

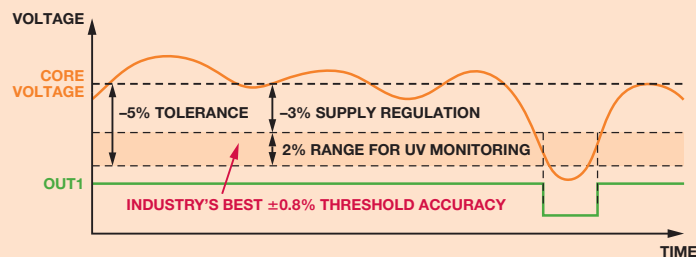


Supervisory Devices Complementary Parts Guide for Altera FPGAs

Advanced fabrication techniques and smaller process geometries are resulting in a trend towards lower core voltages. This trend, coupled with legacy I/O standards, results in FPGA-based designs with multiple voltage rails. To ensure system reliability, each of these rails should be supervised. Analog Devices offers an extensive portfolio of voltage supervisors, from simple single channel reset generators to multivoltage supervisors offering industry-leading threshold accuracy ($\pm 0.8\%$). As core voltages decrease, the importance of high threshold accuracy becomes increasingly important.

The core and I/O voltage requirements of each Altera® FPGA family are listed in the Multivoltage Supervisors for Altera FPGAs selection table. Core voltages range from 0.9 V to 1.5 V, while the I/O voltage levels are between 1.2 V and 3.3 V.

High Accuracy Is Critical When Monitoring Low Voltage



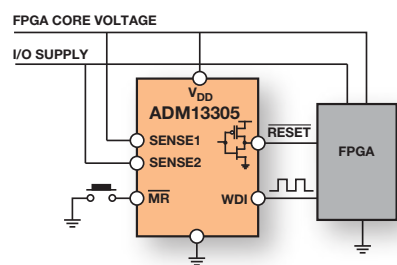
Multivoltage Supervisors for Altera FPGAs

Altera FPGAs

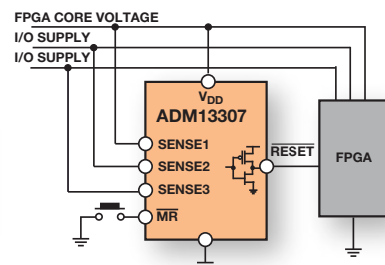
| Altera FPGA Family | Core Voltage (V) | I/O Voltage (V) |
|--------------------|------------------|------------------------------|
| Stratix® IV E/GX | 0.9 | 1.2, 1.5, 1.8, 2.5, 3.0, 3.3 |
| Stratix III | 0.9 or 1.1 | 1.2, 1.5, 1.8, 2.5, 3.0, 3.3 |
| Stratix II GX | 1.2 | 1.2, 1.5, 1.8, 2.5, 3.3 |
| Stratix II | 1.2 | 1.2, 1.5, 1.8, 2.5, 3.3 |
| Stratix GX | 1.5 | 1.5, 1.8, 2.5, 3.3 |
| Stratix | 1.5 | 1.5, 1.8, 2.5, 3.3 |
| Arria™ GX | 1.2 | 1.2, 1.5, 1.8, 2.5, 3.3 |
| Cyclone® III | 1.2 | 1.2, 1.5, 1.8, 2.5, 3.0, 3.3 |
| Cyclone II | 1.2 | 1.5, 1.8, 2.5, 3.3 |
| Cyclone | 1.5 | 1.5, 1.8, 2.5, 3.3 |

ADI Multivoltage Monitors

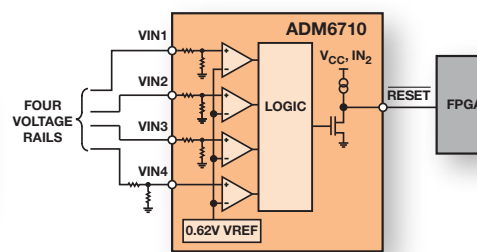
| Number of Voltages Monitored | Part Number |
|------------------------------|--------------------------|
| 1 | ADM8616, ADM809, ADM6319 |
| 2 | ADM13305 |
| 3 | ADM13307 |
| 3 or 4 | ADM6710 |
| 4 | ADM1184 |



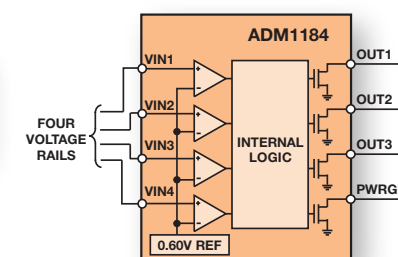
ADM13305: $\pm 0.8\%$ accurate dual processor supervisor with watchdog in 8-lead, narrow-body SOIC package.



ADM13307: $\pm 0.8\%$ accurate triple processor supervisor in 8-lead, narrow-body SOIC package.



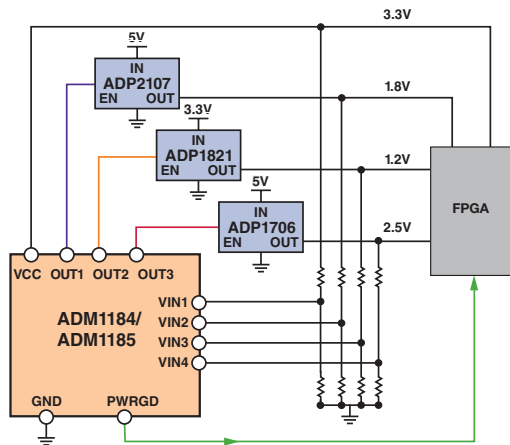
ADM6710: $\pm 1.5\%$ accurate triple/quad voltage microprocessor supervisor in 6-lead SOT-23 package.



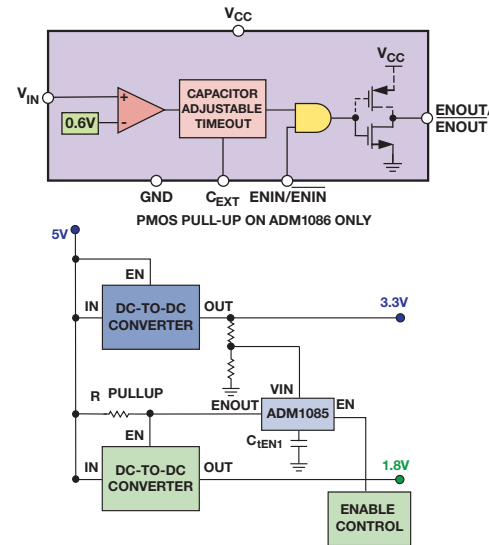
ADM1184: $\pm 0.8\%$ accurate quad voltage monitor in 10-lead MSOP package.

Power Supply Sequencing

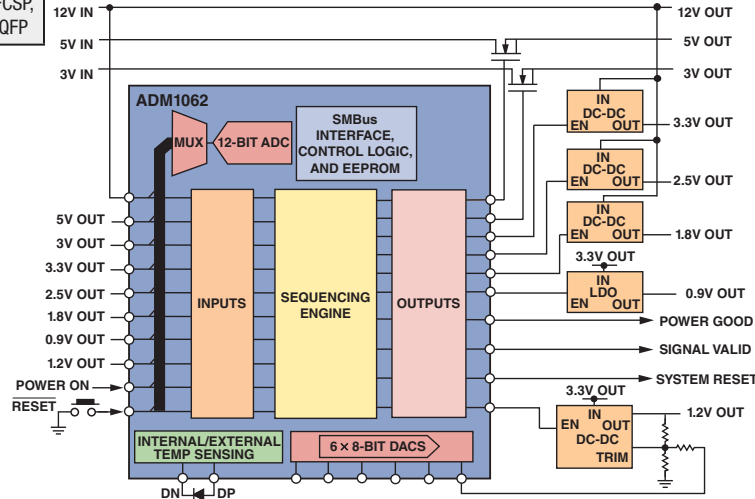
| Number of Supplies Monitored | Part Number | Voltage Monitoring Accuracy ($\pm\%$) | Sequence | FET Drive/Enable Outputs | Programming Method | Package |
|------------------------------|---|---|----------------------------|--------------------------|--------------------|-----------------------------|
| 1: cascadable | ADM1085, ADM1086, ADM1087 | <7 | Up | Enable | R's, C's | 6-lead SC70 |
| 2: cascadable | ADM6819, ADM6820 | <2.6 | Up | FET drive | R's, C's | 6-lead SOT-23 |
| 4: cascadable | ADM1184, ADM1185 | <0.8 | Up | Enable | R's, C's | 10-lead MSOP |
| 4: cascadable | ADM1186-1 | <0.8 | Up, down | Enable | R's, C's | 20-lead QSOP |
| 4 | ADM1186-2 | <0.8 | Up, down | Enable | R's, C's | 16-lead QSOP |
| 7: cascadable | ADM1060 | <2.5 | Programmable logic | Both | SMBus | 28-lead TSSOP |
| 8: cascadable | ADM1068 | <1 | Programmable state machine | Both | SMBus | 32-lead LQFP |
| 8: cascadable | ADM1069 | <1 | Programmable state machine | Both | SMBus | 40-lead LFCSP, 32-lead LQFP |
| 10: cascadable | ADM1062, ADM1063, ADM1064, ADM1065, ADM1067 | <1 | Programmable state machine | Both | SMBus | 40-lead LFCSP, 48-lead TQFP |
| 12: cascadable | ADM1066 | <1 | Programmable state machine | Both | SMBus | 40-lead LFCSP, 48-lead TQFP |



ADM1184/ADM1185: $\pm 0.8\%$ accurate quad monitor and sequencer.



Power-up sequencing with the ADM1085/ADM1086/ADM1087.



ADM1062: monitor and sequencer.

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