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SUBJECT/ Thema: **Power Requirement for CPCI Boards**
Rise Time, Power Sequencing, Tolerance and Regulation of CPCI PSU

Report by/ Bericht von: Technical Support, Kontron Modular Computers
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Requirement of Start-up, Power Sequencing, Tolerance and Regulation

The start-up behavior of CPCI and PCI (ATX) power supplies is critical for all new CPCI - boards and particular CPU - boards. These boards require a defined power of sequence and start-up behavior of the power supply. The required behavior is described in the ATX12V Power Supply Design Guide (http://www.formfactors.org/FFDetail.asp?FFID=1&CatID=2) and the CPCI (PICMG, http://www.picmgeu.org/) specification.

1 General Requirement

1.1 Start-up and Rise Time

The rise time must be:

- Beginning at 10 % of the nominal output voltage, the voltage must rise within > 0.1 ms to < 20 ms to the specified regulation range of the voltage. Typically: > 5 ms to < 15 ms.
- There must be a smooth and continuous ramp of each DC output voltage from 10% to 95% of the regulation band.
- The slope of the turn-on waveform shall be a positive, almost linear voltage increase and have a value from 0 V to nominal Vout.

1.2 Power Sequencing

- The + 5 VDC output level must always be equal or higher than the + 3.3 VDC output during power-up and normal operation.
- The time from + 5 VDC until the output reaches its minimum in regulation level and from + 3.3 VDC until the output reaches its minimum in regulation level must be < 20 ms.

1.3 Tolerance

The tolerance of the voltage lines is described in the cPCI specification (PICMG 2.0 R3.0).
The recommended measurement point for the voltage is the cPCI connector on the CPU board.

Description	Nominal Value	Tolerance	Max. Rippel (p-p)	Info
5V	+ 5.0 VDC	+ 5% / - 3%	50 mV	Main voltage
3.3V	+ 3.3 VDC	+ 5% / - 3%	50 mV	
+ 12V	+ 12 VDC	+ 5% / - 5%	240 mV	
- 12V	- 12 VDC	+ 5% / - 5%	240 mV	Not required
V (I/O) PCI I/O voltage	+ 3.3 or + 5 VDC	+ 5% / - 3%	50 mV	Standard Version + 5.0V
GND	Ground, not directly connected to potential earth (PE)			

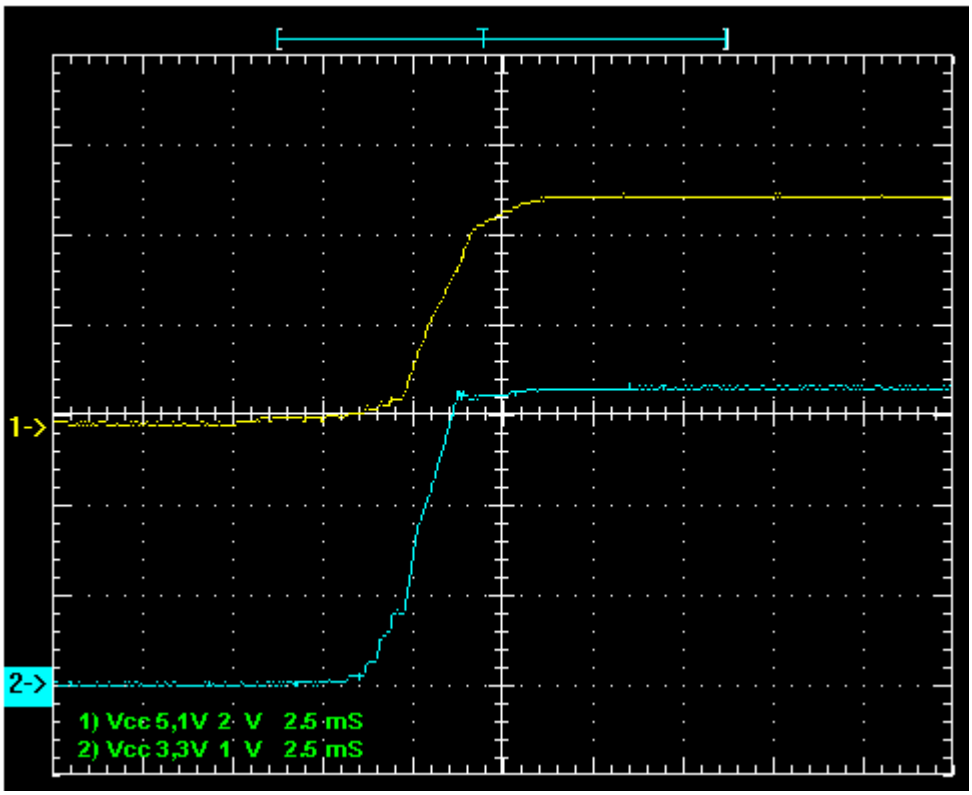
- The output voltage overshoot generated during the application (load changes) or during the removal of the input voltage must be less than 5% of the nominal value.
- No voltage of reverse polarity may be present on any output during turn-on or turn-off.

1.4 Regulation

- The power supply shall be unconditionally stable under line, load, unload and transient load conditions including capacitive loads.
- The operation of the power supply must be consistent even without the minimum load on all output lines.
- All voltages with the same performance characteristics must be functionally coupled to each other in order for them to be controlled in the event that a voltage drops out, for example, due to current or temperature overload.

1.5 Rise Time Diagram

Recommended start-up ramp of a cPCI power supply for all Kontron Modular Computer boards delivered up to now.
Example: Kontron CPCI power supply: CP3-SVE180 AC
AC/DC Type, Index ADBB, S/N 26851000



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