DLP472TP 0.47 4K UHD Digital Micromirror Device

1 Features

- 0.47-inch diagonal micromirror array
  - 4K UHD (3840 × 2160) display resolution
  - 5.4µm micromirror pitch
  - ±17° micromirror tilt (relative to the flat surface)
  - Bottom illumination
- SubLVDS input data bus
- Supports 4K UHD at 60Hz
- Supports 1080p up to 240Hz
- LED operation supported by the DLPC8445 display controller and the DLPA3085 power management IC (PMIC) and LED driver

2 Applications

- Mobile smart TV
- Mobile projector
- Digital signage

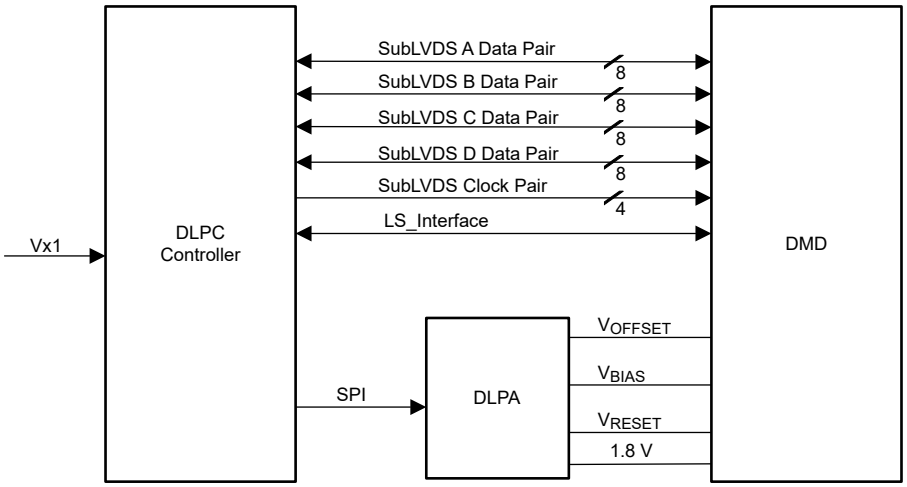
3 Description

The DLP472TP digital micromirror device (DMD) is a digitally controlled micro-electro-mechanical system (MEMS) spatial light modulator (SLM) that enables bright 4K UHD display systems. The TI DLP® products 0.47” 4K UHD chipset comprises the DLP472TP DMD, the DLPC8445 display controller, and the DLPA3085 PMIC and LED driver. The compact physical size of the chipset provides a complete system solution that enables small form factor 4K UHD displays.

Device Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE
DLP472TP	FQY (166)	24.50mm × 11.00mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.



Simplified Application

ADVANCE INFORMATION

4 Device and Documentation Support

4.1 Third-Party Products Disclaimer

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4.2 Device Support

4.2.1 Device Nomenclature

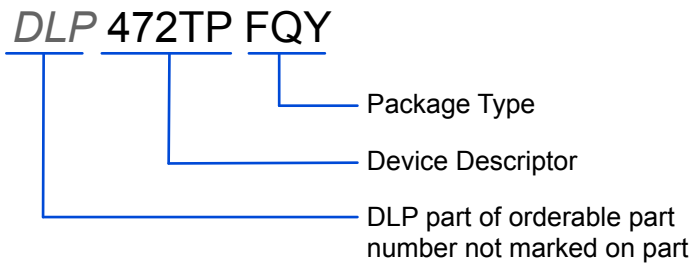


Figure 4-1. Part Number Description

4.2.2 Device Markings

The device marking includes both human-readable information and a 2-dimensional matrix code. The human-readable information is described in Figure 4-2 and includes the legible character string GHJJJJK 472TPFQY. GHJJJJK is the lot trace code and 472TPFQY is the device marking.

Example: GHJJJJK DLP472TPFQY

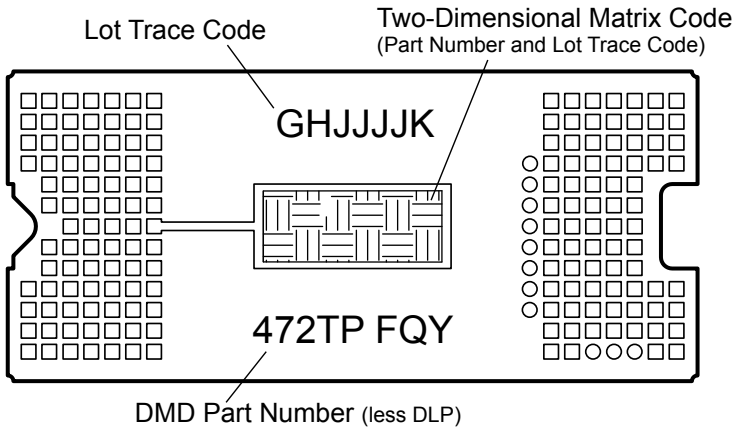


Figure 4-2. DMD Marking Locations

ADVANCE INFORMATION

4.3 Documentation Support

4.3.1 Related Documentation

The following documents contain additional information related to the chipset components used with the DMD.

- *DLPC8445 High Resolution Controller Data Sheet*
- *DLPA3085 PMIC and High-Current LED Driver IC Data Sheet*

4.4 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.5 Trademarks

DLP® is a registered trademark of Texas Instruments.
All trademarks are the property of their respective owners.

4.6 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.7 Glossary

TI Glossary — This glossary lists and explains terms, acronyms, and definitions.

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
May 2024	*	Initial Release

ADVANCE INFORMATION

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
XDLP472TPFQY	ACTIVE	CLGA	FQY	174	80	RoHS & Green	NI/AU	N / A for Pkg Type	0 to 70		Samples

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(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.

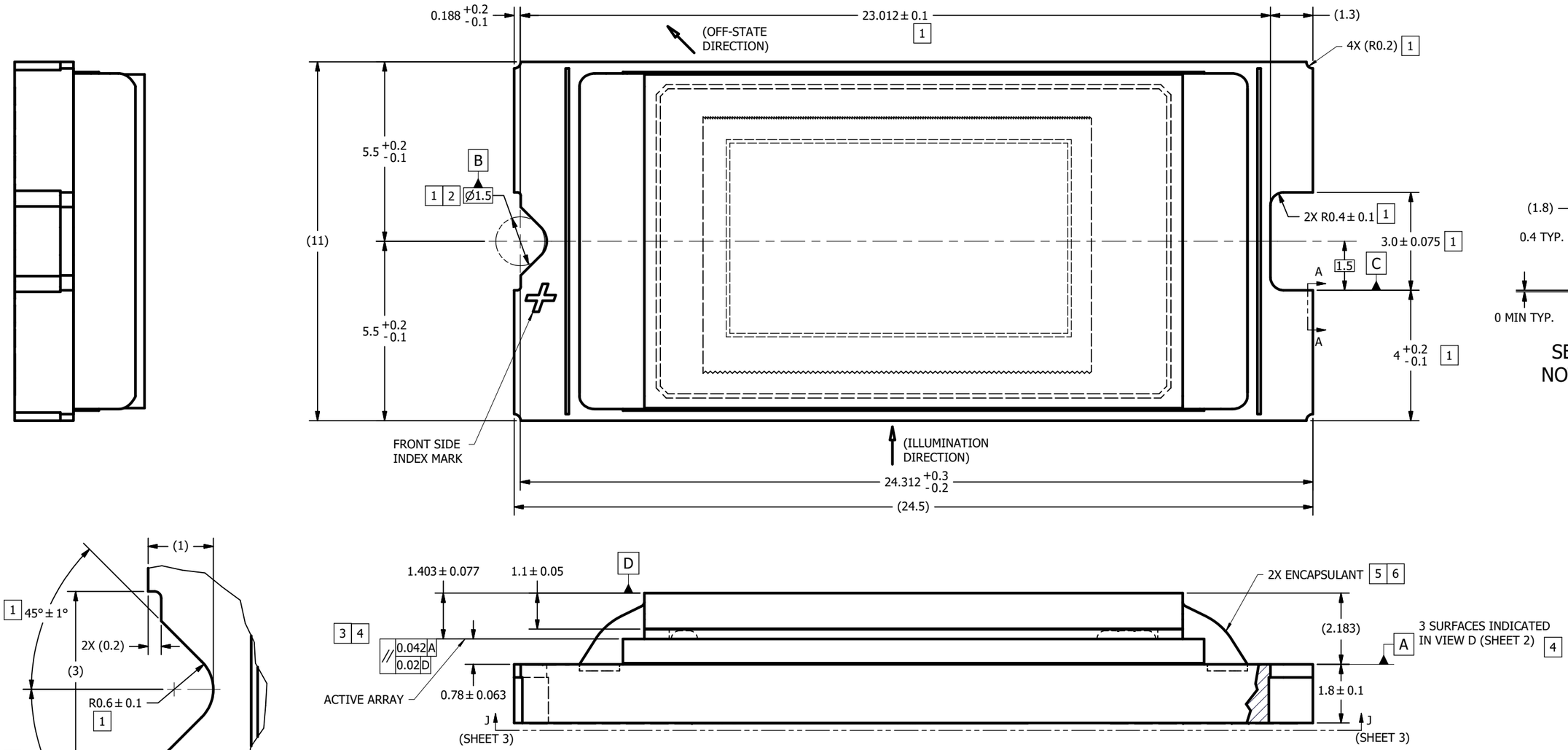
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

REVISIONS

REV	DESCRIPTION	DATE	BY
A	ECO 2202674: INITIAL RELEASE	12/22/22	HG

NOTES UNLESS OTHERWISE SPECIFIED:

1. NOTCH DIMENSIONS ARE DEFINED BY UPPERMOST LAYERS OF CERAMIC, AS SHOWN IN SECTION A-A.
2. SEE DETAIL B FOR "V-NOTCH" DIMENSIONS.
3. DIE PARALLELISM TOLERANCE APPLIES TO DMD ACTIVE ARRAY ONLY.
4. WHILE ONLY THE THREE DATUM A TARGET AREAS A1, A2, AND A3 ARE USED FOR MEASUREMENT, ALL 4 CORNERS SHOULD BE CONTACTED, INCLUDING E1, TO SUPPORT MECHANICAL LOADS.
5. ENCAPSULANT TO BE CONTAINED WITHIN DIMENSIONS SHOWN IN VIEW D (SHEET 2). NO ENCAPSULANT IS ALLOWED ON TOP OF THE WINDOW.
6. ENCAPSULANT NOT TO EXCEED THE HEIGHT OF THE WINDOW.
7. ROTATION ANGLE OF DMD ACTIVE ARRAY IS A REFINEMENT OF THE LOCATION TOLERANCE AND HAS A MAXIMUM ALLOWED VALUE OF 0.6 DEGREES.
8. BOUNDARY MIRRORS SURROUNDING THE DMD ACTIVE ARRAY.



DETAIL B
V-NOTCH
SCALE 30 : 1

0314DA	
NEXT ASSY	USED ON
APPLICATION	

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE IN MILLIMETERS
- TOLERANCES:
  - ANGLES ± 1°
  - 2 PLACE DECIMALS ± 0.25
  - 1 PLACE DECIMALS ± 0.50
- ~~DIMENSIONAL LIMITS APPLY BEFORE PROCESSES~~
- INTERPRET DIMENSIONS IN ACCORDANCE WITH ASME Y14.5M-1994
- ~~REMOVE ALL BURRS AND SHARP EDGES~~
- PARENTHETICAL INFORMATION FOR REFERENCE ONLY

		DATE
DRAWN	H. GAGLIARDI	1/22/2023
ENGINEER	H. GAGLIARDI	12/22/2022
QA/CE	P. KONRAD	12/27/2022
CM	B. HASKETT	12/22/2022
	J. McKINLEY	12/22/2022
APPROVED	M. GARCIA	1/3/2023

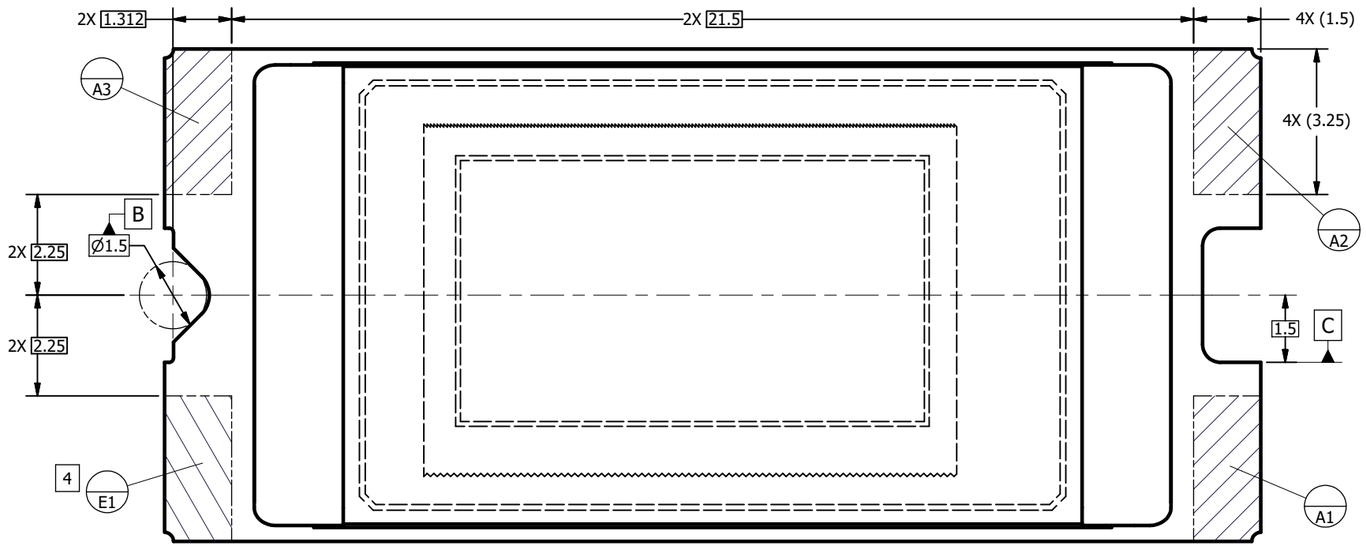
TEXAS INSTRUMENTS
Dallas Texas

TITLE
ICD, MECHANICAL, DMD,
.47 4K PKT-LVDS3 SERIES 321,
(FQY PACKAGE)

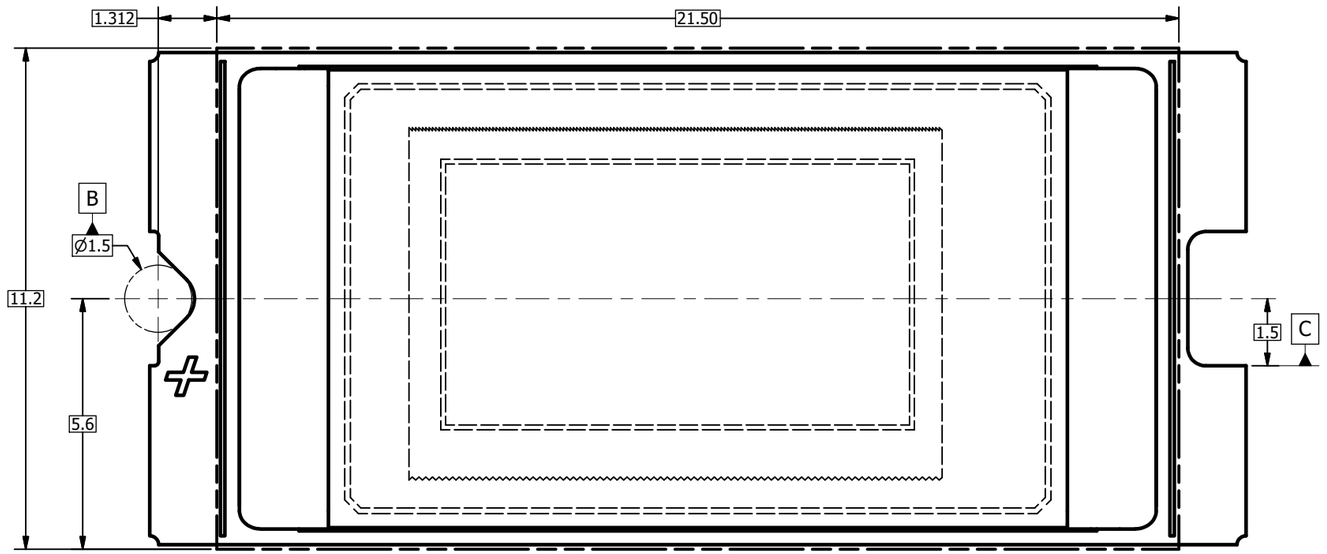
SIZE	DWG NO	REV
D	2518523	A

SCALE 15:1 SHEET 1 OF 3

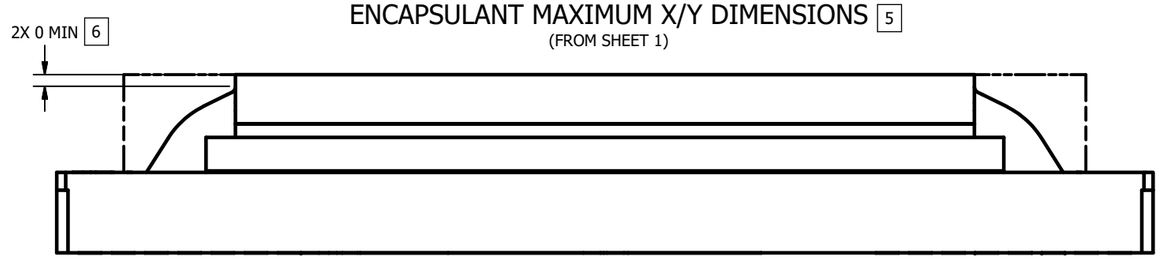
INV11-2006a



VIEW C
DATUMS A AND E
(SUBSTRATE METALLIZATION OMITTED FOR CLARITY)
(FROM SHEET 1)



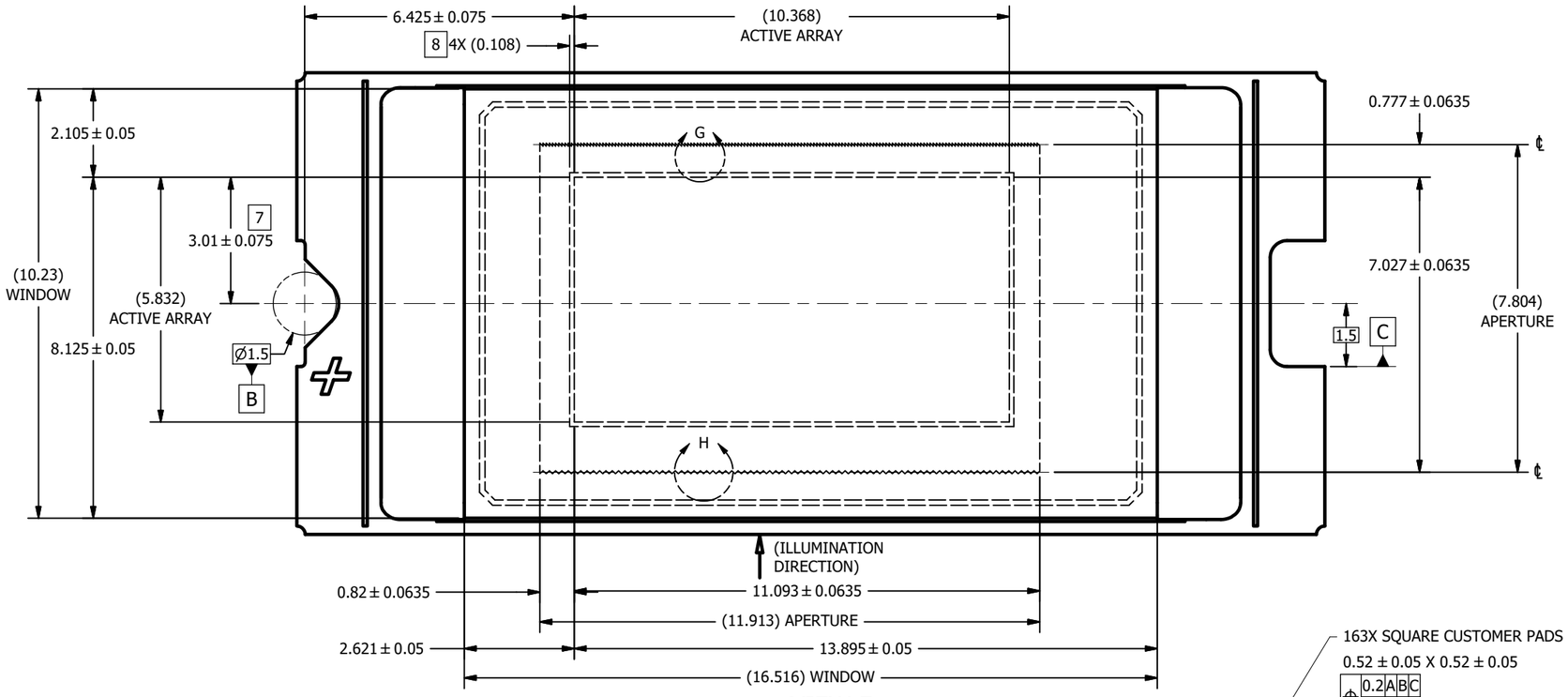
VIEW D
ENCAPSULANT MAXIMUM X/Y DIMENSIONS 5
(FROM SHEET 1)



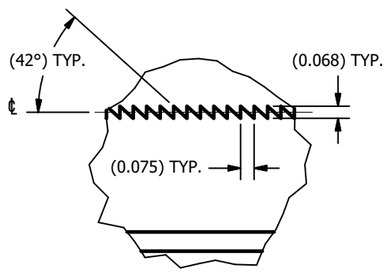
VIEW E
ENCAPSULANT MAXIMUM HEIGHT

TEXAS INSTRUMENTS Dallas Texas	DRAWN H. GAGLIARDI	DATE 1/22/2023	SIZE D	DWG NO 2518523	REV A
			SCALE	SHEET 2 OF 3	

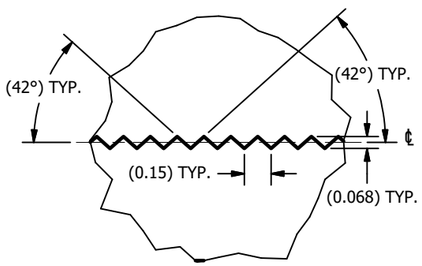
INV11-2006a



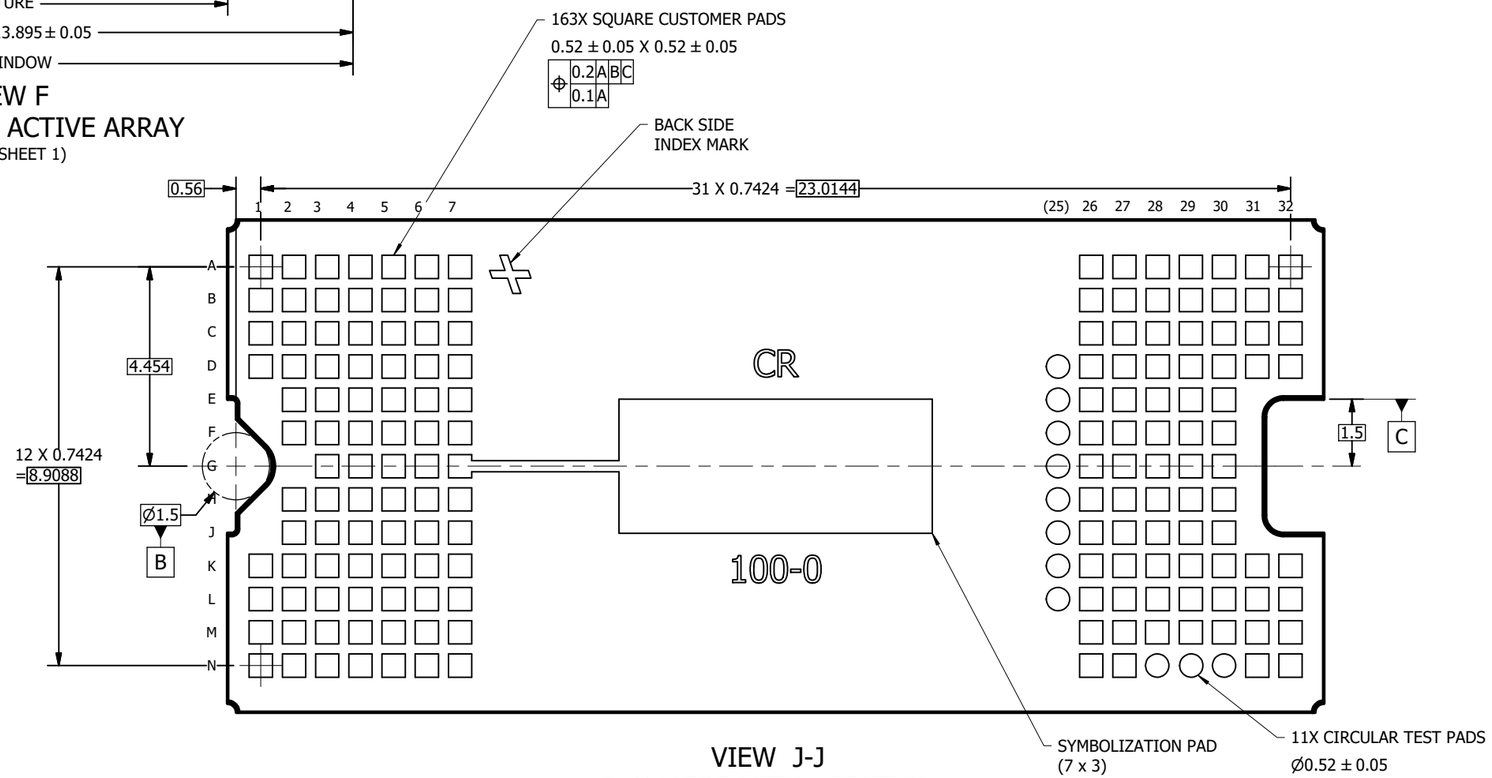
VIEW F
WINDOW AND ACTIVE ARRAY
(FROM SHEET 1)



DETAIL G
APERTURE TOP EDGE
SCALE 60 : 1



DETAIL H
APERTURE BOTTOM EDGE
SCALE 60 : 1



VIEW J-J
BACK SIDE METALLIZATION
(FROM SHEET 1)

TEXAS INSTRUMENTS Dallas Texas	DRAWN H. GAGLIARDI	DATE 1/22/2023	SIZE D	DWG NO 2518523	REV A
			SCALE	SHEET 3 OF 3	

INV11-2006a

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265