

# APC-F203 Series DC-DC CONVERTER

200W Full Brick Triple Output Converter

## Advanced Power Conversion PLC

*An outstanding achievement from APC is the realisation of a TRIPLE output converter in the industry standard "full brick" size package.*

*Able to provide 3 different levels of output voltage from 1 module, this cutting edge design has been developed to offer maximum versatility and supreme flexibility. This helps simplify the design and reduce the cost of distributed power supply architectures.*

*Surface mount technology and a proprietary transformer design give reliable performance, and space saving versatility in a cost effective package.*

*The 200W DC-DC converter has fast dynamic response times and low output ripple. The comprehensive list of in-built protection features such as over voltage protection, under-voltage protection and short circuit protection are complemented by functions such as remote on/off and synchronisation facility to an external clock frequency.*

### FEATURES

- ❑ 3 different outputs from a single standard full brick size module
- ❑ 200W of power and a low profile
- ❑ Low input & output ripple currents
- ❑ Thermal monitoring of voltage to provide early warning of system fault
- ❑ Remote sensing provided to allow automatic compensation for voltage drop.
- ❑ Single connection for parallel operation to provide true N+1 redundancy capability
- ❑ No need for master/slave operation
- ❑ Input transient voltage protection
- ❑ External synchronisation facility
- ❑ Hot plug in capability
- ❑ Remote shutdown
- ❑ Output short circuit protection
- ❑ Wide input voltage range
- ❑ Thermal Current monitor voltage
- ❑ Output current monitor voltage



# Outline Product Specification



## APC-F203 Triple Output Full Brick DC-DC Converter - 200W

| General Characteristics                         | Conditions                                                     | Min   | Typ                      | Max   | Unit |
|-------------------------------------------------|----------------------------------------------------------------|-------|--------------------------|-------|------|
| Efficiency                                      | V1=, nom, Ta=24°C, Io=Io                                       | -     | 83                       | -     | %    |
| Switching frequency                             |                                                                | -     | 300                      | -     | KHz  |
| Isolation resistance input to output            |                                                                | 10    | -                        | -     |      |
| Calculated MTBF                                 | 80% of full load, Tc=40°C                                      | -     | 1.0                      | -     | Mhr. |
| Weight                                          |                                                                | -     | 170                      | -     | g    |
| NB: Absolute Maximum Ratings                    |                                                                |       |                          |       |      |
| Tc                                              | Operating case temperature                                     | -25   |                          | 85    | °C   |
| Tstg                                            | Storage Temperature                                            | -55   |                          | 125   | °C   |
| V1, trans                                       | Transient input voltage (100ms) 48v                            | -     |                          | 100   | V    |
| V1, trans                                       | Transient input voltage (100ms) 24v                            | -     |                          | 50    | V    |
| Viso                                            | input to output isolation voltage                              | -     |                          | 1500  | V    |
| Input Characteristics                           | Conditions                                                     | Min   | Typ                      | Max   | Unit |
| V1                                              | Operating input voltage (48V)                                  | 36    | 48                       | 75    | V    |
|                                                 | Operating input voltage (24V)                                  | 18    | 24                       | 36    | V    |
| I1, typ                                         | Typical Input Current (48V) (24v)                              |       | 5.2<br>10.7              |       | A    |
| In                                              | Input reflected ripple current - pp (5Hz to 20MHz)             |       | 48v - 0.5A<br>24V - 1.0A |       | A    |
| Ir                                              | Input Ripple rejection (120Hz)                                 |       | 60                       |       | dB   |
| Controlled Output Characteristics               | Conditions                                                     | Min   | Typ                      | Max   | Unit |
| Vo1 Output Voltage Setpoint                     | V1=V1, nom, Ta=25°C Io=Io, max                                 | 4.965 | 5                        | 5.035 | V    |
| Vo1 Output Voltage Tolerance Band               | Over all line, load & temperature conditions                   | 4.955 | 5                        | 5.045 | V    |
| Vo1 Line Regulation                             | V1=V1, min to V1 max                                           |       | 0.1                      |       | %Vo  |
| Vo1 Load Regulation                             | Io=Io, min to Io, max                                          |       | 0.1                      |       | %Vo  |
| Vo1 Temperature Regulation                      | Tc=25°C to +100°C                                              |       | 0.01                     |       | %/°C |
| Vo1 Vtr Load Transient voltage deviation        | Vi=V1, nom, Ta=25°C Io/ t=0.1A/us                              |       | 5                        |       | %    |
| Vo1 Ttr Load Transient Recovery Time            | Io change from 50% to 75% of Io, max or 50% to 25% of Io, max  |       | 500                      |       | us   |
| Vo1 Io Output Current                           | The module may exceed output ripple specification at I<Io, min | 0.1   |                          | 20    | A    |
| Vo1, Po, max Maximum Output Power               |                                                                |       |                          | 100   | W    |
| Vo1 Output Current Limit                        |                                                                | 20.5  |                          | 22    | A    |
| Vo1 Output Ripple and Noise RMS                 | Test frequency band width <20MHz                               |       | 25                       |       | mV   |
| Vo1 Output Ripple and Noise Peak to Peak        |                                                                |       | 50                       |       | mV   |
| Semi-Regulated Secondary Output Characteristics |                                                                | Min   | Typ                      | Max   | Unit |
| Vo2 & Vo3 Line Regulation                       | V1, min to V1 max                                              |       | 1                        | 2     | %Vo  |
| Vo2 & Vo3 Load Regulation                       | 10% to 100% Io, max                                            |       | 3                        | 5     | %Vo  |
| Cross Regulation                                | 25% to 100% of Io (controlled output)                          |       | 4                        | 6     | %    |
| Vo2 & Vo3 Output Ripple and Noise Peak to Peak  | 100% of Io, max                                                |       | 3                        | 6     | %    |

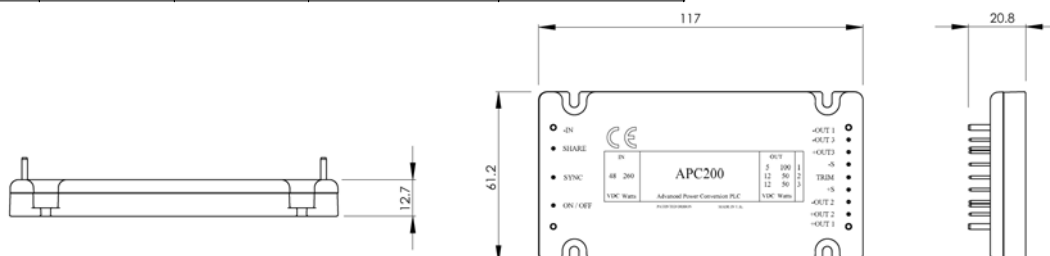
Note: Minimum load is 10% of lowest output current

## Range

Other versions and special custom modules available upon request

| Model Number             | Input Voltage (V) | Output Voltage V1 (V) | Output Voltage V2 (V) | Output Voltage V3 (V) | Maximum Output Current Vo1 (A) | Maximum Output Current Vo2, Vo3 (A) |
|--------------------------|-------------------|-----------------------|-----------------------|-----------------------|--------------------------------|-------------------------------------|
| APC-F203-048-050-120-120 | 48                | 5.0                   | +/- 12                | +/- 12                | 20                             | 4.2                                 |
| APC-F203-048-050-150-150 | 48                | 5.0                   | +/- 15                | +/- 15                | 20                             | 3.3                                 |
| APC-F203-024-050-120-120 | 24                | 5.0                   | +/- 12                | +/- 12                | 20                             | 4.2                                 |
| APC-F203-024-050-150-150 | 24                | 5.0                   | +/- 15                | +/- 15                | 20                             | 3.3                                 |

## Mechanical Outline



**Note:** This power module can be used in a wide variety of applications. To preserve maximum flexibility, internal fusing is not included. However, to achieve maximum safety and system protection, always use an input line fuse. The safety agencies require a normal-blow, DC fuse with a maximum rating of 20A. The same type fuse with a lower rating can be used in practice

Input Specifications (48V & 24V input models)  
Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature condition

### International Safety Standards

This module has been certified by the Nemko approval authority to EN60950 and by UL/CSA to UL1950 & CSA950

Please contact APC for full details



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