Technical Specification

DVP2F Series (SIP6)

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

FEATURES

- Design to meet AEC-Q200 standard
- IATF16949 certified manufacturing
- Ultra high efficiency up to 88%
- Super capacitive load capability, up to 2700uF
- 3KVDC, 5.2KVDC isolation options
- Fixed input : 3.3, 5VDC (±10%)
- Single and bipolar isolated outputs: 3.3, 5, 9, 12, 15, ±5, ±12, ±15VDC
- Fixed switching frequency
- Industrial standard footprint: SIP6
- 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 DVP2F 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 DVP2F 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 DVP2F 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. [%]	Ripple & Noise [mVp-p] ①	Package [inch]
DVP2F03S03S	3.3	2.97-3.63	3.3	606	76	30	0.77"×0.24"×0.40" SIP6
DVP2F05S05S	5	4.5-5.5	5	400	85	30	
DVP2F05S09S	5	4.5-5.5	9	222	86	39	
DVP2F05S12S	5	4.5-5.5	12	167	87	50	
DVP2F05S15S	5	4.5-5.5	15	133	87	66	
DVP2F05B05S	5	4.5-5.5	±5	±200	84	35	
DVP2F05B12S	5	4.5-5.5	±12	±84	84.5	50	
DVP2F05B15S	5	4.5-5.5	±15	±66	88	70	

Note:

① For output ripple & noise test conditions, please see output ripple & noise in technical notes on page 6 for details.

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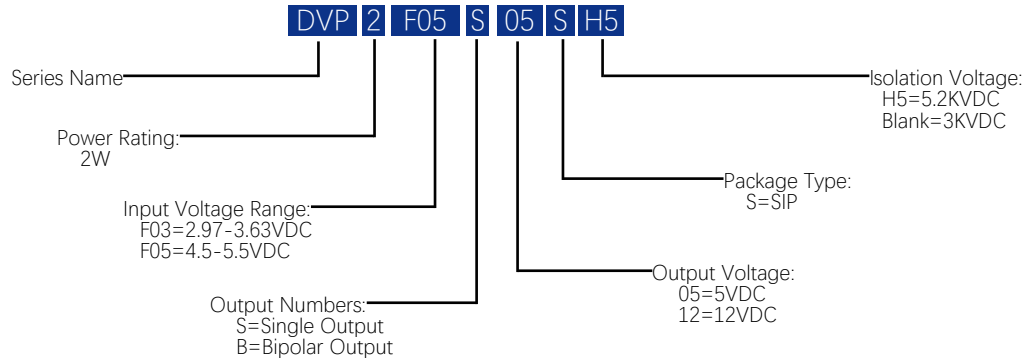
Model Numbering



Absolute Maximum Ratings

Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage	3.3 Vin type			5	VDC
	5 Vin type			6	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			500		KHz
Relative Humidity		5		95	%
Cooling	Free air convection				

Input Specifications

Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	3.3 Vin type	2.97	3.3	3.63	VDC
	5 Vin type	4.5	5	5.5	VDC
Reflected Ripple Current			11	20	mA p-p

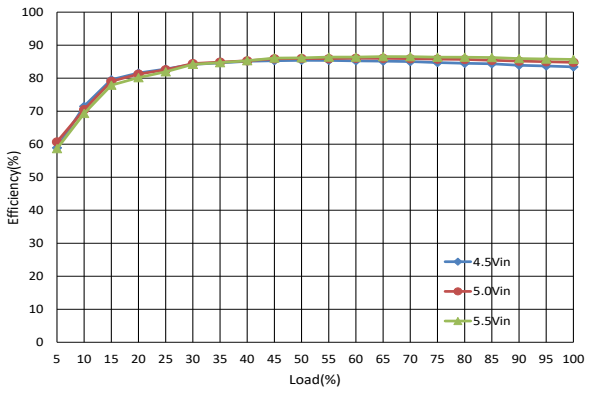
Output Specifications					
Parameters	Conditions	Min.	Typ.	Max.	Units
Output Power				2	W
Vout Accuracy	See voltage accuracy envelope on page 3.				
Line Regulation			1.05	1.1	%/%
Minimum Load ①		0			%
Output Short Protection	Continuous short protection.				
Note: ① Operating below 10% load will not 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

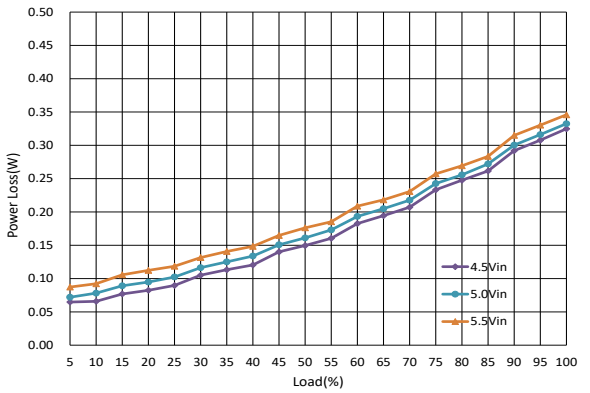
EFFICIENCY VS LOAD

5Vout Module

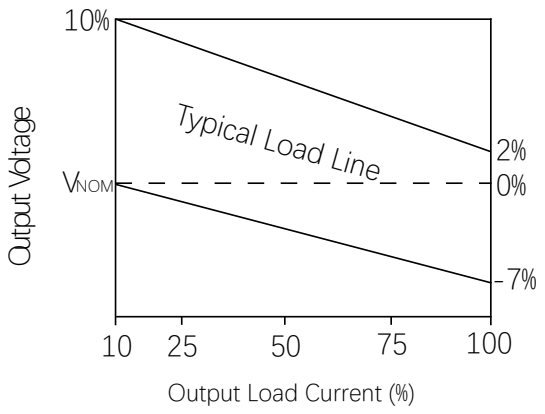


POWER LOSS VS LOAD

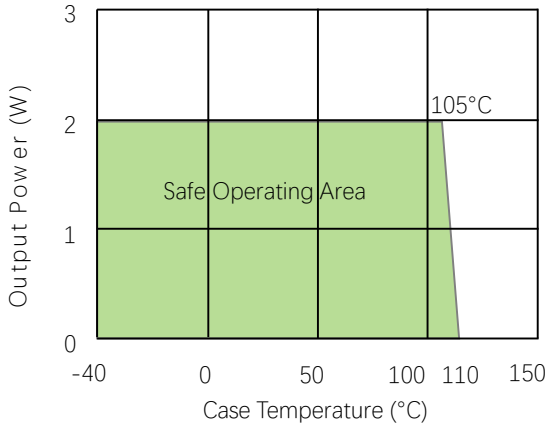
5Vout Module



VOUT ACCURACY ENVELOPE

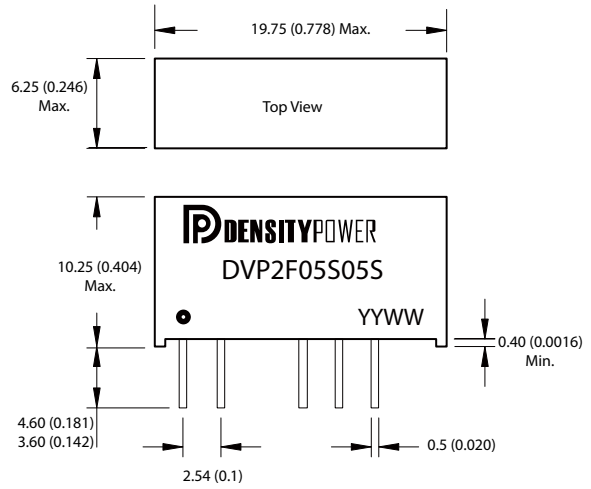


TEMPERATURE DERATING



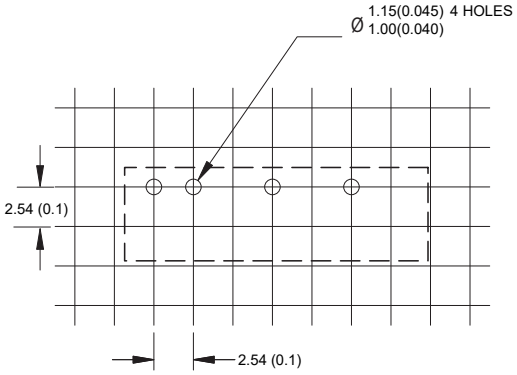
Mechanical Specifications

MECHANICAL DIMENSIONS



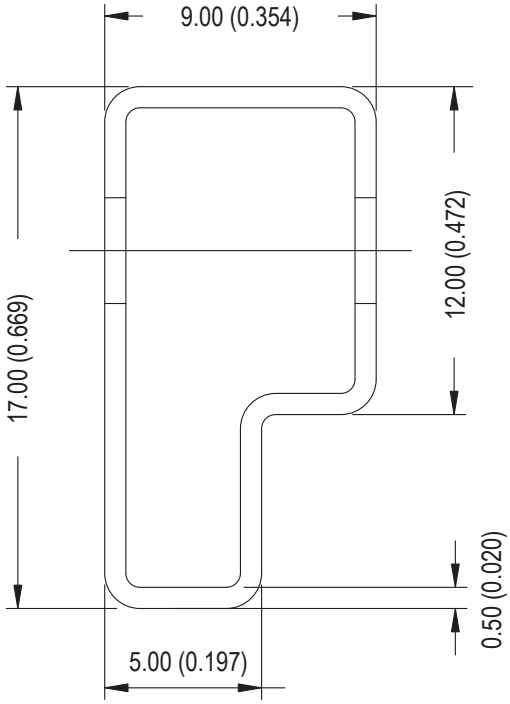
Unless otherwise specified, all dimensions are in mm±0.25 (inches ±0.01).

RECOMMENDED FOOTPRINT DETAILS



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

TUBE OUTLINE DIMENSIONS

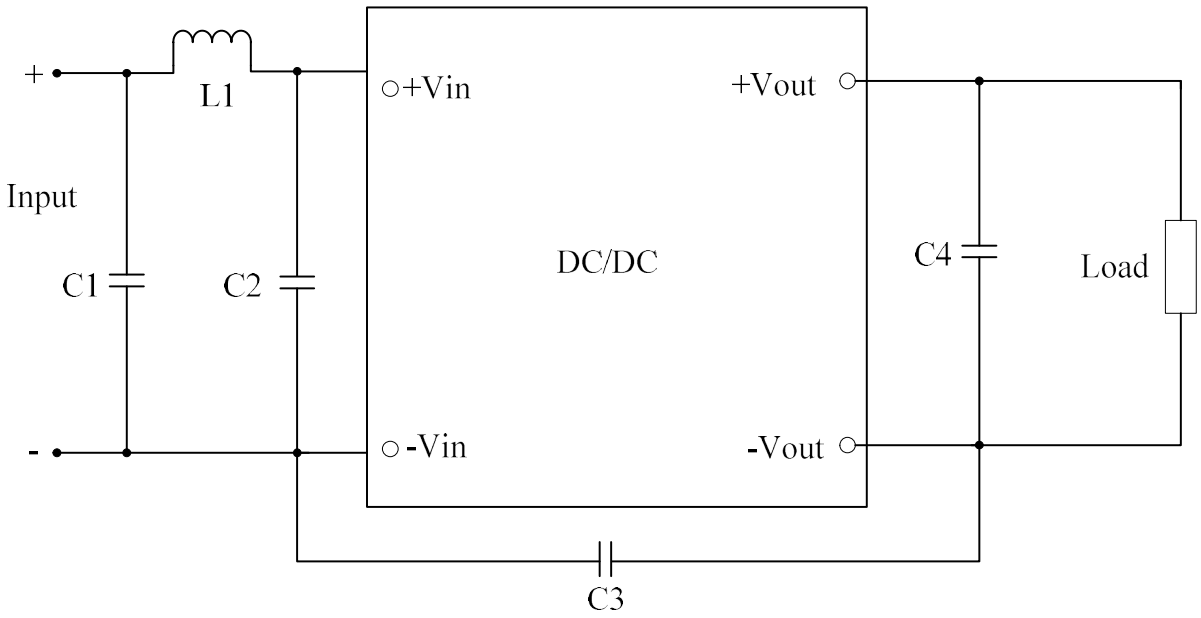


Unless otherwise specified, all dimensions are in mm ±0.5 (inches±0.02).
Tube length : 530mm ±2mm (20.87)
Tube quantity : 25pcs

PIN Connections			
Single Output		Bipolar Output	
Pin	Function	Pin	Function
1	+Vin	1	+Vin
2	-Vin	2	-Vin
4	-Vout	4	-Vout
6	+Vout	5	GND
		6	+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		

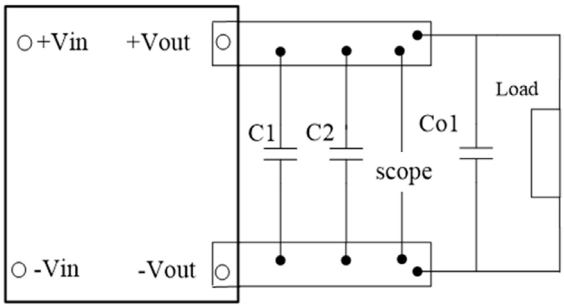
Technical Notes

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 DVP2F 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.

OUTPUT RIPPLE & NOISE



These DVP2F 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.

ISOLATION VOLTAGE

The DVP2F 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.

CAPACITIVE LOADING

The DVP2F series are optimized for robust output capacitance load capability. It can start up with 2700uF capacitance @ 100% rated output current within 20mS.

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