



## 1000Vdc Isolation Single & Dual Output 1 Watt Dc-Dc Converter



### FEATURES:

- 14PIN DIL Package
- High Efficiency up to 85%
- Recognized By UL 60950-1
- Internal SMD Construction
- Unregulated Output Types
- No External Component Required
- Operating Temperature: -40°C TO +85°C
- Industry Standard Pinout



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

| Part Number   | Output Voltage | Output Current | Efficiency | Package Style |
|---------------|----------------|----------------|------------|---------------|
|               | Vdc            | mA             | %TYP       |               |
| 22D-XXS03NNL  | 3.3            | 303            | 70         | 1             |
| 22D-XXS05NNL  | 5              | 200            | 70         | 1             |
| 22D-XXS09NNL  | 9              | 112            | 75         | 1             |
| 22D-XXS12NNL  | 12             | 84             | 78         | 1             |
| 22D-XXS15NNL  | 15             | 67             | 80         | 1             |
| 22D-XXS24NNL  | 24             | 42             | 82         | 1             |
| 22D-XXD03NNL  | ±3.3           | ±150           | 70         | 1             |
| 22D-XXD05NNL  | ±5             | ±100           | 70         | 1             |
| 22D-XXD09NNL  | ±9             | ±56            | 75         | 1             |
| 22D-XXD12NNL  | ±12            | ±42            | 78         | 1             |
| 22D-XXD15NNL  | ±15            | ±34            | 80         | 1             |
| 22D-XXD24NNL  | ±24            | ±21            | 82         | 1             |
| 22D-XXS05N2NL | 5              | 200            | 70         | 2             |
| 22D-XXS09N2NL | 9              | 112            | 75         | 2             |
| 22D-XXS12N2NL | 12             | 84             | 78         | 2             |
| 22D-XXS15N2NL | 15             | 67             | 80         | 2             |
| 22D-XXS24N2NL | 24             | 42             | 82         | 2             |
| 22D-XXD05N2NL | ±5             | ±100           | 70         | 2             |
| 22D-XXD09N2NL | ±9             | ±56            | 75         | 2             |
| 22D-XXD12N2NL | ±12            | ±42            | 78         | 2             |
| 22D-XXD15N2NL | ±15            | ±34            | 80         | 2             |
| 22D-XXD24N2NL | ±24            | ±21            | 82         | 2             |

Note: 1."XX" Is Input Voltage:03=3.3Vdc,05=5Vdc,09=9Vdc,12=12Vdc,15=15Vdc,24=24Vdc,48=48Vdc.

2. Over 48Vdc input voltage, using the 2nd package.

3. The input voltage increases, there will be an increase in efficiency.

### Input Specifications

| Parameters        | Conditions | Min | Typ | Max | Units |
|-------------------|------------|-----|-----|-----|-------|
| Voltage Tolerance | Vo, Io Nom |     |     | ±10 | %     |
| Filter            | Capacitor  |     |     |     |       |

### Output Specifications

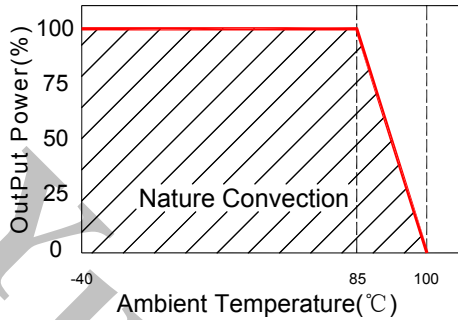
| Parameters                      | Conditions                      | Min | Typ | Max  | Units |
|---------------------------------|---------------------------------|-----|-----|------|-------|
| Voltage Tolerance               | 100% full load                  |     |     | ±5   | %     |
| Short Circuit Protection        | Short Term                      |     |     | 1Sec |       |
| Line Regulation                 | For 1.0% OF Vin                 |     | 1.2 |      | %     |
| Load Regulation                 | 3.3V,5V(10% To 100% F.L)        |     |     | 15   | %     |
| Load Regulation                 | 9V,12V,15V,24V(10% To 100% F.L) |     |     | 10   | %     |
| Ripple & Noise                  | BW=DC To 20MHz                  |     |     | 100  | mVp-p |
| Transient response setting time | 50% load step change            |     | 350 |      | us    |

### General Specifications

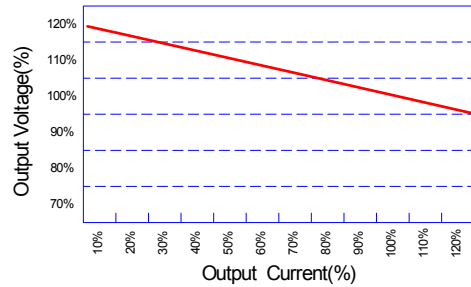
| Parameters            | Conditions              | Min     | Typ              | Max | Units |
|-----------------------|-------------------------|---------|------------------|-----|-------|
| Isolation Resistance  | 500Vdc                  | 1000    |                  |     | MΩ    |
| Switching Frequency   | Full load,nominal input |         | 100              |     | KHz   |
| Operating Temperature |                         | -40     |                  | +85 | °C    |
| Humidity              | Non Condensing          |         |                  | 95  | %     |
| Cooling               | Free air Convection     |         |                  |     |       |
| Case material         | DAP                     |         |                  |     |       |
| MTBF                  | MIL-HDBK-217F@25°C      | 3500000 |                  |     | Hours |
| Weight                | Package 1 or Package 2  |         | 2.3 or 2.8       |     | g     |
| Dimensions            | Package 1               |         | 20.32x10.16x6.80 |     | mm    |
| Dimensions            | Package 2               |         | 20.32x10.16x7.70 |     | mm    |



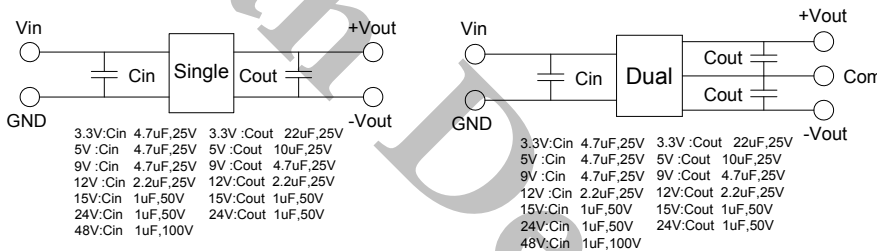
Temperature Derating Graph



Tolerance Envelope Graph



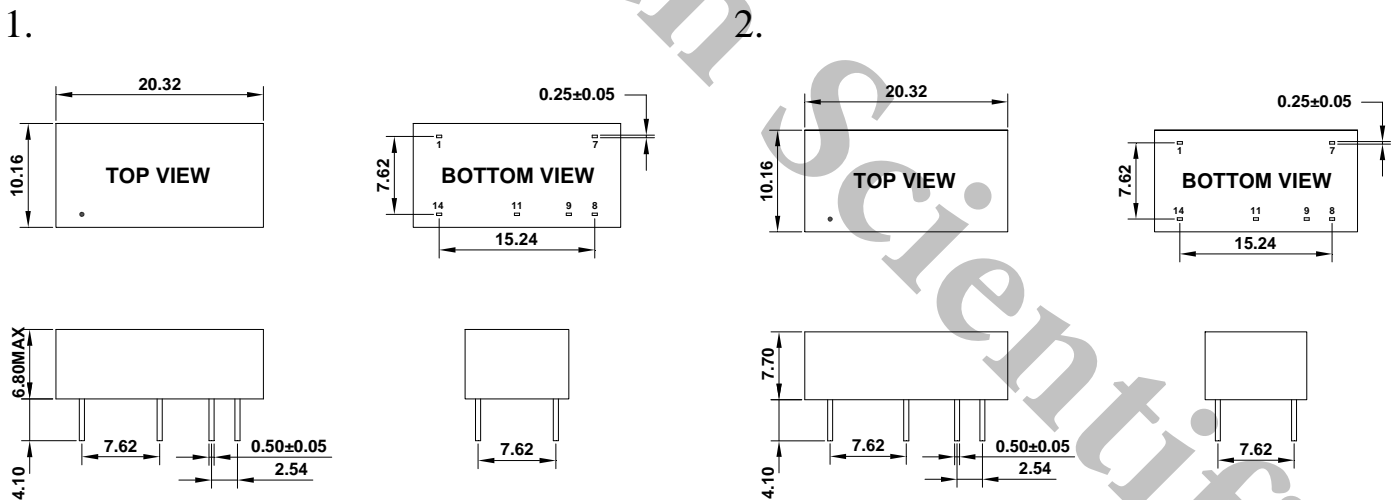
Recommended Test Circuit



Part Number

22D - 05 D 05 N 2 NL  
 A B C D E F G  
 A:Series  
 B:Input Voltage  
 C:Single(S)Dual(D)  
 D:Output Voltage  
 E:Unregulated(N)  
 F:Package  
 G:RoHS Version

Markings and dimensions



Unit: mm Unless otherwise specified, all tolerances are ±0.25

PIN Connection

| PIN    | 1    | 7  | 8     | 9     | 11    | 14   |
|--------|------|----|-------|-------|-------|------|
| Single | -Vin | NC | -Vout | +Vout | NC    | +Vin |
| Dual   | -Vin | NC | COM   | +Vout | -Vout | +Vin |