Technical Specification

DVN2F Series (SIP7)

Fixed Input, 5.2KVDC Isolated 2W DC/DC Converters

FEATURES

- Ultra high efficiency up to 89%
- Super capacitive load capability, up to 2700uF
- 3KVDC, 5.2KVDC isolation options
- Fixed input : 3.3, 5, 12, 15, 24VDC (±10%)
- Single and bipolar isolated outputs: 3.3, 5, 9, 12, 15, 24, ±5, ±12, ±15VDC
- Fixed switching frequency
- Industrial standard footprint: SIP7
- Output short protection
- Operating temperature range: -40°C to 105°C without derating
- All material compliance with UL94V-0
- Fully encapsulated, high reliability
- MTBF up to 4M hours
- RoHS Compliance

PRODUCT OVERVIEW

The DVN2F modules are highly reliable, and efficient isolated DC/DC converter with industrial potted module technology. Wide temperature range and encapsulated package is ideal for industrial applications. Intended target markets include industrial control, power electronics, instrumentations, medical systems, transportation where power modules must meet rugged environmental requirements, impact size and isolated output voltages are required.

The DVN2F modules provide voltage isolation from input to output up to 5.2KVDC. The operation temperature range is -40 ℃ to +105 ℃ , the module delivers full output power @ 105 ℃ ambient temperature under free air convection. These modules are ideal for applications that do not require any heat sink or forced air cooling.

The DVN2F series are designed to IEC/EN 62368-1 safety standards.

Models Selections

Basic Models	Input Voltage [VDC]	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency Typ. [%]	Capacitive Load Max. [μF]	Package [inch]
DVN2F03S03S	3.3	2.97-3.63	3.3	606	76	2400	0.77"×0.24"×0.40" SIP7
DVN2F05S05S	5	4.5-5.5	5	400	85	2400	
DVN2F05S09S	5	4.5-5.5	9	222	86	1000	
DVN2F05S12S	5	4.5-5.5	12	167	87	560	
DVN2F05S15S	5	4.5-5.5	15	133	87	560	
DVN2F05B05S	5	4.5-5.5	±5	±200	84	1200	
DVN2F05B12S	5	4.5-5.5	±12	±84	84.5	220	
DVN2F05B15S	5	4.5-5.5	±15	±66	88	220	
DVN2F12S05S	12	10.8-13.2	5	400	82	220	
DVN2F12S09S	12	10.8-13.2	9	222	83	2400	
DVN2F12S12S	12	10.8-13.2	12	167	85	560	

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DVN2F12S15S	12	10.8-13.2	15	133	87	560	0.77"×0.24"×0.40" SIP7
DVN2F12S24S	12	10.8-13.2	24	83	89	220	
DVN2F12B05S	12	10.8-13.2	±5	±200	81	1200	
DVN2F12B12S	12	10.8-13.2	±12	±84	85	220	
DVN2F12B15S	12	10.8-13.2	±15	±66	89	220	
DVN2F15S05S	15	13.5-16.5	5	400	80	2400	
DVN2F15S09S	15	13.5-16.5	9	222	82	1000	
DVN2F15S12S	15	13.5-16.5	12	167	84	560	
DVN2F15S15S	15	13.5-16.5	15	133	86	560	
DVN2F15S24S	15	13.5-16.5	24	83	88	220	
DVN2F15B05S	15	13.5-16.5	±5	±200	80	1200	
DVN2F15B12S	15	13.5-16.5	±12	±84	85	220	
DVN2F15B15S	15	13.5-16.5	±15	±66	86	220	
DVN2F24S05S	24	21.6-26.4	5	400	80	2400	
DVN2F24S09S	24	21.6-26.4	9	222	84	1000	
DVN2F24S12S	24	21.6-26.4	12	167	84	560	
DVN2F24S15S	24	21.6-26.4	15	133	87	560	
DVN2F24S24S	24	21.6-26.4	24	83	88	220	
DVN2F24B05S	24	21.6-26.4	±5	±200	81	1200	
DVN2F24B12S	24	21.6-26.4	±12	±84	87	220	
DVN2F24B15S	24	21.6-26.4	±15	±66	88	220	

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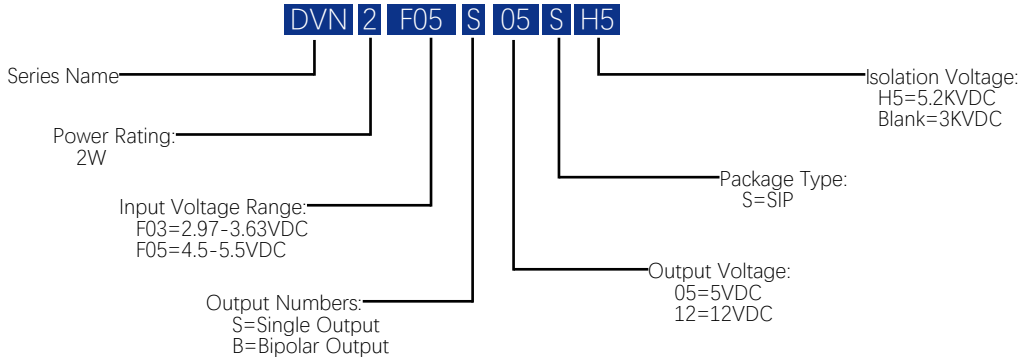
Model Numbering



Absolute Maximum Ratings

Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage	3.3 Vin type			5	VDC
	5 Vin type			10	VDC
	12 Vin type			20	VDC
	15 Vin type			25	VDC
	24 Vin type			36	VDC
Operating Environment Temperature		-40		105	°C
Storage Temperature Range		-50		125	°C
Soldering Temperature	Lead temperature, 1.5mm from case for 10 seconds			300	°C

General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Standard mode, test for 1 minute.	3000			VDC
	H5 type, test for 1 minute.	5200			VDC
Isolation Resistance	Viso=1000VDC	10			GΩ
Case Temperature Above Ambient				20	℃
Switching Frequency			537		KHz
Relative Humidity		5		95	%
Cooling	Free air convection				

Input Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	As shown in the "Models Selection"				
Reflected Ripple Current			11	20	mA p-p
Output Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Output Power				2	W
Vout Accuracy	See voltage accuracy envelope on page 3.				
Line Regulation			1.05	1.1	%/%
Ripple & Noise ①			75	200	mV
Minimum Load ②		0			%
Output Short Protection	Continuous short protection.				

Notes:

① For output ripple & noise test conditions, please see output ripple & noise in technical notes on page 8 for details.

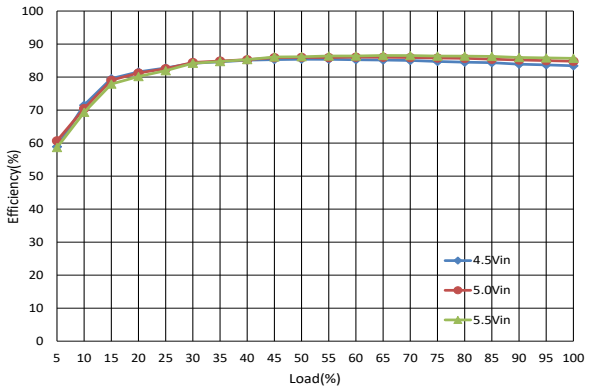
② Operating below 10% load will not harm the converter, but specifications may not be met, such as the output voltage may be higher than rated output voltage.

All specifications are tested at 25 °C ambient temperature, nominal input voltage, rated output current conditions unless otherwise specified.

Performance Data

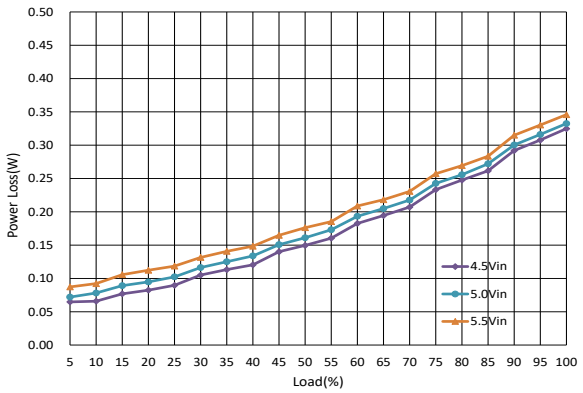
EFFICIENCY VS LOAD

DVN2F05S05S Module

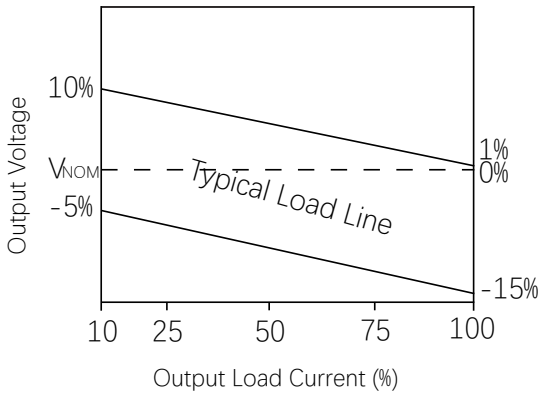


POWER LOSS VS LOAD

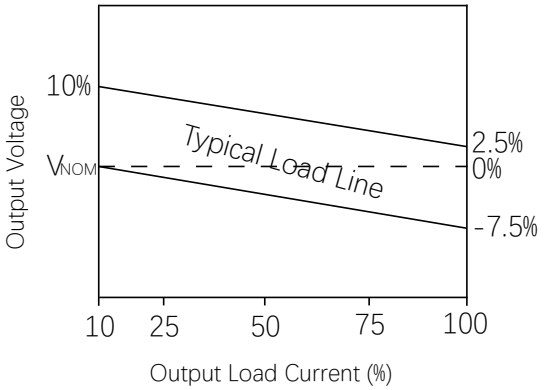
DVN2F05S05S Module



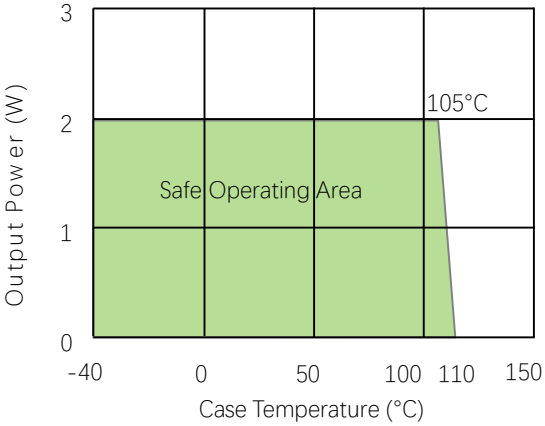
VOUT ACCURACY ENVELOPE (3.3 Vin TYPE)



VOUT ACCURACY ENVELOPE (OTHER TYPES)

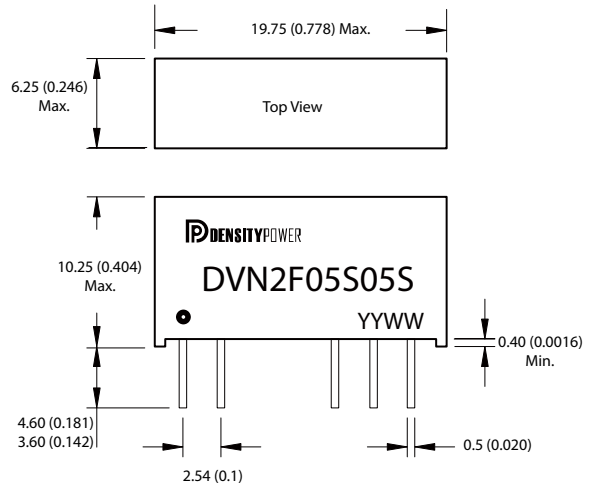


TEMPERATURE DERATING



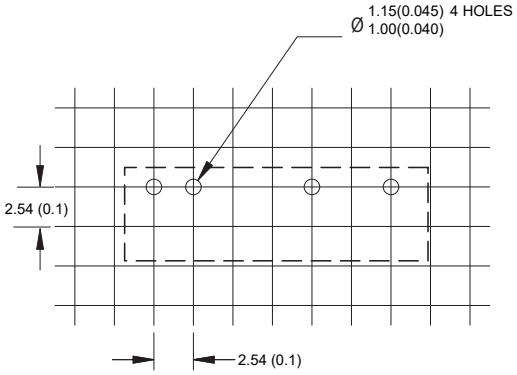
Mechanical Specifications

MECHANICAL DIMENSIONS



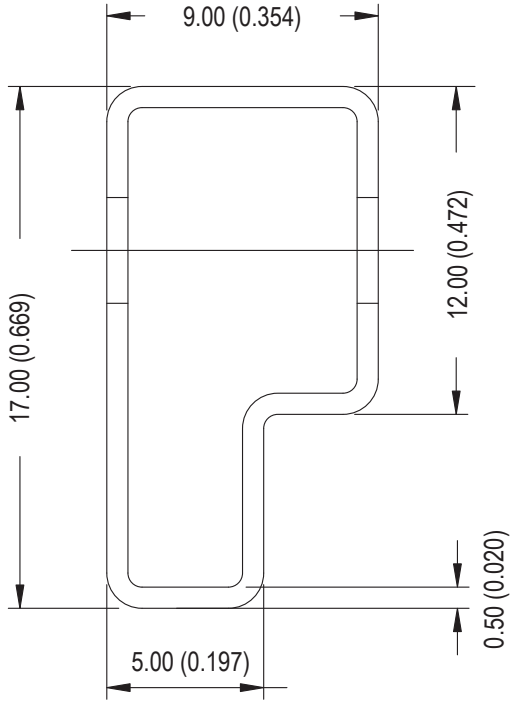
Unless otherwise specified, all dimensions are in mm±0.25 (inches ±0.01).

RECOMMENDED FOOTPRINT DETAILS



Unless otherwise specified, all dimensions are in mm ±0.5 (inches±0.02).

TUBE OUTLINE DIMENSIONS

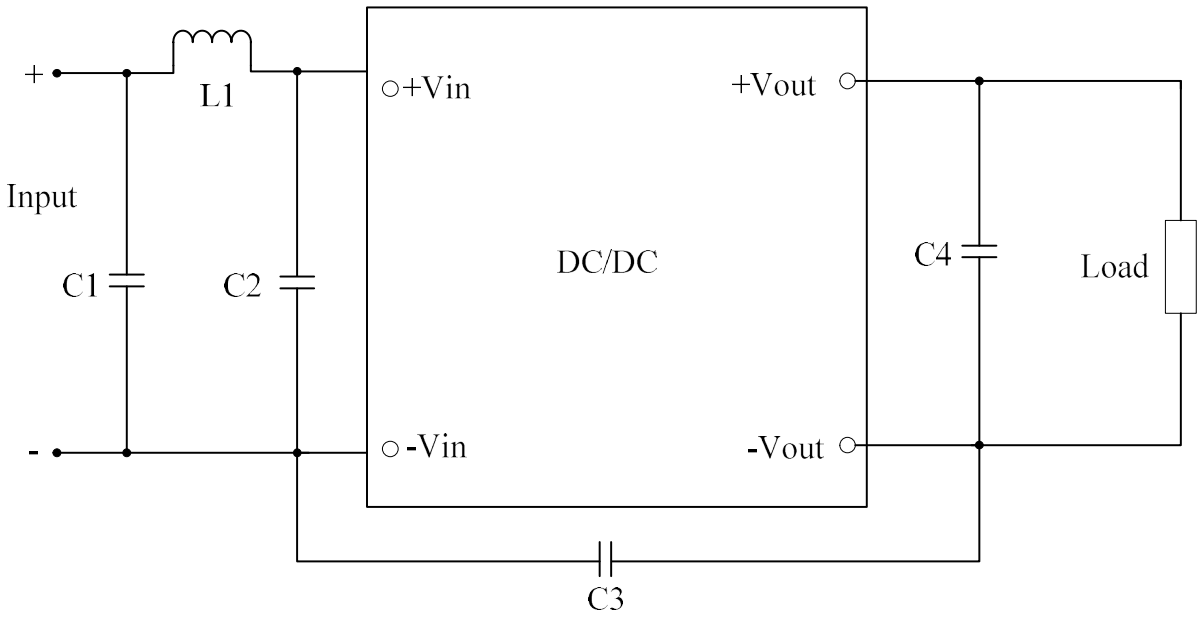


Unless otherwise specified, all dimensions are in mm ±0.5 (inches±0.02).
Tube length : 530mm ±2mm (20.87)
Tube quantity : 25pcs

PIN Connections			
Single Output		Bipolar Output	
Pin	Function	Pin	Function
1	+Vin	1	+Vin
2	-Vin	2	-Vin
5	-Vout	5	-Vout
7	+Vout	6	GND
		7	+Vout

Emissions Performance

Density Power measures its products for emissions against the CISPR32/EN55032 standards. The maximum output power of the module is 2W and the conduction limits can meet class B.



Conducted Emissions Test Circuit

Conducted Emissions Parts List

REFERENCE	DESCRIPTION	REFERENCE	DESCRIPTION
C1	10μF	C3	2.2nF
C2	4.7μF	C4	According to capacitive loading in technical notes on page 6
L1	6.8μH		

Technical Notes

INPUT FUSING

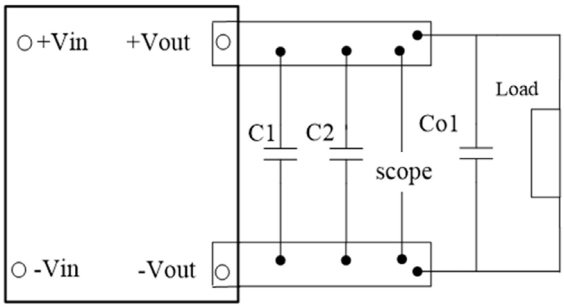
Certain applications may require fuse at the inputs of power conversion components. Fuses should also be used when there is possibility of sustained input voltage reversal which is not current limited. The DVN2F modules are not internally fused. We strongly recommend a fast blow fuse to be used in the ungrounded input supply line.

For safety agency approvals, the installer must install the converter in compliance with the end user safety standard.

ISOLATION VOLTAGE

The DVN2F series are 100% production tested at their specified isolation voltage. Parts can be expected to withstand the specified test voltage several times. But it is well known that repeated high-voltage isolation testing will degrade isolation capability which is depending on materials, construction and environment. Thus, the number of tests should be strictly limited and we strongly advise against repeated high voltage isolation testing.

OUTPUT RIPPLE & NOISE



These DVN2F series' output ripple and noise is measured at the rated input voltage and output current, along with 10uF tantalum capacitor and 0.1uF MLCC are used in parallel with appropriate voltage ratings. The oscilloscope bandwidth is set to 20MHz.

External output capacitors are required to reduce the ripple & noise. The output capacitors should be low ESR and appropriate frequency response with appropriate voltage ratings, and must be located as close to the converters as possible, also particular load and layout must be taken into consideration.

This product is subject to the following operating requirements and the Life and Safety Critical Application Sales Policy:
Refer to: http://www.densitypower.com