ZF MICRO SOLUTIONS

	System-on-a-Chip	Embedded Microprocessors			
	ZF Micro ZFx86 PC-on-a-Chip	AMD Elan400	AMD ElanSC520	National Semiconductor Geode GXLV	ST Microelectronics STPC Industrial
CPU Speed	128MHz	33, 66, 100MHz	100,133MHz	Up to 266MHz	66, 80, 100MHz
Power Requirement	33MHz 251mW 66MHz 319mW 100MHz 382mW 128MHz 716mW (with APM enabled)	33MHz 0.8W 66MHZ 1.6W 100MHz 2.2W	100MHz 1.7W 133MHz 2.0W	266MHz 2.5W	80MHz 4.2W
L1 Cache	8K	8K	16K	16K	8K
FPU	YES	NO	YES	YES	YES
Total Active Devices Required	ZFx86, 1 DRAM & 1 Flash*	SC400, 1 DRAM, 1 Flash *	SC520, 2 DRAM, 1 Flash *	GXLV, CS5530, 4 DRAM, 1 Flash *	ST PC, 4 DRAM, 1 Flash *
Fully PC Compatible	YES	NO	NO	NO	NO
DMA Controller	8237/AT compatible 7-ch. internal/ 2 ext.	8237/AT comp. 2-channels	8237/AT comp. 4 ext. channels	(2) 8237-equivalent	8237/AT comp. 7-channels
Interrupt Controller	(2) 8259/AT compatible,16 IRQs, ISA & PCI	(2) 8259/AT compatible, 8 IRQs	22 interrupts (all muxed ex. 4 PCI)	(2) 8259A-equivalent	(2) 8259/AT comp.,16 IRQs, ISA & PCI
Timer/Counters	(3) 8254 compatible	YES	YES (3)	8254-equivalent	(3) 8254 compatible
Z-TAG™	YES[1]	NO	NO	NO	NO
ZF-Logic™	YES[2]	NO	NO	NO	NO
FailSafe® (patented)	YES[3]	NO	NO	NO	NO
BIOS license	YES	NO	NO	NO	NO
Linux Image	YES	NO	NO	NO	NO
RTO/S	YES VxWorks**	NO	NO	NO	NO
ISA BUS	YES[4]	partial	NO		multiplexed
PCI BUS	YES[4]	NO	YES	YES	multiplexed
I^2C BUS	YES[5]	NO	YES	YES	NO
USB	YES	NO	NO	NO	NO
Serial Ports	2 (16550)	1 (16550)	2 (16550) (1 multiplexed)	NO	2 (1 multiplexed) (15540)
Parallel Port	YES[4]	YES	NO	NO	multiplexed
Floppy Controller	YES[4]	NO	NO	NO	NO
EIDE	YES	NO	YES	NO	NO
Graphics	NO[6]	CGA only	NO	YES	YES
PC/AT Keyboard	YES[4]	NO	NO	NO	multiplexed

Feature Comparison

P/N: 9100-0056-00D
ZF073101

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	ZF Micro ZFx86 PC-on-a-Chip	AMD Elan400	AMD ElanSC520	National Semiconductor Geode GXLV	ST Microelectronics STPC Industrial
PS2 Mouse	YES[4]	NO	NO	NO	multiplexed
PCMCIA	NO[7]	YES (dual)	NO	NO	YES (single)
IrDA infrared port	YES	YES	NO	YES	NO
DRAM Bus	16/32 bit[8]	16/32 bit	32 bit only	64 bit only	64 bit only
DRAM Controller	SDRAM	EDO & Fast Page	SDRAM	SDRAM	SDRAM
Real-Time Clock	YES	YES	YES	YES	NO
GPIO	8	32 (all muxed)	32 (all muxed)	YES	NO
Watchdog Timer	YES (dual H/W-S/W)	NO	YES (dual H/W-S/W)	NO	NO
Pulse Width Mod.	YES (up to 100KHz)[9]	NO	NO	NO	NO
External FLASH decode logic	YES	NO	YES	YES	NO
Software Compatibility	Linux, WinCE, Windows 9x, Windows NT, Various RTOS	WinCE Windows 9x Linux	PSOS, RTXC, VxWorks, WinCE	Linux, WinCE, Windows 9x, Windows NT, Various RTOS	WinCE, Windows 9x, Windows NT, Linux
Standard Temp Rating	33MHz (-40 to 85C) 66MHZ (-40 to 85C) 100MHz (-40 to 85C) 128MHz (0 to 70C)	33MHz (-40 to 85C) 66MHZ (-10 to 70C) 100MHz (0 to 70C w/heatsink)	100MHz (0 to 85C) 133MHz (0 to 85C)	0-85C (max case temp)	66, 80, 100MHZ (0 to 70C with heatsink)
Voltage	2.2V — 2.7V Core[10] 3.3 I/O 5V tolerant	3.3	2.5 core, 3.3 I/O	2.5 core, 3.3 I/O, 5V tolerant	3.3
Advanced Power Management	YES	YES	YES	YES	YES
Package	388-ball grid array	292-ball grid array	388-ball grid array	352-ball grid array	388-ball grid array

Total number of active semiconductor devices required to boot and run an operating system with ONLY the features shown in the respective column. In order to match all the features and functions present in the ZFx86 additional components would be required.

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[1] Z-Tag high-speed serial access allows field or factory software downloads at more than 100 times normal speeds.
[2] ZF-Logic chip select control eases x86 system integration.
[3] FailSafe® Boot ROM redundant boot mechanism allows full recovery even when system BIOS is corrupted due to adverse operating conditions.
[4] ISA, PCI, Floppy, AT/Keyboard, PS2 Mouse, parallel port, serial ports with no signal multiplexing means all devices can be used simultaneously without loss of any features
[5] I^2C bus is a bi-directional 2-wire, serial data (SDA) and serial clock (SCL) bus for inter-IC control.
[6] Graphics controller not included in ZFx86 because standards change rapidly and system power consumption and complexity both increase significantly decreasing reliability.
[7] PCMCIA not included in ZFx86 because most such devices are too expensive to be used cost effectively in embedded applications.
[8] ZFx86's selectable memory bus allows a fully working with 1, 2, or 4 DRAM chips, a significant cost advantage over devices with a 64-bit bus that always require 4 DRAM chips to operate.
[9] PWM is ideal for uses such as motor control.
[10] 2.2V Core Voltage @ 33HMz, 66MHz, and 100Mhz, 2.7V Core Voltage @ 128MHz
** VxWorks run-time license and associated software. Customers of ZF Micro Solutions products are responsible for obtaining any Wind River/VxWorks tools and/or additional licenses required to support their specific applications.

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