



30DMW4_1.6 series

30W - Single/Dual Output - Wide Input - Isolated & Regulated
DIP DC-DC Converter

DC-DC Converter

30 Watt

- ⊕ High efficiency up to 91%
- ⊕ 4:1 wide input voltage range
- ⊕ I/O Isolation 1600VDC
- ⊕ Short circuit protection (SCP)
- ⊕ Operating temp. range:
-40°C to +100°C
- ⊕ MTBF >370,000 hours
- ⊕ Remote on/off control
- ⊕ Over-voltage protection
- ⊕ Over-current protection
- ⊕ Over temperature protection
- ⊕ Adjustable output voltage



Introducing our high-performance 30DMW4_1.6 series, designed to deliver outstanding efficiency and reliability. Achieving up to 91% efficiency, these modules are engineered for optimal energy conversion, minimizing power loss and maximizing performance. With a versatile 4:1 wide input voltage range, they are adaptable to various power sources, making them ideal for a wide range of applications. The modules feature a robust I/O isolation of 1600VDC, providing excellent electrical insulation and safety. They are equipped with continuous short circuit protection (SCP), ensuring the safety of your equipment.

Common specifications

Short circuit protection:	Continuous, hiccup, automatic recovery
Operation temperature range:	-40°C ~ +100°C (with derating)
Storage temperature range:	-55°C ~ +125°C
Case temperature:	105°C max.,
Lead temperature range:	260°C max., 1.5mm from case for 10 sec
Storage humidity range:	95% RH max.
Over temperature protection:	115°C TYP (case temperature)
Thermal impedance	13 °C/W min.
Safety approval:	IEC / EN / UL 62368-1 (DK-63588-UL, E252573)
Cooling:	Nature convection (30-65 LFM)
Case material:	Copper
Base material:	Nonconductive black plastic (UL94V-0 rated)
Pin material:	Ø1.0mm Brass Solder-coated
Potting material:	Epoxy (UL94V-0 rated)
MTBF (MIL-HDBK-217F @25°C):	>370,000 hours Typ.
Dimensions:	1.00" x 1.00" x 0.41"
Weight:	19.0g, typ.

Input specifications

Item	Test condition	Min	Typ	Max	Units	
Input voltage range	• 24VDC input	9	24	36	VDC	
	• 48VDC input	18	48	75	VDC	
Input reflected ripple current*			30		mApk-pk	
Under voltage protection	24VDC input					
	• Module ON		8.6		VDC	
	• Module OFF		7.6		VDC	
	48VDC input					
	• Module ON		17.5		VDC	
	• Module OFF		16.5		VDC	
Recommended input fuse (slow blow)	• 24VDC input		6		A	
	• 48VDC input		2.5		A	
Input surge voltage (100 ms)	• 24VDC input			50	VDC	
	• 48VDC input			100	VDC	
Input filter			PI type			
Start-up time (nominal input)	Constant resistance load		30		ms	
Remote ON/OFF**	• Models ON (or open circuit)		3.0	12	VDC	
			0	1.2	VDC	
	• Models OFF (or short circuit pin2 & pin 3)					
		• OFF idle current		2		mA

* Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor Cin (47uF, ESR<1.0Ω at 100kHz).

** The remote on/off control pin is referenced to -Vin (pin2).

Output specifications

Item	Test condition	Min	Typ	Max	Units	
Voltage accuracy		-1.0		+1.0	%	
Line regulation		-0.5		+0.5	%	
Load regulation	0% to 100% load					
	• Single output	-0.5		+0.5	%	
	• Dual output	-1.0		+1.0	%	
Cross regulation	Asymmetrical Load 25%, 100% for dual output	-5		+5	%	
Ripple and noise	20MHz bandwidth			75	mVpk-pk	
		• Single output		60	mVpk-pk	
	• Dual output					
Over voltage protection	• 3.3V output		3.9		VDC	
	• 5V output		6.2		VDC	
	• 12V output		15		VDC	
	• 15V output		18		VDC	
Temperature drift				±0.02	%/°C	
Over current protection			170		% of FL	
Transient recovery time	Nominal Vin and 25% load step change (75% - 50% - 25% of Io)		250		µs	
Transient response deviation	Nominal Vin and 25% load step change (75% - 50% - 25% of Io)					
		- 3.3V & 5V output	-5		+5	%
		- other output	-3		+3	%

Example:

30DMW4_2415S1.6

30 = 30Watt; D = DIP; M = series; W4 = wide input (4:1) 9-36Vin;
15 = 15Vout; S = Single output; 1.6=1600VDC isolation

Note:

- All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
- In this datasheet, all the test methods of indications are based on corporate standards.
- Only typical models listed, other models may be different, please contact our technical person for more details.
- Specifications subject to change without notice.

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Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	I/O, and rated for 60sec	1600			VDC
	Case-I/O, and rated for 60sec	1600			VDC
Isolation resistance	Input-output	1000			MΩ
Isolation capacitance	Input-output		2000		pF

EMC specifications

EMI	CE	EN55032 with external components	perf. Criteria A
EMI	RE	EN55032	perf. Criteria A
EMS	ESD	IEC 61000-4-2 Air: ±8kV / Contact: ±6kV	perf. Criteria A
EMS	RS	IEC 61000-4-3 20V/m	perf. Criteria A
EMS	EFT	IEC 61000-4-4 ±2kV with external components	perf. Criteria A
EMS	Surge	IEC 61000-4-5 ±2kV with external components	perf. Criteria A
EMS	CS	IEC 61000-4-6 10Vrms	perf. Criteria A
EMS	PFMF	IEC 61000-4-8 10Vrms	perf. Criteria A

Product Selection Guide

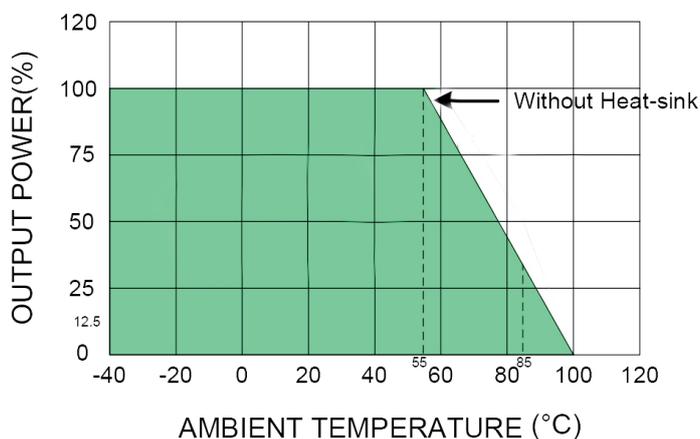
Part Number	Input Voltage [VDC]		Input Current [mA]		Output Voltage [VDC]	Output Current [mA]		Efficiency [% Typ.]	Capacitor load [μF, Max]
	Nominal	Range	No-Load (mA, max.)	Full Load (mA, typ.)		Max	Min		
30DMW4_2403S1.6	24	9-36	10	1081	3.3	7000	0	89	10000
30DMW4_2405S1.6	24	9-36	10	1389	5	6000	0	90	7200
30DMW4_2412S1.6	24	9-36	10	1404	12	2500	0	89	1200
30DMW4_2415S1.6	24	9-36	10	1389	15	2000	0	90	1000
30DMW4_4803S1.6	48	18-75	8	541	3.3	7000	0	89	10000
30DMW4_4805S1.6	48	18-75	8	687	5	6000	0	91	7200
30DMW4_4812S1.6	48	18-75	8	694	12	2500	0	90	1200
30DMW4_4815S1.6	48	18-75	8	687	15	2000	0	91	1000

Part Number	Input Voltage [VDC]		Input Current [mA]		Output Voltage [VDC]	Output Current [mA]		Efficiency [% Typ.]	Capacitor load [μF, Max]
	Nominal	Range	No-Load (mA, max.)	Full Load (mA, typ.)		Max	Min		
30DMW4_2412D1.6	24	9-36	10	1389	±12	±1250	0	90	±750
30DMW4_2415D1.6	24	9-36	10	1389	±15	±1000	0	90	±500
30DMW4_4812D1.6	48	18-75	8	694	±12	±1250	0	90	±750
30DMW4_4815D1.6	48	18-75	8	687	±15	±1000	0	91	±500

Add suffix "H" for heatsink mounted, for example 30DMW4_2405S1.6/H

Typical characteristics

Derating Curve



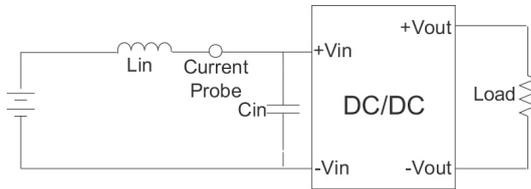
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Test configurations

Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through 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 load.



Design & feature configurations

Over voltage 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.

Over Temperature Protection Test

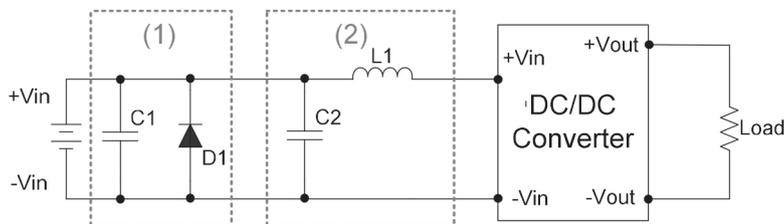
The over temperature protection consists of circuitry that provides protection from thermal damage. If the temperature exceeds the over temperature threshold the module will shut down. The module will try to restart after shut down, if the over temperature condition still exists during restart, the module will shut down again. This restart trial will continue until the temperature is within specification.

Remote Module ON / OFF

Positive logic turns on the module during high logic and off during low logic. Remote module ON/OFF can be controlled by an external switch between the CTRL terminal and -Vin terminal. For positive logic if the remote feature is not used, please leave the CTRL pin floating.

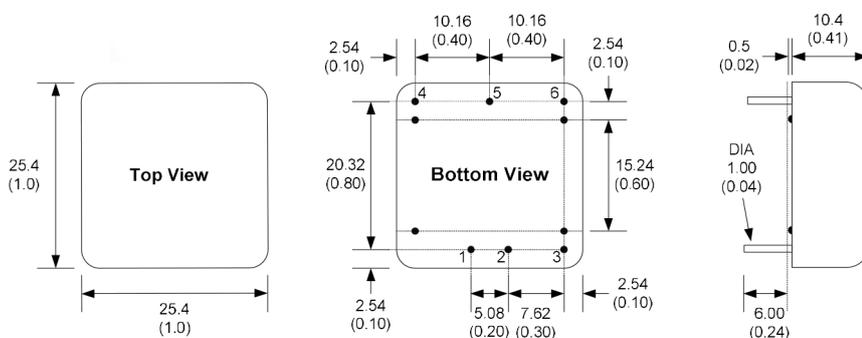
EMC Filter

The part (1) circuit is used to meet surge & EFT test, and the part (2) circuit is used to meet EMI test.



Vin	C1	D1	C2	L
24	300 μ F /100V	SMDJ58A	3.3 μ F /50V	0.82 μ H
48	300 μ F /100V	SMDJ120A	1.0 μ F /100V	2.2 μ H

Mechanical dimensions



Pin	Pin-Out	
	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	Trim	Trim
6	-Vout	-Vout

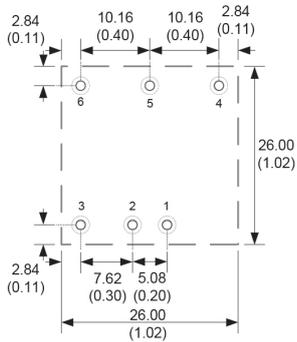
Notes: All dimensions are typical in millimeters (inches).

- Pin diameter: 1.0 ± 0.05 (0.04 ± 0.002)
- Pin pitch and length tolerance: ± 0.35 (± 0.014)
- Case tolerance: ± 0.5 (± 0.02)
- Stand-off tolerance: ± 0.1 (± 0.004)

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Recommended footprint details



Notes: 1. All dimensions are typical in millimeters (inches).
Through hole (black) 1-6: $\varnothing 1.3$ (0.051)
Top view pad (green) 1-6: $\varnothing 1.5$ (0.059)
Bottom view pad (pink) 1-6: $\varnothing 2.6$ (0.098)

External output trimming

Output can be externally trimmed by using the method as below (single output models only)

