



## Wide Input Voltage Range 60 Watt Dc-Dc Converter



### FEATURES:

- 60W DIL PACKAGE
- INDUSTRY STANDARD PACKAGE
- 4:1 WIDE INPUT RANGE
- 100% BURNED IN
- HIGH EFFICIENCY
- UL94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- RoHS COMPLIANT
- 3 YEARS WARRANTY



### Specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified

Part Number	Input Voltage	Input Current		Output Voltage	Output Current	Efficiency
	Vdc	No-Load (mA TYP)	Full Load (mA TYP)	Vdc	Full Load (mA)	% TYP
93DW-24S05RNL	9-36	30	2604	5	10000	80
93DW-24S12RNL	9-36	30	2874	12	5000	87
93DW-24S15RNL	9-36	30	2874	15	4000	87
93DW-24D05RNL	9-36	30	2572	±5	±5000	81
93DW-24D12RNL	9-36	30	2907	±12	±2500	86
93DW-24D15RNL	9-36	30	2907	±15	±2000	86
93DW-48S05RNL	18-72	20	1240	5	10000	84
93DW-48S12RNL	18-72	20	1420	12	5000	88
93DW-48S15RNL	18-72	20	1420	15	4000	88
93DW-48D05RNL	18-72	20	1240	±5	±5000	84
93DW-48D12RNL	18-72	20	1420	±12	±2500	88
93DW-48D15RNL	18-72	20	1420	±15	±2000	88

### Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Types				4:1	
Filter	Pi Network				
Protection	Fuse Recommended				

### Output Specifications (Temperature Coefficient : ±0.03%/°C)

Parameters	Conditions	Min	Typ	Max	Units
Voltage Tolerance	Single/Dual			±2	%
Short Circuit/ Restart	Continuous/ Automatic				
Over Load Protection		120	150	180	%
Line Regulation	Single & Dual (H/L to L/L)			±0.5	%
Load Regulation	Single & Dual (F.L-50%F.L)			±0.5	%
Minimum Load	30% of Full Load				
Ripple & Noise	BW=DC To 20MHz (with 1uF Cap.)		100	150	mVp-p
Transient response setting time	50% Step Load Change			400	us
Capacitive load				1500	uF
External Trim Adj. Range	±10% of Output Voltage				

### General Specifications

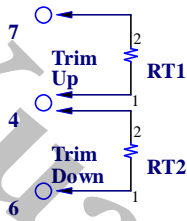
Parameters	Conditions	Min	Typ	Max	Units
Isolation Resistance	500Vdc	1000			MΩ
Switching Frequency			50		KHz
Operating Temperature		-40		85	°C
Humidity	Non Condensing			95	%
Cooling	Free air Convection				
Case material	Six-Side Shielded Case				
Weight			227.5		g
Dimensions	Appearance size		76.7X66.5mmX21.5		mm
Potting Material			Epoxy (UL94V-0 rated)		
Radiated Emissions	EN55022		CLASS A		
Conducted Emissions	EN55022		CLASS A		
Efficiency		80			%
Isolation Voltage	For 10 seconds			3000	VDC
MTBF	MIL-HDBK-217F @25°C , Ground Benign	299424			Hours
Storage Temperature		-55		+100	°C
Case Temperature				+90	°C
Isolation Capacitance				2500	pF



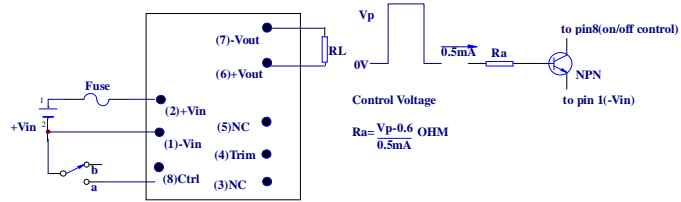
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### Output Voltage Adjustment

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

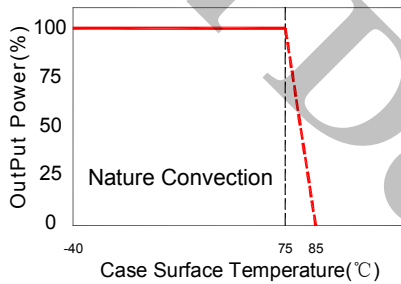


### Control Pin Suggest Circuit

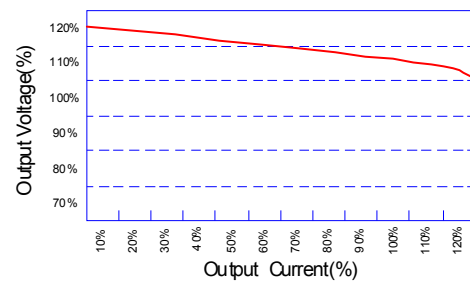


When pin8 short to pin1,D/D ON=>OFF  
When pin8 leave open,D/D => ON

### Temperature Derating Graph

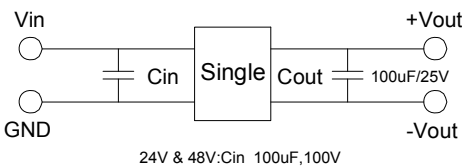


### Tolerance Envelope Graph

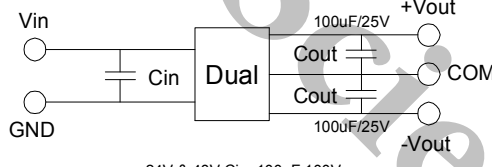


### Recommended Test Circuit

### Part Number



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

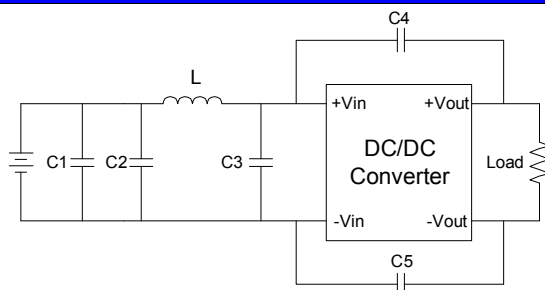


24V & 48V:Cin 100uF,100V

93DW - 24 S 05 R NL  
A B C D E F

A:Series  
B:Input Voltage  
C:Single(S)Dual(D)  
D:Output Voltage  
E:Regulated(R)  
F:RoHS Version

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.



12V. 24V: C1 C2 C3=4.7uF/50V  
L=450uH  
C4 C5=1000P/2KV  
48V: C1 C2 C3=2.2uF/100V  
L=480uH  
C4 C5=1000P/2KV



## Wide Input Voltage Range 60 Watt Dc-Dc Converter

Markings and dimensions	Packaging									
<p><b>UNIT: mm    XX.X±0.5    XX.XX±0.25</b>  <b>Pin Size Tolerance: 1.0Φ ±0.05mm</b></p>	<table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th colspan="3">SIZE(mm)</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">68.0</td> <td style="text-align: center;">78.0</td> <td style="text-align: center;">24.0</td> </tr> </tbody> </table>	SIZE(mm)			A	B	C	68.0	78.0	24.0
SIZE(mm)										
A	B	C								
68.0	78.0	24.0								

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