OUR PRODUCT OF THE MONTH:
CITIZEN HIGH INTENSITY GENERATION 3

FEATURES

- World's smallest LES on the COB market (3.3 mm)
- High lumen density with narrow LES
- Possibility to downsize luminaires
- CCTs: 2700 K, 3000 K, 4000 K
- CRI 80 / 90
- NEW: Ra 97
- Mac Adam Step 3
- ENEC / UL certificates are available
Linear vibration motor have the following advantages:

1. The fast acceleration
   (very suitable for haptic feedbacks like in smartphones)
2. The very long life cycles
3. And the targeted vibration force

Those linear vibration motors are available in two different types:

- **Bar-linear vibration motors** => x-direction
  - Baolong: BLM0412 series
- **Coin-linear vibration motors** => z-direction
  - Baolong: BLM0832 series

### FEATURES

- Fast acceleration
- Long lifecycle
- Targeted vibration force
- Various sizes
- For different driving voltages (1.8Vrms AC, sine wave)
- Different rotation speed and vibration strength
- Wire/connector assembly available
- Automotive specification available
- Expert advice & design-in support available

### APPLICATIONS

- E-call generation for perceptible feedback (mechanical vibration)
- Portable phones and communication devices
- Silent alarm / security communication
- Industrial control units (haptic feedback confirmation)
- Vibration alerting for wearables devices
- Vibration feedback for industrial control units
- Vibration feedback for future multifunction steering wheels

### PART NO. DIMENSION RATED VOLTAGE OPERATING VOLTAGE FREQUENCY MAX. RATED CURRENT MIN. TEMP. MAX. TEMP.

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DIMENSION</th>
<th>RATED VOLTAGE</th>
<th>OPERATING VOLTAGE</th>
<th>FREQUENCY</th>
<th>MAX. RATED CURRENT</th>
<th>MIN. TEMP.</th>
<th>MAX. TEMP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM0832-X10-U</td>
<td>ø 8 x 3.2 mm</td>
<td>1.8Vrms AC, Sine wave</td>
<td>0.1 ~ 1.85 Vrms AC</td>
<td>235 ± 7 Hz</td>
<td>90 mA</td>
<td>-20 °C</td>
<td>+60 °C</td>
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<tr>
<td>BLM0832D-FP81-1SPU</td>
<td>ø 8 x 3.2 mm</td>
<td>1.8Vrms AC, Sine wave</td>
<td>0.1 ~ 1.85 Vrms AC</td>
<td>205 ± 7 Hz</td>
<td>90 mA</td>
<td>-20 °C</td>
<td>+60 °C</td>
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<tr>
<td>BLM0412-FP135-1S03U</td>
<td>12 x 4 x 3.95 mm</td>
<td>1.8Vrms AC</td>
<td>0.1 ~ 1.85 Vrms AC</td>
<td>240 ± 10 Hz</td>
<td>135 mA</td>
<td>-20 °C</td>
<td>+60 °C</td>
</tr>
</tbody>
</table>

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Our supplier Citizen Electronics developed a new COB generation CLU7x2 for high density application with narrow beam angle. With the new 4.2 mm LES we are offering the smallest LES on the COB market. The high intensity COBs will be also available with CRI 97. All available holders which could be used for CLU7x1 can be also used for CLU7x2. Pad-layout size of CLU712 is changed that all holders for CLU038 and CLU711 could be also used for this type.

### APPLICATIONS
- Spotlight with narrow beam angle
- Truck light
- Downlight

### ADDITIONAL INFORMATION
- Ra 97 will be also added to the line-up
- 5 Years Warranty
- Samples are available
- UL certification available
- Mac Adam Step 3 Binning

### ELECTRO-OPTICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>PRODUCT CODE</th>
<th>ELECTRO-OPTICAL CHARACTERISTICS</th>
<th>ABSOLUTE MAX. RATING</th>
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<tr>
<td></td>
<td>Ra</td>
<td>CCT</td>
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<tr>
<td>CLU7A2-1201C9-273MR1</td>
<td>80 Min.</td>
<td>2,700 K</td>
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<tr>
<td>CLU7A2-1201C9-303MR1</td>
<td>80 Min.</td>
<td>3,000 K</td>
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<tr>
<td>CLU7A2-1201C9-403MR1</td>
<td>80 Min.</td>
<td>4,000 K</td>
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<tr>
<td>CLU7A2-1201C9-273MR2</td>
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<td>2,700 K</td>
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<tr>
<td>CLU7A2-1201C9-303MR2</td>
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<td>3,000 K</td>
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<tr>
<td>CLU7A2-1201C9-403MR2</td>
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<tr>
<td>CLU702-1202C9-273MR1</td>
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<tr>
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<tr>
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</table>
The NJL6401R-3 / 6402R-2 are the high speed Si PIN photo diode sensor that is capable of detecting at a wide wavelength range from blue-violet light up to infrared light.

**SPECIFICATIONS OF NJL6401R-3**

- Corresponding to three wavelength: $\lambda = 405\,\text{nm}/650\,\text{nm}/780\,\text{nm}$
- Short rise-time, fall-time: 2ns typ. ($\lambda = 405\,\text{nm}/650\,\text{nm}/780\,\text{nm}$, VR = 2.5 V, 10 – 90%)
- High speed: 250 MHz ($\lambda = 780\,\text{nm}$), 300 MHz ($\lambda = 650\,\text{nm}$), 350 MHz ($\lambda = 405\,\text{nm}$)
- Package: 1.2 x 1.7 x 0.8 mm
- Active area: 0.7 x 0.7 mm

**SPECIFICATIONS OF NJL6402R-2**

- Corresponding to three wavelength: $\lambda = 405\,\text{nm}/650\,\text{nm}/780\,\text{nm}$
- Short rise-time, fall-time: 2ns typ. ($\lambda = 405\,\text{nm}/650\,\text{nm}/780\,\text{nm}$, VR = 2.5 V, 10 – 90%)
- High speed: 200 MHz ($\lambda = 780\,\text{nm}$), 220 MHz ($\lambda = 650\,\text{nm}$), 250 MHz ($\lambda = 405\,\text{nm}$)
- Package: 1.6 x 2.4 x 0.8 mm
- Active area: 1.0 x 1.0 mm

* Pb free solder reflowing permitted • Pb free, halogen free, conformity to RoHS directive • Low wavelength dependence and fast fall-time

**Example: smoke detector**

Optical smoke detectors are changing from std. single wavelength (near IR) to dual wavelength (Blue & near IR) type.

Key requirements for PDs used for dual wavelength smoke detectors are:

- High sensitivity characteristic at 470 nm (blue wavelength)
- No deterioration of the resin at high temperature and blue light

**Challenge:** How to distinguish between real smoke and steam to avoid false alarms?

**Solution:** Usage of two LEDs with IR and Blue wavelengths

- In case of large size particles
  - Difference in optical scattering intensity of two wavelength is very small: $\frac{l_\text{BL}}{l_\text{IR}} = 1$
- In case of small size particles
  - Difference in optical scattering intensity of two wavelength is large blue scattering is bigger than IR: $\frac{l_\text{BL}}{l_\text{IR}} > 1.4$

**Particles are large**

**Particles are small**
Fibocom has developed the brand new LPWA module series named MA510-GL which will be available in several versions.

The derivates enable your application to connect to the network types LTE Cat.M1, LTE Cat.NB2 and EGPRS. The triple-mode (LTE Cat.M1, LTE Cat.NB2 and EGPRS), the dual-mode (LTE Cat.M1 and LTE Cat.NB2), as well as the single-mode module (LTE Cat.M1) are all compatible.

The series is based on Qualcomm IC MDM9205, available with LCC and LGA footprint (22.2 x 20.2 x 2.1 mm), supports GNSS (GPS / GLONASS / BeiDou / Galileo), and has given all needed global certifications.

**FEATURES OF MA510-GL-00**

- Dimension: 22.2 x 20.2 x 2.1 mm
- Package: LCC + LGA, 86 Pin
- Operating frequency band:
- EGPRS: 850/900/1800/1900MHz
- GNSS: GPS / GLONASS / BeiDou / Galileo
- Power supply: 3.3 V ~ 4.5 V (typical 3.8 V)
- Operating temperature: -40 °C ~ +85 °C
- Cat.M1 (kbps): 589 (DL) / 1119 (UL)
- Cat.NB2 (kbps): 136 (DL) / 150 (UL)
- GPRS (kbps): 107 (DL) / 85.6 (UL)
- EDGE (kbps): 296 (DL) / 236.8 (UL)
- Antenna: Main x 1, GNSS x 1
- Functional interfaces:
  - SIM 1.8V / USB 2.0 x 1 /
  - UART x 3, I2C, I2S, GPIO, SPI /
  - ADC / System Indicator / ANT_TUNER
- Global certifications

**APPLICATIONS**

- Asset tracking
- Industrial monitoring and control
- Security systems
- Smart home
- Smart metering

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