AN1217
APPLICATION NOTE

Migrating from STPC Consumer-S to STPC Consumer-II

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1. Overview.

This document describes how to design for the STPC Consumer-S in a way that it can be replaced by the STPC Consumer-II once silicon becomes available.

All information is extracted from the STPC Consumer-S and STPC Consumer-II datasheets.

2. Differences between the two devices.

2.1 Functional difference.

The STPC Consumer-II is the 0.25µm version of the STPC Consumer-S which is based on 0.35µm technology with the resulting advantages in speed and power consumption.
As a result, the list of functionnal differences between the 2 devices is very limited.

Improved features:
- The STPC Consumer-II supports 64-Mbit and 128-Mbit SDRAM devices.

New features:
- JTAG.
- Synchronisation of the CRTC on an external video signal.
- Color_Compare output signal, coming from the picture-in-picture block.

The two devices have also some differences in term of strap options, and VGA RAMDAC reference current.

2.2 Pinout differences.

TABLE 1. Pinout differences

Ball	STPC Consumer-S	STPCConsumer-II	Comment
G3	NC	TCLK	JTAG
N1	NC	TMS	JTAG
W1	NC	TDI	JTAG
AC2	NC	TDO	JTAG
G26	NC	Hi-Z / PA[22]	ISA / Local Bus
A20	NC	Hi-Z / PA[23]	ISA / Local Bus
C15	NC	COL_SEL	Color_Compare Output
AD9	VDD_DAC2	NC	
AF10	VSS_DAC2	NC	
E26	VSS_DLL	NC	
D18	VDD5	NC	5V Power Supply for PCI pads
A16	VDD5	NC	5V Power Supply for PCI pads
B11	VDD5	NC	5V Power Supply for PCI pads
B9	VDD5	NC	5V Power Supply for PCI pads
AF8	3.3V	2.5V	VDD_DAC1
AD12	3.3V	2.5V	VDDA_TV
E25	VSS_DLL	2.5V	VSS_DLL is connected to GND
G24	3.3V	2.5V	VDD_CPUCLK_PLL
F26	3.3V	2.5V	VDD_HCLK_PLL
F25	3.3V	2.5V	VDD_DEVCLK_PLL
AC17	3.3V	2.5V	VDD_MCLKI_PLL
AC15	3.3V	2.5V	VDD_MCLKO_PLL
AD13	3.3V	2.5V	VDD_DCLK_PLL
D11	3.3V	2.5V	Core Power Supply
L23	3.3V	2.5V	Core Power Supply
T4	3.3V	2.5V	Core Power Supply
AC6	3.3V	2.5V	Core Power Supply

The Not Connected pins (NC) are not bonded to the die and can be left routed to the signal for the other configuration.

The PA signals of the local bus are in Tri-State when the STPC is in ISA bus mode.

2.3 Strap Option differences.

Basically, the strap option differences can be divided in two categories: The new ones, and the ones with a potentially different configuration.

TABLE 2. New strap options

Signals	Consumer-II	Comment
MD[1]	DACs test mode	Pull-Up
MD[3:2]	HCLK PLL Speed	Extends MD[26:24] to improve HCLK speed selection
MD[4]	PCI_CLKO divisor	Extends MD[17] to improve PCI_CLKO speed selection
MD[5]	HCLK synchro	Pull-Up if HCLK = MCLK, Pull-Down otherwise
MD[6]	PCI_CLK PLL speed	Pull-Down if PCI_CLK < 32MHz, otherwise Pull-Up
MD[7]	PCI_CLK PLL speed	Pull-Down
MD[13:10]	PCI_CLK deskew	Value not finalized yet
MD[14]	CPU CLK : x2/x4	Pull-Up

TABLE 3. Strap options with potentially different configuration

Signals	Consumer-II	Comment
MD[26:24]	HCLK PLL Speed	Value changed due to MD[3:2] extending HCLK speed selection
MD[30:27]	HCLK Delay	Value not finalized yet
MD[35:31]	HCLK Skew	Value not finalized yet
MD[43:41]	CPU DLL TIC Value	Value not finalized yet
MD[46:45]	HCLK mode	Value not finalized yet (Pull Up by default)

2.4 VGA RAMDAC differences.

Migrating from the STPC Consumer-S to the STPC Consumer-II, the resistor on RSET pin becomes 147 Ohms 1% instead of 540 Ohms 1%.

3. Solution.

3.1 2.5V Power Pins.

In the consumer-II a certain number of balls are powered with 2.5V supply and not 3.3V. These must be connected to a 2.5V supply which can be located on the same plane as the 3.3V supply.

The VSS_DLL ball (E25) needs to be connected to ground (Consumer-S) or to the 2.5V power plane (Consumer-II) using a null resistor, a solder drop, or any equivalent method.

3.2 Not Connected balls.

All the balls which are Not Connected in STPC Consumer-S or STPC Consumer-II configuration can be left routed. The result is summarized in the following table:

TABLE 4. Untouched signals

Ball	Signal	Comment
G3	TCLK	JTAG
N1	TMS	JTAG
W1	TDI	JTAG
AC2	TDO	JTAG
G26	Hi-Z / PA[22]	ISA / Local Bus
A20	Hi-Z / PA[23]	ISA / Local Bus
C15	COL_SEL	Color_Compare Output
AD9	VDD_DAC2	
AF10	VSS_DAC2	
E26	VSS_DLL	
D18, A16, B11, B9	VDD5	5V Power Supply for PCI pads

3.3 Strap options.

The new strap options can be implemented for the STPC Consumer-S, this does not affect the behaviour of the device.

The strap options with different values should remmain easy to modify. This can be achieved by using a dummy resistor in the schematics and doing the final choice during the assembly of the board.

4. Technical Support

STMicroelectronics is on the Internet with a worldwide web (WWW) site on which product presentation, technical literature as well as product support information can be found.

A dedicated STPC section is available providing up to date hardware documentation and software tools.

The Web address is:

WWW : ***http://www.st.com/stpc***

5. Update History for Application Note AN 1217

This is the first issue.

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