

SERIES: PQP3-M | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

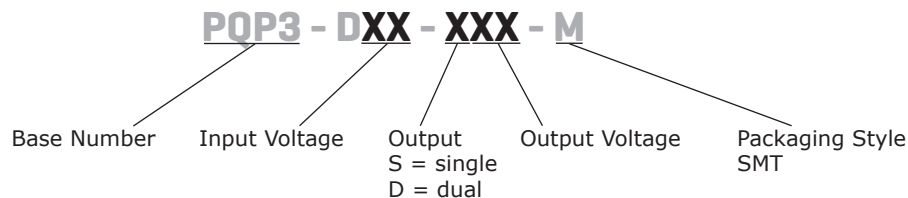
- wide 2:1 input range
- single & dual output options
- 1500 Vdc isolation
- industry standard pin-out
- ultra compact SMD package
- short circuit protection (continuous)
- wide operating temp: -40°C to +85°C
- supports negative output (dual output model)
- EN62368 approved



MODEL	input voltage		output voltage	output current		output power	ripple and noise ¹	efficiency
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p)	typ (%)
PQP3-D12-S3-M	12	9~18	3.3	38	758	2.5	100	75
PQP3-D12-S5-M	12	9~18	5	30	600	3	100	79
PQP3-D12-S12-M	12	9~18	12	13	250	3	100	82
PQP3-D12-S15-M	12	9~18	15	10	200	3	100	83
PQP3-D12-S24-M	12	9~18	24	6	125	3	100	81
PQP3-D24-S3-M	24	18~36	3.3	38	758	2.5	100	74
PQP3-D24-S5-M	24	18~36	5	30	600	3	100	81
PQP3-D24-S12-M	24	18~36	12	13	250	3	100	83
PQP3-D24-S15-M	24	18~36	15	10	200	3	100	83
PQP3-D24-S24-M	24	18~36	24	6	125	3	100	83
PQP3-D12-D5-M	12	9~18	±5	±15	±300	3	100	78
PQP3-D12-D9-M	12	9~18	±9	±9	±167	3	100	78
PQP3-D12-D12-M	12	9~18	±12	±7	±125	3	100	79
PQP3-D12-D15-M	12	9~18	±15	±5	±100	3	100	79
PQP3-D24-D5-M	24	18~36	±5	±15	±300	3	100	78
PQP3-D24-D9-M	24	18~36	±9	±9	±167	3	100	80
PQP3-D24-D12-M	24	18~36	±12	±7	±125	3	100	82
PQP3-D24-D15-M	24	18~36	±15	±5	±100	3	100	81

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	12 Vdc input models		321/30	338/50	mA
	24 Vdc input models		156/20	165/40	mA

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	min to max Vin		±0.2	±0.5	%
load regulation	5% ~ 100% load		±0.5	±1	%
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		±2.5	±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	CISPR32/EN55032				
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				
RoHS	yes				
MTBF	MIL-HDBK-217F @ 25°C	1000			kHours

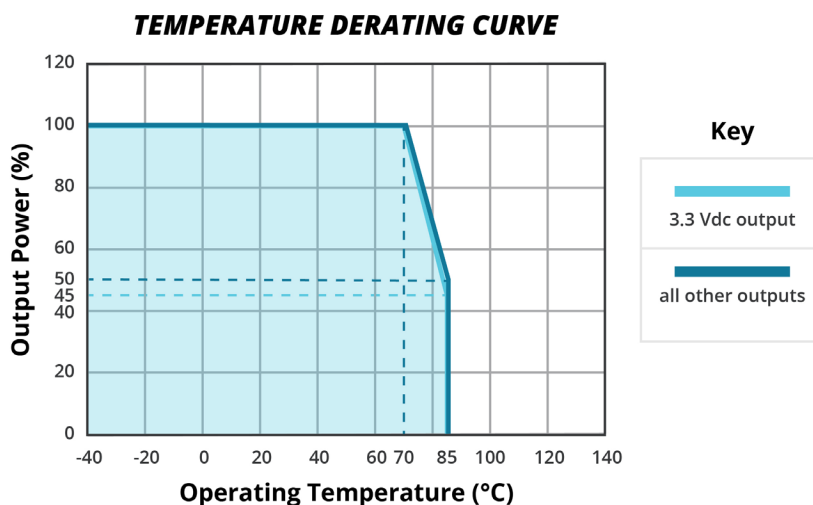
ENVIRONMENTAL

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			245	°C

DERATING CURVE



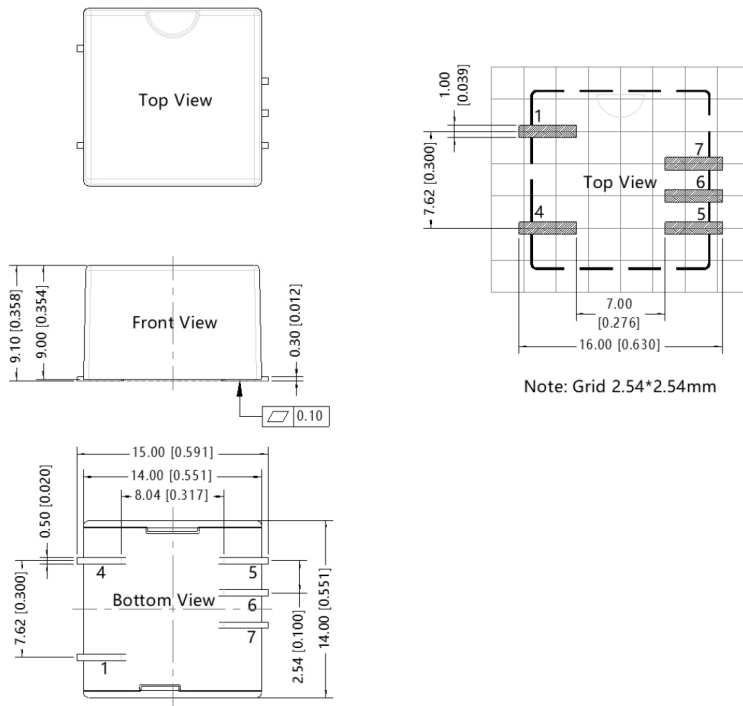
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	14 x 14 x 9				mm
case material	Black plastic; flame-retardant and heat-resistant (UL94-V0)				
weight			2.2		g

MECHANICAL DRAWING

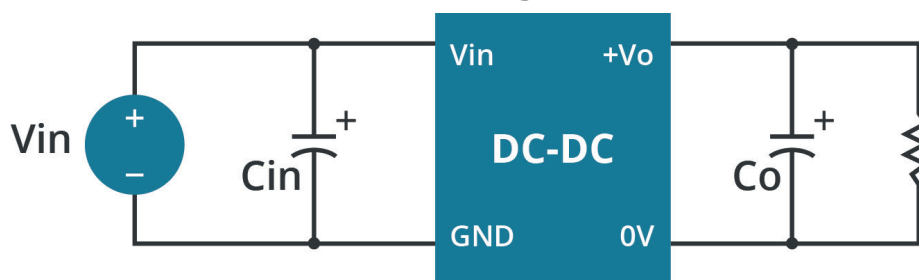
units: mm [inches]
 pin diameter tolerance: ± 0.10 [± 0.004]
 tolerance: ± 0.50 [± 0.020]

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



RECOMMENDED CIRCUITS

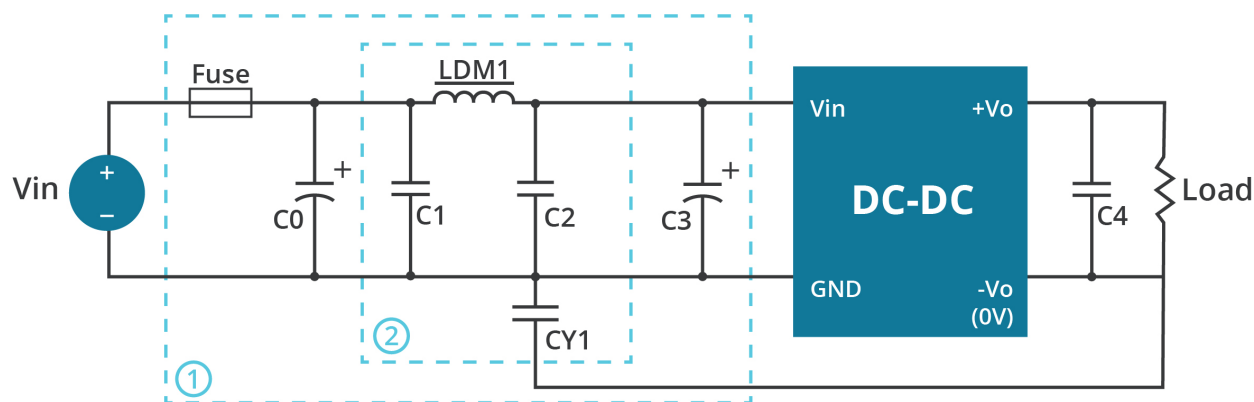
Figure 1



Parameter Description		
V_{in} (Vdc)	12	24
C_{in}	47 μ F/25V	47 μ F/50V
V_o (Vdc)	3.3, 5	12, 15, 24
C_o	100 μ F/6.3V	27 μ F/35V

EMC COMPLIANCE CIRCUITS

Figure 2



Parameter Description										
Part No.	V_{in} : 12 Vdc					V_{in} : 24 Vdc				
V_o (Vdc)	3.3	5	12	15	24	3.3	5	12	15	24
FUSE	slow blow, choose according to actual input current									
C_0	1000 μ F/25V					680 μ F/50V				
C_1	10 μ F/50V		4.7 μ F/50V			10 μ F/50V		4.7 μ F/50V		
LDM1	15 μ H									
C_2	4.7 μ F/50V									
C_3	330 μ F/50V									
CY_1	1nF/2KV									
C_4	Refer to the Cout Fig.2									

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

rev.	description	date
1.0	initial release	03/28/2020
1.01	tolerance update to page 4	06/09/2020
1.02	derating curve and circuit figures updated	07/15/2021

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



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