DC DC

Part Num

VR-78XX-1.0 SERIES

1A OUTPUT CURRENT, NON-ISOLATED DC/DC CONVERTER

Features

- 3 Pin SIL
- Non isolated,No need for heatsinks
- Wide Input Range,Step-down switching dc-dc converter
- Full SMD Technology
- Continuous Short Circuit Protection
- Pin-out compatible with LM78XX three terminals positive Regulator
- Efficiency up to 94%
- -40 ~ 85°C Operation Temperature Range

CE

The VR series is a family of cost effective 1.5~5W single output buck DC-DC converters. These converters are encapsulated in a non-conductive black plastic package 3-pin SIL case, continuous short circuit protection with automatic restart and good line / load regulation . Devices are filled up with flame retardant resin .Input voltages of 4.75~18,and 6.5~18 with output voltage of 1.5, 1.8, 2.5, 3.3, 5, Vdc. High performance features include high efficiency operation up to 94%. Standard features include an input range of 4.75~18Vdc tolerance and low output noise and ripple.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy		±2%
Line regulation		±0.5%
Load regulation	(From 10% to 100% Load)	±0.6%
Ripple & noise (20 MHz bandwidth)(1)		60mV pk-pk
Short Circuit Protection	Indefinite(Automatic Recovery)	
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	40mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
Switching Frequency	330kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>4.3Mhrs

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve)
	-40°C~60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.0g
Dimensions	0.46"x0.29"x0.40"

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions(4)	EN55022	CLASS B
ESD	EN61000-4-2	Perf. Criteria B
RS	EN61000-4-3	Perf. Criteria A
EFT(5)	EN61000-4-4	Perf. Criteria B
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

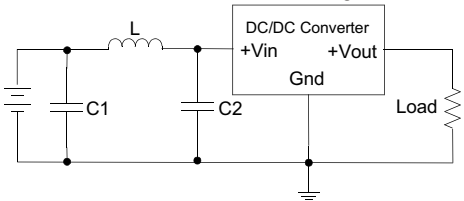
ABSOLUTE MAXIMUM RATINGS(6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Voltage	-0.3~20 Vdc max
Soldering Temperature (1.5mm from case 10sec.)	260°C

NOTE

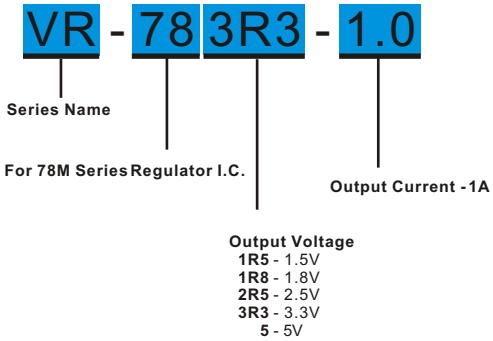
1.Ripple/Noise measured with 20MHz bandwidth.
2.Tested by minimal Vin and constant resistive load.
3.Measured Input reflected ripple current with a simulated source inductance of 12uH.
4.Input filter components (C1, C2, L) are used to help meet conducted emissions requirement for the module.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.
5.An external filter capacitor is required if the module has to meet EN61000-4-4.
The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
6.Do not operate the unit(s) exceeding the absolute maximum rating, over rating causes damage to the units.
7.Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

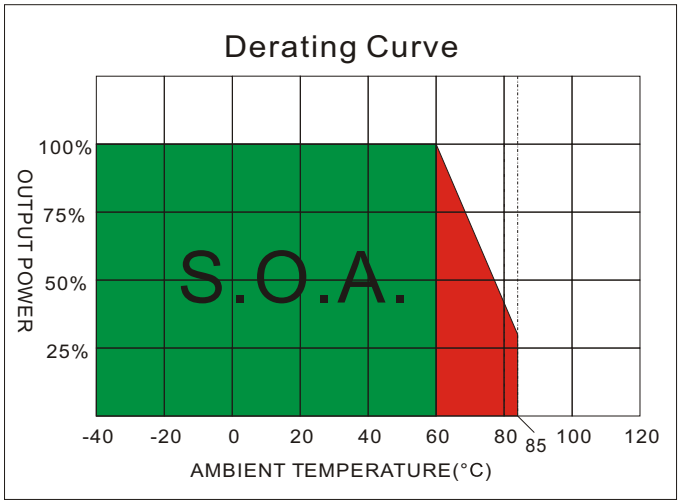


	C1	L	C2
VR-78XX-1.0	470uF,35V	6.4uH	470uF,35V

1A OUTPUT CURRENT, NON-ISOLATED DC/DC CONVERTER

PART NUMBER STRUCTURE

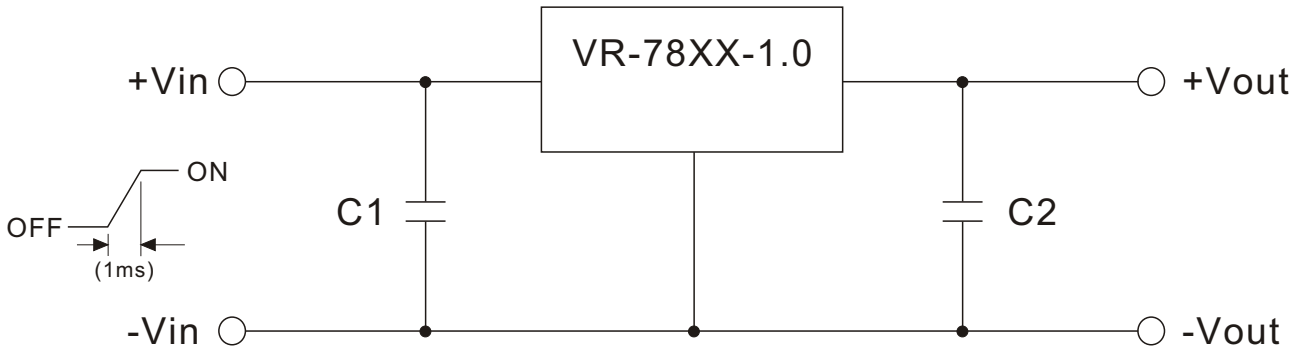




MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current (mA)			OUTPUT		EFFICIENCY		Capacitor Load(uF)
		No-Load (Max)	Full Load		Voltage (Vdc)	Current (mA)	Vin (Min) @FL(%)	Vin (Max) @FL(%)	
			Vin(Min)	Vin(Max)					
VR-781R5-1.0	4.75-18	10.0	416.00	119.00	1.5	1000	78	72	220
VR-781R8-1.0	4.75-18	10.0	474.00	135.00	1.8	1000	82	76	220
VR-782R5-1.0	4.75-18	10.0	619.00	176.00	2.5	1000	87	81	220
VR-783R3-1.0	4.75-18	10.0	790.00	221.00	3.3	1000	90	85	220
VR-7805-1.0	6.5-18	10.0	836.00	319.00	5.0	1000	94	89	220

Standard Application Circuit



1.To protect the converter during power-up, use soft start Vin and C1=47uF
2.C2=100uF(Optional)

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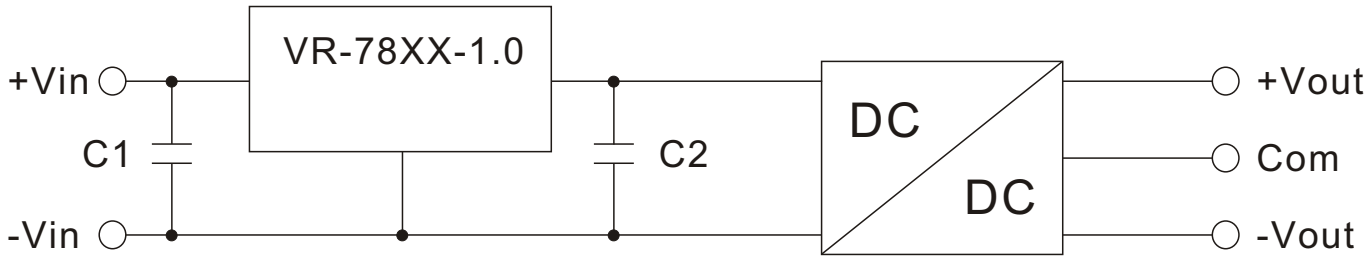
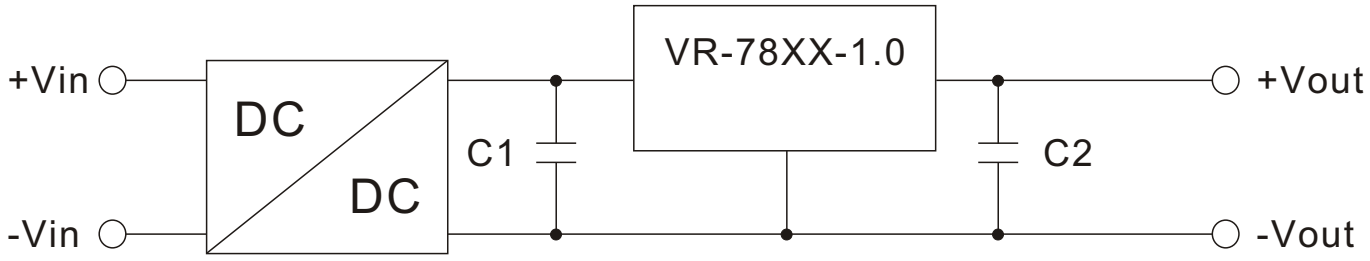
Application Examples

High efficiency, isolated, dual unregulated outputs, one economic way to build up isolated dual output



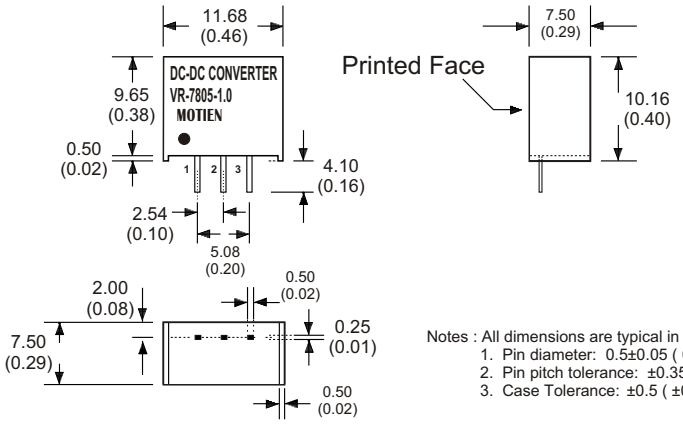
- Isolated dual outputs
- Wide input range 4.75V to 18V
- C1: Optional
- C2: Required(further decoupling filtering may be necessary between the two converters)

Isolated (up to 6KV), wide input range regulated output



- High isolation voltage
- Wide input voltage range
- Improved loading / line regulation
- Point-of-load Architecture
- C1: Required(further decoupling filtering may be necessary between the two converters)
- C2: Optional

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	+V Input
2	GND
3	+V Output

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

Data sheets are subject to change without notice