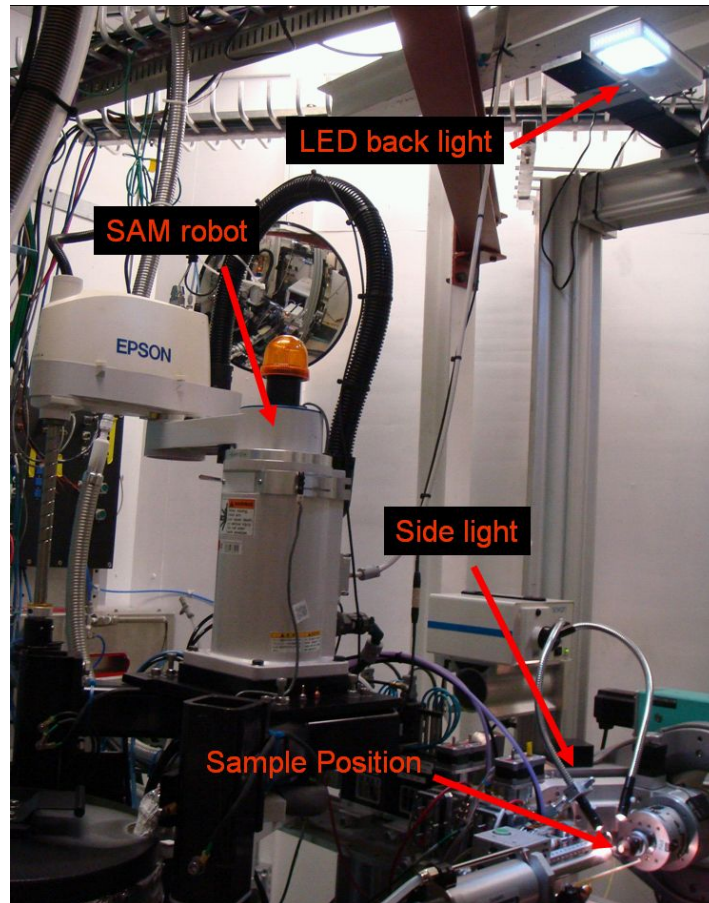


Manufacturing Instructions for the SSRL Sample Overhead Light

This package contains the documentation required to build a sample overhead light (SOL). The package includes mechanical drawing for the enclosure, Gerber files for the printed circuit board (PCB), bill of materials, schematic diagrams and pictures of the completed project. The PCB layout should not be altered because changing it may adversely affect the heat sinking properties in particular for the dual step up DC IC's. The PCB fan is essential to preserve the life of the Super Bright LED's. The Gerber Files include the information necessary for the PCB to be produced by your local printed circuit board manufacturer. The enclosure is milled from a billet of Teflon however other durable plastic materials may be used for this purpose.

Background:

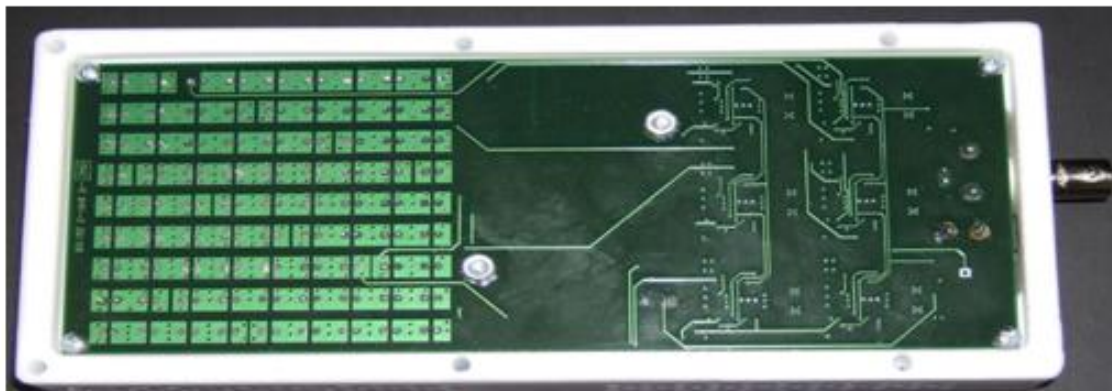
The sample illumination system used at the SSRL macromolecular crystallography beam lines consists of two light sources: 1) a uniform back light, developed in house and composed of an array of 81 ultra-bright LEDs, and 2) a variable intensity side light comprised of an optical fiber bundle connected to a Schott Fostec model DCRIII halogen source. The back light (or sample overhead light) is positioned behind the sample and inline with the sample camera as shown below. Because of space restrictions, this light must be very thin and mounted very close to the ceiling in of most of the experimental hutches. Moreover, to provide a bright even light field, many high intensity LEDs are used in close proximity



SAMPLE LIGHT COMPLETE



TOP VIEW



BOTTOM VIEW PCB IN FRAME



SIDE VIEW



FRONT VIEW

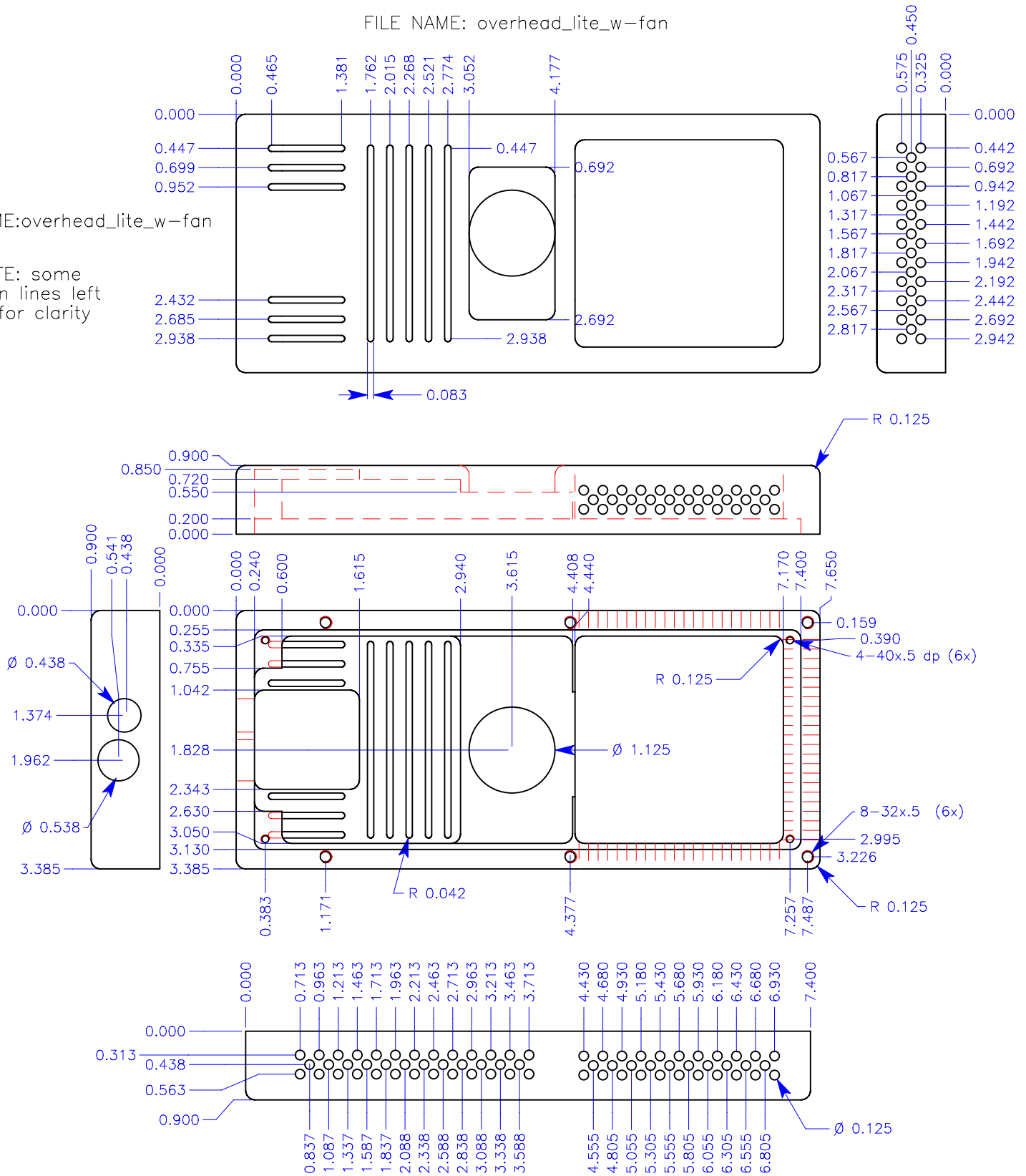


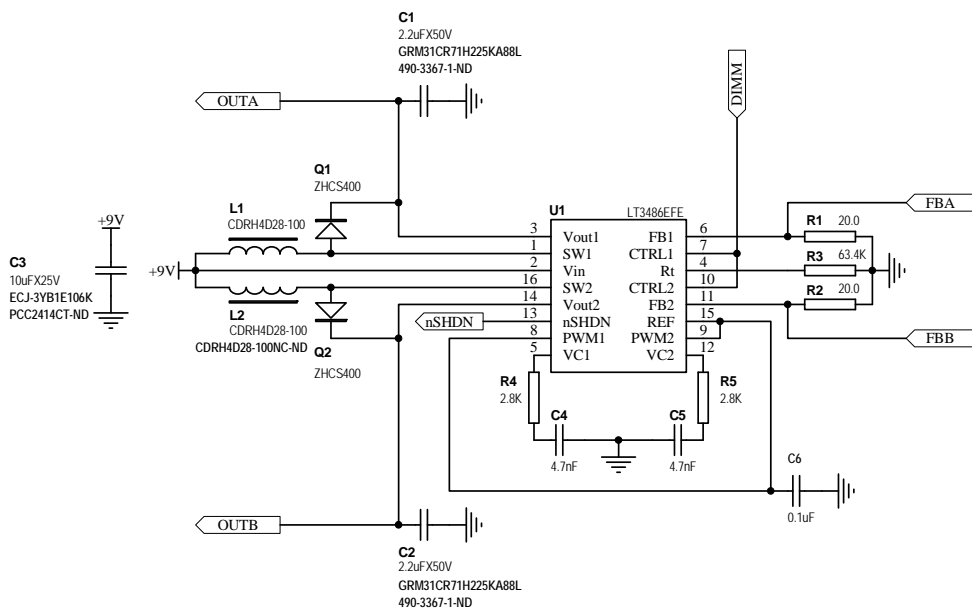
PRINTED CIRCUIT
BOARD COMPLETED

FILE NAME: overhead_lite_w-fan

FILE NAME:overhead_lite_w-fan

NOTE: some hidden lines left out for clarity





NOTE:
THIS SECTION OF THE DESIGN IS REPEATED 6 TIMES. THEY ARE DESIGNATED: OUTA1, OUTB1, OUTA2, OUTB2, OUTA3, OUTB3, OUTA4, OUTB4, OUTA5, OUTB5, OUTA6, OUTB6.

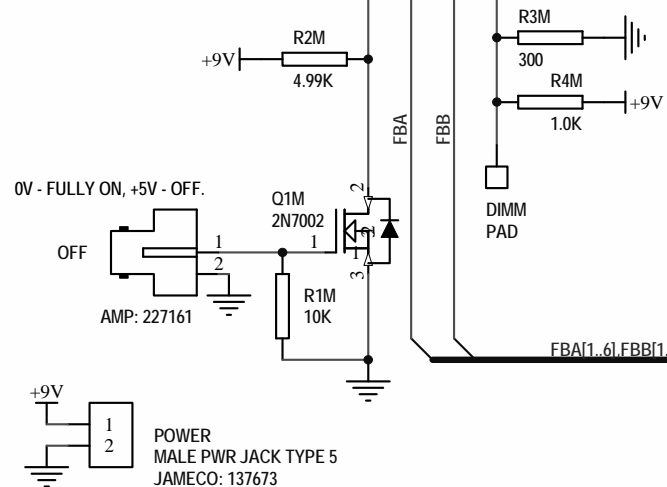
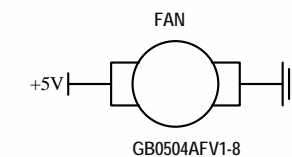
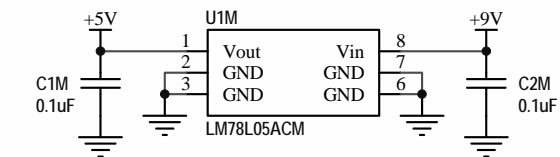
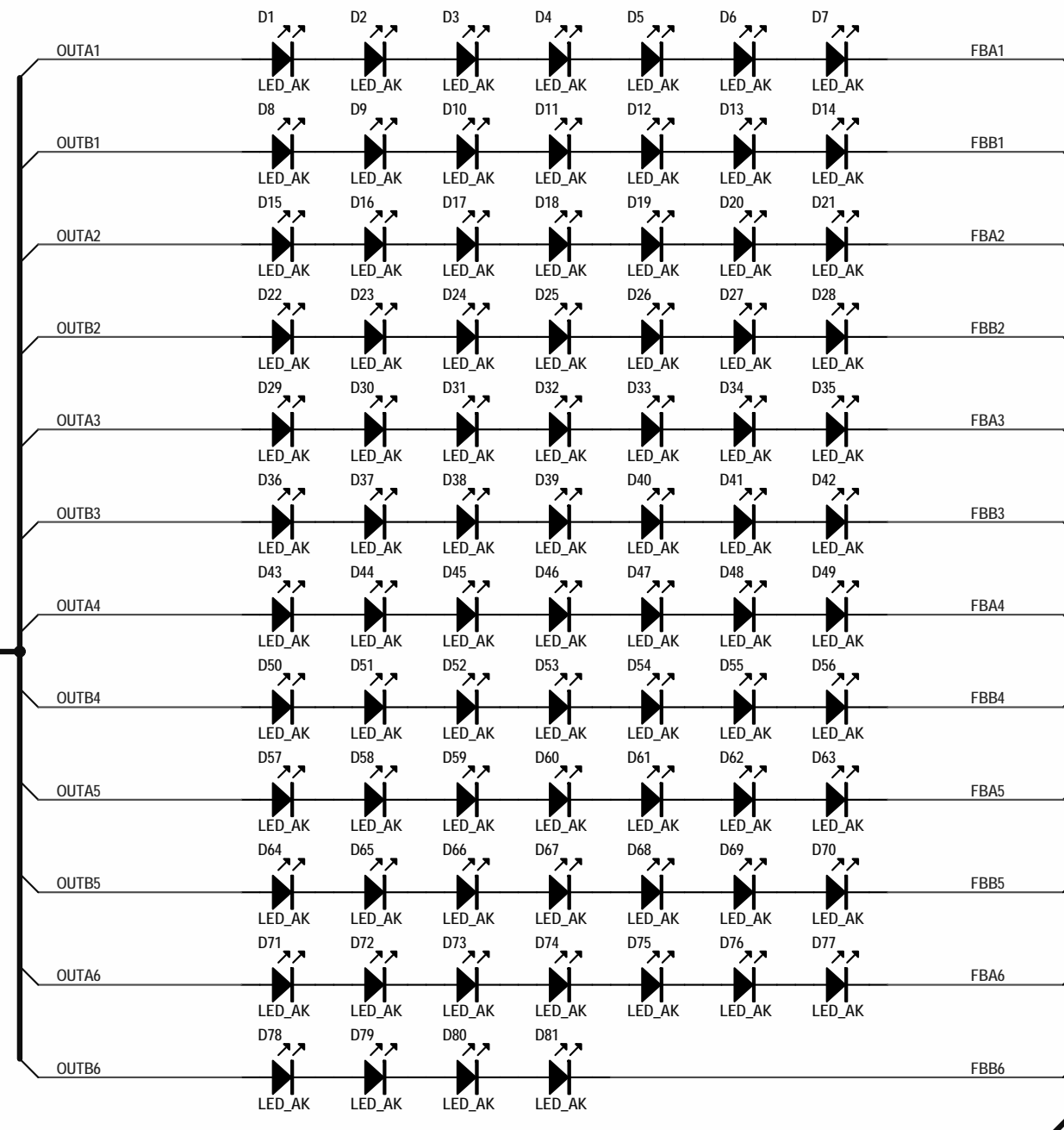
DO NOT SCALE DRAWING	CAD NAME	SAMPLE OVERHEAD LIGHT DRIVER.SCHDOC	NEXT ASS'Y	CODE: 3016
STANFORD SYNCHROTRON RADIATION LABORATORY STANFORD UNIVERSITY STANFORD, CALIFORNIA 94309			S.S.R.L. PHOTON BEAMLINE CONTROLS PHOTON BEAMLINE CONTROL SYSTEMS SAMPLE OVERHEAD LIGHT DRIVER	
UNLESS OTHERWISE NOTED DIM. ARE IN INCHES TOLERANCES: XX X ANGLES ALL SURFACES	DATE ENGINEER DRAFTER CHECKED	12-05-07 V. VINETSKY H. MEIER V. VINETSKY	APPROVALS:	A
SAMPLE OVERHEAD LIGHT DRIVER			SCALE NONE	SHEET 1 OF 2

REPEAT(DRV,1,6)
DRV.SCHDOC

THIS SECTION OF THE DESIGN IS REPEATED 6 TIMES.
THEY ARE DESIGNATED:
OUTA1, OUTB1, OUTA2, OUTB2,
OUTA3, OUTB3, OUTA4, OUTB4,
OUTA5, OUTB5, OUTA6, OUTB6.

REPEAT(OUTA) OUTA
REPEAT(OUTB) OUTB

OUTA[1..6],OUTB[1..6]



DO NOT SCALE DRAWING	CAD NAME: SAMPLE OVERHEAD LIGHT LED.SCHDOC	NEXT ASSY: NONE	CODE: 3016
STANFORD SYNCHROTRON RADIATION		S.S.R.L.	
STANFORD UNIVERSITY	LABORATORY	STANFORD, CALIFORNIA 94309	BEAMLINE CONTROLS
UNLESS OTHERWISE NOTED DIM. ARE IN INCHES		PHOTON BEAMLINE CONTROL SYSTEMS	
TOLERANCES:		SAMPLE OVERHEAD LIGHT LED.SCHDOC	
xx	± 1	SCALE NONE SHEET 2 OF 2	
x	±	B	
ANGLES	±		
ALL SURFACES	±		
DATE	12-06-07	APPROVALS:	
ENGINEER	VLAD VINETSKIY		
DRAFTER	H. MEIER		
CHECKED	VLAD VINETSKIY		

PCB PARTS LIST.XLS

S.S.R.L.
 PHOTON BEAMLINE CONTROL SYSTEM
 BEAMLINE CONTROLS
 SAMPLE OVERHEAD LIGHT LIGHT
 MATERIAL LIST: ML SOL
 CODE: 3016 12-18-2007
 PREPARED BY: H. MEIER
 CHECKED BY: H. MEIER
 APPROVED BY: V. VINETSKIY

<u>ITEM</u>	<u>MFG PART NUMBER</u>	<u>PART DESCRIPTION</u>	<u>DESIGNATOR</u>	<u>QTY</u>	<u>VENDOR</u>	<u>VENDOR P/N</u>
		CAPACITORS				
1	C0603C104J4RACTU	.1uF SMT-0603	C6_DRV1,2,3,4,5,6, C1M,C2M	8	DIGI KEY	399-1097-2-ND
2	GRM31CR71H225KA88L	2.2uF @50V SMT-1206	C1_DRV1,2,3,4,5,6, C2_DRV1,2,3,4,5,6	12	DIGI KEY	490-3367-2-ND
3	ECJ-3YB1E106K	10uF @25V SMT-1206	C3_DRV1,2,3,4,5,6 DIGI-KEY P/N PCC2414CT-ND	6	DIGI KEY	PCC2414TR-ND
4	GRM188F51E472ZA01D	4.7nF SMT-0603	C4_DRV1,2,3,4,5,6, C5_DRV1,2,3,4,5,6	12	DIGI KEY	490-1571-2-ND
		RESISTORS				
5	RC0603FR-071KL	1.0K SMT-0603	R4M	1	DIGI KEY	311-1.00KHRTR-ND
6	ERJ-1GEF2002C	20.0 SMT-0603	R1_DRV1,2,3,4,5,6, R2_DRV1,2,3,4,5,6	12	DIGI KEY	P20.0KABTR-ND
7	ERJ-1GEF1002C	10K SMT-0603	R1M	1	DIGI KEY	P10.0KABTR-ND
8	CRCW06032K80FKEA	2.8K SMT-0603	R4_DRV1,2,3,4,5,6, R5_DRV1,2,3,4,5,6	12	DIGI KEY	541-2.80KHCT-ND
9	MCR03EZPJ301	300 SMT-0603	R3M	1	DIGI KEY	RHM300GTR-ND
10	ERJ-3EKF4991V	4.99K SMT-0603	R2M P4.99KHTR-ND	1		
11	ERJ-1GEF6342C	63.4K SMT-0603	R3_DRV1,2,3,4,5,6	6	DIGI KEY	P63.4KABTR-ND
12	CDRH4D28-100	INDUCTOR POWER 10UH 1.00A SMD	L1_DRV1,2,3,4,5,6, L2_DRV1,2,3,4,5,6	12	DIGI KEY	CDRH4D28-100NC-ND
13	2N7002	TRANSISTOR SOT-23	Q1M	1	DIGI KEY	2N7002_L99Z-ND
14	ZHCS400	DIODE SOD-323	Q1_DRV1,2,3,4,5,6, Q2_DRV1,2,3,4,5,6	12	DIGI KEY	ZHCS4R00CT-ND
15	RL5-W18015 White LED5	SUPER BRIGHT LED	D1-81 SUPERBRIGHTLEDS.COM	81		superbrightleds.com
16	LM78L05ACM	VOLTAGE REG. SOIC8	U1M	1	DIGI KEY	LM78L05ACM-ND

PCB PARTS LIST.XLS

17	LT3486EFE	DUAL STEP UP DC TO DC TSSOP-16	U1_DRV1,2,3,4,5,6	6	DIGI KEY	LT3486EFE#PBF-ND
18	RAPC712BK	RT ANGLE PC MNT JACK	POWER	1	DIGI KEY	RAPC712BK-ND
19	GB0504AFV1-8	BLOWER 5VDC 40 X 40 X 9MM	FAN	1	DIGI KEY	259-1289-ND
20	AMP 227161-6	BNC - FEMALE RT. ANGLE	OFF	1	DIGI KEY	A24494-ND
21	PW117RA09803B01	9V DC POWER BLOCK	P/S	1	MOUSER	831-PW117RA0903B01