



DMR Mobile Radio

Service Manual

VHF Transceiver

MDM-4124



This device complies with part 15 of FCC rules

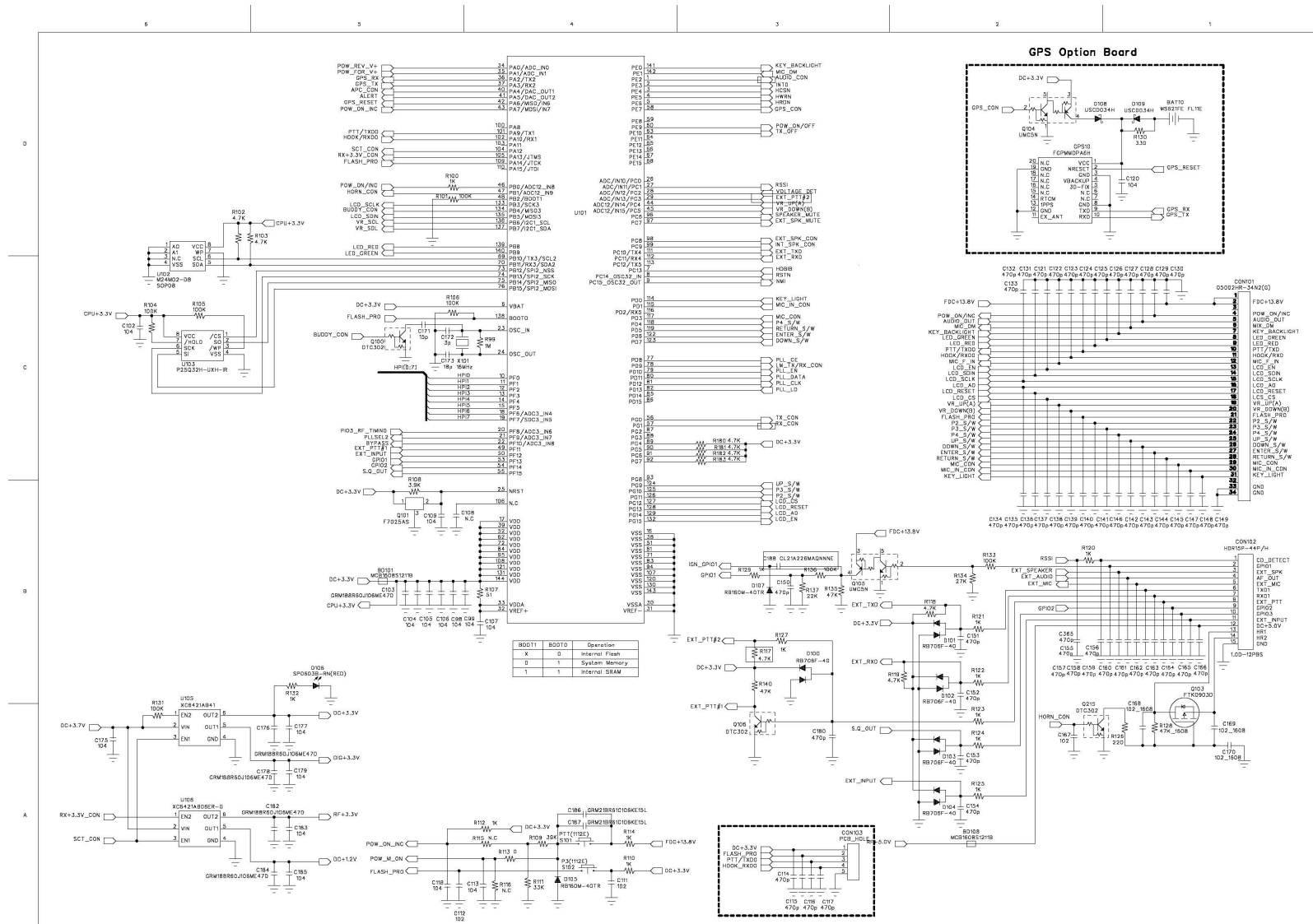
Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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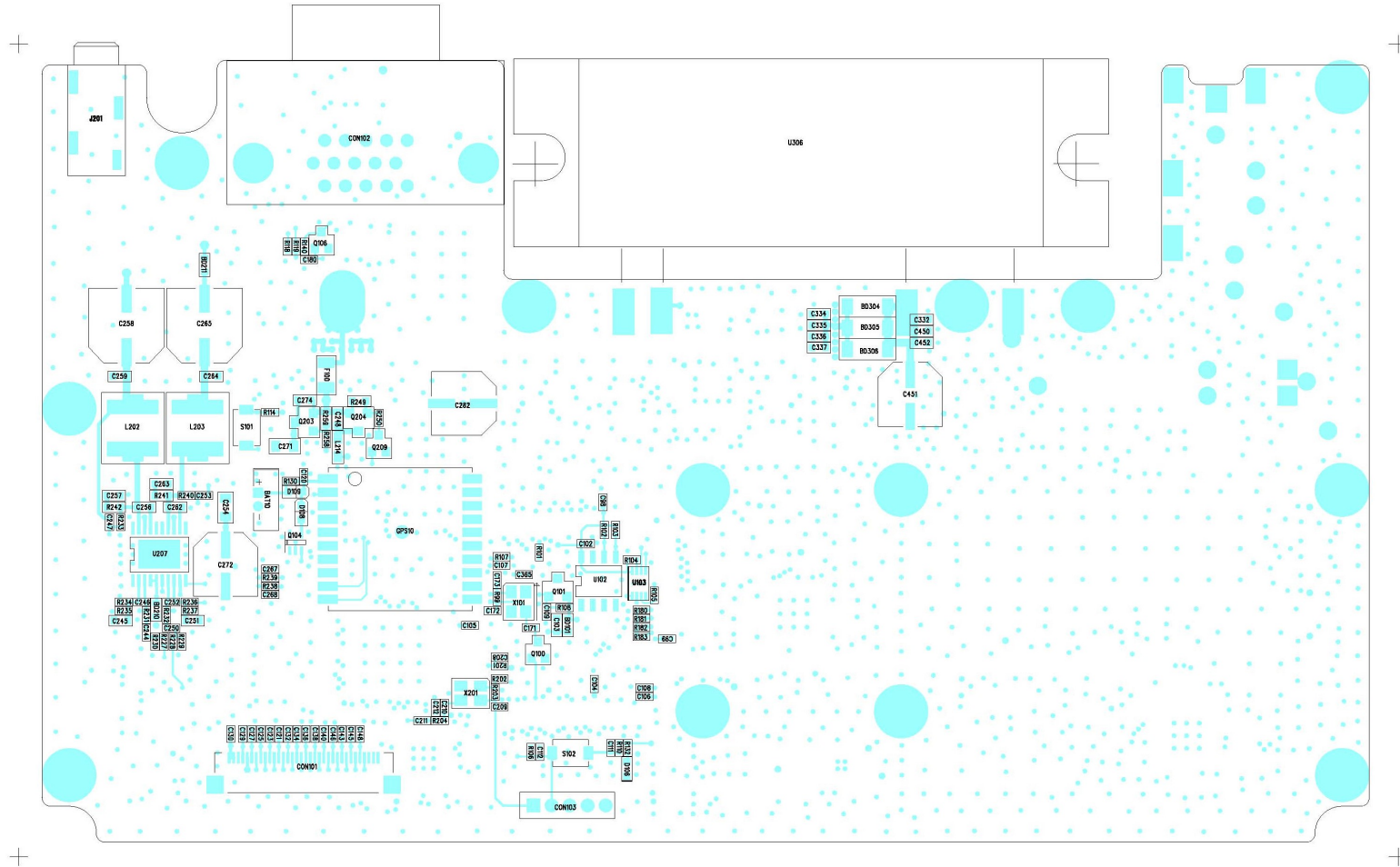
- 1. Main Board Schematic**
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1. Schematic

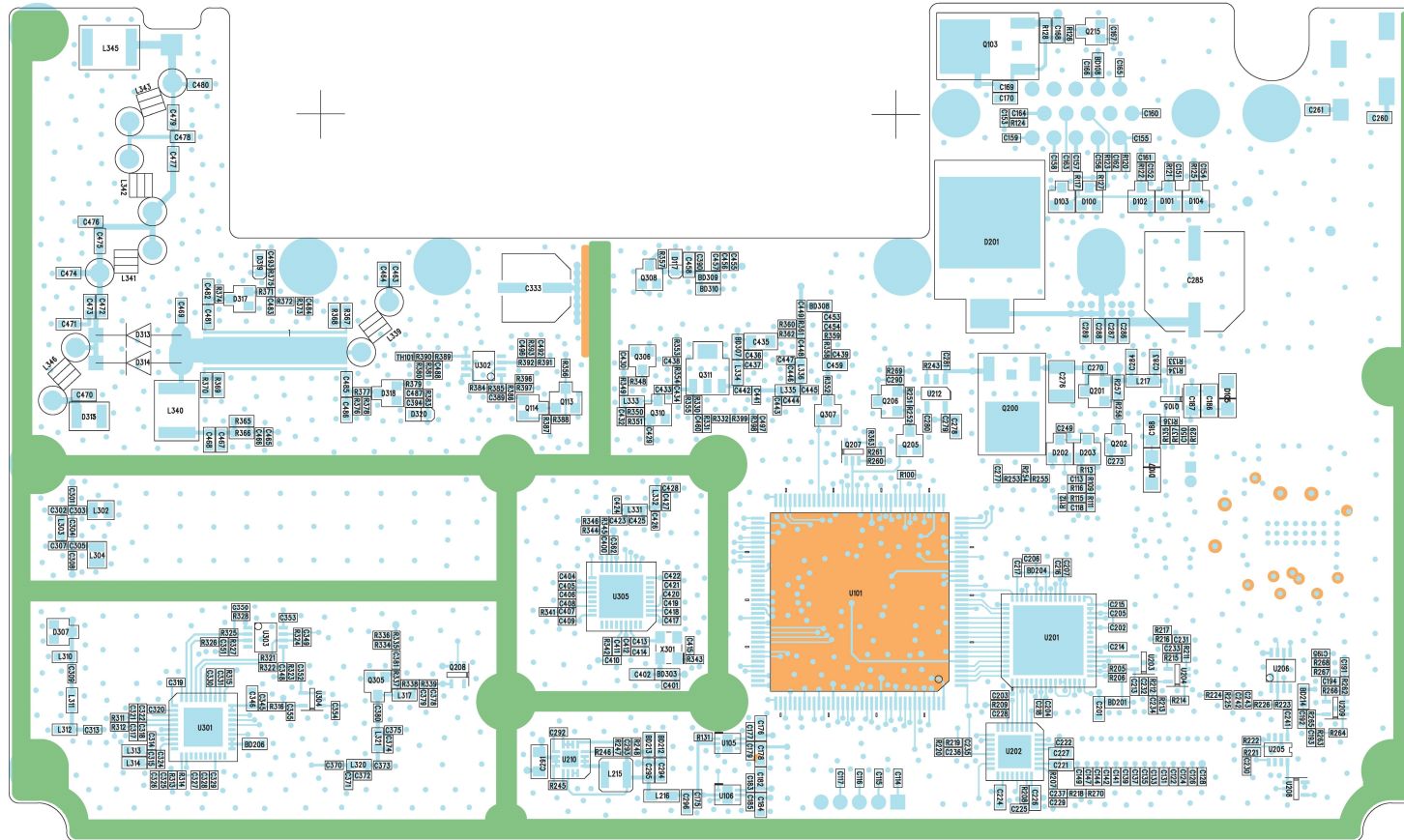


2. Component Layout

Top

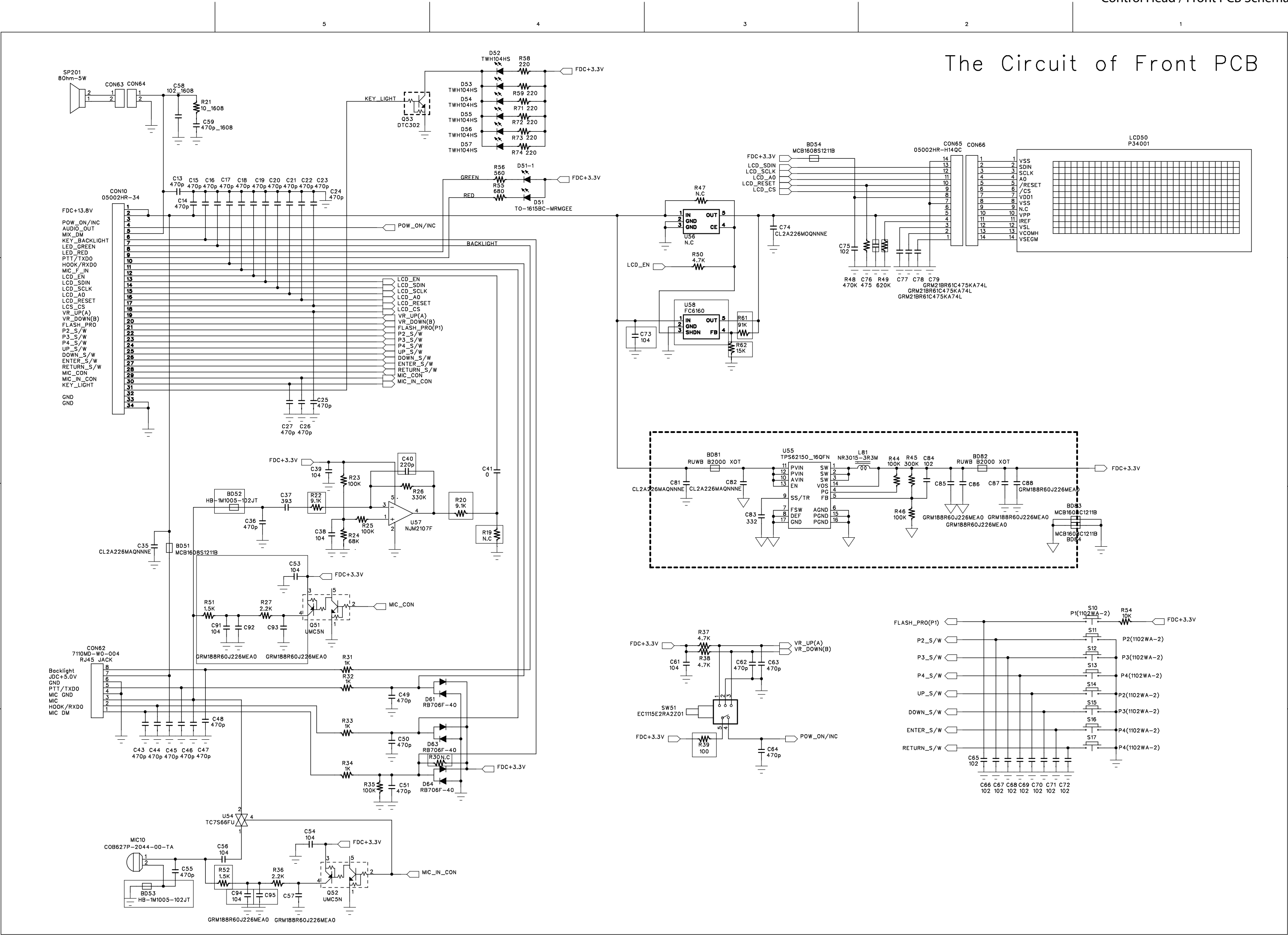


Bottom

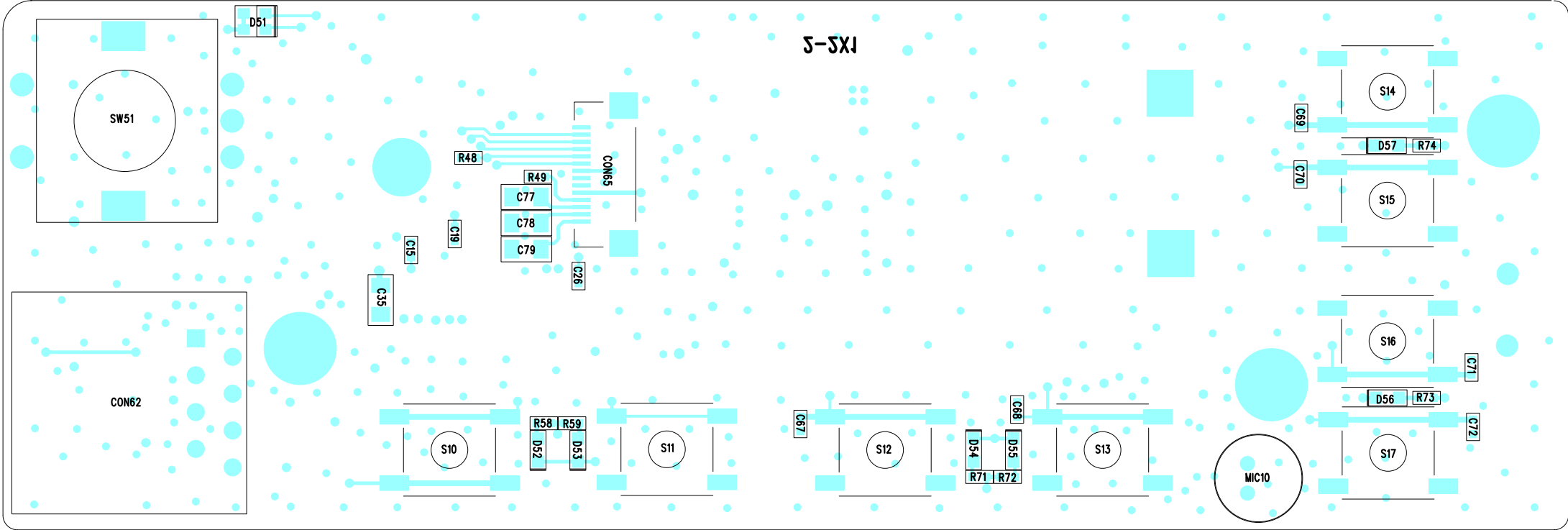


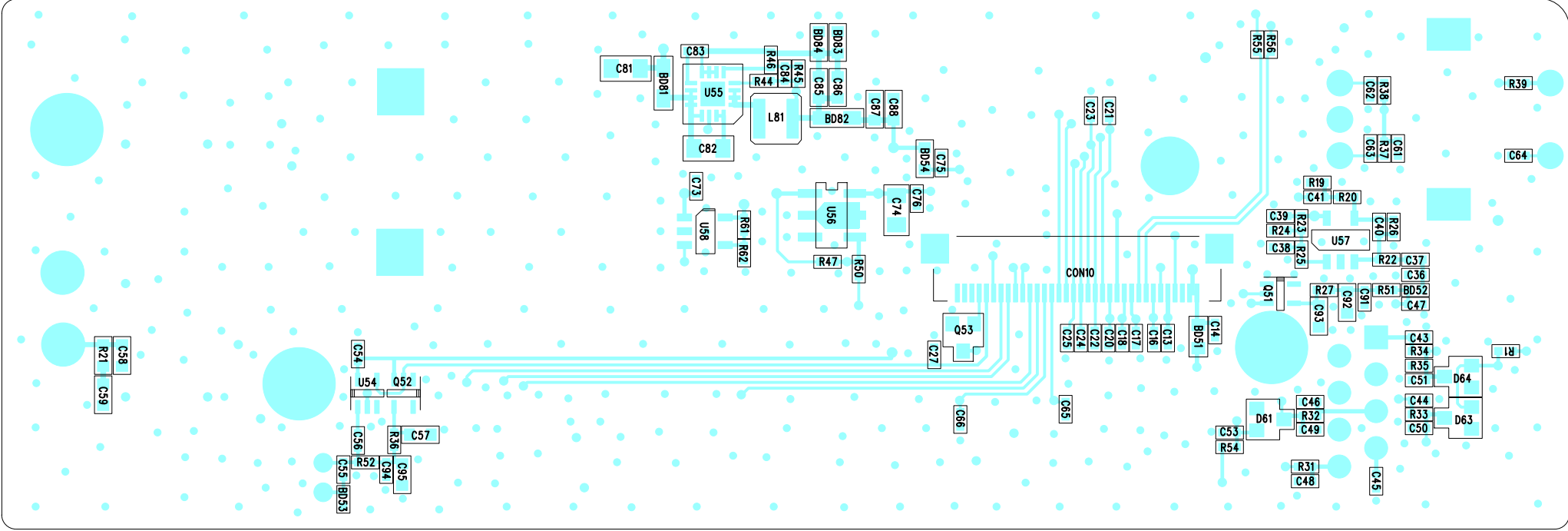


The Circuit of Front PCB



Control Head / PCB Top





3. Part List

			Qty	Reference
1-001-001-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 0Ω	13	R113 R208 R224 R227 R228 R261 R363 R377 R380 R389 R399 C314 C324
1-001-004-00	RES, MG, SMD	1005, 1 %(F), 1/16 W, 100	1	R316
1-001-005-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 18Ω	2	R335 R361
1-001-006-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 22Ω	2	R209 R342
1-001-011-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 51Ω	1	R107
1-001-014-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 100Ω	6	R204 R348 R349 R392 R397 R345
1-001-016-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 150Ω	1	R330
1-001-019-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 220Ω	2	R126 R339
1-001-022-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 330Ω	8	R130 R252 R334 R336 R360 R362 R344 R346
1-001-026-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 680Ω	1	R341
1-001-029-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 1KΩ	21	R100 R110 R112 R114 R120 R121 R122 R123 R124 R125 R127 R129 R132 R201 R207 R343 R352 R357 R371 R379 R390
1-001-030-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 1.2KΩ	2	R231 R232
1-001-033-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 2.2KΩ	1	R358
1-001-039-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 3.9KΩ	1	R108
1-001-041-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 4.7KΩ	20	R102 R103 R118 R119 R180 R181 R182 R183 R205 R206 R217 R220 R238 R239 R332 R351 R372 R375 R383 R117
1-001-043-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 5.6KΩ	1	R211
1-001-044-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 6.8KΩ	1	R331
1-001-048-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 10KΩ	6	R221 R222 R251 R315 R350 R353
1-001-052-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 15KΩ	2	R223 R226
1-001-054-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 20KΩ	1	R391
1-001-055-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 22KΩ	1	R137
1-001-057-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 27KΩ	2	R134 R337
1-001-058-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 30KΩ	3	R250 R256 R258
1-001-059-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 33KΩ	5	R111 R323 R324 R327 R328
1-001-061-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 39KΩ	1	R109
1-001-063-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 47KΩ	5	R135 R140 R359 R396 R398
1-001-066-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 68KΩ	3	R213 R254 R270
1-001-069-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 91KΩ	1	R219
1-001-070-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 100KΩ	23	R101 R104 R105 R106 R131 R133 R136 R202 R203 R212 R214 R216 R218 R234 R235 R236 R237 R243 R245 R246 R253 R384 R385
1-001-072-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 120KΩ	7	R233 R240 R248 R321 R322 R325 R326
1-001-082-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 330KΩ	2	R215 R255
1-001-085-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 430KΩ	1	R247
1-001-091-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 1MΩ	1	R99
1-001-098-00	RES, MG, SMD	1608, 1 %(F), 1/10W, 10Ω	2	R241 R242
1-001-104-00	RES, MG, SMD	1608, 1 %(F), 1/10W, 220Ω	5	R365 R366 R367 R368 R370
1-001-110-00	RES, MG, SMD	1608, 1 %(F), 1/10W, 680Ω	1	BD309
1-001-130-00	RES, MG, SMD	1608, 1 %(F), 1/10W, 47KΩ	1	R128
1-001-133-00	RES, MG, SMD	1608, 1 %(F), 1/10W, 100KΩ	3	R249 R257 R259
1-001-166-00	RES, MG, SMD	1005, 1 %(F), 1/16W, 3.3Ω	4	R311 R312 R313 R314
1-001-186-00	RES, TH, NTC, SMD	NCP15XH103F03RC (1005, 1 %(F), 10KΩ)	1	TH101
1-002-008-00	CAP, CER, SMD	GRM1555C1H2R0CA01D (2pF, 1005, 50V)	1	C304
1-002-012-00	CAP, CER, SMD	GRM1555C1H3R0CA01D (3pF, 1005, 50V)	1	C172
1-002-015-00	CAP, CER, SMD	GRM1555C1H4R0CA01D (4pF, 1005, 50V)	2	C371 C375
1-002-017-00	CAP, CER, SMD	GRM1555C1H4R7CA01D (4.7pF, 1005, 50V)	1	C372
1-002-022-00	CAP, CER, SMD	GRM1555C1H6R8DA01D (6.8pF, 1005, 50V)	1	C374
1-002-024-00	CAP, CER, SMD	GRM1555C1H7R5DA01D (7.5pF, 1005, 50V)	4	C425 C427 C444 C446
1-002-025-00	CAP, CER, SMD	GRM1555C1H8R0DA01D (8pF, 1005, 50V)	2	C303 C305
1-002-027-00	CAP, CER, SMD	GRM1555C1H100JA01D (10pF, 1005, 50V)	9	C348 C349 C350 C351 C424 C428 C441 C443 C447
1-002-028-00	CAP, CER, SMD	GRM1555C1H110JA01D (11pF, 1005, 50V)	1	C315
1-002-029-00	CAP, CER, SMD	GRM1555C1H120JA01D (12pF, 1005, 50V)	1	C381
1-002-032-00	CAP, CER, SMD	GRM1555C1H150JA01D (15pF, 1005, 50V)	1	C171
1-002-034-00	CAP, CER, SMD	GRM1555C1H180JA01D (18pF, 1005, 50V)	2	C173 C433
1-002-035-00	CAP, CER, SMD	GRM1555C1H200JA01D (20pF, 1005, 50V)	1	C373
1-002-036-00	CAP, CER, SMD	GRM1555C1H220JA01D (22pF, 1005, 50V)	14	C301 C308 C309 C362 C370 C380 C400 C423 C426 C429 C434 C442 C445 C448
1-002-044-00	CAP, CER, SMD	GRM1555C1H470JA01D (47pF, 1005, 50V)	1	C414
1-002-051-00	CAP, CER, SMD	GRM1555C1H101JA01D (100pF, 1005, 50V)	8	C318 C322 C325 C328 C404 C413 C419 C455
1-002-053-00	CAP, CER, SMD	GRM155R71H221KA01D (220pF, 1005, 50V)	1	C233
1-002-056-00	CAP, CER, SMD	GRM155R71H391KA01D (390pF, 1005, 50V)	1	C408
1-002-057-00	CAP, CER, SMD	GRM155R71H471KA01D (470pF, 1005, 50V)	59	C114 C115 C116 C117 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130 C131 C132 C133 C134 C135 C136 C137 C138 C139 C140 C141 C142 C143 C144 C145 C146 C147 C148 C149 C150 C151 C152 C153 C154 C155 C156 C157 C158 C159 C160 C161 C162 C163 C164 C165 C166 C180 C365 C390 C421 C454 C456 C465 C487 C496
1-002-059-00	CAP, CER, SMD	GRM155R71H102KA01D (102, 1005, 50V)	22	C111 C112 C167 C242 C267 C268 C273 C290 C293 C313 C379 C394 C409 C417 C438 C439 C449 C457 C483 C484 C488 C493
1-002-062-00	CAP, CER, SMD	GRM155R71H332KA01D (332, 1005, 50V)	2	C252 C292
1-002-064-00	CAP, CER, SMD	GRM155R71H472KA01D (472, 1005, 50V)	4	C246 C319 C330 C407
1-002-067-00	CAP, CER, SMD	GRM155R71E103KA01D (103, 1005, 25V)	8	C210 C211 C212 C214 C280 C329 C430 C492
1-002-068-00	CAP, CER, SMD	GRM155R71E153KA01D (153, 1005, 50V)	1	C415
1-002-073-00	CAP, CER, SMD	GRM155R71C473KA01D (473, 1005, 16V)	1	C229

1-002-076-00	CAP, CER, SMD	GRM155R71C104KA88D (104, 1005, 16V)	66	C98 C99 C102 C104 C105 C106 C107 C109 C113 C118 C120 C175 C177 C179 C183 C185 C202 C203 C204 C205 C206 C207 C208 C209 C213 C215 C216 C217 C218 C222 C228 C230 C231 C232 C234 C235 C236 C237 C241 C243 C249 C277 C279 C281 C317 C321 C326 C327 C345 C352 C353 C354 C355 C378 C401 C406 C410 C411 C412 C418 C420 C422 C436 C453 C460 C466
1-002-080-00	CAP, CER, SMD	GRM155R60J105KE19D(105, 1005, 6.3V)	3	C244 C497 C250
1-002-104-00	CAP, CER, SMD	GRM1885C1H120JA01D (12pF, 1608, 50V)	1	C482
1-002-120-00	CAP, CER, SMD	GRM1885C1H101JA01D (100pF, 1608, 50V)	2	C289 C337
1-002-121-00	CAP, CER, SMD	GRM1885C1H121JA01D (120pF, 1608, 50V)	1	C481
1-002-126-00	CAP, CER, SMD	GRM188R71H471KA01D (470pF, 1608, 50V)	7	C260 C261 C288 C336 C450 C468 C485
1-002-128-00	CAP, CER, SMD	GRM188R71H102KA01D (102, 1608, 50 V)	10	C168 C169 C170 C248 C270 C274 C287 C335 C452 C467
1-002-129-00	CAP, CER, SMD	GRM188R71H103KA01D (103, 1608, 50V)	3	C286 C332 C334
1-002-130-00	CAP, CER, SMD	GRM188R71C104KA01D (104, 1608, 50V)	2	C283 C284
1-002-137-00	CAP, CER, SMD	GQM1875C2E1R0CB12D (1pF, 1608, 250V)	1	C470
1-002-139-00	CAP, CER, SMD	GQM1875C2E2R0CB12D (2pF, 1608, 250V)	0	
1-002-144-00	CAP, CER, SMD	GQM1875C2E4R0CB12D (4pF, 1608, 250V)	0	
1-002-147-00	CAP, CER, SMD	GQM1875C2E5R0CB12D (5pF, 1608, 250V)	3	C469 C478 C471
1-002-153-00	CAP, CER, SMD	GQM1875C2E8R0CB12D (8pF, 1608, 250V)	1	C476
1-002-155-00	CAP, CER, SMD	GQM1875C2E100JB12D (10pF, 1608, 250V)	2	C475 C477
1-002-156-00	CAP, CER, SMD	GQM1875C2E120JB12D (12pF, 1608, 250V)	1	C474
1-002-177-00	CAP, CER, SMD	GRM188R72A102KA01D (102, 1608, 100V)	2	C472 C473
1-002-211-00	CAP, ELEC, SMD	RC1E107M6L07KVR (100uF / 25V, 6.3pi X 7.7mm)	4	C272 C282 C333 C451
1-002-213-01	CAP, ELEC, SMD	UCQ1E221MCL1G5 (220uF / 25V, 8pi X 10mm)	2	C258 C265
1-002-214-00	CAP, ELEC, SMD	SC1E477M10010VR200 (470uF / 25V, 10pi X 10mm)	1	C285
1-002-216-00	CAP, CER, SMD	GRM155R71H152KA01D (152, 1005, 50V)	2	C320 C331
1-002-217-00	CAP, CER, SMD	GRM155R61A325KE95D (225, 1005, 10V)	1	C405
1-002-230-00	CAP, CER, SMD	GRM155R60J475ME47 (475, 1005, 6.3V, 20%)	2	C432 C437
1-002-232-00	CAP, CER, SMD	GRM188R60J226MEAD0 (22 uf, 1608, 6.3V)	5	C294 C295 C296 C435 C458
1-002-232-01	CAP, CER, SMD	GRM188R61A226ME15L (22 uf, 1608, 10V)	0	
1-002-234-00	CAP, CER, SMD	GRM188R60J106ME47D (10uf, 1608, 6.3V)	13	C103 C176 C178 C182 C184 C201 C221 C224 C226 C227 C278 C346 C402
1-002-234-01	CAP, CER, SMD	GRM188R61A106ME69D (10uf, 1608, 10V)	2	C245 C251
1-002-235-00	CAP, CER, SMD	GRM21BR61C106KE15L (10 uf, 2012, 16V)	3	C187 C188 C186
1-002-239-00	CAP, CER, SMD	CL21A226MOGNNNE (22uF, 2012, 16V)	3	C254 C271 C291
1-002-250-00	CAP, CER, SMD	CL32B226KAJNNNE (22uF, 3225, 25V)	1	C276
1-002-256-00	CAP, CER, SMD	GRM188R61H474KA12D (474, 1608, 50V)	4	C256 C259 C262 C264
1-002-257-00	CAP, CER, SMD	GRM1885C1H391JA01D (390pF, 1608, 50V)	2	C257 C263
1-003-003-00	TR, RF, SMD	2SC4236-T1-A(R25)	2	Q305 Q310
1-003-014-00	TR, POWER FET, SMD	RD01MUS2B-T513	1	Q311
1-003-021-00	TR, GENERAL, SMD	KTC4075-Y-RTK/P	1	Q114
1-003-022-00	TR, GENERAL, SMD	KRA225S-RTK/P	1	Q113
1-003-029-00	TR, BRT, SMD	UMC5NTR	4	Q104 Q105 Q207 Q208
1-003-036-00	TR, POWER FET, SMD	FTK3401	4	Q201 Q203 Q204 Q206
1-003-041-00	TR, BRT, SMD	DTC302	9	Q100 Q106 Q202 Q205 Q209 Q215 Q306 Q307 Q308
1-003-045-00	TR, POWER FET, SMD	FTK0903D(100V,18A), TO-252	1	Q103
1-004-009-00	DIODE, PIN, SMD	L709CER / L8104R	1	D315
1-004-011-00	DIODE, PIN, DIP	L407CDB	2	D313 D314
1-004-014-00	DIODE, SCHOTTKY, SMD	RB706F-40	7	D100 D101 D102 D103 D104 D317 D318
1-004-015-00	DIODE, SCHOTTKY, SMD	RB160M-40TR	2	D105 D107
1-004-019-00	DIODE, SWITCH, SMD	DA304U	1	D307
1-004-020-00	DIODE, BANDSWITCH, SMD	DAN235U	2	D202 D203
1-004-023-00	DIODE, ZENER, SMD	EDZTB51.51B	1	D117
1-004-024-00	DIODE, ZENER, SMD	EDZTB51.56B	2	D319 D320
1-004-025-00	DIODE, ZENER, SMD	Z5W27V	1	D201
1-004-026-00	DIODE, SCHOTTKY, SMD	USCD034H	2	D108 D109
1-005-001-01	IC, LINER, RF AMP, DIP	RA60H1317M1B-501 (00MHZ,60W)	1	U306
1-005-018-00	IC, LINER, OPAMP, SMD	NJM12904R(Te1)	2	U302 U303
1-005-019-00	IC, LINER, OPAMP, SMD	NJM2107F3(Te1)	2	U204 U304
1-005-030-00	IC, LINER, REGULATOR, SMD	BA08CC0FP-E2	1	Q200
1-005-042-00	IC, LINER, LDO, SMD	NJM2882F05(Te1)	1	U212
1-005-058-00	IC, LINER, ANALOG SWITCH, SMD	TC7W66FU(Te12L,F)	1	U206
1-005-059-00	IC, LINER, ANALOG SWITCH, SMD	TC7S86FU(T5L,F,T)	1	U208
1-005-062-01	IC, LINER, VOLTAGE DETECTOR, SMD	FA7025AS,SOT-23	1	Q101
1-005-071-00	IC, LINER, POTENTIALMETER, SMD	CAT5171 TBI-50GT3	1	U205
1-005-092-00	IC, LINER, DC/DC, SMD	TPS62150RGT (3mm x 3mm QFN, 16pin)	1	U210
1-005-100-00	IC, LINER, PLL, RF SYNTHESIZER, SMD	LMX2571	1	U305
1-005-105-01	IC, LINER, DIRECT CONVERSION RECEIVER, SMD	SCT3811_40-PIN VQFN	1	U301
1-005-104-00	IC, LINER, ASP, SMD	SCT3258TDM	1	U201
1-005-115-00	IC, LINER, DUAL LDO, SMD	XC6421AB41ER-G, USP-6C (3.3V,3.3V)	1	U105
1-005-116-00	IC, LINER, DUAL LDO, SMD	XC6421AB06ER-G, USP-6C (1.2V,3.3V)	1	U106
1-005-133-01	IC, LINER, AUDIO AMP, SMD	MP7745DF(2 x 20W Class D Stereo), TSSOP20F	1	U207
1-006-007-00	IC, LOGIC, INVERTER, SMD	MC74VHC1GT04 DFT1G /M74VHC1GT04 DFT1G	1	U203
1-006-009-00	IC, LOGIC, CODEC, SMD	TLV320AIC3204IRHBR	1	U202
1-006-026-02	IC, LOGIC, MCU, SMD	GD32F103ZET6	1	U101
1-007-010-02	IC, MEM, EEPROM, SMD	M24M02-DRMN6TP S08(MN) 2M EEPROM	1	U102
1-007-015-00	IC, MEM, FLASH, SMD	P25Q32HUXU (8-Land USON(3.2x0.55mm))	1	U103
1-008-023-00	IND, AIR, SMD	0.4x0.4x11TL (220nH)	2	L340 L345
1-008-025-00	IND, AIR, DIP	0.8x4.0x2.5T	5	L339 L341 L342 L343 L346
1-008-049-00	IND, FIXED, SMD	LOW2BHN47H03L (2012, 470nH)	2	L302 L304
1-008-059-00	IND, FIXED, SMD	LOW18AN47NJ00 (1608, 47nH)	1	L334
1-008-062-00	IND, FIXED, SMD	LOW18ANR22J00 (1608, 220nH)	1	L333
1-008-065-00	IND, BEAD, SMD	BLM41PG600SN1L	3	BD304 BD305 BD306
1-008-067-00	IND, CER, SMD	C1B 1608 27NSJT (1608; 2.7 nH)	1	L303

1-008-105-00	IND, CER, SMD	HI-1608-27NJT (1608, 27nH)	2	L320 L321
1-008-107-M0	IND, CER, SMD	CI-B 1608 330J(T) (1608, 33nH)	1	L317
1-008-108-00	IND, CER, SMD	CI-B 1608 390J(T) (1608, 39nH)	4	L331 L332 L335 L336
1-008-117-00	IND, CER, SMD	HI-1608-R10JT (1608, 100nH)	1	L314
1-008-121-00	IND, CER, SMD	HI-1608-R16JT (1608, 160nH)	1	L311
1-008-129-00	IND, CER, SMD	0603 CIL 10N R62 /EBLS1608 R82K(1608, 820nH)	1	L312
1-008-138-00	IND, BEAD, SMD	MCB1608S121B	14	BD101 BD108 BD201 BD204 BD206 BD210 BD211 BD212 BD213 BD214 BD303 BD307 BD308 BD310
1-008-139-00	IND, UWB CLOCK CHOCK, SMD	RUWB B2000X0T	3	L214 L216 L217
1-008-154-00	IND, POWER, SMD	NR3015T-3R3M (3.3uHz±20%)	1	L215
1-008-157-00	IND, POWER, SMD	NRS6045T-100MMGK	2	L202 L203
1-008-165-00	IND, FIXED, SMD	LOW18ANA3NG00 (1608, 43nH, 2%)	1	L310
1-009-007-01	X-TAL, OSC, SMD	82J1125-16.000MHZ-V0, I20(2.5x2.0x0.5mm)	1	X101
1-009-012-00	X-TAL, TCXO, SMD	12.288MHz, 2ppm, 3225 SIZE	1	X201
1-009-015-01	X-TAL, VC-TCXO, SMD	38.4MHz, (30 PPM)DSA21SJ,2520 SIZE	1	X301
1-011-009-00	DISPLAY, LED, SMD	SP0603B-RN	1	D106
1-013-002-00	FUSE, SMD, SMD	N1206TQ(32V/5A)	1	F100
			1	PCB
2-005-005-00	CONN, DSUB, DIP	HDR15P-44PH	1	CON102
2-005-020-00	CONN, JACK, DIP, EARJACK	TSH-3814-002-T2 (TSH-3814-052-T2)	1	J201
2-005-070-00	CONN, WIRE TO BOARD, SMD	06002HR-34N2(G)	1	CON101
2-008-010-01	UP, ENTER, DOWN SWITCH, TACT, SMD	JT1186SAEM	2	S101 S102