

## DESCRIPTION

The series of DC-DC medical converter in industrial standard pin-out DIP24 package, are capable of delivering 4 watts. They are designed for high end industrial application, medical application.

## FEATURES

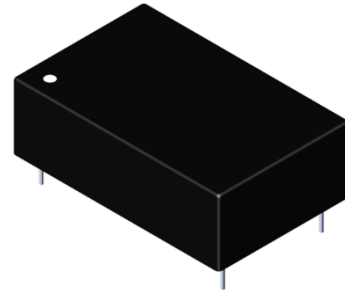
- 2:1 Wide input range voltage
- 4W power in standard DIP 24 package
- 8mm Clearance and creepage distance @ 250Vac working voltage
- 4000Vac isolation for 2MOPP application
- Built-in EMI class A filter
- Continuous short circuit Protection
- UL94V-0 package material
- EN60601 safety approved

## WATTAGE

Wattage: 4W

## DIMENSION

Dimension: 31.8(L) x 20.3(W) x 10.2(H)mm



## SAFETY STANDARD APPROVAL

Medical safety meets 2xMOPP per 3<sup>rd</sup> Edition of IEC/EN 60601-1

## ENVIRONMENTAL SPECIFICATION

Operating temperature: -40°C to +95°C  
Storage temperature: -55°C to +125°C

## SELECTION GUIDE

Part number	Input voltage	Output voltage	Output current @ full load	Input current @ no load	Efficiency <sup>(1)</sup> (typ.)	Capacitive load <sup>(2)</sup> (max.)
D04M-DF2-PT	4.5-9Vdc Nom. 5Vdc	3.3Vdc	100mA	110mA	82%	4700uF
D04M-DF2-PP		05Vdc	800mA	110mA	83%	4700uF
D04M-DF2-PH		12Vdc	333mA	110mA	86%	2200uF
D04M-DF2-PG		15Vdc	267mA	110mA	87%	2200uF
D04M-DF2-PA		24Vdc	167mA	110mA	86%	1000uF
D04M-DF2-HT	9-18Vdc Nom. 12Vdc	3.3Vdc	100mA	45mA	83%	4700uF
D04M-DF2-HP		05Vdc	800mA	45mA	84%	4700uF
D04M-DF2-HH		12Vdc	333mA	45mA	86%	2200uF
D04M-DF2-HG		15Vdc	267mA	45mA	87%	2200uF
D04M-DF2-HA		24Vdc	167mA	45mA	87%	1000uF
D04M-DF2-AT	18-36Vdc Nom. 24Vdc	3.3Vdc	100mA	25mA	82%	4700uF
D04M-DF2-AP		05Vdc	800mA	25mA	85%	4700uF
D04M-DF2-AH		12Vdc	333mA	25mA	86%	2200uF
D04M-DF2-AG		15Vdc	267mA	25mA	87%	2200uF
D04M-DF2-AA		24Vdc	167mA	25mA	87%	1000uF

1. The efficiency is test by nominal input and max. full load @25°C.
2. The capacitive load is test by minimum input and constant resistive load.
3. Special input and output voltage combinations available by request, please check with our sales.

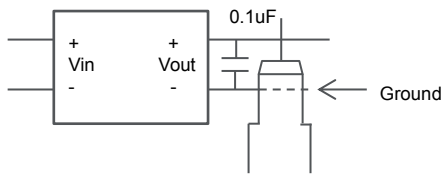
## SPECIFICATION

	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input	Input filter		Pi type			
	Input voltage range	Nominal input = 5V	4.5	5	9	VDC
		Nominal input = 12V	9	12	18	VDC
		Nominal input = 24V	18	24	36	VDC
	Under voltage lockout	5V input		3.7		VDC
		12V input		7.9		VDC
	24V input		16.7		VDC	
Output	Voltage accuracy			±1		
	Line regulation	LL to HL at 100% load			±0.2	%
	Load regulation	10% - 100% load			±0.2	%
	Minimum load		0			%
	Ripple & noise	Nominal Vin @full load			100	mVp-p
	Operating frequency	Nominal Vin @full load			150	KHz
Environment	Operating temperature	Nominal Vin @nature convection	-40		95	°C
	Storage temperature		-55		125	°C
	Max case temperature				105	°C
	Relative Humidity		5		95	%
	MTBF(MIL-HDBK-217F)	+25°C	6.5			KHrs
	Vibration		MIL-STD-810F			
Function	Isolation voltage	60sec.	8			KVDC
		60sec.	4			KVAC

Electrical	Isolation resistance		10			GΩ
	Isolation capacitance			20		pF
	Creepage		8			mm
	UVLO protection		Option			
	Short Circuit Protection		Continuous, auto restart			
	Safety Approvals		Medical safety meets 2xMOPP per 3rd Edition of IEC/EN 60601-1			
Physical	Dimension		31.8x20.3x10.2 mm			
	Weight		14		g	
	Case material		Non-conductive black plastic			
	Base material		Non-conductive black plastic			
	Potting material		Silicone (UL94V-0)			
	Cooling method		Free air convection			
EMC	EMI	EN55011	Class A			
	ESD	EN61000-4-2, Air±15kV; Contact±8kV	Perf. Criteria A			
	Radiated immunity	EN61000-4-3, 10 V/m	Criteria A			
	Fast transient	EN61000-4-4, ± 2kV	Criteria A			
	Surge	EN61000-4-5, ± 1kV	Criteria A			
	Conducted immunity	EN61000-4-6, 10 Vr.m.s	Criteria A			

- The EMI class A without external circuit, the class B suggestion circuit, please contact our sales.
- The product information and specifications are subject to change without prior notice.

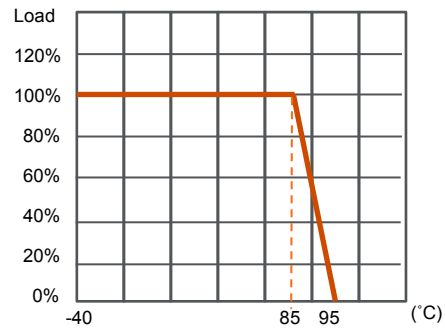
### RIPPLE & NOISE



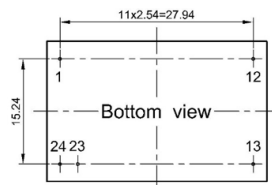
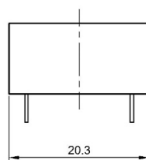
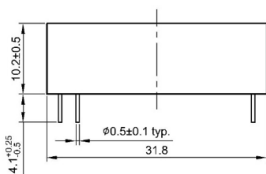
\*Measured with 20MHz bandwidth and 0.1uF ceramic capacitor.

### DERATING CURVE

Ambient temperature nature convection (Nominal Vin)



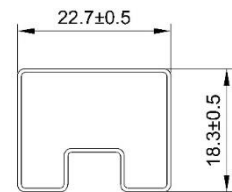
### MECHANICAL SPECIFICATION



Projection : Third angle projection  
Unit : mm  
Tolerance : ±0.25mm

### PACKAGE

Pin	Single
1	+Vin
12	-Vout
13	+Vout
23	-Vin
24	-Vin



UNIT:mm  
1 Tube = 15 pcs  
Length:520±2mm