



## FEATURES

- ◆ Efficiency up to 96%, no need for Heat sink
- ◆ Pin-out compatible with WRN78XX linear
- ◆ Low profile (L\*W\*H=11.6×10.2×7.5mm)
- ◆ Very wide input range(5V~42V)
- ◆ Short circuit protection, Thermal Shutdown
- ◆ Non standard outputs available as specials
- ◆ Low ripple and noise

## MODEL SELECTION

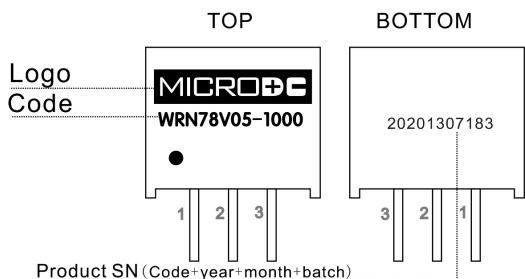
### WRN78<sup>①</sup>V<sup>②</sup>05<sup>③</sup>-1000<sup>④</sup>

- ① Product Series    ② Very wide input range  
③ Output Voltage    ④ Output Current

## DESCRIPTION

The WRN78Vxx-1000 Series switching regulators are ideally suited to replace 1Amp WRN78xx linear regulators and are pin compatible. The efficiency of up to 96% means that very little energy is wasted as heat and the high input Voltage is a useful feature.

## PRODUCT ID DESCRIPTION



## SELECTION GUIDE

Part Number	Input	Output		Efficiency(% Typ)	
	Voltage Range (VDC)	Voltage (VDC)	Current (MA)	Vin(min)	Vin(max)
WRN78V1.8-1000	5-42	1.8	1000	80	71
WRN78V03-1000	7-42	3.3	1000	89	79
WRN78V05-1000	8-42	5	1000	93	85
WRN78V09-1000	12-42	9	1000	95	90
WRN78V12-1000	15-42	12	1000	96	92
WRN78V15-1000	18-42	15	1000	96	94

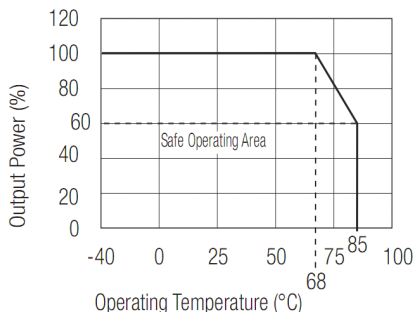
## SPECIFICATIONS ( typical at 25°C, 10% minimum load, unless otherwise specified )

Item	Test conditions	Min.	Typ.	Max.	Units
Input Voltage Range	All Series	Vo+3		42	V
Output Voltage Range	All Series	1.8		15	V
Output Current	All Series	0		1.0	A
Output Current Limit	All Series			3.0	A
Short Circuit Input Current(Vin=24V)	All Series			65mA	
No Load Input Current			1		mA
Short Circuit Protection			Continuous, automatic recovery		
Output Voltage Accuracy(100% Load)	All Series		±2	±3	%
Line Regulation(100% Load, Vin max)	All Series		0.2		%
Load Regulation(10 to 100% full load)	All Series		0.4		%
Dynamic load stability	100%<->50% load 100%<->10% load			±75 ±200	mV
Ripple & Noise (20Mhz BW Limited)	Vin = 24V, Vout = 1.8V-15V		75	100	mVp-p
With 10µF MLCC output capacitor	Full load		30		mVp-p
Temperature Coefficient	-40°C ~ +85°C ambient			0.015	%/°C
Max capacitance load	With normal start-up time, no external components				470µF
Switching Frequency				350khz	
Operating Temperature Range		-40		85	°C
Maximum Case Temperature				100	°C
Storage Temperature Range		-55°C		125	°C
Case Thermal Impedance				70	°C/W
Thermal Shutdown	Internal IC junction			160	°C
Conducted Emissions (with filter)	EN55022				Class B
Radiated Emissions (with filter)	EN55022				Class B
ESD	EN61000-4-2				Class A
Radiated Immunity	EN61000-4-3				Class A
Fast Transient	EN61000-4-4				Class A
Conducted immunity	EN61000-4-6				Class A
Magnetic Field Immunity	EN61000-4-8				Class A
Package Weight					2g
Packing Quantity					42 pcs per Tube



### Derating-Graph

#### Ambient Temperature



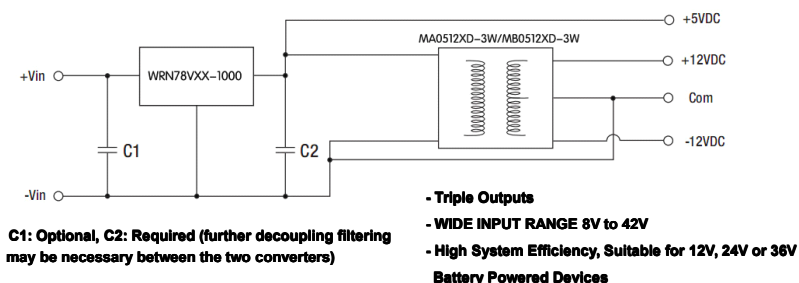
### Specifications

#### Typical Application Circuit

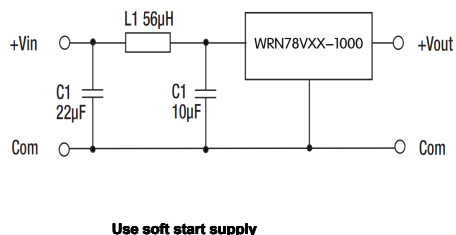
Certifications	General Safety Standby Power	EN 60950-1:2006+A11: 2009+A1: 2010 EN62301: 2005
MTBF (+25°C) (+68°C)	Using MIL - HDBK 217F Using MIL - HDBK 217F	8600 x 10 <sup>3</sup> hours. 3880 x 10 <sup>3</sup> hours.

### Application Examples

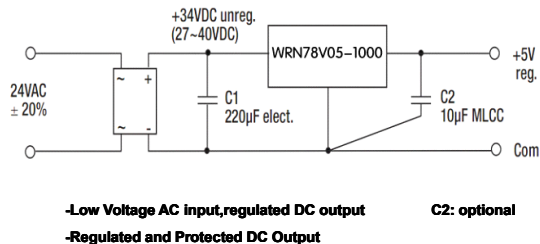
#### High efficiency regulated outputs



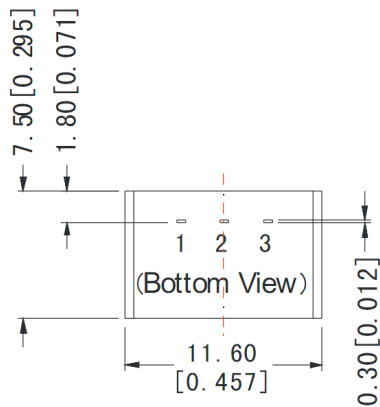
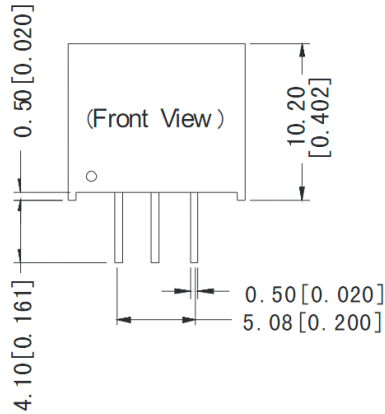
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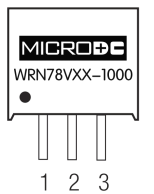
#### High efficiency regulated outputs



### Package Style and Pinning (mm)



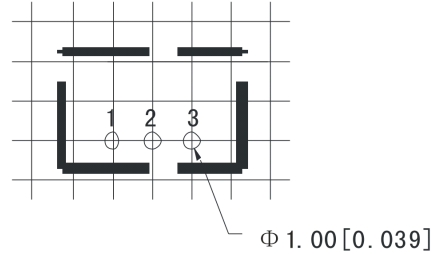
Note:  
Unit:mm[inch]  
Pin section tolerances:±0.10mm[±0.004inch]  
General tolerances:±0.25mm[±0.010inch]



Pin Connections

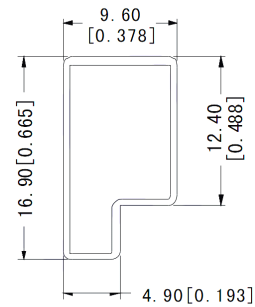
FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout
xx.x ±0.5mm	
xx.xx ±0.25mm	

### Recommended Footprint



Note:grid 2.54\*mm

### Tube Outline Dimensions



Note:  
Unit:mm[inch]  
General tolerances:±0.50mm:[0.020inch]  
L=530mm[20.866inch] Packaging quantity:43 pcs  
L=220mm[8.661inch] Packaging quantity:17 pcs  
Short tube inner packaging dimensions:L\*W\*H=255\*170\*80mm  
Short tube outer packaging dimensions(with six inner packaging boxes):  
L\*W\*H=375\*280\*270mm;  
Long tube inner packaging dimensions:L\*W\*H=580\*200\*100mm;  
Long tube outer packaging dimensions(with two inner packaging boxes):  
L\*W\*H=600\*215\*220mm;  
Short tube outer packaging dimensions(with three inner packaging boxes):  
L\*W\*H=600\*215\*325mm;