**Code Description  
CS43L22 audio DAC, speaker driver**

1. In **STM32CubeMX**, you must enable **I2S3** to Half-Duplex Master mode and tick Master Clock Output for I2S3. set configuration of I2S3 with transmission mode to Mode Master Transmit and Audio Frequency to 44kHz and set I2S\_MCLKOUTPUT to enable. Then, you must enable **USART2** to asynchronous mode. You will see pin PA2 and PA3 will be enabled as USART2\_Tx and USART2\_Rx. Finally you can generate file.
2. In main.c, before while loop coding, you need to initialize this **CS43L2** first by this process.

* Set RESET (PD4 Pin) low until the power supplies are stable.
* Set RESET (PD4 Pin) to high again.
* Load the required initialization settings to device address (0x94) of the CS43L2 to **I2C** Master Transmit these controls according to these addresses.   
   + Write 0x99 to register 0x00.  
   + Write 0x80 to register 0x47.  
   + Write ‘1’b to bit 7 in register 0x32.  
   + Write ‘0’b to bit 7 in register 0x32.  
   + Write 0x00 to register 0x00.
* Apply **MCLK** at appropriate frequency by Interface Control 1 (address 0x06) by value 0x00.
* After that, we have to set Power Ctl 1 (address 0x02) register value to 0x9E.

1. In while loop, we have to play the sound according to the note that you receive from keyboard via **UART** receive. You can play only C4 and C5 to C7 notes if you sent other notes, it don’t play anything.
2. In function for play sound, you have to turn off your **BEEP** first by setting the **Beep & Tone Configuration** (0x1Eh) register with this value 0x20

|  |  |  |
| --- | --- | --- |
| BEEP1 | 0 | off |
| BEEP0 | 0 |
| BEEPMIXDIS | 1 | Mix Disabled |
| TREBCP1 | 0 | 5 kHz |
| TREBCF0 | 0 |
| BASSCF1 | 0 | 50 kHz |
| BASSCF0 | 0 |
| TCEN | 0 | Disabled |

1. Then, Reset the frequency of the BEEP sound by the note n from the parameter by setting the **Beep Frequency & On Time** (0x1Ch) register with note value. Finally, you use for loop 500 iterations to play sound by using **I2S** transmit with increase zero value of uint16\_t by 1 to until this value is 150. Then while loop will repeat step 3 to 5 again.