

Wide Input Voltage Range 30 Watt DC-DC Converter



FEATURES:

- 30W DIL PACKAGE
- 2:1 WIDE INPUT RANGE
- 100% BURNED IN
- HIGH EFFICIENCY UP TO 86%
- UL94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- RoHS COMPLIANT
- Remote Control:On/Off



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	Capacitor Load
	Vdc	No-Load (mA TYP)	Full Load (mA TYP)	Vdc	Full Load (mA)	%TYP	uF MAX
96D-12S03RT12R4NL	9~18V	40	2759	3.3V/±12V	5000mA/±416mA	80	6600u/±220u
96D-12S03RT15R4NL	9~18V	40	2759	3.3V/±15V	5000mA/±333mA	80	6600u/±220u
96D-12S05RT12R4NL	9~18V	40	3046	5V/±12V	4000mA/±416mA	82	6600u/±220u
96D-12S05RT15R4NL	9~18V	40	3046	5V/±15V	4000mA/±333mA	82	6600u/±220u
96D-24S03RT12R4NL	18~36V	30	1329	3.3V/±12V	5000mA/±416mA	83	6600u/±220u
96D-24S03RT15R4NL	18~36V	30	1329	3.3V/±15V	5000mA/±333mA	83	6600u/±220u
96D-24S05RT12R4NL	18~36V	30	1469	5V/±12V	4000mA/±416mA	85	6600u/±220u
96D-24S05RT15R4NL	18~36V	30	1469	5V/±15V	4000mA/±333mA	85	6600u/±220u
96D-48S03RT12R4NL	36~75V	20	656	3.3V/±12V	5000mA/±416mA	84	6600u/±220u
96D-48S03RT15R4NL	36~75V	20	656	3.3V/±15V	5000mA/±333mA	84	6600u/±220u
96D-48S05RT12R4NL	36~75V	20	726	5V/±12V	4000mA/±416mA	86	6600u/±220u
96D-48S05RT15R4NL	36~75V	20	726	5V/±15V	4000mA/±333mA	86	6600u/±220u

Input Specifications

Parameters	Conditions	Min	Typ	Max	Units
Voltage Types			2:1		
Filter	Pi Type				
Input surge voltage	(12V)24V input		50		Vdc
100mS max	48V input		100		Vdc
Input reflected ripple current	Nominal Vin and full load		30		mAp-p
Start-up voltage	12V input		9		Vdc
Start-up voltage	24V input		18		Vdc
Start-up voltage	48V input		36		Vdc
Shutdown voltage	12V input		8		Vdc
Shutdown voltage	24V input		17		Vdc
Shutdown voltage	48V input		35		Vdc
Protection	Fuse Recommended				
Remote ON/OFF (Note 3)	DC-DC ON			OPEN	
(Negative logic)(Option)	DC-DC OFF			Short to ground	
Input current of Remote control pin	Nominal Vin			-0.5mA ~ +0.5mA (TYP)	
Remote off state input current	Nominal Vin			3mA (Typ)	

Output Specifications (Temperature Coefficient : ±0.05%/°C)

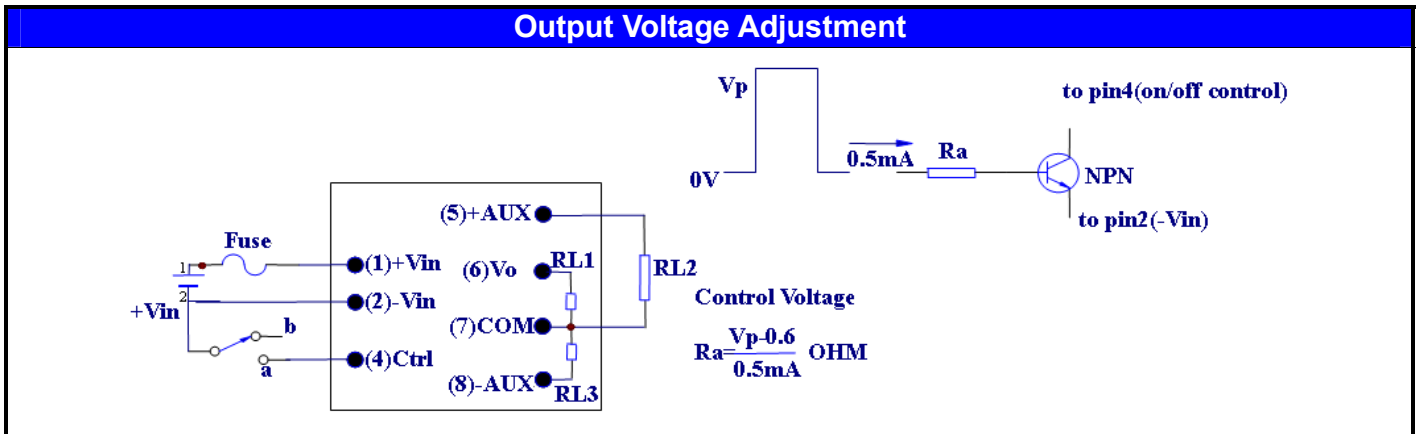
Parameters	Conditions	Min	Typ	Max	Units
Line Regulation (Vmin – Vmax)	Triple 3.3V/5V			±2	%
	Auxiliary			±5	%
Load Regulation (25 – 100 %)	Triple 3.3V/5V			±2	%
	Auxiliary			±5	%
Cross Regulation(Note 2)	Triple 3.3V/5V			±2	%
	Auxiliary			±5	%
Load variation(25%/100%)	dual output models unbalanced load			5.0	%
Minimum load	required	10			%
Ripple and noise(20 MHz bandwidth)	with external capacitor (See Note 1)			100	mVp-p
Temperature coefficient			±0.05		%/°C
Over Load Protection		120	150	180	%
Short circuit protection					Hiccup (automatic recovery)
Over voltage protection	3.3VDC	3.7	3.9	4.1	Vout
	5VDC	5.3	5.6	5.9	Vout
	±12VDC	±15.2	±15	±16.8	Vout
	±15VDC	±17.1	±18	±21	Vout
Start up time	nominal Vin and constant resistive load		30		ms
Transient response setting time	25% load step change		300		us

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General Specifications					
Parameters	Conditions	Min	Typ	Max	Units
Temperature ranges	Operating(with derating)	-40		+85	°C
	Case temperature			105	°C
	Storage	-55		+125	°C
Humidity	non condensing	5		95	%
Reliability, calculated MTBF	MIL-HDBK-217F, @ +25° C, ground benign	659000			Hours
Isolation voltage	For 60 seconds(Input/Output)			1500	VDC
Isolation capacity	Input/Output		1000		pF
Isolation resistance	Input/Output (500 VDC)	1000			MΩ
Remote On/Off	On	3.0 ~ 15 VDC or open circuit			
	Off	0 ~ 1.2 VDC or short circuit pin 4 and pin 2			
	Off idle current:		2.5		mA
Switching frequency (fixed)	pulse width modulation PWM		300		KHz
Vibration and thermal shock		MIL-STD-810E			
Safety standards		EN 60950-1, IEC 60950-1			
Case material		Nickel Coated Copper With Non-Conductive Base			
Base material		Non-conductive FR4			
Potting material		epoxy (UL 94V-0 rated)			
Weight		55 g (0.53 oz)			
Soldering temperature		max. 265°C / 10sec			

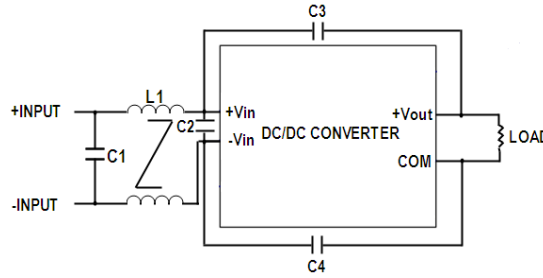
Note : 1 Ripple & Noise measurement bandwidth is 20 MHz, measured with a 1uF M/C.
 2 Triple output – 3.3VDC output / 5VDC output 100% load and one of auxiliary 100% load, other auxiliary load change from 25% to 100% load
 3. The ON/OFF control pin voltage is referenced to -Input.(Leave open if not used.)

Temperature Derating Graph	Part Number
	96D - 12 S 05 R T 12 R 4 NL A B C D E F G H I J A:Series B:Input Voltage C:Single(S),Dual(D) D:Output Voltage E:Regulated(R) F:Triple(T) G:Case Type H: Regulated(R) I:Packge J:RoHs Version



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EMC Considerations

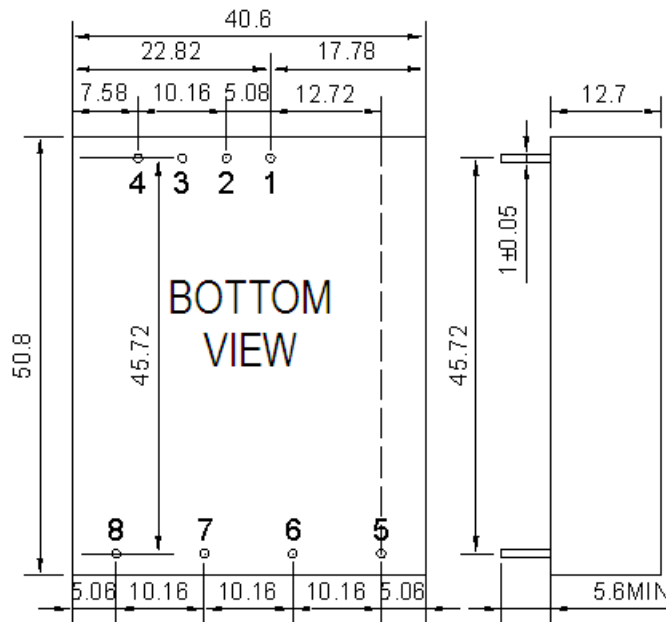


Suggested Schematic to comply with EN55022 Conducted Noise emission Class B

Following components are needed to comply with EN55022 Class B conducted noise:

96D-12SxxRT12R4NL/96D-24SxxRT12R4NL				96D-48xxRT12R4NL			
Componet	Value	Voltage	Reference	Componet	Value	Voltage	Reference
C1	4.7uF	50V	1812 MLCC	C1,C2	2.2uF	100V	1812 MLCC
C3,C4	1000pF	2KV	MLCC	C3,C4	1000pF	2KV	MLCC
L1	450uH		Common Mode Choke	L1	450uH		Common Mode Choke

Markings and dimensions



UNIT:mm XX.X±0.5 XX.XX±0.25
Pin Size Tolerance: 1.0Φ ±0.05mm

PIN Connection

PIN	1	2	3	4	5	6	7	8
SINGLE	+Vin	-Vin	NO PIN	Ctrl	+AUXILIARY	+3.3v/+5V	COM	-AUXILIAR