C Data

Solutions

Compact Flash Computer

Hardware Reference

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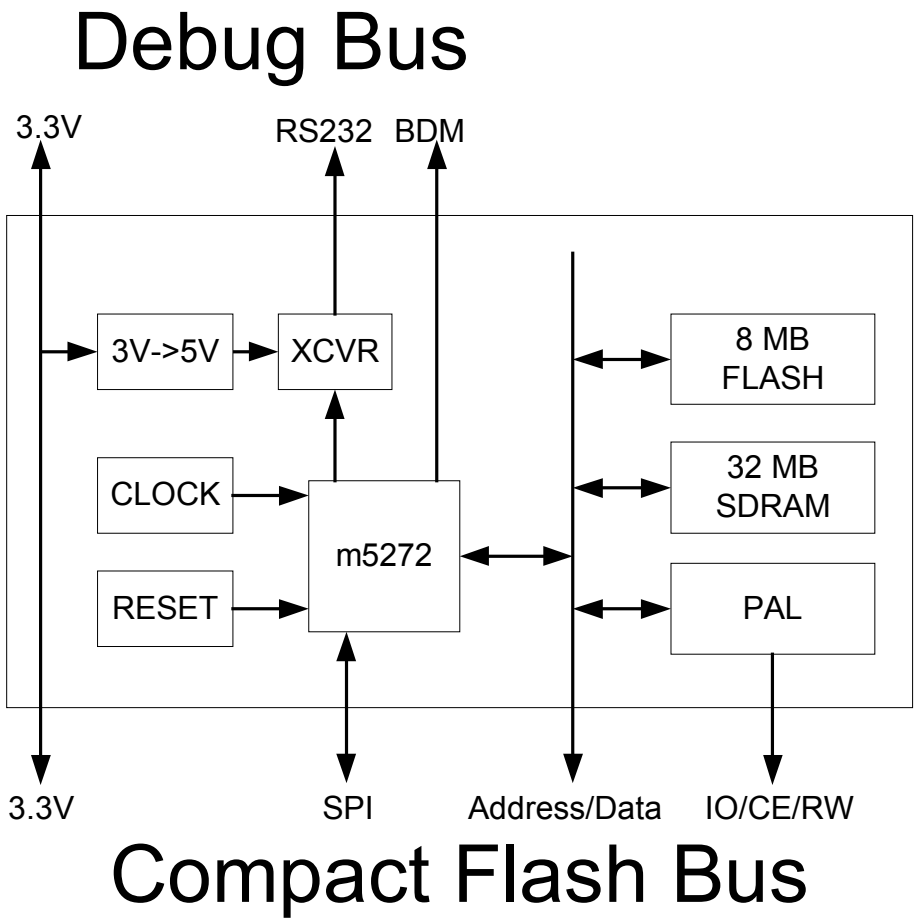
Functional Description

This section provides a functional description of the Compact Flash Computer. The figure below depicts the internal architecture of the Compact Flash Computer:



Motorola MCF5272 CPU

Based on the concept of variable-length RISC technology, ColdFire combines the simplicity of conventional 32-bit RISC architectures with a memory-saving, variable-length instruction set.

The MCF5272 has a 32-bit address bus and a 32-bit data bus. The MCF5272 supports an enhanced subset of the 68000 instruction set. The MAC provides new instructions for DSP applications.

The MCF5272 core incorporates a complete debug module that provides real-time trace, background debug mode, and real-time debug support.

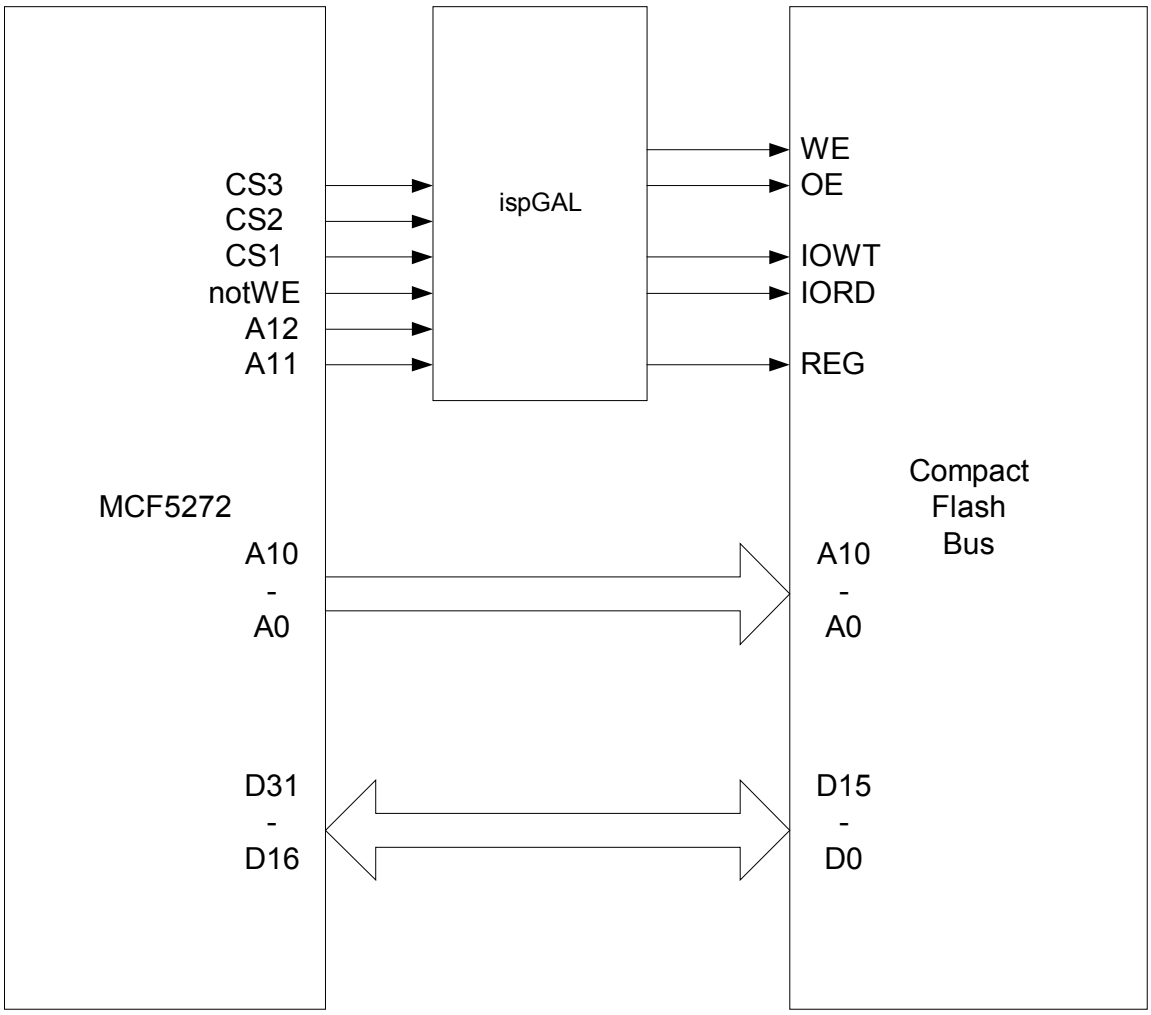
Compact Flash Computer Memory Map

Description	Address range
32 MB SDRAM	0x00000000-0x01ffffff
MCF5272 on chip registers	0x10000000-0x100017ff
8 MB FLASH	0xff800000-0xffffffff
Compact Flash bus (BYTE)	0xa0000000-0xa0001fff
Compact Flash bus (WORD)	0x40000000-0x40001fff

Compact Flash Bus Memory Map

Description	Address range
CIS (BYTE)	0xa00000000-0xa000007ff
Common Memory (BYTE)	0xa00000800-0xa00000fff
I/O (BYTE)	0xa00001000-0xa00001fff
CIS (WORD)	0x400000000-0x4000007ff
Common Memory (WORD)	0x400000800-0x400000fff
I/O (WORD)	0x400001000-0x400001fff

Addresses A10-A10 are connected directly to the Compact Flash Bus.
A11 is connected to (Compact Flash Signal) REG.
A12 is used to generate (Compact Flash Signals) OE, WE or IORD, IOWT.
CS1 access 0xa0000000 and generates BYTE cycles.
CS2 access 0x40000000 and generates BYTE cycles.
CS2 is currently not used. These could be re-programmed to allow access to the Compact Flash Bus with a reduced cycle time.



Compact Flash Bus Operation

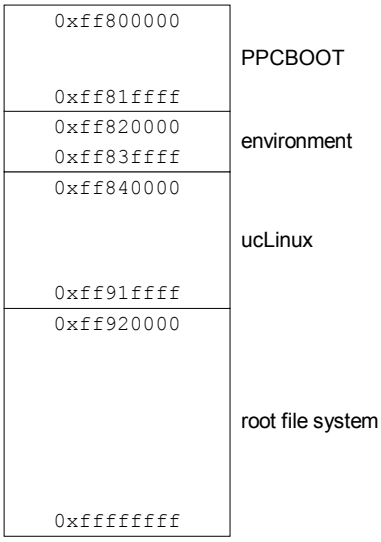
The Compact Flash Computer does not support any bus sizing logic. This does not present a problem when performing 16 bit operations.

When the MCF5272 performs byte operations, when configured as a 16-bit port, it transfers even address data on data lines D31-D24, while the Compact Flash Device will transfer data on D7-D0. This causes a mismatch.

This is simply overcome, read even bytes, as 16 bit data. This ensures that the even data is placed on the lower data lines D23-D16.

Flash Memory

The on-board 8M (4Mx16), FLASH memory provides storage for the operating system as well as OEM application and data.



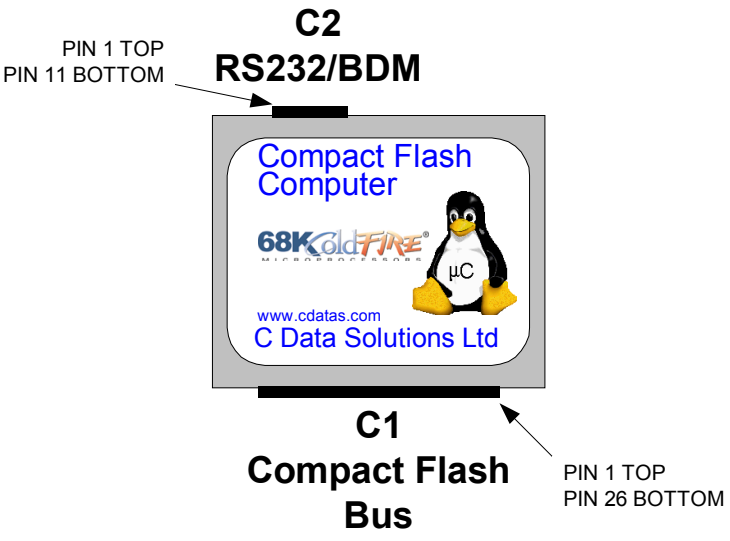
If the PPCBOOT program is damaged and the Compact Flash Computer fails to boot, it can be recovered by attaching a BDM cable and down loading PPCBOOT via the serial interface and re-programming the FLASH.

SDRAM Memory

The on-board 32M (16Mx16), SDRAM memory provides storage for the operating system as well as OEM application and data.

Connector Pin Outs

The connector pin-outs of the Compact Flash Computer are described here.



Connector C1 Compact Flash Bus

Compact Flash Computer					
Pin Num	Signal Name	Pin Type	Pin Num	Signal Name	Pin Type
1	GND		26	QSPI_IN	I/O
2	D03	I/O	27	D11	I/O
3	D04	I/O	28	D12	I/0
4	D05	I/O	29	D13	I/O
5	D06	I/O	30	D14	I/O
6	D07	I/O	31	D15	I/O
7	-CE1	O	32	-CE2	O
8	A10	O	33	QSPI_CS1	O
9	-OE	O	34	-IORD	O
10	A09	O	35	-IOWR	O
11	A08	O	36	-WR	O
12	A07	O	37	IREQ2	O
13	VCC		38	VCC	
14	A06	O	39		
15	A05	O	40	QSPI_CLK	O
16	A04	O	41	RESET	O
17	A03	O	42	-WAIT	I
18	A02	O	43		
19	A01	O	44	-REG	O
20	A00	O	45		
21	D00	I/O	46	IREQ3	I
22	D01	I/O	47	D08	I/O
23	D02	I/O	48	D09	I/O
24	WP	I	49	D10	I/O
25	QSPI_OUT	O	50	GNG	

Signals with shading alter function defined by the Compact Flash Specifications. QSPI signals have been added to allow the Compact Flash Computer to communicate to other devices without using the Compact Flash Bus. This allows hardware to control CE1 and CE2 to different Compact Flash devices. This enables multiple Compact Flash devices to share a common bus.

Connector C2 RS232/BDM

RS232/BDM					
Pin Num	Signal Name	Pin Type	Pin Num	Signal Name	Pin Type
1	VCC		11	VCC	O
2	VCC		12	notPBRST	I/O
3	PST0	O	13	PST1	O
4	PST2	O	14	PST3	O
5	TDO/DSO	O	15	TMS/notBKPT	I
6	notTRST/DSCLK	I	16	TCK/PSTCLK	O
7	TDI/DSI	I	17	MTMOD	O
8	notTEA	I	18	RX	I
9	TX	O	19	GND	
10	GNG		20	GND	

Electrical Specifications

Power Requirements
+3.3V dc ± 5% 200mA Typical
Operating Temperature 0°C - 70°C
Storage Temperature -40°C - +85°C
Relative Humidity 10% to 90% (no-condensing)

WARNING
Stressing the device beyond the Maximum Ratings may cause permanent damage. These are stress ratings only. Operation beyond the Operating Conditions is not recommended; extended exposure beyond the Operating Conditions may affect reliability.

I/O Pin Specifications
All I/O pins are 3.3 volt.

Thermal Specifications

The integrated circuits used on the Compact Flash Computer have a maximum case temperature rating of 70º C. The user will have to insure that these case temperatures are not violated in a particular application by using appropriate cooling techniques if necessary.

Special cooling is typically only needed in cases where high ambient temperatures exists.