I.F.F. (Identification Friend or Foe) System

By

Eric Meyers (emeyer7)

Noah Prince (nprince2)

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TA: Braedon Salz

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Contents

Acronyms & Pre-Requisite Information

- MCU - Microcontroller Unit
- R.F. - Radio Frequency
- T.I. - Texas Instruments
-

1 Introduction

This document is a "Mock Design Review" in preparation for the Design Review occuring during the week of February 29th, 2016. This will better prepare the team for documentation of the design and construction of the Infantry I.F.F. System.

2 Block Diagram

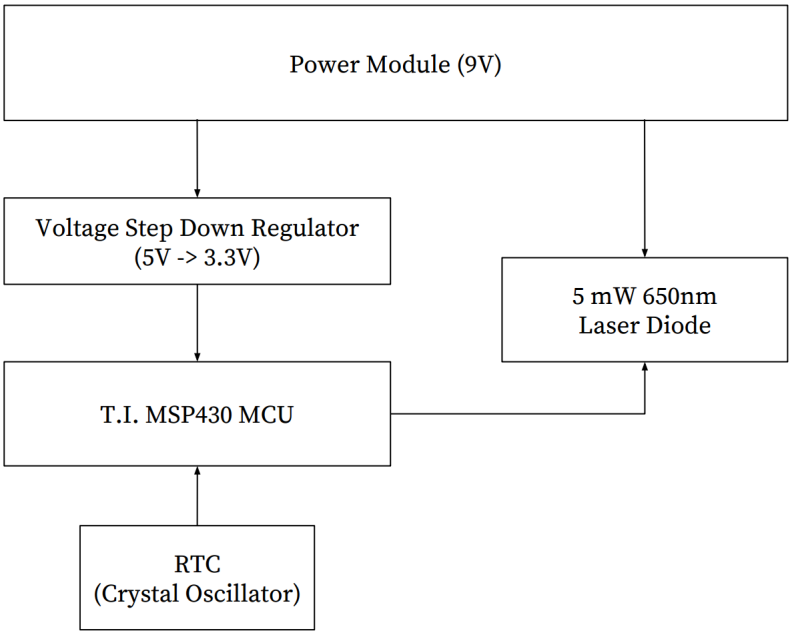

Figure 1: Block Diagram of Laser Transmitter

3 Block Description

The subsystem of the Laser Transmitter will be broken down into 5 primary modules:

1. Power Module
2. Voltage Step Down Regulator
3. Microcontroller
4. Real Time Clock
5. Laser Diode

Power Module

The Power Module will consist of a standard 9V battery. The type of 9-volt battery is at the discretion of the operator due to the availability on the market (i.e. either rechargable or disposable). However, a battery

with least 250 mAh of use time must be selected to supply the circuit with 9V over a period of 8 hours. The team will chose to use a 9V 300 mAh NiMH Rechargable Battery for testing purposes.

The team decided to use a 9 V battery instead of four double-A batteries due to the need of maintaining a constant 3.3V over time as well as simplicity (having one battery with a regulator is much simpler than having 4 double A batteries).

Voltage Step Down Regulator

The LD1117V33 voltage step-down regulator will take the 9V supply input and step it down to 3.3V to supply the MSP430 MCU. The voltage regulator will supply a maximum of 900 mA of current which will be significantly less than this circuit draws.

Microcontroller

This design choice was by far the most difficult. The team chose to work with an T.I. MSP430F2274 Microcontroller Unit due to its simplicity, its availability in the ECE445 Senior Design Labs (inventory) and the number of GPIO Pins on board. The

Real Time Clock

The Real Time Clock is not entirely neccessary for the operation of the Laser Transmitter Subsystem, however it will be neccessary for the operation of the R.F. Receiver and thus must be included in the MCU circuit. It will operate using a 32.768 kHz Crystal Oscillator (as reccomended by T.I.)

Laser Diode

The 5mW laser diode will operate on 3.3V at 25mA so a 1.3lω resistor is neccessary to drop the current being supplied to the diode down to this threshold. This laser diode will prode a beam width of ___

NOAH MAYBE ADD MORE TECHINCAL DETAIL FOR LASER DIODE SECTION

4 Circuit Schematic

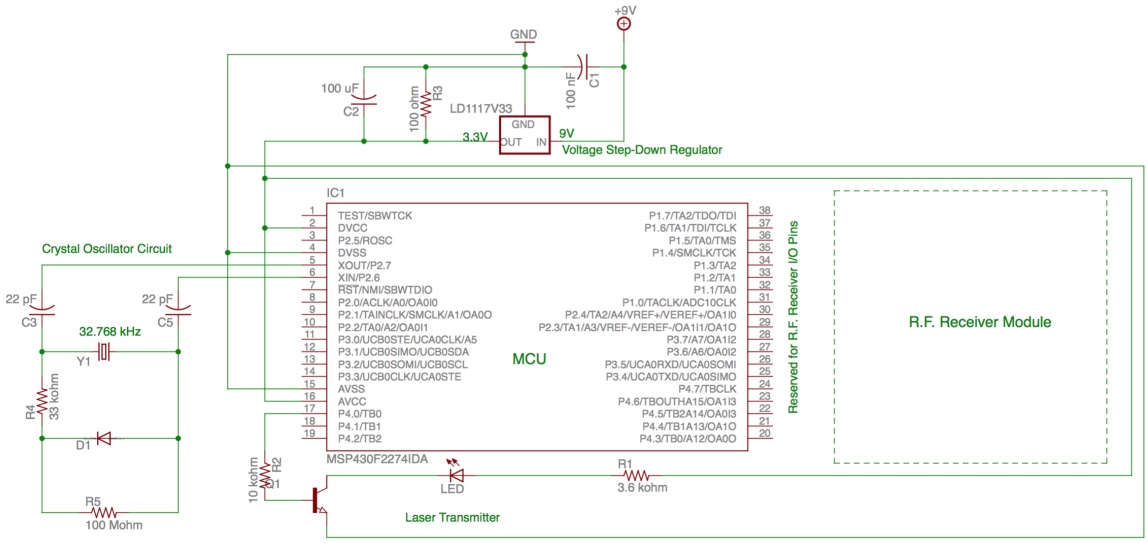

Figure 2: Circuit Schematic of Laser Transmitter

5 Plot

NOAH SECTION

6 Requirements and Verification

FILL OUT TOGETHER

7 Safety & Ethical Considerations

NOAH SECTION