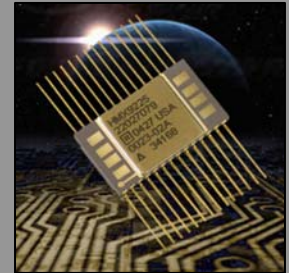


Application Note - AN315 Honeywell's Rad-Hard Version of Analog Device's A-to-D Converter

The Honeywell HMXADC9225 is a radiation-hardened (rad-hard) version of the Analog Device analog to digital converter (ADI) AD9225. This application note summarizes the features of the Honeywell product which are different than the ADI AD9225. This product was designed to have equivalent analog-to-digital conversion performance but there are differences in several functional blocks and minor I/O changes.

Refer to the full data sheet for the HMXADC9225 performance specifications. The data sheet can be downloaded at www.honeywell.com/microelectronics.

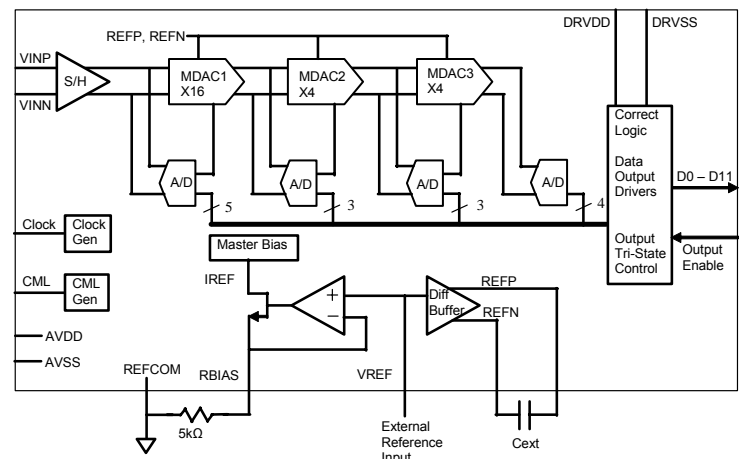


Pinout Table

Three signals have changed function and are highlighted below.

Pin	Honeywell Name	Type	Analog Devices Name	Type
1	CLK		CLK	
2	BIT 12 (LSB)		BIT 12 (LSB)	
3	BIT 11		BIT 11	
4	BIT 10		BIT 10	
5	BIT 9		BIT 9	
6	BIT 8		BIT 8	
7	BIT 7		BIT 7	
8	BIT 6		BIT 6	
9	BIT 5		BIT 5	
10	BIT 4		BIT 4	
11	BIT 3		BIT 3	
12	BIT 2		BIT 2	
13	BIT 1 (MSB)		BIT 1 (MSB)	
14	OE	Input	OTR	Output
15	AVDD		AVDD	
16	AVSS		AVSS	
17	RBIAS	Input	SENSE	Output
18	VREF INPUT	Input	VREF	In/Out
19	REFCOMM		REFCOM	
20	CAPB		CAPB	
21	CAPT		CAPT	
22	CML		CML	
23	VINA		VINA	
24	VINB		VINB	
25	AVSS		AVSS	
26	AVDD		AVDD	
27	DRVSS		DRVSS	
28	DRDVDD		DRDVDD	

Block Diagram



Tri-State Data Output Mode – Output Enable

The digital data output lines can be placed in a high impedance state. This is controlled by the Output Enable (OE) digital logic input signal. This signal is located at pin 14 and replaces the “Out Of Range (OTR)” output signal.

By removing the OTR signal, two codes are lost out of the 4096 total codes. The all 1's and all 0's codes cannot be determined whether they are valid or out of range, therefore, these two codes now become the out of range indication.

OE Input	Data Output
High	Normal Operation
Low	High Impedance

AN315

R-Bias Function

The R-Bias resistor on pin 17 replaces the “SENSE” function. R-Bias is required to create the internal bias currents. An external resistor with a value of 5kΩ shall be connected between pin 17 and ground.

The SENSE function was used for setting the VREF value to 1.0V or 2.0V. This is no longer needed since the external VREF supply is required.

The R-Bias resistor can also be used to change the power consumption. By changing the resistor value, the current consumption can be changed. The range of this feature not yet characterized.

R Bias Resistor	Typical	
Resistor Value	5.0	kΩ
Tolerance	±5	%

Voltage Reference

The HMXADC9225 requires the user to provide an external voltage reference as an *INPUT* to the device. The ADI part generated an internal voltage reference which could be monitored on an *OUTPUT* pin. It also had the capability to accept and externally applied voltage reference. This is located on pin 18. The device is designed to operate using a 1.0V or 2.0V external voltage reference.

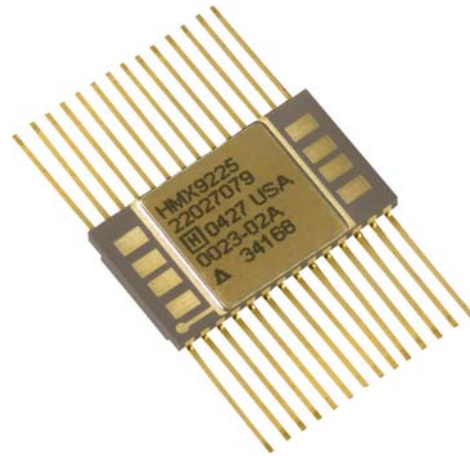
External Voltage Reference	Typical	Max	
Input Voltage	1.0, 2.0		V
Input Voltage Tolerance	±10	±35	mV
Current	250	500	μA

Radiation Hardened – Specifications

This part is designed, manufactured and screened to be radiation hardened to 1Mrad(Si) Total Ionizing Dose. Please consult the data sheet for the complete table radiation level specifications.

Package

The Honeywell package type is a 28 lead ceramic flat pack as compared to plastic 28-lead SOIC or SSOP offered by Analog Devices. The data sheet includes the case outline drawing.



For further questions, please call for applications support at 800-323-8295 (USA toll free) or 763-954-2474 or visit our website at www.honeywell.com/microelectronics.

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