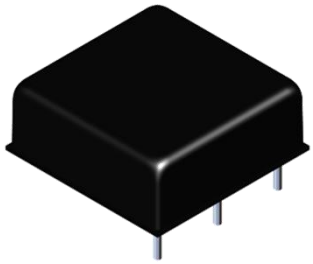
DC-DC Converter
D40-(2)DA4 Series

DESCRIPTION

The series of DC-DC switching power supplies in a package of 25.4x25.4x12.0 mm are capable of delivering 40 watts. They are designed for industry control application, energy battery application, telecom/datacom application, space saving solution.



FEATURES

- 4:1 Wide input range voltage
- 40W power in compact size 1x1" package
- -40°C to +105°C operating temperature
- High power density 85W/inch^3
- Continuous short circuit protection
- High efficiency up to 90%
- Input under voltage lock, output voltage trim, remote ON/OFF function

WATTAGE

Wattage: 40W

DIMENSION

Dimension: 25.4 (L) x 25.4(W) x 12.0(H)mm

SAFETY STANDARD APPROVAL

Meet EN 62368-1

ENVIROMENTAL SPECIFICATION

Operating temperature: -40˚C to +105˚C

Storage temperature: -55˚C to +125˚C

SELECTION GUIDE

Part number	Input voltage	Output voltage	Output current @ full load	Input current @ no load	Efficiency (1) (typ.)	Capacitive load (2) (max.)
D40-DA4-AT	9-36 VDC Nom. 24 VDC	3.3 VDC	10000 mA	12 mA	85%	6000μF
D40-DA4-AP		5 VDC	8000 mA	12 mA	89%	6000μF
D40-DA4-AH		12 VDC	3330 mA	12 mA	90%	3000μF
D40-DA4-AG		15 VDC	2670 mA	12 mA	90%	3000μF
D40-DA4-AA		24 VDC	1670 mA	12 mA	89%	1000μF
D40-DA4-FT	18-75 VDC Nom. 48 VDC	3.3 VDC	10000 mA	10 mA	86%	6000μF
D40-DA4-FP		5 VDC	8000 mA	10 mA	89%	6000μF
D40-DA4-FH		12 VDC	3330 mA	10 mA	90%	3000μF
D40-DA4-FG		15 VDC	2670 mA	10 mA	90%	3000μF
D40-DA4-FA		24 VDC	1670 mA	10 mA	89%	1000μF

1. The efficiency is test by nominal input and max. full load @25˚C.
2. The capacitive load is test by minimum input and constant resistive load.
3. Special input and output voltage combinations available by request, please check with our sales.

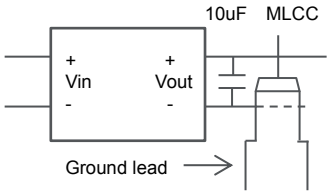
SPECIFICATION

	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input	Input filter		Pi type			
	Input voltage range	24V 48V	9 18		36 75	VDC VDC
	Start-up time	100% load at nominal Vin		15	25	ms
	Start-up voltage	24V 48V		9 18		VDC VDC
	Under voltage lockout	24V 48V		7.7 16.5		VDC VDC
	Input surge voltage (1s)	24V 48V			50 100	VDC VDC
	Remote ON/OFF	DC-DC ON DC-DC OFF	Open or 3V < Vr < 12V Short or 0V < Vr < 1.5V			
		Remote off input current		3		mA
Output	Output voltage accuracy	100% Load at Nominal Vin		±1		%
	Ripple & Noise	20MHz, Io=Full load			100	mVp-p
	Minimum load		0			%
	Line regulation			0.2		%
	Load regulation			0.5		%
	Operating frequency			400		KHz
Environment	Operating temperature	Derating curve	-40		105	˚C
	Storage temperature		-55		125	˚C
	Max case temperature				110	˚C
	Relative Humidity				95	%RH
	MTBF	25˚C, 100% Load at Nom. Vin	190			KHours
Function	Short Circuit Protection		Continuous, automatic recovery			
	Isolation voltage	60sec. Input-output	1.6 1			KVDC KVAC
	Isolation resistance		10			GΩ
	Isolation capacitance				1200	pF

	Parameter	Conditions	Min.	Typ.	Max.	Unit
	Over load protection			170		%
	Over temperature protection			120		˚C
Physical	Dimension			25.40x25.40x12.00 mm		
	Weight			21		g
	Cooling method			Natural convection		
	Case material			Metal case		
	Potting material			Silicone (UL94V-0)		
EMC	EMI	EN55032		Class A/B		
	ESD	EN61000-4-2, Air±8kV; Contact±6kV		Perf. Criteria A		
	Radiated immunity	EN61000-4-3, 10 V/m		Perf. Criteria A		
	Fast transient (1)	EN61000-4-4, ±2kV		Perf. Criteria A		
	Surge (1)	EN61000-4-5, ±2kV		Perf. Criteria A		
	Conducted immunity	EN61000-4-6, 10 V r.m.s		Perf. Criteria A		
	PMF	EN61000-4-8,50Hz 1A/m(r.m.s)		Perf. Criteria A		

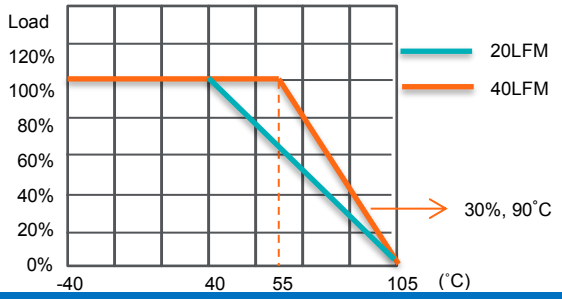
1. Test with E-CAP 470uF/100V at input terminal.
2. All specifications valid at nominal input voltage, full load and 25˚C after warm-up time unless otherwise stated.
3. The product information and specifications are subject to change without prior notice.
4. About EMI circuit, please check suggestion circuit.

RIPPLE & NOISE

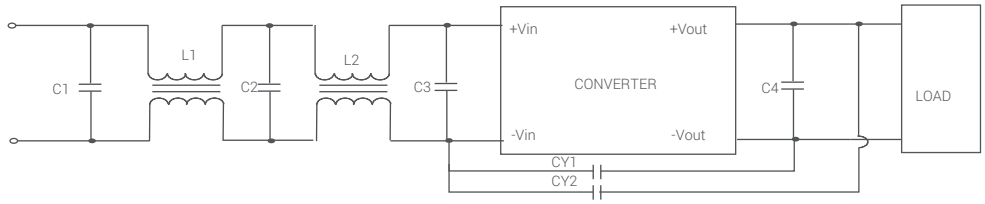


DERATING CURVE

Ambient temperature (Nominal Vin)

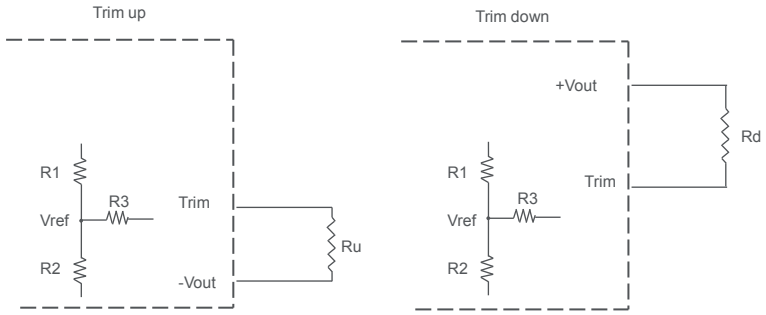


EMI SUGGESTION FOR CLASS A/B



	Class A	Class B
C1	NA	MLCC X7R 10UF
C2	MLCC X7R 10UF	MLCC X7R 10UF
C3	MLCC X7R 10UF	MLCC X7R 10UF
C4	NA	MLCC X7R 10UF
CY1	MLCC X7R 1000PF/2KV	MLCC X7R 2200PF/2KV
CY2	NA	MLCC X7R 2200PF/2KV
L1	Short	Mn-Zn ui=7000 C.M. Choke (separated) 2mH
L2	Mn-Zn ui=7000 C.M. Choke (separated) 2mH	Ni-Zn ui=500 C.M. Choke (parallel) 50uH

EXTERNAL OUTPUT VOLTAGE TRIMMING



Formula for trim resistor:

UP: $R_u = \frac{aR_2}{R_2 - a} - R_3$ $a = \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1$

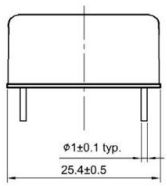
DOWN: $R_d = \frac{bR_1}{R_1 - b} - R_3$ $b = \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2$

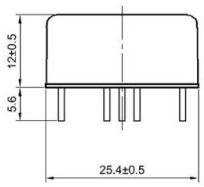
Note:

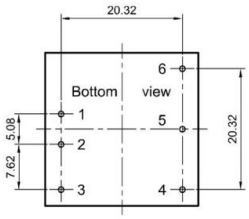
1. Ru, Rd is mean trim resistor, please check the formula.
2. a & b: user define parameter, no actual meanings
3. V_o' is mean trim up/down voltage.
4. Value for R1, R2, R3 and Vref refer to the table below.

Vin	Vout	Vref	R1	R2	R3
24V	5V	2.50V	5.1KΩ	5.1KΩ	18KΩ
24V	12V	2.50V	19.32KΩ	5.1KΩ	33KΩ

MECHANICAL SPECIFICATION



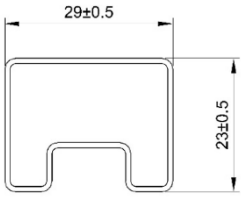




Projection : Third angle projection
Unit : mm
Tolerance : ±0.25mm

PACKAGE

Pin	Single
1	+Vin
2	-Vin
3	CTRL
4	-Vout
5	Trim
6	+Vout



UNIT:mm
1 Tube = 18 pcs
Length:520±2mm