HD-A40i-V1.1

工业级安卓核心板

-25℃~+85℃

规格书

文档修改历史

版本	描述	日期
V1.0	创建	2020-11-01

目录

第一章 产品概述

1.1 A40i-V1.1 核心板适用范围

A40i-V1.1 属于嵌入式核心板，只需供电一路 5V 就可以运行最小系统，硬件底板及操作系统可定制化，普遍适用于低端平板、手持终端、楼宇对讲、智能面板、智能网关、游戏机、工业仪器、智能门锁、自助终端、广告机等相关产品。

1.2 产品概述

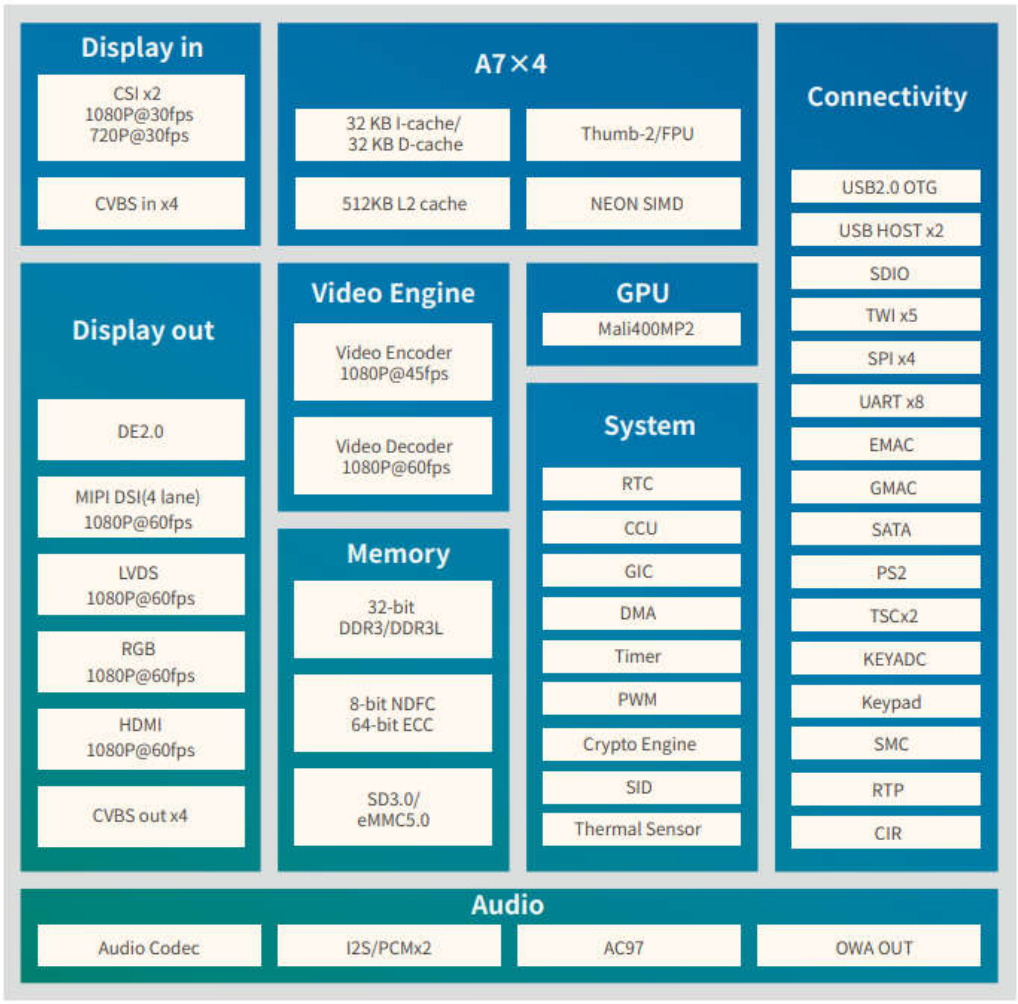
产品采用 Allwinner Quad-Core ARM Cortex™-A7 四核心处理器，搭载 Android7.1/Linux+QT 系统，主频 1.2GHz，GPU 采用 Mali400MP2，支持 H.264 1080P 45 帧解码/H.264 1080P 60 帧编码。支持 RGB、LVDS、MIPI 显示屏接口，分辨率最大 1920*1200 60fps，支持 HDMI 1080P 输出，支持 DVP/CSI 最大 200W 像素摄像头。

1.3 产品特点

1、邮票孔焊接式核心板，全行业尺寸最小，板载 RGB、LVDS、MIPI、HDMI、CSI、UART、I2C、SPI、EMAC/GMAC、SATA 等常用外设接口。

2、支持 Android/Linux+QT 定制，支持硬件 PCBA 定制。

1.4 主芯片方框图


Block Diagram
Display in
CSI x2
1080P@30fps
720P@30fps
CVBS in x4
A7×4
32 KB I-cache/
32 KB D-cache
Thumb-2/FPU
512KB L2 cache
NEON SIMD
Connectivity
USB2.0 OTG
USB HOST x2
SDIO
TWI x5
SPI x4
UART x8
EMAC
GMAC
SATA
PS2
TSCx2
KEYADC
Keypad
SMC
RTP
CIR
Display out
DE2.0
MIPI DSI(4 lane)
1080P@60fps
LVDS
1080P@60fps
RGB
1080P@60fps
HDMI
1080P@60fps
CVBS out x4
Video Engine
Video Encoder
1080P@45fps
Video Decoder
1080P@60fps
GPU
Mali400MP2
System
RTC
CCU
GIC
DMA
Timer
PWM
Crypto Engine
SID
Thermal Sensor
Memory
32-bit
DDR3/DDR3L
8-bit NDFC
64-bit ECC
SD3.0/
eMMC5.0
Audio
Audio Codec
I2S/PCMx2
AC97
OWA OUT

Overview

The A40i processor represents Allwinner's latest achievement in the intelligent industrial control sector. The processor is ideal for applications that require 3D graphics, advanced video processing, rich user interfaces, high quality, low power consumption and a high level of system integration.

The A40i is mainly applied to industrial control products based on visual interaction.

Highlights

- Content can be displayed on either 4-lane MIPI DSI displays, an RGB panel or a Dual-channel LVDS panel. CVBS-out and HDMI V1.4 is also supported.
- Supports dual CMOS sensor parallel interfaces and 4-channel CVBS-in , which is capable of executing multi-channel video recording.
- A40i meets the standard of industrial grade, and the operating temperature reaches the standard of AEC-Q100 grade3.
- Integrated audio codec with 24bit/192KHz DAC playback, and supports I2S/PCM interface for connecting to an external audio codec.I2S/PCM interface includes eight channels of TDM with sampling precision up to 32bit/192KHz.
- To reduce the total system cost, the A40i has an extensive range of support for hardware peripherals allowing for an array of configurations, such as 3*USB2.0, GMAC, EMAC, SATA, 2*TSC, PS2, RTP, 4*SDHC etc.
- Supports Linux3.10, Android 7.1 and the above system.

Feature List

CPU Architecture

- Quad-core ARM Cortex™-A7 MPCore Processor
- ARMv7 ISA standard ARM instruction set
- Thumb-2 Technology
- Jazeller RCT
- NEON Advanced SIMD
- VFPv4 floating point
- Hardware virtualization support
- Large Physical Address Extensions(LPAE)
- JTAG debug
- One general timer for per CPU
- 32KB Instruction and 32KB Data L1 cache for per CPU
- 256KB L2 cache

GPU Architecture

- 3D
  - Mali400 MP2 GPU
  - Support OpenGL ES 2.0 / OpenVG 1.1 standard
- 2D
  - Support BLT and ROP2/3/4
  - Support 90° /180° /270° rotation
  - Support mirror/ alpha (plane and pixel alpha) /color key
  - Format conversion: ARGB 8888/4444/1555, RGB565, MONO 1/2/4/8bpp, Palette 1/2/4/8bpp (input only), YUV

Memory Subsystem

SDRAM

- Compatible with JEDEC standard DDR2/DDR3 /DDR3L/LPDDR2/LPDDR3 SDRAM
- Up to 2GB address space
- 16 address signal lines and 3 bank signal lines
- 32-bit bus width

NAND Flash

- Supports SLC/MLC NAND and EF-NAND
- Supports SDR/Toggle DDR/ONFI DDR NAND interface
- 16 address signal lines and 3 bank signal lines
- up to 8-bit data bus width

SD/MMC Interface

- Up to four SMHC controllers
- Comply with eMMC standard specification V5.0
- Comply with SDIO card specification V3.0
- 1/4/8-bits bus width

USB

- One USB 2.0 OTG
- Two EHCI/OHCI compliant Hosts

Video Decoding

- Support picture size up to 3840x2160
- Support decoding speed up to 1080p@60fps
- Supported multi-formats: MPEG1/2, MPEG4 SP/ASP, WMV, H.263 including Sorenson Spark, H.264 BP/MP/HP, VP6/8, AVS/AVS+, JPEG/MJPEG, etc

Video Encoding

- H.264 HP up to 1080p@45fps
- JPEG baseline: picture size up to 4096x4096
- Alpha blending
- Thumb generation
- 4x2 scaling ratio from 1/16 to 64 arbitrary non-integer ratio

Video Output
- HDMI 1.4 transmitter with HDCP up to 1080p@60fps
- Supports 4 lanes MIPI DSI up to 1080p@60fps
- Supports LVDS interface up to 1920 x 1080@60fps
- Supports RGB interface up to 1920 x 1080@60fps
- Supports CVBS out, 4-ch CVBS, 1-ch YPbPr or 1-ch VGA

Video Input
- Supports 4-ch analog CVBS in
- Supports Dual parallel interfaces:CSI0 and CSI1
- Supports CCIR656 protocol for each CSI
- Supports 16-bit BT1120 interface for CSI0
- Supports 24-bit RGB/YUV444 input for CSI1

EMAC
- Support 10/100Mbps MII PHY interface
- Comply with the IEEE 802.3-2002 standard

GMAC
- Support 10/100/1000Mbps RGMII/MII PHY interface
- Comply with the IEEE 802.3-2002 standard

PWM
- 8 PWM channels outputs
- Support cycle mode and pulse mode
- The pre-scale is from 1 to 64

Smart Card Reader
- One smart card reader controller supporting ISO/IEC 7816-3 and EMV2000 specifications
- Support synchronous and any other non-ISO 7816 and non-EMV cards

UART
- Up to 8 UART controllers
- 64-Bytes Transmit and receive data FIFOs for all UART
- Compliant with industry-standard 16550 UARTs
- Support Infrared Data Association(IrDA) 1.0 SIRR

Analog Audio Output
- Stereo audio DAC
- Stereo capless headphone drivers
- One low-noise analog microphone bias
- Dedicated headphone outputs
- Two mixers to meet different requirements

Analog Audio Input
- Support four analog audio inputs
- Stereo audio ADC

Digital Audio
- One I2S compliant audio interface, supporting 8-channel and 2-channel input
- One PCM, supporting linear sample (8-bit or 16-bit), 8-bit u-law and A-law companded sample
- One AC97 audio codec, supporting 2-channel and 6-channel audio data output

DMA
- 16 channels:8 channels with normal DMA,8 channels with dedicated DMA
- Support data width of 8/16/32 bits
- Support linear and IO address modes
- Support data transfer types with memory-to-memory, memory-to-peripheral, peripheral-to-memory

CIR
- A flexible receiver for IR remote
- Up to two IR controllers
- Programmable FIFO thresholds

SATA
- One SATA Host controller
- Support SATA 1.5Gb/s and SATA 3.0Gb/s
- Comply with SATA spec 2.6
- Support external SATA(eSATA)

Keypad
- One keypad matrix interface up to 8 rows and 8 colums
- Interrupt for key press or key release
- Internal debouncing filter to prevent switching noises

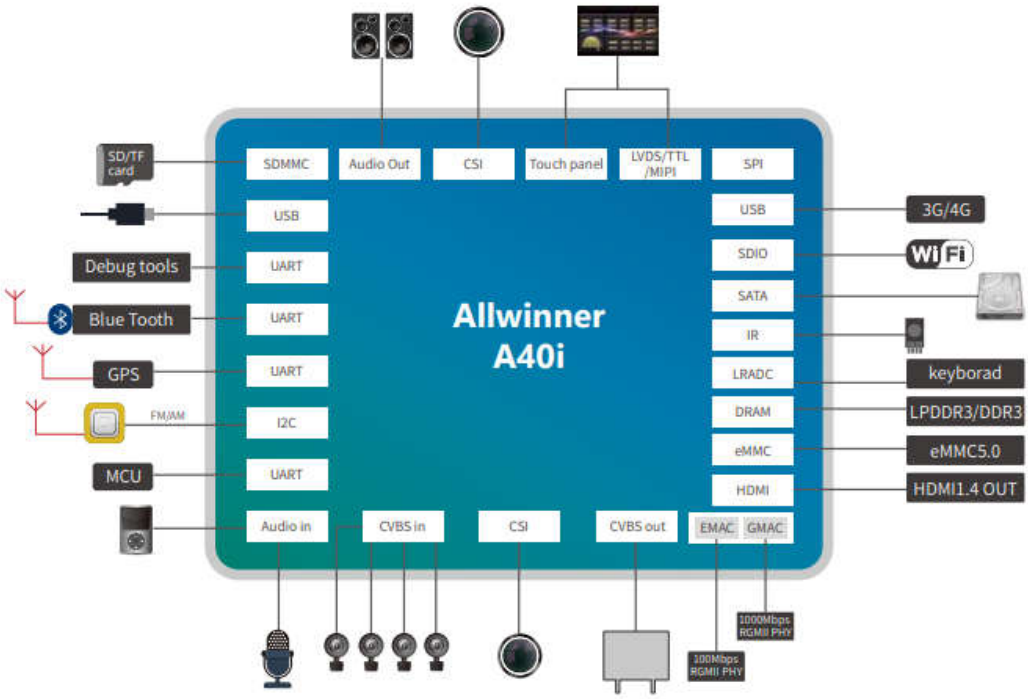
TWI
- Up to 5 TWIs(Two Wire Interface) controllers
- Support Standard mode (up to 100K bps) and Fast mode (up to 400K bps)

SPI
- Up to 4 SPI controllers

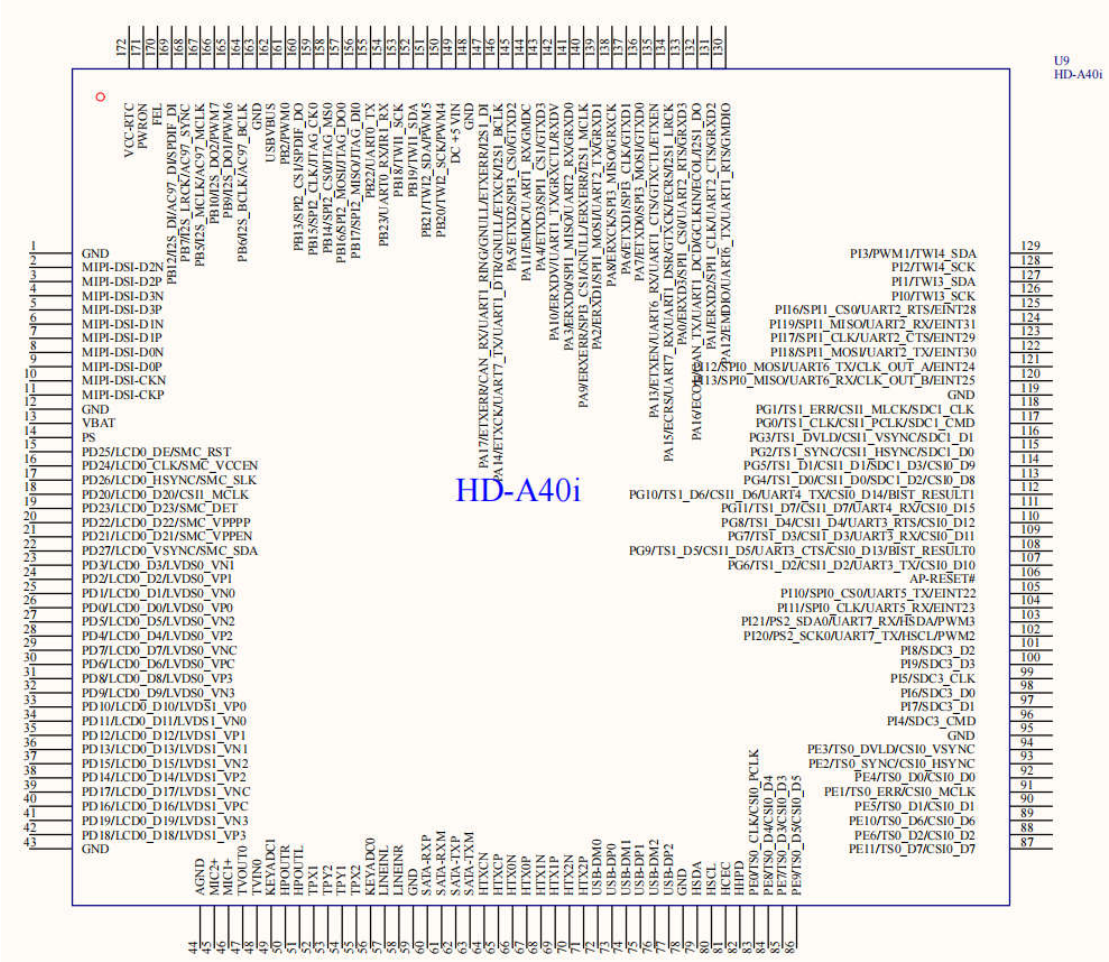
Package
- BGA 468 balls,0.65mm ball pitch, 0.35mm ball size, 16x16mm

Operating Temperature
- - 40°C~ 85°C

Application Diagram

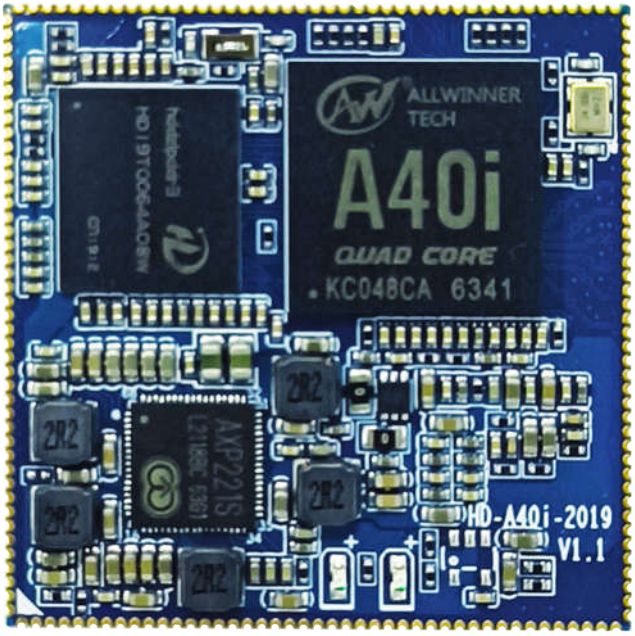


1.5 核心板 PIN 定义图

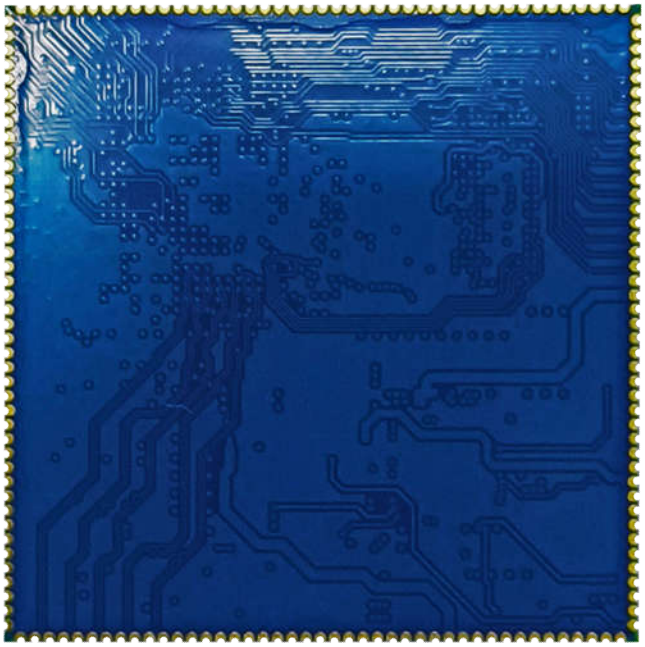


1.6 外观接口示意图

正面



背面



1.7 功能驱动支持列表

A64-V2.0 功能及驱动支持列表				
硬件功能	Android7.1		Linux+QT	备注
RGB 显示(7 寸 1024X600+TP 触摸 GT911）	√		*	
MIPI 显示（10.1 寸 1280*800+TP）	√		*	
HDMI 显示（720P 1080P）	√		*	
RGB 显示(4 寸 720X720+TP 触摸）	√		*	
LVDS 显示（10.1 寸 2*6bit/8bit 1920*1080)	√		*	
LED 灯 （系统电源，呼吸灯）	√		*	
RTC（系统 RTC,FPC8563）	√		*	
音频输出	√		*	
麦克输入	√		*	
USB2.0-OTG	√		*	
USB2.0-HOST	√		*	
百兆以太网（IP101GR）	√		*	
4G 模组（移远）	√		*	
WIFI+BT 2.4G （USB-RTL8723BU）	√		*	
CSI 摄像头 OV2640	√		*	
串口 UART0 调试串口	√		*	
串口 UART2/3/4/5/6/7 普通串口	√		*	
TF 卡 （最大 64G）	√		*	
复位键 RESET	√		*	
休眠键 PWOER	√		*	
升级键 FEL（长按上电进入烧写模式）	√		*	
SATA	√		*	
软件功能	Android7.1		Linux+QT	备注
USB 升级	√		*	
TF 卡升级	×		*	
深度休眠	√		*	

第二章 基本功能列表

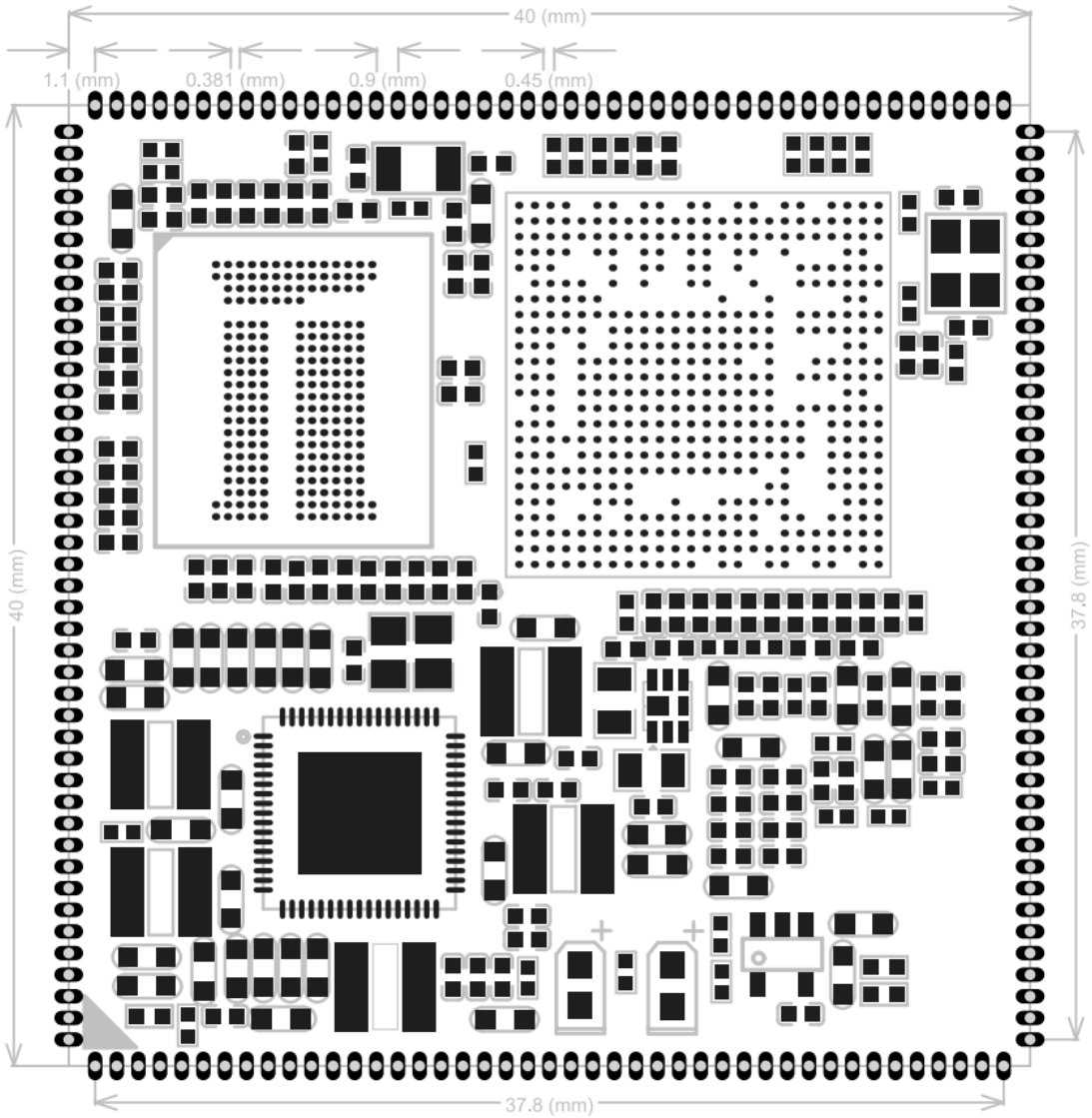
主要硬件指标	
尺寸	40mm 长*40mm 宽*2.6mm 高 172pin
连接方式	邮票孔板对板连接器
CPU	Allwinner Cortex-A53 四核 1.2GHz
GPU	Mali400MP2
DDR 内存	LPDDR3 标配 1GB /2GB
EMMC 存储器	eMMC 5.0 标配 8G/16GB
PMIC 电源管理	AXP221S
核心板工作电压	5V 1.5A 以上
支持系统	Andriod7.1/Linux+QT5.8
运行温度	-25℃到+85℃
存储温度	-40℃到+125℃
使用寿命	连续 24 小时不间断运行 2 年以上
核心板常用接口	
RGB/LVDS/mipi/HDMI	支持 RGB888/LVDS 双 6/8bit 1920*1200
DVP 摄像头	1 路 DVP 摄像头 最大 200W
USB 2.0	3 路独立 USB2.0 其中一路为 OTG
SDIO	2 路 SDIO 接口
UART	7 路串口
I2C	4 路 I2C
SPI	3 路
PWM	2 路
ADC	2 路
I2S	1 路
麦克输入	2 路摸拟输入
音频输出	1 路立体声
GPIO	可复用 GPIO 最多 100 路

第三章 PCB 尺寸和接口定义

正面 TOP

PCB：6 层 FR-4/1.2mm 兰油沉金

尺寸：40mm*40mm*2.6mm

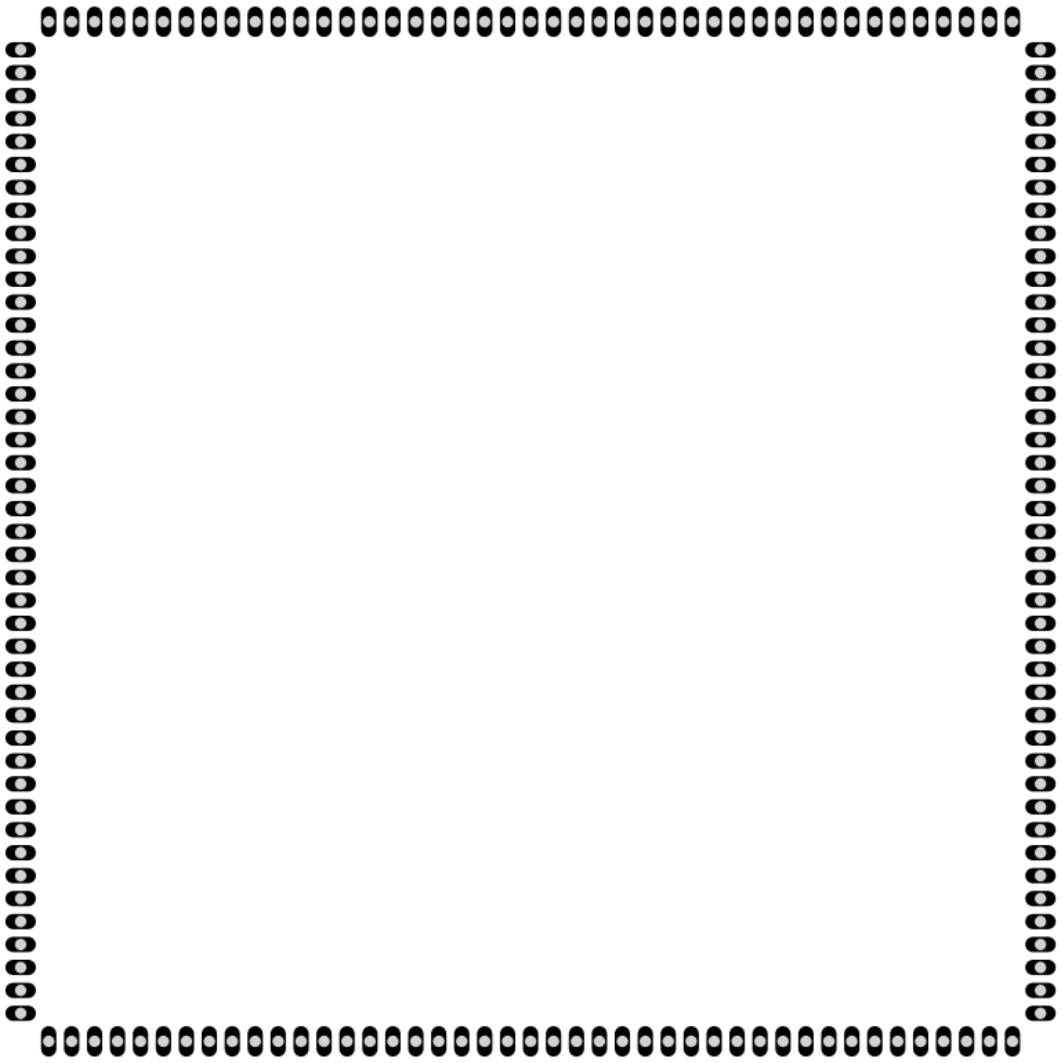


反面 BOTTOM

PCB：6 层 FR-4/1.2mm 兰油沉金

尺寸：40mm*40mm*2.6mm

反面无元件设计



第四章 核心板 PIN 脚定义

脚位	默认功能	IO 电压	PIN 定义（CPU）	备注
1	GND		GND	
2	DSI-D2N		MIPI-DSI-D2N	
3	DSI-D2P		MIPI-DSI-D2P	
4	DSI-D3N		MIPI-DSI-D3N	
5	DSI-D3P		MIPI-DSI-D3P	
6	DSI-D1N		MIPI-DSI-D1N	
7	DSI-D1P		MIPI-DSI-D1P	
8	DSI-D0N		MIPI-DSI-D0N	
9	DSI-D0P		MIPI-DSI-D0P	
10	DSI-CKN		MIPI-DSI-CKN	
11	DSI-CKP		MIPI-DSI-CKP	
12	GND		GND	
13	VBAT		VBAT	
14	PS		PS	
15	LCD-DE		PD25/LCD0_DE/SMC_RST	
16	LCD-CLK		PD24/LCD0_CLK/SMC_VCCEN	
17	LCD-HSYNC		PD26/LCD0_HSYNC/SMC_SLK	
18	LCD-D20		PD20/LCD0_D20/CSI1_MCLK	
19	LCD-D23		PD23/LCD0_D23/SMC_DET	
20	LCD-D22		PD22/LCD0_D22/SMC_VPPPP	
21	LCD-D21		PD21/LCD0_D21/SMC_VPPEN	
22	LCD-VSYNC		PD27/LCD0_VSYNC/SMC_SDA	
23	LVDS0-D1N		PD3/LCD0_D3/LVDS0_VN1	
24	LVDS0-D1P		PD2/LCD0_D2/LVDS0_VP1	
25	LVDS0-D0N		PD1/LCD0_D1/LVDS0_VN0	
26	LVDS0-D0P		PD0/LCD0_D0/LVDS0_VP0	
27	LVDS0-D2N		PD5/LCD0_D5/LVDS0_VN2	
28	LVDS0-D2P		PD4/LCD0_D4/LVDS0_VP2	
29	LVDS0-DCKN		PD7/LCD0_D7/LVDS0_VNC	
30	LVDS0-DCKP		PD6/LCD0_D6/LVDS0_VPC	
31	LVDS0-D3P		PD8/LCD0_D8/LVDS0_VP3	
32	LVDS0-D3N		PD9/LCD0_D9/LVDS0_VN3	
33	LVDS1-D0P		PD10/LCD0_D10/LVDS1_VP0	
34	LVDS1-D0N		PD11/LCD0_D11/LVDS1_VN0	
35	LVDS1-D1P		PD12/LCD0_D12/LVDS1_VP1	

36	LVDS1-D1N		PD13/LCD0_D13/LVDS1_VN1	
37	LVDS1-D2N		PD15/LCD0_D15/LVDS1_VN2	
38	LVDS1-D2P		PD14/LCD0_D14/LVDS1_VP2	
39	LVDS1-DCKN		PD17/LCD0_D17/LVDS1_VNC	
40	LVDS1-DCKP		PD16/LCD0_D16/LVDS1_VPC	
41	LVDS1-D3N		PD19/LCD0_D19/LVDS1_VN3	
42	LVDS1-D3P		PD18/LCD0_D18/LVDS1_VP3	
43	GND		GND	
44	AGND		AGND	
45	MIC2+		MIC2+	
46	MIC1+		MIC1+	
47	TVOUT0		TVOUT0	
48	TVIN0		TVIN0	
49	KEYADC1		KEYADC1	
50	HPOUTR		HPOUTR	
51	HPOUTL		HPOUTL	
52	TPX1		TPX1	
53	TPY2		TPY2	
54	TPY1		TPY1	
55	TPX2		TPX2	
56	KEYADC0		KEYADC0	
57	LINEINL		LINEINL	
58	LINEINR		LINEINR	
59	GND		GND	
60	SATA-RXP		SATA-RXP	
61	SATA-RXN		SATA-RXN	
62	SATA-TXP		SATA-TXP	
63	SATA-TXN		SATA-TXN	
64	HTXCN		HTXCN	
65	HTXCP		HTXCP	
66	HTX0N		HTX0N	
67	HTX0P		HTX0P	
68	HTX1N		HTX1N	
69	HTX1P		HTX1P	
70	HTX2N		HTX2N	
71	HTX2P		HTX2P	
72	USB0-DM		USB0-DM	
73	USB0-DP		USB0-DP	
74	USB1-DM		USB1-DM	
75	USB1-DP		USB1-DP	
76	USB2-DM		USB2-DM	
77	USB2-DP		USB2-DP	
78	GND		GND	

79	HSDA		HSDA	
80	HSCL		HSCL	
81	HDMI-HCEC		HDMI-HCEC	
82	HHPD		HHPD	
83	CSI-PCLK		PE0/TS0_CLK/CSI0_PCLK	
84	CSI-D4		PE8/TS0_D4/CSI0_D4	
85	CSI-D3		PE7/TS0_D3/CSI0_D3	
86	CSI-D5		PE9/TS0_D5/CSI0_D5	
87	CSI-D7		PE11/TS0_D7/CSI0_D7	
88	CSI-D2		PE6/TS0_D2/CSI0_D2	
89	CSI-D6		PE10/TS0_D6/CSI0_D6	
90	CSI-D1		PE5/TS0_D1/CSI0_D1	
91	CSI-MCLK		PE1/TS0_ERR/CSI0_MCLK	
92	CSI-D0		PE4/TS0_D0/CSI0_D0	
93	CSI-HSYNC		PE2/TS0_SYNC/CSI0_HSYNC	
94	CSI-VSYNC		PE3/TS0_DVLD/CSI0_VSYNC	
95	GND		GND	
96	SDC3-CMD		PI4/SDC3_CMD	
97	SDC3-D1		PI7/SDC3_D1	
98	SDC3-D0		PI6/SDC3_D0	
99	SDC3-CLK		PI5/SDC3_CLK	
100	SDC3-D3		PI9/SDC3_D3	
101	SDC3-D2		PI8/SDC3_D2	
102	UART7-TX		PI20/PS2_SCK0/UART7_TX/HSCL/PWM2	
103	UART7-RX		PI21/PS2_SDA0/UART7_RX/HSDA/PWM3	
104	UART5-RX		PI11/SPI0_CLK/UART5_RX/EINT23	
105	UART5-TX		PI10/SPI0_CS0/UART5_TX/EINT22	
106	AP-RESET#		AP-RESET#	
107	UART3-TX		PG6/TS1_D2/CSI1_D2/UART3_TX/CSI0_D10	
108	UART3-CTS		PG9/TS1_D5/CSI1_D5/UART3_CTS/CSI0_D13/BIST_RESULT0	
109	UART3-RX		PG7/TS1_D3/CSI1_D3/UART3_RX/CSI0_D11	
110	UART3-RTS		PG8/TS1_D4/CSI1_D4/UART3_RTS/CSI0_D12	
111	UART4-RX		PG11/TS1_D7/CSI1_D7/UART4_RX/CSI0_D15	
112	UART4-TX		PG10/TS1_D6/CSI1_D6/UART4_TX/CSI0_D14/BIST_RESULT1	
113	WL-SDIO-D2		PG4/TS1_D0/CSI1_D0/SDC1_D2/CSI0_D8	
114	WL-SDIO-D3		PG5/TS1_D1/CSI1_D1/SDC1_D3/CSI0_D9	
115	WL-SDIO-D0		PG2/TS1_SYNC/CSI1_HSYNC/SDC1_D0	
116	WL-SDIO-D1		PG3/TS1_DVLD/CSI1_VSYNC/SDC1_D1	
117	WL-SDIO-CMD		PG0/TS1_CLK/CSI1_PCLK/SDC1_CMD	
118	WL-SDIO-CLK		PG1/TS1_ERR/CSI1_MLCK/SDC1_CLK	
119	GND		GND	
120	UART6-RX		PI13/SPI0_MISO/UART6_RX/CLK_OUT_B/EINT25	
121	UART6-TX		PI12/SPI0_MOSI/UART6_TX/CLK_OUT_A/EINT24	

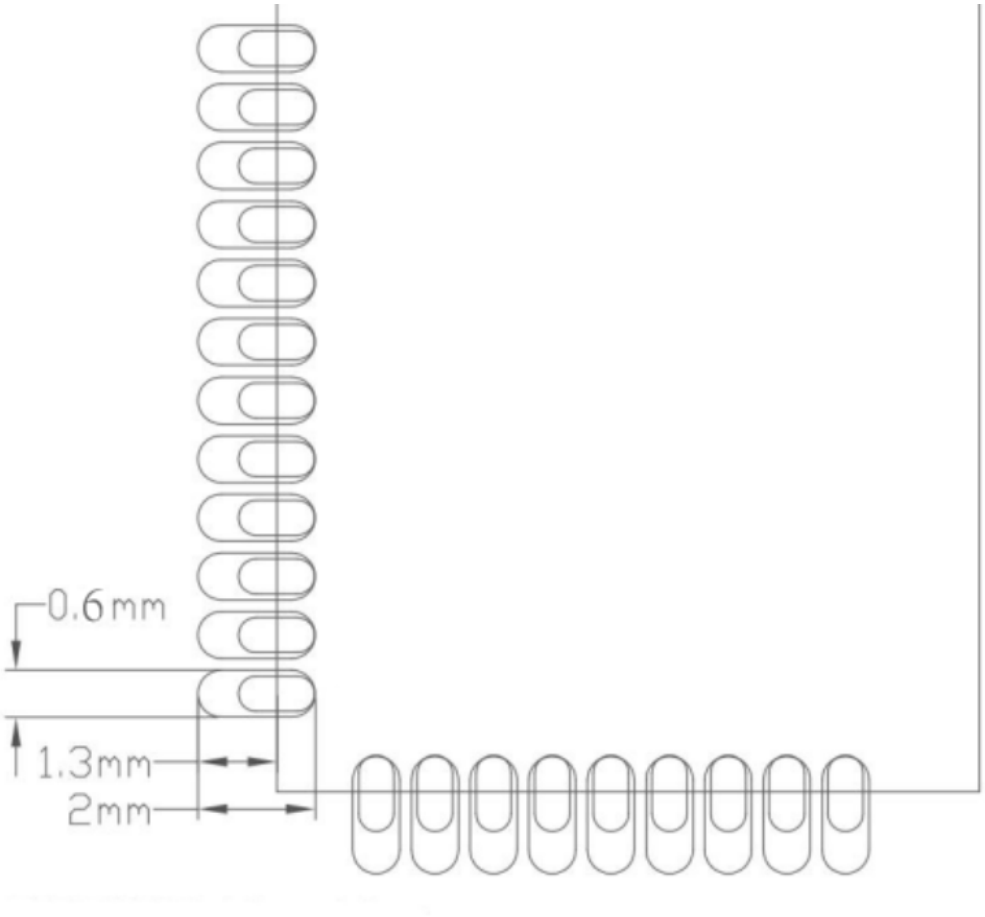
122	UART2-TX		PI18/SPI1_MOSI/UART2_TX/EINT30	
123	UART2-CTS		PI17/SPI1_CLK/UART2_CTS/EINT29	
124	UART2-RX		PI19/SPI1_MISO/UART2_RX/EINT31	
125	UART2-RTS		PI16/SPI1_CS0/UART2_RTS/EINT28	
126	TWI3-SCK		PI0/TWI3_SCK	
127	TWI3-SDA		PI1/TWI3_SDA	
128	TWI4-SCK		PI2/TWI4_SCK	
129	TWI4-SDA		PI3/PWM1/TWI4_SDA	
130	EMDIO		PA12/EMDIO/UART6_TX/UART1_RTS/GMDIO	
131	ERXD2		PA1/ERXD2/SPI1_CLK/UART2_CTS/GRXD2	
132	ECOL		PA16/ECOL/CAN_TX/UART1_DCD/GCLKIN/ECOL/I2S1_DO	
133	ERXD3		PA0/ERXD3/SPI1_CS0/UART2_RTS/GRXD3	
134	ECRS		PA15/ECRS/UART7_RX/UART1_DSR/GTXCK/ECRS/I2S1_LRCK	
135	ETXEN		PA13/ETXEN/UART6_RX/UART1_CTS/GTXCTL/ETXEN	
136	ETXD0		PA7/ETXD0/SPI3_MOSI/GTXD0	
137	ETXD1		PA6/ETXD1/SPI3_CLK/GTXD1	
138	ERXCK		PA8/ERXCK/SPI3_MISO/GRXCK	
139	ERXD1		PA2/ERXD1/SPI1_MOSI/UART2_TX/GRXD1	
140	ERXERR		PA9/ERXERR/SPI3_CS1/GNULL/ERXERR/I2S1_MCLK	
141	ERXD0		PA3/ERXD0/SPI1_MISO/UART2_RX/GRXD0	
142	ERXDV		PA10/ERXDV/UART1_TX/GRXCTL/RXDV	
143	ETXD3		PA4/ETXD3/SPI1_CS1/GTXD3	
144	EMDC		PA11/EMDC/UART1_RX/GMDC	
145	ETXD2		PA5/ETXD2/SPI3_CS0/GTXD2	
146	ETXCK		PA14/ETXCK/UART7_TX/UART1_DTR/GNULL/ETXCK/I2S1_BCLK	
147	TX-ER		PA17/ETXERR/CAN_RX/UART1_RING/GNULL/ETXERR/I2S1_DI	
148	GND		GND	
149	DC+5V		DC+5V	
150	TWI2-SCK		PB20/TWI2_SCK/PWM4	
151	TWI2-SDA		PB21/TWI2_SDA/PWM5	
152	TWI1-SDA		PB19/TWI1_SDA	
153	TWI1-SCK		PB18/TWI1_SCK	
154	UART0-RX		PB23/UART0_RX/IR1_RX	
155	UART0-TX		PB22/UART0_TX	
156	SPI2_MISO		PB17/SPI2_MISO/JTAG_DI0	
157	SPI2_MOSI		PB16/SPI2_MOSI/JTAG_DO0	
158	SPI2_CS0		PB14/SPI2_CS0/JTAG_MS0	
159	SPI2_CLK		PB15/SPI2_CLK/JTAG_CK0	
160	SPI2_CS1		PB13/SPI2_CS1/SPDIF_DO	
161	PWM0		PB2/PWM0	
162	USBVBUS		USBVBUS	
163	GND		GND	
164	I2S_BCLK		PB6/I2S_BCLK/AC97_BCLK	

165	I2S_DO1		PB9/I2S_DO1/PWM6	
166	I2S_DO2		PB10/I2S_DO2/PWM7	
167	I2S_MCLK		PB5/I2S_MCLK/AC97_MCLK	
168	I2S_LRCK		PB7/I2S_LRCK/AC97_SYNC	
169	I2S_DI		PB12/I2S_DI/AC97_DI/SPDIF_DI	
170	FEL		FEL	
171	PWRON		PWRON	
172	VCC-RTC		VCC-RTC	

第五章 电流参数表

项目		最小	典型	最大
电源参数	电压	4.8V	5V	5.5V
	纹波	--	50mV	
核心板 5V 供电电流测试	开机电流	350mA	410mA	500mA
	桌面静态电流		125mA	
环境	相对湿度	--	65%	75%
	工作温度	-25℃	--	+85℃
	存储温度	-40℃	--	+125℃

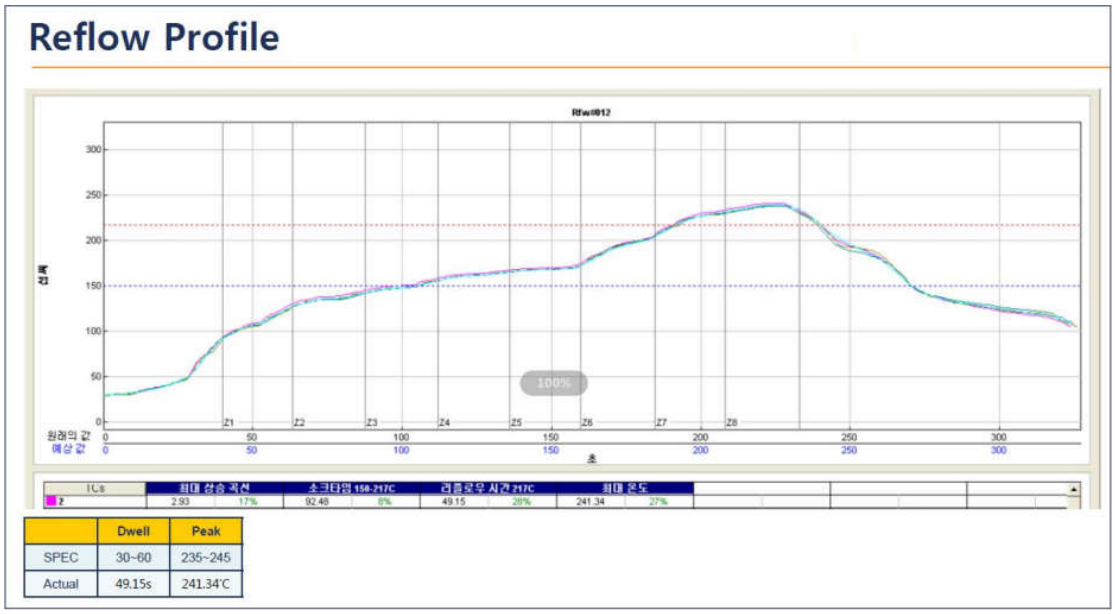
第六章 表贴开钢网工艺说明



1 为保证邮票孔的焊接品质，需要增加钢网的焊盘开孔尺寸，如上图。

2 也可以要求局部加厚邮票孔焊盘的钢网厚度以达到增加锡量的目的。

第七章 核心板二次焊接回流焊曲线图



以上为 8 温区的建议曲线

第八章 组装使用注意事项

贴片安装请注意以下事项：

1，生产尽量考虑 SMT 贴装，CPU 为敏感元件，电烙铁容易产生静电击坏核心 CPU。

2，贴装注意极性，确保 1 脚标志与底板对应，否则会烧坏 CPU。

3，因某些原因需要拆掉核心板，需用返修台拆卸。否则很容易导致邮票孔掉焊盘。

第九章 保修事项

1，非人为损坏保修 2 年。

2，因装配、生产设计导致的问题，需连接底板一起返修，严禁私下拆卸核心板，如因此导致核心板不可逆的，客户自行承担。