

Technical Specification

DVR1F Series (SMD)

Fixed Input, 3KVDC Isolated 1W DC/DC Converters

FEATURES

- Fixed input: 5VDC ($\pm 10\%$)
- Single output: 5VDC
- Operating temperature range: -40°C to 85°C without derating
- Efficiency up to 69%
- Super capacitive load capability, up to 2700uF
- 3KVDC Isolation
- Industrial standard footprint: Visually inspectable LGA package
- Output short protection
- All material compliance with UL94V-0
- MTBF up to 4M hours
- Available in tape & reel package
- RoHS Compliance



PRODUCT OVERVIEW

The DVR1F series are high reliability and efficiency surface mount type isolated DC/DC converters. Wide temperature range and enclosed open frame package is optimized for reflow soldering process per J-STD-020 and J-STD-075. This DVR1F series intend typical applications for industrial control, power electronics, instrumentations, transportations where are required a distribution power system with isolated low power.

The DVR1F series feature an extended ambient temperature operating range of -40°C to $+85^{\circ}\text{C}$ without derating under free air convection and up to 3KVDC isolation from input to output. The modules incorporate the visually Inspectable Land Grid Array (vLGA) package that allows easy of probing and inspecting all soldering pads and be supplied in standard tape and reel package, which is ideal for automated surface mount production process.

The DVR1F series are designed to IEC/EN 62368-1 safety standards.

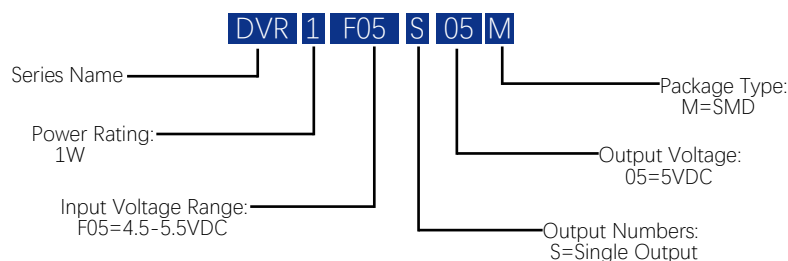
Models Selections

Basic Models	Input Voltage [VDC]	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency Typ. [%]	Ripple & Noise [mVp-p] ^①	Package [inch]
DVR1F05S05M	5	4.5-5.5	5	200	69	20	0.71"×0.42"×0.26" SMD

Note:

- ① For output ripple & noise test conditions, please see output ripple & noise in technical notes on page 5 for details.

Model Numbering



Absolute Maximum Ratings

Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage				7	VDC
Operating Environment Temperature		-40		85	°C
Storage Temperature Range		-50		125	°C
Reflow Temperature	As per J-STD-020D.1			245	°C

General Specifications

Parameters	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Test for 1 minute.	3000			VDC
Isolation Resistance	Viso=1000VDC	10			GΩ
Case Temperature Above Ambient				20	°C
Switching Frequency			280		KHz
Relative Humidity		5		95	%
Cooling	Free air convection				

Input Specifications

Parameters	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range		4.5	5	5.5	VDC
Reflected Ripple Current			10	20	mA p-p

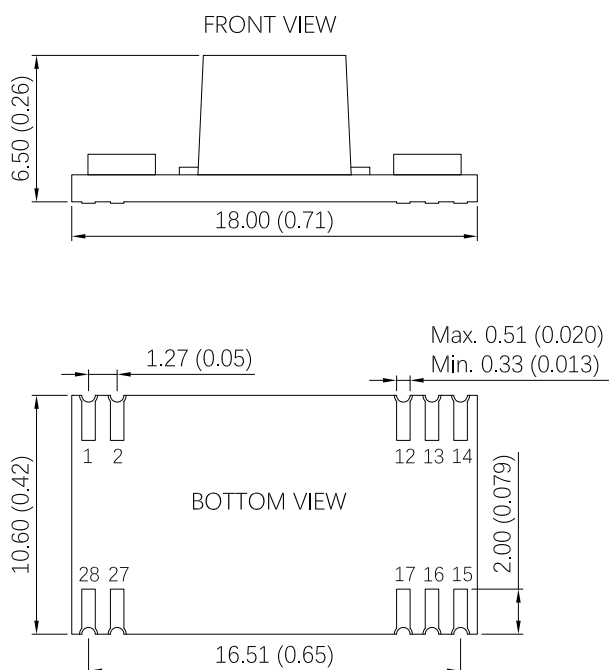
Output Specifications

Parameters	Conditions	Min.	Typ.	Max.	Units
Output Power				1	W
Vout Accuracy		-1.0		+1.0	%
Line Regulation	Half load	-1.0		+1.0	%
Load Regulation	Norminal Vin	-1.0		+1.0	%
Output Short Protection	Continuous short protection.				

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

Mechanical Specifications

MECHANICAL DIMENSIONS

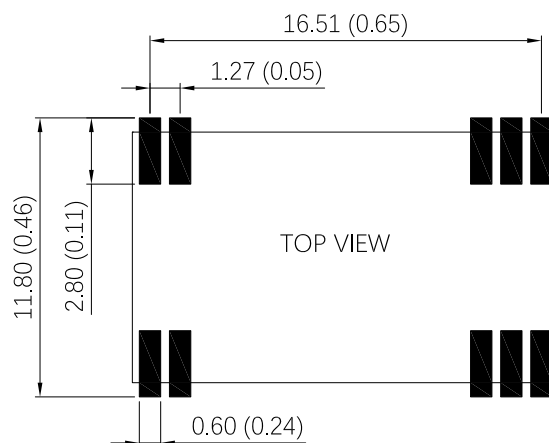


Unless otherwise specified, all dimensions are in mm \pm 0.25 (inches \pm 0.01).

PIN Connections	
Pin	Function
1	+Vin
2	+Vin
12	NC
13	-Vout
14	+Vout
15-17	NC
27	-Vin
28	NC

NC=No Connection

RECOMMENDED FOOTPRINT DETAILS



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

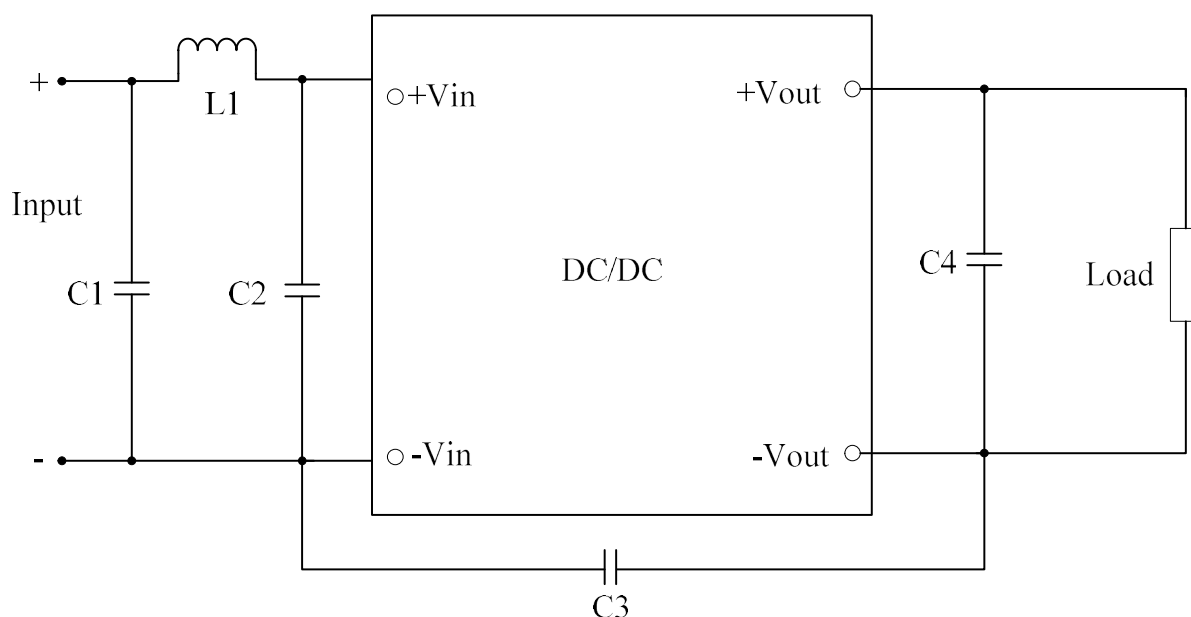
MARKING INFORMATION



DVR0505 = Product Model Marking Code
XXYY = Lot No. Marking

Emissions Performance

Density Power measures its products for emissions against the CISPR32/EN55032 standards. The maximum output power of the module is 1W and the conduction limits can meet class B.



Conducted Emissions Test Circuit

Conducted Emissions Parts List

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

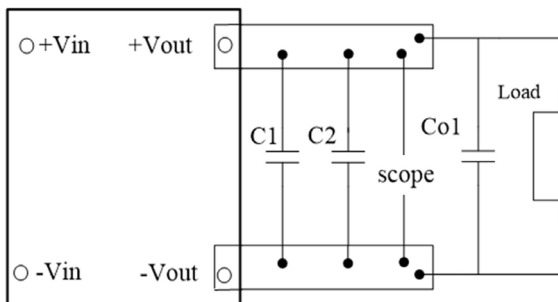
Technical Notes

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 DVR1F 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 DVR1F 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 DVR1F 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 DVR1F 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>

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