OV7670_CAMERA

OV7670 module
OV7670

3.3V	SOIC	GND / SIOD
DCMI SOICLOCK	SOIC	SIOD / DCMI SIODATA
DCMI VSYNC	VSYNC	HREF / DCMI HREF
DCMI PCLK	PCLK	XCLK / DCMI XCLK
DCMI D7	D7	D6 / DCMI D6
DCMI D5	D5	D4 / DCMI D4
DCMI D3	D3	D2 / DCMI D2
DCMI D1	D1	D0 / DCMI D0
DCMI RESET	RESET	PWDN / DCMI PWDN

C1 100nF R00 0R GND

OV7670

3.2touch monitor

C2 100nF R0 0R 3.3V

3.2touch

	GND	3.3V	
FSMC D1	D1	D0	FSMC D0
FSMC D3	D3	D2	FSMC D2
FSMC D5	D5	D4	FSMC D4
FSMC D7	D7	D6	FSMC D6
FSMC D9	D9	D8	FSMC D8
FSMC D11	D11	D10	FSMC D10
FSMC D13	D13	D12	FSMC D12
FSMC D15	D15	D14	FSMC D14
FSMC RegSelect	RS	CS	FSMC CS LCD
FSMC RD	RD	WR	FSMC WR
FSMC BackLight	BL_CNT	RESET	FSMC RESET
FSMC T IRQ	TP_IRQ	TP_SO	FSMC MISO
	NC	TP_SI	FSMC MOSI
	NC	TP_SCK	FSMC SCK
	NC	TP_CS	FSMC CS T

3.2touch

1.8monitor

LCD Small_lcd

GND	
SCLK	LCD SCLK
SDAT	LCD SDAT
CS	LCD CS
RST	LCD RST
DC	LCD DC
VCC	3.3V

CAN

LAN SOCKET
CANL CANL
5V CANH CANH
TJA1050
C12 100nF
CAN1 TX TX S CANH
GND CanH CANL
Vcc CanL
CAN1 RX RX Vref
TJA1050

5V CAN2
CANH
CANL

5V CAN1
CANH
CANL

MCU

UART4 TX	PA0-WKUP / PE0 / DCMI D2
UART4 RX	PA1 / PE1 / DCMI D3
UART2 TX	PA2 / PE2 / BUTTON PE3
UART2 RX	PA3 / PE3
12V DETECT AF ADC12IN5 PA5	PA4 / PE4 / JS1 A
DCMI PCLK	PA5 / PE5 / JS1 B
P2 PA7	PA6 / PE6 / BUZZER PE6 TIM9Ch2
DCMI XCLK	PA7 / PE7 / FSMC D4
UART1 TX	PA8 / PE8 / FSMC D5
UART1 RX	PA9 / PE9 / FSMC D6
CAN1 RX	PA10 / PE10 / FSMC D7
CAN1 TX	PA11 / PE11 / FSMC D8
JTMS	PA12 / PE12 / FSMC D9
	PA13/JTMS/SWDIO / PE13 / FSMC D10
JTCK	PA14/JTCK/SWCLK / PE14 / FSMC D11
LED1 PA15	PA15/JTDI / PE15 / FSMC D12

P5 PB0	PB0 / PD0 / FSMC D2
P6 PB1	PB1 / PD1 / FSMC D3
	PB2/BOOT1 / PD2 / SIG4 PD2
DCMI SOICLOCK	PB3/JTDO / PD3 / SIG5 PD3
P7 PB2	PB4/JNTRST / PD4 / SIG6 PD4
DCMI D5	PB5 / PD5 / SIG7 PD5
DCMI VSYNC	PB6 / PD6 / SIG8 PD6
DCMI D6	PB7 / PD7 / DCMI RESET
DCMI D7	PB8 / PD8 / FSMC D13
UART3 TX	PB9 / PD9 / FSMC D14
UART3 RX	PB10 / PD10 / FSMC RD
LCD CS	PB11 / PD11 / FSMC BackLight
LCD SCLK	PB12 / PD12 / FSMC T IRQ
LCD RST	PB13 / PD13 / FSMC D0
LCD SDAT	PB14 / PD14 / FSMC D1
	PB15 / PD15

BOOT0	BOOT0 / PC0 / ADC_A ADC123 IN10
	PC1 / GPIO PC1
OSC_IN	PC2 / ADC_B ADC123 IN12
OSC_OUT	PC3 / GPIO PC3
	PC4 / P3 PC4
NRST	PC5 / P4 PC5
	PC6 / FSMC WR
VREF+	PC7 / FSMC RegSelect
	PC8 / FSMC CS LCD
VCAP_1	PC9 / FSMC RESET LCD DC
VCAP_2	PC10 / SIG2 PC10
	PC11 / SIG3 PC12
VBAT	PC12 / JS1 C
	PC13 / JS1 D
	PC14-OSC32_IN / JS1 Center
	PC15-OSC32_OUT

VDD_1 VDD_2 VDD_3 VDD_4 VDD_5 VDD_6
VSS_1 VSS_2 VSS_3 VSS_4
VDDA VSSA

STM32F407VGT6

X1 8MHz C13 20pF C14 20pF
R2 10k R3 100k BOOT0
B_LED R4 1k
R5 4k7 RESET C3 100nF
C15 2u2F VCAP_1
C16 2u2F VCAP_2
R34 4k7 R35 1k5 12V_DETECT_AF_ADC12IN5_PA5
R1 100k P7_PB2
Boot0

C4 C5 C6 C7 C8 C9 C10 C11 C80 100nF

Power

BAT MOTOR 12Vraw
12V_OUT 12V
R8 1k5 R9 4k7
5A fuse
IC1 LM2679
C_Boost C17 10nF
L1 100uH 5V
D9 MBR745
C20 470uF 25V
C19 100nF R10 54.7k
C18 2200uF 6.3V
LM1117 LM1117MP-3.3
IN OUT TAB GND
C25 1uF C21 10uF C22 10nF C23 10uF C24 10nF 3.3V

BUZZER_PE6 TIM9Ch2
R48 33R B1 Buzzer
R49 10k BC847
R31 22k 12V
R32 1k 5V
R33 510R 3.3V

ADC_LASER

LS1 12V LASER SENSOR1 GND
R11 470k R12 200k R13 1.5k R14 1k GPIO_PC1
ADC_A_ADC123_IN10

LS2 12V LASER SENSOR2 GND
R15 470k R16 200k R17 1.5k R18 1k GPIO_PC3
ADC_B_ADC123_IN12

Pneumatic

12V P2 PA7 M2 AO3400 R37 100k GND
12V P3 PC4 M3 AO3400 R39 100k GND
12V P4 PC5 M4 AO3400 R41 100k GND
12V P5 PB0 M5 AO3400 R43 100k GND
12V P6 PB1 M6 AO3400 R45 100k GND
12V P7 PB2 M7 AO3400 R47 100k GND

LED1 PA15 R50 510R LED1 GND

Joystick
JS1 C JS1 B JS1 A Center Common JS1 Center JS1 D

BT_STATE Bluetooth State PE2 SIG1_PE2 BT_STATE
UART1 5V UART1 RX UART1 TX GND
UART3 5V UART3 RX UART3 TX GND
JLINK 5V JTMS JTCK GND
BLUETOOTH 5V UART2 RX UART2 TX Bluetooth State GND
UART4 5V UART4 RX UART4 TX GND

S1 PE2 SIG1 PE2 R52 27R C30 100nF
S2 PC10 SIG2 PC10 R53 27R C31 100nF
S3 PC12 SIG3 PC12 R54 27R C32 100nF
S4 PD2 SIG4 PD2 R55 27R C33 100nF
S5 PD3 SIG5 PD3 R56 27R C34 100nF
S6 PD4 SIG6 PD4 R57 27R C35 100nF
S7 PD5 SIG7 PD5 R58 27R C36 100nF
S8 PD6 SIG8 PD6 R59 27R C37 100nF

BUTTON BUTTON_PE3 BUTTON PE3

SIG P3_PC5 12V
SIG P4_PC5 12V
SIG P5_PB0 12V
SIG P6_PB1 12V
SIG P7_PB2 12V
BOOT1
LAN SOCKET
GND LOW CAN1 HI
5V
SIG P2_PA7 12V
GND LOW CAN2 HI 5V
M4
M5
M6
R1
R41
R43
R45
HI 5V LOW 5V
M3
R39
TX UART1 RX 5V
M2
R37
THE HONG KONG
UNIVERSITY OF SCIENCE
AND TECHNOLOGY
香港科技大學
GND PC3 LS2 M12 12V
C12
GND TCK1 LINK TMS 5V
LCD
C4
GND PC1 LS1 M10 12V
C16
S8 C5 C9
LED1
BOOT0
B_LED
C80
12V_OUT
C14 C13
+
3.2touch
R0
B1
OV7670
+
C1
C18
BLUETOOTH GND RX TX STATE
UART4 GND RX TX
UART3 GND RX TX
S7_PD5 GND 5V SIG
S2_PC10 GND 5V SIG
C20
5V
5V
GND 5V SIG
GND 5V SIG
C19
R9
BT_ST GND RX TX BT_STATE
S1
SIG
SIG
S6_PD4 GND 5V SIG
S3_PC12 GND 5V SIG
BUTTON
BAT
5V
5V
D9
12V 3.3V 5V
RESET
S1_PE2
S8_PD6
S5_PD3 GND 5V SIG
S4_PD2 GND 5V SIG
GND
GND
Joystick

Comment	Description	Designator	Footprint	LibRef	Quantity
3.2touch		3.2touch	PCBComponent_1	Component_1	1
3.3V	Typical RED GaAs LED	3.3V	D0805	LED	1
5A fuse	Fuse	5A fuse	FUSE SOCKET	Fuse 1	1
5V	Typical RED GaAs LED	5V	D0805	LED	1
12V	Typical RED GaAs LED	12V	D0805	LED	1
12V_OUT	Header, 2-Pin	12V_OUT	T-CONNECTOR(F)	Header 2	1
Buzzer		B1	POL_BUZZER-12.0	Buzzer	1
MOTOR	Header, 2-Pin	BAT	T-CONNECTOR(M)	Header 2	1
BC847		BC847	npn	BC847	1
BLUETOOTH	Header, 5-Pin	BLUETOOTH	lockedHDR-5	Header 5	1
BOOT1	Header, 3-Pin	BOOT1	HDR1X3	Header 3	1
Boot0		Boot0	PCBComponent_1	Component_1	1
BT_STATE	Header, 3-Pin	BT_STATE	HDR1X3	Header 3	1
BUTTON	Single-Pole, Single-Throw Switch	BUTTON	PUSH SWITCH	SW-SPST	1
B_LED	Typical RED GaAs LED	B_LED	D0805	LED	1
100nF	Capacitor (Semiconductor SIM Model)	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C19, C30, C31, C32, C33, C34, C35, C36, C37, C50, C80	CC2012-0805	Cap Semi	23
20pF	Capacitor (Semiconductor SIM Model)	C13, C14	CC2012-0805	Cap Semi	2
2u2F	Capacitor (Semiconductor SIM Model)	C15, C16	CC2012-0805	Cap Semi	2
10nF	Capacitor (Semiconductor SIM Model)	C17, C22, C24	CC2012-0805	Cap Semi	3
2200uF 6.3V	Polarized Capacitor (Axial)	C18	SV-H	Cap Pol2	1
470uF 25V	Polarized Capacitor (Axial)	C20	SV-G	Cap Pol2	1
10uF	Capacitor (Semiconductor SIM Model)	C21, C23	CC2012-0805	Cap Semi	2
1uF	Capacitor (Semiconductor SIM Model)	C25	CC2012-0805	Cap Semi	1
CAN2	Header, 4-Pin	CAN1, CAN2	LOCKEDHDR-4	Header 4	2
MBR745	Schottky Diode	D9	TO-220AC	D Schottky	1
LM2679	5A Step-Down Switching Mode Voltage Regulator	IC1	TO-263(7)	LM2679	1
JLINK	Header, 4-Pin	JLINK	LOCKEDHDR-4	Header 4	1
Joystick		Joystick	5D_SWITCH	Joystick	1
Inductor	Inductor	L1	MSS1260	Inductor	1
LAN SOCKET		LAN SOCKET	PCBComponent_1	Component_1	1
Small_lcd		LCD	Lcd_red	Small_lcd	1
LED1	Typical RED GaAs LED	LED1	D0805	LED	1
LM1117MP-3.3	800mA Low-Dropout Linear Regulator	LM1117	MP04A_N	LM1117MP-3.3	1
LASER SENSOR1	Header, 4-Pin	LS1	LOCKEDHDR-4	Header 4	1
LASER SENSOR2	Header, 4-Pin	LS2	LOCKEDHDR-4	Header 4	1
AO3400	N-Channel MOSFET	M2, M3, M4, M5, M6, M7	SO-G3/Z3.3	AO3400	6
STM32F407VGT6	STM32 ARM-based 32-bit MCU with 64 Kbytes Flash, 100-pin LQFP, Industrial Temperature	MCU	LQFP100_N	STM32F407VET6	1
OV7670		OV7670	PCBComponent_1	Component_1	1
P2_PA7	Header, 3-Pin	P2_PA7	LOCKEDHDR-3	Header 3	1
P3_PC4	Header, 3-Pin	P3_PC4	LOCKEDHDR-3	Header 3	1
P4_PC5	Header, 3-Pin	P4_PC5	LOCKEDHDR-3	Header 3	1
P5_PB0	Header, 3-Pin	P5_PB0	LOCKEDHDR-3	Header 3	1
P6_PB1	Header, 3-Pin	P6_PB1	LOCKEDHDR-3	Header 3	1
P7_PB2	Header, 3-Pin	P7_PB2	LOCKEDHDR-3	Header 3	1
0R	Semiconductor Resistor	R0, R00	CR2012-0805	Res Semi	2
100k	Semiconductor Resistor	R1, R3, R37, R39, R41, R43, R45, R47	CR2012-0805	Res Semi	8
10k	Semiconductor Resistor	R2, R49	CR2012-0805	Res Semi	2
1k	Semiconductor Resistor	R4, R14, R18, R32	CR2012-0805	Res Semi	4
4k7	Semiconductor Resistor	R5, R9, R34	CR2012-0805	Res Semi	3
1k5	Semiconductor Resistor	R8, R35	CR2012-0805	Res Semi	2
4.7k	Semiconductor Resistor	R10	CR2012-0805	Res Semi	1
470k	Semiconductor Resistor	R11, R15	CR2012-0805	Res Semi	2
200k	Semiconductor Resistor	R12, R16	CR2012-0805	Res Semi	2
1.5k	Semiconductor Resistor	R13, R17	CR2012-0805	Res Semi	2
2.2k	Semiconductor Resistor	R31	CR2012-0805	Res Semi	1
510R	Semiconductor Resistor	R33, R50	CR2012-0805	Res Semi	2
33R	Semiconductor Resistor	R48	CR2012-0805	Res Semi	1
27R	Semiconductor Resistor	R52, R53, R54, R55, R56, R57, R58, R59	CR2012-0805	Res Semi	8
RESET	Single-Pole, Single-Throw Switch	RESET	PUSH SWITCH	SW-SPST	1
S1_PE2	Header, 3-Pin	S1_PE2	LOCKEDHDR-3	Header 3	1
S2_PC10	Header, 3-Pin	S2_PC10	LOCKEDHDR-3	Header 3	1
S3_PC12	Header, 3-Pin	S3_PC12	LOCKEDHDR-3	Header 3	1
S4_PD2	Header, 3-Pin	S4_PD2	LOCKEDHDR-3	Header 3	1
S5_PD3	Header, 3-Pin	S5_PD3	LOCKEDHDR-3	Header 3	1
S6_PD4	Header, 3-Pin	S6_PD4	LOCKEDHDR-3	Header 3	1
S7_PD5	Header, 3-Pin	S7_PD5	LOCKEDHDR-3	Header 3	1
S8_PD6	Header, 3-Pin	S8_PD6	LOCKEDHDR-3	Header 3	1
TJA1050		TJA1050	SO-8	DJA1050	1
UART1	Header, 4-Pin	UART1	LOCKEDHDR-4	Header 4	1
UART3	Header, 4-Pin	UART3	LOCKEDHDR-4	Header 4	1
UART4	Header, 4-Pin	UART4	LOCKEDHDR-4	Header 4	1
8MHz	Crystal Oscillator	X1	BCY-W2/E4.7	XTAL	1