RCnD,
TROMBAY,
MUMBAI - 400 085

Government of India
Bhabha Atomic Research Centre

Ref: BARC/RCnD/RRPSS/2022/ P-46485

Sub: Minor fabrication - invitation to quote **Date: May 23, 2022**

Last date for receiving quotations: 14/06/2022

Dear Sir/Madam,

1. Quotations are invited by Head, Reactor Control Division, on behalf of President of India for minor fabrication job given below:

SI No.	Description	Quantity
1	Fabrication of PCB, Procurement of components, Assembling and Testing of Black Baseband module, Data Converter Module, Radio Control Module & Backplanes as per specifications given in annexure-I, II and III.	15 (3 Sets)

2. Quotations(Technical as well as Commertial) are invited on the letter head with official seal(rubber stamp) for the above mentioned job.The quotations should contain the following details (i) Validity of offer, (ii) Terms and conditions of offer, (iii) PAN, GST, registration no., (iv) Delivery time schedule, (v) Price breakup. Quotations (Technical as well as Commertial) have to be signed by authorized person with company seal.

3. Item intended to be fabricated/procured in this work is required for R&D purpose hence GST @5% shall be applicable and GST certificate shall be provided by BARC for the same.

4. The quotations must reach, Head, Reactor Control Division by **14/06/2022 (12:00 Noon)** and must be sent in a sealed envelope super scribed with the above Ref. No., and due date given above.**The quotations must be sent by speed post/ordinary post only.**

5. **The sealed quotation envelope shall contain Technical and Commercial parts of the offer in two separate sealed envelopes superscripted with type of bid (differentiated clearly by the terms "TECHNICAL" and "COMMERCIAL" on the respective envelopes), Description of job, Tender Ref. No. and due date as mentioned above.** The technical bids will be opened after the due date and commercial bids of technically qualified bidders only will be opened subsequently.

6. Address for sending quotations is as following:

Head,
Reactor Control Division,
BARC, Trombay, Mumbai - 400 085.
(Kind attention: Gaurav, SO/F, RCnD)

7. Validity of the offer shall be for 90 days from the date of opening of quotation. Quotation must also indicate the validity of offer.
8. Requirements of supplier qualification:
   i. Certification : The bidder must have ISO 9001:2008 certification and must attach documentary evidence with the bid.
   ii. Human resources: The supplier must give the details of human resources including Engineers, draftsman, assembly mechanic, quality control inspector, etc.
   iii. Infrastructure: The supplier must give the details of infrastructure suitable for this job such as Orcad design entry tool,cadence allegro layout tool, solidworks/similar mechanical design tool, fabrication facility, assembly equipments,electronic testing equipments.
   iv. Past experience: Bidder must provide documentary evidence of prior experience of working with similar high density, high speed electronic designs with capabilities to do multilayer PCB design (minimum tweleve layers) with client's name.
   v. Bidder must have necessary electronic hardware test set up at their facility to carry out the above layout, fabrication, assembly and testing. The list of facilities must be submitted along with the bid.
   vi. If required, vendor must allow BARC officials factory visit for evaluation.

9. The bidder should quote for fabrication of the items, including the cost of the materials. Schematics and existing layout files shall be provided to the vendor with the Purchase Order. No free issue of materials will be provided by BARC.

10. Delivery schedule :
   1 Minor Layout modification and new Gerber generation within 6 weeks from the date of purchase order issued to the vendor.6 weeks include feedback and layout/gerber check by the user.
   2 Fabrication, Assembly and testing of first set of boards (total 5 nos)within 20 weeks from the date of gerber cleared for from the user/purchaser. Important milestones are as follows:
      i. Fabrication & assembly - 19 weeks
      ii. Testing - 1 weeks (At vendor's site)
   3 Assembly and testing ofremaining two set of boards (total 10 nos) within 2 weeks from the date of acceptance of first 5 boards by I/O.
   4 The vendor shall deliver all the boards within 7 months from the date of purchase order issued to the vendor.

11. The vendorshall give atleast 15 working days advance intimation to the Indenting Officer to arrange for visiting vendors's premises for inspection & functional testing.

12. Boards shall be delivered by the bidder at RCnD Stores, Bhabha Atomic ResearchCentre, Trombay, Mumbai-400085.

13. All materials required for the above said job shall be supplied by the bidder.

14. All work covered by the specification shall be subject to quality surveillance by our engineer . The finished board shall not be dispatched prior to approval by our engineer, at bidder's premises. Necessary inspection facilities shall be provided to our engineers during fabrication/repairs/testing at bidder's premises.

15. The assembled PCBs shall be guaranteed for 1 year against defects and poor workmanship. The guarantee shall include onsite replacement of defective boards at no extra cost.

16. Payment will be made by electonic transfer after satisfactory completion of the work as per government rules.

17. Delivery charges if any must be clearly mentioned in the offer. Quotation must indicate the vaiidity of offer.
18. Head, Reactor Control Division reserves the right to accept/reject any or all the quotations received withoutassigning any reasons.

Encl:

1. Annexure-I: General specification (1 sheet)
2. Annexure-II: Technical specifications, BOM (38 sheets)
3. Annexure-III Layout Modifications (3 sheets)

24/05/2022

(U. W. Vaidya)
Head , Reactor Control Division
[For & on behalf of the President of india(the purchaser)]

उदय वा. वैद्य/Uday W. Vaidya
अध्यक्ष, रिएक्टर नियंत्रण प्रभाग
Head, Reactor Control Division
भाभा.अ.के.द्र, मुंबई/BARC, Mumbai

ANNEXURE-I (1 sheet)

(Ref:BARC/RCnD/RRPSS/2022/ P-46485)

General Specifications

1.0 Quality surveillance, inspection and inspection report:

1.1 All work covered by the specifications shall be subject to quality surveillance by the purchaser or his authorised representatives for which purpose the fabricator shall allow access at all reasonable times during components assembly to:

1.1.1 The premises in which work is being carried out.

1.1.2 The drawings and / or tooling involved.

1.1.3 Gauges, instruments etc. required for inspecting the work.

1.2 Inspection and tests shall be carried out by the fabricator as per the requirements detailed in the drawings and these specifications.

1.3 The finished components shall not be despatched prior to approval by our engineer.

2.0 Delivery:

2.1 The bidder shall complete minor Layout modification (specified in Annex-III) and new Gerber generation within 6 weeks from the date of purchase order issued to the vendor. 6 weeks include feedback and layout/gerber check by the user.

2.2 The bidder shall complete fabrication, assembly and testing of first set of boards within 20 weeks from the date of gerber cleared from the user. The testing shall be conducted at the bidder site.

2.3 In case of deficiency in PCB fabrication or assembly of first set, the bidder shall incorporate the identified solution and provide fresh new board on own's cost.

3.4 The bidder shall deliver remaining two set of boards within 2 weeks from the date of acceptance of first set of boards by I/O.

2.5 The bidder shall deliver all the boards within 7 months from the date of purchase order issued to bidder from RCnD, BARC, Mumbai-85.

2.6 In case any extension in the delivery period is required; the fabricator shall submit a written request for the same before the expiry of work order. Any delay in delivery which is attributable to the fabricator is liable for LD penalty @0.5% per week (max. up to 10%)to be imposed on the fabricator

3.0 Sub Contract:

3.1 The fabricator shall not sub-contract any or all the work without written consent from the purchaser. The fabricator shall be responsible for all work of the sub contractor of the fabricator, if at all allowed by the purchaser.

4.0 Taxes:

4.1 GST @ 5%will be applicable and GST certificate will be provided by BARC for the same.

4.2 An undertaking should be provided regarding promptly deposition of GST to authorities.

5.0 Excise duty:NA

6.0 Payment:

6.1 **Payment will be made only after satisfactory completion of work and on production of bill, advance stamped receipt & Guarantee/Warrantee Certificate. Advance/Part payment against delivery cannot be made.**

6.2 It may be noted that Income tax at 2% and GST TDS at 2% will be deducted from your bill.

7.0 Confidentiality:

7.1 No party shall disclose any information to third party concerning the matters under this contract generally. In particular, any information identified as "PROPRIETARY" in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

7.2 "RESTRICTED INFORMATION" categories under section 18 of the Atomic Energy Act, 1962 and "OFFICIAL SECRETS" under section 5 of the official Secrets Act,1923:-

Any contravention of the above mentioned provisions by any contractor, sub-contractor, consultant, advisor or the employees of a contractor will invite penal consequences under the aforesaid legislation.

7.3 Prohibition against the use of BARC's name without permission for publicity purposes:-

The contractor or sub-contractor, consultant, advisor or the employees engaged by the contractor shall not use BARC's name for Publicity purpose through any public media like press, radio, T.V. or internet without the prior written approval of BARC (vide circular ref: 2/Misc-9/Lgl/2001/92 dated April 30, 2001).

23.05.22

(Gaurav)
Indentor

Annexure-II (38 Sheets)

(Ref:BARC/RCnD/RRPSS/2020/ P-46485)

Technical Specification for Fabrication of PCB, Procurement of components, Assembling and Testing of Black Baseband module, Data Converter Module, Radio Control Module & Backplanes

Job Description:

- Minor Layout modifications, PCB fabrication, procurement of components, assembly, testing of Black Baseband Module, Data Converter Module, Radio Control Module, Backplane-A and Backplane-B as per the technical specifications including scope of work, material, standards and qualification.
- Schematics files, BOM and existing Layout files will be provided by user (purchaser) for minor layout modification and fabrication.
- Supply of Black Baseband Module, Data Converter Module, Radio Control Module, Backplane-A and Backplane-B : 3 No. for each type along with modified layout files.

Technical Specifications

1. Description, Drawings, Bill of Material

The circuit schematics files, Bill of Material (BOM) and existing layout files shall be provided to the supplier after placement of Purchase Order. The PCB layout shall be modified by the supplier as per details given in annexure-III. Layout designer shall interact with user's engineer for required layout changes. After completion of layout modification, the modified layout file shall be submitted to user before fabrication. Refer Table-1, 2, 3,4 & 5 for Bill of material and required minor layout modifications.

2. PCB size specifications:

a) PCB Size: 160 mm x 100 mm (Black Baseband , Data Converter Module and Radio Control Module)
: 120 mm x 209 mm (Backplane-A, Backplane-B)

b) No. of layers & PCB thickness- 12 (Black Baseband, Radio Control Module), 1.6mm
8 (Data Converter Module), 1.6mm
4 (Backplane-A), 2mm
8 (Backplane-B), 2mm

c) PCB Material: FR4

3. Scope of Work

a) Layout Modification and Gerber file generation

i. Schematic design (.dsn format) files, BOM and existing layout (.brd format) files will be provided to supplier. The layout design shall be modified by an experienced and skilled engineer.

ii. Minor Layout design modification shall be carried out as per list of layout changes given in annexure-III and shall follow IPC-2221 guidelines.

iii. All respective datasheets and layout guidelines shall be referred during layout modification.

iv. Modified Layout design files as per the changes given in annexure-III shall be submitted to user for review and approval before proceeding to next stage.

v. New Gerber files in RS 274-X format shall be generated.

b) PCB fabrication and component Assembly:

PCB fabrication shall be started only after the approval of modified Layout and Gerber file from user. The supplier shall procure all the active and passive components and populate/assemble the PCB. PCB fabrication, components assembly, PCB testing shall be as per the following requirements:

1- Baking of PCB shall be done before components assembly as per the standard method.

2- The packages for the assembly of critical components are FCBGA(760 pins), BGA(484 pins).

3- BOM and Package details for all the components are given in annexure-II.

4- The fabricator shall buy all the items as per the BOM and of standard make from authorised distributors.

5- Inspection of assembled PCB for any shorting.

6- X-Ray inspection for soldering of BGA components are needed to insure the proper joint of balls on PCB.

7- Final acceptance of assembled PCBs shall be as per the quality acceptance plan given under clause 6.0-"Quality Acceptance Plan (QAP)" of same annexure.

c) Assembly of first set of Modules and testing

After PCB fabrication, one number of PCB of each type of module (Black Baseband, Data Converter Module, Radio Control Module, and Backplane-A/B) shall be assembled for evaluation and testing. The vendor shall do power supply shorting tests and measurement test and shall share the results with the User. The vendor shall also check for any on-board shorting or assembly related issue. After clearance of basic power supply check, The User shall do the functional testing at the Vendor site. The vendor shall provide basic instruments like Function Generator, regulated power supplies, oscilloscope for functional testing. In case of any fabrication/manufacturing defect, found during the functional testing, the Vendor shall provide fresh new board on own's cost.

d) Assembly of remaining two set of modules and final supply

After approval of first set of assembled modules, remaining two set of modules will be assembled and basic power supply test shall be carried out the vendor and the modules shall be delivered to the user. Functional/performance testing of the final units will be performed by user's engineer at user's site.

e) Documentation

The supplier must provide following documents:

i. Final Bill of material (if there is any changes because of non-availability of component),

ii. Modified PCB layout files and newly generated Gerber files,

iii. Bare Board Test Report

4. Material & Workmanship

a) Materials and standard parts shall be of good quality and in accordance with best engineering practice in order to ensure satisfactory operation and ease of maintenance.

b) The components assembly and workmanship shall be in accordance with high grade industrial practice and the best approved methods as per the given QAP and shall be adequate to achieve

c) A care for cleanliness is to be maintained during assembly and storage of components. A complete record of assembly and subassembly checks is to be carried out. For this purpose a checklist is needed to be maintained for counter verification of the finished / completed jobs, required for assembly.

5. Standards & Engineering Practices to be Followed for PCB

a) PCB quality of FR4 grade Class-2, PCB thickness of 100 mil (or less) copper clad with glass epoxy lamination should be used. Solder mask & legend print shall be provided.

6. QUALITY ACCEPTANCE PLAN (QAP)

Following are quality acceptance plan for the component assembly job under this minor fabrication job.

a) **Inspection**-After components assembly, the boards are required to be tested for interconnections & continuity using test instruments. For BGA& fine pitch assemblies high resolution cameras &AOI machine is required to use to insure solder ability of each pin of BGA on bare PCB. For FPGAs/BGA device, X-ray inspection report is required to be generated for verification of solder ability of BGA on PCB. The test reports should cover all data measured as per instructions given at different stages of soldering. Acceptability of Electronics assemblies will be checked as per IPC-A-610E. Passive impedance for all the on-board's power supplies shall be measured and documented before powering up the board.

b) **Powering up of boards**- All boards shall be powered up after partial assembly (assembly of power sections only) and complete assembly. Output voltages of each power section will be reported.

c) After the inspection and powering test the boards will be given to the user for final functional testing at the Vendor site. Necessary software and firmware shall be brought by the user. The vendor shall provide necessary test equipment like Function generator, Regulated power supplies, Signal generator, Oscilloscope and PC.**If any assembly (soldering) defects are noticed during testing the supplier will correct the same free of cost.** If the boards are found functional, further remaining boards are to be assembled, tested and final delivery can be made. **Final acceptance of all the boards will be given by the indenter after complete functional testing.**

7. QUALITY SURVEILLANCE

a) General: Quality surveillance and expediting, relating to all the aspects of the contract will be carried out by the purchaser or his authorized representative, for which purpose the supplier and his subcontractor shall allow access to the premises in which the work is being carried out, during manufacture, assembly and testing.

b) Produce an inspection plan to the purchaser's satisfaction and notify when checkpoints on the plan are imminent so that the purchaser's representative may be present, if it is so desired.

c) The supplier shall be responsible for the inspection of the components that is subcontracted by him.

d) Waiving of quality surveillance by the purchaser's acceptance of the items by the purchaser or his authorized agent, shall not relieve the supplier from his responsibility for supplying the items in accordance with specification requirements of this document and purchase order.

8. SUBCONTRACTING

The supplier shall not sub-contract any or all the work without the written consent from the purchaser.

9. PACKING AND SHIPMENT

a) PACKAGING: After completion of all tests and acceptance by the purchaser/user, the assembled PCBs shall be thoroughly cleaned, dried, protected from dirt, and any other damage. Afterwards these PCBs shall be crated suitably with proper protection and with antistatic cover and shipped to Purchaser's workplace, RCnD, B.A.R.C., Trombay, Mumbai - 400 085. The Supplier shall be fully responsible for the proper care and handling of PCBs during packing and shipment to ensure their arrival at destination without damage to any part.

b) DELIVERY: Delivery of subassemblies shall be made only after obtaining approval in all respect from purchaser. Completed jobs shall be delivered on or before the stipulated delivery period mentioned in Purchase Order/Work Order.

10. Warranty

The supplier shall give a warranty for a period of 12 months from the date of acceptance of all the modules (after supply of all items) against defects and poor workmanship. A certificate stating the period shall be given by the supplier for the same.

11. Deliverables: The bidder will have to supply the following:

A. Modified Board Layout File.

B. Gerber files in RS-274X format.

C. Fifteen Numbers (3 Set)of Assembled and tested Modules (to be tested in two phases as given in 3c and 3d)

D. Documents as given in section-3 (e)

12. Vendor Qualification

a) Supplier shall have facilities and adequate resources for carrying out work of this nature. He should have executed PCB fabrication & assembling work of similar complexity in recent past. Supplier shall have necessary tools and manpower for layout design, gerber generation and component assembling. Supplier shall have applicable software tools for modification in layout file with .brd extension and schematics file with .dsn extension.

b) If the supplier wants to outsource PCB fabrication then name of such company having fabrication facility shall be provided alongwith the quotation.

c) Supplier should have necessary test equipment like oscilloscope, function generator,multimeter, variable power supply etc.

d) User shall have a right to evaluate the supplier through facility inspection by user's engineer before the placement of purchase order. Vendor's found not meeting above qualification criteria are liable to be rejected during evaluation.

13. Confidentiality

The supplier shall agree to maintain confidentiality for the hardware schematic and other design files.

14. The quotations shall have breakup of engineering cost, component cost and module cost.

BOM (Black Baseband Module)

Item	Quantity	Reference	Part	MfrNum	Mfr	Description	PCB Footprint	Note
1	14	C1,C2,C3,C4,C13,C258,C259,C260,C261,C432,C433,C434,C435,C436	0.1uF,16V	C0402C104K4RACT	Kemet		c0402_l	
2	2	C5,C6	24pF	CC0402JRNPO9BN240	Yageo		c0402_l	
3	57	C7,C8,C9,C10,C11,C16,C17,C18,C37,C56,C58,C60,C66,C74,C78,C85,C86,C89,C90,C95,C98,C105,C110,C111,C114,C115,C117,C118,C200,C202,C203,C205,C206,C209,C210,C214,C215,C216,C217,C234,C235,C236,C252,C254,C255,C286,C287,C289,C415,C417,C419,C423,C429,C473,C475,C476,C533	0.1uF	C0402C104K4RACT	Kemet		c0402_l	
4	1	C12	0.33uf,16V	CGA2B1X7S1C334K050BC	TDK		c0402_l	
5	12	C14,C418,C422,C430,C478,C480,C484,C493,C494,C495,C496,C497	0.01uF	C0402C103K4RACTU	Kemet		c0402_l	
6	1	C15	220pF/50V	GRT1555C1H221FA02D	Murata		c0402_l	
7	90	C19,C21,C25,C26,C34,C35,C36,C40,C41,C42,C43,C44,C45,C46,C47,C50,C53,C65,C72,C80,C87,C91,C96,C104,C112,C116,C119,C121,C122,C124,C125,C127,C128,C129,C131,C132,C134,C135,C137,C138,C140,C141,C149,C152,C192,C219,C220,C221,C222,C224,C225,C226,C227,C228,C229,C230,C231,C232,C233,C237,C238,C239,C240,C242,C243,C244,C245,C246,C247,C248,C249,C250,C251,C253,C262,C265,C267,C268,C269,C270,C271,C272,C273,C274,C277,C278,C279,C280,C281,C439	0.01uF	C0402C103K4RACTU	Kemet		c0402_l	
8	30	C20,C22,C23,C24,C27,C28,C29,C30,C31,C32,C33,C57,C59,C64,C77,C79,C84,C88,C97,C107,C109,C113,C120,C123,C130,C133,C136,C139,C266,C275	1uF	0402ZD105KAT2A	AVX		c0402_l	
9	1	C38	100uF	T598B107M006ATE045	KEMET		case_b_3528	

10	25	C39,C48,C49,C62,C63,C69,C70,C82,C83,C93,C94,C100,C101,C108,C126,C161,C207,C208,C211,C212,C213,C440,C441,C442,C443	10uF	0805YD106KAT2A	AVX		c0805_l	
11	6	C51,C55,C71,C76,C99,C106	0.022uF	C0402C223K4RACTU	Kemet		c0402_l	
12	8	C52,C54,C61,C67,C73,C75,C102,C103	0.047uF	C0402C473K4RACTU	Kemet		c0402_l	
13	3	C68,C81,C92	47uF	TAJD476K010RNJ	AVX		Case_D_7343	
14	7	C142,C143,C191,C193,C197,C256,C263	0.1uF	C0402C104K4RACT	Kemet		c0402_l	
15	3	C144,C147,C151	10uF	CM105X5R106M25AT	AVX		c0603_l	
16	1	C145	1uF	GRT188R61C105KE13D	Murata		c0603_l	
17	1	C146	150uF	TR3D157K016C0075	Vishay Dale		Case_D_7343	
18	2	C148,C150	10pF	04025A100DAT2A	Kyocera AVX		c0402_l	
19	1	C153	DNI	C0402C103K4RACTU	Kemet		c0402_l	
20	1	C154	2.2uF	EMK105CC6225KV-F	Taiyo Yuden		c0402_l	
21	1	C155	0.1uF	C1005X7R1H104K	TDK		c0402_l	
22	6	C156,C158,C166,C169,C170,C276	2.2uF	C0805C225K4RACTU	Kemet		c0805_l	
23	9	C157,C159,C160,C162,C163,C164,C165,C167,C171	2.2uF	JMK105BJ225MV-F	Taiyo Yuden		c0402_l	
24	10	C173,C174,C177,C179,C181,C183,C185,C187,C189,C534	4.7uF	EMK107ABJ475KA-T	Taiyo Yuden		c0603_l	
25	9	C175,C176,C178,C180,C182,C184,C186,C188,C190	47uF, 10V	GRM31CR61A476ME15L	Murata		c1206_l	
26	2	C194,C450	1nF	GRM022R61C102ME01L	Murata		c0402_l	
27	4	C195,C196,C448,C449	1uF	0402ZD105KAT2A	Kyocera AVX		c0402_l	
28	1	C198	100pF	C0402C101K4RACTU	Kemet		c0402_l	
29	2	C199,C201	0.001uF	04025C102JAT2A	AVX		c0402_l	
30	1	C204	10uF	GRM188R61C106MA73D	Murata		c0603_l	
31	1	C218	10pF	04025U100FAT2A	AVX		c0402_l	
32	2	C223,C241	22uF	C2012X5R1C226K125AC	TDK		c0805_l	
33	1	C257	0.001uF	C0402C102M5RACAUTO	Kemet		c0402_l	
34	1	C264	0.1nF	C0402C103K4RACTU	Kemet		c0402_l	
35	1	C288	47uF	C2012JB1A476M125AC	TDK		c0805_l	
36	4	C290,C293,C318,C327	100uF	T598B107M006ATE045	KEMET		case_b_3528	
37	19	C291,C292,C338,C339,C348,C349,C350,C351,C352,C353,C354,C355,C356,C357,C358,C359,C360,C403,C4	4.7uF	0402YD475MAT2A	Kyocera AVX		c0402_l	

		04						
38	48	C294,C295,C296,C297,C304,C305,C306,C307,C308,C313,C314,C315,C316,C317,C322,C323,C324,C325,C326,C331,C332,C333,C334,C335,C340,C341,C342,C343,C344,C364,C365,C366,C367,C373,C374,C375,C376,C377,C392,C393,C394,C395,C396,C407,C408,C409,C410,C411	0.47uF	GRM155R61H474ME11D	Murata		C0402_CUS	
39	1	C299	0.1uF	C0402C104K4RACT	Kemet		c0402_l	
40	12	C301,C302,C310,C311,C319,C320,C328,C329,C337,C388,C389,C405	4.7uF	0402YD475MAT2A	Kyocera AVX		C0402_CUS	
41	2	C345,C386	100uF	T598B107M006ATE045	Kemet		case_b_3528	
42	1	C347	680uF	4TPF680MZH	Panasonic		case_d_7343	
43	7	C368,C369,C370,C371,C372,C378,C379	0.47uF	GRM155R61H474ME11D	Murata		c0402_l	
44	1	C400	47uF	C2012JB1A476M125AC	TDK		c0805_l	
45	4	C414,C416,C428,C472	1uF	GRM155R61H105KE05D	Murata		c0402_l	
46	5	C420,C424,C444,C446,C456	10uF	GRM188R61C106MA73D	Murata		c0603_l	
47	2	C421,C425	2.2uF	GRM155C71A225KE11D	Murata		c0402_l	
48	2	C426,C427	36pF	C0402C360F5GACTU	Kemet		c0402_l	
49	1	C431	0.01uF/50v	C0402C103K5REC7411	Kemet		c0402_l	
50	2	C437,C438	DNP	0805YD106KAT2A	AVX		c0402_l	DNP
51	2	C445,C447	100nF	C0402C104K4RACT	Kemet		c0402_l	
52	4	C451,C457,C460,C467	220uF	T521D227M016ATE035	Kemet		case_d_7343	
53	8	C452,C454,C458,C459,C461,C464,C468,C469	47uF	C2012JB1A476M125AC	TDK		c0805_l	
54	4	C453,C462,C465,C470	100uF	T598B107M006ATE045	Kemet		case_b_3528	
55	2	C455,C466	1nF	GRM022R61C102ME01L	Murata		c0402_l	
56	2	C463,C471	1nF(DNP)	C0402C104K4RACT	Kemet		c0402_l	
57	1	C474	0.1nF	C0402C104K4RACT	Kemet		c0402_l	
58	1	C535	100uF	TAJD107K016RNJ	Kyocera AVX		Case_D_7343	
59	1	C536	1000pF/3KV	C1812C102KHRACTU	Kemet	CAP CER 1000PF 3KV X7R 1812	c1812_l	
60	2	D1,D2	TLVH431	TLVH431CDBZT	TI		sot23	
61	2	FB10,FB11	BLM21PG221SN1	BLM21PG220SN1D	Murata	FERRITE BEAD 220 OHM 0805 1LN	l0805_h	
62	2	F1,F2	5 Amp	0685T5000-01	Bel	FUSE BOARD	f1206_l	

					Fuse Inc.	MNT 5A 63VAC/VDC 1206		
63	1	J1	HEADER 4	PEC04SAAN	Sullins		HEADER_04X01_127X000_ST	
64	1	J6	JUMPER				HEADER_02X01_254X000_ST	
65	1	J8	USB2_STD_A	10033526-N3212LF	FCI	USB Connectors MINIUSB B TYPE RT ANGLE RECEPTACLE	CONN_USB_1734328-1	
66	1	J9	FTR-110-03-GD-06	FTR-110-03-G-D-06-TR	Samtec	Headers & Wire Housings Surface Mount Micro Header, 0.050 x 0.100 Pitch	CONN_FTR-110-03-GD-06	
67	1	J10	878311420	878311420	Molex	CONN HEADER VERT 14POS 2MM	HEADER_07X02_200X200_STP	
68	1	J11	connector	HEADER		HEADER PIN 16,PITCH 2.54MM	conn_TSW_108_07_G_D	
69	1	J12	JUMPER1	HEADER		HEADER PIN 1X2 ,PITCH 2.54MM	header_02x01_254x000_3_644456	
70	1	J13	CON6	HEADER		HEADER PIN 1X6,PITCH 2.54MM	HEADER_06X01_254X000_ST_SQP	
71	1	J15	DM3BT-DSF-PEJS	DM3BT-DSF-PEJS	Hirose Electric Co Ltd	CONN MICRO SD CARD PUSH-PUSH R/A	CONN_DM3BT-DSF-PEJS	
72	1	J44	DNI HEADER 2	PH1-230/120-021	OnShore Technology	CONN HEADER VERT 2POS 2.54MM	HEADER_02X01_254X000_ST	
73	8	LD1,LD2,LD4,LD5,LD7,LD8,LD9,LD10	LTST-C193KGK	LTST-C193KGKT-5A	Lite-On Inc.	LED GREEN CLEAR CHIP SMD	LED_0603_0090	
74	6	L1,L2,L3,L4,L5,L6	NFM21PC474	NFM21PC474R1C3D	Murata		FILTER_NFL21SP107X	
75	9	L7,L8,L9,L10,L11,L12,L13,L14,L15	1uH	IHLP1616ABER1R0M11	Vishay Dale	Fixed Inductors 1uH 20%	IND_IHLP1212BZER2R2M11	
76	3	L16,L17,L18	BLM21BD121SN1D	BLM21BD121SN1D	Murata	Ferrite Beads 0805	l0805_h	

					Fuse Inc.	MNT 5A 63VAC/VDC 1206		
63	1	J1	HEADER 4	PEC04SAAN	Sullins		HEADER_04X01_127X000_ST	
64	1	J6	JUMPER				HEADER_02X01_254X000_ST	
65	1	J8	USB2_STD_A	10033526-N3212LF	FCI	USB Connectors MINIUSB B TYPE RT ANGLE RECEPTACLE	CONN_USB_1734328-1	
66	1	J9	FTR-110-03-GD-06	FTR-110-03-G-D-06-TR	Samtec	Headers & Wire Housings Surface Mount Micro Header, 0.050 x 0.100 Pitch	CONN_FTR-110-03-GD-06	
67	1	J10	878311420	878311420	Molex	CONN HEADER VERT 14POS 2MM	HEADER_07X02_200X200_STP	
68	1	J11	connector	HEADER		HEADER PIN 16,PITCH 2.54MM	conn_TSW_108_07_G_D	
69	1	J12	JUMPER1	HEADER		HEADER PIN 1X2 ,PITCH 2.54MM	header_02x01_254x000_3_644456	
70	1	J13	CON6	HEADER		HEADER PIN 1X6,PITCH 2.54MM	HEADER_06X01_254X000_ST_SQP	
71	1	J15	DM3BT-DSF-PEJS	DM3BT-DSF-PEJS	Hirose Electric Co Ltd	CONN MICRO SD CARD PUSH-PUSH R/A	CONN_DM3BT-DSF-PEJS	
72	1	J44	DNI HEADER 2	PH1-230/120-021	OnShore Technology	CONN HEADER VERT 2POS 2.54MM	HEADER_02X01_254X000_ST	
73	8	LD1,LD2,LD4,LD5,LD7,LD8,LD9,LD10	LTST-C193KGK	LTST-C193KGKT-5A	Lite-On Inc.	LED GREEN CLEAR CHIP SMD	LED_0603_0090	
74	6	L1,L2,L3,L4,L5,L6	NFM21PC474	NFM21PC474R1C3D	Murata		FILTER_NFL21SP107X	
75	9	L7,L8,L9,L10,L11,L12,L13,L14,L15	1uH	IHLP1616ABER1R0M11	Vishay Dale	Fixed Inductors 1uH 20%	IND_IHLP1212BZER2R2M11	
76	3	L16,L17,L18	BLM21BD121SN1D	BLM21BD121SN1D	Murata	Ferrite Beads 0805	l0805_h	

						120 OHM		
77	1	L19	MI0603L221R-10	MI0603L221R-10	Laird-Signal Integrity Products	FERRITE BEAD 220 OHM 0603 1LN	l0603_h	
78	1	PCB1	AM571x Industrial EVM Bare PCB	3M0000	TI		DNP	
79	1	P1	1410189-3	1410189-3	TE Connectivity	High Speed/Modular Connectors V-46 R/A PLG L/E-MOD P0	CONN_14101893	
80	2	P2,P3	1410190-3	1410190-3	TE Connectivity	High Speed/Modular Connectors VITA D-CARD CTR R/A PLG-16S/E	CONN_14101903	
81	2	Q1,Q4	FDN5630	FDN5630	ON Semi	MOSFET SSOT-3 N-CH 60V	sot23	
82	2	Q2,Q3	MMBT2907A	MMBT2907AWT1G	ON Semi	TRANS PNP 60V 600MA SC70-3(SOT323)	sot323	
83	1	Q5	MMBT3904L	MMBT3904LT1		TRANS NPN 40V 0.2A SOT23	SOT23	
84	2	RN5,RN6	1K	EXB-28V102JX	Panasonic		rn_0402	
85	1	R1	1M	RMCF0402FT1M00	Stackpole Electronics		r0402_l	
86	135	R2,R3,R4,R5,R6,R7,R8,R9,R10,R13,R14,R20,R22,R25,R26,R27,R34,R37,R47,R51,R53,R56,R58,R71,R72,R74,R75,R77,R87,R91,R92,R93,R95,R100,R106,R107,R108,R109,R110,R111,R112,R113,R114,R115,R138,R151,R152,R153,R155,R176,R178,R179,R180,R184,R187,R238,R239,R240,R241,R242,R243,R244,R245,R246,R247,R248,R249,R250,R251,R252,R253,R254,R255,R258,R265,R343,R347,R349,R352,R354,R356,R357,R358,R359,R360,R361,R362,R364,R365,R366,R376,R428,R429,R430,R433,R434,R435	0E	ERJ-2GE0R00X	Panasonic		r0402_l	

		,R436,R437,R438,R439,R440,R441,R442,R443,R444,R445,R446,R451,R454,R455,R456,R461,R467,R468,R469,R471,R472,R480,R485,R487,R489,R491,R492,R498,R509,R515,R517,R518,R524,R580,R582,R583,R584,R647						
87	30	R11,R12,R15,R16,R315,R316,R317,R318,R319,R320,R321,R322,R323,R324,R325,R326,R327,R328,R331,R332,R333,R334,R335,R336,R337,R338,R339,R340,R341,R355	22E	ERJ-U02J220X	Panasonic		r0402_l	
88	13	R17,R18,R19,R344,R348,R370,R371,R375,R378,R389,R501,R504,R505	4.7k	ERJ-2RKF4701X	Panasonic		r0402_l	
89	3	R21,R167,R417	22E	ERJ-U02J220X			r0402_l	
90	14	R23,R24,R163,R164,R166,R170,R173,R174,R175,R345,R346,R415,R419,R421	0E	ERJ-2GE0R00X			r0402_l	
91	4	R28,R29,R32,R43	10k,1%	ERJ-2RKF1002X	Panasonic		r0402_l	
92	8	R30,R31,R33,R35,R36,R40,R41,R46	DNP	ERJ-2GE0R00X	Panasonic		r0402_l	DNP
93	1	R38	22.6K,1%	ERJ-2RKF2262X	Panasonic		r0402_l	
94	3	R39,R44,R522	10K, 1%	ERJ-2RKF1002X	Panasonic		r0402_l	
95	1	R42	DNP				r0402_l	DNP
96	2	R45,R177	0,1%	ERJ-2GE0R00X	Panasonic		r0402_l	
97	2	R48,R506	0.047ohm 1% Sense	LVK12R047FER	Ohmite	RES 0.047 OHM 1% 1/2W 1206	RES_0004_0340X0180_140	
98	1	R49	0.015ohm 0.5% Sense	LVK12R015DER	Ohmite	Current Sense Resistors - SMD 1/2W 0.015 Ohm 0.5% 50ppm	RES_0004_0340X0180_140	
99	1	R50	0.024ohm 0.5% Sense	LVK12R024FER	Ohmite	RES 0.024 OHM 1% 1/2W 1206	RES_0004_0340X0180_140	
100	6	R52,R55,R57,R78,R80,R490	DNP	ERJ-2GE0R00X	Panasonic		r0402_l	

101	38	R54,R62,R65,R68,R70,R82,R83,R84,R86,R88,R89,R90,R96,R99,R104,R105,R116,R119,R181,R288,R291,R292,R293,R294,R295,R297,R298,R299,R300,R301,R302,R313,R573,R574,R575,R576,R579,R644	10K	MCR01MZPJ103	Rohm		r0402_l	
102	1	R59	0.05ohm1 % Sense	LVK12R050FER	Ohmite	RES 0.05 OHM 1% 1/2W 1206	RES_0004_0340X0180_140	
103	8	R60,R63,R97,R98,R271,R289,R290,R303	DNP	MCR01MZPJ103	Rohm		r0402_l	
104	2	R61,R64	499	MCR01MZPF4990	Rohm		r0402_l	
105	2	R66,R67	40.2K	MCR01MZPF4022	Rohm		r0402_l	
106	1	R69	47K	CRCW040247K0FKED	Vishay		r0402_l	
107	1	R73	0e	ERJ-2GEJ102X	Panasonic		r0402_l	
108	1	R76	2K	RCC04022K00FKED	Vishay		r0402_l	
109	3	R79,R81,R94	10K	ERJ-2RKF1002X	Panasonic		r0402_l	
110	2	R85,R103	100K	MCR01MZPJ104	Rohm		r0402_l	
111	2	R101,R102	0E	ERJ-3GEY0R00V	Panasonic		R0603_l	
112	2	R117,R118	49.9	ERA-2AEB49R9X	Panasonic		r0402_l	
113	24	R120,R121,R122,R123,R124,R125,R126,R128,R129,R130,R131,R132,R133,R134,R135,R136,R137,R139,R141,R142,R143,R144,R145,R146	47E	RMCF0402FT47R0	Stackpole Electronics		r0402_l	
114	1	R127	100K	RMCF0402FT100K	Stackpole Electronics		r0402_l	
115	1	R140	10E	RMCF0402JT10R0	Stackpole Electronics		r0402_l	
116	2	R147,R150	240	RMCF0402FT240R	Stackpole Electronics		r0402_l	
117	2	R148,R149	1K	ERJ-2GEJ102X	Panasonic		r0402_l	
118	1	R154	0E(DNP)	ERJ-2GE0R00X	Panasonic		r0402_l	
119	12	R156,R157,R159,R160,R161,R473,R474,R477,R479,R649,R650,R651	33 E 1%	ERJ-2RKF33R0X	Panasonic		r0402_l	
120	10	R158,R168,R169,R171,R172,R237,R329,R330,R351,R353	4.7K	ERJ-2RKF4701X	Panasonic	Resistor 2.2Kohm 1/16W 5% 0402	r0402_l	
121	6	R182,R488,R510,R511,R512,R514	0E	ERJ-2GE0R00X	Panasonic		r0402_l	DNP
122	1	R183	DNP	ERJ-2GE0R00X	Panaso		r0402_l	

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123	1	R185	DNP	ERJ-2RKF1002X	Panasonic		r0402_l	
124	1	R186	1M	ERJ-2GEJ105X	Panasonic		r0402_l	
125	27	R188,R189,R190,R191,R192,R193,R194,R195,R196,R197,R198,R199,R200,R201,R202,R203,R204,R205,R206,R208,R209,R211,R213,R214,R215,R217,R566	33E	ERJ-2RKF33R0X	Panasonic		r0402_l	
126	2	R256,R257	2.2K	CRCW04022K20JNED	Vishay Dale		r0402_l	
127	3	R259,R260,R264	4.7K	RMCF0402JT4K70	Stackpole Electronics		r0402_l	
128	1	R261	100, 1%	ERJ-2RKF1000X	Panasonic		RES SMD 100 OHM 1% 1/16W 0402	r0402_l
129	12	R262,R263,R379,R381,R383,R385,R391,R396,R397,R400,R401,R402	22E	MCR01MZPF22R0	ROHM		r0402_l	
130	3	R266,R269,R270	200K	CR0402-JW-204GLF	Bourns	Resistor 2.2Kohm 1/16W 5% 0402	r0402_l	
131	2	R267,R268	2.2K	CRCW04022K20JNED	Vishay Dale	Resistor 2.2Kohm 1/16W 5% 0402	r0402_l	
132	12	R272,R275,R276,R277,R278,R279,R281,R282,R283,R284,R285,R286	DNP	ERJ-2RKF1802X	Panasonic		r0402_l	
133	4	R273,R274,R280,R287	18K	ERJ-2RKF1802X	Panasonic		r0402_l	
134	1	R296	DNI	MCR01MZPJ103	Rohm		r0402_l	
135	9	R304,R305,R306,R307,R308,R309,R310,R311,R312	49.9K	RMCF0402FT49K9	Stackpole Electronics		r0402_l	
136	1	R314	22E	ERJ-U02J220X	Panasonic		r0402_l	
137	1	R342	10K	ERJ-2RKF1002X	Panasonic		r0402_l	DNP
138	1	R367	0E(DNP)	ERJ-2GE0R00X	Panasonic		R0603_l	
139	2	R368,R369	0E	ERJ-2GE0R00X	Panasonic		R0603_l	
140	3	R372,R373,R374	1.2K	ERA-2AED122X	Panasonic		R0603_l	
141	2	R377,R499	4.7K(DNP)	RMCF0402JT4K70	Stackpole Electronics		r0402_l	
142	1	R380	1K5	ERJ-2GEJ152X	Panasonic		r0402_l	
143	5	R382,R384,R388,R466,R47	100E	ERJ-2RKF1000X	Panaso		r0402_l	

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144	5	R386,R398,R399,R403,R404	0E	ERJ-2GE0R00X	Panasonic		r0402_l	
145	1	R387	0E(NF)DNP	ERJ-2GE0R00X	Panasonic		r0402_l	
146	1	R390	4.7K	RMCF0402JT4K70	Stackpole Electronics		r0402_l	
147	2	R392,R531	1k	ERJ-2GEJ102X	Panasonic		r0402_l	
148	3	R393,R394,R395	4.7K	RMCF0402JT4K70	Stackpole Electronics		r0402_l	
149	1	R406	0E(DNP)	ERJ-2GE0R00X	Panasonic		r0402_l	
150	5	R410,R411,R447,R448,R452	DNP	ERJ-2GE0R00X	Panasonic		r0402_l	
151	14	R414,R478,R495,R513,R516,R519,R521,R523,R526,R581,R589,R590,R591,R592	100k	RMCF0402FT100K	Stackpole Electronics		r0402_l	
152	1	R418	1K5	ESR03EZPJ152	Rohm		r0402_l	
153	3	R420,R645,R646	0E	ERJ-2GE0R00X	Panasonic		r0402_l	DNP
154	3	R422,R423,R449	2.2K	CRCW04022K20JNED	Vishay Dale		r0402_l	
155	4	R424,R425,R426,R427	49.9E	RMCF0402FT49K9	Stackpole Electronics		r0402_l	
156	1	R431	2.49K	ERJ-U02F2491X	Panasonic		r0402_l	
157	1	R432	470E	CRCW0402470RFKED	Vishay Dale		r0402_l	
158	1	R450	4.87K	CRCW04024K87FKEDC	Vishay Dale		r0402_l	
159	4	R453,R459,R484,R486	10k	ERJ-2RKF1002X	Panasonic		r0402_l	
160	2	R457,R458	75E	SFR01MZPF75R0	Rohm		r0402_l	
161	2	R475,R652	33 E 1%	ERJ-2RKF33R0X	Panasonic		r0402_l	
162	1	R476	330E	RCS0402330RFKED	Vishay Dale		r0402_l	
163	1	R481	294k	ERJ2RKD2943X	Panasonic		r0402_l	
164	2	R482,R496	348k	CRCW0402348KFKEDC	Vishay Dale		r0402_l	
165	1	R483	1.15k	ERA-2ARB1151X	Panasonic		r0402_l	
166	1	R493	1.2M,0.1%	SG73P1ETTP125J	Panasonic		r0402_l	
167	1	R494	5.83k	RN731ETTP5831B50	KOA		r0402_l	
168	1	R497	1.15k, 0.1%	ERA-2ARB1151X	Panasonic		r0402_l	
169	1	R500	174k	ERJ-U02D1743X	Panasonic		r0402_l	
170	1	R502	673E, 0.1%	RN73H1ETTP6730B	Panaso		r0402_l	

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171	1	R503	200k	ERJ-H2RD2003X	Panasonic		r0402_l	
172	2	R507,R508	5E1,5%	ERJ-2GEJ5R1X	Panasonic		r0402_l	
173	5	R520,R525,R529,R530,R533	330E	RCS0402330RFKED	Vishay Dale		r0402_l	
174	1	R528	300 ohm	ERJ-2RHD3000X	Panasonic		r0402_l	
175	6	R567,R568,R569,R571,R572,R578	0	ERJ-2GE0R00X	Panasonic		r0402_l	
176	1	R570	22 E	ERJ-U02J220X	Panasonic		r0402_l	
177	1	R577	470K	RMCF0402FT470K	Stackpole Electronics	Resistor 470Kohm 1/16W 1% 0402	r0402_l	
178	1	R648	470E	CRCW0402470RFKED	Vishay Dale		r0402_l	
179	1	SW1	RESET BUTTON	TL3301AF160QJ	E-Switch	SWITCH TACTILE SPST-NO 0.05A 12V	SW_TL3301AF160QJ	
180	2	SW2,SW3	SW PUSHBUTTON	TL3301AF160QJ	E-Switch	SWITCH TACTILE SPST-NO 0.05A 12V	SW_TL3301AF160QJ	
181	1	SW4	TDA08H0SB1	TDA08H0SB1R	C&K Switches	SWITCH SLIDE DIP SPST 25MA 24V	TDA_0008_0127x0076	
182	4	TP1,TP15,TP21,TP22	TP	5002	Keystone Electronics		TP_5001	
183	5	TP2,TP10,TP11,TP12,TP14	TP	5002	Keystone Electronics		tp	
184	7	TP3,TP4,TP5,TP6,TP7,TP8,TP9	TP1mm	N/A	N/A		tp	
185	3	TP17,TP19,TP20	TEST POINT				TP_5001	
186	1	TP18	TEST POINT				tp	
187	3	U3,U5,U31	SN74LVC1G08DCKR	SN74LVC1G08DCKR	TI	IC GATE AND 1CH 2-INP SC70-5	SC70_0005_0215X0140_065	
188	1	U4	SN74LVC1G11DBV	SN74LVC1G11DBVR	TI	IC GATE AND 1CH 3-INP SOT23-6	SOT23_0006_0305X0175_095	
189	2	U7,U53	SN74LVC1G07	SN74LVC1G07DCK	TI	IC BUFFER NON-INVERT 5.5V SC70-5	SC70_0005_0215X0140_065	
190	1	U8	TPS3808G09	TPS3808G09DBVT	TI	IC SUPERVISOR 1 CHANNEL SOT23-6	SOT23_0006_0305X0175_095	

191	1	U9	TPS3808G50DBVR	TPS3808G50DBVR	TI	IC SUPERVISOR 1 CHANNEL SOT23-6	SOT23_0006_0305X0175_095	
192	1	U11	TPD1E10B06	TPD1E10B06DPYR	TI	TVS DIODE 5.5VWM 14VC 2X1SON	XSON_0002_0030x0055	
193	1	U14	S25FL256S	S25FL256SAGMFIR01	Cypress Semiconductor Corp	IC FLASH 256MBIT SPI/QUAD 16SOIC	SOIC_0016_1050X0760_127	
194	1	U15	ADP150-1.8	ADP150AUJZ-1.8-R7	Analog Devices Inc.	IC REG LINEAR 1.8V 150MA TSOT5	Tsot23_5	
195	1	U17	TPS51200	TPS51200DRCR	TI	IC REG CONV DDR 1OUT 10VSON	VSON_0010_0310X0310_050	
196	2	U18,U19	IS43TR16256BL-125KBLI	IS43TR16256BL-125KBLI	ISSI	IC DRAM 4GBIT PARALLEL 96TWBGA	FBGA_96_1350X090_080	
197	1	U20	TPD2E001	TPD2E001DRLR	Texas Instruments	TVS DIODE 5.5VWM SOT5	SOT-5X3-5	
198	2	U22,U42	PCA9306	PCA9306DCTR	TI	IC TRNSLTR BIDIRECTIONAL SM8	ssop_0008_0315x0290_065	
199	1	U23	CAT24C256W	CAT24C256WI-GT3	On Semiconductor	IC EEPROM 256KBIT I2C 1MHZ 8SOIC	soic_0008_0500x0400_127	
200	1	U24	IS21ES16G-JCLI	IS21ES16G-JCLI	ISSI	eMMC 16GB 3.3V 200Mhz eMMC 5.0 I-Temp FBGA-153	fbga_153_1310X1160	
201	1	U26	XC7A200T FBG484	XC7A200T-2FBG484I	Xilinx Inc.	IC FPGA 285 I/O 484FCBGA	fbga_0484_2300x2300_100	XC7A200T-2FBG484I
202	1	U27	TMP411	TMP411ADR	TI	TMP411 REMOTE AND LOCAL TEMPERAT	soic_0008_0500x0400_127	
203	1	U28	DSC6102CI2A-100.0000T	DSC6102CI2A-100.0000T	Micron Technology Inc.	MEMS OSC XO 100.0000MHZ CMOS SMD	SMD_004_0320X0250	
204	1	U29	DP83822H	DP83822HRHBR	TI	IC INTERFACE SPECIALIZED 32VQFN	QFN_0032_0515X0515_050	
205	1	U30	HX1188FNL	HX1188FNL	Pulse Electronics	MODULE XFRMR SGL ETHR LAN	SOT162_1	

					Network	16SOIC		
206	1	U33	DAC124S085CIMM	DAC124S085CIMM/NOPB	TI	IC DAC 12BIT V-OUT 10VSSOP	TSSOP_0010_0310X0310_050	
207	1	U34	LP5907MFX-4.5/NOPB	LP5907MFX-4.5/NOPB	TI	IC REG LINEAR 4.5V 250MA SOT23-5	SOT23_5	
208	1	U35	AD7091R-8BCPZ	AD7091R-8BCPZ	Analog Devices Inc.	IC ADC 12BIT SAR 24LFCSP	LFCSP_0024_0400x0400_050	
209	3	U36,U39,U40	TPS84210	TPS84210RKGR	TI	IC REG BUCK ADJ 2A 39B1QFN	BQFN_0039_1115x0915	
210	1	U37	TPS22965	TPS22965DSGR	TI	C PWR SWITCH N-CHAN 1:1 8WSON	WSON_0008_0210X0210_050	
211	1	U38	TPS84410	TPS84410RKGR	TI	DC DC CONVERTER 0.8-3.6V	BQFN_0039_1115x0915	
212	1	U41	LM3880	LM3880MF-1AE/NOPB	TI	IC PWR SUPPLY SEQUENCER SOT23-6	sot23_0006_0305x0175_095	
213	1	U43	INA226	INA226AIDGSR	TI	IC MONITOR PWR/CURR BIDIR 10MSOP	TSSOP_0010_0310X0310_050	
214	2	U52,U54	SN74LVC1T45	SN74LVC1T45DCKR	TI	IC TRNSLTR BIDIRECTIONAL SC70-6	SC70_0006_0215X0140_065	
215	1	U62	AM5718AABCXQ1	AM5718AABCXQ1	TI	ARM® Cortex®-A15 Microprocessor IC Sitara™ 1 Core, 32-Bit 1.5GHz 760-FCBGA (23x23)	FCBGA_0760_0230X0230_080	
216	1	U63	TPS6590379ZWSR	TPS6590379ZWSR	TI	IC PWR MGMT FOR PROCESSORS	PBGA_0169_1210X1210_080	
217	2	U64,U89	TPD6E001	TPD6E001RSE	TI	TVS DIODE 5VWM 10UQFN	UQFN_0010_0205X0155_050	
218	2	U65,U66	74AVC4T245PW	SN74AVC4T245PWR	TI	IC TRANSLATION TXRX 3.6V 16TSSOP	tssop_0016_0510x0450_065	
219	1	U84	TPD1E10B06	TPD1E10B06DPY	TI	TVS DIODE 5.5VWM 14VC 2X1SON	r0402_l	

220	1	U85	74LV132/SO_0	SN74LV132ADR	TI	IC GATE NAND 4CH 2-INP 14SOIC	SOIC_0014_0875X0400_127	
221	1	U87	SN74AVC16T245DGVR	SN74AVC16T245DGVR	TI	SN74AVC16T245 16-BIT DUAL-SUPPLY	tvsop_0048_1260x0620_050	
222	1	U88	SN74AVC32T245NMJR	SN74AVC32T245NMJR	TI	32-BIT DUAL-SUPPLY BUS TRANSCEIV	BGA_96_1360X0560_080	
223	1	Y1	19.2MHz - 20MHz	ECS-200-12-33-AGN-TR	ECS	Crystals 20MHz 25ppm 12pF -40C +85C	XTAL_0004_0320X0250	
224	1	Y2	7V-16.384MAHV-T	403C35D16M38400	CTS-Frequency Controls	CRYSTAL 16.3840MHZ 18PF SMD	XTAL_0004_0320X0250	
225	1	Y3	ABM8G-25-000-18-D2Y-T	ABM8G-25.000MHZ-18-D2Y-T	Abracon LLC	CRYSTAL 25.0000MHZ 18PF SMD	XTAL_0004_0320X0250	

Table-1: BOM for Black Baseband Module

BOM (Data Converter Module)

Item	Quantity	Reference	Part	MfrNum	Mfr	Description	PCB Footprint	Note
1	1	C1	100uF	T491C107K016ATAUTO	Kemet		Case_C_6032	DNP
2	3	C2,C215,C224	10nF	C0603C103K5RACTU7013	Kemet		c0603_l	
3	15	C3,C4,C11,C15,C16,C18,C19,C20,C21,C75,C84,C142,C143,C216,C219	0.1uF	C0603C104K5RACTU3121	Kemet		c0603_l	
4	12	C5,C6,C27,C162,C165,C168,C179,C182,C185,C195,C198,C201	1nF	C0603X102K4RACTU	Kemet		c0603_l	
5	1	C7	3.3kpF	C0603C332G5GACTU	Kemet		c0603_l	
6	2	C8,C12	DNP		Kemet		c0603_l	DNP
7	83	C9,C10,C22,C25,C29,C31,C33,C35,C38,C40,C42,C46,C48,C50,C52,C54,C56,C57,C61,C66,C67,C70,C72,C77,C78,C79,C81,C82,C85,C86,C87,C89,C91,C93,C95,C97,C99,C101,C102,C104,C106,C108,C110,C112,C114,C124,C126,C129,C132,C135,C138,C140,C141,C145,C146,C154,C157,C161,C164,C167,C171,C173,C1	0.1uF	C0603C104K5RACTU3121	Kemet		c0402_l	

		77,C181,C184,C188,C190,C193,C197,C200,C203,C206,C513,C515,C520,C522,C525,C531,C535,C536,C539,C541,C543						
8	1	C13	15kpF	C0603C153K5RACAUTO	Kemet		c0603_l	
9	1	C14	220nF	C1608X7R1H224K080AB	Kemet		c0603_l	
10	1	C17	NU		Kemet		c0603_l	DNP
11	20	C23,C26,C30,C32,C34,C36,C37,C41,C43,C47,C49,C51,C53,C55,C59,C60,C62,C65,C68,C71	100pF	C0402H101J5GAFT1K0	Kemet		c0402_l	
12	14	C24,C28,C58,C63,C64,C69,C134,C137,C156,C159,C187,C192,C204,C208	1uF	C0603C105Z4VACTU	Kemet		c0603_l	
13	8	C39,C44,C103,C116,C128,C131,C170,C175	4.7uF	C0805C475K4RAC7210	Kemet		c0805_l	
14	3	C45,C117,C176	10kpF	C0603X103K4RACTU	Kemet		c0603_l	
15	41	C73,C74,C80,C83,C88,C90,C92,C94,C96,C98,C100,C105,C107,C109,C111,C113,C115,C125,C127,C130,C133,C136,C139,C147,C155,C158,C163,C166,C169,C172,C174,C180,C183,C186,C189,C191,C196,C199,C202,C205,C207	100pF	C0603C101M4HACTU	Kemet		c0603_l	
16	1	C76	4.7pF	C0805X479C5GACAUTO	Kemet		c0805_l	
17	4	C148,C150,C151,C153	33pF	C0603C330K4RACTU	Kemet		c0603_l	
18	2	C149,C152	56pF	C0603C560F4HACAUTO	Kemet		c0603_l	
19	1	C160	10uF/6.3V	GRM188R61C106MA73D	Murata		c0603_l	
20	2	C178,C194	4.7uF/16V	0603YW475KAT2A	Avx		c0603_l	
21	4	C209,C210,C217,C218	2200pF	C0603C222K4RECAUTO	Kemet		c0603_l	
22	4	C211,C213,C220,C222	1000pF	C0603X102K4RACTU	Kemet		c0603_l	
23	4	C212,C214,C221,C223	1200pF	C0603C122K4RACTU	Kemet		c0603_l	
24	4	C514,C516,C521,C523	0.01uF	C0402C103K5REC7411	Kemet		c0402_l	
25	5	C518,C519,C524,C526,C528	0.1uF	GRM155R71H104KE14D	Murata		c0402_l	
26	1	C527	22pF	C0603C220M5HACTU	Kemet		c0603_l	
27	4	C530,C533,C534,C540	10uF	GRM188R61C106MA73D	Murata		c0603_l	
28	1	C532	15pF	C0603C150K5RA	Kemet		c0603_l	

				C7867				
29	1	C537	10uF	GRM188R61C106MA73D	Murata		c0603_l	
30	2	C538,C542	1uF	C0805X105K5RACAUTO	Kemet		c0805_l	
31	2	C544,C545	15pF	C0603C150K5RAC7867	Kemet		c0603_l	DNP
32	1	DN1	RN739F	RN739FT106	Rohm Semiconductor	RF DIODE PIN 50V 100MW UMD3	SOT323	
33	2	D1,D2	LED,RED				LED_0603_0090	
34	2	F1,F2	FUSE,3A	0685T3000-01	BEL FUSE	FUSE 3.0A 63VAC/DC SLOW 1206	F1206_l	
35	5	J1,J2,J3,J4,J5	R125680000	R125680000	Radiall	RF Connectors / Coaxial Connectors SMA R/A JACK RECEP FOR PCB SLDR LEGS	CONN_SMA_901-144	
36	1	LD1	red,LED	LTST-C193KGK			led0805	
37	1	L1	150nH	L0603CR15JRMST	KEMET	FIXED IND 150NH 300MA 1.2OHM SMD	l0603_l	
38	7	L2,L5,L10,L15,L26,L29,L53	NFE61PT472C1H9L	NFE61PT472C1H9L	Murata	FILTER LC(T) 4700PF SMD	FIL_NFE61PT472C1H9L	
39	4	L3,L17,L54,L55	EXCML16A270U	EXCML16A270U	Panasonic	Ferrite Beads 27 OHM 25% MLC BEAD CORE	l0805_l	
40	12	L4,L6,L7,L8,L11,L13,L14,L16,L27,L28,L30,L31	EXCML45A910H	EXCML45A910H	Panasonic	Ferrite Beads 91 OHM 25% BEAD CORE	l1806	
41	1	L9	8.2nH	HK16088N2J-T	Taiyo Yuden	FIXED IND 8.2NH 300MA 240MOHM SM	l0805_l	
42	8	L18,L19,L20,L21,L22,L23,L24,L25	120nH	AMC-0805-R12J-T	ABRACON	Fixed Inductors FIXED IND	l0805_l	

						120NH 300MA 950 MOHM		
43	10	L32,L33,L34,L35,L36,L37,L38,L39,L40,L56	BLM18BD102SN1D	BLM18BD102SN1D	Murata Electronics	FERRITE BEAD 1 KOHM 0603 1LN	l0603_l	
44	4	L41,L44,L47,L48	2700nH	MLF1608A2R7KTA00	TDK	FIXED IND 2.7UH 30MA 1.15OHM SMD	l0603_l	
45	4	L42,L45,L49,L51	2200nH	MLZ1608N2R2LT000	TDK Corporation	FIXED IND 2.2UH 500MA 180MOHM SM	l0603_l	
46	4	L43,L46,L50,L52	3900nH	0805CS-392EJF	Delta Electronics /Components	FIXED IND 3.9UH 300MA 1.6OHM SMD	l0805_l	
47	1	L59	68nH	L-14C68NJV4T	Johanson	FIXED IND 68NH 300MA 1.2 OHM SMD	l0603_l	
48	5	L60,L61,L62,L63,L64	Farrite bead-600ohm	HZ0805E601R-10	Laird Performance Materials	FERRITE BEAD 600 OHM 0805 1LN	L0805_L	
49	10	MH1,MH2,MH3,MH4,MH5,MH6,MH7,MH8,MH9,MH10	T POINT R				MH_0500X0500_320PT	
50	1	P0	1410189-3	1410189-3	TE Connectivity	High Speed/Modular Connectors V-46 R/A PLG L/E-MOD P0	CONN_14101893	
51	2	P1,P2	1410190-3	1410190-3	TE Connectivity	High Speed/Modular Connectors VITA D-CARD CTR R/A PLG-16S/E	CONN_14101903	
52	1	R1	150E,1%	AC0603FR-7W150RL	Yageo	RES SMD 150 OHM 1% 1/10W 0603	R0603_l	
53	8	R2,R9,R62,R64,R68,R69,R	33E	ERJ-S03F33R0V	Panasonic		R0603_l	

		596,R602						
54	43	R3,R4,R6,R12,R25,R26,R45,R49,R53,R63,R70,R72,R75,R78,R82,R104,R105,R107,R108,R112,R113,R114,R115,R116,R117,R130,R131,R133,R134,R135,R136,R137,R138,R139,R140,R595,R597,R601,R603,R616,R617,R684,R689	0E	ERJ-S030R00V	Panasonic		R0603_I	
55	1	R5	91E	CR0603-FX-91R0ELF	Panasonic		R0603_I	
56	1	R7	4.12K	ERJ-3EKF4121V	Panasonic		R0603_I	
57	1	R8	12K	ERJ-S03F1202V	Panasonic		R0603_I	
58	2	R10,R13	82E	ERJ-3EKF82R0V	Panasonic		R0603_I	
59	1	R11	200E	ERJ-S03F2000V	Panasonic		R0603_I	
60	1	R14	5.1K, 1%	CR0603AFX-5101EAS	Bourns Inc.		RES SMD 5.1K OHM 1% 1/10W 0603	R0603_I
61	103	R15,R22,R23,R24,R28,R29,R31,R33,R41,R42,R46,R48,R52,R57,R58,R59,R60,R61,R76,R81,R83,R89,R91,R92,R93,R99,R102,R110,R111,R118,R119,R120,R121,R122,R123,R124,R125,R126,R127,R620,R621,R622,R623,R624,R625,R626,R627,R628,R629,R630,R631,R632,R633,R634,R635,R636,R637,R638,R639,R640,R641,R642,R643,R644,R645,R646,R647,R648,R649,R650,R651,R652,R653,R654,R655,R656,R657,R658,R659,R660,R661,R662,R663,R664,R665,R666,R667,R668,R669,R670,R671,R672,R673,R674,R675,R676,R677,R678,R679,R680,R681,R682,R683	10E	ERJ-U02F10R0X	Panasonic		r0402_I	
62	1	R16	1K	ERJ-U03F1001V	Panasonic		R0603_I	
63	12	R17,R18,R19,R27,R30,R32,R47,R51,R67,R73,R90,R106	DNP		Panasonic		R0603_I	DNP
64	8	R20,R21,R37,R38,R39,R40,R109,R128	240E	ERJ-S03F2400V	Panasonic		R0603_I	
65	12	R34,R35,R36,R43,R44,R50,R55,R56,R79,R80,R591,R592	1K,1%	ERJ-U03F1001V	Panasonic		R0603_I	
66	1	R54	51E	ERJ-U03F51R0V	Panasonic		R0603_I	

67	2	R65,R66	24E	ERJ-3EKF24R0V	Panasonic		R0603_l	
68	4	R71,R85,R129,R586	100E	ERJ-2RKF1000X	Panasonic		r0402_l	
69	1	R77	0E	ERJ-2GE0R00X	Panasonic		r0402_l	
70	7	R84,R86,R87,R88,R94,R101,R598	10K	ERJ-U03F1002V	Panasonic		R0603_l	
71	4	R95,R96,R97,R98	49.9E,1%	ERJ-U03F49R9V	Panasonic		R0603_l	
72	2	R100,R103	10E	ERJ-U02F10R0X	Panasonic		r0402_l	DNP
73	1	R587	2K	ERJ-U03F2001V	Panasonic		R0603_l	
74	2	R593,R600	100K(DNP)		Panasonic		R0603_l	DNP
75	3	R594,R607,R608	10E	ERJ-S03F10R0V	Panasonic		R0603_l	
76	1	R599	49.9E	ERJ-U03F49R9V	Panasonic		R0603_l	
77	2	R618,R619	49.9E	ERJ-U03F49R9V	Panasonic		R0603_l	DNP
78	2	R685,R686	0E	ERJ-S030R00V	Panasonic		R0603_l	DNP
79	2	R687,R688	330E	ERJ-U02F3300X	Panasonic		r0402_l	
80	1	R690	1k	ERJ-S02J102X	Panasonic		r0402_l	
81	2	TP1,TP13	MUX_OUT				tp_105	
82	13	TP2,TP14,TP15,TP16,TP17,TP18,TP19,TP20,TP21,TP22,TP23,TP24,TP25	T POINTS				tp_105	
83	1	T1	ADT1_1WT	ADT1_1WT+	Mini-Circuits	Audio Transformers / Signal Transformers RF XFMR / SURF MOUNT / RoHS	TRF_6pin_CD542	
84	1	T1A	TC4-1W	TC4-1W+	Mini-Circuits	1:4 CORE & WIRE TRANSFORMER, 3 -	TRF_5p_TC4-1W	
85	1	T2	ADT1-1WT+	ADT1_1WT+	Mini-Circuits	Audio Transformers / Signal Transformers RF XFMR / SURF MOUNT / RoHS	TRF_6pin_CD542	
86	2	T3,T4	ADT2-1T-1P	ADT2-1T-1P+	Mini-Circuits	1:2 CORE & WIRE TRANSFORMER, 8 -	TRF_6pin_CD542	
87	1	U1	MAAL-010704	MAAL-010704-TR3000	MACOM	IC AMP GP 100MHZ-3.5GHZ SC70-6	SC70_0006_0215X0140_065	

88	1	U2	AD9517-3	AD9517-3ABCPZ	Analog Devices Inc	IC CLOCK GEN 2.0GHZ VCO 48LFCSP	lfcsp_0048_0700x0700_050	
89	6	U3,U5,U8,U10,U16,U60	NC7WZ07P6X	NC7WZ07P6X	ON Semiconductor	IC BUFFER NON-INVERT 5.5V SC88 (SC-70-6)	SC70_0006_0215X0140_065	
90	1	U4	ADP150-1.8	ADP150AUJZ-1.8-R7	Analog Devices Inc	IC REG LINEAR 1.8V 150MA TSOT5	TSOT_0005_0290x0160_095	
91	1	U6	ADP1706ARDZ-3.3	ADP1706ARDZ-3.3	Analog Devices Inc	IC REG LINEAR 3.3V 1A 8SOIC	soic_0008_0500x0400_127_PWR	
92	4	U7,U9,U15,U19	ADP124-3.3	ADP124ARHZ-3.3-R7	Analog Devices Inc	IC REG LINEAR 3.3V 500MA 8MSOP	msop_0008_0310x0310_065_pwr	
93	1	U11	AD9467	AD9467BCPZ-200	Analog Devices Inc	IC ADC 16BIT PIPELINED 72LFCSP	lfcsp_0072_1000x1000_050_pwr	
94	3	U12,U20,U62	ADP1706ARDZ-1.8	ADP1706ARDZ-1.8	Analog Devices Inc	IC REG LINEAR 1.8V 1A 8SOIC	soic_0008_0500x0400_127_PWR	
95	3	U14,U21,U22	ADP124-1.8	ADP124ARHZ-1.8-R7	Analog Devices Inc.	IC REG LINEAR 1.8V 500MA 8MSOP	msop_0008_0310x0310_065_pwr	
96	1	U17	AD9125	AD9125BCPZ	Analog Devices Inc	Digital to Analog Converters - DAC 16 Bit Dual Signal Proc DAC LFCSP-72	lfcsp_0072_1000x1000_050_6pwr	
97	1	U18	LM75AIM/NOPB	LM75AIM/NOPB	TI	Board Mount Temperature Sensors Digital Temp Sensor	soic_0008_0500x0400_127	

98	1	U59	AD9642 BCPZ-170	AD9642BCPZ-170	Analog Devices Inc.	Analog to Digital Converters - ADC 14 Bit 170 Msps 1.8V ADC LFCSP-32	lfcsp_0032_0500x0500_050	
99	1	U63	ADP3333ARMZ-1.8-RL	ADP3333ARMZ-1.8-RL	Analog Devices Inc	Linear Voltage Regulators 300mA fixed anyCAP LDO MSOP-8	msop_0008_0310x0310_065	

Table-2: BOM for Data Converter Module

BOM (Radio Control Module)

Item	Quantity	Reference	Part	MfrNum	Description	PCB Footprint
1	1	BT1	BR1632A			BATTERY_HOLDER
2	62	C1,C2,C3,C4,C9,C11,C13,C14,C15,C34,C53,C55,C57,C63,C71,C75,C81,C82,C85,C86,C91,C94,C101,C107,C108,C111,C112,C115,C189,C191,C192,C194,C195,C199,C200,C204,C205,C206,C208,C239,C240,C241,C242,C243,C244,C261,C262,C263,C288,C290,C292,C297,C301,C326,C329,C330,C331,C332,C333,C340,C341,C342	0.1uF	C0402C104K4RACT		C0402_L
3	1	C5	220pF/50V			C0603_L
4	1	C6	0.33uf,16V	C0402C103K4RACTU		C0402_L
5	4	C7,C8,C10,C12	24pF	CC0402JRNPO9BN240		C0402_L
6	110	C16,C24,C26,C27,C28,C32,C33,C37,C38,C39,C40,C41,C42,C43,C44,C47,C50,C62,C69,C77,C83,C87,C92,C100,C109,C113,C117,C119,C120,C121,C123,C124,C126,C127,C129,C130,C132,C133,C135	0.01uF	C0402C103K4RACTU		C0402_L

		,C136,C138,C139,C141,C143,C187,C209,C210,C211,C213,C214,C215,C216,C217,C219,C220,C221,C222,C223,C224,C225,C226,C227,C228,C229,C230,C231,C232,C233,C234,C235,C236,C237,C238,C246,C247,C248,C249,C251,C252,C253,C254,C255,C256,C257,C258,C259,C260,C269,C270,C272,C273,C274,C275,C276,C277,C278,C279,C282,C283,C284,C285,C286,C377,C378,C379,C382,C433,C434,C435,C436				
7	30	C17,C18,C19,C20,C21,C22,C23,C25,C29,C30,C31,C54,C56,C61,C74,C76,C80,C84,C93,C103,C106,C110,C122,C125,C128,C131,C134,C137,C271,C280	1uF	0402ZD105KAT2A		C0402_L
8	1	C35	100uF	APXE160ARA101MH70G		CASE_B_3528
9	22	C36,C45,C46,C59,C60,C66,C67,C78,C79,C89,C90,C97,C98,C105,C118,C155,C193,C196,C197,C201,C202,C203	10uF	0805YD106KAT2A		C0402_L
10	6	C48,C52,C68,C73,C95,C102	0.022uF	C0402C223K4RACTU		C0402_L
11	8	C49,C51,C58,C64,C70,C72,C96,C99	0.047uF	C0402C473K4RACTU		C0402_L
12	3	C65,C88,C104	47uF	TAJD476K010RNJ		CASE_B_3528
53	2	C403,C404	47uF			CASE_B_3528
13	6	C114,C287,C289,C300,C325,C328	1uF	C0402C104K4RACT		C0402_L
14	9	C116,C158,C159,C188,C245,C264,C267,C372,C384	0.1uF	C0402C103K4RACTU		C0402_L
15	3	C140,C142,C160	10uF	GRM188R60J106ME47D		C0402_L
16	2	C144,C145	10pF	RFCS04022700BJTT1		C0402_L
17	1	C146	DNI	C0402C103K4RACTU		C0402_L
18	1	C147	2.2uF	C1005X7R1H104K		C0402_L
19	1	C148	0.1uF	C1005X7R1H104K		C0402_L

20	6	C149,C152,C164,C165,C167,C281	2.2uF	C0805C225K4RACTU		C0402_L
21	9	C150,C151,C153,C154,C156,C157,C163,C166,C168	2.2uF	JMK105BJ225MV-F		C0402_L
22	1	C161	1uF	GRM188R60J106ME47D		C0402_L
23	1	C162	150uF	TAJD476K010RNJ		CASE_D_7343
43	1	C337	150uF	C0402C104K4RACT		CASE_D_7343
24	9	C169,C170,C173,C175,C177,C179,C181,C183,C185	4.7uF	EMK107ABJ475KA-T		C0603_L
25	9	C171,C172,C174,C176,C178,C180,C182,C184,C186	47uF, 10V	GRM31CR61A476ME15L		C0805_L
26	2	C190,C198	0.001uF	04025C102JAT2A		C0402_L
27	1	C207	10pF	04025U100FAT2A		C0402_L
28	3	C212,C218,C250	22uF	C2012X5R1C226K125AC		C0603_L
29	2	C265,C266	12pF	C0402C103K4RACTU		C0402_L
30	3	C268,C375,C376	4.7uF	C0402C103K4RACTU		C0603_L
31	26	C291,C296,C303,C304,C320,C347,C348,C349,C350,C351,C352,C353,C354,C355,C356,C357,C358,C359,C360,C361,C362,C367,C368,C369,C370,C371	0.01uF	C0402C104K4RACT		C0402_L
32	5	C293,C298,C324,C327,C338	10uF	C0402C104K4RACT		C0402_L
33	2	C294,C295	2.2uF	C0402C104K4RACT		C0402_L
34	2	C299,C302	36pF	C0402C104K4RACT		C0402_L
35	11	C305,C307,C321,C394,C399,C401,C411,C412,C413,C414,C426	1uF			C0402_L
36	24	C306,C308,C310,C314,C322,C385,C390,C391,C392,C393,C395,C396,C398,C400,,C406,C407,C417,C418,C419,C420,C421,C422,C423,C424,C432	0.1uF			c0402_l
37	6	C309,C313,C317,C323,C386,C389	0.01uF			C0402_L
38	5	C311,C315,C397,C410,C425	10uF			C0402_L
39	2	C312,C316	2.2uF			C0402_L
40	2	C318,C319	36pF			C0402_L
41	1	C334	220uF	C0402C104K4RACT		CASE_D_7343
42	2	C335,C336	47uF	C0402C104K4RACT		CASE_B_3528
44	1	C339	1nF	C0402C104K4RACT		C0402_L
45	1	C343	0.1uF	0805YD106KAT2A		C0402_L
46	1	C344	220pF	0805YD106KAT2A		C0603_L

47	1	C373	0.001uF	C0402C103K4RACTU		C0402_L
48	1	C374	1uF	C0402C103K4RACTU		C0402_L
49	2	C380,C383	4.7uF/16V			C1206_TAN
50	2	C381,C387	1uF/16V	C0402C103K4RACTU		C0402_L
51	1	C388	10uF	C0402C103K4RACTU		C0402_L
52	1	C402	0.47uF			C0402_L
54	4	C405,C408,C409	NF			C0402_L
55	3	C415,C416,C427	4.7uF			C0603_L
56	4	C428,C429,C430,C431	0.1uF,16V	C0402C104K4RACT		c0402_l
57	2	D1,D2	TLVH431	TLVH431ACDBZR	IC VREF SHUNT ADJ 1% SOT23-3	SOT23
58	1	D3	LTST-C193KGKT			LED_002_0175X0095_0045_A
59	1	D4	S1A	S1A	Rectifiers 50V 1a Rectifier Glass Passive	SMA
60	1	D5	ESD9101	ESD9101P2T5G	TVS DIODE 5VWM 7VC SOD923	SOD523
61	2	D6,D7	PESD0603-240	PESD0603-240	TVS DIODE 24VWM 45VC 0603	LED_002_0175X0095_0045_A
62	3	FB1,FB2,FB3	BLM21PG221SN1	BLM21PG221SN1D	FERRITE BEAD 220 OHM 0805 1LN	L0805_L
63	4	FB4,FB5,L16,L17	BLM21BD121SN1D	BLM21BD121SN1D	FERRITE BEAD 120 OHM 0805 1LN	L0805_L
64	2	F1,F2	5 Amp	0685T5000-01	FUSE BOARD MNT 5A 63VAC/VDC 1206	FUSE_1206
65	1	J1	HEADER 4	PEC04SAAN		HEADER_04X01_254X000_ST_SQP
66	6	J2,J3,J4,J5,J8,J11	HEADER 2	PH1-230/120-021		HEADER_02X01_254X000_ST
67	1	J6	JUMPER	header		CONN_TSW-102-23-T-S
68	1	J7	DM3BT-DSF-PEJS	DM3BT-DSF-PEJS	CONN MICRO SD CARD PUSH-PUSH R/A	CONN_DM3BT-DSF-PEJS

69	1	J9	CTI JTAG	FTR-110-03-G-D-06	CONN HEADER SMD 20POS 1.27MM	HEADER_FTSH_110_01_L_DV
70	1	J10	CON6	Header		header_06x01_254x000_st
71	1	J12	USB2_STD_A	87520-0010BLF	CONN RCPT USB2.0 TYPEA 4POS R/A	CONN_USB_87520
72	1	J13	TEST CON			Conn_header_TSW_102_07_T_S
73	1	J14	CONN SOCKET 2			conn_header_1803426
74	1	J15	EXT_GPS_ANTENNA			CONN_SMA
75	1	J18	HEADER 5			HEADER_05X01_254X000_ST
76	3	LD1,LD5,LD6	LTST-C193KGK			LED_ZVG54W
77	3	LD2,LD3,LD4	LTST-C193KGK			led_0805
78	7	L1,L2,L3,L4,L5,L6,L27	NFM21PC474	NFM21PC474R1C3D	CAP FEEDTHRU 0.47UF 20% 16V 0805	FILTER_NFM21PC
79	9	L7,L8,L9,L10,L11,L12,L13,L14,L15	1uH	IHLP1616ABER1R0M11	FIXED IND 1UH 4.2A 47 MOHM SMD	IHLP1616ABER1R0M11
80	3	L18,L19,L20	ACM2012H	ACM2012H-900-2P-T05	CMC 300MA 2LN 90 OHM SMD	Choke_ACM2012H
81	1	L21	NFL21SP106	NFL21SP106X1C3D	FILTER LC(PI) 680NH/670PF SMD	filter_NFL21SP106X1C3D
82	1	L22	MLG1608B33NJT	MLG1608B33NJT	33 nH Unshielded Multilayer Inductor 500 mA 500mOhm Max 0603 (1608 Metric)	L0603_L
83	4	L23,L24,L25,L26	MI0603L221R-10	MI0603L221R-10	FERRITE BEAD 220 OHM 0603 1LN	L0603_L
84	1	L28	BLM18AG121SN1D	BLM18AG121SN1D	FERRITE BEAD 120 OHM 0603 1LN	L0603_L
85	1	P0	1410189-3	1410189-3		conn_14101893

86	2	P1,P2	1410190-3	1410190-3		conn_14 101903
87	8	Q1,Q4,Q5,Q6,Q7,Q9,Q10,Q11	FDN5630	FDN5630	MOSFET N-CH 60V 1.7A SUPERSOT3	SOT23
88	2	Q2,Q3	MMBT2907 A	MMBT2907AWT1G	SMALL SIGNAL BIPOLAR TRANSISTOR,	SC70_00 03_022 0X0135 _065
89	1	Q8	SI2333DS-T1-E3	SI2333DS-T1-E3 / SI2333DS-T1-GE3	MOSFET P-CH 12V 4.1A SOT23-3	SOT23
90	1	Q12	MMBT3904 /SOT	MMBT3904WT1	Bipolar Transistors - BJT SOT-23 NPN GEN PUR	sot23
91	107	R1,R2,R3,R4,R5,R6,R7,R8,R9,R10,R11,R12,R13,R14,R15,R16,R17,R18,R19,R20,R23,R24,R25,R33,R35,R42,R43,R45,R48,R49,R50,R54,R55,R59,R61,R66,R67,R69,R70,R72,R84,R87,R89,R90,R93,R110,R113,R115,R116,R117,R118,R119,R120,R121,R146,R165,R167,R170,R171,R173,R174,R175,R176,R177,R178,R179,R180,R200,R264,R271,R272,R273,R275,R276,R278,R279,R280,R281,R282,R283,R284,R285,R286,R287,R288,R289,R292,R296,R297,R298,R328,R329,R330,R335,R336,R340,R353,R357,R359,R374,R375,R400,R467,R468,R469,R470	0E	ERJ-2GE0R00X		r0402_l
92	5	R21,R22,R265,R266,R290	2.2K	ERJ-2GE0R00X		R0402_L
93	13	R26,R338,R349,R365,R366,R367,R368,R369,R370,R371,R372,R373,R377	100k	ERJ-2GE0R00X		R0402_L
94	17	R27,R248,R249,R250,R251,R252,R253,R254,R255,R256,R257,R258,R259,R260,R261,R262,R263	22E	ERJ-2GE0R00X		R0402_L

95	14	R28,R37,R38,R39,R40,R57,R58,R60,R73,R75,R351,R358,R361	DNP	ERJ-2GE0R00X		R0402_L
96	1	R29	DNP			R0402_L
97	3	R30,R44,R47	10K,1%	ERJ-2GE0R00X		R0402_L
98	1	R31	10k,1%			R0402_L
99	2	R32,,R34,R164	0E,1%	ERJ-2GE0R00X		R0402_L
100	1	R36	22.6K,1%	MCR01MZPJ103		R0402_L
101	2	R41,R46	1M	RMCF0402FT1M00		R0402_L
102	2	R51,R354	0.047ohm1% Sense	LVK12R047FER	Resistor 0.047ohm 0.5W Sense 1% 1206	RES_0004_0340x0180_140
103	1	R52	0.024ohm0.5% Sense	LVK12R024FER	Resistor 0.024ohm 0.5W Sense 0.5% 1206	RES_0004_0340x0180_140
104	1	R53	0.015ohm0.5% Sense	LVK12R015DER	Resistor 0.015ohm 0.5W Sense 0.5% 1206	RES_0004_0340x0180_140
105	42	R56,R63,R65,R77,R79,R80,R81,R82,R83,R85,R86,R88,R94,R97,R98,R99,R102,R105,R111,R112,R124,R131,R166,R181,R183,R184,R185,R186,R187,R221,R224,R225,R226,R227,R228,R231,R232,R233,R234,R235,R237	10K	MCR01MZPJ103		R0402_L
106	1	R62	0.05ohm1% Sense	LVK12R050FER	Resistor 0.05ohm 0.5W Sense 1% 1206	RES_0004_0340x0180_140
107	1	R64	47K	CRCW040247K0FKED		R0402_L
108	1	R68	0E	ERJ-2GEJ102X		R0402_L
109	1	R71	2K	MCR01MZPJ103		R0402_L
110	2	R74,R76	10K	ERJ-2GEJ102X		R0402_L
111	9	R78,R114,R382,R387,R392,R394,R471,R475,R477	100K	MCR01MZPJ103		R0402_L
112	1	R91	1K	ERJ-2GEJ102X		R0402_L
113	1	R92,R230	DNP	ERJ-2GEJ102X		R0402_L
114	9	R95,R96,R100,R103,R220,R222,R223,R229,R236	DNP	MCR01MZPJ103		R0402_L
115	2	R101,R104	499E	MCR01MZPF4990		R0402_L
116	2	R106,R107	40.2K	MCR01MZPF4022		R0402_L
117	2	R108,R109	0E	ERJ-3GEY0R00V		R1206_L
118	2	R122,R123	49.9E	ERA-2AEB49R9X		R0402_L

119	24	R125,R126,R127,R128,R129,R130,R132,R134,R135,R136,R137,R138,R139,R140,R141,R142,R143,R145,R147,R148,R149,R150,R151,R152	47E	RMCF0402FT47R0		R0402_L
120	1	R133	100K	RMCF0402FT100K		R0402_L
121	1	R144	10E	RMCF0402JT10R0		R0402_L
122	3	R153,R154,R163	240E	RMCF0402FT240R		R0402_L
123	8	R155,R156,R157,R158,R159,R160,R161,R162	10K	RMCF0402FT240R		R0402_L
124	1	R168	DNP	CRCW040218K2FKED		R0402_L
125	1	R169	DNP	ERJ-2RKF2052X		R0402_L
126	2	R172,R403	10k	ERJ-2RKF2052X		R0402_L
127	1	R182	470K	MCR01MZPJ103		R0402_L
128	1	R188	22E	MCR01MZPJ103		R0402_L
129	6	R189,R190,R191,R192,R193,R194	0E	MCR01MZPJ103		R0402_L
130	3	R195,R196,R201	4.7K	RMCF0402JT4K70		R0402_L
131	1	R197	100E	ERJ-2RKF1000X		R0402_L
132	2	R198,R199	22E	MCR01MZPF22R0		R0402_L
133	12	R202,R205,R206,R207,R208,R209,R212,R213,R214,R215,R216,R485,R486	DNP	ERJ-2RKF1802X		R0402_L
134	4	R203,R204,R210,R211,R217	18K	ERJ-2RKF1802X		R0402_L
135	2	R218,R219,,R432	2.2K	CRCW04022K20JNED	Resistor 2.2Kohm 1/16W 5% 0402	R0402_L
136	9	R238,R239,R240,R241,R242,R243,R244,R245,R246	49.9K	RMCF0402FT49K9		R0402_L
137	1	R247	22E	RMCF0402FT49K9		R0402_L
138	4	R267,R268,R269,R270	49.9E	ERJ-2GE0R00X		R0402_L
139	1	R274	470E	ERJ-2GE0R00X		R0402_L
140	1	R277	2.49K	ERJ-2GE0R00X		R0402_L
141	1	R291	4.87K	ERJ-2GE0R00X		R0402_L
142	2	R293,R294	75E	ERJ-2GE0R00X		R0402_L
143	8	R295,R327,R341,R346,R348,R398,R399,R402	10K	ERJ-2GE0R00X		R0402_L
144	4	R299,R300,R301,R302	49.9E			R0402_L
145	30	R303,R304,R305,R306,R307,R308,R309,R310,R312,R314,R315,R316,R317,R318,R319,R321,R322,R409,R421,R422,R423,R433,R434,R435,R441,R442,R443,R446,R448,R450,R483,R484	0E			R0402_L
146	3	R311,R407,R408	470E			R0402_L
147	1	R313	2.49K			R0402_L

148	2	R320,R323	2.2K			R0402_L
149	1	R324	4.87K			R0402_L
150	2	R325,R326	1.96K			R0402_L
151	2	R332,R333	75E			R0402_L
152	3	R334,R337,R401	100E	ERJ-2GE0R00X		R0402_L
153	3	R339,R345,R347	0E	ERJ-2GE0R00X		R1206_L
154	1	R342	294k	ERJ-2GE0R00X		R0402_L
155	1	R343	348k	ERJ-2GE0R00X		R0402_L
156	1	R344	1.15k	ERJ-2GE0R00X		R0402_L
157	1	R350	15k	ERJ-2GE0R00X		R0402_L
158	1	R352	1k	ERJ-2GE0R00X		R0402_L
159	2	R355,R356	5E1,1%	ERJ-2GE0R00X		R0603_L
160	5	R376,R379,R380,R381,R390	330E			R0402_L
161	1	R378	300E	ERJ-2GE0R00X		R0402_L
162	3	R383,R388,R395	100E	MCR01MZPJ103		R0402_L
163	3	R384,R385,R386	330E	MCR01MZPJ103		R0402_L
164	9	R389,R391,R454,R472,R473,R474,R476,R478,R479	100E			R0402_L
165	1	R393	600E			R0402_L
166	1	R396	1M			R0402_L
167	1	R397	90K	ERJ-2GE0R00X		R0603_L
168	11	R331,R404,R405,R406,R411,R412,R413,R420,R451,R452,R453,R482	10k			R0402_L
169	5	R410,R444,R445	100k			R0402_L
170	8	R414,R419,R424,R426,R438	NF			R0402_L
171	5	R415,R416,R417,R418,R436	10E			R0402_L
172	4	R425,R437,R439,R440	20K			R0402_L
173	1	R427	22E			R0402_L
174	4	R428,R429,R430,R431	10E,5%			R0402_L
175	3	R447,R449,R481	1k			R0402_L
176	1	R455	3.3K			R0402_L
177	1	R480	0 E			R0402_L
179	2	SW2,SW3	SW PUSHBUTTON	TL3301AF160QJ	Switch Push Button tactile NO	sw_0004_TL3301AF160QJ
180	12	TP1,TP9,TP10,TP11,TP12,TP13,TP14,TP15,TP16,TP21,TP22,TP23	TP	5002		TP_0081_000PS
181	8	TP2,TP3,TP4,TP5,TP6,TP7,TP8,TP17	TP1mm	N/A		TP_0081_000PS
182	5	TP18,TP19,TP20,TP36,TP37	TEST POINT			TP_0081_000PS
183	12	TP24,TP25,TP26,TP27,TP28,TP29,TP30,TP31,TP32,TP33,TP34,TP35	TP	5002		MH_0000X0000_320NPT
184	3	TP38,TP39,TP40	T POINT S			TP_0120_080PT

185	1	U1	AM5718AABCXQ1	AM5718AABCXQ1	ARM® Cortex®-A15 Microprocessor IC Sitara™ 1 Core, 32-Bit 1.5GHz 760-FCBGA (23x23)	FCBGA_0760_0230X0230_080
186	1	U2	SN74LVC1G11DRYR	SN74LVC1G11DRYR	IC GATE AND 1CH 3-INP 6SON	SON_0006_0150X0105_050
211	1	U37	TPS3808G09DBVR	TPS3808G09DBVR	IC SUPERVISOR 1 CHANNEL SOT23-6	sot23_0006_0305x0175_095
187	1	U3	TPS3808G09DBVR	TPS3808G09DBVR	IC SUPERVISOR 1 CHANNEL SOT23-6	sot23_0006_0305x0175_095
188	1	U4	74LV132/SO_0	74LV132PW,118	IC GATE NAND 4CH 2-INP 14TSSOP	TSSOP_0014_0510X0450_065
189	3	U6,U25,U29	SN74LVC1G08/SOT23	SN74LVC1G08DCKR	IC GATE AND 1CH 2-INP SC70-5	SC70_0005_0215X0140_065
190	1	U7	TPS3808G50DBVR	TPS3808G50DBVR	IC SUPERVISOR 1 CHANNEL SOT23-6	SOT23_0006_0300X0175_095
191	1	U8	TPS6590379ZWSR	TPS6590379ZWSR	Processor PMIC 169-NFBGA (12x12)	PBGA_0169_1210X1210_080
192	5	U9,U19,U50,U52,U56	TPD1E10B06	TPD1E10B06DPY	TVS DIODE 5.5VWM 14VC 2X1SON	X1SON
193	1	U10	SN74LVC1G07	SN74LVC1G07DCK	IC BUFFER NON-INVERT 5.5V SC70-5	sc70_0005_0215x0140_065
194	1	U12	S25FL256S	S25FL256SAGMFIR01	FLASH - NOR Memory IC 256Mb (32M x 8) SPI - Quad I/O 133 MHz 16-SOIC	SOIC_0016_1050X0760_127
195	1	U13	TPS51200	TPS51200DRCR	IC REG CONV DDR 1OUT 10VSON	VSON_0010_0310X0310_050
196	3	U14,U15,U16	IS43TR16256BL-125KBLI	IS43TR16256BL-125KBLI	IC DRAM 4GBIT PARALLEL 96TWBGA	FBGA_96_1350X090_080
197	1	U18	MCP79410	MCP79410T-I/SN	IC RTC	SOIC_00

			/TFDN		CLK/CALENDAR I2C 8-SOIC	08_0500X0400_127
198	1	U20	TPD6E001	TPD6E001RSE	TVS DIODE 5VWM 10UQFN	UQFN_0010_0205X0155_050
199	1	U21	CAT24C256W	CAT24C256WI-GT3	IC EEPROM 256KBIT I2C 1MHZ 8SOIC	SOIC_0008_0500X0400_127
200	1	U22	IS21ES16G-JCLI	IS21ES16G-JCLI	eMMC 16GB 3.3V 200Mhz eMMC 5.0 I-Temp FBGA-153	FBGA_153_1310X1160
201	2	U23,U26	DP83822H	DP83822HRHBT	IC INTERFACE SPECIALIZED 32VQFN	QFN_0032_0515X0515_050
202	2	U24,U28	HX1188FNL	HX1188FNL	MODULE XFRMR SGL ETHR LAN 16SOIC	TRANSFORM_0016_1270X0711_127
203	1	U27	TPD4E1U06DCKR	TPD4E1U06DCKR	TVS DIODE 5.5VWM 15VC SC70-6	SC70_0006_0215X0140_065
204	1	U30	TRS3386EIPWR	TRS3386EIPWR	IC TRANSCEIVER FULL 3/2 20TSSOP	TSSOP_0020_0660X0450_065
205	1	U31	TPD2E007	TPD2E007DCKR	TVS DIODE 13VWM SC70-3	SC70_0003_0220X0135_065
206	1	U32	TPS84210	TPS84210RKGR	IC REG BUCK ADJ 2A 39B1QFN	BQFN_0039_1115X0915
207	1	U33	TPS22965	TPS22965NDSGR	IC PWR SWITCH N-CHAN 1:1 8WSON	WSON_0008_0210X0210_050
208	1	U34	TPS1H000	TPS1H000AQDGNRQ1	IC PWR DRIVER N-CHAN 1:1 8MSOP	MSOP_0008_0310X0310_065_PWR
209	1	U35	TMP1075DR	TMP1075DR	I2C Temperature sensor 8-SOIC	SOIC_0008_0500X0400_127
210	1	U36	INA226	INA226AIDGSR	IC MONITOR PWR/CURR BIDIR 10MSOP	msop_0010_0310x0310

						_050
212	9	U39,U40,U41,U42,U43,U44,U45,U46,U62	SN74LVC1T45	SN74LVC1T45DBVR	IC TRNSLTR BIDIRECTIONAL SOT23-6	SOT23_0006_0300X0175_095
213	3	U49,U51,U55	SN74LVC1G17DCKR	SN74LVC1G17DCKR	IC BUF NON-INVERT 5.5V SC70-5	SC70_0005_0215X0140_065
214	8	U53,U54,U78,U79,U80,U81,U82,U83	TPD1E10B06	TPD1E10B06DPYR	TVS DIODE 5.5VWM 14VC 2X1SON	D0402_l
215	1	U57	ADP125ACPZ_R7	ADP125ACPZ-R7	Linear Voltage Regulators 500mA LDO Adjustable Vout LFCSP-8	TDFN_0008_0200X0200_0050
216	1	U58	TPD2E001	TPD2E001DRYR	TVS DIODE 5.5VWM 6SON	SON_0006_0150X0105_050
217	1	U59	SP3012-04HTG	SP3012-04HTG	TVS DIODE 5VWM 7VC SOT23-6	SOT23_0006_0300X0175_095
218	1	U60	TPD4S012	TPD4S012DRYR	ESD Suppressors / TVS Diodes 4Ch USB ESD Solution w/ Pwr Clamp SON-6	SON_0006_0150X0105_050
219	1	U61	TPS2051BD	TPS2051BD	Power Switch ICs - Power Distribution Single 1A Current-Limited SOIC-8	SOIC_0008_0500X0400_127
220	1	U63	XM1100	XM1100_1103874	RF RCVR GPS 1.575GHZ MODULE	qfn_0020_0950x0900_120
221	2	U64,U76	LP5907MFX-3.3	LP5907MFX-3.3/NOPB	IC REG LINEAR 3.3V 250MA SOT23-5	SOT23_0005_0300X0175_095
222	2	U65,U66	SN74LVC1G34DRLR	SN74LVC1G34DBVR	IC BUF NON-INVERT 5.5V SOT23-5	SOT23_0005_0300X0175_095
223	1	U67	SN65HVD33DR	SN65HVD33DR	IC TRANSCEIVER FULL 1/1 14SOIC	SOIC_0014_0875X0400_127
224	1	U68	SN74AHC1G14DBVR	SN74AHC1G14DBVR	IC INVERTER 1CH 1-INP SOT23-5	SOT23_0005_0300X0175_095

225	2	U69,U70	CDSOT23-SM712	CDSOT23-SM712	TVS DIODE 7V/12V 14V/26V SOT23-3	SOT23
226	1	U71	TLV320AIC3106IRGZT	TLV320AIC3106IRGZT	IC AUDIO CODEC 24BIT PCM 48VQFN	QFN_0048_0700X0700_050
227	1	U72	LP5907MFX-1.8	LP5907MFX-1.8/NOPB	IC REG LINEAR 1.8V 250MA SOT23-5	SOT23_0005_0300X0175_095
228	1	U73	LP5907MFX-3.0	LP5907MFX-3.0/NOPB	IC REG LINEAR 3V 250MA SOT23-5	SOT23_0005_0300X0175_095
229	1	U74	XR21V1412	XR21V1412	IC USB UART FIFO FULL SPD 32QFN	QFN_0032_0515X0515_050
230	1	U75	PRTR5V0U2F	PRTR5V0U2F	TVS DIODE 5.5VWM 6XSON SOT886	XSON_0006_0150X0105_050
231	1	U77	SN74AVCA164245GR	SN74AVCA164245GR	IC TRNSLTR BIDIRECTIONAL 48TSSOP	tssop_0048_1260x0620_050
232	2	U84,U85	SN74LVC1T45	SN74LVC1T45DBVR	IC TRNSLTR BIDIRECTIONAL SOT23-6	sot23_0006_0305x0175_095
233	1	Y1	19.2MHz	CX2016DB19200H0FLJC2 / CX2016DB20000H0FLJC1	CRYSTAL 19.2000MHZ 12PF SMD	XTAL_0004_0200X0160
234	1	Y2	7A-24.576MAHE-T	7A-24.576MAHE-T	Crystals 24.576MHz 12pF 30ppm -40C +85C	XTAL_0002_0520X0340_ABM3
235	1	Y3	16.384MHz	ECS-163.84-18-5PLX-AGN-TR	CRYSTAL 16.3840MHZ 18PF SMD	XTAL_0002_1140X0485
236	1	Y4	ECS-327-6-12-TR	ECS-327-6-12-TR	CRYSTAL 32.7680KHZ 6PF SMD	XTAL_0002_0210X0130_000PS
237	1	Y5	25 MHz	ECS-250-18-5PX-F-TR	CRYSTAL 25.0000MHZ 18PF SMD	XTAL_0002_1140X0485
238	1	Y6	ABM8G-25.000MHZ-18-D2Y-T	ABM8G-25.000MHZ-18-D2Y-T	CRYSTAL 25.0000MHZ 18PF SMD	XTAL_0004_0330X0260

Table-3: BOM for Radio Control Module

BOM (Backplane-A)

Item	Quantity	Reference	Part	MfrNum	PCB Footprint
1	1	C1	10uF/50V		c1210
2	1	C2	1000pF/2kV		c1812_l
3	1	C3	1uF/100V		c1206_l
4	1	D1	LTST-C193KGKT		led_0603
5	1	F1	FUSE (3A, 125V)		fuse_1206
6	1	J19	CONN DSUB 9-P	DB FCI 9	conn_dsub9S_ST
7	1	J20	CONN DSUB 25-P	DB 25 4 Row	conn_dsubMicro-D_25P_4R_ST
8	1	J24	CONN PCB 20x2-P	DB FCI 9	conn_erf8-020-050-l-dv-l-tr
9	2	J26,J29	UMPT-04-06.5-T-VT-SM-WT	UMPT-04-06.5-T-VT-SM-WT	CONN_UMPT-04-065-T-VT-SM
10	1	L1	1.5uH		L0603_L
11	2	L2,L3	DNP		l0603_l
12	1	P2	DB FCI 9	DB FCI 9	conn_dsub9P_ST
13	1	P3	DB FCI 15	DB FCI 15	conn_dsub15p_st
14	1	P4	DB FCI 15	DB FCI 15	conn_db15_m_3r
15	1	R5	0E		r0603_l
16	1	R6	1.2K		r0603_l
17	3	TP1,TP2,TP4	+28V_RF_PS_GND		TP
18	1	TP5	DGND_1		TP
19	1	U1	JWL5024S12	JWL5024S12	dip_jwl5024s12-hk

Table-4: BOM for Backplane-A

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BOM (Backplane-B)

Item	Quantity	Reference	Part	MfrNum
1	1	J25	CONN PCB 20x2-P	
2	2	J27,J28	UMPS-04-055-T-VT-SM-WT	UMPS-04-055-T-VT-SM-WT
3	3	M1_J0_,M2_J0_,M3_J0_	1410186-1	1410186-1
8	1	M3_J1_	1410140-1	1410186-1
6	5	M2_J0_,M3_J0_,M4	1410186-1	1410186-1

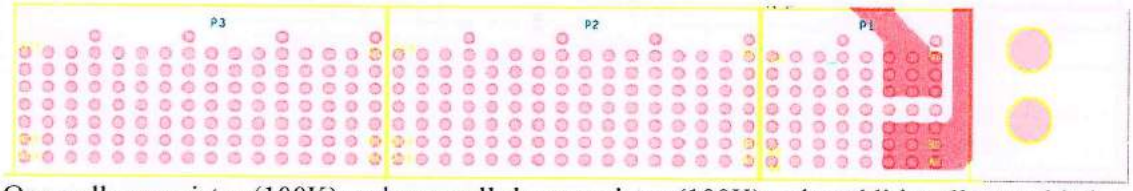
		_J0_,M5_J0_,M9_J0_		
4	2	M1_J1_,M2_J1_	1410140-1	1410140-1
7	4	M3_J1_,M4_J1_,M5_J1_,M9_J1_	1410140-1	1410140-1
5	2	M1_J2_,M2_J2_	1410142-1	1410142-1
9	4	M3_J2_,M4_J2_,M5_J2_,M9_J2_	1410142-1	1410142-1
10	1	M8_J0	1-6450869-4	1-6450869-4
11	13	R2,R3,R4,R7,R8,R9,R10,R11,R12,R13,R14,R15,R16	0E	
12	1	TP3	+28V_RF_PS_GND	

Table-5: BOM for Backplane-B

Annexure-III(03 Sheets)
List of Layout Modifications

1. Black Baseband Module

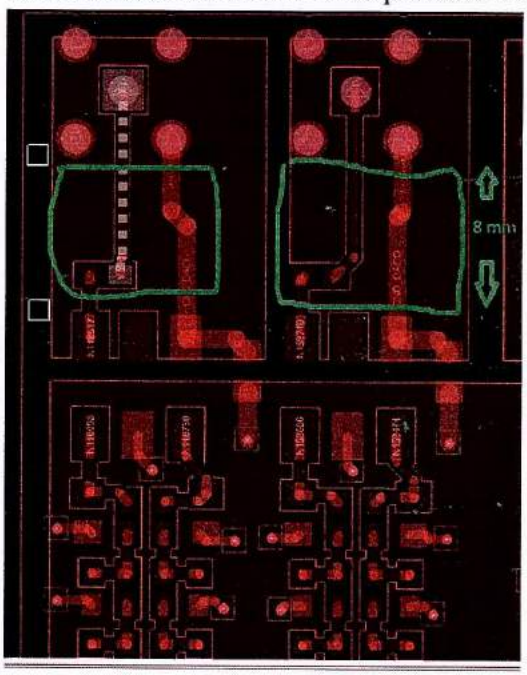
1. VPX Connectors pin diameter (through hole) to be corrected (to be decreased) as per datasheet.



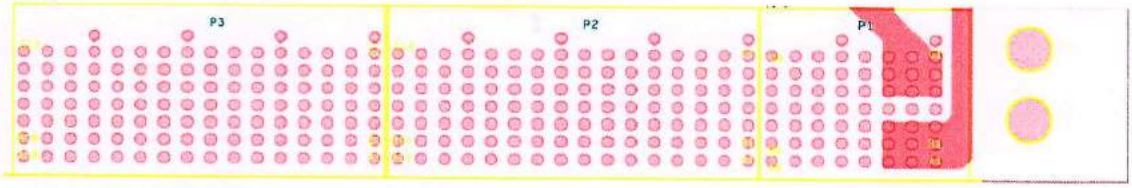
2. One pull-up resistor (100K) and one pull-down resistor (100K) to be additionally provided over specified nets.

2. Data Converter Module

1. Two attenuators (GAT-XX +, https://www.minicircuits.com/pdfs/GAT-3+.pdf) on I/Q output. Exact value of attenuator to be provided during PO)

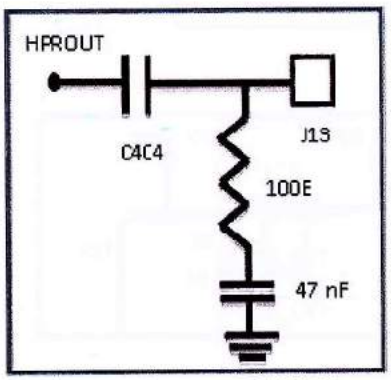


2. VPX Connectors(P0, P1, P2) pin diameter (through hole) to be corrected (to be decreased) as per datasheet.



3. Radio Control Module

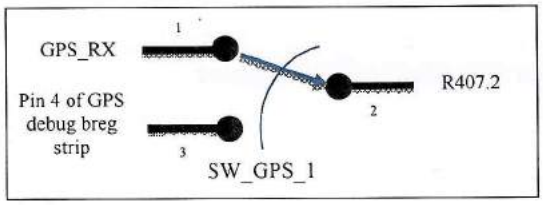
1. Switch the tracks of R428 (AIC_WCLKR) and R429 (AIC_BCLKR) of IC **U71**.
2. Add 100E and 47nF at Pin 23 of IC **U71** as follows:

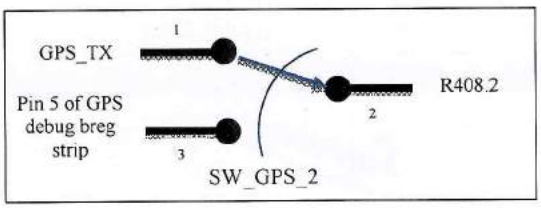


3. Add a 6 pin breg strip (same as **J10**) near IC **U63** and connect as follows:

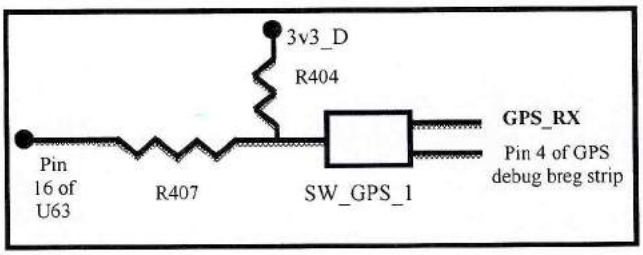
Pin 1 of breg strip	Connect to DGND
Pin 4 of breg strip	Connect to pin 3 of SW_GPS_1
Pin 5 of breg strip	Connect to pin 3 of SW_GPS_2
Rest all pin remains unconnected	

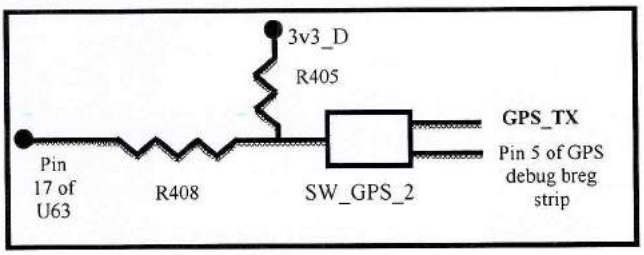
4. Add 2 DPST switches near IC **U63** as follows:



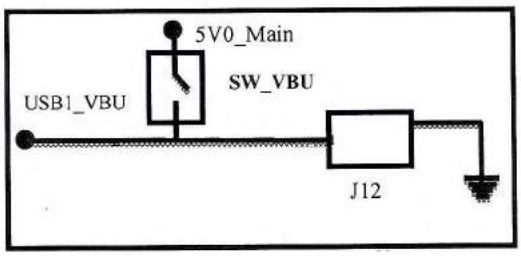


Finally, it will look like this:

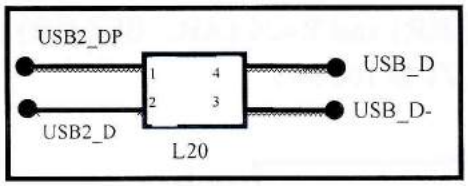




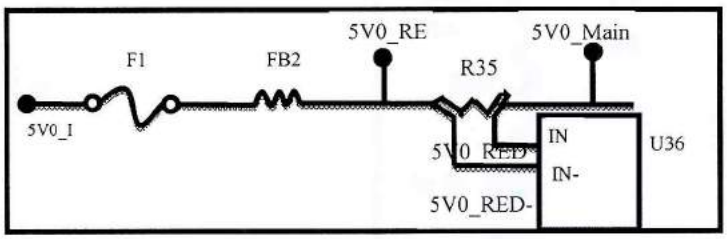
5. Add a switch near J12 as follows;



6. Rearrange connection of L20 as follows:



7. Do the following changes:



8. Connect C304.2 to DGND
9. The footprint of L21 is made incorrect. Placement of pad no. 2 & 3 should be interchanged

4. Backplane-A

1. Connection between two isolated ground planes (current limit 15A) using vias and 0 ohm resistors.
2. Replacing of 40-pin Board-Board connector (J24) with other suitable male connector.

5. Backplane-B

1. Replacing of 40-pin Board-Board connector (J25) with other suitable female connector.