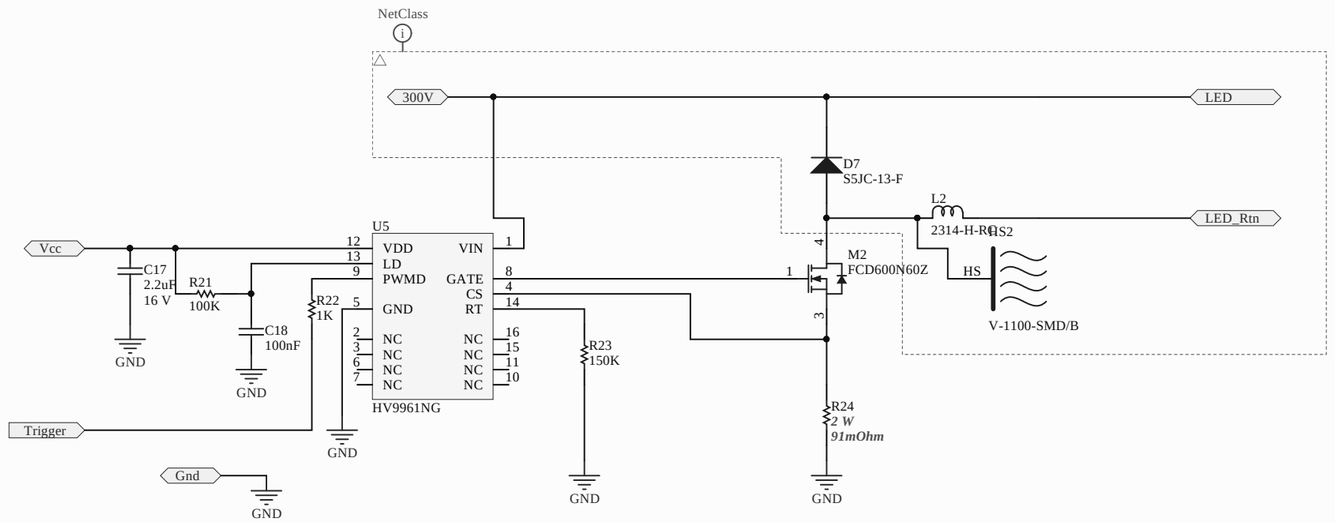
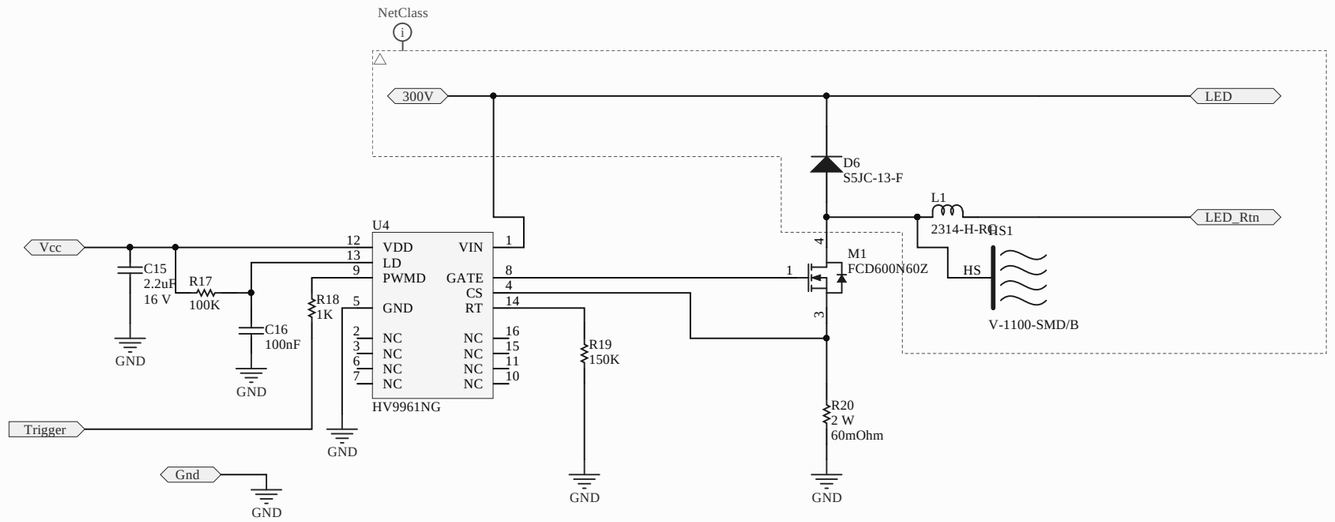
ClassName: 300V



Sheet Title: *			*
Project Title: ***Strobe-Light.PrjPcb***			* * * * *
Size: Tabloid	Number:	Revision:	
Date: 4/11/2019	Time: 1:33:13 PM	Sheet * of *	
Author: *	File: Led-Driver.SchDoc		

ClassName: 300V



Sheet Title: *			* * * * * *
Project Title: ***Strobe-Light.PrjPcb***			
Size: Tabloid	Number:	Revision:	
Date: 4/11/2019	Time: 1:33:13 PM	Sheet * of *	
Author: *	File: Led-Driver.SchDoc		

ClassName: 300V
NetClass

Visible_IP+
Visible_IP-
R25
0R
Polarity reversed for layout reason.
U6
ACS724LLCTR-10AB-T
VCC
GND
VIOUT
FILT
IP+ IP+
IP- IP-
C19
100nF
C21
1nF
R27
10K5
R28
0R
R31
10K
C24
1nF
1.024Vref
C22
100nF
C25
100nF
U8A
TLV3202AID
E16
5015
Filter resistor inside the chip,
1.8kOhm
1nF fc=556kHz
R33
13K7
R35
280R
C30
1uF
C28
100nF
U9
OPA320AIDBVR
R37
0R
E17
5016
PD_Visible_K
PD_Visible_A
R39
10M
R41
53K6
C32
2.7pF

Visible LED

ClassName: 300V
NetClass

IR_IP-
IR_IP+
R26
0R
U7
ACS724LLCTR-10AB-T
C20
100nF
C23
1nF
R29
16K5
R30
0R
R32
10K
C26
1nF
E14
5015
U8B
TLV3202AID
E15
5015
IR_LED_On
1.024Vref
C27
100nF
Filter resistor inside the chip,
1.8kOhm
1nF fc=556kHz
R34
13K7
R36
280R
C31
1uF
C29
100nF
U10
OPA320AIDBVR
R38
0R
E18
5016
PD_IR_K
PD_IR_A
R40
10M
R42
53K6
C33
2.7pF

IR LED

SOT23-5, OPA320, AD8691
PD circuit reference:
http://www.ti.com/lit/ug/tidu535/tidu535.pdf
http://edge.rit.edu/edge/P09051/public/photodiodeamplifers.pdf
http://www.analog.com/designtools/en/photodiode/
http://www.ti.com/lit/an/sboa061/sboa061.pdf

Current sensor calculation:
ACS724, sensitivity = 200mV/A
Output current 4.5A, set threshold at 2A.
Visible LED: 2.5V-2*0.2V=2.1V (Below)
IR LED: 2.5V+1*0.2V=2.7V (Above)

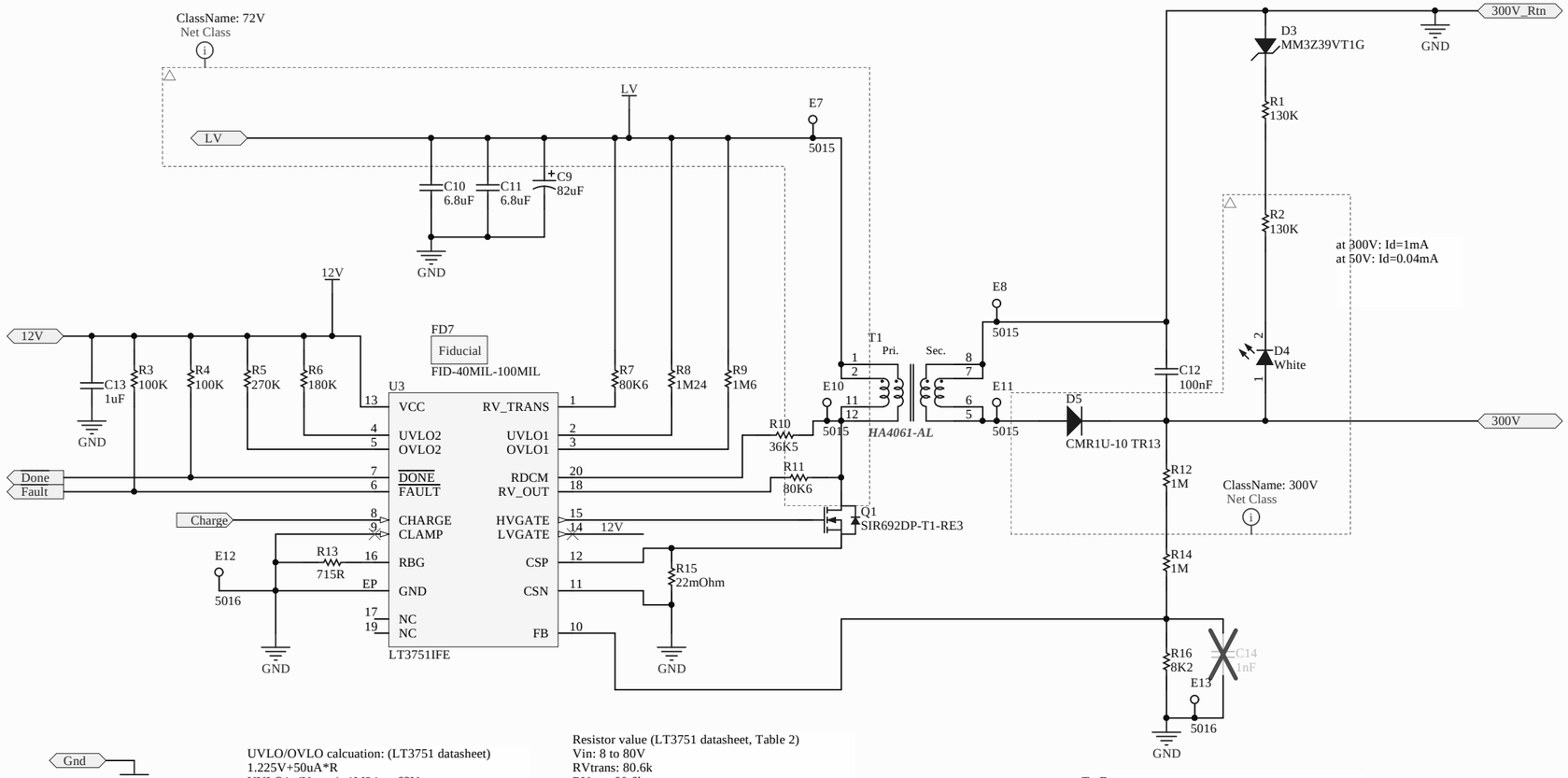
R24:10.51kOhm
R26:16.4kOhm

E19
R43
0R
5015
C34
100nF
U11
SN74LVC1G04DBVR
Visible_LED_On

Logic is inverted when using PD for visible light. U13 and C38 should be fitted for PD configuration.

5V
Gnd
U12
ISL21010DFH310Z-TK
VIN
VOUT
GND
C35
1uF
C36
1uF
1.024Vref

Sheet Title: *			*
Project Title: ***Strobe-Light.PrjPcb***			* * * * *
Size: Tabloid	Number:	Revision:	
Date: 4/11/2019	Time: 1:33:14 PM	Sheet * of *	
Author: *	File: Light-Detector.SchDoc		



Gnd

GND

UVLO/OVLO calcuation: (LT3751 datasheet)
1.225V+50uA*R
UVLO1: (Vtrans), 1M24--> 63V
OVLO1: (Vtrans), 1M6 --> 81V
UVLO2: (Vcc), 180k --> 10.2V
OVLO2: (Vcc), 270k --> 14.7V

Vcc: min 4.75V, max 24V

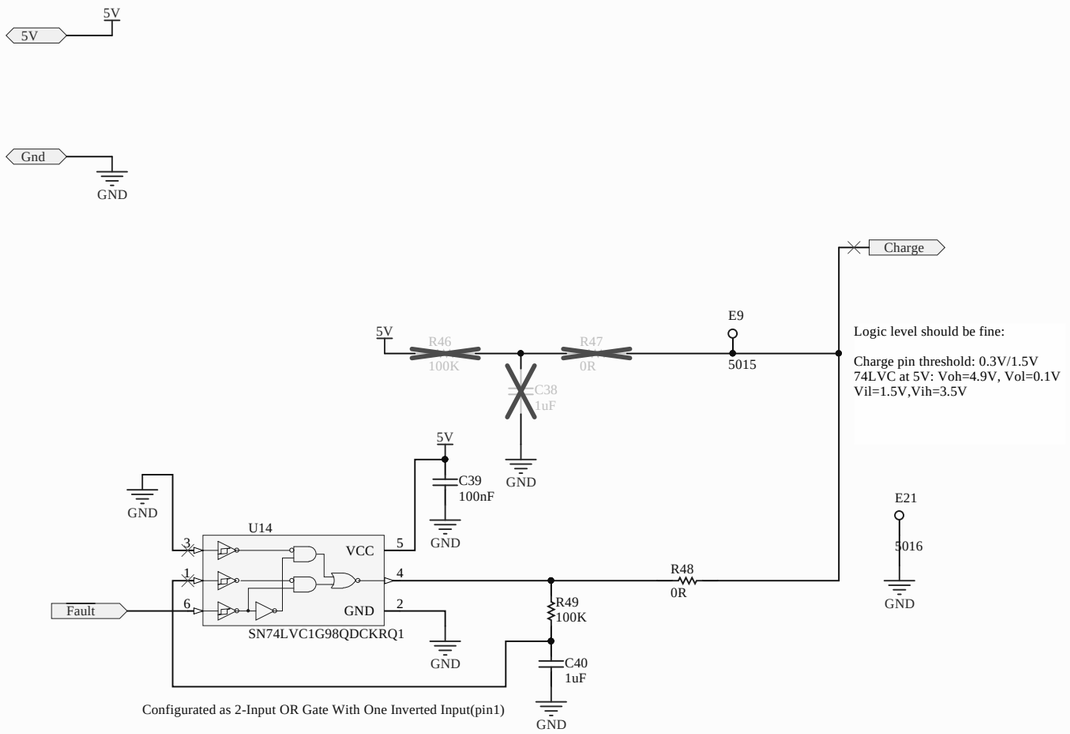
LVGate connects to Vcc while Vcc > 8V

Resistor value (LT3751 datasheet, Table 2)
Vin: 8 to 80V
RVtrans: 80.6k
RVout: 80.6k
Rdcm: 36.5k

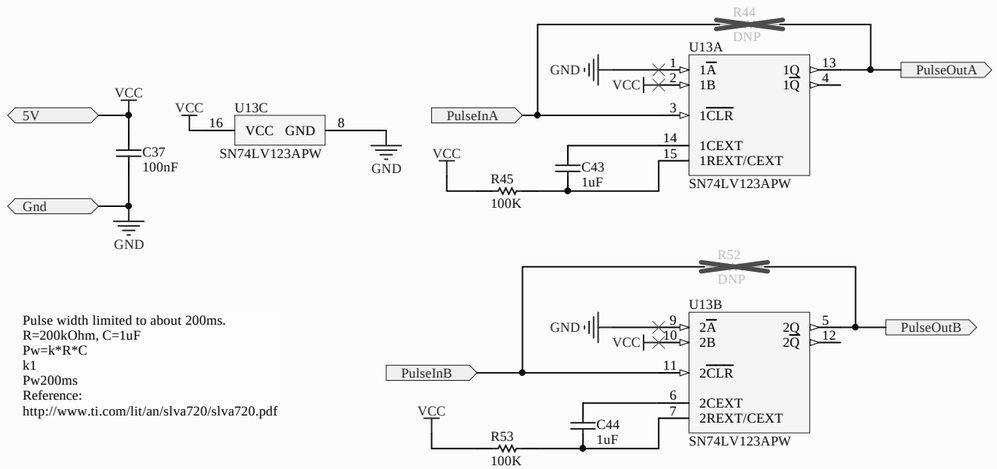
Rbg: 0.98*N*RVout/(Vout,trip + Vdiode) = 715Ohm
Rcs: 22mOhm (high power, 4.8A, 49.5W), 56mOhm (low power, 1.9A, 19.5W)

To Do:
1. Update part number for all resistors
2. Check the T1 connection for all different variations.

Sheet Title: *			*
Project Title: ***Strobe-Light.PrjPcb***			*
Size: Tabloid	Number:	Revision:	*
Date: 4/11/2019	Time: 1:33:14 PM	Sheet * of *	*
Author: *	File: LV-300V.SchDoc		

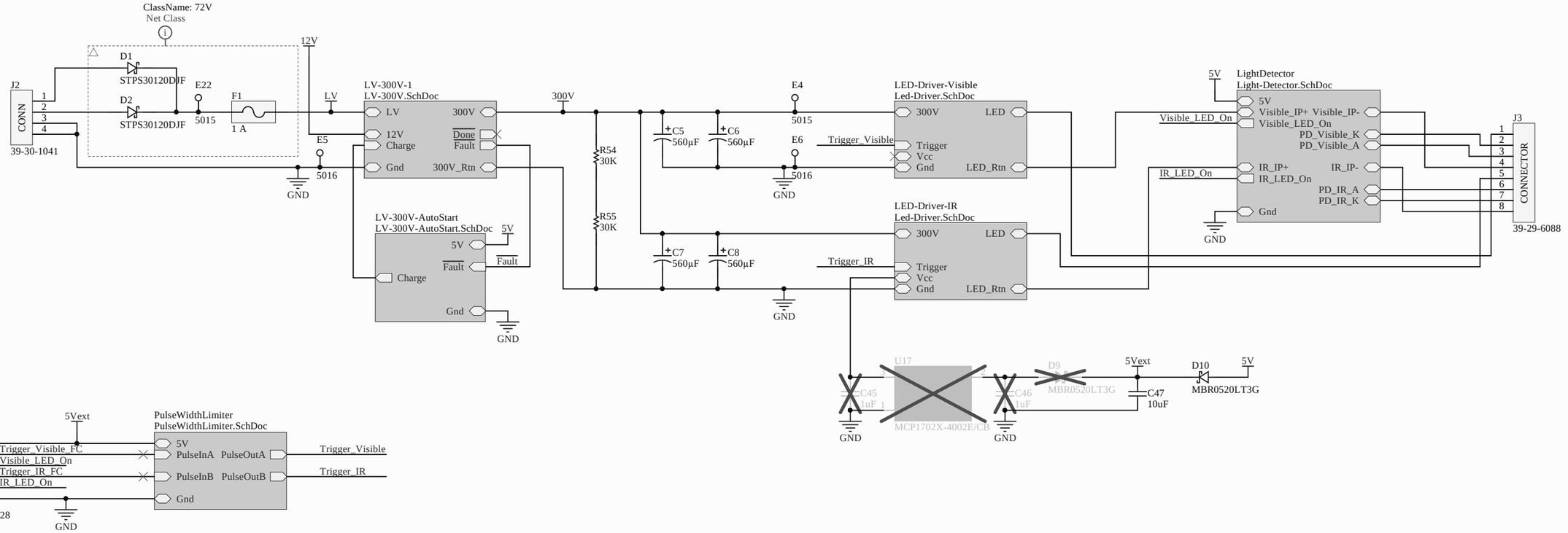


Sheet Title: *			*
Project Title: ***Strobe-Light.PrjPcb***			*
Size: Tabloid	Number:	Revision:	*
Date: 4/11/2019	Time: 1:33:14 PM	Sheet * of *	*
Author: *	File: LV-300V-AutoStart.SchDoc		



Pulse width limited to about 200ms.
R=200kOhm, C=1uF
Pw=k*R*C
k1
Pw200ms
Reference:
http://www.ti.com/lit/an/slva720/slva720.pdf

Sheet Title: *			*
Project Title: ***Strobe-Light.PrjPcb***			*
Size: Tabloid	Number:	Revision:	*
Date: 4/11/2019	Time: 1:33:15 PM	Sheet * of *	*
Author: *	File: PulseWidthLimiter.SchDoc		



5V power:
1. Current sensor (10mA norm / 15mA max) x 2
2. FC isolator: Si8642BC-B-IS1, 15mA @ 5V 150MBPS

Layout notes:
1. 4 layer PCB.
   Top layer: 300V, related traces and components
   Inner 1: GND for 300V
   Inner 2: GND for logic and control
   Bottom layer: Singal traces for logic and control
2. LED driver is reference to 300V GND. FC connector should referenced to the same ground.
3. Clearance rule: 1.3mm or 2.5mm (different IPC standards) for 300VDC

Makani Logo

FD1 Fiducial FID-40MIL-100MIL	FD2 Fiducial FID-40MIL-100MIL	FD3 Fiducial FID-40MIL-100MIL
FD4 Fiducial FID-40MIL-100MIL	FD5 Fiducial FID-40MIL-100MIL	FD6 Fiducial FID-40MIL-100MIL

Sheet Title: *		*
Project Title: ***Strobe-Light.PrjPcb***		
Size: Tabloid	Number:	Revision:
Date: 4/11/2019	Time: 1:33:15 PM	Sheet * of *
Author: *	File: Strobe-Light.SchDoc	