SERIES: V78XX-1000 **DESCRIPTION: DC SWITCHING REGULATOR, NON-ISOLATED**

DESCRIPTION

The V78XX switching regulator series is designed to be a high efficiency drop-in replacement for 78XX linear regulators. Unlike linear regulators, the V78XX series does not require a heatsink, creating a much more compact solution. Built-in short-circuit and over-temperature protections ensure very rugged operations. Additionally, low ripple and noise performance make the parts useful in a wide range of applications.

FEATURES

- **efficiency up to 97%**
- **1A current output**
- **operating temp: -40 ~ +85˚C**
- **short circuit protection**
- **thermal shutdown**
- **low ripple and noise**
- **miniature SIP package, meets UL94-V0 requirement**
- **ultra low power loss**
- **negative output capacity**
- **pin compatible to LM78XX series**
- **MTBF >2,000,000 hours**

RoHS

MODEL

	input voltage		output voltage	output current	efficiency level	
	min (V dc)	max (V dc)	max (V dc)	max. (mA)	Vin (min)	Vin (max)
V7803-1000	4.75 4.75	28 28	3.3 -3.3	1,000 -600	90 80	83 82
V7805-1000	6.5 7	32 27	5.0 -5.0	1,000 -600	93 85	88 87
V7806-1000	9 7	32 25	6.5 -6.5	1,000 -400	94 88	90 90
V7809-1000	12 7	32 23	9.0 -9.0	1,000 -400	95 89	92 91
V7812-1000	16 7	32 20	12 -12	1,000 -300	96 89	94 91
V7815-1000	20 7	32 17	15 -15	1,000 -300	97 87	94 92

*add suffix "R" for 90˚ pins, for example: V7803-1000R

OUTPUT

parameter	conditions/description	min	nom	max	units
voltage accuracy	at 100% load		±2	±3	%
line regulation	Vin = min to max at full load		±0.2	±0.4	%
load regulation	10% to 100%		±0.4	±0.6	%
output ripple	20 MHz bandwidth, typical application circuit		25	35	mVp-p
short circuit protection	continuous, auto-restart				
short circuit input power			0.5	1.8	W
current limit			2,000		mA
switching frequency	full load, input voltage range	300	340	380	KHz
quiescent current	positive output negative output		5 7	8 13	mA mA
thermal shutdown			150		˚C
temperature coefficient	-40 ~ +85˚C			±0.02	%/˚C
load capacitance				1,000	µF

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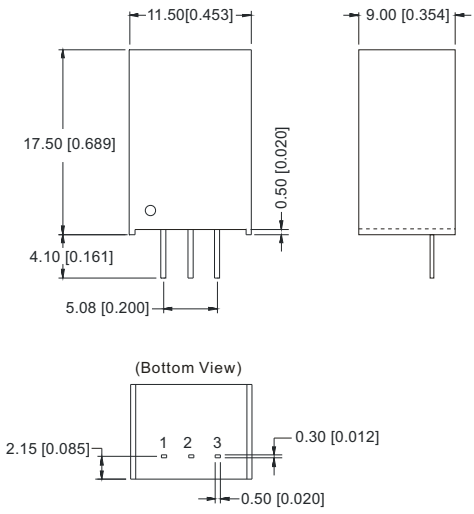
COMMON SPECIFICATIONS

parameter	conditions/description	min	nom	max	units
operating temperature		-40		85	˚C
operating case temperature				100	˚C
storage temperature		-55		125	˚C
storage humidity				95	%
cooling	free air convection				
lead temperature	1.5 mm from the case for 10 seconds			300	˚C
case material	plastic (UL94-V0)				
MTBF		2,000,000			hours
package weight			3.7		g

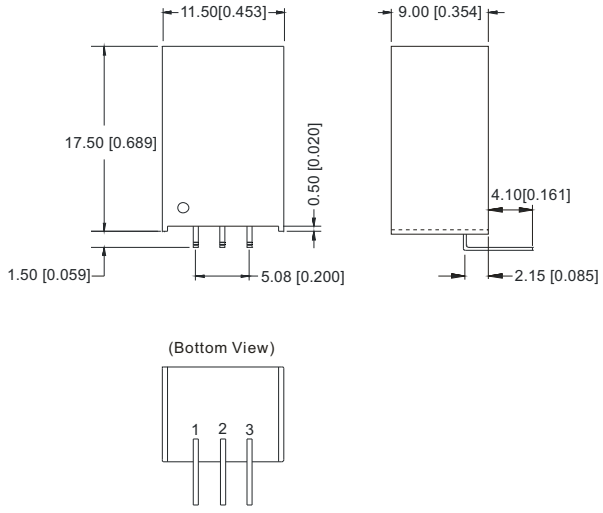
MECHANICAL DRAWING

V78XX-1000



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

V78XX-1000R



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

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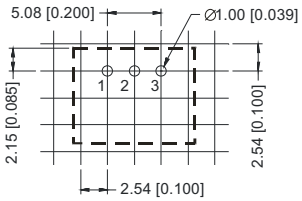
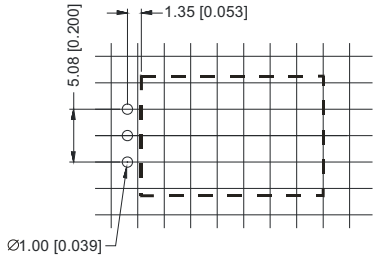
RECOMMENDED FOOTPRINT

V78XX-1000

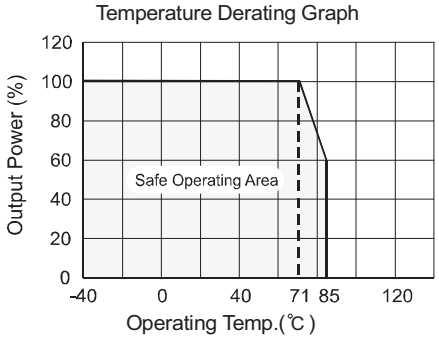


V78XX-1000R



FOOTPRINT DETAILS		
Pin	Positive	Negative
1	+Vin	+Vin
2	GND	-Vout
3	+Vout	GND

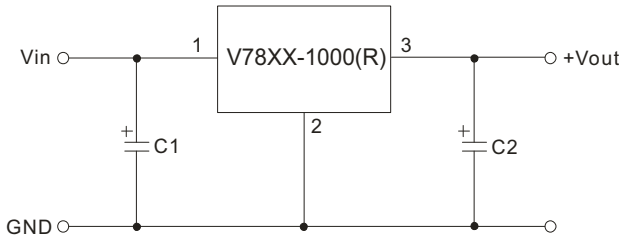
DERATING CURVE

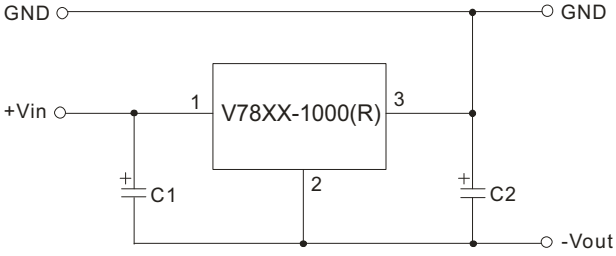


EXTERNAL CAPACITOR TABLE

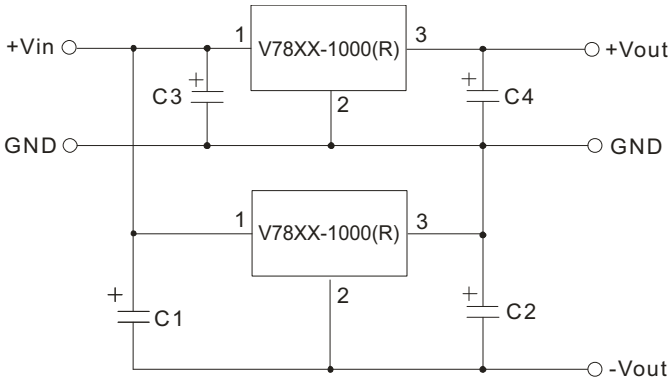
Part Number	C1,C3 (Ceramic capacitor)	C2,C4 (Ceramic capacitor)
V7803-1000(R)	10μF/50V	22μF/6.3V
V7805-1000(R)	10μF/50V	22μF/10V
V7806-1000(R)	10μF/50V	10μF/10V
V7809-1000(R)	10μF/50V	10μF/16V
V7812-1000(R)	10μF/50V	10μF/25V
V7815-1000(R)	10μF/50V	10μF/25V

TYPICAL APPLICATION CIRCUIT





APPLICATION EXAMPLE



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 increased properly if required, and tantalum or low ESR electrolytic capacitors may also suffice.
3. No parallel connection or plug and play.

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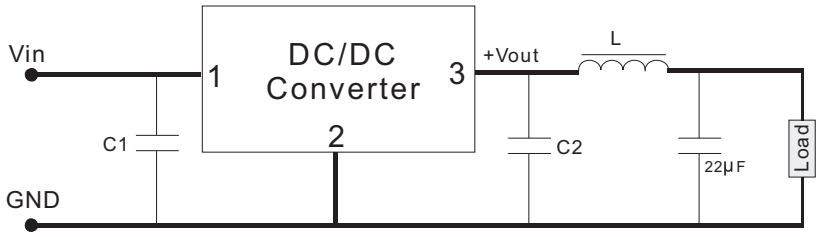
OUTPUT RIPPLE REDUCTION

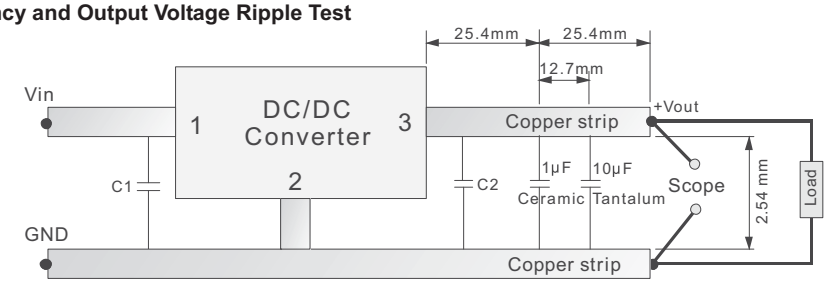


To reduce output ripple, it is recommended to add a LC filter in output port.

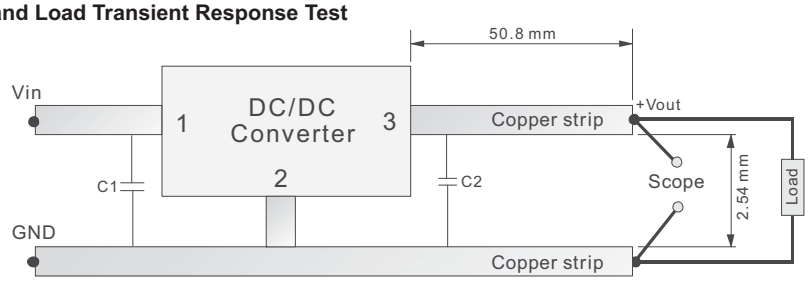
L: Recommended parameter 10µH ~ 47µH.

TEST CONFIGURATION

Efficiency and Output Voltage Ripple Test



Start-up and Load Transient Response Test



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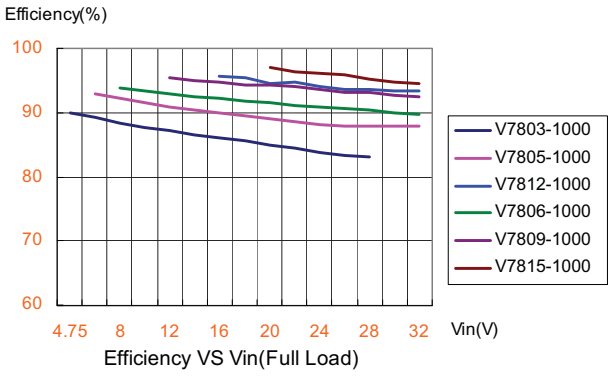
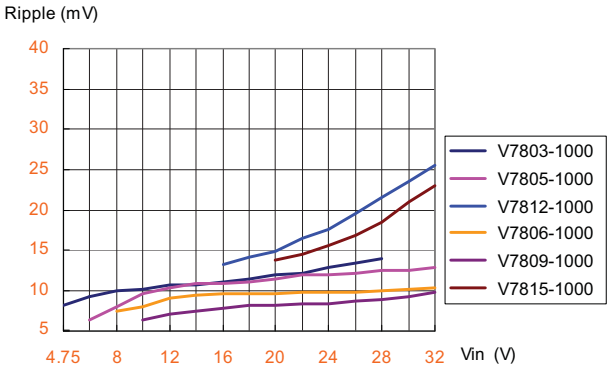
EFFICIENCY AND RIPPLE CURVES

Efficiency

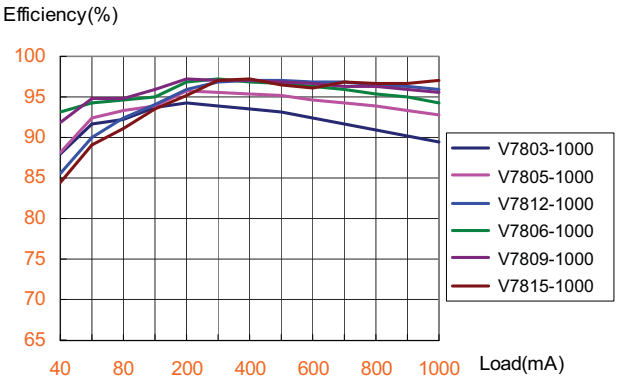


Efficiency VS Vin(Full Load)

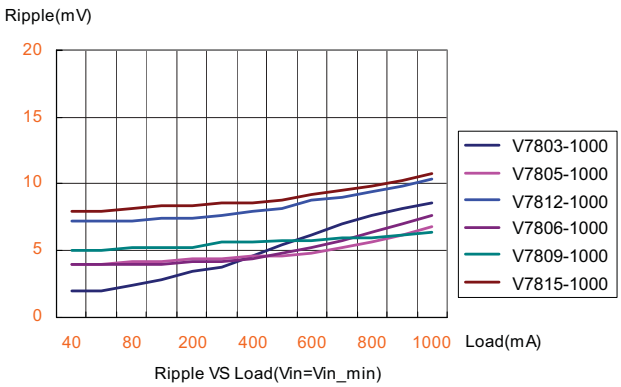
Ripple



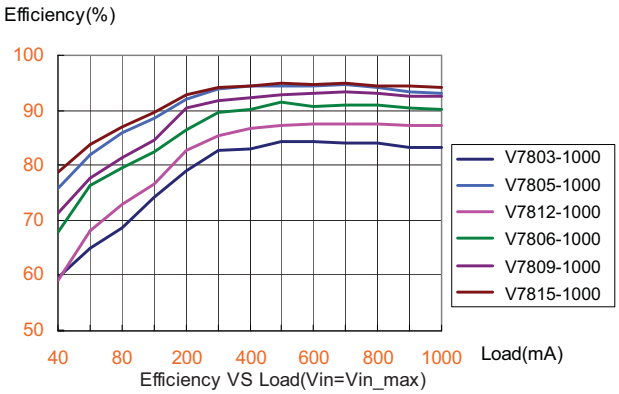
Ripple VS Vin (Full Load)



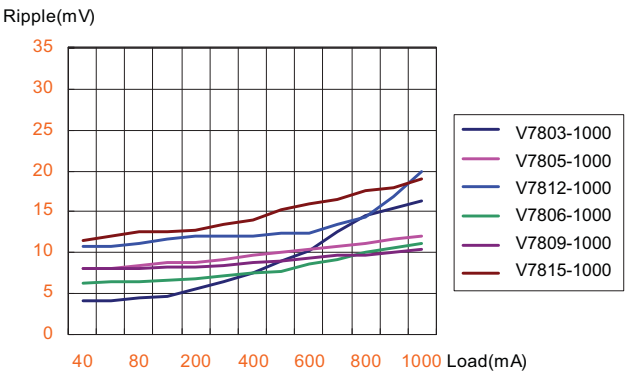
Efficiency VS Load(Vin=Vin_min)



Ripple VS Load(Vin=Vin_min)



Efficiency VS Load(Vin=Vin_max)



Ripple VS Load(Vin=24V)