

12-BIT 30 MSPS DUAL CHANNEL CCD SIGNAL FRONT END FOR DIGITAL COPIER

FEATURES

- **Dual Channel CCD Signal Processing:**
 - Correlated Double Sampler (CDS)
 - Sample Hold Mode
 - Digital Programmable Amplifier
 - CCD Offset Correction (OB loop)
- **High Performance A/D:**
 - 12-Bit Resolution
 - INL: ± 2 LSB
 - DNL: ± 0.5 LSB
 - No Missing Codes
- **High-Speed Operation**
 - Sample Rate: 30 MHz (Minimum)
- **78-dB Signal-To-Noise Ratio (at 0-dB Gain)**
- **Low Power Consumption:**
 - Low Voltage: 3 V to 3.6 V
 - Low Power: 290 mW (Typ) at 3.3 V
 - Standby Mode: 20 mW (Typ)

APPLICATIONS

- Copiers
- Scanners
- Facsimiles

DESCRIPTION

The VSP5000 device is a complete application specific standard product (ASSP) for charge-coupled device (CCD) line sensor applications such as copiers, scanners, and facsimiles. The VSP5000 device provides two independent channels of processing lines and performs analog front-end processing and analog-to-digital (A/D) conversion. Each channel has a correlated double sampler (CDS)/sample hold (SH) circuit, a 14-bit analog-to-digital converter (ADC), a digital programmable gain amplifier (DPGA), and an optical black (OB) correction loop. Data output is 12 bits in length and the 2-channel A/D data is multiplexed and output.

The VSP5000 is available in a 64-lead LQFP package and operates from a single 3.3-V supply.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
VSP5000PM	NRND	LQFP	PM	64	160	Green (RoHS & no Sb/Br)	A42 SNBI	Level-1-260C-UNLIM	-25 to 85	VSP5000	
VSP5000PMG6	NRND	LQFP	PM	64	160	Green (RoHS & no Sb/Br)	A42 SNBI	Level-1-260C-UNLIM	-25 to 85	VSP5000	

(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.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "-" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

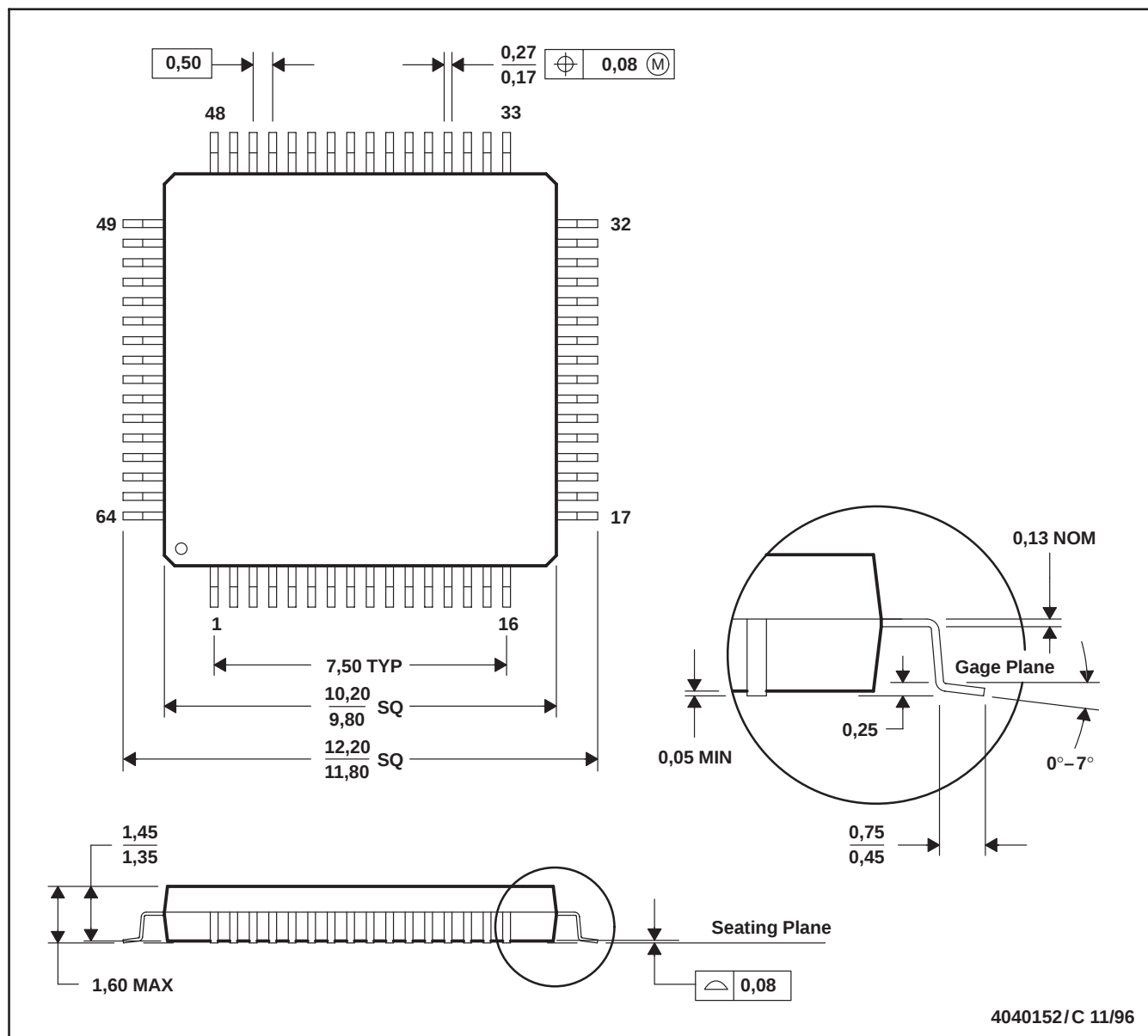
(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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PM (S-PQFP-G64)

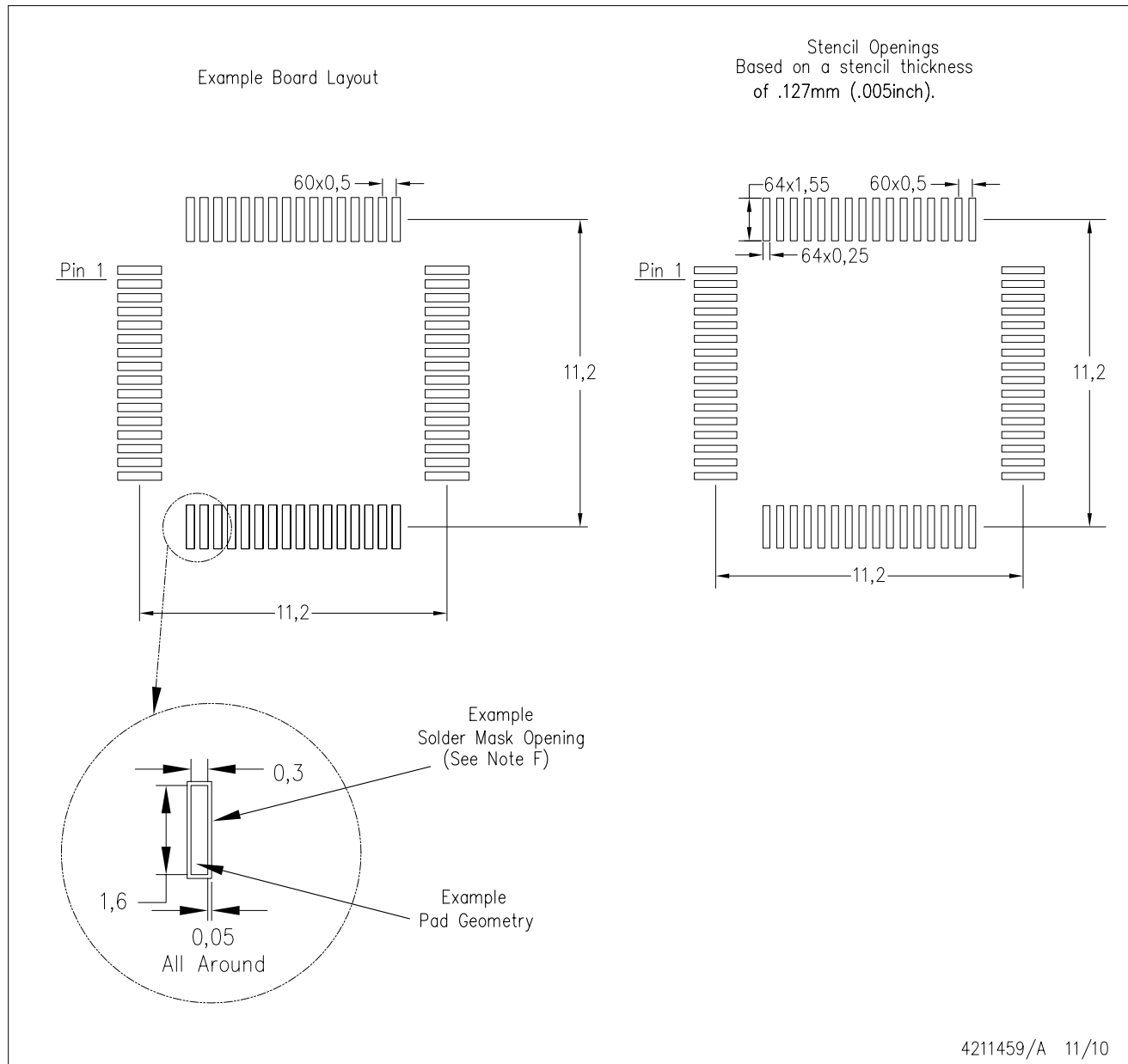
PLASTIC QUAD FLATPACK



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Falls within JEDEC MS-026
 - D. May also be thermally enhanced plastic with leads connected to the die pads.

PM (S-PQFP-G64)

PLASTIC QUAD FLATPACK



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.
 - D. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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