

Texas Instruments DLP® Display & Projection Chipset Selection Guide



This document can help product developers select the right DLP products for display and projection applications. A summary of the digital micromirror devices (DMDs) are presented first, followed by detailed specifications.

≤ **0.47-in array pico products** are designed for **display applications** that demand small form factor and low power consumption. A few example **applications** are smartphones and tablets, battery-powered pico projectors and mobile smart TVs, augmented reality (AR) glasses and smart home displays.



≤ 0.47-in array pico products Designed for small form factor, low power display applications

Chipset (DMD part number)	Micromirror array size (diagonal)	Display resolution
DLP160AP	0.16"	320×180 (QnHD)
DLP160CP	0.16"	640×360 (nHD)
DLP2000	0.2"	640×360 (nHD)
DLP2010	0.2"	854×480 (WVGA)
DLP230GP	0.23"	960×540 (qHD)
DLP230KP	0.23"	1280×720 (720p)
DLP230NP	0.23"	1920×1080 (1080p)
DLP3010	0.3"	1280×720 (720p)
DLP3310	0.33"	1920×1080 (1080p)
DLP4710	0.47"	1920×1080 (1080p)
DLP471TP	0.47"	3840×2160 (4K UHD)

≥ **0.47-in array products** are designed for display **applications** that demand the highest brightness and performance. Example applications include laser TV, digital signage and business and education displays.



≥ 0.47-in array products Designed for high brightness, large screen size display applications

Chipset (DMD part number)	Micromirror array size (diagonal)	Display resolution
DLP470NE	0.47"	1920×1080 (1080p)
DLP470TE	0.47"	3840×2160 (4K UHD)
DLP480RE	0.48"	1920×1200 (WUXGA)
DLP550JE	0.55"	1024×768 (XGA)
DLP650LE	0.65"	1280×800 (WXGA)
DLP650NE	0.65"	1920×1080 (1080p)
DLP660TE	0.66"	3840×2160 (4K UHD)
DLP780NE	0.78"	1920×1080 (1080p)
DLP780TE	0.78"	3840×2160 (4K UHD)
DLP800RE	0.80"	1920×1200 (WUXGA)

≤ 0.47-in array pico products

Selection guide for display applications

This selection guide can be used to compare ≤ 0.47-in array pico products for display applications. A ≤ 0.47-in array pico chipset consists of two types of components: a DMD and a display controller. Most chipsets are also supported by a dedicated power management IC (PMIC) with an integrated illumination driver.

Related technical resources include:

- [Getting Started with TI DLP® Display Technology](#)
- [TI DLP® System Design: Brightness Requirements and Tradeoffs](#)
- [TI DLP® Pico™ System Design: Optical Module Specifications](#)
- [TI DLP® Pico™ product selection video](#)

	Smallest, lowest power			Ultra-mobile, ultra-low power			
DMD part number							
DMD specifications							
Micromirror array diagonal size	0.16"	0.16"	0.20"	0.21"	0.23"	0.23"	0.23"
Display resolution	320×180 QnHD	640×360 nHD	640×360 nHD	854×480 WVGA	960×540 qHD	1280×720 720p	1920×1080 1080p
Micromirror pitch	5.4	5.4	7.6µm	5.4µm	5.4µm	5.4µm	5.4µm
DMD package size (mm)	13.39×4.97×3.18	13.39×4.97×3.18	14.1×5.0×3.6	15.9×5.3×4.0	16.8×5.92×3.58	16.8×5.92×3.58	16.8×5.92×3.58
Illumination direction	Side	Side	Corner	Side	Side	Side	Side
DMD 1ku price ¹	\$12.99	\$14.99	\$15.99	\$35.33	\$33.18	\$37.82	\$48.00
Typical optical module specifications (from third-party optical module manufacturers)							
Typical brightness (lumens) ²	Up to 100	Up to 100	Up to 50	Up to 150	Up to 250	Up to 250	Up to 250
Typical image diagonal size ³	Up to 20"	Up to 40"	Up to 30"	Up to 50"	Up to 60"	Up to 60"	Up to 60"
Typical illumination power ⁴ consumption	Up to 2W	Up to 5W	Up to 3W	Up to 15W	Up to 25W	Up to 25W	Up to 25W
Display controller specifications							
Controller part # and package size	DLPC3420 (7×7mm)	DLPC3421 (7×7mm)	DLPC2607 (7×7mm)	DLPC3430 (7×7mm) DLPC3435 (13×13mm)	DLPC3432 (7×7mm)	DLPC3434 (7×7mm)	DLPC3436 (7×7mm)
Frame refresh rate	Up to 60Hz	Up to 360Hz	Up to 60Hz	Up to 240Hz	Up to 120Hz	Up to 60Hz	Up to 60Hz
DLP IntelliBright™ Algorithms	•	•		•	•	•	•
Keystone correction (1D vertical)	•	•		•	•	•	•
Evaluation Module (EVM)			Order on TI.com				Order on TI.com
TI Reference Design			TIDA-01473	TIDA-00325	TIDA-080002		
Controller 1ku price ¹	\$3.99	\$5.49	\$6.75	\$12.75	\$13.00	\$13.50	\$17.00
PMIC part numbers, illumination drive current, and compatibility							
DLPA1000 (up to 1A)			•				
DLPA2000 (up to 750mA)	•	•		•	•	•	•
DLPA2005 (up to 2.4A)	•	•		•	•	•	•
DLPA3000 (up to 6A)				•	•	•	•
DLPA3005 (up to 16A)							
Example applications and recommended chipsets							
DLP signage				•	•	•	•
Mobile projector	•	•	•		•	•	•
Mobile smart TV						•	•
Smart display	•	•	•	•	•	•	•
Smartphone	•	•	•	•	•		
Robotics	•	•	•	•	•	•	•
AR glasses	•	•	•	•	•		

¹ Suggested Resale Price per unit (USD) for BUDGETARY USE ONLY. For higher volume price quotes, prices in local currency or delivery quotes, please contact your local Texas Instruments Sales Office or Authorized Distributor.

² Brightness is measured out of the projection lens. Estimates are based on illumination technology available as of the publication date of this document. Please read the [Brightness requirements and tradeoffs app note](#) to learn more.

³ Typical projected diagonal image sizes assume a minimum image brightness level of 50 nits for a dark room and 80% projection surface reflectivity. The required image brightness and image size will vary depending on ambient light levels. Please read the [Brightness requirements and tradeoffs app note](#) to learn more.

⁴ Illumination power consumption can be adjusted to meet product power consumption constraints. To learn more about optical module specifications, please read [TI DLP® Pico™ System Design: Optical Module Specifications](#).

≤ 0.47-in array pico products continued

Selection guide for display applications

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Related technical resources include:

- [Getting Started with TI DLP® Display Technology](#)
- [TI DLP® System Design: Brightness Requirements and Tradeoffs](#)
- [TI DLP® Pico™ System Design: Optical Module Specifications](#)
- [TI DLP® Pico™ product selection video](#)

	Mobile, low power		Compact, high brightness	
DMD part number	DLP3010 	DLP3310 	DLP4710 	DLP471TP 
DMD specifications				
Micromirror array diagonal size	0.31"	0.33"	0.47"	0.47"
Display resolution	1280×720 720p	1920×1080 1080p	1920×1080 1080p	3840×2160 4K UHD
Micromirror pitch	5.4µm	5.4µm	5.4µm	5.4µm
DMD package size (mm)	18.2×7.0×3.8	19.3×7.2×3.8	24.5×11.0×3.8	25.65×16.9×4.1
Illumination direction	Side	Side	Bottom	Bottom
DMD 1ku price ¹	\$60.28	\$64.67	\$130.24	\$130.00
Typical optical module specifications (from 3rd party optical module manufacturers)				
Typical brightness (lumens) ²	Up to 300	Up to 500	Up to 1500	Up to 1500
Typical image diagonal size ³	Up to 80"	Up to 80"	Up to 140"	Up to 140"
Typical illumination power ⁴ consumption	Up to 25W	Up to 50W	Up to 120W	Up to 120W
Display controller specifications				
Controller part # and package size	DLPC3433 (7×7mm) DLPC3438 (13×13mm)	DLPC3437 (13×13mm) 2 required	DLPC3439 (13×13mm) 2 required	DLPC6540 (31×31mm)
Frame refresh rate	Up to 120Hz	Up to 60Hz	Up to 60Hz	Up to 60Hz
DLP IntelliBright™ Algorithms	•	•	•	
Keystone correction (1D vertical)	•	•		•
Evaluation Module (EVM)	Order on TI.com		Order on TI.com	Order on TI.com
TI Reference Design	TIDA-01571	TIDA-080000	TIDA-01226	
Controller 1ku price ¹	\$13.50	\$16.21	\$16.21	\$79.00
PMIC part numbers, illumination drive current, and compatibility				
DLPA1000 (up to 1A)				
DLPA2000 (up to 750mA)	•			
DLPA2005 (up to 2.4A)	•			
DLPA3000 (up to 6A)	•	•	•	
DLPA3005 (up to 16A)	•	•	•	•
Example applications and recommended chipsets				
DLP signage	•	•	•	•
Mobile projector	•	•	•	•
Mobile smart TV	•	•	•	•
Smart display	•			
Smartphone				
Robotics	•	•		
AR glasses	•			

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⁴ Illumination power consumption can be adjusted to meet product power consumption constraints. To learn more about optical module specifications, please read [TI DLP® Pico™ System Design: Optical Module Specifications](#).

≥ 0.47-in array products

Selection guide for display applications

This selection guide compares the ≥ 0.47-in array product portfolio for display applications. A ≥ 0.47-in array chipset consists of three components: a DMD, a DLP controller, and a dedicated power management IC (PMIC). Some chipsets also require an additional micromirror driver. Related technical resources include [Getting Started with TI DLP® Display Technology](#) and [TI DLP® System Design: Brightness Requirements and Tradeoffs](#).

DMD part number	4K UHD					WUXGA	
	DLP470TE 	DLP471TE 	DLP650TE 	DLP660TE 	DLP780TE 	DLP480RE 	DLP800RE 
DMD specifications							
Micromirror array diagonal size (inches)	0.47	0.47	0.65	0.66	0.78	0.48	0.80
Display resolution (pixels)	3840×2160	3840×2160	3840×2160	3840×2160	3840×2160	1920×1200	1920×1200
Micromirror pitch (µm)	5.4	5.4	7.6	5.4	9	5.4	9
DMD package size (mm)	32.2×22.3	32.2×22.3	32.2×22.3	35×32.2	32.2×22.3	32.2×22.3	35×32.2
Illumination direction	Bottom	Bottom	Corner	Bottom	Corner	Bottom	Corner
Brightness (lumens) ²	>1500	>1500	>1500	>1500	>1500	>1500	>1500
Typical image resolution size ³	>80"	>80"	>80"	>80"	>80"	>80"	>80"
Controller specifications							
Controller part # and package size	DLPC4422 (27×27mm)	DLPC7540 (31×31mm)	DLPC7540 (31×31mm)	DLPC4422 (27×27mm)	DLPC4420 (27×27mm)	DLPC4422 (27×27mm)	DLPC4430 (27×27mm)
Frame refresh rate (Display res. Hz)	60	60	60	60	60	120	120
DLP BrilliantColor™ Algorithm	•	•	•	•	•	•	•
Warping/Blending correction		•	•				
1D Keystone correction	•	•	•	•	•	•	•
PMIC and driver compatibility							
DLPA100 (PMIC)	•	•	•	•		•	
DLPA300 (Micromirror driver)					•		•
Example applications and recommended chipsets							
Laser TV	•	•	•	•	•		
Business & education	•	•	•	•	•	•	•
Digital signage			•	•	•		•
Warehouse automation							

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³ Typical projected diagonal image sizes assume a minimum image brightness level of 200 nits for a well-lit room and 80% projection surface reflectivity. The required image brightness and image size will vary depending on ambient light levels. Please read the [Brightness requirements and tradeoffs app note](#) to learn more.

⁴ Power consumption of the DLP chipset varies based on media content, input resolution, and frame rate. The specified power consumption assumes full DMD display resolution and 60Hz frame rate.

≥ 0.47-in array products continued

Selection guide for display applications

This selection guide compares the ≥ 0.47-in array product portfolio for display applications. A ≥ 0.47-in array chipset consists of three components: a DMD, a DLP controller, and a dedicated power management IC (PMIC). Some chipsets also require an additional micromirror driver. Related technical resources include [Getting Started with TI DLP® Display Technology](#) and [TI DLP® System Design: Brightness Requirements and Tradeoffs](#).

DMD part number	1080p					WXGA	XGA
	DLP471NE	DLP470NE	DLP650NE	DLP651NE	DLP780NE	DLP650LE	DLP550JE
DMD specifications							
Micromirror array diagonal size (inches)	0.47	0.47	0.65	0.65	0.78	0.65	0.55
Display resolution (pixels)	1920×1080	1920×1080	1920×1080	1920×1080	1920×1080	1280×800	1024×768
Micromirror pitch (µm)	5.4	5.4	7.6	7.6	9	10.8	10.8
DMD package size (mm)	32.2×22.3	32.2×22.3	35×32.2	32.2×22.3	32.2×22.3	35×32.2	32.2×22.3
Illumination direction	Bottom	Bottom	Corner	Corner	Corner	Corner	Corner
Brightness (lumens) ²	>1500	>1500	>1500	>1500	>1500	>1500	>1500
Typical Image resolution size ³	>80"	>80"	>80"	>80"	>80"	>80"	>80"
Controller specifications							
Controller part# and package size	DLPC7540 (31×31mm)	DLPC4422 (27×27mm)	DLPC4422 (27×27mm)	DLPC7540 (31×31mm)	DLPC4430 (27×27mm)	DLPC4422 (27×27mm)	DLPC4422 (27×27mm)
Frame refresh rate (Display res. Hz)	240	120	120	240	120	120	120
DLP BrilliantColor™ Algorithm	•	•	•	•	•	•	•
Warping/Blending correction	•			•			
1D Keystone correction	•	•	•	•	•	•	•
PMIC and driver compatibility							
DLPA100 (PMIC)	•	•	•	•		•	•
DLPA200 (Micromirror driver)						•	•
DLPA300 (Micromirror driver)					•		
Example applications and recommended chipsets							
Laser TV	•	•	•	•	•		
Business & education		•	•	•	•	•	•
Digital signage			•	•	•		
Warehouse automation						•	•

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³ Typical projected diagonal image sizes assume a minimum image brightness level of 200 nits for a well-lit room and 80% projection surface reflectivity. The required image brightness and image size will vary depending on ambient light levels. Please read the [Brightness requirements and tradeoffs app note](#) to learn more.

⁴ Power consumption of the DLP chipset varies based on media content, input resolution, and frame rate. The specified power consumption assumes full DMD display resolution and 60Hz frame rate.

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