

PRODUCT CATALOGUE · 2026

Silicon-Based OLED & Micro LED

Micro-display engineering for AR, VR, night vision, digital sight,
HMD, HUD, EVF, FPV — and Micro LED projection.

0.20"—1.3"

PANEL SIZES

640×480 → 3552×3840

RESOLUTION RANGE

12 000 nit

SI-OLED PEAK BRIGHTNESS

2 500 000 nit

MICRO LED PEAK LUMINANCE

ABOUT

Display technology, engineered end to end.

Ohio

US headquarters

4+

Manufacturing regions

Tier 2

Automotive supplier

10 000+

Display patents (ecosystem)

Golden CZ LLC is a US-headquartered AMOLED display and Mini/Micro-LED company with deep global manufacturing partnerships. We combine US customer-facing agility with direct access to the world's leading display panel fabs and LED packaging ecosystems.

This catalogue covers our silicon-based OLED micro-display line: panels and driver modules from 0.20" to 1.3", spanning AR waveguide engines, VR high-resolution panels, and the high-brightness single-green devices used in night vision and digital sighting optics. Tailor-made solutions are available against your specific requirement.

Engineering coordination and program management run out of Springboro, Ohio; panel and module supply is matched region by region — AMOLED in the Yangtze Delta, Mini/Micro-LED packaging in the Pearl River Delta. One PO, one quality owner, one engineering team for your program.

AR

Waveguide engines, 0.20"–0.65", up to 10 000 nits

VR

1.2"–1.3" panels to 3552×3840, foveated rendering

Night vision & sight

Single-green to 12 000 nits, –45 °C rated

Modules

Micro-HDMI / Type-C / PAL driver boards, AR optics

The line-up at a glance

Eleven silicon-based OLED families from 0.20" to 1.3", plus the Micro LED projection line.

SILICON-BASED OLED

Series	Display size	Resolution	Pixel pitch	Primary application
VGA020	0.20"	640×480	6.3 μm	AR
HD030	0.30"	1280×720	5.22 μm	AR · Waveguide
SXGA037	0.37"	1280×1024	5.67 μm	Observation
XGA039	0.39"	1024×768	7.8 μm	Night vision · Thermal · HMD · EVF · FPV
SVGA060	0.6"	800×600	15 μm	Observation · Sighting
XGA061	0.61"	1024×768	12 μm	Observation
SXGA060	0.6"	1280×1024	9.3 μm	High-end viewing · Digital sight
QHD065	0.65"	2560×1440	5.67 μm	AR · VR
SXGA+096	0.96"	1400×1050	14 μm	AR/VR HMD · Near-eye
FHD120	1.2"	1920×1080 / 3840×2160	13.8 / 6.9 μm	AR/VR HMD · Projection
4KUHD130	1.3"	3552×3840	6.3 μm	VR

MICRO LED

Series	Display size	Resolution	Pixel pitch	Primary application
GZ023	0.23"	320×240	15 μm	Smart projection · Intelligent lighting
M223 / M211	Lens module	320×240	80 / 50 μm	Robotics · In-vehicle · Smart home

AR / VR ROADMAP

The HD030 array optical-waveguide display module is developed jointly with optical manufacturers on our own high-brightness technology, targeting AR products with smaller volume, lower power draw and better display performance. Investment continues across both AR and VR: silicon-based OLED micro-displays in a range of sizes, at high resolution and high brightness.

VGA020 Series

Silicon-based OLED micro-display · 0.20" · 640×480



640×480 at a 6.3 μm pitch in a 0.20-inch active area. Available as standard colour, high-brightness colour and high-brightness single green — the compact end of the AR line-up.

SPECIFICATIONS

	VGA020HW01C High-performance colour	VGA020HW02C High-brightness full colour	VGA020HW01G High-brightness single green
Resolution	640×480		
Pixel size	6.3 μm × 6.3 μm		
Display size	0.20" (4.03 mm × 3.02 mm)		
Pixel arrangement	RGB hexagon		
Brightness uniformity	≥ 90%		
Contrast	10 000:1		
Grayscale	256 levels		
Refresh rate	25 Hz - 120 Hz		
Video interface	Quad-SPI · MIPI (2-lane) · D-PHY v1.2 1.0 Gbps/lane		
Maximum brightness	400 nit	5 000 nit	10 000 nit
Typical brightness	200 nit	5 000 nit	5 000 nit
Typical power	50 mW	100 mW	110 mW
Supply voltage	VAN +5.5 V · VDD +1.8 V · VEE -4.5 V		
Operating temperature	-20 °C - +65 °C		

HD030 Series

Silicon-based OLED micro-display · 0.30" · 1280×720



1280×720 at 5.22 μm in a 0.30-inch active area — 4 865 PPI, 10 000 nits peak and a 98% DCI-P3 gamut. The high-brightness core of the AR waveguide platform.

PRODUCT CHARACTERISTICS

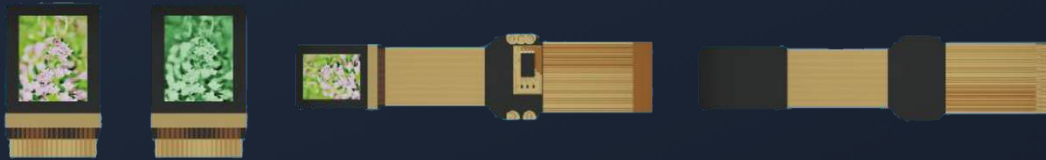
- 10 000 nits peak brightness, 98% DCI-P3 colour gamut
- 4 865 PPI pixel density, 2/3 SPR pixel design
- Low power, minimal heat — suits miniaturised designs
- Single-lane MIPI input (4 lanes)
- Brightness and contrast enhanced by digital signal processing
- Integrated temperature sensor for real-time thermal monitoring
- Built-in PWM dimming with adaptive brightness control
- Display positioning adjustment; low-resolution image compatible

SPECIFICATIONS

GZ030PCC01	
COF-encapsulated colour display	
Resolution	1280×720 (2/3 SPR)
Pixel size	5.22 μm × 5.22 μm
Display size	0.30" (6.68 mm × 3.76 mm)
Pixel arrangement	RGB hexagonal layout
Brightness uniformity	≥ 90%
Contrast ratio	10 000:1
Grayscale	256 levels
Refresh rate	30 Hz – 120 Hz
Video interface	MIPI (4-lane) · D-PHY v1.2 1.0 Gbps/lane
Peak brightness	10 000 nits
Typical brightness	10 000 nits
Typical power	160 mW
Supply voltage	Analog +5.0 V · Digital +1.8 V · Negative -5.0 V
Operating temperature	-20 °C – +65 °C

SXGA037 Series

Silicon-based OLED micro-display · 0.37" · 1280×1024



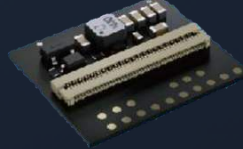
1280×1024 at 5.67 μm in a 0.37-inch active area, in COF and COB packaging plus a high-brightness single-green variant. Aimed at civilian observation optics.

SPECIFICATIONS

	SXGA037HW01C COF packaging, colour	SXGA037HW02C COB packaging, colour	SXGA037HW01G High-brightness single green
Resolution	1280×1024		
Pixel size	5.67 μm × 5.67 μm		
Display size	0.37" (7.26 mm × 5.81 mm)		
Pixel arrangement	RGB hexagon		
Brightness uniformity	≥ 90%		
Contrast	10 000:1		
Grayscale	256 levels		
Refresh rate	25 Hz - 120 Hz		
Video interface	MIPI (4-lane) · D-PHY v1.2 1.0 Gbps/lane		
Maximum brightness	600 nit	600 nit	10 000 nit
Typical brightness	300 nit	300 nit	5 000 nit
Typical power	130 mW	130 mW	150 mW
Supply voltage	VAN +5.5 V · VDD +1.8 V · VEE -4.5 V		
Operating temperature	-20 °C - +65 °C		

XGA039 Series

Silicon-based OLED micro-display · 0.39" · 1024×768



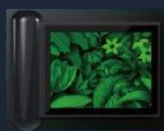
1024×768 at 7.8 μm in a 0.39-inch active area. Four variants from low-voltage colour to ultra-bright single green — the workhorse for night vision, thermal imaging, HMD, digital sight, EVF and FPV.

SPECIFICATIONS

	XGA039HW08C	XGA039HW06C	XGA039HW03G	XGA039HW13C
	Low-voltage colour	High-performance colour	Ultra-brightness single green	Ultra-brightness full colour
Resolution	1024×768			
Pixel size	7.8 μm × 7.8 μm			
Display size	0.39" (8.14 mm × 6.15 mm)			
Pixel arrangement	RGB hexagon			
Brightness uniformity	≥ 90%			
Contrast	10 000:1			
Grayscale	256 levels			
Refresh rate	25 Hz - 75 Hz			
Video interface	24-bit RGB · 8/16/24-bit YCbCr · ITU-R BT.656			
Maximum brightness	200 nit	400 nit	8 000 nit	4 000 nit
Typical brightness	150 nit	200 nit	4 000 nit	4 000 nit
Typical power	150 mW	120 mW	130 mW	270 mW
Supply — analog	+3.3 V	+5 V	+5 V	+5 V
Supply — digital	+1.8 V	+1.8 V	+1.8 V	+1.8 V
Operating temperature	-20 °C - +65 °C			

SVGA060 Series

Silicon-based OLED micro-display · 0.6" · 800×600



800×600 at a 15 μm pitch in a 0.6-inch active area, rated to $-45\text{ }^{\circ}\text{C}$. The entry-level flagship for high-end observation and sighting.

SPECIFICATIONS

	SVGA060HW01C Low-power full colour	SVGA060HW02C High-brightness full colour	SVGA060HW02G Ultra-brightness single green
Resolution	800×600 (808×608 reserved)		
Pixel size	15 μm × 15 μm		
Display size	0.6" (12.0 mm × 9.0 mm)		
Pixel arrangement	RGB bar		
Brightness uniformity	$\geq 90\%$		
Contrast	10 000:1		
Grayscale	256 levels		
Refresh rate	25 Hz - 75 Hz		
Video interface	24-bit RGB · 8/16/24-bit YCbCr · ITU-R BT.656		
Maximum brightness	300 nit	1 000 nit	10 000 nit
Typical brightness	100 nit	1 000 nit	5 000 nit
Typical power	40 mW @ 25 Hz	300 mW	150 mW
Supply — analog	+3.3 V	+5 V	+5 V
Supply — digital	+1.8 V	+1.8 V	+1.8 V
Operating temperature	$-45\text{ }^{\circ}\text{C}$ - $+65\text{ }^{\circ}\text{C}$		

XGA061 Series

Silicon-based OLED micro-display · 0.61" · 1024×768



1024×768 at 12 μm in a 0.61-inch active area. The cost-effective mainstay of the high-end observation line, rated to -45 °C.

SPECIFICATIONS

	XGA061HW02C Low-power full colour	XGA061HW02G Ultra-brightness single green
Resolution	1024×768	
Pixel size	12 μm × 12 μm	
Display size	0.61" (12.29 mm × 9.22 mm)	
Pixel arrangement	RGB bar	
Brightness uniformity	≥ 90%	
Contrast	10 000:1	
Grayscale	256 levels	
Refresh rate	25 Hz - 75 Hz	
Video interface	24-bit RGB · 8/16/24-bit YCbCr · ITU-R BT.656	
Maximum brightness	300 nit	10 000 nit
Typical brightness	100 nit	5 000 nit
Typical power	60 mW @ 25 Hz	170 mW
Supply voltage	Analog +5 V · Digital +1.8 V	
Operating temperature	-45 °C - +65 °C	

SXGA060 Series

Silicon-based OLED micro-display · 0.6" · 1280×1024



1280×1024 at 9.3 μm in a 0.6-inch active area, with a 12 000-nit single-green variant. The high-performance option for high-end viewing and digital sight.

SPECIFICATIONS

	SXGA060HW01C	SXGA060HW01G	SXGA060HW02C
	Low-power full colour	Ultra-brightness single green	Ultra-brightness full colour
Resolution	1280×1024		
Pixel size	9.3 μm × 9.3 μm		
Display size	0.6" (11.9 mm × 9.5 mm)		
Pixel arrangement	RGB bar		
Brightness uniformity	≥ 90%		
Contrast	10 000:1		
Grayscale	256 levels		
Refresh rate	25 Hz - 75 Hz		
Video interface	24-bit RGB · 16-bit YCbCr · ITU-R BT.656/1120		
Maximum brightness	300 nit	12 000 nit	4 000 nit
Typical brightness	100 nit	12 000 nit	4 000 nit
Typical power	70 mW @ 25 Hz	280 mW	390 mW
Supply voltage	VAN +5 V · VDD +1.8 V		
Operating temperature	-45 °C - +65 °C		

QHD065 Series

Silicon-based OLED micro-display · 0.65" · 2560×1440



2560×1440 at 5.67 μm in a 0.65-inch active area — 4 518 PPI at up to 6 000 nits colour. The wide-field-of-view, high-resolution option for AR and VR.

PRODUCT CHARACTERISTICS

- 6 000 nits brightness, 98% DCI-P3 colour gamut
- 4 518 PPI image density
- Low power and low heat — convenient for miniaturisation
- Single-channel MIPI (4-lane) signal input
- Digital signal enhancement for image brightness and contrast
- Built-in temperature sensor reads panel temperature in real time
- Built-in PWM and adaptive brightness adjustment

SPECIFICATIONS

	GZ065PKC01 Low-power colour	GZ065PKC02 High-brightness colour	GZ065PKG01 High-brightness single green
Resolution	2560×1440		
Pixel size	5.67 μm × 5.67 μm		
Display size	0.65" (14.515 mm × 8.164 mm)		
Pixel arrangement	RGB hexagonal layout		
Brightness uniformity	≥ 90%		
Contrast	10 000:1		
Grayscale	256 levels		
Refresh rate	30 Hz – 120 Hz		
Video interface	MIPI (4-lane) · D-PHY v1.2 1.0 Gbps/lane		
Maximum brightness	1 000 nits	6 000 nits	12 000 nits
Typical brightness	1 000 nits	6 000 nits	12 000 nits
Typical power	260 mW		
Supply voltage	VAN +5.0 V · VDD +1.8 V · VEE -5.0 V		
Operating temperature	-45 °C – +65 °C		

SXGA+096 Series

Silicon-based OLED micro-display · 0.96" · 1400×1050



1400×1050 at 14 μm in a 0.96-inch active area, driven over dual LVDS. Built for AR/VR head-mounted and other near-eye devices.

SPECIFICATIONS

SXGA+096HW01C High-performance colour		SXGA+096HW03G High-brightness green
Resolution	1400×1050	
Pixel dimension	14 μm × 14 μm	
Display area	0.96" (19.6 mm × 14.7 mm)	
Pixel arrangement	RGB hexagon	Vertical bar
Brightness uniformity	≥ 90%	
Contrast ratio	> 10 000:1	
Gray levels	Up to 256	
Refresh rate	30 Hz - 75 Hz	
Video interface	Dual LVDS	
Maximum brightness	800 nit	10 000 nit
Typical brightness	450 nit	5 000 nit
Typical power	400 mW	500 mW
Supply voltage	1.8 V · 3.3 V · 5 V	
Operating temperature	-45 °C - +65 °C	

FHD120 Series

Silicon-based OLED micro-display · 1.2" · 1920×1080 / 3840×2160



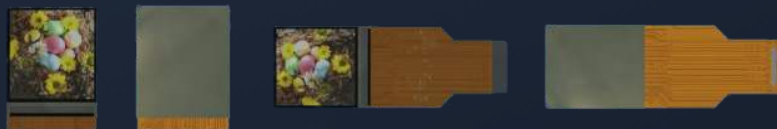
1920×1080 colour at 13.8 μm, or 3840×2160 green at 6.9 μm, in a 1.2-inch active area. For AR/VR head-mounted products, projection and other near-eye devices.

SPECIFICATIONS

	FHD120HW01C High-performance colour	QFHD120HW01G High-brightness green
Resolution	1920×1080	3840×2160
Pixel dimension	13.8 μm × 13.8 μm	6.9 μm × 6.9 μm
Display area	1.2" (26.5 mm × 14.9 mm)	
Pixel arrangement	RGBW hexagon	
Brightness uniformity	≥ 90%	
Contrast ratio	> 10 000:1	
Gray levels	Up to 256	
Refresh rate	30 Hz - 75 Hz	
Video interface	Dual LVDS	
Maximum brightness	800 nit	10 000 nit
Typical brightness	450 nit	5 000 nit
Typical power	480 mW	555 mW
Supply voltage	1.8 V · 3.3 V · 5 V	
Operating temperature	-45 °C - +65 °C	

4KUHD130 Series

Silicon-based OLED micro-display · 1.3" · 3552×3840



3552×3840 at 6.3 μm in a 1.3-inch active area — 4 031 PPI, 100 000:1 contrast, foveated rendering and VESA DSC. A two-chip scheme built for VR.

PRODUCT CHARACTERISTICS

- 4 031 PPI
- Full-colour mode, 16.7 M colours
- Foveated rendering mode
- Real-time scaling (×1.33, ×1.5, ×2)
- IR-drop compensation
- DSC (VESA) version 1.2a
- 4-lane/2-port MIPI, DSI-2 1.0 D-PHY v1.1 DCS 1.3
- 3-lane/2-port MIPI, DSI-2 1.0 C-PHY v1.1 DCS 1.3
- MIPI only, or MIPI + SPI
- Temperature compensation
- Horizontal / vertical image mirroring

SPECIFICATIONS

GZ130PNC01

COF packaging, colour · two-chip scheme

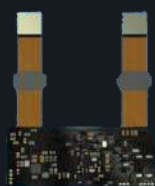
Resolution	3552×3840
Pixel size	6.3 μm × 6.3 μm
Display size	1.3" (22.38 mm × 24.19 mm)
Pixel arrangement	RGB hexagon
Brightness uniformity	≥ 90%
Contrast	100 000:1
Grayscale	256 levels
Refresh rate	30 Hz – 90 Hz
Video interface	4-lane/2-port MIPI · DSI-2 1.0 D-PHY v1.1 DCS 1.3 3-lane/2-port MIPI · DSI-2 1.0 C-PHY v1.1 DCS 1.3
Maximum brightness	5 000 nit
Power @ 5 000 nit	1.5 W
Supply voltage	VAN +3.3 V · VDD +1.8 V · VEE -5 V
Operating temperature	-20 °C – +65 °C

Driver modules

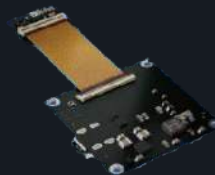
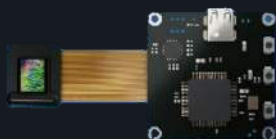
Micro-HDMI / Type-C interface · plug-and-play evaluation

Micro-HDMI interface drive modules are provided across the silicon-based OLED range, including the HD030, XGA039, SVGA060, XGA061 and SXGA060 series. The plug-and-play design allows lighting-up, screen switching and other tests from physical keys; a reserved UART port supports direct interactive development between the host and the micro-display.

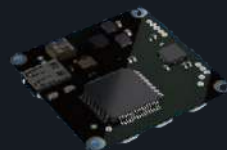
030 SERIES



XGA039 SERIES



SVGA060 · XGA061 · SXGA060 SERIES

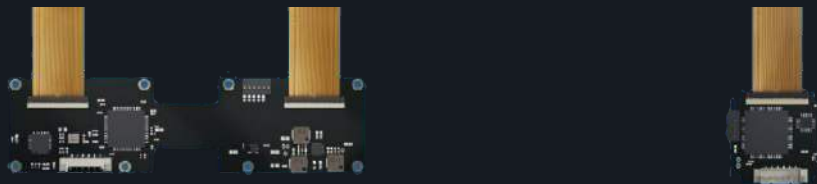


PAL-input driving modules

Monocular and binocular · customised

XGA039 series driving module

High-performance drive modules can be customised for monocular or binocular display on the XGA039 series. Total power draw is only about **500 mW**, and the module resolves PAL signal auto-identification, automatic gain control, low refresh rate, interlaced scanning, screen scaling, sawing and tailing — presenting a clear, smooth image.



Binocular example (left) · monocular example (right)

SVGA060 series driving module

Monocular or binocular drive modules customised on the SVGA060 series, with total power draw of only about **300 mW**, likewise resolving PAL auto-identification, automatic gain control, low refresh rate and interlaced scanning.



SVGA060 series monocular examples

GZ030MCC01 AR optical module

Micro-OLED + one-dimensional expanding waveguide

GZ030MCC01 is an augmented-reality optical module built on a one-dimensional expanding waveguide. It pairs Micro-OLED with waveguide optics to deliver high-contrast, high-definition, true-colour display performance in a 13.4-gram package.



SPECIFICATIONS

OPTICAL	Field of view (FOV)	30°
	Resolution	1280×720
	Micro-display	0.30" Si-OLED
	Colour	RGB
	Maximum luminance	≥ 1 000 nits
	Eye-box	9 × 6 mm ²
	Eye-relief	15 mm
	Contrast ratio	≥ 10 000:1
	Transmittance	≥ 80%
	Brightness uniformity	≥ 60%
ELECTRICAL	Distortion	≤ 1%
	Input video signal format	Single-lane MIPI
	Power consumption @ max brightness	160 mW
OTHER	Refresh rate	30 Hz - 120 Hz
	Total weight	≤ 13.4 g
	Operating temperature	-10 °C - +40 °C
	Storage temperature	-20 °C - +50 °C

HD030 integrated AR glasses

Reference solution · customisable on the HD030 series



Golden CZ supports AR solution customisation on the HD030 series — from the waveguide engine up to a complete binocular Android device.

SPECIFICATIONS

Computing power	Low-power quad-core
Optical scheme	Binocular array optical waveguide, transmittance $\geq 85\%$
Resolution	720p
FOV	$\geq 30^\circ$
Contrast	$> 10\,000:1$
Entry brightness	$\geq 1\,000$ nit
Acoustic system	Dual-microphone noise cancellation, dual-channel bone-conduction speaker
Image acquisition	13 MP camera
Spatial orientation	3DoF + SLAM
Interactive mode	Button + touch
Communication	Wi-Fi + Bluetooth
Operating system	Android
Battery life	Working time ≥ 2 h, fast charge; external power pack supported
Application field	Office, audio-visual, translation, cultural travel, outdoor, industrial cooperation, inspection, operating instructions, maintenance and after-sales

MICRO LED

GZ023 Series

Micro LED microdisplay · 0.23" · 320×240 · monochrome green



The GZ023 series is a monochrome Micro LED microdisplay: 320×240 pixels on a 0.23-inch diagonal, with peak luminance exceeding **2 500 000 nits** and a maximum luminous flux of over **300 lumens**. Ultra-high brightness, a compact form factor and COF (chip-on-film) packaging make it straightforward to integrate — suited to smart projection and intelligent lighting systems.

SPECIFICATIONS

GZ023P0G02	
Monochrome Micro LED · COF	
Product features	Single-green COF packaging
Resolution	320×240
Pixel size	15 μm
Display size	0.23" (4.8 mm × 3.6 mm)
Contrast	100 000:1
Refresh rate	30 Hz – 120 Hz
Video interface	QSPI / SPI
Brightness	300 lm
Peak luminance	> 2 500 000 nits
Operating temperature	-20 °C – +80 °C

APPLICATION SCENARIOS

- Automotive puddle light
- Household projection speaker
- Robot navigation indicator
- Smart projection
- Intelligent lighting

Projection lens modules

M223 · M211 — Micro LED (single green) projection engines



M223 · 8 cc · 80 lm



M211 · 1.5 cc · 50 lm

The M223 and M211 lens modules compete on footprint, luminous output, reliability and cost. The **M223** delivers 80 lumens at a 64° field of view in a compact 8-cc package — a natural fit for industrial robotics and in-vehicle applications. The **M211** delivers 50 lumens at 33° in a mere 1.5-cc package, sized for smart home devices and AI-powered intelligent terminals.

SPECIFICATIONS

	M223	M211
	Mini projection lens module	Ultra-mini projection lens module
Display chip	Micro LED (single green)	
Resolution	320×240	
Contrast (typical)	500:1	
Projection distance	0.2 – 2 m	
Operating temperature	-20 °C – +55 °C	
Focus system	Fixed focus	
Size (L×W×H)	28 × 16 × 19 mm	14 × 13 × 12 mm
FOV	64 ±2°	33 ±2°
Brightness	80 lm	50 lm
Throw ratio	0.98	2.31
Distortion	< 1% (opposite angles)	< 0.8% (opposite angles)

Precision | Partnership | Engineering | Delivery



Golden CZ LLC

Springboro, Ohio, USA — sales, engineering coordination, program management
Shanghai · Suzhou · Kunshan — display & LED manufacturing ecosystem

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