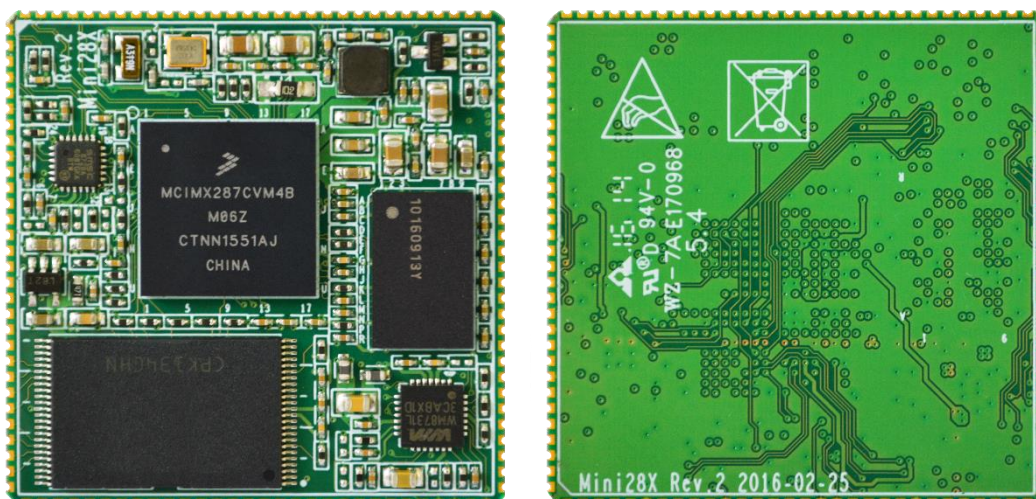


MNI287 Reference User Manual

V2.201602



Boardcon Embedded Design

www.armdesigner.com

1. Introduction

1.1. About this Manual

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

1.2. Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website (www.boardcon.com , www.armdesigner.com).

These include manuals, application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments, or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

1.3. Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation, or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits, incidental or consequential damages, loss of business, or anticipatory profits arising from the use or inability to use this product.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.



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1 MINI287 Introduction

1.1 Summary

MINI287 is a low-cost, high-performance system-on-module (SOM) based on the Freescale i.MX28, with all i.MX28 pin functions.

The i.MX28 offers low power for long battery life via a PMU with high-efficiency DC-DC converters, a Li-ion charger/detector, and Adaptive Voltage Control (AVC), which can halve power consumption and enable higher peak CPU frequencies. DC-DC converters and clocks are dynamically reprogrammable for power/performance trade-offs.

It integrates extensive I/O for most flash memories, serial buses, LCDs, and connectivity such as Wi-Fi/cellular modems via 4-bit SDIO, high-speed UARTs, and a secondary USB host PHY.

An ARM926EJ-S CPU with 16 KB I-cache, 32 KB D-cache, and 128 KB SRAM supports web browsing and portable gaming. Contact your local Freescale representative for BSPs.

The module is supplied with complete documentation, schematics, demo applications, and third-party industry-standard C compilers and embedded development environments for evaluation.

1.2 i.MX28 Features

• Core

- ARM926EJ-S CPU Running at greater than 454 MHz at 1.45 V
- 32-Kbyte data cache and 16-Kbyte instruction cache

• Memories

- 128 Kbytes of Integrated Low-Power on-chip RAM
- 128 Kbytes of Integrated mask-programmable on-chip ROM
- 1280 bits of on-chip one-time-programmable (OCOTP) ROM
- Supports DDR2-400 (1.8 V), LP-DDR1-400 (1.8 V) and LV-DDR2-400 (1.5 V)
- Support for to eight NAND Flash memory devices with up to 20-bit BCH EEC

• Peripherals

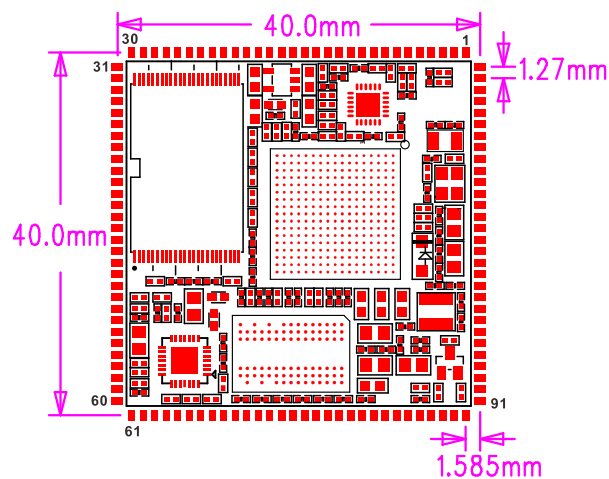
- Two 802.3 compatible 10/100 Ethernet MAC supporting IEEE® 1588 protocols and one 3-port L2 switch
- Two FlexCAN2 interfaces supported
- Two instances of Universal Serial Bus (USB) High-Speed — Up to 480 Mb/s
- Power Management Units
- Optimized for very long battery life
- 16-Channel Low-Resolution ADC
- Single Channel High Speed ADC (HSADC)
- Highly Flexible Display Controller
- Six Universal Asynchronous Receiver-Transmitters (UARTs)
- Two I2C Master/Slave Interfaces
- Four Synchronous Serial Ports (for SPI, MMC, SDIO, Triflash)



1.3 MINI287 Features

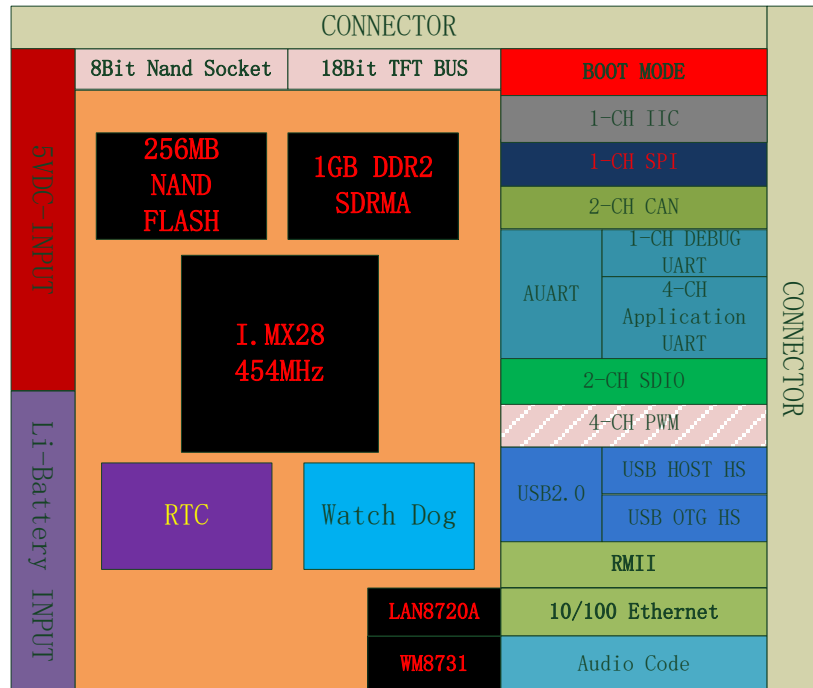
Feature	Specifications
SoC	ARM926 CPU Running at greater than 454 MHz at 1.45 V.
Memory	264MB/128MB
Storage	256MB/512MB/1GB NAND Flash
Power	DC 5V power supply or Li-Battery 3.0 ~ 4.2V optional
UART	5-CH
LCD	18-bit TFT LCD BUS
Ethernet	2-CH 10M/100M High performance Ethernet
USB	1-CH USB2.0 Host, 1-CH USB2.0 OTG
AUDIO CODE	1-CH
CAN BUS	2-CH
SPI	1-CH
ADC	6-CH
IIC	1-CH
PWM	4-CH
HSMMC/SD	2-CH
8-bit NAND Socket	1-ch
Dimensions	40 x 40 mm

1.4 PCB Dimension

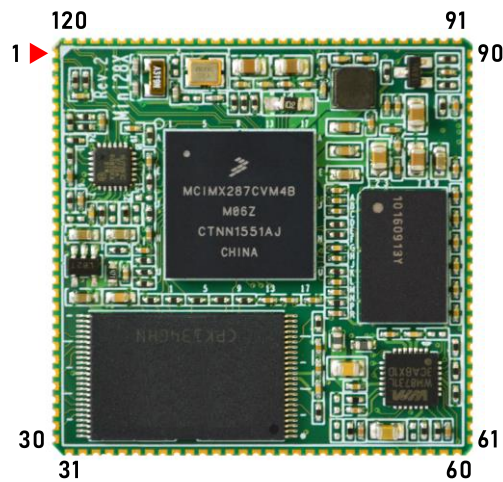




1.5 Block Diagram



1.6 Pin Definition



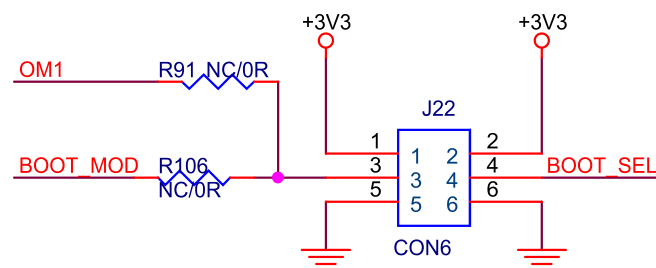
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	ENET_TXN	31	VDD_5V	61	GND_AUDIO	91	SSP0_DETECT
2	ENET_TXP	32	LCD_PWR_EN	62	UART0_TX	92	SSP0_SCK
3	GND	33	LCD_HS	63	UART0_RX	93	SSP0_CMD
4	ENET_RXN	34	LCD_RS	64	UART3_TX	94	SSP0_DATA0
5	ENET_RXP	35	LCD_VS	65	UART3_RX	95	SSP0_DATA1
6	ENET0_100MLED2	36	LCD_DE	66	UART1_TX	96	SSP0_DATA2
7	ENET0_LINKLED1	37	GND	67	UART1_RX	97	SSP0_DATA3
8	GND	38	LCD_D00	68	PWM3	98	GND



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
9	RESETN	39	LCD_D01	69	PWM4	99	TS_XP
10	PSWITCH	40	LCD_D02	70	UART2_TX	100	TS_YP
11	GND	41	LCD_D03	71	UART2_RX	101	TS_XM
12	GPMI_RDN	42	LCD_D04	72	UARTD_TX	102	TS_YM
13	GPMI_WRN	43	LCD_D05	73	UARTD_RX	103	LRADC6
14	GPMI_CE1N	44	LCD_D06	74	I2C0_SCL	104	HSADC0
15	GPMI_CE2N	45	LCD_D07	75	I2C0_SDA	105	PWM0
16	GPMI_CE3N	46	LCD_D08	76	SSP3_MOSI	106	PWM1
17	GPMI_ALE	47	LCD_D09	77	SSP3_SCK	107	ENET1_TX_EN
18	GPMI_CLE	48	LCD_D010	78	SSP3_MISO	108	ENET1_TXD1
19	GPMI_READY1	49	LCD_D11	79	SSP3_SS0	109	ENET1_TXD0
20	GPMI_READY2	50	LCD_D12	80	SSP2_SCK	110	ENET1_RX_EN
21	GPMI_READY3	51	LCD_D13	81	SSP2_CMD	111	ENET1_RXD1
22	GPMI_D0	52	LCD_D14	82	SSP2_DATA0	112	ENET1_RXD0
23	GPMI_D1	53	LCD_D15	83	SSP2_DATA1	113	ENET_MDIO
24	GPMI_D2	54	LCD_D16	84	SSP2_DATA2	114	ENET_MDC
25	GPMI_D3	55	LCD_D17	85	SSP2_DATA3	115	GND
26	GPMI_D4	56	LP_OUT	86	GND	116	USB_0_DM
27	GPMI_D5	57	RP_OUT	87	VDDXTAL	117	USB_0_DP
28	GPMI_D6	58	MIC_IN	88	BOOT_SEL	118	USB_0_ID
29	GPMI_D7	59	AL_IN	89	BOOT_MOD	119	USB_1_DM
30	LI-ION_BATTERY	60	AR_IN	90	GPIO1_19	120	USB_1_DP

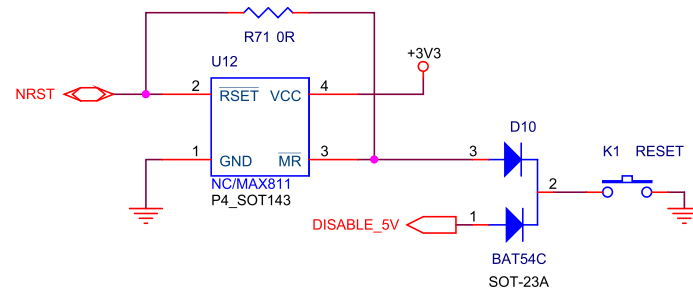
2 MINI287 Operation

2.1 Boot Mode Circuit

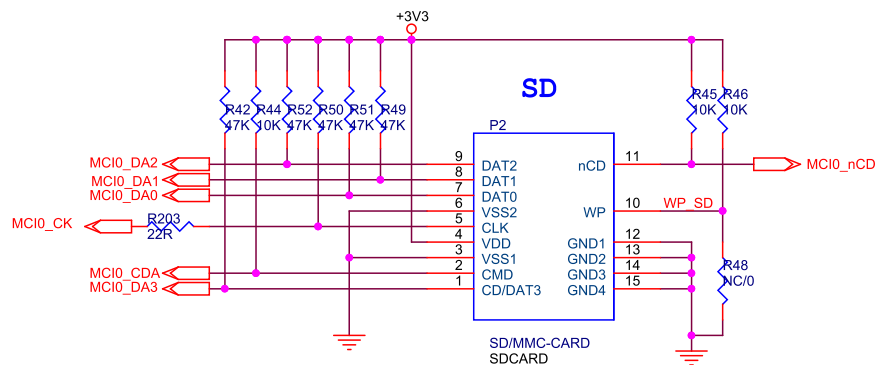


Boot Mode	Boot_MOD	Boot_SEL
Nand Flash	OPEN	OPEN
SD0	OPEN	Hight
USB	Low	OPEN

2.2 Reset Circuit

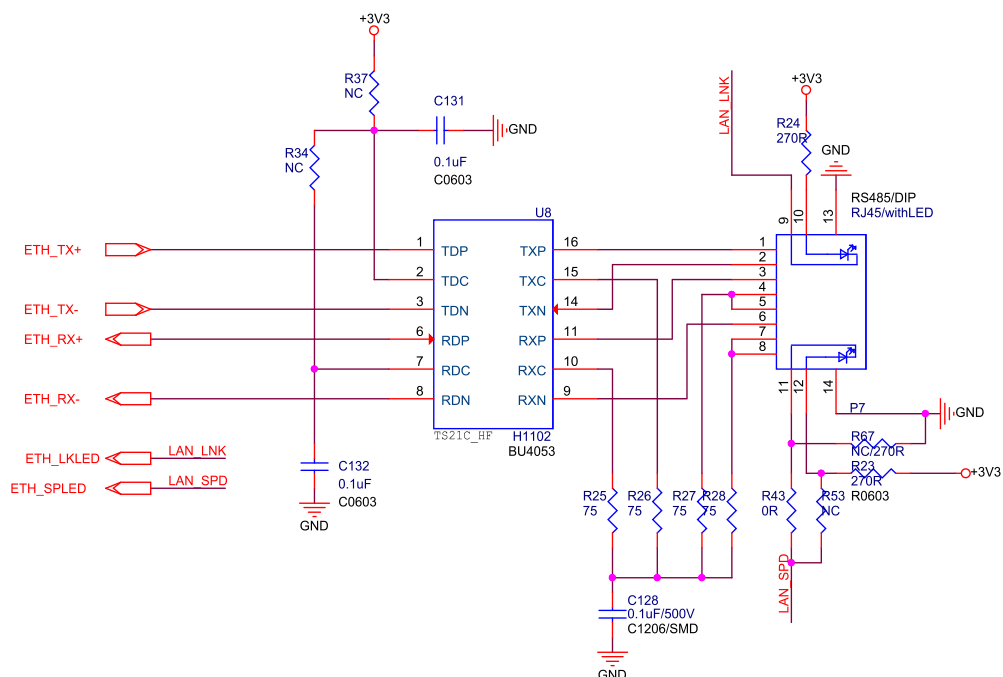


2.3 SD Circuit



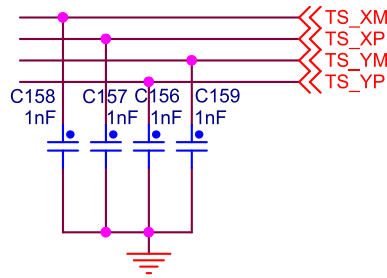
2.4 Ethernet Circuit

Since the Ethernet controller IC of the MINI287 has already been integrated on the core board, our peripheral only needs an Ethernet connector. The specific circuit is shown in the figure below:

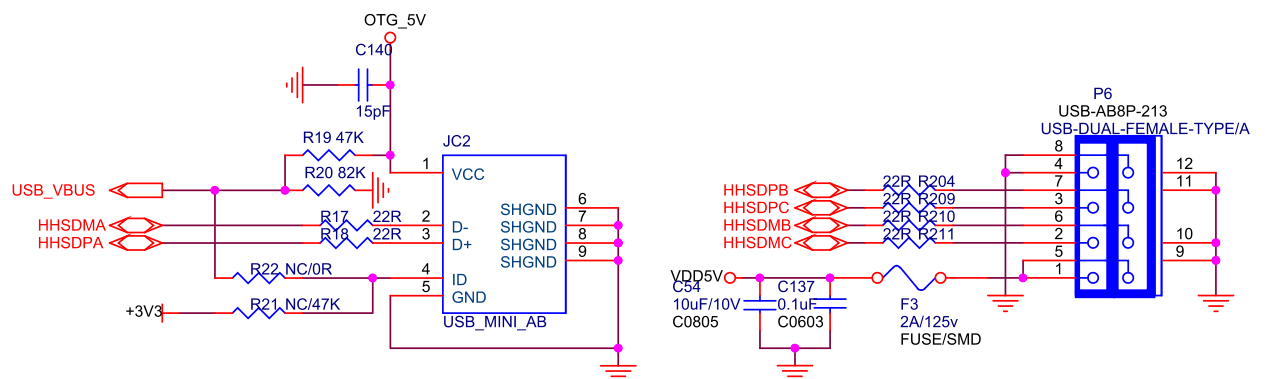




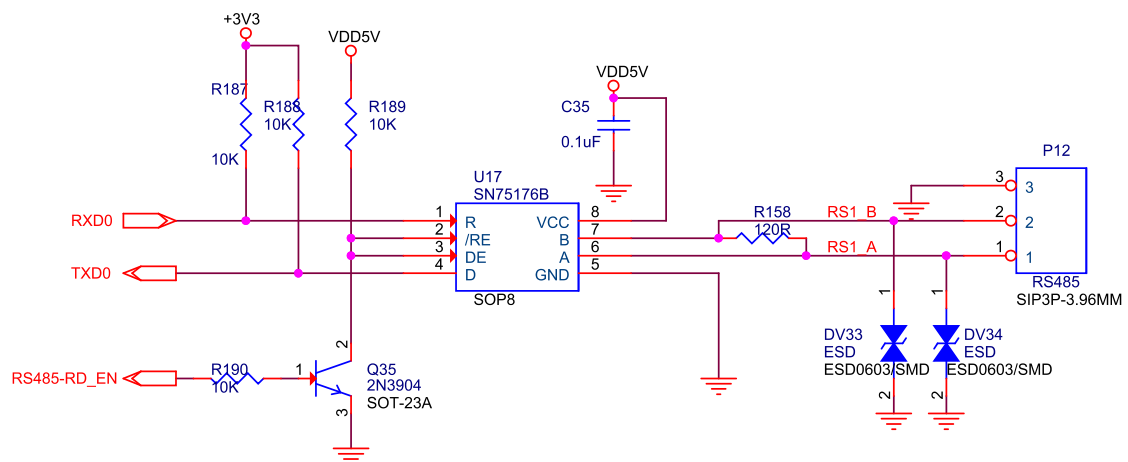
2.6 Res-Touch Circuit



2.7 USB Circuit



2.8 RS485 Circuit





2.9 CAN Circuit

