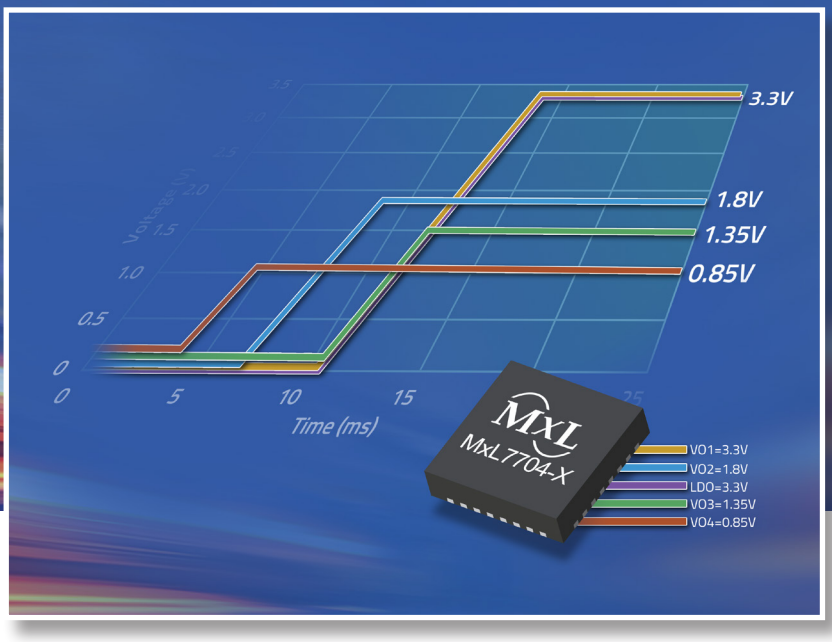
MAXLINEAR

MxL7704

Optimized PMIC for Low Power FPGAs and SoCs



OVERVIEW

MxL7704-A	ARM® Cortex®-A53, A7, A9
MxL7704-X	Xilinx® Zynq® Ultrascale+™ ZU2, ZU3

FEATURES

- Input voltage range: 4.0V to 5.5V
- 4 Synchronous Buck Regulators
  - Internally compensated current mode
  - 1MHz to 2.1MHz switching frequency
  - Buck 1: 3.0V to 3.6V, 20mV step, 1.5A
  - Buck 2: 1.3V to 1.92V, 20mV step, 1.5A
  - Buck 3: 0.8V to 1.6V, 6.25mV step, 2.5A
  - Buck 4: 0.6V to 1.4V, 6.25mV step, 4A
- 100mA LDO: 1.5V to 3.6V, 20mV step
- ±2% maximum total dc output error over line, load and temperature
- 3.3V/5V 400kHz I²C interface
  - Dynamic voltage scaling
  - Status monitoring by channel
  - Sequencing control
  - Input voltage status register
- Highly flexible conditional sequencing engine with external input
- 2 configurable PGOOD outputs
- Adjustable switching frequency
- 5 x 5mm 32-pin QFN package

BENEFITS

- Conditional sequencing engine suitable for nearly any processor
- Integrated 8-bit ADC with 2 external inputs and temperature monitoring provides telemetry and flexibility
- I²C interface allows dynamic voltage control on all outputs, status monitoring by channel, input voltage status, sequencing control and PGOOD routing

APPLICATIONS

- Low power processor, ASIC and FPGA power
- Industrial control
- Test equipment
- POS terminals

The MxL7704 is a five output Universal PMIC optimized for powering a broad range of low power FPGAs, DSPs, and microprocessors from 5V inputs.

The MxL7704 includes four synchronous step-down buck regulators that provide system, memory, I/O and core power from 1.5A to 4A. An on-board 100mA LDO provides clean 1.5V to 3.6V power for analog sub-systems. This PMIC utilizes a conditional sequencing state machine that is flexible enough to meet the requirements of virtually any processor. The MxL7704-X and MxL7704-A are the first standard configurations to be launched based on this unique universal PMIC.

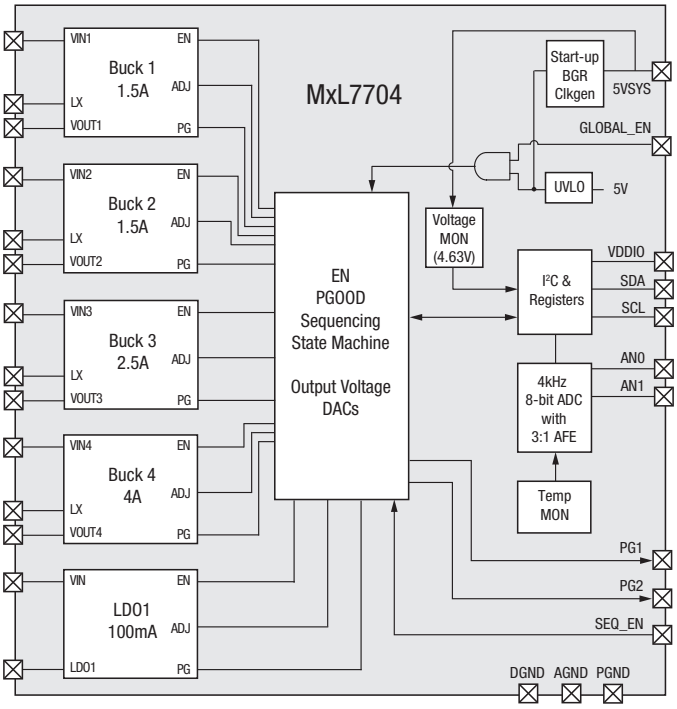
The MxL7704-X has been optimized for powering the Xilinx® Zynq® Ultrascale+™ ZU2 and ZU3 MPSoCs. The bucks are pre-programmed to provide the core rail (0.85V up to 4A), LPDDR3 memory power (1.35V), I/O and system power (1.8V and 3.3V). Sequencing is tailored to the unique needs of the ZU2 and ZU3 MPSoCs.

The MxL7704-A is designed to power a wide range of ARM® Cortex®-based processors such as A7, A9, and A53 which use a more conventional sequencing scheme where the I/O rails power up first and core is last. The bucks provide the 1.2V core rail, 1.35V LPDDR3 power, 1.8V and 3.3V rails for I/O and system power.

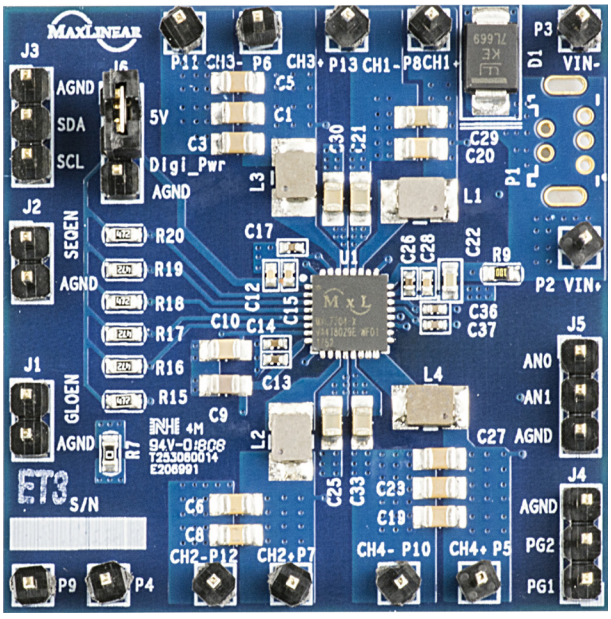
This PMIC offers a high 1MHz to 2.1MHz switching frequency and a current mode architecture with internal compensation. These features enable very fast transient response to line and load changes without sacrificing stability or board space. It operates over an input voltage range of 4V to 5.5V and includes fault protection features such as input under-voltage, overvoltage, overcurrent protection, and thermal protection.

MxL7704 Typical Performance

Part Number	Ch.	Nominal Output Current (A)	Operating Voltage (V)		Min Output Voltage (V)	Quiescent Current (mA)	Programmable Frequency Range (MHz)	Package	Features
			Min	Max					
MxL7704	4	1.5A 1.5A 2.5A 4A	4.5	5.5	3.0 1.3 0.8 0.6	8	1 to 2.1	5 x 5mm QFN32	▪ Two configurable power good outputs ▪ LDO and 2-input 8-bit ADC ▪ Temperature monitoring ▪ Supported by Excel configuration tool ▪ MxL7704-A: Sequencing ARM Cortex-based processors A53, A9, A7 ▪ MxL7704-X: Sequencing for Xilinx Zynq Ultrascale+ ZU2, ZU3



MxL7704 Functional Block Diagram



MxL7704EVB

Corporate Headquarters:
5966 La Place Court
Suite 100
Carlsbad, CA 92008
Tel.:+1 (760) 692-0711
Fax: +1 (760) 444-8598
www.maxlinear.com