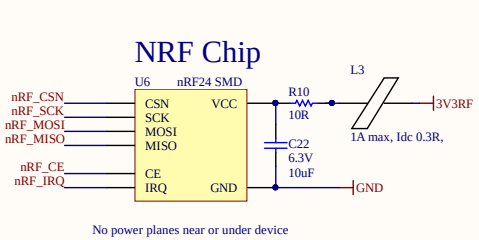
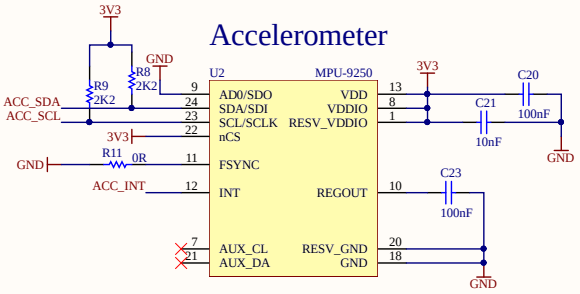
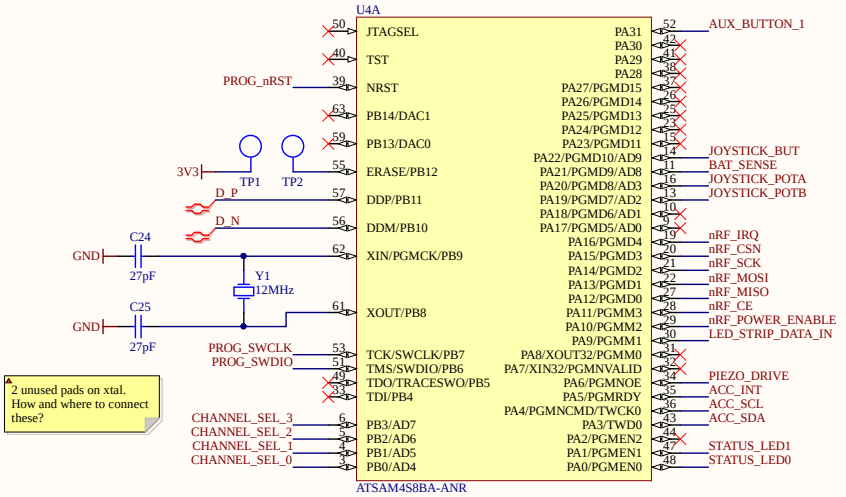
NRF Chip



Accelerometer

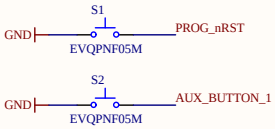


SAM4S

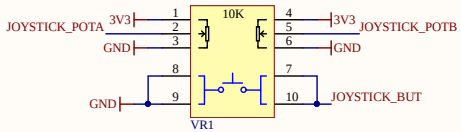


2 unused pads on xtal. How and where to connect these?

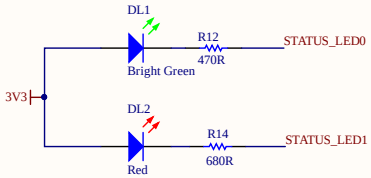
Switches / Buttons



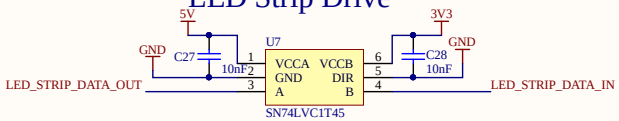
Joystick



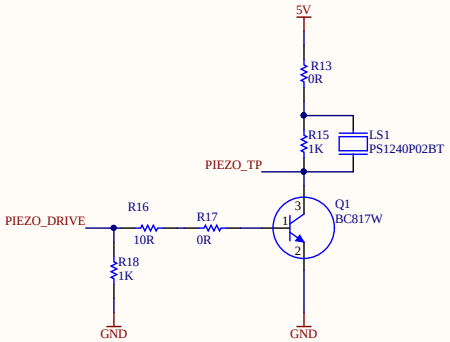
Status LEDs



LED Strip Drive

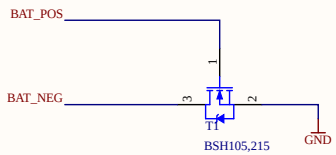


Piezo Buzzer

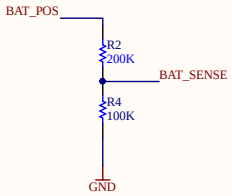


Title	**Wackyraces Hat Main Schemetic**	*ECE Department University of Canterbury Christchurch 8041 New Zealand*	UNIVERSITY OF CANTERBURY
Drawn by	Nathan James, Marcus Hughnan	Revision:	1
Date:	22/06/2020	Time:	10:41:52 PM Sheet 1 of 2
File:	P:\Semester1_2020\ENCE461\Term 1\wacky races\GIT\wacky-racers-2020\boardDesign\hatDesign\Main Sheet.SchDoc		

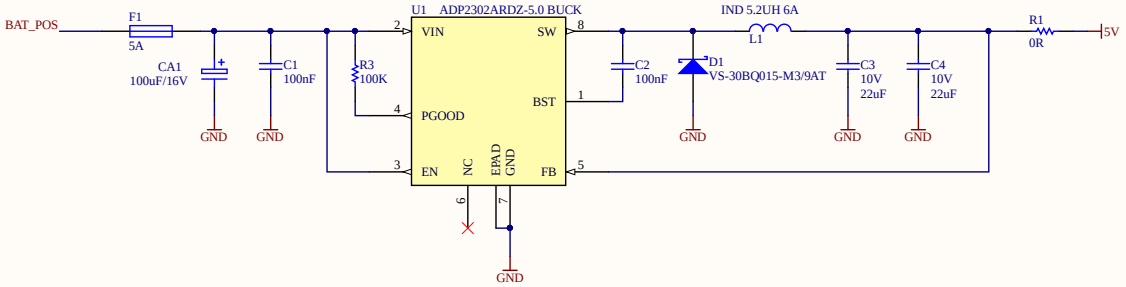
Battery Protection



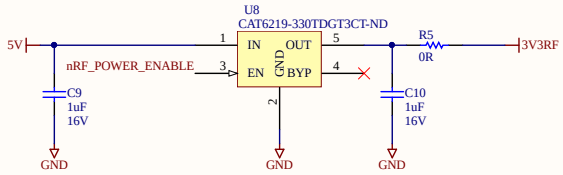
Battery Voltage Sense



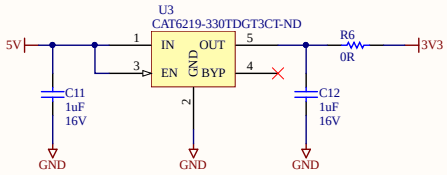
Battery 5V Regulator



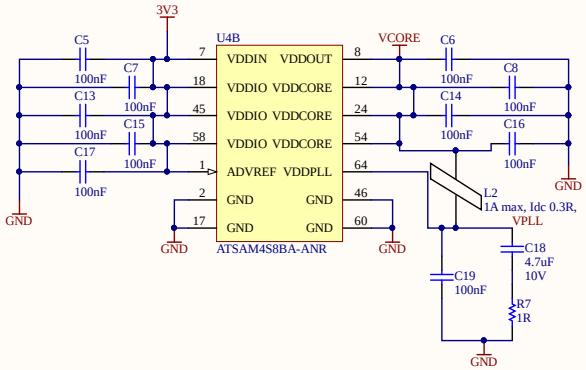
3.3V RF Regulator



3.3V Regulator

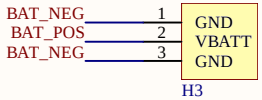


SAMS4S Power

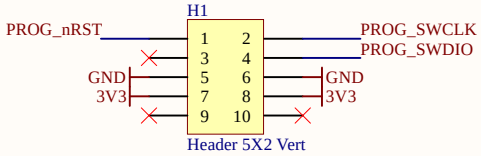


Title	**Wackyraces Hat Power Schematic**	*ECE Department* *University of Canterbury* *Christchurch 8041* *New Zealand*	UNIVERSITY OF CANTERBURY
Drawn by	Nathan James, Marcus Hughnan	Revision:	1
Date:	22/06/2020	Time:	10:41:52 PM Sheet 2 of 2
File:	P:\Semester1_2020\ENCE461\Term 1\wacky races\GIT\wacky-racers-2020\boardDesign\hatDesign\Power Sheet.SchDoc		

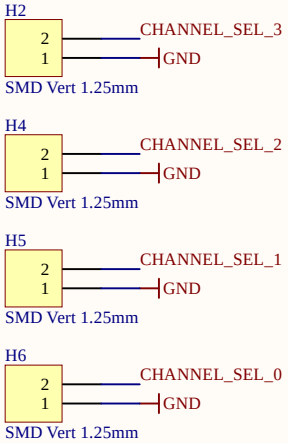
Battery Connector



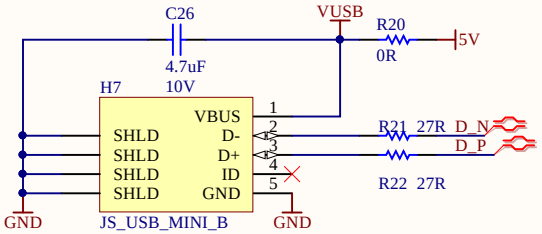
SAM4S Programming Header



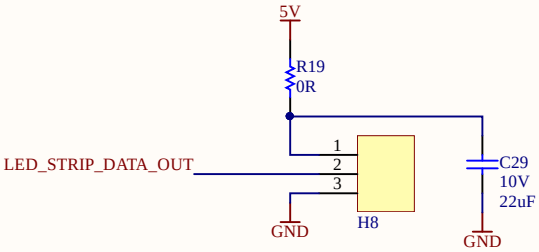
Radio Selection Headers



USB Connector



LED Connector



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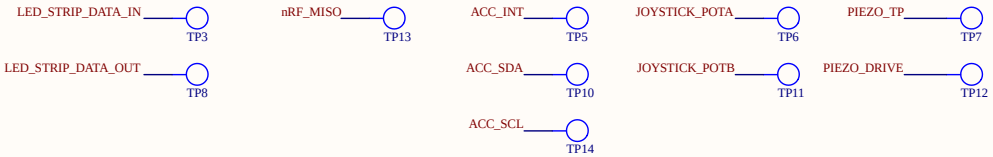
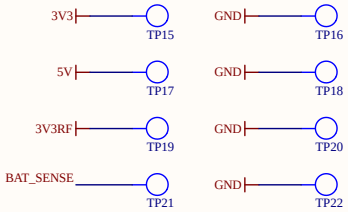
Date: 22/06/2020		Sheet of
File: P:\Semester1_2020\..\Connections.SchDoc		Drawn By:

Data



Power



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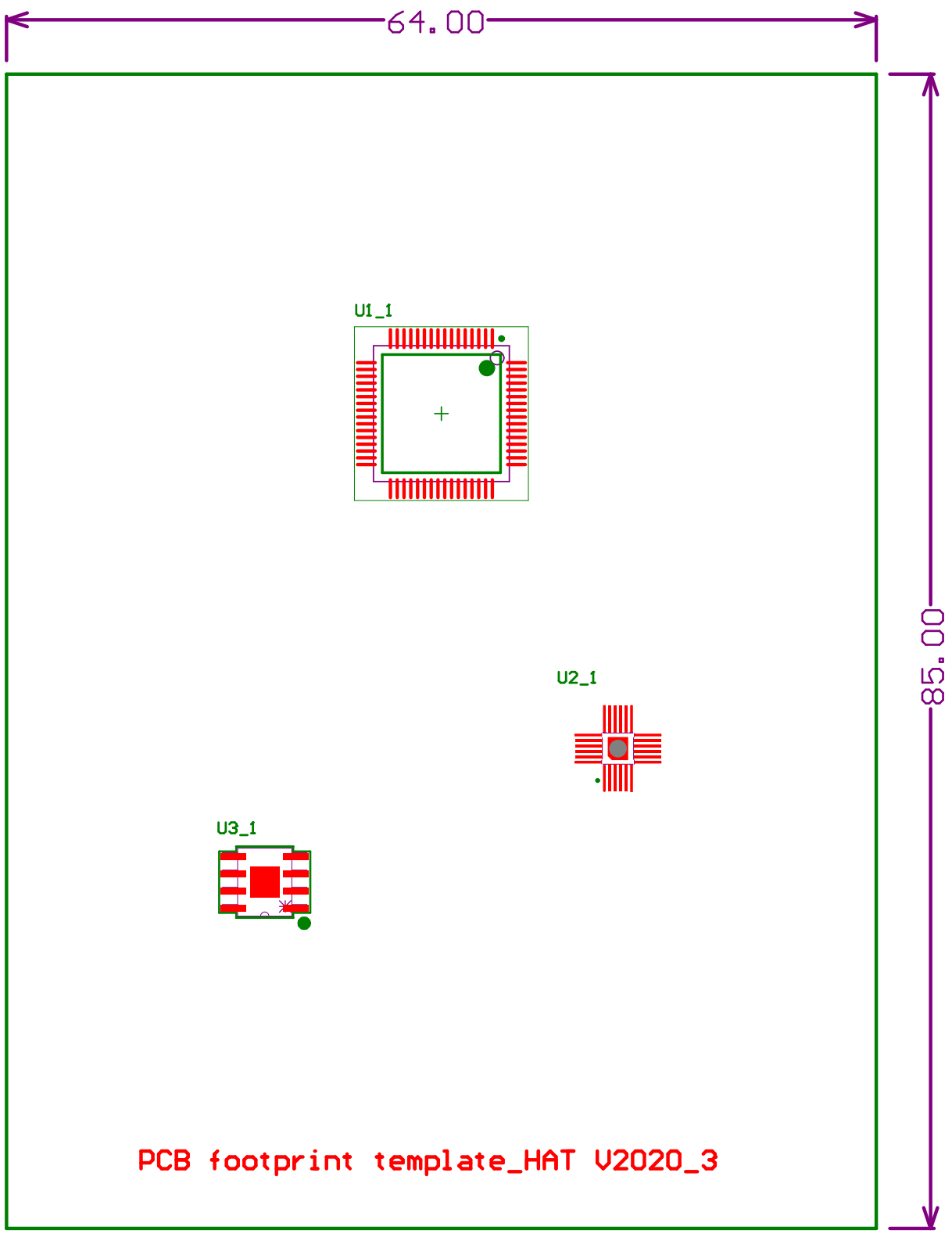
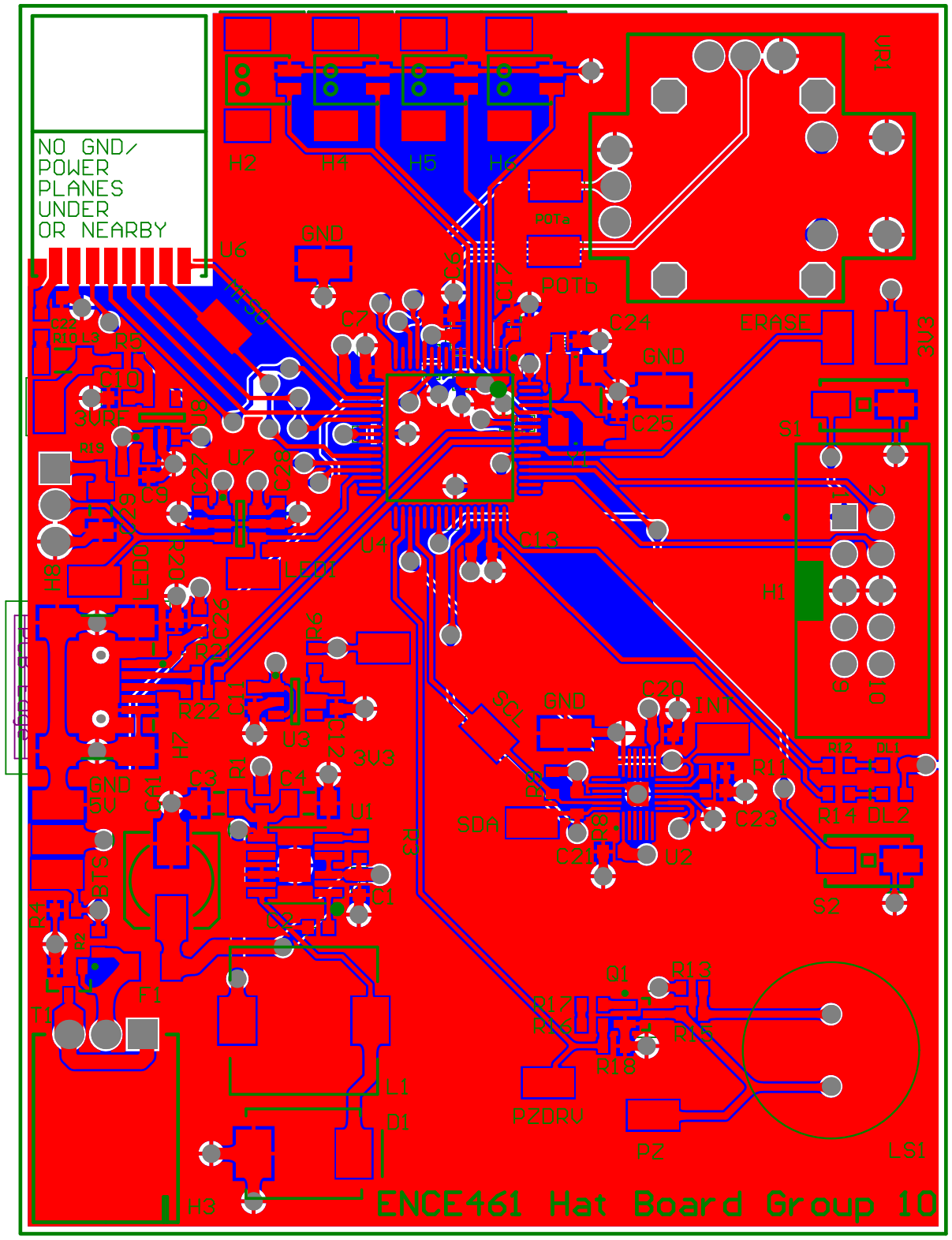
Drawn by: *		Revision: *	
Date: 22/06/2020	Time: 10:41:52 PM	Sheet *	of *
File: P:\Semester1_2020\ENCE461\Term 1\wacky races\GIT\wacky-racers-2020\boardDesign\hatDesign\Test Points Sheet.SchDoc			

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha


64.00
85.00
U1_1
U2_1
U3_1
PCB footprint template_HAT V2020_3


NO GND/
POWER
PLANES
UNDER
OR NEARBY
ENCE461 Hat Board Group 10

Bill of Materials

Bill of Materials for Project [WackyRacesHat.PrjPcb] (No PCB Document Selected)

Source Data From: WackyRacesHat.PrjPcb
Project: WackyRacesHat.PrjPcb
Variant: None

Creation Date: 22/06/2020 10:42 PM
Print Date: 22-Jun-20 10:42:10 PM

Footprint	Comment	LibRef	Designator	Description	Quantity
CAPC1608L	100nF	CC_100nF_0603	C1, C2, C5, C6, C7, C8, C13, C14, C15,	CAP CER 100nF X7R +-10% 50V 0603	14
CAPC3216L	22uF	CC_22uF_1206	C3, C4, C29	CAP CER 22uF Y5V -20% +80% 10V 1206	3
CAPC1608L	1uF	CC_1uF_0603	C9, C10, C11, C12	CAP CER 1uF Y5V -20% +80% 16V 0603	4
CAPC1608N	4.7uF	CC_4.7uF_0603	C18, C26	CAP CER 4.7uF X5R +-20% 10V 0603	2
CAPC1608L	10nF	CC_10nF_0603	C21, C27, C28	CAP CER 10nF X7R +-10% 50V 0603	3
CAPC1608L	10uF	CC_10uF_0603	C22	CAP CER 10UF X5R +-20% 6V3 0603	1
CAPC1608L	27pF	CC_27pF_0603	C24, C25	CAP CER 27pF NPO/COG +-5% 50V 0603	2
NICH-1	100uF/16V	CA_100uF_16V	CA1	CAP ALUM 100uF 16V SMD	1
SMC	VS-30BQ015-M3	DS_VS-30BQ01	D1	DIODE, SCHOTTKY, 3A, 15V, DO-214AB / S	1
WL-SMCW06(	Bright Green	DL_150060VS75	DL1	LED Bright Green 40mcd 0603 SMD	1
WL-SMCW06(	Red	DL_150060RS75	DL2	LED Red 250mcd 0603 SMD	1
RESC3216N	5A	FS_Fuse_5.0A	F1	Fuse 5.0A Fast Acting 1206 SMD	1
IDC2.54-V10D	Header 5X2 Vert	JA_HDR_IDC_5	H1	IDC Header, 2,54mm, 10-Pin, Vert	1
SD-53398-021	SMD Vert 1.25m	JB_53398-02	H2, H4, H5, H6	Header_Vert_2Pos_1.25mm_125V@1A_SM	4
BATT_HEAD	Battery_HEADER	Battery_HEADER	H3	3Pin Header 2.54mm spacing	1
USB/SM0.8-6	JS_USB_MINI_B	JS_USB_MINI_B	H7	USB 2.0, Right Angle, SMT, B Type, Recep	1
HEADER_3P(	HEADER_3	HEADER_3	H8	3Pin Header 2.54mm spacing	1
INDUCTOR5u	IND 5.2UH 6A	CDRH104RNP-5	L1	FIXED IND 5.2UH 6A 22 MOHM SMD	1
INDC3216L	1A max, Idc 0.3R	IN_Ferrite-Bead	L2, L3	Ferrite Bead, Rdc 0.3R, Z100MHZ 600R, Ima	2
XDCR_PS124	PS1240P02BT	PS1240P02BT	LS1	Buzzers Transducer, Externally Driven Piezo	1
SOT323_M	BC817W	TB_BC817W	Q1	NPN GP Bipolar Transistor 45V 500mA SO	1
RESC1608L	0R	RS_0R0	R1, R5, R6, R11, R13, R17, R19, R20	RES 0.0 OHM 1/10W 5% 0603 SMD	8
RESC1608L	200K	RS_200K	R2	RES 200K OHM 1/10W 5% 0603 SMD	1
RESC1608L	100K	RS_100K	R3, R4	RES 100K OHM 1/10W 5% 0603 SMD	2
RESC3216L	1R	RT_1R	R7	RES 1R OHM 1/4W 5% 1206 SMD	1
RESC1608L	2K2	RS_2K2	R8, R9	RES 2.2K OHM 1/10W 5% 0603 SMD	2
RESC1608L	10R	RS_10R	R10, R16	RES 10 OHM 1/10W 5% 0603 SMD	2
RESC1608L	470R	RS_470R	R12	RES 470 OHM 1/10W 5% 0603 SMD	1
RESC1608L	680R	RS_680R	R14	RES 680 OHM 1/10W 5% 0603 SMD	1
RESC1608L	1K	RS_1K	R15, R18	RES 1.0K OHM 1/10W 5% 0603 SMD	2
RESC1608L	27R	RS_27R	R21, R22	RES 27 OHM 1/10W 5% 0603 SMD	2
EVQPNF05M	EVQPNF05M	WS_EVQPNF05	S1, S2	Panasonic 6 x 3.5mm SMD Light Touch Swi	2
SOT23_L	BSH105,215	TM_BSH105	T1	MOSFET N-CH 20V 1.05A SOT-23	1
RD_8_1	ADP2302ARDZ-I	ADP2302ARDZ-I	U1	IC REG BUCK 5V 2A 8SOIC	1
Quad24	MPU-9250	MPU-9250	U2	9 axis IMU	1
SOT95P280X	CAT6219-330TD	SV_CAT6219-33	U3, U8	IC REG LIN 3.3V 500MA TSOT23-5	2
LQFP64_L	ATSAM4S8BA-A	SE_ATSAM4S16	U4	IC MCU 32BIT 512KB FLASH 64LQFP	1
NRF24	nRF24 SMD	NRF24	U6	nRF24 SMD Module	1
SOT23-6_N	SN74LVC1T45	SN74LVC1T45	U7	1.8V - 5V level converter	1
Joystick_Sw	Joystick 10k with	Joystick 10k with	VR1	JOYSTICK 10K OHM 2 AXIS TH	1
6.0X3.5-4	12MHz	XT_CRYSTAL_1	Y1	CRYSTAL 12MHZ 18PF 6X3.5mm SMD	1
					81

Approved	Notes	