STM32F1单片机

U1A
STM32F103C8T6A

PA0-WKUP / PA1 / PA2 / PA3 / PA4 / PA5 / PA6 / PA7
PA8 / PA9 / PA10 / PA11 / PA12 / PA13 / PA14 / PA15
PB0 / PB1 / PB2 / PB3 / PB4 / PB5 / PB6 / PB7
PB8 / PB9 / PB10 / PB11 / PB12 / PB13 / PB14 / PB15
PC13-TAMPER-RTC / PC14-OSC32_IN / PC15-OSC32_OUT
PD0-OSC_IN / PD1 / BOOT0 / NRST

DOUT1 / SCK1 / DOUT2 / SCK2
UART1_TX / UART1_RX / CAN_RX / CAN_TX / SWDIO / SWCLK / DOUT3
TIM3_CH4 / BOOT1 / SCK3 / DOUT4 / SCK4 / TIM4_CH1
UART3_RX / UART3_TX
A8 / RESET

U1B
STM32F103C8T6A
VBAT
VDD_1 / VDD_2 / VDD_3 / VDDA
VSS_1 / VSS_2 / VSS_3 / VSSA
VCC_3V3 GND

X1 8M C14 C18 22p

BOOT0	BOOT1	BOOT TYPE
0	X	Flash
1	0	System Memory
1	1	SRAM

BOOT
R4 10K BOOT0 JP1 BOOT1
R7 1K VCC_3V3 R5 10K GND R8 1K VCC_3V3

复位
R1 10K C7 104 RESET
VCC_3V3

C2 104 C3 104 C4 104 C5 104 GND

GPIO控制LED
VCC_3V3 R13 4.7K LED2 蓝色 A8

电源模块

5V BOOST 电源路径管理
短按（持续时间长于 50ms，但小于 2s）会打开电量显示灯和升压输出

U2 IP5306
VIN / LED1 / LED2 / LED3 / GND / VOUT / SW / BAT / KEY
VBUS C1 104 C6 10u GND
VCC_5V C8 22u C9 22u C10 22u C11 22u
L1 1uH VBAT GND
R2 4.7K SW2 C17 104 GND

LED4 25% / LED5 50% / LED6 75% / LED7 100%

5V转3V3
U3 RT9013-33GB
VIN / VOUT / GND / NC / EN
VCC_5V VCC_3V3
C15 47u C16 104 C12 47u C13 104 GND

TYPE-C供电
USB1
GND / VBUS / CC2 / B5 / B6 / B7 / B8 / B9 / VBUS / GND
A12 / VBUS / CC2 / SBU1 / DN2 / DP2 / DN1 / DP1 / SBU2 / CC1 / VBUS / A1
R3 5.1K GND R6 5.1K GND CC1 CC2
VCC_3V3 VBUS R9 4.7K R10 10K LED1 红色 LED3 红色 GND

锂电池接口
支持4.2V/4.3V/4.35V
VBAT BAT GND

HX711压力传感器

SENSOR1
AVDD1 / PRESS1_IN- / AGND1 / PRESS1_IN+
VCC_3V3 Q1 SS8550 U5 HX711
VSUP / BASE / AVDD / VFB / AGND / VBG / INNA / INPA
DVDD / RATE / XI / XO / DOUT / PD_SCK / INPB / INNB
AVDD1 DOUT1 SCK1
R19/R20 10K C24 104
PRESS1_IN- R23 100 C26 104 PRESS1_IN+ R25 100
AGND1 R41 0 GND

选择输出频率
上拉80Hz 下拉10Hz AVDD2 R15 R17 0 GND

SENSOR2
AVDD2 / PRESS2_IN- / AGND2 / PRESS2_IN+
VCC_3V3 Q2 SS8550 U6 HX711
AVDD2 DOUT2 SCK2
R30 10K C25 104
PRESS2_IN- R24 100 C27 104 PRESS2_IN+ R26 100
AGND2 R42 0 GND

SENSOR3
AVDD3 / PRESS3_IN- / AGND3 / PRESS3_IN+
VCC_3V3 Q3 SS8550 U7 HX711
AVDD3 DOUT3 SCK3
R31 10K C29 104
PRESS3_IN- R35 100 C31 104 PRESS3_IN+ R37 100
AGND3 R45 0 GND

SENSOR4
AVDD4 / PRESS4_IN- / AGND4 / PRESS4_IN+
VCC_3V3 Q4 SS8550 U8 HX711
AVDD4 DOUT4 SCK4
R32 10K C30 104
PRESS4_IN- R36 100 C32 104 PRESS4_IN+ R38 100
AGND4 R46 0 GND

通信和烧录

供电&CAN
IN
GND / GND / CANL / CANH / VBUS / VBUS
OUT
GND / GND / CANL / CANH / VBUS / VBUS

串口
UART1
UART1_RX / UART1_TX / GND / VBUS
UART2
UART3_RX / UART3_TX / GND / VBUS

SWD
GND / SWCLK / SWDIO / VBUS

IC1 TJA1050
TXD / GND / VCC_5V / RXD / S / CANH / CANL / VREF
CAN_TX / GND / VCC_5V / CAN_RX
R30 120 CANH CANL GND
C28 104

RGB控制接口
RGB1
GND / TIM3_CH4 / VCC_5V
RGB2
GND / TIM4_CH1 / VCC_5V

Title	RoboMaster装甲板主控电路
Size A2	Number	Revision v1.4
Date: 8/29/2023		Sheet of
File: D:\WorkSpace\..\Armor_Plate.SchDoc		Drawn By: 阿汝鑫

UART1

USB1

R6 R3

C17

R2

SW2

BAT

IC1

C28

R39

BUPT
鸿雁战队

UART2

VGTR

LED4 LED5 LED6 LED7

LED3 R10
LED2 R13
LED1 R9

VGTR

SENSOR3

Q3

U7

R27

C2

U1

C3

U6

R42

C27 R26

SENSOR2

+G-V

R31

C29

C4

R18

R24 +G-V

R33

R29

R22

R35

C25 R20

RGB1

R37

C31

C5

R16

RGB2

5V_DIN_GND

C14 X1

C18

Q2

5V_DIN_GND

Q4 U8

R45

R28

R1

R41

R25

SENSOR4

R5

JP1

BOOT1

R8

SW1

U5

C26

R23

SENSOR1

+G-V

R32

C30

2 4

R17

R21

R34

R4

1 3

C24 R19

+G-V

R36

R7

C7

Q1

R38

C32

R46

SWD
GCDV

BOOT0

R15

22p

80.50

50.75

Comment	Description	Designator	Footprint	LibRef	Quantity
HDR-1X2	2P接插件	BAT	XH2.54-WS-2P	Header 2	1
104	贴片电容	C1, C2, C3, C4, C5, C7, C17, C24, C25, C26, C27, C28, C29, C30, C31, C32	C 0603_L	C	16
10u	贴片电容	C6	C 0603_L	C	1
22u	贴片电容	C8, C9, C10, C11	C 0603_L	C	4
47u	贴片电容	C12, C15	C 0805_L	C	2
104	贴片电容	C13, C16	C 0805_L	C	2
22p	贴片电容	C14, C18	C 0603_L	C	2
TJA1050	CAN总线收发芯片	IC1	SOP8_N	TJA1050	1
HDR-1X6	6P接插件	IN, OUT	GH1.25-WS-6P	Header 6	2
Header2X2	2*2P接插件	JP1	HDR2.54-LI-2x2P	Header 2X2	1
1uH	CD系列贴片线绕功率电感	L1	CD31	L-SMD	1
红色	贴片LED	LED1, LED3	LED 0805R	LED-SMD	2
蓝色	贴片LED	LED2	LED 0805B	LED-SMD	1
25%	贴片LED	LED4	LED 0603G	LED-SMD	1
50%	贴片LED	LED5	LED 0603G	LED-SMD	1
75%	贴片LED	LED6	LED 0603G	LED-SMD	1
100%	贴片LED	LED7	LED 0603G	LED-SMD	1
SS8550	高频放大-PNP型	Q1, Q2, Q3, Q4	SOT23-3N	8550-SMD	4
10K	贴片电阻	R1, R4, R5, R10, R19, R20, R21, R22, R31, R32, R33, R34	R 0603_L	R	12
4.7K	贴片电阻	R2, R9, R13	R 0603_L	R	3
5.1K	贴片电阻	R3, R6	R 0603_L	R	2
1K	贴片电阻	R7, R8	R 0603_L	R	2
0	贴片电阻	R15, R16, R17, R18, R27, R28, R29, R30, R41, R42, R45, R46	R 0603_L	R	12
100	贴片电阻	R23, R24, R25, R26, R35, R36, R37, R38	R 0603_L	R	8
120	贴片电阻	R39	R 0603_L	R	1
HDR-1X3	3P接插件	RGB1, RGB2	GH1.25-WS-3P	Header 3	2
HDR-1X4	4P接插件	SENSOR1, SENSOR2, SENSOR3, SENSOR4, SWD, UART1, UART2	GH1.25-WS-4P	Header 4	7
ST-1188		SW1	SW-SMD_4P-L4.2-W3.2-P2.15-LS5.2	SW-SMD_4P-L4.2-W3.2-P2.15-LS5.2	1
6x6x5	贴片6x6轻触开关	SW2	TSW SMD-6*6*4.3	TSW SMD-6x6	1
STM32F103C8T6A	STM32 ARM-based 32-bit MCU Performance Line with 64 kB Flash, 20 kB Internal RAM, -40 to +85癈 Temperature, 48-Pin LQFP, Tray	U1	LQFP48 7X7_N	STM32F103C8T6	1
IP5306	移动电源IC	U2	SOP-8-EX	IP5306	1
RT9013-33GB		U3	SOT-23-5_L3.0-W1.7-P0.95-LS2.8-BR	RT9013-33GB	1
HX711		U5, U6, U7, U8	SOP-16_L10.0-W3.9-P1.27-LS6.0-BL	HX711	4
		USB	USB1	USB-C-SMD_KH-TYPE-C-16P	TYPE-C-16M-005	1
8M	4脚无源晶振	X1	OSC 3225-4P	XTAL-4P	1