

## FEATURES :

- 20 Watt Package
- 4:1 Wide Input Voltage
- 100% Burned In
- High Efficiency To 89%
- Customized Solutions Available
- Remote Control: On/Off
- UL94V-0 Package Material
- Operating Temperature: -40°C TO +87°C
- 3 Years Warranty
- Regulated Output Types
- EN 50155 Approval For Railway Applications

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

| Part Number       | Input Voltage Range | Nominal Input Voltage |                    | Output Voltage Range | Output Current | Efficiency |
|-------------------|---------------------|-----------------------|--------------------|----------------------|----------------|------------|
|                   | Vdc                 | No-Load (mA TYP)      | Full Load (mA TYP) | Vdc                  | mA             | %TYP       |
| 98DW20-24S03R3NL  | 9-36                | 7                     | 736                | 3.3                  | 4500           | 84         |
| 98DW20-24S05R3NL  | 9-36                | 7                     | 968                | 5                    | 4000           | 86         |
| 98DW20-24S12R3NL  | 9-36                | 7                     | 946                | 12                   | 1670           | 88         |
| 98DW20-24S15R3NL  | 9-36                | 7                     | 946                | 15                   | 1330           | 88         |
| 98DW20-48S03R3NL  | 18-75               | 6                     | 368                | 3.3                  | 4500           | 84         |
| 98DW20-48S05R3NL  | 18-75               | 6                     | 484                | 5                    | 4000           | 86         |
| 98DW20-48S12R3NL  | 18-75               | 6                     | 473                | 12                   | 1670           | 88         |
| 98DW20-48S15R3NL  | 18-75               | 6                     | 473                | 15                   | 1330           | 88         |
| 98DW20-110S03R3NL | 40-160              | 5                     | 165                | 3.3                  | 4500           | 82         |
| 98DW20-110S05R3NL | 40-160              | 5                     | 214                | 5                    | 4000           | 85         |
| 98DW20-110S12R3NL | 40-160              | 5                     | 211                | 12                   | 1670           | 86         |
| 98DW20-110S15R3NL | 40-160              | 5                     | 211                | 15                   | 1330           | 86         |
| 98DW20-24D12R3NL  | 9-36                | 7                     | 946                | ±12                  | ±833           | 88         |
| 98DW20-24D15R3NL  | 9-36                | 7                     | 958                | ±15                  | ±667           | 87         |
| 98DW20-48D12R3NL  | 18-75               | 6                     | 473                | ±12                  | ±833           | 88         |
| 98DW20-48D15R3NL  | 18-75               | 6                     | 479                | ±15                  | ±667           | 87         |
| 98DW20-110D12R3NL | 40-160              | 5                     | 211                | ±12                  | ±833           | 86         |
| 98DW20-110D15R3NL | 40-160              | 5                     | 214                | ±15                  | ±667           | 85         |

## Input Specifications

| Parameters                           | Conditions                | Min | Typ | Max | Units |
|--------------------------------------|---------------------------|-----|-----|-----|-------|
| Voltage Types                        |                           |     |     | 4:1 |       |
| Surge Voltage<br>(1 sec. max.)       | 24V models                |     |     | 50  | Vdc   |
|                                      | 48V models                |     |     | 100 | Vdc   |
|                                      | 110V models               |     |     | 170 | Vdc   |
| Input Filter                         | PI Type                   |     |     |     |       |
| Reflected ripple current             |                           |     | 30  |     | mAp-p |
| Remote ON/OFF<br>(Refer to -Vin PIN) | Positive Logic            |     |     |     |       |
|                                      | ON : Open                 | 3   |     | 12  | Vdc   |
|                                      | OFF: Short                | 0   |     | 1.2 | Vdc   |
|                                      | Input current of Ctrl PIN | 0.5 |     | 0.5 | mA    |
|                                      | Remote off input current  |     | 3   |     | mA    |

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DC-DC Converter

98DW20-R3 SERIES

20Watt 3KV Isolated

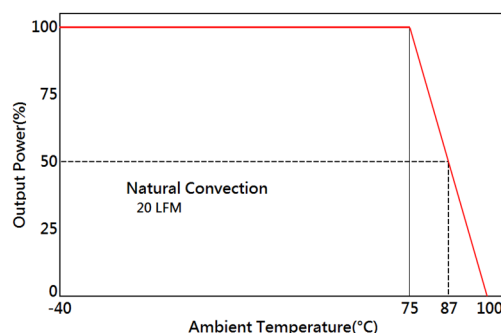
4 : 1 Input Voltage Range

Single &amp; Dual Output

2" x 1"



## Temperature Derating Graph



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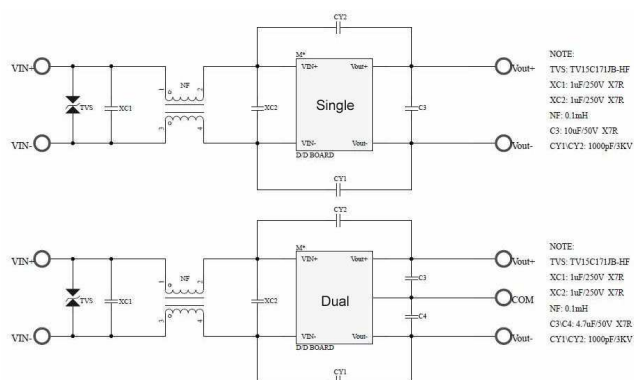
## Output Specifications

| Parameters                                                          | Conditions                    | Min  | Typ | Max  | Units |
|---------------------------------------------------------------------|-------------------------------|------|-----|------|-------|
| Voltage Tolerance                                                   | 100% full load                |      |     | ±2   | %     |
| Short Circuit Protection                                            | Continuous ,<br>Auto-Recovery |      |     |      |       |
| Output Power Protection                                             | Continuous ,<br>Auto-Recovery | 120  |     | 170  | %     |
| Over Voltage Protection                                             | 3.3Vdc                        | 3.7  |     | 5.4  | Vdc   |
|                                                                     | 5Vdc                          | 5.6  |     | 7.0  | Vdc   |
|                                                                     | 12Vdc                         | 13.5 |     | 19.6 | Vdc   |
|                                                                     | 15Vdc                         | 16.8 |     | 20.5 | Vdc   |
| Line Regulation                                                     | Nominal Input Voltage         |      |     | ±0.5 | %     |
| Load Regulation                                                     | Single output models          |      |     | ±0.5 | %     |
|                                                                     | Dual output models            |      |     | ±5   | %     |
| Ripple & Noise<br>(BW=DC To 20MHz<br>Measured with a<br>10uF MLCC.) | 3.3V&5.0V models              |      |     | 75   | mVp-p |
|                                                                     | Other models                  |      |     | 100  | mVp-p |
| Start up time                                                       | Nominal Input Voltage         |      |     | 30   | ms    |
| Transient response<br>setting time                                  | 25% load step change          |      | 350 |      | us    |

## General Specifications

| Parameters            | Conditions                 | Min     | Typ            | Max | Units |
|-----------------------|----------------------------|---------|----------------|-----|-------|
| Isolation Voltage     | Input To Output            | 3000    |                |     | Vdc   |
|                       | Input(Output) To Case      | 1600    |                |     | Vdc   |
| Isolation Resistance  | 500Vdc                     | 1000    |                |     | MΩ    |
| Switching Frequency   | Full load, nominal input   |         | 330            |     | KHz   |
| Operating Temperature |                            | -40     |                | 87  | °C    |
| Storage Temperature   |                            | -55     |                | 125 | °C    |
| Case Temperature      |                            |         |                | 105 | °C    |
| Humidity              | Non Condensing             | 5       |                | 95  | %     |
| Cooling               | Natural Convection (20LFM) |         |                |     |       |
| Case material         | Six-side shield case       |         |                |     |       |
| MTBF                  | MIL-HDBK-217F@25°C         | 1500000 |                |     | Hours |
| Weight                |                            |         | 30             |     | g     |
| Dimensions            |                            |         | 50.8x25.4x10.6 |     | mm    |

## Recommended Test Circuit

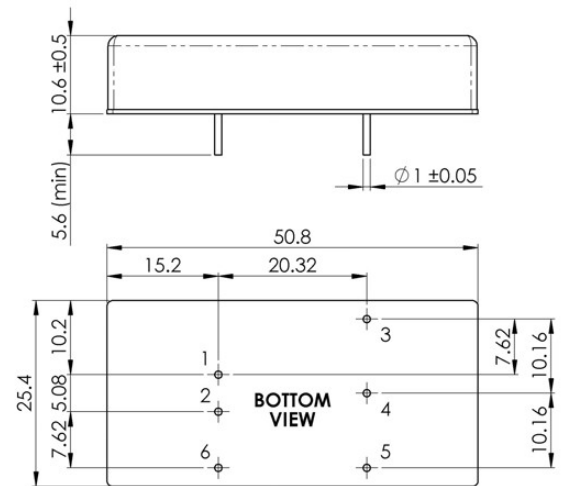


## Part Number

98DW20 - 24 S 05 R 3 NL  
A B C D E F G

A: Series  
B: Input Voltage  
C: Single Output(S),Dual(D)  
D: Output Voltage  
E: Regulated (R)  
F: Package  
G: RoHs Version

## Dimensions



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

## PIN Assignment

| Pin    | 1    | 2    | 3     | 4    | 5     | 6             |
|--------|------|------|-------|------|-------|---------------|
| Single | +Vin | -Vin | +Vout | Trim | -Vout | Remote ON/OFF |
| Dual   | +Vin | -Vin | +Vout | COM  | -Vout | Remote ON/OFF |

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