CMOS 16-BIT DMM MICROCONTROLLER BOARD

S5U1C17M03T Manual

(Software Evaluation Tool for S1C17M03)

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(Rev.e1.0, 2021.9)

Table of Contents

1.   Overview

The S5U1C17M03T (SVT board) is equipped with a 16-bit MCU S1C17M03 for Seiko Epson digital multimeters (DMM).

The SVT board is equipped with the functions required for a DMM and can measure voltage, current, resistance, capacitance, continuity check, diodes, and frequencies.

1.1   Board external view

Figuer1.1.1 shows an external view of the SVT board.

（**Parts surface**）   （**Solder surface**）
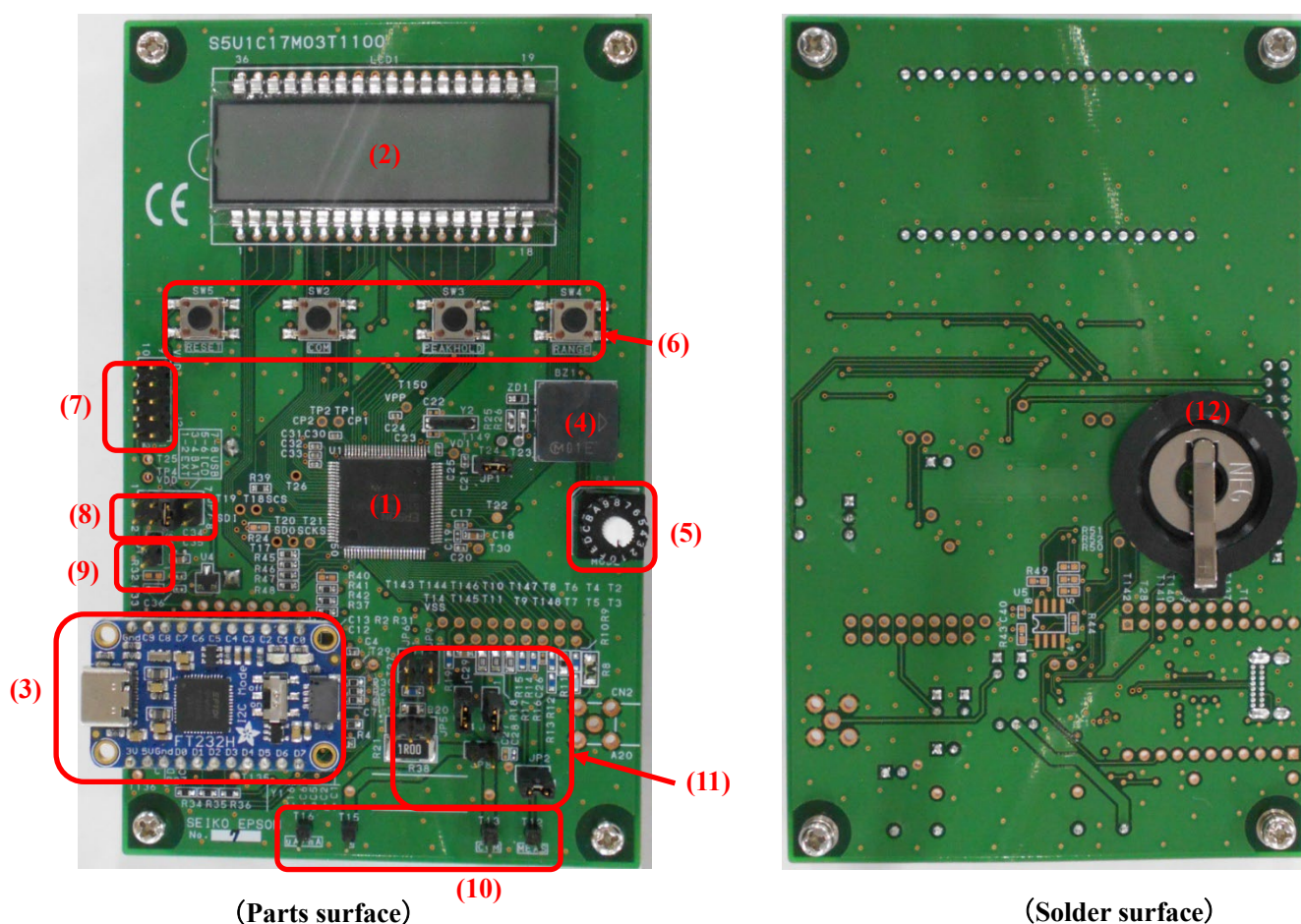
Figure1.1.1   SVT board external view

(1) S1C17M03 16-bit MCU	(7) S5U1C17001H3 (ICDmini Ver.3 Emulator connector
(2) LCD module （8digits、14segments / digit）	(8) Power selection connector
(3) USB⇔SPI bridge IC module USB Type-C connector	(9) External power input connector
(4) Piezo electric buzzer	(10) Voltage, current, resistance, capacitance, continuity check, diodes, and frequencies measurement terminal
(5) Mode switching rotary switch	(11) Setting jumper pins
(6) Tactile switch	(12) CR2032 button battery holder

2.   Specification

The product specifications of the SVT board are shown in Table2.1, and the measurement specifications are in Table2.2.

Table 2.1   Product specifications

Model	S5U1C17M03T
Power	EXT : External BAT : CR2032 (3V) Lithium battery x1 ICD : Emulator USB: USB VBUS
Size	W80×H130×D17.1 (Without spacers)
Weight	60g (Without battery and spacers)

Table 2.2   Measurement specification

Measurement mode	Measurement range
DC voltage	600m/6/60V *
AC voltage	600m/6/60V *
DC current	600u/6m/60mA*
AC current	600u/6m/60mA*
Resistance	600/6k/60k/600k/6M/60MΩ
Capacitance	10n/100n/1u/10u/100u/1000uF
Frequencies	5Hz - 100kHz
Continuity check	Buzzer sound below 50Ω
Diode test	Vf measurement

* The maximum input should be less than twice each measurement range.

3. Function

3.1 Power selection connector

The power supply can be set with JP7. Choose from the following four ways.

- ➢ EXT : External power is supplied from J1.
- ➢ BAT : Power is supplied from the BT1 button battery CR2023.
- ➢ ICD : Power is supplied from the emulator connector J2.
- ➢ USB : Power is supplied from the USB VBUS.

Table 3.1.1   JP7 Power jumper setting

Power selection	Jumper settings	Other comments
EXT	1-2 Short	DC+3V±10%, Others should be open.
BAT	3-4 Short	CR2032 x1, Others should be open.
ICD	5-6 Short	Others should be open.
USB	7-8 Short	Others should be open.

3.2 External power input connector

External power input from JP1. The power supply is DC+3.0V±10%.

Table 3.2.1   JP1 External power input

JP1 Pin No.	Signal name
1	DC+3V±10%
2	GND

3.3 Mode switching rotary switch

The rotary switch SW1 can switch the measurement mode. (Table 3.3.1） For details on the functions, refer to another "S1C17M02/M03 Application Note".

Table 3.3.1   Mode switching rotary switch setting

SW1 No.	Measurement mode	Default range	Mode name
0	DC voltage	6V	DCV
1	AC voltage	6V	ACV
2	DC current	6mA	DCI
3	AC current	6mA	ACI
4	Resistance value (CC method)	600Ω	OHM CC
5	Resistance value (CV method)	600Ω	OHM CV
6	Continuity check	CV	CONT
7	Capacitance (CC method)	1uF	CAP CC
8	Capacitance (CV method)	10nF	CAP CV
9	Diode VF	-	DIODE
A	AC voltage frequency	6V	FREQ ACV
B	AC current frequency	6mA	FREQ ACI
C	Internal temperature	-	TEMP

※ If an unused SW1 number is selected, it will not be measured. "NOFUNC" is displayed on the LCD.

3. Function

3.4　Tactile switch

The tactile switches SW2 to SW5 have the following function. (Table 3.4.1）For details on the functions, refer to another "S1C17M02/M03 Application Note".

Table 3.4.1　Tactile switch

Switch	Function
SW2	Communication mode: Start/End
SW3	Peak hold setting switching
SW4	Measurement range setting switching
SW5	Perform a hardware reset

3.5   Jumper settings

The measurement mode is set in JP2,JP3,JP4,JP5,JP6,JP8,JP9. Table 3.5.1 shows the jumper setting table.

Table 3.5.1   Jumper settings

Measurement mode	Mode	SW1	Measurement range	JP2	JP3	JP4	JP5	JP6	JP8	JP9
DC voltage	DCV	0	600mV	short	short	short	open	open	open	open
			6V	open						
			60V							
AC voltage	ACV	1	600mV	short	short	short	open	open	open	open
			6V	open						
			60V							
DC current	DCI	2	600uA	open	short	short	2-3short	short	short	open
			6mA							
			60mA				1-2short			
AC current	ACI	3	600uA	open	short	short	2-3short	short	short	open
			6mA							
			60mA				1-2short			
Resistance value (CC method)	OHM_CC	4	600Ω	short	short	short	open	open	open	open
			6kΩ							
			60kΩ							
			600kΩ							
			6MΩ							
			60MΩ							
Resistance value (CV method)	OHM_CV	5	600Ω	short	short	short	open	open	open	open
			6kΩ							
			60kΩ							
Continuity check	CONT	6	CV	short	short	short	open	open	open	open
			CC							
Capacitance (CC method)	CAP_CC	7	1uF	short	short	short	open	open	open	open
			10uF							
			100uF							
			1000uF							
Capacitance (CV method)	CAP_CV	8	10nF	short	short	short	open	open	open	open
			100nF							
Diode VF	Diode	9	-	short	short	short	open	open	open	open
AC voltage frequency	Freq_ACV	a	600mV	short	short	short	open	open	open	open
			6V	open						
			60V							
AC current frequency	Freq_ACI	b	600uA	open	short	short	2-3short	short	short	open
			6mA							
			60mA				1-2short			
Temperature	Temp	c	-	open	short	short	open	open	open	open

3. Function

3.6 Emulator connector

J2 is the S5U1C17001H3 ICDmini Ver.3 emulator "S5U1C17001H3" connector.

Table 3.6.1   J2 pin assignment

Pin No.	Signal name	Other comments
1	DCLK	
2	GND	Ground
3	DSIO	
4	DST2	
5	FLASH VCC OUT	Flash memory, power output for programming
6	GND	Ground
7	RSTO	Target reset output
8	VCCIN	
9	3.3V	3.3V power supply
10	N.C.	N.C.

Appendix A   S5U1C17M03T SVT Board schematic

S1C17M03 DMM

BUZZER

POWER

ICD I/F

Serial Flash Memory
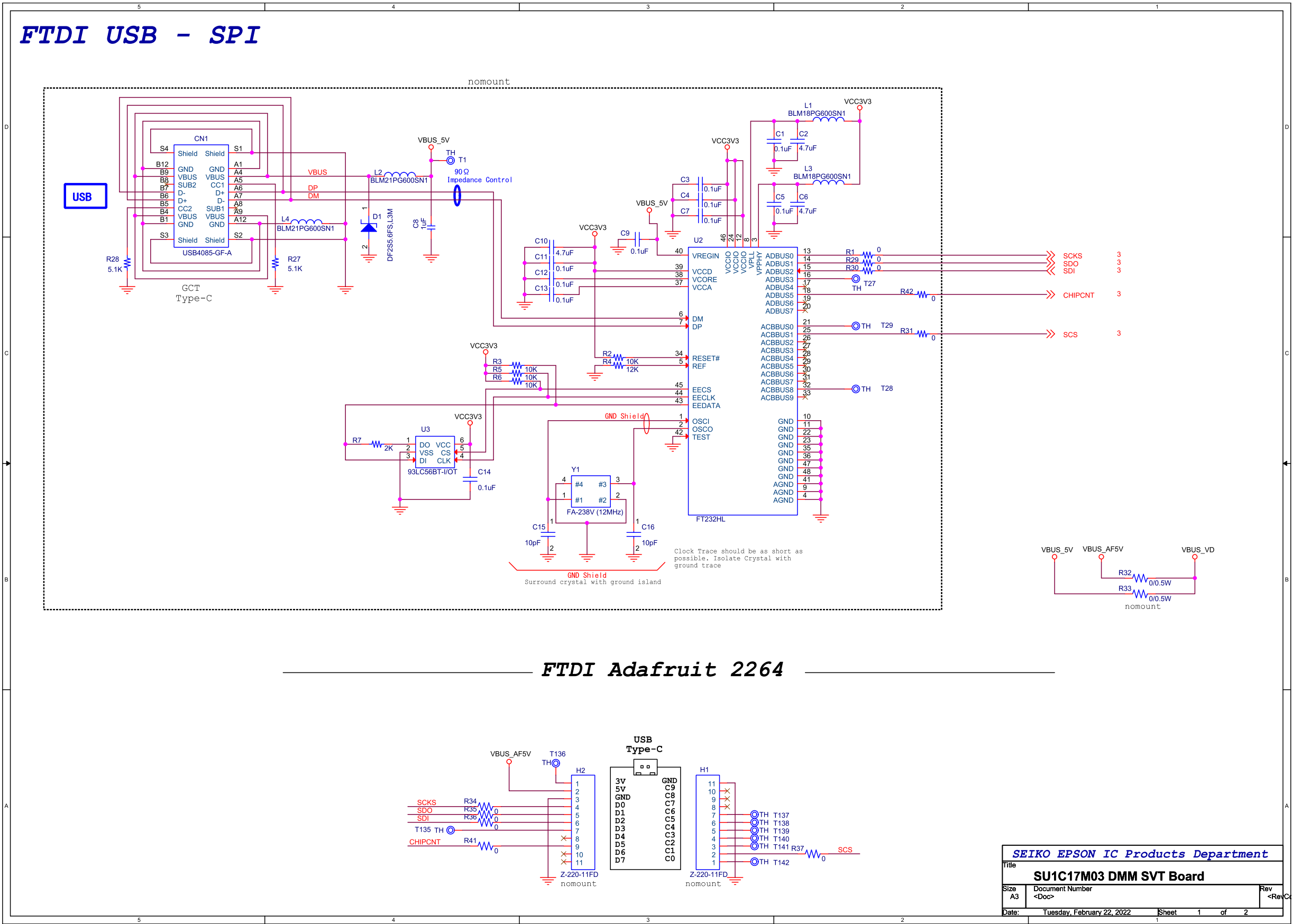
Appendix B   S5U1C17M03T SVT Board Parts List

Note! Parts are subject to change without notice.

Table B.1   S5U1C17M03T SVT Board Parts List

Item	Manufacture	Part Type	Part	Reference	Quantity	mount	Other Commennt
1	KEYSTONE	Battery holder	106	BT1	1		
2	MURATA	Buzzer	PKLCS1212E4001-R1	BZ1	1		
3	GCT	Connector	USB4085-GF-A	CN1	1	nomount	
4	HIROSE	Connector	A2-2PA-2.54DSA(71)	J1,JP1,JP2,JP3,JP4, JP6,JP8,JP9	8		
5	HIROSE	Connector	A2-3PA-2.54DSA(71)	JP5	1		
6	HIROSE	Connector	A1-8PA-2.54DSA(71)	JP7	1		
7	Würth Elektronik	Connector	61301021121	J2	1		
8	TE	Tactile switchi	FSM4JSMATR	SW2,SW3,SW4,SW5	4		
9	OMRON	Rotary switch	A6A-16R	SW1	1		
10	EPSON	IC chip	S1C17M02_DMM	U1	1		
11	FTDI	IC chip	FT232HL	U2	1	nomount	
12	Microchip	IC chip	93LC56BT-I/OT	U3	1	nomount	
13	EPSON	Crystal	FA-238V 12.0000MB-W3	Y1	1	nomount	
14	EPSON	Crystal	MC-146 32.7680KA-AC0:RoHS	Y2	1		
15	VARITRONIX	LCD	VIM-878	LCD1	1		
16	TDK	Varistor	AVRL161A6R8GTA	ZD1	1		
17	MURATA	Ferrite bead	BLM18PG600SH1D	L1,L3	2	nomount	
18	MURATA	Ferrite bead	BLM21PG600SZ1D	L2,L4	2	nomount	
19	TOSHIBA	Diode	DF2S5.6CT,L3F	D1	1	nomount	
20	TE	Chip resistors	2-2176091-4	R20	1		
21	Bourns	Chip resistors	CRM2512-FX-1R00ELF	R21	1		
22		Chip resistors	CRHV1206AF10M0FKFT	R8	1		
23	Panasonic	Chip resistors	ERJ-PA3F1002V	R9,R14,R19R23	4		
24	KOA	Chip resistors	RK73Z1JTTD	R34,R35,R36,R37,R39, R41,R45,R46,R47,R48, R54	11		
25	KOA	Chip resistors	RK73H1JTTD1002F	R2,R3,R5,R6	4	nomount	
26	KOA	Chip resistors	RK73H1JTTD1202F	R4	1	nomount	
27	KOA	Chip resistors	RK73B1JTTD202J	R7	1	nomount	
28	KEYSTONE	Chip resistors	5111	R33	1	nomount	
29	KOA	Chip resistors	MCT06030C1104FP500	R10	1		
30	KOA	Chip resistors	MCT0603PD1001DP500	R12,R15	2		
31	KOA	Chip resistors	MCT0603PD1003DP500	R13	1		
32	KOA	Chip resistors	ERJ-PB6B2000V	R16	1		
33	KOA	Chip resistors	ERJ-PB6D3003V	R17	1		
34	KOA	Chip resistors	ERJ-PB6D2003V	R18	1		
35	KOA	Chip resistors	RK73H1JTTD5101F	R27,R28	2	nomount	
36	MURATA	Chip capacitor	GRM155B31C104K	C19,C21,C24,C28	4		
37	YAGEO	Chip capacitor	CC0402KRX5R5BB475	C2,C6,C10	3	nomount	
38	MURATA	Chip capacitor	GRM155B30J105K	C17,C20,C25,C30,C31, C32,C33,C35,C36	9		
39	MURATA	Chip capacitor	GRM1552C1H100J	C15,C16	2	nomount	
40	TDK	Chip capacitor	C1608X7R1A225K080AC	C18	1		
41	MURATA	Chip capacitor	GRM1552C1H100J	C22,C23	2	nomount	
42		Chip capacitor		C26	1	nomount	
43	MURATA	Chip capacitor	GRM1552C1H102J	C27	1	nomount	
44	YAGEO	Chip capacitor	CC0603KRX7R9BB273	C29	1		
45	Samsung	Chip capacitor	CL10A335KP8NNNC	C34	1		
46	Diodes	Regulator	AP2138N-3.0TRG1	U4	1		
47		Connector		TP1,T1,TP2,T2,T3,TP4 T4,T5,T6,T7,T8,T9,T10 T11,T14,T17,T18,T19, T20,T21,T22,T23,T24, T25,,T26,T27,T28,T29 T30,T135,T136,T137, T138,T139,T140,T141, T142,T143,T144,T145, T146,T147,T148,T149, T150	45		φ1.0
48	Molex	Connector	0731000114	CN2	1	nomount	
49	Sullins	Connector	PPPC111LFBN-RC	H1,H2	2		
50	AKIZUKI	Connector	PH-1x40SG	T12,T13,T15,T16	4		
51	Vishay	Chip resistors	RCC080510M0FKEA	R11	1		
52	Vishay	Chip resistors	LVR03R0100FE70	R38	1	nomount	
53	KOA	Chip resistors	RK73H1JTTD1002F	R24,R43	2	nomount	
54	MURATA	Chip capacitor	GRM155B31C104K	C40	1	nomount	
55	KOA	Chip resistors	RK73Z1JTTD	R40,R49,R50,R51,R52	5	nomount	
56	KOA	Chip resistors	RK73H1JTTD1003F	R44	1	nomount	
57	Microchip	IC chip	23LC512T-I/SN	U5	1	nomount	
58		Chip capacitor		C8	1	nomount	
59		Chip capacitor		C1,C5,C3,C4,C7,C9, C11,C12,C13,C14	10	nomount	
60		Chip resistors		R1,R29,R30,R31,R42, R53	6	nomount	
61	KEYSTONE	Chip resistors	5111	R32	1		
62		Chip resistors	RK73H1JTTD1001F	R25,R26	2		
63	Adafruit	Bridge board	2264	Adafruit 2264	1		

Revision History

<div align="right">Attachment－1</div>

Rev. No.	Date	Page	Category	Contents
Rev 1.0	2022/02/22	All	New	New establishment

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