Product Spec

Motherboard

SHC-N97-VGA
FOR PCB V1.0

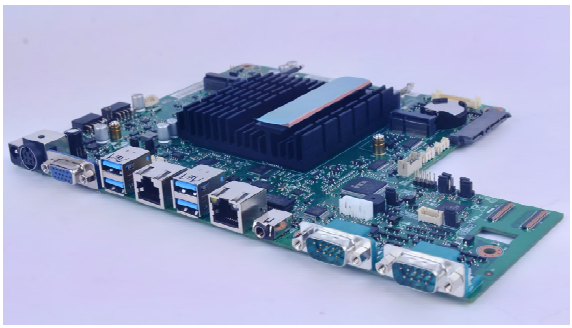
Prepared by：Kevin *Date：2025/01/09*

Approved by：Emily *Date：2025/01/09*

Revision History			
Revision	**Date**	**Description**	**Author**
V1.0	2025/1/9	First release	Kevin

SHC-N97-VGA

REALBOM



Features

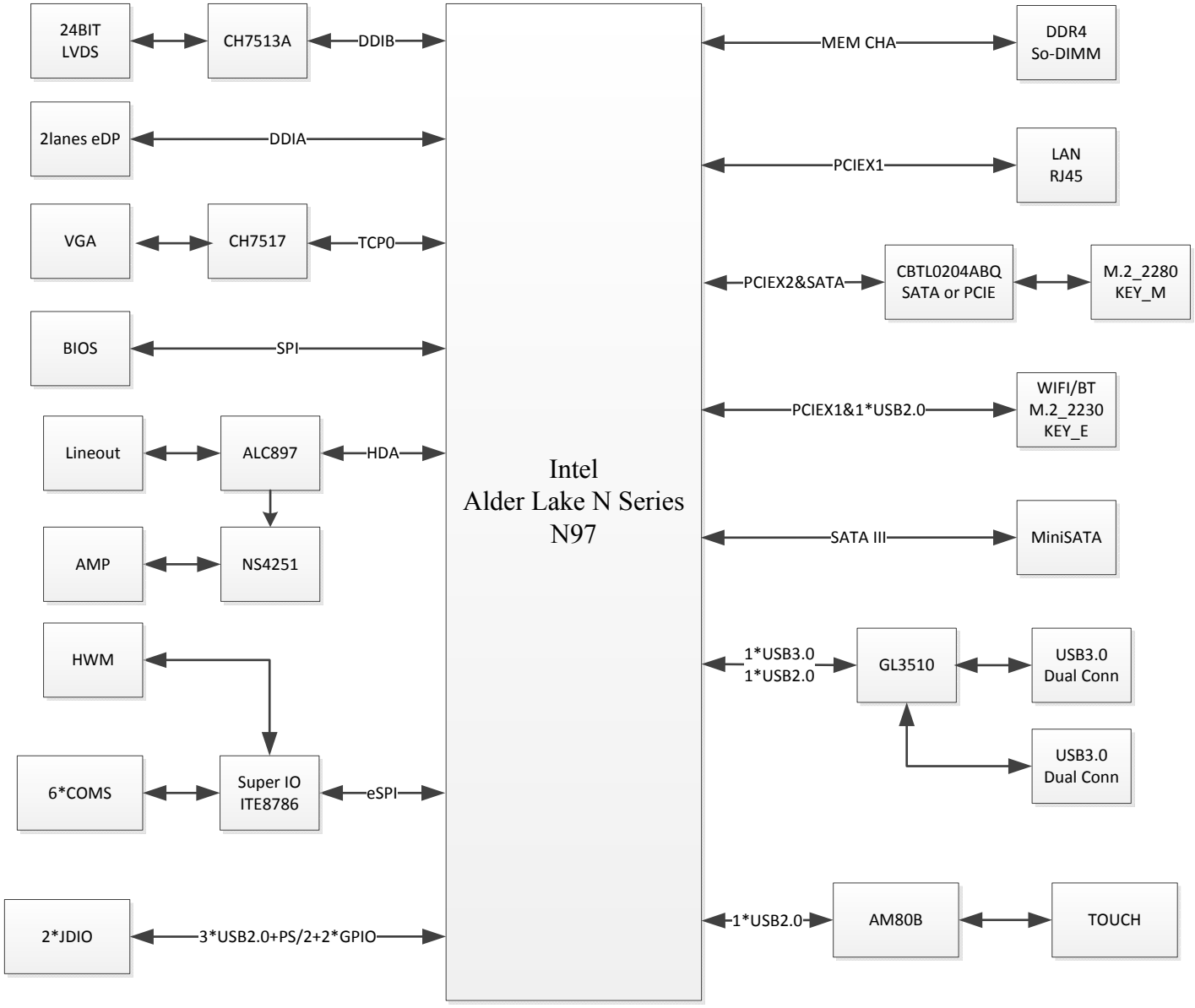
***Intel Alder Lake N97 Platform,**
***Dual 260-pin SODIMM up to 16GB, DDR4 3200MT/S**
***Supports 1 x LVDS + 1 x eDP + 1 x VGA**
***Supports 1 x 10/100/1000M LAN adapter**
***Supports 4 x USB3.0 Port, 4 x USB2.0 Port**
***Supports 6 x COMS, 1x M.2_SSD , 1 x M.2_2230,1 x MiniSATA**
***Support HD Audio line out**
***Support 2 x JDIO, 1 x DC_OUT**
***Support 1 x Capacitive Touch**

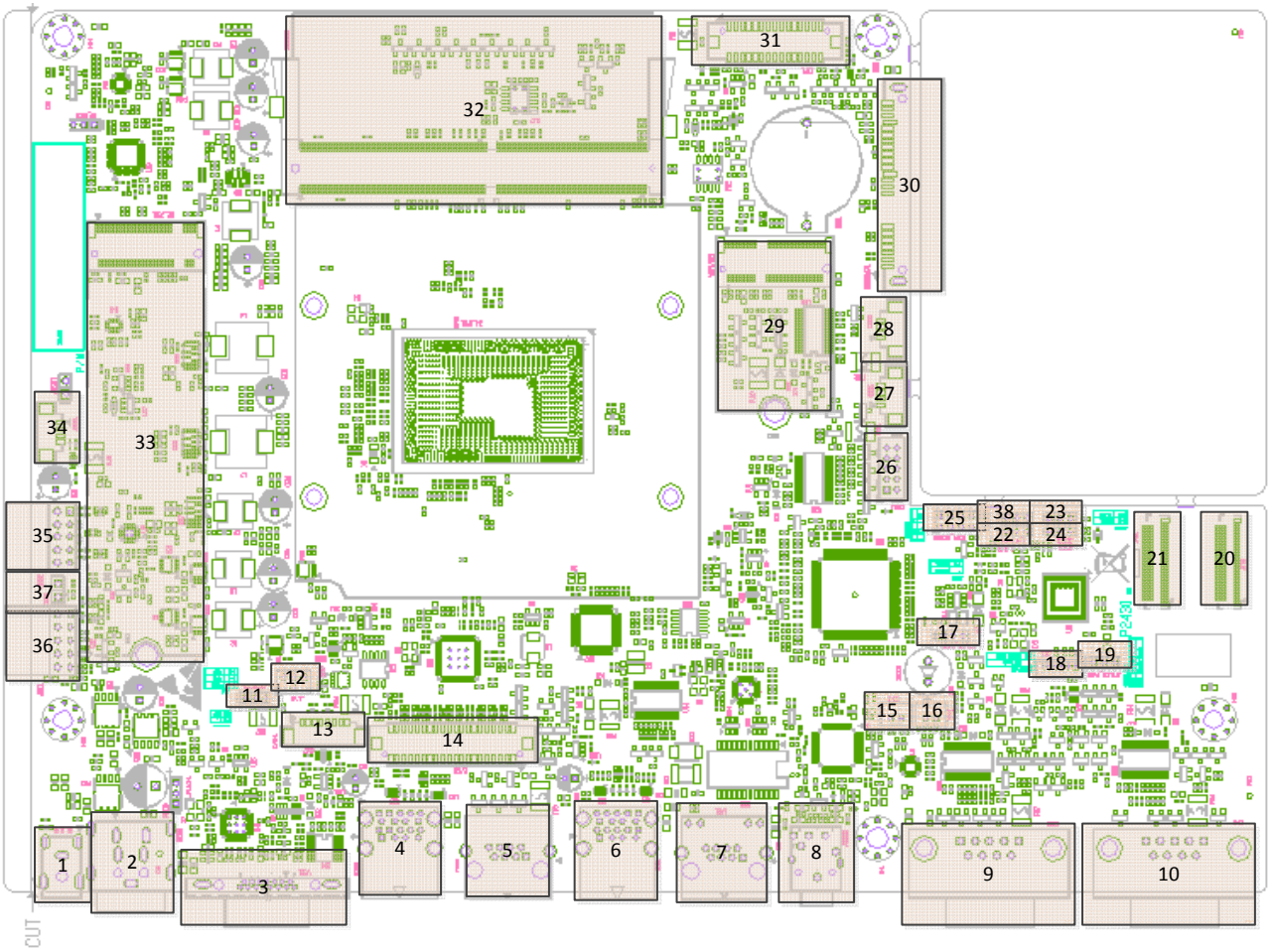
Application Industry

Medical industry.Traffic industry, Advertising Machine,Financial industry,

Specifications

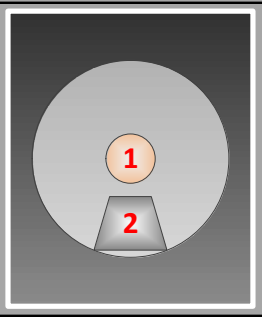
CPU	CPU	Intel Alder Lake N97 CPU
	Instruction Set	64bit
	Lithography	10nm
Memory	Type	SODIMM DDR4 No ECC ,Support 2133/3200MHZ
	Channel	Single Channel
	Max Memory Size	16GB
Graphics	Graphics	Intel HD Graphics
	Displays Supported	3 Independent Display Port EDP/LVDS And DP
Audio	AL897 HD Audio	x1 line out
Ethernet	RTL8111H	X1 10/100/1000M BASET LAN
Internal I/O	M.2	X2 Standard M.2 Nvme 2280 SSD(UP PCIE 2X or SATA III)
	Wi-FI/BT	x1 Support Standard M.2_2230 Socket
	SPK	X2 1*2 Wafer SPK
	COM	X3 COM4-COM6; **COM5/COM6 Not Support Full Signal**
	EDP	X1 Customization EDP
	USB2.0	X1 1*4 USB2.0 Wafer
	TOUCH CONN	X2 Touch CONN
	LVDS	X1 LVDS,Support Dual Channel 24BIT
Extern I/0	DC Input connector	x1 DC JACK Standard 4PIN Adapter connector
	DC output connector	X1 DC JACK Standard 1PIN Adapter connector,output MAX 3A
	VGA	X1 Standard VGA
	USB3.0	X2 Dual Port USB3.0
	JDIO	X2 2*5 Header Support 3*USB2.0,3*GPIO,1*PS2 KeyBoard
	RJ45	X1 Single RJ45(COM3)
	Audio	x1 Support 3.5mm 3-pole Line out Jack
	DB9	X2 Support full signal RS232
	MiniSATA	X1 Standard MiniSATA
BIOS	Vender	AMI
	ACPI	Supported
Power	POWER Brick	12V DC POWER Brick
Dimensions	PCB	170 mm x 239 mm
Requirements	Operation	0 ~ 60°C， 10%~95% RTH , non-condensing
Environment	Storeage	-20 ~ 80°C， 10%~95% RTH, non-condensing

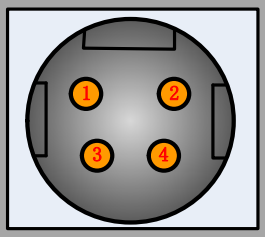

24BIT LVDS
CH7513A
DDIB
2lanes eDP
DDIA
VGA
CH7517
TCP0
BIOS
SPI
Lineout
ALC897
HDA
AMP
NS4251
HWM
6*COMS
Super IO ITE8786
eSPI
2*JDIO
3*USB2.0+PS/2+2*GPIO
Intel
Alder Lake N Series
N97
MEM CHA
DDR4 So-DIMM
PCIEX1
LAN RJ45
PCIEX2&SATA
CBTL0204ABQ SATA or PCIE
M.2_2280 KEY_M
PCIEX1&1*USB2.0
WIFI/BT M.2_2230 KEY_E
SATA III
MiniSATA
1*USB3.0 1*USB2.0
GL3510
USB3.0 Dual Conn
USB3.0 Dual Conn
1*USB2.0
AM80B
TOUCH

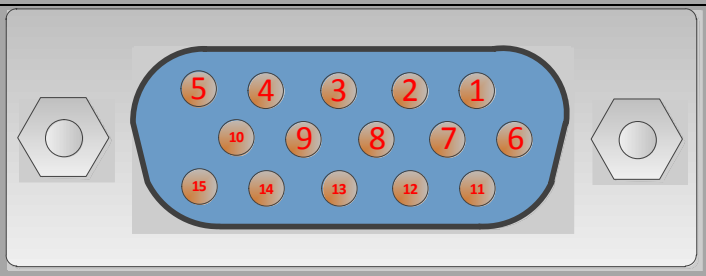


CONN Define

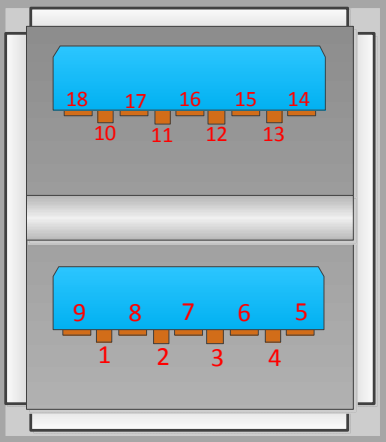
1	DC_OUT	20	JTX1
2	DC_IN	21	JRX1
3	VGA	22	JEUP1
4	USB2	23	JCMOS
5	COM3	24	JTXE1
6	USB1	25	ESPI_DEBUG
7	LAN1	26	COM4
8	AUDIO1	27	COM6
9	COM1	28	COM5
10	COM2	29	WIFI/BT
11	JINVETER1	30	MiniSATA
12	JLV1	31	eDP
13	IVCN1	32	So-DIMM1
14	LVDS1	33	M.2_SSD1
15	SPK2	34	JUSB1
16	SPK1	35	JDIO2
17	JTouch_PWR2	36	JDIO1
18	JI2C1	37	BTN1
19	JTouch_PWR1	38	JATX/AT

Power	DCout(①)
PIN Define	 1 +12V 2 GND
Type	DC JACK,PIN C=2.5mm

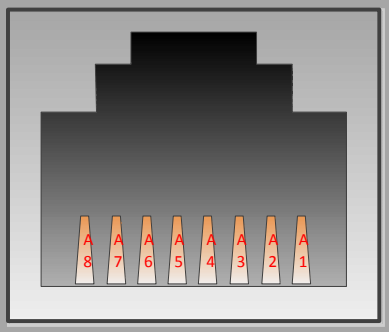
Power	DCIN1(②)
PIN Define	 1-2 +12V 3-4 GND
Type	Standard DC Jack

VGA	VGA1(③)
PIN Define	
Type	Standard DB15 VGA Connector

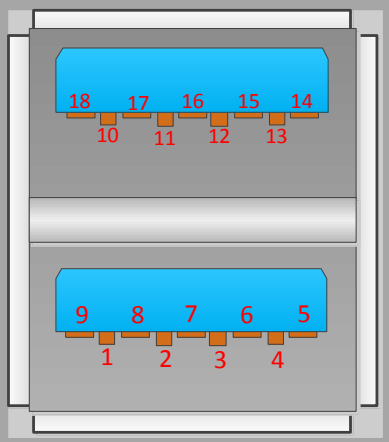
1	R	2	G
3	B	4	NC
5	GND	6	GND
7	GND	8	GND
9	GVCC	10	GND
11	NC	12	SDA
13	HSYNC	14	VSYNC
15	CLK		

USB3.0	USB2(④)
PIN Define	
Type	Standard Dual USB3.0 connector

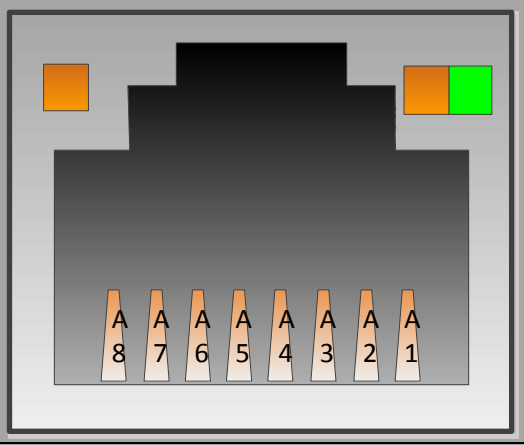
1	Vbus	2	D1-
3	D1+	4	GND
5	SSRX1-	6	SSRX1+
7	GND	8	SSTX1-
9	SSTX1+	10	Vbus
11	D2-	12	D2+
13	GND	14	SSRX2-
15	SSRX2+	16	GND
17	SSTX2-	18	SSTX2+

COM	COM3(⑤)
PIN Define	
Type	Standard 1x1RJ45 Connector Without LED
Memo	The COM PIN1 Select COM Voltage(0V/5V/12V,Default 0V)

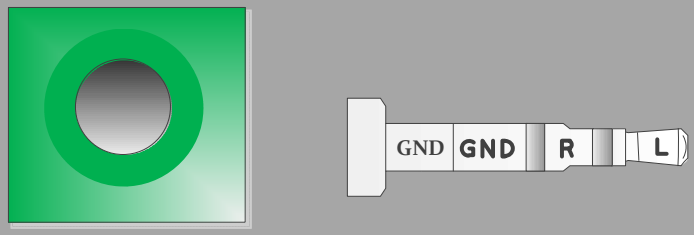
	COM3
A1	RI
A2	DSR
A3	TXD
A4	RXD
A5	RTS
A6	CTS
A7	GND
A8	DTR

USB3.0	USB1(⑥)
PIN Define	
Type	Standard Dual USB3.0 connector

1	Vbus	2	D1-
3	D1+	4	GND
5	SSRX1-	6	SSRX1+
7	GND	8	SSTX1-
9	SSTX1+	10	Vbus
11	D2-	12	D2+
13	GND	14	SSRX2-
15	SSRX2+	16	GND
17	SSTX2-	18	SSTX2+

LAN	LAN1(⑦)
PIN Define	
Type	Standard Single RJ45 Connector

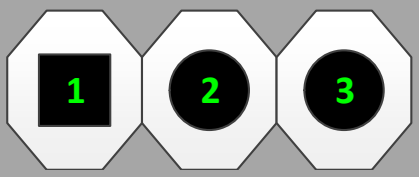
1	A+
2	A-
3	B+
4	C+
5	C-
6	B-
7	D+
8	D-

AUDIO	HP1 (⑧)
PIN Define	
Type	Standard Single 3.5mm Audio jack

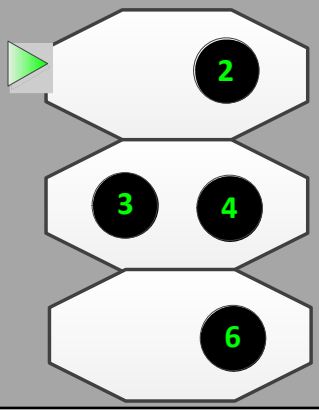
L	Audio L Channel
R	Audio R Channel
GND	GND
GND	GND

COM	COM1(⑨)
PIN Define	
Type	Standard DB9 COM Connector
Memo	1. Support RS232 2. Powered 0V/5V/12V,Setting by GPIO,Default 0V

1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	0V/5V/12V		

Jumper	J_Inveter (⑪)
PIN Define	
Type	Header 1X3P PH=2.0mm Black 180° DIP

1-2	+V5S
2-3	+V12S(Default)

JLV1	JLV1 (⑫)
PIN Define	
Type	2x5 DuPont Header, PH=2.54mm

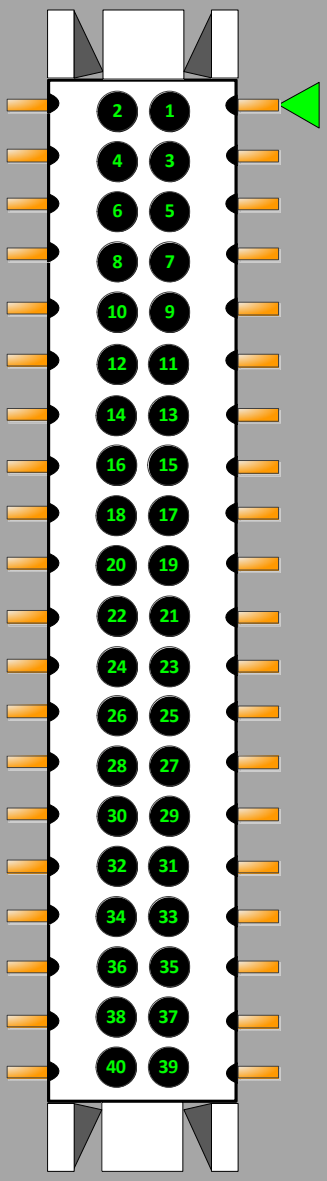
3-4	+V3.3S(Default)
2-4	+V5S
6-4	+V12S

COM	COM2(⑩)
PIN Define	
Type	Standard DB9 COM Connector
Memo	1. Support RS232 2. Powered 0V/5V/12V,Setting by GPIO,Default 0V

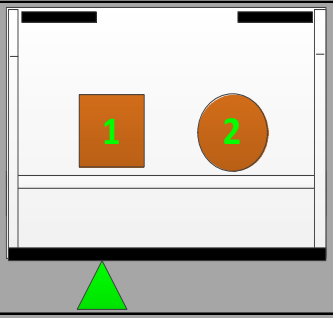
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND	6	DSR2
7	RTS2	8	CTS2
9	0V/5V/12V		

Backlight	IVCN1(13)
PIN Define	
Type	1X6 Wafer，PH=1.25mm
Memo	PIN1/PIN2: +V5S or +V12S setting by JINVETER1

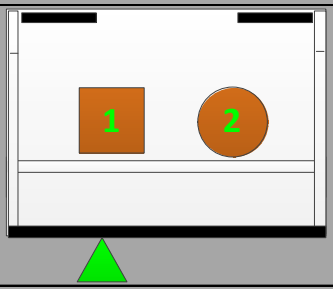
1	+V5S/+V12S
2	+V5S/+V12S
3	NC
4	NC
5	BLK_EN
6	PWM
7	GND
8	GND

LVDS	LVDS(14)
PIN Define	
Type	2x20 PH=0.15mm
Memo	1. LCDVDD support 3.3V/5V,setting by jumper JLV1 2. Support 24bit Dual channel max

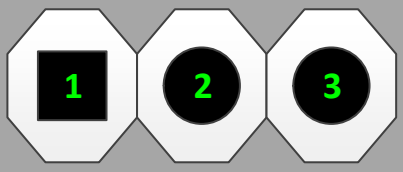
1	A4M	2	LCDVDD
3	A4P	4	LCDVDD
5	GND	6	GND
7	A5M	8	GND
9	A5P	10	A0M
11	GND	12	A0P
13	A6M	14	GND
15	A6P	16	A1M
17	GND	18	A1P
19	CLK2M	20	GND
21	CLK2P	22	A2M
23	GND	24	A2P
25	A7M	26	HPD
27	A7P	28	CLK1M
29	5V	30	CLK1P
31	LVDS_DDC_CLK	32	GND
33	3.3V	34	A3M
35	NC	36	A3P
37	LCDVDD	38	GND
39	LCDVDD	40	LVDS_DDC_DAT

SPK	SPK2(15)
PIN Define	
Type	1X2 Wafer，PH=2.0mm
Memo	Support 2W Speaker

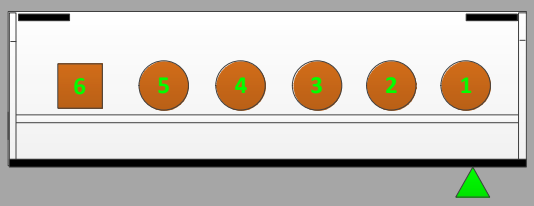
1	LN
2	LP

SPK	SPK1(16)
PIN Define	
Type	1X2 Wafer，PH=2.0mm
Memo	Support 2W Speaker

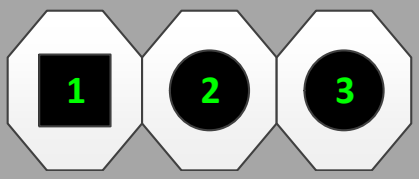
1	RN
2	RP

Jumper	JTouch_PWR2 (17)
PIN Define	
Type	Header 1X3P PH=2.0mm Black 180° DIP

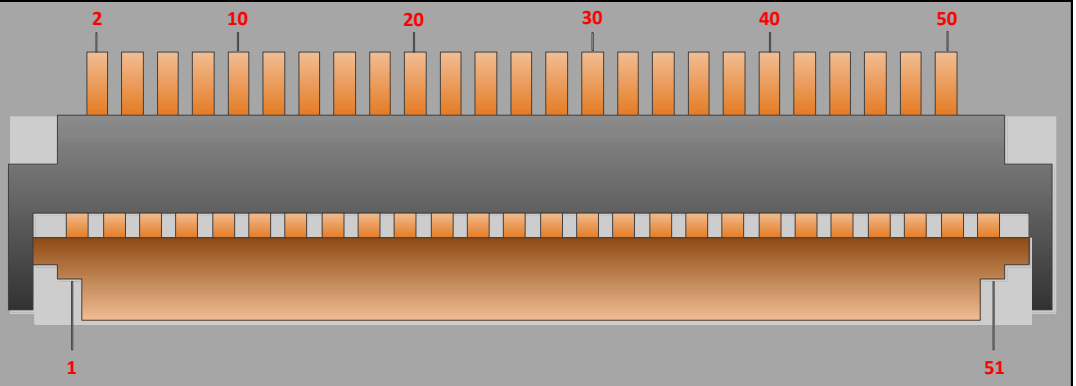
1-2	+V5AL(Default)
2-3	GND

TOUCH	J_I2C (18)
PIN Define	
Type	1X6 Wafer，PH=2.0mm

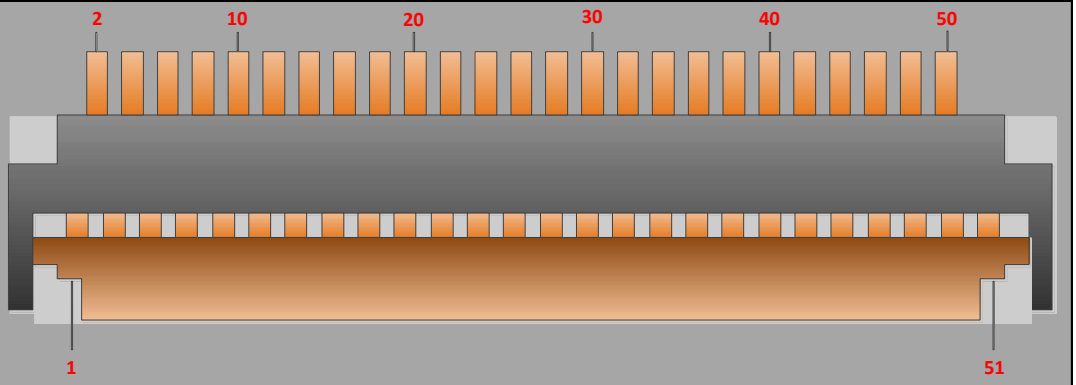
1	EXRST
2	I2C_INT
3	I2C_SCL
4	I2C_SDA
5	VCC_3V3
6	GND

Jumper	JTouch_PWR1 (⑲)
PIN Define	
Type	Header 1X3P PH=2.0mm Black 180° DIP

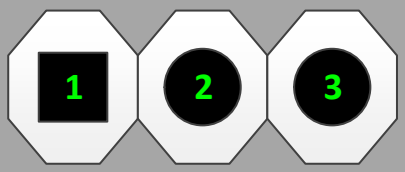
1-2	+V3.3AL(Default)
2-3	NC

JTX	JTX1(⑳)
PIN Define	
Type	51PIN ,FPC PH=0.3mm

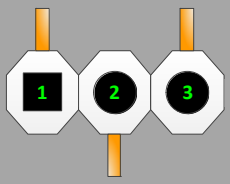
1	GND
2-47	TX45~TX0
48-50	NC
51	GND

JRX	JRX1(㉑)
PIN Define	
Type	51PIN ,FPC PH=0.3mm

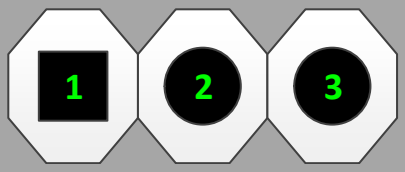
1	GND
2-50	RX55-RX7
51	GND

Jumper	J_EUP (22)
PIN Define	
Type	Header 1X3P PH=2.0mm Black 180° DIP

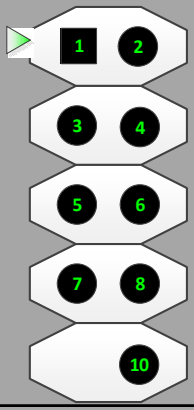
1-2	EUP(Default)
2-3	Disable EUP

JCMOS	JCMOS2(23)
PIN Define	
Type	1x3 DuPont Header PH=2.54mm
Memo	Short 2-3,Clear COMS

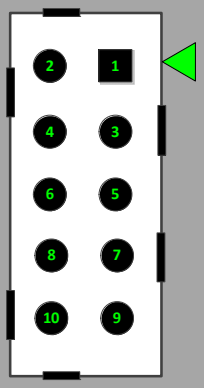
Pin	1-2	2-3
Define	Normal	Clear
Default	1-2	

JTXE	JTXE1(24)
PIN Define	
Type	1x2 DuPont Header PH=2.0mm
Memo	Short 1-2 can Enable TXE

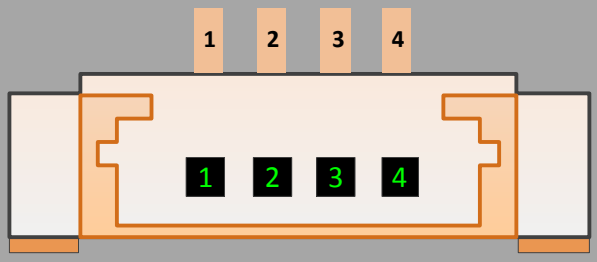
1-2	Enabel TXE
2-3	NA

Debug	ESPI_Debug(25)
PIN Define	
Type	2x7 DuPont Cut pin9 Header, PH=2.0mm

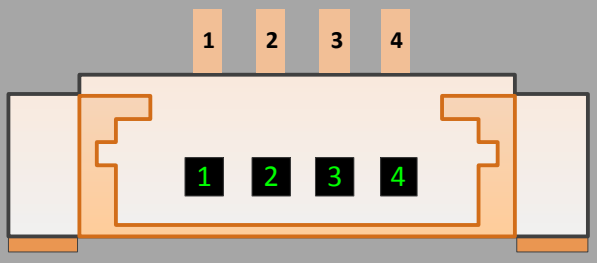
1	ESPI3	2	ESPICLK
3	ESPI2	4	ESPI_CS#
5	ESPI1	6	LRESET#
7	ESPI0	8	GND
		10	+V3.3AL

COM	COM4(㉖)
PIN Define	
Type	2X5 Header Box PH=2.0 mm
Memo	1. Support RS232 2. PIN 9 Powered 0V/5V/12V,Setting by GPIO

1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

COM	**COM6(㉗)**
PIN Define	
Type	1X4 Wafer，PH=1.25mm

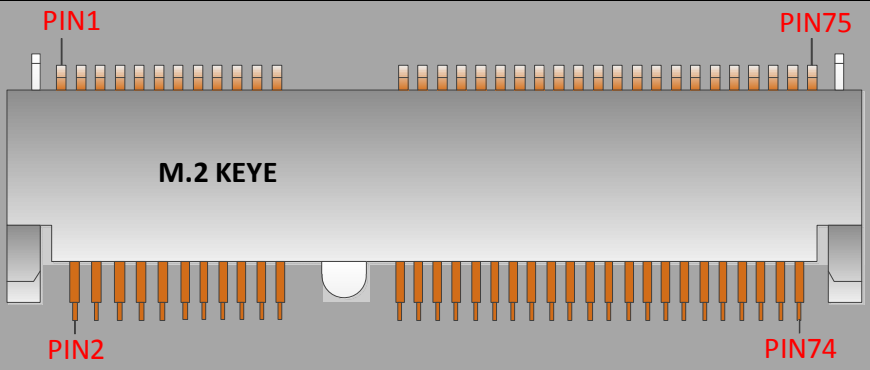
1	+V5S
2	TXD
3	RXD
4	GND

COM	**COM5(㉘)**
PIN Define	
Type	1X4 Wafer，PH=1.25mm

1	+V5S
2	TXD
3	RXD
4	GND

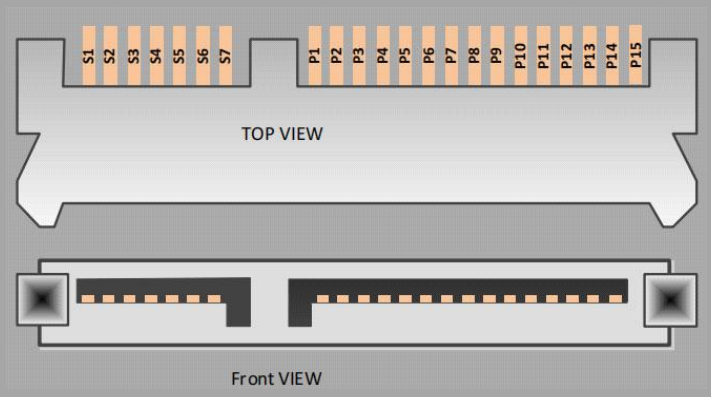
M.2	WIFI/BT(29)

PIN Define

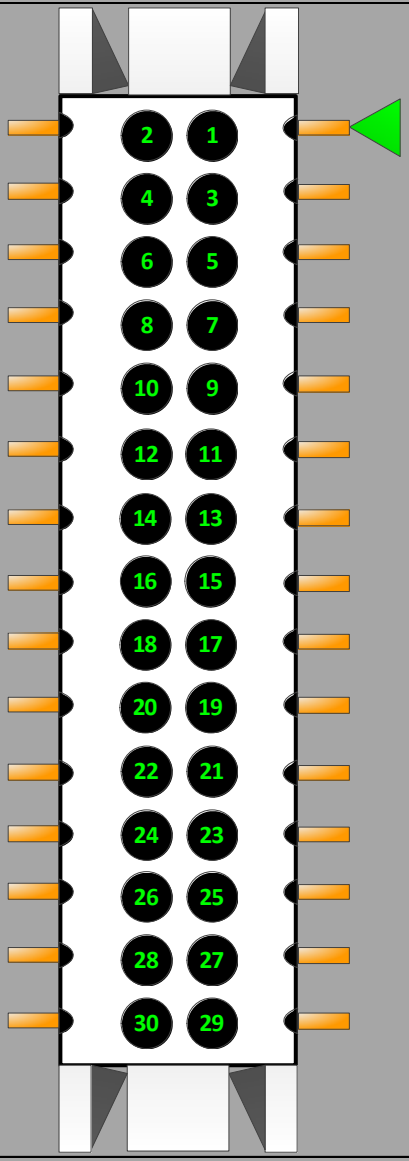


1	GND	2	+3.3V
3	USBD+	4	+3.3V
5	USBD-	6	LED1
7	GND	8	PCM_CLK
9	SDIO CLK	10	PCM_SYNC
11	SDIO CMD	12	PCM_IN
13	SDIO DAT0	14	PCM_OUT
15	SDIO DAT1	16	LED2
17	SDIO DAT2	18	GND
19	SDIO DAT3	20	UART_Wake
21	SDIO Wake	22	UART_RX
23	SDIO Reset	24	KEY
25	KEY	26	KEY
27	KEY	28	KEY
29	KEY	30	KEY
31	KEY	32	UART_TX
33	GND	34	UART_CTS
35	PETP1	36	UART_RTS
37	PETN1	38	REV
39	GND	40	REV
41	PERP0	42	REV
43	PERN0-	44	COEX3
45	GND	46	COEX2
47	REFCLKP	48	COEX1
49	REFCLKN	50	SUSCLK(32KHz)
51	GND	52	PERST#
53	CLKREQ0#	54	W_DISABLE2
55	PEWAKE0#	56	W_DISABLE1
57	GND	58	I2C_DAT
59	REV	60	I2C_CLK
61	REV	62	ALERT
63	GND	64	REV
65	REV	66	REV
67	REV	68	REV
69	GND	70	REV
71	REV	72	+3.3V
73	REV	74	+3.3V
75	GND		

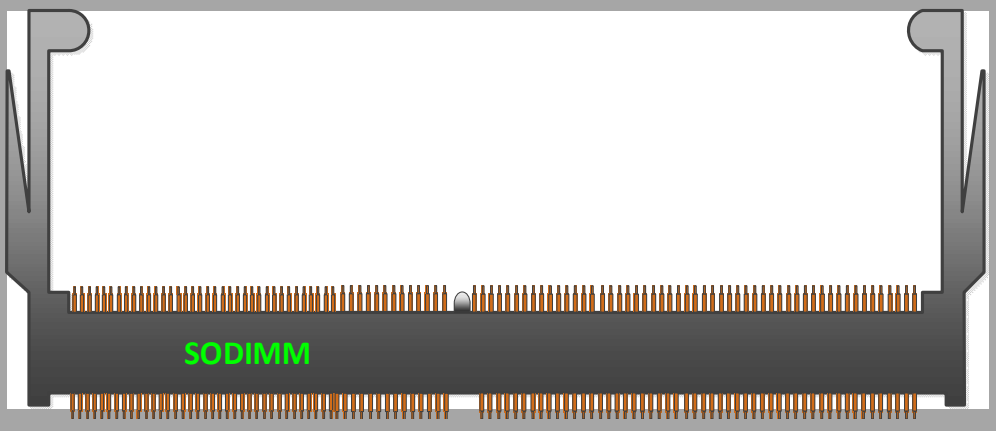
Type	M.2 Key E Socket
Memo	Support WIFI and BT

MiniSATA	MiniSATA (30)
PIN Define	
Type	7+15P Reverse MINI SATA Connector

1	GND	12	GND
2	TXP	13	GND
3	TXN	14	+V5S
4	GND	15	+V5S
5	RXN	16	+V5S
6	RXP	17	GND
7	GND	18	NC
8	+V3.3S	19	GND
9	+V3.3S	20	NC
10	+V3.3S	21	NC
11	GND	22	NC

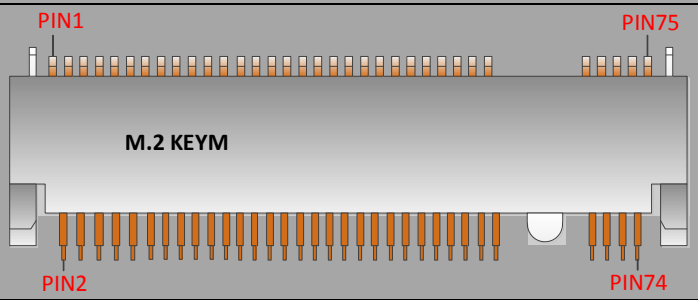
Display	eDP(31)
PIN Define	
Type	2x15 PH=1.25mm

1	+V12S	2	+V12S
3	GND	4	GND
5	+V3.3S	6	+V3.3S
7	EDP_PWM	8	EDP_VDDEN
9	EDP_BKL	10	GND
11	EDP_TX1N	12	EDP_TX1P
13	EDP_TX0N	14	EDP_TX0P
15	GND	16	GND
17	eDP_AUXN	18	eDP_AUXP
19	GND	20	GND
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	NC	28	EDP_HPD
29	NC	30	GND

Memory	DDR4 SODIMM(32)
PIN Define	
Type	260PIN Standard SODIMM Socket
Memo	Standard PIN Define, Detail refer to JEDEC Specification

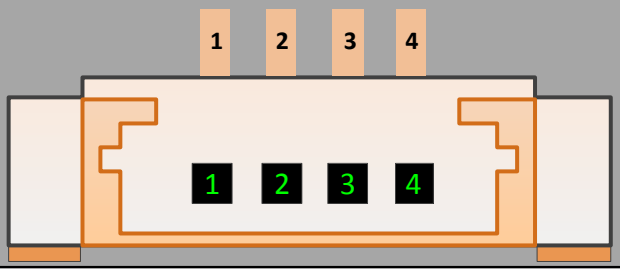
M.2	M.2_SSD1(33)

PIN Define

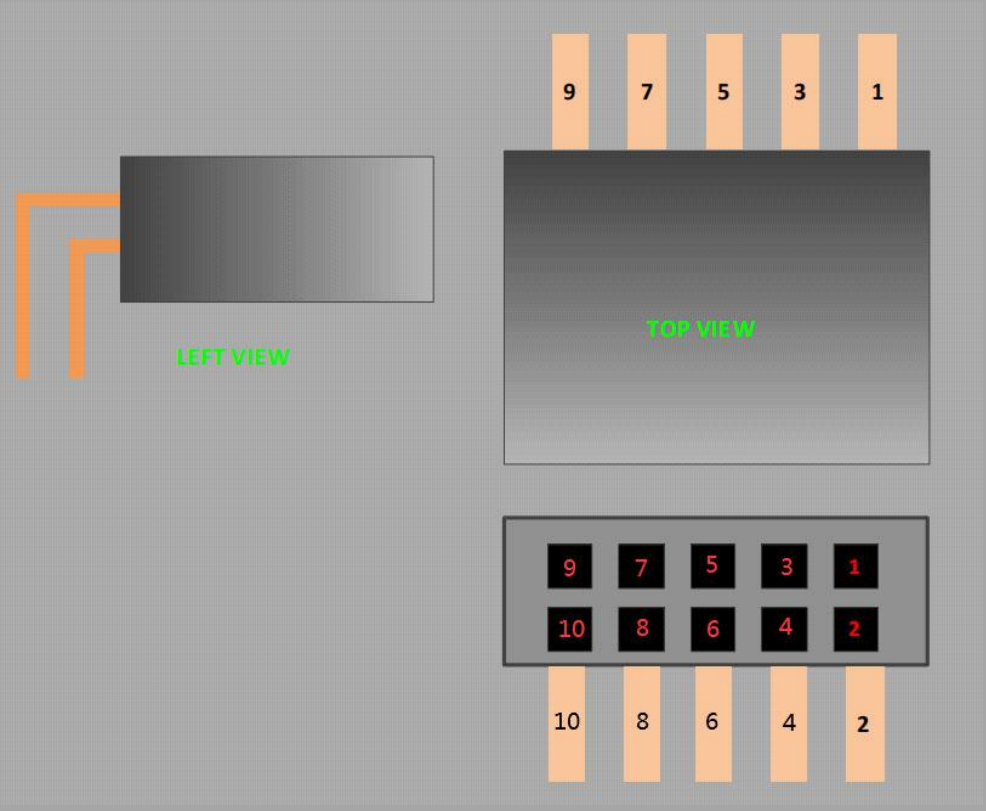


1	GND	2	+3.3V
3	GND	4	+3.3V
5	PERN3	6	N/C
7	PRRP3	8	N/C
9	GND	10	DAS/DSS
11	PETN3	12	+3.3V
13	PETP3	14	+3.3V
15	GND	16	+3.3V
17	PERN2	18	+3.3V
19	PERP2	20	N/C
21	GND	22	N/C
23	PETN2	24	N/C
25	PETP2	26	N/C
27	GND	28	N/C
29	PERN1	30	N/C
31	PERP1	32	N/C
33	GND	34	N/C
35	PETN1	36	N/C
37	PETP1	38	DEVSLP
39	GND	40	N/C
41	PERN0(SATA-B+)	42	N/C
43	PERP0(SATA-B-)	44	N/C
45	GND	46	N/C
47	PETN0(SATA-A-)	48	N/C
49	PETP0(SATA-A+)	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKN	54	PEWAKE#
55	REFCLKP	56	N/C
57	GND	58	N/C
59	KEY	60	KEY
61	KEY	62	KEY
63	KEY	64	KEY
65	KEY	66	KEY
67	N/C	68	SUSCLK
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	GND		

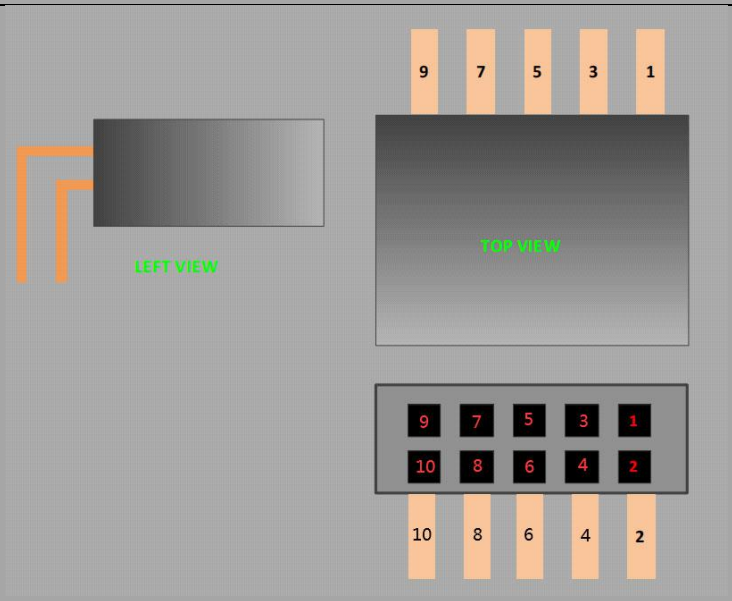
Type	M.2 Key M Socket,Support 2280

USB	JUSB1(34)
PIN Define	
Type	1X4 Wafer，PH=1.25mm

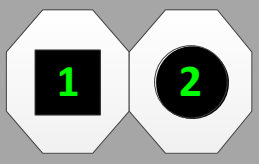
1	VBUS
2	D-
3	D+
4	GND

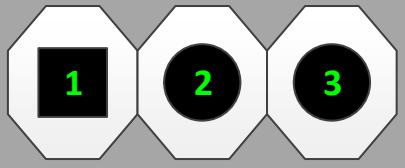
I/O	JDIO2(35)
PIN Define	
Type	2X5 Header Box PH=2.0 mm

1	VBUS	2	+DATA6
3	+V5S	4	-DATA6
5	GND	6	+DATA8
7	GND	8	-DATA8
9	-DATA7	10	+DATA7

I/O	JDIO1(36)
PIN Define	
Type	2X5 Header Box PH=2.0 mm

1	GPIO2	2	+V12S
3	GPIO1	4	PWR SW
5	GPIO0	6	POWER_LED-
7	GND	8	POWER_LED+
9	KB_DT	10	KB_CK

BTN	BTN1 (37)
PIN Define	
Type	1x2 DuPont Header PH=2.54mm
Memo	SHOT PIN 1-2, System Booting

Jumper	J_ATX/AT (38)
PIN Define	
Type	Header 1X3P PH=2.0mm Black 180° DIP

1-2	ATX(Default)
2-3	AT