



10DPMW4_6R series

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

DC-DC Converter 10 Watt

- ⊕ Reinforced isolation for 250Vrms working voltage
- ⊕ DIP24 package
- ⊕ 4:1 input voltage range
- ⊕ 5000VAC isolation
- ⊕ Remote on/off control
No minimum load required
- ⊕ Up to 89% efficiency
- ⊕ Operation temperature range: -40°C to 100°C
- ⊕ Over voltage protection
- ⊕ Over load protection
- ⊕ Short circuit protection (SCP)
- ⊕ Under voltage protection

Introducing our new 10DPMW4_6R series — a high-performance DC-DC converter designed for demanding industrial and power applications. Built with reinforced isolation for 250 Vrms working voltage and housed in a compact DIP24 package, it ensures reliable performance across a wide 4:1 input voltage range. With 5000 VAC isolation and up to 89% efficiency, it delivers consistent power and superior safety. The converter features remote on/off control, requires no minimum load, and operates flawlessly in extreme temperatures from -40 °C to +100 °C.

Comprehensive protection functions — including overvoltage, overload, short-circuit, and undervoltage protection — guarantee stability and long-term durability in every environment.



Common specifications	
Short circuit protection	Indefinite (hiccup - automatic recovery)
Switching frequency	300 kHz
Operation temperature	-40°C ~+100°C (with derating)
Storage temperature	-55°C ~+125°C
Soldering Temperature*	+260°C (1.5mm from case 10s max.)
Storage humidity	95% rel. H
Maximum Case Temperature	105°C (max.)
Thermal Impedance	18°C/W
MTBF: (MIL-HDBK-217F@25°C)	> 650,000 hours
Input filter	Pi Filter
Leakage Current	2.0µA (typ.) 240VAC, 60Hz
Clearance/Creepage	8mm (Min.)
Safety Standard	IEC / EN / UL 62368-1, DK-133116-UL, E252573
Insulation System	Reinforced Isolation
Cooling	Natural Convection (30-65 LFM)
Case/Base Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Silicone (UL94V-0 rated)
Weight	14.0 g (typ.)
Dimensions	31.8 × 20.3 × 10.4 mm

Note: *These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, and rated for 60s	5000			VAC
Isolation resistance	Input-output	1			GΩ
Isolation capacitance	Input-output		17		pF

Example:
10DPMW4_2405S6R
 10 = 10Watt; D = DIP; PM = Series; W = Wide input; 24 = 24Vin; 05 = 5Vout;
 S = Single Output; 6 = 6000VDC isolation; R = Revised version

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy		-1		+1	%
Output voltage adj. (trim)		-10		+10	%
Line regulation		-0.5		+0.5	%
Load regulation (from 0% to 100% load)	Single output	-0.5		+0.5	%
	Dual output	-1		+1	%
Cross regulation	Asymmetrical load 25%/100% for dual out.	-5		+5	%
Ripple & noise* (20mhz bandwidth)	5V Output		30		mVpk-pk
	12V & 15V Output		40		mVpk-pk
Over voltage protection (zener diode clamp)	5V Output		6.2		VDC
	12V Output		15		VDC
	15V Output		18		VDC
Over current protection			160		% of FL
Temperature coefficient		-0.02		+0.02	%/°C
Capacitive load	Minimum Vin and constant resistive load, See Table				
Transient recovery time nominal vin and 25% load step change (75%-50%-25% of io)	All models		250		µs
Transient response deviation nominal vin and 25% load step change (75%-50%-25% of io)	5V output	-5		+5	%
	12V & 15V output	-3		+3	%

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input voltage range	12V Input	4.5	12	18	VDC
	24V Input	9	24	36	VDC
	48V Input	18	48	75	VDC
Under voltage protection	12V Input module ON		4.2		VDC
	12V Input module OFF		3.5		VDC
	24V Input module ON		8.6		VDC
	24V Input module OFF		7		VDC
	48V Input module ON		17.8		VDC
48V Input module OFF		16		VDC	
Input reflected ripple current*			20		mApk-pk
Start up time	Nominal Vin and constant resistive load		30		ms
Remote on/off control**	Module ON (open circuit)	0		1.2	VDC
	Module OFF	2.2		12	VDC
	OFF idle current		2.5		mA
CTRL pin Input current		-0.5		1.0	mA
					mA
Recommended input fuse (slow blow)	12V Input		5		A
	24V Input		2		A
	48V Input		1		A
Input surge voltage *** (100 ms)	12V Input			25	VDC
	24V Input			50	VDC
	48V Input			100	VDC

Note: *Measured with a simulated source inductance of 12µH and a source capacitor C_{in} (47µF, ESR<1.0Ω at 100kHz).
 ** The remote on/off control pin is referenced to -Vin (pin2). *** These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

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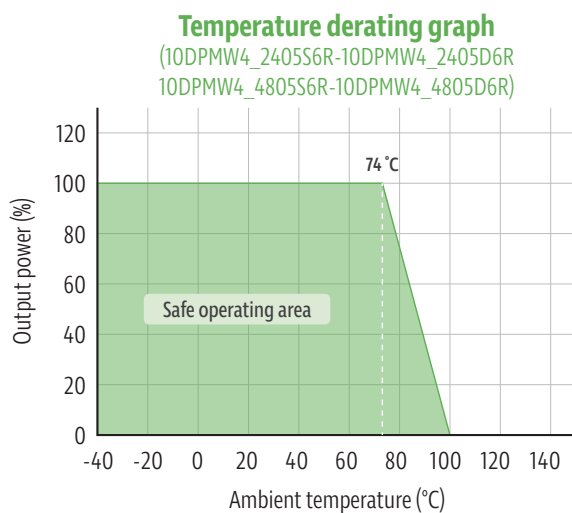
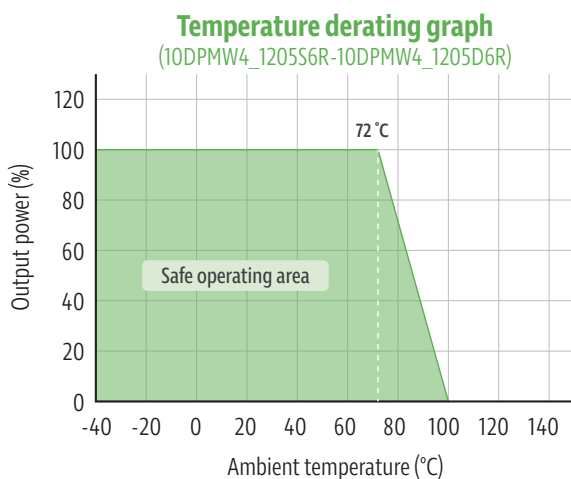
EMC specifications					
EMC	EMI	CE	EN55032	without external components	Criterion A
EMC	EMI	RE	EN55032	without external components	Criterion A
EMC	EMS	ESD	IEC 61000-4-2	Air ± 15kV, Contact ± 8kV	Criterion A
EMC	EMS	RS	IEC 61000-4-3	10V/m	Criterion A
EMC	EMS	EFT	IEC 61000-4-4	±2kV with external components	Criterion A
EMC	EMS	Surge	IEC 61000-4-5	±2kV with external components	Criterion A
EMC	EMS	CS	IEC 61000-4-6	10Vrms	Criterion A
EMC	EMS	PFMF	IEC 61000-4-8	100A/m	Criterion A

Product Selection Guide

Approval	Part number	Input Voltage Range (VDC)	Input Current No-Load (mA, Typ.)	Input Current Full Load (mA, Typ.)	Output Voltage (VDC)	Output Current Min. load (mA)	Output Current Full load (mA)	Efficiency @FL % (typ.)	Capacitive Load @FL Max. (µF)
UL	10DPMW4_1205S6R	12 (4.5-18)	20	987	5	0	2000	84.5	3300
UL	10DPMW4_1212S6R	12 (4.5-18)	20	964	12	0	833	86.5	470
UL	10DPMW4_1215S6R	12 (4.5-18)	20	947	15	0	666	88	390
UL	10DPMW4_2405S6R	24 (9-36)	6	488	5	0	2000	85.5	3300
UL	10DPMW4_2412S6R	24 (9-36)	6	474	12	0	833	88	470
UL	10DPMW4_2415S6R	24 (9-36)	6	468	15	0	666	89	390
UL	10DPMW4_4805S6R	48 (18-75)	4	244	5	0	2000	85.5	3300
UL	10DPMW4_4812S6R	48 (18-75)	4	237	12	0	833	88	470
UL	10DPMW4_4815S6R	48 (18-75)	4	237	15	0	666	88	390

Approval	Part number	Input Voltage Range (VDC)	Input Current No-Load (mA, Typ.)	Input Current Full Load (mA, Typ.)	Output Voltage (VDC)	Output Current Min. load (mA)	Output Current Full load (mA)	Efficiency @FL % (typ.)	Capacitive Load @FL max. (µF)
UL	10DPMW4_1205D6R	12 (4.5-18)	20	987	±5	0	±1000	84.5	±1470
UL	10DPMW4_1212D6R	12 (4.5-18)	20	962	±12	0	±416	86.5	±680
UL	10DPMW4_1215D6R	12 (4.5-18)	20	947	±15	0	±333	88	±390
UL	10DPMW4_2405D6R	24 (9-36)	6	488	±5	0	±1000	85.5	±1470
UL	10DPMW4_2412D6R	24 (9-36)	6	473	±12	0	±416	88	±680
UL	10DPMW4_2415D6R	24 (9-36)	6	468	±15	0	±333	89	±390
UL	10DPMW4_4805D6R	48 (18-75)	4	244	±5	0	±1000	85.5	±1470
UL	10DPMW4_4812D6R	48 (18-75)	4	237	±12	0	±416	88	±680
UL	10DPMW4_4815D6R	48 (18-75)	4	237	±15	0	±333	88	±390

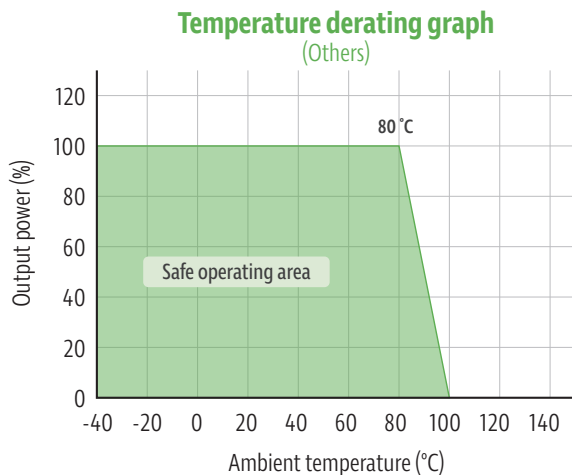
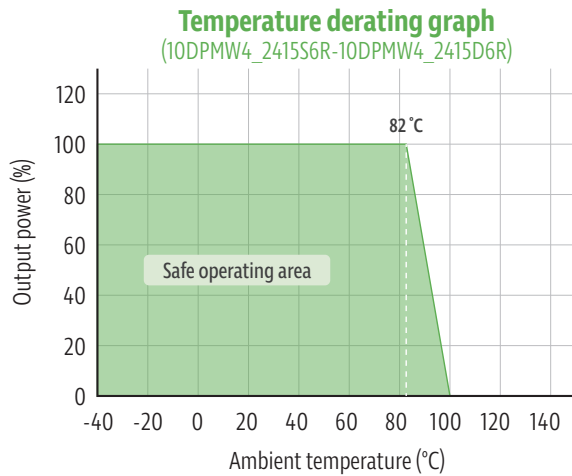
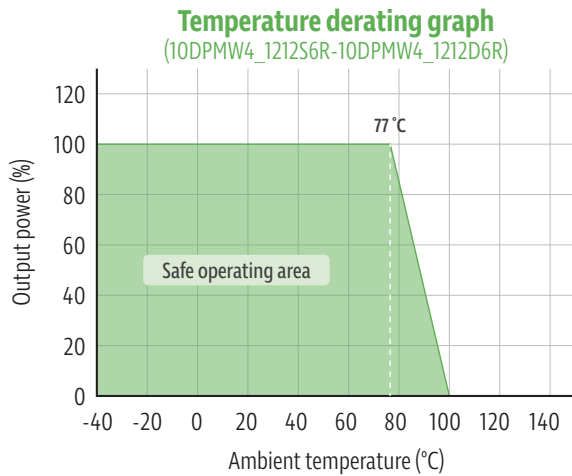
Typical characteristics



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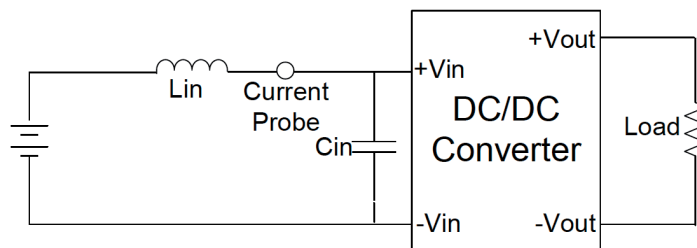
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Typical characteristics



Typical circuit design and application

Input reflected ripple current is measured with a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR <1.0 Ω at 100kHz) at nominal input and full



Over Current Protection

The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup). The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

Over Voltage Protection

The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

Remote Module ON / OFF

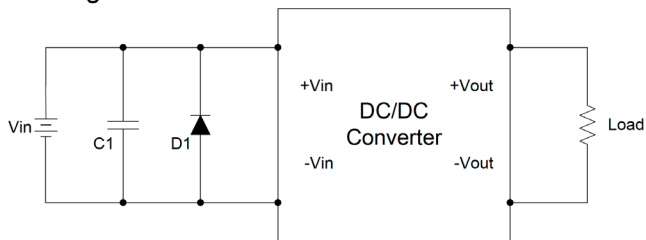
Negative logic turns on the module during low logic and off during high logic. For negative logic if the Remote feature is not used, please leave the Remote pin floating or connected -Vin.

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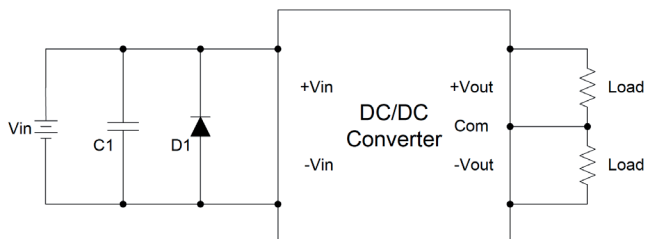
EMI recommended component parameters

Single



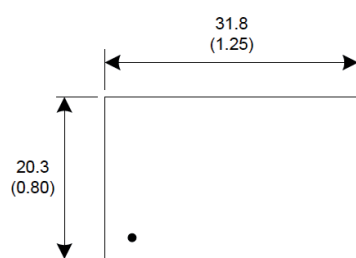
	C1	D1
12V	NIPPON chemi-con KY series 470µF, 100V	Littelfuse SMDJ26A
24V	NIPPON chemi-con KY series 330µF, 100V	Littelfuse SMDJ58A
48V	NIPPON chemi-con KY series 330µF, 100V	Littelfuse SMDJ120A

Dual

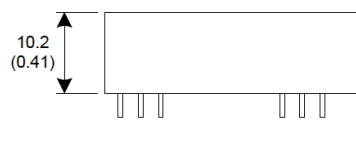


The circuit is used to meet surge & EFT test.

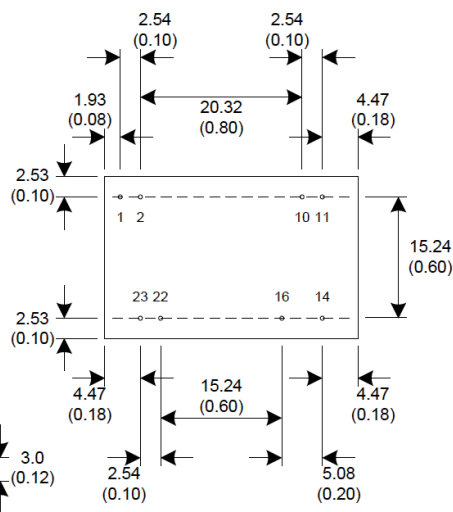
Mechanical dimensions Recommended footprint



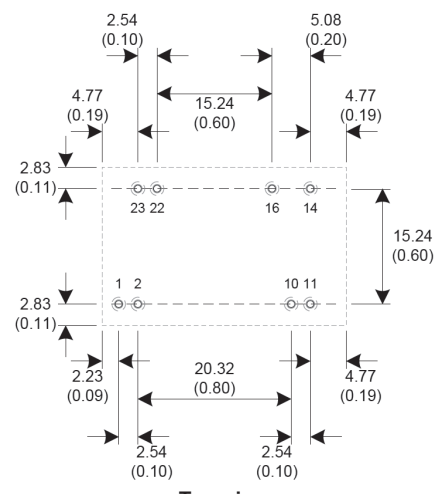
Top view



Side view

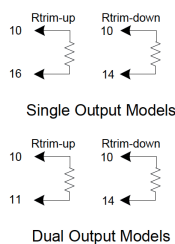


Bottom view



Top view

PIN CONNECTIONS
Output can be externally trimmed by using the method as below.



Pin Definition Table		
Pin	Single	Dual
1	CTRL	CTRL
2	-Vin	-Vin
10	Trim	Trim
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	COM
22	+Vin	+Vin
23	+Vin	+Vin

Notes: 1. All dimensions are typical in millimeters (inches).
Through hole 2, 3, 10, 11, 14, 16, 22, 23 : Ø0.90 (0.035)
Top view pad 2, 3, 10, 11, 14, 16, 22, 23 : Ø1.10 (0.044)
Bottom view pad 2, 3, 10, 11, 14, 16, 22, 23 : Ø1.80 (0.071)
2. There should be at least 8mm distance between primary and secondary circuit.

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case tolerance: ±0.5 (±0.02)