

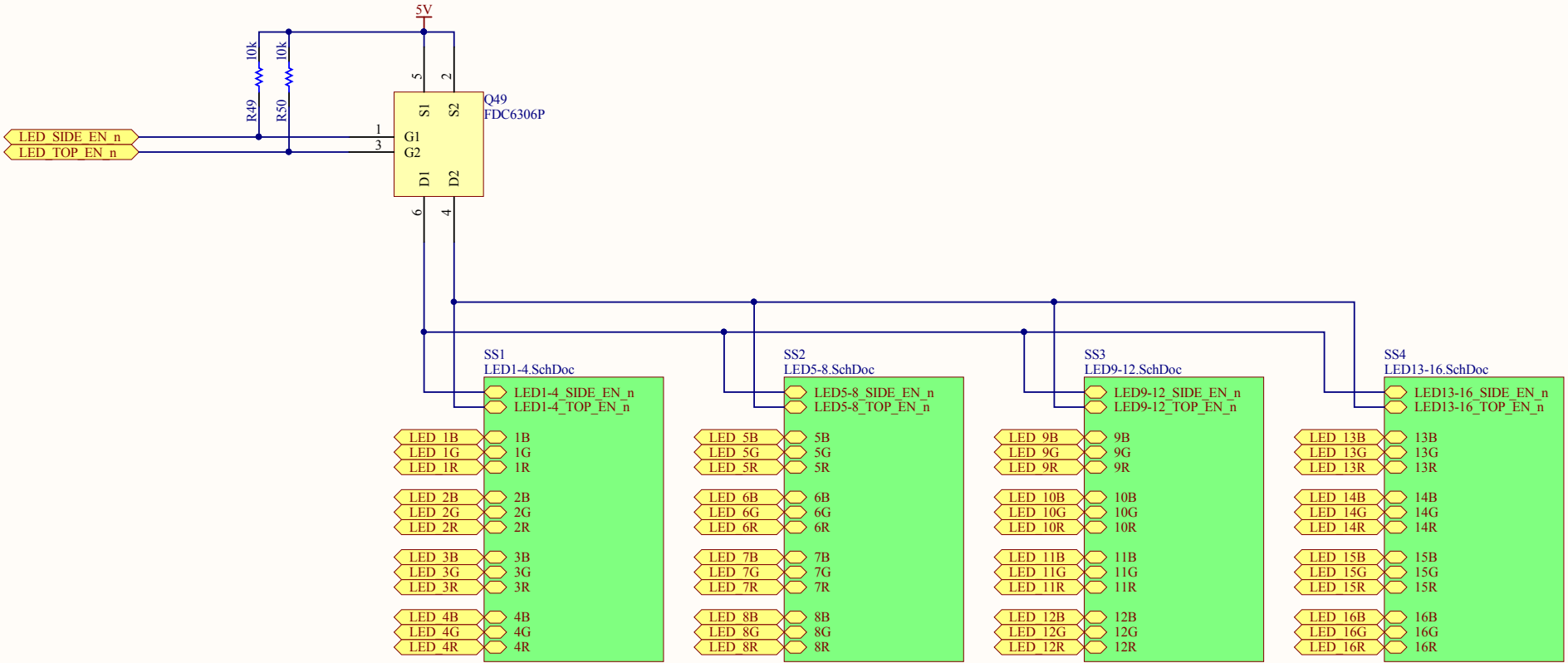


▲ All LEDs have been set to 20mA forward current for 5V via:
RED: R=150R
GREEN: R=91R
BLUE: R=91R

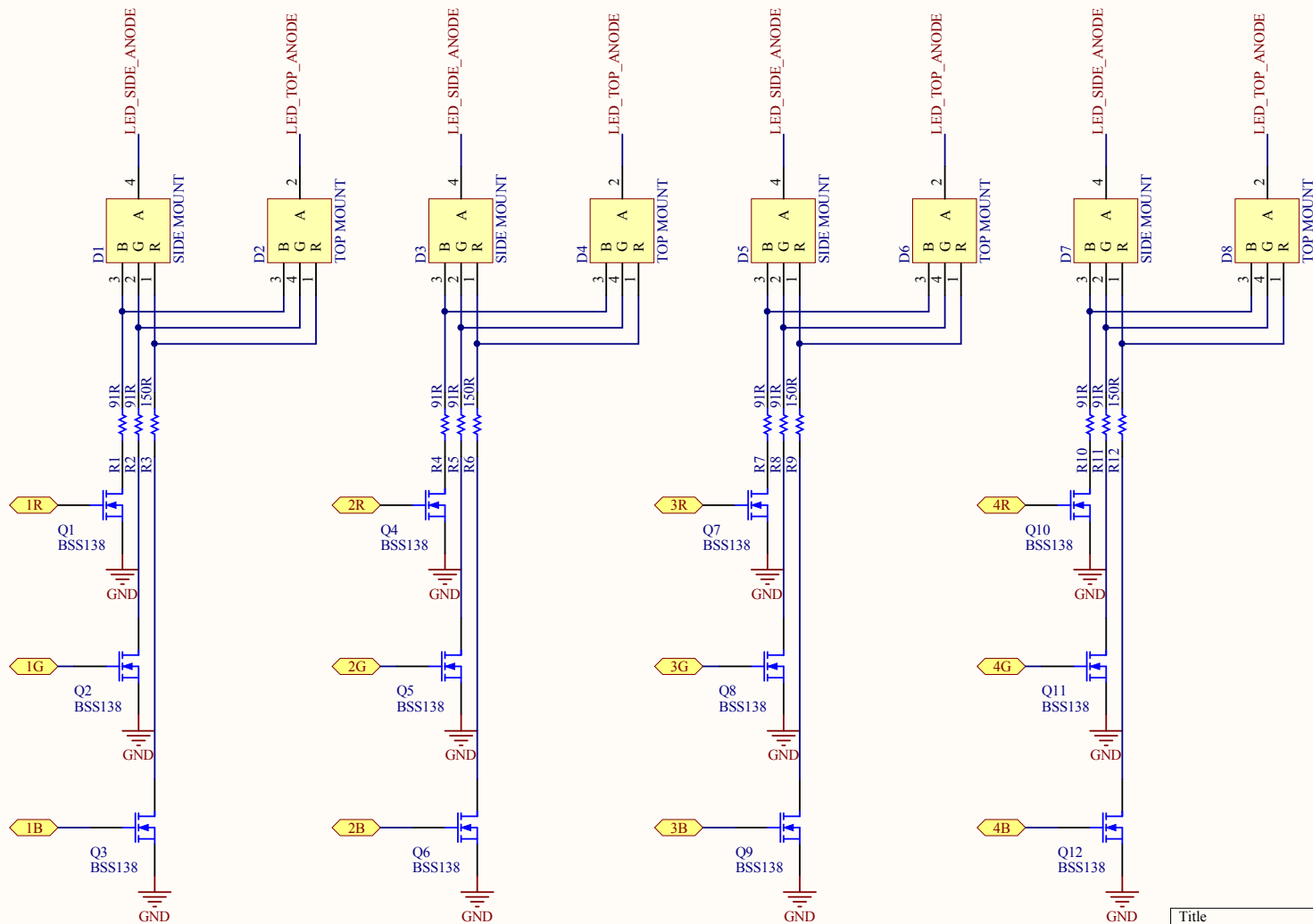
▲ SIDE LED:
Vf @ If=20mA (Min->Typ->Max):
RED: 1.8~2.0~2.4V
GREEN: 3.0~3.3~3.6V
BLUE: 3.0~3.3~3.6V

▲ TOP LED:
Vf @ If=20mA (Avg->Max):
RED: 2.0~2.6V
GREEN: 3.2~4.0V
BLUE: 3.2~4.0V

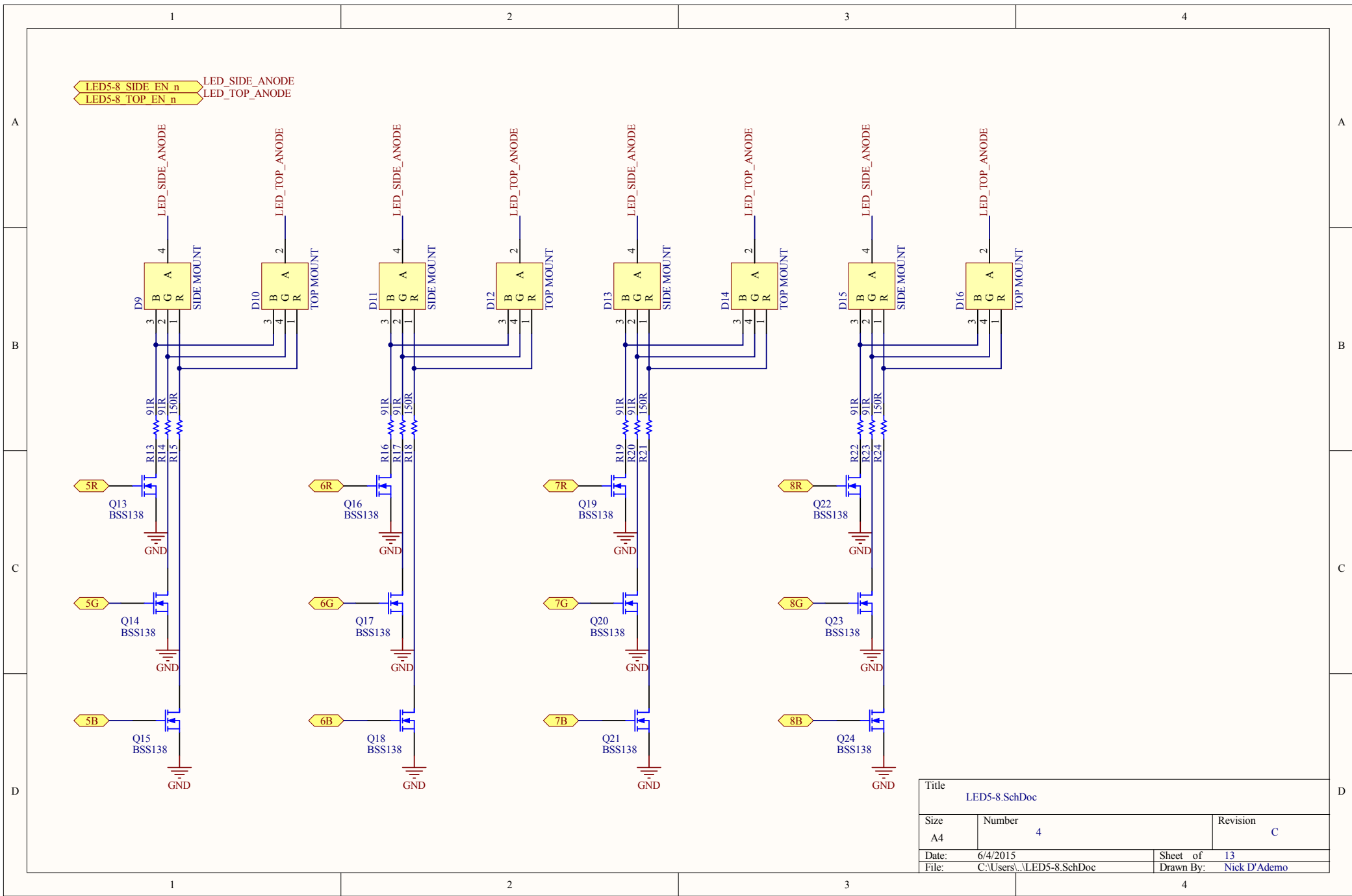
CLV1A-FKB-CJ1M1F1BB7R4S3: 675mcd Red, 1055mcd Green, 337mcd Blue
CLV1A-FKB-CK1N1G1BB7R4S3: 730mcd Red, 1150mcd Green, 365mcd Blue



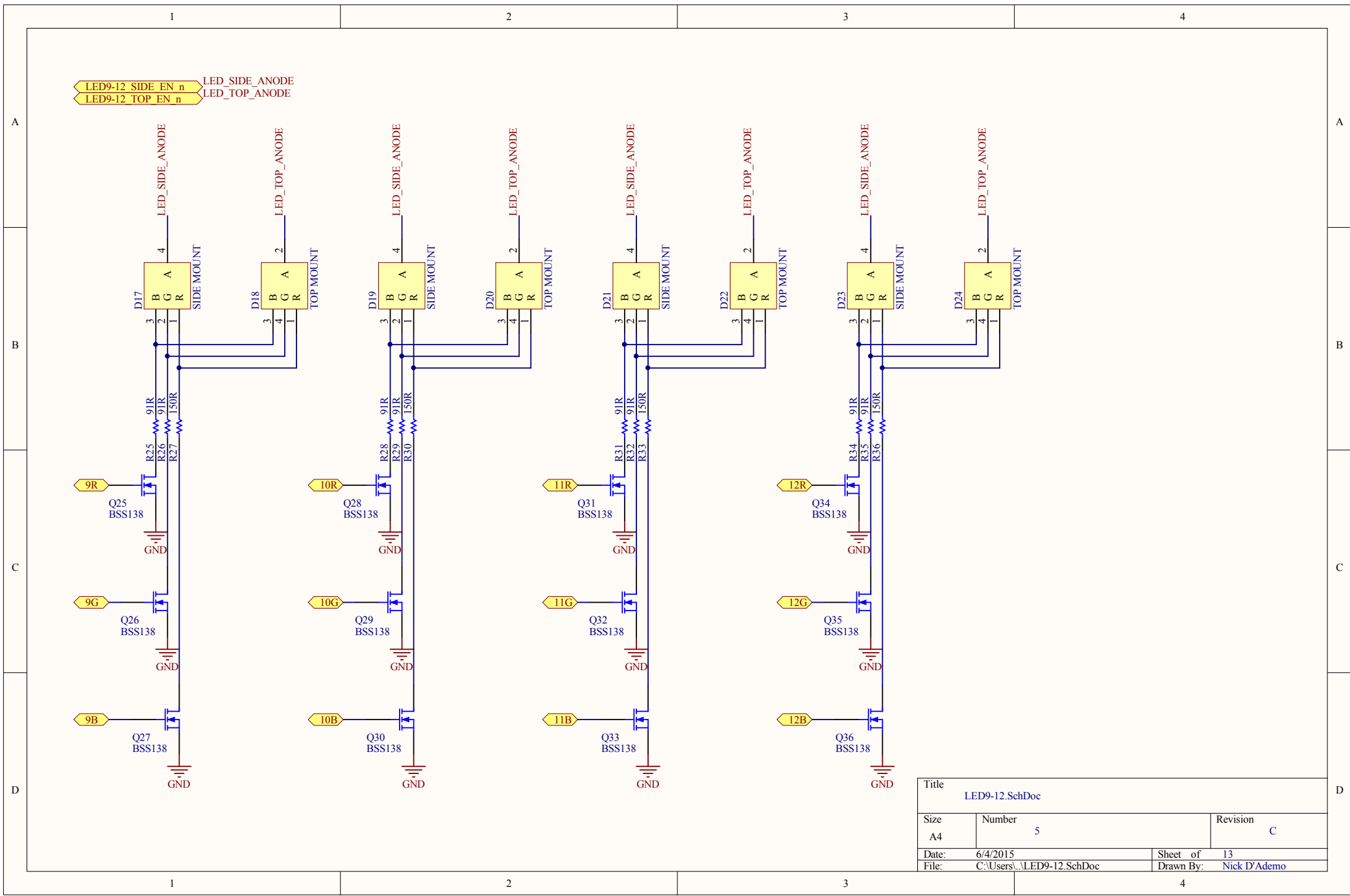
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Size A4	Number 2	Revision C
Date: 6/4/2015	Sheet of 13	
File: C:\Users\...\LEDs.SchDoc	Drawn By: Nick D'Ademo	

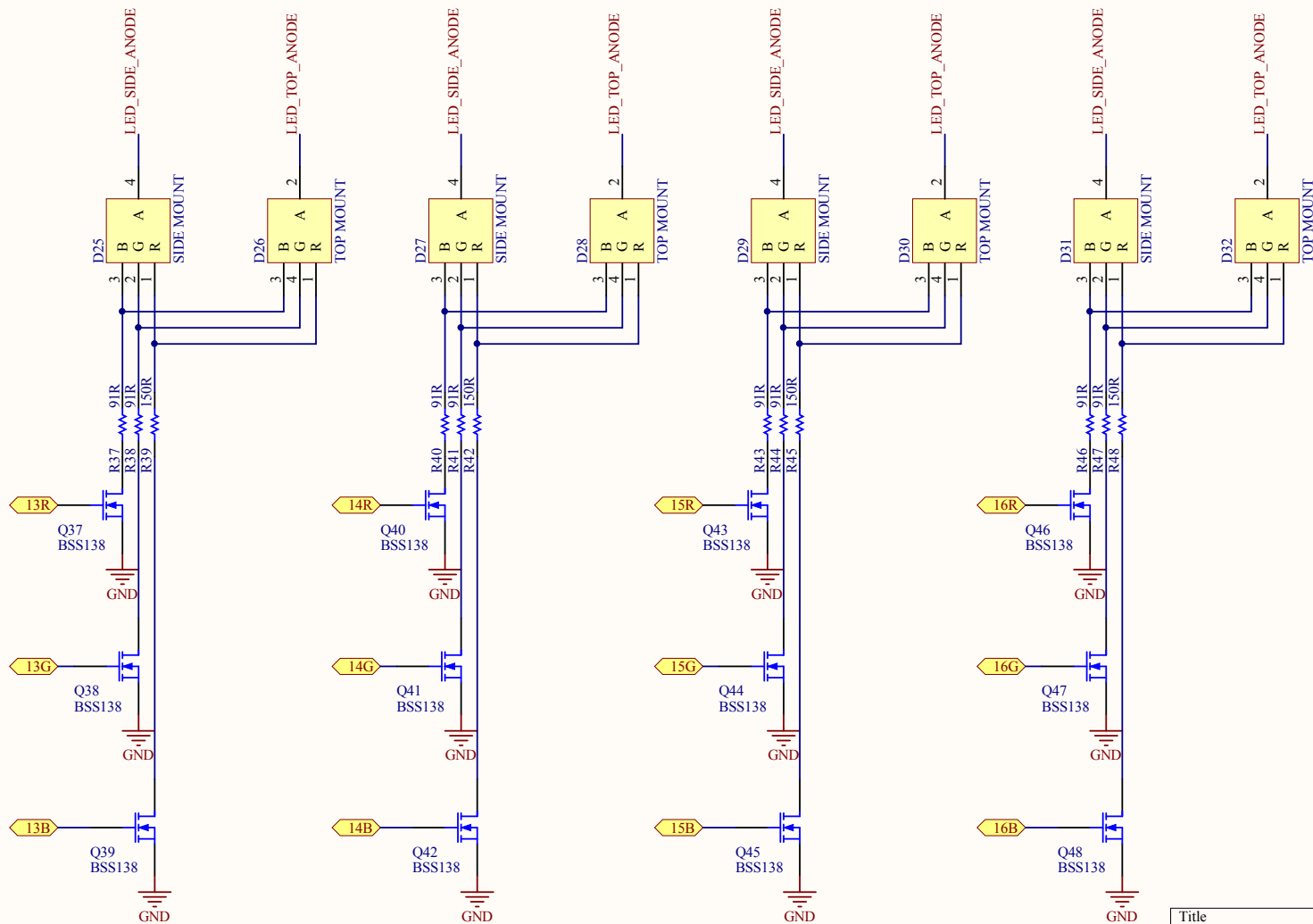


Title LED1-4.SchDoc			
Size A4	Number 3	Revision C	
Date:	6/4/2015	Sheet of	13
File:	C:\Users\A\LED1-4.SchDoc	Drawn By:	Nick D'Ademo

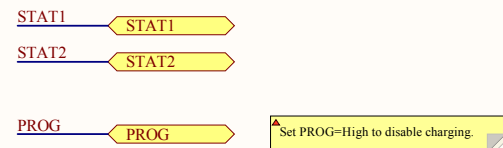
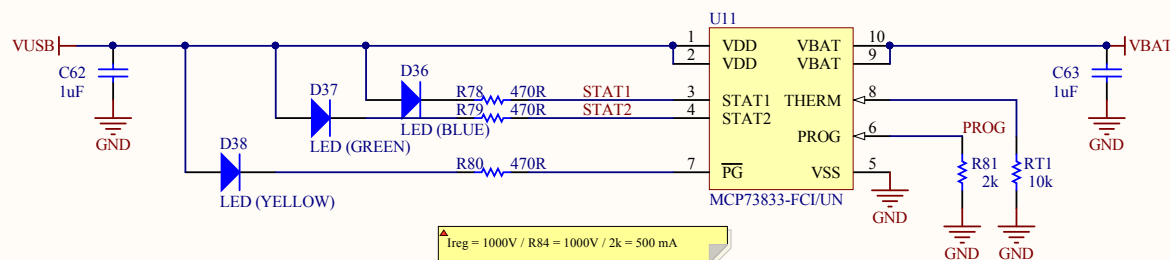
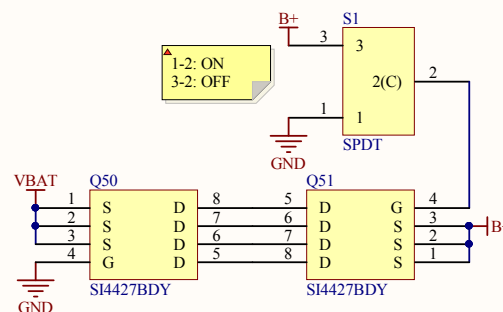
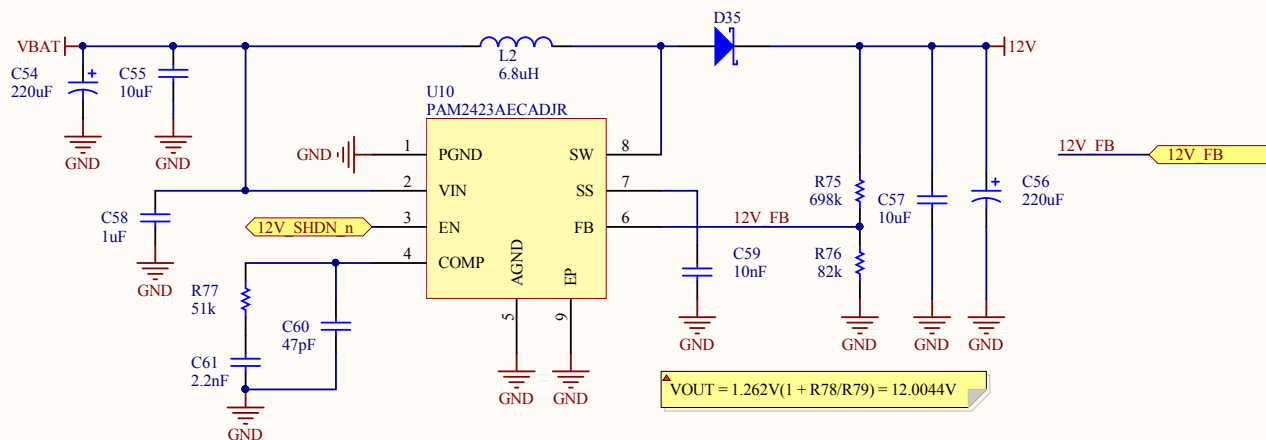
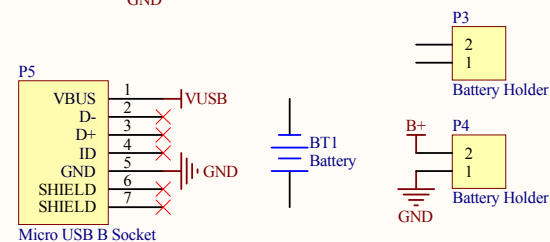
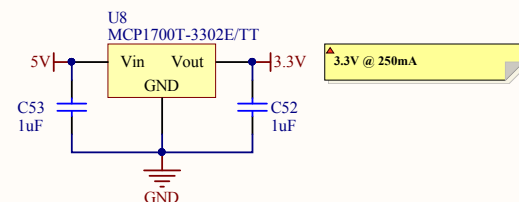
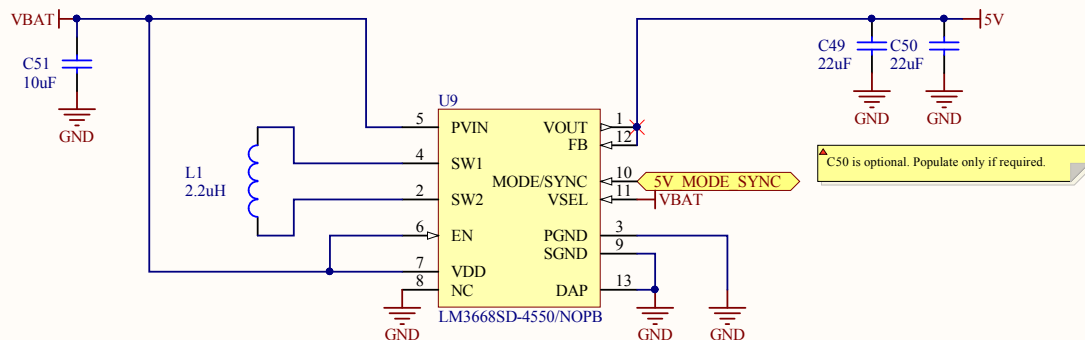


Title LED5-8.SchDoc		
Size A4	Number 4	Revision C
Date: 6/4/2015	Sheet of 13	
File: C:\Users\...\LED5-8.SchDoc	Drawn By: Nick D'Ademo	





Title LED13-16.SchDoc			
Size A4	Number 6	Revision C	
Date: 6/4/2015	Sheet of 13		
File: C:\Users\...LED13-16.SchDoc	Drawn By: Nick D'Ademo		



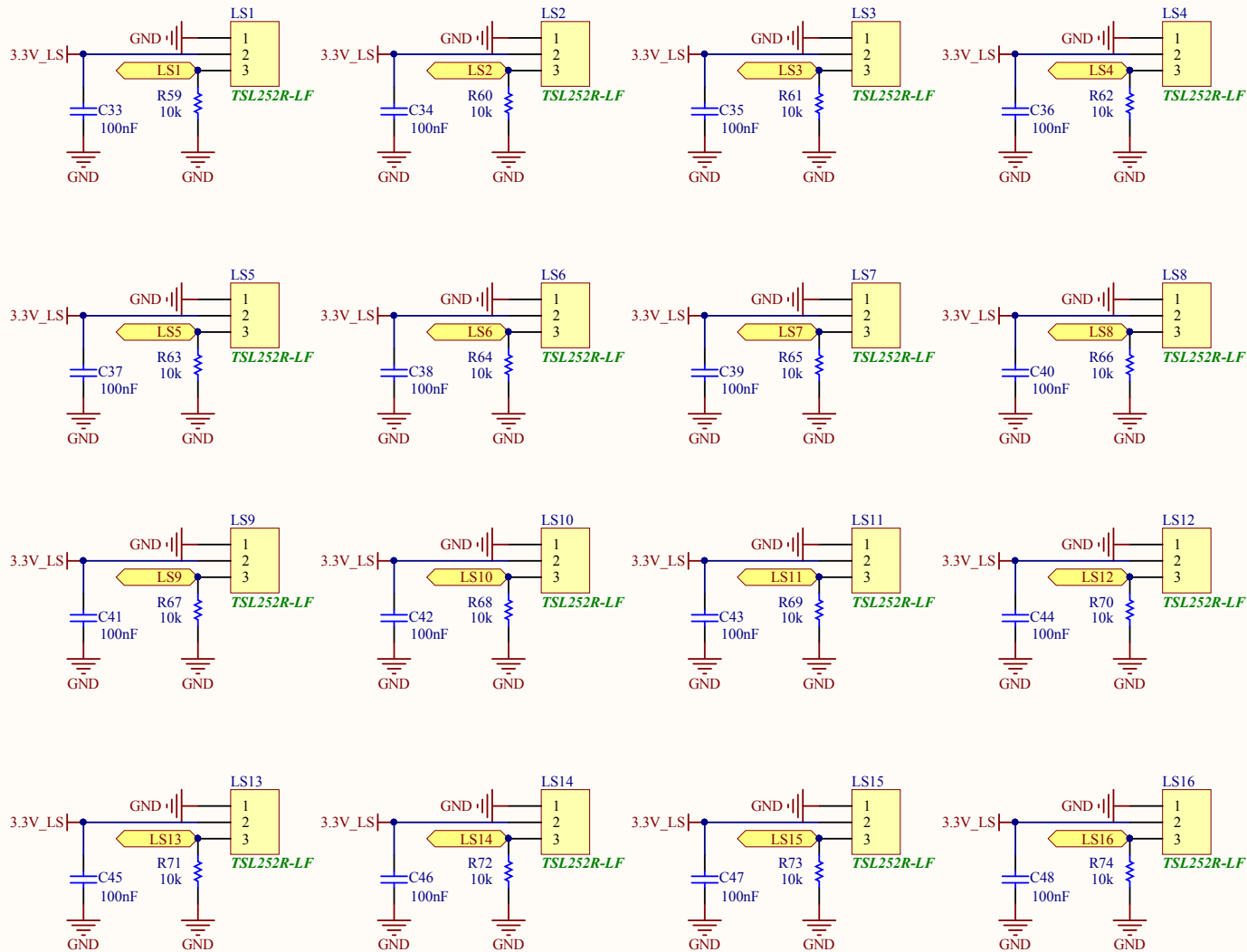
Title		
Power Supply.SchDoc		
Size	Number	Revision
A4	7	C
Date:	6/4/2015	Sheet of 13
File:	C:\Users\...\Power Supply.SchDoc	Drawn By: Nick D'Ademo

▲ AMS light sensors (www.ams.com) have the following pin-outs:
GND - 1
VDD - 2
OUT - 3

▲ Light-to-Frequency parts:
TSL235
TSL237
TSL245 (IR light)

Light-to-Voltage parts:
TSL12S
TSL13S
TSL14S
TSL250R
TSL251R
TSL252R
TSL253R
TSL254R
TSL257
TSL260R (IR light)
TSL261R (IR light)
TSL262R (IR light)
TSL267 (IR light)

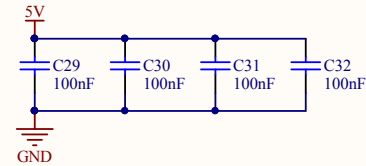
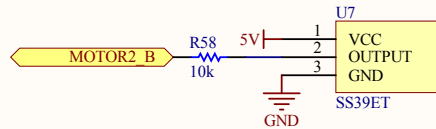
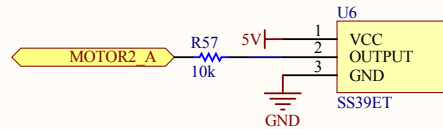
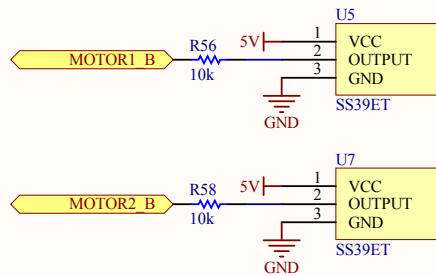
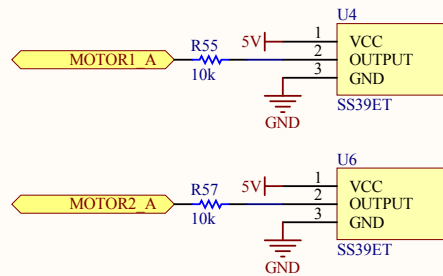
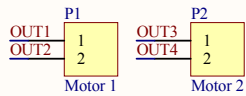
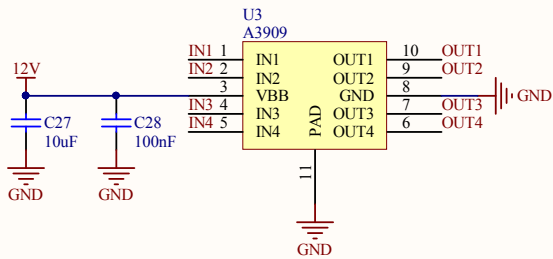
▲ Only install R59 to R74 if Light-to-Voltage parts are used.



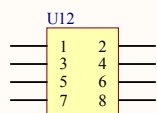
Title Light Sensors.SchDoc		
Size A4	Number 8	Revision C
Date: 6/4/2015		Sheet of 13
File: C:\Users\...\Light Sensors.SchDoc		Drawn By: Nick D'Ademo

MOTOR1 1 IN1
MOTOR1 2 IN2

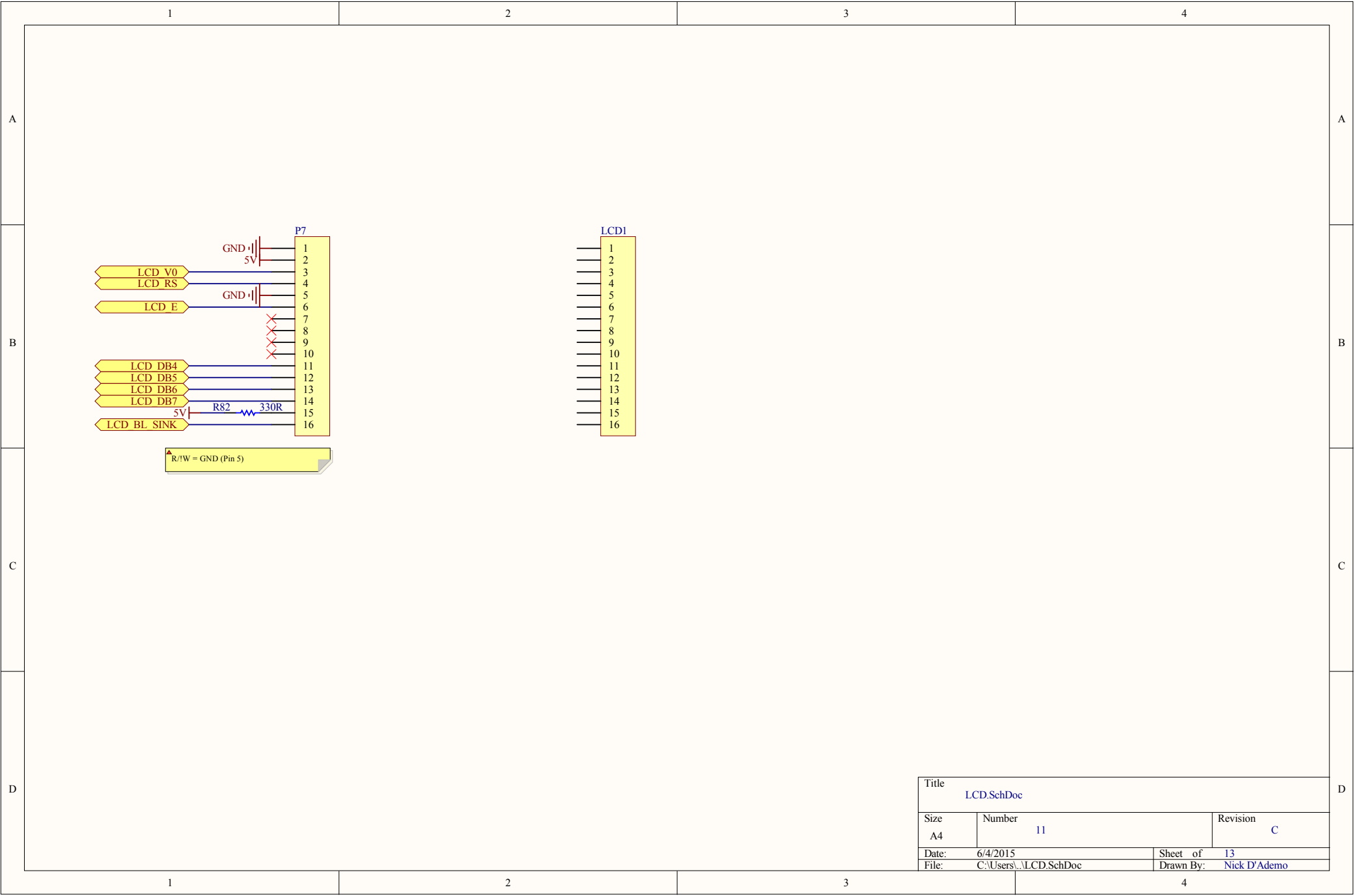
MOTOR2 1 IN3
MOTOR2 2 IN4



Title DC Motors.SchDoc		
Size A4	Number 9	Revision C
Date: 6/4/2015	Sheet of 13	
File: C:\Users\...\DC Motors.SchDoc	Drawn By: Nick D'Ademo	



Title Wireless.SchDoc			
Size A4	Number 10	Revision C	
Date:	6/4/2015	Sheet of	13
File:	C:\Users\... Wireless.SchDoc	Drawn By:	Nick D'Ademo



1

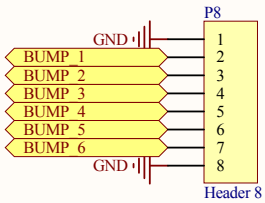
2

3

4

A

A



B

B

C

C

D

D

Title Bump Sensors.SchDoc			
Size A4	Number 12		Revision C
Date:	6/4/2015	Sheet of	13
File:	C:\Users\...\Bump Sensors.SchDoc	Drawn By:	Nick D'Ademo

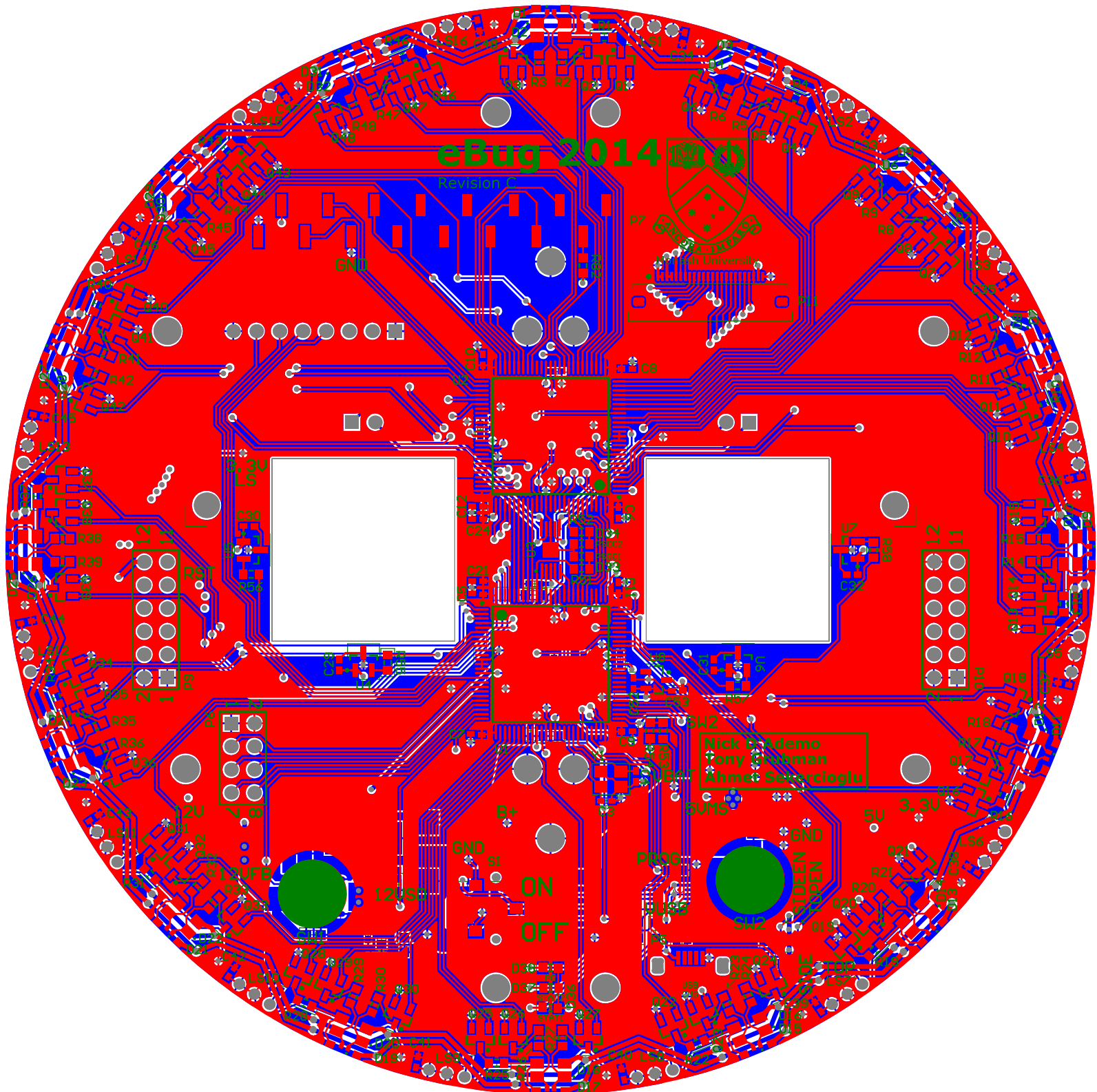
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2

3

4

Title Expansion Header.SchDoc		
Size A4	Number 13	Revision C
Date: 6/4/2015	Sheet of 13	
File: C:\Users\...\Expansion Header.SchDoc	Drawn By: Nick D'Ademo	



Description	Designator	Footprint	Quantity	Value
18650 1-Cell Lithium Ion Battery	B1		1	
	C1, C2, C5, C6, C7, C8, C9, C10, C11, C12, C16, C19, C22, C23, C25, C26, C28, C49, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48			
Capacitor, X7R, ±10%, 16V, 0402	C1, C4	CAPC1005N	37	100nF
Capacitor, NP0, ±2%, 25V, 0402	C1, C4	CAPC1005N	2	12pF
	C13, C14, C15, C17, C18, C20, C41, C24, C52, C53, C58, C62, C63	CAPC1005N	13	1uF
Capacitor, X5R, ±10%, 10V, 0402	C27, C55, C57	CAPC1608N	1	10uF
TAYO YUDEN - EMI1078B1106MA-T - CAP CER 10UF 16V 20% X5R 0603	C49, C50	CAPC2012N	2	22uF
TAYO YUDEN - LM21281226AG-T - CAPACITOR CERAMIC 22UF, 10V, X5R, 0805	C51	CAPC2012N	1	10uF
TAYO YUDEN - LM21212 8106AG-T - CAP. MLCC, X5R, 10UF, 10V, 0805	C54, C56	TC7343-2917	2	220uF
KEMET - T491D227K016AT - CAP TANT 220UF 16V 10% 2917	C59	CAPC1005N	1	10nF
Capacitor, X7R, ±10%, 16V, 0402	C60	CAPC1005N	1	47pF
Capacitor, NP0, ±5%, 25V, 0402	C61	CAPC1005N	1	2.2nF
Capacitor, X7R, ±10%, 16V, 0402				
	D4, D3, D5, D7, D9, D11, D13, D15, D17, D19, D21, D23, D25, D27, D29, D31, D6	OVSRRGBCC3_SI	16	
OPTIK - OVSRRGBCC3 - LED RED/GRN/BLUE 1204 SMD	D7, D9, D5, D8, D10, D12, D14, D16, D18, D20, D22, D24, D26, D28, D30, D32	PLCC4	16	
CREE - CLV1A-FXB-CKX1N1G18B7R453 - LED RGB 3-IN-1 3.2X2.8MM 4PLCC	D33, D34, D36	LED, 0603	3	
ROHM - SMLE12BC778GQ - LED, 0603, LO-CUR, BLU	D35	DO-214A8	1	
VISHAY - SS34-E3/57T - DIODE SCHOTTKY 40V 3A DO214A8	D37	LED, 0603	1	
KINGBRIGHT - KP-1608MGC - LED, 0603, GREEN, 70MCD, 568NM	D38	LED, 0603	1	
KINGBRIGHT - KP-1608SYC - LED, SMD, 0603, YELLOW	L1	COILCRAFT_LPS4 018	1	2.2uH
COILCRAFT - LPS4018-222MRB - INDUCTOR, SHLD, 2.2uH, 20%, 1.5A, SMD	L2	SRP7028A	1	6.8uH
BOURNS - SRP7028A-6R8M - FMED IND 6.8uH 4.5A 60 MOHM SMD	LC01		1	
SHENZHEN EONE ELECTRONICS CO.,LTD - IM120424015 - EONE High 16x2 1602) Characters LCD	LS1, LS2, LS3, LS4, LS5, LS6, LS7, LS8, LS9, LS10, LS11, LS12, LS13, LS14, LS15, LS16			
AMS - TL253R-4F - IC LIGHT TO VOLTAGE SENSOR 3PIN	P1, P2	HDR1X2	2	
MOLEX INC - 0022272021 - CONN HEADER 2POS, 100 VERT TIN	P3, P4	54	2	
KEYSTONE ELECTRONICS - 54 - BATTERY CLIP 18MM 18650 CELL		USB3140-30-0170-1-C	1	
GLOBAL CONNECTOR TECHNOLOGY - USB3140-30-0170-1-C - CONNECTOR, USB 2.0 MICRO B, ACPT, SPOS, SMT	P5	C-MODIFIED	1	
SAMTEC - SSW-116-22-F-S-V5 - Conn Socket Strip SKT 16 POS 2.54mm Solder ST SMD Tube	P7	22-F-S-V5	1	
MOLEX INC - 22-27-2081 - HEADER, SQUARE PIN, 0.1", 8WAY	P8	HDR1X8	1	
SAMTEC - SSW-106-01-T-D - SOCKET, 2.54MM, 2X6WAY	P9, P10	SSW-106-01-X-D	2	
GLOBAL CONNECTOR TECHNOLOGY - FFC2810-24-T - FFC/FFC CONNECTOR, RECEPTACLE, 24POS, 1ROW	P11	FFC2810	1	
	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36, Q37, Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45, Q46, Q47, Q48			
FAIRCHILD SEMICONDUCTOR - BS5138 - MOSFET N-CH 50V 220MA SOT-23	Q49	SOT-6	1	
FAIRCHILD SEMICONDUCTOR - FDC6306P - MOSFET 2P-CH 20V 1.9A SSOT6	Q50, Q51	SOIC127P600-BAN	2	
VISHAY SILICONIX - SH4427BDY-TL-E3 - MOSFET P-CH 30V 9.7A 8-SOIC	R1, R2, R4, R5, R7, R8, R10, R11, R13, R14, R16, R17, R19, R20, R22, R23, R25, R26, R28, R29, R31, R32, R34, R35, R37, R38, R40, R41, R43, R44, R46, R47	RESC1608N	32	01R
Resistor, ±1%, 0.1W, 0603	R3, R6, R9, R12, R15, R18, R21, R24, R27, R30, R33, R36, R39, R42, R45, R48	RESC1608N	16	150R
Resistor, ±1%, 0.1W, 0603	R49, R50, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74	RESC1608N	22	10k
Resistor, ±1%, 0.1W, 0603	R51, R52, R78, R79, R80	RESC1608N	5	470R
Resistor, ±1%, 0.1W, 0603	R53	RESC1608N	1	1M
Resistor, ±1%, 0.1W, 0603	R54	RESC1608N	1	470k
Resistor, ±1%, 0.1W, 0603	R75	RESC1608N	1	698k
Resistor, ±1%, 0.1W, 0603	R76	RESC1608N	1	82k
Resistor, ±1%, 0.1W, 0603	R77	RESC1608N	1	51k
Resistor, ±1%, 0.1W, 0603	R81	RESC1608N	1	12k
Resistor, ±1%, 0.1W, 0603	R82	RESC1608N	1	330R
MURATA - NCF18XH103J03RB - THERMISTOR, NTC, 10K, 5%, SMD	RT1	RESC1608N	1	10k
COPAL ELECTRONICS INC - CL-SB-128-01T - SWITCH SLIDE SPDT 0.2A GULL 12V PSoC Programmable System-on-Chip, 256 KB Flash, 62 GPIOs, 1.71 to 5.5 V, 100 Pin TQFP (AX100), Tray	S1	CL-SB-128-01T	1	
ALLEGRO - A3999GLVTR-T - IC MOTOR DRIVER PAR 10MSOP	U1, U2	CMP-AX100_L	2	
HONEYWELL SAC - SS3NET - SENSOR, HALL EFFECT, LINEAR, SOT23-3	U3	MSOP-10	1	
MICROCHIP - MCP1207-3302E/TT - IC REG LDO 1.3V 0.25A SOT23-3	U4, U5, U6, U7	SOT23-3N	4	
1A, High Efficiency Dual Mode Single Inductor Buck-Boost DC/DC Converter, 12-pin LLP, Pb-Free	U8	SOT89P230-3N	1	
DIODES INCORPORATED - PAM2423AECADIR - IC REG BOOST ADJ 5.5A 8SOIC	U9	SDF12A	1	
MICROCHIP - MCP73833-FCJ/U-N - IC LI-ION/LI-POLY CTRLR 10MSOP	U10	SOIC127P600-BEN	1	
NORDIC SEMICONDUCTOR - nRF2401+	U11	MSOP-LIN10_N	1	
NDK - NX32255A-16.000MHZ-STD-CSR-1 - CRYSTAL 16MHZ 8PF SMD	U12	HDR2K4	1	
	V1	NX32255A	1	