



# POWER<sup>XR</sup>

Programmable Power Technology

2010

[www.exar.com](http://www.exar.com)

## Exar's Power<sup>XR</sup> Digital Power Solutions

Exar's Power<sup>XR</sup> ICs integrate the best of both worlds; the low cost and flexibility of digital power control as well as the robust power capabilities of high performance analog power switches. Power<sup>XR</sup> products reduce development time from weeks to hours, enabling a significant time-to-market advantage for system design engineers.

Additionally, Exar's Digital Power Studio<sup>TM</sup> is an easy to use software environment, empowering engineers to create complex sequencing schemes and power systems, and modify voltage, current or other parameters in seconds.

### Exar's Power<sup>XR</sup> Family

Feature	Advantage	Benefit
(re)configurability / Flexibility	<ul style="list-style-type: none"> <li>Digitally (re)configurable SoC power supply solution</li> </ul>	<ul style="list-style-type: none"> <li>Reduces design effort by using simple GUI instead of changing hardware</li> <li>Reduces risk by enabling customer to repair/upgrade power supply when already at end-customer location</li> <li>Use common platform across multiple customer designs</li> </ul>
Complete, Feature-Rich Power SoC Solution	<ul style="list-style-type: none"> <li>Power SoC Solution replaces up to 13 discrete ICs in 6x6 mm package</li> <li>Usable across a wide range of Vin, and broad cross-section of embedded processors, ASICs, or SOCs.</li> </ul>	<ul style="list-style-type: none"> <li>Replaces cumbersome discrete solutions, reduces footprint and cost of passive components</li> </ul>
Digital Power Studio <sup>TM</sup>	<ul style="list-style-type: none"> <li>Rapid development, easy to use</li> <li>Enables fast, simple design of complex power solution</li> </ul>	<ul style="list-style-type: none"> <li>Accelerates time to market from first meeting to production in as little as 2 weeks</li> <li>Enable wide range of design engineers to leverage their level of expertise for optimal design</li> </ul>

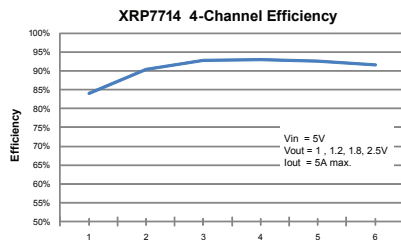
### Small SoC power supply solution with 4 power controllers, 1 LDO and all power management on a single chip.

Power SoC Solution replaces up to 13 discrete ICs in 6x6 mm package.



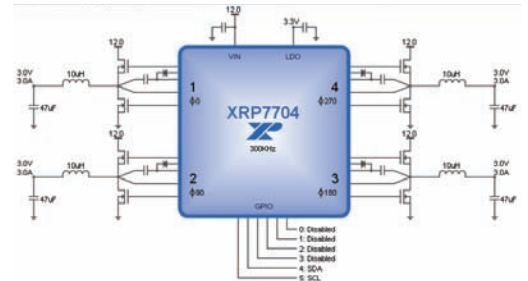
### Excellent Efficiency

Up to 93% efficiency on 4 combined voltage rails.



### Digitally (re)configurable SOC power supply solution

Useable across a wide range of Vin, and broad cross-section of embedded processors, ASICs, or SOCs.



Digital Power Studio<sup>TM</sup> enables fast, simple design of complex power solution.

## The Power<sup>XR</sup> Product Family

The Power<sup>XR</sup> family is comprised of five Pulse-Width Modulated (PWM) step-down DC-DC controllers with a built-in LDO for standby power and GPIOs. The XRP7704, XRP7708, XRP7713, XRP7714, and XRP7740 devices provide a complete power management solution in one IC and are fully programmable via the included I<sup>2</sup>C serial interface. Independent Digital Pulse-Width Modulator (DPWM) channels regulate output voltages and provide all required protection functions such as current limiting and over-voltage protection.



Part Number	Channels	Output Current	Operating Voltage		Min. Output Voltage	Quiescent Current	Frequency	Package	Features
			Min.	Max.					
XRP7713	3	3 x 5A	4.75V	25V	0.9V	9mA	Prog. 0.3MHz to 1.5MHz	TQFN-32	DPWM Controller I <sup>2</sup> C (re)configurable Built-in 3.3V/5V LDO - Integrated Drivers Full protection
XRP7714	4	5A	4.75V	25V	0.9V	9mA	Prog. 0.3MHz to 1.5MHz	TQFN-40	DPWM Controller I <sup>2</sup> C (re)configurable Built-in 3.3V/5V LDO - Integrated Drivers Full protection
XRP7704	4	4 x 5A	6.5V	20V	0.9V	9mA	Prog. 0.3MHz to 1.5MHz	TQFN-40	DPWM Controller I <sup>2</sup> C (re)configurable Built-in 3.3V/5V LDO - Integrated Drivers Full protection
XRP7708	4	2 x 5A 2 x 8A	6.5V	20V	0.9V	9mA	Prog. 0.3MHz to 1.5MHz	TQFN-40	DPWM Controller I <sup>2</sup> C (re)configurable Built-in 3.3V/5V LDO - Integrated Drivers Full protection
XRP7740	4	2 x 5A 2 x 15A	6.5V	20V	0.9V	9mA	Prog. 0.3MHz to 1.5MHz	TQFN-40	DPWM Controller I <sup>2</sup> C (re)configurable Built-in 3.3V/5V LDO - Integrated Drivers Full protection

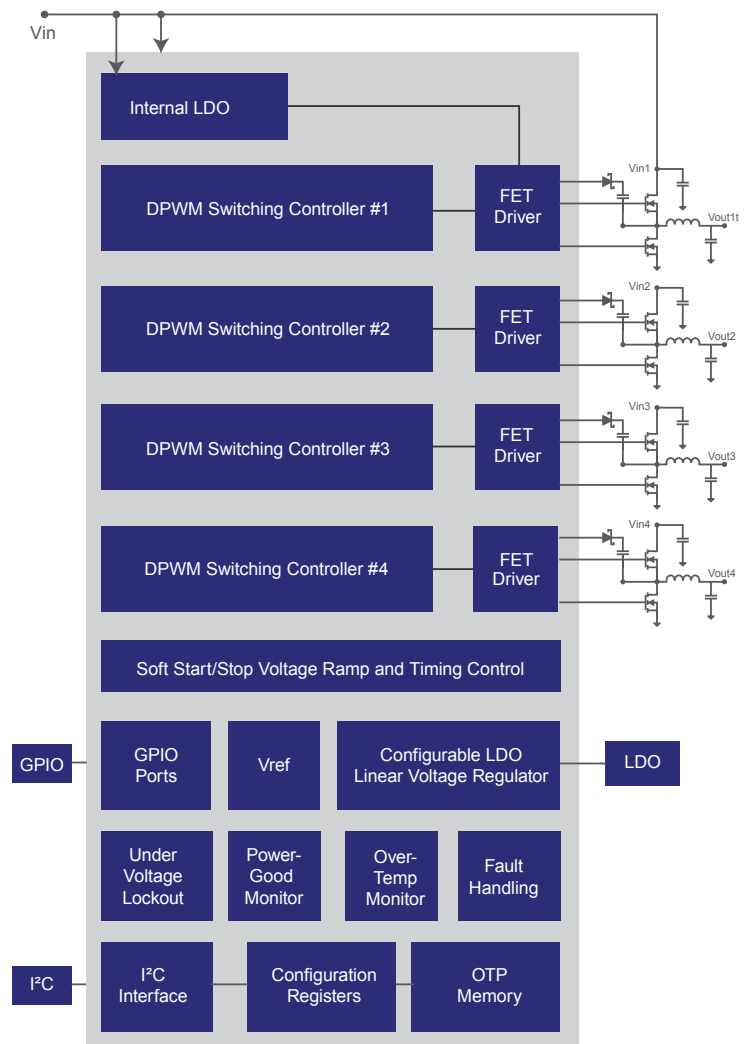
## Applications

- Consumer - Set-Top Box (STB), IP Camera, Plasma Display Panel (PDP)
- Computing - Server, Storage Systems
- Industrial - Automatic Test Equipment, Point of Sale
- Medical Equipment
- Networking and Telecommunications Equipment, Ethernet Adapter cards

## Power<sup>XR</sup> Family Features

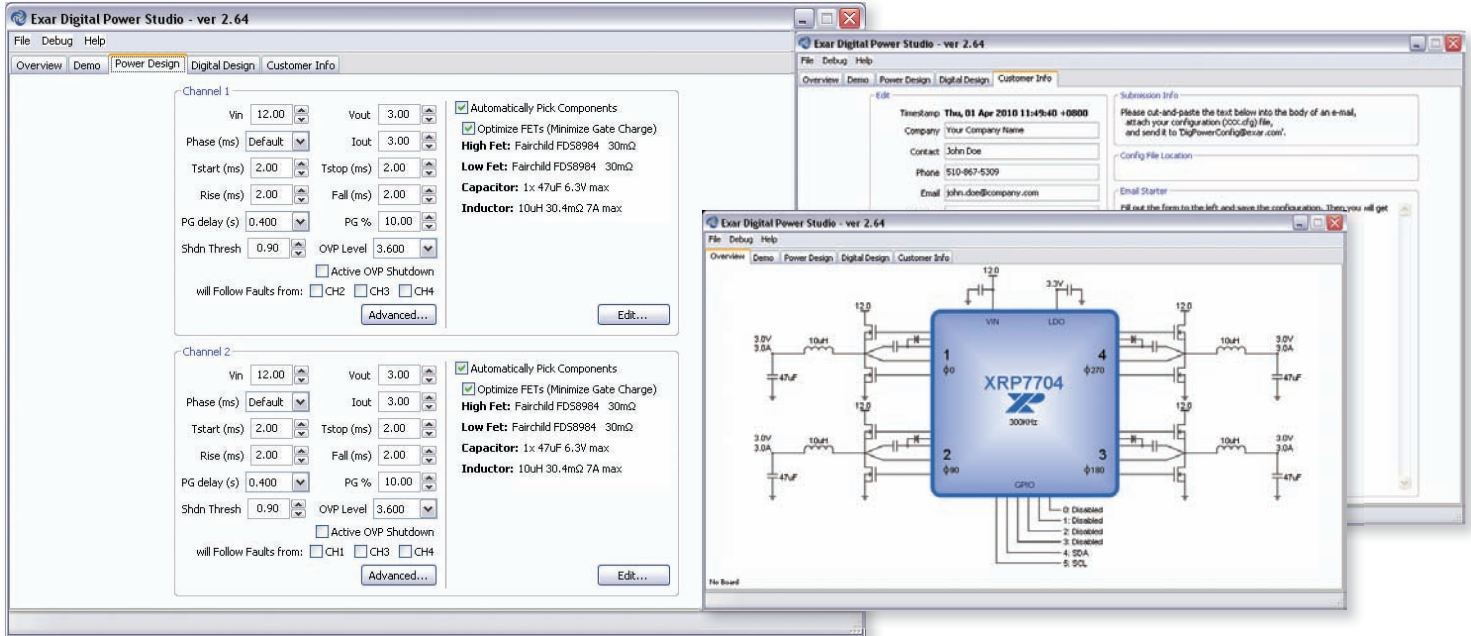
- Three to four switching buck (step-down) controllers each with internal FET drivers
- Output voltages programmable from 0.9V to 5.1V
- Up to 6 (re)configurable GPIO pins
- Fully programmable via I<sup>2</sup>C interface
- Independent Digital Pulse Width Modulator (DPWM) channels with five coefficient PID control
- High Integration: elimination of external circuits and components required for compensation, parameter adjustment and interface
- Programmable DPWM frequency range (300 kHz to 1.5 MHz) enables efficiency and component size optimization
- Complete power monitoring and reporting
- Independently controlled start-up delay and ramp for each regulator
- Independently controlled soft-stop delay and ramp for each regulator with a programmable stop voltage
- Over-temperature protection (OTP) and Under Voltage Lockout (UVLO); per-channel over-current protection (OCP) and over-voltage protection (OVP)
- Built-in LDO (configurable to 3.3V or 5V) with over-current protection
- Non-volatile memory for system

## Power<sup>XR</sup> Architecture Overview

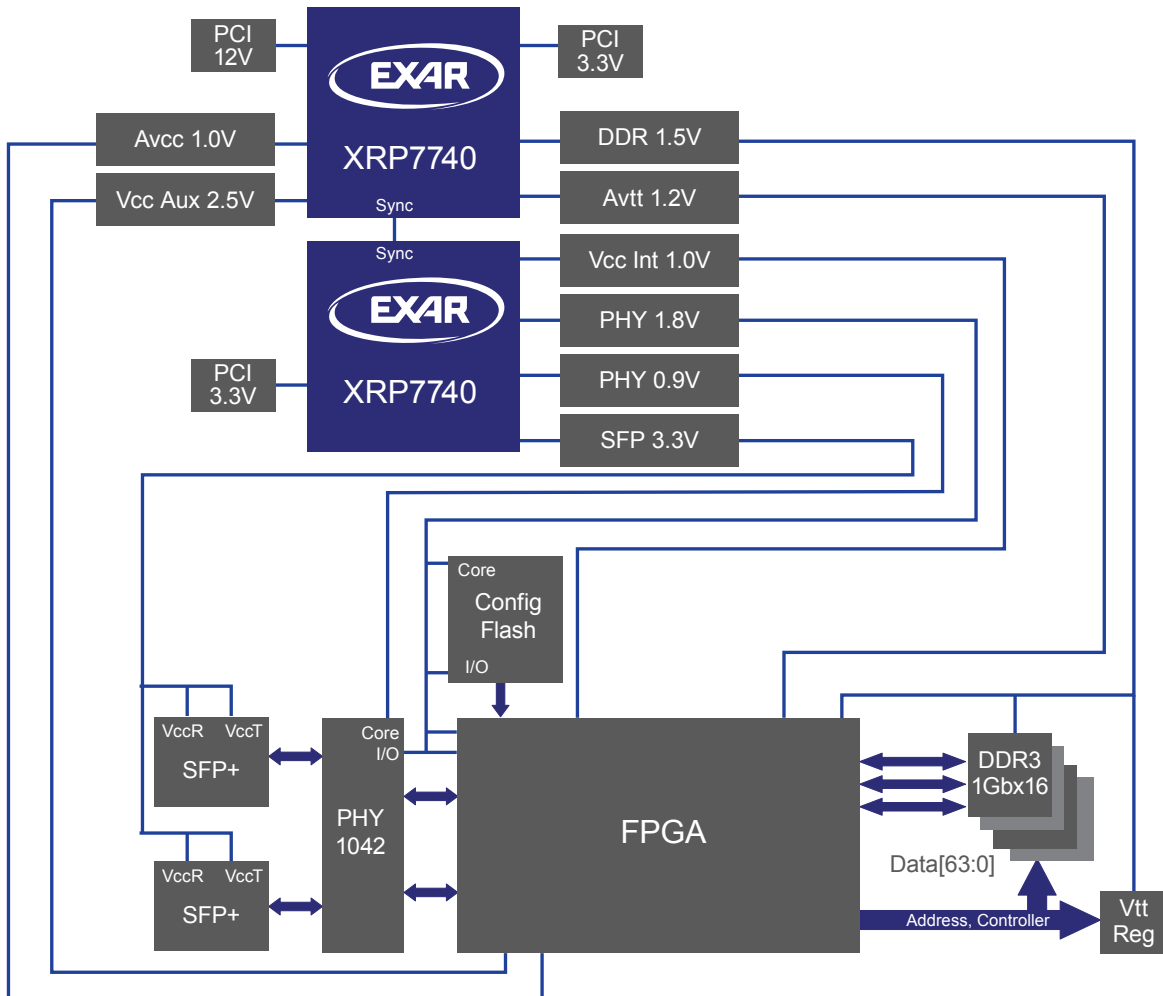


## Exar's Digital Power Studio™

Exar's Digital Power Studio (DPS™) interactive design tool enables you to create a complete 5 channel optimized power supply design with complex sequencing and many advanced power management features all with a few clicks of the mouse. Download the latest DPS from [www.exar.com/DigitalPower](http://www.exar.com/DigitalPower) to start and finish your design today.



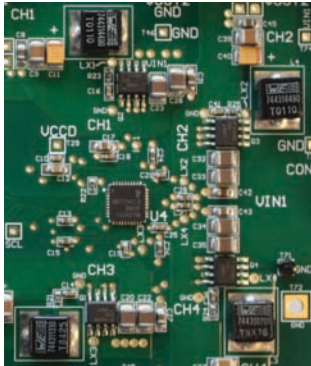
### XRP7740 Application (Vin = 12V, Iout = 3A-15A, Vout = 0.9V-2.5V)



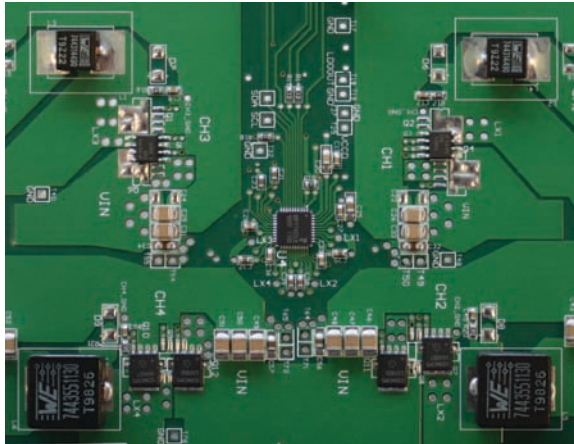


## Evaluation Boards

Evaluation boards for all Power<sup>XR</sup> family of devices are available along with their user manual.

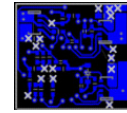


XRP7714EVB

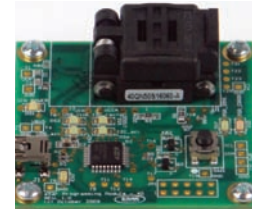


XRP7740EVB

Actual 3-Channel  
Power Supply Solution



XCM



XPM

## Technical Resources

Visit [www.exar.com/digitalpower](http://www.exar.com/digitalpower) to learn more about Power<sup>XR</sup> products, development tools and support.

### Datasheets

- XRP7704 Datasheet
- XRP7708 Datasheet
- XRP7713 Datasheet
- XRP7714 Datasheet
- XRP7740 Datasheet

### Digital Power Studio Software

- ExarDigitalPowerStudio\_setup.zip

### Evaluation Boards

- XRP7704EVB
- XRP7708EVB
- XRP7714EVB
- XRP7740EVB
- XRP77XX-XCM (Exar Configuration Module)
- XRP77XX-XPM (Exar Programming Module)
- XRP77XX Gerber Files

### User Guides

- Digital Power Studio™ Quick Start Guide
- XPM Operator Manual
- XCM Operator Manual

### Articles/White Paper

- Programmable Power Systems Now Essential for Advanced Processors
- 17 Ways Field Programmable PS Reduce Risk

### Technical Email Support

- [digital.power@exar.com](mailto:digital.power@exar.com)

## Power<sup>XR</sup> in the News



The XRP7704 and XRP7740 were recognized as one of the Top 100 new products of 2009 by EDN (Electronic Design Magazine)



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