

## RELAY ATTENUATOR

Relay Attenuator shield has been designed for Audio attenuation after Piano DAC output by 1dB step size, Its Compact and simple circuit, Just 6 tiny relays implement a 64-step logarithmic stereo attenuation. The 64 steps of 1.0dB together span a 63dB audio attenuation range. By avoiding any active electronics, a very clean and open sound is maintained.



## Features:

- ◆ Constant Input resistor:**10K**
- ◆ Load resistance: **60K**
- ◆ Resistance standard:**E192**
- ◆ Step Size :**1dB**
- ◆ No.of relays:**6**
- ◆ No.of Steps:**64dB**

**Input audio connectivity:** Stereo inputs through on-board RCA Connectors.

Left Out→white RCA connector.

Right Out→Red RCA connector.

**Output audio connectivity:** Stereo outputs through on-board RCA Connectors.

Left Input→white RCA connector.

Right Input→Red RCA connector.

**PCB Dimension:** 85X67.8X22.2mm (W\*L\*H)

**Weight:** 42gm.

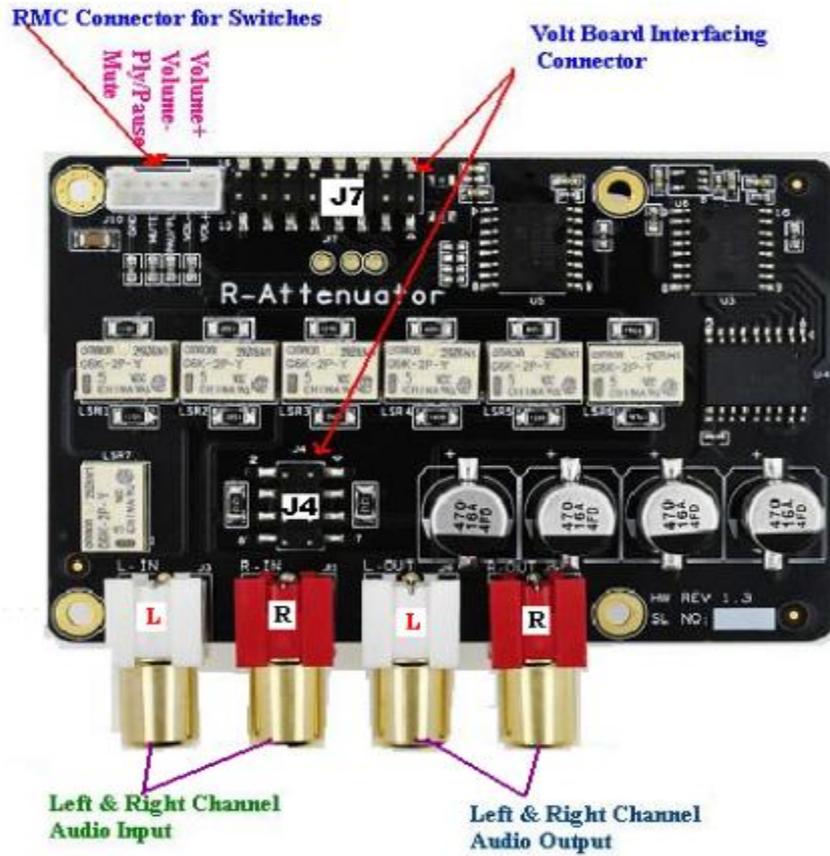
**Operating Temperature:** 0° C to 70°C

**Relay Attenuator** is an add-on stereo sound attenuation card for Sparky / RPI- 2 & 3 version SBCs.

The Relay Attenuator takes the analog audio Input signal from the **PIANO Hi-Fi DAC** through on-board board to board connector or RCA Connector and delivers variable analog audio output to the Piano RCA connectors and Board to Board Connector (to VOLT).

RPI/Sparky sends control signals through I2C interface and I2C EXPANDER (PCF8574) Provides GPIO,s to control Relay Driver(ULN2803), Relay Driver drives 6-stage Relays to achieve 0-63dB (64 steps) logarithmic attenuation.

### Relay Attenuator TOP View



### Relay Attenuator BOTTOM View



## RELAY ATTENUATOR BOARD TO BOARD CONNECTOR PIN OUT DETAILS

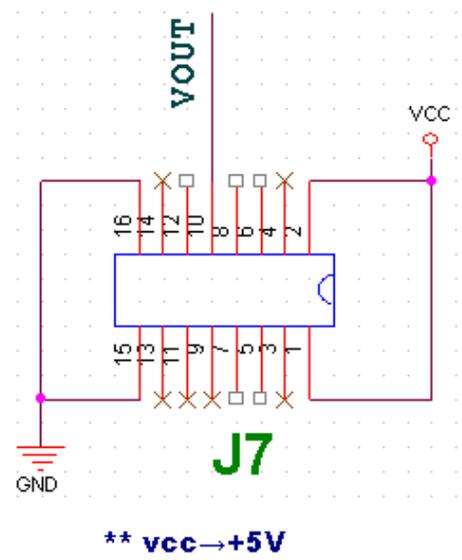
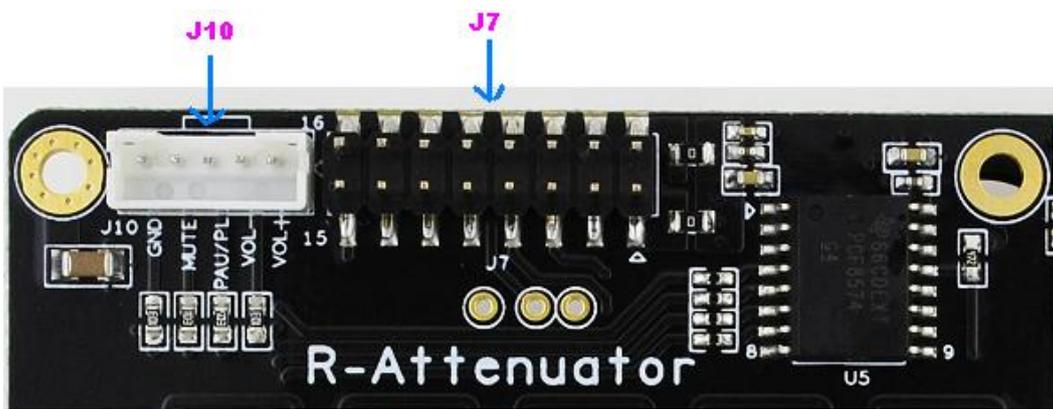
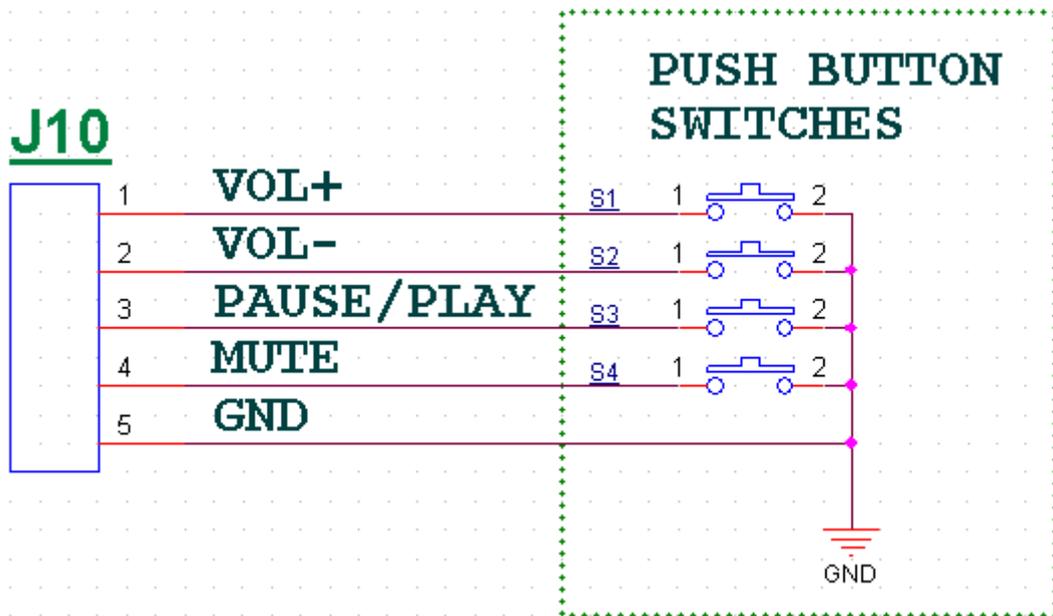
RELAY ATTENUATOR J8 PIN OUT DETAILS					
PIANO DAC	RELAY ATTENUATOR	PIN		RELAY ATTENUATOR	PIANO DAC
5V	5V	1	2	5V	5V
NC	NC	3	4	NC	NC
TWI2_SDA	SDA	5	6	NC	GPIOB14
TWI2_SCK	SCK	7	8	GPIOB15	GPIOB15
NC	NC	9	10	NC	GPIOB16
NC	NC	11	12	NC	GPIOB30
SDZ_AMP	NC	13	14	NC	MUTE_AMP
GND	GND	15	16	GND	GND

RELAY ATTENUATOR J9 PIN OUT DETAILS					
PIANO DAC	RELAY ATTENUATOR	PIN		RELAY ATTENUATOR	PIANO DAC
5V	5V	1	2	5V	5V
AUDIO RIGHT	AUDIO RIGHT	3	4	AUDIO LEFT	AUDIO LEFT
AUDIO RIGHT	AUDIO RIGHT	5	6	AUDIO LEFT	AUDIO LEFT
GND	GND	15	16	GND	GND

RELAY ATTENUATOR J7 PIN OUT DETAILS					
VOLT	RELAY ATTENUATOR	PIN		RELAY ATTENUATOR	VOLT
5V	5V	2	1	5V	5V
NC	NC	4	3	NC	NC
GPIOB14	NC	6	5	SDA	TWI2_SDA
GPIOB15	GPIOB15	8	7	SCK	TWI2_SCK
GPIOB16	NC	10	9	NC	NC
GPIOB30	NC	12	11	NC	NC
MUTE_AMP	NC	14	13	NC	SDZ_AMP
GND	GND	16	15	GND	GND

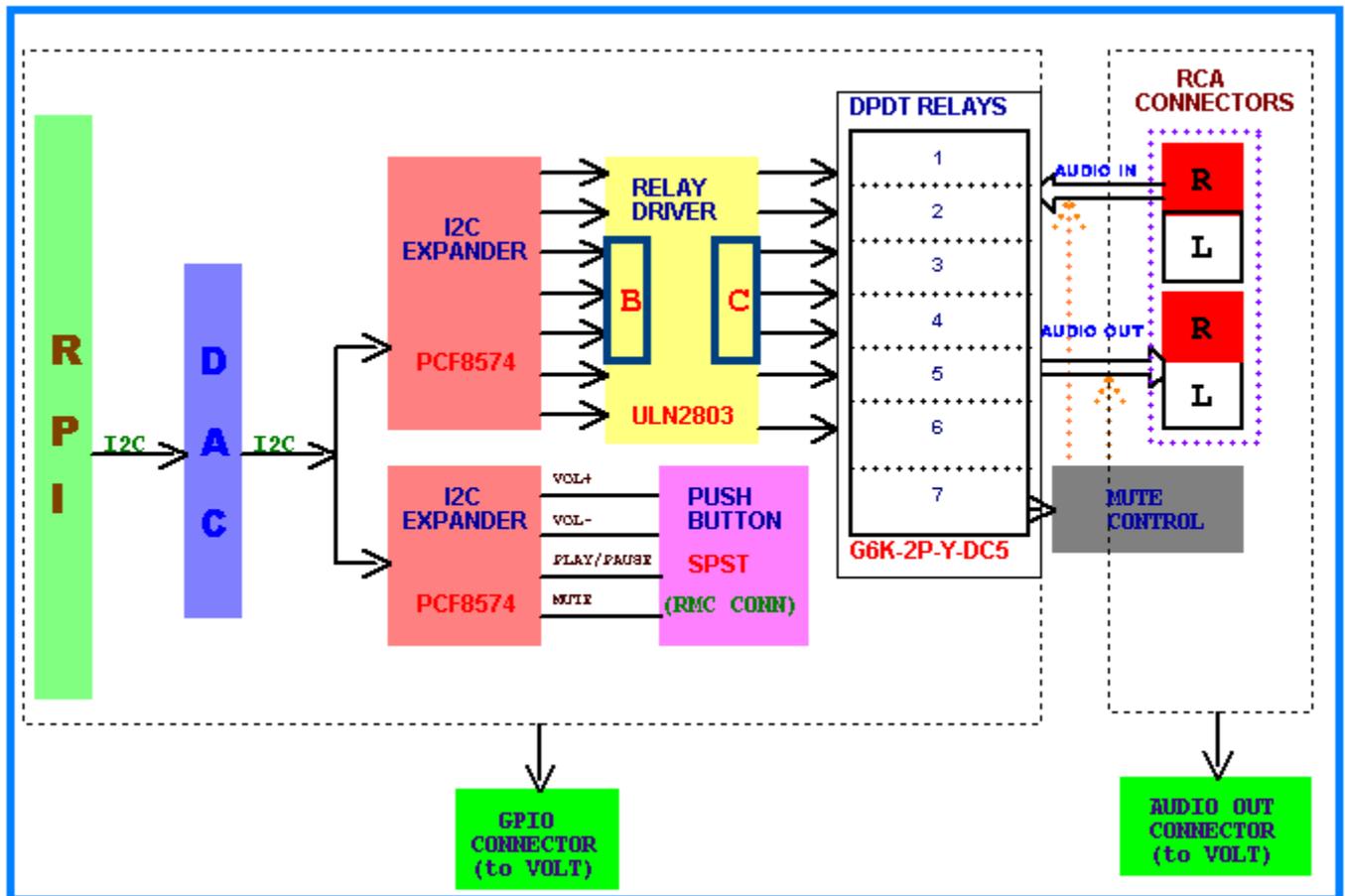
RELAY ATTENUATOR J4 PIN OUT DETAILS					
VOLT	RELAY ATTENUATOR	PIN		RELAY ATTENUATOR	VOLT
5V	5V	2	1	5V	5V
AUDIO LEFT	AUDIO LEFT	4	3	AUDIO RIGHT	AUDIO RIGHT
AUDIO LEFT	AUDIO LEFT	6	5	AUDIO RIGHT	AUDIO RIGHT
GND	GND	16	15	GND	GND

**PUSH BUTTON SWITCHES AND IR SENSOR WIRING DIAGRAM.**



**IR SENSOR**

## RELAY ATTENUATOR BLOCK DIAGRAM



**Power (5V):** No need to connect extra power source to Relay Attenuator, 5V power will source from SBC through DAC compatible header.

**Power (3.3V):** 3.3V power Generated with on-board 5V to 3.3V LDO.