



Australian Government

Department of Education, Employment and Workplace Relations

MEM30026A Select and test components for simple electronic switching and timing circuits

Release: 1

MEM30026A Select and test components for simple electronic switching and timing circuits

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers selecting common electronic components to suit basic applications, and performing basic electronic calculations.
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Application of the Unit

Application of the unit	All work carried out under supervision. Band: 0 Unit Weight: 0
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM12024A	Perform computations

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Perform basic electronic calculations	1.1. Calculations are performed for a given circuit voltage, current, resistance and d.c. power. 1.2. The period, frequency, RMS, peak and peak-to-peak voltages are calculated for a given repetitive waveform. 1.3. Waveform calculations are verified using an oscilloscope.
2. Select, test and use simple electronic switching circuits	2.1. Transistors required for simple switching applications are selected. 2.2. The circuit is wired up and tested using suitable prototyping equipment. 2.3. Calculations are verified.
3. Select, test and use simple electronic timing circuits	3.1. The appropriate timing circuit is selected and the time constant is calculated. 3.2. The circuit is wired up and tested using suitable prototyping equipment. 3.3. Calculations are verified.
4. Select common power supplies and power control devices	4.1. Appropriate rectification is selected. 4.2. Appropriate power control devices are selected.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
<p>This section describes the skills and knowledge required for this unit.</p>
<p>Required skills</p>
<p>Look for evidence that confirms skills in:</p> <ul style="list-style-type: none"> • using a multimeter to measure a.c. and d.c. voltages, resistance and capacitance • setting an oscillator/signal generator to a specified frequency and amplitude • using an oscilloscope to record wave shapes and to measure the peak-to-peak voltage and the period of any repetitive waveform • identifying sine waves, cosine waves, square waves, triangular waves and sawtooth waves • communicating • planning

REQUIRED SKILLS AND KNOWLEDGE

- assessing
- problem solving
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures and other applicable reference documents
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit
- checking for conformance to specifications
- checking and clarifying task related information

Required knowledge

Look for evidence that confirms knowledge of:

- electronic concepts and units
- voltage
- current
- resistance and capacitance
- power
- frequency and period
- common electronic instruments
- multimeters
- power supplies
- signal generators
- oscilloscopes
- timing circuits and oscillators
- semiconductor devices
- diodes (power, zener, LEDs)
- transistors
- linear integrated circuits
- power control devices (triacs, SCRs)
- power supplies
- hazards and control measure associated with selecting and test components for simple electronic switching and timing circuits, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to select and test components for simple electronic switching and timing circuits. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
Context of and specific resources for assessment	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting and testing components for simple electronic switching and timing circuits, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes,</p>

EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Simple electronic switching circuit	Includes simple transistor switches and simple linear integrated circuits
Suitable prototyping equipment	Includes breadboards
Appropriate timing circuit	Includes simple RC timing circuit, type 555 integrated circuit, etc.
Appropriate rectification	May include half or full wave
Power control devices	May include zener diodes and LEDs. SCRs and triacs

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Engineering technician
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