

TOSHIBA PHOTO IC Si MONOLYTIC PHOTO IC

TPS831

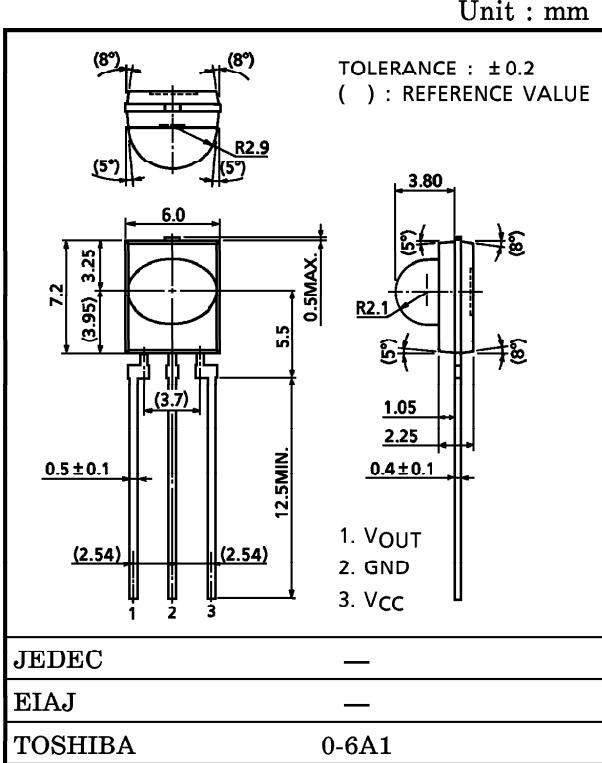
HIGH-SPEED OPTICAL REMOTE CONTROLLERS

CORDLESS CONTROLLERS FOR VIDEO-GAMES

ELECTRONIC ORGANIZERS AND OTHER NEW
PORTABLE INFORMATION TOOLS

IR DATA COMMUNICATION

- The TPS831 is a photo IC which includes a photodiode, I-V converter, band-pass filter and AGC amplifier on a single chip.
- The device's carrier frequency is as follows
: $f_0 = 455\text{kHz}$
- The device's supply voltage is as follows
: $V_{CC} = 5\text{V}$
- Visible light cut-off frequency : 800nm
- The TLN105B and TLN115A are available as infrared LEDs for remote controllers.



Weight : 0.3g (Typ.)

MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	7	V
Operating Temperature Range	T_{opr}	-20~60	°C
Storage Temperature Range	T_{stg}	-30~100	°C
Soldering Temperature Range (5s)	T_{sol}	260	°C

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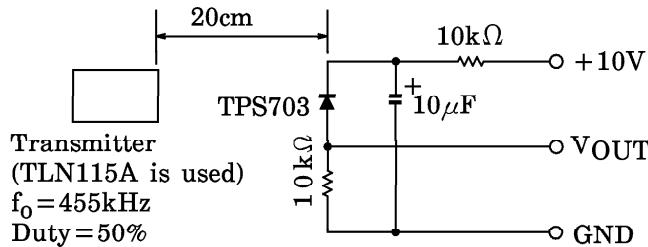
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OPTO-ELECTRICAL CHARACTERISTICS ($V_{CC} = 5V$, $T_a = 25^\circ C$, $C = 1000pF$: Note 1)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	3	5	7	V
Supply Current	I_{CC}	$E=0$	—	1.2	3.0	mA
Electromagnetic Sensitivity	E_S	(Note 5)	—	250	—	V_{p-p}/m
Transmission Range	L (Note 3)	The burst wave shown in (Note 4) is transmitted by a standard transmitter. (Note 2)	3	5	—	m
High-Level Output Voltage	V_{OH}	External light intensity < 500 ℓ_x	4.0	—	—	V
Low-Level Output Voltage	V_{OL}	Output Current < 10 μA	—	—	0.5	V
ON Pulse Width	T_{ON}	—	16	25	40	μs
OFF Pulse Width	T_{OFF}	—	—	63	—	μs
Carrier Frequency	f_0	—	—	455	—	kHz
Radiation Angle	θ_H	Horizontal angle, $L/2$ (Note 6)	± 55	± 63	—	$^\circ$
	θ_V	Vertical angle, $L/2$ (Note 6)	± 25	± 30	—	$^\circ$

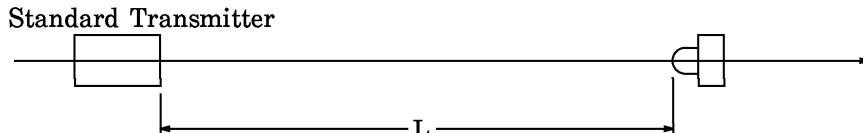
(Note 1) Measurements for the TPS831 are based on a standard circuit that includes a 1000pF capacitor between V_O and GND to prevent oscillation.

(Note 2) Standard Transmitter

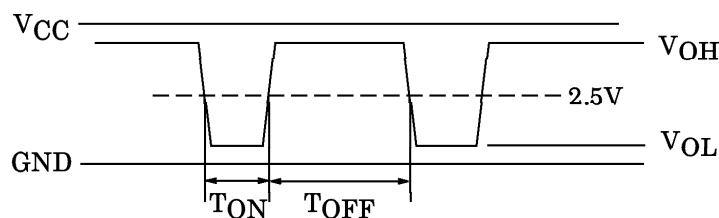


In the figure above, the transmitter shall be set as the output V_{OUT} will be 80mVpp. The TPS703 in this application has a short circuit current $I_{SC} = 1.24\mu A$ measured at $E = 0.1\text{mW/cm}^2$. (E is the radiant incidence using a CIE standard light source A)

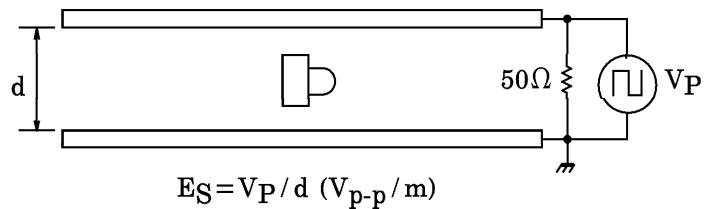
(Note 3) Transmission Distance L



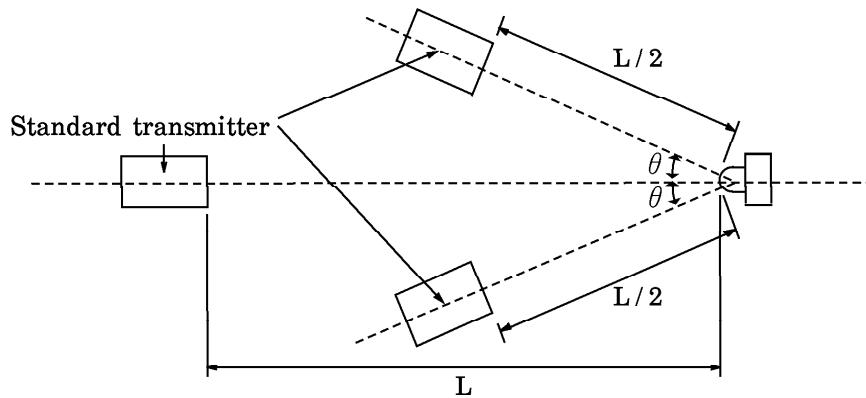
(Note 4) Burst Wave



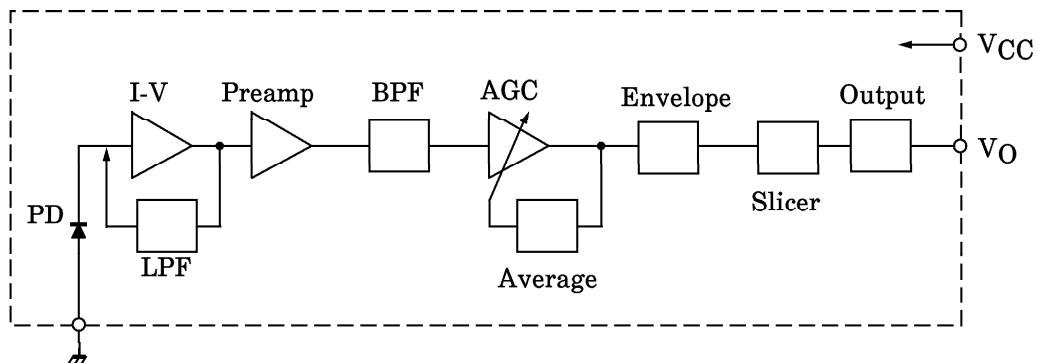
(Note 5) Electromagnetic Sensitivity



(Note 6) Radiation Angle



Circuit Block Diagram



PRECAUTIONS

1. If a lead is formed, it should be formed at a distance of 2mm from the body of the device. Forming the lead should not cause stress to the body of the device. Soldering must be performed after lead forming.
2. Insert a bypass condenser of up to $0.01\mu\text{F}$ between V_{CC} and GND near the device to stabilize the power supply line.
3. Within $100\mu\text{s}$ of V_{CC} turning on, the output voltage changes to stabilize the inner circuit.

