

**DESCRIPTION:** **Wide Input Non-Isolated & Regulated Single Output**  
 TP78LXX-1.5 series switching regulators are ideal replacement for TP78xx linear regulators and LDOs. The efficiency of up to 95% means that very little energy is wasted as heat so there is no need for any heat sinks with their additional space and mounting costs. They are widely used in industrial control, instrumentation, and electric power applications.

**FEATURES**

ROHS Compliant	Wide input non-isolated, regulated single output	Efficiency up to 95%
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)
TP78L1.5	12	4.75~18	1.5	1500	83	78
TP78L1.8	12	4.75~18	1.8	1500	85	81
TP78L2.5	12	4.75~18	2.5	1500	88	85
TP78L3.3	12	4.75~18	3.3	1500	91	88
TP78L5.0	12	6.5-18	5.0	1500	93	91
TP78L6.5	12	8-18	6.5	1500	95	93

The above part number with "L" Suffix are 90° bent pins power converters, for example TP78L1.5-1.5L.

**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		20	45	mvp-p
Short circuit input power			0.5	1.8	W
Short circuit protection		Continuous, automatic recovery			
Thermal shutdown	Internal IC junction		150		°C
Output current limit			5000		mA
Switching frequency	Full load, input voltage range	300	340	380	KHz
Quiescent current			5	10	mA
Temperature coefficient	-40°C~+85°C ambient			±0.02	%/°C
Max capacitance load				1000	µF

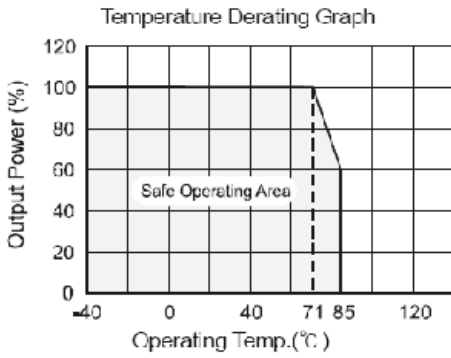
All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

**COMMON SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	
Operating temperature	Power derating (above 71°C)	-40		85	°C
Operating case temp				100	
Storage temperature		-55		125	
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			3.7		g

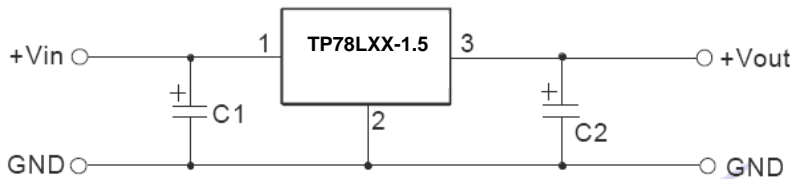
**TEMPERATURE DERATING GRAPHS**

**EXTERNAL CAPACITOR TABLE**



Part Number	C1(Ceramic Capacitor)	C2(Ceramic Capacitor)
TP78L1.5-1.5	10 $\mu$ F/25V	22 $\mu$ F/6.3V
TP78L1.8-1.5	10 $\mu$ F/25V	22 $\mu$ F/6.3V
TP78L2.5-1.5	10 $\mu$ F/25V	22 $\mu$ F/6.3V
TP78L3.3-1.5	10 $\mu$ F/25V	22 $\mu$ F/6.3V
TP78L5.0-1.5	10 $\mu$ F/25V	22 $\mu$ F/16V
TP78L6.5-1.5	10 $\mu$ F/25V	22 $\mu$ F/16V

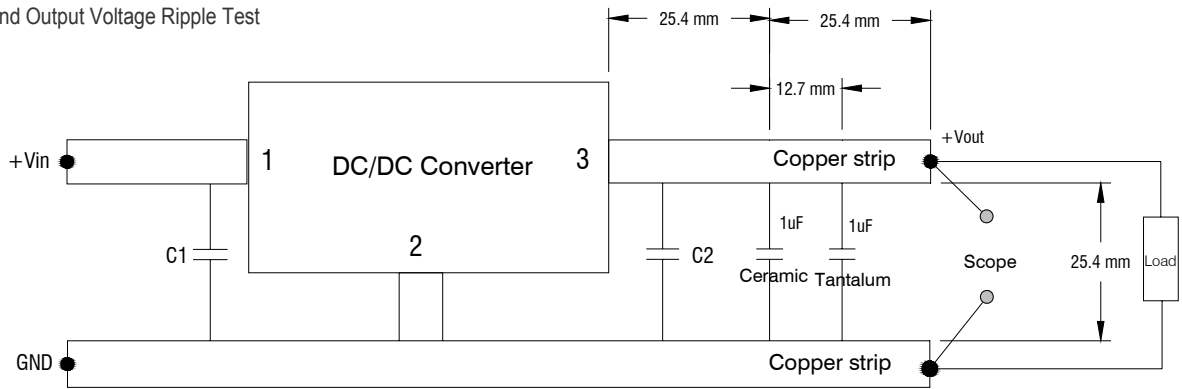
**STANDARD APPLICATION CIRCUIT**



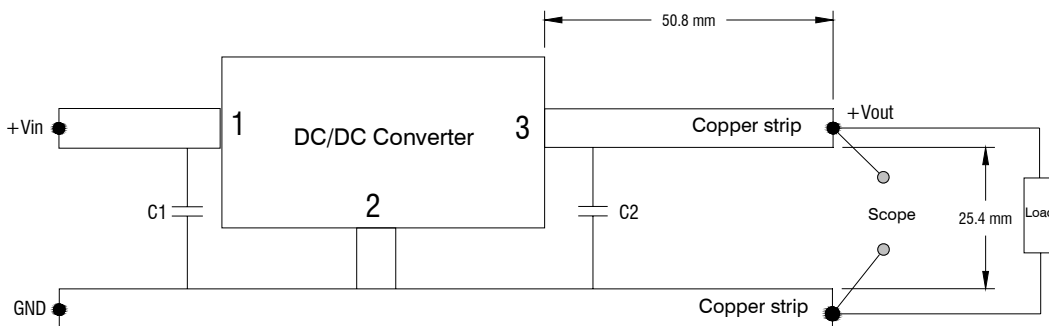
- Note:
1. C1 and C2 are required and should be fitted close to the converter pins.
  2. The capacitance of C1,C2 sees external capacitor table, it can be increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
  3. No parallel connection or plug and play.

**TEST CONFIGURATIONS (TA=25°C)**

1. Efficiency and Output Voltage Ripple Test

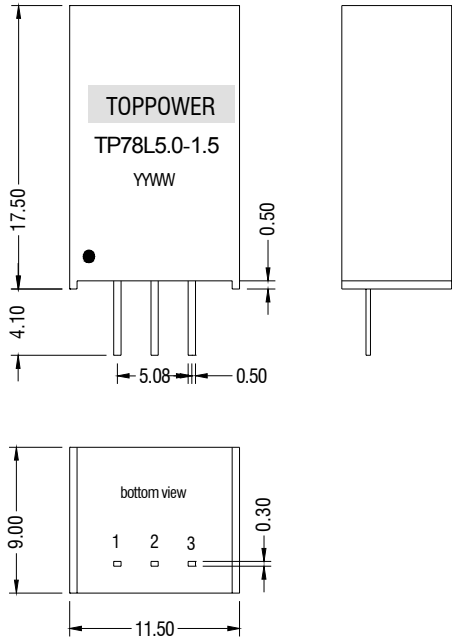


2. Start-up and Load Transient Response Test



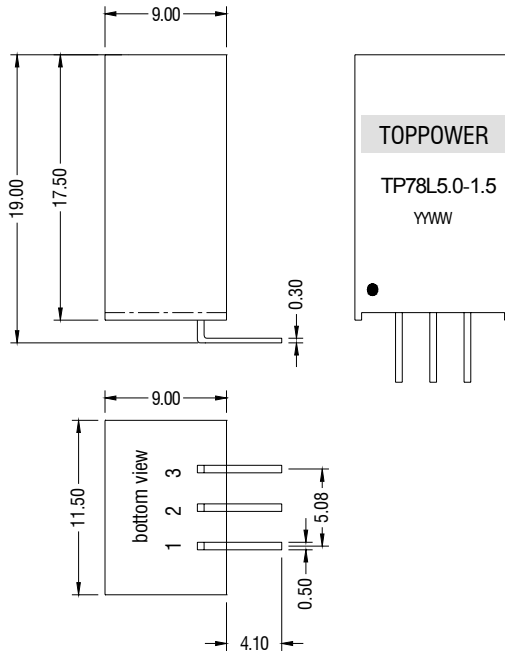
**MECHANICAL DIMENSIONS**

**SIP Package**



All dimensions in mm ±0.25. All pins on a 2.54mm pitch.

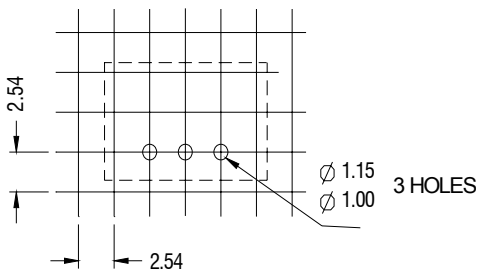
**90° bent pins power converters(part number with "L" Suffix)**



**PIN CONNECTIONS**

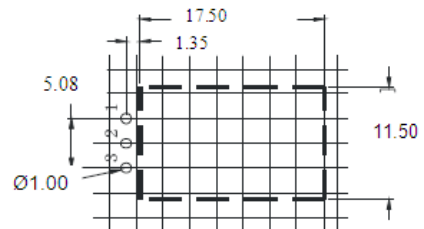
Pin	Function
1	+Vin
2	GND
3	+Vout

**RECOMMENDED FOOTPRINT DETAILS**



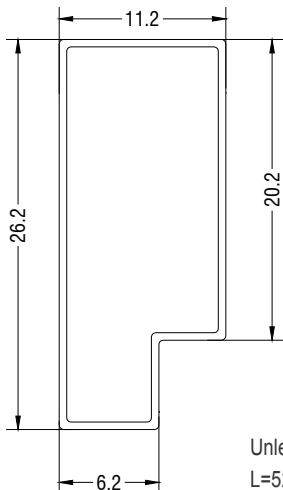
Unless otherwise stated all dimensions in mm ±0.5mm.

**90° bent pins power converters(part number with "L" Suffix)**

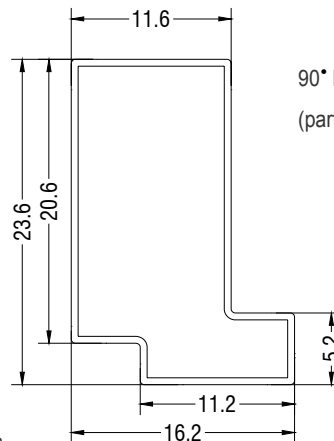


Unless otherwise stated all dimensions in mm ±0.5mm.

**TUBE OUTLINE DIMENSIONS**



Unless otherwise stated all dimensions in mm ±0.5mm.  
 L=520mm ±2mm Packaging quantity:44PCS  
 L=220mm ±2mm Packaging quantity:17PCS



90° bent pins power converters  
 (part number with "L" Suffix)