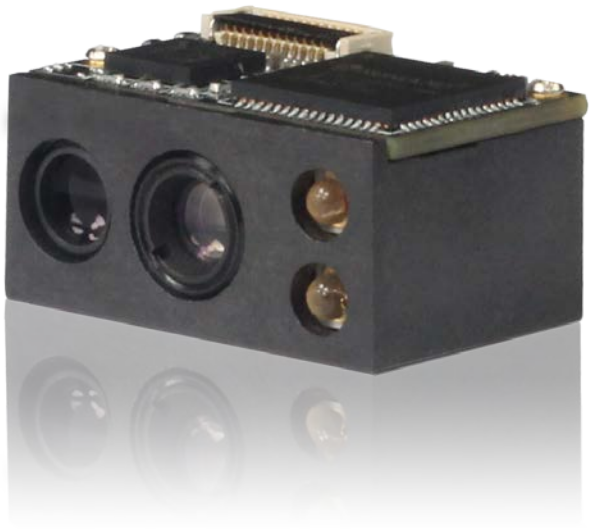
BAR-CODE PROFESSIONAL

LV 3096

OEM Scan Engine



The LV3096 OEM scan engine, armed with the LongView patented UIMG®, a computerized image recognition system, brings about a new era of 2D barcode scan engines.

The LV3096's 2D barcode decoder chip ingeniously blends UIMG® technology and advanced chip design & manufacturing, which significantly simplifies application design and delivers superior performance and solid reliability with low power consumption.

The LV3096 supports all mainstream 1D as well as PDF417, QR Code (M1/M2/Micro), Data Matrix and GS1-DataBar™(RSS) (Limited/ Stacked/ Expanded versions).

This compact engine weighs only 5 grams and fits easily into even the most space-constrained equipments such as data collectors, meter readers, ticket validators and PDAs.

Features:

- **2D Barcode Decoder Chip:** The engine armed with the state-of-the-art 2D barcode decoder chip invented by LongView demonstrates unprecedented reading performance.
- **Two-In-One Design:** Seamless integration of CMOS image sensor and decoder board makes the engine small, lightweight and easy for integration.
- **High Performance & Ultra-Low Power Consumption:** The engine can read 1D and 2D barcodes with a power consumption only one third that of a traditional engine.
- **All-Round Scanning Capability:** It can read barcodes on virtually any medium - paper, plastic cards, mobile phones and LCD displays.

LV3096 Specifications

Performance		
Image Sensor		752×480 CMOS
Processor		IOTC 2D decoder chip 48MHz
Illumination		Red LED 625±10 nm
Symbologies	**2D**	PDF 417, Data Matrix（ECC200,ECC000,050,080,100,140）, QR Code
	1D	Code 128, EAN-13, EAN-8, Code 39, UPC-A, UPC-E, Codabar, Interleaved 2 of 5, ITF-6, ITF-14, ISBN, Code 93, UCC/EAN-128, GS1 Databar, Matrix 2 of 5, Code 11, Industrial 2 of 5, Standard 2 of 5, Plessey, MSI-Plessey, etc.
Reading Precision		≥ 5mil
Depth of Field*	**EAN13 (13mil)**	55mm - 185mm
	Code 39 (5mil)	55mm - 100mm
	PDF 417 (6.67mil)	40mm - 130mm
	Data Matrix (10mil)	40mm - 135mm
	QR Code (15mil)	40mm - 160mm
Symbol Contrast		≥ 30% reflectance difference
Scan Angle**		Roll: 360°, Pitch: ±55°, Skew: ±55°
Field of View		Horizontal 36°; Vertical 23°
Mechanical/Electrical		
Interface		TTL-232, USB (optional)
Rated Power Consumption		0.76 W
Operating Voltage		3.3±10% VDC
Current @ 3.3 VDC	**Operating Current**	230 mA
	Standby Current	4mA (USB communication not supported); 7mA (USB communication supported)
	Sleep Current	<5 uA
Dimensions		21.17(W)×14.6(D)×11.52(H)mm
Weight		5.0g
Environmental		
Operating Temperature		-20℃~ +60℃
Storage Temperature		-40℃~ +80℃
Humidity		5% ~ 95% (non-condensing)
Ambient Light		0 ~ 100000 lux (natural light)
Certifications		
FCC Part15 Class B, CE EMC Class B		
Accessories		
EVK3000		Software development board, equipped with a trigger button, beeper and RS-232 & USB interfaces.
Cable	**RS-232 Cable**	Used to connect the EVK3000 to a host device; equipped with a power connector.
	USB Cable	Used to connect the EVK3000 to a host device.
Power Adaptor		Used to provide power for the EVK3000. Output: DC5V, 2A; Input: AC100~240V, 50~60Hz

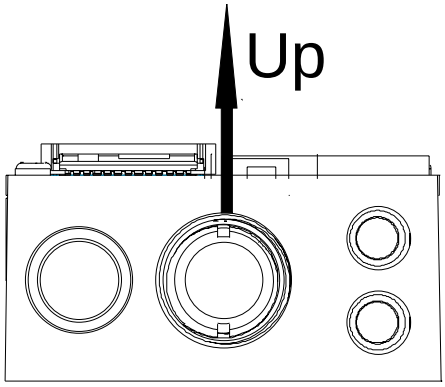
* **Test conditions:** T=23℃, Illumination=300 LUX

** **Test conditions:**

Code 39, 3 Bytes; Resolution=10mil; W:N=3:1; PCS=0.8; Barcode Height=11mm; Scan Distance=120mm, T=23℃, Illumination=300 LUX

Installation Orientation

The following figure illustrates a front view of the LV3096 after correct installation.

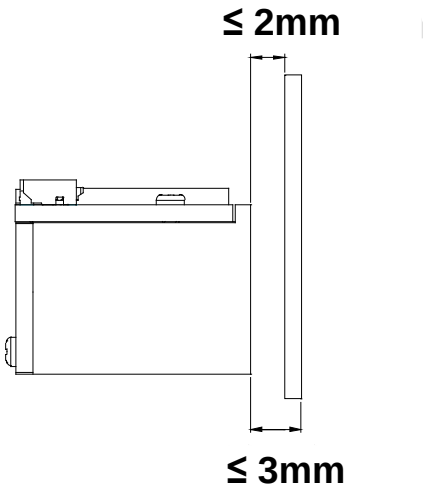


Optics

Window Placement

The window should be positioned properly to let the illumination and aiming beams pass through as much as possible and no reflections back into the engine (reflections can degrade the reading performance).

The window should be mounted close to the front of the engine (parallel). The maximum distance is measured from the front of the engine housing to the farthest surface of the window. In order to reach better reading performance, the distance from the front of the engine housing to the furthest surface of the window should not exceed 3mm and the distance from the front of the engine housing to the nearest surface of the window should not exceed 2mm.



If the window is required to be in a tilted position, the above distance requirements should be met and tilt angle should ensure no reflections back into the lens.

Window Material and Color

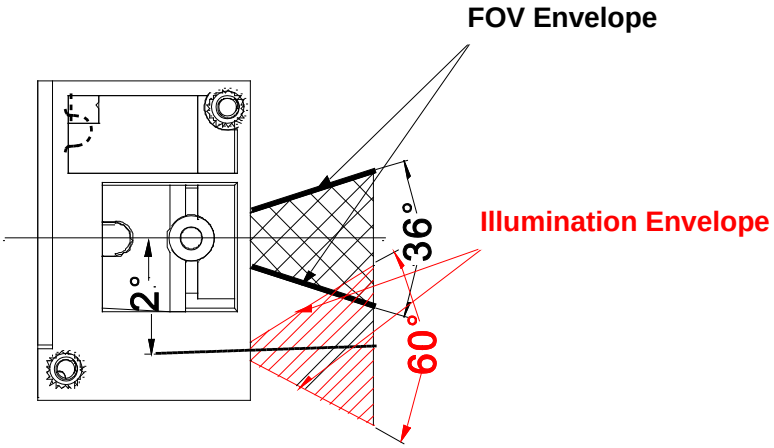
CIS's responsiveness (mainly to wavelengths of red light) should be taken into consideration when choosing window material and color, in order to achieve the possible highest spectral transmission, lowest haze level and homogeneous refractive index. It is suggested to use PMMA or optical glass with spectral transmittance over 90% and haze less than 1%. Whether to use an anti-reflection coating or not depends on the material and application needs.

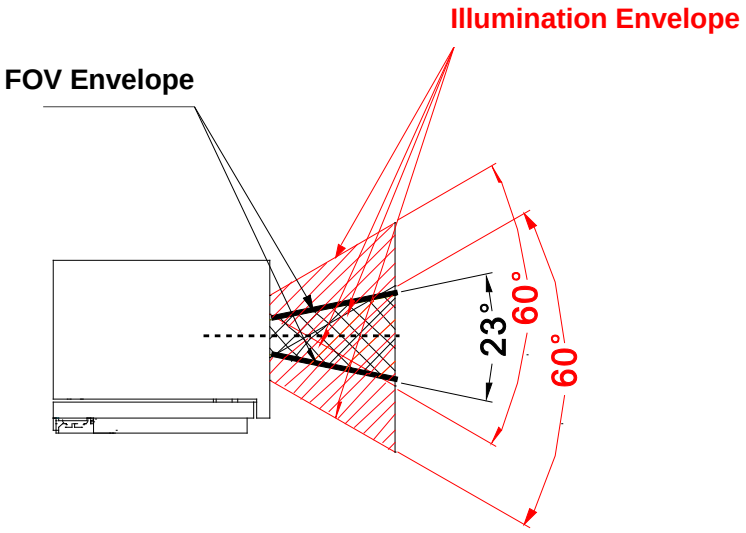
Scratch Resistance and Coating

Scratch on the window can greatly reduce engine performance. It is suggested to use abrasion resistant window material or coating.

Window Size

The window must not block the field of view and should be sized to accommodate the aiming and illumination envelopes shown below.

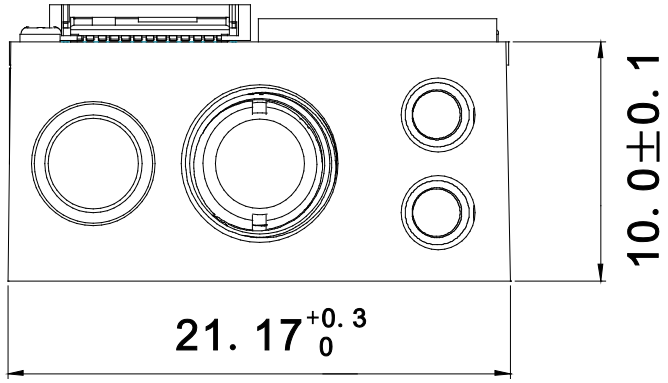




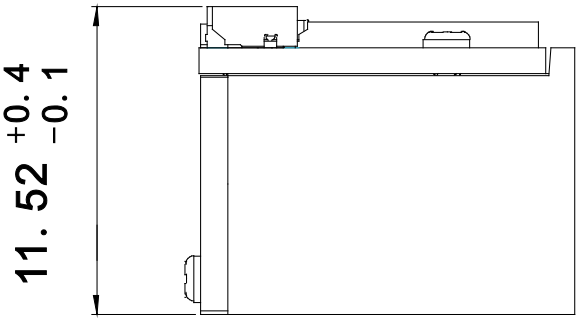
Mounting

The illustrations below show the mechanical mounting dimensions for the LV3096 . The structural design should leave some space between components.

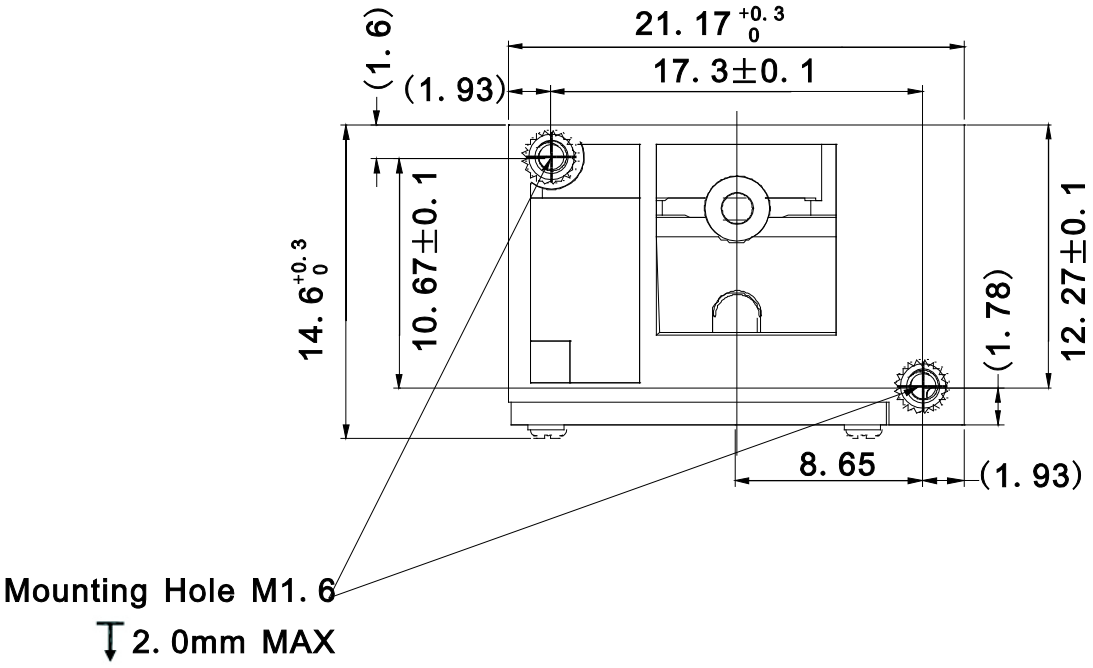
Front View (unit: mm)



Side View (unit: mm)



Top View (unit: mm)



DC Characteristics

Operating Voltage

Ta=25℃

Parameter	Description	Minimum	Typical	Maximum	Unit
V_{DD}	Voltage Drain Drain	3.0	3.3	3.6	V
V_{IH}	High Level Input Voltage	V_{CC}-0.5	-	-	V
V_{IL}	Low Level Input Voltage	-	-	0.5	V
V_{OH}	High Level Output Voltage	V_{CC}-0.3	-	-	V
V_{OL}	Low Level Output Voltage	-	-	0.3	V

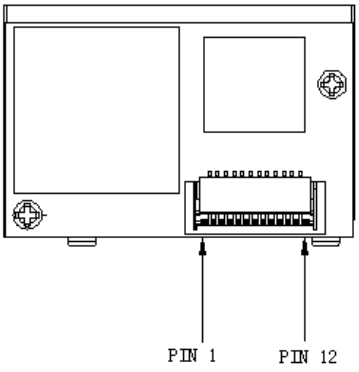
Operating Current

Ta=25℃，V_{DD}=3.3V

Operating Current	Standby Current	Sleep Current
230mA	4mA (USB communication not supported) 7mA (USB communication supported)	<5uA

Host Interface Connector

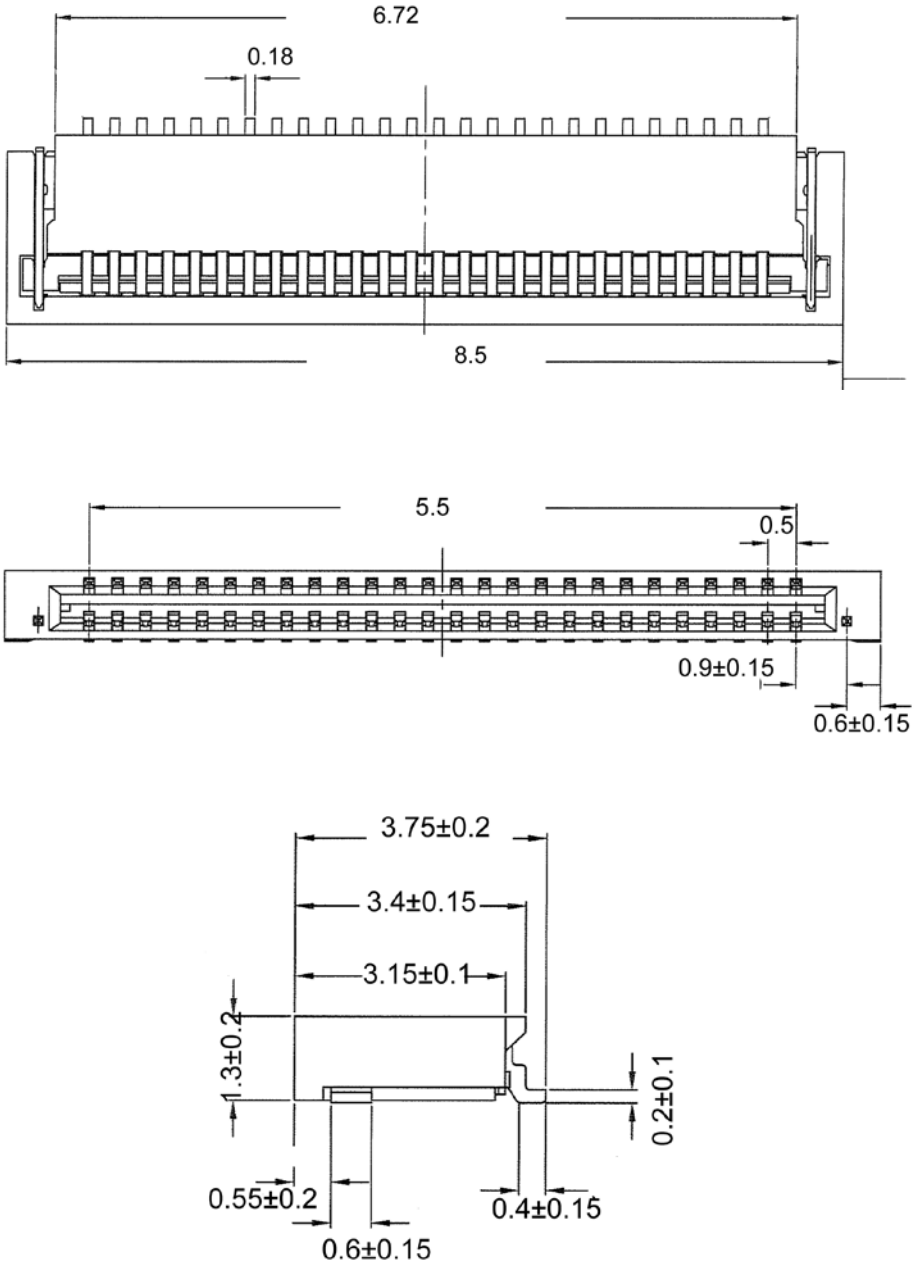
The following table lists the pin functions of the 12-pin host interface connector on the LV3096.



PIN#	Signal Name	I/O	Function
1	NC	-	Not connected.
2	VDD	-	3.3V power supply.
3	GND	-	Power-supply ground.
4	RX	I	TTL level 232 receive data.
5	TX	O	TTL level 232 transmit data.
6	USB_D-	I/O	USB_D- differential data signal. (Optional)
7	USB_D+	I/O	USB_D+ differential data signal. (Optional)
8	NC	-	Not connected.
9	Buzz	O	Beeper output. For the information of beeper driver circuit, see the **Beeper** section in this chapter.
10	LED	O	Good Read LED output. For the information of LED driver circuit, see the **Good Read LED** section.
11	Reset	I	Reset signal input: Driving this pin low for 100us-500us resets the engine.
12	nTrig	I	Trigger signal input: Driving this pin low for at least 10ms causes the LV3096 to start a scan and decode session.

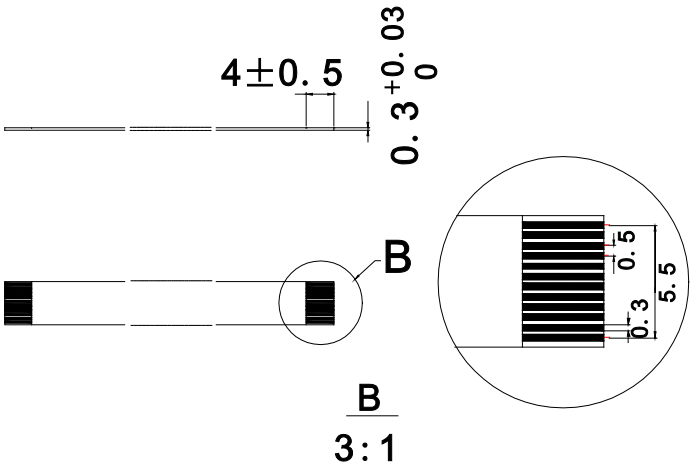
Dimensions of the Host Interface Connector (unit: mm)

The LV 3096 uses a 12-pin FPC ZIF socket (bottom contact, model: 10051922-1210EHLF) manufactured by FCI. The socket can be connected to a host device with a flat flexible cable.



Flat Flexible Cable (unit: mm)

A 12-pin flat flexible cable can be used to connect the LV 3096 to a host device. The cable design must be consistent with the specifications shown below. Use reinforcement material for the connectors on the cable and reduce cable impedance for reliable connection and stable performance.



Good Read LED

The LV30 96 provides a pin (LED, PIN 10) on the host interface connector that can be used by an external driver circuit to drive an LED to indicate a Good Read status. When a good read occurs, the LED pin produces a high level output for about 300ms, and then the signal is back to a low level. This Good Read LED output is not strong enough to drive an LED, so an LED driver circuit is needed.

The following Good Read LED driver circuit is provided for reference.