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# Advanced Monolithic Systems

## AMS26 VOLTAGE DETECTOR

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### FEATURES

- Very Low Supply Current
- Wide Operating Voltage Range
- 2% Precision Voltage Detection
- V-detect 1.45V to 4.6V in 0.05V increments
- V-detect 4.6V to 7.95V in 0.1V increments
- 2.5% Typical Hysteresis

### APPLICATIONS

- CPU and Logic Circuit Reset
- Portable and Battery Powered Equipment
- Memory Battery Back-Up Circuit
- Window Comparator
- Cellular Phones
- Pagers

### GENERAL DESCRIPTION

The AMS26 series are voltage detector ICs featuring a high accuracy detector threshold of  $\pm 2.0\%$  and ultra-low supply current. Internal circuit contains a precision voltage reference, a comparator, resistor network, and an output driver. The AMS26 has an NPN open collector output. The detector threshold is set from 1.45V to 4.6V in 0.05V increments and 4.6V to 7.9 in 0.1V increments. Also available from 7.9V to 12V in 170mV increments, thus making it easy to use in a variety of supervisory applications including microprocessor reset circuits, memory battery back-up circuit, battery checker, power failure detector and portable and battery powered electronics.

AMS26 is available in TO-92 and the sub-miniature 3-pin SOT-23 surface mount package.

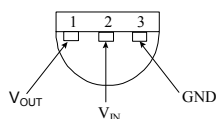
### ORDERING INFORMATION

OUTPUT TYPE	PACKAGE TYPE		OPERATING TEMPERATURE RANGE
	TO-92	3 LEAD SOT-23	
OPEN DRAIN	AMS26N-XA	AMS26M-XA	-30 to +80° C

X= Detector Threshold Setting.

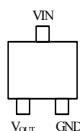
### PIN CONNECTIONS

**TO-92**  
Plastic Package (N)



**Bottom View**

**3L SOT-23**  
(M)



**Top View**

## ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage	16V	Power Dissipation : TO-92 package	300mW
Output Voltage	GND - 0.3V to $V_{IN} + 0.3V$	SOT-23 package	150mW
Output Current	20mA	Storage Temperature	-40°C to +125°C
Operating Temperature Range	-30°C to +80°C	Lead Temperature (Soldering 10 sec)	230°C

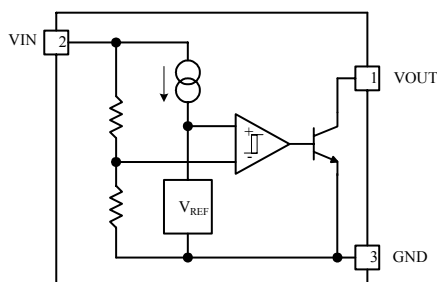
## ELECTRICAL CHARACTERISTICS

Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise noted.

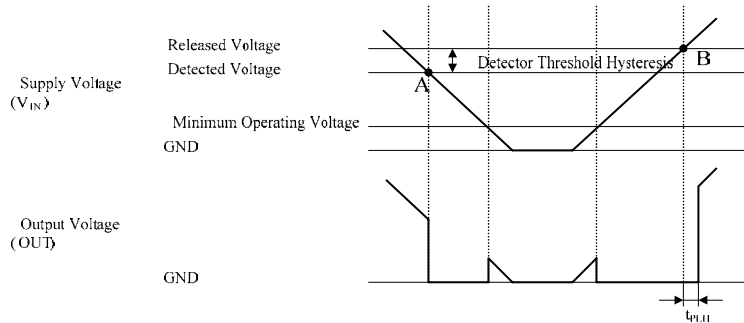
PARAMETER	CONDITIONS (Note 2)	AMS26-X			Units
		Min.	Typ.	Max.	
Detector Threshold ( $V_{DET}$ )		-2.0		+2.0	%
Detector Threshold Hysteresis		$(V_{DET}) * 2\%$		$(V_{DET}) * 5\%$	V
Supply Current	$V_{IN} = 2.0V$		1.0	3.0	$\mu\text{A}$
	$V_{IN} = 3.0V$		1.3	3.4	
	$V_{IN} = 4.0V$		1.6	3.8	
	$V_{IN} = 5.0V$		2.0	4.2	
Operating Voltage		1.50		10.00	V
Output Current	$V_{IN} = 2.0V$	1.5	7.7		mA
	$V_{IN} = 3.0V$	3.0	10.1		
	$V_{IN} = 4.0V$	4.0	11.5		
	$V_{IN} = 5.0V$	5.0	13.0		
Output Delay Time				1	$\mu\text{s}$
Detector Threshold Temperature Coefficient	$-30^\circ\text{C} \leq T_A \leq +80^\circ\text{C}$		$\pm 100$		ppm/ $^\circ\text{C}$

**Note 1:** Absolute Maximum Ratings are limits beyond which damage to the device may occur. For guaranteed performance limits and associated test conditions, see the Electrical Characteristics tables.

## BLOCK DIAGRAM

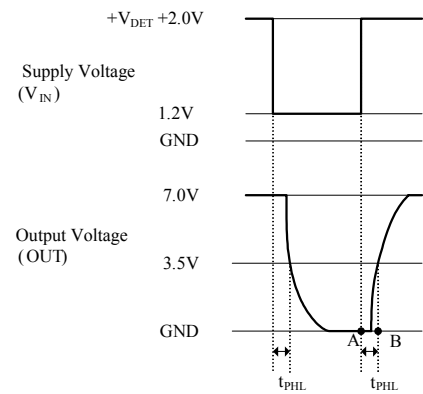


## TIME CHART

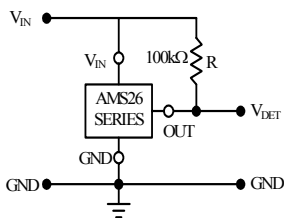


## OUTPUT DELAY TIME

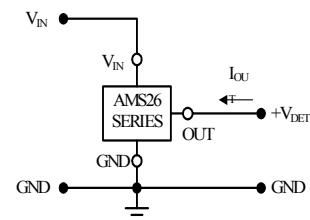
Output Delay Time  $t_{PHL}$  is defined as the time period from Time A through Time B, when the time at which a pulse voltage that increases from 1.2V to  $+V_{DET}+2.0V$  is applied to  $V_{IN}$  is Time A, and the time at which the output reaches 3.5V under the conditions that the output pin (OUT) is pulled up to 7V by a resistor of 100k $\Omega$  is Time B.



**Detector Threshold Test Circuit**

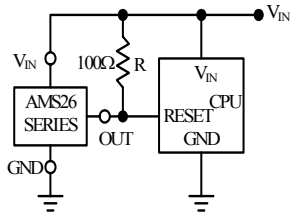


**Output Current Test Circuit**

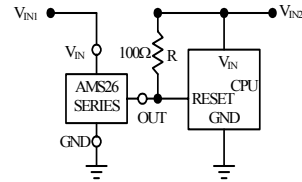


## TYPICAL APPLICATIONS

### CPU Reset Circuit

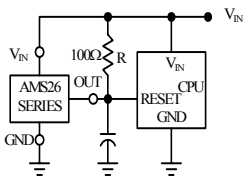


Input Voltage to AMS26 is the same as the input voltage to CPU.

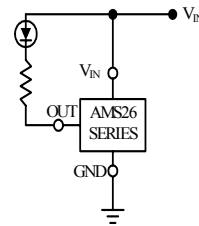


Input Voltage to AMS26 is different from the input voltage to CPU.

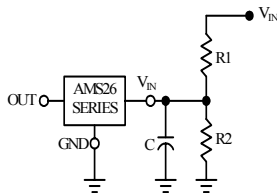
### Output Delay Time Circuit



### Voltage Level Indicator Circuit (lighted when the power runs out)



### Detector Threshold Changing Circuit



$$\text{Changed Detector Threshold} = \frac{R1 + R2}{R2} (-V_{DET})$$

$$\text{Hysteresis Voltage} = \frac{R1 + R2}{R2} (-V_{HYS})$$

When the value of R1 becomes excessively large, the detector threshold detected may differ from the value calculated using above formula.

### Window Comparator Circuit

