



Australian Government

MEM30026 Select and test components for simple electronic switching and timing circuits

Release: 1

MEM30026 Select and test components for simple electronic switching and timing circuits

Modification History

Release 1. Supersedes and is equivalent to MEM30026A Select and test components for simple electronic switching and timing circuits.

Application

This unit of competency defines the skills and knowledge required to select common electronic components to suit basic applications and perform basic electronic calculations. It includes selecting, testing and using simple electronic switching and timing circuits and selecting common power supplies and power control devices.

The unit applies to engineering or related activities and is suitable for people giving technical support in manufacturing or engineering operations and those pursuing technical qualifications and careers at paraprofessional or technician level. All work is carried out under supervision.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

MEM12024 Perform computations

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Engineering technician

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Perform basic electronic calculations	1.1 Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2 Perform calculations for a given circuit voltage, current, resistance and direct current (DC) power 1.3 Calculate the period, frequency, RMS, peak and peak-to-peak

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	voltages for a given repetitive waveform 1.4 Verify waveform calculations using an oscilloscope
2. Select, test and use simple electronic switching circuits	2.1 Select transistors required for simple switching applications 2.2 Wire up the circuit and test using suitable prototyping equipment including breadboards 2.3 Use checking processes to verify calculations
3. Select, test and use simple electronic timing circuits	3.1 Select the appropriate timing circuit and calculate the time constant 3.2 Wire up the circuit and test using breadboards 3.3 Use checking processes to verify calculations
4. Select common power supplies and power control devices	4.1 Select half or full wave rectification based on requirements 4.2 Select appropriate power control devices

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Simple electronic switching circuit includes one or more of the following:	• simple transistor switches • simple linear integrated circuits.
Appropriate timing circuit includes one or more of the following:	• simple resistor capacitor (RC) timing circuit • type 555 integrated circuit.

Power control devices include one or more of the following:	• zener diodes • light emitting diodes (LEDs) • silicon controlled rectifiers (SCRs) • triode for alternating current (TRIACs).
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM30026A Select and test components for simple electronic switching and timing circuits.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM30026 Select and test components for simple electronic switching and timing circuits

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- performing basic electronic calculations
- selecting, testing and using simple electronic switching circuits on at least two occasions
- selecting, testing and using simple electronic timing circuits on at least two occasions
- selecting common power supplies and power control devices.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- electronic concepts and units
- simple electronic switching circuits
- 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 including:
 - zener diodes
 - light emitting diodes (LEDs)
- transistors

- linear integrated circuits
- power control devices including:
 - silicon controlled rectifiers (SCRs)
 - triode for alternating current (TRIACs)
- 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.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting and testing components for simple electronic switching and timing circuits at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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