

Bit3 bit2 bit1 bit0	Theoretical DAC voltage	Measured DAC voltage
0	0	0
1	.22	.23
2	.44	.45
3	.66	.68
4	.88	.90
5	1.1	1.12
6	1.32	1.35
7	1.54	1.59
8	1.76	1.72
9	1.98	1.95
10	2.2	2.18
11	2.42	2.40
12	2.64	2.62
13	2.86	2.85
14	3.08	3.07
15	3.3	3.3

Resolution: $3.3V/(2^4 - 1) = 3.3/15 = .22 V$

Range: 0 – 3.3 V

Precision: 4 bits, 2^4 , 16 distinguishable DAC outputs

Accuracy: $(\text{Actual} - \text{Ideal}) / \text{Ideal}$, Mean Accuracy = $((.23-.22)/.22 + (.45-.44)/.44 + (.68-.66)/.66 + (.90-.88)/.88 + (1.12-1.1)/1.1 + (1.35-1.32)/1.32 + (1.59-1.54)/1.54 + (1.72-1.76)/1.76 + (1.95-1.98)/1.98 + (2.18-2.2)/2.2 + (2.4-2.42)/2.42 + (2.62-2.64)/2.64 + (2.85-2.86)/2.86 + (3.07-3.08)/3.08 + (3.3-3.3)/3.3)/15 = 0.00833570469$

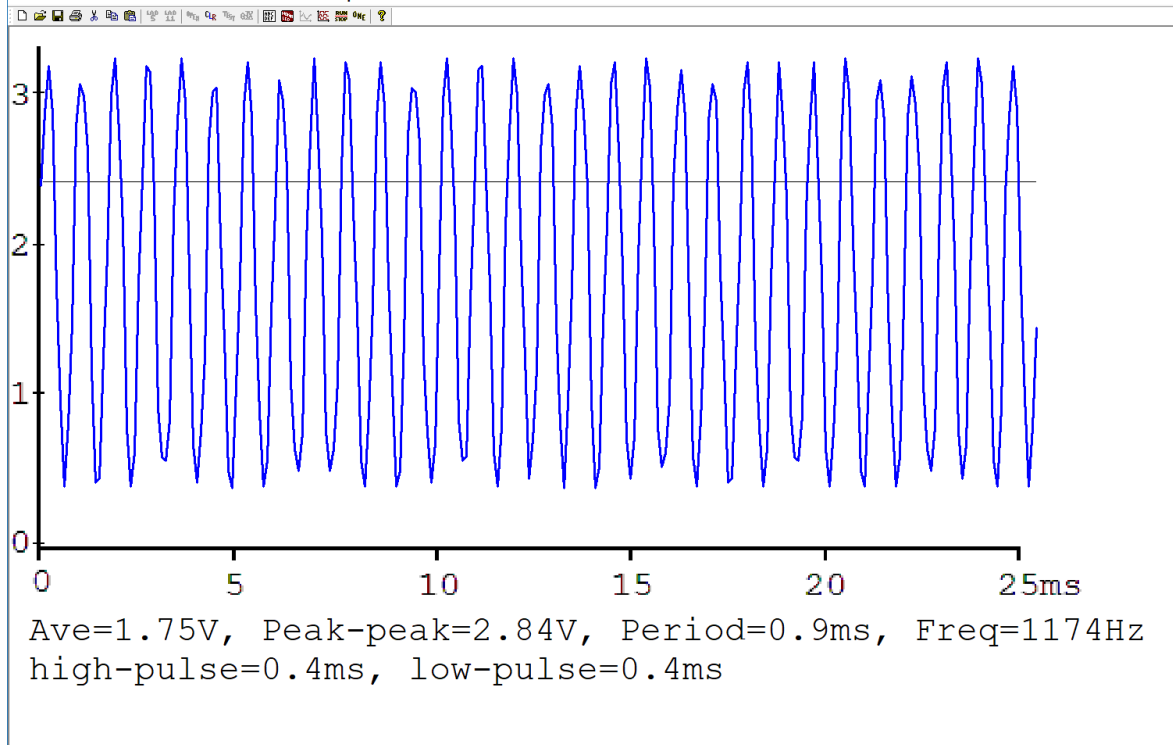
6a. The interrupt trigger occurs when a button is pressed and then runs EnableInterrupts();

b. The interrupt vector is in the Startup.s file.

c. After the trigger occurs, the LR is loaded with the current value of the PC and the PC is loaded with the value stored in the vector table, which leads to the execution of the handler.

d. This returns from interrupt because it changes the memory location that the processor is executing on to the location that it was executing on before the interrupt was called.

File Edit COM Action View Help



8, 9, 11, 12, 13, 13, 14, 14, 15,
 14, 14, 13, 13, 12, 11, 9, 8, 7, 5,
 4, 3, 3, 2, 2, 1, 2, 2, 3, 3, 4, 5, 7
 uint8_t sine[32]

Systick Handler

sine[idx]
 DAC_Out

GPIO_PORTB_DATA_R → DAC

PORT E → pinsVal
 main → soundplay(note) → NVIC_SetReloadR

sine [8
 9
 1
 1
 7] idx = 0 x 20000

