

## Product Overview

# TI DLP® Pico™ Technology for Dynamic Ground Projection



## Introduction

The driver-vehicle experience has evolved from a simple means of transportation to an extension of personality. Modern vehicle options include custom paints, sound systems, and entertainment options, but these are statically limited and contained within the vehicle. Dynamic Ground Projection (DGP) is the next evolution in automotive personalization.

The first generation of puddle lights incorporated small LEDs stored in either the mirrors or door panels of a vehicle. The intent is to shine a light down by the door to alert the occupants of any hazards that can be on the ground. The second generation began integrating still images and logos, but these were limited to a fixed image. TI DLP™ automotive technology ushers in the next generation of the driver experience by allowing vehicle owners complete freedom in what the vehicle displays from puddle lights.

TI DLP Pico technology enables small, high-performance, low-power DGP projections. A DLP Pico digital micromirror device (DMD), with up to millions of micromirrors, creates the image in sync with color-sequential illumination. A DLP controller on a nearby PCB can accept incoming images or videos from Bluetooth® or Wi-Fi from a phone application.



Figure 1. Mirror DGP Application



Figure 2. Warning Sign DGP Display

## Features and benefits

- Dynamic projections
  - Create personalized content with dynamically changing logos or short videos in full color
  - Communicate to surroundings with safety features
  - Reprogram images
- Small form factor
  - Integration with many parts of the vehicle (mirrors, door panel, tail lights, and so on.)
  - Low power requirements.
  - OEM and aftermarket applications
- High image quality
  - High contrast and wide color options enable vibrant images
  - Resolution up to 864 × 480

## Recommended chipsets for DGP applications

For applications that require the brightest projections, the DLP Pico 0.3" automotive qualified chipset is recommended. For automotive applications that require the smallest form factor, the 0.2" automotive qualified chipset is recommended. Aftermarket DGP applications can use non-automotive qualified chipsets with resolution ranges from QnHD to WVGA.

**Table 1. Chipsets for DGP Applications**

Class	DMD	Resolution	Controller	Automotive Qualified
0.16"	<a href="#">DLP160AP</a>	320 × 180	<a href="#">DLPC3420</a>	No
0.16"	<a href="#">DLP160CP</a>	640 × 360	<a href="#">DLPC3421</a>	No
0.2"	<a href="#">DLP2010</a>	860 × 480	<a href="#">DLPC3430</a>	No
0.2"	<a href="#">DLP2021-Q1</a>	588 × 330	<a href="#">FPGA or AM263x-Q1</a>	Yes
0.3"	<a href="#">DLP3021-Q1</a>	864 × 480	<a href="#">DLPC120 or FPGA</a>	Yes

## Additional technical resources

- Texas Instruments, [Dynamic Ground Projection Application Requirements](#), application note.
- Texas Instruments, [Dynamic Ground Projection using DLP Technology for Automotive Exterior Lighting](#), white paper.
- Texas Instruments, [Automotive Dynamic Ground Projection Application Overview](#), video.

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