Technical Data **11181**

Effective May 2021
Supersedes October 2020

EPM78Vx

Non-isolated DC-DC converter

Product features

- Switching regulator, Non-isolated DC-DC converter
- Convenient 3-Pin SIP Package compatible with LM78xx linear regulator
- Input voltages: 4.75 V to 32 Vdc
- 6 SKU's representing 6 output voltages (1.8 V – 15 V) @ 1A output current
- Efficiency up to 96%
- Operating ambient temperature -40 °C to +90 °C
- Continuous short circuit protection
- EN62368 safety approval

Engineering tools

- EPM78 Evaluation kit
- PN: EPM78-EVK
  Includes evaluation board and 7 EPM78 part numbers
- EPM78 Evalaution kit user guide

Applications

- Industrial
  - Automation & testing equipment
  - Displays
  - Lighting
  - IoT
  - Power Supply
- Energy
  - Solar and wind inverters
  - Battery management
- Medical
  - Hospital & home care equipment
  - Inventory tracking
  - Diagnostics
- Telecom
  - Networking and telecommunications
  - Infrastructure

Environmental compliance

RoHS

Ordering part number

EPM 78 Vx- 01R8- 01R0 R

- Eaton converter
- Package type/size code
- Vx= Version code
- Output voltage maximum (R = decimal point)
- Output current maximum (R = decimal point)
- R=Standard, P=Positive logic, N= Negative logic

Powering Business Worldwide

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Specifications

	Parameter	Conditions	Minimum	Typical	Maximum	Unit
Input	Input voltage range			24		Vdc
Output	EFficiency	Vo = 1.8 Vdc @ min. Vin		86		%
		Vo = 3.3 Vdc @ min. Vin		90		%
		Vo = 5.0 Vdc @ min. Vin		93		%
		Vo = 6.5 Vdc @ min. Vin		94		%
		Vo = 12 Vdc @ min. Vin		95		%
		Vo = 15 Vdc @ min. Vin		96		%
	Mimimum load			1		%
	Line voltage regulation	LL-HL		0.2	0.4	%
	Load voltage regulation	10-100% Load		0.4	0.6	%
	Voltage accuracy			±3		%
	Operating frequency	100% Load at nominal Vin		500		kHz
	Ripple & noise	Vo = 1.8 Vdc			50[1]	mVp-p
		Vo = 3.3 Vdc			50	mVp-p
		Vo = 5.0 Vdc			50	mVp-p
		Vo = 6.5 Vdc			75[2]	mVp-p
		Vo = 12 Vdc			100	mVp-p
		Vo = 15 Vdc			100	mVp-p
Environment	Operating temperature	With derating	-40		+90	°C
	Storage temperature		-55		+125	°C
	Relative humidity				95	%RH
	Temperature coefficient			0.015		%/°C
	Maximum case temperature				105	°C
	Vibration			MIL-STD-202G		
Function	Short circuit protection			Continuous, automatic recovery		
	Saftey			EN 62368-1		
	MTBF	MIL-HDBK217F	13300			khours
Physical	Dimension			0.457 (L) x 0.402 (W) x 0.300 (H)		inches
	Weight			1.9		g
	Cooling method			Free air convention		
	Case material			Non conductive black plastic		
EMC	EMI	EN 55032		Class A/B		
	ESD	EN61000-4-2 Air ± 8 kV Contact ± 6 kV		Criteria A		
	Fast transient[3]	EN 61000-4-4, ±2 kV		Criteria A		
	Surge[3]	EN 61000-4-5, ±2 kV		Criteria A		

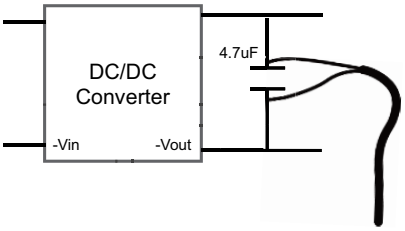
1. If you use 26 V input and the loading is less 5%, the R&N will be 100 mVp-p maximum
2. With a 4.7 µF/ 50 V X7R MLCC, the R&N will be 50 mVp-p maximum
3. External input capacitor required 1500 µF/ 50 V.
4. The product information and specifications are subject to change without prior notice.
5. All specifications valid at 24 V input, full load and +25 °C after warm-up time unless otherwise stated.

Selection guide

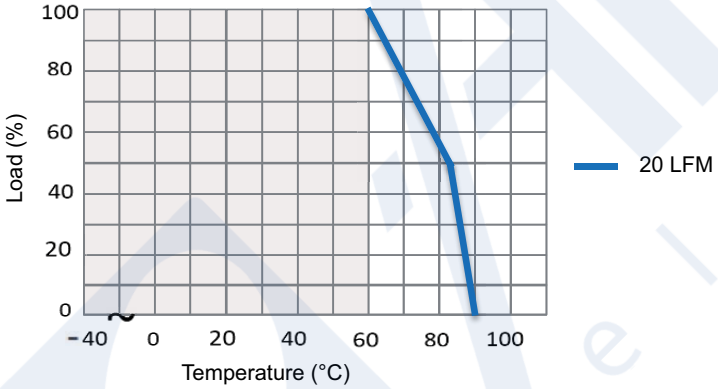
Part number	Input voltage	Output voltage	Output current @ full load	Input current @ no load	Efficiency (typical)[1] Vin minimum/ Vin maximum	Capacitive load[2] maximum
EPM78V1-01R8-01R0R	4.75 - 26 Vdc	1.8 Vdc	1000 mA	10 mA	86.0/77.5%	470 µF
EPM78V2-03R3-01R0R	4.75 - 32 Vdc	3.3 Vdc	1000 mA	12 mA	90.0/82.5%	470 µF
EPM78V2-05R0-01R0R	6.5 - 32 Vdc	5.0 Vdc	1000 mA	16 mA	93.0/86.0%	470 µF
EPM78V2-06R5-01R0R	8 - 32 Vdc	6.5 Vdc	1000 mA	20 mA	94.0/88.0%	470 µF
EPM78V2-12R0-01R0R	15 - 32 Vdc	12 Vdc	1000 mA	23 mA	95.0/92.0%	470 µF
EPM78V2-15R0-01R0R	18 - 32 Vdc	15 Vdc	1000 mA	25 mA	96.0/93.0%	330 µF

1. The efficiency is test by max./ min. input voltage and full load @ +25 °C, and ±2% tolerance
2. The capacitive load is test by minimum input and constant resistive load
3. All specifications valid at 24 V input voltage, full load and +25 °C after warm-up time unless otherwise stated

Measuring circuit

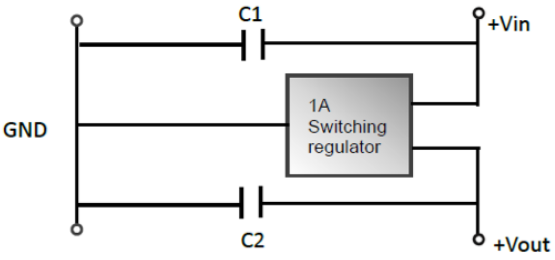


Derating curve

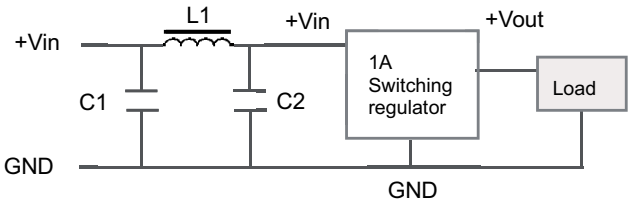


The derating curve was measured at 24 V input

Standard application circuit

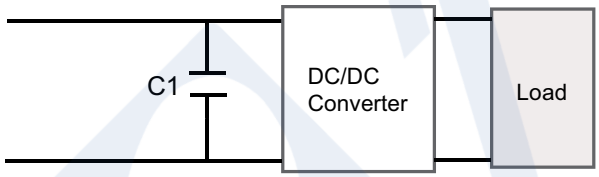


EMC filtering circuit



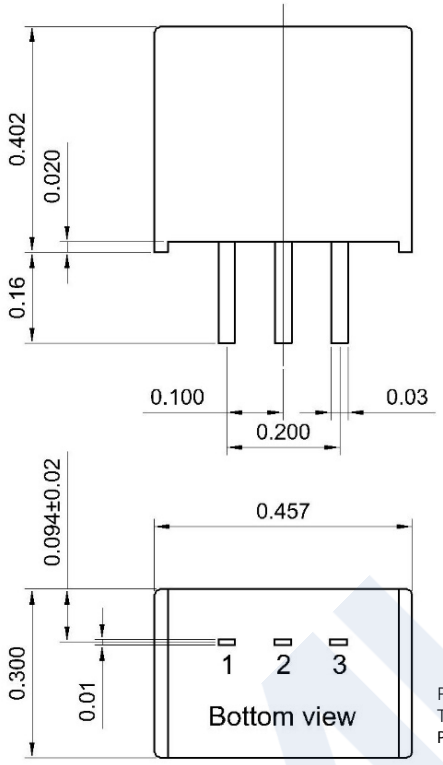
Class	C1	L1	C2
Class A	1206 4.7 µF 50 V MLCC	3.3 µH	x
Class B	1210 10 µF 50 V MLCC	10 µH	1206 4.7µF 50 V MLCC

EFT and surge circuit



C1
1500 µF/ 50 V

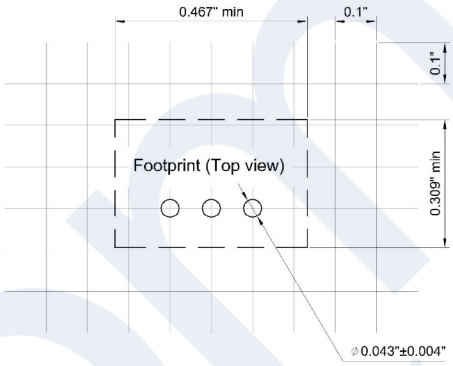
Mechanical dimension and pinning - inches



Pin	Function
1	+Vin
2	GND
3	+Vout

Projection: Third angle projection
Tolerance: X.XX ± 0.02 X.XXX ± 0.01
PIN tolerance: ± 0.004

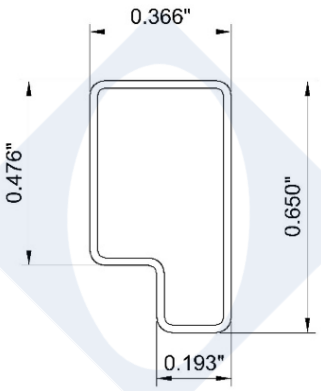
Recommended pad layout



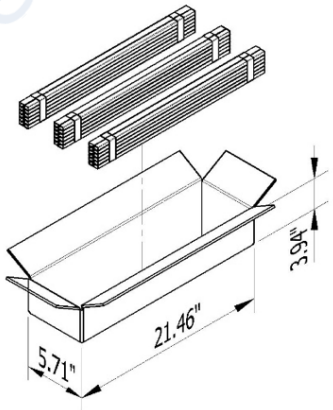
Marking

xxx= lot code

Packaging- Inches



Tolerance : ±0.02"
1 Tube = 42 pcs
Length : 20.47"±0.08"



Carton=21.46*5.71*3.94 inch
MOQ=42(pcs/tube)*12(tube/bundle)*3(bundle)=1512pcs←4Kg

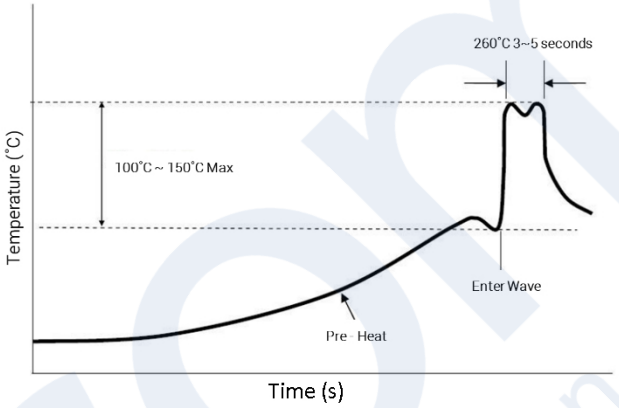
General information

Storage and handling

The shelf life will be a minimum of 12 months, when stored at the following conditions: < 40 ° C, < 90% relative humidity.

Wave solder profile

The wave solder profile is measured based on lead temperature. The internal temperature of the solder parts should not exceed +210 °C. The duration of solder dwell time should be between 3 to 5 seconds, and not to exceed 10 seconds.



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