

30DMW_1.6 Series

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



DC-DC Converter

30 Watt

- ⊕ High efficiency up to 92%
- ⊕ 2:1 wide input voltage range
- ⊕ Adjustable output voltage
- ⊕ I/O Isolation 1600VDC
- ⊕ Short circuit protection (SCP)
- ⊕ MTBF >370,000 hours
- ⊕ No minimum load required
- ⊕ Operating temperature range: -40°C to +100°C
- ⊕ Remote On/Off control
- ⊕ Over-voltage protection
- ⊕ Over-current protection
- ⊕ Over temperature protection
- ⊕ Soft start

The 30DMW_1.6 series offer 30W of output, wide input voltage of 9-18VDC, 18-36VDC and 36-75VDC, and feature 1600VDC isolation, over temperature, over voltage, over current and short circuit protection.

All models are particularly suited to tele-communications, industrial, test equipments power etc.



Common specifications

Cooling:	Nature convection
Short circuit protection:	Continuous, hiccup, automatic recovery
Operation temperature range:	-40°C~+100°C (see derating curve)
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
Thermal impedance:	13°C/W MIN; with heatsink: 12°C/W MIN
Over temperature protection (Case):	115°C TYP
Switching frequency* (PWM mode):	• 3.3/5V: 270kHz TYP • Others: 330kHz TYP
Storage humidity range:	5% MIN, 95% MAX
Safety standard/approvals:	UL/cUL 60950-1, 62368-1 IEC/EN 60950-1, 62368-1
Case material:	Copper
Base material:	Non-conductive Black Plastic (UL94V-0)
MTBF (MIL-HDBK-217F @25°C):	>370,000 hours
Weight:	without heatsink 19g

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	1600			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100kHz/0.1V			2000	pF

Example:

30DMW_2415S1.6

30 = 30Watt; D = DIP; M = series; W = wide input (2:1) 18-36Vin;
 15Vout; S = single output; 1.6 = 1600VDC

Note:

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

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	see table				
Reflected ripple current*			30		mA
Under voltage lockout (Module ON/OFF)	• 12VDC input • 24VDC input • 48VDC input		8.6/7.9 17.8/16.5 34/32.5		VDC VDC VDC
Input surge voltage (100msec. max)	• 12VDC input • 24VDC input • 48VDC input			25 50 100	VDC VDC VDC
Input filter			PI		
Start-up time	Nominal input & constant resistance load		30		ms
Remote ON/OFF**	• Models ON • Models OFF • OFF idle current	3.0 ... 12Vdc or open circuit 0 ... 1.2Vdc or Short circuit pin2 and pin 3 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).

EMC specifications

EMI	CE*	CISPR22/EN55032	CLASS A
EMI	RE	CISPR22/EN55032	CLASS A
EMS	ESD	IEC/EN61000-4-2	perf. Criteria A
EMS	RS	IEC/EN61000-4-3	perf. Criteria A
EMS	EFT**	IEC/EN61000-4-4	perf. Criteria A
EMS	Surge**	IEC/EN61000-4-5	perf. Criteria A
EMS	CS	IEC/EN61000-4-6	perf. Criteria A
PFMF		IEC/EN61000-4-8	perf. Criteria A

* Input filter components are used to help meet conducted emissions

** An external filter is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.

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Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy				±1	%
Trim	Single output			±10	%
Line regulation	Full load, low to high			±0.5	%
Load regulation	0% to 100% load • Single output • Dual output (balanced load)			±0.5 ±1	% %
Cross regulation*	Dual output			±5	%
Temperature drift	100% full load			±0.02	%/°C
Ripple and noise	20MHz Bandwidth • Single output • Dual output			75 60	mV mV

Output specifications					
Transient recovery time**	25% load step change	250			us
Transient response deviation**	25% load step change • Single 3.3V output • Others		±5 ±3		% %
Over current protection	Input voltage range	150			% of FL
Short circuit protection	Input voltage range	Hiccup, continuous, auto-recovery			
Over voltage protection	Zener diode clamp • 3.3V output • 5V output • 12V output • 15V output • ±12V output • ±15V output		3.9 6.2 15 18 ±15 ±18	V V V V V V	

* One load is 25% to 100%, the other load is 100% load, the output voltage variable rate is within 5%.

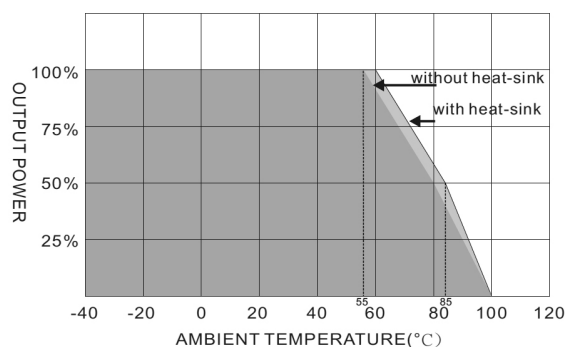
** Tested by normal Vin and 25% load step change (75%-50%-25% of Io)

Part Number	Input Voltage [VDC]		Input Current [mA]		Output Voltage [VDC]	Output Current [mA]		Efficiency [% , Typ.]	Capacitor load [μF, Max]
	Nominal	Range	Full load, typ	No load, max		Max	Min		
30DMW_1203S1.6	12	9-18	2212.64	10	3.3	7000	0	87	10000
30DMW_1205S1.6	12	9-18	2808.99	10	5	6000	0	89	7200
30DMW_1212S1.6	12	9-18	2808.99	12	12	2500	0	89	1200
30DMW_1215S1.6	12	9-18	2777.78	12	15	2000	0	90	1000
30DMW_2403S1.6	24	18-36	1106.32	10	3.3	7000	0	87	10000
30DMW_2405S1.6	24	18-36	1388.89	10	5	6000	0	90	7200
30DMW_2412S1.6	24	18-36	1388.89	10	12	2500	0	90	1200
30DMW_2415S1.6	24	18-36	1373.63	10	15	2000	0	91	1000
30DMW_4803S1.6	48	36-75	540.73	8	3.3	7000	0	89	10000
30DMW_4805S1.6	48	36-75	686.81	8	5	6000	0	91	7200
30DMW_4812S1.6	48	36-75	686.81	8	12	2500	0	91	1200
30DMW_4815S1.6	48	36-75	679.35	8	15	2000	0	92	1000
30DMW_1212D1.6	12	9-18	2808.99	12	±12	±1250	0	89	±750
30DMW_1215D1.6	12	9-18	2777.78	14	±15	±1000	0	90	±500
30DMW_2412D1.6	24	18-36	1388.89	10	±12	±1250	0	90	±750
30DMW_2415D1.6	24	18-36	1373.63	10	±15	±1000	0	91	±500
30DMW_4812D1.6	48	36-75	686.81	8	±12	±1250	0	91	±750
30DMW_4815D1.6	48	36-75	679.35	8	±15	±1000	0	92	±500

Add suffix "H" for heatsink mounted, for example 30DMW_2405S1.6H

Typical characteristics

Derating Curve



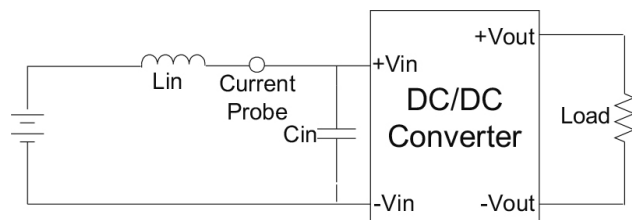
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Test configurations

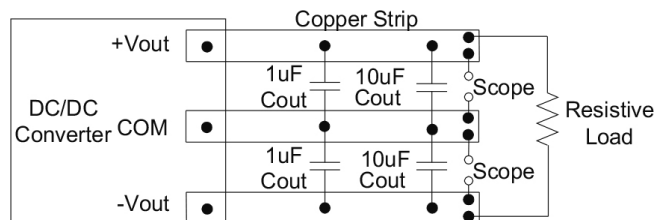
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12uH) and a source capacitor C_{in} (47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



Output Ripple & Noise Measurement Test

To reduce ripple and noise, it is recommended to use a 10uF ceramic disk capacitor to at the output.



Design & feature configurations

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

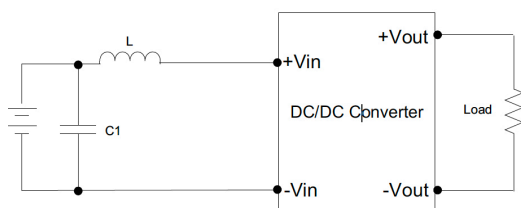
The over temperature protection consists of circuitry that provides protection from thermal damage. If the temperature exceeds the over temperature threshold the module will shut down.

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.

EMI filter

Input filter components (C_1 , L) are used to help meet conducted emissions.

These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L
30DMW_12XXX1.6	1206,335K/50V,X7R	0.82uH
30DMW_24XXX1.6	none	
30DMW_48XXX1.6		

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).

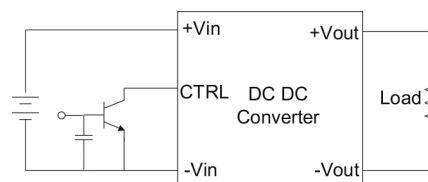
The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

CTRL module ON/OFF

Positive logic turns on the module during high logic and off during low logic.

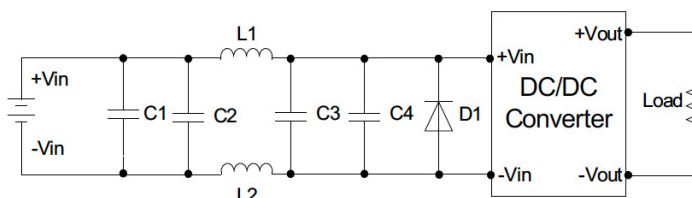
Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal. The switch can be an open collector or open drain.

For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



EFT/ Surge filter

Input filter components (C_1 , C_2 , C_3 , C_4 , L_1 , L_2 , D_1) are used to help meet IEC61000-4-4 and IEC61000-4-5.

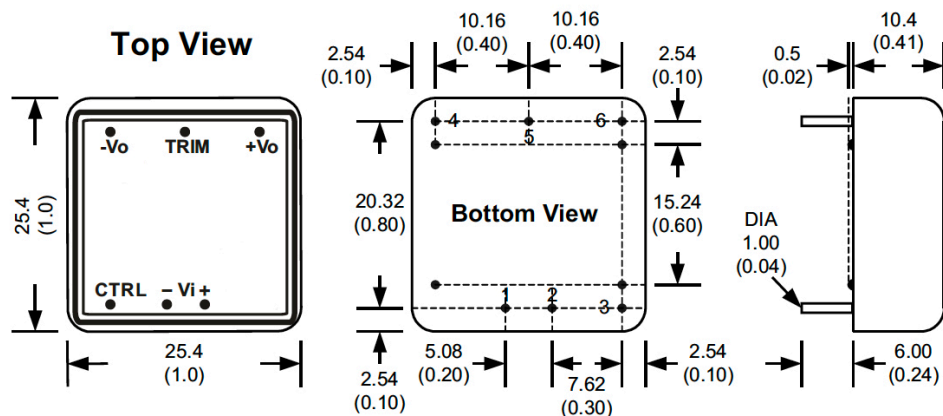


	C1	C2	L1、L2	C3	C4	D1
30DMW_12XXX1.6	330uF,100V	470uF,100V	1uH	330uF,100V	470uF,100V	none
30DMW_24XXX1.6	330uF,100V	none	short	none	none	TVS,58V,3kW
30DMW_48XXX1.6	330uF,100V	none	short	none	none	TVS,120V,3kW

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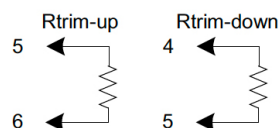
Mechanical dimensions



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

External output trimming

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



Mechanical dimensions (with heatsink)

