

BTEC Assignment Brief for Learning Aim A

Qualification	Pearson BTEC Level 3 National Extended Diploma in Engineering
Unit number and title	Unit 22: Electronic Printed Circuit Board Design and Manufacture
Learning aim(s) (For NQF only)	A: Examine the design and manufacture of printed circuit boards that are widely used in industry
Assignment title	Printed circuit board technology and manufacture.
Assessor	Mark Harris
Issue date	03 February 2021
Hand in deadline	Monday 22 nd February 2021
Internal Verifier	Ian Wilkins

Learner declaration	<p>I certify that the work submitted for this assignment is my own. I have clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.</p> <p>Learner signature: _____ Date: _____</p>
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1. Vocational Scenario or Context	<p>You have started an Apprenticeship with a company that specialises in manufacturing printed circuit boards (PCB) for other companies to put into their products. Some customers provide the printed circuit board design layouts, but others only supply the circuit schematic, which your company turns into a PCB layout.</p> <p>Your Supervisor has asked you to carry out an investigation to familiarise yourself with the range of boards that your company provides, including their practical advantages and limitations.</p>
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2. The Tasks	<p>You have been asked to investigate and evaluate at least two different printed circuit boards that are contained within two products. The circuit architecture of the PCBs and intended application of the products containing PCBs should be significantly different.</p> <p>To do this:</p> <p>Your tutor will provide you with two examples of products that contain two different types of PCB. You need to:</p> <ul style="list-style-type: none"> Research the manufacture and technologies of at least two different types of printed circuit board.
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	<ul style="list-style-type: none"> Investigate the reasons for the use of each type of circuit board in the products you have selected. <p>You then need to:</p> <ul style="list-style-type: none"> Produce either a written report, or deliver a formal presentation that compares, and contrasts, the two types of circuit board, and includes information about: - the technology used for each type of printed circuit board. the characteristics of each type of printed circuit board, including factors such as size, materials used, component attachment methods, connections and case mounting. how thermal management issues are dealt with in the design stage, including the causes and consequences of heat gain. details of the manufacturing processes used (with illustrations) from raw materials through to testing, including information about the hardware and consumables that are needed. quality control methods (e.g., for small batch and mass production). Issues relating to sustainability and environmental considerations of the investigated technologies, including manufacturing and the product lifecycle.
3. Checklist of evidence required	<p>A written report or formal presentation detailing:</p> <ul style="list-style-type: none"> printed circuit board technology PCB characteristics thermal management techniques PCB manufacturing processes quality control methods.

This brief has been verified as being fit for purpose:			
Assessor	Mark Harris		
Signature	<i>MHA</i>	Date	03/02/2021
Internal verifier	Ian Wilkins		
Signature		Date	

4. Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
22/A.P1	Explain the technology used in and characteristics of at least two different printed circuit boards contained in products.
22/A.P2	Explain the causes and consequences of heat gain and thermal management methods used in at least two different printed circuit boards contained in products.
22/A.P3	Explain the manufacturing processes and quality control methods used in at least two different printed circuit boards contained in products.
22/A.M1	Analyze the design and the manufacture of at least two different printed circuit boards contained in products.
22/A.D1	Evaluate, using vocational and high-quality written language, the design and manufacture of at least two different printed circuit boards contained in products and consider how they are likely to evolve.
5. Sources of information to support you with this Assignment	<p>Books</p> <p>Making printed circuit boards; Axelson J L; Tab Electronics (1993); ISBN-13: 978-0830639519</p> <p>Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Boards; Monk S; McGraw-Hill Education TAB (1994); ISBN-13: 978-0071819251</p> <p>Websites:</p> <p>https://learn.sparkfun.com/tutorials/pcb-basics</p> <p>http://www.pcb.electrosoft-engineering.com/04-articles-custom-system-design-and-pcb/01-printed-circuit-board-concepts/printed-circuit-board-pcb-concepts.html</p> <p>Above are some examples of websites. Further useful resources may be found at</p> <p>http://qualifications.pearson.com/en/support/published-resources.html#step1</p>
6. Other assessment materials included with this Assignment Brief	Pictures of two different types of printed circuit from common products (examples of THC, SMT or hybrid technology). In the resources of the Teams Assignment.

Assessment record	
Unit/Criteria reference	You have been assessed according to the criteria, as follows: -
Grade awarded:	PASS/ MERIT/ DISTINCTION
35/A.P1	You have/have not explained the technology used in, and characteristics of, at least two different printed circuit boards contained in products.
22/A.P2	You have/have not explained the causes and consequences of heat gain and thermal management methods used in at least two different printed circuit boards contained in products.
22/A.P3	You have/have not explained the manufacturing processes and quality control methods used in at least two different printed circuit boards contained in products.
35/A.M1	You have/have not compared the methodologies and job roles used in two different software development projects, explaining the purpose and importance of user requirements.
35/A.D1	You have/have not evaluated, using language that is technically correct and of a high standard, the methodologies and job roles used in two different software development projects, explaining the purpose and importance of user requirements.