


**DESCRIPTION: Wide Input Non-Isolated, Regulated Single Output**

The TP78xx-1 series has high efficiency, short circuit protection, Thermal shutdown, no heat sink required, Industry standard pinout.ideal for redialing 78xx linear regulates and are pin compatible.

**FEATURES**

|                                            |                                                  |                          |
|--------------------------------------------|--------------------------------------------------|--------------------------|
| ROHS Compliant                             | Wide input non-isolated, regulated single output | Efficiency up to 93%     |
| Short circuit protection, Thermal shutdown | Temperature range: -40°C ~ +85°C                 | Low ripple noise         |
| SIP package                                | No heat sink required                            | Industry standard pinout |

**SELECTION GUIDE**

| Part Number | Input Voltage (VDC) |         | Output        |              | Efficiency (%) |          |
|-------------|---------------------|---------|---------------|--------------|----------------|----------|
|             | Nominal             | Range   | Voltage (VDC) | Current (mA) | Vin (Min)      | Vin(Max) |
| TP781.5-1   | 12                  | 4.75~18 | 1.5           | 1000         | 78             | 72       |
| TP781.8-1   | 12                  | 4.75~18 | 1.8           | 1000         | 82             | 76       |
| TP782.5-1   | 12                  | 4.75~18 | 2.5           | 1000         | 87             | 82       |
| TP783.3-1   | 12                  | 4.75~20 | 3.3           | 1000         | 90             | 83       |
| TP785.0-1   | 12                  | 6.5~20  | 5.0           | 1000         | 93             | 85       |

**OUTPUT CHARACTERISTICS**

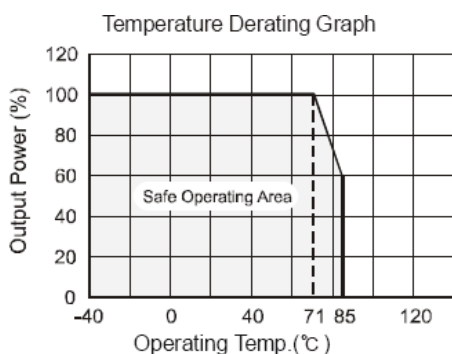
| Parameter                | Conditions                          | Min | Typ.                      | Max.  | Units |
|--------------------------|-------------------------------------|-----|---------------------------|-------|-------|
| Output voltage accuracy  | 100% full load, input voltage range |     | ±2                        | ±3    | %     |
| Line regulation          | Vin=min. to max, at full load       |     | ±0.5                      | ±0.75 |       |
| Load regulation          | 10% to 100% load                    |     | ±0.5                      | ±1.0  |       |
| Ripple & Noise           | 20MHz bandwidth,(refer to figure 3) |     | 25                        | 45    | mvp-p |
| Short circuit protection |                                     |     | Continuous, auto-recovery |       |       |
| Thermal shutdown         | Internal IC junction                |     | 150                       |       | °C    |
| Output current limit     |                                     |     | 3000                      |       | mA    |
| Switching frequency      | Full load, input voltage range      | 335 | 385                       | 435   | KHz   |
| Dynamic load stability   |                                     |     |                           | ±100  | mA    |
| Quiescent current        | Vin from min to max and at 0% load  |     | 7                         | 10    | mA    |
| Temperature coefficient  | -40°C~+85°C                         |     |                           | ±0.02 | %/°C  |
| Max capacitance load     |                                     |     |                           | 1000  | μF    |

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

**COMMON SPECIFICATIONS**

| Parameter                                  | Conditions                     | Min.                | Typ. | Max. | Units   |
|--------------------------------------------|--------------------------------|---------------------|------|------|---------|
| Storage humidity range                     |                                |                     |      | 95   | °C      |
| Operating temp. range                      | Power derating (above 71°C)    | -40                 |      | 85   |         |
| Storage temp. range                        |                                | -55                 |      | 125  |         |
| Storage temp. Range Temp rise at full load |                                |                     |      | 100  |         |
| Lead temperature                           | 1.5mm from case for 10 seconds |                     |      | 300  |         |
| Cooling                                    |                                | Free air convection |      |      |         |
| Case material                              |                                | Plastic (UL94-V0)   |      |      |         |
| MTBF                                       | 25°C (MIL-HDBK-217F)           | 2000                |      |      | k hours |
| Weight                                     |                                |                     | 2.0  |      | g       |

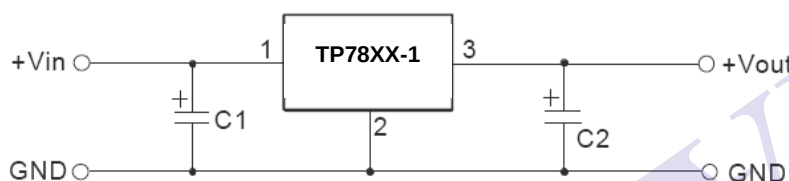
TEMPERATURE DERATING GRAPHS



EXTERNAL CAPACITOR TABLE

| Part Number | C1(Ceramic Capacitor) | C2(Ceramic Capacitor) |
|-------------|-----------------------|-----------------------|
| TP781.5-1   | 10μF/25V              | 22μF/6.3V             |
| TP781.8-1   | 10μF/25V              | 22μF/6.3V             |
| TP782.5-1   | 10μF/25V              | 22μF/10V              |
| TP783.3-1   | 10μF/25V              | 22μF/16V              |
| TP785.0-1   | 10μF/25V              | 22μF/16V              |

STANDARD APPLICATION CIRCUIT

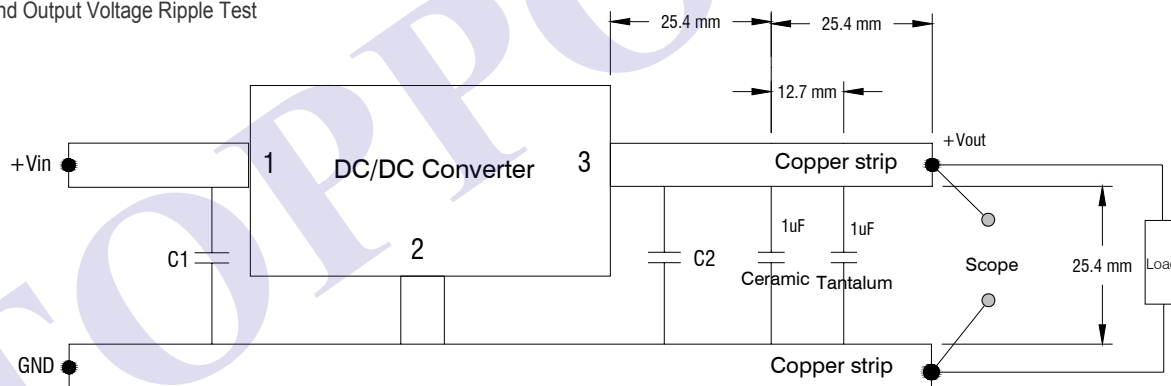


Note:

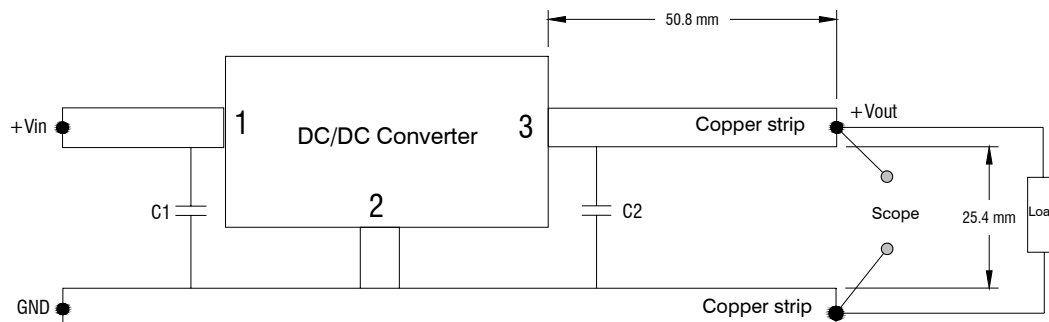
1. C1 and C2 are required and should be fitted close to the converter pins.
2. The capacitance of C1,C2 sees external capacitor table, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

TEST CONFIGURATIONS (TA=25°C)

1.Efficiency and Output Voltage Ripple Test

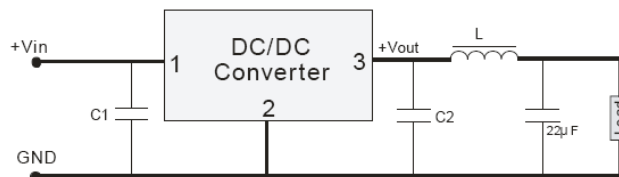


2.Start-up and Load Transient Response Test



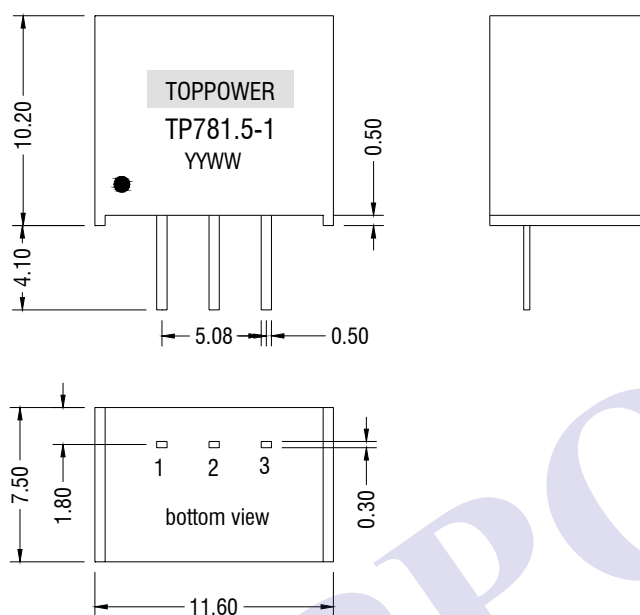
## OUTPUT RIPPLE REDUCTION

To reduce output ripple, it is recommended to add a LC filter in output port. L: Recommended parameter  $10\mu\text{H} \sim 47\mu\text{H}$ .



## MECHANICAL DIMENSIONS

### SIP Package

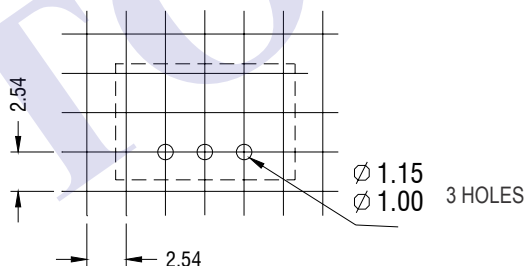


All dimensions in mm  $\pm 0.25$ . All pins on a 2.54mm pitch.

## PIN CONNECTIONS

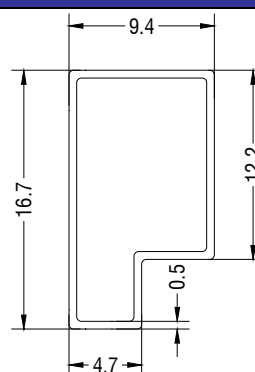
| Pin | Function |
|-----|----------|
| 1   | +Vin     |
| 2   | GND      |
| 3   | +Vout    |

## RECOMMENDED FOOTPRINT DETAILS



Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm.

## TUBE OUTLINE DIMENSIONS



Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm.

L=520mm  $\pm 2$ mm Packaging quantity:43PCS

L=220mm  $\pm 2$ mm Packaging quantity:17PCS