

**CUI INC**

a bel group

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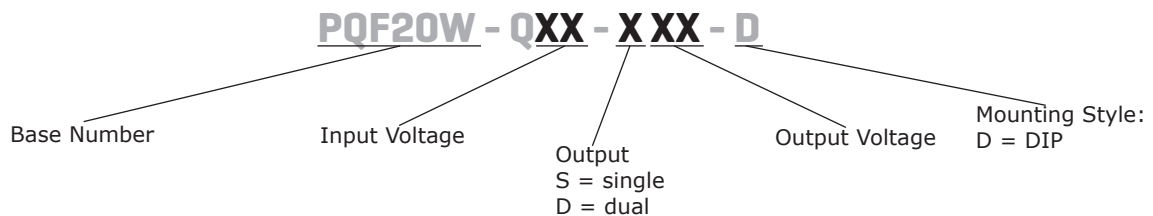
SERIES: PQF20W-D | **DESCRIPTION:** DC-DC CONVERTER**FEATURES**

- ultrawide 4:1 input range
- dual positive output with asymmetrical options
- 3000 Vdc isolation
- input under-voltage protection
- output short circuit and over current protection
- wide operating temp: -40°C to +105°C
- EN 62368 approved
- meets UL 62368 standards
- remote on/off

**MODEL**

MODEL	input voltage		output voltage	output current		output power	ripple & noise ¹	efficiency ²
	typ (Vdc)	range (Vdc)	Vo1/Vo2 (Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p) Vo1/Vo2	min/typ (%)
PQF20W-Q48-D55-D	48	18~75	5/5	0/0	2000/2000	20	100/100	82/84
PQF20W-Q48-D512-D	48	18~75	5/12	0/0	2000/833	20	100/100	82/84
PQF20W-Q48-D524-D	48	18~75	5/24	0/0	2000/417	20	100/100	82/84

Notes: 1. From 5~100% load, nominal input, 20 MHz bandwidth oscilloscope, with 10 μ F tantalum and 1 μ F ceramic capacitors on the output. From 0~5% load, ripple and noise is <5% Vo.
2. Measured at nominal input voltage and rated output load.

PART NUMBER KEY

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		18		80	Vdc
start-up voltage				18	Vdc
surge voltage	for maximum of 1 second	-0.7		100	Vdc
current	full load / no load		496/6	509/12	mA
filter	Pi filter				
CTRL	module on: CTRL open or pulled high (3.5~12 V) module off: CTRL pulled low to GND (0~1.2 V)				

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	output voltage				
	5 Vdc			2000	μF
	12 Vdc			680	μF
	24 Vdc			220	μF
voltage accuracy	Vo1/Vo2 5% to full load		±1/±3	±3/±5	%
	0%~5% load		±1/±3	±3/±5	%
line regulation	from low line to high line, full load				
	Vo1		±0.5	±1	%
	Vo2		±2	±3	%
load regulation	Vo1/Vo2 5% to full load		±0.5/±1.5	±1/±3	%
	0%~5% load		±3/±3	±4/±5	%
switching frequency	PWM mode		300		kHz
transient recovery time	25% load step change, nominal input voltage		300	500	μs
transient response deviation	25% load step change, nominal input voltage		±4	±8	%
temperature coefficient	at full load			±0.03	%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection		110		160	%Vo
over current protection		120		210	%
short circuit protection	output shutdown, auto recovery				
input under voltage protection		12	15		Vdc

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output	3000			Vdc
	output to output	1500			Vdc
	input/output to case	1500			Vdc
isolation resistance	input to output at 500 Vdc	1000			MΩ
isolation capacitance	input to output, 100 kHz / 0.1 V		2200		pF
safety approvals	EN/IEC 62368				
EMI/EMC	CISPR32/EN55032, Class A (without external components) / Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2, Contact ±4KV / perf. Criteria B				
radiated immunity	IEC/EN61000-4-3, 10V/m, perf. Criteria A				
EFT/burst	IEC/EN61000-4-4, ±2KV (see recommended circuit), perf. Criteria B				
surge	IEC/EN61000-4-5, line to line ±2KV (see recommended circuit), perf. Criteria B				
conducted immunity	IEC/EN61000-4-6, 3 Vr.m.s, perf. Criteria A				
MTBF	as per MIL-HDBK-217F, 25°C	1000			K hours
RoHS	yes				

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		105	°C
storage temperature		-55		125	°C
storage humidity	non-condensing	5		95	%
vibration	10-55Hz		2		G

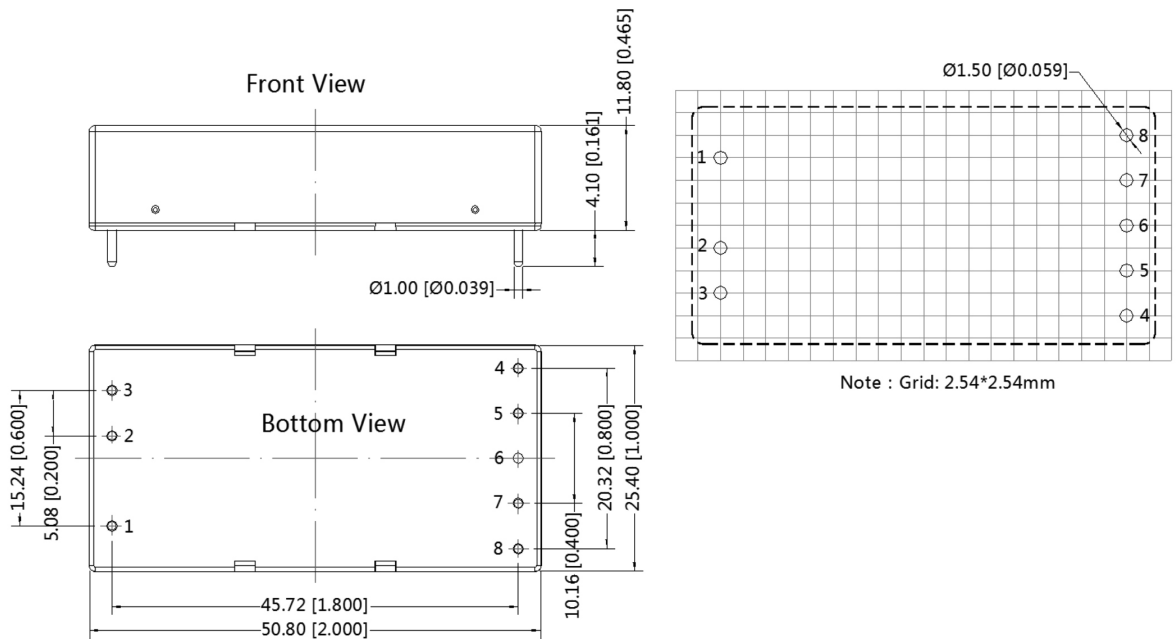
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	50.80 x 25.40 x 11.80 [2 x 1.000 x 0.464 inch]				mm
case material	aluminum alloy				
weight			28		g

MECHANICAL DRAWING

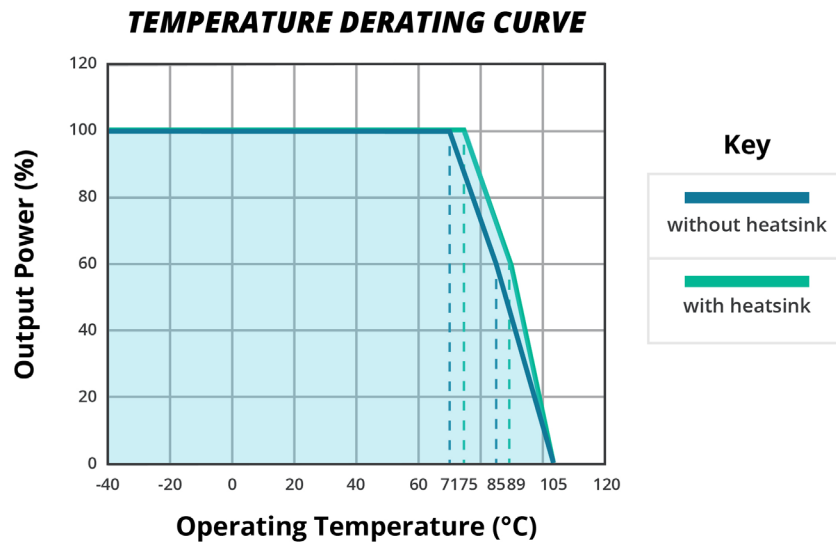
units: mm [inch]
 tolerance: ± 0.50 [± 0.020]
 pin diameter tolerance: ± 0.10 [± 0.004]

PIN Out	
PIN	Function
1	Ctrl
2	GND
3	Vin
4	+Vo2
5	0V2
6	no pin
7	0V1
8	+Vo1



DERATING CURVES

Figure 1



APPLICATION CIRCUIT

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.

Figure 2

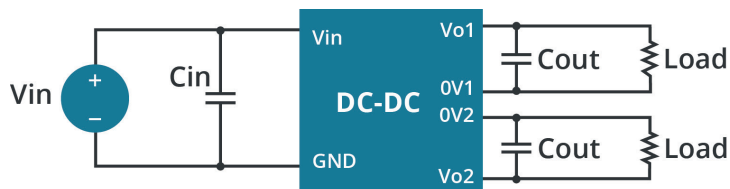


Table 1

Vout (Vdc)	Cin (μF)	Cout (μF)
5	100	100
12	100	22
24	100	22

EMC RECOMMENDED CIRCUIT

Figure 3

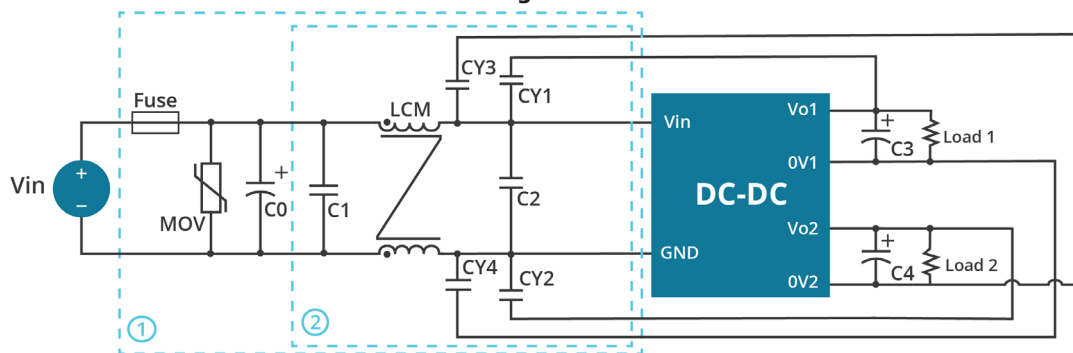


Table 2

Recommended External Circuit Components	
Model	Vin: 48V
FUSE	Choose according to actual input current
MOV	S14K60
C0	680μF/100V
C1, C2, C3, C4	Y1/102M/400 Vac
LCM	1mH (FL2D-30-102)
CY1, CY2, CY3, CY4	2.2nF/2000V

REVISION HISTORY

rev.	description	date
1.0	initial release	06/29/2020
1.02	derating curve and circuit figures updated	08/23/2021
1.03	EMI/EMC information updated	09/09/2021
1.04	EMC circuit & table 2 updated	04/06/2022
1.05	EMC circuit updated	01/11/2023

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.