DESIGN NOTES

REV -4 has TWO variant builds.

OPT1) 5V Buck boost -
This design represents the -2 design. To use this variant
- do NOT populate the OPT 2 components on sheet 1.
- IC1 should be LMV358LIST (5V limit) or TS462CST (handles 10V)

OPT2) Direct battery drive -
This represents a cost saving approach. To use this variant
- do NOT populate the OPT1 components on sheet 1.
- IC1 should ONLY be TS462CST (handles 10V)

HARDWARE CRITICAL:

IC1 CHANGES WITH
OPTIONAL BUILD (5V vs. BATTERY)

OPT1: LMV358LIST (5V limit)
OPT2: TS462CST (handles 10V)

Also, pay attention to BOM changes for pop / non pop

SOFTWARE CRITICAL:
1) OPT2: A separate enable line has now been
added "CPU_POWER_SAVE_CTRL" that disables the
the battery feed to the
circuit for OPT2. Software must now control this line also.

2) OPT2 - Battery direct mode has variance on supply
to IR LED circuit. Current to LED limited for 5V
circuit by resistors. 9V battery will double this current.
Software should alter desired current level by
monitoring battery voltage and scaling appropriately.

Revsion Notes:

5/15/17: Schematic and BOM changed
to show R9 = 3k for option detect. No
change to gerbers/layout, so no revision
change.

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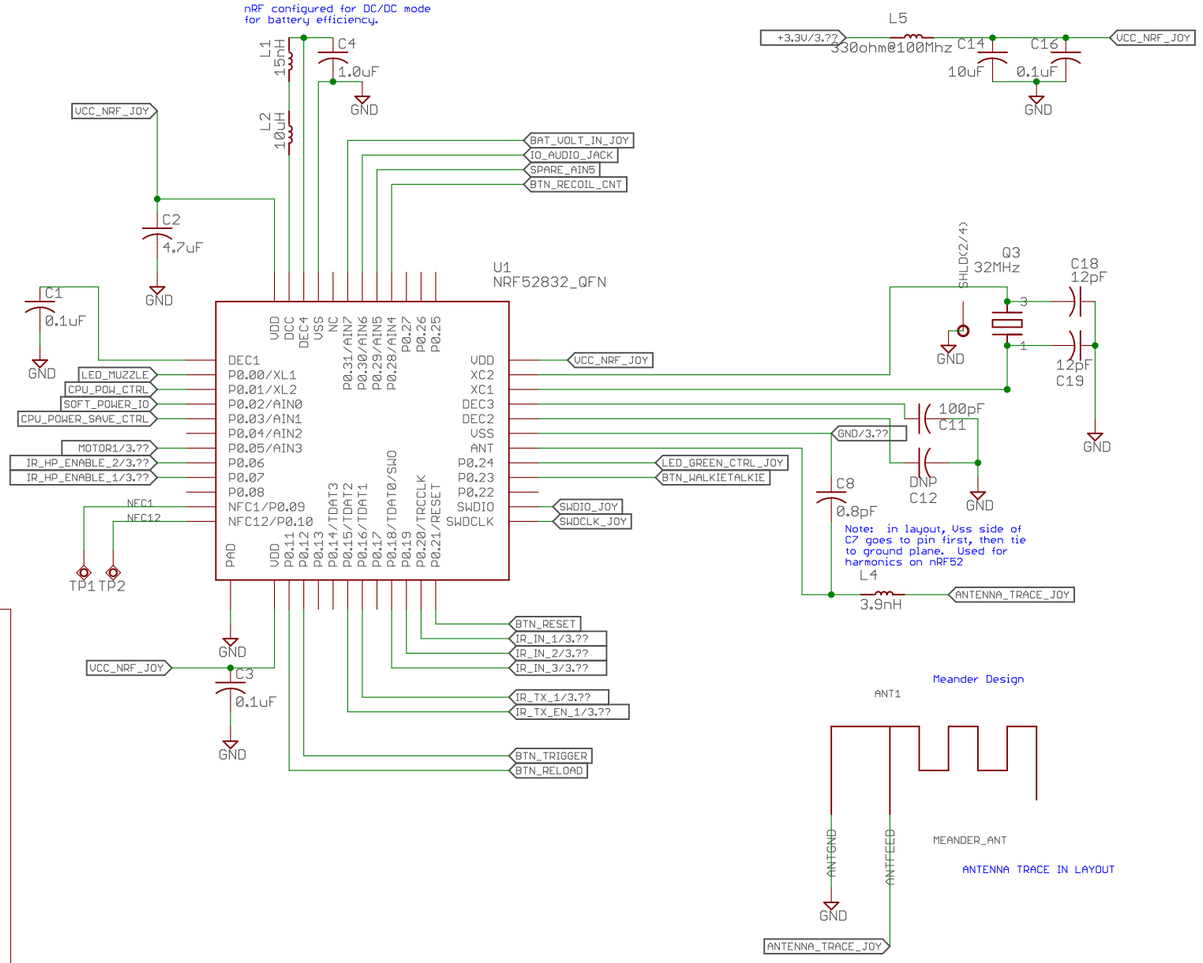
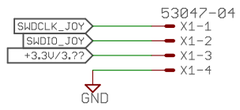
DRAWN	TITLE F17_Recoil_Gun Design Notes			REV -4
CHECKED	DATE 5/15/2017 7:57 PM		DRG Nº 1000	
DATE 4/11/2017	FILE: F17_Recoil_GunDEV_REV-4		PAGE: 1/3	

CPU and RADIO



JTAG and Serial



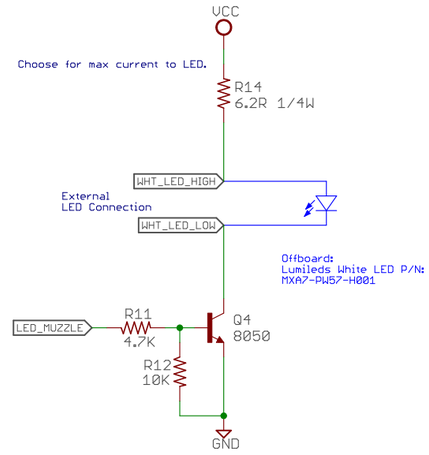
Ref Manual states SWDIO has internal pull-up and SWCLK has internal pull-down

-For standard SWD interface:
-GND goes to pins 3,5,9
-3.3V goes to pin 1
-SWDIO goes to pin 2
-SWDCLK goes to pin 4
-all other N/C

Meander Design

ANTENNA TRACE IN LAYOUT

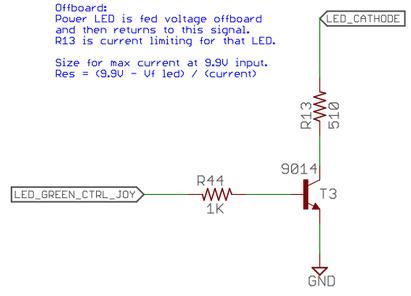
Muzzle LED



Power LED

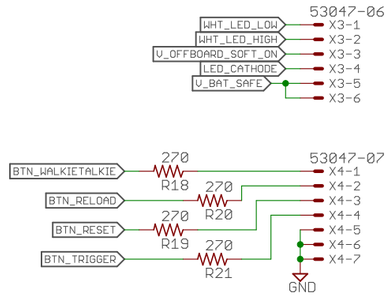
Offboard:
Power LED is fed voltage offboard and then returns to this signal.
R13 is current limiting for that LED.

Size for max current at 9.9V input.
Res = (9.9V - Vf led) / (current)

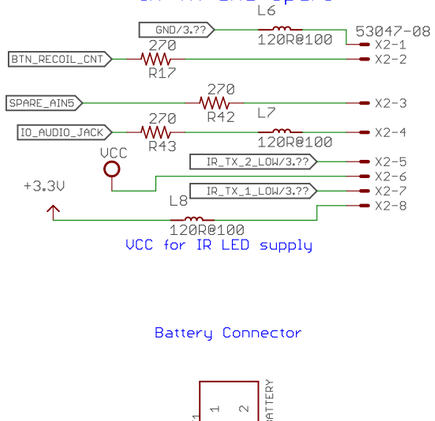


Connectors

Buttons and External LED

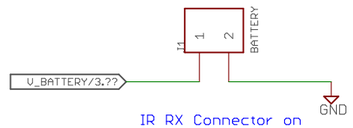


IR TX and Spare



VCC for IR LED supply

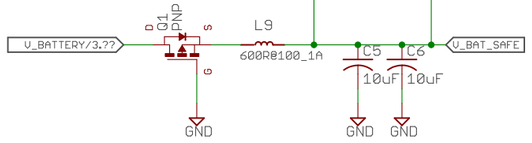
Battery Connector



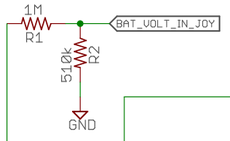
IR RX Connector on Separate Page

Battery Input

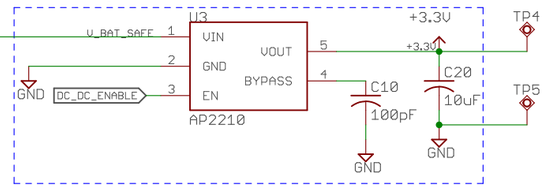
Reverse voltage protect



Scale as appropriate for ADC

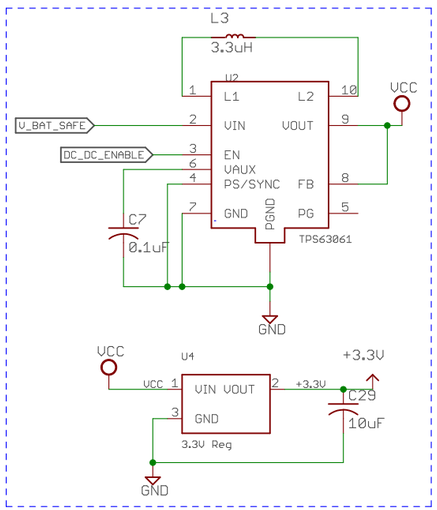


Opt2: Battery direct



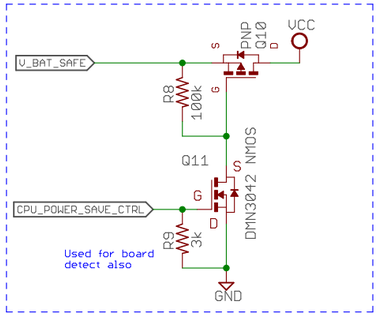
Opt1: 5V DC/DC Converter

Continuous current:
2A buck, 1.3A boost

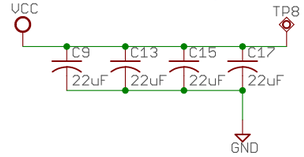


Opt2: Battery direct

Remove all 5V DC/DC and populate this to use.

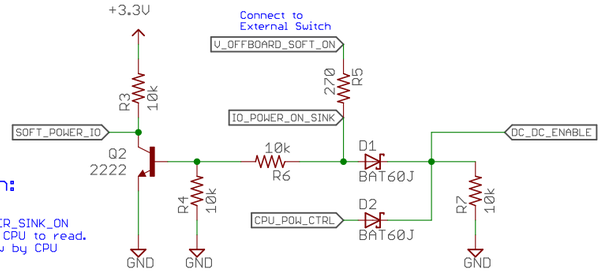


Caps for assist to LED pull and DC/DC stability



Soft On Operation:

S3 enables LDO
When up and running, IO_POWER_SINK_ON triggers "SOFT_POWER_IO" for CPU to read.
CPU_POW_CTRL when pulled low by CPU shuts down system.



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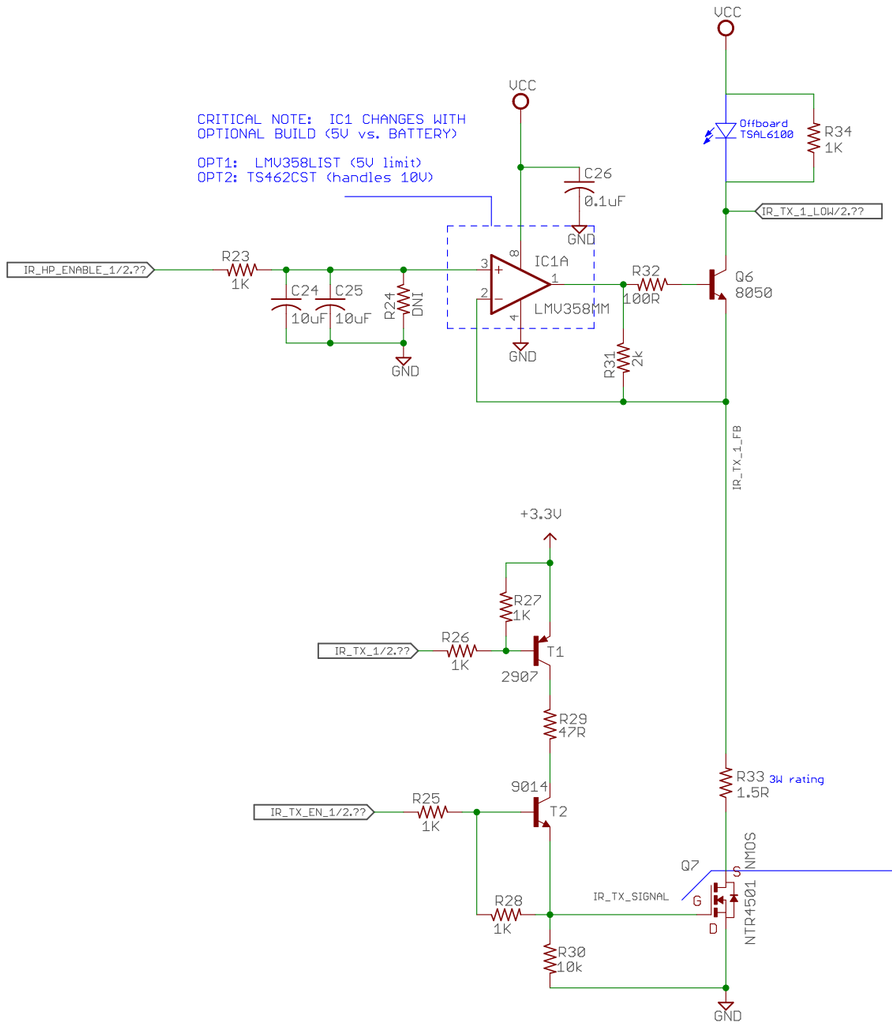
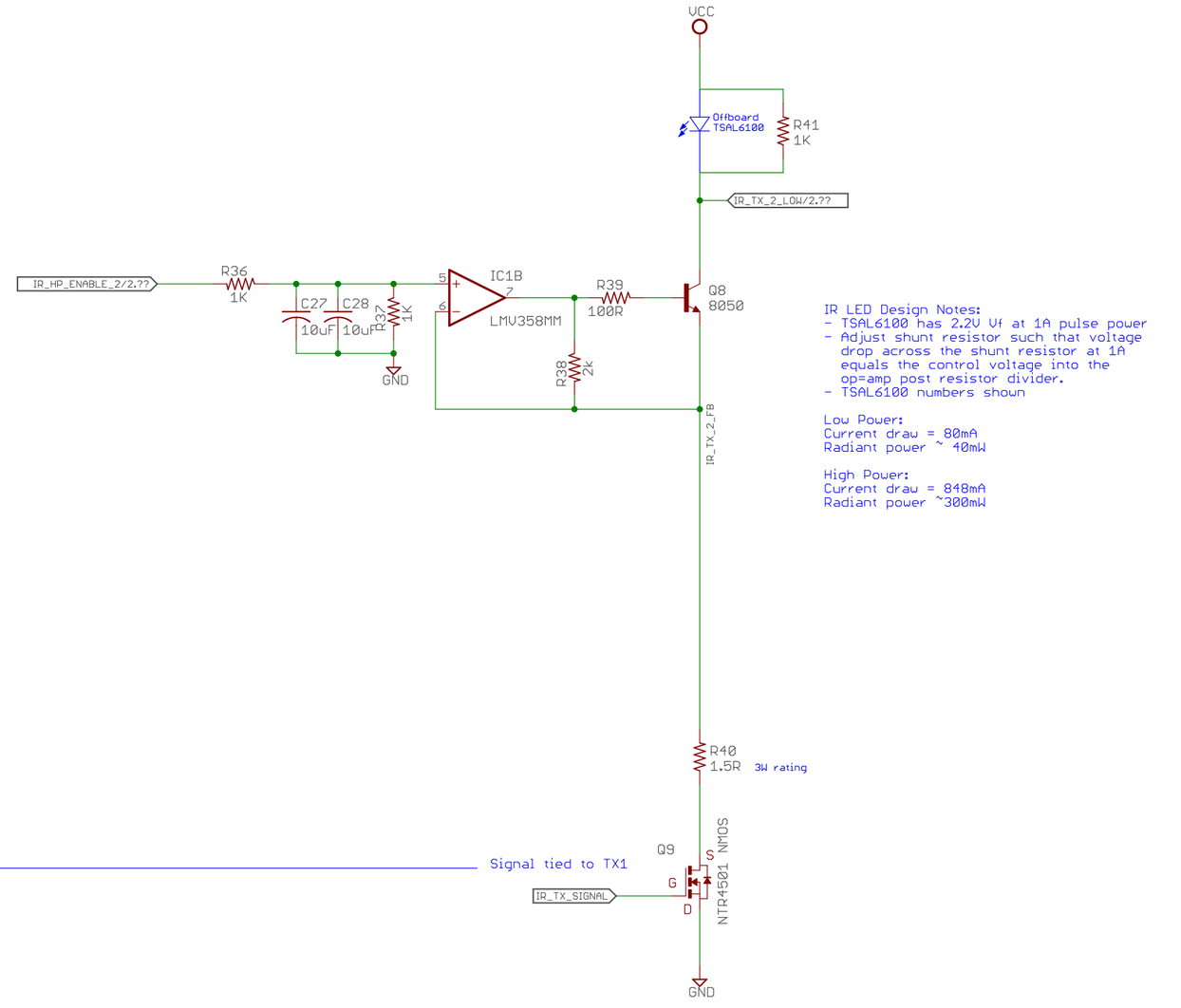
DATE 4/11/2017	FILE: F17_Recoil_GunDEV_REV-4		PAGE: 2/3

IR TX 1



IR TX 2

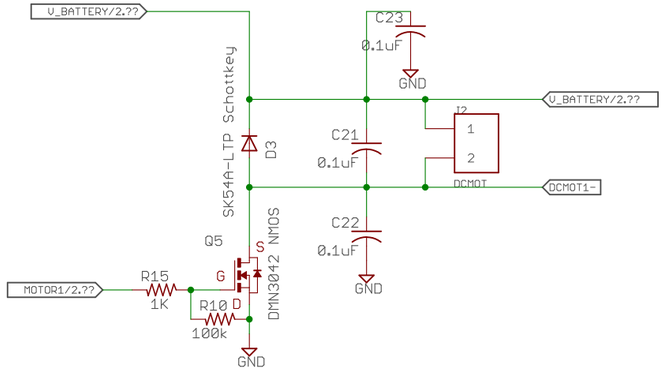


IR LED Design Notes:
- TSAL6100 has 2.2V Vf at 1A pulse power
- Adjust shunt resistor such that voltage drop across the shunt resistor at 1A equals the control voltage into the op=amp post resistor divider.
- TSAL6100 numbers shown

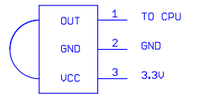
Low Power:
Current draw = 80mA
Radiant power ~ 40mW

High Power:
Current draw = 848mA
Radiant power ~300mW

HAPTIC MOTOR DRIVER

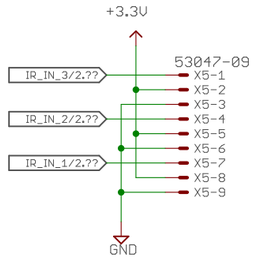


IR Receivers (3)



Intended RX:
TSOP53338

All Off Board



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