16-BIT, 1-MSPS, UNIPOLAR SINGLE ENDED SAR ADC WITH ON-CHIP ADC DRIVER (OPA) AND 8-CHANNEL DIFFERENTIAL MULTIPLEXER

FEATURES

- **1.0-MHz Sample Rate, Zero Latency at Full Speed**
- **16-Bit Resolution**
- **Supports Unipolar Single Ended Input Range: 0 V to +4 V**
- **Built-In Eight Channel, Single Ended Multiplexer; with Channel Count Selection and Auto/Manual Mode**
- **On-Board Single Ended Input, Differential Output ADC Driver (OPA)**
- **Buffered Reference Output to Level Shift Bipolar ±4-V Input with External Resistance Divider**
- **Reference/2 Output to Set Offset for External Signal Conditioner**
- **16-/8-Bit Parallel Interface**
- **SNR: 95.4dB Typ at 2-kHz I/P**
- **THD: –118dB Typ at 2-kHz I/P**
- **Power Dissipation: 331.25 mW at 1 MSPS**
- **Internal Reference**
- **Internal Reference Buffer**
- **64-Pin QFN Package**

APPLICATIONS

- **Medical Imaging/CT Scanners**
- **Automated Test Equipment**
- **High-Speed Data Acquisition Systems**
- **High-Speed Closed-Loop Systems**

DESCRIPTION

The ADS8255 is a high-performance analog system-on-chip (SoC) device with an 16-bit, 1-MSPS A/D converter, 4-V internal reference, an on-chip ADC driver (OPA), and a 8-channel single ended multiplexer. The channel count of the multiplexer and auto/manual scan modes of the device are user selectable.

The ADC driver is designed to leverage the very high noise performance of the differential ADC at optimum power usage levels.

The ADS8255 outputs a buffered reference signal for level shifting of a ±4-V bipolar signal with an external resistance divider. A $V_{ref}/2$ output signal is available to set the offset of a signal conditioning circuit. The device also includes an 16-/8-bit parallel interface.

The ADS8255 is available in a 9 mm x 9 mm, 64-pin QFN package and is characterized from -40°C to 85°C.

PRODUCT PREVIEW

HIGH-SPEED SAR CONVERTER FAMILY

TYPE/SPEED	500 kHz	~600 kHz	750 kHz	1 MHz	1.25 MHz	2 MHz	3 MHz	4MHz
18-Bit Pseudo-Diff / Single Ended	ADS8383	ADS8381		ADS8481				
		ADS8380 (s)		ADS8285				
18-Bit Pseudo-Bipolar, Fully Diff		ADS8382 (s)		ADS8284	ADS8484			
				ADS8482				
16-Bit Pseudo-Diff	ADS8327	ADS8370 (s)	ADS8371	ADS8471	ADS8401	ADS8411		
	ADS8328			ADS8255	ADS8405	ADS8410 (s)		
	ADS8319							
16-Bit Pseudo-Bipolar, Fully Diff	ADS8318	ADS8372 (s)		ADS8472	ADS8402	ADS8412		ADS8422
				ADS8254	ADS8406	ADS8413 (s)		
14-Bit Pseudo-Diff					ADS7890 (s)		ADS7891	
12-Bit Pseudo-Diff				ADS7886		ADS7883		ADS7881

PACKAGING INFORMATION

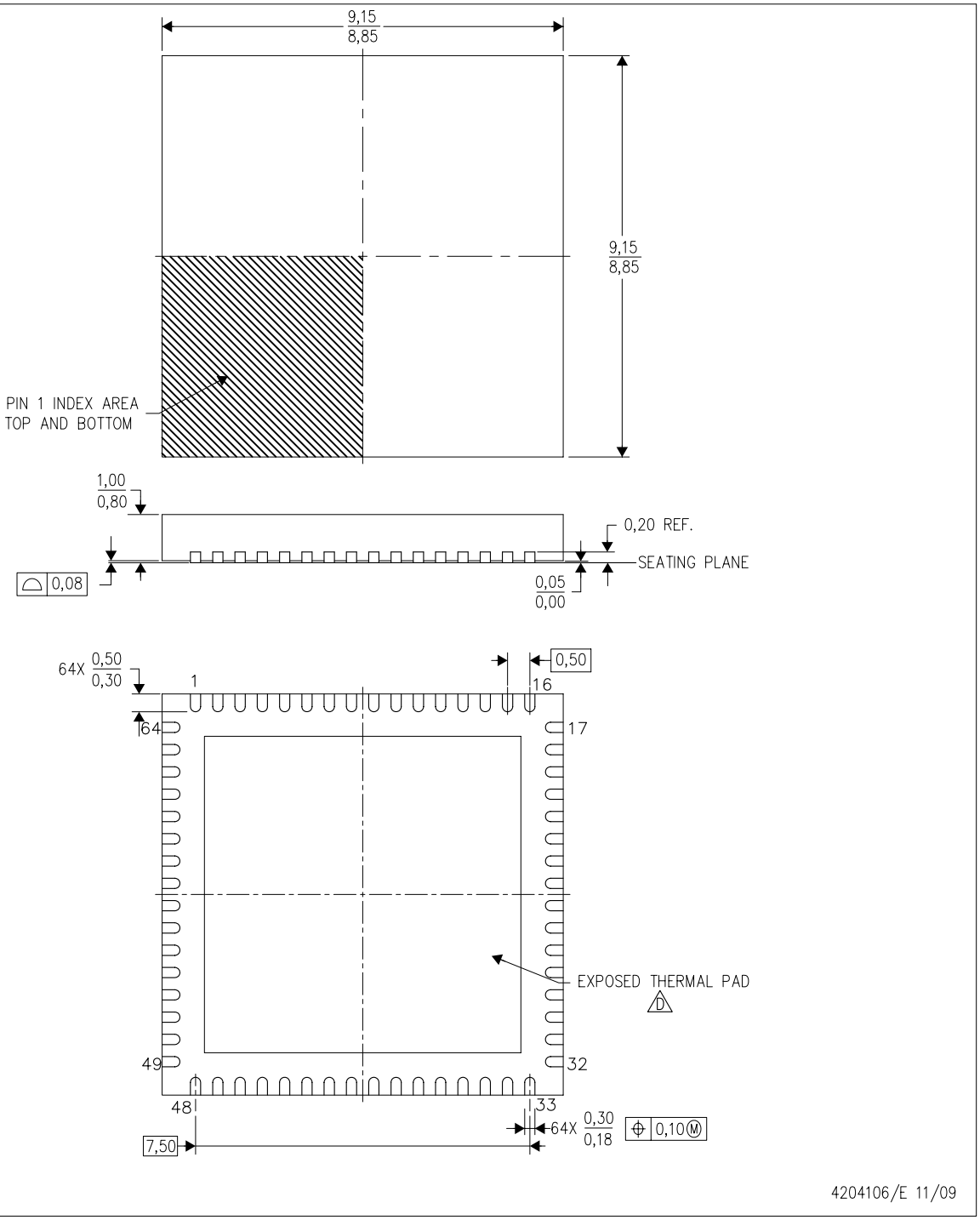
Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
ADS8255IBRGCR	PREVIEW	VQFN	RGC	64	2000	TBD	Call TI	Call TI
ADS8255IBRGCT	PREVIEW	VQFN	RGC	64	250	TBD	Call TI	Call TI
ADS8255IRGCR	PREVIEW	VQFN	RGC	64	2000	TBD	Call TI	Call TI
ADS8255IRGCT	PREVIEW	VQFN	RGC	64	250	TBD	Call TI	Call TI

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

RGC(S–PVQFN–N64) CUSTOM DEVICE PLASTIC QUAD FLATPACK NO–LEAD



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5–1994.
B. This drawing is subject to change without notice.
C. Quad Flatpack, No–leads (QFN) package configuration.
D. The package thermal pad must be soldered to the board for thermal and mechanical performance. See the Product Data Sheet for details regarding the exposed thermal pad dimensions.

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