U8
ITR9909
U7
ITR9909
U9
ITR9909
U6
ITR9909
U10
ITR9909

D13
APTD1608SYCK

C13
100nF
R32
2.2K
R89
39
APTD1608SYCK
C6
100nF
APTD1608SYCK
C12
100nF
2x
BC817-40

R37
6.2
Q11
Q6
2x
BC817-40
D24
Q8
Q13
R39
6.2
C10
100nF

R34
2.2K
R35
2.2K
R40
6.2
Q14
2x
Q9
BC817-40

S2
Q5
Q10
R36
6.2
2x
BC817-40

C11
100nF
R41 2.2K
MC74HC595ADTR2
U14
C27
100nF

SW-PB

R88 D23
39
APTD1608SYCK
D4
D5
APTD1608SYCK
D45
R78
R79
R80
R81
2x
C29
100nF
U16
MC74HC595ADTR2

D1

U20
IRM-3636T
R143
100K

R62
R60
R58
R56
4x99
19-21SURC/S530-A3/TR8
D18
D3
B1
Motor
R115 5.6K
C53
1nF
R117
10K
D33
BAT54S
D22
APTD1608SYCK

R66
39
D7

D36
27-21SURC/S530-A3
D37
27-21/BHC-AN1P2/3C

R134
39
R142
4.7K
R135
33
Q37 Q38
BC817-40
R137
180
C62
100nF
RT1
NCP15XH103F03RC
R102
2x 10K

R87
39
APTD1608SYCK

R86
33

27-21SURC/S530-A3
Q46 Q45
R67
R150
33
2x
BC817-40
Q65
C64
pF
R125
680K
R126
R128
10K
C66
R189
C56
1uF
MC
D8
27-21/BHC-AN1P2/3C
TD4015BPN

C31 UF8 C32
4.7uF 10uF
AP131-33WGCT-ND
C35
100nF
APTD1608SYCK
D21
APTD1608SYCK
X2
ConLx6
APTD1608SYCK
D16
R25 R11
1K 22K
2x
R26
1.5K
R46
R42
22K
R48
R43 R49
R47 22K 1K
R127
100nF 6.8
R25 R11
MMA7660FC

R92
4.7K
R88
38
R100
R94
4.7K
BC817-40
Q35 Q33 Q36
R99
R93
4.7K
Q32 Q31 Q34

100nF C33
10K R101
100nF C38
R104
R105
R104
4.7K

U13
D39 PIC24FJ128GB106-I/PT
100nF
C36
100nF
R2 Motor
R116
5.6K

C37
600nF
C3
100nF
C4
10uF
XSR
R34

G1
100nF
Q40
R44 C2 600pF
R149 R146
33
Q41 Q44
4x
BC817-40
Q42
Q39

BT5050RGBC-T180
D27
C59
47nF C60
47nF
C61
1uF
U25
LM4818M
R148
33
BC817-40 33
R165
4.7K
U22 C48 D38
4.7uF
BT5050RGBC-T180
U24
C49
4.7uF
C50
4.7uF
AP7335-33WG-7
AP9331-33WG-7
R55
6.2
U18

R54
6.2
R132
R130 22K
C57 1.5nF
R131
820
Speaker
R110
10K
R108
R138
100K
R53
2.2K
Q18
2x

2x
BC817-40
Q17
R52
2.2K
Q15
C24
100nF
Q16
C23
100nF
R51
R49
U21
MGP53871-2AAI/ML
BC817-40

C45
4.7uF
Battery
RT1
R109
10K
1K
R139
100K
R140
270K
C46
10uF
C44
4.7uF
U23

R106
100
D31
27-21/BHC-AN1P2/3C
X3
D32
27-21SURC/S530-A3

U11
ITR9909
S1
U12
ITR9909

MicroSD-Astron 5190008-XA4-R
Alstron R3190005-021-R

27-21SURC/S530-A3
D18
D17
27-21SURC/S530-A3
WP7104SRC/D
R83
39
R82
39
WP7104SRC/D
D11
D20
R85 39
U2
LTR990 7
C7
100nF
U3
R990 9
R84
39
D19
27-21SURC/S530-A3
27-21SURC/S530-A3
4.7uF
D10
27-21SURC/S530-A3
R76
56
R4
2.7K
R14
2.7K
Q1
C17
C5
Q2
R6
2.7K
R75
56
R15
2.2K
C18
4.7nF
R1
Q3
BC817-40
Q7
2x R29
R33
10K
BC817-40
2.7K
100nF
Q4
R2
4.7K
R28
10K
C16
4.7nF
R30
10K
2.2K
R3
33
R38
6.2
R5
83
100nF
C64
R13
2.2K
C9
100nF
D12
27-21SURC/S530-A3
C71
2x C8
100nF
R16
2.2K
C19
4.7nF
10K
R31
1K
R23
2x 1.5K
R9
22K
R8
22K
R22 1K
R18
R17 2x 1.5K
U4
D9
27-21SURC/S530-A3
R74
56
C70
100nF
R77
56
R10 1K
R19
R20
U15
C28
100nF
R26
1K
R10
22K
R7
22K
R21
1K
MCP6L04T-E/ST
R27 10K
R12
2.2K
C43
4.7uF
R101
100
MC74HC595ADTR2
C52
100uF
R112
4.7K
T3
R114
4.7K
R113
4.7K
10uF
C51
U14
R61 R70
Q24
Q22
6x
BC817-40
R122
33 4.7K
T4
C50
100K
DMG1013T
DMG1013T
T1
DMG1013T
T2
2x
R114
4.7K
Q26
Q29
R72 R64
DMG1012T
T8
T5
2x
T6
Q21
Q19
R57 R68
Q25
Q27
R71 R63
DMG1012T
T7
100K
R120
DMG1012T
2x 100K
R123
R121
R59 R69
3x
4.7K
Q23
Q20
D2
R73 R65
Q28
Q30
MC74HC595ADTR2
3x
33
6x BC817-40
BT5050RGBC-T180
U18
C26
100nF
BT5050RGBC-T180
D6
C41
18pF
39 39 39
R95 R96 R97
Y1
815-ABLS-8-B2
C42
18pF
MC74HC595ADTR2
U17
C30
100nF
100nF
C68
R51
10K
C69
100nF
R50 10K
AP131-33WGCT-ND
U26
C72
10uF
R44
2.2K
C20
4.7nF
C25
C21
4.7nF
R45
2.2K
C22
100
C40
4.7nF
R136 10K
C63 1uF
R124
100K
C55 100nF
R123 10K
C69
100nF
56 R91
D26
D35
R133
39
R90
56
D25
27-21SURC/S530-A3
27-21SURC/S530-A3
27-21SURC/S530-A3

Quantity	Comment	LibRef	Designator	Description	Footprint	Supplier	Supplier Nr
2	Motor	Motor	B1, B2	Motor, General Kind	RB5-10.5		
1	Battery	Battery	BT1	Multicell Battery	BAT-2		
36	100nF	100nF[[/\]]0603[[/\]]1	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
7	10uF	4.7uF[[/\]]0603[[/\]]1, 10uF[[/\]]0603[[/\]]1	C2, C4, C32, C46, C51, C52, C72	Capacitor	RESC1608X06L	Farnell	1463375, 9227784
7	4.7nF	CAP-NP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N		
9	4.7uF	4.7uF[[/\]]0603[[/\]]1	C31, C40, C43, C44, C45, C47, C48, C49, C50	Capacitor	RESC1608X06L	Farnell	9227784
1	10uF X5R	10uF[[/\]]0603[[/\]]1	C34	Capacitor	RESC1608X06L	Farnell	1463375
2	18pF	10pF[[/\]]0603[[/\]]3	C41, C42		RESC1608X06L	Farnell	8819815
2	1nF	100nF[[/\]]0603[[/\]]1	C53, C54	Capacitor	RESC1608X06L	Farnell	1288255
3	1uF	1uF[[/\]]0603[[/\]]1, 4.7uF[[/\]]0603[[/\]]1	C56, C61, C63	Capacitor	RESC1608X06L	Distrelec, Farnell	823495, 9227784
1	1.5nF	10nF[[/\]]0603[[/\]]1	C57	Capacitor	RESC1608X06L	Farnell	9406182
3	47nF	10nF[[/\]]0603[[/\]]1, 470nF[[/\]]0603[[/\]]1	C58, C59, C60	Capacitor	RESC1608X06L	Distrelec, Farnell	823494, 9406182
1	51pF	10nF[[/\]]0603[[/\]]1	C64	Capacitor	RESC1608X06L	Farnell	9406182
4	19-21SURC/ S530-A3/ TR8	LED	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N		
4	BT5050RGBC-T-180	LED RGB SMD 2	D2, D6, D27, D38	$0.027/ 2000k	LEDSMD5		
12	27-21SURC/ S530-A3	LED	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	LED	D8, D31, D37	SMD blue led right angle mount 3.3V@20ma 28mcd	27-21 Everlight Blue		
8	APTD1608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios SMD Yellow 590nm 480mcd	DIOC1608X08N		
2	WP7104SRC/ D	LED	D19, D20	Red led 2V@20ma 57mcd	Led_TH_3mm_20mm		
3	APTD1608CGCK	LED	D28, D29, D30	LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N		
2	BAT54S	BAT54S	D33, D34	Schottky Barrier Double Diode	SOT23_N		
1	Speaker	Speaker	LS1	Loudspeaker	PIN2		
1	TD4015BPN	Micro1	MC1	Omnidirectional 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[[/\]]0603[[/\]]1	R1, R2, R57, R59, R61, R63, R84, R65, R67, R92, R93, R94, R103, R104, R111, R112, R113, R114, R142, R144, R145, R146	Resistor	RESC1608X06L	Distrelec	715604
16	33	68K[[/\]]0603[[/\]]1, RES	R3, R5, R68, R69, R70, R71, R72, R73, R98, R99, R100, R135, R147, R148, R149, R150	120, Resistor	RESC1608X06L	Distrelec	715632
2	2.7K	RES	R4, R6	Resistor	RESC1608X06L		
8	22K	22K[[/\]]0603[[/\]]1, RES	R7, R8, R9, R10, R11, R42, R43, R130	120, Resistor	RESC1608X06L	Distrelec	715620
15	2.2K	2.2K[[/\]]0603[[/\]]1, RES	R12, R13, R14, R15, R16, R32, R33, R34, R35, R41, R44, R45, R52, R53, R126	120, Resistor	RESC1608X06L	Distrelec	715596
7	1.5K	RES	R17, R18, R19, R20, R26, R46, R47	120	RESC1608X06L		
8	1K	1K[[/\]]0603[[/\]]1, RES	R21, R22, R23, R24, R25, R48, R49, R108	120, Resistor	RESC1608X06L	Distrelec	715588
16	10K	8.2K[[/\]]0603[[/\]]2, 10K[[/\]]0603[[/\]]2, 10K[[/\]]0603[[/\]]2, RES	R27, R28, R29, R30, R31, R50, R51, R101, R102, R109, R110, R117, R118, R128, R129, R136	120, Resistor	RESC1608X06L	Distrelec, Farnell	715612, 9330399, 9331565
7	6.2	RES	R36, R37, R38, R39, R40, R54, R55	120	RESC1608X06L		
14	56	68K[[/\]]0603[[/\]]1	R56, R58, R60, R62, R74, R75, R76, R77, R78, R79, R80, R81, R90, R91	Resistor	RESC1608X06L	Distrelec	715632
14	39	68K[[/\]]0603[[/\]]1	R66, R82, R83, R84, R85, R86, R87, R88, R89, R95, R96, R97, R133, R134	Resistor	RESC1608X06L	Distrelec	715632
2	100	RES_ACORT	R105, R106	Resistance	RESC1608X06N		
2	180	180K[[/\]]0603[[/\]]1	R107, R137	Resistor	RESC1608X06L	Distrelec	715570
2	5.6K	2.2K[[/\]]0603[[/\]]1	R115, R116	Resistor	RESC1608X06L	Distrelec	715596
10	100K	10K[[/\]]0603[[/\]]1, 100K[[/\]]0603[[/\]]1	R119, R120, R121, R122, R123, R124, R138, R139, R141, R143	Resistor	RESC1608X06L	Distrelec	715612, 715636
1	680K	470K[[/\]]0603[[/\]]1	R125	Resistor	RESC1608X06L	Distrelec	715652
1	6.8K	10K[[/\]]0603[[/\]]1	R127	Resistor	RESC1608X06L	Distrelec	715612
1	820	22K[[/\]]0603[[/\]]1	R131	Resistor	RESC1608X06L	Distrelec	715620
1	47K	22K[[/\]]0603[[/\]]1	R132	Resistor	RESC1608X06L	Distrelec	715620
1	270K	270K[[/\]]0603[[/\]]2	R140	Resistor	RESC1608X06L	Farnell	9330941
1	NCP15XH103F03RC	Res Thermal	RT1	Thermistors - NTC 10K OHM 1% 0402	RESC1005X04L		
1	MicroSD-Astron 5190008-XA4-R	SD-Card-Micro-ASLTRON 5190008-XA4-R	S1	MicroSD Card connector 5190008-XA4-R	Astron 5190008-XA4-R		
1	SW-PB	SW-PB	S2	Switch	FSMRA2JH		
4	DMG1013T	DMG1013T	T1, T2, T3, T4	Transistor MOSFET 1 x P Pining : 1=G, 2=S, 3=D	SOT50P160X80-3N		
4	DMG1012T	DMG1012T	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pining : 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	MCP6L04T-E/ ST	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	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 Prallel-Output Shift Register with Latched 3-State Outputs	948F-01_N		
2	AP131-33WGCT-ND	AP7331	U18, U26	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N		
1	PIC24FJ128GB106-I/PT	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-3636T	TSOP32236	U20	IR Receiver Module (36 kHz) for Remote Control Systems	IR-receiver		
1	MCP73871-2AAI/ML	MCP73871-2AAI/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	AP7331-33WG-7	AP7331	U22, U24	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N		
1	FAN3988	FAN3988	U23	USB/ Charger and Over Voltage Detection Device	MLP 1.45x1mm		
1	LM4819M	LM4819M	U25	350mW Audio Power Amplifier with Shutdown Mode	M08A_N		
1	Con1x6	Con1x6	X2	1 x 6 pins connector	MHDR1X6		
1	Alstron R3190005-021-R	USB_MINIAB	X3	USB connector Micro B	Astron 3190005-x21-r		
1	815-ABLS-8-B2	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	1uF[[/\]]06 03[[/\]]1	C63	Capacitor	RESC1608X06L	Distrele c	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	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	Distrele c	715604	Bottom
15	100nF	100nF[[/\]] 0603[[/\]]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[[/\]]0 603[[/\]]3	C41, C42		RESC1608X06L	Farnell	8819815	Bottom
2	2.7K	RES	R4, R6	Resistor	RESC1608X06L			Bottom
2	4.7uF	4.7uF[[/\]] 0603[[/\]]1	C40, C43	Capacitor	RESC1608X06L	Farnell	9227784	Bottom
2	BT5050RGBC-T180	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[[/\]] 0603[[/\]]1 , 10uF[[/\]]0 603[[/\]]1	C51, C52, C72	Capacitor	RESC1608X06L	Farnell	1463375, 9227784	Bottom
3	MC74HC595ADTR2	MC74HC5 95ADTR2	U13, U15, U17	8-Bit Serial-Input/Serial or Prallel-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[[/\]] 0603[[/\]]1	R119, R120, R121, R122, R123, R124	Resistor	RESC1608X06L	Distrele c	715636	Bottom
6	56	68K[[/\]]0 603[[/\]]1	R74, R75, R76, R77, R90, R91	Resistor	RESC1608X06L	Distrele c	715632	Bottom
7	4.7nF	CAP-NP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N			Bottom
8	10K	10K[[/\]]0 603[[/\]]2, RES	R27, R28, R29, R30, R31, R50, R51, R136	120, Resistor	RESC1608X06L	Farnell	9330399	Bottom
8	2.2K	2.2K[[/\]]0 603[[/\]]1, RES	R12, R13, R14, R15, R16, R33, R44, R45	120, Resistor	RESC1608X06L	Distrele c	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	Distrele c	715632	Bottom
9	27-21SURC/S530-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	Farnell	9406182	Top
1	100	RES_ACO RT	R106	Resistance	RESC1608X06N			Top
1	10uF X5R	10uF[[/\]]0 603[[/\]]1	C34	Capacitor	RESC1608X06L	Farnell	1463375	Top
1	270K	270K[[/\]] 0603[[/\]]2	R140	Resistor	RESC1608X06L	Farnell	9330941	Top
1	47K	22K[[/\]]0 603[[/\]]1	R132	Resistor	RESC1608X06L	Distrele c	715620	Top
1	51pF	10nF[[/\]]0 603[[/\]]1	C64	Capacitor	RESC1608X06L	Farnell	9406182	Top
1	6.8K	10K[[/\]]0 603[[/\]]1	R127	Resistor	RESC1608X06L	Distrele c	715612	Top
1	680K	470K[[/\]] 0603[[/\]]1	R125	Resistor	RESC1608X06L	Distrele c	715652	Top
1	820	22K[[/\]]0 603[[/\]]1	R131	Resistor	RESC1608X06L	Distrele c	715620	Top
1	Alstron R3190005-021-R	USB_MINI AB	X3	USB connector Micro B	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	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

Qty	Part	Value	References	Description	Footprint	Supplier	Supplier Part	Layer
1	MCP6L04T-E/ST	T-E/ST	U5	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	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	NCP15XH103F03R C	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[[/\]]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	Farnell	1288255	Top
2	1uF	1uF[[/\]]06 03[[/\]]1, 4.7uF[[/\]] 0603[[/\]]1	C56, C61	Capacitor	RESC1608X06L	Distrele c, Farnell	823495, 9227784	Top
2	5.6K	2.2K[[/\]]0 603[[/\]]1	R115, R116	Resistor	RESC1608X06L	Distrele c	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	BT5050RGBC-T180	LED RGB SMD 2	D27, D38	$0.027/ 2000k	LEDSMD5			Top
2	MC74HC595ADTR2	MC74HC5 95ADTR2	U14, U16	8-Bit Serial-Input/Serial or Prallel-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[[/\]] 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	Farnell	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/ S530-A3	LED	D7, D32, D36	SMD Red led right angle mount 2V@20ma 57mcd	27-21 Everlight			Top
3	47nF	10nF[[/\]]0 603[[/\]]1, 470nF[[/\]] 0603[[/\]]1	C58, C59, C60	Capacitor	RESC1608X06L	Distrele c, Farnell	823494, 9406182	Top
3	APTD1608CGCK	LED	D28, D29, D30	LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N			Top
4	100K	10K[[/\]]0 603[[/\]]1, 100K[[/\]] 0603[[/\]]1	R138, R139, R141, R143	Resistor	RESC1608X06L	Distrele c	715612, 715636	Top
4	10uF	4.7uF[[/\]] 0603[[/\]]1 , 10uF[[/\]]0 603[[/\]]1	C2, C4, C32, C46	Capacitor	RESC1608X06L	Farnell	1463375, 9227784	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	4.7uF	4.7uF[[/\]] 0603[[/\]]1	C31, C44, C45, C47, C48, C49, C50	Capacitor	RESC1608X06L	Farnell	9227784	Top
7	ITR9909	ITR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	ITR9909_EDGE			Top
8	10K	8.2K[[/\]]0 603[[/\]]2, 10K[[/\]]0 603[[/\]]1, 10K[[/\]]0 603[[/\]]2	R101, R102, R109, R110, R117, R118, R128, R129	Resistor	RESC1608X06L	Distrele c, Farnell	715612, 9330399, 9331565	Top
8	33	68K[[/\]]0 603[[/\]]1, RES	R98, R99, R100, R135, R147, R148, R149, R150	120, Resistor	RESC1608X06L	Distrele c	715632	Top
8	56	68K[[/\]]0 603[[/\]]1	R56, R58, R60, R62, R78, R79, R80, R81	Resistor	RESC1608X06L	Distrele c	715632	Top
8	APTD1608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios	DIOC1608X08N			Top

U8
ITR9909
D13
APTD1608SYCK
U7
ITR9909
D24
C13
100nF
R32
2.2K
APTD1608SYCK
R89
39
C6
100nF
U9
ITR9909
C12
100nF
2x
BC817-40
R39
6.2
D14
APTD1608SYCK
R37
6.2
Q11
Q6
2x
BC817-40
Q8
Q13
R34
2.2K
U6
ITR9909
2x
BC817-40
Q5
Q10
R36
6.2
D1
C10
100nF
U10
ITR9909
R35
2.2K
R40
6.2
Q14
Q9
BC817-40
S2
C11
100nF
R41 2.2K
MC74HC595ADTR2
R88 D23
39
APTD1608SYCK
D4
D5
APTD1608SYCK
D15
R78
R79
C29
100nF
U20
IRM-3636T
R43
U14
R62
R60
R58
4x
4x
19-21SURC/S530-A3/TR8
BAT54S
R80
R81
2x
U16
MC74HC595ADTR2
100K
R66
39
D7
SW-PB
C27
100nF
D3
B1
Motor
R115 5.6K
C53
1nF
R117
10K
D33
BAT54S
2 Mot
R116
5.6K
X2
Con1x6 1APTD1608SYCK
D16
MCP6L04T-E/ST
Q46 Q45
R150
33
R67-21SURC/S530-A3
2x
BC817-40
C65
100nF
D36
27-21SURC/S530-A3
D37
27-21/BHC-AN1P2/3C
R134
39
R142
4.7K
R135
33
R87
39
D22
APTD1608SYCK
R86
39
D21
APTD1608SYCK
R25 R11
1K   22K
R26
1.5K
R46
1K
R42
22K
R48
U5
R125
680K
R128
10K
C64
C66
6.8K
R127 C56
C67
R47 R43 R49
1.5K
R126
2.2K
C4 10uF
C3 100nF
R129
10K
1uF
MCl
27-21/BHC-AN1P2/3C
TD4015BPN
R137
180
BC817-40
C62
100nF
RT1
NCP15XH103F03RC
R102
2x 10K
C31 U18 C32
4.7uF   1.0uF
AP131-33WGCT-ND
D2
100nF C33
10K R101
100nF C38
Q104
R103
2x
C35
100nF
U19
PIC24FJ128GB106-I/PT
C37
C34
10uF
100nF
XGR
MMA7660FC
C1   100nF
C2   10uF
C44
4.7uF
6x
BC817-40
R99
R92
4.7K
R98
33
R100
R94
4.7K
Q35 Q33 Q36
Q32 Q31 Q34
R93
4.7K
D27
BT5050RGBC-T180
C39
100nF
D30 D29 D28
3x APTD1608CGCK
C36
100nF
Q43 Q40
R147
BC817-40 33
R148
33
R145
4.7K
U22 C48
C47
4.7uF
AP7331-33WG-7
D38
BT5050RGBC-T180
Q41
Q44
4.7K
Q39
Q42
BC817-40
U24
C50
4.7uF
C49
4.7uF
AP7331-33WG-7
R55 6.2
R53
2.2K
Q18
2x
BC817-40
Q16
C23
100nF
C59
47nF C60
47nF
C58
820
U25
LM4810M
C61
1uF
R130 22K
C57 1.5nF
R131
47K
R132
R54
6.2
2x
BC817-40
Q17
Q15
R52
2.2K
C24
100nF
Speaker
R110
10K
R108
10K
R138
100K
R109
10K
R1
1K
U21
MCP73871-2AAI/ML BC817-40
C45
4.7uF
Battery
C44
4.7uF
R139
100K
R141
100K
R140
270K
C46
10uF
U23
FAN3988
U11
ITR9909
S1
R106
100
X3
R107
180
D31
27-21/BHC-AN1P2/3C
D32
27-21SURC/S530-A3
U12
ITR9909

MicroSD-Astron 5190008-XA4-R   Alstron R3190005-021-R

27-21SURC/S530-A3

WP7104SRC/D
D20
R85
39
U2
LTR990

D18
R83
39

D17
R82
39

WP7104SRC/D
U3
LTR990

D19
R84
39

27-21SURC/S530-A3

D11
27-21SURC/S530-A3

C7
100nF

C17
4.7nF

D10
27-21SURC/S530-A3

R76
56

R4
2.7K

R14
2.2K

C5
100nF

R6
2.7K

R75
56

R15
2.2K
10K
R30

C18
4.7nF

R33
2.2K

Q1
BC817-40

Q7
2x
BC817-40

Q2
2x

R2
4.7K

R28
10K
R13

C16
4.7nF

R1
4.7K

Q3
Q12

Q29

Q4

C9
100nF

27-21SURC/S530-A3
D12

R3
33

R38
6.2

R5
33

C15
4.7nF

D9
27-21SURC/S530-A3

R77
56

C71
2x
C8
100nF

R16
2.2K
R31

C19
4.7nF

R23
1K
2x 1.5K

R9
22K

C14
100nF

R8
22K

R22
1K

R18
2x 1.5K

R27
10K
R12
2.2K

R74
56

C70
100nF

C43
4.7uF

R105
100

R19

R20

U4

R17

U15

C28
100nF

R24
1K

R10
22K

R7
22K

R21
1K

MC74HC595ADTR2

MCP6L04T-E/ST

C52 10uF

R112
4.7K

R113
4.7K

R114
4.7K

C51
10uF

R61
R70

Q24

Q22

6x
BC817-40

33
3x

3x
4.7K

R122
100K

T3
DMG1013T

DMG1013T
T1 2x T2

R111
4.7K

R57
R68

Q21

Q19

R72 R64

T4
DMG1013T

T5 2x T6
DMG1012T

R59
R69

Q23

Q20

Q26

Q29

R71 R63

DMG1012T
T8

R119
2x 100K

R121

3x
4.7K
33
3x

6x BC817-40

Q25

Q27

DMG1012T
T7

R120

D6

Q28

Q30

R73 R65

100K

BT5050RGBC-T180

BT5050RGBC-T180

MC74HC595ADTR2

U13

C26
100nF

C41
18pF

39 39 39

R95 R96 R97

Y1
815-ABLS-8-B2

MC74HC595ADTR2

C42
18pF

U17

C30
100nF

C68
100nF

C69
100nF

R51
10K

AP131-33WGCT-ND
U26

R50 10K

C25
100nF

C21
4.7nF

R45
2.2K

C22
100nF

C40
4.7uF

C72
10uF

C20
4.7nF

R44
2.2K

56 R91

R136 10K

R124
100K

C63 1uF

C55 100nF

R123 100K

R90
56

D26

D35

R133
39

D25

27-21SURC/S530-A3

27-21SURC/S530-A3

27-21SURC/S530-A3