

VIFSD1-DIP Series DC-DC Converter

Rev. 01-2006

Description

Designed to convert fixed voltages into an isolated regulated voltage, the VIFSD1-DIP series is well suited for providing board-mount local supplies in a wide range of applications, including mixed analog/digital circuits, test & measurement equip., process/machine controls, data-com/telecom fields, etc...

Features

- Isolated 1 W output
- Regulated
- High efficiency to 73%
- Single voltage output
- Small footprint
- DIP package style
- Industry standard pinout
- UL94-V0 package
- No heatsink required
- 3K Vdc isolation
- Temperature range: -40°C~+85°C
- No external component required
- Low cost



Model Number	Input Voltage Nominal	Output Voltage	Output Current Max.	Output Current Min.	Efficiency	Package Style
VIFSD1-S5-S5-DIP	5 Vdc	4.75~5.25 Vdc	5 Vdc	150 mA	15 mA	69%
VIFSD1-S5-S9-DIP	5 Vdc	4.75~5.25 Vdc	9 Vdc	111 mA	12 mA	70%
VIFSD1-S5-S12-DIP	5 Vdc	4.75~5.25 Vdc	12 Vdc	83mA	9 mA	71%
VIFSD1-S5-S15-DIP	5 Vdc	4.75~5.25 Vdc	15 Vdc	67 mA	7 mA	72%
VIFSD1-S12-S5-DIP	12 Vdc	11.4~12.6 Vdc	5 Vdc	150 mA	15 mA	69%
VIFSD1-S12-S9-DIP	12 Vdc	11.4~12.6 Vdc	9 Vdc	111 mA	12 mA	71%
VIFSD1-S12-S12-DIP	12 Vdc	11.4~12.6 Vdc	12 Vdc	83 mA	9 mA	72%
VIFSD1-S12-S15-DIP	12 Vdc	11.4~12.6 Vdc	15 Vdc	67 mA	7 mA	72%
VIFSD1-S24-S5-DIP	24 Vdc	22.8~25.2 Vdc	5 Vdc	150 mA	15 mA	70%
VIFSD1-S24-S9-DIP	24 Vdc	22.8~25.2 Vdc	9 Vdc	111 mA	12 mA	72%
VIFSD1-S24-S12-DIP	24 Vdc	22.8~25.2 Vdc	12 Vdc	83 mA	9 mA	73%
VIFSD1-S24-S15-DIP	24 Vdc	22.8~25.2 Vdc	15 Vdc	67 mA	7 mA	73%

Note:

1. All specifications measured at TA=25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.

Output Specifications

Item	Test conditions	Min.	Typ.	Max.	Units
Output power		0.1	1	W	
Line Regulation	For Vin change of 1%			0.25	%
Load Regulation	10% to 100% full load			1	%
Output voltage accuracy	100% full load			±3	
Temperature drift	100% full load			0.03	%/°C
Output ripple & noise	20Hz - 300 KHz Bandwidth	10	15	mVp-p	
Switching frequency	Full load, nominal input	100			KHz

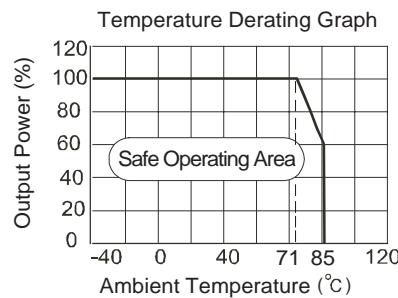
General Specifications

Short circuit protection	<1 second
Temperature rise at full load	25°C Max, 15°C Typ.
Cooling	Free air convection
Operating temperature range	-40°C to +85°C
Storage temperature range	-55°C to +125°C
Soldering temperature	<= 300°C (1.5mm from case for 10 sec.)
Storage humidity range	<95%
Case material	Plastic (UL94-V0)
MTBF	>3,500,000 hrs.
Burn-in	At +85°C, for 4 hours at no-load and 4 hours at full load.

Isolation Specifications

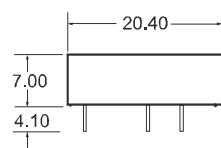
Item	Test Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Tested for 1 min.	3000			Vdc
Insulation Resistance	Test at 500 Vdc	1000			M Ω

Typical Characteristics

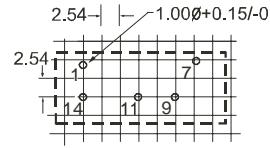


Outline Dimensions & Recommended Layout Pattern

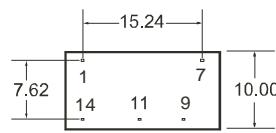
Side View



Layout



Bottom View



Pin	Function
1	-Vin
7	NC
9	+Vout
11	-Vout
14	+Vin

Application Notes:

- Input filtering

To reduce the reflected ripple current and minimize EMI, especially when the converter input is more than 2" away from the DC source, it is recommended to connect a low ESR electrolytic capacitor between Vin and Gnd. The values suggested are as shown in Table 1. If additional filtering is required, the capacitance may be increased, or expanded to an LC network as shown in Figure 1.

Table 1

Input Voltage	External Input Capacitance
5 V	4.7 μ F
12 V	2.2 μ F
24 V	1.0 μ F

- Output filtering

An output capacitor as shown in Table 2 may be used to reduce output ripples and noise. requirements as shown in Table 2. Output capacitance may be increased for additional filtering, but should not exceed 10 μ F. It can also be expanded to an LC network as in Figure 1.

- Minimum loading

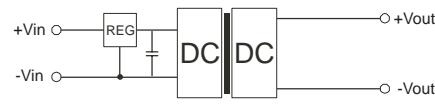
The converter needs a minimum of 10% loading to maintain output regulation. Operation under no-load conditions will not cause immediate damages but may reduce reliability, and cause performance not to meet specifications.

- Protection

The converter has minimal protection against input over-voltage or output over-load, and may be permanently damaged if exposed to these conditions. An input clamping device can be used for input voltage limiting. An input fuse or an output fuse can also be used to protect against over-loading.

- Unregulated input

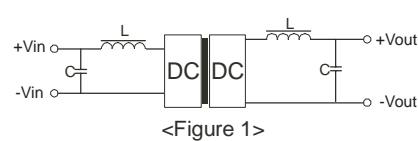
As fixed input converters, this series can accept voltages within a limited range of the nominal input. Otherwise the converter may not function properly or may be damaged. An optional regulator can be used at the input to bring voltage within regulation, as shown in Figure 2.



<Figure 2>

Table 2

Vout	External Output Capacitance
5 V	4.7 μ F
9 V	2.2 μ F
12 V	1.0 μ F
15 V	0.47 μ F



<Figure 1>