

## FEATURES

- ◆ RoHS compliant
- ◆ Efficiency up to 96%
- ◆ SIP Package
- ◆ Wide temperature range: -40°C to 85°C
- ◆ Short circuit protection, Thermal Shutdown
- ◆ No heatsink required
- ◆ Low ripple and noise
- ◆ Industry standard pinout
- ◆ MTBF > 2,000,000 hours
- ◆ Only two extra capacitors are required
- ◆ Input voltage range can be lower than the output voltage for higher output voltages in negative application

## MODEL SELECTION

### WRN78<sup>①</sup> 05<sup>②</sup> -1000<sup>③</sup>

- ① Product Series      ② Output Voltage  
③ Output Current

## DESCRIPTION

The WRN78xx-1000 Series high efficiency switching Regulators are ideally suited to replace WRN78xx linear regulators and are pin compatible. The efficiency of up to 96% 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.



## SELECTION GUIDE

order code	Input	Output		Efficiency(% Typ)	
	Voltage Range (VDC)	Voltage (VDC)	Current (MA)	Vin(min)	Vin(max)
WRN7803-1000	4.75-28	3.3	1000	90	83
	4.75-25	-3.3	-600	80	82
WRN7805-1000	6.5-32	5.0	1000	93	88
	7.0-27	-5.0	-600	85	87
WRN786.5-1000	9-32	6.5	1000	94	90
	7.0-25	-6.5	-400	88	90
WRN7809-1000	12-32	9.0	1000	95	92
	7.0-23	-9.0	-400	89	91
WRN7812-1000	16-32	12	1000	96	94
	7.0-20	-12	-300	89	91

\* Input voltage can't exceed this value, or will cause the permanent damage.

## OUTPUT SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Output Voltage accuracy	100% full load		±2	±3	%
Line regulation	Vin= min. to max. at full load		±0.2	±0.4	%
Load regulation	10% to 100% load		±0.4	±0.6	%
Ripple & Noise*	20MHZ Bandwidth		25	35	%
Short Circuit Input Power			0.5	1.8	W
Short circuit protection		Continuous, automatic recovery			
Switching frequency	100% full load	280	330	450	Khz
Quiescent current	Positive Output		5	8	mA
Quiescent current	Negative Output		7	13	
Thermal Shutdown	Internal IC junction		150		°C
Output Current Limit				2000	mA
Temperature coefficient	-40 °C to +85 °C ambient			0.02	%/°C
Max capacitance load				1000	µF

\* Test ripple and noise by "parallel cable" method.

## COMMON SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Operating Temp. Range		-40		85	°C
Operating Case Temp.				100	°C
Storage Temp. Range		-55		125	°C
Cooling		Free Air Convection			
Case Material		Plastic (UL94-V0)			
Lead Temperature	1.5mm from case for 10 seconds			300	°C
Storage Humidity Range				95	%
MTBF	+25°C MIL-HDBK-217F	2000			K hours
Package Weight			3.7		g

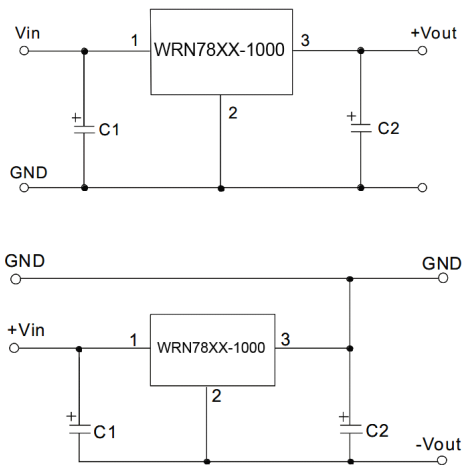
Note:

- All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- Only typical models listed. If you need other model, please confirm the power, input voltage and output voltage, then phone us.

### EXTERNAL CAPACITOR TABLE

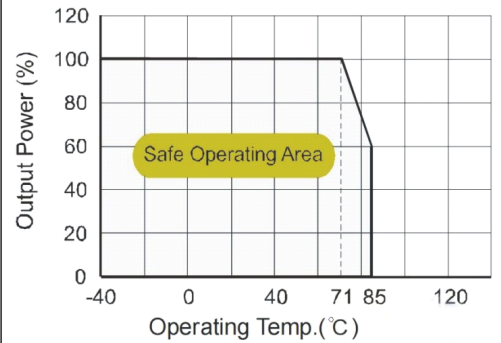
Part Number	C1,C3 (ceramic capacitor)	C2,C4 (ceramic capacitor)
WRN7803-1000	10uF/50V	22uF/6.3V
WRN7805-1000	10uF/50V	22uF/10V
WRN786.5-1000	10uF/50V	10uF/10V
WRN7809-1000	10uF/50V	10uF/16V
WRN7812-1000	10uF/50V	10uF/25V
WRN7815-1000	10uF/50V	10uF/25V

### STANDARD APPLICATION CIRCUIT

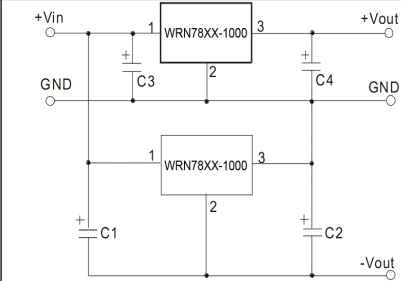


### TYPICAL CHARACTERISTICS

#### Temperature Derating Graph



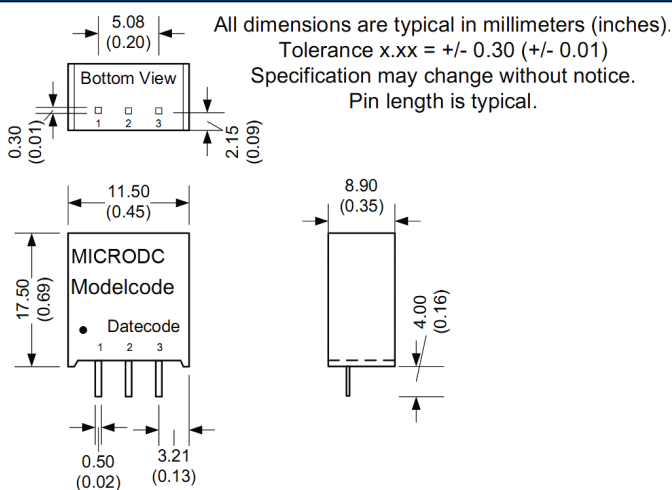
### APPLICATION EXAMPLE



Note:

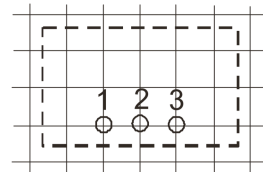
1. C1 and C2 are required and should be fitted close to the converter pins.
2. The capacitance of C1, C2, C3 and C4 sees external capacitor table, it can be increase properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

### MECHANICAL DIMENSIONS



Note:  
Unit:mm[inch]  
Pin section:0.50\*0.30mm(0.020\*0.012inch)  
Pin section tolerances:±0.10mm[±0.004inch]  
General tolerances:±0.25mm[±0.010inch]

### RECOMMENDED FOOTPRINT

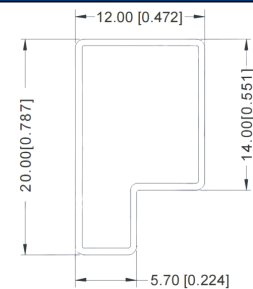


Pin #	Connection
1	+ V Input
2	GND
3	+ V Output

#### RECOMMENDED FOOTPRINT

Top view,grid:2.54mm(0.1inch)  
diameter:1.00mm(0.039inch)

### TUBE OUTLINE DIMENSIONS



Note:

Unit :mm[inch]  
General tolerances: ±0.50mm[±0.020inch]  
L=530mm[20.866inch] Tube Quantity: 22pcs  
L=220mm[8.661inch] Tube Quantity: 8pcs