Comment	Description	Designator	Footprint	LibRef	Quantity
SW-SMD	Switch	BT1, BT2, BT3, RESET	SW-SMD	SW-SMD	4
1uF		C1, C3	0805	CAP 0805	2
10uF		C2, C4	0805	CAP 0805	2
18pF		C5, C6, C7, C8	0805	CAP 0805	4
10nF	Dán	C9, C10, C11, C12, C14	tu 0805	Tu 0805 101 50V 20%	5
0.1uF		C13, C15, C16, C17, C18, C19, C22, C23	0805	CAP 0805	8
100uF	Cắm	C20, C21	tu hoa 5mm	Tu Hoa 100uF 25V 6x11	2
520	5x20mm	F1	De Cau Chi 520 630	De Cau Chi 520 630	1
Header 2	Big Header 2	HEATER1, LOAD, POWER, POWER 12V	BIG_Header 2	Header 2	4
LM78xx	Positive Voltage Regulator	IC1	TO252-123	LM78xx	1
100uH - 3A SMD	Dán	L1	Cuon Cam 12x12x10	CUON CAM 100uH SMD	1
LCD 2004	LCD 2004 5V Xanh Dương	LCD	LCD 2004	LCD 2004 5V	1
LED		LED1, LED2, LED3, LED4	LED-0805-Red	LED SMD	4
HLK-20M12	20W ultra-small series module power supply	PS1	CONV_HLK-20M12	HLK-20M12	1
IRF3709	N-Channel Power MOSFET	Q1	D2PAK	IRF3709S SMD	1
2N222	NPN 600mW, ECB	Q2, Q3	SOT23-231	2N222	2
2.2K	Resistor	R1	RES-SMD-1206	Res-SMD	1
10K	Resistor	R2, R3	RES-SMD-1206	Res-SMD	2
2K	Resistor	R4, R5, R6, R7	RES-SMD-0805	Res-SMD	4
220R	Resistor	R8	RES-SMD-0805	Res-SMD	1
10K	Resistor	R9, R10, R11, R12, R13, R14, R15	RES-SMD-0805	Res-SMD	7
5K	Resistor	R16	RES-SMD-1206	Res-SMD	1
482016514001	Rotary Encoder Mechanical 15 Quadrature (Incremental) Vertical	S1	SW_482016514001	482016514001	1
Header4	Header IDC, 4 x 1 Pin Vertical 2.54mm Pitch (Non-Boxed, Male)	ST-LINK1, UART1	Header4	Header4	2
LM1117-3.3V	800mA Low-Dropout Linear Regulator	U1	SOT223	LM1117	1
OPTO PC817 SMD	Single Opto	U2	SOP4	OPTO PC817 SMD	1
MAX6675	Half-Bridge Driver	U3	SO8	MAX6675	1
STM32F103C8T6	ARM® Cortex®-M3 STM32F1 Microcontroller IC 32-Bit 72MHz 64KB (64K x 8) FLASH 48-LQFP (7x7)	U4	QFP50P900X900X160-48N	STM32F103C8T6	1
PCF8574	I2C PORT EXPANDER	U5	SO16L	PCF8574	1
2A 24V	2A 24V SMD1812	Varistor	Cau chi tu phuc hoi 2A 24V SMD1812	Cau chi tu phuc hoi 2A 24V SMD1812	1
100K	Cắm	VR1	Bien Tro Tam Giac Dung	Bien tro tam giac 100K Dung	1
32.768Khz	Crystal, 32.768 KHz, -40 to 85 degC, 3.2 x 1.5 x 0.9 mm SMD	X1	XT2-32.768KHz-2_V	XT2	1
8Mhz	Crystal For all Crystal 2pin.	XT1	Thach Anh 4 chan 1	Thach Anh 4 Chan SMD	1