

CCD ANALOG FRONT-END FOR DIGITAL CAMERAS

Check for Samples: [VSP2560](#), [VSP2562](#), [VSP2566](#)

FEATURES

- **CCD Signal Processing:**
 - 36-MHz Correlated Double Sampling (CDS)
- **Output Resolution:**
 - VSP2560 (10-Bit)
 - VSP2562 (12-Bit)
 - VSP2566 (16-Bit)
- **16-Bit Analog-to-Digital Conversion:**
 - 36-MHz Conversion Rate
 - No Missing Codes Ensured
- **80-dB Input-Referred SNR (at Gain = 12 dB)**
- **Programmable Black Level Clamping**
- **Programmable Gain Amp (PGA):**
 - –9 dB to +44 dB
 - –3 dB to +18 dB (Analog Front Gain)
 - –6 dB to +26 dB (Digital Gain)
- **Portable Operation:**
 - Low Voltage: 2.7 V to 3.6 V
 - Low Power: 86 mW at 3.0 V, 36 MHz
 - Low Power: 6 mW (Standby Mode)

- **Two-Channel, General-Purpose, 8-Bit DAC**

DESCRIPTION

The VSP2560/62/66 are a family of complete mixed-signal processing ICs for digital cameras that provide correlated double sampling (CDS) and analog-to-digital conversion for the output of CCD arrays. The CDS extracts the pixel video information from the CCD signal, and the analog-to-digital converter (ADC) converts the digital signal. For varying illumination conditions, a very stable gain control of –9 dB to 44 dB is provided. The gain control is linear in dB. Input signal clamping and offset correction of the input CDS are also provided.

Offset correction is performed by the optical black (OB) level calibration loop, and is held in calibrated black level clamping for an accurate black level reference. Additionally, the black level is quickly recovered after gain changes. The VSP2560/62/66 are available in LQFP-48 packages and operate from single +3 V supplies.

Table 1. FEATURE COMPARISON BY DEVICE

DEVICE	RESOLUTION (Bits)	TRANSFER CHARACTERISTICS (LSB)		OB CLAMP LOOP (LSB)		
		DNL	INL	PROGRAMMABLE RANGE	OBCLP LEVEL	OB LEVEL
VSP2560	10	±0.5	±1	16 to 78	32	2
VSP2562	12	±0.5	±2	64 to 312	128	8
VSP2566	16	±2	±32	1024 to 4992	2048	128

PRODUCT PREVIEW


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PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
VSP2560PTR	Obsolete	Production	LQFP (PT) 48	-	-	Call TI	Call TI	-40 to 85	VSP2560
VSP2562PT	Obsolete	Production	LQFP (PT) 48	-	-	Call TI	Call TI	-25 to 85	VSP2562
VSP2566PT	Obsolete	Production	LQFP (PT) 48	-	-	Call TI	Call TI	-25 to 85	VSP2566

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

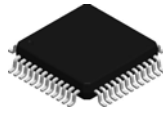
⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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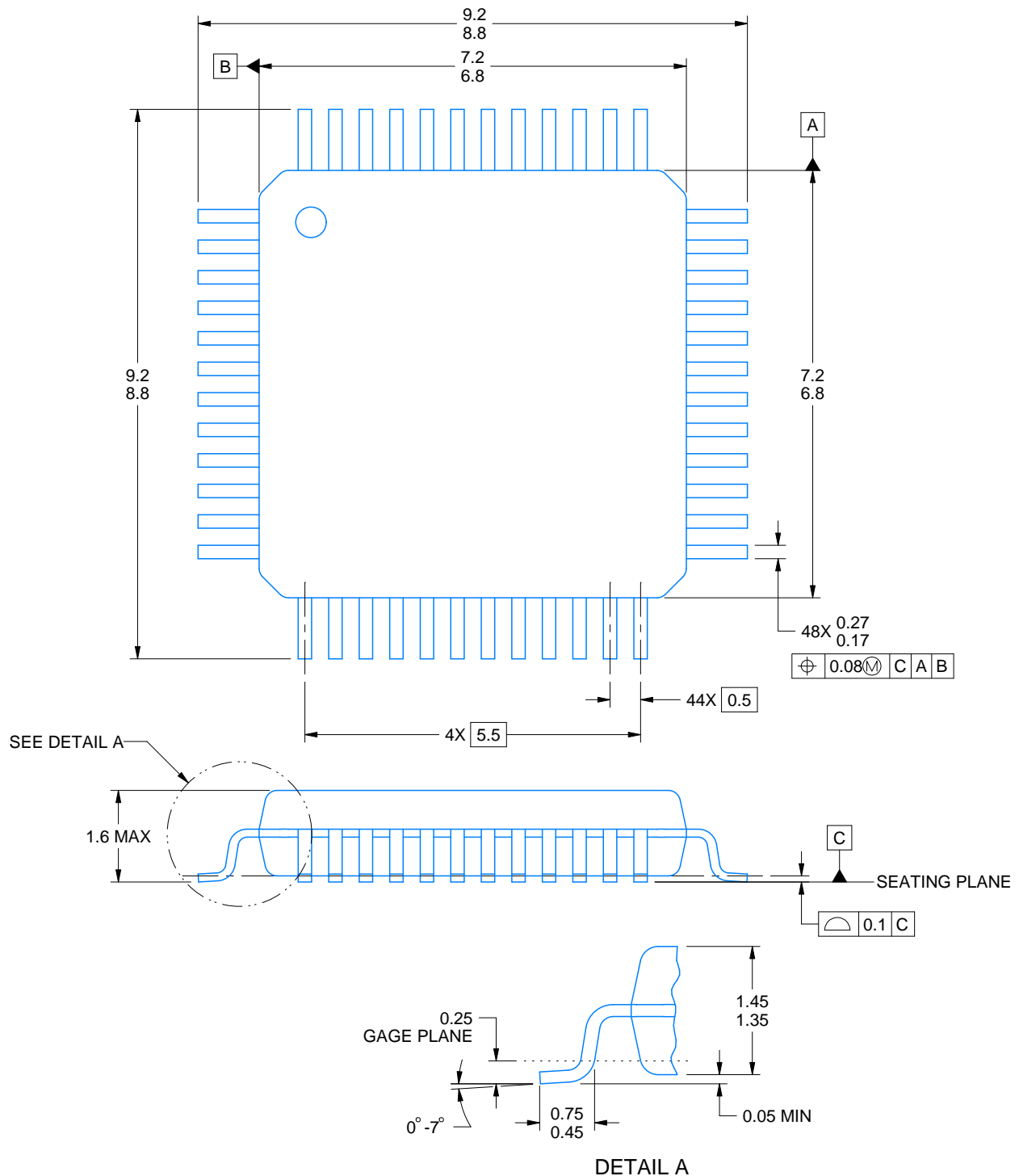
PT0048A



PACKAGE OUTLINE

LQFP - 1.6 mm max height

LOW PROFILE QUAD FLATPACK



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NOTES:

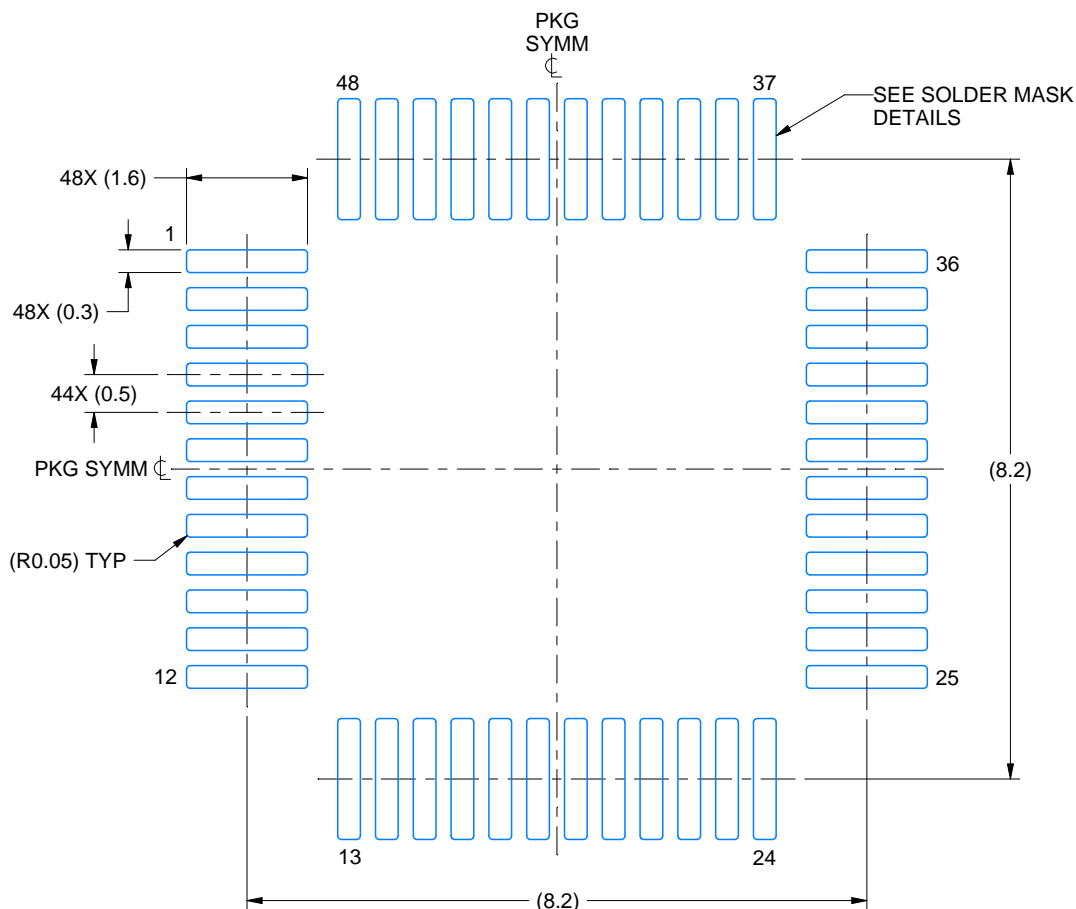
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Reference JEDEC registration MS-026.
4. This may also be a thermally enhanced plastic package with leads connected to the die pads.

EXAMPLE BOARD LAYOUT

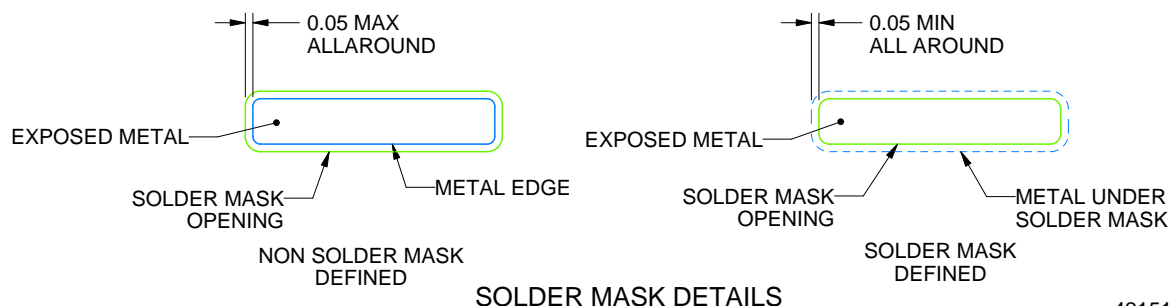
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LQFP - 1.6 mm max height

LOW PROFILE QUAD FLATPACK



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE 10.000



SOLDER MASK DETAILS

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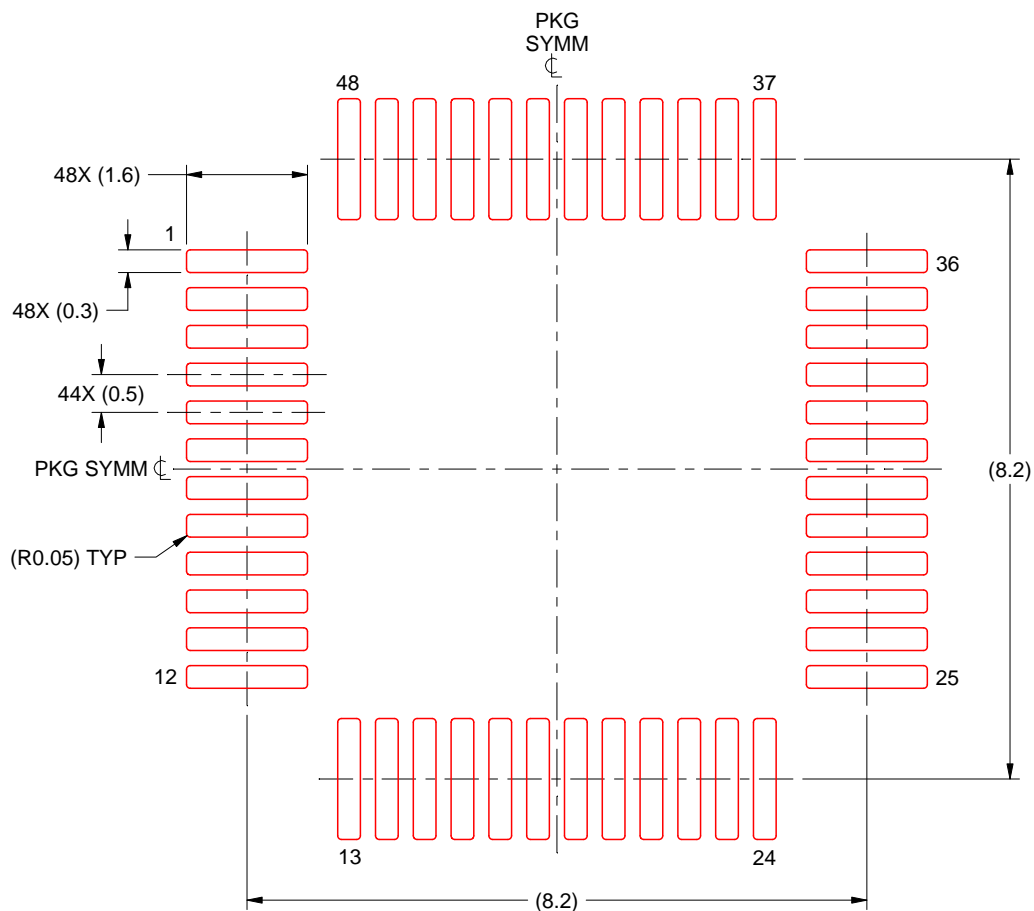
NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.
6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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LQFP - 1.6 mm max height

LOW PROFILE QUAD FLATPACK



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE: 10X

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NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

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