



## Wide Input Voltage Range 10 Watt Dc-Dc Converter



### FEATURES:

- 2:1 Wide Input Voltage.
- Recognized By UL 60950-1
- 10 Watt Package.
- Efficiency To 80%
- PI Input Filter.
- MTBF:>1,500,000 hrs
- 1500Vdc Isolation
- Operating Temperature:-40°C TO +100°C



Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

| Part Number  | Input Voltage | Input Current    |                    | Output Voltage | Output Current | Efficiency | Capacitor Load |
|--------------|---------------|------------------|--------------------|----------------|----------------|------------|----------------|
|              | Vdc           | No-Load (mA TYP) | Full Load (mA TYP) | Vdc            | Full Load(mA)  | %TYP       | uF TYP         |
| 61D-12S03RNL | 9-18          | 30               | 705                | 3.3            | 2000           | 78         | 2200           |
| 61D-12S05RNL | 9-18          | 30               | 1016               | 5              | 2000           | 82         | 2200           |
| 61D-12S09RNL | 9-18          | 30               | 1004               | 9              | 1111           | 83         | 1000           |
| 61D-12S12RNL | 9-18          | 30               | 992                | 12             | 833            | 84         | 680            |
| 61D-12S15RNL | 9-18          | 30               | 992                | 15             | 666            | 84         | 470            |
| 61D-12S18RNL | 9-18          | 30               | 980                | 18             | 555            | 85         | 470            |
| 61D-12S24RNL | 9-18          | 30               | 980                | 24             | 416            | 85         | 330            |
| 61D-12D05RNL | 9-18          | 30               | 1016               | ±5             | ±1000          | 82         | ±1000          |
| 61D-12D09RNL | 9-18          | 30               | 992                | ±9             | ±555           | 84         | ±470           |
| 61D-12D12RNL | 9-18          | 30               | 992                | ±12            | ±416           | 84         | ±470           |
| 61D-12D15RNL | 9-18          | 30               | 980                | ±15            | ±333           | 85         | ±330           |
| 61D-12D18RNL | 9-18          | 30               | 980                | ±18            | ±277           | 85         | ±220           |
| 61D-12D24RNL | 9-18          | 30               | 980                | ±24            | ±208           | 85         | ±220           |
| 61D-24S03RNL | 18-36         | 25               | 352                | 3.3            | 2000           | 78         | 2200           |
| 61D-24S05RNL | 18-36         | 25               | 508                | 5              | 2000           | 82         | 2200           |
| 61D-24S09RNL | 18-36         | 25               | 496                | 9              | 1111           | 84         | 1000           |
| 61D-24S12RNL | 18-36         | 25               | 496                | 12             | 833            | 84         | 680            |
| 61D-24S15RNL | 18-36         | 25               | 490                | 15             | 666            | 85         | 470            |
| 61D-24S18RNL | 18-36         | 25               | 490                | 18             | 555            | 85         | 470            |
| 61D-24S24RNL | 18-36         | 25               | 484                | 24             | 416            | 86         | 330            |
| 61D-24D05RNL | 18-36         | 25               | 508                | ±5             | ±1000          | 82         | ±1000          |
| 61D-24D09RNL | 18-36         | 25               | 502                | ±9             | ±555           | 83         | ±470           |
| 61D-24D12RNL | 18-36         | 25               | 496                | ±12            | ±416           | 84         | ±470           |
| 61D-24D15RNL | 18-36         | 25               | 496                | ±15            | ±333           | 84         | ±330           |
| 61D-24D18RNL | 18-36         | 25               | 490                | ±18            | ±277           | 85         | ±220           |
| 61D-24D24RNL | 18-36         | 25               | 490                | ±24            | ±208           | 85         | ±220           |
| 61D-48S03RNL | 36-72         | 20               | 176                | 3.3            | 2000           | 78         | 2200           |
| 61D-48S05RNL | 36-72         | 20               | 251                | 5              | 2000           | 83         | 2200           |
| 61D-48S09RNL | 36-72         | 20               | 248                | 9              | 1111           | 84         | 1000           |
| 61D-48S12RNL | 36-72         | 20               | 248                | 12             | 833            | 84         | 680            |
| 61D-48S15RNL | 36-72         | 20               | 248                | 15             | 666            | 84         | 470            |
| 61D-48S18RNL | 36-72         | 20               | 245                | 18             | 555            | 85         | 470            |
| 61D-48S24RNL | 36-72         | 20               | 245                | 24             | 416            | 86         | 330            |
| 61D-48D05RNL | 36-72         | 20               | 254                | ±5             | ±1000          | 82         | ±1000          |
| 61D-48D09RNL | 36-72         | 20               | 248                | ±9             | ±555           | 84         | ±470           |
| 61D-48D12RNL | 36-72         | 20               | 245                | ±12            | ±416           | 85         | ±470           |
| 61D-48D15RNL | 36-72         | 20               | 245                | ±15            | ±333           | 85         | ±330           |
| 61D-48D18RNL | 36-72         | 20               | 242                | ±18            | ±277           | 86         | ±220           |
| 61D-48D24RNL | 36-72         | 20               | 242                | ±24            | ±208           | 86         | ±220           |



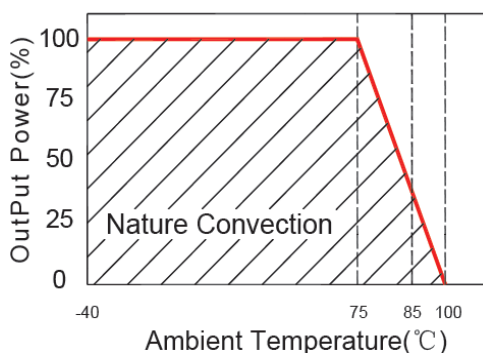
## Wide Input Voltage Range 10 Watt Dc-Dc Converter

| Input Specifications |            |     |     |     |       |
|----------------------|------------|-----|-----|-----|-------|
| Parameters           | Conditions | Min | Typ | Max | Units |
| Voltage Types        |            |     |     | 2:1 |       |
| Filter               | Pi TYPE    |     |     |     |       |

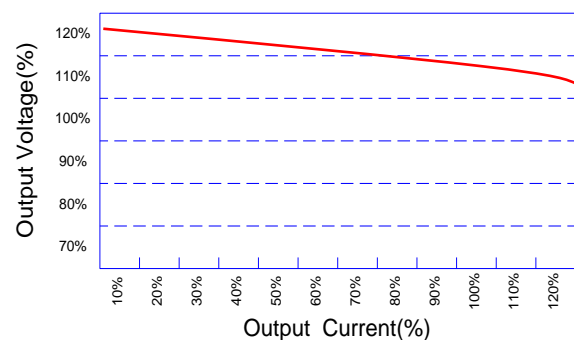
| Output Specifications           |                                 |     |     |      |       |
|---------------------------------|---------------------------------|-----|-----|------|-------|
| Parameters                      | Conditions                      | Min | Typ | Max  | Units |
| Voltage Tolerance               | Full load@Vin(nom.)             |     |     | ±2   | %     |
| Short Circuit Protection        | Hiccup, automatic recovery      |     |     |      |       |
| Line Regulation                 |                                 |     |     | ±0.5 | %     |
| Load Regulation                 | SINGLE(25% to 100%)             |     |     | ±0.5 | %     |
| Load Regulation                 | Dual(25% to 100%, Balance Load) |     |     | ±2.0 | %     |
| Cross Regulation                | DUAL(25% to 100%)               |     |     | ±5.0 | %     |
| Ripple & Noise                  | BW=DC To 20MHz                  |     |     | 100  | mVp-p |
| Transient response setting time | 50% load step change            |     | 350 |      | us    |

| General Specifications |  |      |                |     |       |
|------------------------|--|------|----------------|-----|-------|
| Parameters             | Conditions                             | Min  | Typ            | Max | Units |
| Isolation Resistance   | 500Vdc                                 | 1000 |                |     | MΩ    |
| Switching Frequency    |  |      | 300            |     | KHz   |
| Operating Temperature  | With derating                          | -40  |                | 100 | °C    |
| Humidity               | Non Condensing                         |      |                | 95  | %     |
| Cooling                | Free air Convection                    |      |                |     |       |
| Case material          | Nickel Coated With Non-Conductive Base |      |                |     |       |
| Weight                 |  |      | 36.5           |     | g     |
| Dimensions             |  |      | 50.8x25.4x10.6 |     | mm    |
| Potting Material       | Epoxy (UL94V-0 rated)                  |      |                |     |       |

### Temperature Derating Graph



### Tolerance Envelope Graph



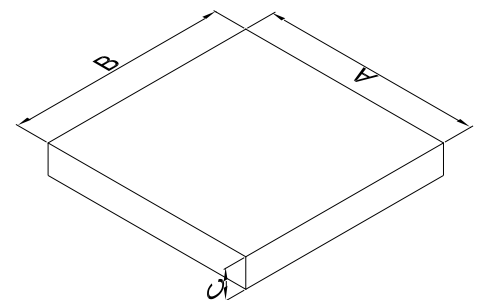
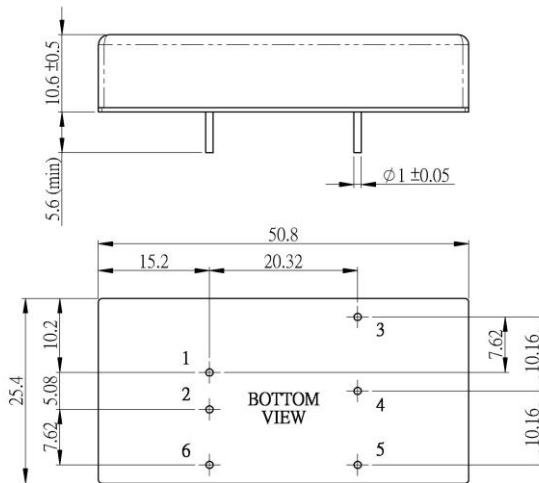


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| Recommended Test Circuit  | Part Number   |
|---|---|
| <p style="font-size: small; text-align: center;">12V :Cin 100uF,25V<br/>24V &amp; 48V:Cin 10uF,100V</p> | <p>61D - <u>12</u> <u>S</u> <u>05</u> <u>R</u> <u>NL</u></p> <p style="text-align: center;">A B C D E F</p> <p>A:Series<br/>B:Input Voltage<br/>C:Single(S)Dual(D)<br/>D:Output Voltage<br/>E:Regulated(R)<br/>F:RoHS Version</p> |
| <p style="font-size: small; text-align: center;">12V :Cin 100uF,25V<br/>24V &amp; 48V:Cin 10uF,100V</p> |   |

Suggest adding input external filter(C1,C2,L)to meet conducted emissions(EN55022 class A)

| Markings and dimensions | Packaging |
|-------------------------|-----------|
|-------------------------|-----------|



| Size(mm) |        |       |
|----------|--------|-------|
| A        | B      | C     |
| 210.00   | 210.00 | 30.00 |

Unit : mm  
Tolerance : XX.X ±0.5 , XX.XX ±0.25

| PIN Assignment |      |      |       |        |       |        |
|----------------|------|------|-------|--------|-------|--------|
| PIN            | 1    | 2    | 3     | 4      | 5     | 6      |
| SINGLE         | +Vin | -Vin | +Vout | NO PIN | -Vout | NO PIN |
| DUAL           | +Vin | -Vin | +Vout | COM    | -Vout | NO PIN |