75 Watt, 4:1 Input Range DC/DC Converters Series DV75QL4

Features

- 75 Watt Isolated Output, Regulated
- 4 : 1 Wide Input Range
- 2250 VDC Isolation
- Industry Standard Quarter-Brick Package
- Five-Sided Metal Shielded
- Meets UL/IEC/EN62368-1
- Efficiency to 93%
- Input Under-Voltage Protection
- Over Voltage/Current Protection
- Continuous Short Circuit Protection
- Over Temperature Protection
- Meets EN55032

MODEL NUMBER	INPUT VOLTAGE [VDC] (NOTE1)	OUTPUT VOLTAGE [VDC]	OUTPUT CURRENT MAX. [A]	EFFICIENCY FULL LOAD TYP. [%]	CAP. LOAD MAX. [µF]	CASE
DV75QL4-48S05	18 – 75	5	15	91	6000	QL
DV75QL4-48S12		12	6,25	92	2000	
DV75QL4-48S15		15	5	93	2000	
DV75QL4-48S24		24	3,13	92	1000	
DV75QL4-48S48		48	1,56	92	470	

NOTE: 1. Nominal Input Voltage 48 Vdc
2. Suffix ”-AL”: with Aluminum Baseplate
Suffix ”-K”: with with Heat Sink

dev-dorsch electronic vertriebs gmbh ● Münchner Str. 123 ● 85774 Unterföhring
Fon +49 / 89 / 95 08 07 – 60 Fax – 77 Mail: contact@dev-electronic.de ● www.dev-electronic.de

INPUT SPECIFICATIONS:

Input Voltage Range	Vin 48V	18-75VDC
Input Surge Voltage (1sec. max.)	Vin 48V	90VDC max.
Input Current (Full Load / No-Load)	Vin 48V	1698mA / 50mA typ.
Reflected Ripple Current	Vin 48V	30mA typ.
Start-up Voltage		18VDC max.
Input Under Voltage Protection:	Vo 5V & 15V	16,5VDC typ.
	Vo Others	15,5VDC typ.
Input Filter		Pi Type
Ctrl. Remote ON/OFF:		
Module ON		Ctrl. Pin Open Circuit or High (3,5-12VDC)
Module OFF		Ctrl. Pin Low to GND (0-1,2VDC)
Input Current when off		2mA typ. / 10mA max.
Ctrl. Pin		is referenced to input GND

OUTPUT SPECIFICATION:

Voltage Accuracy	0%-100% Load	±3,0%max.
Line Regulation	Input Voltage from Low to High at Full Load	±0,5% max.
Load Regulation	0%-100% Load	±0,75% max.
Transient Recovery Time	25% Step Load Change	500µs max.
Transient Response Deviation	25% Step Load Change	±3% typ.
Temperature Coefficient		±0,03%/°C max.
Ripple and Noise, 20 MHz BW (Note 1)	Vo 12V & 15V	200mV pk-pk max.
	Vo Others	250mV pk-pk max.
Over Voltage Protection		110-160%Vo
Over Current Protection		110-190%Io
Short Circuit Protection		Hiccup, Continuous, Self-recovery
Trim Range (Note 4)		95 – 110%Vo
Remote Sense Compensation		105%Vo max.

GENERAL SPECIFICATIONS:

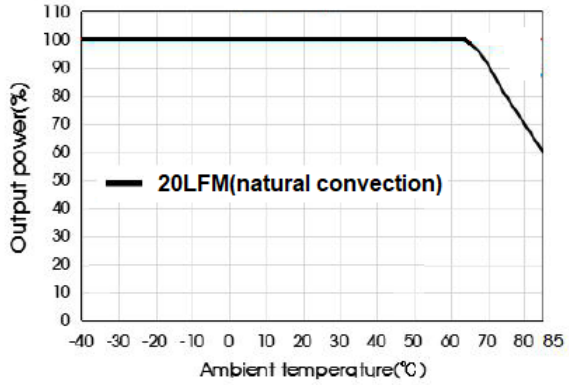
Efficiency		See Table
Isolation Voltage (Test 1 min. & leakage current 5mA).	Input/Output	2250 VDC min.
	Input/Case	1500 VDC min.
	Output/Case	500 VDC min.
Isolation Resistance	at 500VDC	100M Ohm min.
Isolation Capacitance	at 100KHz/0,1V	2200pF typ.
Switching Frequency		250KHz typ.
Operating Temperature Range		-40°C to +85°C
Storage Temperature Range		-55°C to +125°C
Over Temperature Protection	Max. Case Temperature	120°C max.
Storage Humidity		95% RH max. Non condensing
Pin Soldering Resistance Temperature	Wave-soldering 10sec.	260°C max.
	Soldering spot is 1,5mm away from case 10 sec.	300°C max.
MTBF (MIL-HDBK-217, GB, 25°C, Full Load)		500 Khrs min.
Safety Meet		UL62368-1 / IEC62368-1 / EN62368-1
EMC CE/RE		meet CISPR32/EN55032 Class A & B (see Application Note)
Shock/Vibration		meet IEC/EN61373 Cat 1, B
Dimensions		61,8 x 40,2 x 12,7 mm
	With Aluminum Baseplate Suffix -AL	62,0 x 56,0 x 14,6 mm
	With Heat Sink Suffix -K	61,8 x 40,2 x 27,7 mm
Weight		90g typ.
	With Aluminum Baseplate Suffix -AL	110g typ.
Case Material		Aluminum alloy case with black plastic bottom (UL94V-0)

NOTE:

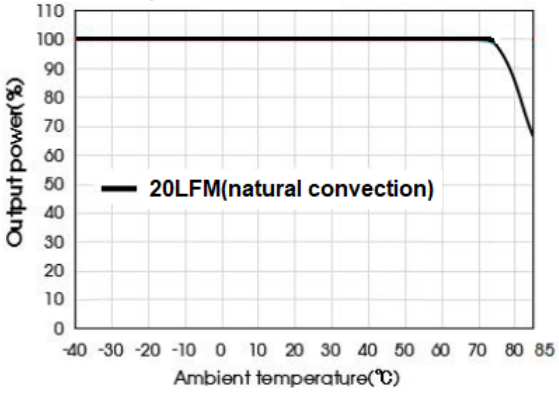
1. The “parallel cable” method is used for ripple and noise test.
2. The maximum capacitive load offered were tested at input voltage range and full load.
3. Remote Sense Connection: If the sense function is not used for remote regulation the user must connect the +Sense to + Vo and -Sense to 0V at the DC-DC converter pins and will compensate for voltage drop across pins only.
   The connections between Sense lines and their respective power lines must be kept as short as possible, otherwise they may be picking up noise, interference and/or causing unstable operation of the power module. See Application Note.
4. If the Trim pin is shorted with “+Vo”, or its value is too low, then the output voltage Vo’ would be lower than 0.95Vo, which may cause permanent damage.
5. Ensure input current meet start-up current of the products, ensuring that the product is not underpower.
6. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated load;

dev-dorsch electronic vertriebs gmbh ● Münchner Str. 123 ● 85774 Unterföhring
Fon +49 / 89 / 95 08 07 – 60 Fax – 77 Mail: contact@dev-electronic.de ● www.dev-electronic.de

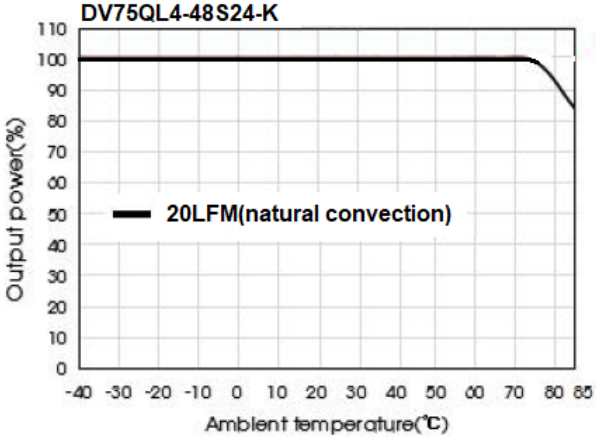
Temperature Derating Curves (Vin = 24V)
DV75QL4-48S24



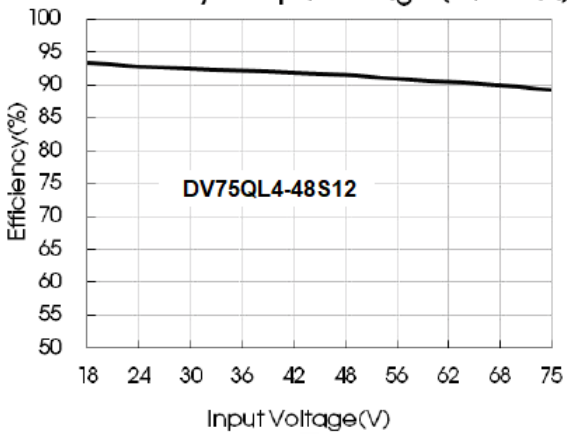
Temperature Derating Curves (Vin = 24V)
DV75QL4-48S24-AL



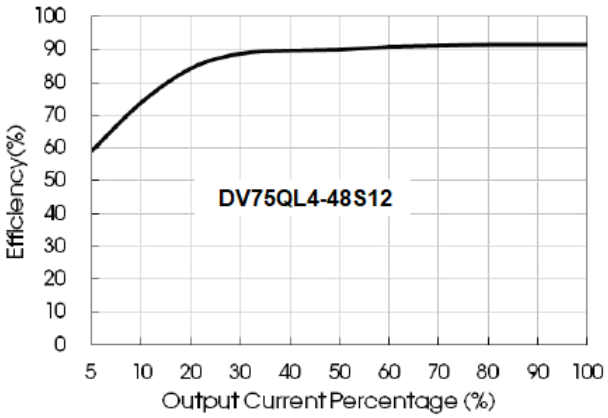
Temperature Derating Curves (Vin = 24V)
DV75QL4-48S24-K



Efficiency Vs Input Voltage (Full Load)



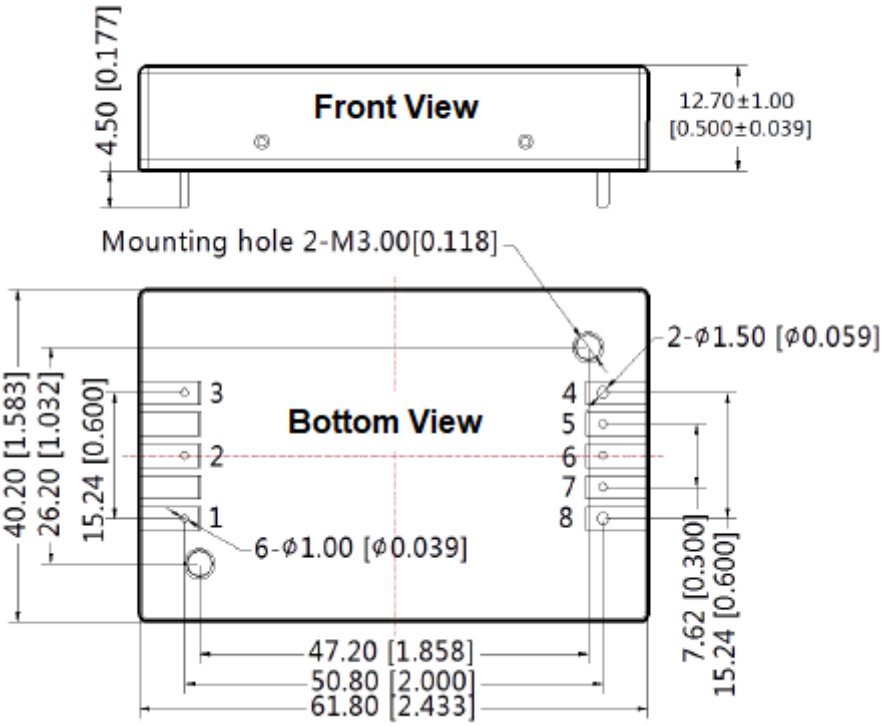
Efficiency Vs Output Load(Vin=48V)



dev-dorsch electronic vertriebs gmbh ● Münchner Str. 123 ● 85774 Unterföhring
Fon +49 / 89 / 95 08 07 – 60 Fax – 77 Mail: contact@dev-electronic.de ● www.dev-electronic.de

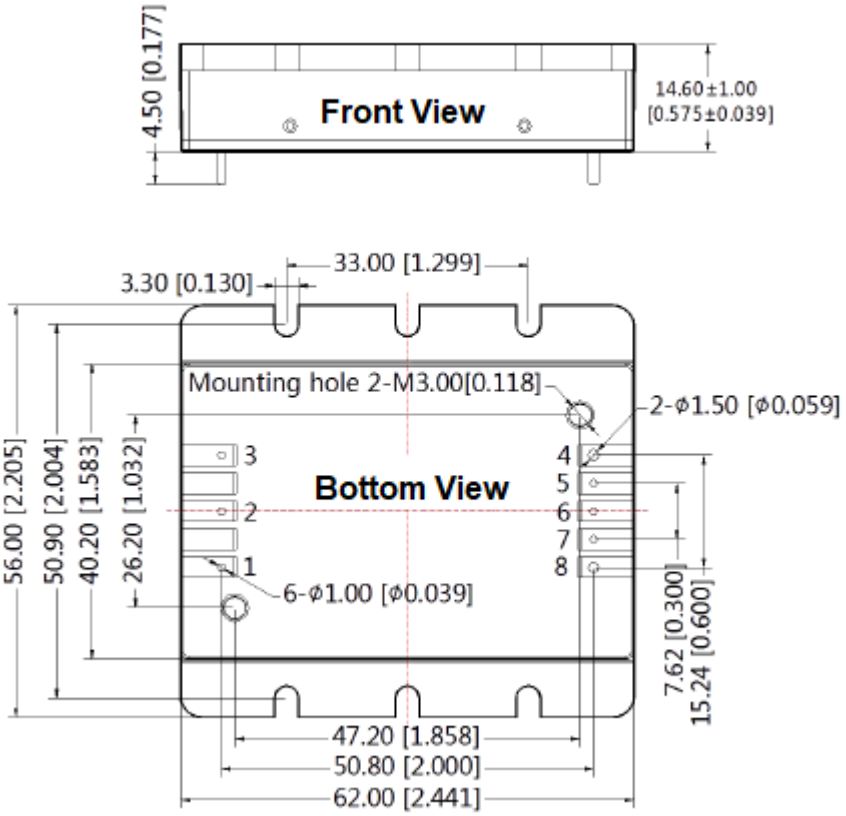
DIMENSIONS DV75QL4-xxSxx

All Dimensions in mm[inches]
Pin1, 2, 3, 5, 6, 7 diameter: 1.00[0.039]
Pin 4,8 diameter: 1.50[0.059]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]
Mounting hole screwing torque: Max. 0.4 Nm



PIN CONNECTION	
Pin	Function
1	+Vin
2	Ctrl. ON/OFF
3	- Vin
4	-Vout
5	-Sense
6	Trim
7	+Sense
8	+Vout

DIMENSIONS DV75QL4-xxSxx-AL

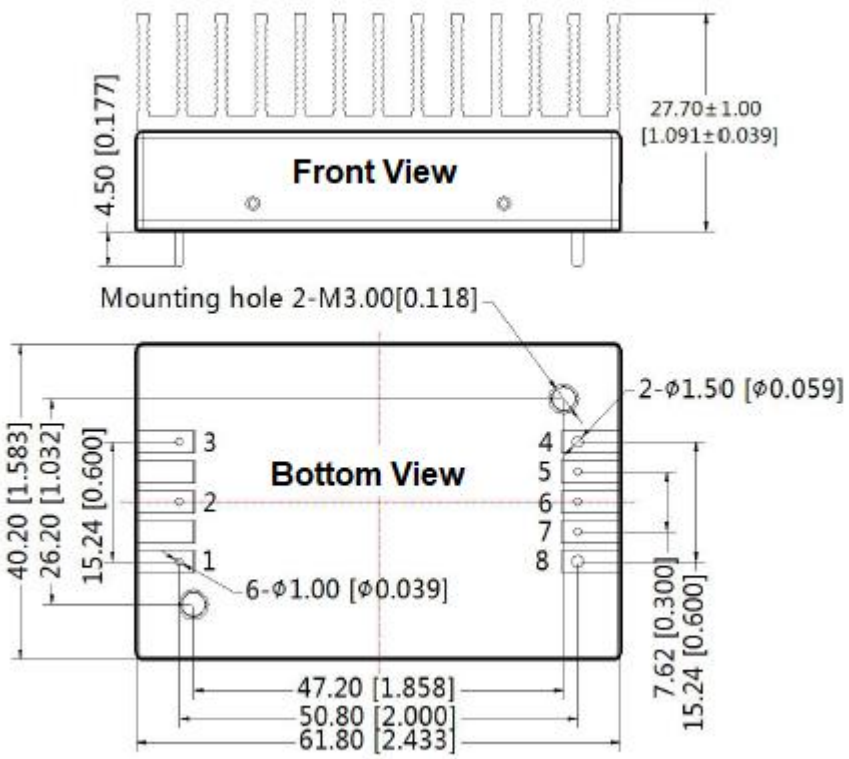


PIN CONNECTION	
Pin	Function
1	+Vin
2	Ctrl. ON/OFF
3	- Vin
4	-Vout
5	-Sense
6	Trim
7	+Sense
8	+Vout

dev-dorsch electronic vertriebs gmbh ● Münchner Str. 123 ● 85774 Unterföhring
Fon +49 / 89 / 95 08 07 – 60 Fax – 77 Mail: contact@dev-electronic.de ● www.dev-electronic.de

DIMENSIONS DV75QL4-xxSxx-K

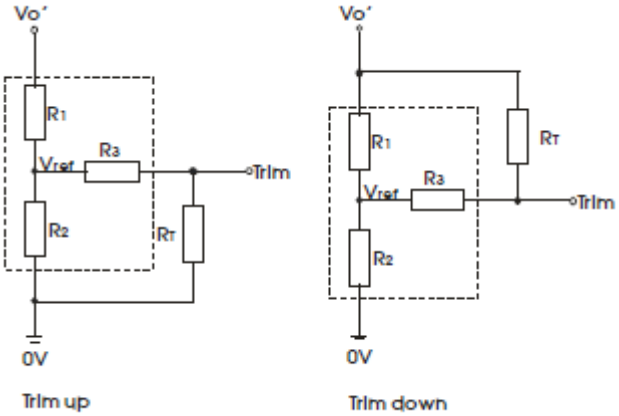
All Dimensions in mm[inches]
Pin1, 2, 3, 5, 6, 7 diameter: 1.00[0.039]
Pin 4,8 diameter: 1.50[0.059]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]
Mounting hole screwing torque: Max. 0.4 Nm



PIN CONNECTION	
Pin	**Function**
1	+Vin
2	Ctrl. ON/OFF
3	- Vin
4	-Vout
5	-Sense
6	Trim
7	+Sense
8	+Vout

TRIM Function

Series DV75QL4



Calculation formula of Trim resistance:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2$$

R_T = Trim Resistor value; a = self-defined parameter
Vo'= desired output voltage (±10% max.)

TRIM resistor connection (dashed line shows internal resistor network)

Vout [VDC]	R1[KΩ]	R2[KΩ]	R3[KΩ]	Vref[V]
5	3.036	3	10	2.5
12	11.00	2.87	15	2.5
15	14.03	2.8	15	2.5
24	24.872	2.87	15	2.5
48	53.017	2.913	15	2.5

dev-dorsch electronic vertriebs gmbh ● Münchner Str. 123 ● 85774 Unterföhring
Fon +49 / 89 / 95 08 07 – 60 Fax – 77 Mail: contact@dev-electronic.de ● www.dev-electronic.de