

CCD SIGNAL PROCESSOR FOR DIGITAL CAMERAS

FEATURES

- **CCD Signal Processing:**
 - Correlated Double Sampling (CDS)
 - Programmable Black Level Clamping
- **Programmable Gain Amplifier (PGA)**
–6-dB to 42-dB Gain Ranging
- **12-Bit Digital Data Output:**
 - Up to 28-MHz Conversion Rate
 - No Missing Codes
- **77-dB Signal-To-Noise Ratio**
- **Portable Operation:**
 - Low Voltage: 2.7 V to 3.6 V
 - Low Power: 94 mW (Typ) at 3 V
 - Stand-By Mode: 6 mW

APPLICATIONS

- DSC, DVC, Security Camera

DESCRIPTION

The VSP2272 device is a complete mixed-signal processing IC for digital cameras providing signal conditioning and analog-to-digital conversion for the output of a charge-coupled device (CCD) array. The primary CCD channel provides correlated double sampling (CDS) to extract the video information from the pixels, –6-dB to 42-dB gain range with digital control for varying illumination conditions, and black level clamping for an accurate black level reference. Input signal clamping and offset correction of the input CDS are also performed. The stable gain control is linear in dB. Additionally, the black level is quickly recovered after gain change.

The VSP2272Y device is available in a 48-lead LQFP package and the VSP2272M device is available in a 48-lead P-VQFN package. Both devices operate from a single 3-V/3.3-V supply.

AVAILABLE OPTIONS

PRODUCT	PACKAGE	PACKAGE OUTLINE DESIGNATOR†	SPECIFIED TEMPERATURE RANGE	PACKAGE MARKING	ORDERING NUMBER‡	TRANSPORT MEDIA
VSP2272Y	48-Lead LQFP	PT	–25°C to 85°C	VSP2272Y	VSP2272Y	250-piece tray
VSP2272Y	48-Lead LQFP	PT	–25°C to 85°C	VSP2272Y	VSP2272Y/2K	Tape and reel
VSP2272M	48-Lead P-VQFN	RGN	–25°C to 85°C	VSP2272M	VSP2272M	250-piece tray
VSP2272M	48-Lead P-VQFN	RGN	–25°C to 85°C	VSP2272M	VSP2272M/2K	Tape and reel

† A detailed drawing and a dimension table are located at the end of the data sheet.

‡ Models with a slash (/) are available only in tape and reel in the quantities indicated (e.g., /2K indicates 2,000 devices per reel). Ordering 2,000 pieces of the VSP2272Y/2K device will get a single 2,000-piece tape and reel.



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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)
VSP2272M/2K	Obsolete	Production	VQFN (RGN) 48	-	-	Call TI	Call TI	-25 to 85	VSP2272M
VSP2272Y	Obsolete	Production	LQFP (PT) 48	-	-	Call TI	Call TI	-25 to 85	VSP2272Y

⁽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.

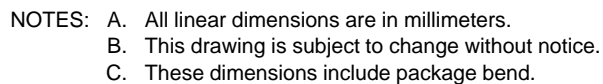
⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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.

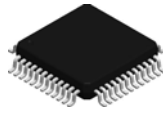
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PLASTIC QUAD FLATPACK



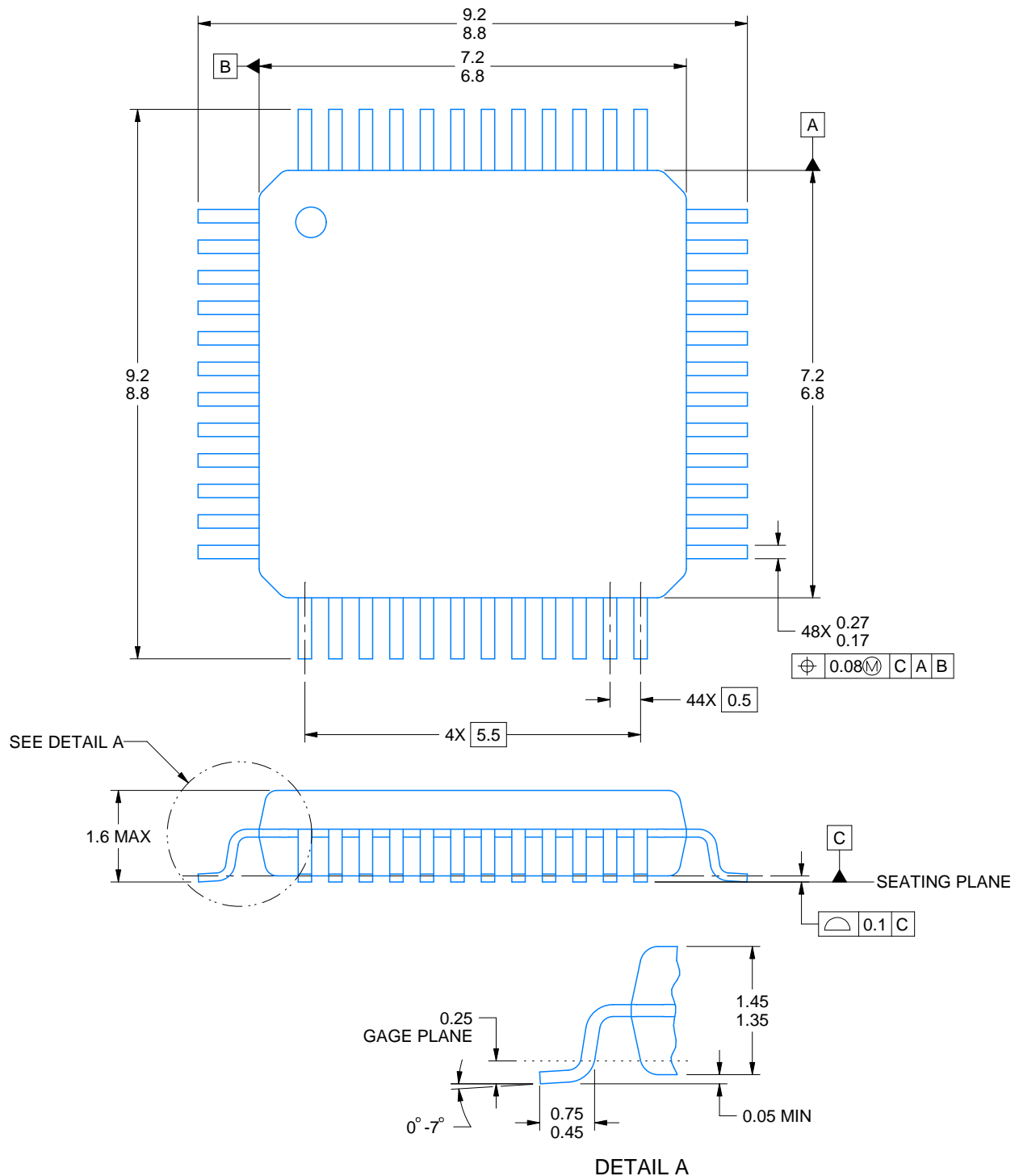
PT0048A



PACKAGE OUTLINE

LQFP - 1.6 mm max height

LOW PROFILE QUAD FLATPACK



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NOTES:

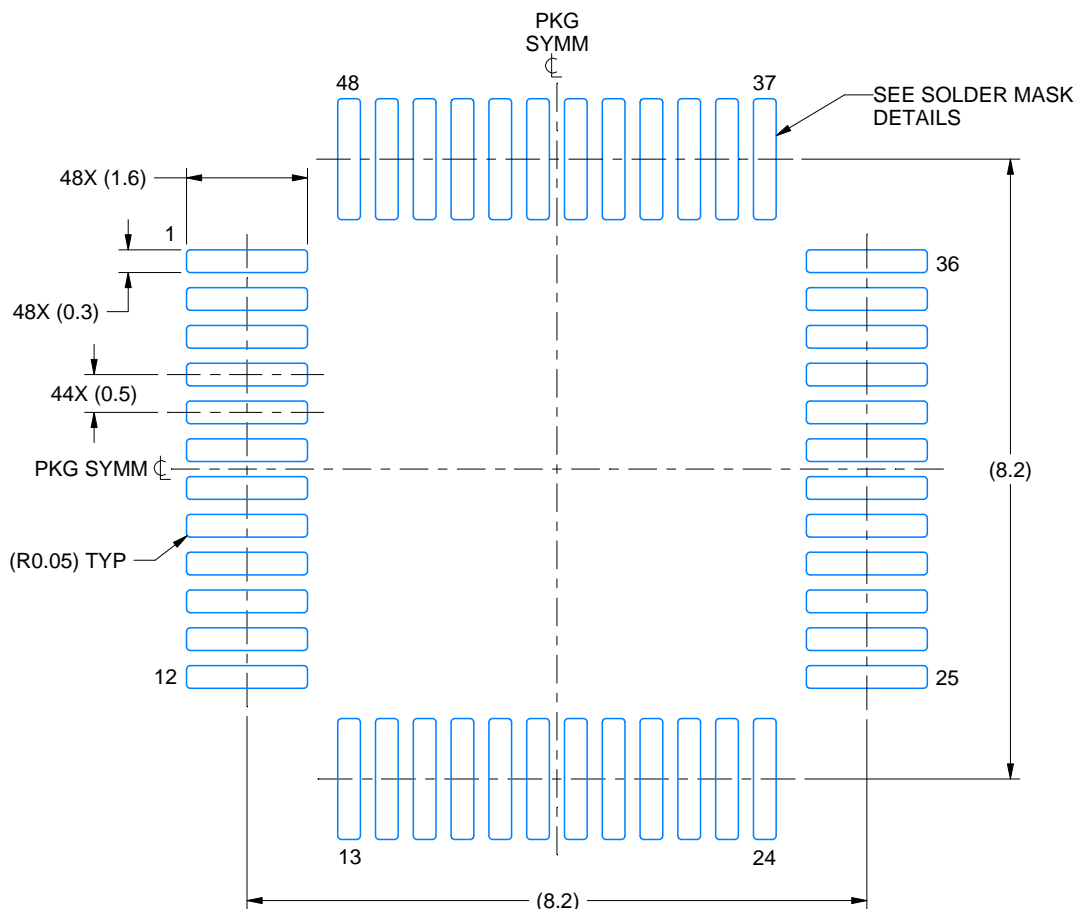
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Reference JEDEC registration MS-026.
4. This may also be a thermally enhanced plastic package with leads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

EXAMPLE BOARD LAYOUT

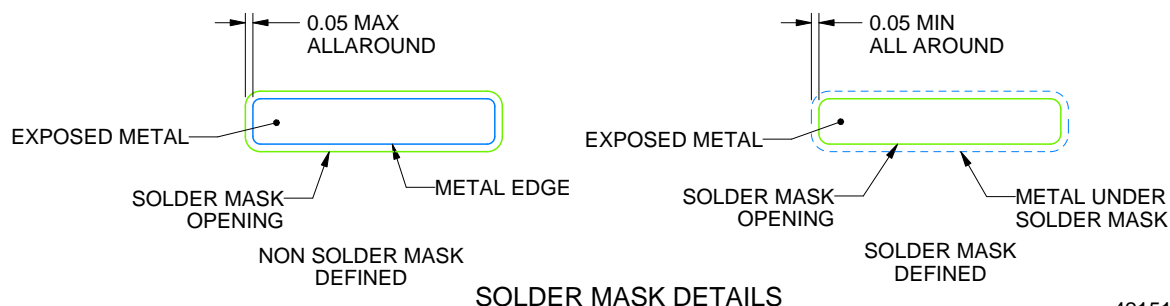
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LQFP - 1.6 mm max height

LOW PROFILE QUAD FLATPACK



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE 10.000



SOLDER MASK DETAILS

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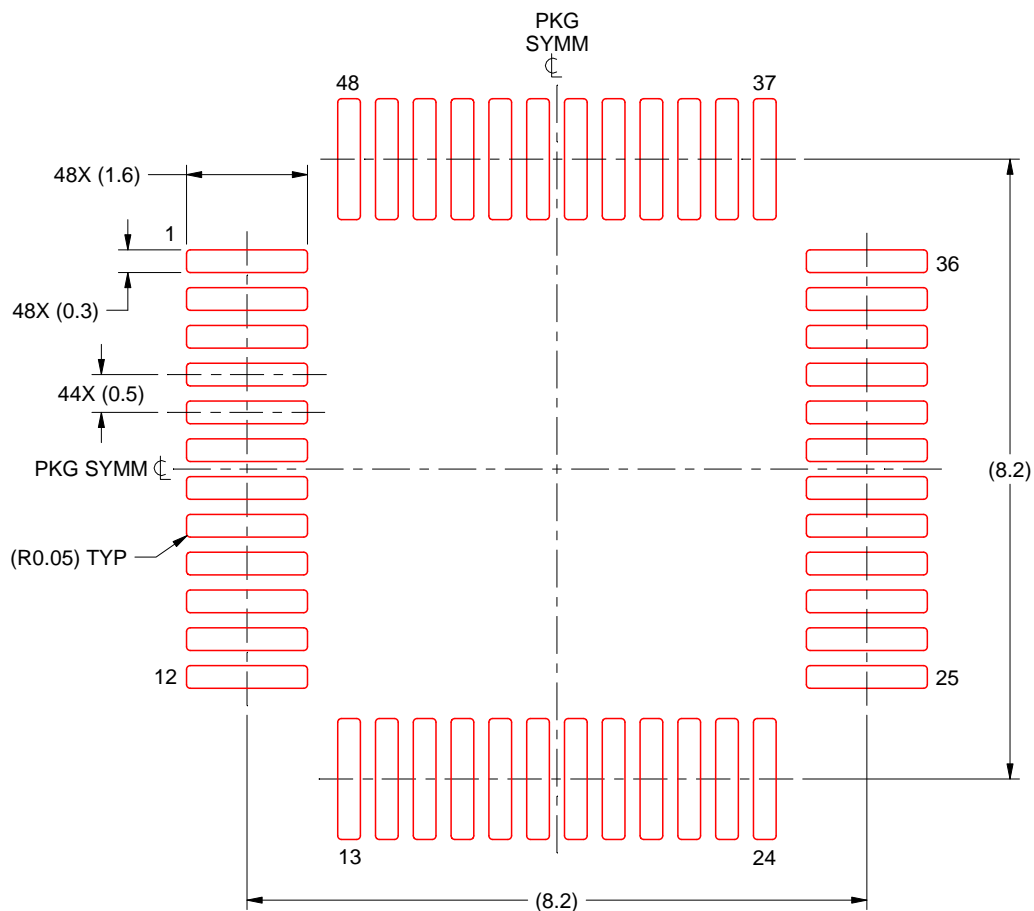
NOTES: (continued)

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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