1. FEATURES

- Compliant with the latest WPC Qi Specification (V2.2) of Baseline Power Profile (BPP), Extended Power Profile (EPP) and Magnetic Power Profile (MPP), and supports various proprietary protocols
- Up to 80W power delivery
- ARM-M0 with 16kB SRAM, 32kB ROM and 64kB MTP
- 4V to 24V wide input VIN voltage
- Supports 6-channel DMA
- Integrates three pairs of N-MOSFET drivers
- Integrates 3.3V LDO for internal and I/O power supplies
- Integrates 1.5V LDO for core power supply
- Supports 16-channel ASK and PSK demodulation including voltage and current mode
- PLL with programmable VCO frequency and output divider
- Supports 12MHz~24MHz XTAL
- 80MHz oscillator with ±1.5% accuracy
- 12-bit 100kSPS SAR ADC
- Supports 12-bit DAC
- Supports SWD and I^2C debug mode
- Supports USB PD, QC, FCP, SCP, AFC, UFCS, and TRANSSION
- 2 UART and 2 I^2C interfaces
- 4 advanced timers with PWM generation and capture function
- 1 basic timer with 2 channels
- 6 pairs PWM generator with FSK modulation and frequency jitter support
- Integrates 2-channel high side current sense circuit
- 2-channel Q-value detection
- Floating point ln(x) operation hardware acceleration support
- Supports CRC hardware
- Embedded with hardware UVLO/OCP
- Supports low power mode and ultra-low power mode
- Halogen free and RoHS compliant
- Available in QFN48L (6mm×6mm) package

2. APPLICATIONS

- WPC compliant wireless power transmitters for smartphones and wearable devices
- Medical, home appliance and industrial applications
- Other wireless power applications

3. TYPICAL APPLICATION CIRCUIT

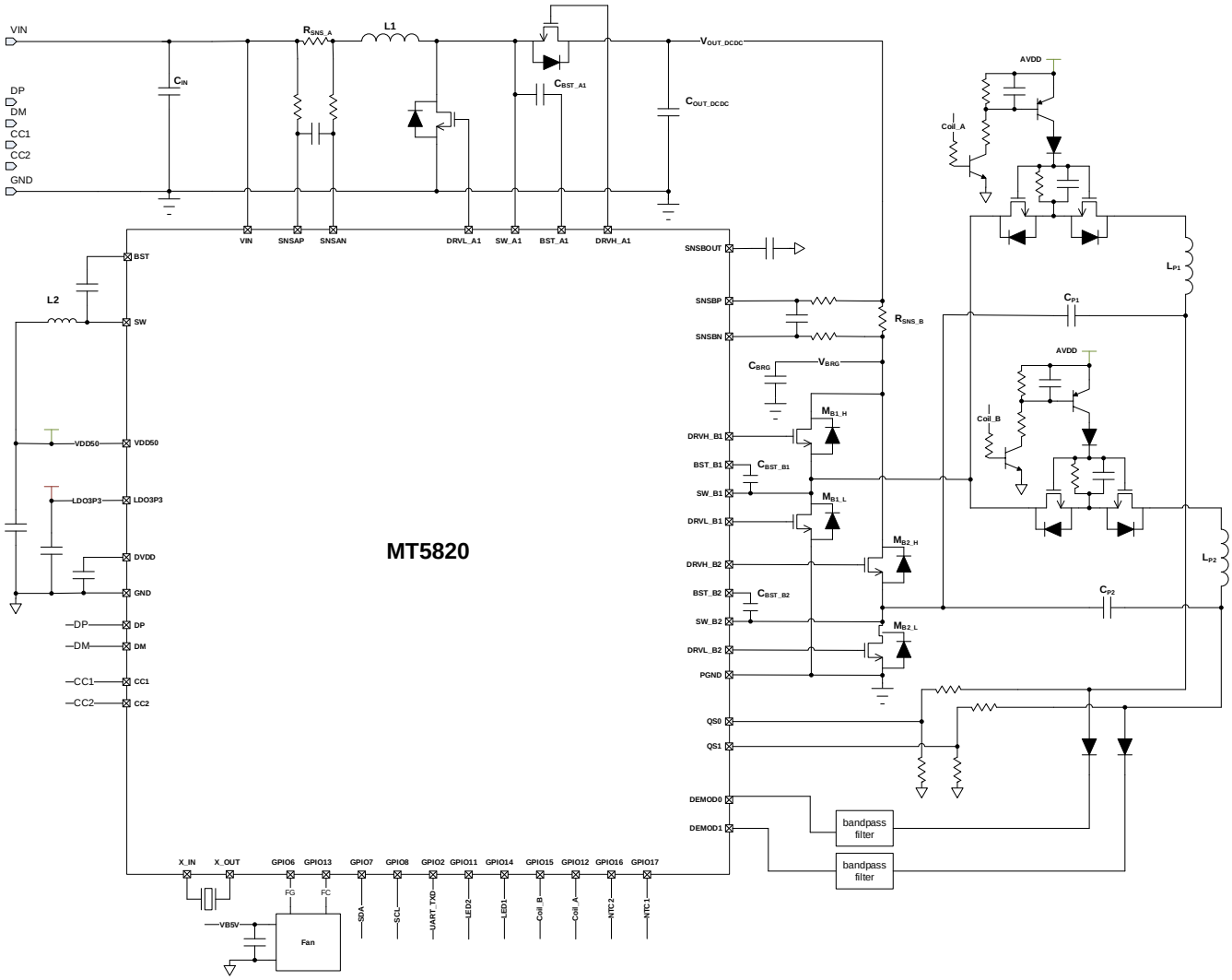

Figure 1 Typical Application Circuit

4. DESCRIPTION

MT5820 is a highly integrated, high-performance System on Chip (SoC) designed for magnetic induction-based wireless power transmitter solutions. It is fully compliant with the latest WPC Qi (V2.2) specification, supporting BPP, EPP and MPP.

MT5820 integrates high separate, high-frequency and low-frequency oscillators for high-power applications. The internal high-frequency PLL with support of external crystal is designed for high accuracy clock and PWM signal generation. The chip is able to provide flexible dead-time control and phase-shift generation to improve EMI performance.

MT5820 supports multi-protocol power adaptor interface detection and control, including QC 2.0/3.0, USB PD, SCP, FCP, UFCS TRANSSION etc.

MT5820 integrates a high-voltage BUCK converter, two LDOs, three pairs of N-MOSFET's drivers, four channels of ASK demodulation analog front end (AFE), 16 channels of ASK demodulation DSP, 2 separate Q detection channels, 2 separate demodulation channels. Its embedded high-precise high-side current sensing, generic 12-bit ADC and DAC, enables accurate FOD and Q-factor detection.

MT5820 supports over-voltage protection (OVP), over-current protection (OCP), under-voltage protection (UVP) and over-temperature protection (OTP) for safe operation. In addition, the chip is embedded with a dynamic power limit (DPL) comparator to prevent IC from UVLO when the input power can't meet the requirement of output power. If VIN drops below the DPL threshold, the chip decreases the output power accordingly to protect system from entering UVLO state.

MT5820 integrates an ARM Cortex M0 processor with 16kB SRAM 32kB ROM and 64kB MTP memory and various serial interfaces (I^2C, UART, GPIO's, etc.), offering powerful processing capabilities and code space. The reference application is available with standard firmware. With the support of library (released separately), customers can easily develop the customized features.