

ISP SOC XC7022

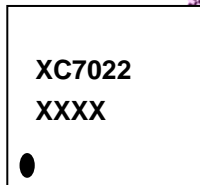
1080p@30fps
720p@60fps

2M
HDR
WDR

MIPI 2 TX
960M bps
MIPI 2 RX
960M bps
I2C slave host
I2C master

I2C host
PLL 6 27M
1.8V/2.8V/3.3V IO
-20 C~ 70 C
Sleep/Active
0.4mm pitch 5x5 QFN40

QFN5x5-40L



XC7022
XXXX -

1 XC7022 ()

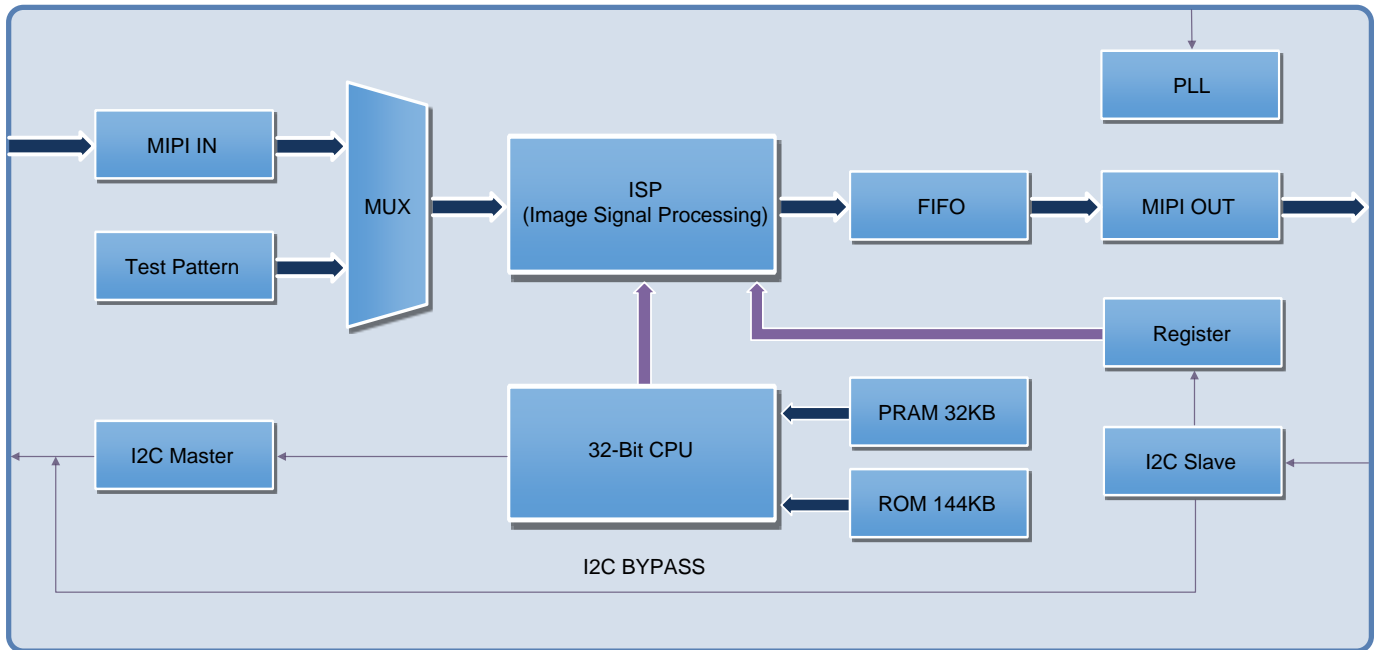
		4
1.1		4
1.2	XC7022	6
1.3		6
1.4		6
		8
2.1		8
2.2		9
		11
3.1		11
3.1.1		11
3.1.2		11
3.1.3	XC7022	11
3.2		12
3.3	ISP	13
3.4	ISP	13
3.5		14
		15
4.1	PLL	15
4.2	MIPI TX PHY	15
4.2.1		15
4.3	MIPI RX PHY	15
4.3.1		15
		16
5.1	MIPI	16
5.2	MIPI	16
5.3	I2C	16
5.3.1		16

5.3.2	I2C SLAVE	17
5.3.3	I2C MASTER	18
5.4	.....	18
5.4.1	.....	18
5.4.2	.....	18
5.4.3	.....	19
5.4.4	.....	19
5.4.5	.....	19
5.4.6	.....	19
5.4.7	.....	19
5.4.8	.....	20
5.4.9	.....	20
5.4.10	.....	20
5.4.11	.....	20
5.4.12	GAMMA	20
5.4.13	.....	21
5.4.14	.....	21
5.4.15	.....	21
5.4.16	.....	21
5.5	32	21
	.....	21

No.	signal Name	pad type(1)	description	
25	TXCP	O DS	MIPI TX clock lane positive output	
26	TXCN	O DS	MIPI TX clock lane negative output	
27	EVDDTX	P	MIPI TX digital power Supply 1.2V	
28	TXDP1	O DS	MIPI TX data lane 1 positive output	
29	TXDN1	O DS	MIPI TX data lane 1 negative output	
30	CVDD	P	Digital Core Power Supply 1.2V	Host Power Domain
31	VSS	G	GROUND	
32	PADVDD2	P	I/O Group2 Power Supply 1.8V /2.8V/3.3V	
33	RESETB	I	System Reset; (active low with internal pull-up resistor) 1: Normal mode 0: Reset mode	
34	VSS	G	GROUND	
35	VSS	G	GROUND	
36	VSS	G	GROUND	
37	XMCLK	I	PLL Master Reference Clock Input	
38	CVDD	P	Digital Core Power Supply 1.2V	
39	PADVDD2	P	I/O Group2 Power Supply 1.8V /2.8V/3.3V	
40	SDA2	I/OD	I2C Data (Host)	

(1) P = Power, G = Ground, I = Input, O = Output, IO = Input and Output Signal, D = Open drain, DS = Differential

1.2 XC7022



1.3

				RoHS	
XC7022QNR	20	70	QFN40, 5mmx5mm		

1.4

XC7022

MIPI TX

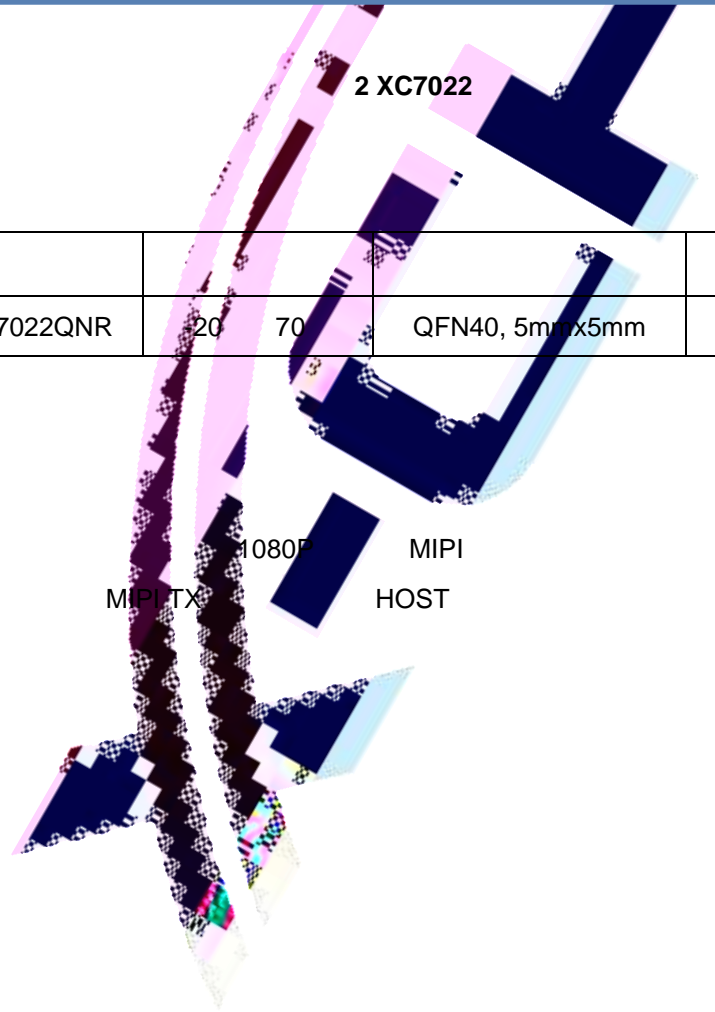
1080P

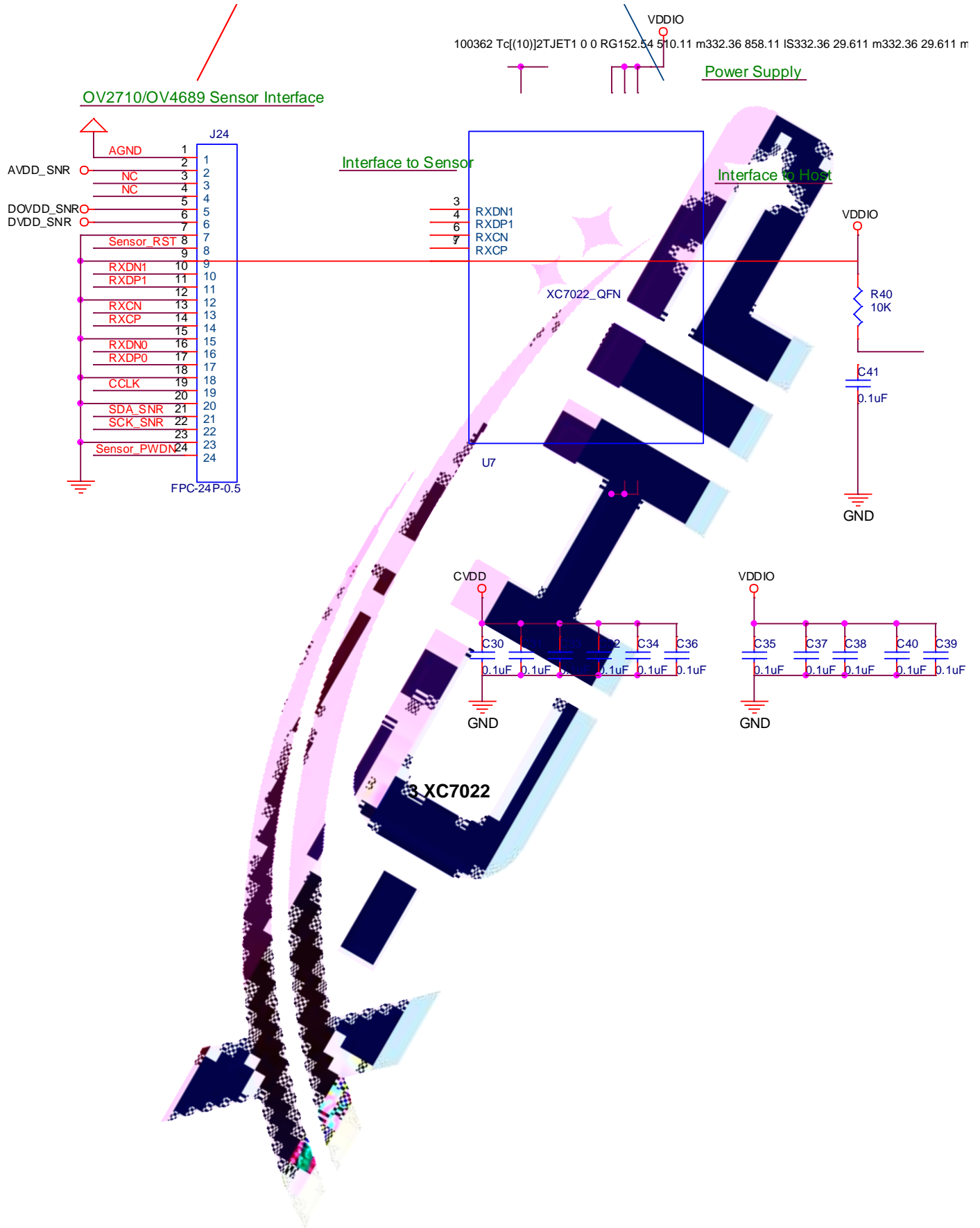
MIPI HOST

MIPI RX

RAW

FAE fae@x-chip.cn





2.1

2

PADVDD1	Sensor PAD	-0.5	TBD(3.6)	V
PADVDD2	Host PAD	-0.5	TBD	V
PVDD33_RX	MIPI RX PAD	-0.5	TBD	V
AVDD33_TX	MIPI TX PAD	-0.5	TBD	V
CVDD	Core	-0.5	TBD(2.0)	V
EVDDR_X	MIPI RX Core	-0.5	TBD	V
EVDDTX	MIPI TX Core	-0.5	TBD	V
Tstg		-55	+150	
Ta		-20	+70	

3

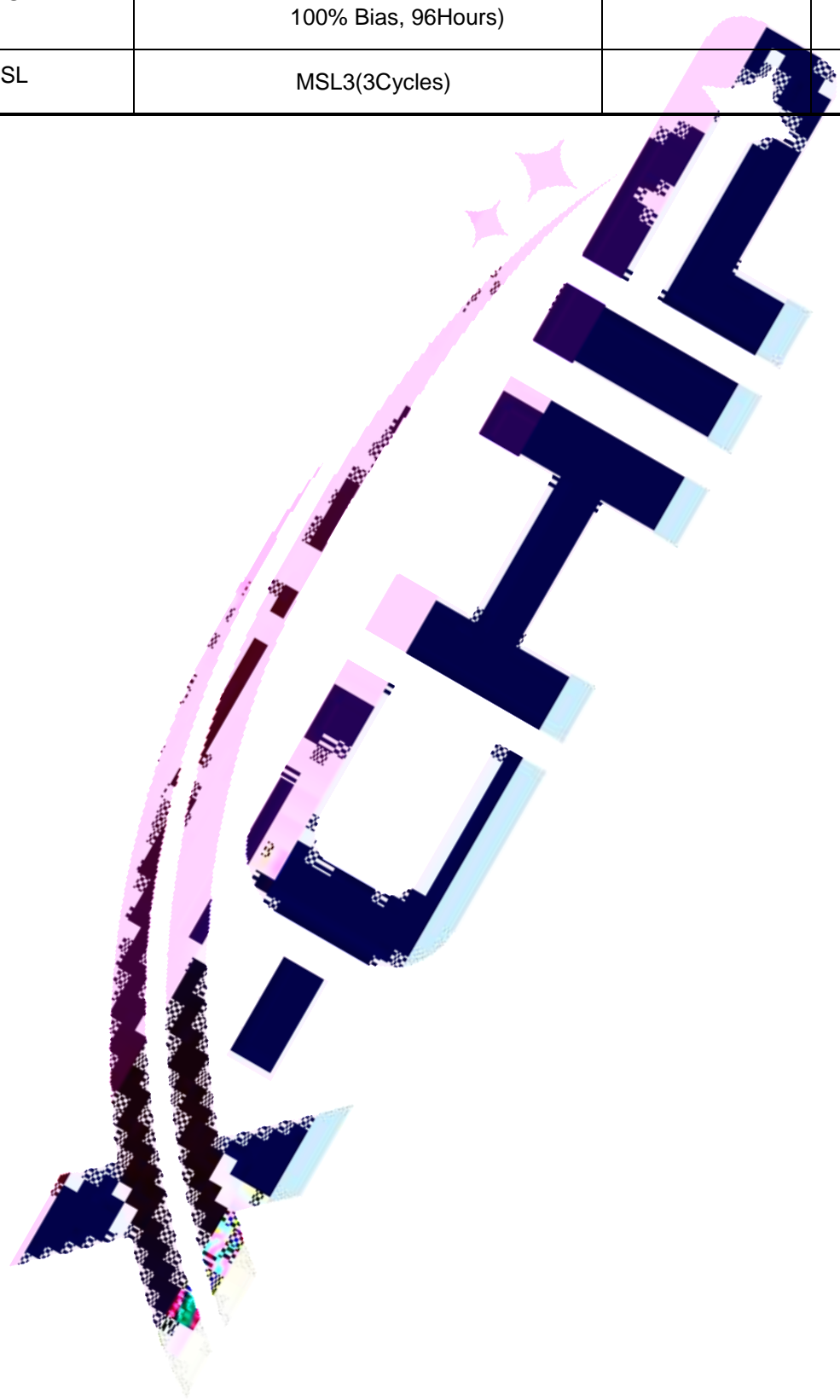
PADVDD1	Sensor PAD	2.52/2.97	2.8/3.3	3.08/3.6	V
PADVDD2	Host PAD	2.52/2.97	2.8/3.3	3.08/3.6	V
PVDD33_RX	MIPI RX PAD	2.52/2.97	2.8/3.3	3.08/3.6	V
AVDD33_TX	MIPI TX PAD	2.52/2.97	2.8/3.3	3.08/3.6	V
CVDD	Core	1.08	1.2	1.32	V
EVDDR_X	MIPI RX Core	1.08	1.2	1.32	V
EVDDTX	MIPI TX Core	1.08	1.2	1.32	V

2.2

4

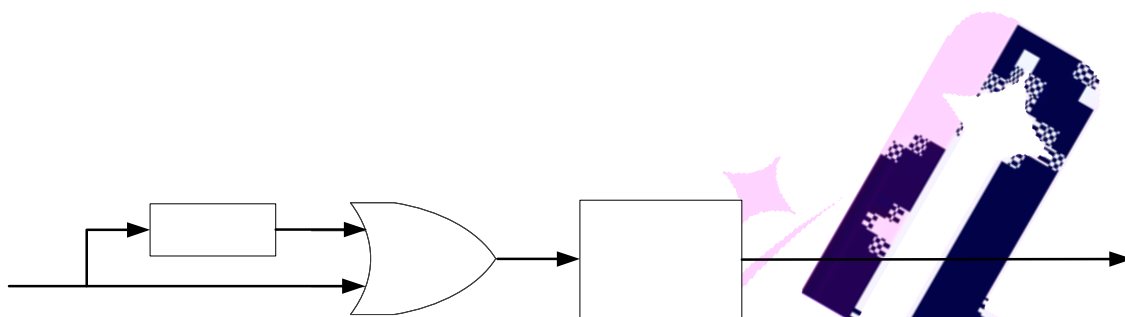


TCT	TC1000(-65 ~150 ,1000Cycles)		TBD
HAST	UHAST96(130 , 85%RH, 33.3 PSIA, 100% Bias, 96Hours)		TBD
MSL	MSL3(3Cycles)		TBD



3.1

3.1.1



XC7022

4

4

RESETB

1.2V

1.2V

3.1.2

CPU

RST

HOST

I2C

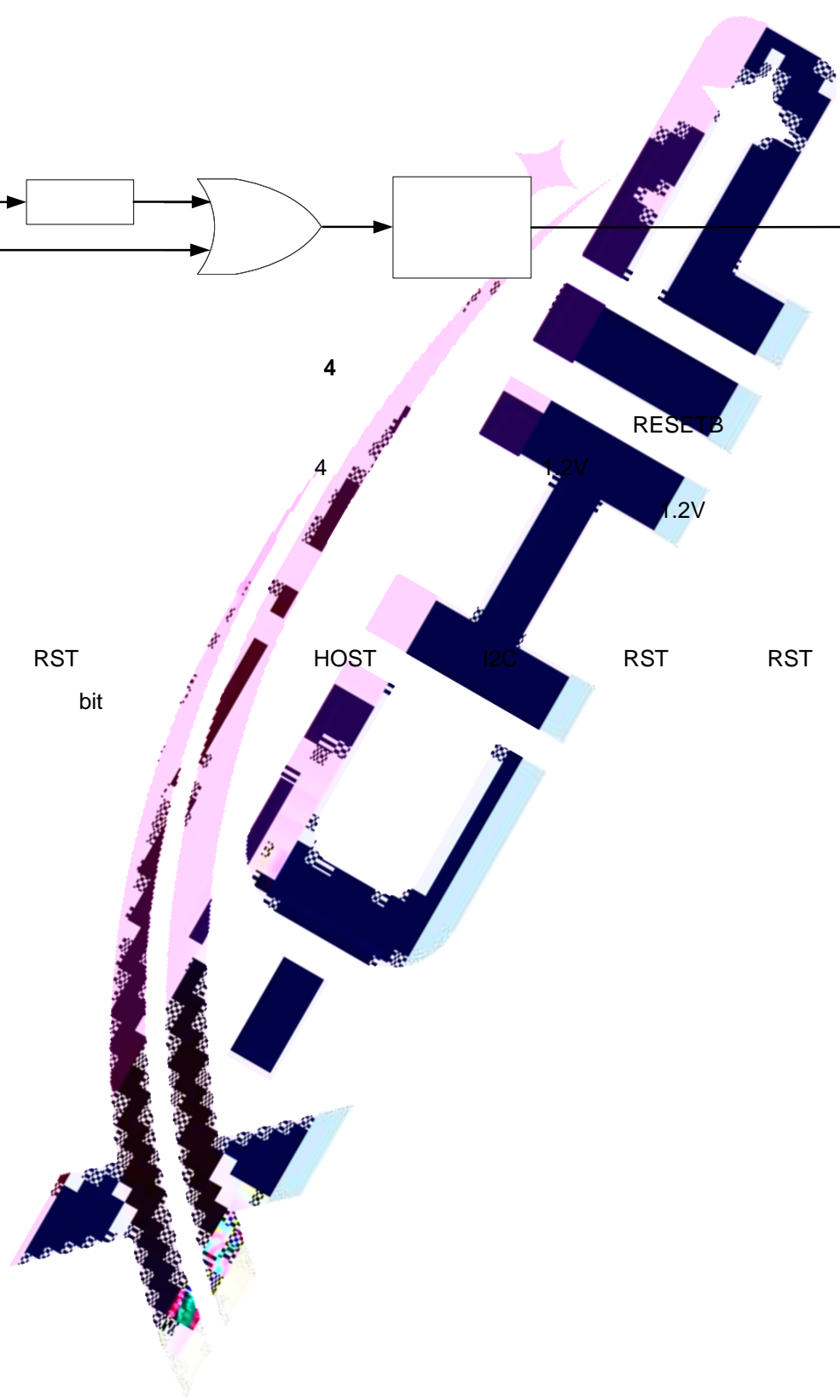
RST

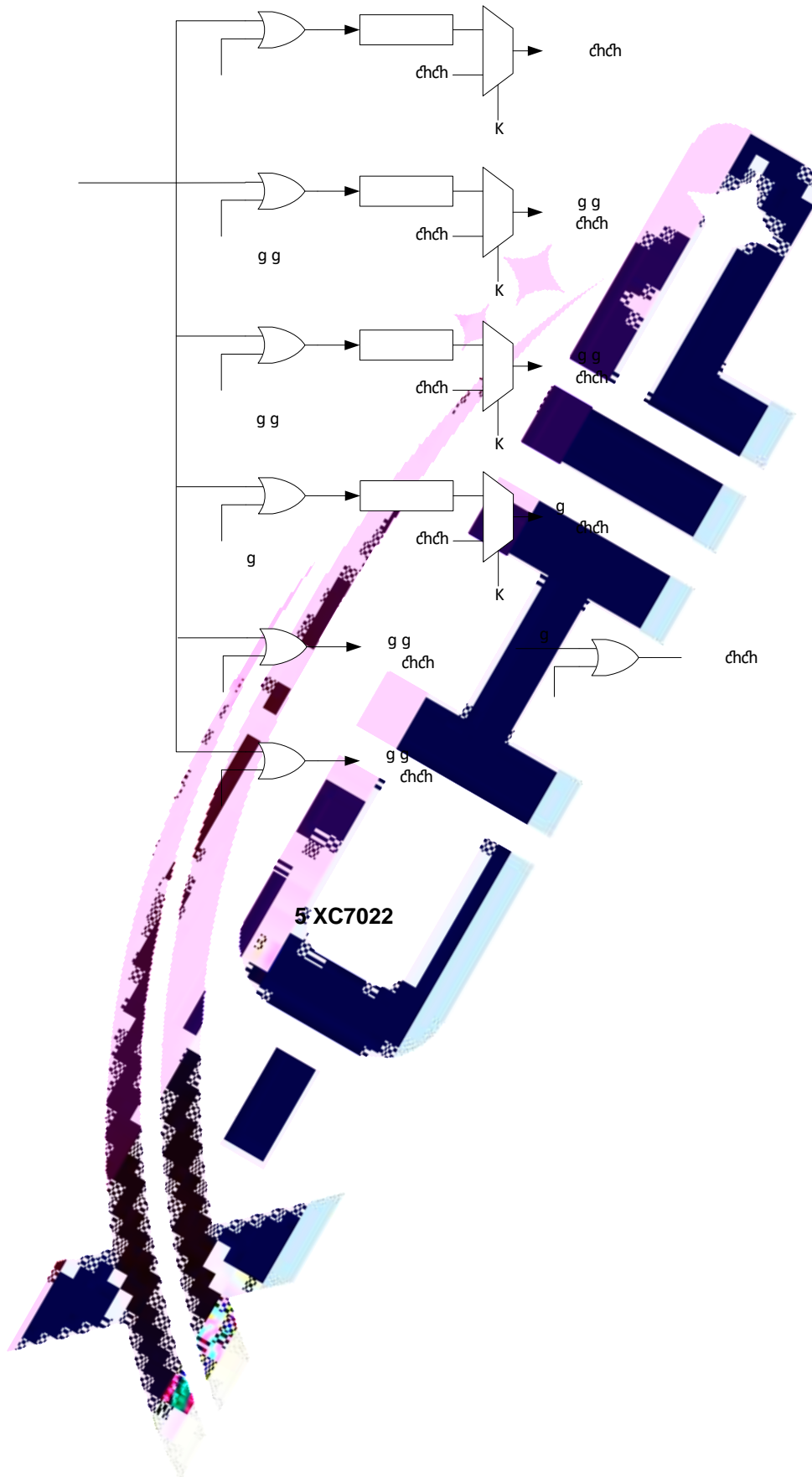
RST

0x80500018

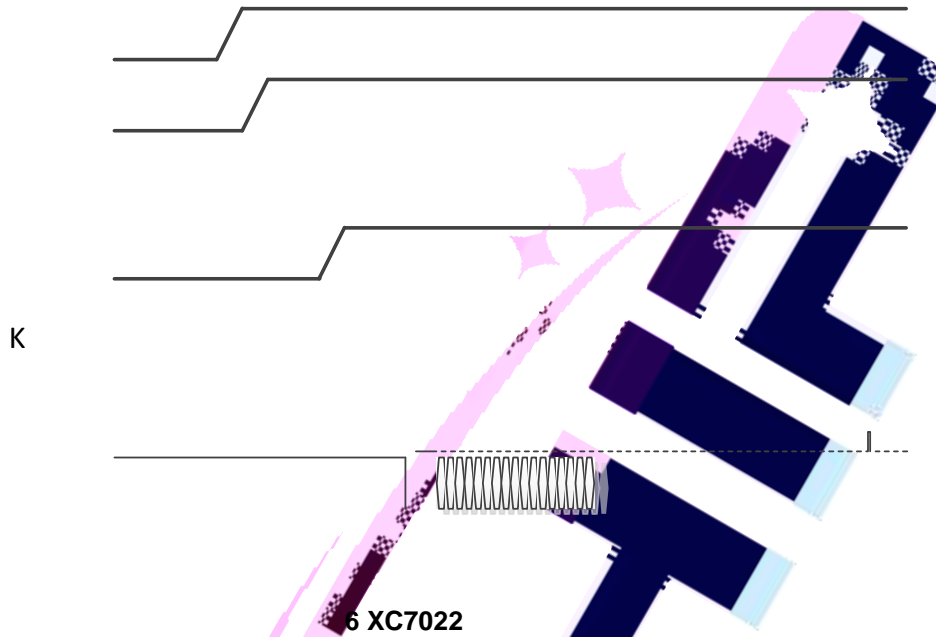
bit

3.1.3 XC7022





3.3 ISP

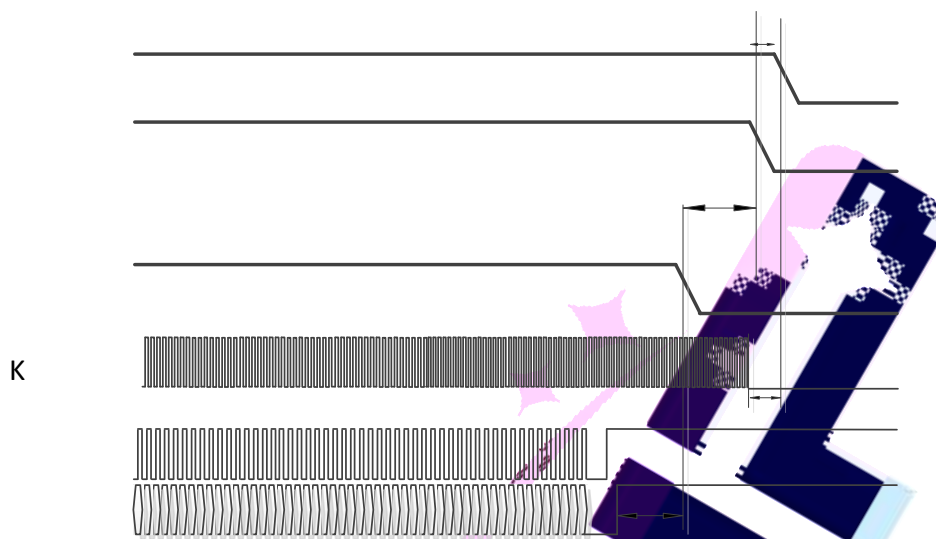


上电过程：

- | | | | | | | | |
|---|--------|------------|--------|-----------|---------|--------|--------|
| 1 | Host | CVDD | EVDD | PADVDD1 | PADVDD2 | PVDD33 | AVDD33 |
| 2 | XC7022 | | RESETB | | | | |
| 3 | | Host | XC7022 | XMCLK | | | |
| 4 | RESETB | 25ms | Host | I2C Slave | | | |
| 5 | XC7022 | I2C master | sensor | sensor | | | |
| 6 | XC7022 | | | | | | |

3.4 ISP

ISP sensor

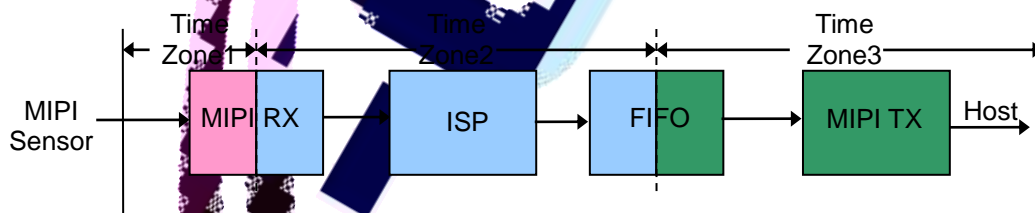


7 XC7022 sensor

下电过程：

- 1 Host XC7022 I2C
- 2 2.5ms RESETB
- 3 RESETB XMCLK
- 4 CVDD EVDD PADVDD PVDD33 AVDD33

3.5



8 XC7022

- 1 MIPI RX
- 2
- 3 MIPI TX

4.1 PLL



4.2 MIPI TX PHY



4.2.1



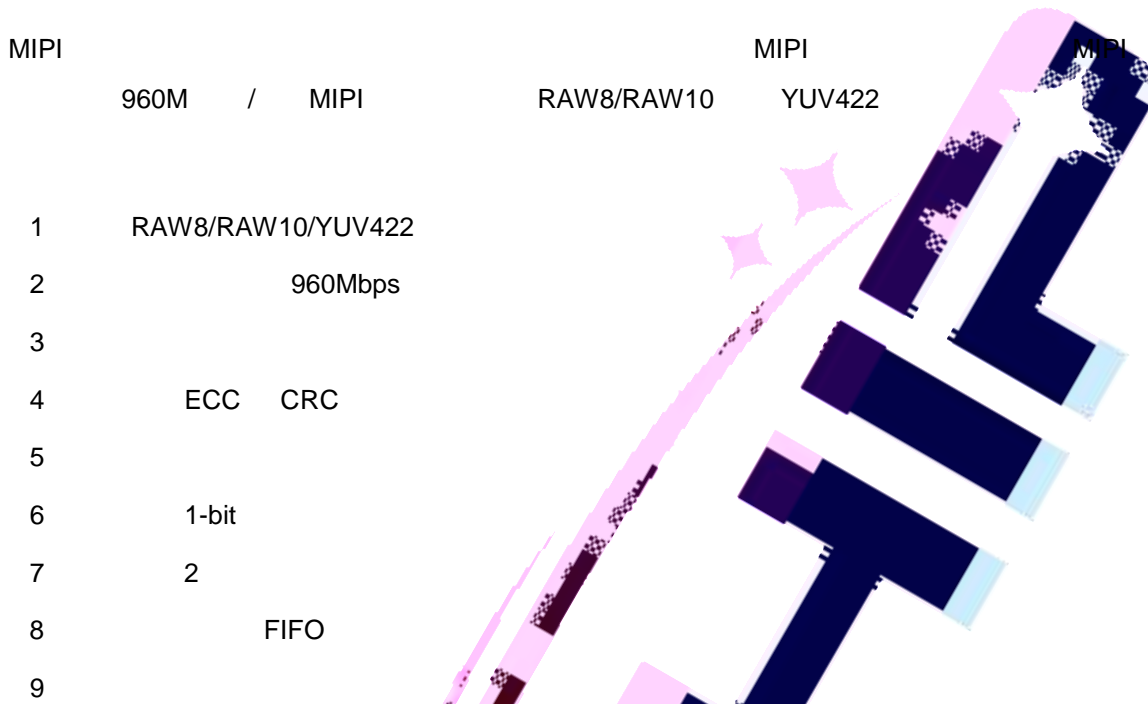
4.3 MIPI RX PHY



4.3.1



5.1 MIPI



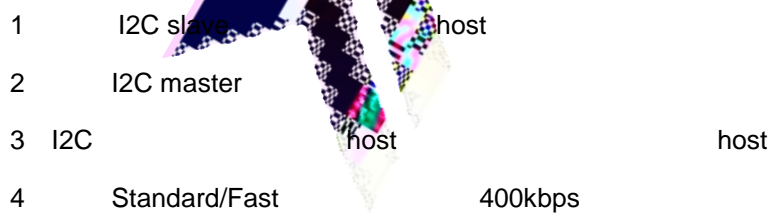
5.2 MIPI



5.3 I2C

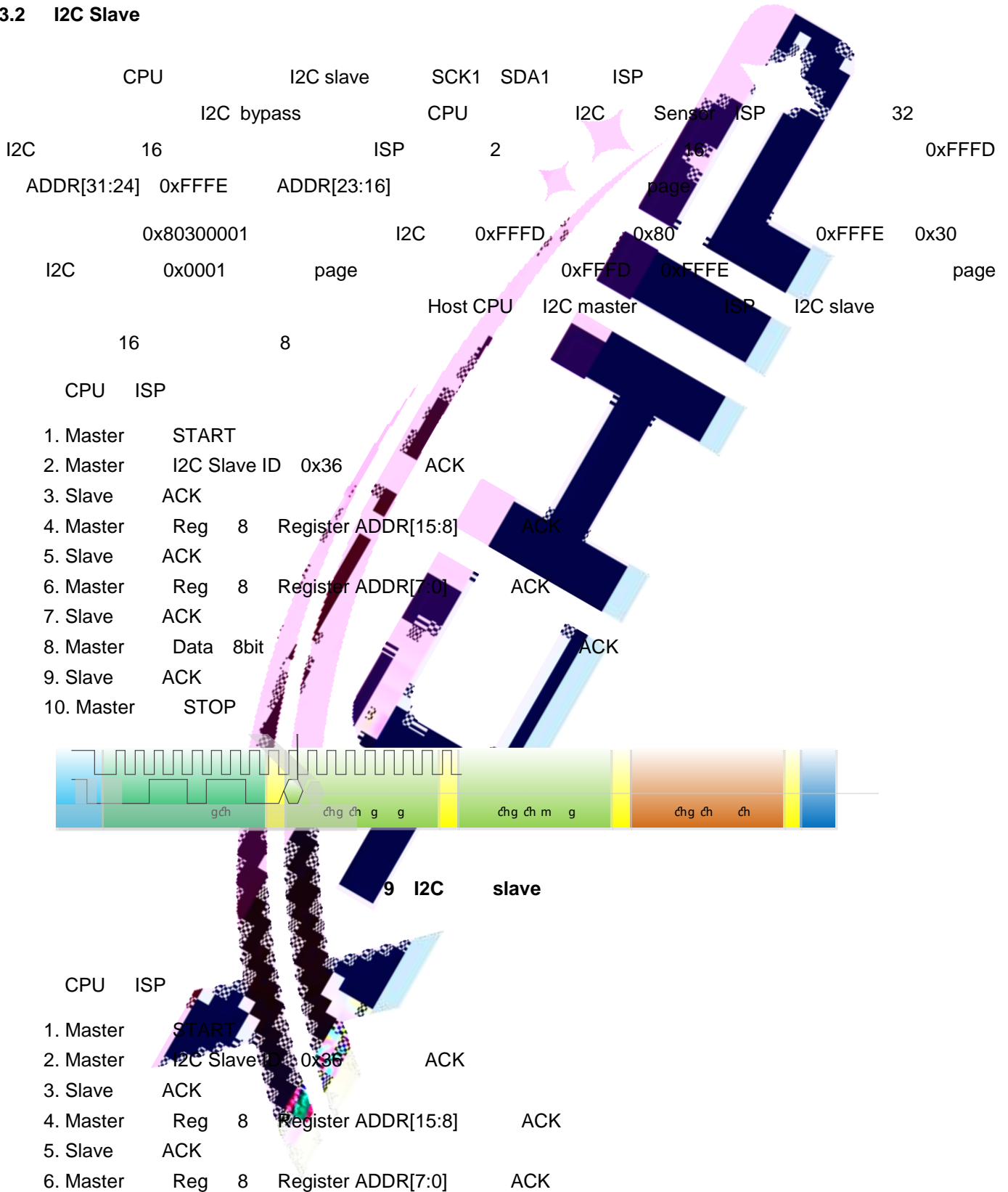


5.3.1

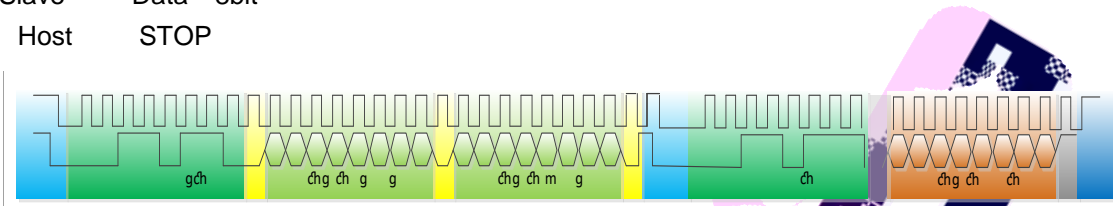


I2C slave 36H

5.3.2 I2C Slave

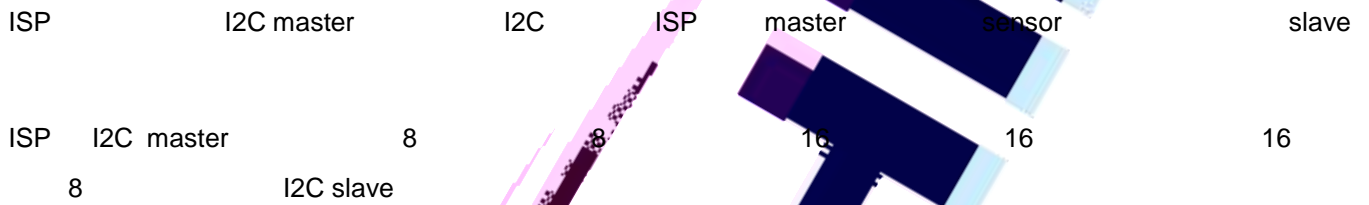


- 7. Slave ACK
- 8. Master I2C 0x37 ACK
- 9. Slave ACK
- 10. Slave Data 8bit
- 11. Host STOP



10 I2C slave

5.3.3 I2C Master



5.4

5.4.1

4~16 RISC RGB

5.4.2

Lens Shading Correction

5.4.3

Defective Pixel Correction DPC

5.4.4

Auto Exposure AE

Gain Control

XC7023

5.4.5

RAW

YUV

5.4.6

Balance AWB

Automatic White

5.4.7

XC7022

VCM

XC7022 25

5.4.8

RAW Bayer

RGB

RAW
RGB

RGB

5.4.9

()

De-noise

5.4.10

Sensor

RAW RGB

Bayer Pattern

R G B

Color Interpolation

RAW RGB

RGB data

RGB

RAW RGB data

5.4.11

(Color Matrix)

R G B

R G B

5.4.12 Gamma

XC7022

Gamma

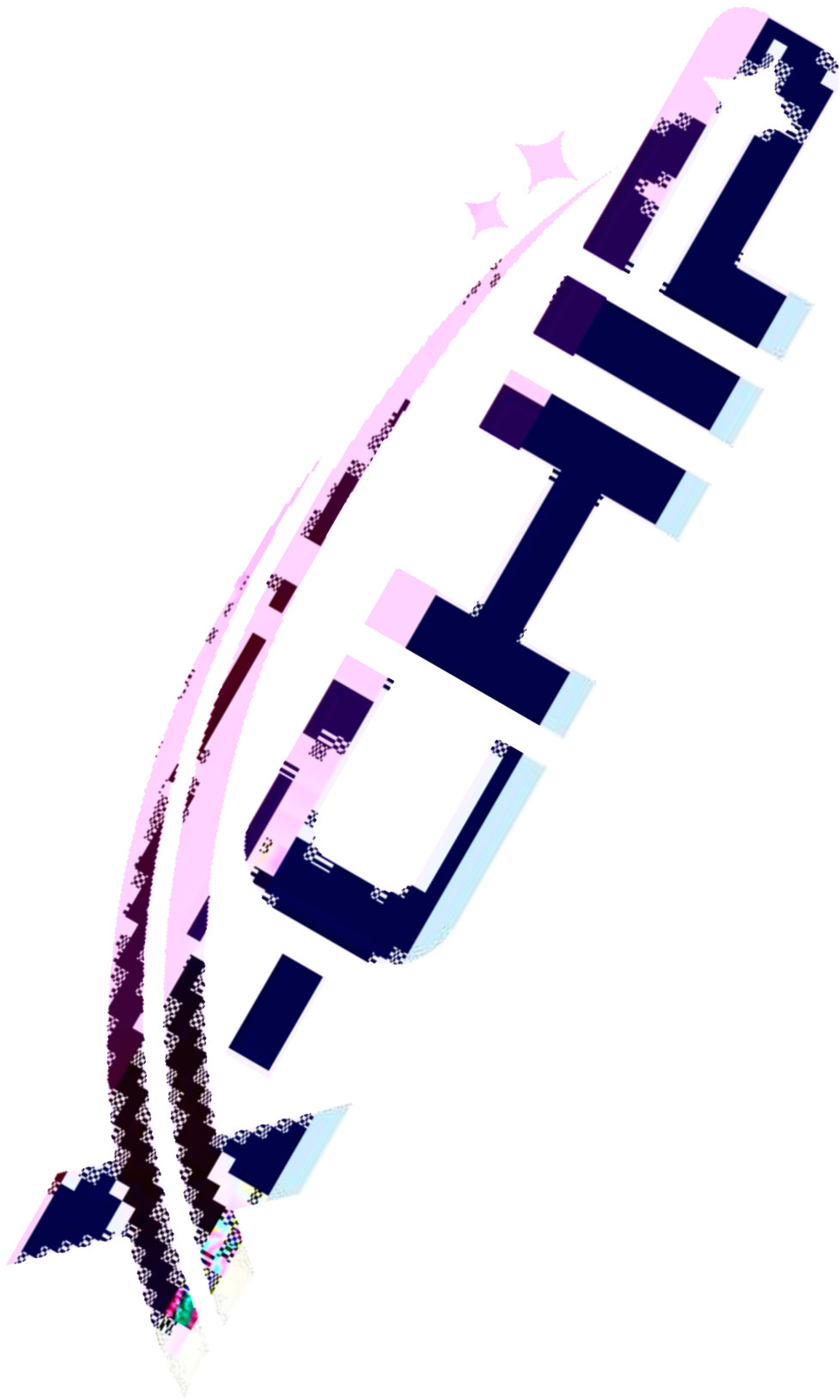
RAW

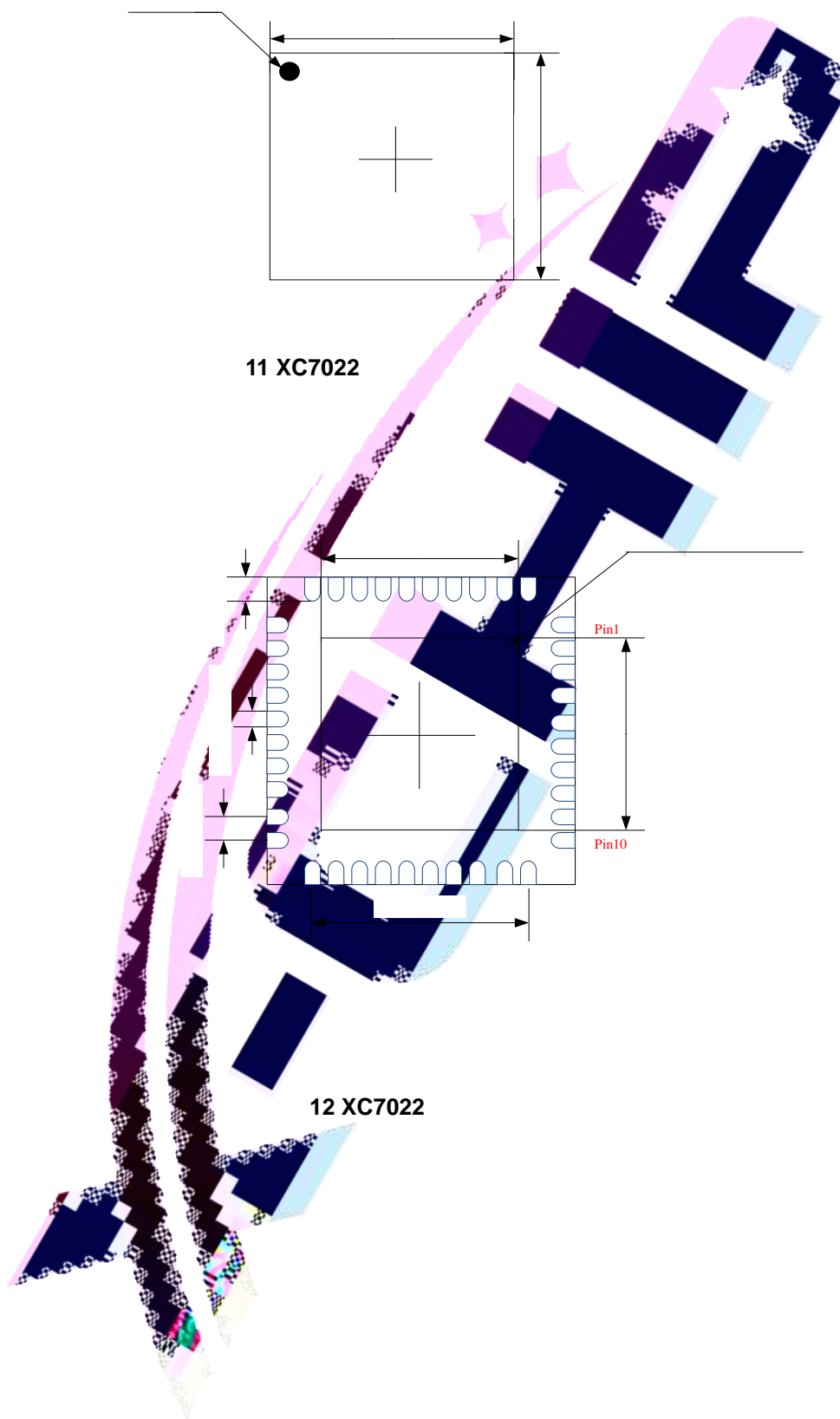
RGB

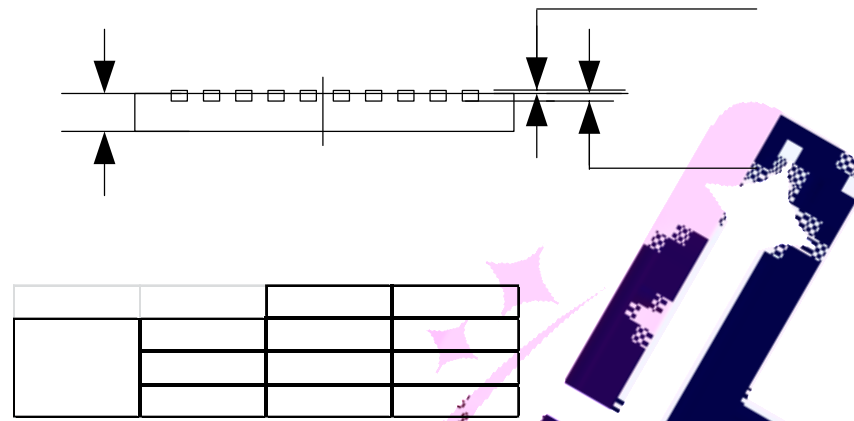
Gamma

XC7022 Gamma

64







13 XC7022

Note: TSLP and SLP share the same expose outline but with different thickness.

XC7022 uses TSLP.

