

TDK μ POLTM DC-DC Power Modules

Power Solutions Cookbook

Various FPGAs/SoCs, multi-ARM SoCs

Table of Contents

TDK's μ POL Chip Embedded DC-DC Power Modules

Starter Designs for various FPGAs, SoCs, multi-ARM SoCs, Ethernet chipsets. Power maps are presented below. The starter designs provide a design guideline for TDK power modules includes the power map, starter schematics on ORCAD (.dsn) files that are downloadable for preview on registration. Additional starter PCB layout files are also available for fast design on various popular tools: Cadence, Altium and Mentor.

Click to Jump to Page



www.us.tdk.com/POL

Download tools for quick design start.

Datasheets, power maps, reference designs, symbols, 3D models, and BOMs >>

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Introduction of TDK μ POL™ DC-DC Power Modules

Chip Embedded DC-DC Power Modules

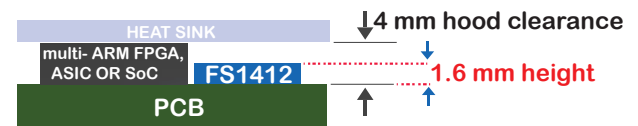
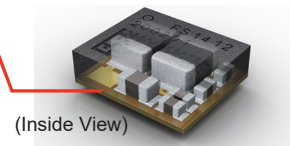
TDK's μ POL Technology provides endless opportunities to save space, design time without compromising in performance. These power modules contain matching MOSFET, Driver, Inductor and package make it possible to provide the most optimum solution without comprising performance, while reducing the number of external components to reduce the overall system cost. Plug and Play concept saves design time and will allow system designer to work on system solution vs. fine tuning individual components

Highlights

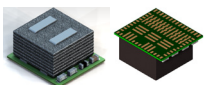
- μ POL Technology Includes Inductor, Controller,
- Power MOSFET, Driver & Digital Engine
- Plug & Play (No Compensation Required)
- Analog DC-DC or Digital DC-DC Design (I2C / PMBUS Serial Bus)
- Voltage, Current, Temperature Telemetry
- Adjustable Vout ± 5 mV
- Output Voltage, $\pm 0.5\%$ Initial accuracy
- -40°C to 125°C Operating Temperature

3D Chip Embedded Power Modules

Ultrathin
1.6 millimeter height

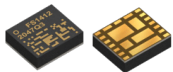


Chip Embedded Power Modules



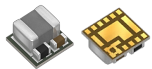
FS1525 Sampling Soon

- 25A / 45W sharable n=8 phase to 200A
- 6.8 mm x 7.6mm x 3.8 mm height
- Analog, I2C/PMBus plus Telemetry



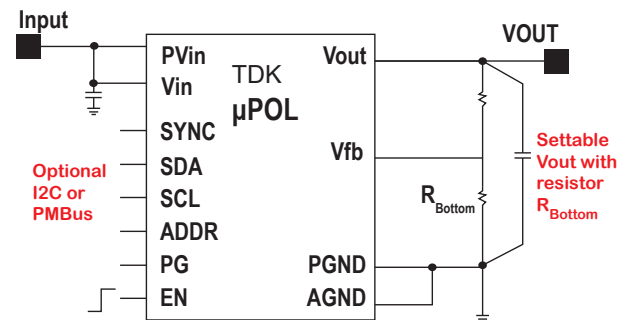
FS1412 Released

- 12A / 20W+ in 4.9mm x 5.8mm x 1.6mm height
- Analog, I2C/PMBus plus Telemetry



FS1406, FS1404, FS1403, FS1703 Released

- 6A-3A / 15W in 3.3mm x 3.3mm x 1.5mm height
- Analog, I2C



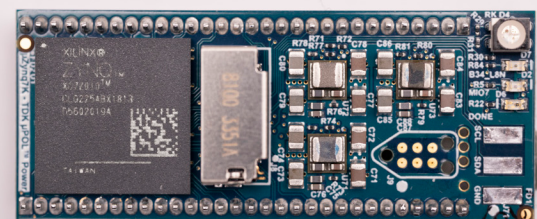
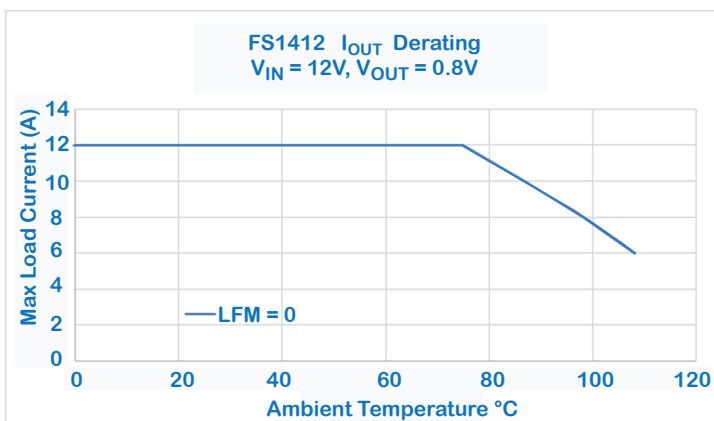
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Technology & Performance Advantages

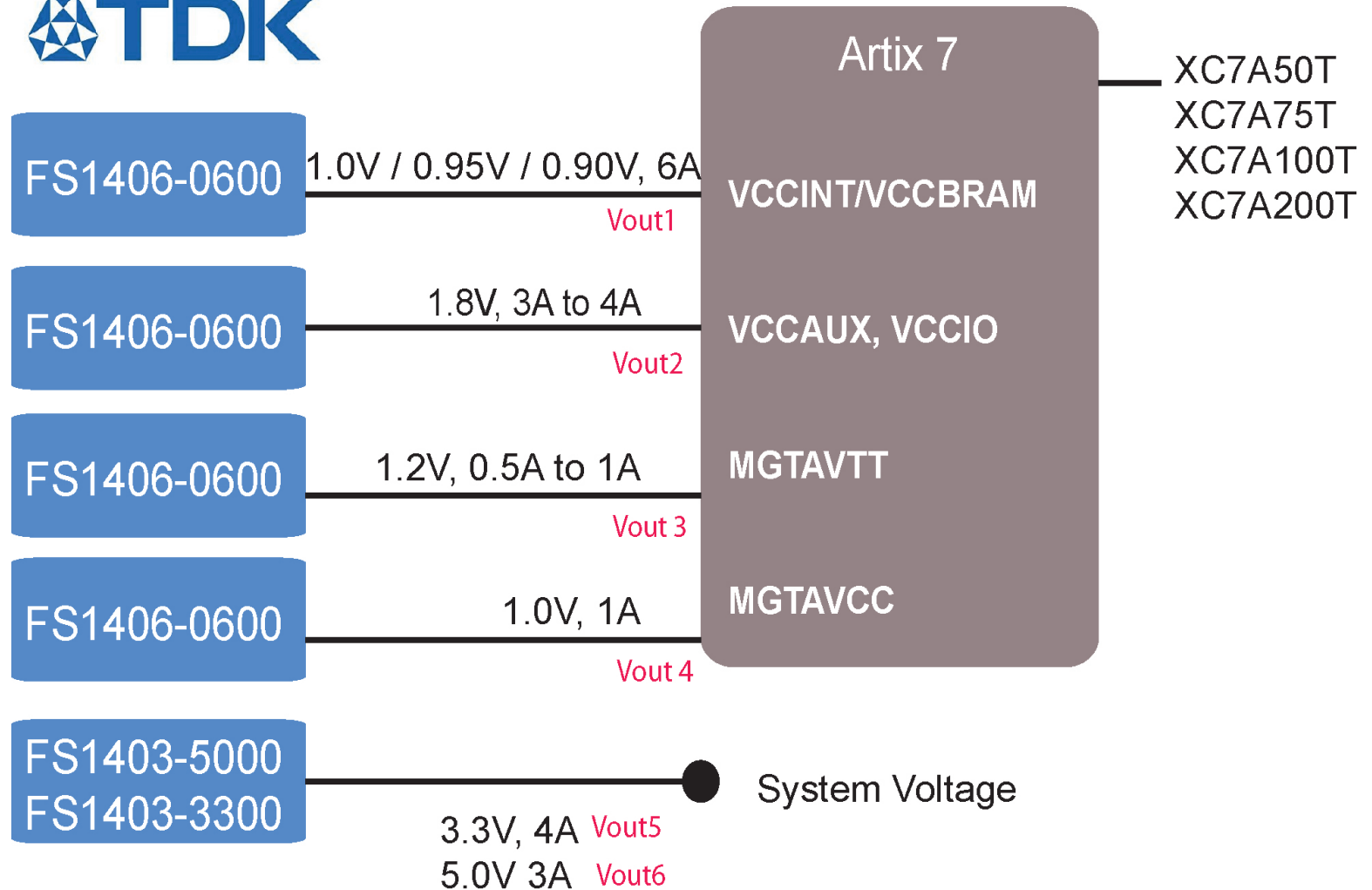
- Chip Embedded Power IC in Thermal Enhanced Packaging, Excellent thermal deratings over temperature
- Ultra Thin height, Small PCB footprint power design:
Total solution: 25% to 50% smaller than competitors



Design Example:
Xilinx FPGA with TDK μ POL Power Modules

TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Artix 7

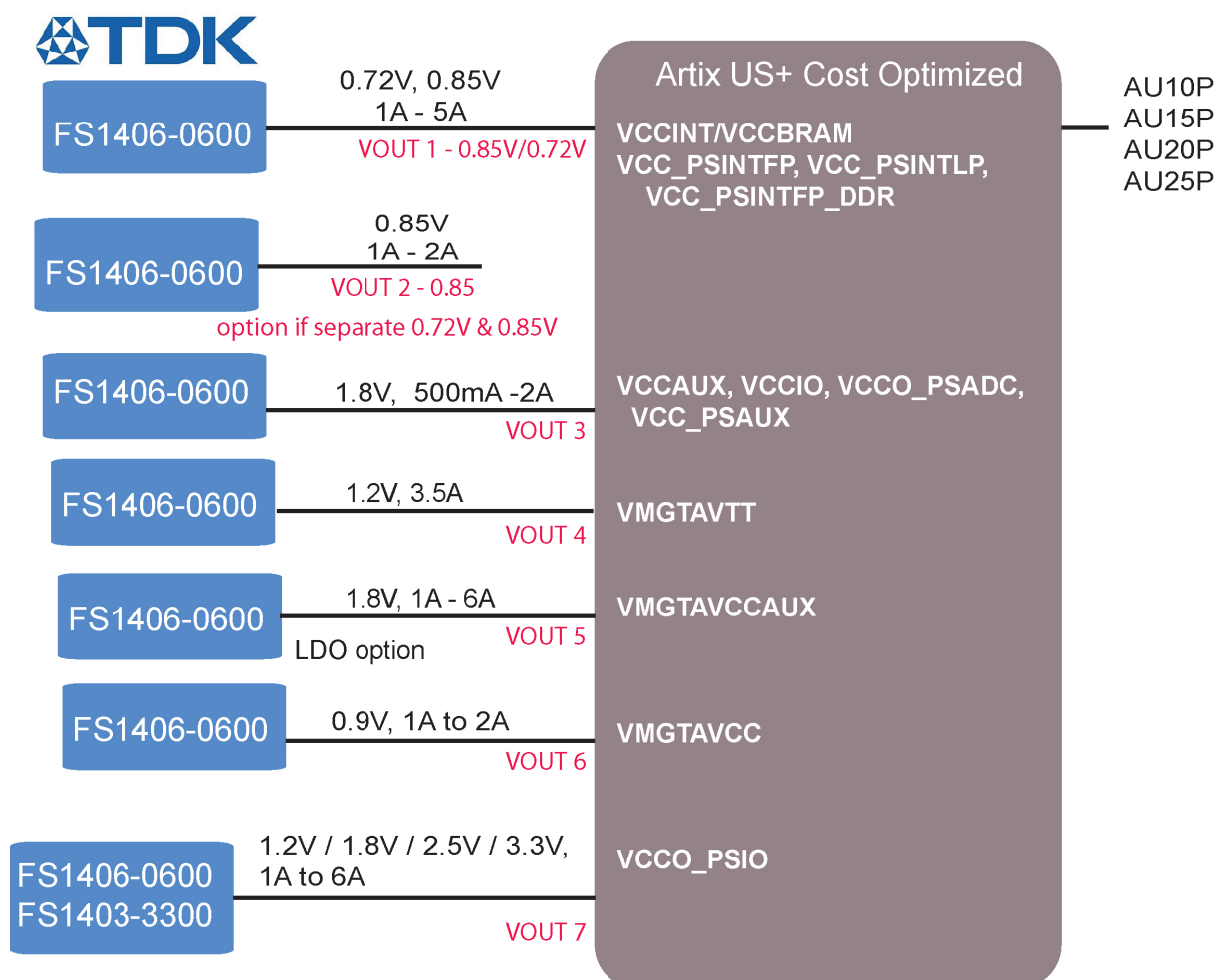


Highlights

- μ POL™ Technology Includes Inductor in a Thermally Enhanced Package
- FS1406-0600 provides a quick analog DC-DC solution for Vout from 0.6V to 1.8V
- Low height profile DC-DC power modules
- Excellent thermal derating performance
- -40°C to 125°C Operating Temperature

TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Artix UltraScale+ Cost Optimize

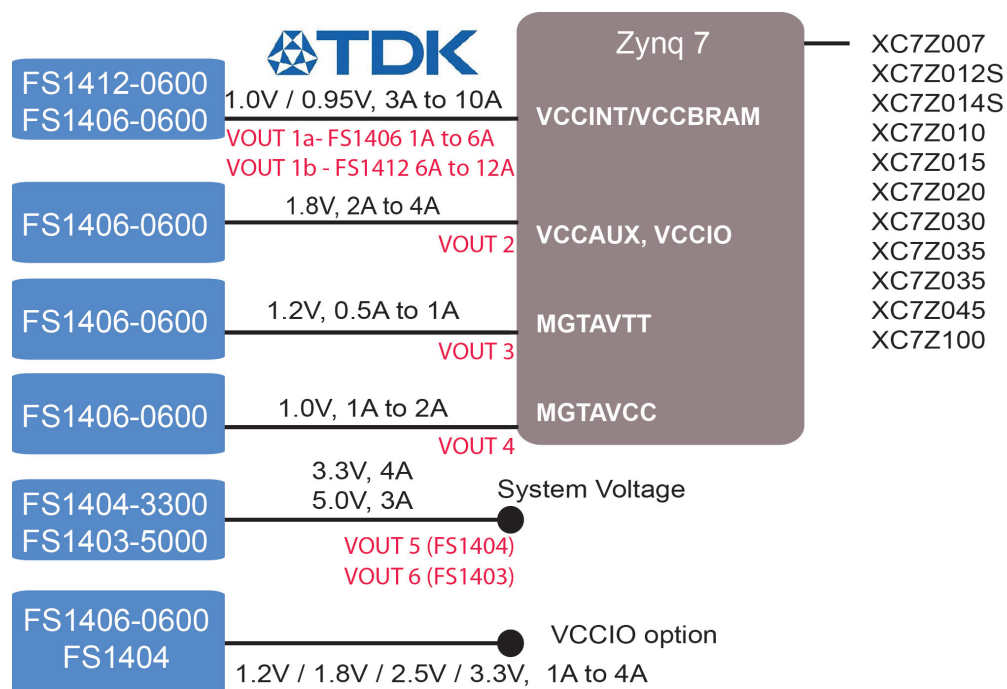


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Zynq 7

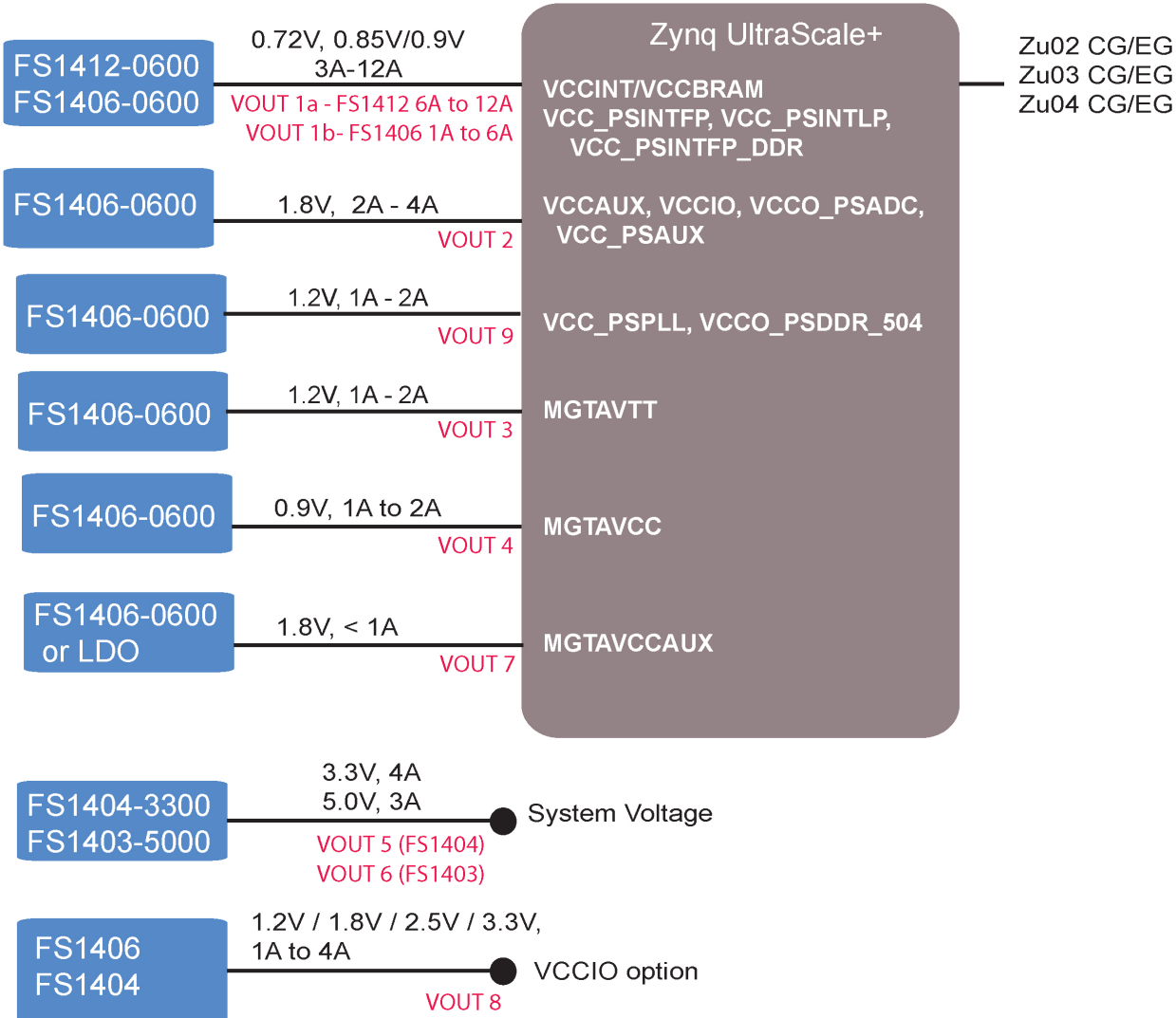


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Zynq UltraScale+ MPSoC

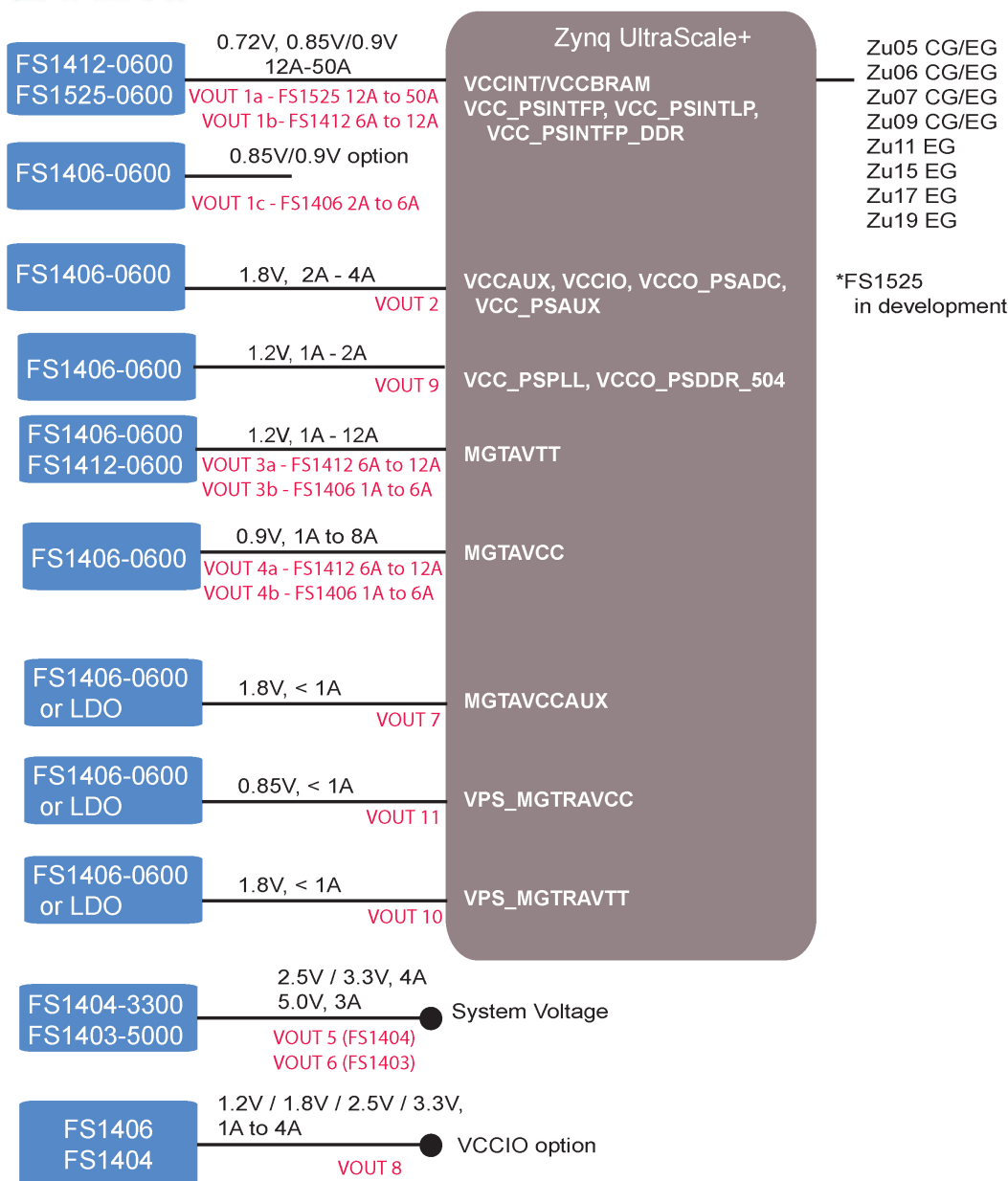


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TDK μ POL™ DC-DC Power Modules Solution

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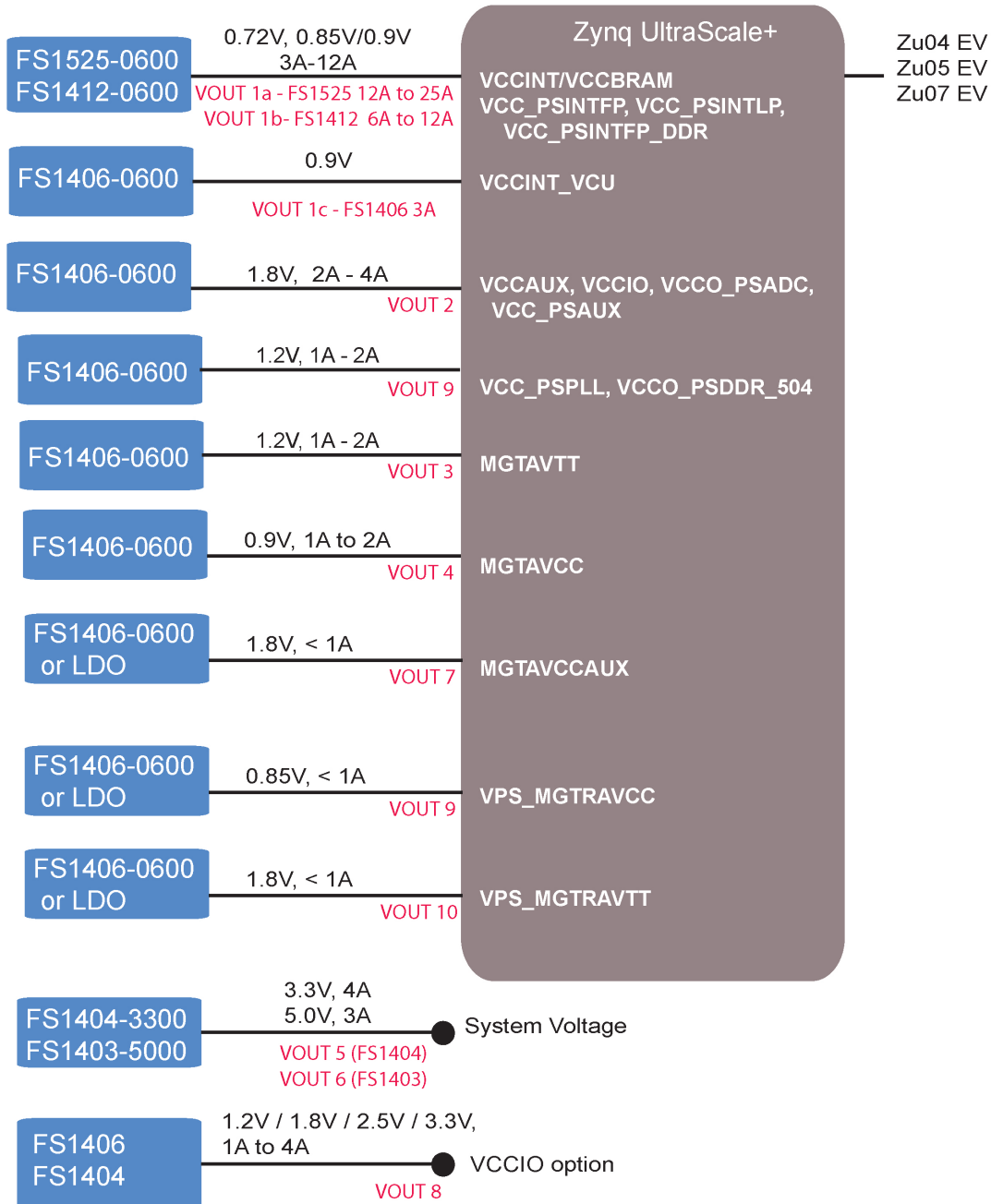


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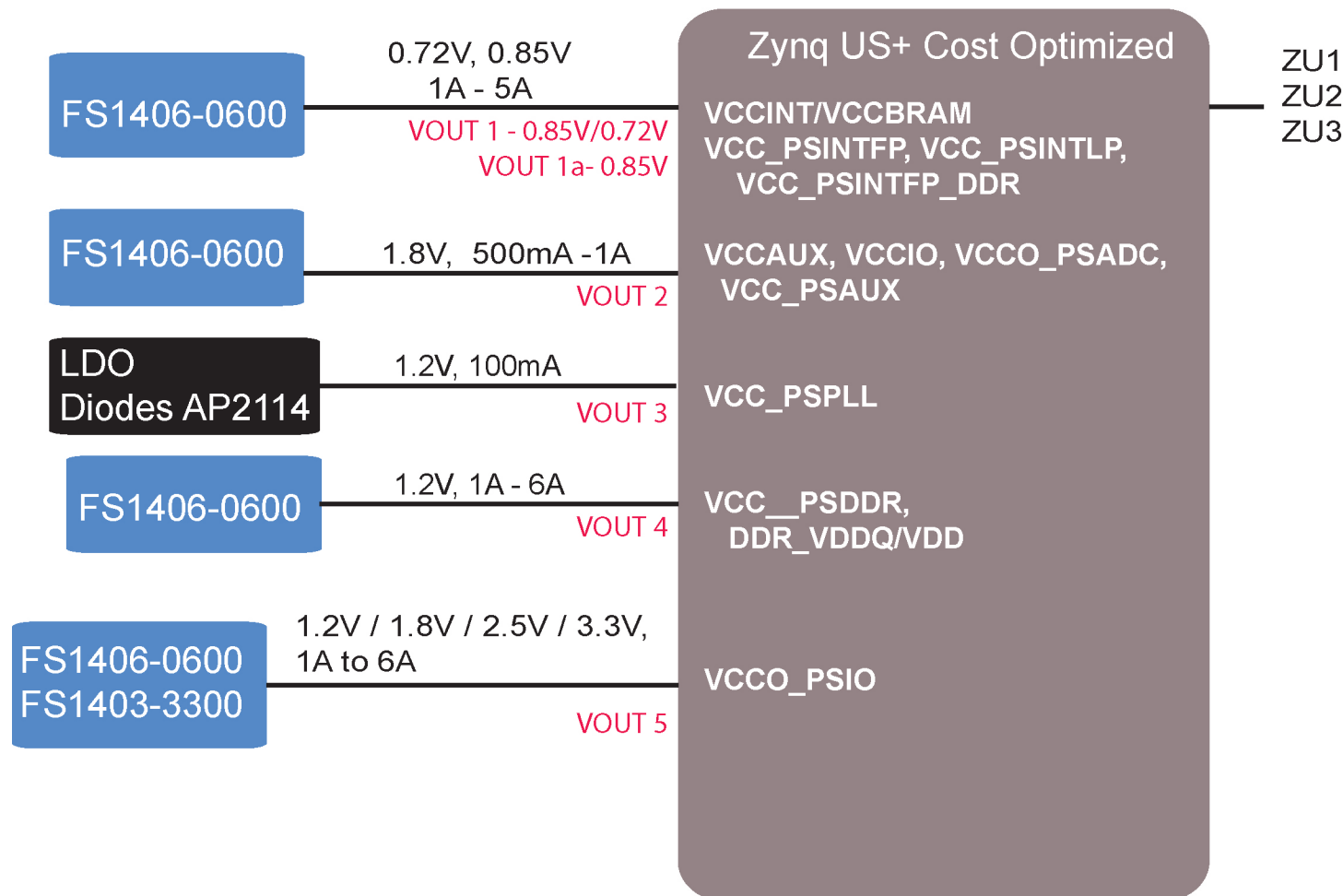


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Zynq UltraScale+ Cost Optimized

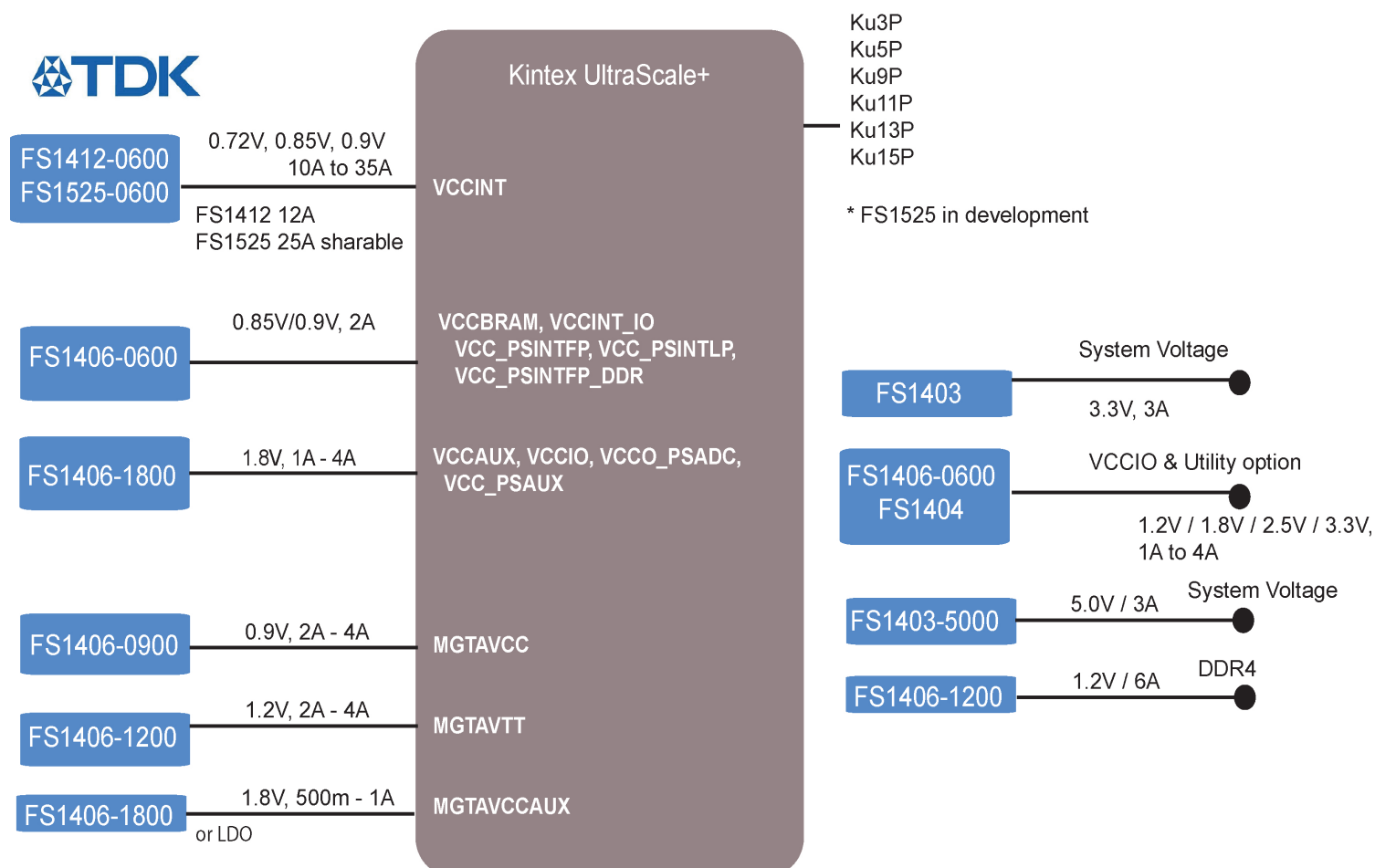


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Kintex UltraScale+

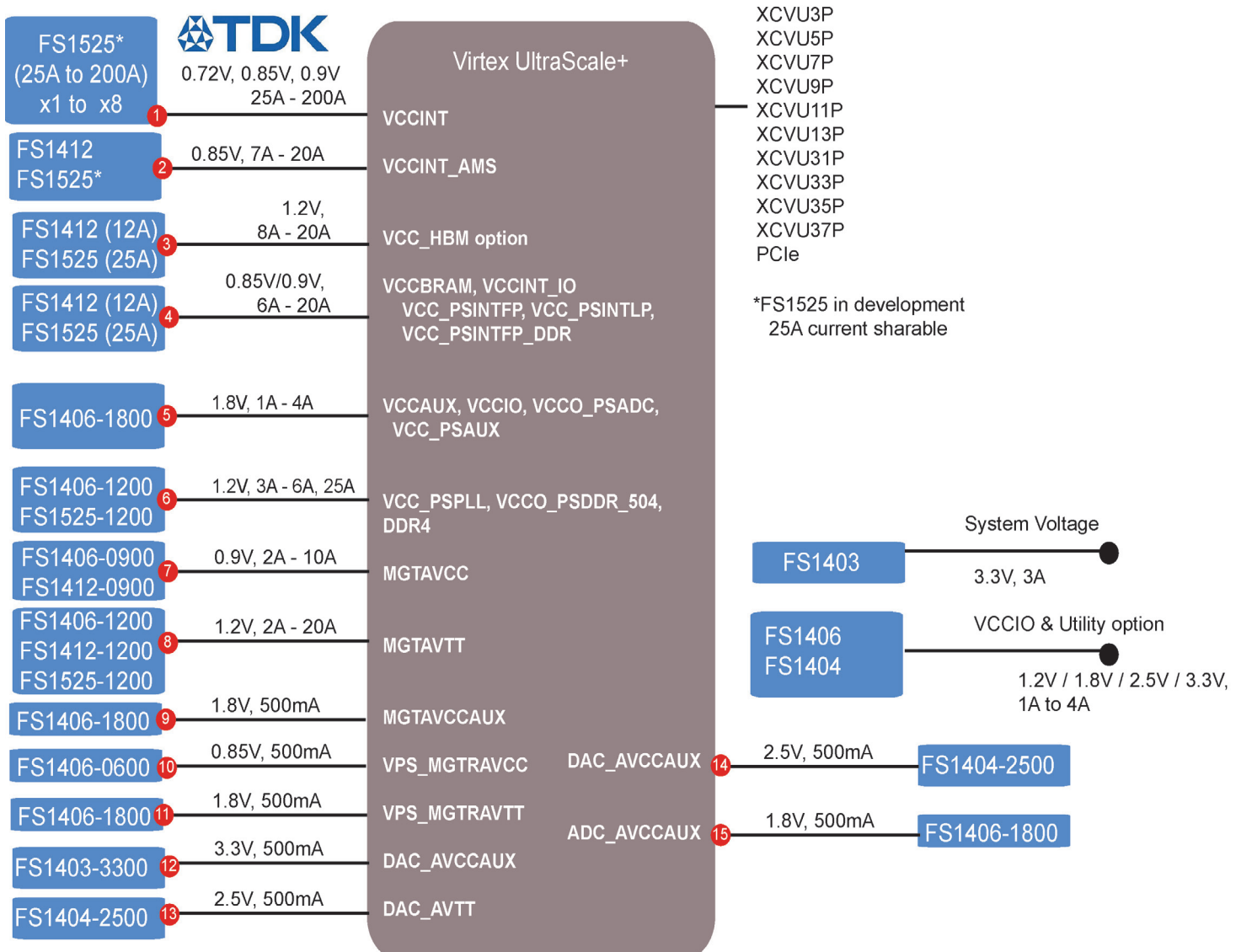


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Virtex UltraScale+



Highlights

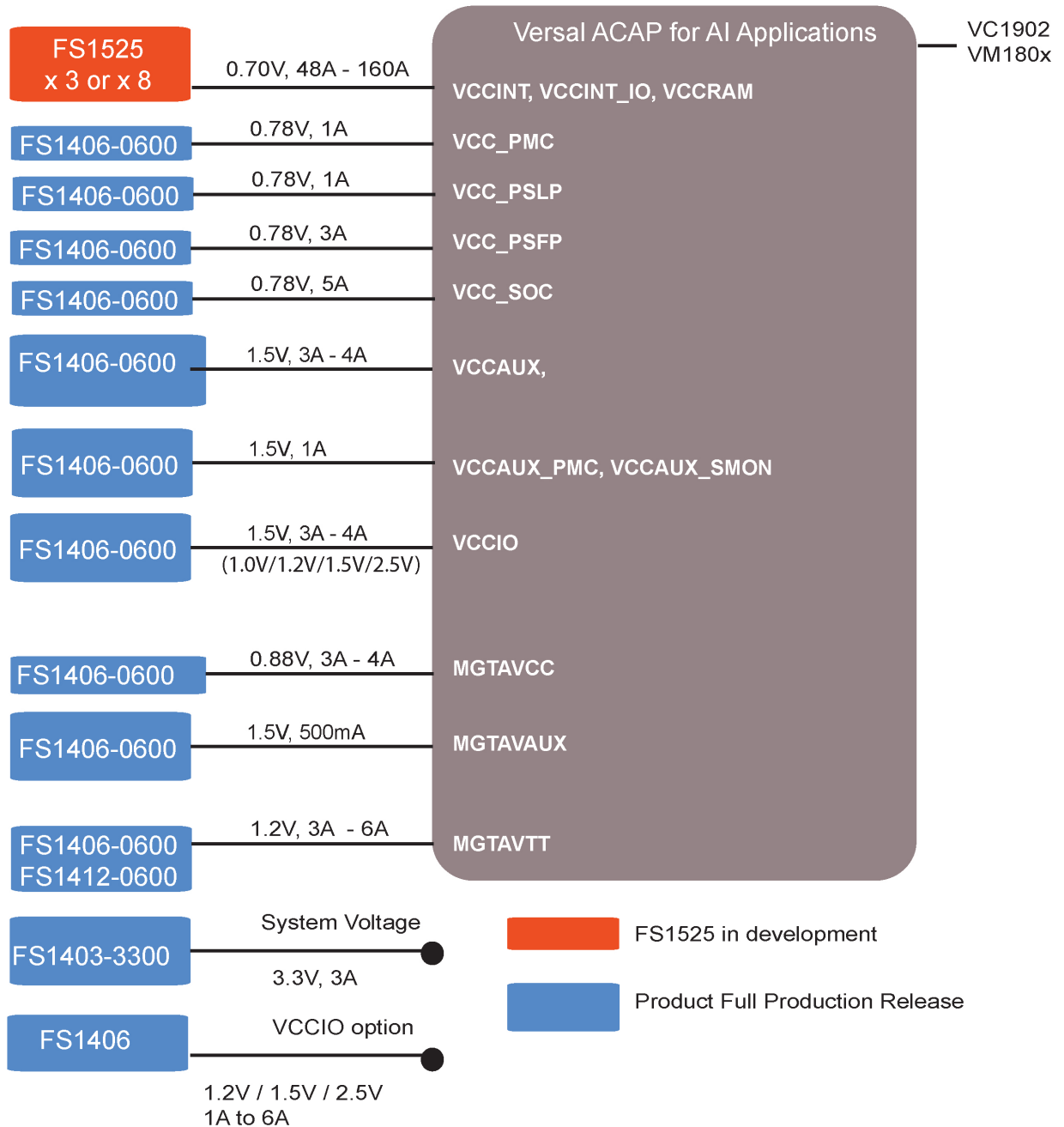
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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Versal ACAP Series



Xilinx

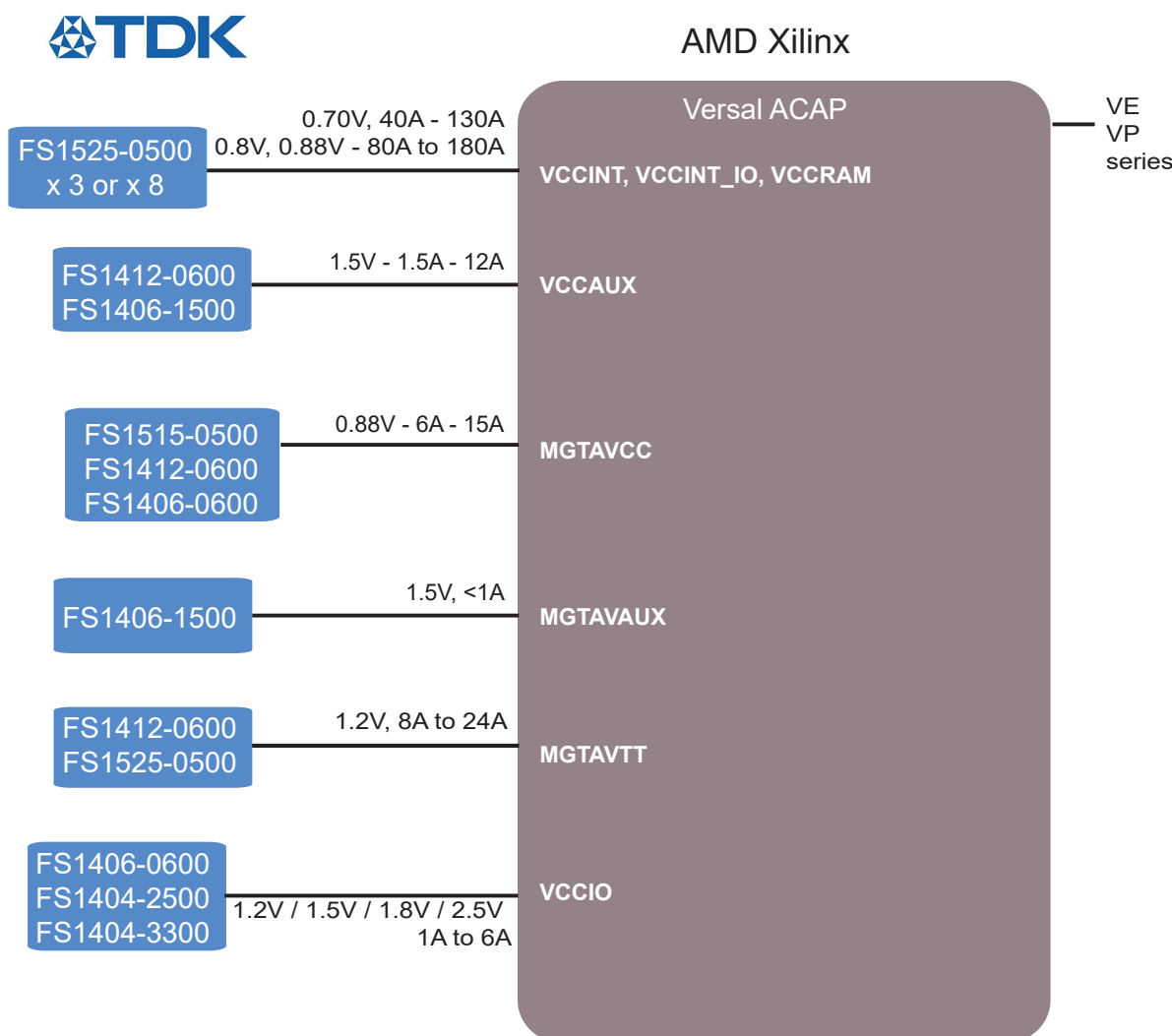


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Xilinx Versal Premium and Edge Series



Note: FS1406 at 1.2V, 1.5V and 0.88V can be generated using FS1406-0600 with external resistor

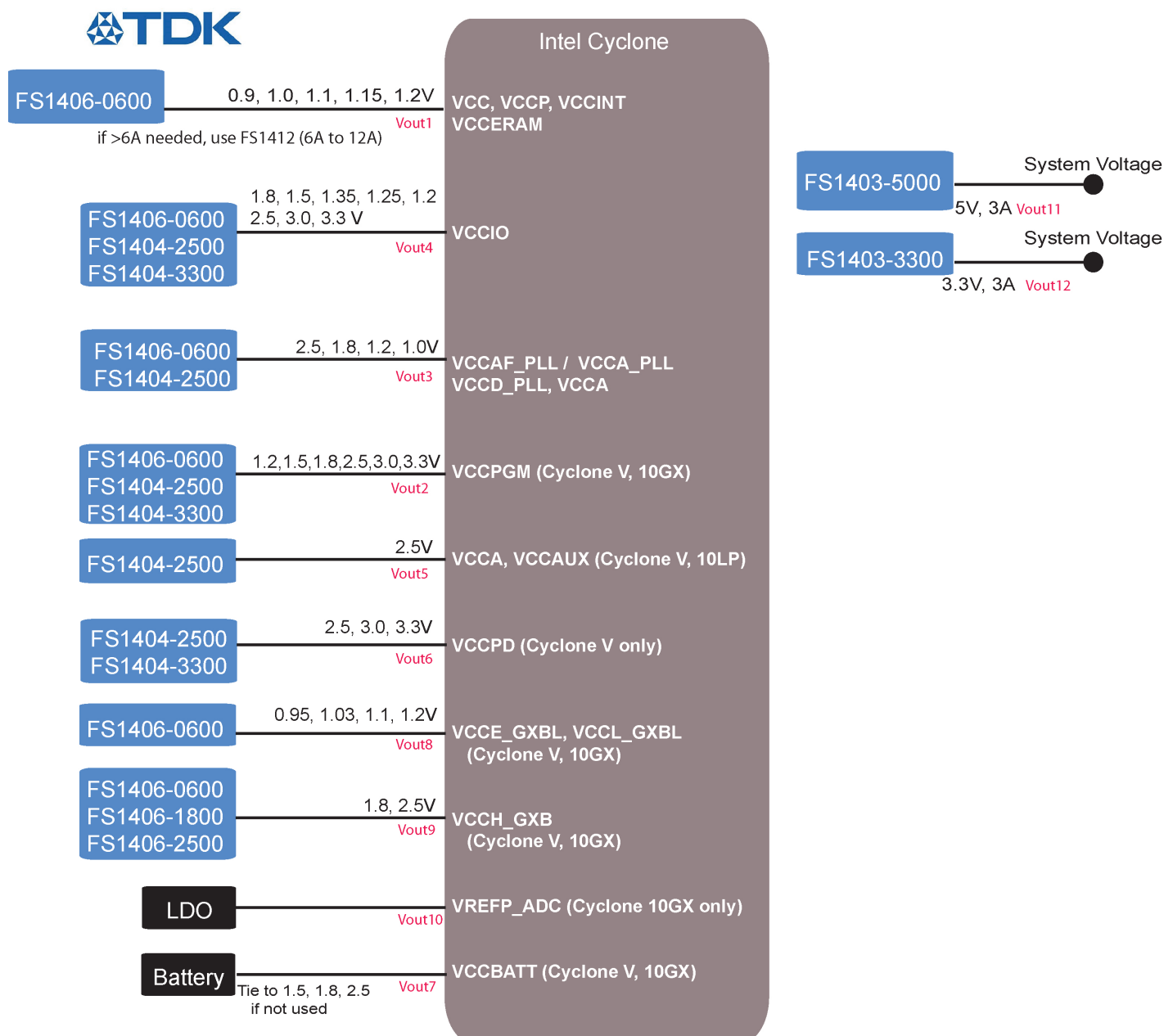
Versal Premium: VP1102, VP1202, VP1402, VP1502, VP1552, VP1702, VP1802
Versal AI Edge: VE1752, VE2002, VE2102, VE2202, VE2302, VE2602, VE2802

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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Intel (Altera) Cyclone

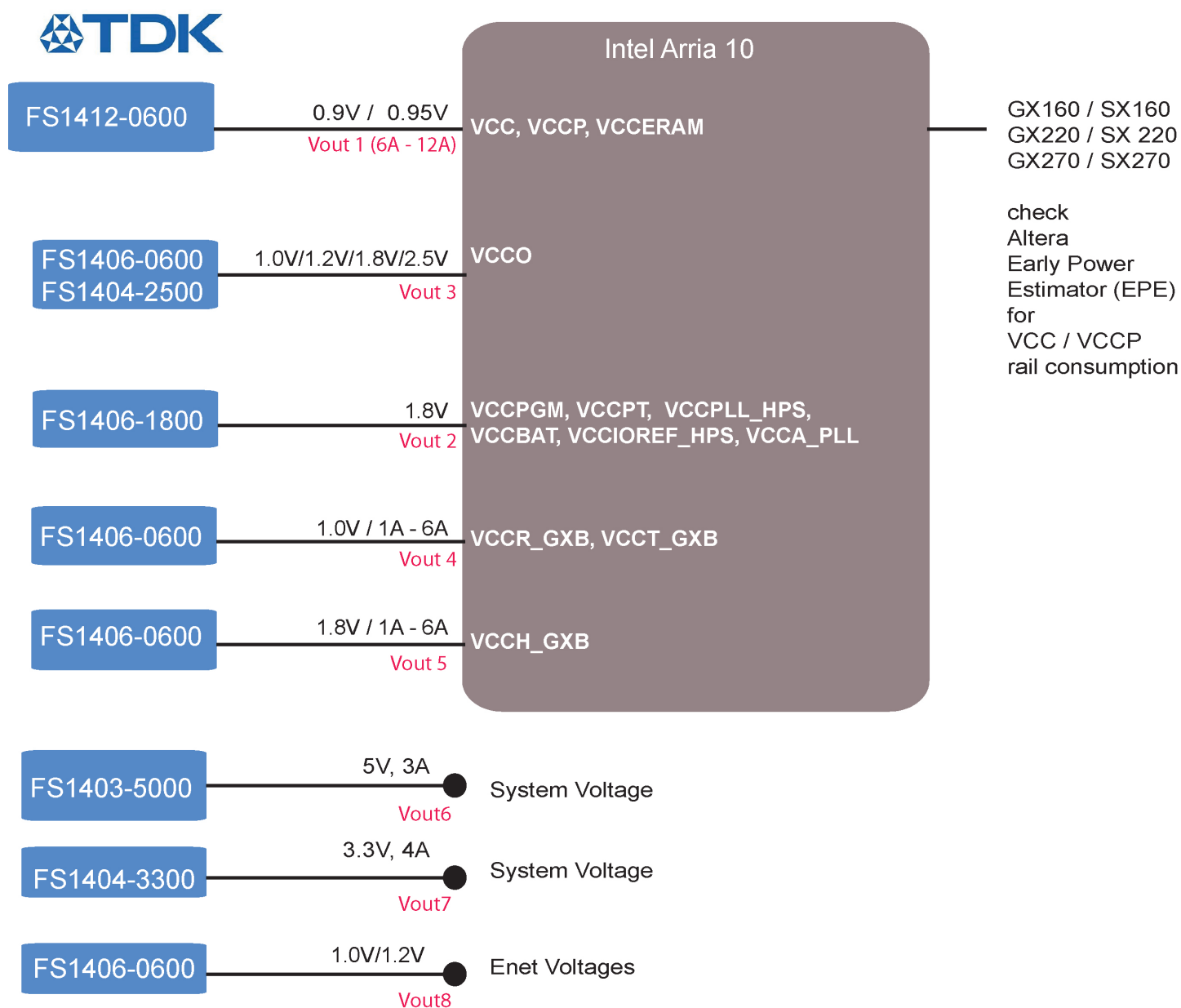


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Intel (Altera) Arria 10 - 10W to 15W

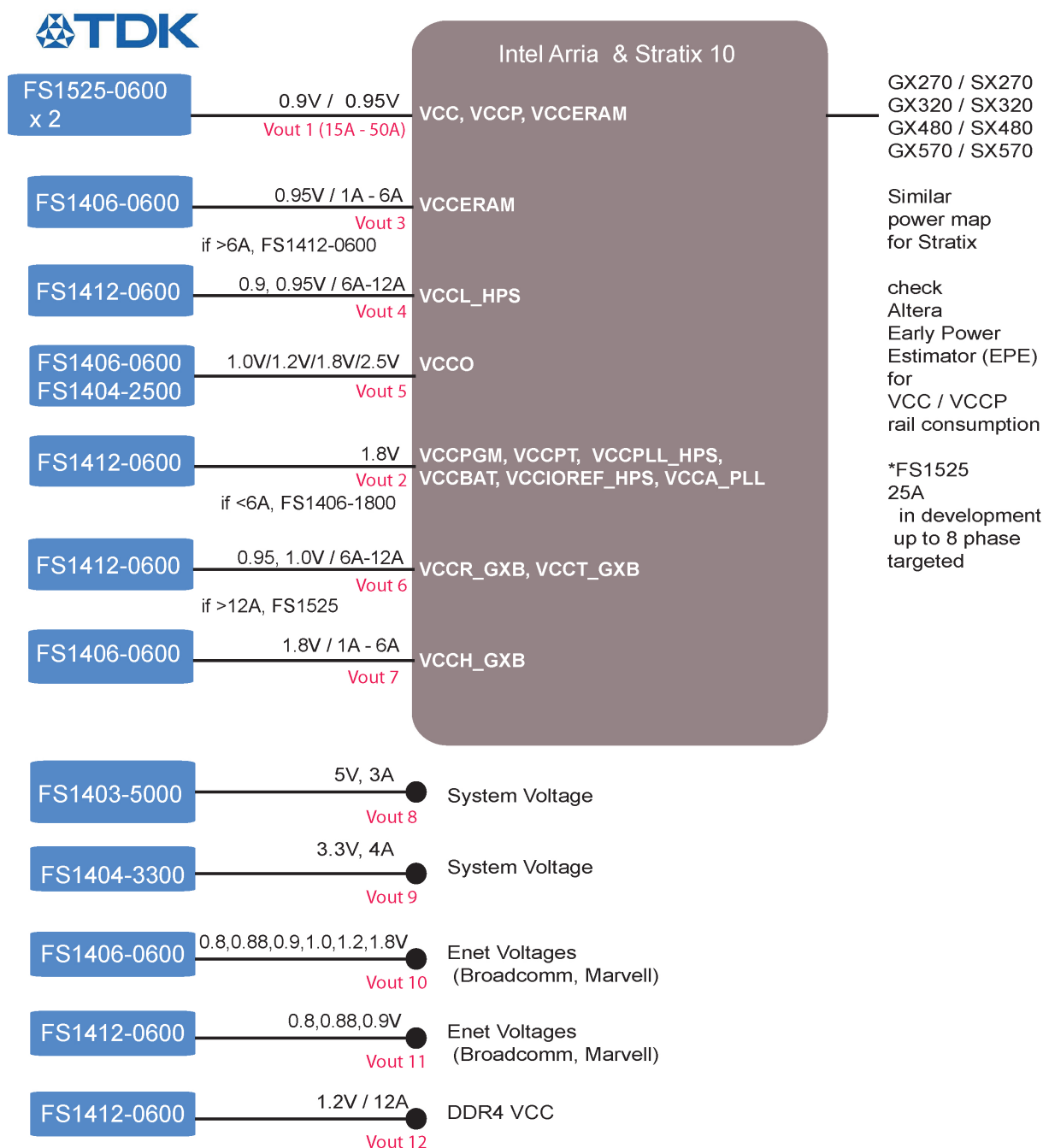


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Intel (Altera) Arria 10 & Stratix 10

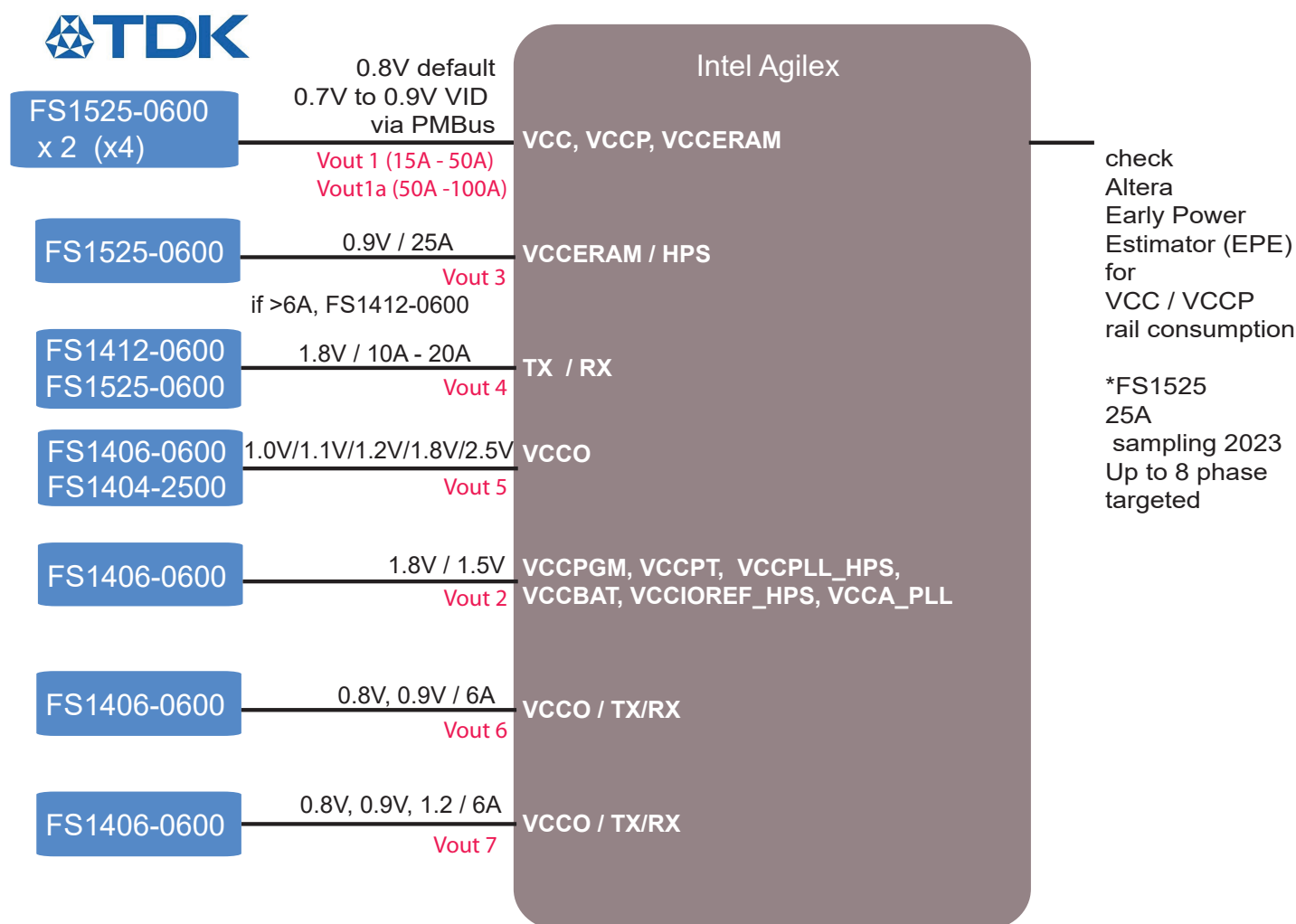


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Intel (Altera) Agilex

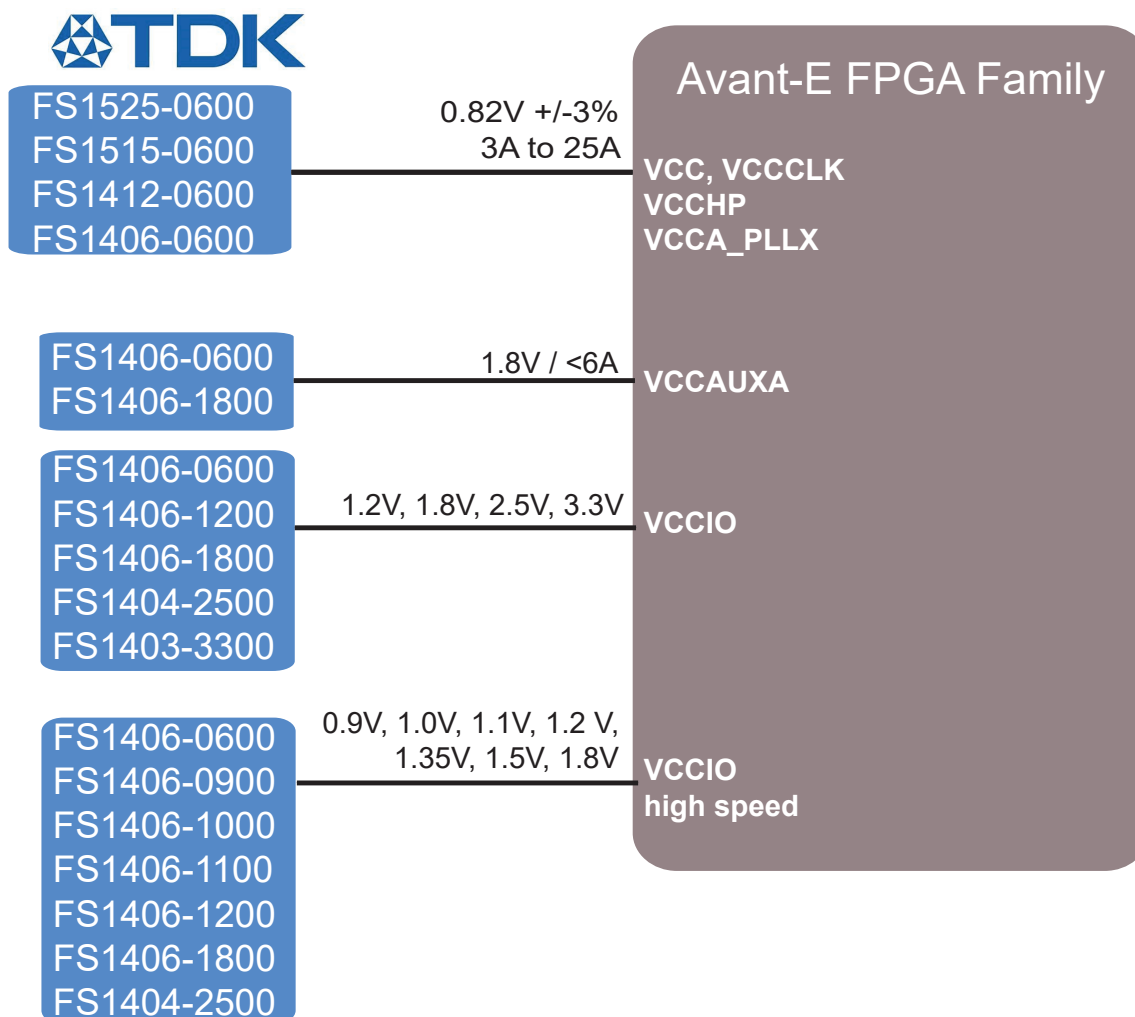


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Lattice Avant-E

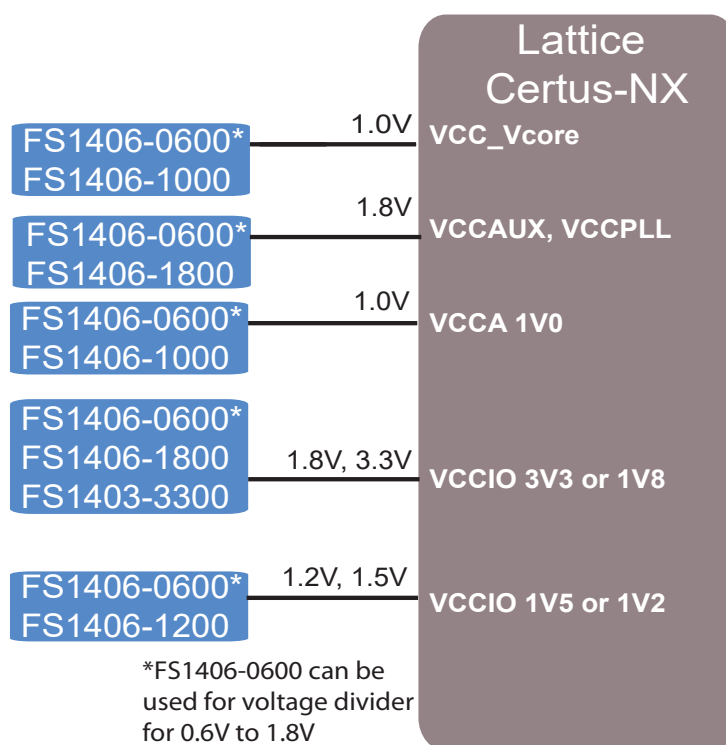


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Lattice Certus-NX



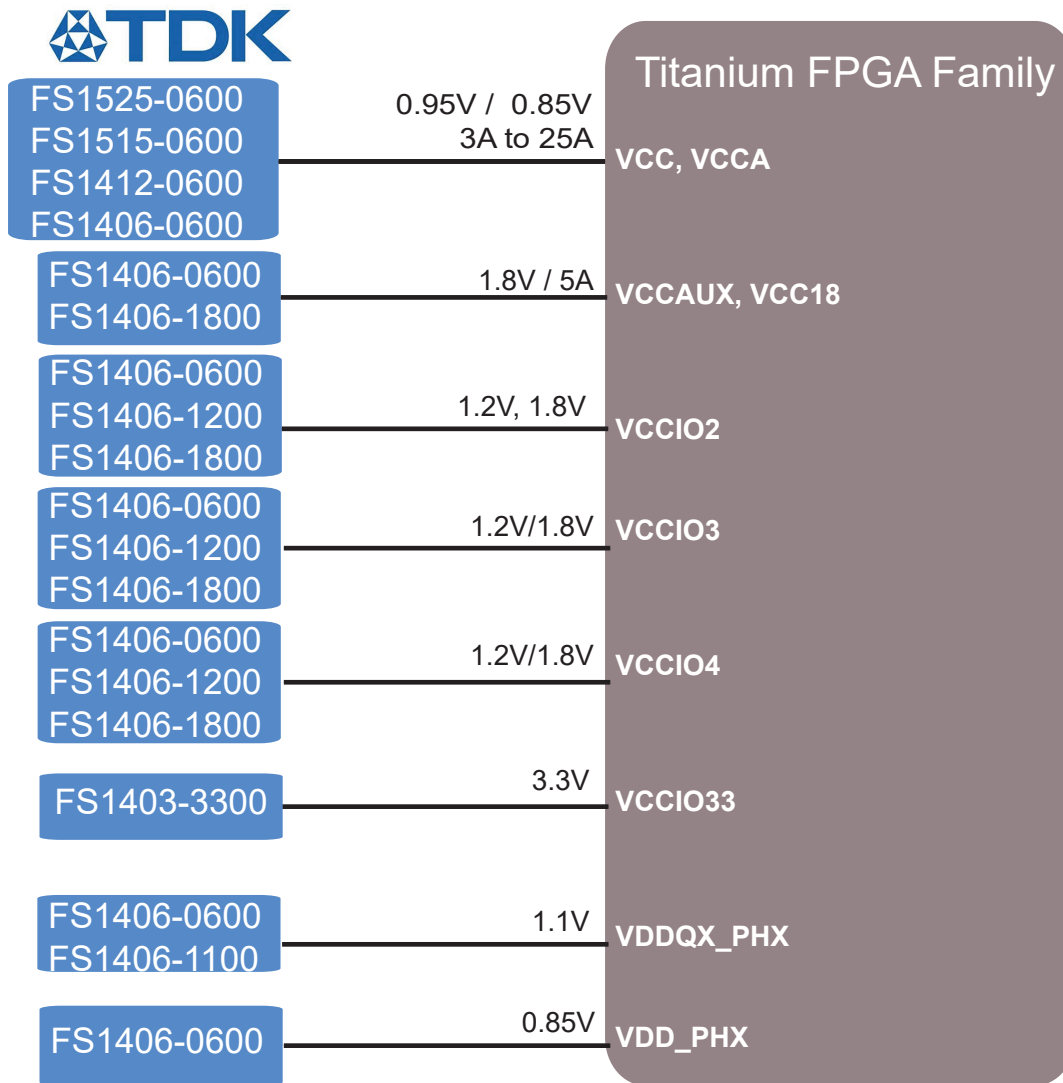
		ice40	CrossLink	Certus
TDK μ POL Power Modules	FS1412			6A - 12A 0.6V - 1.8V
	FS1406	1A - 6A 1.0V, 1.2V	1A - 6A 0.6V - 1.8V	1A - 6A 1.0V, 1.2V, 1.5V, 1.8V, 0.6V - 1.8V
	FS1404	3.3V, 2.5V	3.3V, 2.5V	3.3V, 2.5V
	FS1403 / FS1703	3.3V, 5.0V	3.3V, 5.0V	3.3V, 5.0V

Highlights

- μ POL™ Technology Includes Inductor in a Thermally Enhanced Package
- FS1406 provides a quick analog DC-DC solution for Vout from 0.6V to 1.8V
- See FS1406-0600 used as voltage divider
- Low height profile DC-DC power modules
- Excellent thermal derating performance
- -40°C to 125°C Operating Temperature

TDK μ POL™ DC-DC Power Modules Solution

Power Map for Efinix Titanium

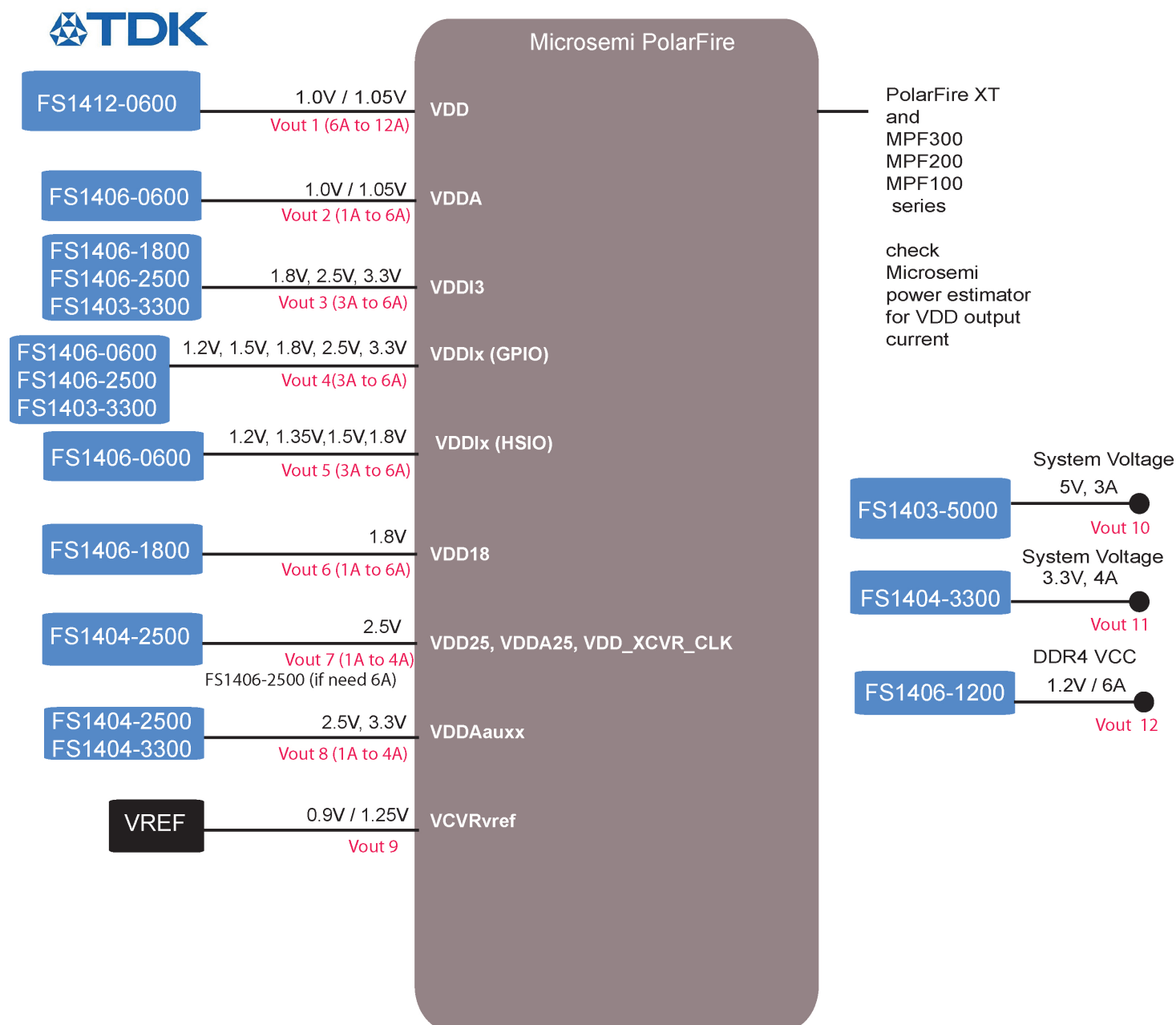


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Microsemi PolarFire

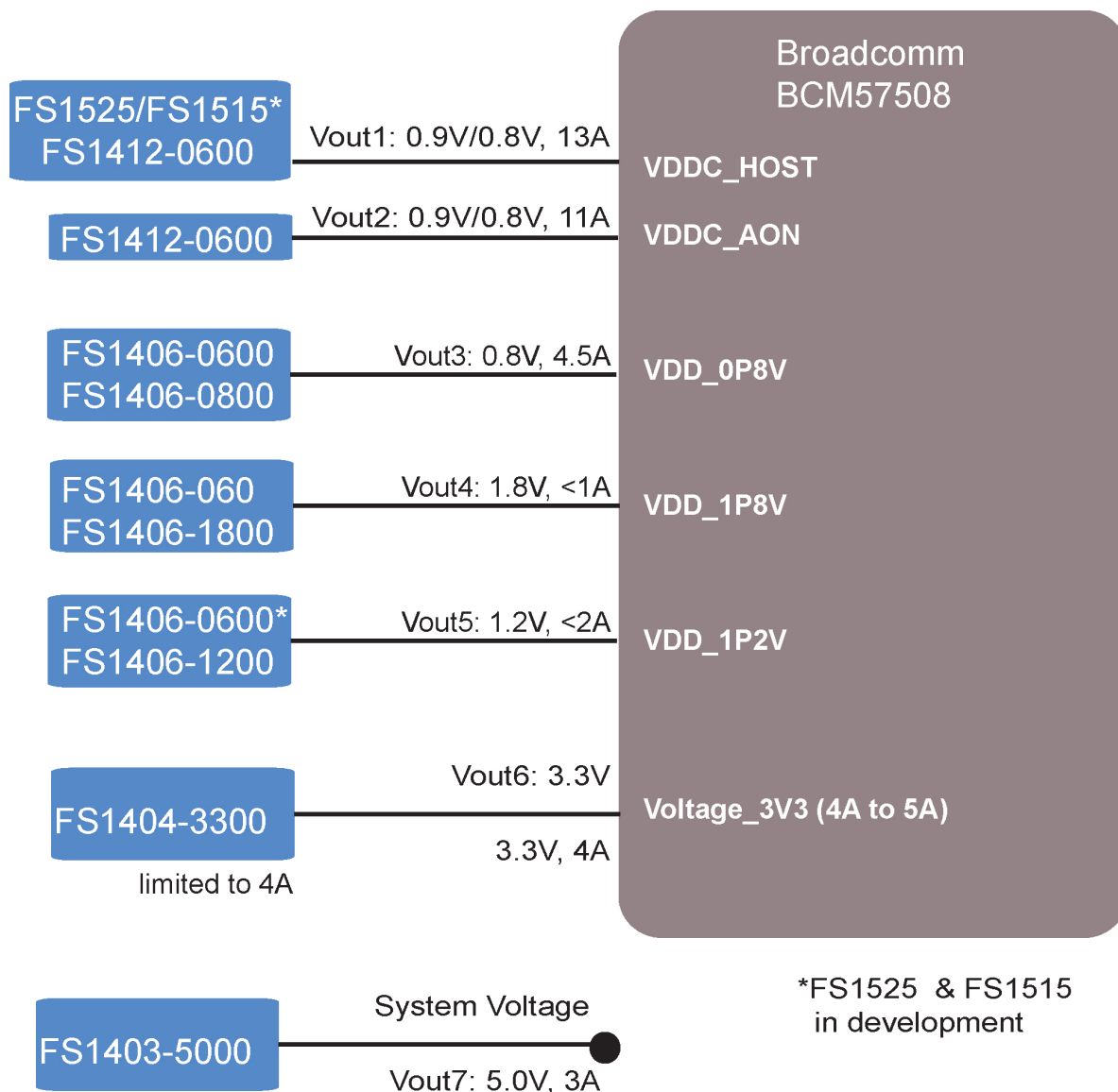


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Broadcom - 100G - 200G Ethernet

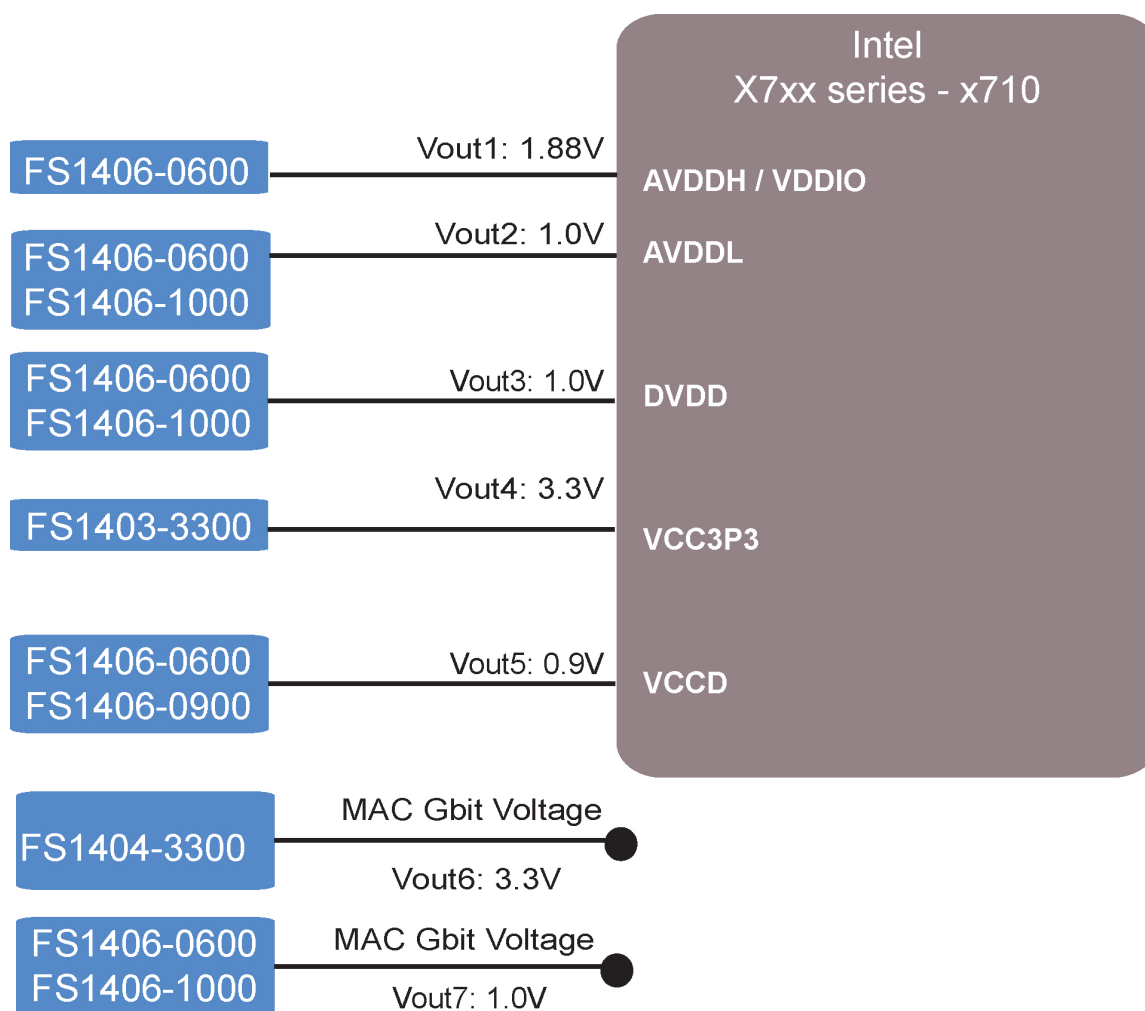


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Intel Ethernet - GbE Ethernet

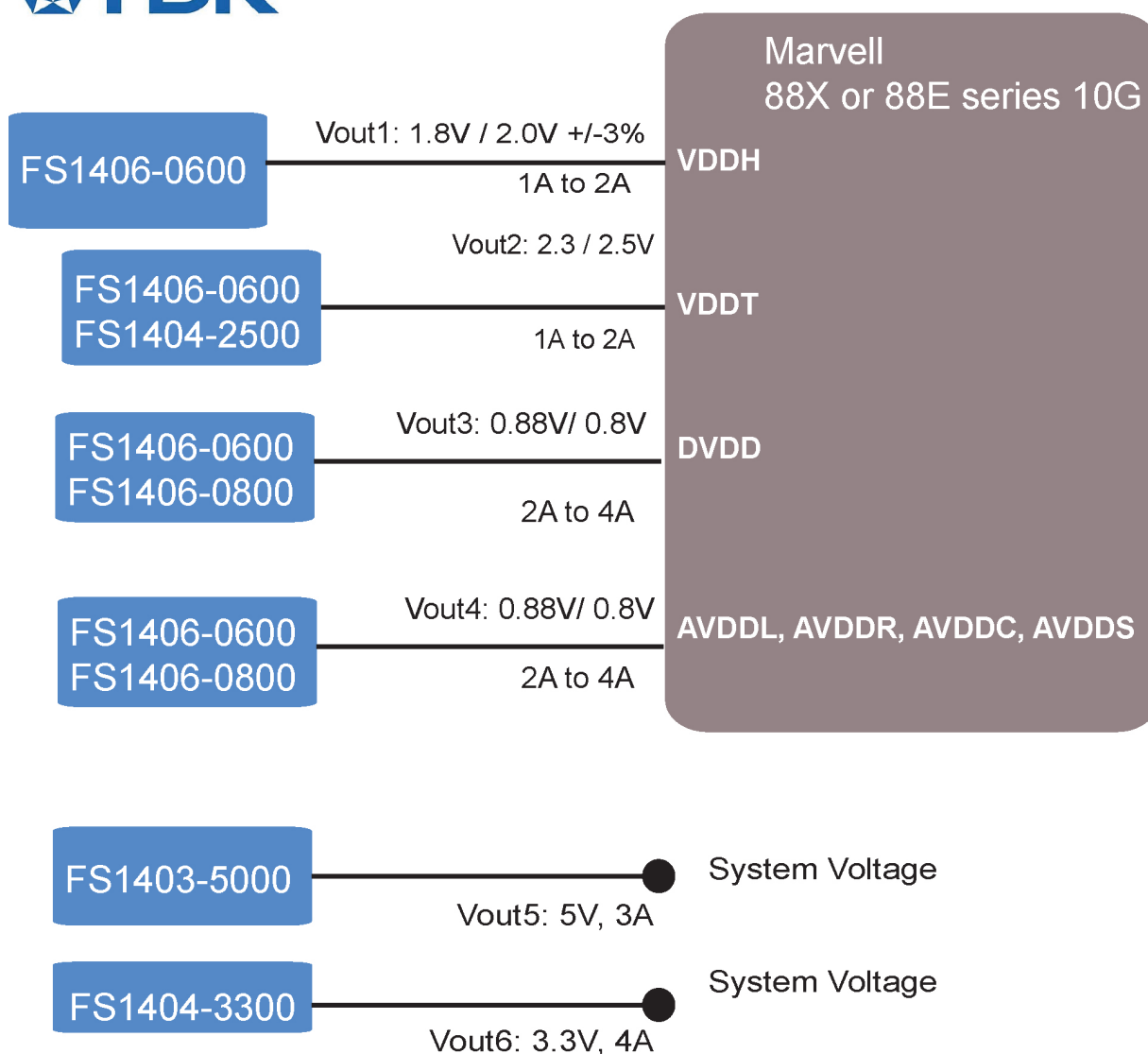


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TDK μ POL™ DC-DC Power Modules Solution

Power Map for Marvell - GbE Ethernet

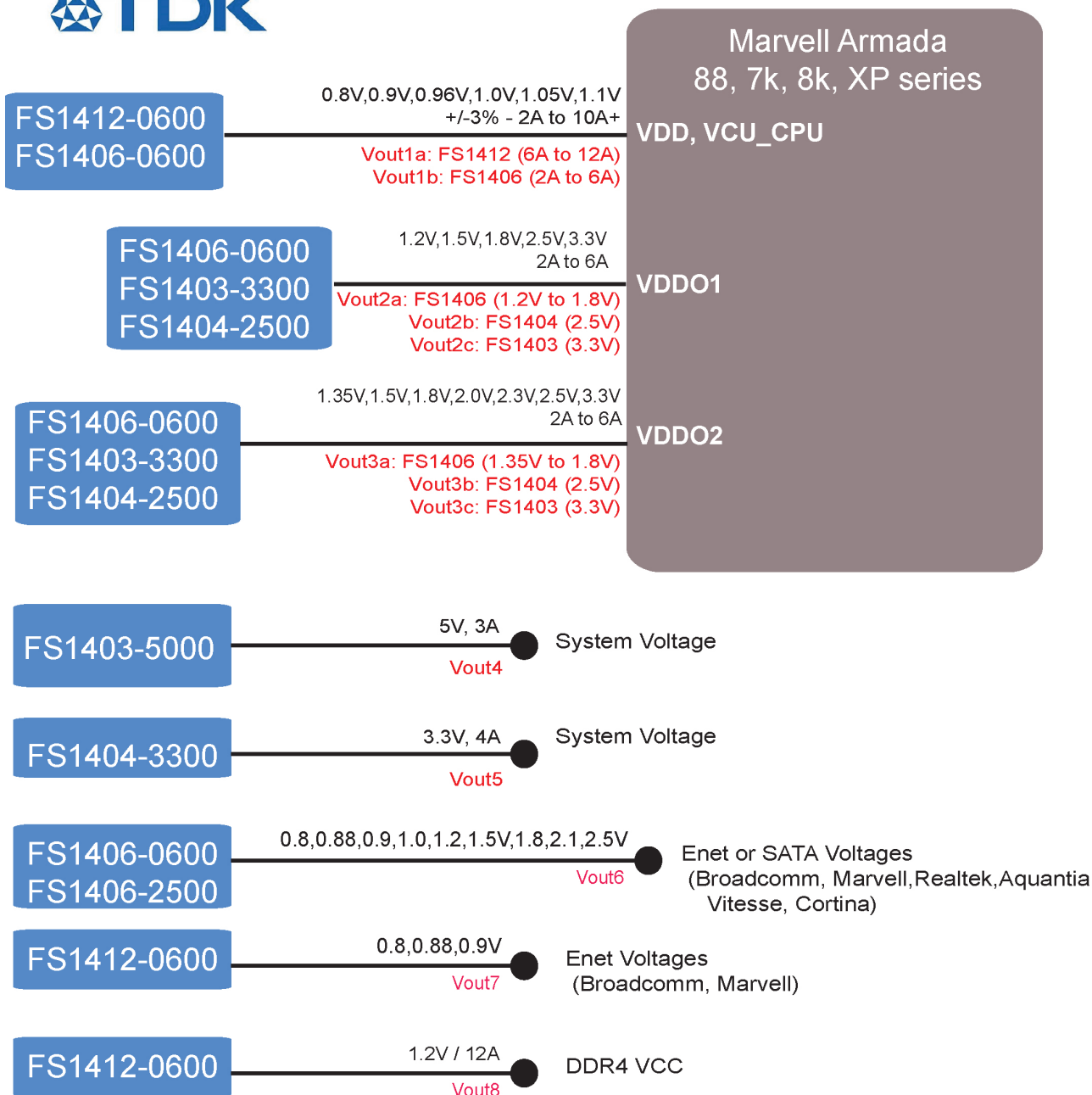


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Power Map for Marvell - Armada - multi-core ARM SoCs

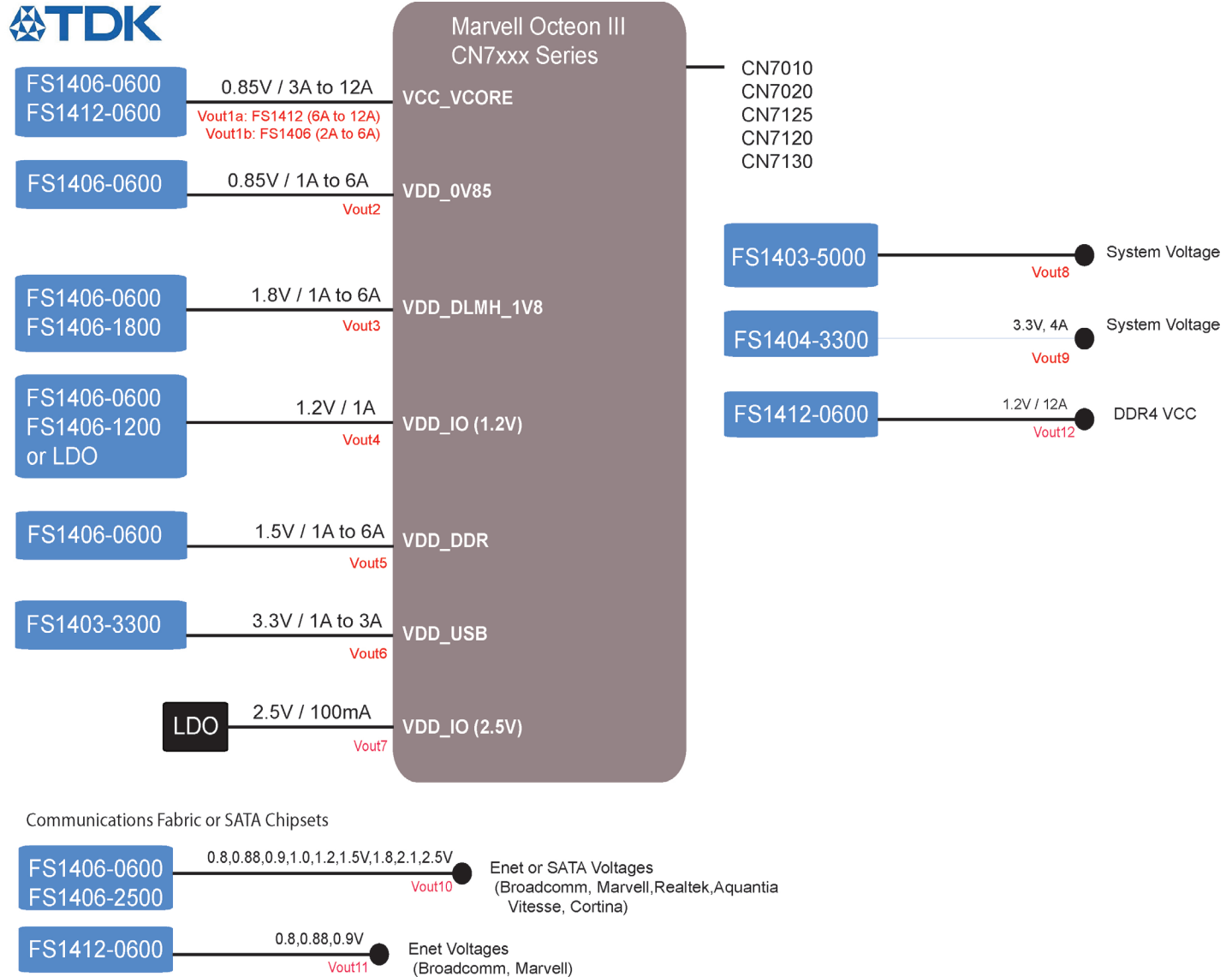


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Power Map for Marvell - Cavium Octeon - ARM Processor SoC

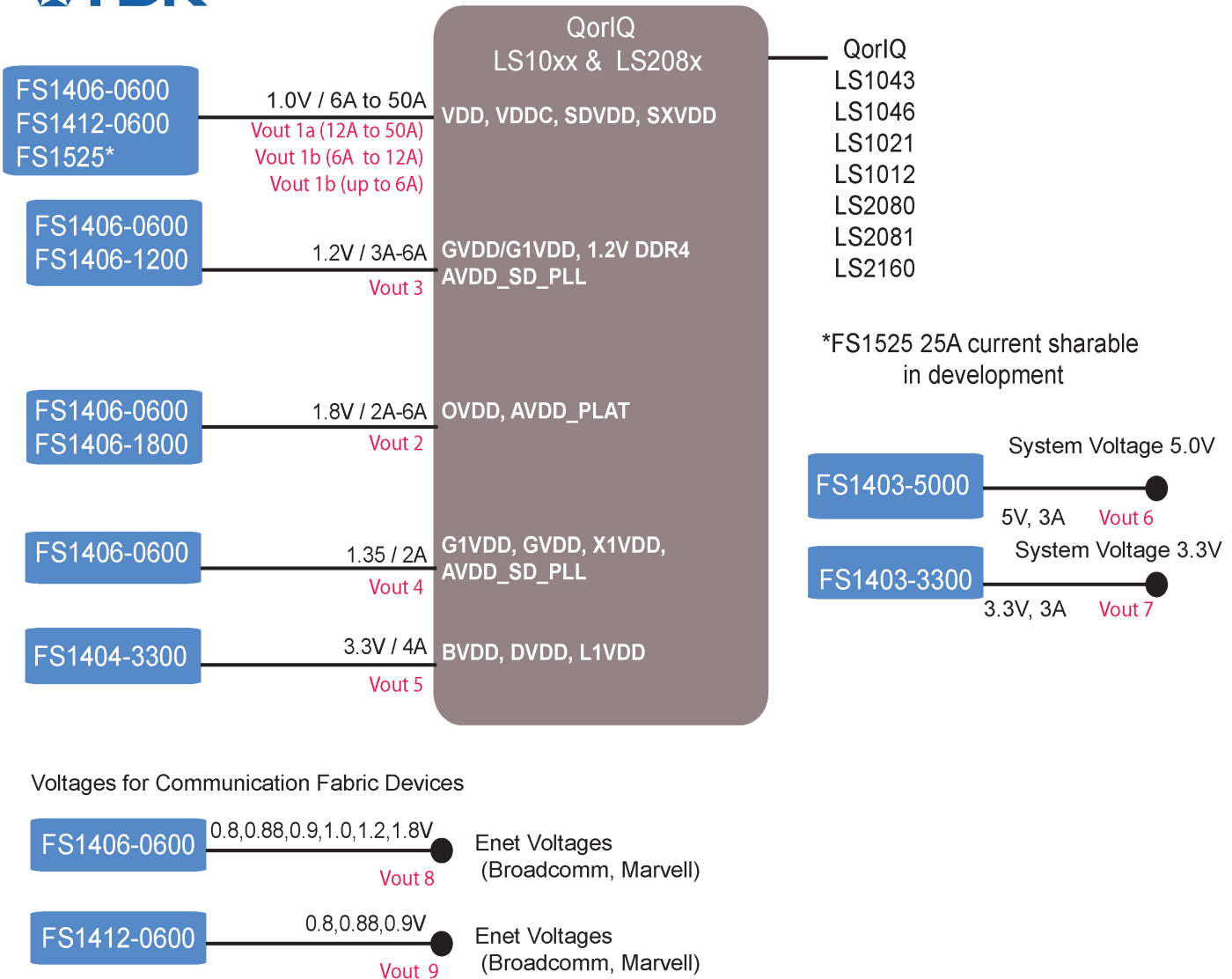


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Power Map for NXP - QorIQ - LayerScale Processors



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