

BRIGHT LED ELECTRONICS CORP.

PHOTO LINK TRANSMITTER SPECIFICATION

● DEVICE NUMBER: BFTX-1001/H3

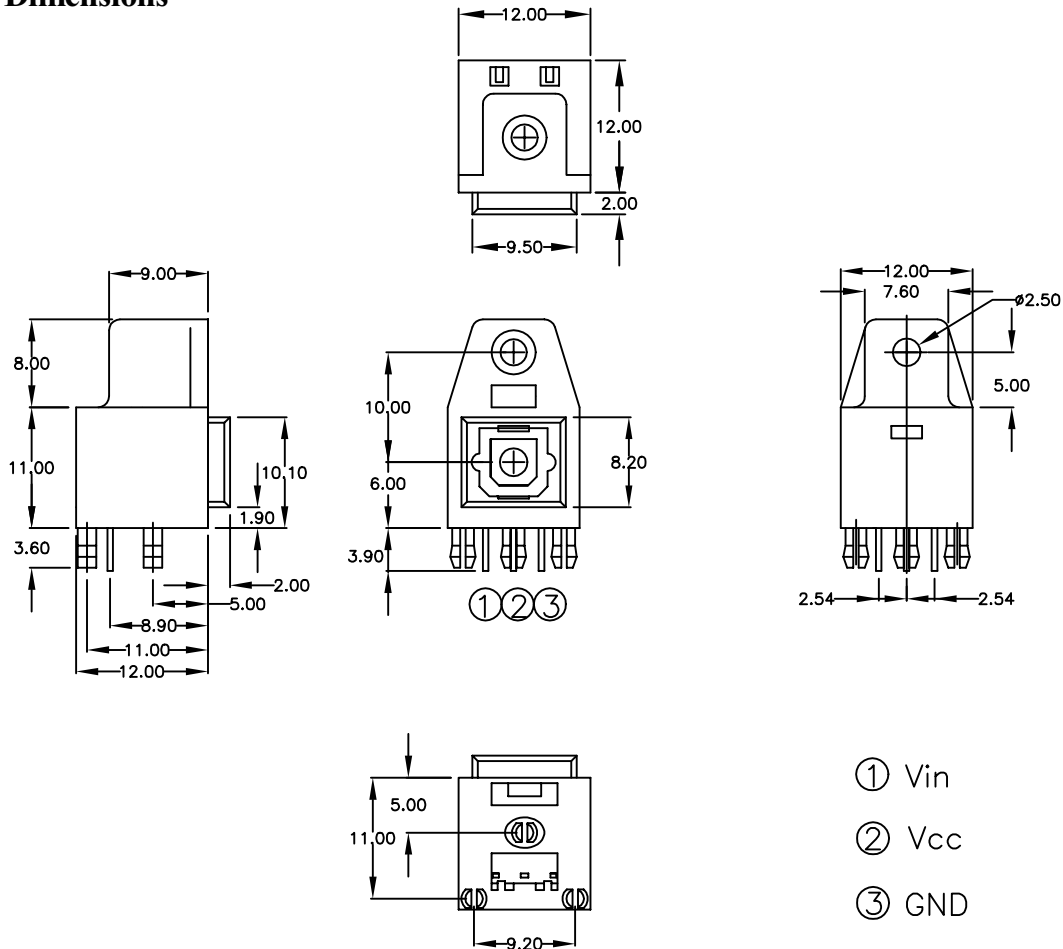
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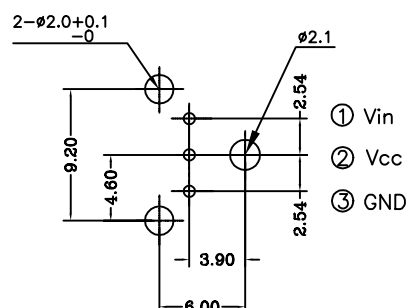
● Features:

1. Uni-directional data transmission using plastic fiber.
2. Operating voltage: 4.75 to 5.25 V.
3. TTL and high speed C-MOS LOGIC compatible.
4. Compatible sharp opto link.

● Outline Dimensions



● Recommended drilling as viewed from the soldering face



NOTES: Tolerance is ± 0.3 mm unless otherwise noted.

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●Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Rating | Unit |
|-----------------------|--------|-------------------|------|
| Power Dissipation | Pd | 100 | mw |
| Supply voltage | Vcc | -0.5 to + 7 | V |
| Input voltage | Vin | -0.5 to Vcc + 0.5 | |
| Operating temperature | Topr | -20 to + 70 | °C |
| Storage temperature | Tstg | -30 to + 80 | |
| Soldering temperature | Tsol | 260 For 5sec | |

●Electro-Optical Characteristics (Ta=25°C)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|--------------------------|------------------|---|------|------|------|------|
| Peak wavelength | λ_p | | --- | 660 | --- | nm |
| Operating supply voltage | Vcc | | 4.75 | 5.0 | 5.25 | V |
| Data rate | T | NRZ code | --- | --- | 12.0 | Mbps |
| Transmission Distance | D | Using All Plastic Fiber (970/1000 μ m) and TORX179 | 0.2 | --- | 5 | m |
| Optical power output | Pc | Refer to Fig. 1 | -21 | -17 | -15 | dBm |
| Dissipation current | Icc | Refer to Fig. 2 | --- | 8 | 13 | mA |
| High level input voltage | V _{iH} | Refer to Fig. 2 | 1.5 | --- | Vcc | V |
| Low level input voltage | V _{iL} | Refer to Fig. 2 | 0 | --- | 0.8 | |
| Low→High delay time | t _{PLH} | Refer to Fig. 3 | --- | --- | 180 | ns |
| High→Low delay time | t _{PHL} | Refer to Fig. 3 | --- | --- | 180 | |
| Pulse width distortion | Δ tw | Refer to Fig. 3 | -25 | --- | +25 | |
| Jitter | Δ tjr | Refer to Fig. 3 | --- | 4 | 25 | |

●Mechanical Characteristics (Ta=25°C)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---------------------|--------|--|------|------|------|------|
| Insertion Force | | * 1 | --- | --- | 40 | N |
| Withdrawal Force | | * 1 | 6 | --- | 40 | |
| Torque for Self-Tap | | Using self-tapping screw (M3 x 8) | 60 | --- | 100 | N-cm |

* 1 : Using standard optical fiber cable (970/1000 μ m)

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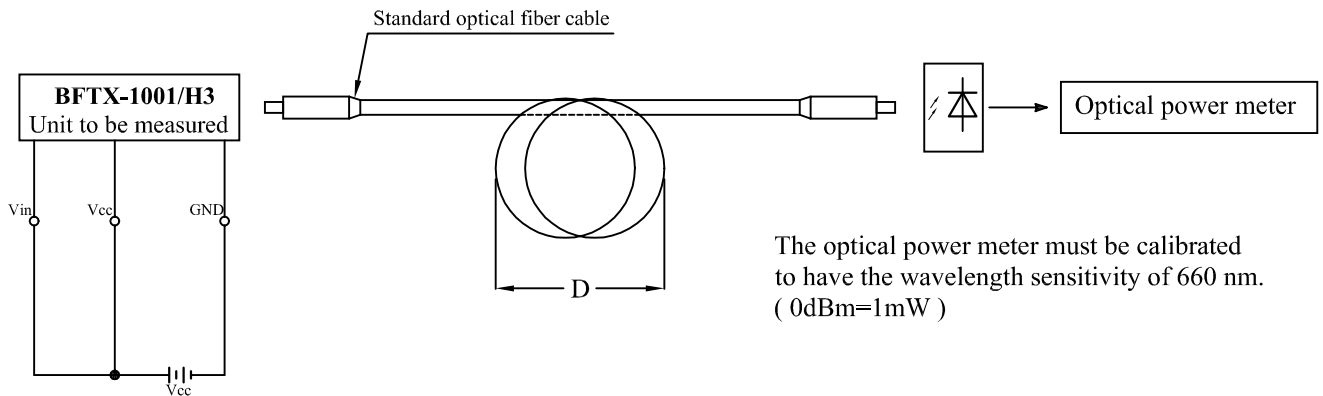
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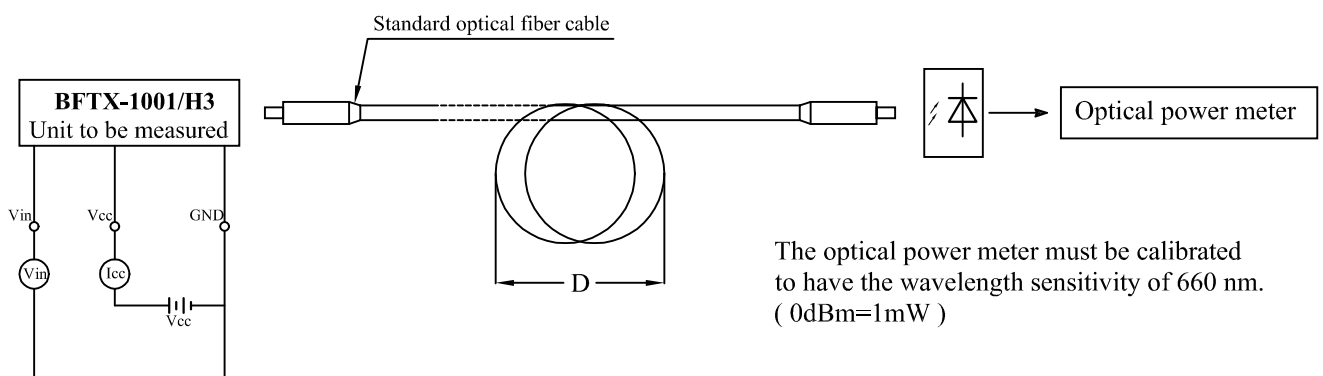
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●Fig.1 Measuring Method of Optical Output Coupling with Fiber.



- Notes: (1) $V_{cc}=5.0V$ (State of operating)
 (2) To bundle up the standard fiber optic cable, make it into a loop with the diameter $D=10cm$ or more.

●Fig.2 Measuring Method of Input Voltage and Supply Current.



Input conditions and judgment method Supply Current.

| Conditions | Judgment method |
|------------------------|---|
| $V_{in}=2.1V$ or more | $-21 \text{ dBm} \leq P_c \leq -15 \text{ dBm}$, $I_{cc}=13mA$ or less |
| $V_{in}=0.8 V$ or less | $P_c \leq -36 \text{ dBm}$, $I_{cc}=13mA$ or less |

Notes: $V_{cc}=5.0V$ (State of operating).

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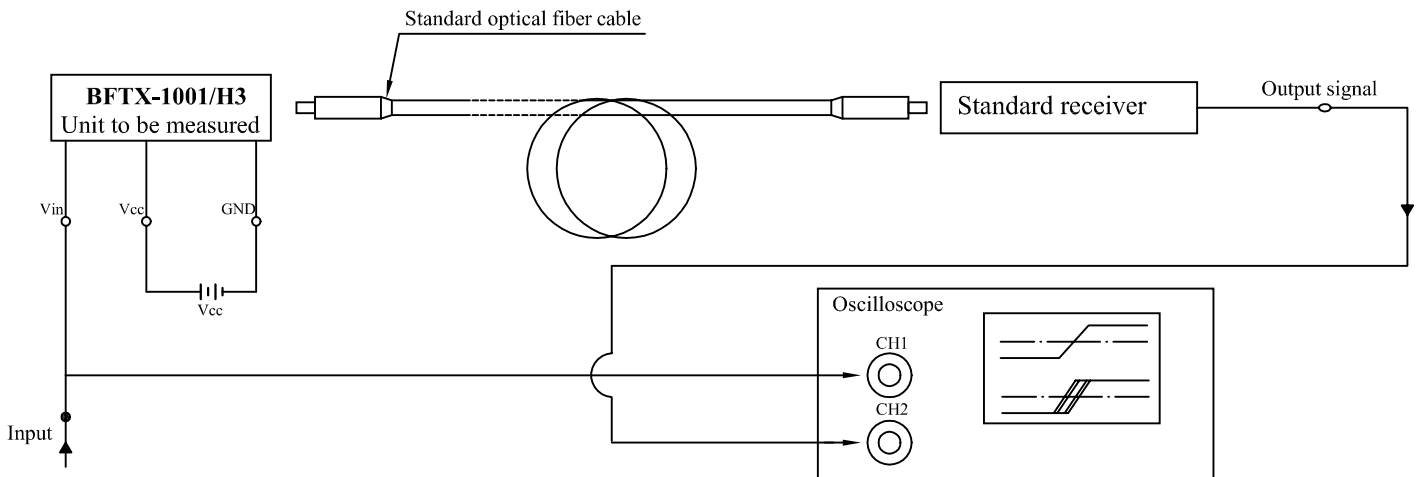
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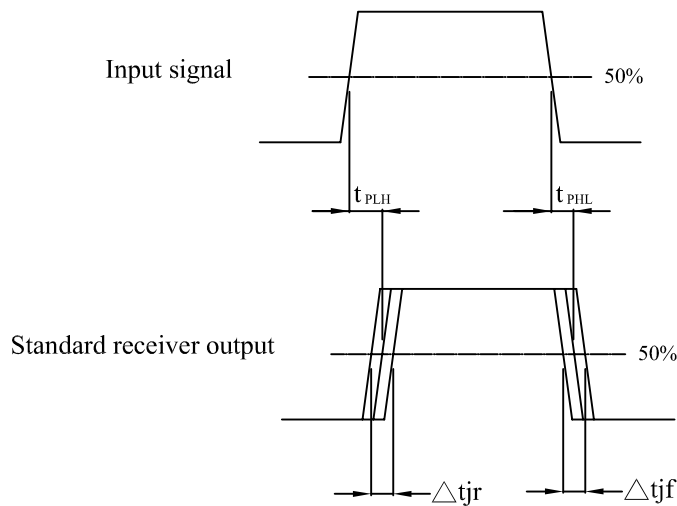
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● Fig.3 Measuring Method of Pulse Response and Jitter.



12Mbps NRZ code, duty 50%



Test item

| Test item | Symbol | Test item |
|---------------------------|-----------------|--|
| Low→High pulse delay time | t_{PLH} | Refer to the above prescriptions. |
| High→Low pulse delay time | t_{PHL} | Refer to the above prescriptions. |
| Pulse width distortion | Δtw | $\Delta tw = t_{PHL} - t_{PLH}$ |
| Low→High Jitter | Δt_{jr} | Set the trigger on the rise of input signal to measure the jitter of the rise of output. |
| High→Low Jitter | Δt_{jf} | Set the trigger on the fall of input signal to measure the jitter of the fall of output. |

- Notes:
- (1) The waveform write time shall be 4 seconds. But do not allow the waveform to be distorted by increasing the brightness too much.
 - (2) $V_{cc} = 5.0V$ (State of operating)
 - (3) To probe for the oscilloscope must be more than $1M\Omega$ and less than $10pF$.

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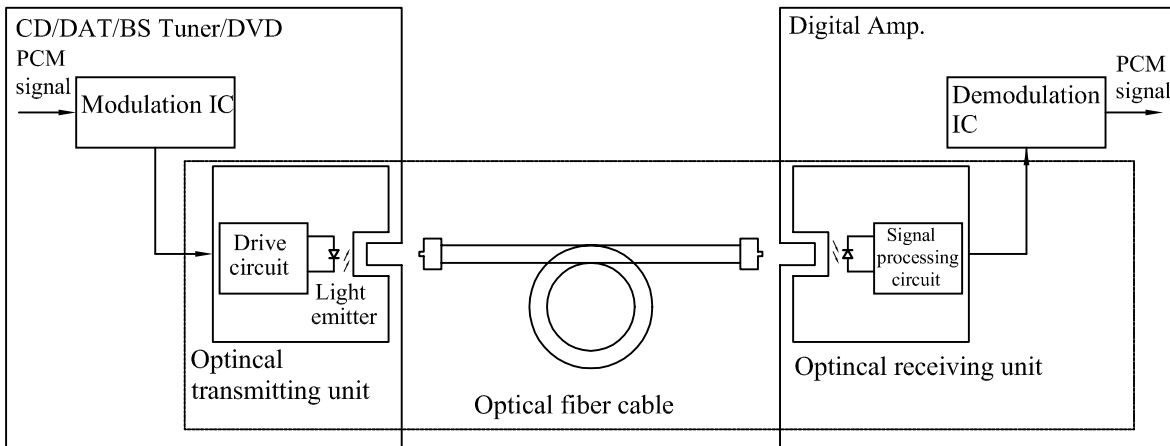
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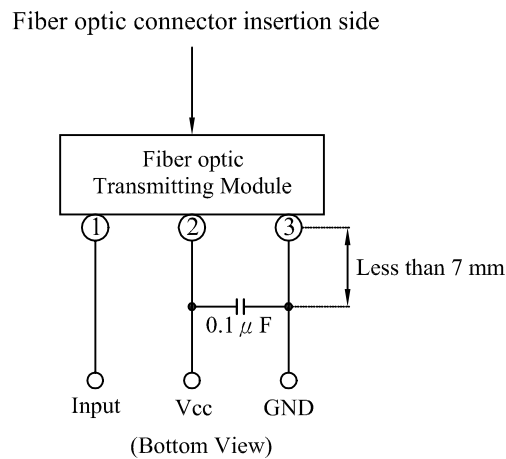
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● System Configuration Example:



● Application Circuit:



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RELIABILITY TEST

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| Classification | Test Item | Reference Standard | Test Conditions | Result |
|--------------------|--|---|--|--------|
| Endurance Test | Operation Life | MIL-STD-750:1026 MIL-STD-883:1005 JIS C 7021 :B-1 | Connect with a power $V_{cc}, V_{in}=5V$ T_a =Under room temperature Test time=1,000hrs | 0/20 |
| | High Temperature High Humidity Storage | MIL-STD-202:103B JIS C 7021 :B-11 | $T_a=85^{\circ}C \pm 5^{\circ}C$ RH=90%-95% Test time=240hrs | 0/20 |
| | High Temperature Storage | MIL-STD-883:1008 JIS C 7021 :B-10 | High $T_a=105^{\circ}C \pm 5^{\circ}C$ Test time=1,000hrs | 0/20 |
| | Low Temperature Storage | JIS-C-7021 :B-12 | Low $T_a=-55^{\circ}C \pm 5^{\circ}C$ Test time=1,000hrs | 0/20 |
| Environmental Test | Temperature Cycling | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS C 7021 :A-4 | $-55^{\circ}C \sim 25^{\circ}C \sim 105^{\circ}C \sim 25^{\circ}C$ 30min 5min 30min 5min Test Time=10cycle | 0/20 |
| | Thermal Shock | MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011 | $-55^{\circ}C \pm 5^{\circ}C \sim 105^{\circ}C \pm 5^{\circ}C$ 10min 10min Test Time=10cycle | 0/20 |
| | Solder Resistance | MIL-STD-202:201A MIL-STD-750:2031 JIS C 7021 :A-1 | $T_{sol}=260 \pm 5^{\circ}C$ Dwell Time=5±1sec. | 0/20 |
| | Solder ability | MIL-STD-202:208D MIL-STD-750:2026 MIL-STD-883:2003 JIS C 7021 :A-2 | $T_{sol}=230 \pm 5^{\circ}C$ Dwell Time=5±1sec. | 0/20 |
| | Lead Bending Stress | MIL-STD-750:2036 JIS C 7021 :A-11 | $0^{\circ} \sim 90^{\circ} \sim 0^{\circ}$ bend , 3 cycles Weight 250g | 0/20 |

JUDGMENT CRITERIA OF FAILURE FOR THE RELIABILITY

| Parameter | Symbol | Measuring conditions | Judgement criteria for failure |
|----------------------|----------|----------------------|--------------------------------|
| Optical power output | P_c | $V_{cc}, V_{in}=5V$ | -21dBm~-15dBm |
| Dissipation current | I_{cc} | $V_{cc}, V_{in}=5V$ | Over U_{x2} |

Note: 1.U means the upper limit of specified characteristics. S means initial value.

2.Measurment shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

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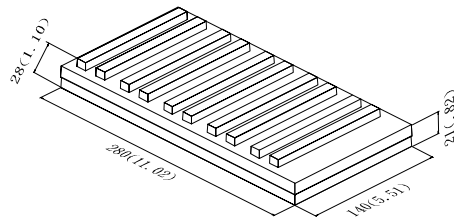
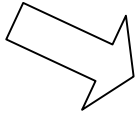
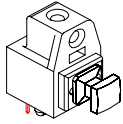
PACKAGING DIMMENSIONS

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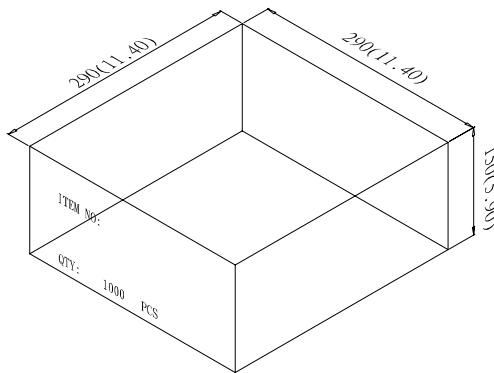
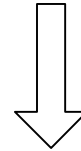
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● Package Method:(unit:mm)



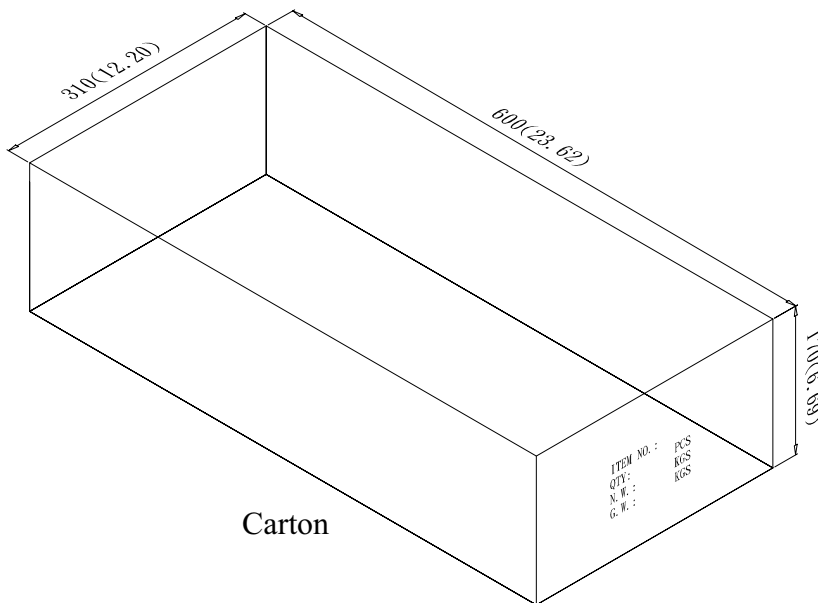
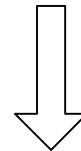
100 Pcs / Tray

Tray



10 Tray / Inner box

Inner box



2 Inner box / Carton

Carton

NOTES : Tray : Tolerance is ± 5 mm unless otherwise noted.

Inner box : Tolerance is ± 10 mm unless otherwise noted.

Carton : Tolerance is ± 10 mm unless otherwise noted.