

## 60DDW\_3 Series

60W - Single/Dual Output - Wide Input - Isolated & Regulated  
DIP DC-DC Converter

### DC-DC Converter

60 Watt

- ⊕ High efficiency up to 88%
- ⊕ 2:1 wide input voltage range
- ⊕ Isolation voltage 3000VDC
- ⊕ Six-sided metal shield
- ⊕ Short circuit protection (SCP) (automatic recovery)
- ⊕ Operating temperature: -40°C to +85°C
- ⊕ Over temperature protection
- ⊕ Industry standard pinout
- ⊕ Under voltage lockout

The 60DDW series offers 60W of output, wide input voltage of 9-18VDC, 18-36VDC and 36-72VDC and features 3000VDC isolation, six-sided metal shield over current and short circuit protection.

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



#### Common specifications

Cooling:	Free air convection
Short circuit protection:	Continuous, auto-recovery
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C~+100°C
Case temperature:	90°C MAX
Lead temperature range:	265°C MAX, 1.5mm from case for 10 sec
Switching frequency (PWM mode):	50kHz TYP
Humidity:	non-condensing, 95% MAX
Case material:	Six-Side Shielded Case
Potting material:	Epoxy (UL94V-0 rated)
Radiated Emissions:	EN55022, Class A
Conducted Emissions:	EN55022, Class A
MTBF (MIL-HDBK-217F @25°C)*:	>299,424 hours
Weight:	227.5g

#### Input specifications

Item	Test condition	Min	Typ	Max	Units
Filter	Pi network				
Protection	Fuse recommended				

#### Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input/Output, tested for 1 minute			3000	VDC
Isolation resistance	500VDC	1000			MΩ
Isolation capacitance	Input/Output			2500	pF

#### Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage tolerance	Single/dual			±2	%
Over load protection	Input voltage range	120	150	180	%
Line regulation	Single & Dual (H/L to L/L)			±0.5	%
Load regulation	Single & Dual (25% to 100% load)			±0.5	%
Minimum load	30% of full load				
Ripple and noise*	20MHz Bandwidth			150	mVp-p
Transient response setting time	50% load step change			400	μs
Capacitive load				1500	μF
External Trim Adj. Range	±10% of Output Voltage				

\* Test ripple and noise by "parallel cable" method. Typical value at nominal input voltage and no load.

#### Example:

60DDW\_2415S3  
60 = 60Watt; D = DIP; D = series; W = wide input (2:1) 24 = 18-36Vin; 15Vout; S = single output; 3 = 3000VDC isolation

#### Note:

- Input voltage can't exceed this value, or will cause the permanent damage.
- The load shouldn't be less than 5%, otherwise ripple will increase dramatically.
- Max. Capacitive Load is tested on Vin-nominal and full load.
- 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.

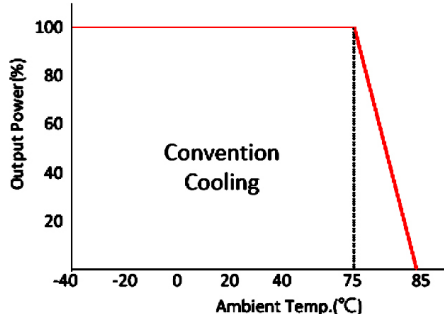
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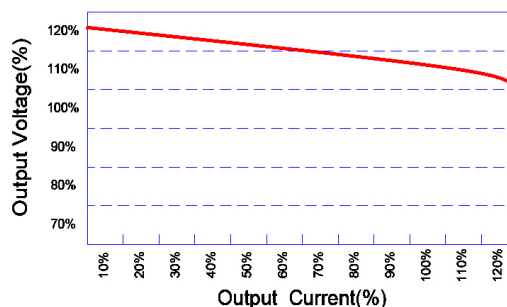
Part Number	Input Voltage Range [VDC]	Input current [mA, typ]		Output Voltage [VDC]	Output Current [mA]	Efficiency [%, Typ.]
		no load	full load			
60DDW_1205S3	9-18	40	5208	5	10000	80
60DDW_1212S3	9-18	40	5882	12	5000	85
60DDW_1215S3	9-18	40	5814	15	4000	86
60DDW_1205D3	9-18	40	5144	±5	±5000	81
60DDW_1212D3	9-18	40	5747	±12	±2500	87
60DDW_1215D3	9-18	40	5747	±15	±2000	87
60DDW_2405S3	18-36	30	2572	5	10000	81
60DDW_2412S3	18-36	30	2841	12	5000	88
60DDW_2415S3	18-36	30	2841	15	4000	88
60DDW_2405D3	18-36	30	2572	±5	±5000	81
60DDW_2412D3	18-36	30	2874	±12	±2500	87
60DDW_2415D3	18-36	30	2841	±15	±2000	88
60DDW_4805S3	36-72	20	1270	5	10000	82
60DDW_4812S3	36-72	20	1420	12	5000	88
60DDW_4815S3	36-72	20	1420	15	4000	88
60DDW_4805D3	36-72	20	1270	±5	±5000	82
60DDW_4812D3	36-72	20	1437	±12	±2500	87
60DDW_4815D3	36-72	20	1437	±15	±2000	87

## Typical characteristics

Temperature derating graph

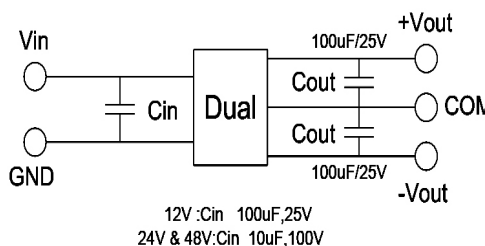
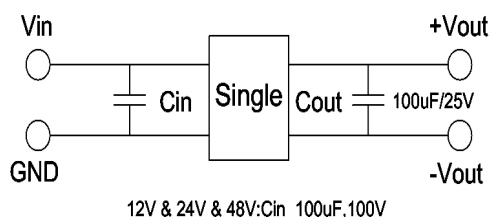


Tolerance envelope graph



## Output voltage adjustment, Control PIN suggest circuit

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



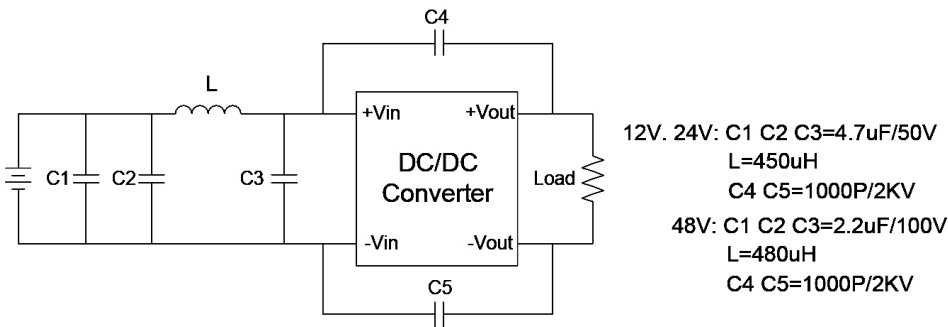
93D - 12 S 05 R NL

A B C D E F  
A : Series  
B : Input Voltage  
C : Single Output(S), DUAL(D)  
D : Output Voltage  
E : Regulated(R)  
F : RoHs Version

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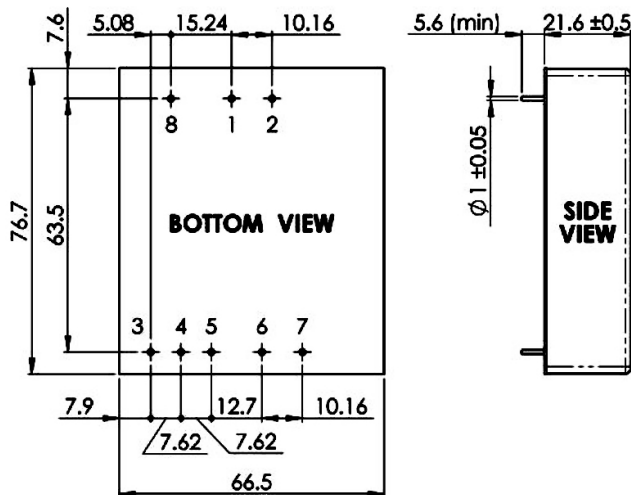
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### Input external filter



Suggest adding input external filter (C1, C2, C3, C4, C5, L) to meet conducted emissions (EN55022 class A) requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

### Mechanical dimensions



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

Note:  
Unit: mm[inch]  
Pin diameter tolerances: ±0.05mm [±0.002inch]  
General tolerances: ±0.25mm [±0.010inch]

PIN connection								
PIN	1	2	3	4	5	6	7	8
Single	+Vin	-Vin	No pin	Trim	No pin	+Vout	-Vout	Remote On/Off
Dual	+Vin	-Vin	+Vout	Com	-Vout	No pin	No pin	Remote On/Off