





Quantity	Comment	LibRef	Designator	Description	Footprint	Supplier	Supplier Nr
2	Motor	Motor	B1, B2	Motor, General Kind	RES-10.5		
1	Battery	Battery	BT1	Multicell Battery	BAT-2		
36	100nF	100nF[/\]J0603[/\]J1	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	Capacitor	RESC1608X06L	Farnell	1288255
6	10uF	10uF[/\]J0603[/\]J1	C2, C4, C34, C46, C51, C52	Capacitor	RESC1608X06L	Farnell	1463375
7	4.7nF	CAPNP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N		
11	4.7uF	4.7uF[/\]J0603[/\]J1	C41, C32, C40, C43, C44, C45, C47, C48, C49, C50, C72	Capacitor	RESC1608X06L	Farnell	9227784
2	18uF	15uF[/\]J0603[/\]J1	C41, C42		RESC1608X06L	Farnell	8819815
2	1nF	1000p[/\]J0603[/\]J1	C53, C54	Capacitor	RESC1608X06L	Farnell	1288255
4	1uF	1uF[/\]J0603[/\]J1	C56, C60, C61, C63	Capacitor	RESC1608X06L	Distelec, Farnell	823495, 9227784
1	1.5nF	1000p[/\]J0603[/\]J1	C57	Capacitor	RESC1608X06L	Farnell	9406182
2	47nF	100nF[/\]J0603[/\]J1	C58, C59	Capacitor	RESC1608X06L	Distelec, Farnell	823494, 9406182
1	51pF	100nF[/\]J0603[/\]J1	C64	Capacitor	RESC1608X06L	Farnell	9406182
4	19-21SURC/SS30-A3/ TR8	LED	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N		
4	BT5050RGBCT180	LED RGB SMD 2	D2, D6, D27, D38	0.027 2000k	LEDSMD5		
10	21SURC/SS36-A3	LED	D7, D8, D10, D11, D12, D17, D18, D25, D26, D32, D35, D36	SMD Red led right angle mount 2V@20ma 57mcd	Z7-21 Everlight		
3	21-21/BHC-AN1P2/ 3C	LED	D8, D31, D37	SMD Blue led right angle mount 3.3V@20ma 28mcd	Z7-21 Everlight Blue		
6	APT01608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios SMD Yellow 590nm 460mcd	DIOC1608X08N		
2	SSL-UX044HD	LED	D19, D20	Red led 2V@20ma 67mcd	Led_TH_3mm_20mm		
3	APT01608GOK	LED	D28, D29, D30	LED standard - CMS Helios SMD Green 530nm 230mcd	DIOC1608X08N		
2	BAT54S	BAT54S	D33, D34	Schottky Barrier Double Diode	SOT23_N		
1	Speaker	Speaker	LS1	Loudspeaker	PIN2		
1	TD4015BPN	Micro1	MC1	Condensation Back Electret Condenser Microphone	MICRO_PANASONIC_WM-64PN		
46	BC817-40	BC817-40	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	NPN General-purpose Transistor	SOT23_N		
22	4.7K	4.7K[/\]J0603[/\]J1	R1, R2, R37, R59, R61, R63, R64, R65, R67, R62, R63, R64, R103, R104, R111, R112, R113, R114, R142, R144, R145, R146	Resistor	RESC1608X06L	Distelec	715604
16	33	68K[/\]J0603[/\]J1	R3, R5, R68, R69, R70, R71, R72, R73, R68, R69, R100, R135, R147, R148, R149, R150	120, Resistor	RESC1608X06L	Distelec	715632
10	1K	1K[/\]J0603[/\]J1	R4, R6, R21, R22, R23, R24, R25, R48, R49, R108	120, Resistor	RESC1608X06L	Distelec	715588
6	22K	22K[/\]J0603[/\]J1	R7, R8, R9, R10, R11, R42, R43, R130	120, Resistor	RESC1608X06L	Distelec	715620
15	2.2K	2.2K[/\]J0603[/\]J1	R12, R13, R16, R16, R16, R16, R16, R16, R16, R41, R44, R45, R52, R53, R126	120, Resistor	RESC1608X06L	Distelec	715596
7	1.9K	RES	R17, R18, R19, R20, R26, R46, R47	120	RESC1608X06L		
16	10K	10K[/\]J0603[/\]J1	R27, R28, R29, R30, R31, R50, R51, R101, R102, R109, R110, R117, R118, R128, R129, R143	120, Resistor	RESC1608X06L	Distelec, Farnell	715612, 9330399, 9331565
7	6.2	RES	R36, R37, R38, R39, R40, R54, R55	120	RESC1608X06L		
14	56	68K[/\]J0603[/\]J1	R56, R58, R60, R62, R74, R75, R76, R77, R78, R79, R80, R81, R80, R81	Resistor	RESC1608X06L	Distelec	715632
14	39	68K[/\]J0603[/\]J1	R66, R82, R83, R84, R85, R86, R87, R88, R89, R96, R96, R97, R133, R134	Resistor	RESC1608X06L	Distelec	715632
2	100	RES_ACCORT	R105, R106	Resistance	RESC1608X06N		
2	180	180R[/\]J0603[/\]J1	R107, R137	Resistor	RESC1608X06L	Distelec	715570
2	5.6K	2.2K[/\]J0603[/\]J1	R115, R116	Resistor	RESC1608X06L	Distelec	715596
9	100K	100K[/\]J0603[/\]J1	R119, R120, R121, R122, R123, R124, R138, R139, R141	Resistor	RESC1608X06L	Distelec	715612, 715636
1	680K	470K[/\]J0603[/\]J1	R125	Resistor	RESC1608X06L	Distelec	715652
1	6.8K	10K[/\]J0603[/\]J1	R127	Resistor	RESC1608X06L	Distelec	715612
1	520	22K[/\]J0603[/\]J1	R131	Resistor	RESC1608X06L	Distelec	715620
1	47K	22K[/\]J0603[/\]J1	R132	Resistor	RESC1608X06L	Distelec	715620
1	270K	270K[/\]J0603[/\]J1	R140	Resistor	RESC1608X06L	Farnell	9330941
1	NCP150H103P3RC	Res Thermal	RT1	Thermistor - NTC 10K Ohm 1%@40C	RESC1005X04L		
1	MicroSD-Astron 5190008-XAA-R	80-Cards Micro-ASL,TRON	S1	MicroSD Card connector 5190008-XAA-R	Astron 5190008-XAA-R		
1	SW-PB	SW-PB	S2	Switch	FSMR42JH		
4	DMG1013T	DMG1013T	T1, T2, T3, T4	Transistor MOSFET 1 x P Pinning : 1+G, 2+S, 3+D	SOT50P160X80-3N		
4	DMG1012T	DMG1012T	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pinning : 1+G, 2+S, 3+D	SOT50P160X80-3N		
1	MMA7660FC	MMA7660FC	U1	MMA7660FC XYZ-AXIS ACCELEROMETER ±1.5 g	DFN50P300X300X100-12N		
2	ITR9909	ITR9909	U2, U3	Everlight Opto Interrupter	ITR9909_LONG		
2	MCPEL04T-E/ ST	MCPEL04T-E/ ST	U4, U5	1+HVC, 2+VCC, 3+GND, 4+PWR, 14+Pin 125C, 17+Extended Temperature Range, Tape and Reel	TSSOP-ST14_N		
7	ITR9909	ITR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	ITR9909_EDGE		
5	MC74HC595ADTR2	MC74HC595ADTR2	U13, U14, U15, U16, U17	8-Bit Serial-Input/Serial or Parallel-Output Shift Register with Latched 3-State Outputs	949F-01_N		
4	AP7331-33WG-7	AP7331	U18, U22, U24, U26	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-6N		
1	PIC24FJ64GB106-I/PT	PIC24FJ64GB106-I/PT	U19	General Purpose 16-Bit Flash Microcontroller with USB On-The-Go, 64KB Flash, 19KB SRAM, 64-Pin TQFP, Industrial Temperature	TQFP-PT64_N		
1	IRM-3636T	TSOP32236	U20	IR Receiver Module (36 KHz) for Remote Control Systems	IR receiver		
1	MCPT73871-2AAJ/ML	MCPT73871-2AAJ/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		
1	FAN3988	FAN3988	U23	USB Charger and Over Voltage Detection Device	MLP-1.45x1mm		
1	LM4819M or NCP2980	LM4819M	U25	550mW Audio Power Amplifier with Shutdown Mode	MOBA_N		
1	Conn1a6	Conn1a6_1	X1	1 x 6 pins connector	TYCOO_7-215079-6		
1	Conn1a6	Conn1a6	X2	1 x 6 pins connector	MHDDR1X6		
1	Astron R3190005-021-R	USB_MINIAB	X3	USB connector Micro B	Astron 3190005-021-r		
1	B15-ABLS-6-B2	HC48/4H_SMX	Y1	Surface Mount Quartz Crystal 8MHz	HC48/4H_SMX		

Quantity	Comment	LibRef	Designator	Description	Footprint	Supplier	Supplier Nr	Layer
1	100	RES_ACO RT	R105	Resistance	RESC1608X06N			Bottom
1	1uF	10uF[[\]]06 03[[\]]1	C63	Capacitor	RESC1608X06L	Distrelec	823495	Bottom
1	6.2	RES	R38	120	RESC1608X06L			Bottom
1	815-ABLS-8-B2	HC49/4H_SMX	Y1	Surface Mount Quartz Crystal 8Mhz	HC49/4H_SMX			Bottom
1	AP7331-33WG-7	AP7331	U26	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N			Bottom
1	Con1x6	Con1x6_1	X1	1 x 6 pins connector	TYCO_7-215079-6			Bottom
1	MCP6L04T-E/ ST	MCP6L04 T-E/ ST	U4	1 MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N			Bottom
12	4.7K	4.7K[[\]]0 603[[\]]1	R1, R2, R57, R59, R61, R63, R64, R65, R111, R112, R113, R114	Resistor	RESC1608X06L	Distrelec	715604	Bottom
15	100nF	100nF[[\]] 0603[[\]]1	C5, C7, C8, C9, C14, C22, C25, C26, C28, C30, C55, C68, C69, C70, C71	Capacitor	RESC1608X06L	Famell	1288255	Bottom
18	BC817-40	BC817-40	Q1, Q2, Q3, Q4, Q7, Q12, Q19, Q20, Q21, Q22, Q23, Q24, Q25, Q26, Q27, Q28, Q29, Q30	NPN General-purpose Transistor	SOT23_N			Bottom
2	10uF	10uF[[\]]0 603[[\]]1	C51, C52	Capacitor	RESC1608X06L	Famell	1463375	Bottom
2	18pF	10pF[[\]]0 603[[\]]3	C41, C42		RESC1608X06L	Famell	8819815	Bottom
2	BT5050RGBCT180	LED RGB SMD 2	D2, D6	\$0.027/ 2000k	LEDSMD5			Bottom
2	ITR9909	ITR9909	U2, U3	Everlight Opto Interrupter	ITR9909_LONG			Bottom
2	SSL-LX3044HD	LED	D19, D20	Red led 2V@20ma 57mcd	Led_TH_3mm_20mm			Bottom
3	4.7uF	4.7uF[[\]] 0603[[\]]1	C40, C43, C72	Capacitor	RESC1608X06L	Famell	9227784	Bottom
3	MC74HC595ADTR2	MC74HC5 95ADTR2	U13, U15, U17	8-Bit Serial-Input/Serial or Parallel-Output Shift Register with Latched 3-State Outputs	948F-01_N			Bottom
4	1.5K	RES	R17, R18, R19, R20	120	RESC1608X06L			Bottom
4	22K	RES	R7, R8, R9, R10	120	RESC1608X06L			Bottom
4	DMG1012T	DMG1012 T	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pining : 1=G, 2=S, 3=D	SOT50P160X80-3N			Bottom
4	DMG1013T	DMG1013 T	T1, T2, T3, T4	Transistor MOSFET 1 x P, Pining : 1=G, 2=S, 3=D	SOT50P160X80-3N			Bottom
6	100K	100K[[\]] 0603[[\]]1	R119, R120, R121, R122, R123, R124	Resistor	RESC1608X06L	Distrelec	715636	Bottom
6	1K	RES	R4, R6, R21, R22, R23, R24	120, Resistor	RESC1608X06L			Bottom
6	56	68K[[\]]0 603[[\]]1	R74, R75, R76, R77, R90, R91	Resistor	RESC1608X06L	Distrelec	715632	Bottom
7	10K	RES	R27, R28, R29, R30, R31, R50, R51	120	RESC1608X06L			Bottom
7	4.7nF	CAP-NP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N			Bottom
8	2.2K	2.2K[[\]]0 603[[\]]1, RES	R12, R13, R14, R15, R16, R33, R44, R45	120, Resistor	RESC1608X06L	Distrelec	715596	Bottom
8	33	RES	R3, R5, R68, R69, R70, R71, R72, R73	120, Resistor	RESC1608X06L			Bottom
8	39	68K[[\]]0 603[[\]]1	R82, R83, R84, R85, R95, R96, R97, R133	Resistor	RESC1608X06L	Distrelec	715632	Bottom
9	27-21SURC/SS50-A3	LED	D9, D10, D11, D12, D17, D18, D25, D26, D35	SMD Red led right angle mount 2V@20ma 57mcd	27-21 Everlight			Bottom
1	1.5nF	10nF[[\]]0 603[[\]]1	C57	Capacitor	RESC1608X06L	Famell	9406182	Top
1	100	RES_ACO RT	R106	Resistance	RESC1608X06N			Top
1	270K	270K[[\]] 0603[[\]]2	R140	Resistor	RESC1608X06L	Famell	9330941	Top
1	47K	22K[[\]]0 603[[\]]1	R132	Resistor	RESC1608X06L	Distrelec	715620	Top
1	51pF	10nF[[\]]0 603[[\]]1	C64	Capacitor	RESC1608X06L	Famell	9406182	Top
1	6.8K	10K[[\]]0 603[[\]]1	R127	Resistor	RESC1608X06L	Distrelec	715612	Top
1	680K	470K[[\]] 0603[[\]]1	R125	Resistor	RESC1608X06L	Distrelec	715652	Top
1	820	22K[[\]]0 603[[\]]1	R131	Resistor	RESC1608X06L	Distrelec	715620	Top
1	Alstron R3190005-021-R	USB_MINI AB	X3	USB connector Micro B	Astron 3190005-x21-r			Top
1	Battery	Battery	BT1	Multicell Battery	BAT-2			Top
1	Con1x6	Con1x6	X2	1 x 6 pins connector	MHDR1X6			Top
1	FAN3988	FAN3988	U23	USB/ Charger and Over Voltage Detection Device	MLP 1.45x1mm			Top
1	IRM-3636T	TSOP322 36	U20	IR Receiver Module (38 kHz) for Remote Control Systems	IR-receiver			Top
1	LM4819M or NCP2980	LM4819M	U25	350mW Audio Power Amplifier with Shutdown Mode	M08A_N			Top
1	MCP6L04T-E/ ST	MCP6L04 T-E/ ST	U5	1 MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N			Top
1	MCP73871-2AAI/ML	MCP7387 1-2AAI/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
		SD-Card-						

1	MCP73871-2AAI/ML	MCP7387 1-2AAI/ML	U21			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	SD-Card- Micro- ASLTRON 5190008- XA4-R	S1			MicroSD Card connector 5190008-XA4-R	Astron 5190008-XA4-R			Top
1	MMA7660FC	MMA7660 FC	U1			MMA7660FC:XYZ-A035 ACCELEROMETER ±1.5 g	DFN50P300X300X100- 12N			Top
1	NCP15XH103F03R C	Res Thermal	RT1			Thermistors - NTC 10K OHM 1% 0402	RESC1005X04L			Top
1	PIC24FJ64GB106- I/PT	PIC24FJ64 GB106- I/PT	U19			General Purpose 16-bit Flash Microcontroller with USB On-The-Go, 64KB Flash, 16KB SRAM, 64-Pin TQFP, Industrial Temperature	TOFP-PT64_N			Top
1	Speaker	Speaker	LS1			Loudspeaker	PIN2			Top
1	SW-PB	SW-PB	S2			Switch	FSMRA2JH			Top
1	TD4015BPN	Micro1	MC1			Omnidirectional Back Electret Condenser Microphone	MICRO_PANASONIC_ WM-64PN			Top
10	4.7K	4.7K[[\]]0 603[[\]]1	R67, R92, R93, R94, R103, R104, R142, R144, R145, R146			Resistor	RESC1608X06L	Distrele c	715604	Top
2	180	180R[[\]] 0603[[\]]1	R107, R137			Resistor	RESC1608X06L	Distrele c	715570	Top
2	1nF	100nF[[\]] 0603[[\]]1	C53, C54			Capacitor	RESC1608X06L	Famell	1288255	Top
2	47nF	10nF[[\]]0 603[[\]]1, 470nF[[\]] 0603[[\]]1	C58, C59			Capacitor	RESC1608X06L	Distrele c, Famell	823494, 9406182	Top
2	5.6K	2.2K[[\]]0 603[[\]]1	R115, R116			Resistor	RESC1608X06L	Distrele c	715596	Top
2	BAT54S	BAT54S	D33, D34			Schottky Barrier Double Diode	SOT23_N			Top
2	BT5050RGB-C180	LED RGB SMD 2	D27, D38			\$0.027/ 2000k	LEDSMD5			Top
2	MC74HC595ADTR2	MC74HC5 95ADTR2	U14, U16			8-Bit Serial-Input/Serial or Parallel-Output Shift Register with Latched 3- State Outputs	948F01_N			Top
2	Motor	Motor	B1, B2			Motor, General Kind	RB5-10.5			Top
21	100nF	100nF[[\]] 0603[[\]]1	C1, C3, C6, C10, C11, C12, C13, C23, C24, C27, C29, C33, C35, C36, C37, C38, C39, C62, C65, C66, C67			Capacitor	RESC1608X06L	Famell	1288255	Top
28	BC817-40	BC817-40	Q5, Q6, Q8, Q9, Q10, Q11, Q13, Q14, Q15, Q16, Q17, Q18, Q31, Q32, Q33, Q34, Q35, Q36, Q37, Q38, Q39, Q40, Q41, Q42, Q43, Q44, Q45, Q46			NPN General-purpose Transistor	SOT23_N			Top
3	1.5K	RES	R26, R46, R47			120	RESC1608X06L			Top
3	100K	10K[[\]]0 603[[\]]1, 100K[[\]] 0603[[\]]1	R138, R139, R141			Resistor	RESC1608X06L	Distrele c	715612, 715636	Top
3	1uF	1uF[[\]]06 03[[\]]1, 4.7uF[[\]] 0603[[\]]1	C56, C60, C61			Capacitor	RESC1608X06L	Distrele c, Famell	823495, 9227784	Top
3	27-211 BHC- AN1P2/ 3C	LED	D8, D31, D37			SMD Blue led right angle mount 3.3V@20ma 28mcd	27-21 Everlight Blue			Top
3	27-21SURC/ S530- A3	LED	D7, D32, D36			SMD Red led right angle mount 2V@20ma 57mcd	27-21 Everlight			Top
3	AP7331-33WG-7	AP7331	U18, U22, U24			300mA Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N			Top
3	APT-D1608CGOK	LED	D28, D29, D30			LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N			Top
4	10uF	10uF[[\]]0 603[[\]]1	C2, C4, C34, C46			Capacitor	RESC1608X06L	Famell	1463375	Top
4	19-21SURC/ S530- A3/ TR8	LED	D1, D3, D4, D5			SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N			Top
4	1K	1K[[\]]06 03[[\]]1, RES	R25, R48, R49, R108			120, Resistor	RESC1608X06L	Distrele c	715588	Top
4	22K	22K[[\]]0 603[[\]]1, RES	R11, R42, R43, R130			120, Resistor	RESC1608X06L	Distrele c	715620	Top
6	39	68K[[\]]0 603[[\]]1	R66, R86, R87, R88, R89, R134			Resistor	RESC1608X06L	Distrele c	715632	Top
6	6.2	RES	R36, R37, R39, R40, R54, R55			120	RESC1608X06L			Top
7	2.2K	2.2K[[\]]0 603[[\]]1	R32, R34, R35, R41, R52, R53, R126			Resistor	RESC1608X06L	Distrele c	715596	Top
7	ITR9909	ITR9909	U6, U7, U8, U9, U10, U11, U12			Everlight Opto Interrupter	ITR9909_EDGE			Top
8	33	68K[[\]]0 603[[\]]1, RES	R98, R99, R100, R135, R147, R148, R149, R150			120, Resistor	RESC1608X06L	Distrele c	715632	Top
8	4.7uF	4.7uF[[\]] 0603[[\]]1	C31, C32, C44, C45, C47, C48, C49, C50			Capacitor	RESC1608X06L	Famell	9227784	Top
8	56	68K[[\]]0 603[[\]]1	R56, R58, R60, R62, R78, R79, R80, R81			Resistor	RESC1608X06L	Distrele c	715632	Top
8	APT-D1608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24			LED standard - CMS Helios SMD Yellow 590nm 480mcd	DIOC1608X08N			Top
9	10K	8.2K[[\]]0	R101, R102, R109, R110, R117, R118, R128, R129, R143			Resistor	RESC1608X06L	Distrele	715612, 9330399, 9331565	Top