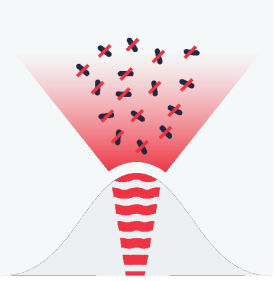
Klaran® LA Series UVC LEDs

Klaran LA Series UVC LEDs are compact and cost effective UVC emitters that enable long life water, air, and surface disinfection systems. Achieving high intensity output at the most effective wavelengths for disinfection, a single Klaran LA UVC LED can provide on-demand disinfection directly into your products.

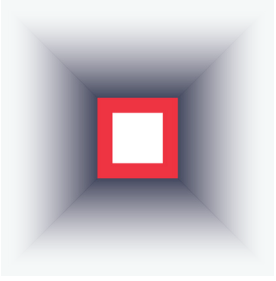


260 NM TO 270 NM: MOST EFFECTIVE FOR DISINFECTION

Klaran LA's 260 nm to 270 nm wavelength range for disinfection assures that products built with Klaran LEDs require less total UVC power to achieve product performance certification than UV LEDs with peak wavelengths greater than 270 nm or mercury lamps at 254 nm.

ON DEMAND PERFORMANCE: GET LONGER LIFE DISINFECTION

Compared to UV lamps, which are constantly operating and require annual replacement, UVC LEDs are on only when disinfection is needed. This conserves UVC LED lifetime and helps extend disinfection maintenance cycles to many years.



HIGHEST INTENSITY AND EASY INTEGRATION

The high etendue Aluminum Nitride die eliminates the need for an expensive and bulky sealed quartz package allowing the highest intensity operation in a compact low cost package.

PREDICTABLE SERVICE LIFE: PERFORMANCE YOU CAN COUNT ON

Robustly characterized, Klaran LA UVC LEDs provide confidence that your disinfection solution perform reliably for its design lifetime.

LOW COST DISINFECTION

Klaran LA Series LEDs are produced from Crystal IS' proprietary Aluminum Nitride substrates which support high yields of UVC LEDs for cost effective solutions.

Product Nomenclature[1]

Klaran LEDs are binned by total power output (Pt).
Total Optical Power Output at 500 mA.

Part Number	Unit	Min
KL265-50W-SM-LA	mW	80
KL265-50V-SM-LA	mW	70
KL265-50U-SM-LA	mW	60

NOTES:

1. Optical Power Output Tolerance of +/- 8% ;Test condition : If pulse = 500mA (If:Forward current), Ta=25˚C (Ta:Ambient Temperature)

LED Characteristics[1]

Characteristic	Symbol	Unit	Min	Typical	Max
Peak Wavelength at 500 mA[2]	λP	nm	260		270
Forward voltage at 500 mA	Vf	V	5.0		8.0
Thermal resistance	Rth	˚C/W		7.0	
Power dissipation at 500 mA[3]	W	W			4
Viewing angle	θ	degrees		130	
Temp. coefficient at Pt		%/°C		-0.35	

NOTES:

1. Test Condition: Ta=25°C
2. Peak Wavelength Tolerance of +/- 1.8nm
3. Power Dissipation, is calculated as W = If x Vf

.

Absolute Maximum Ratings

Characteristic	Symbol	Unit	Min	Max
Forward current (continuous)	If	mA	100	500
Reverse voltage	V_r	V		5
Operating temperature	T_{opr}	˚C	-40	85
Storage temperature	T_{stg}	˚C	-40	100
Junction temperature[1]	T_j	˚C		115

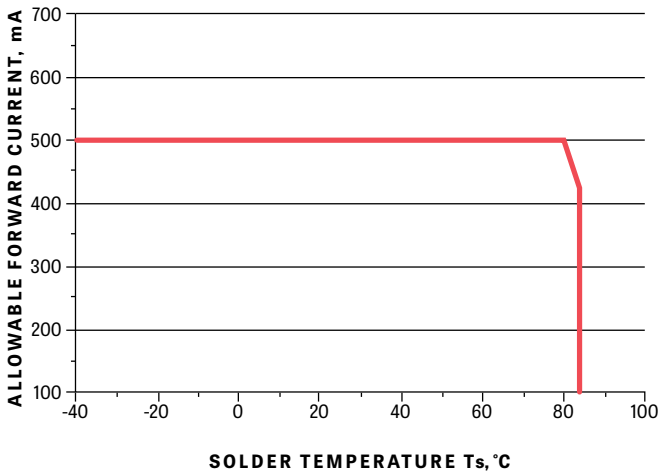
NOTES:

1. Junction temperature: Tj = Ts +Rth x W (Ts: Temperature of solder point)

Solder Temperature vs Allowable Forward Current

Allowable forward current versus solder point temperature.

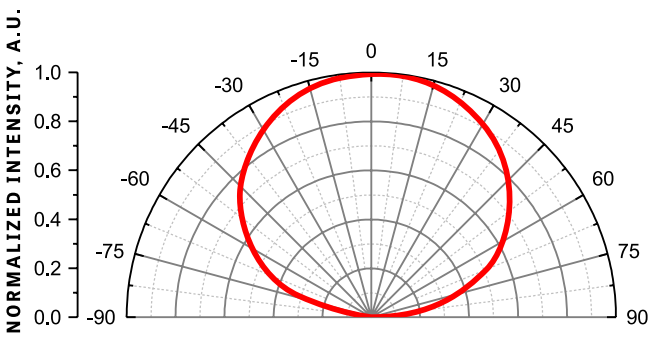
SOLDER TEMPERATURE VS ALLOWABLE FORWARD CURRRENT



Radiation Pattern

Klaran LA LEDs have a nominal viewing angle of 130°

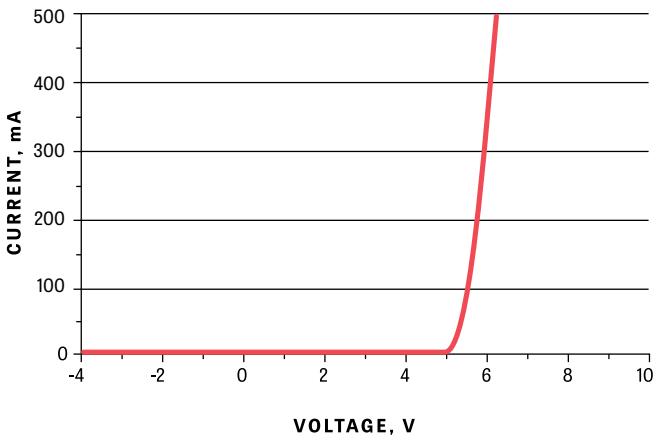
RADIATION PATTERN



Test Conditions: If = 100 mA, T_A = R.T.

Typical Electrical Characteristics

ELECTRICAL CHARACTERISTICS

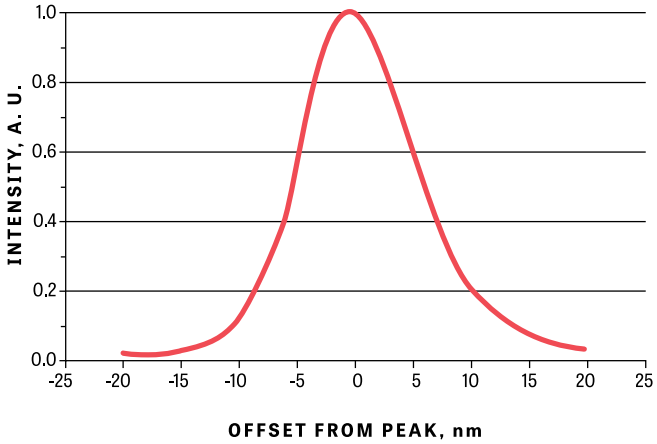


Test Conditions: T_A = R.T.

Spectral Characteristics

The plot below shows the stability of the peak wavelength at 500 mA.

WAVELENGTH SPECTRA

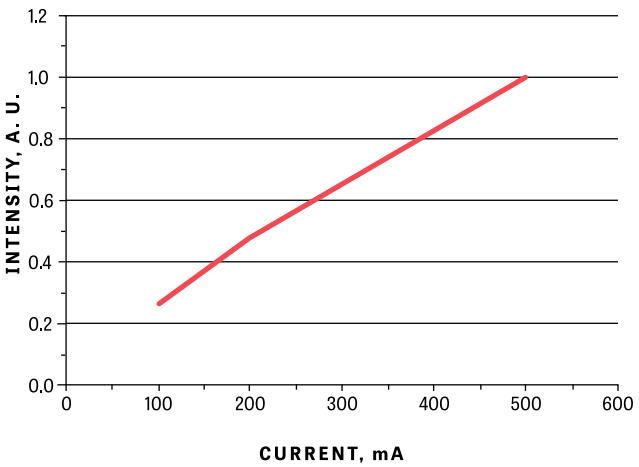


Test Conditions: If pulse = 500 mA, T_A=R.T.

Light Output Characteristics Over Current

The plot below shows the typical variation in light output with forward current. The light output data is normalized to the light output at 500 mA.

LIGHT OUTPUT OVER CURRENT

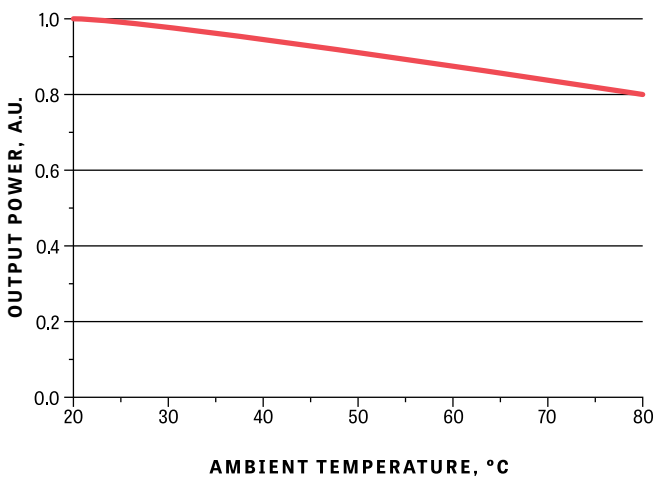


Test Conditions: T_A=R.T.

Thermal Derating

Output power is very sensitive to junction temperature, which is affected by both ambient temperature and the use of proper thermal management techniques.Lower junction temperatures will ensure the optimal performance and lifetime of the LED. The plot below shows the change in optical power with increase in ambient temperature while employing effective thermal management.

LIGHT OUTPUT POWER OVER TEMPERATURE

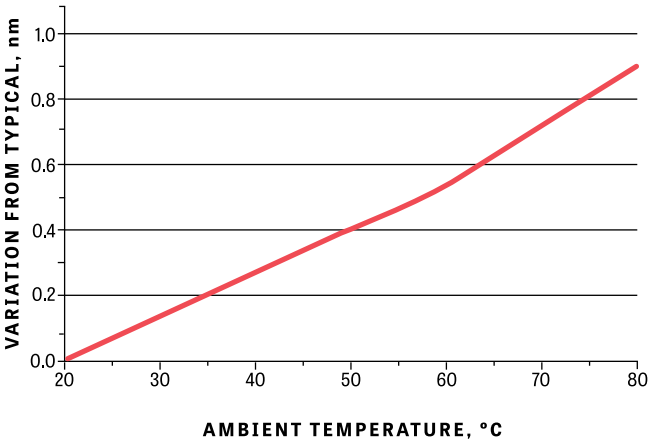


Test Conditions: If pulse = 500 mA

Wavelength Shift Over Temperature

Stability of wavelength characteristics over temperature.

WAVELENGTH SHIFT OVER TEMPERATURE

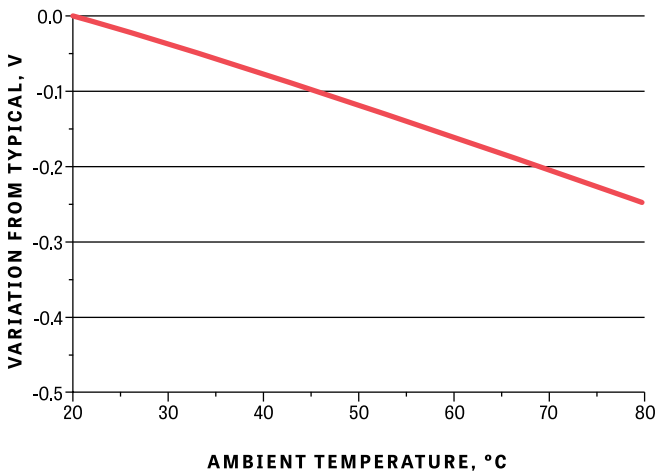


Test Conditions: If pulse = 500 mA

Voltage Shift Over Temperature

Stability of voltage characteristics over temperature.

VOLTAGE SHIFT OVER TEMPERATURE

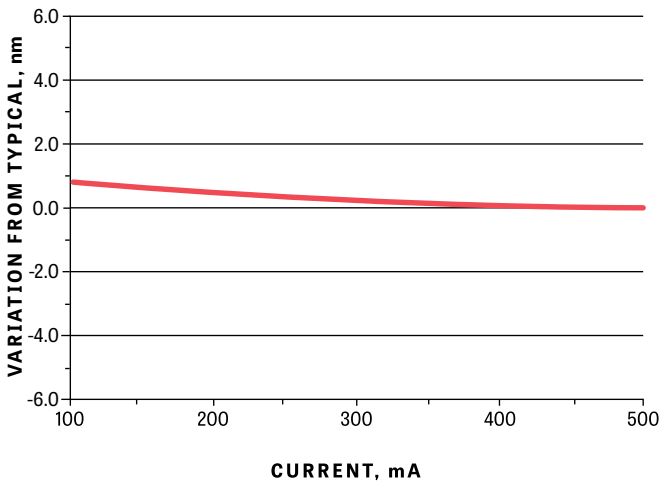


Test Conditions: If pulse = 500 mA

Wavelength Shift Over Current

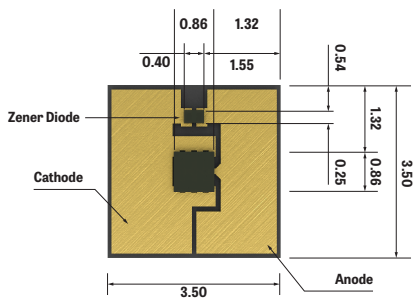
Stability of wavelenth characteristics over current.

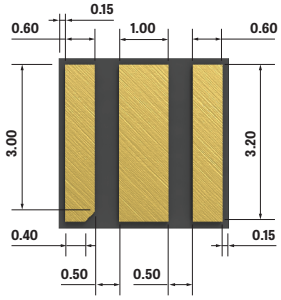
WAVELENGTH SHIFT OVER CURRENT

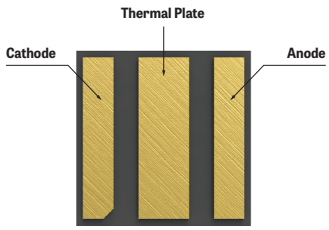


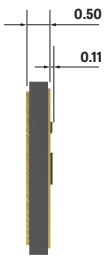
Test Conditions: T_A=R.T.

Mechanical Dimensions

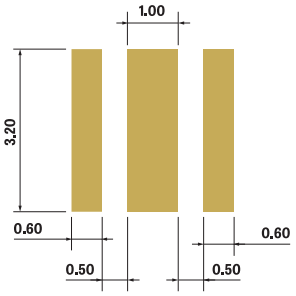








SOLDER PATTERN

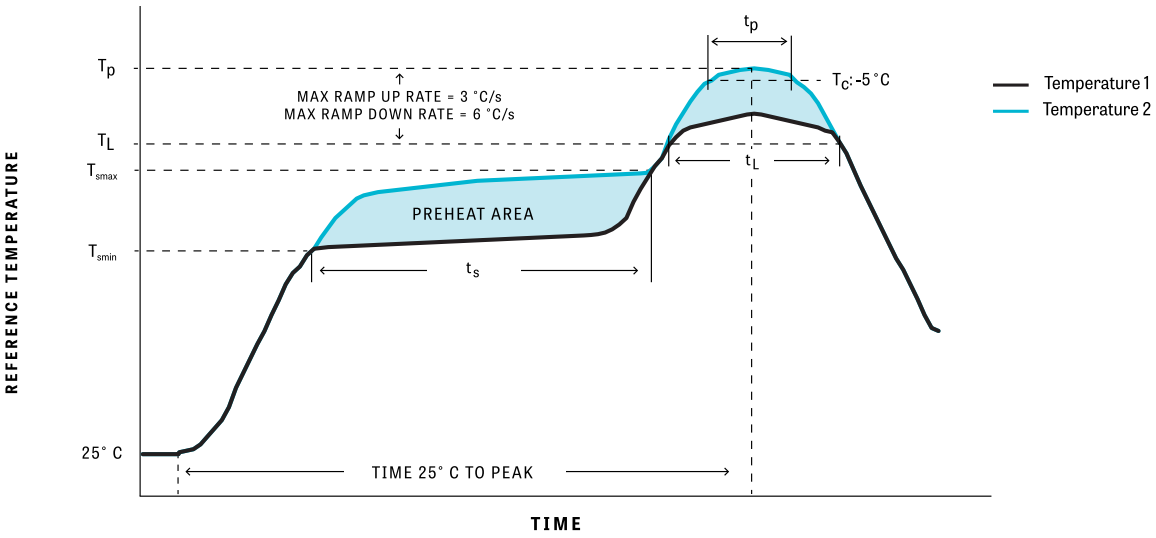


All dimensions are design values and have not been 100% inspected.
All dimensions are in millimeters. Unless noted otherwise, all dimensions have a tolerance of ± 0.05 mm.

Recommended Soldering Guidelines

The recommended solder reflow profile for Klaran UVC LEDs follows the JEDEC standard J-STD-020D. Hand soldering is not recommended for these devices.

FIGURE 1



Guidelines

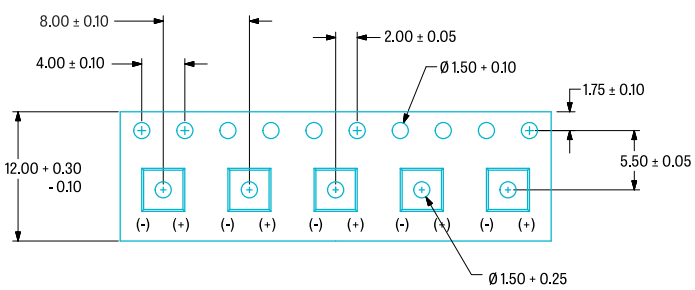
Profile Feature	Pb-Free Assembly
Preheat/Soak	
> Temperature Min (T_{smin})	150 °C
> Temperature Max (T_{smax})	200 °C
> Maximum Time (t_s) from T_{smin} to T_{smax}	60~120 seconds
Ramp-up rate (T_L to T_p)	3 °C/second max.
Liquidous Temperature (T_L)	217 °C
Time (t_L) maintained above T_L	60~150 seconds
Maximum peak package body temperature (T_p)	260 °C
Time (t_p) within 5 °C of the specified temperature (T_C)	30 seconds
Ramp-down rate (T_p to T_L)	6 °C/second max.
Maximum Time 25 °C to peak temperature	8 minutes max.

Reel Packaging Specification

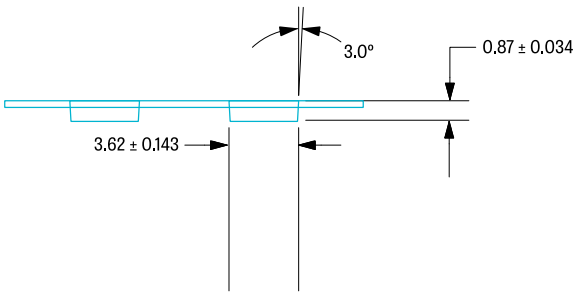
Klaran LA is packaged in tape and reel in quantities of 1000 for machine manufacturing.

TAPE DIMENSIONS

Top View



Side View



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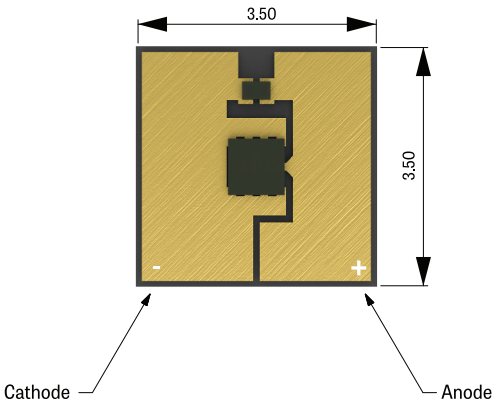
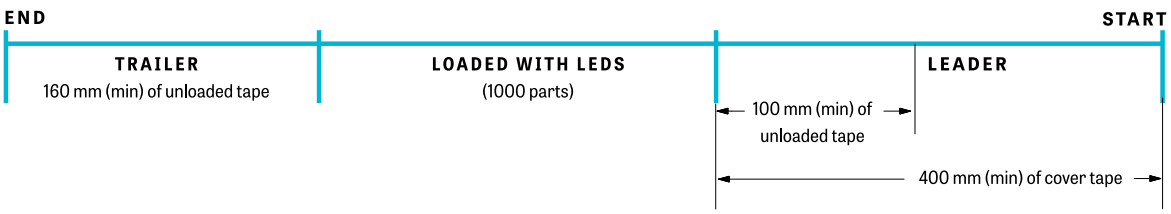
All dimensions are in millimeters (mm).

LED POSITION IN TAPE



Devices are placed with the cathode to the left so the polarity direction is cathode to anode.

REEL INFORMATION



Each reel includes a leader and trailer section that is not loaded with LEDs.

Handling Precautions

- LEDs are ESD (electrostatic discharge) sensitive; static electricity and surge voltages seriously damage UV LEDs and can result in product failure
  - Ensure that tools, jigs and machines being used are properly grounded
  - LED mounting equipment should include protection against voltage surge
  - Use proper ESD protection, including grounded wrist straps, ESD footwear and clothes
- The UVC LED is not protected by a lens and requires careful handling
  - Do not handle the LED with bare hands as it may contaminate the LED surface and affect the optical characteristics.
  - Avoid touching the LED die
- Do not use adhesives that outgas organic vapor
- Dropping the product may cause damage
- If handling the product with tweezers, use only the side of the package and be careful not to apply excessive force
- When populating boards in SMT production avoid excessive mechanical pressure on the product
- Pick and place nozzles must not impinge on the product die or zener diode
- Verify the PCB with the product before use
- PCB warpage after mounting products onto a PCB can cause the package to break.
  - LEDs should be placed in a way to minimize stress on the LED due to board flexing
  - Soldering should be done as soon as possible after opening the moisture-proof bag.
  - Do not rapidly cool device after soldering.
  - Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering.

Storage Precautions

- Product complies with JEDEC MSL1 or equivalent and is shipped in a moisture proof package (with silica desiccant). See IPC/JEDEC STD-202 for moisture sensitivity details.
- Product should be stored in a controlled dust-free environment < 30˚C
- Soldering should be performed as soon as possible after opening the moisture-proof package.
- Unused LEDs should be stored with silica-gel desiccants in a hermetically sealed container.
  - LEDs stored for extended periods may need to be baked prior to soldering

Eye Safety Guidelines

During operation, the LED emits high intensity ultraviolet (UV) light, which is harmful to skin and eyes. UV light is hazardous to skin and may cause cancer. Avoid exposure to UV light when LED is operational. Precautions must be taken to avoid looking directly at the UV light without the use of UV light protective glasses. Do not look directly at the front of the LED or at the LED's lens when LED is operational.

Attach warning labels on products/systems that use UV LEDs.

RoHS Compliance

The levels of environmentally sensitive, persistent biologically toxic (PBT), persistent organic pollutants (POP), or otherwise restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Safety Notice

Product provides or uses ultraviolet light from a LED at specific light output levels. Buyer expressly acknowledges that, depending on wavelength and exposure time, light in this spectrum can have a harmful effect on, among other things, the eyes and skin of an unprotected individual, and must be used with caution. It is the Buyer's responsibility to provide notice that UV light is present where the Product is in use and ensure that product label and labeling effectively communicates the proper and safe use of the product. Buyer assumes full responsibility to become educated in and to protect from harmful irradiation, and agrees to indemnify Seller against all claims, suits, complaints or other disputes related to the presence of UV light that is alleged to originate with Product.

DISCLAIMER

The specifications, characteristics, and technical data presented in this datasheet are subject to change without prior notice. It is recommended that the most updated specifications, characteristics, and technical data be used in your application.

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WE INVITE YOU TO LEARN MORE ABOUT OUR UVC LEDs.

KLARAN®

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