# 3S7B_3UP series

3W Single/Dual Output - Fixed Input - Isolated & Semi-regulated
SIP Package



## DC-DC Converter 3 Watt

- Small Footprint
- SIP7 package
- Low ripple and excellent EMC features
- Operating temperature: range -40°C ~ +105°C
- No heat sink required
- No external components required
- 3kVDC isolation
- Internal SMD construction
- Industry standard pinout
- RoHS compliance
- Up to 89% efficiency

Introducing our new high-efficiency DC-DC converter 3S7B_3UP series in compact SIP7 package. With its small footprint and industry-standard pinout, this converter offers seamless integration into your designs. It delivers low ripple and excellent EMC performance across a wide operating temperature range of –40°C to +85°C – all without the need for a heat sink or external components. Featuring 3kVDC isolation, internal SMD construction, and up to 89% efficiency, it ensures reliable and space-saving power conversion for demanding applications. Fully RoHS compliant.

| Common specifications | |
|---|---|
| Short circuit protection: | continous short circuit protection |
| Cooling: | Free air convection |
| Operation temperature range: | -40°C – +105°C (wwith derating) |
| Storage temperature range: | -50°C – +130°C |
| Case temperature above ambient: | 30°C max. |
| Lead temperature: | 300°C (1.5mm from case for 10 sec.) |
| Storage humidity range: | < 95% |
| Case material: | UL94V-0 package material (unspecified plastic)] |
| Potting material: | Epoxy [UL94-V0] |
| MTBF: | >3,500,000 hours |
| Weight: | 2.85 g |

| Isolation specifications | | | | | |
|---|---|---|---|---|---|
| Item | Test condition | Min | Typ | Max | Units |
| Isolation voltage | Tested for 1 minute | 3000 | | | VDC |
| Isolation capacitance | Tested for 1 minute | | 55 | | pF |
| Isolation resistance | Test at 1000VDC | 1 | | | GΩ |

**Example:**
**3S7B_0505S3UP**
**3 = 3Watt; S7 = SIP7; B = Pinning; 5Vin; 5Vout; S = Single Output;**
**3 = 3kVDC; U= Unregulated Output; P = Short Circuit Protection**

**Note:**
1. Operation under minimum load will not damage the converter; however, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical support for more details.

| Output specifications | | | | | |
|---|---|---|---|---|---|
| Item | Test condition | Min | Typ | Max | Units |
| Line regulation | High Vin to low Vin | | ±1 | ±1.2 | % |
| Load regulation | see table | | | | |
| Output voltage accuracy | 100% full load | ±2 | | ±4 | % |
| Temperature drift | 100% full load | | ±0.02 | | %/°C |
| Ripple&Noise* | 20MHz Bandwidth | | 70 | 200 | mVp-p |
| Switching frequency | Variable | | 65 | | kHz |

*Test ripple and noise measured with 20MHz bandwidth and 1.0UF ceramic capacitor.

| Input specifications | | | | | |
|---|---|---|---|---|---|
| Item | Test condition | Min | Typ | Max | Units |
| Voltage range | • 3.3Vin<br>• 5Vin<br>• 12Vin<br>• 15Vin<br>• 24Vin | 2.9<br>4.5<br>11<br>13.4<br>22 | 3.3<br>5<br>12<br>15<br>24 | 3.6<br>5.5<br>13<br>16.4<br>26 | V<br>V<br>V<br>V<br>V |
| Input filter | Capacitor | | | | |
| Input reflected ripple current | | | 25.5 | | mA pk-pk |

| EMC specifications | | |
|---|---|---|
| EMI | Conduction Emission | CISPR32/EN55032 CLASS B (SEE fig 2) |
| EMI | Radiation Emission | CISPR32/EN55032 CLASS B (SEE fig 2) |
| EMS | Electrostatic Discharge IEC/EN61000-4-2<br>Contact ±6kV perf. Criteria B (dual out) | |
| EMS | Electrostatic Discharge IEC/EN61000-4-2<br>Contact ±8kV perf. Criteria B (single out) | |

* Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. Theses components should be mounted as close as possible to the module; all leads should be minimized to decrease radiated noise (see EMI filter, test configuration).
** An external filter is required if the module has to meet IEC61000-4-4

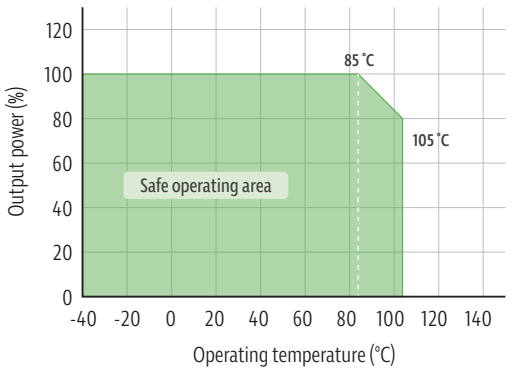

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Specifications subject to change without notice.

# Product Selection Guide

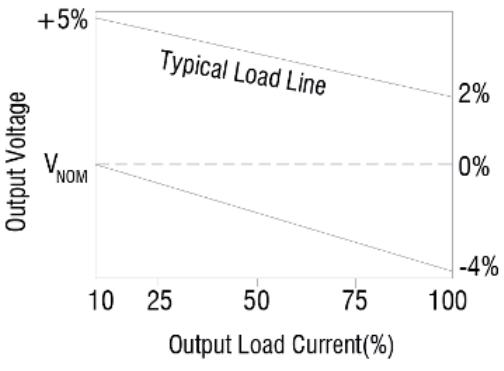
| Part Number | Input Voltage [V] | Output Voltage [VDC] | Current [mA, max] | Load regulation [%] | Efficiency [%, max] |
|---|---|---|---|---|---|
| 3S7B_0303S3UP | 3.3 | 3.3 | 909 | 7.2 | 83 |
| 3S7B_0305S3UP | 3.3 | 5 | 600 | 7.2 | 83 |
| 3S7B_0503S3UP | 5 | 3.3 | 909 | 7.2 | 83 |
| 3S7B_0505S3UP | 5 | 5 | 600 | 7.2 | 83 |
| 3S7B_0509S3UP | 5 | 9 | 333 | 5.8 | 86 |
| 3S7B_0512S3UP | 5 | 12 | 250 | 5.0 | 86 |
| 3S7B_0515S3UP | 5 | 15 | 200 | 4.6 | 87 |
| 3S7B_1205S3UP | 12 | 5 | 600 | 4.9 | 84 |
| 3S7B_1209S3UP | 12 | 9 | 333 | 3.0 | 87 |
| 3S7B_1212S3UP | 12 | 12 | 250 | 2.9 | 87 |
| 3S7B_1215S3UP | 12 | 15 | 200 | 2.5 | 89 |
| 3S7B_1515S3UP | 15 | 15 | 200 | 2.5 | 84 |
| 3S7B_2405S3UP | 24 | 05 | 600 | 4.9 | 84 |
| 3S7B_2412S3UP | 24 | 12 | 250 | 5.0 | 84 |
| 3S7B_2415S3UP | 24 | 15 | 200 | 2.5 | 89 |
| 3S7B_2424S3UP | 24 | 24 | 125 | 5.0 | 83 |
| 3S7B_0505D3UP | 5 | ±5 | ±300 | 6.3 | 83 |
| 3S7B_0509D3UP | 5 | ±9 | ±166.5 | 5.4 | 86 |
| 3S7B_0512D3UP | 5 | ±12 | ±125 | 4.8 | 86 |
| 3S7B_0515D3UP | 5 | ±15 | ±100 | 5.3 | 87 |
| 3S7B_0524D3UP | 5 | ±24 | ±62.5 | 5.0 | 83 |
| 3S7B_1205D3UP | 12 | ±5 | ±300 | 3.9 | 84 |
| 3S7B_1209D3UP | 12 | ±9 | ±166.5 | 2.9 | 86 |
| 3S7B_1212D3UP | 12 | ±12 | ±125 | 2.8 | 87 |
| 3S7B_1215D3UP | 12 | ±15 | ±100 | 2.5 | 87 |
| 3S7B_1515D3UP | 15 | ±15 | ±100 | 2.5 | 87 |
| 3S7B_2405D3UP | 24 | ±5 | ±300 | 3.9 | 84 |
| 3S7B_2412D3UP | 24 | ±12 | ±125 | 2.8 | 87 |
| 3S7B_2415D3UP | 24 | ±15 | ±100 | 2.5 | 87 |
| 3S7B_2424D3UP | 24 | ±24 | ±62.5 | 5.0 | 83 |

# Typical characteristics

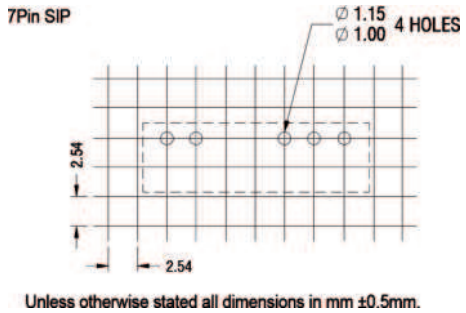
Temperature derating graph




Tolerance envelope graph

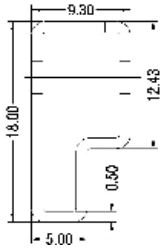


## Footprint




Unless otherwise stated all dimensions in mm ±0.5mm.

## Tube outline




**Note:**
Unit: mm [inch]
All dimensions in mm ±0.5mm.
Tube length: 520mm ±2mm
Tube quantity: 25 pcs.

## EMC and application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.1Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under thecondition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.

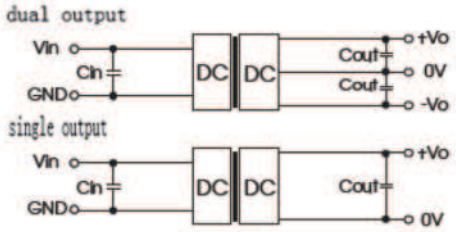


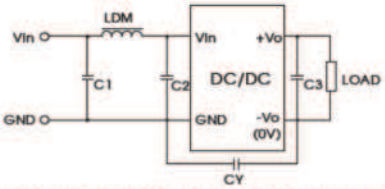

Fig 1

Table1: recommended capacitive load value

| Vin (VDC) | Cin (μF) | single output (VDC) | Cout (μF) | dual output (VDC) | Cout* (μF) |
|---|---|---|---|---|---|
| 5 | 4.7 | 3.3/5 | 10 | ±3.3/±5 | 4.7 |
| 12/15 | 2.2 | 9/12 | 2.2 | ±9/±12 | 1 |
| 24 | 1 | 15/18/24 | 1 | ±15/±24 | 0.47 |

The capacitive load of the positive and negative outputs are the same

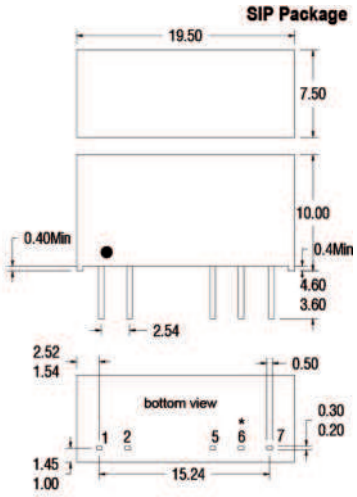
Fig 2




| Input voltage | | 5/12/15 | 24 |
|---|---|---|---|
| EMI | C1/C2 | 4.7μF /50V | |
| | CY | – | 1nF/3KV |
| | C3 | refer to the Cout in fig 1 | |
| | LDM | 6.8μH | |

To ensure the efficient and reliable operation of the module, its minimum output load should not be less than 10% of the rated load during use. If your required power is indeed small, please connect a resistor in parallel at the output end (the sum of the power consumed by the resistor and the actual power used is greater than or equal to 10% of the rated power).

## Mechanical dimensions




## Pin connections

| Pin | Single | Dual |
|---|---|---|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 5 | -Vout | -Vout |
| 6 | -- | 0V |
| 7 | +Vout | +Vout |

**Note:**
Unit: mm[inch]
All dimensions in mm ±0.25mm.
All pins on a 2.54mm pitch and within ±0.25mm of true position.
* Pin not fitted on single output variants