EXAR

A New Direction in Mixed-Signal

POWERXR

Programmable Power Management System Series

2012

www.exar.com

Exar's Power^{XR} Programmable Power Solutions

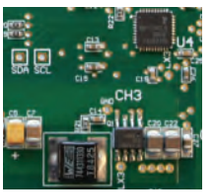
Exar's Power^{XR} family of products combine digital power conversion control and monitoring technology with high performance analog circuitry in the industry's leading portfolio of programmable power-management system solutions. PowerXR enables system architects to create innovative products with advanced, intelligent, switching power supplies that significantly reduce wasted power and improve overall time to market compared to legacy analog power-supply regulators

Additionally, Exar's Power Architect™ 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^{XR} Family		
Feature	**Advantage**	**Benefit**
(re)configurability / Flexibility	• Digitally (re)configurable Programmable Power Management System	• Reduces design effort by using simple GUI instead of changing hardware • Reduces risk by enabling customer to repair/ upgrade power supply when already at end-customer location • Use common platform across multiple customer designs
Complete, Feature-Rich Programmable Power Management System	• Programmable Power Management System replaces numerous discrete ICs in as small as 5x5 mm package • Usable across a wide range of Vin, and broad cross-section of embedded processors, ASICs or SOCs.	• Replaces cumbersome discrete solutions, reduces footprint and cost of passive components
PowerArchitect™	• Rapid development, easy to use • Enables fast, simple design of complex power solution	• Accelerates time to market from first meeting to production in as little as 2 weeks • Enable wide range of design engineers to leverage their level of expertise for optimal design

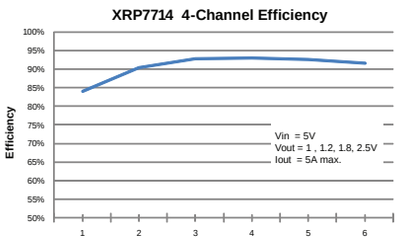
Small Programmable Power Management System with 4 power controllers (XRP7713 3 Controllers, 1 LDO and all power management and monitoring on a single chip.

Programmable Power Management System numerous discrete ICs in as small as a 5x5 mm package.



Excellent Efficiency

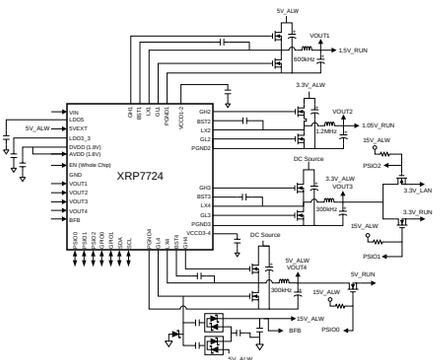
Up to 93% efficiency on 4 combined voltage rails.



Digitally (re)configurable Programmable Power Management System

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

PowerArchitect™ enables fast, simple design of complex power solution.



The Power^{XR} Product Family

The Power^{XR} family is comprised of six Pulse-Width Modulated (PWM) step-down DC-DC controllers with a built-in LDO for standby power and GPIOs. The latest addition to the family, XRP7724, adds Pulse Frequency Modulation (PFM) for improved light load efficiency. The devices provide a complete power management solution in one IC and are fully programmable via the included I²C 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	Vin Range	Vout Range	Gate Drive Pull Up / Down	I/Q	Package type	Junction Temperature Range
XRP7704	6.5V – 20V	0.9V – 5.1V	3ohm / 3ohm	9mA	TQFN40	-40°C to 125°C
XRP7708	6.5V – 20V	0.9V – 5.1V	5ohm / 1.8ohm	9mA	TQFN40	-40°C to 125°C
XRP7740	6.5V – 20V	0.9V – 5.1V	3ohm / 1.8ohm	9mA	TQFN40	-40°C to 125°C
XRP7714	4.75V – 25V	0.9V – 5.1V	6ohm / 3ohm	9mA	TQFN40	-40°C to 125°C
XRP7713	4.75V – 25V	0.9V – 5.1V	6ohm / 3ohm	9mA	TQFN32	-40°C to 125°C
XRP7724	4.75V – 25V	0.6V – 5.5V	4ohm / 2ohm	4mA	TQFN44	-40°C to 125°C

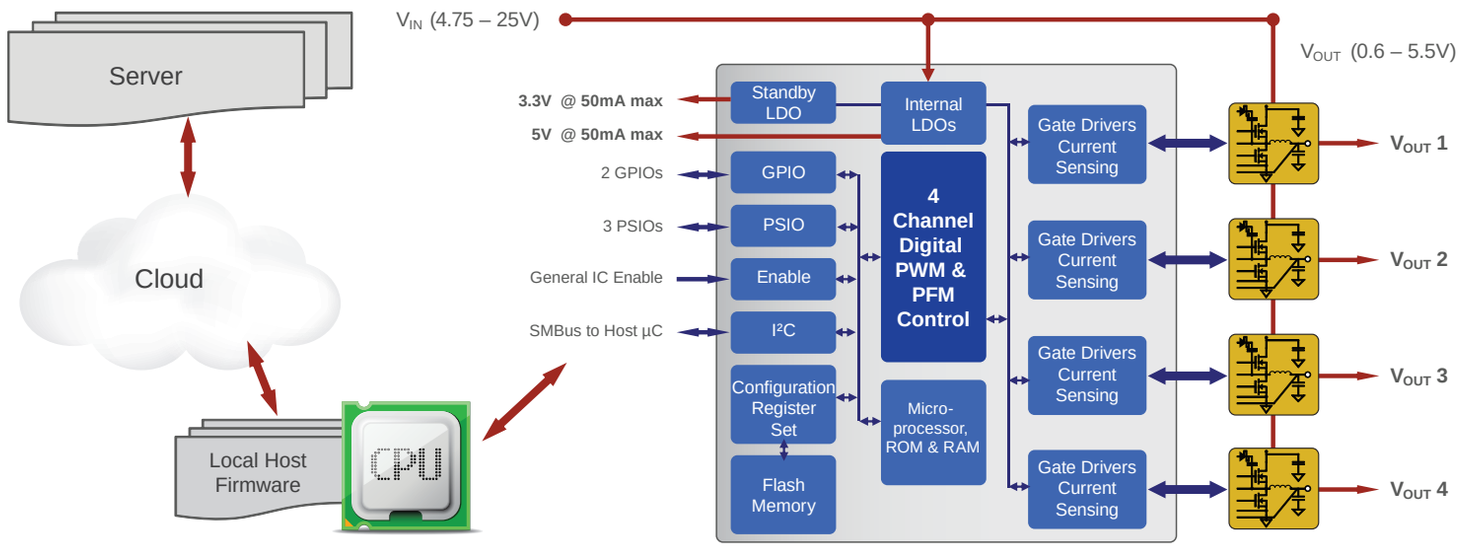
PowerXR Family Features

- Three to four switching buck (step-down) controllers each with internal FET drivers
- Output voltages programmable from 0.6V to 5.5V
- Up to 6 (re)configurable GPIO pins
- Fully programmable via I²C 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 (from 106 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
- Patented DPFM Technology with ultrasonic mode

Applications

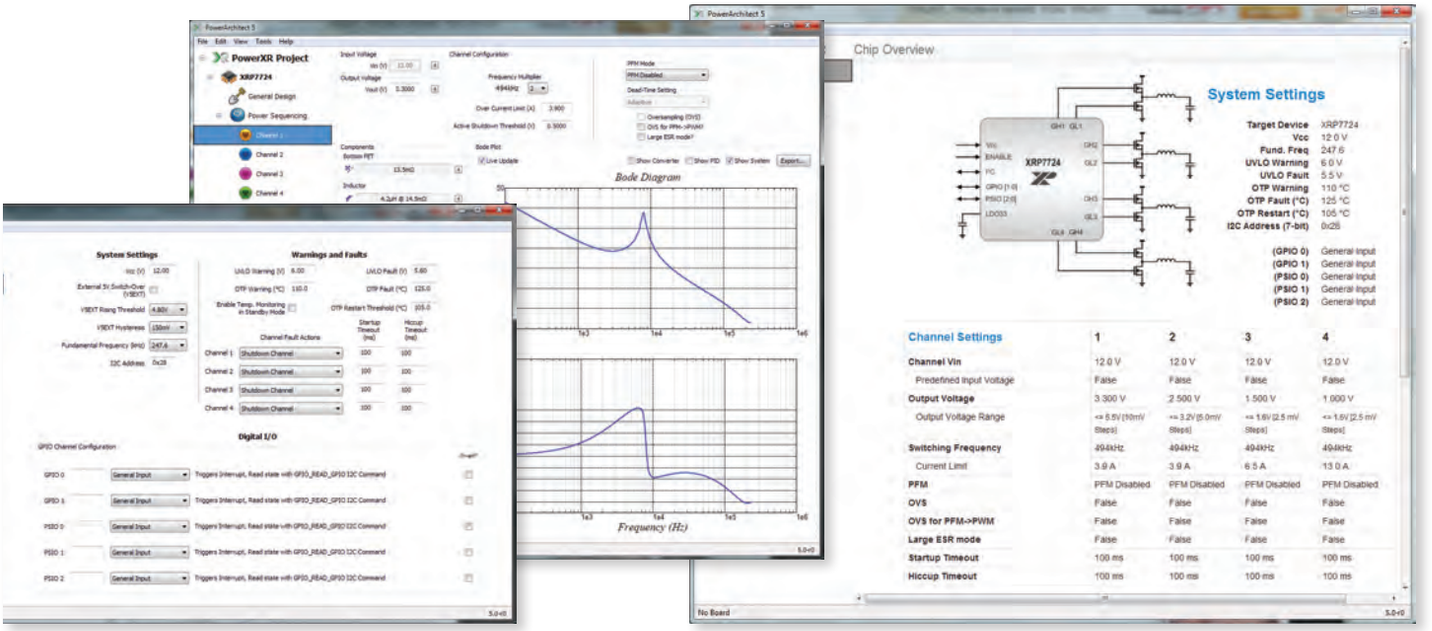
- Portable and High Performance Computing
- Base Stations & Optical Line Cards
- Switches/Routers & Broadcast Equipment
- Video Surveillance & Conferencing Systems
- Medical & Industrial Equipment

PowerXR Architecture Overview



Exar's PowerArchitect™

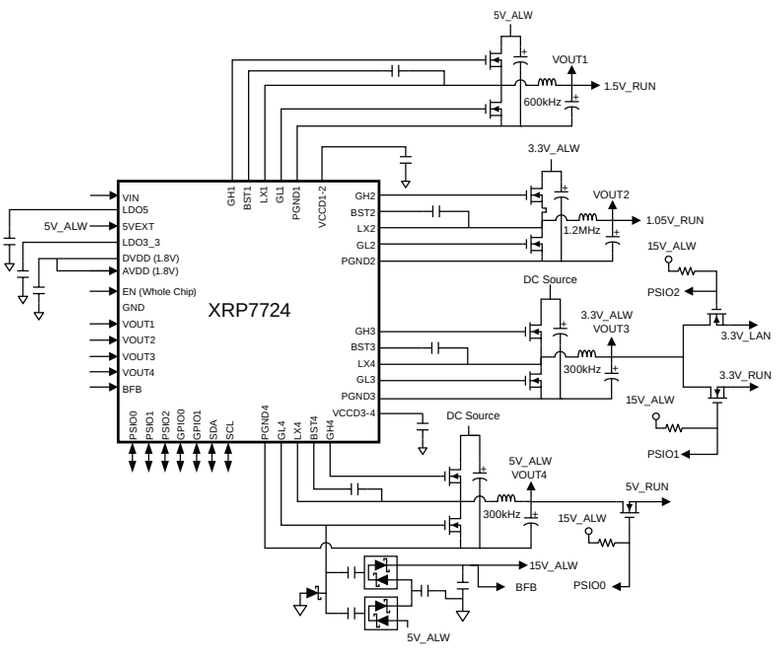
Exar's PowerArchitect™ interactive design tool enables you to create a complete 4-6 channel optimized power supply design with complex sequencing and many advanced power management features all with a few clicks of the mouse. Download the latest PowerArchitect from powerxr.exar.com to start and finish your design today.



XRP7724: World's Lowest Power Consumption, Programmable Power Management System

Latest Four-Channel IC Offers Industry's Most Advanced Feature Set, Lowest Power Consumption, and Highest Flexibility For Any Programmable Power Controller

The XRP7724 offers a wide input voltage range (4.75V to 25V), and output range (0.6V to 5.5V), with two built-in Low-Dropout regulator s(LDO) for standby power, power sequencing capability, and integrated gate drivers. These power system ICs contain patented Digital Pulse Frequency Modulator (DPFM) with ultrasonic mode. The ICs contain an integrated LDO regulator that provides a fifth voltage supply, which can also be employed as a standby-voltage source. The devices contain integrated gate drivers for the switching outputs and up to six General Purpose Input/Output (GPIO) pins. Exar's PowerArchitect™ 5.0 software design tool enables designers to intelligently configure the power supply's voltage setting and current thresholds, fault monitoring and response, soft start and active shutdown timing, and channel sequencing, phase shift management, and loop response, amongst other features. The ICs use a digital PID (proportional, integral, differential) control algorithm that performs full-digital loop control at switching frequencies to 1.2 MHz.

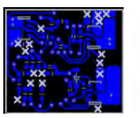


Evaluation Boards

Evaluation boards for all Power^{XR} family of devices are available along with their user manual.

Complete kits available to get you up and running in a minute.

Actual 3-Channel Power Supply Solution



XCM

XPM

Technical Resources

Visit www.exar.com/powerxr to learn more about Power^{XR} products, development tools and support.

Datasheets

- XRP7704 Datasheet
- XRP7708 Datasheet
- XRP7713 Datasheet
- XRP7714 Datasheet
- XRP7724 Datasheet
- XRP7740 Datasheet

PowerArchitect Software

- 4.21 (XRP7704/08/13/14/40)
- 5.0 (XRP7724)

Programming Boards

- XRP77XX-XCM (Exar Configuration Module)
- XRP77XX-XPM (Exar Programming Module)

Articles/White Papers

- Programmable Power Systems Now Essential for Advanced Processors
- 17 Ways Field Programmable PS Reduce Risk
- Digital power supplies make a system tamper proof
- DDR2 And DDR3 Memory Systems Require New Power And Termination Solutions

Technical Email Support

- powertechsupport@exar.com

Online Resources

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LIFE SUPPORT POLICY

EXAR Corporation does not recommend the use of its products in life support applications where the failure or malfunction of the product can reasonably be expected to cause failure of a life support system or to significantly affect its safety or effectiveness. Life support devices or systems are devices or systems which are intended for surgical implant into the body, or support or sustain life, and where failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in death or significant injury to the user. Products are not authorized for use in such applications unless EXAR Corporation receives, in writing, assurances to its satisfaction that: (a) the risk of injury or damage has been minimized; (b) the user assumes all such risks; (c) potential liability and indemnity of EXAR Corporation is adequately protected under the circumstances.

PATENT INFORMATION

Exar Corporation's products are protected under one or more of the following U.S. Patents:
3,306,444, 3,883,889, 4,042,953, 4,152,823, 4,247,951, 4,265,935, 4,318,118, 4,566,914, 4,617,535, 4,771,188, 4,789,838, 4,851,893, 4,866,397, 4,949,150, 4,975,386, 5,007,081, 5,011,784, 5,016,080, 5,023,194, 5,068,702, 5,097,309, 5,148,395, 5,152,842, 5,190,884, 5,229,664, 5,247,581, 5,248,624, 5,283,579, 5,294,927, 5,298,814, 5,315,264, 5,319,704, 5,325,045, 5,325,069, 5,357,379, 5,371,419, 5,387,877, 5,389,829, 5,440,254, 5,444,242, 5,446,412, 5,452,711, 5,502,746, 5,506,532, 5,512,816, 5,552,732, 5,557,481, 5,570,049, 5,572,212, 5,587,684, 5,592,167, 5,604,452, 5,625,281, 5,648,972, 5,650,747, 5,689,259, 5,694,031, 5,698,970, 5,703,524, 5,708,536, 5,790,393, 5,796,361, 5,649,122, 5,801,587, 5,801,593, 5,805,005, 5,818,271, 5,528,330, 5,844,431, 5,852,360, 5,864,257, 5,870,002, 5,880,690, 5,880,632, 5,910,739, 5,914,627, 5,914,632, 5,923,203, 5,923,206, 5,929,799, 5,933,056, 5,949,787, 5,959,494, 6,031,389, 6,121,805, 6,121,837, 6,127,956, 6,300,820, 6,311,246, 6,313,671, 6,313,672, 6,323,703, 6,323,820, 6,326,820, 6,333,651, 6,340,944, 6,350,979, 6,351,165, 6,359,484, 6,404,927, 6,424,197, 6,424,510, 6,452,248, 6,452,425, 6,462,695, 6,501,320, 6,747,503, 6,754,839, 6,774,942, 6,798,857, 6,865,626, 6,947,999, 9,952,240, 6,960,942, 6,695,606, 7,000,158, 7,012,794, 7,038,720, 7,057,241

THERE ARE OTHER U.S. AND FOREIGN PATENTS PENDING.