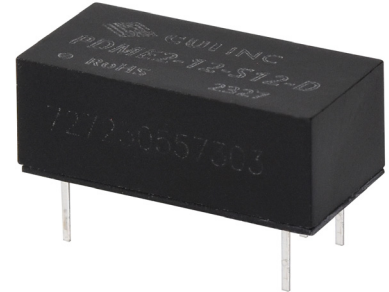


SERIES: PDME2-D | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- 2 W isolated output
- single/dual unregulated outputs
- 1500 Vdc isolation
- continuous short circuit protection
- extended temperature range (-40~105°C)
- no-load input current as low as 8mA
- efficiency up to 88%
- designed to meet UL/EN/BS EN 62368


MODEL

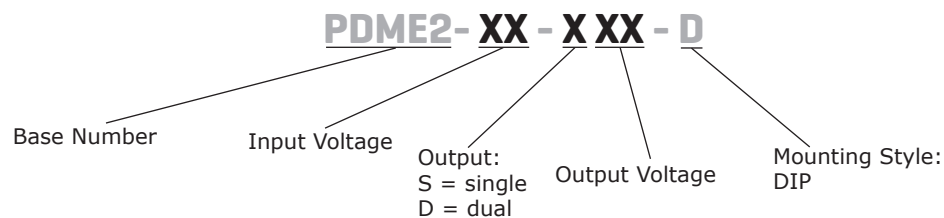
MODEL	input voltage		output voltage	output current		output power max (W)	ripple & noise ¹ max (mVp-p)	efficiency ² typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)			
PDME2-3-S3-D	3.3	2.97~3.63	3.3	40	400	1.3	200	78
PDME2-3-S5-D	3.3	2.97~3.63	5	40	400	2	200	78
PDME2-5-D3-D	5	4.5~5.5	±3.3	±30	±303	2	200	78
PDME2-5-D5-D	5	4.5~5.5	±5	±20	±200	2	200	84
PDME2-5-D7-D	5	4.5~5.5	±7	±14	±143	2	200	84
PDME2-5-D9-D	5	4.5~5.5	±9	±11	±111	2	200	85
PDME2-5-D12-D	5	4.5~5.5	±12	±8	±83	2	200	85
PDME2-5-D15-D	5	4.5~5.5	±15	±7	±67	2	200	86
PDME2-5-D24-D	5	4.5~5.5	±24	±4	±42	2	200	86
PDME2-5-S3-D	5	4.5~5.5	3.3	40	400	2	200	78
PDME2-5-S5-D	5	4.5~5.5	5	40	400	2	200	84
PDME2-5-S9-D	5	4.5~5.5	9	22	222	2	200	85
PDME2-5-S12-D	5	4.5~5.5	12	17	167	2	200	85
PDME2-5-S15-D	5	4.5~5.5	15	13	133	2	200	86
PDME2-5-S24-D	5	4.5~5.5	24	8	83	2	200	86
PDME2-12-D5-D	12	10.8~13.2	±5	±20	±200	2	180	80
PDME2-12-D9-D	12	10.8~13.2	±9	±11	±111	2	180	82
PDME2-12-D12-D	12	10.8~13.2	±12	±8	±83	2	180	83
PDME2-12-D15-D	12	10.8~13.2	±15	±7	±67	2	180	83
PDME2-12-D24-D	12	10.8~13.2	±24	±4	±42	2	200	85
PDME2-12-S5-D	12	10.8~13.2	5	40	400	2	180	82
PDME2-12-S9-D	12	10.8~13.2	9	23	222	2	180	82
PDME2-12-S12-D	12	10.8~13.2	12	17	167	2	180	84
PDME2-12-S15-D	12	10.8~13.2	15	13	133	2	180	85
PDME2-12-S24-D	12	10.8~13.2	24	8	83	2	200	86
PDME2-15-D15-D	15	13.5~16.5	±15	±7	±67	2	180	81
PDME2-15-S5-D	15	13.5~16.5	5	40	400	2	180	79

MODEL (CONTINUED)

	input voltage		output voltage	output current		output power	ripple & noise¹	efficiency²
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p)	typ (%)
PDME2-15-S9-D	15	13.5~16.5	9	23	222	2	180	82
PDME2-15-S15-D	15	13.5~16.5	15	13	133	2	180	79
PDME2-24-D5-D	24	21.6~26.4	±5	±20	±200	2	180	80
PDME2-24-D9-D	24	21.6~26.4	±9	±11	±111	2	180	81
PDME2-24-D12-D	24	21.6~26.4	±12	±8	±83	2	180	83
PDME2-24-D15-D	24	21.6~26.4	±15	±7	±67	2	180	83
PDME2-24-D24-D	24	21.6~26.4	±24	±4	±42	2	200	83
PDME2-24-S5-D	24	21.6~26.4	5	40	400	2	180	82
PDME2-24-S9-D	24	21.6~26.4	9	23	222	2	180	82
PDME2-24-S12-D	24	21.6~26.4	12	17	167	2	180	86
PDME2-24-S15-D	24	21.6~26.4	15	13	133	2	180	88
PDME2-24-S24-D	24	21.6~26.4	24	8	83	2	200	88

Notes:

1. Measured at nominal input, 20 MHz bandwidth oscilloscope.
2. Measured at nominal input voltage, full load.
3. All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated output load unless otherwise specified.

PART NUMBER KEY

INPUT

parameter	conditions/description		min	typ	max	units
operating input voltage	3.3 Vdc input models		2.97	3.3	3.63	Vdc
	5 Vdc input models		4.5	5	5.5	Vdc
	12 Vdc input models		10.8	12	13.2	Vdc
	15 Vdc input models		13.5	15	16.5	Vdc
	24 Vdc input models		21.6	24	26.4	Vdc
surge voltage	for maximum of 1 second					
	3.3 Vdc input models		-0.7		5	Vdc
	5 Vdc input models		-0.7		9	Vdc
	12 Vdc input models		-0.7		18	Vdc
	15 Vdc input models		-0.7		21	Vdc
	24 Vdc input models		-0.7		30	Vdc
current (full load/no load)	3.3 Vdc input models	3.3 Vdc output		513/12	541/-	mA
		5 Vdc output		778/12	820/-	mA
	5 Vdc input models	3.3 Vdc output		513/8	541/-	mA
		5 & 7 Vdc output		477/8	500/-	mA
		9 & 12 Vdc output		471/8	494/-	mA
		15 & 24 Vdc output		466/8	488/-	mA
	12 Vdc input models			209/8	220/-	mA
	15 Vdc input models			169/8	178/-	mA
	24 Vdc input models			105/8	113/-	mA
filter	filter capacitor					

OUTPUT

parameter	conditions/description		min	typ	max	units
maximum capacitive load ⁴	3.3 Vdc input model	3.3, 5 Vdc output models			2,400	μF
		3.3, 5 Vdc output models			2,400	μF
	5 Vdc input model	±3.3, ±5 Vdc output models			1,200	μF
		9 Vdc output models			1,000	μF
		12, 15 Vdc output models			560	μF
		24, ±12, ±15 Vdc output models			220	μF
		±7, ±9 Vdc output models			470	μF
		±24 Vdc output models			100	μF
	12, 15, 24 Vdc input model	5 Vdc output models			2,400	μF
		±5 Vdc output models			1,200	μF
		9 Vdc output models			1,000	μF
		12, 15 Vdc output models			560	μF
		±9 Vdc output models			500	μF
		±12, ±15 Vdc output models			280	μF
		24 Vdc output models			220	μF
line regulation ⁵	3.3, 5 Vdc input model	3.3 Vdc output models			±1.5	%
		all other output models			±1.2	%
	12, 15, 24 Vdc input model				±1.2	%
load regulation ⁶	3.3 Vdc input model	3.3 Vdc output models		15	20	%
		5 Vdc output models		20	25	%
	5 Vdc input model	3.3 Vdc output models		12	20	%
		5, 7 Vdc output models		9	15	%
		9, 12, 15 Vdc output models		7	10	%
		24 Vdc output models		5	10	%
	12, 15, 24 Vdc input model	5 Vdc output models		7	15	%
		9 Vdc output models		5	10	%
		12 Vdc output models		5	10	%
		15 Vdc output models		4	10	%
		24 Vdc output models		3	10	%

OUTPUT

parameter	conditions/description	min	typ	max	units
switching frequency	100% load, nominal input voltage		220		kHz
	3.3, 5 Vdc input models		260		kHz
	all other input models				
temperature coefficient	at full load		±0.02		%/°C

Note: 4. The specified maximum capacitive load for positive and negative output is identical.
5. For Vin change of 1%.
6. From 10% to full load.

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, auto recovery				

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute at 1 mA	1,500			Vdc
isolation resistance	input to output at 500 Vdc	1,000			MΩ
isolation capacitance	input to output, 100 kHz / 0.1 V		20		pF
conducted emissions	CISPR32/EN55032 CLASS B (see recommended circuit)				
radiated emissions	CISPR32/EN55032 CLASS B (see recommended circuit)				
ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B				
radiated immunity	CISPR32/EN55032 CLASS B				
MTBF	as per MIL-HDBK-217F, 25°C	3,500,000			hours
RoHS	yes				

ENVIRONMENTAL

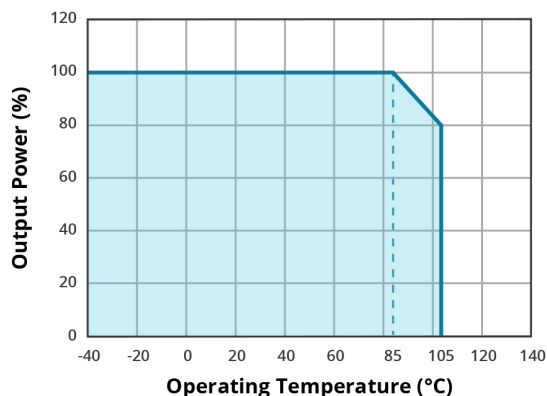
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-40		105	°C
storage temperature		-55		125	°C
storage humidity	non-condensing	5		95	%
case temperature rise	at 25°C		25		°C
vibration	10-150Hz, 5G, 0.75mm. along X, Y and Z				

SOLDERING

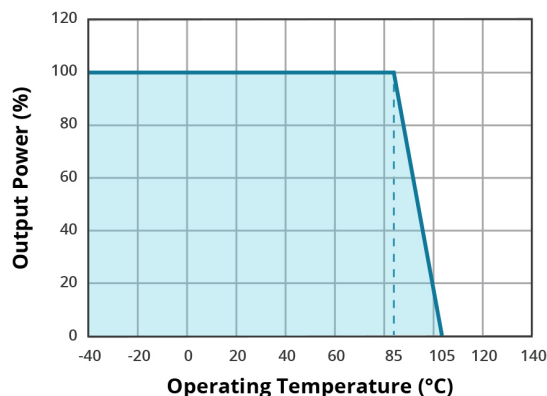
parameter	conditions/description	min	typ	max	units
pin soldering resistance	soldering spot is 1.5mm away from case for 10 seconds			300	°C

DERATING CURVES

TEMPERATURE DERATING CURVE
3.3 & 5 Vdc input models

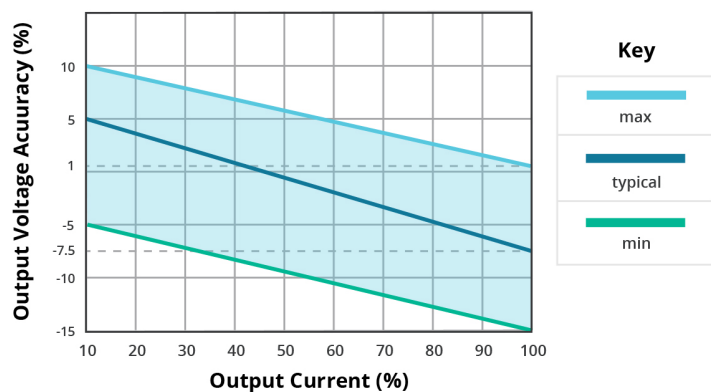


TEMPERATURE DERATING CURVE
12, 15 & 24 Vdc input models

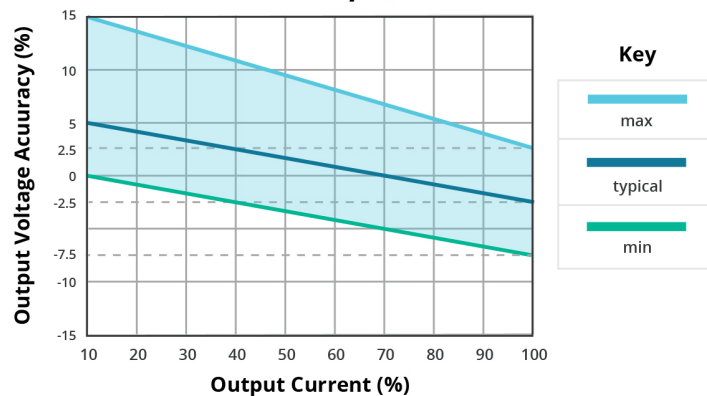


DERATING CURVES (CONTINUED)

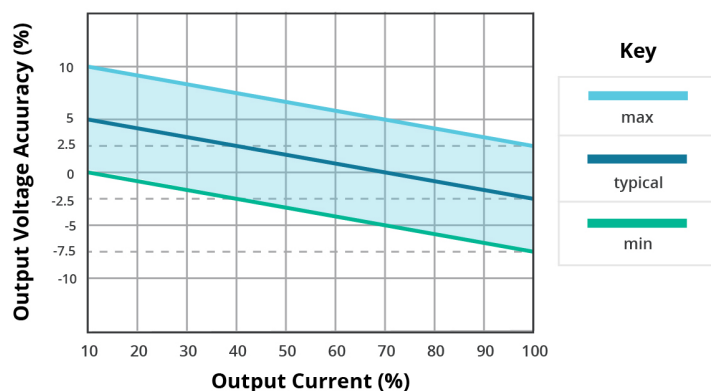
OUTPUT REGULATION CURVE
3.3 & 5 Vdc input / 3.3 Vdc output
(nominal input)



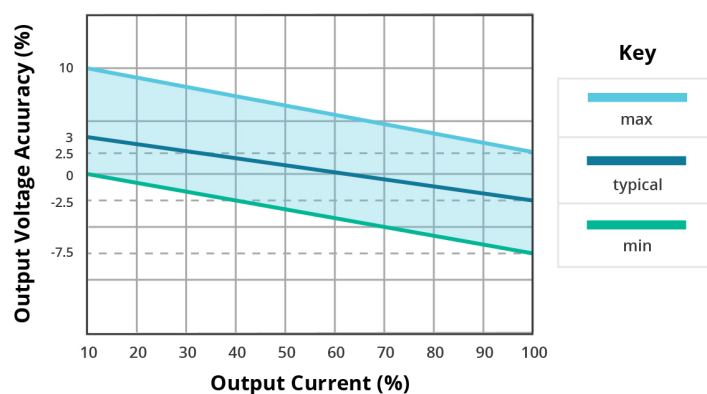
OUTPUT REGULATION CURVE
3.3 input / 5 Vdc output
(nominal input)



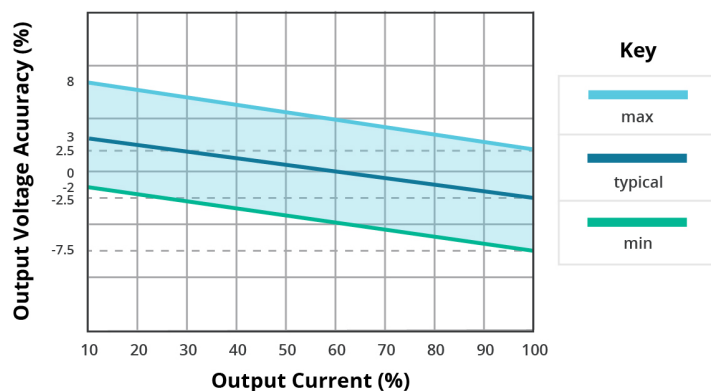
OUTPUT REGULATION CURVE
5 Vdc input / all other outputs
(nominal input)



OUTPUT REGULATION CURVE
12, 15, 24 Vdc input / 5 Vdc output
(nominal input)

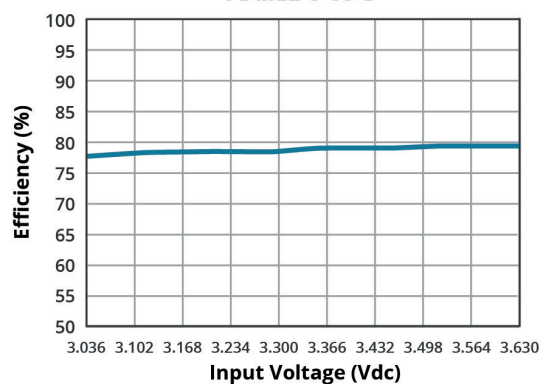


OUTPUT REGULATION CURVE
12, 15, 24 Vdc input / all other outputs
(nominal input)

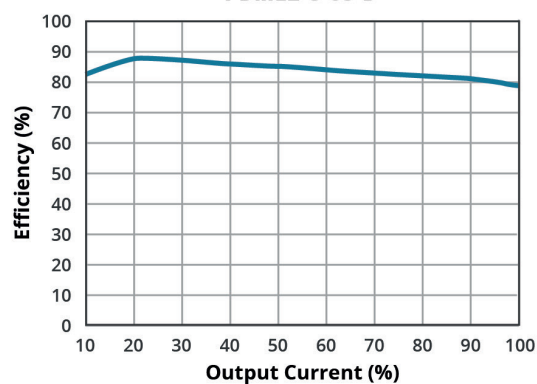


EFFICIENCY CURVES

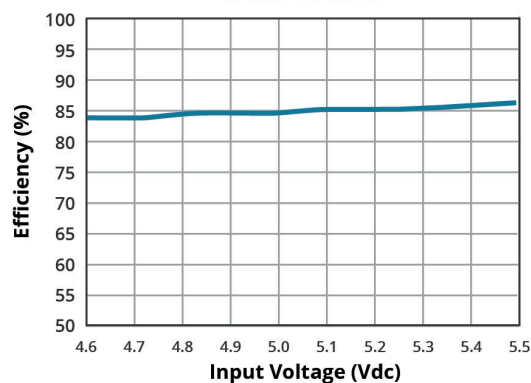
EFFICIENCY VS INPUT VOLTAGE
(full load)
PDME2-3-S5-D



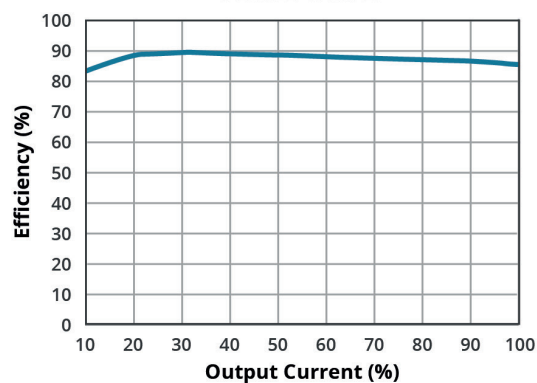
EFFICIENCY VS OUTPUT LOAD
($V_{in} = 3.3\text{ V}$)
PDME2-3-S5-D



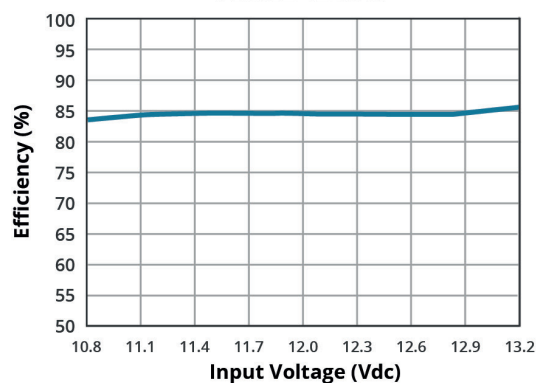
EFFICIENCY VS INPUT VOLTAGE
(full load)
PDME2-5-D5-D



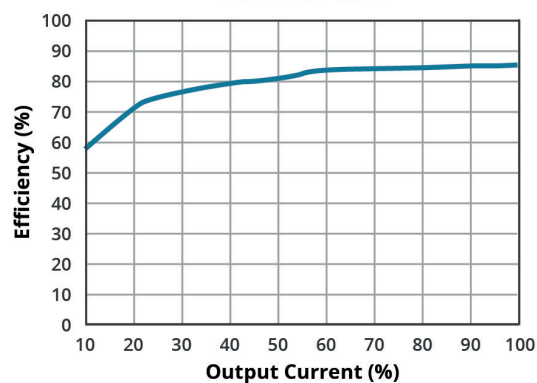
EFFICIENCY VS OUTPUT LOAD
($V_{in} = 5\text{ V}$)
PDME2-5-D5-D



EFFICIENCY VS INPUT VOLTAGE
(full load)
PDME2-12-S5-D

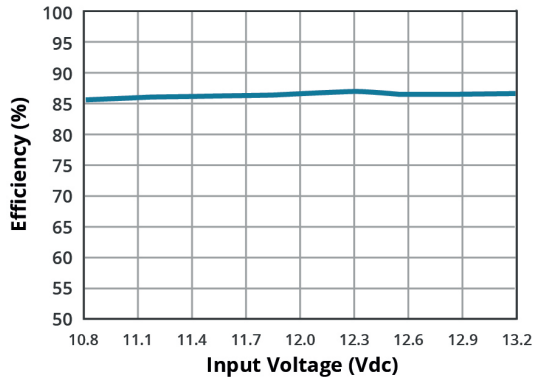


EFFICIENCY VS OUTPUT LOAD
($V_{in} = 12\text{ V}$)
PDME2-12-S5-D

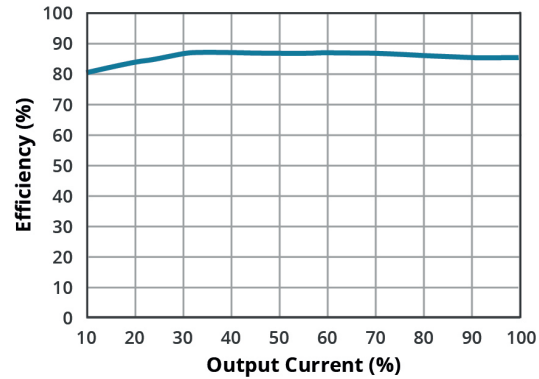


EFFICIENCY CURVES (CONTINUED)

EFFICIENCY VS INPUT VOLTAGE
(full load)
PDME2-12-S5-D



EFFICIENCY VS OUTPUT LOAD
($V_{in} = 12\text{ V}$)
PDME2-12-S5-D



MECHANICAL

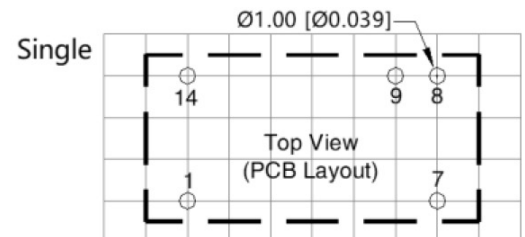
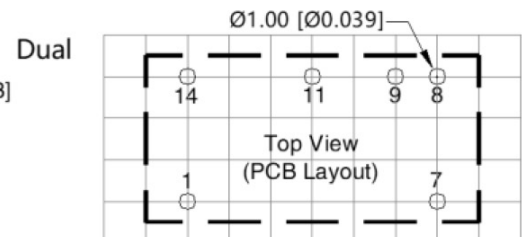
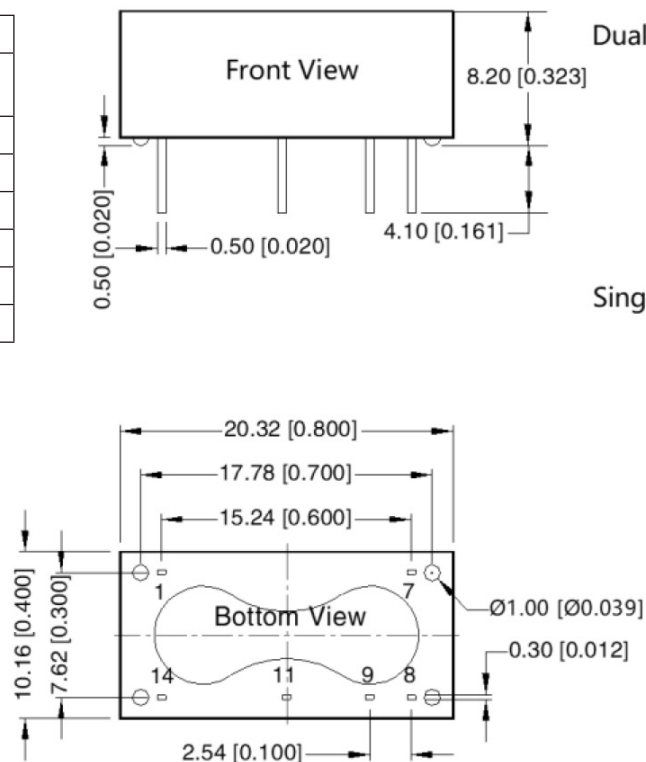
parameter	conditions/description	min	typ	max	units
dimensions	20.32 x 10.16 x 8.20 [0.800 x 0.400 x 0.323 inch]				mm
case material	black flame-retardant and heat-resistant plastic (UL94V-0)				
weight			2.4		g

MECHANICAL DRAWING

units: mm [inch]

tolerance: ± 0.25 [± 0.010]pin section tolerance: ± 0.10 [± 0.004]

PIN CONNECTIONS		
PIN	Function Single output	Function Dual output
1	GND	GND
7	NC	NC
8	0V	0V
9	+Vo	+Vo
11	no pin	-Vo
14	Vin	Vin



Note: Grid 2.54*2.54mm

APPLICATION CIRCUIT

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig 1 & 2. Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1 & 2.

Figure 1
Single Output Models

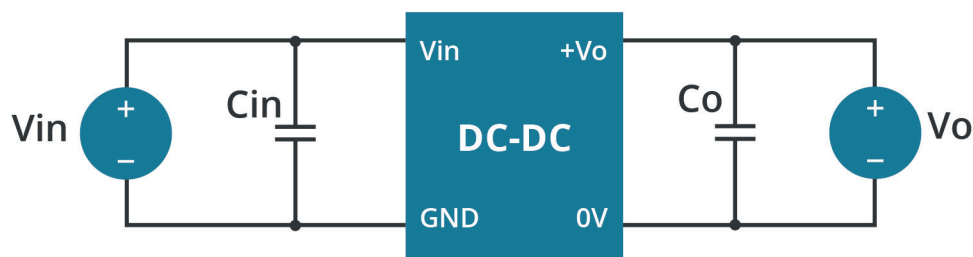


Table 1

Vin (Vdc)	Cin (μF / V)	Vo (Vdc)	Co (μF / V)
3.3	10 / 16	3.3	10 / 16
--	--	5	10 / 16
5	4.7 / 16	3.3	10 / 16
--	--	5	10 / 16
--	--	9	2.2 / 16
--	--	12	2.2 / 25
		15	2.2 / 25
--	--	24	1 / 50
12	2.2 / 25	5	10 / 16
15	2.2 / 25	9	2.2 / 25
24	1 / 50	12	2.2 / 25
--	--	15	2.2 / 25
--	--	24	1 / 50

Figure 2
Dual Output Models

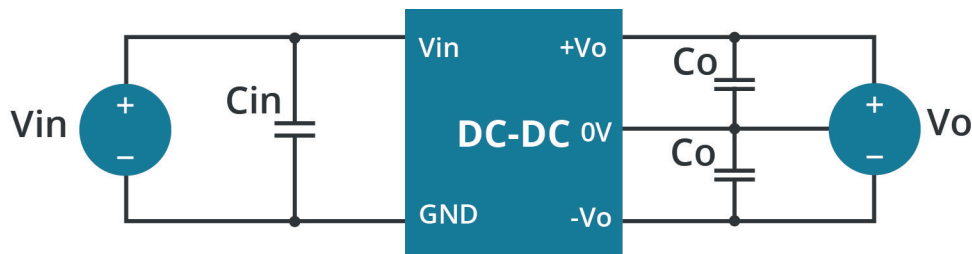


Table 2

Vin (Vdc)	Cin (μF / V)	Vo (Vdc)	Co ⁶ (μF / V)
5	4.7 / 16	±3.3	4.7 / 16
--	--	±5	4.7 / 16
		±7	4.7 / 16
--	--	±9	1 / 16
--	--	±12	1 / 25
--	--	±15	1 / 25
--	--	±24	0.47 / 50
12	2.2 / 25	±5	4.7 / 16
15	2.2 / 25	±9	4.7 / 16
24	1 / 50	±12	1 / 25
--	--	±15	1 / 25
--	--	±24	0.47 / 50

Note: 7. The capacitor value of the positive and the negative output is identical.

EMC RECOMMENDED CIRCUIT

Figure 3
Single Output Models

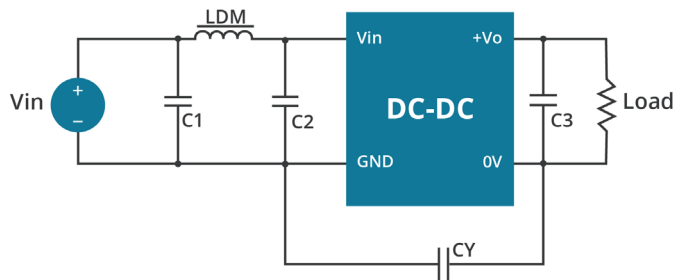


Figure 4
Dual Output Models

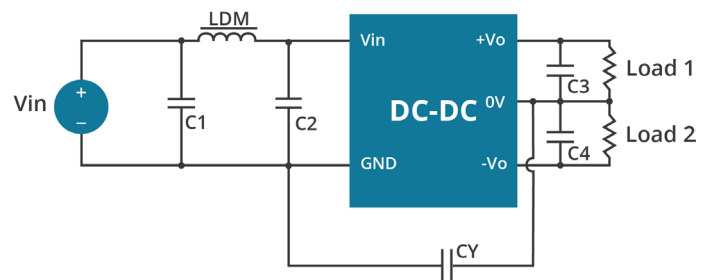


Table 3

Recommended External Circuit Components			
Vin (Vdc)	3.3	5	12, 15, 24
C1 / C2	4.7 μ F / 16 V	4.7 μ F / 16 V	4.7 μ F / 50 V
CY	270 pF / 2 kV	270 pF / 2 kV	270 pF / 2 kV
C3 / C4	refer to the Co in Tables 1, 2		
LDM	6.8 μ H	6.8 μ H	6.8 μ H

REVISION HISTORY

rev.	description	date
1.0	initial release	09/05/2023

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



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