



## Octal, 12-Bit, Low-Power, $\pm 15$ -V Output, Parallel Input DIGITAL-TO-ANALOG CONVERTER

### FEATURES

- **Bipolar Output:**  $\pm 15$  V, Up to  $\pm 16.5$  V
- **Unipolar Output:** 0 V to +18 V
- **12-Bit Resolution**
- **Low Power:** 24 mW/Ch
- **Relative Accuracy:** 1 LSB Max
  - Before User Calibration:  $\pm 2$  LSB Max
  - After User Calibration:  $\pm 1$  LSB Max
- **Flexible System Calibration**
- **Low Glitch**
- **Settling Time:** 10  $\mu$ s
- **Channel Monitor Output**
- **Programmable Gain:** x4, x6
- **Programmable Offset**
- **12-Bit Parallel Interface, 50 MHz**
- **Packages:** QFN-56 (8x8mm), TQFP-64 (10x10mm)

### APPLICATIONS

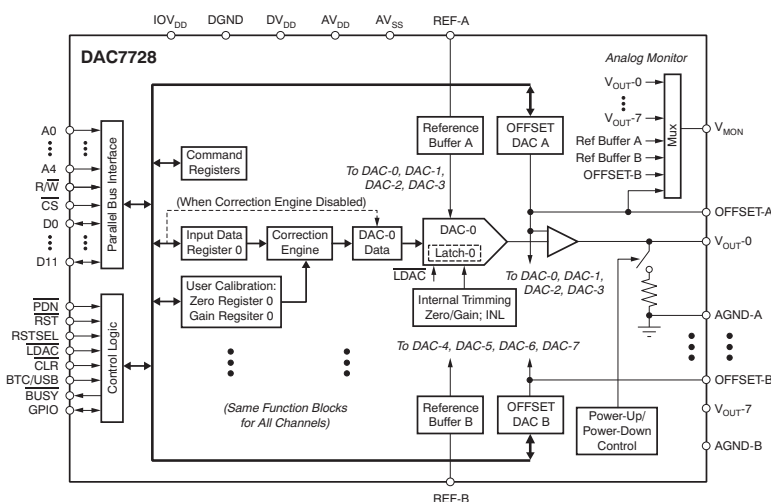
- **Automatic Test Equipment**
- **PLC and Industrial Process Control**
- **Communications**

### DESCRIPTION

The DAC7728 is a low-power, octal, 12-bit digital-to-analog converter (DAC). The output can be a bipolar  $\pm 15$ -V voltage when operating from a dual  $\pm 16.5$ -V power supply, or a unipolar 0-V to +18-V voltage when operating from a +20-V power supply. This DAC provides low-power operation, good linearity, and low glitch over the specified temperature range of  $-40^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$ . This device is trimmed in manufacturing and has very low zero-code and gain error. In addition, system level calibration can be performed to achieve  $\pm 1$  LSB zero-code and gain error over the entire signal chain. The output range can be offset by setting the DAC offset register.

The DAC7728 features a standard, high-speed, 12-bit parallel interface at up to 50 MHz and 1.8-V, 3-V, and 5-V logic compatible, to communicate with a DSP or microprocessor. The eight DACs and the auxiliary registers are addressed with five address lines. The device features double-buffered interface logic. An asynchronous load input ( $\overline{\text{LDAC}}$ ) transfers data from the DAC data register to the DAC latch. The asynchronous  $\overline{\text{CLR}}$  input sets the output of all eight DACs to AGND. The  $V_{\text{MON}}$  pin is a monitor output that connects to the individual analog output, the offset DAC, and the reference buffer outputs through a multiplexer (mux).

The DAC7728 is pin-to-pin compatible with the [DAC8728](#) (16-bit) and the [DAC8228](#) (14-bit).



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**PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
DAC7728SPAG	PREVIEW	TQFP	PAG	64	160	TBD	Call TI	Call TI
DAC7728SPAGR	PREVIEW	TQFP	PAG	64	1500	TBD	Call TI	Call TI
DAC7728SRTQR	PREVIEW	QFN	RTQ	56	2000	TBD	Call TI	Call TI
DAC7728SRTQT	PREVIEW	QFN	RTQ	56	250	TBD	Call TI	Call TI

<sup>(1)</sup> 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.

<sup>(2)</sup> 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)

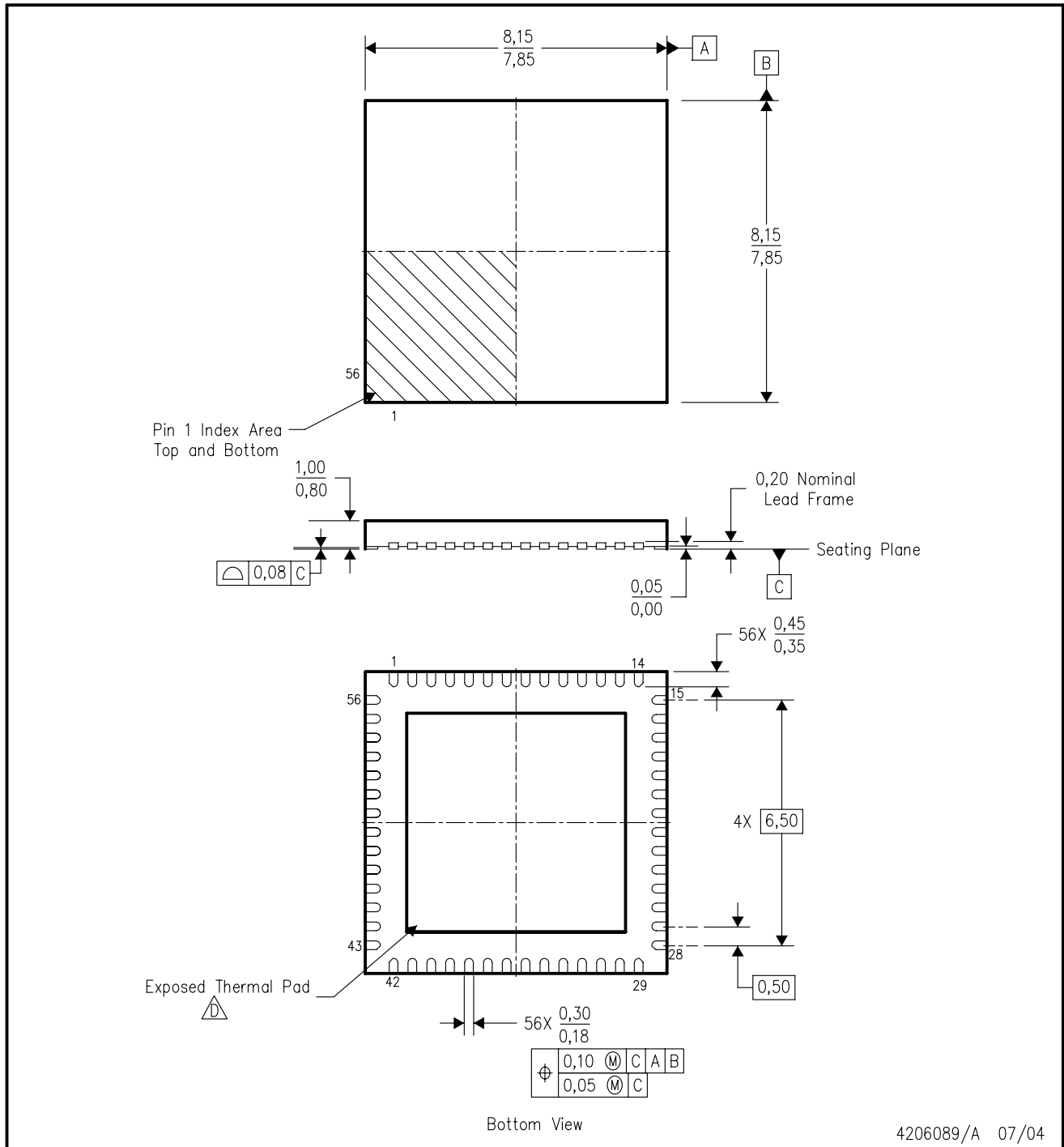
<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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RTQ (S-PQFP-N56)

PLASTIC QUAD FLATPACK



- 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. QFN (Quad Flatpack No-Lead) 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.
  - E. Package complies to JEDEC MO-220.

PAG (S-PQFP-G64)

PLASTIC QUAD FLATPACK



- NOTES: A. All linear dimensions are in millimeters.  
 B. This drawing is subject to change without notice.  
 C. Falls within JEDEC MS-026

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