



Wide Input Voltage Range 60 Watt Dc-Dc Converter



FEATURES:

- 60W DIL PACKAGE
- INDUSTRY STANDARD PACKAGE
- 2:1 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 Vdc	Input Current		Output Voltage Vdc	Output Current Full Load (mA)	Efficiency %TYP
		No-Load (mA TYP)	Full Load (mA TYP)			
93D-12S05RNL	9-18	50	4960	5	10000	84
93D-12S12RNL	9-18	50	5882	12	5000	85
93D-12S15RNL	9-18	50	5882	15	4000	85
93D-12D05RNL	9-18	50	4960	±5	±5000	84
93D-12D12RNL	9-18	50	5882	±12	±2500	85
93D-12D15RNL	9-18	50	5882	±15	±2000	85
93D-24S05RNL	18-36	30	2480	5	10000	84
93D-24S12RNL	18-36	30	2907	12	5000	86
93D-24S15RNL	18-36	30	2907	15	4000	86
93D-24D05RNL	18-36	30	2480	±5	±5000	84
93D-24D12RNL	18-36	30	2907	±12	±2500	86
93D-24D15RNL	18-36	30	2907	±15	±2000	86
93D-48S05RNL	36-72	20	1225	5	10000	85
93D-48S12RNL	36-72	20	1437	12	5000	87
93D-48S15RNL	36-72	20	1437	15	4000	87
93D-48D05RNL	36-72	20	1225	±5	±5000	85
93D-48D12RNL	36-72	20	1437	±12	±2500	87
93D-48D15RNL	36-72	20	1437	±15	±2000	87

Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Types				2:1	
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			150		%
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.)			150	mVp-p
Transient response setting time	50% Step Load Change			500	us
Capacitive load				4800	uF
External Trim Adj. Range	±10% of Output Voltage				

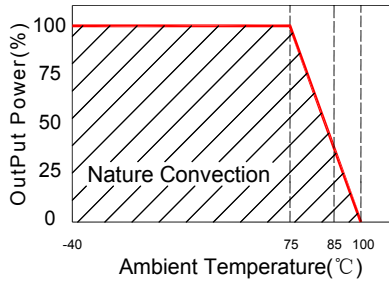
General Specifications

Parameters	Conditions	Min	Typ	Max	Units
Isolation Resistance	500Vdc	1000			MΩ
Switching Frequency			50		KHz
Operating Temperature		-40		100	°C
Humidity	Non Condensing			95	%
Cooling	Free air Convection				
Case material	Six-Side Shielded Case				
Weight			210		g
Dimensions	Appearance size		76.2X66.0mmX20.8		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

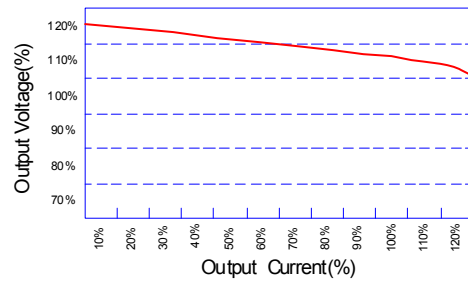


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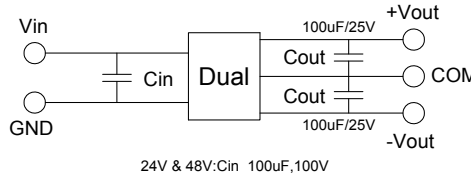
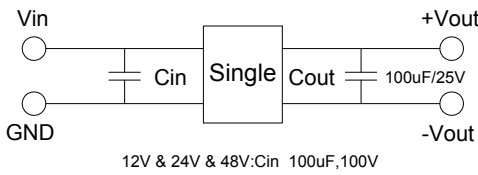
Temperature Derating Graph



Tolerance Envelope Graph



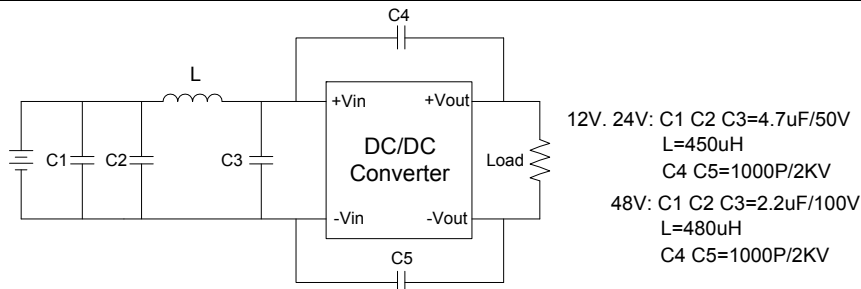
Recommended Test Circuit



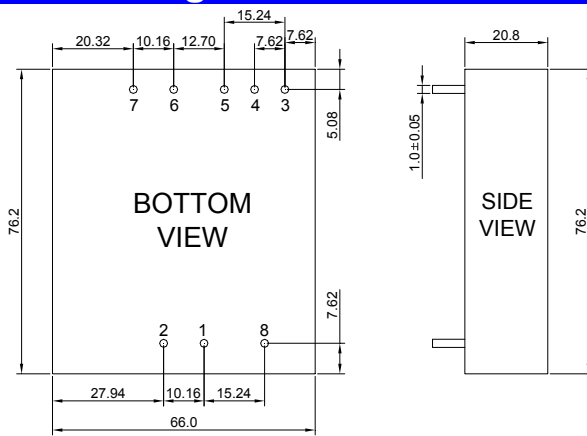
Part Number

93D - 12 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

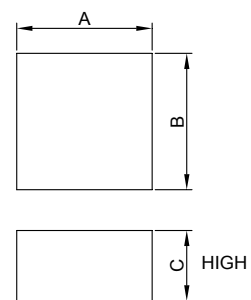
Suggest adding input external filter(C1,C2,C3,C4,C5,L) to meet conducted emissions (EN55022 class A) requirement for the module . These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



Markings and dimensions



Packaging



SIZE(mm)		
A	B	C
68.0	78.0	36.0

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	NC	NC	Remote On/Off