MT5788   A High Efficiency Wireless Power Receiver

1. DESCRIPTION

MT5788 is a System on Chip (SoC) for magnetic induction based wireless power receiver.

It is fully compliant with WPC Qi specification (Version 2.0) of BPP (Baseline Power Profile) and EPP (Extended Power Profile) and MPP (Magnetic Power Profile) and also supports various proprietary fast charging protocols used by major smart phone OEM's. It is capable of true fast wireless charging for up to 80W of delivered power with fully programmable output voltage (maximum 22V).

MT5788 has a very high overall AC to DC conversion efficiency (up to 98%), thanks to the optimized and adaptive full synchronous rectifier control, and extremely low bias current are achieved.

With the exception of a few external passive components, the chip integrates everything that is needed for a wireless power receiving function. It is composed of an ARM Cortex M0 processor with 32KB MTP, full synchronous rectifier and special power LDO, robust and reliable over-voltage, over-current and over-temperature protection circuits, bi-directional communication unit and various GPIO's and serial interfaces.

With the flexibility of SoC architecture and the unique implementation, MT5788 is future proof in supporting WPC Qi specification's further updates and new proprietary protocols. It also supports reverse charging mode where the wireless power receiver can be configured to a wireless power transmitter by firmware control.

2. FEATURES

- Power delivery: up to 80W
- Power delivery in Tx mode: up to 20W
- Fully programmable output voltage: up to 22V
- Embedded with ARM Cortex M0 processor with 6KB SRAM and 32KB MTP
- AC input to DC output efficiency: up to 98%
- Rectifier bridge supports full-wave mode and half-wave mode
- Reverse charging mode with integrated dual channel Tx demodulation
- Integrates Q-Detection
- Integrated external switching capacitor driver for MPP application
- Reliable and unique over voltage, over current, over temperature protection features
- Specially designed power LDO with output clamping and fast response to line and load transient
- WPC compliant and proprietary communication protocols support with hardware ASK and FSK modulation and demodulation
- Independent I^{2}C slave and I^{2}C master interface with additional GPIO's
- Halogen free and RoHS compliant
- Max 3.08mm × 4.08mm (7 × 10 ball array) 69-WLCSP

3. APPLICATIONS

- Standard and fast wireless charging for smart phones with up to 80W received power
- TRx function for phones or power banks where they can be wirelessly charged and can wirelessly charge other devices
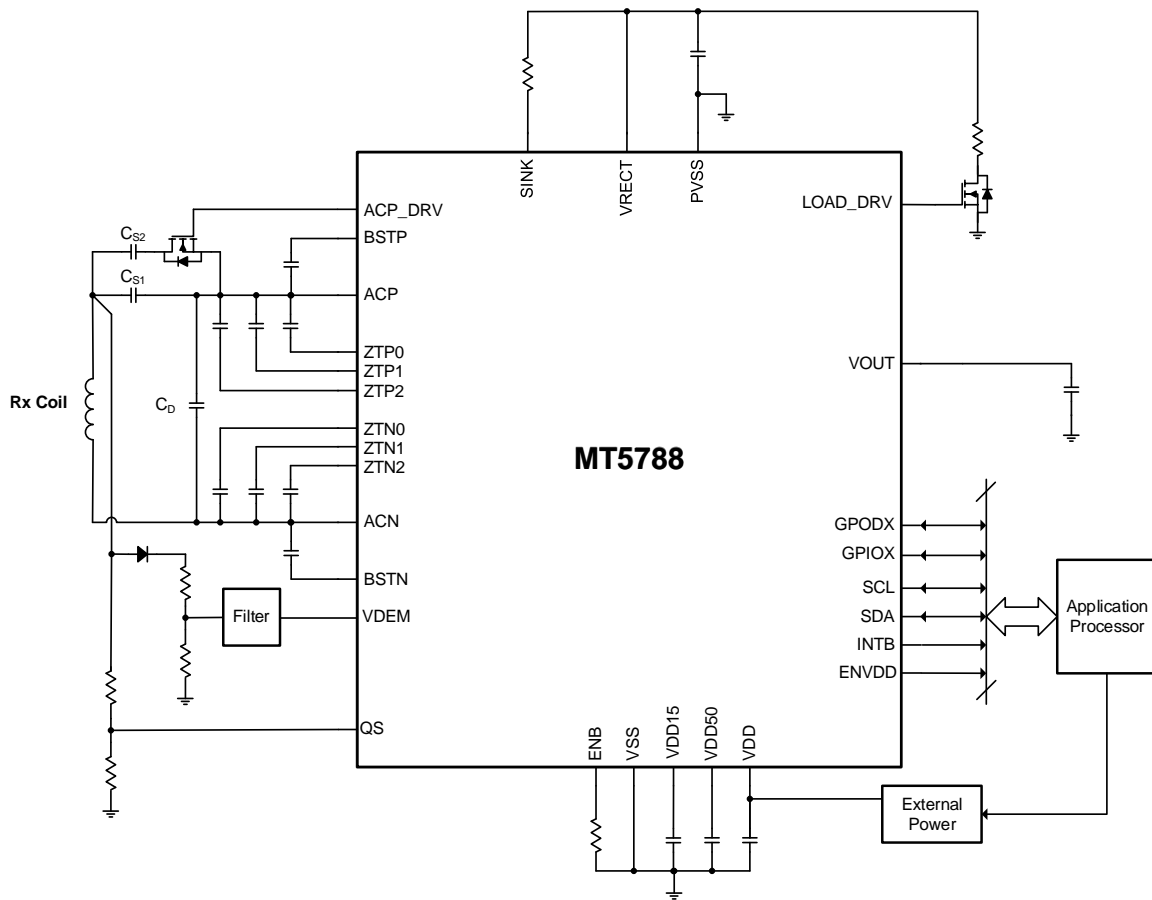- Other wireless power applications

4. TYPICAL APPLICATION CIRCUIT

Figure 1 Typical Application Circuit