

**SERIES:** PEP1-M | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

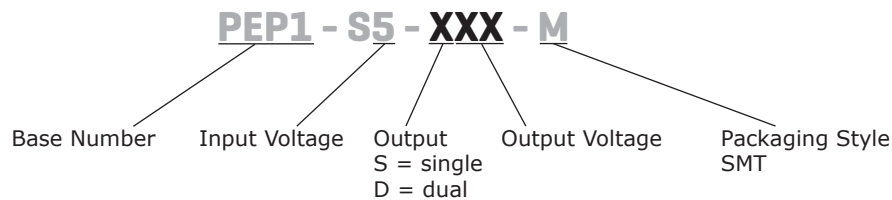
- 1W isolated output
- 3000 Vdc isolation
- compact SMD package
- continuous short circuit protection
- no-load input current as low as 5mA
- wide temperature range: -40°C to +105°C
- high efficiency up to 85%
- UL 62368 approved
- designed to meet EN/BS EN 62368



MODEL	input voltage		output voltage (Vdc)	output current		output power max (W)	output capacitance max (µF)	ripple and noise <sup>1</sup> max (mVp-p)	efficiency typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)				
PEP1-S5-D3-M	5	4.5~5.5	±3.3	±15	±151	1	1200	75	74
PEP1-S5-D5-M	5	4.5~5.5	±5	±10	±100	1	1200	75	82
PEP1-S5-D9-M	5	4.5~5.5	±9	±6	±56	1	470	75	83
PEP1-S5-D12-M	5	4.5~5.5	±12	±5	±42	1	220	75	83
PEP1-S5-D15-M	5	4.5~5.5	±15	±4	±34	1	220	75	83
PEP1-S5-D24-M	5	4.5~5.5	±24	±2	±21	1	100	100	85
PEP1-S5-S3-M	5	4.5~5.5	3.3	30	303	1	2400	75	74
PEP1-S5-S5-M	5	4.5~5.5	5	20	200	1	2400	75	82
PEP1-S5-S9-M	5	4.5~5.5	9	12	111	1	1000	75	83
PEP1-S5-S12-M	5	4.5~5.5	12	9	84	1	560	75	83
PEP1-S5-S15-M	5	4.5~5.5	15	7	67	1	560	75	83
PEP1-S5-S24-M	5	4.5~5.5	24	4	42	1	220	100	85

Notes: 1. Ripple & noise testing condition at nominal input voltage and 10%~100% load, 20 MHz bandwidth

**PART NUMBER KEY**



## INPUT

parameter	conditions/description	min	typ	max	units
input voltage		4.5	5	5.5	Vdc
surge voltage	5 Vdc input, for maximum of 1 second	-0.7		9	Vdc
filter	capacitance filter				
current	full load/no load				
	3.3/5 Vdc output		270/5	286/10	mA
	9/12 Vdc output		241/12	254/20	mA
	15/24 Vdc output		241/18	254/30	mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	Vin change $\pm 1\%$				
	3.3 Vdc output other outputs			1.5 1.2	%/% %/%
load regulation	10% ~ 100% load				
	3.3 Vdc output		15	20	%
	5 Vdc output		10	15	%
	9 Vdc output		8	10	%
	12 Vdc output		7	10	%
	15 Vdc output		6	10	%
	24 Vdc output		5	10	%
set-point accuracy	see regulation curve				
switching frequency	full load, nominal input		270		kHz
temperature coefficient	full load			$\pm 0.02$	%/°C

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	Continuous, self-recovery				

## SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input-output electric strength test for 1 minute	3000			Vdc
isolation resistance	input-output insulation at 500 Vdc	1000			MΩ
isolation capacitance	input-output capacitance at 100 KHz / 0.1 V		20		pF
safety approvals	certified to 62368: UL designed to meet 62368: EN/BS EN				
EMC	CISPR32/EN55032 Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2, Air ±8kV, Contact ±4kV, perf. Criteria B				
RoHS	yes				
MTBF	MIL-HDBK-217F @ 25°C	3500			kHours

## ENVIRONMENTAL

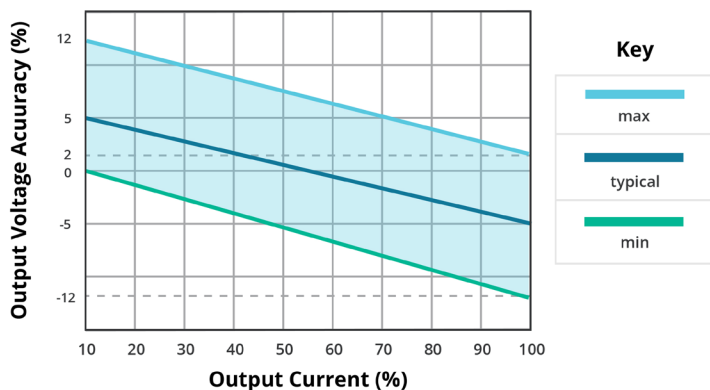
parameter	conditions/description	min	typ	max	units
operating temperature		-40		105	°C
storage temperature		-55		125	°C
humidity	non-condensing	5		95	%

## SOLDERABILITY

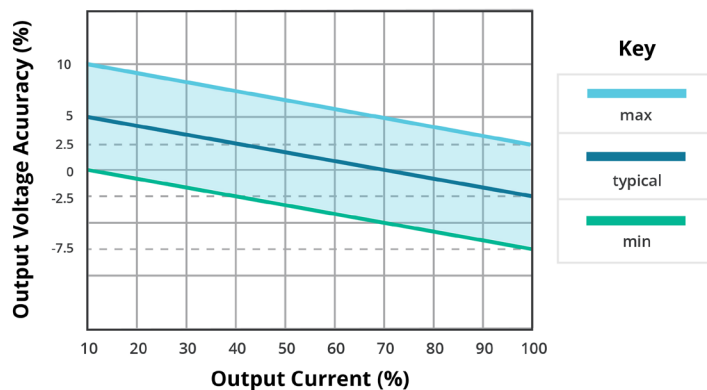
parameter	conditions/description	min	typ	max	units
reflow soldering	60 s max over 217°C			245	°C

## DERATING CURVE

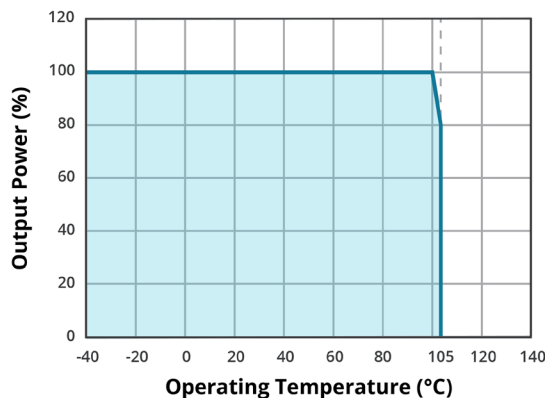
**OUTPUT REGULATION CURVE**  
3.3 Vdc output model  
(nominal input)



**OUTPUT REGULATION CURVE**  
all other output models  
(nominal input)



**TEMPERATURE DERATING CURVE**

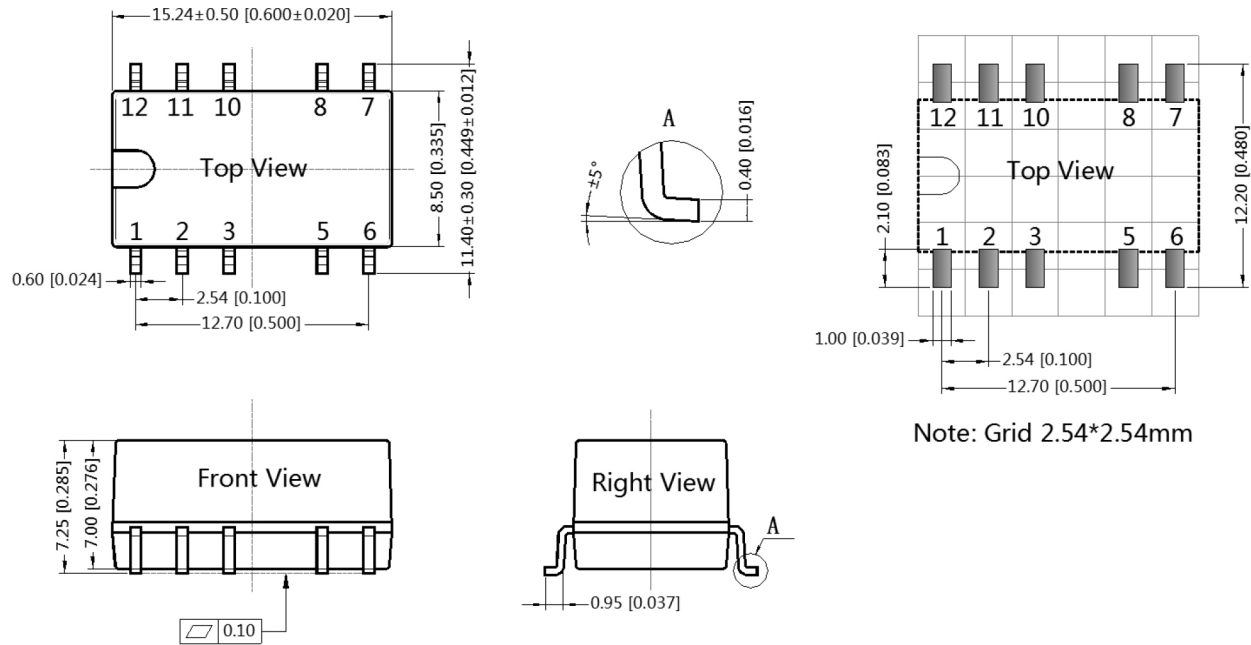


## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	15.24 x 11.40 x 7.25				mm
case material	Black plastic; flame-retardant and heat-resistant (UL94-V0)				
weight			1.3		g

## MECHANICAL DRAWING

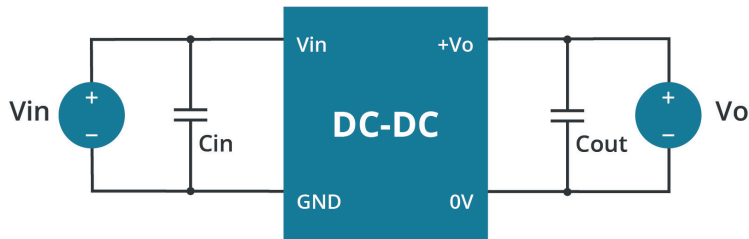
units: mm [inches]  
 tolerance:  $\pm 0.25$  [ $\pm 0.010$ ]



PIN CONNECTIONS		
PIN	Single	Dual
1	GND	GND
2	Vin	Vin
5	0V	0V
6	NC	-Vo
8	+Vo	+Vo
other	NC	NC

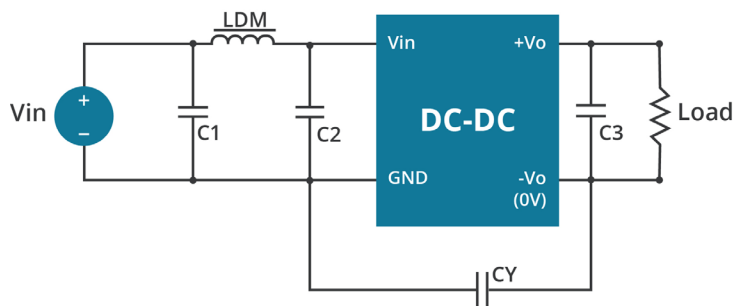
Note: NC pin to be isolated from other circuitry

## RECOMMENDED CIRCUITS



Parameter Description			
$V_{in}$ (Vdc)	$C_{in}$ ( $\mu F$ )	$V_o$ (Vdc)	$C_{out}$ ( $\mu F$ )
5	4.7	3.3/5	10
		9	4.7
		12	2.2
		15	1
		24	0.47

## EMC COMPLIANCE CIRCUITS



Recommended EMC Filter Values			
Output Voltage (Vdc)		3.3/5/9	12/15/24
EMI	C1/C2	47 $\mu F$ / 25V	47 $\mu F$ / 25V
	CY	- -	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA
	C3	refer to the $C_{out}$ in table 1	
	LDM	6.8 $\mu H$	6.8 $\mu H$

Note: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

## REVISION HISTORY

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rev.	description	date
1.0	initial release	03/28/2020
1.01	units updated in mechanical drawing section	01/20/2021
1.02	derating curves and circuit figures updated	07/06/2021
1.03	CE certification removed	11/07/2022

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



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