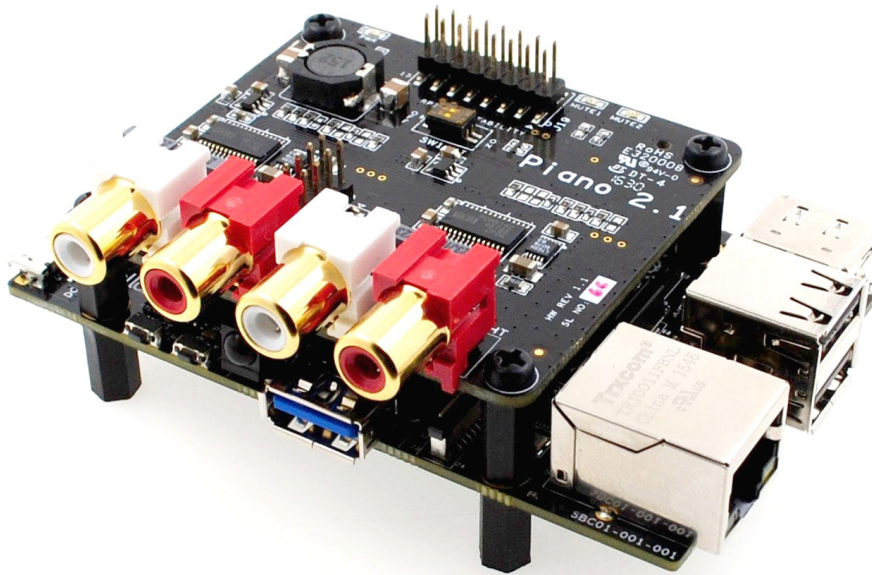


PIANO Hi-Fi DAC 2.1

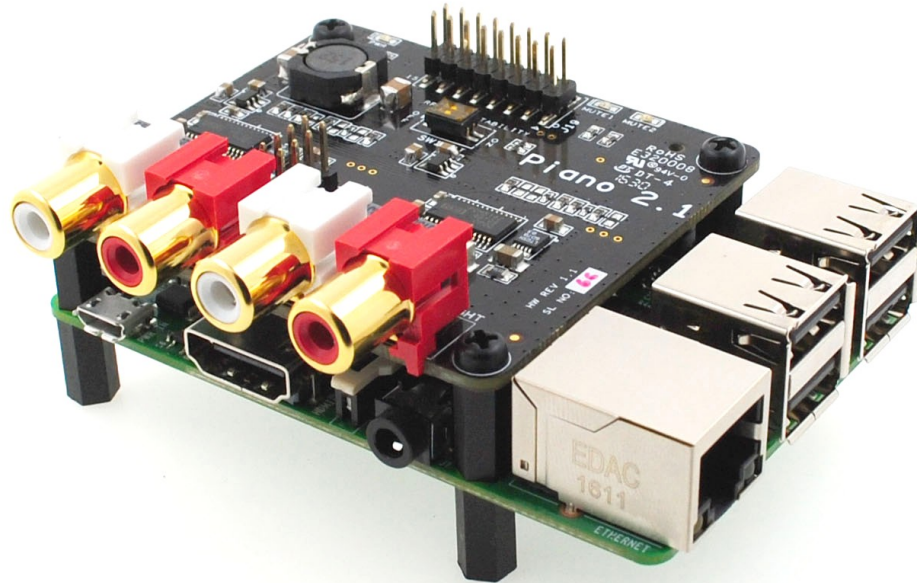
TECHNICAL MANUAL

PIANO Hi-Fi DAC 2.1 (with subwoofer output)

PIANO Hi-Fi DAC 2.1 Shield has been designed for those seeking audio perfection and that extra bass. We have two versions of PIANO HI-FI DAC, 2.0 (only L, R output) and 2.1(with subwoofer). These are specially designed sound cards for Sparky and RPI-2/3/A+/B+ versions.



Sparky + Piano 2.1



RPI + Piano 2.1

PIANO Hi-Fi DAC Features:

- 2 x Dedicated 384 kHz/32bit high-quality TI DAC PCM5142
- Available with different output connectors: 4 x RCA (2 L,R and 2 L,R Sub)
- DAC SNR is 112dB
- DAC THD+N @ - 1dBFS are -93dB
- Full Scale Output of DAC is 2.1Vrms
- Dynamic Range of DAC is 112dB
- Sampling Frequency ranges from 8 kHz to 384 kHz
- Ultra-low-noise voltage regulators for optimal audio performance
- Integrated EEPROM for automatic configuration (with write-protection):

Operating Temperature 0C to 70C

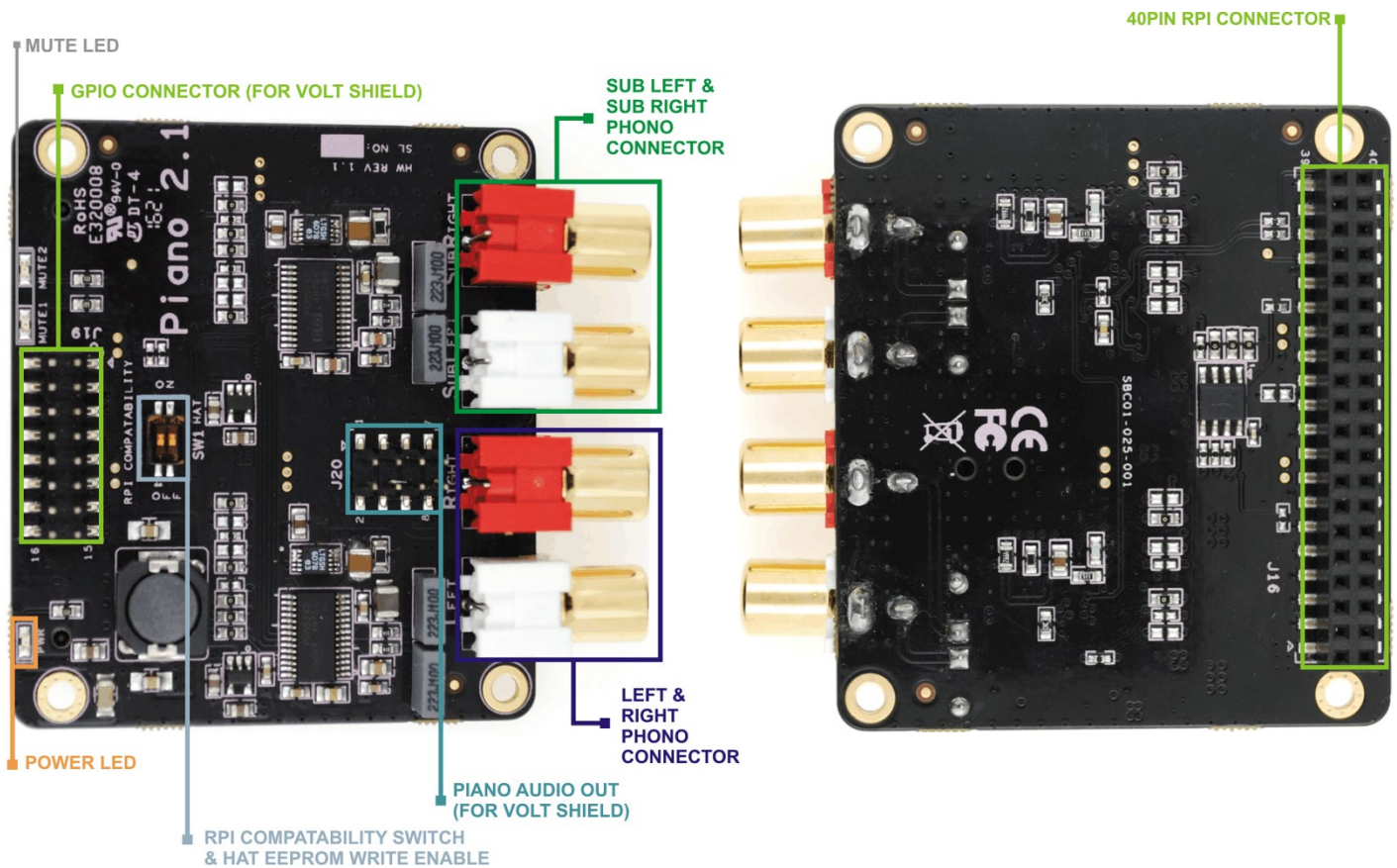
Board Size LWH = 68.7mm * 65mm * 22.2mm

Board Weight 30g

The Piano 2.1 takes the digital audio signal (I2S) from the Sparky/RPI and through the 2 onboard Texas Instruments PCM5142 DAC chipsets, delivers variable output analog audio to the Piano 2.1 RCA connectors. PIANO 2.1 uses 2 DAC ICs: One for Analog Audio (Left & Right) and Another for Analog Audio (SUB LEFT & SUB RIGHT).

The Piano 2.1 can be connected to the RPI compatible 40way pin header without any additional cable or soldering. While not HAT compliant, its HAT size and will fit in some RPI cases.

Component selection, Digital-Analog Partition and track layout have been in the forefront of our design to ensure noise immunity and best possible audio playback with the Piano 2.1.



Top Side Piano 2.1

Bottom Side Piano 2.1

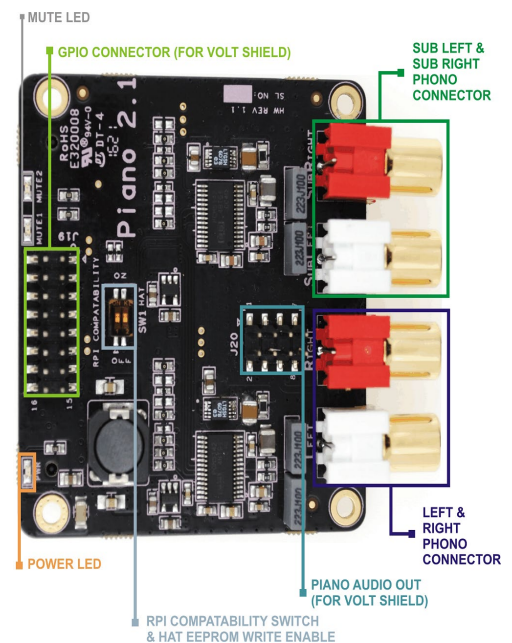
PIANO 2.1 Header PIN Out Details

PIANO 2.1- 40 Pin Bottom connector (RPI compatible)					
RPI	Sparky signal	PIN	PIN	Sparky signal	RPI
NC	NC	1	2	DCIN +5V	DC +5V
SDA1-I2C	I2C -2 SDA	3	4	DCIN +5V	DC +5V
SCL1-I2C	I2C -2 SCLK	5	6	GND	GND
GPIO4	GPIOB14	7	8	UART5_TX	UART_TX
GND	GND	9	10	UART5_RX	UART_RX
GPIO17	GPIOB15	11	12	I2S_BCLK0	I2S_BCLK
GPIO27	GPIOB16	13	14	GND	GND
GPIO22	MUTE_AMP	15	16	SDZ_AMP	GPIO23
NC	NC	17	18	GPIOB30	GPIO24
SPI_MOSI	I2C-3 SDA/SPIO_MOSI	19	20	GND	GND
SPI_MISO	SPIO_MISO	21	22	MUTE_DAC2	GPIO25
SPI_CLK	I2C -3 SCLK/SPIO_CLK	23	24	SPIO_SS	GPIO8
GND	GND	25	26	SPDIF	GPIO7
ID_SD	I2C-1 SDA	27	28	I2C -1 SCLK	ID_SC
GPIO5	I2S_MCLK0_2	29	30	GND	GND
GPIO6	MUTE_DAC1	31	32	GPIOB3	GPIO12
GPIO13	GPIOB4	33	34	GND	GND
I2S_LRCLK	I2S_LRCLK0_2	35	36	GPIOB13	GPIO16
GPIO26	GPIOB19	37	38	I2S_DIN_2	I2S_DIN
GND	GND	39	40	I2S_DOUT_2	I2S_DOUT

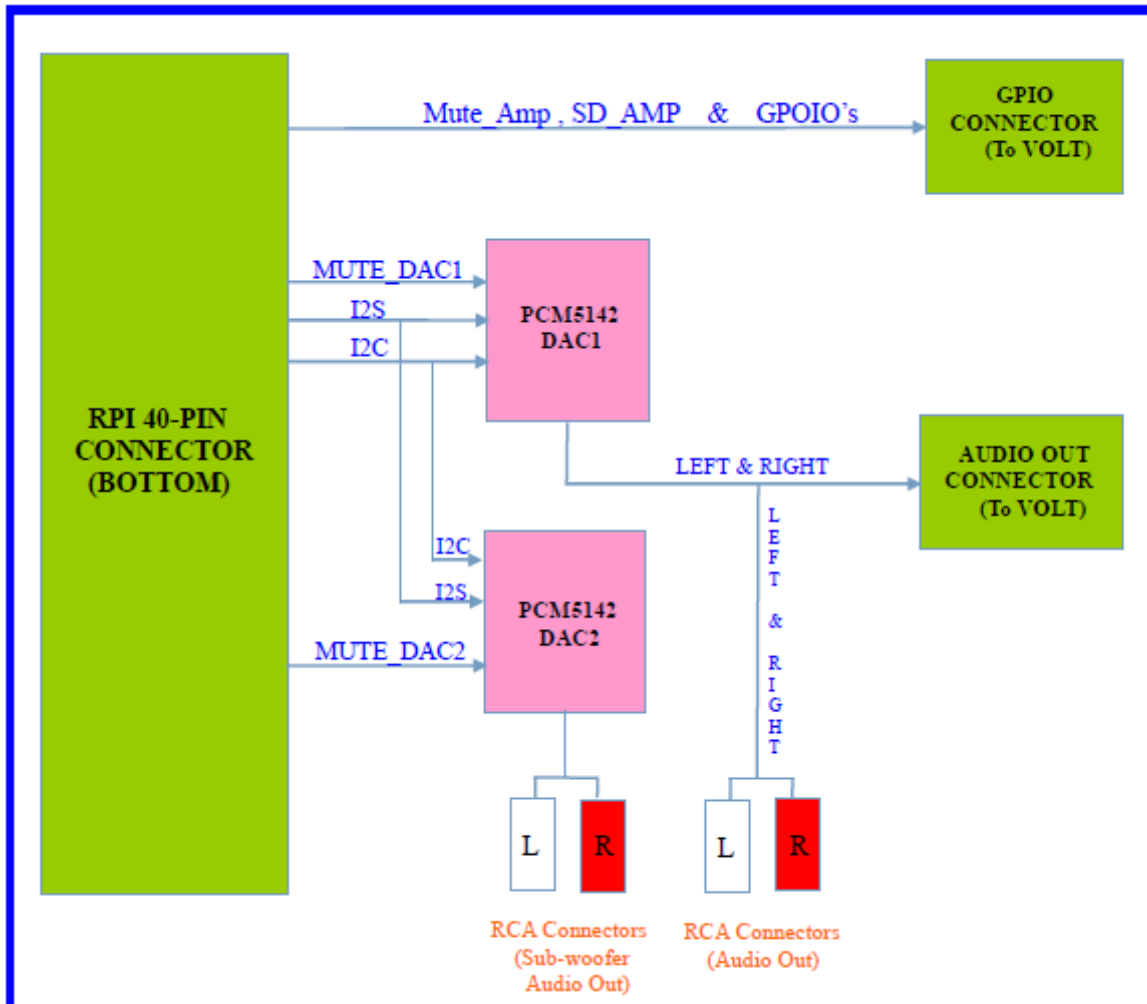
**_highlighted signals are used by piano board

PIANO J19 PIN OUT DETAILS					
RPI	SPARKY	PIN	PIN	SPARKY	RPI
5V	5V	1	2	5V	5V
NC	NC	3	4	NC	NC
SDA1-I2C	TWI2_SDA	5	6	GPIOB14	GPIO4
SCL1-I2C	TWI2_SCK	7	8	GPIOB15	GPIO17
NC	NC	9	10	GPIOB16	GPIO27
NC	NC	11	12	GPIOB30	GPIO24
GPIO23	SDZ_AMP	13	14	MUTE_AMP	GPIO22
GND	GND	15	16	GND	GND

PIANO J20 PIN OUT DETAILS			
SIGNAL	PIN	PIN	SIGNAL
GND	1	2	GND
AUDIO RIGHT	3	4	AUDIO LEFT
AUDIO RIGHT	5	6	AUDIO LEFT
GND	7	8	GND



PIANO Hi-Fi DAC 2.1 BLOCK DIAGRAM



LED STATUS

- **Green** LED'S - Indicates Power up and Mute status - always glow.
- Mute LED off indicates Audio is muted.
- Mute LED on indicates Audio is un-mute (plays).

Power (5V): No need to connect extra power source to PIANO HI-FI DAC, 5V power will source from SBC through RPI compatible header.

SWITCHES:

RPI COMPATIBILITY: switch 1 OFF position by default.

HAT: switch 2 changes to ON position for HAT eeprom write protect disabling, OFF for enable (default state).