



# BRIGHT LED ELECTRONICS CORP.

## PHOTO LINK TRANSMITTER SPECIFICATION

●DEVICE NUMBER: BFTX-1001/HP

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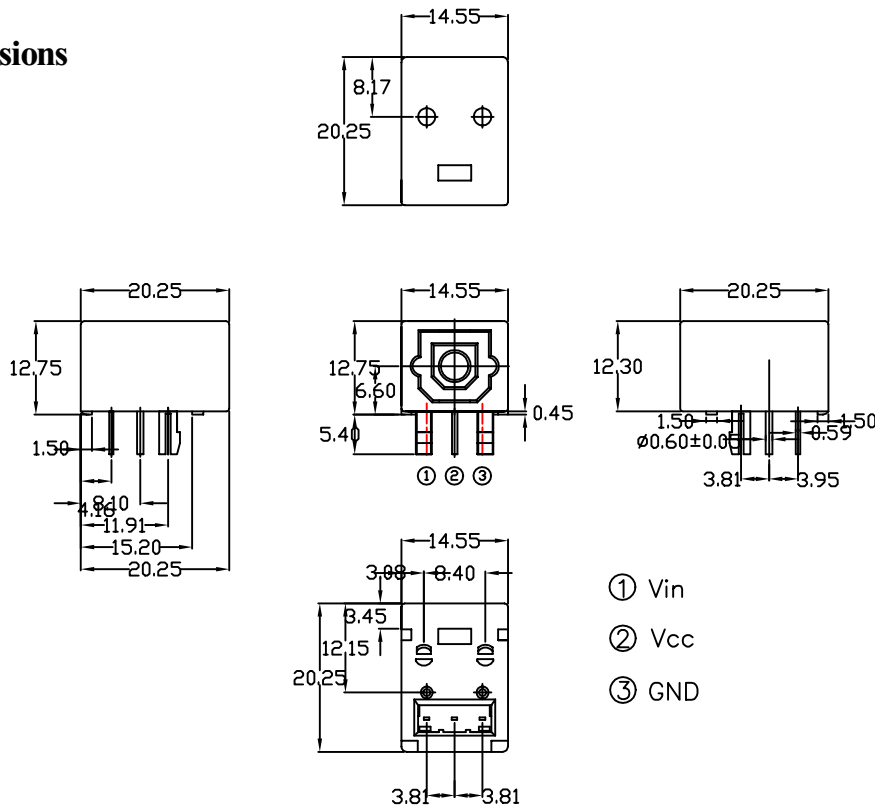
### ●Features:

1. Conform to EIAJ standard CP-1201 (For Digital audio interfaces including fiber optic inter-connections).
2. TTL interface.
3. LED is driven by differential circuit.
4. +5V single power supply.
5. High speed signal transmission (12.5M NRZ signal).
6. ESD tolerance IC > 8KV.
7. Housing heat deflection temperature 290 °C (@ 1.8MPa / ISO75)
8. Compatible Toshiba Toslink mini-package type.

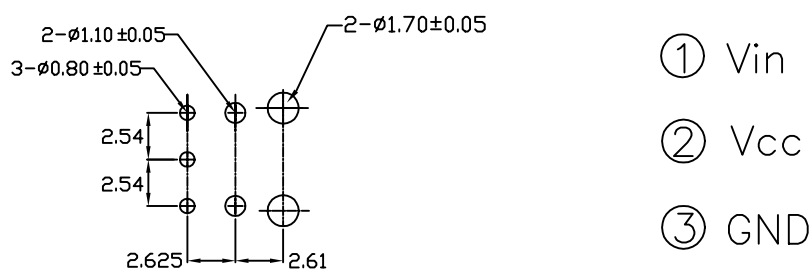
### ●Applications:

1. Digital audio equipment: PC sound cards, Notebook and Portable devices.
2. Navigation system.

### ●Outline Dimensions



### ●Recommended drilling as viewed from the soldering face



NOTES: Tolerance is  $\pm 0.3$  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	$\lambda_p$		---	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 $\mu$ 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 <sub>iH</sub>	Refer to Fig. 2	1.5	---	Vcc	V
Low level input voltage	V <sub>iL</sub>	Refer to Fig. 2	0	---	0.8	
Low→High delay time	t <sub>PLH</sub>	Refer to Fig. 3	---	---	180	ns
High→Low delay time	t <sub>PHL</sub>	Refer to Fig. 3	---	---	180	
Pulse width distortion	$\Delta$ tw	Refer to Fig. 3	-25	---	+25	
Jitter	$\Delta$ 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  $\mu$ m)

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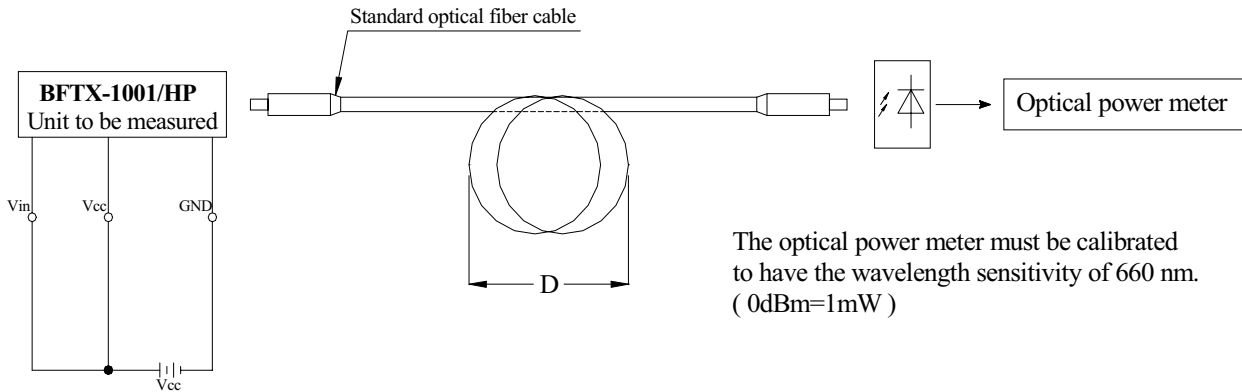
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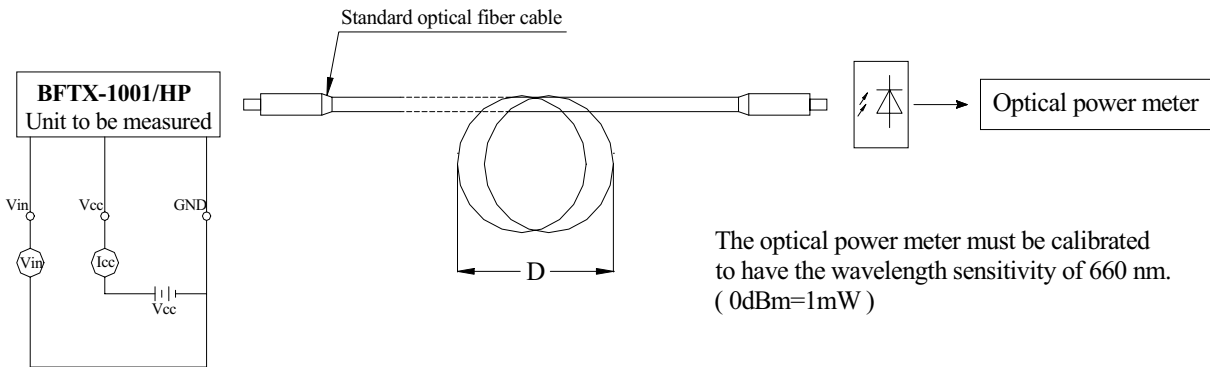
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● **Fig.1 Measuring Method of Optical Output Coupling with Fiber.**



- Notes: (1) Vcc=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 <sub>in</sub> =2.1V or more	-21 dBm ≤ P <sub>c</sub> ≤ -15 dBm, I <sub>cc</sub> =13mA or less
V <sub>in</sub> =0.8 V or less	P <sub>c</sub> ≤ -36 dBm, I <sub>cc</sub> =13mA or less

Notes: Vcc=5.0V (State of operating).

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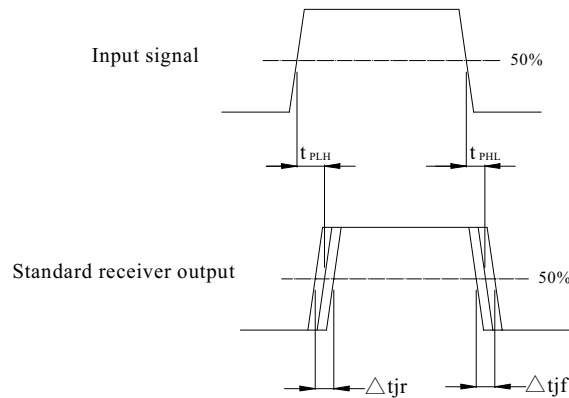
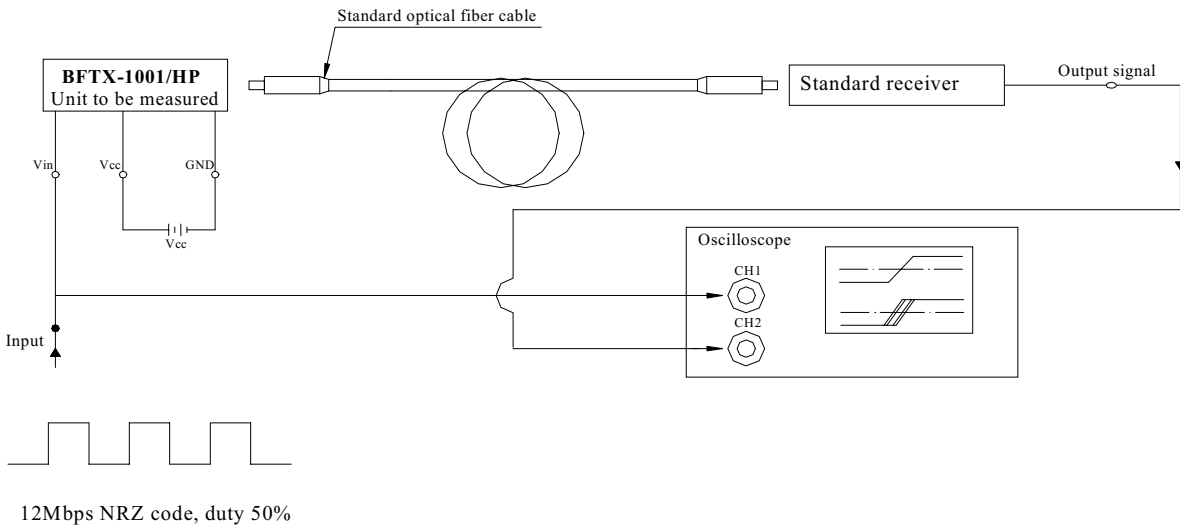
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● Fig.3 Measuring Method of Pulse Response and Jitter.



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	$\Delta tw$	$\Delta tw = t_{PHL} - t_{PLH}$ .
Low→High Jitter	$\Delta tjr$	Set the trigger on the rise of input signal to measure the jitter of the rise of output.
High→Low Jitter	$\Delta tjf$	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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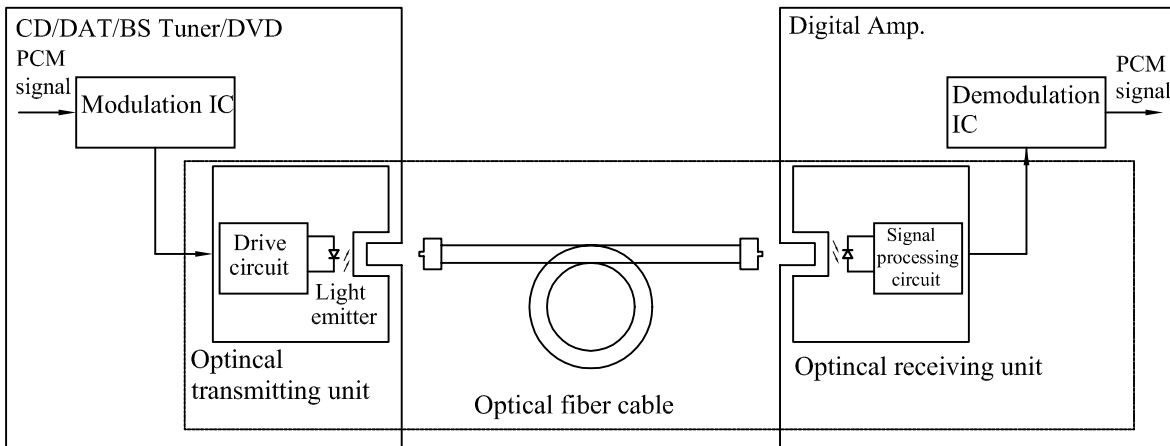
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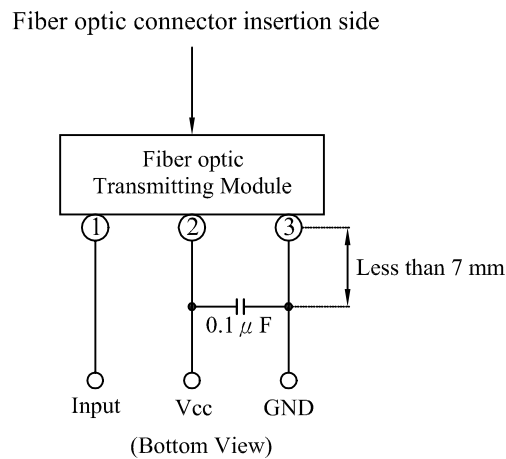
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### ● System Configuration Example:



### ● 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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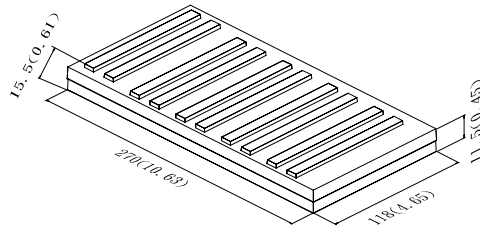
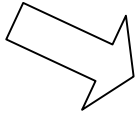
### PACKAGING DIMMENSIONS

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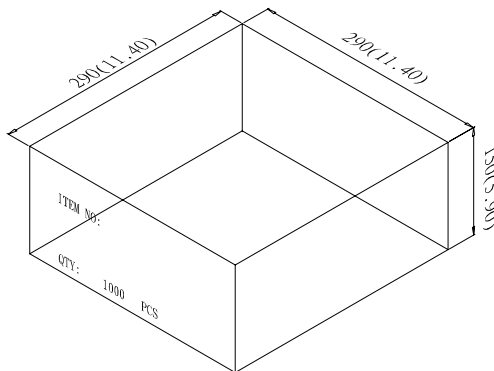
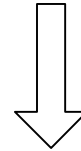
● Package Method:(unit:mm)

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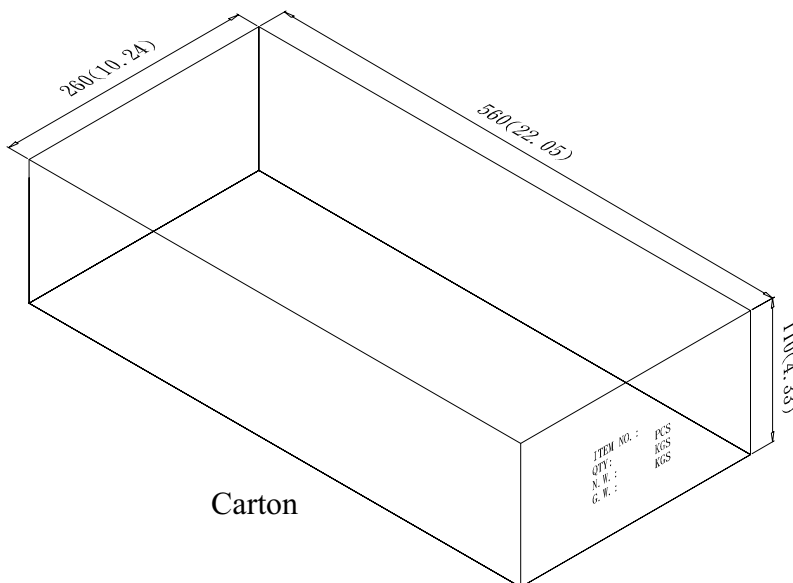
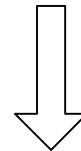
100 Pcs / Tray

Tray



10 Tray / Inner box

Inner box



2 Inner box / Carton

Carton

NOTES : Tray : Tolerance is  $\pm 5$  mm unless otherwise noted.

Inner box : Tolerance is  $\pm 10$  mm unless otherwise noted.

Carton : Tolerance is  $\pm 10$  mm unless otherwise noted.