Data sheet

Part number :BUA1610M-T-10

2011/65/EU, (EU)2015/863
10 Substances regulation compliant

Package	Metal board / COB (Chip on Board) type Outer dimension: 31.5 x 21.0 x 9.3mm (L x W x H)
Product features	・Superior in high luminous flux, large current driving and heat dissipation ・High reliability to withstand harsh environments ・Small light emitting area that is superior for optical design ・Feeding by the connector ・RoHS2 / ELV compliant

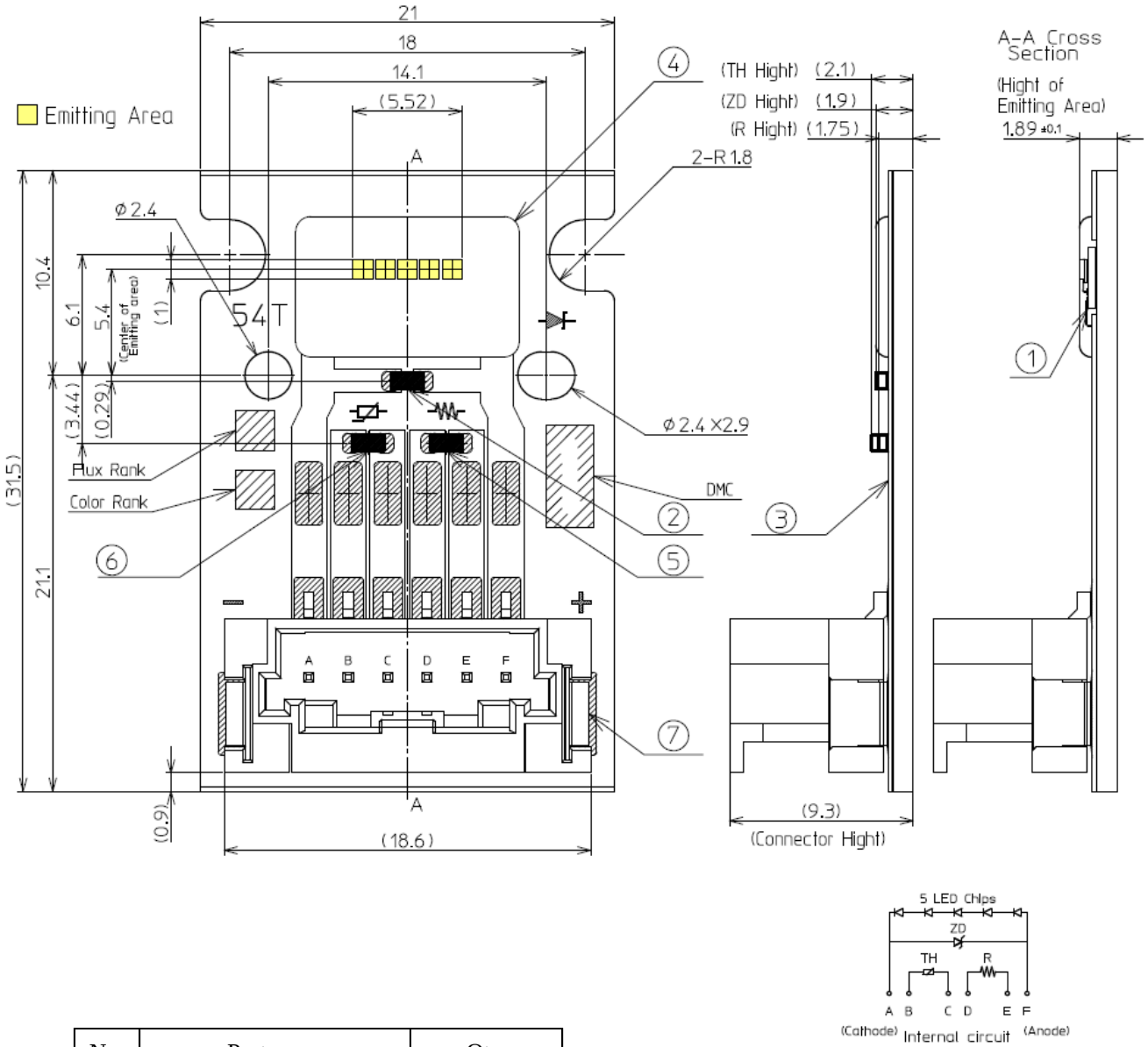
Recommended applications

・Exterior lighting for automotive and motorcycle (Head lamp, Bi-function type head lamp, etc.)
・Light source for other equipment requiring high luminance and high current drive

Outline dimensions

BUA1610M-T-10

Unit : mm
Weight : 7g
Tolerance : ±0.1



No.	Part name	Qty.
①	White LED Submount	1
②	Protection diode (ZD)	1
③	Metal board	1
④	Encpsulant	1
⑤	Resistor (R)	1
⑥	Thermistor (TH)	1
⑦	Connector	1

Specifications BUA1610M-T-10

【 Product overview 】

Die material	InGaN
Emitting color	White
Emitting area color	Diffused pale yellow

【 Absolute maximum ratings 】

(Ta=25℃)

Item	Symbol	Maximum ratings	Units	
Junction temperature	Tj	150.0	℃	
Operating temperature	T_{opr}	-40 to +85	℃	Notes1,2
Storage temperature	T_{stg}	-40 to +125	℃	Notes1
Forward current	I_F	200 to 1,500	mA	
Power dissipation	Pd	25.5	W	
Forward current	I_F	200 to 2,100	mA	
Zener diode power dissipation	Pd-ZD	150	mW	
Zener diode voltage	Vz	32	V	
Electro static discharge threshold "HBM"	ESD	±8,000	V	Notes3

Notes1 The range of operating and storage temperature are not taping condition.

Notes2 ESD testing method : EIAJ4701/300(304) Human Body Model (HBM) 1.5kΩ,100pF

【 Thermal characteristics 】

(Ta=25℃)

Item	Symbol	Typ.	Max.	Units	
Thermal resistance 【Junction - the bottom of Cu substrate】	$R_{th(j-b)}$	0.8	1.0	℃/W	Notes4
Junction temp. increase 【Junction - the bottom of Cu substrate】	△Tj	-	25.5	℃	Notes4

Notes4 The measurement point of thermal resistance is the back surface of the Cu substrate (straight down from emitting area).

Specifications BUA1610M-T-10

【 Electro-optical characteristics 】

(Ta=25℃)

Item	Symbol	Conditions	Min.	Typ.	Max.	Units	
Forward voltage	V_F	I_F = 1,000mA	13.5	15.5	17.0	V	Notes4
Luminous flux	Φv	I_F = 1,000mA	1,700	1,800	2,100	lm	Notes4
Chromaticity coordinates	x	I_F = 1,000mA	-	0.325	-		Notes4,5
	y		-	0.335	-		

Note4 Refer to the attached sheets for each sorting chart.

Note5 Chromaticity coordinates ; x and y according to CIE1931.

【 Electro characteristics of NTC thermistor 】

Thermistor name	NCP18WM154E0SRB Murata Manufacturing Co., Ltd.

Item	Conditions	Min.	Typ.	Max.	Units
Maximum current	Thermistor temp. = 25℃	-	-	80	μA
Resistance value	Thermistor temp. = 25℃	-	150k±3%	-	Ω

Notes

Please refer to the specification sheet of the NCP18WM154E0SRB Made by MURATA Ltd. for thermistor specifications and quality not listed above.

It is a current value to which the NTC thermistor unit generates heat at 1℃ for the Maximum current.

The current value of 1/10 or less is recommended when used for the temperature detection.

【 Sorting chart for forward voltage : V_F 】

LEDs shall be sorted out into the following chart.

(Ta=25℃)

Forward voltage V_F (V)		Conditions
Min.	Max.	
13.5	17.0	I_F=1,000mA

Notes

Tolerance on forward voltage : ±0.1V

Measurement timing : instantly after lighting

Specifications BUA1610M-T-10

【 Sorting chart for luminous flux : Φv 】

LEDs shall be sorted out into the following chart and each rank shall be packed separately for shipping.

Rank	Luminous flux Φ_V (lm)		Conditions
	Min.	Max.	
C	1,700	1,800	I_F=1,000mA Ta=25℃
D	1,800	1,900	
E	1,900	2,000	
F	2,000	2,100	

Notes Tolerance on luminous flux : ±7%
Measurement timing : instantly after lighting (50msec)

【 Resistance table 】

Resistance is mounted by as follows according to the rank of theluminous flux of the LED.

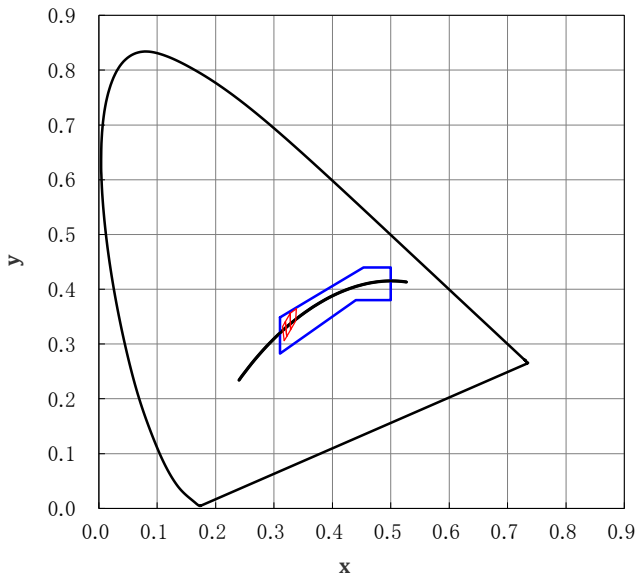
Rank	Resistance (Tolerance ±1%)	Resistance value (Ω) Ta=25℃
C	RK73H1JRTTD1001F	1.0kΩ
D	RK73H1JRTTD1601F	1.6kΩ
E	RK73H1JRTTD3301F	3.3kΩ
F	RK73H1JRTTD1102F	11kΩ

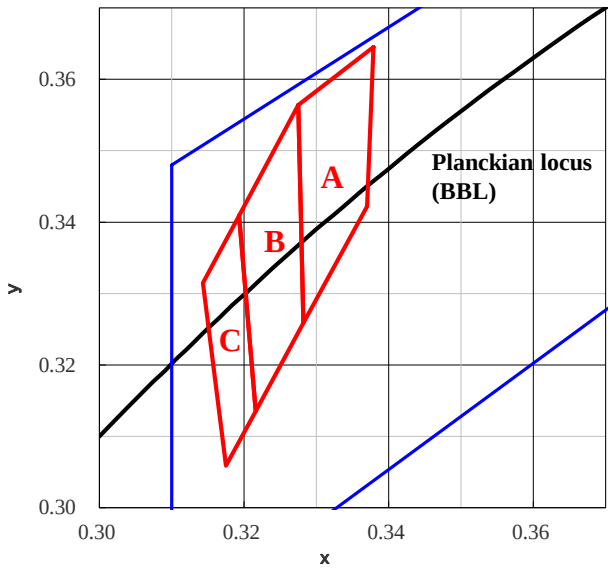
Note Please refer to the specification sheet of the RK73H1JRTTD****F Made by KOA. for resistor specifications and quality not listed above.

Specifications BUA1610M-T-10

【 Sorting chart for chromaticity coordinates : x, y 】

LEDs shall be sorted out into the following chart and each rank shall be packed separately for shipping.





(I_F= 1,000mA, Ta=25℃)

Rank	Cx	Cy	Cx	Cy	Cx	Cy	Cx	Cy
A	0.3379	0.3645	0.3370	0.3422	0.3282	0.3259	0.3275	0.3564
B	0.3275	0.3564	0.3282	0.3259	0.3216	0.3135	0.3193	0.3409
C	0.3193	0.3409	0.3216	0.3135	0.3175	0.3059	0.3143	0.3315

Notes

Tolerance on chromaticity coordinates : ±0.01

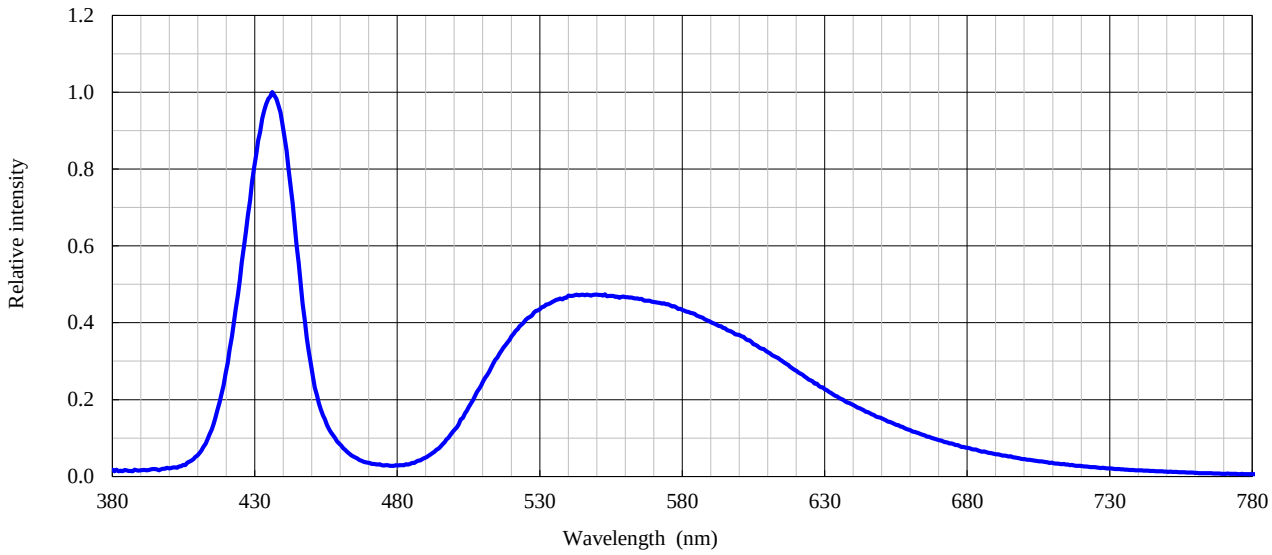
Measurement timing : instantly after lighting (20msec)

Technical Data

BUA1610M-T-10

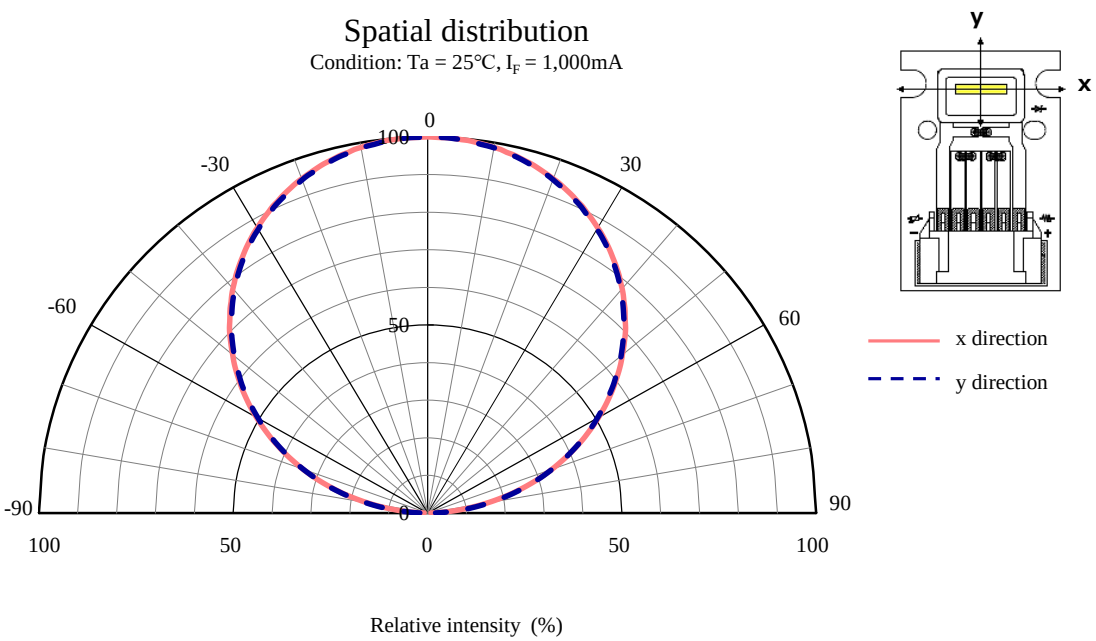
Relative intensity vs. Wavelength

Condition: Ta = 25°C, I_F = 1,000mA



Spatial distribution

Condition: Ta = 25°C, I_F = 1,000mA

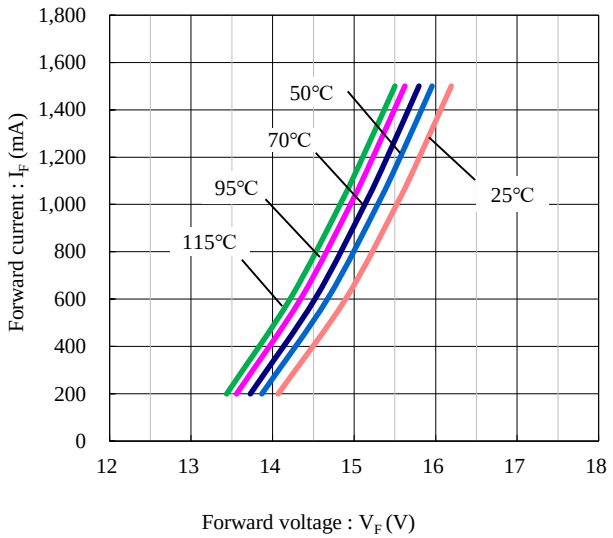


Technical Data

BUA1610M-T-10

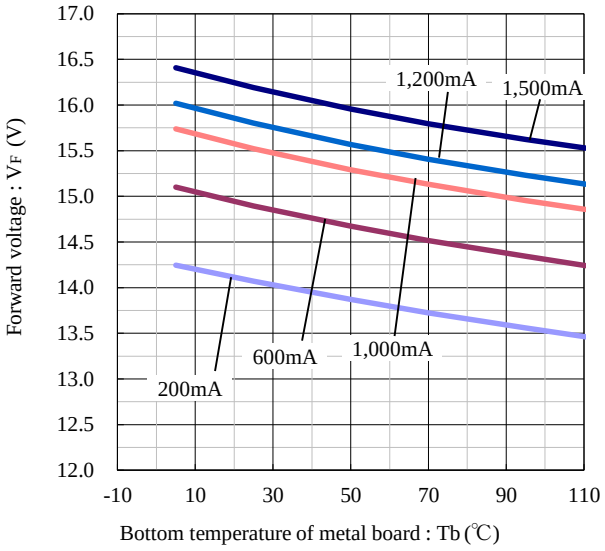
Forward voltage vs. Forward current

Condition: Tb = 25 to 115℃



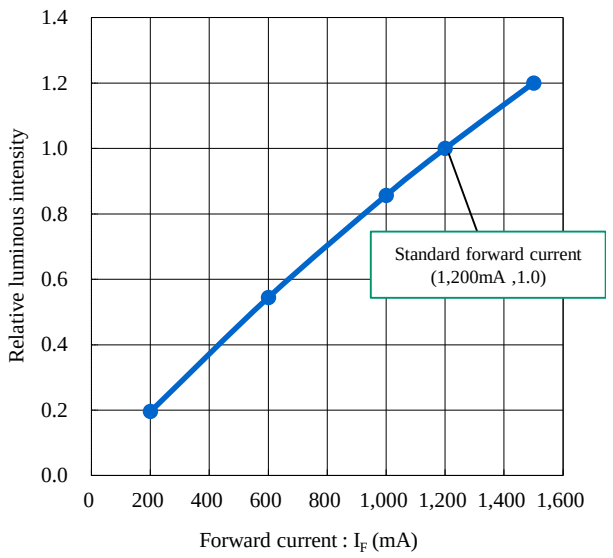
Bottom temp. of metal board vs. Forward voltage

Condition : I_F=200 to 1,500mA



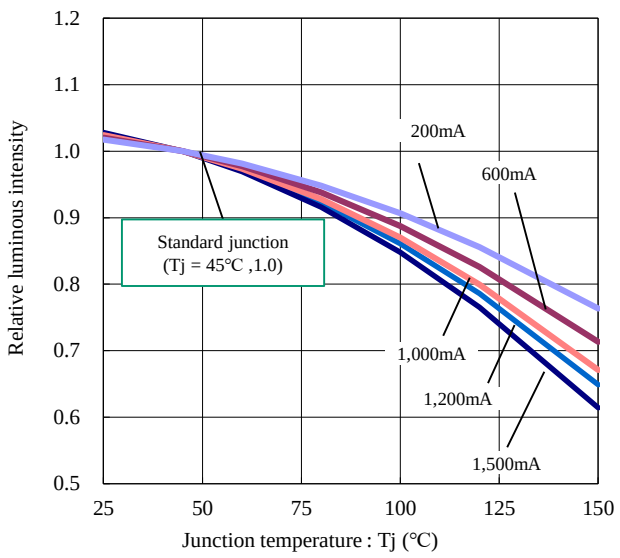
Forward current vs. Relative luminous intensity

Condition : Tb = 25℃



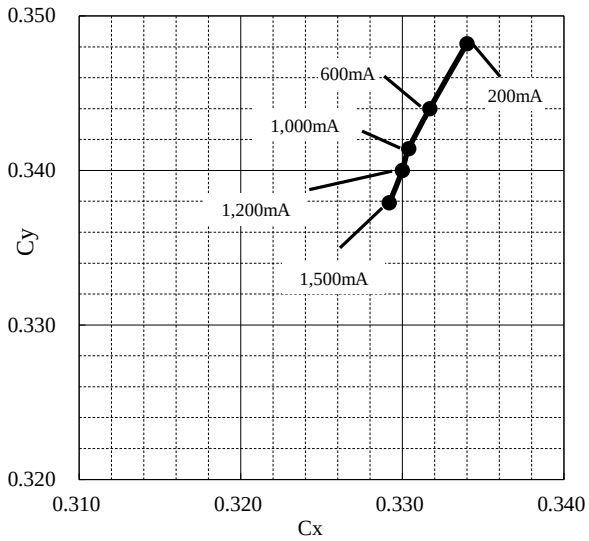
Junction temp. vs. Relative luminous intensity

Condition : Tb=25℃



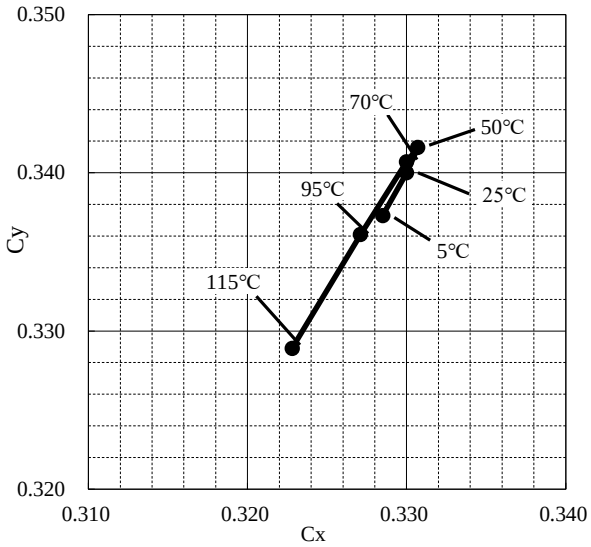
Chromaticity vs. Forward current

Condition: Tb = 25℃



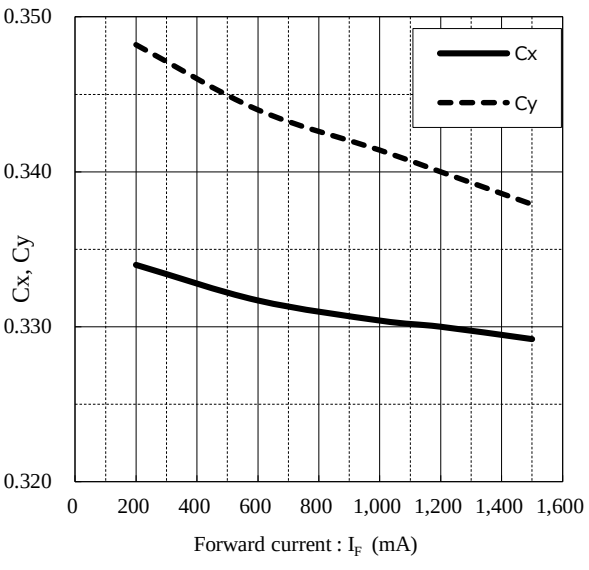
Chromaticity vs. Bottom temp. of metal board

Condition : I_F=1,200mA



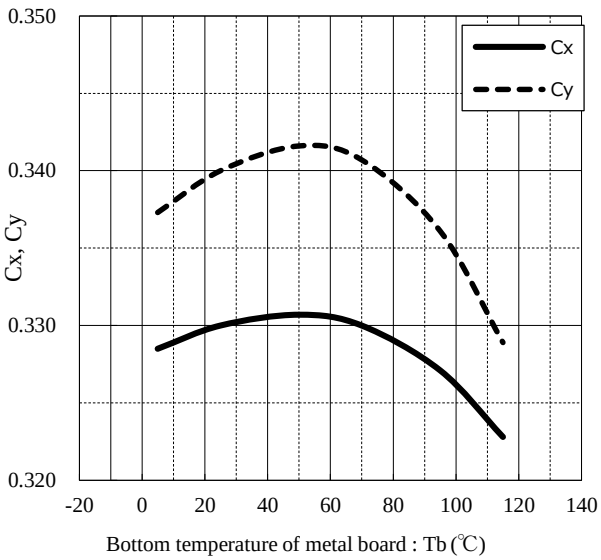
Chromaticity vs. Forward current

Condition: Tb = 25℃



Chromaticity vs. Bottom temp. of metal board

Condition : I_F=1,200mA



Handling precautions

BUA1610M-T-10

【For Electric Static Discharge (ESD)】

InGaN die LEDs are sensitive to voltage surges generated by On/Off status change and friction with synthetic materials, which may cause severe damage to the die or undermine its reliability.
Damaged products may experience conditions such as extremely high reverse voltage or decrease of forward rise voltage deteriorating their optical characteristic.
Stanley InGaN products are packed with anti-static components.
However, the following precautions must be taken into account upon product shipment.

1. Electrification / static electricity protection

In order to avoid product (die) damage from static electricity caused by electrified operator and other materials electrified friction coming in contact with the product, Stanley recommends taking the following precautions.

① Do not place electrified non-conductive materials near the LED product.
Avoid LED products from coming into contact with metallic materials.(Should the metallic material be electrified , the sudden surge voltage will most likely damage the product.)

② Avoid a working process which may cause the LED product to rub against other materials.

③ Install ground wires for any equipment, where they can be installed, with measures to avoid static electricity surges.

④ Prepare a ESD protective area by placing a Conductive Mattress (1MΩ MAX.) and Ionizer to remove any static electricity.

⑤ Operators should wear a protective wrist-strap.

⑥ Operators should wear conductive work-clothes and shoes.

⑦ To handle the products directly, Stanley recommends the use of ceramic, and not metallic, tweezers.

2. Working environment

① Dry environment is more likely to cause static electricity. Although a dry environment is ideal for storage state of LED products, Stanley recommends an environment with approximately 50% humidity after the soldering process.

② Recommended static electricity level in the working environment is less than 150V, which is the same value as Integrated Circuits (which are sensitive to static electricity).

Handling precautions

BUA1610M-T-10

【Other precautions】

1. The products are designed to achieve higher performance reliability, however, they can be influenced by usage conditions.

2. Absolute maximum ratings are set to prevent LED products from breaking due to extreme stress (temperature, current, voltage, etc.). These ratings must never be overrun even for a moment.

3. To achieve the highest performance reliability, it is necessary to take into account, factors such as forward voltage adjusted to the usage temperature condition, derating of the power consumption, and other variable factors.

4. Please insert straight protective resistors into the circuit in order to stabilize LED operation and to prevent the device from overheating.

5. Please do not touch or strike non allowed pick up area（refer to page 13）,because there is possibility to damage the products. And, please avoid foreign material because molding resin has adhesiveness.

6. Please avoid to use the products with materials and products that contain sulfur and chlorine element because the reliability may be decreased. Please keep in desiccator regardless of before or after mounting not to be affected by corrosive gas when keeping products. Also please make sure if there is any gas which occur in surrounding area or enter from outside when using products.

7. This product usually has sufficient resistance to sulfurization; however, if used in the same environment as materials containing large amounts of sulfur (including packaging materials), it may cause defects such as LED not illuminating due to sulfide corrosion. Please avoid exposing this product to materials that contain high concentrations of sulfur. Although this product has passed the sulfurization test recommended by major car manufacturers, when using materials containing sulfur components on this product or the actual unit where this product is mounted, there is a possibility that the environment will be beyond the test's expectations. Please check the impact of the sulfur components before use. Examples of materials containing sulfur components: gaskets, rubber packaging materials, grease, cardboard boxes, rubber (such as vulcanized rubber), sponges, etc. In addition, because there is a possibility of corrosion due to unexpected sources of sulfur (from surrounding environment or materials), even it does not contain the above materials we nevertheless recommend that you check the actual unit where this product is mounted, as well as the operating environment.

8. Please check the actual performance in the assembly because the specification sheets are described only for LED device.

9. Please refrain from looking directly at the light source of the LED at high output, as it may harm your vision.

10. The products are designed to perform without failure in the recommended usage conditions.
    However, please take the necessary precautions to prevent from a fire, injury, and other unexpected failures.

11. Do not drop it. Do not hit it against other objects. The parts may be damaged, the soldered portions may crack or break or the patterns of the board (electrode) may be peeled off or disconnected (for examples of damaged devices, refer to the following).

12. Hold the end faces of the board or portions where no electronic device has been mounted, not the portion where the electronic devices have been mounted (be sure to wear gloves).

13. Do not hold the boards by piling one on top of another. Do not pile or put the boards on top of another.
    The mounted electronics devices and boards may rub against each other and, as a result, the electronic devices may be damaged.

Handling precautions

BUA1610M-T-10

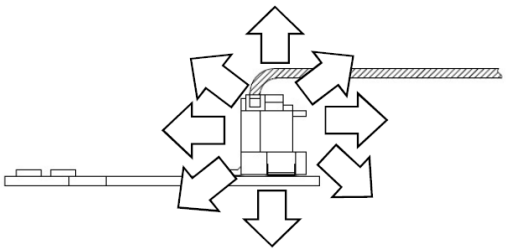
【Other precautions】

14. When wiring, the constant stress or pulling force should not be applied to the connector area.
This phenomenon might damage the connector or the pattern of the substrate. When designing the wire positioning, please ensure that there is enough length of wire to avoid stress on the connector.

15. Connectors should be mated straightly. Angled mating operation has possibility of damaging connector.

16. The insertion of connector is responsibility of customer.

17. When excessive stress apply to the connector, it causes the trouble.
Please take care **the stress from any direction should be less than 10N**.



18. The products are manufactured to be used for general electronic equipment.
Please contact our sales staff in advance when exceptional quality and reliability are required, when the failure or malfunction of the products might directly jeopardize life or health (such as for airplanes, aerospace, medical applications, nuclear reactor control systems and so on).

19. The formal specification sheets shall be exchanged and signed by both parties.

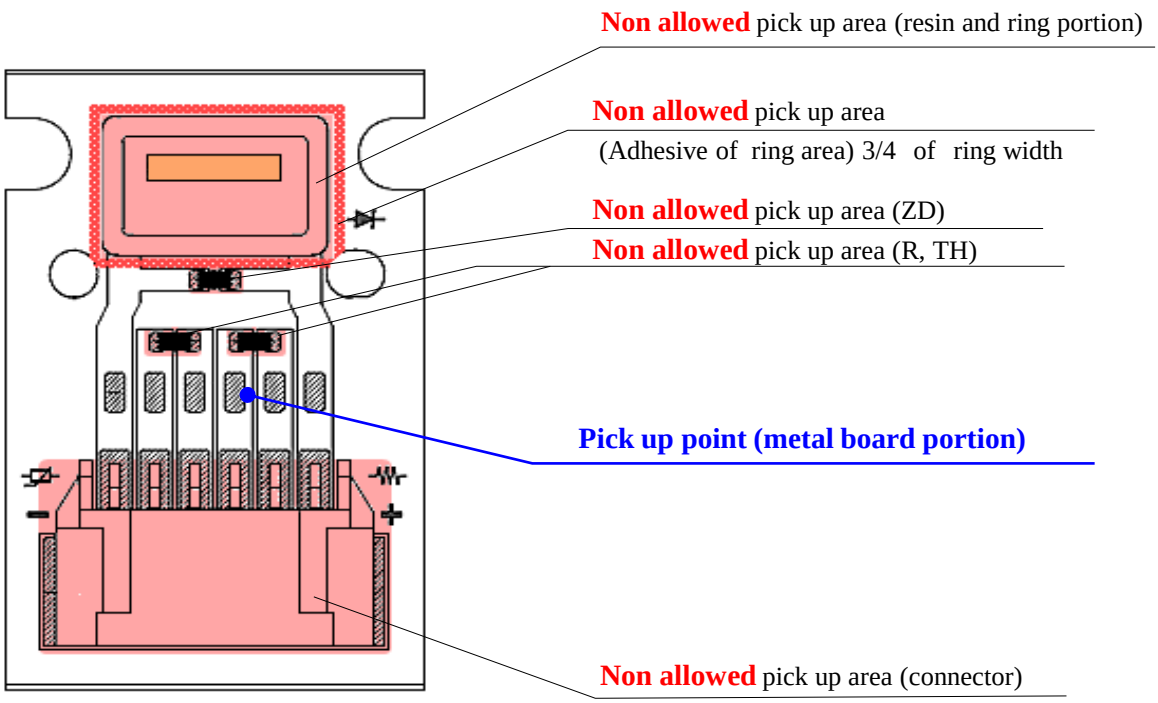
20. Supersonic waves may cause open circuit of wire.

【Handling precautions for product Mounting】

＜Recommendation＞

Picking up point with nozzle: metal board portion of the product (shown below)

The picking up point should be within metal board portion, because the silicone resin used is soft.
(If the nozzle makes contact with the lens, the products might be destroyed)



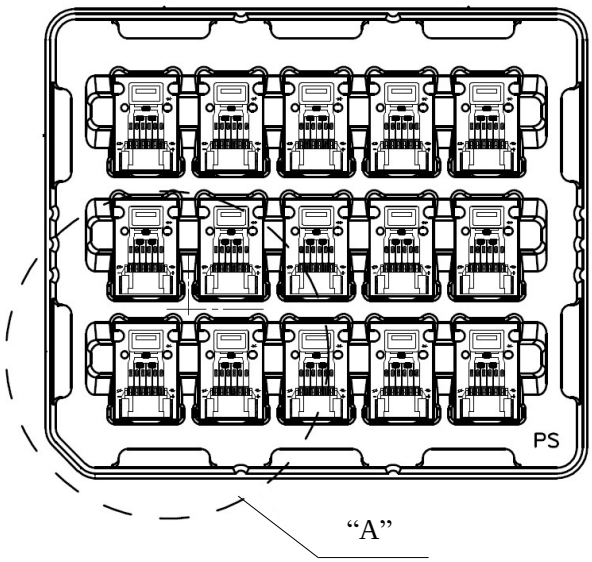
Please adjust the load, the pick up point, the nozzle diameter, etc. before mounting because the over load can cause the breakage of the lamp housing.

Packaging specifications

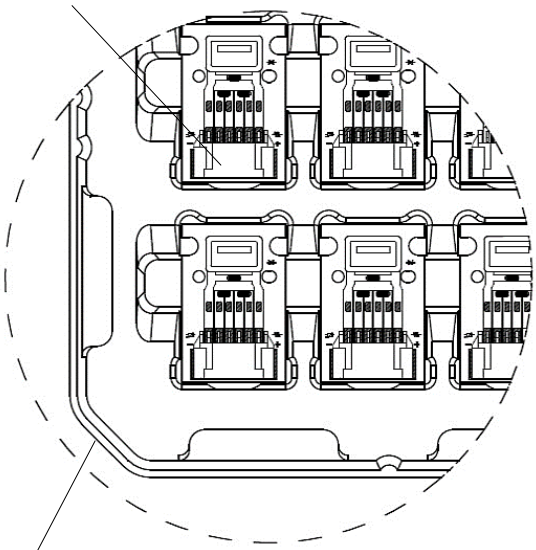
BUA1610M-T-10

【Tray specification】

1. Appearance



Electrode side



Cutting part

Detail of part "A"

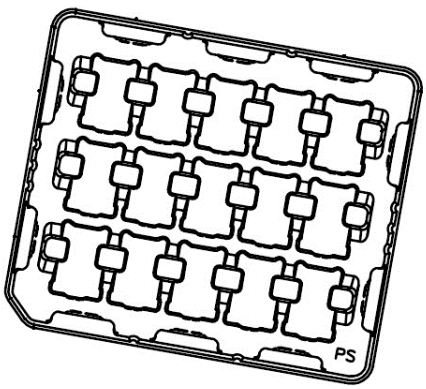
2. Qty. per Tray

15pcs.／tray

Notes) A minimum order quantity is Min.150pcs.

3. Tray per Packaging

6 trays are contained into 1 moisture-proof bag. (The highest tray is an empty tray. ：Lid)



6tray max. (the highest tray is an empty tray. ：Lid)

4. Others

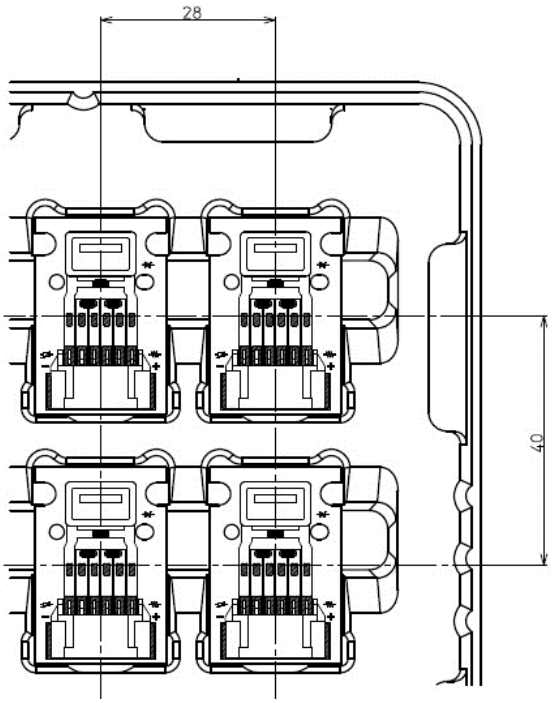
Reversed-orientation, up-side down placing, side placing and out of spec. parts mix shall not be held.

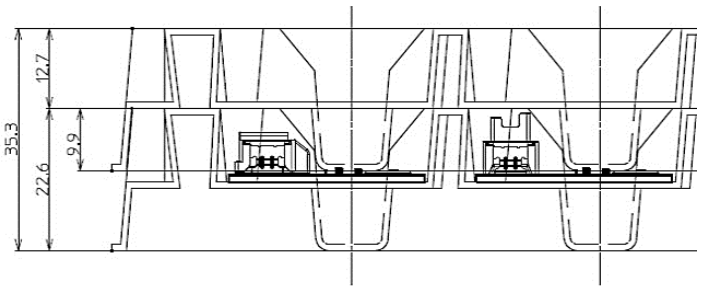
Packaging specifications

BUA1610M-T-10

【Tray specification】

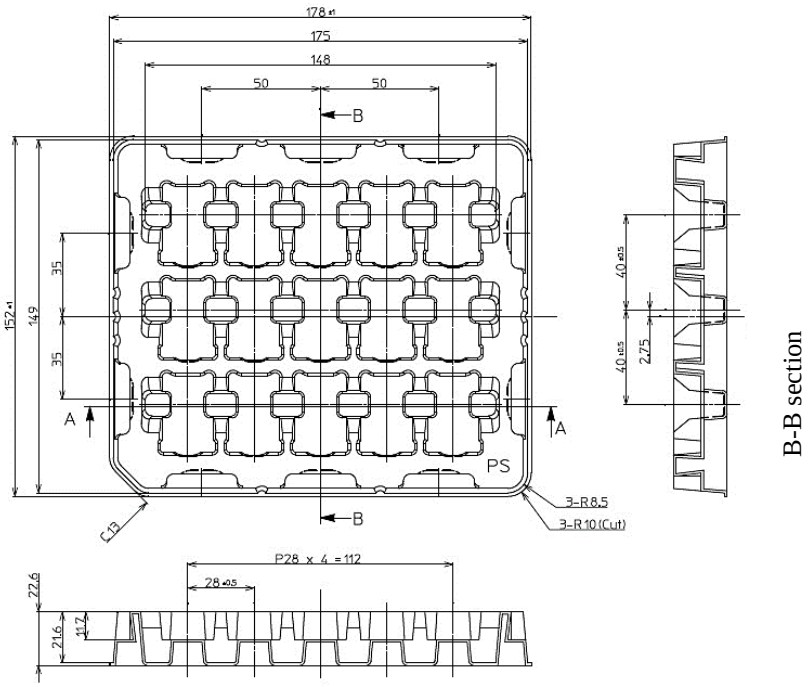
5. Pocket dimensions





Stacked form diagram

6. Tray dimensions



A-A section

Notes
1.Tolerance : ±0.5mm
2.Material : PS
Surface resistance : 10E6Ω max.
Electrification voltage : 150V max.
3. Warp : ±2.0mm

Packaging specifications

BUA1610M-T-10

This products are shipped in moisture-proof packaging (as show below)
to minimize moisture absorption during transportation. However, in regards to storing the products, the use of dry-box under the following conditions is recommended. Moisture-proof bag as the packaging is made of anti-static material but packaging box is not.

【Recommended storage condition / products warranty period 】

temperature	+5～30℃
Humidity	Under 70%

Avoid areas with corroding agent (gases). Avoid rapid transition from low temp. condition to high temp. condition.

【Time elapsed after Package Opening.】

If any components should remain after their use, please seal the package and store them under the conditions described in the【 Recommended storage condition 】.After that please use promptly.

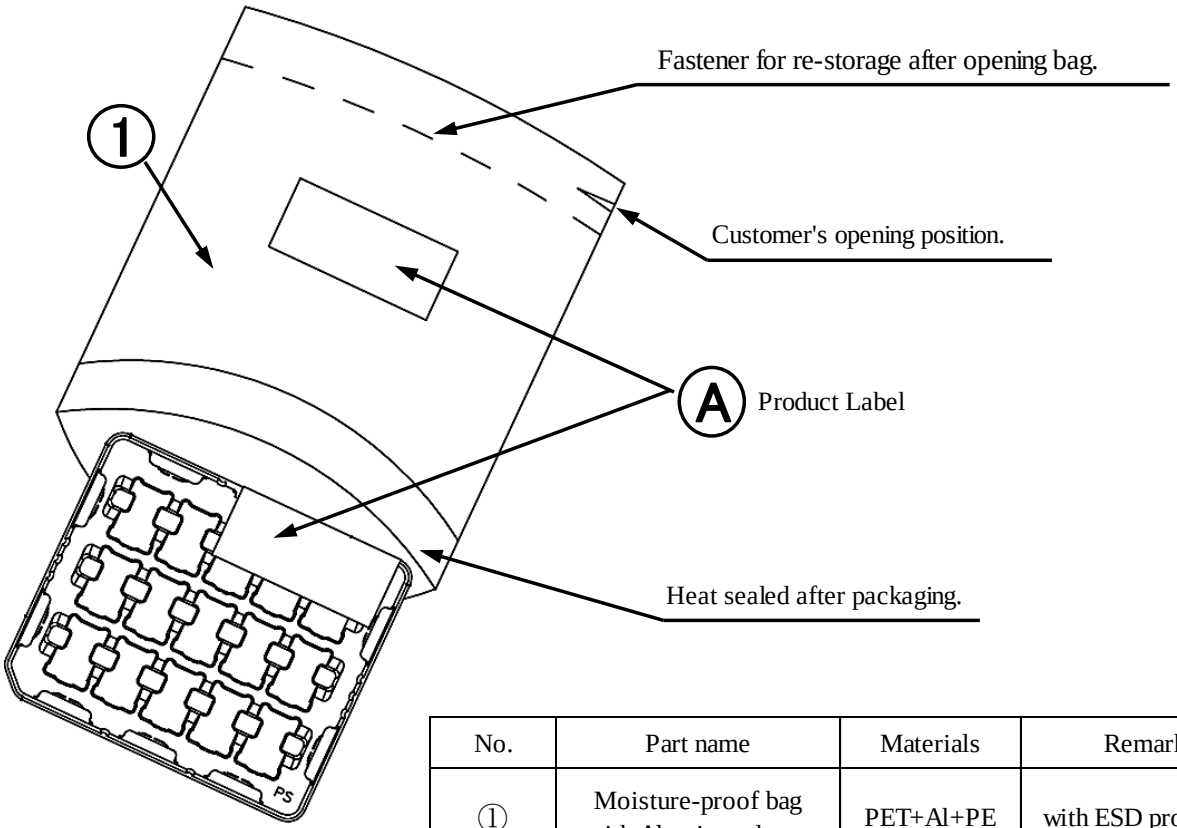
【Products Warrant Period】

Products Warrant Period is 6 months. In the case of the package opened or not kept by 【Recommended storage condition】, it is not that.

Packaging specifications

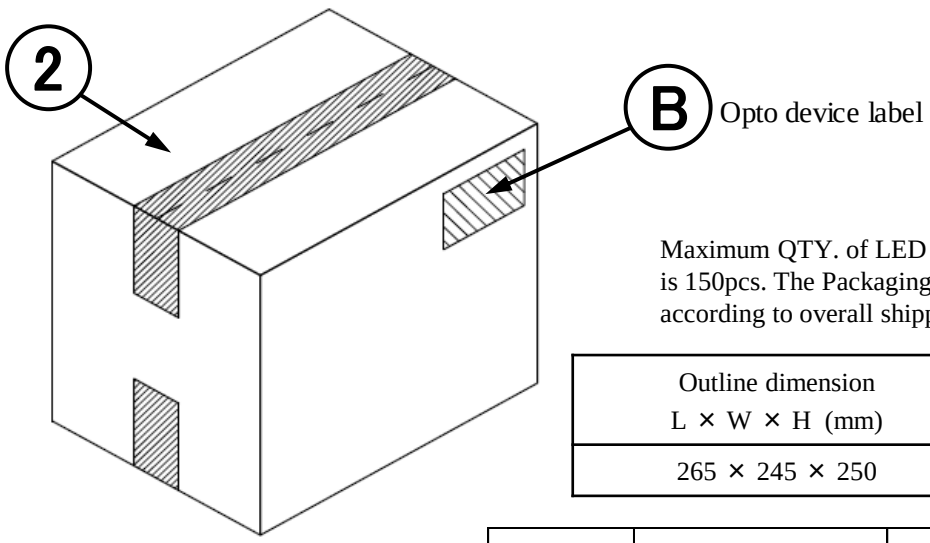
BUA1610M-T-10

【Moisture-proof packaging specification】



No.	Part name	Materials	Remarks
①	Moisture-proof bag with Aluminum layer	PET+Al+PE	with ESD protection

【Packaging box specifications】



Maximum QTY. of LED contained into 1 packaging box is 150pcs. The Packaging box form might be changed according to overall shipping qty.

Outline dimension L × W × H (mm)	Capacity of the box
265 × 245 × 250	12 tray

No.	Part name	Material	Remarks
②	Packing Box	Cardboard	without ESD protection

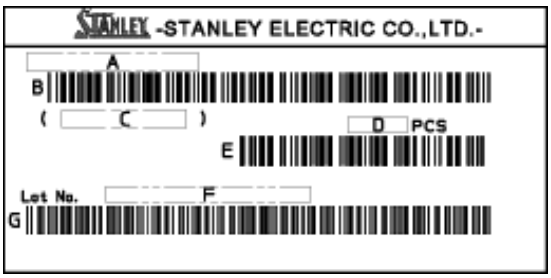
Packaging specifications

BUA1610M-T-10

【Label specification】

(acc.to JIS-X0503(Code-39))

A Product label



A. Parts number

B. Bar-code for parts number

C. Parts code (In-house identification code for each parts number)

D. Packed parts quantity

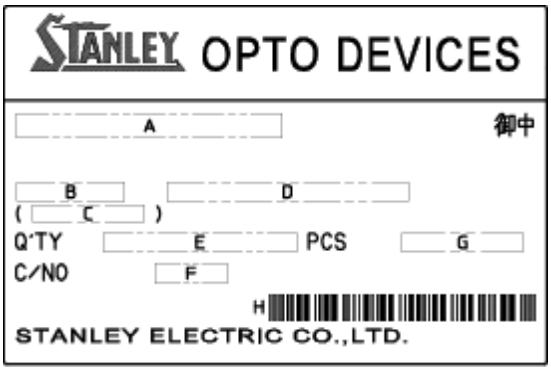
E. Bar-Code for packed parts quantity

F. Lot number & rank

(Please refer to lot number notational system for details)

G. Bar-code for lot number & rank

B Opto device label



A. Customer name

B. Parts type

C. Parts code

D. Parts number

E. Packed parts quantity

F. Carton number

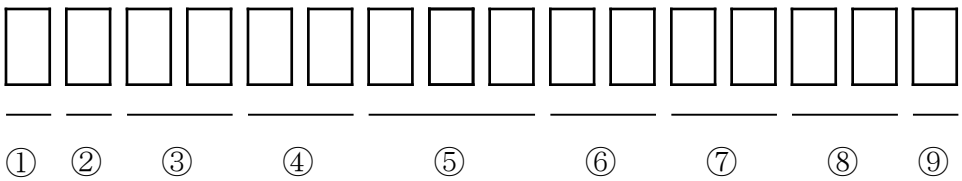
G. Shipping date

H. Bar-code for In-house identification number

<Remarks> Bar-code font : acc.to Code-39(JIS-X0503)

Lot number notational system

BUA1610M-T-10



① - 1digit : Production location (mark identify alphabet)

② - 1digit : Production year (The last digit of production year 2025→5, 2026→6, 2027→7, 2028→8 ･･･)

③ - 2digits : Production month (Jan. to Sep. , should be 01,02,03 ･･･)

④ - 2digits : Production date

⑤ - 3digits : Serial number

⑥ - 2digits : Tape and reel following number

⑦ - 2digits : Total power rank.

(If total power rank is 1 digit, "-" shall be dashed on the place for the second digit.

If there is no identified rank, "- -" is used to indicate.)

⑧ - 2digits : Color / chromaticity rank

(If color / chromaticity rank is 1 digit, "-" shall be dashed on the place for the second digit.

If there is no identified intensity rank, "- -" is used to indicate.)

⑨ - 1digit : V_F rank (If rank is not defined, "-" is described.)

Compliance with RoHS / ELV

BUA1610M-T-10

This product is in compliance with RoHS / ELV.
Prohibition substance and it's criteria value of RoHS / ELV are as follows.

- RoHS instruction … Refer to following 1 to 10.
- ELV instruction … Refer to following 1 to 4.

2011/65/EU, (EU)2015/863

No.	Substance group name	Maximum permissible concentration value
1	Lead and its compounds	1,000ppm (0.1%)
2	Cadmium and its compounds	100ppm (0.01%)
3	Mercury and its compounds	1,000ppm (0.1%)
4	Hexavalent chromium compounds	1,000ppm (0.1%)
5	PBB : Polybrominated Biphenyls	1,000ppm (0.1%)
6	PBDE : Polybrominated Biphenyl Ethers	1,000ppm (0.1%)
7	DEHP : Bis (2-ethylhexyl) phthalate	1,000ppm (0.1%)
8	BBP : Butyl benzyl phthalate	1,000ppm (0.1%)
9	DBP : Dibutyl phthalate	1,000ppm (0.1%)
10	DIBP : Diisobutyl phthalate	1,000ppm (0.1%)

Reliability Testing Result

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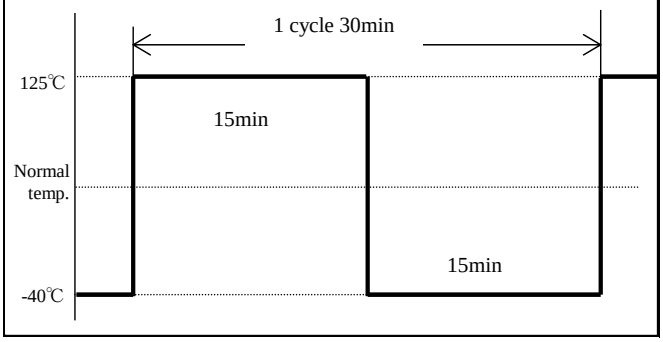
1. Reliability testing result

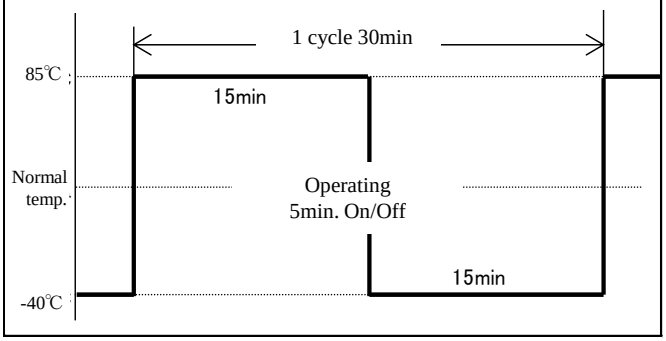
No.	Test item	Test condition	Duration	Failure
1	High temperature operating life 1	Tj=150℃	4,000h	0 / 16
2	High temperature operating life 2	Tj=175℃	100h	0 / 16
3	High temperature Humidity Bias 1	Ta=85℃ Rh=85% Tj=150℃ 30min./on ⇔ 30min./off	1,000h	0 / 16
4	Low temperature operating life	Ta=-40℃ I_F=1,000mA	1,000h	0 / 16
5	Thermal shock cycle	Ta=-40℃ (15min.) to 125℃ (15min.) ※refer graph1	1,000 cycles	0 / 16
6	Thermal shock operating cycle	Ta=-40℃ (15min.) to 85℃ (15min.), Tj=150℃ 5min./on⇔5min./off ※refer graph2	1,000 cycles	0 / 16
7	Electrostatic discharge : HBM	C=100pF R2=1.5kΩ ±8,000V	Once for each polarity	0 / 16
8	Vibration variable Frequency	Use a constant displacement of 1.5mm (double amplitude) in the range of 20Hz to 100Hz Use a constant maximum acceleration of 200m/s2 in the range of 100Hz to 2kHz	2hr, each direction of X, Y, Z	0 / 16
9	Mechanical shock	14,700m/s^2 (1,500G) 0.5ms	5 times, X,Y,Z direction	0 / 16

The number of failures (number of tests) is the number of LED light sources.

< Figure 1: Thermal shock cycle (non-operating) >



< Figure 2: Thermal shock cycle (operating) >



Taping and reel specifications

BUA1610M-T-10

2. Failure criteria

Item	Symbol	Conditions	Acceptance Criteria
Luminous intensity	I_V	I_F=1,000mA Ta=25℃	Initial value × 0.8 > Measured value Initial value × 1.2 ≦ Measured value
Chromaticity coordinates	ccx, ccy	I_F=1,000mA Ta=25℃	Measured value < Initial value - 0.01 Measured value > Initial value + 0.01
Forward voltage	V_F	I_F=1,000mA Ta=25℃	Measured value < Initial value × 0.9 Measured value > Initial value × 1.1
Appearance	—	—	Notable discoloration, deformation and crack

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