MAV331

SINGLE GENERAL PURPOSE LOW VOLTAGE COMPARATOR

CBC Microelectronics
http://www.cbcv .net

General Description

The MAV331 is a low voltage 2.5V to 5.5V, single comparator, which has a very low supply current of 60μA, making the part an excellent choice for portable electronic systems. The device is pin-for-pin compatible replacement of the LMV331.

The MAV331 is built with BiCMOS process with bipolar input and output stages for improved noise performance. It is a cost-effective solution for portable consumer products where space, low voltage, low power and price are the primary specification in circuit design.

SC70-5   SOT-23-5

Figure 1:   Package Types of MAV331

Features

- Guaranteed 2.5V to 5.5V Performance.
- Industrial Temperature Range: -40ºC to 85ºC
- Low Supply Current: 60μA Typical
- Input Common Mode Voltage Range Includes Ground
- Low Output Saturation Voltage 200 mV Typical
- Open Collector Output for Maxima Flexibility
- Space Saving SC-70-5 and SOT-23-5 Packages

Pin Configuration

B/N Package

(SC70-5/SOT-23-5)

IN+	1	5	V_{CC}
V_{EE}	2		
IN-	3	4	OUTPUT
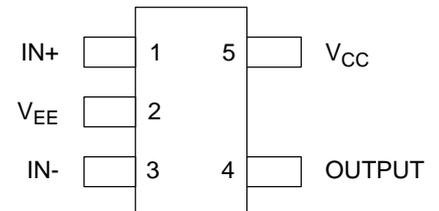
Figure 2:   Pin Configuration of MAV331 (Top View)

Applications

- Notebook and PDA
- Low Power, Low Voltage Applications
- General Purpose Portable Devices
- Mobile Communication
- Battery-Powered Systems

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Ordering Information

MAV 331 ☐ ☐ ☐ ☐

Circuit Type

Blank:MAV 331

Blank: Pb Free
G: Halogen Free

TR : Tape/Reel
Blank : Tube

Package
B:SC70-5
N: SOT- 23-5
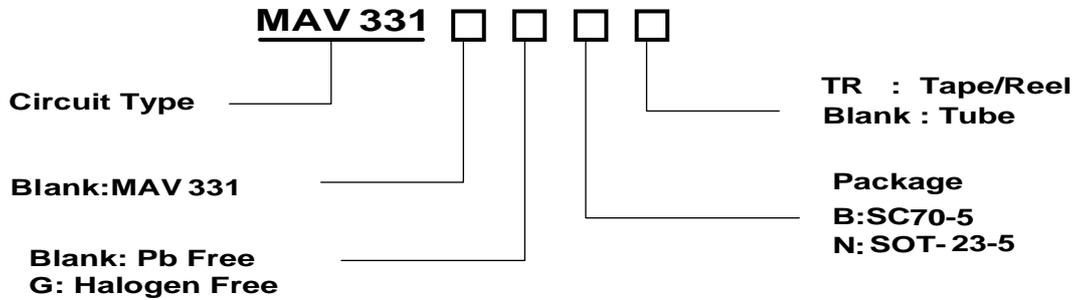
| Package | Condition | Part Number | | Marking ID | | Packing Type |
		Pb-free	Halogen-Free	Pb-free	Halogen-Free	
SC70-5	3.0mV	MAV331B	MAV331GB	A31	G31	Tube
	3.0mV	MAV331BTR	MAV331GBTR	A31	G31	Tape&Reel
SOT-23-5	3.0mV	MAV331N	MAV331GN	A331	G331	Tube
	3.0mV	MAV331NTR	MAV331GNTR	A331	G331	Tape&Reel

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	6	V
Operation Junction Temperature	T_J	150	^oC
Storage Temperature Range	T_{STG}	-65 to 150	^oC
Lead Temperature (Soldering, 10 Seconds)	T_{LEAD}	260	^oC
ESD (Machine Model)		200	V
ESD (Human Body Model)		2000	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

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Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	2.5	5.5	V
Ambient Operating Temperature Range	T_A	-40	85	^oC

2.7V DC Electrical Characteristics

Limits in standard typeface are guaranteed for T_A=25°C, V_{CC}=2.7V, V_{EE}=0V, R_L=5.1kΩ connected to V_{CC} and V_{CM}=0, **bold** typeface applies over full temperature ranges, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Offset Voltage	V_{OS}			1.7	7	mV
					9	
Input Offset Voltage Average Drift	TCV_{OS}			5		$\mu V/^oC$
Input Bias Current	I_B	I_{IN}+ or I_{IN}- with output in linear range, V_{CM}=0V		10	250	nA
					400	
Input Offset Current	I_{IO}	I_{IN}+ - I_{IN}-, V_{CM}=0V		5	50	nA
					150	
Saturation Voltage	V_{SAT}	$I_{SINK}\leq$1mA		200		mV
					500	
Output Sink Current	I_{SINK}	$V_O\leq$1.5V	5	23		mA
Input Common-Mode Voltage Range	V_{CM}		-0.1		2	V
Supply Current	I_{CC}			40	100	μA
					150	
Output Leakage Current	$I_{LEAKAGE}$			0.003		μA

2.7V AC Electrical Characteristics

All limits are guaranteed for T_A=25°C, V_{CC}=2.7V, V_{EE}=0V, R_L=5.1kΩ connected to V_{CC} and V_{CM}=0, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Propagation Delay (High to Low)	T_{PHL}	Input Overdrive=10mV		1000		ns
		Input Overdrive=100mV		350		
Propagation Delay (Low to High)	T_{PLH}	Input Overdrive=10mV		500		ns
		Input Overdrive=100mV		400		

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5V DC Electrical Characteristics

Limits in standard typeface are guaranteed for $T_A=25^oC$, $V_{CC}=5V$, $V_{EE}=0V$, $R_L=5.1k\Omega$ connected to V_{CC} and $V_{CM}=0$, **bold** typeface applies over full temperature ranges, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Offset Voltage	V_{OS}			1.7	7	mV
					9	
Input Offset Voltage Average Drift	TCV_{OS}			5		$\mu V/^oC$
Input Bias Current	I_B	$I_{IN}+$ or $I_{IN}-$ with output in linear range, $V_{CM}=0V$		25	250	nA
					400	
Input Offset Current	I_{IO}	$I_{IN}+ - I_{IN}-$, $V_{CM}=0V$		2	50	nA
					150	
Saturation Voltage	V_{SAT}	$I_{SINK}\leq 4mA$		200	400	mV
					500	
Output Sink Current	I_{SINK}	$V_O\leq 1.5V$	10	84		mA
Input Common-Mode Voltage Range	V_{CM}		-0.1		4.2	V
Voltage Gain	A_V		20	50		V/mV
Supply Current	I_{CC}			60	120	μA
					150	
Output Leakage Current	$I_{LEAKAGE}$			0.003		μA

5V AC Electrical Characteristics

All limits are guaranteed for $T_A=25^oC$, $V_{CC}=5V$, $V_{EE}=0V$, $R_L=5.1k\Omega$ connected to V_{CC} and $V_{CM}=0$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Propagation Delay (High to Low)	T_{PHL}	Input Overdrive=10mV		600		ns
		Input Overdrive=100mV		200		
Propagation Delay (Low to High)	T_{PLH}	Input Overdrive=10mV		450		ns
		Input Overdrive=100mV		300		

Functional Block Diagram
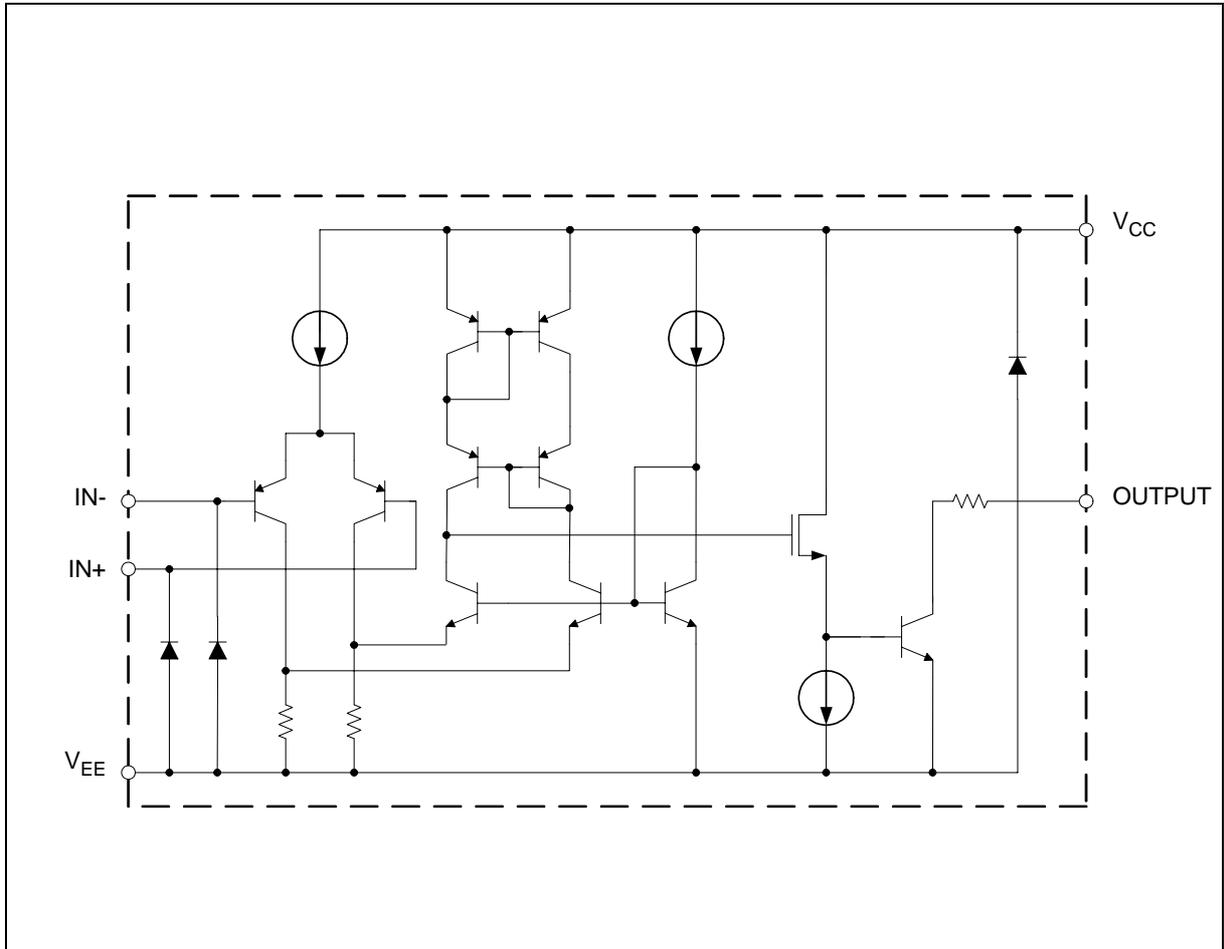
Figure 3 :   Functional Block Diagram of MAV331 (Each Amplifier)

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## Mechanical Dimensions

SC70-5

Unit: mm(inch)

- 2.000(0.079) / 2.200(0.087)
- 0.150(0.006) / 0.350(0.014)
- 2.150(0.085) / 2.450(0.096)
- 0.650(0.026)TYP
- 1.200(0.047) / 1.400(0.055)
- 0° / 8°
- 0.200(0.008)
- 0.260(0.010) / 0.460(0.018)
- 1.150(0.045) / 1.350(0.053)
- 0.525(0.021)REF
- 0.080(0.003) / 0.150(0.006)
- 0.000(0.000) / 0.100(0.004)
- 0.900(0.035) / 1.000(0.039)
- 0.900(0.035) / 1.100(0.043)
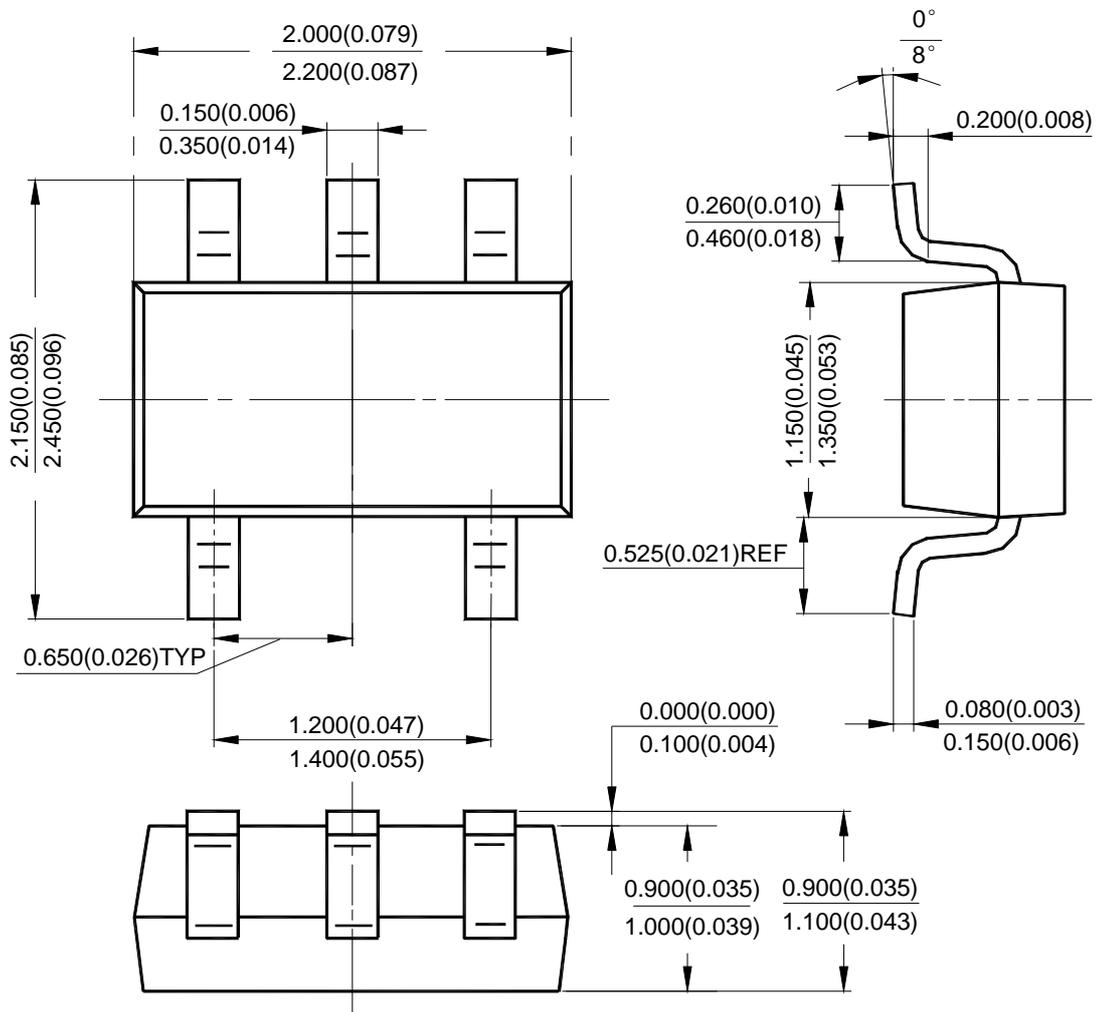
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Mechanical Dimensions (Cont'd)

SOT-23-5　　　　　　　　　　　**Unit: mm(inch)**

2.820(0.111)
3.020(0.119)

2.650(0.104)
2.950(0.116)

1.500(0.059)
1.700(0.067)

0.950(0.037)
TYP

1.800(0.071)
2.000(0.079)

0.300(0.012)
0.400(0.016)

0.100(0.004)
0.200(0.008)

0.300(0.012)
0.600(0.024)

0.200(0.008)

0.700(0.028)
REF

0°
8°

1.050(0.041)
1.250(0.049)

0.000(0.000)
0.100(0.004)

1.050(0.041)
1.150(0.045)

IMPORTANT NOTICE