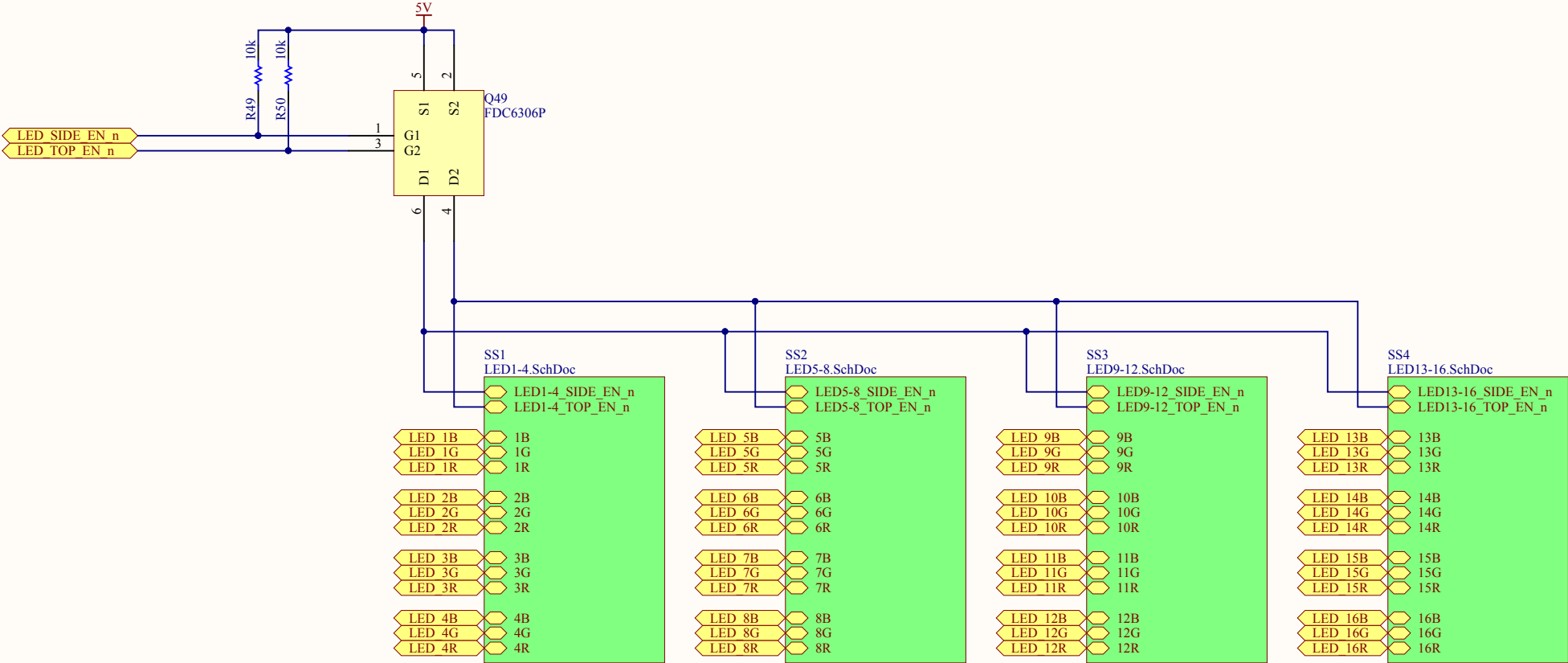




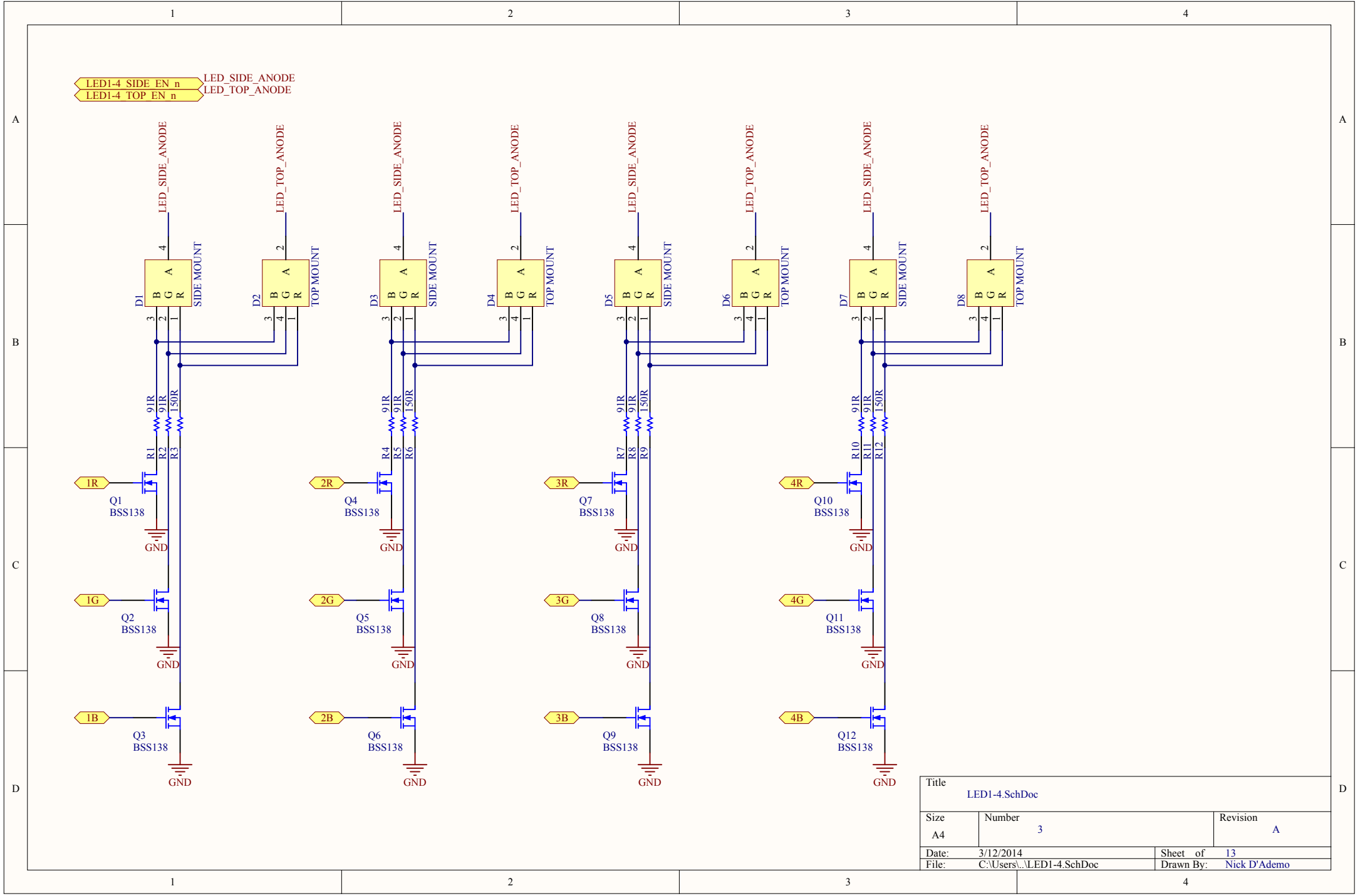
▲ All LEDs have been set to 20mA forward current for 5V via:  
RED: R=150R  
GREEN: R=91R  
BLUE: R=91R

▲ 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

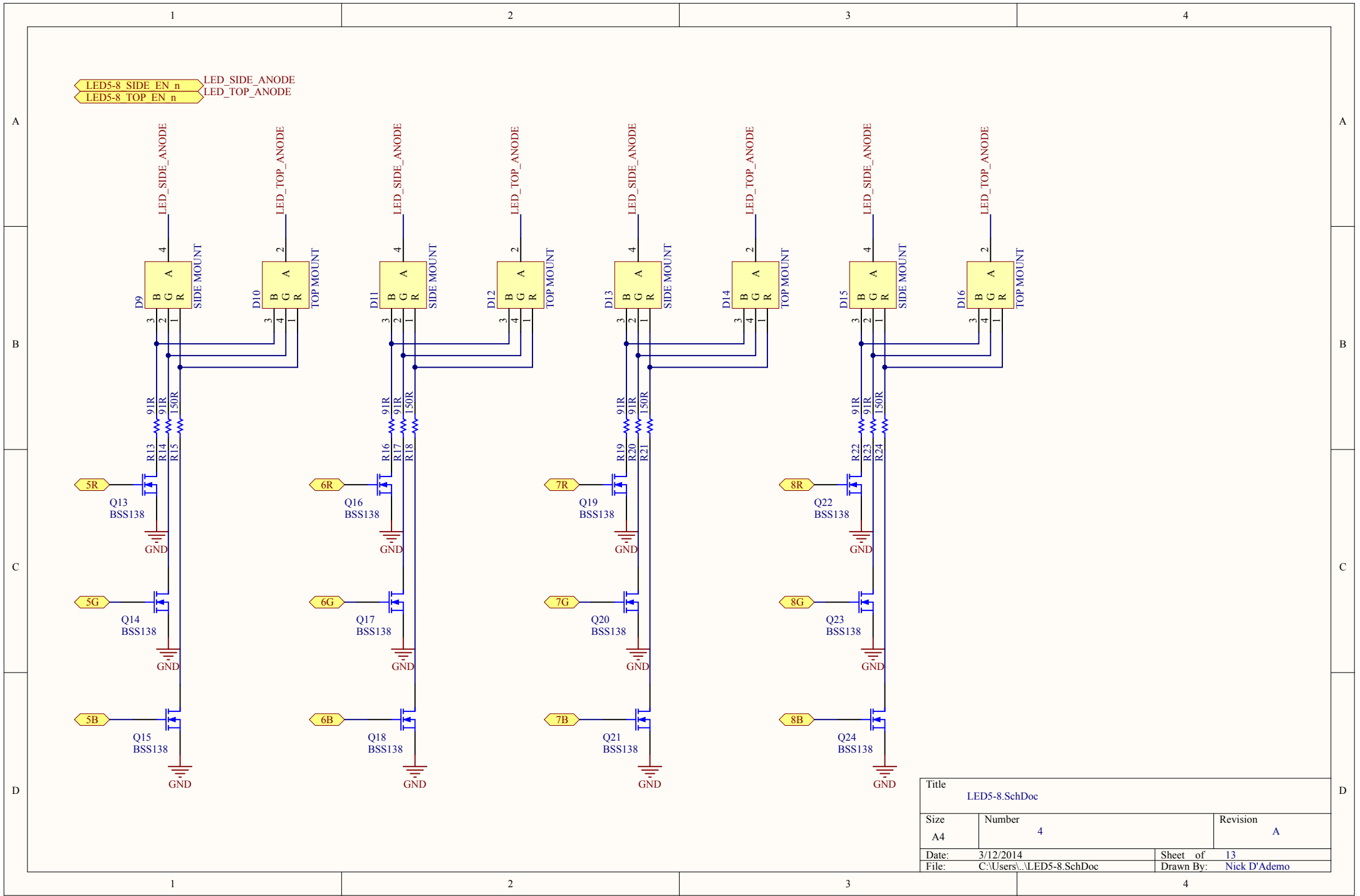
▲ TOP LED:  
Vf @ If=20mA (Avg->Max):  
RED: 2.0->2.6V  
GREEN: 3.2->4.0V  
BLUE: 3.2->4.0V  
  
CLV1A-FKB-CJ1M1F1BB7R4S3: 675med Red, 1055med Green, 337med Blue  
CLV1A-FKB-CK1N1G1BB7R4S3: 730med Red, 1150med Green, 365med Blue



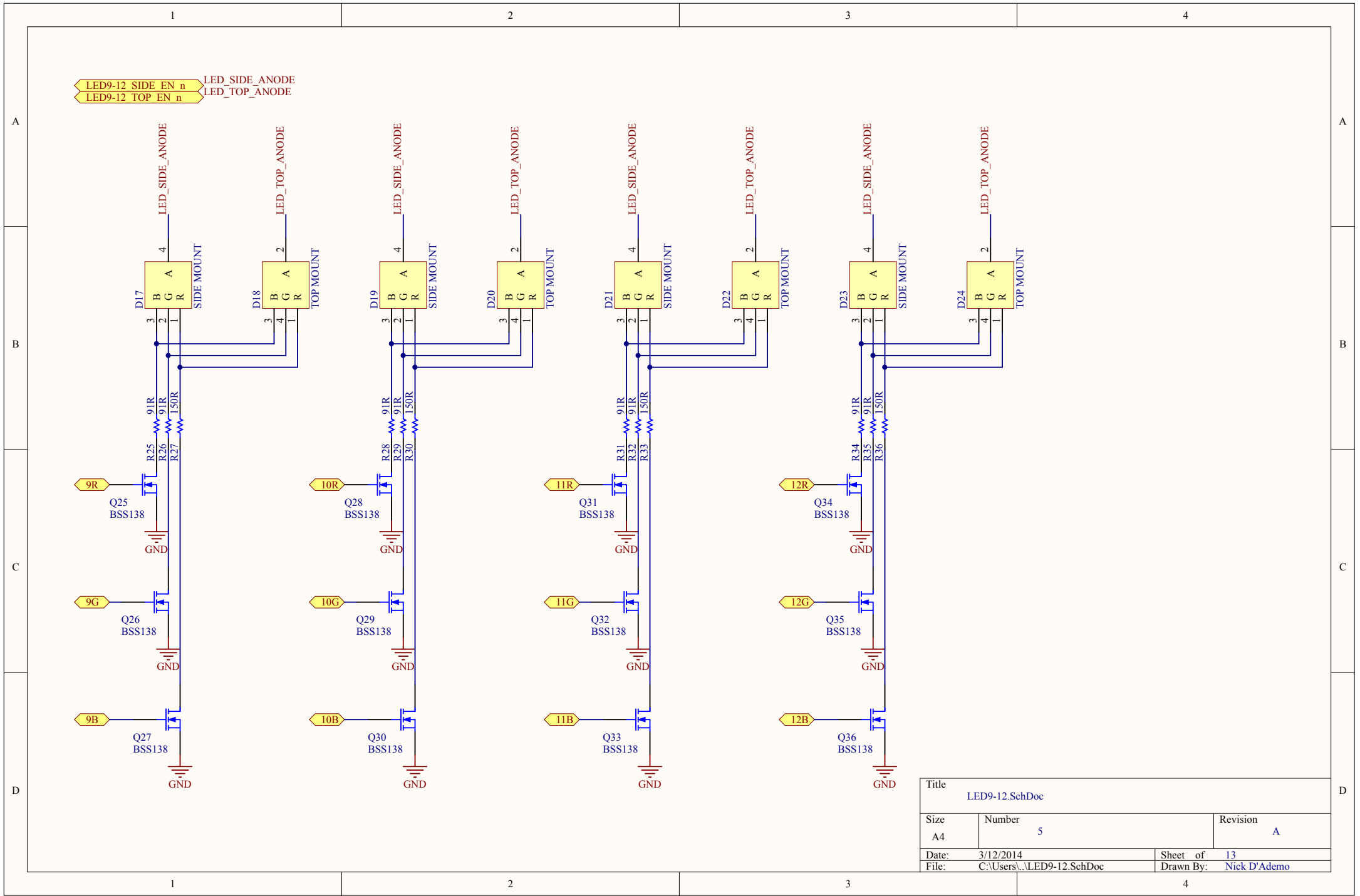
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LEDs.SchDoc		
Size	Number	Revision
A4	2	A
Date:	3/12/2014	Sheet of 13
File:	C:\Users\...\LEDs.SchDoc	Drawn By: Nick D'Ademo

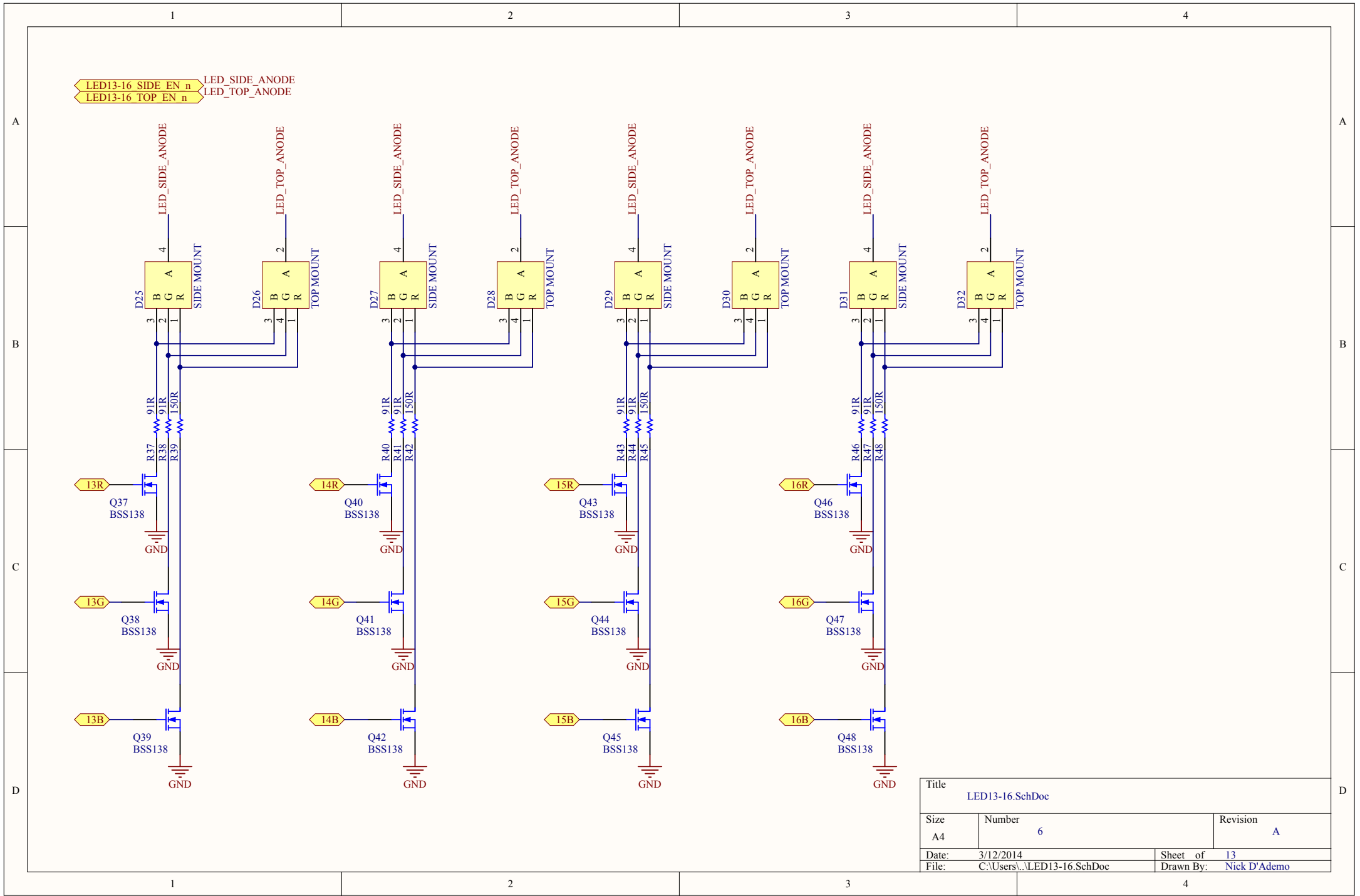


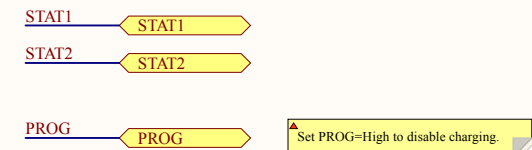
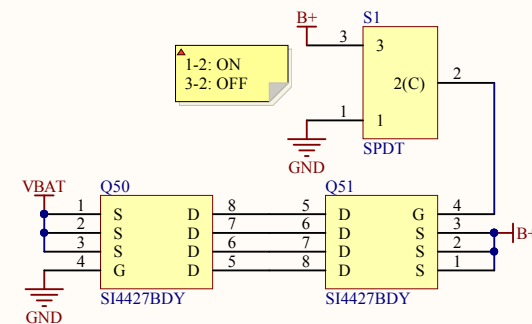
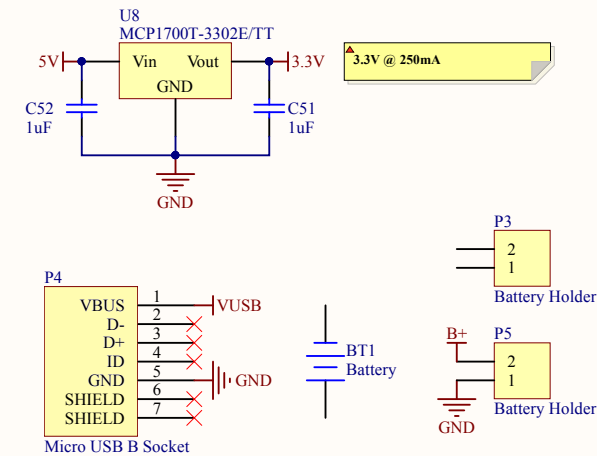
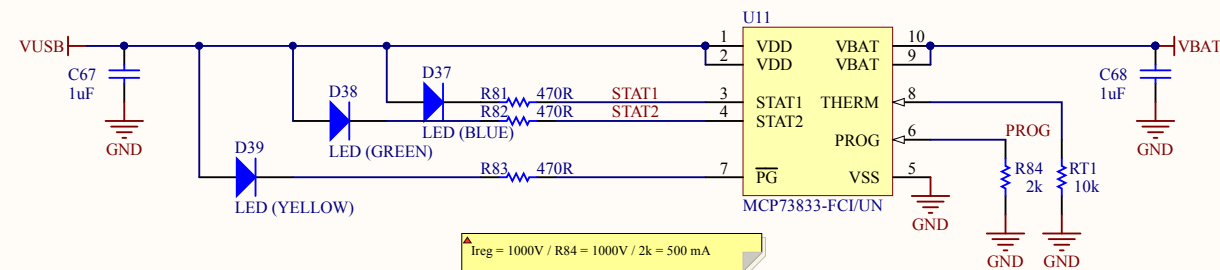
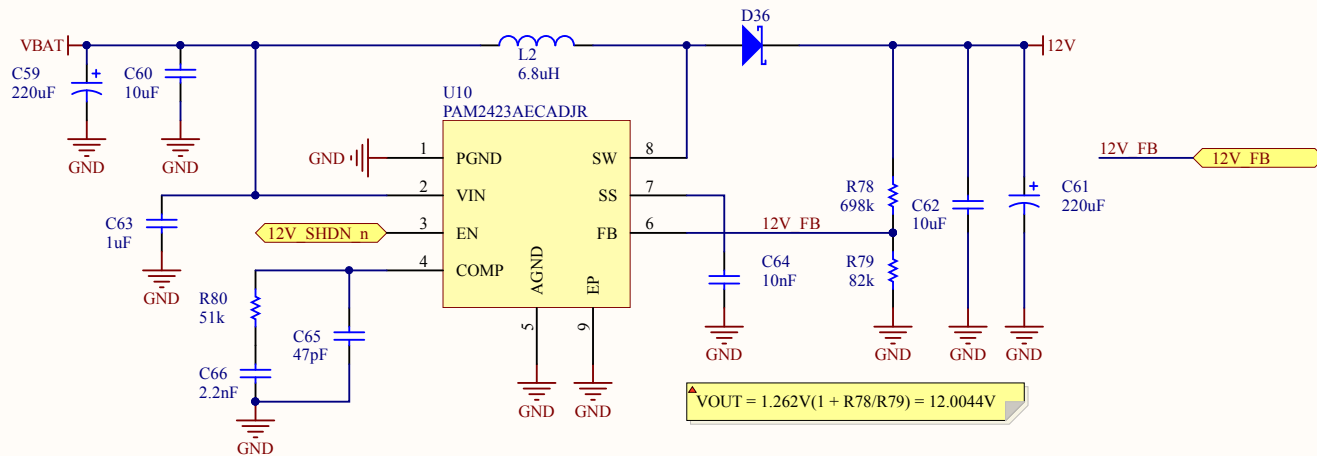
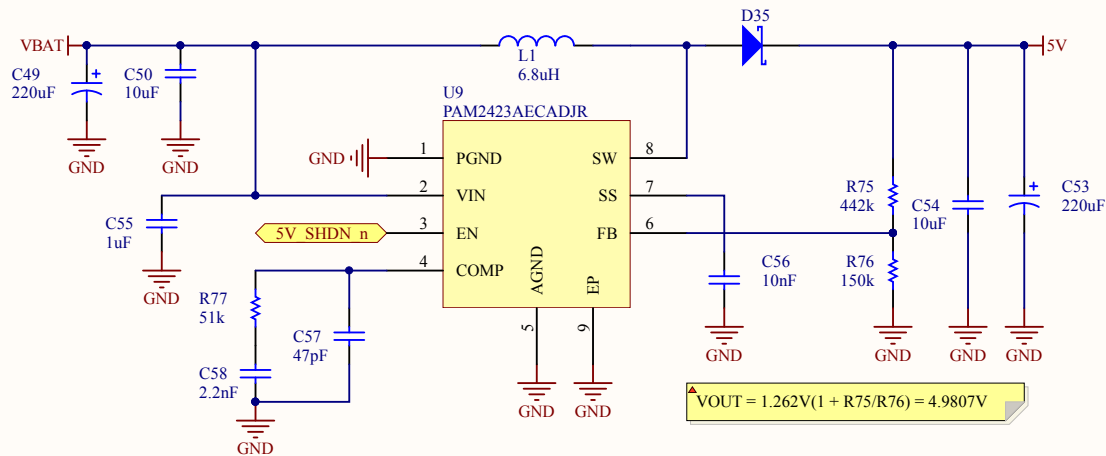
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Size	Number	Revision	
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Date:	3/12/2014	Sheet of	13
File:	C:\Users\...\LED1-4.SchDoc	Drawn By:	Nick D'Ademo



Title		
LED5-8.SchDoc		
Size	Number	Revision
A4	4	A
Date:	3/12/2014	Sheet of 13
File:	C:\Users\...\LED5-8.SchDoc	Drawn By: Nick D'Ademo







Title Power Supply.SchDoc		
Size A4	Number 7	Revision A
Date: 3/12/2014	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

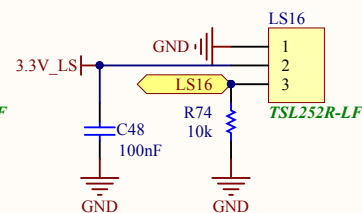
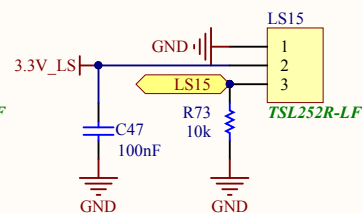
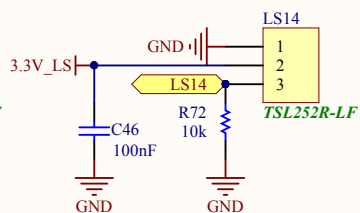
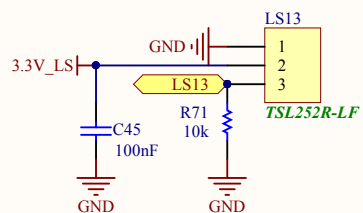
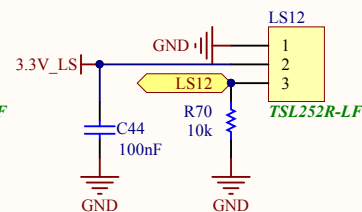
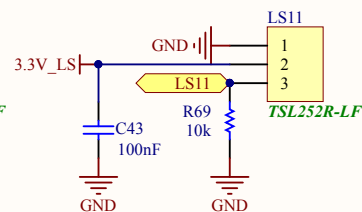
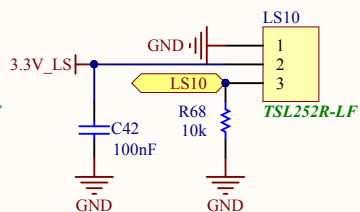
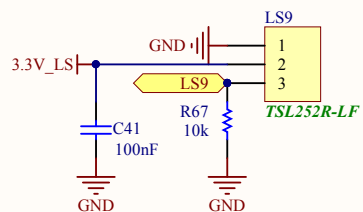
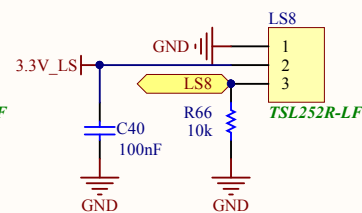
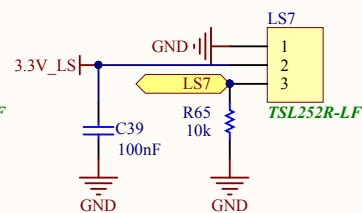
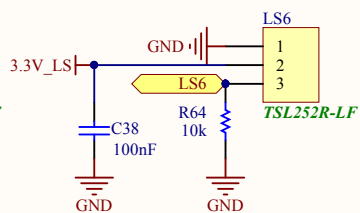
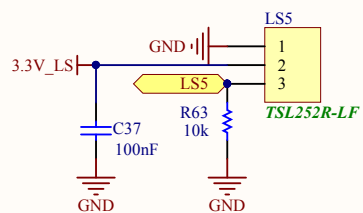
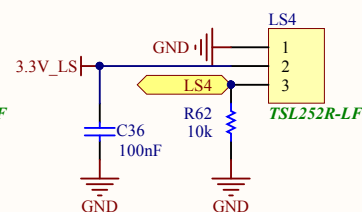
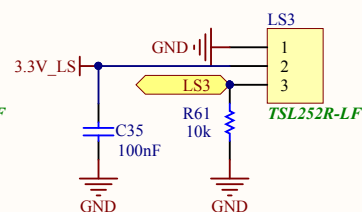
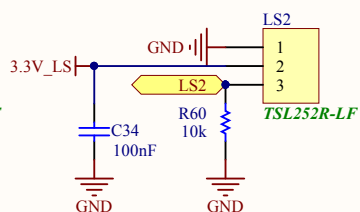
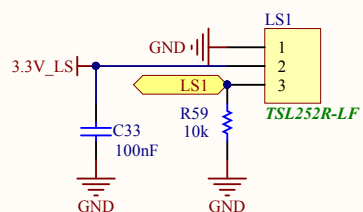
Light-to-Frequency parts:

TSL235  
TSL237  
TSL245 (IR light)

Light-to-Voltage parts:

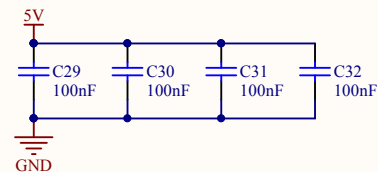
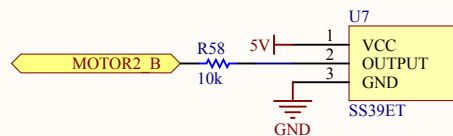
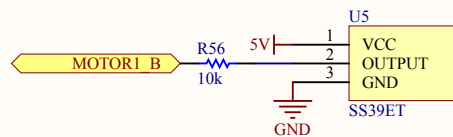
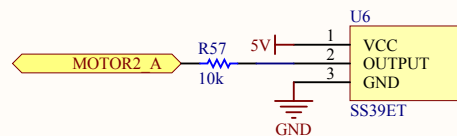
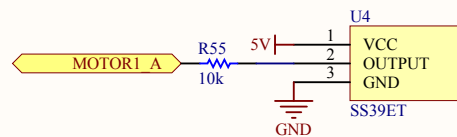
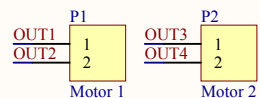
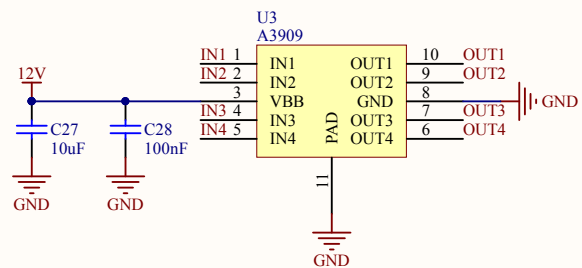
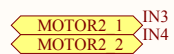
TSL125  
TSL135  
TSL145  
TSL250R  
TSL251R  
TSL252R  
TSL253R  
TSL254R  
TSL257  
TSL260R (IR light)  
TSL261R (IR light)  
TSL262R (IR light)  
TSL267 (IR light)

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

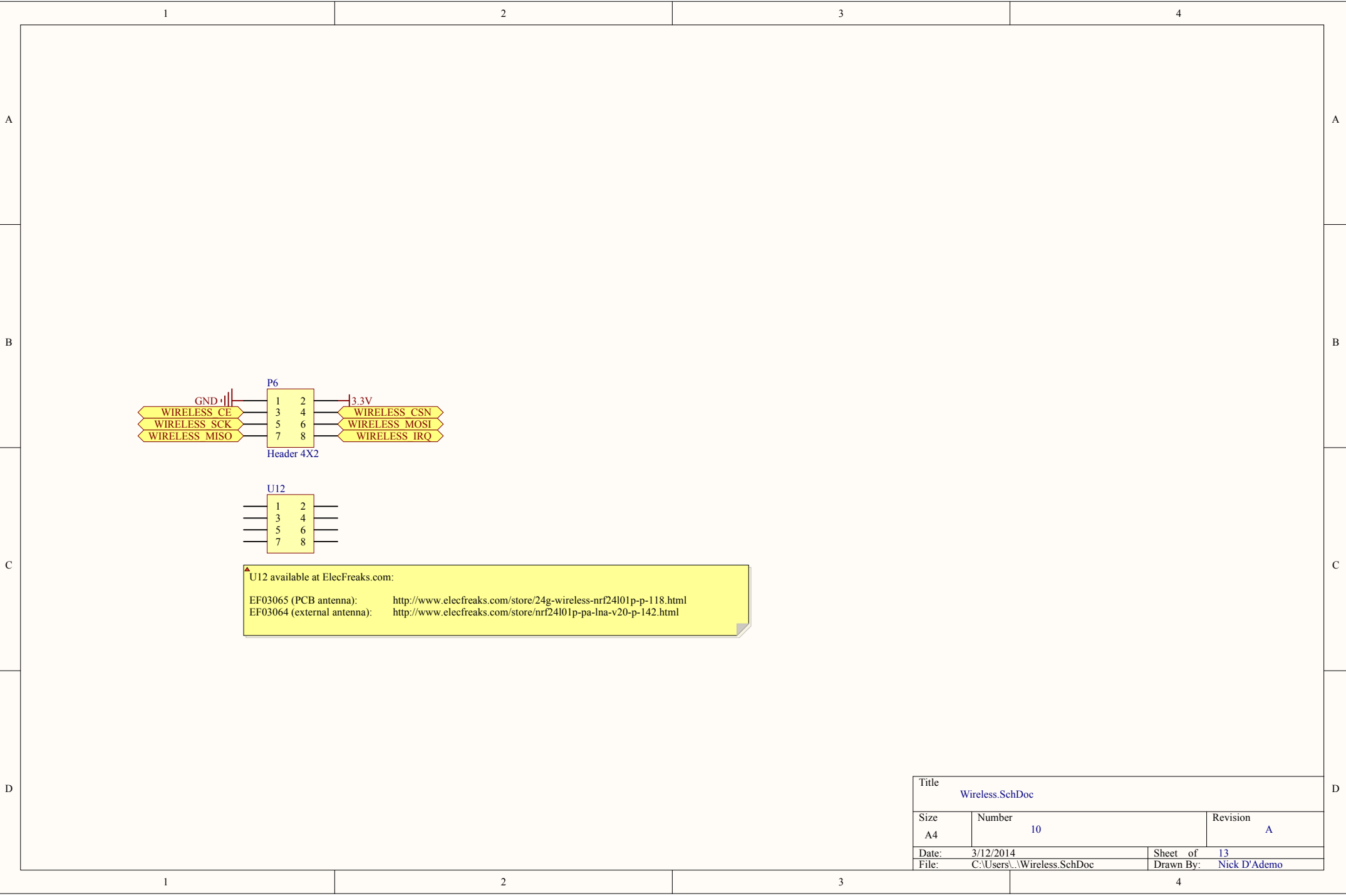


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Light Sensors.SchDoc		
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File:	C:\Users\...\Light Sensors.SchDoc	Drawn By: Nick D'Ademo

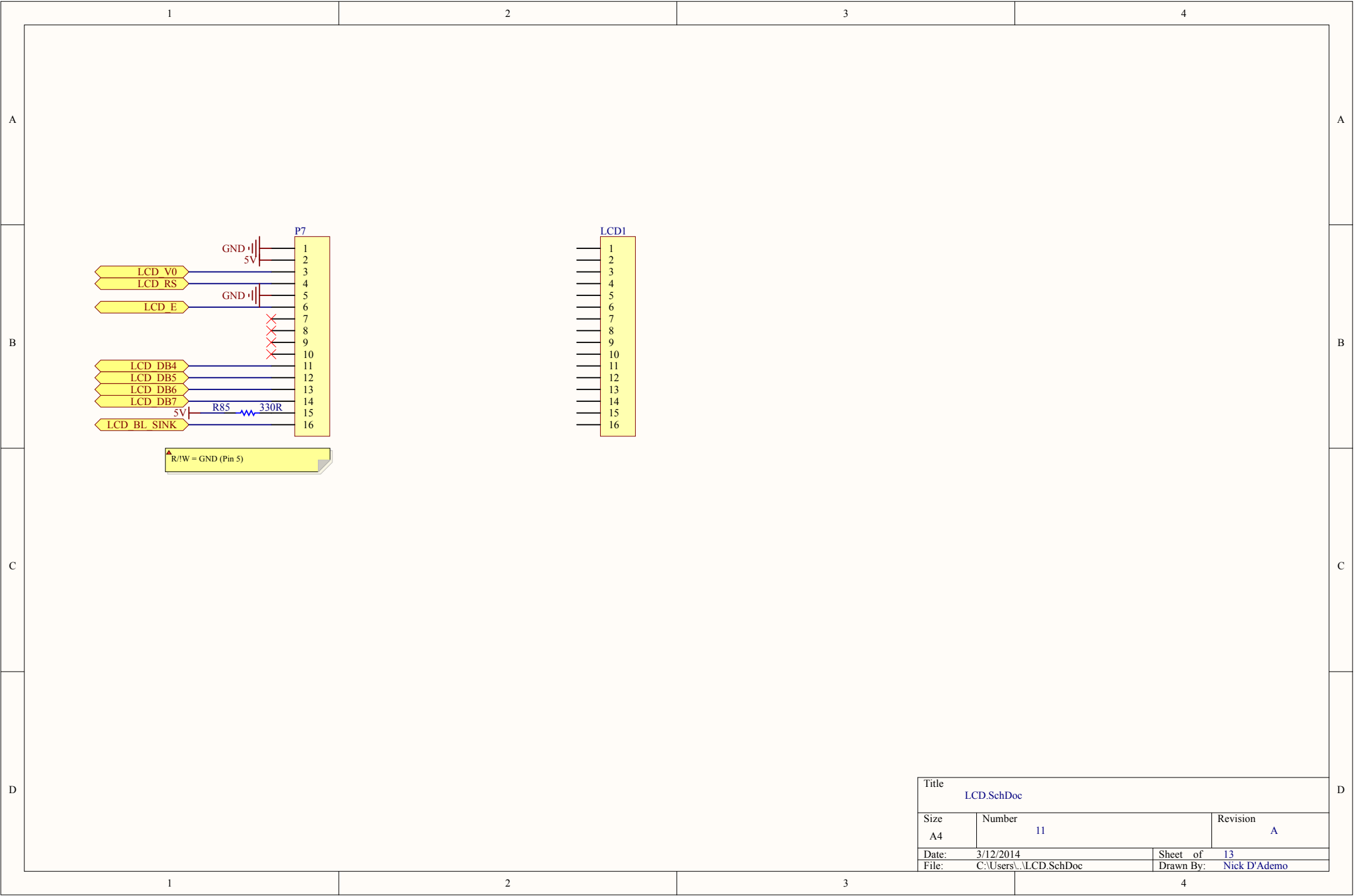




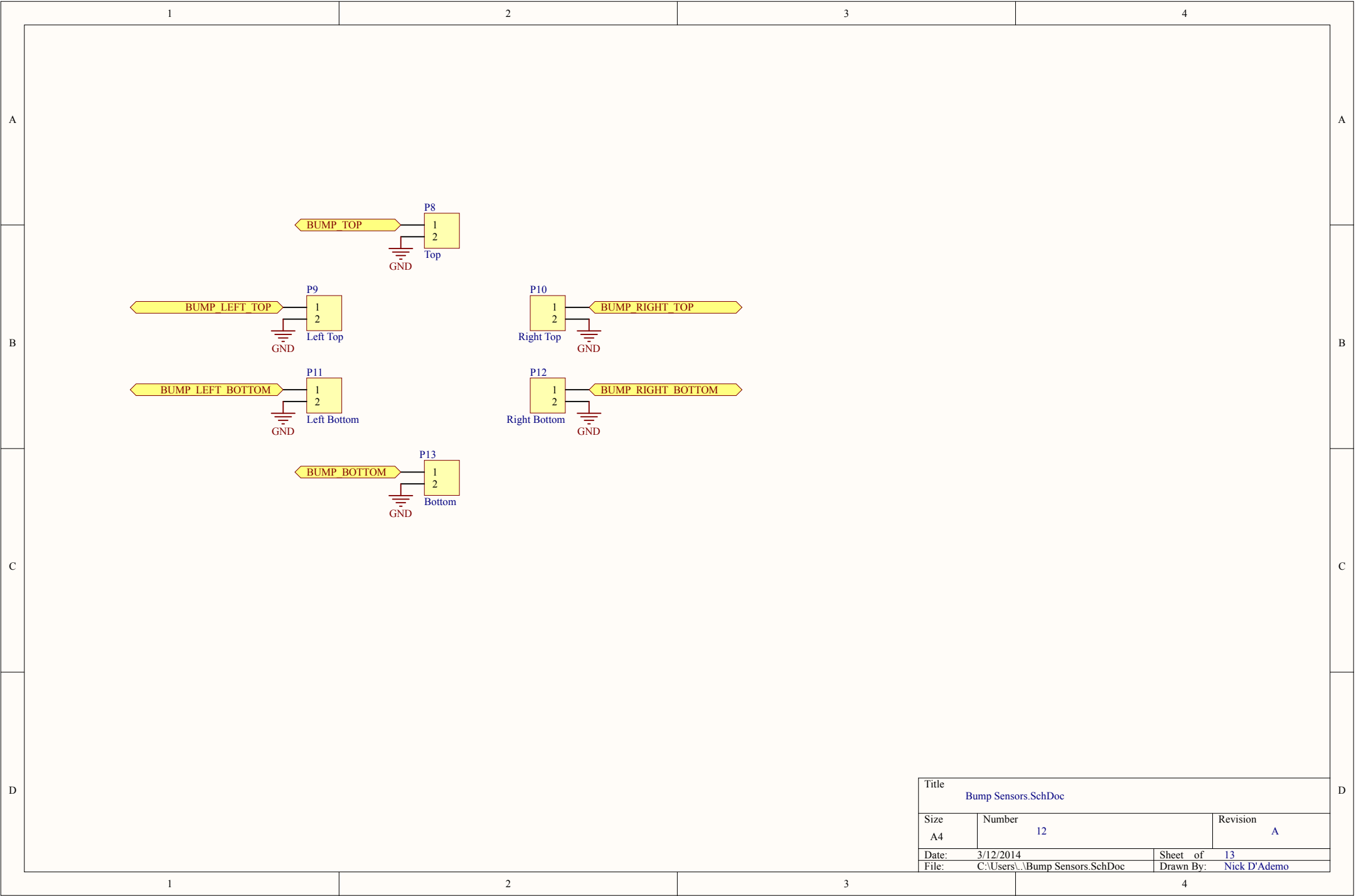
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Size A4	Number 9		Revision A
Date:	3/12/2014	Sheet of	13
File:	C:\Users\...\DC Motors.SchDoc	Drawn By:	Nick D'Ademo

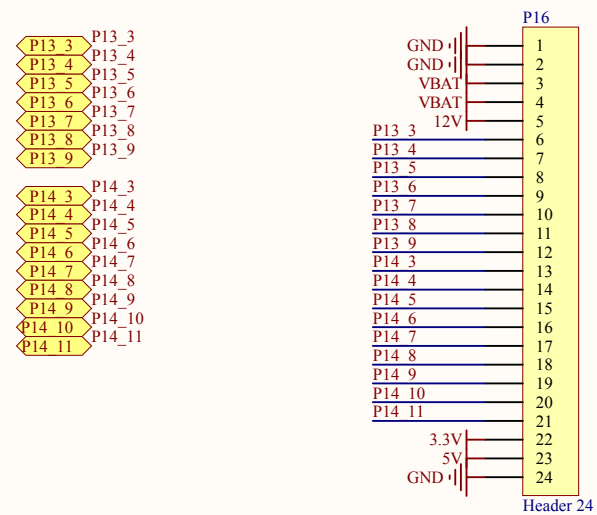
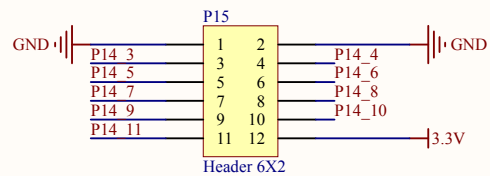
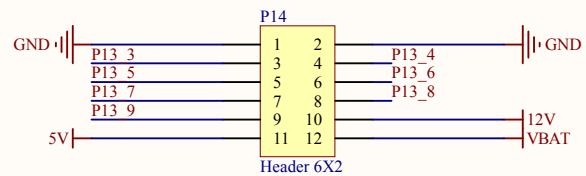


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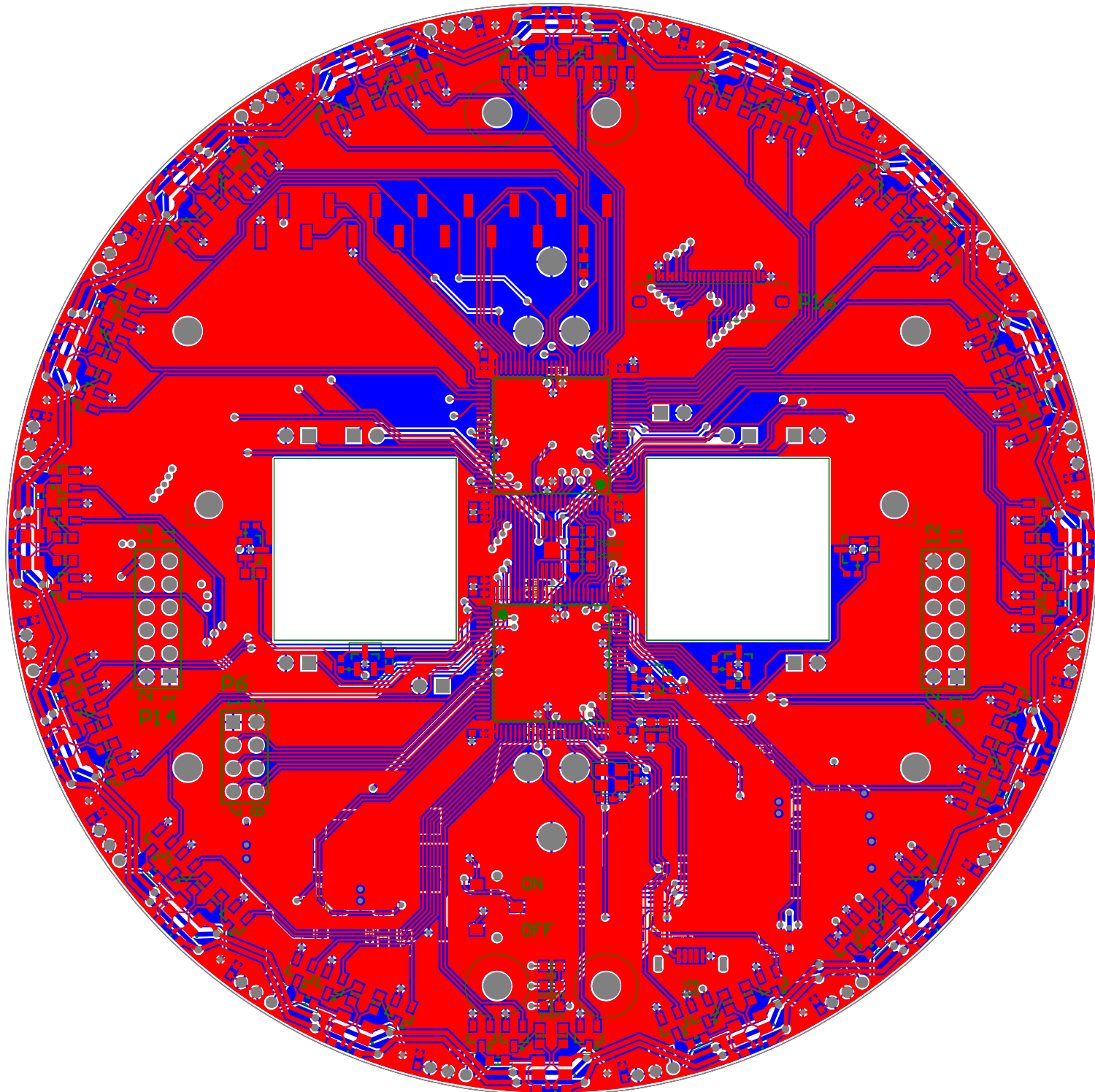


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LCD.SchDoc		
Size	Number	Revision
A4	11	A
Date:	3/12/2014	Sheet of 13
File:	C:\Users\...\LCD.SchDoc	Drawn By: Nick D'Ademo





Title Expansion Header.SchDoc			
Size A4	Number 13	Revision A	
Date:	3/12/2014	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	
Capacitor, X7R, ±10%, 16V, 0402	C1, C2, C5, C6, C7, C8, C9, C10, C11, C12, C16, C19, C22, C23, C25, C26, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48	CAP1005N	37	100nF
Capacitor, NP0, ±2%, 25V, 0402	C3, C4	CAP1005N	2	12pF
Capacitor, X5R, ±10%, 10V, 0402	C13, C14, C15, C17, C18, C20, C21, C24, C51, C52, C55, C63, C67, C68	CAP1005N	14	1uF
TAIYO YUDEN - EMK107BBJ106MA-T - CAP CER 10UF 16V 20% X5R 0603	C27	CAP1005N	1	10uF
KEMET - T491D227K016AT - CAP TANT 220UF 16V 10% T2917	C49, C53, C59, C61	TCT343-2917	4	220uF
Capacitor, X5R, ±20%, 16V, 0603	C60, C54, C60, C62	CAP1608N	4	10uF
Capacitor, NP0, ±10%, 25V, 0402	C56, C64	CAP1005N	2	10nF
Capacitor, NP0, ±10%, 25V, 0402	C57, C65	CAP1005N	2	47pF
Capacitor, NP0, ±10%, 25V, 0402	C58, C66	CAP1005N	2	2.2nF
OPTIX - OV5SRGBCC3 - LED RED/GRN/BLU 1204 SMD	D1, D3, D5, D7, D9, D11, D13, D15, D17, D19, D21, D23, D25, D27, D29, D31	OV5SRGBCC3, S1DE	16	
CREE - CLV1A-FXB -CKIN1G1887R453 - LED RGB 3-IN-1 3.2X2.8MM 4PLCC	D2, D4, D6, D8, D10, D12, D14, D16, D18, D20, D22, D24, D26, D28, D30, D32	PLCC4	16	
ROHM - SMLE12BC7T8Q2 - LED, 0603, LD-CUR, BLU	D33, D34, D37	LED_0603	3	
VISHAY - SS34-E3/STT - DIODE SCHOTTKY 40V 3A DO214A8	D35, D36	DO-214A8	2	
KINGBRIGHT - KP-1608MGC - LED, 0603, GREEN, 70MCD, 568NM	D38	LED_0603	1	
KINGBRIGHT - KP-1608YFC - LED, SMD, 0603, YELLOW	D39	LED_0603	1	
ROUNNE - SRP702BA-68M - FIXED IND 6.8uH ±5A 60 MOHMSMD	L1, L2	SRP702BA	2	6.8uH
SHENZHEN EONE ELECTRONICS CO.,LTD - MT20424015 - EONE High 16x2 (1602) Characters LCD	LCD1		1	
AMS - TSL252R-LF - IC LIGHTTO VOLTAGE SENSOR 3PIN	L51, L52, L53, L54, L55, L56, L57, L58, L59, L510, L511, L512, L513, L514, L515, L516	AMS_5_3PIN	16	
MOLEX INC - 002272021 - CONN HEADER 2POS, 100 VERTIN	P1, P2, P6, P9, P10, P11, P12, P13	HDR1X2	8	
KEYSTONE ELECTRONICS - S4 - BATTERY CLIP 18MM 18650 CELL	P3, P5	S4	2	
GLOBAL CONNECTOR TECHNOLOGY - USB3140-30-0170-1-C - CONNECTOR, USB 3.0 MICRO B, RCPT, SPOS, SMT	P4	USB3140-30-0170-1-C	1	
SAMTEC - SSW-116-22-F-S-V5 - Conn Socket Strip SKT 16 POS 2.54mm Solder ST SMD Tube	P7	Samtec-SSW-116-22-F-S-V5	1	
SAMTEC - SSW-106-01-T-D - SOCKET, 2.54MM, 20EWAY	P14, P15	SSW-106-01-X-D	2	
GLOBAL CONNECTOR TECHNOLOGY - FFC2810-24-T - FFC/FFC, CONNECTOR, RECEPTACLE, 24POS, 1ROW	P16	FFC2810	1	
FAIRCHILD SEMICONDUCTOR - BSS138 - MOSFET N-CH 50V 220MA SOT-23	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	SOT95P230-3N	48	
FAIRCHILD SEMICONDUCTOR - FDC630P - MOSFET 2P-CH 20V 1.9A SSOt6	Q49	SOT-6	1	
VISHAY SILICONIX - S4427BDV-T1-E3 - MOSFET P-CH 30V 9.7A 8-SOIC	Q50, Q51	SOIC127P600-BAN	2	
Resistor, ±1%, 0.1W, 0603	R1, R2, R4, R5, R7, R8, R10, R11, R13, R14, R16, R17, R19, R20, R22, R23, R25, R46, R28, R29, R31, R32, R34, R35, R37, R38, R40, R41, R43, R44, R46, R47	RES1608N	32	91R
Resistor, ±1%, 0.1W, 0603	R3, R6, R9, R12, R15, R16, R21, R24, R27, R30, R33, R36, R39, R42, R45, R48	RES1608N	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	RES1608N	22	10k
Resistor, ±1%, 0.1W, 0603	R51, R52, R61, R62, R63	RES1608N	5	470R
Resistor, ±1%, 0.1W, 0603	R63	RES1608N	1	500k
Resistor, ±1%, 0.1W, 0603	R54	RES1608N	1	1M
Resistor, ±1%, 0.1W, 0603	R75	RES1608N	1	144k
Resistor, ±1%, 0.1W, 0603	R76	RES1608N	1	150k
Resistor, ±1%, 0.1W, 0603	R77, R80	RES1608N	2	51k
Resistor, ±1%, 0.1W, 0603	R78	RES1608N	1	698k
Resistor, ±1%, 0.1W, 0603	R79	RES1608N	1	82k
Resistor, ±1%, 0.1W, 0603	R84	RES1608N	1	2k
Resistor, ±1%, 0.1W, 0603	R85	RES1608N	1	130R
MURATA - MCP180H103303R8 - THERMISTOR, NTC, 10K, 5%, SMD	RT1	RES1608N	1	10k
COPAL ELECTRONICS INC. - CL-S8-128-01T - SWITCH SLIDE SPOT 0.2A GULL 12V	S1	CL-S8-128-01T	1	
PSoC, Programmable System-on-Chip, 256 KB Flash, 62 GPIOs, 1.71 to 5.5 V, 100 Pin, TQFP (AX100), Tray	U1, U2	CYP-AX100_L	2	
ALLEGRO - A3909GLYR-T - IC MOTOR DRIVER PAR 10MSOP	U3	MSOP-10	1	
HONEYWELL S&C - SS39ET - SENSOR, HALL EFFECT, LINEAR, SOT23-3	U4, U5, U6, U7	SOT23-3N	4	
MICROCHIP - MCP1700T-3302E/TT - IC REG LDO 3.3V 0.25A SOT23-3	U8	SOT95P230-3N	1	
DIODES INCORPORATED - PAM2423AECADIR - IC REG BOOST ADJ 5.5A BSOIC	U9, U10	SOIC127P600-RON	2	
MICROCHIP - MCP73833-FCU/LN - IC L-UON/LU-POLY CTRLR 10MSOP	U11	MSOP-UNT10_N	1	
NORDIC SEMICONDUCTOR - nRF2401+	U12	HDR204	1	
NDK - NX3225SA-16.000MHZ-STD-CSR-1 - CRYSTAL 16MHZ 8PF SMD	V1	NX3225SA	1	