

XBOX 360 CPU Datasheet

Version 1.5

Disclaimer

The information contained in this document was obtained from the public domain and/or my own reverse engineering and is provided in good faith but no warranty can be made for its accuracy. Any opinions expressed are entirely those of myself and cannot be taken to represent the views of past, present or future employers.

I do not support piracy or the illegal copying of copyright material. I'm only seeking the ability to run custom software and push the hardware to it's maximum potential. Remember that a profitable game industry will guarantee us all amazing products for the future.

If you notice something incorrect or have any comment, please feel free to contact me.

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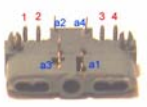
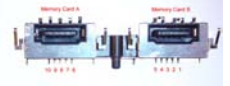


Introduction

Most of the information was based on the top and bottom layers of a dechipped 360 motherboard and decapped chips, I will update the information once I gain full knowledge of the inner layers of the motherboard.

Please double-check my information, I am human and I do make mistakes. I have also attempted to give credit where credit was due. If you find any errors or omissions, please let me know so that I can correct it on future versions.

Like most, I am doing this as a hobby in my spare time, so I will do my best to keep the information up to date but I can not make any guarantees. My plan is to expand this document into a xbox 360 CPU datasheet.

I am currently looking for a supplier/manufacturer for the following components;

	Controller Headset Port Both the Male and Female Connector.
	Memory Card Port Male Connector (On Memory Card)
	RF Module Port Male Connector (On RF Module)
	Hard Drive Port Male Connector (On Hard Drive)

Update: I have not received one reply to my request for the above connectors. I am interested in quantities >50,000 each.

My current employment position will be changing in the near future, so I will be open for new opportunities. I am a Canadian citizen living in Waterloo, ON, Canada with a background in Electronics Engineering and Management. Feel free to contact me for more details.

Help!

Goto www.free60.org or IRC free60 and give us a hand. We need hardware, software, researchers, web page editors, etc.

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XBOX 360 CPU (Version 1.4) by Speedy22

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK
1	1A	1B	1C	1D	1E	1F	1G	1H	1J	1K	1L	1M	1N	1P	1R	1T	1U	1V	1W	1Y	1AA	1AB	1AC	1AD	1AE	1AF	1AG	1AH	1AJ	1AK
2	2A	2B	2C	2D	2E	2F	2G	2H	2J	2K	2L	2M	2N	2P	2R	2T	2U	2V	2W	2Y	2AA	2AB	2AC	2AD	2AE	2AF	2AG	2AH	2AJ	2AK
3	3A	3B	3C	3D	3E	3F	3G	3H	3J	3K	3L	3M	3N	3P	3R	3T	3U	3V	3W	3Y	3AA	3AB	3AC	3AD	3AE	3AF	3AG	3AH	3AJ	3AK
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30	30A	30B	30C	30D	30E	30F	30G	30H	30J	30K	30L	30M	30N	30P	30R	30T	30U	30V	30W	30Y	30AA	30AB	30AC	30AD	30AE	30AF	30AG	30AH	30AJ	30AK

V _{CC}	Core Logic Supply (approx. 1.25 VDC)
ON _{OFF}	IO drives and receives; approx. 1.1 VDC
GND	Ground
AVDD	Analog Supply P.L. Misc. IO, Cpl (with 5 separate filter circuits; approx. 1.8 VDC)
AV_GND	Analog GND (with 5 separate filter circuits)
TEMP	Internal Supply/Source (See Specification)
TEMP	Temperature sensor
CTHRU(A)	Control Line floating with board possibility to go low
CTHRU(B)	Control Line floating with board possibility to go high
CTHRU(L)	Control line set Low
CTHRU(H)	Control line set High
CTHRU(S)	Control Line set low with board possibility to go high
CTHRU(LU)	Control Line set high with board possibility to go low
SR022(H)	Connects to Southbridge ZH
	Test Point
	Possible flag
	Misc IO (VDD, SPI)
NC	Makes no board connection
???	Connects to board via; but no connections found after that.
	Debug Point
	Flying test point
FSB	Front Side Bus; Bottom of board; (n) is the inverse
FSB	Front Side Bus; Top of board; (n) is the inverse

FSB = 40 pins
Possibly
TX1 (16ba), CH1 (20ba), Snop Response (24ba)
TX1 (16ba), CH1 (20ba), Snop Response (24ba)
RX1 (16ba), CH1 (20ba), Snop Response (24ba)
RX1 (16ba), CH1 (20ba), Snop Response (24ba)

CPU Inner Block Diagram

Not in this Public Release

CPU Connection Schematics

Not in this Public Release

Appendix

Document Version

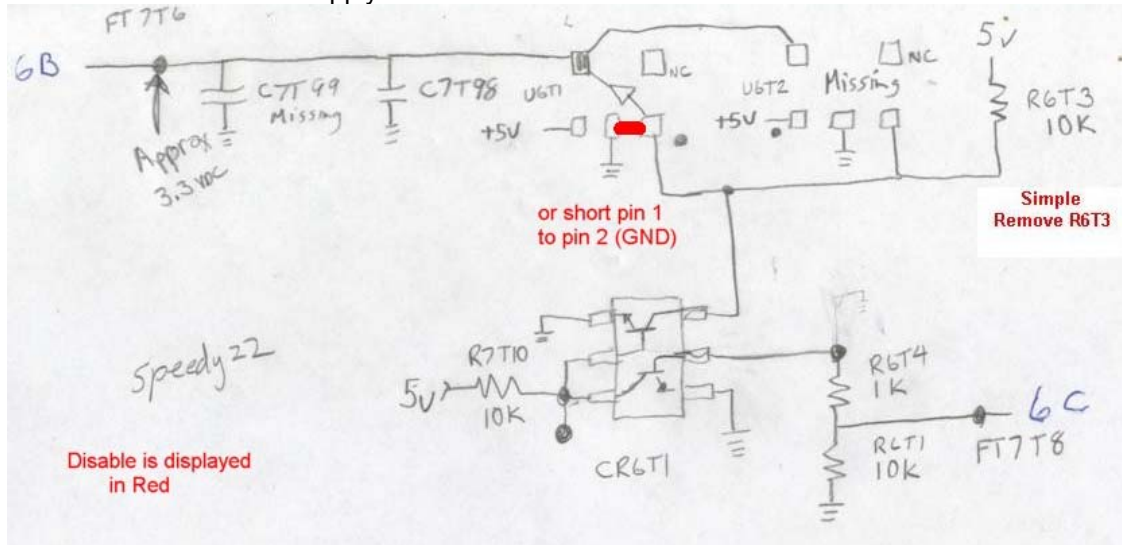
Version 1.5 Mar 06, 2006

Separated from Headers and Connectors
Added Speculation
Current Document

eFuse Speculation

Microsoft, say it ain't so!

While reverse engineering the xbox 360, I've discovered an additional feature I think needs to be discussed. As seen in my diagram, CPU pin 6C and 6B appears to be an eFuse Power Supply enable and eFuse Power Supply line.



It's been reported that IBM incorporates eFuses in some of its products and I wasn't overly surprised to hear it was being used in the xbox 360. eFUSES are electrically programmable fuses reportedly used for redundancy implementation in memory arrays, holding of permanent info such as chip id and possible CPU repair. eFuses are cheaper alternative to a laser-fuse. (Just google eFuse and IBM to learn more)

What has surprised me is that it appears this technology can be software enabled. (System Call 22 I believe)

Don't get me wrong, I do see a need for this technology at the factory and repairshop level, but giving a system designed with various input paths (DVD, CD, USB, Ethernet, Harddrive etc) the ability to make unreversible hardware modification without a switch or the owners permission is just a bad idea in my books.

Now I maybe wrong, I have spent the last week searching for another reason for this circuit and I keep coming back to the same conclusion.

So today I disabled U6T1 thereby disabling this feature until I learn more about it.

Some may say that I should strap on my tin foil hat, but if in fact VID data is stored in the eFuses, it may be possible to shut power off to the CPU permanently or increase the core supply to the point of self-destruct.

Remember that VID "111111" or "111110" (VID order 4,3,2,1,0,5) indicates "NO CPU" therefore no supply power to the core.

This is just one possible scenario and may give new meaning to "FRAG your opponent".

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