SERIES: DQD50 | DESCRIPTION: DC-DC CONVERTER

FEATURES

- up to 50 W isolated output
- single regulated outputs
- over voltage, input under voltage, short circuit, and over current protections
- remote on/off control
- 1,500 Vdc isolation
- -40 ~ 105°C temperature range, with derating
- certified to IEC/EN 62368-1
- PCB, chassis and DIN-rail mount options

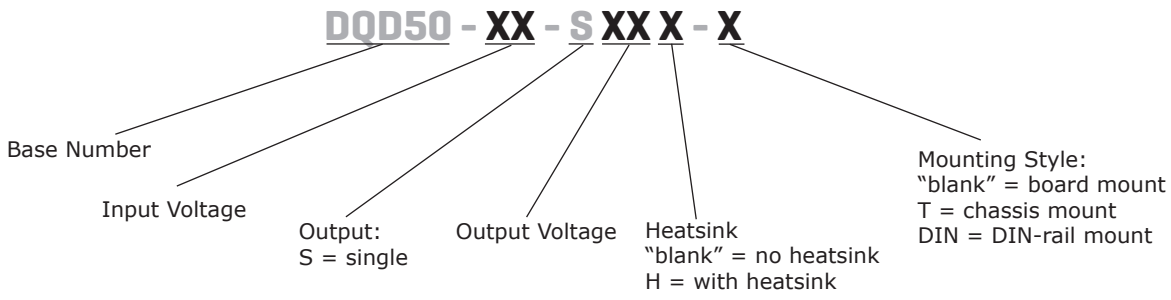
RoHS CE UKCA

MODEL

MODEL	input voltage		output voltage	output current	output power	ripple & noise[1]	efficiency[2]
	typ (Vdc)	range (Vdc)	typ (Vdc)	max (A)	max (W)	max (mVp-p)	typ (%)
DQD50-24-S5	24	9~36	5	10.0	50	150	92
DQD50-24-S12	24	9~36	12	4.167	50	150	92
DQD50-24-S15	24	9~36	15	3.333	50	150	92
DQD50-24-S24	24	9~36	24	2.083	50	150	92
DQD50-48-S5	48	18~75	5	10.0	50	150	92
DQD50-48-S12	48	18~75	12	4.167	50	150	92
DQD50-48-S15	48	18~75	15	3.333	50	150	92
DQD50-48-S24	48	18~75	24	2.083	50	150	92

Notes:
1. The ripple and noise is measured at 5%~100% load and 20MHz bandwidth. 0% ~5% load ripple & noise is less than or equal to 5%Vo; the ripple & noise test adopts the parallel line test method, see the ripple & noise test instructions for details.
2. The efficiency is tested at full load.
3. Unless otherwise specified, all values or indicators in this manual are tested at Ta=25°C, humidity<75%RH, rated input voltage and rated load (pure resistance load).

PART NUMBER KEY



Please read our datasheet & drawing disclaimer here.

INPUT

parameter	conditions/description	min	typ	max	units
input voltage range	24 Vdc input models 48 Vdc input models	9 18	24 48	36 75	Vdc Vdc
input current	24 Vd input models, at full load 48 Vd input models, at full load			6.4 3.0	A A
input current (full load/no load)	24 Vdc input; 5 Vdc output model 24 Vdc input; 12, 15 Vdc output models 24 Vdc input; 24 Vdc output models 48 Vdc input; 5, 12, 15 Vdc output models 48 Vdc input; 24 Vdc output models		2264/8 2264/4 2264/3 1133/4 1133/3		mA mA mA mA mA
surge voltage	1 second max 24 Vdc input models 48 Vdc input models	 -0.7 -0.7		 50 100	 Vdc Vdc
start-up voltage	24 Vdc input models 48 Vdc input models		8 16		Vdc Vdc
turn-off voltage threshold	24 Vdc input models 48 Vdc input models		7 15		Vdc Vdc
filter	Pi filter				
no load power consumption			0.1		W
remote on/off[4]	module on: CTRL pin suspended or pulled high (3~12 Vdc)				
	module off: CTRL pin connected to -Vin or pulled low (0~1.2 Vdc)				
input current when off			10		mA

Notes: 4. The voltage of CTRL pin is relative to -Vin pin.

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	5 Vdc output models 12 Vdc output models 15 Vdc output models 24 Vdc output models			10,000 3,700 2,000 1,000	µF µF µF µF
voltage accuracy			±1	±3	%
voltage regulation	full voltage range, nominal load		±0.2	±0.5	%
load regulation	5% ~ 100% load		±0.5	±1	%
transient response recovery	25% rated load step change		300	500	µs
transient response deviation	25% rated load step change 5 Vdc output models all other models		 ±5 ±3	 ±10 ±5	 % %
temperature coefficient				±0.03	%/°C
start-up time	at rated input voltage and constant resistance load		20	100	ms
switching frequency	PWM mode		300		kHz
adjustability	via trim	90		110	%

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over current protection	5 Vdc output model all other models	110 110	150 150	240 200	% %
over voltage protection		110	130	160	%
short circuit protection	continuous, auto recovery, hiccup				
output overshoot				10	%

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute, 1 mA max input/output to case for 1 minute, 1 mA max	1,500 1,000			Vdc Vdc
isolation capacitance	input to output, (100 kHz, 0.1V)		1,000		pF
safety approvals	certified to 62368-1: IEC, EN				
conducted emissions	CISPR32/EN55032 Class B (see recommended circuit)				
radiated emissions	CISPR32/EN55032 Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2 Contact ±6 kV, perf. Criteria B				
radiated immunity	IEC/EN61000-4-3 10 V/m, perf. Criteria A (see recommended circuit)				
EFT/burst	IEC/EN61000-4-4 ±2 kV, perf. Criteria B (see recommended circuit)				
surge	IEC/EN61000-4-5 ±2 kV, perf. Criteria B (see recommended circuit)				
conducted immunity	IEC/EN61000-4-6 10 Vrms, perf. Criteria A (see recommended circuit)				
vibration	10-150 Hz, 5G, 0.75mm. along X, Y and Z axis				
MTBF	as per MIL-HDBK-217F at 25 °C	1,000,000			hours
RoHS	yes				

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	5		95	%
max case temperature				105	°C

SOLDERING

parameter	conditions/description	min	typ	max	units
pin soldering temperature	1.5mm from the case for 10 seconds			300	°C

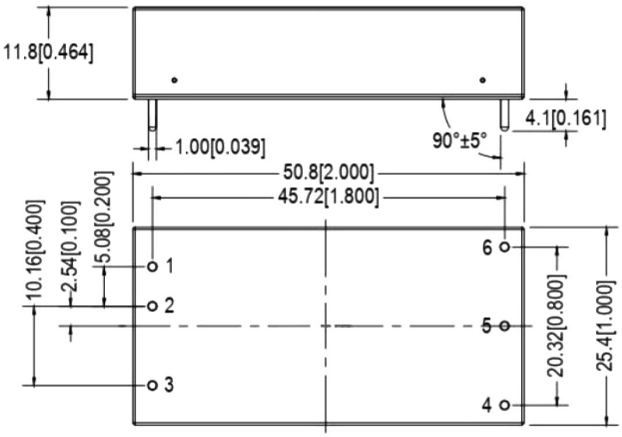
MECHANICAL

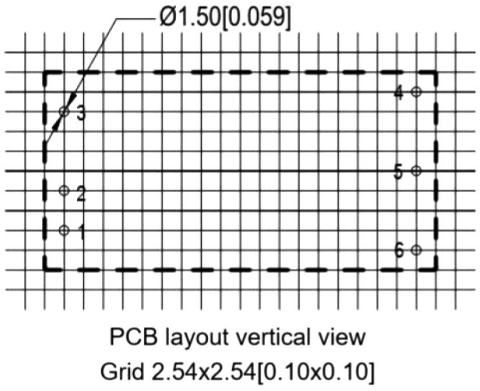
parameter	conditions/description	min	typ	max	units
dimensions	board mount: 50.8 x 25.4 x 11.8 [2.000 x 1.000 x 0.464 inches] board mount with heatsink: 50.8 x 25.4 x 21.8 [2.000 x 1.000 x 0.858 inches] chassis mount: 76.0 x 31.5 x 21.3 [2.990 x 1.240 x 0.838 inches] chassis mount with heatsink 76.0 x 31.5 x 31.0 [2.990 x 1.240 x 1.220 inches] DIN-rail mount: 76.0 x 31.5 x 26.0 [2.990 x 1.240 x 1.023 inches] DIN-rail mount with heatsink: 76.0 x 31.5 x 35.5 [2.990 x 1.240 x 1.397 inches]				mm mm mm mm mm mm
case material	aluminum				
weight	board mount board mount with heatsink chassis mount chassis mount with heatsink DIN-rail mount DIN-rail mount with heatsink		36 48 57 69 77 89		g g g g g g
cooling	natural convection				

MECHANICAL DRAWING

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

PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout

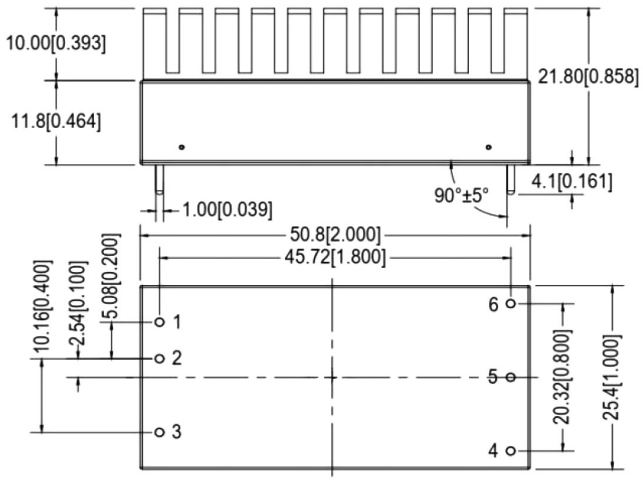


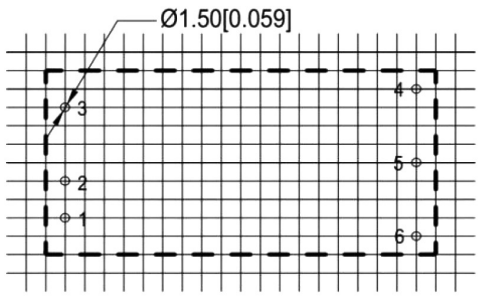


PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

Board Mount with Heatsink
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±0.50 [±0.020]

PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout



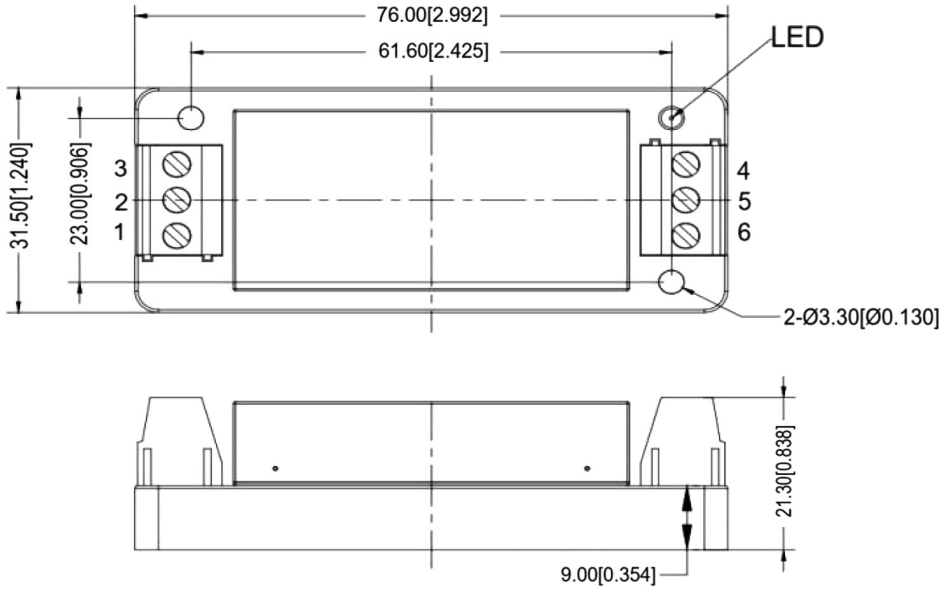


PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

MECHANICAL DRAWING (CONTINUED)

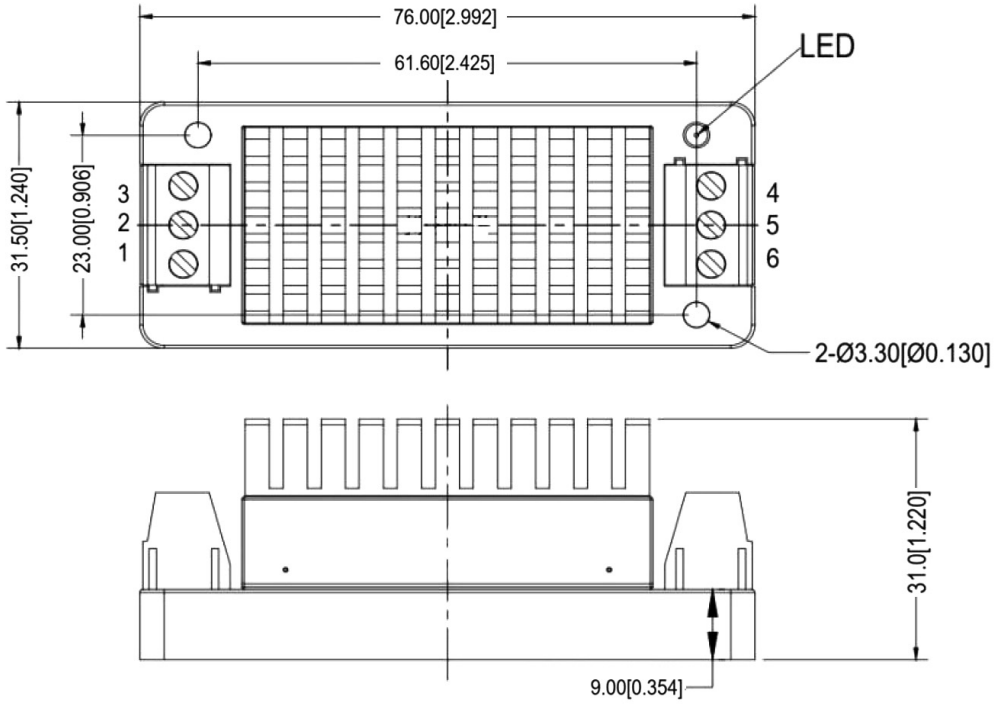
Chassis Mount
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±1.00 [±0.039]
wire range: 24~12 AWG
tightening torque: max 0.4 N·m

PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout



Chassis Mount with Heatsink
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±1.00 [±0.039]
wire range: 24~12 AWG
tightening torque: max 0.4 N·m]

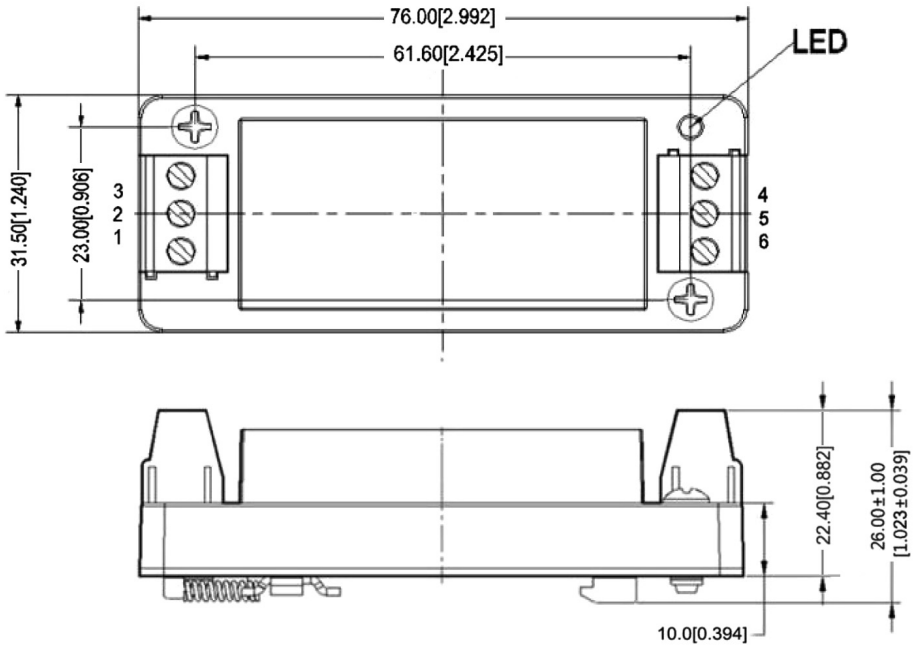
PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout



MECHANICAL DRAWING (CONTINUED)

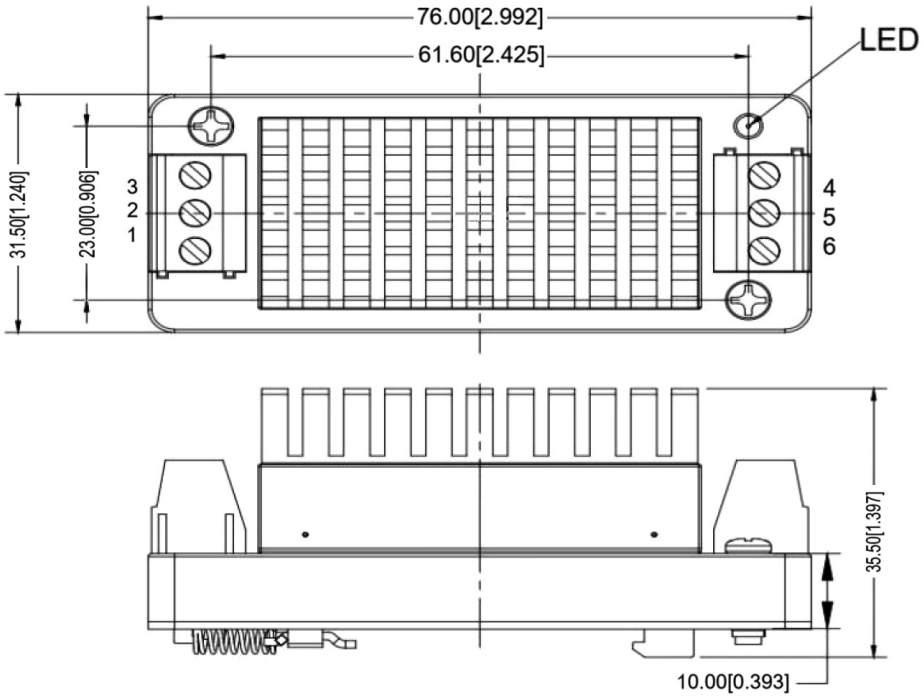
DIN-rail Mount
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±1.00 [±0.039]
wire range: 24~12 AWG
tightening torque: max 0.4 N·m

PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout



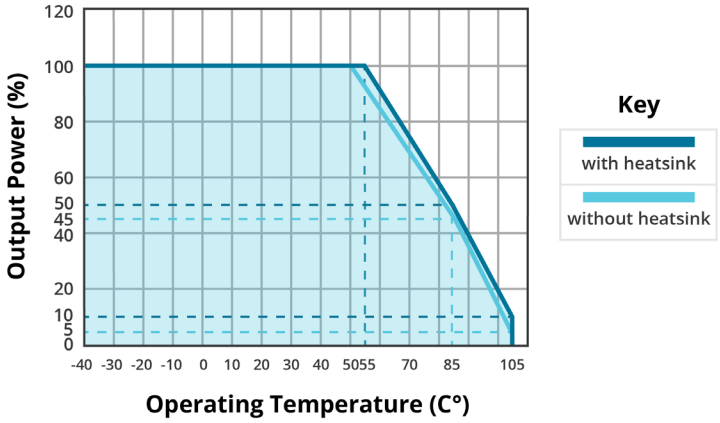
DIN-rail Mount with Heatsink
units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
general tolerance: ±1.00 [±0.039]
wire range: 24~12 AWG
tightening torque: max 0.4 N·m

PIN CONNECTIONS	
PIN	Single
1	+Vin
2	-Vin
3	Ctrl
4	Trim
5	-Vout
6	+Vout

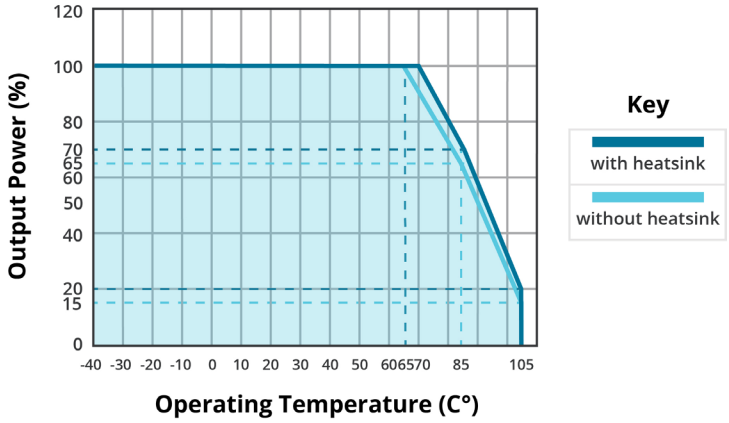


DERATING CURVES

TEMPERATURE DERATING CURVE
5 Vdc output model

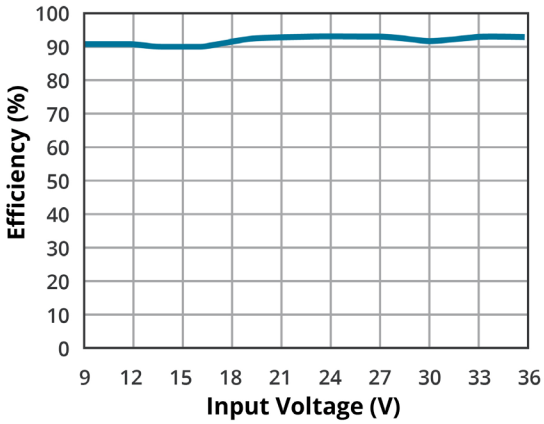


TEMPERATURE DERATING CURVE
all other output models

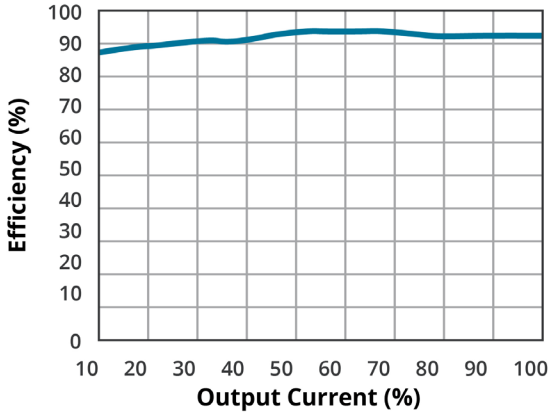


EFFICIENCY CURVES

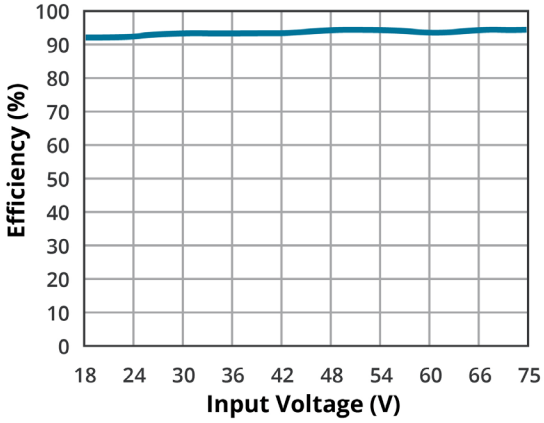
EFFICIENCY VS INPUT VOLTAGE
(full load)



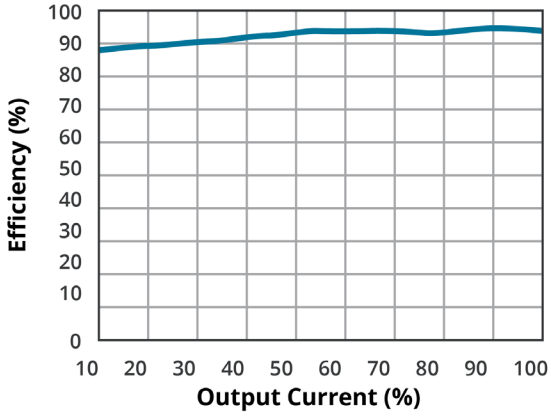
EFFICIENCY VS OUTPUT CURRENT
(Vin = 24 V)



EFFICIENCY VS INPUT VOLTAGE
(full load)



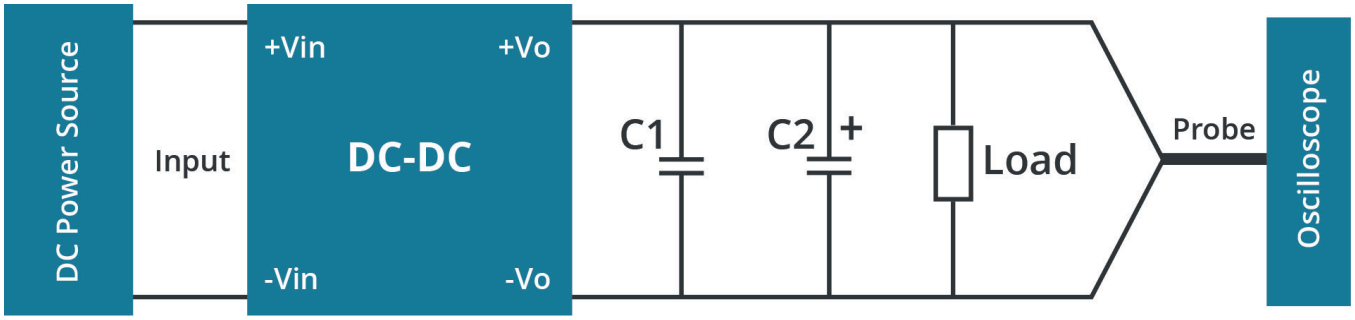
EFFICIENCY VS OUTPUT CURRENT
(Vin = 48 V)



RIPPLE AND NOISE TEST INSTRUCTION

1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1 (0.1μF) and one high-frequency low-resistance electrolytic capacitor C2(10uF) are connected in parallel with the probe.
2. Refer to the test diagram, the converter output connects to the electronic load by the jig with cables which size should be definedaccording to the output current value. The test can start at the converter output terminals after the input power on.
3. It is recommended to connect a ≥5% load or a high-frequency low resistance electrolytic capacitor (≥470μF) load to the output toavoid the output ripple increasing.

Figure 1



APPLICATION NOTES

Figure 2
5 Vdc output model

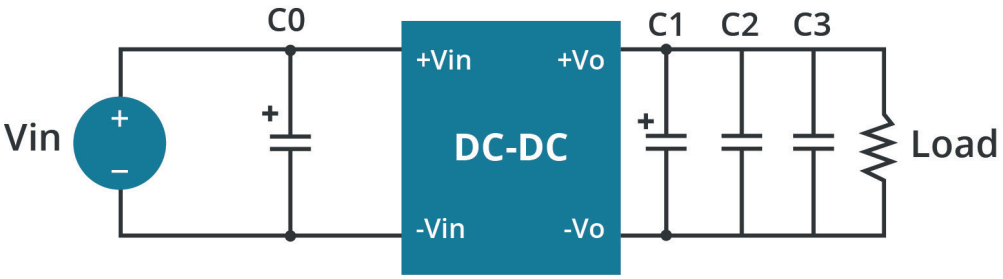


Table 1

5 Vdc output model	
COMPONENT	PARAMETER
C0	100 μF / 100 V
C1	330 μF / 50 V
C2	1 μF / 16 V
C3	10 μF / 16 V

Figure 3
all other output models

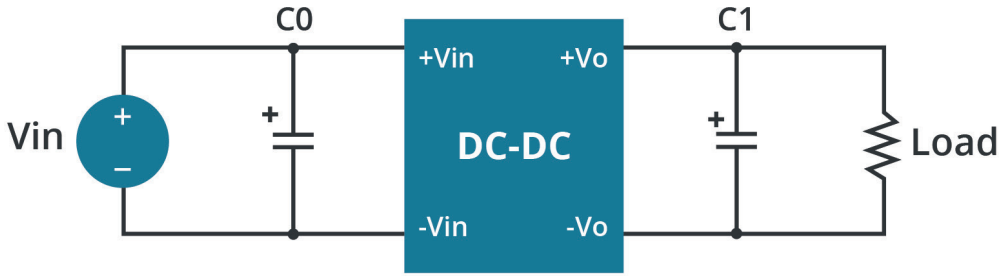


Table 2

12 & 15 Vdc output models	
COMPONENT	PARAMETER
C0	100 μF / 100 V
C1	100 μF / 25 V

24 Vdc output model	
COMPONENT	PARAMETER
C0	100 μF / 100 V
C1	47 μF / 50 V

EMC RECOMMENDED CIRCUIT

Figure 4
5 Vdc output model

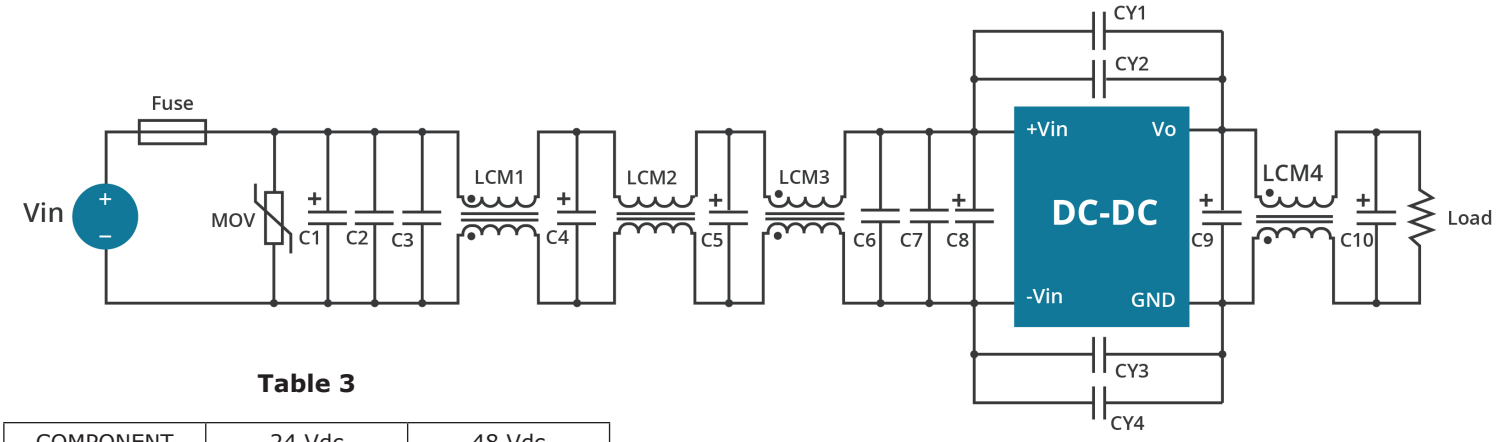


Table 3

COMPONENT	24 Vdc	48 Vdc
Fuse	TBD by customer	
MOV1	14D470K	14D101K
LCM1	2.2 mH	
LCM2	1.0 mH	
LCM3, LCM4	270 µH	
C1, C4, C5, C8	330 µF/100 V	
C2, C3	4.7 µF/100 V	
C6, C7	10 µF/100 V	
C9, C10	100 µF/100 V	
CY1, CY3	2.2 nF/2 kV	
CY2, CY4	10 nF/2 kV	

Figure 5
12 & 15 Vdc output model

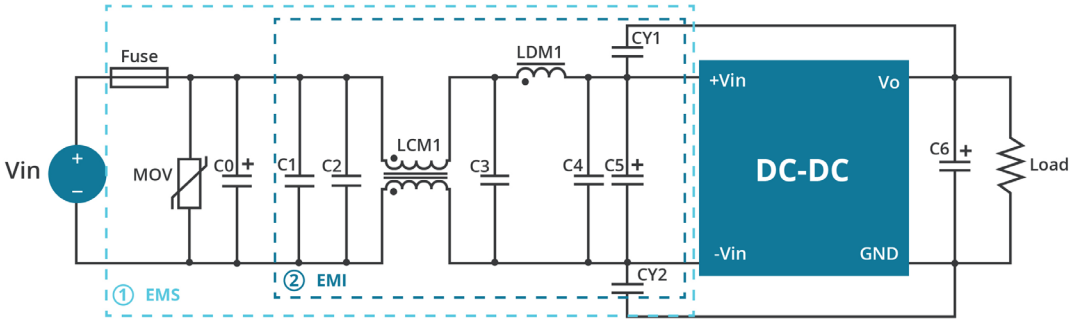


Table 4

COMPONENT	PARAMETER
Fuse	TBD by customer
MOV	14D470K
LDM1	2.2 µH
LCM1	2.2 mH
LCM2	/
C0	680 µH/100 V
C1, C2	4.7 µF/100 V
C3	10 µF/100 V
C4	10 µF/100 V
C5	330 µF/100 V
C6	100 µF/50 kV
CY1, CY2	2.2 nF/2 kV

EMC RECOMMENDED CIRCUIT (CONTINUED)

Figure 6
24 Vdc output model

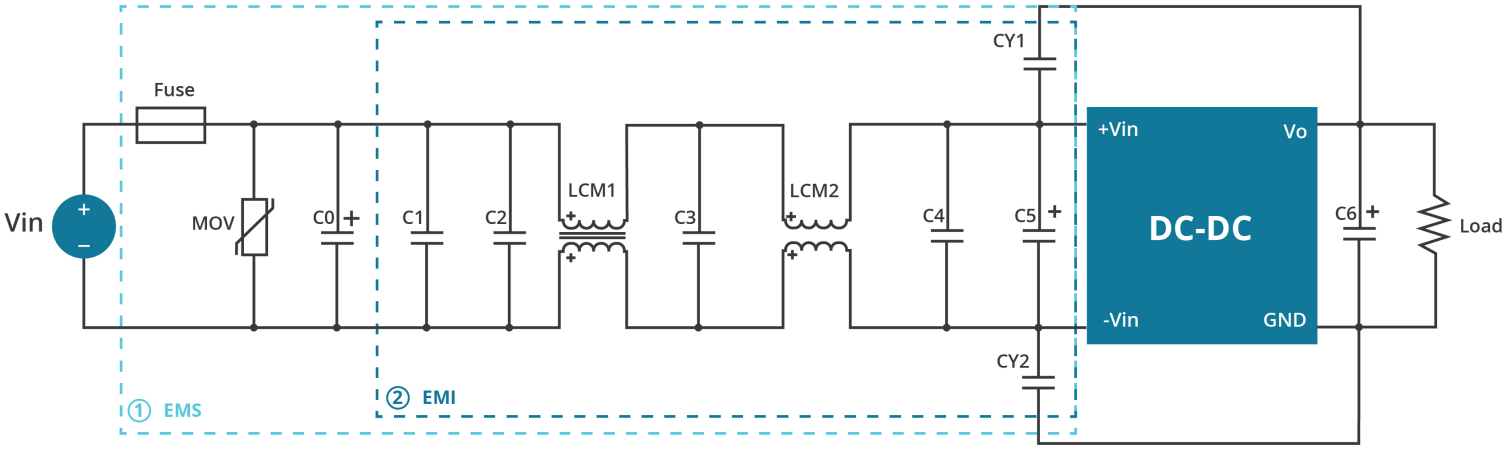


Table 5

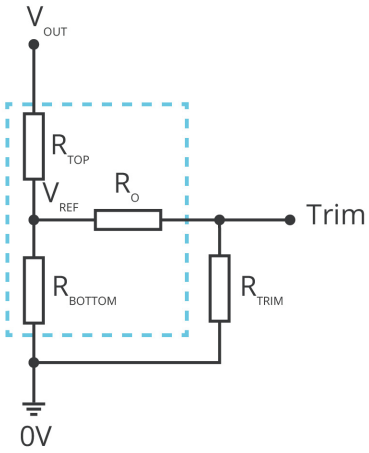
COMPONENT	PARAMETER
Fuse	TBD by customer
MOV	14D470K
LDM1	/
LCM1	10 mH
LCM2	10 mH
C0	680 µH/100 V
C1, C2	4.7 µF/100 V
C3	10 µF/100 V
C4	47 µF/100 V
C5	330 µF/100 V
C6	100 µF/50 kV
CY1, CY2	2.2 nF/2 kV

Note: Part 1 in the circuit is for EMS test, part 2 for EMI filtering, both can be adjusted according to the actual situation.

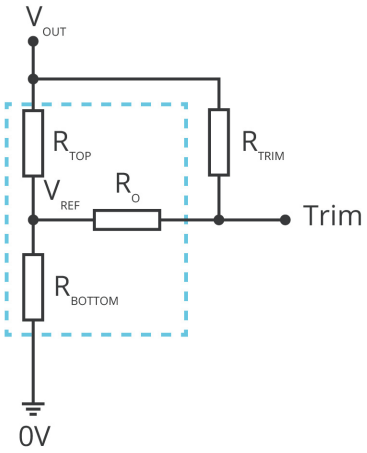
TRIM RESISTOR AND CALCULATION (SINGLE OUTPUT MODELS ONLY)

Figure 7

Trim up



Trim down



$$R_{TRIM} = \frac{a \cdot R_{BOTTOM}}{R_{BOTTOM} - a} - R_O \qquad a = \frac{V_{REF}}{V_{OUT} - V_{REF}} \cdot R_{TOP}$$

Formula for Trim up

$$R_{TRIM} = \frac{a \cdot R_{TOP}}{R_{TOP} - a} - R_O \qquad a = \frac{V_{OUT} - V_{REF}}{V_{REF}} \cdot R_{BOTTOM}$$

Formula for Trim down

Table 6

V_{NOM}	R_{TOP}	R_{BOTTOM}	R_O	V_{REF}
(Vdc)	(kΩ)	(kΩ)	(kΩ)	(V)
5	24	24.0	68	2.5
12	75	19.73	30	2.5
15	24	4.78	30	2.5
24	68	7.89	30	2.5

Note: Value for R_{TOP}, R_{BOTTOM}, R_O, and V_{REF} refer to Table 6 (fixed internal values).
R_{TRIM}: Trim resistance
a: User-defined parameter, no actual meanings
V_{NOM}: Nominal output voltage
V_{OUT}: Target output voltage

REVISION HISTORY

rev.	description	date
1.0	initial release	01/28/2026

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.

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