TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTO IC

TLP1224, TLP1224(C1)

TIMING SENSOR, DETECTION OF PAPER POSITION FOR COPIER, FACSIMILE, ELECTRONIC PRINTER

DETECTION OF PAPER POSITION AROUND HEAT ROLLER OF COPIER / LASER BEAM PRINTER

TIMING DETECTOR FOR FA EQUIPMENT

VARIOUS POSITION DETECTION SENSOR

The TLP1224 and TLP1224 (C1) are photointerrupters with a connector using an GaAs infrared LED at the emitter side and a Si photo IC at the detector side respectively.

These photointerrupters have the wider range of operating temperature and are best suited to position detection around a heat source such as a heat roller of copier.

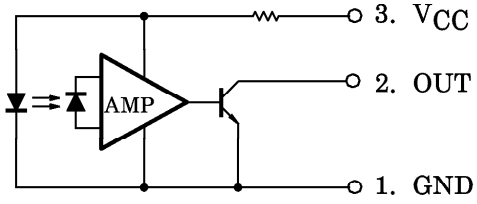
When detecting a substance, the output becomes high level.

- For 24V of power supply voltage
- Open collector output
- Gap : 5mm
- Resolution : Slit width 0.5mm
- Large operating temperature range : $T_{opr} = -25 \sim 95°C$
- Low current consumption : $I_{CC} = 9.5mA$ (max)
- Connectors

  TLP1224 ..... 171826-3 (AMP (Japan), Ltd. made EI connector)

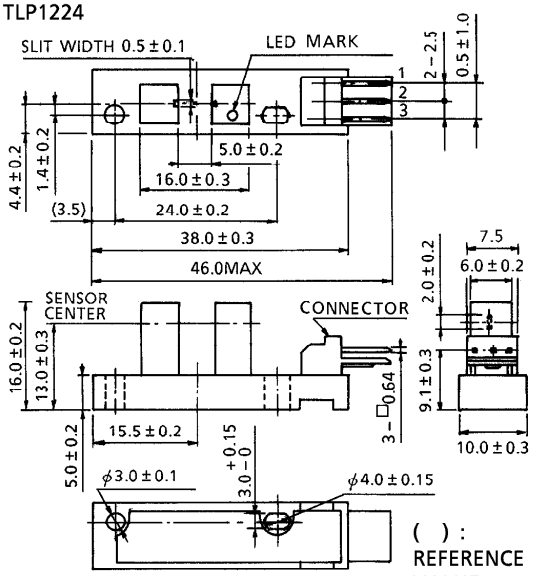
  TLP1224 (C1) .. 171825-3 (AMP (Japan), Ltd. made EI connector)

PIN CONNECTION



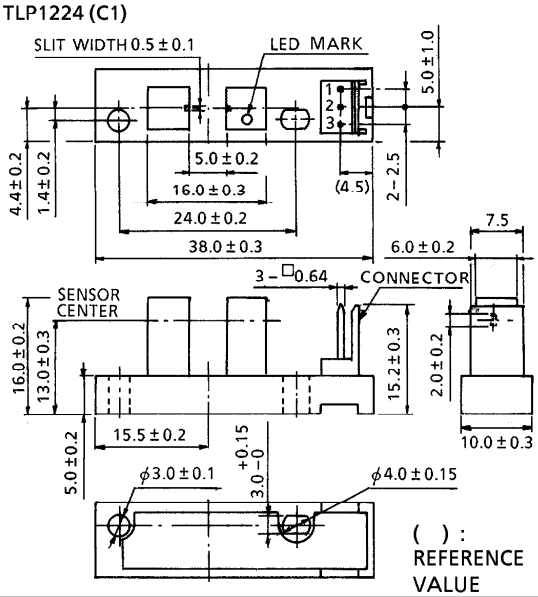
Unit in mm

TLP1224



JEDEC	—
EIAJ	—
TOSHIBA	11-16C1

TLP1224 (C1)



JEDEC	—
EIAJ	—
TOSHIBA	11-16C2

Weight : 2.5g (typ.)

961001EBC2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

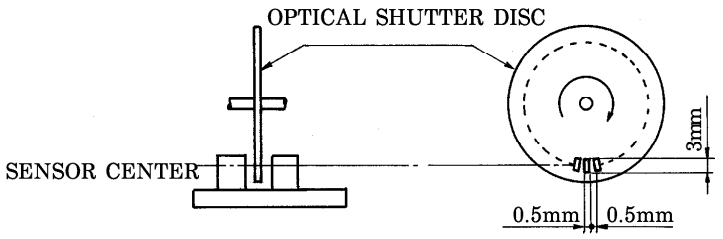
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	30	V
Output Current	V_O	40	V
Low Level Output Current	I_{OL}	50	mA
Output Power Dissipation	P_{OUT}	150	mW
Output Power Dissipation Derating (Ta > 25°C)	ΔP_{OUT} / °C	−2	mW / °C
Operating Temperature Range	T_{opr}	−25~95	°C
Storage Temperature Range	T_{stg}	−40~95	°C

OPTO-ELECTRICAL CHARACTERISTICS (Unless Otherwise Specified, Ta = −25~95°C, V_{CC} = 21~26V)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_{CC}	—	21	24	26	V
Supply Current	Low Level	I_{CCH}	Shutter In	—	—	9.5	mA
	High Level	I_{CCL}	Without Shutter	—	—	9.5	mA
Output Voltage	Low Level	V_{OH}	Shutter In, R_L = 47kΩ	0.9V_{CC}	—	—	V
	High Level	V_{OL}	Without Shutter, I_{OL} = 16mA, Ta = 25°C	—	0.1	0.4	V
			Without Shutter, I_{OL} = 16mA	—	—	0.6	
Low Level Output Current		I_{OL}	Without Shutter	16	—	—	mA
Peak Emission Wavelength		λ_p	Ta = 25°C, LED Side	—	940	—	nm
Peak Sensitivity Wavelength		λ_p	Ta = 25°C, Photo IC Side	—	900	—	nm
Response Frequency		f	R_L = 1.5kΩ, Ta = 25°C (Note)	1000	—	—	Hz

(Note) A value measured when the disc shown in the following figure was rotated. No DC current should be output.



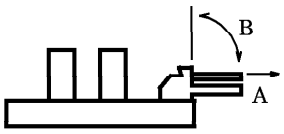
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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

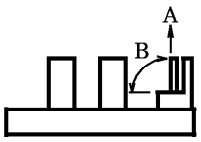
TERMINAL STRENGTH (Ta = 25°C)

CHARACTERISTIC	TEST CONDITION		LIMIT
PULL	DIRECTION	A	NO DEFECT OF ELECTRICAL CHARACTERISTICS
	WEIGHT	19.6N	
	TIME	5s / ONCE	
BEND	DIRECTION	B	
	WEIGHT	9.8N	
	TIME	5s / THRICE	

TLP1224



TLP1224 (C1)



PRECAUTION

Please be careful of the followings.

1. When installing, avoid to work by holding the connector by hand. Always, install by holding the main body of the element while assuring the mounting board is not warped or twisted.
2. Screw shall be tightened to clamping torque of 0.59N · m.
3. The connectors shall be inserted or pulled out at normal temperature.
4. The container is made of polycarbonate. Polycarbonate is usually stable with acid, alcohol, and aliphatic hydrocarbons however, with pertochemicals (such as benzene, toluene, and acetone), alkali, aromatic hydrocarbons, or chloric hydrocarbons, polycarbonate becomes cracked, swollen, or melted. Please take care when chosing a packaging material by referencing the table below.

<Chemicals to avoid with polycarbonate>

	PHENOMENON	CHEMICALS
A	Little deterioration but staining	• nitric acid (low concentration), hydrogen peroxide, chlorine
B	Cracked, crazed, or swollen	• acetic acid (70% or more) • gasoline • methyl ethyl ketone, ehtyl acetate, butyl acetate • ethyl methacrylate, ethyl ether, MEK • acetone, m-amino alcohol, carbon tetrachloride • carbon disulfide, trichloroethylene, cresol • thinners, oil of turpentine • triethanolamine, TCP, TBP
C	Melted { } : Used as solvent.	• concentrated sulfuric acid • benzene • styrene, acrylonitrile, vinyl acetate • ethylenediamine, diethylenediamine • {chloroform, methyl chloride, tetrachloromethane, dioxane, 1, 2-dichloroethane}
D	Decomposed	• ammonia water • other alkali

RECOMMENDABLE MATCHED CONNECTOR

AMP (Japan), Ltd. made EI series connector (Standard type)

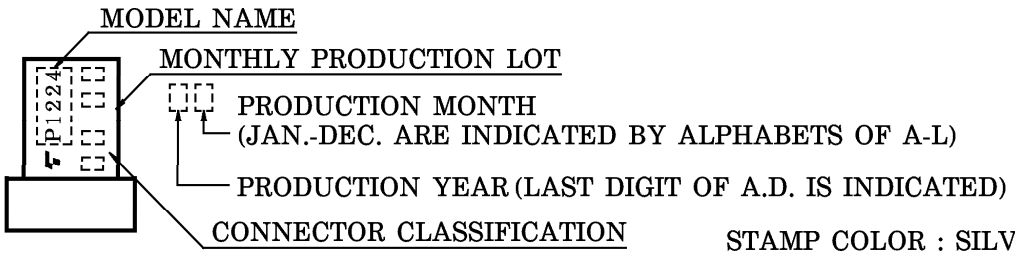
HOUSING	NATURAL COLOR	BLACK	BLUE	GREEN	RED
	171822-3	2-171822-3	4-171822-3	6-171822-3	8-171822-3
TERMINAL	TYPE No.	PRODUCT FORM	MATERIAL	AWG SIZE	INSULATION DIAMETER
	170204-1	LOOSEN	BRASS	AWG20~26	1.1~1.9mm
	170204-2		PHOSPHOR BRONZE		
	170262-1	LINKED	BRASS		
	170262-2		PHOSPHOR BRONZE		
	170205-1	LOOSEN	BRASS	AWG26~30	1.0~1.4mm
	170205-2		PHOSPHOR BRONZE		
	170263-1	LINKED	BRASS		
	170263-2		PHOSPHOR BRONZE		

AMP (Japan), Ltd. made EI series connector (Low profile type)

HOUSING	NATURAL COLOR	BLACK	BLUE	GREEN	RED
	172142-3	2-172142-3	4-172142-3	6-172142-3	8-172142-3
TERMINAL	TYPE No.	PRODUCT FORM	MATERIAL	AWG SIZE	INSULATION DIAMETER
	170369-1	LOOSEN	PHOSPHOR BRONZE	AWG22~26	1.1~1.9mm
	170354-1	LINKED			
	170370-1	LOOSEN		AWG26~30	1.0~1.5mm
	170355-1	LINKED			

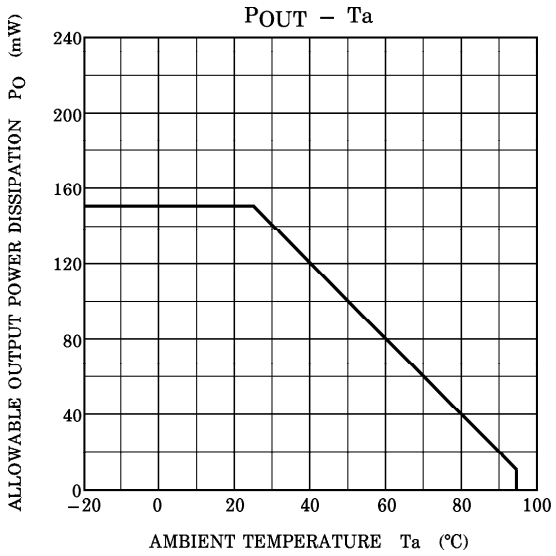
For details of the connectors, please refer to the connector maker.

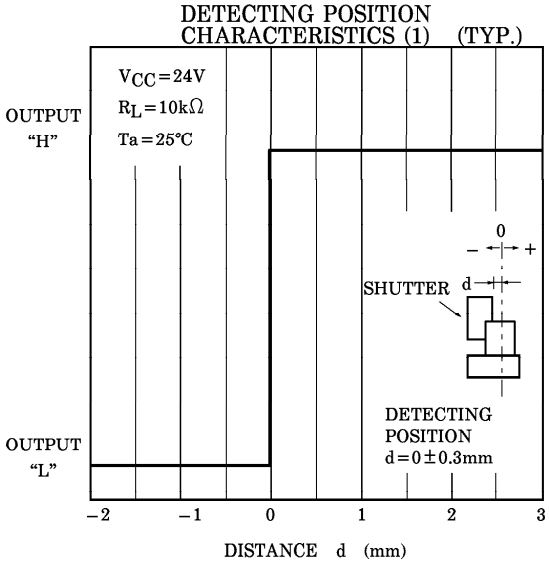
PRODUCT INDICATION

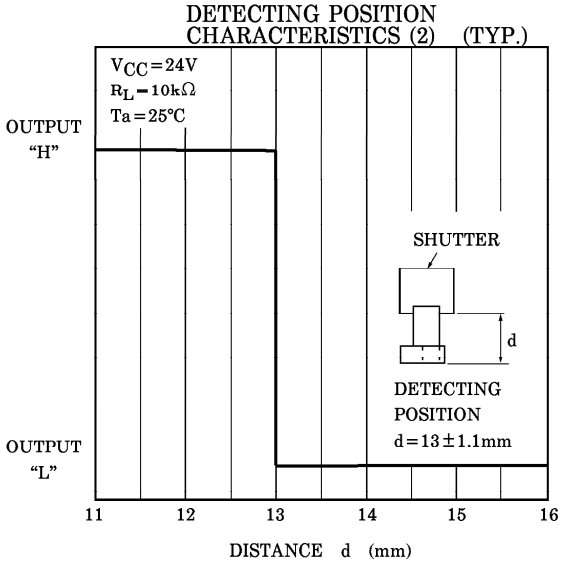


STAMP COLOR : SILVER

TYPE	ABBREVIATION	CONNECTOR CLASSIFICATION
TLP1224	P1224	NO INDICATED
TLP1224 (C1)	P1224	C1


POUT – Ta
ALLOWABLE OUTPUT POWER DISSIPATION PO (mW)
240
200
160
120
80
40
0
–20
0
20
40
60
80
100
AMBIENT TEMPERATURE Ta (°C)


DETECTING POSITION CHARACTERISTICS (1) (TYP.)
VCC=24V
RL=10kΩ
Ta=25°C
OUTPUT "H"
OUTPUT "L"
0
SHUTTER
d
DETECTING POSITION
d=0±0.3mm
–2
–1
0
1
2
3
DISTANCE d (mm)

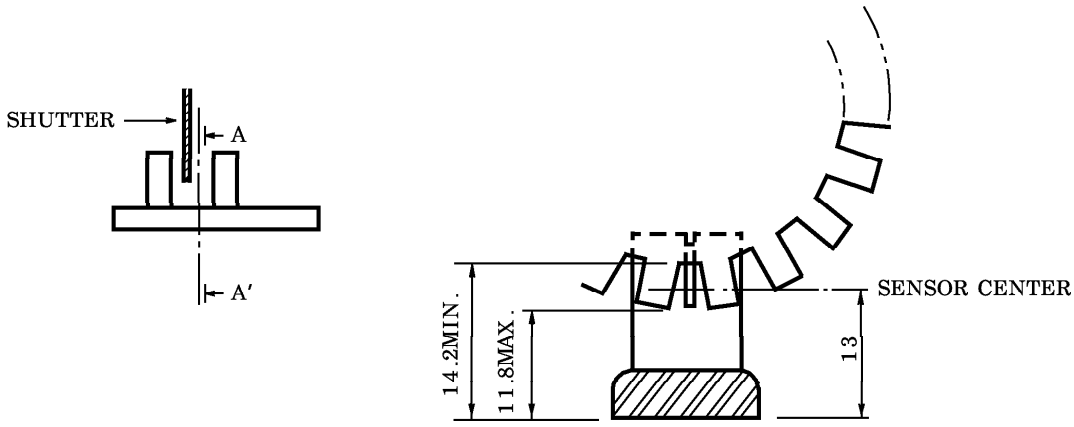

DETECTING POSITION CHARACTERISTICS (2) (TYP.)
VCC=24V
RL=10kΩ
Ta=25°C
OUTPUT "H"
OUTPUT "L"
SHUTTER
d
DETECTING POSITION
d=13±1.1mm
11
12
13
14
15
16
DISTANCE d (mm)

POSITIONING OF SHUTTER AND DEVICE

To operate correctly, make sure that the shutter and the device are positioned as shown in the figure below.

The shit pitch of the shutter must be set wider than the slit width of the device.
Determine the width taking the switching time into consideration.

UNIT IN mm



A – A' CROSS SECTION