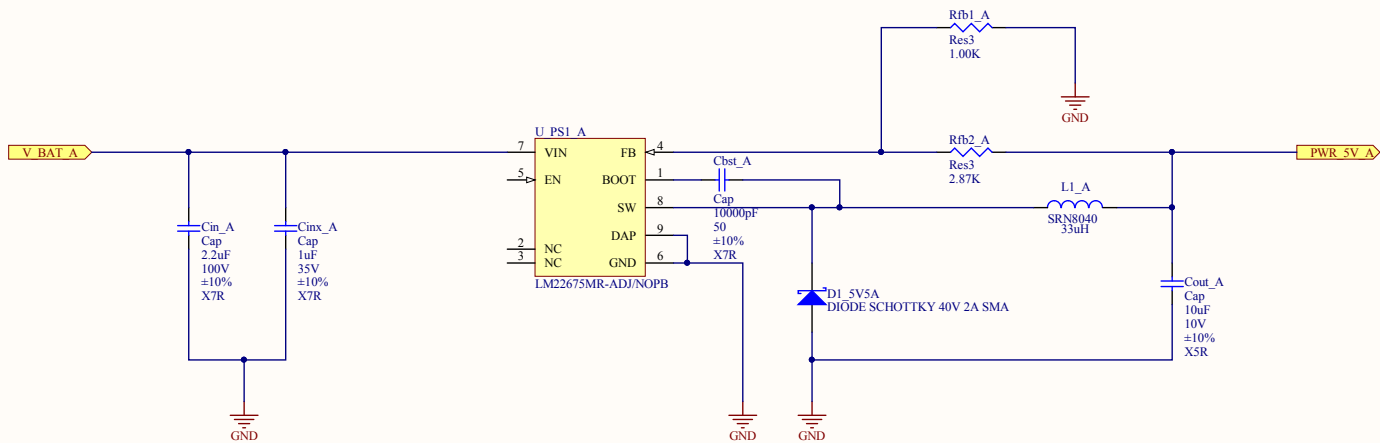
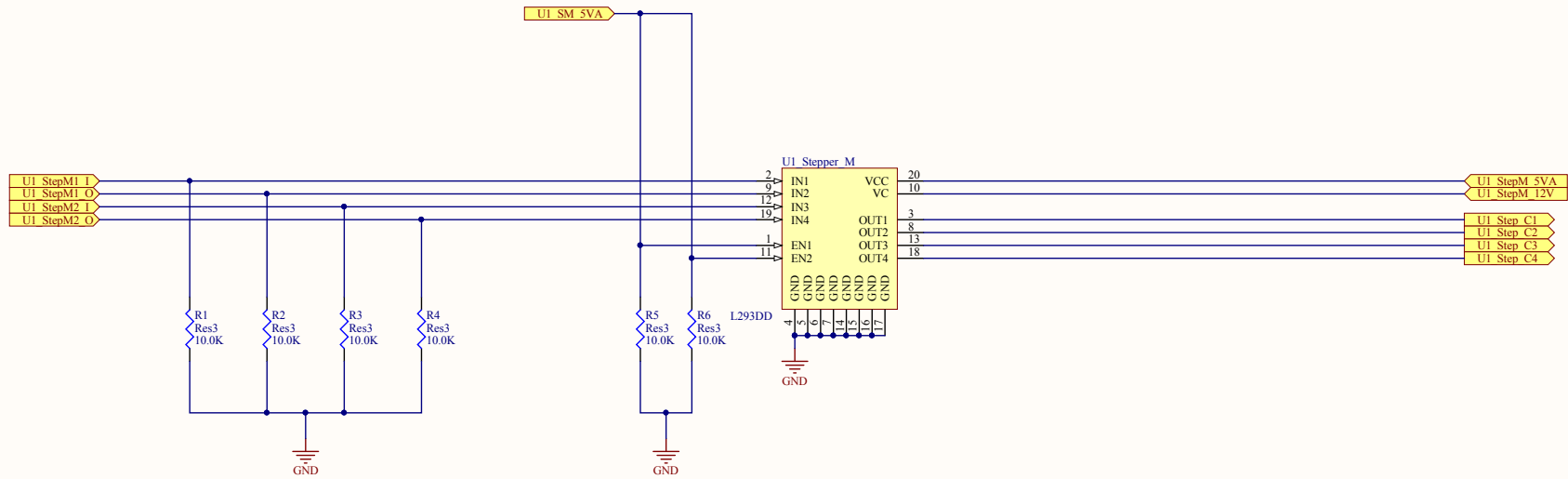


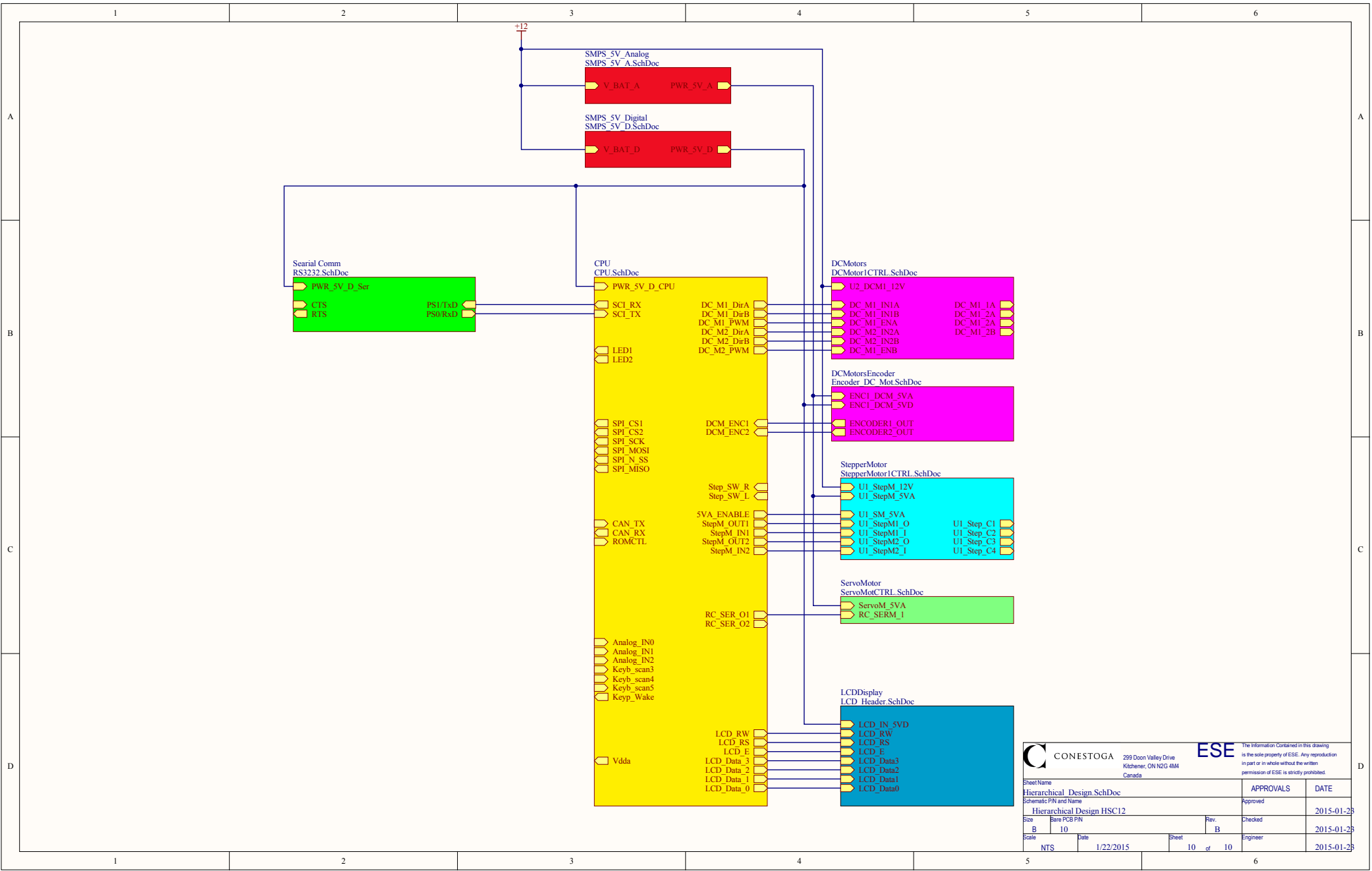
C CONESTOGA 299 Doon Valley Drive Kitchener, ON N2G 4M4 Canada		ESE The Information Contained in this drawing is the sole property of ESE. Any reproduction in part or in whole without the written permission of ESE is strictly prohibited.	
Sheet Name		APPROVALS	
SMPS_5V_D.SchDoc		DATE	
Schematic PN and Name		Approved	
SMPS 5V Using LM22675		2015-01-15	
Size	Bare PCB PN	Rev.	Checked
B	I	A	2015-01-15
Scale	NTS	Date	Engineer
		1/22/2015	
Sheet		3 of 5	
		2015-01-15	





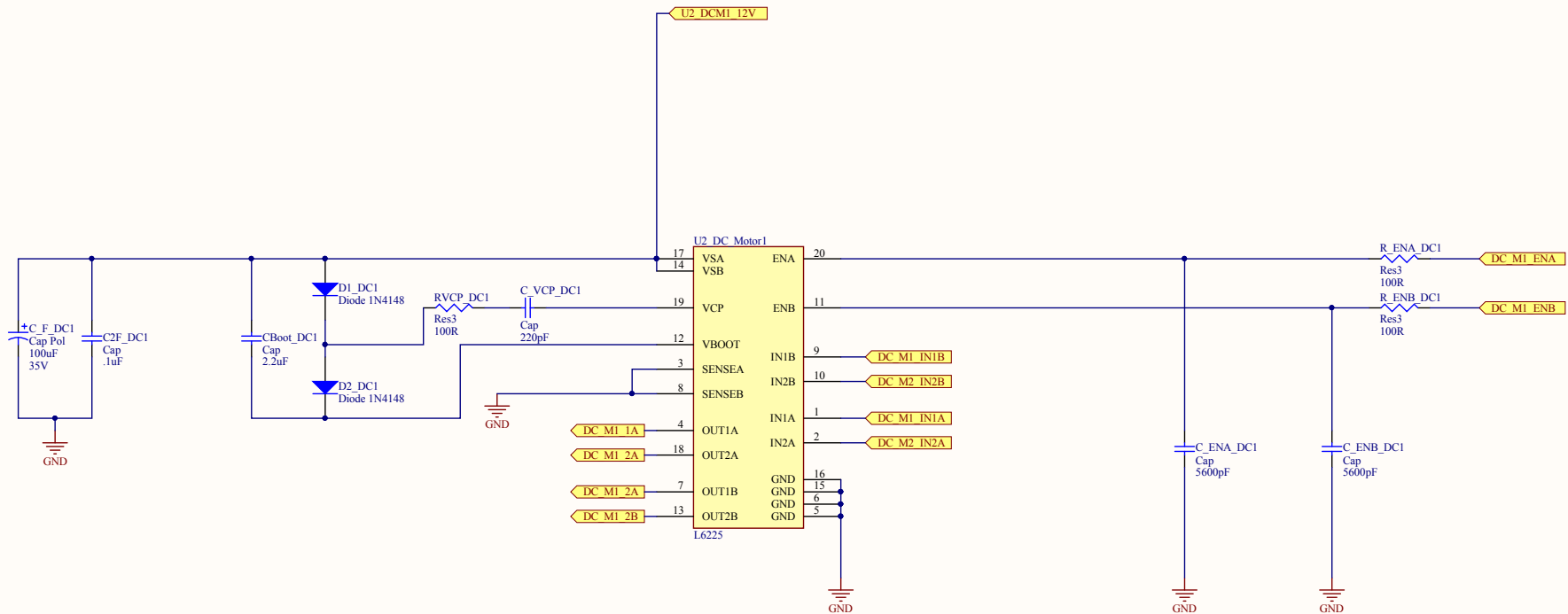
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Sheet Name		APPROVALS	
SMPS 5V A.SchDoe		DATE	
Schematic P/N and Name		Approved	
SMPS 5V Using LM22675		2015-01-15	
Size		Checked	
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I		Rev. A	
Scale		Engineer	
NTS		2015-01-15	
Date 1/22/2015		Sheet 4 of 5	



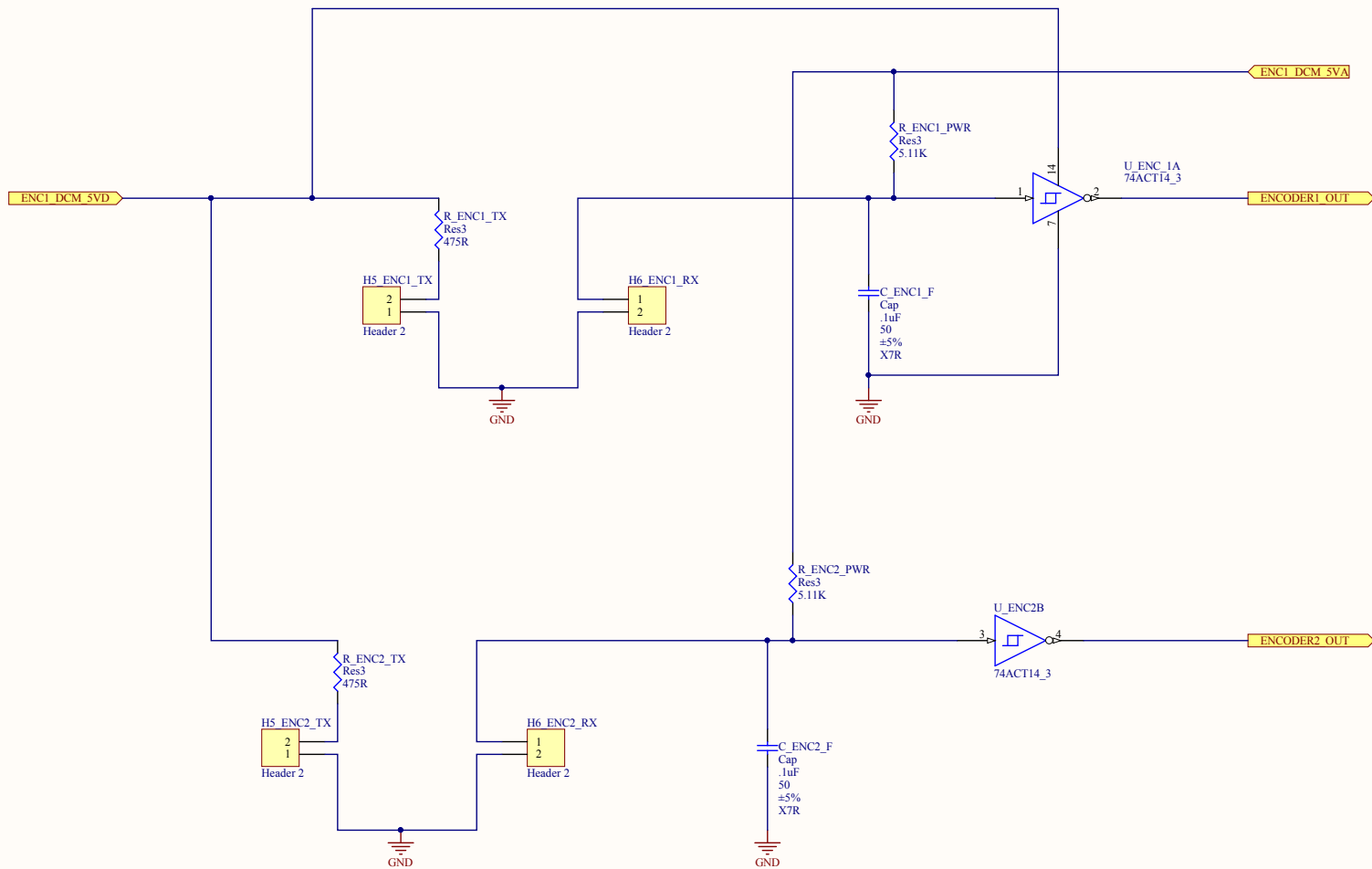
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Sheet Name		APPROVALS	
StepperMotor1CTRL.SchDoc		DATE	
Schematic PN and Name		Approved	
Stepper Motor Driver		2015-01-28	
Size	Bare PCB PN	Rev.	Checked
B	5	A	2015-01-28
Scale	NTS	Date	Engineer
		1/22/2015	2015-01-28
Sheet		5 of 10	





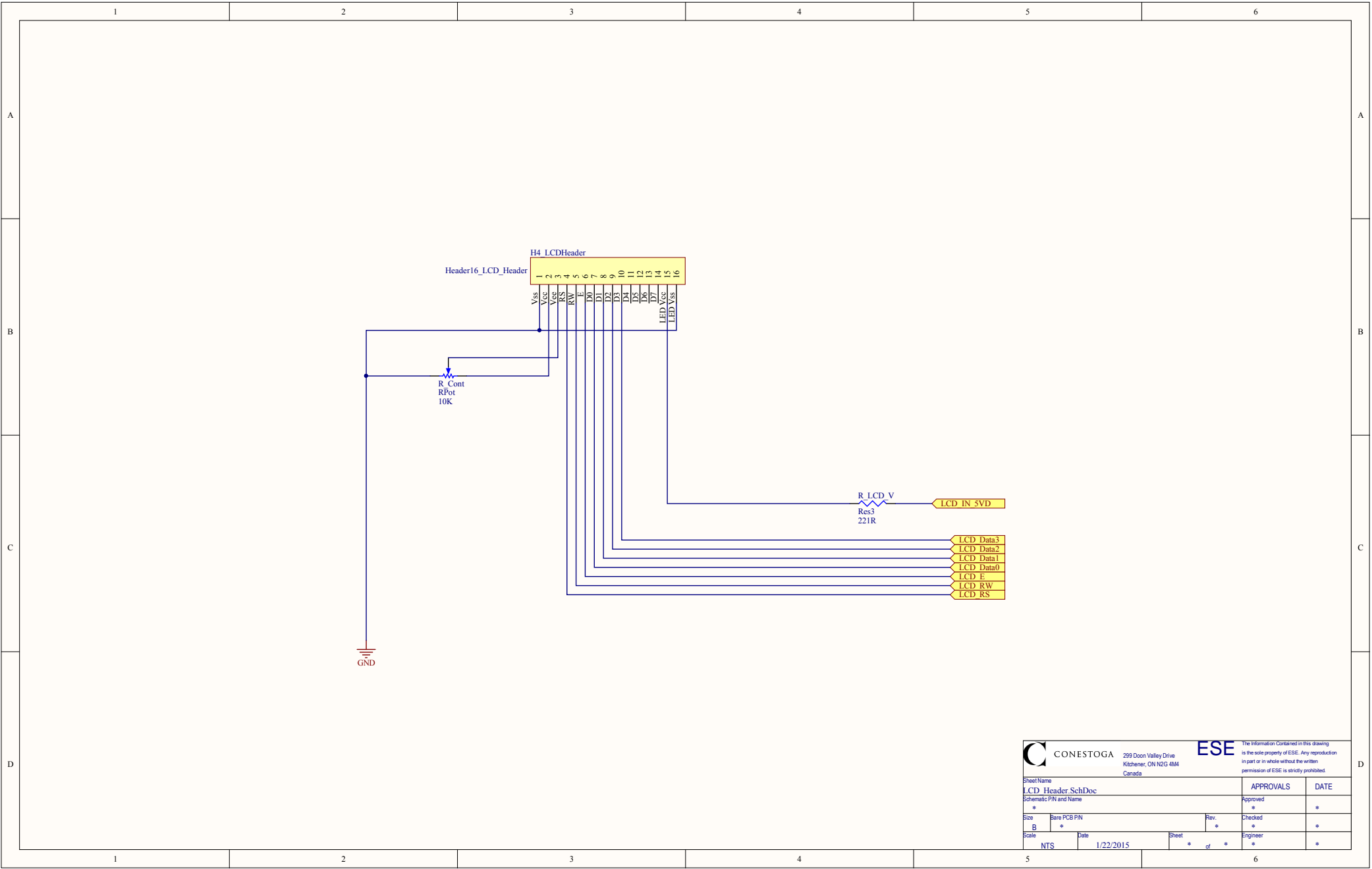
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Sheet Name Hierarchical Design.SchDoc				APPROVALS		DATE	
Schematic P/N and Name Hierarchical Design HSC12				Approved		2015-01-28	
Size B	Bare PCB P/N 10			Rev. B	Checked	2015-01-28	
Scale NTS	Date 1/22/2015	Sheet 10	of 10	Engineer	2015-01-28		





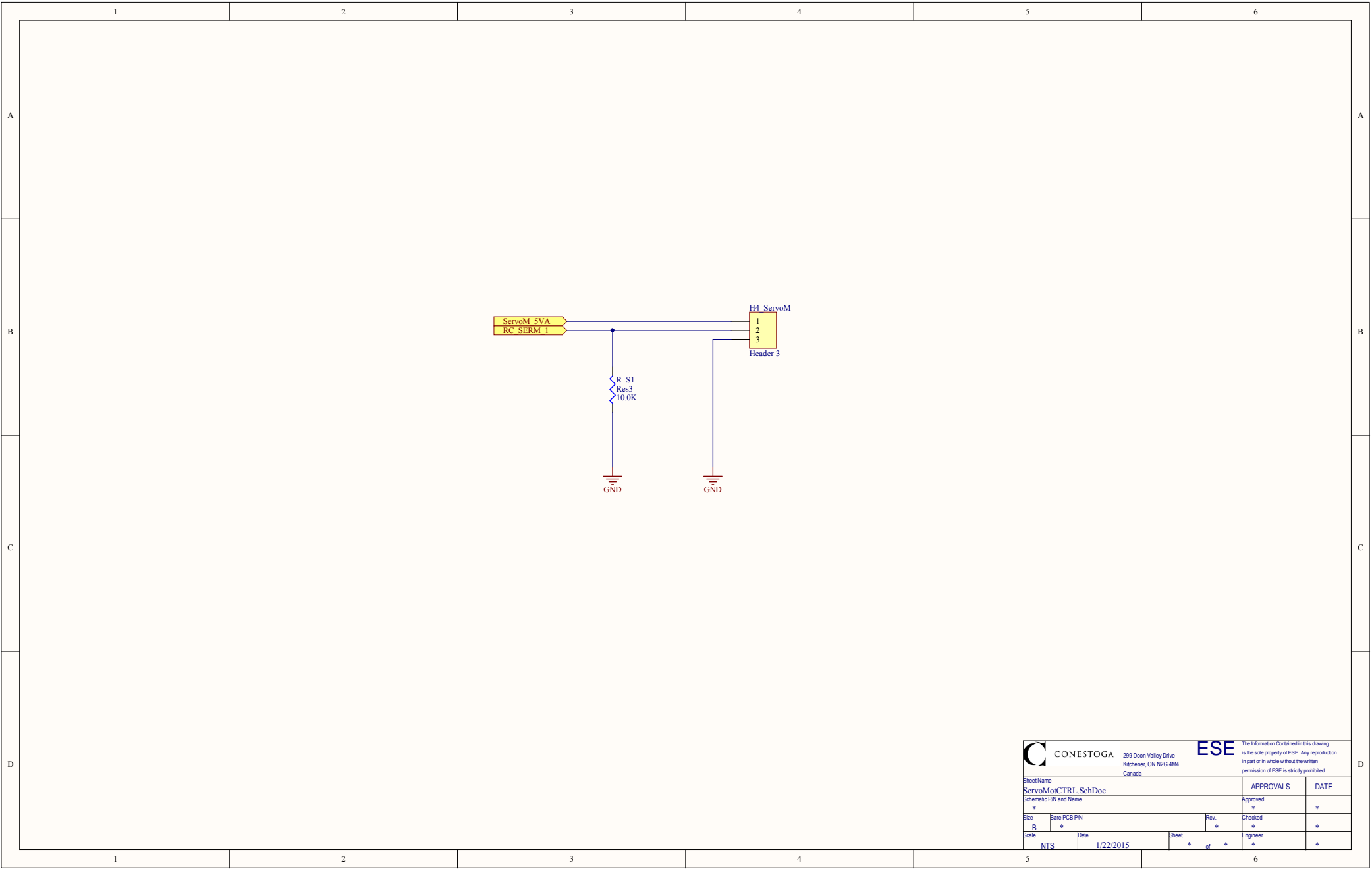
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Sheet Name DCMotor1CTRL SchDoc		APPROVALS		DATE	
Schematic PN and Name *		Approved *		*	
Size B		Rev. *		Checked *	
Scale NTS		Date 1/22/2015		Sheet * of *	
				Engineer *	



		CONESTOGA		299 Doon Valley Drive Kitchener, ON N2G 4M4 Canada				The Information Contained in this drawing is the sole property of ESE. Any reproduction in part or in whole without the written permission of ESE is strictly prohibited.			
Sheet Name Encoder DC_Mot_SchDoc								APPROVALS		DATE	
Schematic P/N and Name *								Approved *		*	
Size B		Part Base PCB P/N			Rev. *		Checked *		*		
Scale NTS		Date 1/22/2015		Sheet * of *		Engineer *		*			



 CONESTOGA		299 Doon Valley Drive Kitchener, ON N2G 4M4 Canada				The Information Contained in this drawing is the sole property of ESE. Any reproduction in part or in whole without the written permission of ESE is strictly prohibited.					
Sheet Name LCD_Header.SchDoc						APPROVALS	DATE				
Schematic PN and Name *						Approved *	*				
Size B	Bare PCB PIN				Rev. *	Checked *	*				
Scale NTS	Date 1/22/2015		Sheet *	of *	Engineer *	*					



Bill of Materials

Hierarchical Design HSC12

Source Data From: PCB.PriPcb
Project: PCB.PriPcb
Variant: None

Creation Date: 1/22/2015 11:43:27 PM
Print Date: 42026 42026.98857

Footprint	Comment	LibRef	Designator	Description	Quantity
CAPC2012X09M	Cap	CAP-X7R-47000pF-50V-±10%, CAP-X7R-1uF-100V-±10%, CAP-X7R-5600pF-50V-±10%, CAP-X7R-5600pF-50V-±10%, CAP-X7R-1uF-50V-±5%, CAP-X7R-1uF-50V-±5%, CAP-COG-220pF-50V-±5%, Cap, CAP-X7R-1uF-16V-±10%, Cap, CAP-COG-22pF-50V-±5%, CAP-COG-22pF-50V-±5%, CAP-X7R-2.2	C1, C2F_DC1, C_ENA_DC1, C_ENB_DC1, C_ENC1_F, C_ENC2_F, C_VCP_DC1, C_VDDX_2, C_VR_PWR, C_VRH2, C_Y1, C_Y2, CBoot_DC1, Cbst_A, Cbst_D, Cinx_A, Cinx_D, Cout_A, Cout_D	CAP CER 47000pF 50v X7R 0805, CAP CER 1uF 100v X7R 0805, CAP CER 5600pF 50v X7R 0805, CAP CER 5600pF 50v X7R 0805, CAP CER 1uF 50v X7R 0805, CAP CER 1uF 50v X7R 0805, CAP CER 220pF 50v COG 0805, CAP CER 0.011uF 50V 5% NPO 0805, CAP CER 0.1uF 50V Y5V 08	19
CAPACITOR_3MM	Cap Pol	Cap Polar-0.33uF-50V, Cap Polar-0.33uF-50V, Cap Polar-0.33uF-50V, Cap Polar-0.1uF-50V	C2, C3, C4, C_BYPASS	CAP 85C 0.33uF ±20% 50V WX Series Aluminum Electrolytic, CAP 85C 0.33uF ±20% 50V WX Series Aluminum Electrolytic, CAP 85C 0.33uF ±20% 50V WX Series Aluminum Electrolytic, CAP 85C 0.1uF ±20% 50V WX Series Aluminum Electrolytic	4
C1210	Cap	CAP-X7R-2.2uF-16V-±10%	Cin_A, Cin_D	CAP CER 2.2uF 100v X7R 1210	2
CAPACITOR_6.3MM	Cap Pol	Cap Polar-100uF-16V	C_F_DC1	CAP 85C 100uF ±20% 16V WX Series Aluminum Electrolytic	1
	TANT.		C_VDDR, C_VDDX_1, C_VRH1	CAP TANT 100uF 10V 20% 0805	3
DIOM4326X23M	DIODE	DIODE SCHOTTKY 40V 2A SMA	D1_5V5A, D1_5V5D	Schottky Rectifier	2
zener_sod323	Diode 1N4148	Diode 1N4148	D1_DC1, D2_DC1	High Conductance Fast Diode	2
HDR2X3	H3x2	Header 3X2	H1_BDM	Header, 3-Pin, Dual row	1
HDR1X2	VRH_EN	Header 2	H2_VRH	Header, 2-Pin	1
HDR1X2	VRL_EN	Header 2	H3_VRL	Header, 2-Pin	1
HDR1X16_LCD_D	Header16_LCD	Header16_LCD	H4_LCDHeader	Header, 16-Pin Female	1
HDR1X3	Header 3	Header 3	H4_ServoM	Header, 3-Pin	1
HDR1X2	Header 2	Header 2	H5_ENC1_TX, H5_ENC2_TX, H6_ENC1_RX, H6_ENC2_RX	Header, 2-Pin	4
DSUB1.385-2H9	D Connector 9	D Connector 9	D_DB9	Receptacle Assembly, 9 Position, Right Angle	1
INDP8080X40M	SRN8040	SRN8040	L1_A, L1_D	FIXED IND 33UH 1.7A 145 MOHM SMD	2
	10uH	INDUCTOR	L_VDDA	FIXED IND 10UH 189MA 2.1 OHM SMD 1210	1
RESC2112X05M	Res3	Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_10.0K, Resistor_100R, Resistor_100R, Resistor_5.11K, Resistor_475R, Resistor_5.11K, Resistor_475R, Resistor_221R, Resistor_4.75K, Resistor_10.0K, Res1	R1, R2, R3, R4, R5, R6, R_BDM, R_ENA_DC1, R_ENB_DC1, R_ENC1_PWR, R_ENC1_TX, R_ENC2_PWR, R_ENC2_TX, R_LCD_V, R_Pierce_EN, R_RESET, R_S1, Rbt1_A, Rbt1_D, Rbt2_A, Rbt2_D, RVCP_DC1	RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 10.0K OHM 1% 1/8W 0805, RES SMD 100R OHM 1% 1/8W 0805, RES SMD 100R OHM 1% 1/8W 0805, RES SMD 5.11K, RES SMD 475R, RES SMD 5.11K, RES SMD 475R, RES SMD 221R, RES SMD 4.75K, RES SMD 10.0K, RES1	22
BOURNS_3386F	RPot	RPot	R_Cont	Potentiometer	1
RESC2112X05M	R_XLT1	Resistor_10.0K	R_Y1	RES SMD 10.0M OHM 1% 1/8W 0805	1
RESC2112X05M	R_XLT2	Resistor_1.02R	R_Y2	RES SMD 0 OHM 1% 1/8W 0805	1
	SWITCH_TACT1	SWITCH_TACT1	SW1_RESET	SWITCH TACTILE SPST-NO 0.05A 12V	1
SO20_N	LE	LE	U1_Stepper_M	Push-Pull Four Channel Driver With Diode	1
POWERSOP20	L293DD L6225	L293DD L6225	U2_Dc_Motor1	IC MOTOR DRIVER PAR 20POWERSO	1
SOT95P230X110-3M	DS1813-10	DS1813-10	U?	5V EconoReset with Pushbutton	1
QUAD 66M/80WG17.45-HCS12	MC9S12C128M FUE	MC9S12C128M FUE	U_CPU1	IC MCU 16BIT 128KB FLASH 80QFP	1
SOIC127P600X175-14M	74ACT14_3	74ACT14_3	U_ENC2, U_ENC_1	IC INVERTER HEX SCHMITT 14SOIC	2
MRA086_L	LM22675MR-ADJNOPB	LM22675MR-ADJNOPB	U_PS1_A, U_PS1_D	1A SIMPLE SWITCHER®, Step-Down Voltage Regulator with Precision Enable, 8-pin PSOP, Pb-Free	2
NSO16_N	MAX3232CSE	MAX3232CSE	U_SER1	3.0V TO 5.5V, Low-Power, up to 1Mbps, True RS-232 Transceiver Using Four 0.1uF External Capacitor	1
	CRYSTAL/SM	CRYSTAL/SM	Y1	CRYSTAL 16MHZ 20PF SMD	1
Approved					82

Approved	Notes