MINI-ITX Power Supply

DC Input mini-ITX power supply

A P P R O V A L S H E E T

MODEL NO.: CP12DTD

REV : 1

DATE : 2017/05/16

Approval	Check	Prepared

1. Scope

This specification defines the performances and characteristics of a *84* watts, *5* output level DC to DC converter for use in ITX computer system product.

2. DC Input

2.1 Input Requirements

Parameter	Minimum	Nominal	Maximum	Unit
Vin	*11.4*	*12.0*	*12.6*	VDC
Iin			*12*	A
Ripple & Noise			*200*	mVp-p

2.2 Efficiency

The converter efficiency should not be less than *90%* at the maximum load of section 3.1
with nominal DC input voltage specified in section 2.1.

3. DC Output

3.1 Output Power Distribution

Output	Load Current (A)			Maximum Combined Power (W)
	Minimum	Maximum	Peak	
+12V	*0*	*3*	*5*	*84*
+5V	*0*	*5*	*7*	
+3.3V	*0*	*5*	*7*	
-12V	*0*	*0.1*	*0.2*	
+5VSB	*0*	*1*	*2*	

3.2 Output Voltage Regulation

Output	Range	Minimum	Nominal	Maximum	Unit
+12V	±5%	*11.40*	*12.00*	*12.60*	Volts
+5V	±5%	*4.75*	*5.00*	*5.25*	Volts
+3.3V	±5%	*3.14*	*3.30*	*3.46*	Volts
-12V	±15%	*-10.80*	*-12.00*	*-13.20*	Volts
+5VSB	±5%	*4.75*	*5.00*	*5.25*	Volts

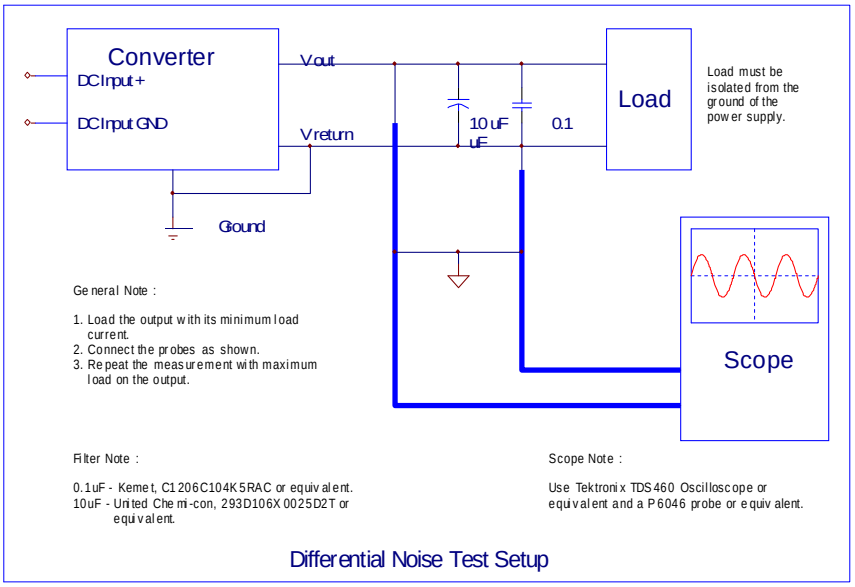
3.3 Output Ripple and Noise

3.3.1 The output ripple & noise requirements listed in below should be met throughout the load ranges specified in section 3.1 and under all input voltage conditions as specified in section 2.1

3.3.2 Ripple and noise are defined as periodic or random signals over frequency band of 10Hz to 20MHz. Measurement shall be made with an oscilloscope with 20MHz bandwidth. Output should be bypass at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

3.3.3 Specification:

Output	Maximum Ripple & Noise (mVp-p)
+12V	*120*
+5V	*50*
+3.3V	*50*
-12V	*120*
+5VSB	*50*



Differential Noise Test Setup

3.4 +5VSB Output

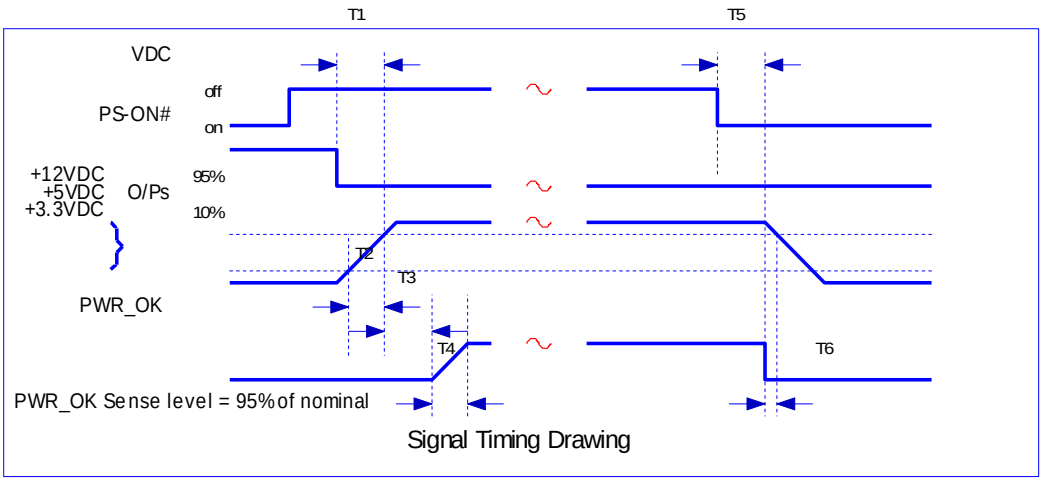
The +5VSB is a standby supply output is active whenever the DC input is present.

3.5 DC Output

This DC output +5VSB is controlled by the DC input, but the other DC output is controlled by the " PS-ON# " signal and DC input.

4. Timing and Signal

4.1 Signal Time Drawing



Signal Timing Drawing

4.2 Overshoot and Undershoot

Any overshoot at turn on or undershoot at turn off shall be less than *±10%* of the nominal output voltage values.

4.3 Power-on Time

The Power-on time is defined as the time from when PS-ON# is pulled low to when the +12VDC, +5VDC, and +3.3VDC output are within the regulation range specified in section 3.2. The power-on time shall be less than *500ms* ($T_1 < 500ms$).

4.4 Rise Time

The output voltage shall rise from 10% of nominal to within the regulation ranges specified in section 3.1 within *0.2ms* to *20ms* ($0.2ms \leqq T_2 \leqq 20ms$).

4.5 Power Good Signal

This is a TTL-compatible signal, At power turn on, the power good signal shall have a turn on delay of at least *100ms* , but no greater than *500ms* after +5V output has reached
its minimum sense level 4.75V. At power turn off, the power good signal shall go to a down level at least *1ms* before +5V fall below the regulation limits described in section 3.2 ($100ms \leqq T_3 \leqq 500ms$ and $T_6 \geqq 1ms$).

4.6 PS-ON# Signal

PS-ON# is an active-low, TTL-compatible signal. When PS-ON# is pulled to TTL low, the converter should turn on the four main DC output rails: +12VDC, +5VDC, +3.3VDC, and –12VDC. When PS-ON# is pulled to TTL high or open-circuit, the DC output rails should not deliver current. PS-ON# has no effect on +5VSB output, which is always enable whenever the DC input is present.
Logic level：“High ” is 2.0V ~ 5.25V
“Low ” is 0.0V ~ 0.8V

5. Output Protection

5.1 Over Voltage Protection

When the +12VDC, +5Vdc, and +3.3VDC output have over voltage condition, the converter shall provide latch mode over voltage protection as defined in following table.

Output	Minimum	Nominal	Maximum	Unit
+12V	*13.2*	*13.8*	*14.4*	Volts
+5V	*5.7*	*6.1*	*6.5*	Volts
+3.3V	*3.7*	*3.9*	*4.1*	Volts

5.2 Short Circuit Protection

An output short circuit is defined as any output impedance of less than 0.1 ohms. The converter shall shut down and latch off for shorting the +3.3VDC, +5VDC, or +12VDC rails to return or any other rail. Shorts between main output rails and +5Vsb shall not cause any damage to converter. The converter shall either shut down and latch off or fold back for shorting the negative rails. +5Vsb must be capable of being shorted indefinitely, but when the short is removed, the +5Vsb output shall recovery automatically or by cycling PS-ON#. The converter shall be capable of withstanding a continuous short-circuit to the output without damage or overstress to the unit.

5.3 Over Power Protection

The converter can use electronic circuit to limit the output power against excess *134W* of surge power or protected against excessive power delivery at section 6.1 temperature environment due to short circuit of any output or over total power at any input condition.

5.4 No-load Operation

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The converter may latch into the shutdown state.

5.5 Reset After Shutdown

If the converter latches into a shutdown state because of a fault condition on its outputs, the converter shall return to normal operation only after the fault has been removed and PS_ON# has been cycled OFF/ON with a minimum OFF time of two seconds.

6. Environment

6.1 Operation

Temperature: 0 ℃ to 40 ℃
Relative humidity: 10% to 90%, non-Condensing

6.2 Shipping and storage

Temperature: -20 ℃ to +70 ℃
Relative humidity: 5% to 95%, non-Condensing

7.Tempreture control function Description

Fan doesnot work when working tempreture is below 60℃. It begin to work when tempreture is more than 60℃. This makes fan economize on energy , but also quiet that fan doesnot work when low tempreture. It will also has good cooling effect that fan works at high tempreture eviroment.

8. Reliability

8.1. MTBF

The demonstrated MTBF shall be *100,000* hours of continuous operation at 25 ℃, full load, 80% confidence limit and nominal line. The MTBF of converter shall be calculated in accordance with MIL-STD-217D/E. The DC Fan is not included.

8.2. Burn-in Test

The power supply shall be 100% burn-in tested with maximum loading and 40 ℃ environment temperature.

9. Mechanical Specification

9.1. Weight

The converter weight: about *38* grams.

9.2. Layout