



DAP018A/B/C/D/F

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

Housed in a SO-14 package, the DAP018X represents an enhanced version of the currently available Speedking controller, the DAP011.

With an internal structure operating at a fixed 65 kHz or 100 kHz frequency, the controller directly connects to the high-voltage rail for a lossless 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 sub-harmonic oscillations from taking place in continuous conduction mode designs. On top of these features, the device takes advantage of the auxiliary winding negative swing to let the user adjust the maximum power the converter can deliver in high line conditions (OPP).

When the current setpoint falls below a given value, e.g. the output power demand diminishes, the IC automatically freezes the peak current and reduces its switching frequency down to 25 kHz. At this point, if further output power reduction occurs, the controller enters skip-cycle.

The DAP018X 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 re-start. Once the fault 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, for instance to implement an over voltage protection (OVP). A separate input accepts a direct NTC connection to ground for a simple and efficient over temperature protection (OTP).

Features

- Fixed-frequency 65 kHz (A and B versions) or 100 kHz (C and D versions) Current-mode Control Operation
- Internal and Adjustable Over Power Protection (OPP) Circuit
- Frequency Foldback down to 25 kHz and Skip-cycle in Light Load Conditions
- Reduced Internal Bias Currents for Improved Standby Performance
- Adjustable Brown-out Protection (B and D versions)
- Internal Ramp Compensation
- Internal Fixed 5 ms Soft-Start
- Adjustable Frequency Jittering for Better EMI Signature

- Auto-recovery internal output short-circuit protection for A, B, C and D versions. F is latched
- Adjustable Timer for Improved Short-circuit Protection
- OTP and OVP Inputs for Improved Robustness
- +500 mA / -800 mA Peak Current Capability
- Up to 28 V V_{CC} Operation
- Improved Creepage Distance between High-voltage and Adjacent Pin
- Extremely Low No-load Standby Power
- This is a Pb-Free Device
- This Device uses Halogen-Free Molding Compound

Typical Applications

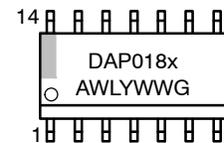
- High Power ac-dc Converters for TVs, Set-top Boxes etc.
- Offline Adapters for Notebooks



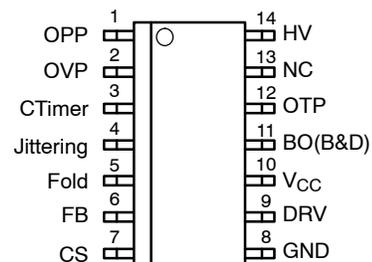
**SOIC-14
D SUFFIX
CASE 751A**

**MARKING
DIAGRAM**

- x = Device Version
- A = Assembly Location
- WL = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb-Free Package



PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

†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.

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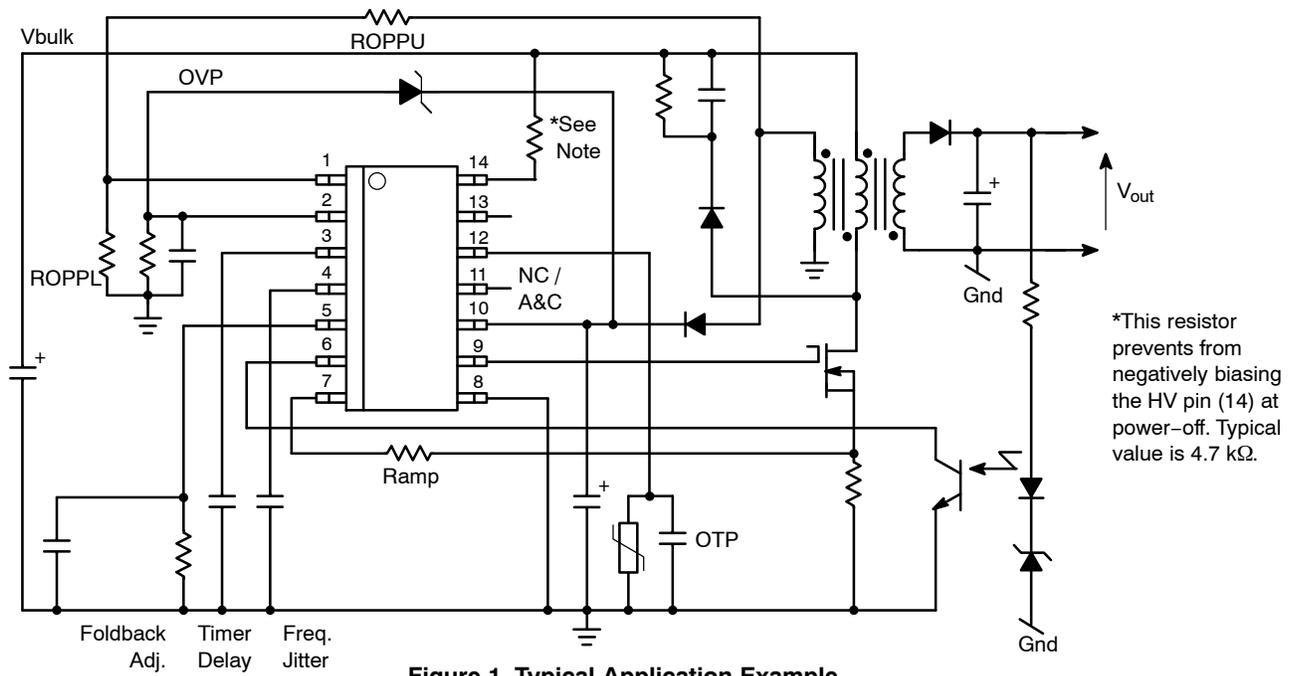


Figure 1. Typical Application Example

Pin No.	Pin Name	Function	Pin Description
1	OPP	Adjust the Over Power Protection	A resistive divider from the auxiliary winding to this pin sets the OPP compensation level.
2	OVP	Input voltage to latch comparator	This pin offers an over-voltage protection input.
3	CTimer	Timer	Wiring a capacitor to ground helps selecting the timer duration.
4	Jitter	Frequency jittering speed	This pin offers a way to adjust the frequency modulation pace.
5	Foldback / skip	Frequency foldback / skip cycle adjustment	By connecting a resistor to ground, it becomes possible to reduce the level at which frequency foldback occurs.
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 means to introduce ramp compensation.
8	GND	-	The controller ground.
9	DRV	Driver output	The driver's output to an external MOSFET gate.
10	V _{CC}	Supplies the controller	This pin is connected to an external auxiliary voltage.
11	BO	Brown-out, B and D versions	For B and D versions, this pin offers a brown-out input.
12	OTP	NTC connection	This pin connects to a pulldown NTC resistor for over temperature protection (OTP).
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.