SMR-78XX-1.0 Series

1.0A Output Current, Non-Isolated DC/DC converter

Features

- 3 Pin SIL, Full SMD Technology
- Non isolated, No need for heatsinks
- Wide Input Range,Step-down switching dc-dc converter
- High voltage input range, up to 28V
- Continuous Short Circuit Protection
- Pin-out compatible with LM78XX three terminals positive Regulator
- Efficiency up to 91%
- Low ripple and noise

The SMR-78XX-1.0 series is a family of cost effective 3.3~5W 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, good line / load regulation and ultra low quiescence current. Devices are filled up with flame retardant resin. Input voltages of 7~28 and 8~28 with output voltage of 3.3 and 5Vdc. High performance features include high efficiency operation up to 91%.

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

OUTPUT SPECIFICATIONS

Voltage accuracy		±5%, max.
Output Current (Min Load)		10mA, min.
Output Current (Full Load)		1000mA, max.
Line regulation		±1%, max.
Load regulation	(From 10% to 100% Load)	±1.5%, max.
Ripple & Noise (1)	(From 10% to 100% Load)	100mVpk-pk, max.
Short Circuit Protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor Load(2)	(From 2% to 100% Load)	See table
Transient Recovery Time(3)		250μs, typ.
Transient Response Deviation(3)		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	10mS, typ.
Input Current (No-Load)	See table
Input Current (Full-Load)	See table
Input Filter	Capacitors
Input Reflected Ripple Current(4)	35mA pk-pk

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-55°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
Switching Frequency	300KHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>3.8Mhrs
Safety Standard (design to meet)	IEC/EN 60950-1
Environmental compliance	RoHS

ABSOLUTE MAXIMUM RATINGS(5)

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

Input Surge Voltage (100mS)	30 Vdc, max.
Soldering Temperature (1.5mm from case 10sec max.)	260°C, max.

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.1g
Dimensions	0.46"x0.29"x0.40"

EMC CHARACTERISTICS (design to meet)

Radiated Emissions	EN55022	CLASS B
Conducted Emissions	EN55022	CLASS B
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT	IEC61000-4-4	Perf. Criteria A
Surge	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

NOTE

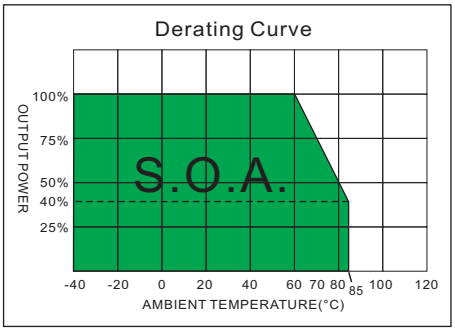
1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal Vin and constant resistive from 2% to 100% load.
3. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
4. Input reflected ripple current is measured through a source inductor L1(12μH) and a source capacitor C1=47μF at nominal input and full load.
5. Do not operate the unit(s) exceeding the absolute maximum rating, over rating causes damage to the units.
6. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

SMR-78XX-1.0 Series *1.0A Output Current, Non-Isolated DC/DC converter*

PART NUMBER STRUCTURE

SMR-783R3-1.0

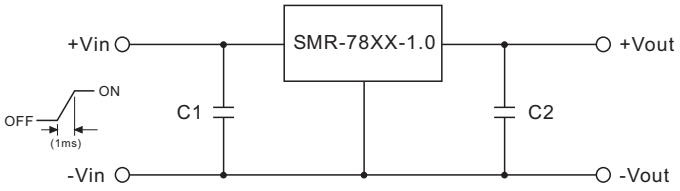
- **Series Name**
- **Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
- **Output Current**
  - **1.0** - 1.0A



MODEL SELECTION GUIDE

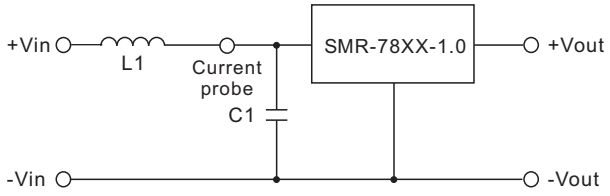
MODEL NUMBER	INPUT	INPUT Current		OUTPUT	OUTPUT Current		EFFICIENCY		Capacitor
	Voltage Range (Vdc)	No-Load (mA, typ.)	Full Load (mA, typ.) @Min. Vin	@Max. Vin	Voltage (Vdc)	Min. Load (mA)	Full Load (mA)	Full Load (%, typ.) @Min. Vin	@Max. Vin	Load @FL (μF, max.)
SMR-783R3-1.0	7 - 28	1.5	541.87	147.32	3.3	100	1000	87	80	220
SMR-7805-1.0	8 - 28	1.5	686.81	210.08	5.0	100	1000	91	85	220

STANDARD APPLICATION CIRCUIT



1. To protect the converter during power-up, use soft start Vin and C1=22μF
2. C2=47μF(Optional)

TEST CONFIGURATIONS

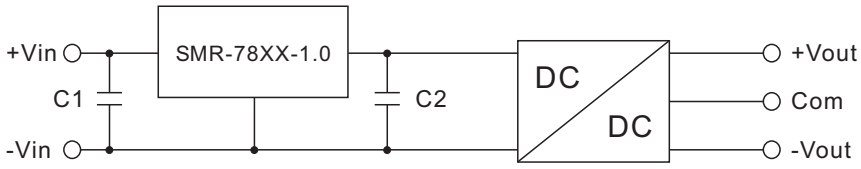


Input reflected ripple current is measured through a source inductor L1(12μH) and a source capacitor C1=47μF at nominal input and full load.

APPLICATION EXAMPLES

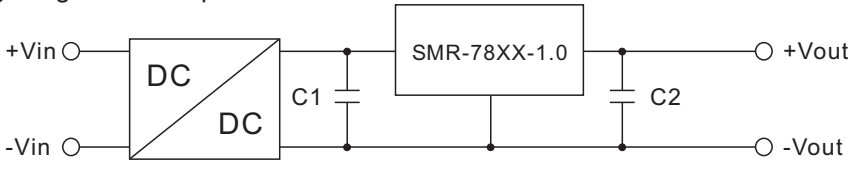
High efficiency, isolated, dual unregulated outputs, one economic way to build up isolated dual output

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

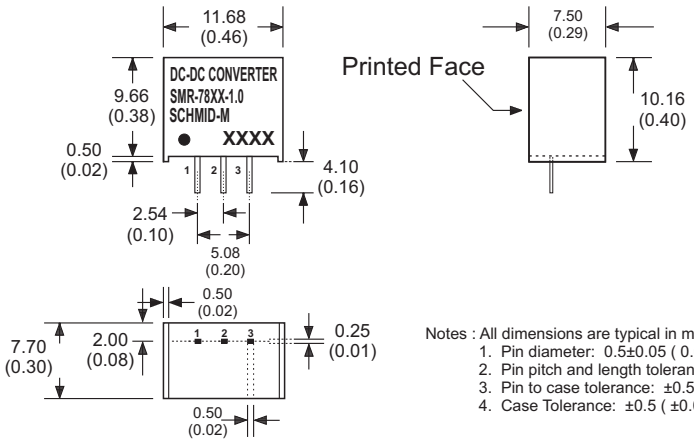


Isolated (up to 6KV), wide input range regulated output

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



MECHANICAL SPECIFICATIONS



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

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