T-962a Oven Controller Schematic

P2 Keyboard
- Gnd 1
- F1 2
- F2 3
- F3 4
- F4 5
- S 6

SW S, SW F4, SW F3, SW F2, SW F1

3V3
R2 4K7, R3 4K7, R4 4K7, R5 4K7, R6 4K7

LCD1 LCD-XC-4617
- Vss 1
- Vdd 2
- V0 3
- RS-SS 4
- R/W/Sin 5
- E/Sclk 6
- DB0 7
- DB1 8
- DB2 9
- DB3 10
- DB4 11
- DB5 12
- DB6 13
- DB7 14
- PSB 15
- N/C 16
- RST 17
- Vout 18
- A 19
- K 20

5V

U3 74HCT157N
- GND 8
- 4Y 12
- 3Y 9
- 2Y 7
- 1Y 4
- 4B 13
- 4A 10
- 3B 11
- 3A 6
- 2B 5
- 2A 3
- 1B 2
- 1A 1
- VCC 16
- A/B OE 15

SCKb, MOSIb, L_CSb
SCK, MOSI, L_CS*
C14 100nF

LCD1a Header 1x8
- 1 2 3 4 5 6 7 8
- L_CSb, MOSIb, SCKb

5V

H1 Expansion
1–10
SCK, MISO, T3 CS*, T4 CS*
USB_DMb, USB_DPb
USB_Gnd
3V3 USB_5V
R11 33R, R12 33R
USB_DM, USB_DP
L2 FB

TB1
2, 1

BR1 DF10S
~ +
~ -

C2 470uF/25V, C3 470uF/25V
12V

U2 NCP5501DT50RKG
- Vin 1
- Vout 3
- 4
5VSup
C1 100nF
C4 4u7/10V

D1 PMEG2005CT
5VSup 2, USB_5V 1
5V
3
C5 100nF
3V3 L1 Vadc FB

U4 MK20DX128VLF5
- Vdd 1
- Vss 2
- USB0_DP 3
- USB0_DM 4
- Vout33 5
- VRegin 6
- ADC0_DP0 7
- ADC0_DM0 8
- VddA 9
- VRefH 10
- VRefL 11
- VssA 12
- VRefout/CMP1_IN5/CMP0_IN5 13
- XTAL32 14
- EXTAL32 15
- Vbat 16
- PTA0 17
- PTA1 18
- PTA2 19
- PTA3 20
- PTA4/LLWU_P3 21
- Vdd 22
- Vss 23
- PTA18/EXTAL 24
- PTD7 48
- PTD6/LLWU_P15 47
- PTD5 46
- PTD4/LLWU_P14 45
- PTD3 44
- PTD2/LL_WU_P13 43
- PTD1 42
- PTD0/LLWU_P12 41
- PTC7 40
- PTC6/LLWU_P10 39
- PTC5/LLWU_P9 38
- PTC4/LLWU_P8 37
- PTC3/LLWU_P7 36
- PTC2 35
- PTC1/LLWU_P6 34
- PTC0 33
- PTB17 32
- PTB16 31
- PTB3 30
- PTB2 29
- PTB1 28
- PTB0/LLWU_P5 27
- RESETb 26
- PTA19/XTAL 25

C6 2u2F, C8 2u2F/6V, C11 100nF, C12 100nF
3V3, 5V
Vref, Xtal32, Extal3315
SWD_CLK, SWD_Rx, SWD_Tx, SWD_DIO
PTA4
USB_DP, USB_DM

PTD7 TP1, T2 CS*, T1 CS*, T3 CS*, MISO, MOSI, SCK, T4 CS*, LED1, LED2, Buzzer, Spare, CaseFan, Heater, OvenFan, L CS*, PTB17 TP2, SW S, SW F1, SW F2, SW F3, SW F4, RESETb

Y1 ABM3B-8.000MHZ-B2-T
EXTAL, XTAL

U1 ULN2003ADR
- 1B 1
- 2B 2
- 3B 3
- 4B 4
- 5B 5
- 6B 6
- 7B 7
- E 8
- COM 9
- 1C 16
- 2C 15
- 3C 14
- 4C 13
- 5C 12
- 6C 11
- 7C 10

12V
LED1, LED2, Buzzer, Spare, CaseFan, Heater, OvenFan
Buzzerb, Spareb

P1 LEDs
4 3 2 1
LED1b, LED2b
R1 1K, R7 1K
LED1r, LED2r
12V

BZ1 5V +

TB2 Auxiliary
1 2 3 4
12V CaseFanb
R8 DNP Sparer
Case Fan

R9 10K, R10 10K, D2, D3
12V

TB3 SSDs
1 2 3 4
OvenFanb, Heaterb

U5 MAX31855KASA+T
- SO 7
- SCK 5
- CS* 6
- Vcc 4
- Gnd 1
- T+ 3
- T- 2
MISO, SCK, T1 CS*
T1+, T1-
C7 100nF, C9 10nF
Vadc
Therm #1

U6 MAX31855KASA+T
- SO 7
- SCK 5
- CS* 6
- Vcc 4
- Gnd 1
- T+ 3
- T- 2
MISO, SCK, T2 CS*
T2+, T2-
C10 100nF, C13 10nF
Vadc
Therm #2

TB4
4 3 2 1

P3 SWD2X5
- VTref
- Gnd
- Gnd
- Key
- GndDet
- SDWIO
- SWDCLK
- SWO/EXTa
- NC/EXTb
- nRESET
3V3
SWD_DIO, SWD_CLK, SWD_Tx, SWD_Rx, RESETb

open source hardware

Title	T-962a Oven Controller		
Size A4	Number		Revision V1.0
Date:	20/09/2016	Sheet of	
File:	C:\Users\..\T962a-P1.SchDoc	Drawn By:	

LCD Module

T962a Oven Controller V1.0

Expansion

OSHW

Thermo-2

Thermo-1

Glue

BZ1

LED2

Spare

+12V

Case
Fan

+12V

Oven Fan

Heater

+12V

SSRs

LCD1

Bill of Materials

T-962a Oven Controller

Source Data From:		T962a.PrjPCB				
Project:		T962a.PrjPCB				
Variant:		None				

Creation Date:	20/09/2016	2:55:08 PM	
Print Date:	20-Sep-16	2:55:19 PM	

Footprint	Comment	Farnell PN	Digikey	Designator	Description	Quantity
Bridge-SMT	DF10S	2101164		BR1	bRIDGE rECTIFIER	1
BUZZER_Small	Buzzer_PCB (Adafruit)			BZ1		1
CCNP2012-0805	100nF			C1, C5, C7, C10, C11, C12, C14	Capacitor, Capacitor, Capacitor SMT 0805, Capacitor SMT 0805, Capacitor, Capacitor SMT 0805, Capacitor	7
RB5/10x13mm	470uF/25V	2469425		C2, C3	Polarized Capacitor	2
CCNP2012-0805	4u7/10V			C4	Capacitor SMT 0805	1
CCNP2012-0805	2u2F			C6	Capacitor	1
CCNP2012-0805	2u2F/6V			C8	Capacitor	1
CCNP2012-0805	10nF			C9, C13	Capacitor SMT 0805	2
SOT23	PMEG2005CT	2459194		D1	Dual Schottky Diode (SMT)	1
LED-SMT-2	LED Red	5790839		D2, D3	LED (Red SMT)	2
HDR2X5S	2x5 Header			H1	Header 2x5	1
CR2012-0805	FB	1515661		L1, L2	Ferrite Bead (0805) 0.045OHM, 2A	2
LCD_XC-4617	LCD-XC-4617			LCD1	LCD 128 x 64 pixel, ST7920 controller & contrast pot (Jaycar XC-4617)	1
HDR1X8S	Header 1x8			LCD1a	Header, 10-Pin, Right Angle	1
HDR1X4H	Header 1x4H			P1	Header, 5-Pin, Right Angle	1
HDR1X6H	Keyboard			P2	Header, 6-Pin	1
SWD-2x5	SWD2X5			P3	SWD Connector 2x5-Pin	1
CR2012-0805	1K			R1, R7	Resistor	2
CR2012-0805	4K7			R2, R3, R4, R5, R6	Resistor	5
CR2012-0805	DNP			R8	Resistor	1
CR2012-0805	10K			R9, R10	Resistor	2
CR2012-0805	33R			R11, R12	Resistor	2
MOLEX-39544-3002	Terminal2	2396251		TB1	MULTICOMP MC24366 Wire-To-Board Terminal Block	1
MOLEX-39544-3004	Terminal4	1624302		TB2, TB3, TB4	MULTICOMP MC24368 Wire-To-Board Terminal Block	3
PCBPIN - 0.9mm	TP			TP1, TP2	Test Point	2
SO-16_N	ULN2003ADR	1470513		U1		1
TO-252	NCP5501DT50RKG	2532866		U2	Fixed LDO Voltage Regulator, 2.5V-16V in, 230mV Dropout, 5V/500mA out, TO-252-3	1
SO-16_N	74HCT157N			U3	Quad 2-1 Multiplexor	1
TSQFP50P900X900-48M	MK20DX128VLF5			U4	Arm Cortex M4	1
SO-8_L	MAX31855KASA+T	2515622		U5, U6		2
Crystal_SMT - ABM3B	ABM3B-8.000MHZ-B2-T	2467818		Y1	Crystal 8MHz (MINIATURE SMT ABM3B)	1
						52

Approved			Notes			