

Title	Demonstrate and apply knowledge of switching power supplies		
Level	4	Credits	4

Purpose	People credited with this unit standard are able to: <ul style="list-style-type: none"> – demonstrate knowledge of switching power supplies; and – apply knowledge of switching power supplies.
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Classification	Electronic Engineering > Core Electronics
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Available grade	Achieved
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Guidance Information

- 1 Recommended skills and knowledge for entry: Unit 27350, *Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons (endorsed)*; Unit 30645, *Demonstrate practical application of theory and legislation for electrical appliance servicepersons (endorsed)*; Unit 30646, *Demonstrate knowledge of electrical theory and legislation for electrical appliance servicepersons EAS (endorsed)*.
- 2 References
 Electricity Act 1992;
 Electricity (Safety) Regulations 2010;
 Electrical Workers Registration Board (*EWRB*) *Rules of the Board and Teaching Guidelines* available at www.ewrb.govt.nz;
 Health and Safety at Work Act 2015;
 and all subsequent amendments and replacements.
- 3 Definitions
d.c. – direct current.
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
SMPS – switched mode power supply.
SOPS – self oscillating power supply.
- 4 Range
 - a Electrical, radiation, and workshop or laboratory safety practices are to be observed at all times.
 - b Evidence for the number and type of equipment chosen are left to the discretion of the assessor but must be sufficient to assess competence in all outcomes of the unit standard.
 - c All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
 - i legislation;
 - ii policies and procedures;

- iii ethical codes;
- iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
- v EWRB Rules of the Board;
- vi safe and sound practice;
- vii applicable site, company, and industry practice.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of switching power supplies.

Range SMPS, SOPS.

Performance criteria

- 1.1 Draw labelled block diagrams from memory showing waveforms at each block.
- 1.2 Explain the operation of individual circuit blocks with reference to circuit diagrams.
- 1.3 Outline the differences between SMPS and SOPS, and between primary and secondary switching.
- 1.4 Explain switching power supply terminology with reference to diagrams where applicable.

Range terminology may include but not limited to – buck converter, boost converter, flyback converter, forward converter, hot and cold chassis, over-voltage and current protection, short circuit protection, pulse width modulation; evidence of four is required.

Outcome 2

Apply knowledge of switching power supplies.

Performance criteria

- 2.1 Measure waveforms and d.c. voltages at points specified by the manufacturer.
- 2.2 Compare the characteristics of switching power supplies with those of linear supplies.

Range characteristics – regulation, efficiency, cost, physical size, radio frequency interference, circuit complexity.

Planned review date	31 December 2025
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	29 October 1996	31 December 2011
Revision	2	3 April 2001	31 December 2011
Review	3	26 July 2004	31 December 2012
Review	4	21 July 2011	31 December 2022
Review	5	24 June 2021	N/A

Consent and Moderation Requirements (CMR) reference

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.