





Quantity	Comment	Designator	Description	Footprint
2	Motor connector 89400-0220	B1, B2	Motor, General Kind	BAT-2
1	Battery connector 1 08940-10210	B11	Multicell Battery	BAT-2
38	100nF	C1, C3, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C22, C23, C24, C25, C26, C27, C28, C29, C30, C33, C35, C36, C37, C38, C39, C55, C62, C65, C66, C67, C68, C69, C70, C71, C74, C75	Capacitor	CAPC1005X05N
8	10uF	C2, C31, C40, C46, C51, C52, C73, C78	Capacitor	CAPC1005X05N
2	51pF	C4, C64	Capacitor	CAPC1005X05N
7	4.7nF	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1005X05N
9	4.7uF	C32, C43, C44, C45, C47, C48, C49, C50, C72	Capacitor	CAPC1005X05N
1	10uF XSR	C34	Capacitor	CAPC1005X05N
2	18pF	C41, C42		CAPC1005X05N
2	1nF	C53, C54	Capacitor	CAPC1005X05N
3	1uF	C56, C61, C63	Capacitor	CAPC1005X05N
1	1.5nF	C57	Capacitor	CAPC1005X05N
3	47nF	C58, C59, C60	Capacitor	CAPC1005X05N
4	19-21SURC/S530-A3/TR8	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N
2	YLL-T50GRB-3-BJ-05	D2, D6		OBLP679E-RGB
12	27-21SURC/S530-A3	D7, D9, D10, D11, D12, D17, D18, D25, D26, D32, D35, D36	SMD Red led right angle mount 2V@20ma 57mcd	27-21 EVERLIGHT
3	27-21/BHC-AN1P2/3C	D8, D31, D37	SMD Blue led right angle mount 3.3V@20ma 28mcd	27-21 Everlight Blue
8	APTID1608SYCK	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios SMD Yellow 590nm 480mcd	DIOC1608X08N
2	WP7104SRC/D	D19, D20	Red led 2V@20ma 57mcd	LED_TH_3MM_20MM
2	OBLP679E-RGB	D27, D38		OBLP679E-RGB
3	APTID1608CGCK	D28, D29, D30	LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N
2	BAT54S	D33, D34	Schottky Barrier Double Diode	SO T23_N
5	2508056017Y2	L1, L2, L3, L4, L5	SMD EMI Suppression Ferrite Bead WE-CBF, Z = 600 Ohm	INDC2012X11L
1	Speaker	LS1	Loudspeaker	PIN2
1	TD4015BPN	MC1	Omnidirectional Back Electret Condenser Microphone	MICRO_TD4015BPN
36	BC817-40	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q22, Q25, Q26, Q28, Q31, Q32, Q34, Q37, Q38, Q39, Q40, Q42, Q45, Q46, Q47, Q48	NPN General-purpose Transistor	SO T23_N
18	4.7K	R1, R2, R57, R59, R61, R63, R64, R65, R92, R93, R94, R111, R112, R113, R114, R144, R145, R146	Resistor	RESC1005X04N
2	33	R3, R5	120, Resistor	RESC1005X04N
2	2.7K	R4, R6	Resistor	RESC1005X04N
10	22K	R7, R8, R9, R10, R11, R42, R43, R67, R130, R142	120, Resistor	RESC1005X04N
17	2.2K	R12, R13, R14, R15, R16, R32, R33, R34, R35, R41, R44, R45, R52, R53, R103, R104, R126	120, Resistor	RESC1005X04N
7	1.5K	R17, R18, R19, R20, R26, R46, R47	120	RESC1005X04N
10	1K	R21, R22, R23, R24, R25, R48, R49, R108, R166, R167	120, Resistor	RESC1005X04N
16	10K	R27, R28, R29, R30, R31, R50, R51, R101, R102, R109, R110, R117, R118, R128, R129, R136	120, Resistor	RESC1005X04N
7	6.2	R36, R37, R38, R39, R40, R54, R55	120	RESC1005X04N
18	56	R56, R58, R60, R62, R69, R72, R74, R75, R76, R77, R78, R79, R80, R81, R90, R91, R98, R147	Resistor, 56	RESC1005X04N
14	39	R66, R82, R83, R84, R85, R86, R87, R88, R89, R95, R96, R97, R133, R134	Resistor	RESC1005X04N
4	200	R68, R71, R99, R148	200	RESC1005X04N
4	82	R70, R73, R100, R149	82	RESC1005X04N
4	100	R105, R106, R135, R150	Resistance, Resistor	RESC1005X04N
2	180	R107, R137	Resistor	RESC1005X04N
2	5.6K	R115, R116	Resistor	RESC1005X04N
15	100K	R119, R120, R121, R122, R123, R124, R138, R139, R141, R143, R155, R156, R157, R158, R159	Resistor	RESC1005X04N
1	680K	R125	Resistor	RESC1005X04N
1	6.8K	R127	Resistor	RESC1005X04N
5	820	R131, R151, R152, R153, R154	Resistor	RESC1005X04N
1	47K	R132	Resistor	RESC1005X04N
1	270K	R140	Resistor	RESC1005X04N
1	NCP15XH103F03RC	RT1	Thermistors - NTC 10K OHM 1% 0402	RESC1005X04L
1	MicroSD-Astron 5190008-XA4-R	S1	MicroSD Card connector 5190008-XA4-R	Astron 5190008-XA4-R
1	SW-PB	S2	Switch	FSMRA2JH
4	DMG1013UW-7	T1, T2, T3, T4	Transistor MOSFET 1 x P Pining : 1=G, 2=S, 3=D	SO T65P210X100-3N
4	DMG1012UW	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pining : 1=G, 2=S, 3=D	SO T65P210X100-3N
1	STM-LIS2DE12-LGA-12	U1		STM-LGA-12
2	ITR9909	U2, U3	Everlight Opto Interrupter	ITR9909_LONG
2	MCP6L04T-E/ST	U4, U5	1 MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N
7	ITR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	ITR9909_EDGE
5	SN74HC595PWR	U13, U14, U15, U16, U17	8-Bit Serial-Input/Serial or Prallel-Output Shift Register with Latched 3-State Outputs	948F-01_N
1	AP2112K-3.3TRG1	U18	300mA, Low Quiescent Current, Fast Transient LDO	SO T95P285X100-5N
1	PIC24FJ128GB106-I/PT	U19	General Purpose 16-Bit Flash Microcontroller with USB On-The-Go, 128KB Flash, 16KB SRAM, 64-Pin TQFP, Industrial Temperature	TQFP-Pt64_N
1	IRM-3638T	U20	IR Receiver Module (38 kHz) for Remote Control Systems	IR-receiver
1	MCP73871-2CAI/ML	U21	Stand-Alone System Load Sharing and Li-Ion/Li-Polymer Battery Charge Management Controller, 4.2V, 20-Pin QFN, Industrial Temperature	QFN-ML20_N
3	AP2210K-3.3TRG1	U22, U24, U26	300mA, Low Quiescent Current, Fast Transient LDO	SO T95P285X100-5N
1	FAN3988	U23	USB/Charger and Over Voltage Detection Device	MLP 1.45X1MM
1	LM4819M	U25	350mW Audio Power Amplifier with Shutdown Mode	M08A_N
1	Con1x6	X2	1 x 6 pins connector	MHDR1X6
1	WR-Communication Connectors 629105150521	X3	WR-COM_USB_Micro Type B_Horizontal_SMT	629105150521
1	815-ABLS-8-B2	Y1	Surface Mount Quartz Crystal 8Mhz	HC49/4H_SMX

Quantity	Comment	Designator	Description	Footprint	Layer
1	1uF	C63	Capacitor	CAPC1005X05N	Bottom
1	6.2	R38	120	RESC1005X04N	Bottom
1	100	R105	Resistance	RESC1005X04N	Bottom
1	815-ABLS-8-B2	Y1	Surface Mount Quartz Crystal 8Mhz	HC49/4H_SMX	Bottom
1	AP2210K-3.3TRG1	U26	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N	Bottom
1	Battery connector t 08940-10210	BT1	Multicell Battery	BAT-2	Bottom
1	MCP6L04T-E/ST	U4	1 MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N	Bottom
2	2.7K	R4, R6	Resistor	RESC1005X04N	Bottom
2	4.7uF	C43, C72	Capacitor	CAPC1005X05N	Bottom
2	18pF	C41, C42	Capacitor	CAPC1005X05N	Bottom
2	33	R3, R5	120, Resistor	RESC1005X04N	Bottom
2	82	R70, R73	82	RESC1005X04N	Bottom
2	200	R68, R71	200	RESC1005X04N	Bottom
2	ITR9909	U2, U3	Everlight Opto Interrupter	ITR9909_LONG	Bottom
1	Motor connector 89400-0220	B1, B2	Motor, General Kind	BAT-2	Bottom
2	WP7104SRC/D	D19, D20	Red led 2V@20ma 57mcd	LED_TH_3MM_20MM	Bottom
2	YLL-T50GRB-3-BJ-05	D2, D6		QBLP679E-RGB	Bottom
3	SN74HC595PWR	U13, U15, U17	8-Bit Serial-Input/Serial or Prallel-Output Shift Register with Latched 3-State Outputs	948F-01_N	Bottom
4	1K	R21, R22, R23, R24	120	RESC1005X04N	Bottom
4	1.5K	R17, R18, R19, R20	120	RESC1005X04N	Bottom
4	22K	R7, R8, R9, R10	120	RESC1005X04N	Bottom
4	820	R151, R152, R153, R154	Resistor	RESC1005X04N	Bottom
4	2508056017Y2	L1, L2, L3, L4	SMD EMI Suppression Ferrite Bead WE-CBF, Z = 600 Ohm	INDC2012X11L	Bottom
4	DMG1012UW	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pining : 1=G, 2=S, 3=D	SOT65P210X100-3N	Bottom
4	DMG1013UW-7	T1, T2, T3, T4	Transistor MOSFET 1 x P Pining : 1=G, 2=S, 3=D	SOT65P210X100-3N	Bottom
5	10uF	C40, C51, C52, C73, C78	Capacitor	CAPC1005X05N	Bottom
7	4.7nF	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1005X05N	Bottom
8	2.2K	R12, R13, R14, R15, R16, R33, R44, R45	120, Resistor	RESC1005X04N	Bottom
8	10K	R27, R28, R29, R30, R31, R50, R51, R136	120, Resistor	RESC1005X04N	Bottom
8	39	R82, R83, R84, R85, R95, R96, R97, R133	Resistor	RESC1005X04N	Bottom
8	56	R69, R72, R74, R75, R76, R77, R90, R91	56, Resistor	RESC1005X04N	Bottom
9	27-21SURC/SS30-A3	D9, D10, D11, D12, D17, D18, D25, D26, D35	SMD Red led right angle mount 2V@20ma 57mcd	27-21 EVERLIGHT	Bottom
10	100K	R119, R120, R121, R122, R123, R124, R155, R156, R157, R158	Resistor	RESC1005X04N	Bottom
12	4.7K	R1, R2, R57, R59, R61, R63, R64, R65, R111, R112, R113, R114	Resistor	RESC1005X04N	Bottom
14	BC817-40	Q1, Q2, Q3, Q4, Q7, Q12, Q19, Q20, Q22, Q25, Q26, Q28, Q47, Q48	NPN General-purpose Transistor	SOT23_N	Bottom
17	100nF	C5, C7, C8, C9, C14, C22, C25, C26, C28, C30, C55, C68, C69, C70, C71, C74, C75	Capacitor	CAPC1005X05N	Bottom
1	1.5nF	C57	Capacitor	CAPC1005X05N	Top
1	6.8K	R127	Resistor	RESC1005X04N	Top
1	10uF X5R	C34	Capacitor	CAPC1005X05N	Top
1	47K	R132	Resistor	RESC1005X04N	Top
1	270K	R140	Resistor	RESC1005X04N	Top
1	680K	R125	Resistor	RESC1005X04N	Top
1	820	R131	Resistor	RESC1005X04N	Top
1	2508056017Y2	L5	SMD EMI Suppression Ferrite Bead WE-CBF, Z = 600 Ohm	INDC2012X11L	Top
1	AP2112K-3.3TRG1	U18	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N	Top
1	Con1x6	X2	1 x 6 pins connector	MHDR1X6	Top
1	FAN3988	U23	USB/Charger and Over Voltage Detection Device	MLP 1.45X1MM	Top
1	IRM-3638T	U20	IR Receiver Module (38 kHz) for Remote Control Systems	IR-receiver	Top
1	LM4819M	U25	350mW Audio Power Amplifier with Shutdown Mode	M08A_N	Top
1	MCP6L04T-E/ST	U5	1 MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N	Top
1	MCP73871-2CAI/ML	U21	Stand-Alone System Load Sharing and Li-Ion/Li-Polymer Battery Charge Management Controller, 4.2V, 20-Pin QFN, Industrial Temperature	QFN-ML20_N	Top
1	MicroSD-Astron 5190008-XA4-R	S1	MicroSD Card connector 5190008-XA4-R	Astron 5190008-XA4-R	Top
1	NCP15XH103F03RC	RT1	Thermistors - NTC 10K OHM 1% 0402	RESC1005X04L	Top
1	PIC24FJ128GB106-I/PT	U19	General Purpose 16-Bit Flash Microcontroller with USB On-The-Go, 128KB Flash, 16KB SRAM, 64-Pin TOFP, Industrial Temperature	TOFP-PT64_N	Top
1	Speaker	LS1	Loudspeaker	PIN2	Top
1	STM-LIS2DE12-LGA-12	U1		STM-LGA-12	Top
1	SW-PB	S2	Switch	FSMRA2JH	Top
1	TD40158PN	MC1	Omnidirectional Back Electret Condenser Microphone	MICRO_TD40158PN	Top
1	WR-Communication Connectors 629105150521	X3	WR-COM_USB_Micro Type B_Horizontal_SMT	629105150521	Top
2	1nF	C53, C54	Capacitor	CAPC1005X05N	Top
2	1uF	C56, C61	Capacitor	CAPC1005X05N	Top
2	5.6K	R115, R116	Resistor	RESC1005X04N	Top
2	51pF	C4, C64	Capacitor	CAPC1005X05N	Top
2	82	R100, R149	82	RESC1005X04N	Top
2	180	R107, R137	Resistor	RESC1005X04N	Top
2	200	R99, R148	200	RESC1005X04N	Top
2	AP2210K-3.3TRG1	U22, U24	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N	Top
2	BAT54S	D33, D34	Schottky Barrier Double Diode	SOT23_N	Top
2	QBLP679E-RGB	D27, D38		QBLP679E-RGB	Top
2	SN74HC595PWR	U14, U16	8-Bit Serial-Input/Serial or Prallel-Output Shift Register with Latched 3-State Outputs	948F-01_N	Top
3	1.5K	R26, R46, R47	120	RESC1005X04N	Top
3	10uF	C2, C31, C46	Capacitor	CAPC1005X05N	Top
3	27-21/BHC-AN1P2/3C	D8, D31, D37	SMD Blue led right angle mount 3.3V@20ma 28mcd	27-21 Everlight Blue	Top
3	27-21SURC/SS30-A3	D7, D32, D36	SMD Red led right angle mount 2V@20ma 57mcd	27-21 EVERLIGHT	Top
3	47nF	C58, C59, C60	Capacitor	CAPC1005X05N	Top
3	100	R106, R135, R150	Resistance, Resistor	RESC1005X04N	Top
3	APTD1608CGCK	D28, D29, D30	LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N	Top
1	19-21SURC/SS30-A3/TR8	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N	Top
5	100K	R138, R139, R141, R143, R159	Resistor	RESC1005X04N	Top
6	1K	R25, R48, R49, R108, R166, R167	120, Resistor	RESC1005X04N	Top
6	4.7K	R92, R93, R94, R144, R145, R146	Resistor	RESC1005X04N	Top
6	6.2	R36, R37, R39, R40, R54, R55	120	RESC1005X04N	Top
6	22K	R11, R42, R43, R67, R130, R142	120, Resistor	RESC1005X04N	Top

Quantity	Comment	Designator	Description	Footprint	Layer
6	39	R66, R86, R87, R88, R89, R134	Resistor	RESC1005X04N	Top
7	4.7uF	C32, C44, C45, C47, C48, C49, C50	Capacitor	CAPC1005X05N	Top
7	ITR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	ITR9909_EDGE	Top
8	10K	R101, R102, R109, R110, R117, R118, R128, R129	Resistor	RESC1005X04N	Top
8	APTD1608SYCK	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios SMD Yellow 590nm 480mcd	DIOC1608X08N	Top
9	2.2K	R32, R34, R35, R41, R52, R53, R103, R104, R126	Resistor	RESC1005X04N	Top
10	56	R56, R58, R60, R62, R78, R79, R80, R81, R98, R147	Resistor, 56	RESC1005X04N	Top
21	100nF	C1, C3, C6, C10, C11, C12, C13, C23, C24, C27, C29, C33, C35, C36, C37, C38, C39, C62, C65, C66, C67	Capacitor	CAPC1005X05N	Top
22	BC817-40	Q5, Q6, Q8, Q9, Q10, Q11, Q13, Q14, Q15, Q16, Q17, Q18, Q31, Q32, Q34, Q37, Q38, Q39, Q40, Q42, Q45, Q46	NPN General-purpose Transistor	SOT23_N	Top



