

# UT01VS50L/D, UT01VS33L/D Function Tables

**Table 1: Cross Reference of Applicable Products**

Product Name	Manufacturer Part Number	SMD #	Device Type	Internal PIC Number
5.0V Single Channel Voltage Supervisor	UT01VS50L, UT01VS50D	5962-11213	Voltage Supervisor	YB12B, YB13B
3.3V Quad Channel Voltage Supervisor	UT01VS33L, UT01VS33D	5962-11213	Voltage Supervisor	YB15A, YB16A

## 1.0 Overview

The CAES Single Channel Voltage Supervisors (UT01VS50L, UT01VS50D, UT01VS33L, and UT01VS33D) contain two separate voltage comparator channels and a Watchdog Timer circuit. This family supports 3.3V and 5.0V members with both push-pull ( $\overline{\text{RESET}}$ ) and open drain ( $\overline{\text{RESET\_OD}}$ ) buffer outputs. Either the VDD voltage comparator or the master reset ( $\overline{\text{MR}}$ ) control the  $\overline{\text{RESET}}$ / $\overline{\text{RESET\_OD}}$  output in the Single Channel Supervisors. See Figure 1: Single Channel Voltage Supervisor Block Diagram

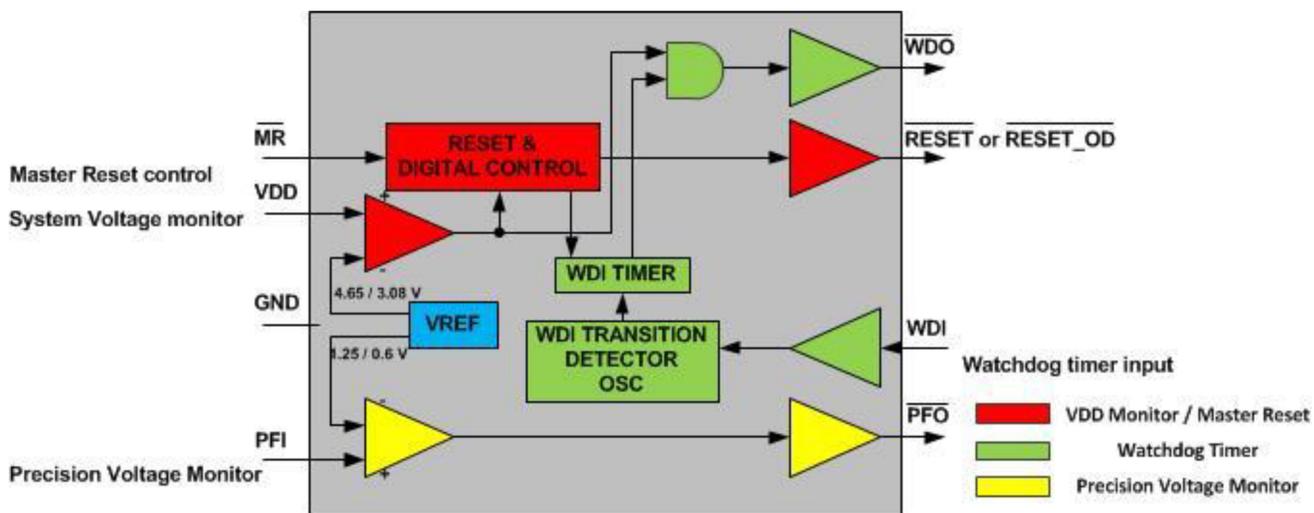


Figure 1: Single Channel Voltage Supervisor Block Diagram

Each Single Channel Supervisor supports three methods for identifying system faults and generating reset/recovery signals.

The first is the VDD pin that monitors the system VDD level with a dedicated internal comparator circuit. The VDD pin compares the system VDD with an internal reference value, either 4.65V for the 5V Voltage Supervisors or 3.08V for the 3.3V Voltage Supervisors. When the system VDD voltage falls below this threshold value, the Single Channel Supervisor forces both  $\overline{\text{RESET}}$  and the Watchdog Timer output ( $\overline{\text{WDO}}$ ) low.

The second method uses the Precision Voltage Monitor input (PFI) to measure a voltage using a second internal comparator. The PFI input compares its' voltage against a second internal reference, either 1.25V in the 5V Voltage Supervisors or 0.6V in the 3.3V Voltage Supervisors. When the voltage at the PFI input drops below its' threshold, the  $\overline{\text{PFO}}$  output is forced low.

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The third method for identifying system faults is the Watchdog Timer input (WDI). The Watchdog Timer typically monitors microprocessor activity or any other system function with a regular “heart beat”. The Watchdog Timer input can assume three states: low, high or float. If the WDI is floating, or connected to a high impedance tristate buffer, the Watchdog Timer is inactive and the  $\overline{WDO}$  output is high. Whenever  $\overline{MR}$  is low, the Watchdog Timer is again inactive and the  $\overline{WDO}$  output is high. Releasing  $\overline{MR}$  reactivates the Watchdog Timer and starts a new Watchdog time-out period. When the Supervisor is not in reset with the  $\overline{MR}$  low, any change of state at WDI that is longer than 100ns will start the Watchdog Timer, or restart it if the timer is already active. If there is no further activity within the timeout period, nominally 1.6 seconds, the timer will time out and drive the  $\overline{WDO}$  output low.

This paper highlights the behavior of the Single Channel Voltage Supervisors using an easy to reference function table. The user is also encouraged to visit the CAES website for data sheets and further information on the Single Channel Voltage Supervisors.

[cobhamaes.com](http://cobhamaes.com)

### 2.0 Single Channel Voltage Supervisors Function Table

Please reference

Table 2: Functional Truth Table for Single Channel Voltage Supervisors. The user should note the effects of the VDD,  $\overline{MR}$ , WDI and PFI on the  $\overline{RESET}$ ,  $\overline{WDO}$ , and  $\overline{PFO}$  outputs.

- A VDD brownout forces the  $\overline{RESET}$  and  $\overline{WDO}$  low
- $\overline{MR}$  active low forces  $\overline{RESET}$  low and the watchdog  $\overline{WDO}$  inactive high
- With VDD above threshold and  $\overline{MR}$  inactive, WDI activates the watchdog timer and controls  $\overline{WDO}$ .

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**Table 2: Functional Truth Table for Single Channel Voltage Supervisors**

MRb	VDD	GND	PFI	PFOb	WDI	RESETb	WDOb
<b>Under-voltage Analysis</b>							
1	AU	0	AU	1	R	1	1
0	AU	0	AU	1	R	0	1
1	AU	0	AU	1	R	1	1
1	AU	0	BU	0	R	1	1
1	AU	0	AU	1	R	1	1
1	BU	0	AU	1	R	0	0
1	AU	0	AU	1	R	1	1
1	BU	0	BU	0	R	0	0
1	AU	0	AU	1	R	1	1
1	AU	0	AU	1	S	1	0
1	AU	0	AU	1	R	1	1
1	AU	0	AU	1	S	1	0
0	AU	0	AU	1	S	0	1
1	AU	0	AU	1	S	1	0
1	AU	0	AU	1	R	1	1
1	AU	0	AU	1	Z	1	1
1	BU	0	AU	1	Z	0	0
1	AU	0	AU	1	Z	1	1
0	AU	0	AU	1	L	0	1
1	AU	0	AU	1	L	1	0
0	AU	0	AU	1	H	0	1
1	AU	0	AU	1	H	1	0
0	AU	0	AU	1	Z	0	1
1	AU	0	AU	1	Z	1	1

1 = HIGH
0 = LOW
AU = value above under-voltage
BU = value below under-voltage
R = watchdog running
S = watchdog stopped
Z = watchdog floating (Tristate)
H = watchdog static high
L = watchdog static low

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## Function Tables

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### *Revision History*

Date	Rev. #	Author	Change Description
12/16/2016	1.0.0	rbl	Initial Release

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## Function Tables

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APPLICATION NOTE

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