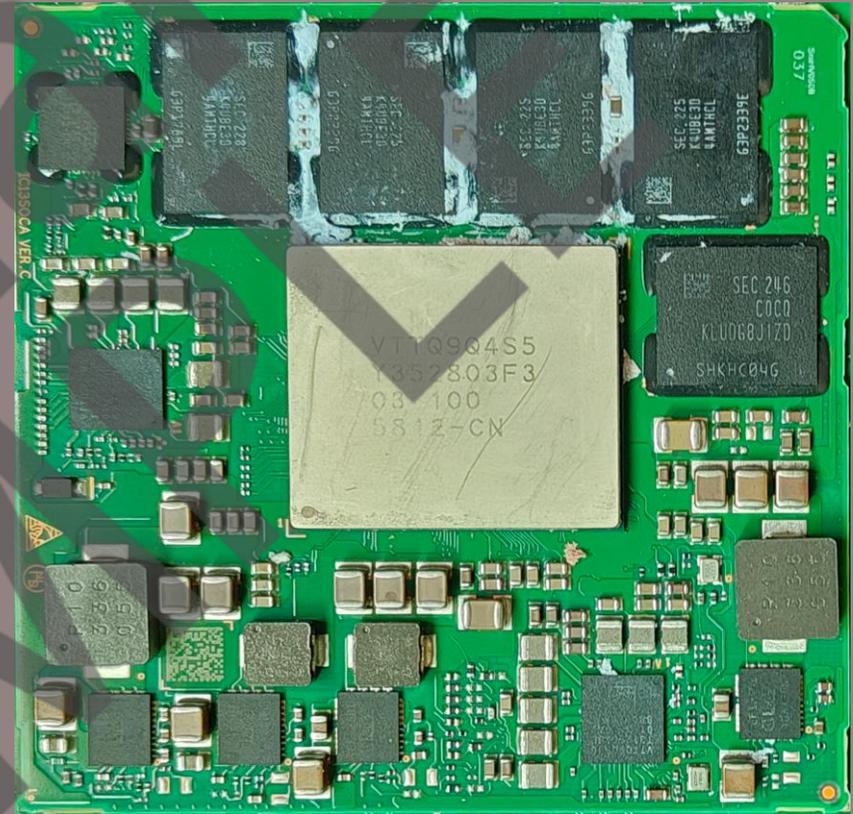
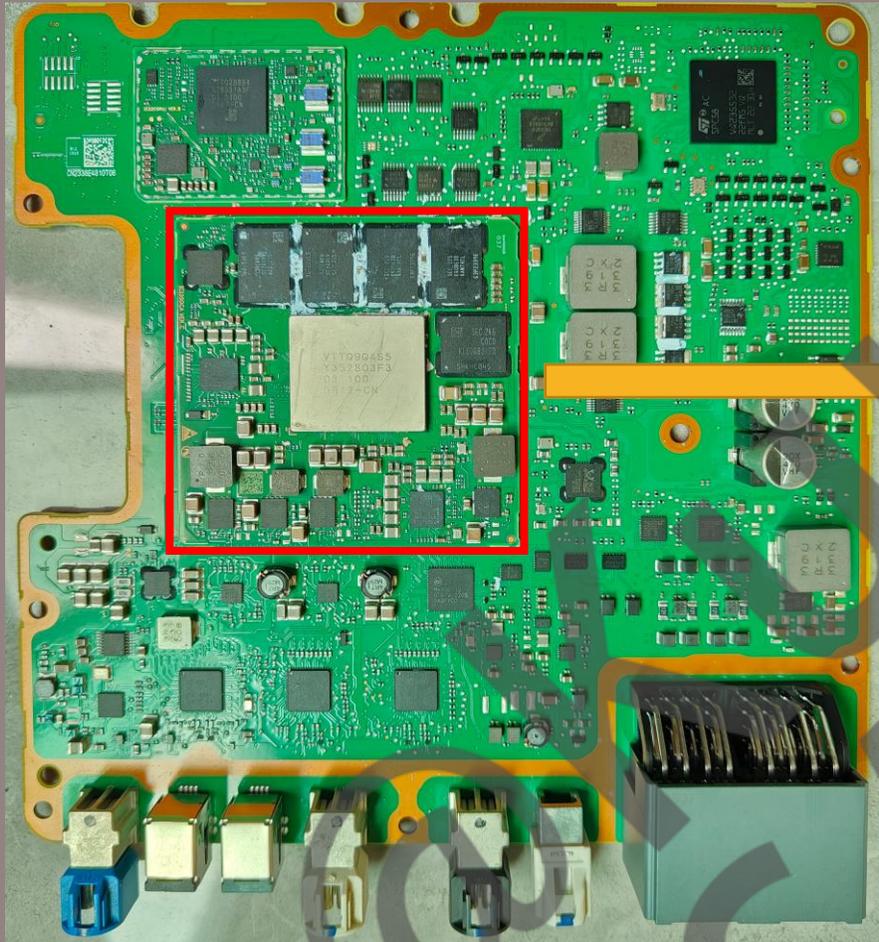




SCC=深南电路

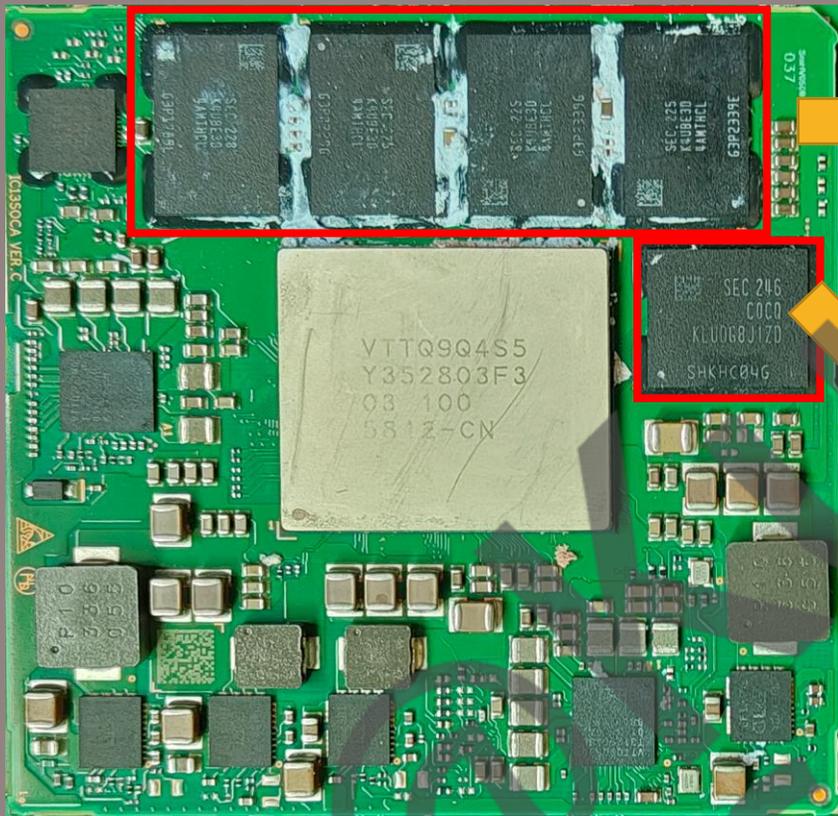
**SCC 深南电路**

# Kirin 9610A Package



Kirin 9610A MCM

# Kirin 9610A Package



Kirin 9610A McM



LPDDR  
SEC 225  
K4UBE30  
4AMTHCL



UFS  
SEC 246  
C0CQ  
KLUDG8J1ZD



SEC **246**  
C0CQ  
KLUDG8J1ZD

UFS 2.1 256GB

Year **2022** Week **46**



SEC **225**  
K4UBE3D  
4AMTHCL

Lpddr4x 4GB 4266Mbps

Year **2022** Week **25**

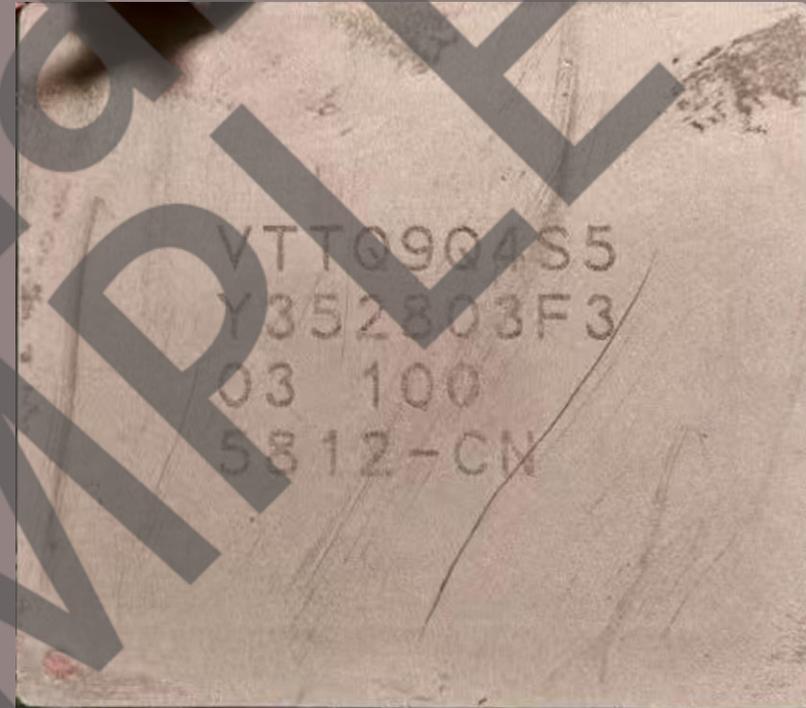
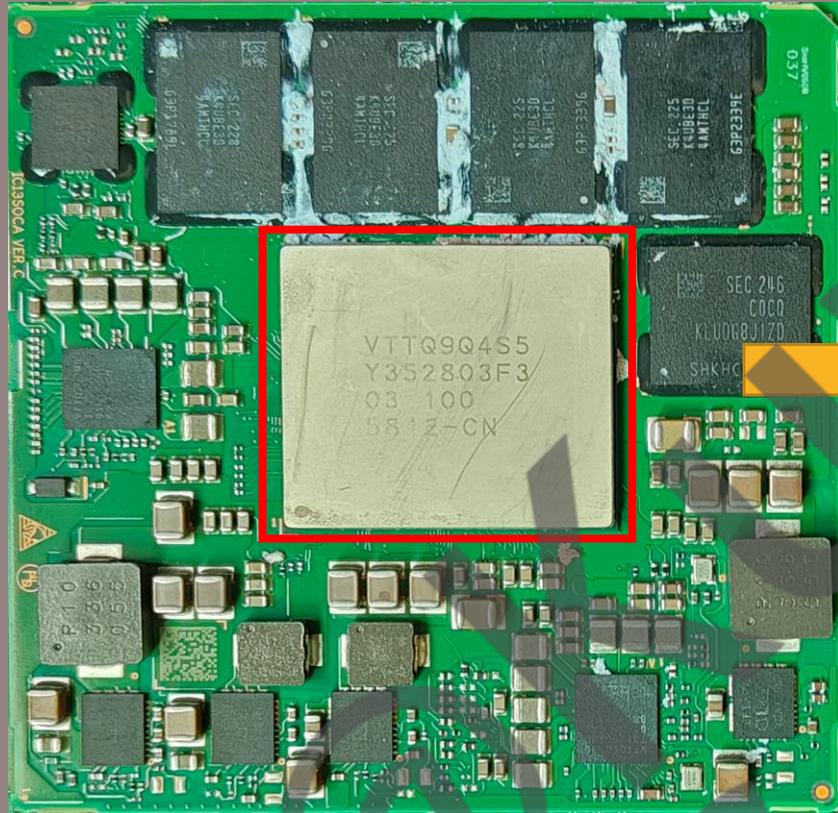
### Specification

Applications <b>Automotive</b>	Voltage <b>1.8 / 3.3 V</b>	Temperature <b>-40 ~ 95 °C</b>	Product Status <b>Mass Production</b>
Interface <b>G3 2Lane</b>	Capacity <b>256 GB</b>	Package Size <b>11.5 x 13 x 1.72 mm</b>	

### Specification

Applications <b>Automotive</b>	Density <b>32 Gb</b>	Organization <b>x32</b>	Speed <b>4266 Mbps</b>
Voltage <b>1.8 / 1.1 / 0.6 V</b>	Temperature <b>-40 ~ 105 °C</b>	Package <b>200 FBGA</b>	Product Status <b>DB Only</b>

# Kirin 9610A Package



Kirin 9610A McM



Hi 3690A S  
GFCV300  
VTFM2U8S8  
2035-CN 02

=

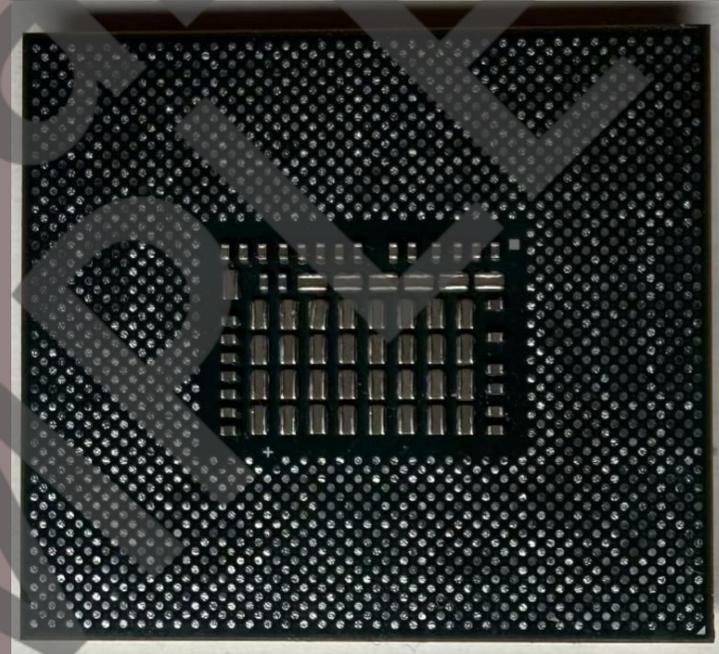


Same chip  
Different Mark

VTTQ9Q4S5  
Y352803f3  
03 100  
5812-CN



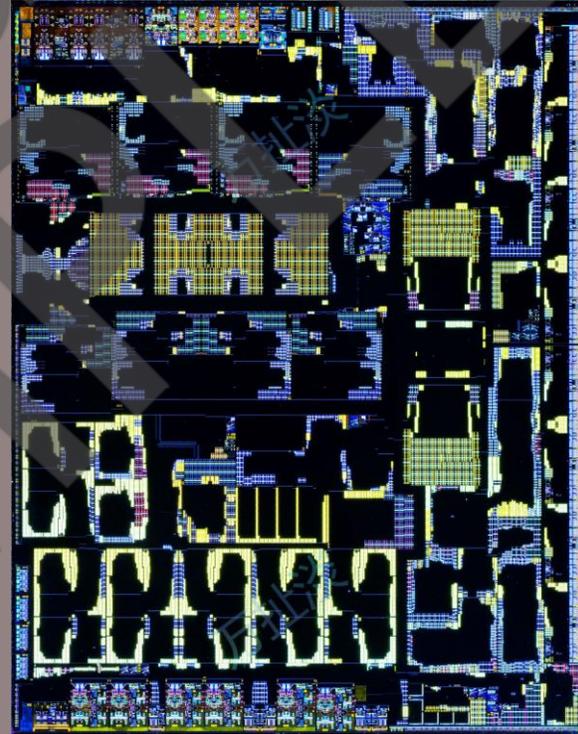
Kirin 9610A Topside

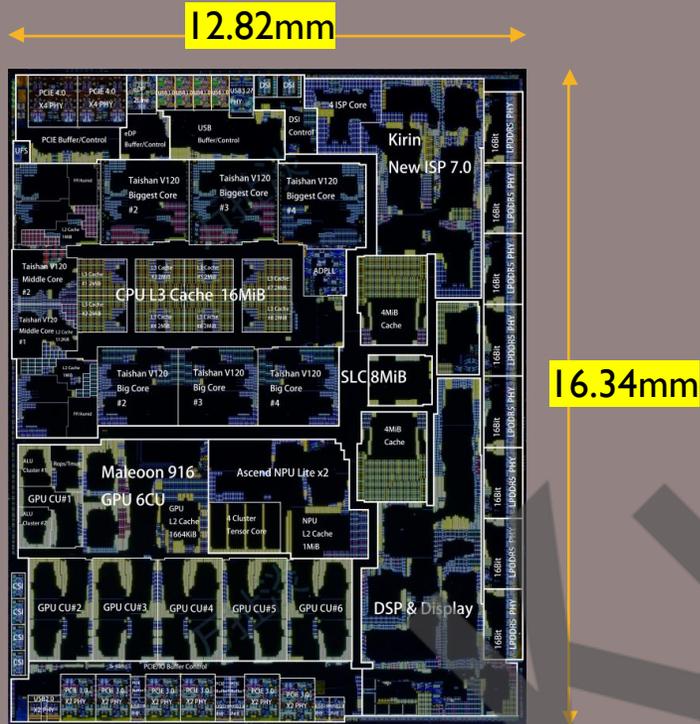


Kirin 9610A Backside



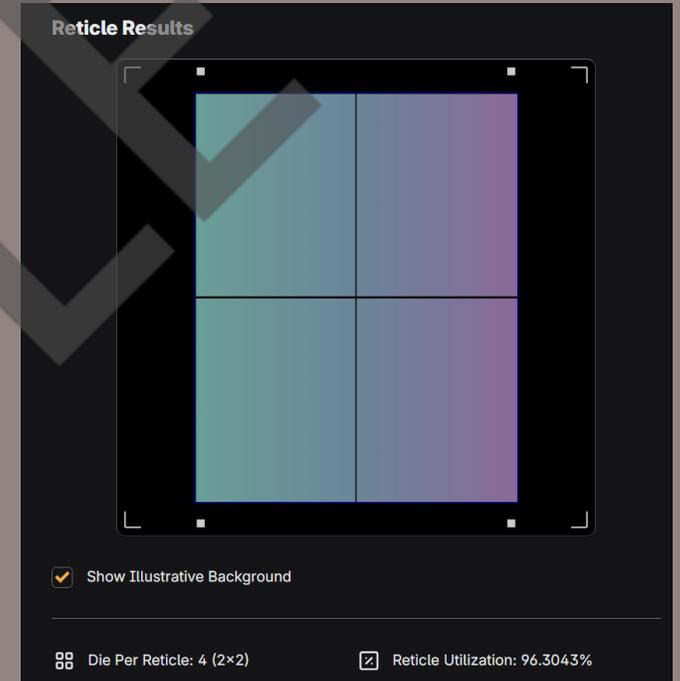
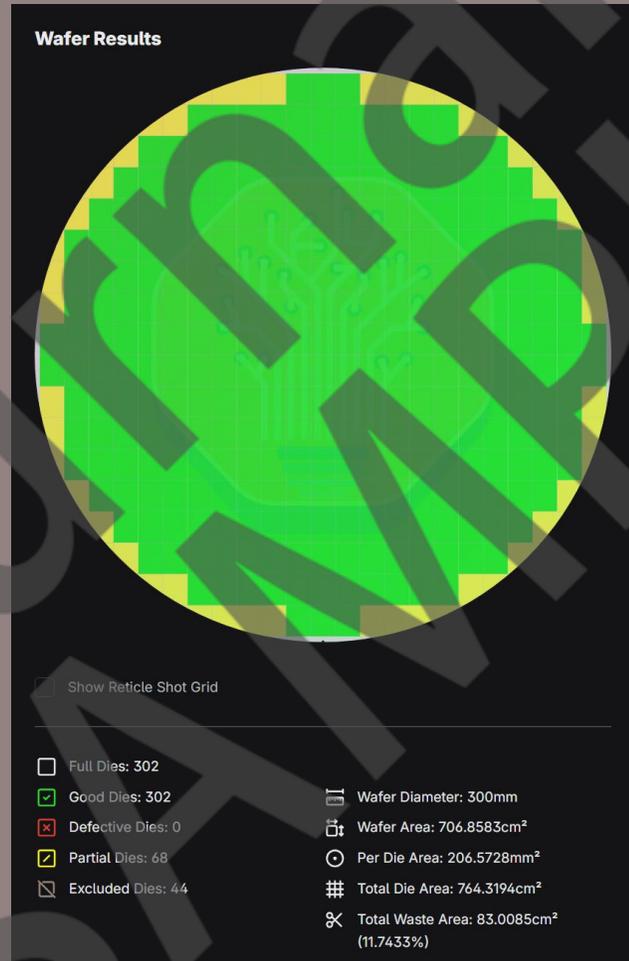
Decapped





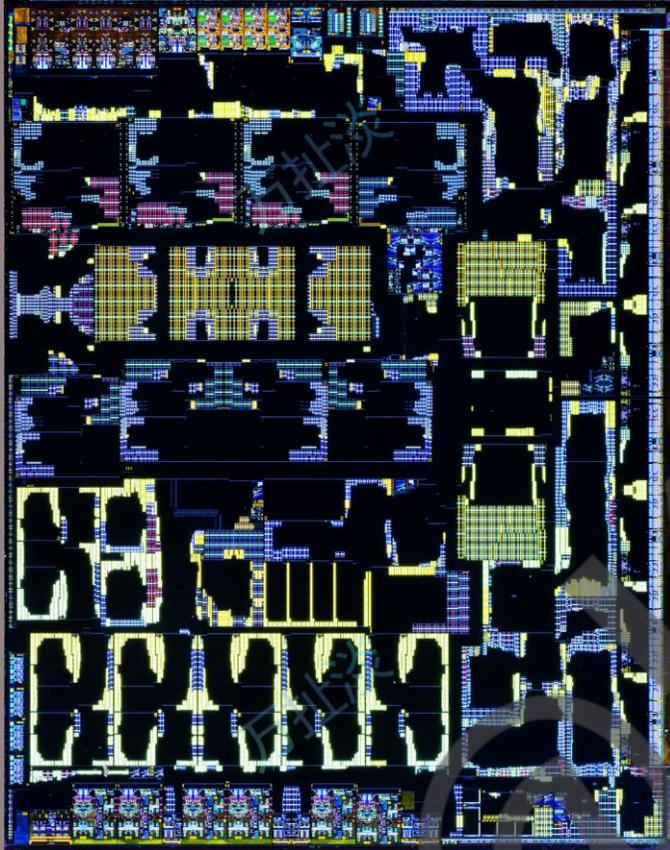
Kirin 9610A

Die size: **209.478**  
 Die Per Wafer: **302**  
 Die Per Mask: **4:1**



# Kirin 9610A chip

On chip analyze



Chip Technology : SMIC N+2



Chip Die Mark:

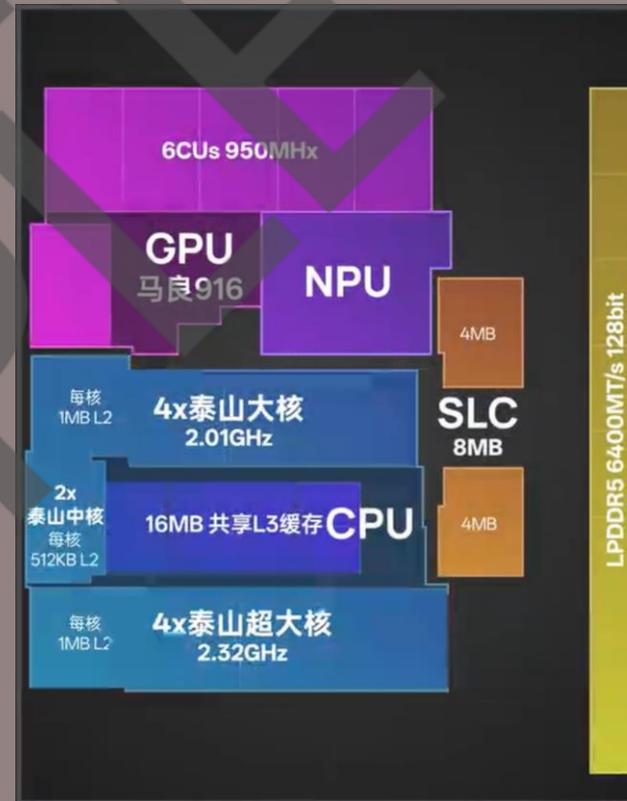
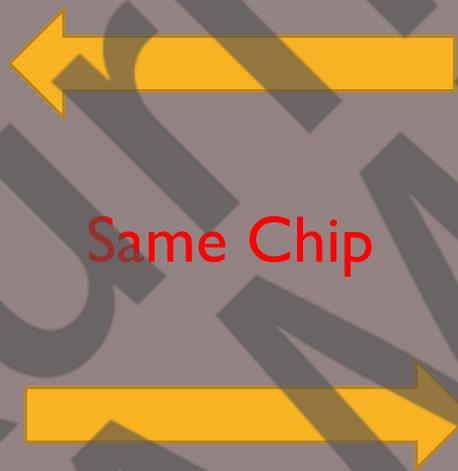
2020 02 13

Year 2020  
February  
Day 13





Kirin 9610A(Car Chip)

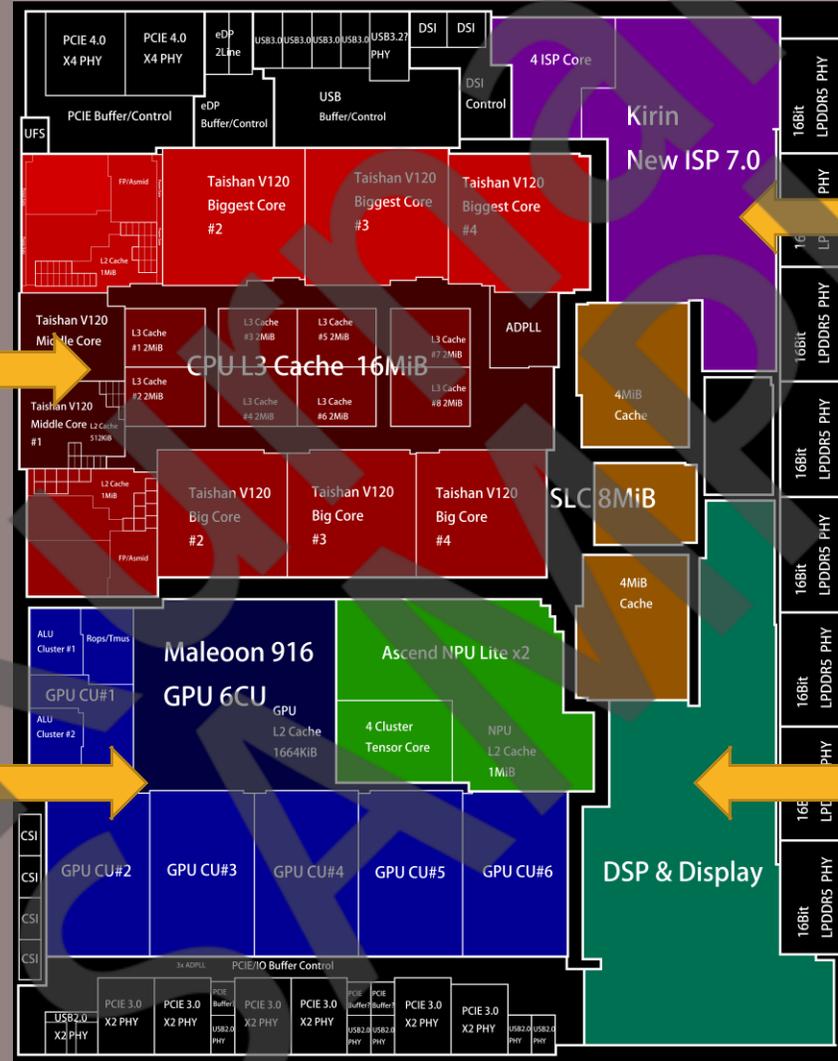


Kirin X90(Note Book)

4+4+2 Core CPU

Shared 16MiB L3 Cache

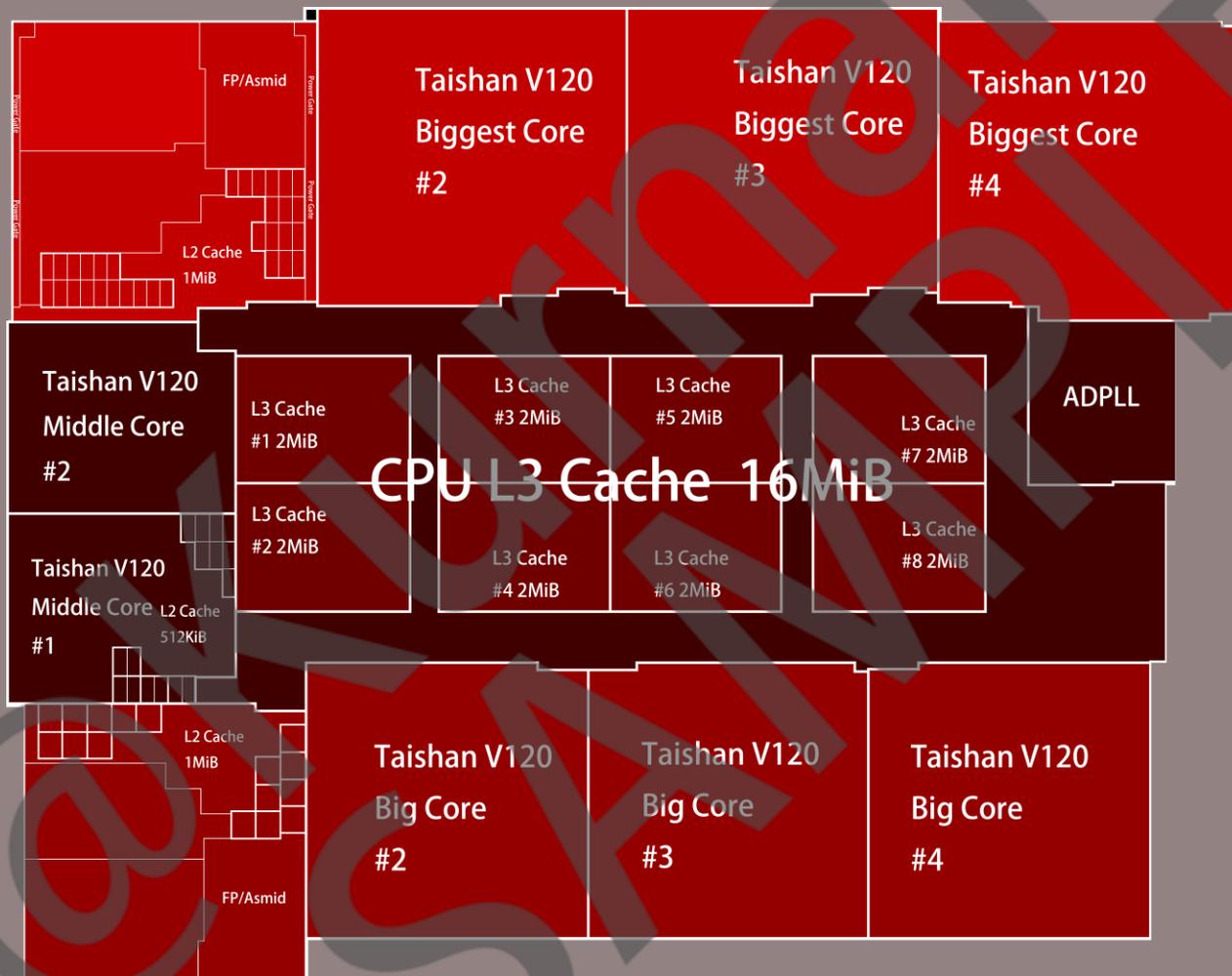
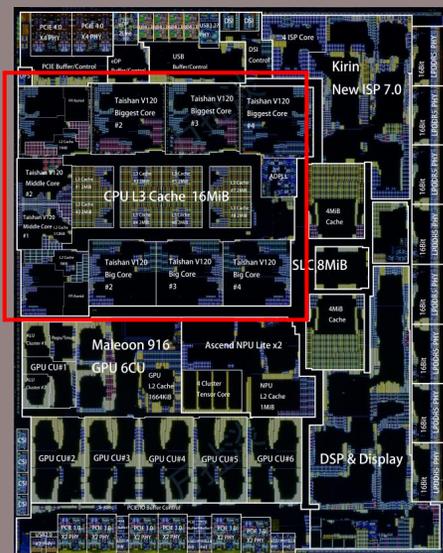
Maleoon 916  
6CU GPU



Same ISP 7.0  
with Kirin 9000S/9010

Same DSP  
with Kirin 9000S/9010

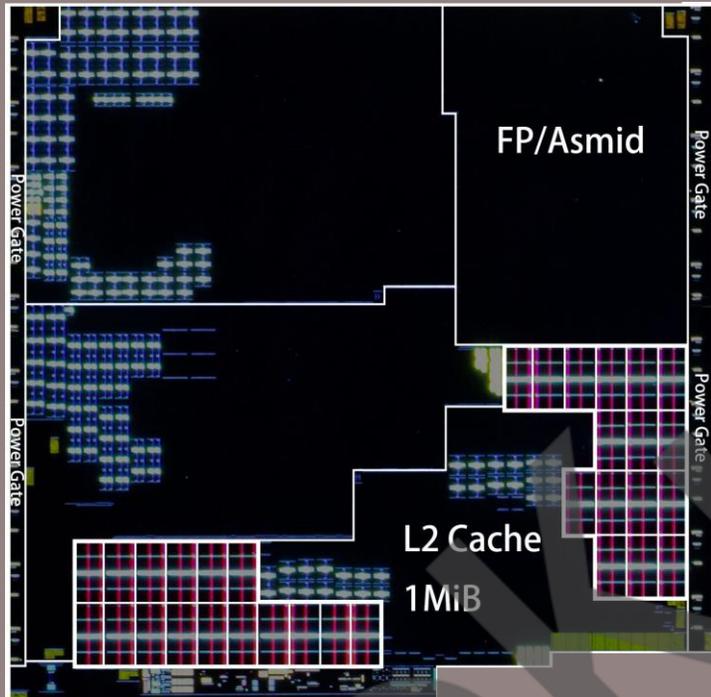
# Kirin 9610A chip analyze-CPU



4 Core "CPU Biggest"

2 Core "CPU Middle"

2 Core "CPU Big"



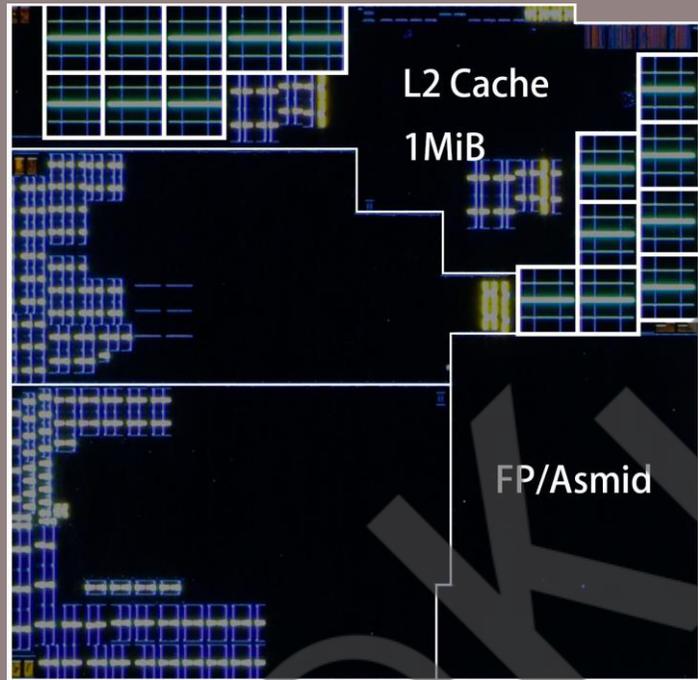
Core size: 4.665mm<sup>2</sup>

CPU L2 Cache  
Power Gate 1MiByte  
have

The Kirin X90&9610A Biggest core has a 1MiB exclusive CPUL2 and edge power supply, also known as Power Gate

which is different from the rest of the CPU cores.

4 Core "CPU Biggest"



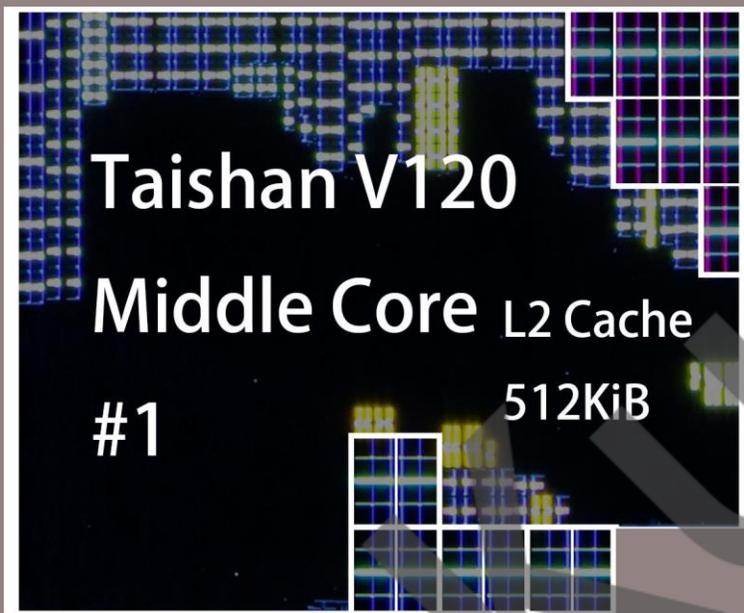
4 Core "CPU Big"

Core size: 3.92mm<sup>2</sup>

CPU L2 Cache 1MiByte  
Power Gate none

The Kirin X90&9610A Big core has a 1MiB exclusive CPUL2

And didn't have the Power Gate



Core size: 2.115mm<sup>2</sup>

CPU L2 Cache 512KiByte  
Power Gate none

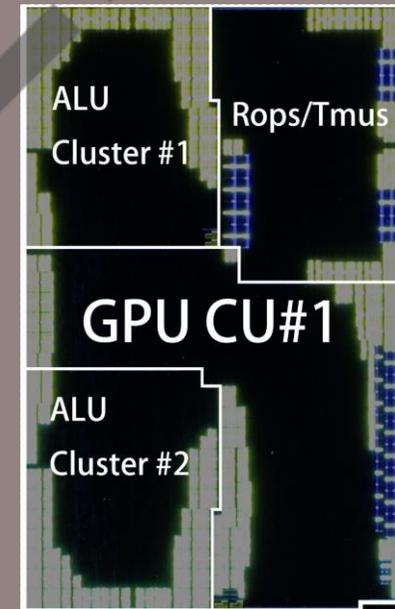
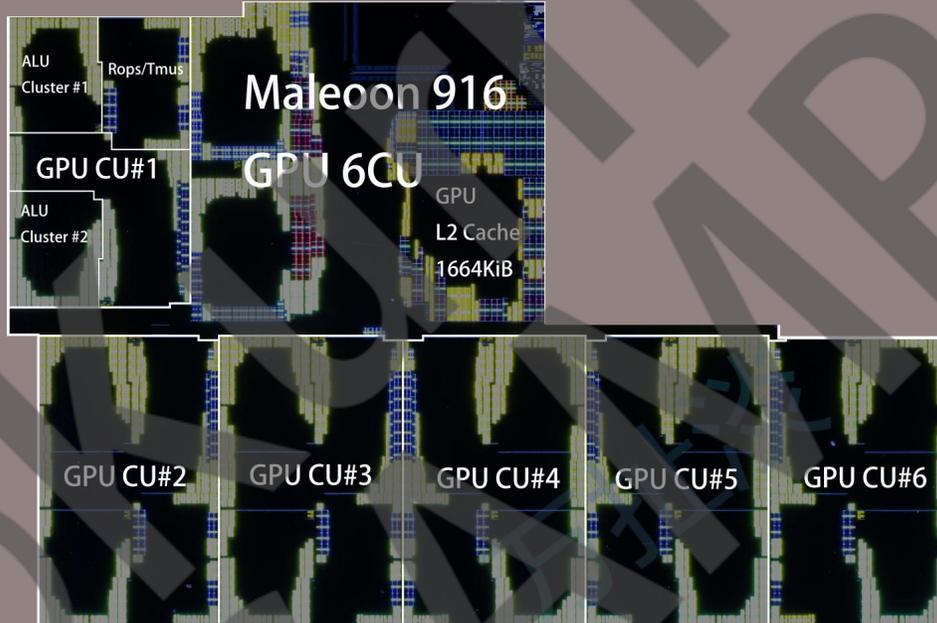
The Kirin X90&9610A Middle core has a 512KiB exclusive CPUL2

And didn't have the Power Gate

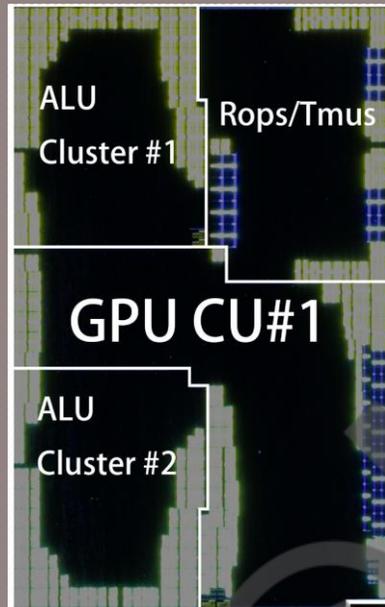
2 Core "CPU Middle"

The Kirin X90&9610A have 6Cu GPU  
Named Maleoon 916

The GPU Per Cu



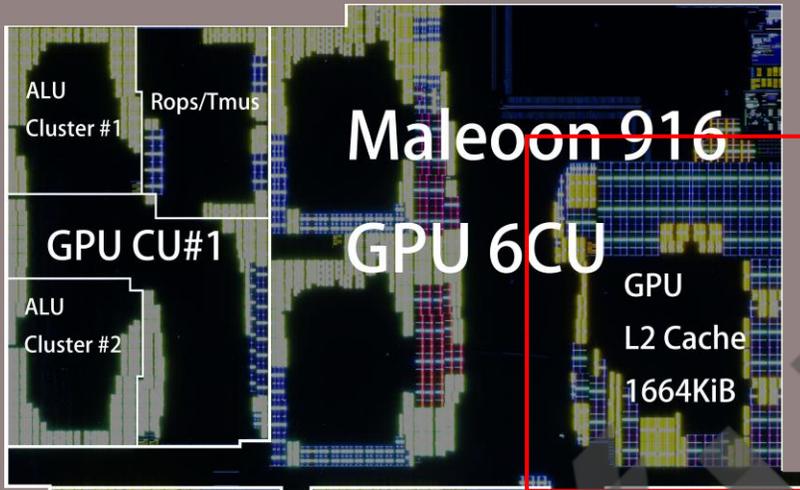
### The GPU Per Cu



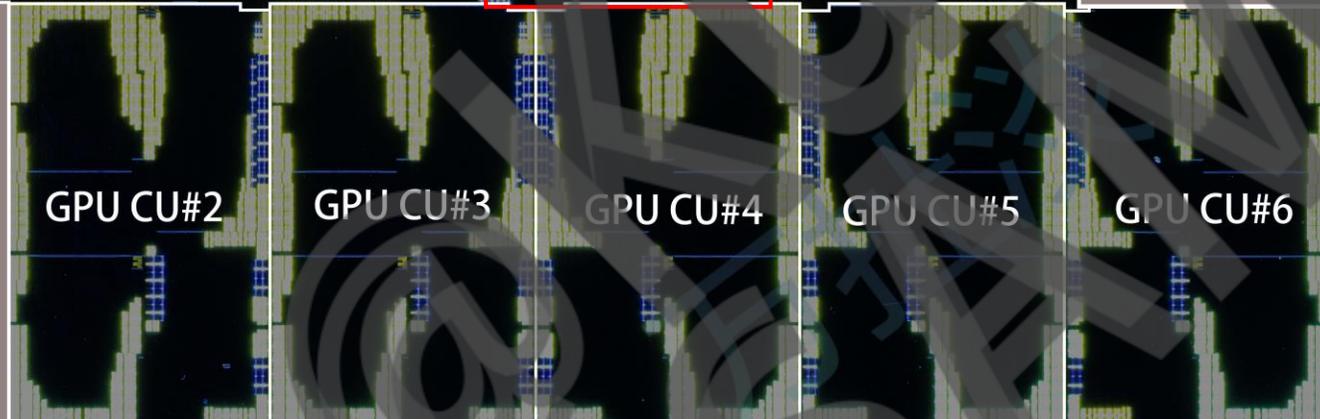
Maleoon 916 GPU Cu Size: 3.956mm<sup>2</sup>  
Alu Cluster Nb: 2

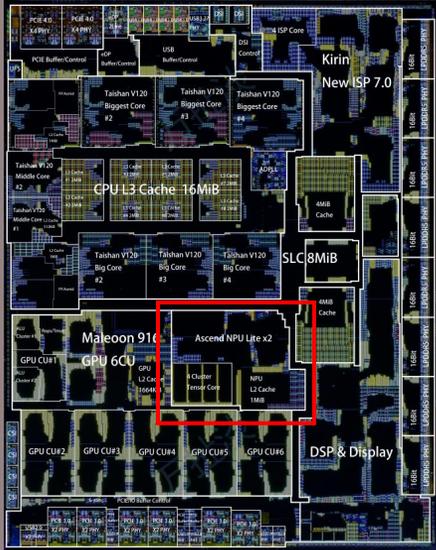
Given that the Maleoon 910, 916, and 920 share identical GPU CU area, ALU cluster count, and ALU cluster area

it is highly likely they utilize the **same GPU IP** core.

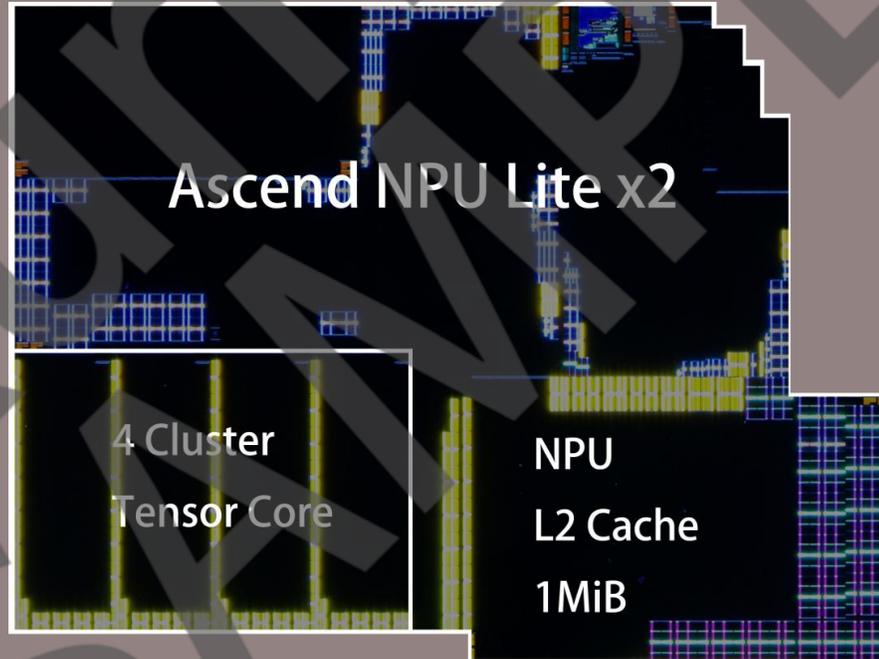


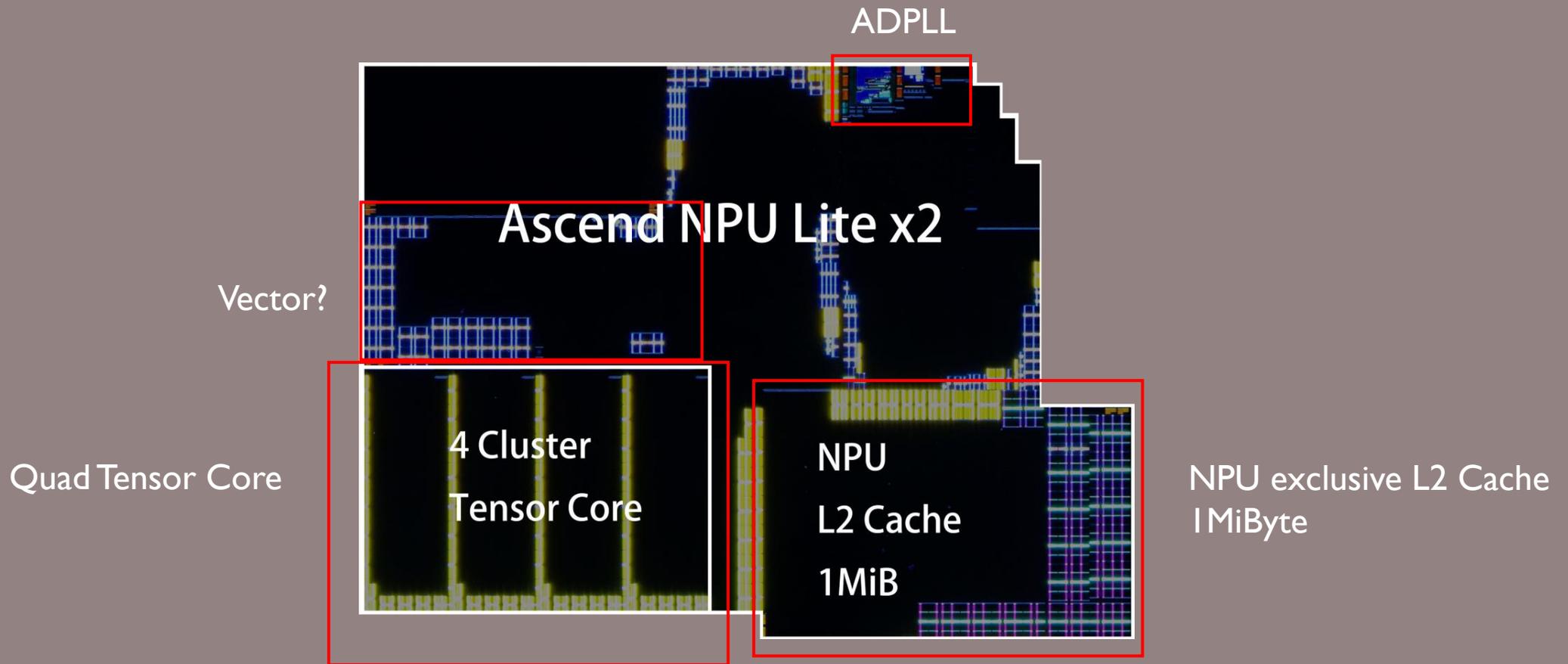
GPU L2 Cache: 1664KiB  
GPU Cu Per L2: 277.33KiB



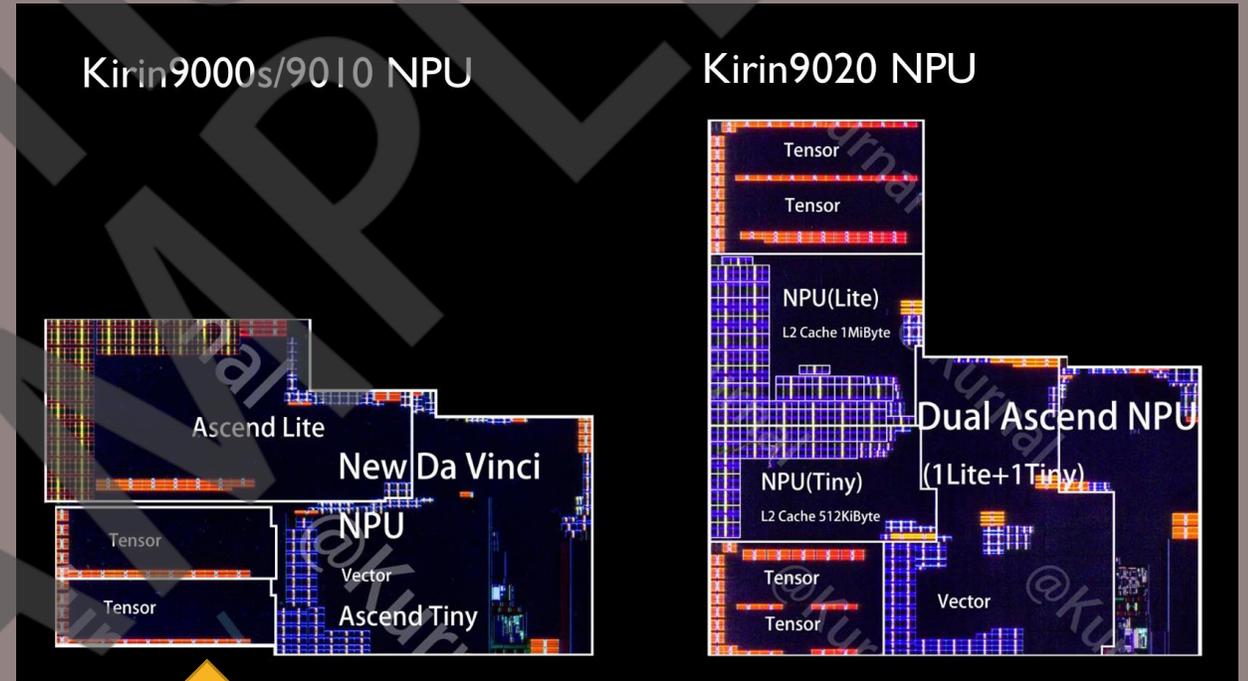
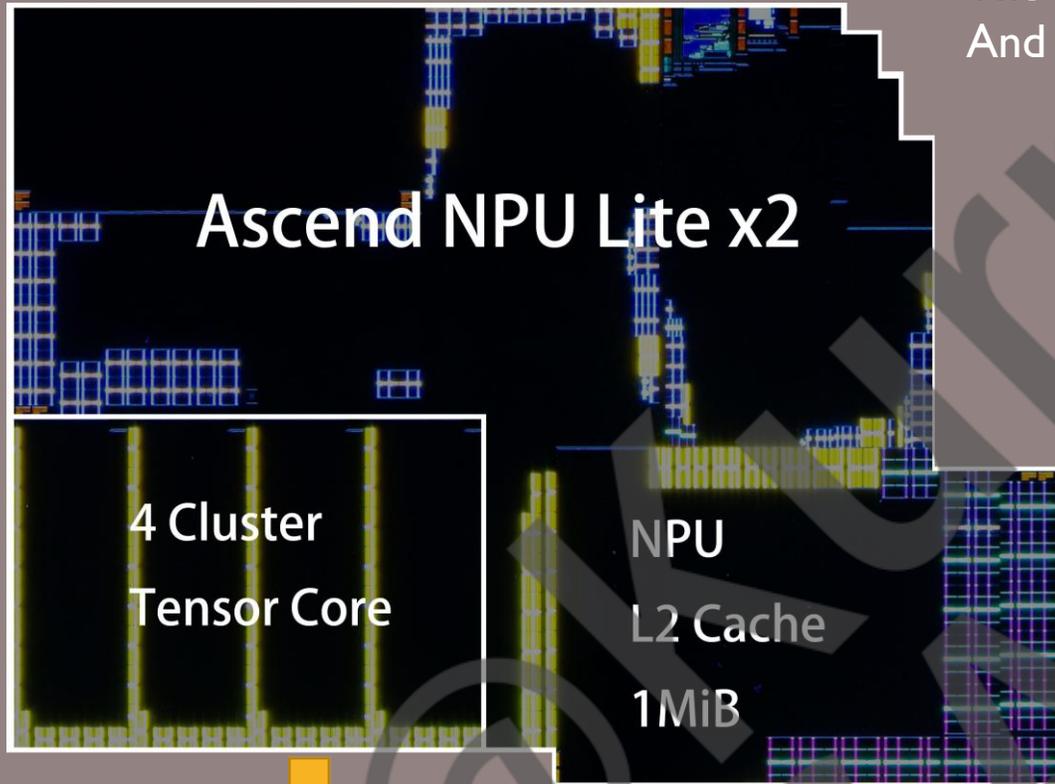


The Kirin X90&9610A have NPU Named Ascend NPU Lite And have **double core** in NPU



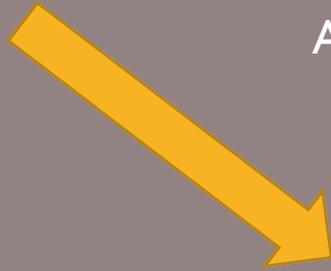
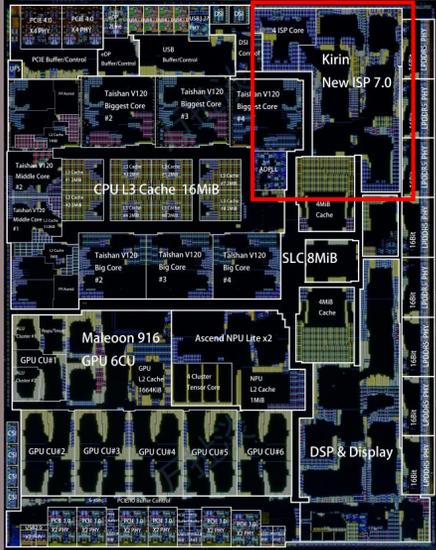


The Kirin X90&9610A have the same NPU IP with Kirin 9000s&9010  
And double than Kirin 9000s&9010 NPU Scale number



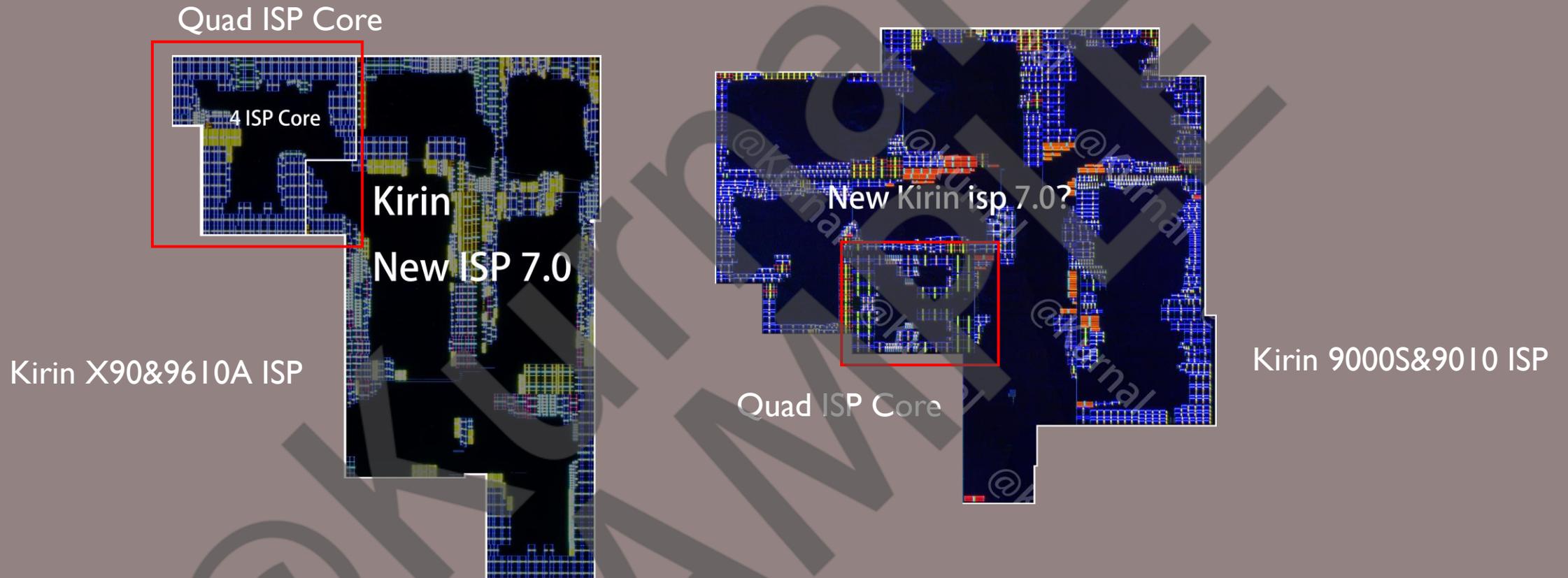
Quad Tensor Core

Double than Kirin 9000S&9010 NPU



The Kirin X90&9610A have the same **ISP IP** named **ISP 7.0**  
And the **ISP 7.0 IP** be used in the **Kirin 9000S&9010**





The Kirin X90&9610A has the same **ISP7.0** as the Kirin 9000S&9010 and its ISP CPU Core is 4 cores.

The other units of the Kirin X90&9610A ISP are also the same as those of the Kirin 9000S&9010