Frequently Asked Questions

Question	What is the maximum output voltage the ZSPM1000 can support?
Answer	The maximum output voltage is 5V and limited by the current sense amplifier common mode range.
Question	What is the lowest output voltage range the ZSPM can support?
Answer	The lowest output voltage supported is 0V.
Question	How accurate is the current measurement system?
Answer	The accuracy of the internal current sense system is < 10%. The overall system accuracy will depend upon the tolerance of the output inductor's DC resistance. A two point end of line calibration will improve the accuracy significantly. A LabView™ program or support to integrate the calibration procedure into your ATE (automated test environment) can be provided.
Question	How accurate is the temperature measurement system?
Answer	The temperature accuracy is < 5 °C.
Question	Is the inductor's DC resistance compensated for temperature variation?
Answer	Yes, the temperature of the inductor is measured via an external sense element and temperature compensation applied to the current sense system.
Question	What is the highest switching frequency I can use?
Answer	The maximum switching frequency available is 1 MHz.
Question	Do I have to calculate the PID coefficients?
Answer	No, the GUI will calculate the required values, based on your input for power stage components. It derived optimized compensation for steady-state, transient and DCM.
Question	Will I get the same or better performance as with an analog controller?
Answer	The transient performance is considerably better through the use of the high performance controller and control loop design, additionally the use of Sub-Cycle Response™ (SCR) and Non-Linear Control will allow near hysteric controller performance. State-Law control allows the use of individually optimized compensation for transient and steady-state. This ensures very quite steady state performance with good transient performance.

Question	Does the ZSPM1000 support drivers with diode emulation?
Answer	Yes, the ZSPM1000 supports configurable sequencing with individual rise and fall times.
Question	Does the ZSPM1000 support a pre-biased output voltage?
Answer	Yes, the ZSPM1000 will support a pre-biased output voltage without sinking current. Once the voltage reaches the pre-biased level it will continue to rise at the rate programmed.
Question	Can I configure the current limit characteristics?
Answer	Yes, the current limit can be configured to give a constant current output to a pre-programmed voltage giving a fold-back or hiccup type response with a programmable number of start up re-tries.
Question	Do I need the ZMDI Graphical User Interface (GUI) in production?
Answer	No, once the configuration file (OTP image) has been generated the device can be programmed without the need for a GUI.
Question	Can end user manufacturing information i.e date, batch codes and manufacturing IDs be programmed and read back.
Answer	Since the device is memory sized optimized, this function is not implemented. However, each unit contains a unique identifier, which can be read out.
Question	Do I have to write the configuration to the controller each time I power on?
Answer	During development the configuration is written in the volatile memory. Hence, the configuration is lost, when the device is powered down. Once having concluded to the optimal configuration, generate an OTP image and permanently write the settings in the non-volatile memory. Please note that the memory is only one time programmable.
Question	What is the maximum current that the controller can support?
Answer	The maximum current rating is depending on the power stage and independent of the controller. Typically the output current is between 20A to 25A.
Question	Can I change the “program” of the controller?
Answer	The ZSPM1000 is delivered with the firmware saved in OTP memory. Hence, you cannot change the firmware but can configure the device for optimal performance in your application circuit. Firmware programming skills are not required by the customer.
Question	What is Tru-Sample™ Technology?
Answer	The major challenge today in the design of digital power control solutions is the control delay involved in sampling and processing the output voltage. The Tru-Sample™ Technology ensures the lowest possible latency in the control loop, by sampling the output voltage fast, reliable and insensitive to noise.

Question	What is State-Law™ Control?
Answer	The ZSPM1000 features ZMDI's State-Law™ control where an optimal compensator for each operation condition is automatically selected. The operation conditions are transient, steady-state and DCM.
Question	What is Sub-Cycle Response™?
Answer	Once a load transient is detected by ZMDI's State-Law™ technique, the controller does not wait on the next switching cycle but immediately enters the fast transient state. As a result, the controller can compensate the effect of the transient between the switching cycle and respond in a sub-cycle.
Question	How does the controller switch between steady-state and transientstate?
Answer	The controller switches into transient-state when a deviation of the output voltage is detected by the internal transient detection logic.
Question	What is DCM?
Answer	Discontinous conduction mode (DCM) is the mode of operation of a synchronous step-down converter, in which the low side MOSFET operates as a diode. Sometimes this is also called diode emulation mode. DCM avoids reverse current and improves the energy efficiency in light load.
Question	How does the controller switch between steady-state and DCM?
Answer	If the output current is below a configurable threshold for the given time the controller switches into DCM operation. The controller will exit DCM in case the current increases or a load transient is detected.

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