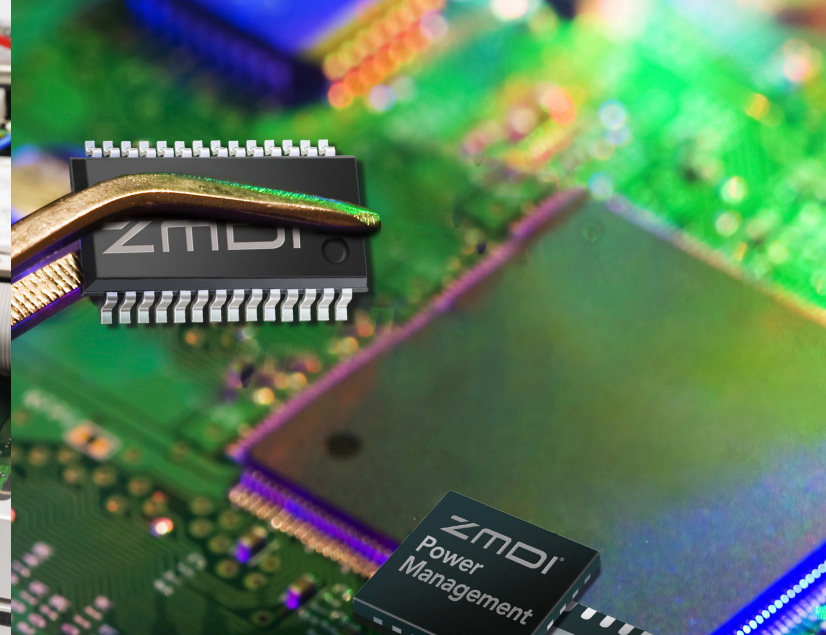




The Analog Mixed Signal Company



# PINK IS THE NEW GREEN<sup>®</sup>

ENABLING ENERGY EFFICIENT SOLUTIONS



## ZMDI Smart Power Management Solutions

Semiconductor Solutions for Tomorrow's Energy Efficiency Challenge



## Energy Efficient Mixed Signal Solutions

**Zentrum Mikroelektronik Dresden AG (ZMDI)** is a global provider of high-performance, energy-efficient analog and mixed signal semiconductors and application-specific ICs. Innovation-driven and customer-focused, we enable IC solutions that reduce fuel consumption and CO<sub>2</sub> emissions to help protect the environment. Our products range from energy-efficient power management ICs to very low-power sensor signal conditioners for mobile applications to rugged AEC-Q100-qualified ICs that expedite automotive product design by providing advanced sensor-signal conditioning and configurability while minimizing power consumption. Our sophisticated calibration and configuration techniques significantly reduce external component count and time to market for products that meet new emission-reduction standards.

For over 50 years, we have offered our customers high-quality products and services at great value. Our high performance products and excellent application support have earned us our customers' trust and have built long-term partnerships with market leaders. ZMDI's solutions enable our customers to create the most energy-efficient products in sensors, power management, and lighting. Our smart power management products provide customers with the key benefits of configurability, control, communications, and diagnostics. They enable cost-effective solutions with greater levels of performance, reliability, and flexibility. Typical applications include server and storage applications, telecom and network systems, base stations, industrial PCs, and FPGAs.



## ZMDI - Making a positive impact

As a result of ZMDI's leadership in energy-efficient solutions for automotive, industrial, and mobile applications, we have been honored with prestigious awards.

We have been selected as a finalist in the **EE Times and EDN ACE Awards 2014** for the category "Energy Technology Award" for our ZSSC1956 Intelligent Battery Monitoring Solution, as well as for the "Marketing Team" for our marketing campaigns.

In 2012 as well as 2013, we received the **Green Apple Award** for products that contribute to "passive" energy savings.

ZMDI was honored with the "**Best Company for Innovation and Sustainability Award**" (regional) by the International Alternative Investment Review (IAIR) for 2013.

In 2012, we received the "**Innovative Enterprise of the Year 2012**" presented by the president of Bulgaria.

Frost & Sullivan have recognized us with the **2012 Europe Frost & Sullivan New Product Innovation Award** for our innovative battery-monitoring device.



Visit [www.zmdi.com](http://www.zmdi.com)  
for more detailed information

## Smart Power Management Solutions from ZMDI

Designers of today's high performance systems face many challenges: competitive features, regulatory requirements, solution stability, aggressive time-to-market, and quick migration to manufacturing. Often the power requirements of the system are not well understood in the early part of the design process. Consequently power system designers need solutions that are high performance, easily optimized, fully-featured, easy to use, flexible, and reusable.

ZMDI's smart power management chipsets provide designers with a complete range of high efficiency solutions to meet low, medium, and high power requirements. Configurability via hardware or software ensures optimum flexibility and reusability of your design. Our solutions offer optional communications for telemetry and fault reporting allowing easier implementation in smart managed systems to meet system reliability, energy efficiency, and regulatory requirements.

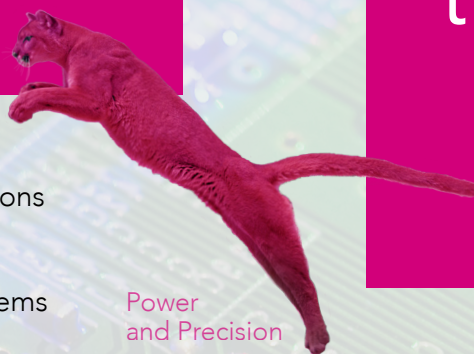
ZMDI's digital smart power management ICs are supported by our easy-to-use PC-based Pink Power Designer™ design optimizer tool. A key advantage of this software and our true digital architecture is the ability to make real time trade-offs between performance, size, and cost. The software helps maintain your design investment as the resulting solution can be easily migrated to meet different power requirements.

Our team of expert technical support staff with extensive power management system design experience is available to help you at all stages from system design through to board layout.

**ZMDI smart power management solutions –  
for tomorrow's energy efficiency challenge**

### Typical Applications

- Server and storage units
- Industrial and high-end PCs
- Telecom equipment and base stations
- Network routers and switches
- FPGAs
- Wireless access points, cable modems
- Set-top boxes



Power  
and Precision

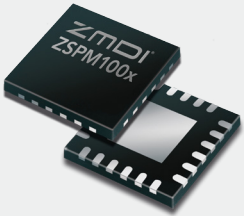
ZMDI's  
smart power  
management  
ICs and extensive  
system expertise  
help you develop  
the optimal  
solution and  
minimize your  
time-to-market

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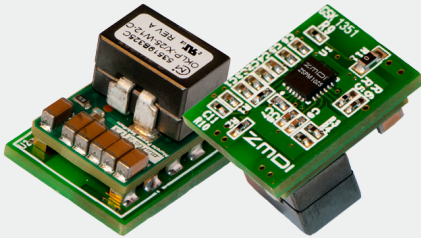
## Single-Phase Power Family

### ZSPM1000 and ZSPM1005 Controllers



- True-digital single-phase PWM controller for point-of-load (POL) solutions
- Advanced digital control techniques for maximum flexibility and excellent transient performance
- Extensive fault monitoring and handling
- Full configurability via PMBus™ or pin-strap selection of user preprogrammed configurations
- Optional PMBus™ communications interface
- Pink Power Designer™ GUI for easy device configuration

### ZSPM1025 and ZSPM1035 Controllers

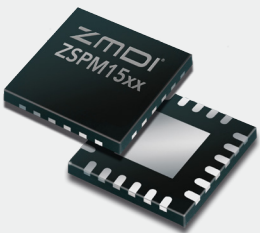


- Optimally preconfigured for the Murata 25A and 35A Power Blocks
- Advanced digital control techniques

for maximum flexibility and excellent transient performance

- Operation from a single 5V or 3.3V supply
- Fast configuration and monitoring via ZMDI's Pink Power Designer™ GUI or pin-strap options
- Downloadable reference designs for fast time-to-market

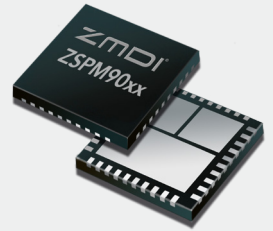
### ZSPM15xx Controller Family



- Factory pre-configured for industry standard output voltages and currents enabling fast time-to-market
- Simplified design and integration
- FPGA designer-friendly solution
- Highest power density with smallest footprint
- Higher energy efficiency across all output loading conditions

## Integrated Power Stage Family

### ZSPM90xx DrMOS Family



- Optimized integrated driver and power MOSFETs power stage for synchronous DC-DC switching regulators
- Based on Intel® 4.0 DrMOS standard
- Optional integrated 5V linear regulator (LDO)
- Integrated bootstrap Schottky diode
- Zero-current detection, Skip Mode, and tri-state PWM
- Under-voltage lockout, over-temperature, and shoot-through protection via adaptive gate drive timing
- Up to 60A output current
- Up to 93% efficiency

## Analog DC-DC Regulator Family

### ZSPM40xx DC-DC Regulator Family



- DC-DC synchronous switching regulator with fully integrated power switches, internal compensation, and full fault protection
- Supports a wide input range up to 28V
- Fully adjustable and fixed output voltages 0.8V to 5.5V
- Outputs current up to 12A
- Automatic mode transition enables maximum efficiency and transient response under all load conditions
- Up to 95% efficiency
- Less than 10µA current consumption in Disabled Mode

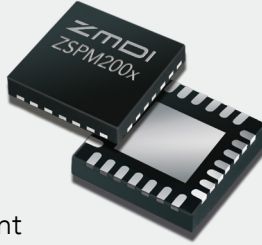
Note: PMBus™ is a trademark of SMIF, Inc.

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for more detailed information

## Digital Controller and Driver Family

### ZSPM2000 and ZSPM2005

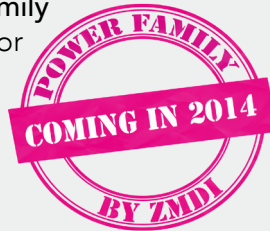
- True-digital single-phase PWM controller with integrated high performance power stage driver for point-of-load (POL) solutions
- Advanced digital control techniques for maximum flexibility and excellent transient performance
- Adaptive anti-cross-conduction and power saving features enable low switching losses and maximum efficiency
- Extensive fault monitoring and handling
- Full configurability via PMBus™ or pin-strap selection of user preprogrammed configurations
- Optional PMBus™ communications interface for monitoring
- Pink Power Designer™ GUI for easy device configuration



## New Additions to the Power Family

### ZSPM13xx Dual-Phase Digital Controller Family

- True-digital dual-phase PWM controller for point-of-load (POL) solutions
- Advanced digital control techniques for maximum flexibility and excellent transient performance
- Extensive fault monitoring and handling
- Current balancing and optional current share with support for up to 12 phases
- Full configurability via PMBus™ or pin-strap selection of user preprogrammed configurations
- Optional PMBus™ communications interface for monitoring operation
- Pink Power Designer™ GUI for easy device configuration



### ZSPM16xx Controller Family

- Factory pre-configured for industry standard output voltages and currents enabling fast time-to-market
- Simplified design and integration
- Communications interface for monitoring operation
- FPGA designer-friendly solution
- Highest power density with smallest footprint
- Higher energy efficiency across all output loading conditions

Note: PMBus™ is a trademark of SMIF, Inc.

ZMDI's  
smart power  
management  
helps you find  
solutions to  
tomorrow's  
energy  
efficiency  
challenges

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Part Number	Description	Features	Type		Vin (V)
			internal switch	external switch	
ZSPM1000ZI1R	Single-Phase DC-DC Digital Controller	PMBus™ Monitoring and Configuration		✓	3.3 or 5.5
ZSPM1000ZA1R	Single-Phase DC-DC Digital Controller	PMBus™ Monitoring and Configuration		✓	3.3 or 5.5
ZSPM1005ZA1R	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration		✓	3.3 or 5.5
ZSPM1025AA1W	Single-Phase DC-DC Digital Controller	PMBus™ Monitoring and Configuration Optimized for Murata 25A Power Block		✓	3.3 or 5.5
ZSPM1025CA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Optimized for Murata 25A Power Block		✓	3.3 or 5.5
ZSPM1025DA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Optimized for Murata 25A Power Block		✓	3.3 or 5.5
ZSPM1035AA1W	Single-Phase DC-DC Digital Controller	PMBus™ Optimized for Murata 35A Power Block		✓	3.3 or 5.5
ZSPM1035CA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Optimized for Murata 35A Power Block		✓	3.3 or 5.5
ZSPM1035DA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Optimized for Murata 35A Power Block		✓	3.3 or 5.5
ZSPM1502ZA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Preprogrammed Output Voltage and Current		✓	3.3 or 5.5
ZSPM1512ZA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Preprogrammed Output Voltage and Current		✓	3.3 or 5.5
ZSPM1521ZA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Preprogrammed Output Voltage and Current		✓	3.3 or 5.5
ZSPM1530ZA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Preprogrammed Output Voltage and Current		✓	3.3 or 5.5
ZSPM1557ZA1W	Single-Phase DC-DC Digital Controller	Pin-Strap Configuration Preprogrammed Output Voltage and Current		✓	3.3 or 5.5
ZSPM2000ZA1R	Single-Phase DC-DC Digital Controller and Power Stage Driver	PMBus™ Monitoring and Configuration		✓	5.0
ZSPM2005ZA1R	Single-Phase DC-DC Digital Controller and Power Stage Driver	Pin-Strap Configuration		✓	5.0
ZSPM9000AI1R	Integrated Power Stage Driver and MOSFETs	Intel® 4.0 DrMOS Integrated 5V LDO, Thermal Flag, Skip Mode	✓		3.0 to 15.0
ZSPM9010ZA1R	Integrated Power Stage Driver and MOSFETs	Intel® 4.0 DrMOS Thermal Flag, Skip Mode	✓		3.0 to 15.0
ZSPM9015ZI1R	Integrated Power Stage Driver and MOSFETs	Intel® 4.0 DrMOS Thermal Shutdown and Flag, Zero Current Detect	✓		4.5 to 25.0
ZSPM9060ZA1R	Integrated Power Stage Driver and MOSFETs	Intel® 4.0 DrMOS Thermal Flag, Skip Mode	✓		3.0 to 16.0
ZSPM4011BA1Wxx	Analog DC-DC Regulator	Fixed and Variable Output Voltage Soft-Start, PWM and PFM Modes <sup>3</sup>	✓		4.5 to 24.0
ZSPM4012BA1Wxx	Analog DC-DC Regulator	Fixed and Variable Output Voltage Soft-Start, PWM and PFM Modes <sup>3</sup>	✓		4.5 to 24.0
ZSPM4013BA1Wxx	Analog DC-DC Regulator	Fixed and Variable Output Voltage Soft-Start, PWM and PFM Modes <sup>3</sup>	✓		4.5 to 18.0
ZSPM4022AA1W06	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 19.0
ZSPM4022AA1W09	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 19.0
ZSPM4022AA1W12	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 19.0
ZSPM4023AA1W06	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 28.0
ZSPM4023AA1W09	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 28.0
ZSPM4023AA1W12	Analog DC-DC Regulator	Variable Output Voltage Soft-Start, CCM and DCM Modes <sup>4</sup>	✓		4.5 to 28.0

1. Note: Output of external power stage    2. Note: Output current limited by external power stage    3. Note: PWM = Pulse-Width Modulation; PFM = Pulse-Frequency Modulation

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Vout (V)	Iout (A)	Operating Frequency (MHz)	Ta (°C) * Tj (°C)	Efficiency	Output Voltage Accuracy	Package (mm x mm)
0.5 to 5.0 <sup>1</sup>	- <sup>2</sup>	≤1	-40 to 85	n/a	±1%	QFN24 (4x4)
0.5 to 5.0 <sup>1</sup>	- <sup>2</sup>	≤1	-40 to 125	n/a	±1%	QFN24 (4x4)
0.5 to 5.0 <sup>1</sup>	- <sup>2</sup>	≤1	-40 to 125	n/a	±1%	QFN24 (4x4)
0.35 to 3.6 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
0.62 to 1.20 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.25 to 3.40 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
0.35 to 3.6 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
0.62 to 1.20 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.25 to 3.40 <sup>1</sup>	- <sup>2</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.0 <sup>1</sup>	15 <sup>1</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.2 <sup>1</sup>	20 <sup>1</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.5 <sup>1</sup>	20 <sup>1</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
1.8 <sup>1</sup>	20 <sup>1</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
3.3 <sup>1</sup>	15 <sup>1</sup>	0.5	-40 to 125	n/a	±1%	QFN24 (4x4)
0.5 to 5.0 <sup>1</sup>	- <sup>2</sup>	≤1	-40 to 105	n/a	±1%	QFN28 (4x4)
0.5 to 5.0 <sup>1</sup>	- <sup>2</sup>	≤1	-40 to 105	n/a	±1%	QFN28 (4x4)
0.5 to 5.0	50	≤1	-40 to 125	93%	n/a	PQFN40 (6x6)
0.5 to 5.0	50	≤1	-40 to 125	93%	n/a	PQFN40 (6x6)
0.5 to 5.0	35	≤1	0 to 150*	93%	n/a	PQFN40 (6x6)
0.5 to 5.0	60	≤1	-40 to 125	93%	n/a	PQFN40 (6x6)
0.9 to 5.5	1	1	-40 to 125*	95%	2%	QFN16 (3x3)
0.9 to 5.5	2	1	-40 to 125*	95%	2%	QFN16 (3x3)
0.9 to 5.5	3	1	-40 to 125*	95%	2%	QFN16 (3x3)
0.8 to 5.5	6	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)
0.8 to 5.5	9	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)
0.8 to 5.5	12	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)
0.8 to 5.5	6	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)
0.8 to 5.5	9	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)
0.8 to 5.5	12	0.6	-40 to 125*	95%	±1%	QFN28 (5x6)

4. Note: CCM = Continuous Conduction Mode; DCM = Discontinuous Conduction Mode

Our world-class customer support, easy-to-use tools and system experience help you throughout the entire design process and beyond

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Products available at ZMDI On-Line Store

Contact Name: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ (       ) \_\_\_\_\_

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