10DPMW4_5 series

10W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 10 Watt

- **Ultra-wide 4:1 input voltage range**
- **100% burned in**
- **High efficiency up to 85%**
- **Customized solutions available**
- **Ul94V-0 package material**
- **Operating temperature: -40°C to +82°C**
- **Medical EMC standard of EMI EN 55011:2009 + A1:2010 (Class A) approved**
- **Medical EMC standard of EMS EN60601-1-2:2015 approved**
- **I/O isolation 5000VACrms with reinforced insulation, rated for 250VAC working voltage**

The 10DPMW4_5 series series are isolated 10W DC-DC converter products with an extremely wide voltage input range of 9-36VDC or 18-75VDC, input to output isolation voltage of 5000VAC, Input under-voltage protection, output short-circuit, over-current and over–voltage protection. They meet EMC standard of EMS EN60601-1-2:2015 standards without external components and they are widely used in applications such as medical, industry and ITE.

Common specifications

Switching Frequency	300 KHz
Operating Temperature	-40°C ~ +85°C (Refer to temperature derating graph)
Storage Temperature	-55°C ~ +125°C
Case Temperature	+95°C
Humidity	5% ~ 95% (Non-condensing)
Cooling	Natural Convection (20LFM)
Case material	Plastic
MTBF (MIL-HDBK-217F @25°C):	900,000 hours
Weight	12.0g Typ.
Dimensions	31.6 x 20.1 x 10.0mm

Input specifications

Item	Test condition	Min	Typ	Max	Units
Voltage Types				4:1	
Filter			PI Network		
Protection	Fuse Recommended				
Start up Time	Constant resistive load		15		ms
Remote ON/OFF	DC-DC ON (Referred to –Vin pin)	0	Open	1.2	VDC
		2.2		12	VDC

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage Tolerance	Full load @Vin (nom.)			±2	%
Short Circuit Protection	Hiccup, automatic Recovery				
Line Regulation				±0.5	%
Load Regulation	Single Dual(Balance Load)			±0.5 ±0.5	% %
Cross Regulation	Dual (25% To 100% Load)			±5	%
Ripple & Noise	Output:3-15V TYPES BW = DC To 20MHz			100	mVp-p
	Output > 15V TYPES BW = DC To 20MHz			1% of Vout	mVp-p
Transient response setting time	25% load step change		350		us
External Trim Adj. Range				±10	%

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	I/P to O/P Reinforced insulation for 250VAC working voltage			5000	VAC
Isolation resistance	500VDC	1000			MΩ

Example:
10DPMW4_2415S5
10 = 10Watt; D = DIP; PM = Series; W4 = Wide input (4:1); 24 = 9-36Vin; 15 = 15Vout; S = Single output; 5 = 5000VAC isolation

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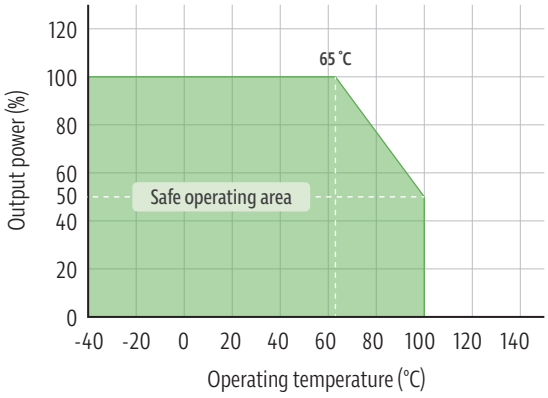
Product Selection Guide

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max/Min]	Efficiency[2] (%, Min./Typ.) @ Full Load	Max. Capacitive load[3] [µF]
	VDC	No Load (mA TYP)	Full Load (mA TYP)				
10DPMW4_2403S5	24 (9-36)	7	414	3.3	2500	83	4700
10DPMW4_2405S5	24 (9-36)	7	496	5	2000	84	2500
10DPMW4_2412S5	24 (9-36)	7	496	12	833	84	430
10DPMW4_2415S5	24 (9-36)	7	499	15	670	84	270
10DPMW4_4803S5	48 (18-75)	4	207	3.3	2500	83	4700
10DPMW4_4805S5	48 (18-75)	4	248	5	2000	84	2500
10DPMW4_4812S5	48 (18-75)	4	248	12	833	84	430
10DPMW4_4815S5	48 (18-75)	4	249	15	670	84	270

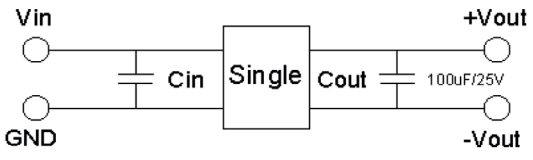
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max/Min]	Efficiency[2] (%, Min./Typ.) @ Full Load	Max. Capacitive load[3] [µF]
	VDC	No Load (mA TYP)	Full Load (mA TYP)				
10DPMW4_2405D5	24 (9-36)	7	496	±5	±1000	84	±1250
10DPMW4_2412D5	24 (9-36)	7	494	±12	±420	85	±220
10DPMW4_2415D5	24 (9-36)	7	500	±15	±340	85	±135
10DPMW4_4805D5	48 (18-75)	4	248	±5	±1000	84	±1250
10DPMW4_4812D5	48 (18-75)	4	247	±12	±420	85	±220
10DPMW4_4815D5	48 (18-75)	4	250	±15	±340	85	±135

Typical characteristics

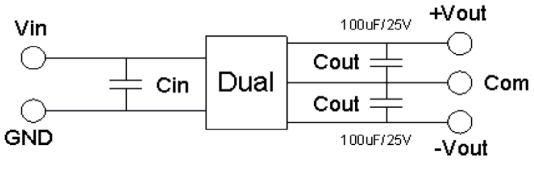
Temperature derating graph



Recommended test circuit



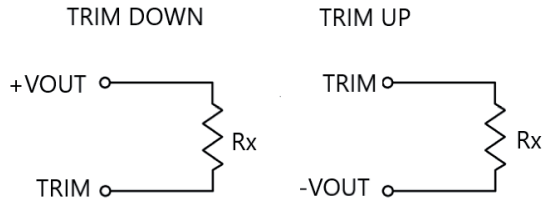
24V&48V: Cin 10uF,100V



24V & 48V :Cin 10uF,100V

External Output Trimming

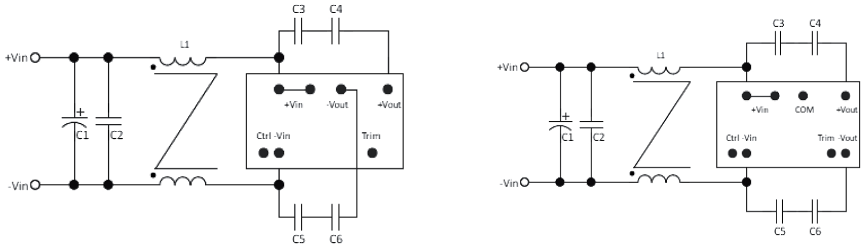
Output can be externally trimmed by using the method shown below.



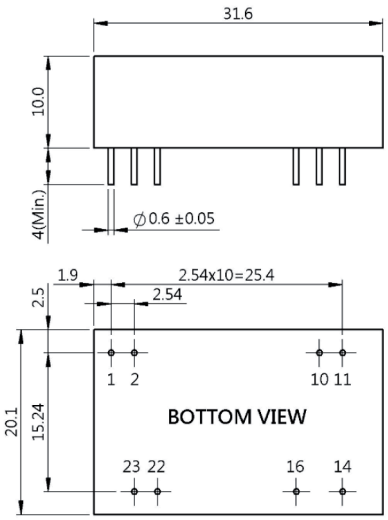
10DPMW4_XX03S5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	152.44KΩ	70.36KΩ	43.01KΩ	29.33KΩ	21.12KΩ	15.65KΩ	11.74KΩ	8.808KΩ	6.53KΩ	4.7KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	87.75KΩ	39.33KΩ	23.18KΩ	15.11KΩ	10.27KΩ	7.04KΩ	4.74KΩ	3.007KΩ	1.66KΩ	0.59KΩ
10DPMW4_XX05S5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	229.9KΩ	102.4KΩ	59.9KΩ	38.65KΩ	25.9KΩ	17.4KΩ	11.33KΩ	6.775KΩ	3.23KΩ	0.4KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	235KΩ	107.5KΩ	65KΩ	43.75KΩ	31KΩ	22.5KΩ	16.43KΩ	11.875KΩ	8.33KΩ	5.5KΩ
10DPMW4_XX12S5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	946.72KΩ	455.16KΩ	291.31KΩ	209.38KΩ	160.22KΩ	127.45KΩ	104.05KΩ	86.49KΩ	72.84KΩ	61.91KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	232.88KΩ	104.44KΩ	61.63KΩ	40.22KΩ	27.38KΩ	18.81KΩ	12.7KΩ	8.11KΩ	4.54KΩ	1.69KΩ
10DPMW4_XX15S5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	1332.4KΩ	644.9KΩ	415.73KΩ	301.15KΩ	232.4KΩ	186.57KΩ	153.83KΩ	129.275KΩ	110.18KΩ	94.9KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	248.9KΩ	111.4KΩ	65.57KΩ	42.65KΩ	28.9KΩ	19.73KΩ	13.19KΩ	8.275KΩ	4.46KΩ	1.4KΩ
10DPMW4_XX05D5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	1483.13KΩ	722.56KΩ	469.04KΩ	342.28KΩ	266.23KΩ	215.52KΩ	179.3KΩ	152.14KΩ	131.01KΩ	114.11KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	258.87KΩ	119.44KΩ	72.96KΩ	49.72KΩ	35.77KΩ	26.48KΩ	19.84KΩ	14.86KΩ	10.99Ω	7.89KΩ
10DPMW4_XX12D5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	1146.29KΩ	514.29KΩ	303.63KΩ	198.3KΩ	135.1KΩ	92.96KΩ	62.87KΩ	40.3KΩ	22.74KΩ	8.7KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	1315.01KΩ	612.01KΩ	377.67KΩ	260.5KΩ	190.2KΩ	143.34KΩ	109.86KΩ	84.75KΩ	65.22KΩ	49.6KΩ
10DPMW4_XX15D5											
Trim down	Vout=	Vox99%	Vox98%	Vox97%	Vox96%	Vox95%	Vox94%	Vox93%	Vox92%	Vox91%	Vox90%
	Rx=	1354.11KΩ	605.56KΩ	356.04KΩ	231.28KΩ	156.42KΩ	106.52KΩ	70.87KΩ	44.14KΩ	23.35KΩ	6.71KΩ
Trim up	Vout=	Vox101%	Vox102%	Vox103%	Vox104%	Vox105%	Vox106%	Vox107%	Vox108%	Vox109%	Vox110%
	Rx=	1692.89KΩ	791.44KΩ	490.96KΩ	340.72KΩ	250.58KΩ	190.48KΩ	147.56KΩ	115.36KΩ	90.32KΩ	70.29KΩ

EMI

Part Position	C1	C2	L1	C3	C4	C5	C6
Part Specification	KY Electrolytic Capacitor 220UF/100V	MLCC 4.7uF/100 V 1812	ACM121 1-701-2 PL-TL01	CD75-B2GA331 KYAKA	CD75-B2GA331 KYAKA	CD75-B2GA331 KYAKA	CD75-B2GA331 KYAKA



Mechanical dimensions



PIN Connection								
PIN	1	2	10	11	14	16	22	23
Single	Remote ON/OFF	-Vin	Trim	No pin	+Vout	-Vout	+Vin	+Vin
Dual	Remote ON/OFF	-Vin	Trim	-Vout	+Vin	Com	+Vin	+Vin

Unit: mm
Tolerance: XX.X±0.5 · XX.XX±0.25