CPU POWER & OSC&RESET&BOOT

U2B STM32F407ZGT6

VDDA OSC_IN
VDD OSC_OUT nRESET
VDD BOOT0 BOOT0
VCAP_1
VCAP_2
VSSA
VSS
PDR_ON
Vbat
VREF+

X1 8MHz C6 20pF C7 20pF
RESET
R10 10kΩ
C12 100nF
C10 2.2uF C11 2.2uF
C14 100nF C13 22uF
AGND
CBM160808U121T CBM160808U121T
C15 100nF C16 100nF
3V3 A3V3 Vref
C18 100nF C19 100nF C20 100nF C21 100nF C22 100nF
BOOT0 R9 10kΩ

CPU

U2A STM32F407ZGT6

PA00 ... PA15, PB00 ... PB15, PC00 ... PC15, PD00 ... PD15, PE00 ... PE15, PF00 ... PF15, PG00 ... PG15

PA2_USART2_TX PA3_USART2_RX PA4_USART2_CK
PA5_SPI1_SCK PA6_SPI1_MISO PA7_SPI1_MOSI
PA8_USART1_CX PA9_USART1_TX PA10_USART1_RX
PA11_CAN1_RX PA12_CAN1_TX
PA15_SPI1_NSS
SWDIO R19 22Ω SWCLK R20 22Ω SWO R21 22Ω
PB4_TIM3_CH1 PB5_TIM3_CH2 PB6_TIM4_CH1 PB7_TIM4_CH2
PB8_I2C1_SCL PB9_I2C1_SDA
PB10_USART3_TX PB11_USART3_RX
PB12_SPI2_NSS PB13_SPI2_SCK PB15_LCD_BLK
PC1_ADC PC2_SPI2_MISO PC3_SPI2_MOSI
PC4_KEY0 PC5_KEY1
PC6_USART6_TX PC7_USART6_RX PC8_485_CTR

FSMC_D2 ... FSMC_D15, FSMC_A0 ... FSMC_A18
FSMC_NOE FSMC_NWE FSMC_NE1 FSMC_NBL0 FSMC_NBL1
PF6_LED0 PF7_LED1 PF8_LED2 PF9_LED3 PF10
FSMC_A6 ... FSMC_A15
FSMC_NE4

GBLC08C-N D26 D28 D27
32.768kHz
C8 12.5pF C9 12.5pF
GND

SRAM

U3 XM8A51216

PD13 FSMC_A18 28 A18
PD12 FSMC_A10 23 A10
PD11 FSMC_A5 18 A5
PG5 FSMC_A6 19 A6
PG4 FSMC_A7 20 A7
PG3 FSMC_A8 21 A8
PG2 FSMC_A9 22 A9
PG1 FSMC_A11 24 A11
PG0 FSMC_A15 25 A12
PF15 FSMC_A14 26 A14
PF14 FSMC_A13 27 A14
PF13 FSMC_A12 42 A12
PF12 FSMC_A16 43 A16
PF5 FSMC_A4 1 A15
PF4 FSMC_A4 1
PF3 FSMC_A3 2 A1
PF2 FSMC_A2 3
PF1 FSMC_A1 4
PF0 FSMC_A0 5 A3 A4

I/O15 38 FSMC_D15 PD10
I/O14 37 FSMC_D14 PD9
I/O13 36 FSMC_D13 PD8
I/O12 35 FSMC_D12 PE15
I/O11 32 FSMC_D11 PE14
I/O10 31 FSMC_D10 PE13
I/O9 30 FSMC_D9 PE12
I/O8 29 FSMC_D8 PE11
I/O7 16 FSMC_D7 PE10
I/O6 15 FSMC_D6 PE9
I/O5 13 FSMC_D5 PE8
I/O4 12 FSMC_D4 PE7
I/O3 10 FSMC_D3 PD1
I/O2 9 FSMC_D2 PD0
I/O1 8 FSMC_D1 PD15
I/O0 7 FSMC_D0 PD14

PD7 FSMC_NE1 CE
PD5 FSMC_NWE 17 WE VDD
PD4 FSMC_NOE 41 OE VDD
PE0 FSMC_NBL0 39 BLE VSS
PE1 FSMC_NBL1 40 BHE VSS

R3 10kΩ
C1 100nF C2 100nF
GND

LCD

CN10 B-3000S24P-0110

FSMC_A6 1 2 FSMC_NE4
FSMC_NOE 3 4 FSMC_NWE
FSMC_D0 5 6 RESET
FSMC_D2 7 8 FSMC_D1
FSMC_D4 9 10 FSMC_D3
FSMC_D6 11 12 FSMC_D5
FSMC_D8 13 14 FSMC_D7
FSMC_D10 15 16 FSMC_D9
FSMC_D12 17 18 FSMC_D11
FSMC_D14 19 20 FSMC_D13
21 22 FSMC_D15
23 24 PB15_LCD_BLK
3V3 GND

KEY&LED

R15 4.7K R0603±0.1%
PC1_ADC R23 10K R0603
100nF C0603 C49
XH2.54-1*2P直插
XH2.56-1*6P直插
PE2 PE3 PE6 PF10
CN11 XH2.54-1*8P
PC4_KEY0 PB7_TIM4_CH2 PB6_TIM4_CH1 PC5_KEY1 PB5_TIM3_CH2 PB4_TIM3_CH1
PF6_LED0 R43 10kΩ
PF7_LED1 R45 10kΩ
PF8_LED2 R47 10kΩ
PF9_LED3 R48 10kΩ
LED2 LED3 LED4 LED5
3V3 GND

I/O

3V3 U12 6V 350mA D6 GBLC08C-N C40 22uF
PA5_SPI1_SCK R26 22Ω
PA6_SPI1_MISO R30 22Ω
PA7_SPI1_MOSI R35 22Ω
PA15_SPI1_NSS R38 22Ω
GBLC08C-N D17 D18 D19
CN5

3V3 U13 6V 350mA D8 C44 22uF GBLC08C-N
PA10_USART1_RX R27 22Ω
PA9_USART1_TX R31 22Ω
PA8_USART1_CX R36 22Ω
GBLC08C-N D10 D11 D12
CN4

5V U18 6V 350mA D21 C50 22uF GBLC08C-N
PB8_I2C1_SCL R51 22Ω
PB9_I2C1_SDA R53 22Ω
GBLC08C-N D24 D25
CN8

PB8_I2C1_SCL R54 10kΩ
PB9_I2C1_SDA R55 10kΩ 3V3

3V3 U14 6V 350mA D9 C45 22uF GBLC08C-N
PA3_USART2_RX R28 22Ω
PA2_USART2_TX R32 22Ω
PA4_USART2_CK R37 22Ω
GBLC08C-N D13 D14 D15
CN6

PA10_USART1_RX R39 10kΩ
PA9_USART1_TX R40 10kΩ
PA8_USART1_CX R41 10kΩ
PA3_USART2_RX R42 10kΩ
PA2_USART2_TX R46 10kΩ
PA4_USART2_CK R49 10kΩ
3V3 GND

This is a schematic/engineering diagram page. It contains circuit schematic content organized into functional blocks.

POWER (main section)

Power supply section with four TLV1117LV33DCYR regulators (U15, U16, U4, U17), each with:
- 3V3 outputs
- 5V inputs
- C25, C27, C24, C28 (1µF C0603)
- 22µF 0603 capacitors
- C34, C35, C29, C42 capacitors
- C43, C47, C41, C48 (100nF 0603)
- GND

Interconnection resistors: R8 (0R R0603), R7 (0R R0603), R13 (0R R0603)

DC input section:
- DC1 connector
- F15 (1A 24V)
- D7 (SS24)
- D3 (SMBJ24CA)
- C3 (100uF ± 20% 35V)
- C4, C5, C17 (100nF ± 10% 50V / 22uF ± 10% 25V)
- U1 (TPS54302DDCR) with pins VIN, SW, GND, FB, EN, BOOT
- R2 (510kΩ), R5 (100kΩ)
- C53 (100nF ± 10% 50V)
- L3 (YSPI1050-100M/10µH/6A)
- C30, C31, C32
- C33 (75pF ± 10% 50V)
- R4 (100kΩ), R6 (13.3kΩ)
- 100nF ± 10% 50V, 22uF ± 10% 25V
- AGND

5V LED indicator:
- R1 (10K R0603)
- LED1 (LED 0805)
- GND

SPI FLASH

U22 (W25Q128JVSIQ):
- CS#, DO, IO2, GND, VCC, IO3, CLK, DI
- C23 (100nF ± 10% 50V)
- R56 (10kΩ), R57 (10kΩ), R58 (10kΩ)
- 3V3, GND
- PB12_SPI2_NSS, PC2_SPI2_MISO, PB13_SPI2_SCK, PC3_SPI2_MOSI
- Connector CN7 (XH2.56-1*6P直插):
  - PC3_SPI2_MOSI
  - PB12_SPI2_NSS
  - PB13_SPI2_SCK
  - PC2_SPI2_MISO

CAN&RS485

U5 (SP3485EN-L/TR):
- RO, RE#, DE, DI, VCC, B, A, GND
- PC7_USART6_RX, PC8_485_CTR, PC6_USART6_TX
- R11 (120Ω)
- L7, L8 (6V 350mA)
- 3V3
- C38 (100nF ± 10% 50V)
- D4 (SZNUP2105LT1G)
- Connector CN1 (XH2.54-1*3P)

U3 (TJA1050T/CM 118):
- TXD, GND, VCC, RXD, S, CANH, CANL, VREF
- PA12_CAN1_TX, PA11_CAN1_RX
- 5V, GND
- L10, L11 (6V 350mA)
- R16 (60Ω), R50 (60Ω)
- C40 (100nF ± 10% 50V), C26 (10nF ± 10% 50V)
- D5 (SZNUP2105LT1G)
- Connector CN2

WiFi&Bluetooth

U6 (ESP32-C3-MINI-1-H4):
- Pins 37-53, pins 1-24, and various NC, GND, IO pins
- C36, C37 (22uF ± 10% 25V / 100nF)
- R12 (10kΩ), R14 (10kΩ)
- IO2, IO3, EN
- C39 (100nF ± 10% 50V)
- TXD0, RXD0, IO19, IO18
- R17 (10kΩ), BOOT
- R18 (22Ω), R22 (22Ω)
- PB10_USART3_TX, PB11_USART3_RX
- 3V3, GND

Connectors P2 and P1:
- P2: GND, 3V3, IO2, IO3, EN, IO0, IO11, 5V
- P1: TXD0, RXD0, GND, IO9, IO8, IO7, IO6, IO5, IO4, IO18, IO19, BOOT
- GND

Parameter Set

Comment	Description	Designator	Footprint	LibRef	Quantity
CC0603KRX7R9BB104		C1, C2, C4, C5, C12, C14, C15, C16, C18, C19, C20, C21, C22, C23, C26, C30, C33, C37, C38, C39, C40, C53	C0603	CC0603KRX7R9BB104	22
VES101M1VTR-0607		C3	CE 6.3*7.7	VES101M1VTR-0607	1
CC0603JRNPO9BN200		C6, C7, C8, C9	C0603	CC0603JRNPO9BN200	4
CL10A225KA8NNNC		C10, C11	C0603	CL10A225KA8NNNC	2
CC0603KRX7R9BB104		C13, C17, C31, C32, C36, C44, C45, C46, C50	C1210	CC0603KRX7R9BB104	9
1µF C0603	X7R/X5R，额定电压>=25,精度=10%	C24, C25, C27, C28	C0603	C0805	4
22µF 0603	X7R/X5R，额定电压>=25,精度=10%	C29, C34, C35, C42	C0603	C0805	4
100nF 0603	X7R/X5R，额定电压>=25,精度=10%	C41, C43, C47, C48	C0603	C0805	4
100nF C0603	X7R/X5R，额定电压>=25,精度=10%	C49	C0603	C0603	1
XH2.54-1*3P	直插	CN1	XH2.54-1*3P-CONN-TH_3P-P2.50_HC-XH-3A-G	XH2.54-1*3P	1
XH-2A_C20079		CN2	XH2.5-2	XH-2A_C20079	1
XH-6A		CN3, CN5	XH2.5-6P	XH-6A	2
XH-5A		CN4, CN6	XH2.5-5P	XH-5A	2
XH2.56-1*6P直插	XH2.56-1*6P直插	CN7, CN9	H2.54-1*6P-直插 CONN-TH_6P-P2.50_HC-XH-6A-G	XH2.56-1*6P直插	2
XH-4A		CN8	XH2.5-4P	XH-4A	1
B-3000S24P-0110	牛角座-2*12p 直插 C132440	CN10	牛角座2*12P-CONN-TH_300S-24P	牛角座-2*12p	1
XH2.54-1*8P	XH2.54-1*8P//直插//C5341207	CN11	XH2.54-1*8P-CONN-TH_8P-P2.50_HC-XH-8A-G	XH2.54-1*8P	1
XH2.54-1*2P直插		CN12	XH2.54-1*2P 直插 CONN-TH_2P-P2.50_HC-XH-2A-G	XH2.54-1*2P	1
SMBJ24CA		D3	SMB	SMBJ24CA_C78416	1
SZNUP2105LT1G		D4, D5	SOT-23	SZNUP2105LT1G	2
GBLC08C-N	LXES1UTAA1-157,0402,MURATA	D6, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D21, D24, D25, D26, D27, D28	SOD-323_L1.8-W1.3-LS2.5-BI	09.04.00336	19
SS24		D7	SMA	SS24_C2829443	1
A3963WV-2P		DC1	CONN-TH_A3963WV-2P	A3963WV-2P	1
TLC-NSMD100/24		F15	F1206	TLC-NSMD100/24	1
CBM160808U121T		L1, L2	L0603	CBM160808U121T	2
YSPI1050-100M/10uH/6A		L3	IND-SMD_L11.5-W10.0_SMMS1040	INDUCTOR	1
LED 0805	LED 0805-NCD0805R1	LED1	LED0805-RD_RED	LED 0805	1
17-21SYGC/S530-E3/TR8		LED2, LED3, LED4, LED5	LED 0805G	17-21SYGC/S530-E3/TR8	4
KH-2.54FH-1X15P-H8.5		P1, P2	HDR2.54-M-LI-15P	KH-2.54FH-1X15P-H8.5	2
10K R0603		R1, R23	R0603	R0603	2
0603WAF5113T5E		R2, R3, R4, R5, R6, R9, R10, R11, R12, R14, R16, R17, R18, R19, R20, R21, R22, R26, R27, R28, R30, R31, R32, R35, R36, R37, R38, R39, R40, R41, R42, R43, R45, R46, R47, R48, R49, R50, R51, R53, R54, R55, R56, R57, R58	R0603	0603WAF5113T5E	45
0R R0603		R7, R8, R13	R0603	R0603	3
4.7K R0603±0.1%		R15	R0603	R0603	1
TPS54302DDCR		U1	SOT23-6	TPS54302DDCR	1
STM32F407ZGT6	STM32F407ZET6	U2	STM32F407ZET6_TQFP144	STM32F407ZET6	1
XM8A51216		U3	IS62WV51216BLL_TSOP44	IS64WV51216BLL-10MA3	1
TLV1117LV33DCYR	C15578 // SOT-223//TI	U4, U15, U16, U17	1117LV-SOT-223_L6.7-W3.5-P2.30-BR	TLV1117LV33DCYR	4
SP3485EN-L/TR		U5	SOP8_SP3485	SP3485EN-L/TR	1
ESP32-C3-MINI-1-H4		U6	WIFIM-SMD_ESP32-C3-MINI-1	ESP32-C3-MINI-1U-H4	1
0603L035YR		U7, U8, U10, U11, U12, U13, U14, U19	F0603	0603L035YR	8
TJA1050T/CM,118		U9	SOP8_TJA1050	TJA1050T/CM,118	1
W25Q128JVSIQ		U22	SOIC8	W25Q128JVSIQ	1
X32258MSB4SI		X1	OSC 3225-4P	X32258MSB4SI	1
X321532768KGD2SI		X2	CR_3215_32768	X321532768KGD2SI	1