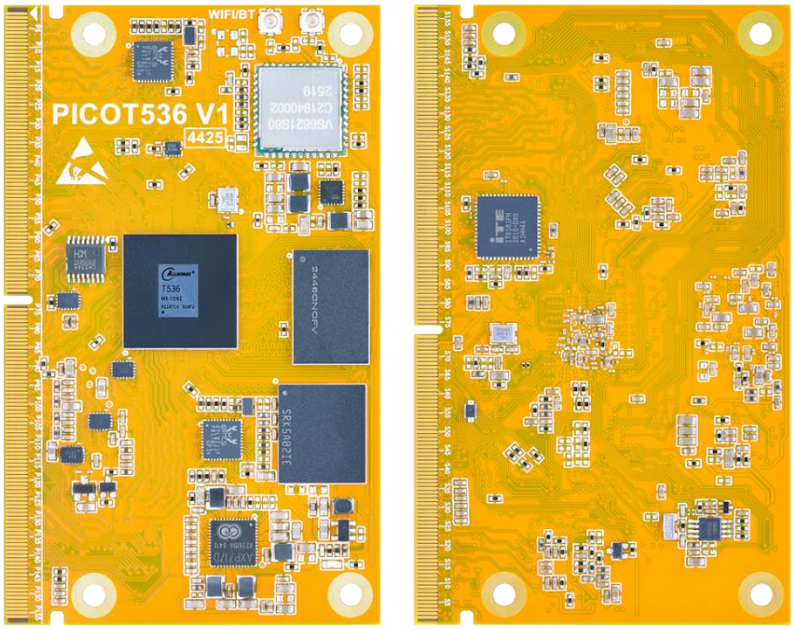
PICOT536 Reference User Manual

V1.202603



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 PICOT536 Introduction

1.1 Summary

The PicoT536 system-on-module is equipped with Allwinner's T536. It has a quad-core Cortex-A55 and single-core E907 and E902 RISC-V processor, Embedded 2.0 TOPs NPU.
It is designed specifically for the Industrial and intelligent hardware fields such as interactive terminals, smart manufacturing, HMI and robots. The high-performance processing and acceleration engine solution can help customers to introduce new technologies more quickly and enhance the overall solution efficiency.
The PicoT536 module is Comply with the SMARC 2.1 3.3V IO interface standard.

1.2 Features

- **Microprocessor**
  - Quad-core Cortex-A55 up to 1.6GHz
  - 32KB I-cache 32KB D-cache, 64KB L2 and 512KB L3 cache with ECC
  - Single-core E907 RISC-V MCU up to 600MHz with 16KB I/D cache and ECC
  - Single-core E902 RISC-V MCU up to 200MHz
  - 2.0 TOPS Neural Process Unit
- **Memory Organization**
  - LPDDR4/4x RAM up to 8GB with inline ECC
  - EMMC up to 64GB
- **Boot ROM**
  - Supports system code download through USB OTG
- **Secure system**
  - Support AES XTS-AES DES 3DES SM4 symmetrical algorithm
  - Support Hash/Random algorithms and Public key algorithms
  - Support 2048-bit eFuse
  - Support secure memory and Peripherals control
  - Support Trust Zone memory access
- **Video Decoder/Encoder**
  - Support MJPEG video decoding up to 4K@15fps
  - Support JPEG video decoding up to 1080P@60fps
  - Support H.264 encode up to 4K@25fps
  - Support MJPEG encoding up to 4K@15fps
- **ISP**
  - Support online 5M@30fps and offline 8M@30fps performance one sensor
  - Support max resolution online is 2688x4224, offline is 4800x4224
  - Supports multiple data stream outputs
- **Display Subsystem**
  - **Video Output**

  Support Dual-link LVDS up to 1920x1080@60fps or single-link up to 1366x768@60fps

Support MIPI 4lanes DSI up to 1920x1200@60Hz

Support RGB up to 1920x1200@60fps or i8080 up to 800x480@60fps

Support BT656 output

Support on core board DSI to HDMI output

- **Video/Image Input**

Support up to 8-16bits parallel CSI interfaces

Support BT656/601/1120 interfaces

Support up to 4-CH MIPI CSI

Support 4+4-lane, 4+2+2-Lane or 2+2+2+2-lane interfaces

- **Audio Subsystem**
  - **Codec**

Support One audio differential line output

16-20bit Sample resolution up to 95 dB SNR

Support dynamic range controller adjusting the DAC playback

- **Digit Interface**

Support Three I2S/PCM interface

Support maximum 8 digital PDM microphones

Support One OWA TX and One OWA RX, compliant with S/PDIF interface

- **USB / PCIE**
  - Four USB2.0 Host interfaces (Hub IC on Core board)
  - One OTG interface
  - One USB3.0 Host or PCIe2.1 interface.
  - Support USB3.1/USB2.0 DRD
- **Ethernet**
  - On board RTL8211F
  - Support 2-CH 1GB Ethernet
- **I2C**
  - Up to 7-CH I2C
  - Support standard mode and fast mode (up to 400kbit/s)
- **SPI**
  - Up to five SPI controllers,
  - Full-duplex synchronous serial interface
- **UART**
  - Support up to 15 UARTs
  - UART0/S-UART0/UART1 for debug
  - Supports 9-bit/RS-485 format and RS-485 full duplex mode
- **CAN FD**
  - Support up to four CAN-FD controller
  - Support CAN 2.0A/B protocol
- **Local Bus Controller**
  - Support 8/16/32-bit up to 100MHz bus clock
  - Support address and data multiplexed access
  - Support burst mode
- **ADC**

- **28-CH ADC channels**

  12-bit resolution

  GPADC0-2 up to 1 MHz sampling rate

  GPADC3 up to 2 MHz sampling rate

  Support 4-wire resistive touch panel

- **1-CH Low Rate ADC**

  6-bit resolution and 2 KHz sampling rate

  Voltage input range between 0V to 1.8V

- **PWM**

  - Up to 30 PWMs with 10 channels capture input
  - Up to 100MHz clock by APB0 or 24MHz clock by DCXO
  - Maximum 4 group of PWM channel output for controlling stepping motors
  - Maximum 5 complementary pairs output and the pairing methods are as follows

- **WIFI Module**

  Support WIFI 6E and BT 6.0

  SDIO/UART and PCM interface

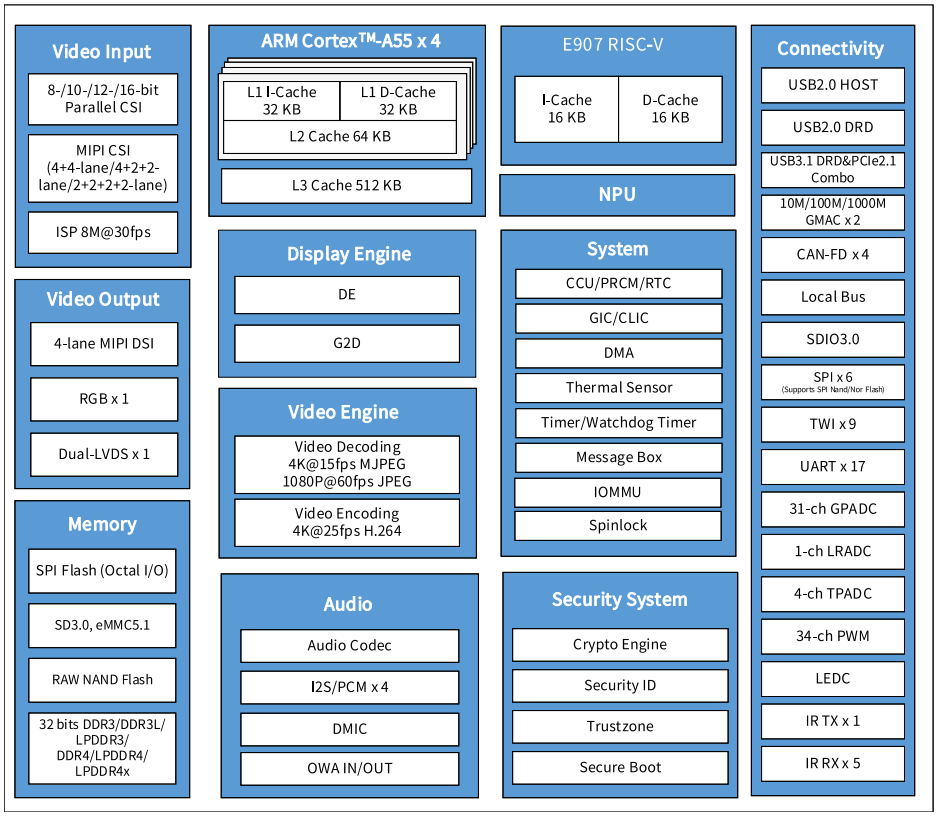
  Support 1T1R dual Antenna

- **Power unit**

  - PMU AXP717D/AXP323 on board
  - 3.4 ~ 5.5V Power input up to 3A current
  - 3.3V max 1000mA output
  - AXP717D BLDO3/4 and CLDO4 output
  - AXP323 ALDO1 and DLDO1 output
  - Very low RTC consume current, less 5uA at 3V button Cell.

1.3 PicoT536 Block Diagram

1.3.1 T536 Block Diagram



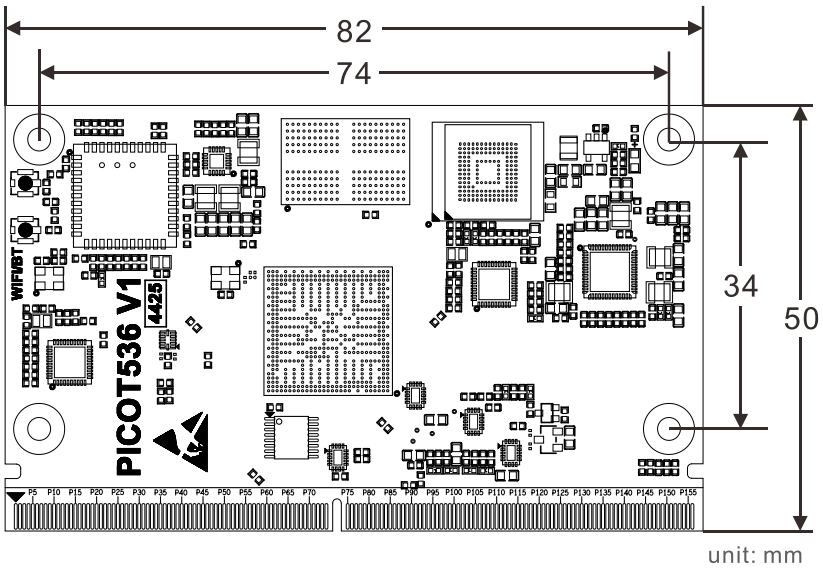
1.3.2 Development board (EMT536) Block Diagram

1.4 PICOT536 specifications

Feature	Specifications
CPU	Quad-core Cortex-A55
DDR	2GB LPDDR4/4x (up to 8GB)
eMMC FLASH	8GB (up to 64GB)
Power	DC 3.4 ~ 5.5V
WIFI/BT	On Board
MIPI DSI	1-CH
LVDS	2-CH or Dual-LVDS
I2S	3-CH
DVP	1-CH

MIPI CSI	4-CH 2Lane or 2-CH 4lane
PCIE/USB3.0	1-CH (can change to USB3.0 HOST)
HDMI out	1-CH (option DSI to HDMI)
LBC	Up to 32bit
USB	1 x USB2.0 OTG + 4 x USB2.0 HOST
Ethernet	2-CH 1 GB PHY
I2C	7-CH
SPI	5-CH
CAN FD	4-CH
UART	15-CH
PWM	30-CH
ADC IN	29-CH
Board Dimension	82 x 50mm

1.5 PICOT536 PCB Dimension



1.6 PICOT536 Pin Definition

Pin	Signal	Description or functions	GPIO serial	IO Voltage
P1	PA0/GPADC0-0/PA-EINT0	GPADC0_0 max 1.8V input	PA0	3.3V/1.8V
P2	GND	Ground		0V
P3	MCSIC-CKP/LBUS-LD17	TWI4_SDA/UART5_RX/SPI3_MISO/NCSI_D13	PK17	3.3V/0.5V
P4	MCSIC-CKN/LBUS-LD16	TWI4_SCK/UART5_TX/SPI3_MOSI/NCSI_D12	PK16	3.3V/0.5V
P5	MCSID-CKP/LBUS-LD23	TWI3_SDA/PWM0_7/CAN3_RX0/NCSI_VSYNC	PK23	3.3V/0.5V
P6	MCSID-CKN/LBUS-LD22	TWI3_SCK/PWM0_6/CAN3_TX0/NCSI_HSYNC	PK22	3.3V/0.5V
P7	MCSIC-D0P/LBUS-LD13	TWI1_SDA/UART7_RX/NCSI_D9	PK13	3.3V/0.5V
P8	MCSIC-D0N/LBUS-LD12	TWI1_SCK/UART7_TX/NCSI_D8	PK12	3.3V/0.5V
P9	GND	Ground		0V
P10	MCSIC-D1P/LBUS-LD15	UART7_CTS/UART5_CTS/SPI3_CLK/NCSI_D11	PK15	3.3V/0.5V
P11	MCSIC-D1N/LBUS-LD14	UART7_CTS/UART5_CTS/SPI3_CLK/NCSI_D11	PK14	3.3V/0.5V
P12	GND	Ground		0V
P13	MCSID-D0P/LBUS-LD19	TWI2_SCK/UART6_RX/SPI3_HOLD/NCSI_D15	PK19	3.3V/0.5V
P14	MCSID-D0N/LBUS-LD18	MCSI0_MCLK/UART6_TX/SPI3_WP/NCSI_D14	PK18	3.3V/0.5V
P15	GND	Ground		0V
P16	MCSID-D1P/LBUS-LD21	MCSI1_MCLK/UART6_CTS/NCSI_MCLK	PK21	3.3V/0.5V
P17	MCSID-D1N/LBUS-LD20	TWI2_SDA/UART6_RTS/NCSI_PCLK	PK20	3.3V/0.5V
P18	GND	Ground		0V
P19	EPHY0-MDI3-			0.5V
P20	EPHY0-MDI3+			0.5V
P21	EPHY0-LED1/CFG-	Link+ 100M		3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	LDO0			
P22	EPHY0-LED2/CFG-LDO1	Link+ 1000M		3.3V
P23	EPHY0-MDI2-			0.5V
P24	EPHY0-MDI2+			0.5V
P25	EPHY0-LED0/CFG-EXT	Link ACT -		3.3V
P26	EPHY0-MDI1-			0.5V
P27	EPHY0-MDI1+			0.5V
P28	GND	Ground		0V
P29	EPHY0-MDI0-			0.5V
P30	EPHY0-MDI0+			0.5V
P31	NC			
P32	GND	Ground		0V
P33	UART6-CTS/SPI2-MOSI/CAN2-TX0/PI8	I2S0_BCLK/PWM2_2	PI8	3.3V
P34	SDC0-CMD	I2S3_LRCK/JTAG_DO/SPI4_CS0/RJTAG_D0	PF3	3.3V/1.8V
P35	SDC0-DET	I2S3_MCLK	PF6	3.3V
P36	SDC0-CLK	I2S3_DIN2/I2S3_DOUT2/UART0_TX/SPI4_CLK	PF2	3.3V/1.8V
P37	UART6-RTS/SPI2-MISO/CAN2-RX0/PI9	I2S0_LRCK/PWM2_3/IR_TX	PI9	3.3V
P38	GND	Ground		0V
P39	SDC0-D0	I2S3_DOUT0/I2S3_DIN1/JTAG_DI/RJTAG_DI	PF1	3.3V/1.8V
P40	SDC0-D1	I2S3_DIN0/I2S3_DOUT1/JTAG_MS/RJTAG_MS	PF0	3.3V/1.8V
P41	SDC0-D2	I2S3_BCLK/SPI4_MISO/JTAG_CK/RJTAG_CK	PF5	3.3V/1.8V
P42	SDC0-D3	UART0_RX/I2S3_DIN3/I2S3_DOUT3/SPI4_MOSI	PF4	3.3V/1.8V
P43	PB11/TWI5-SCK/UART7-RTS/SPI1-CS0/PWM0-2	UART8_RI	PB11	3.3V
P44	PB12/TWI5-SDA/UART7-CTS/SPI1-CLK/PWM0-3		PB12	3.3V
P45	PB14/TWI4-SDA/UART7-RX/SPI1-MISO/PWM0-5	IR_RX3	PB14	3.3V
P46	PB13/TWI4-SCK/UART7-TX/SPI1-	IR_RX2	PB13	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	MOSI/PWM0-4			
P47	GND	Ground		0V
P48	GPADC1-7	Can NC this pin		1.8V
P49	GPADC1-8	Can NC this pin		1.8V
P50	GND	Ground		0V
P51	GPADC1-9	Can NC this pin		1.8V
P52	GPADC2-0	Can NC this pin		1.8V
P53	GND	Ground		0V
P54	PC3/SPI0-CS0/SPIF-CS0		PC3	3.3V
P55	PC7/SPI0-CS1		PC7	3.3V
P56	PC12/SPI0-CLK	Ground		0V
P57	PC4/SPI0-MISO/SPIF-MISO		PC4	3.3V
P58	PC2/SPI0-MOSI/SPIF-MOSI		PC2	3.3V
P59	GND	Ground		0V
P60	USB0-DP			0.5V
P61	USB0-DM			0.5V
P62	USB0-DRVVBUS	Ground		0V
P63	USB0_VBUS	S_IR_RX/S_UART0_RX/S_SPI0_CLK	PL11 (Note1)	5V/3.3V
P64	USB0-ID	S_PWM0_0/S_UART0_TX/S_SPI0_CS0	PL10	3.3V
P65	HUB_USB_DP1			0.5V
P66	HUB_USB_DM1			0.5V
P67	USB1-DRVVBUS	S_PWM0_3/S_UART0_CTS/S_SPI0_MISO	PL13	3.3V
P68	GND	Ground		0V
P69	HUB_USB_DP2			0.5V
P70	HUB_USB_DM2			0.5V
P71	NC			
P72	VCC-3V3	IO 3.3V output Max: 1000mA		3.3V
P73	VCC-3V3	IO 3.3V output Max: 1000mA		3.3V
P74	NC			
P75	LBUS-LD29/DMIC-DATA0/PCIE-PERSTN/UART3-RX/SPI3-CLK/PH5	LEDC	PH5	3.3V
P76	NC			
P77	NC			
P78	PCIE21-	TWI3_SDA/DMIC_CLK/I2S0_	PI12	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	CLKREQn/PWM2-4/PI12	DIN3/I2S0_DOUT3		
P79	GND	Ground		0V
P80	GPADC2-9	Can NC this pin		1.8V
P81	GPADC3-0	Can NC this pin		1.8V
P82	GND	Ground		0V
P83	PCIE21-REFCLKP			0.5V
P84	PCIE21-REFCLKN			0.5V
P85	GND	Ground		0V
P86	PCIE-RX0-DP	Enable by PM3 = H	(Note3)	0.5V
P87	PCIE-RX0-DN	Enable by PM3 = H	(Note3)	0.5V
P88	GND	Ground		0V
P89	PCIE-TX0-DP	Enable by PM3 = H	(Note3)	0.5V
P90	PCIE-TX0-DN	Enable by PM3 = H	(Note3)	0.5V
P91	GND	Ground		0V
P92	HDMI_TX2P	DSI to HDMI	(Note2)	0.5V
P93	HDMI_TX2N	DSI to HDMI	(Note2)	0.5V
P94	GND	Ground		0V
P95	HDMI_TX1P	DSI to HDMI	(Note2)	0.5V
P96	HDMI_TX1N	DSI to HDMI	(Note2)	0.5V
P97	GND	Ground		0V
P98	HDMI_TX0P	DSI to HDMI	(Note2)	0.5V
P99	HDMI_TX0N	DSI to HDMI	(Note2)	0.5V
P100	GND	Ground		0V
P101	HDMI_TXCP	DSI to HDMI	(Note2)	0.5V
P102	HDMI_TXCN	DSI to HDMI	(Note2)	0.5V
P103	GND	Ground		0V
P104	HDMI_TX_HPD	DSI to HDMI	(Note2)	3.3V
P105	HDMI_TX_SCL	DSI to HDMI	(Note2)	3.3V
P106	HDMI_TX_SDA	DSI to HDMI	(Note2)	3.3V
P107	HDMI_TX_CEC	DSI to HDMI	(Note2)	3.3V
P108	LBUS-READY/SPI2-CS0/NCSI-D1/UART12-CTS/PE9		PE9	3.3V
P109	LBUS-ALE/SPI2-CLK/NCSI-D2/MCSI3-MCLK/PE10	PWM0_3	PE10	3.3V
P110	LBUS-BURST0/SPI2-MOSI/UART6-TX/NCSI-D3/PE11	TWI1_SCK/UART5_RTS	PE11	3.3V
P111	LBUS-BURST1/SPI2-MISO/UART6-RX/NCSI-D4/PE12	TWI1_SDA/UART5_CTS	PE12	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
P112	LBUS-INTR/CAN2-TX0/NCSI-D7/MCSI2-MCLK/PE15	PWM0_2	PE15	3.3V
P113	LBUS-LBE/PWM0-5/CSI1-XVS-FSYNC/PE17	TWI6_SDA/PWM0_5	PE17	3.3V
P114	PE-EINT5/LBUS-DP1	MCSI1_MCLK/LEDC/SPI3_HOLD	PE5	3.3V
P115	PD22/PWM0-1/UART2-RTS/TWI4-SCK/TWI0-SCK		PD22	3.3V
P116	PD23/PWM0-0/UART2-CTS/TWI4-SDA/TWI0-SDA		PD23	3.3V
P117	PA1/GPADC0-1/PA-EINT1	GPADC0_1 max 1.8V input	PA1	3.3V/1.8V
P118	UART6-TX/SPI2-CS0/PI6	PWM2_0/I2S0_MCLK/LEDC/CLK_FANOUT0	PI6	3.3V
P119	UART6-RX/SPI2-CLK/PI7	PWM2_1/I2S0_DIN2/I2S0_DOUT2/CLK_FANOUT1	PI7	3.3V
P120	GND	Ground		0V
P121	S-TWI1-SCK/PL8	PU 2.2K	PL8(Note4)	3.3V
P122	S-TWI1-SDA/PL9	PU 2.2K	PL9(Note4)	3.3V
P123	BOOT-SEL-ADC1-4	For boot type selected	N.C.	
P124	DDR-PARA-SEL-ADC1-6		N.C.	0V/1.8V
P125	DDR-PARA-SEL-ADC1-5		N.C.	0V/1.8V
P126	NC			
P127	AP-RESET	System reset key input		1.8V
P128	PWRON	Power key input		1.8V
P129	PB0/UART2-TX/SPI4-CS0/JTAG-MS	PWM0_6/RJTAG_MS	PB0	3.3V
P130	PB1/UART2-RX/SPI4-CLK/JTAG-CK	PWM0_7/RJTAG_CK	PB1	3.3V
P131	PB2/UART2-RTS/SPI4-MOSI/JTAG-DO	RJTAG_DO	PB2	3.3V
P132	PB3/UART2-CTS/SPI4-MISO/JTAG-DI	RJTAG_DI	PB3	3.3V
P133	GND	Ground		0V
P134	UART0-CPUX-TX	I2S2_DIN2/I2S2_DOUT2/TWI0_SCK/UART8_DSR	PB9	3.3V
P135	UART0-CPUX-RX	I2S2_DIN3/I2S2_DOUT3/TWI0_SDA/UART8_DTR/PWM0_1	PB10	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
P136	S-UART1-TX	S_IR_RX	PL4	3.3V
P137	S-UART1-RX		PL5	3.3V
P138	S-UART1-RTS		PL6	3.3V
P139	S-UART1-CTS		PL7	3.3V
P140	CPUS-TX	S_UART0_TX/S_IR_RX/S_PWM0_2	PL2	3.3V
P141	CPUS-RX	S_UART0_RX/S_PWM0_3	PL3	3.3V
P142	GND	Ground		0V
P143	I2S0-BCLK/CAN0-TX0/PI0		PI0	3.3V
P144	I2S0-LRCK/CAN0-RX0/PI1		PI1	3.3V
P145	I2S0-DIN0/CAN3-TX0/PI2	UART9_TX	PI2	3.3V
P146	I2S0-MCLK/CAN3-RX0/PI3	UART9_RX	PI3	3.3V
P147	VCC-5V-PMIC	System Power Input		3.4~5.5V
P148	VCC-5V-PMIC	System Power Input		3.4~5.5V
P149	VCC-5V-PMIC	System Power Input		3.4~5.5V
P150	VCC-5V-PMIC	System Power Input		3.4~5.5V
P151	VCC-5V-PMIC	System Power Input		3.4~5.5V
P152	VCC-5V-PMIC	System Power Input		3.4~5.5V
P153	VCC-5V-PMIC	System Power Input		3.4~5.5V
P154	VCC-5V-PMIC	System Power Input		3.4~5.5V
P155	VCC-5V-PMIC	System Power Input		3.4~5.5V
P156	VCC-5V-PMIC	System Power Input		3.4~5.5V
S1	TWI2-SCK/LBUS-CS1	UART4_TX/SPI3_CLK	PE1	3.3V
S2	TWI2-SDA/LBUS-CS2	UART4_RX/SPI3_MOSI	PE2	3.3V
S3	GND	Ground		0V
S4	LRADC	Low rate ADC input		1.8V
S5	TWI3-SCK/LBUS-CS3	UART4_RTS/CSI0_XHS/SPI3_MISO	PE3	3.3V
S6	MCSI0-MCLK/LBUS-CS0	SPI3_CS0	PE0	3.3V
S7	TWI3-SDA/LBUS-DP0	UART4_CTS/CSI1_XHS/SPI3_WP	PE4	3.3V
S8	MCSIA-CKP/LBUS-LD5	UART12_RX/NCSI1_D1/SPI2_HOLD	PK5	3.3V/0.5V
S9	MCSIA-CKN/LBUS-LD4	UART12_TX/NCSI1_D0/SPI2_WP	PK4	3.3V/0.5V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
S10	GND	Ground		0V
S11	MCSIA-D0P/LBUS-LD1	UART11_RX/SPI2_CLK	PK1	3.3V/0.5V
S12	MCSIA-D0N/LBUS-LD0	UART11_TX/SPI2_CS0	PK0	3.3V/0.5V
S13	GND	Ground		0V
S14	MCSIA-D1P/LBUS-LD3	UART11_CTS/TWI2_SDA/SPI2_MISO	PK3	3.3V/0.5V
S15	MCSIA-D1N/LBUS-LD2	UART11_RTS/TWI2_SCK/SPI2_MOSI	PK2	3.3V/0.5V
S16	GND	Ground		0V
S17	EPHY1-MDI0+			0.5V
S18	EPHY1-MDI0+			0.5V
S19	EPHY1-LED1/CFG-LDO0	Link+ 100M		3.3V
S20	EPHY1-MDI1+			0.5V
S21	EPHY1-MDI1-			0.5V
S22	EPHY1-LED2/CFG-LDO1	Link+ 1000M		3.3V
S23	EPHY1-MDI2+			0.5V
S24	EPHY1-MDI2-			0.5V
S25	GND	Ground		0V
S26	EPHY1-MDI3+			0.5V
S27	EPHY1-MDI3-			0.5V
S28	GND	Ground		0V
S29	TP-X1	RES Touch Panel X1 input	GPADC1_0	1.8V
S30	TP-X2	RES Touch Panel X2 input	GPADC1_1	1.8V
S31	EPHY1-LED0/CFG-EXT	Link ACT -		3.3V
S32	TP-Y1	RES Touch Panel Y1 input	GPADC1_2	1.8V
S33	TP-Y2	RES Touch Panel Y2 input	GPADC1_3	1.8V
S34	GND	Ground		0V
S35	LINEOUTP			0V
S36	LINEOUTN			0V
S37	NC			
S38	LCD-D1/I2S3-MCLK/PWM2-7/SPI3-HOLD/PH9	TWI3_SDA	PH9	3.3V
S39	LCD-D9/I2S3-LRCK/PWM2-9/CAN3-RX0/PH11	IR_RX3	PH11	3.3V
S40	LCD-D16/I2S3-DOUT0/I2S3-DIN1/UART11-TX/PH12	IR_RX1/CAN2_TX0	PH12	3.3V
S41	LCD-D17/I2S3-	IR_RX2/CAN2_RX0	PH13	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	DOUT1/I2S3-DIN0/UART11-RX/PH13			
S42	LCD-D8/I2S3-BCLK/PWM2-8/CAN3-TX0/PH10		PH10	3.3V
S43	UART4-RTS/IR-RX2/PI15	I2S3_DIN0/TWI2_SCK/DMIC_DATA2/CAN0_TX0	PI15	3.3V
S44	UART4-CTS/IR-RX3/PI16	I2S3_MCLK/TWI2_SDA/DMIC_DATA3/CAN0_RX0	PI16	3.3V
S45	LBUS-LD28/DMIC-CLK/UART3-TX/SPI3-CS0/PH4	PWM1_4	PH4	3.3V
S46	LCD-D0/DMIC-DATA3/PWM2-6/SPI3-WP/PH8	OWA_IN/TWI3_SCK	PH8	3.3V
S47	GND	Ground		0V
S48	LBUS-LD30/DMIC-DATA1/PCIE-WAKEN/SPI3-MOSI/TWI6-SCK/PH6	UART3_RTS	PH6	3.3V
S49	LBUS-LD31/DMIC-DATA2/PCIE-CLKREQN/SPI3-MISO/TWI6-SDA/PH7	UART3_CTS	PH7	3.3V
S50	PB6/PWM1-0/I2S2-LRCK/IR-TX	UART8_RTS	PB6	3.3V
S51	PB7/I2S2-DOUT0/I2S2-DIN1/CAN1-TX0	UART8_CTS/OWA_IN/PWM1_1	PB7	3.3V
S52	PB8/I2S2-DIN0/I2S2-DOUT1/CAN1-RX0	UART8_DCD/OWA_OUT/PWM0_0	PB8	3.3V
S53	PB5/TWI1-SDA/I2S2-BCLK/UART8-RX	IR_RX1/PWM0_9	PB5	3.3V
S54	PB4/TWI1-SCK/I2S2-MCLK/UART8-TX	IR_RX1/PWM0_9	PB4	3.3V
S55	LBUS-LD24/TWI0-SCK/PWM2-4/UART1-TX/CAN1-TX0/PH0		PH0	3.3V
S56	LBUS-LD25/TWI0-SDA/PWM2-5/UART1-RX/CAN1-RX0/PH1		PH1	3.3V
S57	LBUS-LD26/TWI1-SCK/CLK-FANOUT0/UART1-		PH2	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	RTS/PH2			
S58	LBUS-LD27/TWI1-SDA/CLK-FANOUT1/UART1-CTS/PH3		PH3	3.3V
S59	HUB_USB_DP4			0.5V
S60	HUB_USB_DM4			0.5V
S61	GND	Ground		0V
S62	GPADC2-1	Can NC this pin		1.8V
S63	GPADC2-2	Can NC this pin		1.8V
S64	GND	Ground		0V
S65	GPADC2-3	Can NC this pin		1.8V
S66	GPADC2-4	Can NC this pin		1.8V
S67	GND	Ground		0V
S68	HUB_USB_DP3			0.5V
S69	HUB_USB_DM3			0.5V
S70	GND	Ground		0V
S71	USB2-U3-TXP	Enabled by PM3 = L	(Note 3)	0.5V
S72	USB2-U3-TXN	Enabled by PM3 = L	(Note 3)	0.5V
S73	GND	Ground		0V
S74	USB2-U3-RXP	Enabled by PM3 = L	(Note 3)	0.5V
S75	USB2-U3-RXN	Enabled by PM3 = L	(Note 3)	0.5V
S76	NC			
S77	NC			
S78	GPADC2-5	Can NC this pin		1.8V
S79	GPADC2-6	Can NC this pin		1.8V
S80	GND	Ground		0V
S81	GPADC2-7	Can NC this pin		1.8V
S82	GPADC2-8	Can NC this pin		1.8V
S83	GND	Ground		0V
S84	NC			
S85	NC			

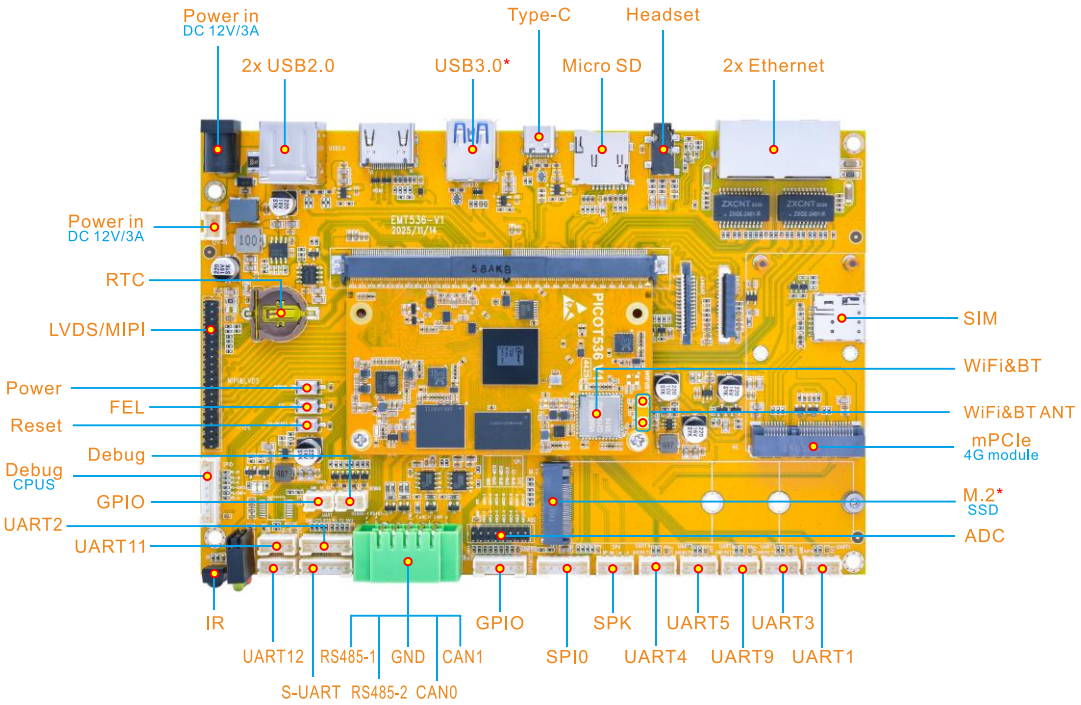
Pin	Signal	Description or functions	GPIO serial	IO Voltage
S86	GND	Ground		0V
S87	NC			
S88	NC			
S89	GND	Ground		0V
S90	NC			
S91	NC			
S92	GND	Ground		0V
S93	MCSIB-D0P/LBUS-LD7	UART12_CTS/NCSI_D3	PK7	3.3V/0.5V
S94	MCSIB-D0N/LBUS-LD6	UART12_RTS/NCSI_D2	PK6	3.3V/0.5V
S95	GND	Ground		0V
S96	MCSIB-CKP/LBUS-LD11	TWI1_SDA/CAN0_RX0/NCSI_D7	PK11	3.3V/0.5V
S97	MCSIB-CKN/LBUS-LD10	TWI1_SCK/CAN0_TX0/NCSI_D6	PK10	3.3V/0.5V
S98	GND	Ground		0V
S99	MCSIB-D1P/LBUS-LD9	MCSI3_MCLK/CAN1_RX0//NCSI_D5	PK9	3.3V/0.5V
S100	MCSIB-D1N/LBUS-LD8	CAN1_TX0//NCSI_D4	PK8	3.3V/0.5V
S101	GND	Ground		0V
S102	AXP323-ALDO1	Output max: 300mA		0.5~3.4V
S103	AXP323-DLDO1	Output max: 500mA		0.5~3.4V
S104	CLDO4	Output max: 500mA		0.5~3.4V
S105	BLDO4	Output max: 400mA		0.5~3.4V
S106	BLDO3	Output max: 500mA		0.5~3.4V
S107	LBUS-WR/NCSI-D0/UART12-RTS/PE8	CLK_FANOUT1	PE8	3.3V
S108	LVDS1-CKP	LCD_D22/CAN2_TX0/PWM1_6/UART3_RTS/UART8_DTR	PD16	3.3V/0.5V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
S109	LVDS1-CKN	LCD_D23/CAN2_RX0/PWM1_7/UART3_CTS/UART8_RI	PD17	3.3V/0.5V
S110	GND	Ground		0V
S111	LVDS1-D0P	LCD_D14/TWI6_SCK/PWM1_0/SPI1_CS0/DBI_CSX/UART8_TX	PD10	3.3V/0.5V
S112	LVDS1-D0N	LCD_D15/TWI6_SDA/PWM1_1/SPI1_CLK/DBI_SCLK/UART8_RX	PD11	3.3V/0.5V
S113	GND	Ground		0V
S114	LVDS1-D1P	LCD_D18/PWM1_2/SPI1_MOSI/DBI_SD0/UART8_RTS	PD12	3.3V/0.5V
S115	LVDS1-D1N	LCD_D15/PWM1_3/SPI1_MISO/DBI_SDI/DBI_TE/DBI_DCX/UART8_CTS	PD13	3.3V/0.5V
S116	LBUS-DRQ/CAN2-RX0/CSI0-XVS-FSYNC/PE16	TWI6_SCK/TWI0_SCK	PE16	3.3V
S117	LVDS1-D2P	LCD_D20/PWM1_4/SPI1_HOLD/DBI_DCX/DBI_WRX/UART8_DCD	PD14	3.3V/0.5V
S118	LVDS1-D2N	LCD_D21/PWM1_5/SPI1_WP/DBI_TE/UART3_RX/UART8_DSR	PD15	3.3V/0.5V
S119	GND	Ground		0V
S120	LVDS1-D3P	LCD_CLK/PWM1_8/TWI6_SCK/CAN0_TX0	PD18	3.3V/0.5V
S121	LVDS1-D3N	LCD_DE/PWM1_9/TWI6_SDA/CAN0_RX0	PD19	3.3V/0.5V
S122	UART4-RX/PWM2-6/PI14	DMIC_DATA1/IR_RX1/I2S_LRCK	PI14	3.3V
S123	LBUS-DP2/UART12-TX/PE6	TWI2_SCK/TCON_FSYNC0	PE6	3.3V
S124	GND	Ground		0V
S125	LVDS0-D0P	LCD_D2/PWM0_0/UART9_TX/DSI_D0P	PD0 (Note5)	3.3V/0.5V
S126	LVDS0-D0N	LCD_D3/PWM0_1/UART9_RX/DSI_D0N	PD1 (Note5)	3.3V/0.5V
S127	LBUS-DP3/UART12-	TWI2_SDA/CLK_FANOUT0	PE7	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
	RX/PE7			
S128	LVDS0-D1P	LCD_D4/PWM0_2/UART9_RTS/DSI_D1P	PD2 (Note5)	3.3V/0.5V
S129	LVDS0-D1N	LCD_D5/PWM0_3/UART9_CTS/DSI_D1N	PD3 (Note5)	3.3V/0.5V
S130	GND	Ground		0V
S131	LVDS0-D2P	LCD_D6/PWM0_4/UART10_TX/DSI_CKP	PD4 (Note5)	3.3V/0.5V
S132	LVDS0-D2N	LCD_D7/PWM0_5/UART10_RX/DSI_CKN	PD5 (Note5)	3.3V/0.5V
S133	LBUS-LCLK/SPI2-HOLD/UART5-RX/NCSI-D6/PE14	TWI4_SDA/UART6_CTS	PE14	3.3V
S134	LVDS0-CKP	LCD_D10/PWM0_6/UART10_RTS/DSI_D2P	PD6 (Note5)	3.3V/0.5V
S135	LVDS0-CKN	LCD_D11/PWM0_7/UART10_CTS/DSI_D2N	PD7 (Note5)	3.3V/0.5V
S136	GND	Ground		0V
S137	LVDS0-D3P	LCD_D12/PWM0_8/CAN1_TX0/DSI_D3P	PD8 (Note5)	3.3V/0.5V
S138	LVDS0-D3N	LCD_D13/PWM0_9/CAN1_RX0/DSI_D3N	PD9 (Note5)	3.3V/0.5V
S139	PD20//PWM0-2/UART2-TX/TWI5-SCK	LCD_HSYNC	PD20	3.3V
S140	PD21/PWM0-3/UART2-RX/TWI5-SDA	LCD_VSYNC/TWI0_SCK	PD20	3.3V
S141	UART4-TX/PWM2-5/PI13	DMIC_DATA0/IR_RX0/I2S3_BCLK	PI13	3.3V
S142	LBUS-BURST2/SPI2-WP/UART5-TX/NCSI-D5/PE13	TWI4_SCK/UART6_RTS	PE13	3.3V
S143	GND	Ground		0V
S144	NC			
S145	PWM1-5/I2S3-DOUT2/I2S3-DIN2//IR-TX/PH14		PH14	3.3V
S146	PCIE-WAKEN/SPI2-HOLD/PI11	TWI3_SCK/PWM2_8/I2S0_DIN0/I2S)_DOUT1	PI11	3.3V

Pin	Signal	Description or functions	GPIO serial	IO Voltage
S147	VRTC	RTC button Cell Power input		3.0V
S148	PA-EINT9	GPADC0_9 max 1.8V input	PA9	3.3V/1.8V
S149	IR-RX0/I2S3-DOUT3/I2S3-DIN3/PH15	LEDC	PH15	3.3V
S150	NC			
S151	CHARGING	UP 10K to VCC-PI		3.3V
S152	CHARGER PRSNT	UP 10K to VCC-PI		3.3V
S153	CHARGER STBY	UP 10K to VCC-PI		3.3V
S154	EX_PWR_EN	Ext-power enable output		1.8V
S155	FEL	Recover mode key input		3.3V
S156	PA2/GPADC0-2/PA-EINT2	GPADC0_2 max 1.8V input	PA2	3.3V/1.8V
S157	TEST	UP 10K to VCC-PH		3.3V
S158	GND	Ground		0V

1.7 Development Kit (EMT536)

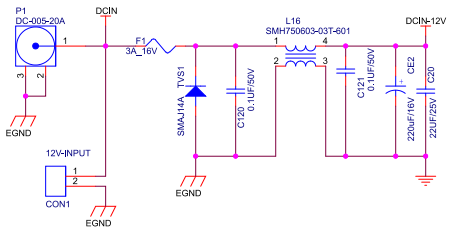


2 Hardware Design Guide

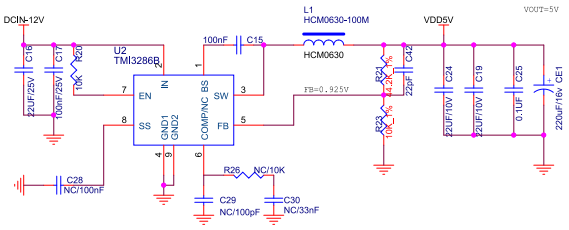
2.1 Peripheral Circuit Reference

2.1.1 External Power

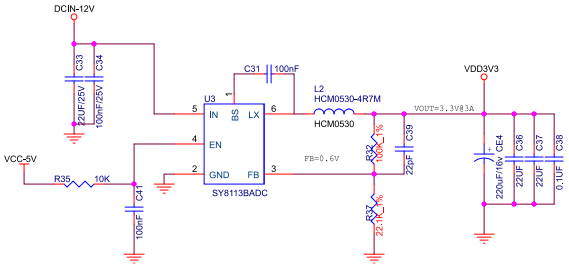
DCIN 12V@3A



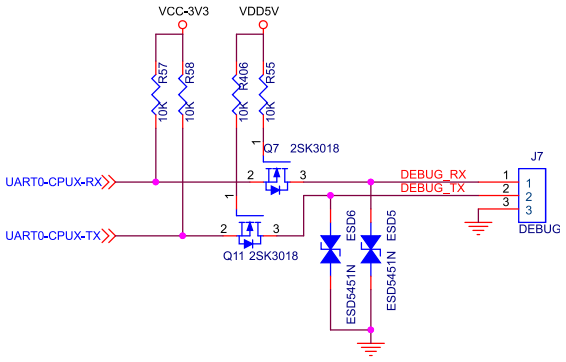
MAIN 5V



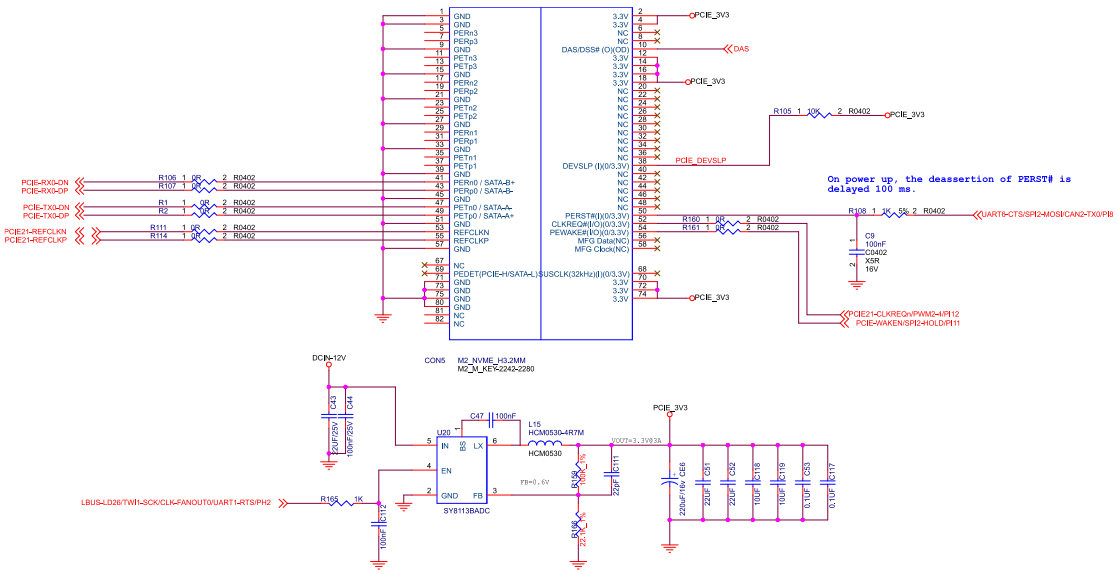
MAIN 3V3



2.1.2 Debug Circuit



2.1.3 PCIE Circuit



2.2 Motherboard Connector



MXM 314P (AS0B826-S55B-7H)

3 Product Electrical Characteristics

3.1 Dissipation and Temperature

Symbol	Parameter	Min	Typ	Max	Unit
VCC_SYS	System IO Voltage	3.4V	5	5.5	V
Isys_in	VCC_SYS input Current		2600		mA

Symbol	Parameter	Min	Typ	Max	Unit
VCC_RTC	RTC Voltage	1.8	3	3.4	V
Irtc	RTC input Current		2	5	uA
I3v3_out	VCC_3V3 output Current			1000	mA
AXP323-ALDO1_out	Voltage	0.5		3.4	V
AXP323-ALDO1_out	Current			300	m
AXP323-DLDO1_out	Voltage	0.5		3.4	V
AXP323-DLDO1_out	Current			500	m
AXP717-CLDO4_out	Voltage	0.5		3.4	V
AXP717-CLDO4_out	Current			500	m
AXP717-BLDO4_out	Voltage	0.5		3.4	V
AXP717-BLDO4_out	Current			400	m
AXP717-BLDO3_out	Voltage	0.5		3.4	V
AXP717-BLDO3_out	Current			500	m
Ta	Operating Temperature	0	NA	70	°C
Tstg	Storage Temperature	-40	NA	85	°C