

Multiple-Mode PWM Controller with Integrated High-Voltage StartUp Circuit Delivers Very Low Standby Power

The AP3128 is a peak-current control, multi-mode (QR+CCM) PWM controller optimized for high performance, low standby power, and cost-effective offline flyback converters.

At no load or light load, the IC will enter burst mode to minimize standby power consumption. The minimum switching frequency is set to avoid audible noise. When the load increases, the IC will enter QR mode with frequency foldback to improve system efficiency and EMI performance. The maximum switching frequency of about 105kHz is set to clamp the QR frequency to reduce switching power loss. Furthermore, the frequency dithering function is built in to reduce EMI emission.

Internal piecewise linear line compensation ensures constant output power limit over the entire universal line voltage range.

Comprehensive protection features are included, such as brown-out protection, cycle-by-cycle current limit (OCP), V_{CC} overvoltage protection (VOVP), secondary-side output OVP (SOVP) and UVP (SUVP), internal OTP, overload protection (OLP), and pins' fault protection.

The AP3128 is available in the SO-8 package.



The Diodes Advantage

The AP3128 is a high-performance, high-integration part for portable consumer applications that need ultra-low standby power and a wide range output.

- **Multiple modes of operations:**
QR mode at high line voltage, and CCM mode at low line voltage. Multi-mode will improve efficiency across all load levels.
- **High voltage startup:**
Achieves ultra-low standby power loss (<30mW).
- **60V process of Vcc pin for wide range output applications:**
Lowers BOM quantity and simplifies system design for USB PD applications.
- **Constant Overcurrent Protection:**
Keeps same OCP point under wide range output conditions.
- **AC input brown-out protection (BNO):**
BNO protects system from damage due to ultra-low line condition.

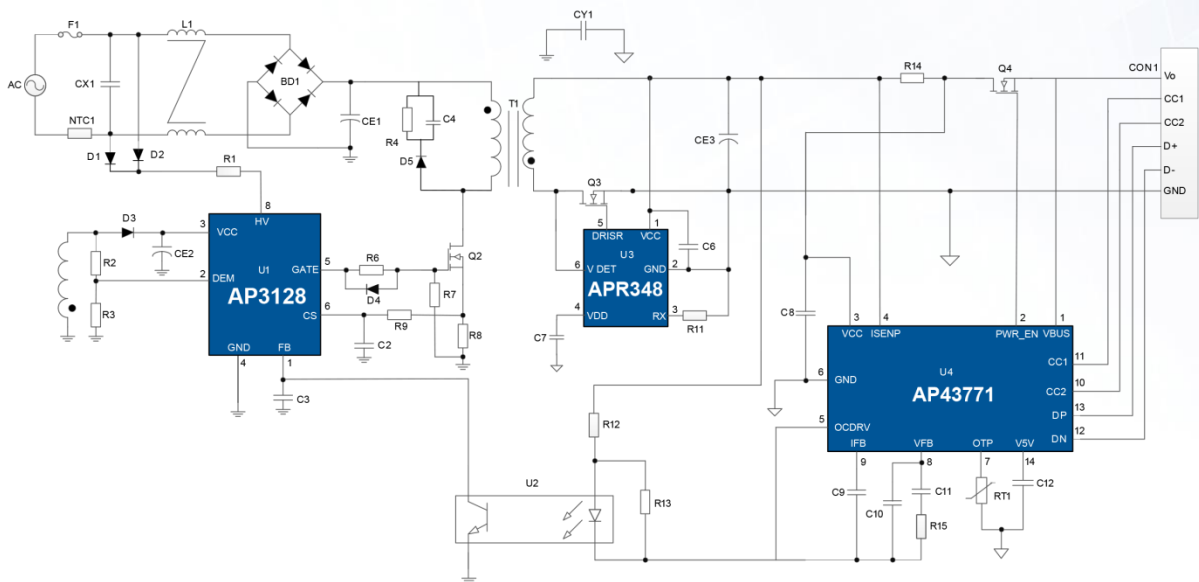
Applications

- Cell phone chargers
- Power Delivery (PD) applications
- Set-Top Box (STB) power supplies
- Open frame switching power supplies

Typical Application Schematic

USB PD3.0 PPS Chargers Solution

AP3128 + APR348 + AP43771



Product Information

| Part Number | HV Startup Circuit | Startup Current (μ A) | UVLO Threshold on/off (V) | Gate Output Current (mA) | Maximum Frequency (kHz) | Package |
|------------------------|--------------------|----------------------------|---------------------------|--------------------------|-------------------------|---------|
| AP3128 | Yes | 1 | 15.8/6.5 | +300/-800 | 80 (CCM mode) | SO-8 |

Ordering Information

| Part Number | Package | Packing | |
|----------------------------|---------|---------|-------------|
| | | Qty. | Carrier |
| AP3128S-13 | SO-8 | 2500 | Tape & Reel |