

Chip Supply Voltage Monitor Limits



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AND9963/D **APPLICATION NOTE**

This application note provided details of how the chip supply voltage monitor limits were established for the AR0220AT, AR0231AT and AR0138AT. This document includes the suggested limits, and the analysis used to arrive at those limits.

Recommended Limits

The following limits are recommended for the chip supply voltage monitors. For these limits to be used, it is recommended to have performed a PDN (power distribution network) analysis of the power supply network for the VAA, VDD and VDD_IO rails. Additionally, when using these limits, a 10 point average is recommended to prevent the safety mechanism from reporting failures due to a transient voltage event.

The recommended thresholds for the minimum and maximum voltage range for each of the supplies exceeds the datasheet recommended limits for the supply voltages. This is to account for a ± 0.2 V worst case accuracy of the voltage monitor.


Table 1.

Temperature Sensor 0	Minimum (V)	Maximum (V)
VAA	2.4	3.2
VAA_PIX	2.4	3.2
VDD	1.0	1.4
VDD_IO	1.5	3.2
VDD_IO_PHY	1.5	3.2
VDD_PHY	1.0	1.4

Limits Analysis

The limits are based on the accuracy of the monitor in conjunction with the lowest allowable voltage level. For example, the VAA voltage minimum is 2.6 V. With a potential for a 5% error in this measurement at -40°C , the

min measured value is 2.47 V. This is rounded down to 2.4 V as an established threshold to prevent false failures. Thresholds for other voltage domains are done similarly assuming a maximum of 5% error in the monitoring circuit.

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