TOSHIBA PHOTOINTERRUPTER INFRARED LED + PHOTOTRANSISITOR

# TLP1230(C4)

COPIER, LASER BEAM PRINTER

FACSIMILE, PRINTER, ELECTRONIC TYPEWRITER AUTOMATIC VENDING MACHINE, TERMINAL **EQUIPMENT IN BANKING FACILITIES** VARIOUS POSITION DETECTION SENSOR

TLP1230 (C4) are photointerrupters with a connector using an GaAs infrared LED at the emitter side and a Si photo IC at the detector side respectively.

The phototransistor is turned off when a substance is detected (when the light is shielded).

This product is also usable in applications requiring severe using temperature condition such as detection of paper exit on copier, etc. connector)

- Small package
- Phototransistor output (Cathode, emitter common)
- Mountable by one touch (Snap-in mounting type)

Mountable to boards in 2 kinds of thickness (1.0mm, 1.2mm)

Gap 5<sub>mm</sub>

Slit width 0.5mm Resolution

Large operation temperature range  $T_{opr} = -25 \sim 95$ °C

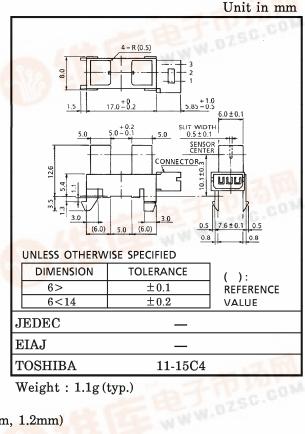
High current transfer ratio  $I_C/I_F=5\%$  (min)

UL recognized PWB adopted UL94V-0

Material of the case Polycarbonate

Connector 53014-0310

(Molex Japan Co., Ltd. made 2mm pitch connector)



961001EBC2

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Formula Semiconductor reliability individuals. 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.

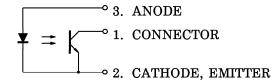
The products with other industrial waste or with domestic garbage.

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The information contained herein is subject to change without notice.

## PIN CONNECTION



# MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT	
Forward Current		$I_{\mathbf{F}}$	50	mA	
Forward Current	Ta>25°C	⊿I <sub>F</sub> /°C	-0.33	mA/°C	
Derating	Ta>85°C		-2		
Reverse Voltage	$V_{\mathbf{R}}$	5	V		
Collector-Emitter Voltage		$v_{CEO}$	35	V	
Emitter-Collector Voltage		$V_{ECO}$	5	V	
Collector Power Dissipation		PC	75	mW	
Collector Power Dissipation Derating (Ta > 25°C)		△P <sub>C</sub> /°C	-1	mW/°C	
Collector Current		$I_{\mathbf{C}}$	50	mA	
Operating Temperature Range		$T_{ m opr}$	-25~95	°C	
Storage Temperature Range		${ m T_{stg}}$	-40~100	°C	

# OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

СН	ARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
	Forward Voltage	$v_{\mathbf{F}}$	$I_{\mathbf{F}} = 10 \text{mA}$	1.00	1.15	1.30	V
LED	Reverse Current	$I_{\mathbf{R}}$	$I_{R}$ $V_{R} = 5V$		_	10	$\mu$ A
TED	Peak Emission Wavelength	$\lambda_{\mathbf{P}}$ I <sub>F</sub> =20mA		_	940	_	nm
	Dark Current	$I_{\mathbf{D}}$	$V_{CE} = 24V, I_{F} = 0$	_		0.1	$\mu$ A
DETECTOR	Peak Sensitivity Wavelength $\lambda_{\mathbf{P}}$	$\lambda_{\mathbf{P}}$	_	_	870	_	nm
COUPLED	Current Transfer Ratio	$I_{C}/I_{F}$	$V_{CE} = 5V, I_F = 20mA$	5	_	100	%
	Collector-Emitter Saturation Voltage	V <sub>CE (sat)</sub>	$I_{\mathrm{F}}\!=\!20\mathrm{mA},I_{\mathrm{C}}\!=\!0.5\mathrm{mA}$		0.15	0.4	V
	Rise Time	$t_r$	$V_{CC}=5V, I_C=2mA$		6		//8
	Fall Time	$t_{\mathrm{f}}$	$R_{\rm L} = 100\Omega$	_	6	_	$\mu$ s

### TERMINAL STRENGTH (Ta = 25°C)

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



#### **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. The connectors shall be inserted or pulled out at normal temperature.
- 2. It is recommended to mount this product by inserting from the sheet metal pressed side.
- 3. 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
Α	Little deterioration but staining	• nitric acid (low concentration), hydrogen peroxide, chlorine
В	Cracked, crazed, or swollen	<ul> <li>acetic acid (70% or more)</li> <li>gasoline</li> <li>methyl ethyl ketone, ehtyl acetate, butyl acetate</li> <li>ethyl methacrylate, ethyl ether, MEK</li> <li>acetone, m-amino alcohol, carbon tetrachloride</li> <li>carbon disulfide, trichloroethylene, cresol</li> <li>thinners, oil of turpentine</li> <li>triethanolamine, TCP, TBP</li> </ul>
C	Melted { }: Used as solvent.	<ul> <li>concentrated sulfuric acid</li> <li>benzene</li> <li>styrene, acrylonitrile, vinyl acetate</li> <li>ethylenediamine, diethylenediamine</li> <li>{chloroform, methyl chloride, tetrachloromethane, dioxane,}</li> <li>1, 2-dichloroethane</li> </ul>
D	Decomposed	<ul><li>ammonia water</li><li>other alkali</li></ul>

## RECOMMENDABLE MATCHED CONNECTOR

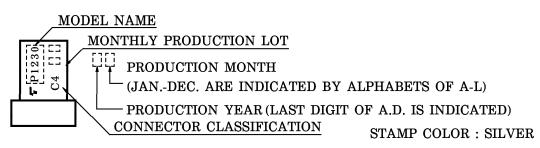
Molex Japan Co., Ltd. made connector (Low profile type)

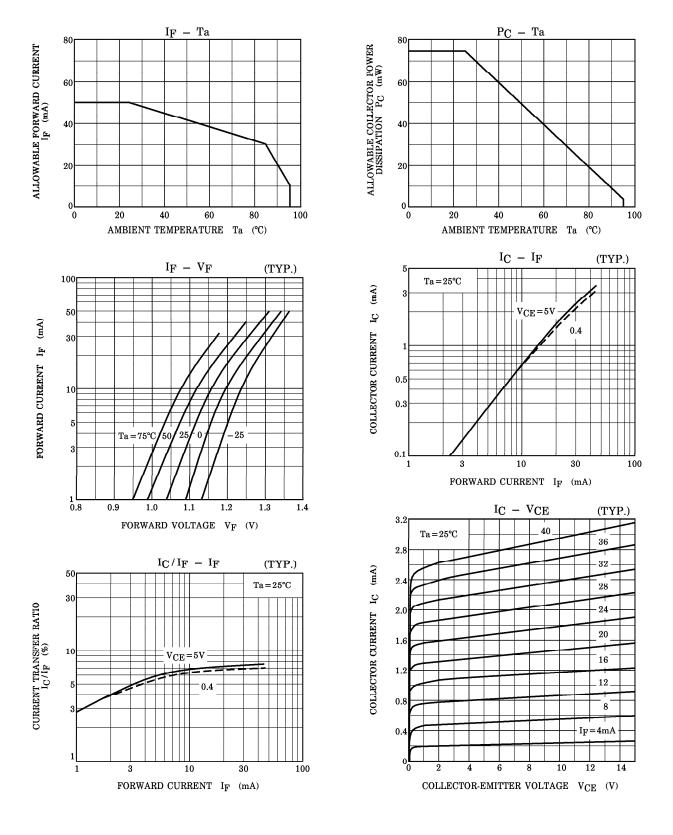
HOUSING	51004-0300				
	TYPE No.	PRODUCT FORM	MATERIAL	AWG SIZE	INSULATION DIAMETER
TERMINAL	50011-8100	LOOSEN		AWG24~30	1 4 MAY
IERMINAL	50011-8000	LINKED	PHOSPHOR	AWG24~30	1.4mm MAX
	50031-8100	LOOSEN	BRONZE	ATUCOO 04	0.0 mm MAV
	50031-8000	LINKED		AWG30~34	0.9mm MAX

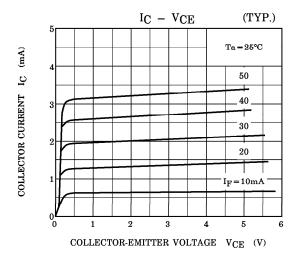
For details of the connectors, please refer to the connector maker.

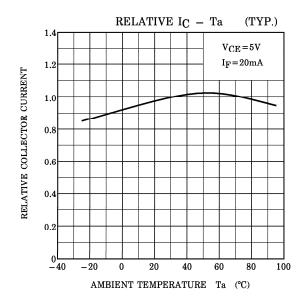
## PRODUCT INDICATION

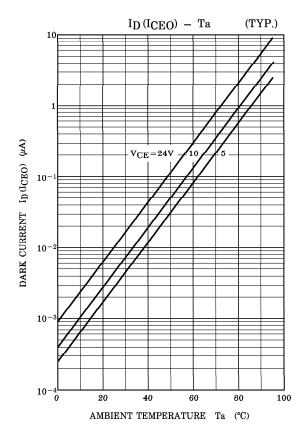
TYPE	ABBREVIATION
TLP1230 (C4)	P1230

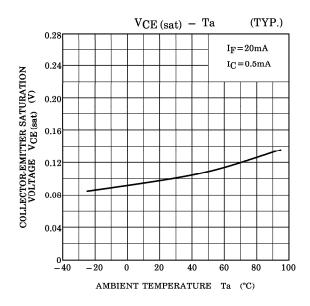


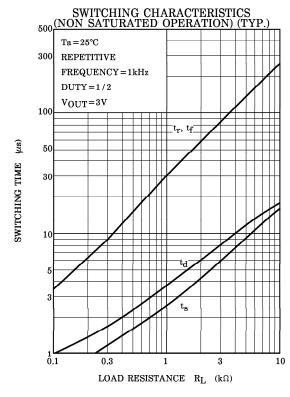


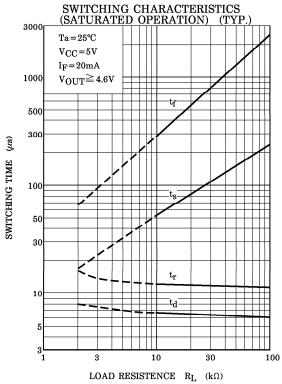


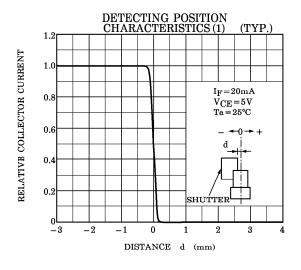


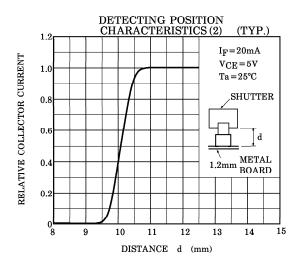




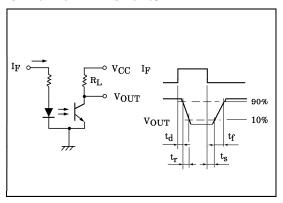








### SWITCHING TIME TEST CIRCUIT

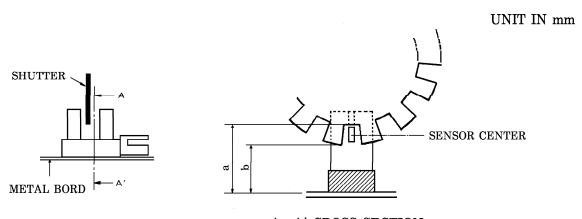


### POSITIONING OF SHUTTER AND DEVICE

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.



A-A' CROSS SECTION

Unit: mm

METAL BOARD THICKNESS	a SIZE	b SIZE
1.0	11.9MIN.	9.4MAX.
1.2	11.7MIN.	9.2MAX.

### RECOMMENDED MOUNTING HOLE

