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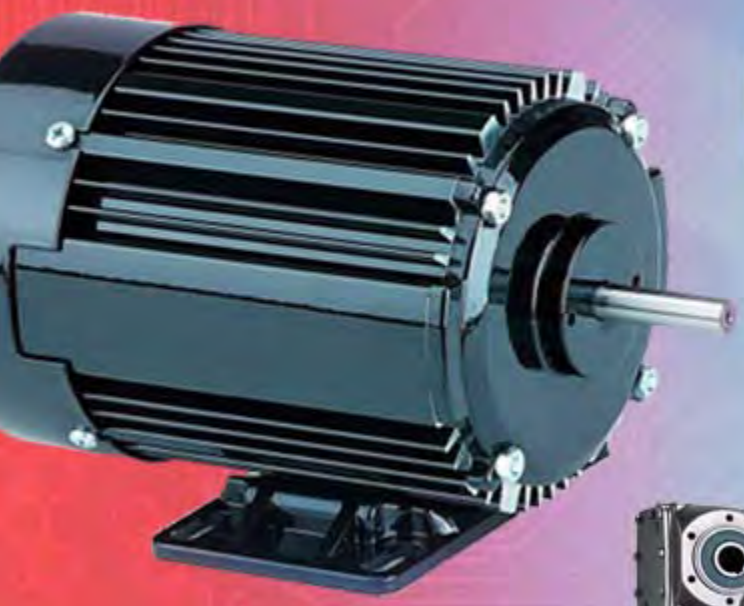
The Channel

Quarterly News from Zilog • May 2014 • Issue 15

Motor and Energy Management



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The Executive Corner

Motors and Energy Management

It may come as no surprise that as energy demands rise, accounting for energy utilization must increasingly become a central design focus toward developing applications in which significant power savings gains can be recognized. With higher energy demands comes higher energy prices, and while companies are spending millions of dollars more in electricity costs, they are actively looking for ways to achieve better cost-versus-output ROI.

As an example, a recent Department of Energy study shows that electric motors consume nearly 63 percent of the electricity used by industry. Last year, industry consumed 1,021 billion kilowatt hours (kWh) of electricity, in which 643 billion kWh were consumed by electric motors. To look at it in another way, optimizing electric motors using advanced motor control could conceivably save 2.6 million short tons of coal, 11.6 million barrels of oil, or 66.2 billion cubic feet of natural gas annually.

Zilog, as well as many other microcontroller companies, offers solutions that are well-suited to the task of reduced energy utilization for the control of motors and other energy-management applications. Over the last five years, Zilog has made tremendous progress at leveraging hardware and software functionality to produce significant improvements in energy savings.

Today, Zilog has solutions for brushed, brushless, stepper, trapezoidal, sinusoidal, and FOC methods for today's motor control needs. Zilog also provides a wide array of development kits to help accelerate our customers' energy-efficient designs.

One consideration for applying reduced energy use is to add a data logger into your system to record and monitor multiple energy-related elements and processes. Such a device can measure CO2, humidity, temperature, and electricity usage, plus record motor run times and on/off cycles, according to *Buildings.com*. For example, an intelligent data logger can record data covering a wide variety of conditions that can be applied to the motor in an HVAC unit toward optimizing a commercial heating and cooling system. Indeed, a data logger can be easily programmed to flash alerts, failure warnings, and even proactive user notifications.

With these ideas in mind, Zilog has just completed a reference design that provides both power line communication and RF wireless mesh networking for communicating with motors, pumps, fans, and other components in a typical commercial system. As an integral facet of its design, it can communicate with a smart meter to ping the best local power rates to further optimize when to run certain energy-intensive tasks.

To enable many of these energy applications, Zilog continues to monitor industry needs and markets in an ongoing effort to build industry value with our microcontrollers, embedded software, and supporting tools.

At Zilog, we understand that we must grow and evolve to provide relevant solutions for our customers, and we're listening for ways in which we can offer you increased value while your customers pursue reduced energy expenditures.

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Product Spotlight

Whether your goal is to secure your devices from external threats or to find the optimal development kit for motor control applications, Zilog has the perfect solution. In this issue, we turn the spotlight on the Z8F2480 Power Monitoring Webserver, the MultiMotor Development Kits, and ZGATE Embedded Security.

Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design

The Z8F2480 Power Monitoring Webserver integrates a Z8F2480-based AC power monitor with Zilog's eZ80F91 Webserver Module. It showcases the capability of an optically-isolated Z8F2480 MCU-based power monitor to measure AC input voltage, AC load current, voltage/current phase shift, the power factor of the load, and to communicate via a standard Ethernet interface and webserver.

The Z8F2480 MCU and the eZ80F91 Webserver Modules are connected for easy mounting. The load is powered via a single-phase AC line with voltage in the range of 90V to 240V RMS at 50Hz or 60Hz. The Z8F2480 MCU-based power board provides current to a power load and provides optically-isolated I^2C signals to communicate with the eZ80F91 Module.

The reference design can be used to develop systems that can control different power installations, including motors and lighting ballasts.

Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design

Features

- 90–240V AC RMS input voltage range
- Load current up to 3 amps
- less than 5mA average current consumed from an AC line in either monitoring or standby modes
- 3750V isolation voltage between the AC line and the eZ80F91 MCU

The Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design package ships with the following items:

- Z8F2480 AC Monitor Power Board
- eZ80F91 Webserver Module
- 5VDC power supply
- UART-to-RS232

Order from the Zilog Store

Order your Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design from the Zilog Store today – just look for Product ID#10035.

MultiMotor Series Development Kit

Develop your motor control applications with ease using Zilog's MultiMotor Series Development Kit. This development kit features a Zilog MCU Module connected to a 3-Phase MultiMotor Series Development Board, in addition to a 24V DC/3200 RPM 3-phase motor.

Several motor types are supported, such as BLDC, PMSM, and ACIM. Control algorithms including sensored, sensorless, trapezoidal, sinusoidal, and FOC/vector are also supported.

MultiMotor Series Development Kit

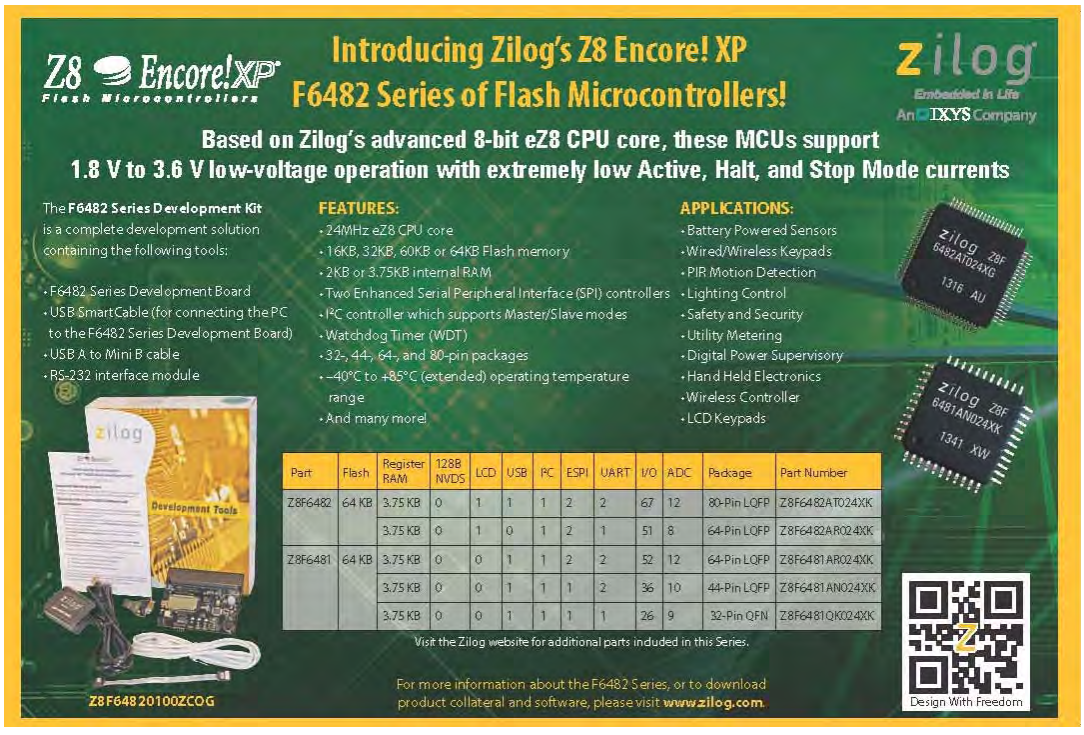
MultiMotor Series Development Kit Contents

- 3-phase MultiMotor Series Development Board
- Multiple MCU modules using different Zilog micro-controllers
- USB SmartCable with opto-isolator
- UART to USB adapter with opto-isolator 3-phase, 24V DC, 30W, 3200 RPM motor with internal Hall sensors
- Universal 24V AC/DC power supply

Highlights

- Sensorless block commutation
- Hall sensor block commutation
- Hall sensor sinusoidal PWM commutation
- Hall sensor space vector modulation commutation
- Several motor types, including BLDC, PMSM, and ACIM
- Control algorithms including sensored, sensorless, trapezoidal, sinusoidal, and space vector modulation

The MultiMotor Series Development Kit is easy to use, and contains everything you need to get started right out of the box.



ZGATE Embedded Security

Block unauthorized access at the device level with ZGATE Embedded Security.

ZGATE Embedded Security combines the eZ80F91 MCU and Zilog's full-featured TCP/IP stack with a world-class embedded firewall to provide for a safer and faster deployment of your embedded communication applications.

ZGATE Embedded Security Devices

The ZGATE Firewall includes a static packet filtering engine that filters packets according to user-defined configuration rules and a stateful packet inspection engine that can automatically filter suspicious packets based on unusual activity.

Additionally, select ZGATE products include threshold-filtering mechanisms that can minimize the effect of packet floods.

The eZ80F91 MCU that powers Zilog's ZGATE Embedded Security devices is a high-performance 8-bit microcontroller with an integrated 10/100 BaseT EMAC. This EMAC is a power-efficient, optimized pipeline architecture microcontroller with a maximum operating speed of 50 MHz.

ZGATE Firewall Features

- Ethernet, IP/UDP/TCP/ICMP filtering
- Extremely low latency
- API for event logging
- Easily-configurable filtering rules:
  - Static/rules-based filtering blocks packets based on configurable rules
  - Dynamic filtering/stateful packet inspection (SPI) blocks packets based on connection state
- Ability to choose your firewall package based on application requirements

Firewall Features	Standard Package	Extended Package	Premium Package*
Static Filtering	Yes	Yes	Yes
Stateful packet inspection	Yes	Yes	Yes
Port, protocol and address limits	15 ports, 10 protocols, 10 IP addresses and 10 MAC addresses	100 ports, 100 protocols, 100 IP addresses and 100 MAC addresses	100 ports, 100 protocols, 100 IP addresses and 100 MAC addresses
Threshold-based filtering	No	No	No

Note: *The ZGATE Embedded Security Development Kit (ZGATE000100ZCOG) ships with the Premium firewall package.

S3 Family of Microcontrollers

Zilog's S3 Family of Microcontrollers offers a fast and efficient processor core, Flash memory, a wide range of integrated peripherals, and an efficient register-oriented architecture designed to enable a wide range of consumer, home appliance, and low-power applications.

Consider building your application with an assortment of 8-bit single-chip CMOS microcontrollers that offer a fast and efficient CPU, a wide range of integrated peripherals, and multiple Flash memory ROM sizes. In this issue of the Zilog newsletter, we highlight two members of Zilog's S3 Family, the S3F80PB and S3F80QB MCUs.

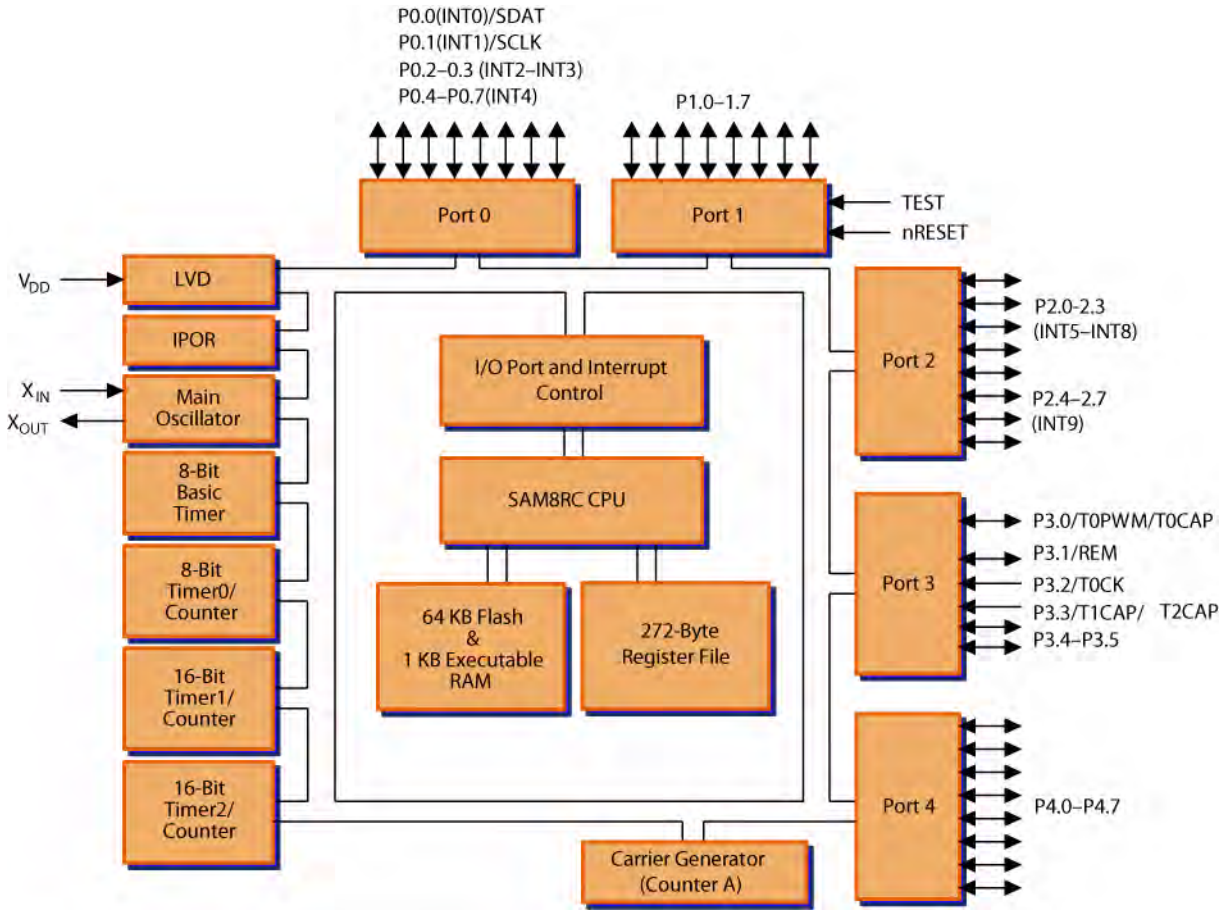
S3F80PB MCU

The S3F80PB MCU offers a fast and efficient Z8-compatible CPU, 64KB of Flash memory, and a wide range of integrated peripherals. This device features an LVD circuit and up to 38 bit-programmable pins, 4 timer/counters, and one basic timer. It includes 24 interrupt sources with 18 vectors, and can recognize up to 9 interrupt levels. As such, the S3F80PB MCU is designed specifically for universal remote control applications.

S3F80PB MCU Packages

The S3F80PB device is offered in the following four package types:

- 32-pin SOP
- 44-pin ELP
- 44-pin QFP
- Pellet (die)



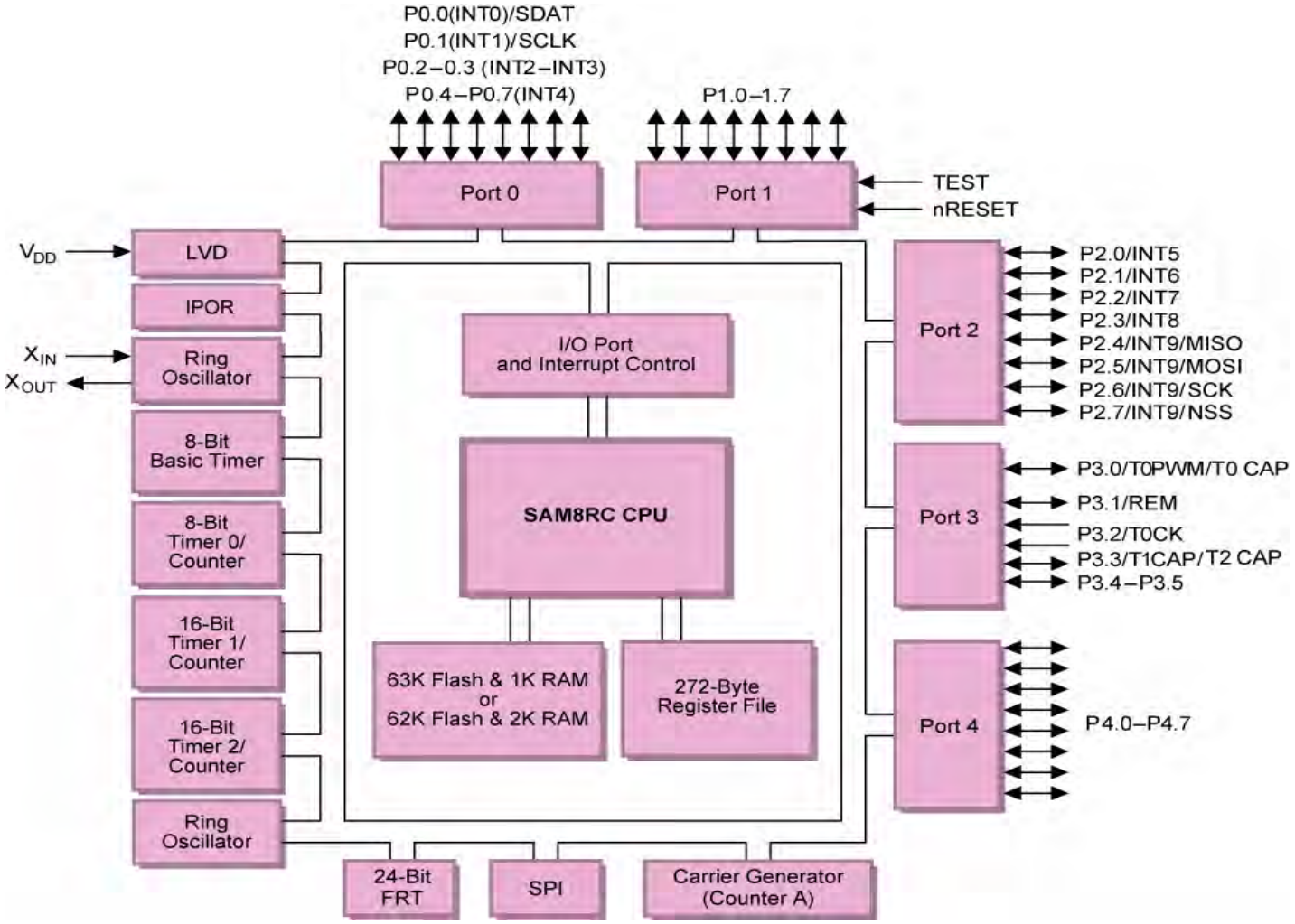
S3F80PB Block Diagram

S3F80PB MCU Features

- SAM88 Z8-compatible CPU core
- 64KB internal Flash program memory
- 128-byte sector size
- CPU-programmable with LDC instruction
- Fast 20 µs byte programming time
- 1KB executable RAM
- 272-byte general purpose data memory
- 78 CISC instructions
- 24 interrupt sources with 18 vectors and 9 levels
- Up to 38 bit-programmable pins
- One programmable 8-bit basic timer, one 8-bit timer/counter, two 16-bit timer/counters, and one 8-bit counter
- Low voltage detect circuit

S3F80QB MCU

The S3F80QB device is a versatile general-purpose microcontroller, which is especially suitable for use as remote transmitter controller. This controller offers a fast and efficient Z8-compatible CPU, 63KB of Flash memory, and a wide range of integrated peripherals.



S3F80PB Block Diagram

S3F80QB MCU Packages

The S3F80QB MCU is offered in the following three package types:

- 44-pin ELP
- 44-pin QFP
- Pellet (Die)

S3F80QB MCU Features

- SAM88 Z8-compatible CPU core
- 63KB internal Flash program memory
- 128-byte sector size
- Byte-programmable; user-programmable with LDC instruction
- 26 interrupt sources with 20 vectors and 9 levels
- 272-byte general purpose data memory
- 78 CISC instructions
- Up to 38 bit-programmable pins
- One programmable 8-bit basic timer, one 8-bit timer/counter, two 16-bit timer/counters, one 8-bit counter, and one 24-bit FRT
- One-channel SPI
- Internal ring oscillator
- Backup Mode, LVD circuit

Browse through the 2014 S3 Family Line Card, now available on the Zilog website, to learn about the many S3 options Zilog offers.

Build your application with the S3 Family devices listed in the following tables.

S3 Family Low Power Devices

Part Number		
S3F80P5	S3F80P9	S3F80PB
S3F80Q5	S3F80QB	

S3 Family Consumer/Appliance Devices

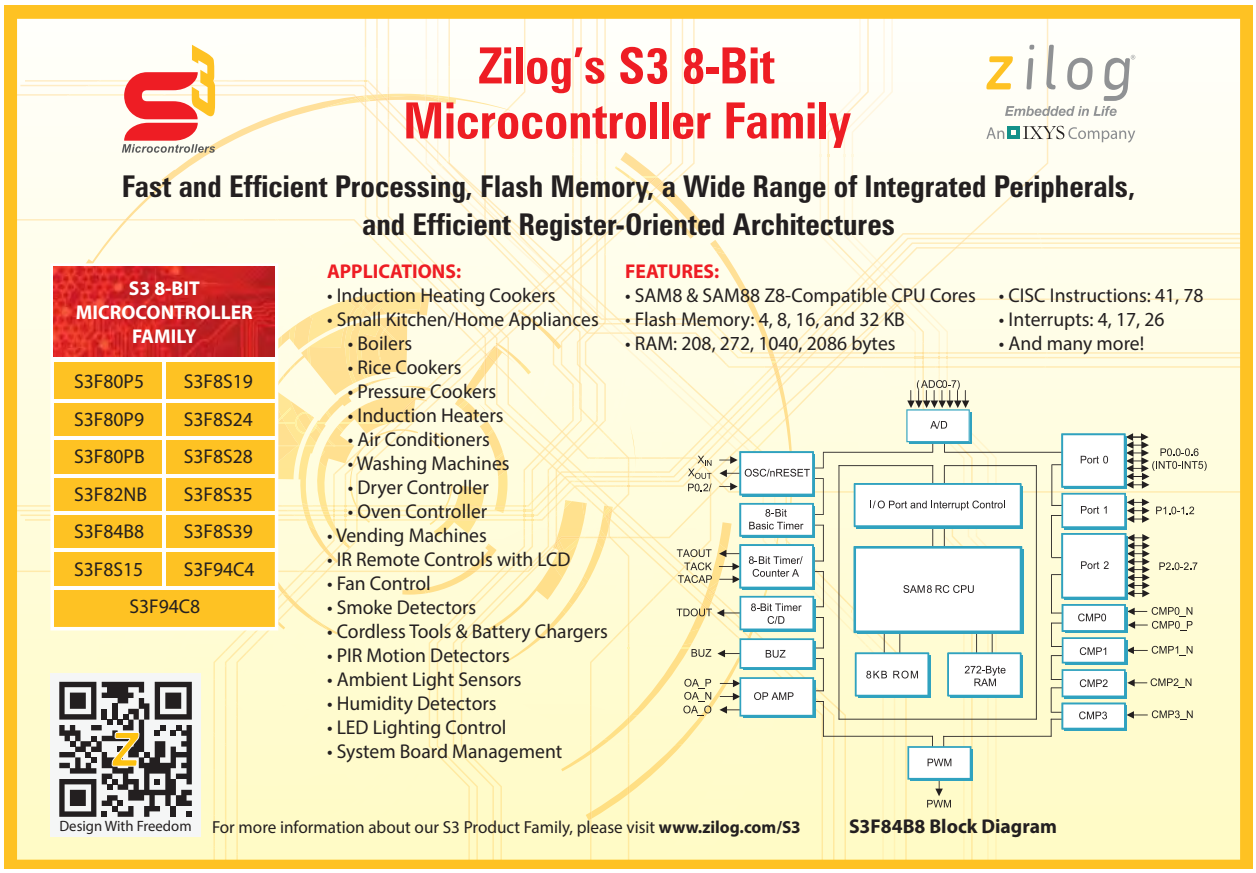
Part Number		
S3F82NB	S3F8S35	S3F8S8B
S3F84B8	S3F8S39	S3F94C4
S3F8S15	S3F8S45	S3F84I9*
S3F8S19	S3F8S5A	S3F828B*
S3F8S24	S3F8S6B	S3FC40D*
S3F8S28	S3F8S7B	S3F84NB*

Note: *Not recommended for new designs

Replacements for EOL Parts

EOL Part	Replacement
S3F84K4, S3F9454	S3F94C4
S3F84A5, S3F84H5, S3F84Q5, S3F84T5, S3F80N8, S3F80L4, S3F94A5	S3F8S39
*S3F9488, S3F84I8, S3F94A5, S3F9228, S3F84U8	S3F8S45
*S3F84I9, S3F84UA	S3F8S5A
*S384VB, S3F8235, S3F8274, S3F8275, S3F8278, S3F84NB, S3F848A, S39234	S3F8S6B
*S384YB, S3C8245, S3F8285, S3F8289, S3F828B, S3F82I9, S3F84MB, S3P7335, S3P8245, S3P8249, S3P825A	S3F8S7B
*S3F84ZB, S3F82HB, S3F833B, S3P72P9, S3P72Q5	S3F8S8B

Note: Items marked with an asterisk (*) are pin-for-pin equivalent with their replacement devices. Some firmware modifications may be required. Contact your local Zilog Sales Representative.



New in the Zilog Store

Current-Sensing Power Switch SCR with ZMOTION Control

Zilog now offers the Current-Sensing Power Switch SCR with ZMOTION Control Reference Design in its store. This reference design integrates a ZMOTION Detection Module II and an AC Power Switch Relay based on the IXYS CPC1966 Module to create a motion-controlled current-sensing power switch.

The CPC1966 Module includes dual, optically-isolated SCR outputs with enhanced zero-crossing detection circuitry to minimize load distortion. The ZMOTION Detection Module II is based on Zilog's Z8FS040 MCU to provide a 5m (on-axis) and 6m (60-degree off-axis) detection pattern. After motion is detected, the AC switch is activated, providing power to the load until 30 seconds after motion stops, at which time the AC switch is deactivated.

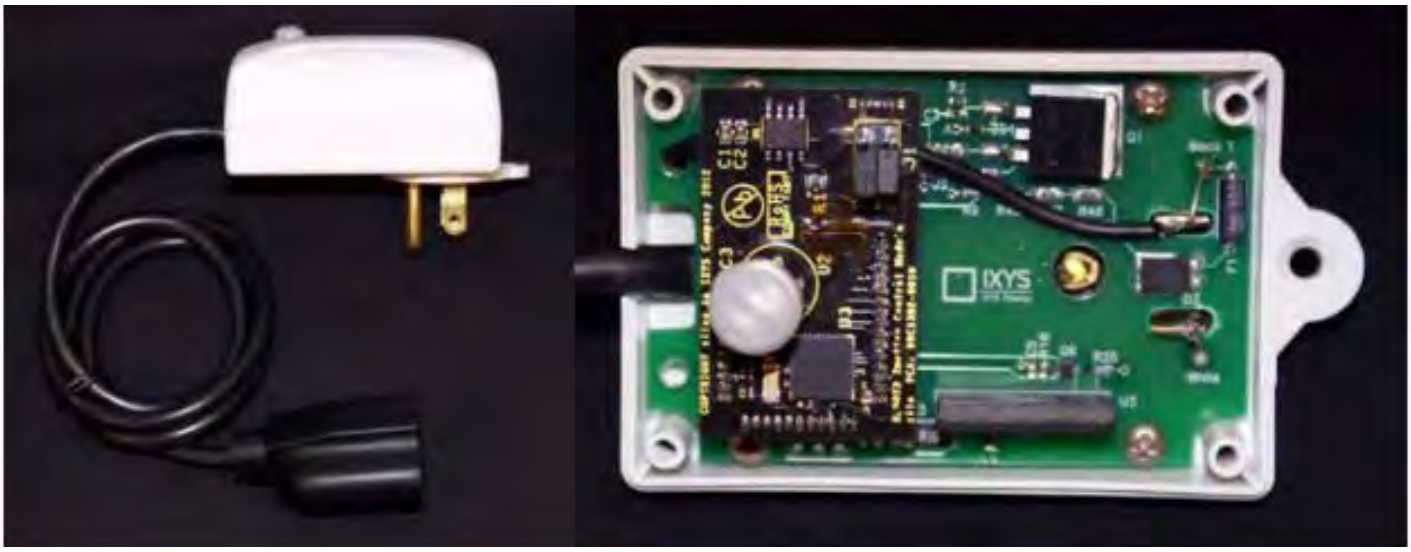
Features

- 90–240V AC RMS input voltage range
- Up to 3A load current
- Overcurrent protection
- Adjustable minimum drop-out current protection
- < 2mA standby current at 120V AC in an OFF state

Potential Applications

The Current-Sensing Power Switch SCR can be used to develop a number of motion-controlled power-switching applications, including the following examples:

- Occupancy-controlled commercial/architectural lighting
- Motion controlled night-lighting within the home or medical care facility



Current Sensing Power Switch SCR with ZMOTION Control Reference Design with ZMOTION Detection Module II

Order from the Zilog Store

Order the Current-Sensing Power Switch SCR with ZMOTION Control Reference Design from our Zilog Store and start developing your applications today! For more information about this Reference Design, visit zilog.com.

Zilog Educational Platform

The Zilog Educational Platform takes learning to the next level by empowering students to apply their classroom knowledge to real-world applications. The Platform's robust educational capabilities allow students to learn about microcontroller architecture, language programming, wireless communication, analog-to-digital conversion, sensing technologies and security encryption methods.

The Zilog Educational Platform

The Zilog Educational Platform is an electronics development system designed to aid in teaching students pursuing a degree in electronics or computer sciences. The core of the Zilog Educational Platform is Zilog's Z16F2810 MCU, a16-bit Flash chip based on Zilog's ZNEO CPU.

The Educational Platform's design layout allows students to use it with intuitive ease, thereby saving time, energy, and money. The Platform is complete in all aspects of its functionality, with attention applied to many of the Platform's details. These details include its integrated audio buzzer and a jumper that, when removed, can disable the backlight display from the LCD panel when power savings are important. The Platform's battery power source allows for mobile capability when considering projects in the field.

Zilog Educational Shields

Zilog Educational (ZED) Shields are application-specific modules that form part of the Zilog Educational Platform. The ZED shields are designed to be modular and stackable to save time and effort, and thus allow flexibility for teaching and experimentation. Each ZED shield is designed to teach a specific subject or application.

The ZED shields can be operated directly from a preprogrammed command shell without requiring any additional programming. As a result, the novice engineer can develop a level of familiarity with the concepts behind each stackable shield before tackling the intricacies of in-depth programming.

Shield	Description
ZED Test Shield	The ZED Test Shield is a tool for testing all available GPIO pins on the Zilog Educational Platform. It ships as part of the Platform kit. It is designed for testing purposes and is not stackable.
ZED WLAN Shield	The ZED WLAN Shield uses a Roving Networks (2.4 GHz) WiFi RN-171 module, which conforms to the 802.11 b/g standard. It is stackable with the WoS Shield, but is not stackable with the Z-PAN Shield or another W-LAN Shield.
ZED Z-PAN Shield	The Zilog Personal Area Network (Z-PAN) Shield uses a Roving Networks Class 1 (2,402-2,480 MHz) Bluetooth RN-41 Module that conforms to the IEEE 802.15 standard. It is stackable with the WoS Shield, but is not stackable with the WLAN Shield or another Z-PAN Shield.
ZED World of Sensors (WoS) Shield	The WoS Shield contains seven sensors. The ZED World of Sensors (WoS) Shield is stackable with the Z-PAN and the WLAN Shields, but is not stackable with another WoS Shield.

Introducing the Student Educational Platform

Zilog now offers another flavor of the Educational Platform, which can be customized to accommodate students' educational goals. We call this the Student Educational Platform, a modular system that facilitates the hands-on learning of embedded microcontroller technologies and is designed to provide a cost-effective way for students to purchase their own system.

Student Educational Platform

The Student Platform consists of a core module along with several auxiliary modules that students can acquire as the curriculum demands. This new platform includes an integrated command shell, a GPIO test shield and power supply.

Additional devices that can be connected to the Student Platform are:

- A 16-key input (shown above) and/or PC console application
- A 16 x 2 LCD output (shown above) and/or standard PC monitor
- Dual-format breadboards, both standard and solderless

These types of devices will be available in the Zilog Store in the near future, so stay tuned, students!

Student Platform Features

- Dual main power options: 6V–12V wall outlet or 9V battery for mobile operation
- Three voltages are available to the Platform when it is powered with the included AC power adapter:
  - VMAIN
  - 3.3V
  - 5V with a maximum current of 2.0 amps
- 47 GPIO lines
- Stackable application shield interface
- Preprogrammed command shell
- I/O signal access connector
- Buzzer

Educational Platform iOS App

The Educational Platform iOS App for iPhone is almost ready and will soon be available at the Apple Store. The iOS app performs the following actions:

- Collects information from the Educational Platform, sensor shields, and peripherals, which display sensor data
- Communicates user-supplied settings to the Educational Platform for shields and alarm limits
- Receives alarm signals from the Educational Platform and alerts the iOS user appropriately

Use Textbook with Zilog Educational Platform

Enhance your understanding of designing and programming Embedded Control Systems using Zilog microcontrollers by ordering the textbook *Programming the Zilog ZNEO Microcontroller by Example* authored by Dan Eisenreich. You can purchase the ebook from Amazon or Smashwords for the low price of $3.00.

For more information about Zilog's Education Solutions, or to purchase the platform, kit or shields, please visit the Zilog Store.

Tips from Professor Ken

Stuck on a designing problem? Have a question about a Zilog product? Our very own Professor Ken has the answers you're looking for!

Q Do Z8 Encore! products offer buffered PWMs?

A While our older Z8 Encore! products did not offer buffered PWMs, newer products such as the Z8F1680 MCU have a buffered PWM register to allow the PWM value to be updated without the requirement to disable the timer.

Q What do part numbers 1866 and 1903 mean for the Z86E04 and Z86E08 devices?

A These numbers signify the type of oscillator that is used. 1866 refers to one of the following oscillator types: crystal, resonator, LC, or external clock driver; while 1903 refers to an external RC oscillator type.

Q I am not able to connect to the target after altering the ZNEO MCU's Oscillator Control (OSCCTL) Register. What is the correct unlocking and write sequence for this register?

A Use the following procedure to reconnect to the target successfully after modifying the ZNEO MCU's OSCCTL Register:

1. Power down the target board.
2. Disconnect the SmartCable.
3. Use the following unlocking code sequences at the beginning of `Main()`:

```
OSCCTL = 0xE7;
OSCCTL = 0x18;
OSCCTL = 0x80; // this will use the
internal precision oscillator.
```

4. Compile the project code by selecting Rebuild All in ZDSII.
5. Press and hold the RESET button on the Board.
6. Connect the SmartCable to the Board.
7. Connect power to the Board.
8. Release the RESET button.
9. In ZDSII, proceed to download the code to the ZNEO MCU.
10. Run the code.

Q How do I change PWM values on the fly with ZNEO's Multi-Channel PWM Timer?

A The ZNEO CPU's PWM registers, which control the timing of the PWM output, are buffered. The PWM Control 0 (PWMCTL0) Register's READY bit 1 is used to indicate to the PWM that new values in the holding registers, PWM Reload High and Low Byte (PWMRH and PWMRL), are available to transfer to the working PWM registers at the next PWM reload event. The user should not use the PWM Control 0 (PWMCTL0) Register's PWM Enable (PWMEN) bit 0 to change PWM values *on the fly*.

Scenario: A user tries to change the PWM value *on the fly*.

Example:

```
PWMCTL0 |= 0x03;  // PWM control is ready to use, PWMEN is set to 1 for the first time
PWMCTL0 |= 0x80;  // Enabled PWM (assuming duty cycle set initially at 100%)
Delay(5);
PWMCTL0 = 0x40;   // Disabled PWM
PWMH1D = 0x3E;    // Update duty cycle at 50%
PWMCTL0 |= 0x03;  // Notify changes
PWMCTL0 |= 0x80;  // Reenable PWM control again
```

Result: The PWM does not function, as indicated in the following figure.

PWM Register Before Workaround

Workaround: As suggested in the following table, if you enable and disable the PWMEN bit (i.e., the PWMCTL0 bit 0), the PWM master clock will not start.

PWM Control 0 Register (PWMCTL0)

Bits	7	6	5	4	3	2	1	0
Field	PWMOFF	OUTCTL	ALIGN	Reserved	ADCTRIG	Reserved	READY	PWMEN
RESET	0	0	0	0	0	0	0	0
R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W
Addr	FF_E380h							

Bit	Description
[0] PWMEN	**PWM Enable** 0 = PWM is disabled, and the enabled PWM output pins are forced to default to an off state. The PWM master counter is stopped. Certain control registers may only be written in this state. 1 = PWM is enabled and the PWM output pins are enabled as outputs.

To prevent this scenario from happening, use the following code snippet:

```
PWMCTL0 |= 0x03;  // Set the READY and PWMEN bits for the first time
PWMCTL0 |= 0x80;  // Start the PWM (assuming a duty cycle set initially at 100%)
                  // to test with an updated PWM duty cycle
PWMCTL0 = 0x41;   // Disable the PWM (note that the value of PWMCTL0 bit 0 is still
                  // 1; you must not set it to 0)
Delay(5);         // Set a delay of 5 seconds (this is only an example)
PWMH1D = 0x3E;    // Update the duty cycle at 50%
PWMCTL0 |= 0x02;  // Notify changes
PWMCTL0 |= 0x80;  // Reenable PWM control
```

Result: The PWM functions without requiring the PWMEN bit to be cleared to 0.

PWM Register after Workaround

Tools Developments

See what's in store at DigiKey's IXYS EEWeb Tech Community, a platform that showcases Zilog tools and product documentation, plus Zilog-related news and feature articles.

2013 Product Line Card

Browse through the Zilog 2013 Product Line Card to learn more about Zilog's many product offerings.

Application Solutions

Zilog brings you updated technical documentation to help you use Zilog products and reference designs with ease. Zilog's Application Notes give you the technical information you require to start designing your projects, providing an overview of the potential application, its features, and how to design your application for optimal functionality with Zilog microcontroller solutions. Many of our Application Notes come with companion software to help get you up and running quickly. Examples of our recent Application Notes include:

- Sensorless Brushless DC Motor Control with the Z8FMC16100 MCU (AN0370)
- Space Vector Modulation of a 3- Phase AC Induction Motor with the Z8FMC16100 MCU (AN0369)
- Three-Phase Hall Sensor BLDC Driver Using The Z8FMC16100 MCU (AN0368)
- BLDC Motor Control Using Sensored Sinusoidal PWM Modulation with the Z8FMC16100 (AN0367)
- BLDC Motor Control on Z8FMC16 Series MCUs Using Sensored Sinusoidal PWM Modulation (AN0361)
- Three-Phase Hall Sensor BLDC Driver Using The Z16FMC MCU (AN0356)

Find the right Zilog application solution for you under the Applications menu on zilog.com. Want your application notes all wrapped up as a single source? Our new 2014 application guide, *Design for Success! Zilog Reference Design and Application Cookbook,* is a collection of design recipes that will help you quickly get your products to market. It combines many of our recent Application Notes and Reference Design documentation, and is available for free download from the left sidebar of the zilog.com home page.

Community

Zilog Online Community Forum

Zilog welcomes you to participate in our Online Community Forum! The Zilog Forum is a great platform for sharing fun and unique ways in which you are using Zilog products. You can also interact with other Forum users and exchange information and tips.

To help you quickly get the answers you're looking for, the Zilog Forum is organized into the following groups:

General. Get to know each other and share common interests here.

In the Know. Learn about technical solutions to application designs from our application engineers to save time and get the results you seek.

The Wake Up Channel. We are listening! This is the place to provide your feedback to Zilog.

Fun and New Ideas. Share how you or others are using Zilog products in unique and fun ways.

Emerging Energy Management Frontier. This is the place to talk about Energy Management solutions.

Development Tools Tips and Tricks. Got a tip about Zilog tools? Share it here!

Being an active participant on the Zilog Forum can help you benefit from the information and ideas being shared in the Zilog community. As always, our technical engineers are available to assist you with solutions to your application design challenges.

We welcome your productive feedback because it gives us a chance to improve and to provide good experiences for our customers. We're listening to your questions and concerns, so feel free to share your thoughts and ideas.

We look forward to seeing you in our community!

Zilog Quarterly Sales Representative Conference

Zilog values its sales representatives, who connect us with our customers. In an effort to keep the lines of communication with our Sales and Field teams open, we have initiated a quarterly teleconference with our global extended sales representative teams.

Our first Sales Representative Conference was held in May 2014. During the conference call, we discussed upcoming products and emerging opportunities, and shared information on new sales tools. We also provided updates on new reference designs and application notes, so that our sales teams have the most updated information to share with customers.

The Zilog management team listened for feedback from our representatives to better understand how we can help support them as they engage and promote Zilog products and technologies.

Zilog News and Events

Zilog Announces New MultiMotor Series Development Kit for its ZNEO and Z8 Encore! XP Devices

Latest Series of High-Performance Motor Control Solutions Offering Advanced Microcontroller Technology

Milpitas, CA and Leiden, The Netherlands.March 11, 2014 – Zilog, Inc., a wholly-owned subsidiary of IXYS Corporation (NASDAQ:IXYS) and a pioneer supplier of microcontrollers (MCUs) providing solutions for the industrial, telecommunication, automotive and consumer markets, introduces its new MultiMotor Series Development Kit to aid in the development of motor control applications using an assortment of Zilog MCUs designed specifically for motor control environments.

> "Using our MultiMotor Kit helps developers produce a much smoother motor rotation than that of a full step drive, plus it provides greater resolution and freedom from resonance problems because it involves more steps per revolution."
>
> *Steve Darrough, Zilog VP of Marketing*

Zilog's Z16FMC MCU-based MultiMotor Series Development Kit (ZMULTIMC100ZCOG) is a complete application-specific platform for creating a design featuring a Zilog motor control MCU Module connected to a 3-phase MultiMotor Series Development Board. A 24V DC/3200 RPM 3-phase motor is included with the Kit, though several motor types are supported, including BLDC, PMSM, and ACIM. Control algorithms including sensored, sensorless, trapezoidal, sinusoidal, and vector are also supported in this MultiMotor Series.

The 2.5" x 3.0" Motor Control Module provides circuitry that interfaces its Z16FMC MCU to an external development PC running the Zilog Developer Studio II (ZDS II) Integrated Development Environment (IDE), and to the 3-Phase MultiMotor Series Development Board.

Other key features of the MultiMotor Series Development Kit include switches to control the speed, direction, and stop/run settings of the motor, plus 32MB of SPI Flash memory for data logging.

The Z16FMC Series Flash microcontroller that is central to the MultiMotor Series Development Kit is based on Zilog's advanced ZNEO 16-bit CPU core, which is optimized for motor control applications in which the control of single and multi-phase variable-speed motors is crucial. Target applications are large appliances, small appliances, and HVAC systems. The key features of the Z16FMC MCU include a 20MHz, 16-bit optimized single-cycle CISC core, up to 128KB of in-circuit programmable Flash memory, 4KB internal RAM with 16-bit access, plus highly integrated digital/analog peripherals such as a 12-bit PWM module with three complementary pairs (or six independent PWM outputs), a fast 12-channel, 10-bit Analog-to-Digital Converter (ADC) for current sampling and back-EMF detection, three standard 16-bit timers with capture, compare, and PWM capability, an analog comparator for current limiting or overcurrent shutdown, an operational amplifier, a 4-channel DMA controller, and a flexible communication interface including a UART with LIN and IrDA, I^2C, and enhanced SPI.

The MultiMotor Series Development Kit is easy to use, and contains everything you need to get started right out of the box.It is now available for customers that place orders with our distributors.

To learn more, visit the MultiMotor Series Development Kit page on the Zilog website.

Zilog News and Events (continued)

PCIM Conference May 20–22 in Nuremberg, Germany

Zilog participated in the Power Conversion Intelligent Motion (PCIM) Europe conference that took place in Nuremberg, Germany from May 20–22, 2014.

The PCIM conference is an annual power electronics and sensors show that draws attendees from all over the world. The Zilog and IXYS exhibit was a large booth that allowed us to showcase new products and engage with new, existing, and potential customers.

Zilog's display of new products and reference designs drew steady attention during the 3-day the conference. Of particular interest to booth visitors were our MultiMotor Series Development Kit and our Current-Sensing Power Switch SCR with ZMOTION Control Reference Design.

Visitors attend the IXYS Booth at this Spring's PCIM Europe 2014 Conference

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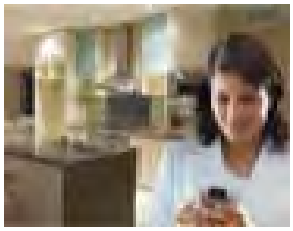

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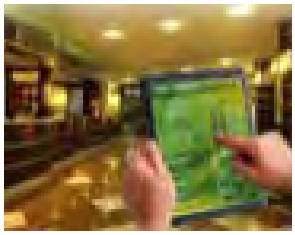

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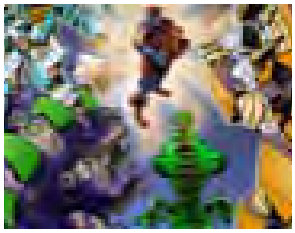

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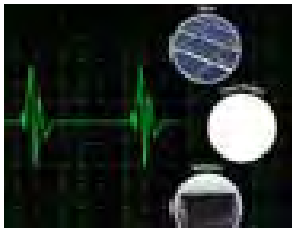

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