

New Product Update: **DLP Pico 0.16-inch DLP160CP DMD** for the smallest projection display applications

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November 4, 2021

Agenda

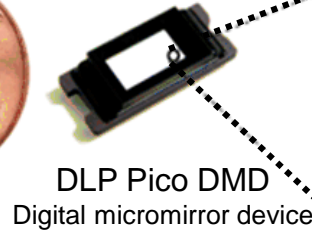
- DLP Pico technology introduction
- New 0.16-inch chipset overview
- Projection module size and performance
- Ultra compact display applications
- Getting started with the new 0.16 chipsets
 - TI.com and third-party resources

DLP Technology | Millions of mirrors



An industry leader in digital cinema, projection, and MEMS

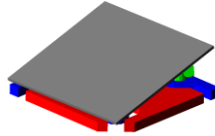
Extremely flexible and programmable light management



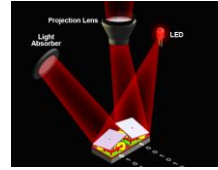
DLP Pico DMD
Digital micromirror device



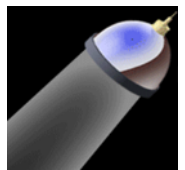
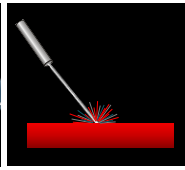
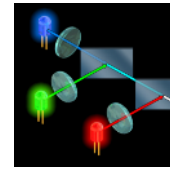
Array of mirrors (5.4µm TRP)



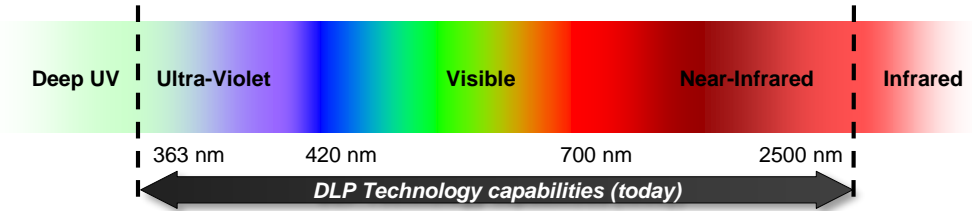
that digitally switches...



...to steer light



Works with LED, lasers and lamps



Home / [DLP products](#) 

DLP products

Product tree

Advanced light-control chipsets (33)

High-speed visible chipsets (25)

Near-infrared (NIR) chipsets (6)

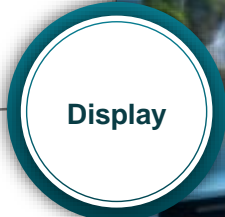
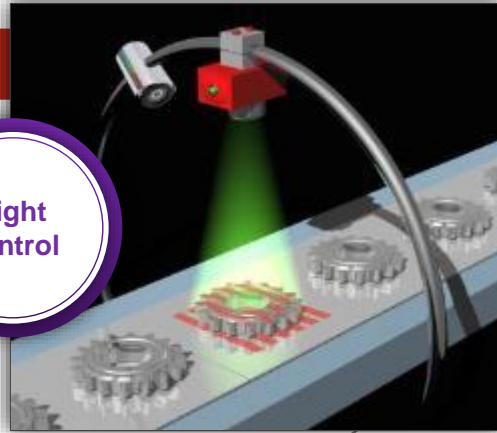
Ultraviolet (UV) chipsets (12)

Automotive chipsets (14)

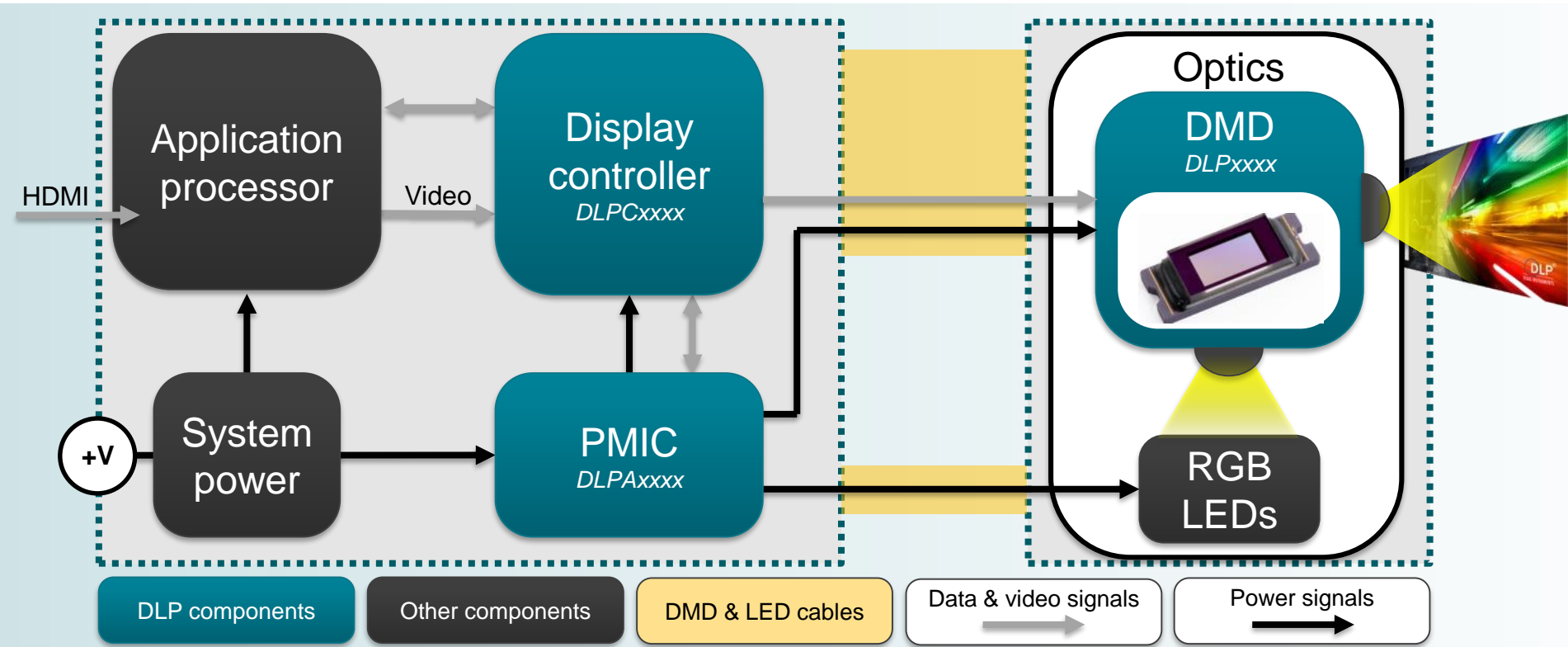
Display & projection chipsets (43)

Pico chipsets (28)

Standard chipsets (15)



DLP Display | Sub-system overview



DLP Pico | display applications



Wide range of
Smallest lowest power
display applications:

Smartphones & tablets
Smartphone companion

AR glasses

Robotics

Appliances

Mobile smart TVs

Laser TVs

Smart displays

Educational toys

Enterprise projectors

AR signage

Interactive lighting

Commercial gaming

And more...

DLP Pico Display | smallest lowest power projection

Key technology advantages

High brightness



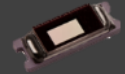
- Highly reflective micromirrors enable high brightness optical engines
- Small 0.2" DLP chips designed for up to 300 lumens (out of the projector)

Low power



- Highly efficient optical systems enable lower illumination power
- Content adaptive illumination control (CAIC) for brighter, lower power images

Small size



- 0.1" and 0.2" micromirror arrays enable small optics
- <7mm thick optical engines enable thin products

New 0.16 chipset | Introduction

Smallest form factor and lowest power DLP solutions up to 100lm

Up to 80% smaller optics than gen1 .2nHD with higher brightness & efficiency

0.16 nHD Chipset



DLP160CP / DLP160AP DMD

0.16-Inch diagonal array, side illumination for smallest optics

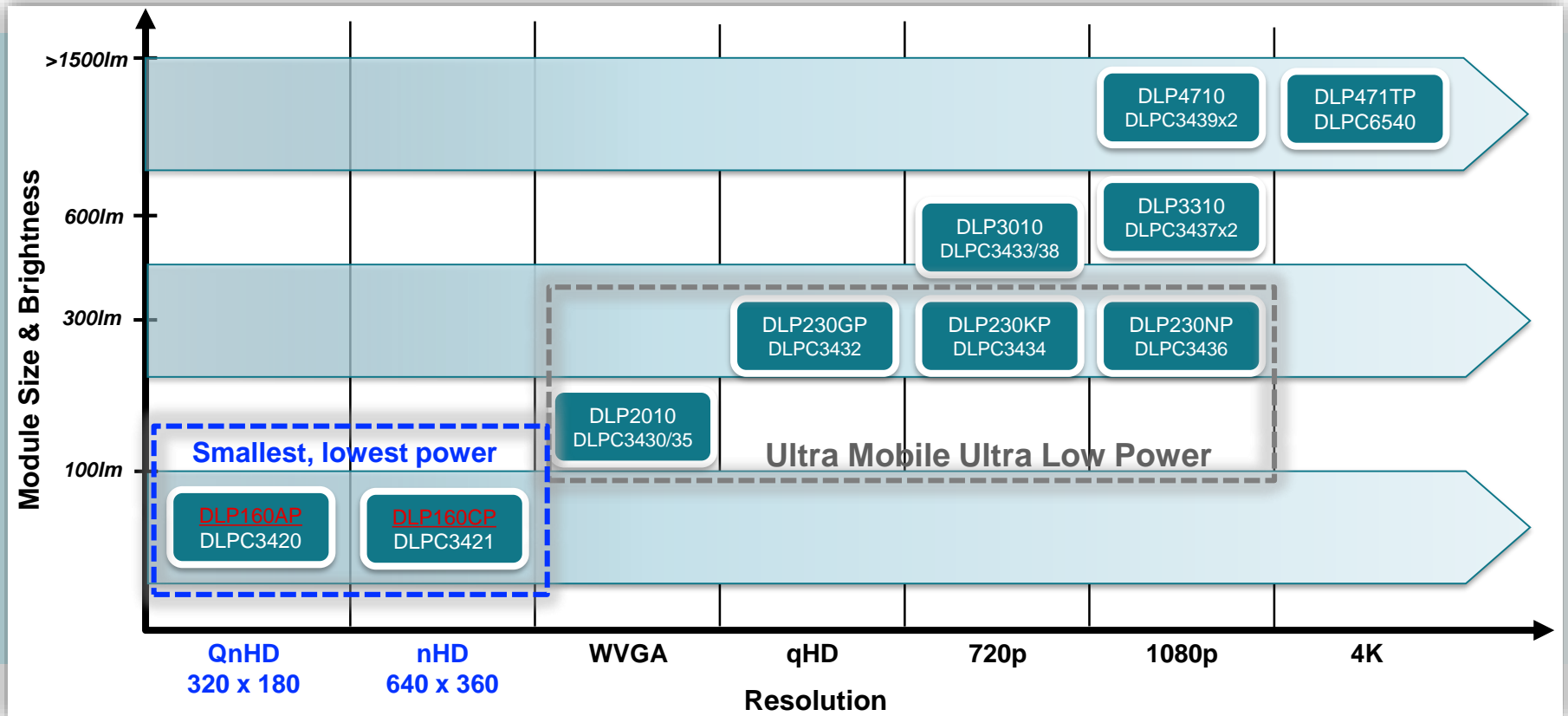


DLPC3421 / DLPC3420 Controller

Optimized for small form factor, low power display applications





DLP Products | Pico display portfolio



DLP160CP .16 nHD Chipset | Overview

Features

- **0.16 nHD DMD: [DLP160CP](#)** 
 - S248 package, LGA interposer for interconnect
 - Package dimensions (mm): 13.39 x 4.97 x 3.18
 - Side illuminated, supports up to 100 lm
 - 640 x 360 Display Resolution
- Supports up to WVGA 360Hz input frame rate
- **DLPC3421 Controller** 
 - 7x7mm .4mm ball pitch
 - Parallel and DSI input interface
 - Embedded frame memory
 - Input data formats: 8-bit RGB
 - 1D keystone correction
 - Content adaptive illumination control (CAIC)
 - Pairs with DLPA2000/5 PMIC and LED driver

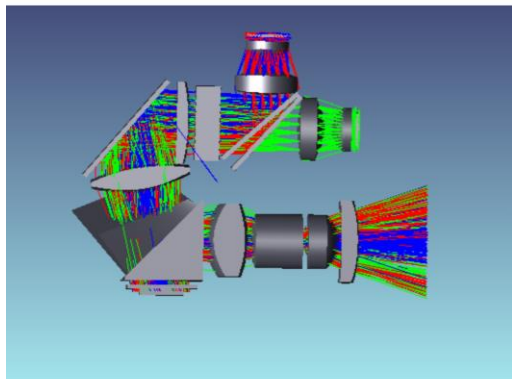
Benefits

- **Smallest form factor (can enable <2cc optical module)**
 - Up to 80% smaller optics than gen1 nHD with higher brightness and efficiency
- **Lower BOM cost**
 - Lowest cost optics and electronics; controller eliminates external frame memory, DSI to parallel bridge
- **Video performance in small package**
 - Parallel & DSI input I/F; up to WVGA input; KS correction, content adaptive illumination control, and local area brightness boost

0.16 Chipset | Optical Module Size Reduction

Gen1

Optics volume: 8.1cc
Optics dimensions: 30 x 30 x 9 mm

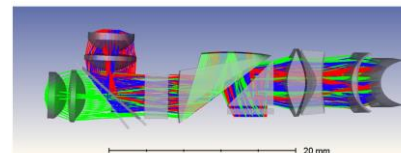


DLP2000 (0.2-inch nHD)
Corner illumination, 2-Channel



Gen2

Optics volume: 1.65cc
Optics dimensions: 32.5 x 10.6 x 4.8mm



DLP160CP (0.16-inch nHD)
Side illumination, 2-Channel

DLP Pico Display | AR Glasses



Low Contrast vs High Contrast

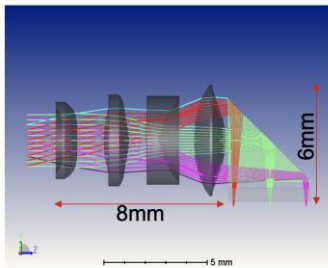
High contrast makes graphics pop and the background more see-through

Example 0.16" eyepiece optical design

Side-illuminated DMDs can enable slim, in-line optical engines for compact AR glasses

FOV 30 deg (diagonal)

[0.16 eyepiece optical reference design](#)



5.4 mm x 5.4mm x 8mm= .23cc
(Eyepiece only, prism excluded)

Description & Benefits

- Improve productivity and throughput
- High optical efficiency
- Fast pixel switching
- Vivid colors
- High contrast
- Content adaptive illumination control
- Smaller gaps between pixels

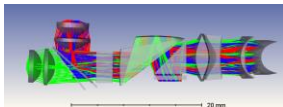
DLP Pico Display | Appliances

Description & Benefits

- Unique industrial designs
- Large image from small form factor
- On-demand/disappears when off
- Free form display
- Display on any surface (including projecting on heated cooktop)
- Can incorporate interactivity
- Pair with transparent film



Example 0.16" optical design



Dimensions: 32.5 x 10.6 x 4.8mm

Volume: 1.65cc

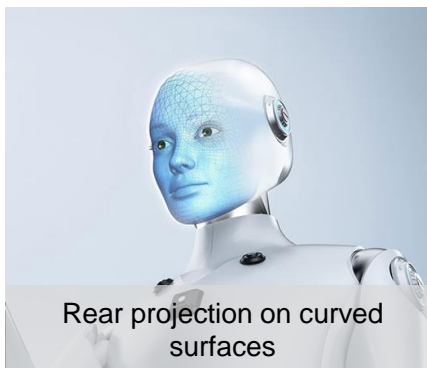
[0.16 Optical Reference Design](#)
[DLP160AP \(0.16-inch QnHD\) DMD](#)



DLP Pico Display | Robotics

Description & Benefits

- Project on any surface
- On-demand/disappears when off
- Large image from small form factor
- Content adaptive illumination control
- High contrast
- Wide color gamut
- Optical and power efficiency
- Pair with low-cost camera to find and highlight objects

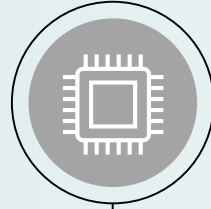


DLP Pico Display | Development options



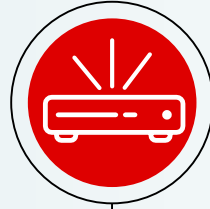
Custom product design

Design a new product from the ground up with a custom optical module sourced from a DLP Pico optical module manufacturer.



System Integrator

Work with an experienced DLP Pico system integrator on a semi-custom product, with control over some features and specs.

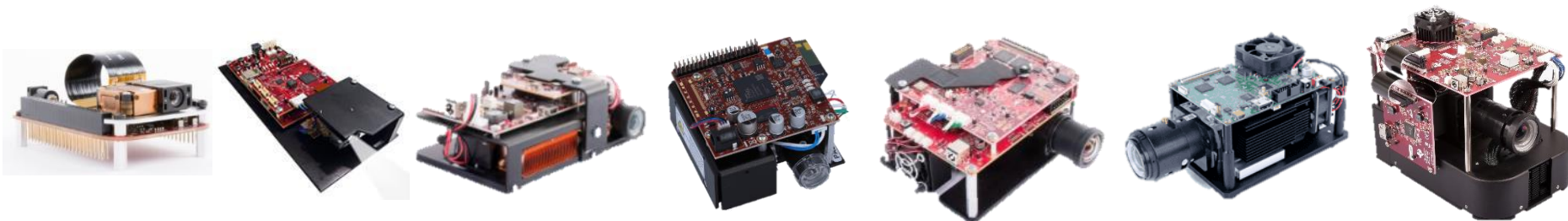


ODM

Source a turnkey product with minimal customization options from an experienced DLP Pico projector ODM.

DLP Pico Display | Evaluation modules

Micromirror array size	Resolution	Typical brightness	DMD	Evaluation module	EVM Brightness	Reference design
0.47"	4K	Up to 1500 lm	DLP471TP	DLPDLCR471TPEVM	500 lm	
0.47"	1080p	Up to 1500 lm	DLP4710	DLPDLCR4710EVM-G2	600 lm	TIDA-01226
0.33"	1080p	Up to 600 lm	DLP3310	DLPDLCR3310EVM	300 lm	TIDA-080000
0.23"	1080p	Up to 300 lm	DLP230NP	DLPDLCR230NPEVM	100 lm	
0.3"	HD (720p)	Up to 400 lm	DLP3010	DLPDLCR3010EVM-G2	300 lm	TIDA-01571
0.23"	HD (720p)	Up to 300 lm	DLP230KP			
0.23"	qHD	Up to 300 lm	DLP230GP			TIDA-080002
0.2"	WVGA	Up to 180 lm	DLP2010	DLPDLCR2010EVM	25 lm	TIDA-00325
0.2"	nHD	Up to 50 lm	DLP2000	DLPDLCR2000EVM	20 lm	TIDA-01473
0.16"	nHD	Up to 100 lm	DLP160CP	Coming soon		



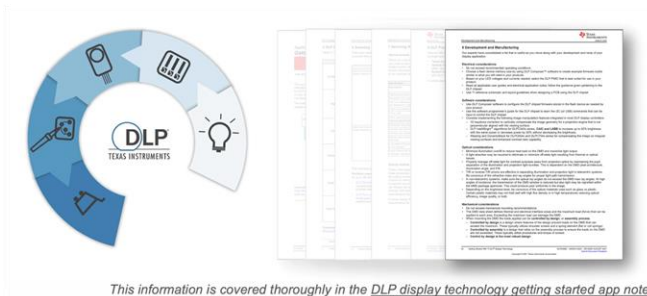
0.16 Chipset | Additional resources



[DLP160CP](#)



[DLPC3421](#)



[Getting started video](#)

- [How we designed a DMD for the smallest projection display applications](#) technical article
- [TI DLP Pico System Design: Optical Module Specifications](#) application note
- [DLP Pico .16-inch chipsets](#) DMDs and controllers (nHD and QnHD)
- [Third-party search tools](#) optical module and third-part search tools

Visit www.ti.com/npu

For more information on the New Product Update series, calendar and archived recordings



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