U8
ITR9909
U7
ITR9909
U9
ITR9909
U6
ITR9909
U10
ITR9909
APTD1608SYCK
100nF
APTD1608SYCK
APTD1608SYCK
100nF
BC817-40
BC817-40
MC74HC595A
R41 2.2K
C21
100nF
R62
R68
19-215UBC/S530-A3
U20
ITR-3636T
MC74HC595DTR2
R40
6.2
C29
100pF
D36
27-21SURC/S530-A3
D37
27-21/BHC-AN1P2/3C
R134
R142
MCP6L01T-E/ST
R150
19-215URC/S530-A3
C62
100nF
BC817-40
D8
27-21/BHC-AN1P2/3C
TB1815BPN
RT1
NCP15XH103F03RC
R102
2x 10K
P1
1uF
MMA7660FC
BC817
U25
M24M01-RM
R130 22K
R132
R108 10K
2x
BC817-40
U21
R148
100K 270K
ITR9909
U11
D31
27-21/BHC-AN1P2/3C
D32
27-21SURC/S530-A3
ITR9909
U12
MicroSD-Astron 5190008-XA4-R
Alstron R3190005-021-R

Quantity	Comment	LibRef	Designator	Description	Footprint	Layer
1	100	RES_ACORT	R105	Resistance	RESC1608X06N	Bottom
1	1uF	1uF[[/\]]0603[[/\]]1	C63	Capacitor	RESC1608X06L	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	MCP6L04T-E/ST	MCP6L04T-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[[/\]]0603[[/\]]1	R1, R2, R57, R59, R61, R63, R64, R65, R111, R112, R113, R114	Resistor	RESC1608X06L	Bottom
15	100nF	100nF[[/\]]0603[[/\]]1	C5, C7, C8, C9, C14, C22, C25, C26, C28, C30, C55, C68, C69, C70, C71	Capacitor	RESC1608X06L	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[[/\]]0603[[/\]]3	C41, C42		RESC1608X06L	Bottom
2	2.7K	RES	R4, R6	Resistor	RESC1608X06L	Bottom
2	4.7uF	4.7uF[[/\]]0603[[/\]]1	C40, C43	Capacitor	RESC1608X06L	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[[/\]]0603[[/\]]1	C51, C52, C72	Capacitor	RESC1608X06L	Bottom
3	MC74HC595ADTR2	MC74HC595ADTR2	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	DMG1012T	T5, T6, T7, T8	Transistor MOSFET 1 x N, Pining : 1=G, 2=S, 3=D	SOT50P160X80-3N	Bottom
4	DMG1013T	DMG1013T	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	Bottom
6	56	68K[[/\]]0603[[/\]]1	R74, R75, R76, R77, R90, R91	Resistor	RESC1608X06L	Bottom
7	4.7nF	CAP-NP	C15, C16, C17, C18, C19, C20, C21	Capacitor	CAPC1608N	Bottom
8	10K	10K[[/\]]0603[[/\]]2, RES	R27, R28, R29, R30, R31, R50, R51, R136	120, Resistor	RESC1608X06L	Bottom
8	2.2K	2.2K[[/\]]0603[[/\]]1, RES	R12, R13, R14, R15, R16, R33, R44, R45	120, Resistor	RESC1608X06L	Bottom
8	33	RES	R3, R5, R68, R69, R70, R71, R72, R73	120, Resistor	RESC1608X06L	Bottom
8	39	68K[[/\]]0603[[/\]]1	R82, R83, R84, R85, R95, R96, R97, R133	Resistor	RESC1608X06L	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[[/\]]0603[[/\]]1	C57	Capacitor	RESC1608X06L	Top
1	100	RES_ACORT	R106	Resistance	RESC1608X06N	Top
1	10uF X5R	100uF[[/\]]0603[[/\]]1	C34	Capacitor	RESC1608X06L	Top
1	270K	270K[[/\]]0603[[/\]]2	R140	Resistor	RESC1608X06L	Top
1	47K	22K[[/\]]0603[[/\]]1	R132	Resistor	RESC1608X06L	Top
1	51pF	10nF[[/\]]0603[[/\]]1	C64	Capacitor	RESC1608X06L	Top
1	6.8K	10K[[/\]]0603[[/\]]1	R127	Resistor	RESC1608X06L	Top
1	680K	470K[[/\]]0603[[/\]]1	R125	Resistor	RESC1608X06L	Top
1	820	22K[[/\]]0603[[/\]]1	R131	Resistor	RESC1608X06L	Top
1	Alstron R3190005-021-R	USB_MINIAB	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	TSOP32236	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	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	MCP73871-2AAI/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	Top

Qty	Part	Value	Designator	Description	Footprint	Side
1	MCP6L04T-E/ST	MCP6L04T-E/ST	U5	Temperature Range, Tape and Reel	TSSOP-ST14_N	Top
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	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	MMA7660FC	U1	MMA7660FC: XYZ-AXIS ACCELEROMETER ±1.5 g	DFN50P300X300X100-12N	Top
1	NCP15XH103F03RC	Res Thermal	RT1	Thermistors - NTC 10K OHM 1% 0402	RESC1005X04L	Top
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	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[[/\]]0603[[/\]]1	R67, R92, R93, R94, R103, R104, R142, R144, R145, R146	Resistor	RESC1608X06L	Top
2	180	180R[[/\]]0603[[/\]]1	R107, R137	Resistor	RESC1608X06L	Top
2	1nF	100nF[[/\]]0603[[/\]]1	C53, C54	Capacitor	RESC1608X06L	Top
2	1uF	1uF[[/\]]0603[[/\]]1, 4.7uF[[/\]]0603[[/\]]1	C56, C61	Capacitor	RESC1608X06L	Top
2	5.6K	2.2K[[/\]]0603[[/\]]1	R115, R116	Resistor	RESC1608X06L	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	MC74HC595ADTR2	U14, U16	8-Bit Serial-Input/Serial or Parallel 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	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[[/\]]0603[[/\]]1, 470nF[[/\]]0603[[/\]]1	C58, C59, C60	Capacitor	RESC1608X06L	Top
3	AP7331-33WG-7	AP7331	U18, U22, U24	300mA, Low Quiescent Current, Fast Transient LDO	SOT95P285X100-5N	Top
3	APTD1608CGCK	LED	D28, D29, D30	LED standard - CMS Helios SMD Green 570nm 230mcd	DIOC1608X08N	Top
4	100K	10K[[/\]]0603[[/\]]1, 100K[[/\]]0603[[/\]]1	R138, R139, R141, R143	Resistor	RESC1608X06L	Top
4	10uF	4.7uF[[/\]]0603[[/\]]1, 10uF[[/\]]0603[[/\]]1	C2, C4, C32, C46	Capacitor	RESC1608X06L	Top
4	19-21SURC/S530-A3/ TR8	LED	D1, D3, D4, D5	SMD Red 0603 2V@20ma 56 mcd	DIOC1608X08N	Top
4	1K	1K[[/\]]0603[[/\]]1, RES	R25, R48, R49, R108	120, Resistor	RESC1608X06L	Top
4	22K	22K[[/\]]0603[[/\]]1, RES	R11, R42, R43, R130	120, Resistor	RESC1608X06L	Top
6	39	68K[[/\]]0603[[/\]]1	R66, R86, R87, R88, R89, R134	Resistor	RESC1608X06L	Top
6	6.2	RES	R36, R37, R39, R40, R54, R55	120	RESC1608X06L	Top
7	2.2K	2.2K[[/\]]0603[[/\]]1	R32, R34, R35, R41, R52, R53, R126	Resistor	RESC1608X06L	Top
7	4.7uF	4.7uF[[/\]]0603[[/\]]1	C31, C44, C45, C47, C48, C49, C50	Capacitor	RESC1608X06L	Top
7	ITR9909	ITR9909	U6, U7, U8, U9, U10, U11, U12	Everlight Opto Interrupter	ITR9909_EDGE	Top
8	10K	8.2K[[/\]]0603[[/\]]2, 10K[[/\]]0603[[/\]]1, 10K[[/\]]0603[[/\]]2	R101, R102, R109, R110, R117, R118, R128, R129	Resistor	RESC1608X06L	Top
8	33	68K[[/\]]0603[[/\]]1, RES	R98, R99, R100, R135, R147, R148, R149, R150	120, Resistor	RESC1608X06L	Top
8	56	68K[[/\]]0603[[/\]]1	R56, R58, R60, R62, R78, R79, R80, R81	Resistor	RESC1608X06L	Top
8	APTD1608SYCK	LED	D13, D14, D15, D16, D21, D22, D23, D24	LED standard - CMS Helios SMD	DIOC1608X08N	Top

U8
ITR9909
D13
APTD1608SYCK

U7
ITR9909
D24
APTD1608SYCK

U9
ITR9909
2x
BC817-40
APTD1608SYCK

C13
100nF
R32
2.2K
R89
39

C6
100nF

D14
APTD1608SYCK

C12
100nF

R37
6.2
BC817-40
R39
6.2

R34
2.2K

U6
ITR9909
2x
BC817-40
R36
6.2
R35
2.2K

U10
ITR9909

C11
100nF R41 2.2K
MC74HC595ADTR2

R40
6.2
C10
100nF

BC817-40

S2
R88 D23
39 APTD1608SYCK

D4

D5

D15
APTD1608SYCK
R78
R79
R80
R81
2.2K

C29
100nF

U20
IRM-3636T

U14
R62
R60
R58
R56
4x99

D1

MC74HC595ADTR2

U16

D43
100K

R66
39

C27
100nF

4x
19-21SURC/S530-A3/TR8

D36
27-21SURC/S530-A3
R134
R142
4.7K

B1
Motor
R118 5.6K
C53
1nF
R117
10K

D3

BRT54S

B2 Motor
R116
5.6K

Q46 Q45
R150
27-21SURC/S530-A3

D37
27-21/BHC-AN1P2/3C
R135
33

R87
39
D22
APTD1608SYCK

D33
BAT54S

X2
Conn x6
APTD1608SYCK

R25 R11

C65
100nF

U5

R129
10K
R127 C56

D8
27-21/BHC-AN1P2/3C

D137
BC817-40
C62
100nF

R86
39
D2
APTD1608SYCK

D16
100nF C33
10K R10
100nF C38

R48

R43 R49
R42 22K 1K

R126
2.2K
T81815DPN

RT1
NCP15XH103F03RC
R102
2x 10K

C31 U18 C32
AP7331-33WG-7

C35
100nF

C37

C41
100nF
10uF

1.5K

R146

BC817-40
R89
R92
R100

C39
100nF

U19
24FJ128GB106

C34

NMA7560FC

C46 100nF
10uF

U13
R94
4.7K

3x APTD1608CGCK

U25

R149
33

R145
4.7K

D47

C47
4.7uF

U22 C48 D34

AP7331-33WG-7

C49
4.7uF
C50
4.7uF

U24

AP7331-33WG-7
R55 6.2

R54
6.2

R52
2.2K
BC817-40
2x

U25
M4813M

R130 22K
C57 1.5nF

R110
10K
R138
100K

R53
2.2K

R52
2.2K
BC817-40

C24
100nF

Speaker

R109
10K

MCP73871-2AAI/ML

C45
4.7uF
Battery

U21
R139
100K
C44
4.7uF
R141

D139
FGN3988
R140
270K

U11
ITR9909

R106
100
D31
27-21/BHC-AN1P2/3C

R107
180
D32
27-21SURC/S530-A3

U12
ITR9909

C23
100nF

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

27-21SURC/S530-A3 D18 D17 27-21SURC/S530-A3
WP7104SRC/D R83 WP7104SRC/D
D20 39 D82 D19
R85 U2 U3 R84
39 TR9909 C7 39 TR9909 39
27-21SURC/S530-A3 D11 100nF R14 C17 4.7nF D10 27-21SURC/S530-A3
R76 R4 C5 R6 R75
56 2.2K BC817-40 100nF R33 BC817-40 2.7K 56
R15 C18 R28 R2
2.2K 4.7nF 2.2K R5 33 4.7K R28 C16
10K R30 R3 R35 R13 10K 4.7nF
R31 4.7K 33 6.2 2.2K
27-21SURC/S530-A3 D12 100nF D9 27-21SURC/S530-A3
C71 C19 C14 R74
R77 2x C8 2.2K 4.7nF 1K R9 R8 R221K 10K 56 C70
56 100nF 10K R23 22K R27 2.2K 100nF
C43 R105 2x 1.5K R19 U4 R18 2x 1.5K
4.7uF 100 R20 R17
R24 R13 R21
MC7 DTR2 1K 22K 22K 1K
U15 C28 MCP6L04T-E/ST
100nF
MC7 DTR2
C52 10uF R112
R122 4.7K
6x 3x 3x T3 R114 4.7K C51 10uF
BC817-40 33 4.7K DMG1013T 4.7K R113 DMG1013T
R72 R64 DMG1012T DMG1012T R111
T8 R61 R70 4.7K
DMG1012T T1 2x T2
R63 T7 R57 R68 T5 2x T6 R121
R65 100K R120 R119 DMG1012T R59 R69
BT5050RGBC-T180 2x 100K 4.7K 33 6x BC817-40
MC74HC595ADTR2 BT5050RGBC-T180
U18 C26
100nF
C41
18pF
39 39 39
Y1 ABLS-8-B2 R95 R96 R97
815
MC74HC595ADTR2
C42 U17
18pF C30
100nF
C68 C69
100nF AP7331-33WG-7 100nF
R51 10K U26 R50 10K
C21 R45 C40 C72 C20 R44 C25
4.7nF 2.2K C22 4.7uF 10uF 4.7nF 2.2K 10nF
100nF R136 10K
R124 C63 1uF
56 R91 100K C55 100nF R90 56
D26 C123 100K D25
27-21SURC/S530-A3 D35 R133 27-21SURC/S530-A3
39 27-21SURC/S530-A3