CC-218 VOL BOARD Design

2023/08/20
2025/04/08

Specifications

Contents

Outline spec

*** Inputs**

Name	Input imp.	Max input	Note
EQ	15k Ohm	10.0V	
DAC	15k Ohm	10.0V	Input resistor bridges RCA jack and this board
AUX	15k Ohm	10.0V	Input resistor bridges RCA jack and this board

*** Outputs**

Name	Output impedance	Max output	Note
PRE OUT	47 Ohm	12.0V	Output resistor bridges RCA jack and this board
REAR OUT	47 Ohm	12.0V	Output resistor bridges RCA jack and this board

*** Selector**

Shunt type selector ==> audio signals don't pass through a switch
Micro relay that employs Au contact is employed

*** Volume**

Digitally controlled analog volume is employed
Commands are received from BD3 MCU Board

*** PCB**

Double-sided through hall PCB

Power dissipation

Analog power: +23V

Device	QTY	Current	Total	Note
PGA2310	1	10.0mA	10.0mA	
78L15	4	6.5mA	26.0mA	
OPA627	4	7.5mA	30.0mA	
LME49720	1	12.0mA	12.0mA	
Grand total			78.0mA	

Analog power: -23V

Device	QTY	Current	Total	Note
PGA2310	1	10.0mA	10.0mA	
79L15	4	6.5mA	26.0mA	
OPA627	4	7.5mA	30.0mA	
LME49720	1	12.0mA	12.0mA	
Grand total			78.0mA	

Digital power: +5V

Device	QTY	Current	Total	Note
PGA2310	1	1.5mA	1.5mA	
G5V-2-DC5V	6	100.0mA	600.0mA	
LED	2	20.0mA	40.0mA	
Grand total			641.5mA	

Connector spec

*** PL401: Digital**

Connected with: BD3 MCU Board

Connector: B14B-XH-A (14-pin SIL, 2.5mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	nMUTE	Mute request to VOL chip	Active low
2	ZCEN	Zero cross enable to VOL chip	
3	nCS	Chip select to VOL chip	Active low
4	SCLK	Serial clock to VOL chip	
5	SDI	Serial data to VOL chip	
6	SDO	Serial data from VOL chip	
7	+5V	Power supply for digital circuits	
8	+5V	Power supply for digital circuits	
9	DGND	Digital ground	
10	DGND	Digital ground	
11	nSEL_PHONO	Select PHONO	Active low
12	nSEL_DAC	Select DAC	Active low
13	nSEL_AUX	Select AUX	Active low
14	DGND	Ground	

*** PL402: PowerIn**

Connected with: PS1, PS2 (PSU) 2024/04/26

Connector: S8B-XH-A (8-pin SIL, 2.5mm spacing) 2025/02/04

Pin assignment:

Pin#	Signal	Function	Note
1	~~AGND~~~~+23V~~+24V	Analog ground	
2	~~AGND~~~~+23V~~+24V	Analog ground	
3	~~+23V~~AGND	Plus power supply	
4	~~+23V~~AGND	Plus power supply	
5	AGND	Analog ground	
6	AGND	Analog ground	
7	~~-23V~~-24V	Minus power supply	
8	~~-23V~~-24V	Minus power supply	

*** PL403: PowerOut**

Connected with: BD4 VOL Board

Connector: S8B-XH-A (8-pin SIL, 2.5mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	GND	Ground	
2	GND	Ground	
3	GND	Ground	
4	GND	Ground	
5	+23V	Plus power supply	
6	GND	Ground	
7	-23V	Minus power supply	
8	GND	Ground	

*** SK401: EQ_L**

Connected with: BD5 EQ Board

Connector: 2-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	EQ_L	L-ch of EQ output	

*** SK402: EQ_R**

Connected with: BD5 EQ Board

Connector: 2-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	EQ_R	R-ch of EQ output	

*** SK403: DAC_L**

Connected with: J5 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	DAC_L	L-ch of DAC	

*** SK404: DAC_R**

Connected with: J6 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	DAC_R	R-ch of DAC	

*** SK405: AUX_L**

Connected with: J7 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	AUX_L	L-ch of AUX	

*** SK406: AUX_R**

Connected with: J8 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	AUX_R	R-ch of AUX	

*** SK407: PRE_OUT_L**

Connected with: J9 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	PRE_OUT_L	L-ch of PRE OUT	

*** SK408: AUX_R**

Connected with: J10 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	PRE_OUT_R	R-ch of PRE OUT	

*** SK409: REAR_L**

Connected with: J11 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	REAR_L	L-ch of REAR OUT	

*** SK410: REAR_R**

Connected with: J12 (RCA jack in Back Panel)

Connector: 3-pin SIP pin socket, 2.54mm spacing)

Pin assignment:

Pin#	Signal	Function	Note
1	AGND	Analog ground	
2	AGND	Analog ground	
3	REAR_R	R-ch of REAR OUT	

PCB spec

*** Basic spec**

t=1.6mm, double-sided PCB
Substrate: FR-4
Copper: Tough pitch, t=35um (1oz)
Finish: LeadFree HASL
Track width (signal): 0.152mm (min), 0.2mm (norm)
Track width (power/GND): 0.152mm (min), 0.5mm (norm), 1.2mm (max), 1.8mm (for AGND)
Spacing track to track: 0.152mm
Spacing track to via: 0.304mm
Spacing track to pad: 0.152mm
Small via (for signal track): hole: 0.3mm, width: 0.6mm
Large via (for power/GND track): hole: 0.6mm, width: 1.2mm

*** Dimension**

See the sheet "PcbDesign".

*** Layout of the key parts**

See the sheet "PcbDesign".

*** Guard ground**

Ground plane is used to prevent crosstalks.
The potential of the ground plane is defined ~~GGND~~AGND. [Rev.A]
~~GGND is connected to AGND (analog ground) at one point, so that signal currents never go through GGND plane.~~

*** Ground connection**

AGND and DGND are connected near the volume chip (PGA2310).
Signal grounds (AGND and DGND) are connected to FG (frame ground) at one of the studs that supports BD4.

[END OF DOCUMENT]