

Welcome!

Texas Instruments New Product Update

- This webinar will be recorded and available at www.ti.com/npu
- Phone lines will be muted
- Please post questions in the chat or contact your sales person or field applications engineer



TI DLP[®] Pico[™] Products

Introducing desktop DLP 3D printer chipsets

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July 2021

DLP Pico 3D Print New Product Update

❑ DLP® Pico Light Control introduction

❑ New 3D print chipsets and features:

- DLP300S DMD
- DLP301S DMD
- DLPC1438 controller

❑ Getting started with DLP 3D printer technology

❑ TI.com and third-party resources



TI DLP Products | a history of innovation

1987

Dr. Larry Hornbeck
invents DLP
technology



1996

First commercial
DLP systems



1998

DLP Products
receives first
Emmy® Award
for Outstanding
Achievement In
Engineering
Development



1999

**Star Wars: Episode
1 – The Phantom
Menace** shown on
DLP Digital Cinema



2009

Consumer devices
ship featuring **DLP
Pico™ technology**
based projectors



2012

**DLP Industrial
development kit**
launches allowing
developers to
use DLP technology
in new markets



2015

Dr. Hornbeck receives
the **2014 Scientific and
Technical Academy
Award® of Merit**
(**Oscar® statuette**) for
the invention of DMD
technology as used in
DLP Cinema® projection
Photo credit: Michael Yada /
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2017

Lincoln Continental,
**first automobile
with DLP
technology based
HUD**



2021

DLP 3D printing
expands into
consumer market



**First 4K UHD
projector with
MSRP < \$2000**
with DLP 4K
UHD chipset



First automotive-
qualified DLP chipset
for head-up display
(HUD) applications



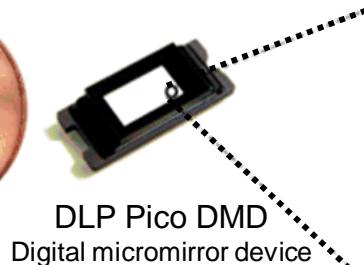
For more than three decades, award-winning DLP Product innovations have solved some of the world's most complex display and light control applications

DLP Technology | Millions of mirrors



An industry leader in
digital cinema, projection,
and MEMS

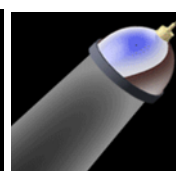
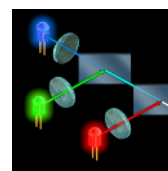
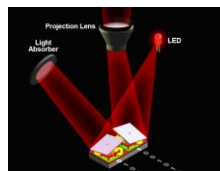
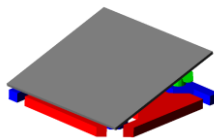
Extremely flexible and
programmable light
management



DLP Pico DMD
Digital micromirror device

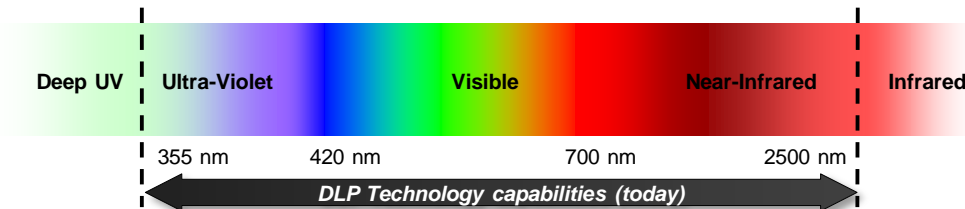


Array of mirrors (5.4 μ m TRP)



that digitally switches... ...to steer light

Works with LED, lasers and lamps



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)

Light
control

Automotive

Display

New DLP 3D Print Chipsets

Factory floor performance, at desktop prices

Desktop DLP 3D printing:

Ultra fast print speeds

High efficiency and output

Full layer exposure

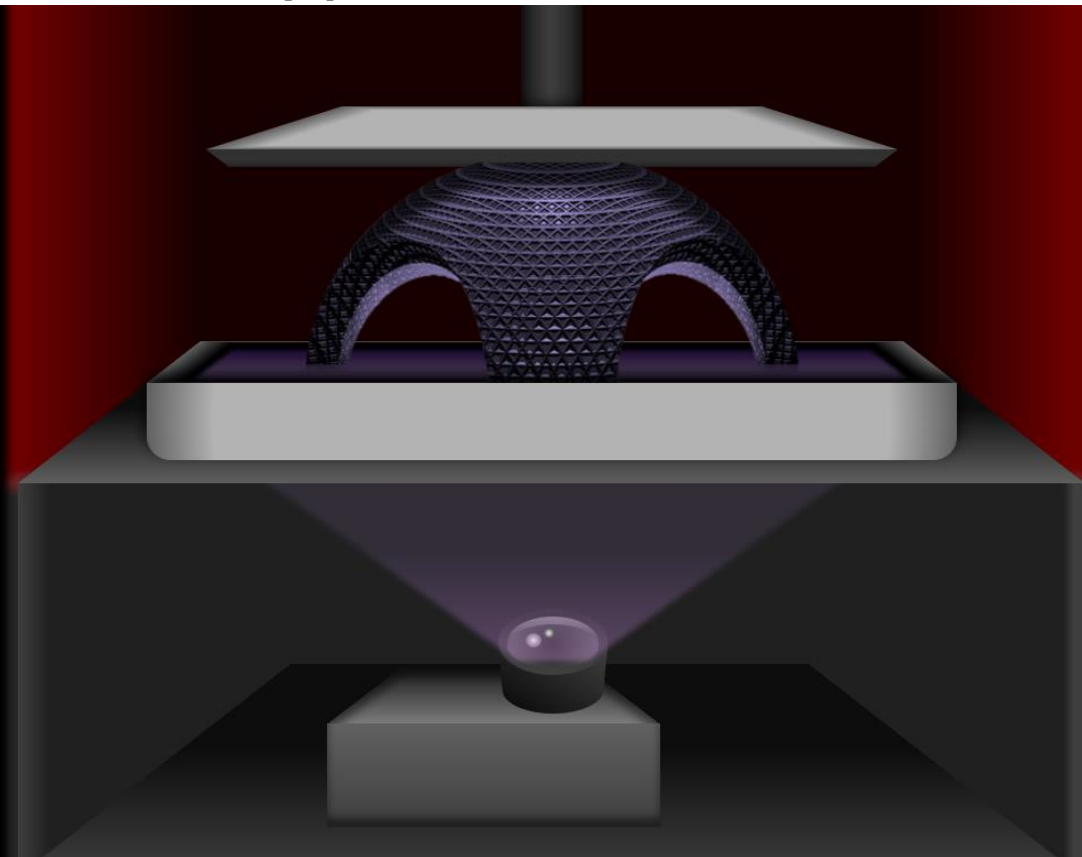
Fine detail, high accuracy

Focused images on resin

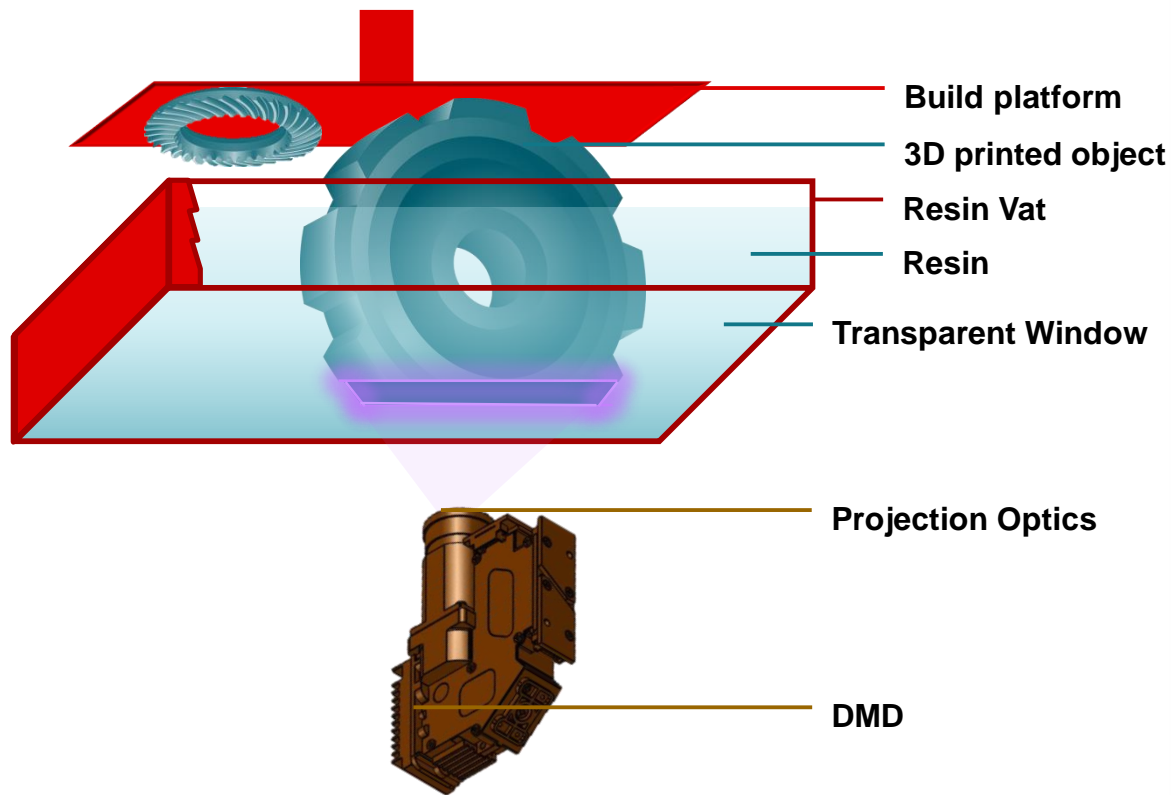
Small features, smooth surface finish

Built to perform

Based on technology used in \$100,000+ industrial DLP 3D printers



DLP 3D Printers | System and benefits



Desktop DLP 3D printing means:

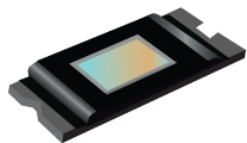
- ☐ Fast print speed
 - Print a full layer at a time
 - High optical efficiency and output
- ☐ High resolution
 - DMD speed + pixel actuation
 - Focused image on resin
- ☐ Reliable operation at 405nm
 - Inherent to DLP technology
 - Based on technology used in:
 - PCB lithography
 - Industrial 3D printers

DLP4710LC Chipset | Overview

Available now

Chipset

DLP4710LC DMD



2x DLPC3479 controllers



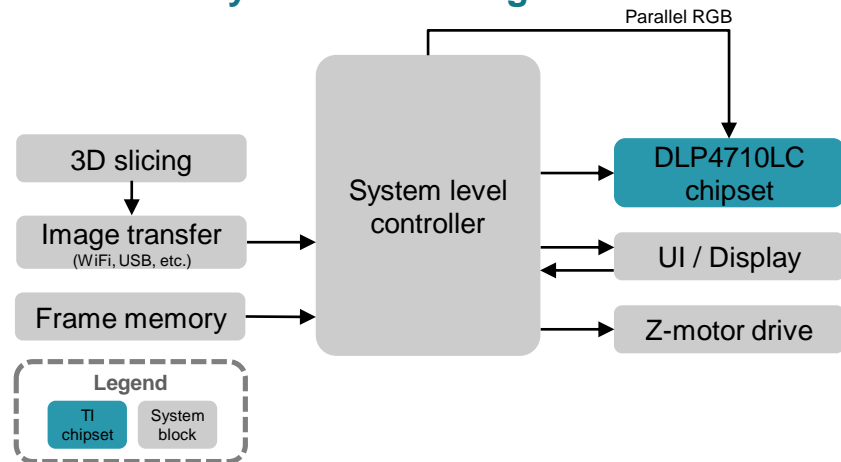
System highlights

- ❑ Functionally equivalent, drop-in replacement to:
 - DLP4710
 - DLP4711
- ❑ Fast DMD switching speed
- ❑ 3rd party optical modules and systems available today
- ❑ Specified wavelengths: 420-700nm

Features

- ❑ **Functionally equivalent** – DLP4710, DLP4711
- ❑ **Process improvements** – for light control applications
- ❑ **High resolution 2.1 MP** – Focused optics, high accuracy

System block diagram



DLP300S Chipset | Overview

Samples Available

Chipset

DLP300S DMD



DLPC1438 controller



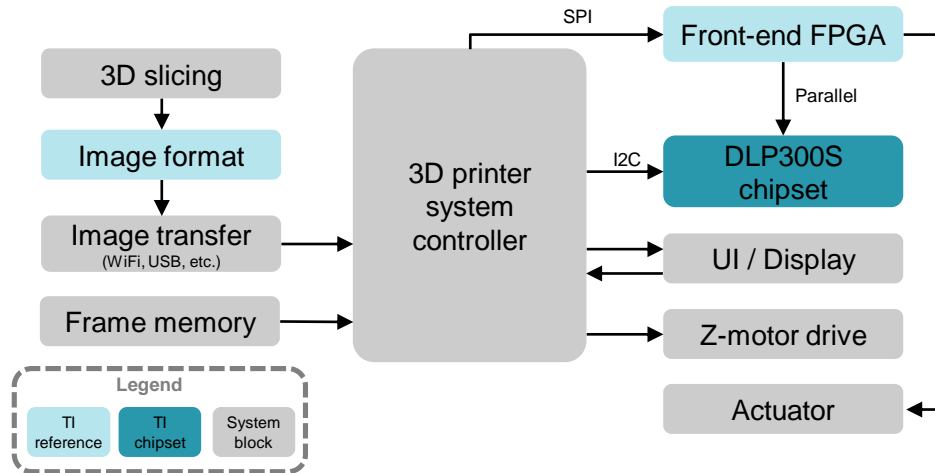
Features

- ❑ **Fast printing speed** – Print a full layer at a time
- ❑ **Reliable operation at 405nm** – >3x output vs RGB LCD
- ❑ **High resolution 3.6 MP** – Focused optics, high accuracy

System highlights

- ❑ Enables <\$499 DLP 3D printers
 - Lowest cost DLP 3D printing chipset
- ❑ Fast DMD switching speed and 4-way actuator
 - For high accuracy resolution and smooth prints
- ❑ TI reference designs will be available:
 - DLP subsystem electronics & optics
 - Reference code:
 - ❑ Image formatting
 - ❑ Actuator logic

System block diagram



DLP301S Chipset | Overview

Samples Available

Chipset

DLP301S DMD



DLPC1438 Controller



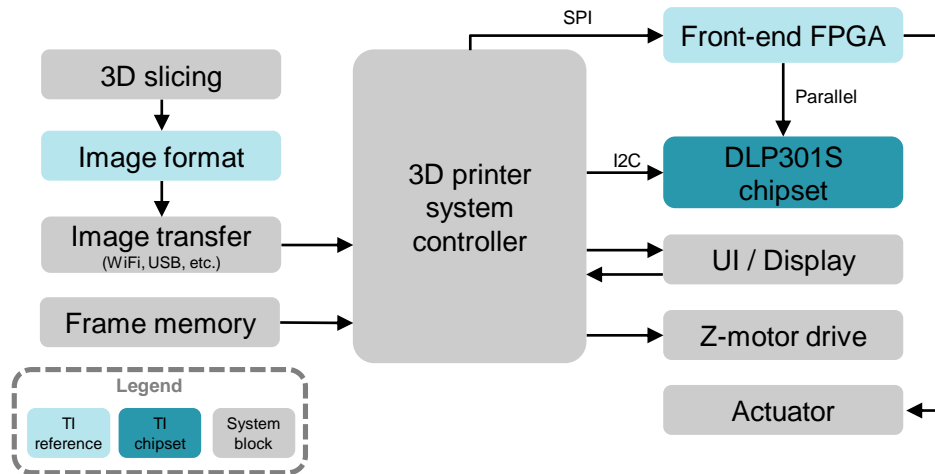
Features

- ❑ **Fast printing speed** – Print a full layer at a time
- ❑ **Reliable operation at 405nm** – >14x output vs RGB LCD
- ❑ **High resolution 3.6 MP** – Focused optics, high accuracy

System highlights




- ❑ Enables low cost, high performance DLP 3D printers
 - Low cost SPI bus instead of parallel RGB
- ❑ 3.6 MP solution in higher power package
 - Increased print speed and material capabilities
- ❑ Fast DMD speed and 4-way actuator
 - For high accuracy resolution and smooth prints
- ❑ TI reference designs will be available:
 - DLP subsystem electronics & optics
 - Reference code:
 - ❑ Image formatting
 - ❑ Actuator logic

System block diagram

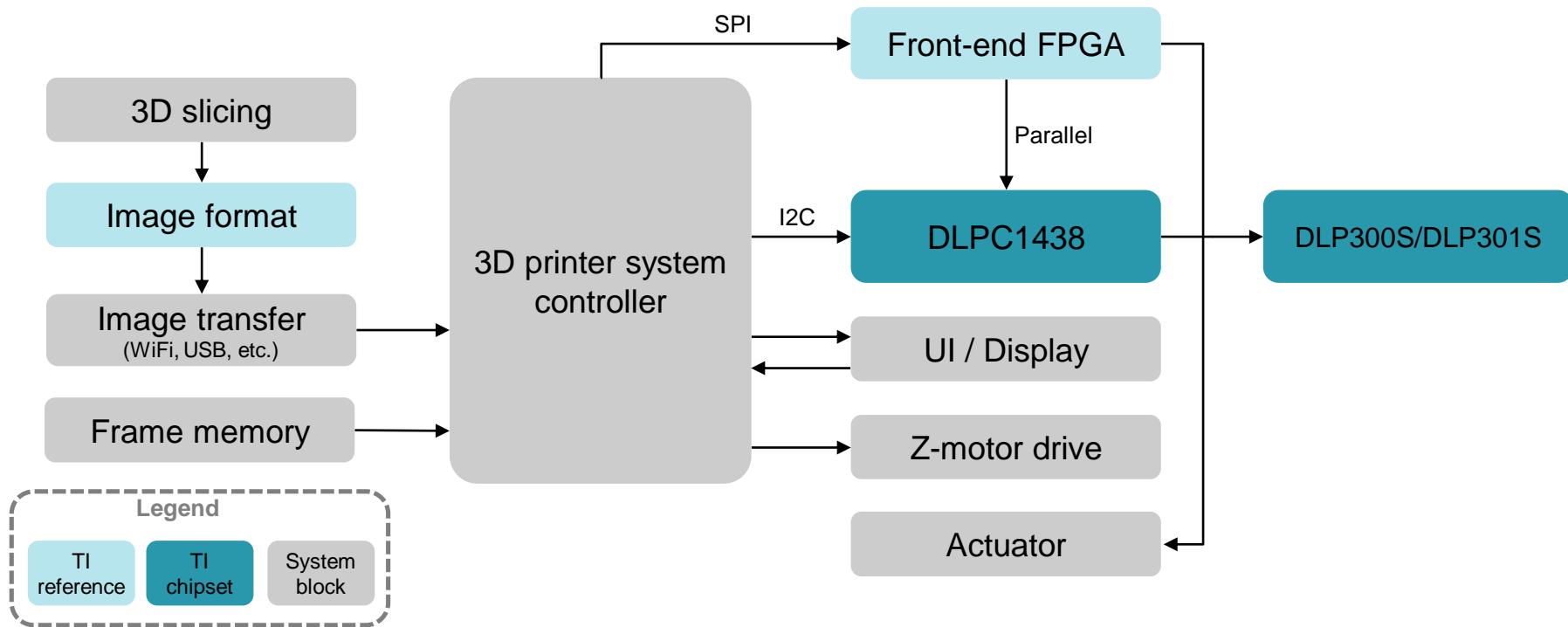


Desktop 3D print chipsets **overview***

*Specifications are targets and subject to change

	DLP4710LC	DLP300S DLP301S	Future
Availability	 Today	 Samples available	 In Progress
Resolution	2.1 MP	3.6 MP	≥ 3.6 MP
Wavelength	420 – 700 nm	400 – 550 nm	400 – 550 nm

3D Printer System block diagram



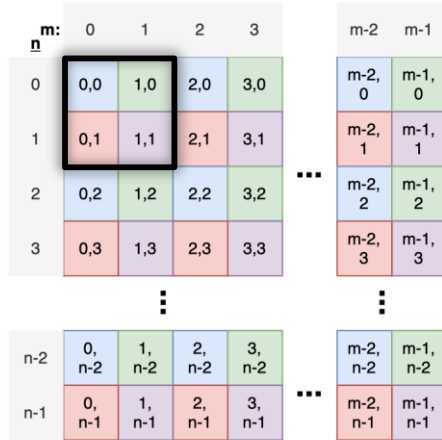
High resolution **with actuated pixels on resin**

Input image: 2560 x 1440

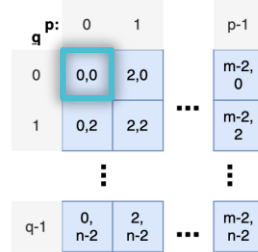
4 Subframes: 1280 x 720

Displayed image: 2560 x 1440

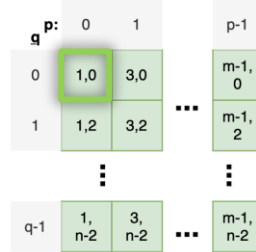
Input Frame: $m \times n$ resolution



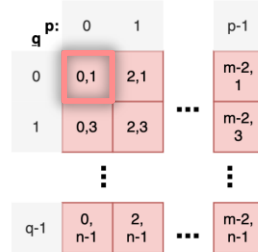
Subframe A: $p \times q$ resolution



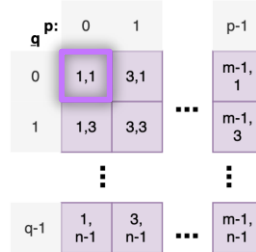
Subframe B: $p \times q$ resolution



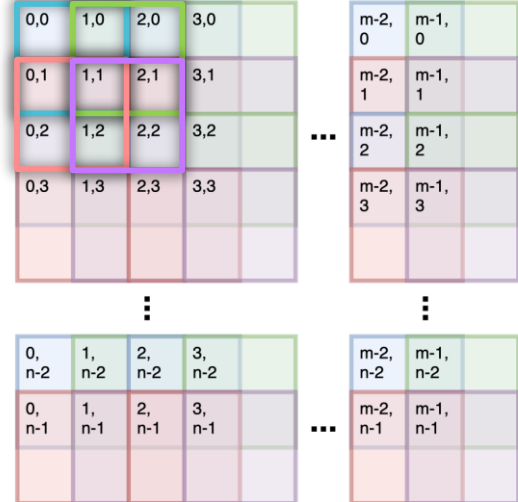
Subframe D: $p \times q$ resolution



Subframe C: $p \times q$ resolution



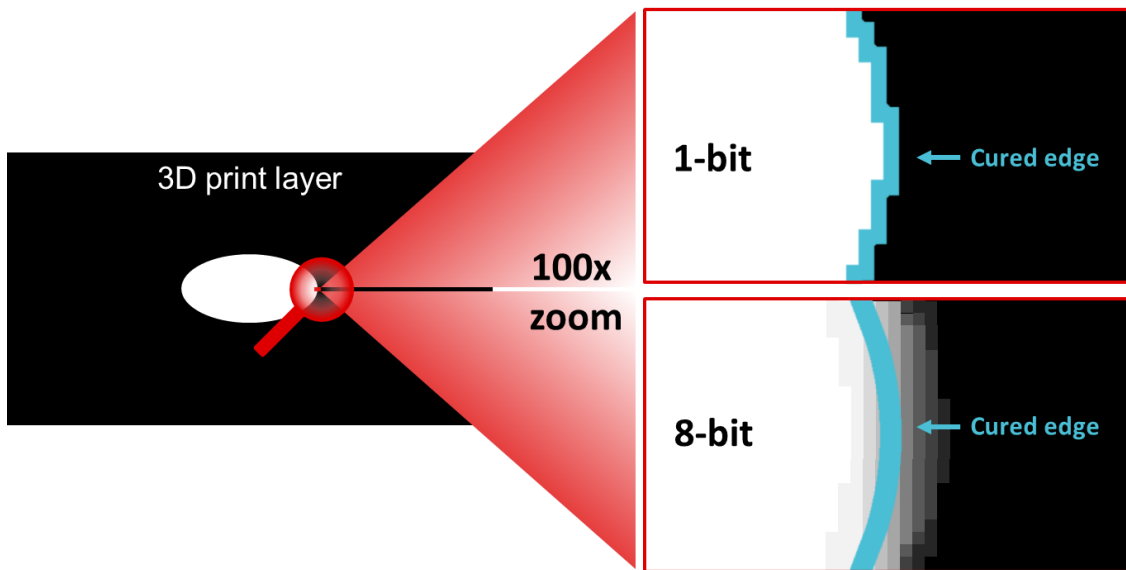
Displayed Image: $m \times n$ resolution, actuated pixels



- ❑ Same concept as modern displays – optimized for 3D printing
- ❑ Print 4 times the number of addressable pixels with no slow down in print speed
- ❑ TI will provide easy reference design to get from input resolution to projected images

DLP 3D Print with Grayscale

More accurate prints by taking advantage of every pixel



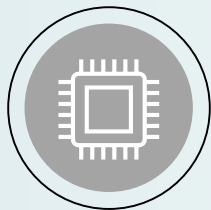
- ❑ DLP 3D printers have light in focus on resin
 - Unlike LCD pixels, which can blur together
- ❑ DLP 3D printers can print exactly what you project
 - Smooth, round curves
 - Sharp edges and defined points
- ❑ Use soft grayscale edges for smooth surfaces
 - 8-bit grayscale available
 - Selectable gamma curves for optimization

DLP Pico | Development options



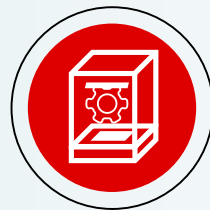
Custom product design

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



System Integrator

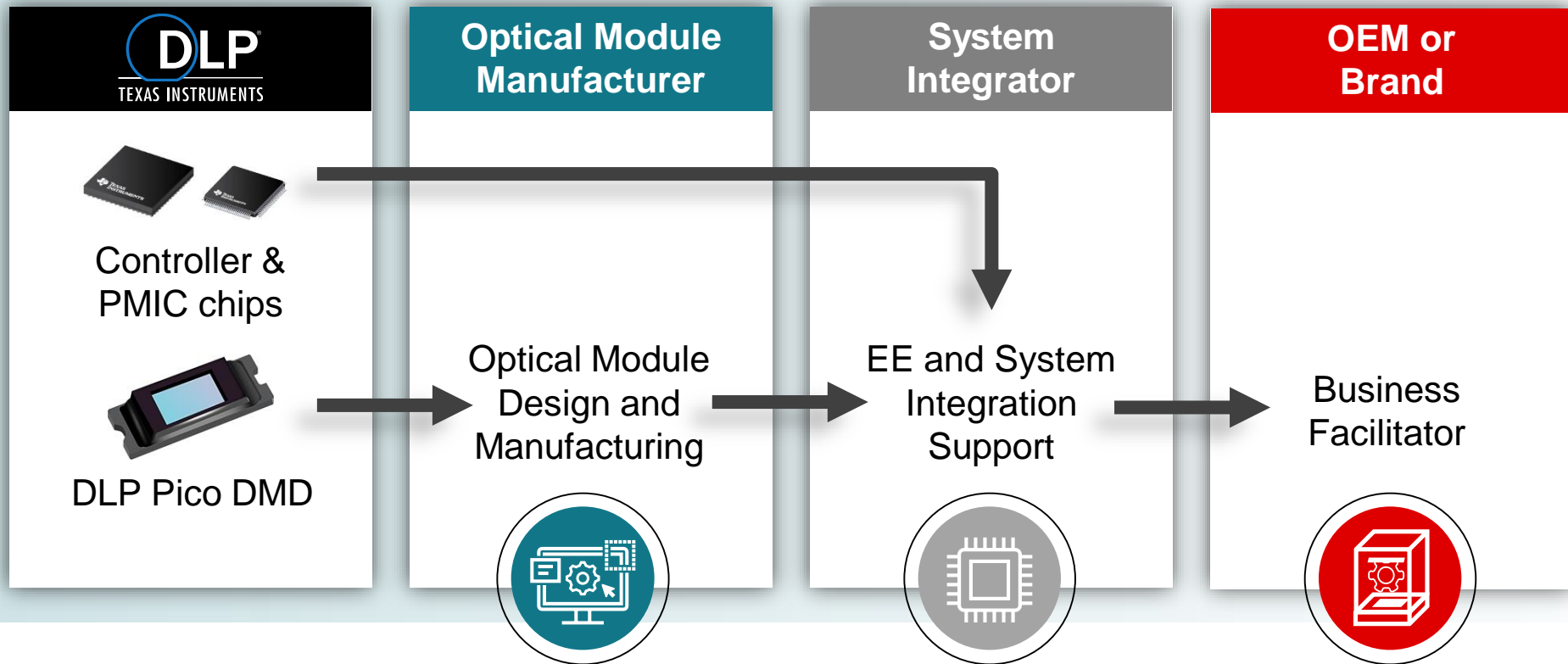
Work with an experienced DLP Pico system integrator on a semi-custom product, with control over some features and specs.



ODM

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

DLP Pico Display | Development options



DLP Pico 3D Print | Learn more

Articles

- ❑ [Bringing high quality 3D printing to your desktop](#)
- ❑ [3 Key design decisions for your desktop 3D printer design](#)

3D Print Chipsets

- ❑ [DLP300S](#)
- ❑ [DLP301S](#)
- ❑ [DLPC1438](#)

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