

PCB & MOUNTINGS

1. INTRODUCTION:

Printed circuit board (PCB) is base of any electronics/electrical equipment. A PCB provides the connectivity to the electronic component such as resistor, capacitor, coils, pots, diodes, FET, transistor, ICs, transformer etc. to form a complete electronic circuit. In the present scenario, the existence of electronics equipments cannot be imagined without a PCB. The PCBs are not only providing the connectivity among the electronic components but also reduces the size and increases the efficiency of the electronic equipment. Broadly the PCBs may be divided in two categories i.e. single layer PCBs and multi-layer PCBs. One can easily find the contribution of electronic industries in each and every field of our daily life i.e. entertainment, communication, education, R&D, Public Services, Defence, Transport, Agriculture, health care services etc. With the growing demand of electronic equipments/appliances in every sphere of human beings the electronic industry is growing up with a very fast rate. Similarly, the demand of micro servicing industries such as assembling/mounting of electronic component on PCBs to meet the requirement of the small/medium/large scale electronic industries is also increasing. This project profile is prepared for the leaded electronic components to be assembled on PCBs. The PCBs & components are provided by the customer.

2. PRODUCT & ITS APPLICATION:

In electronics, printed circuit boards, or PCBs, are used to mechanically support electronic components which have their connection leads soldered onto copper pads in surface mount applications or through drilled holes in the board and copper pads for soldering the component leads in thru-hole applications. A board design may have all thru-hole components on the top or component side, a mix of thru-hole and surface mount on the top side only, a mix of thru-hole and surface mount components on the top side and surface

mount components on the bottom or circuit side, or surface mount components on the top and bottom sides of the board. The boards are also used to electrically connect the required leads for each component using conductive copper traces. The component pads and connection traces are etched from copper sheets laminated onto a non-conductive substrate. Printed circuit boards are designed as single sided with copper pads and traces on one side of the board only, double sided with copper pads and traces on the top and bottom sides of the board, or multilayer designs with copper pads and traces on top and bottom of board with a variable number of internal copper layers with traces and connections.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Promoter for this project may have any graduation plus background of electronics or electrical maintenance knowledge or experience.

4. MARKET POTENTIAL AND MARKETING ISSUES:

Total Indian PCB Market Size is USD 920 Million. The Indian electronics market is one of the fastest growing in the world and is anticipated to reach US\$ 400 billion in 2022, with domestic manufacturing climbing to over US\$ 100 billion. This will create immense scope for the PCB market. According to an ELCINA study, domestic market demand for PCBs will grow at a CAGR of 20.56 per cent over the period 2015-2020, and will reach over US\$ 6 billion by 2020 from the current level of US\$ 2.38 billion (Figure 1). Currently, only 35 per cent of this demand is met by local manufacturers. And for the remaining 65 per cent, India is still dependent on imports. The current demand of US\$ 2.38 billion represents the demand for all types of PCBs, and includes both the bare board and the populated PCBs. The current market size for bare board PCBs is US\$ 1.2 billion, and only 30 per cent of this demand is being met by local PCB manufacturers. The remaining 70 per cent is imported. The Indian market is slightly different from the rest of the globe. Globally, the market for flexible circuits is expected to grow much faster than that for rigid PCBs, since the former can facilitate form factor reduction and eliminate connectors. However, Indian PCB

manufacturers are mostly focused on single-sided, double-sided and multi-layered PCBs with a layer count of four to six, in most cases. A majority of the Indian manufacturers adopt the high-mix, medium-volume strategy where different types of PCBs are manufactured in low to medium volumes. There are around 200 PCB manufacturers in India — more than 60 per cent of them are very small and un-organized. PCBs are used in each and every electronic and most of the electrical equipments. The working of any electronic equipments such as home appliances, entertainment equipment, testing, medical equipments or even defence electronic equipment etc. cannot be imagined without a PCB. The small, medium and large scale units have Nos. of vendors to carry out the specific job. The mounting of electronic components on PCB is also a one of the ancillary job. The charges for this type of job depend on the size and level of complexity of the PCB. The test equipments, raw material required to run this type of service unit are indigenously available. With proper marketing, high quality and competitive price this type of units have sufficient scope in the present scenario.

5. REQUIREMENTS – Material/Equipment:

The consumables such as solder, flux, chemical, adhesive, PCB may be procured from the local market.

Machinery and equipment

Heat wave soldering machine, Oscilloscope (50 MHz) LCR - Q Meter Function Generator Power Supplies (0 - 30V, 3 Amp) Digit Digital Multimeter, Analogue Multimeter, Magnifying glass fitted with tube light, Temperature control soldering station, Soldering Iron 25 W, Soldering Iron 65 W, Variant Rheostat. The total cost of equipments would be Rs. 4.00 lakhs.

Land & Building:

Total Built up area required will be 150 Sq. Mtrs. out of which for Office, Stores 50 Sq. Mtrs. And for Assembly & Testing 100 Sq. Mtrs. Will be required. The same will be available on rent.

MOTIVE POWER:

The power requirement would be 10 KVA.

6. MANUFACTURING PROCESS:

Assembling/Mounting Procedure: The incoming electronic components and PCBs are tested for the required specification. In the assembly line electronic components such as resistor, capacitor, coils, diodes, transistors, ICs, SCRs etc. are fitted on the PCB at their appropriate location at different stages. These PCBs then passed over the heat wave soldering bath for soldering of component to the PCB. In the next stage, unwanted leads of the components are removed and proper soldering of the components is checked with the help of magnifying glass fitted with tube light. Then the assembled PCB is tested for its specification with the help of appropriate test jigs before dispatch to the customer.

7. MANPOWER REQUIREMENT:

Sr. No.	Designation Employees	Of Salary Person	Per Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
1	Operators	12,000	12000.00	1	1	1	1	1
2	Helpers	10,000	10000.00	1	1	1	1	1
3	Admin Manager	12,000	12000.00	1	1	1	1	1
4	Office Boy	10,000	10000.00	1	1	1	1	1
	Total		44000.00	4	4	4	4	4

8. IMPLEMENTATION SCHEDULE:

The project can be implemented in 2 months' time as detailed below:

Sr. No.	Activity	Time Required
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	1.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (<i>some activities shall run concurrently</i>)	2.00

9. COST OF PROJECT:

Sr. No.	Particulars	₹ in Lacs
1	Land	0.00
2	Building	0.00
3	Plant & Machinery	4.00
4	Furniture, Electrical Installations	1.00
5	Other Assets including Preliminary / Pre-operative expenses	0.40
6	Margin for Working Capital	4.32
	Total	9.72

10. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets.

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	2.43
2	Bank Finance	7.29
	Total	9.72

11. WORKING CAPITAL CALCULATION:

The project requires working capital of lakhs as detailed below:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	2.16	0.25	0.54	1.62
2	Receivables	1.08	0.25	0.27	0.81
3	Overheads	1.08	100%	1.08	0.00
4	Creditors	-		0.00	0.00
	Total	4.32		1.89	2.43

12. LIST OF MACHINERY REQUIRED:

Sr. No.	Particulars	UOM	QUANTITY	Rate (₹)	Value (₹ in Lacs)
	Plant & Machinery / equipments				
a)	Main Machinery				
1	Heat wave soldering machine	NOS.	1	60000	0.60
2	Oscilloscope (50 MHz) LCR - Q Meter Function Generator Power Supplies (0 -	NOS.	1	65000	0.65
3	Digital Multimeter, Analogue Multimeter	NOS.	1	25000	0.25
4	Magnifying glass fitted with tube light	NOS.	1	40000	0.30
5	Temperature control soldering station, Soldering Iron 25 W, Soldering Iron 65 W, Rheostat.	NOS.	1	100000	1.00
6	Installation, Electrification, taxes and transportation.	NOS.	1	120000	1.20
	<i>sub-total Plant & Machinery</i>				4.00
	Furniture / Electrical installations				
a)	Office furniture	LS	1	50000	0.50
b)	Stores cupboard	LS	1	0	0.00
c)	Computer & Printer	L. S.	1	50000	0.50
	<i>sub total</i>				1.00
	Other Assets				
a)	preliminary and preoperative				0.40
	<i>sub-total Other Assets</i>				0.40
	Total				5.40

Turnover

Sr No	Description	Cost/Unit	Quantity	Sales/month	Revenue/year
1	PCB MOUNTING	₹400	450	₹180000.00	₹ 21,60,000.00
Total					₹ 21,60,000.00

13. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	12.96	15.12	17.28	19.44	21.60
3	Raw Materials & Other direct inputs	₹. In Lacs	4.25	4.96	5.67	6.38	7.09
4	Gross Margin	₹. In Lacs	8.71	10.16	11.61	13.06	14.51
5	Overheads except interest	₹. In Lacs	2.31	2.46	2.75	2.83	2.89
6	Interest	₹. In Lacs	0.73	0.73	0.49	0.36	0.29
7	Depreciation	₹. In Lacs	2.80	2.00	1.40	1.00	0.90
8	Net Profit before tax	₹. In Lacs	2.86	4.97	6.98	8.86	10.43

14. BREAKEVEN ANALYSIS:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	21.60
2	Variable costs	₹. In Lacs	7.09
3	Fixed costs incl. interest	₹. In Lacs	3.18
4	BEP = $FC/(SR-VC) \times 100 =$	% of capacity	21.93%