Government of India
Bhabha Atomic Research Centre
Electronics Division

1-313 S Modlab D, BARC,
Mumbai 400 085

Ref: BARC/ED/Minor Fab/01/2019/26383 **Dated: __/__/2019**

SUBJECT: Minor Fabrication - Invitation to quote
Last date for receiving quotations: **01/03/2019**.

Dear Sir/Madam,

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

S.No.	Description	Quantity
1	a) PCB Layout and fabrication, procurement of components as per given BOM, assembly and testing of module 1 as per specifications given in annexure II of tender enquiry	3
	b) PCB Layout and fabrication, procurement of components as per given BOM, assembly and testing of module 2 as per specifications given in annexure III of tender enquiry.	3

2. Quotations are invited on the letter head with official seal (rubber stamp) for the above mentioned job. The quotation should contain the following details: (i) Validity of Offer, (ii) Terms and conditions of offer, (iii) PAN, GST, registration number, (iv) Delivery time schedule, (v) Price breakup. The quotation has to be signed by authorized person with company seal.
3. GST shall be quoted separately and shall be paid.
4. The quotations must reach Head, Electronics Division by **01/03/2019 (by 12:00 Noon)** and must be sent in a sealed envelope by Indian Speed Post or ordinary post only, super scribed with the above reference number and due date given above.
5. Enquiry reference should be mentioned on the top of the envelope for all correspondences via post.
6. The address on the envelope should read:

Head, Electronics Division (Attention: Anurag Sawhney, SO/E),
Modular Labs D Block,
Bhabha Atomic Research Centre,
Trombay, Mumbai - 400085.

7. Head, Electronics Division, BARC reserves the right to accept/reject any or all quotations without assigning any reason.
8. The vendor must attach technical compliant statement meeting the technical specifications attached without which offer may not be considered.

9. The vendor should quote for fabrication of the items, including the cost of materials.
10. No free issue materials will be provided by BARC.
11. Delivery: The vendor shall deliver the finished modules within 24 weeks from the date of issue of work order to ED Stores, BARC, Mumbai - 400085.
12. The vendor should give at least 15 working days advance intimation to the Indenting Officer or his representative to arrange for visiting vendor's premises for inspection and testing.
13. Delivery charges if any must be clearly mentioned in the offer.
14. Enclosed
    a. Annexure-A describing minor fabrication details
    b. Annexure-I describing general specifications for minor fabrication.
    c. Annexure-II describing specifications for Module 1
    d. Annexure-III describing specifications for Module 2

(Anita Behere)
Head, Electronics Division, BARC
[For and on behalf of President of India]

ANNEXURE-A

Minor Fabrication Details

1	2	3
S. No	**Name of items**	**Qty**
1	a) PCB Layout and fabrication, procurement of components as per given BOM, assembly and testing of module 1 as per specifications given in annexure II of tender enquiry	3
	b) PCB Layout and fabrication, procurement of components as per given BOM, assembly and testing of module 2 as per specifications given in annexure III of tender enquiry.	3

(Anurag Sawhney)
Indenting Officer,
SO/E, ED, BARC.

ANNEXURE-I

GENERAL SPECIFICATIONS

1 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 authorized representatives for which purpose the vendor shall allow access at all reasonable times during manufacture to:

1.1.1 Inspections and tests shall be carried out by the vendor as per the requirements detailed in test procedure, schematics and specifications

1.1.2 The vendor shall submit the inspection reports to the indenting officer for approval.

1.1.3 The components found un-satisfactory as to workmanship or functionally shall be removed and replaced with good quality components by the vendor.

1.1.4 The finished components shall not be dispatched prior to approval.

2 Raw Materials

2.1 No free issue materials will be provided by BARC.

3 Delivery

3.1 The vendor shall deliver the finished modules within 24 weeks from the date of issue of work order to ED Store, BARC, Mumbai - 400085.

3.2 In case of any extension in the delivery period is required, the vendor should submit a written request for the same before the expiry of work order.

3.3 Any delay which is attributable to the fabricator is liable for penalty @ 0.5% per week (max. 5%) to be imposed on the vendor.

4 **Sub-Contract**

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

5 Payment

5.1 Payment will be made only after satisfactory completion of work and on production of bill, advance stamped receipt and guarantee/warrantee certificate.

5.2 It may be noted that income tax @ 2% will be deducted from the bill.

6 Confidentiality

6.1 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.

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

6.3 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.

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)

Anurag Sawhney, SO/E
Indenting Officer

ANNEXURE II
(For Module 1)

A. **PCB Specifications of Module 1**

1	Board Size	Double Euro (233.35mm X 160 mm)
2	Quantity	3
3	No. of Layers	6 with finished thickness of 1.6 mm
4	PCB/Cu thickness	35 microns
5	PCB Material	FR-4 glass epoxy material
6	Final Finish	Electroless Nickel Immersion Gold (ENIG)
7	Min trace width/spacing	4 mil
8	Testing and inspection of PCB	i. Bare Board Testing ii. Hardware Testing

B. Scope of Work for Module 1

1	PCB layout designing work
2	PCB fabrication for 3 boards
3	Bare Board Testing
4	Component Procurement
5	PCB Population
6	Hardware Testing
7	Delivery of 3 populated PCBs
8	Delivery of all design documents, associated design files and test reports

C. Work Flow for Module 1

Note to Vendor:

After receiving the P.O., the vendor is required to interact with the indenting officer. Schematic will be given by the indenting Officer in .dsn format. At each stage of the layout design, PCB fabrication and assembling the vendor shall interact with indenting officer. The result & status of each step has to be submitted to the indenting officer and approval has to be taken to go ahead to the next step. The following work flow shall be followed.

S.No.	Work Flow
1	The vendor has to prepare layout of design that will be provided by the indenting officer in ORCAD (.dsn) format. Allegro package will be the preferred choice for making the layout.
2	Final layout and netlist shall be submitted to the Indenting Officer for approval.
3	After the approval, the vendor shall generate the gerber files in RS-274X format.
4	The PCBs should be manufactured with the specifications mentioned in PCB specifications section A of annexure II

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(Indenting Officer)

5	Vendor shall procure all the components as per the BOM (section G of annexure II). All the components should be original and purchased from authorized dealers. All components as mentioned in the BOM should be mounted on the PCB by the vendor. The components marked as DNP (do not populate) in the schematic must not be mounted on the PCB and must be supplied separately along with the PCB. Any changes in part numbers for components must be intimated to Indenting Officer and approval must be taken before performing the change.
6	Provision for 5V/3.3V DC power supply and multimeter must be made by the vendor at vendor's site for first phase of hardware testing to be performed at Vendor's site.
7	Hardware testing will be carried out in two phases. Refer to the **block diagram 1** for scope of hardware testing at vendor's site. In the first phase, hardware testing at vendor's site would be performed which shall include the following: ➢ Visual inspection of assembled boards ➢ Cold testing of assembled boards ➢ Power-on testing of assembled boards by measuring power output at various test points as per the test procedure provided. The tested boards will then be shipped to BARC for second phase of hardware testing. The second phase of hardware testing shall include the following: ➢ JTAG programming of microcontroller. ➢ LED output toggle operation ➢ UART1 test point signals check ➢ I2C line toggle check ➢ SPI line toggle check ➢ Isolated output check via LED output The test reports for both first phase and second phase will form the basis of acceptance of the boards.
8	If any faults in components or wiring are detected during second phase of testing at BARC, the hardware will be sent back to the vendor who must replace the said faulty component and re-test the board before shipping it back to BARC.
9	Final acceptance will be given after successful completion of both phases of hardware testing.
10	The vendor shall deliver all the final design files and gerber files along with three numbers of populated and tested PCBs at the end.

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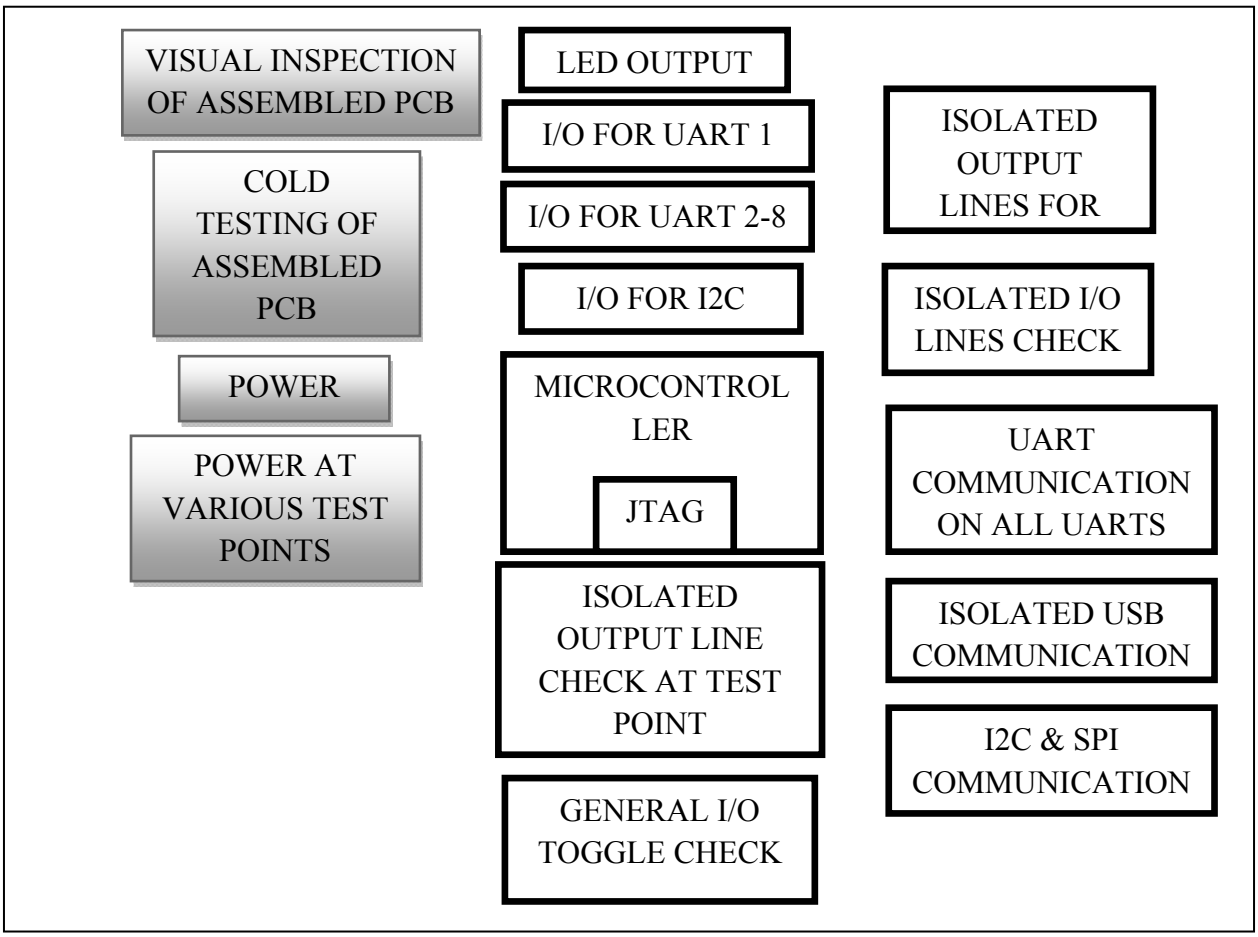
BLOCK DIAGRAM 1 FOR SCOPE OF HARDWARE TESTING AT VENDOR'S SITE



NOTE: a) BLOCKS GREY COLOR ARE THE TESTS THAT ARE UNDER THE SCOPE OF TESTING AT VENDOR'S SITE (FIRST PHASE).

b) BLOCKS WITHOUT GREY COLOR ARE THE TESTS THAT ARE TO BE CARRIED OUT AT BARC AFTER COMPLETION OF TESTS AT VENDOR'S SITE (SECOND PHASE).

D. Deliverables for Module 1

S.No.	Deliverables
1	Total of 3 numbers of populated and tested and accepted PCBs of module 1 shall be delivered by the vendor
2	Final schematic (ORCAD .dsn format)
3	Final Bill of Material

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(Indenting Officer)

4	PCB layout files in Cadence Allegro format
5	Gerber Files in RS274-X format
6	Pick & Place file
7	N.C. Drill files
8	Drill Drawing
9	Layer Stack up report
10	Assembly Drawing (PDF format)
11	The delivery should include bare board acceptance test reports, Populated PCB test reports

E. **Guarantee**

The populated PCBs shall be guaranteed for 12 months against any defects and poor workmanship. The guarantee shall include on-site replacement of defective boards at no extra cost.

F. Delivery Schedule

1. Final gerber generation - 8 weeks from the date of purchase order issued to the vendor (this includes three weeks for netlist verification and layout approval at BARC).
2. Fabrication and assembly - 8 weeks
3. Testing - 8 weeks (First Phase at vendor's site: 2 weeks; Second Phase at BARC: 6 weeks)

G. Bill of Materials for one PCB of Module 1

S.No.	Description	Package	Quantity	Part Number
1	50V 10pF 0805 1%	0805	4	CC0805FRNPO9BN100
2	16V 0.1uF 0805 5%	0805	73	0805YC104JAT2A
3	16V 2.2uF 0805 10%	0805	2	C0805C225K4RAC3123
4	4.7uF 16V 0805 10%	0805	2	C2012X5R1C475K085AB
5	1uF 16V 0805 10%	0805	2	GRM21BR61C105KA01K
6	0.01uF 16V 0805 1%	0805	7	0805YA103JAT4A
7	10uF 16V 0805 10%	0805	11	GRM21BC71C106KE11L
8	2.2nF 16V 0805 1%	0805	1	0805YA222FAT2A
9	47uF 10V 2% 1210	1210	2	C1210C476M8PAC
10	0805 SMD LED WHITE	0805	16	SMLMN2WB1CW1C

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11	4 PIN PHOENIX CONTACT FIXED TERMINAL BLOCK		1	1725672
12	2 POSITION SWITCH SPST	SMD/SMT	1	SDA01H1SBD
13	20 PIN CONNECTOR		1	FTSH-110-01-L-DV
14	20 PIN HEADER		1	103308-5
15	2 PIN PHOENIX CONTACT FIXED TERMINAL BLOCK 2.54mm 90 DEG		3	1725656
16	FERRITE BEAD 600MA, 120 OHM 0805	0805	4	BLM21BB121SZ1D
17	470uH INDUCTOR		1	WE 7447471471
18	0805 4A 180 OHM 20mOHM	0805	1	BLM21SP181SH1D
19	1uH, 33.6mOHM 6.7 Apk		1	SPM4015T-1R0M-LR
20	96 PIN CONNECTOR MALE RIGHT ANGLE		2	Part No. 108457096002025
21	1 KOHM 0805 1/4W	0805	96	CRS0805-FX-1001ELF
22	10 KOHM 0805 1/4W	0805	7	CRS0805-FX-1002ELF
23	0 OHM 0805 1/4 W	0805	20	PT0805-R-070RL
24	500 OHM 0805 1/4W	0805	7	RK73H2ATTD5100F
25	2 KOHM 0805 1/4W	0805	2	RK73H2ARTTD2001F
26	120 OHM 0805 1/4W	0805	1	RK73H2ATTDD1200F
27	24 OHM 0805 1/4W	0805	4	RC0805FR-0724RL
28	5.1 KOHM 0805 1/4W	0805	14	RC0805FR-075K1L
29	22 OHM 0805 1/4W	0805	6	RC0805FR-0722RL
30	10 OHM 0805 1/4W	0805	1	RK73H2ARTTD10R0F
31	SWITCH	SMD/SMT	3	LL3301NF065QG
32	3 PIN SPDT SWITCH	SMD/SMT	1	TDD01H0SB1R
33	3 PIN SPDT SWITCH		2	E103J1AQE2

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34	TEST POINT		43	151-206-RC
35	HX1188NL	SMD/SMT	1	HX1188NL
36	ARM MICROCONTROLLER	LQFP208	1	STM32F429BIT6
37	RS485 ISOLATED IC	SOIC-W 20 PIN	7	ADM2582EBRWZ
38	RS232 ISOLATED IC	SOIC-W 20 PIN	1	ADM3251EARWZ
39	I2C ISOLATION IC	SOIC-8	1	ADUM1250ARZ
40	SPI ISOLATION IC	16 LEAD PLASTIC MSOP	1	LTC6820IMS#3ZZPBF
41	RJ45 CONNECTOR	RJ45 PCB MOUNT	1	PART NO. 615008138221
42	PROTECTION DIODE ARRAY	SC-88	1	NUP4202W1T2G
43	USB ISOLATION IC	16 LEAD SOIC_W	1	ADUM4160BRWZ
44	USB CONNECTOR	USB MINI-B PCB MOUNT	1	UX60-MB-5ST
45	CHOKE	0805 SIZE COMMON MODE CHOKE	2	DLW21SN261SQ2L
46	ISOLATION IC	16 LEAD SOIC_W	11	ADUM1400CRWZ
47	VOLTAGE CONVERTOR IC	DIP-24 Miniature	1	RV-3.305S
48	BUFFER IC	SOIC_14	3	SN74LVC07ADR
49	VOLTAGE REGULATOR IC	LFCSP-16	1	ADP2164ACPZ-3.3-R7
50	CRYSTAL 25 MHz	25 MHz CRYSTAL	1	ABL-25.000MHZ-B1UB
51	CRYSTAL 32.768 KHz	32.768 KHz CRYSTAL	1	AB26TRQ-32.768KHz-T

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(Indenting Officer)

ANNEXURE III
(For Module 2)

A. **PCB Specifications of Module 2**

1	Board Size	190mm X 120 mm custom size
2	Quantity	3
3	No. of Layers	6 with finished thickness of 1.6 mm
4	PCB/Cu thickness	35 microns
5	PCB Material	FR-4 glass epoxy material
6	Final Finish	Electroless Nickel Immersion Gold (ENIG)
7	Min trace width/spacing	4 mil
8	Testing and inspection of PCB	i. Bare Board Testing ii. Hardware Testing

B. Scope of Work for Module 2

1	PCB layout designing work
2	PCB fabrication for 3 boards
3	Bare Board Testing
4	Component Procurement
5	PCB Population
6	Hardware Testing
7	Delivery of 3 populated PCBs
8	Delivery of all design documents, associated design files and test reports

C. Work Flow for Module 2

Note to Vendor:

After receiving the P.O., the vendor is required to interact with the indenting officer. Schematic will be given by the indenting Officer in .dsn format. At each stage of the PCB layout, PCB fabrication and assembling the vendor shall interact with indenting officer. The result & status of each step has to be submitted to the indenting officer and approval has to be taken to go ahead to the next step. The following work flow shall be followed.

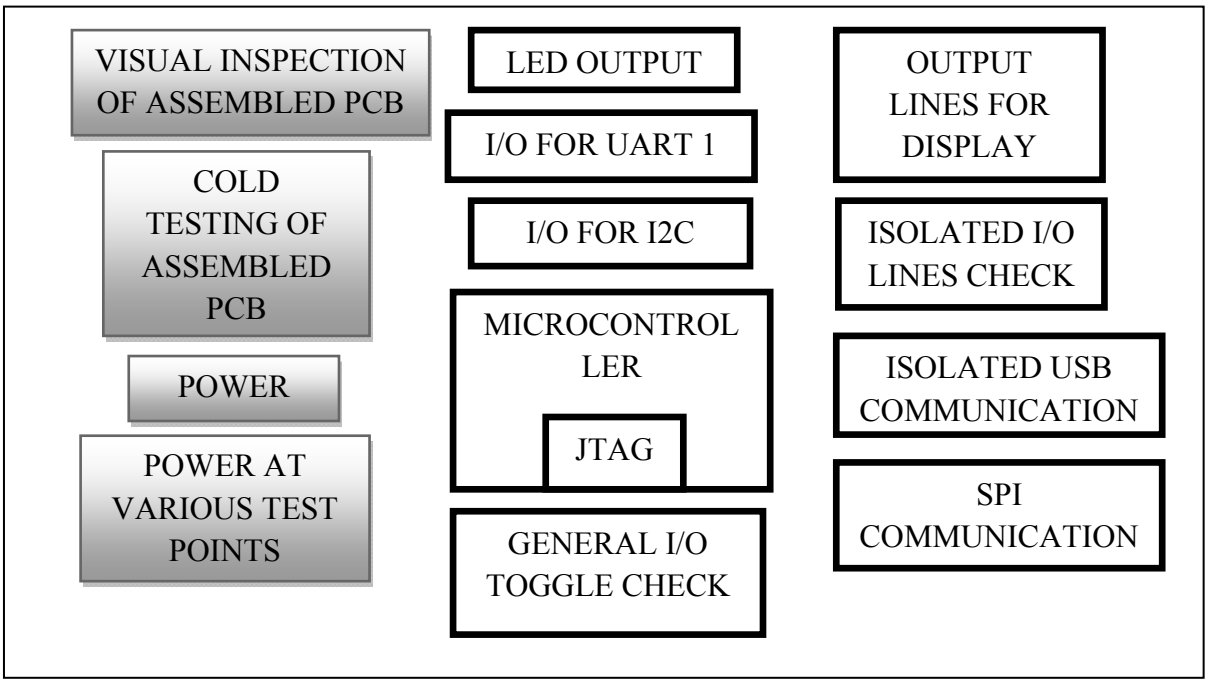
S.No.	Work Flow
1	The vendor has to prepare layout of design that will be provided by the indenting officer in ORCAD (.dsn) format. Allegro package will be the preferred choice for making the layout.
2	Final layout and netlist shall be submitted to the Indenting Officer for approval.
3	After the approval, the vendor shall generate the gerber files in RS-274X format.
4	The PCBs should be manufactured with the specifications mentioned in PCB specifications section A of annexure III.

Anurag Sawhney
(Indenting Officer)

5	Vendor shall procure all the components as per the BOM (section G of annexure III). All the components should be original and purchased from authorized dealers. All components as mentioned in the BOM should be mounted on the PCB by the vendor. The components marked as DNP (do not populate) must not be mounted on the PCB and must be supplied separately along with the PCB. Any changes in part numbers for components must be intimated to Indenting Officer and approval must be taken before performing the change.
6	Provision for 5V/3.3V DC power supply and multimeter must be made by the vendor at vendor's site for first phase of hardware testing to be performed at Vendor's site.
7	Hardware testing will be carried out in two phases. Refer to the block diagram 2 for scope of hardware testing at vendor's site. In the first phase, hardware testing at vendor's site would be performed which shall include the following: ➢ Visual inspection of assembled boards ➢ Cold testing of assembled boards ➢ Power-on testing of assembled boards by measuring power output at various test points as per the test procedure provided. The tested boards will then be shipped to BARC for second phase of hardware testing. The second phase of hardware testing shall include the following: ➢ JTAG programming of microcontroller. ➢ LED output toggle operation ➢ UART1 test point signals check ➢ I2C line toggle check ➢ SPI line toggle check ➢ output line check for display The test reports for both first phase and second phase will form the basis of acceptance of the boards.
8	If any faults in components or wiring are detected during second phase of testing at BARC, the hardware will be sent back to the vendor who must replace the said faulty component and re-test the board before shipping it back to BARC.
9	Final acceptance will be given after successful completion of both phases of hardware testing.
10	The vendor shall deliver all the final design files and gerber files along with three numbers of populated and tested PCBs at the end.

Anurag Sawhney
(Indenting Officer)

BLOCK DIAGRAM 2 FOR SCOPE OF HARDWARE TESTING AT VENDOR'S SITE



NOTE: a) BLOCKS GREY COLOR ARE THE TESTS THAT ARE UNDER THE SCOPE OF TESTING AT VENDOR'S SITE (FIRST PHASE).

b) BLOCKS WITHOUT GREY COLOR ARE THE TESTS THAT ARE TO BE CARRIED OUT AT BARC AFTER COMPLETION OF TESTS AT VENDOR'S SITE (SECOND PHASE).

D. Deliverables for Module 2

S.No.	Deliverables
1	Total of 3 numbers of populated and tested and accepted PCBs of Module 2 shall be delivered by the vendor
2	Final schematic (ORCAD .dsn format)
3	Final Bill of Material
4	PCB layout files in Cadence Allegro format
5	Gerber Files in RS274-X format
6	Pick & Place file
7	N.C. Drill files
8	Drill Drawing
9	Layer Stack up report
10	Assembly Drawing (PDF format)
11	The delivery should include bare board acceptance test reports, Populated PCB test reports

(Indenting Officer)

E. **Guarantee**

The populated PCBs shall be guaranteed for 12 months against any defects and poor workmanship. The guarantee shall include on-site replacement of defective boards at no extra cost.

F. Delivery Schedule

4. Final gerber generation - 8 weeks from the date of purchase order issued to the vendor (this includes three weeks for netlist verification and layout approval at BARC).
5. Fabrication and assembly - 8 weeks
6. Testing - 8 weeks (First Phase at vendor's site: 2 weeks; Second Phase at BARC: 6 weeks)

G. Bill of Materials for one PCB of Module 2

S.No.	Description	Package	Quantity	Part Number
1	50V 10pF 0805 1%	0805	4	CC0805FRNPO9BN100
2	16V 0.1uF 0805 5%	0805	41	0805YC104JAT2A
3	0.01uF 16V 0805 5%	0805	1	0805YA103JAT4A
4	10uF 16V 0805 10%	0805	2	GRM21BC71C106KE11L
5	16V 2.2uF 0805 10%	0805	2	C0805C225K4RAC3123
6	4.7uF 16V 0805 10%	0805	3	C2012X5R1C475K085AB
7	1uF 16V 0805 10%	0805	4	GRM21BR61C105KA01K
8	50V 0805 4pF	0805	2	CBR08C409C5GAC
9	35V 1uF 1206 10%	1206	1	GCJ31CL8YA105KA01L
10	16V 22uF 0805 20%	0805	2	GRM219R61C226ME15L
11	0805 SMD LED RED	0805	7	SMLMN2WB1CW1C
12	SCHOTTKY DIODE	SOD-123	1	MBR0530
13	5 PIN PHOENIX CONTACT FIXED TERMINAL BLOCK		1	1725685
14	2 POSITION SWITCH SPST	SMD/SMT	1	SDA01H1SBD
15	1 MM PITCH 4 CONDUCTOR FFC MOLEX CONNECTOR TOP CONTACT	SMD/SMT	1	52207-0433
16	4 PIN PHOENIX CONTACT FIXED TERMINAL BLOCK		3	1725672
17	2 POSITION SWITCH SPST	SMD/SMT	1	SDA01H1SBD
18	20 PIN CONNECTOR		1	FTSH-110-01-L-DV
19	20 PIN HEADER		1	103308-5

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20	2 PIN PHOENIX CONTACT FIXED TERMINAL BLOCK 2.54mm 90 DEG		1	1725656
21	10% 400mA 7.72 OHM	SMD/SMT	1	SDR0703-470KL
22	FERRITE BEAD 600MA, 120 OHM 0805	0805	1	BLM21BB121SZ1D
23	0805 4A 180 OHM 20mOHM	0805	1	BLM21SP181SH1D
24	3.3uH INDUCTOR		1	TCK-108
25	COMMON MODE CHOKE		1	TCK-117
26	1 KOHM 0805 1/4W	0805	66	CRS0805-FX-1001ELF
27	10 KOHM 0805 1/4W	0805	13	CRS0805-FX-1002ELF
28	500 OHM 0805 1/4W	0805	1	RK73H2ATTD5100F
29	0 OHM 0805 1/4 W	0805	31	PT0805-R-070RL
30	1206 1MOHM 0.5% 1/4W	1206	1	HV732BTTD1004D
31	0805 150KOHM 0.1% 1/4W	0805	1	ERJ-PB6B1503V
32		0805	3	
33	4.7 KOHM 1% 0805 1/4W	0805	3	RK73H2ATTD4701F
34	100 KOHM 1% 1/4W 0805	0805	4	RK73H2ATTD1003F
35	2 KOHM 0805 1/4W	0805	6	RK73H2ARTTD2001F
36	120 OHM 0805 1/4W	0805	3	RK73H2ATTDD1200F
37	24 OHM 0805 1/4W	0805	4	RC0805FR-0724RL
38	22 OHM 0805 1/4W	0805	6	RC0805FR-0722RL
39	SWITCH	SMD/SMT	1	LL3301NF065QG
40	3 PIN SPDT SWITCH	SMD/SMT	5	TDD01H0SB1R
41	TEST POINT		67	151-206-RC
42	HX1188NL	SMD/SMT	3	HX1188NL
43	ARM MICROCONTROLLER IC	LQFP208	1	STM32F429BIT6
44	RS485 ISOLATION IC	SOIC-W 20 PIN	1	ADM2582EBRWZ
45	SRAM IC	TSOP-48	1	IS61WV102416BLL-10TLI
46	FLASH IC	TSOP-56	1	IS29GL128-70SLET

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47	0.5mm PITCH 40 CONDUCTOR FFC MOLEX TOP CONTACT		1	54104-4031
48	VOLTAGE REGULATOR IC	SOT-23	1	TPS61041QDBVRQ1
49	TOUCH CONTROLLER IC	QFN-16	1	STMPE811QTR
50	SPI ISOLATION IC	16 LEAD PLASTIC MSOP	3	LTC6820IMS#3ZZPBF
51	RJ45 CONNECTOR	RJ45 PCB MOUNT	3	PART NO. 615008138221
52	PROTECTION DIODE ARRAY	SC-88	1	NUP4202W1T2G
53	USB ISOLATION IC	16 LEAD SOIC_W	1	ADUM4160BRWZ
54	USB CONNECTOR	USB MINI-B PCB MOUNT	1	UX60-MB-5ST
55	CHOKE	0805 SIZE COMMON MODE CHOKE	2	DLW21SN261SQ2L
56	VOLTAGE CONVERTOR IC		1	THM 10-0510WI
57	CRYSTAL 25 MHz	25 MHz CRYSTAL	1	ABL-25.000MHZ-B1UB
58	CRYSTAL 32.768 KHz	32.768 KHz CRYSTAL	1	AB26TRQ-32.768KHz-T
59	LCD DISPLAY 7 INCH WITH RESISTIVE TOUCH SCREEN		1	NHD-7.0-800480EF-ASXV#-T

(Anurag Sawhney)
Indenting Officer,
SO/E, ED, BARC.