





Quantity	Comment	LibRef	Designator	Description	Footprint	Supplier	Supplier Nr
2	Motor	Motor	B1, B2	Motor, General Kind			
1	Battery	Battery	BT1	Multicell Battery	RBS_10.5		
36	100nF	100nF[1][0603][1]1	C1, C3, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C22, C23, C24, C25, C26, C27, C28, C29, C30, C33, C36, C38, C37, C38, C39, C35, C32, C35, C36, C67, C68, C69, C70, C71	Capacitor	RESCH1608X06L	Farnell	1288255
7	10uF	4.7uF[1][0603][1]1, 10uF[1][0603][1]1	C2, C4, C32, C46, C51, C52, C72	Capacitor	RESCH1608X06L	Farnell	1463375, 9227784
7	4.7nF	CAP-AMP 4.7uF[1][0603][1]1	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N		
9	4.7uF	4.7uF[1][0603][1]1	C31, C40, C43, C44, C45, C47, C48, C49, C50	Capacitor	RESCH1608X06L	Farnell	9227784
1	10uF XSR	10uF[1][0603][1]1	C34	Capacitor	RESCH1608X06L	Farnell	1463375
2	18pF	10pF[1][0603][1]1	C41, C42		RESCH1608X06L	Farnell	8819815
2	1nF	100nF[1][0603][1]1	C53, C54	Capacitor	RESCH1608X06L	Farnell	1288255
3	1uF	1uF[1][0603][1]1, 4.7uF[1][0603][1]1	C58, C61, C63	Capacitor	RESCH1608X06L	Distelec, Farnell	823495, 9227784
1	1.5nF	15nF[1][0603][1]1	C57	Capacitor	RESCH1608X06L	Farnell	9406182
3	47nF	10pF[1][0603][1]1, 470nF[1][0603][1]1	C58, C59, C60	Capacitor	RESCH1608X06L	Distelec, Farnell	823494, 9406182
1	51pF	10pF[1][0603][1]1	C64	Capacitor	RESCH1608X06L	Farnell	9406182
4	19-21SURC/S530-A3/ TR8	LED	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DI0CH1608X06N		
4	BT5050RGBCT180	LED RGB SMD 2	D2, D6, D27, D38	\$0.0271 2000k	LEDSMD5		
12	27-21SURC/S530-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	27-21/4HC-A4H1P2 3C	LED	D8, D31, D37	SMD blue led right angle mount 3.3V@20ma 28mcd	Z7-21 Everlight Blue		
8	APT01608SYCK	LED	D13, D14, D15, D16, D22, D23, D24	LED standard - CMS Helios SMD Yellow 500nm 480mcd	DI0CH1608X06N		
2	WPF104SRC/D	LED	D19, D20	Red led 2V@20ma 57mcd	LED_TH_3mm_20mm		
3	APT01608GCK	LED	D28, D29, D30	LED standard - CMS Helios SMD Green 510nm 230mcd	DI0CH1608X06N		
2	BAT54S	BAT54S	D33, D34	Schottky Barrier Double Diode	SDT23_N		
1	Speaker	Speaker	LS1	Loudspeaker	PIN2		
1	TD4015BPN	Micro1	MC1	Omnidirectional stack electret Condenser Microphone	MICRO_PANASONIC_WM64PN		
46	BC217-40	BC217-40	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46	NPN General-purpose Transistor	SOT23_N		
22	4.7K	4.7K[1][0603][1]1	R1, R2, R57, R58, R61, R63, R64, R65, R67, R62, R63, R64, R103, R104, R111, R112, R113, R114, R142, R144, R145, R146	Resistor	RESCH1608X06L	Distelec	715604
16	33	33K[1][0603][1]1, RES	R2, R5, R68, R69, R70, R71, R72, R73, R58, R59, R100, R135, R147, R148, R149, R150	120, Resistor	RESCH1608X06L	Distelec	715632
2	2.7K	2.2K[1][0603][1]1, RES	R4, R6	Resistor	RESCH1608X06L		
8	22K	2.2K[1][0603][1]1, RES	R7, R8, R9, R10, R11, R42, R43, R130	120, Resistor	RESCH1608X06L	Distelec	715620
15	2.2K	2.2K[1][0603][1]1, RES	R12, R13, R14, R15, R16, R32, R33, R34, R35, R41, R44, R45, R52, R53, R120	120, Resistor	RESCH1608X06L	Distelec	715596
7	1.5K	RES	R17, R18, R19, R20, R26, R46, R47	120	RESCH1608X06L		
6	1K	1K[1][0603][1]1, RES	R21, R22, R23, R24, R25, R48, R49, R108	120, Resistor	RESCH1608X06L	Distelec	715588
16	10K	10K[1][0603][1]1, RES	R27, R28, R29, R30, R31, R50, R51, R101, R102, R109, R110, R117, R118, R128, R129, R136	120, Resistor	RESCH1608X06L	Distelec, Farnell	715612, 9330399, 9331565
7	5.2	RES	R32, R37, R38, R39, R40, R54, R55	120	RESCH1608X06L		
14	56	68K[1][0603][1]1	R56, R58, R60, R62, R74, R75, R76, R77, R78, R79, R80, R81, R90, R91	Resistor	RESCH1608X06L	Distelec	715632
14	39	68K[1][0603][1]1	R82, R83, R84, R85, R86, R87, R88, R89, R95, R96, R97, R133, R134	Resistor	RESCH1608X06L	Distelec	715632
2	100	RES_ACORT	R105, R106	Resistance	RESCH1608X06N		
2	180	180K[1][0603][1]1	R107, R137	Resistor	RESCH1608X06L	Distelec	715570
2	5.0K	2.2K[1][0603][1]1	R115, R116	Resistor	RESCH1608X06L	Distelec	715596
10	100K	10K[1][0603][1]1, 100K[1][0603][1]1	R119, R120, R121, R122, R123, R124, R138, R139, R141, R143	Resistor	RESCH1608X06L	Distelec	715612, 715636
1	680K	4.7K[1][0603][1]1	R125	Resistor	RESCH1608X06L	Distelec	715652
1	6.8K	10K[1][0603][1]1	R127	Resistor	RESCH1608X06L	Distelec	715612
1	820	22K[1][0603][1]1	R131	Resistor	RESCH1608X06L	Distelec	715620
1	47K	22K[1][0603][1]1	R132	Resistor	RESCH1608X06L	Distelec	715620
1	270K	270K[1][0603][1]2	R140	Resistor	RESCH1608X06L	Farnell	9330941
1	NCP1501013F030RC	Res Thermal	RT1	Thermistors - NTC 10K OHM 1%0402	RESCH1005X04L		
1	MicroSD-Astron 5190008-XM4-R	SD-Card	S1	MicroSD Card connector 5190008-XM4-R	Astron 5190008-XM4-R		
1	SW-PB	SW-PB	S2	Switch	FSMRA2H1		
4	DMG1013T	DMG1013T	T1, T2, T3, T4	Transistor MOSFET 1 x P Pining : 1-4S, 2-5S, 3-6D	SOT50P160X80-3N		
4	DMG1012T	DMG1012T	T5, T6, T7, T8	Transistor MOSFET 1 x N Pining : 1-4S, 2-5S, 3-6D	SOT50P160X80-3N		
1	MMA7660FC	MMA7660FC	U1	MMA7660FC XYZ-AXIS ACCELEROMETER ±1.5 g	DFN50P00X0300X100-12N		
2	TR9909	TR9909	U2, U3	Everlight Opto Interrupter	TR9909_LONG		
2	MCPL94T-E/ ST	MCPL94T-E/ ST	U4, U5	1MR, 85 pA Quad Op Amp, 14Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-8T14_N		
7	TR9909	TR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	TR9909_EDGE		
5	MC74HC595ADTR2	MC74HC595ADTR2	U13, U14, U15, U16, U17	8-Bit Serial Input/Serial or Parallel Output Shift Register with Latched 3-State Outputs	94BF-01_N		
2	AP131-33WGCV-ND	AP7331	U18, U28	330mA, Low Quiescent Current, Fast Transient LDO	SOT96P285X100-6N		
1	PIC24F128GB106-I/PT	PIC24F128GB106-I/PT	U19	General Purpose 16-Bit Flash Microcontroller with USB On-The-Go, 128Kb Flash, 196Kb SRAM, 64-Pin TQFP, Industrial Temperature	TQFP-P164_N		
1	RM3-363ET	TSOP32236	U20	IR Receiver Module (38 KHz) for Remote Control Systems	IR-receiver		
1	MCPT3871-2AAI/ML	MCPT3871-2AAI/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		
2	AP7331-33WGCV-7	AP7331	U22, U24	300mA, Low Quiescent Current, Fast Transient LDO	SOT96P285X100-6N		
1	FAN3988	FAN3988	U23	USB Charger and Over Voltage Detection Device	MLP 1.45x1mm		
1	LM4819M	LM4819M	U25	500mW Audio Power Amplifier with Shutdown Mode	M08A_N		
1	Con1a6	Con1a6	X2	1 x 6 pins connector	MHCR1X6		
1	Alabon R190005-021-R	USB_MMINAB	X3	USB connector Micro B	Astron 3190005-021-r		
1	B15-ABL5-B-82	HC49-4H_SMX	Y1	Surface Mount Quartz Crystal 8MHz	HC49-4H_SMX		

Quantity	Comment	LibRef	Designator	Description	Footprint	Supplier	Supplier Nr	Layer
1 100		RES_ACO RT	R105	Resistance	RESC1608X06N			Bottom
1 1uF		10uF[[\A]]06 03[[\A]]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 AP131-33WGCT-ND		AP7331	U26	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N			Bottom
1 MCP6L04T-E/ ST		MCP6L04 T-E/ ST	U4	1MHz, 85 µA Quad Op Amp, 14-Pin TSSOP, Extended Temperature Range, Tape and Reel	TSSOP-ST14_N			Bottom
12 4.7K		4.7K[[\A]]0 603[[\A]]1	R1, R2, R57, R59, R61, R63, R64, R65, R111, R112, R113, R114	Resistor	RESC1608X06L	Distrelec	715604	Bottom
15 100nF		100nF[[\A]] 0603[[\A]]1	C5, C7, C8, C9, C14, C22, C25, C26, C28, C30, C55, C68, C69, C70, C71	Capacitor	RESC1608X06L	Farnell	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 18pF		10pF[[\A]]0 603[[\A]]3	C41, C42		RESC1608X06L	Farnell	8819815	Bottom
2 2.7K		RES	R4, R6	Resistor	RESC1608X06L			Bottom
2 4.7uF		4.7uF[[\A]] 0603[[\A]]1	C40, C43	Capacitor	RESC1608X06L	Farnell	9227784	Bottom
2 BT5050RGBCT-180		LED RGB SMD 2	D2, D6	\$0.027/ 2000k	LEDSMD5			Bottom
2 ITR9909		ITR9909	U2, U3	Everlight Opto Interrupter	ITR9909_LONG			Bottom
2 WP7104SRC/D		LED	D19, D20	Red led 2V@20ma 57mcd	Led_TH_3mm_20mm			Bottom
3 10uF		4.7uF[[\A]] 0603[[\A]]1 10uF[[\A]]0 603[[\A]]1	C51, C52, C72	Capacitor	RESC1608X06L	Farnell	1463375, 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 1K		RES	R21, R22, R23, R24	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[[\A]] 0603[[\A]]1	R119, R120, R121, R122, R123, R124	Resistor	RESC1608X06L	Distrelec	715636	Bottom
6 56		68K[[\A]]0 603[[\A]]1	R74, R75, R76, R77, R90, R91	Resistor	RESC1608X06L	Distrelec	715632	Bottom
7 4.7nF		CAP-NP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N			Bottom
8 10K		10K[[\A]]0 603[[\A]]2 RES	R27, R28, R29, R30, R31, R50, R51, R136	120, Resistor	RESC1608X06L	Farnell	9330399	Bottom
8 2.2K		2.2K[[\A]]0 603[[\A]]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[[\A]]0 603[[\A]]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[[\A]]0 603[[\A]]1	C57	Capacitor	RESC1608X06L	Farnell	9406182	Top
1 100		RES_ACO RT	R106	Resistance	RESC1608X06N			Top
1 10uF X5R		10uF[[\A]]0 603[[\A]]1	C34	Capacitor	RESC1608X06L	Farnell	1463375	Top
1 270K		270K[[\A]] 0603[[\A]]2	R140	Resistor	RESC1608X06L	Farnell	9330941	Top
1 47K		22K[[\A]]0 603[[\A]]1	R132	Resistor	RESC1608X06L	Distrelec	715620	Top
1 51pF		10nF[[\A]]0 603[[\A]]1	C64	Capacitor	RESC1608X06L	Farnell	9406182	Top
1 6.8K		10K[[\A]]0 603[[\A]]1	R127	Resistor	RESC1608X06L	Distrelec	715612	Top
1 680K		470K[[\A]] 0603[[\A]]1	R125	Resistor	RESC1608X06L	Distrelec	715652	Top
1 820		22K[[\A]]0 603[[\A]]1	R131	Resistor	RESC1608X06L	Distrelec	715620	Top
1 Abstron R3190005-021-R		USB_MINI AB	X3	USB connector Micro B 300mA, Low Quiescent Current, Fast Transient LDO	Astron 3190005-x21-r			Top
1 AP131-33WGCT-ND		AP7331	U18	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N			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 (36 kHz) for Remote Control Systems	IR-receiver			Top
1 LM4819M		LM4819M	U25	350mW Audio Power Amplifier with Shutdown Mode	M08A_N			Top
1 MCP6L04T-E/ ST		MCP6L04 T-E/ ST	U5	1MHz, 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

1	MCP6L04T-E/ST	T-E/ST	U5			Stand-Alone System Load Sharing and Li-Ion/Li-Polymer Battery Charge Management Controller, 4.2V, 20-Pin QFN, Industrial Temperature	TSSOP-ST14_N				Top
1	MCP73871-2AAJ/ML	MCP7387 1-2AAJ/ML	U21				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-AXIS ACCELEROMETER ±1.5 g	DFN50P300X300X100-12N				Top
1	NCP15XH103P03RC	Res Thermal	RT1			Thermistors - NTC 10K OHM 1%0402	RESC1005X04L				Top
1	PIC24FJ128GB106-I/PT	PIC24FJ12 8GB106-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				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[[\A]]0603[[\A]]1	R67, R92, R93, R94, R103, R104, R142, R144, R145, R146			Resistor	RESC1608X06L	Distrelec, Famell	715604		Top
2	180	180R[[\A]]0603[[\A]]1	R107, R137			Resistor	RESC1608X06L	Distrelec, Famell	715570		Top
2	1nF	100nF[[\A]]0603[[\A]]1	C53, C54			Capacitor	RESC1608X06L	Famell	1288255		Top
2	1uF	1uF[[\A]]0603[[\A]]1, 4.7uF[[\A]]0603[[\A]]1	C56, C61			Capacitor	RESC1608X06L	Distrelec, Famell	823495, 9227784		Top
2	5.6K	2.2K[[\A]]0603[[\A]]1	R115, R116			Resistor	RESC1608X06L	Distrelec, Famell	715596		Top
2	AP7331-33WG-7	AP7331	U22, U24			300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N				Top
2	BAT54S	BAT54S	D33, D34			Schottky Barrier Double Diode	SOT23_N				Top
2	BT5050RGBCT180	LED RGB SMD 2	D27, D38			\$0.027/2000k	LEDSMD5				Top
2	MC74HC595ADTR2	MC74HC5 95ADTR2	U14, U16			8-Bit Serial-Input/Serial-Output Shift Register with Latched 3-State Outputs	948F-01_N				Top
2	Motor	Motor	B1, B2			Motor, General Kind	RB5-10.5				Top
21	100nF	100nF[[\A]]0603[[\A]]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	27-21/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/SS30-A3	LED	D7, D32, D36			SMD Red led right angle mount 2V@20ms 57mcd	27-21 Everlight				Top
3	47nF	10nF[[\A]]0603[[\A]]1, 470nF[[\A]]0603[[\A]]1	C58, C59, C60			Capacitor	RESC1608X06L	Distrelec, Famell	823494, 9406182		Top
3	APTD1608CGCK	LED	D28, D29, D30			LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N				Top
4	100K	10K[[\A]]0603[[\A]]1, 100K[[\A]]0603[[\A]]1	R138, R139, R141, R143			Resistor	RESC1608X06L	Distrelec, Famell	715612, 715636		Top
4	10uF	4.7uF[[\A]]0603[[\A]]1, 10uF[[\A]]0603[[\A]]1	C2, C4, C32, C46			Capacitor	RESC1608X06L	Famell	1463375, 9227784		Top
4	19-21SURC/SS30-A3/ TR8	LED	D1, D3, D4, D5			SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N				Top
4	1K	1K[[\A]]0603[[\A]]1, RES	R25, R48, R49, R108			120, Resistor	RESC1608X06L	Distrelec, Famell	715588		Top
4	22K	22K[[\A]]0603[[\A]]1, RES	R11, R42, R43, R130			120, Resistor	RESC1608X06L	Distrelec, Famell	715620		Top
6	39	68K[[\A]]0603[[\A]]1	R66, R86, R87, R88, R89, R134			Resistor	RESC1608X06L	Distrelec, Famell	715632		Top
6	6.2	RES	R36, R37, R39, R40, R54, R55			120	RESC1608X06L				Top
7	2.2K	2.2K[[\A]]0603[[\A]]1	R32, R34, R35, R41, R52, R53, R126			Resistor	RESC1608X06L	Distrelec, Famell	715596		Top
7	4.7uF	4.7uF[[\A]]0603[[\A]]1	C31, C44, C45, C47, C48, C49, C50			Capacitor	RESC1608X06L	Famell	9227784		Top
7	ITR9909	ITR9909	U6, U7, U8, U9, U10, U11, U12			Everlight Opto Interrupter	ITR9909_EDGE				Top
8	10K	8.2K[[\A]]0603[[\A]]2, 10K[[\A]]0603[[\A]]1, 10K[[\A]]0603[[\A]]2	R101, R102, R109, R110, R117, R118, R128, R129			Resistor	RESC1608X06L	Distrelec, Famell	715612, 9330399, 9331565		Top
8	33	68K[[\A]]0603[[\A]]1, RES	R98, R99, R100, R135, R147, R148, R149, R150			120, Resistor	RESC1608X06L	Distrelec, Famell	715632		Top
8	56	68K[[\A]]0603[[\A]]1	R56, R58, R60, R62, R78, R79, R80, R81			Resistor	RESC1608X06L	Distrelec, Famell	715632		Top
8	APTD1608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24			LED standard - CMS Helios	DIOC1608X08N				Top

