ITER-India, Institute for Plasma Research
Block A, Sangath SKYZ, Bhat- Motera Road, Koteshwar, Ahmedabad 380005 Gujarat,India.

www.iter-india.org

Email: pws.group@iter-india.org

Minor Fabrication Work

ENQUIRY - LOCAL

OFFICE COPY

ENQUIRY NO : **Enq/MF/1/PWSP**
Date : **08/09/2020**
Due Date : **25/09/2020** by 5:00 PM (IST)

We invite your rate/s for the following item/s. The Instructions to bidders and Terms & Conditions are attached herewith.

Important Note :

1. Enquiry No., Date & Due Date should appear on the envelope otherwise your offer will be rejected.
2. ITER-India, IPR is entitled to avail concessional rate of GST @ 5% (2.5% CGST and 2.5% SGST) as per Central Goods and Service Tax (CGST) Notification No. 45/2017-Central Tax (Rate) dated 14th November, 2017, State Goods and Service Tax (SGST) Notification No. 45/2017 – State Tax (Rate) dated 15th November, 2017 and IGST @ 5% as per Notification No. 47/2017-Integrated Tax (Rate) dated 14th November, 2017 for supply of Goods. Therefore, please consider GST in your quotation accordingly.
3. Quotations in hard copy should be addressed to Project Manager, Power Supply Group only at above address. Email quotations are not acceptable
4. Any clarification on this enquiry may be sought from pws.group@iter-india.org

Sr No.	Material Description	Quantity	Unit
1	SWITCHED POWER SUPPLY (SPS) CARD	45	NOS

Note:

(1) The required Completion period is within 3 Months from the date of order.Vendor must specify the completion period in the quotation.

(2) Technical specifications are appended herewith.

Encl:- as above

Project Manager
(Narinder Pal Singh)
Power Supply
ITER-India

Note: This Enquiry is electronically generated and no signature is required.

TERMS AND CONDITIONS

1. The quotation and any order resulting from this enquiry shall be governed by our Conditions of Order and supplier quoting against this enquiry shall be deemed to have read and understood the same in total
2. Where counter terms and conditions have been offered by the Tenderer, the same shall not be deemed to have been accepted by ITER-India unless our specific written acceptance thereof is obtained.
3. Quotation: Your quotation superscripting our enquiry No., date, due date and brief description of item should be submitted in sealed envelope on or before the due date. Late/ Delayed/incomplete quotations will not be considered. Envelopes received without Enquiry number, date, due date and brief description of item may be rejected.
4. The quoted prices should be firm for a period of 30 days from due date of bid submission. ITER-India is not bound to accept lowest rate/s. Bidder shall submit the price bid/offer on Bidder's letter head with official seal and sign on each page.
5. The bid documents shall be prepared in English language only
6. All pages of the bid documents shall be numbered. Each page of the bid document shall be stamped and initialized.
7. In the event of any date indicated above is a declared Holiday, the next working day with the same time limit shall become operative for the respective purpose mentioned herein
8. In case of deviation in payment terms including demand of advance other than specified in payment schedule and accepted by ITER-India, prevailing Prime Lending Rate (PLR) of SBI will be loaded for price comparison purpose
9. ITER-India and their authorized representatives may visit the Contractor/Sub-contractors if required as part of technical evaluation process
10. ITER-India reserves the right to place order on one or more parties.
11. Specifications: Material should be offered strictly conforming to our specifications/drawings, if any. Deviation, if any, should be clearly indicated by the supplier in their quotation. The Tenderer should also indicate the Make/Type number of the materials offered and catalogues, technical literature and samples, wherever necessary should accompany the quotation. Clarification/s on specifications/drawings should be obtained from Purchaser before submitting quotation.
12. Terms of Prices : Quotation should be submitted on door delivery basis, duly packed without extra charge wherever possible.
13. Unit rate/s should be valid throughout the validity of Purchase Order for addition/deletion purposes. Break-up of price should be furnished. The quoted price should not be subject to price escalation for whatsoever reasons. The quoted price shall be firm, fixed and non-revisable during the validity/ extended validity of Purchase Order.
14. Prices are required to be quoted according to the units indicated in the tender form/Enquiry. When Quotations are given in terms of units other than those specified in the tender form, relationship between the two sets of units must be furnished.
15. Tender should be free from Correction and Erasures. Corrections, if any, must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quoted in words shall prevail. Unsigned quotations will summarily be rejected.
16. ITER-India shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of the quantity offered and the tenderers shall supply the same at the rates quoted. ITER-India also reserves the right to split the order at its sole discretion
17. Delivery Date/Period: Delivery period is essence of the Order. Supplier must indicate the firm delivery date by which the materials will be dispatched / delivered by them from the date of our order.
18. Inspection: Materials on its arrival at ITER-India will be inspected by our Engineer/Stores In-Charge, and his decision in the matter will be final. However, where the items are required to be inspected at the Suppliers Premises, Supplier has to give advance notice to the Purchaser regarding readiness of the material to enable Purchase/Stores section to depute his representative for inspection.
19. Payment: Payment will be arranged for accepted materials only within 30 days from the date of acceptance of materials at ITER-India and receipt of error free bills in our accounts section, complete in all respects.
20. No correspondence will be entertained within 30 days from the date of receipt of material and bills, whichever is later.
21. Warranty: The Stores/Items offered should be guaranteed for a minimum period of twelve months from the date of acceptance, against defective materials, design, workmanship, operation or manufacture. For defects noticed and communicated during the Guarantee period, replacement/rectification should be arranged free of cost within a reasonable period of such notification. In case where our specifications call for a guarantee period more than 12 months specifically, then such a period shall apply.
22. The Contractor/Supplier shall at all times indemnify the purchaser against all claims which may be made in respect of the stores for infringement of any right protected by Patent, Registration of design or Trade Mark and shall take all risk of accidents or damage, which may cause failure of supply from whatever cause arising and the entire responsibility for sufficiency of all means used by him for the fulfillment of the Order.
23. Successful tenderer will have to furnish in the form a Bank Guarantee or in Indemnity Bond form as called for by the Purchaser towards adequate security for the materials/property provided/issued by the Purchaser as Free Issue Material for the due execution of the Order. Insurance for the Free Issue Material shall be arranged by the Supplier/Contractor at his risk and cost.
24. Non-compliance to tender specifications and/or tender scope and/or tender terms and conditions are liable for rejection. Decision of ITER-India in respect of non-compliance shall be final and binding on the bidders.
25. Canvassing in any form with regard to this tender will lead to rejection of the bid.
26. The Project Director, ITER-India reserves the right to accept or reject any quotations fully or partly or to cancel the enquiry without assigning any reasons.
27. This enquiry is not a commitment and the Purchaser reserves the right to reject or cancel any or all offers.
28. Jurisdiction: The Order shall be governed by the Laws of India for the time being in force. The Courts of Ahmedabad/Gandhinagar only shall have jurisdiction to deal with and decide any legal or dispute arising out of this Order.
29. Unsuccessful bidders will not be intimated about the results of the enquiry/tender.
30. Purchase will not be responsible for payment of any interest to the Supplier, in case of delay in releasing payment.
31. The price evaluation shall be carried out on Landed price including taxes, duties and all other applicable charges.

FORMAT FOR SUBMISSION OF QUOTATION

Enquiry No. : **Enq/MF/1/PWSP**

Name Of Party : **OFFICE COPY**

Quotation No. & Date :

Due on : **25/09/2020** by 5:00 PM (IST)

Sr No.	Material Description	Qty	Unit	Rate	Total
1	SWITCHED POWER SUPPLY (SPS) CARD	45	NOS		
				Grand Total	

COMMERCIAL TERMS & CONDITIONS *

Sr.No	Description	Bidder's Compliance [Comply Yes/No (In case of No Please provide details)]
1	Payment: ITER-India payment terms will apply (Refer Sr. No. 19 of Terms and Condition)	
2	Validity Period (Refer Sr.No. 4 Of Terms and Condition)	
3	Warranty (Refer Sr.No. 21 Of Terms and Condition)	
4	GST (5% extra as per sr. no 2 of Note in enquiry document)	
5	GST No. (To Specify)	
6	Discount(if any)	
7	The rates of spare material (As listed in Annexure-III)	

* Fill in the applicable details

Place: Authorised Signatory:

Date: Company Seal

Technical Specifications for Customized Switch Power Supply (SPS) Cards

Scope of Work:

Scope of work include fabrication and supply of 45 Nos. of SPS cards as per following,

(1) Submission of BoM for approval to ITER-India.
(2) Approval of gerber file by ITER-India, produced on the basis of layout file (*.brd) provided by ITER-India.
(3) Component procurement as per approved Bill of Material
(4) Production of 45 Nos. of PCB as per approved gerber file.
(5) Bare Board Test Report shall be submitted for ITER-India approval
(6) Bare board shall be submitted for inspection before component stuffing and soldering
(7) Component stuffing on PCB and mounting of cards in Poly Carbonate Enclosure.
(8) Verification of workmanship and testing of all SPS cards at Vendors site.
(9) Delivery of 45 Nos. of SPS cards and site acceptance testing at ITER-India, along with spare components.

A prototype card has been developed as shown in image below. Present scope covers the bulk manufacturing of identical 45 Units.

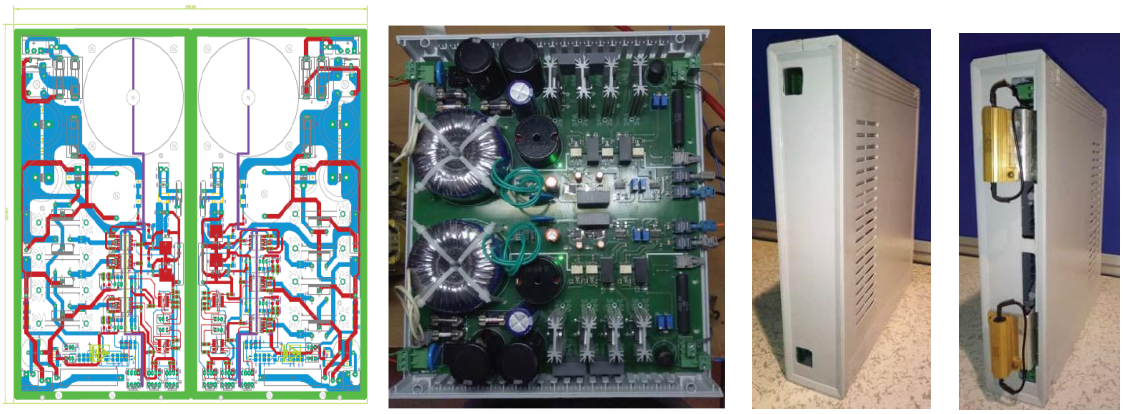


Figure 1 : (1) PCB Layout (2) SPS Card with Component (3)(4) Front and Back view of assembled SPS Card

Eligibility Criteria:

(1) Vendor must have experience in the field of fabrication of similar jobs viz. Electronic cards/populated PCBs for SMPS/Power Supplies / LED Lightings/Audio Amplifiers etc. An unpriced PO of similar work executed in last 2 years should be provided as an evidence.
(2) Vendor must have inhouse facility for soldering, verification and Testing. Make and model of Temperature controlled soldering station, Oscilloscope should be provided as an evidence.

Specifications for PCB:

The layout file is as per Annexure I. For soft-copy of layout file, interested vendors should approach us by writing email to pws.group@iter-india.org. The specifications for PCB are listed in table below.

Type:	Double-sided, PTH with SM, SMOBC, HAL Surface finish
Layer:	2 layers
Material:	Glass epoxy (FR-4) Nema Grade IPC-4101/99
Thickness:	2 mm+/- 0.1mm

Base copper	> 60 micron each side
Finish copper	> 90 micron each side
Size of PCB	265 mm X 240 mm, 2 mm thickness
Solder mask/Legend	Green Colour /White Colour on both Top and Bottom side
Compliance	IPC 6012, IPC-A-610, UL
PCB should be fabricated only at facilities having valid ISO 9001 certifications.	

Specifications of Components

- Annexure –II provides the list of components including Free issue materials (FIM) to be provided by ITER-India. It includes SMD, through hole components and polycarbonate enclosure. Annexure –III provides the list of the components and spare quantity to be provided as loose.
- Components other than FIMs (including spare quantity) must be procured from authorized sources only. A certificate of compliance against specification/make shall be produced. ITER-India may ask for PO copies to verify the source.
- In case of non-availability or long lead time, an alternate component shall be suggested for approval.
- Cut outs at facia of enclosure must be properly finished (machined finish). It must display stickers for identification viz. Sr., Input, Output, FO etc.

Assembly Instructions

- For Surface Mount Discrete components, automated stencil-based soldering is recommended.
- Soldering must be done in ESD protected Assembly station.
- IPC J-001 should be followed for workmanship
- Conformal coating should be applied on each PCB and baked for 1 hour at 60 C.
- Populated PCB to be mounted in PC Enclosure using non-metallic hardware.
- Enclosure cover fixing also should be done by non-metallic fasteners.

Documents along with Offer

- Vendor must have experience in the field of fabrication of similar jobs viz. Electronic cards/populated PCBs for SMPS/Power Supplies / LED Lightings/Audio Amplifiers etc. An unpriced PO of similar work executed in last 2 years should be provided as an evidence.
- Vendor must have inhouse facility for soldering, verification and Testing. Make and model of Temperature controlled soldering station, Oscilloscope should be provided as an evidence.
- List of proposed vendors for PCB manufacturing (Only ISO9001 certified)
- Tentative schedule

Acceptance Test

Test at Vendor'site (Factory test):

Following tests will be performed on each SPS card-

(1) Check for workmanship
(2) Card shall be Powered-ON and Control Pulses shall be given. It must produce output according to given pulses.
(3) Each card shall be kept Powered-On for duration of 1 Hour.

A test setup shall be arranged (not in scope of supply) consisting of following equipment.

(1) 230V: 285 V Transformer with soft-charging mechanism
(2) Optical Pulse generator
(3) Load Bank
(4) Measuring Instruments viz. DMM, Oscilloscope
Items at Sr. 1, 2, 3 can be provided on returnable basis by ITER-India on request of Vendor.

Only after successful testing of all SPS cards, Vendor delivers the material at ITER-India.

Test at ITER-India site (acceptance test):

Following tests will be performed on each SPS card-

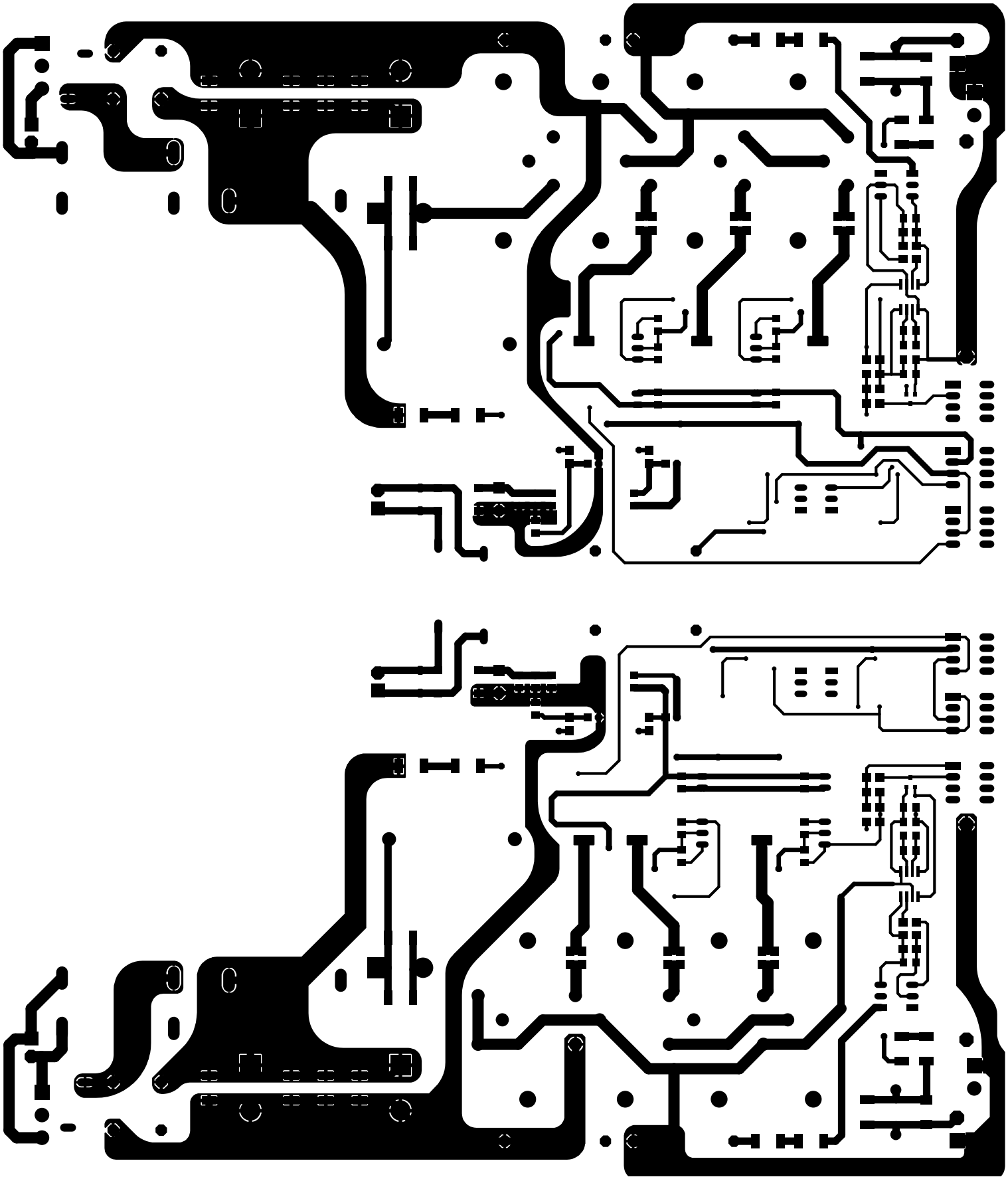
(1) Card shall be Powered-ON and Control Pulses shall be given. It must produce output according to given pulses.

Deliverables:

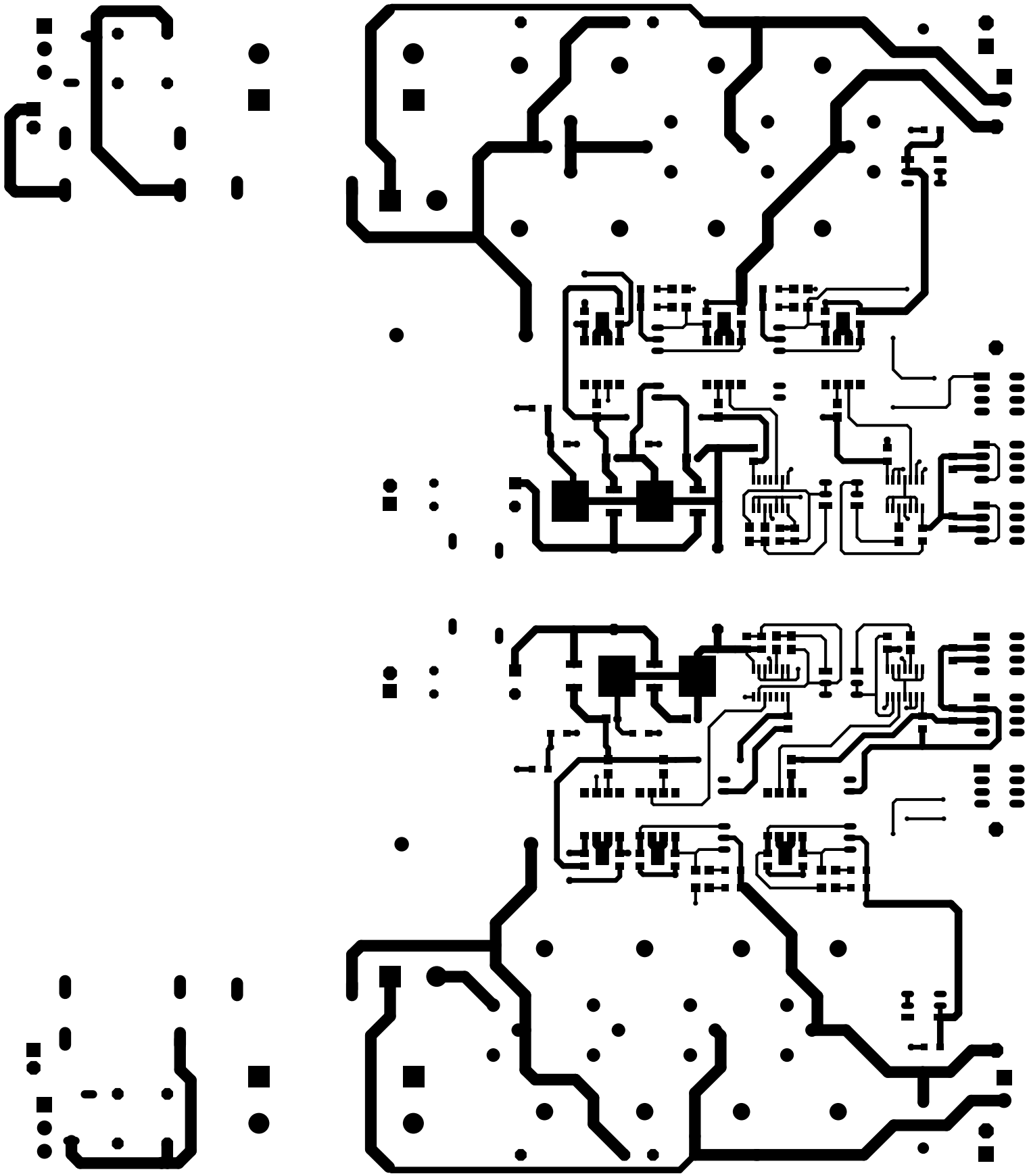
1) 45 Nos. of SPS cards
2) Bare PCB Test Report
3) Factory test report & Site Acceptance Test Report

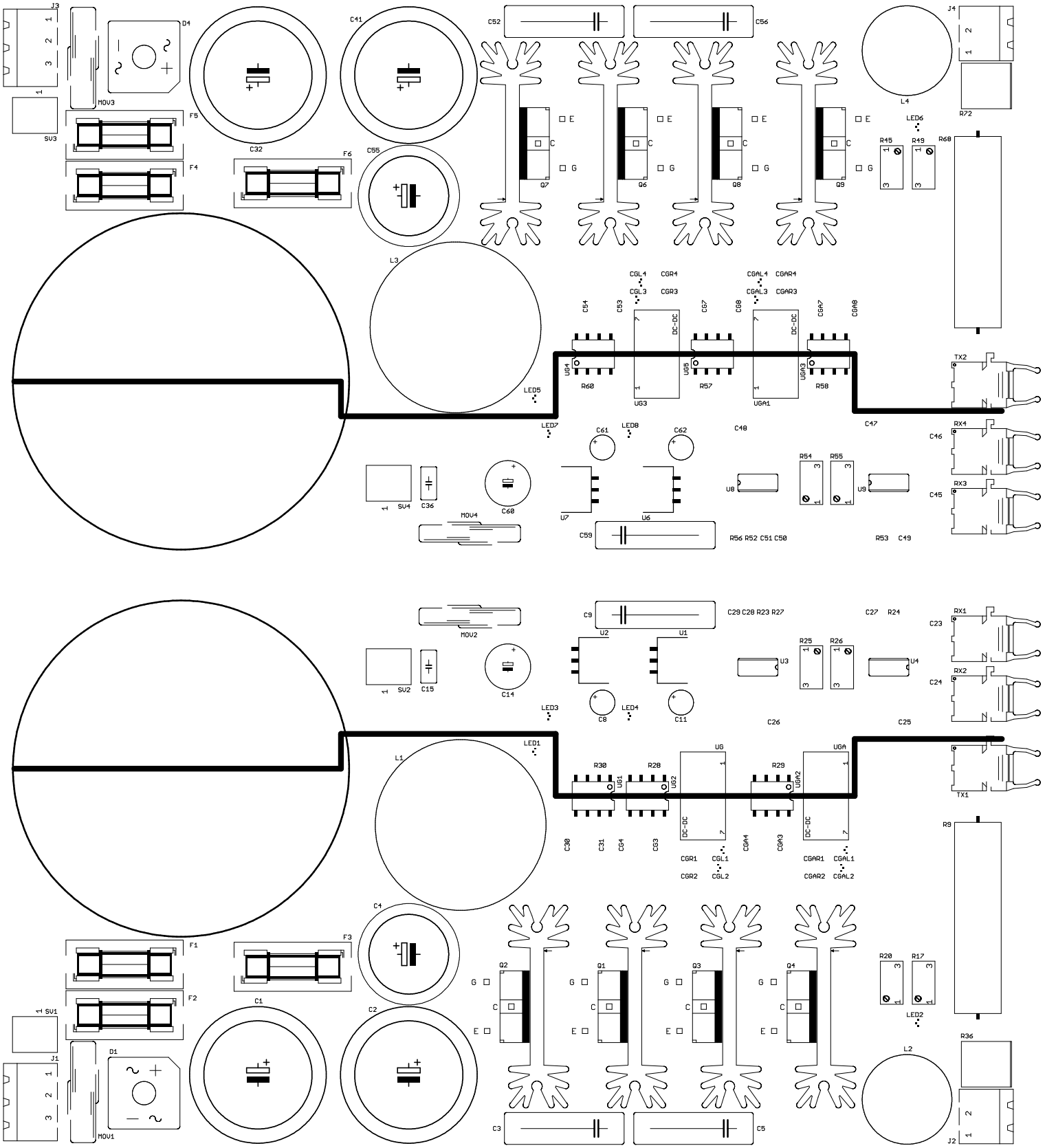
New_job (Board layer 1) Scale=0.89 Wed Sep 2 12:01:10 2020

Annexure – I LAYOUT



New_job (Board layer 5) Scale=0.90 Wed Sep 2 12:01:36 2020




J3
D4
C41
C52
C56
J4
L4
MOV3
F5
F4
C32
F6
C55
Q7
Q6
Q8
Q9
LED6
R45
R49
R68
R72
L3
CGL4
CGR4
CGL3
CGR3
CGAL4
CGAR4
CGAL3
CGAR3
C54
C53
C67
C68
C66
C69
DC-DC
UG4
UG5
UGA3
R60
R57
R58
UG3
UGA1
TX2
LED5
LED7
LED8
C61
C62
C48
C47
RX4
C46
RX3
C45
R54
R55
U8
U9
SV4
C36
C60
MOV4
U7
U6
C59
R56 R52 C51 C50
R53 C49
MOV2
C9
C29 C28 R23 R27
C27 R24
RX1
C23
RX2
C24
U2
U1
U3
U4
R25
R26
SV2
C15
C14
LED3
LED4
C8
C11
C26
C25
LED1
L1
UG
UGA
R30
R28
R29
UG1
UG2
UGA2
TX1
C30
C31
C64
C63
C62
C65
CGR1
CGL1
CGR2
CGL2
CGAR1
CGAL1
CGAR2
CGAL2
R9
C4
F1
F3
F2
C1
C2
Q2
Q1
Q3
Q4
G
C
E
R20
R17
LED2
SV1
J1
D1
MOV1
C3
C5
L2
R36
J2

Annexure – II – Bill of Material

Sr No.	Part	Qty	Description	Value	Package	Make
1	J1, J3	2	PCB Connector - Male Female Pair	MKDS-3-PIN plug type, PCB Mounting - Male Horizontal with Female Block	5.08 mm - 3 Pin	Phoenix, Elmac, RS Components
2	J4, J2	2	PCB Connector - Male Female Pair	MKDS-2-PIN, plug type, PCB Mounting - Male Horizontal with Female Block	5.08 mm - 2 Pin	Phoenix, Elmac, RS Components
3	MOV3, MOV1	2	Varistor	820V, 510VAC, 670VDC, 20MM DISC	20 mm	Bourns-20d821k, OR Equivalent EPCOS, Vishay
4	MOV4, MOV2	2	Varistor	275 V, 350 V, 430VDC, 20MM DISC	20 mm	Bourns-20d431k, EPCOS, Equivalent EPCOS, Vishay
5	F1, F2, F3, F4, F5, F6	6	Cartridge Fuse Holder, PCB Mount	600V, 10A, 5 x 20mm, Solder, Through Hole	5 x 20mm	Little Fuse - 05200101z Schurter - 0031.8201 OR Equivalent
6	D3, D6	2	Bridge Rectifier	Single Phase, 1 kV, 6 A, Through Hole, 4 Pins	D-72	Vishay - VS-KBPC610PBF OR Equivalent
7	D1, D4	2	Bridge Rectifier	single Phase, 600 V, 2 A, SDIP, 4 Pins	SDIP	On Semiconductor - DF06S2 OR Equivalent
8	C32, C41, C1, C2	4	Polarized Capacitor	Aluminium Electrolytic, 470- 560 uF, 450V,85C,	Lead: 10 mm Diameter: 30mm, Height - 45 mm	United Chemi-Con - Ekmw451vs, Kemet-Alc80 Series, Samways

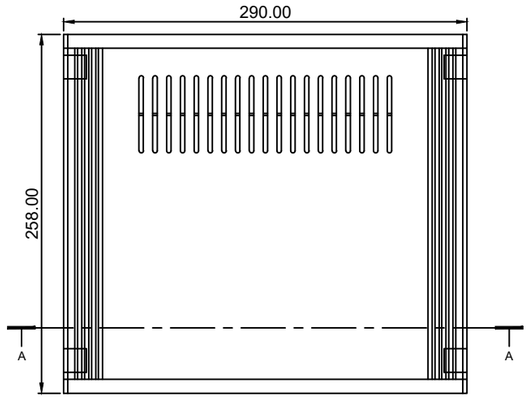
9	L1, L3	2	Inductor	High Current Choke, 10mH±10%, 1.3A,	Radial, Día: 28 mm Height: 26 mm	Bourns-JW-Miller – Model 1140-103k
10	C4, C55	2	Polarized Capacitor	Aluminium Electrolytic, 120uF ± 20% , , 450V , Snap-In Type	Lead Spacing 10 mm Dia.: < 25mm, Height - < 45 Mm	Cornell Dubilier Wurth Electronic United Chemi-Con Kemet
11	Q6, Q7, Q8, Q9, Q1, Q2, Q3, Q4	8	NPT Trench IGBT	FGA25N120	TO-247	**Free Issue Material**
12		8	Heatsink	Square, With Radial Fins, R_{TH} < 7 C/W	TO-218 /TO-220	Fischer, Aavid
13	C52, C56, C3, C5	4	DC Film Capacitor	Film Capacitor, Box Type, 0.33 µF ±10 %, 400 V	Lead : 22.5 mm	EPCOS- B32523 Series or Equivalent
14	R41, R13	2	Resistor	4.7 K	RESISTOR_1206	Multicomp, Yageo, Murata
15	L2, L4	2	Inductor	100 µH± 10%, 1.7 A, ,5 MHz Support	Radial, Dia. < 20 mm Height < 30 mm	Bourns-JW-Miller, Coilcraft - RFC0810B-104KE
16	Q5, Q10	2	Transistor NPN	MMBT2222	SOT23-3	Analog-Devices, Fairchild, Semikron
17	D5, D2	2	Diode	UF4007	SOD87	Analog-Devices, Fairchild, Semikron
18	R71, R35	2	Resistor	100 Ohm, 1 W	R2512	Multicomp, Yageo, Murata
19	C59, C9	2	DC Film Capacitor	Film Capacitor, Box Type, 0.33 µF, 400 V	Lead : 22.5 mm	EPCOS B32523 Series OR Equivalent

20	C60, C14	2	Polarized Capacitor	1000uF, > 35 V, Aluminium Electrolytic, 85 C	E5-13	Vishay, Nichicon, EPCOS
21	C36, C15	2	Capacitor	Film Capacitor, Box Type, 100nf, 275 V AC, 85C	3.96 mm	EPCOS, Vishay OR Equivalent
22	R5, R33, R34, R6, R64, R69, R70, R65, R66, R67, R8, R7	12	Resistor	1.2 M /1W	R2512	Multicomp, Yageo, Murata
23	U1, U6	2	VOLTAGE REGULATOR	LM7815	TO263-3	Analog-devices, ST Microelectronics
24	U2, U7	2	VOLTAGE REGULATOR	LM7805	TO263-3	Analog-devices, ST Microelectronics
25	U8, U9, U3, U4	4	Quad NAND Schmitt Trigger, CD4093	2 Inputs, 3 V to 18 V Supply, 6.8 mA Out	SOIC-14	Analog-devices, Fairchild, Semikron
26	U5, U10	2	V/F Converter	AD654 - SOIC8	AD654, SOIC8	**Free Issue Material**
27	UG4, UG5, UGA3, UG1, UG2, UGA2	6	MOSFET Gate Driver Optocoupler	FOD3180, 1 Channel, 2 A Peak Current, 250 KHz Support, 8 Pins, 5 kV,	SOIC8, 6.3MM	ON Semiconductor
28	UG3, UGA1, UG, UGA	4	Isolated DC/DC Converter	13.5-16.5 V Input, +15 V & -8.7 V Output, 2 W, SIP, 5.2 kV DC Isolation	Width: 9.95mm Height: .65mm Depth: 19.65mm	Murata: MGJ2D151509SC
29	RX1, RX2, RX3, RX4	4	Receiver	HFBR-2521	HFBR-15X3	**Free Issue Material**
30	TX1, TX2	2	Transmitter	HFBR-1521	HFBR-15X3	**Free Issue Material**

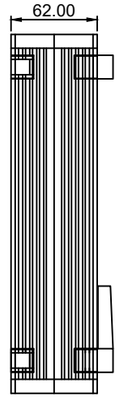
31	C19, C40	2	SMD Multilayer Ceramic Capacitor	470 pF, 50 V, ± 10%, dielectric X7R	SMD, 1.60x 0.80x 0.80 mm	AVX, Multicomp, KEMET
32	LED5, LED6, LED2, LED1	4	Led	Green	LED3MM	Osram, Electrolube,
33	LED7, LED8, CGL4, CGL3, LED3, LED4, CGAL4, CGAL3, CGL1, CGL2, CGAL1, CGAL2	12	Led	Red	LED3MM	Osram, Electrolube,
34	Hang on Heatsink	2	Resistor	2K, 100 W, Wire-wound, Aluminium Housed, Epoxy Potted, V Max > 2500 V, Isolation > 3 kV DC	0411/15	Arcol, PEC, Vishay
35	R38, R10, R15, R14, R43, R42	6	Resistor	470E	RESISTOR_1206	Multicomp, Yageo, Murata
36	CGR4, CGAR4, CGR2, CGAR2, CGR4	5	Resistor	8.2K	RESISTOR_1206	Multicomp, Yageo, Murata
37	R39, R11, CGAR3, CGR1, CGAR1, CGR3,	6	Resistor	1.5K	RESISTOR_1206	Multicomp, Yageo, Murata
38	R40		Resistor	10K	RESISTOR_1206	Multicomp, Yageo, Murata
39	R31, RG1, RGA1, R61, RG3, RGA3, R16, R53, R52, R44, R24, R23	12	Resistor	51E	RESISTOR_1206	Multicomp, Yageo, Murata
40	R54, R55, R25, R26, R17, R45, R12	7	Potentiometer	10K	S64W	Multicomp, Yageo, Murata
41	R18, R19, R46, R47,	4	Resistor	100K	RESISTOR	Multicomp, Yageo, Murata
42	R49, R20	2	Potentiometer	1M	S64W	Multicomp, Yageo, Murata
43	R50, R51, R48, R37, R21, R22	6	Resistor	2.2M	R2512	Multicomp, Yageo, Murata

44	R57, R58, R60, R30, R28, R29	6	Resistor	220E	RESISTOR	Multicomp, Yageo, Murata
45	R68, R9	2	Resistor	25k- 10W, Wire wound, Axial Leaded	47.62 mm	Vishay - CW01025K00JE73 or Equivalent
46	R36, R72	2		MKDS-2-PIN(5.08mm) plug type, PCB Mounting - Male Horizontal with Female Block	5.08 mm - 2 Pin	Phoenix, Elmac
47	R3, R4, R63, R59, R1, R2	6		50k/1W	R2512	Multicomp, Yageo, Murata
48	SV1, SV2, SV3, SV4	4	PCB Connector	JST-2-PIN (3.96mm)	3.96 mm	ELMAC, RS or Equivalent
49	C27, C29, C49, C50	4	SMD Multilayer Ceramic Capacitor,	1.5nF, 50 V, +/- 10 %	0.4 m x 0.2 mm	AVX, Multicomp, KEMET
50	C61, C62, C8, C11	4	Polarized Capacitor	100uF, 25 V, 85 C		Vishay, Nichicon, EPCOS
51	C22, C30, C31, CG4, CG3, CG2, CG1, CGA1, CGA2 CGA4, C16, C17, C20, C21, C44, C54, C53, C42, C43, C46, C47, C45, C23, C24, C25, C6, C7, C10, C12, C13, C26, CG5, CG6, C37, C38, CG7, CG8, CGA5, CGA6, CGA7, CGA8, C33, C34, C35, C57, C 48	46	SMD Multilayer Ceramic Capacitor	100 nF, 50 V, ± 10%, X7R dielectric	SMD, 1.60x 0.80 mm	AVX, Multicomp, KEMET
52	Tr1, Tr2	2	Toroidal Transformer	300V:18 V, 2 A, Toroidal	OD : 75 mm Height : 35 mm	M/s. Shilchar Transformer
53	Enclosure	1	Rectangular Box with Facia	Polycarbonate	Detailed drawings are appended here.	SPM Electronics, Gandhinagar

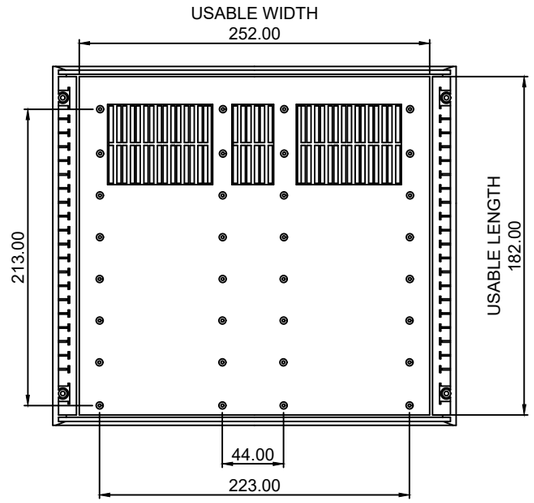
Note: It is recommended to refer Layout File for verification of Footprint. Component size exceeding the footprint shall not be accepted.



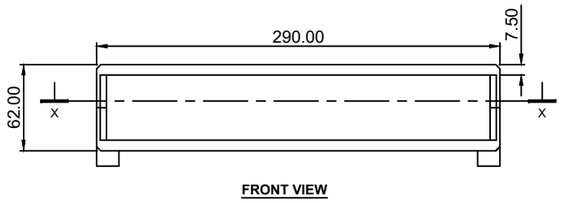
TOP VIEW



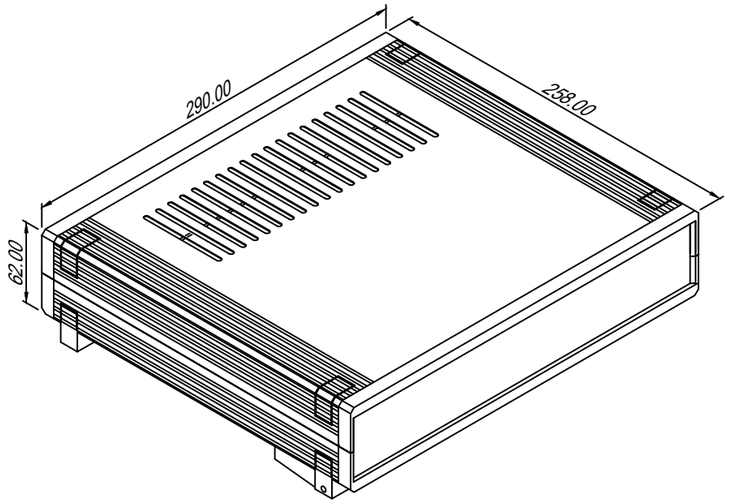
SIDE VIEW

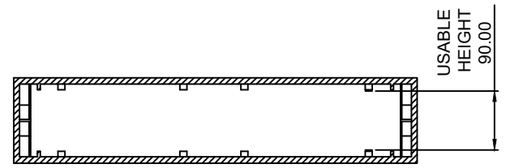


SECTION VIEW X - X

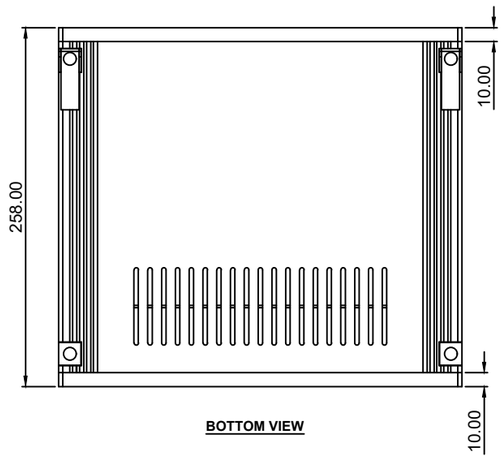


FRONT VIEW





SECTION VIEW A - A



BOTTOM VIEW

SPM ELECTRONICS AND SYSTEMS		**B-45/1, GIDC Electronics Estate, Sector-25, Gandhinagar-382024 Email: info@spmelectronics.com (M) +91 9925027048**	
TITLE- MODEL: SPM 15-34 PLASTIC TABLE TOP ENCLOSURE DIMENSION: 290X258X62 MM	SCALE -		
	VIEW-		
	SHEET 01 OF 01	DRAWN / NPS / 25.07.2020	A3
		CHKD	
		APPROVED	

Annexure – III – Spares to be Provided

Sr No.	Part	Qty	Description	Value	Package	Make
1	MOV3, MOV1	6	Varistor	820V, 510VAC, 670VDC, 20MM DISC	20 mm	Bourns-20d821k, OR Equivalent EPCOS, Vishay
2	MOV4, MOV2	6	Varistor	275 V, 350 V, 430VDC, 20MM DISC	20 mm	Bourns-20d431k, EPCOS, Equivalent EPCOS, Vishay
3	D3, D6	6	Bridge Rectifier	Single Phase, 1 kV, 6 A, Through Hole, 4 Pins	D-72	Vishay - VS-KBPC610PBF OR Equivalent
4	D1, D4	6	Bridge Rectifier	single Phase, 600 V, 2 A, SDIP, 4 Pins	SDIP	On Semiconductor - DF06S2 OR Equivalent
5	C32, C41, C1, C2	12	Polarized Capacitor	Aluminium Electrolytic, 470- 560 uF, 450V,85C,	Lead: 10 mm Diameter: 30mm, Height - 45 mm	United Chemi-Con - Ekmw451vs, Kemet-Alc80 Series, Samways
6	L1, L3	6	Inductor	High Current Choke, 10mH±10%, 1.3A,	Radial, Día: 28 mm Height: 26 mm	Bourns-JW-Miller – Model 1140-103k
7	C4, C55	6	Polarized Capacitor	Aluminium Electrolytic, 120uF ± 20%, , 450V , Snap-In Type	Lead Spacing 10 mm Dia.: < 25mm, Height - < 45 Mm	Cornell Dubilier Wurth Electronic United Chemi-Con Kemet
8	C52, C56, C3, C5	12	DC Film Capacitor	Film Capacitor, Box Type, 0.33 µF ±10 %, 400 V	Lead: 22.5 mm	EPCOS- B32523 Series or Equivalent
9	L2, L4	6	Inductor	100 µH± 10%, 1.7 A, ,5 MHz Support	Radial, Dia. < 20 mm Height < 30 mm	Bourns-JW-Miller, Coilcraft - RFC0810B-104KE

10	D5, D2	6	Diode	UF4007	SOD87	Analog-Devices, Fairchild, Semikron
11	C59, C9	6	DC Film Capacitor	Film Capacitor, Box Type, 0.33 µF, 400 V	Lead: 22.5 mm	EPCOS B32523 Series OR Equivalent
12	U8, U9, U3, U4	12	Quad NAND Schmitt Trigger, CD4093	2 Inputs, 3 V to 18 V Supply, 6.8 mA Out	SOIC-14	Analog-devices, Fairchild, Semikron
13	UG4, UG5, UGA3, UG1, UG2, UGA2	18	MOSFET Gate Driver Optocoupler	FOD3180, 1 Channel, 2 A Peak Current, 250 KHz Support, 8 Pins, 5 kV,	SOIC8, 6.3MM	ON Semiconductor
14	UG3, UGA1, UG, UGA	18	Isolated DC/DC Converter	13.5-16.5 V Input, +15 V & -8.7 V Output, 2 W, SIP, 5.2 kV DC Isolation	Width: 9.95mm Height: .65mm Depth: 19.65mm	Murata: MGJ2D151509SC
15	Hang on Heatsink	6	Resistor	2K, 100 W, Wire-wound, Aluminium Housed, Epoxy Potted, V Max > 2500 V, Isolation > 3 kV DC	0411/15	Arcol, PEC, Vishay
16	R68, R9	6	Resistor	25k- 10W, Wire wound, Axial Leaded	47.62 mm	Vishay - CW01025K00JE73 or Equivalent
17	Tr1, Tr2	6	Toroidal Transformer	300V:18 V, 2 A, Toroidal	300 V: 18 V Transformer	M/s. Shilchar Transformer
18	UG4, UG5, UGA3, UG1, UG2, UGA2	18	MOSFET Gate Driver Optocoupler	FOD3180, 1 Channel, 2 A Peak Current, 250 KHz Support, 8 Pins, 5 kV,	SOIC8, 6.3MM	ON Semiconductor