

**SERIES:** P78B-1000 | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

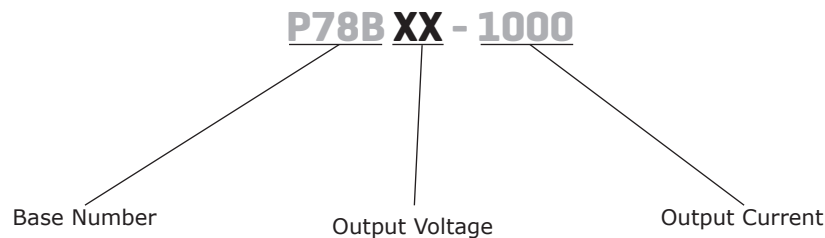
- 1A current output
- pin compatible with LM78XX linear regulators
- -40 to +90°C operating temperature
- input voltage range up to 4.75~36 Vdc
- continuous short circuit protection
- compact SIP3 package
- low ripple and noise
- designed to meet EN/IEC 62368-1



MODEL	input voltage		output voltage (Vdc)	output current max (mA)	output power max (W)	ripple & noise max (mVp-p)	efficiency <sup>3</sup> typ (%)
	typ (Vdc)	range (Vdc)					
P7802B-1000	12	4.75~26	1.8	1000	1.8	50 <sup>1</sup>	84
P7803B-1000	24	4.75~36	3.3	1000	3.3	50	89
P7805B-1000	24	6.5~36	5.0	1000	5.0	50	92
P7806B-1000	24	8~36	6.5	1000	6.5	75 <sup>2</sup>	93.5
P7809B-1000	24	11~36	9.0	1000	9.0	100	93.5
P7812B-1000	24	15~36	12.0	1000	12.0	100	94
P7815B-1000	24	18~36	15.0	1000	15.0	100	94.5

- Notes:
1. If you use 26V input and the loading is less 5%, the ripple and noise will be 100mVp-p maximum.
  2. With a 4.7μF/50V X7R MLCC, the ripple and noise will be 50mVp-p maximum.
  3. At min Vin, full load @25°C, and ±2% tolerance
  4. All specifications measured at: Ta=25°C, nominal input voltage, rated output load, and after warm up unless otherwise specified.

**PART NUMBER KEY**



## INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	1.8 Vdc output model		12		Vdc
	all other output models		24		Vdc
no load input current	1.8 Vdc output model		10		mA
	3.3 Vdc output model		12		mA
	5 Vdc output model		16		mA
	6.5 & 9 Vdc output models		20		mA
	12 Vdc output model		23		mA
	15 Vdc output model		25		mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load <sup>5</sup>	15 Vdc output model			330	μF
	all other output models			470	μF
line regulation	measured from low to high line, full load		0.2	0.4	%
load regulation	measured from 10~100% load, typical Vin				
	9 Vdc output model		0.4	1.0	%
	all other output models		0.4	0.6	%
voltage accuracy			±3		%
switching frequency	at nominal Vin		500		kHz

Note: 5. The capacitive load is test by minimum input and constant resistive load.

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, auto recovery				

## SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
safety approvals	designed to meet 62368-1: EN, IEC				
EMI	EN 55032 Class A/Class B				
ESD	EN61000-4-2 Air±8kV; Contact ±6kV, perf. Criteria A				
radiated immunity	EN61000-4-3, 10V/m, perf. Criteria A				
fast transient <sup>6</sup>	EN 61000-4-4, ±2kV, perf. Criteria A				
surge <sup>6</sup>	EN 61000-4-5, ±2kV, perf. Criteria A				
conducted immunity	EN61000-4-6, 10V/rms, perf. Criteria A				
magnetic field immunity	EN61000-4-8, 10A/m, perf. Criteria A				
MTBF	as per MIL-HDBK-217F, full load, 25 °C	13,300,000			hours
RoHS	yes				

Note: 6. External input capacitor required 1500μF/ 50V.

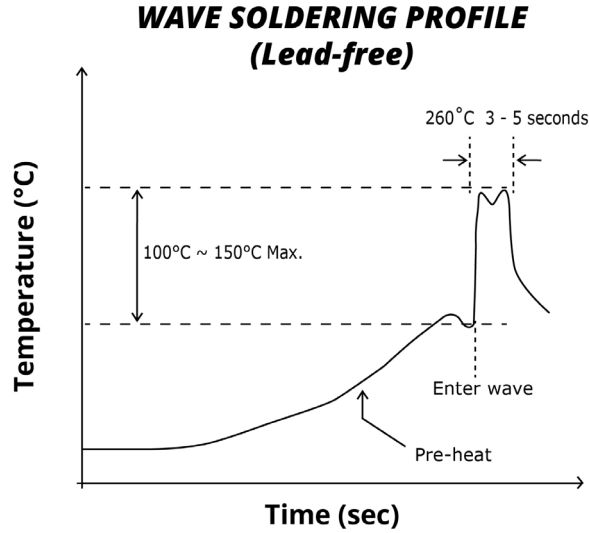
## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		90	°C
storage temperature		-55		125	°C
operating humidity	non-condensing			95	%
temperature coefficient			0.015		%/ °C
maximum case temperature				105	°C
vibration	MIL-STD-202G				

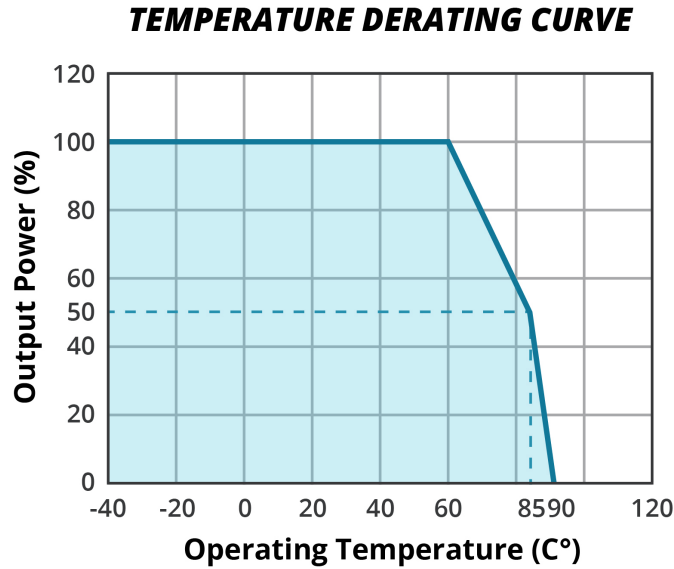
## SOLDERABILITY

parameter	conditions/description	min	typ	max	units
wave soldering <sup>7,8</sup>	see wave solder profile			210	°C

Note: 7. The wave solder profile is measured on lead temperature.  
 8. Need to keep the solder parts internal temperature less than about 210°C. For the period of solder dwell time should be 3 - 5 seconds, and should not over than 10 second.



## DERATING CURVE



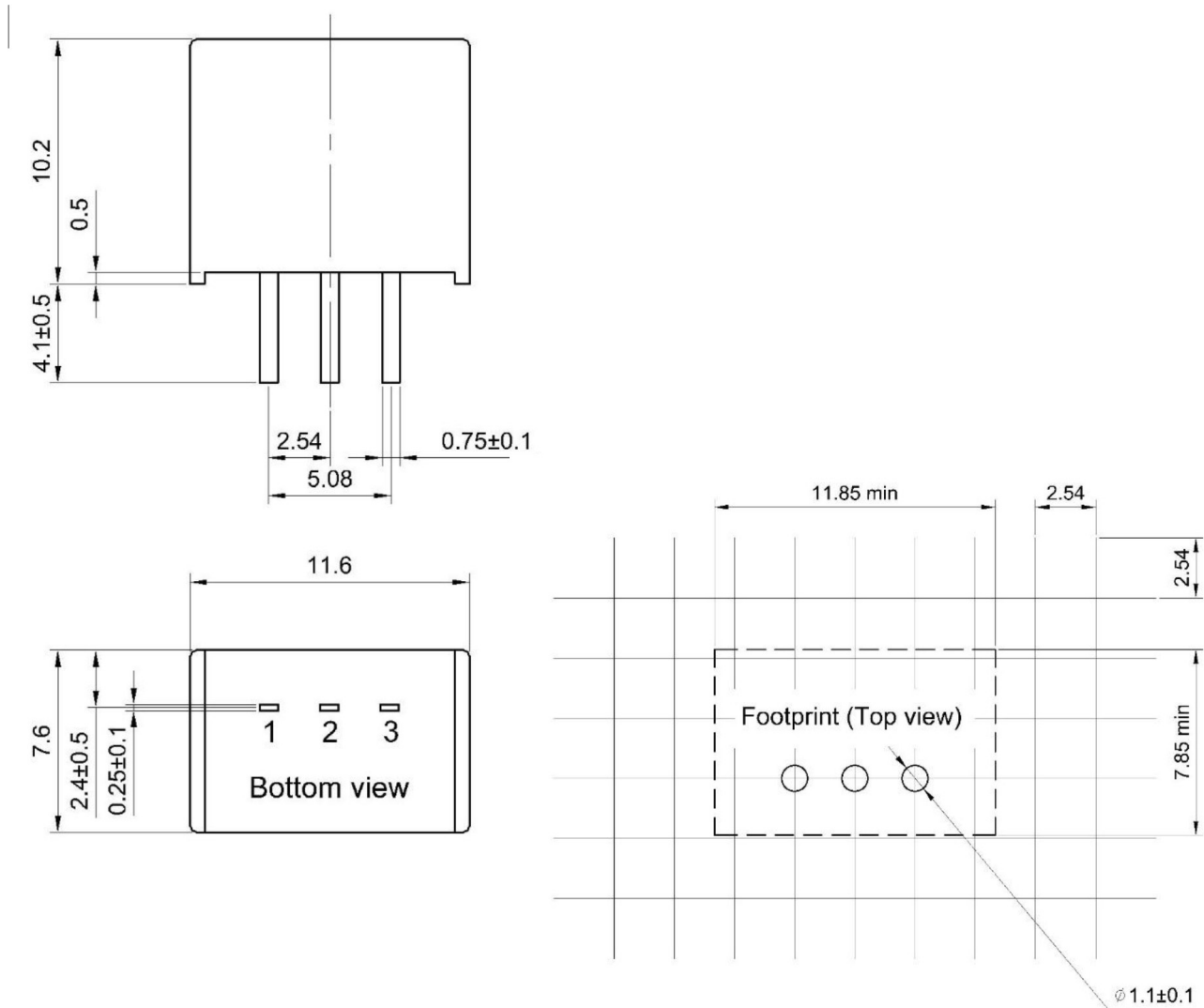
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	11.6 x 7.6 x 10.2				mm
case material	heat resistant UL94 V-0 plastic				
weight			1.9		g
cooling method	natural convection				

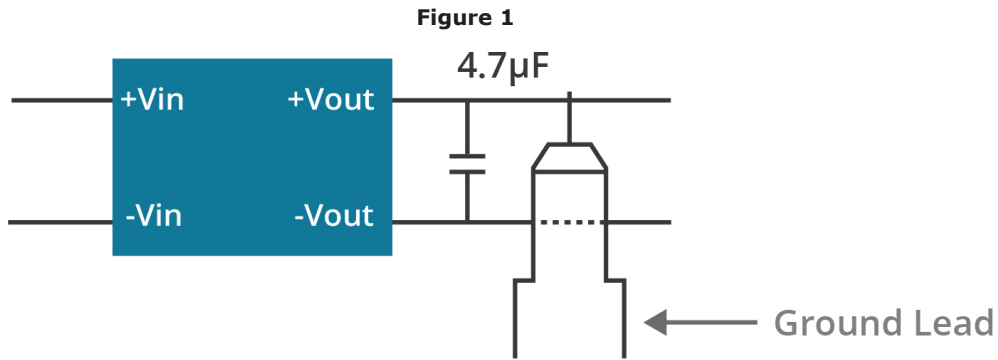
## MECHANICAL DRAWING

units: mm  
tolerance: ±0.25 mm

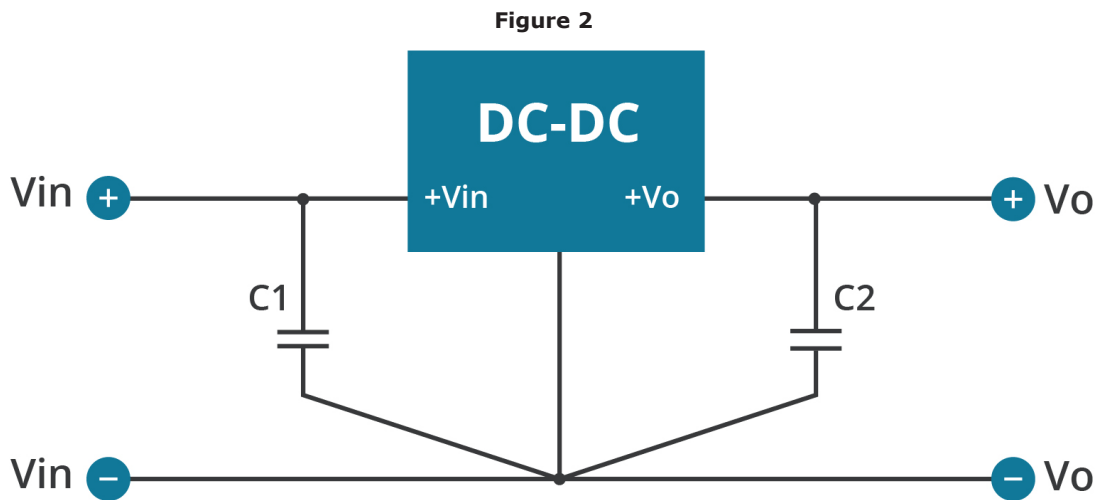
PIN CONNECTIONS	
PIN	Function
1	+Vin
2	GND
3	+Vout



## RIPPLE AND NOISE MEASUREMENT METHOD



## APPLICATION CIRCUIT



## EMC RECOMMENDED CIRCUIT

Figure 3

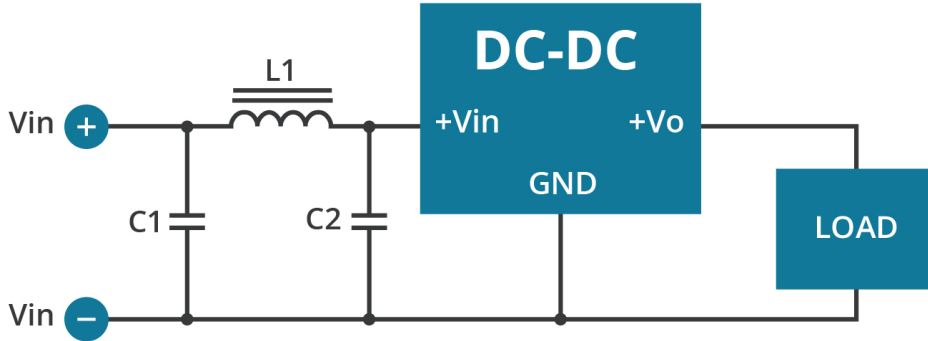


Table 1

COMPONENTS			
CLASS	C1	L1	C2
Class A	1,206 / 4.7μF / 50V / MLCC	4.7μH	-
Class B	1,206 / 4.7μF / 50V / MLCC x 2	10μH	1,206 / 4.7μF / 50V / MLCC

## EFT AND SURGE EXTERNAL CAPACITOR REQUIRED

Figure 4



Table 2

C1
1,500 / 50V

## REVISION HISTORY

rev.	description	date
1.0	initial release	06/28/2024
1.01	9 Vdc output model added	10/25/2024

The revision history provided is for informational purposes only and is believed to be accurate.



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