



STRUCTURED-LIGHT PROJECTION ENGINE

Structured-Light Projection Engine

This structured-light projection engine is the "heart" of a high-performance 3D AOI camera and the core power source for accurately reconstructing object geometry in 3D inspection for electronics manufacturing. As the key component for projecting encoded light patterns, it directly determines the inspection accuracy, interference resistance and operating speed of the complete 3D AOI system, laying the foundation for high-precision defect inspection.

Featuring advanced DLP display technology, the engine projects high-brightness, high-contrast encoded patterns, including multi-frequency fringes, Gray codes and random dot patterns. Fine pixel pitch provides clear, controllable imaging details. The innovative blue-light projection design effectively suppresses specular reflections from solder joints and metal components. Combined with adaptive pattern modulation, it delivers stable and clear imaging even on high-density PCBs or in shadowed areas.

Key Features

- TI DLP4710 DMD chip
- Physical display resolution: 1920×1080
- Special shift design ensures projection-plane confocality
- Programmable exposure time
- USB / RS485 / Trigger In / Trigger Out interfaces
- All-metal construction with passive cooling for industrial stability

Applications

- 3D AOI
- 3D SPI
- High-precision 3D scanning

Optical Parameters

Display Technology	DMD Technology
Illuminant	Blue LED (450–460 nm)
F#	F2.6
Relative Illumination	>95%
Resolution	1920 × 1080
Projection Angle	25°
Contrast	>1500:1
Distortion	⩽ 1.8%
Illumination Uniformity	>85%
Working Distance	220 mm
Frame Size (mm)	132.65 × 77.36 (@220 mm working distance)

Electrical Parameters

Main Board Power Supply	12–19 V
LED Current	200 mA–16000 mA
Trigger Input	Opto-isolated input; drive current range 6–14 mA, default 5 V
Trigger Output	Schmitt-buffer output; maximum drive capability 32 mA @5 V

Other Parameters

Working Temperature	0–60° C
Weight	Approx. 500 g
Dimensions	74.5 (W) × 110.7 (H) × 184.9 (L) mm

Size

