



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

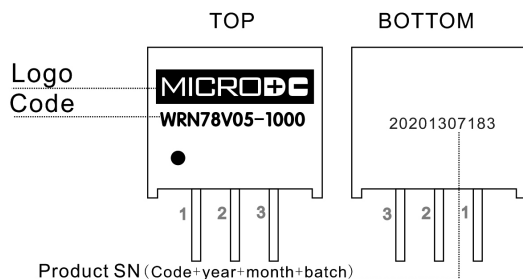
WRN78^①V^②05^③-1000^④

- 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

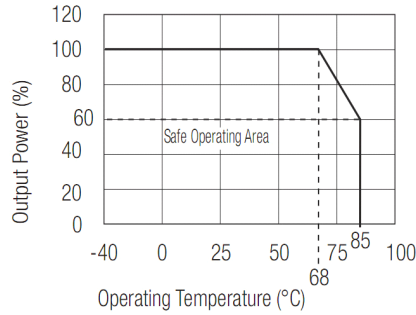
SPECIFICATIONS (typical at 25°C, 10% minimum load, unless otherwise specified)

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



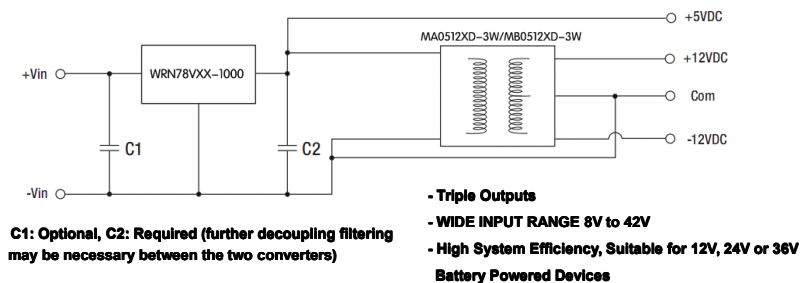
Specifications

Typical Application Circuit

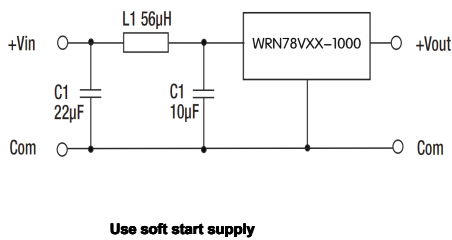
Certifications	General Safety Standby Power	EN 60950-1:2006+A11: 2009+A1: 2010 EN62301: 2005
MTBF (+25°C) (+68°C)	Using MIL - HDBK 217F Using MIL - HDBK 217F	8600 x 10 ³ hours. 3880 x 10 ³ hours.

Application Examples

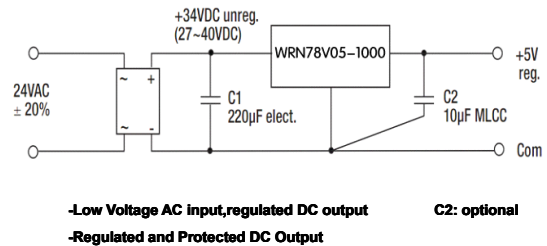
High efficiency regulated outputs



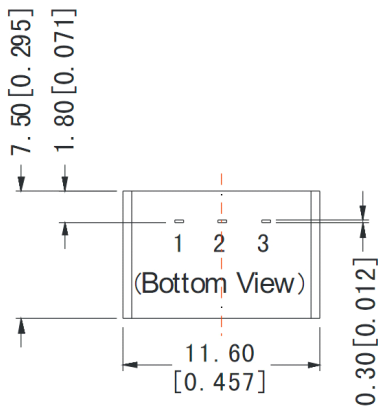
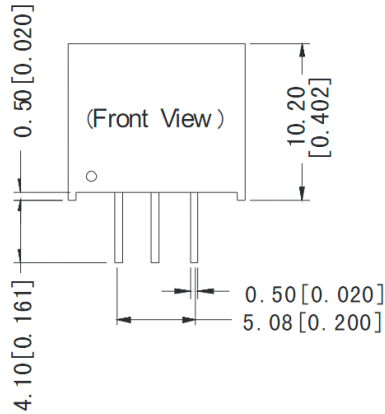
High efficiency regulated outputs



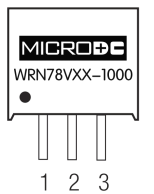
High efficiency regulated outputs



Package Style and Pinning (mm)



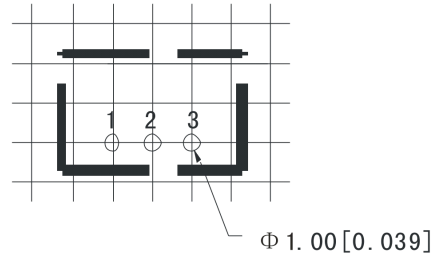
Note:
 Unit:mm[inch]
 Pin section tolerances:±0.10mm[±0.004inch]
 General tolerances:±0.25mm[±0.010inch]



Pin Connections

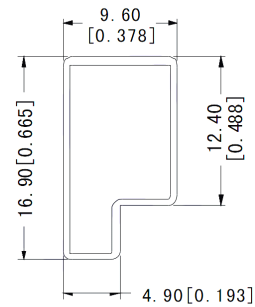
FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout
xx.x ±0.5mm	
xx.xx ±0.25mm	

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;