

1

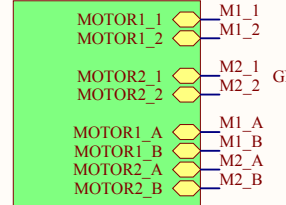
2

3

4

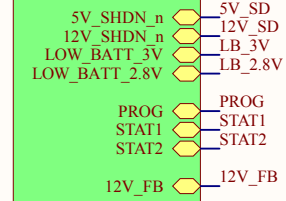
SS7

DC Motors.SchDoc



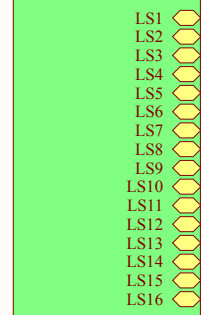
SS6

Power Supply.SchDoc



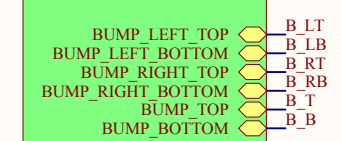
SS8

Light Sensors.SchDoc



SS10

Bump Sensors.SchDoc



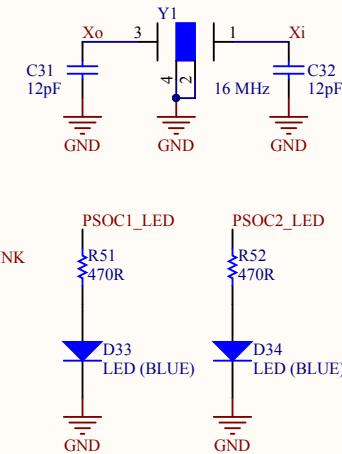
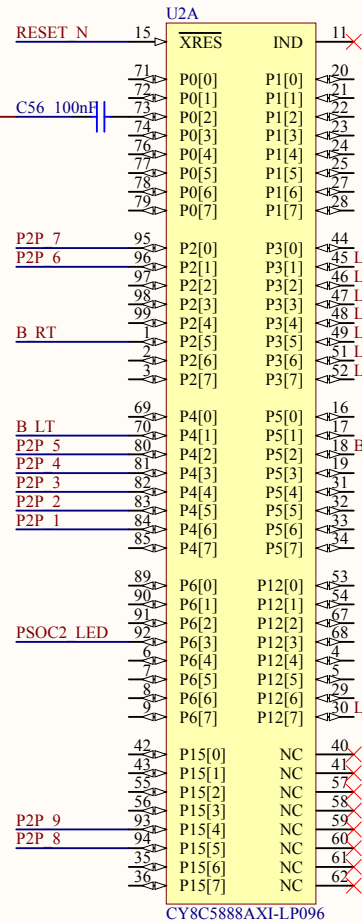
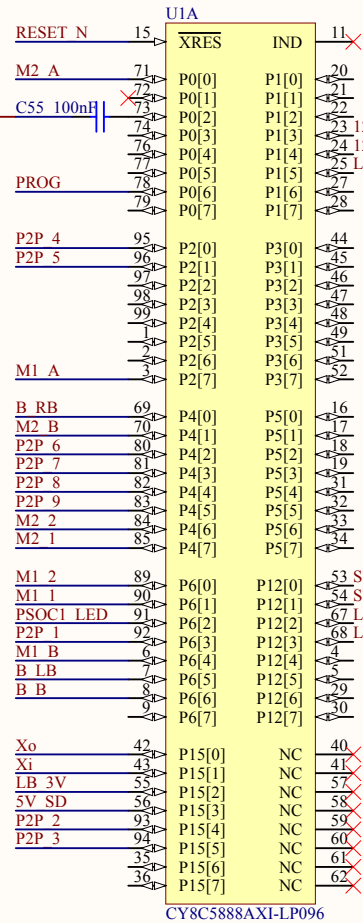
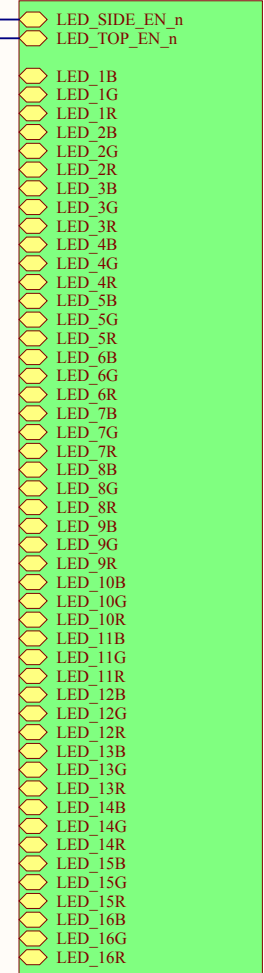
SS9

LCD.SchDoc



SS5

LEDs.SchDoc



1

2

3

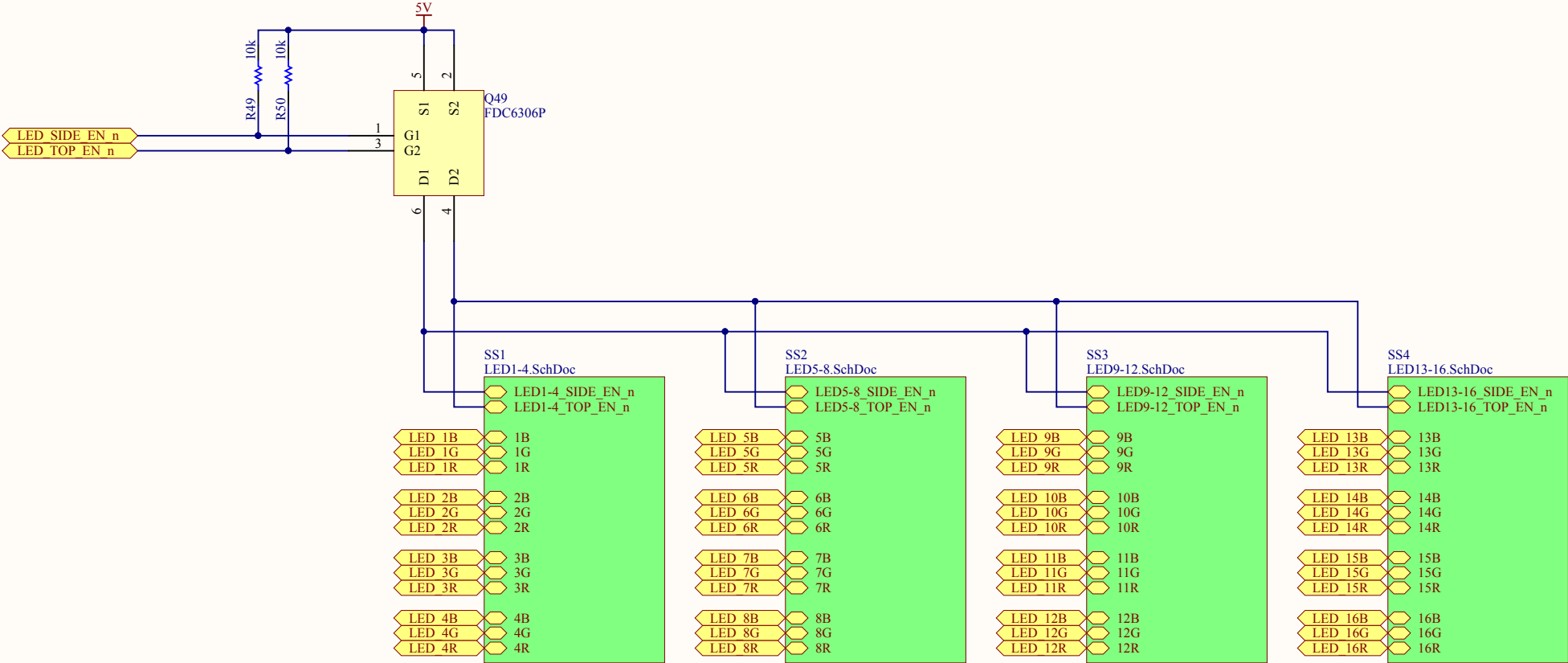
4

Title		
PSoC.SchDoc		
Size	Number	Revision
A4	1	A
Date:	28/11/2014	Sheet of 12
File:	C:\Users\...\PSoC.SchDoc	Drawn By: Nick D'Ademo

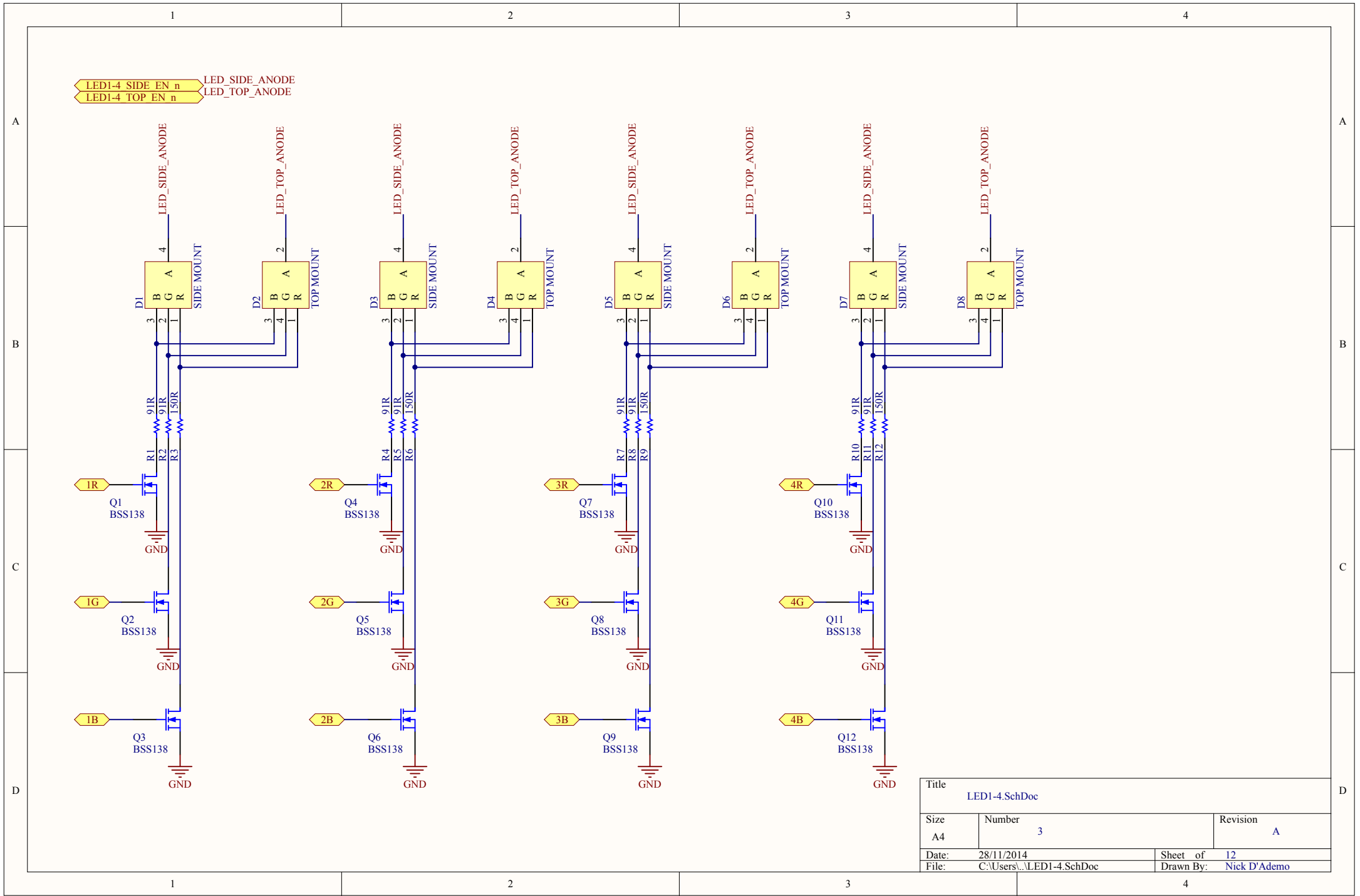
▲ All LEDs have been set to 20mA forward current for 5V via:  
RED: R=150R  
GREEN: R=91R  
BLUE: R=91R

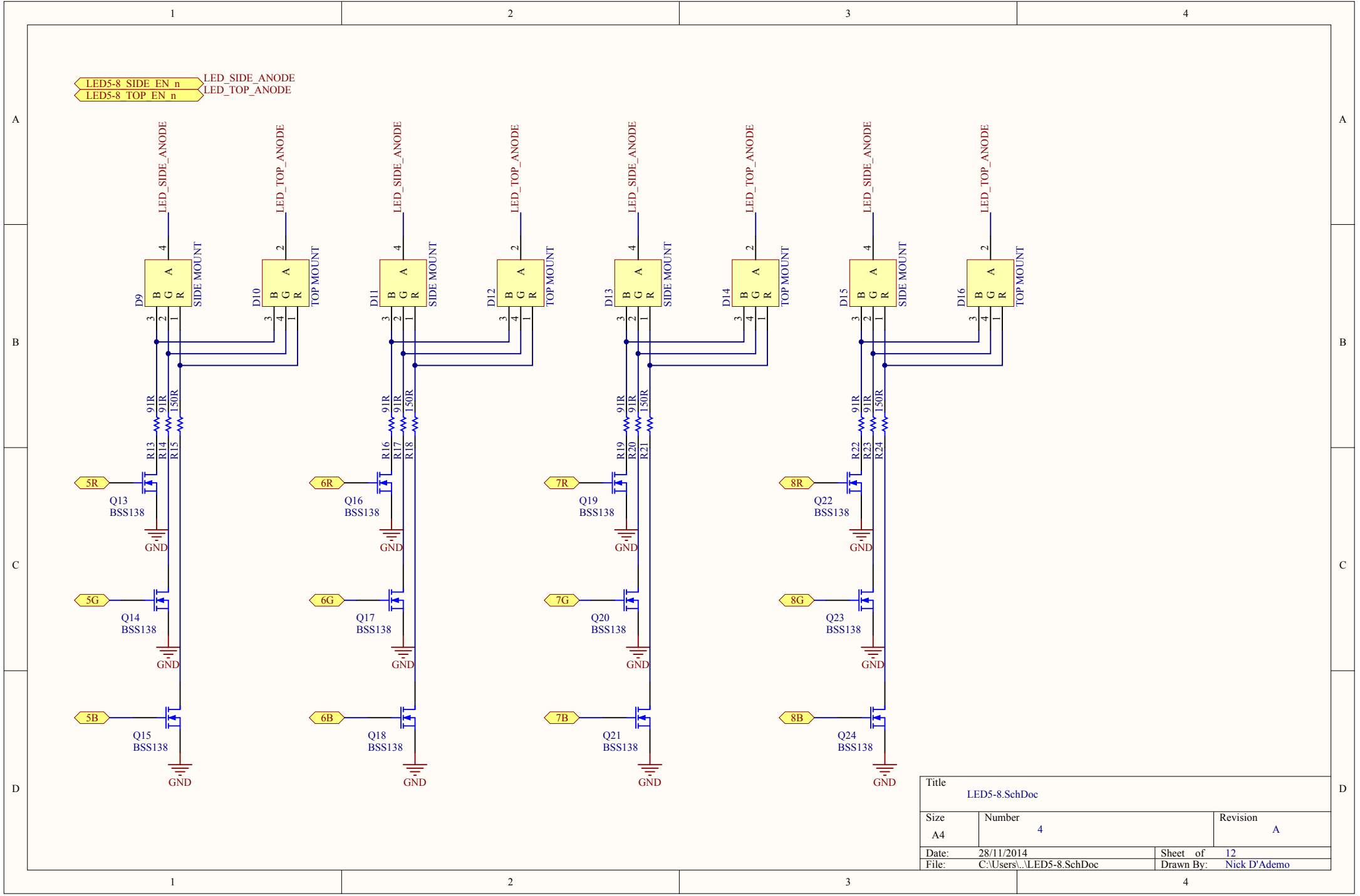
▲ SIDE LED:  
Vf @ If=20mA (Min->Typ->Max):  
RED: 1.8->2.0->2.4V  
GREEN: 3.0->3.3->3.6V  
BLUE: 3.0->3.3->3.6V

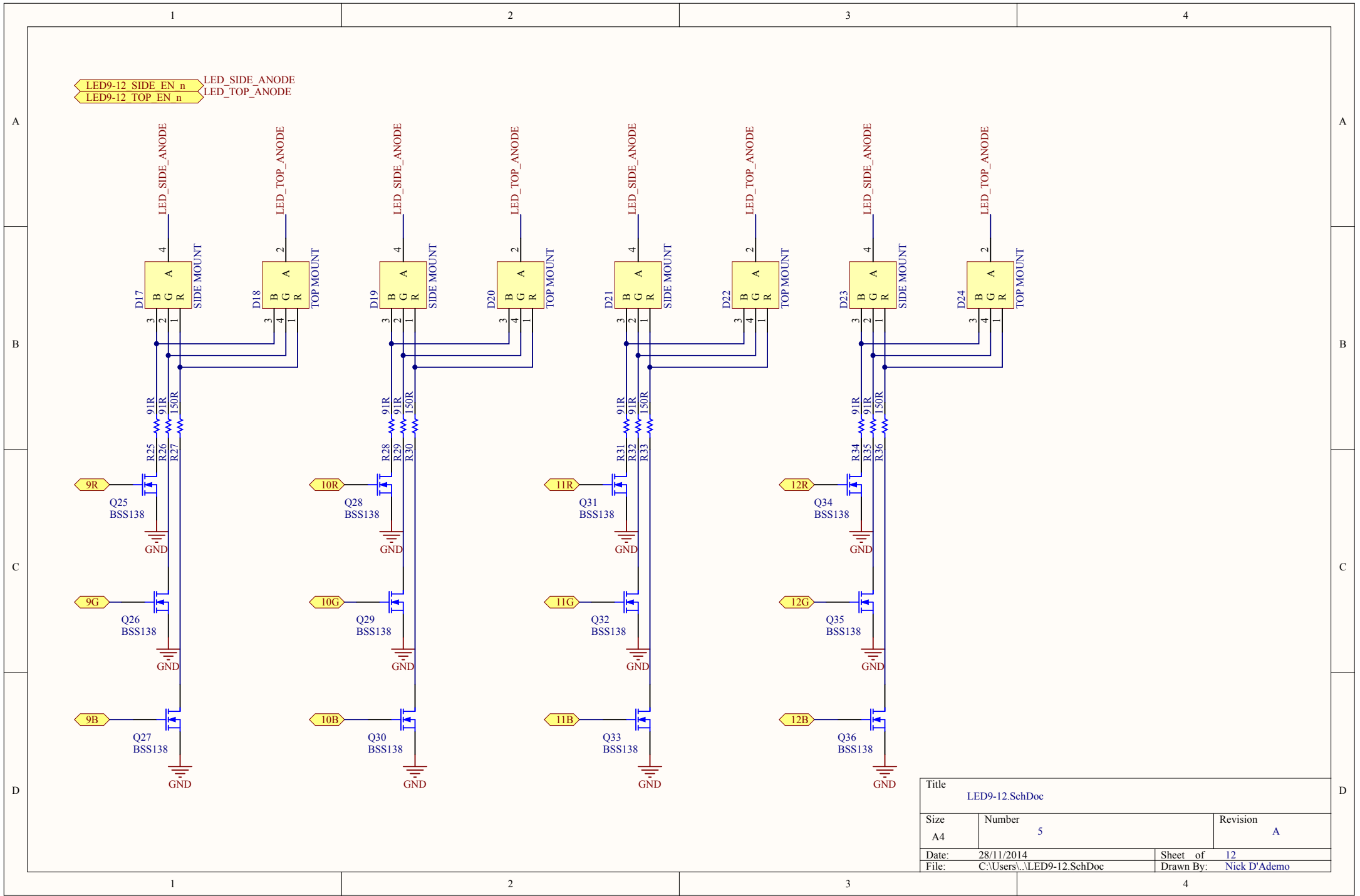
▲ TOP LED:  
Vf @ If=20mA (Avg->Max):  
RED: 2.0->2.6V  
GREEN: 3.2->4.0V  
BLUE: 3.2->4.0V  
  
CLV1A-FKB-CJ1M1F1BB7R4S3: 675med Red, 1055med Green, 337med Blue  
CLV1A-FKB-CK1N1G1BB7R4S3: 730med Red, 1150med Green, 365med Blue

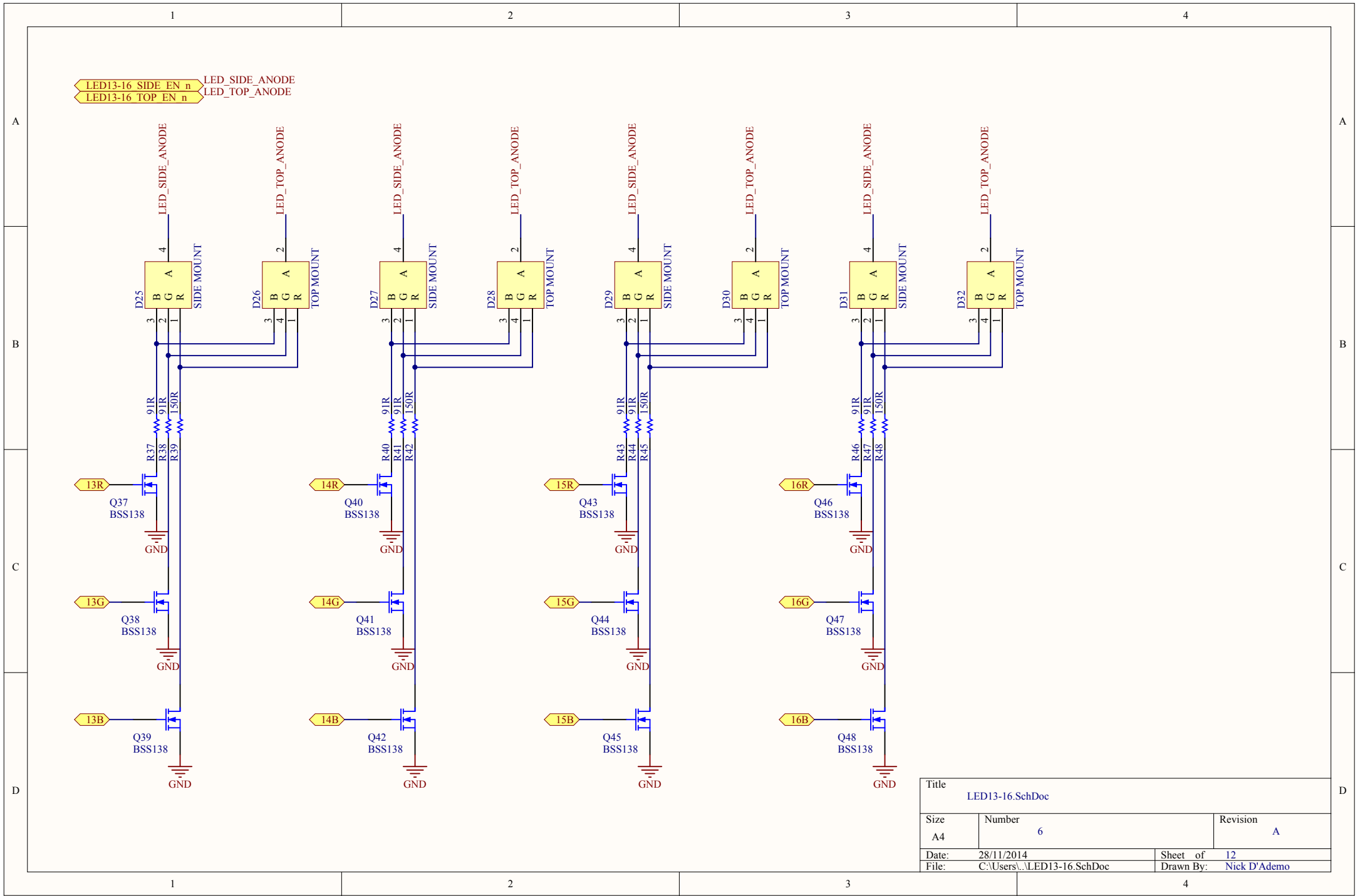


Title		
LEDs.SchDoc		
Size	Number	Revision
A4	2	A
Date:	28/11/2014	Sheet of 12
File:	C:\Users\...\LEDs.SchDoc	Drawn By: Nick D'Ademo









Title		
LED13-16.SchDoc		
Size	Number	Revision
A4	6	A
Date:	28/11/2014	Sheet of 12
File:	C:\Users\...\LED13-16.SchDoc	Drawn By: Nick D'Ademo

1

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4

A

B

C

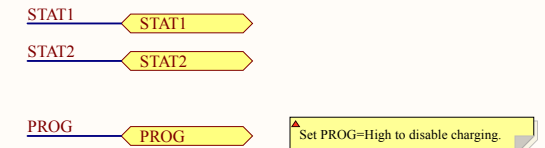
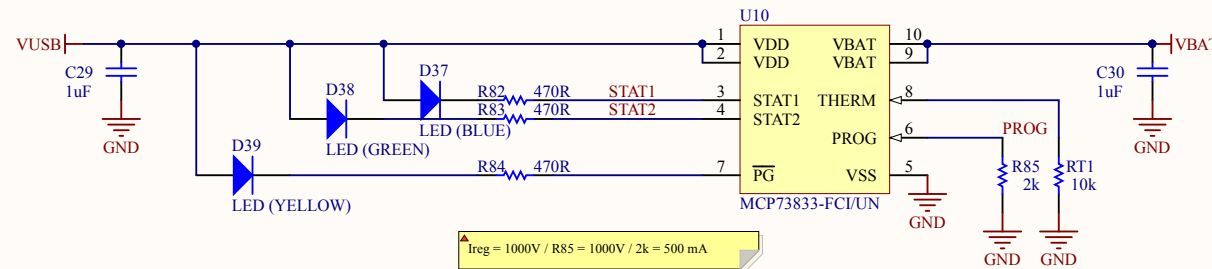
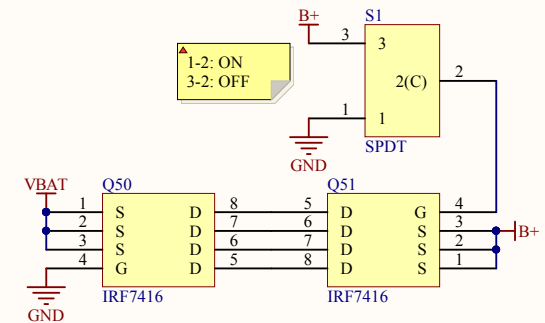
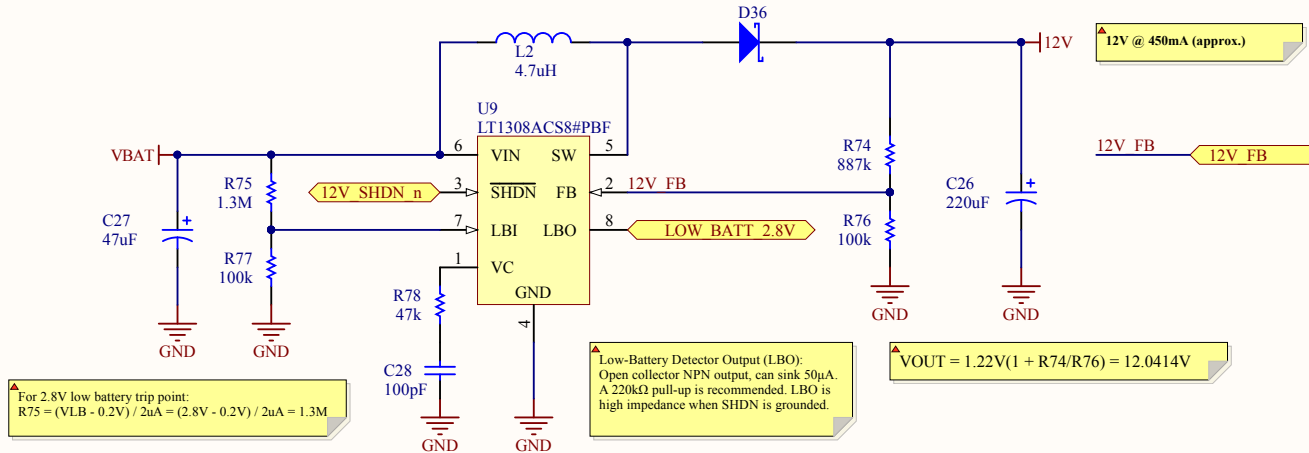
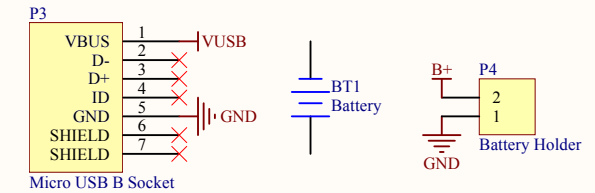
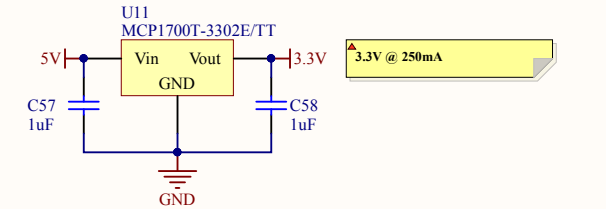
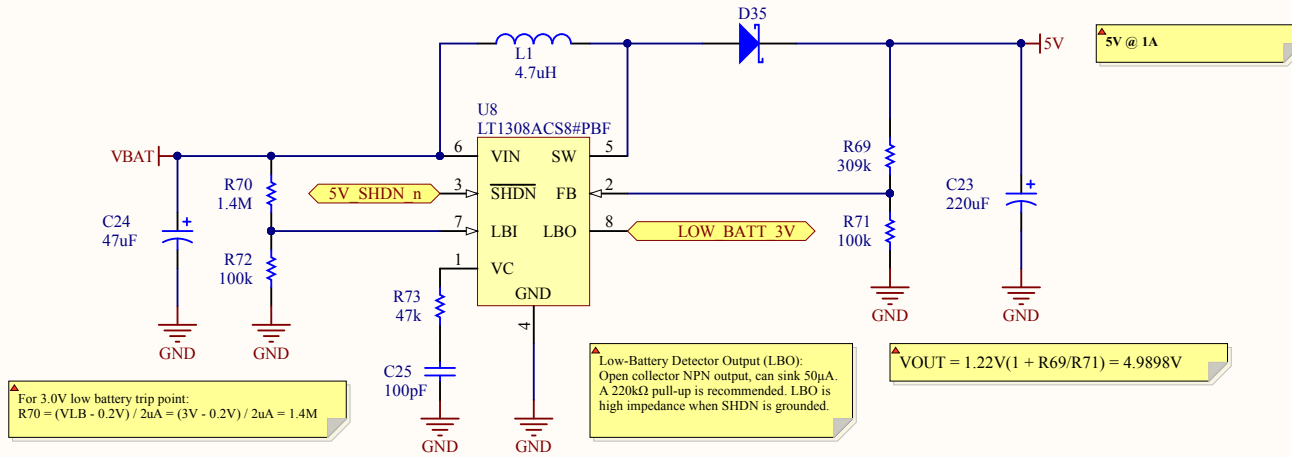
D

A

B

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D



Title		
Power Supply.SchDoc		
Size	Number	Revision
A4	7	A
Date:	28/11/2014	Sheet of 12
File:	C:\Users\...\Power Supply.SchDoc	Drawn By: Nick D'Ademo

1

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

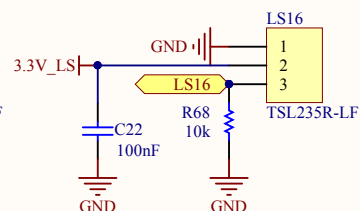
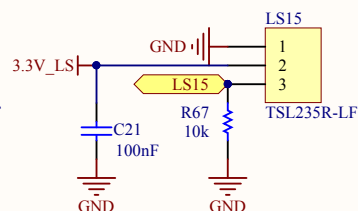
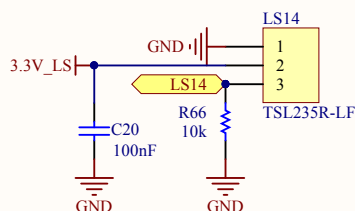
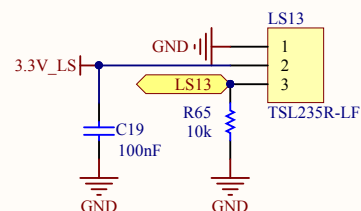
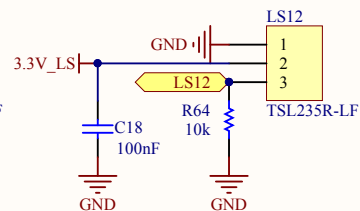
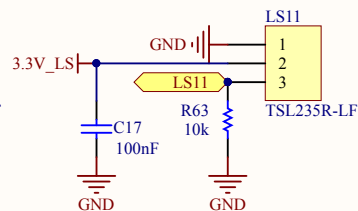
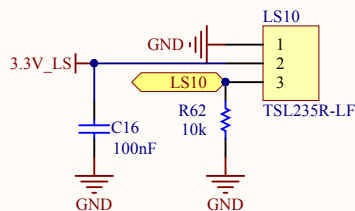
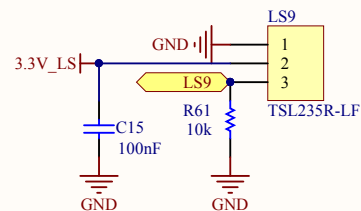
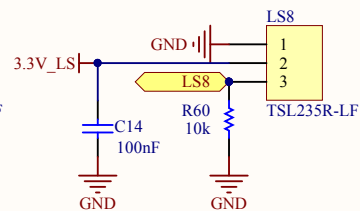
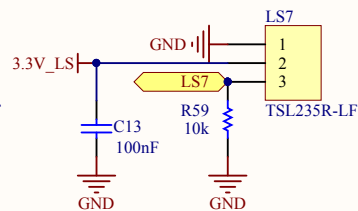
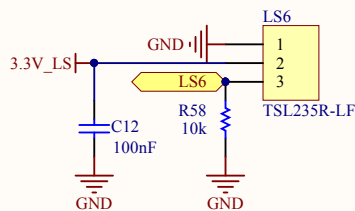
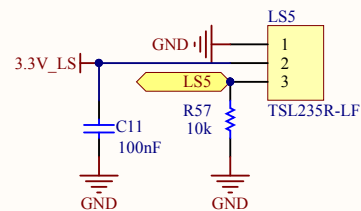
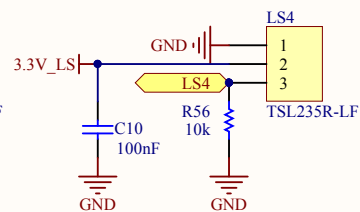
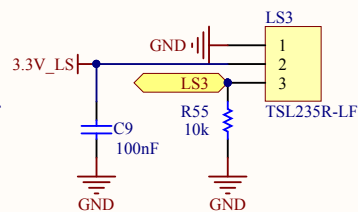
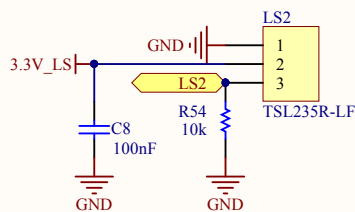
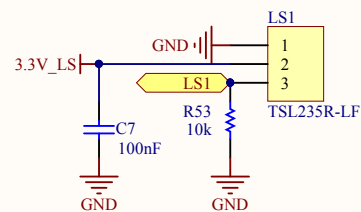
Light-to-Frequency parts:

TSL235  
TSL237  
TSL245 (IR light)

Light-to-Voltage parts:

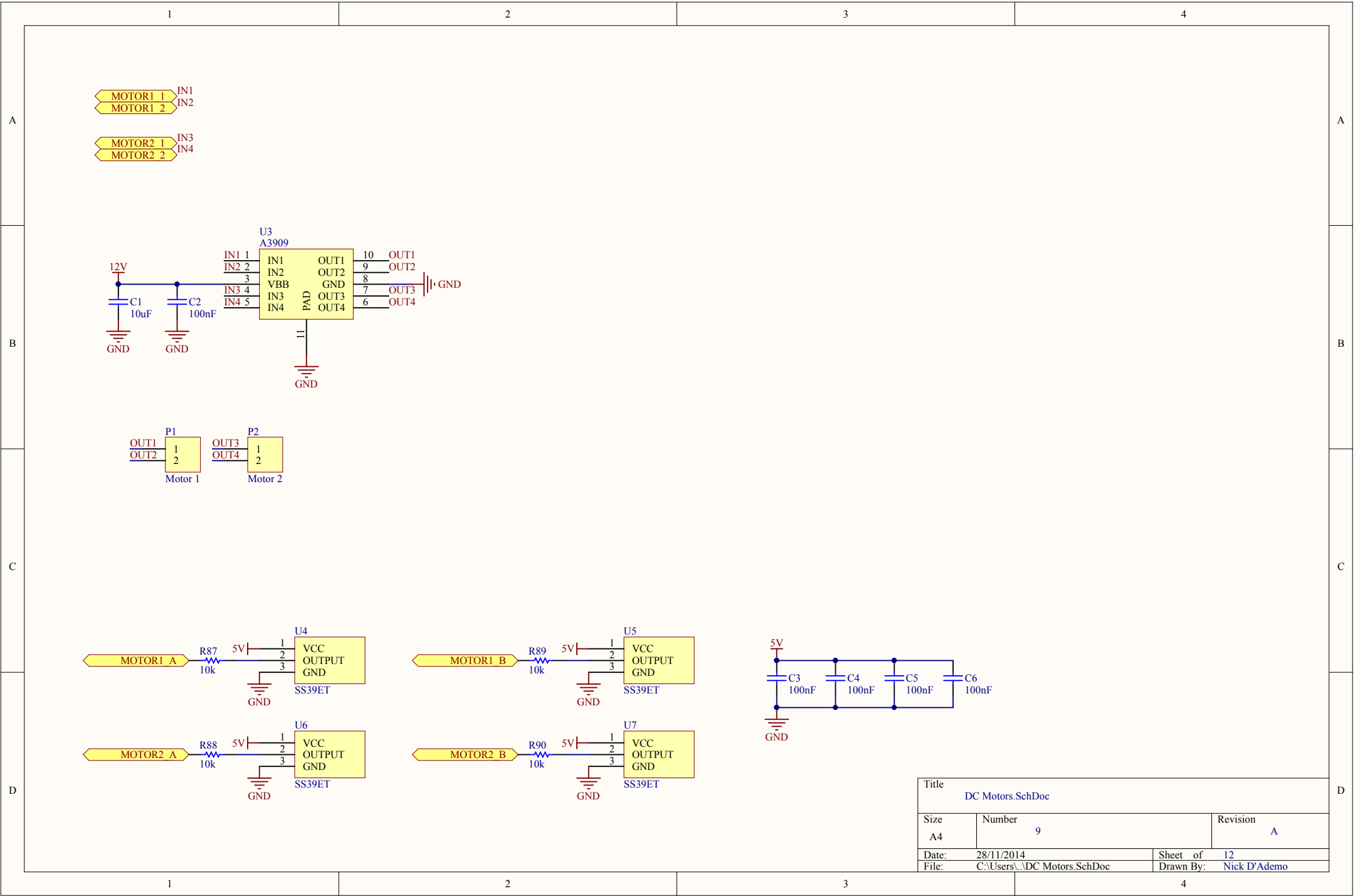
TSL125  
TSL135  
TSL145  
TSL250R  
TSL251R  
TSL252R  
TSL253R  
TSL254R  
TSL257  
TSL260R (IR light)  
TSL261R (IR light)  
TSL262R (IR light)  
TSL267 (IR light)

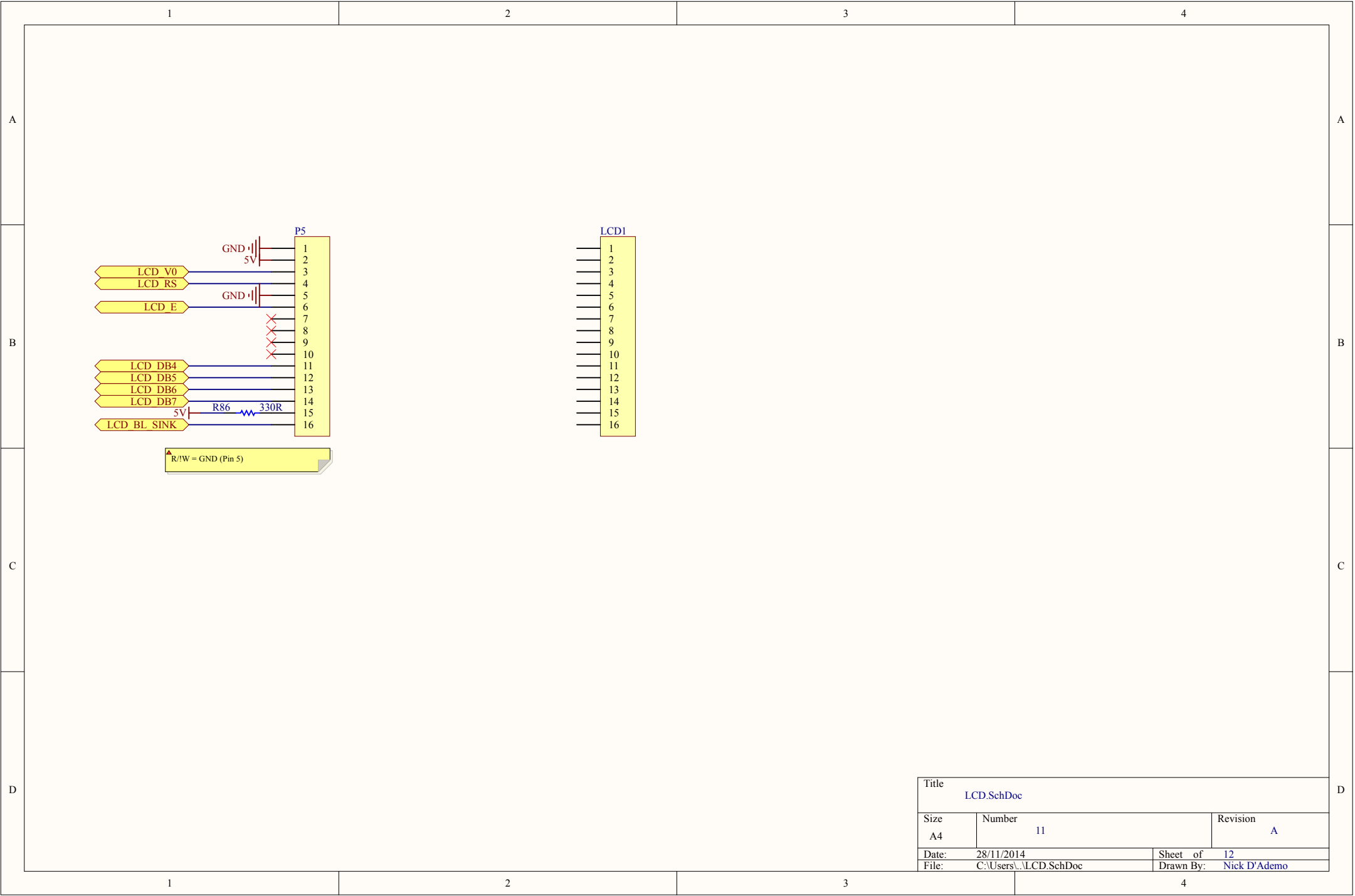
▲ Only install R53 to R68 if Light-to-Voltage parts are used.



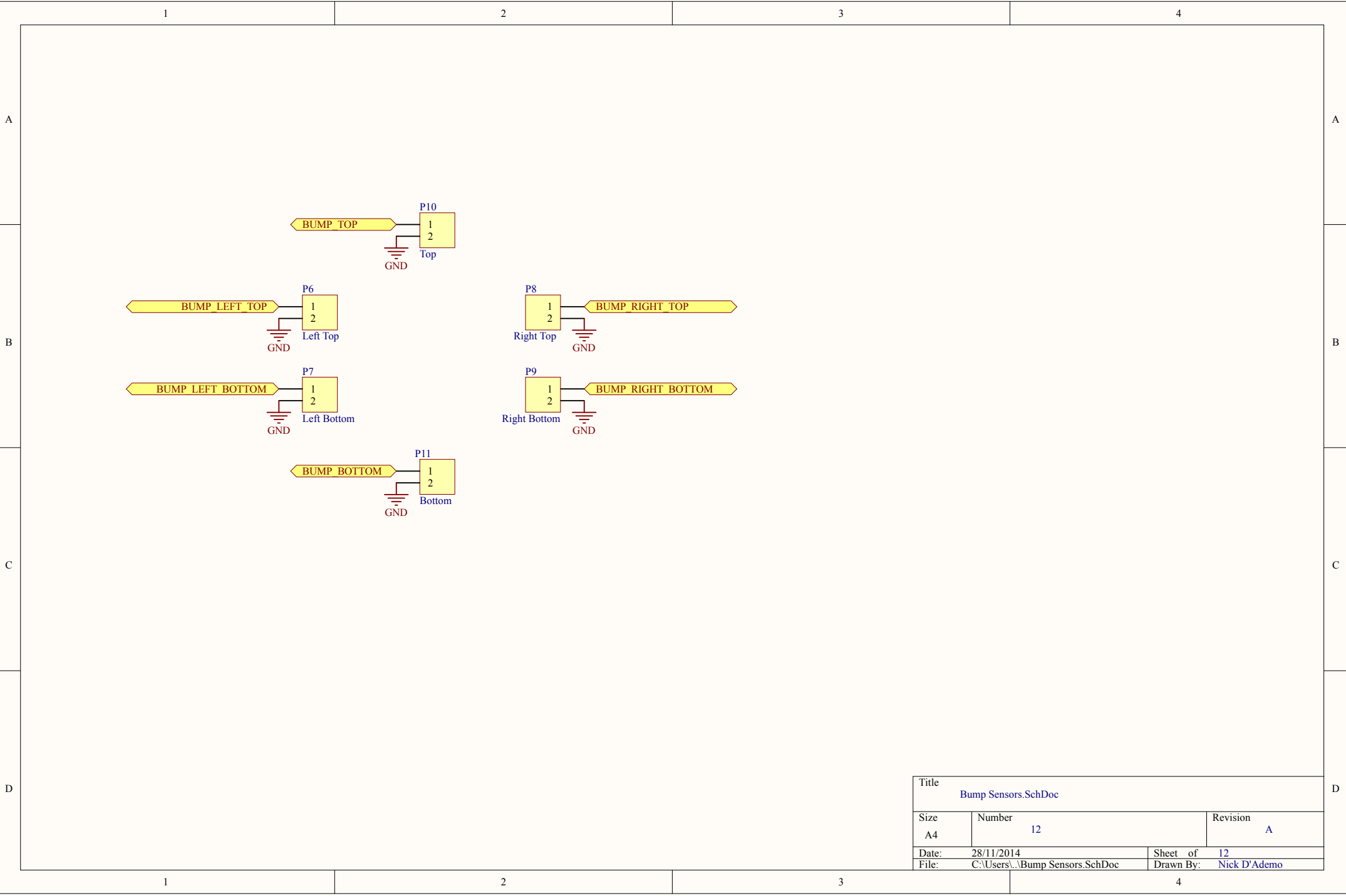
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Size A4	Number 8	Revision A
Date: 28/11/2014	Sheet of 12	
File: C:\Users\...\Light Sensors.SchDoc	Drawn By: Nick D'Ademo	



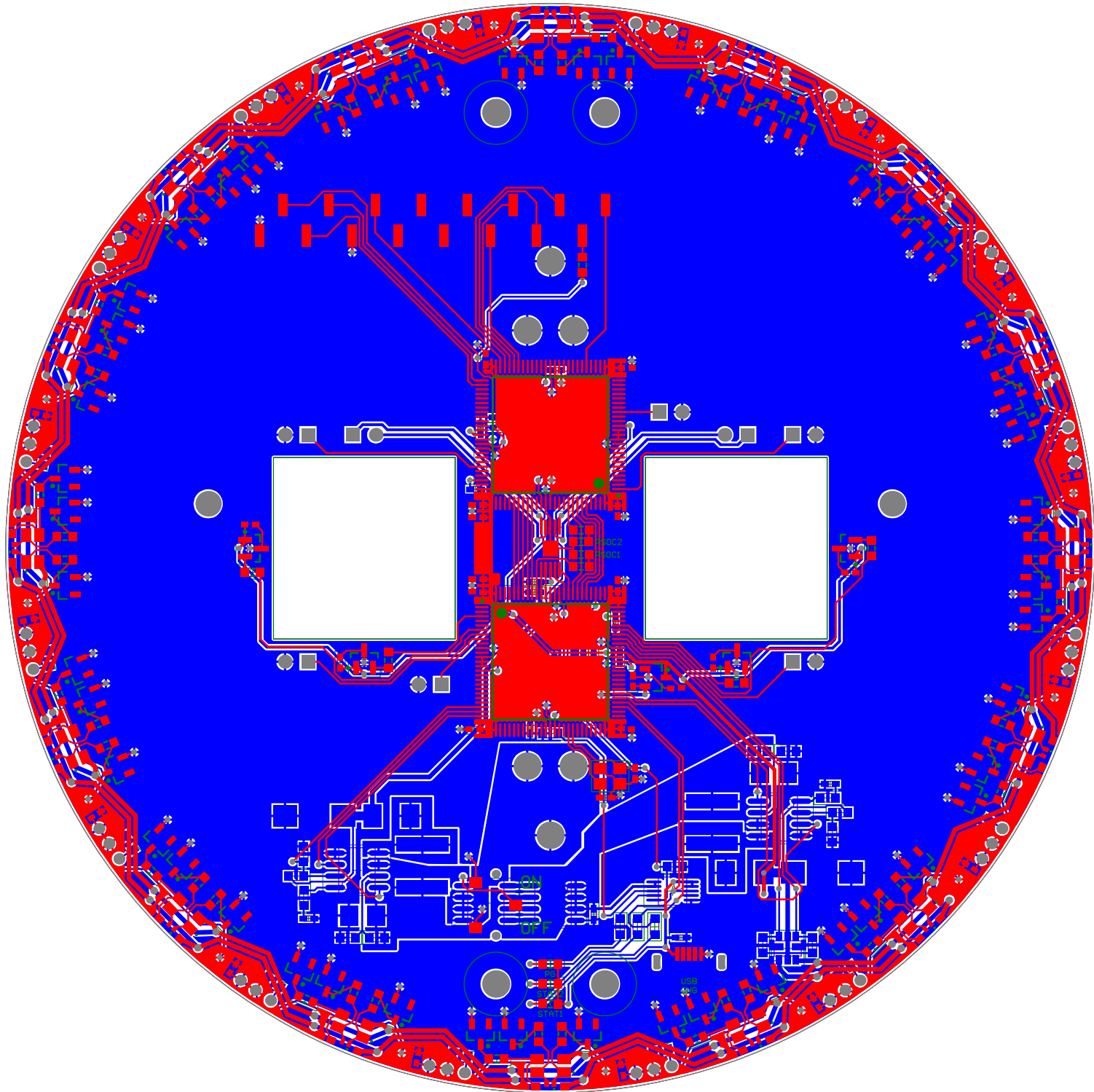




Title			LCD.SchDoc
Size	Number	Revision	
A4	11	A	
Date:	28/11/2014	Sheet of	12
File:	C:\Users\...\LCD.SchDoc	Drawn By:	Nick D'Ademo



Title			Bump Sensors.SchDoc	
Size	Number	Revision		
A4	12	A		
Date:	28/11/2014	Sheet of	12	
File:	C:\Users\...\Bump Sensors.SchDoc	Drawn By:	Nick D'Ademo	



Description	Designator	Footprint	Quantity	Value
18650 1-Cell Lithium Ion Battery	BT1		1	
TAIYO YUDEN - EMK107BBJ106MA-T - CAP CER 10uF 16V 20% X5R 0603	C1	CAPC1005N	1	10uF
Capacitor, X5R, ±10%, 16V, 0402	C2, C3, C4, C5, C6	CAPC1005N	5	100nF
	C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C55, C56	CAPC1005N	32	100nF
Capacitor, X7R, ±10%, 6.3V, 0402	C23, C26	TC7343-2917	2	220uF
KEMET - T491D227K016AT - CAP TANT 220UF 16V 10% 2917	C24, C27	TC3528-1411	2	47uF
KEMET - T491B476K010AT - CAP TANT 47UF 10V 10% 1411	C25, C28	CAPC1005N	2	100pF
Capacitor, NP0, ±10%, 6.3V, 0402	C29, C30	CAPC1005N	2	1uF
Capacitor, X5R, ±10%, 6.3V, 0402	C31, C32	CAPC1005N	2	12pF
Capacitor, NP0, ±2%, 25V, 0402	C33, C34, C35, C36, C51, C52, C53, C54, C57, C58	CAPC1005N	10	1uF
Capacitor, X5R, ±10%, 10V, 0402	D1, D3, D5, D7, D9, D11, D13, D15, D17, D19, D21, D23, D25, D27, D29, D31	OVSRRG8CC3_SI DE	16	
OPTEK - OVSRRG8CC3 - LED RED/GRN/BLUE 1204 SMD	D2, D4, D6, D8, D10, D12, D14, D16, D18, D20, D22, D24, D26, D28, D30, D32	PLCC4	16	
CREE - CLV1A-F8B-CK1N1G18B7R453 - LED RGB 3-IN-1 3.2X2.8MM 4PLCC	D33, D34, D37	LED_0603	3	
ROHM - SMLE128C7T786Q - LED, 0603, LO-CUR, BLU	D35, D36	SMB_DIODE	2	
VISHAY SEMICONDUCTOR - VS-MBR5130TRPBF - DIODE SCHOTTKY 30V 1A DO214AA	D38	LED_0603	1	
KINGBRIGHT - KP-1608MGC - LED, 0603, GREEN, 70MCD, 568NM	D39	LED_0603	1	
KINGBRIGHT - KP-1608SYC - LED, SMD, 0603, YELLOW	L1, L2	TY_NR	2	4.7uH
TAIYO YUDEN - NR6028T4R7M - INDUCTOR 4.7UH 2.7A 20% SMD	LCD1		1	
SHERZEN EONE ELECTRONICS CO.,LTD - IMT294240T5 - EONE High 16x2 (1602) Characters LCD	LS1, LS2, LS3, LS4, LS5, LS6, LS7, LS8, LS9, LS10, LS11, LS12, LS13, LS14, LS15, LS16	AMS_5_3PIN	16	
AMS - TSL235R-LF - IC LIGHT TO FREQUENCY CONV 3PIN	P1, P2, P6, P7, P8, P9, P10, P11	HDR1X2	8	
MOLEX INC - 0022272021 - CONN HEADER 2POS. 100 VERT TIN	P3	USB3140-30-0170-1-C	1	
GLOBAL CONNECTOR TECHNOLOGY - USB3140-30-0170-1-C - CONNECTOR, USB 2.0 MICRO B, RCPT, SPOS, SMT	P4	54	1	
KEYSTONE ELECTRONICS - 54 - BATTERY CLIP 18MM 18650 CELL	P5	Samtec-SSW-116-22-F-5-V5	1	
SAMTEC - SSW-116-22-F-5-V5 - Conn Socket Strip SKT 16 POS 2.54mm Solder ST SMD Tube	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 - BSS138 - 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	
INTERNATIONAL RECTIFIER - IRF7416TRPBF - MOSFET P-CH 30V 10A 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	RES1608N	32	91R
Resistor, ±1%, 0.1W, 0603	R3, R6, R9, R12, R15, R18, R21, R24, R27, R30, R33, R36, R39, R42, R45, R48	RES1608N	16	150R
Resistor, ±1%, 0.1W, 0603	R49, R50, R87, R88, R89, R90	RES1608N	6	10k
Resistor, ±1%, 0.1W, 0603	R69	RES1608N	1	309k
Resistor, ±1%, 0.1W, 0603	R70	RES1608N	1	1.4M
Resistor, ±1%, 0.1W, 0603	R71, R72, R76, R77	RES1608N	4	100k
Resistor, ±1%, 0.1W, 0603	R73, R78	RES1608N	2	47k
Resistor, ±1%, 0.1W, 0603	R74	RES1608N	1	887k
Resistor, ±1%, 0.1W, 0603	R75	RES1608N	1	1.3M
Resistor, ±1%, 0.1W, 0603	R85	RES1608N	1	2k
MURATA - NCP18XH103J03RB - THERMISTOR, NTC, 10K, 5%, SMD	RT1	RES1608N	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 - A3909GLYR-T - IC MOTOR DRIVER PAR 10MSOP	U1, U2	CMP-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	
LINEAR TECHNOLOGY - LT1308ACS84PBF - IC REG BOOST 5V 1A 8SOIC	U8, U9	LT-S8-8_N	2	
MICROCHIP - MCP73833-FCI/UN - IC LI-ION/LI-POLY CTRLR 10MSOP	U10	MSOP-UN10_N	1	
MICROCHIP - MCP1700T-3302E/IT - IC REG LDO 3.3V 0.25A SOT23-3	U11	SOT95P230-3N	1	
NDK - NX3225SA-16.000MHZ-STD-CSR-1 - CRYSTAL 16MHZ 8PF SMD	V1	NX3225SA	1	