ON Semiconductor®

DAP011/DAP011C

PWM Current-Mode Controller for High-Power Universal Off-Line Supplies

Housed in an SO−14 package, the DAP011/DAP011C represents an enhanced version of the Maximus, DAP008, controller. Due to its high drive capability, *SpeedKing* drives large gate−charge MOSFETs which, together with internal ramp compensation and a user selectable frequency jittering, ease the design of modern AC/DC adapters.

With an internal structure operating at a fixed 65/100 kHz frequency, the controller directly connects to the high−voltage rail for a loss less and clean startup sequence. Current−mode control also provides an excellent input audio−susceptibility and inherent pulse−by−pulse control. Internal ramp compensation easily prevents subharmonic oscillations from taking place in continuous conduction mode designs.

When the current setpoint falls below a given value, e.g. the output power demand diminishes, the IC automatically enters the so−called skip cycle mode and provides excellent efficiency at light loads. Because this occurs at a user adjustable low peak current, no acoustic noise takes place. Due to a proprietary SoftSkip technique, the absence of sharp transitions during skip mode significantly reduces acoustical noise.

The DAP011/DAP011C features an efficient protective circuitry which, in presence of an overcurrent condition, disables the output pulses while the device enters a safe burst mode, trying to restart. Once the default has gone, the device auto−recovers. By implementing a timer to acknowledge a fault condition, independently from the auxiliary supply, the designer's task is eased when stringent fault mode conditions need to be met.

A dedicated input helps triggering a latch−off circuitry which permanently disables output pulses.

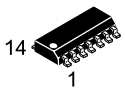
Features

- Current−Mode Control with Adjustable Skip−Cycle Capability
- Internal Ramp Compensation
- Adjustable Frequency Jittering for Better EMI Signature
- Auto−Recovery Internal Output Short−Circuit Protection
- Adjustable Timer for Improved Short−Circuit Protection
- Dedicated Latch Input
- +500 mA/−800 mA Peak Current Capability
- Fixed Frequency Versions at 65/100 kHz
- 5.0 V – 5.0 mA Reference Voltage
- Internal Temperature Shutdown
- Direct Optocoupler Connection
- Extremely Low No−Load Standby Power
- Adjustable Soft−Start
- This is a Pb−Free Device*

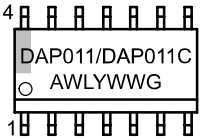
Typical Applications

- High Power AC/DC Converters for TVs, Set−Top Boxes, etc.
- Offline Adapters for Notebooks
- All Power Supplies

MARKING DIAGRAM

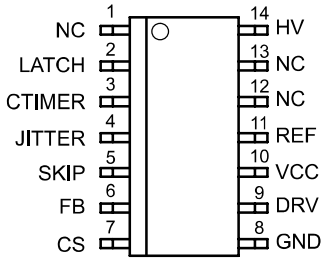


SOIC−14
D SUFFIX
CASE 751A



A	= Assembly Location
WL	= Wafer Lot
Y	= Year
WW	= Work Week
G	= Pb−Free Package

PIN CONNECTIONS



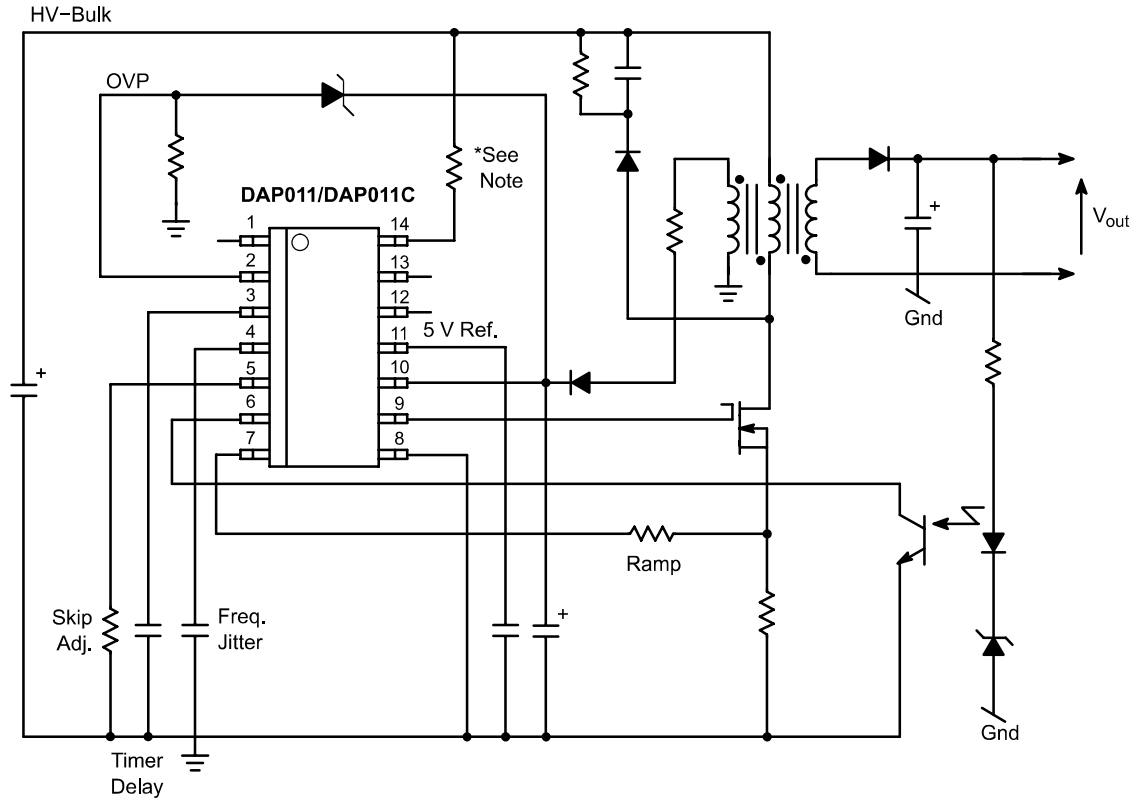
(Top View)

ORDERING INFORMATION

Device	fosc	Package	Shipping†
DAP011 DAP011C	(65 kHz) (100 kHz)	SO−14 (Pb−Free)	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



*This resistor prevents from negatively biasing the HV pin (14) at power−off. Typical value is 4.7 kΩ.

Figure 1. Typical Application Example

PIN FUNCTION DESCRIPTION

Pin No.	Pin Name	Function	Description
1	NC	−	−
2	Latch	Input voltage to latch comparator	By bringing this pin above 3.0 V, e.g. via a Zener or an NTC, the circuit permanently latches−off.
3	CTimer	Timer/soft−start delay	Wiring a capacitor to ground helps selecting the timer duration. 10% of this duration fixes the soft−start period.
4	Jitter	Frequency jittering speed	This pin offers a way to adjust the frequency modulation pace.
5	Skip	Skip cycle adjustment	By connecting a resistor to ground, it becomes possible to alter the default skip cycle level.
6	FB	Feedback pin	Hooking an optocoupler collector to this pin will allow regulation.
7	CS	Current sense + ramp compensation	This pin monitors the primary peak current but also offers a mean to introduce ramp compensation.
8	GND	−	The controller ground.
9	DRV	Driver output	The driver's output to an external MOSFET.
10	VCC	Supplies the controller	This pin is connected to an external auxiliary voltage.
11	Ref.	Reference voltage	This pin delivers 5.0 V and sources up to 5.0 mA.
12	NC	−	Non−connected for improved creepage.
13	NC	−	Non−connected for improved creepage.
14	HV	High−voltage input	Connected to the bulk capacitor, this pin powers the internal current source to deliver a startup current.

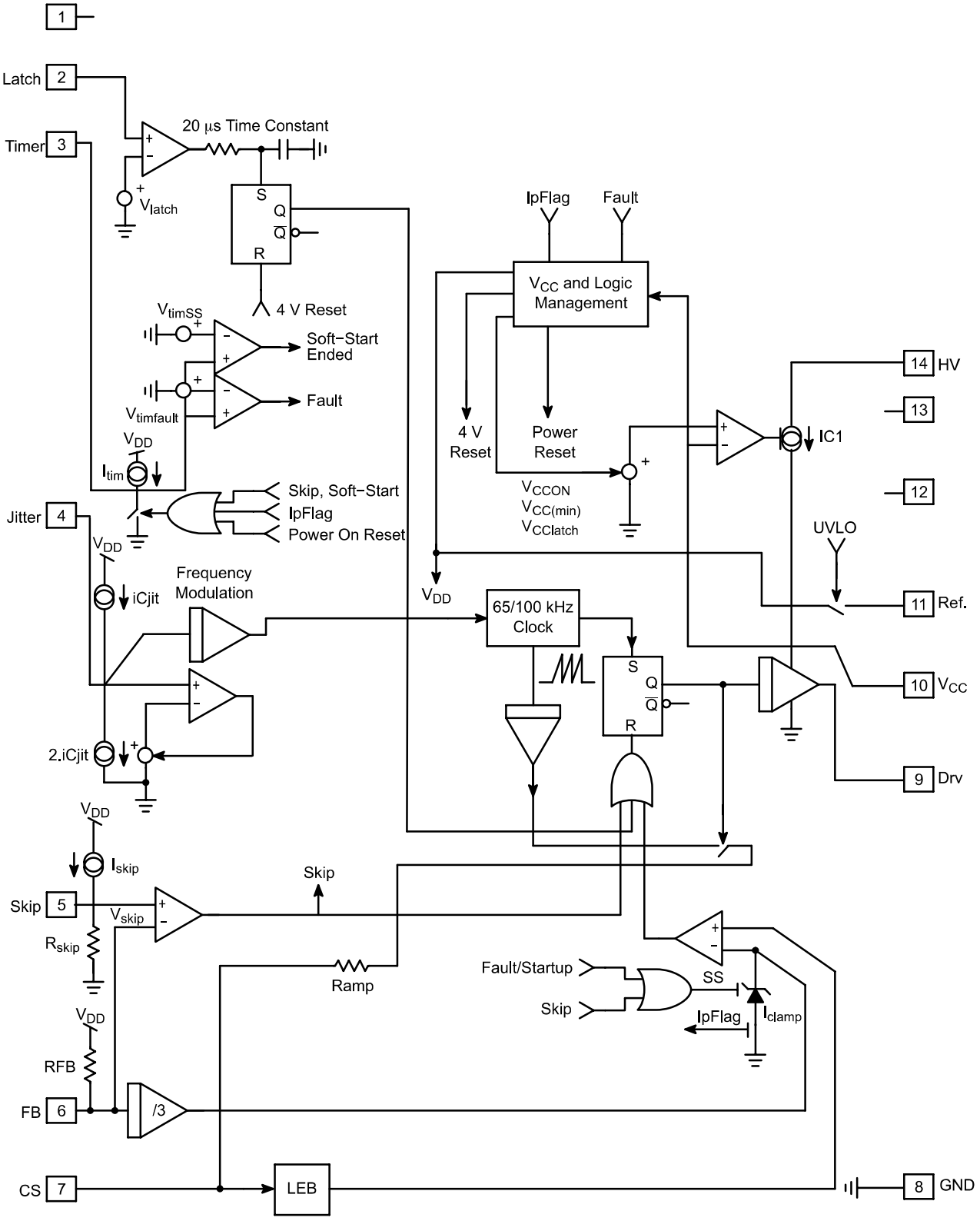


Figure 2. Internal Circuit Architecture