CYPRESS

PAG1P

Cypress' Primary Startup Controller

Cypress' PAG1P is a primary start-up controller for AC/DC applications. It is designed to work with PAG1S in a secondary controlled AC/DC flyback convertor topology where the voltage and current regulation is performed by PAG1S, and PAG1P provides the start-up function, drives the primary FET, and responds to the fault condition. PAG1P also supports X-cap discharge mode for better efficiency.

PAG1S

Cypress' Secondary Side Controller for USB-PD power adapters

Cypress' PAG1S is a single-chip, secondary-side controller that integrates the synchronous rectification driver, PD controller, and a wide range of protection circuits. The controller is designed to support a traditional primary controlled flyback architecture, as well as a more efficient secondary-controlled flyback architecture with a simple primary start-up up controller. PAG1S helps you design world-class, high-performance power adapters at lower BOM costs.

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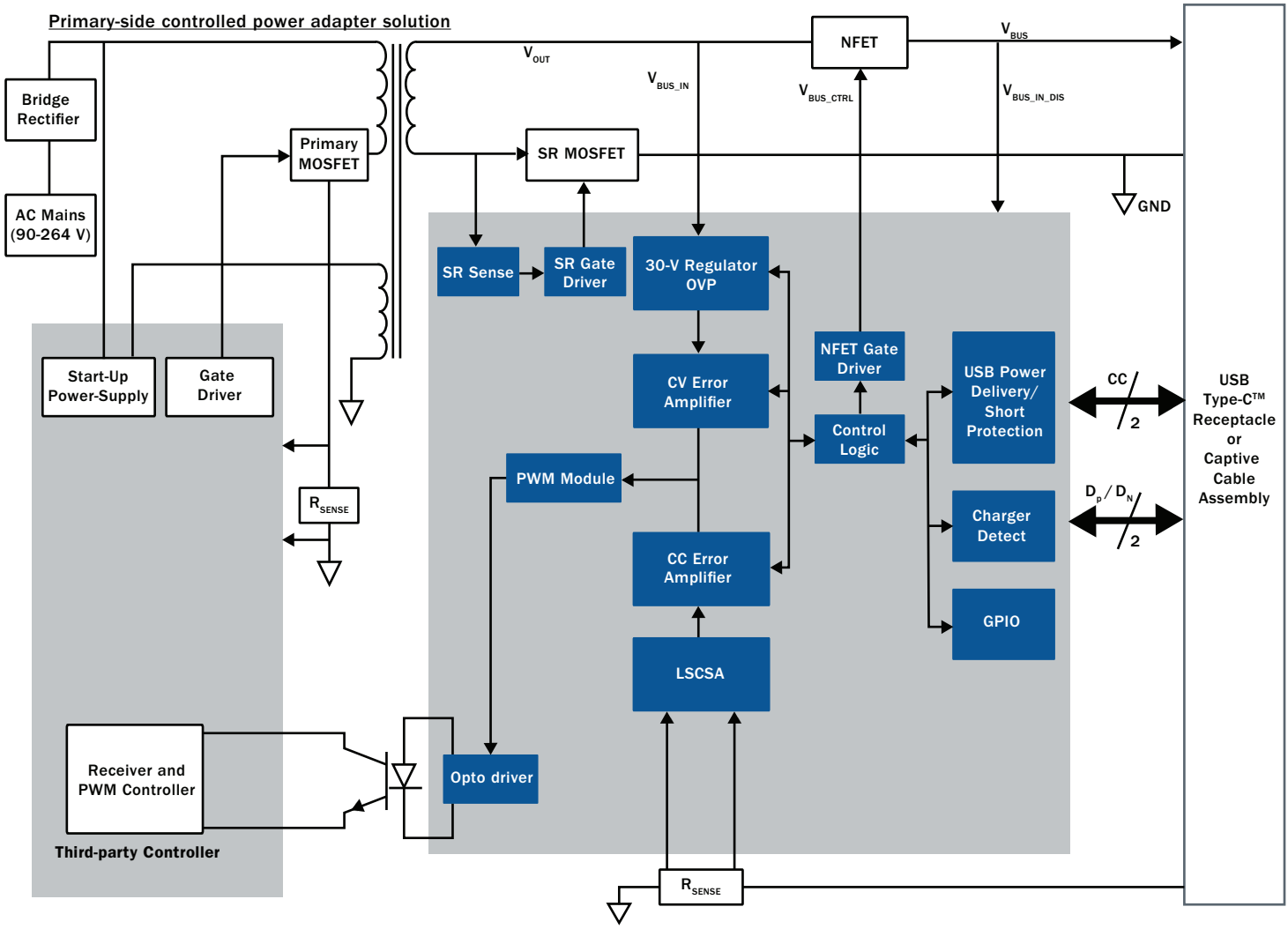
PAG1S FEATURES

- Works with both primary-side and secondary-side controlled fly back designs
- Integrates secondary-side regulation, synchronous rectifier (SR), and charging port controller
- Supports Quasi-Resonant (QR) or Critical Conduction Mode (CrCM), valley switching, Discontinuous Conduction Mode (DCM), and burst mode for light load operations
- Switching frequency range of 20kHZ to 150kHZ
- Higher efficiency across line and load levels with independent CC/CV loop control
- Supports USB PD 3.0 with PPS (USB-IF certified, TID:1475), QC4+
- Supports legacy charging protocols: BC v1.2, AFC, and Apple charging
- Integrates low side current sense amplifier and V_{BUS} NFET gate drivers
- Available in a 24 QFN (4x4) package

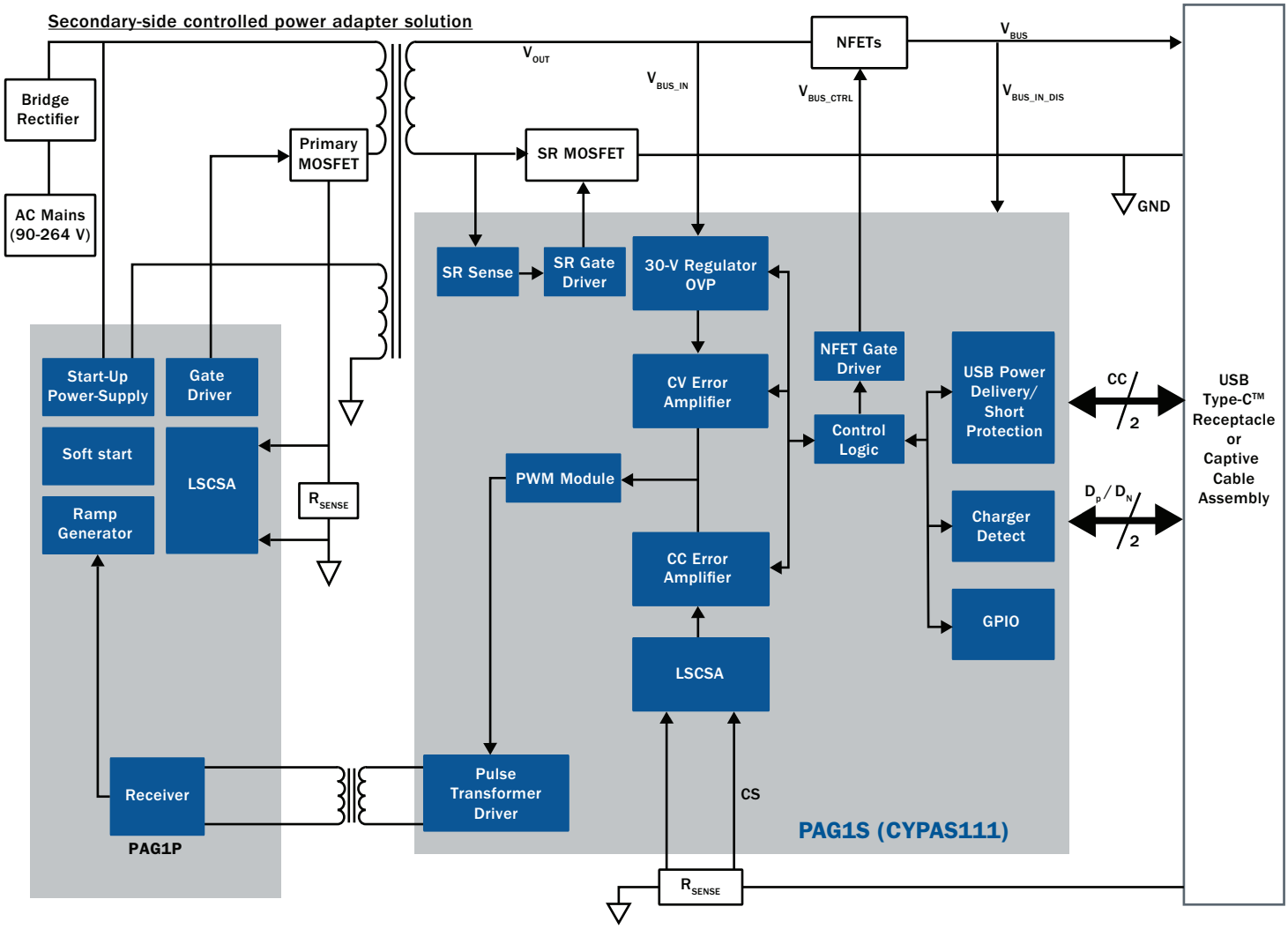
Design Example - Primary - Controlled Flyback Solution



PAG1P FEATURES

- Works across universal AC main input 85VAC to 265VAC
- Synchronizes to PWM from secondary side using a pulse edge transformer
- Integrated low-side gate driver to drive primary side FET
- Integrated high-voltage start-up and shunt regulator
- Supports X-cap discharge mode for enhanced efficiency
- Integrated line UV, OCP, and secondary OVP
- Fixed auto-restart timer for fault recovery
- Programmable soft-start configurable with external capacitor

Design Example - Secondary - Controlled Flyback Solution



Device	MPN	Application	Package
PAG1S	CYPD3184A1-24LQXQ	USB Power Delivery Adapter with Primary Side Control	24-Pin QFN
PAG1S	CYPAS111A1-24LQXQ	USB Power Delivery Adapter with Secondary Side Control	24-Pin QFN
PAG1P	CYPAP111A3-10SXQ	USB Power Delivery Adapter with Secondary Side Control (Non X-Cap discharge)	10-pin SOIC
PAG1P	CYPAP112A3-10SXQ	USB Power Delivery Adapter with Secondary Side Control (X-Cap discharge)	10-pin SOIC

ROADMAP

www.cypress.com/product roadmaps/cypress usb controllers roadmap

PAG1 WEBPAGE

www.cypress.com/pag1

USB POWER DELIVERY SPECIFICATION

www.usb.org/developers/powerdelivery

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