MPD8020-0015

Current Mode Buck Switching Regulator Controller

Design Concept

General Description

The MPD8020-0015 is a complete current mode controller for buck switching regulator applications, It contains additional features for external control as well as fault and status outputs in a single 28-pin package. The device is fabricated using Micrel's proprietary BCD* process and the MPD8020 array. Included are the high voltage and current interface stages that drive two external Power MOSFETs in the buck regulator circuit topology. A mode select line allows setting of single or two-phase drive operation.

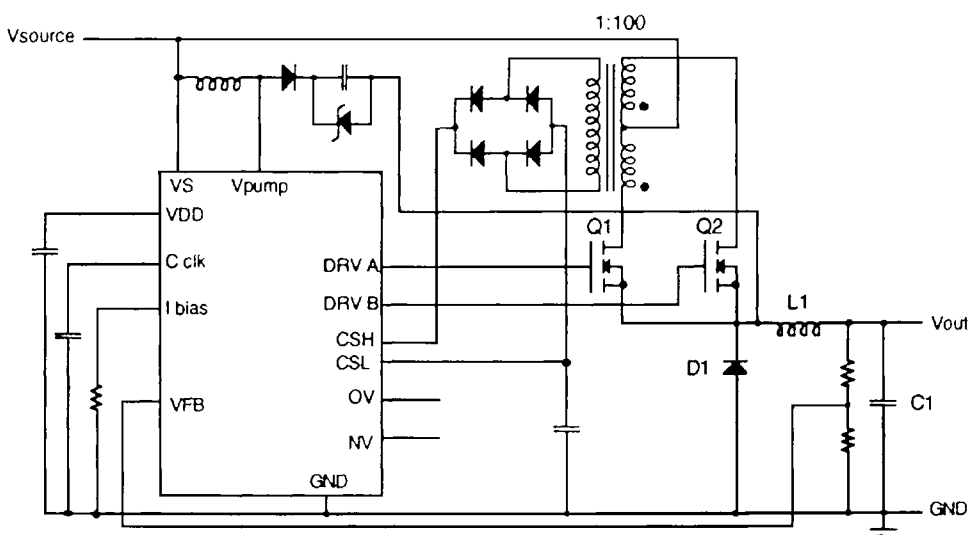
Configured within the gate array portion of the IC is the clock generator and digital timing generator that control the drive output synchronization, deadband pulse duration, and drive pre-drive for the voltage pump. The analog portion of the IC contains a bandgap voltage reference, error amplifier, and threshold comparators. Status outputs for over, under, and normal output conditions can drive LED indicators. An on-board pass regulator powers the lower voltage portions of the IC.

Features

- Up to 50 Volt operation
- Fully optioned current-mode control capability
- Dual DMOS Translator/ Power MOSFET drivers
- Digitally generated synchronization and deadband pulses
- Selectable single- or two-phase output drive modes
- Over-voltage and Under-voltage shutdown
- Over-voltage and Normal voltage status indicator drivers
- On-board regulator for analog and logic sections

* BCD is an advanced Bipolar, CMOS, and DMOS integrated processing technology.

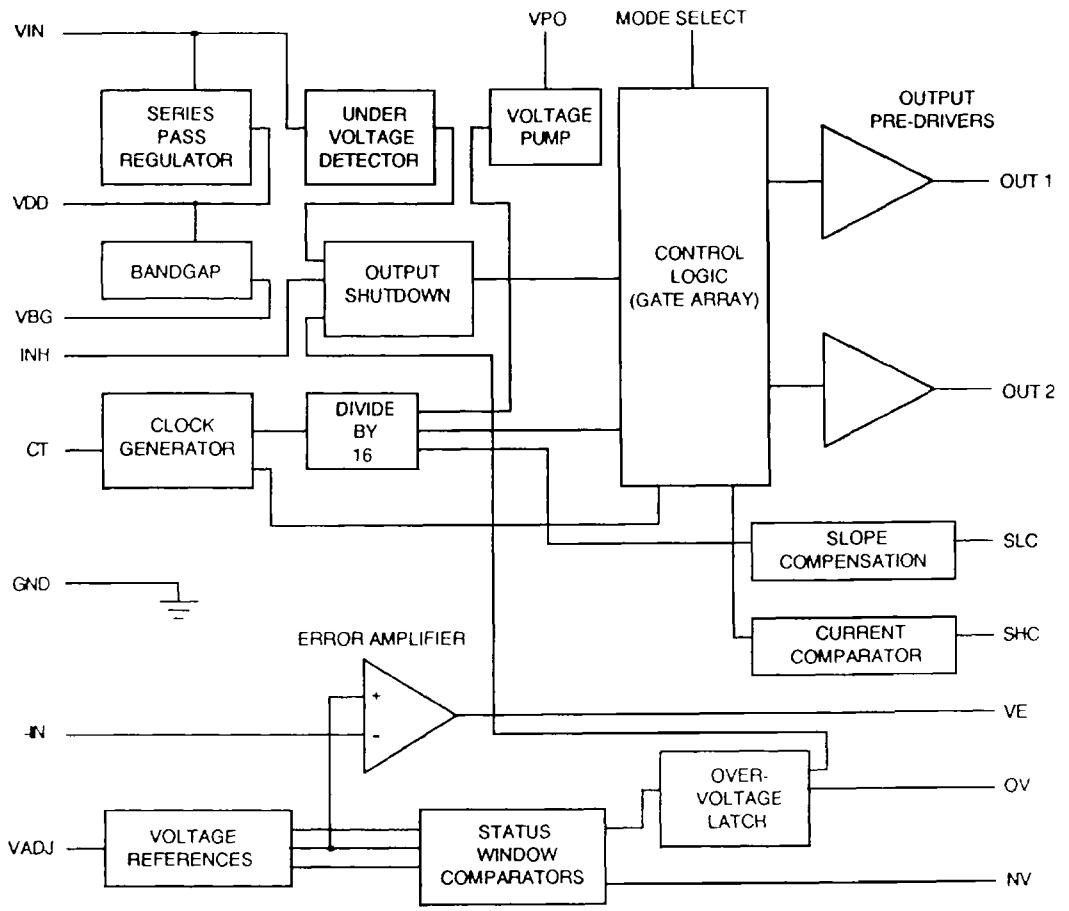
Application Schematic Diagram



Specifications

Operating Voltage	20 to 50V
Output Pre-driver	Tr = 60nS (@ 250mA) Tf = 30nS (@ –470mA) (Where C_L = 1500pF, Vr = 1 to 11V, and Vf = 15 to 5V
Drive Method	High-side, External N Channel MOSFETs
Bandgap	6.25V, ±10%, at I_{BG} = 1mA
Clock Frequency	2MHz, where Ct = 100pF, Blanking pulse = fo/16, Voltage Pump (VPO) = fo/4
Shutdown	Drivers held low, VPO OFF
Voltage References	Vh = 5.2V Vr = 5.0V Vl = 4.8V Ext. set and VBG = 6.25V
Amplifier/buffer	Avo > 50dB @ 100Hz Vos << 100mV Slew Rate > 4V/µS Iout = 5mA (typ.)
Comparator	Vth = 500mV Response Time = 100nS
Series Regulator	Vout = 12 to 15V, Isource = 25mA

Block Diagram



Note : Option pins not shown

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