

**CUI INC**

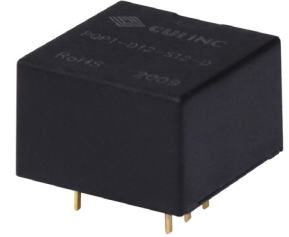
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date 06/30/2021

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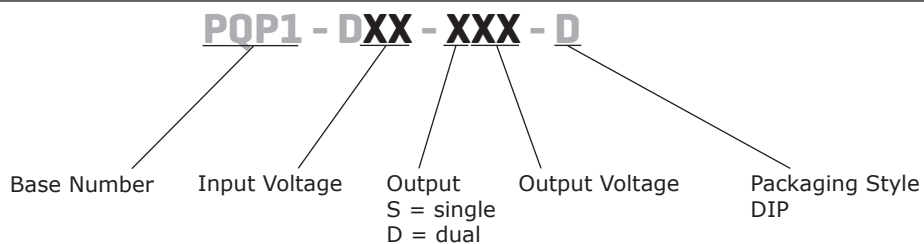
**SERIES: PQP1-D** | **DESCRIPTION: DC-DC CONVERTER****FEATURES**

- wide 2:1 input range
- single and Dual output options
- 1500 Vdc isolation
- industry standard pin-out
- ultra compact DIP package
- short circuit protection (continuous)
- wide operating temp: -40°C to +85°C
- supports negative output (dual output model)
- EN 62368 approved



MODEL	input voltage		output voltage	output current		output power	ripple and noise <sup>1</sup>	efficiency
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p)	typ (%)
PQP1-D12-S3-D	12	9~18	3.3	15	303	1	150	75
PQP1-D12-S5-D	12	9~18	5	10	200	1	150	77
PQP1-D12-S12-D	12	9~18	12	4	83	1	150	79
PQP1-D12-S15-D	12	9~18	15	3	67	1	150	80
PQP1-D12-S24-D	12	9~18	24	2	42	1	150	76
PQP1-D24-S3-D	24	18~36	3.3	15	303	1	100	75
PQP1-D24-S5-D	24	18~36	5	10	200	1	100	77
PQP1-D24-S12-D	24	18~36	12	4	83	1	100	78
PQP1-D24-S15-D	24	18~36	15	3	67	1	100	78
PQP1-D24-S24-D	24	18~36	24	2	42	1	100	77
PQP1-D12-D5-D	12	9~18	±5	±5	±100	1	150	77
PQP1-D12-D9-D	12	9~18	±9	±2.8	±56	1	150	80
PQP1-D12-D12-D	12	9~18	±12	±2.1	±42	1	150	80
PQP1-D12-D15-D	12	9~18	±15	±1.7	±33	1	150	77
PQP1-D24-D5-D	24	18~36	±5	±5	±100	1	100	77
PQP1-D24-D9-D	24	18~36	±9	±2.8	±56	1	100	77
PQP1-D24-D12-D	24	18~36	±12	±2.1	±42	1	100	77
PQP1-D24-D15-D	24	18~36	±15	±1.7	±33	1	100	77

Notes: 1. Ripple & noise testing condition at nominal input voltage and 5%-100% load, the "tip and barrel" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

**PART NUMBER KEY**

## INPUT

parameter	conditions/description	min	typ	max	units
input voltage	12 Vdc input models	9	12	18	Vdc
	24 Vdc input models	18	24	36	Vdc
start-up voltage	12 Vdc input models			9	Vdc
	24 Vdc input models			18	Vdc
surge voltage	for maximum of 1 second				
	12 Vdc input models	-0.7		25	Vdc
	24 Vdc input models	-0.7		50	Vdc
filter	capacitance filter				
current	full load/no load				
	12 Vdc input models		111/15	114/30	mA
	24 Vdc input models		55/6	57/10	mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	min to max Vin				
	positive output		±0.2	±0.5	%
	negative output		±0.5	±1	%
load regulation	5% ~ 100% load				
	positive output		±0.5	±1	%
	negative output			±2	%
set-point accuracy	5% ~ 100% load				
	positive outputs		±1	±3	%
	negative outputs		±3	±5	%
switching frequency	full load, nominal input		300		kHz
transient response	25% load step change		±3	±5	%
temperature coefficient	full load			±0.03	%/°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	1500			Vdc
isolation resistance	input-output insulation at 500 Vdc	1000			MΩ
isolation capacitance	input-output capacitance at 100 KHz / 0.1 V		100		pF
safety approvals	EN62368				
EMC	CISPR32/EN55032 Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2, Contact ±6K, perf. Criteria B				
radiated immunity	IEC/EN61000-4-3, 10 v/m, perf. Criteria A				
EFT/burst	IEC/EN61000-4-4, ±2KV, perf. Criteria B (see recommended circuit)				
surge	IEC/EN61000-4-5, line to line ±2KV, perf. Criteria B (see recommended circuit)				
conducted immunity	IEC/EN61000-4-6 3 Vrms, perf. Criteria A				
RoHS	yes				
MTBF	MIL-HDBK-217F @ 25°C	1000			kHours

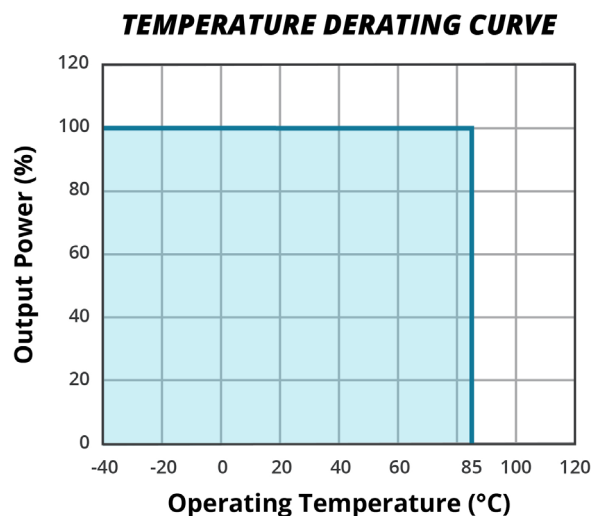
## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-55		125	°C
humidity	non-condensing	5		95	%

## SOLDERABILITY

parameter	conditions/description	min	typ	max	units
hand soldering	1.5 mm from case for 10 seconds			300	°C
reflow soldering	60 s max above 217°C			217	°C

## DERATING CURVE



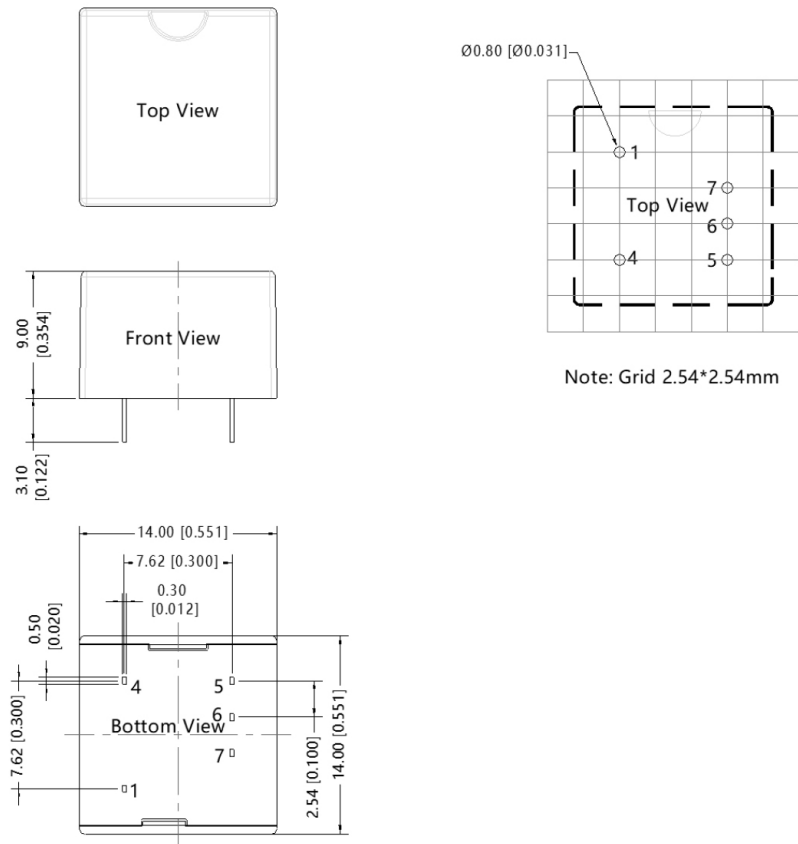
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	14 x 14 x 9				mm
case material	Black plastic; flame-retardant and heat-resistant				
weight			2.2		g

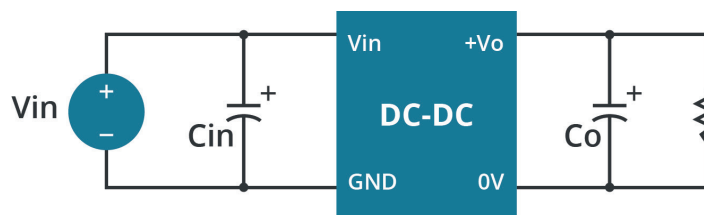
## MECHANICAL DRAWING

units: mm [inches]  
 tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

PIN CONNECTIONS		
PIN	Single	Dual
1	GND	GND
4	Vin	Vin
5	+Vo	+Vo
6	NC	0V
7	0V	-Vo

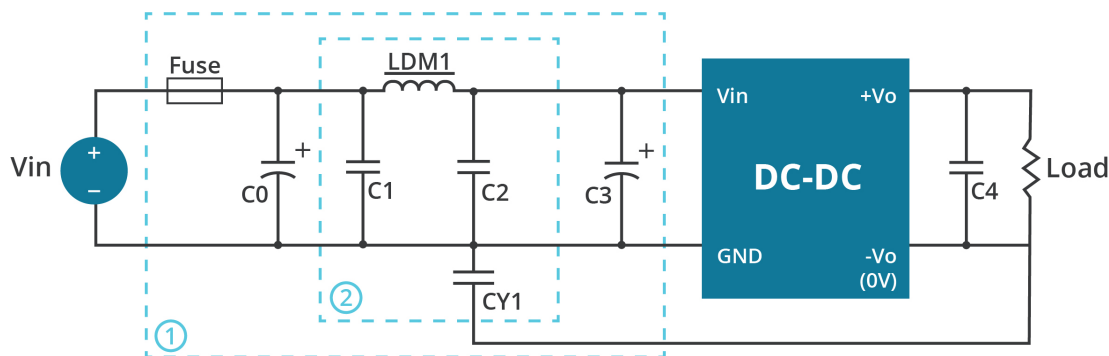


## RECOMMENDED CIRCUITS



Parameter Description		
Vin (Vdc)	12	24
Cin	47uF/25V	47uF/50V
Vo (Vdc)	3.3, 5	12, 15, 24
Cout	100uF/6.3V	27uF/35V

## EMC COMPLIANCE CIRCUITS



Parameter Description		
Part No.	Vin: 12 Vdc	Vin: 24 Vdc
FUSE	slow blow, choose according to actual input current	
C0	1000μF/25V	680μF/50V
C1	4.7μF/50V	
LDM1	15μH	
C2	4.7μF/50V	
C3	330μF/50V	
CY1	1nF/2KV	
C4	Refer to the Cout Fig.2	

## REVISION HISTORY

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rev.	description	date
1.0	initial release	03/28/2020
1.01	measurements updated	10/30/2020
1.02	derating curve and circuit figures updated	06/30/2021

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



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

CUI reserves the right to make changes to the product at any time without notice. Information provided by CUI is believed to be accurate and reliable. However, no responsibility is assumed by CUI for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

CUI products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.