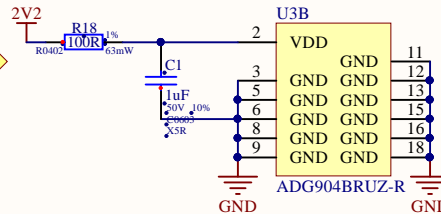
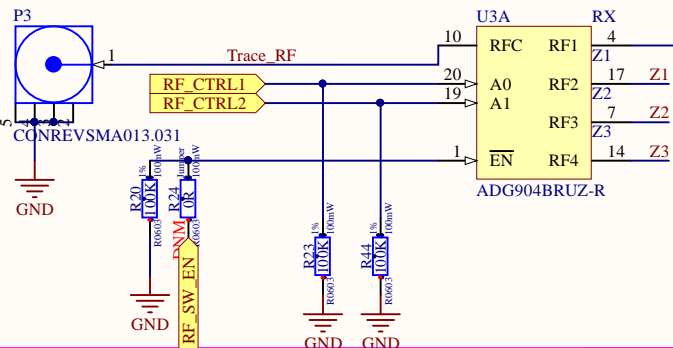


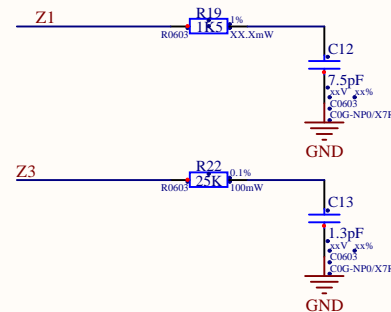
1	2	3	4
A			A
B			B
C			C
D			D
1	2	3	4

Title Main (top sheet)			<div><div>TWTG</div><div>Delftsestraat 11 3013 AB Rotterdam www.twtg.io</div><div>File: TOP.SchDot</div></div> <div><div>TW</div><div>TG</div><div>the red company</div></div>
Size: A4	Number: P2017-034	Revision: V0	
Date: 20/02/2018	Time: 12:25:10	Sheet 1 of 1	
Project: Tag2Tag			

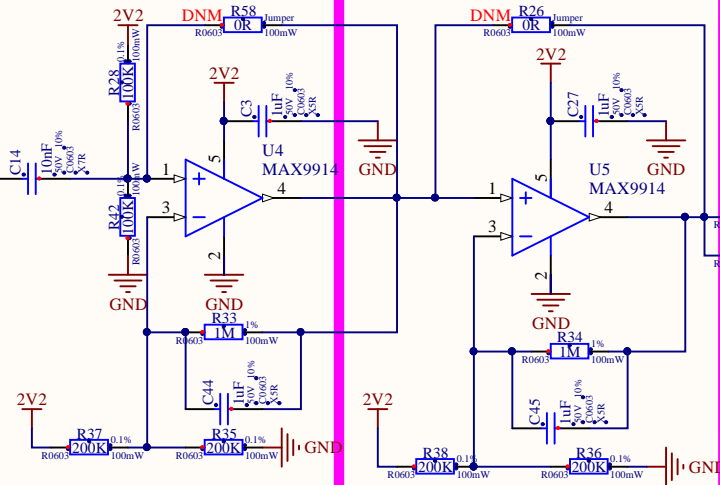
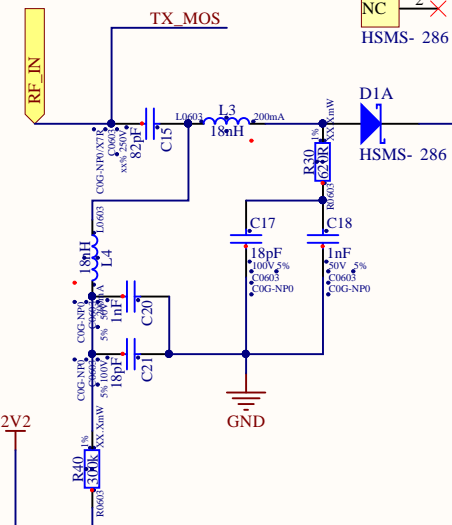
TX



Need to be tuned

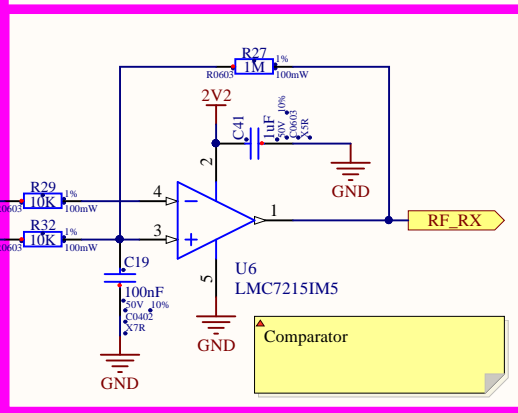


▲ If Mounted, Rx should be 10 M instead of 1 M (gain to 100)

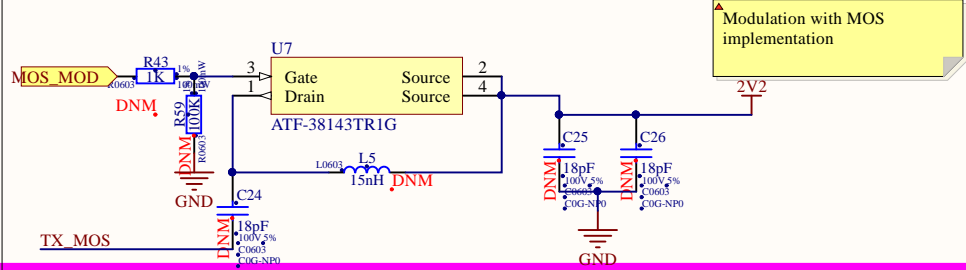


▲ Op amp 1
G = 11

▲ Op amp 1
G = 11
Gtot = 121

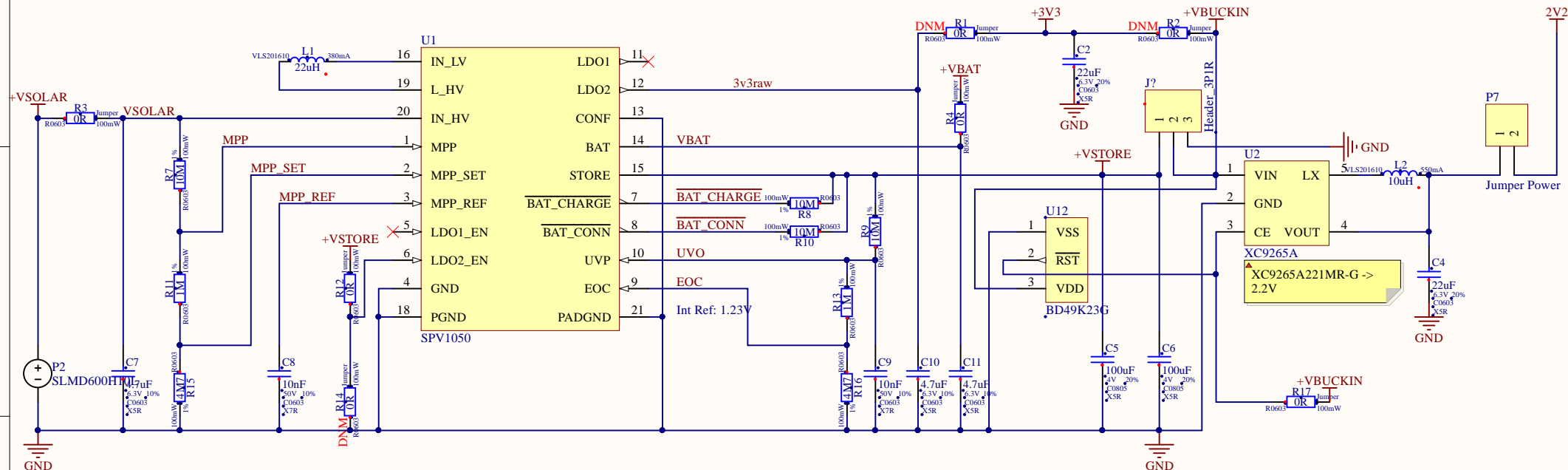
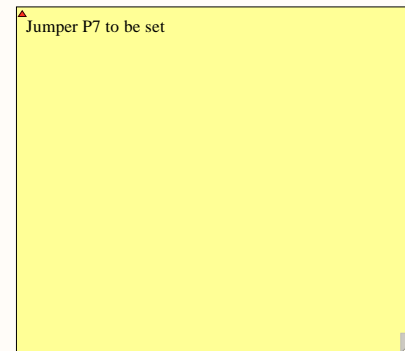
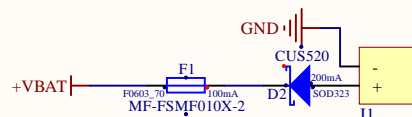
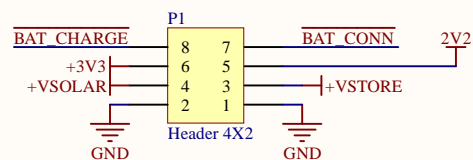


▲ Comparator



▲ Modulation with MOS implementation

Title RF			TW TG	
Size: A4	Number: P2017-034	Revision: V0	Delftsestraat 11 3013 AB Rotterdam www.twtg.io	
Date: 20/02/2018	Time: 12:25:10	Sheet 1 of 1	File: RF.SchDot	
Project: Tag2Tag			the r&d company	



▲ Solar input capacitor must be 4.7uF (recommended) or 10uF (max), see page 25

$V_{mpp} = V_{oc} * 4.7 / (1 + 4.7) = V_{oc} * 0.82$

LDO1 = 1V8


LDO2 = 3V3

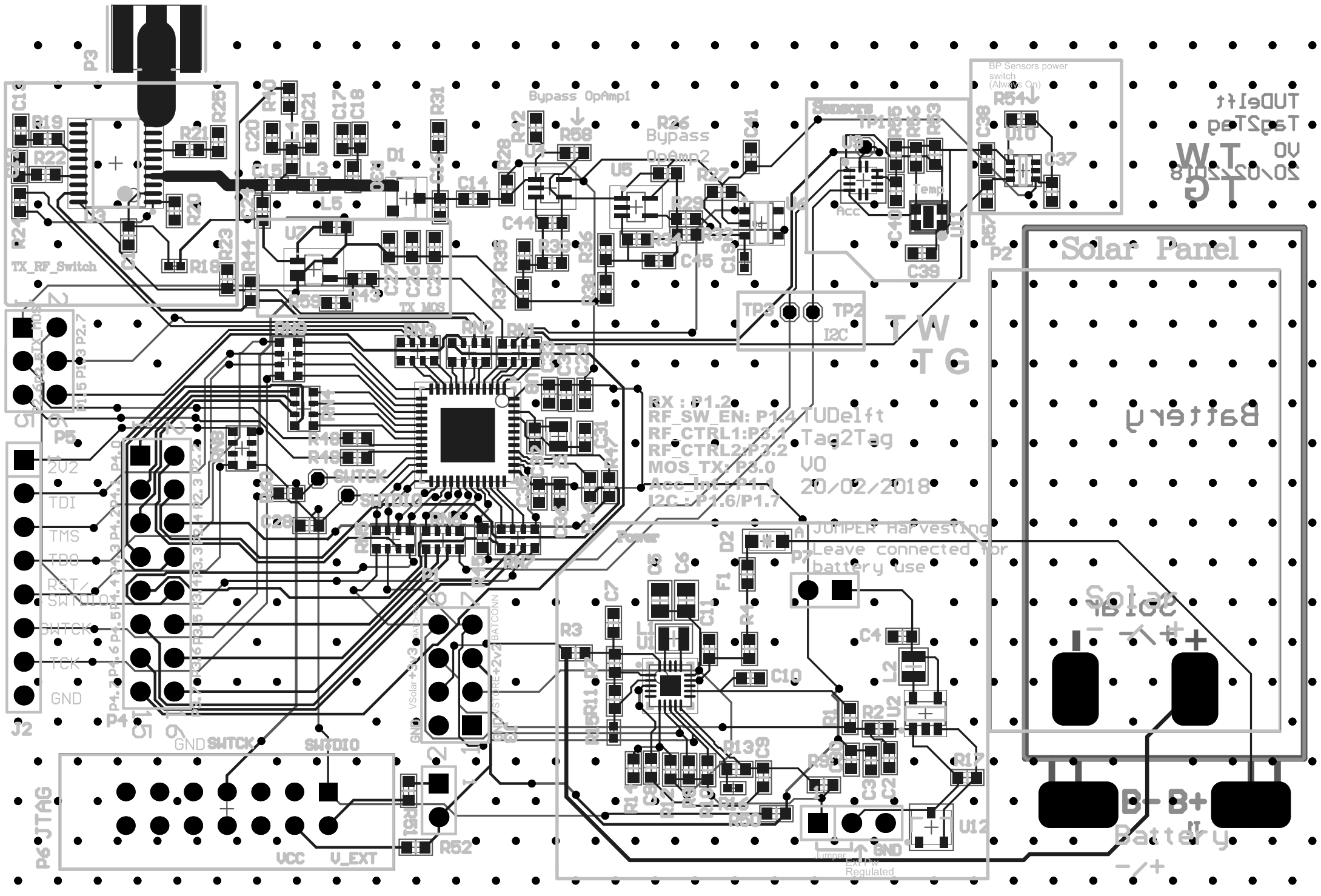
CONF = 0 => Buck-boost, CONF = 1 => boost

▲ Battery voltage config:

- UVP = 3.38 V
- EOC = 4.11 V

For values 10M, 1M, 4M7

Title Power			TWTG		
Size: A4	Number: P2017-034	Revision: V0	Delftsestraat 11		
Date: 20/02/2018	Time: 12:25:10	Sheet 1 of 1	3013 AB Rotterdam		
Project: Tag2Tag			www.twtg.io		
			File: Energy_harvesting.SchDot		



TUDELFT
Tag2Tag
V0
20/02/2018

Solar Panel

Battery

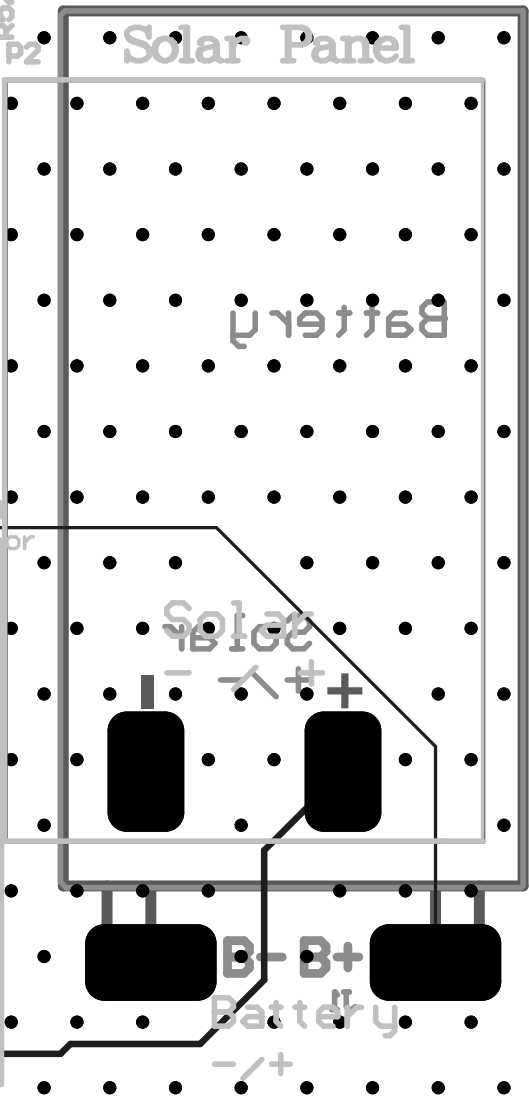
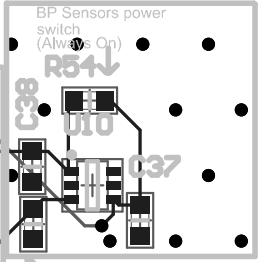
Solar

B- B+
Battery

RX : P1.2
RF_SW_EN: P1.4
RF_CTRL1: P3.1
RF_CTRL2: P3.2
MOS_TX: P3.0
Acc_In: P1.1
I2C : P1.6/P1.7

JUMPER Harvesting
Leave connected for
battery use

Jumper
Regulated



Value	Comment	Description	Designator	Footprint	LibRef	Manufacturer	Manufacturer 1	Manufacturer Part Number 1	Quantity
1uF		1uF, 10%, 50V, XSR, 0603	C1, C2, C37, C39, C44, C45	C0603	0603_10F_10%	Taiyo Yuden	Taiyo Yuden	06M1071050K-1	1
22uF		22uF, 20%, 6.3V, XSR, 0603	C2	C0603	0603_22uF_20%	Murata Electronics North America	Murata	GRM18BR022A060A00	1
22uF		22uF, 20%, 6.3V, XSR, 0603	C4	C0603	0603_22uF_20%	Murata Electronics North America	Murata	GRM18BR022A060A00	1
100uF		100uF, 20%, 4V, XSR, 0805	C5, C6	C0805	0805_100uF_20%_4V	Murata Electronics North America	Murata	GRM218R0107M175L	1
4.7uF		4.7 uF, 10%, 4.5V, XSR, 0603	C7, C10, C11	C0603	0603_4.7uF_10%	Taiyo Yuden	Taiyo Yuden	06M30X005088475	1
100nF		100nF, 10%, 50V, X7R, 0603	C8, C9, C14	C0603	0603_100nF_10%	Taiyo Yuden	Taiyo Yuden	06M30X0009088103	1
7.5pF		Capacitor	C12	C0603	Capacitor			2518145785CVAT	1
1.3pF		Capacitor	C13	C0603	Capacitor			2518145183BVAT	1
0.01uF		Capacitor	C15	C0603	Capacitor	Murata	Murata	GRM1875C00100B0120	1
10pF		10pF, 5%, 100V, COG-NPO, 0603	C16, C17, C21	C0603	0603_10pF_5%	Murata Electronics North America	Murata	GRM18FC24100A0102	1
10pF		10pF, 5%, 50V, COG-NPO, 0603	C18, C20	C0603	0603_10pF_5%	AVX Corporation	Epcos ARK	9603S102102A2	1
100nF		100nF, 10%, 50V, X7R, 0603	C19	C0402	0603_100nF_10%	AVX Corporation	Epcos ARK	0603C10024100A0102	1
100nF		100nF, 5%, 100V, COG-NPO, 0603	C20, C25, C26	C0603	0603_100nF_5%	Murata Electronics North America	Murata	GRM18FC24100A0102	1
2.2nF		2.2nF, 10%, 50V, X7R, 0603	C28	C0603	0603_2.2nF_10%	Taiyo Yuden	Taiyo Yuden	06M30X0009088222	1
4.7pF		4.7pF, 10%, 50V, COG-NPO, 0603	C30, C33, C35, C38, C39	C0603	0603_100nF_10%	AVX Corporation	Epcos ARK	0603C10024100A0102	1
8.2pF		8.2pF, 10%, 50V, COG-NPO, 0603	C31, C32	C0603	0603_4.7pF_10% 1pF	Samsung Electro-Mechanics America, Inc.	Samsung	C110C4878800090NC	1
1u		Capacitor	C37	C0603	Capacitor	Samsung	Samsung	C110A10508804NC	1
HSMS-286		HSMS-286 Schottky Barrier Diode: 40 V, 200 mA, 45 to 125 deg., 1 Pin SOT23, RoHS Tape and Reel	D1	D10D SOT23-3 V	HSMS-286 DIODE SCHOTTKY, 40V0.2A, 3-PIN SOT23, XSR	Broadcom	Broadcom	HSMS-286-0L05	1
CUS520		CUS520 Flash Memory: 16 Mbit, 1.8V, 100ns, 100MB/s, RoHS Reflowable 10V, Conces 1	D2	SC1321	Flash Memory: 16 Mbit, 1.8V, 100ns, 100MB/s, RoHS Reflowable 10V, Conces 1	Toshiba Semiconductor and Storage	Toshiba	CUS520 H3F	1
MF-F5M0100K-2		MF-F5M0100K-2 Film Capacitor: 100nF, 5%, 100V, 100MB/s, RoHS Reflowable 10V, Conces 1	F1	F5M01, 39	Film Capacitor: 100nF, 5%, 100V, 100MB/s, RoHS Reflowable 10V, Conces 1	Bourns Inc.	Bourns Inc.	MF-F5M0100K-2	1
Lion battery 3.7	Battery Pads	Pad for soldering Battery	J1	Battery	Battery			2750	1
Header_8P1R		Header 8 Positions 1 Row Connector 0.100" (2.54mm) Through Hole Gold	J2	HEADER8X1	HEADER_8PX1R, 2.54MM	Santec Inc.	Loading...	loading...	1
Header_3P1R		Header 3 Positions 1 Row Connector 0.100" (2.54mm) Through Hole Gold	J3	HEADER3X1	HEADER_3PX1R, 2.54MM	Santec Inc.	Santec	HTSW-102-03-01-G-5	1
Header_3P1R		Header 3 Positions 1 Row Connector 0.100" (2.54mm) Through Hole Gold	J7	HEADER3X1	HEADER_3PX1R, 2.54MM	Santec Inc.	Santec	HTSW-102-03-01-G-5	1
22uH		Inductor 22uH, 10%, 100mA, 100MHz, RoHS Wirewound	L1	VL5201610	Inductor 22uH, 10%, 100mA, 100MHz, RoHS Wirewound	TDK	TDK	VL52016-10C-2200M	1
10uH		Inductor 10uH, 10%, 100mA, 100MHz, RoHS Wirewound	L2	VL5201610	Inductor 10uH, 10%, 100mA, 100MHz, RoHS Wirewound	TDK	TDK	VL52016-10C-1000M	1
10mH		Inductor 10mH, 10%, 100mA, 100MHz, RoHS Wirewound	L3, L4	L0603	Inductor	Johanson	Johanson	L-05810N070	1
15uH		Inductor 15uH, 10%, 100mA, 100MHz, RoHS Wirewound	L5	L0603	Inductor 0603, 15uH	Bourns Inc.	Bourns	CT14008B-1501	1
SUM660H01L		SUM660H01L Solar SUM660H01L, 30V, 1W, 100mA, 100MHz, RoHS Wirewound	P2	POWER-SUM660H01L-30V-1W	Voltage Source	005	SUM660H01L		1
CONV5M0A113-011		CONV5M0A113-011 DC-DC Converter: 5V, 1A, 100mA, 100MHz, RoHS Wirewound	P3	CONV5M0A-EDGE	DC-DC Converter: 5V, 1A, 100mA, 100MHz, RoHS Wirewound	Linear	Linear	CONV5M0A011	1
Header 8P2		Header 8 Positions, Dual row	P4	HS08X2	Header 8P2			CONV5M0A011	1
Header 3P2		Header 3 Positions, Dual row	P5	HS03X2	Header 3P2			CONV5M0A011	1
N2514-6002R		Main Header, Pin2 2.54 mm, 2 x 7 Position, Length 9.91 mm, Tail Length 2.64 mm, SS to 105 deg., RoHS, Tray	P6	3M-N2514-6002R-V	CP-2N-P-814	3M			1
Jumpier Power		Header 2-pin	P7	HS01X2	Header 2				1
OR		OR, Jumper, 1000nW, 0603	R1, R2, R14, R24, R25, R60	R0603	0603_OR_Jumper	Taiyo Yuden	Taiyo Yuden	RC0603OR-0700L	1
OR		OR, Jumper, 1000nW, 0603	R3, R12, R17	R0603	0603_OR_Jumper	Taiyo Yuden	Taiyo Yuden	RC0603OR-0700L	1
OR		OR, Jumper, 1000nW, 0603	R4, R21, R52	R0603	0603_OR_Jumper	Taiyo Yuden	Taiyo Yuden	RC0603OR-0700L	1
10M		10M, 1%, 1000nW, 0603	R7, R8, R9, R10	R0603	0603_10M_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-0710ML	1
10M		1M, 1%, 1000nW, 0603	R11, R13, R27, R33, R34	R0603	0603_1M_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-071ML	1
0M7		0M7, 1%, 1000nW, 0603	R15, R16	R0603	0603_0M7_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-070M7L	1
102R		102R, 1%, 430nW, 0402	R18	R0402	0402_102R_1%	Taiyo Yuden	Taiyo Yuden	RT0402FR-0710RL	1
1K5		Resistor	R19	R0603	0603_1K5	Taiyo Yuden	Taiyo Yuden	RT0603FR-071K5L	1
100K		100K, 1%, 1000nW, 0603	R20, R21, R44	R0603	0603_100K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-07100KL	1
20K		20K, 0.1%, 1000nW, 0603	R22	R0603	0603_20K_0.1%	Vishay Film	Vishay Dale Thin Film	PRM0603020K20E075	1
10K		10K, 1%, 1000nW, 0603	R23	R0603	0603_10K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-0710KL	1
100K		100K, 0.1%, 1000nW, 0603	R28, R31, R42	R0603	0603_100K_0.1%	Panasonic Electronic Components	Panasonic ECG	ERA-3AER100V	1
10K		10K, 1%, 1000nW, 0603	R29, R32, R53, R54	R0603	0603_10K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-0710KL	1
020R		Resistor	R30	R0603	Resistor	Panasonic ECG	Panasonic ECG	ERA-3AER020V	1
200K		200K, 0.1%, 1000nW, 0603	R35, R36, R37, R38	R0603	0603_200K_0.1%	Panasonic Electronic Components	Panasonic ECG	ERA-3AER200V	1
300K		Resistor	R40	R0603	Resistor	Sucomm	Sucomm	RC0160MP-30K-B-75	1
1K	DNM	1K, 1%, 1000nW, 0603	R43	R0603	0603_1K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-071KL	1
1K		1K, 1%, 1000nW, 0603	R45, R46, R47, R48, R49	R0603	0603_1K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-071KL	1
47K		47K, 1%, 1000nW, 0603	R50	R0603	0603_47K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-0747KL	1
470R		470R, 1%, 1000nW, 0603	R55	R0603	0603_470R_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-07470RL	1
10M		1M, 1%, 1000nW, 0603	R57	R0603	0603_1M_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-0710ML	1
100K	DNM	100K, 1%, 1000nW, 0603	R59	R0603	0603_100K_1%	Taiyo Yuden	Taiyo Yuden	RC0603FR-07100KL	1
1K		1K, 1%, 1000nW, 1206 (1 Resistor Array 4 Channels) 1A, 5V, 40mA, 1206 (