SERIES: DDP1-D | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

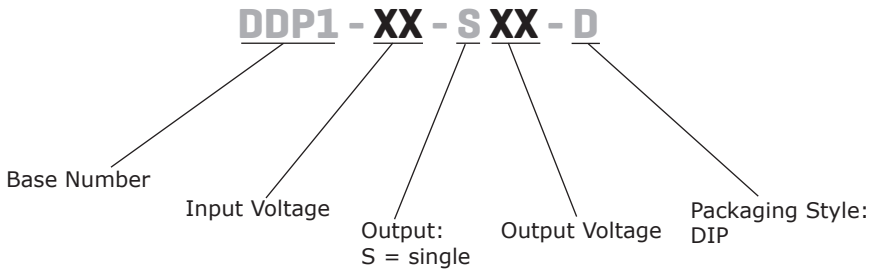
- 1 W isolated output
- industry standard DIP package
- single regulated output
- 1,500 Vdc isolation voltage
- certified to EN 62368-1
- -40 to 105°C temperature range with derating

RoHS CE UKCA

MODEL	input voltage		output voltage	output current		output power	ripple & noise[1]	efficiency
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	max (mVp-p)	typ (%)
DDP1-3-S3-D	3.3	2.97~3.63	3.3	30	303	1	120	82
DDP1-3-S5-D	3.3	2.97~3.63	5	20	200	1	120	83
DDP1-3-S9-D	3.3	2.97~3.63	9	11	111	1	120	84
DDP1-3-S12-D	3.3	2.97~3.63	12	8	84	1	120	85
DDP1-3-S15-D	3.3	2.97~3.63	15	7	67	1	120	85
DDP1-3-S24-D	3.3	2.97~3.63	24	4	42	1	120	85
DDP1-5-S3-D[2]	5	4.5~5.5	3.3	30	303	1	120	80
DDP1-5-S5-D[2]	5	4.5~5.5	5	20	200	1	120	84
DDP1-5-S9-D[2]	5	4.5~5.5	9	11	111	1	120	86
DDP1-5-S12-D[2]	5	4.5~5.5	12	8	84	1	120	89
DDP1-5-S15-D[2]	5	4.5~5.5	15	7	67	1	120	88
DDP1-5-S24-D[2]	5	4.5~5.5	24	4	42	1	120	88
DDP1-12-S3-D	12	10.8~13.2	3.3	30	303	1	120	83
DDP1-12-S5-D	12	10.8~13.2	5	20	200	1	120	86
DDP1-12-S9-D	12	10.8~13.2	9	11	111	1	120	89
DDP1-12-S12-D	12	10.8~13.2	12	8	84	1	120	89
DDP1-12-S15-D	12	10.8~13.2	15	7	67	1	120	89
DDP1-12-S24-D	12	10.8~13.2	24	4	42	1	120	89
DDP1-15-S3-D	15	13.5~16.5	3.3	30	303	1	120	82
DDP1-15-S5-D	15	13.5~16.5	5	20	200	1	120	85
DDP1-15-S9-D	15	13.5~16.5	9	11	111	1	120	88
DDP1-15-S12-D	15	13.5~16.5	12	8	84	1	120	89
DDP1-15-S15-D	15	13.5~16.5	15	7	67	1	120	89
DDP1-15-S24-D	15	13.5~16.5	24	4	42	1	120	89
DDP1-24-S3-D	24	21.6~26.4	3.3	30	303	1	120	84
DDP1-24-S5-D	24	21.6~26.4	5	20	200	1	120	87
DDP1-24-S9-D	24	21.6~26.4	9	11	111	1	120	89
DDP1-24-S12-D	24	21.6~26.4	12	8	84	1	120	88
DDP1-24-S15-D	24	21.6~26.4	15	7	67	1	120	89
DDP1-24-S24-D	24	21.6~26.4	24	4	42	1	120	89

Notes:
1. At full load, nominal input, 20 MHz bandwidth oscilloscope.
2. Model is UL certified
3. All specifications are measured at TA=25°C, nominal input voltage and rated output current unless otherwise specified

PART NUMBER KEY



INPUT

parameter	conditions/description		min	typ	max	units
input current (full load/no load)	3.3 Vdc input models	3.3 Vdc output all other outputs		370/10 356/12	388/15 365/18	mA mA
	5 Vdc input models	3.3 Vdc output 5 Vdc output 9, 12 Vdc output all other outputs		250/8 238/8 232/10 224/18	260/15 250/15 240/15 236/25	mA mA mA mA
	12 Vdc input models	3.3 Vdc output all other outputs		101/7 94/8	105/15 99/15	mA mA
	15 Vdc input models	3.3 Vdc output all other outputs		82/6 75/6	85/15 79/15	mA mA
	24 Vdc input models	3.3 Vdc output all other outputs		50/3 48/4	53/15 50/15	mA mA
filter	capacitance filter					
surge	3.3 Vdc input models 5 Vdc input models 12 Vdc input models 15 Vdc input models 24 Vdc input models		-0.7 -0.7 -0.7 -0.7 -0.7		5 9 18 21 30	Vdc Vdc Vdc Vdc Vdc
reflected ripple current				15		mA

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	3.3, 5 Vdc output models 9 Vdc output models 12 & 15 Vdc output models 24 Vdc output models			2,400 1,000 560 220	µF µF µF µF
voltage accuracy	see derating curves				
line regulation	3.3 Vdc output models all other output models		±1.5 ±1.2		% %
load regulation	measured from 10~100% load 3.3, 5 Vdc output models 9, 12, 15 Vdc output models 24 Vdc output models		 10 8 6		 % % %
switching frequency	at Vin nominal, full load		220		kHz
temperature coefficient	at full load		±0.02		%/°C

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, 1 mA max	1,500			Vdc
isolation capacitance	input to output, 100 kHz/0.1V		20		pF
safety approvals	certified to 62368-1: EN, UL[4]				
conducted emissions	CISPR32/EN55032 CLASS B (see recommended circuit Fig. 2)				
radiated emissions	CISPR32/EN55032 CLASS B (see recommended circuit Fig. 2)				
ESD	IEC/EN61000-4-2 contact: ±6 kV, perf. Criteria B				
MTBF	as per MIL-HDBK-217, at 25°C	3,500,000			hours
RoHS	yes				

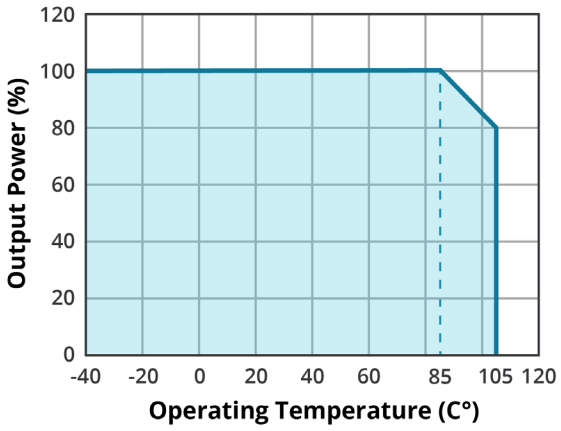
Note: 4. Only 5Vin models are UL certified.

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		105	°C
storage temperature		-55		125	°C
operating humidity	non-condensing	-		95	%
storage humidity	non-condensing	5		95	%RH
case temperature rise	at nominal input, full load		25		°C

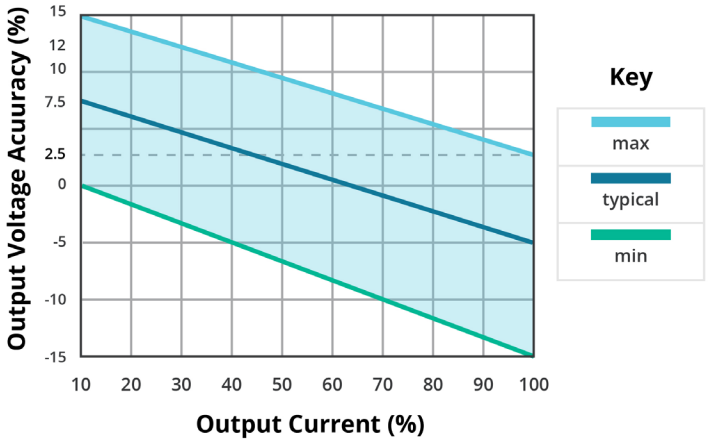
DERATING CURVE

TEMPERATURE DERATING CURVE

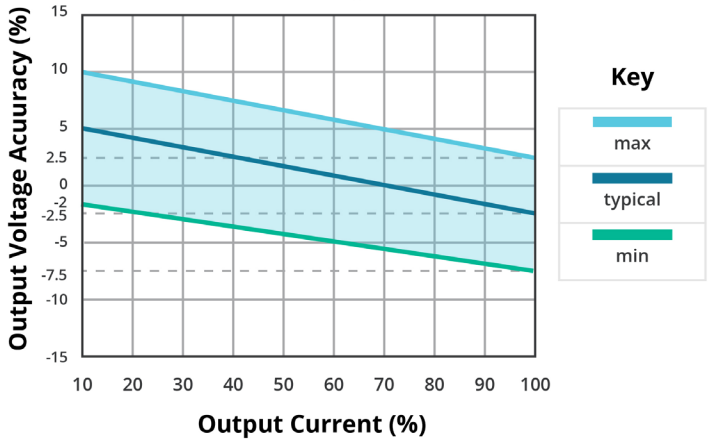


DERATING CURVE (CONTINUED)

OUTPUT REGULATION CURVE
3.3 Vdc output
(nominal input)

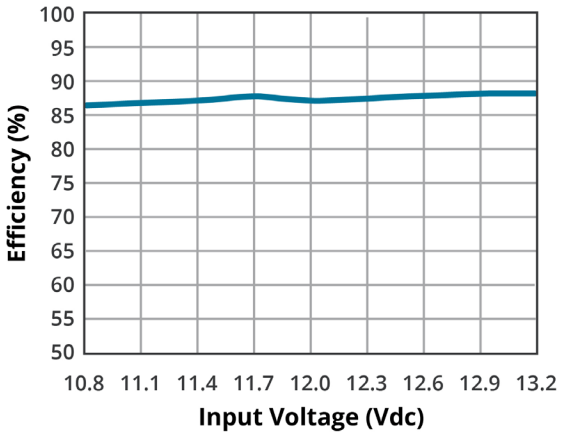


OUTPUT REGULATION CURVE
all other outputs
(nominal input)

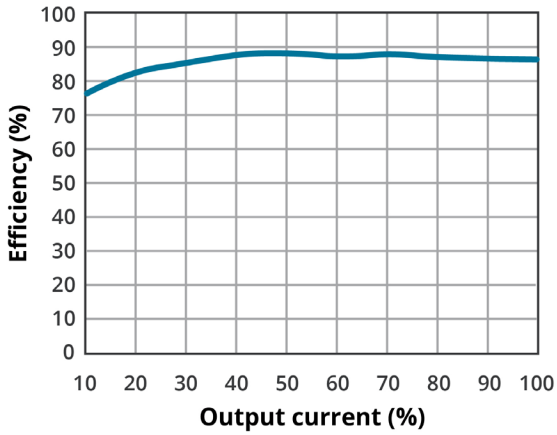


EFFICIENCY CURVE

EFFICIENCY VS INPUT VOLTAGE
DDP1-12-S5-D



EFFICIENCY VS OUTPUT LOAD
DDP1-12-S5-D



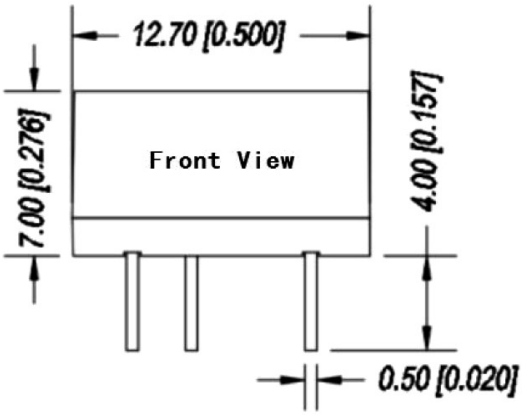
MECHANICAL

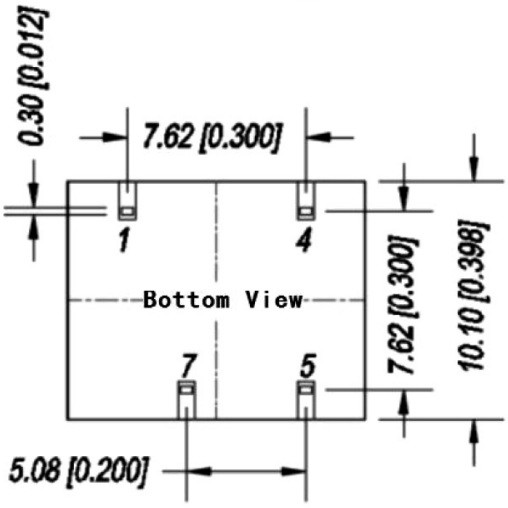
parameter	conditions/description	min	typ	max	units
dimensions	12.7 (L) x 10.1 (W) x 7.0 (H)				mm
case material	black plastic, flame-retardant and heat-resistant (UL94V-0 rated)				
weight			1.65		g

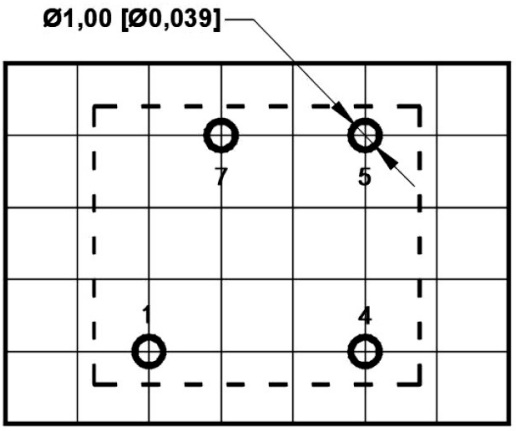
MECHANICAL DRAWING

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

PIN CONNECTIONS	
PIN	Functions
1	GND
4	Vin
5	+Vout
7	-Vout







TYPICAL APPLICATION

If additional reduction of input and output ripple is needed, a capacitor filtering network can be added to the input and output terminals (see Figure 1).
Careful selection of filtering capacitors is essential—excessive capacitance may lead to startup issues.
For each output, refer to the recommended capacitive load values provided in the table to ensure safe and reliable operation.

Output Load Requirements
To maintain efficient and reliable module performance, the minimum output load should be at least 10% of the rated load during operation.
If your application requires a lower power output, connect a resistor in parallel at the output. The combined power consumption of the resistor and the actual load should be no less than 10% of the module's rated power.

Figure 1

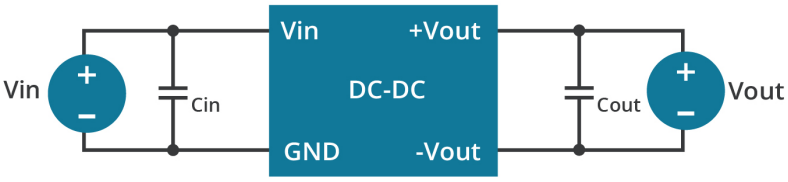


Table 1

RECOMMENDED VALUES			
Vin	Cin	Vout	Cout
3.3, 5	4.7μF/16V	3.3, 5	10μF/16V
12	2.2μF/25V	9, 12	4.7μF/25V
15	1μF/25V	15	1μF/25V
24	1μF/50V	24	0.47μF/50V

EMC RECOMMENDED CIRCUIT

Figure 2

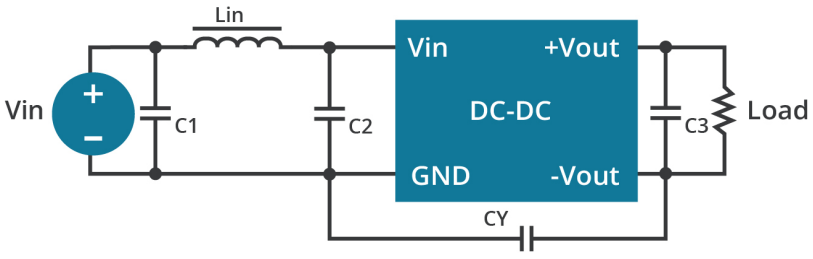


Table 2

RECOMMENDED VALUES	
C1	4.7μF/50V
C2	4.7μF/50V
C3	see Table 1
CY	1,000pF/2kV
Lin	6.8μH

REVISION HISTORY

rev.	description	date
1.0	initial release	04/28/2026

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

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